CHAPTER

28

FUEL

CHAPTER 28
FUEL

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516	May 05/2018	

Subject/Page	Date	COC
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552	Sep 05/2017	

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406	Sep 05/2017	

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Subject/Page	Date	COC
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Subject/Page	Date	COC
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411	Jan 05/2018	

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R 620	Sep 05/2018	
621	Sep 05/2016	

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414	Sep 05/2017	

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28-31-02		
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418	May 05/2018	

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424	May 05/2017	
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28-31-03		
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428	May 05/2018	
429	Sep 05/2017	
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414	Sep 05/2017	
28-31-05		
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Airworthiness Limitation Precautions TASK 28-00-00-910-801			201	ARO ALL
Inspection of the Electrical Bonding Jumpers in the Fuel System TASK 28-00-00-200-801			202	ARO ALL
Replacement of the Electrical Bonding Jumpers in the Fuel System TASK 28-00-00-960-801			203	ARO ALL
Fuel System Static Bond Path Left Center Tank - Inspection TASK 28-00-00-280-803			207	ARO ALL
Fuel System Static Bond Path Right Center Tank - Inspection TASK 28-00-00-280-804			208	ARO ALL
Fuel System Static Bond Path Wing Center Section - Inspection TASK 28-00-00-280-805			210	ARO ALL
Fuel System Static Bond Path Left Main Tank TASK 28-00-00-280-807			218	ARO ALL
Fuel System Static Bond Path Right Main Tank - Inspection TASK 28-00-00-280-808			231	ARO ALL
Fuel System Fault Current, Left Side - Inspection TASK 28-00-00-760-801			245	ARO ALL
Fuel System Fault Current, Right Side - Inspection TASK 28-00-00-760-802			248	ARO ALL
APU DC Fuel Pump Fault Current - Inspection TASK 28-00-00-760-803			250	ARO ALL
FUEL SYSTEM - DDG MAINTENANCE PROCEDURES	28-00-00		901	ARO ALL
DDG Graphics TASK 28-00-00-901-801			902	ARO ALL
MMEL 28-11-1 (DDG) Preparation - Sump Drain Valves Inoperative TASK 28-00-00-040-801			915	ARO ALL

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MMEL 28-11-1 (DDG) Restoration - Sump Drain Valves Inoperative TASK 28-00-00-440-801			915	ARO ALL
MMEL 28-21-01-01 (DDG) Preparation - Refuel Valve(s) Inoperative TASK 28-00-00-040-802			916	ARO ALL
MMEL 28-21-01-01 (DDG) Restoration - Refuel Valve(s) Inoperative TASK 28-00-00-440-802			919	ARO ALL
MMEL 28-21-01-02 (DDG) Preparation - Fuel Quantity Indication (Integrated Refuel Panel) Inoperative TASK 28-00-00-040-816			921	ARO ALL
MMEL 28-21-01-02 (DDG) Restoration - Fuel Quantity Indication (Integrated Refuel Panel) Inoperative TASK 28-00-00-040-817			925	ARO ALL
MMEL 28-21-3 (DDG) Preparation - Refuel Adapter Inoperative TASK 28-00-00-040-834			925	ARO ALL
MMEL 28-21-3 (DDG) Restoration - Refuel Adapter Inoperative TASK 28-00-00-440-829			926	ARO ALL
MMEL 28-22-1 (DDG) Preparation - Main Tank Fuel Pump Inoperative TASK 28-00-00-040-803			927	ARO ALL
MMEL 28-22-1 (DDG) Restoration - Main Tank Fuel Pump Inoperative TASK 28-00-00-440-803			929	ARO ALL
MMEL 28-22-2 (DDG) Preparation - Center Override/Jettison Pump Inoperative TASK 28-00-00-040-804			930	ARO ALL
MMEL 28-22-2 (DDG) Restoration - Center Override/Jettison Pump Inoperative TASK 28-00-00-440-804			931	ARO ALL
MMEL 28-22-3 (DDG) Preparation - Crossfeed Valve Inoperative TASK 28-00-00-040-805			932	ARO ALL

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MMEL 28-22-3 (DDG) Restoration - Crossfeed Valve Inoperative TASK 28-00-00-440-805			934	ARO ALL
MMEL 28-22-4 (DDG) Preparation - Fuel Scavenge Systems Inoperative TASK 28-00-00-040-819			936	ARO 001-004 PRE SB 777-28-0078
MMEL 28-22-4 (DDG) Restoration - Fuel Scavenge Systems Inoperative TASK 28-00-00-440-815			936	ARO 001-004 PRE SB 777-28-0078
MMEL 28-22-7 (DDG) Preparation - Fuel Scavenge Shutoff Valve Inoperative TASK 28-00-00-040-818			937	ARO 001-004 PRE SB 777-28-0078
MMEL 28-22-7 (DDG) Restoration - Fuel Scavenge Shutoff Valve Inoperative TASK 28-00-00-440-814			940	ARO 001-004 PRE SB 777-28-0078
MMEL 28-25-1 (DDG) Preparation - APU DC Fuel Pump Inoperative TASK 28-00-00-040-806			941	ARO ALL
MMEL 28-25-1 (DDG) Restoration - APU DC Fuel Pump Inoperative TASK 28-00-00-440-806			942	ARO ALL
MMEL 28-25-2 (DDG) Preparation - APU Fuel Shutoff Valve Inoperative TASK 28-00-00-040-807			943	ARO ALL
MMEL 28-25-2 (DDG) Restoration - APU Fuel Shutoff Valve Inoperative TASK 28-00-00-440-807			944	ARO ALL
MMEL 28-25-3 (DDG) Preparation - APU Fuel Isolation Valve Inoperative TASK 28-00-00-040-808			946	ARO ALL
MMEL 28-25-3 (DDG) Restoration - APU Fuel Isolation Valve Inoperative TASK 28-00-00-440-808			947	ARO ALL
MMEL 28-26-1 (DDG) Preparation - Defuel Valve Inoperative TASK 28-00-00-040-809			949	ARO ALL

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MMEL 28-31-1 (DDG) Preparation - Fuel Jettison System Inoperative TASK 28-00-00-040-810			953	ARO ALL
MMEL 28-31-1 (DDG) Restoration - Fuel Jettison System Inoperative TASK 28-00-00-440-810			955	ARO ALL
MMEL 28-31-2 (DDG) Preparation - Center Tank Jettison Isolation Valves Inoperative TASK 28-00-00-040-811			960	ARO ALL
MMEL 28-31-2 (DDG) Restoration - Center Tank Jettison Isolation Valve(s) Inoperative TASK 28-00-00-440-811			962	ARO ALL
MMEL 28-31-3 (DDG) Preparation - Main Tank Jettison Pumps Inoperative TASK 28-00-00-040-812			964	ARO ALL
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MMEL 28-31-4 (DDG) Preparation - Fuel Jettison Nozzle Valve(s) Inoperative TASK 28-00-00-040-813			967	ARO ALL
MMEL 28-31-4 (DDG) Restoration - Fuel Jettison Nozzle Valve(s) Inoperative TASK 28-00-00-440-813			969	ARO ALL
MMEL 28-41-1 (DDG) Preparation - Fuel Quantity Indicating System (Flight Deck) Inoperative TASK 28-00-00-040-814			972	ARO ALL
MMEL 28-41-1 (DDG) Restoration - Fuel Quantity Indicating System (Flight Deck) Inoperative TASK 28-00-00-040-815			973	ARO ALL
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External Wires Over the Center Fuel Tank - Inspection TASK 28-11-00-210-801			631	ARO ALL

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Center Tank Access Door - Removal TASK 28-11-02-000-801			401	ARO ALL
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Pressure Relief Valve - Installation TASK 28-13-03-400-801			205	ARO ALL
Pressure Relief Valve - Inspection/Check TASK 28-13-03-200-801			208	ARO ALL
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Surge Tank Vent Flame Arrestor - Removal TASK 28-13-05-000-801			401	ARO ALL
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Poppet Valve Assembly - Installation TASK 28-21-01-420-801			419	ARO ALL; AIRPLANES WITH SWEENEY 56-2500-2 OR 56-2500-3 REFUEL ADAPTER
Poppet Valve Assembly - Removal TASK 28-21-01-020-802			420	ARO ALL; AIRPLANES WITH INTERTECHNIQUE K97B63-601 REFUEL ADAPTER
Poppet Valve Assembly - Installation TASK 28-21-01-420-802			425	ARO ALL; AIRPLANES WITH INTERTECHNIQUE K97B63-601 REFUEL ADAPTER
REFUEL VALVE - REMOVAL/INSTALLATION	28-21-02		401	ARO ALL
Refuel Valve - Removal TASK 28-21-02-000-801			401	ARO ALL
Refuel Valve - Installation TASK 28-21-02-400-801			408	ARO ALL
REFUEL VALVE - INSPECTION/CHECK	28-21-02		601	ARO ALL
Refuel Valve - Bonding Resistance Check TASK 28-21-02-200-802			601	ARO ALL
REFUEL VALVE CONTROL UNIT - REMOVAL/INSTALLATION	28-21-03		401	ARO ALL
Refuel Valve Control Unit - Removal TASK 28-21-03-000-801			401	ARO ALL
Refuel Valve Control Unit - Installation TASK 28-21-03-400-801			408	ARO ALL
SURGE TANK FLOAT SWITCH - REMOVAL/INSTALLATION	28-21-04		401	ARO ALL
Surge Tank Float Switch - Removal TASK 28-21-04-000-801			401	ARO ALL
Surge Tank Float Switch - Installation TASK 28-21-04-400-801			405	ARO ALL
SURGE TANK FLOAT SWITCH - INSPECTION/CHECK	28-21-04		601	ARO ALL
Surge Tank Float Switch - Bonding Resistance Check TASK 28-21-04-200-801			601	ARO ALL

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REFUELING MANIFOLD DRAIN VALVE - REMOVAL/INSTALLATION	28-21-05		401	ARO ALL
Inboard Refueling Manifold Drain Valve - Removal TASK 28-21-05-000-801			401	ARO ALL
Inboard Refueling Manifold Drain Valve - Installation TASK 28-21-05-400-801			404	ARO ALL
Outboard Refueling Manifold Drain Valve - Removal TASK 28-21-05-000-802			405	ARO ALL
Outboard Refueling Manifold Drain Valve - Installation TASK 28-21-05-400-802			409	ARO ALL
REFUELING STATION DOOR PROXIMITY SWITCH - REMOVAL/INSTALLATION	28-21-06		401	ARO ALL
Refueling Station Door Proximity Switch - Removal TASK 28-21-06-000-801			401	ARO ALL
Refueling Station Door Proximity Switch - Installation TASK 28-21-06-400-801			405	ARO ALL
INTEGRATED REFUEL PANEL (IRP) - REMOVAL/INSTALLATION	28-21-07		401	ARO ALL
Integrated Refuel Panel - Removal TASK 28-21-07-000-801			401	ARO ALL
Integrated Refuel Panel - Installation TASK 28-21-07-400-801			405	ARO ALL
REFUEL MANIFOLD AND COUPLINGS - REMOVAL/INSTALLATION	28-21-08		401	ARO ALL
Refuel/Jettison Manifold and Couplings - Removal (Selection) TASK 28-21-08-000-802			401	ARO ALL
Refuel/Jettison Manifold and Couplings - Installation (Selection) TASK 28-21-08-400-802			408	ARO ALL

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Coupling and Clamp Removal (General Procedures) TASK 28-21-08-000-803			409	ARO ALL
Coupling and Clamp Installation (General Procedures) TASK 28-21-08-400-803			418	ARO ALL
Center Tank Refuel Distribution Tube Removal TASK 28-21-08-000-816			424	ARO ALL
Center Tank Refuel Distribution Tube Installation TASK 28-21-08-400-816			432	ARO ALL
Main Tank Inboard Refuel Valve Tubes Removal TASK 28-21-08-000-805			435	ARO ALL
Main Tank Inboard Refuel Valve Tubes Installation TASK 28-21-08-400-805			446	ARO ALL
Main Tank Outboard Refuel Valve Tubes Removal TASK 28-21-08-000-806			449	ARO ALL
Main Tank Outboard Refuel Valve Tubes Installation TASK 28-21-08-400-806			459	ARO ALL
Refuel Tubing Removal TASK 28-21-08-000-807			464	ARO ALL
Refuel Tubing Installation TASK 28-21-08-400-807			469	ARO ALL
Surge Tank Tube Removal TASK 28-21-08-000-817			471	ARO ALL
Surge Tank Tube Installation TASK 28-21-08-400-817			478	ARO ALL
Side of Body (SOB) Rib Bulkhead Fitting Removal TASK 28-21-08-000-809			484	ARO ALL
Side of Body (SOB) Rib Bulkhead Fitting Installation TASK 28-21-08-400-809			489	ARO ALL
Main Tank Rib 8 Bulkhead Fitting Removal TASK 28-21-08-000-810			491	ARO ALL

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Main Tank Rib 8 Bulkhead Fitting Installation TASK 28-21-08-400-810			497	ARO ALL
Main Tank Rib 18 Bulkhead Fitting Removal TASK 28-21-08-000-811			498.1	ARO ALL
Main Tank Rib 18 Bulkhead Fitting Installation TASK 28-21-08-400-811			498.7	ARO ALL
Fuel Jettison Pump Tube Removal TASK 28-21-08-000-814			498.10	ARO ALL
Fuel Jettison Pump Tube Installation TASK 28-21-08-400-814			498.17	ARO ALL
Fuel Jettison Tube Removal TASK 28-21-08-000-815			498.19	ARO ALL
Fuel Jettison Tube Installation TASK 28-21-08-400-815			498.26	ARO ALL
REFUEL/JETTISON MANIFOLD AND COUPLINGS - INSPECTION/CHECK	28-21-08		601	ARO ALL
Refuel/Jettison Manifold (Out of Tank) - Bonding Resistance Check TASK 28-21-08-200-801			601	ARO ALL
INTEGRATED REFUEL PANEL (IRP) INDICATOR LIGHT - REMOVAL/INSTALLATION	28-21-09		401	ARO ALL
Integrated Refuel Panel Indicator Light - Removal TASK 28-21-09-000-801			401	ARO ALL
Integrated Refuel Panel Indicator Light - Installation TASK 28-21-09-400-801			404	ARO ALL
SECONDARY REFUEL VALVE - REMOVAL/INSTALLATION	28-21-10		401	ARO ALL
Secondary Refuel Valve - Removal TASK 28-21-10-000-801			401	ARO ALL
Secondary Refuel Valve - Installation TASK 28-21-10-400-801			404	ARO ALL
SECONDARY REFUEL VALVE FLOAT VALVE - REMOVAL/INSTALLATION	28-21-11		401	ARO ALL
Secondary Refuel Valve Float Valve - Removal TASK 28-21-11-000-801			401	ARO ALL

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Secondary Refuel Valve Float Valve - Installation TASK 28-21-11-400-801			404	ARO ALL
ENGINE FUEL FEED SYSTEM - MAINTENANCE PRACTICES	28-22-00	1	201	ARO ALL
Engine Fuel Feed System - Deactivation TASK 28-22-00-040-801-001		1	201	ARO ALL
Engine Fuel Feed System - Activation TASK 28-22-00-440-801-001		1	204	ARO ALL
ENGINE FUEL FEED SYSTEM - ADJUSTMENT/TEST	28-22-00		501	ARO ALL
Engine Fuel Feed Pumps and Crossfeed Valves - Functional Test TASK 28-22-00-730-801			501	ARO ALL
Engine Fuel Spar Valve - Electrical Control and Indication Test TASK 28-22-00-710-801			512	ARO ALL
Engine Fuel Spar Valve Installation - Test TASK 28-22-00-720-801			515	ARO ALL
Fuel Shutoff Valve Battery - Test TASK 28-22-00-720-803			522	ARO ALL
Fuel Scavenge System - Functional Test TASK 28-22-00-720-802			524	ARO 001-004 PRE SB 777-28-0078
Fuel Scavenge System - Functional Test TASK 28-22-00-720-805			529	ARO 005-999; ARO 001-004 POST SB 777-28-0078
Abbreviated Fuel Scavenge System - Functional Test TASK 28-22-00-720-804			533	ARO 001-004 PRE SB 777-28-0078
Engine Fuel Suction Feed - Operational Test TASK 28-22-00-710-808			536	ARO ALL
Main Tank Fuel Boost Pump Ground Fault Interrupter - Operational Test TASK 28-22-00-710-803			543	ARO ALL
Center Fuel Tank Override/Jettison Pump Ground Fault Protection - Operational Test TASK 28-22-00-710-806			551	ARO ALL

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Fuel Jettison Pump Ground Fault Protection - Operational Test TASK 28-22-00-710-807			559	ARO ALL
AC Fuel Pumps - Insulation Resistance Test TASK 28-22-00-760-801			567	ARO ALL
ENGINE FUEL FEED SYSTEM - INSPECTION/CHECK	28-22-00		601	ARO ALL
Main Fuel Boost Pump Inspection TASK 28-22-00-750-801			601	ARO ALL
Out-of-Tank Wire Bundle (Installed on Fuel Tank) - Inspection TASK 28-22-00-210-801			607	ARO ALL
ENGINE FUEL SPAR VALVE AND ADAPTER/SHAFT - REMOVAL/INSTALLATION	28-22-01		401	ARO ALL
Engine Fuel Spar Valve (Valve Body) - Removal TASK 28-22-01-000-801			401	ARO ALL
Engine Fuel Spar Valve (Valve Body) - Installation TASK 28-22-01-400-801			405	ARO ALL
Engine Fuel Spar Valve (Adapter/Shaft) - Removal TASK 28-22-01-000-803			408	ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS
Engine Fuel Spar Valve (Adapter/Shaft) - Installation TASK 28-22-01-400-803			414	ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS
Rework the Fay Sealed Fay Surface Bonds for the Spar Valve TASK 28-22-01-300-801			423	ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS
Adapter Shaft Alignment TASK 28-22-01-820-801			429	ARO ALL
ENGINE FUEL SPAR VALVE - INSPECTION/CHECK	28-22-01	1	601	ARO ALL
Engine Fuel Spar Valve - Pressure Leak Check TASK 28-22-01-790-801-001		1	601	ARO ALL

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ENGINE FUEL SPAR VALVE ACTUATOR - REMOVAL/INSTALLATION	28-22-02		401	ARO ALL
Engine Fuel Spar Valve Actuator - Removal TASK 28-22-02-000-802			401	ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS
Engine Fuel Spar Valve Actuator - Installation TASK 28-22-02-400-802			405	ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS
ENGINE FUEL SPAR VALVE ACTUATOR - INSPECTION/CHECK	28-22-02		601	ARO ALL
Engine Fuel Spar Valve Actuator - Bonding Resistance Check TASK 28-22-02-200-801			601	ARO ALL
FORWARD/AFT FUEL CROSSFEED VALVE - REMOVAL/INSTALLATION	28-22-03		401	ARO ALL
FWD/AFT Fuel Crossfeed Valve (Valve Body) - Removal TASK 28-22-03-000-801			401	ARO ALL
FWD/AFT Fuel Crossfeed Valve (Valve Body) - Installation TASK 28-22-03-400-801			405	ARO ALL
Engine Fuel Crossfeed Valve (Adapter/Shaft) - Removal TASK 28-22-03-000-803			408	ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS
Engine Fuel Crossfeed Valve (Adapter/Shaft) - Installation TASK 28-22-03-400-803			414	ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS
Adapter Shaft Alignment TASK 28-22-03-820-801			422	ARO ALL
Rework the Fay Sealed Fay Surface Bonds for the Engine Fuel Crossfeed Valve TASK 28-22-03-300-801			427	ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS

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FWD/AFT FUEL CROSSFEED VALVE ACTUATOR - REMOVAL/INSTALLATION	28-22-04		401	ARO ALL
FWD/AFT Fuel Crossfeed Valve Actuator - Removal TASK 28-22-04-000-802			401	ARO ALL
FWD/AFT Fuel Crossfeed Valve Actuator - Installation TASK 28-22-04-400-802			405	ARO ALL
FWD/AFT FUEL CROSSFEED VALVE ACTUATOR - INSPECTION/CHECK	28-22-04		601	ARO ALL
FWD/AFT Fuel Crossfeed Valve Actuator - Bonding Resistance Check TASK 28-22-04-200-801			601	ARO ALL
MAIN TANK FUEL BOOST PUMP - REMOVAL/INSTALLATION	28-22-05		401	ARO ALL
Boost Pump Motor-Impeller - Removal TASK 28-22-05-000-801			401	ARO ALL
Boost Pump Motor-Impeller - Installation TASK 28-22-05-400-801			410	ARO ALL
Boost Pump Housing - Removal TASK 28-22-05-000-802			418	ARO ALL
Boost Pump Housing - Installation TASK 28-22-05-400-802			427	ARO ALL
MAIN TANK FUEL BOOST PUMP - INSPECTION/CHECK	28-22-05		601	ARO ALL
Main Tank Fuel Boost Pump Motor-Impeller - Bonding Resistance Check TASK 28-22-05-200-801			601	ARO ALL
Main Tank Fuel Boost Pump Housing - Bonding Resistance Check TASK 28-22-05-200-802			608	ARO ALL
CENTER FUEL TANK OVERRIDE/JETTISON PUMP - REMOVAL/INSTALLATION	28-22-06		401	ARO ALL
Override/Jettison Pump Motor-Impeller - Removal TASK 28-22-06-000-801			402	ARO ALL

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Override/Jettison Pump Motor-Impeller - Installation TASK 28-22-06-400-801			408	ARO ALL
Override/Jettison Pump Housing - Removal TASK 28-22-06-000-802			414	ARO ALL
Override/Jettison Pump Housing - Installation TASK 28-22-06-400-802			422	ARO ALL
CENTER FUEL TANK OVERRIDE/JETTISON PUMP - INSPECTION/CHECK	28-22-06		601	ARO ALL
Override/Jettison Pump Motor-Impeller - Bonding Resistance Check TASK 28-22-06-200-802			601	ARO ALL
MOTIVE FLOW CHECK VALVE - REMOVAL/INSTALLATION	28-22-07		401	ARO ALL
Motive Flow Check Valve (Out Of Fuel Tank) - Removal TASK 28-22-07-000-801			401	ARO ALL
Motive Flow Check Valve (Out Of Fuel Tank) - Installation TASK 28-22-07-400-801			407	ARO ALL
Motive Flow Check Valve (Pump Housing) - Removal TASK 28-22-07-000-802			408	ARO ALL
Motive Flow Check Valve (Pump Housing) - Installation TASK 28-22-07-400-802			409	ARO ALL
DISCHARGE CHECK VALVE - REMOVAL/INSTALLATION	28-22-08		401	ARO ALL
Discharge Check Valve (Out Of Fuel Tank) - Removal TASK 28-22-08-000-801			401	ARO ALL
Discharge Check Valve (Out Of Fuel Tank) - Installation TASK 28-22-08-400-801			405	ARO ALL
Discharge Check Valve (Pump Housing) - Removal TASK 28-22-08-000-802			406	ARO ALL

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Discharge Check Valve (Pump Housing) - Installation TASK 28-22-08-400-802			407	ARO ALL
DISCHARGE CHECK VALVE - ADJUSTMENT/TEST	28-22-08		501	ARO ALL
Discharge Check Valve - Functional Test TASK 28-22-08-720-801			501	ARO ALL
VAPOR VENT VALVE - REMOVAL/INSTALLATION	28-22-09		401	ARO ALL
Vapor Vent Valve (Out Of Tank) - Removal TASK 28-22-09-000-801			401	ARO ALL
Vapor Vent Valve (Out Of Tank) - Installation TASK 28-22-09-400-801			405	ARO ALL
Vapor Vent Valve (Pump Housing) - Removal TASK 28-22-09-000-802			406	ARO ALL
Vapor Vent Valve (Pump Housing) - Installation TASK 28-22-09-400-802			407	ARO ALL
MAIN FUEL TANK FUEL SUCTION BYPASS VALVE - REMOVAL/INSTALLATION	28-22-10		401	ARO ALL
Suction Bypass Valve - Removal TASK 28-22-10-020-801			401	ARO ALL
Suction Bypass Valve - Installation TASK 28-22-10-420-801			405	ARO ALL
FLOAT-OPERATED SHUTOFF VALVES - REMOVAL/INSTALLATION	28-22-11		401	ARO 001-004 PRE SB 777-28-0078
Outlet Float-Operated Shutoff Valve - Removal TASK 28-22-11-000-803			401	ARO 001-004 PRE SB 777-28-0078
Outlet Float-Operated Shutoff Valve - Installation TASK 28-22-11-400-803			405	ARO 001-004 PRE SB 777-28-0078
Inlet Float-Operated Shutoff Valve - Removal TASK 28-22-11-000-801			407	ARO 001-004 PRE SB 777-28-0078
Inlet Float-Operated Shutoff Valve - Installation TASK 28-22-11-400-801			408	ARO 001-004 PRE SB 777-28-0078
FUEL SCAVENGE JET PUMP - REMOVAL/INSTALLATION	28-22-12		401	ARO ALL
Fuel Scavenge Jet Pump - Removal TASK 28-22-12-000-801			401	ARO ALL

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Fuel Scavenge Jet Pump - Installation TASK 28-22-12-400-801			407	ARO ALL
FUEL SCAVENGE JET PUMP - INSPECTION/CHECK	28-22-12		601	ARO ALL
Fuel Scavenge Jet Pump - Bonding Resistance Check TASK 28-22-12-200-801			601	ARO 001-004 PRE SB 777-28-0078
Fuel Scavenge Jet Pump - Bonding Resistance Check TASK 28-22-12-200-802			603	ARO 005-999; ARO 001-004 POST SB 777-28-0078
WATER SCAVENGE JET PUMP - REMOVAL/INSTALLATION	28-22-13		401	ARO ALL
Water Scavenge Jet Pump - Removal TASK 28-22-13-000-801			401	ARO ALL
Water Scavenge Jet Pump - Installation TASK 28-22-13-400-801			408	ARO ALL
WATER SCAVENGE JET PUMP - INSPECTION/CHECK	28-22-13		601	ARO ALL
Water Scavenge Jet Pump Check TASK 28-22-13-200-801			601	ARO ALL
Water Scavenge Jet Pump - Bonding Resistance Check TASK 28-22-13-200-802			607	ARO ALL
ENGINE FUEL SPAR VALVE BATTERY - REMOVAL/INSTALLATION	28-22-14		401	ARO ALL
Engine Fuel Spar Valve Battery - Removal TASK 28-22-14-000-801			401	ARO ALL
Engine Fuel Spar Valve Battery - Installation TASK 28-22-14-400-801			403	ARO ALL
FUEL FEED MANIFOLD AND COUPLINGS - MAINTENANCE PRACTICES	28-22-15		201	ARO ALL
Engine Fuel Feed and Refuel Manifold - Leak Isolation TASK 28-22-15-790-808			201	ARO ALL

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Fuel Line, Fitting and Coupling - Removal TASK 28-22-15-000-802-001		1	401	ARO ALL
Fuel Line, Fitting and Coupling - Installation TASK 28-22-15-400-802-001		1	418	ARO ALL
Fuel Line, Engine Strut Coupling O-Ring - Removal TASK 28-22-15-000-804-001		1	431	ARO ALL
Fuel Line, Engine Strut Coupling O-Ring - Installation TASK 28-22-15-400-804-001		1	445	ARO ALL
FUEL FEED MANIFOLD COUPLINGS - INSPECTION/CHECK	28-22-15	1	601	ARO ALL
Engine Fuel Feed Manifold, Spar and Crossfeed Valve - Leak Check TASK 28-22-15-790-802-001		1	601	ARO ALL
Engine Fuel Feed Manifold - Suction Feed Line Leak Check TASK 28-22-15-710-802-001		1	620	ARO ALL
Fuel Tube Damage Criteria - Inspection/Check TASK 28-22-15-700-802-001		1	626	ARO ALL
CENTER TANK CHECK VALVE - REMOVAL/INSTALLATION	28-22-16		401	ARO ALL
Center Tank Check Valve - Removal TASK 28-22-16-000-801			401	ARO ALL
Center Tank Check Valve - Installation TASK 28-22-16-400-801			404	ARO ALL
FUEL SYSTEM CONTROL PANEL - REMOVAL/INSTALLATION	28-22-17		401	ARO ALL
Fuel System Module Assembly Removal TASK 28-22-17-000-801			401	ARO ALL
Fuel System Module Assembly Installation TASK 28-22-17-400-801			403	ARO ALL

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GROUND FAULT INTERRUPTER RELAY - REMOVAL/INSTALLATION	28-22-19		401	ARO ALL
Ground Fault Interrupter (GFI) Relay - Removal TASK 28-22-19-000-801			401	ARO ALL
Ground Fault Interrupter (GFI) Relay - Installation TASK 28-22-19-400-801			405	ARO ALL
APU FUEL FEED SYSTEM - MAINTENANCE PRACTICES	28-25-00		201	ARO ALL
Purge the Air from the APU Fuel Supply Line TASK 28-25-00-700-801			201	ARO ALL
APU FUEL FEED SYSTEM - ADJUSTMENT/TEST	28-25-00		501	ARO ALL
APU Fuel Feed System - System Test TASK 28-25-00-710-801			501	ARO ALL
APU Fuel Shutoff Valve and DC Pump - Operational Test TASK 28-25-00-710-802			510	ARO ALL
Pressure Test - APU Fuel Line Shroud and Drain Tubing TASK 28-25-00-780-801			512	ARO ALL
APU DC Fuel Pump - Insulation Resistance Test TASK 28-25-00-760-801			517	ARO ALL
APU FUEL SHUTOFF VALVE - REMOVAL/INSTALLATION	28-25-01		401	ARO ALL
APU Fuel Shutoff Valve - Removal TASK 28-25-01-000-801			401	ARO ALL
APU Fuel Shutoff Valve - Installation TASK 28-25-01-400-801			405	ARO ALL
APU FUEL SHUTOFF VALVE ACTUATOR - REMOVAL/INSTALLATION	28-25-02		401	ARO ALL
APU Fuel Shutoff Valve Actuator - Removal TASK 28-25-02-000-802			401	ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS
APU Fuel Shutoff Valve Actuator - Installation TASK 28-25-02-400-802			405	ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS

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APU FUEL SHUTOFF VALVE ACTUATOR - INSPECTION/CHECK	28-25-02		601	ARO ALL
APU Fuel Shutoff Valve Actuator - Bonding Resistance Check TASK 28-25-02-200-801			601	ARO ALL
APU DC FUEL PUMP - REMOVAL/INSTALLATION	28-25-03		401	ARO ALL
APU DC Fuel Pump (Motor-Impeller) - Removal TASK 28-25-03-000-801			401	ARO ALL
APU DC Fuel Pump (Motor-Impeller) - Installation TASK 28-25-03-400-801			406	ARO ALL
APU DC Fuel Pump (Housing) - Removal TASK 28-25-03-000-802			410	ARO ALL
APU DC Fuel Pump (Housing) - Installation TASK 28-25-03-400-802			411	ARO ALL
APU DC FUEL PUMP - INSPECTION/CHECK	28-25-03		601	ARO ALL
APU DC Fuel Pump (Motor-Impeller Unit) - Bonding Resistance Check TASK 28-25-03-200-801			601	ARO ALL
APU FUEL ISOLATION VALVE - REMOVAL/INSTALLATION	28-25-04		401	ARO ALL
APU Isolation Valve - Removal TASK 28-25-04-000-801			401	ARO ALL
APU Isolation Valve - Installation TASK 28-25-04-400-801			405	ARO ALL
APU ISOLATION VALVE ACTUATOR - REMOVAL/INSTALLATION	28-25-05		401	ARO ALL
APU Isolation Valve Actuator - Removal TASK 28-25-05-000-802			401	ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS
APU Isolation Valve Actuator - Installation TASK 28-25-05-400-802			405	ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS

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APU FUEL ISOLATION VALVE ACTUATOR - INSPECTION/CHECK	28-25-05		601	ARO ALL
APU Fuel Isolation Valve Actuator - Bonding Resistance Check TASK 28-25-05-200-801			601	ARO ALL
APU FUEL SUPPLY LINE AND SHROUD - REMOVAL/INSTALLATION	28-25-06		401	ARO ALL
APU Fuel Supply Line (Left Main Tank, Left Center Fuel Tank and Wing Center Fuel Section) - Removal TASK 28-25-06-000-801			401	ARO ALL
APU Fuel Supply Line (Left Main Tank, Left Center Fuel Tank and Wing Center Fuel Section) - Installation TASK 28-25-06-400-801			408	ARO ALL
APU Fuel Supply Line and Shroud (Wing Center Fuel Section to the Aft Wheel Well Bulkhead) - Removal TASK 28-25-06-000-802			410	ARO ALL
APU Fuel Supply Line and Shroud (Wing Center Fuel Section to Aft Wheel Well Bulkhead) - Installation TASK 28-25-06-400-802			416	ARO ALL
APU Fuel Supply Line and Shroud (Aft Wheel Well Bulkhead to Aft Pressure Bulkhead) - Removal TASK 28-25-06-000-805			419	ARO ALL
APU Fuel Supply Line and Shroud (Aft Wheel Well Bulkhead to Aft Pressure Bulkhead) - Installation TASK 28-25-06-400-805			426	ARO ALL
APU Fuel Supply Line and Shroud (Aft Pressure Bulkhead to the APU Firewall) - Removal TASK 28-25-06-000-803			430	ARO ALL
APU Fuel Supply Line and Shroud (Aft Pressure Bulkhead to the APU Firewall) - Installation TASK 28-25-06-400-803			434	ARO ALL
APU Fuel Shroud Drain Line - Removal TASK 28-25-06-000-804			437	ARO ALL

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SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
APU Fuel Shroud Drain Line - Installation TASK 28-25-06-400-804			441	ARO ALL
APU FUEL SUPPLY DRAIN MAST - REMOVAL/INSTALLATION	28-25-07		401	ARO ALL
APU Fuel Supply Drain Mast - Removal TASK 28-25-07-000-801			401	ARO ALL
APU Fuel Supply Drain Mast - Installation TASK 28-25-07-400-801			404	ARO ALL
DEFUELING - MAINTENANCE PRACTICES	28-26-00		201	ARO ALL
Precautions and Limits for the Defuel Operation TASK 28-26-00-600-801			202	ARO ALL
Pressure Defueling TASK 28-26-00-650-801			203	ARO ALL
Tank to Tank Transfer TASK 28-26-00-650-802			214	ARO ALL
Suction Defueling TASK 28-26-00-650-803			218	ARO ALL
DEFUELING - ADJUSTMENT/TEST	28-26-00		501	ARO ALL
Operational Test - Defuel Valve TASK 28-26-00-720-802			501	ARO ALL
DEFUEL VALVE - REMOVAL/INSTALLATION	28-26-01		401	ARO ALL
Defuel Valve (Valve Body) - Removal TASK 28-26-01-000-801			401	ARO ALL
Defuel Valve (Valve Body) - Installation TASK 28-26-01-400-801			405	ARO ALL
Defuel Valve (Adapter/Shaft) - Removal TASK 28-26-01-000-803			408	ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS
Defuel Valve (Adapter/Shaft) - Installation TASK 28-26-01-400-803			413	ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS
Adapter Shaft Alignment TASK 28-26-01-820-801			421	ARO ALL

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CHAPTER 28
FUEL

SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
Rework the Fay Sealed Fay Surface Bonds for the Defuel Valve TASK 28-26-01-300-801			425	ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS
DEFUEL VALVE ACTUATOR - REMOVAL/INSTALLATION	28-26-02		401	ARO ALL
Defuel Valve (Actuator) - Removal TASK 28-26-02-000-802			401	ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS
Defuel Valve (Actuator) - Installation TASK 28-26-02-400-802			404	ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS
DEFUEL VALVE ACTUATOR - INSPECTION/CHECK	28-26-02		601	ARO ALL
Defuel Valve Actuator - Bonding Resistance Check TASK 28-26-02-200-801			601	ARO ALL
FUEL JETTISON SYSTEM - MAINTENANCE PRACTICES	28-31-00		201	ARO ALL
Fuel Jettison System - Deactivation TASK 28-31-00-040-801			201	ARO ALL
Fuel Jettison System - Activation TASK 28-31-00-440-801			204	ARO ALL
FUEL JETTISON SYSTEM - ADJUSTMENT/TEST	28-31-00		501	ARO ALL
Fuel Jettison System - Operational Test TASK 28-31-00-720-801			501	ARO ALL
Fuel/Fuel Jettison Panel (M28001) - Operational Test TASK 28-31-00-710-801			521	ARO ALL
FUEL JETTISON PUMP - REMOVAL/INSTALLATION	28-31-01		401	ARO ALL
Fuel Jettison Pump (Motor-Impeller) - Removal TASK 28-31-01-000-801			401	ARO ALL
Fuel Jettison Pump (Motor-Impeller) - Installation TASK 28-31-01-400-801			406	ARO ALL
Fuel Jettison Pump Housing - Removal TASK 28-31-01-000-802			412	ARO ALL

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SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
Fuel Jettison Pump Housing - Installation TASK 28-31-01-400-802			418	ARO ALL
FUEL JETTISON PUMP - INSPECTION/CHECK	28-31-01		601	ARO ALL
Fuel Jettison Pump (Motor-Impeller) - Bonding Resistance Check TASK 28-31-01-200-801			601	ARO ALL
FUEL JETTISON NOZZLE VALVE - REMOVAL/INSTALLATION	28-31-02		401	ARO ALL
Fuel Jettison Nozzle Valve (Valve Body) - Removal TASK 28-31-02-000-802			401	ARO ALL
Fuel Jettison Nozzle Valve (Valve Body) - Installation TASK 28-31-02-400-802			406	ARO ALL
Fuel Jettison Nozzle Valve (Adapter/Shaft) - Removal TASK 28-31-02-000-804			409	ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS
Fuel Jettison Nozzle Valve (Adapter/Shaft) - Installation TASK 28-31-02-400-804			411	ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS
Adapter Shaft Alignment TASK 28-31-02-820-801			421	ARO ALL
Rework the Fay Sealed Fay Surface Bonds for the Fuel Jettison Nozzle Valve TASK 28-31-02-300-801			425	ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS
FUEL JETTISON NOZZLE VALVE ACTUATOR - REMOVAL/INSTALLATION	28-31-03		401	ARO ALL
Fuel Jettison Nozzle Valve Actuator - Removal TASK 28-31-03-000-804			401	ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS
Fuel Jettison Nozzle Valve Actuator - Installation TASK 28-31-03-400-804			405	ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS

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SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
FUEL JETTISON NOZZLE VALVE ACTUATOR - INSPECTION/CHECK	28-31-03		601	ARO ALL
Fuel Jettison Nozzle Valve Actuator - Bonding Resistance Check TASK 28-31-03-200-801			601	ARO ALL
FUEL JETTISON ISOLATION VALVE - REMOVAL/INSTALLATION	28-31-04		401	ARO ALL
Fuel Jettison Isolation Valve - Removal TASK 28-31-04-000-801			401	ARO ALL
Fuel Jettison Isolation Valve - Installation TASK 28-31-04-400-801			405	ARO ALL
Fuel Jettison Isolation Valve (Adapter/Shaft) - Removal TASK 28-31-04-000-803			408	ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS
Fuel Jettison Isolation Valve (Adapter/Shaft) - Installation TASK 28-31-04-400-803			414	ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS
Adapter Shaft Alignment TASK 28-31-04-820-801			423	ARO ALL
Rework the Fay Sealed Fay Surface Bonds for the Fuel Jettison Isolation Valve TASK 28-31-04-300-801			427	ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS
FUEL JETTISON ISOLATION VALVE ACTUATOR - REMOVAL/INSTALLATION	28-31-05		401	ARO ALL
Fuel Jettison Isolation Valve Actuator - Removal TASK 28-31-05-000-802			401	ARO ALL
Fuel Jettison Isolation Valve Actuator - Installation TASK 28-31-05-400-802			405	ARO ALL
FUEL JETTISON ISOLATION VALVE ACTUATOR - INSPECTION/CHECK	28-31-05		601	ARO ALL
Fuel Jettison Isolation Valve Actuator - Bonding Resistance Check TASK 28-31-05-200-801			601	ARO ALL

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SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
FUEL JETTISON ISOLATION CHECK VALVE - REMOVAL/INSTALLATION	28-31-06		401	ARO ALL
Fuel Jettison Isolation Check Valve - Removal TASK 28-31-06-000-801			401	ARO ALL
Fuel Jettison Isolation Check Valve - Installation TASK 28-31-06-400-801			405	ARO ALL
FUEL QUANTITY INDICATING SYSTEM (FQIS) - ADJUSTMENT/TEST	28-41-00		501	ARO ALL
Fuel Quantity Indicating System (FQIS) TANK UNITS and DENSITOMETERS - Operational Check TASK 28-41-00-710-801			501	ARO ALL
Fuel Quantity Processor Unit (FQPU) - Operational Check TASK 28-41-00-710-802			504	ARO ALL
Fuel Quantity Processor Unit (FQPU) - Operational Test TASK 28-41-00-400-801			505	ARO ALL
Comparison Check - Fuel Quantity Indicating System with the Fuel Measuring Sticks TASK 28-41-00-720-801			506	ARO ALL
FUEL QUANTITY PROCESSOR UNIT (FQPU) - MAINTENANCE PRACTICES	28-41-01		201	ARO ALL
FQPU Software Installation TASK 28-41-01-400-802			201	ARO ALL
FUEL QUANTITY PROCESSOR UNIT (FQPU) - REMOVAL/INSTALLATION	28-41-01		401	ARO ALL
Fuel Quantity Processor Unit (FQPU) - Removal TASK 28-41-01-000-801			401	ARO ALL
Fuel Quantity Processor Unit (FQPU) - Installation TASK 28-41-01-400-801			404	ARO ALL
TANK UNIT - REMOVAL/INSTALLATION	28-41-02		401	ARO ALL
Tank Unit - Removal TASK 28-41-02-000-801			401	ARO ALL

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SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
Tank Unit - Installation TASK 28-41-02-400-801			411	ARO ALL
FQIS DENSITOMETER - REMOVAL/INSTALLATION	28-41-03		401	ARO ALL
Densitometer - Removal TASK 28-41-03-000-801			401	ARO ALL
Densitometer - Installation TASK 28-41-03-400-801			407	ARO ALL
WATER DETECTOR - REMOVAL/INSTALLATION	28-41-04		401	ARO ALL
Water Detector - Removal TASK 28-41-04-000-801			401	ARO ALL
Water Detector - Installation TASK 28-41-04-400-801			407	ARO ALL
FQIS IN-TANK WIRING HARNESS - REMOVAL/INSTALLATION	28-41-05		401	ARO ALL
FQIS In-Tank Wiring Harness - Removal TASK 28-41-05-000-801			401	ARO ALL
FQIS In-Tank Wiring Harness - Installation TASK 28-41-05-400-801			415	ARO ALL
FUEL TANK WIRING HARNESS -INSPECTION/CHECK	28-41-05		601	ARO ALL
FQIS Wiring and Component Visual Inspection TASK 28-41-05-210-801			601	ARO ALL
FQIS, Left Main Fuel Tank - Inspection TASK 28-41-05-280-801			606	ARO ALL
FQIS, Right Main Fuel Tank - Inspection TASK 28-41-05-280-802			616	ARO ALL
FQIS, Center Fuel Tank - Inspection TASK 28-41-05-280-803			626	ARO ALL
FUEL PUMP PRESSURE SWITCH - REMOVAL/INSTALLATION	28-42-01		401	ARO ALL
Remove the Fuel Pump Pressure Switch TASK 28-42-01-000-801			401	ARO ALL
Install the Fuel Pump Pressure Switch TASK 28-42-01-420-801			411	ARO ALL

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SUBJECT	CHAPTER SECTION SUBJECT	CONF	PAGE	EFFECT
FUEL TEMPERATURE SENSOR - REMOVAL/INSTALLATION	28-43-01		401	ARO ALL
Fuel Temperature Sensor - Removal TASK 28-43-01-000-801			401	ARO ALL
Fuel Temperature Sensor - Installation TASK 28-43-01-400-801			405	ARO ALL
FUEL MEASURING STICK ASSEMBLY - REMOVAL/INSTALLATION	28-44-01		401	ARO ALL
Fuel Measuring Stick - Removal TASK 28-44-01-000-801			401	ARO ALL
Fuel Measuring Stick - Installation TASK 28-44-01-400-801			409	ARO ALL
Fuel Measuring Stick Housing - Removal TASK 28-44-01-000-802			410	ARO ALL
Fuel Measuring Stick Housing - Installation TASK 28-44-01-400-802			413	ARO ALL
Fuel Measuring Stick Mounting Base - Removal TASK 28-44-01-000-803			416	ARO ALL
Fuel Measuring Stick Mounting Base - Installation TASK 28-44-01-400-803			421	ARO ALL
INCLINOMETER - REMOVAL/INSTALLATION	28-44-02		401	ARO ALL
Inclinometer - Removal TASK 28-44-02-000-801			401	ARO ALL
Inclinometer - Installation TASK 28-44-02-400-801			404	ARO ALL

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1. General

A. This procedure contains scheduled maintenance task data.

TASK 28-00-00-910-801

2. Airworthiness Limitation Precautions

A. General

(1) Critical Design Configuration Control Limitations (CDCCLs)

(a) All occurrences of CDCCLs found in this chapter of the AMM are identified by this note after each applicable CDCCL design feature:

1) NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

(b) Design features that are identified as CDCCLs are defined and controlled by Special Federal Aviation Regulation (SFAR) 88, and can be found in Section 9 of the Maintenance Planning Data (MPD) document. CDCCLs are a means of identifying certain design configuration features intended to preclude a fuel tank ignition source for the operational life of the airplane. These design features are mandatory and cannot be changed or deleted without the approval of the FAA Oversight Office that is responsible for the airplane model Type Certificate. A critical fuel tank ignition source prevention feature may exist in the fuel system and its related installation or in systems that, if a failure condition were to develop, could interact with the fuel system in such a way that an unsafe condition would develop without this limitation. Strict adherence to configuration, methods, techniques, and practices as prescribed is required to ensure the CDCCL is complied with. Any use of parts, methods, techniques or practices not contained in the applicable CDCCL must be approved by the FAA Oversight Office that is responsible for the airplane model Type Certificate.

(2) Airworthiness Limitation Instructions (ALIs)

(a) All occurrences of fuel tank system ALIs found in this chapter of the AMM are identified by this note after each applicable ALI inspection feature:

1) NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

(b) Inspection features that are ALIs are defined and controlled by Special Federal Aviation Regulation (SFAR) 88, and can be found in Section 9 of the Maintenance Planning Data (MPD) document. These ALIs identify inspection features related to fuel tank ignition source prevention which must be done to maintain the design level of safety for the operational life of the airplane. These inspection features are mandatory and cannot be changed or deleted without the approval of the FAA Oversight Office that is responsible for the airplane model Type Certificate. Strict adherence to methods, techniques and practices as prescribed is required to ensure the ALI is complied with. Any use of methods, techniques or practices not contained in these ALIs must be approved by the FAA Oversight Office that is responsible for the airplane model Type Certificate.

B. Location Zones

Zone	Area
100	Lower Half of Fuselage

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(Continued)

Zone	Area
200	Upper Half of Fuselage
300	Empennage and Body Section 48
400	Powerplants and Nacelle Struts
500	Left Wing
600	Right Wing

C. Critical Design Configuration Control Limitations (CDCCLs)

SUBTASK 28-00-00-910-010

WARNING OBEY THE MANUFACTURER'S PROCEDURES WHEN YOU DO MAINTENANCE THAT HAS AN EFFECT ON A CDCCL. IF YOU DO NOT OBEY THE PROCEDURES, IT CAN INCREASE THE RISK OF A SOURCE OF FUEL TANK IGNITION. INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR IF THERE IS A FIRE OR EXPLOSION.

(1) Make sure you follow the procedures for items identified as CDCCLs.

D. Airworthiness Limitation Instructions (ALIs)

SUBTASK 28-00-00-910-002

WARNING OBEY THE MANUFACTURER`S PROCEDURES WHEN YOU DO ANY MAINTENANCE THAT MAY AFFECT AN ALI. IF YOU DO NOT FOLLOW THE PROCEDURES, IT CAN INCREASE THE RISK OF A FUEL TANK IGNITION SOURCE.

(1) Make sure you follow the procedures for the items identified as ALIs.

——— END OF TASK ———

TASK 28-00-00-200-801

3. Inspection of the Electrical Bonding Jumpers in the Fuel System

A. General

(1) This task gives the visual and mechanical inspections for the electrical bonding jumpers in the fuel system.

(2) Fuel system installation has a large number of bonding jumpers for the electrical bonding of tubing, mechanical components and electrical components. These bonding jumpers are made up of braided wire and have a mating lug on each end.

(3) The tin plating on the bonding jumper usually has a smooth finish. When there is deterioration of the tin plating on the bonding jumper, the copper in the jumper wire chemically reacts with any sulfur compounds in the fuel. Black or brown deposits can be seen, the finish becomes rough to the touch and the bonding jumper can show signs of fraying.

(4) Do not flex, bend or kink the bonding jumpers more than is necessary. If the bonding jumpers are moved too much, it can cause the loss of tin plating on the wire braid of the bonding jumper.

(5) When you inspect the bonding jumpers, inspect for loose clamps and corrosion.

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(6) When you inspect the bonding jumpers, you may see black or brown deposits on the wire braid. This can occur when there is a deterioration of the tin plating on the bonding jumper and the copper in the wire reacts with the sulfur compounds. This discoloration of the tin plating on the bonding jumper and the copper in the wire reacts with the sulfur compounds. This discoloration is not a problem unless the wire braid contains broken strands. If the bonding jumper has broken strands, then you must replace the bonding jumper.

B. References

Reference	Title
SWPM 20-20-00	Standard Wiring Practices Manual
SWPM 20-20-10	Standard Wiring Practices Manual

C. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074

D. Electrical Bonding Jumper Visual Inspection

SUBTASK 28-00-00-210-005

(1) Visually examine the bonding jumper for color and deterioration.

(2) If the bonding jumper is silver in color, and free from black or brown deposits, then the bonding jumper is okay.

(3) If the wire braid has black or brown deposits, then inspect the bonding jumper for broken strands.

(a) If the wire braid does not have broken strands, then the bonding jumper is okay.

(b) If the wire braid has broken strands, then do this task: Replacement of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-960-801.

E. Electrical Bonding Jumper Mechanical Inspection

SUBTASK 28-00-00-210-007

(1) Do a check of the mechanical integrity of the electrical bond path.

(a) Try to turn the bonding jumper lugs and tube clamps, if applicable, with light finger pressure.

(b) If the bonding jumper is loose, rework the electrical bond path (SWPM 20-20-00 and SWPM 20-20-10).

——— END OF TASK ———

TASK 28-00-00-960-801

4. Replacement of the Electrical Bonding Jumpers in the Fuel System

A. References

Reference	Title
SWPM 20-20-00	Standard Wiring Practices Manual
SWPM 20-20-10	Standard Wiring Practices Manual

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B. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074

C. Procedure

SUBTASK 28-00-00-960-005

(1) Replace the electrical bonding jumper.

(a) Remove the bonding jumper.

1) Keep all the parts that are necessary for the installation of the bonding jumper.

(b) For bonding jumpers used to bond electrical equipment, follow the applicable installation procedure in the Airplane Maintenance Manual (AMM).

(c) For bonding jumpers used to bond mechanical equipment or tubing, install the new bonding jumper and hardware (SWPM 20-20-00 and SWPM 20-20-10).

1) Make sure the mating surfaces are correctly prepared.

2) Make sure the bonding jumper installation gives adequate clearance from the structure, tubing, or all fuel system parts to prevent abrasion.

(d) Do a check of the electrical integrity of the fuel system bond path.

NOTE: SWPM 20-20-00 and SWPM 20-20-10define the measurement processes necessary for the installation of electrical bonding hardware. The fuel system tubing and components often incorporate multiple electrical bonds in series between the component and the primary structure. The measurement of the tubing or component bond is a separate requirement.

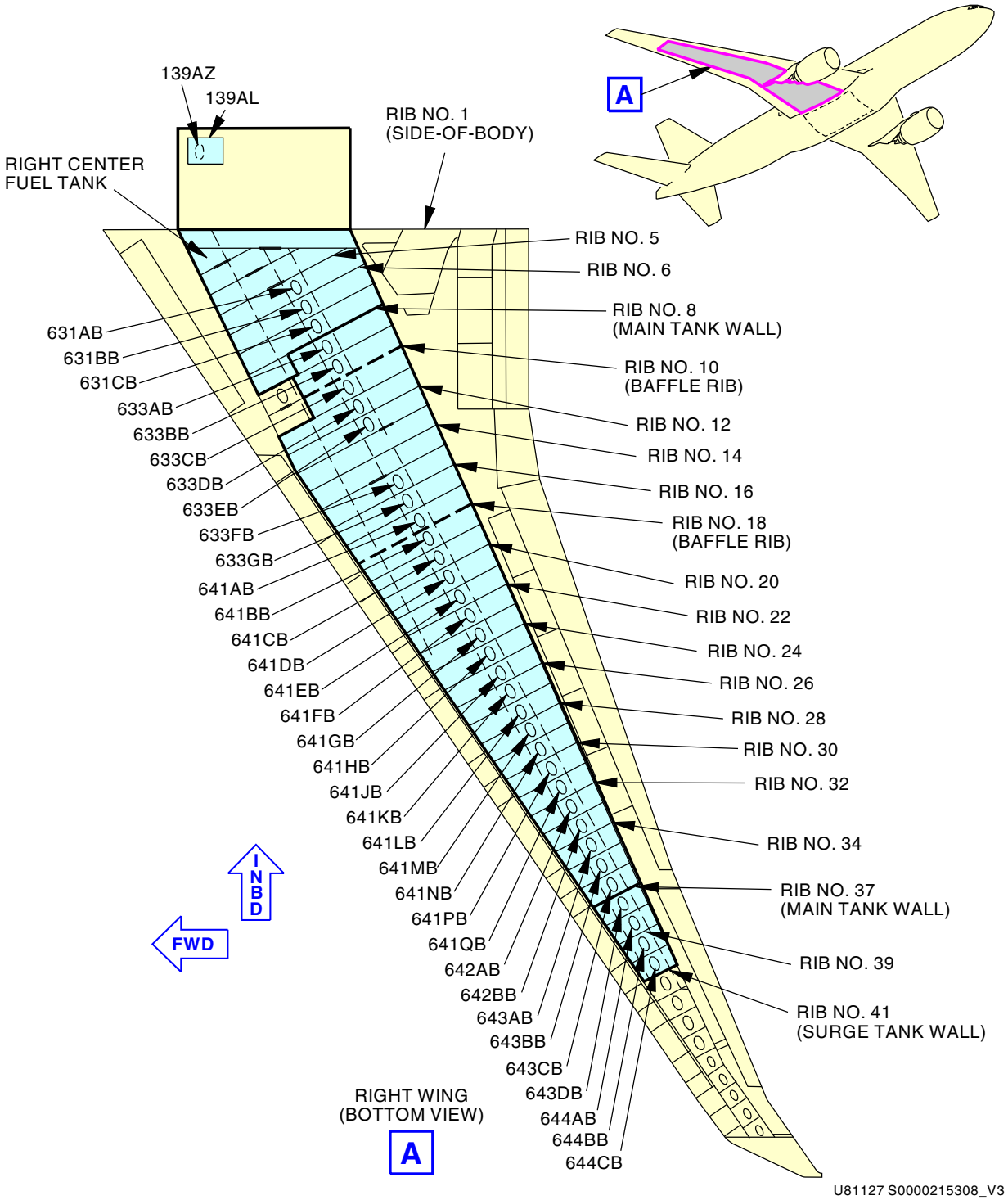
1) For the fuel system tubing or components, measure the total resistance from the tubing or component to the primary structure.

a) Make sure the resistance is not more than 0.010 ohms.

2) For bonding jumper hardware installations, do the resistance measurement for electrical integrity (SWPM 20-20-00).

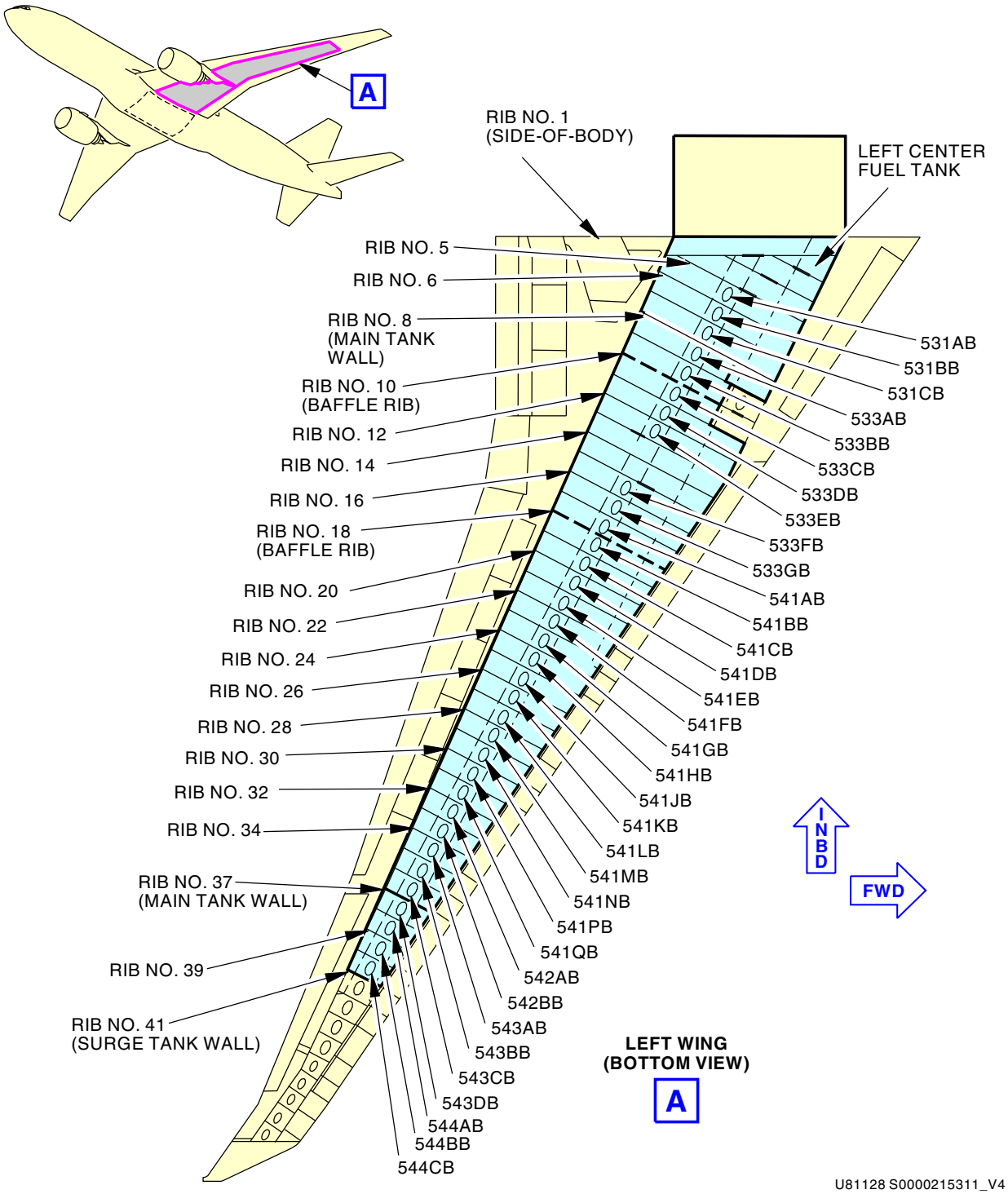
——— END OF TASK ———

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Fuel Tank - Right Wing
Figure 201/28-00-00-990-808

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Fuel Tank - Left Wing
Figure 202/28-00-00-990-809

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SFAR 88

TASK 28-00-00-280-803

5. Fuel System Static Bond Path Left Center Tank - Inspection

(Figure 202)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)

B. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing

C. Access Panels

Number	Name/Location
531AB	Access Door
531BB	Access Door
531CB	Access Door

D. Procedure

SUBTASK 28-00-00-280-055

(1) For the area in the left center fuel tank between rib No. 7 and rib No. 8 (tank end), do these steps:

(a) Remove this access door:

Number	Name/Location
531CB	Access Door

1) To do this, do this task: Center Tank Access Door - Removal, TASK 28-11-02-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
531CB	Access Door

(c) For all bonding jumpers between Rib No. 7 and Rib No. 8, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
531CB	Access Door

1) To do this, do this task: Center Tank Access Door - Installation, TASK 28-11-02-400-801.

SUBTASK 28-00-00-280-056

(2) For the area in the left center fuel tank between rib No. 6 and rib No. 7, do these steps:

(a) Remove this access door:

Number	Name/Location
531BB	Access Door

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1) To do this, do this task: Center Tank Access Door - Removal, TASK 28-11-02-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
531BB	Access Door

(c) For all bonding jumpers between Rib No. 6 and Rib No. 7, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
531BB	Access Door

1) To do this, do this task: Center Tank Access Door - Installation, TASK 28-11-02-400-801.

SUBTASK 28-00-00-280-057

(3) For the area in the left center fuel tank between rib No. 1 (side-of-body rib) and rib No. 6, do these steps:

(a) Remove this access door:

Number	Name/Location
531AB	Access Door

1) To do this, do this task: Center Tank Access Door - Removal, TASK 28-11-02-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
531AB	Access Door

(c) For all bonding jumpers between Rib No. 6 and Rib No. 1 (side-of-body rib), do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
531AB	Access Door

1) To do this, do this task: Center Tank Access Door - Installation, TASK 28-11-02-400-801.

——— END OF TASK ———

SFAR 88

TASK 28-00-00-280-804

6. Fuel System Static Bond Path Right Center Tank - Inspection

(Figure 201)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)

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B. Location Zones

Zone	Area
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

C. Access Panels

Number	Name/Location
631AB	Access Door
631BB	Access Door
631CB	Access Door

D. Procedure

SUBTASK 28-00-00-280-058

(1) For the area in the right center fuel tank between rib No. 7 and rib No. 8 (tank end), do these steps:

(a) Do this task:

Remove this access door:

Number	Name/Location
631CB	Access Door

1) To do this, do this task: Center Tank Access Door - Removal, TASK 28-11-02-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
631CB	Access Door

(c) For all bonding jumpers between Rib No. 7 and Rib No. 8, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
631CB	Access Door

1) To do this, do this task: Center Tank Access Door - Installation, TASK 28-11-02-400-801.

SUBTASK 28-00-00-280-059

(2) For the area in the right center fuel tank between rib No. 6 and rib No. 7, do these steps:

(a) Remove this access door:

Number	Name/Location
631BB	Access Door

1) To do this, do this task: Center Tank Access Door - Removal, TASK 28-11-02-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
631BB	Access Door

(c) For all bonding jumpers between Rib No. 6 and Rib No. 7, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

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(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
631BB	Access Door

1) To do this, do this task: Center Tank Access Door - Installation, TASK 28-11-02-400-801.

SUBTASK 28-00-00-280-060

(3) For the area in the right center fuel tank between rib No. 1 (side-of-body rib) and rib No. 6, do these steps:

(a) Remove this access door:

Number	Name/Location
631AB	Access Door

Do this task:

1) To do this, do this task: Center Tank Access Door - Removal, TASK 28-11-02-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
631AB	Access Door

(c) For all bonding jumpers between Rib No. 6 and Rib No. 1 (side-of-body rib), do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
631AB	Access Door

1) To do this, do this task: Center Tank Access Door - Installation, TASK 28-11-02-400-801.

——— END OF TASK ———

SFAR 88

TASK 28-00-00-280-805

7. Fuel System Static Bond Path Wing Center Section - Inspection

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)

B. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

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C. Access Panels

Number	Name/Location
139AZ	Center Wing Access Door

D. Procedure

SUBTASK 28-00-00-280-061

(1) For the area in the wing center section which contains fuel, do these steps:

(a) Remove this access door:

Number	Name/Location
139AZ	Center Wing Access Door

1) To do this, do this task: Center Tank Access Door - Removal, TASK 28-11-02-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
139AZ	Center Wing Access Door

(c) For all bonding jumpers in the wing center section, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

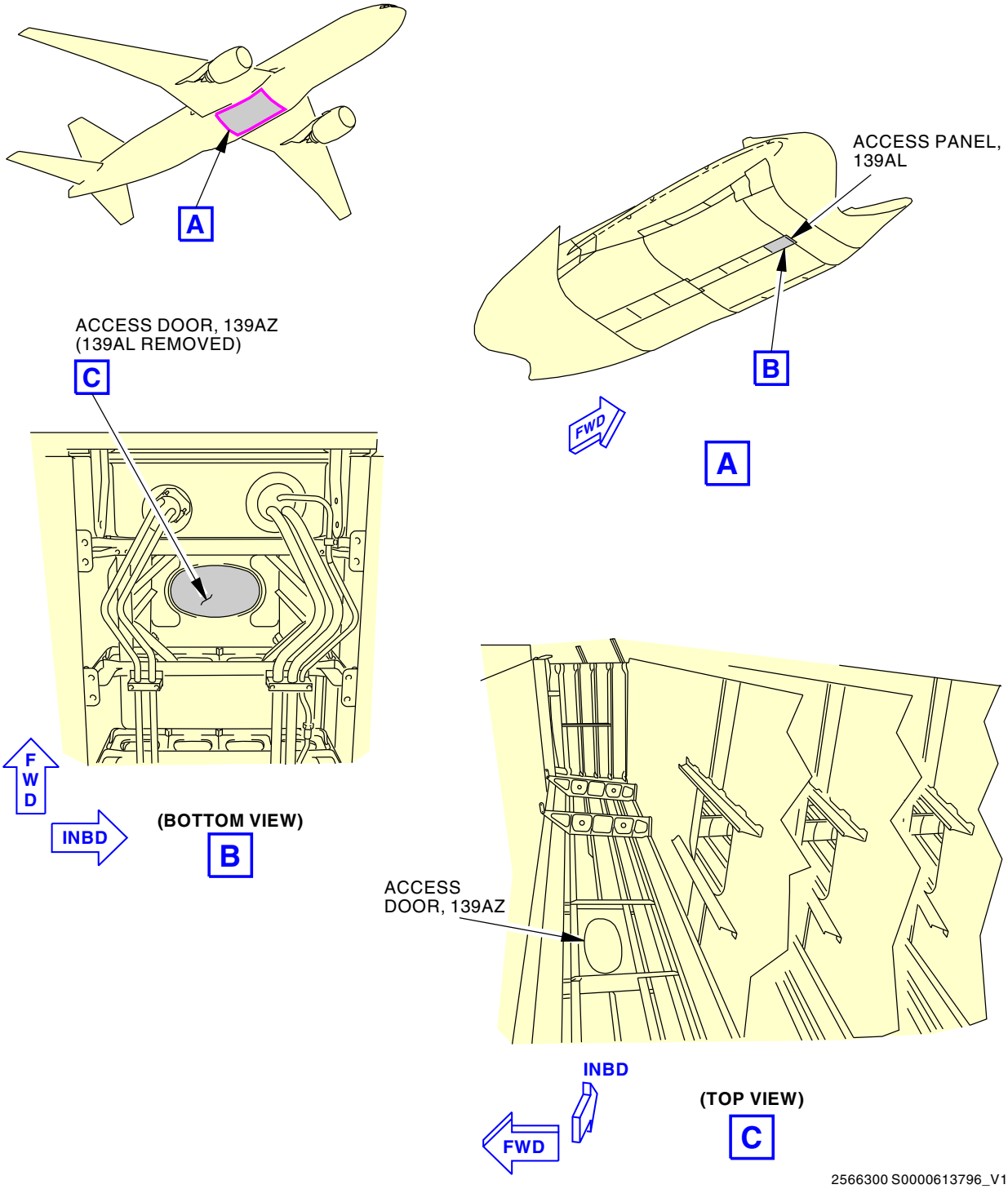
(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
139AZ	Center Wing Access Door

1) To do this, do this task: Center Tank Access Door - Installation, TASK 28-11-02-400-801.

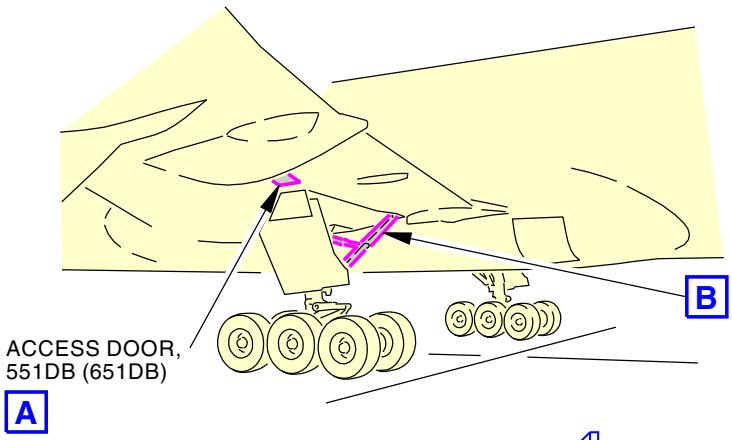
——— END OF TASK ———

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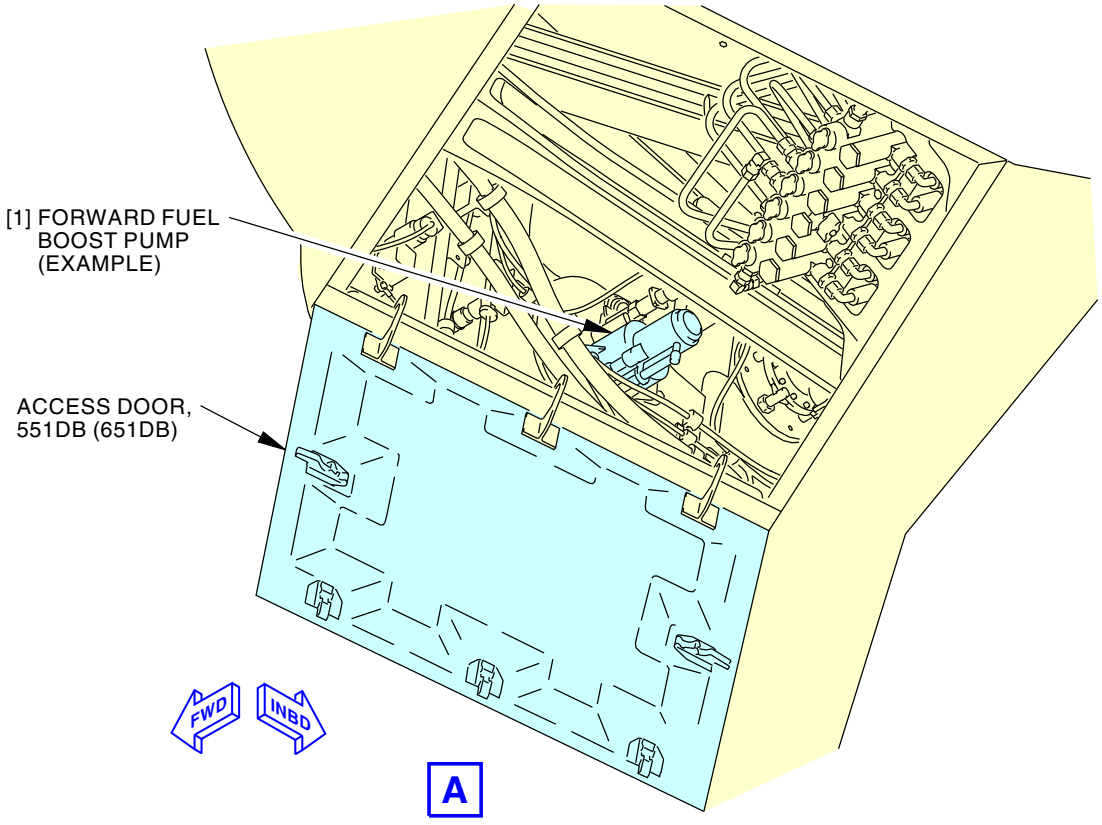


Center Tank Access Door Location
Figure 203/28-00-00-990-821

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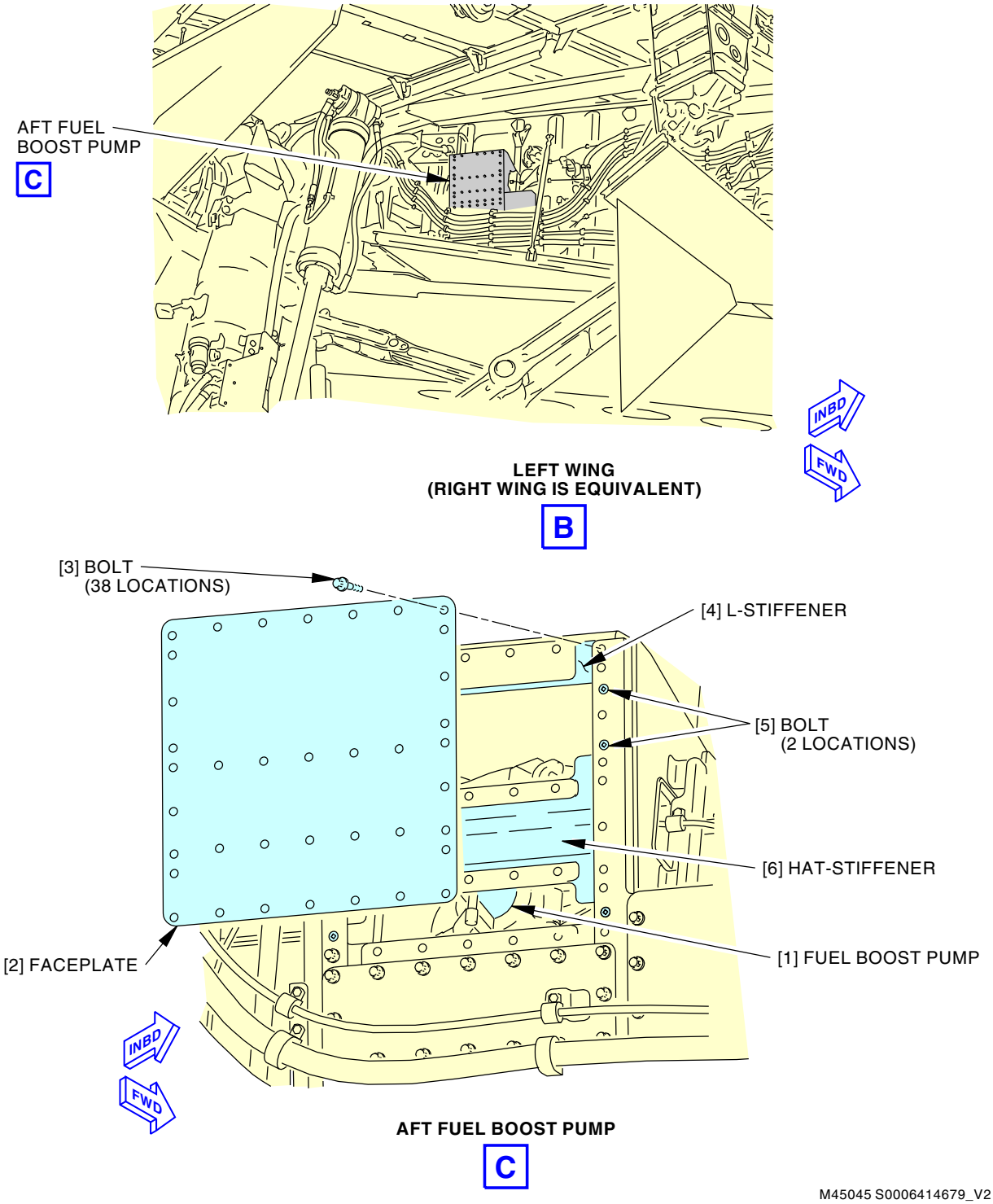
LEFT WING
(RIGHT WING IS EQUIVALENT)



M45013 S0006414678_V2

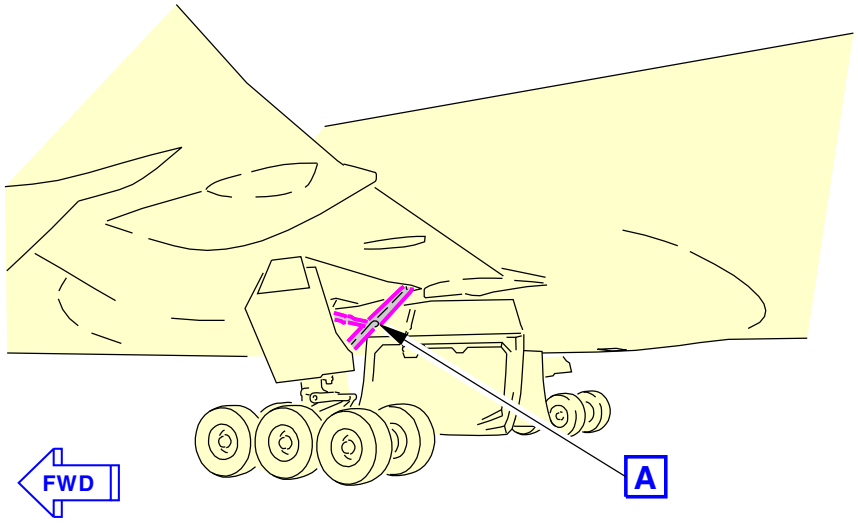
Main Fuel Tank Fuel Boost Pump Location
Figure 204/28-00-00-990-810 (Sheet 1 of 2)

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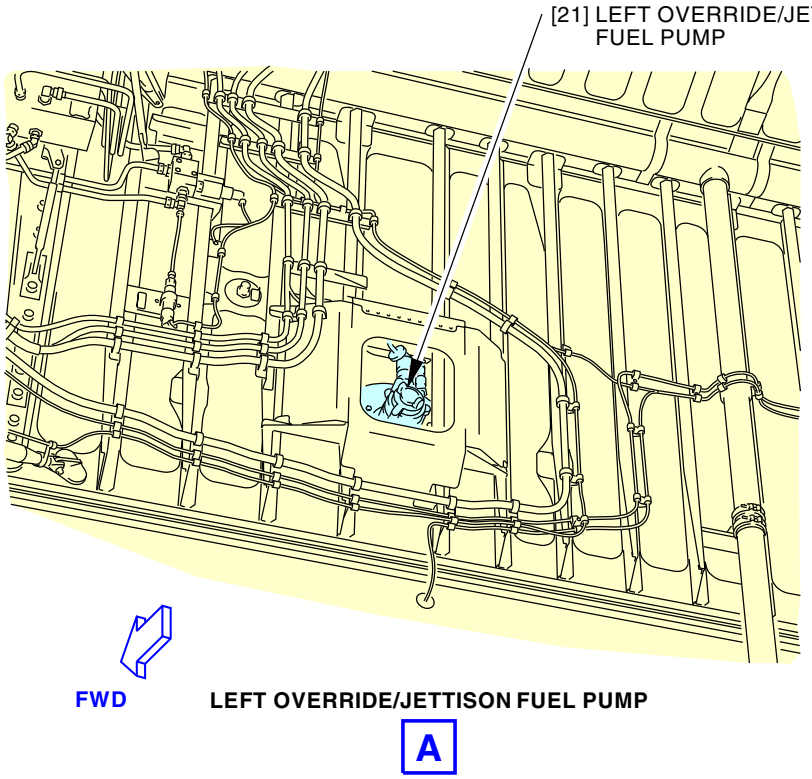


Main Fuel Tank Fuel Boost Pump Location
Figure 204/28-00-00-990-810 (Sheet 2 of 2)

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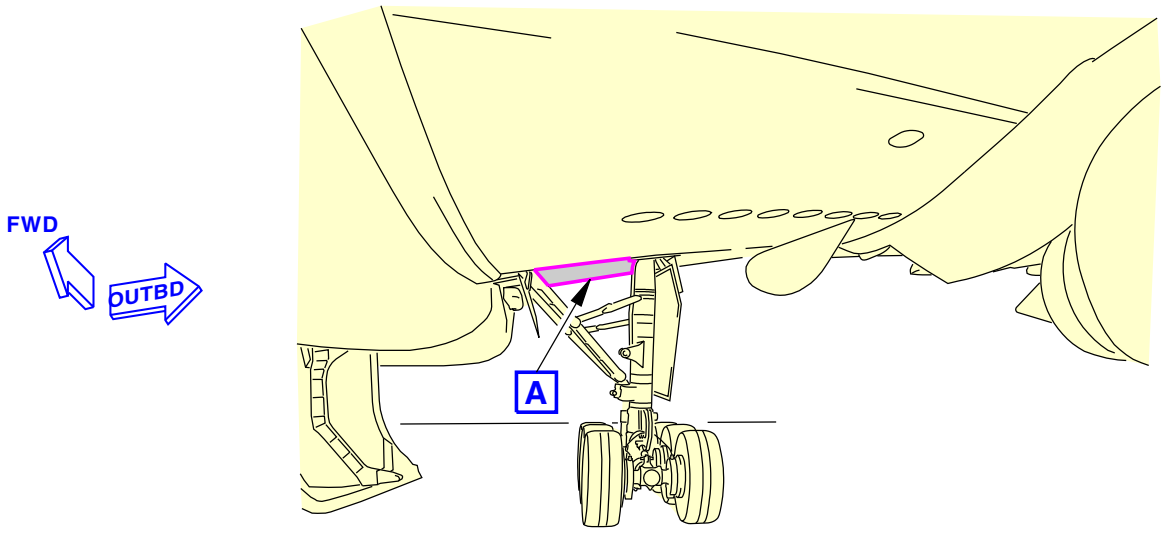
LEFT WING
(RIGHT WING IS EQUIVALENT)



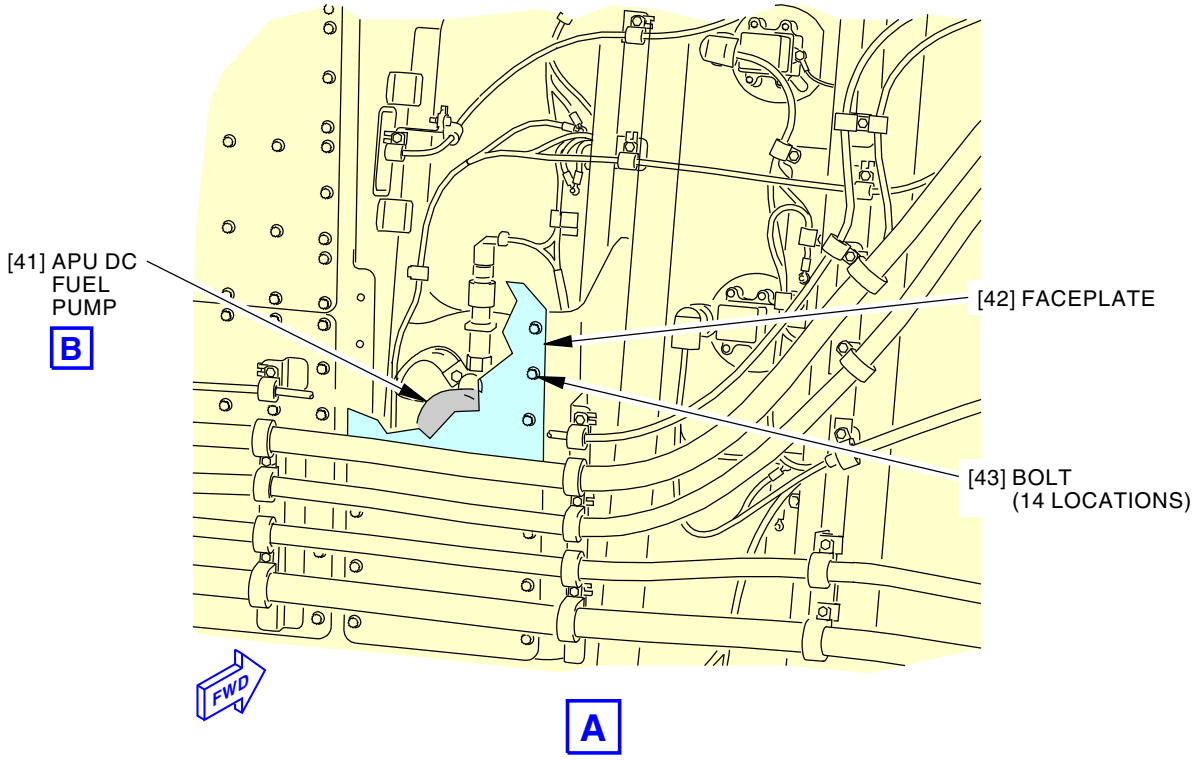
M45047 S0006414680_V2

Override/Jettison Fuel Pump Location
Figure 205/28-00-00-990-811

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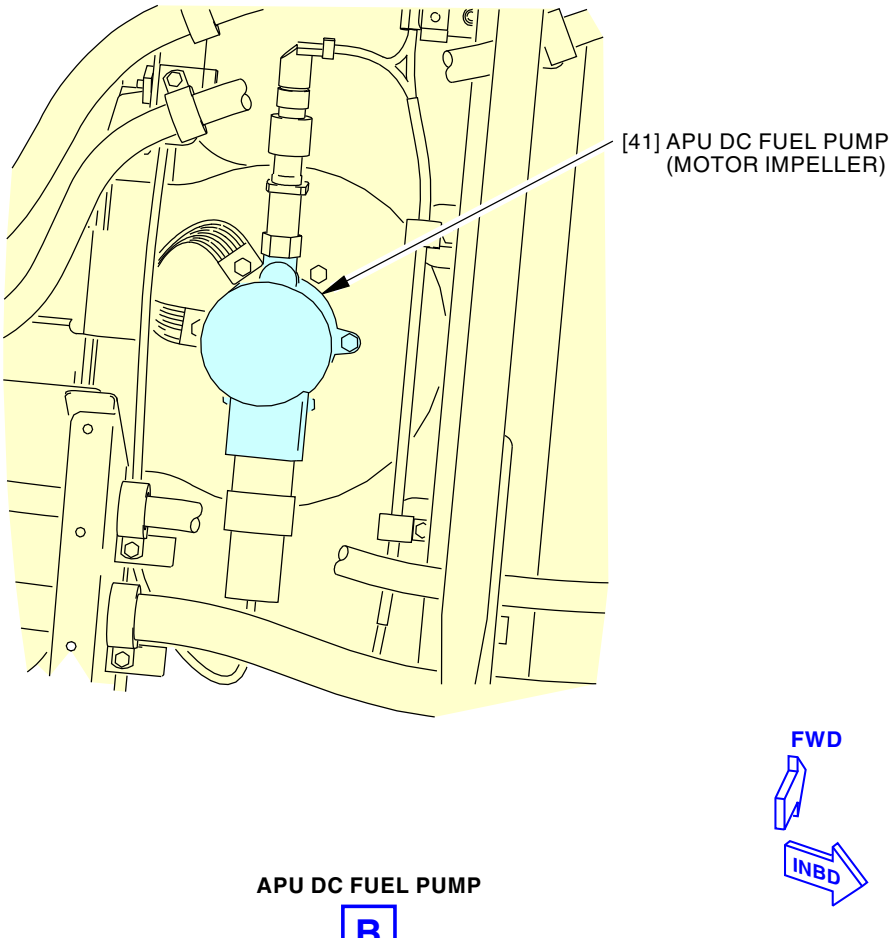
LEFT WING
(RIGHT WING IS EQUIVALENT)



M45058 S0006414681_V3

APU DC Fuel Pump Location
Figure 206/28-00-00-990-812 (Sheet 1 of 2)

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APU DC Fuel Pump Location
Figure 206/28-00-00-990-812 (Sheet 2 of 2)

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SFAR 88

TASK 28-00-00-280-807

8. Fuel System Static Bond Path Left Main Tank

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-11-03-000-801	Surge Tank Access Door - Removal (P/B 401)
28-11-03-400-801	Surge Tank Access Door - Installation (P/B 401)

B. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
544	Surge Tank - Rib 38 - Rib 41 - WS 1182 - WS 1264.5; and Spar Area - Rib 41 (WS 1264.5) - Wing Tip (WBL 1233)

C. Access Panels

Number	Name/Location
533AB	Access Door
533BB	Access Door
533CB	Access Door
533DB	Access Door
533EB	Access Door
533FB	Access Door
533GB	Access Door
541AB	Access Door
541BB	Access Door
541CB	Access Door
541DB	Access Door
541EB	Access Door
541FB	Access Door
541GB	Access Door
541HB	Access Door
541JB	Access Door
541KB	Access Door
541LB	Access Door
541MB	Access Door
541NB	Access Door
541PB	Access Door
541QB	Access Door

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(Continued)

Number	Name/Location
542AB	Access Door
542BB	Access Door
543AB	Access Door
543BB	Access Door
543CB	Access Door
543DB	Pressure Relief Door
544AB	Access Door
544BB	Vent Scoop Door
544CB	Access Door

D. Procedure

SUBTASK 28-00-00-280-083

(1) For the area in the left main fuel tank between rib No. 8 (inboard tank end) and rib No. 9, do these steps:

(a) Remove this access door:

Number	Name/Location
533AB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
533AB	Access Door

(c) For all bonding jumpers between Rib No. 8 and Rib No. 9, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
533AB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-084

(2) For the area in the left main fuel tank between rib No. 9 and rib No. 10, do these steps:

(a) Remove this access door:

Number	Name/Location
533BB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
533BB	Access Door

(c) For all bonding jumpers between Rib No. 9 and Rib No. 10, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

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(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
533BB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-085

(3) For the area in the left main fuel tank between rib No. 10 and rib No. 11, do these steps:

(a) Remove this access door:

Number	Name/Location
533CB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
533CB	Access Door

(c) For all bonding jumpers between Rib No. 10 and Rib No. 11, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
533CB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-086

(4) For the area in the left main fuel tank between rib No. 11 and rib No. 12, do these steps:

(a) Remove this access door:

Number	Name/Location
533DB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
533DB	Access Door

(c) For all bonding jumpers between Rib No. 11 and Rib No. 12, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
533DB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-087

(5) For the area in the left main fuel tank between rib No. 12 and rib No. 14, do these steps:

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(a) Remove this access door:

Number	Name/Location
533EB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
533EB	Access Door

(c) For all bonding jumpers between Rib No. 12 and Rib No. 14, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
533EB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-088

(6) For the area in the left main fuel tank between rib No. 14 and rib No. 16, do these steps:

(a) Remove this access door:

Number	Name/Location
533FB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
533FB	Access Door

(c) For all bonding jumpers between Rib No. 14 and Rib No. 16, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
533FB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-089

(7) For the area in the left main fuel tank between rib No. 16 and rib No. 17, do these steps:

(a) Remove this access door:

Number	Name/Location
533GB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
533GB	Access Door

(c) For all bonding jumpers between Rib No. 16 and Rib No. 17, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

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(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
533GB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-090

(8) For the area in the left main fuel tank between rib No. 17 and rib No. 18, do these steps:

(a) Remove this access door:

Number	Name/Location
541AB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
541AB	Access Door

(c) For all bonding jumpers between Rib No. 17 and Rib No. 18, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
541AB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-091

(9) For the area in the left main fuel tank between rib No. 18 and rib No. 19, do these steps:

(a) Remove this access panel:

Number	Name/Location
541BB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
541BB	Access Door

(c) For all bonding jumpers between Rib No. 18 and Rib No. 19, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
541BB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-092

(10) For the area in the left main fuel tank between rib No. 19 and rib No. 20, do these steps:

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(a) Remove this access door:

Number	Name/Location
541CB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
541CB	Access Door

(c) For all bonding jumpers between Rib No. 19 and Rib No. 20, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
541CB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-093

(11) For the area in the left main fuel tank between rib No. 20 and rib No. 21, do these steps:

(a) Remove this access door:

Number	Name/Location
541DB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
541DB	Access Door

(c) For all bonding jumpers between Rib No. 20 and Rib No. 21, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
541DB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-094

(12) For the area in the left main fuel tank between rib No. 21 and rib No. 22, do these steps:

(a) Remove this access door:

Number	Name/Location
541EB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
541EB	Access Door

(c) For all bonding jumpers between Rib No. 21 and Rib No. 22, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

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(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
541EB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-095

(13) For the area in the left main fuel tank between rib No. 22 and rib No. 23, do these steps:

(a) Remove this access door:

Number	Name/Location
541FB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
541FB	Access Door

(c) For all bonding jumpers between Rib No. 22 and Rib No. 23, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
541FB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-096

(14) For the area in the left main fuel tank between rib No. 23 and rib No. 24, do these steps:

(a) Remove this access door:

Number	Name/Location
541GB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
541GB	Access Door

(c) For all bonding jumpers between Rib No. 23 and Rib No. 24, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
541GB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-097

(15) For the area in the left main fuel tank between rib No. 24 and rib No. 25, do these steps:

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(a) Remove this access door:

Number	Name/Location
541HB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
541HB	Access Door

(c) For all bonding jumpers between Rib No. 24 and Rib No. 25, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
541HB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-098

(16) For the area in the left main fuel tank between rib No. 25 and rib No. 26, do these steps:

(a) Remove this access door:

Number	Name/Location
541JB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
541JB	Access Door

(c) For all bonding jumpers between Rib No. 25 and Rib No. 26, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access panel:

Number	Name/Location
541JB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-099

(17) For the area in the left main fuel tank between rib No. 26 and rib No. 27, do these steps:

(a) Remove this access door:

Number	Name/Location
541KB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
541KB	Access Door

(c) For all bonding jumpers between Rib No. 26 and Rib No. 27, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

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(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
541KB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-100

(18) For the area in the left main fuel tank between rib No. 27 and rib No. 28, do these steps:

(a) Remove this access door:

Number	Name/Location
541LB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
541LB	Access Door

(c) For all bonding jumpers between Rib No. 27 and Rib No. 28, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
541LB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-101

(19) For the area in the left main fuel tank between rib No. 28 and rib No. 29, do these steps:

(a) Remove this access door:

Number	Name/Location
541MB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
541MB	Access Door

(c) For all bonding jumpers between Rib No. 28 and Rib No. 29, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
541MB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-102

(20) For the area in the left main fuel tank between rib No. 29 and rib No. 30, do these steps:

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(a) Remove this access door:

Number	Name/Location
541NB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
541NB	Access Door

(c) For all bonding jumpers between Rib No. 29 and Rib No. 30, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
541NB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-103

(21) For the area in the left main fuel tank between rib No. 30 and rib No. 31, do these steps:

(a) Remove this access door:

Number	Name/Location
541PB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
541PB	Access Door

(c) For all bonding jumpers between Rib No. 30 and Rib No. 31, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
541PB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-104

(22) For the area in the left main fuel tank between rib No. 31 and rib No. 32, do these steps:

(a) Remove this access door:

Number	Name/Location
541QB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
541QB	Access Door

(c) For all bonding jumpers between Rib No. 31 and Rib No. 32, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

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(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
541QB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-105

(23) For the area in the left main tank between rib No. 32 and rib No. 33, do these steps:

(a) Remove this access door:

Number	Name/Location
542AB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
542AB	Access Door

(c) For all bonding jumpers between Rib No. 32 and Rib No. 33, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
542AB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-106

(24) For the area in the left main tank between rib No. 33 and rib No. 34, do these steps:

(a) Remove this access door:

Number	Name/Location
542BB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
542BB	Access Door

(c) For all bonding jumpers between Rib No. 33 and Rib No. 34, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
542BB	Access Door

(e) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-107

(25) For the area in the left main tank between rib No. 34 and rib No. 35, do these steps:

(a) Remove this access door:

Number	Name/Location
543AB	Access Door

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1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
543AB	Access Door

(c) For all bonding jumpers between Rib No. 34 and Rib No. 35, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
543AB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-108

(26) For the area in the left main tank between rib No. 35 and rib No. 36, do these steps:

(a) Remove this access door:

Number	Name/Location
543BB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
543BB	Access Door

(c) For all bonding jumpers between Rib No. 35 and Rib No. 36, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
543BB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-109

(27) For the area in the left main tank between rib No. 36 and rib No. 37, do these steps:

(a) Remove this access panel:

Number	Name/Location
543CB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
543CB	Access Door

(c) For all bonding jumpers between Rib No. 36 and Rib No. 37, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
543CB	Access Door

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1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-110

(28) For the area in the left surge tank between rib No. 37 and rib No. 38, do these steps:

(a) Remove this access door:

Number	Name/Location
543DB	Pressure Relief Door

1) To do this, do this task: Surge Tank Access Door - Removal, TASK 28-11-03-000-801.

(b) Go into the opening for:

Number	Name/Location
543DB	Pressure Relief Door

(c) For all bonding jumpers between Rib No. 37 and Rib No. 38, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
543DB	Pressure Relief Door

1) To do this, do this task: Surge Tank Access Door - Installation, TASK 28-11-03-400-801.

SUBTASK 28-00-00-280-111

(29) For the area in the left surge tank between rib No. 38 and rib No. 39, do these steps:

(a) Remove this access door:

Number	Name/Location
544AB	Access Door

1) To do this, do this task: Surge Tank Access Door - Removal, TASK 28-11-03-000-801.

(b) Go into the opening for:

Number	Name/Location
544AB	Access Door

(c) For all bonding jumpers between Rib No. 38 and Rib No. 39, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
544AB	Access Door

1) To do this, do this task: Surge Tank Access Door - Installation, TASK 28-11-03-400-801.

SUBTASK 28-00-00-280-112

(30) For the area in the left surge tank between rib No. 39 and rib No. 40, do these steps:

(a) Remove this access door:

Number	Name/Location
544BB	Vent Scoop Door

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1) To do this, do this task: Surge Tank Access Door - Removal, TASK 28-11-03-000-801.

(b) Go into the opening for:

Number	Name/Location
544BB	Vent Scoop Door

(c) For all bonding jumpers between Rib No. 39 and Rib No. 40, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
544BB	Vent Scoop Door

1) To do this, do this task: Surge Tank Access Door - Installation, TASK 28-11-03-400-801.

SUBTASK 28-00-00-280-113

(31) For the area in the left surge tank between rib No. 40 and rib No. 41, do these steps:

(a) Remove this access door:

Number	Name/Location
544CB	Access Door

1) To do this, do this task: Surge Tank Access Door - Removal, TASK 28-11-03-000-801.

(b) Go into the opening for:

Number	Name/Location
544CB	Access Door

(c) For all bonding jumpers between Rib No. 40 and Rib No. 41, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
544CB	Access Door

1) To do this, do this task: Surge Tank Access Door - Installation, TASK 28-11-03-400-801.

END OF TASK

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TASK 28-00-00-280-808

9. Fuel System Static Bond Path Right Main Tank - Inspection

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)

B. Location Zones

Zone	Area
633	Main Tank, Rib 8 To Rib 17 - Right Wing

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(Continued)

Zone	Area
641	Main Tank - Rib 17 to Rib 32 - Right Wing
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182
644	Surge Tank - Rib 38 - Rib 41 - WS 1182 - WS 1264.5; and Spar Area - Rib 41 (WS 1264.5) to wing tip (WBL 1233)

C. Access Panels

Number	Name/Location
633AB	Access Door
633BB	Access Door
633CB	Access Door
633DB	Access Door
633EB	Access Door
633FB	Access Door
633GB	Access Door
641AB	Access Door
641BB	Access Door
641CB	Access Door
641DB	Access Door
641EB	Access Door
641FB	Access Door
641GB	Access Door
641HB	Access Door
641JB	Access Door
641KB	Access Door
641LB	Access Door
641MB	Access Door
641NB	Access Door
641PB	Access Door
641QB	Access Door
642AB	Access Door
642BB	Access Door
643AB	Access Door
643BB	Access Door
643CB	Access Door
643DB	Pressure Relief Door
644AB	Access Door
644BB	Vent Scoop Door
644CB	Access Door

D. Procedure

SUBTASK 28-00-00-280-114

(1) For the area in the right main fuel tank between rib No. 8 (inboard tank end) and rib No. 9, do these steps:

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(a) Remove this access door:

Number	Name/Location
633AB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
633AB	Access Door

(c) For all bonding jumpers between Rib No. 8 and Rib No. 9, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
633AB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-115

(2) For the area in the right main fuel tank between rib No. 9 and rib No. 10, do these steps:

(a) Remove this access door:

Number	Name/Location
633BB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
633BB	Access Door

(c) For all bonding jumpers between Rib No. 9 and Rib No. 10, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
633BB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-116

(3) For the area in the right main fuel tank between rib No. 10 and rib No. 11, do these steps:

(a) Remove this access door:

Number	Name/Location
633CB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
633CB	Access Door

(c) For all bonding jumpers between Rib No. 10 and Rib No. 11, do this task: Inspection of

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the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
633CB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-117

(4) For the area in the right main fuel tank between rib No. 11 and rib No. 12, do these steps:

(a) Remove this access door:

Number	Name/Location
633DB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
633DB	Access Door

(c) For all bonding jumpers between Rib No. 11 and Rib No. 12, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
633DB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-118

(5) For the area in the right main fuel tank between rib No. 12 and rib No. 14, do these steps:

(a) Remove this access door:

Number	Name/Location
633EB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
633EB	Access Door

(c) For all bonding jumpers between Rib No. 12 and Rib No. 14, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
633EB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-119

(6) For the area in the right main fuel tank between rib No. 14 and rib No. 16, do these steps:

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(a) Remove this access door:

Number	Name/Location
633FB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
633FB	Access Door

(c) For all bonding jumpers between Rib No. 14 and Rib No. 16, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
633FB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-120

(7) For the area in the right main fuel tank between rib No. 16 and rib No. 17, do these steps:

(a) Remove this access door:

Number	Name/Location
633GB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
633GB	Access Door

(c) For all bonding jumpers between Rib No. 16 and Rib No. 17, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
633GB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-121

(8) For the area in the right main fuel tank between rib No. 17 and rib No. 18, do these steps:

(a) Remove this access door:

Number	Name/Location
641AB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
641AB	Access Door

(c) For all bonding jumpers between Rib No. 17 and Rib No. 18, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

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(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
641AB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-122

(9) For the area in the right main fuel tank between rib No. 18 and rib No. 19, do these steps:

(a) Remove this access door:

Number	Name/Location
641BB	Access Door

Do this task:

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
641BB	Access Door

(c) For all bonding jumpers between Rib No. 18 and Rib No. 19, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
641BB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-123

(10) For the area in the right main fuel tank between rib No. 19 and rib No. 20, do these steps:

(a) Remove this access door:

Number	Name/Location
641CB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
641CB	Access Door

(c) For all bonding jumpers between Rib No. 19 and Rib No. 20, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) Do this task:

If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
641CB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-124

(11) For the area in the right main fuel tank between rib No. 20 and rib No. 21, do these steps:

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(a) Remove this access door:

Number	Name/Location
641DB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
641DB	Access Door

(c) For all bonding jumpers between Rib No. 20 and Rib No. 21, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
641DB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-125

(12) For the area in the right main fuel tank between rib No. 21 and rib No. 22, do these steps:

(a) Remove this access door:

Number	Name/Location
641EB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
641EB	Access Door

(c) For all bonding jumpers between Rib No. 21 and Rib No. 22, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
641EB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-126

(13) For the area in the right main fuel tank between rib No. 22 and rib No. 23, do these steps:

(a) Remove this access door:

Number	Name/Location
641FB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
641FB	Access Door

(c) For all bonding jumpers between Rib No. 22 and Rib No. 23, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

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(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
641FB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-127

(14) For the area in the right main fuel tank between rib No. 23 and rib No. 24, do these steps:

(a) Remove this access door:

Number	Name/Location
641GB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
641GB	Access Door

(c) For all bonding jumpers between Rib No. 23 and Rib No. 24, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
641GB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-128

(15) For the area in the right main fuel tank between rib No. 24 and rib No. 25, do these steps:

(a) Remove this access door:

Number	Name/Location
641HB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
641HB	Access Door

(c) For all bonding jumpers between Rib No. 24 and Rib No. 25, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
641HB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-129

(16) For the area in the right main fuel tank between rib No. 25 and rib No. 26, do these steps:

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(a) Remove this access door:

Number	Name/Location
641JB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
641JB	Access Door

(c) For all bonding jumpers between Rib No. 25 and Rib No. 26, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
641JB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-130

(17) For the area in the right main fuel tank between rib No. 26 and rib No. 27, do these steps:

(a) Remove this access door:

Number	Name/Location
641KB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
641KB	Access Door

(c) For all bonding jumpers between Rib No. 26 and Rib No. 27, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
641KB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-131

(18) For the area in the right main fuel tank between rib No. 27 and rib No. 28, do these steps:

(a) Remove this access door:

Number	Name/Location
641LB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
641LB	Access Door

(c) For all bonding jumpers between Rib No. 27 and Rib No. 28, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

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(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
641LB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-132

(19) For the area in the right main fuel tank between rib No. 28 and rib No. 29, do these steps:

(a) Remove this access door:

Number	Name/Location
641MB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
641MB	Access Door

(c) For all bonding jumpers between Rib No. 28 and Rib No. 29, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
641MB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-133

(20) For the area in the right main fuel tank between rib No. 29 and rib No. 30, do these steps:

(a) Remove this access door:

Number	Name/Location
641NB	Access Door

Do this task:

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
641NB	Access Door

(c) For all bonding jumpers between Rib No. 29 and Rib No. 30, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
641NB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-134

(21) For the area in the right main fuel tank between rib No. 30 and rib No. 31, do these steps:

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(a) Remove this access door:

Number	Name/Location
641PB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
641PB	Access Door

(c) For all bonding jumpers between Rib No. 30 and Rib No. 31, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
641PB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-135

(22) For the area in the right main fuel tank between rib No. 31 and rib No. 32, do these steps:

(a) Remove this access door:

Number	Name/Location
641QB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
641QB	Access Door

(c) For all bonding jumpers between Rib No. 31 and Rib No. 32, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
641QB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-136

(23) For the area in the right main tank between rib No. 32 and rib No. 33, do these steps:

(a) Remove this access door:

Number	Name/Location
642AB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
642AB	Access Door

(c) For all bonding jumpers between Rib No. 32 and Rib No. 33, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

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(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
642AB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-137

(24) For the area in the right main tank between rib No. 33 and rib No. 34, do these steps:

(a) Remove this access door:

Number	Name/Location
642BB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
642BB	Access Door

(c) For all bonding jumpers between Rib No. 33 and Rib No. 34, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
642BB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-138

(25) For the area in the right main tank between rib No. 34 and rib No. 35, do these steps:

(a) Remove this access door:

Number	Name/Location
643AB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
643AB	Access Door

(c) For all bonding jumpers between Rib No. 34 and Rib No. 35, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
643AB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-139

(26) For the area in the right main tank between rib No. 35 and rib No. 36, do these steps:

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(a) Remove this access door:

Number	Name/Location
643BB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
643BB	Access Door

(c) For all bonding jumpers between Rib No. 35 and Rib No. 36, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
643BB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-140

(27) For the area in the right main tank between rib No. 36 and rib No. 37, do these steps:

(a) Remove this access door:

Number	Name/Location
643CB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for this access door:

Number	Name/Location
643CB	Access Door

(c) For all bonding jumpers between Rib No. 36 and Rib No. 37, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
643CB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-141

(28) For the area in the right surge tank between rib No. 37 and rib No. 38, do these steps:

(a) Remove this access door:

Number	Name/Location
643DB	Pressure Relief Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
643DB	Pressure Relief Door

(c) For all bonding jumpers between Rib No. 37 and Rib No. 38, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

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(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
643DB	Pressure Relief Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-142

(29) For the area in the right surge tank between rib No. 38 and rib No. 39, do these steps:

(a) Remove this access door:

Number	Name/Location
644AB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
644AB	Access Door

(c) For all bonding jumpers between Rib No. 38 and Rib No. 39, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
644AB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-143

(30) For the area in the right surge tank between rib No. 39 and rib No. 40, do these steps:

(a) Remove this access door

Number	Name/Location
644BB	Vent Scoop Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
644BB	Vent Scoop Door

(c) For all bonding jumpers between Rib No. 39 and Rib No. 40, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
644BB	Vent Scoop Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-00-00-280-144

(31) For the area in the right surge tank between rib No. 40 and rib No. 41, do these steps:

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(a) Remove this access door:

Number	Name/Location
644CB	Access Door

1) To do this, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Go into the opening for:

Number	Name/Location
644CB	Access Door

(c) For all bonding jumpers between Rib No. 40 and Rib No. 41, do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(d) If access is not necessary for subsequent tasks, install this access door:

Number	Name/Location
644CB	Access Door

1) To do this, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

——— END OF TASK ———

TASK 28-00-00-760-801

10. Fuel System Fault Current, Left Side - Inspection

(Figure 203 or Figure 204, Figure 205)

A. References

Reference	Title
20-11-00-910-801	Standard Torque Values (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Consumable Materials

Reference	Description	Specification
C00913	Compound - Corrosion Inhibiting Material, Nondrying Resin Mix	BMS3-27
G50237	Compound - Corrosion Inhibiting, Non-drying - Cor-Ban 27L	BMS3-38

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D. Location Zones

Zone	Area
133	Wing Center Section, Left
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing

E. Access Panels

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

F. Procedure

SUBTASK 28-00-00-860-076

WARNING MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Make sure the landing gear downlocks are installed (TASK 32-00-30-480-801).

SUBTASK 28-00-00-860-077

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-00-00-760-001

WARNING USE NITRILE GLOVES FOR SKIN PROTECTION WHEN YOU USE COR-BAN 27L, G50237. IF IT GETS ON YOUR SKIN, IMMEDIATELY REMOVE IT WITH WATER. IF THIS MATERIAL GETS IN YOUR EYES, IMMEDIATELY FLUSH YOUR EYES WITH WATER. GET MEDICAL AID. THIS MATERIAL CONTAINS FLAMMABLE AGENTS WHICH CAN CAUSE INJURIES TO PERSONNEL.

WARNING DO NOT GET THIS MATERIAL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THIS MATERIAL. PUT ON A RESPIRATOR, EYE PROTECTION (GOGGLES, OR OTHER APPROVED PROTECTION), AND GLOVES BEFORE YOU USE THIS MATERIAL. MAKE SURE THAT THERE IS SUFFICIENT AIRFLOW. KEEP THIS MATERIAL AWAY FROM SPARKS, FLAME, AND HEAT. THIS MATERIAL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(3) Do these steps to do an inspection of the aft boost pump for the left main tank:

(a) Remove the thirty-eight bolts [3] and remove the faceplate [2] assembly.

(b) Remove the two bolts [5] and remove the L-stiffener [4] assembly.

(c) Remove the two bolts [5] and remove the Hat-stiffener [6] assembly.

(d) Do a check of the electrical bond between the aft boost pump for the left main tank and the airplane structure with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

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1) Make sure the resistance is 0.00025 ohm (0.25 milliohm) or less.

(e) Apply Cor-Ban 27L Compound, G50237 or Mastinox 6856 K, C00913, to the surfaces of the support structure and the surfaces of each of these parts that touch the support structure:

1) L-stiffener [4] assembly

2) Hat-stiffener [6] assembly

3) faceplate [2] assembly.

(f) Apply Cor-Ban 27L Compound, G50237 or Mastinox 6856 K, C00913, to the bolts [3], and bolts [5] before installation.

(g) Put the L-stiffener [4] assembly in its position and install the two bolts [5]. Refer to Standard Torque Values, TASK 20-11-00-910-801.

(h) Put the Hat-stiffener [6] assembly in its position and install the two bolts [5]. Refer to Standard Torque Values, TASK 20-11-00-910-801.

(i) Put the faceplate [2] assembly in its position and install the thirty-eight bolts [3]. Refer to Standard Torque Values, TASK 20-11-00-910-801.

SUBTASK 28-00-00-760-002

(4) Do these steps to do an inspection of the forward boost pump for the left main tank:

(a) To get access to the left forward fuel boost pump, installed on the rear spar of the left wing, do this task:

Open this access panel:

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

(b) Do a check of the electrical bond between the forward fuel boost pump for the left main tank and the airplane structure with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

1) Make sure the resistance must is 0.00025 ohm (0.25 milliohm) or less.

(c) Do this task:

Close this access panel:

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-00-00-760-003

(5) Do these steps to do an inspection of the left override/jettison pump:

(a) Do a check of the electrical bond between the left override/jettison pump and the airplane structure with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

1) Make sure the resistance is 0.00025 ohm (0.25 milliohm) or less.

END OF TASK

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TASK 28-00-00-760-802

11. Fuel System Fault Current, Right Side - Inspection

(Figure 203 or Figure 204, Figure 205)

A. References

Reference	Title
20-11-00-910-801	Standard Torque Values (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Consumable Materials

Reference	Description	Specification
C00913	Compound - Corrosion Inhibiting Material, Nondrying Resin Mix	BMS3-27
G50237	Compound - Corrosion Inhibiting, Non-drying - Cor-Ban 27L	BMS3-38

D. Location Zones

Zone	Area
134	Wing Center Section, Right
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

E. Access Panels

Number	Name/Location
651DB	Inboard Fixed Trailing Edge Panel

F. Procedure

SUBTASK 28-00-00-860-078

WARNING MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Make sure the landing gear downlocks are installed (TASK 32-00-30-480-801).

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SUBTASK 28-00-00-860-079

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-00-00-760-004

WARNING USE NITRILE GLOVES FOR SKIN PROTECTION WHEN YOU USE COR-BAN 27L, G50237. IF IT GETS ON YOUR SKIN, IMMEDIATELY REMOVE IT WITH WATER. IF THIS MATERIAL GETS IN YOUR EYES, IMMEDIATELY FLUSH YOUR EYES WITH WATER. GET MEDICAL AID. THIS MATERIAL CONTAINS FLAMMABLE AGENTS WHICH CAN CAUSE INJURIES TO PERSONNEL.

WARNING DO NOT GET THIS MATERIAL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THIS MATERIAL. PUT ON A RESPIRATOR, EYE PROTECTION (GOGGLES, OR OTHER APPROVED PROTECTION), AND GLOVES BEFORE YOU USE THIS MATERIAL. MAKE SURE THAT THERE IS SUFFICIENT AIRFLOW. KEEP THIS MATERIAL AWAY FROM SPARKS, FLAME, AND HEAT. THIS MATERIAL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(3) Do these steps to do an inspection of the aft boost pump for the right main tank:

(a) Remove the thirty-eight bolts [3] and remove the faceplate [2] assembly.

(b) Remove the two bolts [5] and remove the L-stiffener [4] assembly.

(c) Remove the two bolts [5] and remove the Hat-stiffener [6] assembly.

(d) Do a check of the electrical bond between the aft boost pump for the right main tank and the airplane structure with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

1) Make sure the resistance is 0.00025 ohm (0.25 milliohm) or less.

(e) Apply Cor-Ban 27L Compound, G50237 or Mastinox 6856 K, C00913, to the surfaces of the support structure and the surfaces of each of these parts that touch the support structure:

1) L-stiffener [4] assembly

2) Hat-stiffener [6] assembly

3) faceplate [2] assembly.

(f) Apply Cor-Ban 27L Compound, G50237 or Mastinox 6856 K, C00913, to the bolts [3], and bolts [5] before installation.

(g) Put the L-stiffener [4] assembly in its position and install the two bolts [5]. Refer to Standard Torque Values, TASK 20-11-00-910-801.

(h) Put the Hat-stiffener [6] assembly in its position and install the two bolts [5]. Refer to Standard Torque Values, TASK 20-11-00-910-801.

(i) Put the faceplate [2] assembly in its position and install the thirty-eight bolt [3]. Refer to Standard Torque Values, TASK 20-11-00-910-801.

SUBTASK 28-00-00-760-005

(4) Do these steps to do an inspection of the forward boost pump for the right main tank:

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(a) To get access to the right forward fuel boost pump, installed on the rear spar of the right wing.

Do this task:

Open this access panel:

Number	Name/Location
651DB	Inboard Fixed Trailing Edge Panel

(b) Do a check of the electrical bond between the forward fuel boost pump for the right main tank and the airplane structure with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

1) Make sure the resistance is 0.00025 ohm (0.25 milliohm) or less.

(c) Do this task:

Close this access panel:

Number	Name/Location
651DB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-00-00-760-006

(5) Do these steps to do an inspection of the right override/jettison pump:

(a) Do a check of the electrical bond between the right override/jettison pump and the airplane structure with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

1) Make sure the resistance is 0.00025 ohm (0.25 milliohm) or less.

——— END OF TASK ———

TASK 28-00-00-760-803

12. APU DC Fuel Pump Fault Current - Inspection

(Figure 206)

A. References

Reference	Title
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

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C. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing

D. Procedure

SUBTASK 28-00-00-860-080

WARNING

MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Make sure the landing gear downlocks are installed (TASK 32-00-30-480-801).

SUBTASK 28-00-00-860-081

WARNING

OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-00-00-010-013

(3) To get access to the APU DC fuel pump, do these steps:

(a) Remove the fourteen bolts [52].

(b) Remove the faceplate [51].

SUBTASK 28-00-00-220-001

(4) Measure the bonding resistance between the motor impeller unit of the APU DC boost pump and the airplane structure with an electrical bonding intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

(a) Make sure the bonding resistance is not more than 0.0005 ohm.

END OF TASK

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FUEL SYSTEM - DDG MAINTENANCE PROCEDURES

1. General

A. This procedure has the maintenance tasks for the Master Minimum Equipment List (MMEL) maintenance requirements as shown in the Dispatch Deviations Guide (DDG). These tasks prepare the airplane for flight with certain systems/components inoperative.

B. This procedure also has the tasks that put the airplane back to its usual condition.

C. These are the tasks for the components in the fuel system:

(1) MMEL 28-11-1 (DDG) Preparation - Sump Drain Valves Inoperative

(2) MMEL 28-11-1 (DDG) Restoration - Sump Drain Valves Inoperative

(3) MMEL 28-21-01-01 (DDG) Preparation - Refuel Valve Inoperative

(4) MMEL 28-21-01-01 (DDG) Restoration - Refuel Valve Inoperative

(5) MMEL 28-21-01-02 (DDG) Preparation - Fuel Quantity Indication (Integrated Refuel Panel) Inoperative

(6) MMEL 28-21-01-02 (DDG) Restoration - Fuel Quantity Indication (Integrated Refuel Panel) Inoperative

(7) MMEL 28-22-1 (DDG) Preparation - Main Tank Fuel Pump Inoperative

(8) MMEL 28-22-1 (DDG) Restoration - Main Tank Fuel Pump Inoperative

(9) MMEL 28-22-2 (DDG) Preparation - Center Tank Fuel Override/Jettison Pump Inoperative

(10) MMEL 28-22-2 (DDG) Restoration - Center Tank Fuel Override/Jettison Pump Inoperative

(11) MMEL 28-22-3 (DDG) Preparation - Crossfeed Valve Inoperative

(12) MMEL 28-22-3 (DDG) Restoration - Crossfeed Valve Inoperative

ARO 001-004 PRE SB 777-28-0078

(13) MMEL 28-22-4 (DDG) Preparation - Fuel Scavenge Jet Pumps Inoperative

(14) MMEL 28-22-4 (DDG) Restoration - Fuel Scavenge Jet Pumps Inoperative

(15) MMEL 28-22-7 (DDG) Preparation - Fuel Scavenge Shutoff Valve Inoperative

(16) MMEL 28-22-7 (DDG) Restoration - Fuel Scavenge Shutoff Valve Inoperative

ARO ALL

(17) MMEL 28-25-1 (DDG) Preparation - APU DC Fuel Pump Inoperative

(18) MMEL 28-25-1 (DDG) Restoration - APU DC Fuel Pump Inoperative

(19) MMEL 28-25-2 (DDG) Preparation - APU Fuel Shutoff Valve Inoperative

(20) MMEL 28-25-2 (DDG) Restoration - APU Fuel Shutoff Valve Inoperative

(21) MMEL 28-25-3 (DDG) Preparation - APU Fuel Isolation Valve Inoperative

(22) MMEL 28-25-3 (DDG) Restoration - APU Fuel Isolation Valve Inoperative

(23) MMEL 28-26-1 (DDG) Preparation - Defuel Valve Inoperative

(24) MMEL 28-26-1 (DDG) Restoration - Defuel Valve Inoperative

(25) MMEL 28-31-1 (DDG) Preparation - Fuel Jettison System Inoperative

(26) MMEL 28-31-1 (DDG) Restoration - Fuel Jettison System Inoperative

(27) MMEL 28-31-2 (DDG) Preparation - Center Tank Jettison Isolation Valves Inoperative

(28) MMEL 28-31-2 (DDG) Restoration - Center Tank Jettison Isolation Valves Inoperative

(29) MMEL 28-31-3 (DDG) Preparation - Main Tanks Jettison Pumps Inoperative

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(30) MMEL 28-31-3 (DDG) Restoration - Main Tanks Jettison Pumps Inoperative

(31) MMEL 28-31-4 (DDG) Preparation - Fuel Jettison Nozzle Valves Inoperative

(32) MMEL 28-31-4 (DDG) Restoration - Fuel Jettison Nozzle Valves Inoperative

(33) MMEL 28-41-1 (DDG) Preparation - Fuel Quantity Indication (Flight Deck) Inoperative

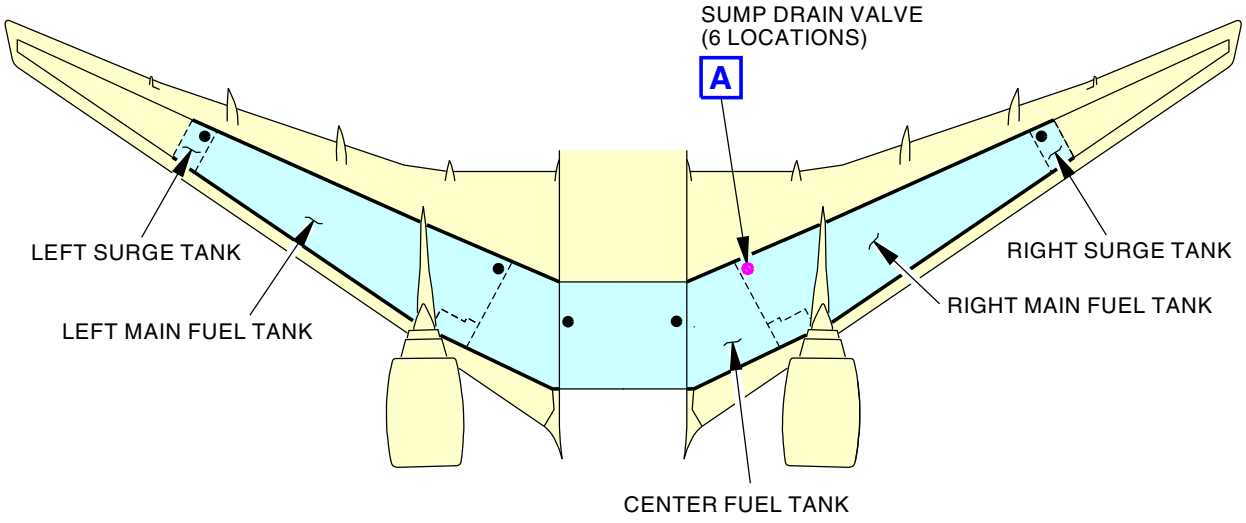
(34) MMEL 28-41-1 (DDG) Restoration - Fuel Quantity Indication (Flight Deck) Inoperative

TASK 28-00-00-901-801

2. DDG Graphics

——— END OF TASK ———

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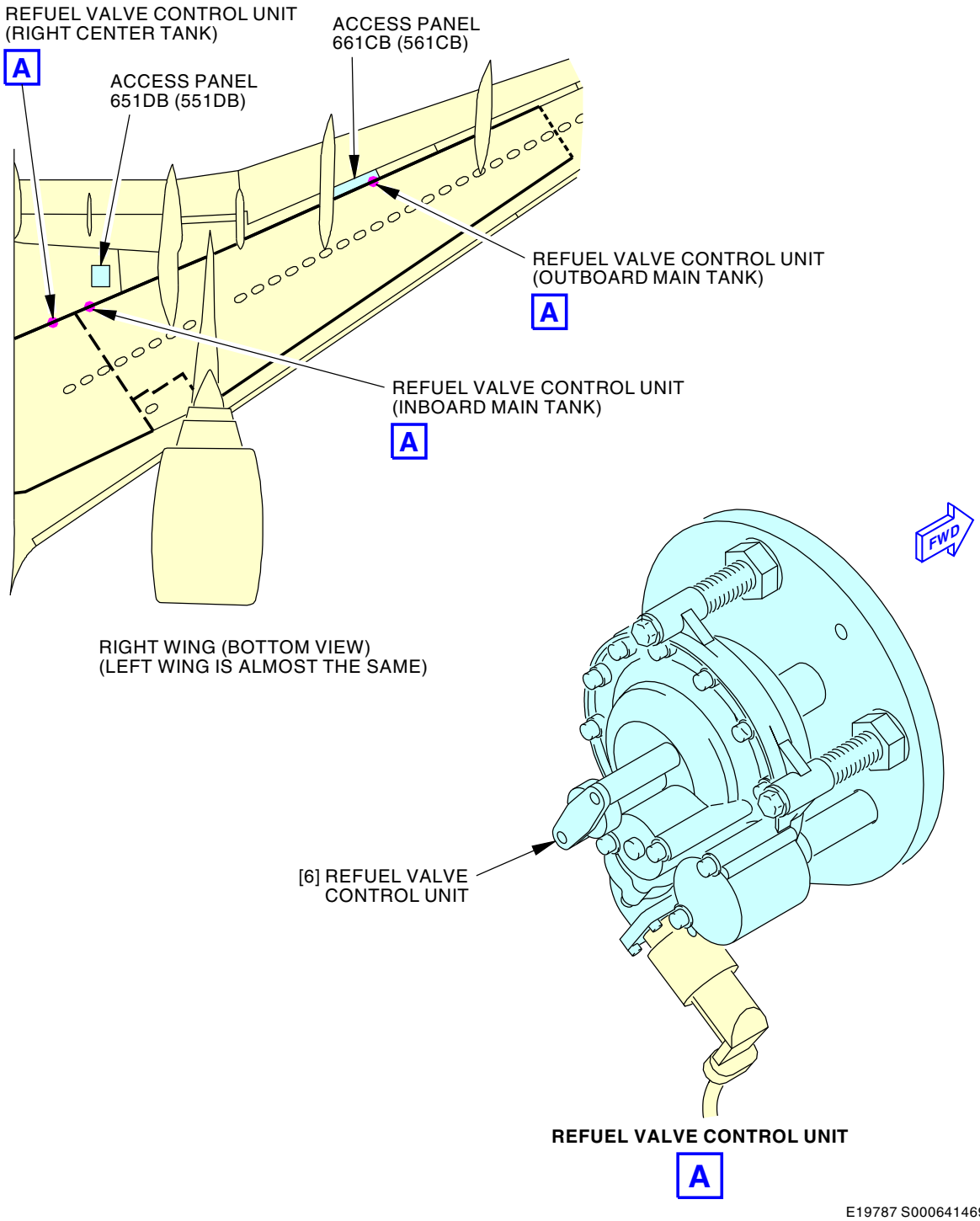


WINGS
(BOTTOM VIEW)

F90450 S0006414697_V2

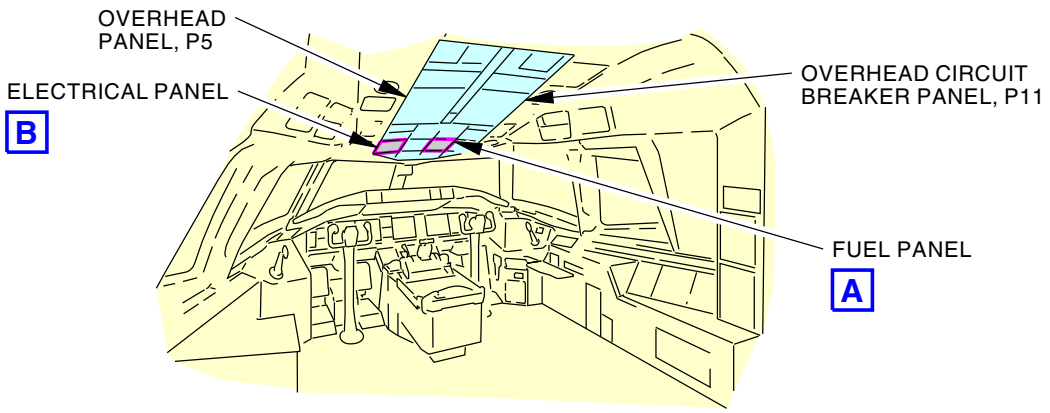
Fuel Sump Drain Valves Installation
Figure 901/28-00-00-990-801

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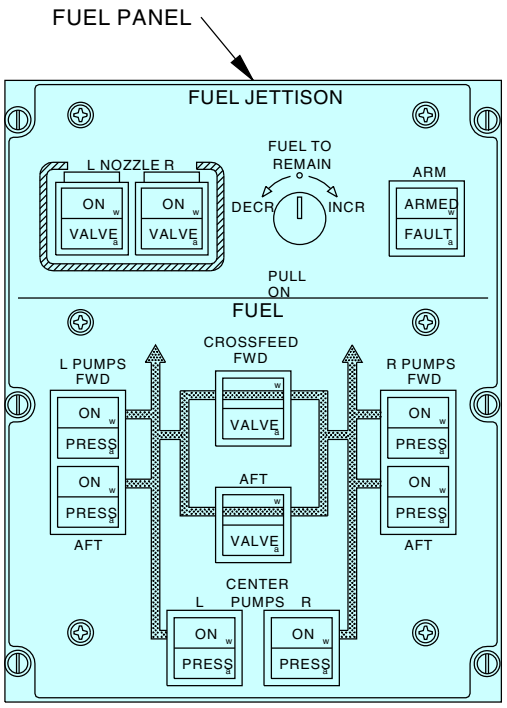


Refuel Shutoff Valve Control Unit Installation
Figure 902/28-00-00-990-802

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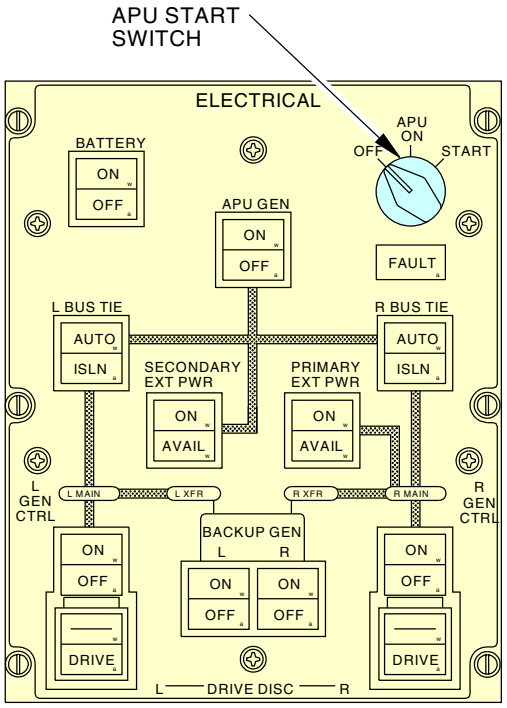


FLIGHT COMPARTMENT



FUEL/FUEL JETTISON PANEL

A



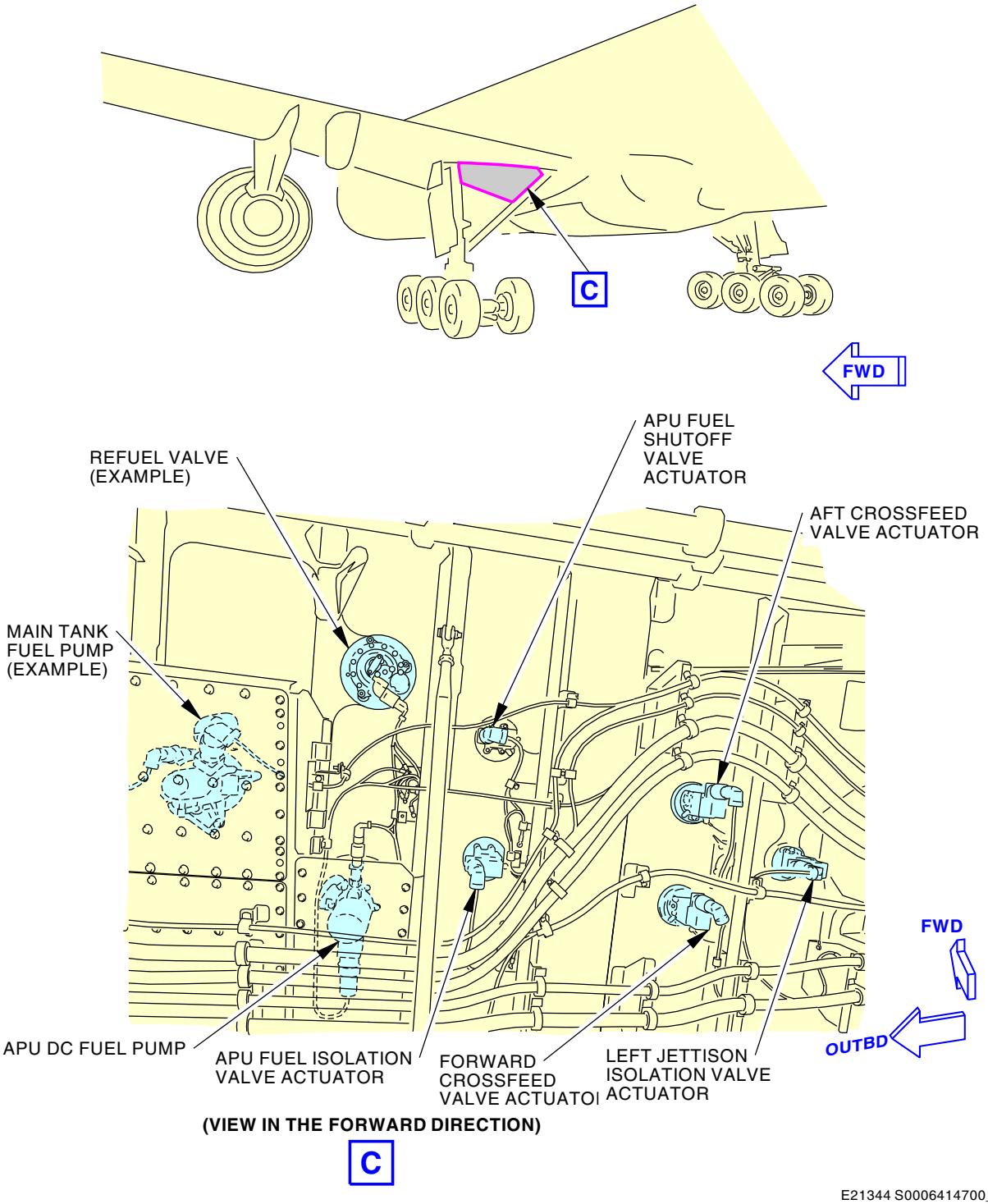
ELECTRICAL PANEL

B

E19812 S0006414699_V2

Engine/APU Fuel Feed Systems
Figure 903/28-00-00-990-803 (Sheet 1 of 2)

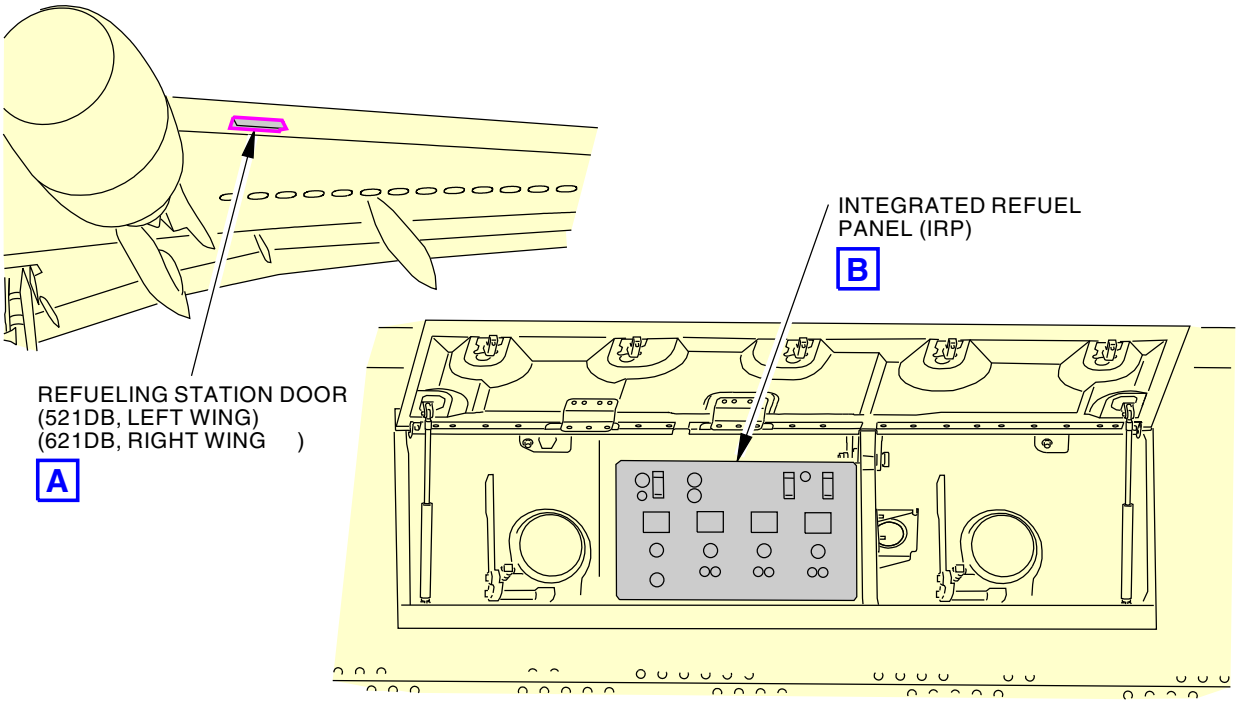
ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



E21344 S0006414700_V2

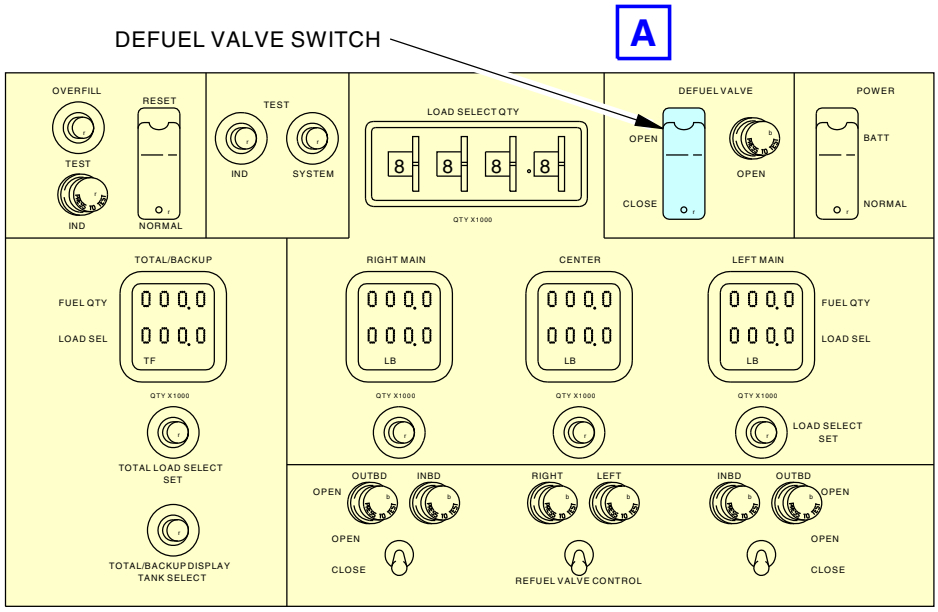
Engine/APU Fuel Feed Systems
Figure 903/28-00-00-990-803 (Sheet 2 of 2)

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**REFUELING STATION DOOR
(BOTTOM VIEW)**

A



INTEGRATED REFUEL PANEL

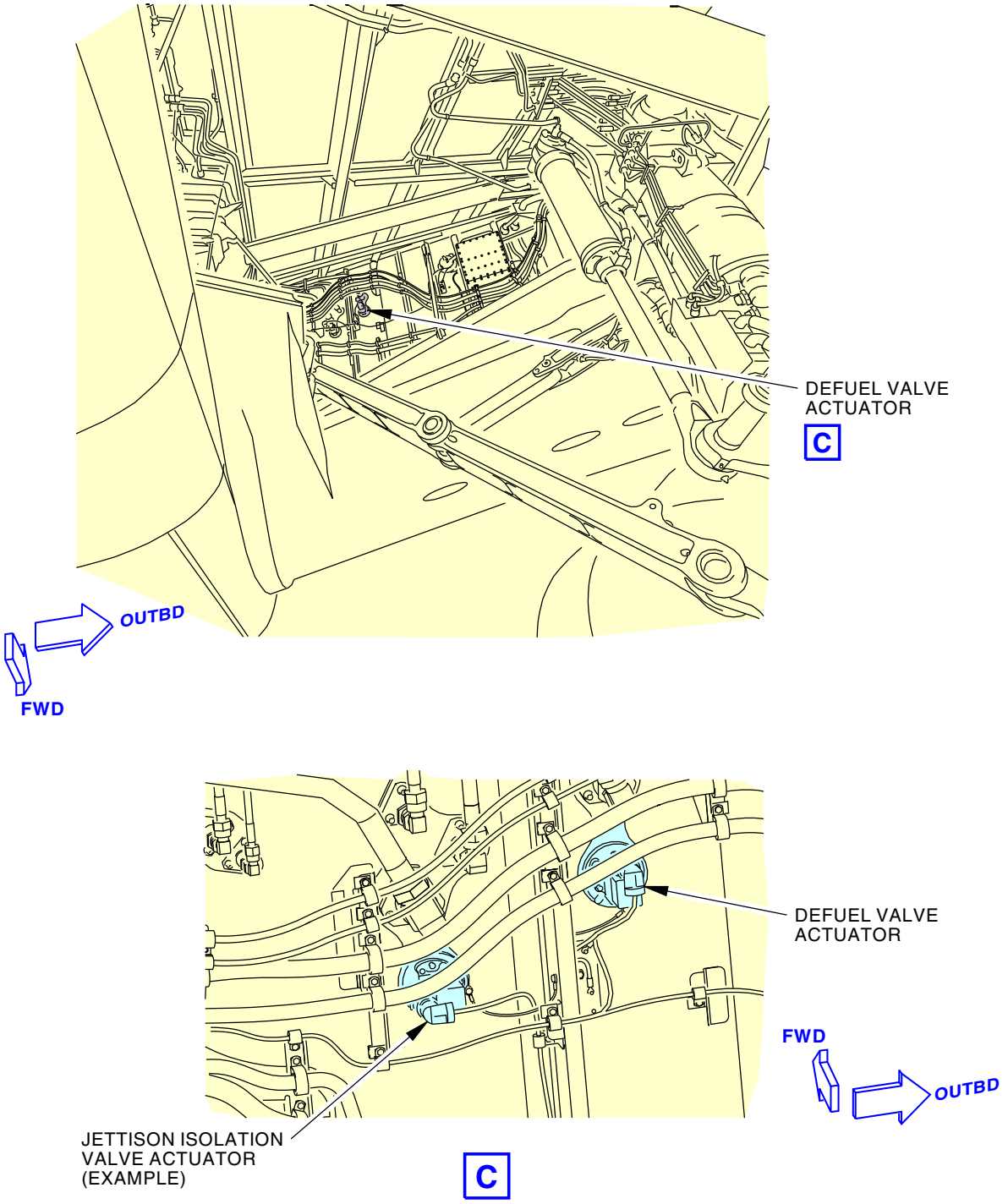
1 IF INSTALLED

B

E20473 S0006414701_V2

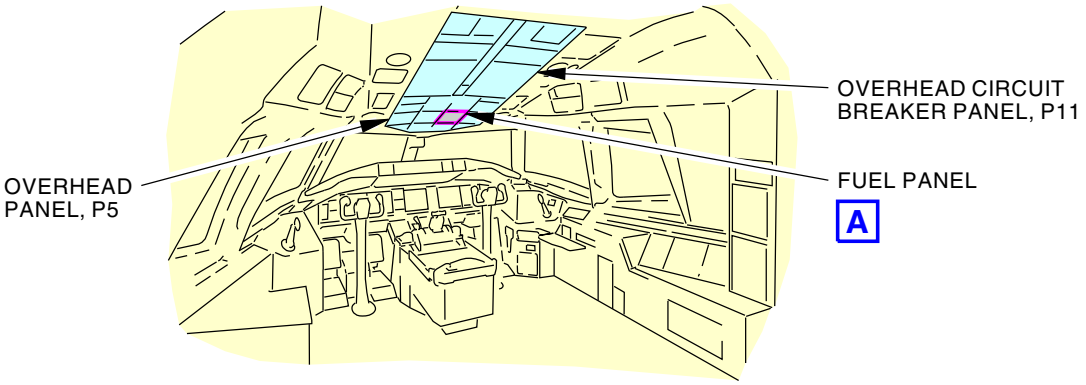
**Defuel System
Figure 904/28-00-00-990-804 (Sheet 1 of 2)**

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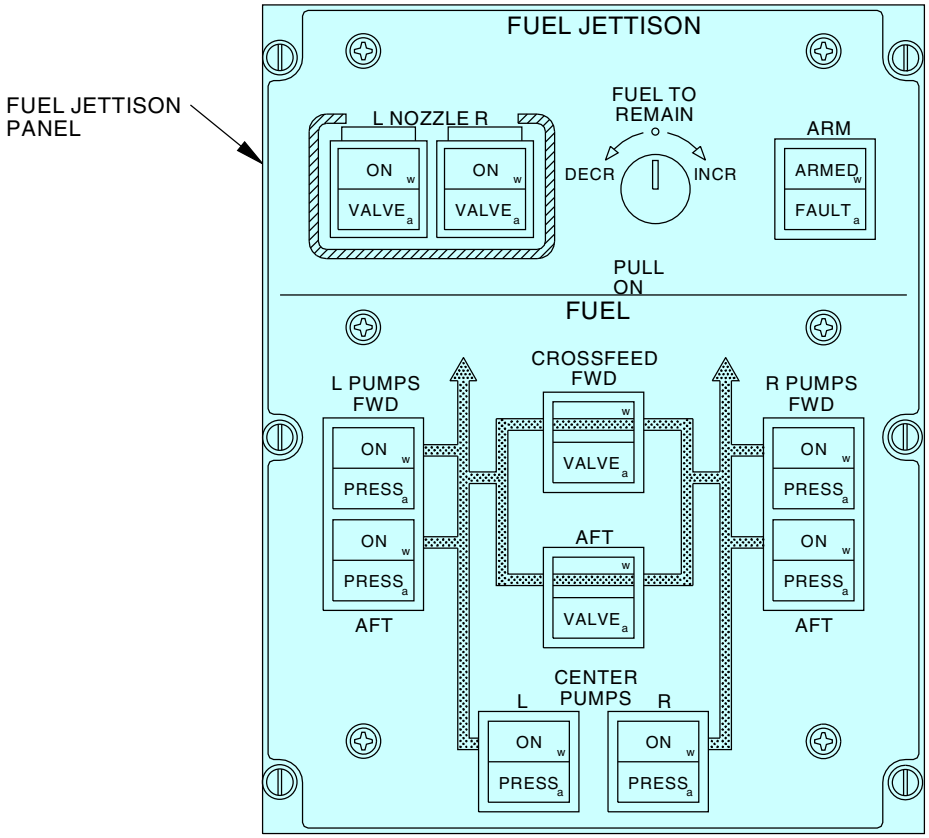


Defuel System
Figure 904/28-00-00-990-804 (Sheet 2 of 2)

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FLIGHT COMPARTMENT



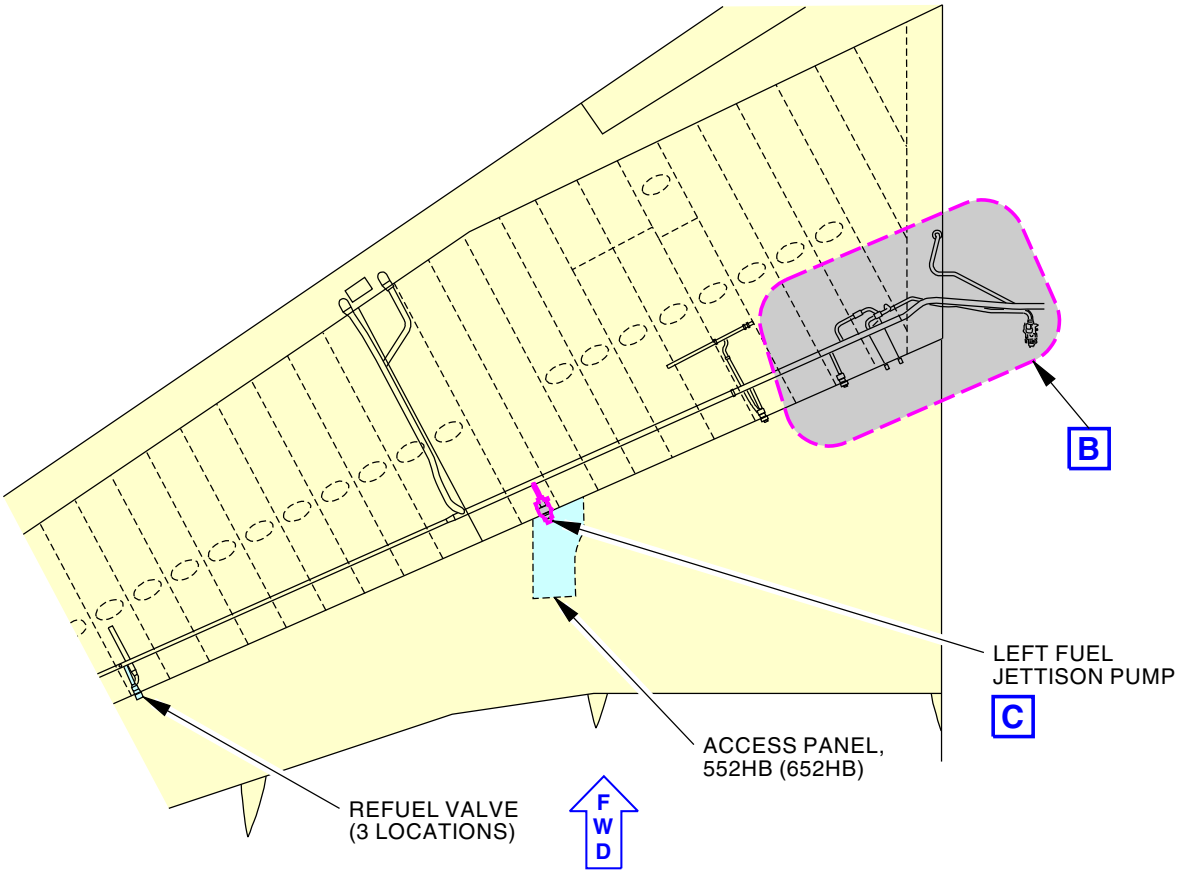
FUEL/FUEL JETTISON PANEL

A

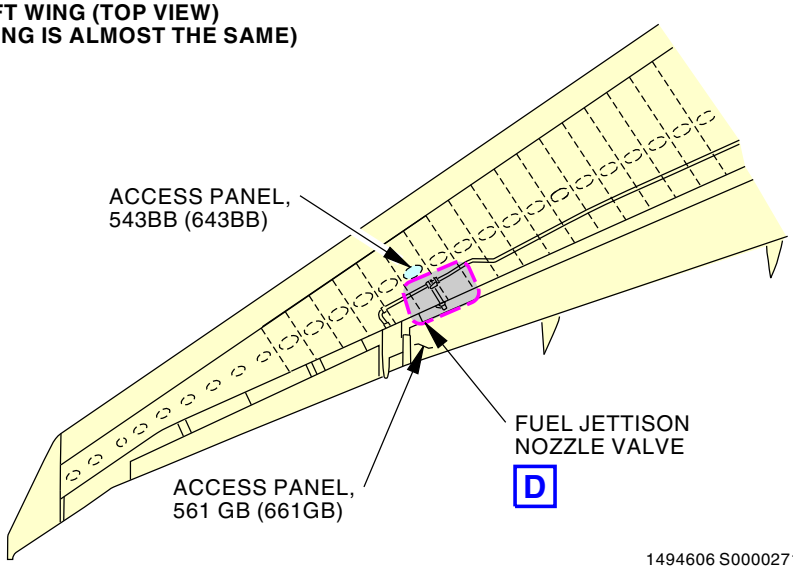
E20494 S0006414703_V2

Fuel Jettison System
Figure 905/28-00-00-990-805 (Sheet 1 of 4)

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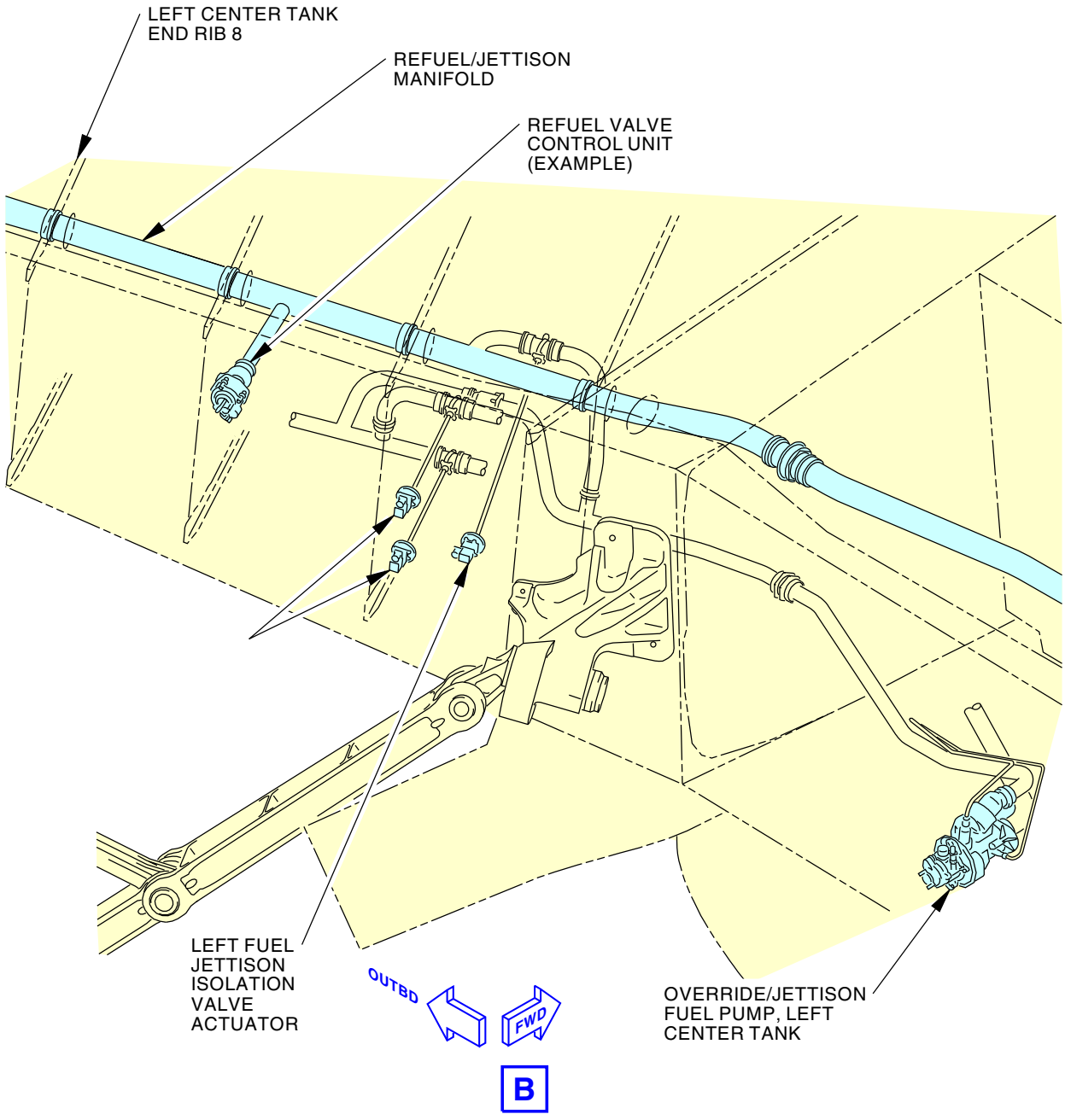
LEFT WING (TOP VIEW)
(RIGHT WING IS ALMOST THE SAME)



1494606 S0000271465_V3

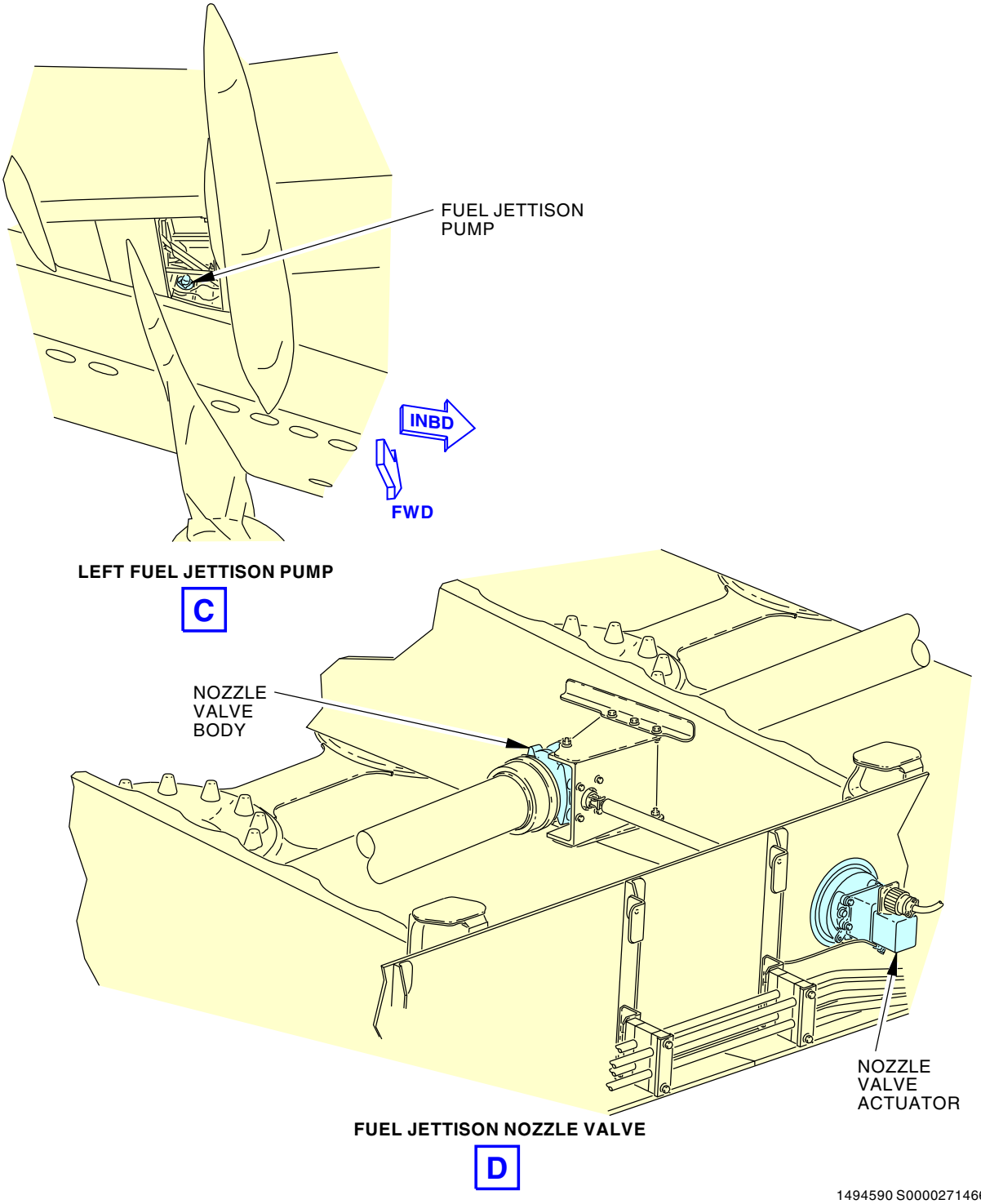
Fuel Jettison System
Figure 905/28-00-00-990-805 (Sheet 2 of 4)

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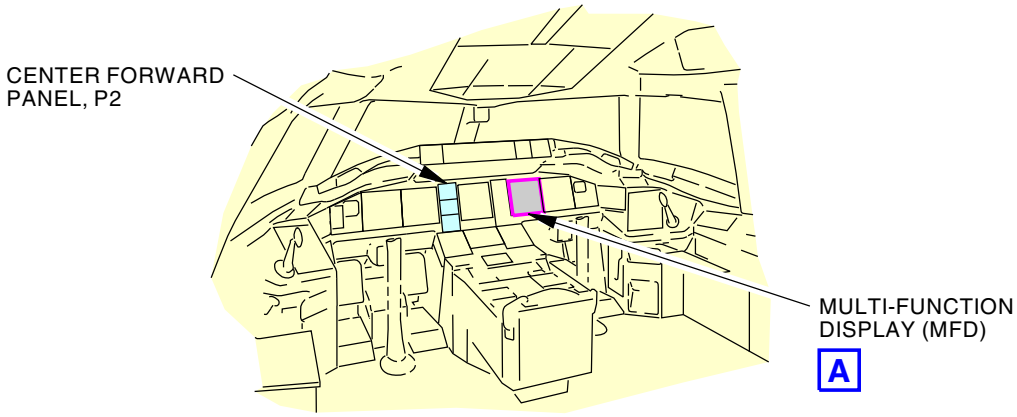
Fuel Jettison System
Figure 905/28-00-00-990-805 (Sheet 3 of 4)

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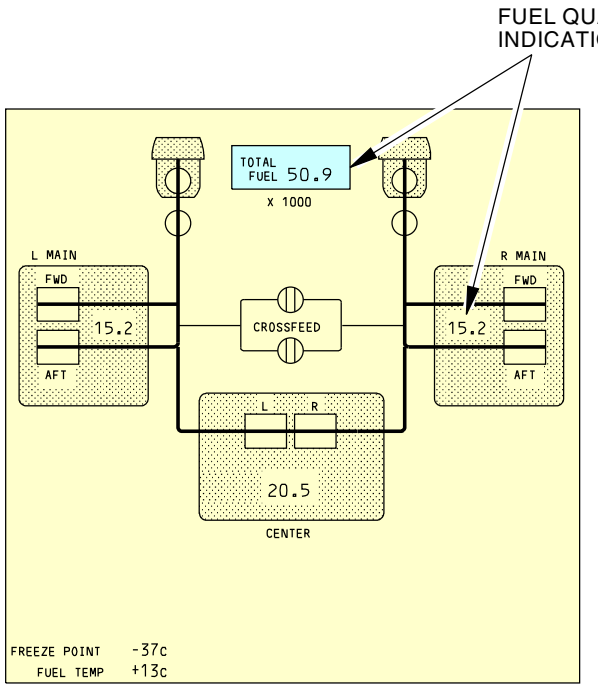


Fuel Jettison System
Figure 905/28-00-00-990-805 (Sheet 4 of 4)

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FLIGHT COMPARTMENT



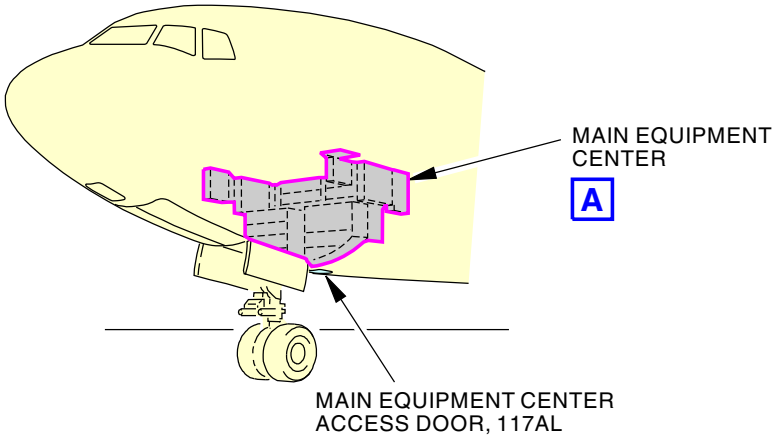
MULTI-FUNCTION DISPLAY (MFD)

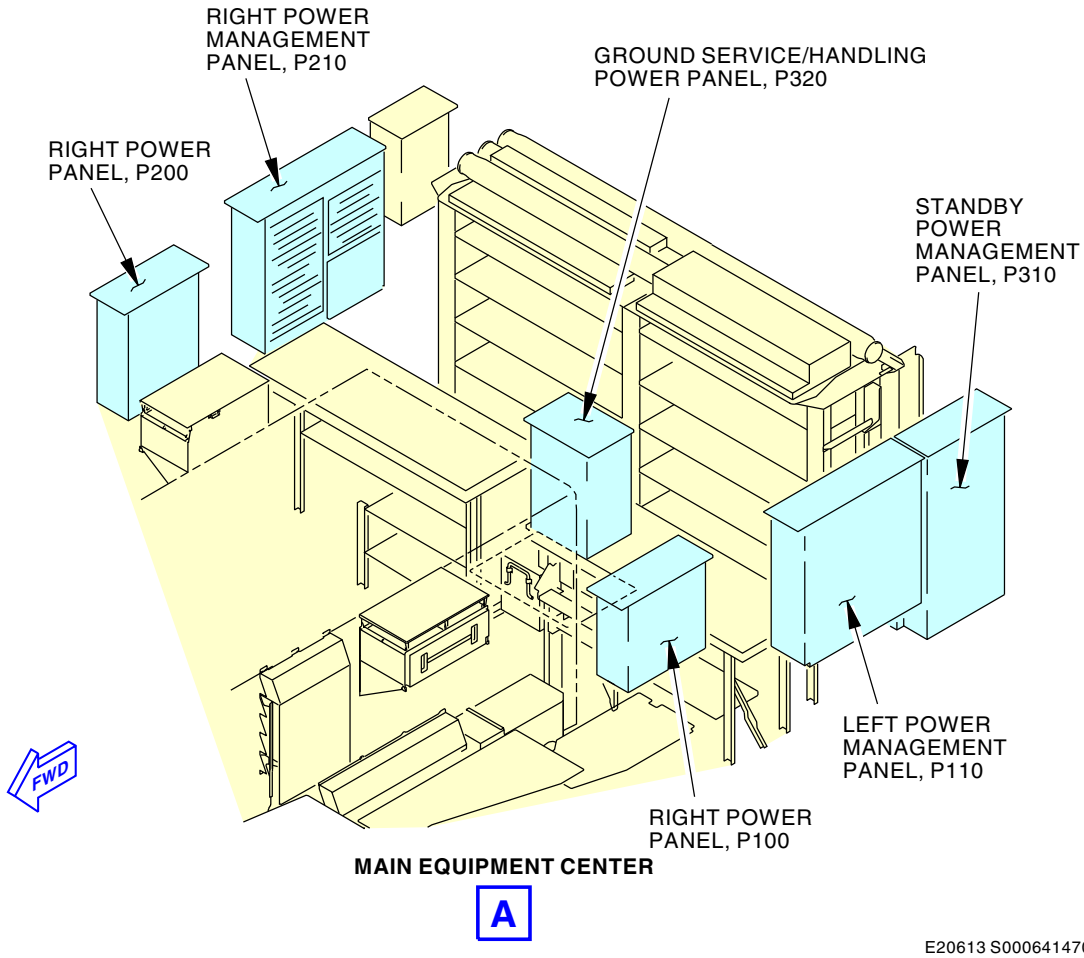
A

E20612 S0006414707_V2

Fuel Quantity Indicating System
Figure 906/28-00-00-990-806

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E20613 S0006414708_V2

Fuel Jettison System
Figure 907/28-00-00-990-807

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TASK 28-00-00-040-801

3. MMEL 28-11-1 (DDG) Preparation - Sump Drain Valves Inoperative

(Figure 901)

A. General

(1) This task gives the maintenance steps which prepare the airplane for flight with the sump drain valve(s) inoperative.

B. Location Zones

Zone	Area
195	Underwing Wing-to-Body Fairings, Left
196	Underwing Wing-to-Body Fairings, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

C. Sump Drain Valve(s) (Surge Tank) Inoperative

SUBTASK 28-00-00-210-001

(1) If a sump drain valve is inoperative, make sure there is no fuel leakage from the applicable sump drain valve.

D. Sump Drain Valve (Main or Center Tank) Inoperative

SUBTASK 28-00-00-210-004

(1) If one sump drain valve is inoperative, in the main or center tank, then do the subsequent steps:

(a) Make sure that there is no fuel leakage from the inoperative sump drain valve.

(b) Use an alternative procedure to make sure that water does not collect in the tank with the inoperative sump drain valve.

NOTE: One alternative procedure is to do a check of the refuel service equipment for moisture accumulation before and after each refuel operation.

——— END OF TASK ———

TASK 28-00-00-440-801

4. MMEL 28-11-1 (DDG) Restoration - Sump Drain Valves Inoperative

(Figure 901)

A. General

(1) This task puts the airplane back to its usual condition after operation with the sump drain valves inoperative.

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B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
12-11-02-680-801	Fuel Tank Sump Drain Valve - Water Removal/Sampling (P/B 301)
28-11-06-000-801	Sump Drain Valve - Removal (P/B 401)
28-11-06-400-801	Sump Drain Valve - Installation (P/B 401)

C. Location Zones

Zone	Area
195	Underwing Wing-to-Body Fairings, Left
196	Underwing Wing-to-Body Fairings, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

D. Activate the Sump Drain Valve(s) that are Inoperative

SUBTASK 28-00-00-960-001

(1) If the sump drain valve is bad, replace the valve.

(a) These are the tasks:

Sump Drain Valve - Removal, TASK 28-11-06-000-801,

Sump Drain Valve - Installation, TASK 28-11-06-400-801.

SUBTASK 28-00-00-650-002

(2) To do a leak check of the installed valve, do this task: Pressure Refueling, TASK 12-11-01-650-801.

SUBTASK 28-00-00-700-001

(3) Do a check of the sump drain valve with the sampling tool (TASK 12-11-02-680-801).

SUBTASK 28-00-00-210-003

(4) Make sure there is no fuel leakage from the replaced sump drain valve.

——— END OF TASK ———

TASK 28-00-00-040-802

5. MMEL 28-21-01-01 (DDG) Preparation - Refuel Valve(s) Inoperative

(Figure 902)

A. General

(1) This task is for operating the airplane with one or more refuel valves inoperative.

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B. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
12-11-01-650-801	Pressure Refueling (P/B 301)
12-11-01-650-808	Pressure Refueling - With Inoperative Refuel Valves (P/B 301)
28-21-01-000-801	Refuel Adapter - Removal (P/B 401)
28-21-01-400-801	Refuel Adapter - Installation (P/B 401)
28-21-02-000-801	Refuel Valve - Removal (P/B 401)
28-21-02-400-801	Refuel Valve - Installation (P/B 401)

C. Location Zones

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing
561	Rear Spar to Trailing Edge - Outboard of Flaperon - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing
661	Rear Spar to Trailing Edge - Outboard of Flaperon - Right Wing

D. Access Panels

Number	Name/Location
521DB	Refueling Station Door

E. Initial Evaluation of Inoperative Refuel Valve

SUBTASK 28-00-00-860-001

WARNING DO NOT OPERATE THE LEADING EDGE SLATS. ACCIDENTAL SLAT OPERATION COULD CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Put a DO-NOT-OPERATE tag on the flap control lever, in the flight compartment.

SUBTASK 28-00-00-010-001

(2) Do this step to access the integrated refuel panel (IRP), P28 (TASK 06-44-00-800-802).

Open this access door:

Number	Name/Location
521DB	Refueling Station Door

SUBTASK 28-00-00-860-002

(3) Make sure the refuel valve control switches for the left, center and right fuel tanks are in the CLOSED position.

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SUBTASK 28-00-00-650-003

WARNING

MAKE SURE THAT THERE IS NO TENSION ON THE HOSE. THE HOSE MUST HANG FREELY FROM THE REFUEL ADAPTER, WITH NO FORCE ON IT. TENSION ON THE HOSE CAN CAUSE DAMAGE TO THE FUEL RECEPTACLE AND CAUSE THE HOSE TO DISCONNECT. INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(4) Connect the fueling nozzles to the refuel adapters and apply fueling pressure (TASK 12-11-01-650-801).

(a) Make sure that the refuel adapter is clean, not damaged and there are no fuel leaks.

1) Make sure that the screws and lugs are not loose or damaged.

(b) If there is a problem with the refuel adapter, replace the refuel adapter (TASK 28-21-01-000-801 and TASK 28-21-01-400-801).

SUBTASK 28-00-00-860-003

(5) Push and release each blue refuel valve light, for the left, center and right fuel tanks respectively.

(a) Make sure each light comes on and goes off.

SUBTASK 28-00-00-860-004

(6) Do these steps to test the refuel valves in the left, center and right fuel tanks:

(a) Put the refuel valve control switches for the left, center and right fuel tanks to the OPEN position.

(b) Make sure each refuel valve light comes on and stays on.

(c) If one or more refuel valve lights do not come on, do this task to open the refuel valve(s) and continue fueling:

Pressure Refueling - With Inoperative Refuel Valves, TASK 12-11-01-650-808

NOTE: Go to step detailing the failed closed fault procedure.

(d) Put the refuel valve control switches for the left, center and right fuel tanks to the CLOSED position.

(e) Make sure each refuel valve light goes off and stays off.

(f) If only one refuel valve light is on (failed open), do these steps:

NOTE: If one refuel valve is failed OPEN, the refuel system will not stop the refuel operation at a set fuel quantity. Stop the fueling source at the set quantity to prevent an overfill condition.

1) Continue refueling the fuel tank to the correct fuel quantity.

2) Do this task: MMEL 28-31-1 (DDG) Preparation - Fuel Jettison System Inoperative, TASK 28-00-00-040-810.

(g) If more than one of refuel valve lights does not go off (are failed open), do these steps:

NOTE: If the one or more refuel valves are failed OPEN, the refuel system will not stop the refuel operation at a set fuel quantity. Stop the fueling source at the set quantity to prevent an overfill condition.

1) Do these tasks to replace the refuel valves that are failed open:

Refuel Valve - Removal, TASK 28-21-02-000-801,

Refuel Valve - Installation, TASK 28-21-02-400-801.

2) Refuel the fuel tank (TASK 12-11-01-650-801).

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SUBTASK 28-00-00-860-005

(7) Remove the DO-NOT-OPERATE tag from the flap control lever, in the flight compartment.

——— END OF TASK ———

TASK 28-00-00-440-802

6. MMEL 28-21-01-01 (DDG) Restoration - Refuel Valve(s) Inoperative

(Figure 902)

A. General

(1) This task restores the airplane with one or more refuel valves inoperative.

B. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
12-11-01-650-801	Pressure Refueling (P/B 301)
28-21-01-000-801	Refuel Adapter - Removal (P/B 401)
28-21-01-400-801	Refuel Adapter - Installation (P/B 401)
28-21-02-000-801	Refuel Valve - Removal (P/B 401)
28-21-02-400-801	Refuel Valve - Installation (P/B 401)
28-21-03-000-801	Refuel Valve Control Unit - Removal (P/B 401)
28-21-03-400-801	Refuel Valve Control Unit - Installation (P/B 401)
SSM 28-21-21	System Schematics Manual
SSM 28-21-31	System Schematics Manual

C. Location Zones

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing
561	Rear Spar to Trailing Edge - Outboard of Flaperon - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing
661	Rear Spar to Trailing Edge - Outboard of Flaperon - Right Wing

D. Access Panels

Number	Name/Location
521DB	Refueling Station Door

E. Refuel Valve Inoperative Restoration

SUBTASK 28-00-00-960-002

(1) Replace the applicable refuel valve control unit.

(a) These are the tasks:

Refuel Valve Control Unit - Removal, TASK 28-21-03-000-801,

Refuel Valve Control Unit - Installation, TASK 28-21-03-400-801.

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SUBTASK 28-00-00-840-005

(2) Do this task: MMEL 28-31-1 (DDG) Restoration - Fuel Jettison System Inoperative, TASK 28-00-00-440-810.

SUBTASK 28-00-00-860-069

WARNING DO NOT OPERATE THE LEADING EDGE SLATS. ACCIDENTAL SLAT OPERATION COULD CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Put a DO-NOT-OPERATE tag on the flap control lever, in the flight compartment.

SUBTASK 28-00-00-010-002

(4) To get access to the integrated refuel panel (IRP), P28 (TASK 06-44-00-800-802).

Do this task:

Open this access door:

Number	Name/Location
521DB	Refueling Station Door

SUBTASK 28-00-00-860-006

(5) Make sure the refuel valve control switches for the left, center and right fuel tanks are in the CLOSED position.

SUBTASK 28-00-00-650-004

WARNING MAKE SURE THAT THERE IS NO TENSION ON THE HOSE. THE HOSE MUST HANG FREELY FROM THE REFUEL ADAPTER, WITH NO FORCE ON IT. TENSION ON THE HOSE CAN CAUSE DAMAGE TO THE FUEL RECEPTACLE AND CAUSE THE HOSE TO DISCONNECT. INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(6) Connect the fueling nozzles to the refuel adapters and apply fueling pressure (TASK 12-11-01-650-801).

(a) Make sure that the refuel adapter is clean, not damaged and there are no fuel leaks.

1) Make sure that the screws and lugs are not loose or damaged.

(b) If there is a problem with the refuel adapter, replace the refuel adapter (TASK 28-21-01-000-801 and TASK 28-21-01-400-801).

SUBTASK 28-00-00-860-007

(7) Push and release each blue refuel valve light, for the left, center and right fuel tanks respectively.

(a) Make sure each light comes on and goes off.

SUBTASK 28-00-00-860-008

(8) Put the refuel valve control switches for the left, center and right fuel tanks to the OPEN position.

(a) Make sure each refuel valve light comes on and stays on.

SUBTASK 28-00-00-860-009

(9) Put the refuel valve control switches for the left, center and right fuel tanks to the CLOSED position.

(a) Make sure each refuel valve light goes off.

(b) If the problem continues, do a wiring check (SSM 28-21-21), (SSM 28-21-31).

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(c) Repair the problems that you find.

(d) If the problem continues, replace the refuel valve.

1) These are the tasks:

Refuel Valve - Removal, TASK 28-21-02-000-801,

Refuel Valve - Installation, TASK 28-21-02-400-801.

SUBTASK 28-00-00-080-001

(10) Disconnect the fueling nozzles from the refuel adapters (TASK 12-11-01-650-801).

SUBTASK 28-00-00-410-001

(11) Do this task:

Close this access door:

Number	Name/Location
521DB	Refueling Station Door

(TASK 06-44-00-800-802).

SUBTASK 28-00-00-860-070

(12) Remove the DO-NOT-OPERATE tag from the flap control lever, in the flight compartment.

——— END OF TASK ———

TASK 28-00-00-040-816

7. MMEL 28-21-01-02 (DDG) Preparation - Fuel Quantity Indication (Integrated Refuel Panel) Inoperative

(Figure 904)

A. General

(1) This task is for operation of the airplane with an inoperative Integrated Refuel Panel.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
12-11-01-650-809	Pressure Refueling - With An Inoperative Fuel Quantity Display (P/B 301)

C. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing

D. Access Panels

Number	Name/Location
521DB	Refueling Station Door

E. Integrated Refuel Panel Fuel Quantity Indicator(s) or Load Select System Inoperative

SUBTASK 28-00-00-860-067

(1) Do the applicable steps that follow, to find the fuel quantity in the fuel tank with the inoperative indication:

(a) To find the fuel tank quantity at the integrated refuel panel P28, do these steps:

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1) Put a DO-NOT-OPERATE tag on the flap control lever, in the flight compartment.
2) Get access to the integrated refuel panel (IRP), P28.
   a) Open this access door:

Number	Name/Location
521DB	Refueling Station Door

3) Push the TOTAL/BACKUP DISPLAY TANK SELECT switch on the IRP, P28, to monitor the fuel quantity for the applicable fuel tank.
4) Close this access door:

Number	Name/Location
521DB	Refueling Station Door

5) Remove the DO-NOT-OPERATE tag from the flap control lever, in the flight compartment.

(b) To find the fuel tank quantity in the flight compartment, go to the multi-function display (MFD) in the flight compartment and monitor the fuel quantity for the applicable fuel tank.

(c) Use the fuel quantity measuring sticks:

NOTE: When you refuel the airplane with inoperative FQIS, only one refuel valve will open. The fuel level near the open refuel valve will temporarily be higher than the fuel level away from the open refuel valve because the fuel tank structure will limit fuel movement. The fuel quantity measuring sticks may not give accurate results until the fuel level across the fuel tank structure becomes equal (5 to 15 minutes after you refuel the airplane).

1) To measure the fuel quantity, refer to the applicable Fuel Measuring Stick Manual (FMSM).

Table 901/28-00-00-993-802

FMSM Number	Document Title
D634W122	777-200 A-MARKET Fuel Measuring Stick Manual - Pounds
D634W123	777-200 A-MARKET Fuel Measuring Stick Manual - Kilograms
D634W124	777-200ER/300 NON-ER Fuel Measuring Stick Manual - Pounds
D634W125	777-200ER/300 NON-ER Fuel Measuring Stick Manual - Kilograms
D634W126-1	777-200LR/300ER Fuel Measuring Stick Manual - Pounds
D634W127-1	777-200LR/300ER Fuel Measuring Stick Manual - Kilograms

(d) To calculate the fuel quantity from the FMCS and EICAS, do the steps that follow:

1) Do these steps to get the total fuel quantity from the FMCS:
   a) Push the PROG mode select key on the CDU.
   b) Push the NEXT PAGE mode select key to show the PROGRESS PAGE 2/2.
   c) Look at the FUEL QTY CALCULATED indication on the CDU.

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2) Use the EICAS fuel synoptic display or the IRP to get the fuel quantity for the other two tanks.

3) Subtract the total EICAS indicated fuel (for the other two tanks) from the FUEL QTY CALCULATED indication.

(e) Add a known quantity of fuel:

1) Do these steps to get the total fuel quantity from the FMCS:

a) Push the PROG mode select key on the CDU.

b) Push the NEXT PAGE mode select key to show the PROGRESS PAGE 2/2.

c) Look at the FUEL QTY CALCULATED indication on the CDU.

d) Make a record of this indication.

2) To add a known quantity of fuel, look at the fueling source meter while you refuel the airplane, do this task: Pressure Refueling - With An Inoperative Fuel Quantity Display, TASK 12-11-01-650-809.

3) To calculate the total quantity of fuel (after refueling); add the quantity of fuel you added to the tanks to the record you made of the FUEL QTY CALCULATED indication.

4) After you refuel, use the EICAS fuel synoptic display or the IRP to get the fuel quantity for the other two tanks.

5) To calculate the quantity of fuel in the applicable tank; subtract the total EICAS indicated fuel for the other two tanks from the total fuel you calculated above.

F. Integrated Refuel Panel Refuel Valve Light(s) Inoperative

SUBTASK 28-00-00-860-084

WARNING DO NOT OPERATE THE LEADING EDGE SLATS. ACCIDENTAL SLAT OPERATION COULD CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Put a DO-NOT-OPERATE tag on the flap control lever, in the flight compartment.

SUBTASK 28-00-00-010-022

(2) Open this access door:

Number	Name/Location
521DB	Refueling Station Door

SUBTASK 28-00-00-210-010

(3) Push the OVERFILL TEST switch to do a test on the overfill system.

(a) Make sure the OVERFILL IND light comes on.

SUBTASK 28-00-00-210-011

(4) Push the OVERFILL RESET switch to RESET and to NORMAL to reset the overfill system.

(a) Make sure the OVERFILL IND light goes off.

SUBTASK 28-00-00-650-021

(5) Do this task: Pressure Refueling, TASK 12-11-01-650-801.

(a) Do these steps to make sure the refuel valves close:

NOTE: Make sure the refuel valves close before the tank reaches volumetric top off (VTO).

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1) Put all refuel valve switches to the CLOSED position.

a) Make sure refueling stops.

NOTE: Use the EICAS fuel synoptic display, IRP, or fueling source to make sure fuel quantity does not increase in any tank.

(b) If it is necessary, continue refueling (TASK 12-11-01-650-801).

SUBTASK 28-00-00-410-027

(6) Close this access door:

Number	Name/Location
521DB	Refueling Station Door

SUBTASK 28-00-00-860-087

(7) Remove the DO-NOT-OPERATE tag on the flap control lever, in the flight compartment.

G. Integrated Refuel Panel Overfill Function Inoperative

SUBTASK 28-00-00-860-085

WARNING DO NOT OPERATE THE LEADING EDGE SLATS. ACCIDENTAL SLAT OPERATION COULD CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Put a DO-NOT-OPERATE tag on the flap control lever, in the flight compartment.

SUBTASK 28-00-00-010-023

(2) Open this access door:

Number	Name/Location
521DB	Refueling Station Door

SUBTASK 28-00-00-860-086

(3) Push and release each refuel valve light as follows:

(a) RIGHT MAIN OUTBD

(b) RIGHT MAIN INBD

(c) CENTER RIGHT

(d) CENTER LEFT

(e) LEFT MAIN INBD

(f) LEFT MAIN OUTBD.

SUBTASK 28-00-00-210-012

(4) Make sure each refuel valve light comes on and then goes off.

NOTE: This tests the light bulb in the refuel valve position indication.

SUBTASK 28-00-00-650-022

(5) Do this task: Pressure Refueling, TASK 12-11-01-650-801.

(a) Make sure the refuel valves close at the desired fuel quantity.

SUBTASK 28-00-00-410-028

(6) Close this access door:

Number	Name/Location
521DB	Refueling Station Door

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SUBTASK 28-00-00-860-088

(7) Remove the DO-NOT-OPERATE tag on the flap control lever, in the flight compartment.

H. Integrated Refuel Panel Defuel Valve Function Inoperative

SUBTASK 28-00-00-040-032

(1) Do this task: MMEL 28-26-1 (DDG) Preparation - Defuel Valve Inoperative, TASK 28-00-00-040-809.

——— END OF TASK ———

TASK 28-00-00-040-817

8. MMEL 28-21-01-02 (DDG) Restoration - Fuel Quantity Indication (Integrated Refuel Panel) Inoperative

(Figure 904)

A. General

(1) This task restores the airplane with an inoperative Integrated Refuel Panel.

B. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing

C. Integrated Refuel Panel Fuel Quantity Indicator(s) or Load Select System Inoperative

SUBTASK 28-00-00-440-024

(1) No maintenance action is necessary.

D. Integrated Refuel Panel Refuel Valve Light(s) Inoperative

SUBTASK 28-00-00-440-025

(1) No maintenance action is necessary.

E. Integrated Refuel Panel Overfill Function Inoperative

SUBTASK 28-00-00-440-026

(1) No maintenance action is necessary.

F. Integrated Refuel Panel Defuel Valve Function Inoperative

SUBTASK 28-00-00-440-027

(1) Do this task: MMEL 28-26-1 (DDG) Restoration - Defuel Valve Inoperative, TASK 28-00-00-440-809.

——— END OF TASK ———

TASK 28-00-00-040-834

9. MMEL 28-21-3 (DDG) Preparation - Refuel Adapter Inoperative

A. General

(1) This task is for operation of the airplane when one refuel adapter per refuel station does not operate.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)

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(Continued)

Reference	Title
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)

C. Location Zones

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing

D. Access Panels

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

E. Get Access to the Refuel Adapter

SUBTASK 28-00-00-860-089

WARNING DO NOT OPERATE THE LEADING EDGE SLATS. ACCIDENTAL SLAT OPERATION COULD CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Put a DO-NOT-OPERATE tag on the flap control lever, in the flight compartment (TASK 27-81-00-440-801).

SUBTASK 28-00-00-010-024

(2) Open the applicable pressure refuel station access doors:

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

F. Refuel Adapter Deactivation

SUBTASK 28-00-00-210-013

(1) Do this task: Pressure Refueling, TASK 12-11-01-650-801.

(a) During the refuel operation, make sure that fuel does not leak from the inoperative refuel adapter.

END OF TASK

TASK 28-00-00-440-829

10. MMEL 28-21-3 (DDG) Restoration - Refuel Adapter Inoperative

A. General

(1) This task puts the airplane back to its usual condition after operation with one refuel adapter per refuel station inoperative.

B. References

Reference	Title
28-21-01-000-801	Refuel Adapter - Removal (P/B 401)
28-21-01-400-801	Refuel Adapter - Installation (P/B 401)

C. Location Zones

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing

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(Continued)

Zone	Area
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing

D. Access Panels

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

E. Refuel Adapter Activation

SUBTASK 28-00-00-420-003

(1) Do these tasks to replace the refuel adapter:

(a) Refuel Adapter - Removal, TASK 28-21-01-000-801.

(b) Refuel Adapter - Installation, TASK 28-21-01-400-801.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 28-00-00-410-030

(1) Close the applicable pressure relief refuel station access doors:

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

SUBTASK 28-00-00-860-090

(2) Remove the DO-NOT-OPERATE tag from the flap control lever, in the flight compartment.

——— END OF TASK ———

TASK 28-00-00-040-803

11. MMEL 28-22-1 (DDG) Preparation - Main Tank Fuel Pump Inoperative

(Figure 903)

A. General

(1) This task is for operation of the airplane with one main tank fuel (boost) pump inoperative.

B. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

C. Main Tank Fuel Boost Pump Deactivation

SUBTASK 28-00-00-860-010

(1) If the forward fuel pump in the left main tank is inoperative, do this step:

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(a) Open these circuit breakers and install safety locks:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
E	5	C28307	L FWD FUEL BOOST PUMP

Standby Power Management Panel, P310

Row	Col	Number	Name
B	2	C28604	L FWD FUEL BOOST PUMP CTRL

SUBTASK 28-00-00-860-011

(2) If the aft fuel pump in the left main tank is inoperative, do this step:

(a) Open these circuit breakers and install safety locks:

Left Power Management Panel, P110

Row	Col	Number	Name
E	2	C28303	L AFT FUEL BOOST PUMP
L	26	C28607	L AFT FUEL BOOST PUMP CTRL

SUBTASK 28-00-00-860-012

(3) If the forward fuel pump in the right main tank is inoperative, do this step:

(a) Open these circuit breakers and install safety locks:

Left Power Management Panel, P110

Row	Col	Number	Name
C	18	C28302	R FWD FUEL BOOST PUMP L AC SECT 2
L	27	C28606	R FWD FUEL BOOST PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
F	27	C28306	R FWD FUEL BOOST PUMP R XFR

SUBTASK 28-00-00-860-013

(4) If the aft fuel pump in the right main tank is inoperative, do this step:

(a) Open these circuit breakers and install safety locks:

Right Power Management Panel, P210

Row	Col	Number	Name
E	27	C28300	R AFT FUEL BOOST PUMP
K	11	C28609	R AFT FUEL BOOST PUMP CTRL

——— END OF TASK ———

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TASK 28-00-00-440-803

12. MMEL 28-22-1 (DDG) Restoration - Main Tank Fuel Pump Inoperative

(Figure 903)

A. General

(1) This task restores the airplane with an inoperative main tank fuel pump.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

D. Main Tank Fuel Pump Restoration

SUBTASK 28-00-00-860-014

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-00-00-860-015

(2) Make sure all of the fuel pump switchlights are in the off position on the P5 overhead panel.

SUBTASK 28-00-00-860-016

(3) If the forward fuel pump in the left main tank is inoperative, do this step:

(a) Remove the safety locks and close these circuit breakers:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
E	5	C28307	L FWD FUEL BOOST PUMP

Standby Power Management Panel, P310

Row	Col	Number	Name
B	2	C28604	L FWD FUEL BOOST PUMP CTRL

SUBTASK 28-00-00-860-017

(4) If the aft fuel pump in the left main tank is inoperative, do this step:

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(a) Remove the safety locks and close these circuit breakers:

Left Power Management Panel, P110

Row	Col	Number	Name
E	2	C28303	L AFT FUEL BOOST PUMP
L	26	C28607	L AFT FUEL BOOST PUMP CTRL

SUBTASK 28-00-00-860-018

(5) If the forward fuel pump in the right main tank is inoperative, do this step:

(a) Remove the safety locks and close these circuit breakers:

Left Power Management Panel, P110

Row	Col	Number	Name
C	18	C28302	R FWD FUEL BOOST PUMP L AC SECT 2
L	27	C28606	R FWD FUEL BOOST PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
F	27	C28306	R FWD FUEL BOOST PUMP R XFR

SUBTASK 28-00-00-860-019

(6) If the aft fuel pump in the right main tank is inoperative, do this step:

(a) Remove the safety locks and close these circuit breakers:

Right Power Management Panel, P210

Row	Col	Number	Name
E	27	C28300	R AFT FUEL BOOST PUMP
K	11	C28609	R AFT FUEL BOOST PUMP CTRL

SUBTASK 28-00-00-810-001

(7) Use the maintenance access terminal (MAT) to look for the maintenance messages for the main tank fuel pumps, on the 28 FUEL MANAGEMENT SYSTEM display.

(a) Put the applicable fuel pump switchlight, on the P5 overhead panel, to the ON position.

(b) Select the maintenance messages that show for the main tank fuel pumps and select MAINTENANCE MESSAGE DATA or refer to the applicable Maintenance Message Index in the FIM.

(c) Put the applicable fuel pump switchlight, on the P5 overhead panel, to the OFF position.

(d) Do the applicable fault isolation procedure(s), for the maintenance messages that show, for the fuel pump(s).

SUBTASK 28-00-00-860-020

(8) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

——— END OF TASK ———

TASK 28-00-00-040-804

13. MMEL 28-22-2 (DDG) Preparation - Center Override/Jettison Pump Inoperative

(Figure 903)

A. General

(1) This task is for operation of the airplane with one or two center tank override/jettison pumps inoperative.

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B. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
133	Wing Center Section, Left
134	Wing Center Section, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

C. Center Tank Fuel Pump Deactivation

SUBTASK 28-00-00-860-021

(1) Make sure all of the fuel pump switchlights are in the off position on the P5 overhead panel.

SUBTASK 28-00-00-860-022

(2) If the left center override fuel pump is inoperative, do this step:

(a) Open this circuit breaker and install safety lock:

Left Power Management Panel, P110

Row	Col	Number	Name
L	21	C28647	CTR L OVRD FUEL PUMP CTRL

SUBTASK 28-00-00-860-023

(3) If the right center fuel pump is inoperative, do this step:

(a) Open this circuit breaker and install safety lock:

Right Power Management Panel, P210

Row	Col	Number	Name
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

——— END OF TASK ———

TASK 28-00-00-440-804

14. MMEL 28-22-2 (DDG) Restoration - Center Override/Jettison Pump Inoperative

(Figure 903)

A. General

(1) This task restores the airplane with inoperative center tank fuel override/jettison pumps.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
133	Wing Center Section, Left
134	Wing Center Section, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

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D. Center Tank Fuel Pump Restoration

SUBTASK 28-00-00-860-024

(1) Make sure all of the fuel pump switchlights are in the off position on the P5 overhead panel.

SUBTASK 28-00-00-860-071

(2) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-00-00-860-025

(3) If the left center fuel pump is inoperative, do this step:

(a) Remove the safety lock and close this circuit breaker:

Left Power Management Panel, P110

Row	Col	Number	Name
L	21	C28647	CTR L OVRD FUEL PUMP CTRL

SUBTASK 28-00-00-860-026

(4) If the right center fuel pump is inoperative, do this step:

(a) Remove the safety lock and close this circuit breaker:

Right Power Management Panel, P210

Row	Col	Number	Name
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

SUBTASK 28-00-00-810-002

(5) Use the maintenance access terminal (MAT) to look for the maintenance messages for the center tank fuel pumps, on the 28 FUEL MANAGEMENT SYSTEM display.

(a) Put the applicable fuel pump switchlight, on the P5 overhead panel, to the ON position.

(b) Select the maintenance messages that show for the center tank fuel pumps and select MAINTENANCE MESSAGE DATA or refer to the applicable Maintenance Message Index in the FIM.

(c) Put the applicable fuel pump switchlight, on the P5 overhead panel, to the OFF position.

(d) Do the applicable fault isolation procedure(s), for the maintenance messages that show, for the fuel pump(s).

SUBTASK 28-00-00-860-027

(6) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

——— END OF TASK ———

TASK 28-00-00-040-805

15. MMEL 28-22-3 (DDG) Preparation - Crossfeed Valve Inoperative

(Figure 903)

A. General

(1) This task is for operation of the airplane with an inoperative engine fuel crossfeed valve.

B. References

Reference	Title
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

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C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing

D. Crossfeed Valve Deactivation

SUBTASK 28-00-00-480-001

WARNING

MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.

SUBTASK 28-00-00-480-002

WARNING

OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-00-00-860-028

(3) Make sure the forward and aft crossfeed valve switchlights are in the off position, on the P5 overhead panel.

SUBTASK 28-00-00-860-029

(4) If the forward crossfeed valve is inoperative, do these steps:

(a) Open this circuit breaker and install safety lock:

Left Power Management Panel, P110

Row	Col	Number	Name
L	23	C28629	FUEL XFEED VLV FWD

(b) Remove, cap and stow the electrical connector (DV28163) to the actuator for the forward crossfeed valve.

(c) Move the manual override handle on the actuator for the forward crossfeed valve to the CLOSED position.

1) Install lockwire to the manual override handle to lock the actuator in the CLOSED position.

SUBTASK 28-00-00-860-030

(5) If the aft crossfeed valve is inoperative, do these steps:

(a) Open this circuit breaker and install safety lock:

Standby Power Management Panel, P310

Row	Col	Number	Name
G	9	C28612	FUEL XFEED VLV AFT

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(b) Remove, cap and stow the electrical connector (DV28263) to the actuator for the aft crossfeed valve.

(c) Move the manual override handle on the actuator for the aft crossfeed valve to the CLOSED position.

NOTE: The fuel imbalance pointer may appear if the affected crossfeed valve is in the OPEN position when deactivated.

1) Install lockwire to the manual override handle to lock the actuator in the CLOSED position.

SUBTASK 28-00-00-080-004

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(6) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 28-00-00-080-003

WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR BEFORE YOU MOVE THE CONTROL LEVER. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(7) If maintenance and servicing of the airplane is complete, do this task: Landing Gear Downlock Pins Removal, TASK 32-00-30-080-801

——— END OF TASK ———

TASK 28-00-00-440-805

16. MMEL 28-22-3 (DDG) Restoration - Crossfeed Valve Inoperative

(Figure 903)

A. General

(1) This task restores the airplane with an inoperative engine fuel crossfeed valve.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing

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D. Crossfeed Valve Restoration

SUBTASK 28-00-00-860-031

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-00-00-480-004

WARNING MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.

SUBTASK 28-00-00-480-005

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-00-00-860-032

(4) Make sure the forward and aft crossfeed valve switchlights are in the off position, on the P5 overhead panel.

SUBTASK 28-00-00-860-033

(5) If the forward crossfeed valve is inoperative, do these steps:

(a) Install the electrical connector (DV28163) to the actuator for the forward crossfeed valve.

(b) Remove the lockwire from the manual override handle of the actuator for the forward crossfeed valve.

(c) Remove the safety lock and close this circuit breaker:

Left Power Management Panel, P110

Row	Col	Number	Name
L	23	C28629	FUEL XFEED VLV FWD

SUBTASK 28-00-00-860-034

(6) If the aft crossfeed valve is inoperative, do these steps:

(a) Install the electrical connector (DV28263) to the actuator for the aft crossfeed valve.

(b) Remove the lockwire from the manual override handle of the actuator for the aft crossfeed valve.

(c) Remove the safety lock and close this circuit breaker:

Standby Power Management Panel, P310

Row	Col	Number	Name
G	9	C28612	FUEL XFEED VLV AFT

SUBTASK 28-00-00-810-003

(7) Use the maintenance access terminal (MAT) to look for the maintenance messages for the crossfeed valves, on the 28 FUEL MANAGEMENT SYSTEM display.

(a) Put the applicable crossfeed valve switchlight, on the P5 overhead panel, to the ON position.

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(b) Select the maintenance messages that show for the crossfeed valves and select MAINTENANCE MESSAGE DATA or refer to the applicable Maintenance Message Index in the FIM.

(c) Put the applicable crossfeed valve switchlight, on the P5 overhead panel, to the OFF position.

(d) Do the applicable fault isolation procedure(s), for the maintenance messages that show, for the crossfeed valve.

SUBTASK 28-00-00-080-005

WARNING OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(8) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 28-00-00-080-002

WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR BEFORE YOU MOVE THE CONTROL LEVER. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(9) If maintenance and servicing of the airplane is complete, do this task: Landing Gear Downlock Pins Removal, TASK 32-00-30-080-801

SUBTASK 28-00-00-860-035

(10) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

——— END OF TASK ———

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TASK 28-00-00-040-819

17. MMEL 28-22-4 (DDG) Preparation - Fuel Scavenge Systems Inoperative

A. General

(1) This task is for operation of the airplane when a fuel scavenge jet pump does not operate or a fuel scavenge shutoff valve does not open.

NOTE: For multiple fuel scavenge shutoff valves inoperative refer to: MMEL 28-22-7 (DDG) Preparation - Fuel Scavenge Shutoff Valve Inoperative, TASK 28-00-00-040-818.

——— END OF TASK ———

TASK 28-00-00-440-815

18. MMEL 28-22-4 (DDG) Restoration - Fuel Scavenge Systems Inoperative

A. General

(1) This task restores the airplane if a fuel scavenge jet pump does not operate or a fuel scavenge shutoff valve does not open.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
28-22-11-000-801	Inlet Float-Operated Shutoff Valve - Removal (P/B 401)

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(Continued)

Reference	Title
28-22-11-000-803	Outlet Float-Operated Shutoff Valve - Removal (P/B 401)
28-22-11-400-801	Inlet Float-Operated Shutoff Valve - Installation (P/B 401)
28-22-11-400-803	Outlet Float-Operated Shutoff Valve - Installation (P/B 401)
28-22-12-000-801	Fuel Scavenge Jet Pump - Removal (P/B 401)
28-22-12-400-801	Fuel Scavenge Jet Pump - Installation (P/B 401)

C. Fuel Scavenge Jet Pumps Restoration

SUBTASK 28-00-00-900-001

(1) If a fuel scavenge jet pump does not operate, replace the fuel scavenge jet pump.

These are the tasks:

Fuel Scavenge Jet Pump - Removal, TASK 28-22-12-000-801,

Fuel Scavenge Jet Pump - Installation, TASK 28-22-12-400-801.

SUBTASK 28-00-00-900-002

(2) If an inlet shutoff valve for the fuel scavenge system does not open, replace the inlet shutoff valve.

These are the tasks:

Inlet Float-Operated Shutoff Valve - Removal, TASK 28-22-11-000-801,

Inlet Float-Operated Shutoff Valve - Installation, TASK 28-22-11-400-801.

SUBTASK 28-00-00-900-003

(3) If an outlet shutoff valve for the fuel scavenge system does not open, replace the outlet shutoff valve.

These are the tasks:

Outlet Float-Operated Shutoff Valve - Removal, TASK 28-22-11-000-803,

Outlet Float-Operated Shutoff Valve - Installation, TASK 28-22-11-400-803.

SUBTASK 28-00-00-650-007

(4) To refuel the fuel tanks, do this task: Pressure Refueling, TASK 12-11-01-650-801.

——— END OF TASK ———

TASK 28-00-00-040-818

19. MMEL 28-22-7 (DDG) Preparation - Fuel Scavenge Shutoff Valve Inoperative

A. General

(1) This task is for operation of the airplane with a fuel scavenge shutoff valve that does not close.

NOTE: The task is divided between procedures for one or multiple fuel scavenge shutoff valves inoperative.

(2) This procedure is not necessary if these two conditions are satisfied:

(a) You will operate the airplane with less than 400 lb (181 kg) of fuel in the center wing tank.

(b) There are no maintenance messages, EICAS messages, or observed faults related to fuel quantity indication in the center wing tank.

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B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
28-22-00-720-802	Fuel Scavenge System - Functional Test (P/B 501)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)
28-26-00-650-803	Suction Defueling (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right

D. Fuel Scavenge Shutoff Valve Deactivation - One Valve Inoperative

NOTE: This procedure is based on previous knowledge of a stuck open valve. If you are not sure a valve is failed, then do the complete Fuel Scavenge System Functional Test to identify the failed valve and make sure the other valve operates correctly (TASK 28-22-00-720-802).

NOTE: See 777 MT 28-008 for more data about the fuel scavenge system. The following procedure reports fuel quantity values necessary for float valve operation. These fuel quantities include margins to make sure the float valves are in the correct position.

SUBTASK 28-00-00-800-001

(1) If an outlet shutoff valve for the fuel scavenge system does not open, do this task: MMEL 28-22-4 (DDG) Preparation - Fuel Scavenge Systems Inoperative, TASK 28-00-00-040-819.

SUBTASK 28-00-00-700-002

(2) If an outlet shutoff valve for the fuel scavenge system does not close, do these steps to make sure the inlet shutoff valve operates correctly:

(a) Make sure that the main fuel tank on the same side as the inoperative shutoff valve contains less than 53,900 lb (24,449 kg) of fuel.

NOTE: This step closes the inlet float-operated shutoff valve.

1) To refuel the tank, do this task: Pressure Refueling, TASK 12-11-01-650-801.

2) To defuel the tank, do this task: Pressure Defueling, TASK 28-26-00-650-801.

3) To transfer fuel to or from the tank, do this task: Tank to Tank Transfer, TASK 28-26-00-650-802.

(b) Make sure that the center fuel tank contains more than 48,100 lb (21,818 kg) of fuel.

NOTE: This step closes the inlet float-operated shutoff valve.

1) To refuel the tank, do this task: Pressure Refueling, TASK 12-11-01-650-801.

2) To defuel the tank, do this task: Pressure Defueling, TASK 28-26-00-650-801.

3) To transfer fuel to or from the tank, do this task: Tank to Tank Transfer, TASK 28-26-00-650-802.

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WARNING DO NOT OPERATE ANY FUEL PUMP IF THE AMBER PRESS LIGHT COMES ON AND STAYS ON. FUEL VAPORS IN THE TANK MAY IGNITE AND CAUSE A FIRE OR EXPLOSION.

(c) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

1) Immediately set the applicable fuel pump switch-light(s) to OFF if the amber PRESS light comes on and stays on.

(d) Put the PUMPS FWD and AFT switches (P5 panel) on the side with the failed shutoff valve to the ON position. Make sure the opposite side PUMPS FWD and AFT switches are in the OFF position.

NOTE: If the APU is operating when verifying left main tank shutoff valve operation, put the CENTER PUMPS L switch on the P5 panel to the ON position.

(e) Let the pumps operate for 30 minutes.

1) Make sure the main tank fuel quantity on the same side as the failed valve does not increase.

2) Make sure the center tank fuel quantity does not increase.

NOTE: The inlet float valves can leak 35 ±15 lb (16 ±7 kg) of fuel per hour into the center tank when the boost pumps are on and the outlet or inlet float valves are closed. This quantity of fuel transfer is for both inlet valves (17.5 ±7.5 lb (7.9 ±3.4 kg) per valve) and is within the limits of the fuel scavenge system and will not show on the center tank fuel quantity indication in 30 minutes.

(f) Put the L or R PUMPS FWD and AFT switches to the OFF position. If applicable, put the CENTER PUMPS L switch to the OFF position.

(g) If an inlet shutoff valve for the fuel scavenge system does not operate correctly, do the procedure for multiple fuel scavenge shutoff valves inoperative.

SUBTASK 28-00-00-700-003

(3) If an inlet shutoff valve for the fuel scavenge system does not close, do these steps to make sure the outlet shutoff valve operates correctly:

(a) Make sure that the quantity of fuel in the center fuel tank is more than 1000 lb (454 kg).

NOTE: This step opens the inlet float-operated shutoff valve.

1) To refuel the tank, do this task: Pressure Refueling, TASK 12-11-01-650-801.

2) To defuel the tank, do this task: Pressure Defueling, TASK 28-26-00-650-801.

3) To transfer fuel to or from the tank, do this task: Tank to Tank Transfer, TASK 28-26-00-650-802.

(b) Make sure that the main fuel tank on the same side as the inoperative shutoff valve contains more than 56,350 lb (25,560 kg) of fuel.

NOTE: This step closes the outlet float-operated shutoff valve.

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WARNING DO NOT OPERATE ANY FUEL PUMP IF THE AMBER PRESS LIGHT COMES ON AND STAYS ON. FUEL VAPORS IN THE TANK MAY IGNITE AND CAUSE A FIRE OR EXPLOSION.

(c) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

1) Immediately set the applicable fuel pump switch-light(s) to OFF if the amber PRESS light comes on and stays on.

(d) Put the PUMPS FWD and AFT switches (P5 panel) on the side with the failed shutoff valve to the ON position. Make sure the opposite side PUMPS FWD and AFT switches are in the OFF position.

NOTE: If the APU is operating during left main tank shutoff valve operation, put the CENTER PUMPS L switch on the P5 panel to the ON position.

(e) Let the pumps operate for 30 minutes.

1) Make sure the main tank fuel quantity on the same side as the failed valve does not increase.

2) Make sure the center tank fuel quantity does not increase.

NOTE: The inlet float valve can leak 35 ±15 lb (16 ±7 kg) of fuel per hour into the center tank when the boost pumps are on and the outlet or inlet float valves are closed. This quantity of fuel transfer is for both valves (17.5 ±7.5 lb (7.9 ±3.4 kg) per valve) and is within the limits of the fuel scavenge system and will not show on the center tank fuel quantity indication in 30 minutes.

(f) Put the L or R PUMPS FWD and AFT switches to the OFF position. If applicable, put the CENTER PUMPS L switch to the OFF position.

(g) If an outlet shutoff valve for the fuel scavenge system does not operate correctly, do the procedure for multiple fuel scavenge shutoff valves inoperative.

SUBTASK 28-00-00-650-006

(4) Put the airplane back to its usual condition with respect to fuel on board.

(a) To refuel a tank, do this task: Pressure Refueling, TASK 12-11-01-650-801.

(b) To defuel a tank, do this task: Pressure Defueling, TASK 28-26-00-650-801.

(c) To transfer fuel from tank to tank, do this task: Tank to Tank Transfer, TASK 28-26-00-650-802.

E. Fuel Scavenge Shutoff Valve Deactivation - Multiple Valves Inoperative

SUBTASK 28-00-00-650-019

(1) Defuel the center fuel tank to less than 400 lb (181 kg) by the suction defueling procedure. If it is necessary, drain the fuel to get less than 400 lb (181 kg). To defuel, do this task: Suction Defueling, TASK 28-26-00-650-803.

END OF TASK

TASK 28-00-00-440-814

20. MMEL 28-22-7 (DDG) Restoration - Fuel Scavenge Shutoff Valve Inoperative

A. General

(1) This task restores the airplane with an inoperative fuel scavenge shutoff valve.

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B. References

Reference	Title
28-22-11-000-801	Inlet Float-Operated Shutoff Valve - Removal (P/B 401)
28-22-11-000-803	Outlet Float-Operated Shutoff Valve - Removal (P/B 401)
28-22-11-400-801	Inlet Float-Operated Shutoff Valve - Installation (P/B 401)
28-22-11-400-803	Outlet Float-Operated Shutoff Valve - Installation (P/B 401)

C. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right

D. Fuel Scavenge Shutoff Valve Restoration

SUBTASK 28-00-00-860-074

(1) Replace the applicable inoperative inlet or outlet fuel scavenge shutoff valve.

(a) These are the tasks:
Inlet Float-Operated Shutoff Valve - Removal, TASK 28-22-11-000-801,
Inlet Float-Operated Shutoff Valve - Installation, TASK 28-22-11-400-801.

(b) These are the tasks:
Outlet Float-Operated Shutoff Valve - Removal, TASK 28-22-11-000-803,
Outlet Float-Operated Shutoff Valve - Installation, TASK 28-22-11-400-803.

ARO ALL

——— END OF TASK ———

TASK 28-00-00-040-806

21. MMEL 28-25-1 (DDG) Preparation - APU DC Fuel Pump Inoperative

A. General

(1) This task is for operation of the airplane with an inoperative APU DC fuel pump.

B. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing

C. APU DC Fuel Pump Deactivation

SUBTASK 28-00-00-860-036

(1) Make sure all of the APU start switch is in the OFF position, on the P5 overhead panel.

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SUBTASK 28-00-00-860-037

(2) Open this circuit breaker and install safety lock:

Standby Power Management Panel, P310

Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP

——— END OF TASK ———

TASK 28-00-00-440-806

22. MMEL 28-25-1 (DDG) Restoration - APU DC Fuel Pump Inoperative

(Figure 903)

A. General

(1) This task restores the airplane with an inoperative APU DC fuel pump.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing

D. APU DC Fuel Pump Restoration

SUBTASK 28-00-00-860-038

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-00-00-860-039

(2) Make sure the APU DC start switch is in the OFF position, on the P5 overhead panel.

SUBTASK 28-00-00-860-040

(3) Remove the safety lock and close this circuit breaker:

Standby Power Management Panel, P310

Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP

SUBTASK 28-00-00-810-004

(4) Use the maintenance access terminal (MAT) to look for the maintenance messages for the APU DC fuel pump, on the 28 FUEL MANAGEMENT SYSTEM display.

(a) Put the APU START switch, on the P5 overhead panel, to the ON position.

(b) Select the maintenance messages that show for the APU DC fuel pump and select MAINTENANCE MESSAGE DATA or refer to the applicable Maintenance Message Index in the FIM.

(c) Put the APU START switch, on the P5 overhead panel, to the OFF position.

(d) Do the applicable fault isolation procedure(s), for the maintenance messages that show, for the APU DC fuel pump.

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SUBTASK 28-00-00-860-041

(5) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

END OF TASK

TASK 28-00-00-040-807

23. MMEL 28-25-2 (DDG) Preparation - APU Fuel Shutoff Valve Inoperative

(Figure 903)

A. General

(1) This task is for operation of the airplane with an inoperative APU fuel shutoff valve.

B. References

Reference	Title
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing

D. APU Fuel Shutoff Valve Deactivation

SUBTASK 28-00-00-480-007

WARNING MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.

SUBTASK 28-00-00-480-008

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-00-00-860-042

(3) Make sure the APU START switch is in the OFF position, on the P5 overhead panel.

SUBTASK 28-00-00-860-043

(4) Do these steps to deactivate the APU fuel shutoff valve:

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(a) Open this circuit breaker and install safety lock:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	17	C28003	APU FUEL S/O VALVE

(b) Remove, cap and stow the electrical connector (DV28023) to the actuator for the APU fuel shutoff valve.

(c) Move the manual override handle on the actuator for the APU fuel shutoff valve to the CLOSED position.

1) Install lockwire to the manual override handle to lock the actuator in the CLOSED position.

SUBTASK 28-00-00-080-006

WARNING OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(5) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 28-00-00-080-007

WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR BEFORE YOU MOVE THE CONTROL LEVER. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(6) If maintenance and servicing of the airplane is complete, do this task: Landing Gear Downlock Pins Removal, TASK 32-00-30-080-801

——— END OF TASK ———

TASK 28-00-00-440-807

24. MMEL 28-25-2 (DDG) Restoration - APU Fuel Shutoff Valve Inoperative

(Figure 903)

A. General

(1) This task restores the airplane with an inoperative APU fuel shutoff valve.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left

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(Continued)

Zone	Area
212	Flight Compartment, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing

D. APU Fuel Shutoff Valve Restoration

SUBTASK 28-00-00-860-044

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-00-00-480-010

WARNING MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.

SUBTASK 28-00-00-480-011

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-00-00-860-045

(4) Make sure the APU start switch is in the OFF position, on the P5 overhead panel.

SUBTASK 28-00-00-860-046

(5) Do these steps to activate the APU fuel shutoff valve:

(a) Install the electrical connector (DV28023) to the actuator for the APU fuel shutoff valve.

(b) Remove the lockwire from the manual override handle of the actuator for the APU fuel shutoff valve.

(c) Remove the safety lock and close this circuit breaker:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	17	C28003	APU FUEL S/O VALVE

SUBTASK 28-00-00-810-005

(6) Use the maintenance access terminal (MAT) to look for the maintenance messages for the APU fuel shutoff valve, on the 28 FUEL MANAGEMENT SYSTEM display.

(a) Put the APU START switch, on the P5 overhead panel, to the ON position.

(b) Select the maintenance messages that show for the APU fuel shutoff valve and select MAINTENANCE MESSAGE DATA or refer to the applicable Maintenance Message Index in the FIM.

(c) Put the APU START switch, on the P5 overhead panel, to the OFF position.

(d) Do the applicable fault isolation procedure(s), for the maintenance messages that show, for the APU fuel shutoff valve.

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SUBTASK 28-00-00-080-008

WARNING OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(7) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 28-00-00-080-009

WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR BEFORE YOU MOVE THE CONTROL LEVER. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(8) If maintenance and servicing of the airplane is complete, do this task: Landing Gear Downlock Pins Removal, TASK 32-00-30-080-801

SUBTASK 28-00-00-860-047

(9) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

——— END OF TASK ———

TASK 28-00-00-040-808

25. MMEL 28-25-3 (DDG) Preparation - APU Fuel Isolation Valve Inoperative

(Figure 903)

A. General

(1) This task is for operation of the airplane with an inoperative APU Fuel Isolation valve.

B. References

Reference	Title
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing

D. APU Fuel Isolation Valve Deactivation

SUBTASK 28-00-00-480-013

WARNING MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.

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SUBTASK 28-00-00-480-014

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-00-00-860-048

(3) Make sure the APU start switch is in the OFF position, on the P5 overhead panel.

SUBTASK 28-00-00-860-049

(4) Do these steps to deactivate the APU fuel isolation valve:

(a) Open this circuit breaker and install safety lock:

Standby Power Management Panel, P310

Row	Col	Number	Name
F	5	C28638	APU FUEL ISLN VLV

(b) Remove, cap and stow the electrical connector (DV28031) to the actuator for the APU fuel isolation valve.

(c) Move the manual override handle on the actuator for the APU fuel isolation valve to the CLOSED position.

1) Install lockwire to the manual override handle to lock the actuator in the CLOSED position.

SUBTASK 28-00-00-080-010

WARNING OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(5) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 28-00-00-080-011

WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR BEFORE YOU MOVE THE CONTROL LEVER. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(6) If maintenance and servicing of the airplane is complete, do this task: Landing Gear Downlock Pins Removal, TASK 32-00-30-080-801

END OF TASK

TASK 28-00-00-440-808

26. MMEL 28-25-3 (DDG) Restoration - APU Fuel Isolation Valve Inoperative

(Figure 903)

A. General

(1) This task restores the airplane with an inoperative APU fuel isolation valve.

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B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing

D. APU Fuel Isolation Valve Restoration

SUBTASK 28-00-00-860-050

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-00-00-480-016

WARNING MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.

SUBTASK 28-00-00-480-017

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-00-00-860-051

(4) Make sure the APU start switch is in the OFF position, on the P5 overhead panel.

SUBTASK 28-00-00-860-052

(5) Do these steps to activate the APU fuel isolation valve:

(a) Install the electrical connector (DV28031) to the actuator for the APU fuel isolation valve.

(b) Remove the lockwire from the manual override handle of the actuator for the APU fuel isolation valve.

(c) Remove the safety lock and close this circuit breaker:

Standby Power Management Panel, P310

Row	Col	Number	Name
F	5	C28638	APU FUEL ISLN VLV

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SUBTASK 28-00-00-810-006

(6) Use the maintenance access terminal (MAT) to look for the maintenance messages for the APU fuel isolation valve, on the 28 FUEL MANAGEMENT SYSTEM display.

(a) Put the APU START switch, on the P5 overhead panel, to the ON position.

(b) Select the maintenance messages that show for the APU fuel isolation valve and select MAINTENANCE MESSAGE DATA or refer to the applicable Maintenance Message Index in the FIM.

(c) Put the APU START switch, on the P5 overhead panel, to the OFF position.

(d) Do the applicable fault isolation procedure(s), for the maintenance messages that show, for the APU fuel system.

SUBTASK 28-00-00-080-012

WARNING OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(7) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 28-00-00-080-013

WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR BEFORE YOU MOVE THE CONTROL LEVER. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(8) If maintenance and servicing of the airplane is complete, do this task: Landing Gear Downlock Pins Removal, TASK 32-00-30-080-801

SUBTASK 28-00-00-860-053

(9) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

——— END OF TASK ———

TASK 28-00-00-040-809

27. MMEL 28-26-1 (DDG) Preparation - Defuel Valve Inoperative

(Figure 904)

A. General

(1) This task is for operation of the airplane with an inoperative defuel valve. This task will deactivate and secure the inoperative defuel valve.

B. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left

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(Continued)

Zone	Area
118	Main Equipment Center, Right
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

D. Access Panels

Number	Name/Location
521DB	Refueling Station Door

E. Defuel Valve Deactivation

SUBTASK 28-00-00-480-019

WARNING MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.

SUBTASK 28-00-00-480-020

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-00-00-010-003

(3) Do this step to access the integrated refuel panel (IRP) P28 (TASK 06-44-00-800-802).

Open this access panel:

Number	Name/Location
521DB	Refueling Station Door

SUBTASK 28-00-00-040-001

(4) Do these steps to deactivate the defuel valve:

(a) Open this circuit breaker and install safety lock:

Standby Power Management Panel, P310

Row	Col	Number	Name
J	10	C28637	DFUEL VLVS

(b) Make sure the DEFUEL VALVE switch, on the IRP P28, is in the CLOSED position.

(c) Remove, cap and stow the electrical connector (DV28310) to the actuator for the defuel valve.

NOTE: The actuator for the defuel valve is installed on the rear spar of the right center fuel tank.

(d) Move the manual override handle on the actuator for the defuel valve to the CLOSED position.

1) Install lockwire to the manual override handle to lock the actuator in the CLOSED position.

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SUBTASK 28-00-00-080-014

WARNING OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(5) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 28-00-00-080-015

WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR BEFORE YOU MOVE THE CONTROL LEVER. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(6) If maintenance and servicing of the airplane is complete, do this task: Landing Gear Downlock Pins Removal, TASK 32-00-30-080-801

——— END OF TASK ———

TASK 28-00-00-440-809

28. MMEL 28-26-1 (DDG) Restoration - Defuel Valve Inoperative

(Figure 904)

A. General

(1) This task restores the airplane with an inoperative defuel valve.

B. References

Reference	Title
28-26-01-000-801	Defuel Valve (Valve Body) - Removal (P/B 401)
28-26-01-400-801	Defuel Valve (Valve Body) - Installation (P/B 401)
28-26-02-000-802	Defuel Valve (Actuator) - Removal (P/B 401)
28-26-02-400-802	Defuel Valve (Actuator) - Installation (P/B 401)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
SSM 28-26-11	System Schematics Manual

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

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D. Defuel Valve Restoration

SUBTASK 28-00-00-480-022

WARNING MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.

SUBTASK 28-00-00-480-023

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-00-00-860-054

(3) Do these steps to activate the defuel valve:

(a) Install the electrical connector (DV28310) to the actuator for the defuel valve.

NOTE: The actuator for the defuel valve is installed on the rear spar of the right center fuel tank.

(b) Remove the lockwire from the manual override handle of the actuator for the defuel valve.

(c) Remove the safety lock and close this circuit breaker:

Standby Power Management Panel, P310

Row	Col	Number	Name
J	10	C28637	DFUEL VLVS

SUBTASK 28-00-00-960-003

(4) Replace the actuator for the defuel valve.

ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS

(a) These are the tasks:

Defuel Valve (Actuator) - Removal, TASK 28-26-02-000-802,

Defuel Valve (Actuator) - Installation, TASK 28-26-02-400-802.

ARO ALL

SUBTASK 28-00-00-860-055

(5) Push and release defuel valve light, on the IRP, P28.

(a) Make sure the light comes on and goes off.

SUBTASK 28-00-00-860-056

(6) Put the DEFUEL VALVE control switch for the defuel valve to the OPEN position.

(a) Make sure the defuel valve light comes on and stays on.

SUBTASK 28-00-00-860-057

(7) Put the DEFUEL VALVE control switch for the defuel valve to the CLOSED position.

(a) Make sure the defuel valve light goes off.

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SUBTASK 28-00-00-960-004

(8) If the problem continues, do a wiring check (SSM 28-26-11).

(a) Repair the problems that you find.

(b) If the problem continues, replace the defuel valve.

1) These are the tasks:

Defuel Valve (Valve Body) - Removal, TASK 28-26-01-000-801,

Defuel Valve (Valve Body) - Installation, TASK 28-26-01-400-801.

SUBTASK 28-00-00-080-016

WARNING OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(9) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 28-00-00-080-017

WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR BEFORE YOU MOVE THE CONTROL LEVER. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(10) If maintenance and servicing of the airplane is complete, do this task: Landing Gear Downlock Pins Removal, TASK 32-00-30-080-801

END OF TASK

TASK 28-00-00-040-810

29. MMEL 28-31-1 (DDG) Preparation - Fuel Jettison System Inoperative

(Figure 905)

A. General

(1) This task is for operation of the airplane with an inoperative fuel jettison system.

B. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
27-51-00-040-801	Trailing Edge Flap Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap Reactivation (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
561	Rear Spar to Trailing Edge - Outboard of Flaperon - Left Wing
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

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(Continued)

Zone	Area
661	Rear Spar to Trailing Edge - Outboard of Flaperon - Right Wing

D. Access Panels

Number	Name/Location
561GB	Midspan Fixed Trailing Edge Panel
661GB	Midspan Fixed Trailing Edge Panel

E. Fuel Jettison System Deactivation

SUBTASK 28-00-00-040-009

WARNING MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(1) Deactivate the trailing edge flaps (TASK 27-51-00-040-801).

SUBTASK 28-00-00-010-004

(2) Do this step to get access to the left jettison nozzle valve (TASK 06-44-00-800-802).

Remove this access panel:

Number	Name/Location
561GB	Midspan Fixed Trailing Edge Panel

SUBTASK 28-00-00-010-005

(3) Do this step to get access to the right jettison nozzle valve (TASK 06-44-00-800-802).

Remove this access panel:

Number	Name/Location
661GB	Midspan Fixed Trailing Edge Panel

SUBTASK 28-00-00-040-002

(4) Do these steps to deactivate the fuel jettison system:

(a) Open these circuit breakers and install safety locks:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL
L	24	C28631	L FUEL JETT ISLN VLV
L	25	C28621	L FUEL JETT NOZ VLV

Right Power Management Panel, P210

Row	Col	Number	Name
K	12	C28620	R FUEL JETT NOZ VLV
K	13	C28630	R JETT ISLN VLV
K	14	C28646	R FUEL JETT PUMP CTRL

(b) Make sure the L and R JETTISON NOZZLE switches, on the P5 overhead panel, are in the OFF position.

(c) Make sure the JETTISON ARM switch, on the P5 overhead panel, is in the OFF position.

(d) Do these steps for the jettison nozzle valves:

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1) Remove, cap and stow the electrical connectors (DV28166 and DV28266) to the actuators for the left and right jettison nozzle valves.

NOTE: The actuator for the left and right jettison nozzle valves are behind the rear spar between ribs 34 and 35, on the left and right wings respectively.

2) Move the manual override handle on the actuator for the left and right jettison nozzle valves to the CLOSED position.

3) Install lockwire to each manual override handle to lock the actuators in the CLOSED position.

SUBTASK 28-00-00-410-002

(5) Do this step for the left jettison nozzle valve (TASK 06-44-00-800-802).

Install this access panel:

Number	Name/Location
561GB	Midspan Fixed Trailing Edge Panel

SUBTASK 28-00-00-410-003

(6) Do this step for the right jettison nozzle valve (TASK 06-44-00-800-802).

Install this access panel:

Number	Name/Location
661GB	Midspan Fixed Trailing Edge Panel

SUBTASK 28-00-00-440-006

WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(7) Reactivate the trailing edge flaps (TASK 27-51-00-440-801).

END OF TASK

TASK 28-00-00-440-810

30. MMEL 28-31-1 (DDG) Restoration - Fuel Jettison System Inoperative

(Figure 905)

A. General

(1) This task restores the airplane with an inoperative fuel jettison system.

B. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
27-51-00-040-801	Trailing Edge Flap Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap Reactivation (P/B 201)
28-31-00-720-801	Fuel Jettison System - Operational Test (P/B 501)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

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C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
552	Landing Gear Support Beam & Rear Spar to Wing Trailing Edge - Left Wing
561	Rear Spar to Trailing Edge - Outboard of Flaperon - Left Wing
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182
652	Landing Gear Support Beam & Rear Spar to Wing Trailing Edge - Right Wing
661	Rear Spar to Trailing Edge - Outboard of Flaperon - Right Wing

D. Access Panels

Number	Name/Location
521DB	Refueling Station Door
552HB	Inboard Fixed Trailing Edge Panel
561GB	Midspan Fixed Trailing Edge Panel
652HB	Inboard Fixed Trailing Edge Panel
661GB	Midspan Fixed Trailing Edge Panel

E. Fuel Jettison System Restoration

SUBTASK 28-00-00-860-058

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-00-00-480-025

WARNING MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.

SUBTASK 28-00-00-480-026

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-00-00-860-083

WARNING MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(4) Deactivate the trailing edge flaps. To deactivate them, do this task: Trailing Edge Flap Deactivation, TASK 27-51-00-040-801.

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SUBTASK 28-00-00-010-006

(5) To get access to the left jettison nozzle valve(TASK 06-44-00-800-802);

Remove this access panel:

Number	Name/Location
561GB	Midspan Fixed Trailing Edge Panel

SUBTASK 28-00-00-010-007

(6) To get access to the right jettison nozzle valve (TASK 06-44-00-800-802);

Remove this access panel:

Number	Name/Location
661GB	Midspan Fixed Trailing Edge Panel

SUBTASK 28-00-00-010-008

(7) To get access to the left jettison pump (TASK 06-44-00-800-802);

Remove this access panel:

Number	Name/Location
552HB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-00-00-010-009

(8) To get access to the right jettison pump (TASK 06-44-00-800-802);

Remove this access panel:

Number	Name/Location
652HB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-00-00-840-001

(9) To unlatch the FUEL JETT NOZZLE L and FUEL JETT NOZZLE R EICAS messages, do the applicable steps in this task: Fuel Jettison System - Operational Test, TASK 28-31-00-720-801.

NOTE: The FUEL JETT NOZZLE L and FUEL JETT NOZZLE R EICAS messages will show during the DDG restore task.

(a) Refer to the section of this task that begins with “Test of the Fuel Jettison System in the Air Mode".

(10) Do these steps to remove pressure from the refuel/jettison manifold:

(a) Open this access panel:

Number	Name/Location
521DB	Refueling Station Door

NOTE: This step will remove pressure from the refuel/jettison manifold.

1) Put the refuel valve control switches for the left and right main fuel tanks to the OPEN position.
2) Wait 10 minutes to remove the pressure in the manifold.
3) Put the refuel valve control switches to the CLOSED position.
4) Make sure the defuel valve control switch is in the CLOSED position.

SUBTASK 28-00-00-440-001

(11) Do these steps to activate the fuel jettison system:

(a) Make sure the L and R JETTISON NOZZLE switches, on the P5 overhead panel, are in the OFF position.

(b) Make sure the JETTISON ARM switch, on the P5 overhead panel, is in the OFF position.

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(c) Do these steps for the jettison nozzle valves:

1) Install the electrical connectors (DV28166 and DV28266) to the actuators for the left and right jettison nozzle valves.

NOTE: The actuator for the left and right jettison nozzle valves are behind the read spar between ribs 34 and 35, on the left and right wings respectively.

2) Remove the lockwire from the manual override handles for the left and right nozzle valve actuators.

(d) Remove the safety locks and close these circuit breakers:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL
L	24	C28631	L FUEL JETT ISLN VLV
L	25	C28621	L FUEL JETT NOZ VLV

Right Power Management Panel, P210

Row	Col	Number	Name
K	12	C28620	R FUEL JETT NOZ VLV
K	13	C28630	R JETT ISLN VLV
K	14	C28646	R FUEL JETT PUMP CTRL

SUBTASK 28-00-00-810-007

(12) Use the maintenance access terminal (MAT) to look for the maintenance messages for the fuel jettison system, on the 28 FUEL MANAGEMENT SYSTEM display.

WARNING

MAKE SURE THE EICAS MESSAGES "FUEL JETT NOZZLE L" OR "FUEL JETT NOZZLE R", DO NOT SHOW ON THE EICAS DISPLAY. IF THE JETTISON ARM SWITCH IS ON AND THESE MESSAGES SHOW, FUEL CAN SPILL FROM THE NOZZLES AND CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(a) Make sure the manual override handles for the jettison nozzle valves are in the CLOSED position.

1) If the above EICAS messages show or the jettison nozzle valves are open, do the corrective action for the Jettison Nozzle Valves before you continue.

(b) Open this access panel:

Number	Name/Location
521DB	Refueling Station Door

1) Put the DEFUEL VALVE switch, on the Integrated Refuel Panel (IRP), P28, to the OPEN position.

(c) Put the FUEL JETTISON ARM switch, on the P5 overhead panel, to the ARMED position.

1) Make sure the left and right jettison pumps are on.

NOTE: The jettison pumps are installed on the rear spar of the left and right main tanks.

2) Make sure the manual override handle for the left and right jettison isolation valves are in the OPEN position.

NOTE: The jettison isolation valves are installed on the rear spar of the left and right center tank.

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(d) Select the maintenance messages that show for the fuel jettison system and select MAINTENANCE MESSAGE DATA or refer to the applicable Maintenance Message Index in the FIM.

(e) Put the FUEL JETTISON ARM switch, on the P5 overhead panel, to the off position.

(f) Put the DEFUEL VALVE switch, on the IRP, P28, to the CLOSE position.

(g) Close this access panel:

Number	Name/Location
521DB	Refueling Station Door

(h) Do the fault isolation procedure(s) for the maintenance messages that show for the fuel jettison system.

SUBTASK 28-00-00-410-004

(13) For the left jettison pump (TASK 06-44-00-800-802).

Do this task:

Install this access panel:

Number	Name/Location
552HB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-00-00-410-005

(14) For the right jettison pump (TASK 06-44-00-800-802).

Do this task:

Install this access panel:

Number	Name/Location
652HB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-00-00-410-006

(15) For the left jettison nozzle valve (TASK 06-44-00-800-802).

Do this task:

Install this access panel:

Number	Name/Location
561GB	Midspan Fixed Trailing Edge Panel

SUBTASK 28-00-00-410-007

(16) For the right jettison nozzle valve (TASK 06-44-00-800-802).

Do this task:

Install this access panel:

Number	Name/Location
661GB	Midspan Fixed Trailing Edge Panel

SUBTASK 28-00-00-860-082

WARNING MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(17) To reactivate the trailing edge flaps, do this step: Trailing Edge Flap Reactivation, TASK 27-51-00-440-801.

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SUBTASK 28-00-00-080-018

WARNING OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(18) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 28-00-00-080-019

WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR BEFORE YOU MOVE THE CONTROL LEVER. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(19) If maintenance and servicing of the airplane is complete, do this task: Landing Gear Downlock Pins Removal, TASK 32-00-30-080-801

END OF TASK

TASK 28-00-00-040-811

31. MMEL 28-31-2 (DDG) Preparation - Center Tank Jettison Isolation Valves Inoperative

(Figure 905)

A. General

(1) This task is for operation of the airplane with inoperative center tank jettison isolation valve(s).

B. References

Reference	Title
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

D. Center Tank Jettison Isolation Valve(s) Deactivation

SUBTASK 28-00-00-480-028

WARNING MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.

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SUBTASK 28-00-00-480-029

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-00-00-040-003

(3) Do these steps to deactivate the left or right jettison isolation valves:

(a) Open these circuit breakers and install safety locks:

Left Power Management Panel, P110

Row	Col	Number	Name
L	24	C28631	L FUEL JETT ISLN VLV

Right Power Management Panel, P210

Row	Col	Number	Name
K	13	C28630	R JETT ISLN VLV

(b) Make sure the L and R JETTISON NOZZLE switches, on the P5 overhead panel, are in the OFF position.

(c) Make sure the JETTISON ARM switch, on the P5 overhead panel, is in the OFF position.

(d) Do these steps to deactivate the left jettison isolation valve:

1) Remove, cap and stow the electrical connector (DV28165) to the actuator for the left jettison isolation valve.

NOTE: The actuator for the left jettison isolation valve is installed on the rear spar of the left center tank.

2) Move the manual override handle on the actuator for the left jettison isolation valve to the CLOSED position.

3) Install lockwire to the manual override handle to lock the actuator in the CLOSED position.

(e) Do these steps to deactivate the right jettison isolation valve:

1) Remove, cap and stow the electrical connector (DV28265) to the actuator for the right jettison isolation valve.

NOTE: The actuator for the right jettison isolation valve is installed on the rear spar of the right center tank.

2) Move the manual override handle on the actuator for the right jettison isolation valve to the CLOSED position.

3) Install lockwire to the manual override handle to lock the actuators in the CLOSED position.

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SUBTASK 28-00-00-480-030

WARNING OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(4) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

——— END OF TASK ———

TASK 28-00-00-440-811

32. MMEL 28-31-2 (DDG) Restoration - Center Tank Jettison Isolation Valve(s) Inoperative

(Figure 905)

A. General

(1) This task restores the airplane with inoperative center tank jettison isolation valves.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-080-801	Landing Gear Downlock Pins Removal (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

D. Access Panels

Number	Name/Location
521DB	Refueling Station Door

E. Center Tank Jettison Isolation Valve(s) Restoration

SUBTASK 28-00-00-860-060

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-00-00-480-031

WARNING MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.

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SUBTASK 28-00-00-480-032

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-00-00-440-002

(4) Do these steps to activate the fuel jettison system:

(a) Remove the safety locks and close these circuit breakers:

Left Power Management Panel, P110

Row	Col	Number	Name
L	24	C28631	L FUEL JETT ISLN VLV

Right Power Management Panel, P210

Row	Col	Number	Name
K	13	C28630	R JETT ISLN VLV

(b) Make sure the L and R JETTISON NOZZLE switches, on the P5 overhead panel, are in the OFF position.

(c) Make sure the JETTISON ARM switch, on the P5 overhead panel, is in the OFF position.

(d) Do these steps to activate the jettison isolation valves:

1) Install the electrical connectors (DV28165 and DV28265) to the actuators for the left and right jettison isolation valves.

NOTE: The actuators for the left and right jettison isolation valves are installed on the rear spar of the left and right center tanks, respectively.

2) Remove the lockwire from the manual override handles for the left and right isolation valve actuators.

(e) Open this access panel:

Number	Name/Location
521DB	Refueling Station Door

1) Put the DEFUEL VALVE switch, on the Integrated Refuel Panel (IRP), P28, to the OPEN position.

(f) Put the FUEL JETTISON ARM switch, on the P5 overhead panel, to ARMED.

1) Make sure the manual override handle for the left and right jettison isolation valves are in the OPEN position.

NOTE: The jettison isolation valves are installed on the rear spar of the left and right center tank.

SUBTASK 28-00-00-810-008

(5) Use the maintenance access terminal (MAT) to look for the maintenance messages for the fuel jettison isolation valves, on the 28 FUEL MANAGEMENT SYSTEM display.

(a) Select the maintenance messages that show for the fuel jettison isolation valves and select MAINTENANCE MESSAGE DATA or refer to the applicable Maintenance Message Index in the FIM.

(b) Push the FUEL JETTISON ARM switch, on the P5 overhead panel, to the off position.

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(c) Put the DEFUEL VALVE switch, on the IRP, P28, to the CLOSE position.

(d) Close this access panel:

Number	Name/Location
521DB	Refueling Station Door

(e) Do the applicable fault isolation procedure(s) for the maintenance messages that show, for the jettison system.

SUBTASK 28-00-00-080-022

WARNING OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(6) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 28-00-00-080-023

WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR BEFORE YOU MOVE THE CONTROL LEVER. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(7) If maintenance and servicing of the airplane is complete, do this task: Landing Gear Downlock Pins Removal, TASK 32-00-30-080-801

SUBTASK 28-00-00-860-061

(8) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

——— END OF TASK ———

TASK 28-00-00-040-812

33. MMEL 28-31-3 (DDG) Preparation - Main Tank Jettison Pumps Inoperative

(Figure 905)

A. General

(1) This task is for operation of the airplane with inoperative main tank jettison pumps. If one main tank jettison pump is inoperative, the opposite main tank jettison pump will be off.

B. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right
552	Landing Gear Support Beam & Rear Spar to Wing Trailing Edge - Left Wing
652	Landing Gear Support Beam & Rear Spar to Wing Trailing Edge - Right Wing

C. Main Tank Jettison Pumps Deactivation

SUBTASK 28-00-00-040-004

(1) Do these steps to deactivate the left or right main tank jettison pumps:

(a) Make sure the applicable L or R JETTISON NOZZLE switches, on the P5 overhead panel, are in the OFF position.

(b) Make sure the JETTISON ARM switch, on the P5 overhead panel, is in the OFF position.

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(c) To deactivate the left jettison pump, do this task:

1) Open this circuit breaker and install safety lock:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL

(d) To deactivate the right jettison pump, do this task:

1) Open this circuit breaker and install safety lock:

Right Power Management Panel, P210

Row	Col	Number	Name
K	14	C28646	R FUEL JETT PUMP CTRL

——— END OF TASK ———

TASK 28-00-00-440-812

34. MMEL 28-31-3 (DDG) Restoration - Main Tanks Jettison Pumps Inoperative

(Figure 905)

A. General

(1) This task restores the airplane with inoperative fuel jettison pumps in the main fuel tanks.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right
552	Landing Gear Support Beam & Rear Spar to Wing Trailing Edge - Left Wing
652	Landing Gear Support Beam & Rear Spar to Wing Trailing Edge - Right Wing

D. Access Panels

Number	Name/Location
521DB	Refueling Station Door
552HB	Inboard Fixed Trailing Edge Panel
652HB	Inboard Fixed Trailing Edge Panel

E. Main Tank Jettison Pumps Restoration

SUBTASK 28-00-00-860-062

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-00-00-440-003

(2) Do these steps to activate the main tank jettison pumps:

(a) Make sure the L and R JETTISON NOZZLE switch-lights, on the P5 overhead panel, are in the off position.

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(b) Make sure the FUEL JETTISON ARM switch-light, on the P5 overhead panel, is in the off position.

(c) Remove the safety locks and close these circuit breakers:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
K	14	C28646	R FUEL JETT PUMP CTRL

(d) To get access to the left jettison pump.

Do this task:

Remove this access panel:

Number	Name/Location
552HB	Inboard Fixed Trailing Edge Panel

(e) To get access to the right jettison pump.

Do this task:

Remove this access panel:

Number	Name/Location
652HB	Inboard Fixed Trailing Edge Panel

(f) Open this access panel:

Number	Name/Location
521DB	Refueling Station Door

1) Put the DEFUEL VALVE switch, on the Integrated Refuel Panel (IRP), P28, to the OPEN position.

(g) Push the FUEL JETTISON ARM switch-light, on the P5 overhead panel, to ARMED.

1) Do a check to make sure the left jettison pump operates.

2) Do a check to make sure the right jettison pump operates.

SUBTASK 28-00-00-810-009

(3) Use the maintenance access terminal (MAT) to look for the maintenance messages for the fuel jettison system, on the 28 FUEL MANAGEMENT SYSTEM display.

(a) Select the maintenance messages that show for the jettison pumps and select MAINTENANCE MESSAGE DATA or refer to the applicable Maintenance Message Index in the FIM.

(b) Push the FUEL JETTISON ARM switch-light, on the P5 overhead panel, to the off position.

(c) Put the DEFUEL VALVE switch, on the IRP, P28, to the CLOSE position.

(d) Close this access panel:

Number	Name/Location
521DB	Refueling Station Door

(e) Do the fault isolation procedure(s) for the maintenance messages that show.

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SUBTASK 28-00-00-410-008

(4) For the left jettison pump.

Do this task:

Install this access panel:

Number	Name/Location
552HB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-00-00-410-009

(5) For the right jettison pump.

Do this task:

Install this access panel:

Number	Name/Location
652HB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-00-00-860-063

(6) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

——— END OF TASK ———

TASK 28-00-00-040-813

35. MMEL 28-31-4 (DDG) Preparation - Fuel Jettison Nozzle Valve(s) Inoperative

(Figure 905)

A. General

(1) This task is for operation of the airplane with inoperative fuel jettison nozzle valve(s).

B. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
561	Rear Spar to Trailing Edge - Outboard of Flaperon - Left Wing
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182
661	Rear Spar to Trailing Edge - Outboard of Flaperon - Right Wing

D. Access Panels

Number	Name/Location
561GB	Midspan Fixed Trailing Edge Panel
661GB	Midspan Fixed Trailing Edge Panel

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E. Fuel Jettison Nozzle Valves (L and R Nozzle Valve Failed) Deactivation

SUBTASK 28-00-00-040-005

(1) If the left and right, FUEL JETT NOZZLE L and R, EICAS messages show, do the MMEL 28-31-1 (DDG) Fuel Jettison System Inoperative Preparation procedure.

F. Fuel Jettison Nozzle Valves (L or R Nozzle Valve Failed) Deactivation

SUBTASK 28-00-00-410-010

(1) To get access to the left jettison nozzle valve (TASK 06-44-00-800-802) do this task:

Open this access panel:

Number	Name/Location
561GB	Midspan Fixed Trailing Edge Panel

SUBTASK 28-00-00-410-011

(2) To get access to the right jettison nozzle valve (TASK 06-44-00-800-802) do this task:

Open this access panel:

Number	Name/Location
661GB	Midspan Fixed Trailing Edge Panel

SUBTASK 28-00-00-040-006

(3) Do these steps to deactivate the left or right fuel jettison nozzle valve:

(a) Make sure the L and R JETTISON NOZZLE switches, on the P5 overhead panel, are in the OFF position.

(b) Make sure the JETTISON ARM switch, on the P5 overhead panel, is in the OFF position.

(c) Do these steps to deactivate the left jettison nozzle valve:

(d) Open this circuit breaker and install safety lock:

Left Power Management Panel, P110

Row	Col	Number	Name
L	25	C28621	L FUEL JETT NOZ VLV

1) Remove, cap and stow the electrical connectors (DV28166) to the actuator for the left jettison nozzle valve.

NOTE: The actuator for the left jettison nozzle valve is installed behind the rear spar between ribs 34 and 35, on the left wing.

2) Move the manual override handle on the actuator for the left jettison nozzle valve to the CLOSED position.

3) Install lockwire to the manual override handle to lock the actuator in the CLOSED position.

(e) Do these steps to deactivate the right jettison nozzle valve:

1) Open this circuit breaker and install safety lock:

Right Power Management Panel, P210

Row	Col	Number	Name
K	12	C28620	R FUEL JETT NOZ VLV

2) Remove, cap and stow the electrical connectors (DV28266) to the actuator for the right jettison nozzle valve.

NOTE: The actuator for the right jettison nozzle valve is installed behind the rear spar between ribs 34 and 35, on the right wing.

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3) Move the manual override handle on the actuator for the right jettison nozzle valve to the CLOSED position.

4) Install lockwire to the manual override handle to lock the actuator in the CLOSED position.

SUBTASK 28-00-00-410-012

(4) For the left jettison nozzle valve (TASK 06-44-00-800-802) do this task:

Close this access panel:

Number	Name/Location
561GB	Midspan Fixed Trailing Edge Panel

SUBTASK 28-00-00-410-013

(5) For the right jettison nozzle valve (TASK 06-44-00-800-802) do this task:

Close this access panel:

Number	Name/Location
661GB	Midspan Fixed Trailing Edge Panel

G. Deactivate the Fuel Jettison System

SUBTASK 28-00-00-040-031

(1) If it is necessary, do these steps:

(a) Make sure these circuit breakers are opened:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL
L	24	C28631	L FUEL JETT ISLN VLV

Right Power Management Panel, P210

Row	Col	Number	Name
K	13	C28630	R JETT ISLN VLV
K	14	C28646	R FUEL JETT PUMP CTRL

——— END OF TASK ———

TASK 28-00-00-440-813

36. MMEL 28-31-4 (DDG) Restoration - Fuel Jettison Nozzle Valve(s) Inoperative

(Figure 905)

A. General

(1) This task restores the airplane with inoperative fuel jettison nozzle valve(s).

B. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
28-31-00-720-801	Fuel Jettison System - Operational Test (P/B 501)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

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C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
561	Rear Spar to Trailing Edge - Outboard of Flaperon - Left Wing
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182
661	Rear Spar to Trailing Edge - Outboard of Flaperon - Right Wing

D. Access Panels

Number	Name/Location
561GB	Midspan Fixed Trailing Edge Panel
661GB	Midspan Fixed Trailing Edge Panel

E. Fuel Jettison Nozzle Valves (L and R Nozzle Valve Failed) Reactivation

SUBTASK 28-00-00-040-007

(1) If the left and right fuel jettison nozzle valves are deactivated, do MMEL 28-31-1 (DDG) Restoration - Fuel Jettison System Inoperative, TASK 28-00-00-440-810.

F. Fuel Jettison Nozzle Valves (L or R Nozzle Valve Failed) Reactivation

SUBTASK 28-00-00-480-034



WARNING: MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Make sure the landing gear downlock pins are installed (TASK 32-00-30-480-801).

SUBTASK 28-00-00-480-035



WARNING: OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Make sure the landing gear door safety pins are installed (TASK 32-00-15-480-801).

SUBTASK 28-00-00-860-064

(3) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-00-00-010-010

(4) To get access to the left jettison nozzle valve (TASK 06-44-00-800-802);

Open this access panel:

Number	Name/Location
561GB	Midspan Fixed Trailing Edge Panel

SUBTASK 28-00-00-010-011

(5) To get access to the right jettison nozzle valve (TASK 06-44-00-800-802);

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Open this access panel:

Number	Name/Location
661GB	Midspan Fixed Trailing Edge Panel

SUBTASK 28-00-00-440-004

(6) Do these steps to activate the left or right fuel jettison nozzle valve:

(a) Make sure the L and R JETTISON NOZZLE switches, on the P5 overhead panel, are in the OFF position.

(b) Make sure the JETTISON ARM switch, on the P5 overhead panel, is in the OFF position.

(c) Install the electrical connectors (DV28166 or DV28266) to the actuators for the left or right jettison nozzle valve.

NOTE: The actuator for the left and right jettison nozzle valves are behind the rear spar between rib 34 and 35, on the left and right wings respectively.

(d) Remove the lockwire from the manual override handle of the left or right nozzle valve actuator.

(e) Remove the safety locks and close these circuit breakers:

Left Power Management Panel, P110

Row	Col	Number	Name
L	25	C28621	L FUEL JETT NOZ VLV

Right Power Management Panel, P210

Row	Col	Number	Name
K	12	C28620	R FUEL JETT NOZ VLV

SUBTASK 28-00-00-810-010

(7) Use the maintenance access terminal (MAT) to look for the maintenance messages for the fuel jettison system, on the 28 FUEL MANAGEMENT SYSTEM display.

NOTE: The FUEL JETT NOZZLE L and FUEL JETT NOZZLE R EICAS msgs will show during the DDG Restore task.

(a) Select the maintenance messages that show for the fuel jettison nozzle valves and select MAINTENANCE MESSAGE DATA or refer to the applicable Maintenance Message Index in the FIM.

(b) Do the fault isolation procedure(s) for the maintenance messages that show for the fuel jettison system.

(c) To unlatch the FUEL JETT NOZZLE L and FUEL JETT NOZZLE R EICAS messages, do the applicable steps in this task: Fuel Jettison System - Operational Test, TASK 28-31-00-720-801.

1) Refer to the section of this task that begins with “Test of the Fuel Jettison System in the Air Mode".

SUBTASK 28-00-00-410-014

(8) For the left jettison nozzle valve (TASK 06-44-00-800-802);

Close this access panel:

Number	Name/Location
561GB	Midspan Fixed Trailing Edge Panel

SUBTASK 28-00-00-410-015

(9) For the right jettison nozzle valve (TASK 06-44-00-800-802);

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Close this access panel:

Number	Name/Location
661GB	Midspan Fixed Trailing Edge Panel

——— END OF TASK ———

TASK 28-00-00-040-814

37. MMEL 28-41-1 (DDG) Preparation - Fuel Quantity Indicating System (Flight Deck) Inoperative

(Figure 906)

A. General

(1) This task is for operation of the airplane with an inoperative fuel quantity indicating system (Flight Deck).

B. References

Reference	Title
12-11-01-650-809	Pressure Refueling - With An Inoperative Fuel Quantity Display (P/B 301)

C. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

D. Fuel Quantity Indicating System (FQIS) Inoperative (One Fuel Tank)

SUBTASK 28-00-00-040-008

(1) Do the applicable steps that follow to find the actual fuel quantity (in the fuel tank with an inoperative fuel quantity indication):

(a) Use the applicable integrated refuel panel (IRP) indication (if it is available).

(b) Use the fuel quantity measuring sticks:

NOTE: When you refuel the airplane with inoperative FQIS, only one refuel valve will open. The fuel level near the open refuel valve will temporarily be higher than the fuel level away from the open refuel valve because the fuel tank structure will limit fuel movement. The fuel quantity measuring sticks may not give accurate results until the fuel level across the fuel tank structure becomes equal (5 to 15 minutes after you refuel the airplane).

1) To measure the fuel quantity, refer to the applicable Fuel Measuring Stick Manual (FMSM 28-44-01/301).

Table 902/28-00-00-993-801

FMSM Number	Document Title
D634W122	777-200 A-MARKET Fuel Measuring Stick Manual - Pounds
D634W123	777-200 A-MARKET Fuel Measuring Stick Manual - Kilograms
D634W124	777-200ER/300 NON-ER Fuel Measuring Stick Manual - Pounds

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Table 902/28-00-00-993-801 (Continued)

FMSM Number	Document Title
D634W125	777-200ER/300 NON-ER Fuel Measuring Stick Manual - Kilograms
D634W126-1	777-200LR/300ER Fuel Measuring Stick Manual - Pounds
D634W127-1	777-200LR/300ER Fuel Measuring Stick Manual - Kilograms

(c) To calculate the fuel quantity from the FMCS and EICAS, do the steps that follow:

1) Do these steps to get the total fuel quantity from the FMCS:
   a) Push the PROG mode select key on the CDU.
   b) Push the NEXT PAGE mode select key to show the PROGRESS PAGE 2/2.
   c) Look at the FUEL QTY CALCULATED indication on the CDU.
2) Use the EICAS fuel synoptic display or the IRP to get the fuel quantity for the other two tanks.
3) Subtract the total EICAS indicated fuel (for the other two tanks) from the FUEL QTY CALCULATED indication.

(d) Add a known quantity of fuel:

1) Do these steps to get the total fuel quantity from the FMCS:
   a) Push the PROG mode select key on the CDU.
   b) Push the NEXT PAGE mode select key to show the PROGRESS PAGE 2/2.
   c) Look at the FUEL QTY CALCULATED indication on the CDU.
   d) Make a record of this indication.
2) To add a known quantity of fuel, look at the fueling source meter while you refuel the airplane, do this task: Pressure Refueling - With An Inoperative Fuel Quantity Display, TASK 12-11-01-650-809.
3) To calculate the total quantity of fuel (after refueling); add the quantity of fuel you added to the tanks to the record you made of the FUEL QTY CALCULATED indication.
4) After you refuel, use the EICAS fuel synoptic display or the IRP to get the fuel quantity for the other two tanks.
5) To calculate the quantity of fuel in the applicable tank; subtract the total EICAS indicated fuel for the other two tanks from the total fuel you calculated above.

——— END OF TASK ———

TASK 28-00-00-040-815

38. MMEL 28-41-1 (DDG) Restoration - Fuel Quantity Indicating System (Flight Deck) Inoperative

(Figure 906)

A. General

(1) This task restores the airplane with an inoperative fuel quantity indicating system (Flight Deck).

B. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right

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(Continued)

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

C. Fuel Quantity Indicating System (FQIS) Inoperative (One Fuel Tank)

SUBTASK 28-00-00-860-066

(1) Go to the top EICAS display to make sure the fuel quantity is on for the applicable fuel tank.

(a) If the fuel quantity does not show on the EICAS display, do the next step.

SUBTASK 28-00-00-810-011

(2) Use the maintenance access terminal (MAT) to look for FQIS maintenance messages, on the 28 FUEL QUANTITY INDICATING SYSTEM display.

(a) Select the maintenance messages that show for the Fuel Quantity Indicating System and select MAINTENANCE MESSAGE DATA or refer to the applicable Maintenance Message Index in the FIM.

(b) Do the applicable fault isolation procedure(s), for the maintenance messages that show, for the FQIS.

——— END OF TASK ———

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STORAGE - MAINTENANCE PRACTICES

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure contains these tasks:

(1) Detection Test for Microbial Growth

(2) Treatment of Fuel Tanks Contaminated With Microbial Growth

(3) Biocide Treatment of Fuel Tanks - Metered Injection Cart

(4) Microbial Growth Removal - Manual Removal Method

(5) Microbial Growth Removal - Pressure Washer Method

C. Contamination in fuel tanks and structural corrosion can result from the presence of microorganisms, which live and multiply at the interface of fuel and water.

D. Figure 201 gives an overview of actions necessary to detect, treat and remove microbial contamination.

TASK 28-10-00-200-801

2. Detection Test for Microbial Growth

Figure 201

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) Use a microbial detection kit or laboratory standard test to check the fuel/water samples taken from each fuel tank. A positive result for microbial contamination requires action that may include a biocide treatment or physical removal of the growth from the fuel tanks.

(2) These are the approved microbial test kit, COM-4806:

(a) FUELSTAT RESINAE

(b) EASICULT COMBI

(c) MICROBMONITOR2

(d) HY-LITE JET A-1 FUEL TEST

(e) The fuel samples can also be sent to a laboratory for testing. IP385 is the Institute for Petroleum's test for microbial contamination.

(3) All instructions supplied with the detection kits should be followed closely. It is important to retest if a detection test shows microbial contamination. Differences in the fuel/water sample and the ability of the detection kits to consistently measure the level of microbial growth make it important to retest and verify test results. Do not compare the test results between the different types of detection kits.

(4) All time intervals listed in this task are recommendations. There is no MMEL or scheduled maintenance requirements for testing for microbial contamination.

(5) Frequent removal of water from the airplane sump drains in each fuel tank will help reduce the risk associated with microbial growth.

B. References

Reference	Title
12-11-02-680-801	Fuel Tank Sump Drain Valve - Water Removal/Sampling (P/B 301)

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C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1535	Equipment - Sampling, Fuel Part #: 100-0128-04 Supplier: 5N582 Part #: A12001-15 Supplier: 81205
COM-4806	Test Kit - Microbial, Fuel Part #: EASICULT COMBI Supplier: A007G Part #: FHR-8 Supplier: KE385 Part #: FHR8-2 Supplier: KE385 Part #: HY-LITE JET A1 FUEL TEST Supplier: D2186 Part #: MICROBMONITOR2 Supplier: KG976
STD-421	Goggles - Eye Protection
STD-1129	Coveralls - Tyvek/Saranex 23-p (Approved Cotton Substitute), No Pockets
STD-6365	Bottle - Fuel Sample, Glass or Fuel Resistant Plastic
STD-7374	Gloves - Fuel and Solvent Resistant

D. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
532	Left Wing Dry Bay
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
632	Right Wing Dry Bay
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074

F. Clean the Fuel Sampling Equipment

SUBTASK 28-10-00-280-001

(1) You must wear protective equipment when you clean, sample and test for microbial growth. Protective equipment includes the following:

(a) Pair of eye protection goggles, STD-421

(b) Clean, fuel resistant gloves, STD-7374

(c) Clean protective coverall (approved cotton substitute), STD-1129, or equivalent.

SUBTASK 28-10-00-280-002

(2) Do these steps to clean the fuel sampling equipment, COM-1535:

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(a) Mix a solution of one part tap water to three to four parts alcohol, B00130.

(b) Clean these items with the alcohol solution and cotton wiper, G00034:

1) Probe assembly (part of fuel sampling equipment, COM-1535)

2) Hose assembly (part of fuel sampling equipment, COM-1535), if applicable

3) Beaker assembly (part of fuel sampling equipment, COM-1535)

4) fuel sample bottle, STD-6365, (if reused).

(c) Air dry the fuel sampling equipment, COM-1535, and fuel sample bottle, STD-6365.

(d) Make sure the fuel sampling equipment, COM-1535, and fuel sample bottle, STD-6365, are free from residue alcohol.

(e) Protect the containers from contamination.

SUBTASK 28-10-00-280-003

(3) Do these steps to clean the sump drain area:

(a) Mix a solution of one part water to three to four parts alcohol, B00130.

(b) Thoroughly clean the exterior area of the fuel sump drain with the alcohol solution and cotton wipers, G00034.

(c) Air dry the sump area.

(d) Repeat for each sump drain.

G. Collect the Fuel Sample

SUBTASK 28-10-00-280-004

(1) Make sure the beaker and the fuel sample bottle, STD-6365, are clean and dry.

SUBTASK 28-10-00-280-005

(2) Do these steps to collect a fuel sample:

NOTE: Each fuel sample must be collected separately for each fuel tank and kept in separate sample containers.

(a) Use the fuel sump drain to get a fuel sample:

1) Fuel Tank Sump Drain Valve - Water Removal/Sampling, TASK 12-11-02-680-801.

(b) Fill the beaker with approximately one quart (one liter) of fuel.

(c) If possible, make sure the fuel sample has some visible water (free water) and some fuel.

(d) Pour the fuel/water from the beaker into the fuel sample bottle, STD-6365.

(e) Do not add any additives, such as food coloring, to identify the presence of water.

SUBTASK 28-10-00-280-006

(3) After you collect the fuel sample, do these steps:

(a) Install the cover on the fuel sample bottle, STD-6365.

(b) Label each fuel sample with a date, airplane and fuel tank identification.

(c) Protect the fuel samples from contamination.

SUBTASK 28-10-00-280-007

(4) Continue to collect fuel samples for the remaining tanks.

(a) Clean the fuel sampling equipment, COM-1535, again before you collect a new sample.

(b) Make sure to collect a fuel sample from each tank.

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H. Microbial Growth Detection Test

SUBTASK 28-10-00-280-008

(1) Test the sample within 6 hours of collection if possible, but no more than 24 hours after collection.

NOTE: After you collect the fuel sample, any microbial growth in the sample will start to die.

SUBTASK 28-10-00-280-009

(2) Use one of the approved microbial test kit, COM-4806, to test the fuel samples.

SUBTASK 28-10-00-280-010

(3) Follow all instructions supplied with the microbial test kit, COM-4806.

NOTE: Some test kits will not function correctly if fuel is tested. Even traces of fuel can coat the test slide and prevent the microbes from growing. Other test kits can test either fuel or free water, but free water is recommended.

I. Initial Test Results

SUBTASK 28-10-00-280-011

(1) Use the data supplied with the test kit to define the level of microbial growth:

(a) Negligible contamination

(b) Moderate contamination

(c) Heavy contamination.

SUBTASK 28-10-00-280-012

(2) If the test confirms negligible levels of contamination, then do these steps:

(a) Continue with the usual operations.

(b) Continue to test the aircraft at the usual intervals.

SUBTASK 28-10-00-280-013

(3) If the initial test results are positive for moderate or heavy levels of microbial contamination, then do these steps:

(a) Within 10 days (after receipt of test results) get a new fuel sample.

1) Continue Fuel Sump Operations during the 10 day period; do this task Fuel Tank Sump Drain Valve - Water Removal/Sampling, TASK 12-11-02-680-801.

(b) Repeat the microbial detection test with the same test method. See Microbial Growth Detection Test,

(c) Confirm the level of microbial contamination.

J. Retest Results

SUBTASK 28-10-00-280-014

(1) If the retest confirms negligible levels of microbial contamination, then do these steps:

(a) Continue with the usual operations.

(b) Continue to test the aircraft at the usual intervals.

SUBTASK 28-10-00-280-015

(2) If the retest confirms moderate levels of microbial contamination, then do these steps:

(a) Within 10 days (after receipt of test results) schedule a biocide treatment to kill the microbial growth.

1) Continue Fuel Sump Operations during the 10 day period; do this task Fuel Tank Sump Drain Valve - Water Removal/Sampling, TASK 12-11-02-680-801.

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(b) Do the subsequent task for moderate levels of contamination.

SUBTASK 28-10-00-280-016

(3) If the retest confirms heavy levels of microbial contamination, then do these steps:

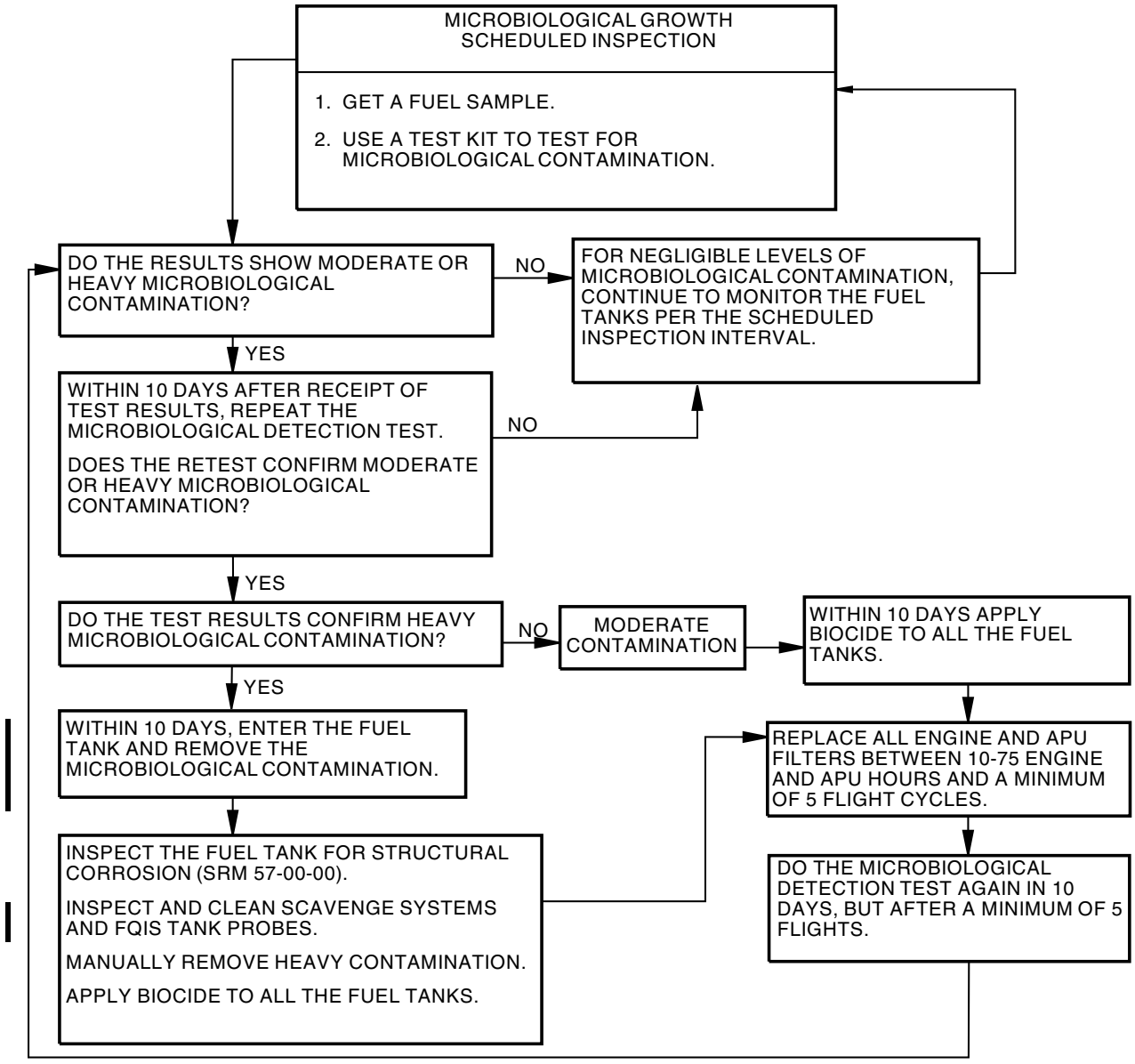
(a) Within 10 days (after receipt of test results) schedule a task to go into the fuel tank(s) to inspect and remove the microbial growth.

1) Continue Fuel Sump Operations during the 10 day period; do this task Fuel Tank Sump Drain Valve - Water Removal/Sampling, TASK 12-11-02-680-801.

(b) Do the subsequent task for heavy levels of microbial contamination.

——— END OF TASK ———

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NOTE: IF THE DETECTION TEST SHOWS MICROBIAL GROWTH, THEN DO THE SCHEDULED INSPECTION TEST MORE OFTEN.

AFTER A TREATMENT WITH BIOCIDE, DON'T TEST AGAIN UNTIL AFTER 10 DAYS (MINIMUM OF 5 FLIGHTS). THIS IS TO MAKE SURE THE FUEL TREATED WITH BIOCIDE IS FULLY REMOVED FROM THE FUEL TANKS BEFORE THE NEXT TEST.

IF THE BIOCIDE TREATMENT IS NOT EFFECTIVE USING A 1/3 FUEL LOAD, USE A BIOCIDE TREATMENT WITH A FULL FUEL LOAD AND USE THE MAXIMUM SOAK TIME. THE CONTAMINATION MAY BE TOWARDS THE TOP OF THE TANK.

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Microbial Growth - In Fuel Tanks
Figure 201/28-10-00-990-801

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TASK 28-10-00-600-801

3. Treatment of Fuel Tanks Contaminated with Microbial Growth

(Figure 201)

A. General

(1) A positive result for moderate or heavy levels of microbial contamination requires action that may include a biocide treatment or physical removal of the growth from the fuel tanks.

(2) All time intervals listed in this task are recommendations. There is no MEL or scheduled maintenance requirements for testing for microbial contamination.

B. Equipment

(1) Protective outer clothing to prevent skin contact with microbial contamination:

(a) Fuel and solvent resistant gloves

(b) Saranex suit

(c) Neoprene boots

(d) Respirator - Half face canister style respirators (minimum), U.S. Bureau of Mines Approved or equivalent

C. References

Reference	Title
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-26-00-650-801	Pressure Defueling (P/B 201)
49-31-02-000-801	Fuel Filter Element Removal (P/B 401)
49-31-02-400-801	Fuel Filter Element Installation (P/B 401)
73-11-02-000-801-H01	Fuel Filter Element Removal (P/B 401)
73-11-02-400-801-H01	Fuel Filter Element Installation (P/B 401)

D. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
532	Left Wing Dry Bay
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
632	Right Wing Dry Bay
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074

E. Treatment of Fuel Tanks with Moderate Levels of Microbial Contamination

NOTE: It is recommended to apply biocide to all tanks within 10 days (or five flights) after positive results for moderate levels of microbial contamination.

SUBTASK 28-10-00-280-017

(1) Within 10 days (after receipt of positive test results) do these steps:

(a) Do a biocide treatment for all of the fuel tanks.

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(b) Return the airplane to service.

(c) Make sure all of the biocide treated fuel has been burned through the engines (a minimum of five flights).

I (d) After 10 to 75 engine and APU hours replace these items:

NOTE: The hours are of engine run time.

1) Engine fuel filter element (TASK 73-11-02-000-801-H01, TASK 73-11-02-400-801-H01).

2) APU fuel filter element (TASK 49-31-02-000-801, TASK 49-31-02-400-801).

SUBTASK 28-10-00-280-018

(2) After the biocide treatment do these steps:

(a) Wait at least 10 days (minimum of five flights) after the biocide treatment.

(b) Get a new fuel sample for each tank.

(c) If the tests show that the biocide treatment was not successful, do these steps:

1) Completely fill the fuel tanks with biocide treated fuel.

2) Use the maximum soak time:

a) Biobor JF - 72 Hours

b) Kathon FP 1.5 - 24 Hours

(d) If the tests show that the biocide treatment was successful, then continue to test the aircraft at the usual intervals.

F. Treatment of Fuel Tanks with Heavy Levels of Microbial Contamination

NOTE: If the detection test (and retest) confirms heavy levels of microbial contamination, then do this procedure. It is recommended to do a fuel tank entry within 10 days after positive results for heavy levels of microbial contamination.

SUBTASK 28-10-00-280-019

(1) Within 10 days (after receipt of test results) schedule a task to inspect the fuel tank(s) for microbial growth.

SUBTASK 28-10-00-280-020

(2) Do these steps to prepare for the fuel tank inspection:

WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(a) Defuel and drain the applicable fuel tank(s) (TASK 28-26-00-650-801).

(b) Prepare for a fuel tank entry (TASK 28-11-00-010-801, TASK 28-11-00-650-801).

(c) Make sure the fuel tank has a sufficient flow of air.

(d) Put on this protective gear to prevent contact with microbial growth:

1) Respirator - Half face canister style respirators (minimum)

2) Eye protection

3) Fuel resistant gloves

4) Saranex suit

5) Neoprene boots

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(e) Go into the fuel tank (TASK 28-11-00-010-801, TASK 28-11-00-650-801).

SUBTASK 28-10-00-280-021

(3) Examine the fuel tank for microbial growth:

(a) Microbial growth usually occurs at the fuel/water interface in the fuel tanks.

(b) Microbial growth can also occur in other areas such as vertical surfaces and convex shapes such as fuel tubing.

(c) Microbial growth can appear in a variety of colors.

(d) If a tank is wet with fuel, the microbial growth can appear as a smooth slimy transparent gel material.

(e) If a tank is dry, the microbial growth can appear as a dark solid material on the tank surfaces.

(f) Microbial growth can cause the tank protective primer coating to appear stained.

SUBTASK 28-10-00-280-022

(4) Microbial growth is usually found in these areas:

(a) The bottom of the tank where water collects.

(b) The lower surfaces of the wing structure (stringers, spars, ribs etc).

(c) The top surfaces of the tubing.

(d) The flow holes and the drain tubes.

(e) Areas where water is possibly trapped.

(f) Inside or around fuel system components.

SUBTASK 28-10-00-280-023

(5) Do these steps if you find microbial growth:

(a) Do the applicable task to remove the microbial growth:

1) Microbial Growth Removal - Manual Removal Method (TASK 28-10-00-100-801 or TASK 28-10-00-100-802)

2) Microbial Growth Removal - Pressure Washer Removal Method (TASK 28-10-00-100-801 or TASK 28-10-00-100-802)

(b) Examine the fuel tank structure for corrosion (SRM Chapter 57).

SUBTASK 28-10-00-280-024

(6) Do these steps after you clean the fuel tank:

(a) Do the inspection for the remaining tanks that have tested positive for microbial growth.

(b) Do this task: Fuel Tank Closure, TASK 28-11-00-410-801.

(c) Do a biocide treatment of the fuel tanks.

(d) Return the airplane to service.

(e) Make sure all of the biocide treated fuel has been burned through the engines (a minimum of five flights).

(f) After 10 to 75 engine and APU hours replace these items:

NOTE: The hours are engine run time.

1) Engine fuel filter element (TASK 73-11-02-000-801-H01, TASK 73-11-02-400-801-H01).

2) APU fuel filter element (TASK 49-31-02-000-801, TASK 49-31-02-400-801).

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SUBTASK 28-10-00-280-025

(7) After the biocide treatment do these steps:

(a) Wait at least 10 days (minimum of five flights) after the biocide treatment.

(b) Get a new fuel sample for each tank.

(c) Do the microbial growth detection test again.

(d) If the tests show that the biocide treatment was not successful, do these steps:

1) Completely fill the fuel tanks with biocide treated fuel.

2) Use the maximum soak time:

a) Biobor JF - 72 Hours

b) Kathon FP 1.5 - 24 Hours

(e) If the tests show that the biocide treatment was successful, then continue to test the aircraft at the usual intervals.

——— END OF TASK ———

TASK 28-10-00-600-802

4. Biocide Treatment of Fuel Tanks - Metered Injection Cart

A. General

(1) A metered injection cart must be available to do this task.

(2) There are two types of metered-injection carts:

(a) Adjustable metered injection cart

(b) Non-adjustable metered injection cart.

(3) ADJUSTABLE METERED INJECTION CART;

(a) This type of metered injection cart is equipped with an adjustable concentration setting. You can adjust the concentration setting from tank to tank.

(4) NON-ADJUSTABLE METERED INJECTION CART;

(a) This type of metered injection cart is not field adjustable. You cannot adjust the concentration setting from tank to tank. You can recalibrate the cart (in a maintenance shop) to achieve the desired 270 ppm concentration for Biobor JF or 100 ppm concentration for Kathon FP 1.5. To account for the typical fuel remaining on-board after a flight, a procedure is given to recalibrate the cart to 1.5 times the usual setting. This method will allow the correct concentration of treated fuel to be added to the fuel tanks.

(5) Biocide treatment is used to kill microbial growth within the fuel tank. The process requires that the biocide be mixed at a specified concentration with fuel and allowed to soak for a period of time. After soaking, the biocide treated fuel may be burned through the engines.

(6) Two biocidal fuel additives are certified by the airframe and engine manufactures. These are:

(a) Biobor JF - manufactured by Hammonds

(b) Kathon FP 1.5 - manufactured by Rohm & Haas Company

NOTE: Biobor JF and Kathon FP 1.5 have not been approved in some geographic areas. Local regulatory agencies should be consulted with respect to approval status.

(7) Obey all Health and Safety precautions specified by the manufacturer related to the use of biocide.

(8) It is recommended to do this task with no fuel or a minimum fuel load (after a flight, before fuel servicing). It is not necessary to defuel the aircraft before you begin the biocide treatment.

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B. Equipment

(1) portable biocide injection hydrant cart, COM-1781

C. Consumable Materials

(1) Biocide - Use one of these fuel additives:

(a) Biobor JF additive, G00452

(b) Kathon FP1.5 biocide, G02347, Rohm and Haas Company, Pennsylvania, USA (215) 592-3000

Distributor for Kathon FP 1.5,

Fuel Quality Services, Inc.

Georgia, USA

(770) 967-9790

(770) 967-9982 (Fax number)

D. References

Reference	Title
12-11-01-650-808	Pressure Refueling - With Inoperative Refuel Valves (P/B 301)
12-11-02-650-801	Fuel Tank Sump Drain Valve - Tank Entry (P/B 301)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)
49-31-02-000-801	Fuel Filter Element Removal (P/B 401)
49-31-02-400-801	Fuel Filter Element Installation (P/B 401)
73-11-02-000-801-H01	Fuel Filter Element Removal (P/B 401)
73-11-02-400-801-H01	Fuel Filter Element Installation (P/B 401)

E. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1781	Cart - Hydrant, Portable, Biocide Injection Part #: HC800-1S Supplier: 47186 Opt Part #: 69-10-04-999 Supplier: 1X7Q9 Opt Part #: MODEL 800 HC Supplier: 47186

F. Consumable Materials

Reference	Description	Specification
G00452	Additive, Fuel - Biobor JF	
G02347	Biocide - Fuel - Kathon FP1.5	

G. Location Zones

Zone	Area
530	Subzone 530 - Wing Inspar Area (Fuel Tanks) - Inboard of Wing Rib 17
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
540	Subzone 540 - Wing Inspar Area (Fuel Tanks) - Rib 17 to Wing Tip
541	Main Tank - Rib 17 to Rib 32 - Left Wing
630	Subzone 630 - Wing Inspar Area (Fuel Tanks) - Inboard of Wing Rib 17
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

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(Continued)

Zone	Area
632	Right Wing Dry Bay
640	Subzone 640 - Wing Inspar Area (Fuel Tanks) - Rib 17 to Wing Tip
641	Main Tank - Rib 17 to Rib 32 - Right Wing

H. Biocide Precautions

SUBTASK 28-10-00-620-001

(1) Obey these personnel precautions:

WARNING DO NOT BREATHE BIOCIDE FUMES, OR TOUCH THE BIOCIDE FUEL ADDITIVE. READ THE MANUFACTURERS MSDS. THE BIOCIDE FUEL ADDITIVE CAN CAUSE HEALTH PROBLEMS (INJURIES TO PERSONNEL).

(a) Do not breathe or touch the biocide fuel additive.

(b) During maintenance with biocide fuel additives, wear these protective equipment items:

1) Eye protection

2) Fuel resistant gloves

3) Protective outerwear

(c) Do not sump the fuel tanks when biocide has been added to the fuel tank(s). A high concentration of biocide will be present at the sump drain.

SUBTASK 28-10-00-620-002

(2) Obey these biocide additive precautions:

(a) Obey all requirements specified by the manufacturer related to the use of the biocide.

CAUTION DO NOT ADD MORE THAN THE MAXIMUM CONCENTRATION OF BIOCIDE. DAMAGE TO THE ENGINES CAN OCCUR IF THE BIOCIDE CONCENTRATION IS HIGHER THAN THE MAXIMUM LIMIT.

(b) Do not exceed the maximum allowable concentration of biocide (parts per million) in a fuel tank.

(c) If the concentration exceeds the limit, then add more untreated fuel to dilute the biocide concentration.

(d) If you exceed the maximum allowable concentration of biocide in a fuel tank and you cannot dilute the concentration with untreated fuel, then contact the engine manufacturer for corrective action.

(e) If you spill biocide, then do these steps:

1) Immediately contain the spill area.

2) Use sponges and water to clean the area.

3) Use the correct procedures to dispose of the material.

I. Prepare for the Biocide Treatment

SUBTASK 28-10-00-680-001

(1) Sump the fuel tanks (TASK 12-11-02-650-801).

SUBTASK 28-10-00-620-003

(2) Do one of these procedures:

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(a) Apply the Biocide to the Fuel Tanks - Adjustable Metered.

(b) Apply the Biocide to the Fuel Tanks - Non-adjustable Metered Injection.

J. Apply the Biocide to the Fuel Tanks - Adjustable Metered Injection

SUBTASK 28-10-00-620-004

(1) Obey the biocide precautions.

SUBTASK 28-10-00-620-005

(2) Do these steps to calculate the metered injection setting:

(a) Use Table 201 to determine the final biocide concentration.

NOTE: Table 201 gives the final concentration of biocide allowed in the fuel tank. This is the maximum concentration of biocide that can be run through the engines. You must adjust the metered injection setting to achieve the correct concentration of biocide.

NOTE: If you add a biocide concentration that is much lower than the maximum concentration, the biocide treatment must soak longer and is not as effective in killing the microbial growth.

(b) Use Table 202 to calculate the biocide concentration setting for each fuel tank.

(c) The metered injection cart setting depends on these variables:

1) Type of biocide used.

2) Quantity of untreated fuel in the fuel tank.

3) Quantity of treated fuel to be uplifted into the fuel tank.

Table 201/28-10-00-993-801 Biocide Concentration

BIOCIDE	CONCENTRATION
BIOBOR JF	270 ppm by weight
KATHON FP 1.5	100 ppm by volume

Table 202/28-10-00-993-802 Metered Injection Cart Setting

BIOBOR JF	KATHON FP 1.5
$C(uf) = \frac{270\ (FOB + UPLIFT)}{UPLIFT}$	$C(uf) = \frac{100\ (FB + UPLIFT)}{UPLIFT}$
C(uf) = Concentration of fuel to be uplifted FOB = Untreated fuel quantity on-board UPLIFT = Fuel quantity with metered biocide to be added Fill each tank to a minimum of 1/3 full.	

SUBTASK 28-10-00-620-006

(3) Adjust the metered injection cart (portable biocide injection hydrant cart, COM-1781):

(a) Use the instructions provided with the metered injection cart to adjust the cart.

(b) Set the injection setting to achieve the desired biocide concentration.

SUBTASK 28-10-00-620-007

(4) Plan the refueling operation:

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(a) Each tank must be filled to a minimum of 1/3 full.

SUBTASK 28-10-00-620-008

(5) Do these steps to add the biocide:

(a) Open the refuel valve(s) for one tank only (TASK 12-11-01-650-808).

(b) Begin the refuel operation (TASK 12-11-01-650-808).

(c) Make sure the correct biocide concentration is mixed with the fuel and added to the fuel tank.

(d) Refuel the tank to the desired fuel load.

(e) Make sure the tank is filled a minimum of 1/3 full.

(f) Stop the refuel operation (TASK 12-11-01-650-808).

(g) Do the biocide calculation again and adjust the injection cart setting for the next tank (Table 202).

(h) Continue to apply the treated fuel to all fuel tanks.

SUBTASK 28-10-00-620-009

(6) Do this procedure: Biocide Treatment Soak Time.

K. NO FUEL ON-BOARD; Apply the Biocide to the Fuel Tanks - Non-Adjustable Metered Injection

SUBTASK 28-10-00-620-010

(1) Do this procedure if all of the fuel tanks are empty before you begin to add the biocide treated fuel.

SUBTASK 28-10-00-620-011

(2) Obey the biocide precautions.

SUBTASK 28-10-00-620-012

(3) Do these steps to calibrate the metered injection cart:

(a) Use the instructions provided with the metered injection cart to calibrate the equipment.

NOTE: The equipment is not field adjustable. The calibration must be done in a maintenance shop.

(b) Calibrate the concentration setting to the applicable value:

1) Biobor JF - 270 ppm by weight

2) Kathon FP 1.5 - 100 ppm by volume

(c) Use the instructions provided with the metered injection cart to connect the cart to the refueling equipment.

SUBTASK 28-10-00-620-013

(4) Plan the refueling operation:

(a) Plan the refuel operation to maintain the center of gravity within the limits per the weight and balance manual.

(b) Each tank must be filled to a minimum of 1/3 full.

SUBTASK 28-10-00-620-014

(5) Do these steps to add the biocide:

(a) Open the refuel valves in sequence to maintain the airplane within the center of gravity limits.

(b) Begin the refuel operation (TASK 12-11-01-650-808).

(c) The correct biocide concentration is mixed with the fuel and added to the fuel tank.

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(d) Fill each fuel tank to a minimum of 1/3 full.

(e) Stop the refueling operation (TASK 12-11-01-650-808).

SUBTASK 28-10-00-620-015

(6) Do this procedure: Biocide Treatment Soak Time.

L. UNTREATED FUEL ON-BOARD; Apply the Biocide to the Fuel Tanks - Non-Adjustable Metered Injection

SUBTASK 28-10-00-620-016

(1) Do this procedure if there is less than 43,092 pounds (19,590 kilograms) of untreated fuel on-board before you begin to add the biocide treated fuel.

SUBTASK 28-10-00-620-017

(2) Obey the biocide precautions.

SUBTASK 28-10-00-620-018

(3) Do these steps to distribute the untreated on-board fuel:

(a) Transfer all of the fuel in equal quantities to each of the two main tanks (TASK 28-26-00-650-802).

(b) If necessary, refuel the main tanks with untreated fuel until each tank is 1/3 full, 21,546 pounds (9,800 kilograms) (TASK 12-11-01-650-808).

SUBTASK 28-10-00-620-019

(4) Do these steps to calibrate the metered injection cart:

(a) Use the instructions provided with the metered injection cart to calibrate the equipment.

NOTE: The equipment is not field adjustable. The calibration must be accomplished in a maintenance shop.

(b) With 21,546 pounds (9,800 kilograms) of untreated fuel in each main tank, calibrate the concentration setting to 1.5 times the maximum concentration:

1) Biobor JF - 405 ppm

2) Kathon FP 1.5 - 150 ppm

(c) Use the instructions provided with the metered injection cart to connect the cart to the refueling equipment.

SUBTASK 28-10-00-620-020

(5) Do these steps to add the biocide:

(a) Open the refuel valves for the main tanks only (TASK 12-11-01-650-808).

(b) Begin the refuel operation (TASK 12-11-01-650-808).

(c) Completely fill the two main tanks with treated fuel.

(d) After the treated and untreated fuel is mixed in the tanks, the concentration of biocide will be correct.

(e) Distribute the biocide treated fuel in the main tanks to the center tank (TASK 28-26-00-650-802).

(f) Make sure each fuel tank is a minimum of 1/3 full.

SUBTASK 28-10-00-620-021

(6) Do this procedure: Biocide Treatment Soak Time.

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M. Biocide Treatment Soak Time

SUBTASK 28-10-00-620-022

(1) Obey the biocide precautions.

SUBTASK 28-10-00-620-023

(2) Allow the biocide treatment to soak per the applicable minimum time given in Table 203.

Table 203/28-10-00-993-803 Biocide Soak Time

BIOCIDE	SOAK TIME
BIOBOR JF	36 - 72 HOURS
KATHON FP 1.5	12 - 24 HOURS

SUBTASK 28-10-00-620-024

(3) These factors affect how quickly the biocide kills the microbial growth:

(a) The longer the soak time, the better the biocide will work.

(b) Additional soak time may be required for low temperatures.

(c) A low concentration of biocide is not as effective in killing microbial growth.

NOTE: If the concentration of biocide is too low, the microbes can become resistant to the biocide.

SUBTASK 28-10-00-620-025

(4) During the soak time, do not move the airplane or operate the fuel pumps or APU pumps.

N. Post-Biocide Treatment Maintenance Actions

SUBTASK 28-10-00-620-026

(1) After the biocide soak time, return the airplane to service.

NOTE: The biocide treated fuel is burned through the engines.

SUBTASK 28-10-00-620-027

I (2) After 10 to 75 engine and APU hours replace these filters:

NOTE: This is hours of engine run time.

NOTE: If one engine filter shows high levels of particulates, replace the other filters before the next flight.

(a) Engine fuel filter element (TASK 73-11-02-000-801-H01, TASK 73-11-02-400-801-H01).

(b) APU fuel filter element (TASK 49-31-02-000-801, TASK 49-31-02-400-801).

SUBTASK 28-10-00-620-028

(3) Wait 10 days (minimum five flights), do the microbial growth detection test again.

SUBTASK 28-10-00-620-029

(4) If the tests show that the biocide treatment was not successful, then do these steps:

(a) Completely fill the fuel tanks with biocide treated fuel.

(b) Use the maximum soak time:

1) Biobor JF - 72 Hours

2) Kathon FP 1.5 - 24 Hours

END OF TASK

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TASK 28-10-00-100-801

5. Microbial Growth Removal - Manual Removal Method

A. General

(1) There are two methods to remove the microbial growth. If the fuel tank inspection shows that the area that is contaminated is small, then do this task to manually remove the contamination.

(2) If the fuel tank inspection shows that the contamination area is large or the area is inaccessible (manual removal is not practical), then do this task: Microbial Growth Removal - Pressure Washer Method.

B. References

Reference	Title
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-06-000-801	Sump Drain Valve - Removal (P/B 401)
28-11-06-400-801	Sump Drain Valve - Installation (P/B 401)
28-22-12-000-801	Fuel Scavenge Jet Pump - Removal (P/B 401)
28-22-12-400-801	Fuel Scavenge Jet Pump - Installation (P/B 401)
28-41-02-000-801	Tank Unit - Removal (P/B 401)
28-41-02-400-801	Tank Unit - Installation (P/B 401)
SRM 57-00-00	General - Wings

C. Tools/Equipment

Reference	Description
STD-421	Goggles - Eye Protection
STD-1129	Coveralls - Tyvek/Saranex 23-p (Approved Cotton Substitute), No Pockets
STD-7374	Gloves - Fuel and Solvent Resistant
STD-7377	Boots - Neoprene
STD-7380	Respirator - Half-Mask, Air Purifying (with filters/cartridges)

D. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Location Zones

Zone	Area
530	Subzone 530 - Wing Inspar Area (Fuel Tanks) - Inboard of Wing Rib 17
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
540	Subzone 540 - Wing Inspar Area (Fuel Tanks) - Rib 17 to Wing Tip
630	Subzone 630 - Wing Inspar Area (Fuel Tanks) - Inboard of Wing Rib 17
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
640	Subzone 640 - Wing Inspar Area (Fuel Tanks) - Rib 17 to Wing Tip

F. Prepare to Remove the Microbial Growth

SUBTASK 28-10-00-620-030

(1) Do this procedure after you have completed this task: Microbial Growth Fuel Tank Inspection.

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SUBTASK 28-10-00-620-031

WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Prepare the fuel tank for a tank entry Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

SUBTASK 28-10-00-620-032

WARNING MAKE SURE THAT THERE IS A GOOD FLOW OF AIR IN THE FUEL TANK WHERE YOU WILL REMOVE THE MICROBIAL GROWTH. A GOOD FLOW OF AIR WILL PREVENT THE BUILD-UP OF ISOPROPYL ALCOHOL FUMES. ISOPROPYL ALCOHOL IS FLAMMABLE AND POISONOUS. INJURIES TO PERSONNEL CAN OCCUR.

(3) Make sure the fuel tank has a sufficient flow of air.

SUBTASK 28-10-00-620-033

WARNING PUT ON AN APPROVED RESPIRATOR AND PROTECTIVE CLOTHING BEFORE YOU GO INTO A FUEL TANK THAT HAS MICROBIAL GROWTH CONTAMINATION. DO NOT BREATHE AIR THAT HAS MICROBIAL GROWTH RESIDUE. DO NOT GET THE MICROBIAL GROWTH ON YOUR SKIN. HEALTH PROBLEMS CAN OCCUR. MICROBIAL CONTAMINATION CAN CAUSE INJURIES TO PERSONNEL.

(4) Put on this protective gear to prevent contact with microbial growth:

(a) half-mask respirator, STD-7380

(b) glove, STD-7374

(c) eye protection goggles, STD-421

(d) coverall (approved cotton substitute), STD-1129

(e) boot, STD-7377

SUBTASK 28-10-00-620-034

(5) Go into the fuel tank (TASK 28-11-00-010-801).

SUBTASK 28-10-00-010-001

(6) Remove these components for the tank(s) to be inspected and cleaned:

NOTE: Make a component removal record.

(a) Sump drain valve (TASK 28-11-06-000-801)

(b) FQIS tank units (TASK 28-41-02-000-801)

(c) Fuel scavenge jet pump (TASK 28-22-12-000-801).

SUBTASK 28-10-00-910-007

(7) Put a protective cover on these fuel system components and attach a REMOVE BEFORE FLIGHT TAG:

(a) Fuel pump inlets

(b) Scavenge and water ejector pump inlets

(c) By-pass valve inlets

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SUBTASK 28-10-00-160-006

(8) Use the applicable manufacturers instructions to inspect and clean these components as necessary:

(a) Fuel scavenge jet pump

(b) Tank units

G. Remove the Microbial Growth - Manual Method

SUBTASK 28-10-00-620-035

(1) Do these steps to remove the microbial growth:

(a) Use a fiber brush to loosen the contamination.

(b) Apply alcohol, B00130 to a cotton wiper, G00034.

(c) Use the minimum amount of isopropyl alcohol that is necessary.

(d) Use the wiper to remove the microbial growth.

(e) Put the used cotton wiper, G00034 in a plastic bag to decrease the isopropyl alcohol fumes in the tank.

(f) Use an air hose or a wire to make sure the flow hole areas are free of unwanted material.

(g) Use an air hose with a nozzle (90 psi maximum) to blow any material from the inlet screen on the water and fuel scavenge pumps.

SUBTASK 28-10-00-620-036

(2) Do a visual check of the fuel tank structure for corrosion.

(a) If you find corrosion, then repair the damage SRM 57-00-00.

H. Put the Airplane Back to the Usual Condition

SUBTASK 28-10-00-080-003

(1) Remove the fuel tank cleaning equipment and material.

SUBTASK 28-10-00-910-008

(2) Remove the protective covers from these fuel system components:

(a) Fuel pump inlets

(b) Fuel scavenge system inlets

(c) Bypass valve inlets

SUBTASK 28-10-00-410-005

(3) Install these components:

(a) Sump drain valve (TASK 28-11-06-400-801)

(b) FQIS tank units (TASK 28-41-02-400-801)

(c) Fuel scavenge jet pumps (TASK 28-22-12-400-801).

SUBTASK 28-10-00-620-037

(4) Install any panels or structure that you removed.

SUBTASK 28-10-00-620-038

(5) Do this task: Fuel Tank Closure, TASK 28-11-00-410-801.

SUBTASK 28-10-00-620-039

(6) Do this task: Biocide Treatment of Fuel Tanks - Metered Injection Cart, TASK 28-10-00-600-802. .

END OF TASK

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TASK 28-10-00-100-802

6. Microbial Growth Removal - Pressure Washer Method

A. General

(1) There are two methods to remove the microbial growth. If the fuel tank inspection shows that the area that is contaminated is small, then do this task: Microbial Growth Removal - Manual Removal Method.

(2) If the fuel tank inspection shows that the contamination area is large or the area is inaccessible (manual removal is not practical), then use the pressure washer method to remove the contamination.

(3) If you use a pressure washer you must remove all of the in-tank FQIS components and use care not to damage the fuel tank sealant. After you finish the procedure make sure all the water is removed and the tank is completely dried.

B. Equipment

(1) Gloves - applicable for hot water cleaning

(2) Protective Clothing - Waterproof pants, boots, jacket with hood

(3) Pressure Washer - Hot Water - Surface impact requirement (Maximum):

Temperature: 160°F (71°C)

Pressure: 100 psi (689 kPa)

Flow: 3 gal (11 l) to 5 gal (19 l) per minute

(4) Respirator - Full face canister style respirators (minimum), U.S. Bureau of Mines Approved or equivalent

(5) Source of hot water

(6) Vacuum cleaner - air powered, wet/dry

C. References

Reference	Title
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-300-802	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-00-790-801	Fuel Leak Detection Procedures (P/B 601)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-11-06-000-801	Sump Drain Valve - Removal (P/B 401)
28-11-06-400-801	Sump Drain Valve - Installation (P/B 401)
28-22-12-000-801	Fuel Scavenge Jet Pump - Removal (P/B 401)
28-22-12-400-801	Fuel Scavenge Jet Pump - Installation (P/B 401)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)
28-41-02-000-801	Tank Unit - Removal (P/B 401)
28-41-02-400-801	Tank Unit - Installation (P/B 401)

D. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

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E. Location Zones

Zone	Area
530	Subzone 530 - Wing Inspar Area (Fuel Tanks) - Inboard of Wing Rib 17
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
540	Subzone 540 - Wing Inspar Area (Fuel Tanks) - Rib 17 to Wing Tip
541	Main Tank - Rib 17 to Rib 32 - Left Wing
630	Subzone 630 - Wing Inspar Area (Fuel Tanks) - Inboard of Wing Rib 17
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
632	Right Wing Dry Bay
640	Subzone 640 - Wing Inspar Area (Fuel Tanks) - Rib 17 to Wing Tip
641	Main Tank - Rib 17 to Rib 32 - Right Wing

F. Hot Water Pressure Washer - Precautions

SUBTASK 28-10-00-860-001

WARNING OBEY THESE PRECAUTIONS WHEN YOU CLEAN THE FUEL TANK WITH A HOT-WATER PRESSURE WASHER. HOT WATER CAN BURN YOU AND HIGH TEMPERATURES IN THE TANK CAN CAUSE HEAT-RELATED HEALTH PROBLEMS. USE THE PRESSURE WASHER CORRECTLY TO PREVENT DAMAGE TO THE FUEL TANK SEALS. HOT WATER AND HEAT CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(1) The person in the fuel tank must have these items for protection:

(a) Heat protective gloves

(b) Water-proof outer gloves

(c) Water-proof coat and pants

(d) Water-proof and heat protective hood

(e) A full face mask

(f)) Protective gear to protect against breathing or touching microbial growth

(g) A hot water line that closes automatically when you release it ("deadman" control switch).

SUBTASK 28-10-00-910-001

(2)) The fuel tank observer must monitor the person in the tank for signs of health problems related to overheating.

SUBTASK 28-10-00-860-002

(3) Use air movers to have a good flow of air in the tanks.

SUBTASK 28-10-00-910-002

(4) While you clean, continue to move air through the tank.

SUBTASK 28-10-00-160-001

(5) Make sure to use the correct pressure washer technique:

(a) Use a spray of approximately 100 psi (689 kPa) maximum at the tank surface.

(b) Keep the time you point the nozzle at one position to a minimum

(c)) Move the spray through an area at approximately 6 in. (152 mm) per second.

(d) Many fast passes are better than one slow pass.

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(e) Do not point the spray at the feathered edge of the seal compound.

NOTE: This loosens the joint.

(f) If you put heat or water pressure on the sealant for a long time, you can damage the sealant.

G. Prepare the Tank for the Hot Water Pressure Washing

SUBTASK 28-10-00-910-003

WARNING

DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(1) Prepare to go into the fuel tank:

Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801,

Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

SUBTASK 28-10-00-020-001

(2) Remove the applicable access doors for the fuel tank in the area that you must clean:

Center Tank Access Door - Removal, TASK 28-11-02-000-801,

Main Tank Access Door Removal, TASK 28-11-01-000-801.

SUBTASK 28-10-00-020-002

(3) Remove the necessary fuel tank equipment and support brackets to get access to the area that you must clean.

SUBTASK 28-10-00-910-004

WARNING

PUT ON AN APPROVED RESPIRATOR AND PROTECTIVE CLOTHING BEFORE YOU GO INTO A FUEL TANK THAT HAS MICROBIAL GROWTH CONTAMINATION. DO NOT BREATHE AIR THAT HAS MICROBIAL GROWTH RESIDUE. DO NOT GET THE MICROBIAL GROWTH ON YOUR SKIN. HEALTH PROBLEMS CAN OCCUR. MICROBIAL CONTAMINATION CAN CAUSE INJURIES TO PERSONNEL.

(4) Put on this protective gear to prevent contact with microbial growth:

(a) Respirator - Half face canister style respirators (minimum)

(b) Fuel resistant gloves

(c) Saranex coveralls

(d) Neoprene boots.

SUBTASK 28-10-00-020-003

(5) Remove these components for the tank(s) to be cleaned:

NOTE: Make a component removal record.

(a) Sump drain valve (TASK 28-11-06-000-801)

(b) FQIS tank units (TASK 28-41-02-000-801)

(c) Fuel scavenge jet pump (TASK 28-22-12-000-801).

SUBTASK 28-10-00-910-005

(6) Put a protective cover on these fuel system components and attach a REMOVE BEFORE FLIGHT TAG:

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(a) Fuel pump inlets

(b) Scavenge and water ejector pump inlets

(c) By-pass valve inlets

SUBTASK 28-10-00-110-001

(7) Use the applicable manufacturers instructions to clean these components:

(a) Fuel scavenge jet pump

(b) Tank units

H. Pressure Wash the Fuel Tank

SUBTASK 28-10-00-110-002

WARNING

OBEY THESE PRECAUTIONS WHEN YOU CLEAN THE FUEL TANK WITH A HOT-WATER PRESSURE WASHER. HOT WATER CAN BURN YOU AND HIGH TEMPERATURES IN THE TANK CAN CAUSE HEAT-RELATED HEALTH PROBLEMS. USE THE PRESSURE WASHER CORRECTLY TO PREVENT DAMAGE TO THE FUEL TANK SEALS. HOT WATER AND HEAT CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(1) Put on this protective gear to protect against the hot water pressure spray:

(a) Respirator - Full face canister style respirators (minimum)

(b) Heat protective gloves

(c) Water-proof outer gloves

(d) Water-proof pants, coat and boots

(e) Water-proof and heat protective hood

(f) A full face mask.

SUBTASK 28-10-00-160-002

(2) Use the pressure washer to clean the fuel tank:

(a) Start at the outboard end of the tank.

(b) Hold the nozzle at a distance between 6 in. (152 mm) and 10 in. (254 mm) from the tank surface.

(c) Position the nozzle at a 45°arc (1 rad) angle to the tank surface.

(d) Point the nozzle in the direction of the access opening and the drain valve opening.

(e) Continue to clean in the direction of the drain valve opening and the access opening.

(f) Only use enough spray to remove the microbial growth.

(g) Use short bursts, not a continuous flow.

(h) Move the loose microbial growth and any unwanted material to the inboard end of the tank and out of the openings.

(i) Complete the pressure washing of the fuel tank.

SUBTASK 28-10-00-160-003

(3) After you pressure wash the fuel tank, do these steps:

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CAUTION

MAKE SURE THAT YOU REMOVE ALL OF THE WASTE PARTICLES AFTER YOU CLEAN THE FUEL TANK. THE UNWANTED MATERIAL CAN CAUSE A BLOCKAGE OF THE EJECTOR AND SCAVENGE PUMPS. PARTICLES CAN STOP THE OPERATION OF THESE SYSTEMS.

(a) Use an air hose with a nozzle (90 psi maximum) to blow any material from the inlet screen on the water and fuel scavenge pumps.

(b) Use an air hose or a wire to make sure the flow hole areas are free of loosened microbial growth or unwanted material.

(c) For the outboard main tanks, make sure that the drain hole in the midspar web is clear.

SUBTASK 28-10-00-160-004

(4) Repeat these steps to pressure wash the remaining tanks as necessary.

I. Restore the Fuel Tank

SUBTASK 28-10-00-160-005

(1) Remove the water from the fuel tank:

(a) Continue to have a good flow of air until the tank is dry.

(b) Use an air-powered vacuum cleaner to remove the water.

(c) Mop-up any water that remains with a cotton wiper, G00034.

(d) Continue to move air through the fuel tanks until all moisture is removed.

SUBTASK 28-10-00-210-001

(2) Do a check of the fuel tank for damage:

(a) Do a visual check of the fuel tank structure for corrosion.

1) If you find corrosion, then repair the damage (SRM 57-00-00).

(b) Do a visual check for missing or damaged fuel tank sealant.

1) If there is damage, repair the sealant (TASK 28-11-00-300-802).

(c) Do a visual check for missing or loose fuel tank protective finish (topcoat).

1) If there is loose finish, do this task: Apply the Corrosion Resistant Finish (Topcoat) (TASK 28-11-00-300-802).

J. Put the Fuel Tank Back to Its Usual Condition

SUBTASK 28-10-00-080-001

(1) Remove the fuel tank cleaning equipment and material.

SUBTASK 28-10-00-080-002

(2) Remove the protective covers from these fuel system components:

(a) Fuel pump inlets

(b) Fuel scavenge system inlets

(c) Bypass valve inlets

SUBTASK 28-10-00-410-001

(3) Install these components:

(a) Sump drain valve (TASK 28-11-06-400-801)

(b) FQIS tank units (TASK 28-41-02-400-801)

(c) Fuel Scavenge Jet Pumps (TASK 28-22-12-400-801).

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SUBTASK 28-10-00-410-002

(4) Install the support brackets and the fuel tank equipment that you removed.

K. Put the Airplane Back to the Usual Condition

SUBTASK 28-10-00-410-003

(1) Install any panels or tank structure removed for access.

SUBTASK 28-10-00-910-006

(2) Do this task: Fuel Tank Closure, TASK 28-11-00-410-801.

SUBTASK 28-10-00-210-002

(3) Make sure there is no fuel leakage (TASK 28-11-00-790-801).

SUBTASK 28-10-00-650-001

WARNING

DO THE FUEL TRANSFER PROCEDURE TO REMOVE AIR POCKETS. AIR BUBBLES CAN CAUSE THE ENGINE TO STOP DURING FLIGHT.

(4) Do this task: Fuel Transfer to Remove Air Pockets from the Engine Fuel Feed Line Adjacent to the Defueling Valve (TASK 28-26-00-650-802).

SUBTASK 28-10-00-620-040

(5) Do this task: Biocide Treatment of Fuel Tanks - Metered Injection Cart, TASK 28-10-00-600-802.

END OF TASK

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FUEL TANKS - MAINTENANCE PRACTICES

1. General

A. This procedure contains these tasks:

(1) Purging and Fuel Tank Entry Precautions

(2) Purging and Fuel Tank Entry

(3) Fuel Tank Closure.

B. If you make a decision not to do this recommended procedure, you must have an approved alternate procedure. Make sure the conditions during the purging and fuel tank entry operations give sufficient protection to the persons and equipment used in this procedure. It is possible that local fire codes, and standards make it necessary to use more restrictive procedures or more procedures than those given in the subsequent steps.

C. The safety, fire and health limits in this procedure are used by Boeing at the manufacturing sites in the state of Washington. For fuel tank and confined space entry, Boeing is required to have an aircraft confined space entry program. This program is established to control the entry into confined spaces to protect the safety and health of persons who go into fuel tanks and other closed areas. Important requirements of the program include:

(1) Identification and Warning Sign Placement

(2) Observer Communication with Persons inside Confined Spaces

(3) Entry Permit Requirements

(4) Pre-entry Procedures

(5) Entry Procedures

(6) Emergency and Rescue Service

(7) Fuel Tank Closure

(8) Training.

D. It is recommended that a fuel tank entry program which complies with the local, state and national regulations be followed.

TASK 28-11-00-650-801

2. Purging and Fuel Tank Entry Precautions

(Figure 201, Figure 202)

A. General

(1) This procedure contains the precautions you must obey before you purge and enter the fuel tanks for maintenance. This task contains these procedures:

(a) Purging and Fuel Tank Entry - Definitions

(b) Purging and Fuel Tank Entry - Airplane Precautions

(c) Purging and Fuel Tank Entry - Electrical Equipment Precautions

(d) Purging and Fuel Tank Entry - Equipment Precautions

(e) Purging and Fuel Tank Entry - Personnel Precautions

(f) Purging and Fuel Tank Entry - Adverse Weather Conditions Precautions

(2) The next task, Purging and Fuel Tank Entry, contains the steps you must follow to purge and enter a fuel tank.

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B. References

Reference	Title
12-11-01 P/B 301	FUEL TANK - PRESSURE REFUELING
28-26-00 P/B 201	DEFUELING - MAINTENANCE PRACTICES

C. Tools/Equipment

Reference	Description
STD-1081	Flashlight - Explosion Proof
STD-1129	Coveralls - Tyvek/Saranex 23-p (Approved Cotton Substitute), No Pockets
STD-7374	Gloves - Fuel and Solvent Resistant
STD-7380	Respirator - Half-Mask, Air Purifying (with filters/cartridges)

D. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
532	Left Wing Dry Bay
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
632	Right Wing Dry Bay
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074

F. Purging and Fuel Tank Entry - Definitions

SUBTASK 28-11-00-910-073

(1) APPROVED PERSONS:

(a) Persons who are trained and understand the dangers and procedures for fuel tank entry and are responsible to make sure the airplane, equipment and the environment is safe for maintenance operations.

SUBTASK 28-11-00-910-004

(2) APPROVED PERSONS FOR FUEL TANK ENTRY:

(a) Persons who are trained and understand the dangers and procedures for fuel tank entry.

SUBTASK 28-11-00-910-005

(3) CLASS I, DIVISION 1, HAZARDOUS LOCATIONS (or equivalent standard):

(a) Locations where ignitable concentrations of flammable gases or vapors can exist under standard operational conditions.

(b) Locations where ignitable concentrations of flammable gases or vapors may exist frequently because of repair or maintenance operations.

(c) Locations where ignitable concentrations of flammable gases or vapors can exist because of leakage.

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(d) Locations where equipment problems or incorrect operation of equipment or processes can release ignitable concentrations of flammable gases or vapor, and can also cause failure of electrical equipment at the same time.

SUBTASK 28-11-00-910-006

(4) CLASS I, DIVISION 2, HAZARDOUS LOCATIONS (or equivalent standard):

(a) Locations where flammable liquids or gases are handled, processed or used, but where the liquid, vapors, or gases will usually be in closed containers or closed systems. The containers or systems will not allow the release of liquid, gas or vapor in sufficient quantity to produce an ignitable fuel and air mixture unless the container or system fails or is damaged.

SUBTASK 28-11-00-910-007

(5) EXPLOSION-PROOF EQUIPMENT:

(a) Equipment contained in a case that will not be damaged by an internal explosion caused by explosive vapors inside the unit and,

(b) equipment which will not cause explosive vapors around the unit to ignite even when sparks, flashes or an explosion of vapor occurs inside the unit and,

(c) equipment which operates at an external temperature which will not cause explosive vapors around the unit to ignite and,

(d) equipment which has been approved by an independent test laboratory such as Underwriters Laboratories (UL) or Factory Mutual, for use in Class I Division 1 hazardous locations (or an equivalent standard).

SUBTASK 28-11-00-910-071

(6) FIRE-SAFE CONDITION:

(a) A FIRE-SAFE condition occurs when the vapor concentration is less than 10% of the lower explosive limit (LEL).

SUBTASK 28-11-00-910-009

(7) HEALTH-SAFE CONDITION:

(a) An atmosphere where oxygen content is a minimum of 19.5% to a maximum of 23.5% by volume at sea level, and the vapor concentrations are below the permissible exposure limits (PEL) shown in (Table 201).

Table 201/28-11-00-993-842

Fuel	Permissible Exposure Level Total Hydrocarbons TWA *[1] (ppm)	Lower Explosive Level (percent)
Aviation Gasoline	300	1.0
Jet A	160	0.7
Jet A-1	160	0.7
JP-5	160	0.7
JP-8	160	0.7

*[1] TWA - Time Weighted Average

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(b) Because kerosene has a low vapor pressure, the concentrations are usually within the limits needed for a Health-Safe condition. Thus, you usually get very low (safe) values at usual temperatures (less than approximately 70 °F). At tank temperatures of approximately 90 °F, it is possible to get gas concentrations more than the Health-Safe value with kerosene. At tank temperatures of more than 90 °F, it is possible to get gas concentrations more than the Fire-Safe value. It is also possible that a different type of fuel was kept in a tank that usually contains kerosene. If the purging procedure was not done, this causes high concentration values when you use the combustible gas indicator.

WARNING THERE IS NO HEALTH-SAFE LIMIT FOR JP-4/JET-B FUEL WHICH CAN CONTAIN BENZENE. IT IS POSSIBLE THAT BENZENE CAUSES CANCER.

(c) Before you go into a fuel tank that contained JP-4, wear a full-mask respirator with an attached breathing supply.

SUBTASK 28-11-00-910-010

(8) LOWER EXPLOSIVE LIMITS (LEL):

(a) The minimum concentration of flammable vapors in air below which propagation of flame does not occur on contact with a source of ignition.

SUBTASK 28-11-00-910-011

(9) PERMISSIBLE EXPOSURE LEVEL (PEL):

(a) The time weighted average airborne concentrations of substances at which it is believed that nearly all workers may be repeatedly exposed 8 hours a day, 40 hours a week, without adverse health effects.

NOTE: The PEL limits used in this procedure are the PEL limits used by Boeing personnel during fuel tank entry. If the local PEL limits are more restrictive than the ones given in this procedure, use the equivalent local PEL limits.

SUBTASK 28-11-00-910-012

(10) PURGING or PURGED (FOR FUEL TANK ENTRY):

(a) Purging an aircraft fuel tank is defined as the removal of any fuel or fuel vapor that remains after the fuel tanks are sumped. A purged fuel tank contains a nonflammable atmosphere that can be maintained by mechanical ventilation.

SUBTASK 28-11-00-910-013

(11) UNWANTED SOURCES OF IGNITION:

(a) Unwanted sources of ignition include:

1) open flames (matches, cigarette lighters)
2) electrical equipment (lights, motors, sparks from engine exhaust)
3) frictional hot spots
4) electromagnetic energy (radio transmissions or radars)
5) static electricity
6) lightning

G. Purging and Fuel Tank Entry - Airplane Precautions

SUBTASK 28-11-00-910-014

(1) Do the maintenance on the fuel tanks in areas which allow the free movement of air, fire fighting equipment and other emergency equipment.

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SUBTASK 28-11-00-910-015

(2) A rope barrier must be placed around the airplane, to identify the Class I, Division 1 hazardous locations. See (Figure 201) for the distance requirements. The rope barrier must include signs or placards which state "DANGER - OPEN FUEL TANKS.

SUBTASK 28-11-00-910-016

(3) The airplane must be correctly grounded to an approved ground before you defuel the airplane or open any fuel tanks.

SUBTASK 28-11-00-910-017

WARNING DO NOT USE AIRPLANE ELECTRICAL POWER WHEN FUEL TANK ACCESS DOORS ARE OPEN. SPARKS FROM ELECTRICAL EQUIPMENT CAN CAUSE IGNITION OF FUEL VAPOR AND CAUSE A FIRE OR EXPLOSION. A FIRE OR EXPLOSION CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(4) Before the fuel tank access doors are opened, all of the electrical power to and from the airplane must be removed. Placards which state that power should not be restored on the airplane until the fuel tank(s) are closed should be attached to applicable locations.

SUBTASK 28-11-00-910-018

(5) The main, and APU batteries must be disconnected. Placards which state not to connect the batteries unit the fuel tanks are closed should be attached to all disconnected battery locations.

SUBTASK 28-11-00-910-019

(6) All safety, support and maintenance equipment must be in place before you open the fuel tank access doors. Movement of equipment can cause sparks which can cause fuel vapors to ignite.

SUBTASK 28-11-00-910-020

(7) No painting operations are allowed on airplanes with open fuel tanks.

H. Purging and Fuel Tank Entry - Electrical Equipment Precautions

SUBTASK 28-11-00-910-072

WARNING FOLLOW THE SUBSEQUENT RADIO AND RADAR LIMITS. FAILURE TO FOLLOW THE SUBSEQUENT RADIO AND RADAR LIMITS CAN CAUSE A FIRE OR EXPLOSION. A FIRE OR EXPLOSION CAN CAUSE SERIOUS INJURY OR DEATH TO PERSONS AND CAN CAUSE DAMAGE TO EQUIPMENT.

(1) No radio or radar equipment should operate nearer to an open fuel tank than the distances specified in (Table 202).

Table 202/28-11-00-993-843

POWER (EIRP *[1]) OF EQUIPMENT TRANSMITTING RADAR OR RADIO *[2]	SEPARATION DISTANCE (FT,M)	
	MAINTENANCE WITH OPEN FUEL TANKS PURGED	MAINTENANCE WITH OPEN FUEL TANKS NOT PURGED (or during purging)
More than 100 watts	200 FT (61 M)	200 FT (61 M)
25 to 100 watts	50 FT (15 M)	50 FT (15 M)
Less than 25 watts *[3]	10 FT (3 M)	50 FT (15 M)

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Table 202/28-11-00-993-843 (Continued)

POWER (EIRP *[1]) OF EQUIPMENT TRANSMITTING RADAR OR RADIO *[2]	SEPARATION DISTANCE (FT,M)	
	MAINTENANCE WITH OPEN FUEL TANKS PURGED	MAINTENANCE WITH OPEN FUEL TANKS NOT PURGED (or during purging)
Radiating ground approach control or pattern surveillance radar	300 FT (91 M)	300 FT (91 M)
Open flame, heat sources, lighted smoking material, and any other potential ignition sources	50 FT (15 M)	50 FT (15 M)

*[1] EIRP is Effective Isotropic Radiated Power in watts.

*[2] This separation distance does not apply to airplane installed radio transmitters. Any limits on operations for the airplane VHF, SATCOM, HF, weather radar, etc., are listed in the airplane operations manuals.

*[3] This category includes mobile phones, pagers, two-way radios, etc. There are low power (explosion proof) radios that are approved for use in Class I division 1 hazardous locations that can be used safely in the vicinity of open, not purged, fuel cells and other areas containing fuel vapors.

SUBTASK 28-11-00-910-022

(2) Fuel in the beam of operational high-powered radar which can produce a peak power density that exceeds 5 watts per square centimeter is hazardous. Electromagnetic energy of this intensity can ignite fuel vapors and cause a fire.

SUBTASK 28-11-00-910-023

WARNING

DURING OPEN FUEL TANK OPERATIONS, THE ENTIRE AREA AROUND THE AIRPLANE AND ANY ADJACENT AREAS THAT COULD COLLECT FUEL VAPORS ARE CLASSIFIED AS CLASS I DIVISION 1 HAZARDOUS LOCATIONS. THE HAZARDOUS LOCATION CLASSIFICATION APPLIES TO AIRPLANES BEFORE AND AFTER A FUEL TANK IS PURGED.

THE CLASS I DIVISION 1 HAZARDOUS LOCATION EXTENDS FROM THE GROUND UP TO 18 INCHES ABOVE THE GROUND. ONLY USE ELECTRICAL EQUIPMENT WHICH IS APPROVED FOR THE APPLICABLE HAZARDOUS LOCATION.

(3) Electrical equipment which is energized or operated within 50 ft (15 m) horizontally and 18 in. (457 mm) or less above the ground of an open fuel tank, must be rated explosion-proof for Class I, Division 1 hazardous locations. This includes energized plugs and receptacles. For radio and radar equipment (transmitting equipment) see Table 202 for separation distance requirements.

SUBTASK 28-11-00-910-024

(4) Shows the different classification of hazardous locations around airplanes with open fuel tanks. (Figure 201)

SUBTASK 28-11-00-910-025

(5) Only use an approved explosion proof flashlight, STD-1081, that operate correctly in the fuel tanks.

NOTE: The use of explosion-proof lights in or near an open fuel tank is allowed only by approved persons. The air in the fuel tank must be 10 percent or less of the lower explosive limit (LEL).

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SUBTASK 28-11-00-910-026

(6) Only use explosion-proof flood extension lights and power cords which are approved to supply external light.

SUBTASK 28-11-00-910-027

(7) Do not connect or disconnect electrical equipment from energized outlets (within 100 feet of an open fuel tank) unless the equipment is fitted with explosion-proof plugs.

SUBTASK 28-11-00-910-028

(8) Do not use electrical test equipment which can cause sparks in a fuel tank.

I. Purging and Fuel Tank Entry - Equipment Precautions

SUBTASK 28-11-00-910-029

(1) All metal work platforms or stands used for entry into the fuel tanks or located within a 50-foot radius of an open fuel tank (before and after the fuel tank purging) must be bonded to the airplane and grounded to an approved earth ground.

SUBTASK 28-11-00-910-030

(2) Before you use ventilation equipment make sure the blower or venturi is connected to the airplane ground. The ventilation blower or the venturi must be explosion-proof.

SUBTASK 28-11-00-910-031

(3) Air ducts must be bonded to form a continuous electrical conductor, and grounded in at least one place to a static electrical ground.

SUBTASK 28-11-00-910-032

(4) If you use the ventilation equipment to exhaust fuel vapors from the tank, static build-up on or in the air ducts can reach a level where a spark can ignite the vapors and an explosion can occur. It is strongly recommended that the air ducts be coated inside and out with a conductive coating. Each section of the air duct must be correctly bonded to each other. Air ducts made from vinyl fabric are not recommended because vinyl is an insulator of static charges. If the air duct uses a metal helical wire to create a non-collapsible duct, make sure the wire is permanently attached to a metal or conductive plastic connection on each end of the duct section.

SUBTASK 28-11-00-910-033

(5) Equipment used to ventilate the fuel tanks or provide warm or cool air must not be turned off with the air duct in the fuel tank. The fuel vapor from the fuel tank can enter the air duct and cause an explosion at the motor. Make sure the blower is on before you put the air duct in the fuel tank. Make sure the blower remains on until the air duct is removed from the fuel tank.

SUBTASK 28-11-00-910-034

(6) When you remove an air duct from the fuel tank or disconnect the air duct at the blower, turn the duct 180 degrees away from the purging area. This will stop the flow of fuel vapor into the air duct line.

SUBTASK 28-11-00-910-035

(7) During fuel tank maintenance, make sure there is continuous mechanical ventilation. The fresh air flow from the ventilation equipment must maintain the oxygen levels between 19.5% and 23.5% by volume and the fuel vapor levels below 10% LEL (fire safe limit).

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SUBTASK 28-11-00-910-036

(8) Use a combustible gas indicator or an air monitor with Photoionization Detector (PID) to monitor the environment inside the fuel tank. The combustible gas indicator or air monitor with PID must be designed for Class I, Division 1 hazardous locations and calibrated for the correct type of jet fuel. The combustible gas indicator or air monitor with PID must be securely attached to a ladder or stand at the fuel tank entry location. As an alternate procedure, you can take an additional combustible gas indicator or air monitor with PID into the fuel tank to monitor the environment where you will do the maintenance.

SUBTASK 28-11-00-910-037

(9) Obey these precautions for equipment used to do maintenance in the fuel tanks:

(a) Only use approved non-static plastic containers with rounded corners to hold tools and supplies.

(b) Keep all sharp edged tools in the container at all times when not in use. Sharp edged tools can cause damage to equipment and sealant.

(c) Only use a cotton wiper, G00034, for wiping materials in open fuel tanks. When you wipe up fuel in the fuel tank, use a clean cotton wiper, G00034.

(d) Solvents, sealants, or other materials used in the fuel tank can be a health and fire hazard. Use the correct protective equipment for the solvent or material that is used. Protective equipment includes: respirators, eye protection, protective clothes, gloves etc.

(e) Keep the amount of solvents that you use to a minimum. Only bring enough solvent in the tank to complete the maintenance. Apply the solvent to a clean cotton wiper, G00034, not the airplane structure or sealant. After you finish with the cotton wiper, G00034, put the cotton wiper, G00034, in a polyethylene bag or remove the cotton wiper, G00034, from the airplane. This will keep the solvent vapor to a minimum.

(f) Powered tools must be air driven.

WARNING

ONLY USE SHOP AIR OR BOTTLED AIR AS THE SOURCE OF GAS TO POWER AIR DRIVEN EQUIPMENT. GASES OTHER THAN SHOP OR BOTTLED AIR CAN REMOVE OXYGEN FROM A CLOSED AREA. IF YOU GO INTO A CLOSED AREA WITHOUT ENOUGH OXYGEN , YOU CAN BECOME UNCONSCIOUS OR IT CAN KILL YOU.

(g) Only use shop air or bottled air as a gas source for air-driven tools. Do not use nitrogen, oxygen, carbon dioxide (CO_2) or any other non-air source of gas.

J. Purging and Fuel Tank Entry - Personnel Precautions

SUBTASK 28-11-00-910-038

(1) Make sure the persons who will go into fuel tanks are approved persons for fuel tank entry. (Figure 202)

SUBTASK 28-11-00-910-039

(2) Make sure observers who will watch persons in the fuel tank(s) are approved as fuel tank entry observers.

SUBTASK 28-11-00-910-040

(3) The fuel vapors in and from the fuel tank are explosive and hazardous to your health. The fuel tanks must be in a fire-safe condition when an initial fuel tank entry is made. You must wear an approved respirator with a breathing-air supply when you go into a fuel tank that is in a fire-safe condition. It is necessary to have a good flow of air through the fuel tank to get a fire-safe condition. The air must flow continuously during the fuel tank entry procedure.

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SUBTASK 28-11-00-910-041

(4) The fuel tank must be in a health-safe condition before you can go into the fuel tank without a breathing-air supply. When the fuel tank is in a health-safe condition, at a minimum, it is recommended that a half-mask respirator with an organic vapor filter be used. It is necessary to have a good flow of air through the fuel tank to get a health-safe condition. The air must flow continuously during the fuel tank entry procedure.

SUBTASK 28-11-00-910-095

WARNING

DO NOT BREATHE THE AIR FROM THE FUEL TANK UNTIL YOU MAKE IT SAFE. THE NITROGEN GENERATION SYSTEM DECREASES THE OXYGEN IN THE AIR. IF YOU BREATHE AIR THAT DOES NOT HAVE SUFFICIENT OXYGEN, DANGEROUS HEALTH CONDITIONS CAN QUICKLY OCCUR. DANGEROUS HEALTH CONDITIONS INCLUDE NAUSEA, UNCONSCIOUSNESS, AND CONVULSIONS. IF THE OXYGEN LEVEL OF THE AIR THAT YOU BREATHE IS VERY LOW, IT CAN KILL YOU.

(5) The nitrogen generation system decreases the oxygen content of the center fuel tank. Obey these precautions before you breathe the air inside a fuel tank:

(a) The nitrogen generation system uses nitrogen-enriched air (NEA) to decrease the flammability of the center wing tank. NEA is a hazard in a confined space. NEA increases the nitrogen content and decreases the oxygen. If you breathe air without enough oxygen, it can have serious and immediate effects.

(b) The low oxygen content air will remain in the fuel tank even when the nitrogen generation system is not active. The nitrogen-enriched air (NEA) is designed to flow into the center wing tank only. The flow path of the NEA is from vent channels in the center wing tank to the surge tanks. From the surge tanks, the NEA is vented overboard. An oxygen level, below heath-safe limits, can exist in the fuel tank. You must always fully ventilate the fuel tank before you do a fuel tank entry. Mechanical ventilation will remove the NEA from the fuel tank and supply air with an oxygen content within health-safe limits.

(c) A person that breathes air with a low oxygen content cannot sense that the oxygen level is too low. You must use an oxygen sensor to detect a hazardous low oxygen environment. Do not go into a fuel tank if you hear the aural alarm for the oxygen sensor.

(d) Fully ventilate the applicable fuel tank before you do a fuel tank entry.

(e) Before you go into a fuel tank, open and collar the nitrogen generation system circuit breakers. You must also install the manual lock bolt into the NGS shutoff valve in the closed position.

(f) Continuously monitor the oxygen sensor (aural alarm and % oxygen) on the combustible gas indicator or air monitor with Photoionization Detector (PID). Make sure the oxygen level in the fuel tank remains between 19.5% and 23.5% by volume. Make sure there is an oxygen sensor at the fuel tank entry location for the observer, and one oxygen sensor at the location of the person(s) inside the fuel tank. Get out of the fuel tank immediately if the ventilation equipment stops or you hear the oxygen sensor alarm.

(g) An organic vapor filter respirator is helpful for fuel vapor, but will not help you breathe in a low oxygen environment.

(h) If you are the observer and the person in the tank does not respond, do not enter the tank before additional help is available. Make sure that medical help is alerted. Do not try to rescue a person in the fuel tank without a breathing-air supply respirator and a lifeline.

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SUBTASK 28-11-00-910-042

(6) Hydrocarbon fuels that touch the skin can remove protective oils. Without protective oils, the skin can become dry, chapped, cracked, or possibly become infected. If a person breathes too much fuel vapor, the person can become dizzy, get a headache or lose his or her coordination. Jet fuel is composed of many different kinds of hydrocarbon molecules. Exposure to some of these molecules for a long time is known to cause cancer.

SUBTASK 28-11-00-910-043

(7) Vapors from fuel or other materials (solvents etc.) used for fuel tank maintenance can replace oxygen from a confined area such as a fuel tank or dry bay. If a person goes into a confined area that contains fuel vapor (or other vapors) without an air supply, the person may not get enough oxygen. This may cause unconsciousness or death. Make sure the environment is continuously monitored with a approved combustible gas indicator.

SUBTASK 28-11-00-910-044

(8) No one is allowed to go into or remain in a fuel tank if:

(a) the flammable vapor concentration is more than 10% of the lower explosive limit

(b) the oxygen content of the fuel tank is below 19.5% or above 23.5%

(c) the air ventilation system fails

(d) a strong fuel odor is noticed

(e) a person feels any physical problems, such as trouble breathing, dizziness, irritation, confusion, light-headedness, fullness in the head, ringing sensation on the ears, nausea, headache, difficulty in breathing, sensation of apparent suffocation, immobility, unusual behavior, failure to respond to communication, or other signs of illness.

(f) there is an observed or reported hazard which may reduce the level of safety.

SUBTASK 28-11-00-910-045

(9) Persons who work in or near an open fuel tank must not:

(a) Slide metal objects, such as tool boxes, ladders, etc.

(b) Carry matches or pocket warmers.

(c) Wear shoes with metal clips or exposed nails.

(d) Wear or use battery-operated devices such as hearing aids, electrical pacemakers or watches, pocket radios, cellular phones or paging equipment unless it is explosion-proof and allowed by approved persons.

SUBTASK 28-11-00-910-046

(10) Persons who work in an open fuel tank must wear approved fuel tank protective clothing. Protective clothing includes:

(a) Cotton coveralls with non-sparking zippers or buttons. Do not wear wool, silk, nylon or other synthetic clothing.

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WARNING

MAKE SURE THE TEMPERATURE IN THE FUEL TANK DOES NOT GET TOO HOT. IF THE FUEL TANK TEMPERATURE GETS TOO HOT, A PERSON IN THE FUEL TANK CAN HAVE HEAT-RELATED DISORDERS. IF A PERSON BECOMES TOO HOT, GET THE PERSON OUT OF THE FUEL TANK. FIND OUT IF MEDICAL ASSISTANCE IS NECESSARY. COVERALLS THAT ARE COATED WITH SARANEX 23P WILL KEEP BODY HEAT IN. CLOSELY MONITOR A PERSON IN SARANEX 23P COVERALLS FOR SIGNS OF HEAT-RELATED DISORDERS. IF A PERSON BECOMES TOO HOT, GET THE PERSON OUT OF THE FUEL TANK. FIND OUT IF MEDICAL ASSISTANCE IS NECESSARY.

(b) Saranex coveralls are also approved for use in fuel tanks.

(c) Clean cotton boot socks or fuel cell boots.

NOTE: It is recommended that boot socks be worn over fuel cell boots when you stand in a fuel tank. This will reduce the chance that you will slip and fall down.

(d) Clean cotton head cover (doctor-type hats) with tie strings or a lint free shower-type cap with an attached elastic headband.

(e) Cotton or rubber gloves.

SUBTASK 28-11-00-100-006

(11) If a fuel tank entry is necessary before two flights after a biocide treatment, do one of these:

(a) Flush the fuel tank with untreated fuel a minimum of two times (PAGEBLOCK 12-11-01/301, PAGEBLOCK 28-26-00/201).

NOTE: After a biocide treatment, the concentration of biocide decreases to a lower level after the fuel tank is refueled two times.

(b) Or, move the treated fuel to a different fuel tank or defuel the applicable fuel tank (PAGEBLOCK 28-26-00/201).

WARNING

DO NOT GET THIS MATERIAL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THIS MATERIAL. PUT ON A RESPIRATOR, EYE PROTECTION (GOGGLES, OR OTHER APPROVED PROTECTION), AND GLOVES BEFORE YOU USE THIS MATERIAL. MAKE SURE THAT THERE IS SUFFICIENT AIRFLOW. KEEP THIS MATERIAL AWAY FROM SPARKS, FLAME, AND HEAT. THIS MATERIAL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

1) Before fuel tank entry, put on this specific equipment: a full face half-mask respirator, STD-7380, coverall (approved cotton substitute), STD-1129, and gloves, STD-7374.

NOTE: The biocide manufacturers Material Safety Data Sheet (MSDS) has information regarding the handling of the product. However, the MSDS is intended for the product before it is diluted in fuel. Once diluted, the concentration is greatly reduced.

SUBTASK 28-11-00-910-047

(12) Persons who work in or near an open fuel tank must not remove or change clothes near an open fuel tank. You can create sufficient static electricity in the clothes to cause fuel vapor to ignite.

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SUBTASK 28-11-00-910-048

(13) Persons who work in fuel tanks must wear the correct respiratory protection for the fuel tank conditions.

(a) Persons that use respiratory protection must be trained and know the proper use and limitations of respiratory protection.

(b) An approved respirator with an attached breathing-air supply is necessary for each person who goes into a fuel tank that is in a fire-safe condition.

(c) An approved half-mask respirator with a organic vapor filter, at a minimum, is recommended for each person who goes into a fuel tank that is in a health-safe condition.

(d) Airline Hoods (or equivalent) should be worn by persons if the respirator does not fit correctly due to facial hair or other facial configurations.

SUBTASK 28-11-00-910-049

(14) At each fuel tank entry location there must be an observer who is outside of the fuel tank. The observer's responsibility is to make sure that person(s) in the fuel tank are safe. The observer must remain outside of the fuel tank in visual contact with the access opening. The observer must be able to communicate with the person(s) inside the fuel tank at all times.

(a) There are two ways the observer and the person(s) in the fuel tank can communicate:

1) A confined space communication system designed for aircraft fuel tank use.

2) The observer and the person who will go into the tank can agree on a communication plan such as tugs on the safety rope at a set time interval.

SUBTASK 28-11-00-910-050

(15) The observer must also keep a report that shows who is in the fuel tank and when that person comes out. A sign attached to the ladder or support equipment which states, "CAUTION - PERSONNEL INSIDE - MOVE NO EQUIPMENT", must be placed at the location of a fuel tank entry. When the personnel in the tank come out, the observer should remove the sign or place it where it does not show.

SUBTASK 28-11-00-910-051

(16) Many local, state and national regulatory agencies require a confined space entry permit to be signed and approved before a person goes into a fuel tank. A pre-entry checklist is often required by the confined space entry permit. It is recommended that a pre-entry checklist be used before you go into a fuel tank. (Figure 206) is an example of a pre-entry checklist used at Boeing facilities.

K. Purging and Fuel Tank Entry - Adverse Weather Conditions

SUBTASK 28-11-00-910-052

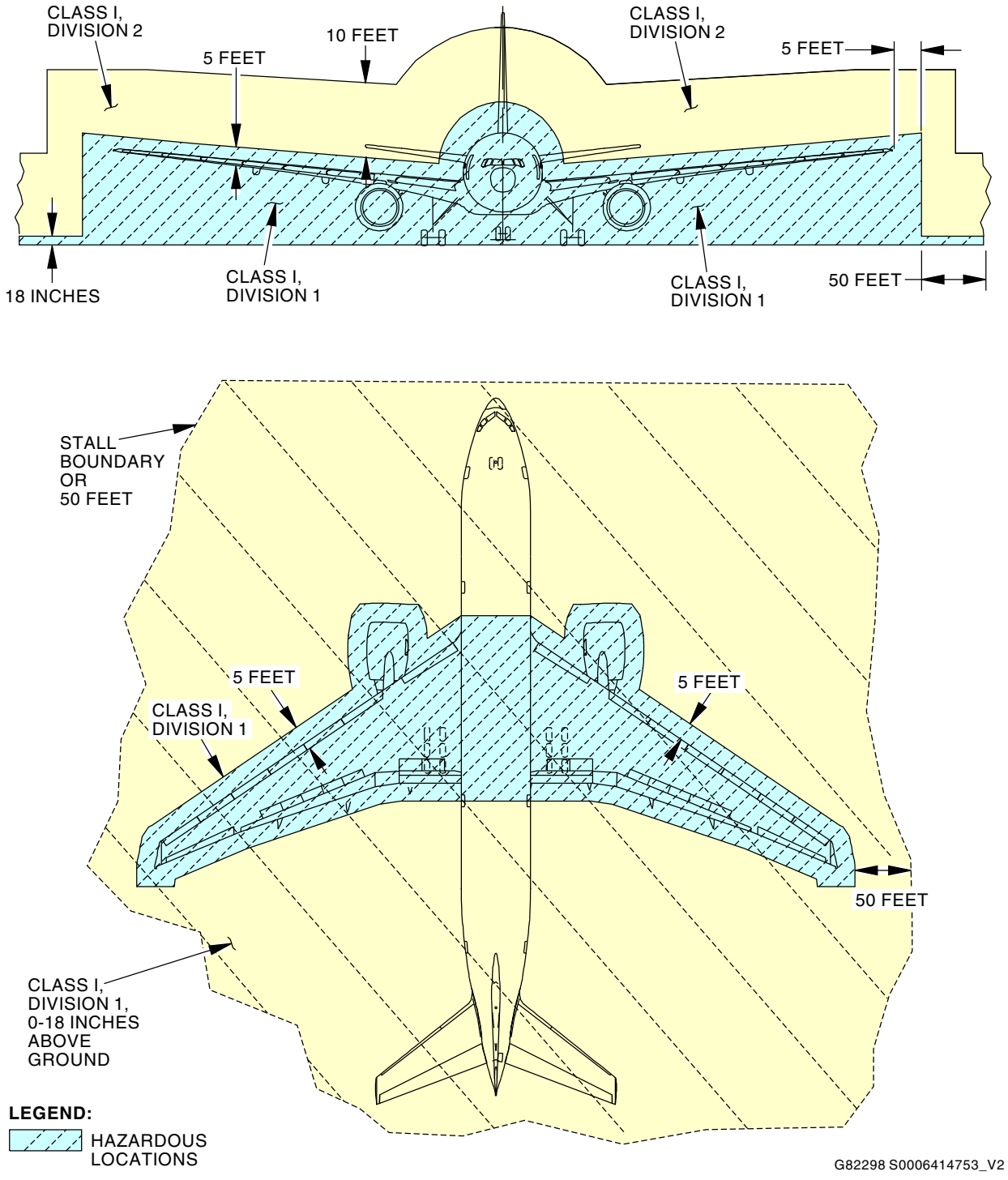
(1) When thunderstorms or lightning are within a 10 mile radius of the immediate area, open fuel tank maintenance procedures should stop. Persons inside of the fuel tanks should get out. Air ducts inside the fuel tanks should be removed and the power for all support equipment should be switched off. The fuel tank access openings must be closed.

SUBTASK 28-11-00-910-053

(2) Strong wind conditions can cause a build-up of static electricity. Large charges of static electricity can develop on support equipment while parked as a result of the movement of dust particles and air currents during strong wind conditions. Strong wind conditions can also cause the unwanted movement of items or equipment which can hit the airplane or injure persons. Wind gusts can damage the airplane structure. Fueling, defueling or open fuel tank maintenance procedures should stop if strong wind conditions are present.

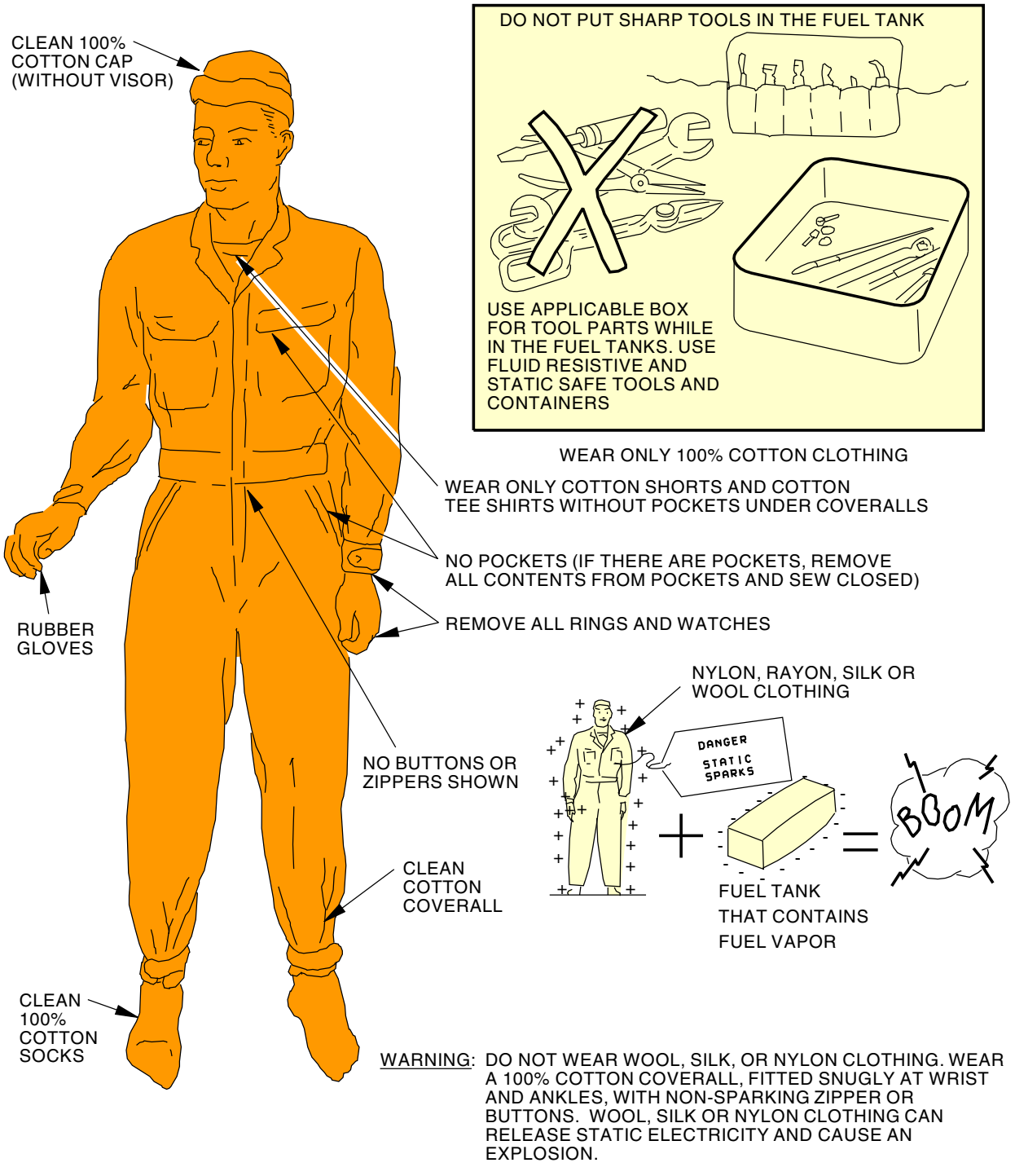
END OF TASK

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Hazardous Locations - Open Fuel Tank(s)
Figure 201/28-11-00-990-808

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Fuel Tank Entry Precautions
Figure 202/28-11-00-990-809

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TASK 28-11-00-010-801

3. Purging and Fuel Tank Entry

A. General

(1) This task has these procedures:

(a) Prepare the Airplane for Fuel Tank Purging

(b) Prepare the Equipment for Fuel Tank Purging

(c) Fuel Tank Purging

(d) Fuel Tank Entry

(2) Make sure you read and obey the precautions in this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

(3) Make sure that when you remove the wing dry bay access door (TASK 28-11-05-000-801), refer to this procedure, but follow the steps applicable only to the wing dry bay.

NOTE: Because fuel and fuel vapor can leak into the wing dry bay, the wing dry bay is considered a fuel tank. Follow the steps applicable to the wing dry bay only. Unless there is fuel leakage into the dry bay, it is not necessary to defuel and sump the main or center tanks.

B. References

Reference	Title
12-11-02-650-801	Fuel Tank Sump Drain Valve - Tank Entry (P/B 301)
20-41-00-760-802	Measurement of Airplane Electrical Resistance to Ground (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
24-31-01-020-801	Disconnect Main Battery Power (P/B 201)
24-31-05-020-801	Disconnect APU Battery Power (P/B 201)
27-51-00-040-801	Trailing Edge Flap Deactivation (P/B 201)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-11-03-000-801	Surge Tank Access Door - Removal (P/B 401)
28-11-04-000-801	Center Purge Door Removal (P/B 401)
28-11-05-000-801	Wing Dry Bay Access Door - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
45-10-00-970-801	How to Send a Report to the Printer (P/B 201)
45-10-00-970-802	How to Send a Report to Removable Media (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

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Reference	Description
COM-1768	Alarm - Combustible Gas and Oxygen Opt Part #: 1314 Supplier: 51906 Opt Part #: 1314 SMPN Supplier: 51906 Opt Part #: 476149 Supplier: 8F723 Opt Part #: 711409 Supplier: 8F723 Opt Part #: 72-0026-49 Supplier: 0HTS3 Opt Part #: 72-6201-10 Supplier: 51906 Opt Part #: 72-6201-11 Supplier: 51906
COM-7844	Equipment - Communication, Confined Space Part #: 1120-01-050 Supplier: 0V3X2 Part #: 1120-01-055 Supplier: 0V3X2
COM-11427	Equipment - Respiratory Protection Part #: CAB50 Supplier: 8K196 Part #: MAV-5C Supplier: 58501 Part #: SYSTEM #5 Supplier: 58501 Opt Part #: NF-1100A Supplier: 58501 Opt Part #: TRAVELPANEL 50 Supplier: 62170
COM-14039	Gas Detector with Photoionization Detector (PID) Part #: 10165446 Supplier: 55799 Part #: A-ALT5XDLK021EC010 Supplier: 55799 Part #: MX6-K103R211 Supplier: 65147 Part #: MX6KIT-K103R211 Supplier: 65147 Opt Part #: MX6-K003R211 Supplier: 65147
SPL-1778	Ventilation Equipment, Fuel Tank Part #: A28003-91 Supplier: 81205 Part #: CAN-50 Supplier: 58501 Part #: MAV-1C Supplier: 58501 Part #: SYSTEM #2 Supplier: 58501 Opt Part #: A28003-89 Supplier: 81205 Opt Part #: BOE-501 Supplier: 58501 Opt Part #: MAC-1 Supplier: 58501
STD-1081	Flashlight - Explosion Proof
STD-1119	Blower - Air, Explosion Proof, 90-100 Cubic Feet per Minute, Includes sufficient hose to reach all areas of Fuel Tanks
STD-1121	Compressor - Air, Portable, Explosion Proof
STD-1122	Thermometer - Alcohol/Mercury (or equivalent meter meets task requirements)
STD-1123	Source - Breathing Air, 125 PSIG Max Output
STD-1124	Container - Non-static, with Rounded Edges (used to hold tools and rags)
STD-1128	Coveralls - Cotton, No Pockets
STD-1129	Coveralls - Tyvek/Saranex 23-p (Approved Cotton Substitute), No Pockets
STD-7377	Boots - Neoprene
STD-7380	Respirator - Half-Mask, Air Purifying (with filters/cartridges)
STD-7386	Hose - Air Supply
STD-11392	Fire Extinguisher - 150lb Portable, Carbon Dioxide, Dry Chemical, or Halon

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D. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
500	Left Wing
600	Right Wing

F. Access Panels

Number	Name/Location
133AZ	Baffle Door
133BZ	Baffle Door
133CZ	Baffle Door
195BL	ECS High Pressure Connection Door

G. Prepare the Airplane for Fuel Tank Purging

SUBTASK 28-11-00-940-027

WARNING

OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. IF YOU IGNORE THE PRECAUTIONS, THE CONDITIONS CAN KILL PERSONNEL, CAUSE INJURIES, AND CAUSE DAMAGE TO EQUIPMENT.

(1) Read and obey the precautions in this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-11-00-650-018

(2) To do the pressure defueling, do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-11-00-650-019

(3) To drain the fuel tank sumps, do this task: Fuel Tank Sump Drain Valve - Tank Entry, TASK 12-11-02-650-801.

SUBTASK 28-11-00-940-028

(4) Make sure the airplane is correctly grounded to an approved and identified ground (TASK 20-41-00-760-802).

SUBTASK 28-11-00-480-013

WARNING

DO THE DEACTIVATION PROCEDURE FOR THE TRAILING EDGE FLAP BEFORE YOU DO WORK ON THE FLAP SYSTEM. THE FLAPS MOVE QUICKLY. THEY CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

(5) Do the deactivation procedure for the trailing edge flaps (TASK 27-51-00-040-801).

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SUBTASK 28-11-00-480-014

WARNING DO THE DEACTIVATION PROCEDURE FOR THE LEADING EDGE SLATS. THE SLATS RETRACT QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT.

(6) Do the deactivation procedure of the leading edge slats (TASK 27-81-00-040-801).

SUBTASK 28-11-00-480-015

WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR BEFORE YOU MOVE THE CONTROL LEVER. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(7) If the downlock pins are not installed in the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.

SUBTASK 28-11-00-480-016

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(8) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-11-00-940-029

(9) Put ropes around the airplane to identify the hazardous location areas (Figure 201), and attach these signs with words you can see clearly written on both sides:

(a) DANGER - OPEN FUEL TANKS - NO SMOKING

(b) AUTHORIZED PERSONNEL ONLY

SUBTASK 28-11-00-860-007

(10) Make sure the fuel pump switch lights on the overhead panel, P5, are in the off position, and attach DO-NOT-OPERATE tags.

SUBTASK 28-11-00-860-008

(11) Open these circuit breakers and install safety tags:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
B	10	C47401	NGS RAM AIR ACTUATOR
C	18	C28302	R FWD FUEL BOOST PUMP L AC SECT 2
E	2	C28303	L AFT FUEL BOOST PUMP
E	5	C28307	L FWD FUEL BOOST PUMP
H	10	C47301	NGS FAN
L	9	C47601	NGS CONTROL
L	10	C47602	NGS 28V DC POWER
L	21	C28647	CTR L OVRD FUEL PUMP CTRL

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(Continued)

Left Power Management Panel, P110

Row	Col	Number	Name
L	23	C28629	FUEL XFEED VLV FWD
L	26	C28607	L AFT FUEL BOOST PUMP CTRL
L	27	C28606	R FWD FUEL BOOST PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
E	27	C28300	R AFT FUEL BOOST PUMP
F	27	C28306	R FWD FUEL BOOST PUMP R XFR
K	11	C28609	R AFT FUEL BOOST PUMP CTRL
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

Standby Power Management Panel, P310

Row	Col	Number	Name
B	2	C28604	L FWD FUEL BOOST PUMP CTRL
G	9	C28612	FUEL XFEED VLV AFT

SUBTASK 28-11-00-860-009

(12) Open the applicable circuit breakers for the system on which you will do maintenance.

SUBTASK 28-11-00-860-010

(13) Do the steps that follow if the fuel tank is defueled:

(a) To print a maintenance message from FAULT HISTORY, do this task: How to Send a Report to the Printer, TASK 45-10-00-970-801.

NOTE: When the main battery is disconnected and external power is removed, AIMS will lose the FAULT HISTORY data.

(b) To put a maintenance message from FAULT HISTORY on a disk, do this task: How to Send a Report to Removable Media, TASK 45-10-00-970-802.

NOTE: When the main battery is disconnected and external power is removed, AIMS will lose the FAULT HISTORY data.

(c) Open the applicable circuit breakers for any system(s) that show a problem with wiring or electrical faults.

SUBTASK 28-11-00-860-011

(14) Remove the electrical power from the airplane before you remove the fuel tank access doors (TASK 24-22-00-860-806).

SUBTASK 28-11-00-940-030

WARNING DO NOT USE AIRPLANE ELECTRICAL POWER WHEN FUEL TANK ACCESS DOORS ARE OPEN. SPARKS FROM ELECTRICAL EQUIPMENT CAN CAUSE IGNITION OF FUEL VAPOR AND CAUSE A FIRE OR EXPLOSION. A FIRE OR EXPLOSION CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(15) Do not supply electrical power again until you have completed this task: Fuel Tank Closure, TASK 28-11-00-410-801.

SUBTASK 28-11-00-860-012

(16) Disconnect these airplane batteries:

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(a) Main Battery (TASK 24-31-01-020-801)

(b) APU Battery (TASK 24-31-05-020-801)

SUBTASK 28-11-00-940-031

(17) Attach this sign to each of the battery locations:

(a) OPEN FUEL TANKS - DO NOT CONNECT

SUBTASK 28-11-00-940-032

(18) Attach this sign to the external power receptacle:

(a) OPEN FUEL TANKS - DO NOT PUT POWER ON

SUBTASK 28-11-00-040-001

(19) Manually close and lock the Nitrogen Generation System (NGS) shutoff valve:

(a) Open this access door:

Number	Name/Location
195BL	ECS High Pressure Connection Door

(b) Go to the location of the NGS shutoff valve (Figure 207).

(c) Remove the manual lock bolt from the servo housing (Figure 207, View C).

(d) Turn the manual lock arm to the closed position (Figure 207, View C).

1) Make sure the hole on the manual lock arm aligns with the threaded boss.

(e) Install the manual lock bolt on the threaded boss to lock the NGS shutoff valve in the closed position.

H. Prepare the Equipment for Fuel Tank Purging

SUBTASK 28-11-00-910-067

WARNING OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. IF YOU IGNORE THE PRECAUTIONS, THE CONDITIONS CAN KILL PERSONNEL, CAUSE INJURIES, AND CAUSE DAMAGE TO EQUIPMENT.

(1) Read and obey the precautions in this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-11-00-940-048

(2) You may need one or more of these items to do work in the fuel tank:

(a) explosion proof flashlight, STD-1081

(b) explosion proof flashlight, STD-1081

(c) non-static container, STD-1124

(d) no pockets cotton coveralls, STD-1128

(e) coverall (approved cotton substitute), STD-1129

(f) thermometer, STD-1122

SUBTASK 28-11-00-940-033

(3) Make sure one of these fire extinguishers, STD-11392, is available:

(a) one - 150 pound dry chemical wheeled extinguisher

(b) one - 150 pound CO2 wheeled extinguisher

(c) one - 150 pound Halon wheeled extinguisher

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SUBTASK 28-11-00-940-034

(4) Make sure the electrical equipment is approved and is appropriate for the hazardous location as shown in (Figure 201).

SUBTASK 28-11-00-860-013

(5) Make sure all radio or radar equipment is off and locked out if it is closer than the minimum separation distance permitted in Table 202.

SUBTASK 28-11-00-940-035

(6) Do these steps to prepare metal support equipment such as work platforms/stands, ladders etc:

NOTE: These steps apply to all metal support equipment within a 50 ft (15 m) radius of an open fuel tank.

(a) All support equipment must be in place before you begin the fuel purging procedure.

(b) Bond the support equipment at an approved airplane bonding location.

(c) Ground the support equipment to the same earth ground as the airplane.

ARO ALL; AIRPLANES WITH VENTURI TYPE VENTILATION EQUIPMENT

SUBTASK 28-11-00-480-017

(7) Do these steps to prepare the ventilation equipment, SPL-1778, for purging:

(a) Assemble these ventilation equipment, SPL-1778, components (Figure 203).

1) tank adapter assembly (-34)

2) air mover assembly (-94)

3) air supply hose, STD-7386

(b) Make sure each flexible air duct section is attached correctly and that each section is bonded correctly.

WARNING MAKE SURE THAT THE AIR MOVER ASSEMBLY IS AWAY FROM THE AIRPLANE. POINT THE EXHAUST AIR FROM THE EXHAUST HORN OF THE AIR MOVER AWAY FROM THE AIRPLANE STRUCTURE. EXHAUST AIR FLOW ON THE AIRPLANE STRUCTURE CAUSES STATIC ELECTRICITY. STATIC ELECTRICITY CAN CAUSE THE IGNITION OF THE FUEL FUMES AND AN EXPLOSION. AN EXPLOSION WILL CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

(c) Set-up the air mover assembly away from the airplane.

(d) Ground the air mover assembly to the airplane ground.

(e) Put the portable air compressor a minimum of 100 ft (30 m) from the fuel tank that will be opened, unless the air compressor is explosion-proof.

(f) Connect the air compressor to the air mover assembly with the air supply hose, STD-7386.

(g) Connect a power supply to the air compressor.

ARO ALL; AIRPLANES WITH HEATER AIR/BLOWER EQUIPMENT

SUBTASK 28-11-00-480-018

(8) Do these steps to prepare the ventilation equipment, SPL-1778, for purging (Figure 203):

(a) Set-up the ventilation blower(s) in an area where the fuel tank entry will be made.

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ARO ALL; AIRPLANES WITH HEATER AIR/BLOWER EQUIPMENT (Continued)

1) Make sure the ventilation blower will be in an area free from fuel vapor when the access doors are open.

(b) Attach the static grounding cable on the ventilation blower(s) to an approved ground source.

(c) Do these steps to connect an air supply to the ventilation blower:

1) If shop air is used, connect an air supply hose, STD-7386, to the ventilation blower.

2) If a portable air compressor is used, do these steps:

a) Put the air compressor a minimum of 100 ft (30 m) from the fuel tank that will be opened, unless the air compressor is explosion-proof.

b) Connect an air supply hose, STD-7386, from the air compressor to the ventilation blower.

c) Connect the portable air compressor to a power source.

(d) Do these steps to connect the air ducts to the ventilation blower.

1) Connect the eight inch air duct to the ventilation blower outlet port.

2) Connect enough air duct segments to get to the access door where you will do maintenance.

3) Use the attached bonding connections to electrically bond each air duct segment.

ARO ALL; FOR MAIN TANK MAINTENANCE OUTBOARD OF WING STATION 599.5 (RIB 16)

(e) Attach the access door adapter to the end of the air duct.

ARO ALL; FOR MAIN TANK MAINTENANCE INBOARD OF WING STATION 599.5 (RIB 16)

(f) Do these steps to prepare the air ducts that will go inside the fuel tank:

NOTE: The air ducts will be positioned inside the fuel tank at the location where you will do the maintenance.

1) Attach an adapter/reducer to the end of the 8 in. (203 mm) air duct segments.

2) Attach the 4 in. (102 mm) air ducts.

3) Use the attached bonding connections to electrically bond each air duct segment.

4) Make sure you have enough segments to route the air ducts to the maintenance area.

ARO ALL; AIRPLANES WITH HEATER AIR/BLOWER EQUIPMENT

SUBTASK 28-11-00-480-019

(9) Do these steps to prepare the heater/air explosion proof, 90-100 CFM air blower, STD-1119, for purging (if it is necessary):

NOTE: The use of a heater/air blower is for the comfort of persons in the fuel tank. It is not part of the ventilation equipment, SPL-1778, which is used to remove hazardous fuel vapor during the fuel purging procedure.

(a) Set-up the heater/air blower in the area where the fuel tank entry will be made.

1) Make sure the heater/air blower will be in an area free from fuel vapor when the access doors are open.

(b) Attach the static grounding cable on the heater/air blower(s) to an approved ground source.

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ARO ALL; AIRPLANES WITH HEATER AIR/BLOWER EQUIPMENT (Continued)

(c) Do these steps to connect an air supply to the blower:

1) If shop air is used, connect an air supply hose, STD-7386, to the heater/air blower.

2) If a portable explosion-proof air compressor, STD-1121, is used, do these steps:

a) Put the air compressor a minimum of 100 ft (30 m) from the fuel tank that will be opened, unless the air compressor is explosion-proof.

b) Connect an air supply hose, STD-7386, from the air compressor to the heater/air blower.

c) Connect the portable air compressor to a power source.

(d) Do these steps to connect the air ducts to the heater/air blower.

1) Connect the air duct to the heater/air blower outlet port.

2) Connect enough air duct segments to get to the maintenance area.

3) Connect the air duct segments to the inlet port on the ventilation blower (if it is necessary for your ventilation system set-up).

4) Use the attached bonding connections to electrically bond each air duct segment.

(e) Connect a power supply to the heater/air blower.

ARO ALL

SUBTASK 28-11-00-480-020

WARNING

MAKE SURE THE FLAMMABLE GAS INDICATOR IS EXPLOSION-PROOF (CLASS I, DIVISION 1 OR EQUIVALENT STANDARD) AND IS SATISFACTORY FOR USE IN A FUEL TANK. IF YOU USE A FLAMMABLE GAS INDICATOR THAT IS NOT FOR USE IN A FUEL TANK, AN EXPLOSION CAN OCCUR. AN EXPLOSION CAN CAUSE SERIOUS INJURY OR DEATH TO PERSONS AND DAMAGE TO EQUIPMENT.

(10) Prepare the gas detector, COM-14039 with photoionization detector (PID) or the combustible gas and oxygen alarm, COM-1768 (Figure 205):

NOTE: An gas detector, COM-14039 with photoionization detector (PID) is the recommended tool.

(a) Do these steps to prepare the gas detector, COM-14039, with photoionization detector (PID):

NOTE: Use the instruction manual supplied with the air monitor with PID.

1) Make sure the air monitor with PID is calibrated for each of these sensors:

a) Oxygen

b) Lower Explosive Limit (LEL)

c) Parts Per Million (PPM) (set the response factor of the PID to the applicable jet fuel).

2) Make sure the alarm values are set to these limits:

a) 19.5% oxygen by volume

b) 10% of the LEL

c) 160 PPM.

3) Make sure the air monitor with PID operates correctly:

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a) Zero the air monitor in clean air.

b) Do a functional check (bump test) of the oxygen, LEL and PPM sensors.

4) Put the air monitor with PID on a stand or ladder next to the access door where you will go into the fuel tank.

a) To prevent the accidental movement of the air monitor with PID, safely attach the air monitor with PID to the stand or ladder.

(b) Do these steps to prepare the combustible gas and oxygen alarm, COM-1768 (Figure 205):

NOTE: Use of the combustible gas and oxygen alarm is permitted. The use the air monitor with PID is recommended.

NOTE: These steps are for the combustible gas indicators called out in the equipment section of this procedure. If you use a different combustible gas indicator, use the instruction manual supplied with the combustible gas indicator.

NOTE: GASTECH GT-series combustible gas indicators correspond to 72-6201-XX optional tool numbers for combustible gas and oxygen alarm, COM-1768.

1) Make sure the combustible gas indicator is calibrated for each of these scales:

NOTE: Make sure the GASTECH GT-series combustible gas indicators are labeled for calibration with hexane gas, and that the ppm range in the channel set-up menu is set to 5000 ppm hexane.

a) Oxygen

b) Lower Explosive Limit (LEL)

c) Parts Per Million (PPM)

2) Make sure the calibration on the combustible scales are specific to hexane gas.

3) Make sure the alarm values are set to these limits:

a) 160 PPM

b) 10% of the LEL

c) 19.5% oxygen by volume.

4) Do these steps to make sure the combustible gas indicator operates correctly:

a) Make sure the combustible gas indicator, sampling line, and sampling probe (with dust filter) are clean and not damaged.

b) Put the combustible gas indicator switch to the ON position.

c) Make sure there is enough charge on the battery to allow for the scheduled time in the fuel tank.

d) Let the combustible gas indicator warm-up for 20 minutes before you look at the readings.

e) Adjust the indicator to zero in clean air for these scales:

<1> Oxygen

<2> PPM

<3> LEL

f) If there is a negative value during the use of the combustible gas indicator, adjust the combustible gas indicator scale(s) to zero in clean air.

NOTE: Do not turn the combustible gas indicator off before you adjust the scales.

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5) Do these steps to do a check of the alarms:
   a) To do a check of the oxygen alarm, blow across the probe until the alarm comes on (19.5%).
   b) To do a check of the PPM and LEL scales, hold the tip of the probe over a solvent bottle or some solvent on a rag until the alarm comes on.
6) Put the combustible gas indicator on a stand or ladder next to the access door where you will enter the fuel tank.
   a) To prevent the accidental movement of the combustible gas indicator, safely attach the combustible gas indicator to the stand or ladder.

I. Fuel Tank Purging

SUBTASK 28-11-00-910-068

WARNING OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. IF YOU IGNORE THE PRECAUTIONS, THE CONDITIONS CAN KILL PERSONNEL, CAUSE INJURIES, AND CAUSE DAMAGE TO EQUIPMENT.

(1) Read and obey the precautions in this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

ARO ALL; AIRPLANES WITH VENTURI TYPE VENTILATION EQUIPMENT

SUBTASK 28-11-00-480-021

(2) Do these steps to install the ventilation equipment, SPL-1778 (Figure 203):
   (a) For the main fuel tanks, do these steps:
      1) Remove one or more main tank access doors (TASK 28-11-01-000-801).
      2) Install rubber protectors around the openings of the main tank access doors.
      3) Start the air supply connected to the air mover.
   (b) For the surge tanks, do these steps:
      1) Remove the surge tank access doors (TASK 28-11-03-000-801).
      2) Install the tank adapter assembly to one of the surge tank access doors (Figure 203).
      3) Start the air supply connected to the air mover.
   (c) For the center wing tank, do these steps:
      1) Remove all of the center wing tank access doors (TASK 28-11-02-000-801).
      2) Install the air mover assembly to one of the center wing tank access doors (Figure 203).
      3) Start the air supply connected to the air mover.

ARO ALL

   (d) For additional ventilation, you can remove the center purge door (TASK 28-11-04-000-801).

   NOTE: Removal of the center purge door is optional. If you remove the center purge door, replace the O-ring.

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ARO ALL; AIRPLANES WITH AIR BLOWER TYPE VENTILATION EQUIPMENT (BOE-501 OR EQUIVALENT)

SUBTASK 28-11-00-480-022

(3) Do these steps to install the ventilation equipment, SPL-1778 (Figure 203):

WARNING DO NOT STOP OR START THE VENTILATION BLOWER WHILE THE AIR DUCT IS IN THE FUEL TANK. THE FUEL FUMES FROM THE FUEL TANK CAN CAUSE AN EXPLOSION AT THE BLOWER MOTOR. AN EXPLOSION CAN KILL PERSONNEL OR CAUSE INJURIES, AND DAMAGE TO EQUIPMENT.

(a) Start the ventilation blower before you put the air duct in the fuel tank.

ARO ALL; FOR MAIN TANK MAINTENANCE OUTBOARD OF WING STATION 599.5 (RIB 16)

(b) Do these steps:

1) At the location where you will do maintenance, remove three adjacent access doors (TASK 28-11-01-000-801 or TASK 28-11-03-000-801).

NOTE: Usually the middle access door is the door where you will go into the fuel tank.

2) Install rubber protectors around the openings of the access doors.

3) Install the access door adapter to the access door (the outboard access door is the preferred door).

4) Bond the access door adapter to the airplane structure.

5) Make sure there will be a flow of air into the area where you will do the maintenance.

ARO ALL; FOR MAIN TANK MAINTENANCE INBOARD OF WING STATION 599.5 (RIB 16)

(c) Do these steps:

1) Remove the access door where you will do the maintenance (TASK 28-11-01-000-801).

2) Install rubber protectors around the openings of the main tank access doors.

3) Put the air duct inside the open access door.

4) Use the pigtail on the end of the air duct to bond the air duct to the airplane structure.

5) Make sure there will be a flow of air into the area where you will do the maintenance.

ARO ALL; FOR THE CENTER WING TANK

(d) Do these steps:

1) Remove the center wing tank access doors (TASK 28-11-02-000-801).

2) For additional ventilation, you can remove the center purge door (TASK 28-11-04-000-801).

NOTE: Removal of the center purge door is optional. If you remove the center purge door, replace the O-ring.

3) Put the 4 in. (102 mm) air duct inside the open access door where you will do maintenance.

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ARO ALL; FOR THE CENTER WING TANK (Continued)

4) Use the pigtail on the end of the air duct to bond the air duct to the airplane structure.

5) Make sure there will be a flow of air into the area where you will do the maintenance.

ARO ALL

SUBTASK 28-11-00-480-023

(4) After the air supply has operated for approximately 30 minutes, put the sampling line of the gas detector, COM-14039 with photoionization detector (PID), or the combustible gas and oxygen alarm, COM-1768 (Figure 205), as far into the fuel tank as possible.

NOTE: The gas detector, COM-14039 with photoionization detector (PID) is the recommended tool.

NOTE: It is recommended that you take the gas detector, COM-14039 with PID or combustible gas indicator value regardless of the type of fuel that was contained in the fuel tank. If the fuel tank had contained kerosene only, then the combustible gas indicator should show zero. This shows that the tank atmosphere is in fire-safe and health-safe condition.

SUBTASK 28-11-00-480-024

(5) Wait one minute for each 1.0 ft (30.5 cm) of sampling line before you take a reading.

SUBTASK 28-11-00-480-036

(6) If you use a combustible gas and oxygen alarm, COM-1768, convert the values from the GASTECH combustible gas indicator to get the actual value.

(a) Use Table 203 to convert the values on the combustible gas indicator to the actual levels.

Table 203/28-11-00-993-844

COMBUSTIBLE GAS INDICATOR	FOR PPM, MULTIPLY VALUE BY:	FOR LEL, MULTIPLY VALUE BY:
GASTECH 1314	2	3
GASTECH 1314SMPN	2	3
GASTECH GT SERIES	2	3

(b) If you are using a combustible gas indicator not made by GASTECH, follow the manufacturer's instructions to get the actual valves.

SUBTASK 28-11-00-480-026

WARNING DO NOT USE A HEATER/AIR BLOWER UNTIL THE FUEL FUME CONCENTRATION IS 10% OR LESS OF THE LOWER EXPLOSIVE LIMIT. IF THE FUEL FUME CONCENTRATION IS NOT 10% OR LESS OF THE LOWER EXPLOSIVE LIMIT, IGNITION OF THE FUEL FUME COULD OCCUR.

(7) When the gas detector, COM-14039 with photoionization detector (PID) or combustible gas indicator shows the fuel vapor concentration is 10% or less of the lower explosive limit, you can put warm or cool air in the fuel tank through the tank access opening with an explosion-proof heater/air blower.

NOTE: The use of warm or cool air is for the comfort of persons in the fuel tank. It is not part of the purging procedure.

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SUBTASK 28-11-00-480-027

WARNING DO NOT STOP OR START THE HEATER/AIR BLOWER WHILE THE AIR DUCT IS IN THE FUEL TANK. THE FUEL FUMES FROM THE FUEL TANK COULD CAUSE AN EXPLOSION AT THE HEATER OR BLOWER MOTOR. A FIRE OR EXPLOSIONS CAN KILL OR CAUSE INJURIES TO PERSONNEL AND CAN CAUSE DAMAGE TO EQUIPMENT.

(8) Start the heater/air blower before you put the air duct in the fuel tank.

SUBTASK 28-11-00-480-028

(9) Put the air duct for the heater/air blower in the fuel tank through the tank access opening.

SUBTASK 28-11-00-480-029

(10) Bond the air duct to the airplane structure.

SUBTASK 28-11-00-940-036

(11) Continue to have a good flow of air through the fuel tank with the air mover until you prepare to the close the fuel tank.

(a) Read the air monitor with PID or combustible gas indicator values every half hour or less.

SUBTASK 28-11-00-940-037

(12) If fuel vapors get into the fuel tank that was in a fire-safe condition, get all persons out of the fuel tank until you make sure the air in the fuel tank is in a fire-safe condition again.

SUBTASK 28-11-00-940-038

(13) Go into the fuel tank per the "Fuel Tank Entry" procedure to do maintenance.

J. Fuel Tank Entry

SUBTASK 28-11-00-910-069

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Read and obey the precautions in this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-11-00-970-004

(2) Complete the confined space entry permit (if it is a requirement).

SUBTASK 28-11-00-970-005

(3) Use the pre-entry checklist (an example is given in Figure 206).

SUBTASK 28-11-00-480-030

(4) Do these steps to prepare the half-mask respirators, STD-7380, for fuel tank entry:

(a) Use Table 201 to find out what level of respiratory protection is necessary.

NOTE: A Health-Safe condition occurs when the oxygen content in the atmosphere is a minimum of 19.5% to a maximum of 23.5% by volume at sea level, and the vapor concentrations are below the permissible exposure limits (PEL) shown in Table 201.

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(b) If the fuel tank is in a fire-safe condition, but not a health-safe condition, wear a full-face half-mask respirator, STD-7380, with an attached 125 psig max. output breathing air source, STD-1123.

NOTE: A Fire-Safe condition occurs when the vapor concentration is less than 10% of the lower explosive limit (LEL).

WARNING

DO NOT BREATHE THE FUMES FROM THIS MATERIAL. PUT ON A RESPIRATOR WHEN YOU USE THIS MATERIAL. MAKE SURE THAT THERE IS SUFFICIENT AIRFLOW. THIS MATERIAL CAN CAUSE INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT.

(c) If the fuel tank was previously filled with Jet-B fuel, wear a full face half-mask respirator, STD-7380, with an attached 125 psig max. output breathing air source, STD-1123.

NOTE: There is not a health-safe limit for Jet-B fuel.

(d) If the fuel tank was not previously filled with Jet -B and the tank is in a health-safe condition, a full face half-mask respirator, STD-7380, is not required, but a full or half-face half-mask respirator, STD-7380, with an organic vapor filter is recommended.

(e) Connect the subsequent half-mask respirators, STD-7380, to the air supply (Figure 204):

1) One half-mask respirator, STD-7380, for the person who goes into the fuel tank.

2) Two emergency rescue half-mask respirators, STD-7380.

(f) Make sure air gets to the half-mask respirators, STD-7380.

(g) Make sure the respirator system (Respiratory Protection, COM-11427, mask etc.) is clean.

NOTE: When you use the half-mask respirator, STD-7380, you should regularly drain moisture from the filter on the Respiratory Protection, COM-11427. If you drain dirt or oil from the filter, or if the air in the half-mask respirator, STD-7380, smells bad, replace the filter.

(h) Make sure the emergency air supply and half-mask respirators, STD-7380, operate correctly.

SUBTASK 28-11-00-940-039

(5) Remove these items before you go into a fuel tank:

(a) all jewelry - rings, bracelets, wrist watches etc.

(b) matches

(c) pocket warmers

(d) Hearings aid devices or other battery operated equipment.

SUBTASK 28-11-00-940-040

(6) Remove any clothes made of this material:

(a) wool

(b) silk

(c) nylon

(d) synthetic clothing.

SUBTASK 28-11-00-940-041

(7) Put on these approved protective clothes (Figure 202):

(a) cotton or SARANEX 23P coveralls (non-sparking zippers or buttons)

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(b) clean cotton head cover

(c) approved cotton or rubber gloves

(d) safety glasses or face shield

CAUTION

DO NOT PUT ON THE COTTON SOCKS UNTIL IMMEDIATELY BEFORE YOU GO INTO THE FUEL TANK. IF THE COTTON SOCKS ARE NOT CLEAN, YOU CAN CAUSE DAMAGE TO THE FUEL TANK.

(e) 100% cotton socks and/or fuel cell boots, STD-7377.

(f) Put rubber bands around your wrists and ankles to hold clothes tight.

SUBTASK 28-11-00-940-042

(8) Make sure the person who goes into the fuel tank and the person who watches agree on safety signals.

SUBTASK 28-11-00-940-043

(9) If confined space communication equipment, COM-7844, is used, attach the system.

(a) Do a check to make sure the system operates correctly.

SUBTASK 28-11-00-480-032

(10) Put on the necessary respiration protection.

SUBTASK 28-11-00-280-016

(11) Make sure the half-mask respirator, STD-7380, operates.

SUBTASK 28-11-00-910-070

(12) Do these steps if you are the observer:

(a) Make sure the confined space entry permit is complete and approved (if this is a requirement).

(b) Make a record that shows the time and who is inside the fuel tank.

(c) Attach this sign at the fuel tank entry location where it can be seen:

1) CAUTION - PERSONNEL INSIDE - MOVE NO EQUIPMENT

(d) Make sure you and the person(s) who will go into the tank agree that the checklist items are complete.

(e) Make sure you and the person(s) who will go into the tank agree on communication signals and set a communication time interval.

(f) Look at the Respiratory Protection, COM-11427, to make sure the supplied air system operates correctly.

(g) Keep visual contact with the fuel tank entry location.

(h) Keep constant communication with the person(s) the fuel tank.

(i) Look at the combustible gas indicator or air monitor with photoionization detector (PID) to make sure the air in the fuel tank is at 10% or less of the lower explosive limit.

(j) Do not put your head in the fuel tank access opening unless you have the correct half-mask respirator, STD-7380, on, for the condition of the tank.

1) Make sure that there is an observer to watch you.

NOTE: This is considered the same as a fuel tank entry.

(k) Look out for any changes which could cause a dangerous condition.

(l) Make sure person(s) in the fuel tank get out if there is a dangerous condition.

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SUBTASK 28-11-00-940-044

(13) Persons with half-mask respirators, STD-7380, must touch the identified airplane ground to release static electricity before they go into the fuel tank.

SUBTASK 28-11-00-480-033

(14) Go into the fuel tank.

SUBTASK 28-11-00-010-013

(15) If you need to access the aft bays of the center tank, open these baffle doors, as applicable:

Number	Name/Location
133AZ	Baffle Door
133BZ	Baffle Door
133CZ	Baffle Door

SUBTASK 28-11-00-480-034

(16) As an alternate procedure, you can take an additional air monitor with photoionization detector (PID) or combustible gas indicator into the fuel tank to monitor the environment where you will do the maintenance.

SUBTASK 28-11-00-480-035

(17) If it is necessary for your air ventilation system, route the air duct to the maintenance area (Figure 203).

(a) Bond the air duct to the airplane structure.

SUBTASK 28-11-00-940-045

WARNING

THE MAXIMUM ALLOWABLE CONCENTRATION (MAC) VALUE FOR PROLONGED EXPOSURE TO JET FUEL VAPORS IS 500 PARTS PER MILLION PARTS OF AIR BY VOLUME. PERSONS BREATHING HIGH CONCENTRATIONS OF FUEL VAPOR MAY EXPERIENCE SEVERE HEADACHES OR GENERAL FEELING OF SLEEPINESS OR FAINTING. IF BREATHING HAS SLOWED OR STOPPED, APPLY ARTIFICIAL RESPIRATION AT ONCE. HAVE SOMEONE ELSE GET MEDICAL AID. IN ANY EVENT, DO NOT DELAY OR STOP THE ARTIFICIAL RESPIRATION. PERSONS SUFFERING FROM SLIGHT HEADACHES, IRRITATION OF THE EYES OR OTHER SYMPTOMS OF OVEREXPOSURE SHOULD MOVE TO FRESH AIR IMMEDIATELY. JET FUELS CONTAIN SMALL AMOUNTS OF CHEMICAL ANTIOXIDANTS, METAL DEACTIVATORS AND CORROSION INHIBITORS. THESE CHEMICALS ARE ALL IRRITANTS, PARTICULARLY TO THE EYES. IF SPLASHED INTO THE EYES, FLUSH WITH WATER FOR AT LEAST 15 MINUTES. LIFT UPPER AND LOWER EYELIDS FREQUENTLY TO ENSURE COMPLETE WASH. OBTAIN MEDICAL ASSISTANCE. JET FUELS MAY ALSO CAUSE SKIN IRRITATION.

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(WARNING PRECEDES)

WARNING

MAKE SURE THE TEMPERATURE IN THE FUEL TANK DOES NOT GET TOO HOT. IF THE FUEL TANK TEMPERATURE GETS TOO HOT, A PERSON IN THE FUEL TANK CAN HAVE HEAT-RELATED DISORDERS. IF A PERSON BECOMES TOO HOT, GET THE PERSON OUT OF THE FUEL TANK. FIND OUT IF MEDICAL ASSISTANCE IS NECESSARY. COVERALLS THAT ARE COATED WITH SARANEX 23P WILL KEEP BODY HEAT IN. CLOSELY MONITOR A PERSON IN SARANEX 23P COVERALLS FOR SIGNS OF HEAT-RELATED DISORDERS. IF A PERSON BECOMES TOO HOT, GET THE PERSON OUT OF THE FUEL TANK. FIND OUT IF MEDICAL ASSISTANCE IS NECESSARY.

(18) The observer must keep in communication with person(s) in the tank and watch for changes in conditions or a signal of danger.

SUBTASK 28-11-00-680-002

WARNING

MAKE SURE THAT THERE IS A GOOD FLOW OF AIR WHEN YOU ARE IN THE FUEL TANK. DO NOT REMOVE THE RESPIRATOR WHILE YOU ARE IN THE FUEL TANK. DO NOT DO MAINTENANCE IN THE FUEL TANK UNTIL YOU REMOVE ALL FUEL FROM THE AREA. FUEL FUMES CAN KILL YOU.

(19) Do these steps to remove any fuel that remains in the fuel tank:

(a) Put cotton wipers, G00034, on the bottom of the fuel tank to absorb any fuel that remains in the tank.

(b) Count the number of cotton wipers, G00034, that are put into the fuel tank.

(c) Remove the cotton wipers, G00034, when soaked.

(d) Count the number of cotton wipers, G00034, that are removed from the fuel tank.

(e) Make sure the counts agree.

(f) Make sure you remove all cotton wipers, G00034, from the fuel tank.

WARNING

OBEY THE APPROVED PROCEDURES FOR FUEL-SOAKED COTTON WIPERS, G00034. PUT FUEL-SOAKED COTTON WIPERS, G00034 IN APPROVED BARRELS ONLY. COTTON WIPERS, G00034 THAT YOU USE TO CLEAN THE FUEL TANK CAN CAUSE FIRES. FIRES CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(g) Follow approved procedures to dispose of or clean the fuel soaked cotton wipers, G00034.

SUBTASK 28-11-00-360-009

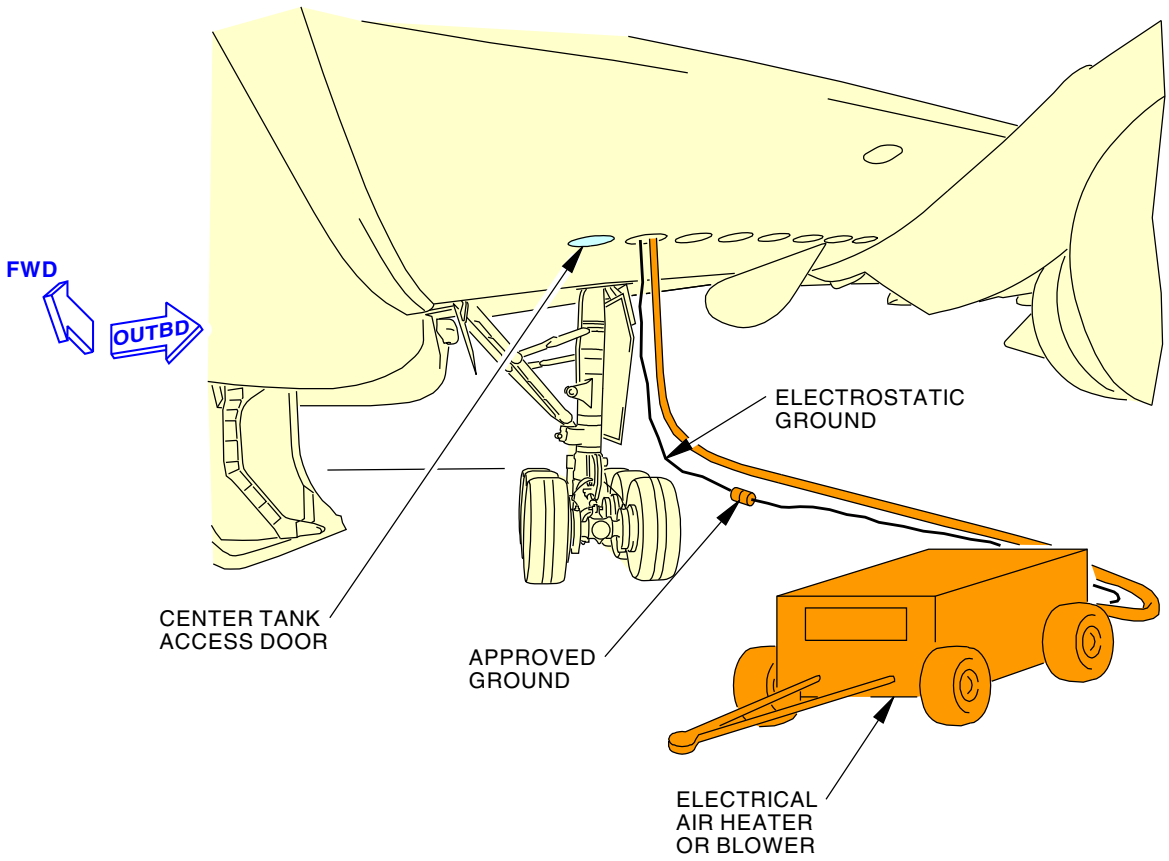
(20) Do the necessary repair or maintenance procedures.

SUBTASK 28-11-00-090-012

(21) After you complete the maintenance, do this task: Fuel Tank Closure, TASK 28-11-00-410-801.

——— END OF TASK ———

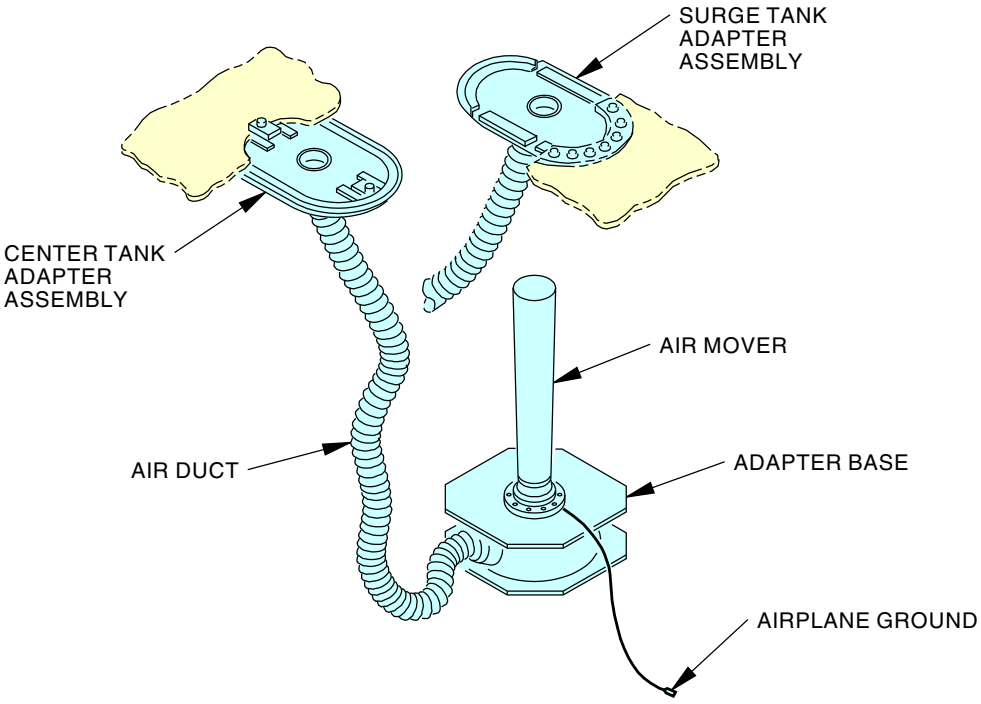
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G82542 S0006414757_V2

Tank Ventilation Equipment
Figure 203/28-11-00-990-810 (Sheet 1 of 5)

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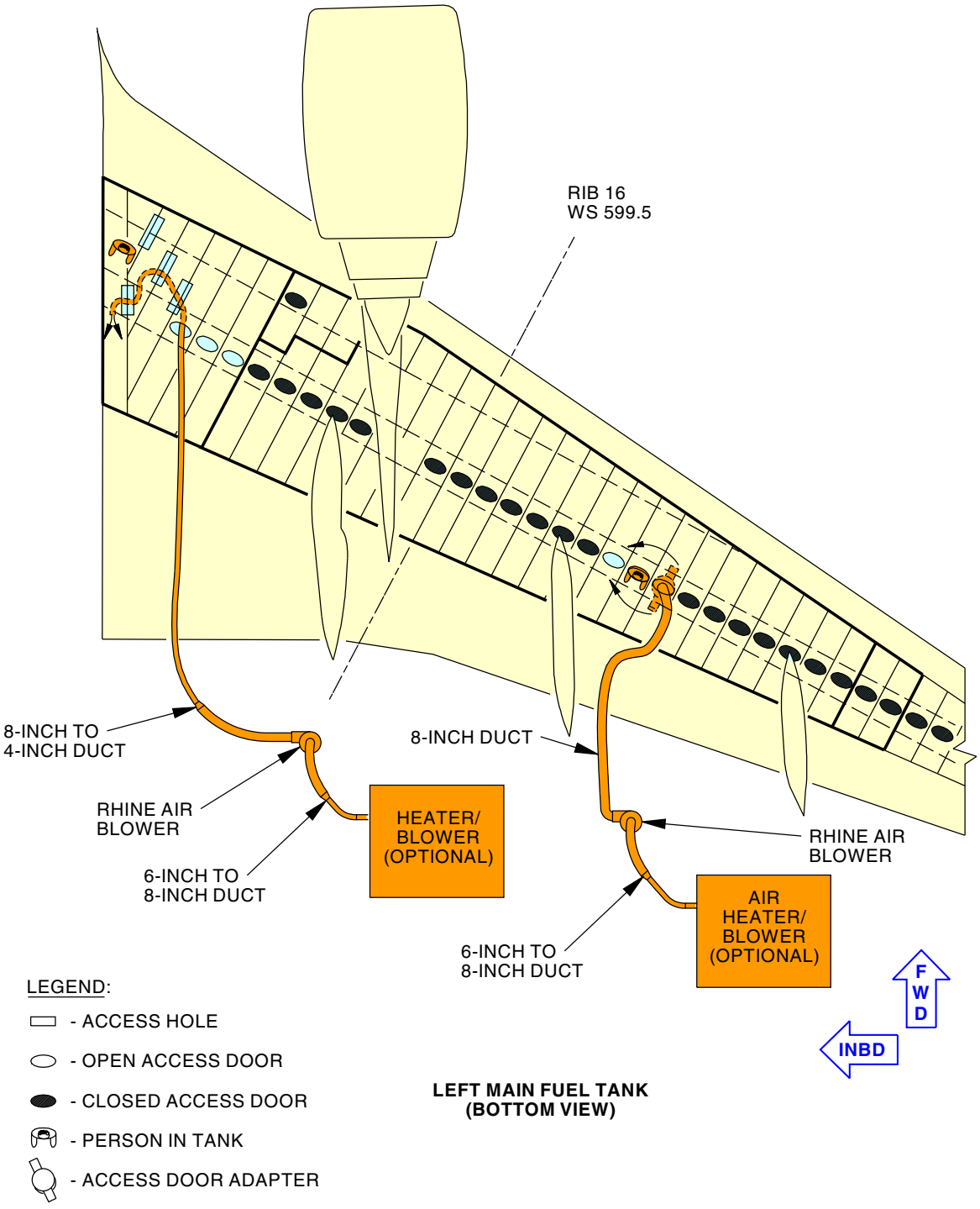


AIR MOVER ADAPTER ASSEMBLY

G82228 S0006414758_V2

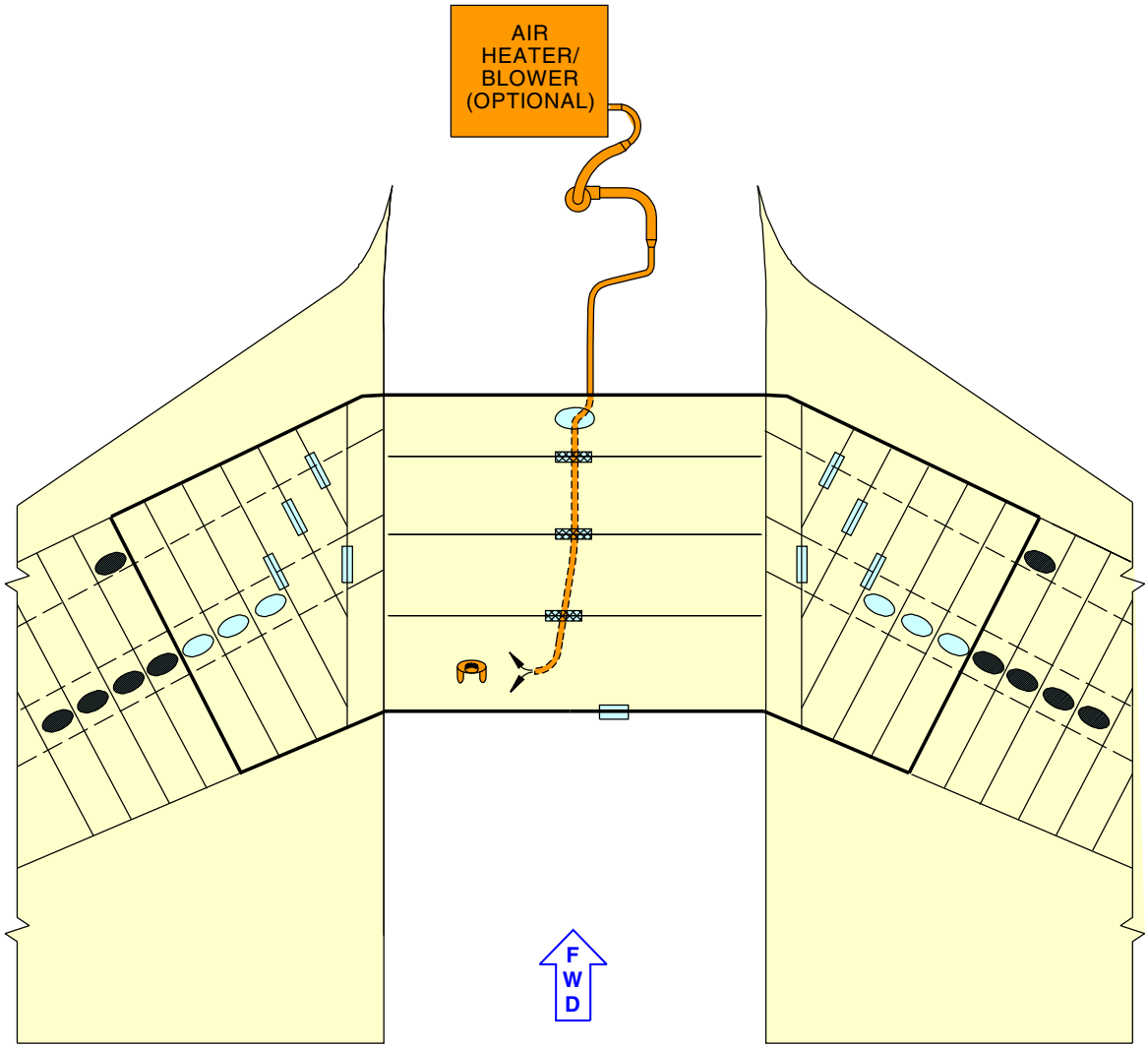
Tank Ventilation Equipment
Figure 203/28-11-00-990-810 (Sheet 2 of 5)

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Tank Ventilation Equipment
Figure 203/28-11-00-990-810 (Sheet 3 of 5)

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LEGEND:

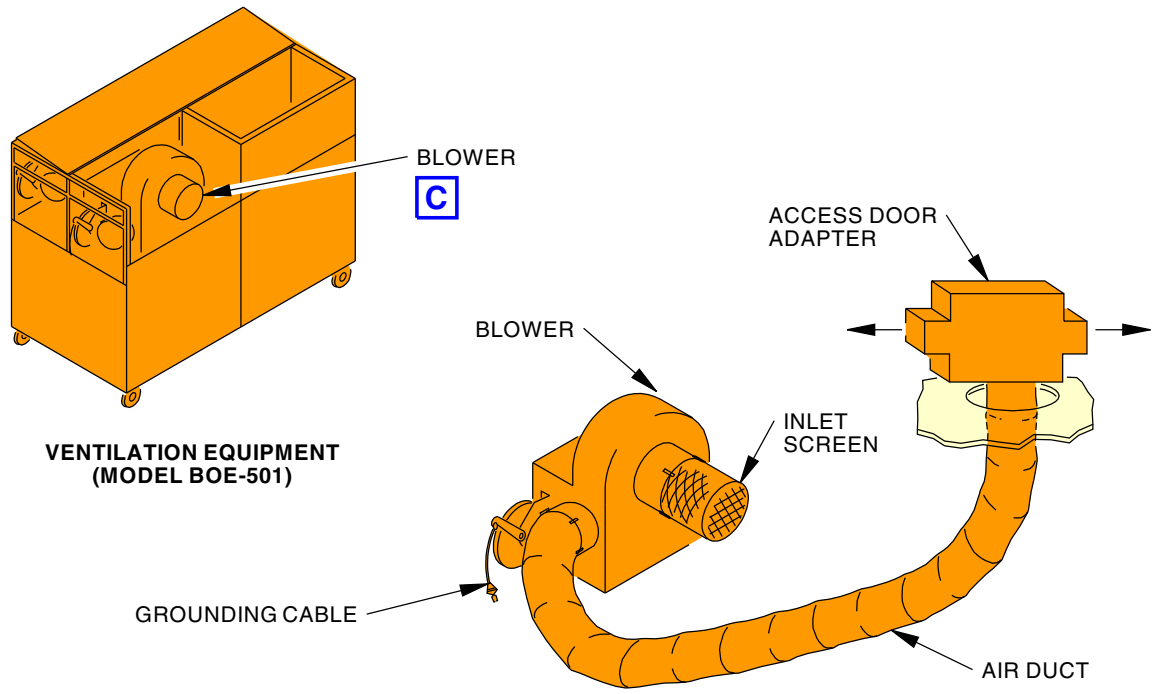
- OPEN BAFFLE DOOR
- ACCESS HOLE
- OPEN ACCESS DOOR
- CLOSED ACCESS DOOR
- PERSON IN TANK
- ACCESS DOOR ADAPTER

CENTER FUEL TANK
(BOTTOM VIEW)

G82231 S0006414760_V5

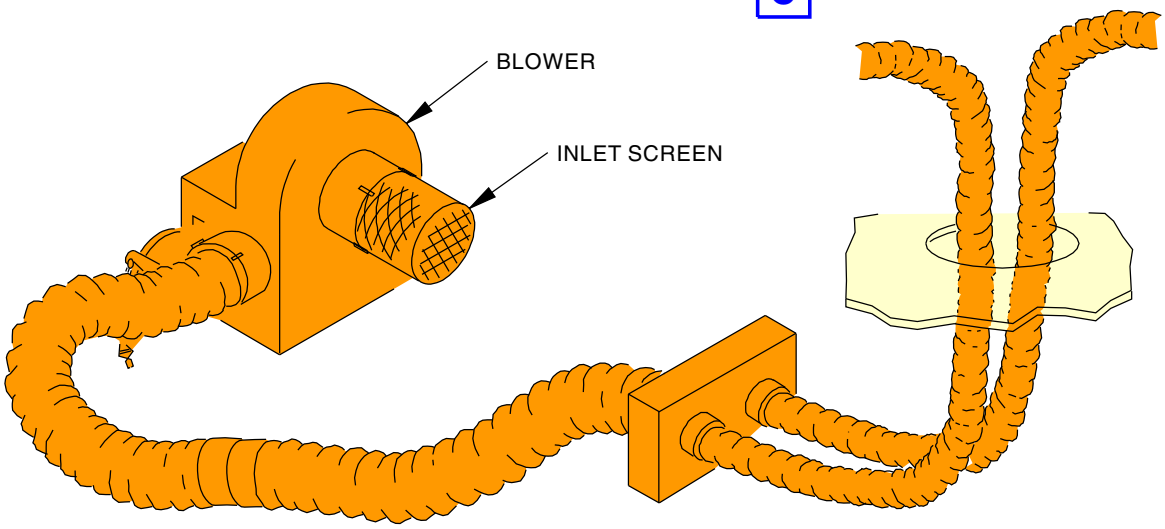
Tank Ventilation Equipment
Figure 203/28-11-00-990-810 (Sheet 4 of 5)

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**VENTILATION EQUIPMENT
(MODEL BOE-501)**

BLOWER
C

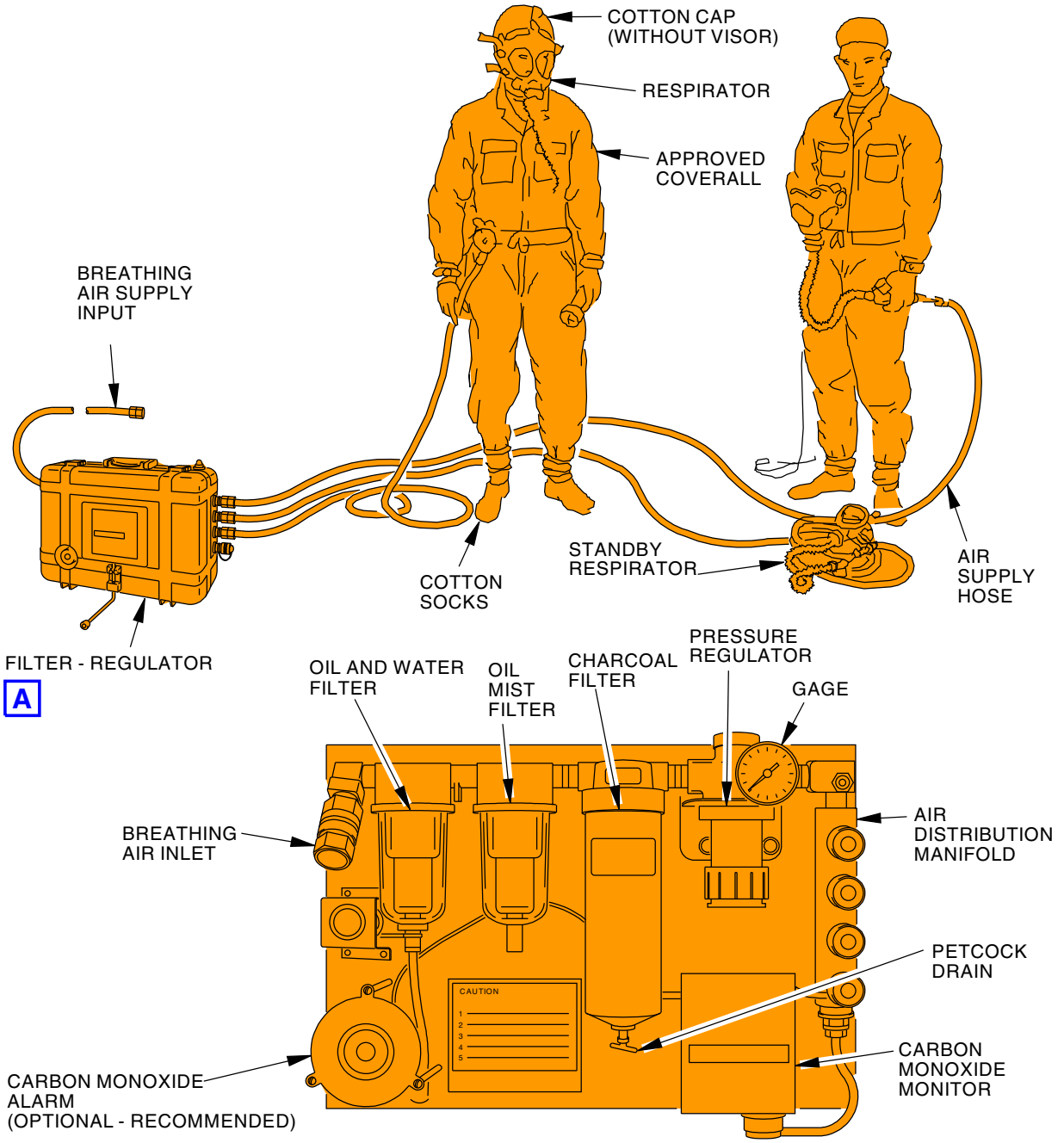


**EXAMPLE CONFIGURATION FOR
VENTILATION EQUIPMENT (MODEL BOE-501)**

G82235 S0006414762_V2

**Tank Ventilation Equipment
Figure 203/28-11-00-990-810 (Sheet 5 of 5)**

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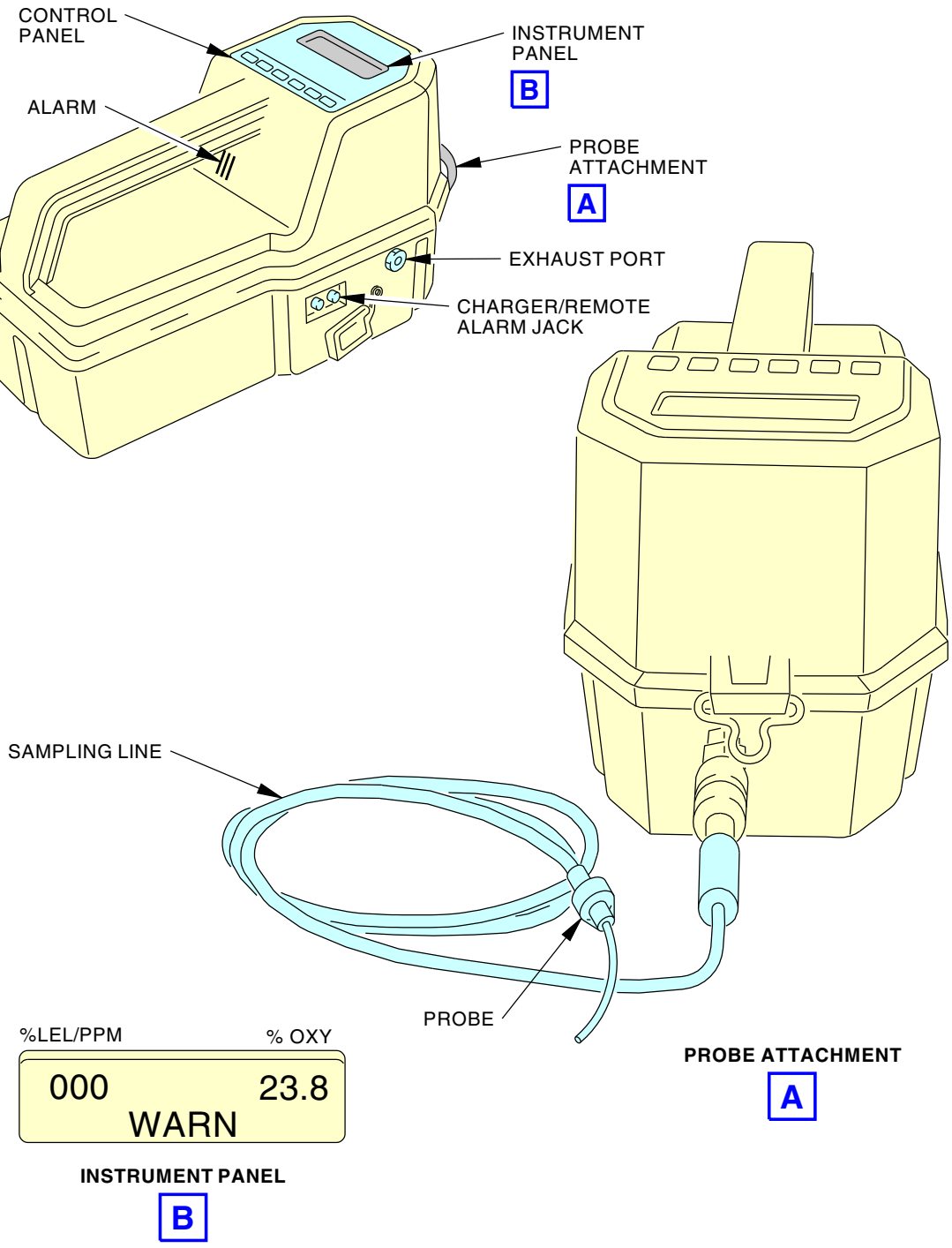
FILTER - REGULATOR
(EXAMPLE)

A

G82238 S0006414763_V4

Respiratory Equipment and Clothing (Example)
Figure 204/28-11-00-990-811

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G82240 S0006414764_V2

Combustible Gas Indicator (Example)
Figure 205/28-11-00-990-812

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EXAMPLE OF A WET FUEL CELL PRE-ENTRY CHECKLIST

This checklist must be completed prior to start of wet fuel cell entry and/or at shift change PRIOR to work assignment for the continuation of tank work started by a previous shift.

Wet Fuel Cell Entry Location

Area or Building: _____ Stall: _____ Airplane: _____ Tank: _____

Shift: _____ Date: _____ Supervisor: _____

☐ 1. Airplane and adjacent equipment properly grounded.

☐ 2. Area secured and warning signs positioned.

☐ 3. Boost pump switches off and circuit breakers pulled and placarded.

☐ 4. No power on airplane: battery disconnected, external Power Cord disconnected from airplane, and external power receptacle placarded.

☐ 5. Radio and radar equipment off (see separation distance requirements).

☐ 6. Only approved explosion proof equipment and tools will be used for fuel cell entry (lights, blowers, pressure and test equipment, etc.).

☐ 7. Ensure requirements listed on Aircraft Confined Space Entry Permit are complied with, including appropriate personal protective equipment: OSH class 110 respirator at a minimum, approved coveralls, caps and foot coverings, and eye protection.

☐ 8. Trained attendant and confined space logsheet required for all wet fuel cell entries.

☐ 9. Aerators checked for cleanliness prior to use.

☐ 10. Sponges available for residual fuel mop out.

☐ 11. All plugs used have streamers attached.

☐ 12. Mechanical ventilation (venturis or blowers) installed to ventilate all open fuel cells.

NOTE: Ventilation system must remain in operation at all times while fuel cells are open. If ventilation system fails or any ill effects such as dizziness, irriation, or excessive odors are noted, all work shall stop and fuel cells must be evacuated.

☐ 13. Shop personnel entering cells and standby observers have current "fuel cell entry" certification cards. Certification requires the following training:

- Aircraft Confined Space Entry Safety
- Respirator Use and Maintenance
- Wet Fuel Cell Entry

☐ 14. Fire Department notified.

Meter Readings

☐ 15. Oxygen reading (%): _____ By: _____

☐ 16. Fuel vapor level reading (ppm): _____ By: _____

☐ 17. Combustible gas meter (LEL) reading: _____ By (FD): _____

I confirm that all entry requirements were met prior to any entry.

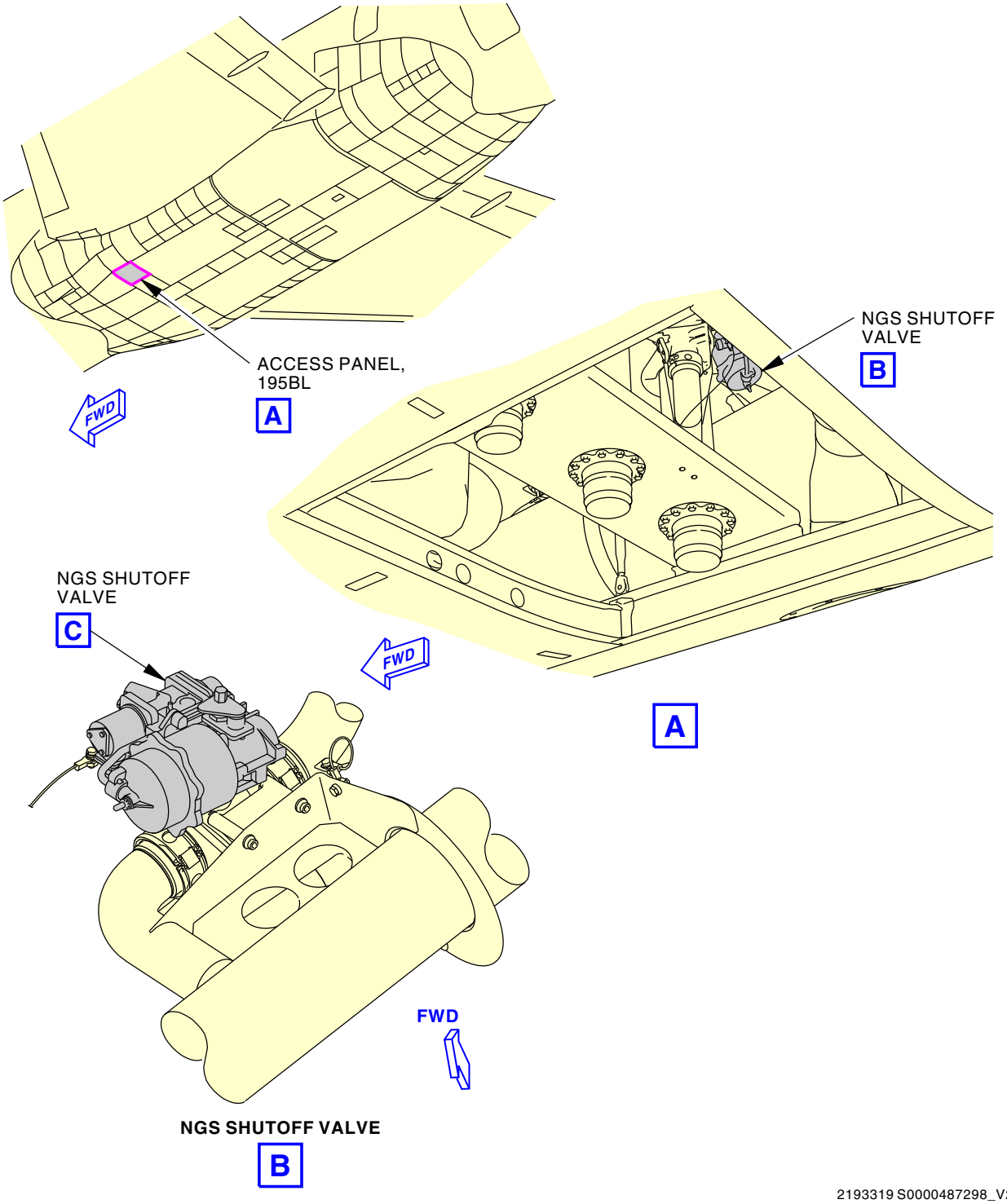
_____ _____

Signature of Supervisor or Designee Date

G82242 S0006414765_V2

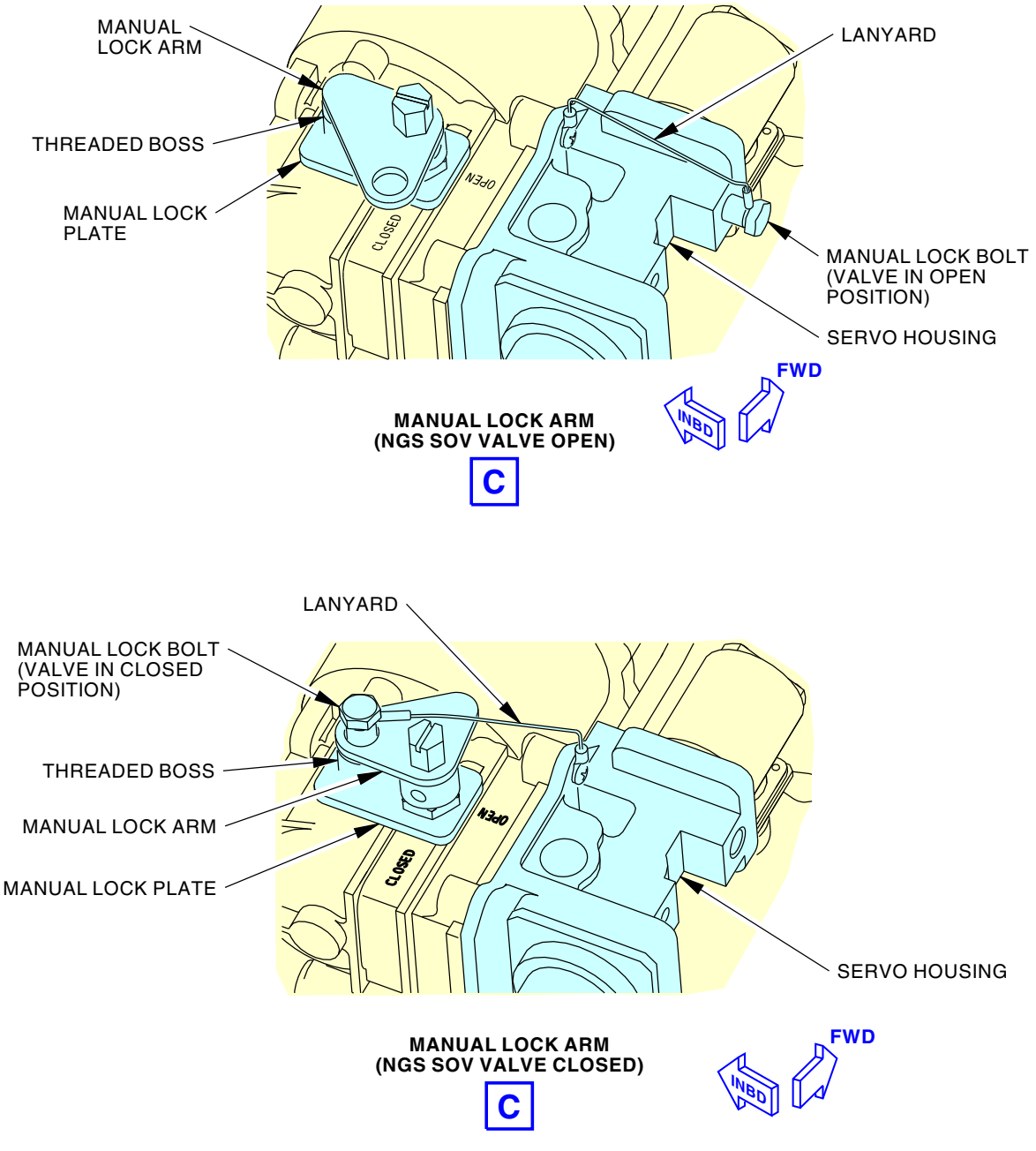
Fuel Tank Pre-Entry Checklist (Example)
Figure 206/28-11-00-990-841

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NGS Shutoff Valve Deactivation
Figure 207/28-11-00-990-862 (Sheet 1 of 2)

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2193316 S0000487299_V2

NGS Shutoff Valve Deactivation
Figure 207/28-11-00-990-862 (Sheet 2 of 2)

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TASK 28-11-00-410-801

4. Fuel Tank Closure

A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-28.

(2) After you do maintenance, do this task to close the fuel tank.

(3) Make sure you read and obey the precautions in this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-31-01-420-801	Restore Main Battery Power (P/B 201)
24-31-05-420-801	Restore APU Battery Power (P/B 201)
27-51-00-440-801	Trailing Edge Flap Reactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)
28-11-03-400-801	Surge Tank Access Door - Installation (P/B 401)
28-11-04-400-801	Center Purge Door Installation (P/B 401)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)

C. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

D. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
500	Left Wing
600	Right Wing

E. Access Panels

Number	Name/Location
133AZ	Baffle Door
133BZ	Baffle Door
133CZ	Baffle Door
195BL	ECS High Pressure Connection Door

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F. Clean the Fuel Tank

WARNING

REMOVE ALL MAINTENANCE ITEMS, AND UNWANTED MATERIAL FROM THE FUEL TANK BEFORE YOU CLOSE IT. EQUIPMENT, TOOLS, LOOSE PARTS, OR CONTAMINATION CAN CAUSE DAMAGE TO THE FUEL SYSTEM. UNWANTED FLAMMABLE MATERIALS ARE POSSIBLE IGNITION SOURCES. AN IGNITION SOURCE IN A FUEL TANK CAN CAUSE A FIRE OR EXPLOSION. THIS CAN INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.

SUBTASK 28-11-00-210-037

(1) Each time you go into a fuel tank you must examine the fuel tank very carefully before you close it.

SUBTASK 28-11-00-090-010

(2) Remove all the equipment used to do maintenance (for example, tools, solvent, containers, plugs, brushes, and other equipment).

NOTE: Keep a written record of all the tools, equipment, materials, and persons when they go into the tank. Before you close the tank, make sure that the records show that there are no unwanted items in the tank.

SUBTASK 28-11-00-100-004

(3) Use a cotton wiper, G00034, to clean unwanted solvents, liquids or grease.

SUBTASK 28-11-00-490-001

WARNING

GROUND ALL OF THE EQUIPMENT AND HOSES THAT YOU USE IN THE FUEL TANK. IF YOU DO NOT GROUND ALL OF THE EQUIPMENT AND HOSES, AN EXPLOSION CAN OCCUR. INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(4) Make sure that all hoses and equipment used in the fuel tank are grounded.

SUBTASK 28-11-00-100-005

WARNING

WHEN YOU DO WORK IN A FUEL TANK, MAKE SURE YOU USE ONLY FILTERED SHOP/COMPRESSED AIR TO OPERATE AIR-DRIVEN TOOLS AND VACUUMS. DO NOT USE DRY NITROGEN OR OTHER GASES. THIS WILL HELP PREVENT DEATH AND INJURY TO PERSONS.

(5) Use only shop air or bottled air as a gas source for air-driven tools. Do not use nitrogen (N2), oxygen (O2), carbon dioxide (CO2), or any other non-air source of gas.

(6) Use an air-driven vacuum to remove unwanted particles and pieces of used sealant.

G. Inspect the Fuel Tank

SUBTASK 28-11-00-200-008

(1) Examine all the repairs, sealant, and finishes to make sure they are correct and complete.

SUBTASK 28-11-00-211-002

WARNING

REMOVE ALL CONTAMINATION, UNWANTED PARTICLES, AND MATERIALS FROM THE FUEL TANK. UNWANTED MATERIALS CAN COLLECT IN THE FUEL TANK. THIS CAN CAUSE A BLOCKAGE, OR CAUSE THE SYSTEM TO OPERATE INCORRECTLY. MATERIALS CAN BE AN IGNITION SOURCE. THIS CAN CAUSE A FIRE OR EXPLOSION.

(2) Make sure these components are free from unwanted material or objects:

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(a) Fuel and water drain holes and paths

(b) Fuel quantity indicating system components

(c) Fuel scavenge system components.

SUBTASK 28-11-00-210-044

28-AWL-28: CDCCL

(3) If any maintenance, preventative maintenance, or alteration is done inside the fuel tanks, do these checks in the affected areas (this includes the touchpoints during transit to and from the tank access point) where work is done:

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-28.

28-AWL-28: CDCCL

(a) Make sure the fillet seals around the periphery of the equipment interface with structure inside the fuel tank are not damaged (peeling off or cracking).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-28.

28-AWL-28: CDCCL

(b) Make sure the cap seals installed on the fasteners and fittings inside the fuel tank are not damaged (peeling off or cracking).

NOTE: Not all fasteners and fittings have cap seals. If the fastener or fitting sealant is damaged, there will be residual evidence of a previously installed cap seal on the fasteners and fittings in areas where installation is necessary.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-28.

SUBTASK 28-11-00-211-003

(4) Do a check of the areas of the tank that were accessed for any damage to in-tank components, bonding jumpers, wiring and structure.

(a) Repair all problems that you find.

SUBTASK 28-11-00-212-001

(5) Do a final inspection of the fuel tank to make sure you removed all unwanted materials, tools, and equipment.

NOTE: Make sure the necessary approved persons do an inspection of the tank before you close it.

SUBTASK 28-11-00-210-038

(6) Do a check of the record to make sure no unwanted items remain in the tank.

H. Close the Main, Surge or Center Fuel Tank

SUBTASK 28-11-00-090-011

(1) If you used an air duct, move the air duct to the access door opening.

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SUBTASK 28-11-00-410-023

(2) If you accessed the aft bays of the center tank, install these baffle doors, as applicable:

Number	Name/Location
133AZ	Baffle Door
133BZ	Baffle Door
133CZ	Baffle Door

SUBTASK 28-11-00-910-084

(3) Go out of the fuel tank.

SUBTASK 28-11-00-970-009

(4) If you are the observer, do these steps:

(a) Make a report that states the time and that all persons are out of the tank.

(b) Remove the sign that states: CAUTION - PERSONNEL INSIDE TANK - MOVE NO EQUIPMENT.

SUBTASK 28-11-00-090-007

WARNING

DO NOT STOP OR START THE VENTILATION BLOWER WHILE THE AIR DUCT IS IN THE FUEL TANK. THE FUEL FUMES FROM THE FUEL TANK CAN CAUSE AN EXPLOSION AT THE BLOWER MOTOR. AN EXPLOSION CAN KILL PERSONNEL OR CAUSE INJURIES, AND DAMAGE TO EQUIPMENT.

(5) If you used a heater or ventilation blower, do these steps:

(a) Remove the air duct from the fuel tank.

(b) Turn the air duct 180 degrees away from the open fuel tank.

(c) Stop the heater and/or and ventilation blower if used.

(d) Stop the air compressor.

(e) Disconnect the air supply hose from the air mover or blower(s).

ARO ALL; AIRPLANES WITH VENTURI TYPE VENTILATION EQUIPMENT

SUBTASK 28-11-00-090-008

(6) Do these steps to remove the air mover equipment:

(a) Remove the tank adapter assembly from the opening of the access doors.

(b) Remove the air mover from the adapter base (Figure 203).

(c) Remove the ground from the air mover.

ARO ALL; AIRPLANES WITH AIR BLOWER TYPE VENTILATION EQUIPMENT (BOE-501 OR EQUIVALENT)

SUBTASK 28-11-00-090-009

(7) Do these steps to remove the air blower equipment:

(a) Remove the ventilation equipment from the airplane.

(b) Remove the ground from the airplane to the ventilation blower.

ARO ALL

SUBTASK 28-11-00-910-081

(8) Follow approved procedures to clean and return all respiratory equipment.

SUBTASK 28-11-00-410-022

(9) Do these steps to install the applicable doors:

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(a) Install the center tank purge door if you removed it (TASK 28-11-04-400-801).

1) Make sure you do the applicable leak test for the purge door.

(b) Install the applicable tank access doors:

1) For the main fuel tanks, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

2) For the surge tank, do this task: Surge Tank Access Door - Installation, TASK 28-11-03-400-801.

3) For the center tank, do this task: Center Tank Access Door - Installation, TASK 28-11-02-400-801.

I. Put the Airplane Back to the Usual Condition

SUBTASK 28-11-00-440-004

(1) Manually unlock and open the Nitrogen Generation System (NGS) shutoff valve:

(a) Go to the location of the NGS shutoff valve (Figure 207).

(b) Remove the manual lock bolt from the threaded boss (Figure 207, View C).

(c) Install the manual lock bolt back on the servo housing.

(d) Turn the manual lock arm to the open position to unlock the NGS shutoff valve (Figure 207, View C).

(e) Close this access panel:

Number	Name/Location
195BL	ECS High Pressure Connection Door

SUBTASK 28-11-00-910-082

WARNING OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 28-11-00-440-002

(3) To do the activation procedure for the trailing edge flaps, do this task: Trailing Edge Flap Reactivation, TASK 27-51-00-440-801.

SUBTASK 28-11-00-440-003

(4) To do the activation of the leading edge slat procedure, do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

SUBTASK 28-11-00-865-001

(5) Close these circuit breakers:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
B	10	C47401	NGS RAM AIR ACTUATOR
C	18	C28302	R FWD FUEL BOOST PUMP L AC SECT 2
E	2	C28303	L AFT FUEL BOOST PUMP

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(Continued)

Left Power Management Panel, P110

Row	Col	Number	Name
E	5	C28307	L FWD FUEL BOOST PUMP
H	10	C47301	NGS FAN
L	9	C47601	NGS CONTROL
L	10	C47602	NGS 28V DC POWER
L	21	C28647	CTR L OVRD FUEL PUMP CTRL
L	23	C28629	FUEL XFEED VLV FWD
L	26	C28607	L AFT FUEL BOOST PUMP CTRL
L	27	C28606	R FWD FUEL BOOST PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
E	27	C28300	R AFT FUEL BOOST PUMP
F	27	C28306	R FWD FUEL BOOST PUMP R XFR
K	11	C28609	R AFT FUEL BOOST PUMP CTRL
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

Standby Power Management Panel, P310

Row	Col	Number	Name
B	2	C28604	L FWD FUEL BOOST PUMP CTRL
G	9	C28612	FUEL XFEED VLV AFT

SUBTASK 28-11-00-861-001

(6) Connect these airplane batteries:

(a) Main Battery (TASK 24-31-01-420-801)

(b) APU Battery (TASK 24-31-05-420-801).

SUBTASK 28-11-00-910-083

(7) Remove all precautionary signs and placards.

SUBTASK 28-11-00-090-013

(8) Remove all support equipment, stands, ladders, ropes etc.

SUBTASK 28-11-00-440-001

(9) If it is necessary, do this task: Supply Electrical Power, TASK 24-22-00-860-805.

——— END OF TASK ———

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FUEL TANKS - INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure contains these tasks:

(1) Analysis of Fuel Leak Type

(2) Analysis of Fuel Leak Cause

(3) Fuel Leak Detection Procedures

(4) Surge Tank Access Door Leak Test Procedure

(5) Helitest Leak Detection Procedure

(6) External Wires Over the Center Fuel Tank - Inspection

C. After you have identified the leaks, refer to these procedures to repair the fuel tanks:

(1) To make sealant repairs in the fuel tank, do this task: Repair of Sealant Leaks in the Fuel Tank Structure, TASK 28-11-00-300-802.

(2) For cleaning and painting of the fuel tank, do this task: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

D. If there is indication of damage to the secondary fuel barrier, you must find and repair the leakage in the fuel tank and in the secondary fuel barrier (TASK 28-11-00-300-803) before the airplane can be released for flight.

NOTE: The most usual indication of such damage is a report of fuel fumes in the passenger cabin.

E. If the cause of the fuel leak is a result of structural damage, do the structural repair. Refer to the Structural Repair Manual before you apply the sealant.

TASK 28-11-00-300-804

2. Analysis of the Fuel Leak Type

(Figure 601, Figure 602)

A. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
532	Left Wing Dry Bay
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
632	Right Wing Dry Bay
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074

B. Procedure

SUBTASK 28-11-00-790-001

(1) Fuel leakage is divided into four groups to calculate flight safety.

NOTE: The dimension patterns of fuel leaks (Figure 601, Figure 602) are based on an examination 15 minutes after the leak area was rubbed clean.

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SUBTASK 28-11-00-220-003

(2) The four groups are stain, seep, heavy seep, and running leak and are defined as follows (Figure 601):

(a) A stain is a leak where the wetted area is not more than 1 1/2 inches wide after the time interval noted above.

(b) A seep is a leak where the wetted area is not more than 4 inches wide after the time interval noted above.

(c) A heavy seep is a leak where the wetted area is not larger than 6 inches wide after the time interval noted above.

(d) A running leak is a leak where the wet area is more than 6 inches wide after 15 minutes.

NOTE: Fuel will usually come into view again immediately after you wipe the area dry and can run or drip from the surface.

SUBTASK 28-11-00-790-002

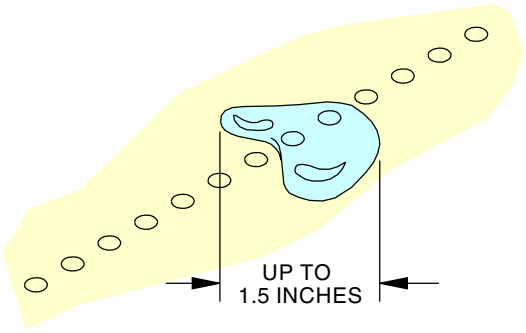
(3) Examine the wet area around the leak source to find the group of the fuel leak.

SUBTASK 28-11-00-790-003

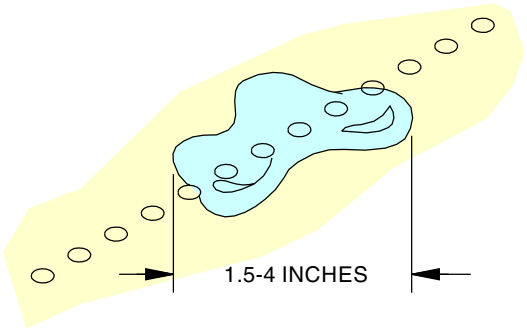
(4) After you examine the leak area, rub the area clean and examine the leak area again.

——— END OF TASK ———

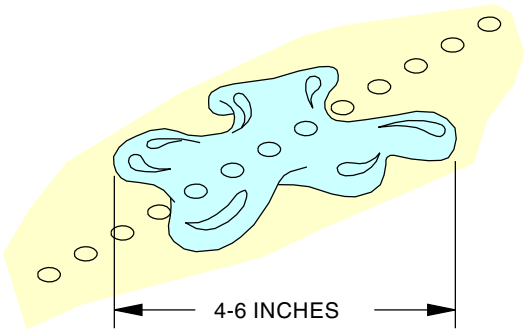
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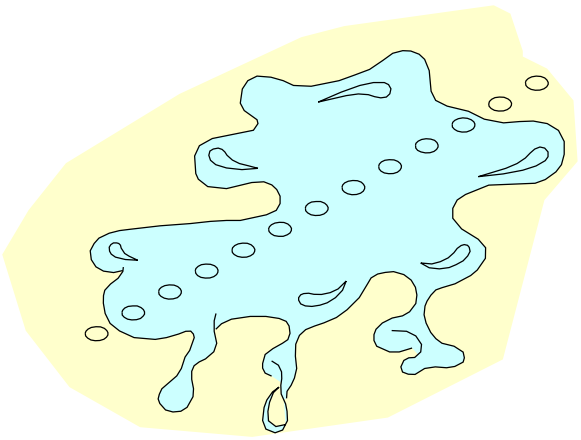
STAIN



SEEP



HEAVY SEEP



RUNNING LEAK

D01357 S0006414776_V2

Fuel Leak Types
Figure 601/28-11-00-990-801

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LEAKAGE LOCATION	STAIN	SEEP	HEAVY SEEP	RUNNING LEAK
Open areas with a good flow of air where fuel leakage cannot move to a possible fire source. Example: upper and lower wing surfaces that do not have fairings.	1	1	2	3
Areas that are not fully closed and do not have a good flow of air. Example: rear spar at the trailing edge flaps and wheel wells.	1	2 Two locations maximum	3	3
Wing Dry Bay/Drain Holes	5	4	4	4
Closed areas without a flow of air. Example: wing dry bay, wing lower surface with fairings, air conditioning bay, wing/body fairings, front and rear spar, and the refueling station(s).	2	3	3	3
Pressurized area of the center fuel tank, or optional auxiliary tank.	4	4	4	4

1 No repair procedure is necessary; examine the fuel leak frequently to make sure it does not get larger.

2 It is not necessary to repair the fuel leak immediately. Examine the fuel leak frequently to make sure it does not get larger. Make the necessary repairs on the next airplane layup.

3 Repair the fuel leak immediately to a minimum of 1 or 2 classification.

4 Repair the fuel leak immediately. No fuel leakage is permitted.

5 Do an inspection of the dry bay drain holes after each flight. If no fuel drops are seen 15 minutes after you wipe away the fuel, the airplane can be released for the subsequent flight. If fuel drops are seen 15 minutes after you wipe away the fuel, repair the leak immediately. (The leak is at least a seep).

D00410 S0006414777_V3

Fuel Leak Evaluation
Figure 602/28-11-00-990-802

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TASK 28-11-00-200-801

3. Analysis of Fuel Leak Cause

(Figure 603)

A. General

(1) This task lists the causes of the fuel leaks and discusses leak path analysis.

(2) The cause of fuel tank leaks is usually incorrect fitting installations, damaged sealant, incorrectly installed or damaged O-rings, or loose fasteners.

(3) Before you defuel a fuel tank which has a leak, try to find all of the leaks in the fuel tank.

(4) Repair all leaks each time a fuel tank is defueled to repair leaks.

(5) The causes of most of the fuel leaks in the fuel tank structure are:

(a) Surfaces are prepared incorrectly

(b) Sealants are mixed or kept incorrectly

(c) Sealants are applied incorrectly

(d) Fasteners are loose

(e) Fittings and connections are installed incorrectly.

B. References

Reference	Title
28-11-00-300-802	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)

C. Location Zones

Zone	Area
139	Forward Keel Beam
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
532	Left Wing Dry Bay
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
632	Right Wing Dry Bay
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074

D. Procedure - Fuel Leak Causes

SUBTASK 28-11-00-280-001

(1) Surfaces are prepared incorrectly.

(a) The surfaces must not contain unwanted materials such as grease, metal particles, hair, loose paint or wax.

(b) Unwanted materials can cause the sealant not to bond correctly.

SUBTASK 28-11-00-280-002

(2) Sealants are mixed or kept incorrectly (TASK 28-11-00-300-802).

(a) Synthetic rubber makes the base for most sealing compounds.

NOTE: The manufacturer adds ingredients to control strength, cure time, plasticity, usable life, and fuel resistance.

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(b) Sealants are supplied in two parts; base material and accelerator.

NOTE: You must be very careful to make sure the correct proportions of the base material and the accelerator recommended by the manufacturer are used. If you do not obey the manufacturer's instructions, you can change the physical properties of the mixture which can cause a seal failure and a fuel tank leak.

(c) Sealing compounds have a specified shelf life.

NOTE: After the specified time, you must do a test of the sealing compounds to find out if you can use them.

(d) You can keep some sealants in refrigeration for a short time after they are mixed with the accelerator.

NOTE: You must discard these sealants after the specified time.

SUBTASK 28-11-00-280-003

(3) Sealants are applied incorrectly (TASK 28-11-00-300-802).

(a) If you do not do the subsequent steps, fuel leaks can occur:

1) Follow all manufacturer's instructions.

2) Use a brush to apply precoat when recommended.

3) Do all the steps to apply the sealant.

4) Make sure there are no air bubbles in the sealant.

5) Make sure you fill all the spaces completely with sealant.

6) Make sure you do not make an overlap with the sealants.

7) Make sure the sealant touches all the surfaces.

SUBTASK 28-11-00-280-004

(4) The fasteners are loose.

(a) Loose fasteners start fuel leaks because they let attached surfaces move.

(b) Faying surface seals get cracks and let fuel leak through the seal plane (TASK 28-11-00-300-802).

(c) Loose rivets are not self-sealing.

(d) Sealant or metal seal covers do not bond with loose fasteners.

SUBTASK 28-11-00-280-005

(5) Fittings and connections are installed incorrectly.

(a) Fittings and connections attached to or that go through the fuel tank structure are sealed with O-rings.

NOTE: Damaged or incorrectly installed O-rings can cause fuel leaks.

E. Leak Path Analysis

SUBTASK 28-11-00-790-004

(1) After you find the external leak point and the internal leak source, find the point where fuel goes through the seal plane.

(a) The internal area where you see the bubble or dye usually shows the point where fuel goes through the seal plane.

(b) If there is an injection, prepack or hidden seal failure, the fuel can move along the tank structure and leak at a point far from the leak source.

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(c) If you repair the internal area where you see the bubble or dye and do not repair the injection, prepack or hidden seal failure, you can only temporarily repair the leak.

(d) You must find all possible leak paths between the external leak point and internal leak source to repair the seal failure.

NOTE: You can increase the height of the seal plane as an alternative to a repair of the seal.

SUBTASK 28-11-00-210-018

(2) The seal plane stops the fuel leaks from the fuel tank.

(a) When there is a seal plane failure, the mating surfaces of the tank structure, external to the seal plane, get wet.

NOTE: The area that gets wet extends in all directions from the point fuel goes through until it finds an injection, faying surface, prepack or hidden seal.

(b) There are no seals on the external side of the seal plane and fuel that goes through the seal plane follows the path of least resistance.

1) For example, a row of fasteners in a groove are wet but only one fastener has a leak.

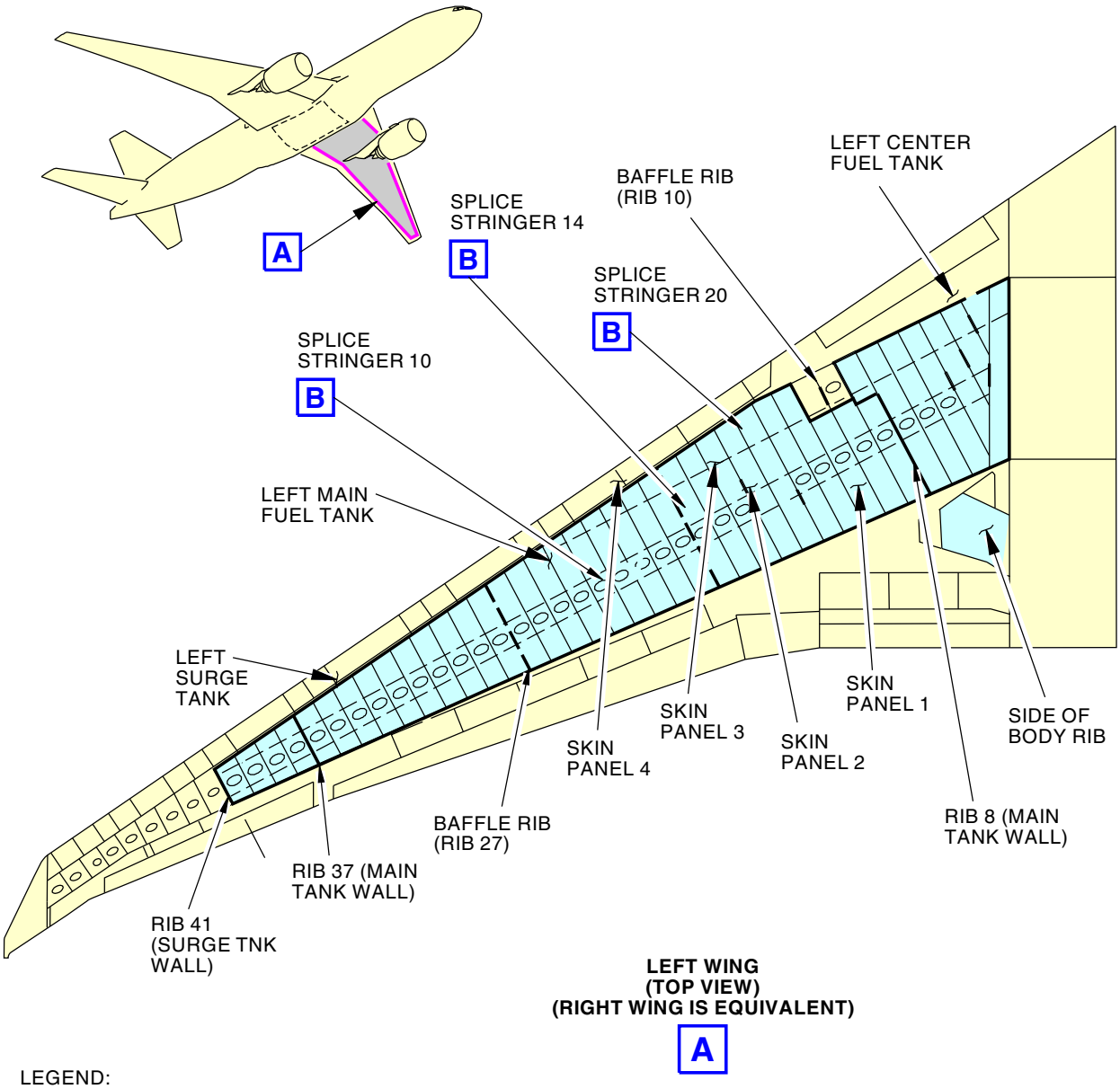
2) If the fastener with the leak is sealed, then the fastener with the subsequent least resistance will leak.

(c) If you find the leak path you can see how fuel gets from the internal leak source to the external leak point.

(d) To understand the leak, examine the tank structure and sealant.

——— END OF TASK ———

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LEFT WING
(TOP VIEW)
(RIGHT WING IS EQUIVALENT)

A

LEGEND:

SPLICE STRINGER (COVERS A SKIN JOINT)

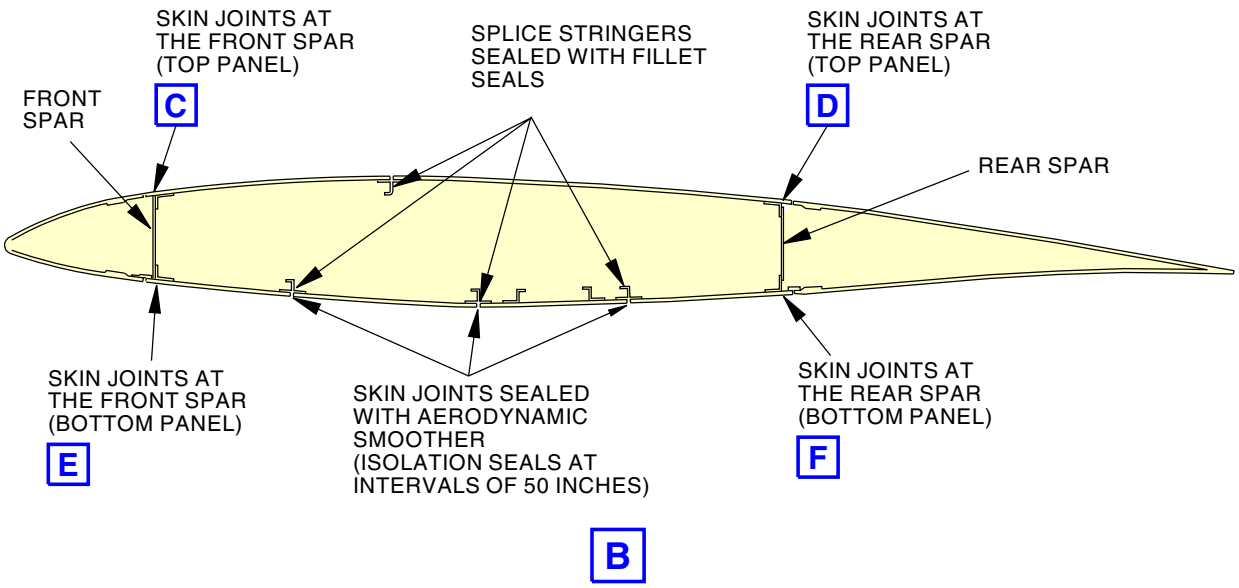
BAFFLE RIB (LIMTS FUEL FLOW)

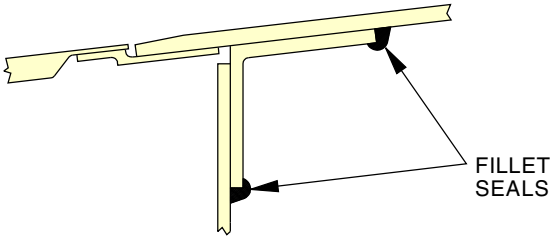
PRIMARY SEAL SURFACE (FUEL TANK BOUNDARY)

M45098 S0006414782_V5

Skin Joints and Fillet Seals of the Wing
Figure 603/28-11-00-990-803 (Sheet 1 of 2)

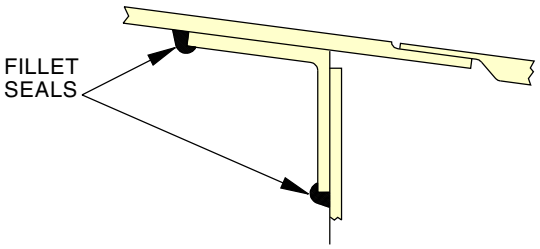
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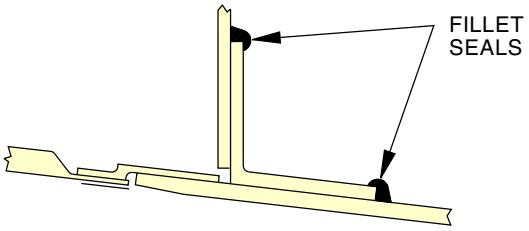
SKIN JOINTS AT THE FRONT SPAR (TOP PANEL)

C



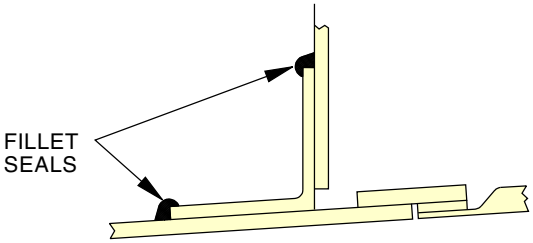
SKIN JOINTS AT THE REAR SPAR (TOP PANEL)

D



SKIN JOINTS AT THE FRONT SPAR (BOTTOM PANEL)

E



SKIN JOINTS AT THE REAR SPAR (BOTTOM PANEL)

F

D11153 S0006414783_V2

Skin Joints and Fillet Seals of the Wing
Figure 603/28-11-00-990-803 (Sheet 2 of 2)

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TASK 28-11-00-790-801

4. Fuel Leak Detection Procedures

(Figure 604)

A. General

(1) This task has procedures used to find a leak as follows:

NOTE: The procedures recommended to find the leak and the leak paths are "Find the External Leaks with Talcum Powder" and the "Air Pressure and Bubble Solution (Backblowing)" procedures.

(a) Find the External Leaks with Talcum Powder

(b) Air Pressure and Bubble Solution (Backblowing) procedure

(c) Air Bubble with Hollow Bolt procedure

NOTE: This procedure finds leaks in areas with complex structure.

(d) Dye Injection with Hollow Bolt

NOTE: This procedure finds leaks in areas with complex structure.

(e) Dye Injection procedure

NOTE: This procedure puts dye into the leak from outside the fuel tank and looks for dye inside the fuel tank.

(f) Internal Pressure and Bubble procedure

NOTE: This procedure pressurizes the fuel tank to help find leaks on the outside of the fuel tank with soap solution. After the leaks are found, the backblowing procedure can be used to find the internal leaks. This procedure can help find leaks after the other procedures have been tried and when there is no fuel in the fuel tanks.

(g) Find the Leaks at the Fuel Tank Access Doors

NOTE: This procedure gives fuel quantities to find access doors that leak.

(h) Find the Leaks in the Wing Dry Bay

NOTE: This procedure finds leaks in the wing dry bays.

(i) Leak Check

NOTE: This check fuels the airplane to make sure the leak is corrected.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
28-11-00-300-802	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-11-00-300-803	Repair of the Secondary Fuel Barrier Sealant (P/B 801)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)
28-11-03-000-801	Surge Tank Access Door - Removal (P/B 401)
28-11-03-400-801	Surge Tank Access Door - Installation (P/B 401)
28-11-05-000-801	Wing Dry Bay Access Door - Removal (P/B 401)
28-11-05-400-801	Wing Dry Bay Access Door Installation (P/B 401)

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(Continued)

Reference	Title
28-11-07-900-801	Rubber Door Seal - Replacement (P/B 801)
28-26-00-650-801	Pressure Defueling (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-1761	Leakage Tracing Device, Integral Tank Leakage Test Part #: F71329 Supplier: 81205
SPL-1774	Manometer - Water, Test Equipment Part #: F72951-1 Supplier: 81205
SPL-1777	Pressure Plug Equipment, Fuel System Part #: B28005-42 Supplier: 81205 Opt Part #: B28005-27 Supplier: 81205
SPL-6214	Console - Shop Air Supply Part #: J28010-139 Supplier: 81205 Opt Part #: J28010-135 Supplier: 81205 Opt Part #: J28010-26 Supplier: 81205
STD-123	Brush - Soft Bristle
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)
STD-1081	Flashlight - Explosion Proof
STD-1082	Source - Air, Regulated, Dry Filtered, 0-50 PSIG
STD-1084	Gauge - Pressure, 0-10 PSIG (0-69 KPa)

D. Consumable Materials

Reference	Description	Specification
C00070	Dye - Liquid For The Detection Of Leaks In Aircraft Fuel Systems	MIL-D-81298
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A
G00091	Compound - Oxygen System Leak Detection - Snoop Leak Detector	MIL-PRF-25567
G50304	Dye - T-100/OS-80 Fluorescent Tracer Dye (Blue-White Color)	BSS7074 (Supersedes BMS10-34)
G50957	Dye - T-100/OS-31 Fluorescent Tracer Dye (Green Color)	BSS7074 (Supersedes BMS10-34)

E. Location Zones

Zone	Area
139	Forward Keel Beam
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
532	Left Wing Dry Bay
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074

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(Continued)

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
632	Right Wing Dry Bay
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

F. Access Panels

Number	Name/Location
532AB	Wing Dry Bay Access Door
543DB	Pressure Relief Door
632AB	Wing Dry Bay Access Door
643DB	Pressure Relief Door

G. Prepare to Find the Leaks

SUBTASK 28-11-00-650-015

(1) Do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-11-00-650-016

(2) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-11-00-010-006

(3) Remove the applicable main tank access doors, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

SUBTASK 28-11-00-010-007

(4) To remove the applicable center tank access doors, do this task: Center Tank Access Door - Removal, TASK 28-11-02-000-801.

SUBTASK 28-11-00-010-008

(5) To remove the applicable surge tank access doors, do this task: Surge Tank Access Door - Removal, TASK 28-11-03-000-801.

SUBTASK 28-11-00-210-023

(6) If there is leakage from the upper surface of the wing center section, look for leakage in the fillet seals in the upper surface of the wing center section, and for leakage through the secondary fuel barrier on top of the wing center section.

NOTE: If leakage is found in the upper surface of the wing center section, you must also repair the secondary fuel barrier (TASK 28-11-00-300-803) before you release the airplane for flight.

SUBTASK 28-11-00-210-020

(7) Visual Procedure

(a) Examine the area you think contains a leak for seal defects such as cracked or loose fillets, pinholes, or loose fasteners.

NOTE: If it is necessary, use mirrors to examine seals which are difficult to see.

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CAUTION

HOLD THE AIR HOSE A MINIMUM OF ½ IN. (13 MM) FROM THE AIRPLANE STRUCTURE. IF THE AIR HOSE IS TOO NEAR THE AIRPLANE STRUCTURE, DAMAGE TO THE SEALS CAN OCCUR.

(b) Do a check of the fillet seals that you think have a bad bond.

(c) Rub the edges with a pencil eraser, or supply air at a maximum of 100 psig and at least 1/2 inch from seal.

(d) Look at the tank structure for cracks or distortion.

H. Find External Leaks with Talcum Powder

NOTE: This procedure is optional after you do a visual inspection when an access door is installed after removal for other maintenance. If you install the access door after it was repaired for a known leak, then this procedure is required.

SUBTASK 28-11-00-150-006

(1) Remove aerodynamic smoother if applied over the applicable seam or joint.

SUBTASK 28-11-00-160-010

(2) Rub the leak dry with a cotton wiper, G00034.

SUBTASK 28-11-00-360-007

(3) With a soft-bristle or camel-hair soft bristle brush, STD-123, apply talcum powder on the area you think contains the leak.

SUBTASK 28-11-00-210-019

(4) Look at the area with the talcum powder and see if the talcum powder changes color.

SUBTASK 28-11-00-930-001

(5) Make a mark on each leak and do the same procedure again until each external leak is found.

I. Air Pressure and Bubble Solution (Backblowing) Procedure

NOTE: This procedure gives good results for leaks detection.

SUBTASK 28-11-00-280-006

(1) Two persons are necessary to do this task:

(a) One person must be out of the fuel tank at the external location of the leak.

(b) One person must go into the fuel tank(s) and find the internal leak location(s).

1) The person(s) that goes into the fuel tank must have these items:

a) An explosion-proof explosion proof flashlight, STD-1081

b) Non-corrosive soap Snoop Leak Detector compound, G00091, or bubble bath

c) Marking pen (Berol Filmograph or equivalent)

(c) If the external leak location is near the side-of-body rib, the leak can be in the center fuel tank.

NOTE: It can be faster to put one person in each fuel tank to find the leaks.

SUBTASK 28-11-00-700-001

(2) The two persons must agree on a procedure to communicate.

(a) The person that is out of the fuel tank can knock on the airplane skin to make it easier for the person in the fuel tank to find the correct location.

(b) The person in the fuel tank must tell the person out of the fuel tank when to blow air through the external leak.

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(c) Agree on a system of knocks.

NOTE: For example, the person in the fuel tank can knock one time to start blowing air, two times if he finds a leak, and three times if the leak is not found.

SUBTASK 28-11-00-700-002

(3) The person in the fuel tank must apply the soap solution to a large area near the external leak location.

NOTE: The internal leak can easily be as far as 3 feet from the external location of the leak. Examine the internal surface of the tank for loose sealant or bad sealant or a bad fastener. This can help you make a decision about where to look for the internal leak. If the external leak is a fastener, find the fastener in the fuel tank. Examine this fastener before you try to find leaks in a different location.

(a) If the external leak location is in a skin joint (Figure 603), examine the fillet seal on the nearest splice stringer.

NOTE: Splice stringers are stringers that cover the joints of the airplane skin. There are three splice stringers in each wing. Faying surface seals (isolation seals) are applied at intervals of 30 inches along the splice stringers. These seals are applied between the splice stringers and the airplane skin. The purpose of these faying surface seals are to limit the length of a leak path to 30 inches. Leak paths and backblowing paths usually do not go through the isolation seals.

(b) If the external leak location is the front or rear spar, examine the fillet seals on the internal surface of the applicable spar.

(c) If the external leak location is at rib 8 or rib 1 (side-of-body) examine both sides of these ribs for leakage.

NOTE: Examine the full length of the fillet seals in the fuel tank. It is possible for the head pressure of the fuel in the fuel tank to cause the fuel to show at an external location that is higher than the internal leak location.

SUBTASK 28-11-00-700-003

CAUTION

HOLD THE AIR HOSE A MINIMUM OF 1/2 INCH FROM THE AIRPLANE STRUCTURE. IF YOU HOLD THE AIR HOSE LESS THAN 1/2 INCH FROM THE AIRPLANE STRUCTURE, DAMAGE TO THE SEALS CAN OCCUR.

(4) The person out of the fuel tank must use an 0-50 psig dry filtered regulated air source, STD-1082, with a nozzle to blow air through the external location of the leak (Figure 604).

(a) If the leak is small, it can be necessary to use the maximum pressure (100 psi).

(b) If the leak is larger, it is easier to find the leak with less pressure (for example 50 psi).

SUBTASK 28-11-00-700-004

(5) Have the person(s) in the fuel tank look for bubbles.

(a) Look for bubbles that show the location of the leak.

(b) It is also possible to feel for blowing air to find the leak.

(c) Find all the leak locations on the internal surface of the fuel tank.

NOTE: It is possible that three or four internal leaks are related to one external leak. Make a signal to the person out of the fuel tank to stop the blowing of air when you find all of the leaks.

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(d) Make a mark on these leak locations with a marking pen.

NOTE: If you are not sure you found the correct leak path, you can apply the bubble solution to the external leak location and blow air through the internal leaks. If the air blows through the external leak location, you found the correct leak path.

SUBTASK 28-11-00-700-005

(6) If you see bubbles, make a mark in and out of the fuel tank at the area where you see bubbles.

SUBTASK 28-11-00-700-006

(7) After you do a check on the full area, do a check again on the areas where you saw bubbles to make sure you isolate the leaks.

SUBTASK 28-11-00-700-007

(8) Clean the bubble solution in the fuel tank.

SUBTASK 28-11-00-700-008

(9) Repair the leaks that you find (TASK 28-11-00-300-802).

J. Air Bubble with Hollow Bolt Procedure

(Figure 605, Figure 606)

SUBTASK 28-11-00-280-007

(1) Remove the fastener.

NOTE: Refer to the structural repair manual for fastener removal.

SUBTASK 28-11-00-280-008

(2) Install the hollow bolt assembly.

SUBTASK 28-11-00-700-010

(3) Apply the noncorrosive soap solution to the area in the fuel tank that you think contains the leak.

SUBTASK 28-11-00-700-029

(4) Connect the integral fuel tank leak leakage tracing device, SPL-1761, to the hollow bolt.

SUBTASK 28-11-00-700-011

CAUTION

MAKE SURE THE FUEL TANK VENTS ARE OPEN AND NOT BLOCKED. IF THE FUEL TANK IS CLOSED (ACCESS DOORS INSTALLED AND VENTS BLOCKED), THE FUEL TANK PRESSURE CAN INCREASE AND CAUSE DAMAGE TO EQUIPMENT.

(5) Supply air pressure with an compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to the leakage tracing device, SPL-1761, and look for air bubbles in the fuel tank.

NOTE: Use a lower pressure (1-5 psi), to look for leaks.

SUBTASK 28-11-00-700-012

(6) Make a mark at the locations where you see air bubbles in the fuel tank.

SUBTASK 28-11-00-700-013

(7) Remove the hollow bolt assembly.

SUBTASK 28-11-00-700-014

(8) Install the fastener.

NOTE: Refer to the structural repair manual for fastener installation.

SUBTASK 28-11-00-700-015

(9) Clean the bubble solution from the fuel tank.

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K. Dye Injection with Hollow Bolt Procedure

(Figure 605, Figure 606)

NOTE: Use this procedure only after you use the Air Bubble with Hollow Bolt Procedure.

SUBTASK 28-11-00-280-014

(1) Remove the fastener.

NOTE: Refer to the structural repair manual for fastener removal.

SUBTASK 28-11-00-280-015

(2) Install the hollow bolt assembly.

SUBTASK 28-11-00-700-016

(3) Connect the integral fuel tank leak leakage tracing device, SPL-1761, to the hollow bolt.

SUBTASK 28-11-00-700-030

CAUTION

MAKE SURE THE FUEL TANK VENTS ARE OPEN AND NOT BLOCKED. IF THE FUEL TANK IS CLOSED (ACCESS DOORS INSTALLED AND VENTS BLOCKED), THE FUEL TANK PRESSURE CAN INCREASE AND CAUSE DAMAGE TO EQUIPMENT.

(4) Supply air pressure with an compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to the integral leak leakage tracing device, SPL-1761.

SUBTASK 28-11-00-700-017

(5) Make sure you monitor the dye container, gage, and equipment while they are in position.

SUBTASK 28-11-00-700-018

(6) Add one of the dyes that follow, through the hollow bolt:

(a) T-100/OS-31 green fluorescent tracer dye, G50957.

(b) T-100/OS-80 blue-white fluorescent tracer dye, G50304.

(c) liquid dye, C00070.

SUBTASK 28-11-00-700-019

(7) Remove the integral fuel tank leak tracing device.

SUBTASK 28-11-00-700-020

(8) Remove the hollow bolt assembly.

SUBTASK 28-11-00-700-021

(9) Install the fastener.

NOTE: Refer to the structural repair manual for fastener removal.

SUBTASK 28-11-00-700-022

(10) Make a mark at the location where you first see the dye.

SUBTASK 28-11-00-700-023

(11) Use a cotton wiper, G00034 to remove all the dye.

SUBTASK 28-11-00-700-024

(12) To repair or replace the sealant, do this task: Repair of Sealant Leaks in the Fuel Tank Structure, TASK 28-11-00-300-802.

L. Dye Injection Procedure

NOTE: This method injects dyed fuel through the external leak point to find the internal leak source. You can use dye in maximum concentrations of 2 fluid ounces per 100 gallons of fuel.

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SUBTASK 28-11-00-280-009

(1) Put the integral fuel tank leak leakage tracing device, SPL-1761, in position near external leak (Figure 605).

SUBTASK 28-11-00-790-005

(2) Use the leak tracing tool to add one of the dyes that follow, through the external leak:

(a) T-100/OS-31 green fluorescent tracer dye, G50957.

(b) T-100/OS-80 blue-white fluorescent tracer dye, G50304.

(c) liquid dye, C00070.

SUBTASK 28-11-00-790-006

(3) Continue to add pressure until the dye shows in the fuel tank.

SUBTASK 28-11-00-790-007

(4) Make a mark at the point where dye is first seen.

SUBTASK 28-11-00-790-008

(5) Remove the leak tracing tool.

SUBTASK 28-11-00-790-009

(6) Use a cotton wiper, G00034, to remove all the dye.

SUBTASK 28-11-00-790-010

(7) To repair or replace the sealant, do this task: Repair of Sealant Leaks in the Fuel Tank Structure, TASK 28-11-00-300-802.

M. Internal Pressure and Bubble Procedure

NOTE: Use this method after all other methods are tried. When it is difficult to find the leaks on the outside surface of the wing, the fuel tank can be pressurized and a bubble solution applied to the wing. Bubbles will show the external leak points.

SUBTASK 28-11-00-480-002

(1) Install the pressure pressure plug equipment, SPL-1777, equipment as follows:

NOTE: A pressure gauge (0-10 PSIG) (0-69 KPa), STD-1084, should be used with pressure plug equipment B28005-42.

(a) Install the scoop plug assemblies in the surge tank vent scoop openings.

(b) Remove the applicable access panels:

(TASK 28-11-03-000-801)

Number	Name/Location
543DB	Pressure Relief Door
643DB	Pressure Relief Door

(c) Install the tank cover assemblies in the openings of the surge tank access doors.

SUBTASK 28-11-00-410-011

(2) Install all other fuel tank access doors that are removed (TASK 28-11-01-400-801, TASK 28-11-02-000-801, TASK 28-11-03-400-801).

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SUBTASK 28-11-00-480-003

WARNING BLOW INTO THE MANOMETER HOSE AND MAKE SURE THAT THE WATER LEVEL CHANGES. THIS WILL SHOW THAT THE MANOMETER IS FREE OF ALL BLOCKAGES AND OPERATES SAFELY. IF THE MANOMETER IS NOT CLEAR, INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT COULD OCCUR.

(3) Connect water manometer, SPL-1774, assembly to the adapter on the tank cover assembly (Figure 606).

NOTE: You can also use the shop air supply console, SPL-6214.

SUBTASK 28-11-00-780-001

WARNING REMOVE ALL PERSONNEL FROM THE FUEL TANK BEFORE YOU PRESSURIZE IT. DO NOT PRESSURIZE IT TO MORE THAN THE MAXIMUM SAFE PRESSURE OF 5.20 PSI (35.85 KPA). INJURIES TO PERSONNEL CAN OCCUR.

(4) Supply 4 psig (28 kPa) air pressure to fuel tank.

SUBTASK 28-11-00-700-025

(5) Apply the bubble solution to the area out of the fuel tank that you think contains the leak.

SUBTASK 28-11-00-210-021

(6) Watch the area that you think has the leak for bubbles.

NOTE: The size of the leak can cause the bubbles to show very slowly. It can be necessary to constantly watch to see the leak.

SUBTASK 28-11-00-200-001

(7) Make a mark at the locations where you see bubbles.

SUBTASK 28-11-00-100-001

(8) Use a moist cotton wiper, G00034, to remove the bubble solution from the external surface of the fuel tank.

SUBTASK 28-11-00-780-002

(9) Remove the pressure from the fuel tank.

SUBTASK 28-11-00-080-004

(10) Remove the pressure pressure plug equipment, SPL-1777, equipment as follows:

(a) Remove the pressure plug equipment from the surge tank vent scoop openings.

(b) Remove the pressure plug equipment from the surge tank pressure relief valve door openings.

SUBTASK 28-11-00-410-012

(11) Install the access panels that follow:

(TASK 28-11-03-400-801)

Number	Name/Location
543DB	Pressure Relief Door
643DB	Pressure Relief Door

SUBTASK 28-11-00-080-005

(12) Disconnect the water manometer assembly from the adapter on the tank cover assembly.

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SUBTASK 28-11-00-700-026

(13) Use one of the procedures given above to find the internal leak source.

SUBTASK 28-11-00-700-027

(14) Repair or replace the sealant as necessary (TASK 28-11-00-300-802).

N. Find the Leaks at the Fuel Tank Access Doors

SUBTASK 28-11-00-650-030

(1) Fill the applicable fuel tank to a level which will cover the access door that you think has a fuel leak Table 601.

NOTE: The fuel quantities in Table 601 are approximate values when the airplane is at the nominal attitude of -0.7 degrees pitch and 0 degrees wing roll. The fuel quantities required to cover the access doors will increase or decrease at different attitudes. For the most outboard access doors in the main fuel tanks fill the tanks to volumetric shutoff (VSO). The fuel quantities required to cover theses access doors will change due to changes in fuel density and the amount of expansion space in each main fuel tank.

Table 601/28-11-00-993-849 Fuel Necessary to Cover the Access Doors

ACCESS DOORS LEFT/RIGHT	FUEL (LBS)	FUEL (KG)
139AZ	29669	13485
531AB/631AB	37003	16820
531BB/631BB	51579	23445
531CB/631CB	67349	30613
CENTER PURGE DOOR	93156	42344
533AB/633AB	354	177
533BB/633BB	1133	515
533CB/633CB	2402	1090
533DB/633DB	4019	1827
533EB/633EB	5873	2670
533FB/633FB	13736	6244
533GB/633GB	16911	7687
541AB/641AB	20443	9292
541BB/641BB	24227	11012
541CB/641CB	28221	12828
541DB/641DB	32311	14687
541EB/641EB	36017	16371
541FB/641FB	39568	17985
541GB/641GB	42827	19467
541HB/641HB	45859	20845
541JB/641JB	48635	22107
541KB/641KB	51202	23724

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Table 601/28-11-00-993-849 Fuel Necessary to Cover the Access Doors (Continued)

ACCESS DOORS LEFT/RIGHT	FUEL (LBS)	FUEL (KG)
541B/641LB	53631	24378
541MB/641MB	56136	25516
541NB/641NB	58424	26556
541PB/641PB	60498	27499
541QB/641QB	62402	28365
542AB/642AB	64088	29131
542BB642BB	65468	29758
543AB/643AB	66708	30322
543BB/643BB	67827	30831
543CB/643CB	68854	31297

SUBTASK 28-11-00-280-010

(2) Examine the access door for leaks using Find External Leaks with Talcum Powder Procedure.

NOTE: This procedure is optional after you do a visual inspection when an access door is installed after removal for other maintenance. If you install the access door after it was repaired for a known leak, then this procedure is required.

SUBTASK 28-11-00-280-011

(3) Repair or replace the access door as applicable (TASK 28-11-01-400-801, TASK 28-11-02-000-801, TASK 28-11-07-900-801).

O. Find the Leaks in the Wing Dry Bay

(Figure 607)

SUBTASK 28-11-00-210-022

(1) To find a leak in the dry bay, look at the two drain holes on the bottom of the wing dry bay No. 1 and the lower wing surface of the dry bay (Figure 605)

SUBTASK 28-11-00-280-021

(2) Find the bay (1 or 2) within the wing dry bay that the leak starts from.

NOTE: The fuel leak at a drain hole does not always correspond to the dry bay that is the source of the fuel leak. The fuel leak can flow down a stringer and go out one of the drain holes. Use the drain holes only as an aid to find where the source of a fuel leak is.

SUBTASK 28-11-00-280-013

(3) If there is a leak from the dry bay, isolate the leak with the Air Pressure and Bubble Solution (Backblowing) procedure, do these steps:

(a) To defuel the applicable main fuel tank, do this task: Pressure Defueling, TASK 28-26-00-650-801.

(b) Remove the applicable fuel tank access doors (TASK 28-11-01-000-801).

(c) Remove this access door to get access to the dry bay in the left wing:

(TASK 28-11-05-000-801

Number	Name/Location
532AB	Wing Dry Bay Access Door

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(d) Remove this access door to get access to the dry bay in the right wing:

(TASK 28-11-05-000-801

Number	Name/Location
632AB	Wing Dry Bay Access Door

WARNING OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. FAILURE TO OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS COULD CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(e) To purge the wing dry bay and the applicable main fuel tank, do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

(f) Have one person go into the fuel tank and one person go into the dry bay.

(g) Find the bay (1 or 2) within the wing dry bay that the leak starts from.

NOTE: The fuel leak at a drain hole does not always correspond to the dry bay that is the source of the fuel leak. The fuel leak can flow down a stringer and go out one of the drain holes. Use the drain holes only as an aid to find where the source of a fuel leak is.

(h) After you find the leak(s) do the backblowing procedure to isolate the leaks in the fuel tank.

(i) Apply noncorrosive soap solution to all sealed joints in the fuel tank for the dry bay that leaks.

NOTE: This includes areas where sealant has been extended to adjacent structure.

(j) Identify all the areas where there are air bubbles.

(k) Identify all the areas where there is fuel leakage.

(l) To repair or replace the sealant, do this task: Repair of Sealant Leaks in the Fuel Tank Structure, TASK 28-11-00-300-802.

P. Leak Check

SUBTASK 28-11-00-700-028

(1) Do these steps to check for fuel leaks after the repairs are finished:

(a) Remove all materials from the fuel tank and go out of the tank.

(b) Install the applicable fuel tank access doors (TASK 28-11-01-400-801, (TASK 28-11-02-400-801).

(c) To refuel the applicable fuel tank(s), do this task: Pressure Refueling, TASK 12-11-01-650-801.

(d) Look at the area of the repair for 1 hour and make sure there are no leaks.

(e) If removed, install the access door:

(TASK 28-11-05-400-801

Number	Name/Location
532AB	Wing Dry Bay Access Door

(f) If removed, install the access door:

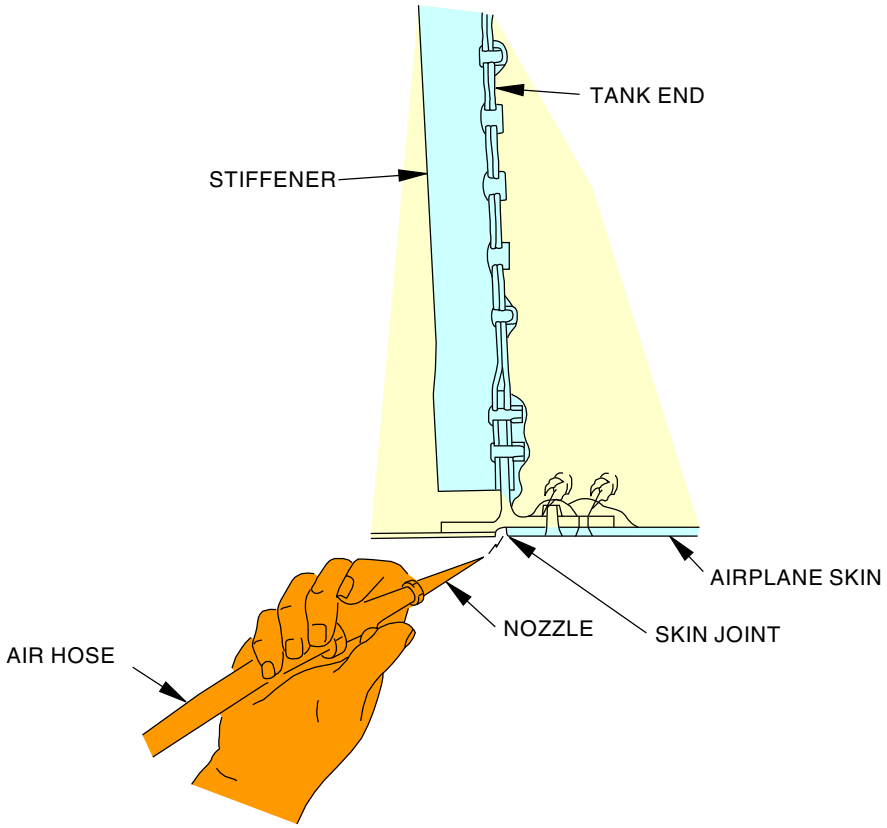
(TASK 28-11-05-400-801

Number	Name/Location
632AB	Wing Dry Bay Access Door

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END OF TASK

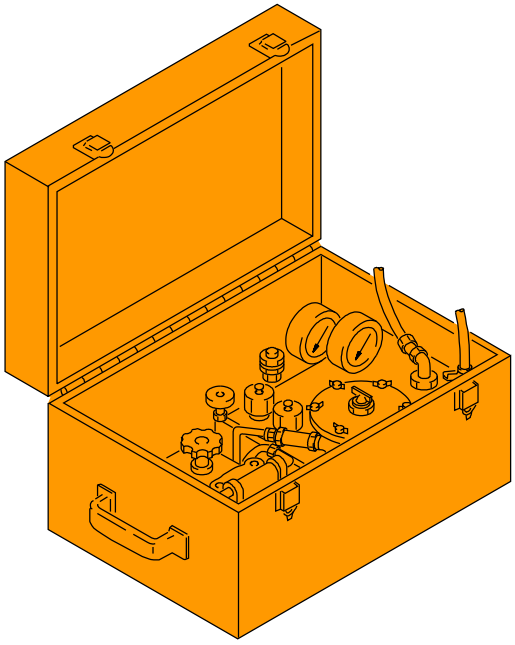
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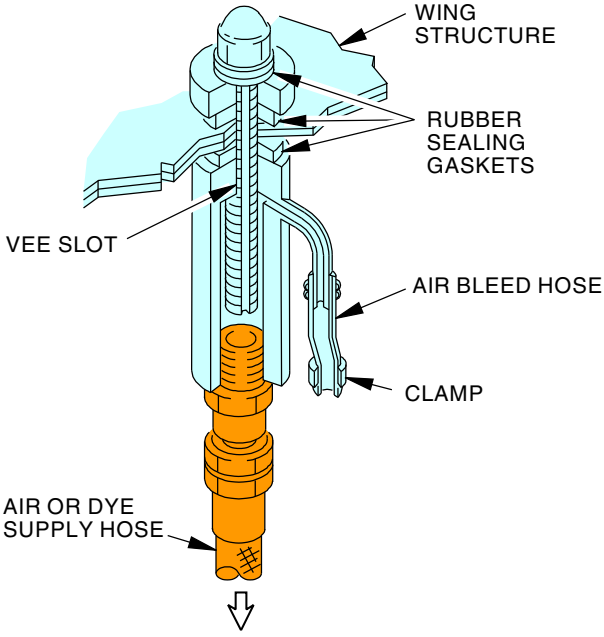
D11131 S0006414788_V2

Backblowing Procedure (Example)
Figure 604/28-11-00-990-804

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LEAK TRACING DEVICE (F71329)



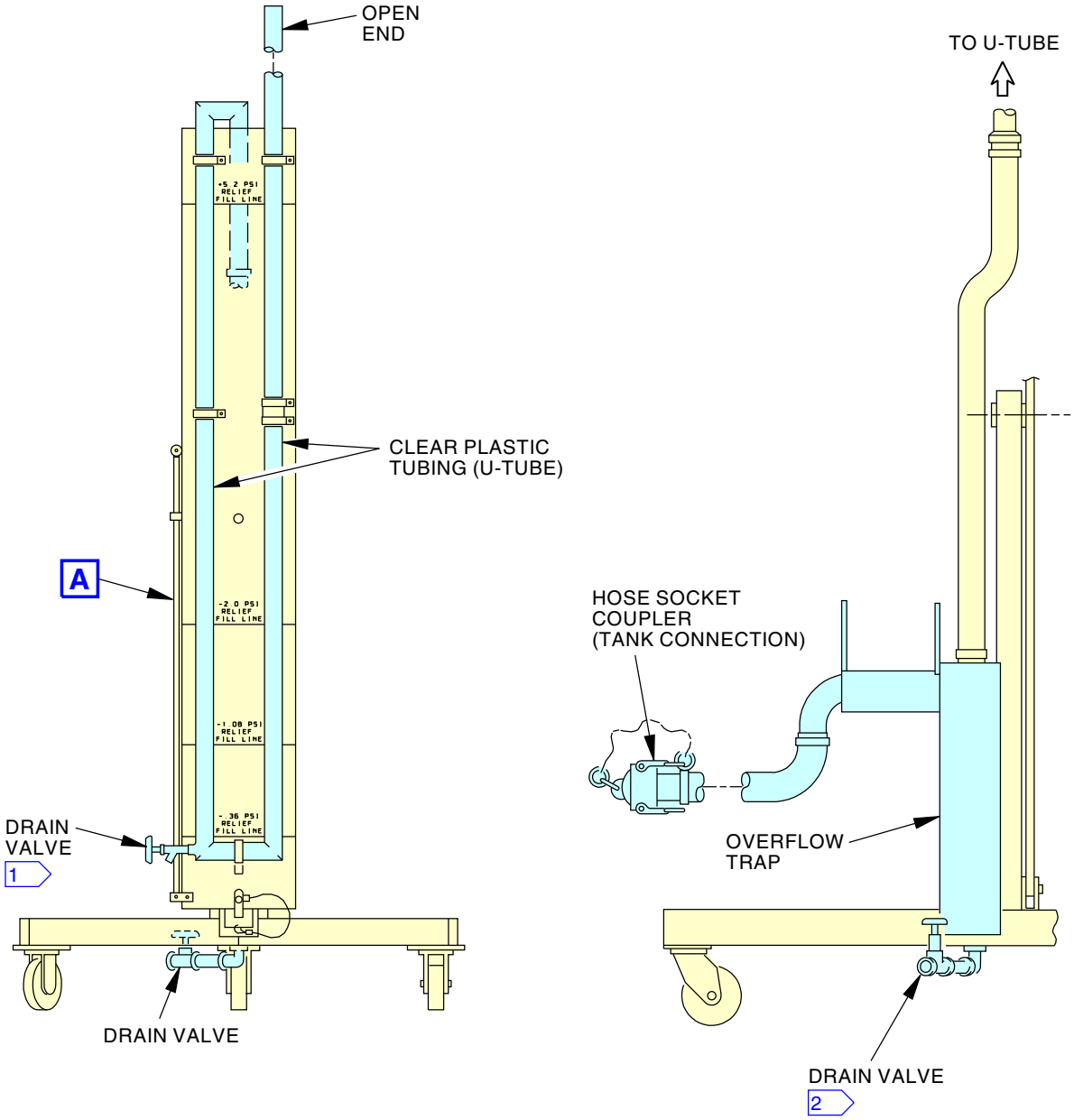
ADAPTER ASSEMBLY - FUEL LEAK TRACING HOLLOW BOLT (F70206-1)

1 MONITOR THE PRESSURE EQUIPMENT CONSTANTLY TO MAKE SURE THE PRESSURE IS NOT MORE THAN THE MAXIMUM SAFE PRESSURE

E51653 S0006414789_V2

Hollow Bolt for Areas With Complex Structure
Figure 605/28-11-00-990-805

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NOTE: DRAIN THE MANOMETER AFTER YOU USE IT TO PREVENT FREEZING.

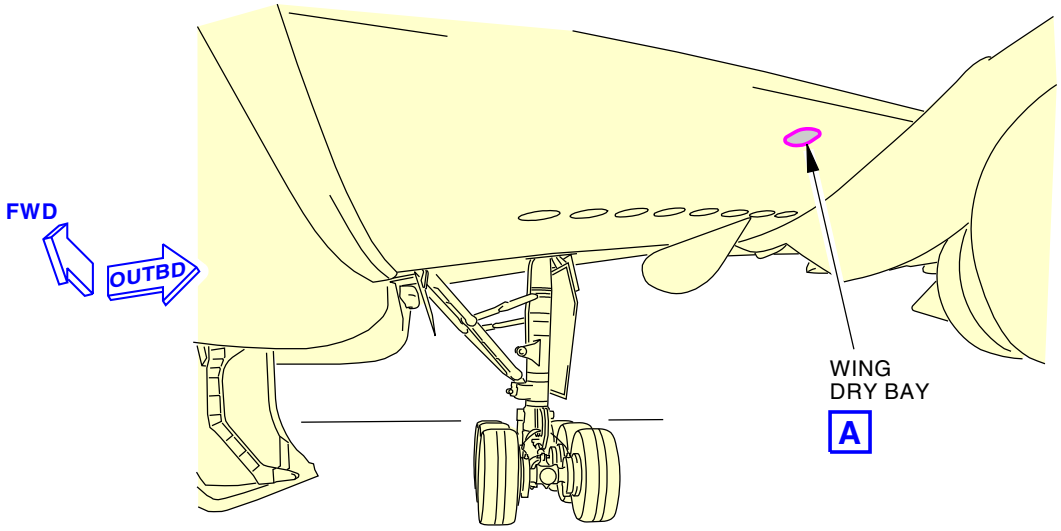
1 USE THE VALVE TO ADJUST THE FILL LEVEL AND TO DRAIN THE TUBING

2 USE THE VALVE TO DRAIN THE OVERFLOW TRAP

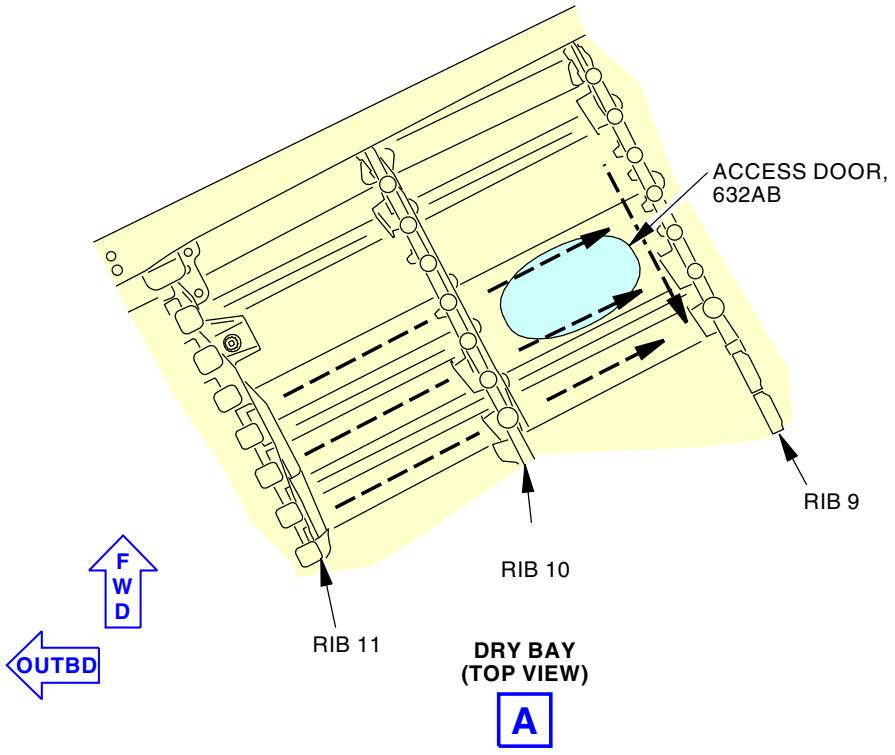
E51652 S0006414790_V2

Water Manometer Assembly
Figure 606/28-11-00-990-806

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LEFT WING
(RIGHT WING IS EQUIVALENT)



1975382 S0000380239_V2

Dry Bay Drain Holes
Figure 607/28-11-00-990-807

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TASK 28-11-00-790-803

5. Surge Tank Access Door Leak Test Procedure

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
12-11-01-650-808	Pressure Refueling - With Inoperative Refuel Valves (P/B 301)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)

B. Location Zones

Zone	Area
532	Left Wing Dry Bay
533	Main Tank - Rib 8 to Rib 17 - Left Wing
632	Right Wing Dry Bay
633	Main Tank, Rib 8 To Rib 17 - Right Wing

C. Procedure

SUBTASK 28-11-00-650-027

(1) To do a leak test of the left surge tank doors, fill the left main tank to its full capacity (to automatic shutoff). To do this, do this task: Pressure Refueling, TASK 12-11-01-650-801

SUBTASK 28-11-00-650-028

(2) To do a leak test of the right surge tank doors, fill the right tank to its full capacity (to automatic shutoff). To do this, do this task: Pressure Refueling, TASK 12-11-01-650-801

SUBTASK 28-11-00-790-022

(3) Do these steps to add fuel to the applicable main tank to get the overflow fuel into the adjacent surge tank:

(a) Manually open one of the fueling shutoff valves for the applicable main tank (TASK 12-11-01-650-808).

(b) Slowly add 100 gallons to the applicable main tank (the left or the right main tank) to cover the surge tank access doors with fuel.

NOTE: Open one of the fueling shutoff valves manually to add fuel beyond the automatic shutoff quantity.

(c) Manually close the fueling shutoff valve that you opened before (TASK 12-11-01-650-808).

SUBTASK 28-11-00-790-023

(4) Permit the fuel to stay in the surge tank for a minimum of one hour.

SUBTASK 28-11-00-280-019

(5) Examine the applicable access door for leaks using Find External Leaks with Talcum Powder Procedure.

SUBTASK 28-11-00-790-024

(6) Make sure there is no leakage from the applicable surge tank access door.

SUBTASK 28-11-00-650-029

(7) If it is necessary, adjust the fuel quantities in the fuel tanks. To do this, do this task: Pressure Refueling, TASK 12-11-01-650-801

or, do this task: Tank to Tank Transfer, TASK 28-26-00-650-802

END OF TASK

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TASK 28-11-00-790-802

6. Helitest Leak Detection Procedure

A. References

Reference	Title
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-300-802	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-6882	Test Kit - Fuel Leak Part #: 969-4450 Supplier: 4K2P3 Part #: ASM-102 Supplier: F6180 Part #: DET-HWK Supplier: 4K2P3
STD-77	Air Source - Regulated, Dry Filtered, 0-50 psig
STD-1074	Scissors
STD-8422	Helium - Pressure, Regulated, Supply
STD-11112	Equipment - Ventilation, Positive or Negative

C. Consumable Materials

Reference	Description	Specification
B01002	Solvent - General Cleaning Of Solvent Resistant Organic Coatings - Series 82	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A
G00252	Film - Polyethylene Film And Sheeting	ASTM D2103 (Supersedes L-P-512)
G02329	Tape - Aluminum Foil, Pressure Sensitive - Vibration Damping Tape 434	
G50004	Tape - Vacuum Bag Sealant, SM 5126 Tacky Tape	

D. Procedure

SUBTASK 28-11-00-790-011

(1) Find the location of the external leak (TASK 28-11-00-790-801).

SUBTASK 28-11-00-790-012

(2) Defuel the tank that has the leak (TASK 28-26-00-650-801 or TASK 28-26-00-650-802).

SUBTASK 28-11-00-860-018

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(3) For the tank with the leak, do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

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SUBTASK 28-11-00-100-002

(4) Apply 0-50 psig dry filtered regulated air source, STD-77, to a maximum of 50 psig (345 kPa), to the external leak point to dry the fuel leak path.

SUBTASK 28-11-00-100-003

(5) Completely clean and dry the area immediately surrounding the external leak point with Series 82 solvent, B01002.

SUBTASK 28-11-00-480-037

(6) Do one of these two steps:

(a) Install one of the pressure cups supplied in the fuel leak test kit, COM-6882, to keep the pressure of helium on the outer surface of the tank.

NOTE: This is the recommended method.

1) Install SM 5126 tacky tape, G50004, around the pressure cup.
2) Attach the helium injection tube to the cup with the fittings supplied with the fuel leak test kit, COM-6882.

(b) Build a custom plastic pressure chamber around the external leak point with plastic film.

1) Install SM 5126 tacky tape, G50004, around the leak area.
   a) Work the tape to stick it to the surface.
2) Use scissors, STD-1074, to cut a piece of polyethylene film, G00252, to the size of the chamber formed by the SM 5126 tacky tape, G50004.
3) Set the plastic over the tape.
4) Work the plastic to make sure it sticks well to the tape.
5) Make sure the chamber is as small as possible.

   NOTE: A small chamber can hold more helium pressure than a larger one.
6) Trim the plastic with a razor knife to follow the outline of the vacuum tape.
7) Apply Vibration Damping Tape 434 tape, G02329, or equivalent, over the plastic chamber and work it well for the best adhesion.
   a) Use a sufficiently large quantity of Vibration Damping Tape 434 tape, G02329, to reinforce the plastic helium chamber so it can handle more pressure.
8) Wrap the helium injection tube with vacuum tape to form a 2 in. (5 cm) diameter flange 1.5 ±0.5 in. (3.8 ±1.3 cm) from the end of the tube.
9) Slice a small hole in the plastic chamber and put the helium tube in the hole.
10) Work the tape flange on the injection tube so it sticks well and seals the plastic chamber.

SUBTASK 28-11-00-480-038

(7) Set up the fuel leak test kit, COM-6882, and purge the lines with the helium, STD-8422, to remove air.

NOTE: Refer to the instructions supplied with the kit.

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SUBTASK 28-11-00-790-013

(8) Carefully and slowly apply approximately 0.2 psig (1.4 kPa) of helium, STD-8422, to the pressure cup or chamber.

NOTE: Start with low pressure and then slowly increase the pressure. Less helium is necessary for larger leaks than for smaller leaks. Too much helium will flood the fuel tank. Inspect the chamber or rubber cup to make sure there is no leakage. If it leaks too much, rebuild the chamber because the helium can interfere with the detector.

SUBTASK 28-11-00-790-014

(9) Use the ventilation equipment, STD-11112, to draw leaking helium away from the area to make sure it does not interfere with the detector by drifting into the tank.

SUBTASK 28-11-00-790-015

(10) Permit the helium to soak into the leak path for 10 to 15 minutes before you go into the tank.

NOTE: Time is necessary to push the remaining fuel out of the leak path and start the flow of helium from the external leak point to the internal leak point.

SUBTASK 28-11-00-790-016

WARNING KEEP THE DETECTOR AND THE PUMP AWAY FROM THE TANK. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(11) Make sure you keep the fuel leak test kit, COM-6882, detector and the auxiliary pump away from the open fuel tank at all times.

SUBTASK 28-11-00-790-017

(12) Go into the tank with the fuel leak test kit, COM-6882, Visual Probe (intrinsically safe for Class I, Div I areas).

SUBTASK 28-11-00-790-018

(13) Slowly probe the inside of the tank.

NOTE: Patience is important. With a systematic approach, slowly move away from the area where you expect to find the leak until you find the exact location of the leak.

SUBTASK 28-11-00-790-019

CAUTION DO NOT PUT THE PROBE INTO FUEL PUDDLES. IT CAN CAUSE DAMAGE TO THE INSTRUMENT.

(14) If there is a puddle of fuel in the area where you expect to find the leak, use a cotton wiper, G00034 ,and compressed air to dry the area.

(a) Build cotton wiper, G00034, dams to soak up additional running fuel.

(b) Completely dry hidden areas.

(c) If fuel is drawn into the fuel leak test kit, COM-6882, probe, immediately remove it to a safe area and permit it to operate until all the fuel is vaporized.

1) Disconnect the Visual Probe gas line and permit it to run dry also.

2) Replace the wet filter on the visual probe tip with a dry filter.

3) Do not shut the fuel leak test kit, COM-6882, off while it is contaminated with fuel because permanent damage can occur.

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SUBTASK 28-11-00-790-020

(15) If you do not find the leak, increase the helium, STD-8422, to 0.6 psig (4.1 kPa), and then to 1.2 psig (8.3 kPa).

(a) Continue to increase the helium, STD-8422, pressure in similar increments until the leak is found.

NOTE: The compression chamber can hold 3.5 ±1.5 psig (24.1 ±10.4 kPa) maximum. The maximum pressure depends on the size of the chamber. A smaller chamber can hold a larger pressure.

SUBTASK 28-11-00-360-008

(16) When you find the leak, repair it with the applicable repair procedure (TASK 28-11-00-300-802).

SUBTASK 28-11-00-790-021

(17) After the leak repair, do another test of the leak with the fuel leak test kit, COM-6882, equipment before you remove the helium chamber from the outside of the tank.

NOTE: This procedure makes sure the leak was repaired correctly.

SUBTASK 28-11-00-110-007

(18) Do these steps to put the area back to its usual condition:

(a) Remove the pressure chamber or pressure cup and the tape.

(b) Clean the area around the leak with Series 82 solvent, B01002.

END OF TASK

TASK 28-11-00-210-801

7. External Wires Over the Center Fuel Tank - Inspection

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This task has one or more steps which are a means to satisfy Airworthiness Limitation Instruction (ALI) requirements. An ALI note will follow the step to which it applies. Any step or sub-step that precedes or follows an ALI identified step is not subject to the ALI requirement.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-01.

(2) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-02.

(3) This task does a detailed inspection of the wire bundles routed over the center fuel tank and under the main deck floor boards.

(a) The area that is inspected is approximately between body station 1035 and body station 1245.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)

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(Continued)

Reference	Title
25-24-08-000-801	Class Divider Removal (P/B 401)
25-24-08-400-801	Class Divider Installation (P/B 401)
25-25-01-000-801	Passenger Seat - Removal (P/B 401)
25-25-01-400-801	Passenger Seat - Installation (P/B 401)
25-27-01-000-801	Carpet (Without Adhesive Back) Removal (P/B 401)
25-27-01-400-801	Carpet (Without Adhesive Back) Installation (P/B 401)
25-31-02-000-805	Mid Galley Removal (P/B 401)
25-31-02-400-805	Mid Galley Installation (P/B 401)
25-41-01-000-801	Lavatory Removal (P/B 401)
25-41-01-400-801	Lavatory Installation (P/B 401)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
53-01-01-000-801	Floor Panel Removal (P/B 401)
53-01-01-400-801	Floor Panel Installation (P/B 401)
SWPM 20-10-11	WIRING ASSEMBLY AND INSTALLATION CONFIGURATION
SWPM 20-10-13	Repair of Electrical Wire and Cable
SWPM 20-10-22	Repair of Seal Fittings

C. Location Zones

Zone	Area
131	Area Above Wing Center Section, Left
132	Area Above Wing Center Section, Right

D. Prepare for the Inspection

SUBTASK 28-11-00-010-012

(1) Do these steps to get access to the area between the floor and the top of the center fuel tank:

(a) Remove the seats (TASK 25-25-01-000-801).

(b) If it is applicable, remove the class dividers (TASK 25-24-08-000-801).

(c) Remove the carpets (TASK 25-27-01-000-801).

(d) If it is applicable, remove the galley M5 (TASK 25-31-02-000-805).

(e) If it is applicable, remove the lavatory (TASK 25-41-01-000-801).

(f) Remove the passenger cabin floor panels (TASK 53-01-01-000-801).

E. External Wires Over the Center Fuel Tank Inspection

SUBTASK 28-11-00-211-001

28-AWL-01: ALI

(1) Do a detailed inspection of the wire bundles routed over the center fuel tank and under the main deck floor boards:

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-01.

(a) Do the inspection from approximately body station 1035 to body station 1245.

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28-AWL-02: CDCCL

(b) Keep the existing (or newly approved) wire bundle routing, clamping and sleeving.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-02.

28-AWL-01: ALI

28-AWL-02: CDCCL

(c) Look for these items:

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-01 and 28-AWL-02.

28-AWL-01: ALI

28-AWL-02: CDCCL

1) Damaged wire bundles and clamps

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-01 and 28-AWL-02.

28-AWL-01: ALI

28-AWL-02: CDCCL

2) Visible damage to sleeving (if installed)

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-01 and 28-AWL-02.

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28-AWL-01: ALI

28-AWL-02: CDCCL

3) Wire chafing

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-01 and 28-AWL-02.

28-AWL-01: ALI

28-AWL-02: CDCCL

4) Wire bundles that touch (are in contact with) the surface of the center fuel tank.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitations 28-AWL-01 and 28-AWL-02.

SUBTASK 28-11-00-210-041

(2) If you found a problem, do these steps:

(a) Remove electrical power from the airplane (TASK 24-22-00-860-806).

(b) Do the applicable repair (SWPM 20-10-11, SWPM 20-10-13, SWPM 20-10-22).

F. Put the Airplane Back to Its Usual Condition

SUBTASK 28-11-00-410-019

(1) For the area between the floor and the top of the center fuel tank, do these steps to install the parts that you removed to do the inspection:

(a) Install the passenger cabin floor panels (TASK 53-01-01-400-801).

(b) If it is applicable, install the lavatory (TASK 25-41-01-400-801).

(c) If it is applicable, install the galley M5 (TASK 25-31-02-400-805).

(d) Install the carpets (TASK 25-27-01-400-801).

(e) If it is applicable, install the class dividers (TASK 25-24-08-400-801).

(f) Install the seats (TASK 25-25-01-400-801).

SUBTASK 28-11-00-860-022

(2) If it is necessary, supply electrical power to the airplane (TASK 24-22-00-860-805).

——— END OF TASK ———

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FUEL TANKS - CLEANING/PAINTING

1. General

A. This procedure contains these tasks:

(1) Apply the Corrosion Resistant Finish (Topcoat)

(a) Repair or replace bad sealant in the fuel tank before you apply the topcoat (TASK 28-11-00-300-802).

(2) Clean the Fuel Tanks Contaminated with Red Dye.

(3) Examine and Close the Fuel Tank.

TASK 28-11-00-600-801

2. Apply the Corrosion Resistant Finish (Topcoat)

A. General

(1) Corrosion resistant finish (topcoat) is applied to prevent corrosion to the internal structural and tubing surfaces, especially the bottom and lower sides, of the fuel tank. BMS 10-20 Type II and MIL-C-27725 are two types of corrosion resistant material which are approved for internal fuel tank use. An advantage of BMS 10-20 Type II finish material is that you can make additional BMS 5-45 sealant repairs, if necessary, after you apply the finish material if it is fully heat cured before sealant is applied. The MIL-C-27725 material can only be used as a topcoat after the sealant installation is complete.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-30-81-910-801	General Cleaning of Solvent Sensitive Organic Coatings (Series 81) (P/B 201)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
20-41-00-910-801	Static Grounding (P/B 201)
28-11-00-300-802	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-11-00-300-804	Analysis of the Fuel Leak Type (P/B 601)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)
28-11-03-400-801	Surge Tank Access Door - Installation (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1064	Scraper - Phenolic, Hard Resin
STD-1080	Brush - Paint
STD-1119	Blower - Air, Explosion Proof, 90-100 Cubic Feet per Minute, Includes sufficient hose to reach all areas of Fuel Tanks
STD-1120	Fan - Exhaust, Centrifugal, Explosion Proof, 125-150 Cubic Feet per Minute, Includes 75 feet of 3 Inch suction hose and sufficient delivery hose to carry air out of work area

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D. Consumable Materials

Reference	Description	Specification
B00102	Abrasive - Aluminum Oxide Coated Cloth	
B00148	Solvent - Methyl Ethyl Ketone (MEK)	ASTM D740
B00184	Solvent - Presealing, Cleaning Solvent	BMS11-7
B01001	Solvent - General Cleaning Of All Organic Coatings - Series 81	
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
C00064	Coating - Aluminum Chemical Conversion	BAC5719 Type II Class A (MIL-DTL-5541 Class 1A)
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20 Type II
C00321	Coating - Corrosion Preventive Coating For Aircraft Integral Fuel Tanks	AMS-C-27725 (Supersedes MIL-C-27725)
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A
G00270	Tape - Scotch Flatback Masking 250	ASTM D6123 (Supersedes A-A-883)
G02088	Abrasive - Silicon Carbide, Waterproof Paper	

E. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
532	Left Wing Dry Bay
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
632	Right Wing Dry Bay
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074

F. Prepare to Apply the Corrosion Resistant Finish (Topcoat)

SUBTASK 28-11-00-650-009

(1) Do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-11-00-650-010

WARNING

OBEY THE FUEL TANK PURGING AND ENTRY PRECAUTIONS. IF YOU DO NOT OBEY THE FUEL TANK PURGING AND ENTRY PRECAUTIONS INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

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SUBTASK 28-11-00-480-004

WARNING MAKE SURE THERE IS AN ELECTRICAL GROUND FOR ALL VENTILATION EQUIPMENT IN OR NEAR AN OPEN FUEL TANK. SPARKS IN OR NEAR AN OPEN FUEL TANK COULD CAUSE A FIRE OR EXPLOSION.

(3) Connect the hoses and nozzles to an electrical ground (TASK 20-41-00-910-801).

SUBTASK 28-11-00-480-005

(4) Set up the air explosion proof, 90-100 CFM air blower, STD-1119 and the flexible hose to have a good flow of air in the fuel tank.

SUBTASK 28-11-00-160-005

CAUTION MAKE SURE THE CAPACITY OF THE EXHAUST FAN IS MORE THAN THE CAPACITY OF THE AIR BLOWER. THE CAPACITY OF THE EXHAUST FAN MUST BE MORE THAN THE CAPACITY OF THE AIR BLOWER TO MAKE SURE THERE IS A GOOD FLOW OF AIR.

(5) Use the exhaust explosion proof 125-150 CFM exhaust fan, STD-1120 and hoses to move exhaust air from the fuel tank to an open space away from the work area or hangar.

SUBTASK 28-11-00-210-010

(6) Examine the internal fuel tank and tubing surfaces for fungus (mildew) and corrosion.

NOTE: A slimy, black layer on the inner surfaces of the fuel tank, soon after defueling, shows fungus contamination. As it dries, the layer becomes solid and turns light brown in color.

(a) If there is fungus or corrosion, clean the fuel tank.

SUBTASK 28-11-00-140-002

(7) Remove all loose finish with a wood or plastic hard resin phenolic scraper, STD-1064 and sand the surface with aluminum oxide abrasive cloth, B00102, paper or disks.

(a) Do a check for loose finish on the surfaces adjacent to those with loose finish and other areas you are not sure about.

1) Apply a strip of pressure sensitive Scotch Flatback Masking Tape 250, G00270, to the applicable surface.

2) Push on the pressure sensitive tape with constant and hard pressure.

3) Pull the pressure sensitive tape off the surface with a quick movement, vertical to the surface.

4) Examine the surface and the pressure sensitive tape for signs of loose finish.

a) If there are signs of loose finish, remove the loose finish.

SUBTASK 28-11-00-120-001

(8) Use wet abrasive, G02088, paper to make all finish areas and adjacent areas you will apply a layer to, rough.

SUBTASK 28-11-00-160-006

(9) Use a cotton wiper, G00034 soaked in cleaning solvent, B00148, and rub all unwanted materials from the applicable surfaces.

SUBTASK 28-11-00-160-007

(10) Use a clean cotton wiper, G00034 to make the surfaces dry.

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SUBTASK 28-11-00-160-008

(11) Remove by suction all unwanted materials from the fuel tank.

SUBTASK 28-11-00-370-002

(12) If alodine metal surface treatment is worn or damaged, do the "Alodine Metal Surface Treatment" procedure before you apply the finish.

SUBTASK 28-11-00-390-002

(13) If sealant is damaged by removal of corrosion resistant finish, do this task: Repair of Sealant Leaks in the Fuel Tank Structure, TASK 28-11-00-300-802.

SUBTASK 28-11-00-210-011

(14) Make sure all equipment used to apply the corrosion resistant finish is clean.

(a) If you are not sure, clean the equipment in MEK solvent, B00148, before you apply the corrosion resistant finish.

SUBTASK 28-11-00-210-012

(15) Make sure that all surfaces of the fuel tank that you apply corrosion resistant finish to are clean.

(a) If you are not sure, clean the surfaces of the fuel tank with BMS 11-7 solvent, B00184, before you apply the corrosion resistant finish.

SUBTASK 28-11-00-210-013

(16) Make sure the storage life of the corrosion resistant compounds that are not mixed is not expired.

(a) The storage life of BMS 10-20 coating, C00307, Type II, Class A is 12 months at 40 ° to 90 °F (4.4 ° to 32.2 °C) from the date of manufacture.

(b) The storage life of MIL-C-27725 corrosion resistant finish coating, C00321, is as follows:

1) For DeSoto 823-011 or 823-730 the storage life is 12 months at 50 ° to 90 °F (10.0 ° to 32.2 °C) from the date of manufacture.

2) For Products Research Co. PR-1560M, PR-1560MC, PR-1560MK the storage life is 6 months at 50 ° to 90 °F (10.0 ° to 32.2 °C) from the date of manufacture.

SUBTASK 28-11-00-210-014

(17) Make sure there is sufficient corrosion resistant material to apply the corrosion resistant finish.

SUBTASK 28-11-00-950-001



CAUTION

REMOVE ALL MASKING TAPE AFTER YOU APPLY THE CORROSION RESISTANT FINISH. FAILURE TO REMOVE ALL THE MASKING TAPE COULD BLOCK THE SUCTION INLETS OF THE FUEL BOOST PUMP.

(18) Apply masking Scotch Flatback Masking Tape 250, G00270, to all non structural equipment areas in the fuel tank which are near the surfaces that you apply the corrosion resistant finish (topcoat) to.

NOTE: Do not apply the corrosion resistant finish (topcoat) to

electrical bonding surfaces, clamps, O-rings, valves, fuel measuring sticks, tank units, wiring, pumps, filler caps or other non structural equipment.

SUBTASK 28-11-00-220-002

(19) Make sure you keep the corrosion resistant finish at 50 ° to 100 °F (10.00 to 37.8 °C) with less than 85 percent relative humidity while you apply it.

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G. Alodine Metal Surface Treatment

SUBTASK 28-11-00-370-003

(1) If alodine metal surface treatment is worn or damaged, do the steps that follow before you apply topcoat:

WARNING

DO NOT GET ALODINE 600 POWDER OR PREPARED SOLUTION IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE ALODINE POWDER OR SOLUTION. PUT ON A RESPIRATOR, GOGGLES, RUBBER OR NEOPRENE GLOVES, BOOTS AND OUTER CLOTHING. SOAK ALL MATERIALS USED TO APPLY OR REMOVE ALODINE SOLUTION IN WATER AFTER USE. ALODINE IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(a) To prepare the alodine coating, C00064, do the steps that follow:

1) Measure 1 gallon of distilled water, or water with a solids content of less than 50 ppm, into a clean, stainless steel container.
2) Add 3 ounces of Alodine 600 powder.

   NOTE: Mix the powder before use.
3) Mix the powder in the water until you make a solution.

   NOTE: A small quantity of powder may not become a liquid.
4) Let the alodine solution stand a minimum of 1 hour before use.

(b) To apply the alodine solution, do the steps that follow:

1) Remove all burrs or particles from the surface and make nicks or scratches smooth.

WARNING

DO NOT GET SOLVENTS IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE HAZARDOUS MATERIALS. SOLVENTS MAY BE FLAMMABLE OR HARMFUL TO THE ENVIRONMENT. REFER TO PRODUCT MATERIAL SAFETY DATA SHEETS (MSDS) AND LOCAL REQUIREMENTS FOR PROPER HANDLING PROCEDURES.

2) Clean the metal surfaces with Series 88 solvent, B01008 (TASK 20-30-88-910-801).
3) Apply alodine solution to the metal surface with a hard resin phenolic scraper, STD-1064 brush, swab, and a soaked cotton wiper, G00034.

   NOTE: If the alodine solution does not apply smoothly, the metal surface is not cleaned correctly.
4) Keep the surface continuously moist with the alodine solution until a layer is made.

   NOTE: It can take 1 to 5 minutes to make a layer. The time is related to the temperature.
5) Flush with clean water or carefully rub with a soft cotton wiper, G00034 to remove unwanted alodine solution.

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H. Apply the Corrosion Resistant Finish (Topcoat)

WARNING

HAVE A GOOD FLOW OF AIR IN THE AREA THAT YOU APPLY THE CORROSION RESISTANT FINISH (TOPCOAT). DO NOT GET THE CORROSION RESISTANT FINISH IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE THE CORROSION RESISTANT FINISH. KEEP THE CORROSION RESISTANT FINISH AWAY FROM SPARKS, FLAME AND HEAT. THE CORROSION RESISTANT FINISH IS A POISONOUS AND FLAMMABLE COMPOUND WHICH CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

SUBTASK 28-11-00-620-002

WARNING

MAKE SURE THERE IS A GOOD FLOW OF AIR IN THE AREA WHERE YOU MIX THE CORROSION RESISTANT FINISH. ONLY QUALIFIED PERSONS WHO WEAR RESPIRATORS CAN MIX THE CORROSION RESISTANT FINISH OR BE IN THE AREA. THE CORROSION RESISTANT FINISH IS A POISONOUS AND FLAMMABLE COMPOUND WHICH CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(1) To mix the corrosion resistant finish, do the steps that follow:

(a) Make sure the materials are at 60 ° to 90 °F (15.6 ° to 32.2 °C) before you mix them.

(b) Shake the base component for 10 minutes in a shaker.

(c) Measure proportional volumes of base and catalyst, and reducer or thinner if you want to apply the corrosion resistant finish with a spray gun, refer to (Table 701).

(d) Mix the base and the catalyst.

(e) Add a reducer if it is necessary.

Table 701/28-11-00-993-837

Corrosion Resistant Finish Mixing Proportions						
Manufacturer	Component	METHOD OF APPLICATION				
		SPRAY			BRUSH	
		Manufacturer Designation	Parts By Volume	Viscosity Zahn No. 1 72° ±2° F	Manufacturer Designation	Parts By Volume
Bostick West (BMS 10-20 Type II)	Base Catalyst Reducer	454-1 CA109 TL-52	3 1 approx 1	31-40 seconds	454-1 CA-109	3 1
Desoto (MIL-C-27725)	Base Activator Reducer	823-011 910-099 020-037	4 1 approx 4	31-40 seconds	823-011 910-099 020-037	4 1 0-4
	Base Activator Reducer	823-730 910-702 020-707	4 1 approx 4	31-40 seconds	823-730 910-702 020-707	4 1 0-4
Products Research (MIL-C-27725)	--------- ---------	Part A Part B	1 2	31-40 seconds	Part A Part B	1 2

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SUBTASK 28-11-00-620-003

(2) Do not use the corrosion resistant finish until a minimum of 1 hour after you mix it.

NOTE: The maximum usable life of the corrosion resistant finish is 8 hours at 75 ° ±5 °F (23.9 ° ±2.8 °C).

(a) Immediately after you mix the corrosion resistant finish, write the date, the time you mixed the finish, and the usable life expiration on the containers.

1) Keep the containers with the corrosion resistant finish tightly closed until you use it or the finish will become thicker.

SUBTASK 28-11-00-620-004

(3) To apply the corrosion resistant finish, use the brush procedure or spray gun procedure as follows:

(a) For the brush procedure (applicable for small areas), do the steps that follow:

1) Apply a thin layer of corrosion resistant finish (approximately 0.0005 inch) with a soft bristle paint brush, STD-1080 to apply the finish.

NOTE: Move the brush in one direction as much as possible.

a) To prevent air bubbles, spaces and removal of finish already applied, do not move the brush quickly or too many times when you apply the corrosion resistant finish.

2) Let the corrosion resistant finish dry for a minimum of 30 minutes.

3) Apply a second thin layer like the first layer.

4) Make sure the corrosion resistant finish you applied makes an overlap with all adjacent topcoat applied before.

(b) For the spray gun procedure (recommended for large areas), do the steps that follow:

1) Set the spray gun to 40 psi air pressure and 5 to 10 psi fluid pressure.

2) Apply the corrosion resistant finish with a spray gun on the surface.

3) Let the corrosion resistant finish dry for a minimum of 30 minutes.

4) Apply the second layer like the first layer.

5) Make sure the corrosion resistant finish you applied makes an overlap with all adjacent topcoat applied before.

SUBTASK 28-11-00-110-001

(4) Clean the equipment and tools after you apply the corrosion resistant finish (topcoat).



WARNING

DO NOT GET SOLVENTS IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE HAZARDOUS MATERIALS. SOLVENTS MAY BE FLAMMABLE OR HARMFUL TO THE ENVIRONMENT. REFER TO PRODUCT MATERIAL SAFETY DATA SHEETS (MSDS) AND LOCAL REQUIREMENTS FOR PROPER HANDLING PROCEDURES.

(a) Clean the equipment with Series 81 solvent, B01001 (TASK 20-30-81-910-801) immediately after use.

(b) Soak the brushes in Series 81 solvent, B01001 (TASK 20-30-81-910-801) immediately after use.

NOTE: Discard the brushes when the bristles become rigid.

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SUBTASK 28-11-00-620-005

(5) Cure the corrosion resistant finish.

(a) Cure all finish layers, refer to (Table 702).

(b) The cure time can decrease if you increase the temperatures and, with some finish compounds, increase relative humidity (Figure 701, Figure 702, Figure 703, Figure 704).

(c) Do the solvent (MEK) or fuel resistance check that follows to make sure the cure is complete.

1) Soak a 4-inch square pad of cotton wiper, G00034 with solvent or fuel.

2) Apply the cotton wiper, G00034 to the surface you check and let the solvent or fuel soak the area.

3) Use hard pressure and rub the area 100 strokes.

NOTE: Count each movement in one direction as a stroke.

4) Look and see if the corrosion resistant finish is removed.

NOTE: If you can see metal, the corrosion resistant finish is removed.

a) If you do not see metal, the cure is satisfactory.

Table 702/28-11-00-993-838

CORROSION RESISTANT FINISH (BY MFGR.)	CURE TIME BEFORE FUEL EXPOSURE *[1]	CURE TIME BEFORE TRAFFIC	CURE TIME BEFORE ASSEMBLY *[1]	CURE TIME BEFORE SEALING *[2]
Bostick West (BMS 10-20 TYPE II)	12 hours at 65° F or higher or Fig. 702. *[3]	12 hours at 65° F or higher, or Fig. 702 *[3]	12 hours at 65° F or higher, or Fig. 702 *[3]	Fig. 702 *[3]
Desoto (MIL-C-27725)	Fig. 703 *[3]	24 hrs at 65° F or higher,	Fig. 704 or 240 Hrs at 65° F or higher *[3]	Not Applicable
Products Research (MIL-C-27725)	Fig. 705	24 hours at 65° F or higher	240 Hrs at 75° F and minimum of 30 percent relative humidity	Not Applicable

*[1] Do the fuel resistance check to make sure the cure is completed.

*[2] Do the MEK resistance check to make sure the cure is completed.

*[3] Let the finish dry a minimum of 30 minutes at the temperature you applied it at, before you cure the finish at a higher temperature.

I. Return the Airplane to Its Usual Configuration

SUBTASK 28-11-00-950-002

(1) Make sure all masking tape is removed from the fuel tank and tank equipment.

SUBTASK 28-11-00-410-008

(2) Install all substructure, support brackets, and fuel tank equipment removed for access.

SUBTASK 28-11-00-210-015

(3) Make sure that all tools, cotton wiper, G00034, hoses, and other equipment are removed from the fuel tank.

SUBTASK 28-11-00-410-009

(4) To install the applicable access doors:

(a) Do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

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(b) Do this task: Center Tank Access Door - Installation, TASK 28-11-02-400-801.

(c) Do this task: Surge Tank Access Door - Installation, TASK 28-11-03-400-801.

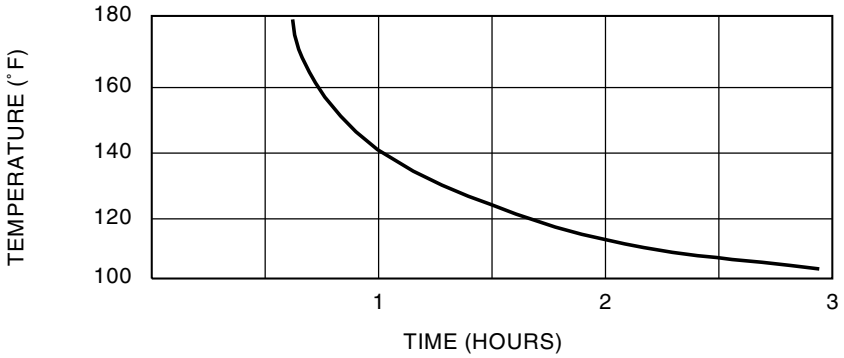
SUBTASK 28-11-00-650-011

(5) Do this task: Pressure Refueling, TASK 12-11-01-650-801.

SUBTASK 28-11-00-210-016

(6) Make sure there are no fuel leaks, do this task: Analysis of the Fuel Leak Type, TASK 28-11-00-300-804.

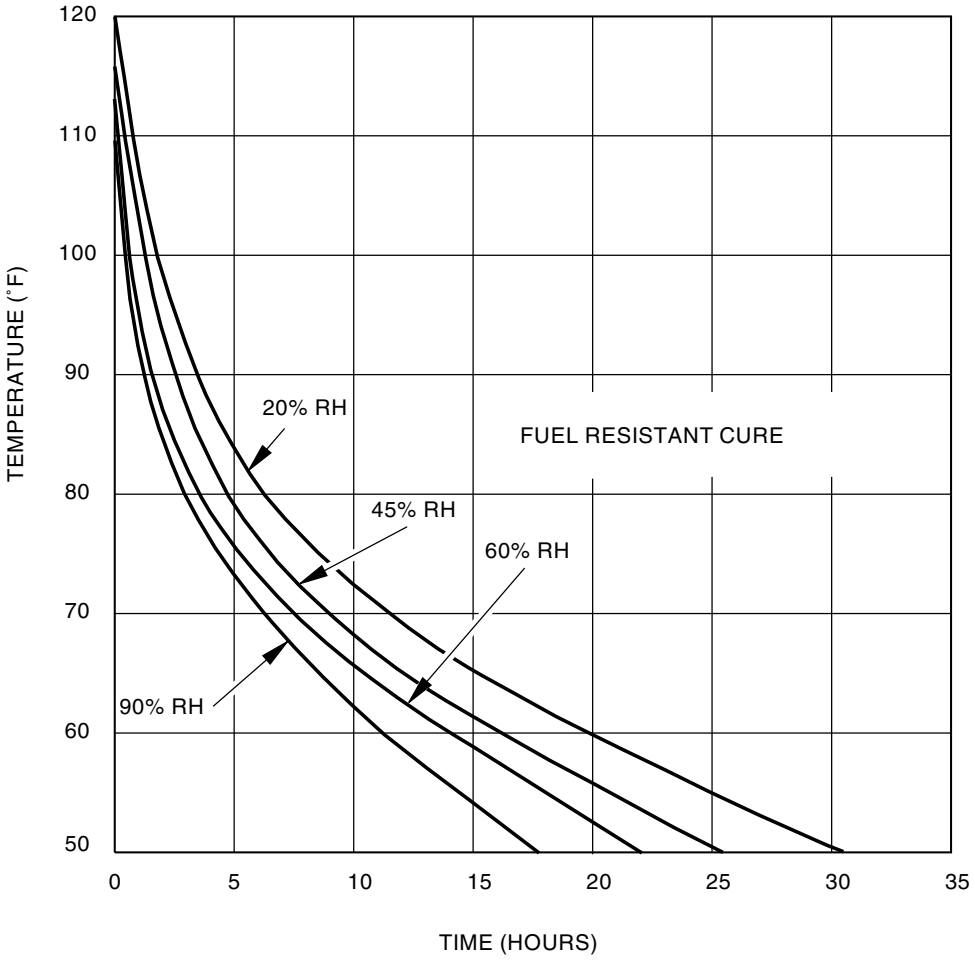
END OF TASK



C51029 S0006414802_V2

Bostik-Finch (BMS 10-20 Type II) Compound Cure Time Versus Temperature
Figure 701/28-11-00-990-814

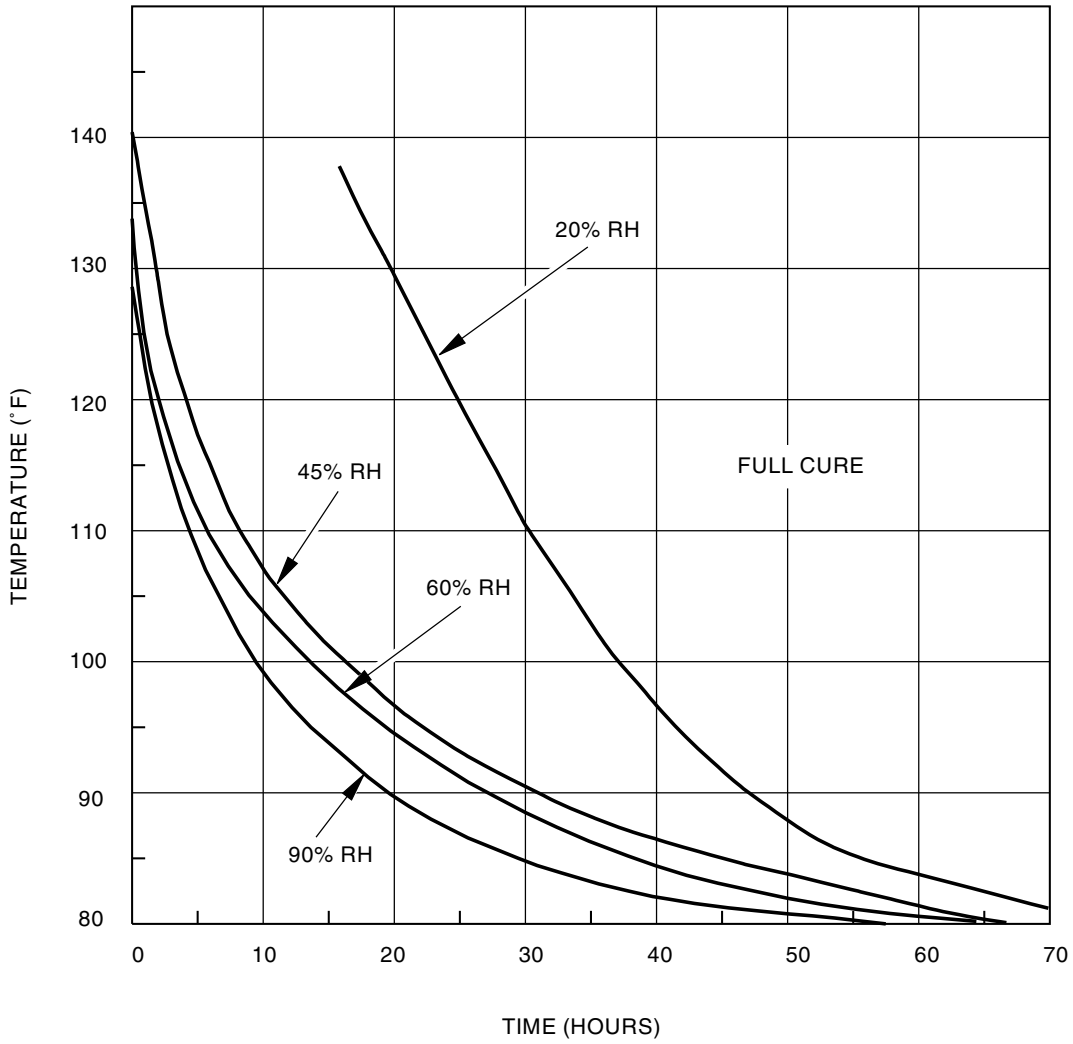
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C51039 S0006414803_V2

DeSoto (MIL-C-27725) Compound Fuel Resistant Cure Time Versus Temperature and Relative Humidity (RH)
Figure 702/28-11-00-990-815

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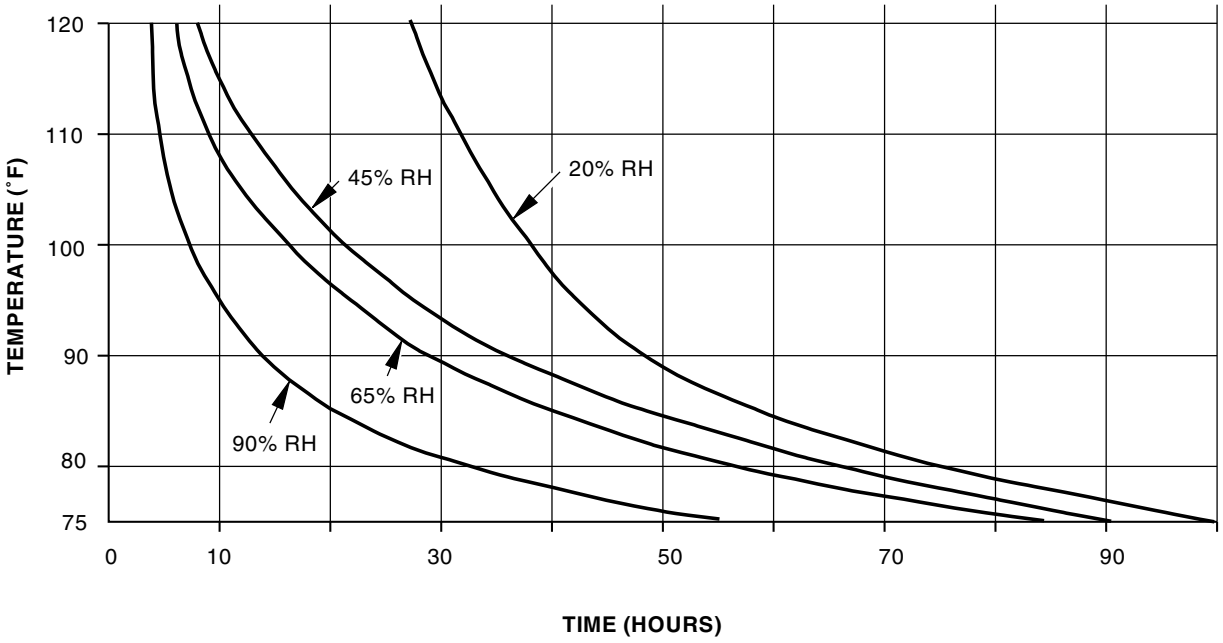


C51050 S0006414804_V2

DeSoto (MIL-C-27725) Compound Full Cure Time Versus Temperature and Relative Humidity (RH)
Figure 703/28-11-00-990-816

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% RELATIVE HUMIDITY (RH)	TEMPERATURE (˚F)	
	65	70
20	392	228
45	376	212
65	344	184
90	240	124



C51077 S0006414805_V2

Products Research (MIL-C-27725) Compound Cure Time Versus Temperature and Relative Humidity (RH)
Figure 704/28-11-00-990-817

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TASK 28-11-00-100-802

3. Clean the Fuel Tanks Contaminated with Red Dye

A. General

(1) Do the procedure that follows if:

(a) The concentration of red dye is more than 0.28 milligrams per liter as indicated by the JT-100S analyzer or equivalent.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
12-11-02-650-801	Fuel Tank Sump Drain Valve - Tank Entry (P/B 301)
12-11-02-680-801	Fuel Tank Sump Drain Valve - Water Removal/Sampling (P/B 301)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-26-00-650-801	Pressure Defueling (P/B 201)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)
71-00-00-800-805-H01	Engine Automatic Start (P/B 201)
71-00-00-800-837-H00	Usual Engine Stop (P/B 201)
73-11-02-000-801-H01	Fuel Filter Element Removal (P/B 401)
73-11-02-400-801-H01	Fuel Filter Element Installation (P/B 401)

C. Procedure

SUBTASK 28-11-00-860-015

(1) Do not start or operate the engines or the APU.

SUBTASK 28-11-00-650-020

(2) Defuel the fuel tanks to the fuel tank sump levels. To defuel them, do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-11-00-650-021

(3) Drain the fuel tank sumps and leave only trapped fuel. To drain them, do this task: Fuel Tank Sump Drain Valve - Tank Entry, TASK 12-11-02-650-801.

SUBTASK 28-11-00-020-003

(4) Remove the fuel filter. To remove it, do this task: Fuel Filter Element Removal, TASK 73-11-02-000-801-H01.

SUBTASK 28-11-00-020-004

(5) Do a check of the engine fuel filter and the fuel filter bowl for signs of contamination of the fuel.

(a) Replace the filter if you think that there is contamination. To replace it, do this task: Fuel Filter Element Installation, TASK 73-11-02-400-801-H01.

(b) If there is no contamination, install the same filter. To install it, do this task: Fuel Filter Element Installation, TASK 73-11-02-400-801-H01.

SUBTASK 28-11-00-650-022

(6) Refuel the fuel tanks with new clean fuel. To refuel them, do this task: Pressure Refueling, TASK 12-11-01-650-801.

NOTE: For most airplane fuel tanks, this will give a dilution ratio of new fuel to trapped fuel in the range of 1,000:1 to 10,000:1.

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SUBTASK 28-11-00-210-024

(7) Take a sample of the fuel from the tank sumps. To take a sample, do this task: Fuel Tank Sump Drain Valve - Water Removal/Sampling, TASK 12-11-02-680-801.

SUBTASK 28-11-00-210-025

(8) If you see signs of continued contamination, repeat the defueling and refueling steps above.

(a) If the contamination continues, remove all fuel from the tank, including trapped fuel. To remove the trapped fuel from the tank, do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

SUBTASK 28-11-00-860-016

(9) If the samples from the fuel tank sumps do not show signs of contamination, do the subsequent steps:

(a) Start the engines, do this task: Engine Automatic Start, TASK 71-00-00-800-805-H01.

(b) Start the APU, do this task: APU Starting and Operation, TASK 49-11-00-860-804.

(c) Let them operate until the dirty fuel is flushed from the fuel system.

(d) Make sure that the engine and its controls operate correctly in all standard power settings.

(e) Stop the engines, do this task: Usual Engine Stop, TASK 71-00-00-800-837-H00.

(f) Stop the APU, do this task: APU Usual Shutdown, TASK 49-11-00-860-805.

(g) Speak to the engine and APU manufacturers about more inspections or tests.

SUBTASK 28-11-00-020-005

(10) After you operate the engine and the APU, remove the fuel filter. To remove it, do this task: Fuel Filter Element Removal, TASK 73-11-02-000-801-H01.

SUBTASK 28-11-00-210-026

(11) Do a check of the engine fuel filter and the fuel filter bowl for signs of contamination of the fuel.

(a) If you see no signs of contamination, do these steps:

1) Install the filter, do this task: Fuel Filter Element Installation, TASK 73-11-02-400-801-H01.

2) Operate the airplane as usual.

(b) If you see signs of contamination, do these steps:

1) Clean the filter bowl.

2) Replace the filter, do this task: Fuel Filter Element Installation, TASK 73-11-02-400-801-H01.

SUBTASK 28-11-00-860-017

(12) If the engines do not operate correctly, or if contamination continues, you will possibly have to do more engine inspections and tests.

NOTE: Speak to the engine and APU manufacturer for more procedures for their equipment.

SUBTASK 28-11-00-280-018

(13) If you operated the engines for a long time with contaminated fuel, you must fully examine the engine fuel system, its components, and the turbine blades.

NOTE: Speak to the engine and APU manufacturer for the procedures for their equipment.

END OF TASK

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TASK 28-11-00-160-801

4. Examine and Close the Fuel Tank

A. References

Reference	Title
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-10710	Explosion Proof Vacuum Part #: EXP1-55 TC TE Supplier: 0YX65 Part #: SS-55 TE TC Supplier: 0YX65

C. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

D. Location Zones

Zone	Area
500	Left Wing
600	Right Wing

E. Procedure

SUBTASK 28-11-00-210-027

(1) Each time you go into a fuel tank (TASK 28-11-00-650-801), you must examine the fuel tank very carefully before you close it.

(a) If you applied some sealant, you must clean the fuel tank and examine it before you close the fuel tank.

SUBTASK 28-11-00-410-015

(2) Do these steps to close the repaired fuel tank:

(a) Remove all coverplates, plugs, and equipment used in tests to isolate leakage.

(b) Remove all tools, solvent containers, cotton wiper, G00034, and brushes used for sealant repairs.

NOTE: Keep a written record of all tools, equipment, material, and persons when they go into and go out of the fuel tank. Before you close the fuel tank, make sure that the record shows that there are no unwanted items in the tank.

WARNING GROUND ALL OF THE EQUIPMENT AND HOSES THAT YOU USE IN THE FUEL TANK. IF YOU DO NOT GROUND ALL OF THE EQUIPMENT AND HOSES, AN EXPLOSION CAN OCCUR. INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(c) Use a vacuum, COM-10710, to clean the repaired fuel tank fully to remove unwanted particles and pieces of the used sealant.

(d) If the fuel tank is wet, rub the wet area clean with a cotton wiper, G00034.

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(e) Examine all the repair sealant and the finish to make sure that you applied it correctly.

(f) Replace all of the structure that you removed for access.

CAUTION

MAKE SURE THAT YOU REMOVE ALL UNWANTED MATERIAL FROM THE AREA. UNWANTED MATERIAL CAN CAUSE DAMAGE TO COMPONENTS.

(g) Make sure that there is not a blockage in the fuel and water drain holes and paths.

(h) Do this task: Fuel Tank Closure, TASK 28-11-00-410-801.

——— END OF TASK ———

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FUEL TANKS - REPAIRS

1. General

A. This procedure contains three tasks as follows:

(1) Repair of Fuel Tank Corrosion

(a) This procedure is for small corrosion repairs. Corrosion can make the structure weak. Before you do a corrosion repair, refer to the Structural Repair Manual to calculate if the structure is weak.

(2) Repair of Sealant Leaks in the Fuel Tank Structure

(a) Before you repair a leak, make an analysis of the source and cause of the leak with the Fuel Leak Detection procedure (TASK 28-11-00-200-801).

(b) If the cause of the fuel leak is a result of structural damage, do the structural repair. Refer to the Structural Repair Manual before you apply sealant (TASK 28-11-00-300-802).

(3) Approved Repairs of the Secondary Fuel Barrier Sealant.

CAUTION MAKE SURE THAT THE SEALANT AND SURFACE FINISH THAT YOU USE IN THE FUEL TANK ARE RECOMMENDED MATERIALS. IF THE MATERIALS DO NOT HAVE APPROVAL TO BE USED WITH EACH OTHER, DAMAGE TO THE FUEL TANK COULD OCCUR.

B. This procedure also contains information on how to prepare, use and cure the sealant materials.

(1) The recommended sealant and finish materials shown for use in this procedure can be used with each other. For example, you can apply sealant on fully cured corrosion resistant finish for fuel tanks (coating, C00307) or you can apply corrosion resistant finish for fuel tanks (coating, C00307) on sealant with a spray gun or brush.

(2) Remove the old corrosion resistant finish in the area of sealant repair, unless you know the old finish can be used with the new sealant. If you need to remove the finish, remove it to the bare metal.

TASK 28-11-00-300-801

2. Repair of Fuel Tank Corrosion

A. General

WARNING MAKE SURE THAT THERE IS A GOOD FLOW OF AIR WHEN YOU ARE IN THE FUEL TANK. DO NOT REMOVE THE RESPIRATOR WHILE YOU ARE IN THE FUEL TANK. DO NOT DO MAINTENANCE IN THE FUEL TANK UNTIL YOU REMOVE ALL FUEL FROM THE AREA. FUEL FUMES CAN KILL YOU.

(1) To repair fuel tank corrosion, the areas of repair in the fuel tank must be cleaned and treated with etchant and Alodine. Corrosion resistant finish for fuel tanks (coating, C00307) is then applied to the surfaces to prevent more corrosion. Be careful to clean and treat all corners, crevices and other limited access areas.

B. References

Reference	Title
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)

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(Continued)

Reference	Title
28-26-00-650-801	Pressure Defueling (P/B 201)

C. Consumable Materials

Reference	Description	Specification
B00184	Solvent - Presealing, Cleaning Solvent	BMS11-7
B50154	solution - chromium nitrate etchant	
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20 Type II

D. Repair of Fuel Tank Corrosion

SUBTASK 28-11-00-650-012

(1) Do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-11-00-650-013

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-11-00-010-019

(3) Do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

SUBTASK 28-11-00-140-003

(4) Look for corrosion on all structural surfaces of the fuel tank and do the following to remove the corrosion:

(a) If there is light surface corrosion, rub the surface with fine abrasive paper or cloth to remove the corrosion.

(b) If you cannot fully remove the corrosion with the abrasive paper or cloth, refer to the Structural Repair Manual.

SUBTASK 28-11-00-110-002

(5) Clean the fuel tank surfaces in the area of the repair with solvent, B00184 (Figure 801) (Figure 802).

SUBTASK 28-11-00-150-001

(6) Apply etchant (solution, B50154) over the cleaned fuel tank surfaces in the area of the repair.

SUBTASK 28-11-00-150-002

(7) Keep the etchant on the fuel tank surfaces for 3 to 5 minutes.

SUBTASK 28-11-00-170-001

(8) Flush the fuel tank surface with water to remove the etchant.

SUBTASK 28-11-00-370-004

(9) To apply the Alodine treatment, do this task: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

NOTE: Refer to the Alodine Metal Surface Treatment procedure.

SUBTASK 28-11-00-390-003

(10) To repair all sealant damaged or removed durng the corrosion repair, do the task: Repair of Sealant Leaks in the Fuel Tank Structure, TASK 28-11-00-300-802.

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SUBTASK 28-11-00-370-005

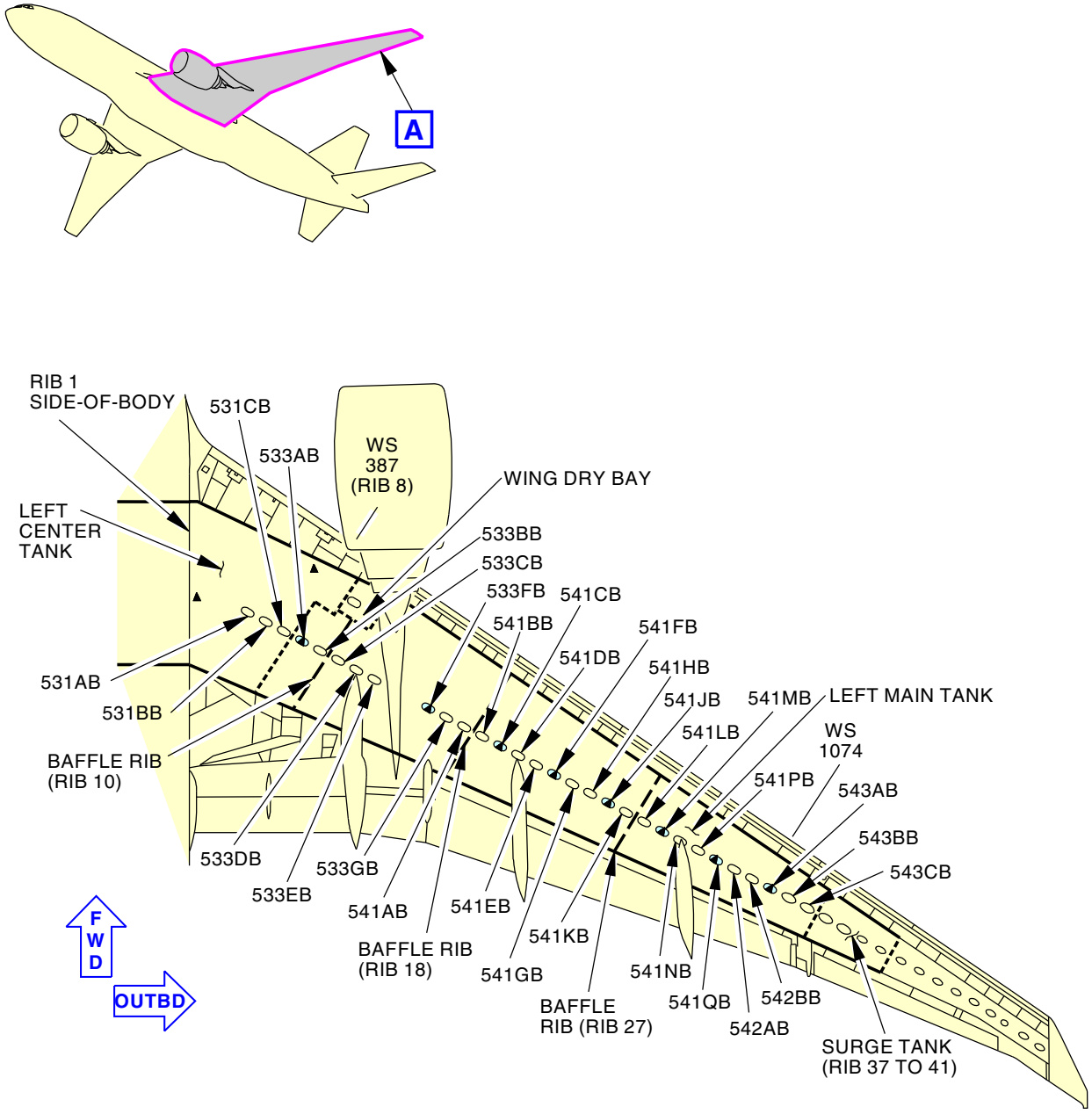
(11) To apply the corrosion resistant finish for fuel tanks (coating, C00307), do this task: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

SUBTASK 28-11-00-410-010

(12) Do this task:Fuel Tank Closure, TASK 28-11-00-410-801.

——— END OF TASK ———

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FUEL TANK ACCESS DOORS
(LEFT WING, BOTTOM VIEW)

A

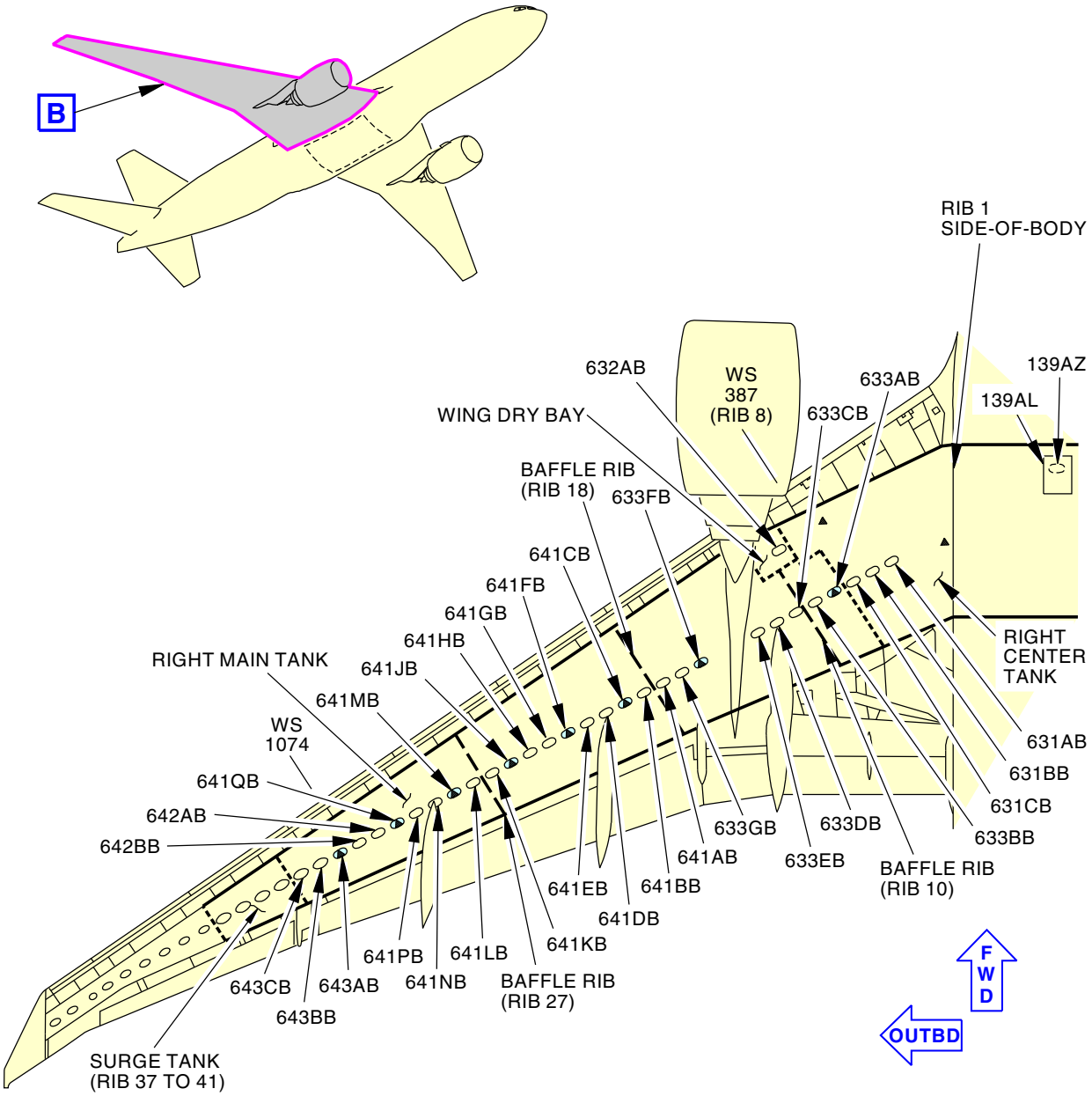
LEGEND:

▲ FUEL MEASURING STICK

M45089 S0006414813_V3

Fuel Tank - Left Wing
Figure 801/28-11-00-990-854

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FUEL TANK ACCESS DOORS
(RIGHT WING, BOTTOM VIEW)

B

LEGEND:

▲ FUEL MEASURING STICK

M45093 S0006414816_V3

Fuel Tank - Right Wing
Figure 802/28-11-00-990-856

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TASK 28-11-00-300-802

3. Repair of Sealant Leaks in the Fuel Tank Structure

A. General

(1) It is necessary to use materials that are poisonous and flammable when you repair the sealant. You must have a good flow of air in the area. You must obey all fire safety precautions.

(2) For application of sealants in the fuel tank structure(s), it is acceptable to use sealant, A50303, as an alternative to sealant, A00767, for Class A and B non-faying seal applications:

NOTE: BMS5-168 is not approved for faying surface seals.

(a) sealant, A50153, and sealant, A50301, are mutually interchangeable.

(b) For non-faying surface seals, sealant, A50110, and sealant, A50302, are mutually interchangeable.

(c) sealant, A50153, cannot be used in combination with sealant, A50302, and sealant, A50301, cannot be used with sealant, A50110.

B. References

Reference	Title
20-30-93-910-801	Final Cleaning Prior to Fuel Tank Sealing (Series 93) (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-00-790-801	Fuel Leak Detection Procedures (P/B 601)
28-26-00-650-801	Pressure Defueling (P/B 201)
SRM 51-40-00	Structural Repair Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-768	Sealant Removal Tool, Hardwood or Plastic Part #: ST982 Supplier: 81205
SPL-1762	Sealing Tool, Fuel Tank Rivet Part #: F70230-1 Supplier: 81205 Part #: J28006-1 Supplier: 81205
STD-124	Brush - Stiff Bristle, Non-Metallic
STD-449	Gun - Sealant
STD-809	Spatula
STD-1075	Gun - Rivet, Cherry Monel
STD-1182	Tool - Seal Cutting, Hardwood or Plastic

D. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
A01019	Sealant - Integral Fuel Tank (Quick Repair)	AMS-S-83318A (MIL-S-83318)
A50052	Sealant - PR-1826 Class B Rapid Curing Fuel Tank Sealant	SAE AMS3277 Class B

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(Continued)

Reference	Description	Specification
A50084	Sealant - P/S 860 Class B-1/6 Quick Repair Fuel Tank Sealant	AMS-S-83318 Class B
A50110	Sealant	BMS5-45 Class B-2
A50153	Sealant - Fuel Tank - Class A-2	BMS5-45 Class A-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50301	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168 Type I Class A-2
A50302	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168 Type I Class B-2
A50303	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168
A50337	Sealant - Fuel Tank	BMS5-45 Class B
B00184	Solvent - Presealing, Cleaning Solvent	BMS11-7
B01013	Solvent - Final Cleaning Prior To Fuel Tank Sealing - Series 93	
C00064	Coating - Aluminum Chemical Conversion	BAC5719 Type II Class A (MIL-DTL-5541 Class 1A)
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20 Type II
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A
G50381	Abrasive - Aluminum Oxide Paper, 180 Grit	
G50653	Kit - Semco Click-Patch Kit, Sealant Type (Patch Kit Assembly P/N 231255, 231231, 231230)	
G50654	Kit - Semco Click-Patch Kit, Fast Set Epoxy Type (Patch Kit Assembly P/N 231256, 231232, 231265)	

E. Prepare for Fuel Tank Repair

SUBTASK 28-11-00-650-014

(1) For the applicable fuel tank, do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-11-00-650-023

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-11-00-010-020

(3) Do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

SUBTASK 28-11-00-810-001

(4) To find the leak source, do this task: Fuel Leak Detection Procedures, TASK 28-11-00-790-801.

SUBTASK 28-11-00-150-003

(5) Use the sealant cutting tools (Figure 803) to remove the bad sealant.

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(a) To cut sealant away from a fillet seal, refer to Figure 805.

1) Cut the ends of the bad sealant at a slope such that the new sealant makes an overlap with the remaining sealant.

2) Make sure you cut the sealant smoothly.

3) When you remove the sealant, be careful so you do not damage the bare metal.

(b) If the fillet seal bond to the finish is good and the finish bond to the tank surface is good, it is not necessary to cut the sealant to the bare metal (Figure 805).

1) Make sure you remove all sealant that is loose.

(c) If the bad sealant includes fasteners with fillet seals, do the steps that follow:

1) Cut around the bottom of the fastener with a sealant cutting tool (Figure 803).

2) Use pliers and pull the sealant from the fastener.

NOTE: It is not necessary to remove small quantities of the sealant that bond to the fastener.

(d) If there is a bad injection seal, do the steps that follow:

1) Remove the bad sealant from short injection channels with hooked wire and small cutting tools.

NOTE: You must disassemble long injection channels (refer to the Structural Repair Manual). You can repair bad injection seals if you lift the new seal plane above the used seal plane to isolate the bad seal from the fuel.

2) Make sure the injection channel is clean.

NOTE: If air is caught in the injection channel when you apply the sealant, the new sealant cannot fully fill the channel.

3) Be careful not to cause damage to the tank structure when you remove sealant or disassemble parts.

SUBTASK 28-11-00-360-001

(6) For a bad prepack or faying surface seal, do the steps that follow:

(a) Disassemble the structure around the bad sealant (Refer to the Structural Repair Manual).

1) If you do not want to disassemble the structure, you can repair the leak if you lift the new seal plane above the old seal plane to isolate the bad sealant from the fuel.

NOTE: The area of bad sealant must be small to use this method.

(b) Remove the bad sealant with seal cutting tools, STD-1182, and sealant removal tools, SPL-768.

SUBTASK 28-11-00-150-004

(7) If there is corrosion resistant finish on the surface, remove all the corrosion resistant finish from the sealant repair area unless you know it is coating, C00307 (BMS 10-20, Type II corrosion resistant finish).

(a) Use 180 grit abrasive paper, G50381, and remove the corrosion resistant finish until either bare metal or sealant shows (in good condition).

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(b) Use clean cotton wipers, G00034, and Series 93 solvent, B01013, (TASK 20-30-93-910-801) to clean all removed corrosion resistant finish surfaces and sealant.

(c) Rub the surfaces with clean cotton wipers, G00034, until the solvent is dry.

(d) Continue to clean and dry the surfaces until the dry cotton wiper, G00034, stays clean.

SUBTASK 28-11-00-150-005

(8) Remove all sealant precoat from the repair area unless it is known that precoat is sealant, A00767 (or equivalent), material in good condition.

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(a) Remove the used sealant precoat with an abrasive pad and Series 93 solvent, B01013 (TASK 20-30-93-910-801).

(b) Clean the surface with a clean brush and cotton wiper, G00034, soaked with Series 93 solvent, B01013 (TASK 20-30-93-910-801).

NOTE: The area you clean must make an overlap with the adjacent area. Make the total area a minimum of two times as large as the area you apply the sealant to.

(c) Rub dry with a clean, dry cotton wiper, G00034.

(d) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

SUBTASK 28-11-00-210-017

(9) Make sure that all fasteners in the sealant repair area are installed and tightened, unless you must install the fastener after you apply the faying surface sealant.

NOTE: You cannot install and tighten most fasteners after you apply the sealant.

SUBTASK 28-11-00-110-003

(10) If the Alodine metal surface treatment is worn or damaged, you must apply an Alodine coating, C00064, to the metal surface before you apply the new sealant or finish material.

SUBTASK 28-11-00-110-004

(11) Refer to the Alodine Metal Surfaces procedure to apply Alodine to the surfaces that are worn, damaged or where metal shows (TASK 28-11-00-600-801).

SUBTASK 28-11-00-110-005

(12) Immediately before you apply the sealant, clean the surface with solvent, B00184, and rub dry with clean cotton wipers, G00034.

NOTE: Do not let the solvent dry on the surface. Do not touch the area with your fingers.

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F. Prepare, Apply, and Cure Sealants

NOTE: It is very important to mix, use and keep sealants correctly. You must follow approved procedures to prevent damage or injury. Fully mix all components, refer to the manufacturer's instructions. Do not mix sealants that you apply with a brush until you use them. Do not put thinners in the sealant. Keep the sealants covered when not in use.

SUBTASK 28-11-00-390-004

CAUTION

DISCARD ALL SEALANT THAT DOES NOT APPLY SMOOTHLY. IF YOU APPLY THE SEALANT INCORRECTLY, IT CAN CAUSE LEAKAGE.

(1) Storage of Sealant Compound that is not Mixed

NOTE: You should keep sealant at temperatures between 50°F (10°C) to 80°F (27°C).

(a) Keep the sealant for 6 months or less from the manufacturer's date of packaging.

(b) Do a test of sealant that is kept for 6 months or more from the manufacturer's date of packaging.

1) Mix a sample of the sealant base compound and the curing compound in a container, at room temperature.

a) Use an entire 2-part kit or make a 2-part kit.

<1> To make a 2-part kit, use the correct ratio of base compound and curing compound.

<2> Weigh the components to calculate the ratio.

<3> If you use a Semkit, mix the entire Semkit.

2) Apply a fillet seal (Class B) or brush a thick coating of sealant (Class A) to a sample piece of structure or scrap metal to find the time necessary before a sample of the sealant is not tacky.

a) Use the plastic film in the applicable sealant specification to find the time when the sealant is not tacky (tack-free time).

3) Compare this time with maximum permitted tack-free time given in the applicable sealant specification.

4) If this time is more than the maximum permitted time, discard the sealant.

5) The storage life may be extended only once by a maximum of 3 months.

SUBTASK 28-11-00-390-005

(2) Mix the Sealant Compound

WARNING

KEEP THE SOLVENTS AWAY FROM SOURCES OF HEAT, FIRE OR SPARKS. IF YOU DO NOT, AN EXPLOSION CAN OCCUR.

DO NOT PERMIT THE SOLVENTS TO TOUCH YOUR SKIN, EYES OR CLOTHING. DO NOT BREATHE THE VAPORS. WEAR PROTECTIVE CLOTHING AND EYE PROTECTION. MAKE SURE THERE IS A GOOD FLOW OF CLEAN AIR. IN A CONFINED SPACE, USE MECHANICAL VENTILATION FOR RESPIRATORY PROTECTION. INJURY TO PERSONS CAN OCCUR.

(a) Mix only the quantity of sealant necessary for the job to be done.

NOTE: Identify the necessary sealant for the repair before you mix it.

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The use of premeasured Semkits (purchased from the vendor) is recommended for small repairs.

(b) Make sure all equipment used to mix the sealant is clean.

(c) Mix the sealant compounds as shown in the manufacturer's instructions.

NOTE: Always use the curing compound with the base compound from the same repair kit. Do not mix the contents of one repair kit with that of a different kit. Do not mix the sealant too much or the time you can apply the sealant will decrease.

CAUTION

MAKE SURE THAT THERE ARE NO AIR BUBBLES IN THE SEALANT WHEN YOU MIX IT. IF THERE ARE AIR BUBBLES IN THE SEALANT, IT WILL NOT BOND CORRECTLY.

(d) For small repair kits (less than 0.5 lb (0.2 kg), mix the curing compound and base compound until the sealant is of a constant, equal color with a clean spatula, STD-809, or other applicable tool.

1) Put the sealant in a container cleaned with Series 93 solvent, B01013 (TASK 20-30-93-910-801).

2) Use immediately after you mix it.

(e) Sealant may be machine-mixed and stored frozen to extend the storage life.

1) Thoroughly mix the accelerator with a machine mixer.

2) Use an entire kit or weigh out the base and accelerator in the correct proportion for mixing.

a) Use the ratio recommended by the manufacturer.

3) Mix the base and accelerator together with a machine mixer.

NOTE: Use either a batch or a continuous mixer recommended by the manufacturer of the sealant.

4) Make sure the sealant is mixed correctly.

NOTE: The sealant is mixed correctly if it is uniform in color and free from streaks.

5) Immediately after the sealant is mixed, do these steps:

a) Put the mixed sealant, A00767, into cartridges.

b) Install caps on both ends of the cartridges.

c) Write the date you mix the sealant, sealant type, class, supplier, and the expiration date on the cartridges.

d) Put the cartridges in a freezer at a temperature of -40°F (-40°C) or colder.

e) Discard the sealant if it is kept more than 21 days at -40°F (-40°C).

f) Discard the sealant if it is kept more than 7 days at -20°F (-29°C).

SUBTASK 28-11-00-390-006

(3) Sealant application time at 77°F (25°C) and 50% relative humidity (Figure 806)

NOTE: Sealant application time is the maximum length of time you can apply the sealant to the part. Application time starts when mixing or thawing (for frozen sealant) is complete.

(a) BMS5-45 Class B-½ sealant, A00767 - ½ hour

(b) BMS5-45 Class B-2 sealant, A50110 - 2 hours

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(c) BMS5-45 Class C-24 sealant, A50155 - 8 hours

(d) BMS5-45 Class C-48 sealant, A50155 - 12 hours

(e) BMS5-45 Class C-168 sealant, A50155 - 48 hours

(f) BMS5-168 Class B-2 sealant, A50302 - 2 hours

(g) Pro-Seal 860 B ⅙ sealant, A01019 - 10 minutes

(h) PR-1826 sealant, A50052 Class B-½ - ½ hour

SUBTASK 28-11-00-390-020

(4) Maximum temperature to apply fay surface sealant.

(a) For sealant, A50110 - 95°F (35°C) maximum

(b) For sealant, A50155 - 100°F (38°C) maximum

SUBTASK 28-11-00-390-007

(5) Sealant squeeze-out life.

(a) Squeeze-out life is the length of time you can assemble parts with faying surface sealant.

(b) Squeeze-out life starts when mixing or thawing (for frozen sealant) is complete.

(c) You must apply the sealant within the application time and finish the assembly within the squeeze-out life.

(d) The squeeze-out life when measured at 77°F (25°C) and 50% relative humidity is shown in Figure 806 for BMS5-45 sealant, A00767, and BMS5-168 sealant, A50303.

SUBTASK 28-11-00-390-008

(6) Sealant cure time.

(a) You must let the BMS 5-45 sealant, A00767 (or equivalent), cure until it is at least tack-free (Figure 806) before you continue maintenance operations in the fuel tank or refuel the fuel tank.

(b) BMS 5-168 sealant can touch fuel after 8 hours and has cure time of 8 hours.

(c) Pro-Seal 860, B 1/6 sealant can touch fuel after 2 hours and has a cure time of 4 hours.

(d) PR-1826 Class B-1/2 sealant can touch fuel after 2–1/2 hours and has a cure time of 3 hours.

WARNING DO NOT STOP OR START THE HEATER/AIR BLOWER WHILE THE AIR DUCT IS IN THE FUEL TANK. THE FUEL FUMES FROM THE FUEL TANK COULD CAUSE AN EXPLOSION AT THE HEATER OR BLOWER MOTOR. A FIRE OR EXPLOSIONS CAN KILL OR CAUSE INJURIES TO PERSONNEL AND CAN CAUSE DAMAGE TO EQUIPMENT.

CAUTION DO NOT APPLY SEALANT WHEN THE STRUCTURE TEMPERATURE IS LESS THAN 50 °F (10 °C) OR MORE THAN 140 °F (60 °C). THE SEALANT WILL NOT CURE CORRECTLY IF THE STRUCTURE TEMPERATURE IS OUT OF RANGE.

(e) The cure times in Figure 806 are at a temperature of 77 ±5°F (25 ±3°C) and a relative humidity of 50 ± 5 percent.

1) The best condition would be with a good flow of air in the area.

2) Make sure the tank and component surfaces are dry.

NOTE: Sealant will not adhere to wet surfaces.

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3) If you increase the temperature of the tank structure, the curing time decreases.
   a) You can increase the temperature of all the tank structure up to 140°F (60°C).
   b) Tack-free and cure times are approximately one-half as long for each 20°F (11°C) increase in temperature.
4) If you increase the humidity of the tank structure, the curing time decreases.
   a) Tack-free and cure times are approximately double for each 20°F (11°C) decrease in temperature.
   b) You must know the relative humidity at all times during the sealant operations.
      <1> If the relative humidity is less than 40 percent, the cure of the sealant is slower.
      <2> For faying and non-faying surface seals, to increase the relative humidity, put or flow warm, moist air above the repair area or over the sealant.
         <a> Make sure the water added to the air contains less than 100 parts per million of total solids and less than 10 parts per million of chlorides.

            NOTE: In hot dry climates, if you put a pan of water in the fuel tank near the repair area, it could add the necessary humidity.

SUBTASK 28-11-00-360-002

(7) To apply a new fillet seal, do the steps that follow:
   (a) BMS 5-45 Class B sealant, A00767 (or equivalent), is used to apply all fillet seals after a brushcoat of BMS 5-45 Class A sealant, A00767 (or equivalent).
      1) When you apply sealant in the fuel tank, you can use sealant, A50303, as an alternative to sealant, A00767, for Class A and Class B applications.
         a) For Class A, use sealant, A50153, or sealant, A50301.
         b) For Class B, use sealant, A50110, or sealant, A50302.
         c) For Class B over Class A sealing, use sealant, A50110, with sealant, A50153, or use sealant, A50302, with sealant, A50301.
            <1> Do not use with sealant, A50110, with sealant, A50301.
            <2> Do not use sealant, A50302, with sealant, A50153.
   (b) Examine the seal area to make sure you have the correct selection of tools for the job.
   (c) Apply a brushcoat of correctly mixed BMS 5-45 Class A sealant, A00767 (or equivalent), to the surface with a stiff bristle non-metallic brush, STD-124 (Figure 807).
      1) Use a vigorous motion to apply the brushcoat.
      2) Make sure that you apply the brushcoat into all crevices and to an area larger than the area where you will apply the fillet seal..
   (d) If you let the brushcoat become tack-free, clean with Series 93 solvent, B01013, (TASK 20-30-93-910-801) before you apply the fillet seal.

      NOTE: It is not necessary to let the brushcoat cure. A minimum time of 15 to 20 minutes, after you apply the brushcoat, is recommended before you apply the fillet seal.
   (e) If you use PR-1826 sealant, A50052, let the PR-1826 adhesion promoter dry for a minimum 30 minutes before you apply the fillet seal.

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1) If the PR-1826 adhesion promoter becomes contaminated or sealant is not applied within 24 hours, it is necessary to remove and re-apply the PR-1826 adhesion promoter.

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a) Remove the old or contaminated PR-1826 adhesion promoter with an abrasive pad and Series 93 solvent, B01013 (TASK 20-30-93-910-801).

b) Clean the surface with a stiff bristle non-metallic brush, STD-124, and cotton wiper, G00034, soaked with Series 93 solvent, B01013 (TASK 20-30-93-910-801).

NOTE: The area you clean must make an overlap with the adjacent area. Make the total area a minimum of two times as large as the area you apply the sealant to.

c) Rub dry with a clean, dry cotton wiper, G00034.

d) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

e) Re-apply the PR-1826 adhesion promoter to the surface.

(f) If you use P/S 860 B-1/6 sealant, A50084, let the PR-148 adhesion promoter dry for a minimum 30 minutes before you apply the fillet seal.

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1) Remove the old or contaminated PR-148 adhesion promoter with an abrasive pad and Series 93 solvent, B01013 (TASK 20-30-93-910-801).

2) Clean the surface with a stiff bristle non-metallic brush, STD-124, and cotton wiper, G00034, soaked with Series 93 solvent, B01013 (TASK 20-30-93-910-801).

NOTE: The area you clean must make an overlap with the adjacent area. Make the total area a minimum of two times as large as the area you apply the sealant to.

3) Rub dry with a clean, dry cotton wiper, G00034.

4) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

5) Re-apply the PR-148 adhesion promoter to the surface.

(g) Apply a small first fillet seal of BMS 5-45 Class B sealant, A00767, or equivalent with the sealant gun, STD-449 (Figure 808).

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1) Make sure there are no air bubbles in the sealant.

NOTE: Air bubbles in the sealant make a path for fuel to leak.

2) When you use a nozzle tip, point the nozzle tip into the seam, almost perpendicular to the direction of travel.

3) Keep a bead of sealant in front of the nozzle tip.

(h) Use a sealant fairing tool and push the first fillet seals tightly into position (Figure 809) (Figure 810).

1) Apply all the first fillet seals.

2) Make sure all sealant fairing tools are clean.

3) Do not use solutions or lubricants to help the fairing tools move over the sealant.

4) Clean the fairing tools frequently with a clean gauze.

(i) If the first fillet seal is tack-free or cured, but is not clean, then it must be cleaned before you apply the second fillet seal.

(j) Apply BMS 5-45 Class B sealant, A00767, or equivalent, a second time to make a full bodied fillet seal.

NOTE: Use a larger nozzle for the second fillet seal.

1) If you are extruding sealant with a nozzle, do the steps that follow to apply the second fillet seal:

a) Cut the nozzle to get the dimensions shown in Figure 810.

b) Put the nozzle at the seam, and push the sealant bead ahead of the nozzle while you move along the seam.

NOTE: Keep the nozzle of the sealing gun near the surface to prevent air bubbles.

<1> Make sure the second fillet seal stays at the seam.

2) Remove all air bubbles and fair out re-entrant edges.

(k) Apply corrosion resistant finish (topcoat) if it is necessary.

NOTE: You must apply alodine and coating, C00307, if bare metal is open to fuel after the repair.

Follow the procedure in this task: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

SUBTASK 28-11-00-390-009

(8) Repair of fastener seals (SRM 51-40-00)

(a) Repair self-sealing rivets.

1) Self-sealing rivets are used in skin panels in the fuel tank area. If you find a fuel leak at a rivet, you must replace the rivet to make a permanent repair. You can make a temporary repair if you make a permanent repair the next time you go into the fuel tank, refer to the structural repair manual.

2) To make a temporary repair of a self-sealing rivet, use one of the procedures that follows:

a) Apply sealant to a self-sealing rivet with a sealing tool (Figure 804, Figure 811).

NOTE: Use this procedure for fuel leaks at mechanically sealed rivets only.

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<1> Clean the surface of the sealing tool adapter with emery cloth if it is necessary.

<2> Remove the paint from around the rivet that leaks.

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<3> Clean the surface with Series 93 solvent, B01013 (TASK 20-30-93-910-801).

NOTE: Do not touch the surface with your fingers after you clean it.

WARNING

DO NOT GET THE ADHESIVE IN YOUR EYES OR ON YOUR SKIN. WEAR SAFETY GLASSES TO PROTECT YOUR EYES. WEAR POLYETHYLENE GLOVES TO PROTECT YOUR HANDS. INJURIES TO PERSONNEL COULD OCCUR.

<4> Use a cotton-tipped stick to apply a thin layer of Eastman 910 adhesive to the surface of the adapter, Step 1, (Figure 811).

<5> Put the adapter over the center of the rivet and tightly push against the wing surface for 10 seconds, Step 2, (Figure 811).

<6> Release your hold on the adapter.

<7> Do not touch the adapter for 15 minutes.

<8> Remove the screw from the sealant loading port (Figure 804).

<9> Turn the screw in the sealant bleed port until only one more turn will remove it.

<10> Remove the pressure bolt.

<11> Drain all collected fuel.

<12> Install the pressure bolts (approximately 12 turns or 0.5 in. (1.3 cm)).

<13> Put BMS 5-45 Class A sealant, A00767, in the sealant loading port until it comes out of the sealant bleed port, Step 3, (Figure 811).

<14> Install the screw in the sealant loading port.

<15> Tighten the screw in the sealant bleed port.

<16> Tighten the pressure bolt to 5 pound-inches and hold for 5 minutes.

<17> Hit the sides of the adapter lightly with a small hammer or mallet, Step 4, (Figure 811), to remove the adapter.

<18> Examine the repair for fuel leaks.

<19> If the fuel leak continues, do the procedure again.

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<20> If you must replace the self-sealing rivet, refer to the structural repair manual.

<21> Clean the sealant from the wing surface and the adapter with Series 93 solvent, B01013 (TASK 20-30-93-910-801).

<22> Do not try to clean the adhesive from the wing surface.

NOTE: The adhesive wears off in 1 to 2 weeks.

b) Apply sealant to a self-sealing rivet with a temporary repair tool (Figure 812).

<1> Remove paint from around the rivet that leaks with an approved emery cloth.

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<2> Clean the temporary repair tool and the wing surface with Series 93 solvent, B01013 (TASK 20-30-93-910-801).

NOTE: Do not touch the wing surface with your fingers after you clean it.

<3> Make a mark on the wing surface to show the position of the temporary repair tool while it is in use (Figure 812).

<4> Fill the temporary repair rivet sealing tool, SPL-1762, with mixed BMS 5-45 Class A sealant, A00767.

<5> Put the temporary repair tool into a small rivet gun, STD-1075.

<6> Put the O-ring of the temporary repair tool on the wing surface at the marked location.

CAUTION

ALWAYS KEEP THE TEMPORARY REPAIR TOOL PERPENDICULAR TO THE WING SURFACE. IF YOU DO NOT KEEP THE TEMPORARY REPAIR TOOL PERPENDICULAR TO THE WING SURFACE, DAMAGE TO THE WING SURFACE COULD OCCUR.

<7> Operate the rivet gun until sealant is applied around the rivet that leaks.

<8> Examine the repair for fuel leaks.

<9> If the fuel leak continues, do the procedure again.

<10> If you must replace the self-sealing rivet, refer to the structural repair manual.

<11> Clean the sealant from the temporary repair tool and the wing surface with Series 93 solvent, B01013 (TASK 20-30-93-910-801).

NOTE: Make sure you do not touch the area with the new sealant.

c) Install a Click-Patch.

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<1> You can use a Semco fast-set epoxy click-patch kit, G50654, or Semco sealant click-patch kit, G50653, to repair fuel leaks through Class C (Heavy Seep) Fuel Leak - Isolation procedure (TASK 28-11-00-600-801).

<2> Semco fast-set epoxy click-patch kit, G50654, and Semco sealant click-patch kit, G50653, have flat disks for fasteners that do not come out of the surface and hatted disks for rivets or bolts that are above the wing surface. The disks are put on the fasteners that leak.

<3> The subsequent limits apply to Click-Patch repairs:

<4> You can install a Click -Patch only after you make sure there are no structural cracks in the applicable area of the fuel leak.

<5> The maximum size of a Click -Patch is 1.25 in. (31.75 mm) in diameter.

<6> A Click-Patch is a temporary repair and you must make a permanent repair when possible.

(b) Apply a fillet seal to a sealed fastener.

NOTE: You can use BMS5-45, PR-1826 or Pro-Seal 860 sealant.

1) If you use BMS5-45 sealant, apply a precoat of BMS 5-45 Class A sealant, A00767 (or equivalent), to the fastener and the area 0.5 in. (1.3 cm) in width in all directions from the fastener.

NOTE: PR-148 adhesion promoter is required before the use of P/S 860 B-1/6 sealant, A50084, on all surfaces. Adhesion promoter is required before the use of PR-1826 sealant, A50052, on all surfaces. A precoat of BMS5-45, Class A sealant is optional before the use of PR-148 adhesion promoter and Pro-Seal 860, B 1/6 or PR-1826 adhesion promoter and sealant.

a) Use a stiff, bristled brush to vigorously apply the precoat on the surfaces and into crevices.

b) Let the precoat dry until it is not tacky.

2) If you use PR-1826 sealant, A50052, apply PR-1826 adhesion promoter and wait 30 minutes before you apply the sealant.

a) If the PR-1826 adhesion promoter becomes contaminated or the sealant is not applied within 24 hours, it is necessary to remove and re-apply the adhesion promoter.

WARNING

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<1> Remove the old or contaminated PR-1826 adhesion promoter with an abrasive pad and Series 93 solvent, B01013 (TASK 20-30-93-910-801).

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<2> Clean the surface with a clean brush and cotton wiper, G00034, soaked with Series 93 solvent, B01013 (TASK 20-30-93-910-801).

NOTE: The area you clean must make an overlap with the adjacent area. Make the total area a minimum of two times as large as the area you apply the sealant to.

<3> Rub dry with a clean, dry cotton wiper, G00034.

<4> Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

<5> Re-apply PR-1826 adhesion promoter on the surface.

3) If you use P/S 860 B-1/6 sealant, A50084, apply PR-148 adhesion promoter and wait 30 minutes before you apply the sealant.

WARNING DO NOT GET SOLVENT IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE SOLVENT. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE THE SOLVENT. KEEP THE SOLVENT AWAY FROM SPARKS, FLAME, AND HEAT. THE SOLVENT IS POISONOUS AND FLAMMABLE LIQUID WHICH CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

a) Remove the old or contaminated PR-148 adhesion promoter with an abrasive pad and Series 93 solvent, B01013 (TASK 20-30-93-910-801).

b) Clean the surface with a clean brush and cotton wiper, G00034, soaked with Series 93 solvent, B01013 (TASK 20-30-93-910-801).

NOTE: The area you clean must make an overlap with the adjacent area. Make the total area a minimum of two times as large as the area you apply the sealant to.

c) Rub dry with a clean, dry cotton wiper, G00034.

d) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

e) Re-apply PR-148 adhesion promoter on the surface.

4) Use a sealing gun or spatula and apply a layer of BMS 5-45 Class B sealant, A00767, BMS 5-168 Class B sealant, A50302, Pro-Seal 860, B 1/6 sealant, or PR-1826 sealant, A50052 Class B-1/2 around and on the fastener.

5) Move the sealant with a sealant fairing tool until you get the dimensions shown in (Figure 813) for the fillet seal.

6) Examine the sealant for holes, bubbles, or spaces.

a) If there are holes, bubbles or spaces, use the fairing tool to move the sealant and remove these.

7) Apply corrosion resistant finish (topcoat) (TASK 28-11-00-600-801).

(c) Repair fasteners with metal seal covers.

NOTE: BACC50H and BACC50AJ are the specifications for acceptable metal seal covers.

1) Use a sealant cutting tool to cut around and below the metal seal cover and to move apart the sealant from the structure.

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2) Hold the metal seal cover with pliers and pull away from the fastener.

NOTE: This will remove most of the sealant.

3) Cut and remove the remaining sealant.

NOTE: You do not have to remove small quantities of the sealant that bond tightly to the fastener.

4) Clean the metal seal covers, fastener ends, and structure with cleaning solvent.

5) Vigorously apply precoat BMS 5-45 Class A sealant, A00767 (or equivalent), to the area with a stiff, bristle brush.

NOTE: Precoat BMS 5-45 Class A is necessary when you use BMS 5-45 Class B sealant, A50337. Precoat is optional when you use P/S 860 B-1/6 sealant, A50084. PR-148 adhesion promoter is required before the use of P/S 860 B-1/6 sealant, A50084.

a) Apply (brush) the precoat into all the crevices.

6) Fill a metal seal cover, of the correct size and shape, two-thirds full of BMS 5-45 Class B sealant, A50337, or P/S 860 B-1/6 sealant, A50084, with a sealing gun or a clean spatula (Figure 814).

7) Make sure there is sufficient sealant to be extruded around the base and through the hole in the top of the metal seal cover.

8) Push the sealant in the metal seal cover to make sure there are no holes.

9) Push the metal seal cover on the fastener until the metal seal cover touches the structure (Figure 814).

10) Move the extruded sealant around the top of the metal seal cover and remove the unwanted sealant.

NOTE: Use a clean cotton wiper, G00034, to rub the sealant fairing tool.

11) Hold the metal seal cover in its position and move the extruded sealant around the base.

a) Keep the metal seal cover on the center of the bolt.

b) Do not let the metal seal cover move.

c) If there is not sufficient clearance with adjacent metal seal covers, structures, or fillet seal, you can remove 25 percent or less of the area of the metal seal cover.

d) Make sure the metal seal cover has the dimensions shown in (Figure 815).

12) If it is necessary, do this task: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

SUBTASK 28-11-00-390-010

(9) Apply an injection seal.

NOTE: You could lift the seal plane of the new sealant to isolate the bad seal from the fuel as an alternative to a new injection seal.

(a) Make sure you have these tools: pipe cleaners, a sealant fairing tool, and a sealing gun with an injection nozzle attached.

(b) Make sure the channel to be injected is clean.

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(c) Apply a precoat of BMS 5-45 Class A sealant, A00767 (or equivalent), to the channel surfaces with pipe cleaners or a long, bristled pencil brush.

NOTE: If the channel cross-section is 0.07 in. (1.78 mm) or less, it is not necessary to apply precoat.

1) Make sure you do not seal the channel with the precoat of BMS 5-45 Class A sealant, A00767 (or equivalent).

NOTE: If you seal the channel, it will prevent the flow of the sealant into the channel.

(d) Put BMS 5-45 Class B sealant, A00767 (or equivalent), into one end of the channel and fill until sealant comes out of all other openings (Figure 816).

1) Make sure there is sufficient sealant in the sealing gun for a full seal.

NOTE: If you stop and start when you apply the seal, air bubbles can get into the seal.

(e) Fill all slots, joggles and channels where continuity of a seal or a block-off seal is necessary.

(f) Fair the ends of the sealant to make a smooth transition to and adjacent fillet seal or the component surface, as applicable.

(g) Remove excess sealant with the sealant fairing tool.

(h) Examine the seal for a bad bond or air bubbles.

1) If the seal has a bad bond or air bubbles, do the procedure again.

2) If it is necessary, do this task: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

SUBTASK 28-11-00-360-003

(10) Apply a prepack seal.

(a) Apply a bead of BMS 5-45 Class B sealant, A50337 (or equivalent), along each corner of the part cavity (Figure 817).

1) Fill all of the cavity with an excess of sealant.

(b) Make sure you apply sufficient sealant to completely fill the parts.

(c) Assemble the parts in the sealant squeeze-out life (Figure 806).

1) If it is necessary, do this task: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

SUBTASK 28-11-00-360-004

(11) Apply a faying surface seal.

NOTE: The maximum temperature for application of a faying seal is 95°F (35°C) for sealant, A50110, and 100°F (38°C) for sealant, A50155.

(a) Apply a layer of sealant, A50110, or sealant, A50155, to one faying surface with a sealing gun or spatula (Figure 818).

(b) Make sure the sealant covers the surface and is approximately 0.03 in. (0.76 mm) thick (Figure 818).

(c) Assemble the parts in the sealant squeeze-out life (Figure 806).

(d) Use a sealant fairing tool to smooth the sealant along the joint.

NOTE: You must apply sufficient sealant to make sure there is continuous extruded sealant along the entire length of the joint.

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1) If it is necessary, do this task: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

SUBTASK 28-11-00-360-005

(12) Increase the seal plane above the initial seal plane (Figure 819).

(a) You can replace an injection, prepack, or faying surface seal, or you can increase the seal plane to isolate a bad seal from the fuel.

NOTE: Because you add a large quantity of sealant when you increase the seal plane above the initial seal plane, it is better to replace the bad seal.

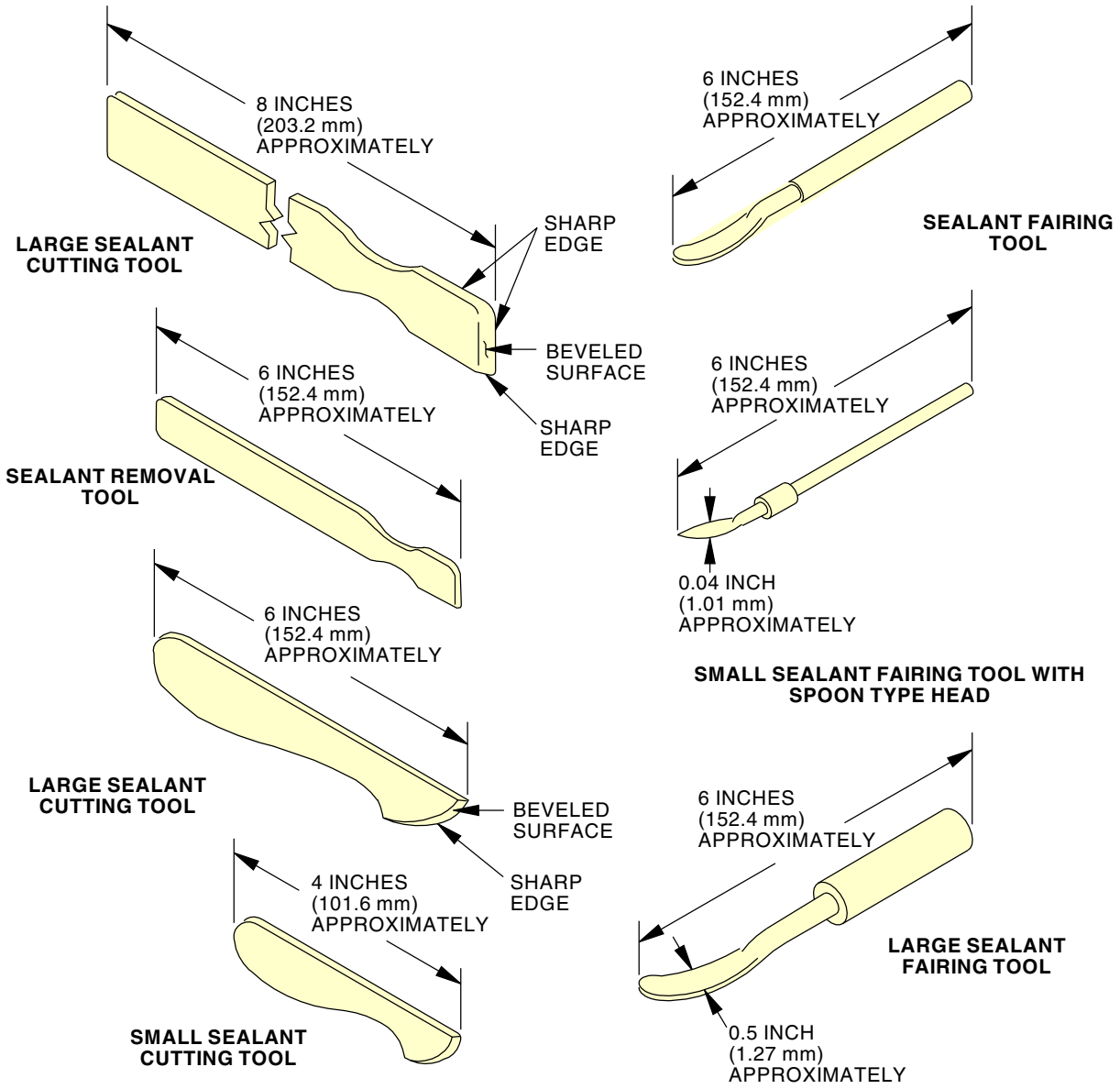
1) Examine the structure around the bad seal to find where to increase the seal plane.

2) Apply a new fillet seal around the structure with the applicable seals and fasteners to increase the seal plane (Figure 819).

3) If it is necessary, do this task: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

END OF TASK

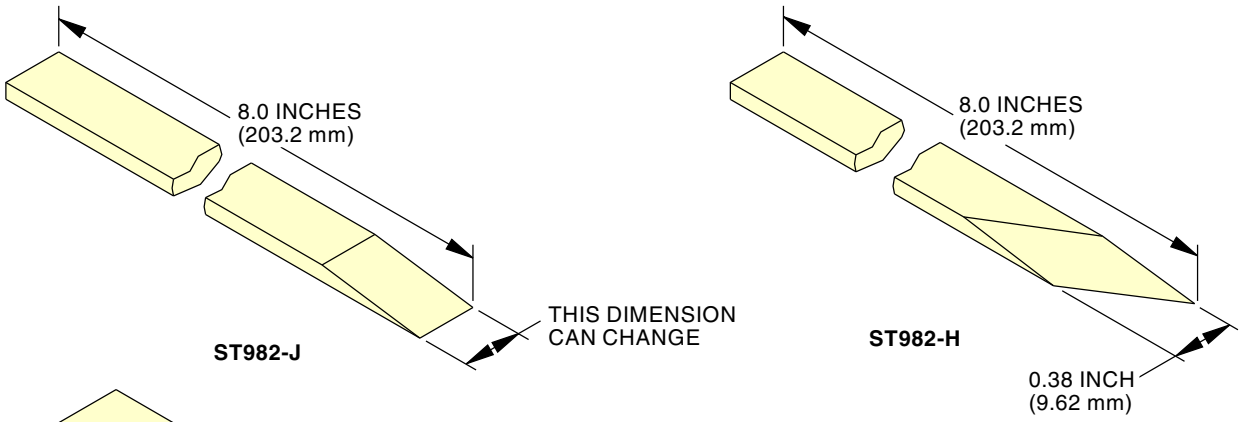
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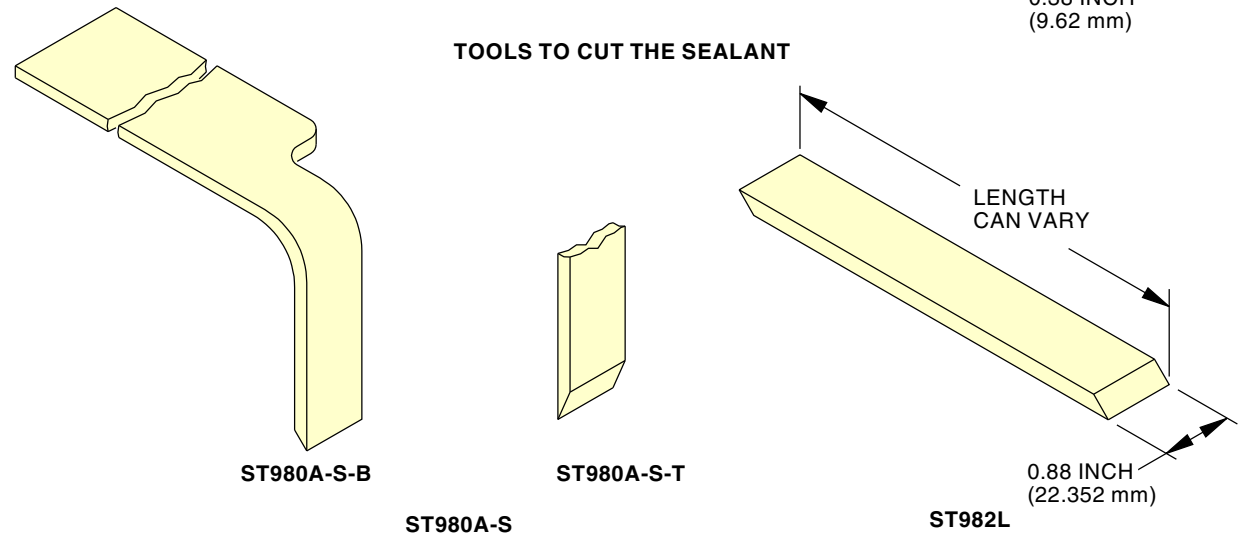
C52397 S0006414818_V3

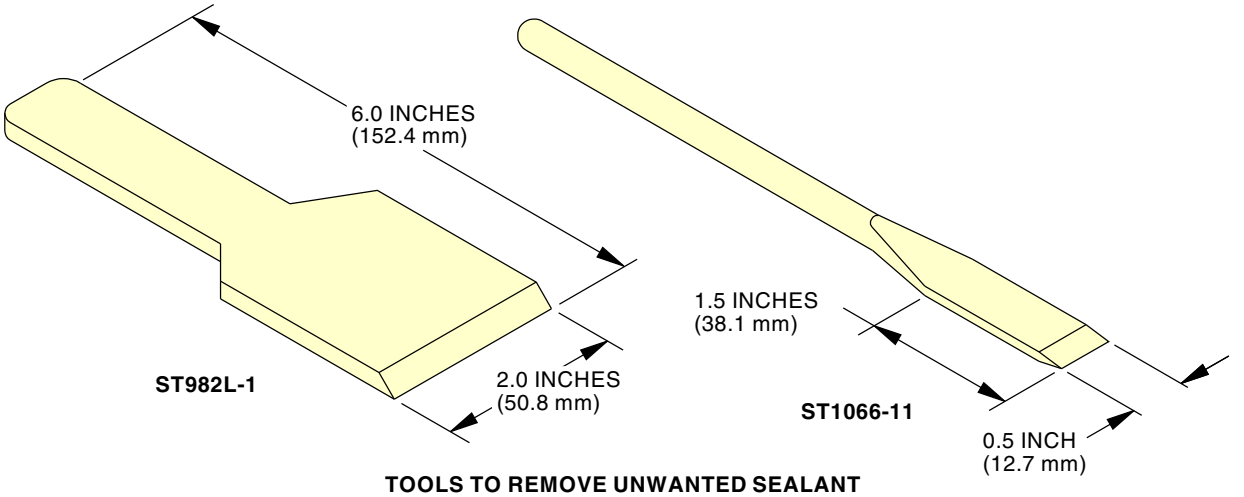
Sealant Removal, Cutting and Fairing Tools
Figure 803/28-11-00-990-820 (Sheet 1 of 2)

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TOOLS TO CUT THE SEALANT



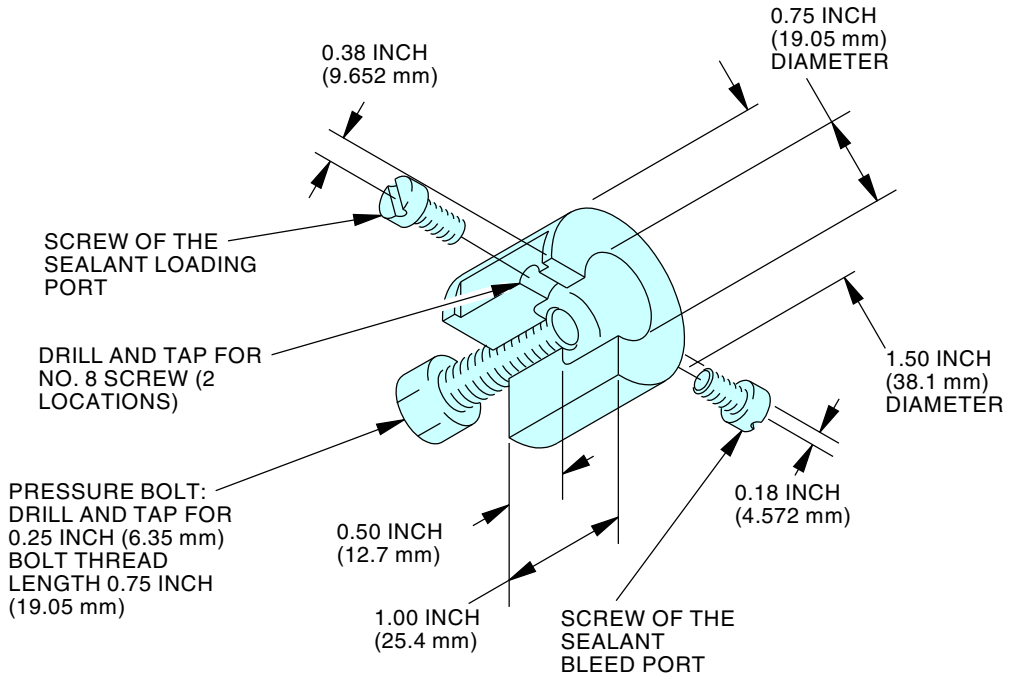


TOOLS TO REMOVE UNWANTED SEALANT (SCRAPERS)

D12152 S0006414819_V3

Sealant Removal, Cutting and Fairing Tools
Figure 803/28-11-00-990-820 (Sheet 2 of 2)

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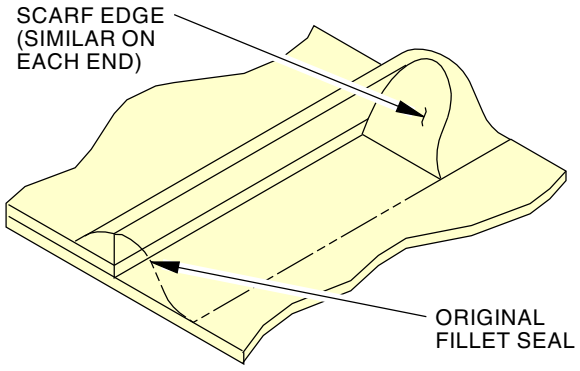


MATERIAL: MILD STEEL CADMIUM PLATED

C52402 S0006414820_V4

Sealing Tool for Rivets that Leak
Figure 804/28-11-00-990-821

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C52404 S0006414821_V2

Fillet Seal Removal
Figure 805/28-11-00-990-822

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SEALANT	CLASS	APPLICATION TIME (MINIMUM) HOURS [1]	TACK-FREE TIME (MINIMUM) HOURS [1]	SQUEEZE-OUT LIFE (MINIMUM) HOURS [1]	CURING TIME (MINIMUM) HOURS [1]
PROSEAL 860 [3]	B-1/6	1/6	1.5 [2]	--	4
PR-1826 [4] [7]	B-1/2	1/2	2.5	--	3
BMS 5-45,	A-2 (GRADE 1)	2	36	--	72
	A-2 (GRADE 2)	2	24	--	48
	A-2 (GRADE 3)	2	8	--	8
	B [6]	1/2	--	--	6
	B-1/2	1/2	10	--	12
	B-2	2	12	6	24
	C-24 [5]	8	--	24	168
	C-48 [5]	12	--	48	336
	C-168 [5]	48	--	168	1,344
BMS 5-168	A-2	2	8	--	8
	B-2	2	8	4	8

1 AT 77˚F (25˚C) AND 50% RELATIVE HUMIDITY AMBIENT CONDITIONS. OTHER TEMPERATURE AND RELATIVE HUMIDITY CONDITIONS WILL CHANGE THE TIMES.

2 DO NOT LET FUEL TOUCH THE SEALANT UNTIL IT IS NOT TACKY FOR A MINIMUM OF 2 HOURS.

3 WHEN YOU USE PROSEAL 860, NO PRECOAT IS NECESSARY. PROSEAL 860 IS RECOMMENDED FOR SMALL REPAIRS ONLY, DUE TO ITS SHORT APPLICATION TIME. AVAILABLE FROM PPG AEROSPACE, MOJAVE CA.

4 USED TO REPAIR FILLET SEALS OF BMS 5-45. AVAILABLE FROM PPG AEROSPACE, MOJAVE CA.

5 USED WITH FAYING SURFACE SEALS THAT HAVE A LONG SQUEEZE-OUT LIFE.

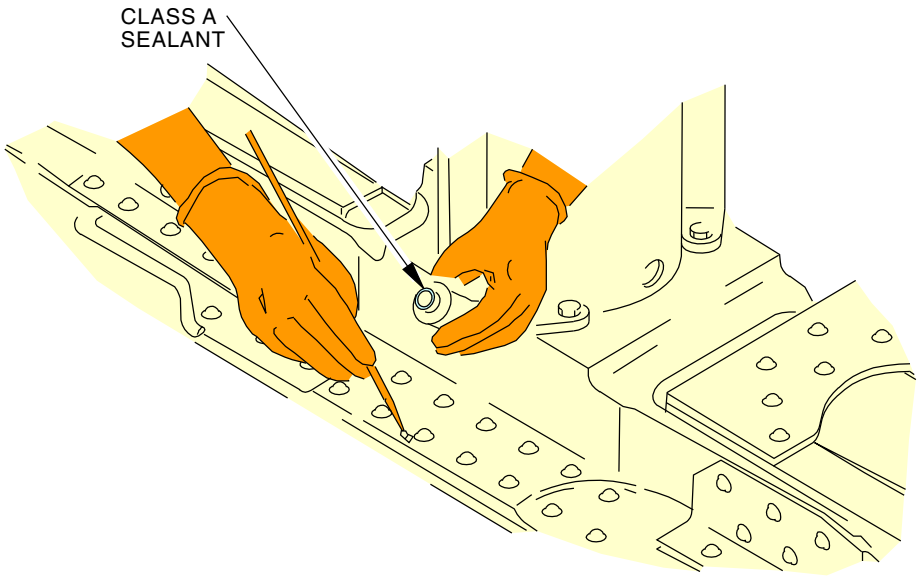
6 MIX BMS 5-45, CLASS B SEALANT WITH A 20:100 ACCELERATOR/BASE RATIO BY WEIGHT OR GET THIS SEALANT PRE-MIXED.

7 PR-1826 PRIMER IS REQUIRED BEFORE THE USE OF PR-1826 SEALANT.

C54117 S0006414822_V8

Sealant Usable Time
Figure 806/28-11-00-990-823

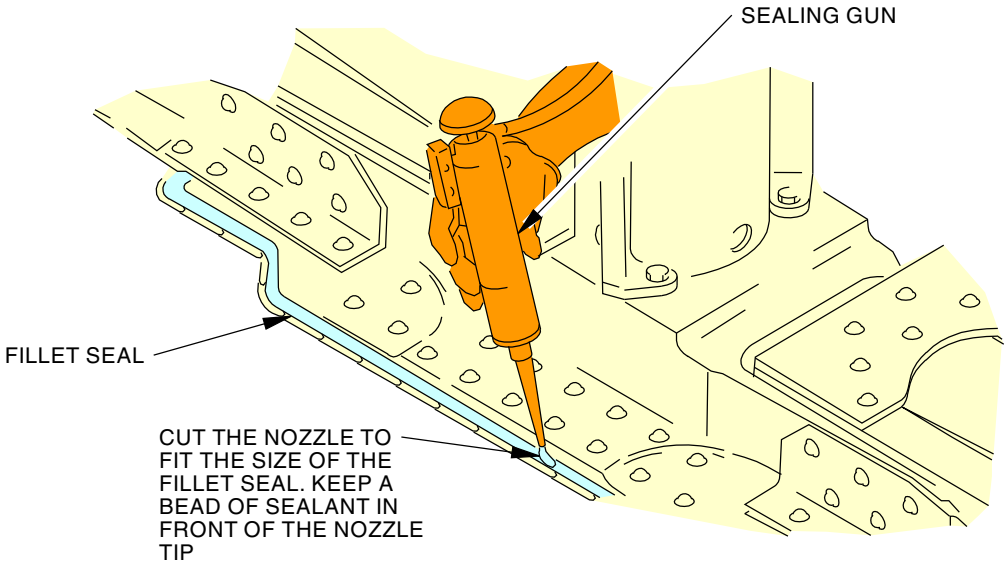
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C52409 S0006414823_V3

Apply the Precoat
Figure 807/28-11-00-990-824

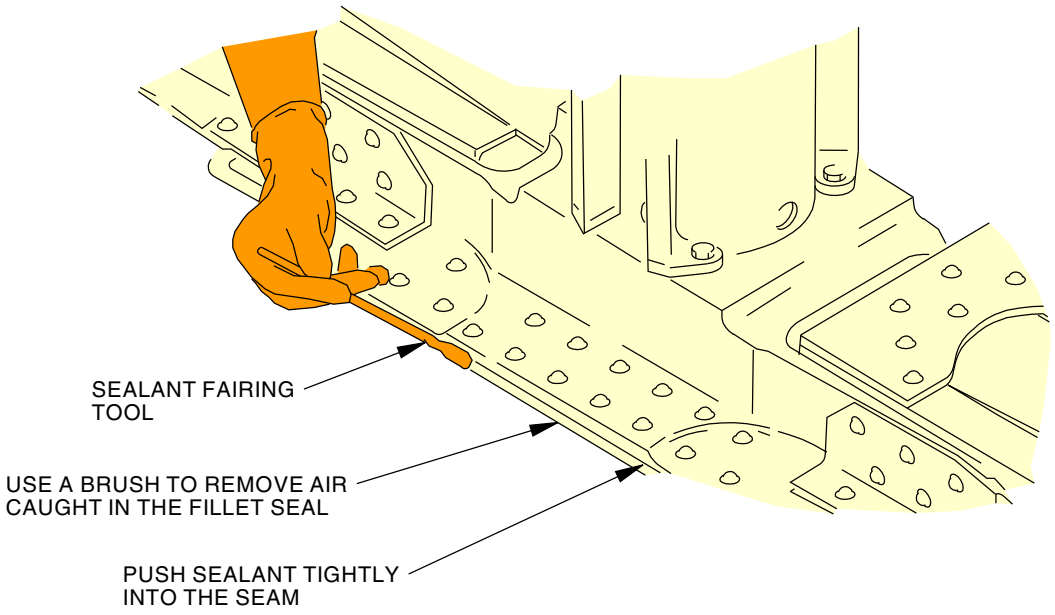
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C52410 S0006414824_V2

Apply a Fillet Seal
Figure 808/28-11-00-990-825

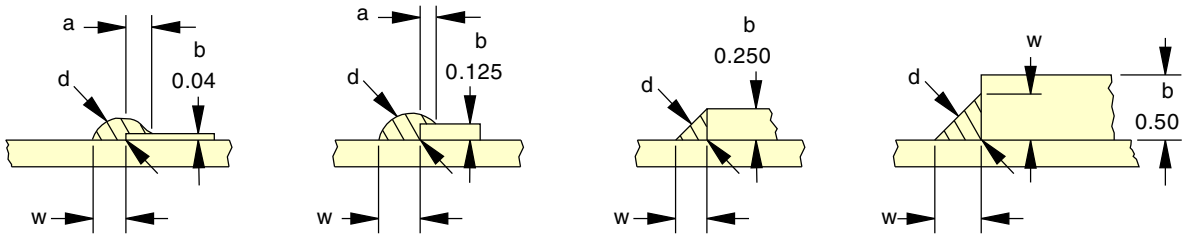
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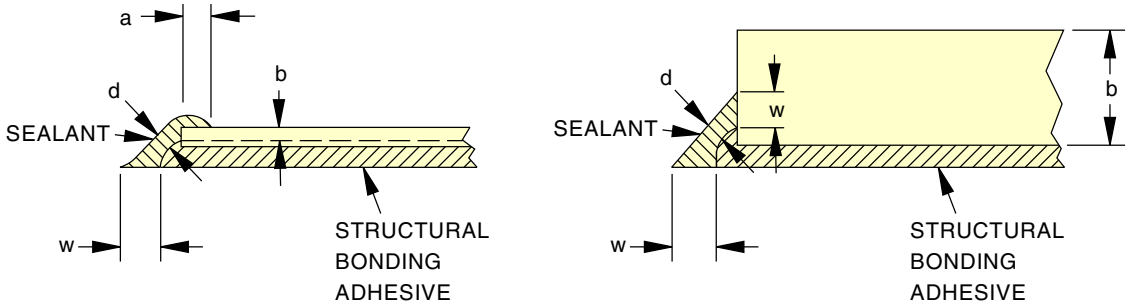
C52425 S0006414825_V2

Push the First Fillet Seal into the Seam
Figure 809/28-11-00-990-826

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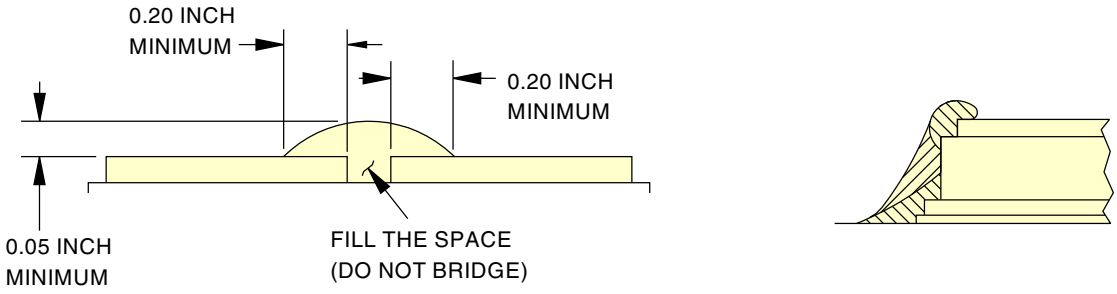


NON-BONDED SURFACES



BONDED SURFACES

d = 0.15 INCH MINIMUM
w = 0.25-0.50 INCH
a+b = w, EXCEPT a = ZERO WHEN b = 0.25 INCH OR MORE



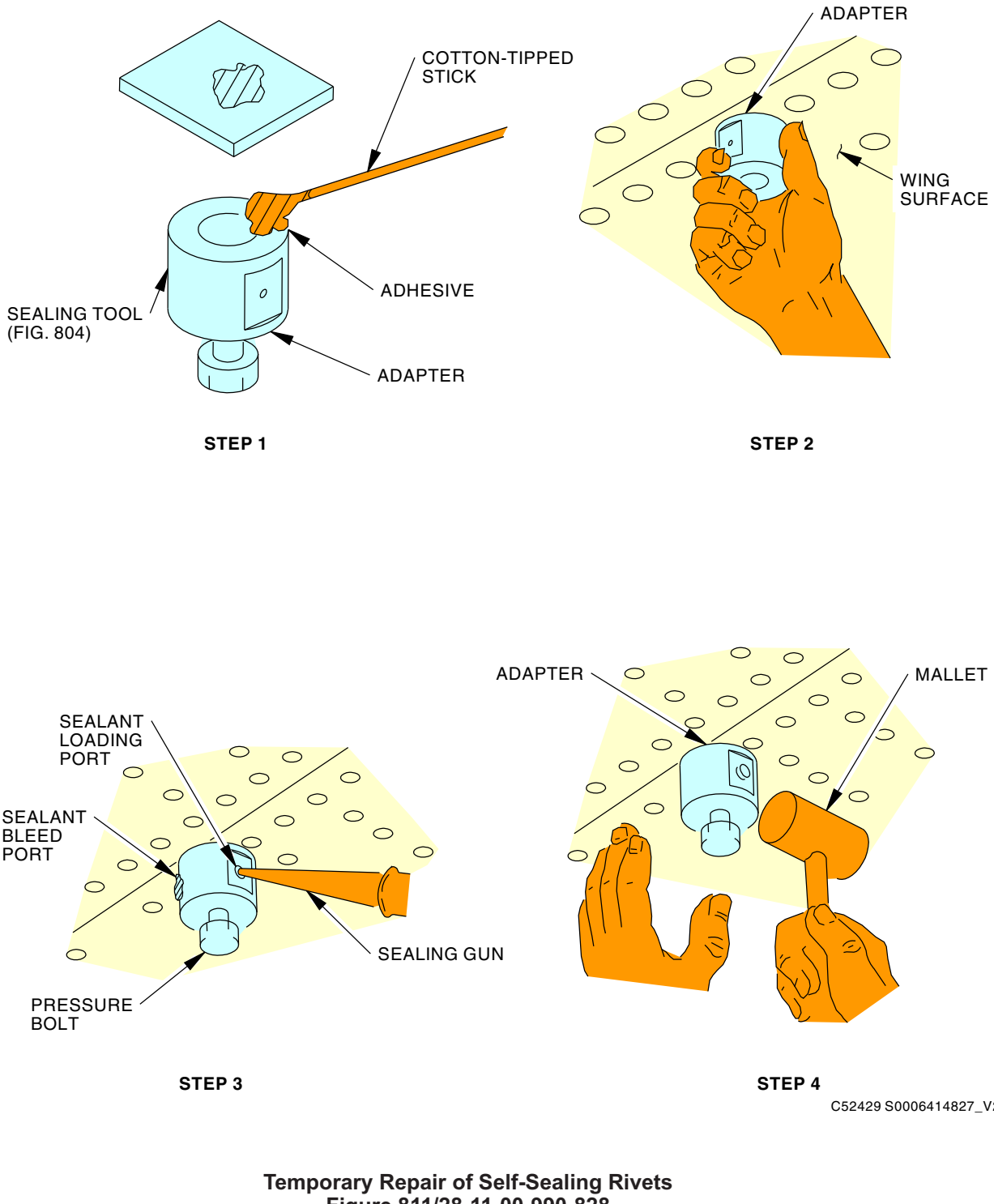
BUTT JOINT

MORE THAN ONE FILLET SEAL

C52423 S0006414826_V2

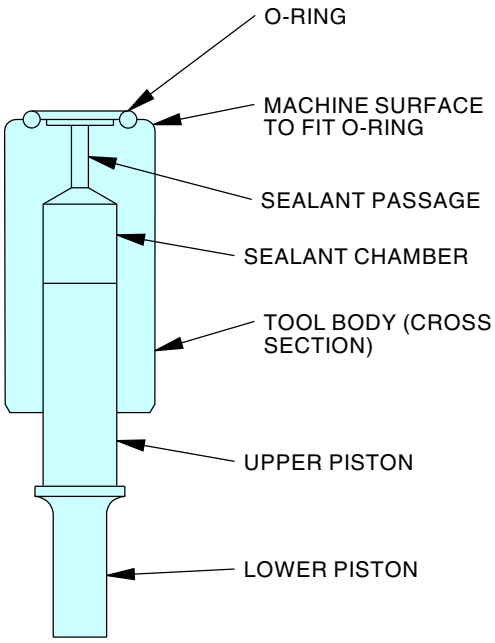
Fillet Seal and Dimensions of Full Bodied Fillet Seals
Figure 810/28-11-00-990-827

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Temporary Repair of Self-Sealing Rivets
Figure 811/28-11-00-990-828

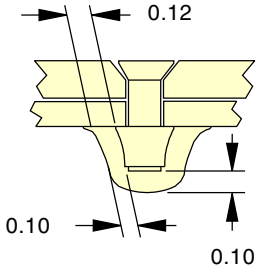
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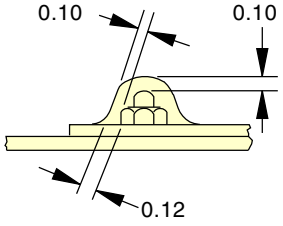
C52435 S0006414828_V2

Temporary Repair Tool (F70230) for Self-Sealing Rivets
Figure 812/28-11-00-990-829

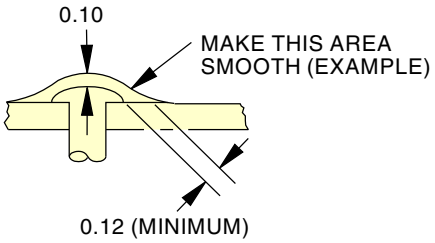
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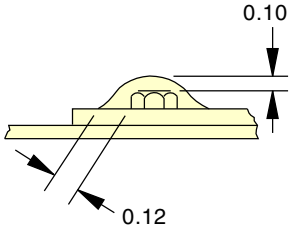
RIVET



BOLT



RIVET



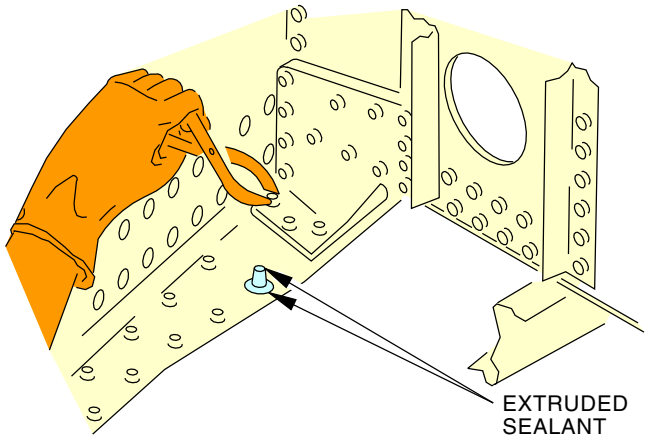
BOLT

NOTE: ALL DIMENSIONS ARE IN INCHES.

C52433 S0006414829_V2

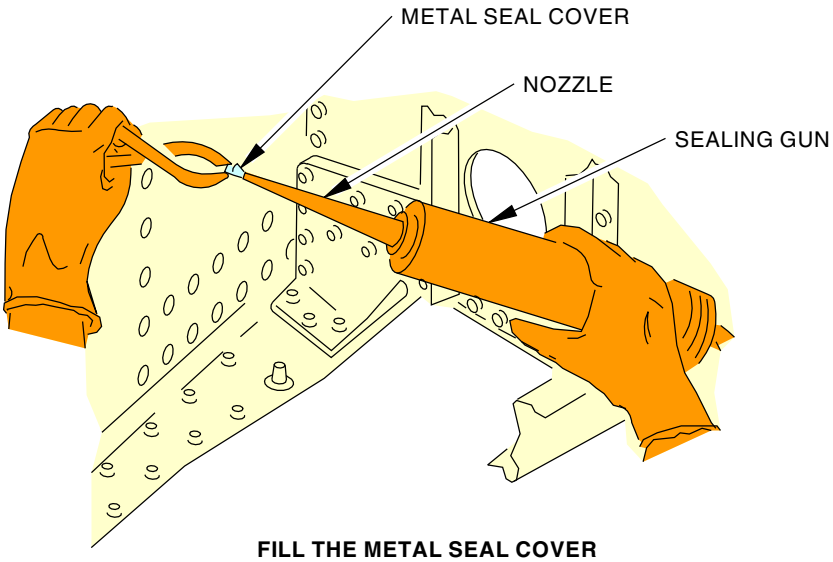
Dimensions of Fillet Seals (Inches) for Fasteners
Figure 813/28-11-00-990-830

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PUSH THE METAL SEAL COVER INTO POSITION

NOTE: THE NOZZLE SIZE DEPENDS ON THE SIZE OF THE METAL SEAL COVER.

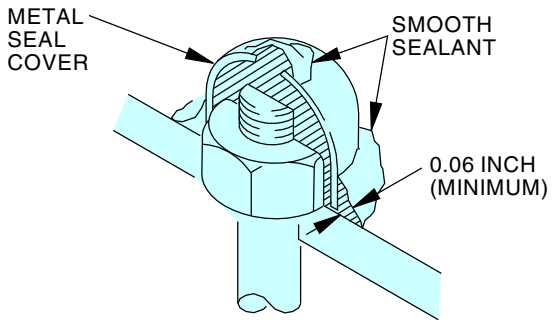


FILL THE METAL SEAL COVER

C52438 S0006414830_V2

Metal Seal Cover Installation
Figure 814/28-11-00-990-831

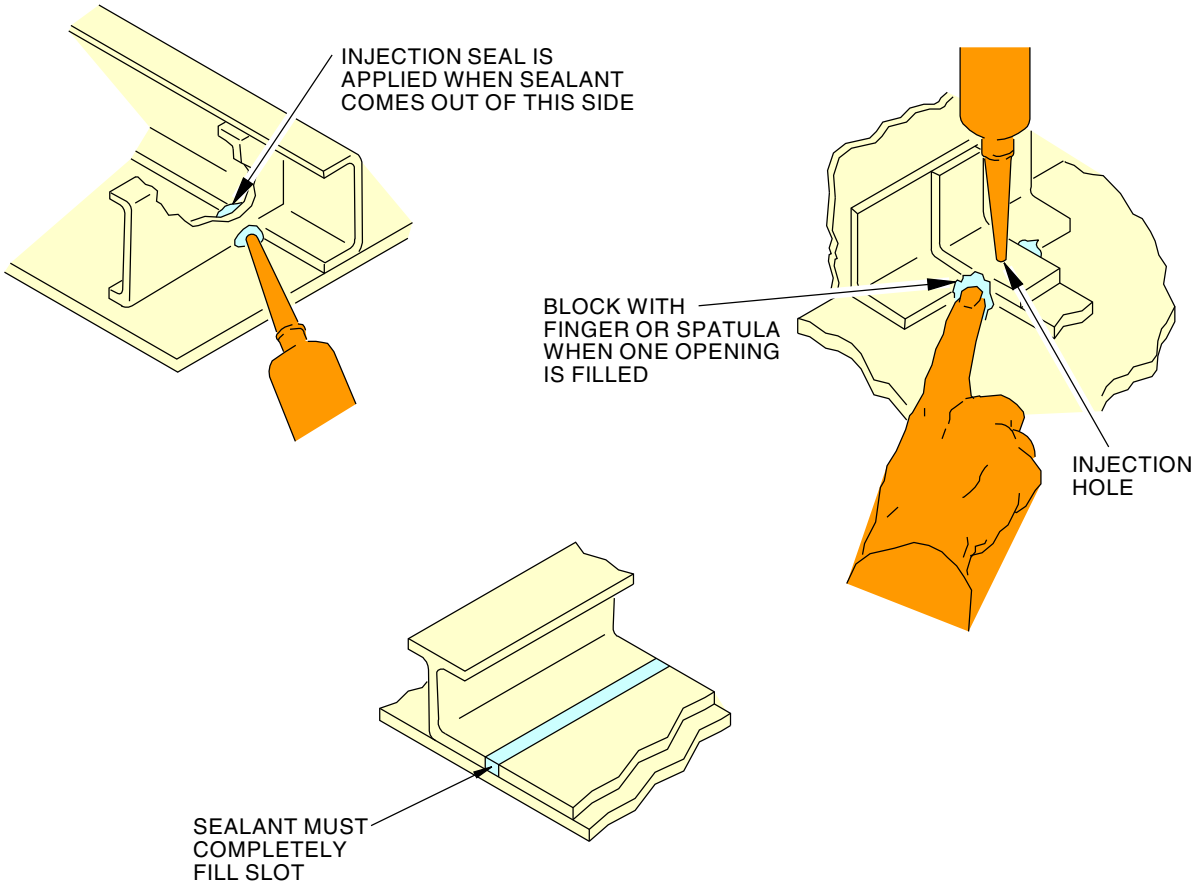
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C52439 S0006414831_V2

Installed Metal Seal Cover
Figure 815/28-11-00-990-832

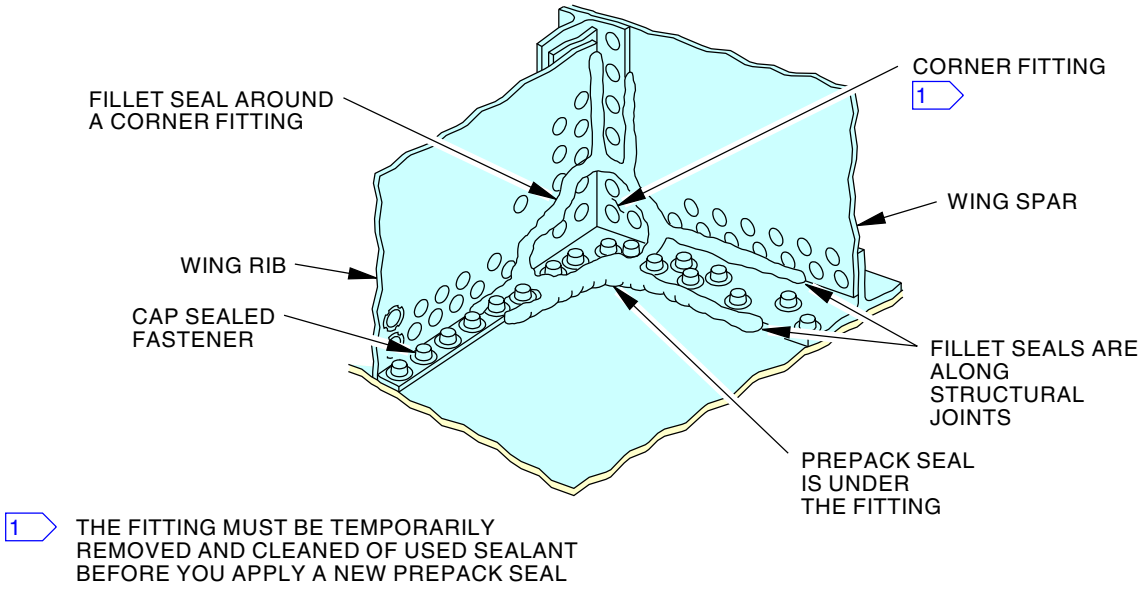
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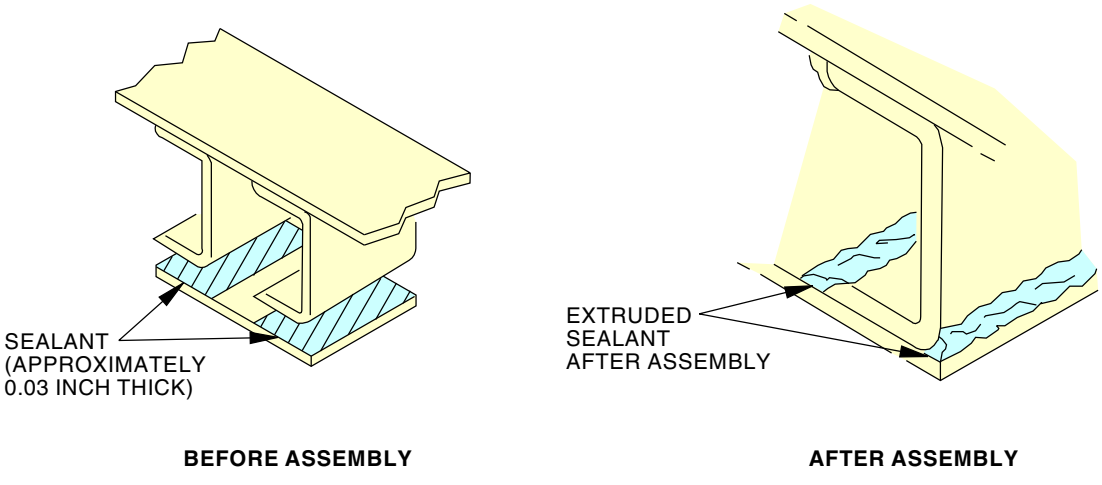
C52440 S0006414832_V2

Apply an Injection Seal
Figure 816/28-11-00-990-833

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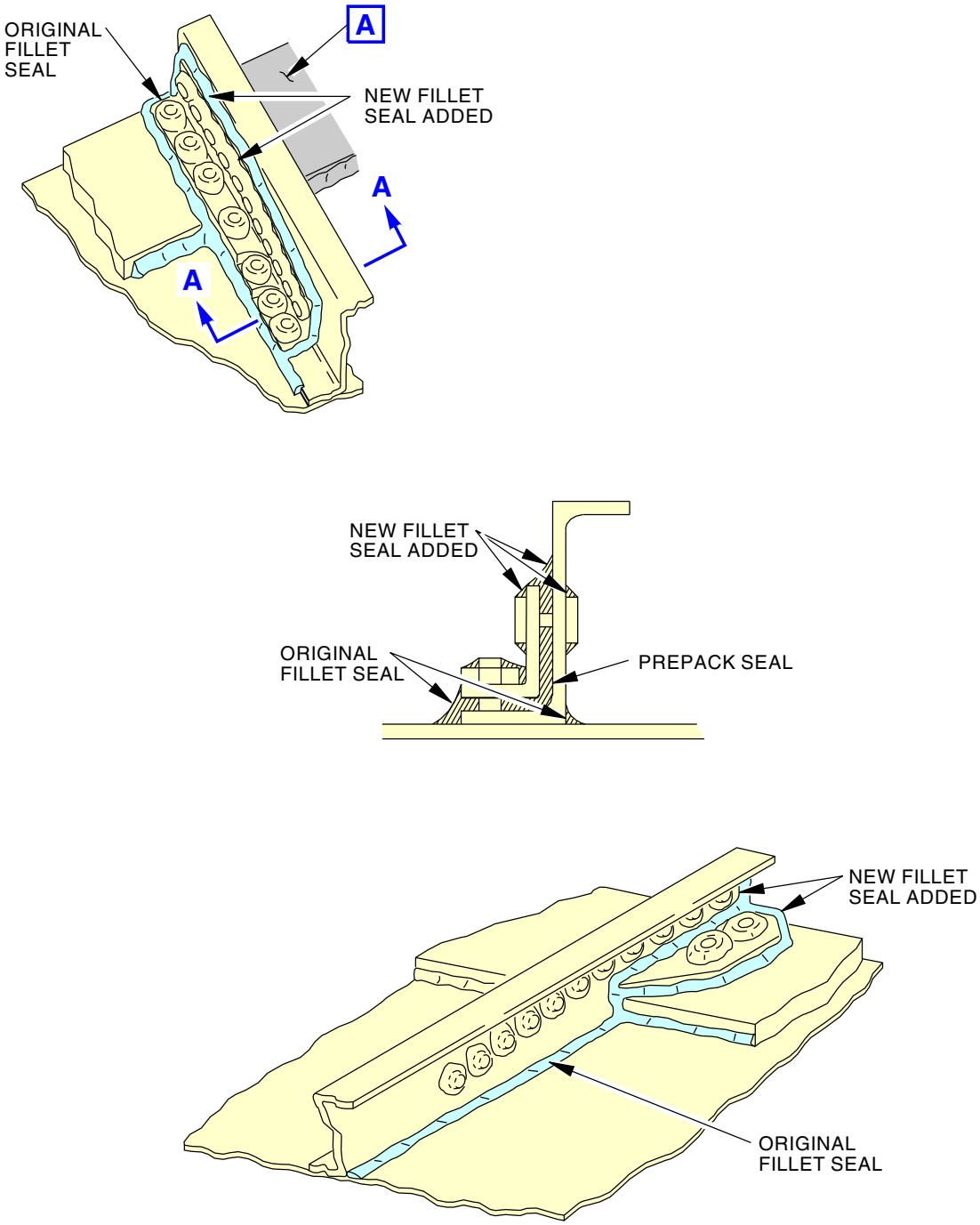


Example of a Combination of Prepack Seal and Fillet Seals
Figure 817/28-11-00-990-834



Faying Surface Seal
Figure 818/28-11-00-990-835

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C52447 S0006414835_V2

Prepack Seal Repair
Figure 819/28-11-00-990-836

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TASK 28-11-00-300-803

4. Repair of the Secondary Fuel Barrier Sealant

(Figure 810, Figure 820)

A. General

(1) Secondary fuel barrier sealant is a polyurethane (Type II) material applied to the top exterior surface of the center fuel tank.

(2) The sealant is applied on the entire front spar and top of the center wing box.

(3) If there is leakage in the secondary fuel barrier, the leakage must be repaired before the airplane is released for flight.

B. References

Reference	Title
51-21-02-370-801	Prepare the Surface to be Painted (P/B 701)
51-21-04-620-801	Alodine 600, 1000, 1200, and 1200S Coating Application (P/B 701)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1595	Instrument - Thickness Measurement, Eddy Current Test Method Part #: 604-299 Supplier: 61325 Part #: 605-023 Supplier: 61325 Opt Part #: 602-814 Supplier: 61325 Opt Part #: 602-816 Supplier: 61325 Opt Part #: 603-693 Supplier: 61325 Opt Part #: 603-694 Supplier: 61325 Opt Part #: 604-285 Supplier: 61325
COM-1596	Probe - Thickness Measurement, Pencil-Type, Model FTA3.3H Part #: 604-142 Supplier: 61325 Opt Part #: 602-128 Supplier: 61325
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: $0855 Part #: 234350 Supplier: $0857 Part #: 311 Supplier: F6892 Part #: 411B60 Supplier: 3DN12 Part #: 411B90 Supplier: 3DN12 Part #: DAD5013 Supplier: $0856 Part #: DFD5019 Supplier: $0856 Part #: J5-0275-2010 Supplier: 435R8 Part #: SCD5019 Supplier: $0856 Part #: ST982LF-9 Supplier: 62176 Part #: TS1275-4 Supplier: 1DWR5
STD-1080	Brush - Paint

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D. Consumable Materials

Reference	Description	Specification
A00015	Sealant - Secondary Fuel Barrier, 2 Part Polyurethane	BMS5-81 Type II
B00184	Solvent - Presealing, Cleaning Solvent	BMS11-7
C00259	Coating - Chemical And Solvent Resistant Finish, Corrosion Inhibiting Primer	BMS10-11 Type I
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A
G50077	Abrasive - Aluminum Oxide Paper, 240 grit or finer	
G50078	Abrasive - Aluminum Oxide Paper, 320 grit or finer	

E. Location Zones

Zone	Area
131	Area Above Wing Center Section, Left
132	Area Above Wing Center Section, Right

F. Prepare the Surface Area

(Figure 821)

SUBTASK 28-11-00-200-010

CAUTION

DO NOT APPLY SEALANT WHEN THE TEMPERATURE OF THE FUEL TANK STRUCTURE IS TOO HOT OR TOO COLD. THE SEALANT WILL NOT CURE CORRECTLY IF THE STRUCTURE TEMPERATURE IS OUT OF RANGE. INCORRECTLY CURED SEALANT CAN CAUSE A FUEL LEAK.

(1) Make sure the following conditions are met in the repair area when you apply sealant, A00015, and primer, C00259:

(a) The air temperature is between 65°F (18°C) and 95°F (35°C).

(b) The relative humidity is below 95 percent.

SUBTASK 28-11-00-150-007

(2) Remove any disbonded or damaged secondary fuel tank barrier sealant, A00015, and primer, C00259 (yellow), with sealant removal tools, COM-2481.

NOTE: Removal of disbonded material is necessary to make sure new secondary fuel tank barrier sealant, A00015, adheres to existing secondary fuel tank barrier sealant, A00015.

SUBTASK 28-11-00-110-008

(3) Clean 1.50 in. (3.8 cm) or more from the edge of the existing secondary fuel barrier sealant, A00015.

(a) Use a clean cotton wiper, G00034, wet with solvent, B00184.

(b) Rub the area dry with a clean, dry cotton wiper, G00034.

SUBTASK 28-11-00-120-002

(4) Lightly sand the existing secondary fuel barrier sealant, A00015, with 240 grit or finer abrasive paper, G50077.

NOTE: Be careful not to sand through the primer to bare metal. If you sand into the bare metal it can damage metal surface treatments that affect structural performance.

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(a) If it is necessary, break the edge of the existing secondary fuel barrier sealant, A00015.

(b) Lightly sand the area 0.50 in. (1.27 cm) or more from the edge of the existing secondary fuel barrier sealant, A00015.

SUBTASK 28-11-00-120-003

(5) If it is necessary, do these steps to reactivate surfaces coated with primer, C00259 (yellow):

(a) Use a clean cotton wiper, G00034, soaked with solvent, B00184

(b) Rub the area dry with a clean, dry cotton wiper, G00034.

(c) Lightly sand the surface with 320 grit or finer abrasive paper, G50078.

NOTE: Be careful not to sand through the primer to bare metal. If you sand into the bare metal it can damage metal surface treatments that affect structural performance.

SUBTASK 28-11-00-370-006

(6) If it is necessary, do these tasks to refinish bare metal surfaces:

(a) Prepare the Surface to be Painted, TASK 51-21-02-370-801.

(b) Alodine 600, 1000, 1200, and 1200S Coating Application, TASK 51-21-04-620-801.

SUBTASK 28-11-00-110-006

(7) Do these steps to final clean the repair area:

(a) Use a clean cotton wiper, G00034, soaked with solvent, B00184

(b) Rub the area dry with a clean, dry cotton wiper, G00034.

(c) Continue to clean and dry the surface until the cotton wiper, G00034, stays clean.

SUBTASK 28-11-00-370-007

(8) Apply the primer, C00259 (yellow), with a paint brush, STD-1080, up to the edge of the existing secondary fuel barrier sealant, A00015.

SUBTASK 28-11-00-390-011

(9) Let the primer, C00259, dry for 30 minutes to 3.5 hours.

G. Repair of the Secondary Fuel Barrier Sealant

SUBTASK 28-11-00-360-006

(1) Prepare the secondary fuel barrier sealant, A00015, as follows:

(a) Make sure the base resin and catalyst are each homogeneous, free from lumps or jelled particles.

(b) Make sure the base resin is clear.

1) If the base resin is cloudy, do these steps:

a) Heat the base resin in a 125 ±5°F (52 ±3°C) oven for 60 to 70 minutes.

b) Let the base resin cool to 77.5 ±17.5°F (25.3 ±9.7°C) before use.

c) Discard the base resin if it is still cloudy.

(c) Before you measure the necessary quantities of base resin and accelerator, stir the base resin and the accelerator, each in its container, to make sure each is homogeneous.

NOTE: Heating can cause the accelerator to form particulates (seeding) and become unstable.

1) After you stir the base resin and the accelerator, let them rest for 10 minutes to help remove trapped nitrogen or air.

2) Make sure the accelerator has no lumps or particulate matter after you stir it.

NOTE: Particulate matter is a result of seeding and cannot be corrected.

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a) Discard the accelerator if there is particulate matter in it.

(d) Slowly mix the accelerator into the base resin in a ratio of 100 parts of base resin to 90 parts of accelerator by weight or by volume.

NOTE: The material is normally supplied in premeasured kits to give the correct ratio.

SUBTASK 28-11-00-390-013

WARNING

DO NOT GET PRIMER AND SEALANT IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM PRIMER AND SEALANT. PUT ON GOGGLES, AND GLOVES WHEN YOU USE PRIMER AND SEALANT. KEEP PRIMER AND SEALANT AWAY FROM SPARKS, FLAME, AND HEAT. PRIMER AND SEALANT IS POISONOUS AND FLAMMABLE, AND CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(2) Apply two layers of sealant, A00015, with a flat, bristle brush.

NOTE: At 77 ±5°F (25 ±3°C) and 50 ±5 percent relative humidity, the approximate application time of sealant, A00015, Class 1 is 120 minutes. The approximate application time of sealant, A00015, Class 2 is 30 minutes. Higher temperatures make the application time shorter. Lower temperatures make the application time longer.

(a) Apply the sealant, A00015, to overlap the existing secondary fuel barrier sealant by a minimum of 1.00 in. (2.54 cm).

(b) Let the sealant dry (flash-off) a minimum of 15 minutes between layers.

(c) Make sure the second layer is applied before it reaches the sealant dry hard time (Table 801)

(d) Make sure the total thickness of the applied sealant is 0.010 in. (0.254 mm) to 0.015 in. (0.381 mm).

NOTE: Some variation of secondary fuel barrier sealant thickness is acceptable. In some localized areas the secondary fuel barrier sealant thickness is acceptable between 0.008 in. (0.203 mm) and 0.020 in. (0.508 mm). The maximum total thickness in overlapping areas including the existing secondary fuel barrier sealant is 0.030 in. (0.762 mm).

(e) Use a thickness measurement instrument, COM-1595, and thickness measurement probe, COM-1596, to make sure the sealant has the correct thickness.

SUBTASK 28-11-00-390-014

(3) Let the sealant dry.

(a) The cure rates of the sealant are shown in Table 801:

NOTE: A cure temperature of more than 80°F (27°C) is recommended for the best results.

Table 801/28-11-00-993-847 Cure Conditions

CURE TEMPERATURE	CURE CONDITIONS			
	DRY HARD (HOURS) *[1]		DRY THROUGH (HOURS) *[2]	
	TYPE II, CLASS 1	TYPE II, CLASS 2	TYPE II, CLASS 1	TYPE II, CLASS 2
75 ± 5 deg. F 23.8 ± 2.8 deg. C	50	8	96	24
100 ± 5 deg. F 37.8 ± 2.8 deg. C	18	2.5	36	3.5

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Table 801/28-11-00-993-847 Cure Conditions (Continued)

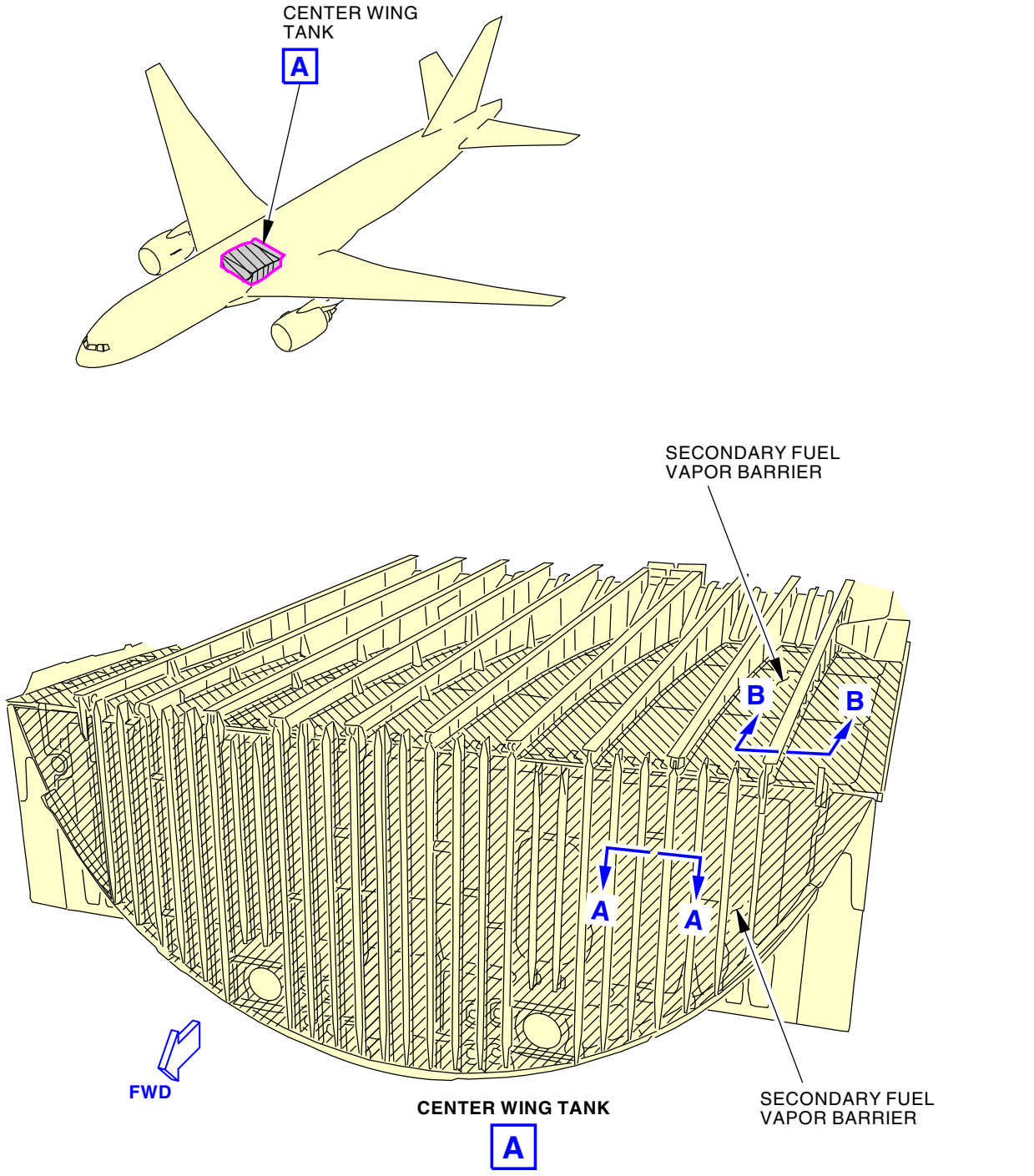
CURE TEMPERATURE	CURE CONDITIONS			
	DRY HARD (HOURS) *[1]		DRY THROUGH (HOURS) *[2]	
	TYPE II, CLASS 1	TYPE II, CLASS 2	TYPE II, CLASS 1	TYPE II, CLASS 2
125 ± 5 deg. F 51.7 ± 2.8 deg. C	7.5	1.5	15	2.5
150 ± 5 deg. F 65.6 ± 2.8 deg. C	2.5	1.5	5	2

*[1] Condition where metal particles do not bond to the sealant.

*[2] Condition where sealant is sufficiently hard to prevent damage when walked on with boot socks.

——— END OF TASK ———

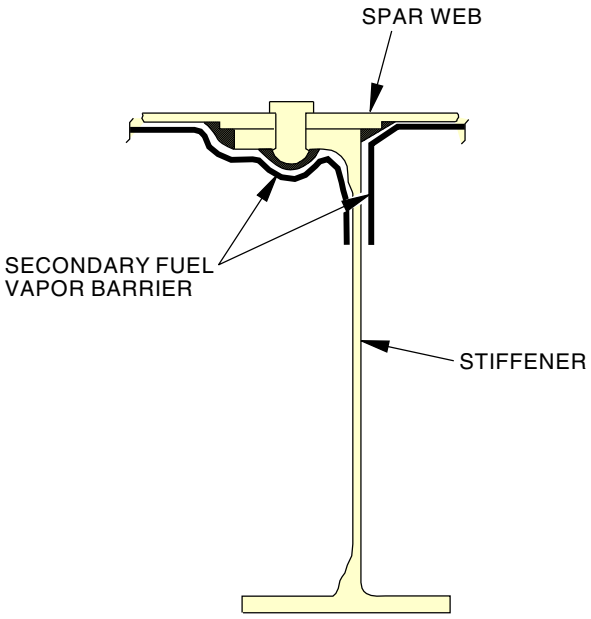
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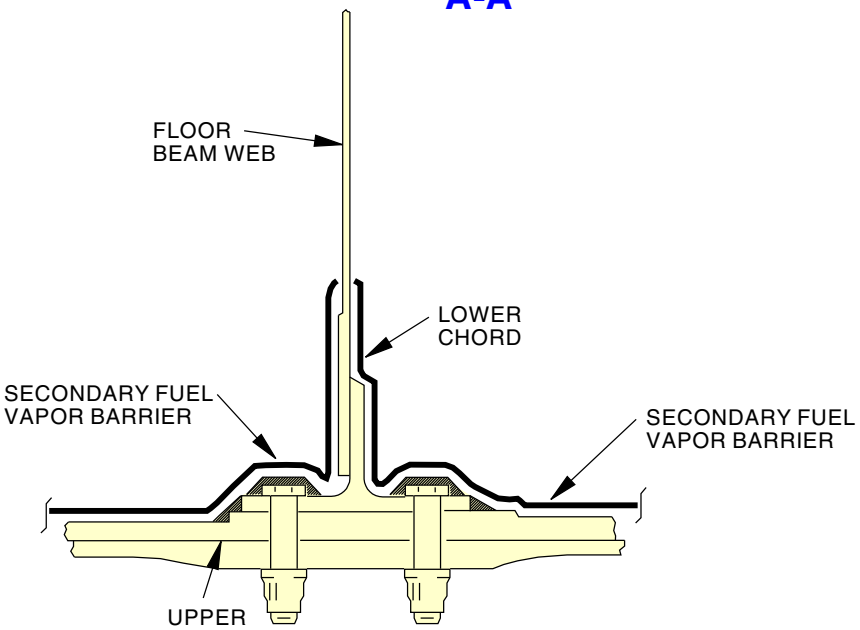
Secondary Fuel Vapor Barrier Sealant Repair
Figure 820/28-11-00-990-848 (Sheet 1 of 2)

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(EXAMPLE)

A-A



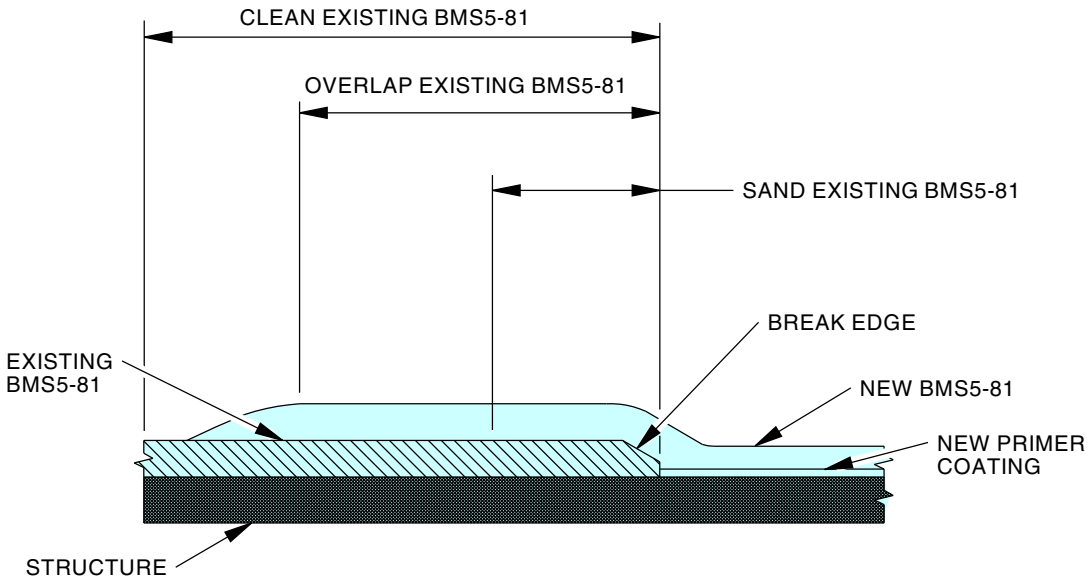
(EXAMPLE)

B-B

L45002 S0006414839_V2

Secondary Fuel Vapor Barrier Sealant Repair
Figure 820/28-11-00-990-848 (Sheet 2 of 2)

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**SURFACE AREA PREPARATION
(EXAMPLE)**

1958951 S0000374915_V2

**Secondary Fuel Barrier Sealant Repair Preparation
Figure 821/28-11-00-990-857**

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MAIN TANK ACCESS DOOR - REMOVAL/INSTALLATION

1. General

A. Each main fuel tank has 27 elliptical shaped access doors installed in the lower wing surface. The access doors let you go into the main fuel tanks.

B. This procedure contains two tasks. The first task removes a main tank access door. The second task installs a main tank access door.

TASK 28-11-01-000-801

2. Main Tank Access Door Removal

(Figure 401)

A. References

Reference	Title
27-51-28-000-801	Outboard Flap Support Fairing Removal (P/B 401)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)
28-26-00-650-803	Suction Defueling (P/B 201)

B. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

C. Procedure

SUBTASK 28-11-01-650-001

(1) To defuel the applicable fuel tank, do this task: Pressure Defueling, TASK 28-26-00-650-801, Tank to Tank Transfer, TASK 28-26-00-650-802, or Suction Defueling, TASK 28-26-00-650-803.

SUBTASK 28-11-01-010-001

(2) To remove the outboard flap support fairing 1 or 2 if it is necessary, do this task: Outboard Flap Support Fairing Removal, TASK 27-51-28-000-801.

SUBTASK 28-11-01-940-001

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(3) Do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

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SUBTASK 28-11-01-030-001

(4) Hold the clamp ring [5] and remove the mounting bolts [4] for the applicable access door.

SUBTASK 28-11-01-420-001

CAUTION

DO NOT USE A LEVER (PRY) ON THE ACCESS DOOR. IF THE ACCESS DOOR DOES NOT MOVE FREELY, USE A RUBBER MALLET TO HIT LIGHTLY AROUND THE ACCESS DOOR. IF YOU ARE NOT CAREFUL, SCRATCHES OR DAMAGE TO THE SEAL SURFACE CAN OCCUR.

(5) On the main tank access doors without the fuel measuring sticks, push up on the access door.

(a) If the main tank access door [1], access door [10], or access door [14] does not move freely, use a rubber mallet and lightly hit around the access door [1], access door [10], or access door [14].

SUBTASK 28-11-01-020-001

CAUTION

BE CAREFUL WHEN YOU REMOVE OR INSTALL THE ACCESS DOORS THAT HAVE FUEL MEASURING STICKS. IF THE FUEL MEASURING STICKS TOUCH THE STRINGERS IN THE FUEL TANK, DAMAGE TO THE FUEL MEASURING STICKS CAN OCCUR.

(6) On the main tank access doors with the fuel measuring sticks, push up and put the access doors at an angle so the fuel measuring sticks do not touch the stringers at the top of the fuel tank.

(a) If the main tank access door [6], access door [8], or access door [15] does not move freely, use a rubber mallet and lightly hit around the main tank access door [6], access door [8], or access door [15].

SUBTASK 28-11-01-020-002

CAUTION

BE CAREFUL WHEN YOU REMOVE AN ACCESS DOORS WITH A FUEL MEASURING STICK INSTALLED ON THE ACCESS DOOR. IF YOU ARE NOT CAREFUL WHEN YOU REMOVE THESE ACCESS DOORS, DAMAGE TO THE FUEL MEASURING STICK CAN OCCUR.

(7) Remove the main tank access door from the fuel tank.

(a) These access doors have fuel measuring stick assemblies that attach to the inner surface of the door:

Table 401/28-11-01-993-801

LEFT MAIN TANK	RIGHT MAIN TANK
533AB	633AB
533FB	633FB
541CB	641CB
541FB	641FB
541JB	641JB
541MB	641MB
541QB	641QB
543AB	643AB

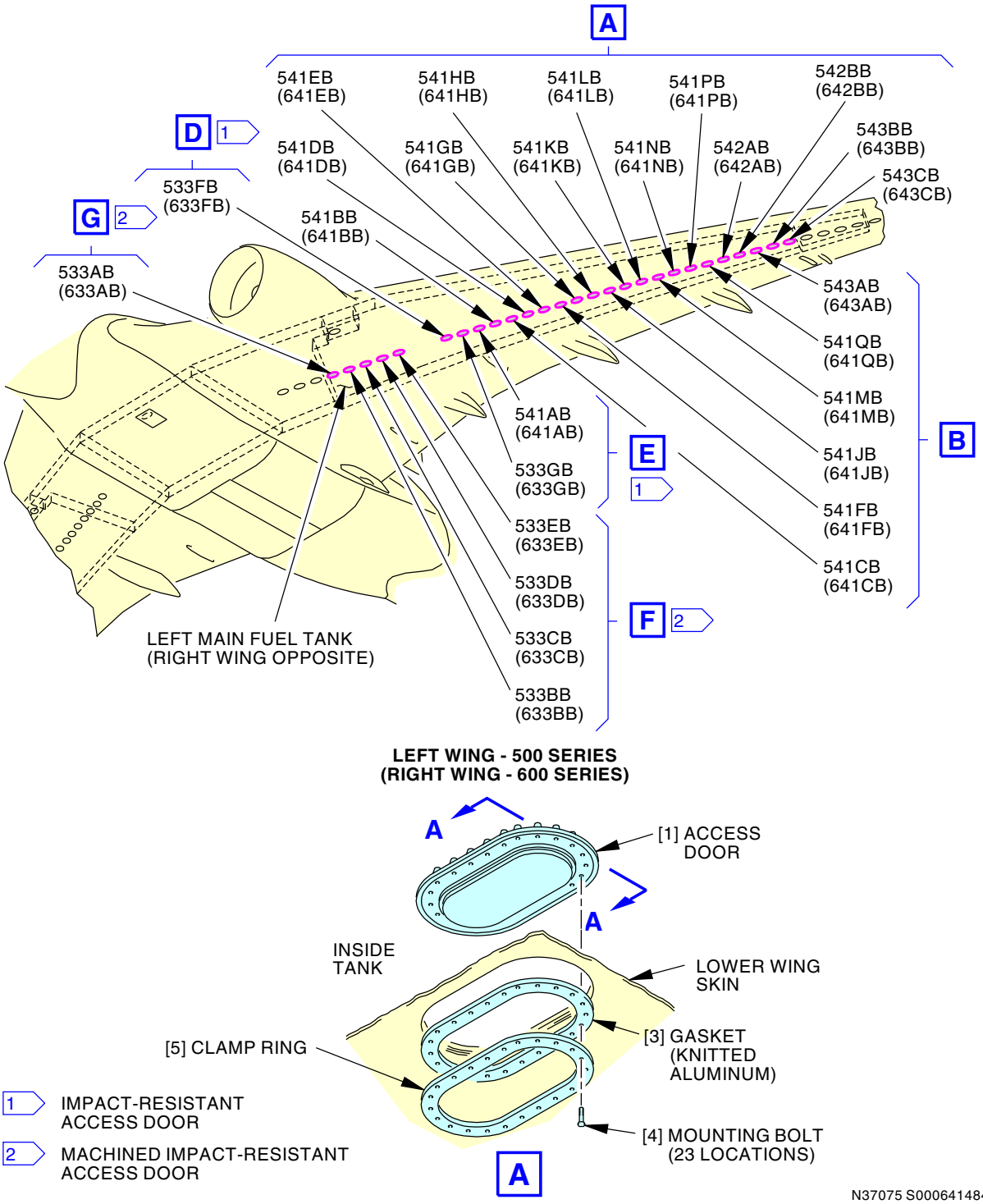
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SUBTASK 28-11-01-410-002

(8) Install a rubber protector to the access door opening.

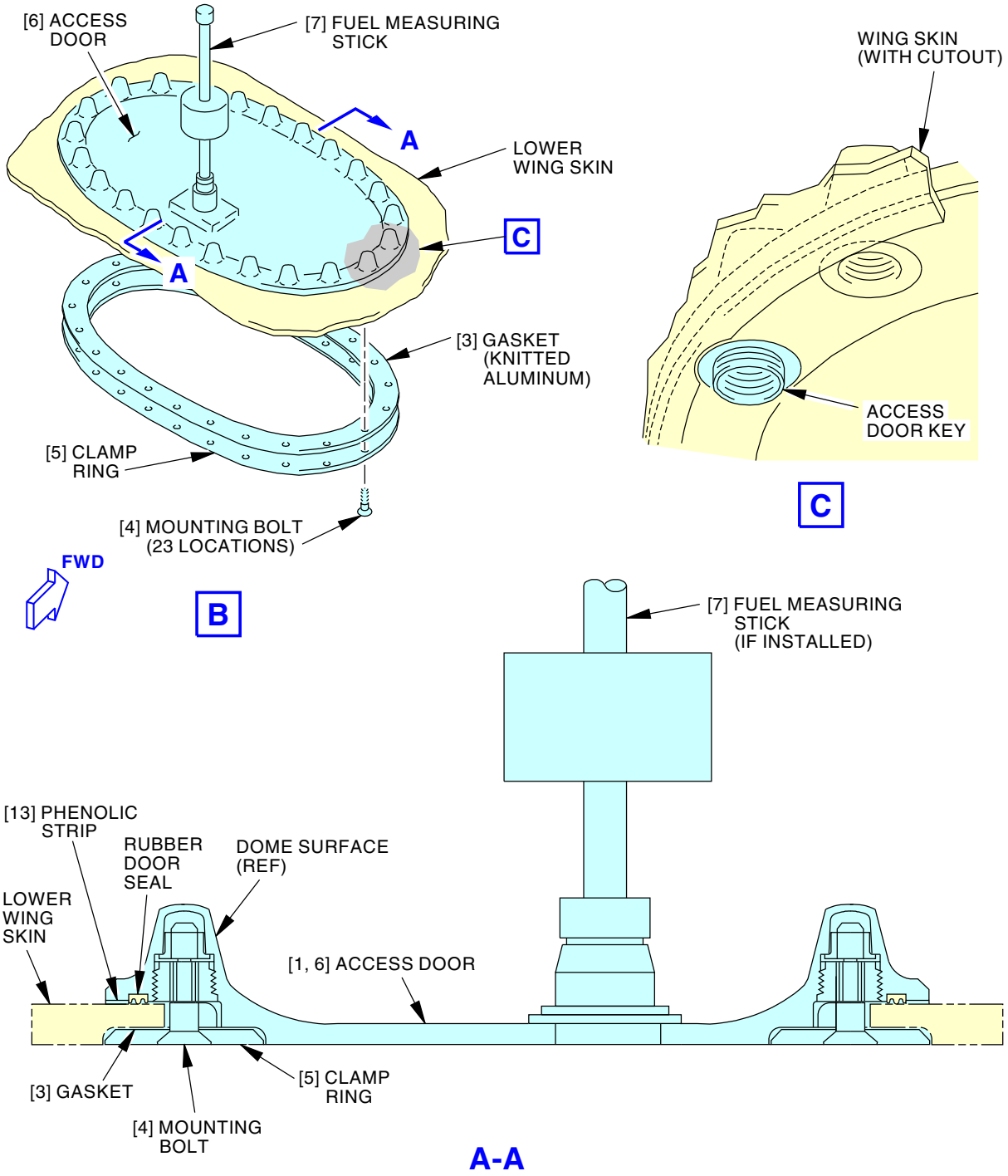
END OF TASK

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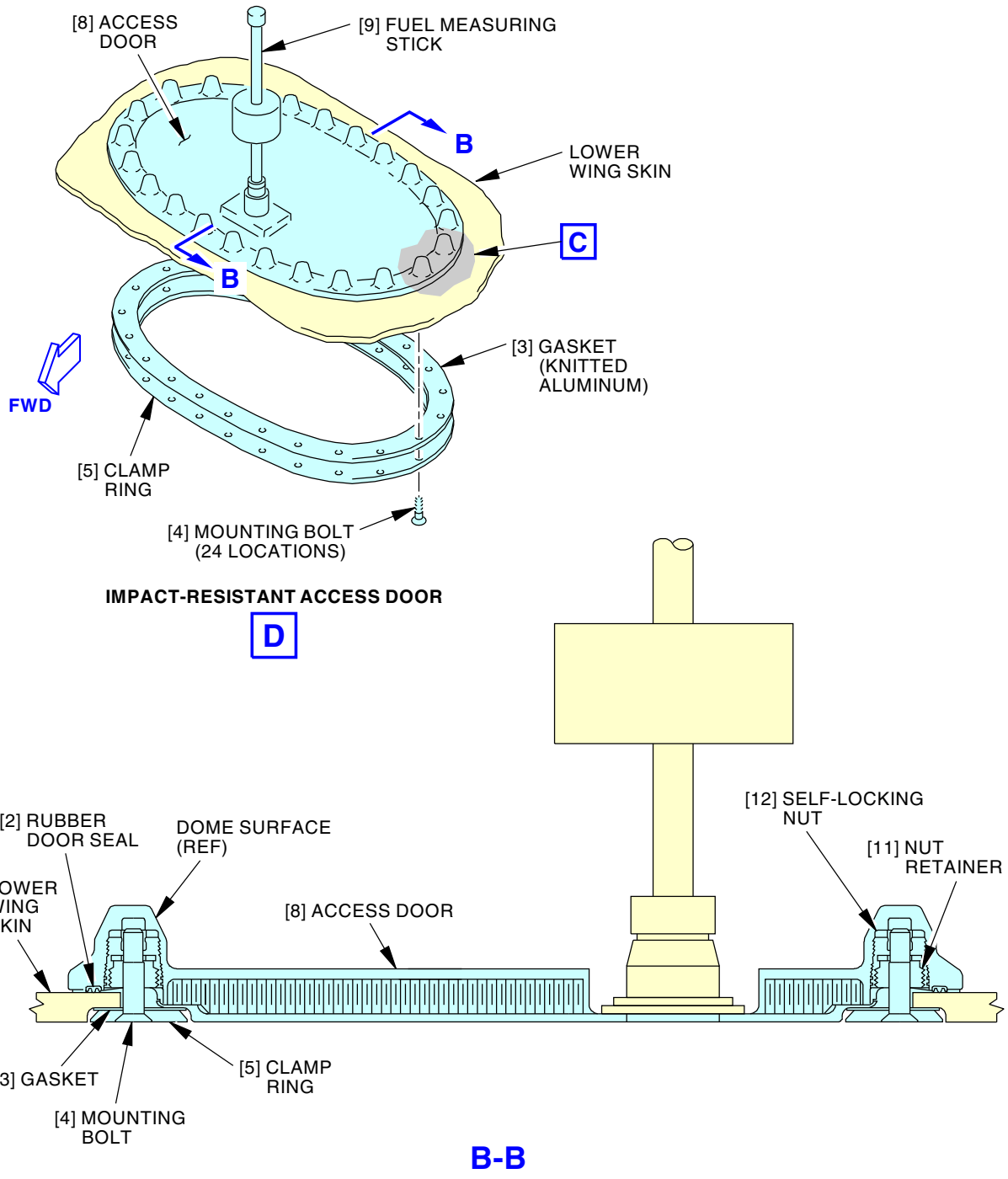
Main Tank Access Door Installation
Figure 401/28-11-01-990-801 (Sheet 1 of 6)

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Main Tank Access Door Installation
Figure 401/28-11-01-990-801 (Sheet 2 of 6)

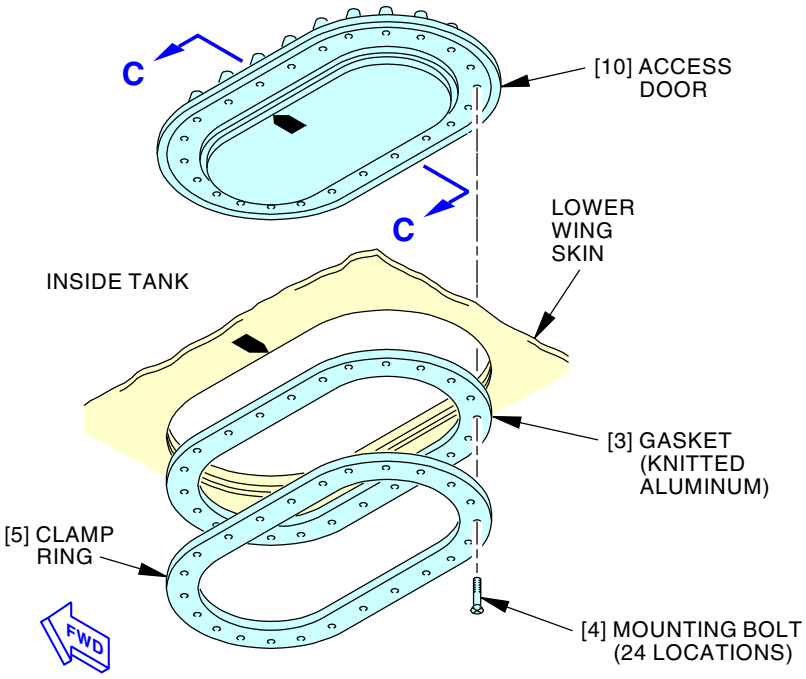
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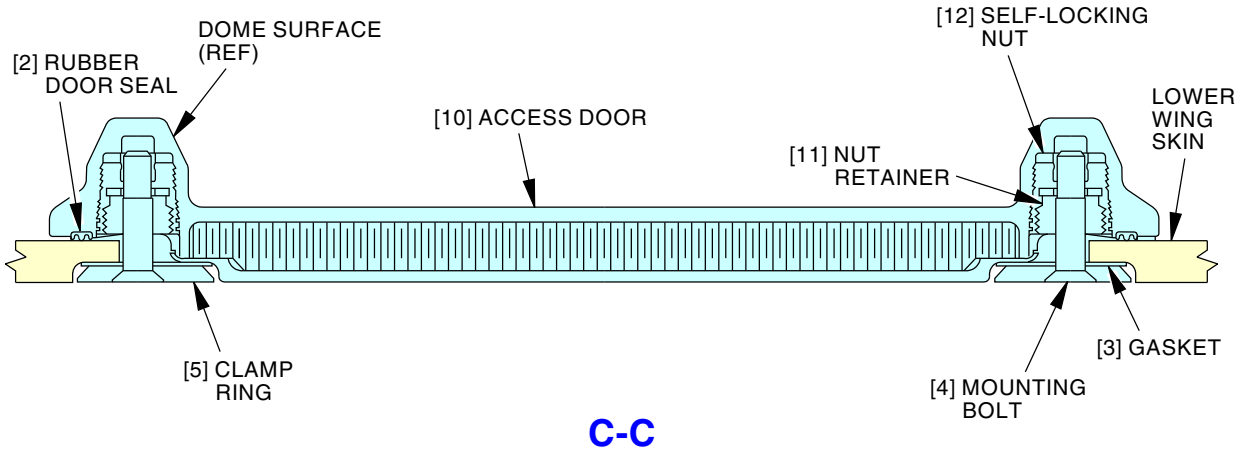
Main Tank Access Door Installation
Figure 401/28-11-01-990-801 (Sheet 3 of 6)

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IMPACT-RESISTANT ACCESS DOOR

E

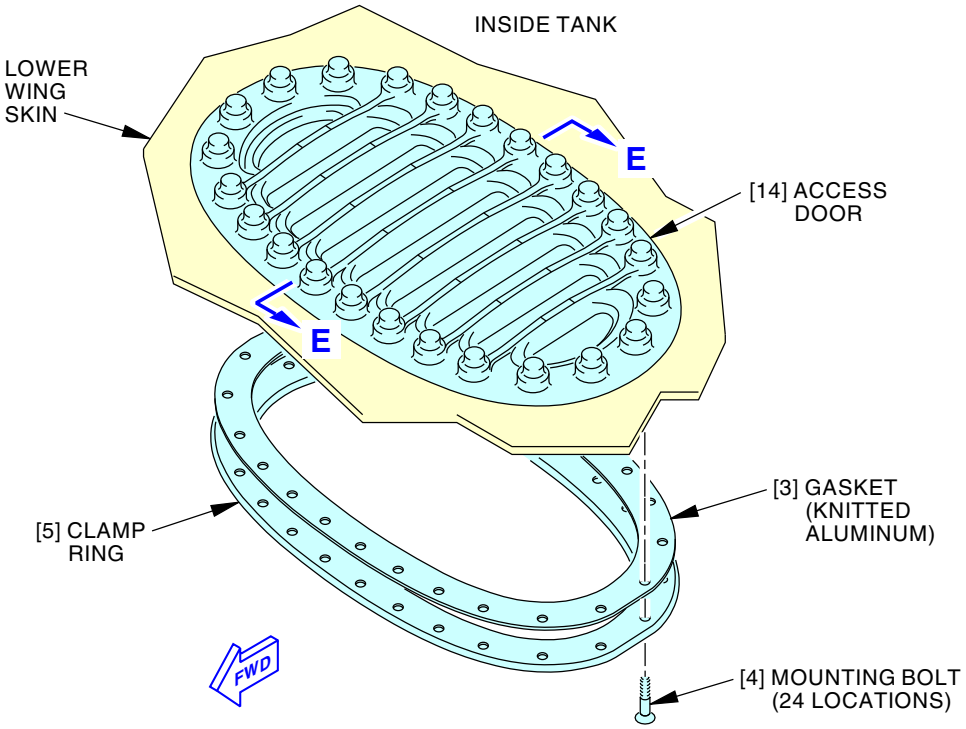


C-C

K19217 S0006414850_V5

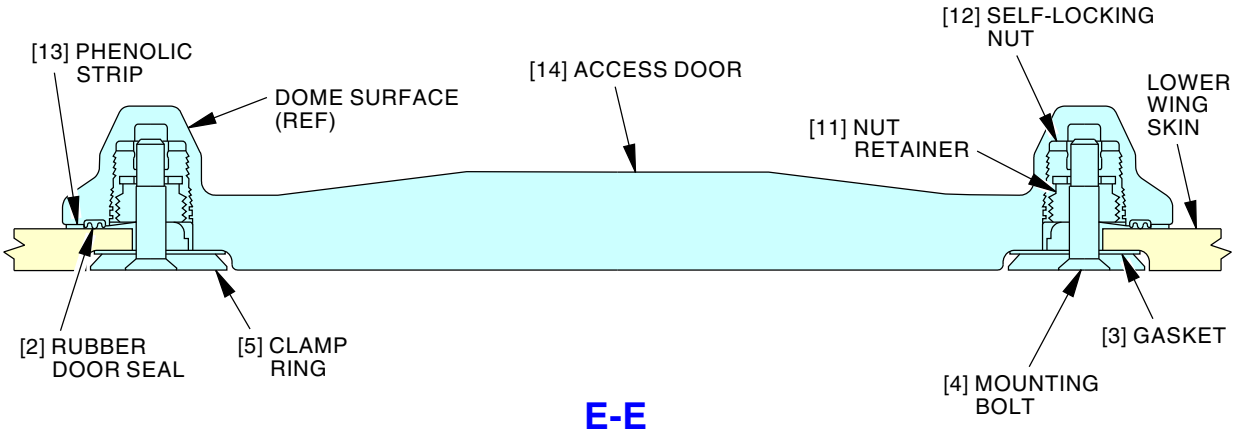
Main Tank Access Door Installation
Figure 401/28-11-01-990-801 (Sheet 4 of 6)

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MACHINED IMPACT-RESISTANT ACCESS DOOR

F

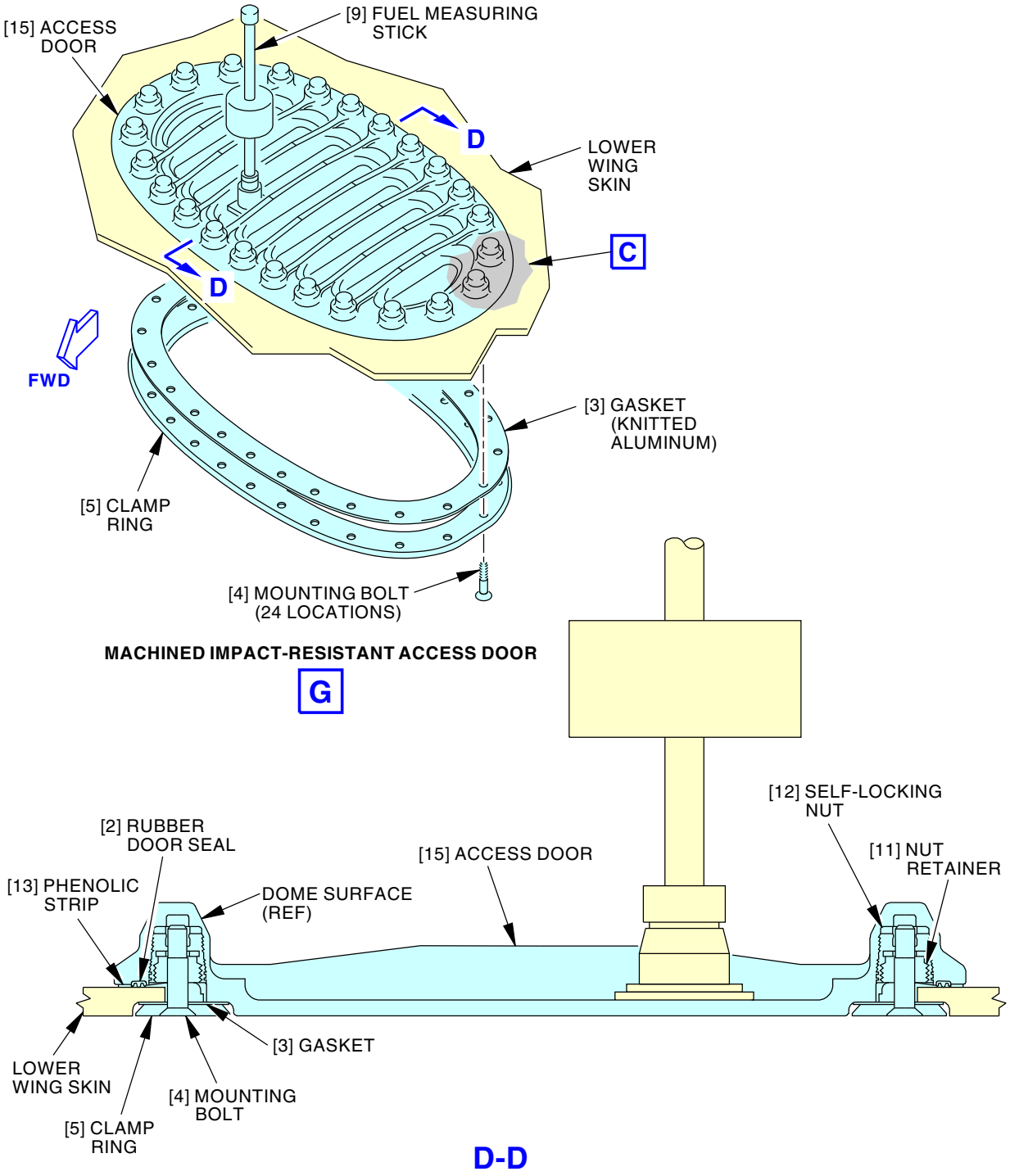


E-E

1852275 S0000331407_V3

Main Tank Access Door Installation
Figure 401/28-11-01-990-801 (Sheet 5 of 6)

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Main Tank Access Door Installation
Figure 401/28-11-01-990-801 (Sheet 6 of 6)

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TASK 28-11-01-400-801

3. Main Tank Access Door Installation

(Figure 401)

A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

(2) For all access doors except machined impact-resistant doors 533AB (633AB) - 533EB (633EB);

Mobilgrease 33, D50306 is recommended for access door gasket installations. Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, can still be used for access door gaskets, but should be replaced with Mobilgrease 33, D50306, as soon as practical.

(3) For all access doors except machined impact-resistant doors 533AB (633AB) - 533EB (633EB);

Do not mix Cor-Ban 27L Compound, G50237, and Aeroshell 14 helicopter grease, D50050. When you apply the recommended Aeroshell 14 helicopter grease, D50050, make sure to remove all anti-corrosion compound, Cor-Ban 27L Compound, G50237, from the gasket, clamp ring and the access door structure on the airplane.

(4) For all machined impact-resistant access doors 533AB (633AB) - 533EB (633EB);

Cor-Ban 27L Compound, G50237, is the only material used for access door gasket installations.

(5) It is recommended to install a new knitted aluminum gasket for the door installation.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
27-51-28-400-801	Outboard Flap Support Fairing Installation (P/B 401)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-790-801	Fuel Leak Detection Procedures (P/B 601)
28-11-07-900-801	Rubber Door Seal - Replacement (P/B 801)

C. Consumable Materials

Reference	Description	Specification
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III
C00528	Compound - Corrosion Preventive, Petroleum Hot Application (Soft Film)	MIL-C-11796 Class III
D00504	Grease - Petrolatum	VV-P-236
D50050	Grease - Multipurpose, Helicopter Oscillating Bearing Grease with Calcium Soap Thickener - Aeroshell 14	MIL-G-25537

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(Continued)

Reference	Description	Specification
D50306	Grease - Synthetic Aircraft Grease (Mobilgrease 33)	BMS3-33 Type 1, MIL-PRF-23827 Type 1
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A
G50237	Compound - Corrosion Inhibiting, Non-drying - Cor-Ban 27L	BMS3-38

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Access door	Not Specified	
3	Gasket	Not Specified	
6	Access door	Not Specified	
8	Access door	Not Specified	
10	Access door	Not Specified	
14	Access door	Not Specified	
15	Access door	Not Specified	

E. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

F. Prepare for the Access Door Installation

SUBTASK 28-11-01-210-007

(1) Examine the open tank for unwanted objects or material.

(a) The access doors for the main fuel tanks shown in Table 402 are impact-resistant doors and they must not be replaced with a standard door:

Table 402/28-11-01-993-802

THE LEFT WING	THE RIGHT WING
533AB	633AB
533BB	633BB
533CB	633CB
533DB	633DB
533EB	633EB
533FB	633FB

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Table 402/28-11-01-993-802 (Continued)

THE LEFT WING	THE RIGHT WING
533GB	633GB
541AB	641AB

SUBTASK 28-11-01-100-002

(2) Clean the open tank if it is necessary: (TASK 28-11-00-410-801).

28-AWL-16: CDCCL

SUBTASK 28-11-01-210-009

(3) Make sure there is no visible corrosion on the access door, clamp ring [5], and the lower wing skin electrical faying surfaces.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

G. Prepare the Molded Rubber Seal for Installation

SUBTASK 28-11-01-210-002

(1) Make sure the rubber door seal [2] is in good condition.

(a) To replace the rubber door seal [2] if it is necessary, do this task: Rubber Door Seal - Replacement, TASK 28-11-07-900-801.

(b) Apply a thin layer of petrolatum grease, D00504, to the rubber door seal [2].

H. Prepare the New Knitted Aluminum Gasket for Installation (Recommended Procedure)

SUBTASK 28-11-01-210-008

(1) Examine the container of the new gasket [3] to find the manufacture date of the gasket [3].

28-AWL-16: CDCCL

(a) For all except the machined impact-resistant access doors [14] or access doors [15] [533AB (633AB) - 533EB (633EB)]:

If the new gasket [3] is more than five years old from the manufacturing date, do these steps before you install the gasket [3]:

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

1) Remove (De-grease) the old grease or compound from the new gasket [3].

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

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28-AWL-16: CDCCL

2) Refill (Re-impregnate) both sides of the new gasket [3] with Mobilgrease 33, D50306 (recommended), Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

a) Do not mix Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, and Cor-Ban 27L Compound, G50237, together.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

b) Apply 0.5 fl-oz (15 ml) - 1 fl-oz (30 ml) of Mobilgrease 33, D50306 (recommended), Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

(b) For machined impact-resistant access doors [14] or access doors [15] [533AB (633AB) - 533EB (633EB)];

If the new gasket [3] is more than five years old from the manufacturing date, do these steps before you install the gasket [3]:

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

1) Remove (De-grease) the Cor-Ban 27L Compound, G50237 from the new gasket [3].

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

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28-AWL-16: CDCCL

2) Refill (Re-impregnate) both sides of the new gasket [3] with Cor-Ban 27L Compound, G50237t.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

a) Use Cor-Ban 27L Compound, G50237, to refill the new gasket [3].

28-AWL-16: CDCCL

b) Apply 0.5 fl-oz (15 ml) - 1 fl-oz (30 ml) of Cor-Ban 27L Compound, G50237.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

(c) If the new gasket [3] is less than five years old from the manufacturing date, it is not necessary to remove the grease or anti-corrosion compound.

SUBTASK 28-11-01-490-001

(2) Put the tray assembly for the new gasket [3] on a flat surface with its face up.

SUBTASK 28-11-01-030-003

(3) Remove the paper cover from the tray.

SUBTASK 28-11-01-430-006

(4) Put the clamp ring [5] on the new gasket [3] (with the countersink end of the holes face up).

(a) Make sure the clamp ring holes and the gasket holes align.

NOTE: The holes are not symmetrical.

SUBTASK 28-11-01-430-007

(5) Push the clamp ring [5] on the gasket [3] until the clamp ring [5] is tightly against the gasket [3].

SUBTASK 28-11-01-430-008

(6) Remove the clamp ring [5], the gasket [3], and the release strip from the tray as a unit.

SUBTASK 28-11-01-430-009

(7) Put the assembly, with the gasket side turned up, on a flat surface.

SUBTASK 28-11-01-030-004

(8) Remove the release strip from the gasket [3].

I. Prepare the Original Knitted Aluminum Gasket for Installation (Alternate Procedure)

SUBTASK 28-11-01-110-001

(1) Clean the gasket [3] and clamp ring [5] with a cotton wiper, G00034, and solvent, B00083.

(a) Continue cleaning until the cotton wiper, G00034, remains clean.

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SUBTASK 28-11-01-211-001

28-AWL-16: CDCCL

(2) A used gasket [3] that meets the criteria that follows can be installed:

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

(a) No fastener holes are torn.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

(b) The gasket [3] is not elongated or out of shape.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

(c) The gasket rubber seals around the inner and outer periphery must be a minimum of 0.015 in. (0.4 mm) thick.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

(d) No more than 10% of strands in all three layers are broken through in any one area.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

SUBTASK 28-11-01-620-008

28-AWL-16: CDCCL

(3) For all except machined impact-resistant access doors [14] or access doors [15] [533AB (633AB) - 533EB (633EB)];

Fill both sides of the gasket [3] with Mobilgrease 33, D50306 (recommended), Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

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28-AWL-16: CDCCL

(a) Do not mix Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, and Cor-Ban 27L Compound, G50237.

NOTE: The Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, must be the same as on the clamp ring [5] and access door structure.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

(b) Make sure the Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, fully fills the mesh of the gasket.

(c) Make sure there is a continuous layer of Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, on both sides of the gasket [3].

SUBTASK 28-11-01-620-006

28-AWL-16: CDCCL

(4) For machined impact-resistant access doors [14] or access doors [15] [533AB (633AB) - 533EB (633EB)];

Fill both sides of the gasket [3] with Cor-Ban 27L Compound, G50237.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

(a) Make sure the Cor-Ban 27L Compound, G50237, fully fills the mesh of the gasket.

(b) Make sure there is a continuous layer of Cor-Ban 27L Compound, G50237, on both sides of the gasket [3].

SUBTASK 28-11-01-420-004

(5) Put the clamp ring [5] on the gasket [3] (with the countersink end of the holes face up).

(a) Make sure the clamp ring [5] holes and the gasket [3] holes align.

NOTE: The holes are not symmetrical.

SUBTASK 28-11-01-420-005

(6) Push the clamp ring [5] on the gasket [3] until the clamp ring [5] is tightly against the gasket [3].

J. Inspect the Access Door

28-AWL-16: CDCCL

SUBTASK 28-11-01-212-003

(1) Make sure there is a phenolic strip [13] around the access door [1], access door [6], access door [14], or access door [15] that mates with the wing skin inside the tank.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

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SUBTASK 28-11-01-212-001

(2) Make sure that there are no cracks in the nut domes of the access door.

NOTE: Paint flaking or bulging can show cracks in the nut domes of the access door.

SUBTASK 28-11-01-200-001

(3) Do a check of the minimum locking torque of the self-locking nuts [12] from the machined impact-resistant access doors [14] or access doors [15], [533AB (633AB) - 533EB (633EB)]:

(a) Apply 15.0 in-lb (1.7 N·m).

1) If the self locking torque is less than 15.0 in-lb (1.7 N·m), do the steps that follow:

a) Remove the nut retainers [11] and self-locking nuts [12].

b) Install new self-locking nuts [12].

c) Install the nut retainers [11] until the nut retainers [11] contact the land area of the door.

K. Install the Access Door

SUBTASK 28-11-01-410-003

(1) Do the applicable steps in this task: Fuel Tank Closure, TASK 28-11-00-410-801.

SUBTASK 28-11-01-020-003

(2) Remove the rubber protector in the access door opening.

SUBTASK 28-11-01-210-001

(3) Make sure the areas on the access door and the wing skin, that the rubber door seal [2] touches, are clean.

(a) Use solvent, B00083, to clean the surface if it is necessary.

SUBTASK 28-11-01-420-002

(4) On the main tank access doors fuel measuring sticks, put the access door in the fuel tank and set the door in the opening.

SUBTASK 28-11-01-420-003

CAUTION

BE CAREFUL WHEN YOU REMOVE OR INSTALL THE ACCESS DOORS THAT HAVE FUEL MEASURING STICKS. IF THE FUEL MEASURING STICKS TOUCH THE STRINGERS IN THE FUEL TANK, DAMAGE TO THE FUEL MEASURING STICKS CAN OCCUR.

CAUTION

MAKE SURE THAT THE ACCESS DOOR IS INSTALLED CORRECTLY. IF YOU INSTALL THE ACCESS DOOR INCORRECTLY, FUEL CAN SPILL.

(5) On the main tank access doors with the fuel measuring sticks, put the access door in the fuel tank at an angle so the fuel measuring stick [7] or fuel measuring stick [9] do not touch the stringers at top of the fuel tank and set the door in the opening.

NOTE: Access doors with fuel measuring sticks have a door key (View C) (Figure 401). Make sure the key is installed correctly in the lower wing skin.

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SUBTASK 28-11-01-640-005

28-AWL-16: CDCCL

CAUTION DO NOT APPLY TOO MUCH GREASE TO THE LOWER SURFACE OF THE WING. YOU CAN CAUSE DAMAGE TO THE ACCESS DOOR WITH HYDRAULIC PRESSURE FROM THE GREASE WHEN YOU INSTALL THE MOUNTING FASTENERS.

(6) For all except machined impact-resistant access doors [14] or access doors [15] [533AB (633AB) - 533EB (633EB)];

Apply a very thin layer of Mobilgrease 33, D50306 (recommended), Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, to the lower surface of the wing skin that touches the aluminum gasket [3] for the access door [1], access door [6], access door [8] or access door [10].

NOTE: Do not mix Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, and Cor-Ban 27L Compound, G50237.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

SUBTASK 28-11-01-640-003

28-AWL-16: CDCCL

(7) For machined impact-resistant access doors [14] or access doors [15] [533AB (633AB) - 533EB (633EB)];

Apply a very thin layer of Cor-Ban 27L Compound, G50237, to the lower surface of the wing skin that touches the aluminum gasket [3] for the access door.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

SUBTASK 28-11-01-100-001

(8) Clean the clamp ring [5] surface with solvent, B00083.

SUBTASK 28-11-01-210-005

(9) Make sure that the gasket [3] is installed on the clamp ring [5].

(a) Make sure the clamp ring [5] and gasket [3] holes align.

NOTE: The holes are not symmetrical.

SUBTASK 28-11-01-430-001

CAUTION VISUALLY EXAMINE THE INTERNAL DOME SURFACES OF THE TANK ACCESS DOOR FOR CRACKS BEFORE YOU INSTALL THE MOUNTING BOLTS. MAKE SURE MOUNTING BOLTS ARE THE CORRECT LENGTH. BOLTS THAT EXCEED THREAD LENGTH CAN CAUSE DAMAGE TO THE INTERNAL DOME SURFACE OF THE DOOR.

(10) Set and hold the gasket [3] and the clamp ring [5] in the opening between the outer face of the access door and the wing skin while you install the mounting bolts [4] for the access door.

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SUBTASK 28-11-01-430-004

(11) Do the steps that follow to install the 1/4 inch mounting bolts [4] for all access doors except machined impact-resistant access doors [14] or access doors [15] [533AB (633AB) - 533EB (633EB)]:

(a) Apply a thin layer of compound, C00528, to the threads and shank of the mounting bolt [4].

28-AWL-16: CDCCL

(b) Tighten the mounting bolts [4] to 35 ±5 in-lb (4 ±1 N·m).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

NOTE: Tighten the mounting bolts [4] as shown in Figure 402.

SUBTASK 28-11-01-430-005

(12) Do the steps that follow to install the 5/16 inch mounting bolts [4] for machined impact-resistant access doors [14] or access doors [15] [533AB (633AB) - 533EB (633EB)]:

(a) Apply a thin layer of Cor-Ban 27L Compound, G50237, to the threads and shank of the mounting bolts [4].

28-AWL-16: CDCCL

(b) Tighten the mounting bolts [4] to 65 ±5 in-lb (7 ±1 N·m).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

NOTE: Tighten the mounting bolts [4] as shown in (Figure 402).

SUBTASK 28-11-01-220-001

(13) Do the steps that follow to inspect the fit of the access door:

(a) Make sure the gap between the clamp ring [5] and the access door is within 0.030 ±0.030 in. (0.076 ±0.076 cm).

(b) Make sure the gap between the clamp ring [5] and the lower wing skin panel is within 0.030 ±0.030 in. (0.076 ±0.076 cm).

(c) Make sure the access door is flush with the lower wing skin panel within 0.000 ±0.030 in. (0.000 ±0.076 cm).

(d) Make sure the mounting bolts [4] are flush with the clamp ring [5] within 0.000 +0.002 / -0.010 in. (0.000 +0.005 / -0.025 cm)

NOTE: If the bolt loosens after several minutes, the bolt grip length may not be correct.

(e) If the mounting bolt loosened or is not flush with the clamp ring, make sure that the grip length of the mounting bolt is correct.

NOTE: The material stackup can effect the bolt grip length:

- A material stackup between 0.6685 in. (1.6980 cm) and 0.66915 in. (1.69964 cm) range should use a #10 bolt grip length.
- A material stackup between 0.6955 in. (1.7666 cm) and 0.7185 in. (1.8250 cm) range should use a #11 bolt grip length.

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- A material stackup between 0.7540 in. (1.9152 cm) and 0.7781 in. (1.9764 cm) range should use a #12 bolt grip length.

POSITIVE CLAMP UP MUST BE MAINTAINED.

NO FASTENER SPIN OR LOOSE FIT ALLOWED.

SUBTASK 28-11-01-410-001

(14) To install the outboard flap support fairing 1 or 2 if removed, do this task: Outboard Flap Support Fairing Installation, TASK 27-51-28-400-801.

SUBTASK 28-11-01-650-002

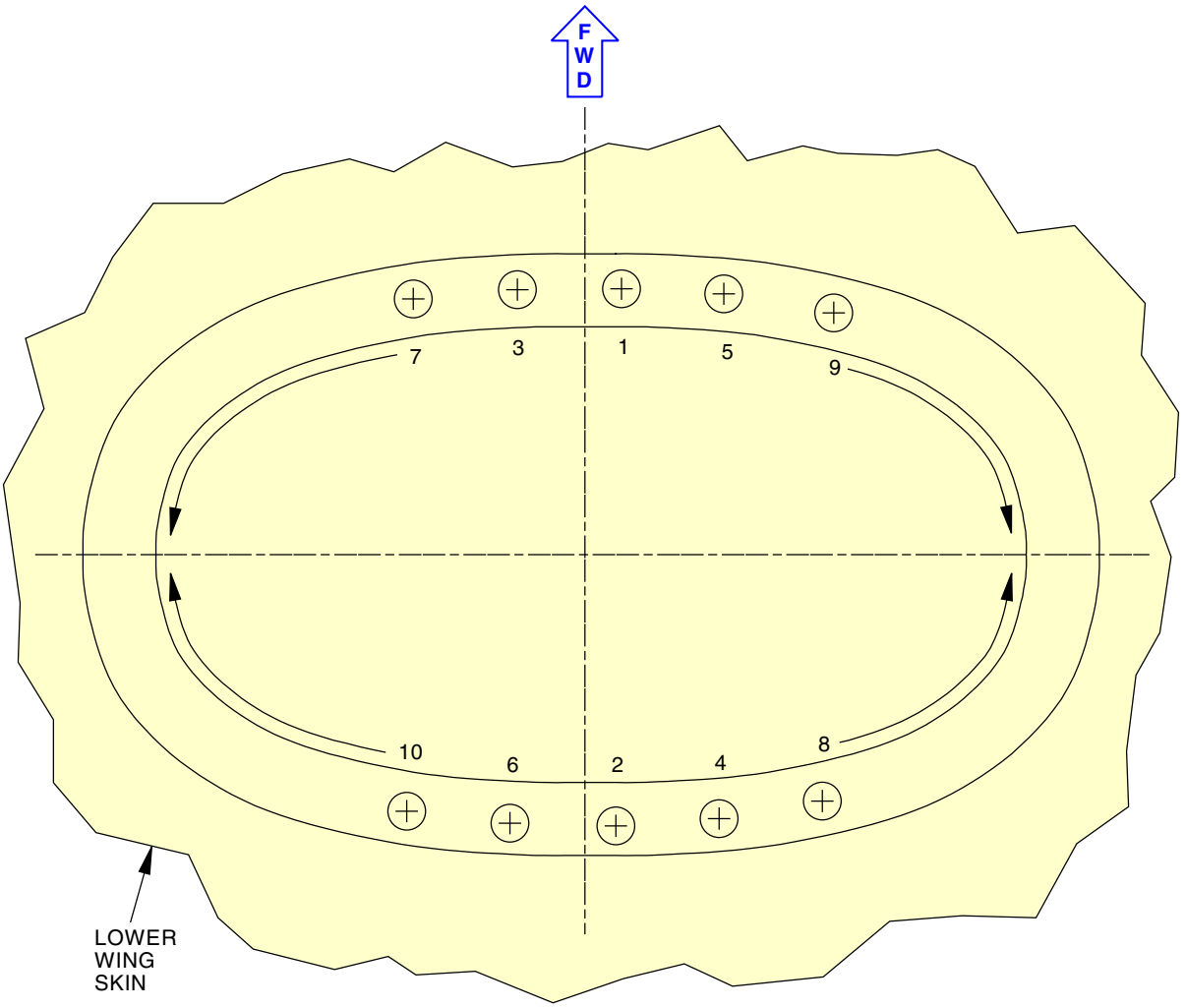
(15) Do this task: Pressure Refueling, TASK 12-11-01-650-801.

SUBTASK 28-11-01-210-006

(16) To make sure there are no leaks from the applicable access door, do the “Find the Leaks at the Fuel Tank Access Doors” procedure in this task: Fuel Leak Detection Procedures, TASK 28-11-00-790-801.

——— END OF TASK ———

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NOTES:

TORQUE THE MOUNT BOLTS IN THE SEQUENCE SHOWN BY THE NUMBERS. THIS WILL MAKE SURE FUEL DOES NOT LEAK AROUND THE ACCESS PANEL.

TORQUE ALL BOLTS IN THE DIRECTIONS FOLLOWING 7,8,9,10

L44776 S0006414854_V2

Access Panel Mount Bolt Torque Pattern
Figure 402/28-11-01-990-802

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CENTER TANK ACCESS DOOR - REMOVAL/INSTALLATION

1. General

A. There are seven access doors for the center fuel tank. Three access doors are on the lower left wing surface (531AB, 531BB, 531CB from inboard to outboard respectively). Three access doors are on the lower right wing surface (631AB, 631BB, 631CB from inboard to outboard respectively). One access door (139AZ) is in the wing center fuel section. To get to the access door 139AZ you must remove the access panel 139AL from the forward keel beam.

B. This procedure contains two tasks. The first task removes a center tank access door. The second task installs a center tank access door.

TASK 28-11-02-000-801

2. Center Tank Access Door - Removal

(Figure 401)

A. References

Reference	Title
06-41-00-800-801	Finding an Access Door or Panel on the Fuselage (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)
28-26-00-650-803	Suction Defueling (P/B 201)

B. Location Zones

Zone	Area
139	Forward Keel Beam
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

C. Access Panels

Number	Name/Location
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door
531AB	Access Door
531BB	Access Door
531CB	Access Door
631AB	Access Door
631BB	Access Door
631CB	Access Door

D. Procedure

SUBTASK 28-11-02-650-001

(1) To defuel the center fuel tank, do this task: Pressure Defueling, TASK 28-26-00-650-801, Tank to Tank Transfer, TASK 28-26-00-650-802, or Suction Defueling, TASK 28-26-00-650-803.

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SUBTASK 28-11-02-940-001

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

SUBTASK 28-11-02-010-001

(3) Find the applicable access door [1] on the lower wing surface.

(a) The access doors for the left center fuel cheek tank are:

Number	Name/Location
531AB	Access Door
531BB	Access Door
531CB	Access Door

(b) The access doors for the right center fuel cheek tank are:

Number	Name/Location
631AB	Access Door
631BB	Access Door
631CB	Access Door

SUBTASK 28-11-02-010-004

(4) To remove the access door [6] for the wing center fuel section, do this steps:

(a) Remove this access panel:

Number	Name/Location
139AL	Forward Keel Beam Access Panel

(TASK 06-41-00-800-801).

(b) Find the access door [6]:

Number	Name/Location
139AZ	Center Wing Access Door

SUBTASK 28-11-02-020-005

(5) Hold the clamp ring [5]/clamp ring [10] on the access door [1] or access door [6] and remove the mounting bolts [4]/mounting bolts [9].

SUBTASK 28-11-02-020-006

(6) Remove the clamp ring [5]/clamp ring [10] and the gasket [3]/gasket [8].

SUBTASK 28-11-02-020-001

CAUTION DO NOT USE A LEVER (PRY) ON THE FUEL TANK ACCESS DOORS. THE LOWER SURFACE OF THE ACCESS DOOR FLANGE AND THE UPPER SURFACE OF THE WING SKIN AROUND THE ACCESS DOORS ARE SEAL SURFACES. IF YOU ARE NOT CAREFUL, SCRATCHES OR DAMAGE TO THE SEAL SURFACE CAN OCCUR.

(7) Push up on the access door [1] or access door [6].

(a) If the access door [1] or access door [6] does not move freely, use a rubber mallet and hit lightly around the access door [1] or access door [6].

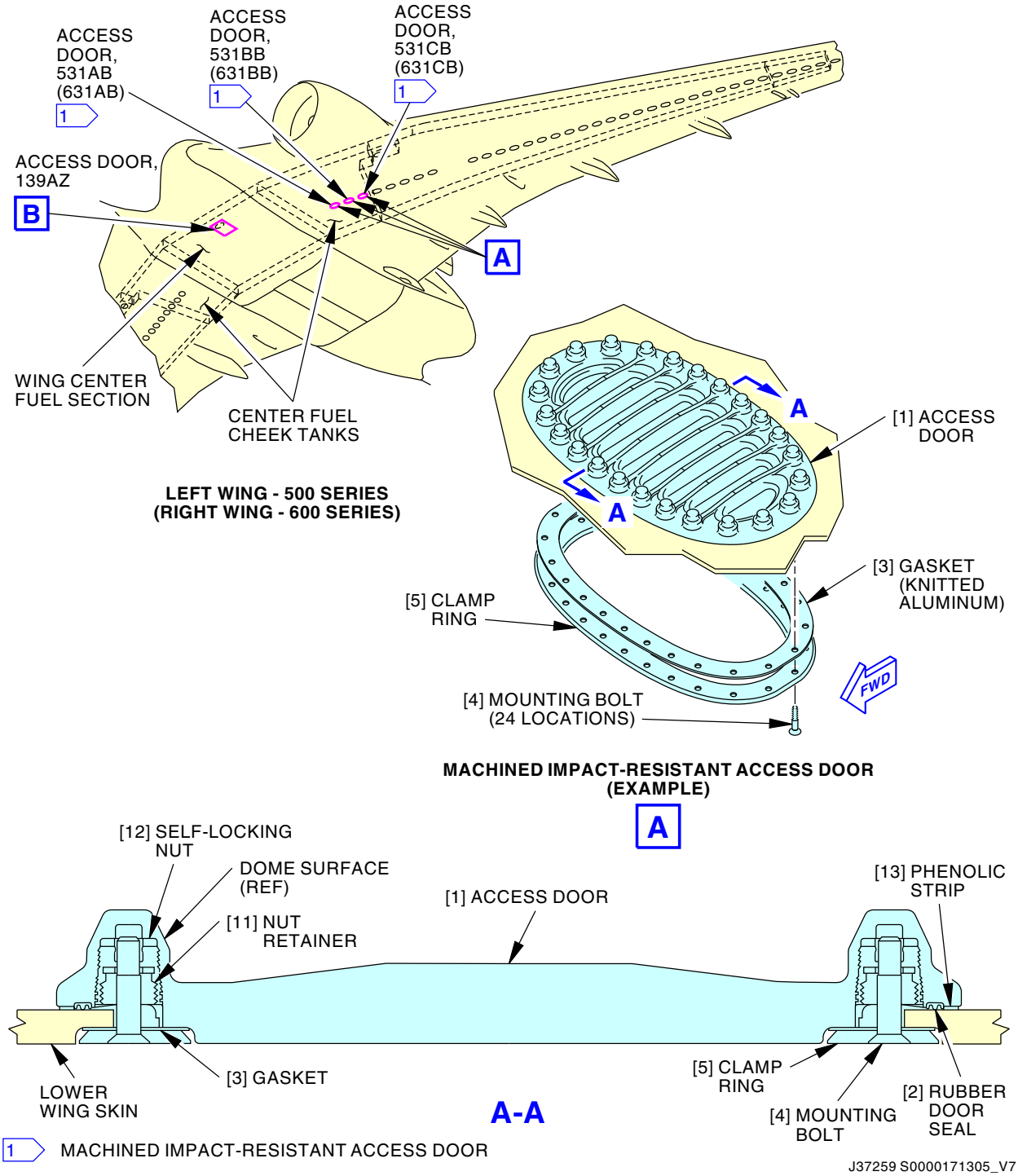
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SUBTASK 28-11-02-020-002

(8) Remove the access door [1] or access door [6].

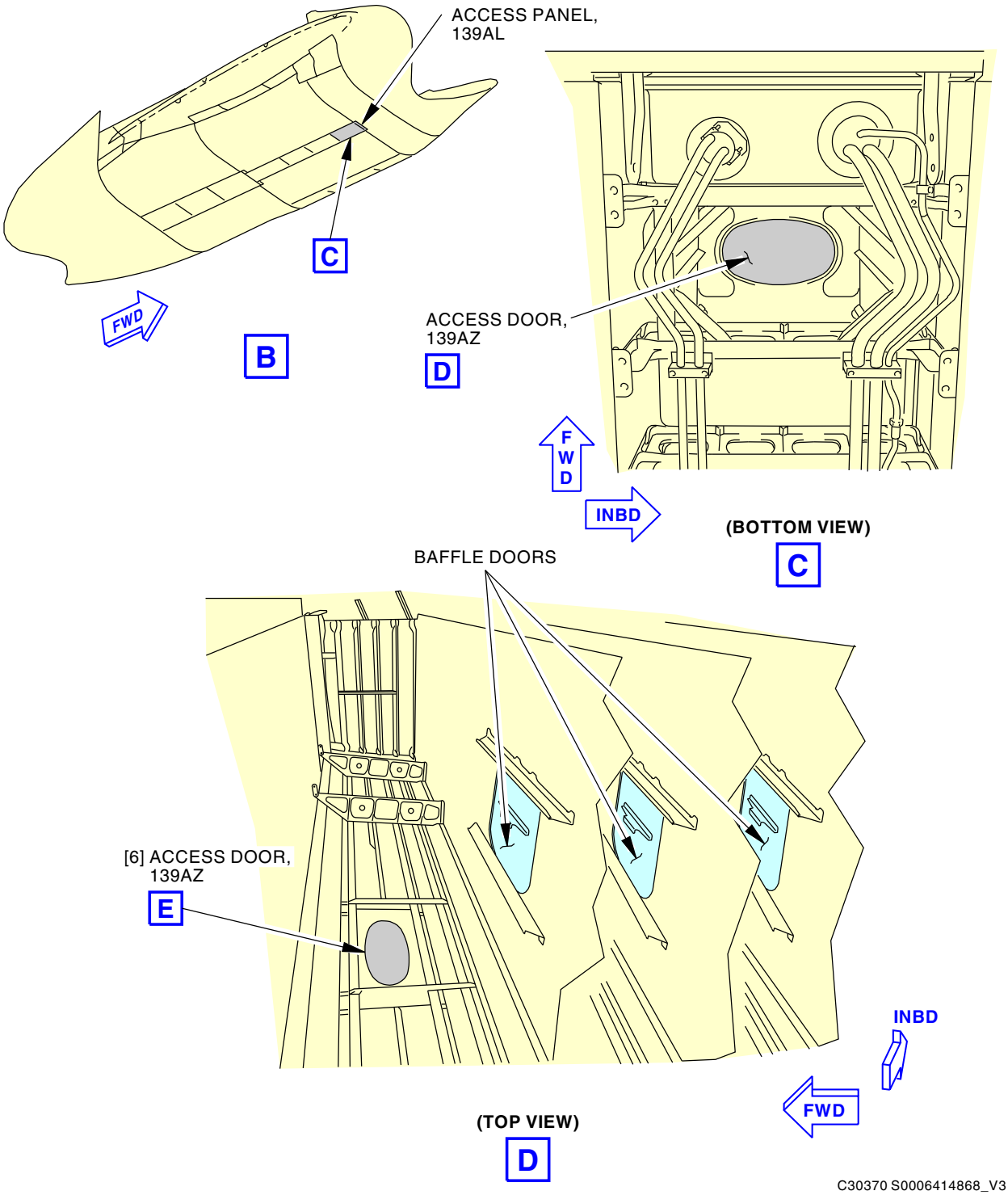
END OF TASK

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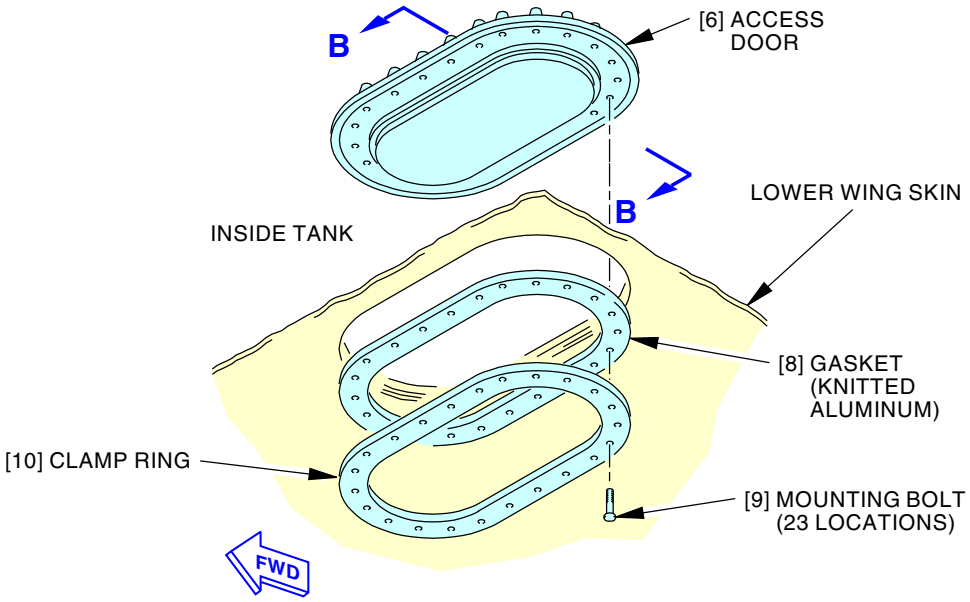
Center Fuel Tank Access Door Installation
Figure 401/28-11-02-990-803 (Sheet 1 of 3)

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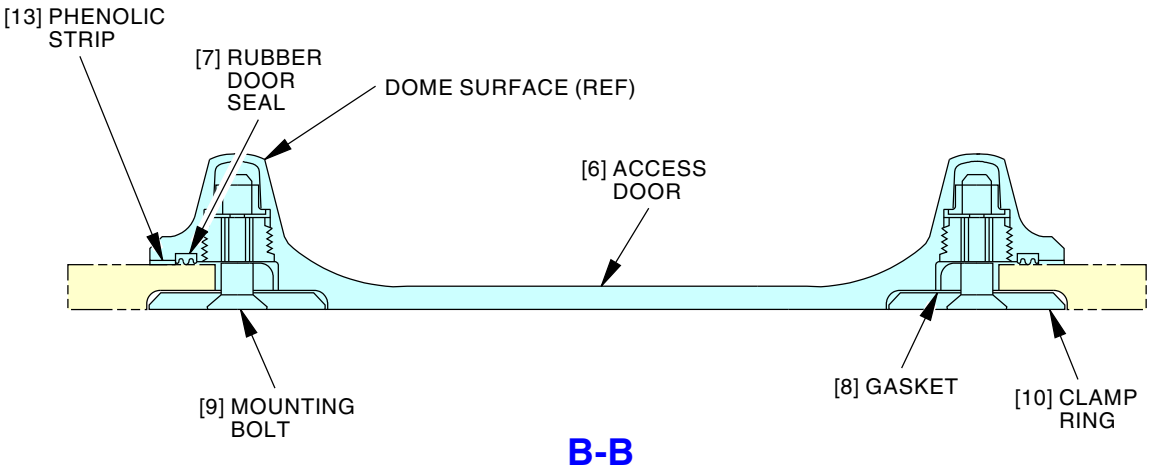
Center Fuel Tank Access Door Installation
Figure 401/28-11-02-990-803 (Sheet 2 of 3)

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CENTER TANK ACCESS DOOR, 139AZ

E



B-B

E50504 S0006414869_V3

Center Fuel Tank Access Door Installation
Figure 401/28-11-02-990-803 (Sheet 3 of 3)

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TASK 28-11-02-400-801

3. Center Tank Access Door - Installation

(Figure 401)

A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

(2) For access door [6], Mobilgrease 33, D50306, is the recommended anti-corrosion compound/grease for access door gasket installations. Cor-Ban 27L Compound, G50237, or Aeroshell 14 helicopter grease, D50050, can still be used for access door gaskets, but should be replaced with Mobilgrease 33, D50306, as soon as practical.

(a) Do not mix Mobilgrease 33, D50306, Cor-Ban 27L Compound, G50237, and Aeroshell 14 helicopter grease, D50050, together. If you replaced a Cor-Ban 27L Compound, G50237, or Aeroshell 14 helicopter grease, D50050, filled gasket with a Mobilgrease 33, D50306, filled gasket, remove all Cor-Ban 27L Compound, G50237 or Aeroshell 14 helicopter grease, D50050, from the clamp ring and the access door structure on the airplane.

(3) For access door [1], Cor-Ban 27L Compound, G50237, is the recommended anti-corrosion compound for access door gasket installations.

(4) It is recommended to install a new knitted aluminum gasket for the door installation.

B. References

Reference	Title
06-41-00-800-801	Finding an Access Door or Panel on the Fuselage (P/B 201)
12-11-01-650-801	Pressure Refueling (P/B 301)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-790-801	Fuel Leak Detection Procedures (P/B 601)
28-11-07-900-801	Rubber Door Seal - Replacement (P/B 801)

C. Consumable Materials

Reference	Description	Specification
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III
C00528	Compound - Corrosion Preventive, Petroleum Hot Application (Soft Film)	MIL-C-11796 Class III
D00020	Grease - Aircraft Oscillating Bearing	MIL-G-25537 (NATO G-365)
D00504	Grease - Petrolatum	VV-P-236
D50050	Grease - Multipurpose, Helicopter Oscillating Bearing Grease with Calcium Soap Thickener - Aeroshell 14	MIL-G-25537
D50306	Grease - Synthetic Aircraft Grease (Mobilgrease 33)	BMS3-33 Type 1, MIL-PRF-23827 Type 1

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(Continued)

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A
G50237	Compound - Corrosion Inhibiting, Non-drying - Cor-Ban 27L	BMS3-38

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Access door	28-11-02-05A-025	ARO ALL

E. Location Zones

Zone	Area
139	Forward Keel Beam
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

F. Access Panels

Number	Name/Location
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door
531AB	Access Door
531BB	Access Door
531CB	Access Door
631AB	Access Door
631BB	Access Door
631CB	Access Door

G. Prepare for the Access Door Installation

SUBTASK 28-11-02-210-007

(1) Examine the open tank for unwanted objects or material.

(a) Make sure you not replace the access doors [1] for the center fuel tanks, which are machined impact-resistant doors (Table 401), with a standard door:

Table 401/28-11-02-993-802

THE LEFT WING	THE RIGHT WING
531AB	631AB
531BB	631BB
531CB	631CB

SUBTASK 28-11-02-160-001

(2) Clean the open tank if it is necessary (TASK 28-11-00-410-801).

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28-AWL-16: CDCCL

SUBTASK 28-11-02-210-011

(3) Make sure there is no visible corrosion on the access door [1], clamp ring [5] and the lower wing skin electrical faying surfaces.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

H. Prepare the Molded Rubber Seal for Installation

SUBTASK 28-11-02-210-008

(1) Make sure the rubber door seal [2] or rubber door seal [7] is in good condition.

(a) To replace the rubber door seal [2] or rubber door seal [7] if it is necessary, do this task: Rubber Door Seal - Replacement, TASK 28-11-07-900-801.

(b) Apply a thin layer of petrolatum grease, D00504, to the rubber door seal [2] or rubber door seal [7].

I. Prepare the New Knitted Aluminum Gasket for Installation (Recommended Procedure)

SUBTASK 28-11-02-211-002

(1) For access door [1], examine the container of the new gasket [3] to find the manufacture date of the gasket.

28-AWL-16: CDCCL

(a) If the new gasket [3] is more than five years old from the manufacturing date, do these steps before you install the gasket [3]:

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

1) Remove (De-grease) the old Cor-Ban 27L Compound, G50237, from the new gasket [3].

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

2) Refill both sides of the new gasket [3] with Cor-Ban 27L Compound, G50237.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

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28-AWL-16: CDCCL

a) Apply 0.5 fl-oz (15 ml) - 1 fl-oz (30 ml) of Cor-Ban 27L Compound, G50237.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

(b) If the new gasket [3] is less than five years old from the manufacturing date, it is not necessary to remove the Cor-Ban 27L Compound, G50237.

SUBTASK 28-11-02-211-003

(2) For access door [6], examine the container of the new gasket [8] to find the manufacture date of the gasket.

(a) If the new gasket [8] is more than five years old from the manufacturing date, do these steps before you install the gasket:

28-AWL-16: CDCCL

1) Remove (De-grease) the old Mobilgrease 33, D50306, Cor-Ban 27L Compound, G50237, or Aeroshell 14 helicopter grease, D50050, from the new gasket [8].

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

2) Refill (Re-impregnate) both sides of the new gasket [8] with Mobilgrease 33, D50306 (recommended), Aeroshell 14 helicopter grease, D50050 or Cor-Ban 27L Compound, G50237.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

a) Do not mix Mobilgrease 33, D50306 (recommended), Aeroshell 14 helicopter grease, D50050 and Cor-Ban 27L Compound, G50237.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

b) Apply 0.5 fl-oz (15 ml) - 1 fl-oz (30 ml) of Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050 or Cor-Ban 27L Compound, G50237.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

(b) If the new gasket [8] is less than five years old from the manufacturing date, it is not necessary to remove the Mobilgrease 33, D50306, Cor-Ban 27L Compound, G50237, or Aeroshell 14 helicopter grease, D50050.

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SUBTASK 28-11-02-490-001

(3) Put the tray assembly for the new gasket [3] or gasket [8] on a flat surface with its face up.

SUBTASK 28-11-02-490-002

(4) Remove the paper cover from the tray.

SUBTASK 28-11-02-430-008

(5) Put the clamp ring [5] or clamp ring [10] on the gasket [3] or gasket [8] (with the countersink end of the holes face up).

(a) Make sure the clamp ring [5] or clamp ring [10] holes and the gasket [3] or gasket [8] holes align.

NOTE: The holes are not symmetrical.

SUBTASK 28-11-02-430-009

(6) Push the clamp ring [5] or clamp ring [10] on the gasket [3] or gasket [8] until the clamp ring is tightly against the gasket.

SUBTASK 28-11-02-090-002

(7) Remove the clamp ring [5] or clamp ring [10], the gasket [3] or gasket [8], and the release strip from the tray as a unit.

SUBTASK 28-11-02-430-010

(8) Put the assembly, with the gasket side turned up, on a flat surface.

SUBTASK 28-11-02-090-003

(9) Remove the release strip from the gasket [3] or gasket [8].

J. Prepare the Original Knitted Aluminum Gasket for Installation (Alternate Procedure)

SUBTASK 28-11-02-110-004

(1) Clean the gasket [3] or gasket [8] and clamp ring [5] or clamp ring [10] with a cotton wiper, G00034, and solvent, B00083.

(a) Continue cleaning until the cotton wiper, G00034, remains clean.

SUBTASK 28-11-02-211-001

28-AWL-16: CDCCL

(2) A used gasket [3] or gasket [8] that meets the criteria that follows can be installed:

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

(a) No fastener holes are torn.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

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28-AWL-16: CDCCL

(b) The gasket [3] or gasket [8] is not elongated or out of shape.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

(c) The gasket rubber seals around the inner and outer periphery must be a minimum of 0.015 in. (0.4 mm) thick.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

(d) No more than 10% of strands in all three layers are broken through in any one area.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

SUBTASK 28-11-02-620-005

28-AWL-16: CDCCL

(3) For access door [1], fill both sides of gasket [3] with Cor-Ban 27L Compound, G50237.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

(a) Make sure the Cor-Ban 27L Compound, G50237, fully fills the mesh of the gasket [3].

(b) Make sure there is a continuous layer of Cor-Ban 27L Compound, G50237, on both sides of gasket [3].

SUBTASK 28-11-02-620-010

28-AWL-16: CDCCL

(4) For access door [6], fill both sides of gasket [8] with Mobilgrease 33, D50306 (recommended), Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

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28-AWL-16: CDCCL

(a) Do not mix Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237.

NOTE: The Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, must be the same as on the clamp ring [10] and access door structure.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

(b) Make sure the Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, fully fills the mesh of the gasket.

(c) Make sure there is a continuous layer of Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, on both sides of the gasket [8].

SUBTASK 28-11-02-420-008

(5) Put clamp ring [5] or clamp ring [10] on gasket [3] or gasket [8] (with the countersink end of the holes face up).

(a) Make sure clamp ring [5] or clamp ring [10] holes and gasket [3] or gasket [8] holes align.

NOTE: The holes are not symmetrical.

SUBTASK 28-11-02-420-009

(6) Push clamp ring [5] or clamp ring [10] on the gasket [3] or gasket [8] until the clamp ring is tightly against the gasket.

K. Inspect the Access Door

28-AWL-16: CDCCL

SUBTASK 28-11-02-212-002

(1) Make sure there is a phenolic strip [13] around the access door [1] or access door [6], that mates with the wing skin inside the tank.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

SUBTASK 28-11-02-210-010

(2) Make sure that there are no cracks in the nut domes of the access door [1] or access door [6].

NOTE: Paint flaking or bulging can show cracks in the nut domes of the access door.

SUBTASK 28-11-02-200-001

(3) Do a check of the minimum locking torque of the self-locking nuts [12] for the machined impact-resistant access door [1]:

(a) Apply 15.0 in-lb (1.7 N·m).

1) If the self locking torque is less than 15.0 in-lb (1.7 N·m), do the steps that follow:

a) Remove the nut retainers [11] and self-locking nuts [12].

b) Install the new self-locking nuts [12].

c) Install the nut retainers [11] until the nut retainers [11] contact the land area of the door.

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L. Install the Access Door

SUBTASK 28-11-02-410-003

(1) Do the applicable parts of this task: Fuel Tank Closure, TASK 28-11-00-410-801.

SUBTASK 28-11-02-090-001

(2) Remove the rubber protector in the access door opening.

SUBTASK 28-11-02-110-002

(3) Make sure the access door [1] or access door [6] areas on the wing skin, that the rubber door seal [2] or rubber door seal [7] touches, are clean.

(a) Use solvent, B00083, to clean the surface if it is necessary.

SUBTASK 28-11-02-620-007

(4) For the access door [1], apply a very thin layer of Cor-Ban 27L Compound, G50237, to the lower surface of the wing skin that touches the aluminum gasket [3].

SUBTASK 28-11-02-620-013

28-AWL-16: CDCCL

CAUTION DO NOT APPLY TOO MUCH GREASE TO THE LOWER SURFACE OF THE WING. YOU CAN CAUSE DAMAGE TO THE ACCESS DOOR WITH HYDRAULIC PRESSURE FROM THE GREASE WHEN YOU INSTALL THE MOUNTING FASTENERS.

(5) For the access door [6], apply a very thin layer of Mobilgrease 33, D50306 (recommended), Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, to the lower surface of the wing skin that touches the aluminum gasket [8].

NOTE: Do not mix Mobilgrease 33, D50306, Cor-Ban 27L Compound, G50237, and Aeroshell 14 helicopter grease, D50050, together.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

SUBTASK 28-11-02-420-001

(6) Set the access door [1] or access door [6] in the opening of the fuel tank.

SUBTASK 28-11-02-110-003

(7) Clean the clamp ring [5] or clamp ring [10] surface with solvent, B00083.

SUBTASK 28-11-02-430-002

(8) Make sure that the gasket [3] or gasket [8] is installed on the clamp ring [5] or clamp ring [10].

(a) Make sure the clamp ring [5] or clamp ring [10] and gasket [3] or gasket [8] holes align.

NOTE: The holes are not symmetrical.

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SUBTASK 28-11-02-430-011

CAUTION

VISUALLY EXAMINE THE INTERNAL DOME SURFACES OF THE TANK ACCESS DOOR FOR CRACKS BEFORE YOU INSTALL THE MOUNTING BOLTS. MAKE SURE MOUNTING BOLTS ARE THE CORRECT LENGTH. BOLTS THAT EXCEED THREAD LENGTH CAN CAUSE DAMAGE TO THE INTERNAL DOME SURFACE OF THE DOOR.

(9) Set and hold the gasket [3] or gasket [8] and the clamp ring [5] or clamp ring [10] in the opening between the outer face of the access door and the wing skin while you install the mounting bolts [4] or mounting bolts [9] for the access door [1] or access door [6].

SUBTASK 28-11-02-430-014

(10) Do the steps that follow to install mounting bolts [4]:

(a) Apply a thin layer of Cor-Ban 27L Compound, G50237, to the mounting bolt [4] shank and threads.

28-AWL-16: CDCCL

(b) Tighten the mounting bolts [4] to 65 ±5 in-lb (7 ±1 N·m).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

NOTE: Tighten the mounting bolt [4] as shown in Figure 402.

SUBTASK 28-11-02-430-013

(11) Do the steps that follow to install mounting bolts [9]:

(a) Apply a thin layer of compound, C00528, to the mounting bolt [9] shank and threads.

NOTE: Do not mix compound, C00528, and grease, D00020, together.

28-AWL-16: CDCCL

(b) Tighten the mounting bolts [9] to 35 ±5 in-lb (4 ±1 N·m).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

NOTE: Tighten the mounting bolts [9] as shown in Figure 402.

SUBTASK 28-11-02-220-001

(12) Do the steps that follow to inspect the fit of the access door [1]:

(a) Make sure the gap between the clamp ring [5] and the access door [1] is within 0.030 ±0.030 in. (0.076 ±0.076 cm).

(b) Make sure the gap between the clamp ring [5] and the lower wing skin panel is within 0.030 ±0.030 in. (0.076 ±0.076 cm).

(c) Make sure the access door [1] is flush with the lower wing skin panel within 0.000 ±0.030 in. (0.000 ±0.076 cm).

(d) Make sure the mounting bolts [4] are flush with the clamp ring [5] within 0.000 +0.002 / -0.010 in. (0.000 +0.005 / -0.025 cm)

SUBTASK 28-11-02-650-003

(13) Do this task: Pressure Refueling, TASK 12-11-01-650-801.

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SUBTASK 28-11-02-210-006

(14) To make sure there is no fuel leakage at the applicable access door [1] or access door [6], do the “Find the Leaks at the Fuel Tank Access Doors” procedure in this task: Fuel Leak Detection Procedures, TASK 28-11-00-790-801.

SUBTASK 28-11-02-010-003

(15) Find the applicable access door [1] on the lower wing surface.

(a) The access doors for the left center fuel tank are:

Number	Name/Location
531AB	Access Door
531BB	Access Door
531CB	Access Door

(b) The access doors for the right center fuel tank are:

Number	Name/Location
631AB	Access Door
631BB	Access Door
631CB	Access Door

SUBTASK 28-11-02-410-001

(16) If the access door [6] was removed, do this step:

(a) The access door [6] for the center tank is:

Number	Name/Location
139AZ	Center Wing Access Door

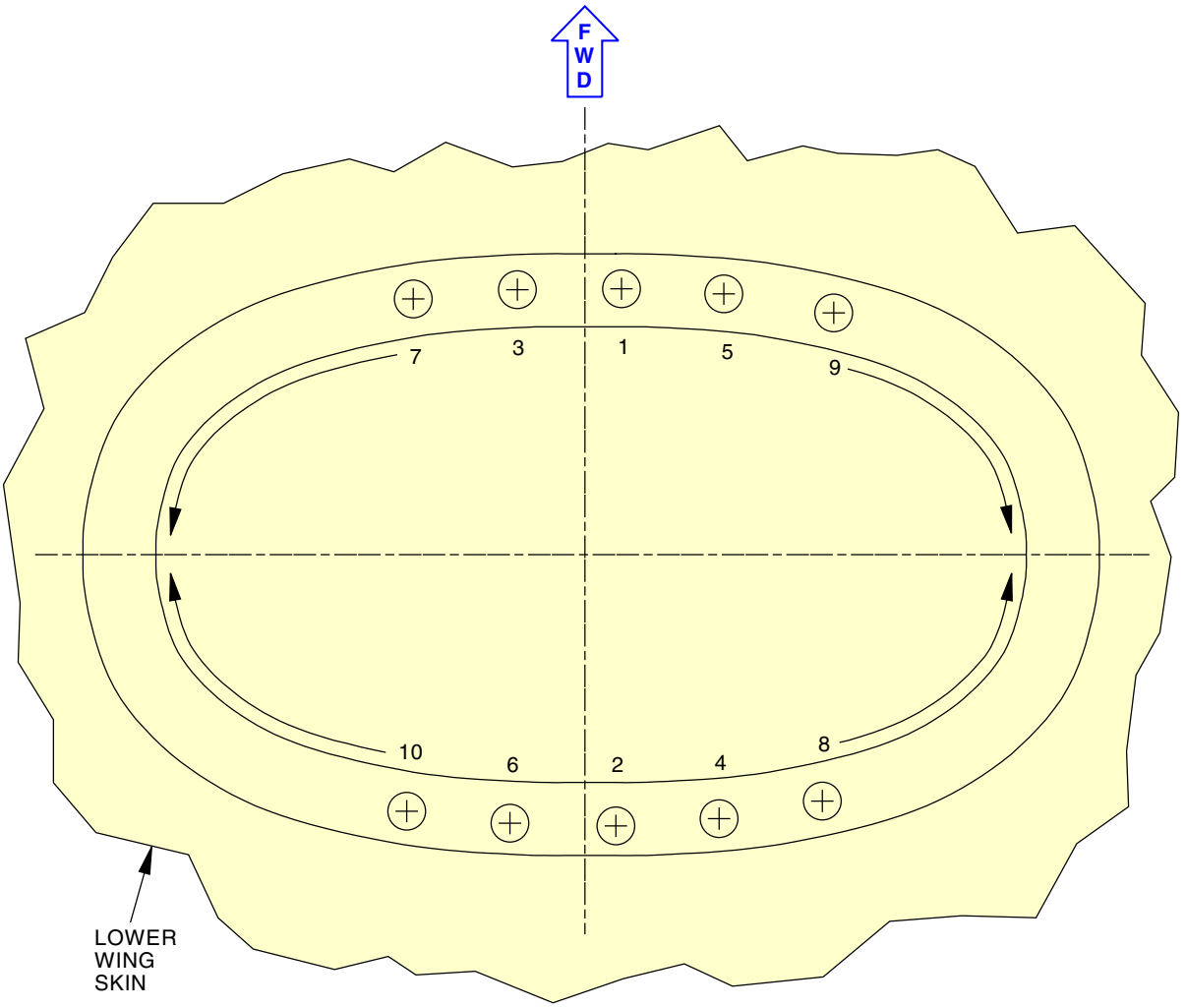
(b) Install this access panel:

Number	Name/Location
139AL	Forward Keel Beam Access Panel

(TASK 06-41-00-800-801).

END OF TASK

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NOTES:

TORQUE THE MOUNT BOLTS IN THE SEQUENCE SHOWN BY THE NUMBERS. THIS WILL MAKE SURE FUEL DOES NOT LEAK AROUND THE ACCESS PANEL.

TORQUE ALL BOLTS IN THE DIRECTIONS FOLLOWING 7,8,9,10

L44777 S0006414871_V2

Access Panel Mount Bolt Torque Pattern
Figure 402/28-11-02-990-802

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SURGE TANK ACCESS DOOR - REMOVAL/INSTALLATION

1. General

A. Each surge tank has four access doors installed in the lower wing surface. A pressure relief valve attaches to the surge tank access doors 543DB and 643DB. A vent scoop and flame arrestor attaches to the surge tank access doors 544BB and 644BB.

B. This procedure contains two tasks. The first task removes a surge tank access door. The second task installs a surge tank access door.

TASK 28-11-03-000-801

2. Surge Tank Access Door - Removal

(Figure 401)

A. References

Reference	Title
12-11-02-650-802	Surge Tank Sump Drain Valve - Fuel Check (P/B 301)
28-00-00-200-801	Inspection of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-00-00-960-801	Replacement of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-13-03-000-801	Pressure Relief Valve - Removal (P/B 201)

B. Location Zones

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
544	Surge Tank - Rib 38 - Rib 41 - WS 1182 - WS 1264.5; and Spar Area - Rib 41 (WS 1264.5) - Wing Tip (WBL 1233)
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182
644	Surge Tank - Rib 38 - Rib 41 - WS 1182 - WS 1264.5; and Spar Area - Rib 41 (WS 1264.5) to wing tip (WBL 1233)

C. Procedure

SUBTASK 28-11-03-650-001

WARNING OBEY THE PRECAUTIONS IN THE PROCEDURE WHEN YOU DRAIN THE FUEL TANK. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) To drain the surge tank at the sump drain valve, do this task: Surge Tank Sump Drain Valve - Fuel Check, TASK 12-11-02-650-802.

NOTE: It is not necessary to defuel the adjacent main fuel tank.

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SUBTASK 28-11-03-940-001

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) For the applicable surge tank, do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

SUBTASK 28-11-03-020-003

(3) To remove access door [14], do these steps:

NOTE: The removal procedure for access door 544AB or 544CB on the left wing or 644AB or 644CB on the right wing is the same(Figure 401, View E).

(a) Hold the clamp ring [8] and remove the mounting bolt [9] (Figure 401).

(b) Remove the clamp ring [8] and the gasket [7].

1) Discard the gasket [7].

CAUTION DO NOT USE A LEVER (PRY) ON THE ACCESS DOOR. IF THE ACCESS DOOR DOES NOT MOVE FREELY, USE A RUBBER MALLET TO HIT LIGHTLY AROUND THE ACCESS DOOR. IF YOU ARE NOT CAREFUL, SCRATCHES OR DAMAGE TO THE SEAL SURFACE CAN OCCUR.

(c) Push up on the access door [14].

(d) Remove the access door [14] from the surge tank.

SUBTASK 28-11-03-020-001

(4) To remove the access door [11], do these steps:

NOTE: Access door [11] is Pressure Relief Door, 543DB, left wing or Pressure Relief Access Door, 643DB, right wing, View C (Figure 401)

(a) Hold the clamp ring [8] and remove the mounting bolt [9] (Figure 401).

(b) Remove the clamp ring [8] and the gasket [7].

1) Discard the gasket [7]

CAUTION DO NOT USE A LEVER (PRY) ON THE ACCESS DOOR. IF THE ACCESS DOOR DOES NOT MOVE FREELY, USE A RUBBER MALLET TO HIT LIGHTLY AROUND THE ACCESS DOOR. IF YOU ARE NOT CAREFUL, SCRATCHES OR DAMAGE TO THE SEAL SURFACE CAN OCCUR.

(c) Push up on the access door [11].

(d) Remove the access door [11] from the surge tank.

WARNING DO NOT TOUCH THE PRESSURE RELIEF VALVE WHEN YOU REMOVE THE ACCESS PANEL. IF THE PRESSURE RELIEF VALVE OPENS ACCIDENTALLY, INJURIES TO PERSONNEL CAN OCCUR.

(e) Remove the pressure relief valve [12] from the access door (TASK 28-13-03-000-801).

SUBTASK 28-11-03-020-002

(5) To remove the access door [1], do these steps:

NOTE: Access door [1] is Vent Scoop Door, 544BB, left wing or Vent Scoop Access Door, 644BB, right wing, View A (Figure 401).

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(a) Hold the clamp ring [8] and remove the mounting bolt [9] (Figure 401).

(b) Remove the clamp ring [8] and the gasket [7].

CAUTION

DO NOT USE A LEVER (PRY) ON THE ACCESS DOOR. IF THE ACCESS DOOR DOES NOT MOVE FREELY, USE A RUBBER MALLET TO HIT LIGHTLY AROUND THE ACCESS DOOR. IF YOU ARE NOT CAREFUL, SCRATCHES OR DAMAGE TO THE SEAL SURFACE CAN OCCUR.

(c) Push up on the access door [1].

(d) Remove the access door [1] from the surge tank.

(e) If necessary, do these steps to remove the vent scoop assembly [2] from the access door [1]:

1) Remove the 18 screws [10] that attach the vent scoop assembly [2] to the access door [1].

2) Remove the screw [4], washer [5], and nut [6] that attach the bonding jumper [3] to the access door [1].

3) Remove the vent scoop assembly [2] from the access door [1].

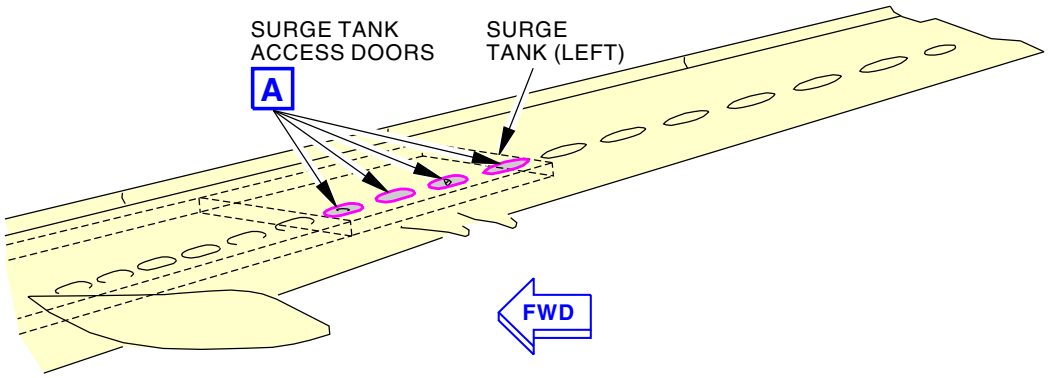
SUBTASK 28-11-03-210-006

(6) Do a check of the bonding jumper; do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

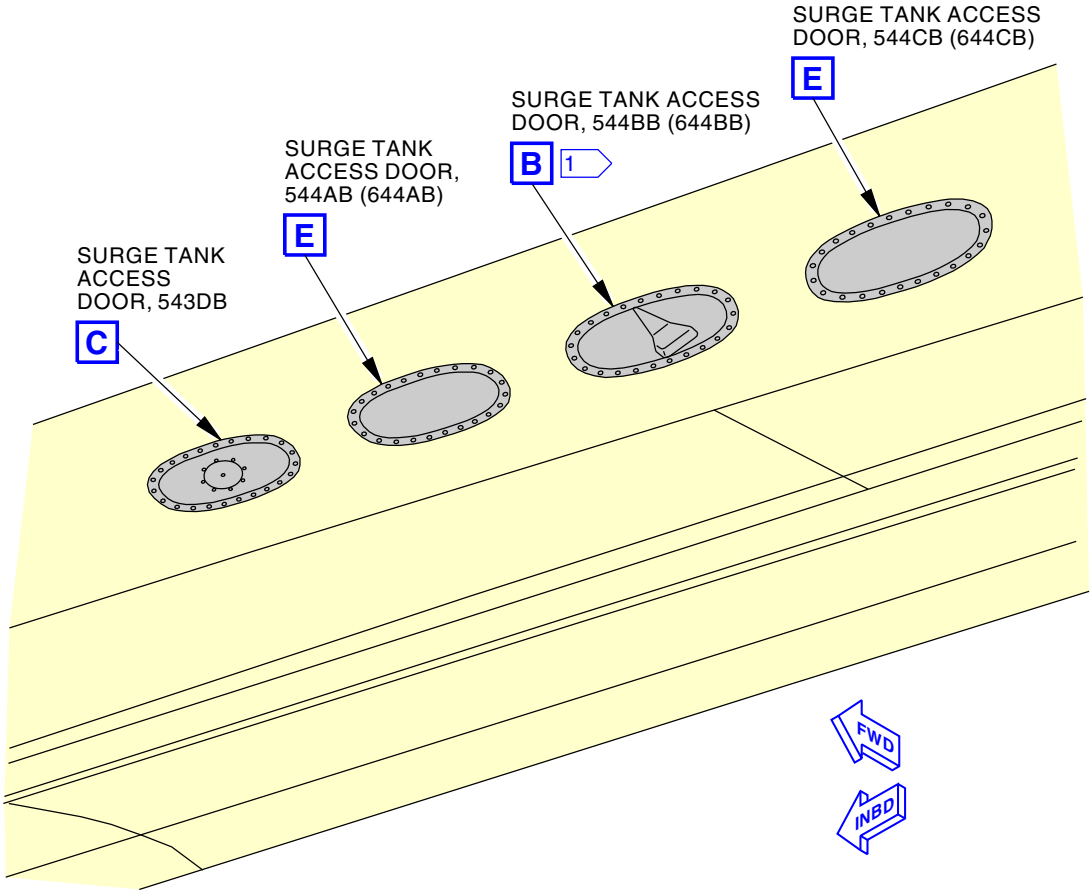
(a) Replace the bonding jumper as necessary (TASK 28-00-00-960-801).

——— END OF TASK ———

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LEFT WING - 500 SERIES
(RIGHT WING - 600 SERIES IS EQUIVALENT)



SURGE TANK ACCESS DOORS

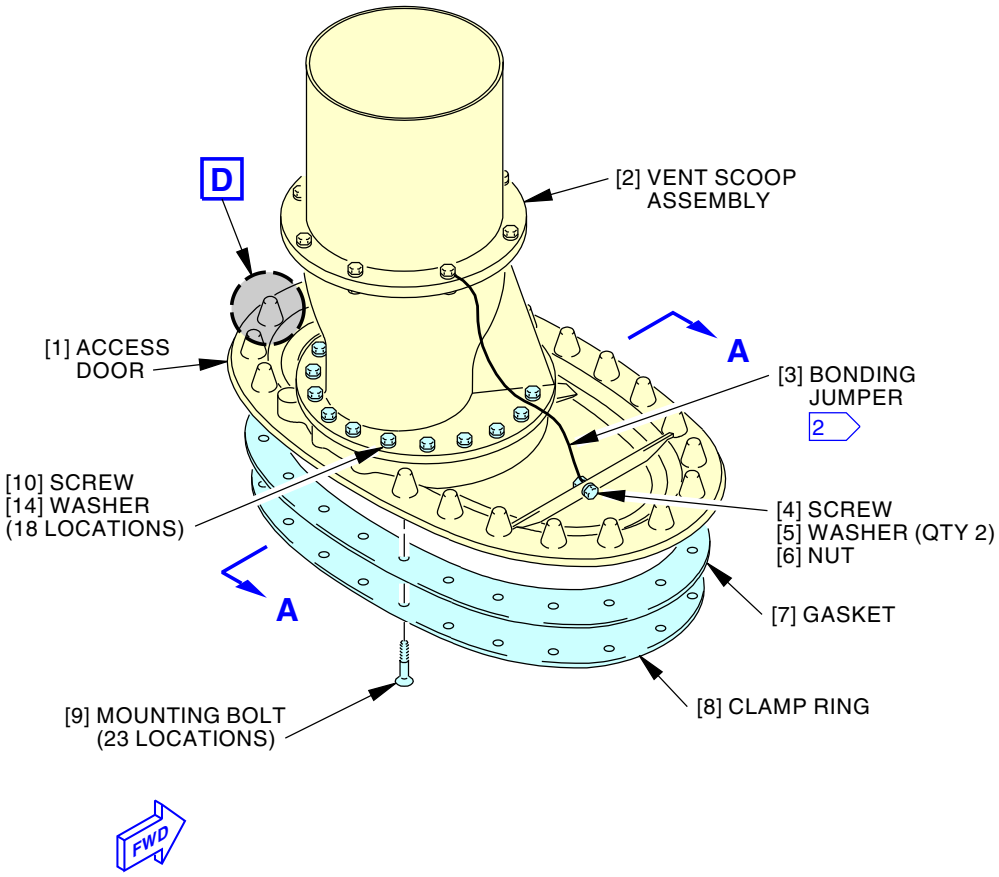
A

1 MAKE SURE THAT THE VENT SCOOP IS ORIENTED CORRECTLY

N36998 S0006414877_V5

Surge Tank Access Door Installation
Figure 401/28-11-03-990-803 (Sheet 1 of 4)

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SURGE TANK ACCESS DOOR, 544BB (644BB)

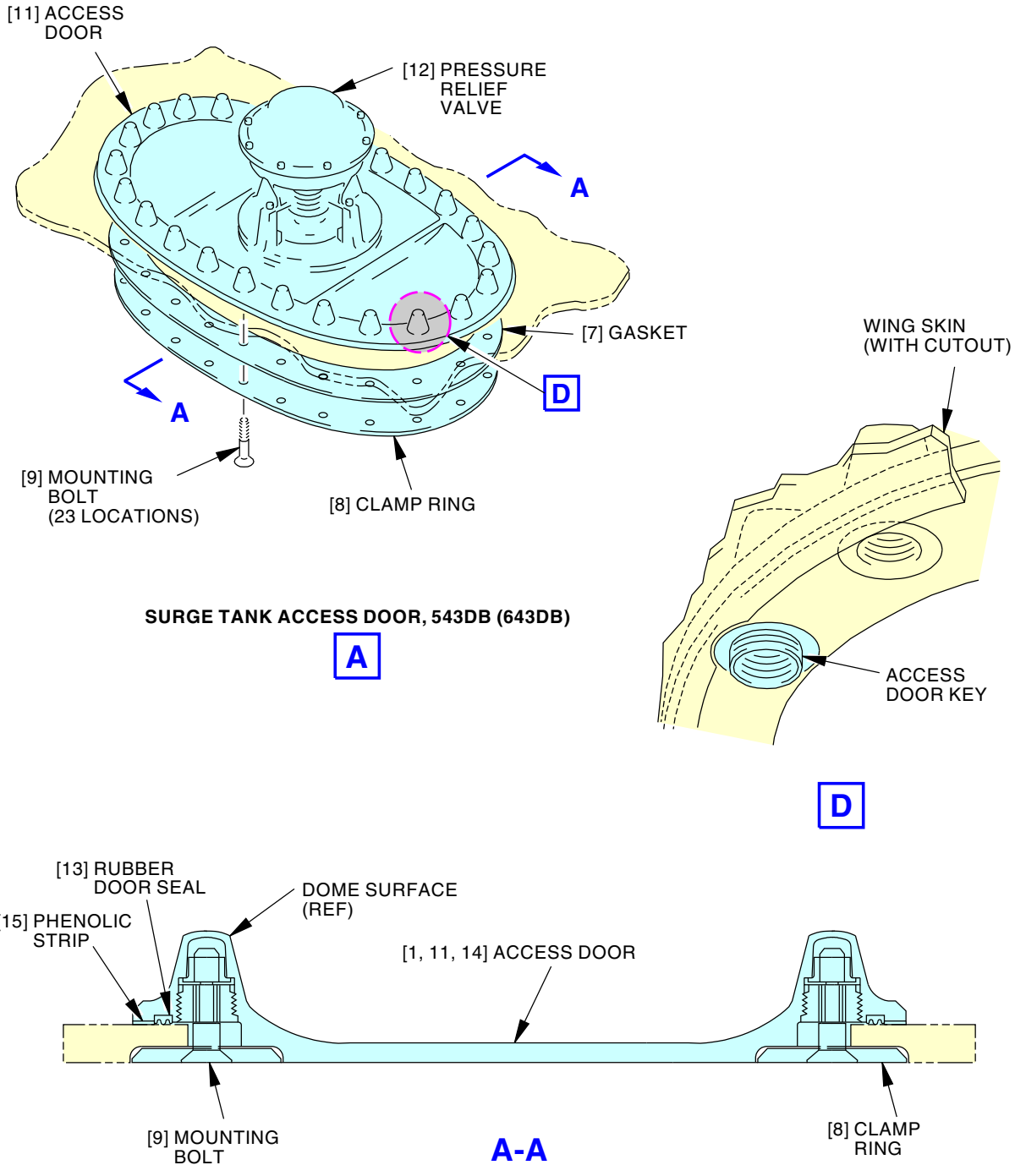
B

2 THE BONDING RESISTANCE BETWEEN THE UPPER DUCT AND THE ACCESS DOOR MUST BE 0.010 OHM OR LESS

N37004 S0006414879_V5

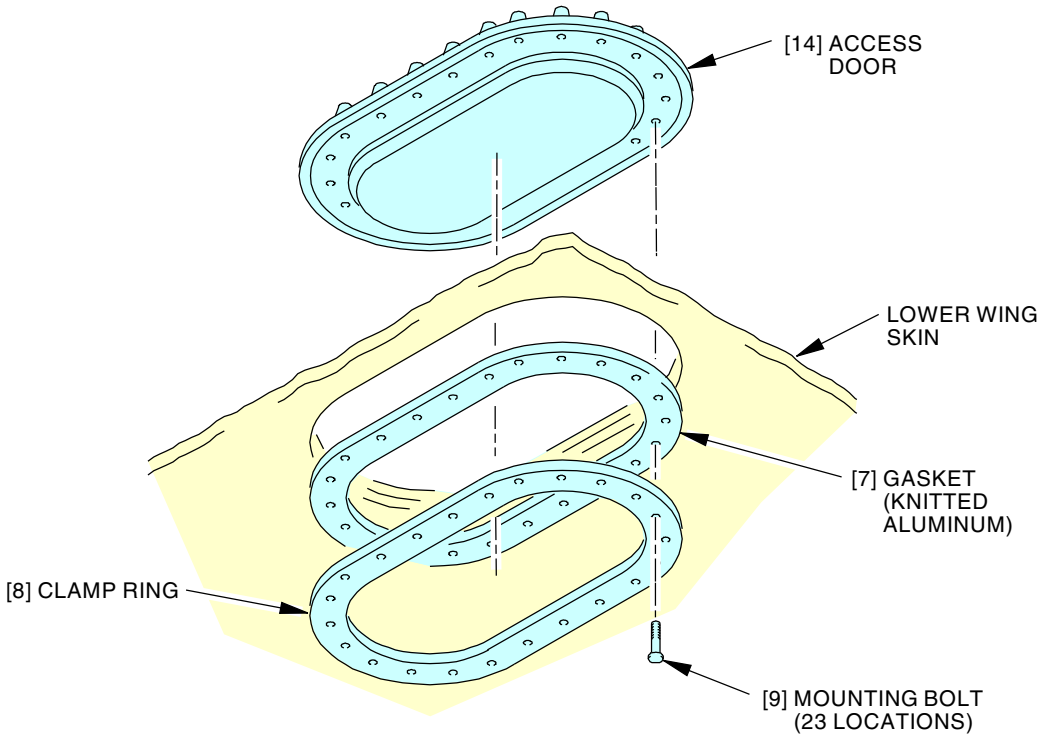
Surge Tank Access Door Installation
Figure 401/28-11-03-990-803 (Sheet 2 of 4)

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Surge Tank Access Door Installation
Figure 401/28-11-03-990-803 (Sheet 3 of 4)

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SURGE TANK ACCESS DOOR, 544EB (644AB) AND 544CB (644CB)

E

1560037 S0000288493_V2

Surge Tank Access Door Installation
Figure 401/28-11-03-990-803 (Sheet 4 of 4)

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TASK 28-11-03-400-801

3. Surge Tank Access Door - Installation

(Figure 401)

A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

(2) The Mobilgrease 33, D50306 is the recommended material for access door gasket installations. Aeroshell 14 helicopter grease, D50050 or Cor-Ban 27L Compound, G50237, can still be used for access door gaskets, but should be replaced with Mobilgrease 33, D50306, as soon as practical.

(3) Do not mix Mobilgrease 33, D50306, Cor-Ban 27L Compound, G50237, and Aeroshell 14 helicopter grease, D50050, together. If you replaced a Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, filled gasket with an Mobilgrease 33, D50306 filled gasket, remove all Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, from the clamp ring and the access door structure on the airplane.

(4) It is recommended to install a new knitted aluminum gasket for the door installation.

(5) For applying sealants in the fuel tank structure(s), it is acceptable to use sealant, A50303, as an alternative to sealant, A00767, for Class A and B non-faying seal applications:

(a) sealant, A50153, and sealant, A50301, are mutually interchangeable.

(b) sealant, A50110, and sealant, A50302, are mutually interchangeable.

(c) sealant, A50153, cannot be used in combination with sealant, A50302, and sealant, A50301, cannot be used with sealant, A50110.

B. References

Reference	Title
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-300-802	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-790-803	Surge Tank Access Door Leak Test Procedure (P/B 601)
28-11-07-900-801	Rubber Door Seal - Replacement (P/B 801)
28-13-03-400-801	Pressure Relief Valve - Installation (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

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Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

D. Consumable Materials

Reference	Description	Specification
A00706	Sealant - Fast Curing for Integral Fuel Tanks and General Purpose, Intermittent Use to 400 F (204 C)	AMS3277 (Supersedes MIL-S-29574)
A00767	Sealant - Fuel Tank	BMS5-45
A50110	Sealant	BMS5-45 Class B-2
A50153	Sealant - Fuel Tank - Class A-2	BMS5-45 Class A-2
A50301	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168 Type I Class A-2
A50302	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168 Type I Class B-2
A50303	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III
B00184	Solvent - Presealing, Cleaning Solvent	BMS11-7
C00528	Compound - Corrosion Preventive, Petroleum Hot Application (Soft Film)	MIL-C-11796 Class III
D00504	Grease - Petrolatum	VV-P-236
D50050	Grease - Multipurpose, Helicopter Oscillating Bearing Grease with Calcium Soap Thickener - Aeroshell 14	MIL-G-25537
D50306	Grease - Synthetic Aircraft Grease (Mobilgrease 33)	BMS3-33 Type 1, MIL-PRF-23827 Type 1
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A
G50237	Compound - Corrosion Inhibiting, Non-drying - Cor-Ban 27L	BMS3-38

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
7	Gasket	28-11-03-01A-020	ARO ALL

F. Location Zones

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
544	Surge Tank - Rib 38 - Rib 41 - WS 1182 - WS 1264.5; and Spar Area - Rib 41 (WS 1264.5) - Wing Tip (WBL 1233)

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(Continued)

Zone	Area
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182
644	Surge Tank - Rib 38 - Rib 41 - WS 1182 - WS 1264.5; and Spar Area - Rib 41 (WS 1264.5) to wing tip (WBL 1233)

G. Prepare for the Door Installation

SUBTASK 28-11-03-210-011

(1) Examine the open tank for unwanted objects or material.

SUBTASK 28-11-03-110-003

(2) Make sure the areas on the access door [1], access door [11], or access door [14] and the wing skin, that the rubber door seal [13] touches, are clean (Figure 401, View A-A).

(a) Use solvent, B00083, with a clean cotton wiper, G00034, to clean the surfaces if it is necessary.

28-AWL-16: CDCCL

SUBTASK 28-11-03-210-009

(3) Make sure there is no visible corrosion on the access door [1], access door [11], or access door [14] and the clamp ring [8] and the lower wing skin electrical faying surfaces.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

SUBTASK 28-11-03-010-001

(4) Do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

H. Prepare the Access Door for Installation

SUBTASK 28-11-03-960-001

(1) Make sure the rubber door seal [13] is in good condition.

(a) To replace the rubber door seal [13] if it is necessary, do this task: Rubber Door Seal - Replacement, TASK 28-11-07-900-801.

(b) Apply a thin layer of petrolatum grease, D00504, to the rubber door seal.

28-AWL-16: CDCCL

SUBTASK 28-11-03-210-010

(2) Make sure there is a phenolic strip [15] around the access door [1], access door [11], or access door [14] that mates with the wing skin inside the tank.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

I. Prepare the New Knitted Aluminum Gasket for Installation (Recommended Procedure)

SUBTASK 28-11-03-960-003

(1) Examine the container of the new gasket [7] to find the manufacture date of the gasket.

(a) If the new gasket [7] is more than five years old from the manufacturing date, do these steps before you install the gasket:

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28-AWL-16: CDCCL

1) Remove (De-grease) the old Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, from the new gasket [7].

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

2) Re-fill (Re-impregnate) both sides of the new gasket [7] with grease (recommended) or anti-corrosion compound.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

a) Use Mobilgrease 33, D50306, (recommended), Aeroshell 14 helicopter grease, D50050 or Cor-Ban 27L Compound, G50237, to re-fill the new gasket [7].

NOTE: Do not mix Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, and Cor-Ban 27L Compound, G50237, together.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

b) Apply 0.5 fl-oz (15 ml) - 1 fl-oz (30 ml) of grease or anti-corrosion compound.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

SUBTASK 28-11-03-490-001

(2) Put the tray assembly for the gasket on a flat surface with its face up.

SUBTASK 28-11-03-030-001

(3) Remove the paper cover from the tray.

SUBTASK 28-11-03-490-002

(4) Put the clamp ring [8] on thegasket [7] (with the countersink end of the holes face up).

(a) Make sure the clamp ring holes and the gasket holes align.

NOTE: The holes are not symmetrical.

SUBTASK 28-11-03-490-003

(5) Push the clamp ring [8] on the gasket [7] until the clamp ring [8] is tightly against the gasket [7].

SUBTASK 28-11-03-090-001

(6) Remove the clamp ring [8], the gasket [7], and the release strip from the tray as a unit.

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SUBTASK 28-11-03-430-001

(7) Put the assembly, with the gasket [7] side turned up, on a flat surface.

SUBTASK 28-11-03-090-002

(8) Remove the release strip from the gasket [7].

J. Prepare the Original Knitted Aluminum Gasket for Installation (Alternate Procedure)

SUBTASK 28-11-03-110-004

(1) Clean the gasket [7] and clamp ring [8] with a cotton wiper, G00034, and solvent, B00083.

(a) Continue cleaning until the cotton wiper, G00034, remains clean.

28-AWL-16: CDCCL

SUBTASK 28-11-03-211-001

(2) A used gasket [7] that meets the criteria that follows can be installed:

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

(a) No fastener holes are torn.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

(b) The gasket [7] is not elongated or out of shape.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

(c) The gasket rubber seals around the inner and outer periphery must be a minimum of 0.015 in. (0.4 mm) thick.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

(d) No more than 10% of strands in all three layers are broken through in any one area.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

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SUBTASK 28-11-03-620-002

28-AWL-16: CDCCL

(3) Fill both sides of the gasket [7] with grease (recommended) or anti-corrosion compound.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

28-AWL-16: CDCCL

(a) Use Mobilgrease 33, D50306 (recommended), Aeroshell 14 helicopter grease, D50050 or Cor-Ban 27L Compound, G50237, to fill the gasket [7].

NOTE: Do not mix Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, and Cor-Ban 27L Compound, G50237, together. The Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, must be the same as on the clamp ring and access door structure.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

(b) Make sure the Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, fully fills the mesh of the gasket.

(c) Make sure there is a continuous layer of Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, on both sides of the gasket [7].

SUBTASK 28-11-03-420-005

(4) Put the clamp ring [8] on the gasket [7] (with the countersink end of the holes face up).

(a) Make sure the clamp ring [8] holes and the gasket [7] holes align.

NOTE: The holes are not symmetrical.

SUBTASK 28-11-03-420-006

(5) Push the clamp ring [8] on the gasket [7] until the clamp ring [8] is tightly against the gasket [7].

K. Install the Access Door

SUBTASK 28-11-03-410-001

(1) Do the applicable steps in this task: Fuel Tank Closure, TASK 28-11-00-410-801.

SUBTASK 28-11-03-100-001

(2) Clean the clamp ring [8] surface with solvent, B00083, and a clean cotton wiper, G00034.

SUBTASK 28-11-03-210-005

(3) Make sure that the gasket [7] is installed on the clamp ring [8].

(a) Make sure the clamp ring [8] and gasket [7] holes align.

NOTE: The holes are not symmetrical.

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SUBTASK 28-11-03-640-003

28-AWL-16: CDCCL

CAUTION DO NOT APPLY TOO MUCH GREASE TO THE LOWER SURFACE OF THE WING. YOU CAN CAUSE DAMAGE TO THE ACCESS DOOR WITH HYDRAULIC PRESSURE FROM THE GREASE WHEN YOU INSTALL THE MOUNTING FASTENERS.

(4) Apply a very thin layer of Mobilgrease 33, D50306 (recommended), Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, to the lower surface of the wing skin that touches the gasket [7] for the access door [1], access door [11], or access door [14].

NOTE: Do not mix Mobilgrease 33, D50306, Aeroshell 14 helicopter grease, D50050, and Cor-Ban 27L Compound, G50237, together.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

SUBTASK 28-11-03-420-001

(5) Install the pressure relief valve [12], if removed, to the access door [11] (View B) (TASK 28-13-03-400-801).

SUBTASK 28-11-03-420-002

(6) If the vent scoop assembly [2] was removed, do these steps to install the vent scoop assembly [2] to the access door [1] (View A):

(a) Clean the surfaces of the access door [1] and the lower vent scoop assembly [2] with solvent, B00184.

(b) Apply sealant to the surfaces between the access door [1] and the vent scoop assembly [2].

1) Use one of these sealants to install the vent scoop assembly:

a) sealant, A00767

b) sealant, A50303

c) sealant, A00706

(c) Put the vent scoop assembly [2] into its correct position on the access door [1].

NOTE: Make sure you align the bolt holes in the vent scoop assembly and the access door.

(d) Install the 18 screws [10] that attach the vent scoop assembly [2] to the access door [1].

(e) Tighten the screws [10].

(f) Install the screw [4], washer [5] and nut [6] to attach the bonding jumper [3] to the access door [1].

(g) Measure the electrical bonding resistance between the upper duct on the vent scoop assembly [2] and the access door [1] (SWPM 20-20-00).

1) Use an intrinsically safe approved bonding meter, COM-1550.

2) Make sure the electrical bonding resistance is 0.010 ohm (10 milliohms) or less.

(h) Apply a thin layer of the sealant around the mating surface of the lower flange of the vent scoop assembly [2] and the access door [1] (TASK 28-11-00-300-802).

(i) Apply the sealant along the top of the screws [10] (TASK 28-11-00-300-802).

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SUBTASK 28-11-03-210-012

(7) If the vent scoop assembly [2] was not removed from the access door [1], make sure the bonding jumper [3] is installed between the vent scoop and the access door.

(a) Measure the electrical bonding resistance between the upper duct on the vent scoop assembly [2] and the access door [1] (SWPM 20-20-00).

1) Use an intrinsically safe approved bonding meter, COM-1550.

2) Make sure the electrical bonding resistance is 0.010 ohm (10 milliohms) or less.

SUBTASK 28-11-03-420-004

(8) To install the access door [1], access door [11], or access door [14]; do these steps:

NOTE: The access door [11] is Pressure Relief Door, 543DB, left wing or Pressure Relief Access Door, 643DB, right wing. The access door [1] is Vent Scoop Door, 544BB, left wing or Vent Scoop Access Door, 644BB, right wing. The access door [14] is 544AB or 544CB on the left wing or 644AB or 644CB on the right wing.

(a) Make sure the seal surfaces on the access door [1], access door [11], or access door [14] and the lower wing skin are clean.

(b) Make sure the rubber door seal [13] in the access door [1], access door [11], or access door [14] is clean and not damaged.

CAUTION

MAKE SURE THAT THE ACCESS DOOR IS INSTALLED CORRECTLY. IF YOU INSTALL THE ACCESS DOOR INCORRECTLY, FUEL CAN SPILL.

(c) Put the access door [1], access door [11], or access door [14] in the opening of the surge tank.

NOTE: The surge tank access door [1] and access door [11] have a door key (View C) (Figure 401). Make sure the key is installed correctly in the lower wing skin.

CAUTION

VISUALLY EXAMINE THE INTERNAL DOME SURFACES OF THE TANK ACCESS DOOR FOR CRACKS BEFORE YOU INSTALL THE MOUNTING BOLTS. MAKE SURE MOUNTING BOLTS ARE THE CORRECT LENGTH. BOLTS THAT EXCEED THREAD LENGTH CAN CAUSE DAMAGE TO THE INTERNAL DOME SURFACE OF THE DOOR.

(d) Put and hold the gasket [7] and the clamp ring [8] in the opening between the outer face of the access door and the wing skin while you install the mounting bolts [9] for the access door [1], access door [11], or access door [14].

(e) Do the steps that follow to install the mounting bolts [9]:

1) Apply a thin layer of compound, C00528, to the mounting bolts [9] shank and threads.

28-AWL-16: CDCCL

2) Start at the centerline and tighten the mounting bolts [9] to 35 ±5 in-lb (4 ±1 N·m), equally in each direction.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

NOTE: Tighten the mounting bolt [9] as shown in (Figure 402).

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SUBTASK 28-11-03-760-001

(9) Measure the electrical bonding resistance between the access door [1] and the lower wing skin (skin panel) (SWPM 20-20-00).

(a) Use an intrinsically safe approved bonding meter, COM-1550.

(b) Make sure the electrical bonding resistance is 0.010 ohm (10 milliohms) or less.

SUBTASK 28-11-03-220-001

(10) Do the steps that follow to inspect the fit of the access door [1]:

(a) Make sure that the vent scoop is installed in the correct direction (Figure 401, View A).

(b) Make sure the gap between the clamp ring [8] and the access door [1] is within 0.030 ±0.030 in. (0.076 ±0.076 cm).

(c) Make sure the gap between the clamp ring [8] and the lower wing skin panel is within 0.030 ±0.030 in. (0.076 ±0.076 cm).

(d) Make sure the access door [1] is flush with the lower wing skin panel within 0.000 ±0.030 in. (0.000 ±0.076 cm).

(e) Make sure the mounting bolt [9] are flush with the clamp ring [8] within 0.000 +0.002 / -0.010 in. (0.000 +0.005 / -0.025 cm)

SUBTASK 28-11-03-810-001

WARNING

MAKE SURE YOU INSTALL THE SURGE TANK ACCESS DOORS CORRECTLY. FUEL CAN ENTER THE SURGE TANKS DURING SOME GROUND OR FLIGHT MANEUVERS. IF THE SURGE TANK ACCESS DOOR(S) ARE NOT INSTALLED CORRECTLY, AN OVERBOARD FUEL SPILL CAN OCCUR. AN OVERBOARD FUEL SPILL IS A FIRE HAZARD.

(11) Use one of these methods to check the surge tank access door installation:

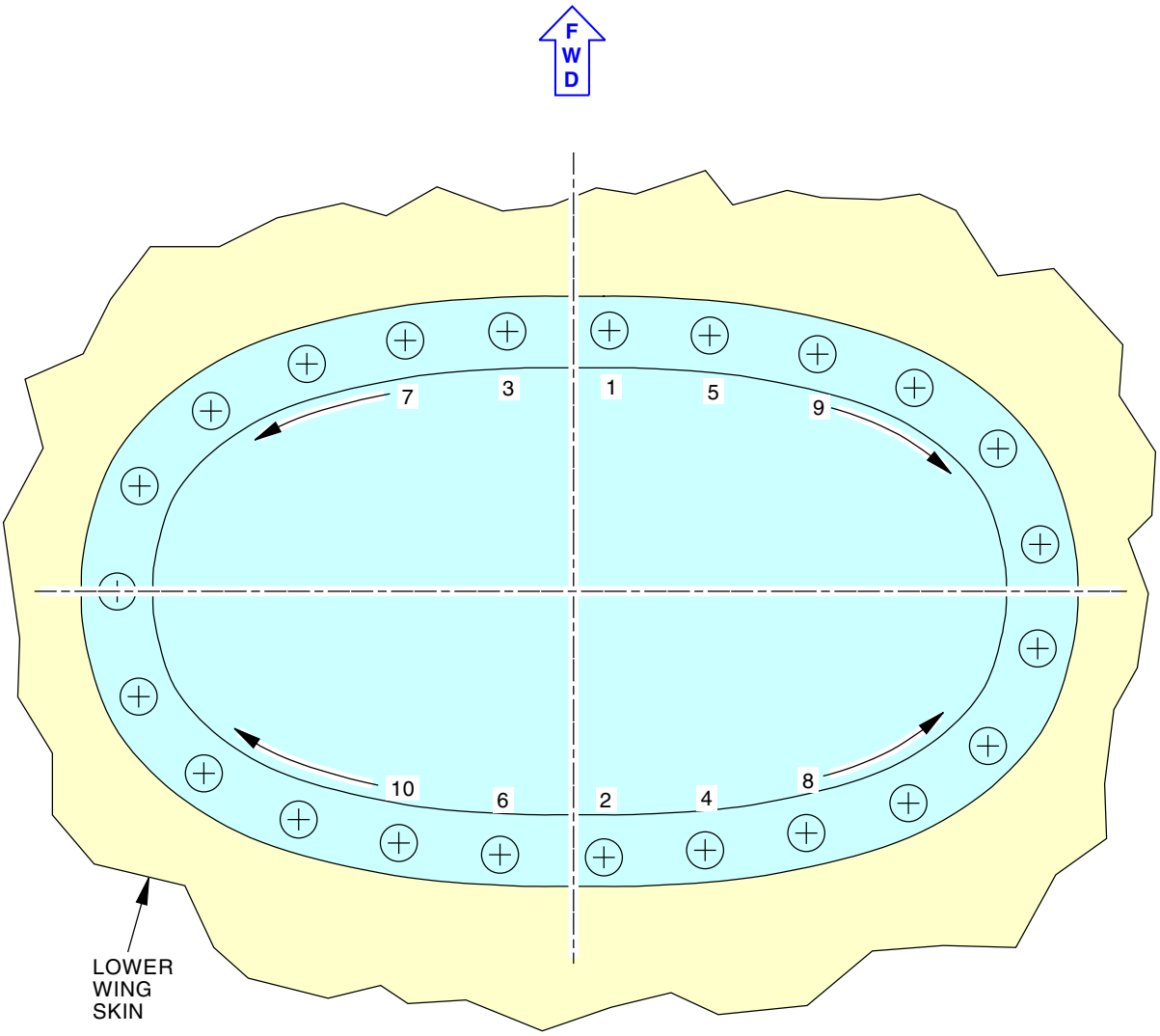
(a) Do a visual check to make sure the access door installation is fluid tight.

(b) Do a fuel leak check for the surge tank access doors.

1) Do this task: Surge Tank Access Door Leak Test Procedure, TASK 28-11-00-790-803.

——— END OF TASK ———

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NOTE:

TORQUE THE MOUNT BOLTS IN THE SEQUENCE SHOWN BY THE NUMBERS.
THIS WILL MAKE SURE FUEL DOES NOT LEAK AROUND THE ACCESS PANEL.

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Access Panel Mount Bolt Torque Pattern
Figure 402/28-11-03-990-802

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CENTER PURGE DOOR - REMOVAL/INSTALLATION

1. General

A. This procedure contains two tasks. The first task removes the center purge door. The second task installs the center purge door.

B. The center purge door is installed on the rear spar in the left wheel well, approximately 7 in. (178 mm) to the left of the airplane centerline. The center purge door is used to remove fuel fumes from the center section.

C. Removal of the center purge door to ventilate the center fuel tank is optional. If the center purge door is removed, additional ventilation of the center fuel tank is supplied.

NOTE: If the center purge door is removed, the O-ring must be replaced.

NOTE: If the center purge door is removed, a leak check must be done after the installation of the center purge door.

TASK 28-11-04-000-801

2. Center Purge Door Removal

(Figure 401)

A. General

(1) Removal of the center purge door [1] is optional for fuel tank ventilation.

(2) If you remove the center purge door [1], you must replace the o-ring [2].

B. References

Reference	Title
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)
28-26-00-650-803	Suction Defueling (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1049	Stepladder - 12 foot
STD-3731	Streamer - REMOVE BEFORE FLIGHT

D. Location Zones

Zone	Area
133	Wing Center Section, Left
139	Forward Keel Beam

E. Access Panels

Number	Name/Location
133AZ	Baffle Door
133BZ	Baffle Door
133CZ	Baffle Door
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door

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F. Procedure

SUBTASK 28-11-04-480-001

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-11-04-650-002

(2) Do this step to defuel the center fuel tank (TASK 28-26-00-650-801, TASK 28-26-00-650-802, or TASK 28-26-00-650-803).

SUBTASK 28-11-04-480-004

(3) Use a 12 foot stepladder, STD-1049, to get access to the center purge door [1].

SUBTASK 28-11-04-800-001

(4) Make sure that the center purge door [1] has one end of the cable assembly [6] attached to it and the other end attached to the rear spar.

SUBTASK 28-11-04-020-001

(5) Remove the six bolts [4], washers [5], and the clamp ring [3] from the center purge door [1]

SUBTASK 28-11-04-020-002

(6) Lower the center purge door [1].

(a) Make sure that the o-ring [2] does not fall to the bottom of the tank.

SUBTASK 28-11-04-490-001

(7) Attach a REMOVE BEFORE FLIGHT streamer, STD-3731, to the opening for the center purge door [1].

(a) Make sure the REMOVE BEFORE FLIGHT streamer, STD-3731, is extended and can be easily seen from outside the tank.

SUBTASK 28-11-04-010-006

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(8) Go into the center fuel tank (TASK 28-11-00-010-801).

(a) Open this access panel:

Number	Name/Location
139AL	Forward Keel Beam Access Panel

(b) Do this task: Center Tank Access Door - Removal, TASK 28-11-02-000-801.

1) Open this access panel:

Number	Name/Location
139AZ	Center Wing Access Door

(c) Make sure that there is a good flow of air into the center section (TASK 28-11-00-650-801).

(d) Go into the wing center section.

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(e) Remove the fourteen bolts and washers to remove each of these panels:

Number	Name/Location
133AZ	Baffle Door
133BZ	Baffle Door
133CZ	Baffle Door

(f) Remove the nut [7], washer [8], washers [9], spacer [10] and the bolt [11].

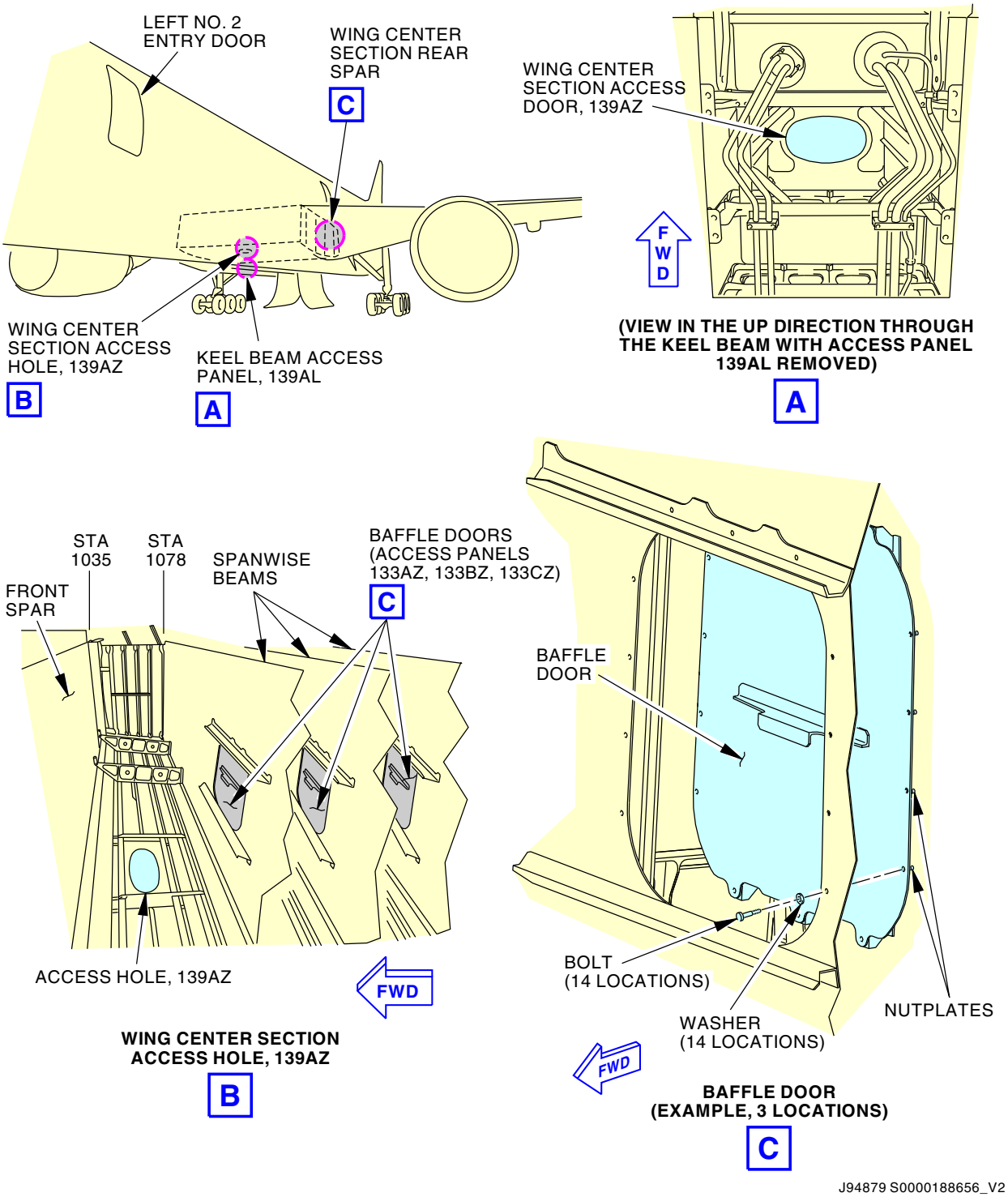
(g) Remove the cable assembly [6] from the rear spar end.

(h) Remove the center purge door [1] and the o-ring [2].

1) Discard the o-ring [2].

——— END OF TASK ———

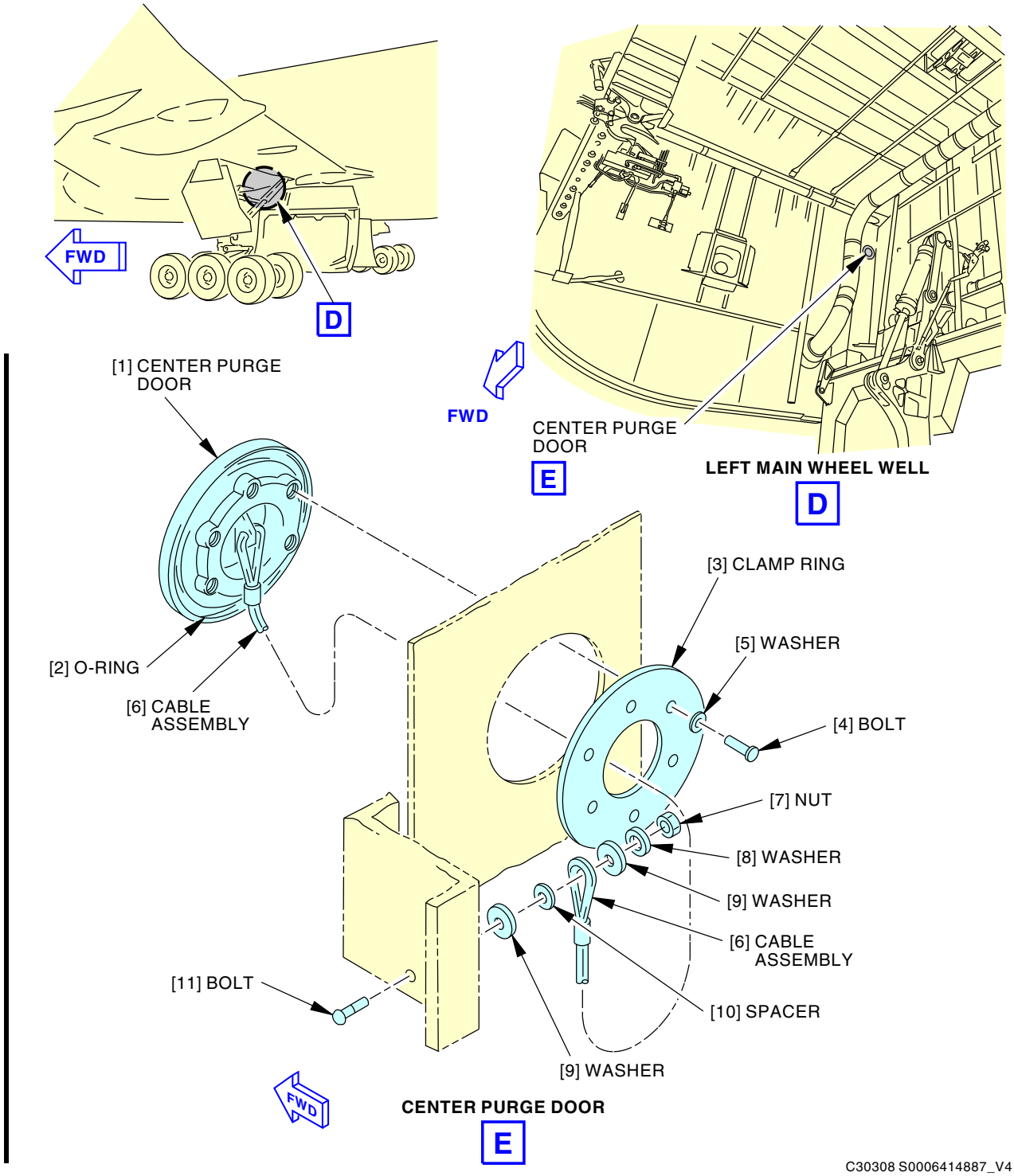
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Center Purge Door Installation
Figure 401/28-11-04-990-801 (Sheet 1 of 2)

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Center Purge Door Installation
Figure 401/28-11-04-990-801 (Sheet 2 of 2)

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TASK 28-11-04-400-801

3. Center Purge Door Installation

(Figure 401)

A. General

(1) Removal of the center purge door [1] is optional for fuel tank ventilation.

(2) If the center purge door [1] is removed, replace the o-ring [2].

(3) The center purge door [1] is mainly installed from outside of the wing center section. However, you must go into the wing center section with the center purge door [1] to attach it to the cable assembly [6].

(a) This task can be done by one person, and is written for one person, but it is easier to have one person inside the wing center section and one person outside the wing center section.

B. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
12-11-01-650-801	Pressure Refueling (P/B 301)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-790-801	Fuel Leak Detection Procedures (P/B 601)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1049	Stepladder - 12 foot
STD-3731	Streamer - REMOVE BEFORE FLIGHT

D. Consumable Materials

Reference	Description	Specification
D00013	Grease - Aircraft And Instrument Grease	MIL-PRF-23827 (NATO G-354) (Supersedes MIL-G-23827)
D00504	Grease - Petrolatum	VV-P-236

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	O-ring	28-11-04-01-040	ARO ALL

F. Location Zones

Zone	Area
133	Wing Center Section, Left
139	Forward Keel Beam

G. Access Panels

Number	Name/Location
133AZ	Baffle Door
133BZ	Baffle Door
133CZ	Baffle Door

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(Continued)

Number	Name/Location
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door

H. Install the Center Purge Door

SUBTASK 28-11-04-210-001

(1) Do these steps to install the o-ring [2]:

(a) Apply a thin layer of petrolatum grease, D00504, to the o-ring [2]

(b) Put the o-ring [2] in the groove on the center purge door [1].

SUBTASK 28-11-04-910-004

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Go into the wing center section with the center purge door [1] (TASK 28-11-00-010-801).

SUBTASK 28-11-04-420-002

(3) Put the cable assembly [6] through the opening for the center purge door [1] in the rear spar and temporarily attach the one end of the cable assembly [6] with bolt [11] and nut [7].

SUBTASK 28-11-04-910-005

(4) Go out of the wing center section.

SUBTASK 28-11-04-869-001

(5) Use a 12 foot stepladder, STD-1049, to get access to the center purge door [1].

SUBTASK 28-11-04-910-003

(6) Do these steps to install the center purge door [1]:

(a) Apply grease, D00013, to each bolt [4].

(b) Pull on the cable assembly [6], from the left wheel well until the center purge door [1] bolt holes align with the bolt holes in the rear spar.

(c) Install the clamp ring [3], bolts [4] and washers [5] to attach the center purge door [1] to the rear spar.

NOTE: You must hold onto the cable assembly to keep the bolt hole alignment between the center purge door [1] and the rear spar. Two people may be necessary to do this step.

(d) Tighten the bolts [4] to 100 ±10 in-lb (11 ±1 N·m).

(e) Remove the REMOVE BEFORE FLIGHT streamer, STD-3731, that you attached to the center purge door [1].

(f) Remove the temporarily installed nut [7] and one end of the cable assembly [6] from the bolt [11].

(g) Install the washers [9], spacer [10], cable assembly [6], washer [8] and the nut [7] on the bolt [11].

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SUBTASK 28-11-04-790-001

(7) To make sure that there is no fuel leakage at the center purge door [1], do the Air Pressure and Bubble Solution (Backblowing) leak check procedure (TASK 28-11-00-790-801).

NOTE: This is the recommended leak check procedure for the center purge door. Two people are necessary for this procedure. If you do not want to do this recommended procedure, you can do the alternate procedure that is called out later.

SUBTASK 28-11-04-410-007

(8) Go out of the wing center section (TASK 28-11-00-410-801).

(a) Use the fourteen bolts and washers to install these access panels:

Number	Name/Location
133AZ	Baffle Door
133BZ	Baffle Door
133CZ	Baffle Door

(b) Install this access door:

(TASK 28-11-02-400-801)

Number	Name/Location
139AZ	Center Wing Access Door

(c) Install this access panel:

(TASK 06-44-00-800-802)

Number	Name/Location
139AL	Forward Keel Beam Access Panel

SUBTASK 28-11-04-650-001

(9) If you did not do the recommended procedure to make sure that there is no fuel leakage at the center purge door [1] earlier, do these steps:

(a) Refuel the center fuel tank to a minimum fuel quantity of 115,000 lb (52,163 kg) (TASK 12-11-01-650-801).

NOTE: This fuel quantity is sufficient to cover the center purge door [1] opening with fuel at a nominal ground pitch attitude of -0.7 deg and 0 deg roll.

(b) Do this task to find the leak using talcum powder: Fuel Leak Detection Procedures, TASK 28-11-00-790-801.

SUBTASK 28-11-04-080-001

WARNING OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(10) If it is necessary, do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

END OF TASK

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WING DRY BAY ACCESS DOOR - REMOVAL/INSTALLATION

1. General

A. This procedure contains two tasks. The first task removes the wing dry bay access door. The second task installs the wing dry bay access door.

TASK 28-11-05-000-801

2. Wing Dry Bay Access Door - Removal

(Figure 401)

A. References

Reference	Title
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)

B. Location Zones

Zone	Area
532	Left Wing Dry Bay
632	Right Wing Dry Bay

C. Access Panels

Number	Name/Location
532AB	Wing Dry Bay Access Door
632AB	Wing Dry Bay Access Door

D. Procedure

SUBTASK 28-11-05-940-001

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) For the applicable wing dry bay, do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

NOTE: Because fuel and fuel vapor can leak into the wing dry bay, the wing dry bay is considered a fuel tank. Follow the steps applicable to the wing dry bay only. Unless there is fuel leakage into the dry bay, it is not necessary to defuel and sump the main or center tanks.

SUBTASK 28-11-05-030-001

(2) Hold the clamp ring [5] and remove the mounting bolt [4].

SUBTASK 28-11-05-030-002

(3) Remove the clamp ring [5] and the gasket [3].

SUBTASK 28-11-05-420-001

CAUTION DO NOT USE A LEVER (PRY) ON THE DRY BAY ACCESS DOOR. THE LOWER SURFACE OF THE ACCESS DOOR FLANGE AND THE UPPER SURFACE OF THE WING SKIN AROUND THE ACCESS DOORS ARE SEAL SURFACES. IF YOU ARE NOT CAREFUL, SCRATCHES OR DAMAGE TO THE SEAL SURFACE CAN OCCUR.

(4) Push up on the access door [1].

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(a) Remove the applicable access doors:

Number	Name/Location
532AB	Wing Dry Bay Access Door
632AB	Wing Dry Bay Access Door

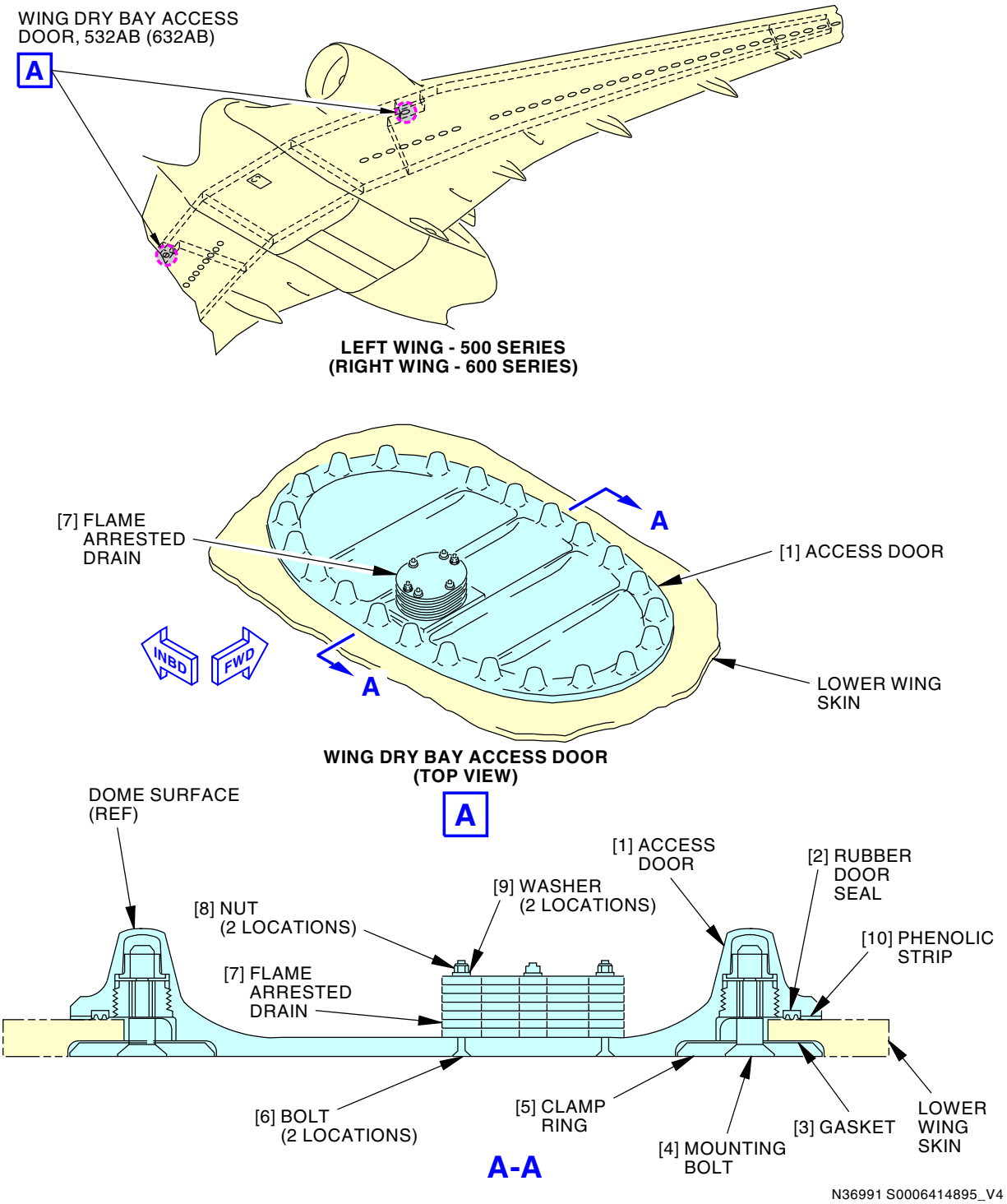
(b) If the access door [1] does not move freely, use a rubber mallet and lightly hit around the access door.

SUBTASK 28-11-05-020-001

(5) Remove the access door [1] from the wing.

——— END OF TASK ———

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Wing Dry Bay Access Door Installation
Figure 401/28-11-05-990-803

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TASK 28-11-05-400-801

3. Wing Dry Bay Access Door Installation

(Figure 401)

A. General

(1) Aeroshell 14 helicopter grease, D50050, is the recommended material for access door gasket installations. The Cor-Ban 27L Compound, G50237, can still be used for access door gaskets, but should be replaced with Aeroshell 14 helicopter grease, D50050, as soon as practical.

(2) Do not mix Aeroshell 14 helicopter grease, D50050, and Cor-Ban 27L Compound, G50237, together. If you replaced a Cor-Ban 27L Compound, G50237, filled gasket with a Aeroshell 14 helicopter grease, D50050, filled gasket, remove all Cor-Ban 27L Compound, G50237, from the clamp ring and the access door structure on the airplane.If you replaced a Aeroshell 14 helicopter grease, D50050, filled gasket with a Cor-Ban 27L Compound, G50237, filled gasket, remove all Aeroshell 14 helicopter grease, D50050, from the clamp ring and the access door structure on the airplane.

(3) It is recommended to install a new knitted aluminum gasket for the door installation. Do the alternate procedure to re-use a serviceable knitted aluminum gasket if a new part is not available.

B. References

Reference	Title
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-07-900-801	Rubber Door Seal - Replacement (P/B 801)

C. Consumable Materials

Reference	Description	Specification
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III
C00528	Compound - Corrosion Preventive, Petroleum Hot Application (Soft Film)	MIL-C-11796 Class III
D50050	Grease - Multipurpose, Helicopter Oscillating Bearing Grease with Calcium Soap Thickener - Aeroshell 14	MIL-G-25537
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A
G50237	Compound - Corrosion Inhibiting, Non-drying - Cor-Ban 27L	BMS3-38

D. Location Zones

Zone	Area
532	Left Wing Dry Bay
632	Right Wing Dry Bay

E. Access Panels

Number	Name/Location
532AB	Wing Dry Bay Access Door
632AB	Wing Dry Bay Access Door

F. Prepare for the Door Installation

SUBTASK 28-11-05-210-008

(1) Examine the dry bay for unwanted objects or material.

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SUBTASK 28-11-05-210-001

(2) Make sure the areas on the access door [1] and the wing skin, that the rubber door seal [2] touches, are clean.

(a) Use solvent, B00083, to clean the surfaces if it is necessary.

G. Prepare the Access Door for Installation

SUBTASK 28-11-05-210-002

(1) Make sure the rubber door seal [2] is in good condition.

(a) To replace the rubber door seal [2] if it is necessary, do this task: Rubber Door Seal - Replacement, TASK 28-11-07-900-801.

SUBTASK 28-11-05-210-006

(2) Make sure there is a phenolic strip [10] installed around the access door [1] that mates with the wing skin.

H. Prepare the New Knitted Aluminum Gasket for Installation (Recommended Procedure)

SUBTASK 28-11-05-210-007

(1) Examine the container of the new gasket [3] to find the manufacture date of the gasket.

(a) If the new gasket [3] is more than five years old, do these steps before you install the gasket:

1) Remove the old Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, from the new gasket [3].

2) Refill both sides of the new gasket [3] with Aeroshell 14 helicopter grease, D50050, (recommended) or Cor-Ban 27L Compound, G50237.

NOTE: Do not mix Aeroshell 14 helicopter grease, D50050, and Cor-Ban 27L Compound, G50237, together.

SUBTASK 28-11-05-210-004

(2) Make sure that the Aeroshell 14 helicopter grease, D50050 (recommended) or Cor-Ban 27L Compound, G50237, fills the aluminum mesh on both sides of the new gasket [3].

NOTE: If you do not fill the aluminum mesh with Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, the spaces with no Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, can collect water. If you apply too much Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, the Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, can leak onto the wing surface.

NOTE: Do not mix Aeroshell 14 helicopter grease, D50050, and Cor-Ban 27L Compound, G50237, together.

SUBTASK 28-11-05-420-003

(3) Put the tray assembly for the gasket on a flat surface with its face up.

SUBTASK 28-11-05-020-002

(4) Remove the paper cover from the tray.

SUBTASK 28-11-05-420-004

(5) Put the clamp ring [5] on the gasket [3] (with the countersink end of the holes face up).

(a) Make sure the clamp ring holes and the gasket holes align.

NOTE: The holes are not symmetrical.

SUBTASK 28-11-05-420-005

(6) Push the clamp ring [5] on the gasket [3] until the clamp ring [5] is tightly against the gasket [3].

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SUBTASK 28-11-05-020-003

(7) Remove the clamp ring [5], the gasket [3], and the release strip from the tray as a unit.

SUBTASK 28-11-05-420-006

(8) Put the assembly, with the gasket [3] side turned up, on a flat surface.

SUBTASK 28-11-05-020-004

(9) Remove the release strip from the gasket [3].

I. Prepare the Original Knitted Aluminum Gasket for Installation (Alternate Procedure)

SUBTASK 28-11-05-110-001

(1) Clean the gasket [3] and clamp ring [5] with a cotton wiper, G00034, and solvent, B00083.

(a) Continue cleaning until the cotton wiper, G00034, remains clean.

SUBTASK 28-11-05-211-001

(2) A used gasket [3] that meets the criteria that follows can be installed..

(a) No fastener holes are torn.

(b) The gasket [3] is not elongated or out of shape.

(c) The gasket rubber seals around the inner and outer periphery must be a minimum of 0.015 in. (0.381 mm) thick.

(d) No more than 10% of strands in all three layers are broken through in any one area.

SUBTASK 28-11-05-620-001

(3) Fill both sides of the gasket [3] with Aeroshell 14 helicopter grease, D50050 (recommended), or Cor-Ban 27L Compound, G50237.

NOTE: Do not mix Aeroshell 14 helicopter grease, D50050, and Cor-Ban 27L Compound, G50237, together. The Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, must be the same as on the clamp ring and access door structure.

(a) Make sure the Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, fully fills the mesh of the gasket.

(b) Make sure there is a continuous layer of Aeroshell 14 helicopter grease, D50050, or Cor-Ban 27L Compound, G50237, on both sides of the gasket [3].

SUBTASK 28-11-05-420-007

(4) Put the clamp ring [5] on the gasket [3] (with the countersink end of the holes face up).

(a) Make sure the clamp ring [5] holes and the gasket [3] holes align.

NOTE: The holes are not symmetrical.

SUBTASK 28-11-05-420-008

(5) Push the clamp ring [5] on the gasket [3] until the clamp ring [5] is tightly against the gasket [3].

J. Procedure

SUBTASK 28-11-05-410-001

(1) Do the applicable steps in this task: Fuel Tank Closure, TASK 28-11-00-410-801.

SUBTASK 28-11-05-420-002

(2) Put the access door [1] in the dry bay and set the door in the opening.

(a) Install the applicable access doors:

Number	Name/Location
532AB	Wing Dry Bay Access Door

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(Continued)

Number	Name/Location
632AB	Wing Dry Bay Access Door

SUBTASK 28-11-05-100-001

(3) Clean the clamp ring [5] surface with solvent, B00083, and a clean cotton wiper, G00034.

SUBTASK 28-11-05-210-005

(4) Make sure that the gasket [3] is installed on the clamp ring [5].

(a) Make sure that the clamp ring [5] and gasket [3] holes align.

NOTE: The holes are not symmetrical.

SUBTASK 28-11-05-640-001

CAUTION

DO NOT APPLY TOO MUCH GREASE OR ANTI-CORROSION COMPOUNDTO THE LOWER SURFACE OF THE WING. YOU CAN CAUSE DAMAGE TO THE ACCESS DOOR WITH HYDRAULIC PRESSURE FROM THE GREASE OR ANTI-CORROSION COMPOUND WHEN YOU INSTALL THE MOUNTING BOLTS.

(5) Apply a very thin layer of Aeroshell 14 helicopter grease, D50050, (recommended) or Cor-Ban 27L Compound, G50237, to the lower surface of the wing skin that touches the gasket [3] for the access door [1].

NOTE: Do not mix Aeroshell 14 helicopter grease, D50050, and Cor-Ban 27L Compound, G50237, together.

SUBTASK 28-11-05-430-001

CAUTION

VISUALLY EXAMINE THE INTERNAL DOME SURFACES OF THE TANK ACCESS DOOR FOR CRACKS BEFORE YOU INSTALL THE MOUNTING BOLTS. MAKE SURE MOUNTING BOLTS ARE THE CORRECT LENGTH. BOLTS THAT EXCEED THREAD LENGTH CAN CAUSE DAMAGE TO THE INTERNAL DOME SURFACE OF THE DOOR.

(6) Set and hold the gasket [3] and the clamp ring [5] in the opening while you install the mounting bolt [4] for the access door [1].

SUBTASK 28-11-05-430-002

(7) Do the steps that follow to install the mounting bolt [4]:

(a) Apply a thin layer of compound, C00528, to the mounting bolt [4] shank and threads.

NOTE: Do not mix compound, C00528, and Aeroshell 14 helicopter grease, D50050, together.

(b) Tighten the mounting bolt [4] to 35 ±5 in-lb (4 ±1 N·m).

NOTE: Tighten the mounting bolt [4] as shown in (Figure 402).

SUBTASK 28-11-05-220-001

(8) Do the steps that follow to inspect the fit of the access door [1]:

(a) Make sure the gap between the clamp ring [5] and the access door [1] is within 0.030 ±0.030 in. (0.076 ±0.076 cm).

(b) Make sure the gap between the clamp ring [5] and the lower wing skin panel is within 0.030 ±0.030 in. (0.076 ±0.076 cm).

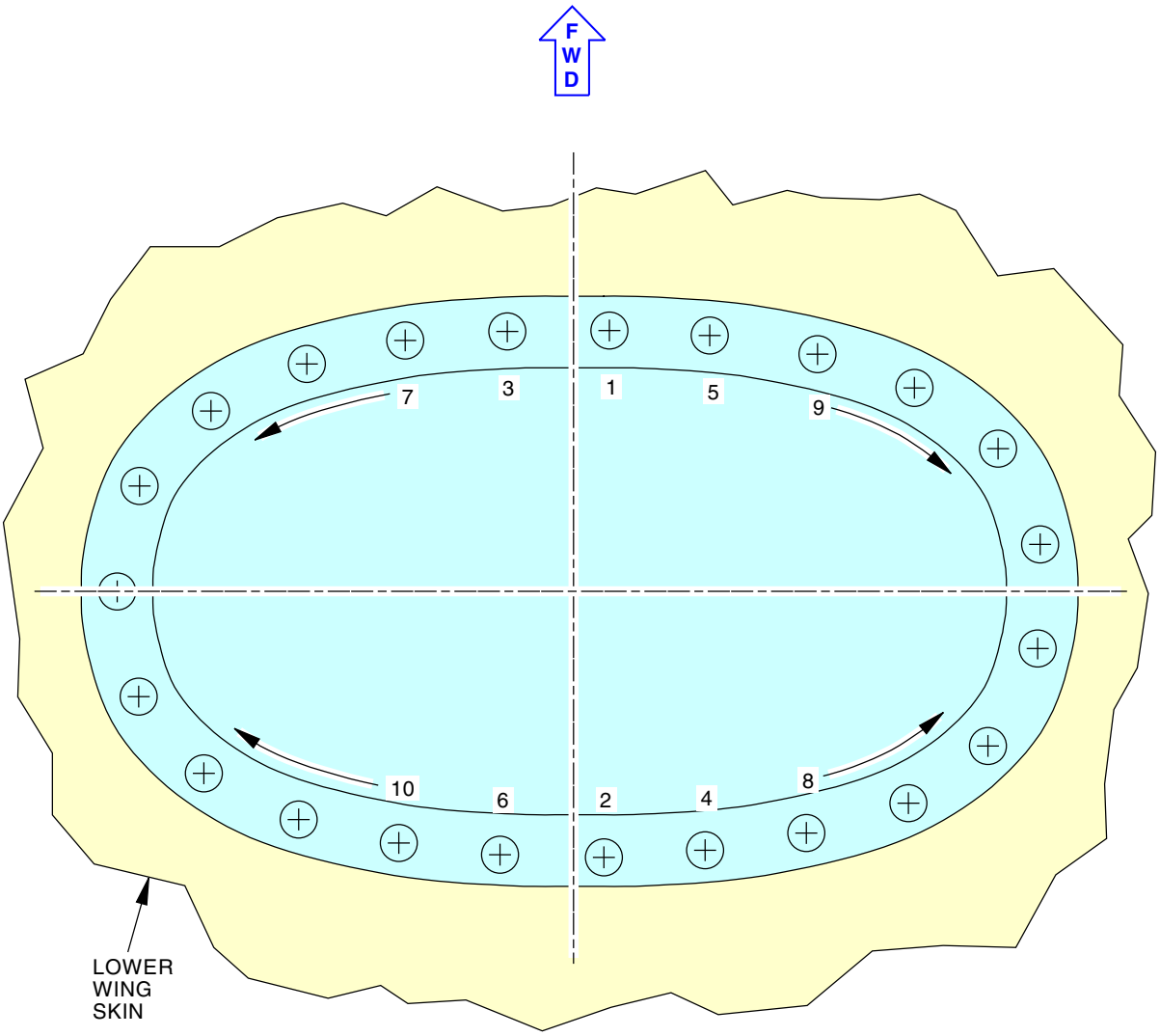
(c) Make sure the access door [1] is flush with the lower wing skin panel within 0.000 ±0.030 in. (0.000 ±0.076 cm).

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(d) Make sure the mounting bolts [4] are flush with the clamp ring [5] within 0.000 +0.002 / -0.010 in. (0.000 +0.005 / -0.025 cm)

——— END OF TASK ———

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NOTE:

TORQUE THE MOUNT BOLTS IN THE SEQUENCE SHOWN BY THE NUMBERS. THIS WILL MAKE SURE FUEL DOES NOT LEAK AROUND THE ACCESS PANEL.

L44779 S0006414897_V2

Access Panel Mount Bolt Torque Pattern
Figure 402/28-11-05-990-802

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FUEL SUMP DRAIN VALVES - REMOVAL/INSTALLATION

1. General

A. A sump drain valve is installed at the low point of each main fuel tank and surge tank. There are two sump drain valves in the center fuel tank. Removal of the fuel that remains in the fuel tanks after tank defueling is through the sump drain valves. Water and fuel contaminants are also removed through the sump drain valves.

B. This procedure contains instructions for these four tasks:

(1) Sump Drain Valve - Removal

(2) Sump Drain Valve - Installation

(3) Sump Drain Valve (Primary Poppet) - Removal

(4) Sump Drain Valve (Primary Poppet) - Installation.

C. To remove the sump drain valve you must go into the fuel tank. The secondary poppet is removed with the sump drain valve.

D. To remove the primary poppet of the sump drain valve you do not have to go into the fuel tank. Do not remove the primary poppet unless it is necessary to increase the speed of defueling for tank entry.

TASK 28-11-06-000-801

2. Sump Drain Valve - Removal

(Figure 401)

A. References

Reference	Title
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-11-03-000-801	Surge Tank Access Door - Removal (P/B 401)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-1764	Adapter - Removal/Installation, Sump Drain Valve Part #: B28001-18 Supplier: 81205
SPL-1775	Wrench - Spanner, Fuel Sump Drain Valve Part #: A28012-1 Supplier: 81205 Opt Part #: A28010-1 Supplier: 81205 Opt Part #: A28010-2 Supplier: 81205

C. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
139	Forward Keel Beam
533	Main Tank - Rib 8 to Rib 17 - Left Wing

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(Continued)

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
633	Main Tank, Rib 8 To Rib 17 - Right Wing
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

D. Access Panels

Number	Name/Location
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door
195GAL	Underwing Fairing Door
196GAR	Underwing Fairing Door
533AB	Access Door
543DB	Pressure Relief Door
633AB	Access Door
643DB	Pressure Relief Door

E. Procedure

SUBTASK 28-11-06-020-001

(1) To remove the sump drain valve in the main or surge tanks, do the steps that follow:

(a) For the sump drain valve in the main tank, remove the applicable access panels:

(TASK 28-11-01-000-801)

Number	Name/Location
533AB	Access Door
633AB	Access Door

(b) For the sump drain valve in the surge tank, remove the applicable access panels:

(TASK 28-11-03-000-801)

Number	Name/Location
543DB	Pressure Relief Door
643DB	Pressure Relief Door

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(c) For the applicable fuel or surge tank, do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

(d) Go into the applicable fuel tank and get access to the valve body [13] (TASK 28-11-00-010-801).

(e) Cut the lockwire [14] and remove it from the jam nut [15].

(f) Have one person hold the valve body [13] with the fuel sump drain valve spanner wrench, SPL-1775 (from outside of the fuel tank).

(g) Have the other person turn the jam nut [15] to remove it from the valve body [13].

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1) Push the valve body [13] out of the tank to remove it.

NOTE: Spanner wrench A28012-1 and A28012-2 are the recommended wrenches to the alternate A28010.

NOTE: Spanner wrench A28012-1 has only one wrench with a T-handle A28012-3 which is used with valves that have a 0.1250 in. (3.1750 mm) pin keyway.

NOTE: Spanner wrench set A28012-2 has two wrenches with T-handles; A28012-3 and A28012-4. A28012-4 is used with valves that have a 0.0625 in. (1.5875 mm) pin keyway. A28012-3 is used with valves that have a 0.1250 in. (3.1750 mm) pin keyway.

NOTE: Spanner wrench A28010-1 is a reversible disk for use with valves that have either a 0.0625 in. (1.5875 mm) or 0.1250 in. (3.1750 mm) pin keyway. Use a 3/8 inch (0.375 in. (9.525 mm)) square drive extension and wrench.

NOTE: Spanner wrench set A28010-2 has two wrenches with T-handles; A28010-4 and A28010-17. A28010-4 is used with valves that have a 0.0625 in. (1.5875 mm) pin keyway. A28010-17 is used with valves that have a 0.1250 in. (3.1750 mm) pin keyway.

(h) Remove the jam nut [15], shim [22] and lockwire [14] from the fuel tank.

(i) Remove the o-ring [31] from the valve body [13] and discard.

SUBTASK 28-11-06-020-008

(2) To remove the center tank sump drain valve assembly [25], do the steps that follow:

(a) Open the applicable access panels:

Number	Name/Location
195GAL	Underwing Fairing Door
196GAR	Underwing Fairing Door

(b) Disconnect the drain line [26] from the sump drain valve assembly [25].

(c) Remove the sump drain valve assembly [25].

1) Use adapter B28001-5 from adapter, SPL-1764.

NOTE: Tool B28001-18 has adapter B28001–2 and adapter B28001-5. Use adapter B28001–2 with a 5/8 inch (0.625 in. (15.875 mm)) socket and a torque wrench. Use adapter B28001-5 with an 1/2 inch (0.5 in. (12.7 mm)) square drive extension and torque wrench.

2) Discard the packing [24].

SUBTASK 28-11-06-020-007

(3) To remove the center tank flapper assembly [28], do these steps:

(a) Remove the applicable access panels:

(Center Tank Access Door - Removal, TASK 28-11-02-000-801)

Number	Name/Location
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door

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WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

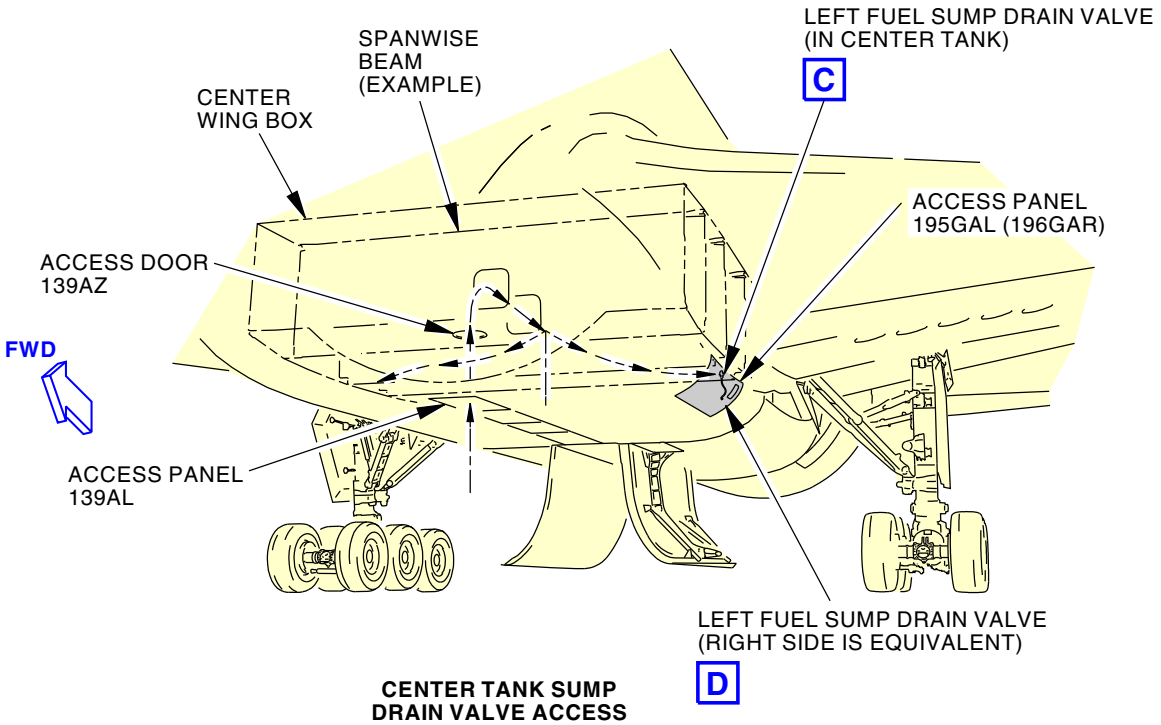
(b) For the center fuel tank, do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

(c) Remove the screw [27] to open the flange on the flapper assembly [28].

(d) Remove the flapper assembly [28].

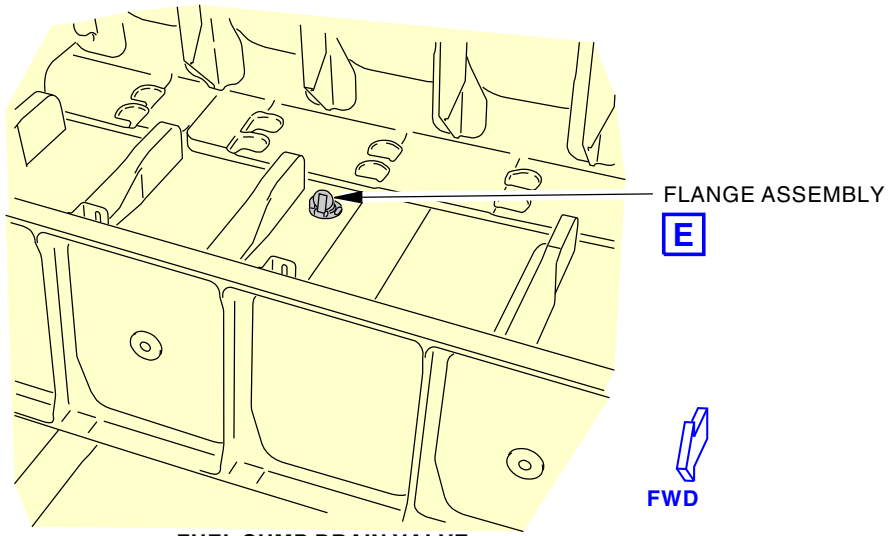
END OF TASK

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**CENTER TANK SUMP
DRAIN VALVE ACCESS**

B



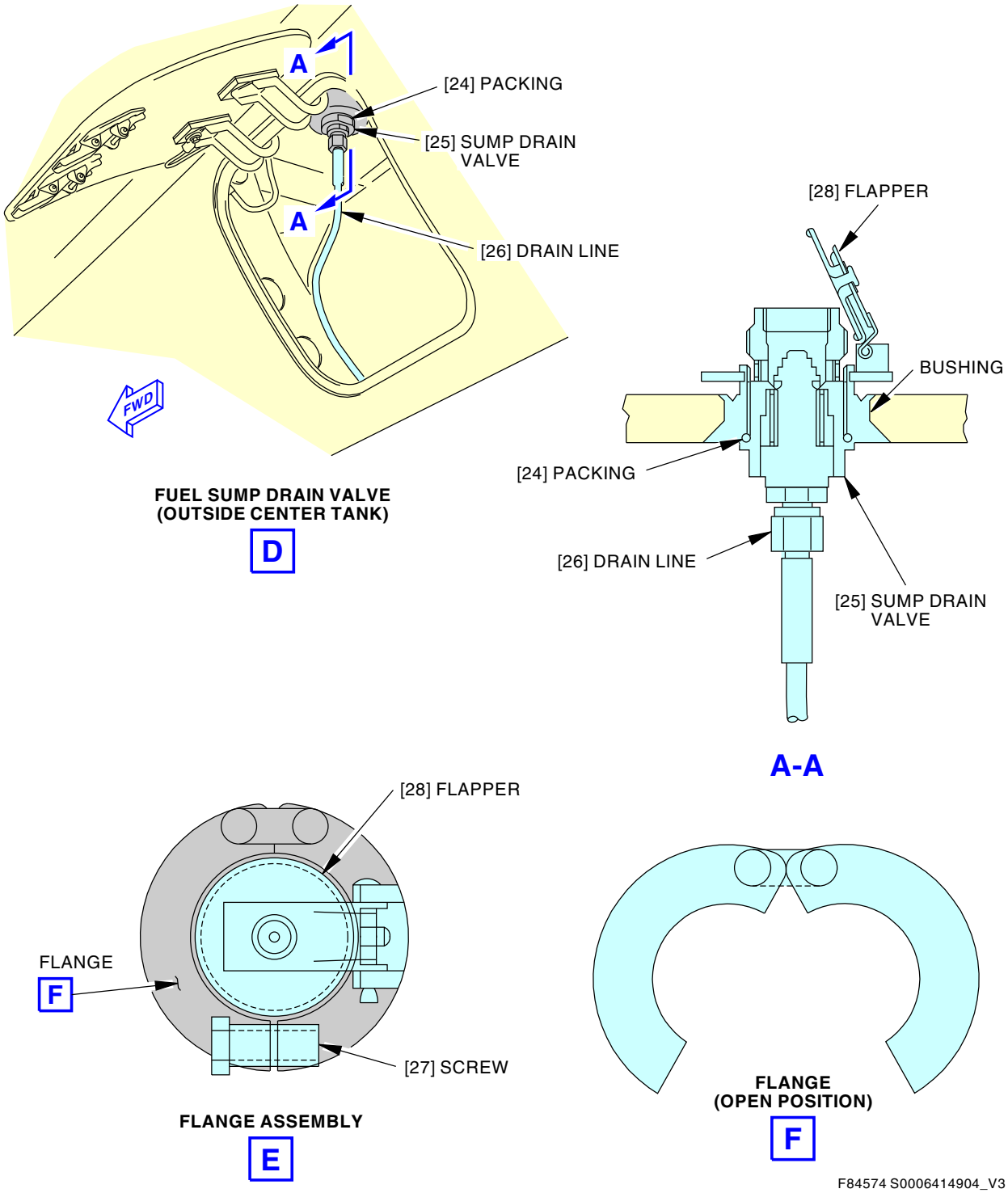
**FUEL SUMP DRAIN VALVE
(IN CENTER TANK)**

C

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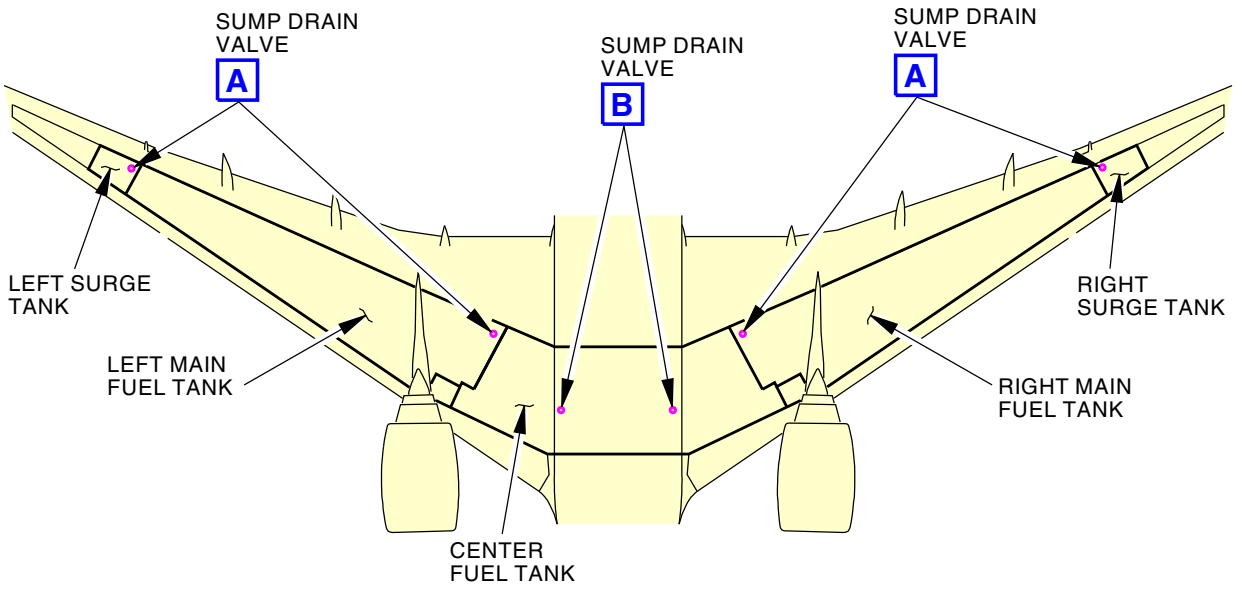
**Fuel Sump Drain Valves Installation
Figure 401/28-11-06-990-802 (Sheet 1 of 3)**

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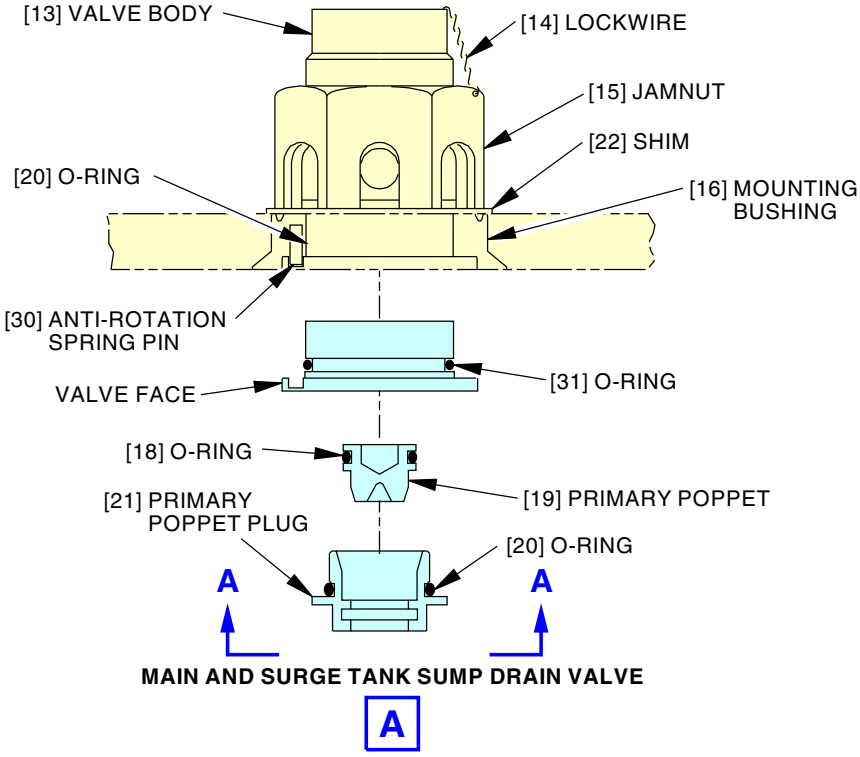


Fuel Sump Drain Valves Installation
Figure 401/28-11-06-990-802 (Sheet 2 of 3)

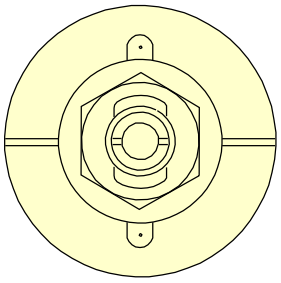
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WINGS
(BOTTOM VIEW)



MAIN AND SURGE TANK SUMP DRAIN VALVE
A



VALVE FACE ASSEMBLED
A-A

U44132 S0000195951_V2

Fuel Sump Drain Valves Installation
Figure 401/28-11-06-990-802 (Sheet 3 of 3)

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TASK 28-11-06-400-801

3. Sump Drain Valve - Installation

(Figure 401)

A. General

(1) This task installs the sump drain valve.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
12-11-02-680-801	Fuel Tank Sump Drain Valve - Water Removal/Sampling (P/B 301)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)
28-11-03-400-801	Surge Tank Access Door - Installation (P/B 401)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-1764	Adapter - Removal/Installation, Sump Drain Valve Part #: B28001-18 Supplier: 81205
SPL-1775	Wrench - Spanner, Fuel Sump Drain Valve Part #: A28012-1 Supplier: 81205 Opt Part #: A28010-1 Supplier: 81205 Opt Part #: A28010-2 Supplier: 81205

D. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236
G01912	Lockwire - MS20995NC32, Monel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
24	Packing	28-11-06-01-212	ARO ALL

F. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
139	Forward Keel Beam
533	Main Tank - Rib 8 to Rib 17 - Left Wing
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
633	Main Tank, Rib 8 To Rib 17 - Right Wing
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

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G. Access Panels

Number	Name/Location
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door
195GAL	Underwing Fairing Door
196GAR	Underwing Fairing Door
533AB	Access Door
543DB	Pressure Relief Door
633AB	Access Door
643DB	Pressure Relief Door

H. Procedure

SUBTASK 28-11-06-910-002

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-11-06-410-008

(2) To install the center tank sump drain valve assembly [25], do the steps that follow:

(a) Lubricate new packing [24] with a thin layer of petrolatum grease, D00504.

(b) Install the new packing [24] on the sump drain valve assembly [25].

(c) Install the sump drain valve assembly [25] in the bushing on the lower surface of the fuel tank.

1) Use adapter B28001-5 from adapter, SPL-1764.

NOTE: Tool B28001-18 has adapter B28001–2 and adapter B28001-5. Use adapter B28001-5 with an 1/2 inch (0.5 in. (12.70 mm)) square drive extension and a torque wrench. Use adapter B28001–2 with a 5/8 inch (0.625 in. (15.875 mm)) socket and a torque wrench.

(d) Tighten the sump drain valve assembly [25] to 200 ±10 in-lb (23 ±2 N·m).

(e) If the lower end of the drain line [26] was disconnected, connect and tighten the drain line [26] at the lower fitting to 110 ±6 in-lb (12.4 ±0.6 N·m).

(f) Connect the drain line [26] to the sump drain valve assembly [25].

(g) Tighten the drain line [26] to 140 ±7 in-lb (16 ±1 N·m) at the drain valve.

SUBTASK 28-11-06-410-004

(3) To install the center tank flapper assembly [28], do the steps that follow:

(a) Put the flapper assembly [28] in the groove of the bushing in the lower surface of the fuel tank.

1) Optional to turn the flapper assembly [28] in any direction to prevent interference with the paddle fitting.

(b) Install the screw [27] that attaches the flapper assembly [28].

(c) Tighten the screw [27] to 17 ±1 in-lb (2 ±0 N·m).

(d) Make sure the flapper swings freely through full range of travel and does not interfere with the paddle fitting or paddle fitting bolts.

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SUBTASK 28-11-06-020-004

(4) To install the sump drain valve in the main or surge tanks, do the steps that follow:

(a) Make sure the seal areas of the mounting ring and the lower wing surface that touch are clean and not damaged.

(b) Have the person outside the fuel tank install a new o-ring [31], lubricated with a thin layer of petrolatum grease, D00504, to the valve body [13].

(c) Install the valve body [13] through the mounting ring from outside the fuel tank.

1) If applicable, make sure that the spring pin is engaged in the hole in the mounting ring.

(d) Have the person out of the fuel tank hold the valve body [13] with the fuel sump drain valve spanner wrench, SPL-1775.

NOTE: Spanner wrench A28012-1 and A28012-2 are the recommended wrenches to alternate A28010.

NOTE: Spanner wrench A28012-1 has only one wrench with a T-handle A28012-3 which is used with valves that have a 0.1250 in. (3.1750 mm) pin keyway.

NOTE: Spanner wrench set A28012-2 has two wrenches with T-handles; A28012-3 and A28012-4. A28012-4 is used with valves that have a 0.0625 in. (1.5875 mm) pin keyway. A28012-3 is used with valves that have a 0.1250 in. (3.1750 mm) pin keyway.

NOTE: Spanner wrench A28010-1 is a reversible disk for use with valves that have either a 0.0625 in. (1.5875 mm) or 0.1250 in. (3.1750 mm) pin keyway. Use with a 3/8 inch (0.375 in. (9.525 mm)) square drive extension and wrench.

NOTE: Spanner wrench set A28010-2 has two wrenches with T-handles; A28010-4 and A28010-17. A28010-4 is used with valves that have a 0.0625 in. (1.5875 mm) pin keyway. A28010-17 is used with valves that have a 0.1250 in. (3.1750 mm) pin keyway.

(e) One person must go into the applicable fuel tank and get access to the valve body [13].

(f) Install the shim [22] and jam nut [15] to the valve body [13].

(g) Tighten the jam nut [15] to 180 ±12 in-lb (20 ±2 N·m).

(h) Install a lockwire [14] between thejam nut [15] and the valve body [13]; use MS20995NC32 lockwire, G01912.

SUBTASK 28-11-06-410-005

(5) For the sump drain valve in the center tank, install the applicable access panels:

(TASK 28-11-02-400-801)

Number	Name/Location
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door

SUBTASK 28-11-06-410-002

(6) For the sump drain valve in the main tank, install the applicable access panels:

(TASK 28-11-01-400-801)

Number	Name/Location
533AB	Access Door
633AB	Access Door

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SUBTASK 28-11-06-410-003

(7) For the sump drain valve in the surge tank, install the applicable access panels:

(TASK 28-11-03-400-801)

Number	Name/Location
543DB	Pressure Relief Door
643DB	Pressure Relief Door

SUBTASK 28-11-06-630-001

(8) To refuel the applicable fuel tank, do this task: Pressure Refueling, TASK 12-11-01-650-801.

SUBTASK 28-11-06-210-001

(9) Make sure fuel does not leak at the applicable sump drain valve or fuel tank access door.

SUBTASK 28-11-06-600-001

(10) Drain a small quantity of fuel from the applicable fuel tank to do a check on the sump drain valve.

(a) To do the check, do this task: Fuel Tank Sump Drain Valve - Water Removal/Sampling, TASK 12-11-02-680-801.

(b) If the drain valve does not operate correctly, replace the drain valve.

SUBTASK 28-11-06-410-006

(11) Close the applicable access panels:

Number	Name/Location
195GAL	Underwing Fairing Door
196GAR	Underwing Fairing Door

——— END OF TASK ———

TASK 28-11-06-000-802

4. Sump Drain Valve (Primary Poppet) - Removal

(Figure 401)

A. General

(1) The primary poppet can be removed from out of the fuel tank when the fuel tank contains fuel. The secondary poppet prevents fuel leakage from the fuel tank when the primary poppet is removed.

B. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
633	Main Tank, Rib 8 To Rib 17 - Right Wing
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

C. Procedure

SUBTASK 28-11-06-020-006

(1) Remove the primary poppet plug [21] and primary poppet [19] from the valve body [13] for the main and surge tanks.

(a) Use a 5/8 inch (0.625 in. (15.875 mm)), 12 point socket and wrench.

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(b) Remove the o-ring [18] and o-ring [20] from the primary poppet plug [21] and primary poppet [19].

(c) Discard the o-ring [18] and the o-ring [20].

——— END OF TASK ———

TASK 28-11-06-400-802

5. Sump Drain Valve (Primary Poppet) - Installation

(Figure 401)

A. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
18	O-ring	28-11-06-01A-120	ARO ALL
20	O-ring	28-11-06-01A-125	ARO ALL

C. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
633	Main Tank, Rib 8 To Rib 17 - Right Wing
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

D. Procedure

SUBTASK 28-11-06-420-004

(1) For the sump drain valve in the main or surge tank, do the steps that follow:

(a) Install the new o-ring [18] and o-ring [20] on the primary poppet [19] and primary poppet plug [21], lubricated with a thin layer of petrolatum grease, D00504.

(b) Install the primary poppet [19] and primary poppet plug [21] into the valve body [13].

(c) Use a 5/8 inch (0.625 in. (15.875 mm)), 12 point socket and wrench.

(d) Tighten the primary poppet plug [21] to between 108 ±12 in-lb (12 ±2 N·m).

——— END OF TASK ———

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WING FUEL TANK ACCESS DOORS - REPAIRS

1. General

A. This procedure has one task. This task replaces the rubber door seal for each of the fuel tank access doors.

B. The rubber door seal is the same for all of the access doors.

TASK 28-11-07-900-801

2. Rubber Door Seal - Replacement

(Figure 801)

A. General

(1) The rubber door seal must be in its position before you install the access door.

(2) The phenolic strip must be installed on the access door (if applicable) before you install the access door.

(3) For applying sealants in the fuel tank structure(s), it is acceptable to use sealant, A50303, as an alternative to sealant, A00767, for Class A and B non-faying seal applications:

(a) sealant, A50153, and sealant, A50301, are mutually interchangeable.

(b) sealant, A50110, and sealant, A50302, are mutually interchangeable.

(c) sealant, A50153, cannot be used in combination with sealant, A50302, and sealant, A50301, cannot be used with sealant, A50110.

B. References

Reference	Title
28-11-00-300-802	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)
28-11-03-000-801	Surge Tank Access Door - Removal (P/B 401)
28-11-03-400-801	Surge Tank Access Door - Installation (P/B 401)
28-11-05-000-801	Wing Dry Bay Access Door - Removal (P/B 401)
28-11-05-400-801	Wing Dry Bay Access Door Installation (P/B 401)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

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Reference	Description
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: $0855 Part #: 234350 Supplier: $0857 Part #: 311 Supplier: F6892 Part #: 411B60 Supplier: 3DN12 Part #: 411B90 Supplier: 3DN12 Part #: DAD5013 Supplier: $0856 Part #: DFD5019 Supplier: $0856 Part #: J5-0275-2010 Supplier: 435R8 Part #: SCD5019 Supplier: $0856 Part #: ST982LF-9 Supplier: 62176 Part #: TS1275-4 Supplier: 1DWR5
STD-124	Brush - Stiff Bristle, Non-Metallic
STD-197	Container - Plastic, Polyethylene or Polypropylene

D. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
A50052	Sealant - PR-1826 Class B Rapid Curing Fuel Tank Sealant	SAE AMS3277 Class B
A50084	Sealant - P/S 860 Class B-1/6 Quick Repair Fuel Tank Sealant	AMS-S-83318 Class B
A50110	Sealant	BMS5-45 Class B-2
A50153	Sealant - Fuel Tank - Class A-2	BMS5-45 Class A-2
A50301	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168 Type I Class A-2
A50302	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168 Type I Class B-2
A50303	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168
B00068	Alcohol - Denatured, Ethyl (Ethanol)	AMS 3002, MIL-E-51454 Type II
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A
G00624	Bag - Plastic, General Purpose	
G50078	Abrasive - Aluminum Oxide Paper, 320 grit or finer	

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Seal	28-11-01-01A-030	ARO ALL
		28-11-01-01A-085	ARO ALL
		28-11-01-01A-155	ARO ALL
		28-11-01-01A-220	ARO ALL
		28-11-01-01A-300	ARO ALL
		28-11-01-01A-380	ARO ALL
		28-11-02-05A-045	ARO ALL
		28-11-03-01A-030	ARO ALL

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(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
1 (cont.)		28-11-03-01A-185	ARO ALL
		28-11-03-01A-230	ARO ALL
		28-11-05-01A-040	ARO ALL

F. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
532	Left Wing Dry Bay
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
632	Right Wing Dry Bay
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074

G. Procedure

SUBTASK 28-11-07-020-002

(1) To remove the applicable access door, do the applicable removal procedure:

(a) Do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) Do this task: Center Tank Access Door - Removal, TASK 28-11-02-000-801.

(c) Do this task: Surge Tank Access Door - Removal, TASK 28-11-03-000-801.

(d) Do this task: Wing Dry Bay Access Door - Removal, TASK 28-11-05-000-801.

SUBTASK 28-11-07-020-001

(2) Remove the seal [1] from the access door fully.

SUBTASK 28-11-07-140-001

CAUTION

DO NOT CAUSE DAMAGE TO THE FINISH WHEN YOU REMOVE THE SEALANT. TOO MUCH FORCE CAN REMOVE THE PAINT OR PRIMER.

(3) Remove the remaining sealant, with a sealant removal tool, COM-2481, from the seal groove in the access door.

NOTE: The finish in the door groove is Alodine 1200 with a topcoat of BMS10-79, Type III primer.

SUBTASK 28-11-07-120-001

(4) Clean the new seal [1] carefully before you install it.

(a) Wear rubber gloves when you clean the seal.

(b) Abrade the bottom surface of the seal with 320 grit or finer abrasive paper, G50078, to remove the parting agent.

(c) Remove the unwanted material from the seal with a clean cotton wiper, G00034, moist with denatured alcohol, B00068.

(d) Do not handle the cleaned seal with bare hands; continue to wear gloves.

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(e) Store the cleaned seal in a clean plastic bag, G00624, or a clean, sealed plastic container, STD-197, to protect the cleaned seal from contamination.

(f) Install the cleaned seal within one hour.

SUBTASK 28-11-07-390-001

WARNING

DO NOT GET THE DENATURED ALCOHOL IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THE DENATURED ALCOHOL. PUT ON A PROTECTIVE SPLASH GOGGLE AND GLOVES WHEN YOU USE THE DENATURED ALCOHOL. KEEP THE DENATURED ALCOHOL AWAY FROM THE SPARKS, FLAME AND HEAT. THE DENATURED ALCOHOL IS A POISONOUS AND FLAMMABLE SOLVENT WHICH CAN CAUSE INJURY OR DAMAGE.

(5) Prepare the seal groove.

(a) Wear rubber gloves when you clean the groove.

(b) Wipe the surface of the door groove with a clean, dry cotton wiper, G00034, to remove any waxes, dirt, grease, oil or unwanted material.

(c) Clean the seal groove with clean cotton wiper, G00034, and denatured alcohol, B00068.

1) Continue to clean the groove with a new cotton wiper, G00034, and alcohol until the cotton wiper, G00034, shows no contamination.

2) Let the alcohol evaporate.

(d) Protect the cleaned groove from further contamination and install the new seal within one hour.

1) Clean the groove again if the new seal is not installed in one hour.

SUBTASK 28-11-07-420-001

(6) Install the seal [1] in the access door groove.

(a) Apply the sealant, A00767 (or equivalent), Class A-2, Grade 1 to the full width of the seal groove with a stiff, non-metallic bristle stiff bristle non-metallic brush, STD-124 (TASK 28-11-00-300-802).

NOTE: You may use sealant, A50301, P/S 860 B-1/6 sealant, A50084, or PR-1826 sealant, A50052 as an alternative to sealant, A00767.

(b) Immediately install the new seal in the door groove and make sure it is firmly seated against the seal groove.

(c) Clean the squeezed out sealant with a clean, cotton wiper, G00034, and denatured alcohol.

(d) Apply even, adequate clamping pressure to make sure the rubber fuel seal is completely seated in seal groove.

(e) Maintain clamping pressure for minimum of 2 hours at room temperature or 1 hour at 120°F (49°C).

(f) Do not stress the bond line until sealant is fully cured.

NOTE: Depending on the sealant used, sealant is fully cured between XX hrs – 72 hours minimum at 75 ±5°F (24 ±3°C) and 45-55 percent relative humidity. Refer to sealant specification for cure time.

SUBTASK 28-11-07-420-003

(7) To install the applicable access door, do the applicable installation procedure:

(a) Do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

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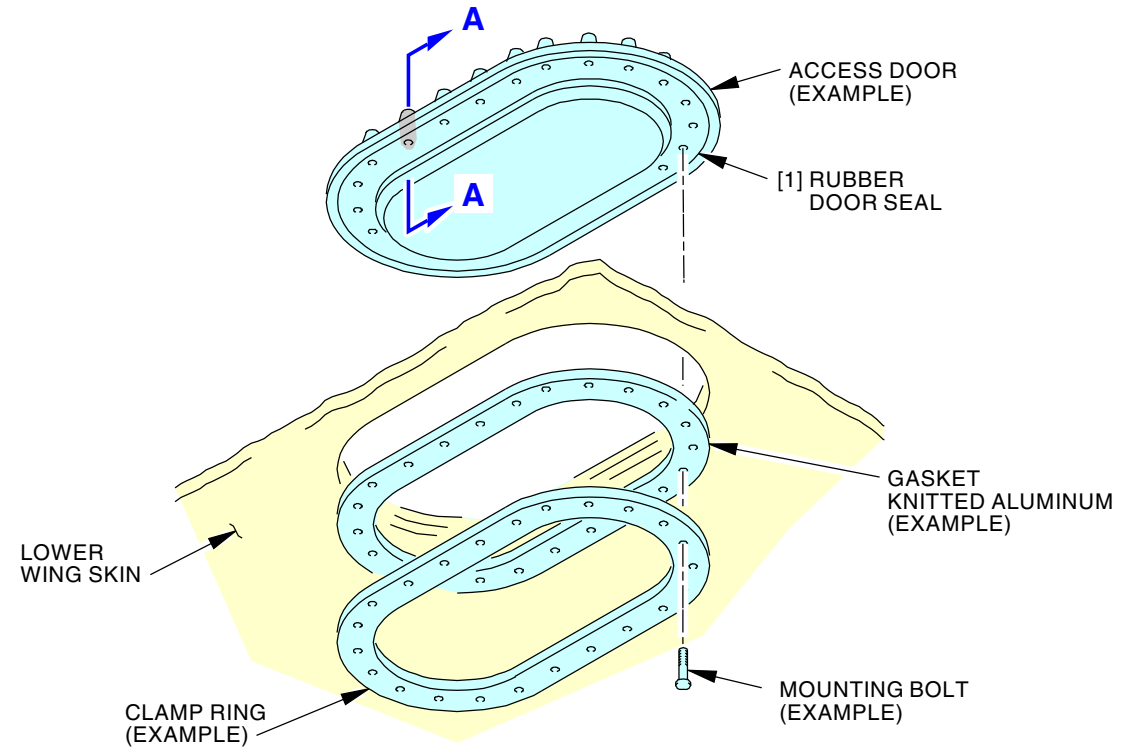
(b) Do this task: Center Tank Access Door - Installation, TASK 28-11-02-400-801.

(c) Do this task: Surge Tank Access Door - Installation, TASK 28-11-03-400-801.

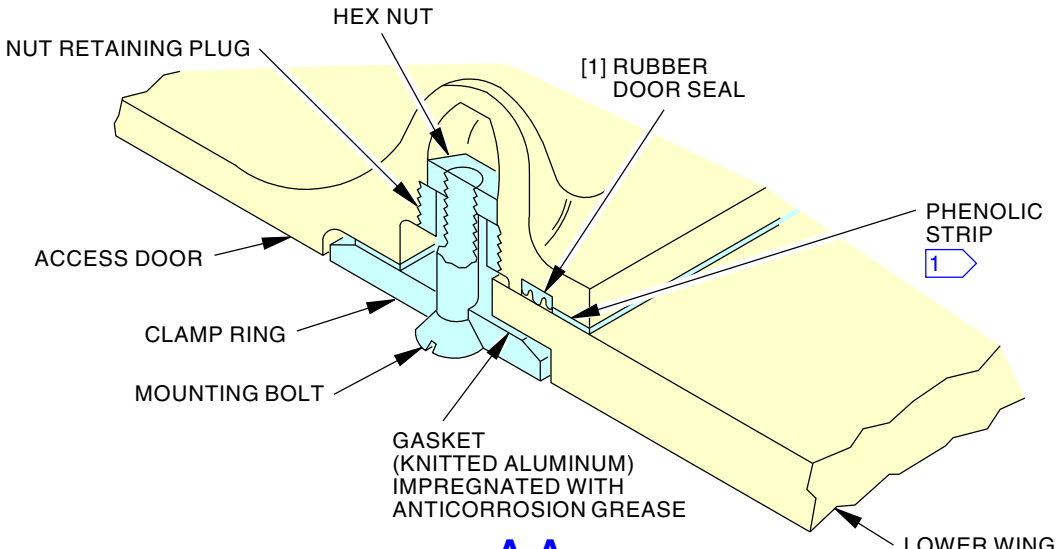
(d) Do this task: Wing Dry Bay Access Door Installation, TASK 28-11-05-400-801.

——— END OF TASK ———

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**FUEL TANK ACCESS PANEL
(EXAMPLE)**



1 NOT INSTALLED ON ALL HIGH IMPACT RESISTANT ACCESS DOOR

1852279 S0000331408_V3

**Fuel Tank Access Door Repair
Figure 801/28-11-07-990-801**

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FUEL VENT FLOAT VALVE - REMOVAL/INSTALLATION

1. General

A. There are two float valves in the fuel vent system. The float valves are installed horizontally under the vent port of the vent channel in each main tank.

B. The float valves are installed inboard of each main fuel tank end rib 37 (Figure 401).

C. This procedure contains two tasks. The first task removes the float valve. The second task installs the float valve.

TASK 28-13-01-000-801

2. Fuel Vent Float Valve - Removal

(Figure 401)

A. References

Reference	Title
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-26-00-650-803	Suction Defueling (P/B 201)

B. Location Zones

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

C. Access Panels

Number	Name/Location
543CB	Access Door
643CB	Access Door

D. Procedure

SUBTASK 28-13-01-650-001

(1) To defuel the applicable main fuel tank, do one of these tasks:

(a) Pressure Defueling, TASK 28-26-00-650-801

(b) Suction Defueling, TASK 28-26-00-650-803

SUBTASK 28-13-01-010-001

(2) For the float valve in the left main fuel tank, remove the access door that follows: To remove the access door, do this task Main Tank Access Door Removal, TASK 28-11-01-000-801.

Remove the access door:

Number	Name/Location
543CB	Access Door

SUBTASK 28-13-01-010-002

(3) For the float valve in the right main fuel tank, remove the access door that follows: To remove the access door, do this task Main Tank Access Door Removal, TASK 28-11-01-000-801.

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Remove the access door:

Number	Name/Location
643CB	Access Door

SUBTASK 28-13-01-910-001

WARNING OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. FAILURE TO OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS CAN CAUSE INJURY OR DAMAGE.

(4) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-13-01-030-001

(5) Remove the bolt [2], washer [3], washer [4], and nut [5] from the float valve [1].

SUBTASK 28-13-01-020-001

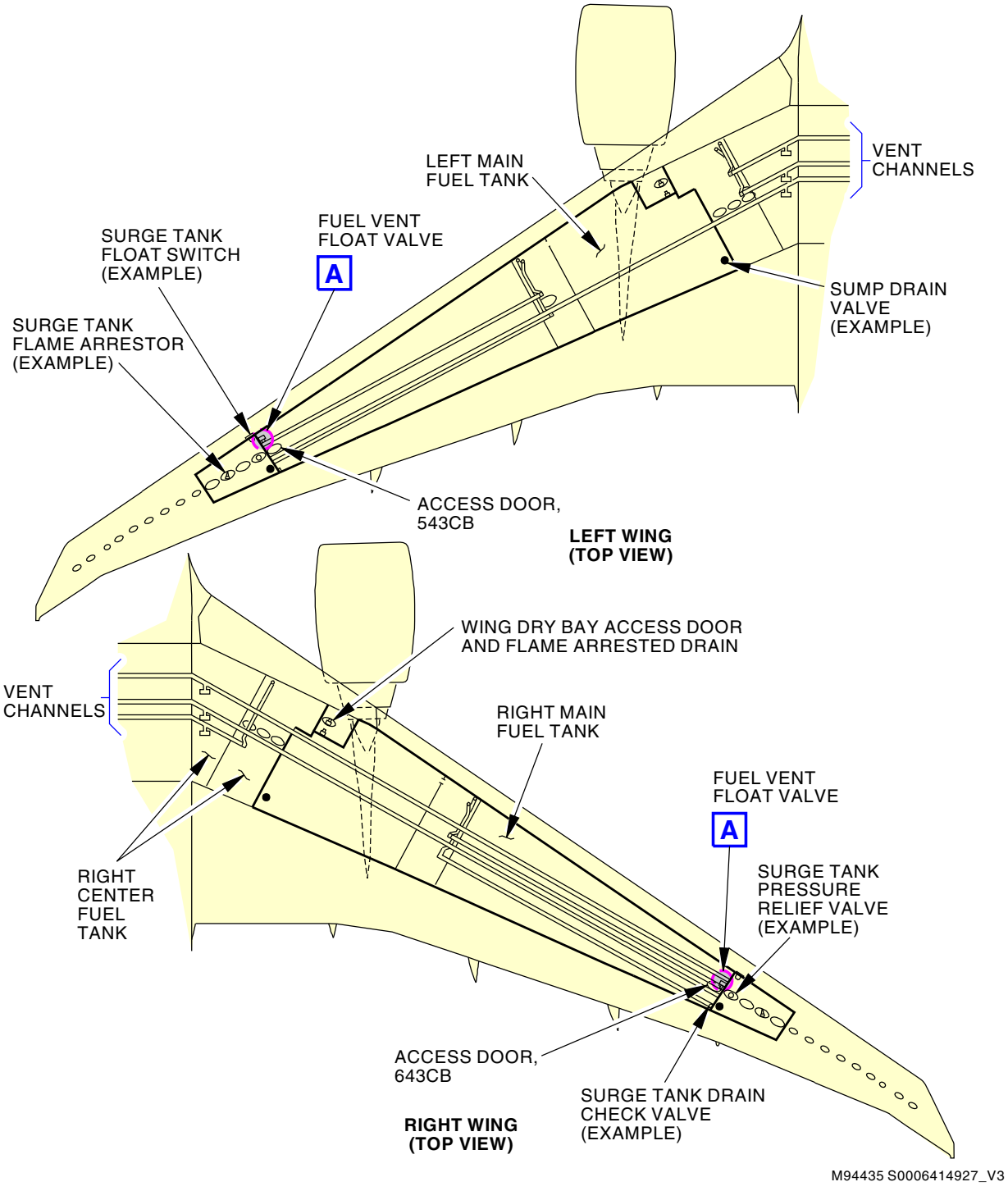
(6) Remove the float valve [1].

SUBTASK 28-13-01-020-002

(7) Remove the o-ring [6] and discard.

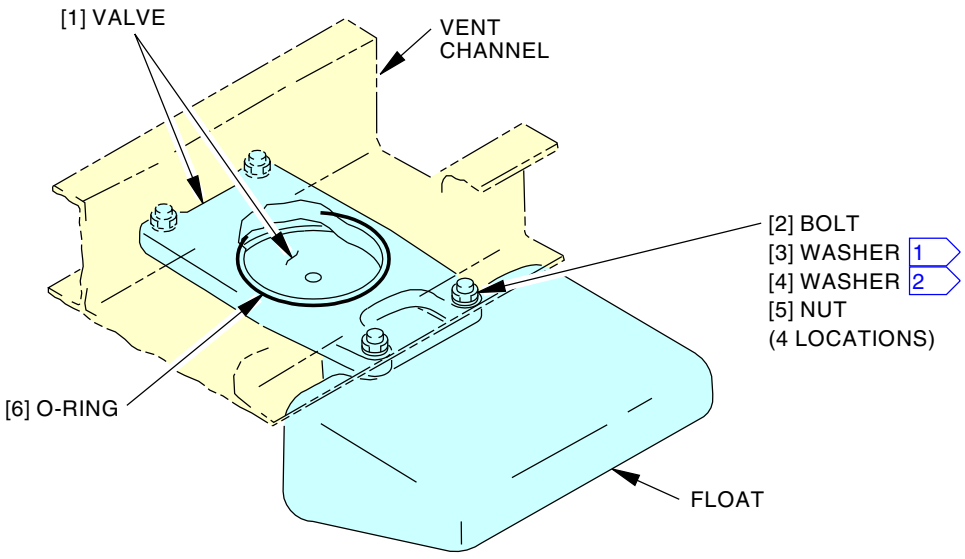
——— END OF TASK ———

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Fuel Vent Float Valve Installation
Figure 401/28-13-01-990-804 (Sheet 1 of 2)

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FUEL VENT FLOAT VALVE

A

1 INSTALL UNDER BOLT HEAD
2 INSTALL UNDER NUT

C56054 S0006414928_V2

Fuel Vent Float Valve Installation
Figure 401/28-13-01-990-804 (Sheet 2 of 2)

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TASK 28-13-01-400-801

3. Fuel Vent Float Valve - Installation

(Figure 401)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-00-790-801	Fuel Leak Detection Procedures (P/B 601)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Float valve	28-13-01-01A-040	ARO ALL
6	O-ring	28-13-01-01A-035	ARO ALL

E. Location Zones

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

F. Access Panels

Number	Name/Location
543CB	Access Door
643CB	Access Door

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G. Procedure

SUBTASK 28-13-01-910-002

WARNING OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. FAILURE TO OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS CAN CAUSE INJURY OR DAMAGE.

(1) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-13-01-430-001

(2) Install a new o-ring [6], lubricated with a thin layer of petrolatum grease, D00504.

SUBTASK 28-13-01-420-001

(3) Put and hold the float valve [1] in its position.

SUBTASK 28-13-01-420-002

(4) Install the bolt [2], washer [3], washer [4], and nut [5] on the float valve [1].

SUBTASK 28-13-01-210-001

(5) Make sure the float of the float valve [1] can move freely between the open and closed positions.

SUBTASK 28-13-01-210-002

(6) Measure the bonding resistance between the mounting flange on the float valve [1] and the vent channel with a bonding intrinsically safe approved bonding meter, COM-1550.

(a) Make sure that the bonding resistance between the mounting flange on the float valve [1] and the vent channel is not more than 0.100 ohm.

SUBTASK 28-13-01-410-001

(7) Install the access door on the left main tank. If it is removed, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

Install the access door:

Number	Name/Location
543CB	Access Door

SUBTASK 28-13-01-410-002

(8) Install the access door on the right main tank. If it is removed, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

Install the access door:

Number	Name/Location
643CB	Access Door

SUBTASK 28-13-01-650-002

(9) To refuel the fuel tanks, do this task: Pressure Refueling, TASK 12-11-01-650-801.

SUBTASK 28-13-01-210-003

(10) Make sure there are no fuel leaks at the applicable access door (TASK 28-11-00-790-801).

END OF TASK

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FUEL VENT FLOAT VALVE - ADJUSTMENT/TEST

1. General

A. This procedure contains scheduled maintenance task data.

B. There are two float valves in the fuel vent system. The float valves are installed horizontally under the vent port of the vent channel in each main tank.

C. The float valves are installed inboard of each main fuel tank end rib 37.

TASK 28-13-01-710-801

2. Fuel Vent Float Valve - Operational Test

(Figure 501)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-00-790-801	Fuel Leak Detection Procedures (P/B 601)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-26-00-650-803	Suction Defueling (P/B 201)

B. Location Zones

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

C. Access Panels

Number	Name/Location
543CB	Access Door
643CB	Access Door

D. Procedure

SUBTASK 28-13-01-650-003

(1) To defuel the left or right main fuel tank, do one of these tasks:

(a) Pressure Defueling, TASK 28-26-00-650-801

(b) Suction Defueling, TASK 28-26-00-650-803

SUBTASK 28-13-01-010-003

(2) To get access to the float valve in the left main fuel tank, remove the access door. To remove the access door, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

Remove the access door:

Number	Name/Location
543CB	Access Door

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SUBTASK 28-13-01-010-004

(3) To get access to the float valve in the right main fuel tank, remove the access door. To remove the access door, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801

Remove the access door:

Number	Name/Location
643CB	Access Door

SUBTASK 28-13-01-910-003

WARNING OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. FAILURE TO OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS CAN CAUSE INJURY OR DAMAGE.

(4) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-13-01-030-002

(5) To make sure the float valve is free to operate, move the float valve from the open position to the closed position.

SUBTASK 28-13-01-860-001

(6) Let the float go to the open position.

SUBTASK 28-13-01-860-002

(7) Make sure the float valve seal is not damaged and the vent opening is not blocked.

SUBTASK 28-13-01-410-003

(8) Install the access door on the left main tank. Do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801

Install the access door:

Number	Name/Location
543CB	Access Door

SUBTASK 28-13-01-410-004

(9) Install the access door on the right main tank. Do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801

Install the access door:

Number	Name/Location
643CB	Access Door

SUBTASK 28-13-01-650-004

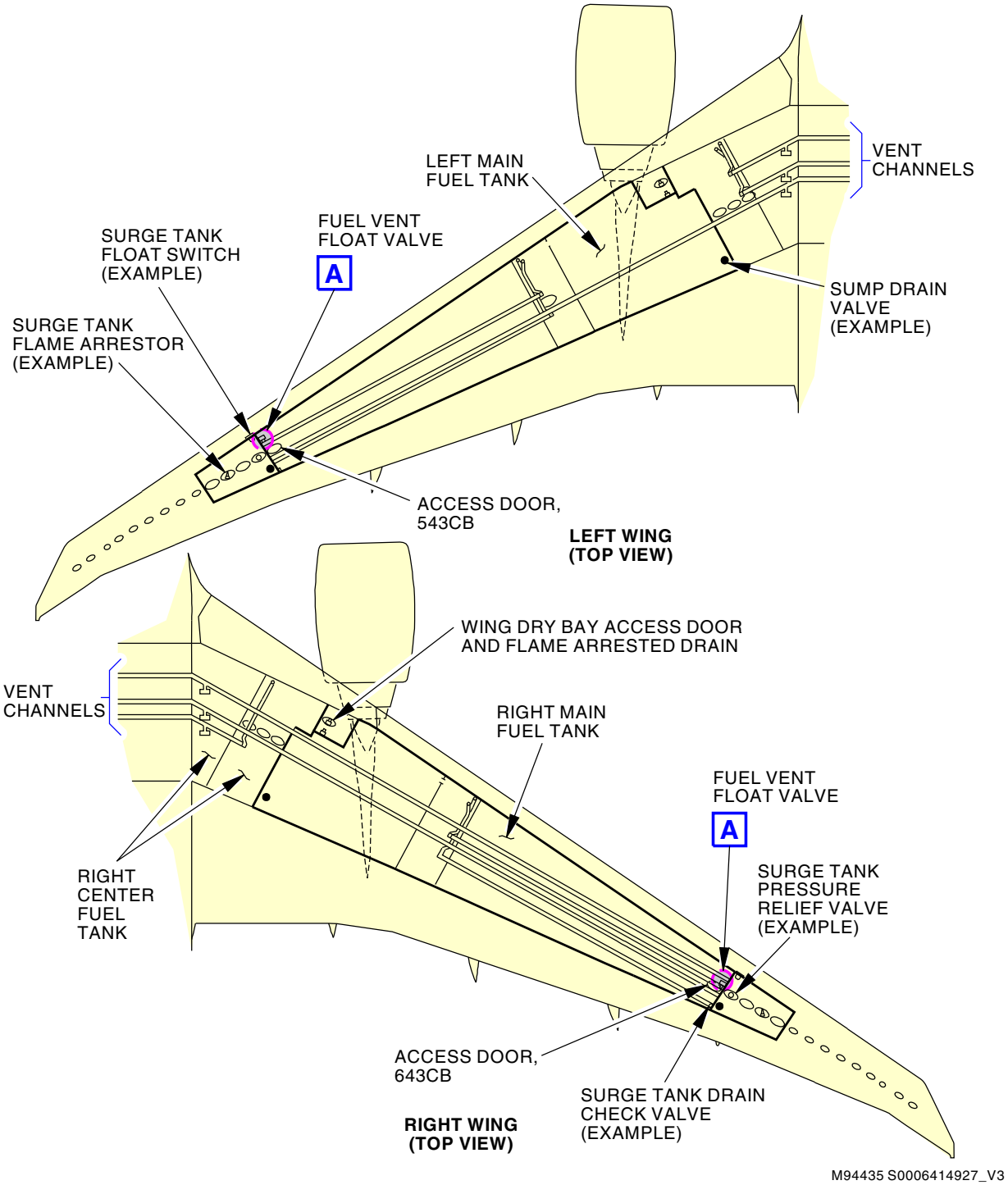
(10) To refuel the fuel tanks, do this task: Pressure Refueling, TASK 12-11-01-650-801.

SUBTASK 28-13-01-210-004

(11) Make sure there are no fuel leaks at the applicable access door (TASK 28-11-00-790-801).

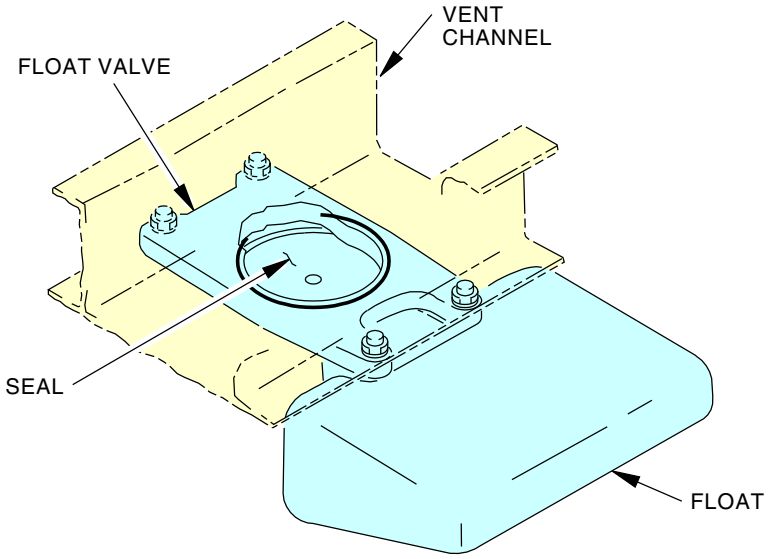
END OF TASK

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Fuel Vent Float Valve
Figure 501/28-13-01-990-803 (Sheet 1 of 2)

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FUEL VENT FLOAT VALVE

A

E68651 S0006414936_V2

Fuel Vent Float Valve
Figure 501/28-13-01-990-803 (Sheet 2 of 2)

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FUEL VENT FLOAT ACTUATED DRAIN VALVE - REMOVAL/INSTALLATION

1. General

A. This procedure contains two tasks:

(1) Float Valve Removal, TASK 28-13-02-000-803

(2) Float Valve Installation, TASK 28-13-02-400-803

B. The float valve is located in the center wing tank, between rib 1 and rib 2 in the vent stringer No. 15.

TASK 28-13-02-000-803

2. Float Valve Removal

(Figure 401)

A. References

Reference	Title
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-300-802	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: $0855 Part #: 234350 Supplier: $0857 Part #: 311 Supplier: F6892 Part #: 411B60 Supplier: 3DN12 Part #: 411B90 Supplier: 3DN12 Part #: DAD5013 Supplier: $0856 Part #: DFD5019 Supplier: $0856 Part #: J5-0275-2010 Supplier: 435R8 Part #: SCD5019 Supplier: $0856 Part #: ST982LF-9 Supplier: 62176 Part #: TS1275-4 Supplier: 1DWR5
SPL-768	Sealant Removal Tool, Hardwood or Plastic Part #: ST982 Supplier: 81205
STD-7423	Cover - Protective Tube

C. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing

D. Access Panels

Number	Name/Location
531AB	Access Door

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E. Prepare for the Removal

SUBTASK 28-13-02-650-004

(1) Defuel or transfer fuel from the center tank (TASK 28-26-00-650-801 or TASK 28-26-00-650-802).

SUBTASK 28-13-02-100-004

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

SUBTASK 28-13-02-010-007

WARNING DO ALL THE SAFETY PROCEDURES TO DEFUEL THE TANK AND TO GO INTO IT. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR IF YOU DO NOT FOLLOW THE SAFETY PROCEDURES.

WARNING DO NOT BREATHE THE AIR FROM THE FUEL TANK UNTIL YOU MAKE IT SAFE. THE NITROGEN GENERATION SYSTEM DECREASES THE OXYGEN IN THE AIR. IF YOU BREATHE AIR THAT DOES NOT HAVE SUFFICIENT OXYGEN, DANGEROUS HEALTH CONDITIONS CAN QUICKLY OCCUR. DANGEROUS HEALTH CONDITIONS INCLUDE NAUSEA, UNCONSCIOUSNESS, AND CONVULSIONS. IF THE OXYGEN LEVEL OF THE AIR THAT YOU BREATHE IS VERY LOW, IT CAN KILL YOU.

(3) To get access to the center tank, do this task: Center Tank Access Door - Removal, TASK 28-11-02-000-801.

(a) Open this access panel:

Number	Name/Location
531AB	Access Door

NOTE: The float valve [1] is on the left vent stringer [4] (vent stringer No. 15) of the center wing tank, between body rib No. 1 and No. 2.

F. Remove the Float Valve

SUBTASK 28-13-02-100-005

(1) Use the sealant removal tool, SPL-768 (sealant removal tool, COM-2481, or equivalent), to remove the old sealant from around the float valve [1].

NOTE: Do not remove the sealant from around the cover plate. Do not remove the cover plate or the adapter [7].

NOTE: The sealant removal/application tools are shown in this task: Repair of Sealant Leaks in the Fuel Tank Structure, TASK 28-11-00-300-802.

SUBTASK 28-13-02-020-004

(2) Do these steps to remove the float valve [1]:

(a) Hold the float valve [1] in its position.

(b) Remove the four nuts [3] and washers [2] from the bolts [5].

(c) Remove the float valve [1] from the adapter [7] and the cover plate.

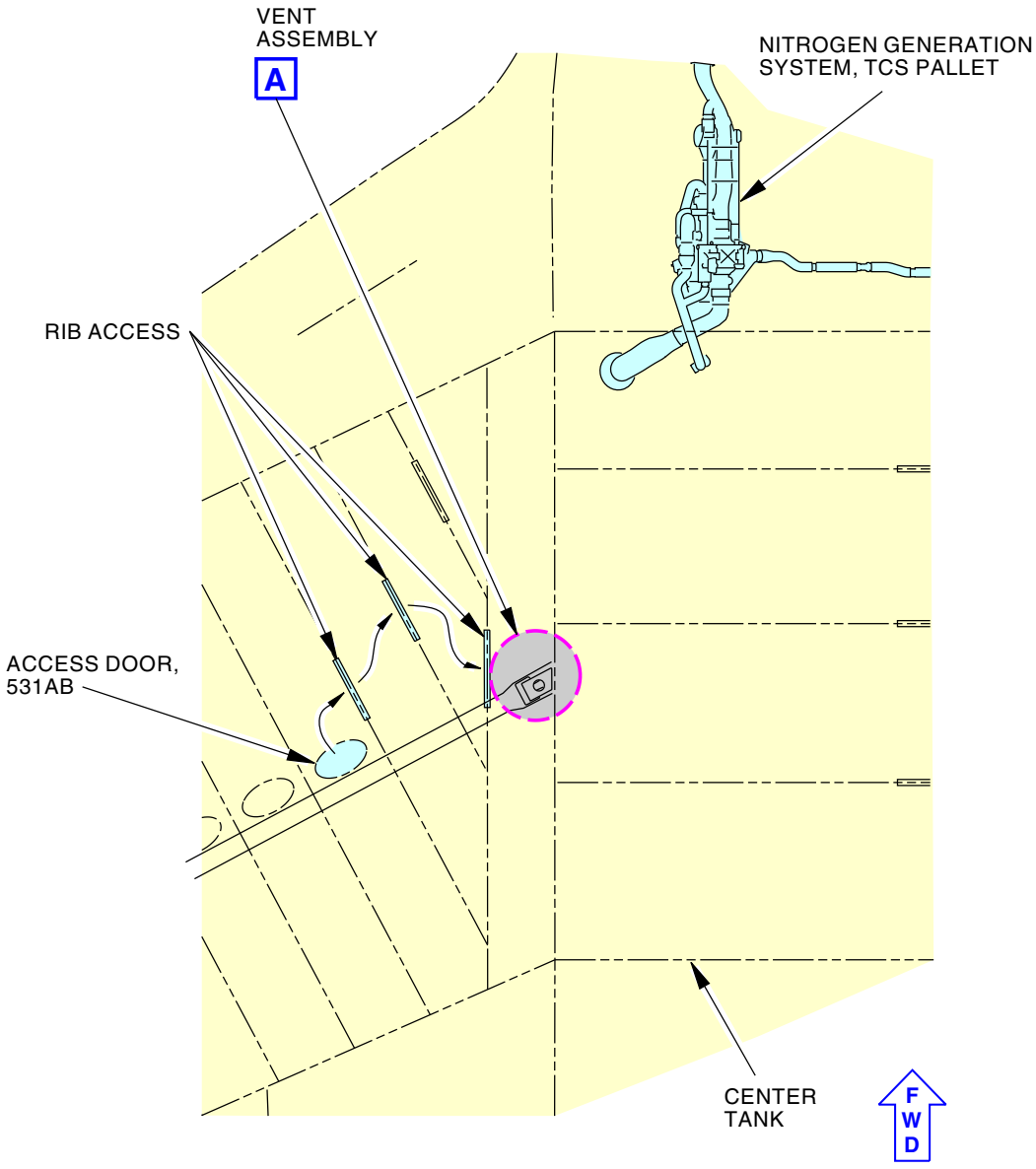
(d) Discard the used o-ring [6].

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(e) Install a protective cover, STD-7423, in the vent stringer [4] (vent stringer No. 15).

——— END OF TASK ———

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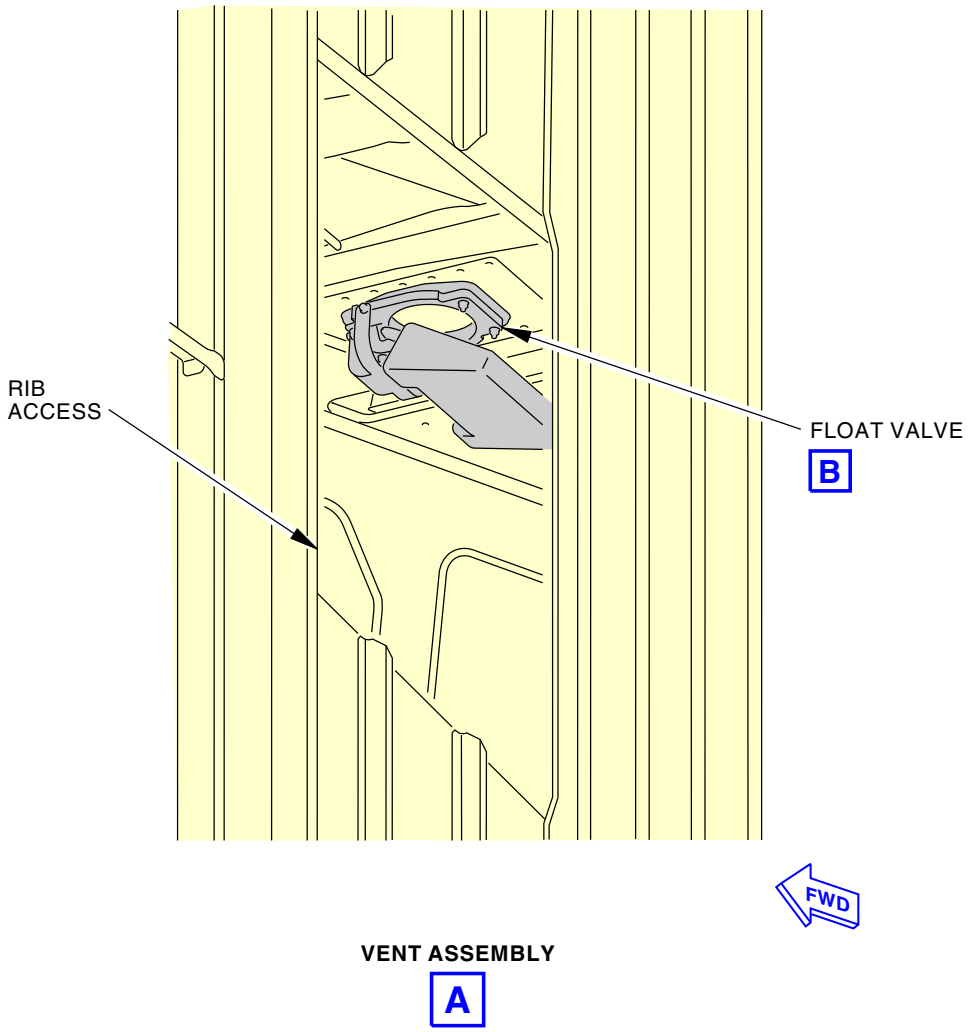


LEFT WING
(TOP VIEW)

1663507 S0000302915_V2

Float Valve - Removal and Installation
Figure 401/28-13-02-990-804 (Sheet 1 of 3)

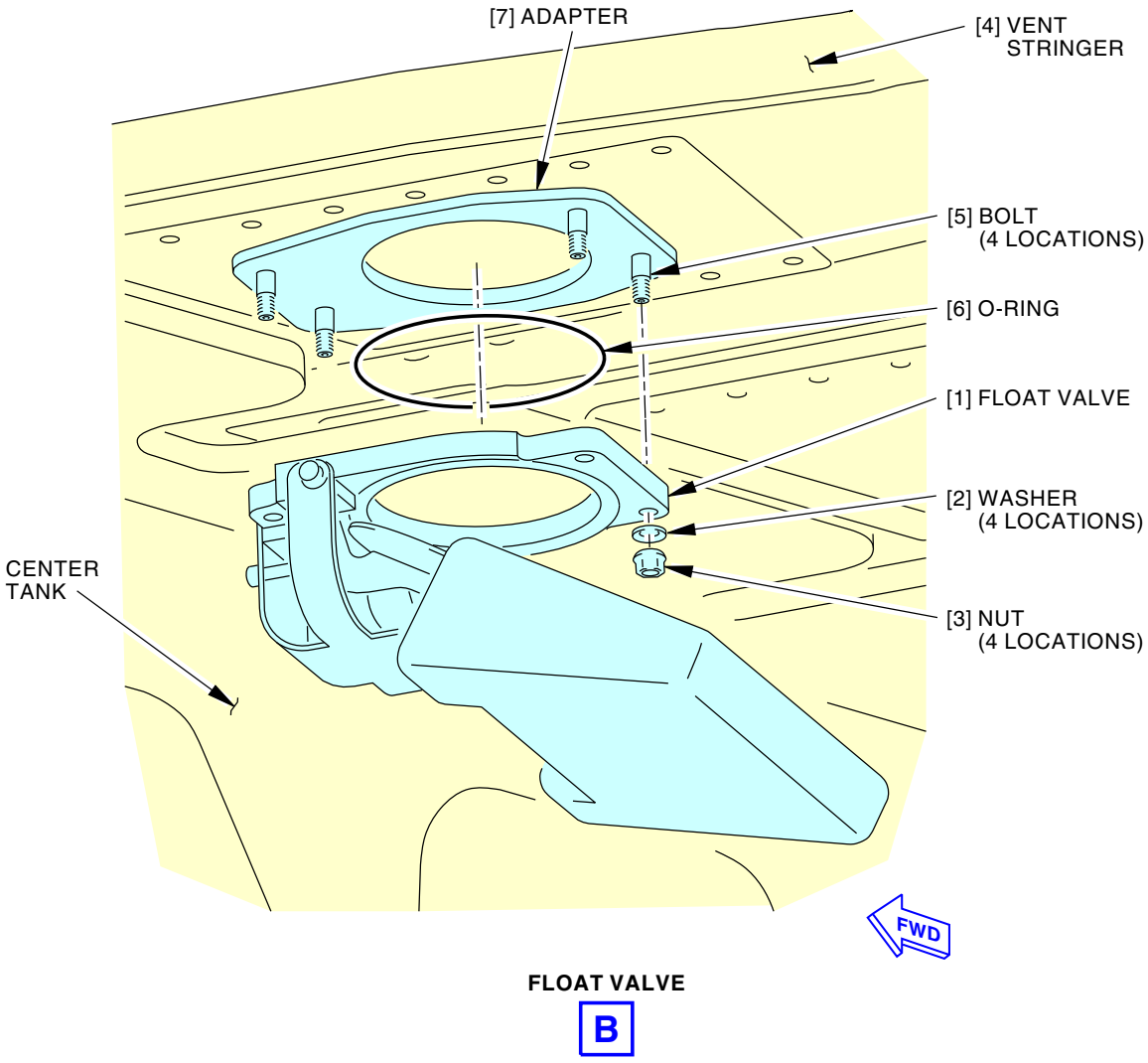
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1663526 S0000302917_V2

Float Valve - Removal and Installation
Figure 401/28-13-02-990-804 (Sheet 2 of 3)

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1663607 S0000302918_V2

Float Valve - Removal and Installation
Figure 401/28-13-02-990-804 (Sheet 3 of 3)

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TASK 28-13-02-400-803

3. Float Valve Installation

(Figure 401)

A. References

Reference	Title
20-30-80-910-801	General Cleaning of Metal (Series 80) (P/B 201)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17
STD-7423	Cover - Protective Tube

C. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
D00128	Grease - Silicone	A-A-59173
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

D. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing

E. Access Panels

Number	Name/Location
531AB	Access Door

F. Prepare for the Installation

SUBTASK 28-13-02-010-006

(1) Remove the protective cover, STD-7423, from the vent stringer [4].

SUBTASK 28-13-02-100-003

(2) Make sure that the mating surfaces between the float valve [1] and the adapter [7] are free of sealants, grease, and unwanted material.

(a) Make sure that the new o-ring cavity in the float valve [1] is clean and free of sealants and unwanted material.

SUBTASK 28-13-02-110-001

(3) To clean the components, do this task: General Cleaning of Metal (Series 80), TASK 20-30-80-910-801.

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SUBTASK 28-13-02-110-002

(4) Prepare the contact surfaces of these components for a faying surface bond (SWPM 20-20-00):

(a) float valve [1]

(b) adapter [7]

G. Install the Float Valve

SUBTASK 28-13-02-640-001

(1) Do these steps to install the new o-ring [6]:

(a) Apply a thin coat of grease, D00128, to the new o-ring [6].

(b) Put the new o-ring [6] in the cavity on the float valve [1].

(c) Remove excess grease, D00128, with a cotton wiper, G00034.

SUBTASK 28-13-02-420-003

(2) Do these steps to install the float valve [1]:

(a) Put the float valve [1] in its position on the adapter [7].

(b) Install the four washers [2] and nuts [3].

SUBTASK 28-13-02-210-003

(3) Do a check of the float valve [1]:

(a) Make sure that the float valve [1] is in the fully open position.

(b) Make sure that the float valve [1] moves freely.

(c) Make sure that the float valve [1] is not limited by the adjacent structure.

SUBTASK 28-13-02-390-001

(4) Apply a fillet seal of sealant, A00767, around the float valve [1] and the adapter [7].

SUBTASK 28-13-02-760-001

(5) Use an intrinsically safe approved bonding meter, COM-1550, to measure the bonding resistance between the base of the float valve [1] and the vent stringer [4] (SWPM 20-20-00).

(a) Make sure the total resistance is 0.01 ohm (10 milliohms or less).

H. Put the Airplane Back to the Usual Condition

SUBTASK 28-13-02-410-002

(1) Do this task: Fuel Tank Closure, TASK 28-11-00-410-801.

(2) Close this access panel:

Number	Name/Location
531AB	Access Door

END OF TASK

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SURGE TANK PRESSURE RELIEF VALVE - MAINTENANCE PRACTICES

1. General

A. There are two surge tank pressure relief valves. The pressure relief valves are installed on access doors the left and right surge tanks.

B. This procedure contains four tasks. The first task removes the pressure relief valve. The second task installs the pressure relief valve. The third task is an inspection/check of the pressure relief valve. The fourth task manually operates the pressure relief valve.

TASK 28-13-03-000-801

2. Pressure Relief Valve - Removal

(Figure 201)

A. References

Reference	Title
28-11-03-000-801	Surge Tank Access Door - Removal (P/B 401)

B. Location Zones

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

C. Access Panels

Number	Name/Location
543DB	Pressure Relief Door
643DB	Pressure Relief Door

D. Procedure

SUBTASK 28-13-03-010-001

(1) Remove the applicable access door from the surge tanks. To remove this door, do this task, Surge Tank Access Door - Removal, TASK 28-11-03-000-801.

Open these access panels:

Number	Name/Location
543DB	Pressure Relief Door
643DB	Pressure Relief Door

SUBTASK 28-13-03-020-005

(2) Remove the sealant from the edges of the joint between the pressure relief valve and the access door.

SUBTASK 28-13-03-020-004

WARNING

BE CAREFUL WITH A CLOSED PRESSURE RELIEF VALVE. THE PRESSURE RELIEF VALVE CAN MOVE QUICKLY AND CAUSE INJURY.

(3) Remove the eight mounting bolts [3] that hold the pressure relief valve [1] to the access door.

SUBTASK 28-13-03-020-001

(4) Remove the pressure relief valve [1].

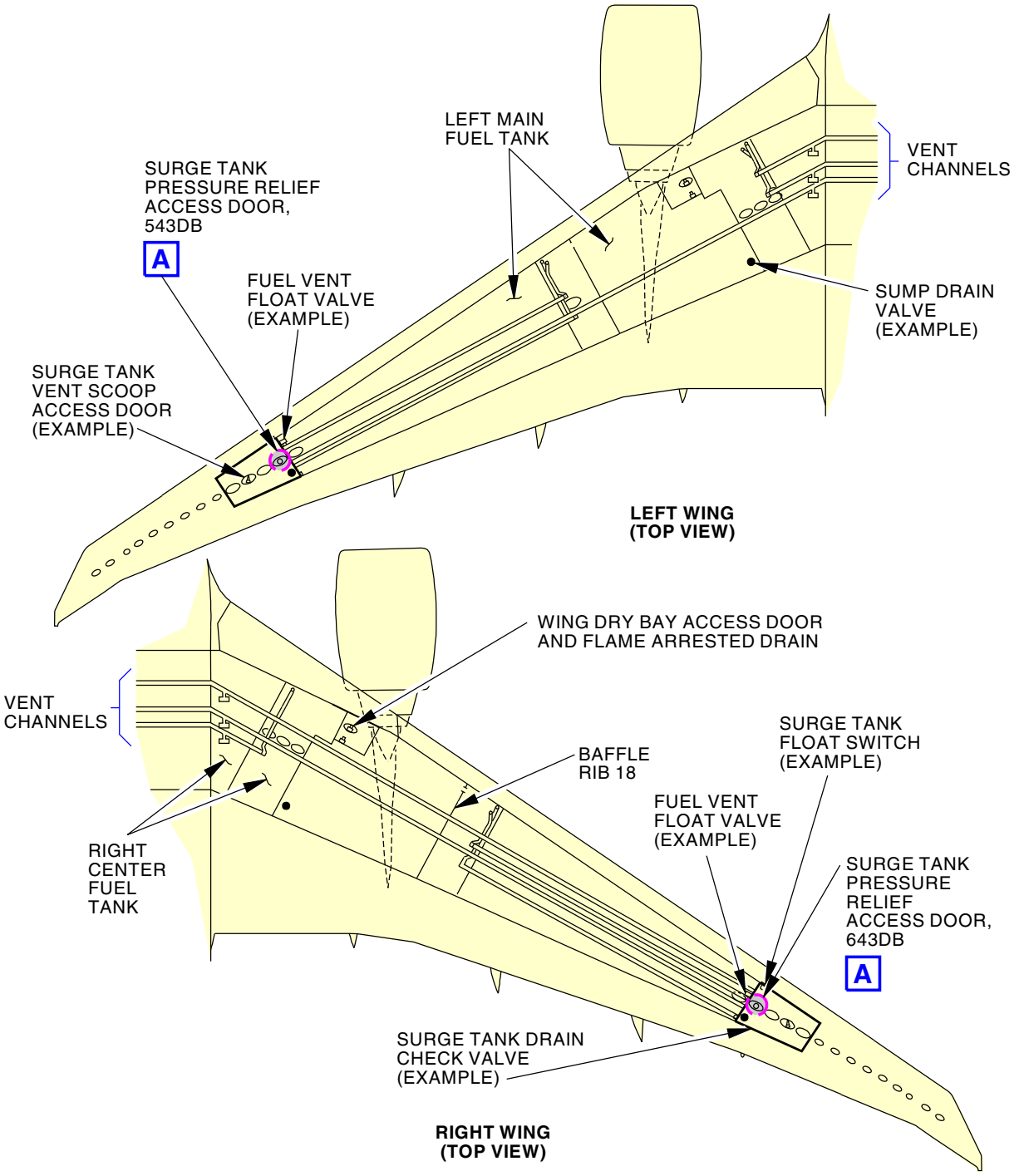
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SUBTASK 28-13-03-020-002

(5) Remove the O-ring [2] and discard.

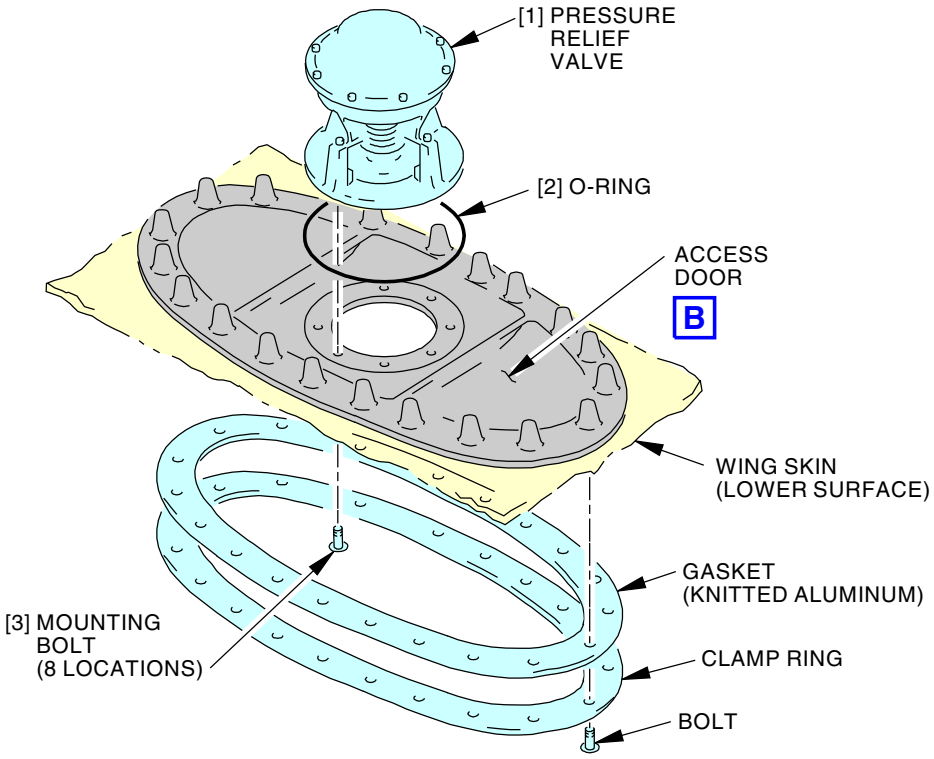
END OF TASK

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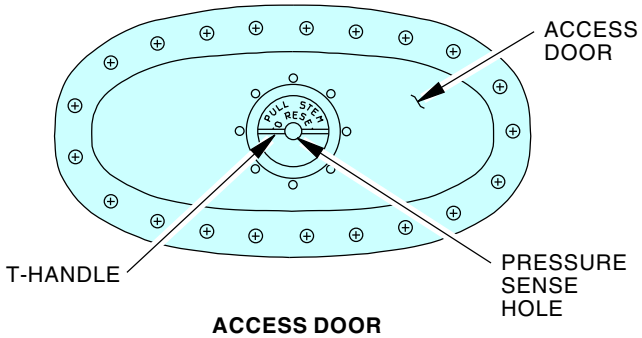
Surge Tank Pressure Relief Valve Installation
Figure 201/28-13-03-990-803 (Sheet 1 of 2)

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SURGE TANK PRESSURE RELIEF ACCESS DOOR

A



ACCESS DOOR

B

C30140 S0006414953_V2

Surge Tank Pressure Relief Valve Installation
Figure 201/28-13-03-990-803 (Sheet 2 of 2)

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TASK 28-13-03-400-801

3. Pressure Relief Valve - Installation

(Figure 201)

A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

(2) For applying sealants in the fuel tank structure(s), it is acceptable to use sealant, A50303, as an alternative to sealant, A00767, for Class A and B non-faying seal applications:

(a) sealant, A50153, and sealant, A50301, are mutually interchangeable.

(b) sealant, A50110, and sealant, A50302, are mutually interchangeable.

(c) sealant, A50153, cannot be used in combination with sealant, A50302, and sealant, A50301, cannot be used with sealant, A50110.

B. References

Reference	Title
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-03-400-801	Surge Tank Access Door - Installation (P/B 401)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

D. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
A50110	Sealant	BMS5-45 Class B-2
A50153	Sealant - Fuel Tank - Class A-2	BMS5-45 Class A-2
A50301	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168 Type I Class A-2
A50302	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168 Type I Class B-2
A50303	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168

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(Continued)

Reference	Description	Specification
B00062	Solvent - Acetone (99.5% Grade)	ASTM D 329 (Supersedes O-A-51)
B00130	Alcohol - Isopropyl	TT-I-735
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Pressure relief valve	28-13-03-10-015	ARO ALL
		28-13-03-20-030	ARO ALL
2	O-ring	28-13-03-10-020	ARO ALL
		28-13-03-20-020	ARO ALL

F. Location Zones

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

G. Access Panels

Number	Name/Location
543DB	Pressure Relief Door
643DB	Pressure Relief Door

H. Procedure

SUBTASK 28-13-03-110-001

28-AWL-16: CDCCL

(1) Install a fillet sealed fay surface bond between the pressure relief valve [1] (valve body mounting flange) and the surge tank access door (SWPM 20-20-00).

NOTE: Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

(a) Fully clean these surfaces and dry them:

NOTE: You must clean these surfaces to supply a good electrical bond.

1) Clean the mating surfaces of the surge tank, access door and pressure relief valve with a clean cotton wiper, G00034.

2) Clean mating surfaces of surge tank, access door with clean cotton wiper, G00034, with alcohol, B00130, or solvent, B00062.

3) Clean mating surfaces of pressure relief valve with clean cotton wiper, G00034, with alcohol, B00130, or solvent, B00062.

a) Clean the unwanted alcohol with a clean, dry cotton wiper, G00034, before it dries.

SUBTASK 28-13-03-420-006

(2) Lubricate the new O-ring [2] with a thin layer of grease, D00504.

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SUBTASK 28-13-03-420-004

(3) Install the new o-ring [2] in the groove of the valve flange.

SUBTASK 28-13-03-420-001

WARNING

BE CAREFUL WITH A CLOSED PRESSURE RELIEF VALVE. THE PRESSURE RELIEF VALVE CAN MOVE QUICKLY AND CAUSE INJURY.

(4) Align the pressure relief valve [1] on the surge tank access door.

SUBTASK 28-13-03-420-005

(5) Install the eight mounting bolts [3] through access door into the pressure relief valve [1].

SUBTASK 28-13-03-200-001

28-AWL-16: CDCCL

(6) Apply a fillet seal between the pressure relief valve [1] (valve body mounting flange) and the access door.

NOTE: Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

(a) Use sealant, A00767 (or equivalent).

SUBTASK 28-13-03-200-002

28-AWL-16: CDCCL

(7) Measure the electrical bonding resistance between the body of the pressure relief valve and the access door (SWPM 20-20-00).

NOTE: Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

(a) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-16: CDCCL

(b) Make sure the electrical bonding resistance between the pressure relief valve and the access door is 0.0100 ohm (10.0 milliohms) or less.

NOTE: Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-16.

SUBTASK 28-13-03-410-001

(8) Install the applicable access door on the surge tanks (TASK 28-11-03-400-801).

Install the applicable access doors:

Number	Name/Location
543DB	Pressure Relief Door
643DB	Pressure Relief Door

END OF TASK

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TASK 28-13-03-200-801

4. Pressure Relief Valve - Inspection/Check

(Figure 201, Figure 202)

A. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-8420	Check Fixture Equipment, Pressure Relief Valve Part #: G28005-35 Supplier: 81205 Opt Part #: G28005-23 Supplier: 81205 Opt Part #: G28005-29 Supplier: 81205
STD-1083	Source - Air, Regulated, Dry Filtered, 0-10 PSIG
STD-1089	Source - Vacuum, 0 to -3.00 PSIG

B. Location Zones

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

C. Access Panels

Number	Name/Location
543DB	Pressure Relief Door
643DB	Pressure Relief Door

D. Procedure

SUBTASK 28-13-03-220-001

(1) Do a check on the pressure relief settings of the pressure relief valve [1].

(a) Remove the four of the mounting bolts on the left or right surge tank access door.

The access doors:

Number	Name/Location
543DB	Pressure Relief Door
643DB	Pressure Relief Door

(b) Put and hold the check valve check equipment, SPL-8420 on the exit of the pressure relief valve [1].

1) The holes to use in the valve check equipment, SPL-8420 are steel stamped and labeled "10X18 DOOR".

2) Install the four socket head cap screws which are stored on the valve check equipment, SPL-8420.

(c) Connect the regulated 0-10 psig dry filtered regulated air source, STD-1083 to the valve check equipment, SPL-8420.

(d) Slowly and continuously supply a positive pressure of more than 1.00 psig (6.89 kPa) from the air source.

(e) Make sure the pressure relief valve [1] opens between 1.00 psig (6.89 kPa) and 1.25 psig (8.62 kPa).

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(f) Put the pressure to 0 psig (0 kPa).

(g) Remove the 0-10 psig dry filtered regulated air source, STD-1083.

(h) Hold the check fixture and remove the four socket head cap screws to remove the valve check equipment, SPL-8420.

1) Store the four socket head cap screws in the threaded holes on the valve check equipment, SPL-8420.

(i) Pull the T-handle down until the pressure relief valve [1] sets again.

(j) Put and hold the check valve check equipment, SPL-8420 on the exit of the pressure relief valve.

1) The holes to use in the valve check equipment, SPL-8420 are steel stamped and labeled "10X18 DOOR".

2) Install the four socket head cap screws which are stored on the valve check equipment, SPL-8420.

(k) Install the vacuum source (0 to -3 PSIG), STD-1089 on the valve check equipment, SPL-8420.

(l) Slowly and continuously supply a vacuum pressure of more than -2.50 psig (-17.24 kPa).

(m) Make sure the pressure relief valve [1] opens between -2.50 psig (-17.24 kPa) and -2.75 psig (-18.96 kPa).

(n) Put the pressure to 0 psig (0 kPa).

(o) Remove the vacuum source (0 to -3 PSIG), STD-1089 from the valve check equipment, SPL-8420.

(p) Hold onto the valve check equipment, SPL-8420 and remove the four socket head cap screws to remove the valve check equipment, SPL-8420.

1) Store the four socket head cap screws in the threaded holes on the valve check equipment, SPL-8420.

(q) Install the four mounting bolts on the left or right surge tank access doors.

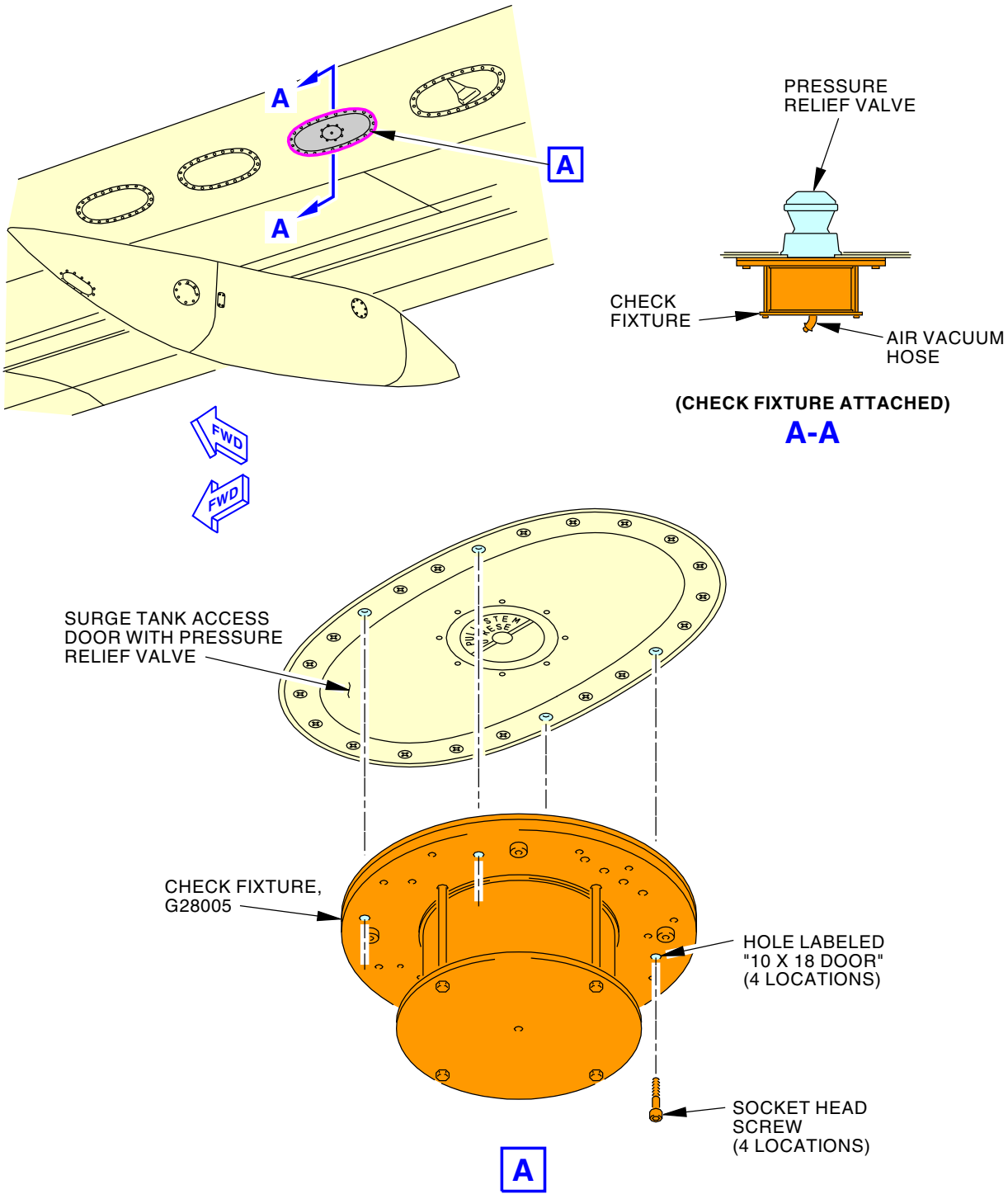
The access doors:

Number	Name/Location
543DB	Pressure Relief Door
643DB	Pressure Relief Door

(r) Pull the T-handle down until the pressure relief valve [1] sets again.

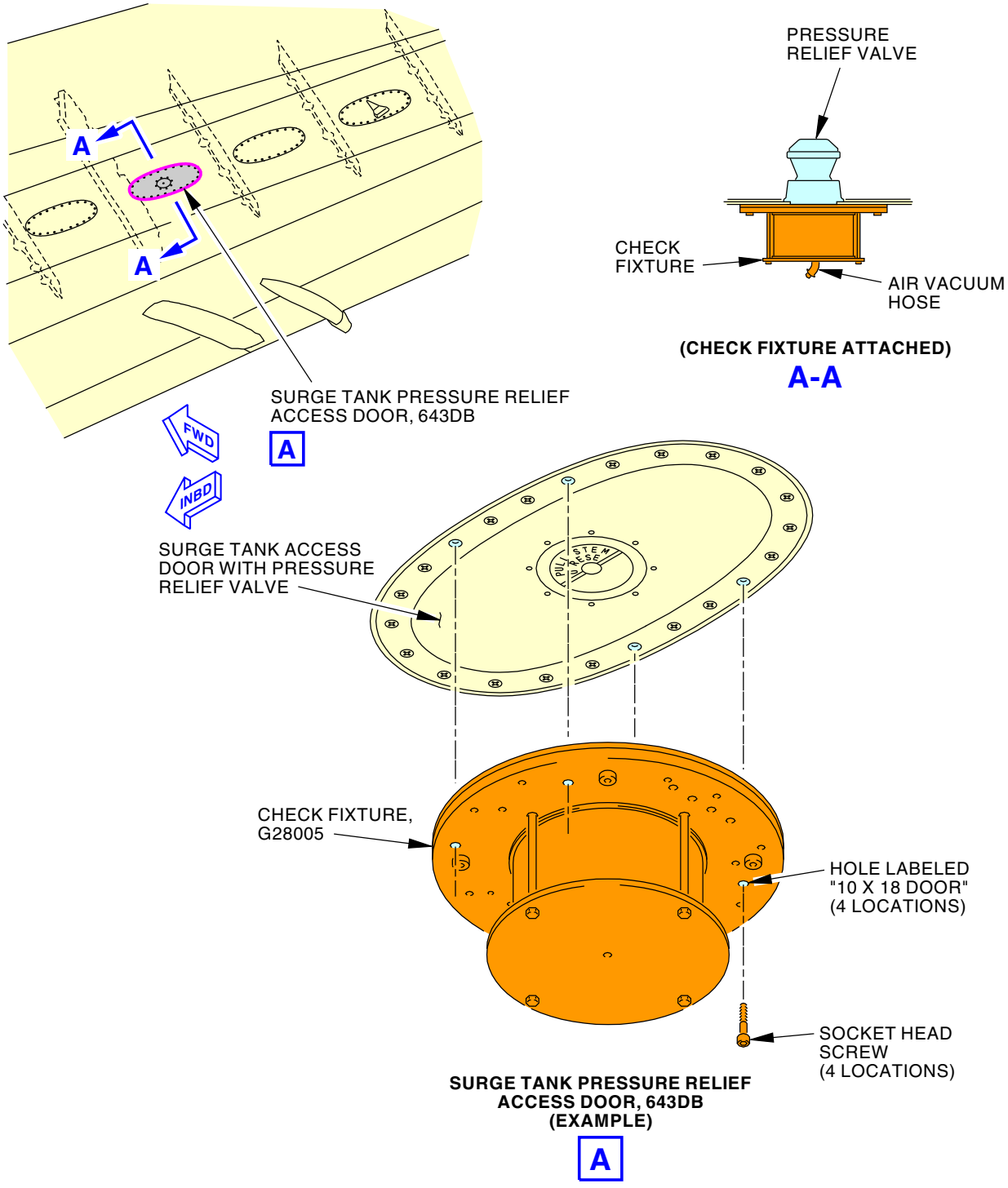
END OF TASK

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Pressure Relief Valve Check Fixture
Figure 202/28-13-03-990-802 (Sheet 1 of 2)

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Pressure Relief Valve Check Fixture
Figure 202/28-13-03-990-802 (Sheet 2 of 2)

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TASK 28-13-03-280-801

5. Pressure Relief Valve - Manual Operation

(Figure 201)

A. Location Zones

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

B. Access Panels

Number	Name/Location
543DB	Pressure Relief Door
643DB	Pressure Relief Door

C. Procedure

SUBTASK 28-13-03-280-001

(1) Manually operate the pressure relief valve [1].

(a) Put a screwdriver into the pressure sense hole of the pressure relief valve on the left and right access door that follows for the surge tank.

The access doors:

Number	Name/Location
543DB	Pressure Relief Door
643DB	Pressure Relief Door

(b) Push up on the screwdriver until the pressure relief valve opens.

NOTE: There is a loud noise and the pressure relief valve moves away from the screwdriver, when the pressure relief valve opens.

(c) Remove the screwdriver from the pressure sense hole.

(d) Pull the T-handle down until the pressure relief valve sets again.

——— END OF TASK ———

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SURGE TANK PRESSURE RELIEF VALVE - INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure contains a functional check of the bonding resistance between the structure and the surge tank pressure relief valve.

SFAR 88

TASK 28-13-03-200-802

2. Surge Tank Pressure Relief Valve - Bonding Resistance Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Location Zones

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

D. Access Panels

Number	Name/Location
543DB	Pressure Relief Door
643DB	Pressure Relief Door

E. Procedure

SUBTASK 28-13-03-010-002

(1) Go to the applicable surge tank and get access to the pressure relief valve on the access door.

(a) Go to the applicable access door:

Number	Name/Location
543DB	Pressure Relief Door
643DB	Pressure Relief Door

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SUBTASK 28-13-03-765-001

(2) Outside the tank, use an intrinsically safe approved bonding meter, COM-1550, to measure the bonding resistance between the pressure relief valve poppet and the applicable access door (SWPM 20-20-00).

(a) Make sure that the bonding resistance is 1 ohm (1000 milliohms) or less.

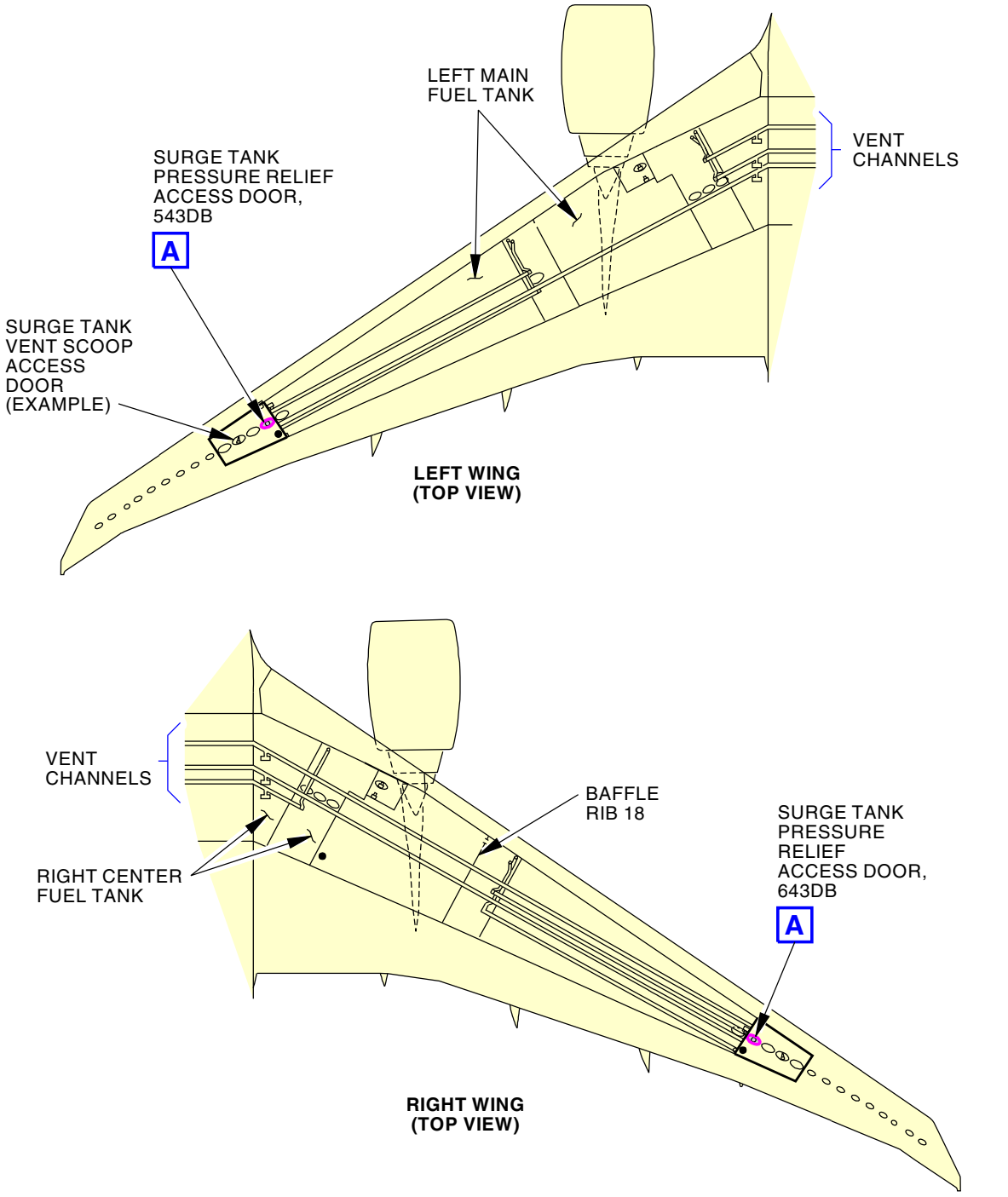
SUBTASK 28-13-03-765-002

(3) Outside the tank, use an intrinsically safe approved bonding meter, COM-1550, to measure the bonding resistance between the pressure relief valve body and the applicable access door (SWPM 20-20-00).

(a) Make sure that the bonding resistance is 0.010 ohm (10 milliohms) or less.

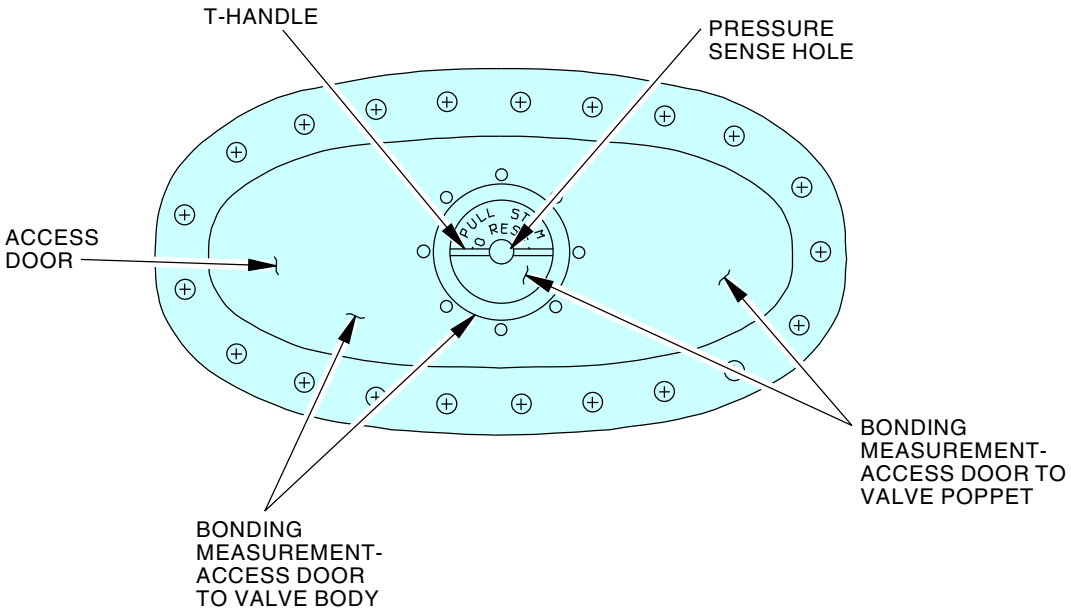
——— END OF TASK ———

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Surge Tank Pressure Relief Valve - Bonding Resistance Measurement
Figure 601/28-13-03-990-804 (Sheet 1 of 2)

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1368875 S0000243376_V3

Surge Tank Pressure Relief Valve - Bonding Resistance Measurement
Figure 601/28-13-03-990-804 (Sheet 2 of 2)

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SURGE TANK DRAIN CHECK VALVE - REMOVAL/INSTALLATION

1. General

A. There are two drain check valves. One drain check valve is installed on rib 37 of each main fuel tank.

B. The drain check valve prevents the flow of fuel from the main fuel tank into the surge tank. The drain check valve lets fuel drain into the main fuel tank from the surge tank.

C. This procedure contains two tasks. The first task removes the drain check valve. The second task installs the drain check valve.

TASK 28-13-04-000-801

2. Surge Tank Drain Check Valve - Removal

(Figure 401)

A. References

Reference	Title
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-11-03-000-801	Surge Tank Access Door - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

C. Access Panels

Number	Name/Location
543CB	Access Door
543DB	Pressure Relief Door
643CB	Access Door
643DB	Pressure Relief Door

D. Procedure

SUBTASK 28-13-04-650-001

(1) To defuel the left or right main fuel tank, do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-13-04-010-001

(2) To get access to the drain check valve from the main fuel tank, remove the access door.

Remove the applicable access doors:

Number	Name/Location
543CB	Access Door
643CB	Access Door

(a) To remove the applicable access door, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

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SUBTASK 28-13-04-010-002

(3) To get access to drain check valve from the surge tank, remove the access door.

Remove the applicable access doors:

Number	Name/Location
543DB	Pressure Relief Door
643DB	Pressure Relief Door

(a) To remove the applicable access door, do this task: Surge Tank Access Door - Removal, TASK 28-11-03-000-801.

SUBTASK 28-13-04-650-002

WARNING OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. FAILURE TO OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS CAN CAUSE INJURY OR DAMAGE.

(4) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-13-04-030-001

(5) Remove the four screw [2] and washer [3] from the drain check valve [1].

SUBTASK 28-13-04-020-001

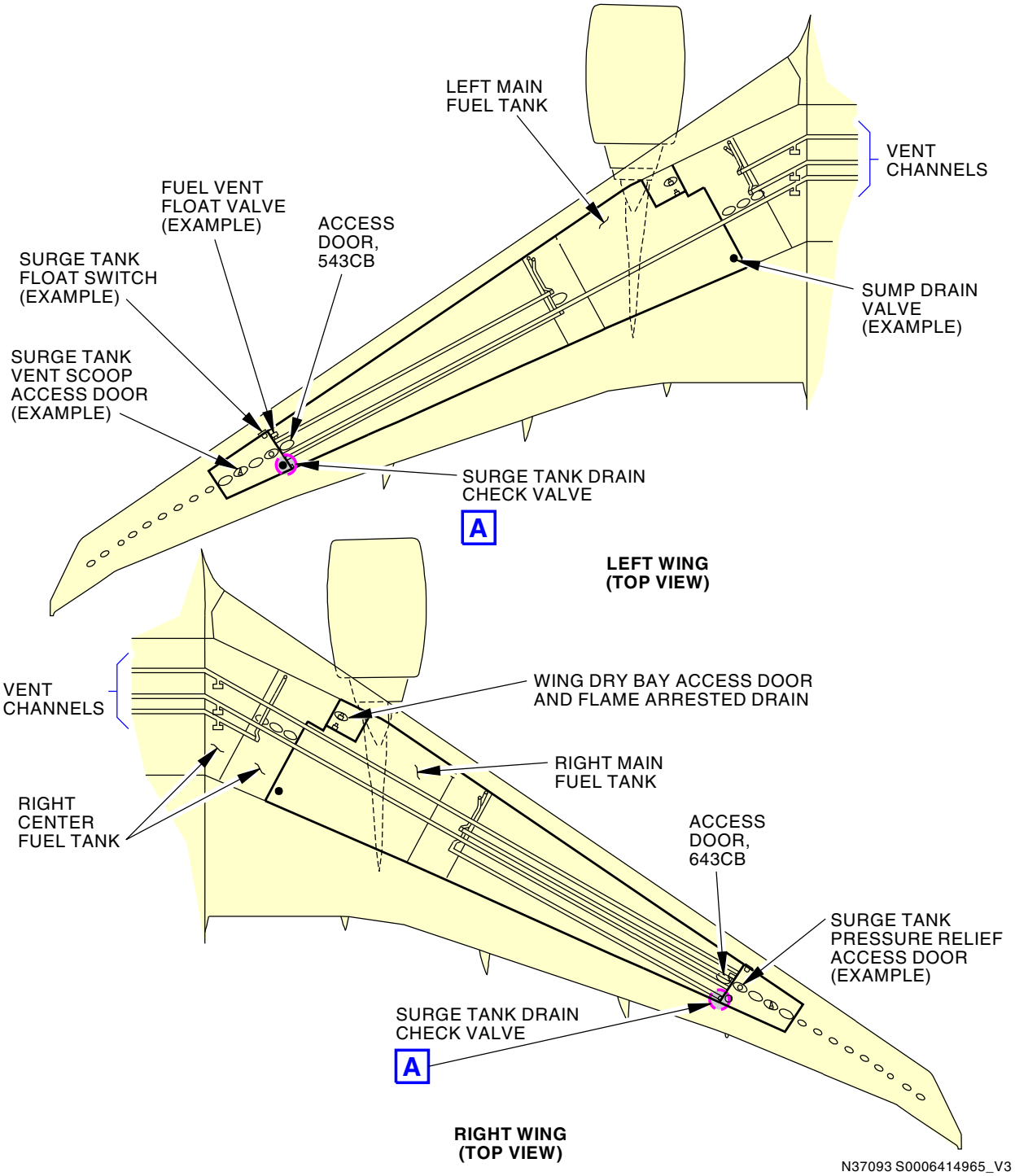
(6) Remove the drain check valve [1] from the main tank.

SUBTASK 28-13-04-100-001

(7) Remove excess sealant from the mounting surface on the tank end rib, from the main tank and the surge tank sides of the rib.

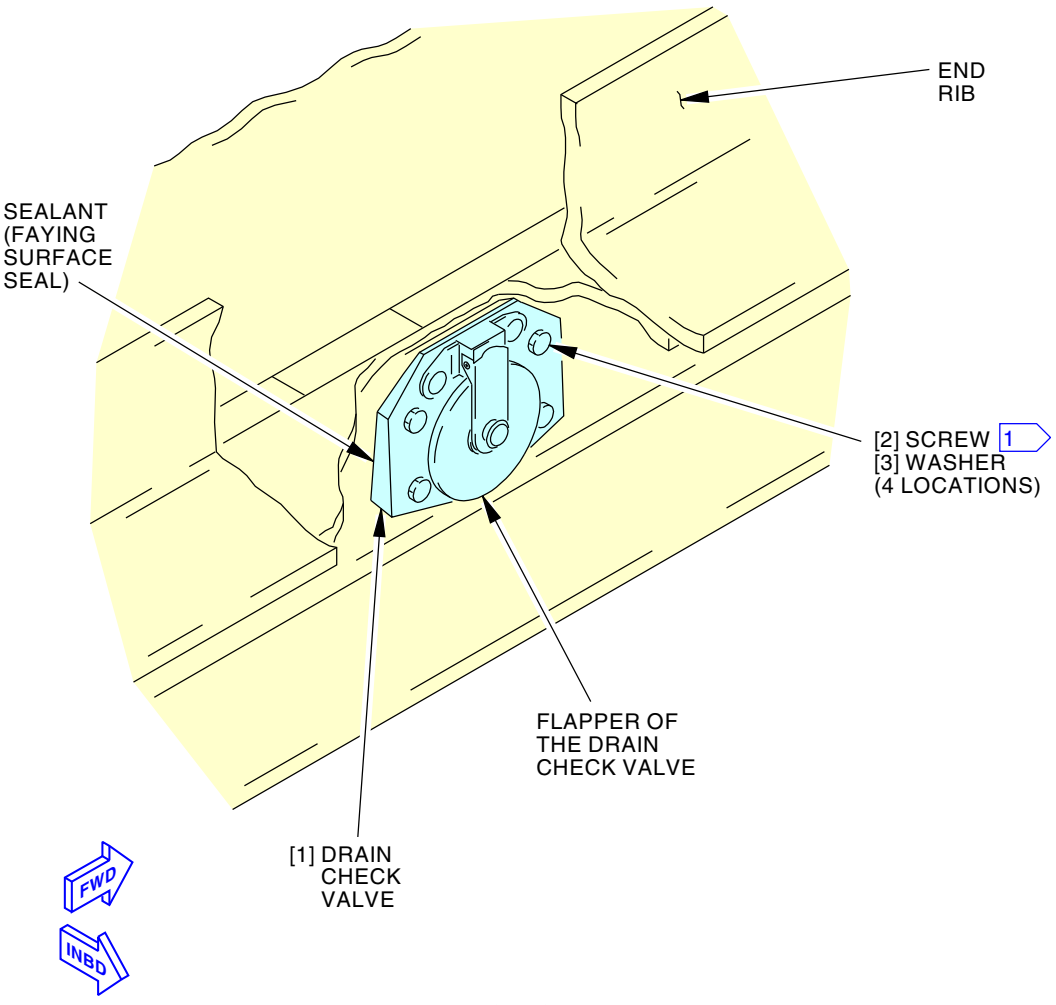
——— END OF TASK ———

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Drain Check Valve Installation
Figure 401/28-13-04-990-802 (Sheet 1 of 2)

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DRAIN CHECK VALVE

A

1 FILLET SEAL THE SCREWS

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Drain Check Valve Installation
Figure 401/28-13-04-990-802 (Sheet 2 of 2)

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TASK 28-13-04-400-801

3. Surge Tank Drain Check Valve - Installation

(Figure 401)

A. General

(1) For applying sealants in the fuel tank structure(s), it is acceptable to use sealant, A50303, as an alternative to sealant, A00767, for Class A and B non-faying seal applications:

(a) sealant, A50153, and sealant, A50301, are mutually interchangeable.

(b) sealant, A50110, and sealant, A50302, are mutually interchangeable.

(c) sealant, A50153, cannot be used in combination with sealant, A50302, and sealant, A50301, cannot be used with sealant, A50110.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
12-11-02-650-802	Surge Tank Sump Drain Valve - Fuel Check (P/B 301)
28-11-00-300-802	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-00-790-801	Fuel Leak Detection Procedures (P/B 601)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-11-03-400-801	Surge Tank Access Door - Installation (P/B 401)

C. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
A50110	Sealant	BMS5-45 Class B-2
A50153	Sealant - Fuel Tank - Class A-2	BMS5-45 Class A-2
A50301	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168 Type I Class A-2
A50302	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168 Type I Class B-2
A50303	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168

D. Location Zones

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

E. Access Panels

Number	Name/Location
543CB	Access Door
543DB	Pressure Relief Door
643CB	Access Door
643DB	Pressure Relief Door

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F. Procedure

SUBTASK 28-13-04-650-004

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-13-04-010-003

(2) Get access to the drain check valve through the access door.

Open the applicable access doors:

Number	Name/Location
543CB	Access Door
643CB	Access Door

SUBTASK 28-13-04-390-001

(3) Apply sealant to the mating surface of the drain check valve before you install the valve (TASK 28-11-00-300-802).

NOTE: Do not get sealant on the flapper seal or flapper seal surface.

(a) Use this sealant (or equivalent):

1) sealant, A00767.

SUBTASK 28-13-04-420-001

(4) Align the drain check valve [1] with the end rib of the main fuel tank.

SUBTASK 28-13-04-650-005

(5) Make sure the flapper of the drain check valve [1] is free to operate.

SUBTASK 28-13-04-420-002

(6) Do these steps to attach the drain check valve [1]:

NOTE: Do not get sealant on the flapper seal surfaces.

(a) Apply sealant to the four screw [2] and install the screw [2] and washer [3] on the drain check valve [1] (TASK 28-11-00-300-802).

(b) Apply a fillet seal of sealant, A00767 (or equivalent), to the four screw [2] from the surge tank side of the tank end rib (TASK 28-11-00-300-802).

(c) Use this sealant (or equivalent):

1) sealant, A00767.

SUBTASK 28-13-04-410-001

(7) Install the applicable main tank access doors:

Number	Name/Location
543CB	Access Door
643CB	Access Door

(a) To install the access door, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

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SUBTASK 28-13-04-010-004

(8) Install the applicable surge tank access doors:

Number	Name/Location
543DB	Pressure Relief Door
643DB	Pressure Relief Door

(a) To install the access door, do this task: Surge Tank Access Door - Installation, TASK 28-11-03-400-801.

SUBTASK 28-13-04-390-002

(9) Make sure the sealant is tack free before you refuel the airplane (TASK 28-11-00-300-802).

SUBTASK 28-13-04-650-003

(10) To refuel the applicable fuel tank, do this task: Pressure Refueling, TASK 12-11-01-650-801.

SUBTASK 28-13-04-210-001

(11) Make sure there are no fuel leaks at the applicable main fuel tank access door (TASK 28-11-00-790-801).

SUBTASK 28-13-04-210-002

(12) To make sure there is no fuel in the applicable surge tank, do this task: Surge Tank Sump Drain Valve - Fuel Check, TASK 12-11-02-650-802.

——— END OF TASK ———

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SURGE TANK VENT FLAME ARRESTOR - REMOVAL/INSTALLATION

1. General

A. This section contains instructions for the removal and installation of the flame arrestor installed in each surge tank. There is one surge tank, between rib 37 and rib 41, in each wing.

B. The flame arrestor is found in the duct of the vent scoop assembly in the surge tank. Each vent scoop assembly is installed on an access door in each surge tank. You remove the flame arrestor, the vent scoop assembly and the access door from the airplane as a full unit. You then remove the flame arrestor from the vent scoop assembly.

C. The flame arrestor in the vent scoop assembly does not let external flames enter the fuel tank through the vent outlet. Each vent scoop assembly contains one flame arrestor. The duct of the vent scoop assembly prevents damage to the flame arrestor and controls the level at which a fuel spill will occur from the surge tank.

TASK 28-13-05-000-801

2. Surge Tank Vent Flame Arrestor - Removal

(Figure 401)

A. References

Reference	Title
12-11-02-650-801	Fuel Tank Sump Drain Valve - Tank Entry (P/B 301)
28-00-00-200-801	Inspection of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-00-00-960-801	Replacement of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-11-03-000-801	Surge Tank Access Door - Removal (P/B 401)

B. Location Zones

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

C. Access Panels

Number	Name/Location
544BB	Vent Scoop Door
644BB	Vent Scoop Door

D. Procedure

SUBTASK 28-13-05-010-001

(1) To make sure there is no fuel in the surge tank, do this task: Fuel Tank Sump Drain Valve - Tank Entry, TASK 12-11-02-650-801.

SUBTASK 28-13-05-010-005

(2) Remove the applicable access doors from the surge tank as follows:

Number	Name/Location
544BB	Vent Scoop Door
644BB	Vent Scoop Door

(a) To remove the access doors, do this task: Surge Tank Access Door - Removal, TASK 28-11-03-000-801.

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SUBTASK 28-13-05-140-001

(3) Remove the bolts [5], washers [6] and nuts [7] that attach the upper duct [1] to the lower duct [2].

(a) Set the bonding jumper [3] connection to the side.

SUBTASK 28-13-05-140-002

(4) Remove the upper duct [1].

(a) Remove and discard the o-ring [8].

SUBTASK 28-13-05-020-001

(5) Remove the flame arrestor [4] from the lower duct [2].

SUBTASK 28-13-05-140-003

(6) To remove the lower duct [2] from the access doors, refer to (TASK 28-11-03-000-801).

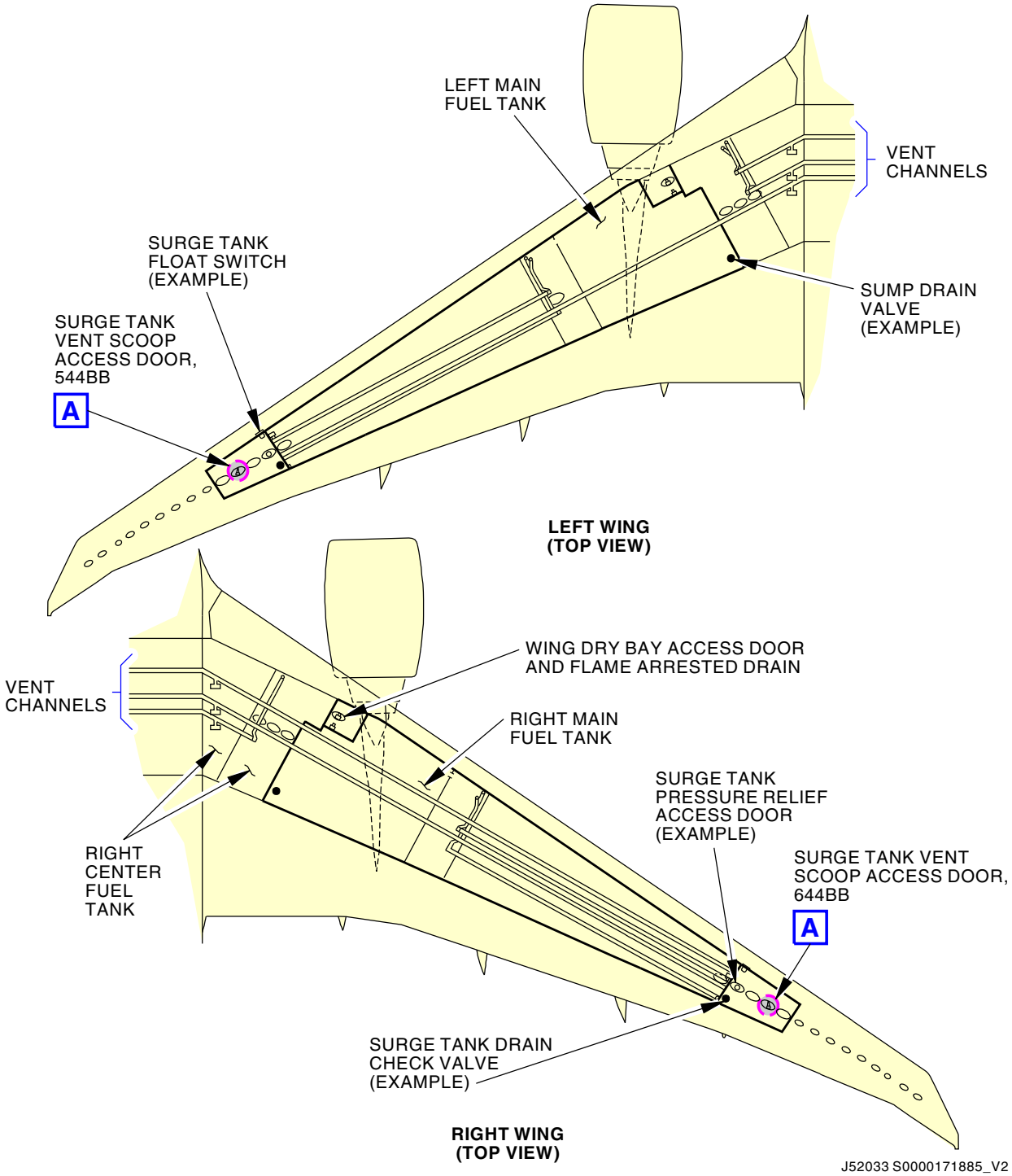
SUBTASK 28-13-05-210-002

(7) Do a check of the bonding jumper; do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(a) Replace the bonding jumper as necessary. To replace the bonding jumper, do this task: Replacement of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-960-801.

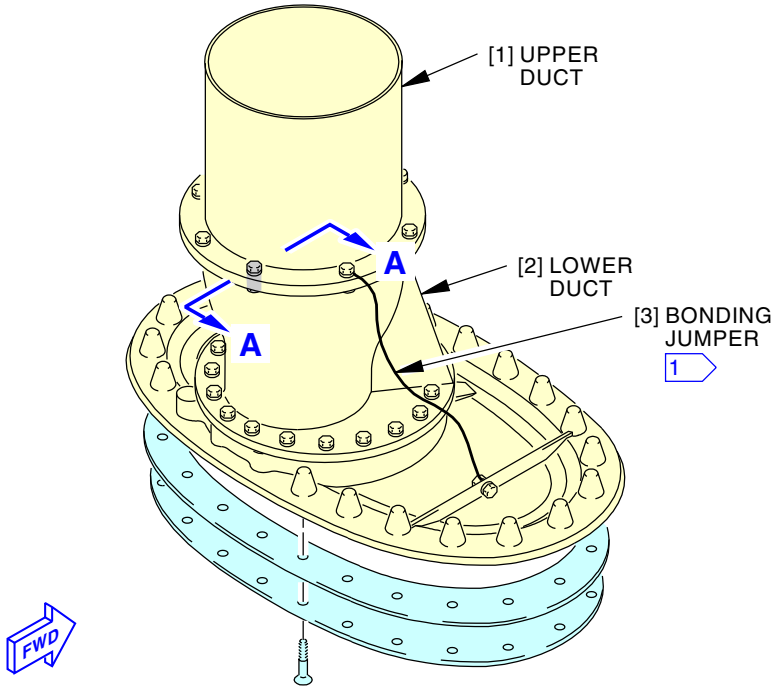
——— END OF TASK ———

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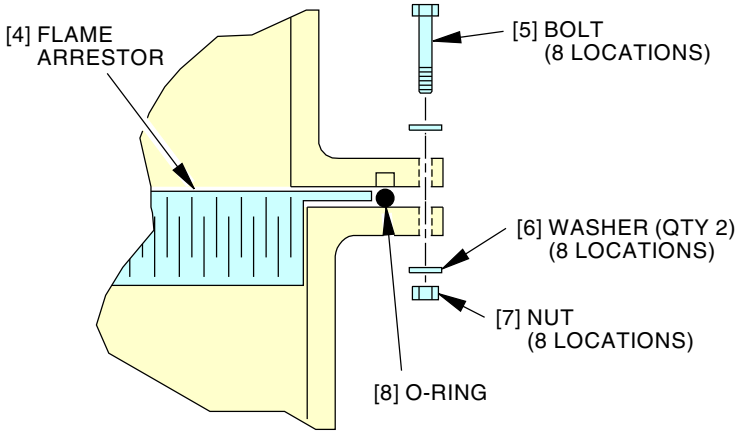
Vent Scoop Assembly Installation
Figure 401/28-13-05-990-801 (Sheet 1 of 2)

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VENT SCOOP ACCESS DOOR ASSEMBLY
(LEFT SIDE IS SHOWN, RIGHT SIDE IS EQUIVALENT)

A



A-A

1 THE BONDING RESISTANCE BETWEEN THE UPPER DUCT AND THE ACCESS DOOR MUST BE 0.010 OHM OR LESS

C30158 S0006414972_V4

Vent Scoop Assembly Installation
Figure 401/28-13-05-990-801 (Sheet 2 of 2)

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TASK 28-13-05-420-801

3. Surge Tank Vent Flame Arrestor - Installation

(Figure 401)

A. General

(1) This task installs the surge tank vent flame arrestor.

B. References

Reference	Title
28-11-03-400-801	Surge Tank Access Door - Installation (P/B 401)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

D. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
4	Flame arrestor	28-13-05-04-010	ARO ALL
8	O-ring	28-11-03-01A-130	ARO 001-014

F. Location Zones

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

G. Access Panels

Number	Name/Location
544BB	Vent Scoop Door
644BB	Vent Scoop Door

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H. Procedure

SUBTASK 28-13-05-420-001

CAUTION

DO NOT CAUSE DAMAGE TO THE HONEYCOMB CORE OF THE FLAME ARRESTOR DURING INSTALLATION. YOU WILL HAVE TO USE FORCE TO CORRECTLY INSTALL THE FLAME ARRESTOR INTO THE UPPER DUCT. TOO MUCH FORCE CAN CAUSE DAMAGE TO THE FLAME ARRESTOR.

(1) Put the flame arrestor [4] into the lower duct [2].

SUBTASK 28-13-05-640-001

(2) Apply grease, D00504, to a new O-ring [8].

SUBTASK 28-13-05-420-002

(3) Install the o-ring [8] into the upper duct [1].

SUBTASK 28-13-05-410-001

(4) Install the upper duct [1] onto the lower duct [2].

SUBTASK 28-13-05-420-003

(5) Install the bolt [5], two washers [6] and nut [7] to attach the bonding jumper [3] in its position between the upper duct [1] and access door.

SUBTASK 28-13-05-420-004

(6) Install the remaining bolt [5], two washers [6] and nut [7] (7 locations).

SUBTASK 28-13-05-420-005

(7) If the lower duct [2] is not installed on the access door, refer to (TASK 28-11-03-400-801) to install it.

SUBTASK 28-13-05-210-001

(8) Measure the bonding resistance between the upper duct [1] and the access door.

(a) Use an intrinsically safe approved bonding meter, COM-1550.

(b) Make sure the bonding resistance is 0.010 ohm (10 milliohms) or less between the upper duct [1] and the access door.

SUBTASK 28-13-05-410-004

(9) Install the applicable access doors that follows:

Number	Name/Location
544BB	Vent Scoop Door
644BB	Vent Scoop Door

(a) To install the access doors, do this task: Surge Tank Access Door - Installation, TASK 28-11-03-400-801.

——— END OF TASK ———

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SURGE TANK VENT FLAME ARRESTOR - INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This section contains instructions for doing an inspection of the flame arrestor installed in each surge tank. There is one surge tank, between rib 37 and rib 41, in each wing.

C. The flame arrestor is found in the standpipe of the vent scoop/access door assembly in the surge tank.

TASK 28-13-05-200-801

2. Surge Tank Vent Flame Arrestor - Inspection/Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
12-11-02-650-801	Fuel Tank Sump Drain Valve - Tank Entry (P/B 301)
28-11-03-000-801	Surge Tank Access Door - Removal (P/B 401)
28-11-03-400-801	Surge Tank Access Door - Installation (P/B 401)

B. Tools/Equipment

Reference	Description
STD-1082	Source - Air, Regulated, Dry Filtered, 0-50 PSIG

C. Location Zones

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

D. Access Panels

Number	Name/Location
544BB	Vent Scoop Door
644BB	Vent Scoop Door

E. Procedure

SUBTASK 28-13-05-010-003

(1) To make sure there is no fuel in the surge tank, do this task: Fuel Tank Sump Drain Valve - Tank Entry, TASK 12-11-02-650-801.

SUBTASK 28-13-05-010-006

(2) Remove the applicable access doors from the surge tank as follows:

Number	Name/Location
544BB	Vent Scoop Door
644BB	Vent Scoop Door

(a) To remove the access doors, do this task: Surge Tank Access Door - Removal, TASK 28-11-03-000-801.

SUBTASK 28-13-05-020-002

(3) Inspect each flame arrestor in the upper standpipe.

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SUBTASK 28-13-05-140-004

(4) Make sure each flame arrestor is not blocked.

SUBTASK 28-13-05-140-005

CAUTION

DO NOT CAUSE DAMAGE TO THE HONEYCOMB CORE OF THE FLAME ARRESTOR DURING CLEANING. TOO MUCH FORCE OR PRESSURE CAN CAUSE DAMAGE TO THE FLAME ARRESTOR.

(5) Clean the flame arrestor with an 0-50 psig dry filtered regulated air source, STD-1082, if it is necessary.

SUBTASK 28-13-05-140-006

(6) Make sure there are no loose materials in the left or right surge tank that could block the flame arrestor.

SUBTASK 28-13-05-410-003

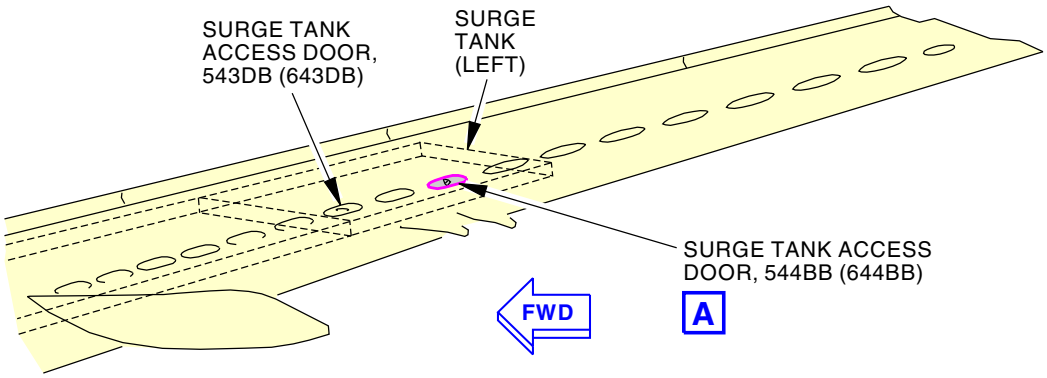
(7) Install the applicable access doors that follows:

Number	Name/Location
544BB	Vent Scoop Door
644BB	Vent Scoop Door

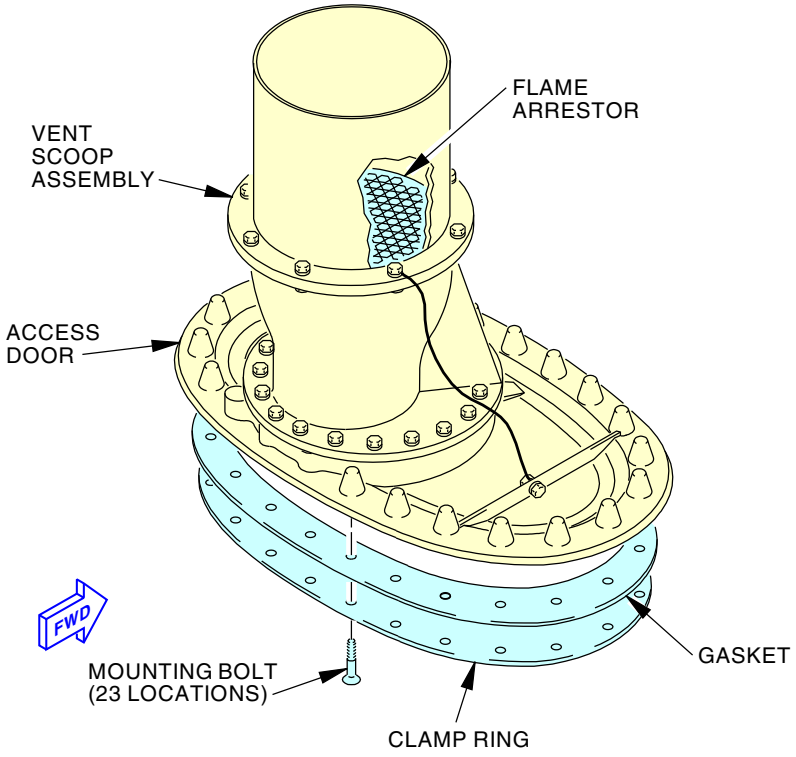
(a) To install the access doors, do this task: Surge Tank Access Door - Installation, TASK 28-11-03-400-801.

END OF TASK

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LEFT WING - 500 SERIES
(RIGHT WING - 600 SERIES IS EQUIVALENT)



SURGE TANK ACCESS DOOR, 544BB (644BB)
(LEFT SIDE IS SHOWN, RIGHT SIDE IS EQUIVALENT)

A

N36579 S0006414979_V4

Surge Tank Flame Arrestor
Figure 601/28-13-05-990-802

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SURGE TANK VENT SCOOP ASSEMBLY - INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure contains a functional check of the bonding resistance between the structure and the surge tank vent scoop assembly.

SFAR 88

TASK 28-13-06-200-801

2. Surge Tank Vent Scoop Assembly - Bonding Resistance Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
28-11-03-000-801	Surge Tank Access Door - Removal (P/B 401)
28-11-03-400-801	Surge Tank Access Door - Installation (P/B 401)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Location Zones

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

D. Access Panels

Number	Name/Location
544BB	Vent Scoop Door
644BB	Vent Scoop Door

E. Procedure

SUBTASK 28-13-06-010-002

(1) Remove the applicable access doors from the surge tank as follows:

Number	Name/Location
544BB	Vent Scoop Door
644BB	Vent Scoop Door

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(a) To remove the access doors, do this task: Surge Tank Access Door - Removal, TASK 28-11-03-000-801.

SUBTASK 28-13-06-765-001

(2) Use an intrinsically safe approved bonding meter, COM-1550, to measure the bonding resistance between the vent scoop upper duct and the access door.

(a) Make sure the bonding resistance is 0.010 ohm (10 milliohms) or less.

SUBTASK 28-13-06-410-002

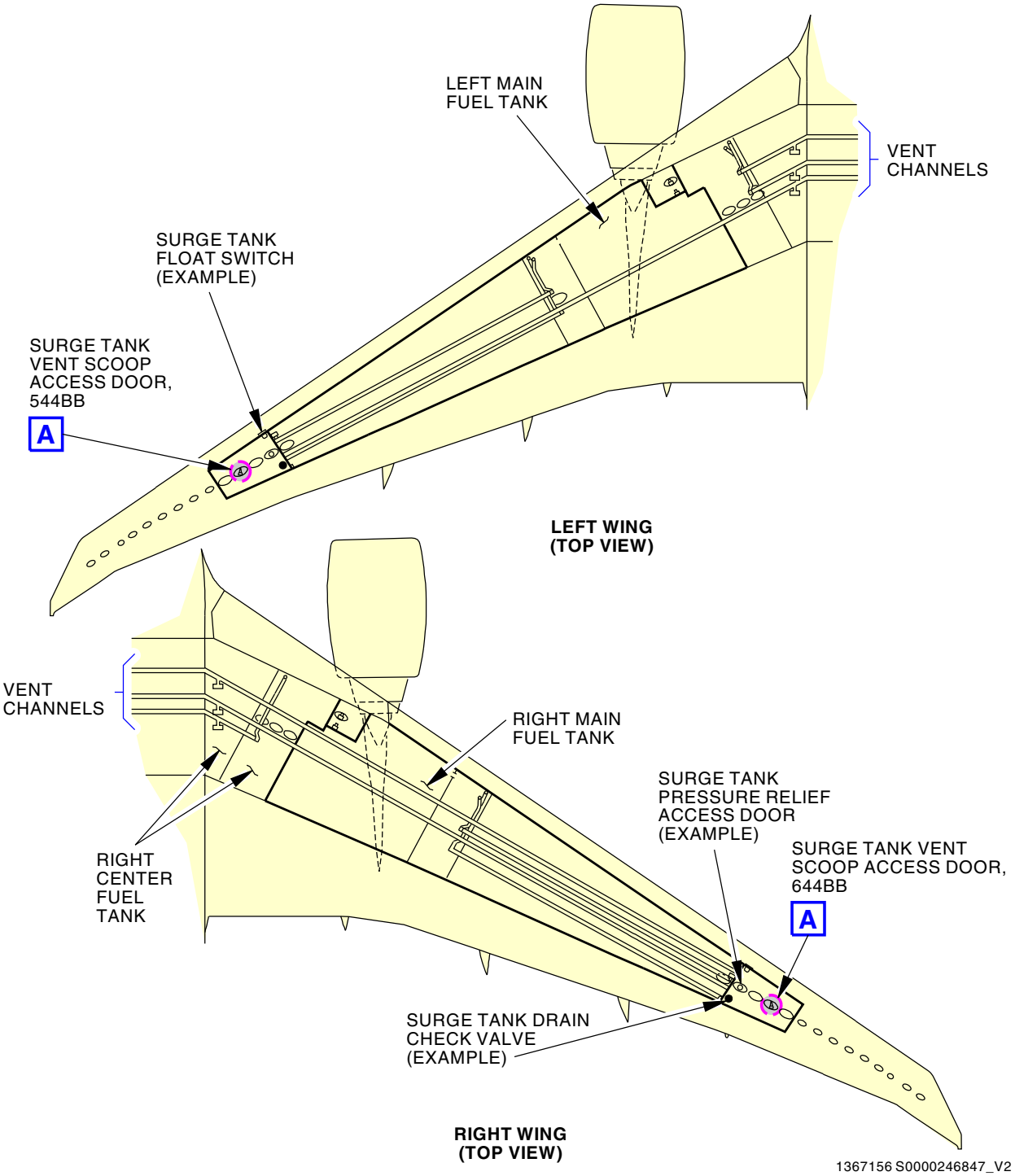
(3) Install the applicable access doors that follows:

Number	Name/Location
544BB	Vent Scoop Door
644BB	Vent Scoop Door

(a) To install the access doors, do this task: Surge Tank Access Door - Installation, TASK 28-11-03-400-801.

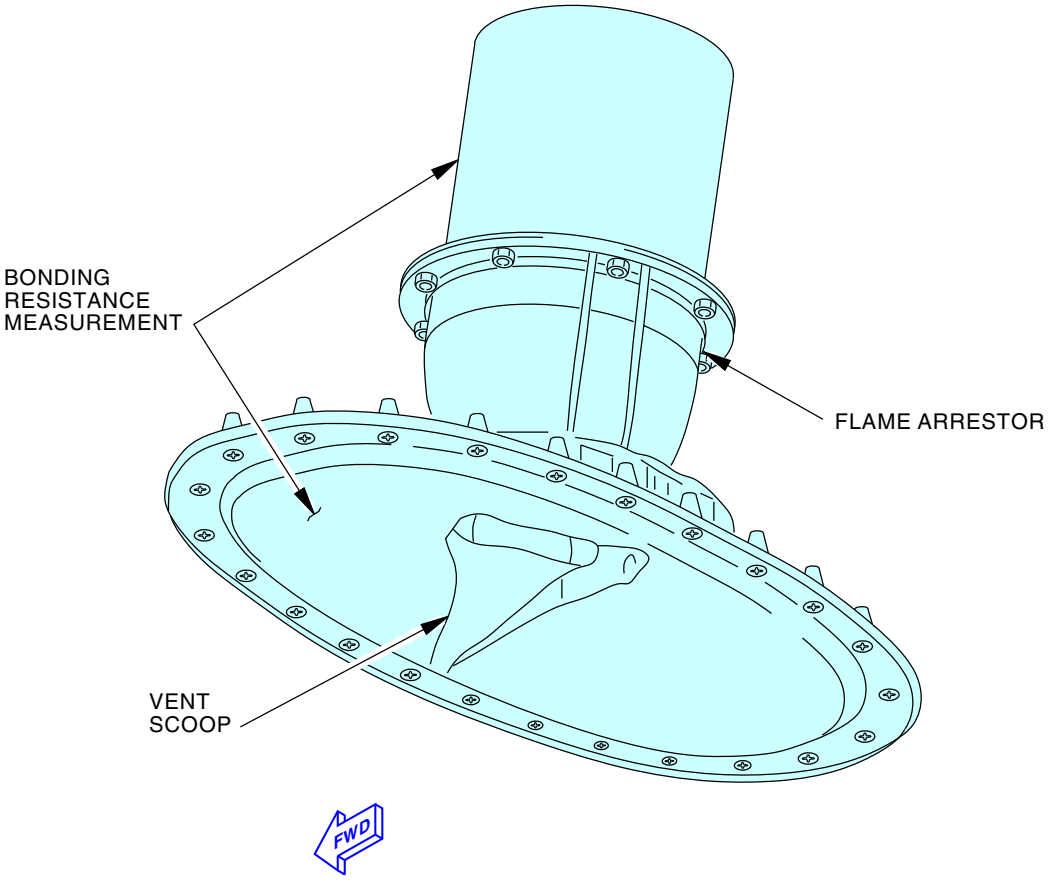
END OF TASK

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Vent Scoop Assembly - Bonding Resistance Measurement
Figure 601/28-13-06-990-801 (Sheet 1 of 2)

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VENT SCOOP ACCESS DOOR ASSEMBLY

A

1367958 S0000246848_V4

Vent Scoop Assembly - Bonding Resistance Measurement
Figure 601/28-13-06-990-801 (Sheet 2 of 2)

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PRESSURE REFUELING SYSTEM - ADJUSTMENT/TEST

1. General

A. This procedure contains two tasks. The first task in an operational test of the pressure refueling system. The second task is a leak test of the refuel/jettison and fuel feed manifolds.

(1) The operational test does an electrical and operational check of the refuel shutoff valves, integrated refuel panel (IRP), overfill system and the volumetric shutoff function.

(2) The refuel/jettison and fuel feed manifold leak test makes sure the refuel/jettison manifold, fuel feed manifold, drain valves, couplings, refuel valves and check valves do not leak.

TASK 28-21-00-710-801

2. Operational Test - Pressure Refueling System

(Figure 501)

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
08-21-00-580-801	Make the Airplane Level (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
28-21-01-000-801	Refuel Adapter - Removal (P/B 401)
28-21-01-400-801	Refuel Adapter - Installation (P/B 401)

B. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing

C. Access Panels

Number	Name/Location
521DB	Refueling Station Door

D. Prepare For Test

(Figure 503)

SUBTASK 28-21-00-860-017

(1) Adjust the airplane attitude to -0.7° ± 0.25° nose down and 0° ±0.25° roll (TASK 08-21-00-580-801).

SUBTASK 28-21-00-910-001

WARNING YOU MUST ELECTRICALLY GROUND AND BOND THE AIRPLANE BEFORE YOU DO REFUEL SYSTEM MAINTENANCE. THE RELEASE OF STATIC ELECTRICITY CAN CAUSE A FIRE OR EXPLOSION.

(2) Do these steps to correctly ground and bond the airplane:

(a) Electrically ground the airplane to an approved ground.

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(b) Electrically ground the fueling truck to an approved ground.

(c) Electrically bond the fueling truck to the airplane.

SUBTASK 28-21-00-860-001

CAUTION

DO NOT REMOVE ELECTRICAL POWER WHILE REFUELING. IF YOU REMOVE ELECTRICAL POWER WHILE REFUELING, THE REFUELING VALVES WILL CLOSE AND CAN DAMAGE EQUIPMENT.

(3) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-21-00-860-002

(4) Make sure that these circuit breakers are closed:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
C	7	C28626	RFLNG VLVS GND
D	7	C28603	RFLNG CTRL GND
D	8	C28622	RFLNG QTY GND

Right Power Management Panel, P210

Row	Col	Number	Name
L	1	C28625	FUEL QTY 1

Standby Power Management Panel, P310

Row	Col	Number	Name
A	11	C28005	RFLNG DR LTS
G	10	C28624	FUEL QTY 2
J	8	C28600	RFLNG CTRL
J	9	C28601	RFLNG VLVS
J	10	C28637	DFUEL VLVS
J	11	C28623	RFLNG QTY

SUBTASK 28-21-00-040-001

WARNING

DO NOT OPERATE THE LEADING EDGE SLAT SYSTEM. THE LEADING EDGE SLATS CAN MOVE QUICKLY AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(5) Put a DO-NOT-OPERATE tag on the flap control lever, in the flight compartment (TASK 27-81-00-440-801).

SUBTASK 28-21-00-210-009

(6) Make sure that the FUEL JETTISON L(R) NOZZLE valve switch-lights, on the Fuel Jettison Panel (P5 Overhead Panel), are in the closed position.

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E. Operational Test of the Pressure Refueling System

(Figure 502)

SUBTASK 28-21-00-010-001

WARNING

DO NOT PUT GROUND EQUIPMENT BELOW THE WINGTIPS DURING THE REFUELING OPERATION. THE WEIGHT OF THE FUEL WILL CAUSE THE WINGS TO MOVE DOWN AND THE WINGTIPS MOVE THE MOST. BECAUSE THE FUEL TANKS ARE VENTED THROUGH THE WINGTIPS, A DANGEROUS AND EXPLOSIVE MIXTURE AROUND THE WINGTIP CAN OCCUR.

WARNING

DO NOT OPERATE THE HF COMMUNICATION SYSTEM DURING REFUELING OPERATIONS. A FIRE OR EXPLOSION CAN OCCUR.

(1) Open this access door:

(TASK 06-44-00-800-802)

Number	Name/Location
521DB	Refueling Station Door

SUBTASK 28-21-00-210-001

(2) Make sure the fuel quantity displays (FQD) are on.

(a) The FQD will come on within 60 seconds after you open the Refueling Station Door, 521DB.

SUBTASK 28-21-00-860-003

(3) Make sure the REFUEL/DEFUEL handle for each refuel adapter is in the FUEL position.

SUBTASK 28-21-00-480-004

WARNING

YOU MUST ELECTRICALLY BOND THE AIRPLANE TO THE REFUELING SOURCE CORRECTLY BEFORE YOU REFUEL THE AIRPLANE. THE RELEASE OF STATIC ELECTRICITY CAN CAUSE A FIRE OR EXPLOSION.

(4) Connect the bonding cable at the refueling station.

NOTE: Static grounding of the airplane by positive grounding means is not necessary when performing pressure refueling or pressure defueling of the airplane. Electrical bonding between the airplane and the refueling vehicle is required.

NOTE: Static grounding of the airplane by positive grounding means is required when performing maintenance activities using devices such as lights, power tools, and instruments powered from external electrical power sources.

SUBTASK 28-21-00-480-005

WARNING

MAKE SURE THAT THERE IS NO TENSION ON THE HOSE. THE HOSE MUST HANG FREELY FROM THE REFUEL ADAPTER, WITH NO FORCE ON IT. TENSION ON THE HOSE CAN CAUSE DAMAGE TO THE FUEL RECEPTACLE AND CAUSE THE HOSE TO DISCONNECT. INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

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(WARNING PRECEDES)

CAUTION DO NOT USE MORE THAN 55 PSI FUEL PRESSURE AT THE FUELING NOZZLE. IF YOU USE MORE THAN 55 PSI FUEL PRESSURE, YOU CAN CAUSE DAMAGE TO THE REFUELING SYSTEM COMPONENTS.

(5) Connect the fueling nozzles to one or more of the refuel adapters.

(a) Make sure that the refuel adapter is clean, not damaged and there are no fuel leaks.

1) Make sure that the screws and lugs are not loose or damaged.

(b) If there is a problem with the refuel adapter, replace the refuel adapter (TASK 28-21-01-000-801 and TASK 28-21-01-400-801).

(c) Connect the fueling nozzle to the refuel adapter.

SUBTASK 28-21-00-860-004

(6) Push the TEST IND switch, on the Integrated Refuel Panel (IRP) P28, to do a test of the load select indicators and blue valve position lights.

ARO 001-010

SUBTASK 28-21-00-210-002

(7) Make sure that the correct test patterns (###.#) show on the FQD and load select display (LSD) on the IRP P28.

NOTE: A checker-board pattern will show on the FQD and the LSD for 2 seconds, the opposite pattern will show for 2 seconds, and then the displays will go off for 2 seconds. The test patterns will show one more time and then the FQD and LSD will return to their usual condition.

ARO 011-999

SUBTASK 28-21-00-210-011

(8) Make sure that all LEDs show on the FUEL QTY displays and the LOAD SEL displays on the IRP.

NOTE: All LEDs will show on the FUEL QTY displays and the LOAD SEL displays for 2 seconds, then the dot matrix LEDs will go off for 4 seconds, and then come on for 2 seconds. Each time after the dot matrix LEDs go off, the LB/KG/RM/LM/CT/TF LEDs stay on for 2 seconds and then go off. After the test, the LEDs for each FUEL QTY display and LOAD SEL display will return to their usual condition.

ARO ALL

SUBTASK 28-21-00-210-003

(9) Make sure that the blue light on each PRESS TO TEST button comes on, then goes off.

NOTE: This tests the light bulb in the refuel valve position indication.

SUBTASK 28-21-00-860-006

(10) Put the POWER switch, on the IRP P28, to the BATT position.

SUBTASK 28-21-00-860-007

(11) Push and release each PRESS TO TEST button for these refuel valve lights:

(a) RIGHT MAIN OUTBD

(b) RIGHT MAIN INBD

(c) CENTER RIGHT

(d) CENTER LEFT

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(e) LEFT MAIN INBD

(f) LEFT MAIN OUTBD.

SUBTASK 28-21-00-210-004

(12) Make sure that the blue light on each PRESS TO TEST button comes on and then goes off.

NOTE: This tests the light bulb in the refuel valve position indication.

SUBTASK 28-21-00-860-008

(13) Put the POWER switch to the NORMAL position.

SUBTASK 28-21-00-860-009

(14) Set the fuel quantity, on the IRP P28, for each fuel tank as follows:

(a) Set the thumbwheel switches of the LOAD SELECT QTY to 42.9.

(b) Push the LOAD SELECT SET switch for the right main fuel tank for 1 second and release it.

(c) Make sure 42.9 shows on the load select display (LSD) for the right main fuel tank.

(d) Set the thumbwheel switches of the LOAD SELECT QTY to 42.9.

(e) Push the LOAD SELECT SET switch for the center fuel tank for 1 second and release it.

(f) Make sure 42.9 shows on the LSD for the center fuel tank.

(g) Set the thumb wheel switches of the LOAD SELECT QTY to 42.9.

(h) Push the LOAD SELECT SET switch for the left main fuel tank for 1 second and release it.

(i) Make sure 42.9 shows on the LSD for the left main fuel tank.

(j) Push each LOAD SELECT SET switch for 1 second and release, to remove the value from the LSD.

1) Make sure that each LSD goes off.

SUBTASK 28-21-00-860-010

(15) Set the TOTAL/BACKUP FUEL QTY as follows:

(a) Set the thumbwheel switches of the LOAD SELECT QTY to 80.0.

(b) Push the TOTAL LOAD SELECT SET switch for the TOTAL/BACKUP display for 1 second and release it.

NOTE: The total fuel quantity is the sum of all the fuel tanks. If the total quantity selected is more than the main fuel tanks capacity, the main tanks will fill to full and the center fuel tank will fill with the fuel that remains. All fuel tanks will start to fuel at the same time.

(c) Make sure total fuel quantity is divided between the right, center and left LSD.

(d) Push the TOTAL LOAD SELECT SET switch to remove the values from the total LSD and LSD.

1) Make sure that each LSD goes off.

SUBTASK 28-21-00-650-001

(16) Start the fueling source.

SUBTASK 28-21-00-860-011

(17) To open the refuel shutoff valves, do the steps that follow:

(a) Put the RIGHT MAIN REFUEL VALVE CONTROL switch to the OPEN position.

(b) Put the CENTER REFUEL VALVE CONTROL switch to the OPEN position.

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(c) Put the LEFT MAIN REFUEL VALVE CONTROL switch to the OPEN position.

(d) Make sure each blue refuel valve light comes on.

SUBTASK 28-21-00-210-005

(18) Monitor the fuel quantity on the FQD.

SUBTASK 28-21-00-730-001

(19) Push the TEST SYSTEM switch, IRP P28, to do a refueling system test.

NOTE: If you push the TEST SYSTEM switch during the refueling procedure, it causes the FQIS processor to test the pressure refueling system. The FQIS processor does a load select test, and a full tank shutoff test. After these tests are done, the refuel shutoff valves close in sequence. The refuel shutoff valves then open, and refueling continues.

SUBTASK 28-21-00-210-006

(20) Make sure that these PRESS TO TEST buttons for the refuel valve lights goes off:

(a) RIGHT MAIN OUTBD

(b) RIGHT MAIN INDB

(c) CENTER RIGHT

(d) CENTER LEFT

(e) LEFT MAIN INBD

(f) LEFT MAIN OUTBD

SUBTASK 28-21-00-210-007

(21) Make sure that the blue light on each refuel valve light comes on.

SUBTASK 28-21-00-710-001

(22) For an overfill test, do the steps that follow:

(a) Push the OVERFILL TEST switch on the IRP, P28.

(b) Make sure that the OVERFILL IND light comes on.

(c) Make sure that the blue light on each refuel valve light goes off.

NOTE: This shows that the refuel shutoff valves are closed.

(d) Set the OVERFILL RESET switch to the RESET position on the IRP, P28.

(e) Set the OVERFILL RESET switch to the NORMAL position on the IRP, P28.

(f) Make sure that the OVERFILL IND light goes off.

(g) Make sure that the blue light on each refuel valve light comes on.

NOTE: This shows that the refuel valves are open.

SUBTASK 28-21-00-211-001

(23) For a test of the secondary refuel valves, do the steps that follow:

NOTE: To do a test of the secondary refuel valve at nominal ground attitude, the center tank fuel quantity should be less than 162,000 lb (73,482 kg).

(a) Monitor the refuel rate for the center tank.

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1) Make sure the secondary refuel valves open.

NOTE: The secondary refuel valves increase the rate of refuel. At 35 psig (241 kPa), the refuel rate should be approximately 550 gpm (2082 l/min) with both secondary refuel valves operating. Without either secondary refuel valve, the refuel rate at 35 psig (241 kPa) would be approximately 400 gpm (1514 l/min)

2) Make sure the refuel rate slows when the center tank contains between 172,000 lb (78,018 kg) and 182,000 lb (82,554 kg).

NOTE: The secondary refuel valve float valves close the secondary refuel valves at 95% of the volumetric shutoff (VSO). The fuel limit values are based on a nominal ground attitude of 0.54 degrees nose down pitch and 0.0 degree roll.

NOTE: At 35 psig (241 kPa), the refuel rate should slow from approximately 550 gpm (2082 l/min) to approximately 400 gpm (1514 l/min). It is acceptable for the refuel to slow in steps if the secondary refuel valve on one side closes before the other.

SUBTASK 28-21-00-700-002

(24) When refueling stops at volumetric shutoff (VSO) for each tank, do the steps that follow:

NOTE: Wait 10 seconds after the refuel valves close to make sure fueling is complete. The refuel valves can open and refueling can continue if the fuel tank is not full.

NOTE: If the fuel quantity is not between the limits that follow, take a fuel sample from the applicable fuel tank and get a density measurement of the fuel. Calculate the fuel quantity with this formula:

FUEL QTY =

[0.816/(MEASURED DENSITY (KGS/LITER))] * [ACTUAL FUEL QTY]

The calculated FUEL QTY for the applicable tank is OK if the fuel quantity is within the limits that follow.

(a) Make sure the airplane is within the specified ground attitude and tolerances.

(b) Make sure the fuel quantity for the tanks are as follows:

1) Center tank is between 83.7 and 84.9 (X 1000) KGS

2) Left main tank is between 31.6 and 32.2 (X 1000) KGS

3) Right main tank is between 31.6 and 32.2 (X 1000) KGS

SUBTASK 28-21-00-860-015

(25) Set these refuel valve control switches to the CLOSE position:

(a) RIGHT MAIN REFUEL VALVE CONTROL

(b) CENTER REFUEL VALVE CONTROL

(c) LEFT MAIN REFUEL VALVE CONTROL

SUBTASK 28-21-00-080-004

(26) Disconnect the fueling nozzles.

SUBTASK 28-21-00-080-005

(27) Disconnect the bonding cable from the refueling station, if installed.

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SUBTASK 28-21-00-410-001

(28) Close this access door:

(TASK 06-44-00-800-802)

Number	Name/Location
521DB	Refueling Station Door

SUBTASK 28-21-00-910-002

(29) Do these steps to remove the ground and bond cables from the airplane:

(a) Remove the fuel truck bonding cable from the airplane.

(b) Disconnect the grounding cable from the airplane.

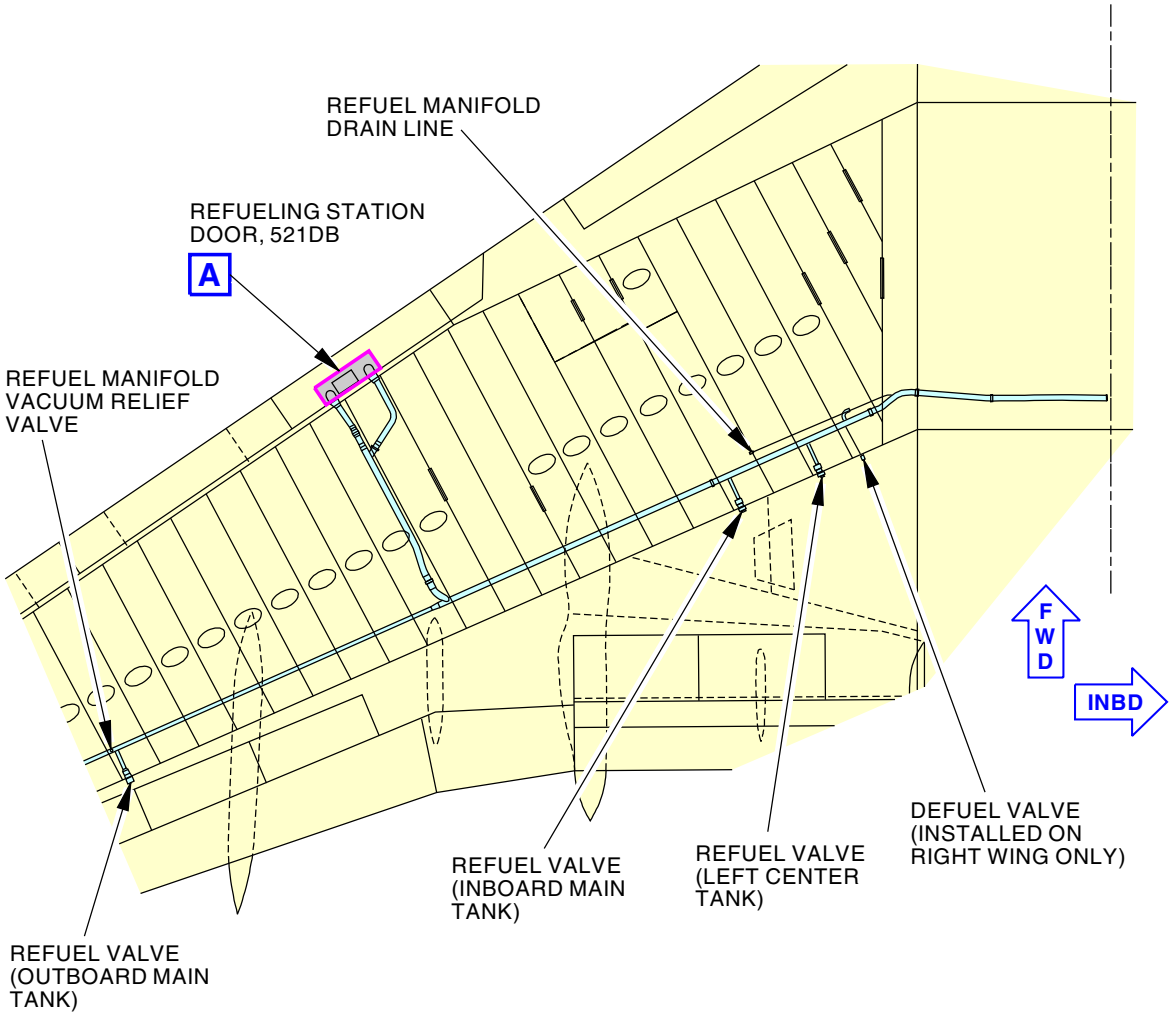
(c) Disconnect the grounding cable for the fueling truck.

SUBTASK 28-21-00-040-002

(30) Remove the DO-NOT-OPERATE tag from the flap control lever (TASK 27-81-00-440-801).

——— END OF TASK ———

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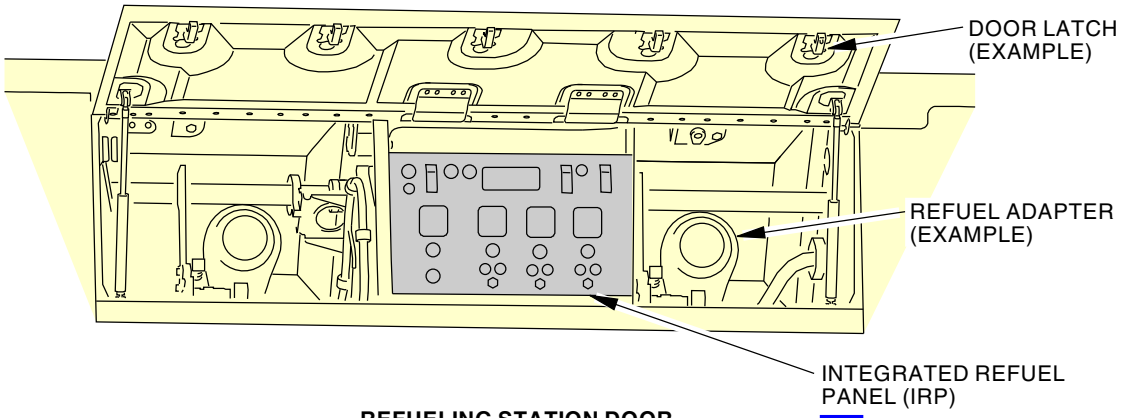


LEFT WING
(TOP VIEW)
(RIGHT WING IS ALMOST THE SAME)

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Pressure Refueling System
Figure 501/28-21-00-990-801 (Sheet 1 of 2)

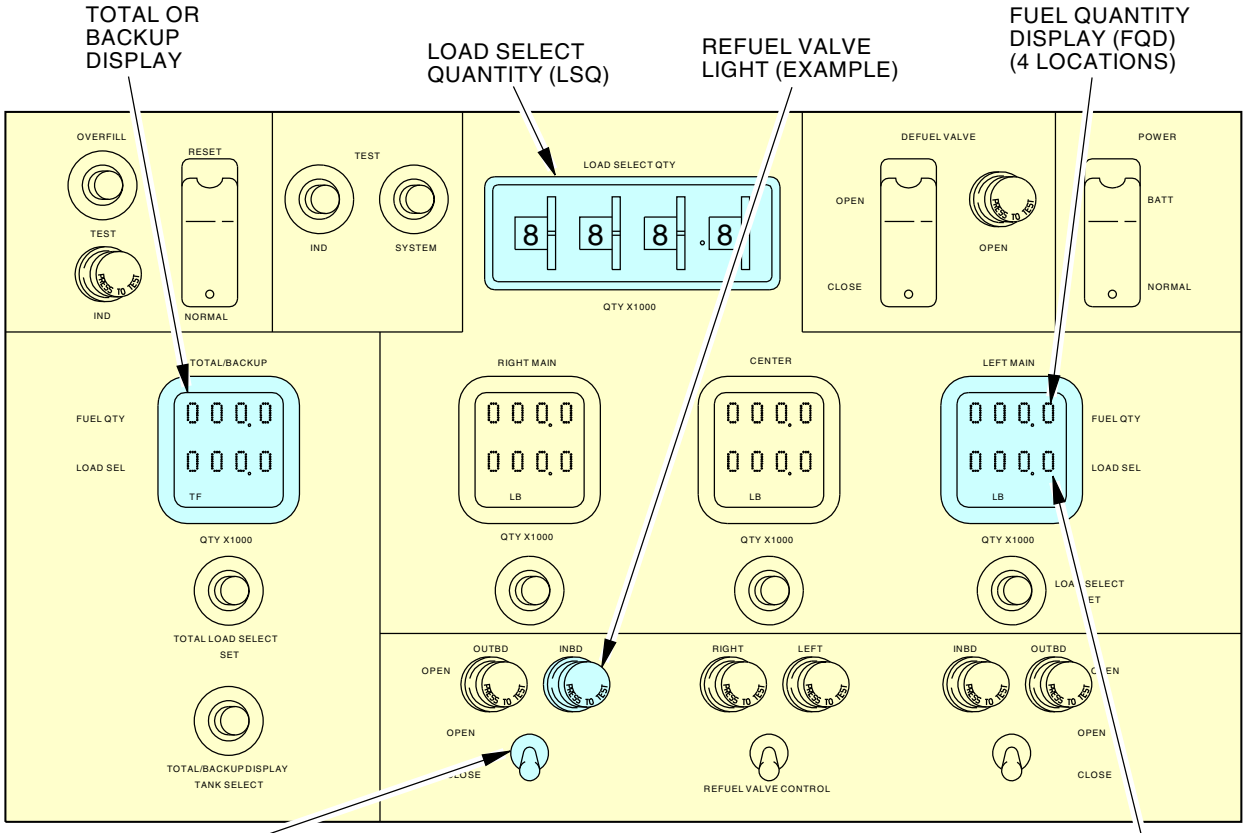
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REFUELING STATION DOOR

A

B



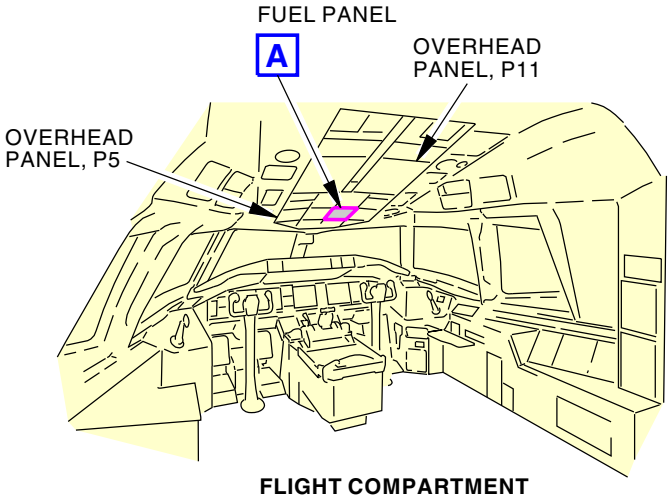
INTEGRATED REFUEL PANEL (IRP)

B

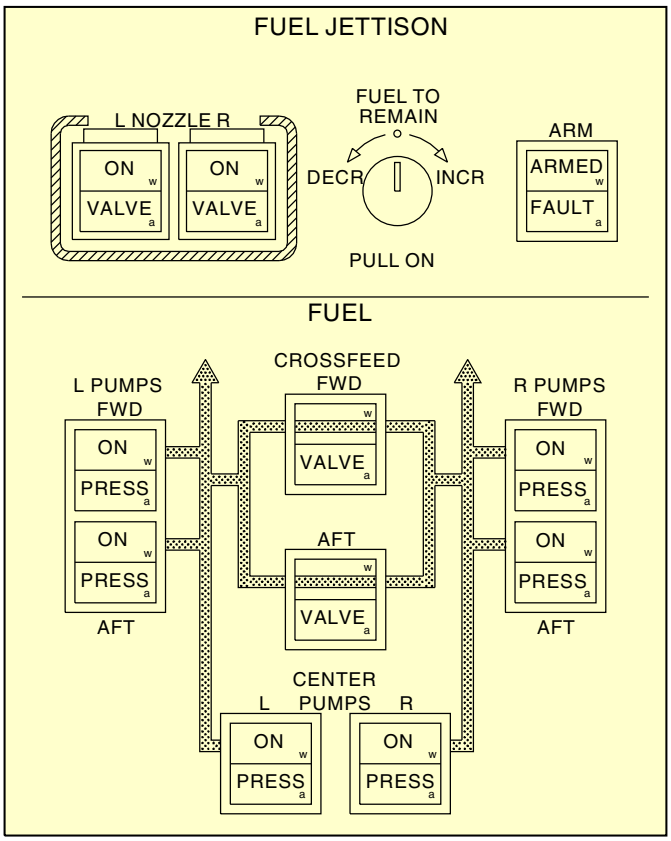
E07865 S0006414985_V2

Pressure Refueling System
Figure 501/28-21-00-990-801 (Sheet 2 of 2)

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FLIGHT COMPARTMENT



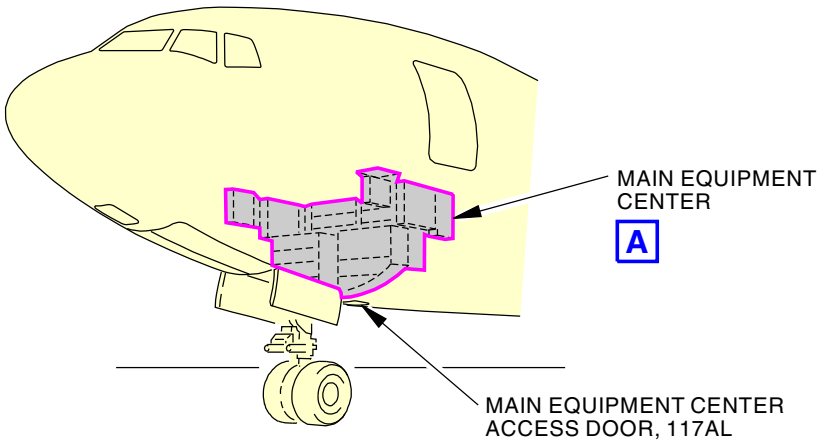
FUEL PANEL, M28001

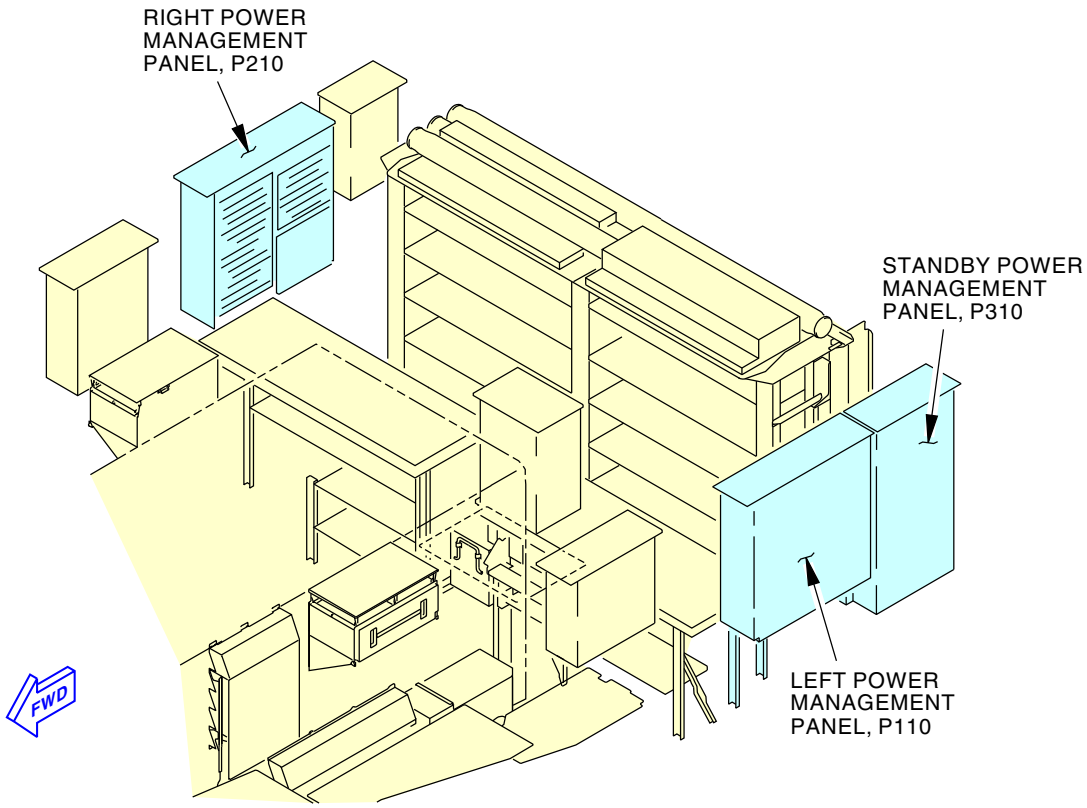
A

E07870 S0006414986_V2

Fuel Panel
Figure 502/28-21-00-990-802

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MAIN EQUIPMENT CENTER

A

E07871 S0006414987_V2

Main Equipment Center
Figure 503/28-21-00-990-803

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TASK 28-21-00-790-802

3. Refuel/Jettison and Fuel Feed Manifold - Leak Test

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
12-11-01-650-801	Pressure Refueling (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-21-01-000-801	Refuel Adapter - Removal (P/B 401)
28-21-01-400-801	Refuel Adapter - Installation (P/B 401)
28-21-08-400-802	Refuel/Jettison Manifold and Couplings - Installation (Selection) (P/B 401)
28-22-15-000-802-001	Fuel Line, Fitting and Coupling - Removal (P/B 401)
28-22-15-400-802-001	Fuel Line, Fitting and Coupling - Installation (P/B 401)
28-22-15-790-802-001	Engine Fuel Feed Manifold, Spar and Crossfeed Valve - Leak Check (P/B 601)
28-26-00-650-801	Pressure Defueling (P/B 201)
71-00-00-800-836-H00	Dry Motor (P/B 201)

B. Location Zones

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing

C. Access Panels

Number	Name/Location
521DB	Refueling Station Door

D. Prepare For Test

SUBTASK 28-21-00-860-012

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-21-00-860-018

(2) Make sure that the L and R FUEL CONTROL switches, on the P10 Control Stand, are in the CUTOFF position.

NOTE: This step makes sure the fuel spar valves are closed.

SUBTASK 28-21-00-210-010

(3) Make sure that the FUEL JETTISON L(R) NOZZLE valve switch-lights, on the Fuel Jettison Panel (P5 Overhead Panel), are in the closed position.

SUBTASK 28-21-00-860-013

(4) Make sure that all fuel pump switch-lights, on the Fuel Panel (P5 Overhead Panel), are in the off position.

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SUBTASK 28-21-00-040-003

WARNING DO NOT OPERATE THE LEADING EDGE SLATS. ACCIDENTAL SLAT OPERATION COULD CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(5) Put a DO-NOT-OPERATE tag on the flap control lever, in the flight compartment (TASK 27-81-00-440-801).

SUBTASK 28-21-00-010-002

(6) Open the refueling station door, installed on the left wing (TASK 06-44-00-800-802).

Open this access door:

Number	Name/Location
521DB	Refueling Station Door

SUBTASK 28-21-00-860-014

(7) Make sure the REFUEL/DEFUEL handle for each refuel adapter is in the FUEL position.

SUBTASK 28-21-00-910-003

WARNING YOU MUST ELECTRICALLY GROUND AND BOND THE AIRPLANE BEFORE YOU DO MAINTENANCE ON THE FUEL SYSTEM. IF YOU DO NOT GROUND AND BOND THE AIRPLANE, STATIC ELECTRICITY CAN CAUSE A FIRE OR EXPLOSION.

(8) Do these steps to correctly ground and bond the airplane:

(a) Electrically ground the airplane to an approved ground.

(b) Electrically ground the fueling truck to an approved ground.

(c) Electrically bond the fueling truck to the airplane.

SUBTASK 28-21-00-480-006

WARNING MAKE SURE THAT THERE IS NO TENSION ON THE HOSE. THE HOSE MUST HANG FREELY FROM THE REFUEL ADAPTER, WITH NO FORCE ON IT. TENSION ON THE HOSE CAN CAUSE DAMAGE TO THE FUEL RECEPTACLE AND CAUSE THE HOSE TO DISCONNECT. INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(9) Attach the fueling nozzles to the refuel adapters (TASK 12-11-01-650-801).

(a) Make sure that the refuel adapter is clean, not damaged and there are no fuel leaks.

1) Make sure that the screws and lugs are not loose or damaged.

(b) If there is a problem with the refuel adapter, replace the refuel adapter (TASK 28-21-01-000-801 and TASK 28-21-01-400-801).

E. Procedure

SUBTASK 28-21-00-720-003

WARNING DO NOT KEEP FUEL PRESSURE ON THE FUEL FEED MANIFOLD FOR MORE THAN 30 MINUTES. PRESSURE IN THE FUEL FEED MANIFOLD CAN CAUSE FUEL LEAKAGE INTO THE COMBUSTION CHAMBER AND TURBINE CASE. THIS CAN CAUSE A FIRE.

(1) Do these steps to test the refuel/jettison and fuel feed manifolds:

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(a) Put the DEFUEL VALVE switch, on the integrated refuel panel (IRP) P28, to the OPEN position.

NOTE: This step connects the refuel manifold with the engine fuel feed manifold.

(b) Make sure that the DEFUEL VALVE OPEN indication light comes on.

(c) Push the FUEL CROSSFEED FWD and AFT switch-lights, on the Fuel Panel (P5 Overhead Panel), to the open position.

(d) Start the fueling source at 32.5 ±2.5 psig (224.1 ±17.3 kPa) nozzle pressure.

(e) Hold the pressure at a minimum of 25 psi (172 kPa) nozzle pressure, after the pressure has stabilized.

(f) Make sure the leakage is not more than 1.5 gal (5.7 l) for 5 minutes, as shown on the fueling source flowmeter.

1) If the system does not leak more than 1.5 gal (5.7 l) in 5 minutes the system is OK.

2) If the system leaks more than 1.5 gal (5.7 l) in 5 minutes, continue and do the leak test for the refuel/jettison manifold only.

NOTE: This will isolate which manifold leaks.

(g) Remove the pressure from the fueling source.

(h) Put the RIGHT MAIN REFUEL VALVE CONTROL switch, on the IRP P28, to the OPEN position.

NOTE: The open refuel valve will help remove pressure from the refuel manifold. Wait approximately five minutes for the pressure to decrease.

(i) Put the RIGHT MAIN REFUEL VALVE CONTROL switch to the CLOSE position.

(j) Put the DEFUEL VALVE switch to the CLOSE position.

NOTE: This step isolates the refuel manifold from the engine fuel feed manifold.

(k) Make sure the defuel valve indication light goes off.

SUBTASK 28-21-00-720-004

(2) To do a test of the refuel/jettison manifold only, do these steps:

(a) Start the fueling source at 32.5 ±2.5 psig (224.1 ±17.3 kPa) nozzle pressure.

(b) Hold the pressure at a minimum of 25 psi (172 kPa) nozzle pressure.

(c) When the fuel pressure has stabilized, make sure the leakage is not more than 1.5 gal (5.7 l) in 5 minutes, as shown on the flowmeter.

(d) Remove the pressure from the fueling source.

(e) If the refuel/jettison manifold does not leak more than 1.5 gal (5.7 l) in 5 minutes, the refuel/jettison manifold is OK.

1) To find a leak in the fuel feed manifold, do this task: Engine Fuel Feed Manifold, Spar and Crossfeed Valve - Leak Check, TASK 28-22-15-790-802-001.

(f) If the refuel/jettison manifold leaks more than 1.5 gal (5.7 l) in 5 minutes, there is a leak in the refuel/jettison manifold.

1) To isolate a leak in the refuel/jettison manifold, do these steps:

2) Do a check for fuel leaks on the left and right jettison nozzles.

3) Defuel all of the fuel tanks (TASK 28-26-00-650-801).

4) Remove the fueling nozzles from the refuel adapters.

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5) To pressurize the refuel/jettison manifold with air and inspect the refuel/jettison manifold for leaks, do these steps:

a) Put the DEFUEL VALVE switch to the OPEN position.

NOTE: This will connect the refuel/jettison manifold with the fuel feed manifold.

b) Remove electrical power (TASK 24-22-00-860-806).

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

c) Do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

d) Pressurize the manifolds as shown in Test 1, in the task: Engine Fuel Feed Manifold, Spar and Crossfeed Valve - Leak Check, TASK 28-22-15-790-802-001.

NOTE: With the defuel valve in the open position the air pressure will pressurize the fuel feed and refuel/jettison manifolds.

e) Go into the applicable fuel tank to inspect the refuel/jettison manifold for leaks.

NOTE: The drain valves in the refuel/jettison manifold will leak a small quantity of air. This is normal operation for the drain valves and does not indicate a bad drain valve.

NOTE: For a description of the refuel/jettison manifold refer to Refuel/Jettison Manifold and Couplings - Installation (Selection), TASK 28-21-08-400-802.

6) Repair any leaks that you find (TASK 28-22-15-000-802-001, TASK 28-22-15-400-802-001).

7) Do this task: Fuel Tank Closure, TASK 28-11-00-410-801.

8) Put the DEFUEL VALVE switch to the CLOSE position.

9) Supply electrical power (TASK 24-22-00-860-805).

10) Do the leak test for the refuel/jettison manifold only, to make sure the refuel/jettison manifold does not leak.

SUBTASK 28-21-00-868-001

(3) Do this task: Dry Motor, TASK 71-00-00-800-836-H00.

NOTE: This task removes any unburned fuel from the engine.

F. Put the Airplane Back to its Usual Condition

SUBTASK 28-21-00-860-016

(1) Push the FUEL CROSSFEED FWD and AFT switch-lights, on the Fuel Panel (P5 Overhead Panel), to the close position.

SUBTASK 28-21-00-080-006

(2) Remove the fueling nozzles from the refuel adapters.

SUBTASK 28-21-00-910-004

(3) Do these steps to remove the ground and bond cables from the airplane:

(a) Remove the fuel truck bonding cable from the airplane.

(b) Disconnect the grounding cable from the airplane, if it is necessary.

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(c) Disconnect the grounding cable for the fueling truck.

SUBTASK 28-21-00-410-002

(4) Close the refueling station door, installed on the left wing (TASK 06-44-00-800-802).

Close this access doorl:

Number	Name/Location
521DB	Refueling Station Door

SUBTASK 28-21-00-040-004

(5) Remove the DO-NOT-OPERATE tag from the flap control lever (TASK 27-81-00-440-801).

——— END OF TASK ———

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PRESSURE FUELING SYSTEM - INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure contains instructions to do a check of the refuel receptacle adapter.

(1) If there is fuel leakage or damage at the refuel adapter, it must be replaced.

C. This procedure also contains a functional check of the bonding resistance between the structure and the refuel receptacle.

TASK 28-21-00-750-801

2. Refuel Receptacle Adapter Check

(Figure 601, Figure 602)

A. References

Reference	Title
28-21-01-000-802	Inlet Adapter - Removal (P/B 401)
28-21-01-400-802	Inlet Adapter - Installation (P/B 401)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-8626	Wear Gage - Inlet Adapter Part #: 61657-2 Supplier: 0DT23

C. Location Zones

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing

D. Access Panels

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

E. Procedure

SUBTASK 28-21-00-010-003

(1) Open the applicable pressure refuel station access doors:

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

SUBTASK 28-21-00-210-008

(2) Do these steps to make sure the refuel adapter is clean and does not have any damage:

(a) Examine the inlet adapter to make sure each of the screws that attach the inlet adapter is not loose or damaged.

(b) Examine the inlet adapter for bent or cracked lugs.

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(c) Do a detailed visual examination of the cylinder area within 0.5 in. (12.7 mm) circumferentially on each side of each lug for cracks.

1) The examination area includes the inside and outside surfaces of the inlet adapter from the bottom of the adapter flange to the shear groove.

(d) If there are problems with the inlet adapter, replace the inlet adapter (“flange”). These are the tasks: Inlet Adapter - Removal, TASK 28-21-01-000-802, Inlet Adapter - Installation, TASK 28-21-01-400-802.

SUBTASK 28-21-00-750-001

(3) Make sure the flange of the adapter is in these limits (Figure 601):

NOTE: Use of the wear gage, COM-8626, is recommended to measure these limits (Figure 602).

(a) The thickness of the three lugs of the flange is more than 0.224 in. (5.690 mm) (View E).

(b) The width of the three lugs of the flange is more than 0.425 in. (10.795 mm) (View E).

(c) The three slots of the flange must not be worn to more than the maximum width of 0.305 in. (7.747 mm) (View D).

SUBTASK 28-21-00-220-001

(4) If you use the wear gage, COM-8626, to measure the dimensions of the flange, do these steps (Figure 602):

(a) Do these steps to measure the dimensions of the slot:

1) Put the gage on the adapter, near one lug so that the gage cap and center pin face away from the adapter, towards you.

2) Make sure the adapter groove in the opposite face of the gage (the face towards the adapter, away from you) fits on the rim of the adapter and moves smoothly along the rim.

3) There are two lines on the face of the adapter towards you to help you line up the groove with the adapter rim.

4) The center pin must protrude out of the gage cap towards you.

5) Slide the gage around the rim toward the opposite lug until the center pin goes into the slot.

a) If the adapter is OK, you will only hear a slight click and only get a slight feeling of resistance when the pin touches the slot. The pin will not move significantly into the slot. The pin will continue to protrude from the gage cap.

b) If the adapter is not OK, you will feel more resistance when the pin enters the slot. The pin will be flush with the gage cap or lower than the gage cap.

c) When the pin is in the slot, do a check to make sure the pin continues to protrude from the gage cap to see if the pin has not significantly entered the slot.

<1> If the pin continues to protrude from the gage cap, then the slot is okay.

<2> If the pin is flush with the gage cap or lower than the gage cap, then the slot is not okay. Replace the inlet adapter (“flange”).

6) Do this same check for the other two slots on the inlet adapter (“flange”).

(b) To measure the thickness of the adapter lugs, use the smaller of the two notches provided on the gage.

1) Try to pass the smaller of the two notches across one of the lugs.

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2) If the gage will pass completely across the lug, then the lug has less than the minimum thickness.

a) Replace the inlet adapter (“flange”). These are the tasks: Inlet Adapter - Removal, TASK 28-21-01-000-802, Inlet Adapter - Installation, TASK 28-21-01-400-802.

3) If the gage will not pass across the lug, then the lug is okay.

a) Do this same check for the other two lugs

(c) To measure the thickness of the adapter lugs, use the larger of the two notches provided on the gage.

1) Try to seat the gage onto the lug through the larger notch.

2) If you can seat the gage onto the lug through the larger notch, then the lug has less than the minimum width.

a) Replace the inlet adapter (“flange”). These are the tasks: Inlet Adapter - Removal, TASK 28-21-01-000-802, Inlet Adapter - Installation, TASK 28-21-01-400-802.

3) If you can not seat the gage onto the lug through the larger notch, then the lug is okay.

a) Do this same check for the other two lugs.

SUBTASK 28-21-00-960-001

(5) If the flange of the adapter is not in the correct limits, replace the inlet adapter (“flange"). These are the tasks: Inlet Adapter - Removal, TASK 28-21-01-000-802, Inlet Adapter - Installation, TASK 28-21-01-400-802.

F. Put the Airplane Back to the Usual Condition

SUBTASK 28-21-00-860-019

CAUTION

MAKE SURE THAT THE DEFUEL LEVER IS IN THE CORRECT POSITION, IN THE RECESS ON THE REFUEL RECEPTACLE ADAPTER. IF THE DEFUEL LEVER IS NOT IN THE CORRECT POSITION, YOU CAN CAUSE DAMAGE TO THE REFUEL RECEPTACLE ASSEMBLY.

(1) Make sure the defuel lever is correctly positioned in the recess for refuel adapter.

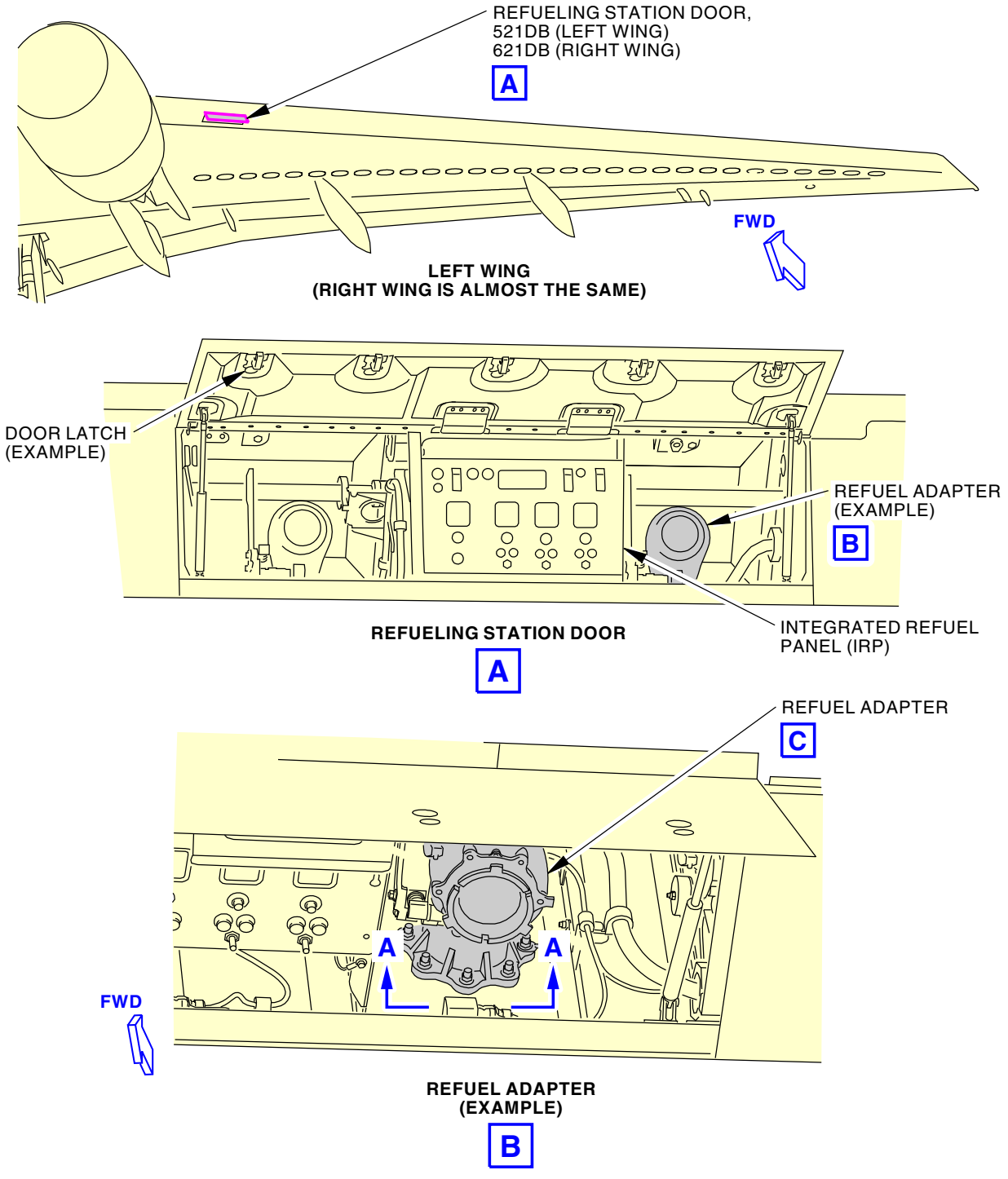
SUBTASK 28-21-00-410-003

(2) Close the applicable access doors:

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

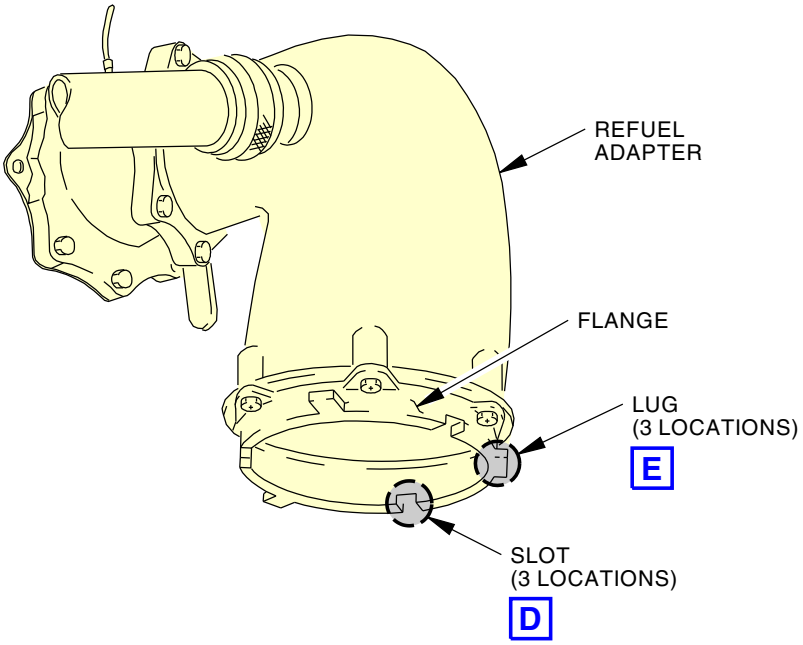
END OF TASK

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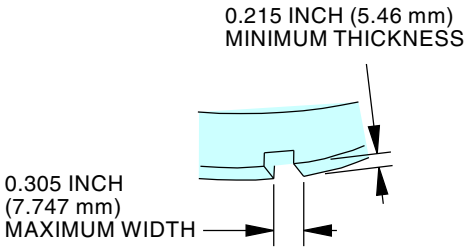
Refuel Adapter Inspection
Figure 601/28-21-00-990-805 (Sheet 1 of 2)

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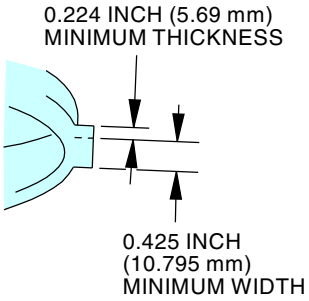
**REFUEL ADAPTER
(EXAMPLE)**

C



**SLOT
(3 LOCATIONS)**

D



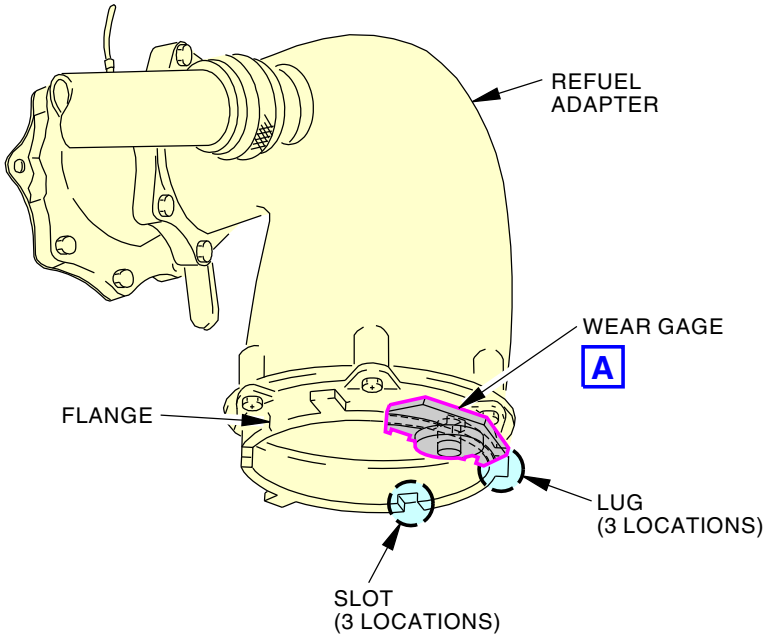
**LUG
(3 LOCATIONS)**

E

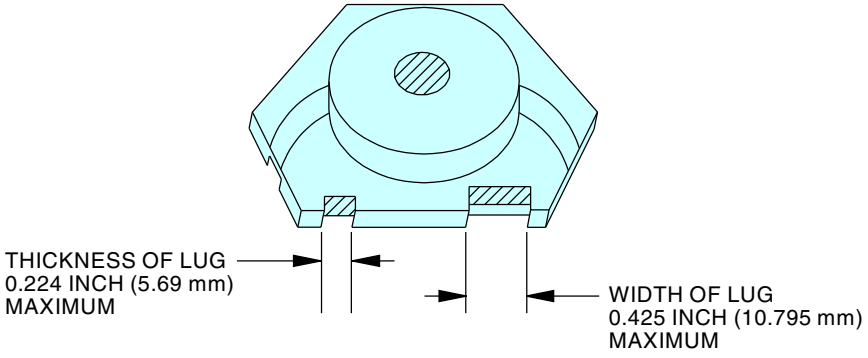
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**Refuel Adapter Inspection
Figure 601/28-21-00-990-805 (Sheet 2 of 2)**

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**REFUEL ADAPTER
(EXAMPLE)**



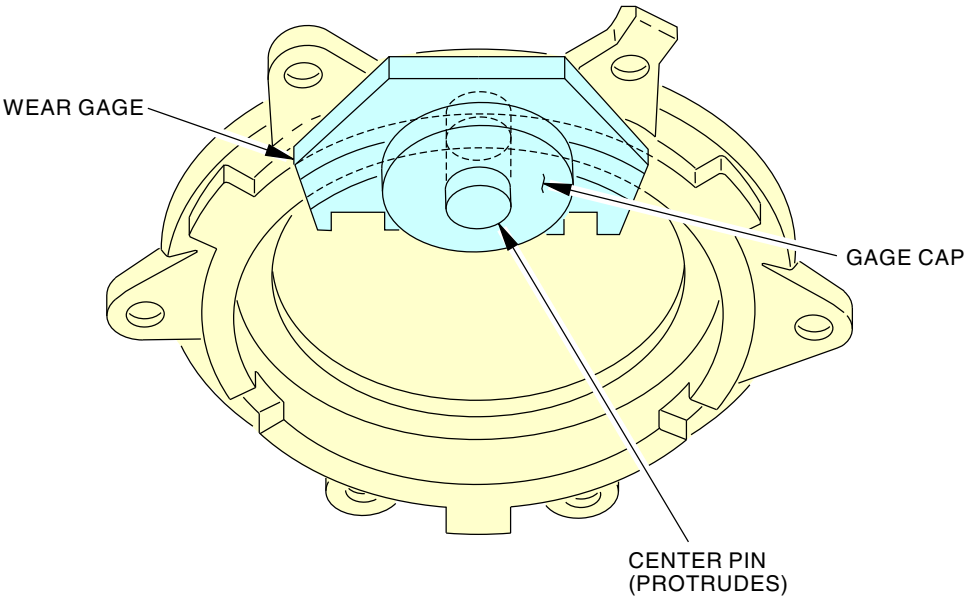
**WEAR GAGE
(DIMENSIONS)**

A

W69660 S0000128257_V2

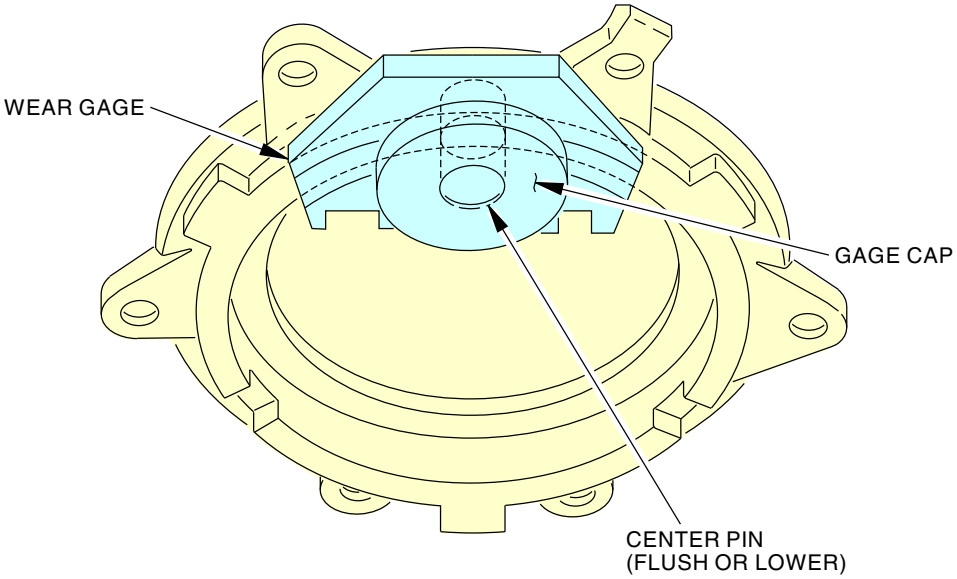
**Refuel Adapter Wear Gage
Figure 602/28-21-00-990-806 (Sheet 1 of 3)**

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WEAR GAGE
(SLOT OK)

A



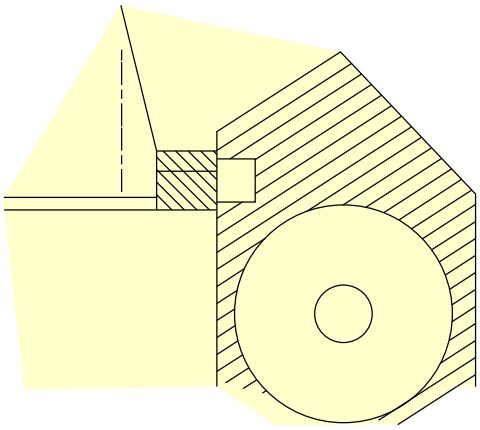
WEAR GAGE
(SLOT NOT OK)

A

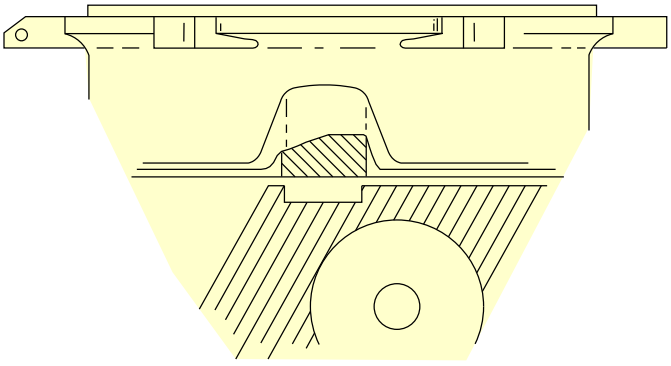
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Refuel Adapter Wear Gage
Figure 602/28-21-00-990-806 (Sheet 2 of 3)

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CHECKING ADAPTER LUG THICKNESS



CHECKING ADAPTER LUG WIDTH

W69728 S0000128265_V2

Refuel Adapter Wear Gage
Figure 602/28-21-00-990-806 (Sheet 3 of 3)

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SFAR 88

TASK 28-21-00-200-801

3. Refuel Receptacle - Bonding Resistance Check

(Figure 603)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Location Zones

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing

D. Access Panels

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

E. Procedure

SUBTASK 28-21-00-010-004

(1) Open these access doors:

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

SUBTASK 28-21-00-765-001

(2) Use an intrinsically safe approved bonding meter, COM-1550, to measure the bonding resistance between the subsequent components on the inboard refuel receptacle (SWPM 20-20-00):

(a) Measure the bonding resistance between the refuel receptacle and the spar.

1) Make sure the resistance is 0.005 ohm (5 milliohms) or less.

(b) Measure the bonding resistance between the bonding jumper and the spar.

1) Make sure the resistance is 0.010 ohm (10 milliohms) or less.

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SUBTASK 28-21-00-765-002

(3) Use an intrinsically safe approved bonding meter, COM-1550, to measure the bonding resistance between these components on the outboard refuel receptacle (SWPM 20-20-00):

(a) Measure the bonding resistance between the refuel receptacle and the spar.

1) Make sure the bonding resistance is 0.005 ohm (5 milliohms) or less.

(b) Measure the bonding resistance between the bonding jumper and the spar.

1) Make sure the bonding resistance is 0.010 ohm (10 milliohms) or less.

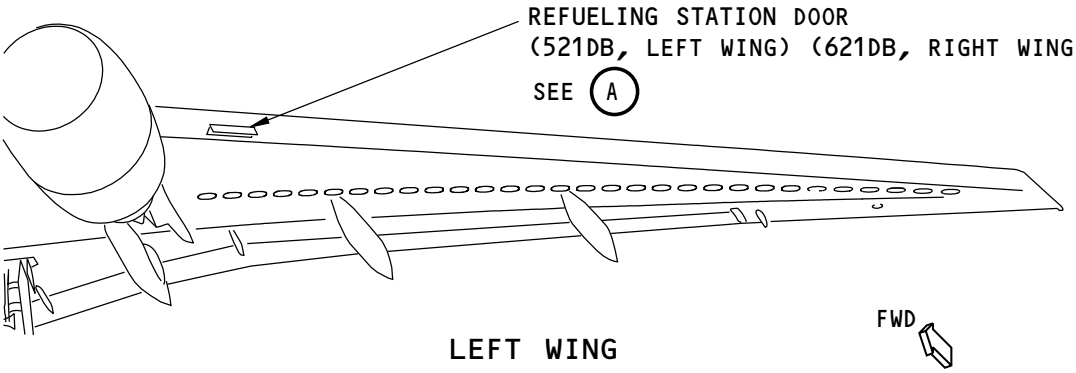
SUBTASK 28-21-00-410-004

(4) Close these access doors:

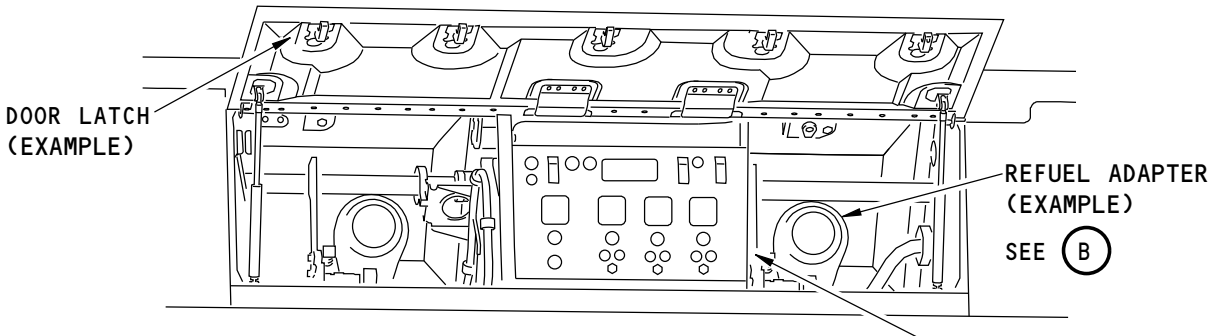
Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

——— END OF TASK ———

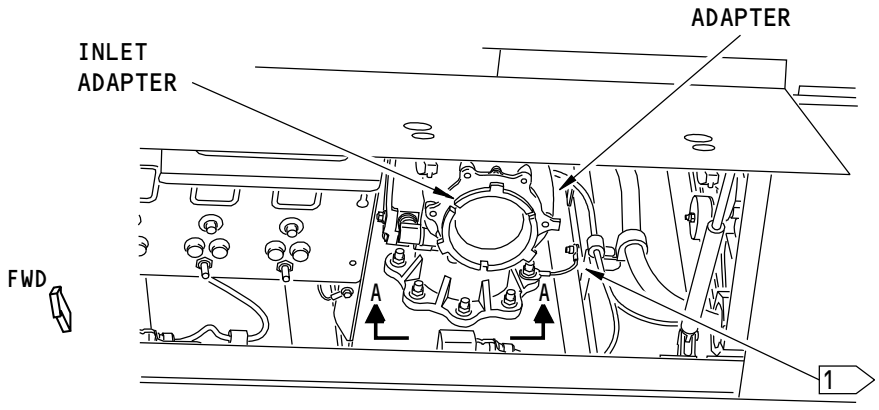
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LEFT WING
(RIGHT WING IS ALMOST THE SAME)



REFUELING STATION DOOR
A



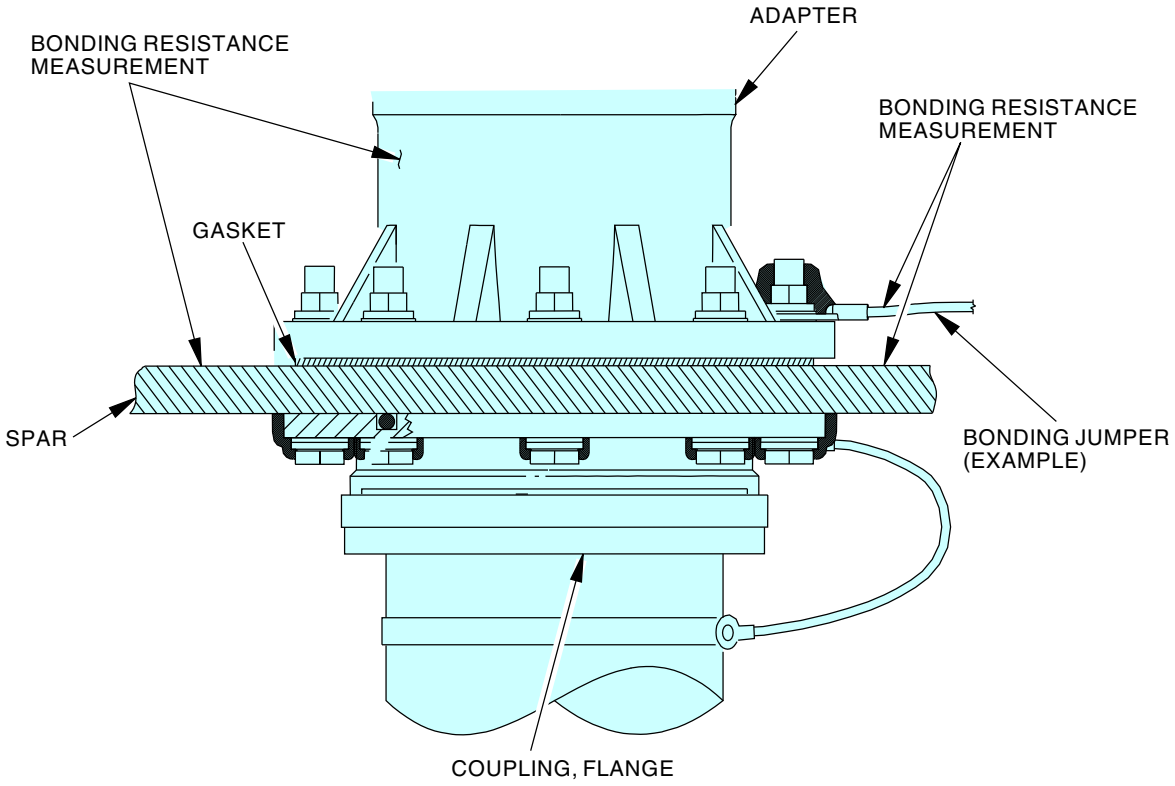
1 THE BONDING JUMPER IS INSTALLED AT THE 3 O'CLOCK POSITION ON THE LEFT WING. THE BONDING JUMPER IS INSTALLED AT THE 9 O'CLOCK POSITION ON THE RIGHT WING (IF INSTALLED)

REFUEL ADAPTER
(EXAMPLE)
B

1366444 S0000246878_V1

Refuel Receptacle - Bonding Resistance Measurement
Figure 603/28-21-00-990-807 (Sheet 1 of 2)

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A-A

1366479 S0000246880_V2

Refuel Receptacle - Bonding Resistance Measurement
Figure 603/28-21-00-990-807 (Sheet 2 of 2)

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REFUEL ADAPTER - REMOVAL/INSTALLATION

1. General

A. Two refuel adapters attach to the front spar aft of leading edge slat No. 6 on the left wing. The refuel adapters are installed at the refueling station P28.

B. Two refuel adapters attach to the front spar aft of leading edge slat No. 6 on the right wing.

C. This procedure contains these tasks:.

(1) Refuel Adapter - Removal

(2) Refuel Adapter - Installation

(3) Inlet Adapter - Removal

(4) Inlet Adapter - Installation

ARO ALL; AIRPLANES WITH SWEENEY 56-2500-2 OR 56-2500-3 REFUEL ADAPTER

(5) Poppet Valve Assembly - Removal

ARO ALL; AIRPLANES WITH INTERTECHNIQUE K97B63-601 REFUEL ADAPTER

(6) Poppet Valve Assembly - Removal

ARO ALL; AIRPLANES WITH SWEENEY 56-2500-2 OR 56-2500-3 REFUEL ADAPTER

(7) Poppet Valve Assembly - Installation

ARO ALL; AIRPLANES WITH INTERTECHNIQUE K97B63-601 REFUEL ADAPTER

(8) Poppet Valve Assembly - Installation

ARO ALL

TASK 28-21-01-000-801

2. Refuel Adapter - Removal

(Figure 401)

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
28-00-00-200-801	Inspection of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-00-00-960-801	Replacement of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

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C. Access Panels

Number	Name/Location
521DB	Refueling Station Door
533FB	Access Door
533GB	Access Door
621DB	Refueling Station Door
633FB	Access Door
633GB	Access Door

D. Procedure

SUBTASK 28-21-01-020-008

(1) If you only need to remove the inlet adapter [19], do this task: Inlet Adapter - Removal, TASK 28-21-01-000-802.

NOTE: Do not remove the inlet adapter [19] if you will remove the adapter [4].

SUBTASK 28-21-01-860-001

(2) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-21-01-860-005

WARNING DO NOT OPERATE THE LEADING EDGE SLATS. ACCIDENTAL SLAT OPERATION COULD CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Put a DO-NOT-OPERATE tag on the flap control lever, in the flight compartment.

SUBTASK 28-21-01-010-001

(4) Open the applicable access panel:

(TASK 06-44-00-800-802)

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

SUBTASK 28-21-01-080-002

(5) Put the REFUEL/DEFUEL handle on the refuel adapters to the defuel position.

SUBTASK 28-21-01-650-001

WARNING OBEY ALL DEFUELING PRECAUTIONS AND PROCEDURES. FAILURE TO OBEY ALL DEFUELING PRECAUTIONS AND PROCEDURES COULD CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(6) To defuel the main fuel tanks (and drain the refuel manifold), do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-21-01-860-002

(7) Put the DEFUEL VALVE switch on the integrated refuel panel, P28, to the CLOSE position.

SUBTASK 28-21-01-860-003

(8) Attach a DO-NOT-OPERATE tag to the DEFUEL VALVE switch.

SUBTASK 28-21-01-860-006

(9) Attach a DO-NOT-OPERATE tag to the JETTISON ARM switch, on the Overhead Panel P5.

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SUBTASK 28-21-01-650-003

WARNING OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. FAILURE TO OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS COULD CAUSE DAMAGE TO EQUIPMENT AND INJURY TO PERSONS.

(10) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-21-01-010-006

(11) To get access to the applicable refuel adapter, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(a) Remove this access panel for the left inboard refuel adapter:

Number	Name/Location
533FB	Access Door

(b) Remove this access panel for the left outboard refuel adapter:

Number	Name/Location
533GB	Access Door

(c) Remove this access panel for the right inboard refuel adapter:

Number	Name/Location
633FB	Access Door

(d) Remove this access panel for the right outboard refuel adapter:

Number	Name/Location
633GB	Access Door

SUBTASK 28-21-01-020-001

(12) Disconnect the coupling nut [33].

(a) Discard the o-ring [14].

SUBTASK 28-21-01-020-009

(13) Remove the bolt [1], bolt [7], bolt [9],washer [2], washer [8], washer [10], packing [11], nut [3], nut [12], and disconnect bonding jumper [5] and bonding jumper [6] that attach the adapter [4] to the front spar.

NOTE: Before removing the fasteners, make a record of which fasteners on the outside of the tank contain sealant. The adapter must be re-installed in the same orientation with sealant on the applicable fasteners.

(a) Discard the packing [11].

SUBTASK 28-21-01-020-002

(14) Remove the adapter [4], gasket [16], coupling flange [32] and o-ring [15].

(a) Discard the gasket [16] and o-ring [15].

SUBTASK 28-21-01-210-003

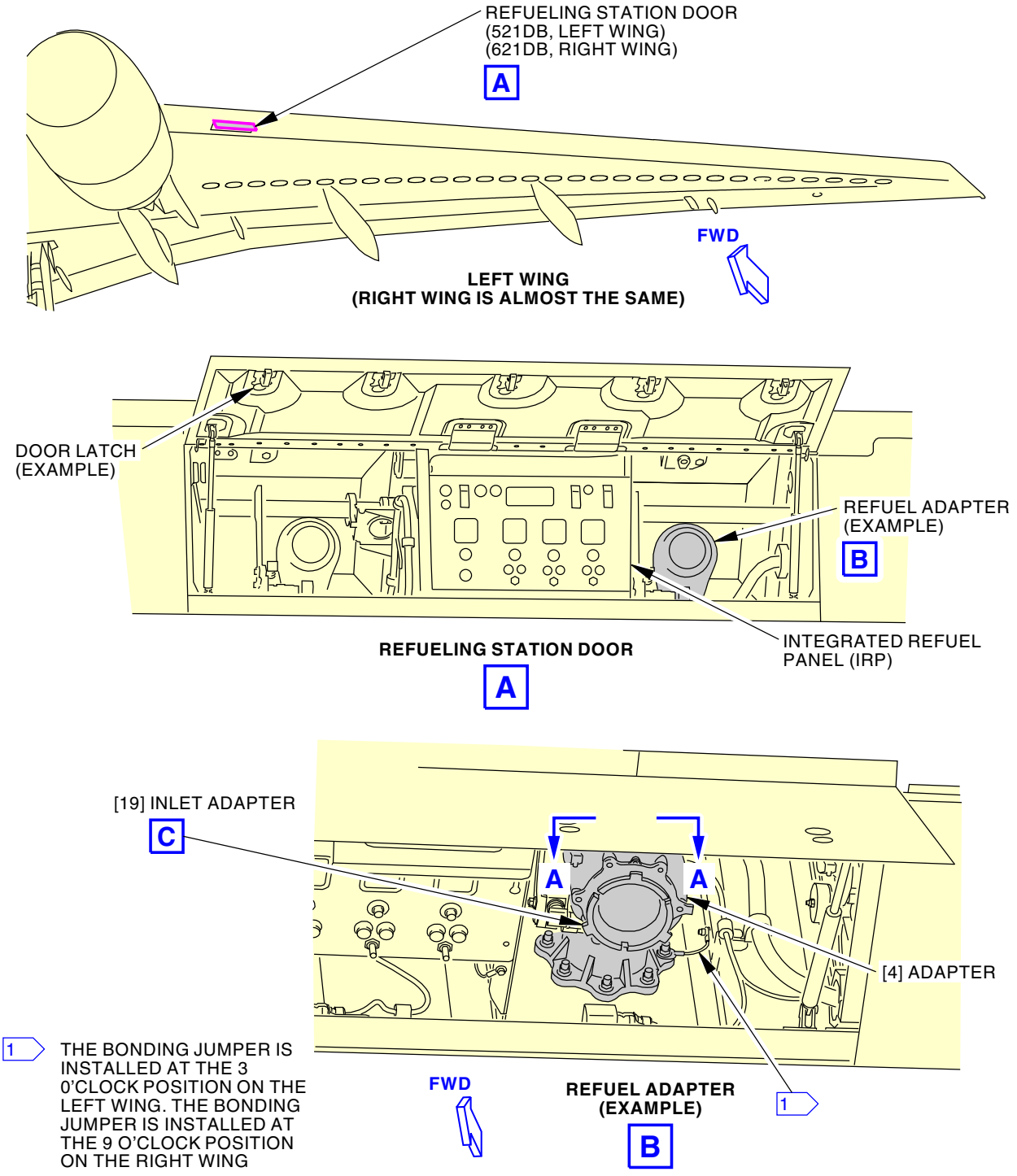
(15) Do a check of the bonding jumper; do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(a) Replace the bonding jumper as necessary. To replace the bonding jumper, do this task: Replacement of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-960-801.

NOTE: There are two acceptable bonding jumper configurations, see Figure 401.

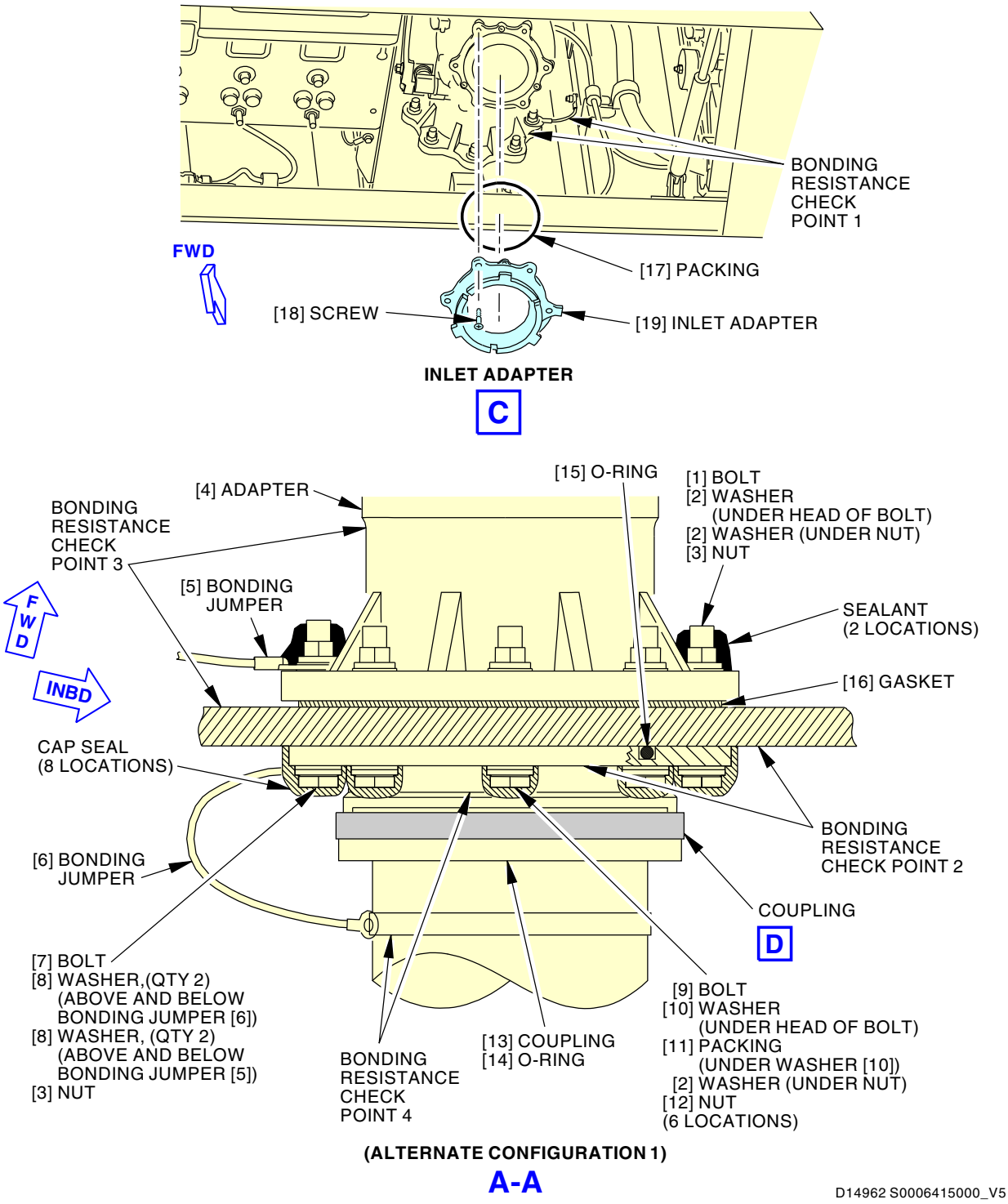
END OF TASK

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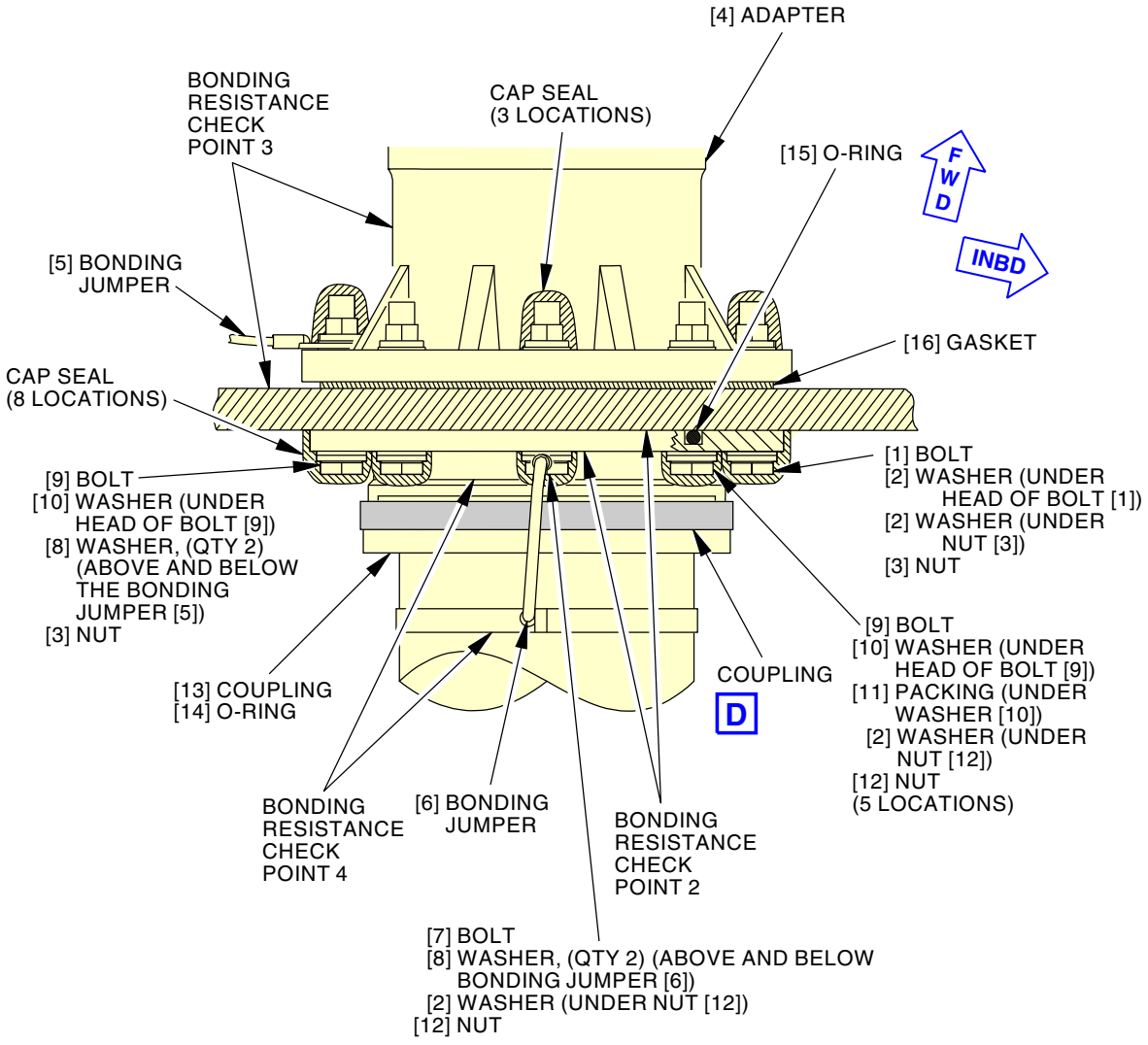
Refuel Adapters Installation
Figure 401/28-21-01-990-801 (Sheet 1 of 4)

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Refuel Adapters Installation
Figure 401/28-21-01-990-801 (Sheet 2 of 4)

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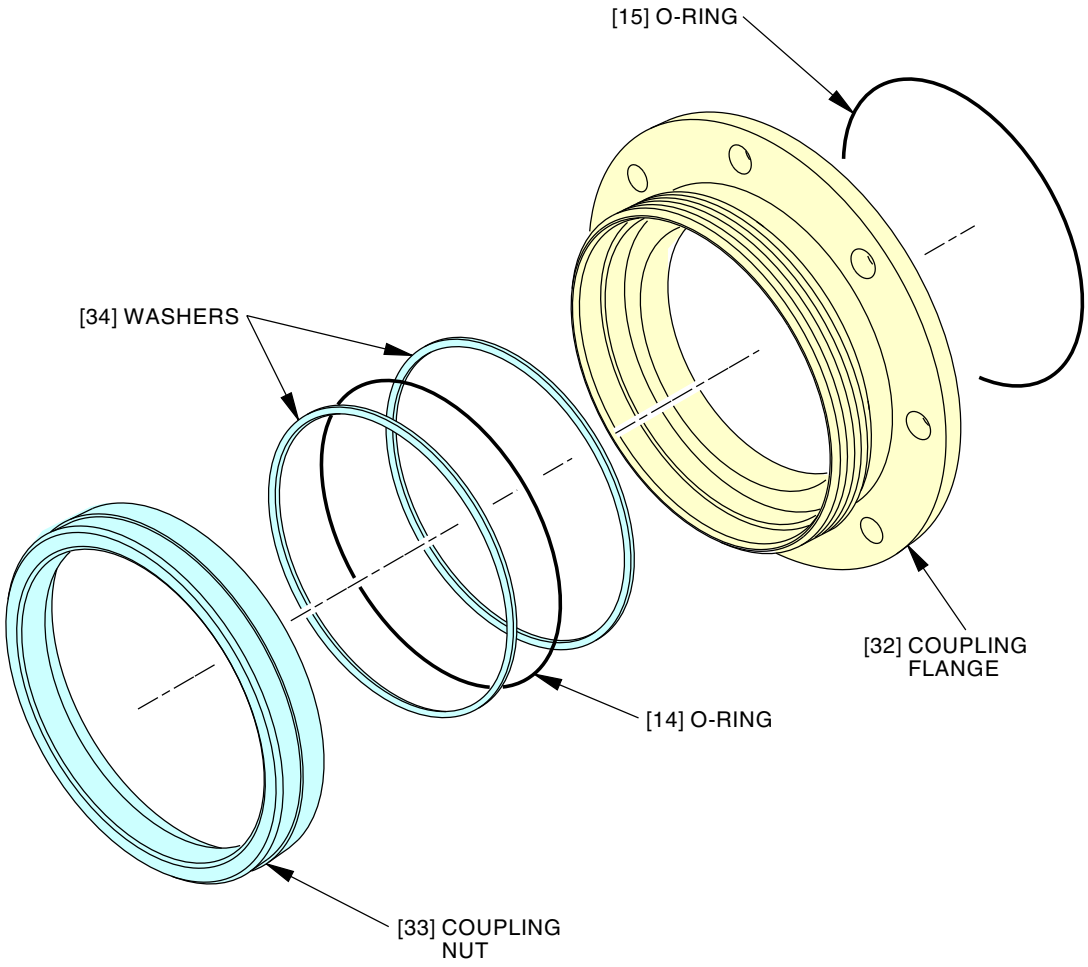
(ALTERNATE CONFIGURATION 2)

A-A

1437173 S0000259304_V5

Refuel Adapters Installation
Figure 401/28-21-01-990-801 (Sheet 3 of 4)

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COUPLING

D

1660154 S0000301852_V2

Refuel Adapters Installation
Figure 401/28-21-01-990-801 (Sheet 4 of 4)

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TASK 28-21-01-400-801

3. Refuel Adapter - Installation

(Figure 401)

A. General

(1) For applying sealants in the fuel tank structure(s), it is acceptable to use sealant, A50303, as an alternative to sealant, A00767, for Class A and B non-faying seal applications:

(a) sealant, A50153, and sealant, A50301, are mutually interchangeable.

(b) sealant, A50110, and sealant, A50302, are mutually interchangeable.

(c) sealant, A50153, cannot be used in combination with sealant, A50302, and sealant, A50301, cannot be used with sealant, A50110.

B. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
12-11-01-650-807	Pressure Refueling - With No SET Fuel Quantity (P/B 301)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
28-00-00-960-801	Replacement of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-11-00-300-802	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-00-790-801	Fuel Leak Detection Procedures (P/B 601)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-22-15-400-802-001	Fuel Line, Fitting and Coupling - Installation (P/B 401)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

D. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142 Type II
A50110	Sealant	BMS5-45 Class B-2
A50153	Sealant - Fuel Tank - Class A-2	BMS5-45 Class A-2
A50301	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168 Type I Class A-2

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(Continued)

Reference	Description	Specification
A50302	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168 Type I Class B-2
A50303	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168
D00504	Grease - Petrolatum	VV-P-236

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
11	Packing	28-21-01-05-065	ARO ALL
		28-21-01-10-065	ARO ALL
13	Coupling	28-21-01-10-090	ARO ALL
14	O-ring	28-21-51-20-101	ARO ALL
		28-21-51-21-150	ARO ALL
15	O-ring	28-21-01-05-085	ARO ALL
		28-21-01-10-085	ARO ALL
16	Gasket	28-21-01-05-080	ARO ALL
		28-21-01-10-080	ARO ALL

F. Location Zones

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

G. Access Panels

Number	Name/Location
521DB	Refueling Station Door
533FB	Access Door
533GB	Access Door
621DB	Refueling Station Door
633FB	Access Door
633GB	Access Door

H. Procedure

SUBTASK 28-21-01-650-004

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-21-01-010-007

(2) Have one person go into the main fuel tank, and one person go out of the tank to install refuel adapter.

SUBTASK 28-21-01-960-001

(3) Replace the bonding jumpers as necessary (TASK 28-00-00-960-801).

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SUBTASK 28-21-01-100-001

(4) Prepare the front spar surfaces that touch the adapter [4] and the coupling [13] for an electrical bond.

SUBTASK 28-21-01-640-001

(5) Apply a thin layer of petrolatum grease, D00504, to a new o-ring [15] and a new gasket [16].

SUBTASK 28-21-01-420-001

(6) With one person inside the fuel tank and one person out of the fuel tank, align the adapter [4] and gasket [16] with the coupling flange [32] and o-ring [15] on the front spar.

SUBTASK 28-21-01-020-010

(7) Install the bolt [1], bolt [7], bolt [9], washer [2], washer [8], washer [10], new packings [11], nut [3], nut [12], bonding jumper [5] and bonding jumper [6] that attach the adapter [4] and coupling flange [32] to the front spar.

SUBTASK 28-21-01-020-011

(8) Measure these bonding resistances with a bonding intrinsically safe approved bonding meter, COM-1550:

(a) Make sure the bonding resistance between the adapter [4] and the structure at the connection of bonding jumper [5], bonding resistance check point 1, is less than 0.01 ohm (10 milliohms) (Figure 401, View C).

(b) Make sure the bonding resistance between the coupling flange [32] and the front spar, bonding resistance check point 2, is less than 0.001 ohm (1 milliohm) (Figure 401, Sectional View A-A).

(c) Make sure the bonding resistance between the adapter [4] and the front spar, bonding resistance check point 3, is less than 0.0025 ohm (2.5 milliohms) (Figure 401, Sectional View A-A).

(d) Make sure the bonding resistance between the coupling flange [32] and the refuel tube near the connection of bonding jumper [6], bonding resistance check point 4, is less than 0.001 ohm (1 milliohm) (Figure 401, Sectional View A-A).

SUBTASK 28-21-01-020-003

(9) Do these steps to connect the coupling [13] (TASK 28-22-15-400-802-001):

(a) Apply thin layer of petrolatum grease, D00504, to a new o-ring [14].

(b) Install the coupling nut [33], washers [34], and o-ring [14] on the coupling flange [32]].

(c) Install lockwire to the coupling [13] (TASK 20-10-23-400-801).

SUBTASK 28-21-01-020-004

(10) Apply sealant as follows (Figure 401):

NOTE: For equivalent sealants refer to (TASK 28-11-00-300-802).

(a) Apply a cap seal of sealant, A00767 (or equivalent), to each bolt [1], bolt [7], and bolt [9] on the inside of the fuel tank (TASK 28-11-00-300-802).

(b) Apply a fillet or cap seal of sealant, A02315, to the bolt [7] out of the fuel tank with the bonding jumper [6] (TASK 28-11-00-300-802).

(c) If the bolt [9] has a bonding jumper [5], apply a fillet or cap seal of sealant, A02315, to the bolt [9] and nut [12] out of the fuel tank (TASK 28-11-00-300-802).

(d) Apply a fillet seal of sealant, A00767 (or equivalent), between the coupling flange [32] and the front spar, on the inside of the fuel tank (TASK 28-11-00-300-802).

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(e) Apply a cap seal of sealant, A02315, to the bolt [1] and nut [3] on the outside of the tank (TASK 28-11-00-300-802).

SUBTASK 28-21-01-860-004

(11) Remove the DO-NOT-OPERATE tag from the DEFUEL VALVE switch on the integrated refuel panel, P28.

SUBTASK 28-21-01-860-007

(12) Remove the DO-NOT-OPERATE tag from the JETTISON ARM switch on the Overhead Panel P5.

SUBTASK 28-21-01-410-002

(13) To install an access door that follows, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

(a) Install this access panel for the left inboard refuel adapter:

Number	Name/Location
533FB	Access Door

(b) Install this access panel for the left outboard refuel adapter:

Number	Name/Location
533GB	Access Door

(c) Install this access panel for the right inboard refuel adapter:

Number	Name/Location
633FB	Access Door

(d) Install this access panel for the right outboard refuel adapter:

Number	Name/Location
633GB	Access Door

SUBTASK 28-21-01-650-002

(14) Do one of these steps to make sure that there is no fuel leakage at the front spar connection for the refuel adapter:

(a) Fill the applicable tank to its full capacity (Volumetric Shutoff) (TASK 12-11-01-650-807).

(b) Do the Air Pressure and Bubble Solution (Backblowing) leak check procedure for the refuel adapter (TASK 28-11-00-790-801).

SUBTASK 28-21-01-210-001

(15) Make sure there are no fuel leaks at the front spar connection for the refuel adapter.

SUBTASK 28-21-01-210-002

(16) Make sure there are no fuel leaks at the applicable access door.

SUBTASK 28-21-01-410-001

(17) Close these access panels:

(TASK 06-44-00-800-802)

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

SUBTASK 28-21-01-860-008

(18) Remove the DO-NOT-OPERATE tag from the flap control lever, in the flight compartment.

END OF TASK

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TASK 28-21-01-000-802

4. Inlet Adapter - Removal

(Figure 401)

A. General

(1) This procedure can be used to remove the inlet adapter without the removal of the complete refuel adapter. Do not remove the inlet adapter [19] if you will remove the adapter [4].

B. References

Reference	Title
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)

C. Location Zones

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

D. Procedure

SUBTASK 28-21-01-860-009

WARNING DO NOT OPERATE THE LEADING EDGE SLATS. ACCIDENTAL SLAT OPERATION COULD CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Put a DO-NOT-OPERATE tag on the flap control lever, in the flight compartment TASK 27-81-00-040-801

ARO ALL; AIRPLANES WITH SWEENEY 56-2500-2 OR 56-2500-3 REFUEL ADAPTER

SUBTASK 28-21-01-020-012

(2) Remove the screws [18].

ARO ALL; AIRPLANES WITH INTERTECHNIQUE K97B63-601 REFUEL ADAPTER

SUBTASK 28-21-01-020-017

(3) Remove the washers and screws.

ARO ALL

SUBTASK 28-21-01-020-013

(4) Remove the inlet adapter [19].

SUBTASK 28-21-01-020-014

(5) Remove and discard the packing [17].

END OF TASK

TASK 28-21-01-400-802

5. Inlet Adapter - Installation

(Figure 401)

A. General

(1) This procedure installs the inlet adapter [19] if it was removed without the removal of the complete refuel adapter [4].

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ARO ALL; AIRPLANES WITH SWEENEY 56-2500-2 OR 56-2500-3 REFUEL ADAPTER

(2) If you install a new adapter from spares, it is possible that this will change the part number of the refuel adapter assembly. Make sure any configuration changes that you make because of this procedure are correctly documented. For example, inlet adapter P/N 56-2554 is the currently-provided spare. This inlet adapter can be installed on refuel adapter assembly 56-2500-2 or 56-2500-3. However, if inlet adapter P/N 56-2554 is installed on a refuel adapter assembly P/N 56-2500-2, the refuel adapter assembly part number must be changed to P/N 56-2500-3. This is because it has the newer inlet adapter P/N 56-2554. This change must be documented to show the airplane configuration accurately.

ARO ALL

B. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
12-11-01-650-801	Pressure Refueling (P/B 301)

C. Consumable Materials

Reference	Description	Specification
A00648	Compound - Retaining - Loctite 242	ASTM D5363 Grp 3 Cl 2 Gd 1 (SUPERSEDES MIL-S-46163)

D. Location Zones

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

E. Access Panels

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

F. Procedure

SUBTASK 28-21-01-420-003

(1) To install the inlet adapter [19], do these steps:

(a) Install new packing [17].

(b) Install the inlet adapter [19].

(c) For Sweeney refuel adapter, 56-2500-3 only;

Lightly coat the threads of the screws [18] with Loctite 242 compound, A00648

1) Install the screws [18].

a) Tighten the screws [18] to a torque of 27.5 ±2.5 in-lb (3.1 ±0.3 N·m).

ARO ALL; AIRPLANES WITH INTERTECHNIQUE K97B63-601 REFUEL ADAPTER

(d) Do these steps:

1) Install the washers and screws.

a) Tighten the screws to a torque of 40 in-lb (5 N·m).

ARO ALL

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SUBTASK 28-21-01-650-005

(2) Do this task: Pressure Refueling, TASK 12-11-01-650-801.

SUBTASK 28-21-01-210-004

(3) Make sure there are no fuel leaks from the refuel adapter [4] or adjacent to the refuel adapter [4].

SUBTASK 28-21-01-410-003

(4) Close these access panels:

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

TASK 06-44-00-800-802

SUBTASK 28-21-01-860-010

(5) Remove the DO-NOT-OPERATE tag from the flap control lever, in the flight compartment.

——— END OF TASK ———

ARO ALL; AIRPLANES WITH SWEENEY 56-2500-2 OR 56-2500-3 REFUEL ADAPTER

TASK 28-21-01-020-801

6. Poppet Valve Assembly - Removal

A. General

(1) This task gives the steps to remove the poppet valve assembly from the refuel adapter.

B. References

Reference	Title
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)

C. Tools/Equipment

Reference	Description
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liter)

D. Location Zones

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

E. Procedure

SUBTASK 28-21-01-860-011

WARNING DO NOT OPERATE THE LEADING EDGE SLATS. ACCIDENTAL SLAT OPERATION COULD CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Put a DO-NOT-OPERATE tag on the flap control lever, in the flight compartment
TASK 27-81-00-040-801

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ARO ALL; AIRPLANES WITH SWEENEY 56-2500-2 OR 56-2500-3 REFUEL ADAPTER (Continued)

SUBTASK 28-21-01-860-012

(2) Make sure the REFUEL/DEFUEL lever is in the REFUEL position.

NOTE: This makes sure the flapper valve operates normally to block the flow of fuel out of the refuel adapter.

SUBTASK 28-21-01-616-001

(3) Hold an empty 1 gallon (4 l) fuel resistant container, STD-4049 below the refuel adapter inlet.

(a) Press the poppet [26], to permit any fuel between the flapper valve and the poppet valve to drain out of the refuel adapter into the container.

SUBTASK 28-21-01-030-001

(4) Remove the screws [18].

SUBTASK 28-21-01-020-015

(5) Remove the inlet adapter [19].

SUBTASK 28-21-01-030-002

(6) Remove the O-ring [17] (MS29513-042).

(a) Discard the O-ring [17].

SUBTASK 28-21-01-030-003

(7) Remove the screws [23].

SUBTASK 28-21-01-020-016

(8) Remove the poppet assembly [22].

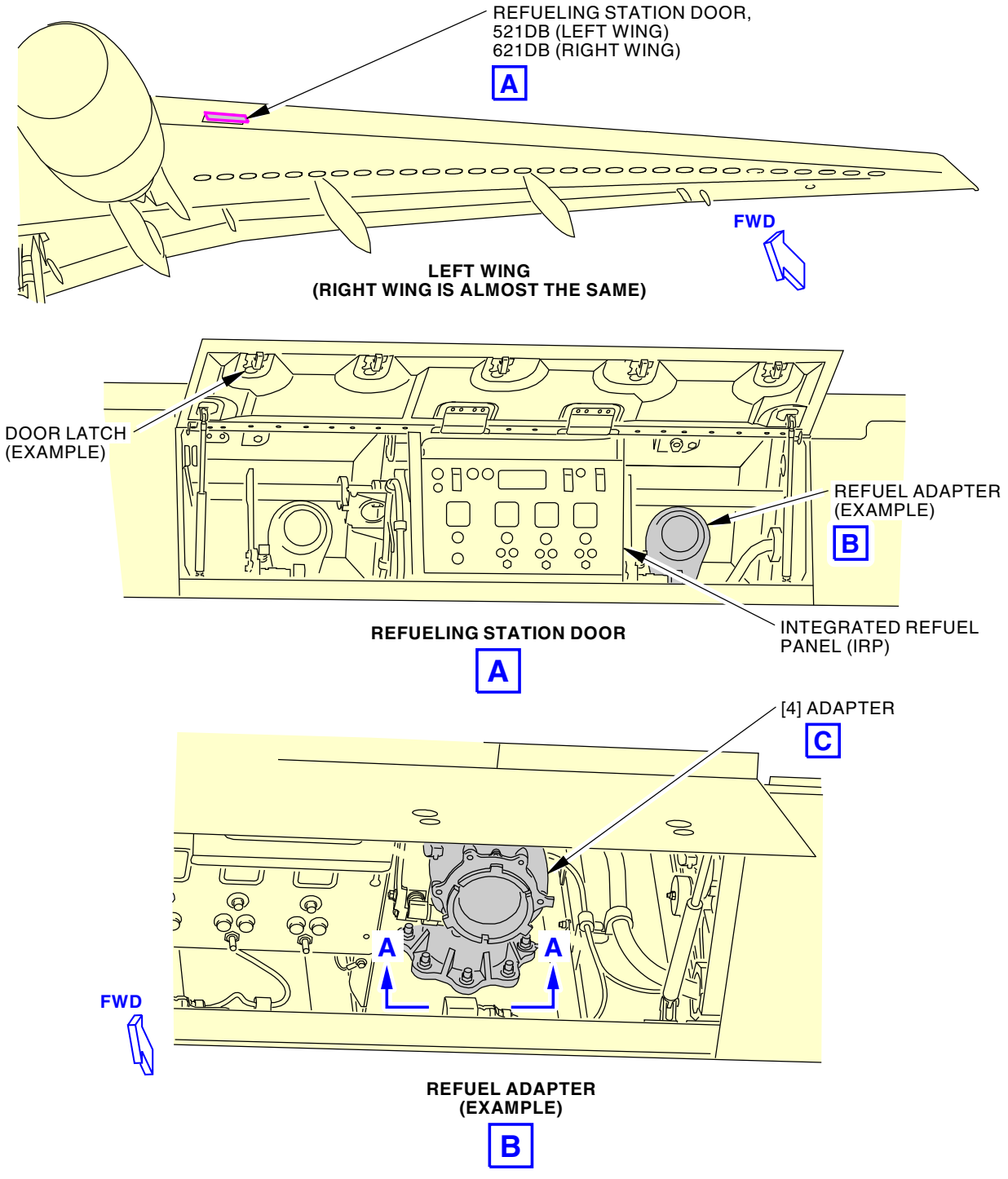
SUBTASK 28-21-01-030-004

(9) Remove the O-ring [25] (MS29513-042).

(a) Discard the O-ring [25].

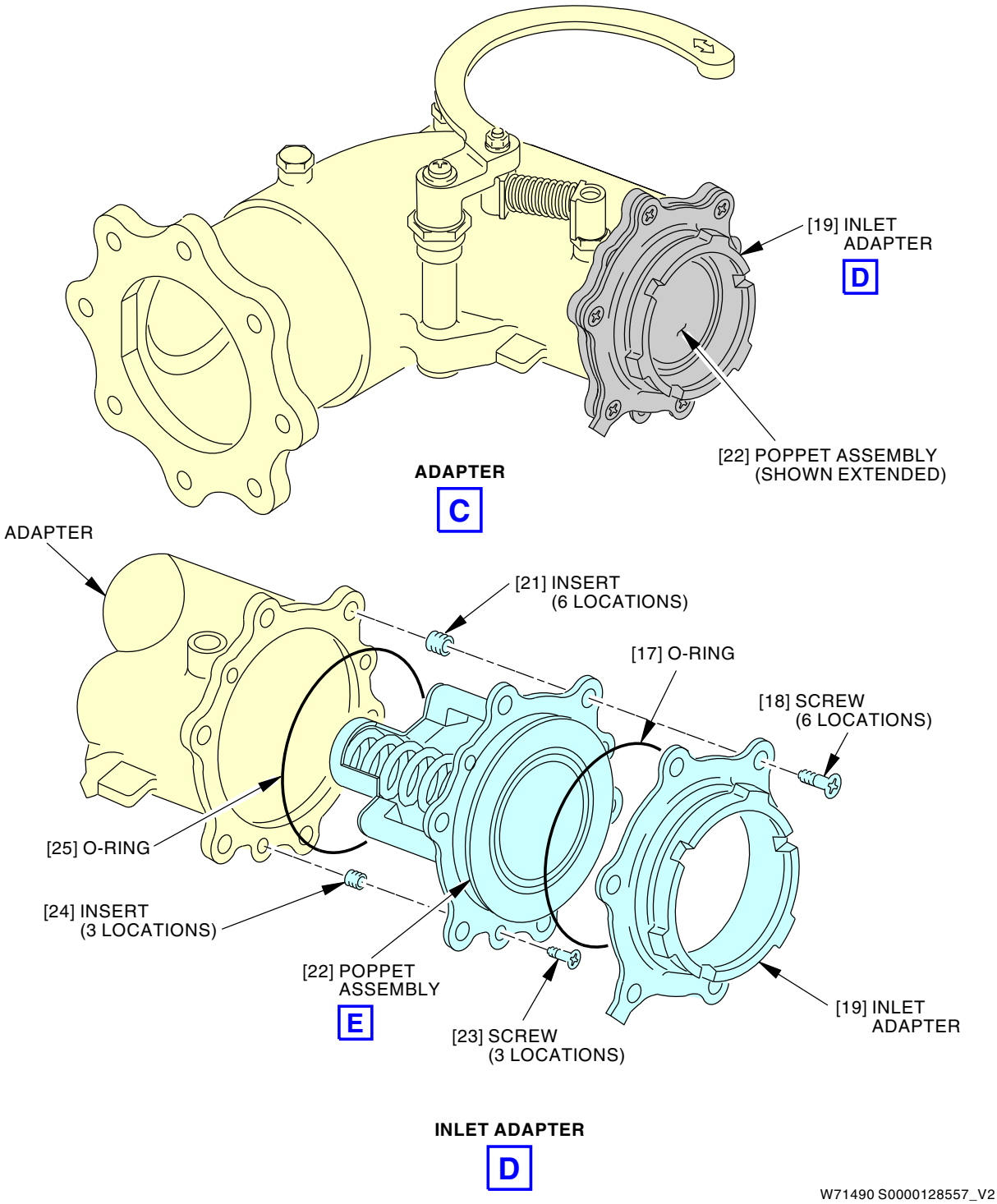
——— END OF TASK ———

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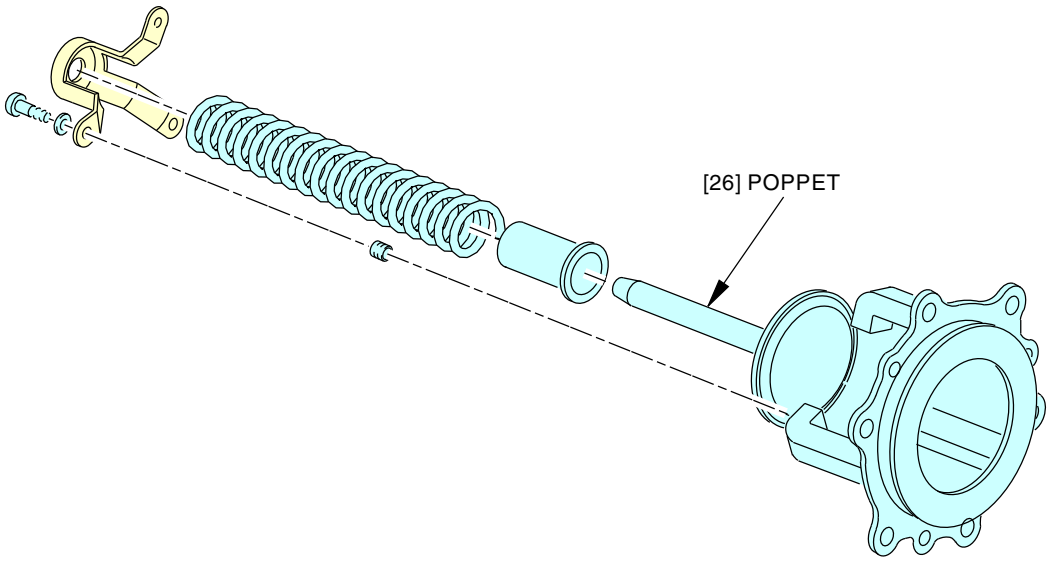
Poppet Valve Assembly
Figure 402/28-21-01-990-802 (Sheet 1 of 3)

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Poppet Valve Assembly
Figure 402/28-21-01-990-802 (Sheet 2 of 3)

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POPPET ASSEMBLY

E

W71500 S0000128558_V2

Poppet Valve Assembly
Figure 402/28-21-01-990-802 (Sheet 3 of 3)

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TASK 28-21-01-420-801

7. Poppet Valve Assembly - Installation

A. General

(1) This task gives the steps to install the poppet valve assembly on the refuel adapter.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)

C. Consumable Materials

Reference	Description	Specification
A00648	Compound - Retaining - Loctite 242	ASTM D5363 Grp 3 Cl 2 Gd 1 (SUPERSEDES MIL-S-46163)
D00652	Lubricant - O-Ring - Parker Super-O-Lube	

D. Location Zones

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

E. Procedure

SUBTASK 28-21-01-640-002

(1) Lightly coat new O-rings [25] and [17] (MS29513-042) with Parker Super-O-Lube lubricant, D00652.

SUBTASK 28-21-01-430-001

(2) Install the new O-rings [25] and [17] (MS29513-042) on the poppet assembly [22].

SUBTASK 28-21-01-420-004

(3) Install the poppet assembly [22] with the three screws [23].

SUBTASK 28-21-01-430-002

(4) For Sweeney refuel adapter 56-2500-3 only;

Lightly coat the threads of the screws [18] with Loctite 242 compound, A00648.

SUBTASK 28-21-01-420-005

(5) Install the inlet adapter [19] with the screws [18].

(a) Tighten each of the screws [18] to a torque of 27.5 ±2.5 in-lb (3.1 ±0.3 N·m)25-30 inch-pounds.

SUBTASK 28-21-01-790-001

(6) Do this task to do a leak check of the poppet valve:

(a) Make sure that the refuel adapter is clean, not damaged.

1) Make sure that the screws and lugs are not loose or damaged.

(b) Attach the fueling nozzles to the refuel adapters (Pressure Refueling, TASK 12-11-01-650-801).

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ARO ALL; AIRPLANES WITH SWEENEY 56-2500-2 OR 56-2500-3 REFUEL ADAPTER (Continued)

(c) Make sure there are no fuel leaks.

(d) Disconnect the fueling nozzles.

——— END OF TASK ———

ARO ALL; AIRPLANES WITH INTERTECHNIQUE K97B63-601 REFUEL ADAPTER

TASK 28-21-01-020-802

8. Poppet Valve Assembly - Removal

A. General

(1) This task gives the steps to remove the poppet valve assembly from the refuel adapter.

B. References

Reference	Title
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)

C. Tools/Equipment

Reference	Description
STD-4049	Container - Fuel Resistant, 1 Gallon (4 Liter)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
20	O-ring	28-21-01-05-165	ARO ALL
		28-21-01-10-165	ARO ALL
28	O-ring	28-21-01-05-115	ARO ALL
		28-21-01-10-115	ARO ALL

E. Location Zones

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

F. Procedure

SUBTASK 28-21-01-430-003

WARNING DO NOT OPERATE THE LEADING EDGE SLATS. ACCIDENTAL SLAT OPERATION COULD CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Put a DO-NOT-OPERATE tag on the flap control lever, in the flight compartment TASK 27-81-00-040-801

SUBTASK 28-21-01-710-001

(2) Make sure the REFUEL/DEFUEL lever is in the REFUEL position.

NOTE: This makes sure the flapper valve operates normally to block the flow of fuel out of the refuel adapter.

SUBTASK 28-21-01-170-001

(3) Hold an empty 1 gallon (4 l) fuel resistant container, STD-4049 below the refuel adapter inlet.

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ARO ALL; AIRPLANES WITH INTERTECHNIQUE K97B63-601 REFUEL ADAPTER (Continued)

(a) Press the poppet [24], to permit any fuel between the flapper valve and the poppet valve to drain out of the refuel adapter into the container.

SUBTASK 28-21-01-020-018

(4) Remove the screws [31] and washers [30].

SUBTASK 28-21-01-020-019

(5) Remove the inlet adapter [19].

SUBTASK 28-21-01-020-020

(6) Remove the o-ring [28].

(a) Discard the o-ring [28].

SUBTASK 28-21-01-020-021

(7) Remove the screws [27].

SUBTASK 28-21-01-020-022

(8) Remove the poppet assembly.

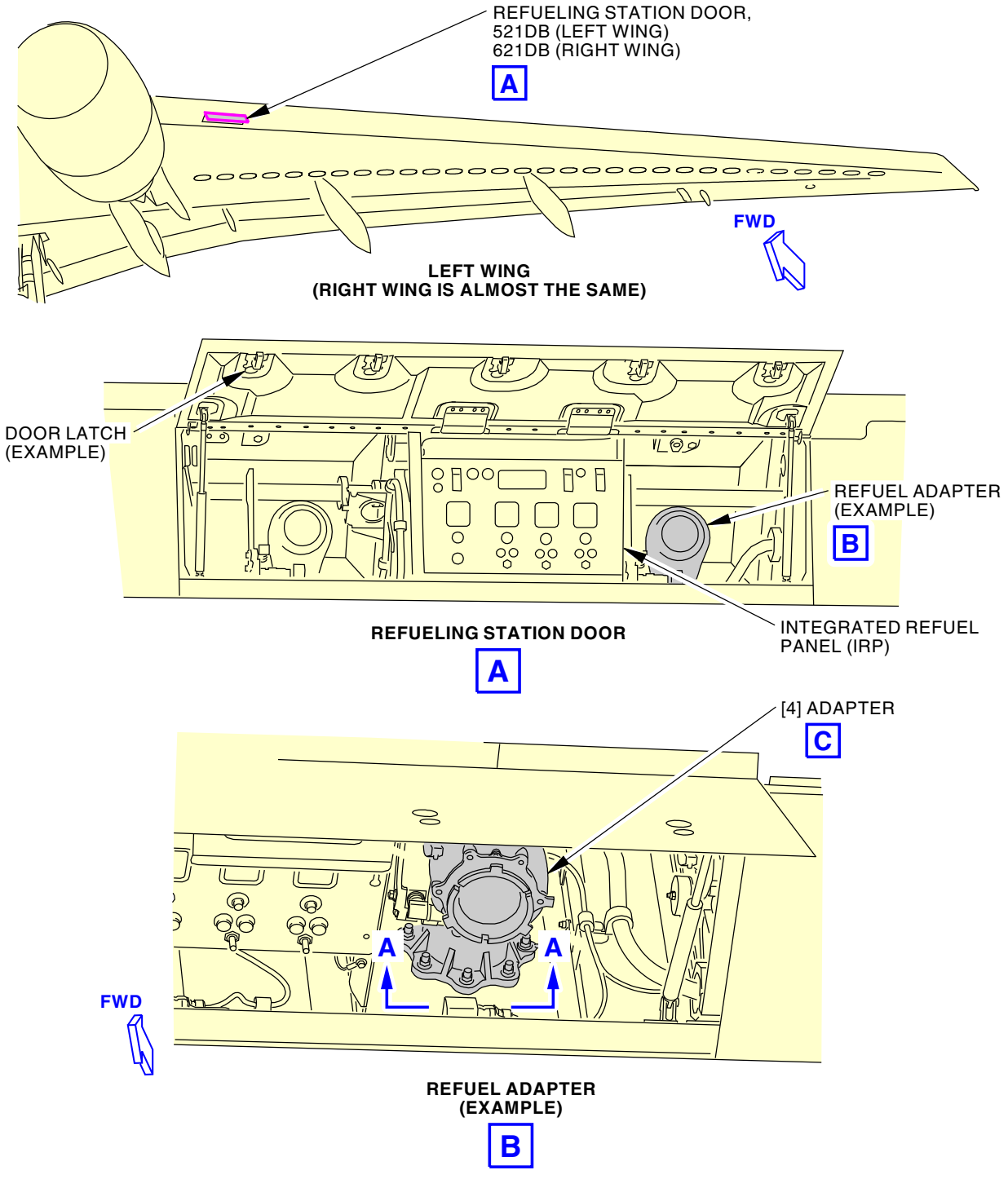
SUBTASK 28-21-01-020-023

(9) Remove the o-ring [20].

(a) Discard the o-ring [20].

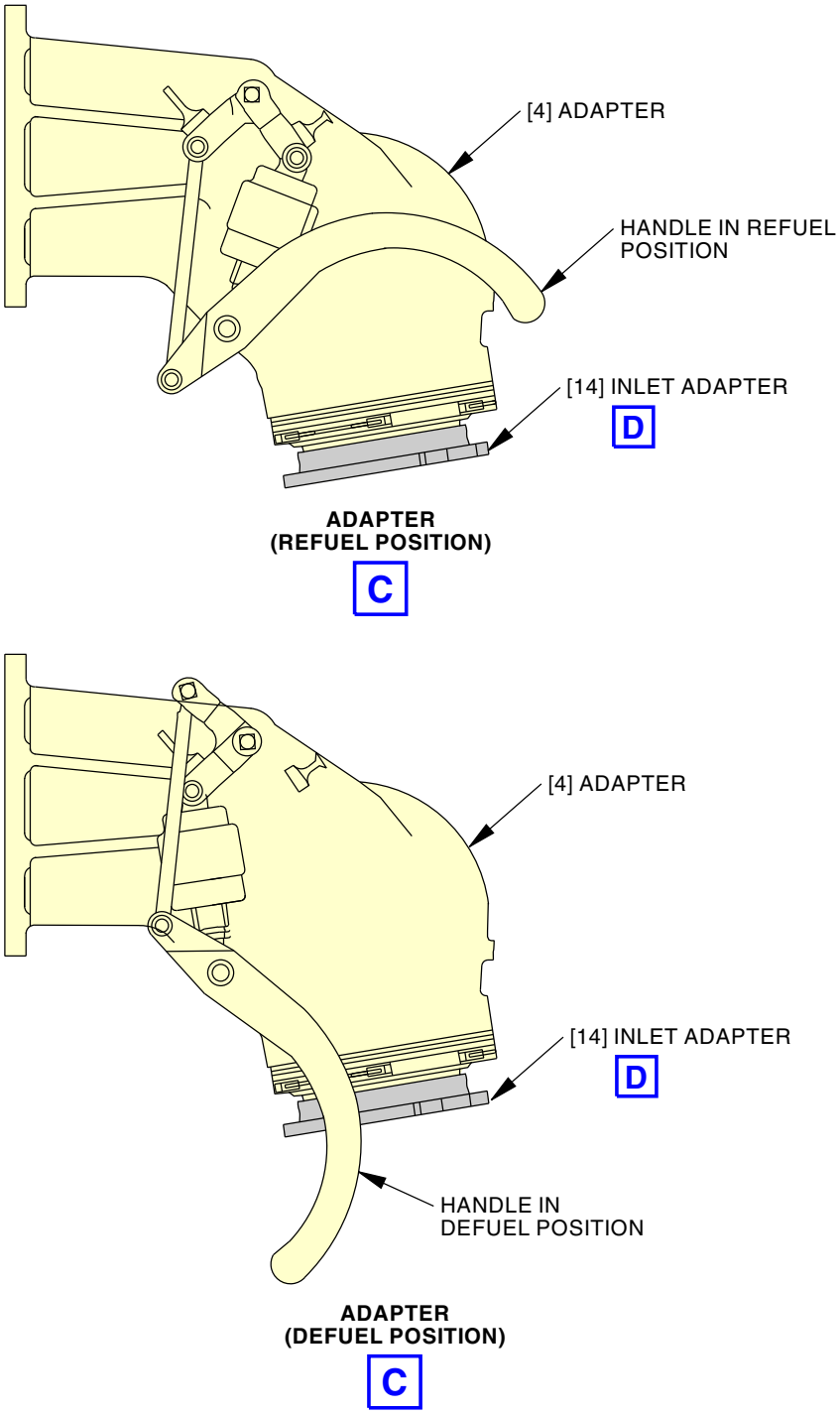
——— END OF TASK ———

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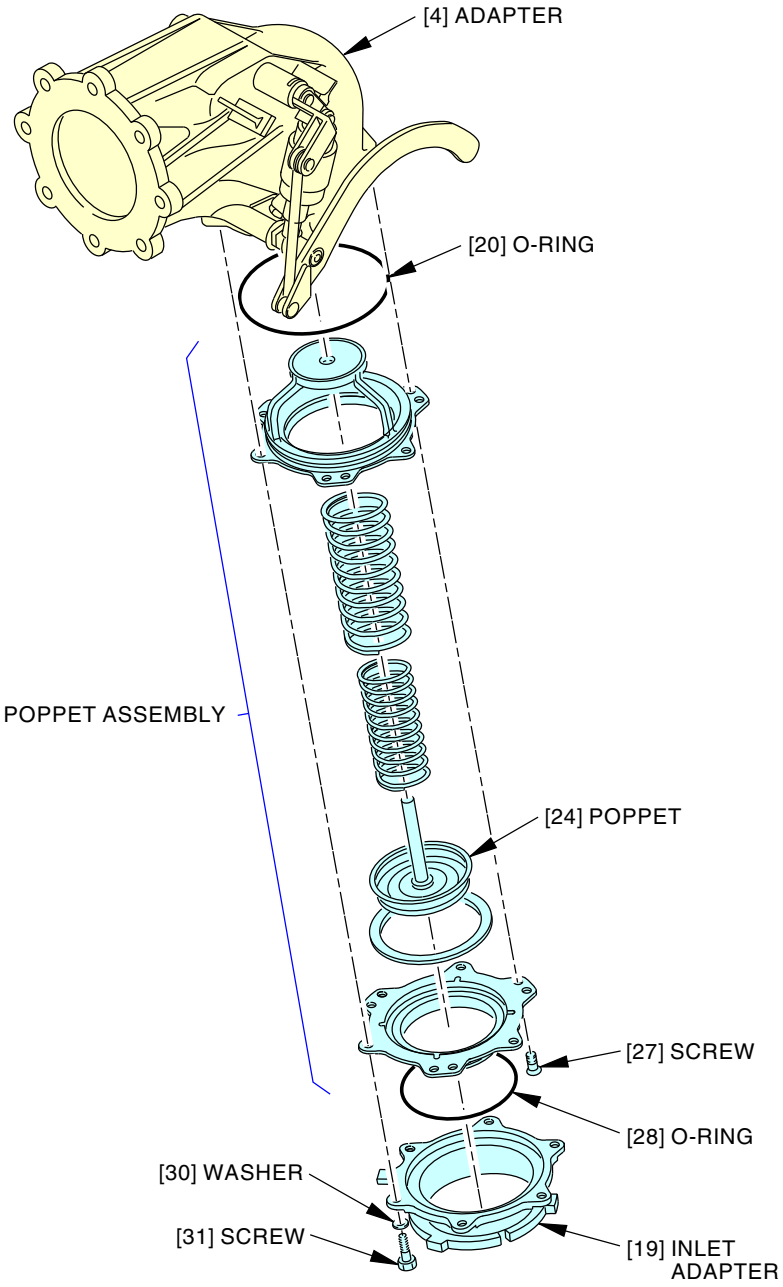
Poppet Valve Assembly
Figure 403/28-21-01-990-803 (Sheet 1 of 3)

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Poppet Valve Assembly
Figure 403/28-21-01-990-803 (Sheet 2 of 3)

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Poppet Valve Assembly
Figure 403/28-21-01-990-803 (Sheet 3 of 3)

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TASK 28-21-01-420-802

9. Poppet Valve Assembly - Installation

(Figure 403)

A. General

(1) This task gives the steps to install the poppet valve assembly on the refuel adapter.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-11-00-910-801	Standard Torque Values (P/B 201)

C. Consumable Materials

Reference	Description	Specification
C50056	Compound - Corrosion Inhibiting Material, Nondrying Resin Mix	BMS3-27
G50237	Compound - Corrosion Inhibiting, Non-drying - Cor-Ban 27L	BMS3-38

D. Location Zones

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

E. Procedure

SUBTASK 28-21-01-420-006

(1) Install the new o-ring [28] and o-ring [20] on the poppet assembly.

ARO ALL

SUBTASK 28-21-01-640-003

WARNING USE NITRILE GLOVES FOR SKIN PROTECTION WHEN YOU USE COR-BAN 27L, G50237. IF IT GETS ON YOUR SKIN, IMMEDIATELY REMOVE IT WITH WATER. IF THIS MATERIAL GETS IN YOUR EYES, IMMEDIATELY FLUSH YOUR EYES WITH WATER. GET MEDICAL AID. THIS MATERIAL CONTAINS FLAMMABLE AGENTS WHICH CAN CAUSE INJURIES TO PERSONNEL.

WARNING DO NOT GET THIS MATERIAL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THIS MATERIAL. PUT ON A RESPIRATOR, EYE PROTECTION (GOGGLES, OR OTHER APPROVED PROTECTION), AND GLOVES BEFORE YOU USE THIS MATERIAL. MAKE SURE THAT THERE IS SUFFICIENT AIRFLOW. KEEP THIS MATERIAL AWAY FROM SPARKS, FLAME, AND HEAT. THIS MATERIAL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(2) Lightly coat the threads of the screws [27] with Cor-Ban 27L Compound, G50237 or Mastinox 6856 K, C50056.

ARO ALL; AIRPLANES WITH INTERTECHNIQUE K97B63-601 REFUEL ADAPTER

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ARO ALL; AIRPLANES WITH INTERTECHNIQUE K97B63-601 REFUEL ADAPTER (Continued)

SUBTASK 28-21-01-420-007

(3) Install the poppet assembly to the adapter [4] with the screws [27]. Refer to Standard Torque Values, TASK 20-11-00-910-801.

SUBTASK 28-21-01-420-008

(4) Install the inlet adapter [19] to the adapter [4] with the screws [31].

(a) Tighten the screws [31] to a torque of 40 in-lb (5 N·m).

SUBTASK 28-21-01-710-002

(5) Do this task to do a leak check of the poppet valve:

(a) Make sure that the refuel adapter is clean, not damaged.

1) Make sure that the screws and lugs are not loose or damaged.

(b) Attach the fueling nozzles to the refuel adapters (Pressure Refueling, TASK 12-11-01-650-801).

(c) Make sure there are no fuel leaks.

(d) Disconnect the fueling nozzles.

——— END OF TASK ———

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REFUEL VALVE - REMOVAL/INSTALLATION

1. General

A. Six pressure refuel valves are installed on the rear spar of the wing. Two refuel valves are installed in the center fuel tank. Two refuel valves are installed in each main fuel tank.

B. The refuel valves let fuel flow from the refueling manifold to the fuel tanks.

C. The removal/installation procedures are almost the same for all the refuel valves.

D. This procedure contains two tasks. The first task removes the refuel valve. The second task installs the refuel valve.

TASK 28-21-02-000-801

2. Refuel Valve - Removal

(Figure 401)

A. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-21-03-000-801	Refuel Valve Control Unit - Removal (P/B 401)
28-21-08-000-802	Refuel/Jettison Manifold and Couplings - Removal (Selection) (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing

C. Access Panels

Number	Name/Location
531BB	Access Door
533AB	Access Door
541HB	Access Door
631BB	Access Door
633AB	Access Door
641HB	Access Door

D. Procedure

SUBTASK 28-21-02-860-001

(1) Supply electrical power (TASK 24-22-00-860-805).

SUBTASK 28-21-02-650-001

(2) To defuel the applicable fuel tank, do this task: Pressure Defueling, TASK 28-26-00-650-801.

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SUBTASK 28-21-02-020-001

(3) Do this task: Refuel Valve Control Unit - Removal, TASK 28-21-03-000-801.

SUBTASK 28-21-02-020-002

(4) Remove the lockwire from the three jamnut [14].

SUBTASK 28-21-02-020-003

(5) Remove the three jamnut [14] and washer [15] which hold the refuel valve in its position from out of the fuel tank.

NOTE: There are three more installation nuts on the inside of the fuel tank that also hold the refuel valve in its position.

SUBTASK 28-21-02-650-005

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(6) Do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

SUBTASK 28-21-02-650-006

(7) To get access to the applicable refuel valve in the center tank, do this task: Center Tank Access Door - Removal, TASK 28-11-02-000-801.

(a) For the left center tank refuel valve:

Remove this access door:

Number	Name/Location
531BB	Access Door

(b) For the right center tank refuel valve:

Remove this access door:

Number	Name/Location
631BB	Access Door

SUBTASK 28-21-02-650-002

(8) To get access to the applicable refuel valve in the main tanks, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(a) For the left main tank outboard refuel valve:

Remove this access door:

Number	Name/Location
541HB	Access Door

(b) For the left main tank inboard refuel valve:

Remove this access door:

Number	Name/Location
533AB	Access Door

(c) For the right main tank outboard refuel valve:

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Remove this access door:

Number	Name/Location
641HB	Access Door

(d) For the right main tank inboard refuel valve:

Remove this access door:

Number	Name/Location
633AB	Access Door

SUBTASK 28-21-02-020-004

(9) To remove the applicable inlet tube [7], [16], outlet tube [10], [18] and reprime tube [17] assemblies, do this task: Refuel/Jettison Manifold and Couplings - Removal (Selection), TASK 28-21-08-000-802.

SUBTASK 28-21-02-020-005

(10) For the center tank refuel valves, do these steps:

(a) Remove the four bolt [19] and washer [20] to remove the flange coupling [9], gasket [13] and orifice plate [21].

(b) Hold the refuel valve [6] and remove the three nut [3], washer [4] and packing [5].

1) Discard the packing [5].

(c) Remove the refuel valve [6] and gasket [2] from the rear spar.

1) Discard the gasket [2].

SUBTASK 28-21-02-020-006

(11) For the main tank refuel valves, do these steps:

(a) Remove the four bolt [11] and washer [12] to remove the flange coupling [9], gasket [13] and orifice plate [8].

(b) Hold the refuel valve [6] and remove the three nut [3], washer [4], and packing [5].

1) Discard the packing [5].

(c) Remove the refuel valve [6] and gasket [2] from the rear spar.

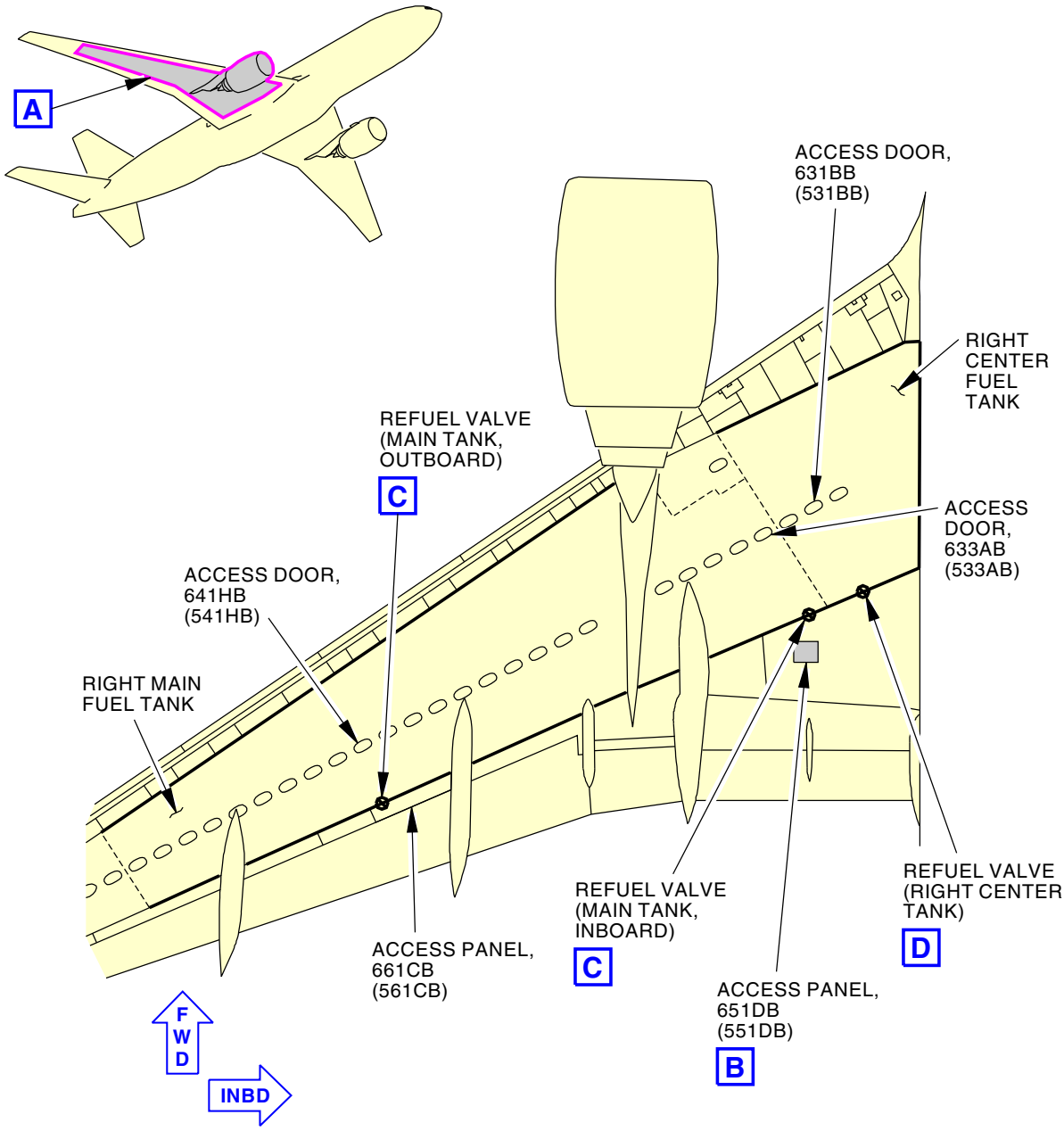
1) Discard the gasket [2].

SUBTASK 28-21-02-480-001

(12) Put covers on the holes in the outlet tubing and the refueling manifold to keep unwanted materials out.

END OF TASK

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RIGHT WING
(BOTTOM VIEW)
(LEFT WING IS EQUIVALENT)

A

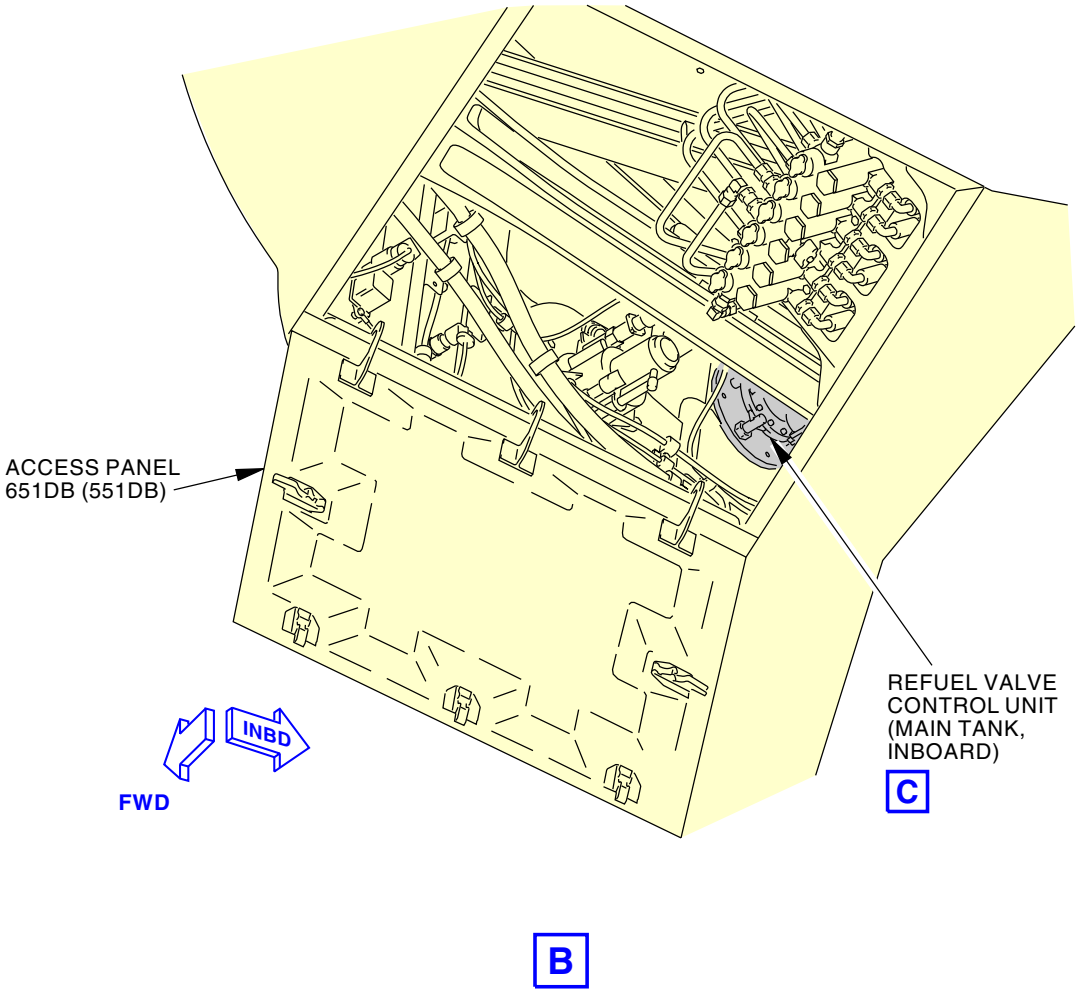
NOTE:

500 SERIES - LEFT WING
600 SERIES - RIGHT WING

D16809 S0006415005_V2

Refuel Valve Installation
Figure 401/28-21-02-990-801 (Sheet 1 of 4)

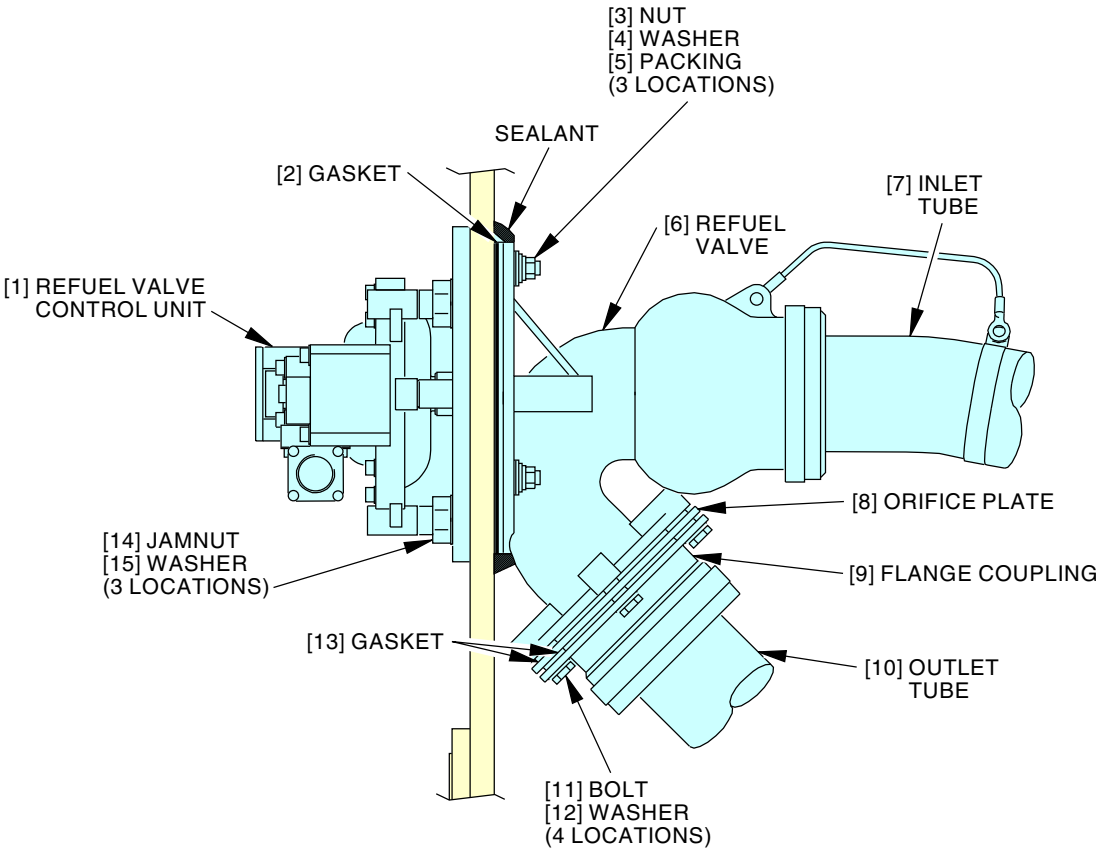
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E40333 S0006415006_V2

Refuel Valve Installation
Figure 401/28-21-02-990-801 (Sheet 2 of 4)

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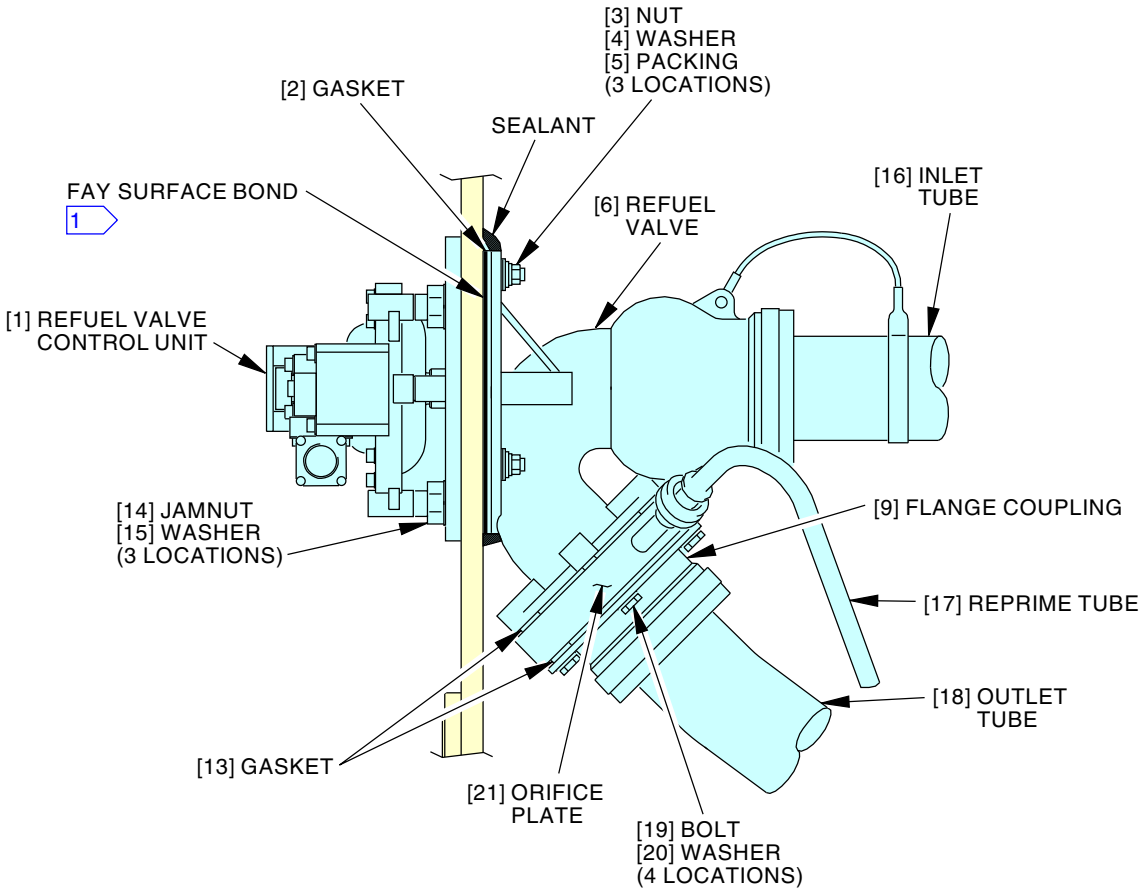
REFUEL VALVE
(MAIN TANK)

C

E00878 S0006415007_V2

Refuel Valve Installation
Figure 401/28-21-02-990-801 (Sheet 3 of 4)

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REFUEL VALVE
(CENTER TANK)

D

1 THE BONDING RESISTANCE BETWEEN THE VALVE BODY AND THE REAR SPAR, IN THE TANK, MUST BE 0.0025 OHM OR LESS.

E03116 S0006415008_V3

Refuel Valve Installation
Figure 401/28-21-02-990-801 (Sheet 4 of 4)

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TASK 28-21-02-400-801

3. Refuel Valve - Installation

(Figure 401)

A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-12.

B. References

Reference	Title
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-300-802	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)
28-21-03-400-801	Refuel Valve Control Unit - Installation (P/B 401)
28-21-08-400-802	Refuel/Jettison Manifold and Couplings - Installation (Selection) (P/B 401)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

D. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

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E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Gasket	28-21-02-01-113	ARO ALL
		28-21-02-10-060	ARO ALL
5	Packing	28-21-02-01-100	ARO ALL
		28-21-02-10-055	ARO ALL
13	Gasket	28-21-02-01-027	ARO ALL

F. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing

G. Access Panels

Number	Name/Location
531BB	Access Door
533AB	Access Door
541HB	Access Door
631BB	Access Door
633AB	Access Door
641HB	Access Door

H. Procedure

SUBTASK 28-21-02-650-007

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

SUBTASK 28-21-02-650-003

(2) Go into the center or main fuel tank, through the applicable access door, to get access to the refuel valve.

SUBTASK 28-21-02-080-001

(3) Remove the covers from the tubing and the refueling manifold.

SUBTASK 28-21-02-210-001

(4) Prepare a fillet sealed fay surface bond between the refuel valve [6] and the gasket [2] and between the gasket [2] and the rear spar.

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WARNING

DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(a) Final clean the contact surfaces of the refuel valve [6] and the gasket [2] and between the gasket [2] and the rear spar with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

(b) Rub dry with a clean, dry cotton wiper, G00034.

(c) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

SUBTASK 28-21-02-080-002

(5) If necessary, remove any protective caps installed on the refuel valve [6].

SUBTASK 28-21-02-420-003

28-AWL-12: CDCCL

(6) Install a fay surface bond between the refuel valve [6] (valve body) and the gasket [2] and between the gasket [2] and the rear spar inside the tank (SWPM 20-20-00).

NOTE: For the refuel valve [6] in the center wing tank (CWT);

CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: For the refuel valve [6] in the center wing tank (CWT);

This is applicable to Airworthiness Limitation 28-AWL-12.

SUBTASK 28-21-02-430-001

(7) Put the gasket [2] on the refuel valve [6].

SUBTASK 28-21-02-420-001

(8) Align the refuel valve [6] on the rear spar.

SUBTASK 28-21-02-420-002

(9) Install the three nuts [3], washers [4] and new packings [5] to install the refuel valve [6] on the rear spar.

SUBTASK 28-21-02-760-001

28-AWL-12: CDCCL

(10) Measure the electrical bonding resistance between the refuel valve [6] (valve body) and the rear spar inside the tank.

NOTE: For the refuel valve [6] in the center wing tank (CWT);

CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: For the refuel valve [6] in the center wing tank (CWT);

This is applicable to Airworthiness Limitation 28-AWL-12.

(a) Use an intrinsically safe approved bonding meter, COM-1550.

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28-AWL-12: CDCCL

(b) Make sure the electrical bonding resistance is 0.0025 ohm (2.5 milliohms) or less.

NOTE: For the refuel valve [6] in the center wing tank (CWT);

CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: For the refuel valve [6] in the center wing tank (CWT);

This is applicable to Airworthiness Limitation 28-AWL-12.

SUBTASK 28-21-02-390-001

28-AWL-12: CDCCL

(11) Apply a fillet seal around the entire perimeter of the refuel valve [6] (valve body) and the gasket [2] on the rear spar, inside the fuel tank (TASK 28-11-00-300-802).

NOTE: For the refuel valve [6] in the center wing tank (CWT);

CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: For the refuel valve [6] in the center wing tank (CWT);

This is applicable to Airworthiness Limitation 28-AWL-12.

(a) Use sealant, A00767 (or equivalent), for the fillet seal.

SUBTASK 28-21-02-430-002

(12) For the refuel valves installed in the main fuel tank, do the steps that follow:

(a) Put the two gasket [13] on each side of the orifice plate [8].

(b) Align the gasket [13], orifice plate [8] and flange coupling [9] on the refuel valve [6].

1) Make sure the "AFT" indication arrow is installed correctly on the orifice plate [8].

(c) Install the four bolts [11] and washers [12].

(d) Install the outlet tube [10] and inlet tube [7] (TASK 28-21-08-400-802).

SUBTASK 28-21-02-430-003

(13) For the refuel valves installed in the center fuel tank, do the steps that follow:

(a) Put the two gaskets [13] on each side of the orifice plate [21].

(b) Align the gasket [13], orifice plate [21] and flange coupling [9] on the refuel valve [6].

1) Make sure the "AFT" indication arrow is installed correctly on the orifice plate [21].

(c) Install the four bolts [19] and washers [20].

(d) Install the outlet tube [18], reprime tube [17] and inlet tube [16] (TASK 28-21-08-400-802).

SUBTASK 28-21-02-430-004

(14) Install the three jamnuts [14] and washers [15] to the refuel valve [6], on the aft side of the rear spar.

(a) Tighten the jamnut [14] to 97.5 ±2.5 in-lb (11.0 ±0.3 N·m).

(b) Install lockwire to the jamnut [14] (TASK 20-10-23-400-801).

SUBTASK 28-21-02-650-008

(15) Install the applicable center tank access doors (TASK 28-11-02-400-801).

(a) For the left center tank refuel valve:

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Install this access door:

Number	Name/Location
531BB	Access Door

(b) For the right center tank refuel valve:

Install this access door:

Number	Name/Location
631BB	Access Door

SUBTASK 28-21-02-650-004

(16) Install the applicable main tank access doors(TASK 28-11-01-400-801).

(a) For the left main tank outboard refuel valve:

Install this access door:

Number	Name/Location
541HB	Access Door

(b) For the left main tank inboard refuel valve:

Install this access door:

Number	Name/Location
533AB	Access Door

(c) For the right main tank outboard refuel valve:

Install this access door:

Number	Name/Location
641HB	Access Door

(d) For the right main tank inboard refuel valve:

Install this access door:

Number	Name/Location
633AB	Access Door

SUBTASK 28-21-02-430-005

(17) Install the refuel valve control unit (TASK 28-21-03-400-801).

——— END OF TASK ———

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REFUEL VALVE - INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure contains a functional check of the bonding resistance between the structure and the refuel valve.

SFAR 88

TASK 28-21-02-200-802

2. Refuel Valve - Bonding Resistance Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing

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D. Access Panels

Number	Name/Location
531BB	Access Door
533AB	Access Door
541HB	Access Door
631BB	Access Door
633AB	Access Door
641HB	Access Door

E. Procedure

SUBTASK 28-21-02-650-010

(1) Defuel the applicable fuel tank (TASK 28-26-00-650-801).

SUBTASK 28-21-02-171-002

WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-21-02-010-003

(3) To get access to the applicable refuel valve in the center tank, do this task: Center Tank Access Door - Removal, TASK 28-11-02-000-801.

(a) Remove this access door:

Number	Name/Location
631BB	Access Door

for the right center tank refuel valve.

(b) Remove this access door:

Number	Name/Location
531BB	Access Door

for the left center tank refuel valve.

SUBTASK 28-21-02-010-004

(4) To get access to the applicable refuel valve in the main tanks, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(a) For the right main tank outboard refuel valve:

Remove this access door:

Number	Name/Location
641HB	Access Door

(b) For the right main tank inboard refuel valve:

Remove this access door:

Number	Name/Location
633AB	Access Door

(c) For the left main tank outboard refuel valve:

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Remove this access door:

Number	Name/Location
541HB	Access Door

(d) For the left main tank inboard refuel valve:

Remove this access door:

Number	Name/Location
533AB	Access Door

F. Electrical Bonding Measurement

SUBTASK 28-21-02-765-002

(1) For each of the refuel valves, use an intrinsically safe approved bonding meter, COM-1550, to measure the bonding resistance between the refuel valve and the structure (SWPM 20-20-00).

(a) Make sure the bonding resistance is 0.008 ohm (8 milliohms) or less.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 28-21-02-410-003

(1) To install the applicable center tank access doors, do this task: Center Tank Access Door - Installation, TASK 28-11-02-400-801.

(a) For the right center tank refuel valve:

Install this access door:

Number	Name/Location
631BB	Access Door

(b) For the left center tank refuel valve:

Install this access door:

Number	Name/Location
531BB	Access Door

SUBTASK 28-21-02-410-004

(2) To install the applicable main tank access doors, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

(a) For the right main tank outboard refuel valve:

Install this access door:

Number	Name/Location
641HB	Access Door

(b) For the right main tank inboard refuel valve:

Install this access door:

Number	Name/Location
633AB	Access Door

(c) For the left main tank outboard refuel valve:

Install this access door:

Number	Name/Location
541HB	Access Door

(d) For the left main tank inboard refuel valve:

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Install this access door:

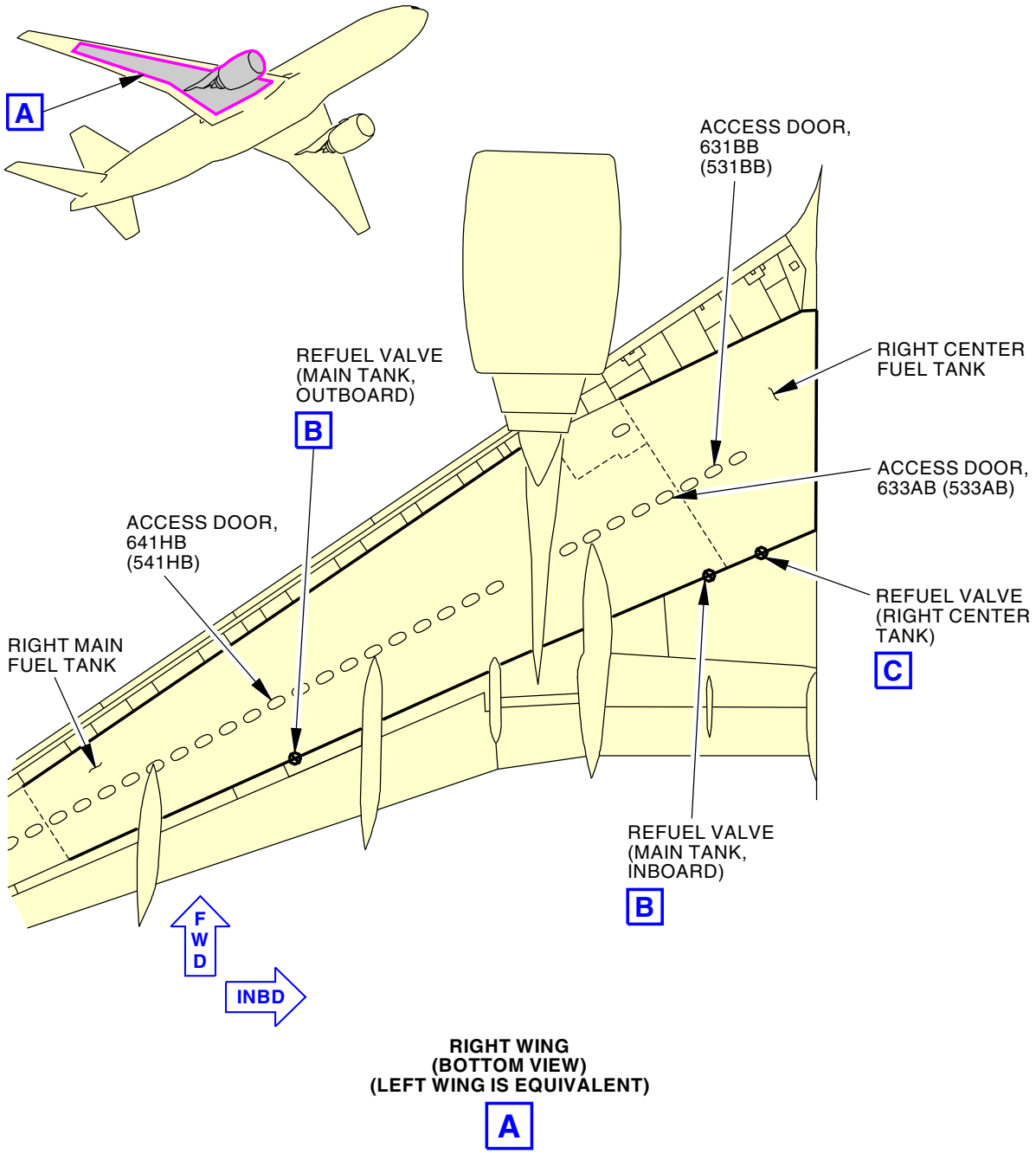
Number	Name/Location
533AB	Access Door

SUBTASK 28-21-02-650-011

(3) Refuel the applicable tank (TASK 12-11-01-650-801).

——— END OF TASK ———

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RIGHT WING
(BOTTOM VIEW)
(LEFT WING IS EQUIVALENT)

A

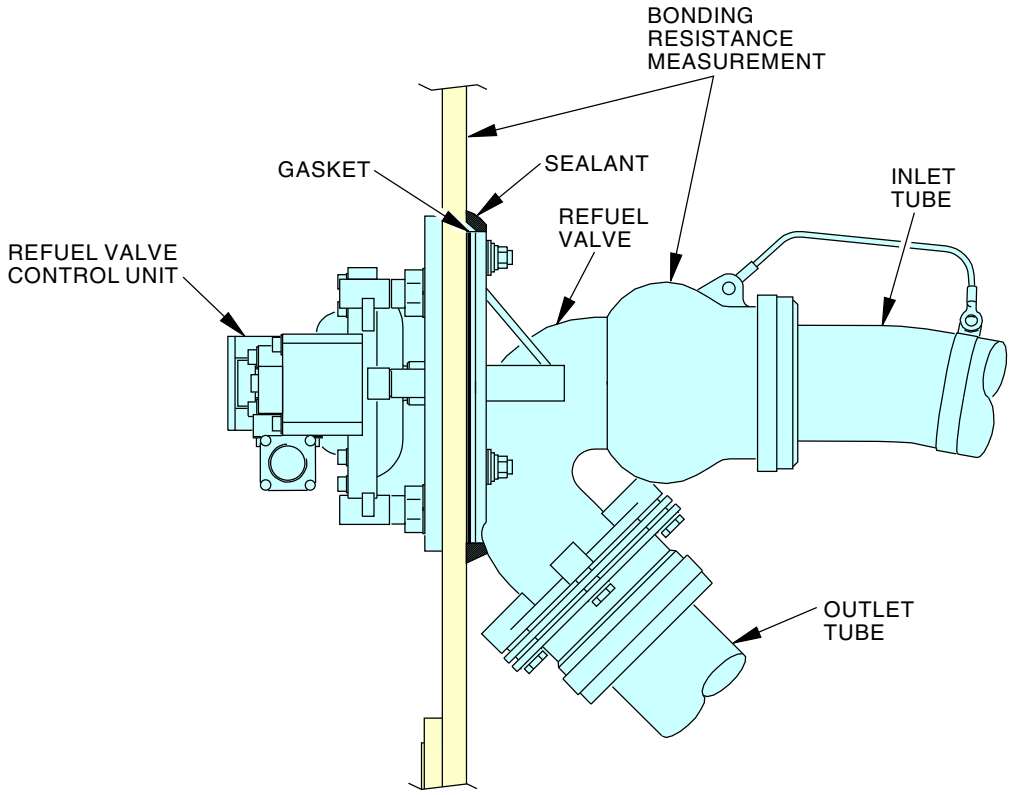
NOTE:

500 SERIES - LEFT WING
600 SERIES - RIGHT WING

1368728 S0000247196_V3

Refuel Valve - Bonding Resistance Measurement
Figure 601/28-21-02-990-802 (Sheet 1 of 3)

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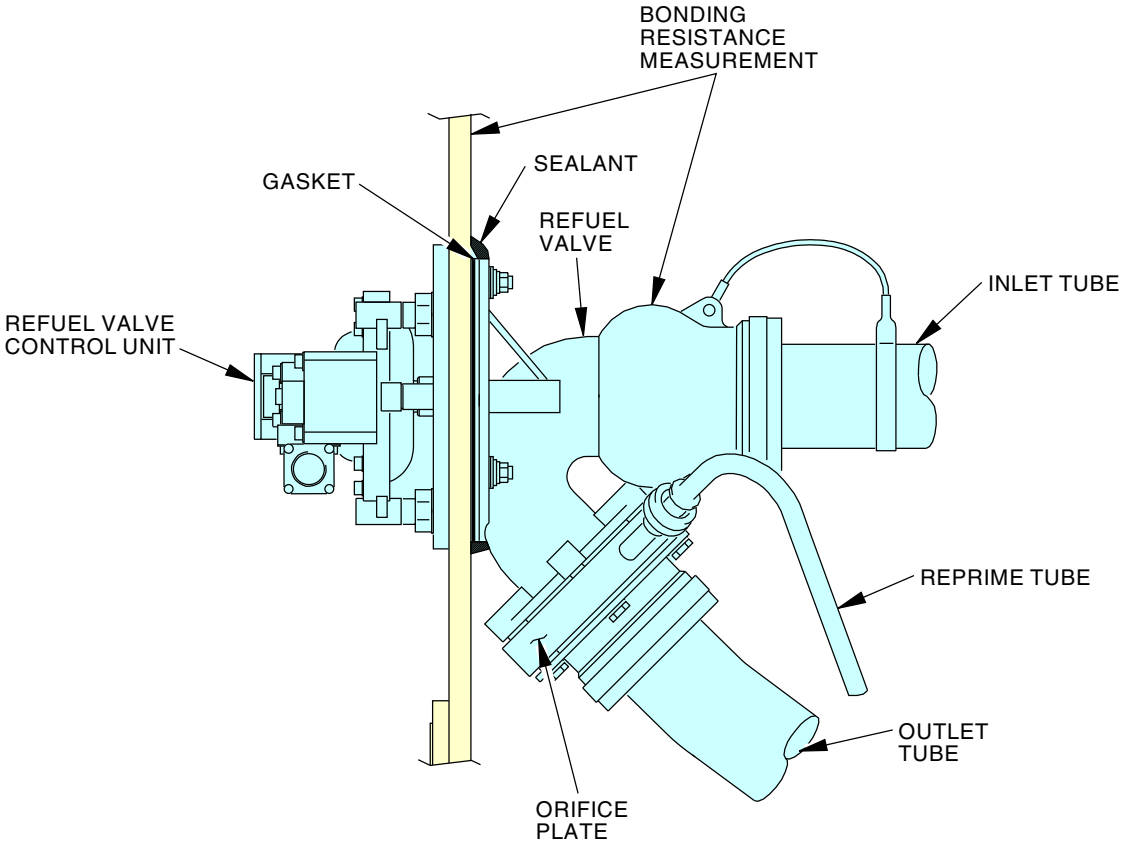
REFUEL VALVE
(MAIN TANK)

B

1368758 S0000247200_V3

Refuel Valve - Bonding Resistance Measurement
Figure 601/28-21-02-990-802 (Sheet 2 of 3)

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REFUEL VALVE
(CENTER TANK)

C

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Refuel Valve - Bonding Resistance Measurement
Figure 601/28-21-02-990-802 (Sheet 3 of 3)

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REFUEL VALVE CONTROL UNIT - REMOVAL/INSTALLATION

1. General

A. There are six refuel valves, two refuel valves are installed in each main tank and two refuel valves are installed in the center tank. The refuel valves are installed inside the applicable fuel tank. The refuel valve control units are installed outside of the applicable fuel tank, and can be removed without defueling the fuel tank. The refuel valve control unit will be referred to as the valve in this procedure.

B. This procedure contains two tasks. The first task removes the refuel valve control unit. The second task installs the refuel valve control unit.

TASK 28-21-03-000-801

2. Refuel Valve Control Unit - Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
27-51-00-040-801	Trailing Edge Flap Deactivation (P/B 201)
27-51-00-860-804	Extend the Trailing Edge Flaps (P/B 201)
28-21-02-000-801	Refuel Valve - Removal (P/B 401)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
561	Rear Spar to Trailing Edge - Outboard of Flaperon - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
661	Rear Spar to Trailing Edge - Outboard of Flaperon - Right Wing

C. Access Panels

Number	Name/Location
521DB	Refueling Station Door
551BB	Inboard Fixed Trailing Edge Panel
551DB	Inboard Fixed Trailing Edge Panel
561CB	Midspan Fixed Trailing Edge Panel
651BB	Inboard Fixed Trailing Edge Panel
651DB	Inboard Fixed Trailing Edge Panel
661CB	Midspan Fixed Trailing Edge Panel

D. Procedure

SUBTASK 28-21-03-870-001

(1) Do these steps to decrease the pressure in the refuel/jettison manifold:

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WARNING DO NOT OPERATE THE LEADING EDGE SLATS. ACCIDENTAL SLAT OPERATION COULD CAUSE DAMAGE TO EQUIPMENT AND INJURY TO PERSONS.

(a) Install a DO-NOT-OPERATE tag on the flap control lever.

(b) Open this access panel:

Number	Name/Location
521DB	Refueling Station Door

(c) Put the three refuel valve control switches to the OPEN position.

NOTE: The pressure in the refuel/jettison manifold will immediately decrease when the valves are opened. The valve will automatically close when the back pressure in the refuel/jettison manifold is not sufficient to move the spring-loaded valve poppet.

(d) Put the three refuel valve control switches to the CLOSE position.

(e) Wait 15 minutes for the remaining fuel pressure in the manifold to decrease.

SUBTASK 28-21-03-210-002

WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONS, AND DAMAGE TO EQUIPMENT.

(2) Make sure the downlocks are installed for the nose and main landing gear (TASK 32-00-30-480-801).

SUBTASK 28-21-03-860-001

(3) Open these circuit breakers and install safety tags:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
C	7	C28626	RFLNG VLVS GND

Standby Power Management Panel, P310

Row	Col	Number	Name
J	9	C28601	RFLNG VLVS

SUBTASK 28-21-03-010-001

(4) To get access to the refuel valve control units installed in the center fuel tank, do this step:

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(a) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-21-03-010-004

(5) To get access to the inboard refuel valve control units installed in the main tanks, do these steps:

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(a) For the inboard refuel valve installed in the left main tank (TASK 06-44-00-800-802):

NOTE: There are two methods to get access to the inboard refuel valve control unit. Use the applicable access panel.

Open this access panel:

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

As an alternate method to get access to the inboard refuel valve control unit, you can also open this access panel:

Number	Name/Location
551BB	Inboard Fixed Trailing Edge Panel

(b) For the inboard refuel valve installed in the right main tank (TASK 06-44-00-800-802):

NOTE: There are two methods to get access to the inboard refuel valve control unit. Use the applicable access panel.

Open this access panel:

Number	Name/Location
651DB	Inboard Fixed Trailing Edge Panel

As an alternate method to get access to the inboard refuel valve control unit, you can also open this access panel:

Number	Name/Location
651BB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-21-03-010-002

(6) To get access to the outboard refuel valve control units installed in the main tanks, do one of these steps:

(a) To get access thru a panel:

1) For the outboard refuel valve installed in the left main tank (TASK 06-44-00-800-802):

Open this access panel:

Number	Name/Location
561CB	Midspan Fixed Trailing Edge Panel

2) For the outboard refuel valve installed in the right main tank (TASK 06-44-00-800-802):

Open this access panel:

Number	Name/Location
661CB	Midspan Fixed Trailing Edge Panel

(b) To get access thru extended trailing edge flaps:

1) Extend the trailing edge flaps to 30 degrees (TASK 27-51-00-860-804).

SUBTASK 28-21-03-040-001



WARNING OBEY THE FLAP DEACTIVATION PROCEDURE. THE ACCIDENTAL MOVEMENT OF THE FLAPS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(7) Deactivate the trailing edge flaps (TASK 27-51-00-040-801).

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SUBTASK 28-21-03-020-005

(8) Disconnect the electrical connector [3] from the refuel valve control unit [6].

SUBTASK 28-21-03-020-001

(9) Remove the each bolt [5] and washer [4] that attach the refuel valve control unit [6] to the rear spar.

SUBTASK 28-21-03-020-002

WARNING ALIGN THE TWO SPACERS ON THE CONTROL UNIT WITH THE APPLICABLE HOLES IN THE REFUEL VALVE DURING CONTROL UNIT REMOVAL. FAILURE TO ALIGN THE CONTROL UNIT CORRECTLY DURING REMOVAL CAN RESULT IN FUEL LEAKS AND INJURY TO PERSONS.

(10) Remove the refuel valve control unit [6].

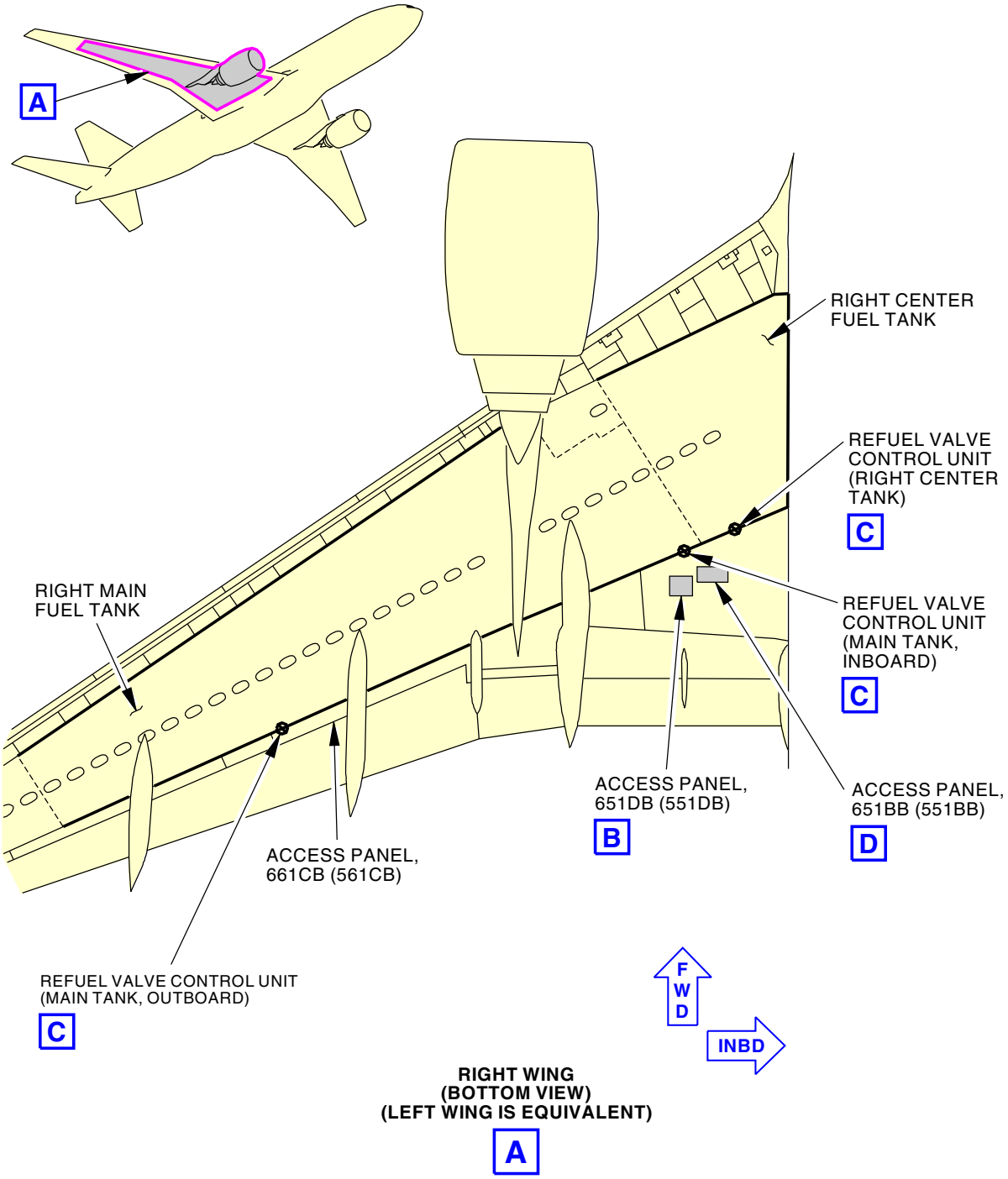
NOTE: If fuel leaks from the refuel valve when the refuel valve control unit [6] is removed, then the check valve has failed and the refuel valve must be replaced (TASK 28-21-02-000-801).

NOTE: If more than 10,000 lb (4536 kg) of fuel is in the tank when you remove the Control Unit, a fuel leak can occur if the check valve is bad. If a fuel leak occurs temporarily install the Control Unit then defuel the tank to less than 10,000 lb (4536 kg) before you continue.

(a) Remove the o-ring [1] and each of the o-ring [2] from the refuel valve control unit [6] and discard.

——— END OF TASK ———

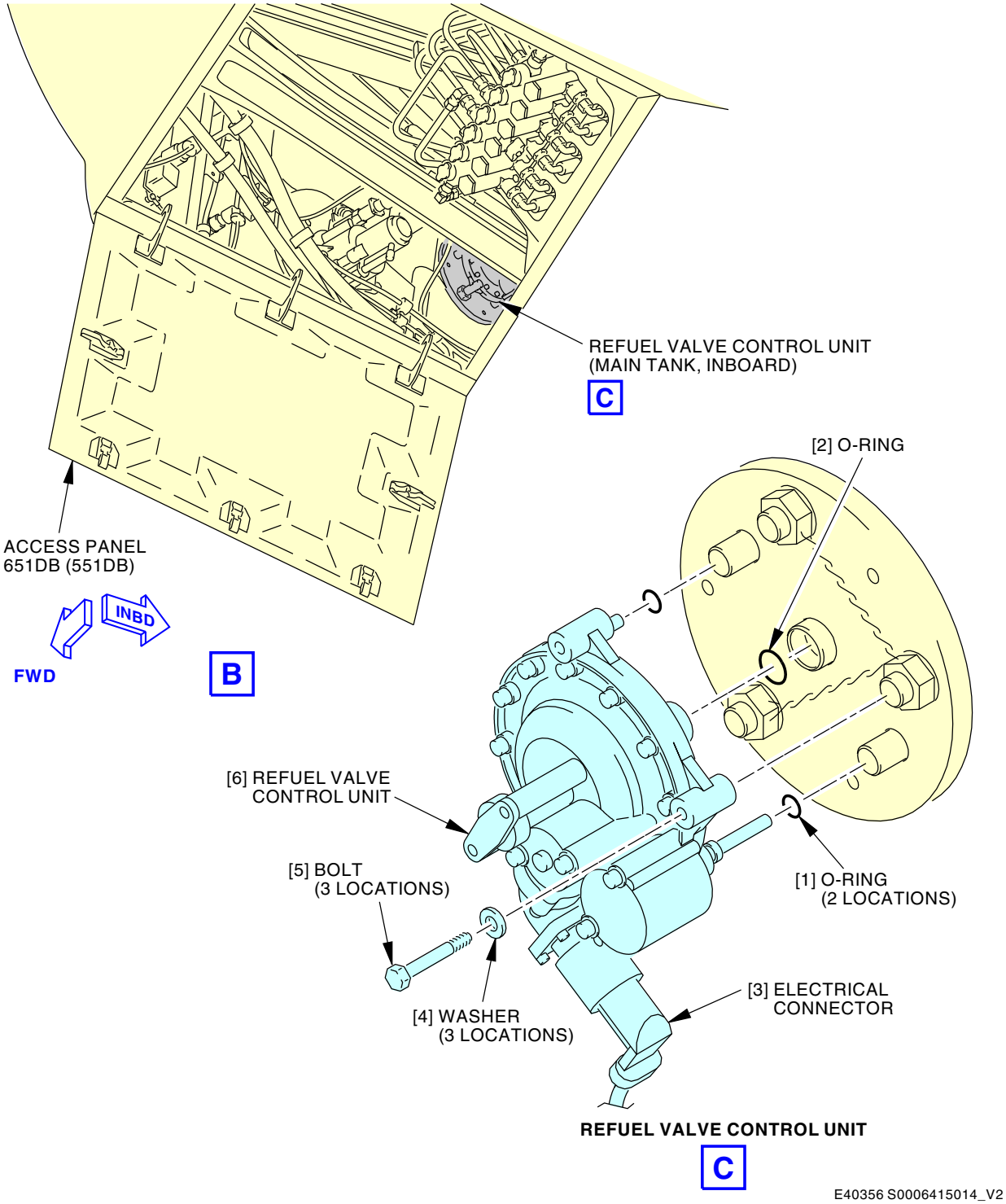
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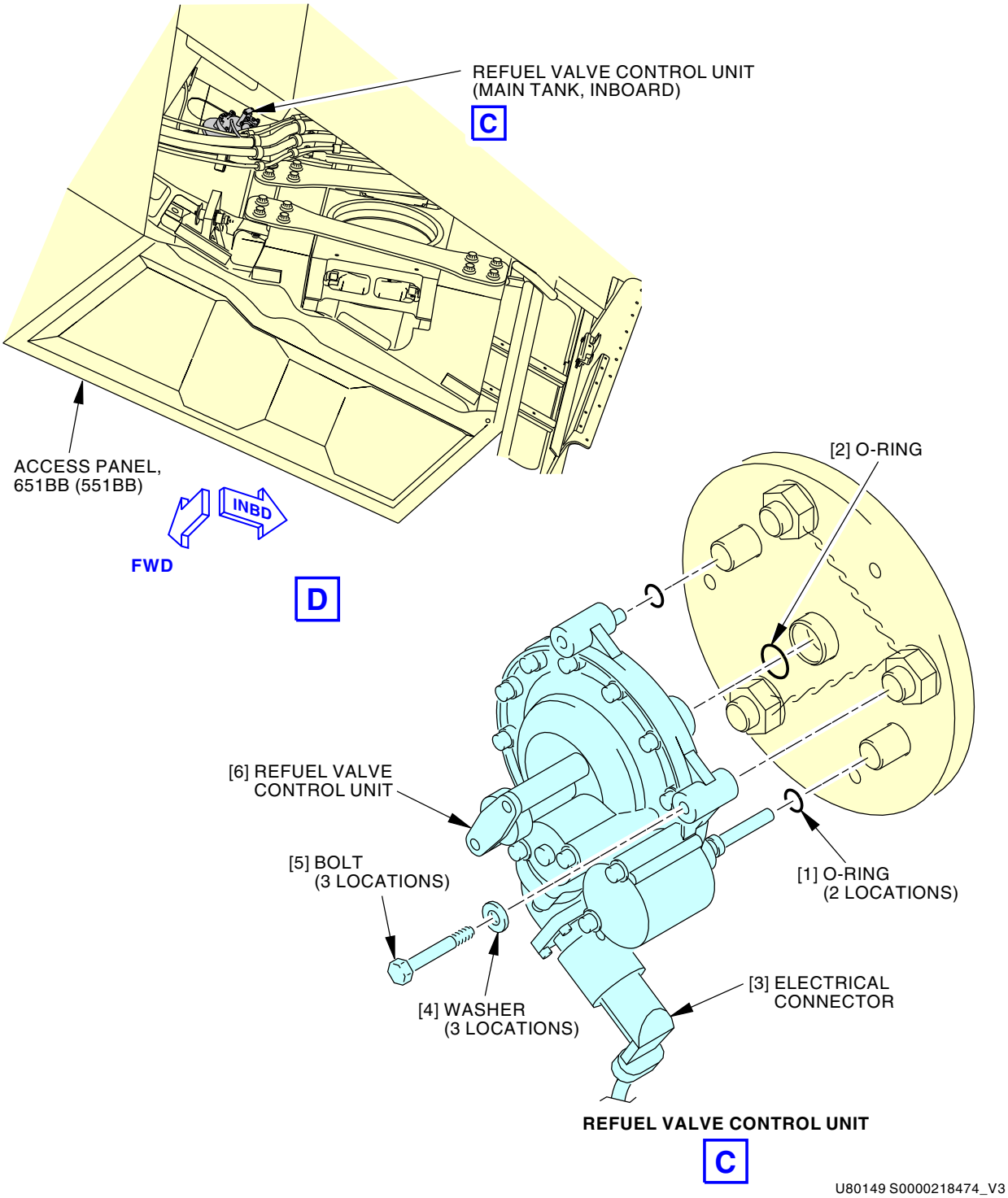
Refuel Valve Control Unit Installation
Figure 401/28-21-03-990-801 (Sheet 1 of 3)

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Refuel Valve Control Unit Installation
Figure 401/28-21-03-990-801 (Sheet 2 of 3)

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Refuel Valve Control Unit Installation
Figure 401/28-21-03-990-801 (Sheet 3 of 3)

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TASK 28-21-03-400-801

3. Refuel Valve Control Unit - Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
12-11-01-650-801	Pressure Refueling (P/B 301)
27-51-00-440-801	Trailing Edge Flap Reactivation (P/B 201)
27-51-00-740-802	Flap System Primary Control Test (P/B 501)
27-51-00-740-803	Flap System Secondary Control Test (P/B 501)
28-21-00-790-802	Refuel/Jettison and Fuel Feed Manifold - Leak Test (P/B 501)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	O-ring	28-21-03-01-032	ARO ALL
		28-21-03-10-030	ARO ALL
2	O-ring	28-21-03-01-027	ARO ALL
		28-21-03-10-025	ARO ALL
6	Refuel valve control unit	28-21-03-01-037	ARO ALL
		28-21-03-10-035	ARO ALL

D. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
561	Rear Spar to Trailing Edge - Outboard of Flaperon - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
661	Rear Spar to Trailing Edge - Outboard of Flaperon - Right Wing

E. Access Panels

Number	Name/Location
521DB	Refueling Station Door
551BB	Inboard Fixed Trailing Edge Panel
551DB	Inboard Fixed Trailing Edge Panel
561CB	Midspan Fixed Trailing Edge Panel
651BB	Inboard Fixed Trailing Edge Panel

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(Continued)

Number	Name/Location
651DB	Inboard Fixed Trailing Edge Panel
661CB	Midspan Fixed Trailing Edge Panel

F. Procedure

SUBTASK 28-21-03-650-004

(1) Make sure that the applicable tank contains less than 10,000 LB (4,500 KG) of fuel.

(a) If the applicable tank contains more than 10,000 LB (4,500 KG) of fuel, then do one of these steps to remove fuel from the tank:

1) Do this task: Tank to Tank Transfer, TASK 28-26-00-650-802.

2) Do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-21-03-870-002

(2) Do these steps to decrease the pressure in the refuel/jettison manifold:

WARNING DO NOT OPERATE THE LEADING EDGE SLATS. ACCIDENTAL SLAT OPERATION COULD CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(a) Install a DO-NOT-OPERATE tag on the flap control lever.

(b) Open this access panel:

Number	Name/Location
521DB	Refueling Station Door

(c) Put the three refuel valve control switches to the OPEN position.

NOTE: The pressure in the refuel/jettison manifold will immediately decrease when the valves are opened. The valve will automatically close when the back pressure in the refuel/jettison manifold is not sufficient to move the spring-loaded valve poppet.

(d) Put the three refuel valve control switches to the CLOSE position.

(e) Wait 15 minutes for the remaining fuel pressure in the manifold to decrease.

SUBTASK 28-21-03-210-001

(3) Apply a thin layer of petrolatum grease, D00504 to o-ring [1] and o-ring [2].

(a) Install the o-ring [1] and o-rings [2] on the refuel valve control unit [6].

SUBTASK 28-21-03-420-006

WARNING ALIGN THE TWO SPACERS ON THE CONTROL UNIT WITH THE APPLICABLE HOLES IN THE REFUEL VALVE DURING CONTROL UNIT INSTALLATION. FAILURE TO ALIGN THE CONTROL UNIT CORRECTLY DURING INSTALLATION CAN RESULT IN FUEL LEAKS AND INJURY TO PERSONS.

(4) Insert the two spacers on the refuel valve control unit [6] into applicable holes in the refuel valve.

NOTE: Make sure that the three bolt holes on the refuel valve control unit are aligned with the threaded inserts on the refuel valve.

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SUBTASK 28-21-03-420-004

(5) Install the three washer [4] and bolt [5] to attach the refuel valve control unit [6] to the threaded inserts of the refueling valve on the rear spar.

(a) Tighten the bolt [5] to 90-95 pound-inches (10.2-10.7 newton-meters).

SUBTASK 28-21-03-420-005

(6) Connect the electrical connector [3] to the refuel valve control unit [6].

SUBTASK 28-21-03-860-002

(7) Remove the safety tags and close these circuit breakers:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
C	7	C28626	RFLNG VLVS GND

Standby Power Management Panel, P310

Row	Col	Number	Name
J	9	C28601	RFLNG VLVS

SUBTASK 28-21-03-650-002

(8) To test the refuel valve control unit installation, do this step:

(a) To operate the refuel valve control unit, do this task: Pressure Refueling, TASK 12-11-01-650-801 or Tank to Tank Transfer, TASK 28-26-00-650-802.

SUBTASK 28-21-03-650-001

(9) If the refuel valve (valve body) was replaced, do these steps to test the refuel valve installation:

(a) Do this task: Refuel/Jettison and Fuel Feed Manifold - Leak Test, TASK 28-21-00-790-802.

(b) Refuel the applicable fuel tank to the quantity shown in (Table 401) to make sure there are no fuel leaks at the refuel valve control unit, on the rear spar.

Table 401/28-21-03-993-802 Fuel Quantities Required To Cover Refuel Valves

REFUEL VALVE	POUNDS (LB)	KILOGRAMS (KG)
OUTBOARD MAIN TANK, REFUEL VALVES (L or R MAIN TANK)	31,500	14,300
INBOARD MAIN TANK, REFUEL VALVES (L or R MAIN TANK)	13,300	6,000
CENTER TANK, REFUEL VALVES (L and R REFUEL VALVES)	166,000	75,300

(c) Make sure there are no fuel leaks at the applicable access doors, removed for access to the refuel valve (valve body).

SUBTASK 28-21-03-410-001

(10) To close the access to the inboard refuel valve control units in the main fuel tanks, do the applicable step:

(a) Close this access panel for the inboard refuel valve control unit, installed in the left main tank:

(TASK 06-44-00-800-802)

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Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

(b) If opened for access, close the access to the inboard refuel valve control unit in the left main fuel tank by

Closing this access panel:

Number	Name/Location
551BB	Inboard Fixed Trailing Edge Panel

(c) Close this access panel for the inboard refuel valve control unit, installed in the right main tank:

(TASK 06-44-00-800-802)

Number	Name/Location
651DB	Inboard Fixed Trailing Edge Panel

(d) If opened for access, close the access to the inboard refuel valve control unit in the right main fuel tank by

Closing this access panel:

Number	Name/Location
651BB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-21-03-410-002

(11) To close the access to the outboard refuel valves in the main fuel tanks, do the applicable step:

(a) Install this access panel if removed for access to the left refuel valve:

(TASK 06-44-00-800-802)

Number	Name/Location
561CB	Midspan Fixed Trailing Edge Panel

(b) If removed for access to the right refuel valve (TASK 06-44-00-800-802):

Install this access panel if removed for access to the right refuel valve:

Number	Name/Location
661CB	Midspan Fixed Trailing Edge Panel

SUBTASK 28-21-03-440-001

(12) To reactivate the trailing edge flaps, do these steps:

(a) Do this task: Trailing Edge Flap Reactivation, TASK 27-51-00-440-801.

SUBTASK 28-21-03-710-001

(13) Do these tests of the trailing edge flaps:

(a) Do this task: Flap System Primary Control Test, TASK 27-51-00-740-802.

(b) Do this task: Flap System Secondary Control Test, TASK 27-51-00-740-803.

SUBTASK 28-21-03-440-002

WARNING OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(14) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

END OF TASK

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SURGE TANK FLOAT SWITCH - REMOVAL/INSTALLATION

1. General

A. A float switch is installed on the front spar inside each wing surge tank.

B. This procedure contains two tasks. The first task removes the surge tank float switch. The second task installs the surge tank float switch.

TASK 28-21-04-000-801

2. Surge Tank Float Switch - Removal

(Figure 401)

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
12-11-02-650-802	Surge Tank Sump Drain Valve - Fuel Check (P/B 301)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-1772	Drain Fitting, Fuel System Part #: J28013-1 Supplier: 81205

C. Location Zones

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

D. Access Panels

Number	Name/Location
521XB	Outboard Fixed Leading Edge Panel
621XB	Outboard Fixed Leading Edge Panel

E. Procedure

SUBTASK 28-21-04-680-001

(1) Use the drain fitting, SPL-1772, to do a check for fuel in the left or right wing surge tank (TASK 12-11-02-650-802).

(a) If there is fuel in the surge tank, remove it through the fuel sump.

SUBTASK 28-21-04-860-001

(2) Open these circuit breakers and install safety tags:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
D	7	C28603	RFLNG CTRL GND

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Right Power Management Panel, P210

Row	Col	Number	Name
L	1	C28625	FUEL QTY 1

Standby Power Management Panel, P310

Row	Col	Number	Name
A	11	C28005	RFLNG DR LTS
G	10	C28624	FUEL QTY 2
J	5	C24640	P310 PSU B ALTN
J	8	C28600	RFLNG CTRL
J	9	C28601	RFLNG VLVS
J	11	C28623	RFLNG QTY

SUBTASK 28-21-04-040-001

WARNING DO NOT OPERATE THE LEADING EDGE SLATS. ACCIDENTAL SLAT OPERATION COULD CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Do the Slat Deactivation procedure to put a DO-NOT-OPERATE tag on the flap control lever, in the flight compartment (TASK 27-81-00-040-801).

SUBTASK 28-21-04-010-003

(4) For access to the left float switch (TASK 06-44-00-800-802):

Remove this access panel:

Number	Name/Location
521XB	Outboard Fixed Leading Edge Panel

SUBTASK 28-21-04-010-002

(5) For access to the right float switch (TASK 06-44-00-800-802):

Remove this access panel:

Number	Name/Location
621XB	Outboard Fixed Leading Edge Panel

SUBTASK 28-21-04-020-006

(6) Disconnect the electrical connector [4] from the float switch [1].

SUBTASK 28-21-04-020-003

(7) Remove the sealant from the nuts [3] that attach the float switch [1] to the front spar.

SUBTASK 28-21-04-020-001

(8) Hold the studs [5] in position with an allen wrench.

SUBTASK 28-21-04-020-002

(9) Remove the nuts [3] that attach the float switch [1] to the front spar from the studs [5].

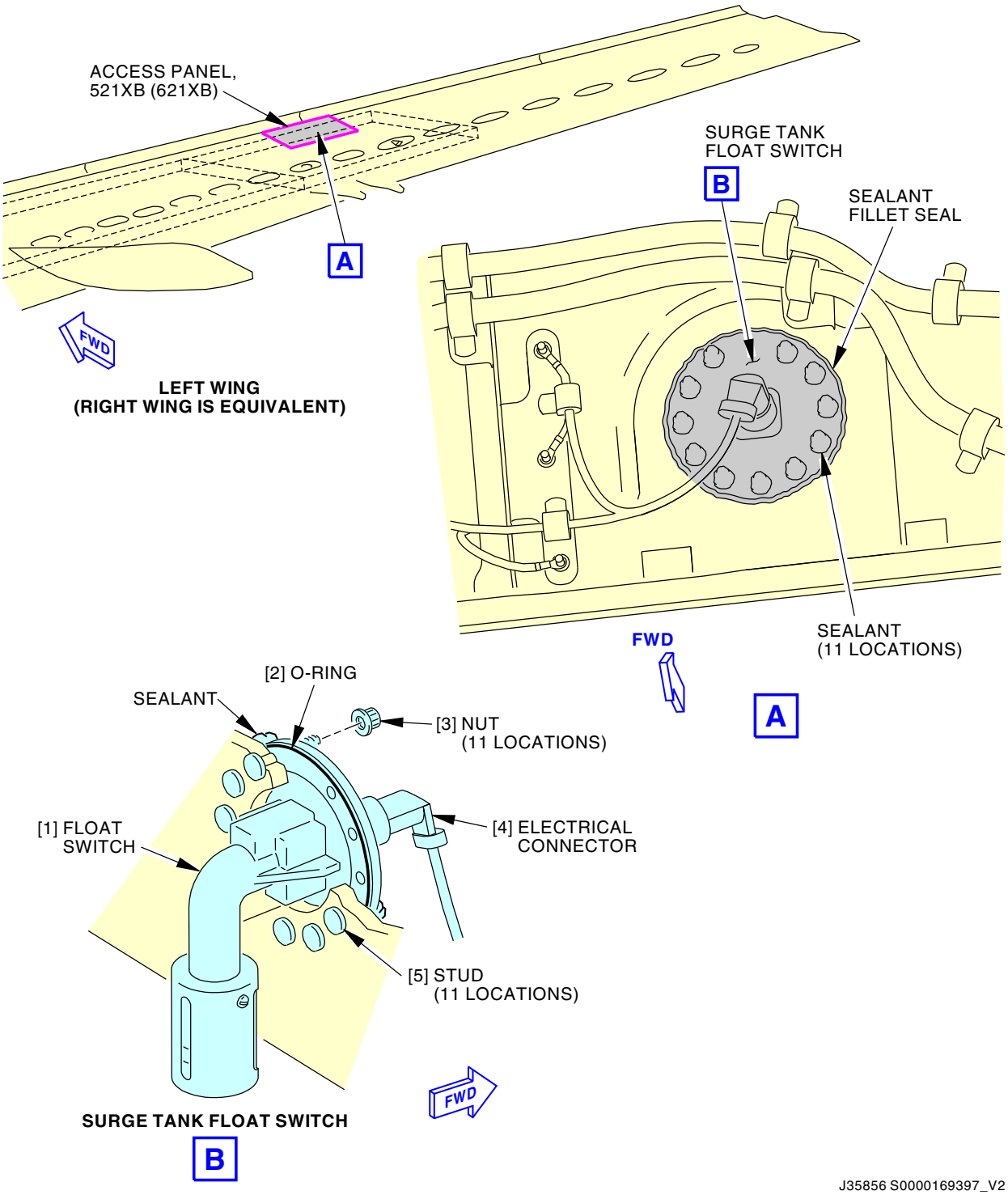
SUBTASK 28-21-04-020-007

(10) Carefully pull the float switch [1] and remove it from the front spar.

(a) Remove and discard the o-ring [2].

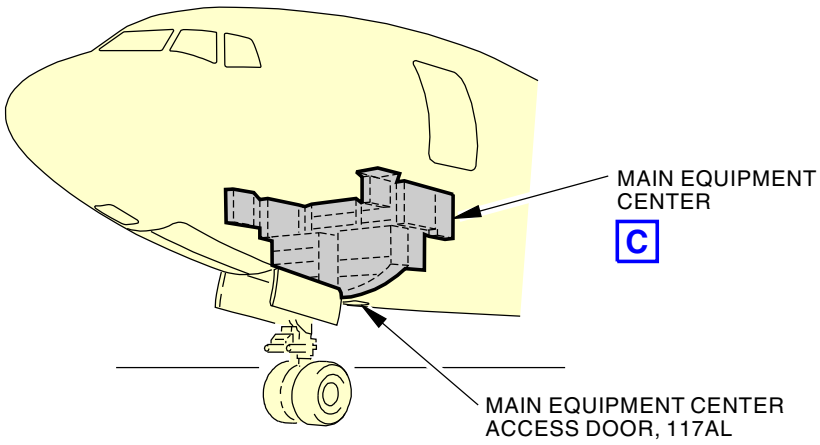
END OF TASK

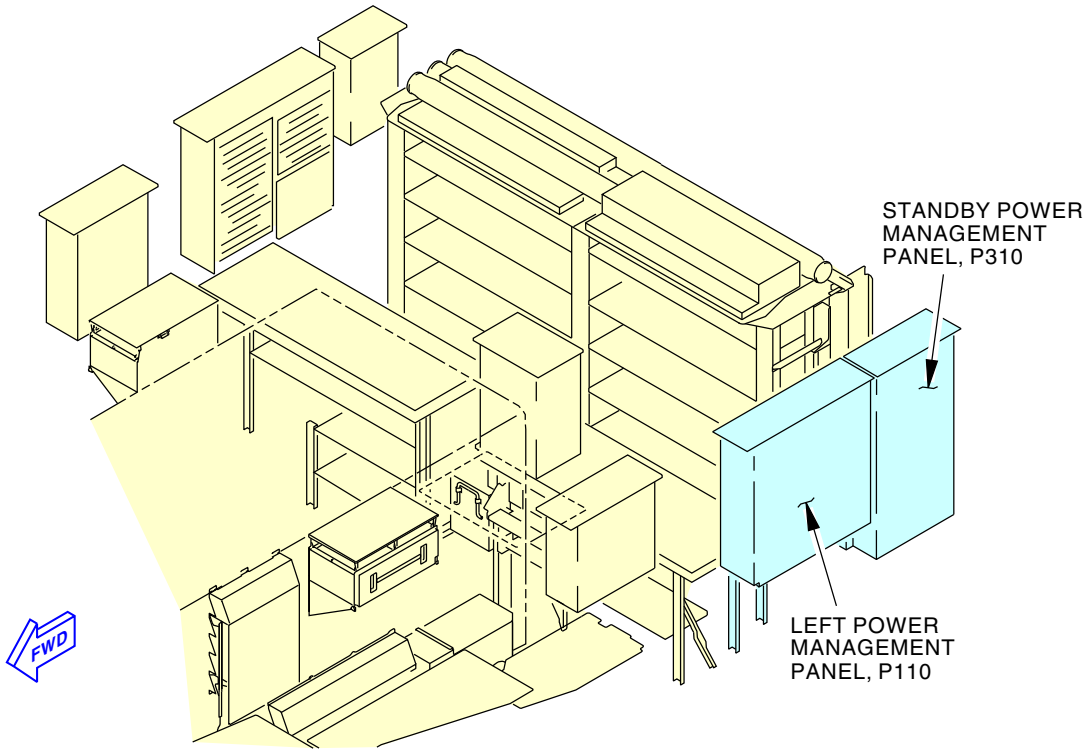
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Surge Tank Float Switch Installation
Figure 401/28-21-04-990-801 (Sheet 1 of 2)

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MAIN EQUIPMENT CENTER

C

E49870 S0006415021_V2

Surge Tank Float Switch Installation
Figure 401/28-21-04-990-801 (Sheet 2 of 2)

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TASK 28-21-04-400-801

3. Surge Tank Float Switch - Installation

(Figure 401)

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
28-11-00-300-802	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
WDM 28-21-41	Wiring Diagram Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Consumable Materials

Reference	Description	Specification
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142 Type II
B00062	Solvent - Acetone (99.5% Grade)	ASTM D 329 (Supersedes O-A-51)
B00068	Alcohol - Denatured, Ethyl (Ethanol)	AMS 3002, MIL-E-51454 Type II
B00130	Alcohol - Isopropyl	TT-I-735
B00148	Solvent - Methyl Ethyl Ketone (MEK)	ASTM D740
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Float switch	28-21-04-01A-020	ARO ALL
2	O-ring	28-21-04-01A-015	ARO ALL

E. Location Zones

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

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F. Access Panels

Number	Name/Location
521DB	Refueling Station Door
521XB	Outboard Fixed Leading Edge Panel
621XB	Outboard Fixed Leading Edge Panel

G. Procedure

SUBTASK 28-21-04-420-007

(1) Connect the electrical connector [4] to the float switch [1].

SUBTASK 28-21-04-710-001

(2) Do these steps to test the float switch [1]:

(a) Have one person hold the float switch [1] in the correct position (float in the down position).

(b) Have another person remove the connector D31023, on the Power Management Panel - Standby, P310 (WDM 28-21-41).

(c) Make sure there is no continuity between pin 34 on connector D31023 and airplane ground.

(d) Have one person hold the float switch [1] in the upside down position (float in the up position).

(e) Make sure there is continuity between pin 34 on connector D31023 and the airplane ground.

SUBTASK 28-21-04-420-008

(3) Disconnect the electrical connector [4] from the float switch [1].

SUBTASK 28-21-04-110-001

WARNING DO NOT GET SOLVENTS IN YOUR MOUTH, OR YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE HAZARDOUS MATERIALS. REFER TO PRODUCT MATERIAL SAFETY DATA SHEETS (MSDS) AND LOCAL REQUIREMENTS FOR PROPER HANDLING PROCEDURES.

(4) Clean the mating surfaces of the float switch [1] and airplane structure with solvent, B00148, solvent, B00062, alcohol, B00130, or alcohol, B00068 applied with a cloth applicator.

SUBTASK 28-21-04-160-001

(5) Rub the mating surfaces dry with a clean cotton wiper, G00034.

SUBTASK 28-21-04-420-009

(6) Lubricate the new o-ring [2] with a grease, D00504, of petrolatum jelly.

(a) Install the new o-ring [2] on the float switch [1].

SUBTASK 28-21-04-420-001

(7) Put the float switch [1] through the opening in the front spar.

SUBTASK 28-21-04-420-002

(8) Install the eleven nuts [3] that attach the float switch [1] to the front spar.

NOTE: Hold the studs [5] in position with an allen wrench.

SUBTASK 28-21-04-390-001

(9) Apply a fillet seal of sealant, A02315, to the studs [5] and nuts [3] (TASK 28-11-00-300-802).

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SUBTASK 28-21-04-390-002

(10) Apply a fillet seal of sealant, A02315, to the mating surface between the float switch [1] and the front spar (TASK 28-11-00-300-802).

SUBTASK 28-21-04-760-001

(11) Measure the bonding resistance between the body of the float switch [1] and the forward side of the spar web with a bonding intrinsically safe approved bonding meter, COM-1550.

(a) Make sure the bonding resistance between the body of the float switch [1] and the forward side of the spar web is not more than 0.0025 ohm.

SUBTASK 28-21-04-420-010

(12) Connect the electrical connector [4] to the float switch [1].

SUBTASK 28-21-04-410-001

(13) Install this access panel:

Number	Name/Location
521XB	Outboard Fixed Leading Edge Panel

if removed (TASK 06-44-00-800-802).

SUBTASK 28-21-04-410-002

(14) Install this access panel:

Number	Name/Location
621XB	Outboard Fixed Leading Edge Panel

if removed (TASK 06-44-00-800-802).

SUBTASK 28-21-04-860-002

(15) Remove the safety tags and close these circuit breakers:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
D	7	C28603	RFLNG CTRL GND

Right Power Management Panel, P210

Row	Col	Number	Name
L	1	C28625	FUEL QTY 1

Standby Power Management Panel, P310

Row	Col	Number	Name
A	11	C28005	RFLNG DR LTS
G	10	C28624	FUEL QTY 2
J	5	C24640	P310 PSU B ALTN
J	8	C28600	RFLNG CTRL
J	9	C28601	RFLNG VLVS
J	11	C28623	RFLNG QTY

SUBTASK 28-21-04-710-002

(16) Do these steps to test the overfill system:

(a) On the left wing,

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Open this access panel:

Number	Name/Location
521DB	Refueling Station Door

(b) Make sure that the fuel quantity indicators on the integrated refuel panel (IRP) are on.

NOTE: This shows that there is 28V DC at the IRP panel.

(c) Push the OVERFILL TEST switch on the IRP, P28.

(d) Make sure that the red OVERFILL indicator light comes on.

(e) Push the OVERFILL RESET switch on the IRP to the RESET and to the NORMAL positions.

(f) Make sure that the red OVERFILL indicator light goes off.

(g) Close this access panel:

Number	Name/Location
521DB	Refueling Station Door

SUBTASK 28-21-04-440-001

(17) Reactivate the leading edge slats and remove the DO-NOT-OPERATE tag from the flap control lever (TASK 27-81-00-440-801).

——— END OF TASK ———

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SURGE TANK FLOAT SWITCH - INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure contains a functional check of the bonding resistance between the structure and the surge tank float switch.

SFAR 88

TASK 28-21-04-200-801

2. Surge Tank Float Switch - Bonding Resistance Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
28-21-04-400-801	Surge Tank Float Switch - Installation (P/B 401)
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Location Zones

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

D. Access Panels

Number	Name/Location
521XB	Outboard Fixed Leading Edge Panel
621XB	Outboard Fixed Leading Edge Panel

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E. Prepare for the Procedure

SUBTASK 28-21-04-865-001

(1) Open these circuit breakers and install safety tags:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
D	7	C28603	RFLNG CTRL GND

Right Power Management Panel, P210

Row	Col	Number	Name
L	1	C28625	FUEL QTY 1

Standby Power Management Panel, P310

Row	Col	Number	Name
A	11	C28005	RFLNG DR LTS
G	10	C28624	FUEL QTY 2
J	5	C24640	P310 PSU B ALTN
J	8	C28600	RFLNG CTRL
J	9	C28601	RFLNG VLVS
J	11	C28623	RFLNG QTY

SUBTASK 28-21-04-040-002

WARNING DO NOT OPERATE THE LEADING EDGE SLATS. ACCIDENTAL SLAT OPERATION COULD CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do the Slat Deactivation procedure to put a DO-NOT-OPERATE tag on the flap control lever, in the flight compartment (TASK 27-81-00-040-801).

SUBTASK 28-21-04-010-006

(3) For access to the left float switch (TASK 06-44-00-800-802):

(a) Remove this access panel:

Number	Name/Location
521XB	Outboard Fixed Leading Edge Panel

SUBTASK 28-21-04-010-007

(4) For access to the right float switch (TASK 06-44-00-800-802):

(a) Remove this access panel:

Number	Name/Location
621XB	Outboard Fixed Leading Edge Panel

F. Electrical Bonding Measurement

SUBTASK 28-21-04-862-001

(1) Disconnect the electrical connector from the float switch.

SUBTASK 28-21-04-765-001

(2) Measure the bonding resistance between the float switch flange and the forward side of the spar web with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

(a) Make sure the bonding resistance is 0.005 ohm (5 milliohms) or less.

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SUBTASK 28-21-04-861-001

(3) Connect the electrical connector to the float switch.

SUBTASK 28-21-04-860-003

(4) Remove the safety tags and close these circuit breakers:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
D	7	C28603	RFLNG CTRL GND

Right Power Management Panel, P210

Row	Col	Number	Name
L	1	C28625	FUEL QTY 1

Standby Power Management Panel, P310

Row	Col	Number	Name
A	11	C28005	RFLNG DR LTS
G	10	C28624	FUEL QTY 2
J	5	C24640	P310 PSU B ALTN
J	8	C28600	RFLNG CTRL
J	9	C28601	RFLNG VLVS
J	11	C28623	RFLNG QTY

SUBTASK 28-21-04-710-004

(5) Do the steps to test the overfill system in Surge Tank Float Switch - Installation, TASK 28-21-04-400-801.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 28-21-04-410-005

(1) Install this access panel:

Number	Name/Location
521XB	Outboard Fixed Leading Edge Panel

if removed (TASK 06-44-00-800-802).

SUBTASK 28-21-04-410-006

(2) Install this access panel:

Number	Name/Location
621XB	Outboard Fixed Leading Edge Panel

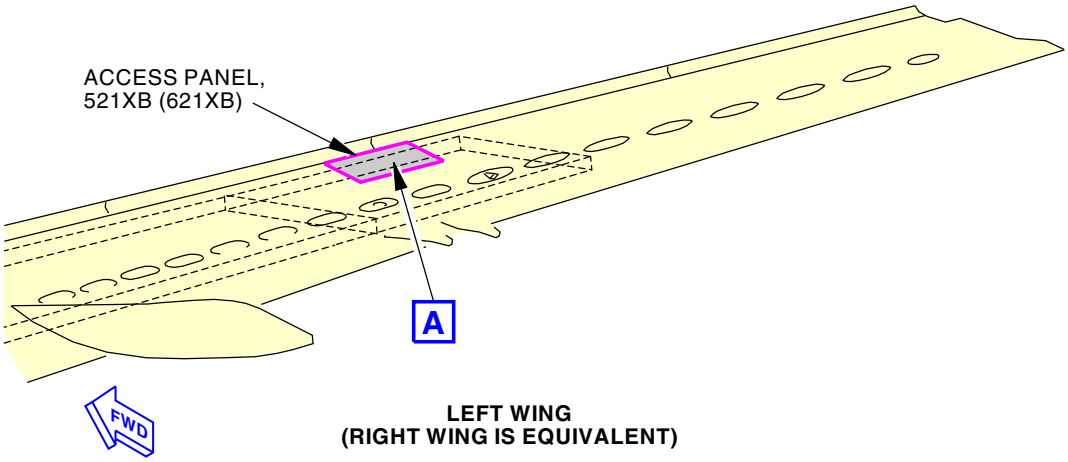
if removed (TASK 06-44-00-800-802).

SUBTASK 28-21-04-440-002

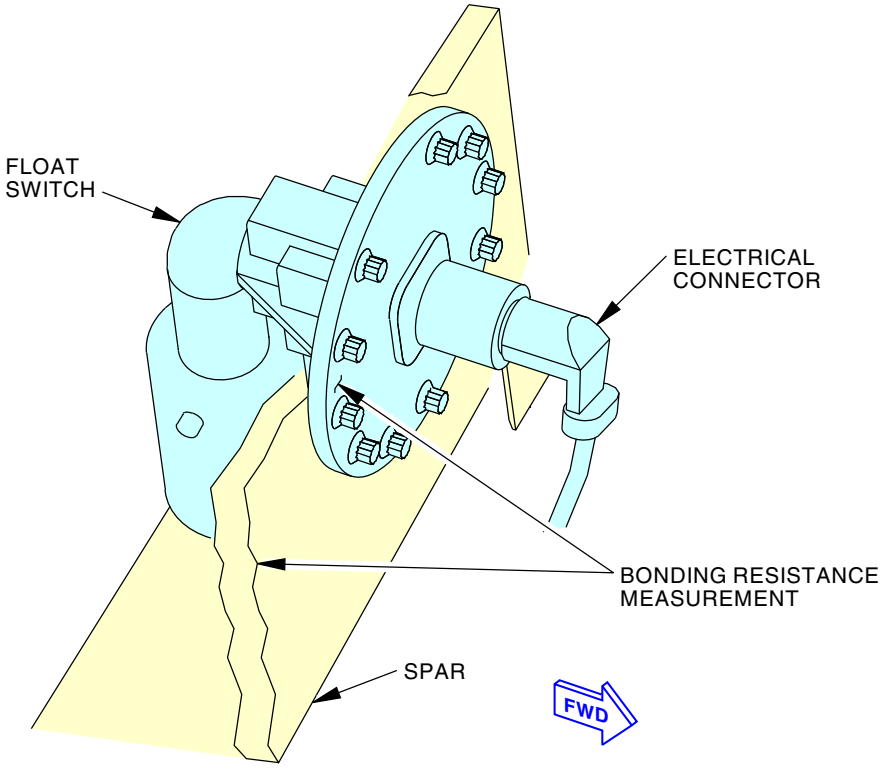
(3) Reactivate the leading edge slats and remove the DO-NOT-OPERATE tag from the flap control lever (TASK 27-81-00-440-801).

——— END OF TASK ———

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LEFT WING
(RIGHT WING IS EQUIVALENT)



SURGE TANK FLOAT SWITCH

A

1367918 S0000246827_V2

Surge Tank Float Switch - Bonding Resistance Measurement
Figure 601/28-21-04-990-802

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REFUELING MANIFOLD DRAIN VALVE - REMOVAL/INSTALLATION

1. General

A. Two drain lines connect to the refueling manifold in the center tank and drain fuel into the left and right main tanks respectively. An inline drain valve prevents fuel flow into the refueling manifold from the main fuel tanks.

B. There is a second refueling manifold drain outboard in each main tank. A drain valve connects directly to the bottom of the manifold to prevent fuel flow into the refueling manifold from the main fuel tanks.

C. This procedure contains four tasks. The first two tasks remove and install the inboard drain valve. The second two tasks remove and install the outboard drain valve.

TASK 28-21-05-000-801

2. Inboard Refueling Manifold Drain Valve - Removal

(Figure 401)

A. References

Reference	Title
28-00-00-200-801	Inspection of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

C. Access Panels

Number	Name/Location
531AB	Access Door
631AB	Access Door

D. Procedure

SUBTASK 28-21-05-650-001

(1) Defuel the center and applicable left or right main fuel tank.

(a) To defuel, do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-21-05-010-001

(2) For the drain valve in the left center tank,

Remove this access panel:

Number	Name/Location
531AB	Access Door

SUBTASK 28-21-05-010-002

(3) For the drain valve in the right center tank,

Remove this access panel:

Number	Name/Location
631AB	Access Door

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SUBTASK 28-21-05-650-002

WARNING OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. FAILURE TO OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS COULD CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(4) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-21-05-940-001

(5) Go into the left or right center fuel tank.

SUBTASK 28-21-05-020-001

(6) Loosen the B-nuts [2], [5] to remove the elbow [1] of the drain line.

SUBTASK 28-21-05-020-003

(7) Loosen the outboard B-nut [2] to remove the drain valve [3].

SUBTASK 28-21-05-210-001

(8) Do a check of the bonding jumper; do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

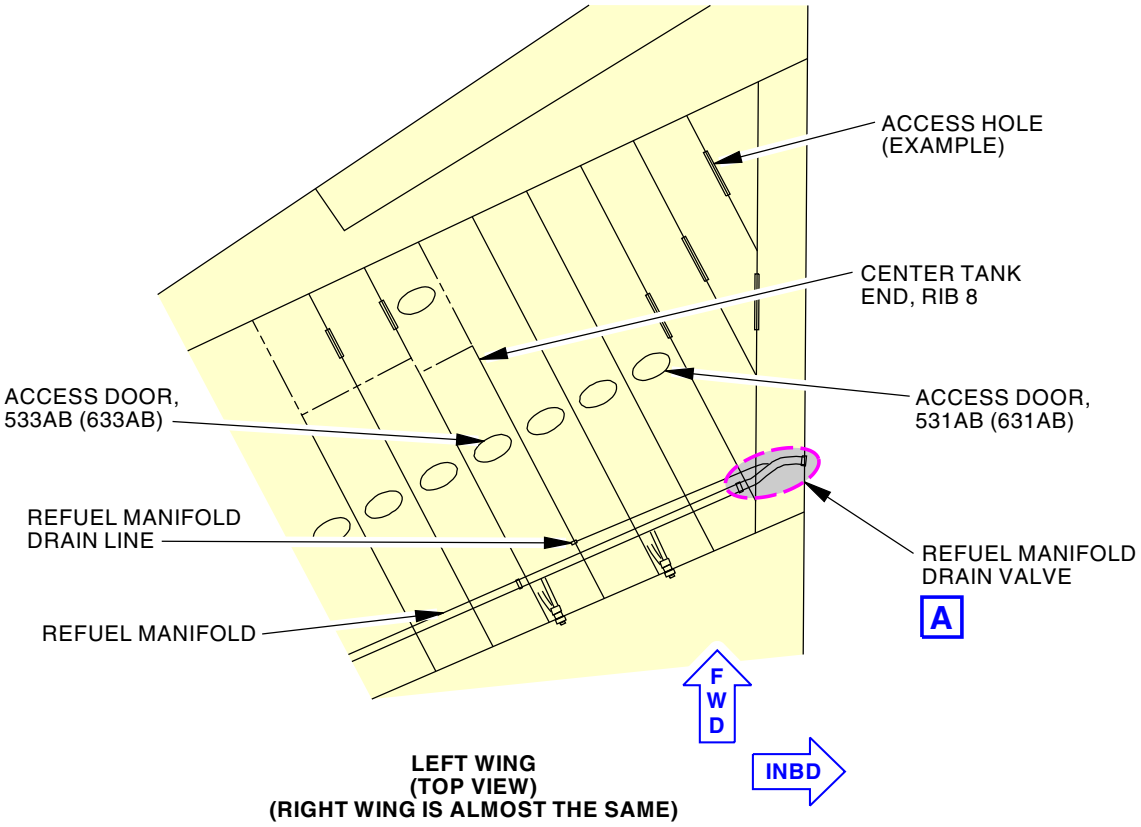
(a) Replace the bonding jumper as necessary.

SUBTASK 28-21-05-020-002

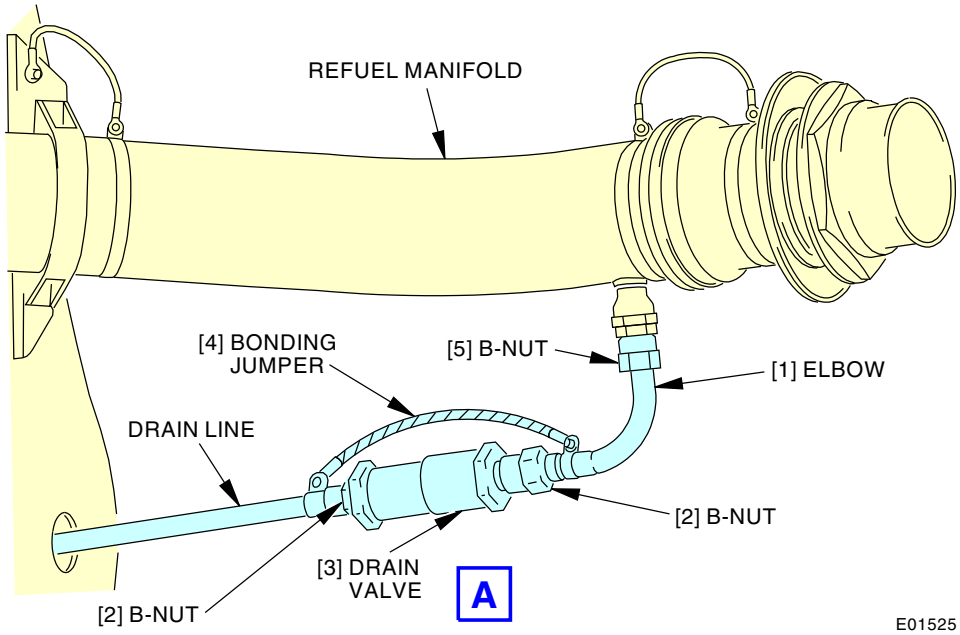
(9) Go out of the applicable fuel tank.

END OF TASK

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**LEFT WING
(TOP VIEW)
(RIGHT WING IS ALMOST THE SAME)**



**Refuel Manifold Drain Valve Installation
Figure 401/28-21-05-990-801**

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TASK 28-21-05-400-801

3. Inboard Refueling Manifold Drain Valve - Installation

(Figure 401)

A. References

Reference	Title
28-00-00-960-801	Replacement of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Drain valve	28-21-05-02-010	ARO ALL

C. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

D. Access Panels

Number	Name/Location
531AB	Access Door
631AB	Access Door

E. Procedure

SUBTASK 28-21-05-650-003

WARNING OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. FAILURE TO OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS COULD CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(1) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-21-05-940-002

(2) Go into the left or right center fuel tank.

SUBTASK 28-21-05-420-001

(3) Tighten the outboard B-nut [2] to install the drain valve [3].

SUBTASK 28-21-05-420-002

(4) Install the B-nuts [2], [5] to install the elbow [1] to the drain line.

SUBTASK 28-21-05-960-001

(5) Replace the bonding jumper as necessary. To replace the bonding jumper, do this task: Replacement of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-960-801.

SUBTASK 28-21-05-940-003

(6) Go out of the applicable fuel tank.

SUBTASK 28-21-05-410-001

(7) For the drain valve in the left center tank,

Install this access panel:

Number	Name/Location
531AB	Access Door

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SUBTASK 28-21-05-410-002

(8) For the drain valve in the right center tank,

Install this access panel:

Number	Name/Location
631AB	Access Door

——— END OF TASK ———

TASK 28-21-05-000-802

4. Outboard Refueling Manifold Drain Valve - Removal

(Figure 402)

A. References

Reference	Title
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
541	Main Tank - Rib 17 to Rib 32 - Left Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing

C. Access Panels

Number	Name/Location
541HB	Access Door
641HB	Access Door

D. Procedure

SUBTASK 28-21-05-650-004

(1) Defuel the applicable left or right main fuel tank.

(a) To defuel, do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-21-05-010-003

(2) For the outboard drain valve in the left main tank,

Remove this access panel:

Number	Name/Location
541HB	Access Door

SUBTASK 28-21-05-010-004

(3) For the outboard drain valve in the right main tank,

Remove this access panel:

Number	Name/Location
641HB	Access Door

SUBTASK 28-21-05-650-005

WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(4) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

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SUBTASK 28-21-05-940-004

(5) Go into the left or right main fuel tank.

SUBTASK 28-21-05-020-004

(6) Do these steps to remove the drain valve [6]:

(a) Remove the lockwire.

(b) Loosen the B-nut [7].

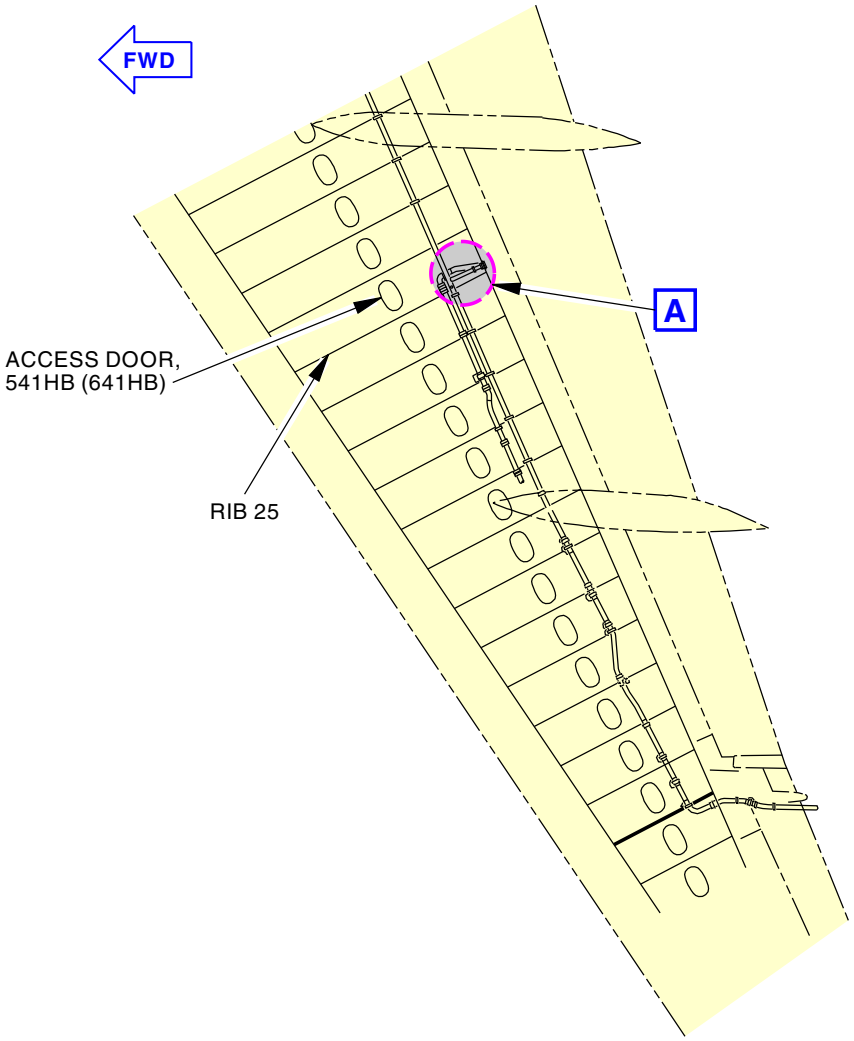
(c) Discard the O-ring [8].

SUBTASK 28-21-05-020-005

(7) Go out of the applicable fuel tank.

——— END OF TASK ———

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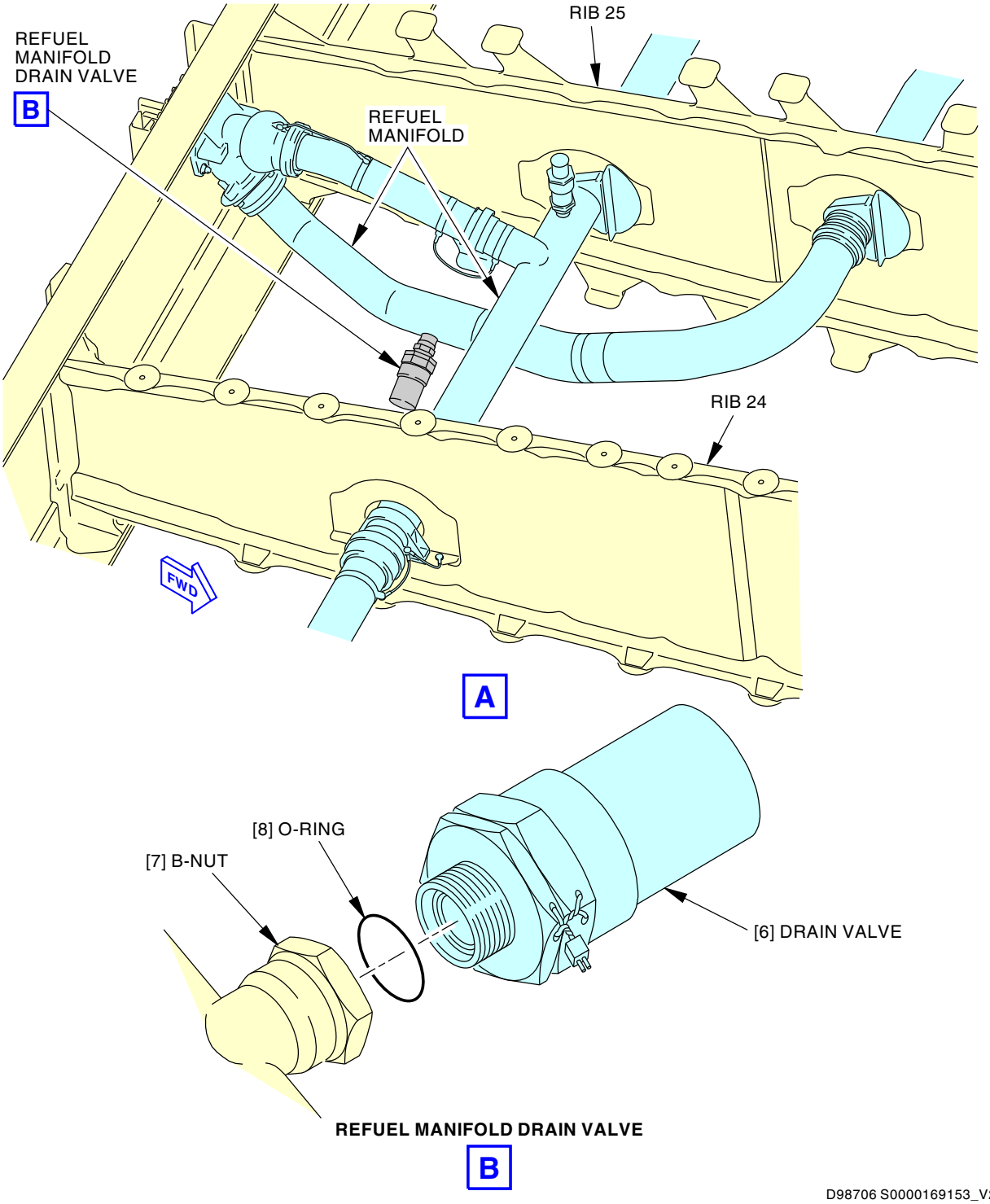


**LEFT WING
(TOP VIEW)
(RIGHT WING IS ALMOST THE SAME)**

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**Refuel Manifold Drain Valve Installation
Figure 402/28-21-05-990-802 (Sheet 1 of 2)**

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Refuel Manifold Drain Valve Installation
Figure 402/28-21-05-990-802 (Sheet 2 of 2)

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TASK 28-21-05-400-802

5. Outboard Refueling Manifold Drain Valve - Installation

(Figure 402)

A. References

Reference	Title
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D50098	Lubricant - Fuel System Fittings	BAC5001-6 Table 1

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
6	Drain valve	28-21-05-01-315	ARO ALL
8	O-ring	28-21-05-01-310	ARO ALL

D. Location Zones

Zone	Area
541	Main Tank - Rib 17 to Rib 32 - Left Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing

E. Access Panels

Number	Name/Location
541HB	Access Door
641HB	Access Door

F. Procedure

SUBTASK 28-21-05-650-006

WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(1) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-21-05-940-005

(2) Go into the left or right center fuel tank.

SUBTASK 28-21-05-420-003

(3) Do these steps to install the drain valve [6]:

(a) Lubricate the threads of the drain valve [6] with lubricant, D50098.

(b) Install a new O-ring [8].

(c) Connect the drain valve [6] and the B-nut [7].

1) Tighten the B-nut [7] to 280 ±28 in-lb (32 ±4 N·m).

SUBTASK 28-21-05-940-006

(4) Go out of the applicable fuel tank.

SUBTASK 28-21-05-410-003

(5) For the drain valve in the left main tank,

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Install this access panel:

Number	Name/Location
541HB	Access Door

SUBTASK 28-21-05-410-004

(6) For the drain valve in the right main tank,

Install this access panel:

Number	Name/Location
641HB	Access Door

——— END OF TASK ———

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REFUELING STATION DOOR PROXIMITY SWITCH - REMOVAL/INSTALLATION

1. General

A. This procedure contains two tasks. The first task removes the sensor for the refueling station door proximity switch. The second task installs the sensor for the refueling station door proximity switch.

B. There is a left and a right refueling station door.

TASK 28-21-06-000-801

2. Refueling Station Door Proximity Switch - Removal

(Figure 401)

A. References

Reference	Title
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)

B. Location Zones

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing

C. Access Panels

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

D. Procedure

SUBTASK 28-21-06-860-001

(1) Open these circuit breakers and install safety tags:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
D	7	C28603	RFLNG CTRL GND

Standby Power Management Panel, P310

Row	Col	Number	Name
J	8	C28600	RFLNG CTRL

SUBTASK 28-21-06-040-001

WARNING DO NOT OPERATE THE LEADING EDGE SLATS. ACCIDENTAL SLAT OPERATION COULD CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Put a DO-NOT-OPERATE tag on the flap control lever, in the flight compartment (TASK 27-81-00-440-801).

SUBTASK 28-21-06-010-001

(3) Open the refueling station door.

For the left wing,

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Open this access panel:

Number	Name/Location
521DB	Refueling Station Door

For the right wing,

Open this access panel:

Number	Name/Location
621DB	Refueling Station Door

SUBTASK 28-21-06-020-004

(4) Remove the two bolts [7] and nuts [8] that attach the target bracket assembly [1] to the refueling station door.

(a) Remove the two screws [2] that attach the target [6] to the bracket assembly [1].

SUBTASK 28-21-06-020-005

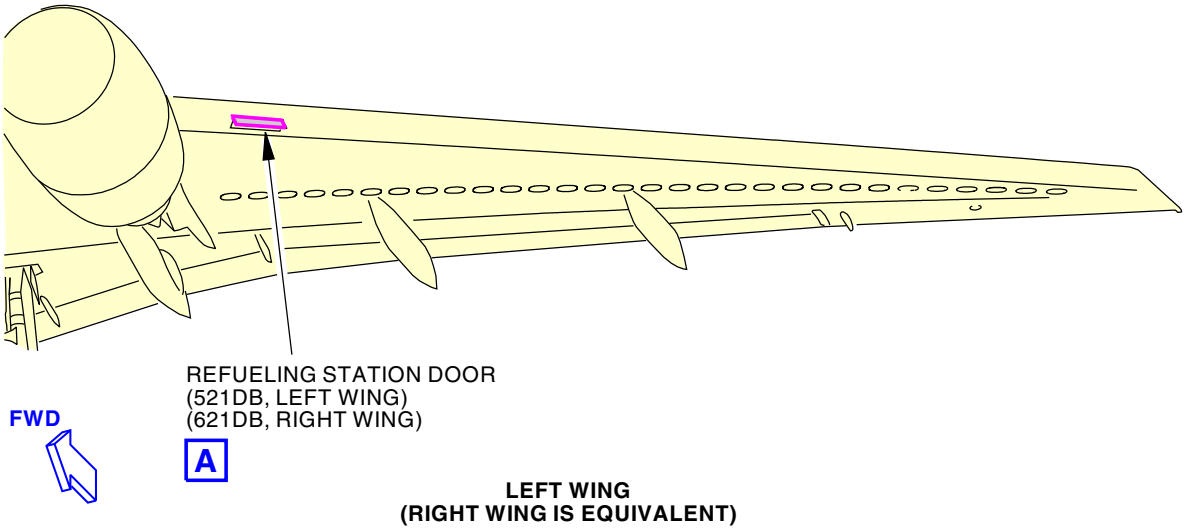
(5) Remove the two screws [5] that attach the sensor [4] to the sensor bracket.

SUBTASK 28-21-06-020-006

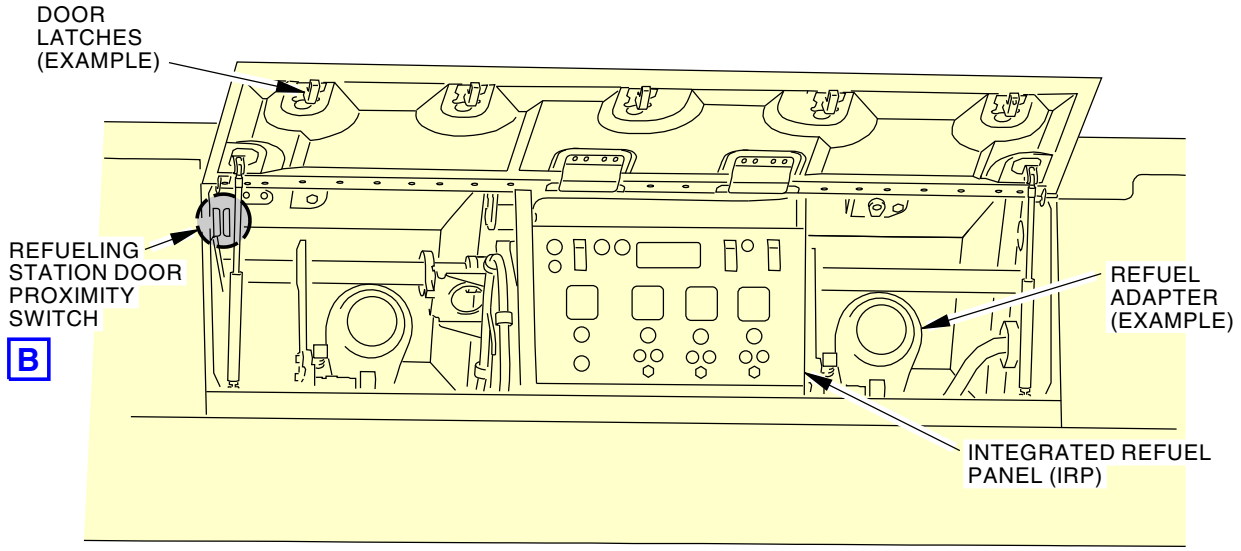
(6) Cut the splice which connects the sensor [4] and airplane wire.

——— END OF TASK ———

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LEFT WING
(RIGHT WING IS EQUIVALENT)



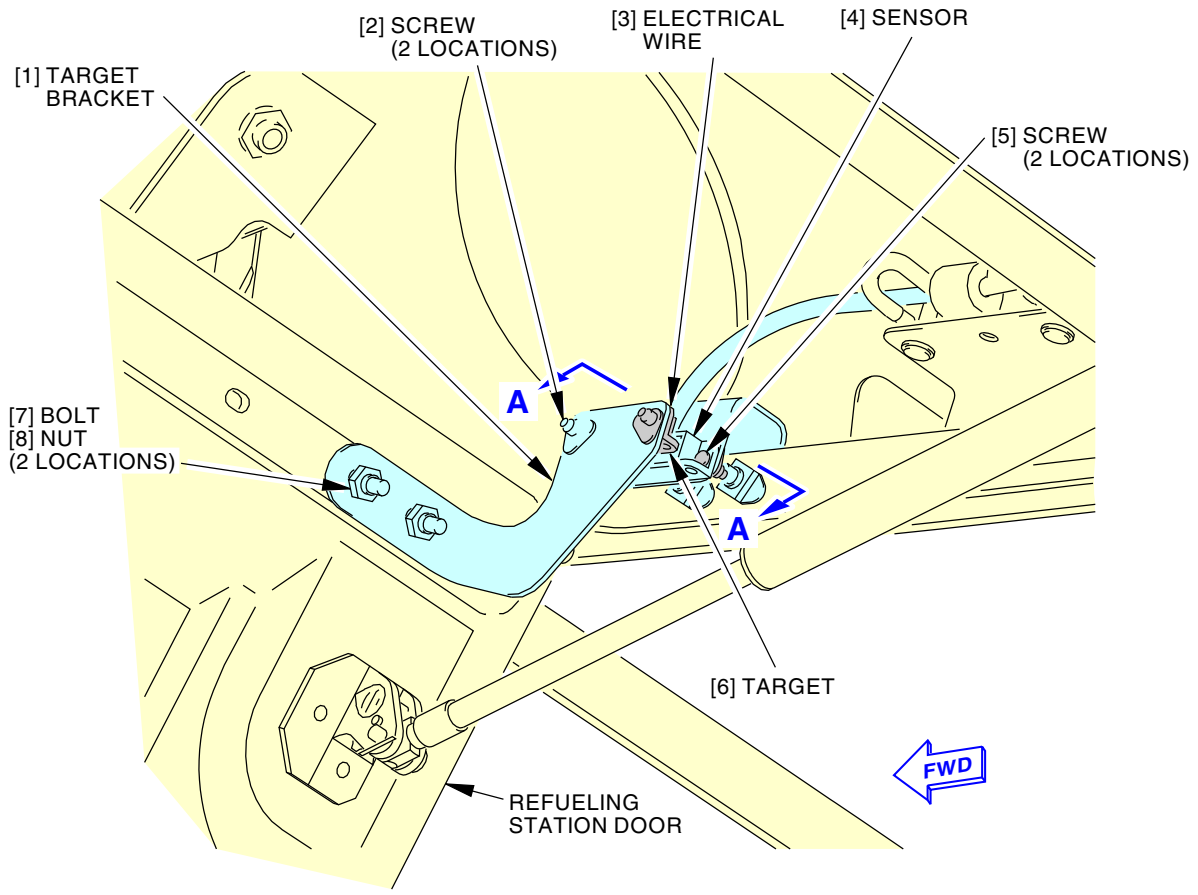
REFUELING STATION
(BOTTOM VIEW)

A

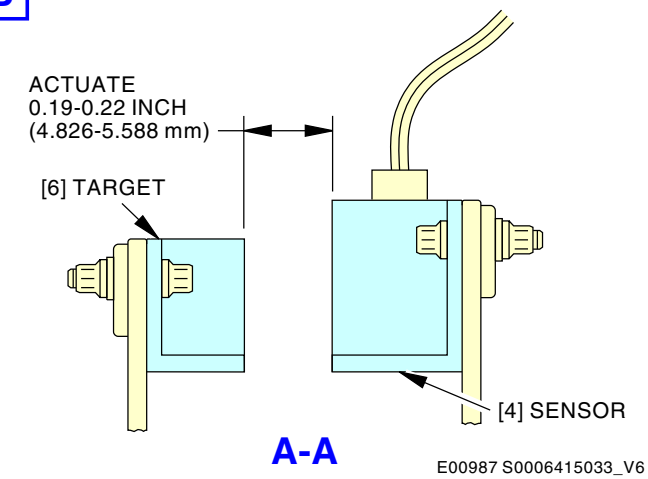
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Refueling Station Door Proximity Switch Installation
Figure 401/28-21-06-990-801 (Sheet 1 of 2)

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REFUELING STATION DOOR PROXIMITY SWITCH



Refueling Station Door Proximity Switch Installation
Figure 401/28-21-06-990-801 (Sheet 2 of 2)

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TASK 28-21-06-400-801

3. Refueling Station Door Proximity Switch - Installation

(Figure 401)

A. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
SWPM 20-30-12	Assembly of Splices

B. Location Zones

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing

C. Access Panels

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

D. Procedure

SUBTASK 28-21-06-420-005

(1) Splice to connect the sensor [4] to the electrical connector [3] (SWPM 20-30-12).

SUBTASK 28-21-06-420-001

(2) Install the two screws [5] to attach the sensor [4] to the sensor bracket.

SUBTASK 28-21-06-420-003

(3) Install the two screws [2] to attach the target [6] to the target bracket assembly [1].

SUBTASK 28-21-06-420-002

(4) Install the two bolts [7] and nuts [8] to attach the target bracket assembly [1] to the refueling station door.

(a) If necessary, align the target [6] to cover the sensitive surface of the sensor [4].

(b) If necessary, adjust the target to be in the 0.19 in. (4.826 mm)-0.22 in. (5.588 mm) actuation range of the sensor [4] (Figure 401, View A-A).

SUBTASK 28-21-06-860-002

(5) Remove the safety tags and close these circuit breakers:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
D	7	C28603	RFLNG CTRL GND

Standby Power Management Panel, P310

Row	Col	Number	Name
J	8	C28600	RFLNG CTRL

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SUBTASK 28-21-06-860-003

(6) Make sure that this circuit breaker is closed:

Standby Power Management Panel, P310

Row	Col	Number	Name
A	11	C28005	RFLNG DR LTS

SUBTASK 28-21-06-860-004

(7) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-21-06-210-001

(8) Make sure the refueling door lights come on.

SUBTASK 28-21-06-410-001

(9) Close the refueling station door.

(a) For the left wing,

Close this access panel:

Number	Name/Location
521DB	Refueling Station Door

(b) For the right wing,

Close this access panel:

Number	Name/Location
621DB	Refueling Station Door

(c) Make sure the refueling door lights go off.

SUBTASK 28-21-06-040-002

(10) Remove the DO-NOT-OPERATE tag from the flap control lever (TASK 27-81-00-440-801).

——— END OF TASK ———

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INTEGRATED REFUEL PANEL (IRP) - REMOVAL/INSTALLATION

1. General

A. The integrated refuel panel (IRP), P28, is installed at the left wing refueling station. The IRP contains switches and indicators for refueling and defueling operations.

B. This procedure contains two tasks. The first task removes the integrated refuel panel. The second task installs the integrated refuel panel.

TASK 28-21-07-000-801

2. Integrated Refuel Panel - Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)

B. Location Zones

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing

C. Access Panels

Number	Name/Location
521DB	Refueling Station Door

D. Procedure

SUBTASK 28-21-07-860-018

(1) Open these circuit breakers and install safety tags:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
D	7	C28603	RFLNG CTRL GND
D	8	C28622	RFLNG QTY GND

Standby Power Management Panel, P310

Row	Col	Number	Name
A	11	C28005	RFLNG DR LTS
J	8	C28600	RFLNG CTRL
J	11	C28623	RFLNG QTY

SUBTASK 28-21-07-040-001

WARNING DO NOT OPERATE THE LEADING EDGE SLAT SYSTEM. WITH THE SLATS ACTIVATED, THE SLATS CAN MOVE QUICKLY AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Put a DO-NOT-OPERATE tag on the flap control lever, in the flight compartment (TASK 27-81-00-040-801).

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SUBTASK 28-21-07-010-001

(3) Open this access panel:

Number	Name/Location
521DB	Refueling Station Door

(TASK 06-44-00-800-802).

SUBTASK 28-21-07-030-001

(4) Remove the nut [3] and washer [4], to disconnect the bonding jumper [5] from the airplane structure.

SUBTASK 28-21-07-030-002

(5) Remove the four screw [1] and washer [2] that attach the upper and lower edges of the integrated refuel panel (IRP) to the airplane structure.

SUBTASK 28-21-07-030-003

(6) Loosen the two screw [1] that attach the middle of the IRP [6] to the airplane structure.

NOTE: Only loosen (do not remove) the middle screw [1]. The IRP [6] can be removed over the screw [1], for easier installation.

SUBTASK 28-21-07-020-001

(7) Carefully remove the IRP [6] from the middle screws.

SUBTASK 28-21-07-030-004

(8) Disconnect the electrical connector [7] to remove the IRP [6].

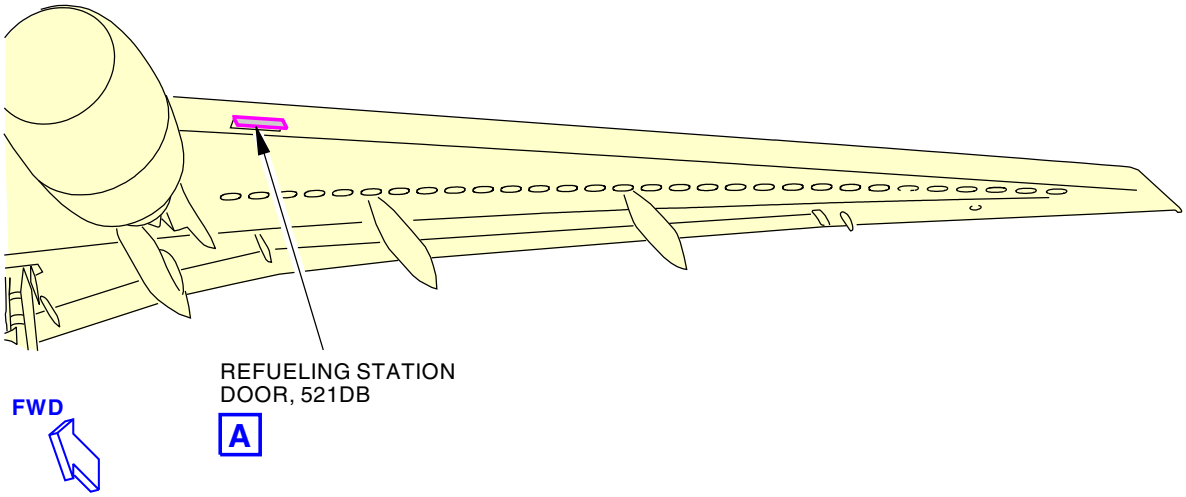
SUBTASK 28-21-07-020-006

(9) Remove the nut [3] and washer [4], to disconnect the bonding jumper [5] from the IRP [6].

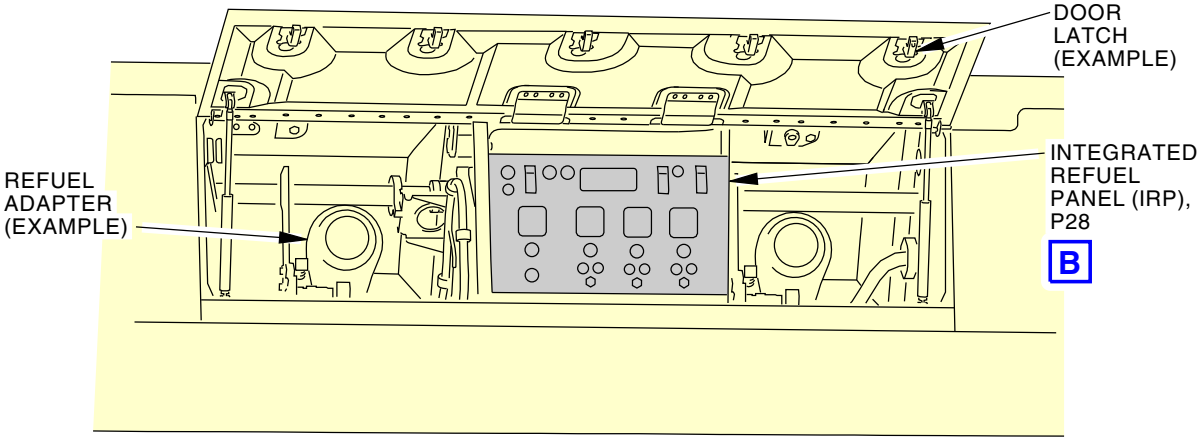
(a) Keep the bonding jumper [5] for installation on the new IRP [6].

END OF TASK

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LEFT WING



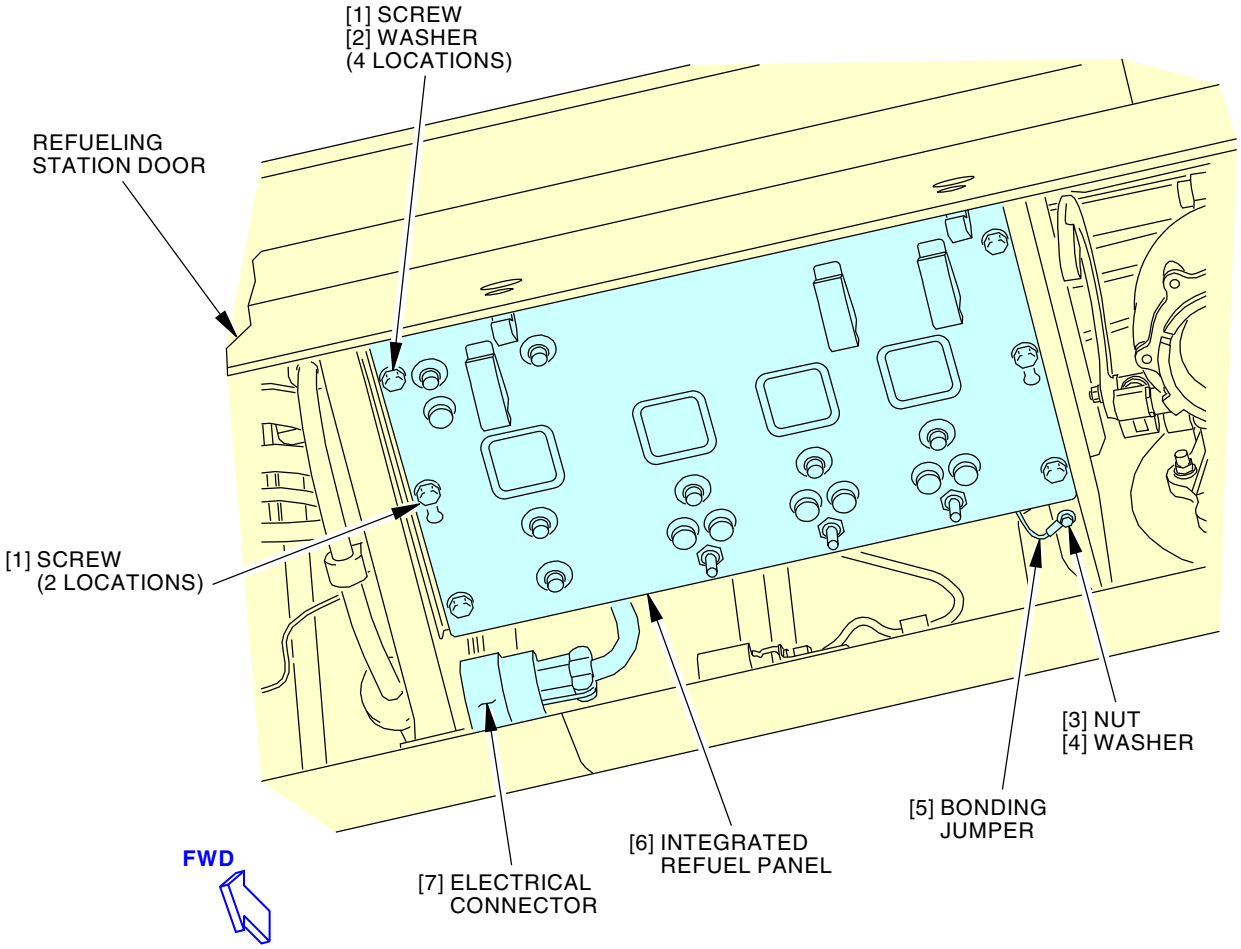
**REFUELING STATION DOOR, P28
(BOTTOM VIEW)**

A

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**Integrated Refuel Panel (IRP) Installation
Figure 401/28-21-07-990-801 (Sheet 1 of 2)**

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Integrated Refuel Panel (IRP) Installation
Figure 401/28-21-07-990-801 (Sheet 2 of 2)

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TASK 28-21-07-400-801

3. Integrated Refuel Panel - Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
12-11-01-650-801	Pressure Refueling (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Consumable Materials

Reference	Description	Specification
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142 Type II

D. Location Zones

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing

E. Access Panels

Number	Name/Location
521DB	Refueling Station Door

F. Procedure

SUBTASK 28-21-07-420-006

(1) If the bonding jumper [5] is not already installed on the IRP, install the washer [4] and nut [3], to attach the bonding jumper [5] to the IRP [6].

(a) Seal the connection with sealant, A02315.

SUBTASK 28-21-07-420-001

(2) Install the electrical connector [7].

SUBTASK 28-21-07-430-001

(3) Carefully install the IRP [6] onto the two middle screw [1].

SUBTASK 28-21-07-430-002

(4) Install the four screw [1] and washer [2] at the upper and lower edges of the IRP [6].

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SUBTASK 28-21-07-430-003

(5) Tighten the two screw [1] at the middle of the IRP [6].

SUBTASK 28-21-07-430-004

(6) Install the washer [4] and nut [3], to attach the bonding jumper [5] to the airplane structure.

(a) Measure the bonding resistance between the IRP [6] and the airplane structure with an I intrinsically safe approved bonding meter, COM-1550.

(b) Make sure the bonding resistance is n 0.01 ohm (10 milliohms) or less.

(c) Seal the connection with sealant, A02315.

SUBTASK 28-21-07-860-002

(7) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-21-07-860-016

(8) Remove the safety tags and close these circuit breakers:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
D	7	C28603	RFLNG CTRL GND
D	8	C28622	RFLNG QTY GND

Standby Power Management Panel, P310

Row	Col	Number	Name
A	11	C28005	RFLNG DR LTS
J	8	C28600	RFLNG CTRL
J	11	C28623	RFLNG QTY

SUBTASK 28-21-07-210-001

(9) Make sure the fuel quantity displays (FQD) are on.

(a) The FQD will come on within 60 seconds after you close the circuit breakers.

1) Make sure the total fuel legend "TF" on the TOTAL/BACKUP display of the IRP [6] is on.

NOTE: Make sure the total fuel legend "TF" shows on the Total FQD. This shows there is 28 Vdc at the IRP [6].

2) Put the IRP power switch to the BATT position.

3) Make sure the total fuel legend "TF" is on and the refueling station lights are on.

4) Put the IRP power switch to the NORMAL position.

SUBTASK 28-21-07-860-004

(10) Push the TEST IND switch to do a test of the fuel quantity indicators and blue valve position lights.

ARO 001-010

(a) Make sure the correct test patterns (###.#) show on the FQD and load select display (LSD) of the integrated refuel panel.

NOTE: A checker-board pattern will show on the FQD and the LSD for 2 seconds, the opposite pattern will show for 2 seconds, and then the displays will go off for 2 seconds. The test patterns will show one more time and then the FQD and LSD will return to their usual condition.

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ARO 011-999

(b) Make sure that all LEDs show on the FUEL QTY displays and the LOAD SEL displays on the IRP.

NOTE: All LEDs will show on the FUEL QTY displays and the LOAD SEL displays for 2 seconds, then the dot matrix LEDs will go off for 4 seconds, and then come on for 2 seconds. Each time after the dot matrix LEDs go off, the LB/KG/RM/LM/CT/TF LEDs stay on for 2 seconds and then go off. After the test, the LEDs for each FUEL QTY display and LOAD SEL display will return to their usual condition.

ARO ALL

SUBTASK 28-21-07-210-003

(11) Make sure each blue valve position light comes on and then goes off.

NOTE: This tests the light bulb in the refuel valve light.

SUBTASK 28-21-07-860-005

(12) Push the OVERFILL TEST switch to do a test on the overfill system.

(a) Make sure the OVERFILL IND light comes on.

SUBTASK 28-21-07-860-011

(13) Push the OVERFILL RESET switch to RESET and to NORMAL to reset the overfill system.

(a) Make sure the OVERFILL IND light goes off.

SUBTASK 28-21-07-860-007

(14) To set the fuel quantity for each fuel tank, do the steps that follow:

(a) At the LOAD SELECT QTY, set the thumbwheel switches to the fuel quantity 25.2.

(b) Push the LOAD SELECT SET switch for the applicable fuel tank for 1 second and release it.

(c) Make sure the quantity 25.2 shows on the LOAD SELECT QTY for the applicable fuel tank.

1) If you make an error during the selection procedure, push the applicable LOAD SELECT SET switch to remove the value from the LSD and do the procedure again.

SUBTASK 28-21-07-860-008

(15) To set the TOTAL fuel quantity for all fuel tanks, do the steps that follow:

(a) At the LOAD SELECT QTY, set the thumbwheel switches to the necessary quantity of fuel.

(b) Make sure the TOTAL/BACKUP display on the IRP [6] is set to show the total fuel quantity.

(c) Push the LOAD SELECT SET switch for the total fuel indicator for 1 second and release it.

(d) Make sure the quantity on the LOAD SELECT QTY shows on the LSD for the TOTAL/BACKUP display.

NOTE: The total fuel quantity is the sum of all the fuel tanks.

1) If you make an error during the selection procedure, push the applicable LOAD SELECT SET switch to remove the value and do the procedure again.

SUBTASK 28-21-07-720-001

(16) Push the DEFUEL VALVE light switch and make sure the light comes on.

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SUBTASK 28-21-07-860-009

(17) Put the DEFUEL VALVE switch to the OPEN position.

(a) Make sure the blue valve light comes on.

(b) Put the DEFUEL VALVE switch to the CLOSED position.

(c) Make sure the blue valve light goes off.

SUBTASK 28-21-07-860-010

(18) Do a test of the refuel valves (TASK 12-11-01-650-801).

SUBTASK 28-21-07-410-001

(19) Close this access door:

Number	Name/Location
521DB	Refueling Station Door

(TASK 06-44-00-800-802).

SUBTASK 28-21-07-040-002

(20) Remove the DO-NOT-OPERATE tag from the flap control lever (TASK 27-81-00-440-801).

——— END OF TASK ———

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REFUEL MANIFOLD AND COUPLINGS - REMOVAL/INSTALLATION

1. General

A. This selection procedure includes these tasks to remove the different components of the refuel/jettison manifold tubing. Removal procedures for the fuel lines and couplings of the refuel manifold are equivalent to procedures for the fuel lines and couplings of the engine fuel feed system. For more information on coupling removal/installation procedures, refer to (TASK 28-22-15-000-802-001).

B. After the fuel lines and couplings of the refuel manifold are installed, do a leak test of the refuel manifold (TASK 28-21-00-790-802).

TASK 28-21-08-000-802

2. Refuel/Jettison Manifold and Couplings - Removal (Selection)

A. General

(1) This selection procedure includes these tasks to install the different components of the refuel/jettison manifold tubing.

(a) Couplings and clamps; these components are included:

1) Flexible full couplings, flexible half couplings, rigid couplings, U-clamps, bonding clamps and bonding jumpers.

(b) Center Tank Refuel Distribution Tubes

(c) Main Tank Inboard Refuel Valve Tubes

(d) Main Tank Outboard Refuel Valve Tubes

(e) Refuel Tubing

(f) Surge Tank Tube Removal

(g) Side of Body (SOB) Rib Bulkhead Fitting

(h) Main Tank Rib 8 Bulkhead Fitting

(i) Main Tank Rib 18 Bulkhead Fitting

(j) Fuel Jettison Pump Tubes

(k) Fuel Jettison Tubes

(2) Removal/Installation procedures for the fuel lines and couplings of refuel/jettison manifold are equivalent to procedures for the engine fuel feed system (TASK 28-22-15-000-802-001, TASK 28-22-15-400-802-001).

B. References

Reference	Title
28-22-15-000-802-001	Fuel Line, Fitting and Coupling - Removal (P/B 401)
28-22-15-400-802-001	Fuel Line, Fitting and Coupling - Installation (P/B 401)

C. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing

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(Continued)

Zone	Area
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

D. Procedure Selection

SUBTASK 28-21-08-020-024

(1) Do the applicable task to remove the applicable component of the refuel/jettison manifold:

(a) Coupling and Clamp Removal (General Procedures), TASK 28-21-08-000-803

(b) Center Tank Refuel Distribution Tube Removal, TASK 28-21-08-000-816

(c) Main Tank Inboard Refuel Valve Tubes Removal, TASK 28-21-08-000-805

(d) Main Tank Outboard Refuel Valve Tubes Removal, TASK 28-21-08-000-806

(e) Refuel Tubing Removal, TASK 28-21-08-000-807

(f) Surge Tank Tube Removal, TASK 28-21-08-000-817

(g) Side of Body (SOB) Rib Bulkhead Fitting Removal, TASK 28-21-08-000-809

(h) Main Tank Rib 8 Bulkhead Fitting Removal, TASK 28-21-08-000-810

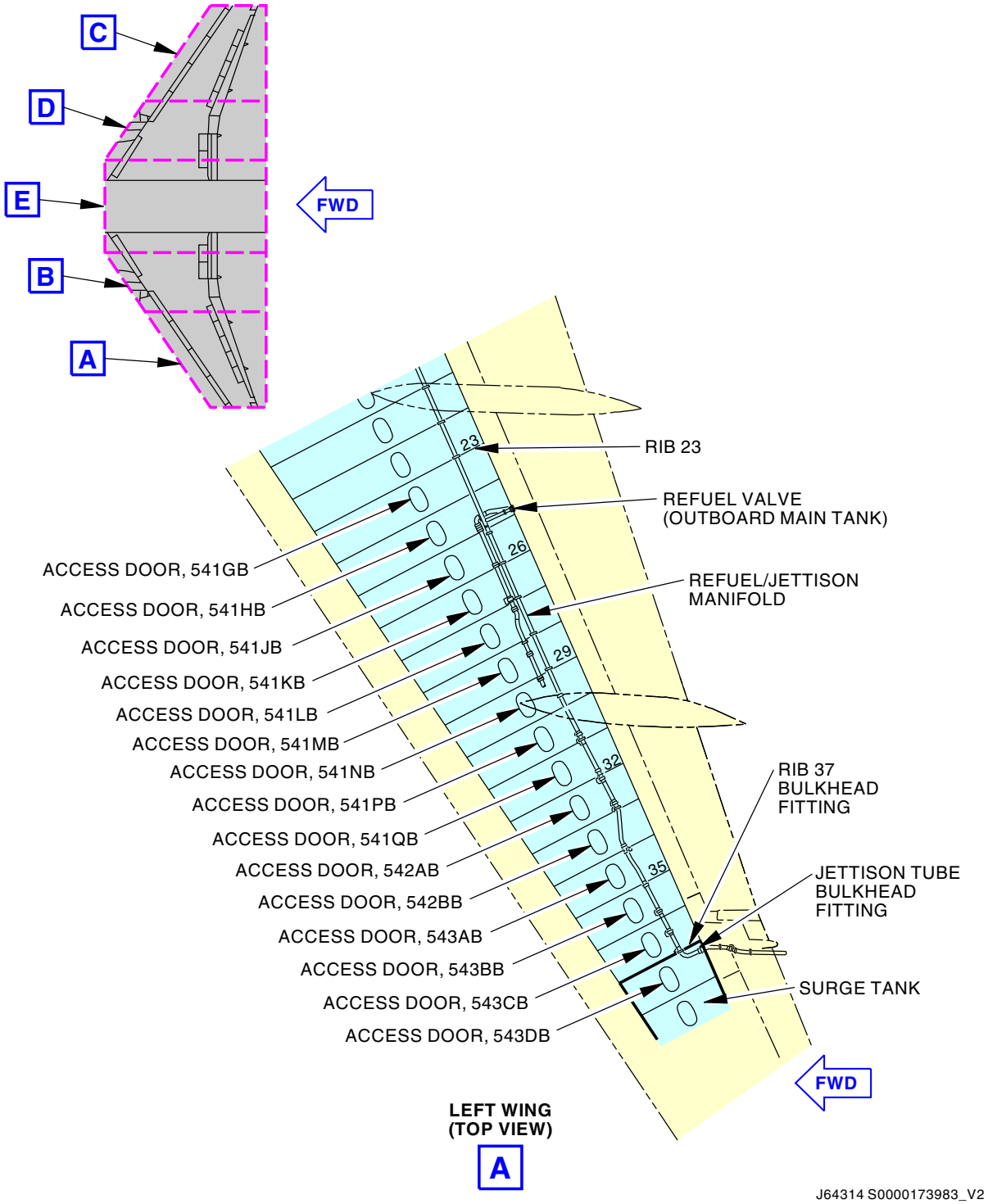
(i) Main Tank Rib 18 Bulkhead Fitting Removal, TASK 28-21-08-000-811

(j) Fuel Jettison Pump Tube Removal, TASK 28-21-08-000-814

(k) Fuel Jettison Tube Removal, TASK 28-21-08-000-815

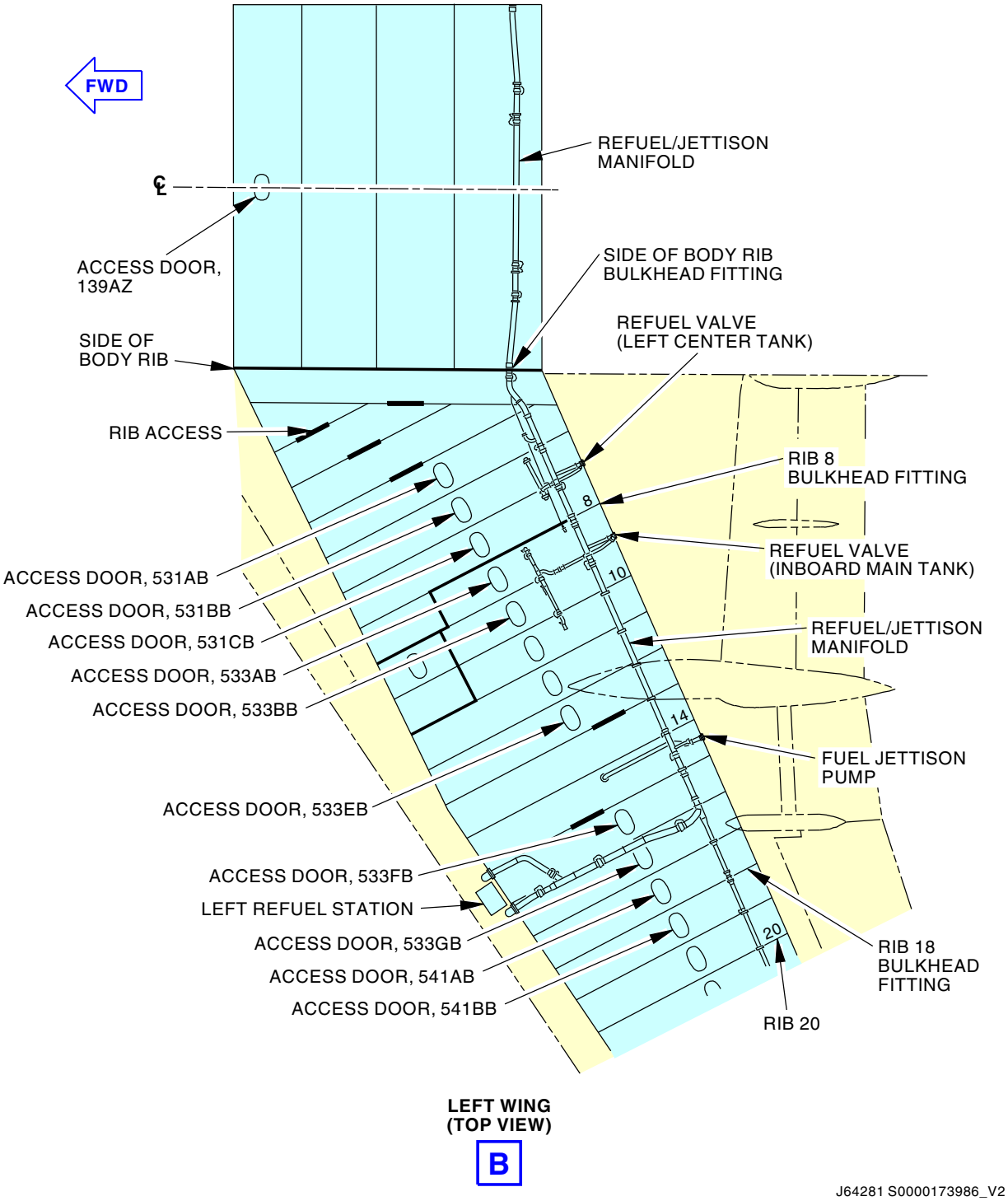
——— END OF TASK ———

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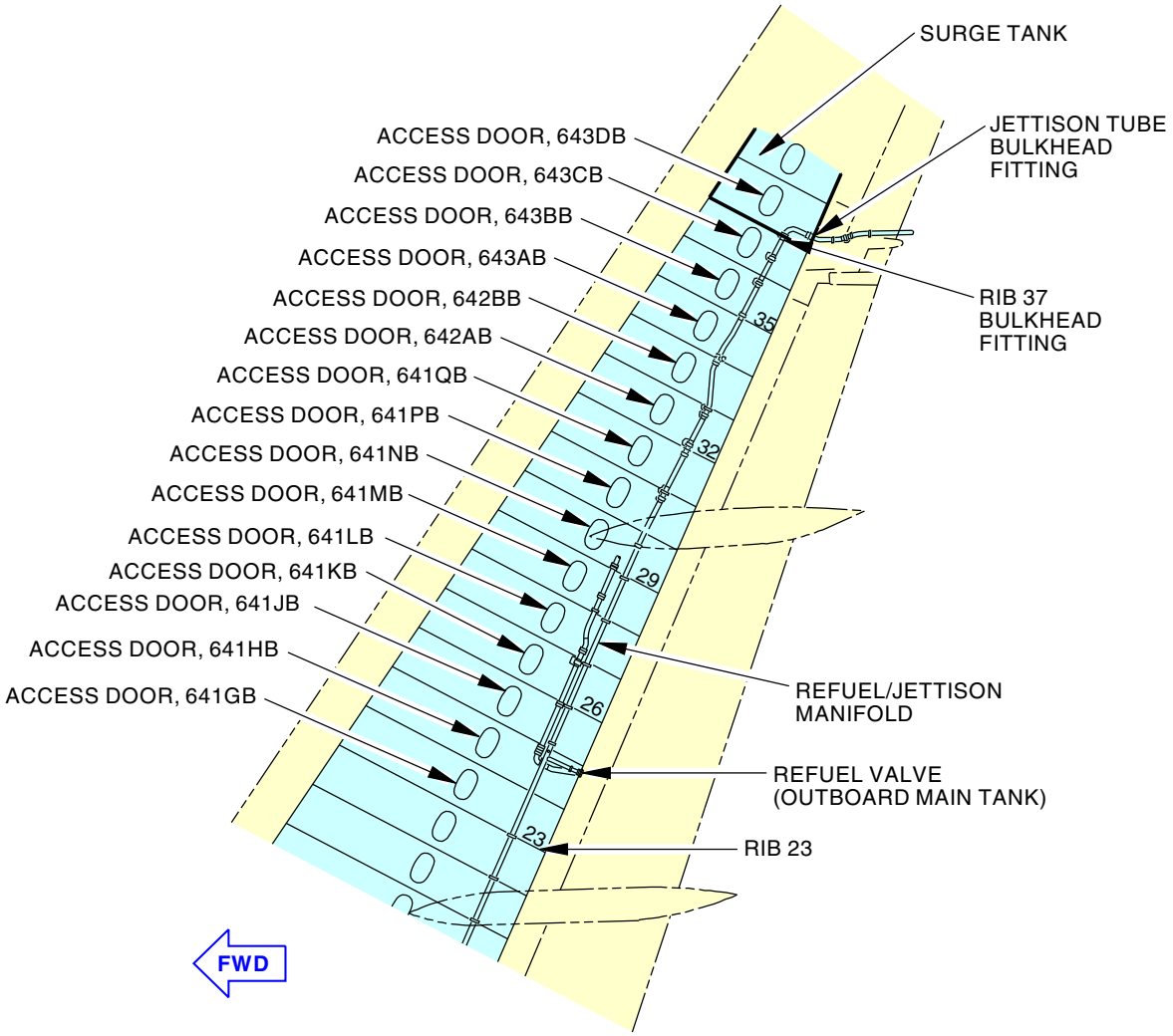
Refuel/Jettison Manifold Tubing Location
Figure 401/28-21-08-990-820 (Sheet 1 of 5)

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Refuel/Jettison Manifold Tubing Location
Figure 401/28-21-08-990-820 (Sheet 2 of 5)

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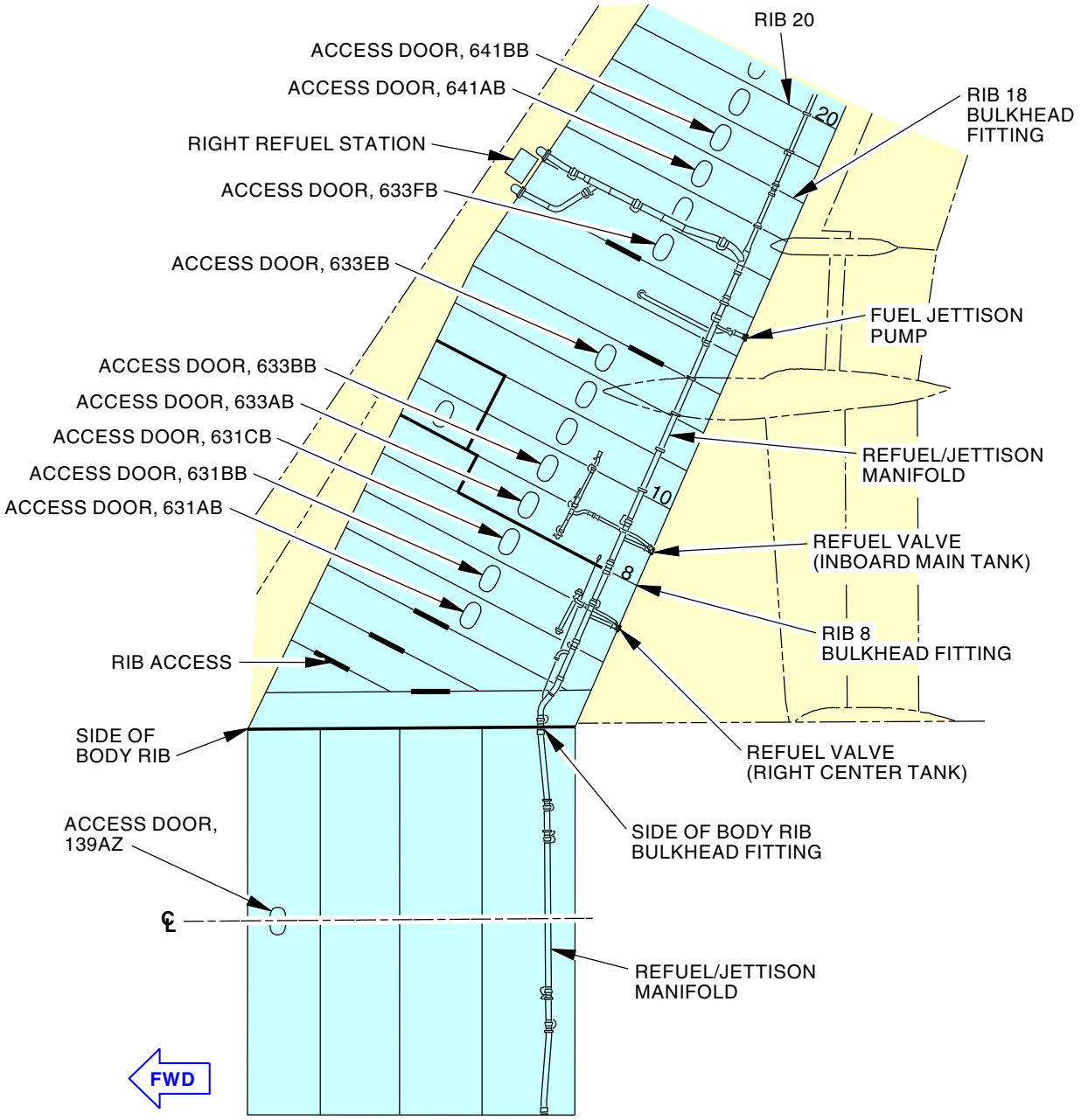
RIGHT WING
(TOP VIEW)

C

J64321 S0000173988_V2

Refuel/Jettison Manifold Tubing Location
Figure 401/28-21-08-990-820 (Sheet 3 of 5)

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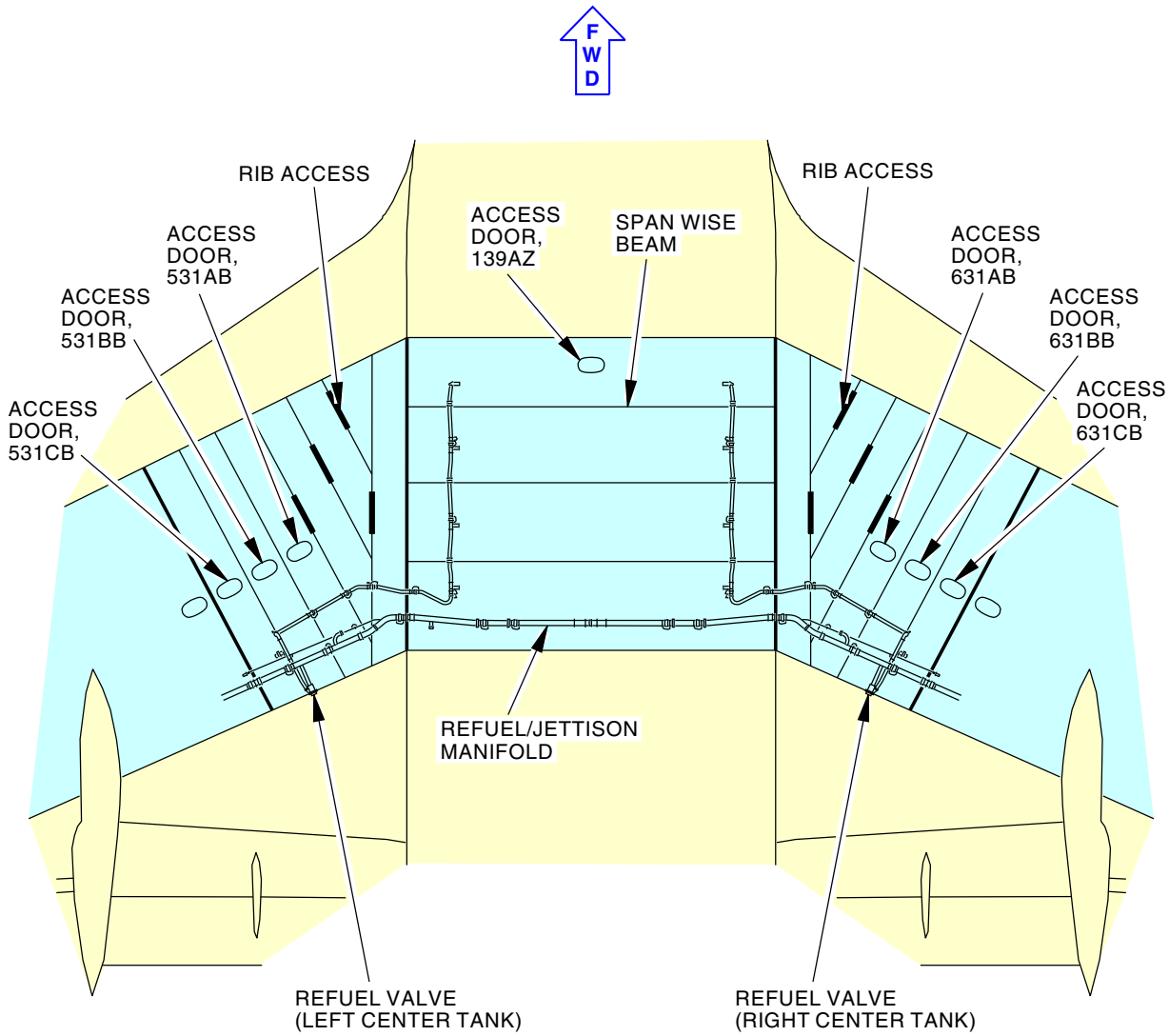
RIGHT WING
(TOP VIEW)

D

J64290 S0000173991_V2

Refuel/Jettison Manifold Tubing Location
Figure 401/28-21-08-990-820 (Sheet 4 of 5)

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CENTER TANK
(TOP VIEW)

E

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Refuel/Jettison Manifold Tubing Location
Figure 401/28-21-08-990-820 (Sheet 5 of 5)

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TASK 28-21-08-400-802

3. Refuel/Jettison Manifold and Couplings - Installation (Selection)

Figure 401

A. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

B. General

SUBTASK 28-21-08-420-017

(1) This selection procedure includes these tasks to install the different components of the refuel/jettison manifold tubing.

(a) Couplings and clamps; these components are included:

1) Flexible full couplings, flexible half couplings, rigid couplings, U-clamps, bonding clamps and bonding jumpers.

(b) Center Tank Refuel Distribution Tubes

(c) Main Tank Inboard Refuel Valve Tubes

(d) Main Tank Outboard Refuel Valve Tubes

(e) Refuel Tubing

(f) Surge Tank Tube Removal

(g) Side of Body (SOB) Rib Bulkhead Fitting

(h) Main Tank Rib 8 Bulkhead Fitting

(i) Main Tank Rib 18 Bulkhead Fitting

(j) Fuel Jettison Pump Tubes

(k) Fuel Jettison Tubes

(2) Removal/Installation procedures for the fuel lines and couplings of refuel/jettison manifold are equivalent to procedures for the engine fuel feed system.

C. Procedure Selection

SUBTASK 28-21-08-420-018

(1) Do the applicable task to install the applicable component of the refuel/jettison manifold:

(a) Coupling and Clamp Installation (General Procedures), TASK 28-21-08-400-803

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(b) Center Tank Refuel Distribution Tube Installation, TASK 28-21-08-400-816

(c) Main Tank Inboard Refuel Valve Tubes Installation, TASK 28-21-08-400-805

(d) Main Tank Outboard Refuel Valve Tubes Installation, TASK 28-21-08-400-806

(e) Refuel Tubing Installation, TASK 28-21-08-400-807

(f) Surge Tank Tube Installation, TASK 28-21-08-400-817

(g) Side of Body (SOB) Rib Bulkhead Fitting Installation, TASK 28-21-08-400-809

(h) Main Tank Rib 8 Bulkhead Fitting Installation, TASK 28-21-08-400-810

(i) Main Tank Rib 18 Bulkhead Fitting Installation, TASK 28-21-08-400-811

(j) Fuel Jettison Pump Tube Installation, TASK 28-21-08-400-814

(k) Fuel Jettison Tube Installation, TASK 28-21-08-400-815

——— END OF TASK ———

TASK 28-21-08-000-803

4. Coupling and Clamp Removal (General Procedures)

Figure 402

A. References

Reference	Title
28-00-00-200-801	Inspection of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-22-15-700-802-001	Fuel Tube Damage Criteria - Inspection/Check (P/B 601)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

C. Prepare for Removal

SUBTASK 28-21-08-650-012

(1) To defuel all of the fuel tanks, do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-21-08-860-004

(2) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

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SUBTASK 28-21-08-010-011

(3) Go into the fuel tank.

D. Flexible Full Couplings Removal

SUBTASK 28-21-08-020-025

(1) To remove flexible full couplings, do these steps Figure 402:

(a) Remove the lockwire from the coupling.

(b) Loosen the coupling nuts.

(c) Discard the O-rings.

(d) Examine the retaining rings, retainer halves, coupling, and coupling nuts for wear Fuel Tube Damage Criteria - Inspection/Check, TASK 28-22-15-700-802-001.

1) Replace these components if it is necessary.

E. Flexible Half Couplings Removal

SUBTASK 28-21-08-020-026

(1) To remove flexible half couplings, do these steps Figure 402:

(a) Remove the lockwire from the coupling.

(b) Loosen the coupling nuts.

(c) Discard the O-rings.

(d) Examine the retaining rings, retainer halves, coupling and coupling nuts for wear Fuel Tube Damage Criteria - Inspection/Check, TASK 28-22-15-700-802-001.

1) Replace these components if it is necessary.

F. Rigid Couplings Removal

SUBTASK 28-21-08-020-027

(1) To remove the rigid couplings, do these steps Figure 402:

(a) Remove the lockwire from the coupling.

(b) Loosen the coupling nut.

(c) Discard the O-ring.

(d) Examine the retaining ring and coupling nut for wear Fuel Tube Damage Criteria - Inspection/Check, TASK 28-22-15-700-802-001.

G. U-Clamp Removal

SUBTASK 28-21-08-020-028

(1) Remove the u-clamp as follows:

NOTE: The u-clamp has two parts; the clamp strap and the clamp saddle.

(a) Remove the screws, washers, and nuts to remove the u-clamp and spacer from the structure or bracket and the fuel tube.

(b) Remove the clamp strap from the top of the fuel tube.

(c) Remove the clamp saddle from the bottom of the fuel tube.

(d) Remove and keep the spacer under the clamp saddle for the installation.

H. Bonding Jumper and Bonding Clamp Removal

SUBTASK 28-21-08-020-029

(1) Remove the bonding jumper and bonding clamps as follows:

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(a) Remove the screws, washers, and nuts to remove the bonding jumper from the bonding clamps.

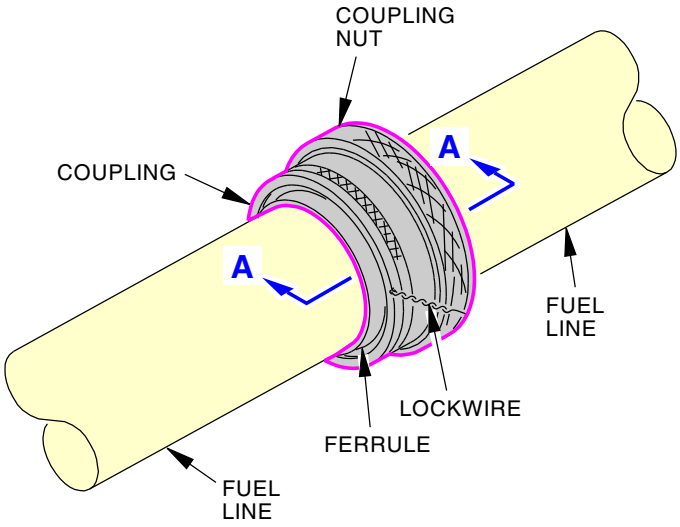
(b) Remove the bonding clamps from the fuel tube.

(c) Do a check of the bonding jumper. To do this, Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801

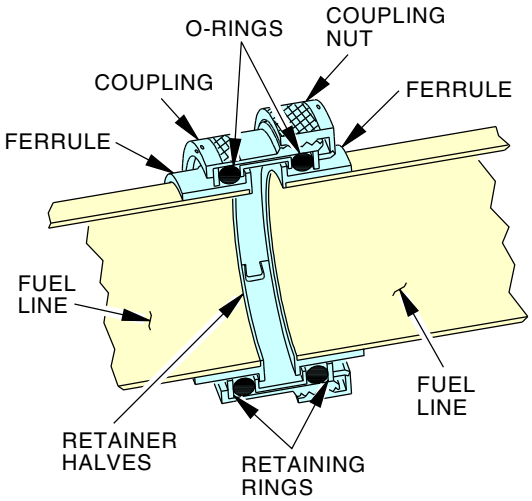
1) Replace the bonding jumpers as necessary.

——— END OF TASK ———

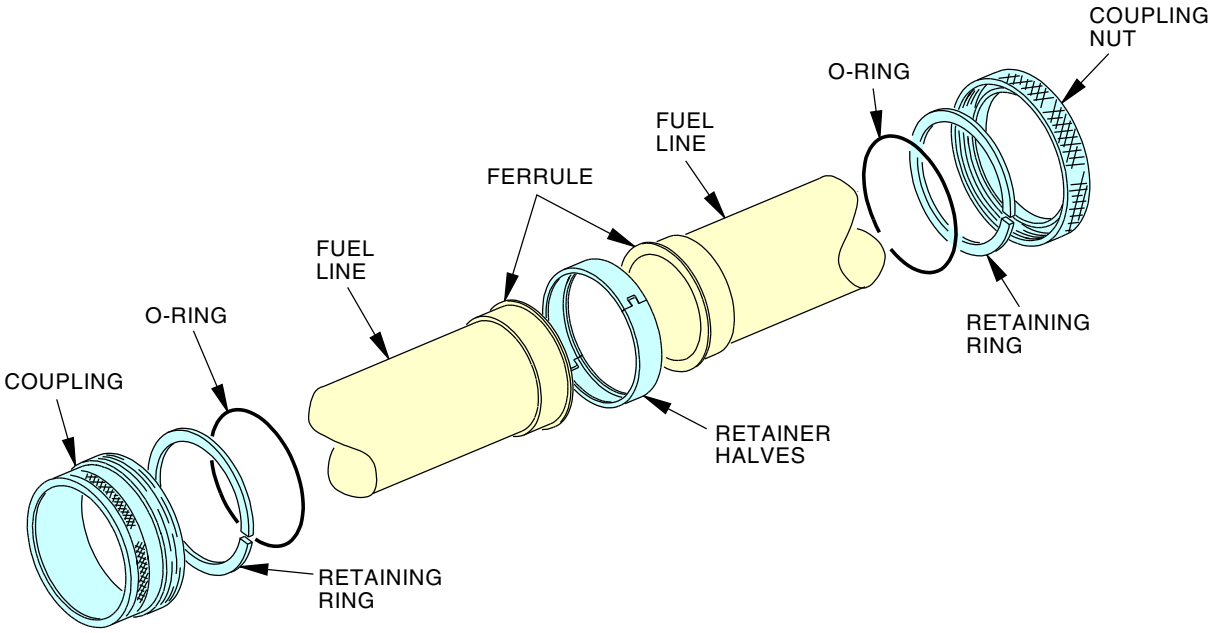
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FLEXIBLE FULL COUPLING - ASSEMBLED VIEW (EXAMPLE)



A-A

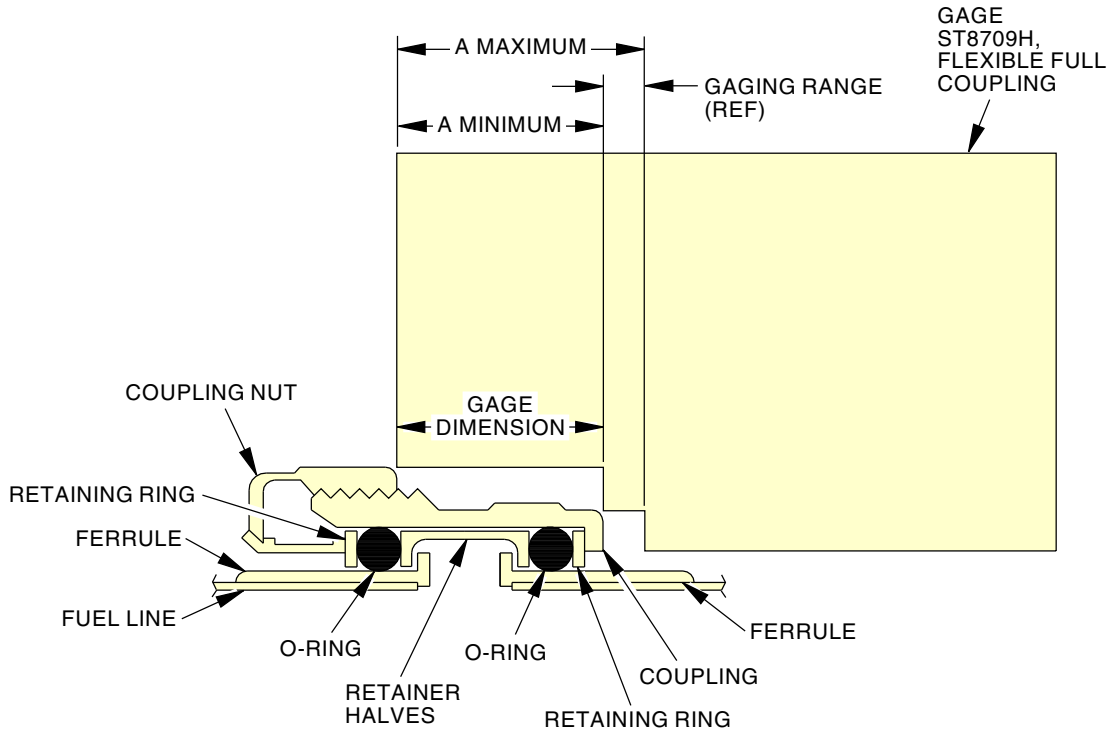


FLEXIBLE FULL COUPLING - EXPLODED VIEW (EXAMPLE)

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Refuel/Jettison Manifold Coupling and Clamp Installation
Figure 402/28-21-08-990-804 (Sheet 1 of 6)

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FLEXIBLE FULL COUPLING WITH GAGE

SIZE	MAX GAGE 1	MIN GAGE 1	GAGE NO. ST8709H
08	0.59	0.47	1
10	0.59	0.47	1
12	0.69	0.55	2
16	0.75	0.60	3
20	0.75	0.60	3
24	0.93	0.76	4
28	0.93	0.76	4
32	0.93	0.76	4

SIZE	MAX GAGE 1	MIN GAGE 1	GAGE NO. ST8709H
36	0.93	0.76	4
40	0.93	0.76	4
48	0.93	0.76	4
56	1.03	0.88	5
64	1.03	0.88	5
72	1.16	0.99	6
80	1.39	1.22	7
88	1.39	1.22	7

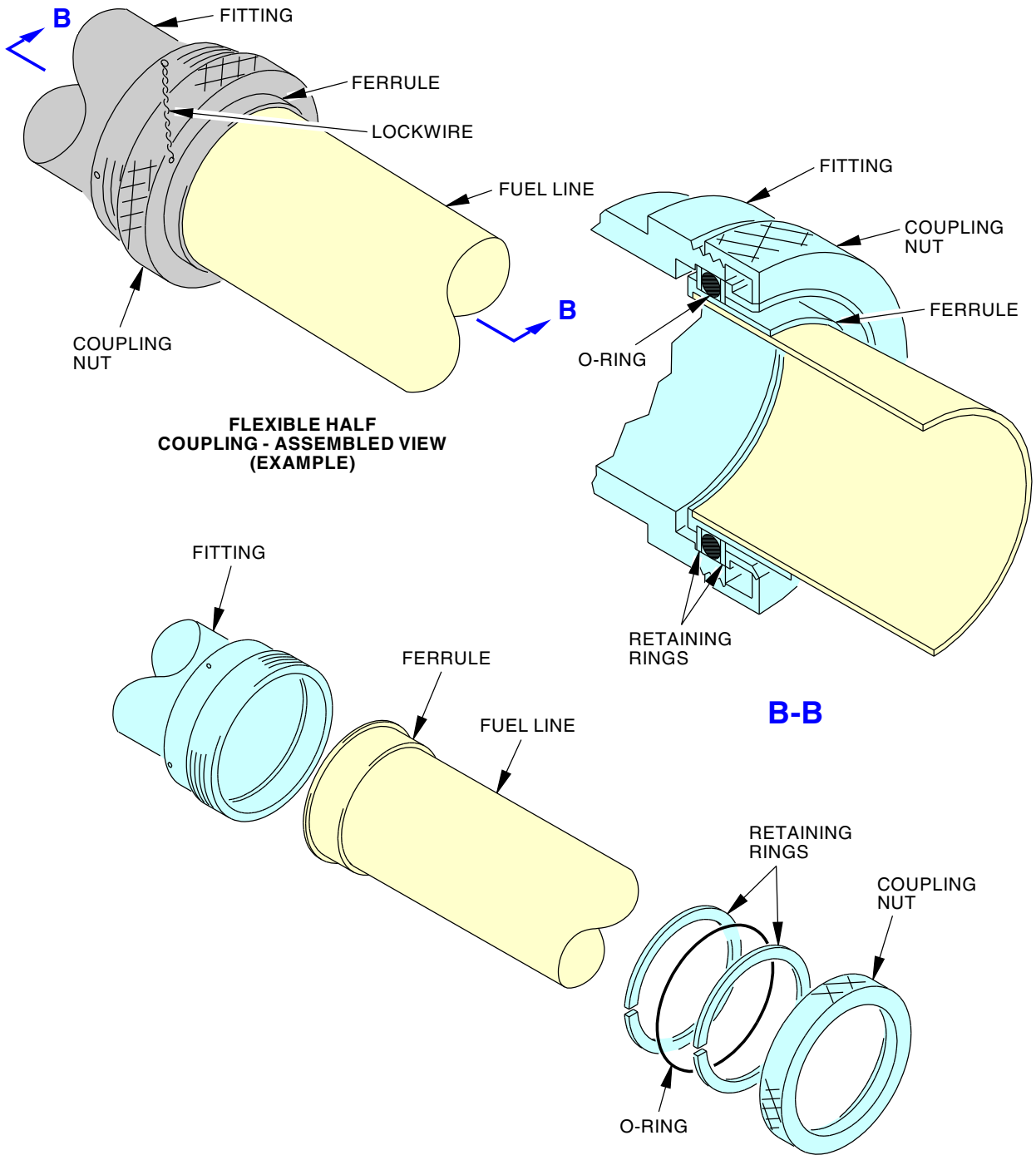
1 DIMENSIONAL REQUIREMENTS FOR ASSEMBLING FLEXIBLE FULL COUPLING

FLEXIBLE FULL COUPLING DIMENSIONS

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Refuel/Jettison Manifold Coupling and Clamp Installation
Figure 402/28-21-08-990-804 (Sheet 2 of 6)

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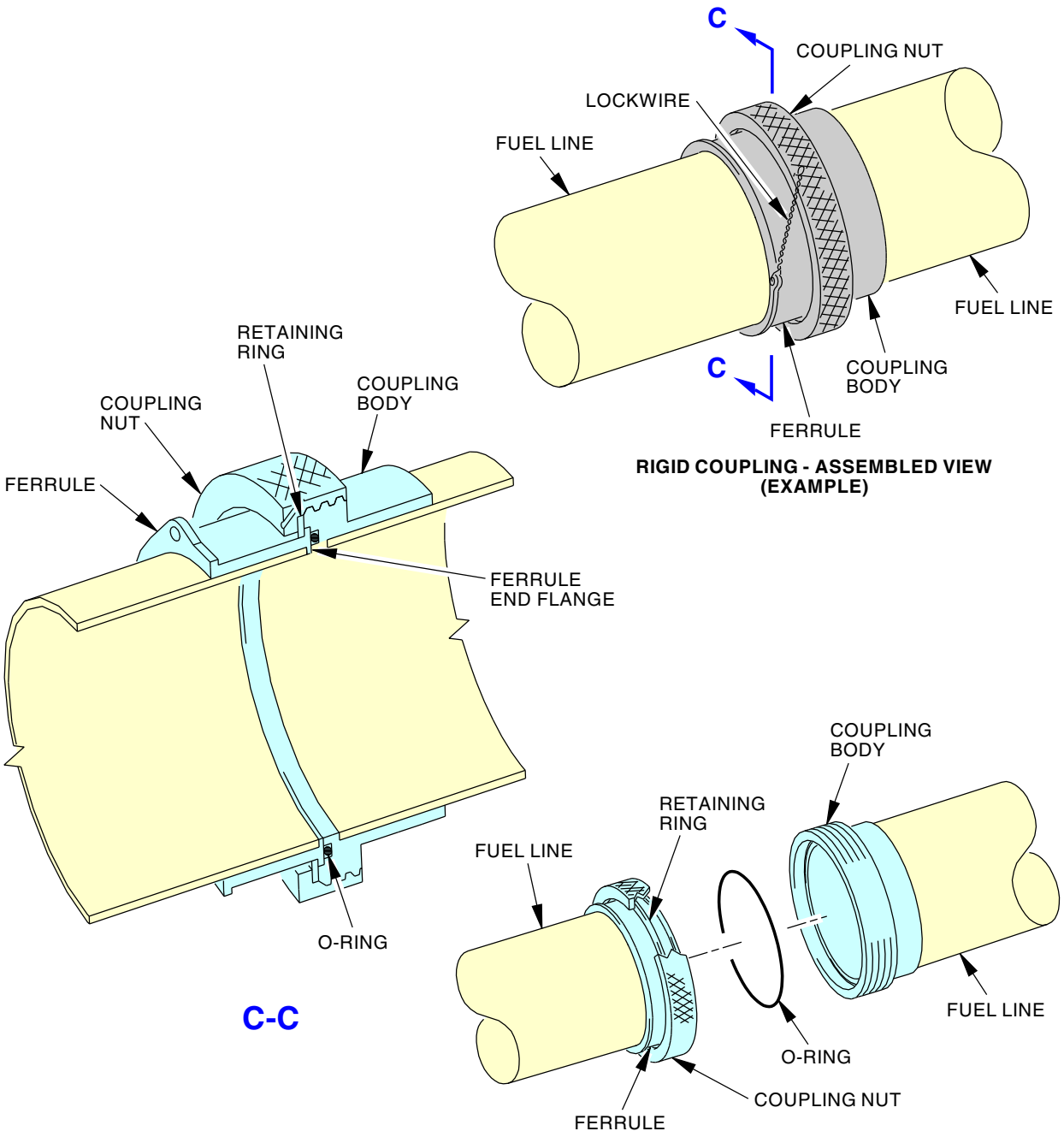
FLEXIBLE HALF COUPLING - ASSEMBLED VIEW (EXAMPLE)

FLEXIBLE HALF COUPLING - EXPLODED VIEW (EXAMPLE)

M45159 S0000122827_V2

Refuel/Jettison Manifold Coupling and Clamp Installation
Figure 402/28-21-08-990-804 (Sheet 3 of 6)

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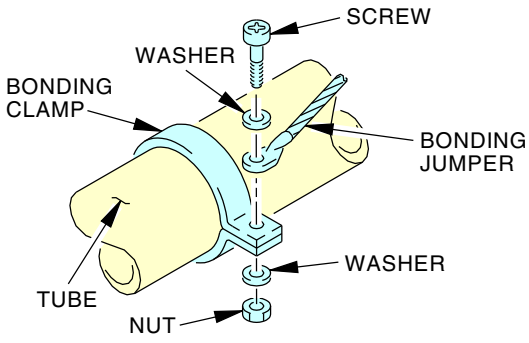
RIGID COUPLING - ASSEMBLED VIEW (EXAMPLE)

RIGID COUPLING - EXPLODING VIEW (EXAMPLE)

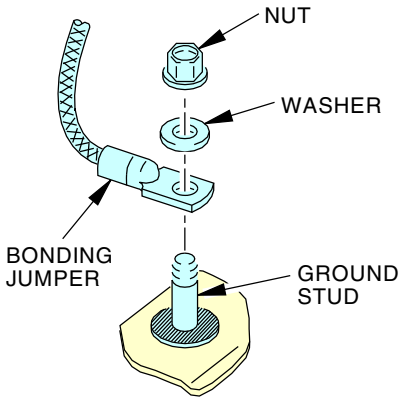
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Refuel/Jettison Manifold Coupling and Clamp Installation
Figure 402/28-21-08-990-804 (Sheet 4 of 6)

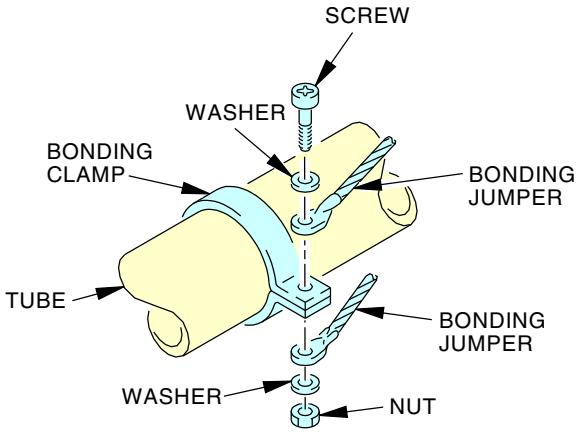
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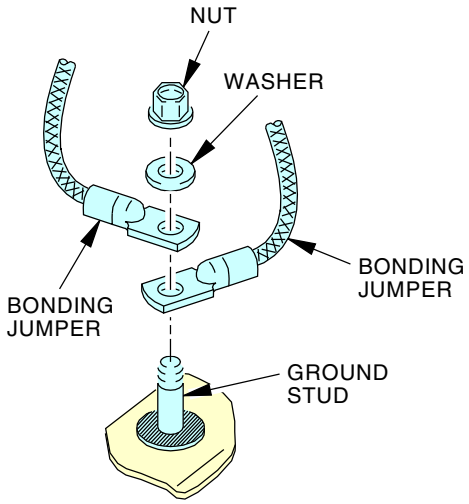
SINGLE BONDING JUMPER CLAMP (EXAMPLE)



SINGLE BONDING JUMPER GROUND STUD (EXAMPLE)



DOUBLE BONDING JUMPER CLAMP (EXAMPLE)

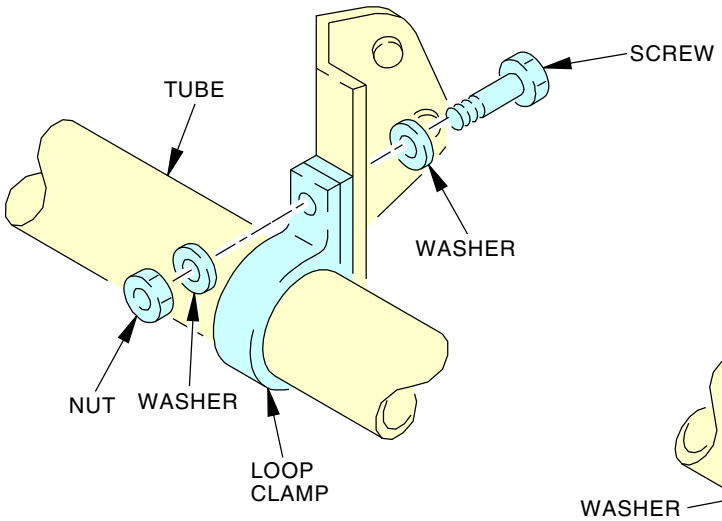


DOUBLE BONDING JUMPER GROUND STUD (EXAMPLE)

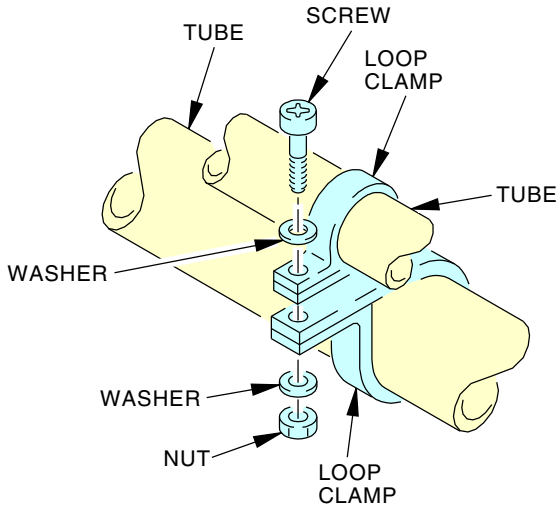
M45300 S0000122829_V2

Refuel/Jettison Manifold Coupling and Clamp Installation
Figure 402/28-21-08-990-804 (Sheet 5 of 6)

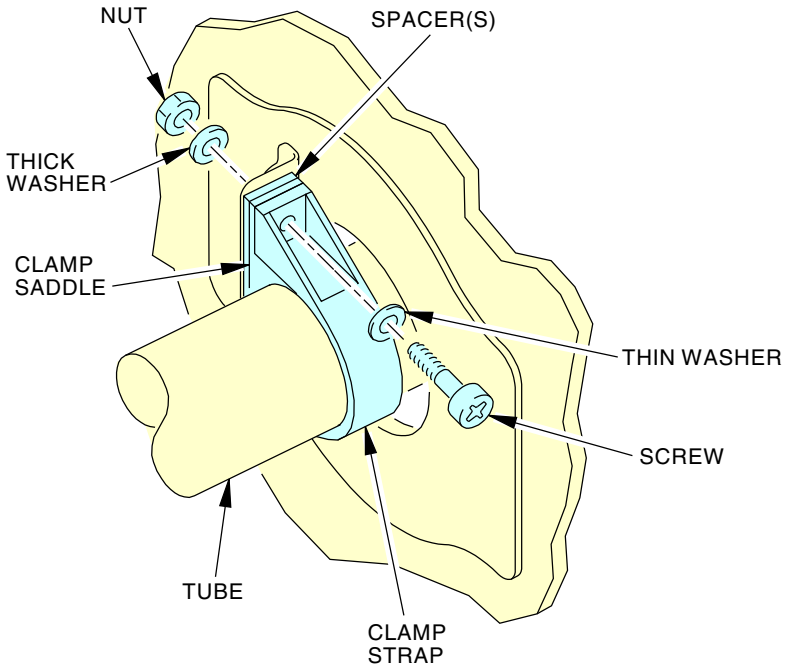
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LOOP CLAMP
(EXAMPLE)



DOUBLE LOOP CLAMP
(EXAMPLE)



U CLAMP
(EXAMPLE)

M45362 S0000122830_V2

Refuel/Jettison Manifold Coupling and Clamp Installation
Figure 402/28-21-08-990-804 (Sheet 6 of 6)

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TASK 28-21-08-400-803

5. Coupling and Clamp Installation (General Procedures)

Figure 402

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-21-00-790-802	Refuel/Jettison and Fuel Feed Manifold - Leak Test (P/B 501)
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Consumable Materials

Reference	Description	Specification
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142 Type II
D00504	Grease - Petrolatum	VV-P-236
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

D. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074

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(Continued)

Zone	Area
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

E. General

SUBTASK 28-21-08-420-019

(1) This task provides the general procedures to connect the flexible full couplings, flexible half couplings, rigid couplings, U-clamps, bonding jumpers, and bonding clamps on any refuel/jettison manifold tubing connections.

F. Prepare for the Procedure

WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

SUBTASK 28-21-08-860-005

(1) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801

SUBTASK 28-21-08-010-012

(2) Go into the fuel tank.

G. Flexible Full Couplings Installation

SUBTASK 28-21-08-420-020

(1) To install the flexible full couplings on the fuel lines, do these steps (Figure 402):

(a) Select the correct size of O-ring for the coupling and fuel tube size.

(b) Put the coupling nut on the ferrule of the fuel line.

(c) Put the coupling on the ferrule of the opposite fuel line.

CAUTION DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

(d) Put one retaining ring on each ferrule to hold the coupling nut and coupling on the ends of each fuel line.

(e) Apply a thin layer of petrolatum, grease, D00504, to the new O-ring.

CAUTION DO NOT USE THE SAME O-RING FOR THE FUEL LINE FITTINGS AFTER YOU TIGHTEN THE COUPLING ONE TIME. YOU MUST INSTALL NEW O-RINGS TO PREVENT FUEL LEAKS.

(f) Put one O-ring on each ferrule.

(g) Align the ends of the fuel lines with a 0.12 +/- 0.03 inch (3.048 +/- 0.762 millimeter) clearance between the ferrules.

(h) Put the retainer halves together on the ferrules to connect fuel lines.

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CAUTION

DO NOT USE TOOLS TO TIGHTEN THE FITTINGS. DAMAGE TO THE FITTING COMPONENTS COULD OCCUR. THE ADJACENT FITTINGS COULD BECOME LOOSE.

(i) Manually tighten the coupling nut to the necessary dimension.

NOTE: You can use the coupling gage ST8709H-X to make sure a flexible full coupling is installed correctly. The flexible full couplings can catch and feel tight when the coupling nut is not fully installed. The coupling gage ST8709H will show a coupling nut that is not installed correctly.

(j) Install MS20995C32 lockwire, G01048 between the coupling nut and the coupling (Lockwire, Cotter Pins, and Lockrings - Installation, TASK 20-10-23-400-801)

H. Flexible Half Couplings Installation

SUBTASK 28-21-08-420-021

(1) To install the flexible half couplings on the fuel line, do these steps (Figure 402):

(a) Select the correct size of O-ring for the coupling and fuel tube size.

(b) Put the coupling nut on the ferrule of the fuel line.

CAUTION

DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

(c) Put one retaining ring on the ferrule to hold the coupling nut on the fuel line.

(d) Apply a thin layer of petrolatum, grease, D00504 to the new O-ring.

CAUTION

DO NOT USE THE SAME O-RING FOR THE FUEL LINE FITTINGS AFTER YOU TIGHTEN THE COUPLING ONE TIME. YOU MUST INSTALL NEW O-RINGS TO PREVENT FUEL LEAKS.

(e) Put the new O-ring on the ferrule.

CAUTION

DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

(f) Put the second retaining ring on the ferrule.

(g) Put the fuel line into the half coupling fitting.

CAUTION

DO NOT USE TOOLS TO TIGHTEN THE FITTINGS. DAMAGE TO THE FITTING COMPONENTS COULD OCCUR. THE ADJACENT FITTINGS COULD BECOME LOOSE.

(h) Manually tighten the coupling nut.

(i) Install MS20995C32 lockwire, G01048 between the coupling nut and the ferrule (Lockwire, Cotter Pins, and Lockrings - Installation, TASK 20-10-23-400-801).

I. Rigid Couplings Installation

SUBTASK 28-21-08-420-022

(1) To install the rigid couplings on the fuel line, do these steps (Figure 402):

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(a) Select the correct size of O-ring for the coupling and fuel tube size.

(b) Loosen the adjacent clamps and coupling before you install the rigid coupling.

NOTE: This will prevent a preload on the rigid coupling.

(c) Put the coupling nut on the ferrule of the fuel line.

CAUTION

DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

(d) Put a new retaining ring on the ferrule to hold the coupling line.

CAUTION

YOU MUST ALIGN THE FUEL TUBES CORRECTLY FOR RIGID COUPLINGS. IF YOU DO NOT ALIGN THE FUEL LINES CORRECTLY A FUEL LEAK WILL OCCUR.

CAUTION

DO NOT TWIST THE FUEL TUBES AFTER THE RIGID COUPLINGS HAVE BEEN TIGHTENED. DAMAGE TO THE O-RINGS CAN OCCUR.

(e) Make sure the fuel lines align correctly.

(f) Apply a thin layer of petrolatum, grease, D00504, to the new O-ring.

CAUTION

DO NOT USE THE SAME O-RING FOR THE FUEL LINE FITTINGS AFTER YOU TIGHTEN THE COUPLING ONE TIME. YOU MUST INSTALL NEW O-RINGS TO PREVENT FUEL LEAKS.

(g) Install the O-ring on the fuel line.

(h) Make sure the two fuel lines align end to end.

CAUTION

DO NOT USE TOOLS TO TIGHTEN THE FITTINGS. DAMAGE TO THE FITTING COMPONENTS COULD OCCUR. THE ADJACENT FITTINGS COULD BECOME LOOSE.

(i) Manually tighten the coupling nut of the rigid coupling to connect the fuel lines.

(j) Install MS20995C32 lockwire, G01048 between the coupling nut and the ferrule (Lockwire, Cotter Pins, and Lockrings - Installation, TASK 20-10-23-400-801).

(k) Tighten the adjacent clamps and couplings.

J. U-Clamp Installation

SUBTASK 28-21-08-420-023

(1) Install the U-clamps on the fuel tubes (Figure 402):

(a) Select the correct size of U-clamp for the fuel tube size.

(b) Install the spacer under the clamp saddle.

NOTE: U-clamps have two parts; a clamp saddle and a clamp strap.

1) Add spacers only as required to prevent preload of the fuel tubes.

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2) Maximum number of spacers allowed per u-clamp is three; spacers of alternate thickness is allowed.

NOTE: Spacer 69B92447 (-X) is made of nylon. The table is a partial list of spacer and shows the reference tube outer diameter, spacer thickness and length. See the drawing 69B92447 for spacers with other dimensions.

a) For center wing spanwise beams, Rib SOB thru Rib 9;

A maximum total stackup of spacers is 0.375 inch (9.525 millimeters).

b) For rib 10 thru 16;

The maximum total stack-up of spacers is 0.90 inch.

3) The minimum clearance between the fuel tubes and the structure at the attachment point must be 0.10 inch (2.54 millimeters).

(c) Install the clamp strap over the fuel tube, the screws, washers, and nuts and tighten them.

1) The screw lengths can be increased of decreased by two sized for the spacer stack-up.

Table 401

P/N Dash No.	Ref Tube OD -inch (mm)	Spacer Thickness - inch (mm)	Spacer Length - inch (mm)
-25	2.0 (50.8)	0.060 (1.54)	3.64 (92.46)
-18	2.0 (50.8)	0.125 (3.17)	3.64 (92.46)
-54	2.5 (63.5)	0.060 (1.54)	3.79 (96.27)
-3	2.5 (63.5)	0.060 (1.54)	4.26 (108.2)
-7	2.5 (63.5)	0.125 (3.17)	4.26 (108.2)
-31	2.5 (63.5)	0.240 (6.10)	4.26 (108.2)
-52	3.0 (76.2)	0.060 (1.54)	4.76 (120.9)
-8	3.0 (76.2)	0.125 (3.17)	4.76 (120.9)
-11	3.0 (76.2)	0.375 (9.52)	4.76 (120.9)
-50	3.0 (76.2)	0.500 (12.70)	4.76 (120.9)
-21	3.5 (88.9)	0.060 (1.54)	5.26 (133.6)
-9	3.5 (88.9)	0.125 (3.17)	5.26 (133.6)
-12	3.5 (88.9)	0.375 (9.52)	5.26 (133.6)
-33	4.0 (101.6)	0.060 (1.54)	5.26 (133.6)
-34	4.0 (101.6)	0.120 (3.05)	5.26 (133.6)

K. Bonding Clamp and bonding Jumper Installation

SUBTASK 28-21-08-420-024

(1) Install the bonding clamps and bonding jumpers on the fuel tubes as follows:

(a) Install the bonding clamps as follows:

1) Select the correct size of bonding clamp for the fuel tube size.

2) Remove any temporary coatings or masking form the fuel tube.

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3) Clean the bonding surface on the fuel tube and clamp just before you assemble the bond.

4) Position the bonding clamp along the fuel tube to prevent excess slack in the bonding jumper.

5) Install the bonding clamp around the fuel tube, the bonding jumper(s), screw, washers, and nut and tighten them.

6) For bonding clamps installed in outboard wing dry fuel tank;

Apply a corrosion fillet seal of sealant, A02315 completely around each side of the bonding clamp.

NOTE: These clamps are installed on the refuel/jettison manifold after the jettison nozzle valve.

a) Extend the seal a maximum of 0.1 inch (2.5 millimeters) past the edge of any clean surface.

(b) Install the bonding jumpers as follows:

1) Select the correct length of bonding jumper.

NOTE: Bonding jumper (80) is a wide braided jumper. Bonding jumpers (27) and (35) are wire cable jumpers.

a) You can increase or decrease the bonding jumper length by 1.0 inch (25.4 millimeters) to reduce the slack in the bonding jumper or give more clearance around the couplings.

2) Remove any colored plastic identification band from the bonding jumper before installation.

3) Install the screw, washers and nut to connect the bonding jumper to the ground stud or bonding clamp.

4) Measure the bonding resistance between the applicable tube and airplane structure or bracket with a intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

a) Do not measure the bonding resistance between the bonding hardware such as the jumper, clamp, or screw.

b) Make sure the bonding resistance is not more than 0.10 ohm for the applicable tube and the airplane structure.

SUBTASK 28-21-08-790-003

(2) Do a leak check of the refuel manifold (Refuel/Jettison and Fuel Feed Manifold - Leak Test, TASK 28-21-00-790-802).

SUBTASK 28-21-08-650-013

(3) To refuel the fuel tanks (if no more work is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801

——— END OF TASK ———

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TASK 28-21-08-000-816

6. Center Tank Refuel Distribution Tube Removal

Figure 403

A. References

Reference	Title
28-00-00-200-801	Inspection of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

C. Access Panels

Number	Name/Location
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door
531BB	Access Door
531CB	Access Door
631BB	Access Door
631CB	Access Door

D. General

SUBTASK 28-21-08-020-016

(1) This task provides the procedure to remove the center tank refuel distribution tubes.

E. Prepare for the Procedure

SUBTASK 28-21-08-650-006

(1) To defuel all of the fuel tanks, do this task:Pressure Defueling, TASK 28-26-00-650-801

SUBTASK 28-21-08-650-007

WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801

SUBTASK 28-21-08-010-007

(3) Remove the applicable access doors Center Tank Access Door - Removal, TASK 28-11-02-000-801

Open the applicable access panels:

Number	Name/Location
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door
531BB	Access Door
531CB	Access Door

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(Continued)

Number	Name/Location
631BB	Access Door
631CB	Access Door

SUBTASK 28-21-08-940-002

(4) Go into the fuel tank.

F. Center Tank Refuel Distribution Tubes Removal

SUBTASK 28-21-08-030-001

(1) To remove the fuel tube [51] in the center fuel tank, do these steps:

(a) To disconnect the bonding jumper [27], remove the washer [14] and nut [13].

(b) To disconnect the clamp [5] from the fuel tube [51] and retain for the installation.

(c) Disconnect the flexible full coupling [73],.

1) Discard the two O-rings [65], retaining rings and lockwire [60] from the flexible full coupling [73].

(d) Disconnect the rigid coupling [71].

1) Discard the two O-rings [64], retaining rings and lockwire [60] from the rigid coupling [71].

(e) Disconnect the coupling [52] from the bulkhead fitting [55] in the spanwise beam.

(f) Remove the fuel tube [51].

1) Discard the O-ring [53].

SUBTASK 28-21-08-030-002

(2) To remove the fuel fitting [55] in the spanwise beam, do these steps:

(a) To remove the fuel fitting [55] in the spanwise beam, remove four bolts [97], washers [98], and nuts [99].

(b) Discard the O-ring [58] in the fuel fitting [55].

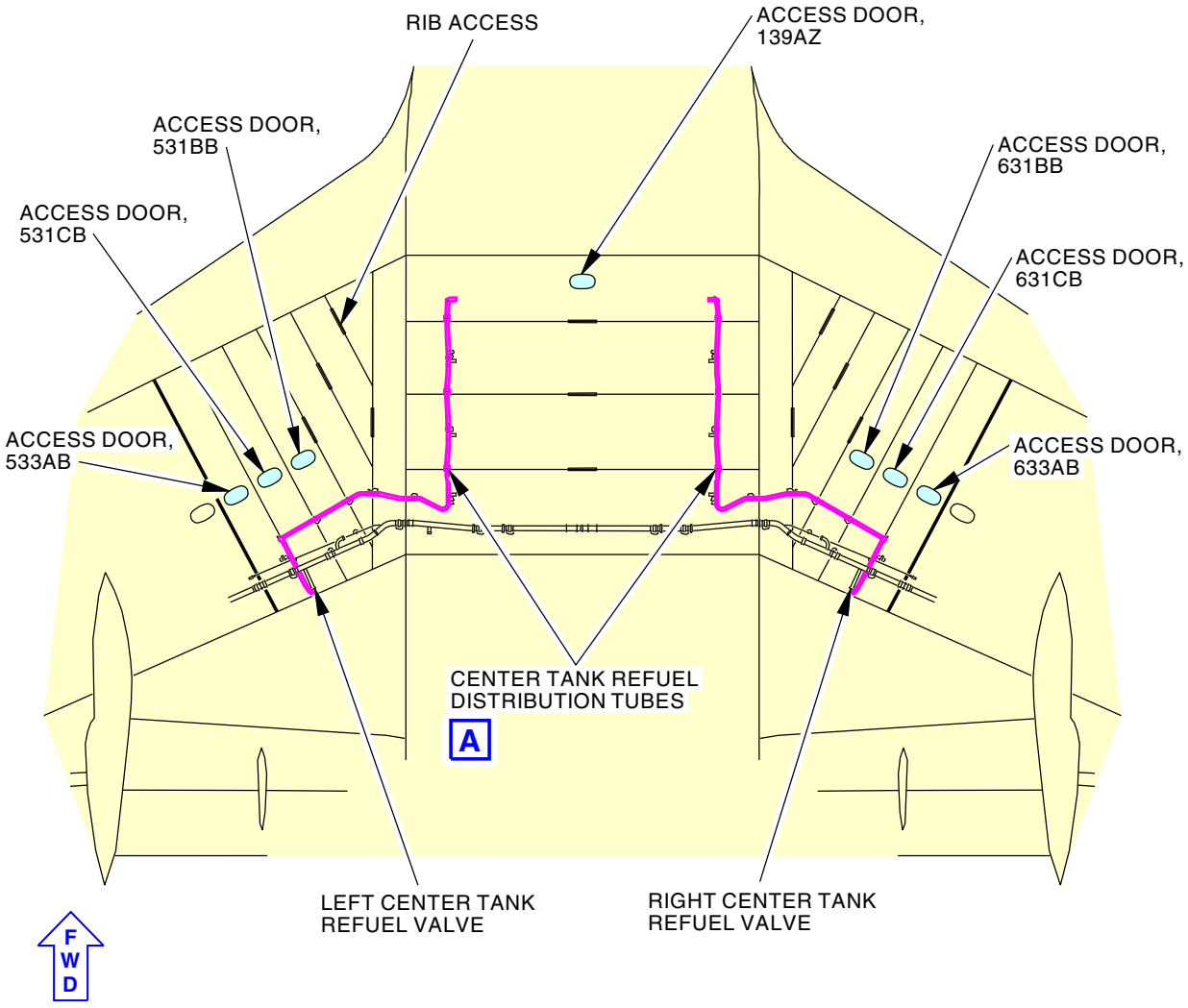
SUBTASK 28-21-08-760-001

(3) Do a check of the bonding jumpers Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801

(a) Replace the bonding jumpers as necessary.

——— END OF TASK ———

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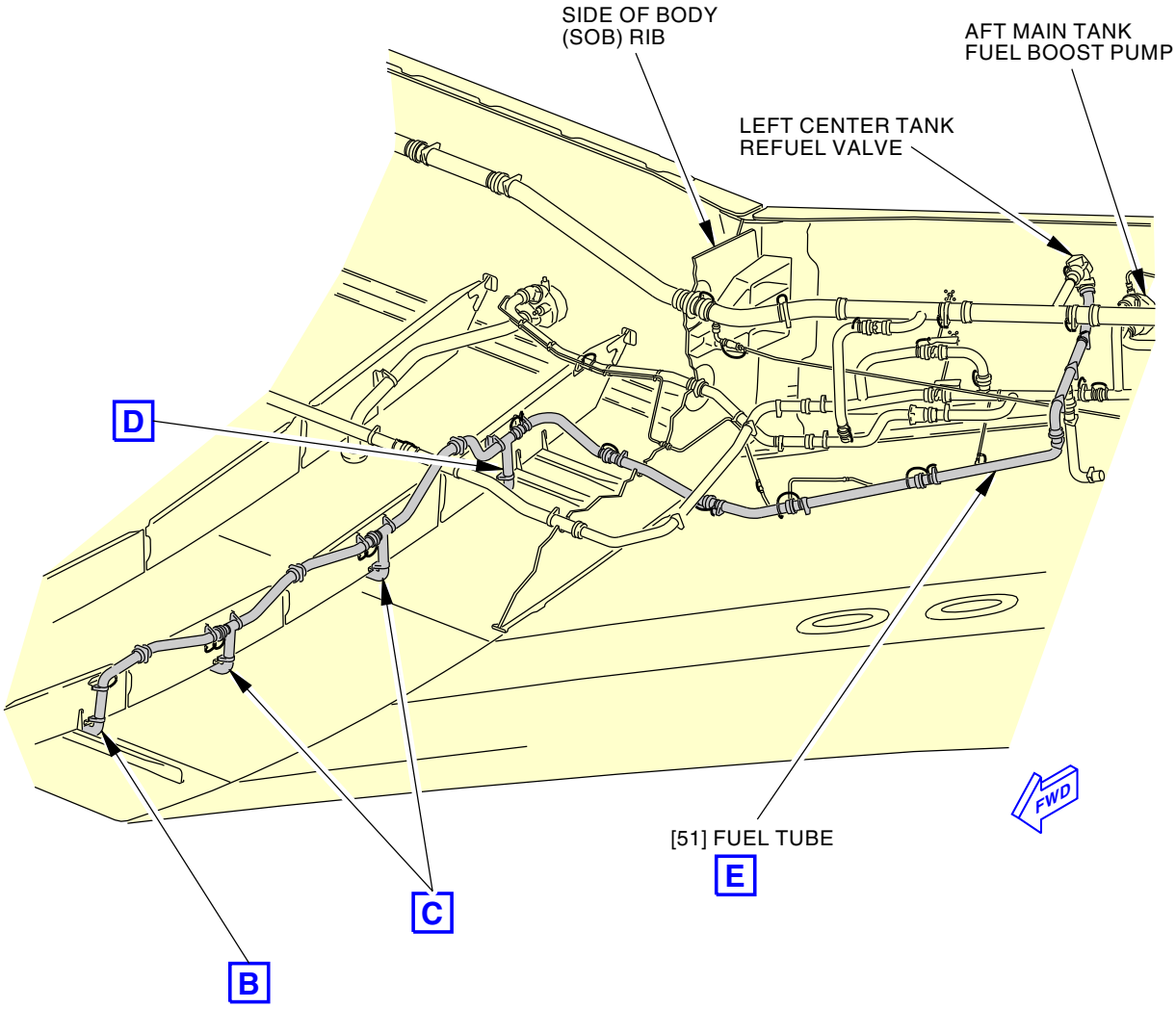


CENTER TANK (TOP VIEW)

W12287 S0000124530_V2

Center Tank Refuel Distribution Tube Installation
Figure 403/28-21-08-990-816 (Sheet 1 of 6)

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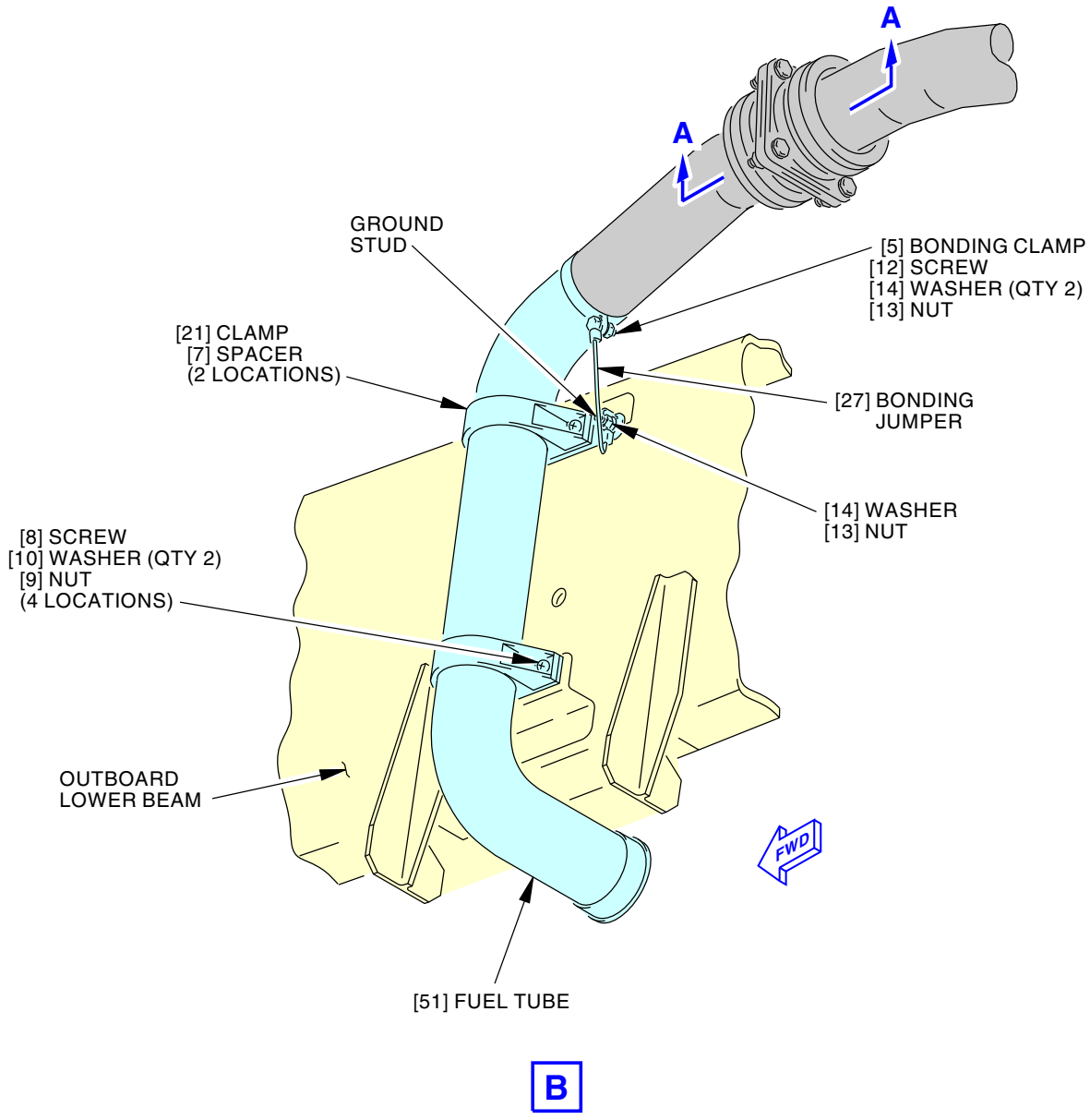
CENTER TANK REFUEL DISTRIBUTION TUBES
(SPANWISE BEAMS, RIBS REMOVED FOR CLARITY)
(LEFT SIDE IS SHOWN, RIGHT SIDE IS EQUIVALENT)

A

W12364 S0000124531_V2

Center Tank Refuel Distribution Tube Installation
Figure 403/28-21-08-990-816 (Sheet 2 of 6)

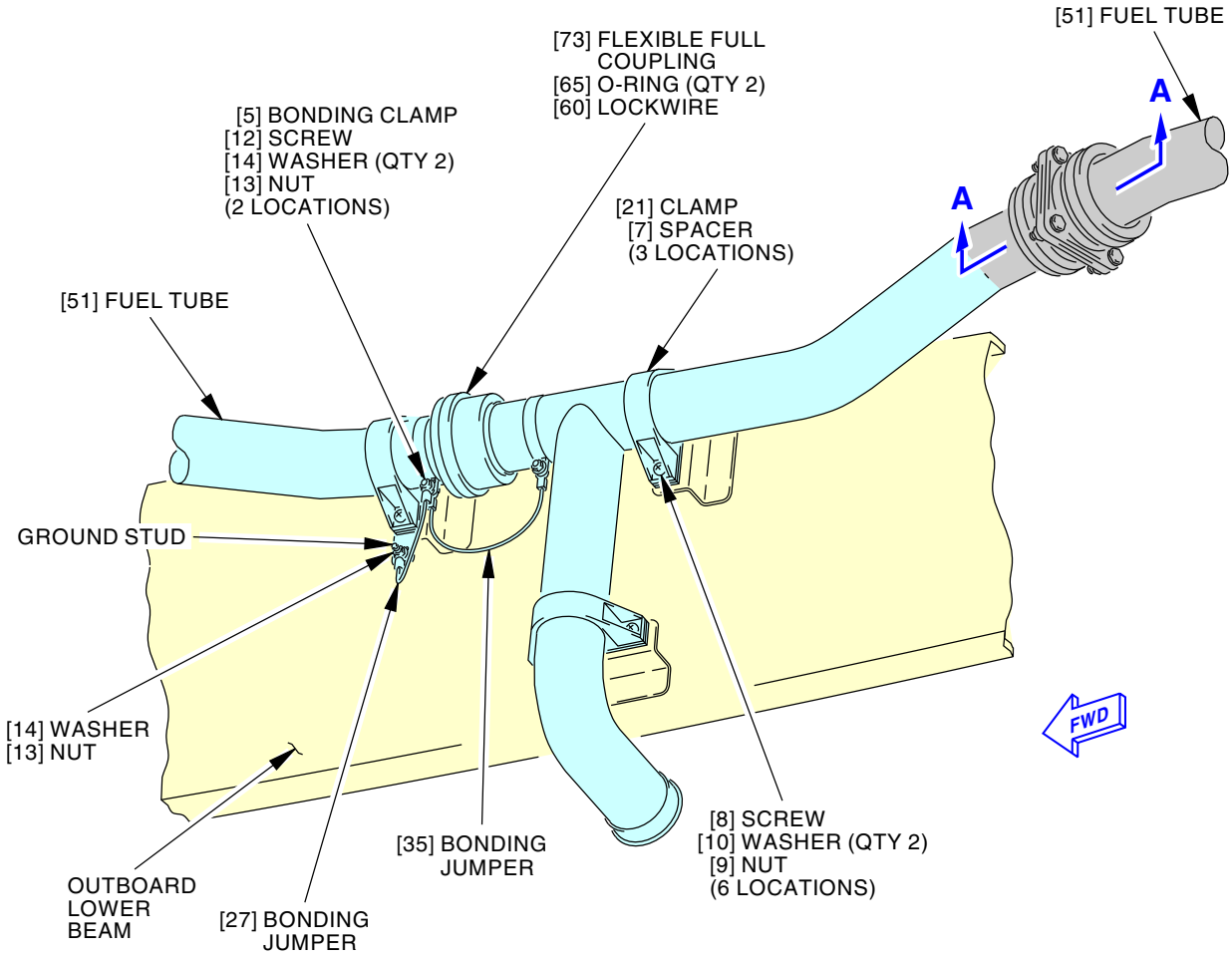
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W12581 S0000124532_V2

Center Tank Refuel Distribution Tube Installation
Figure 403/28-21-08-990-816 (Sheet 3 of 6)

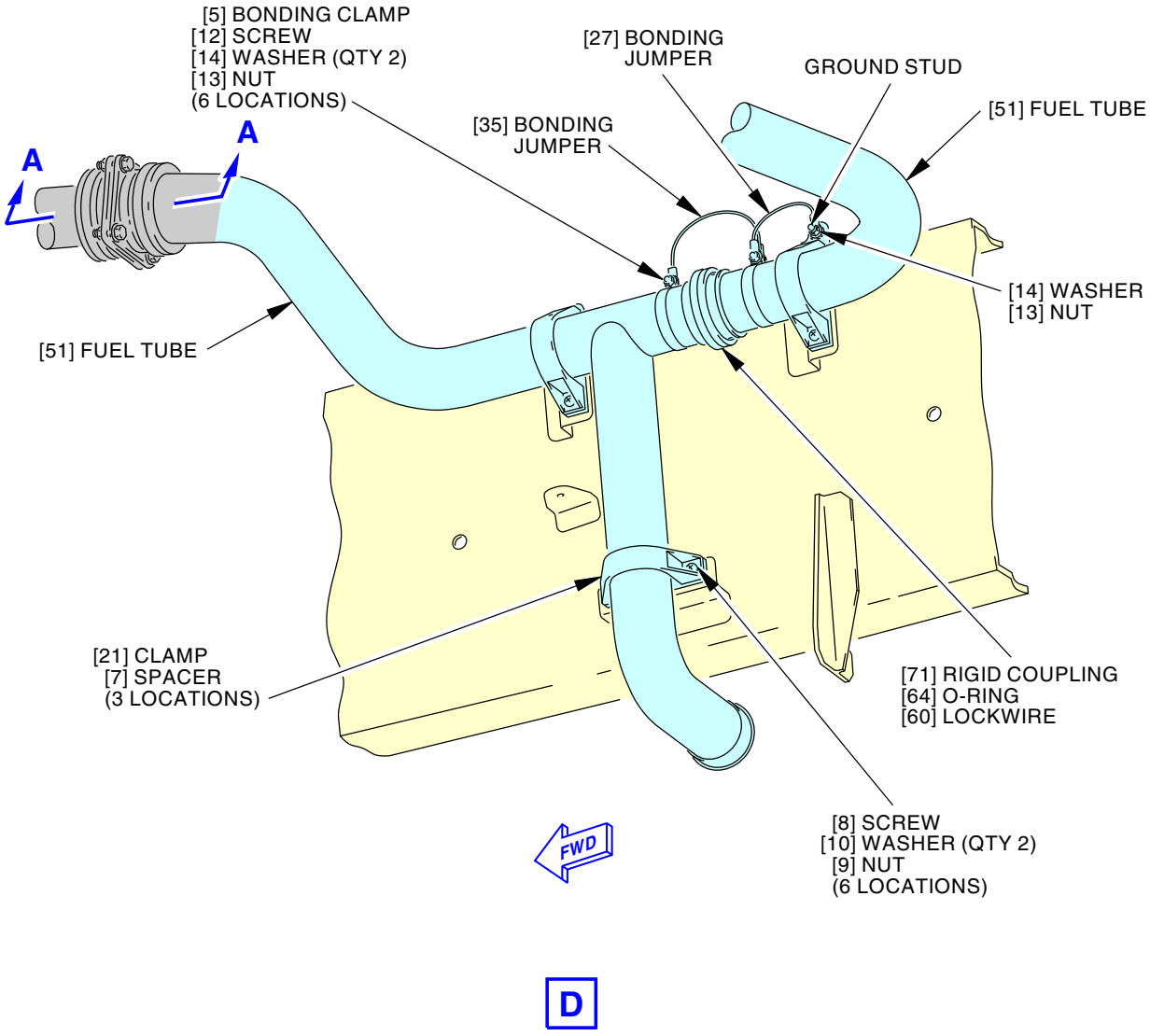
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W22419 S0000124533_V2

Center Tank Refuel Distribution Tube Installation
Figure 403/28-21-08-990-816 (Sheet 4 of 6)

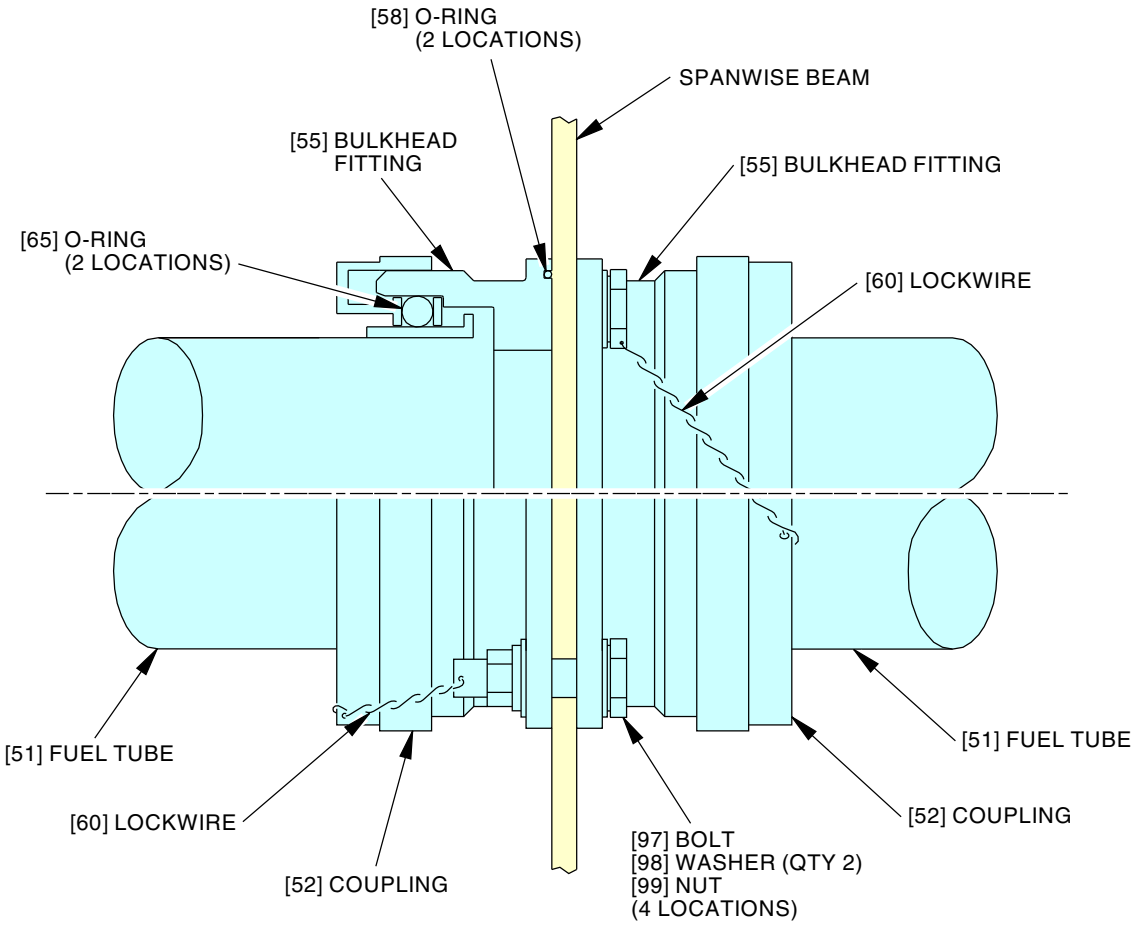
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W22560 S0000124534_V2

Center Tank Refuel Distribution Tube Installation
Figure 403/28-21-08-990-816 (Sheet 5 of 6)

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(EXAMPLE)

A-A

W22709 S0000124536_V2

Center Tank Refuel Distribution Tube Installation
Figure 403/28-21-08-990-816 (Sheet 6 of 6)

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TASK 28-21-08-400-816

7. Center Tank Refuel Distribution Tube Installation

Figure 403

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
28-00-00-200-801	Inspection of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-160-801	Examine and Close the Fuel Tank (P/B 701)
28-21-00-790-802	Refuel/Jettison and Fuel Feed Manifold - Leak Test (P/B 501)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

D. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

E. Access Panels

Number	Name/Location
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door
531BB	Access Door
531CB	Access Door
631BB	Access Door
631CB	Access Door

F. General

SUBTASK 28-21-08-420-008

(1) This task provides the procedure to install the center tank refuel distribution tubes.

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G. Prepare for Procedure

SUBTASK 28-21-08-650-008

(1) Do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801

SUBTASK 28-21-08-940-003

(2) Go into the fuel tank.

H. Center Tank Refuel Distribution Tube Installation

SUBTASK 28-21-08-760-002

(1) Do a check of the bonding jumpers (Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801).

(a) Replace the bonding jumpers as necessary.

SUBTASK 28-21-08-430-001

(2) To install the fuel fitting [55] in the spanwise beam of the center tank, do these steps:

(a) Lubricate a new O-ring [58] with a thin coating of grease, D00504.

(b) Install the new O-ring [58] in each fuel fitting [55].

(c) Install the two fuel fittings [55] in the spanwise beam with four bolts [97], washers [98], and nuts [99].

SUBTASK 28-21-08-420-009

(3) To install the fuel tube [51] in the center fuel tank, do these steps:

(a) Install the fuel tube [51] to the bulkhead fitting [55] in the spanwise beam.

1) Lubricate a new O-ring [65] with a thin coating of grease, D00504.

2) Install the coupling [52] with a new O-ring [65] and retaining ring on the fuel tube [51]

3) Manually tighten the coupling and install MS20995C32 lockwire, G01048

(b) Install the fuel tube [51] with clamp [21] and spacer [7].

NOTE: The clamp [21] and (u-clamp) has two parts: the clamp strap and the clamp saddle.

1) Add spacer [7] only as required to prevent preload of the fuel tubes.

2) Maximum number of spacer [7] allowed per U-clamp is three; a combination of spacers of alternate thickness is allowed.

NOTE: Spacer 69B92447(-X) is made of nylon. See the u-clamps installation procedure for a partial list of spacers which shows the reference tube outer diameter, spacer thickness and length. See the drawing 69B92447 for spacers with other dimensions.

a) The maximum total stack-up of spacers is 0.375 inch (9.525 millimeters).

b) The minimum clearance between the fuel tubes and the structure at the attachment point must be 0.10 inch (2.54 millimeters).

3) Put the spacer [7] under the clamp saddle.

4) Install the clamp strap over the fuel tube, install the two screws [8], washers [10], and nuts [9] and tighten.

NOTE: The screw lengths can be increased or decreased by two sizes for the spacer stack-up.

(c) Connect fuel tubes [51] with the flexible full coupling [73].

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1) Lubricate two new O-rings [65] with a thin coating of grease, D00504.
2) Install two O-rings [65] and retaining rings in the flexible full coupling [73].
3) Manually tighten the coupling and install MS20995C32 lockwire, G01048.

(d) Connect the fuel tubes [51] with the rigid coupling [71].
1) Lubricate a new O-ring [64] with a thin coating of grease, D00504.
2) Install O-ring [64] and retaining ring in the rigid coupling [71].
3) Manually tighten the coupling and install MS20995C32 lockwire, G01048.

(e) Install bonding clamp [5] on the fuel tube [51].

(f) Connect the bonding jumper [27] to the ground stud with the washer [14] an nut [13].
1) Measure the bonding resistance between the applicable tube and the airplane structure with a bonding intrinsically safe approved bonding meter, COM-1550.
2) Make sure the bonding resistance is not more than 0.010 ohm between the applicable tube and the airplane structure.

(g) Connect the bonding jumper [35] to bonding clamp [5] with the screw [15], washers [14], and nut [13].
1) Measure the bonding resistance between the applicable tube and the airplane structure with a bonding intrinsically safe approved bonding meter, COM-1550.
2) Make sure the bonding resistance is not more than 0.010 ohm between the applicable tube and the airplane structure.

I. Put the Airplane Back To Its Usual Condition

SUBTASK 28-21-08-410-004

(1) Go out of and close the applicable fuel tanks (Examine and Close the Fuel Tank, TASK 28-11-00-160-801).

(a) Install the applicable access doors:

Number	Name/Location
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door
531BB	Access Door
531CB	Access Door
631BB	Access Door
631CB	Access Door

SUBTASK 28-21-08-790-001

(2) Do a leak test of the refuel manifold (Refuel/Jettison and Fuel Feed Manifold - Leak Test, TASK 28-21-00-790-802).

SUBTASK 28-21-08-650-009

(3) Do this task to refuel the fuel tanks (if no more work is necessary):Pressure Refueling, TASK 12-11-01-650-801.

——— END OF TASK ———

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TASK 28-21-08-000-805

8. Main Tank Inboard Refuel Valve Tubes Removal

(Figure 404)

A. References

Reference	Title
28-00-00-200-801	Inspection of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-00-00-960-801	Replacement of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-21-02-000-801	Refuel Valve - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

C. Access Panels

Number	Name/Location
533AB	Access Door
533BB	Access Door
633AB	Access Door
633BB	Access Door

D. General

SUBTASK 28-21-08-020-030

(1) This task has the procedure to remove the main tank inboard refuel valve tubes.

E. Prepare for the Procedure

SUBTASK 28-21-08-650-014

(1) To defuel all of the fuel tanks, do this task: Pressure Defueling, TASK 28-26-00-650-801.

WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

(3) To remove the applicable access door, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(a) Remove the applicable access door:

Number	Name/Location
533AB	Access Door
533BB	Access Door
633AB	Access Door
633BB	Access Door

(4) Go into the fuel tank.

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F. Main Tank Inboard Refuel Valve Tubes Removal

SUBTASK 28-21-08-020-031

(1) To remove the inlet tube [30] for the inboard refuel valves in the main fuel tanks, do these steps:

(a) To disconnect the support clamp [36] for the water scavenge tube, remove the screw [22], washers [24] and nut [23] from the clamp [6].

(b) To disconnect the clamp [6] used to attach support clamp [36], remove the screws [8], washers [10], and nuts [9].

NOTE: The u-clamp has two parts: the clamp strap and the clamp saddle.

(c) To disconnect the bonding jumper [35] from the refuel valve, remove the screw [16], washers [14], and nut [13].

(d) To disconnect the flexible half coupling [72] at the refuel valve.

1) Discard the O-ring [65], retaining rings and lockwire [60] from the flexible half coupling [72].

(e) Disconnect the two flexible full couplings [75] on the refuel/jettison manifold.

1) Discard the O-rings [62], retaining rings and lockwire [60] from each flexible full coupling [75].

(f) Disconnect the two bonding jumpers [35] on the refuel/jettison manifold, remove the screw [12], washers [14], and nut [13] from the bonding clamps [11].

(g) To disconnect the clamps [6] and spacer [7] from the structure, remove the screws [8], washers [10] and nuts [9].

NOTE: The u-clamp has two parts: the clamp strap and the clamp saddle.

(h) To disconnect the bonding jumper [27] from the ground stud, remove the washer [14] and nut [13].

(i) Remove the inlet tube [30].

SUBTASK 28-21-08-020-032

(2) To remove the outlet tube [32] for the inboard refuel valves in the main fuel tanks, do these steps:

(a) Disconnect the flexible half coupling [72] at the refuel valve.

1) Discard the O-ring [65], retaining rings and lockwire [60] from the flexible half coupling [72].

(b) Disconnect the flexible full coupling [73] on the outlet tube [32].

1) Discard the two O-rings [61], retaining rings and lockwire [60] from the flexible full coupling [74].

(c) To disconnect the bonding jumper [27] from the ground stud, remove the nut [13] and washer [14].

(d) To disconnect the bonding jumper [35] from the outlet tube [32], remove the screw [16], washers [14], and nut [13].

(e) To disconnect the clamps [21] and spacer [7] from the structure, remove the screws [8], washers [10], and nuts [9].

NOTE: The u-clamp has two parts: the clamp strap and the clamp saddle.

(f) Remove the outlet tube [32].

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(g) To remove the refuel valve, do this task: Refuel Valve - Removal, TASK 28-21-02-000-801.

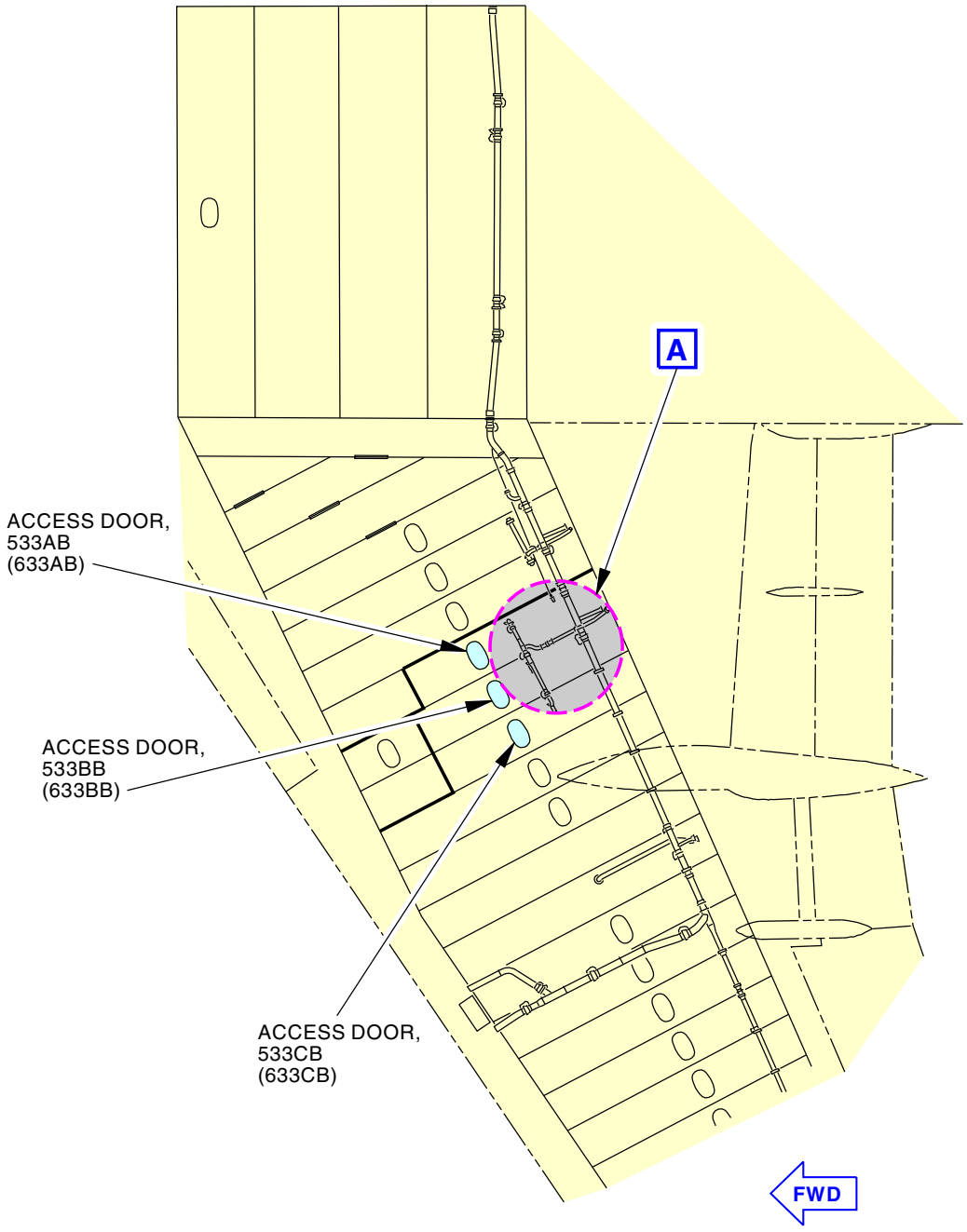
SUBTASK 28-21-08-212-002

(3) Do a check of the bonding jumpers (TASK 28-00-00-200-801).

(a) Replace the bonding jumpers as necessary (TASK 28-00-00-960-801).

——— END OF TASK ———

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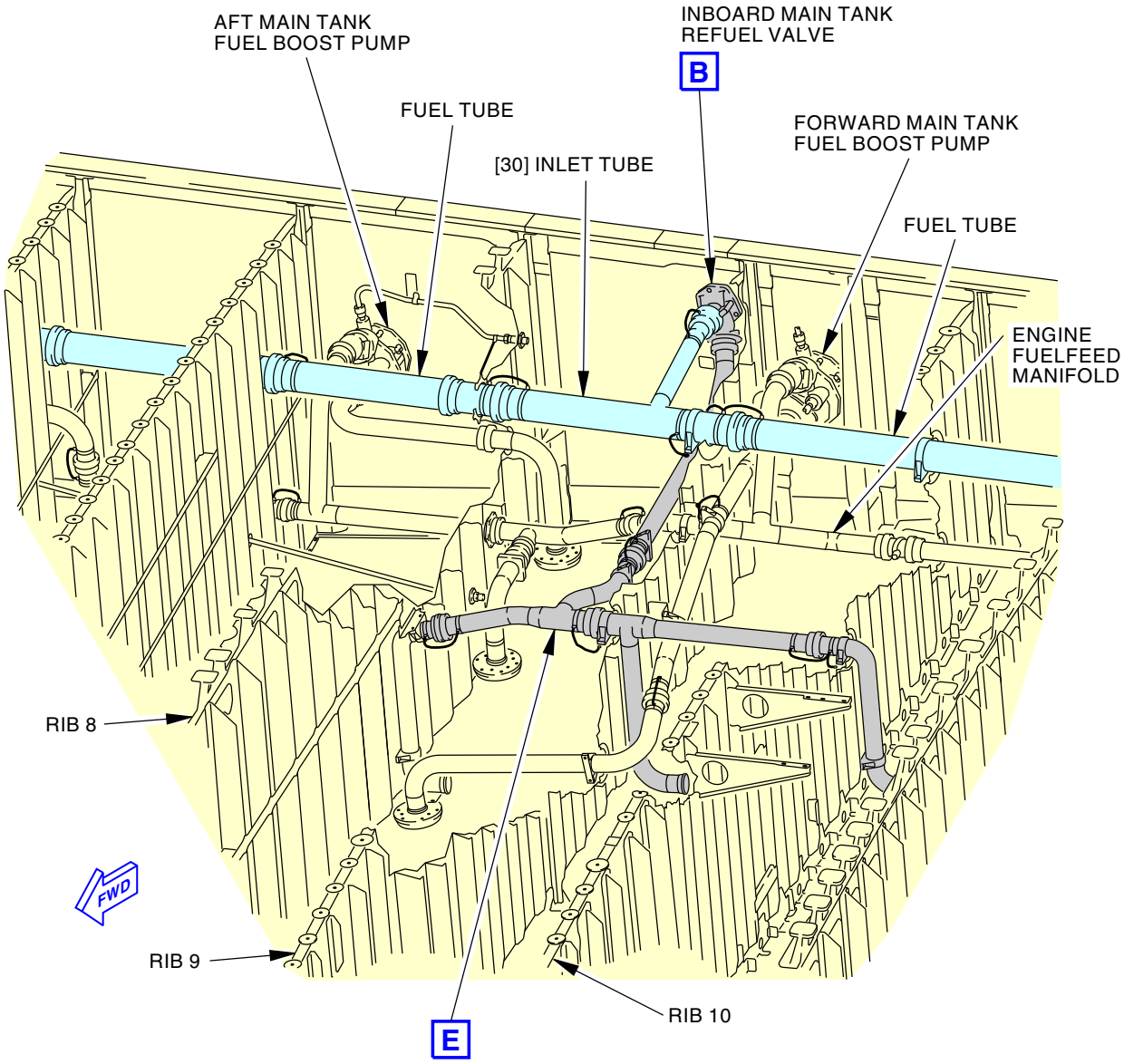


LEFT WING
(TOP VIEW)
(RIGHT WING IS EQUIVALENT)

J64462 S0000172858_V2

Inboard Main Tank Refuel Valve Tube Installation
Figure 404/28-21-08-990-805 (Sheet 1 of 8)

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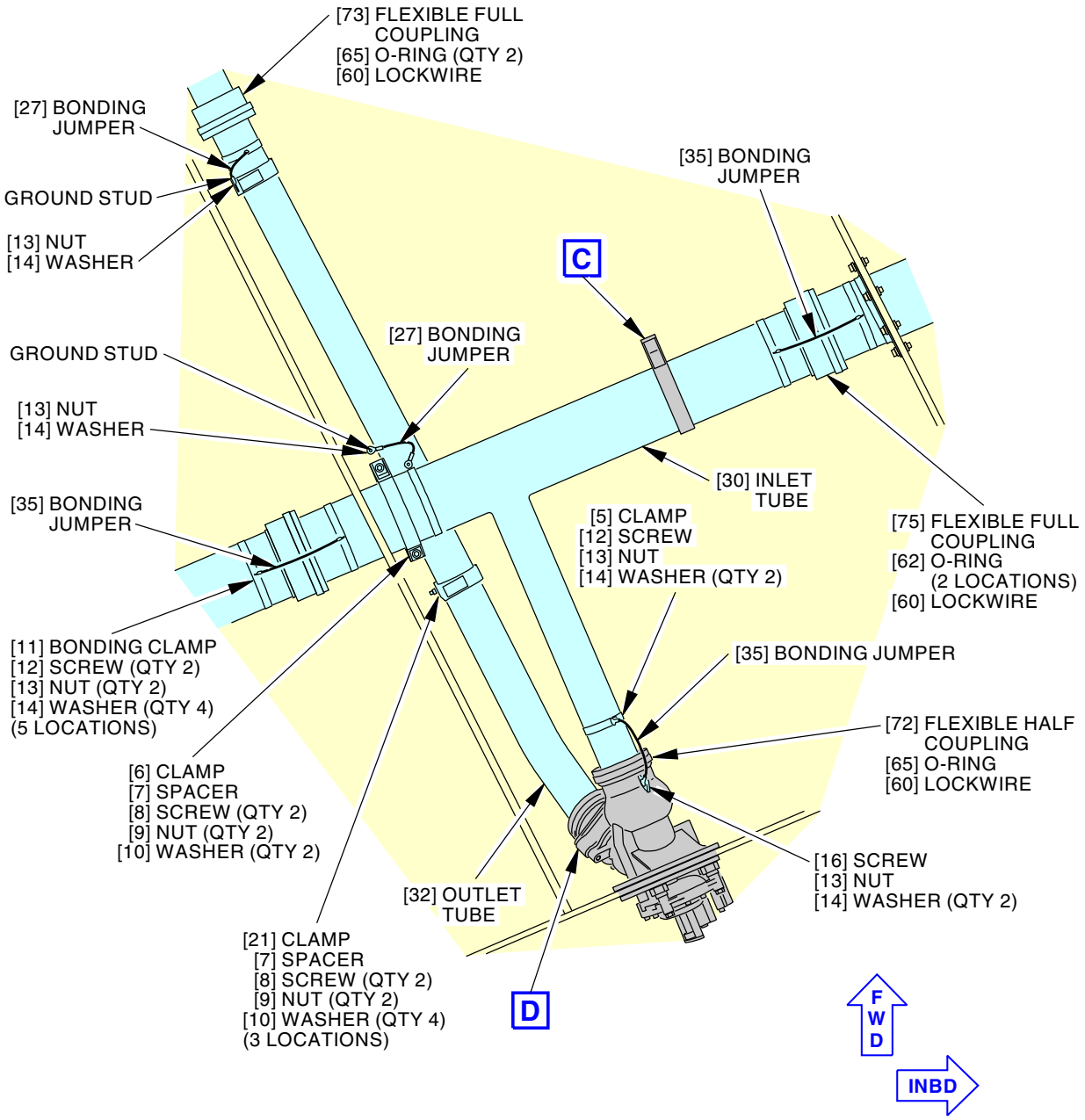
LEFT WING REFUEL/JETTISON MANIFOLD
(RIBS 8, 9, 10 REMOVED FOR CLARITY)
(RIGHT WING IS OPPOSITE)

A

W26074 S0000123028_V2

Inboard Main Tank Refuel Valve Tube Installation
Figure 404/28-21-08-990-805 (Sheet 2 of 8)

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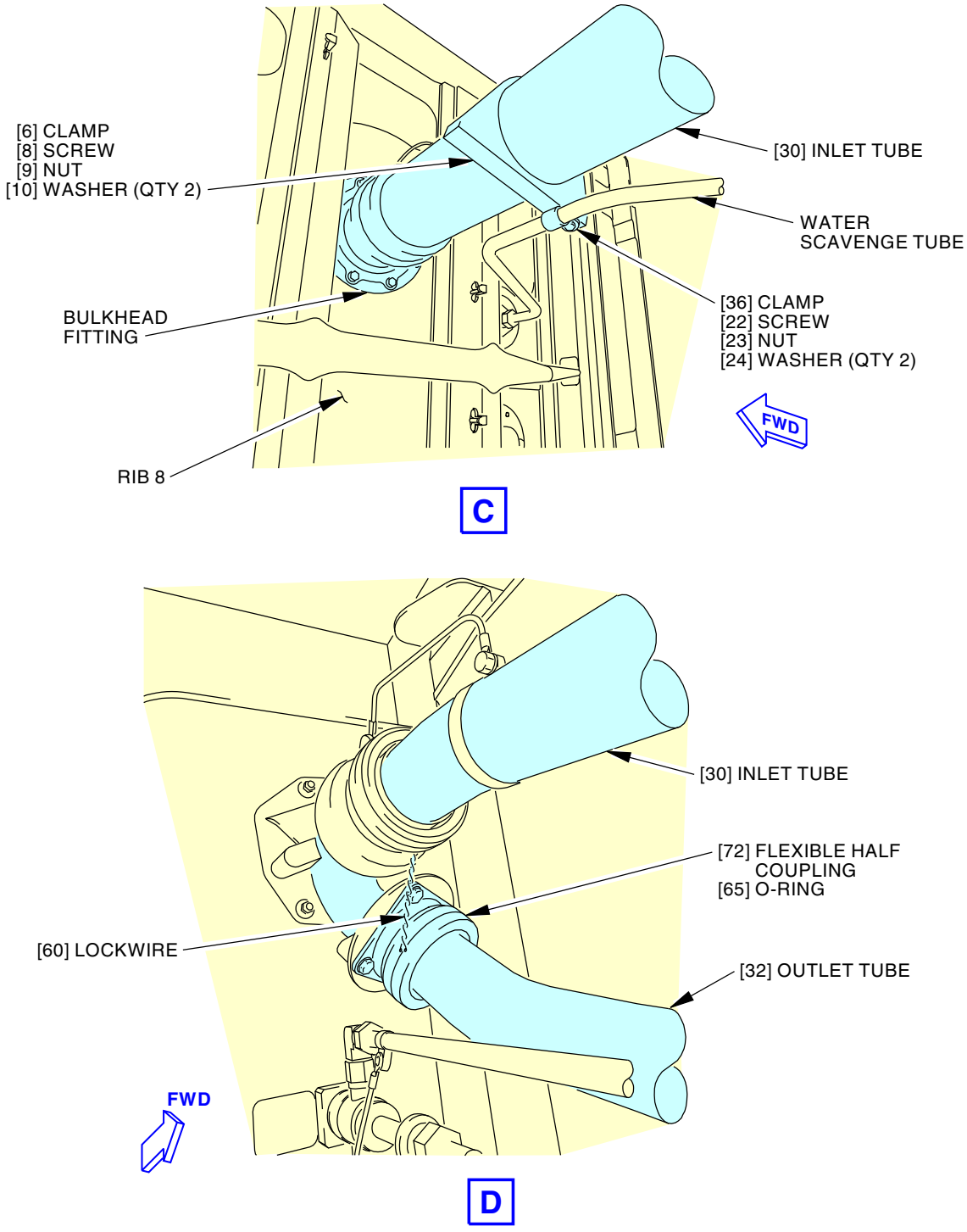
INBOARD MAIN TANK REFUEL VALVE

B

W25912 S0000123029_V2

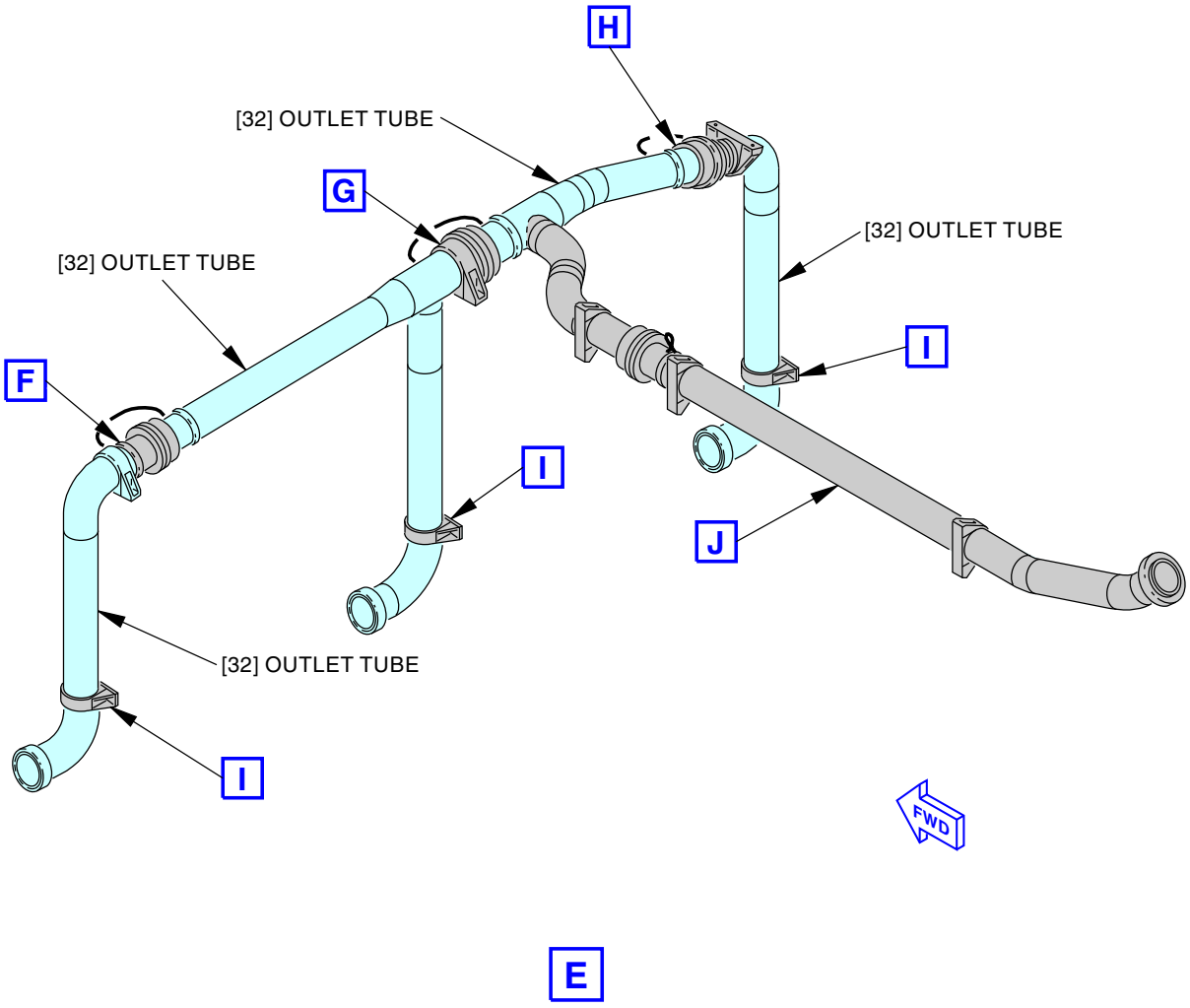
Inboard Main Tank Refuel Valve Tube Installation
Figure 404/28-21-08-990-805 (Sheet 3 of 8)

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Inboard Main Tank Refuel Valve Tube Installation
Figure 404/28-21-08-990-805 (Sheet 4 of 8)

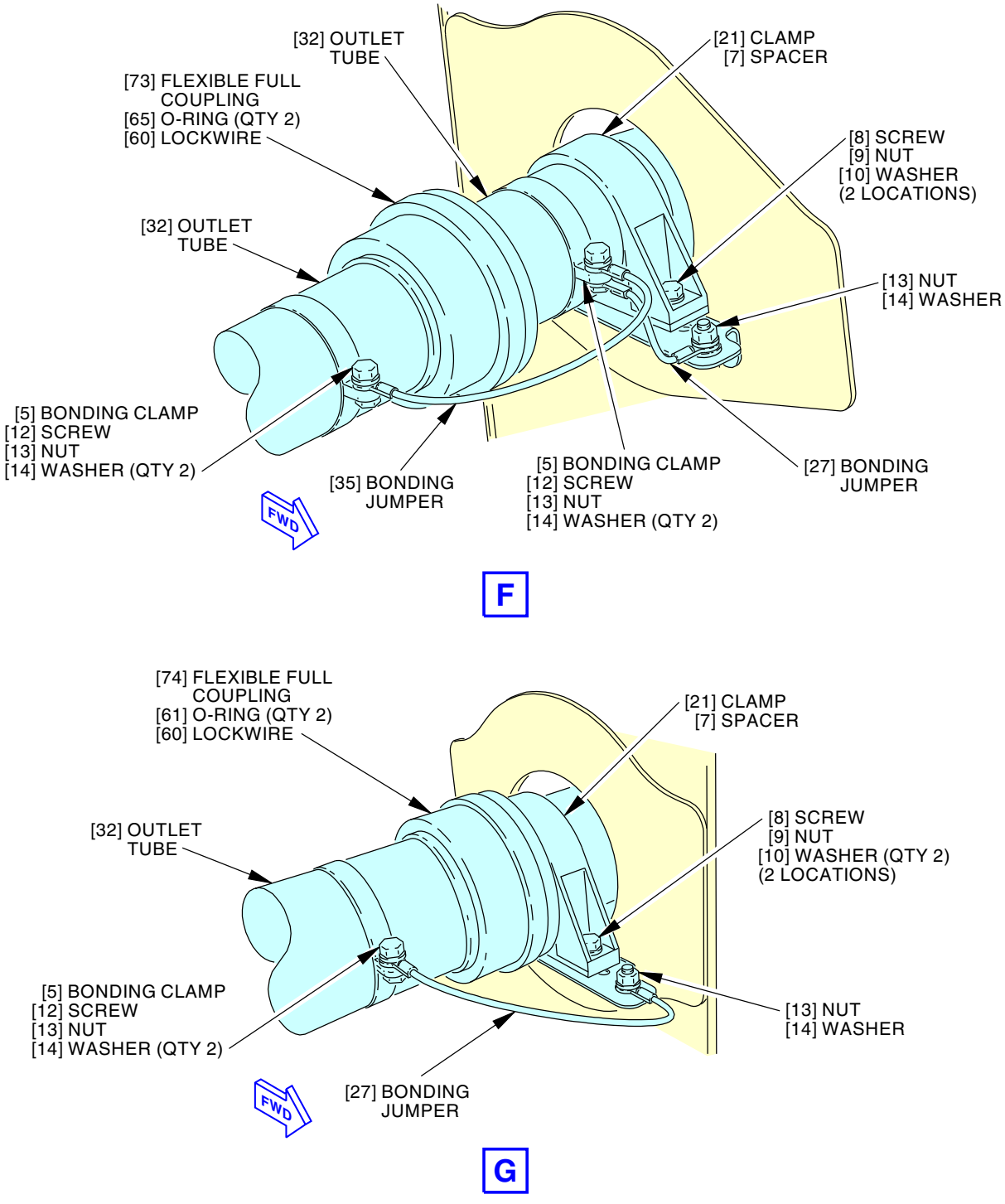
ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



W27723 S0000123031_V2

Inboard Main Tank Refuel Valve Tube Installation
Figure 404/28-21-08-990-805 (Sheet 5 of 8)

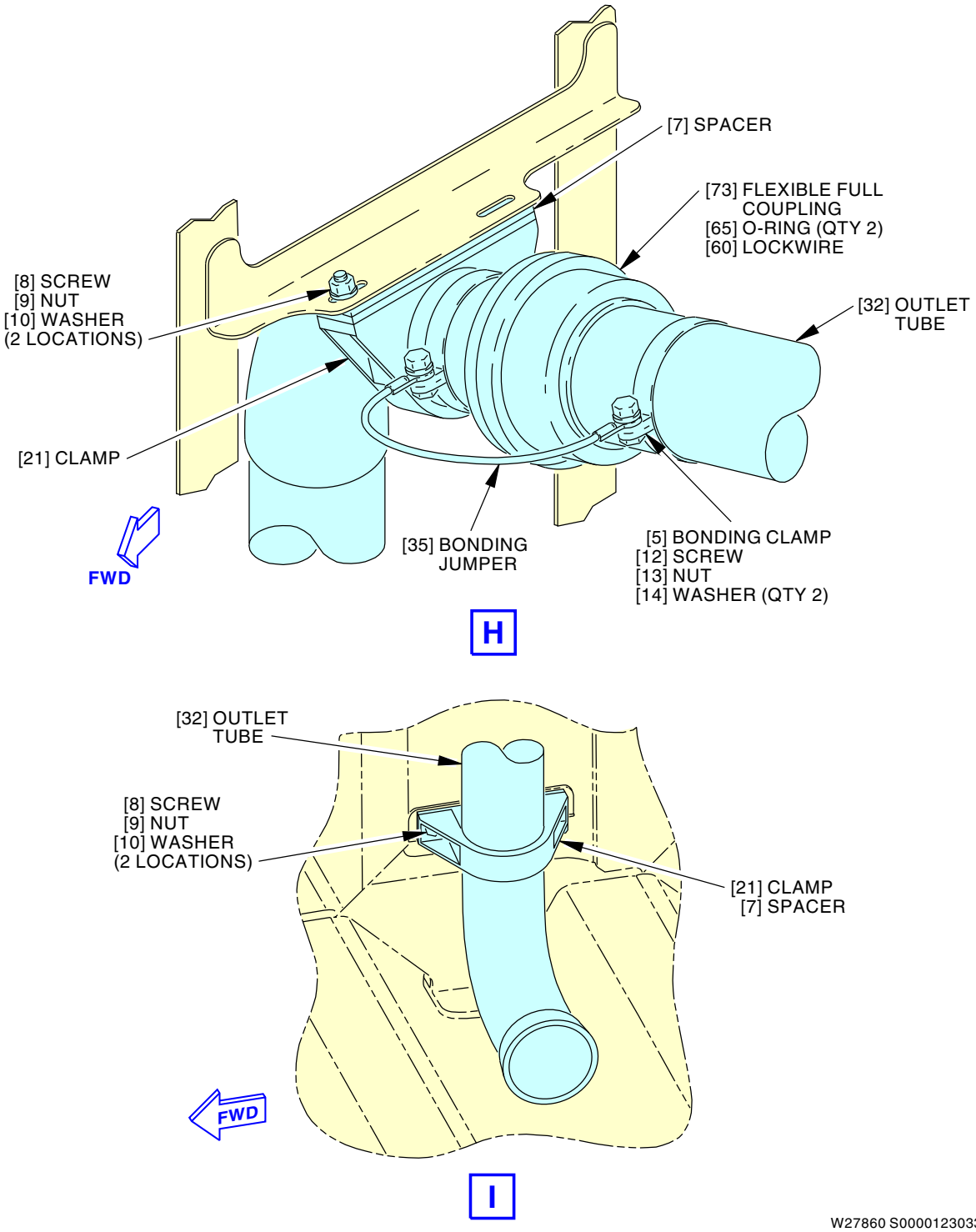
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W27788 S0000123032_V2

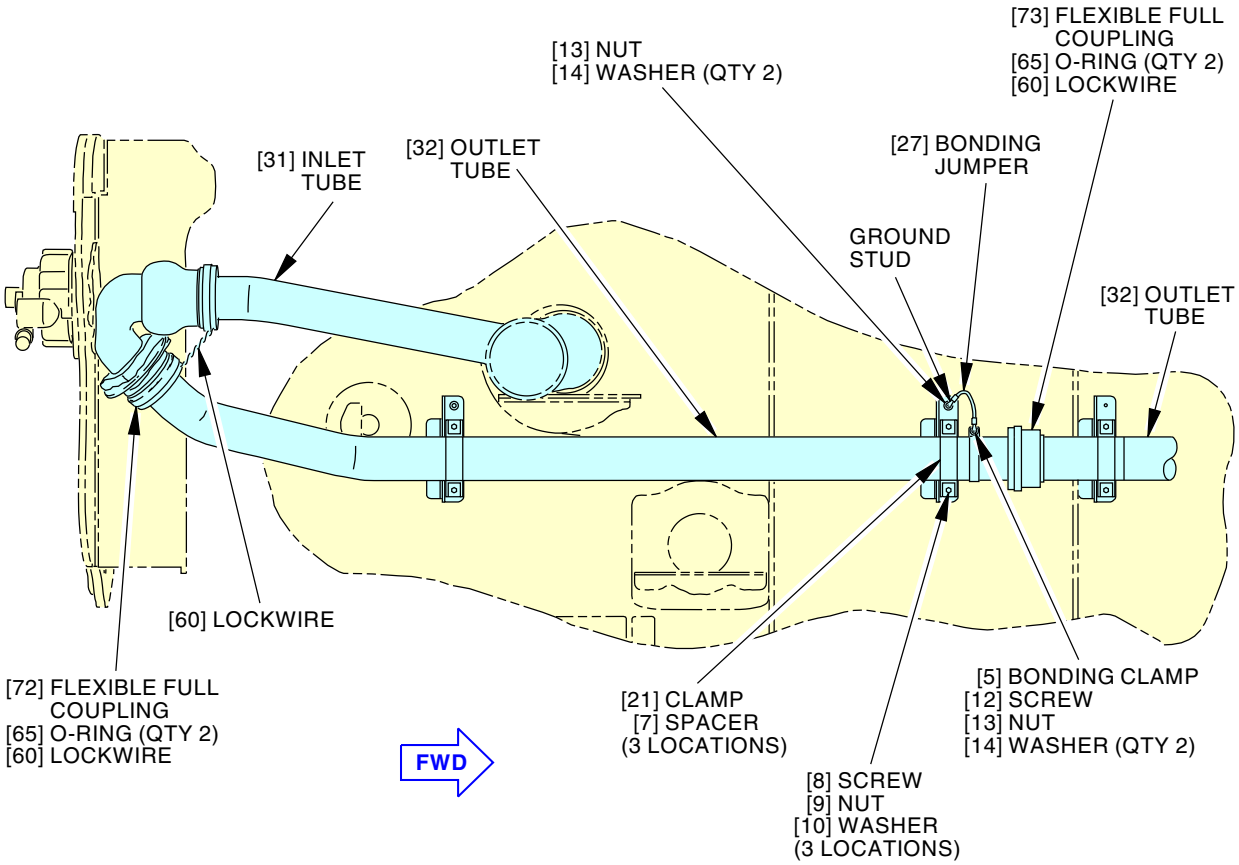
Inboard Main Tank Refuel Valve Tube Installation
Figure 404/28-21-08-990-805 (Sheet 6 of 8)

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Inboard Main Tank Refuel Valve Tube Installation
Figure 404/28-21-08-990-805 (Sheet 7 of 8)

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W27892 S0000123034_V2

Inboard Main Tank Refuel Valve Tube Installation
Figure 404/28-21-08-990-805 (Sheet 8 of 8)

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TASK 28-21-08-400-805

9. Main Tank Inboard Refuel Valve Tubes Installation

(Figure 404)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
28-00-00-200-801	Inspection of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-21-00-790-802	Refuel/Jettison and Fuel Feed Manifold - Leak Test (P/B 501)
28-21-02-400-801	Refuel Valve - Installation (P/B 401)
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

D. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

E. Access Panels

Number	Name/Location
533AB	Access Door
633AB	Access Door

F. General

SUBTASK 28-21-08-420-025

(1) This task has the procedure to install the main tank inboard refuel valve tubes.

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G. Prepare for the Procedure

SUBTASK 28-21-08-860-006

(1) Do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

SUBTASK 28-21-08-010-013

(2) Go into the fuel tank.

H. Main Tank Inboard Refuel Valve Tubes Installation

SUBTASK 28-21-08-212-003

(1) Do a check of the bonding jumpers (TASK 28-00-00-200-801).

(a) Replace the bonding jumpers as necessary.

SUBTASK 28-21-08-420-026

(2) To install the outlet tube [32] for the inboard refuel valves in the main tanks, do these steps:

(a) To install the refuel valve (if it was removed), do this task: Refuel Valve - Installation, TASK 28-21-02-400-801..

(b) Put the outlet tube [32] in position.

(c) Install the clamp [21] and spacer [7] to the structure and outlet tube [32].

NOTE: The u-clamp has two parts: the clamp strap and the clamp saddle.

1) Add spacer only as necessary to prevent preload of the fuel tubes.

2) Maximum number of spacers permitted per U-clamp is three; a combination of spacers of alternate thickness is permitted.

NOTE: Spacer 69B92447(-X) is made of nylon. See the U-clamps installation procedure for a partial list of spacers which shows the reference tube outer diameter, spacer thickness and length. See the drawing 69B92447 for spacers with other dimensions.

a) The maximum total stack-up of spacers is 0.375 in. (9.525 mm).

b) The minimum clearance between the fuel tubes and the structure at the attachment point must be 0.10 in. (2.54 mm).

3) Put the spacer [7] under the clamp saddle.

4) Install the clamp strap over the fuel tube, install the two screws [8], washers [10], and nuts [9] and tighten.

NOTE: The screw lengths can be increased or decreased by two sizes for the spacer stack-up.

(d) Connect the flexible half coupling [72].

1) Lubricate a new O-ring [65] with a thin coating of grease, D00504.

2) Install O-ring [65] and retaining rings in the flexible half coupling [72].

3) Manually tighten the coupling and install MS20995C32 lockwire, G01048, to the flexible half coupling [72] (TASK 20-10-23-400-801).

(e) Connect the flexible full coupling [73].

1) Lubricate new O-rings [65] with a thin coating of grease, D00504.

2) Install O-rings [65] and retaining rings in the flexible full coupling [73].

3) Manually tighten the coupling and install MS20995C32 lockwire, G01048, to the flexible full coupling [73] (TASK 20-10-23-400-801).

(f) Connect the bonding jumper [27] with washer [14] and nut [13].

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1) Measure the bonding resistance between the applicable tube and the airplane structure with a intrinsically safe approved bonding meter, COM-1550.

2) Make sure the bonding resistance is 0.010 ohm (10 milliohms) or less between the applicable tube and the airplane structure.

SUBTASK 28-21-08-420-027

(3) To install the inlet tube [30] for the inboard refuel valves in the main fuel tanks, do these steps:

(a) Install the inlet tube [30].

(b) Install the clamps [6] and spacer [7] to the structure and inlet tube [30].

NOTE: The u-clamp has two parts: the clamp strap and the clamp saddle.

1) Add spacers only as necessary to prevent preload of the fuel tubes.

2) Maximum number of spacers permitted per U-clamp is three; a combination of spacers of alternate thickness is permitted.

NOTE: Spacer 69B92447(-X) is made of nylon. See the U-clamps installation procedure for a partial list of spacers which shows the reference tube outer diameter, spacer thickness and length. See the drawing 69B92447 for spacers with other dimensions.

a) The maximum total stack-up of spacers is 0.375 in. (9.525 mm).

b) The minimum clearance between the fuel tubes and the structure at the attachment point must be 0.10 in. (2.54 mm).

3) Put the spacer [7] under the clamp saddle.

4) Install the clamp strap over the fuel tube, install the two screws [8], washers [10], and nuts [9] and tighten them.

NOTE: The screw lengths can be increased or decreased by two sizes for the spacer stack-up.

(c) Connect the flexible half coupling [72].

1) Lubricate a new O-ring [65] with a thin coating of grease, D00504.

2) Install O-ring [65] and retaining rings in the flexible half coupling [72].

3) Manually tighten the coupling and install MS20995C32 lockwire, G01048, to the flexible half coupling [72] (TASK 20-10-23-400-801).

(d) Connect the two flexible half couplings [75].

1) Lubricate new O-rings [65] with a thin coating of grease, D00504.

2) Install O-rings [65] and retaining rings in the flexible full coupling [75].

3) Manually tighten the coupling and install MS20995C32 lockwire, G01048, to the flexible full coupling [75] (TASK 20-10-23-400-801).

(e) Connect the bonding clamp [5] and bonding jumper [35] to the inlet tube [30] at the refuel valve with the screw [12], washers [14], and nut [13].

(f) Connect the one side of clamp [6] to the inlet tube [30] with the screw [8], washers [10], and nut [9].

NOTE: The u-clamp has two parts: the clamp strap and the clamp saddle.

(g) Connect the clamp [36] and the water scavenge tube to the inlet tube [30] and clamp [6] with the screw [22], washers [24], and nut [23].

(h) Connect the two bonding jumpers [35] across the flexible full couplings [75] with bonding clamps [11], screw [12], washers [14], and nut [13].

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1) Measure the bonding resistance between the applicable tube and the airplane structure with a intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

2) Make sure the bonding resistance is 0.010 ohm (10 milliohms) or less between the applicable tube and the airplane structure.

(i) Connect the bonding jumper [35] to the refuel valve with screw [16], washers [14], and nut [13].

1) Measure the bonding resistance between the applicable tube and the airplane structure with a intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

(j) Connect the bonding jumper [27] to the ground stud with washer [14] and nut [13].

1) Measure the bonding resistance between the applicable tube and the airplane structure with a intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

2) Make sure the bonding resistance is 0.010 ohm (10 milliohms) or less between the applicable tube and the airplane structure.

I. Put the Airplane Back to the Usual Condition

SUBTASK 28-21-08-410-008

(1) Go out of and close the applicable fuel tanks (TASK 28-11-00-410-801).

SUBTASK 28-21-08-410-009

(2) Install the applicable access door (TASK 28-11-01-400-801).

(a) Install the applicable access door:

Number	Name/Location
533AB	Access Door
633AB	Access Door

SUBTASK 28-21-08-790-004

(3) Do a leak test of the refuel manifold (TASK 28-21-00-790-802).

SUBTASK 28-21-08-650-015

(4) To refuel the fuel tanks (if no more work is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

——— END OF TASK ———

TASK 28-21-08-000-806

10. Main Tank Outboard Refuel Valve Tubes Removal

(Figure 405)

A. References

Reference	Title
28-00-00-200-801	Inspection of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-21-05-000-802	Outboard Refueling Manifold Drain Valve - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)

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B. Tools/Equipment

Reference	Description
STD-764	Scraper - Non-metallic

C. Location Zones

Zone	Area
541	Main Tank - Rib 17 to Rib 32 - Left Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing

D. Access Panels

Number	Name/Location
541GB	Access Door
541HB	Access Door
541JB	Access Door
541KB	Access Door
541LB	Access Door
541MB	Access Door
541NB	Access Door
641GB	Access Door
641HB	Access Door
641JB	Access Door
641KB	Access Door
641LB	Access Door
641MB	Access Door
641NB	Access Door

E. General

SUBTASK 28-21-08-020-033

(1) This task has the procedure to remove the main tank outboard refuel valve tubes.

F. Prepare for Procedure

SUBTASK 28-21-08-650-016

(1) To defuel all of the fuel tanks, do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-21-08-860-007

WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

SUBTASK 28-21-08-010-038

(3) To remove the applicable main tank access doors, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(a) Open the applicable access doors:

Number	Name/Location
541GB	Access Door
541HB	Access Door
541JB	Access Door

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(Continued)

Number	Name/Location
541KB	Access Door
541LB	Access Door
541MB	Access Door
541NB	Access Door
641GB	Access Door
641HB	Access Door
641JB	Access Door
641KB	Access Door
641LB	Access Door
641MB	Access Door
641NB	Access Door

SUBTASK 28-21-08-010-015

(4) Go into the fuel tank.

G. Main Tank Outboard Refuel Valve Tubes Removal

SUBTASK 28-21-08-020-034

(1) To remove the inlet tube [34] for the outboard refuel valves in the main fuel tanks, do these steps (TASK 28-21-08-000-803):

(a) Remove the bonding jumper [233] and the bonding jumper [247] from the part of the inlet tube [34] that connects to the refuel valve.

(b) Remove the bonding jumper [242] and the bonding jumper [243] from the inlet tube [34], near rib 24.

(c) Remove the flexible full coupling [237] and the flexible full coupling [244] to disconnect the inlet tube [34] from the fuel tube [109].

(d) Remove the flexible half coupling [231] to disconnect the inlet tube [34] from the refuel valve.

(e) Remove the rigid coupling [235] to disconnect the two parts of the inlet tube [34].

(f) Remove the U-clamp [238] and the U-clamp [241].

(g) Remove the two parts of the inlet tube [34] from the fuel tank.

SUBTASK 28-21-08-020-049

(2) To remove the outlet tube [38] for the outboard refuel valves in the main fuel tanks, do these steps (TASK 28-21-08-000-803):

(a) Remove the part of the outlet tube [38] that is outboard of the bulkhead fitting [262].

1) Remove the two U-clamps [263], on the outboard sides of rib 28 and rib 29.

2) Remove the two bonding jumpers [264] and the bonding jumper [267].

3) Disconnect the rigid coupling [265].

a) Remove the free part of the outlet tube [38] from the fuel tank.

4) Disconnect the flexible full coupling [259] that is outboard of the bulkhead fitting [262].

a) Remove the free part of the outlet tube [38] from the fuel tank.

(b) Remove the bulkhead fitting [262].

1) Remove the bonding jumper [261].

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2) Disconnect the full coupling [259] that is inboard of the bulkhead fitting [262].

3) Remove the sealant from the two sides of the bulkhead fitting and from the eight fasteners with a non-metallic scraper, STD-764.

a) Remove the eight bolts [268], washers [269], washers [270], and nuts [271].

b) Remove the bulkhead fitting [262] from the rib

(c) Remove the part of the outlet tube [38] that is inboard of the bulkhead fitting [262].

1) Remove the bonding jumper [257].

2) Remove the U-clamp [258].

3) Disconnect the flexible full coupling [255].

a) Remove the free part of the outlet tube [38] from the fuel tank.

4) Remove the bonding jumper [239] and the bonding jumper [248] on the inboard side of rib 25.

5) Remove the U-clamp [240] on the inboard side of rib 25.

6) Disconnect the rigid coupling [251].

a) Remove the free part of the outlet tube [38] from the fuel tank.

7) Remove the U-clamp [240] that holds the bent part of the outlet tube [38].

8) Disconnect the flexible half coupling [250] to remove the outlet tube [38] from the refuel valve.

a) Remove the bent part of the outlet tube [38] from the fuel tank.

SUBTASK 28-21-08-020-036

(3) Remove the manifold vacuum relief valve [120] from the inlet tube [34].

(a) Discard the o-ring [89] and lockwire [60].

SUBTASK 28-21-08-020-054

(4) Do this task to remove the refuel manifold drain valve [253] from the outlet tube [38]: Outboard Refueling Manifold Drain Valve - Removal, TASK 28-21-05-000-802.

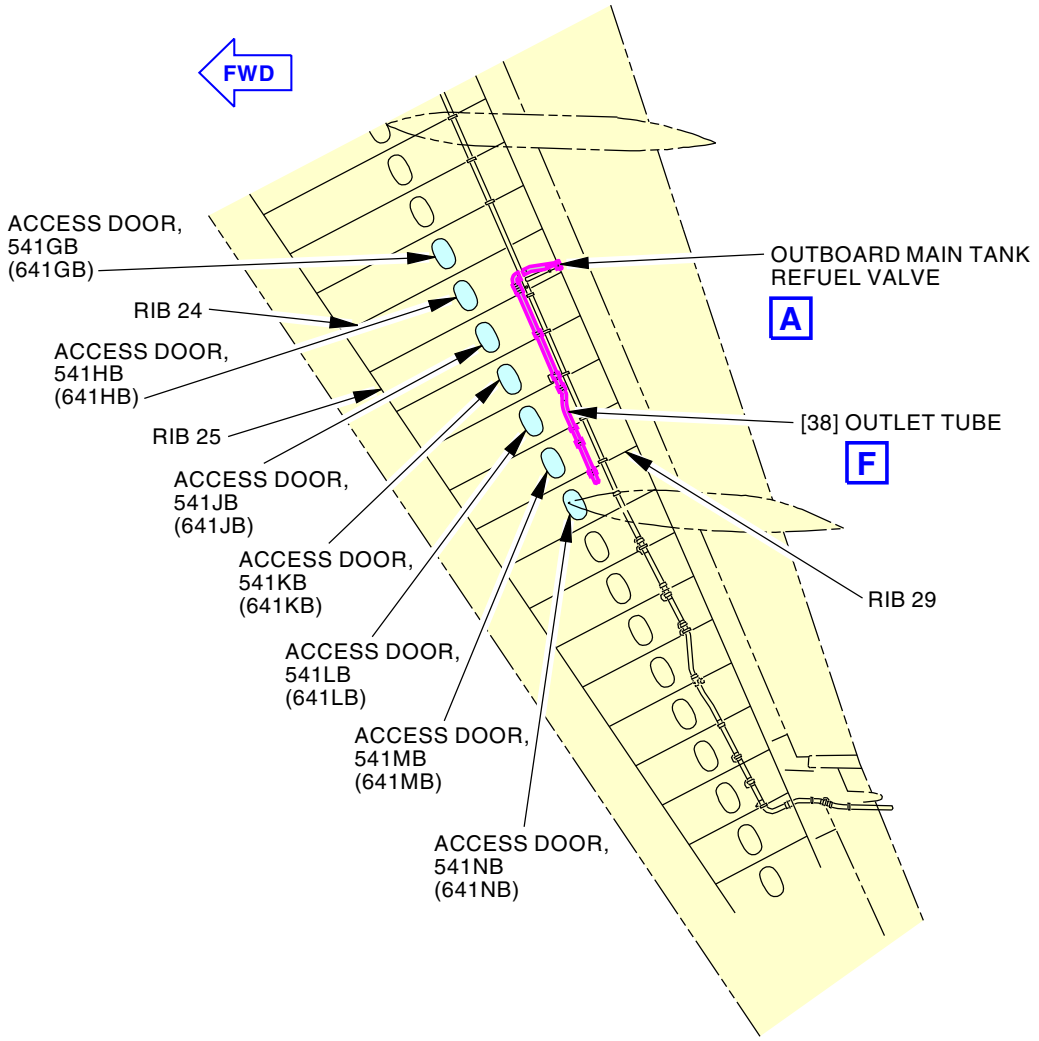
SUBTASK 28-21-08-212-004

(5) Do a check of the bonding jumpers (TASK 28-00-00-200-801)

(a) Replace the bonding jumpers as necessary.

——— END OF TASK ———

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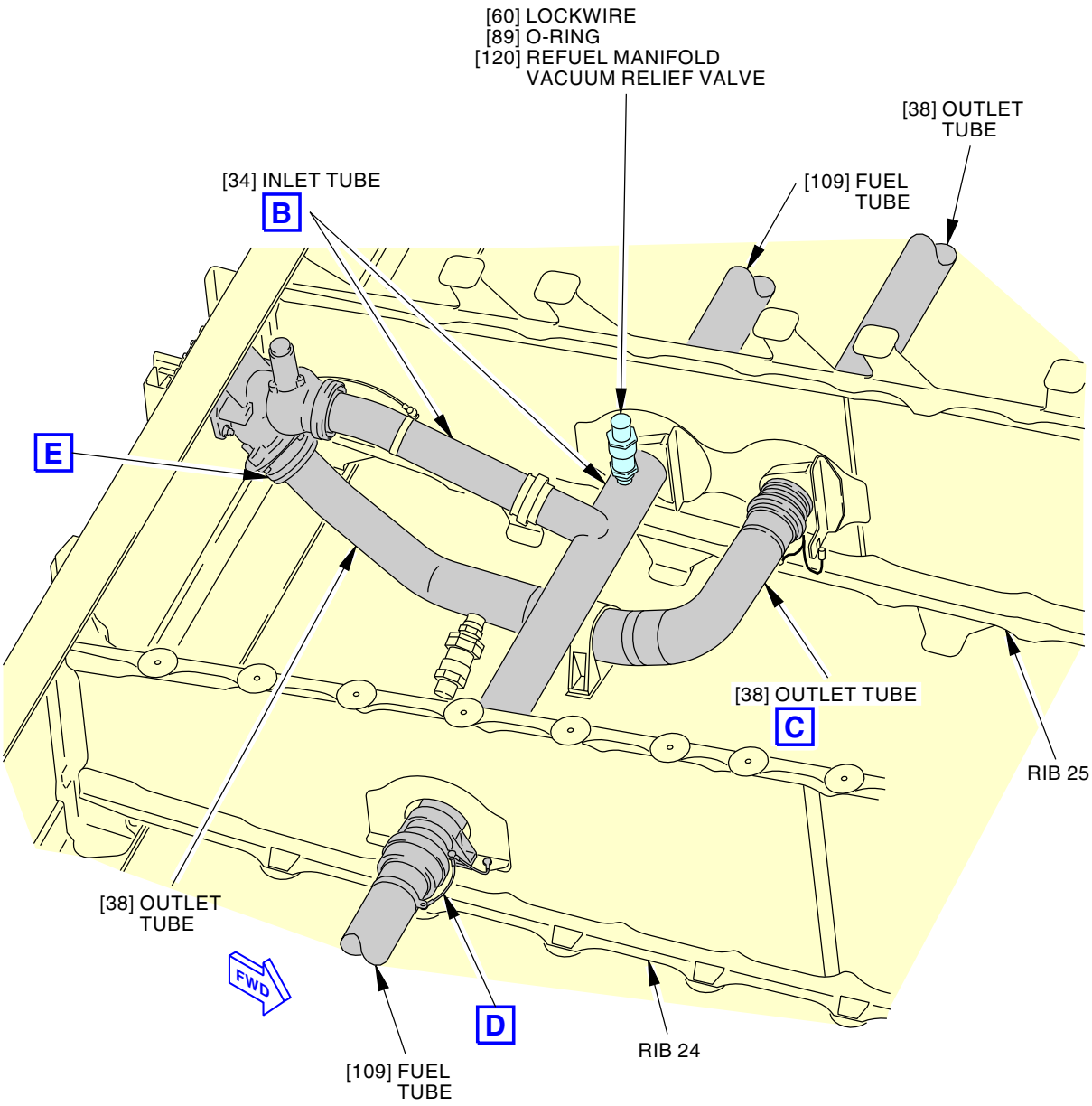


LEFT WING
(TOP VIEW)
(RIGHT WING IS ALMOST THE SAME)

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Outboard Main Tank Refuel Valve Tubes Installation
Figure 405/28-21-08-990-819 (Sheet 1 of 6)

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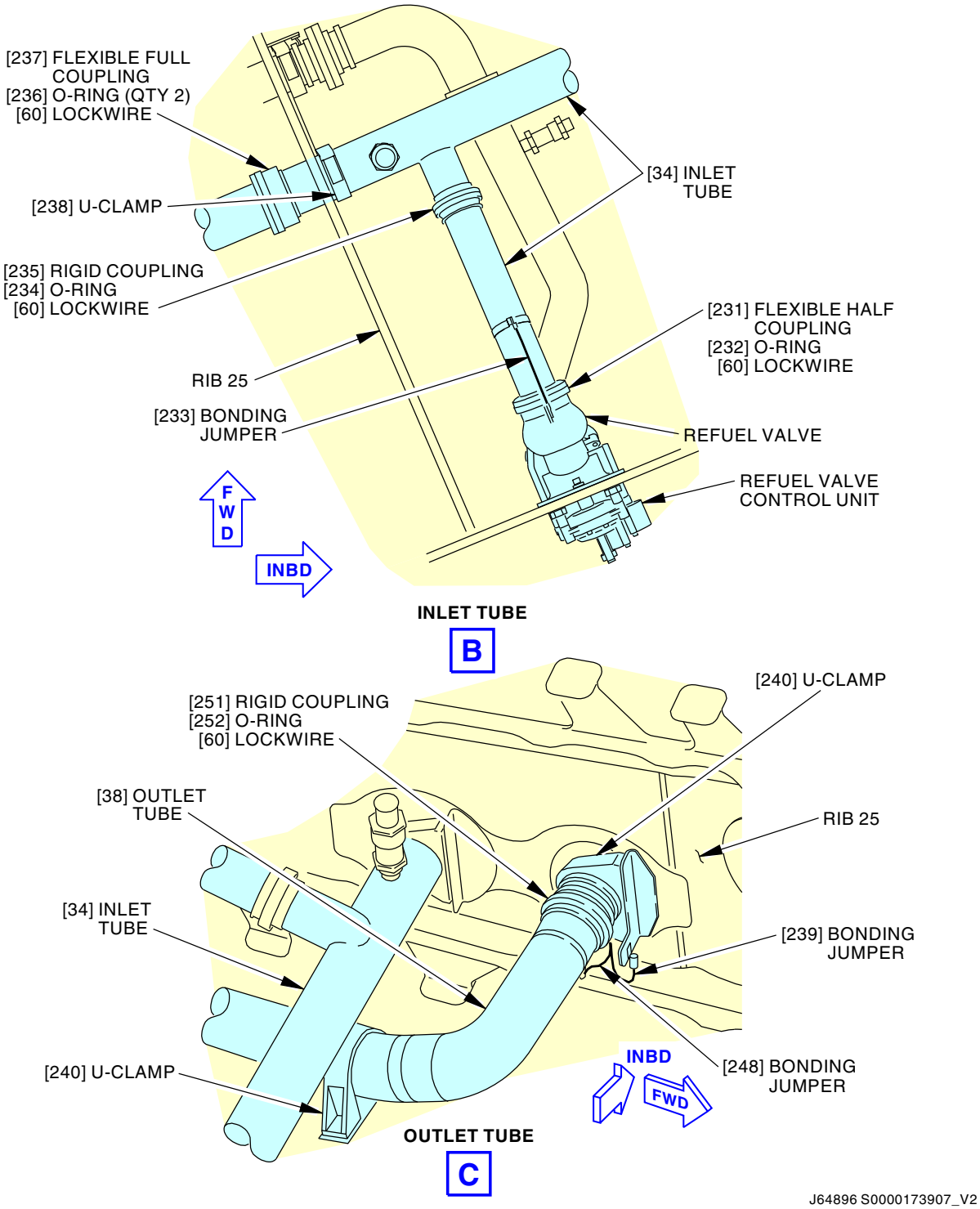
OUTBOARD MAIN TANK REFUEL VALVE
(LEFT WING IS SHOWN, RIGHT WING IS OPPOSITE)

A

J64888 S0000173906_V2

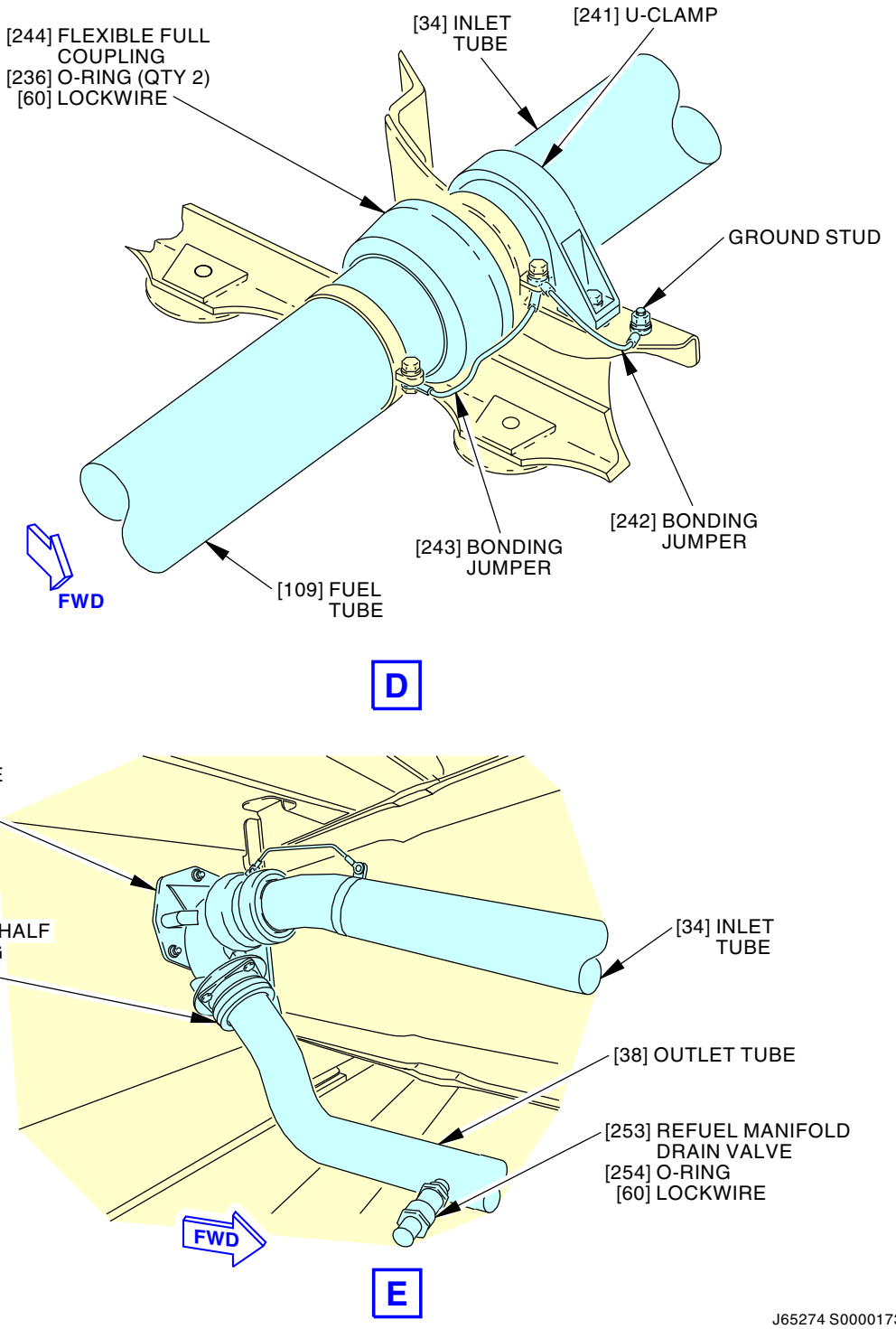
Outboard Main Tank Refuel Valve Tubes Installation
Figure 405/28-21-08-990-819 (Sheet 2 of 6)

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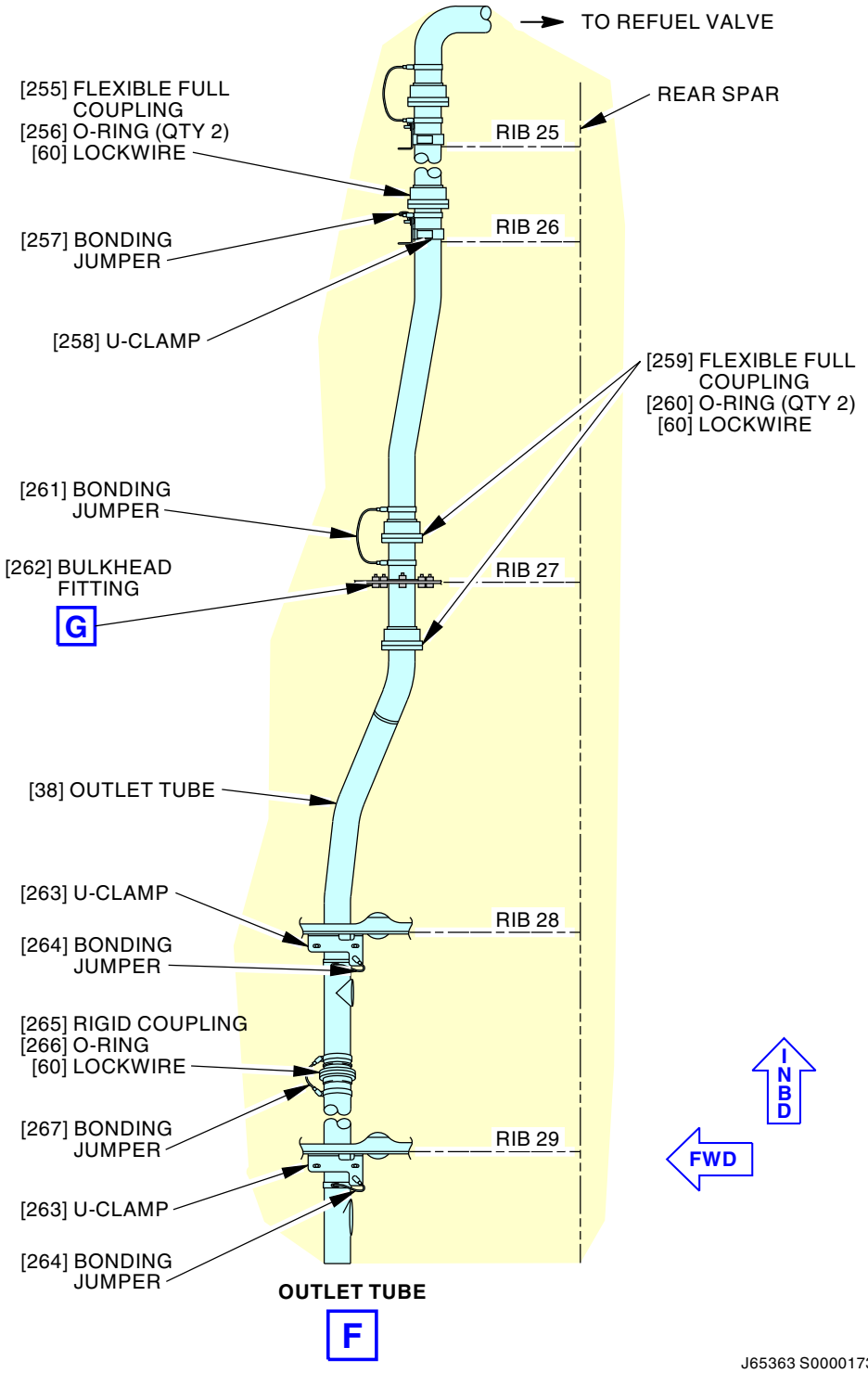
Outboard Main Tank Refuel Valve Tubes Installation
Figure 405/28-21-08-990-819 (Sheet 3 of 6)

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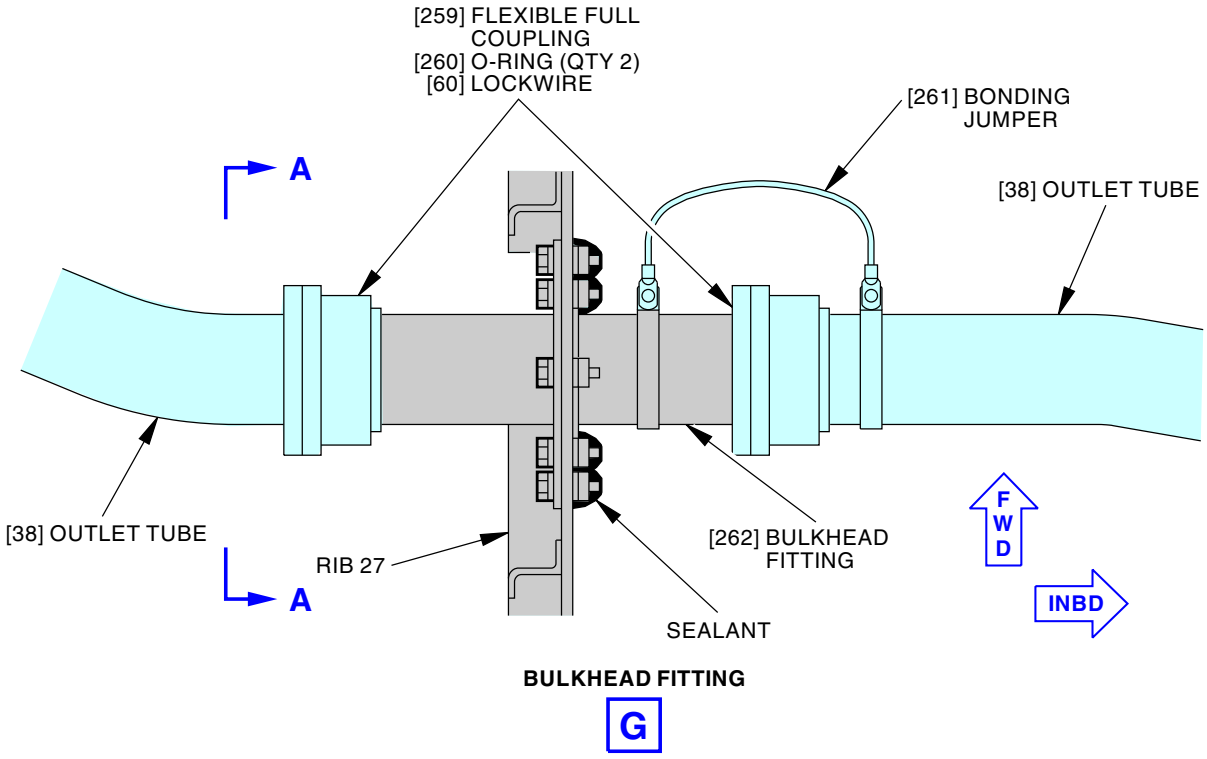
Outboard Main Tank Refuel Valve Tubes Installation
Figure 405/28-21-08-990-819 (Sheet 4 of 6)

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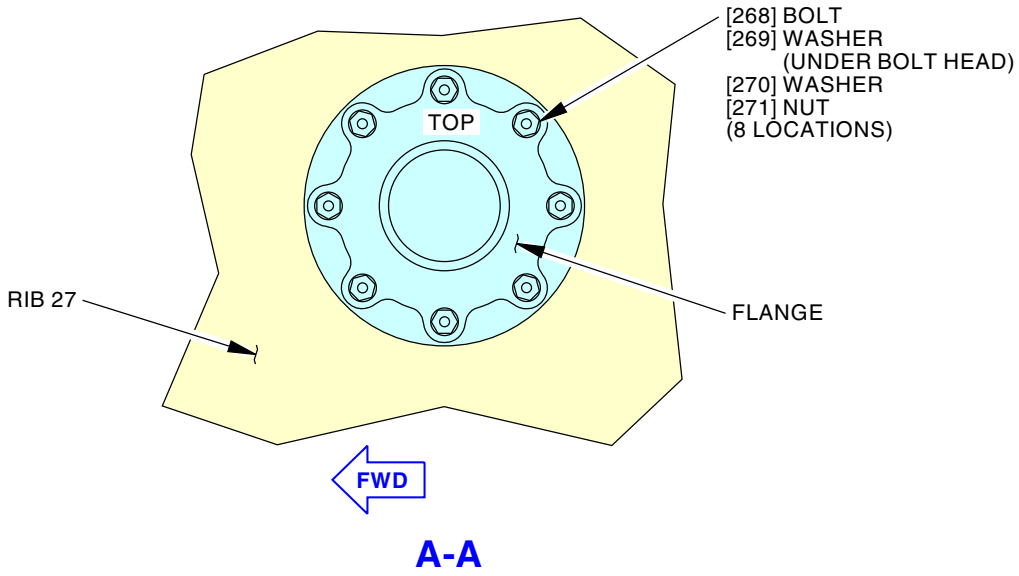
Outboard Main Tank Refuel Valve Tubes Installation
Figure 405/28-21-08-990-819 (Sheet 5 of 6)

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BULKHEAD FITTING

G



A-A

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Outboard Main Tank Refuel Valve Tubes Installation
Figure 405/28-21-08-990-819 (Sheet 6 of 6)

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TASK 28-21-08-400-806

11. Main Tank Outboard Refuel Valve Tubes Installation

(Figure 405)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
28-00-00-200-801	Inspection of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-00-00-960-801	Replacement of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-21-00-790-802	Refuel/Jettison and Fuel Feed Manifold - Leak Test (P/B 501)
28-21-05-400-802	Outboard Refueling Manifold Drain Valve - Installation (P/B 401)
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
A50110	Sealant	BMS5-45 Class B-2
A50153	Sealant - Fuel Tank - Class A-2	BMS5-45 Class A-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50301	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168 Type I Class A-2
A50302	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168 Type I Class B-2
A50303	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
89	O-ring	28-21-08-01A-010	ARO ALL

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(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
232	O-ring	28-21-51-15D-155	ARO ALL
234	O-ring	28-21-51-15D-180	ARO ALL
236	O-ring	28-21-51-15D-165	ARO ALL
252	O-ring	28-21-51-15D-180	ARO ALL
254	O-ring	28-21-05-01-310	ARO ALL
256	O-ring	28-31-51-02E-125	ARO ALL
260	O-ring	28-31-51-02E-125	ARO ALL
266	O-ring	28-31-51-02E-115	ARO ALL

E. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

F. Access Panels

Number	Name/Location
541GB	Access Door
541HB	Access Door
541JB	Access Door
541KB	Access Door
541LB	Access Door
541MB	Access Door
541NB	Access Door
641GB	Access Door
641HB	Access Door
641JB	Access Door
641KB	Access Door
641LB	Access Door
641MB	Access Door
641NB	Access Door

G. General

SUBTASK 28-21-08-420-028

(1) This task has the procedure to install the main tank outboard refuel valve tubes.

(2) For applying sealants in the fuel tank structure(s), it is acceptable to use sealant, A50303, as an alternative to sealant, A00767, for Class A and B non-faying seal applications:

(a) sealant, A50153, and sealant, A50301, are mutually interchangeable.

(b) sealant, A50110, and sealant, A50302, are mutually interchangeable.

(c) sealant, A50153, cannot be used in combination with sealant, A50302, and sealant, A50301, cannot be used with sealant, A50110.

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H. Prepare for the Procedure

SUBTASK 28-21-08-010-016

WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(1) Do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801

(2) Go into the fuel tank.

I. Main Tank Outboard Refuel Valve Tubes Installation

SUBTASK 28-21-08-212-005

(1) Do this task to do a check of the bonding jumpers: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(a) Replace the bonding jumpers as necessary (TASK 28-00-00-960-801).

SUBTASK 28-21-08-420-029

(2) Install the manifold vacuum relief valve [120] with a new o-ring [89] on the inlet tube [34].

(a) Install MS20995C32 lockwire, G01048, on the valve.

SUBTASK 28-21-08-420-050

(3) Do this task to install the refuel manifold drain valve [253] with a new o-ring [254] on the outlet tube [38]: Outboard Refueling Manifold Drain Valve - Installation, TASK 28-21-05-400-802.

SUBTASK 28-21-08-420-051

(4) To install the outlet tube [38] for the outboard refuel valves in the main fuel tanks, do these steps (TASK 28-21-08-400-803):

(a) Do these steps to install the bent part of the outlet tube [38] between rib 24 and rib 25:

1) Put the bent part of the outlet tube [38] in its position.

2) Install the flexible half coupling [250] with a new o-ring [249] to connect the outlet tube [38] to the refuel valve.

3) Install the rigid coupling [251] with a new o-ring [252] to connect the bent and outboard parts of the outlet tube [38].

4) Install the two U-clamps [240] to attach the outlet tube [38] to the airplane structure.

5) Install the bonding jumper [239] and the bonding jumper [248] on the outlet tube [38], near rib 25.

(b) Do these steps to install the outboard part of the outlet tube [38]:

1) Install the flexible full coupling [255] with a new o-ring [256].

2) Install the U-clamp [258] on the inboard side of rib 26.

3) Install the bonding jumper [257].

4) Do these steps to install the bulkhead fitting [262] and the adjacent components:

a) Apply a faying surface seal with sealant, A50110, or sealant, A50155, to the inboard side of the flange of the bulkhead fitting [262].

NOTE: Alternative sealants are not acceptable for faying surface seals.

b) Install the bulkhead fitting [262] through rib 27 from the outboard side.

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c) Apply a faying surface seal with sealant, A50110, or sealant, A50155, to these surfaces before you install the fasteners:

NOTE: Alternative sealants are not acceptable for faying surface seals.

<1> The surface of the bulkhead fitting [262], where the eight fasteners will be installed (and the surfaces of the eight washers [269] that you will install on there).

<2> The surface of the rib, where the eight fasteners will be installed (and the surfaces of the eight washers [270] that you will install there).

d) Install the eight bolts [268], washers [269], washers [270], and nuts [271].

e) Apply a fillet seal with sealant, A50110, or sealant, A50155, to these locations (on both sides of the rib):

NOTE: Use the same sealant that was used for the faying surface seal.

<1> Around the edge of the flange of the bulkhead fitting [262] and the rib.

<2> Around the eight fasteners.

f) Fully seal the eight fasteners with sealant, A50110, or sealant, A50155.

NOTE: Use the same sealant that was used for the faying surface seal.

g) Install the two flexible full couplings [259] with new o-rings [260] to connect the bulkhead fitting [262] to the outlet tube [38].

h) Install the bonding jumper [261].

5) Install the rigid coupling [265] with a new o-ring [266] to connect the last part of the outlet tube [38].

6) Install the two U-clamps [263], outboard of rib 28 and rib 29.

7) Install the bonding jumper [267] across the rigid coupling [265].

8) Install the two bonding jumpers [264].

SUBTASK 28-21-08-420-052

(5) Do these steps to do an electrical bonding check of the components of the outlet tube [38]:

(a) Do a check of the bonding resistance across the seven bonding jumpers with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

1) For each of the seven bonding jumpers, make sure the bonding resistance is 0.001 ohm (1 milliohm) or less.

(b) Measure the bonding resistance between the bulkhead fitting [262] and the airplane structure.

1) Make sure that the bonding resistance is 0.100 ohm (100 milliohms).

(c) For each of the five sections of the outlet tube [38] (between each coupling), measure the bonding resistance between the tube and the airplane structure (SWPM 20-20-00).

1) Make sure that the bonding resistance is 0.100 ohm (100 milliohms) or less.

SUBTASK 28-21-08-420-031

(6) To install the inlet tube [34] for the outboard refuel valves in the main fuel tanks, do these steps:

(a) Put the inlet tube [34] in its position.

(b) Do these steps to install the clamps, couplings, and bonding jumpers (TASK 28-21-08-400-803):

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1) Install the rigid coupling [235] with a new o-ring [234] to connect the two parts of the inlet tube [34].
2) Install the flexible half coupling [231] with a new o-ring [232] to connect the inlet tube [34] to the refuel valve.
3) Install the flexible full coupling [237] and the flexible full coupling [244] with new o-rings [236] to connect the inlet tube [34] to the fuel tube [109].
4) Install the U-clamp [238] and the U-clamp [241] to attach the inlet tube [34] to the airplane structure.
5) Install the bonding jumper [233] and the bonding jumper [247] on the part of the inlet tube [34] that connects to the refuel valve.
6) Install the bonding jumper [242] and the bonding jumper [243] on the inlet tube [34], near rib 24.

SUBTASK 28-21-08-760-007

(7) Do these steps to do an electrical bonding check of the components of the inlet tube [34] with an intrinsically safe approved bonding meter, COM-1550:
   (a) Do a check of the bonding resistance across the four bonding jumpers (SWPM 20-20-00).
      1) For each of the four bonding jumpers, make sure the bonding resistance is 0.001 ohm (1 milliohm) or less.
   (b) Measure the bonding resistance between the short part of the inlet tube [34] (near the refuel valve) and the airplane structure (SWPM 20-20-00).
      1) Make sure that the bonding resistance is 0.100 ohm (100 milliohms) or less.
   (c) Measure the bonding resistance between the longer part of the inlet tube [34] and the airplane structure.
      1) Make sure that the bonding resistance is 0.100 ohm (100 milliohms) or less.

J. Put the Airplane Back to Its Usual Condition

SUBTASK 28-21-08-410-010

(1) Go out of and close the applicable tanks TASK 28-11-00-410-801.
   (a) To install the applicable main tank access doors, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.
      1) Install the applicable access doors:

Number	Name/Location
541GB	Access Door
541HB	Access Door
541JB	Access Door
541KB	Access Door
541LB	Access Door
541MB	Access Door
541NB	Access Door
641GB	Access Door
641HB	Access Door
641JB	Access Door
641KB	Access Door
641LB	Access Door

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(Continued)

Number	Name/Location
641MB	Access Door
641NB	Access Door

SUBTASK 28-21-08-790-005

(2) Do a leak test of the refuel manifold (TASK 28-21-00-790-802).

SUBTASK 28-21-08-650-017

(3) To refuel the fuel tanks (if no more work is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

——— END OF TASK ———

TASK 28-21-08-000-807

12. Refuel Tubing Removal

Figure 406

A. References

Reference	Title
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-22-15-700-802-001	Fuel Tube Damage Criteria - Inspection/Check (P/B 601)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

C. General

SUBTASK 28-21-08-020-037

(1) This task provides the procedure to remove the refuel tubing.

D. Prepare for the Procedure

SUBTASK 28-21-08-650-018

(1) To defuel all of the fuel tanks, do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-21-08-860-009

WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

SUBTASK 28-21-08-010-018

(3) Get access to the section of refuel tubing, find the applicable access panel.

(a) To remove the applicable main tank access door, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801

SUBTASK 28-21-08-010-019

(4) Go into the fuel tank.

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E. Refuel Tubing Removal

SUBTASK 28-21-08-020-038

(1) To remove any short segment fuel tube [106], do these steps:

NOTE: These short segment fuel tubes are installed with U-clamps at each rib. These tubes are ground with bonding clamps and bonding jumpers at the coupling ends, either to the next tube segment or a ground stud.

(a) Remove the bonding jumpers [27], [35], and bonding clamps [6], [18].

(b) Remove the lockwire [60] from each coupling.

(c) Loosen the coupling nuts.

(d) Remove the U-clamps [6], [37] to remove the tube segment.

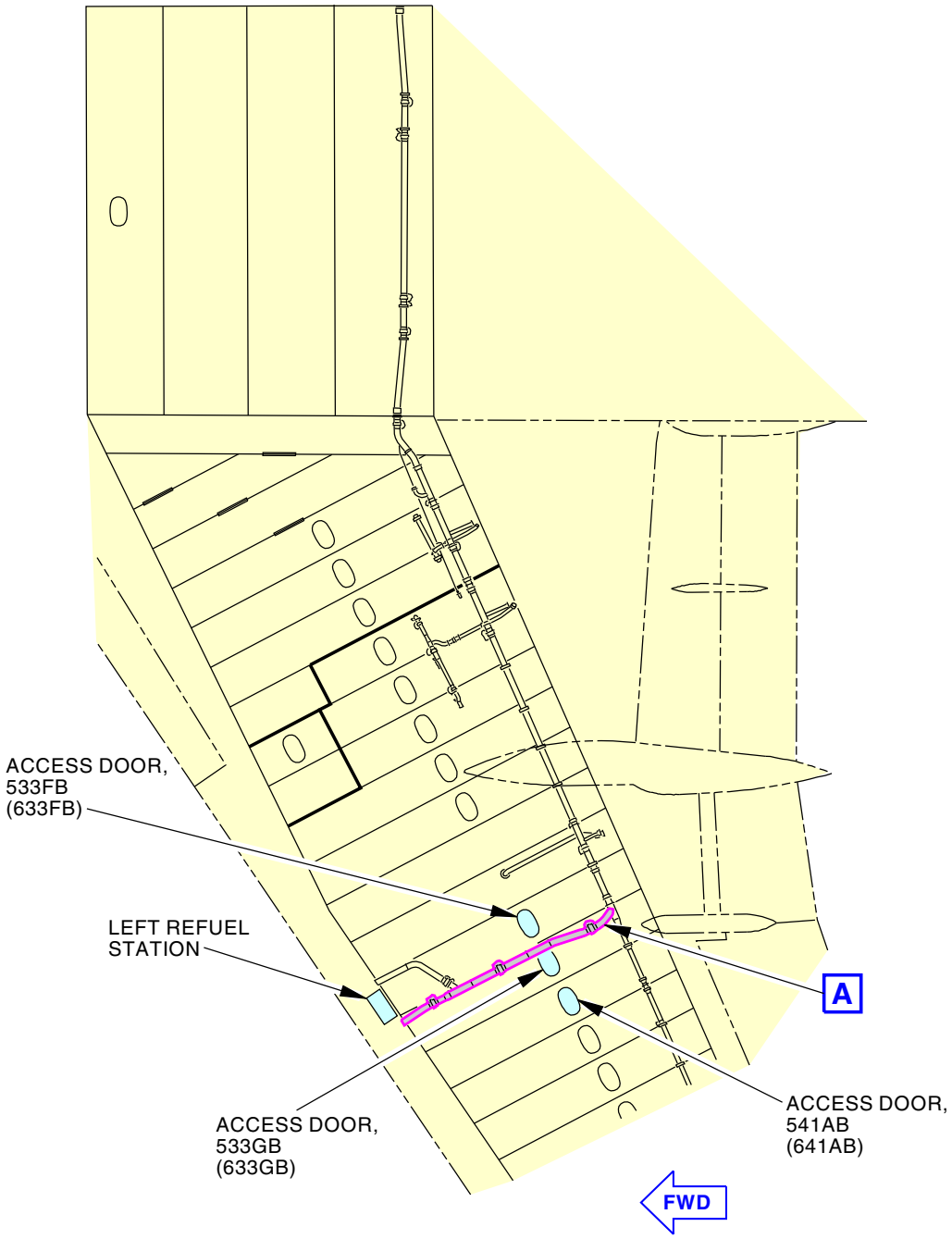
(e) Examine the retaining rings and coupling nuts for wear Fuel Tube Damage Criteria - Inspection/Check, TASK 28-22-15-700-802-001

1) Replace these components if it is necessary.

2) Discard the O-rings from the coupling nuts.

——— END OF TASK ———

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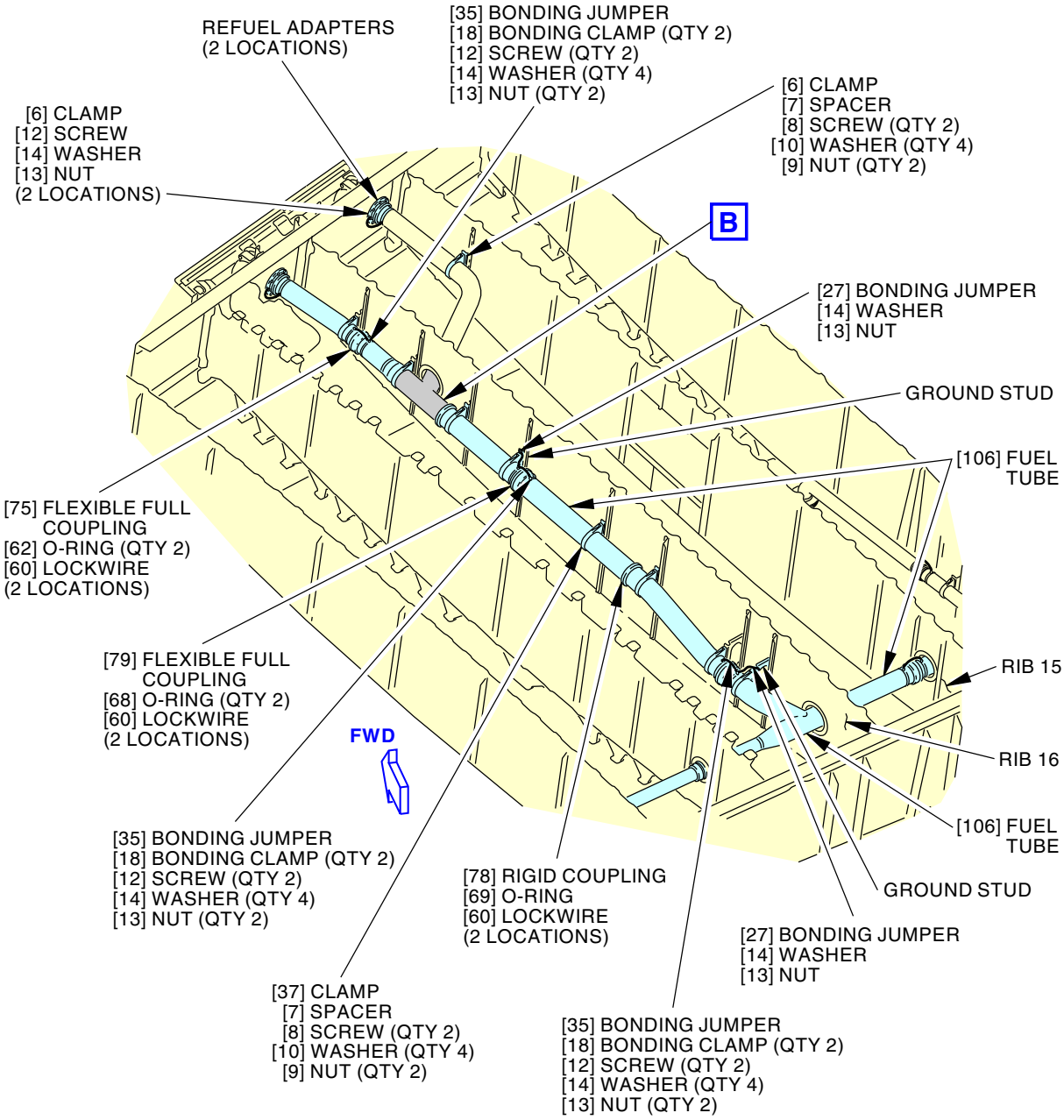


LEFT WING
(TOP VIEW)
(RIGHT WING IS EQUIVALENT)

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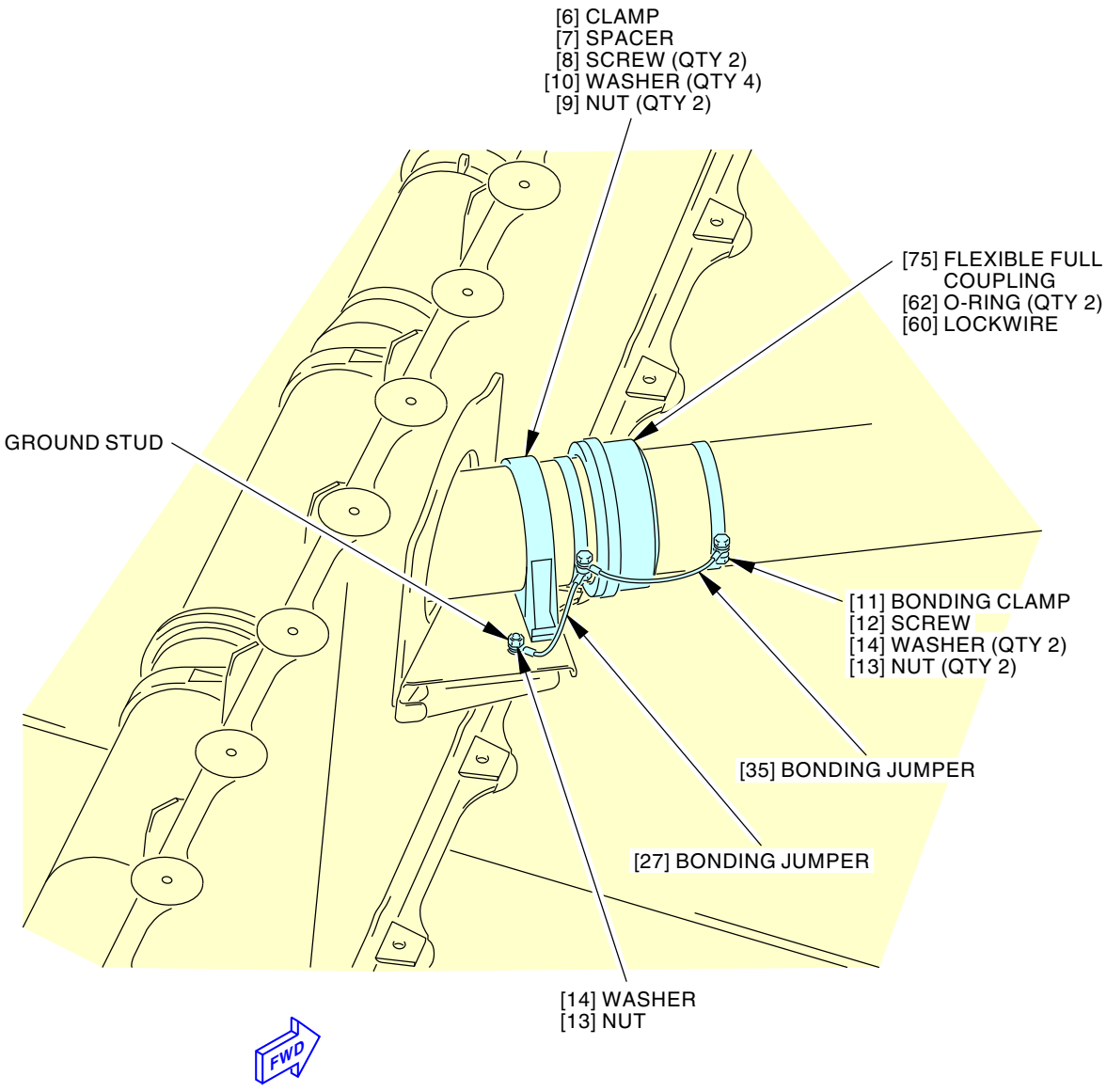
Refuel Tubing Installation
Figure 406/28-21-08-990-807 (Sheet 1 of 3)

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Refuel Tubing Installation
Figure 406/28-21-08-990-807 (Sheet 2 of 3)

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Refuel Tubing Installation
Figure 406/28-21-08-990-807 (Sheet 3 of 3)

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TASK 28-21-08-400-807

13. Refuel Tubing Installation

Figure 406

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
28-11-00-160-801	Examine and Close the Fuel Tank (P/B 701)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-21-00-790-802	Refuel/Jettison and Fuel Feed Manifold - Leak Test (P/B 501)

B. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

C. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

D. General

SUBTASK 28-21-08-420-033

(1) This task provides the procedure to install the refuel tubing.

E. Prepare for the Procedure

SUBTASK 28-21-08-860-008

WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(1) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801

SUBTASK 28-21-08-010-021

(2) Go into the fuel tank.

F. Refuel Tube Installation

SUBTASK 28-21-08-420-034

(1) To install any refuel tube [106], do these steps:

NOTE: These short segment fuel tubes are installed with U-clamps at each rib. These tubes are grounded with bonding clamps and bonding jumpers at the coupling ends, either to the next tube segment or a ground stud.

(a) Put the coupling nuts on the ferrule of the fuel tubes.

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CAUTION DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

(b) Put a retaining ring on each ferrule to hold the coupling nuts on the fuel tubes.

(c) Apply a thin layer of grease, D00504, to the new O-rings.

CAUTION DO NOT USE THE SAME O-RING FOR THE FUEL LINE FITTINGS AFTER YOU TIGHTEN THE COUPLING ONE TIME. YOU MUST INSTALL NEW O-RINGS TO PREVENT FUEL LEAKS.

(d) Install the O-rings on the fuel tubes.

CAUTION DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

(e) Put the second retaining ring on each ferrule of the fuel tubes.

(f) Make sure the two fuel tubes align to the body of the bulkhead fitting or the next fuel tube segment.

CAUTION DO NOT USE TOOLS TO TIGHTEN THE FITTINGS. DAMAGE TO THE FITTING COMPONENTS COULD OCCUR. THE ADJACENT FITTINGS COULD BECOME LOOSE.

(g) Manually tighten the coupling nuts to connect fuel tubes.

(h) Install the MS20995C32 lockwire, G01048 to the coupling nuts Lockwire, Cotter Pins, and Lockrings - Installation, TASK 20-10-23-400-801

(i) Install U-clamps [6], [37] to install the tube segment.

(j) Install the bonding clamps [6], [18] and bonding jumpers [27], [35].

G. Put The Airplane Back to Its Usual Condition

SUBTASK 28-21-08-410-011

(1) Go out of and close the applicable fuel tanks (Examine and Close the Fuel Tank, TASK 28-11-00-160-801).

(a) Close the applicable access panel.

1) To install the applicable main tank access door, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801

SUBTASK 28-21-08-790-006

(2) Do a leak test of the refuel manifold Refuel/Jettison and Fuel Feed Manifold - Leak Test, TASK 28-21-00-790-802

SUBTASK 28-21-08-650-019

(3) To refuel the fuel tanks (if no more work is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

END OF TASK

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TASK 28-21-08-000-817

14. Surge Tank Tube Removal

(Figure 407)

A. References

Reference	Title
28-00-00-200-801	Inspection of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-11-03-000-801	Surge Tank Access Door - Removal (P/B 401)
28-22-15-700-802-001	Fuel Tube Damage Criteria - Inspection/Check (P/B 601)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)

B. Location Zones

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
561	Rear Spar to Trailing Edge - Outboard of Flaperon - Left Wing
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182
661	Rear Spar to Trailing Edge - Outboard of Flaperon - Right Wing

C. Access Panels

Number	Name/Location
543CB	Access Door
543DB	Pressure Relief Door
561JB	Lower Fuel Jettison Support Panel
561JT	Upper Fuel Jettison Support Panel
643CB	Access Door
643DB	Pressure Relief Door
661JB	Lower Jettison Support Panel
661JT	Upper Fuel Jettison Support Panel

D. General

SUBTASK 28-21-08-020-050

(1) This task provides the procedure to remove these items:

(a) Surge Tank Tube

(b) Rib 37 Bulkhead Fitting

(c) Jettison Tube Bulkhead Fitting (rear spar)

(2) This task has removal steps for the two bulkhead fittings. If you only need to remove the fuel tube elbow, these steps are not necessary. If you need to remove the fuel tube elbow and one bulkhead fitting, the steps to remove the other bulkhead fitting are not necessary.

E. Prepare for the Procedure

SUBTASK 28-21-08-650-028

(1) Do one of these tasks to defuel the applicable main fuel tank:

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(a) Pressure Defueling, TASK 28-26-00-650-801

(b) Tank to Tank Transfer, TASK 28-26-00-650-802

WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-21-08-860-016

(3) Open these circuit breakers and install safety tags:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL
L	24	C28631	L FUEL JETT ISLN VLV

Right Power Management Panel, P210

Row	Col	Number	Name
K	13	C28630	R JETT ISLN VLV
K	14	C28646	R FUEL JETT PUMP CTRL

(4) For the left fuel jettison tube,

Open this circuit breaker and install safety tag:

Left Power Management Panel, P110

Row	Col	Number	Name
L	25	C28621	L FUEL JETT NOZ VLV

(5) For the right fuel jettison tube,

Open this circuit breaker and install safety tag:

Right Power Management Panel, P210

Row	Col	Number	Name
K	12	C28620	R FUEL JETT NOZ VLV

SUBTASK 28-21-08-010-039

(6) Open the applicable fuel tanks:

(a) For the main fuel tank (TASK 28-11-01-000-801),

Open the applicable access panel:

Number	Name/Location
543CB	Access Door
643CB	Access Door

(b) For the surge tank (Surge Tank Access Door - Removal, TASK 28-11-03-000-801),

Open the applicable access panel:

Number	Name/Location
543DB	Pressure Relief Door
643DB	Pressure Relief Door

(c) For access to the jettison tube bulkhead fitting,

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Open the applicable access panels:

Number	Name/Location
561JB	Lower Fuel Jettison Support Panel
561JT	Upper Fuel Jettison Support Panel
661JB	Lower Jettison Support Panel
661JT	Upper Fuel Jettison Support Panel

1) To remove the upper panel [158], remove 36 bolts [191] and two bonding fasteners [192].
2) Do these steps to remove the lower panel [159]:
   a) Remove 58 bolts [191] and two bonding fasteners [192] in the flat area of the panel.
   b) Remove 11 bolts [191] and two bonding fasteners [192] in the tube fairing area of the panel.

SUBTASK 28-21-08-010-040

(7) Go into the fuel tank.

F. Surge Tank Tube Removal

SUBTASK 28-21-08-020-051

(1) Do these steps to remove the fuel tube elbow [202]:
   (a) Remove the bonding jumper from the bonding clamp (TASK 28-21-08-000-803).
      1) Do a check of the bonding jumper (TASK 28-00-00-200-801).
         a) Replace the bonding jumper if it is necessary.
   (b) Remove the U-clamp (TASK 28-21-08-000-803).
   (c) Loosen the coupling nuts [204] to remove the fuel tube elbow [202] from the bulkhead fitting [201] and the bulkhead fitting [203].
      1) Examine the coupling nuts [204] and retaining rings [205] for wear (TASK 28-22-15-700-802-001).
         a) Replace these components if it is necessary.
         b) Discard the o-rings [211] from the coupling nuts [204].

G. Rib 37 Bulkhead Fitting Removal

SUBTASK 28-21-08-020-052

(1) Do these steps to remove the fuel tube [108] between rib 36 and rib 37:
   (a) Remove the bonding jumper from the bonding clamp nearest the rib 37 bulkhead fitting [203] (TASK 28-21-08-000-803).
      1) Do a check of the bonding jumper (TASK 28-00-00-200-801).
         a) Replace the bonding jumper if it is necessary.
   (b) Loosen the flexible full coupling to disconnect the fuel tube [108] (TASK 28-21-08-000-803).
      1) Discard the o-rings [213].
   (c) Remove the lockwire from the coupling nut [204] and the bulkhead fitting [203].
   (d) Loosen the coupling nut [204] to remove the fuel tube [108] from the bulkhead fitting [203].

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1) Examine the coupling nut [204] and the retaining rings [205] for wear (TASK 28-22-15-700-802-001).
   a) Replace these components if it is necessary.
   b) Discard the o-ring [211] from the coupling nut [204].

(2) Do these steps to remove the bulkhead fitting [203]:
   (a) Remove the sealant from the two sides of the bulkhead fitting [203].
   (b) Loosen and remove the jamnut [210] and the washer [209].
   (c) Remove the body [207] from rib 37.
      1) Discard the o-ring [208].

H. Jettison Tube Bulkhead Fitting Removal

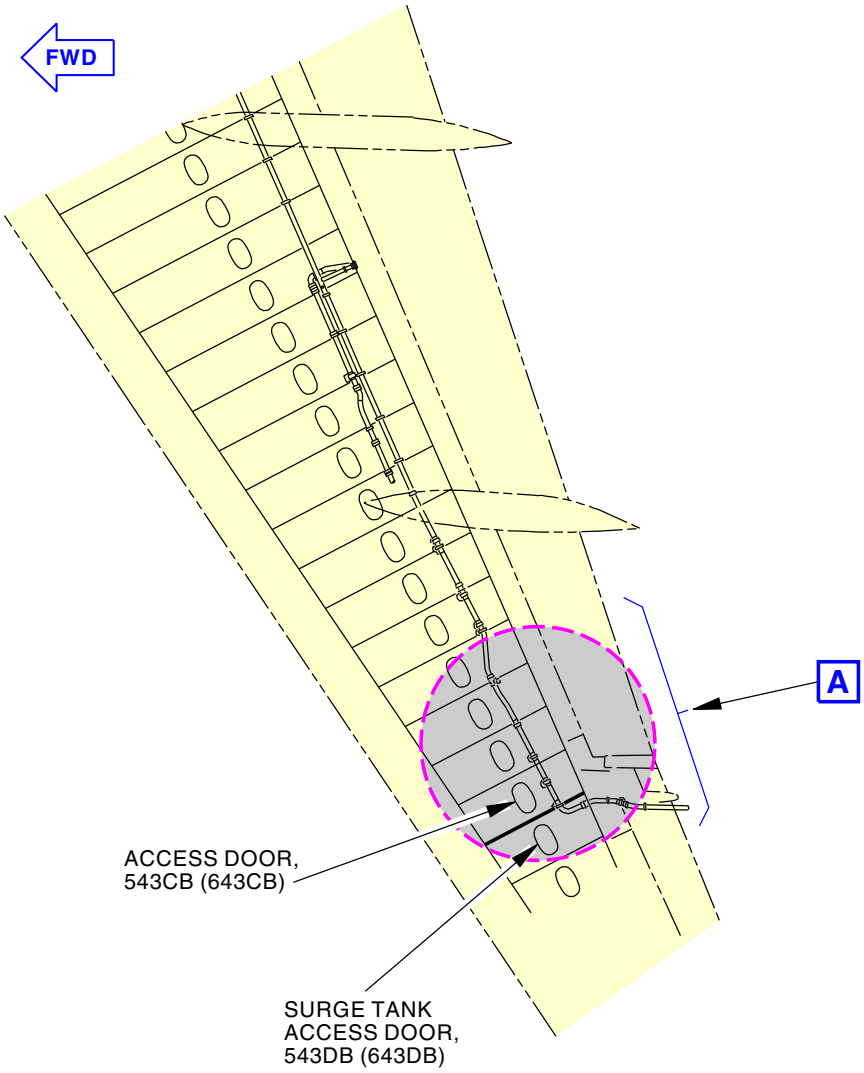
SUBTASK 28-21-08-020-053

(1) Do these steps to remove the fuel tube [108], aft of the rear spar:
   (a) Remove the bonding jumper from the bonding clamp nearest the jettison tube bulkhead fitting [201] (TASK 28-21-08-000-803).
      1) Do a check of the bonding jumper (TASK 28-00-00-200-801).
         a) Replace the bonding jumper if it is necessary.
   (b) Remove the U-clamp (TASK 28-21-08-000-803).
   (c) Loosen the flexible full coupling to disconnect the fuel tube [108] (TASK 28-21-08-000-803).
      1) Discard the o-rings [212].
   (d) Remove the lockwire from the coupling nut [204] and the bulkhead fitting [201].
   (e) Loosen the coupling nut [204] to remove the fuel tube [108] from the bulkhead fitting [201].
      1) Examine the coupling nut [204] and the retaining rings [205] for wear (TASK 28-22-15-700-802-001).
         a) Replace the components if it is necessary.
         b) Discard the o-ring [211] from the coupling nut [204].

(2) Do these steps to remove the bulkhead fitting [201]:
   (a) Remove the sealant from the two sides of the bulkhead fitting [201].
   (b) Loosen and remove the jamnut [210] and the washer [209].
   (c) Remove the body [207] from the rear spar.
      1) Discard the o-ring [208].

——— END OF TASK ———

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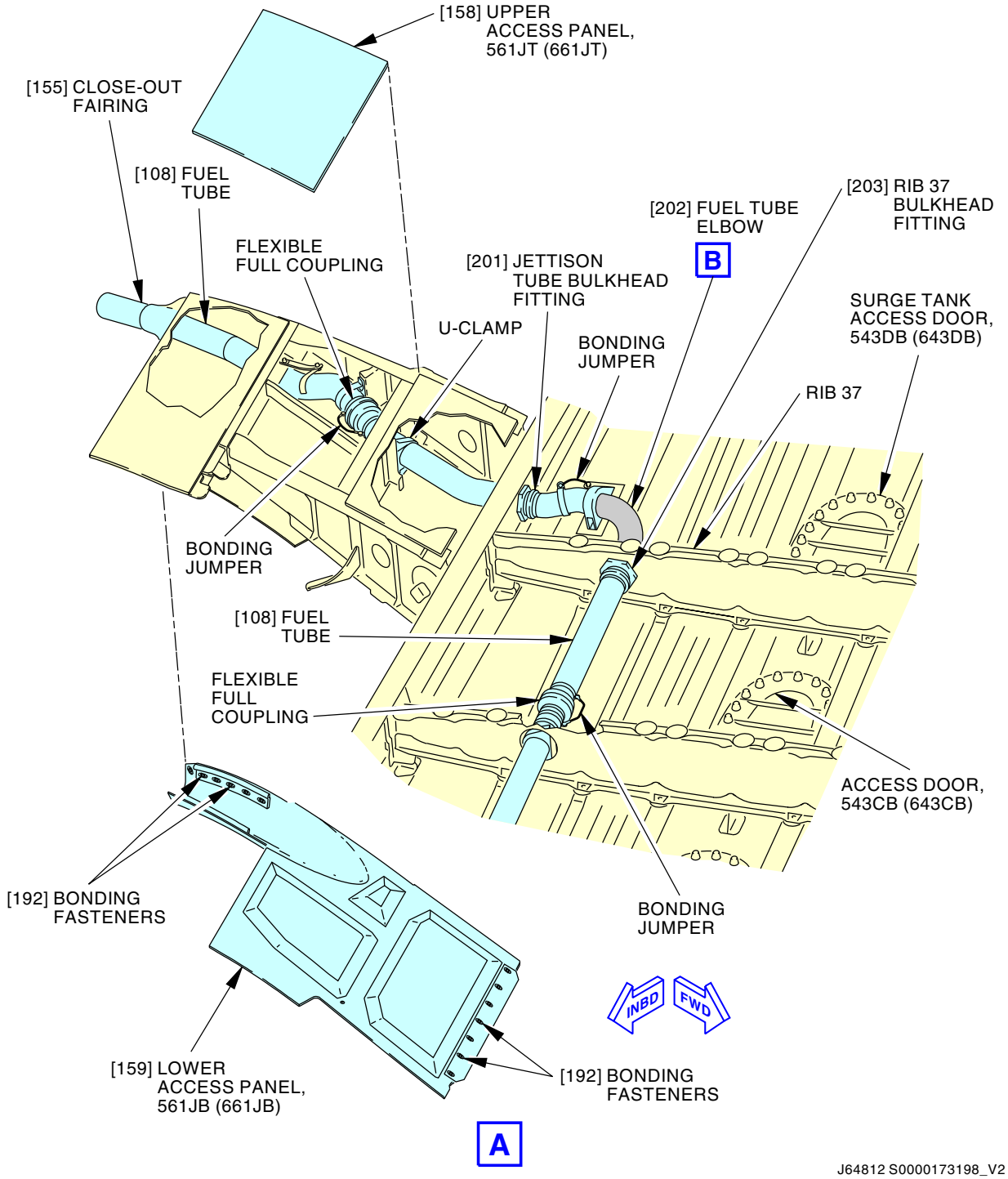


LEFT WING
(TOP VIEW)
(RIGHT WING IS ALMOST THE SAME)

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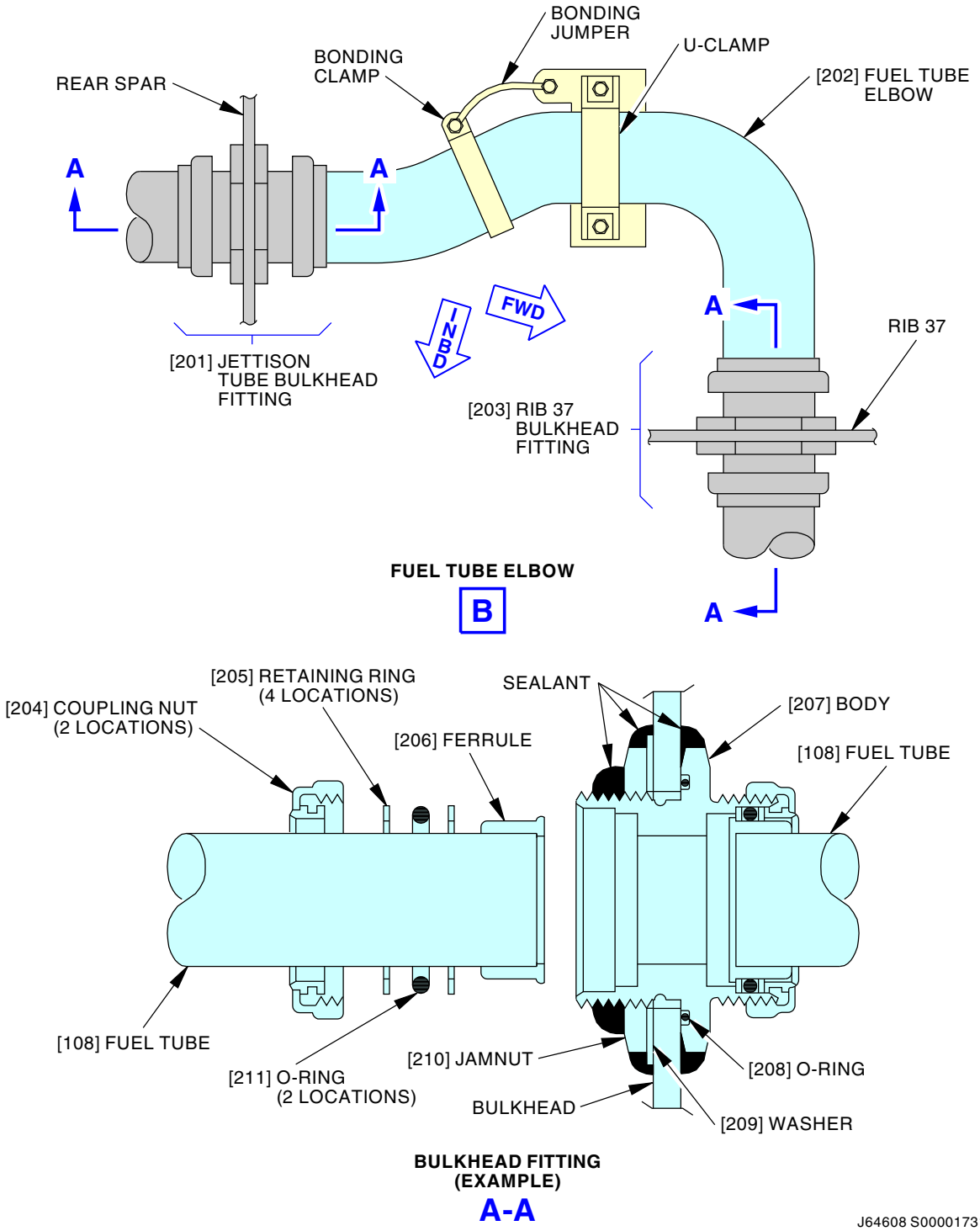
Surge Tank Tube Installation
Figure 407/28-21-08-990-818 (Sheet 1 of 3)

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Surge Tank Tube Installation
Figure 407/28-21-08-990-818 (Sheet 2 of 3)

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Surge Tank Tube Installation
Figure 407/28-21-08-990-818 (Sheet 3 of 3)

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TASK 28-21-08-400-817

15. Surge Tank Tube Installation

(Figure 407)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
28-00-00-200-801	Inspection of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-00-00-960-801	Replacement of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-11-03-400-801	Surge Tank Access Door - Installation (P/B 401)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142 Type II
A50110	Sealant	BMS5-45 Class B-2
A50153	Sealant - Fuel Tank - Class A-2	BMS5-45 Class A-2
A50301	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168 Type I Class A-2
A50302	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168 Type I Class B-2
A50303	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168
C00528	Compound - Corrosion Preventive, Petroleum Hot Application (Soft Film)	MIL-C-11796 Class III

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
208	O-ring	28-31-51-03A-150	ARO ALL

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(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
211	O-ring	28-31-51-03A-145	ARO ALL
212	O-ring	28-31-51-03A-075	ARO ALL
213	O-ring	28-31-51-04-155	ARO ALL

E. Location Zones

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
561	Rear Spar to Trailing Edge - Outboard of Flaperon - Left Wing
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182
661	Rear Spar to Trailing Edge - Outboard of Flaperon - Right Wing

F. Access Panels

Number	Name/Location
543CB	Access Door
543DB	Pressure Relief Door
561JB	Lower Fuel Jettison Support Panel
561JT	Upper Fuel Jettison Support Panel
643CB	Access Door
643DB	Pressure Relief Door
661JB	Lower Jettison Support Panel
661JT	Upper Fuel Jettison Support Panel

G. General

SUBTASK 28-21-08-420-044

(1) This task has the procedure to install the fuel jettison tube elbow, found in the surge tank. The task has three parts:

(a) Jettison Tube Bulkhead Fitting Installation

(b) Rib 37 Bulkhead Fitting Installation

(c) Surge Tank Tube Installation

(2) This task has installation steps for the two bulkhead fittings. If you only removed the fuel tube elbow, these steps are not necessary. If you removed the fuel tube elbow and one bulkhead fitting, the steps to install the other bulkhead fitting are not necessary.

(3) For applying sealants in the fuel tank structure(s), it is acceptable to use sealant, A50303, as an alternative to sealant, A00767, for Class A and B non-faying seal applications:

(a) sealant, A50153, and sealant, A50301, are mutually interchangeable.

(b) sealant, A50110, and sealant, A50302, are mutually interchangeable.

(c) sealant, A50153, cannot be used in combination with sealant, A50302, and sealant, A50301, cannot be used with sealant, A50110.

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H. Prepare for the Procedure

SUBTASK 28-21-08-010-041

> **WARNING** DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(1) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

(2) Go into the fuel tank.

SUBTASK 28-21-08-210-004

(3) Do a check of the bonding jumpers (TASK 28-00-00-200-801).

(a) Replace the bonding jumpers, if it is necessary (TASK 28-00-00-960-801).

I. Jettison Tube Bulkhead Fitting Installation

SUBTASK 28-21-08-110-001

(1) Prepare a fay surface bond around the opening on the forward side of the rear spar (SWPM 20-20-00).

(a) Solvent-clean the bonding surface on the rear spar and the body [207] of the bulkhead fitting [201].

SUBTASK 28-21-08-420-045

(2) Do these steps to install the bulkhead fitting [201]:

(a) Install a new o-ring [208] on the body [207] of the bulkhead fitting [201].

(b) Install the body [207] through the hole in the rear spar, from the inside of the surge tank.

(c) Install the washer [209] around the threads of the body [207], on the aft side of the rear spar.

(d) Install the jamnut [210] over the washer [209], on the threads of the body [207].

1) Torque the jamnut [210] to 920 ±110 in-lb (104 ±12 N·m).

SUBTASK 28-21-08-420-046

(3) Do these steps to install the fuel tube [108], aft of the rear spar:

(a) Install the coupling nut [204], the two retaining rings [205], and a new o-ring [211] on the ferrule [206] of the fuel tube [108].

1) Tighten the coupling nut [204] to install the fuel tube [108] on the bulkhead fitting [201].

(b) Install new o-rings [212] on the flexible full coupling.

1) Install the flexible full coupling to connect the fuel tube [108] (TASK 28-21-08-400-803).

(c) Install the U-clamp (TASK 28-21-08-400-803).

(d) Install the bonding jumper across the flexible full coupling (TASK 28-21-08-400-803).

1) If you install the bonding clamp for this bonding clamp for this bonding jumper, do these steps:

a) Solvent-clean the fuel tube [108] and the bonding clamp at their mating surfaces.

b) After you install the bonding clamp, apply a fillet seal of sealant, A02315, around the two sides of the bonding clamp.

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SUBTASK 28-21-08-760-003

(4) Do these steps to do an electrical bonding check of the components:

(a) Measure the bonding resistance between the body [207] and the rear spar.

1) Make sure the bonding resistance is 0.001 ohm or less.

(b) Measure the bonding resistance across the flexible full coupling (SWPM 20-20-00).

1) Make sure the bonding resistance is 0.001 ohm (1 milliohm) or less.

(c) Measure the bonding resistance between the fuel tube [108] and the airplane structure with a intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

1) Make sure the bonding resistance is 0.100 ohm (100 milliohms) or less.

J. Rib 37 Bulkhead Fitting Installation

SUBTASK 28-21-08-420-047

(1) Do these steps to install the bulkhead fitting [203]:

(a) Install a new o-ring [208] on the body [207] of the bulkhead fitting [203].

(b) Install the body [207] through the hole in rib 37, from the inside of the surge tank.

(c) Install the washer [209] around the threads of the body [207], on the inboard side of rib 37.

(d) Install the jamnut [210] over the washer [209], on the threads of the body [207].

1) Torque the jamnut [210] to 920 ±110 in-lb (104 ±12 N·m).

SUBTASK 28-21-08-420-048

(2) Do these steps to install the fuel tube [108] between rib 36 and rib 37:

(a) Install the coupling nut [204], the two retaining rings [205], and a new o-ring [211] on the ferrule of the fuel tube [108].

1) Tighten the coupling nut [204] to install the fuel tube [108] on the bulkhead fitting [203].

(b) Install new o-rings [213] on the flexible full coupling.

1) Install the flexible full coupling to connect the fuel tube [108] (TASK 28-21-08-400-803).

(c) Install the bonding jumper across the flexible full coupling (TASK 28-21-08-400-803).

SUBTASK 28-21-08-760-004

(3) Do these steps to do an electrical bonding check of the components:

(a) Measure the bonding resistance across the flexible full coupling (SWPM 20-20-00).

1) Make sure the bonding resistance is 0.001 ohm (1 milliohm) or less.

(b) Measure the bonding resistance between the fuel tube [108] and the airplane structure with a intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

1) Make sure the bonding resistance is 0.100 ohm (100 milliohms) or less.

K. Surge Tank Tube Installation

SUBTASK 28-21-08-420-049

(1) Do these steps to install the fuel tube elbow [202]:

(a) Put the fuel tube elbow [202] in its position between the two bulkhead fittings.

(b) Install the coupling nut [204], two retaining rings [205], and a new o-ring [211] on the ferrule [206] at the two ends of the fuel tube elbow [202].

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1) Tighten the coupling nuts [204] to install the fuel tube elbow [202]on the bulkhead fitting [201] and the bulkhead fitting [203].

(c) Install the U-clamp (TASK 28-21-08-400-803).

(d) Install the bonding jumper from the bracket for the U-clamp to the bonding clamp (TASK 28-21-08-400-803).

SUBTASK 28-21-08-760-005

(2) Do these steps to do an electrical bonding check of the components:

(a) Measure the bonding resistance across the flexible full coupling (SWPM 20-20-00).

1) Make sure the bonding resistance is 0.001 ohm (1 milliohm) or less.

(b) Measure the bonding resistance between the fuel tube [108] and the airplane structure with a intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

1) Make sure the bonding resistance is 0.100 ohm (100 milliohms) or less.

SUBTASK 28-21-08-390-001

(3) If you installed the jettison tube bulkhead fitting [201] on the rear spar, do these steps:

(a) Apply an integral fuel tank fillet seal of sealant, A00767 (or equivalent), around this interface:

1) Between the body [207] and the forward side of the rear spar

(b) Apply a fillet seal of sealant, A02315, around these interfaces:

1) Between the jamnut [210] and the aft surface of the rear spar

2) Between the jamnut [210] and the threads of the body [207]

(c) Install the lockwire from the jamnut [210] to the coupling nut [204] on the aft side of the rear spar.

SUBTASK 28-21-08-390-002

(4) If you installed the rib 37 bulkhead fitting [203], do these steps:

(a) Apply an integral fuel tank fillet seal of sealant, A00767 (or equivalent), around these interfaces:

1) Between the body [207] and the outboard surface of rib 37

2) Between the jamnut [210] and the inboard surface of rib 37

3) Between the jamnut [210] and the threads of the body [207]

(b) Install the lockwire from the jamnut [210] to the coupling nut [204] on the inboard side of rib 37.

L. Put the Airplane Back to Its Usual Condition

SUBTASK 28-21-08-410-018

(1) Close the applicable fuel tanks:

(a) For the main fuel tank (TASK 28-11-01-400-801),

Close the applicable access panel:

Number	Name/Location
543CB	Access Door
643CB	Access Door

(b) For the surge tank (TASK 28-11-03-400-801),

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Close the applicable access panel:

Number	Name/Location
543DB	Pressure Relief Door
643DB	Pressure Relief Door

SUBTASK 28-21-08-410-019

(2) Close the applicable access panels:

Number	Name/Location
561JB	Lower Fuel Jettison Support Panel
561JT	Upper Fuel Jettison Support Panel
661JB	Lower Jettison Support Panel
661JT	Upper Fuel Jettison Support Panel

(a) To install theupper panel [158] and the lower panel [159], install the bolts [191] and bonding fasteners [192].

1) For the bolts [191], apply corrosion preventative compound, C00528, to the countersunk hole and bore in the panel and immediately install the bolt.

2) Install the bonding fasteners [192] through the close-out fairing [155] and the lower panel [159].

SUBTASK 28-21-08-860-017

(3) Remove the safety tags and close these circuit breakers:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL
L	24	C28631	L FUEL JETT ISLN VLV

Right Power Management Panel, P210

Row	Col	Number	Name
K	13	C28630	R JETT ISLN VLV
K	14	C28646	R FUEL JETT PUMP CTRL

(4) For the left fuel jettison tube,

Remove the safety tag and close this circuit breaker:

Left Power Management Panel, P110

Row	Col	Number	Name
L	25	C28621	L FUEL JETT NOZ VLV

(5) For the right fuel jettison tube,

Remove the safety tag and close this circuit breaker:

Right Power Management Panel, P210

Row	Col	Number	Name
K	12	C28620	R FUEL JETT NOZ VLV

SUBTASK 28-21-08-650-029

(6) If it is necessary, do one of these tasks to refuel the applicable main fuel tank:

(a) Pressure Refueling, TASK 12-11-01-650-801

(b) Tank to Tank Transfer, TASK 28-26-00-650-802.

END OF TASK

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TASK 28-21-08-000-809

16. Side of Body (SOB) Rib Bulkhead Fitting Removal

Figure 408

A. References

Reference	Title
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-22-15-700-802-001	Fuel Tube Damage Criteria - Inspection/Check (P/B 601)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

C. Access Panels

Number	Name/Location
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door
531AB	Access Door
631AB	Access Door

D. General

SUBTASK 28-21-08-020-041

(1) This task provides the procedure to remove the side of body (SOB) rib bulkhead fitting.

E. Prepare for the Procedure

SUBTASK 28-21-08-650-020

(1) To defuel all of the fuel tanks, do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-21-08-860-010

WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

SUBTASK 28-21-08-010-024

(3) Get access to the section of refuel tubing, find the applicable access panel.

(a) To remove the applicable center wing tank access door, do this task: Center Tank Access Door - Removal, TASK 28-11-02-000-801

Open the applicable access door:

Number	Name/Location
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door
531AB	Access Door

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(Continued)

Number	Name/Location
631AB	Access Door

SUBTASK 28-21-08-010-025

(4) Go into the fuel tank.

F. Side Of Body (SOB) Rib Bulkhead Fitting Removal

SUBTASK 28-21-08-020-042

(1) To remove side of body (SOB) rib bulkhead fitting (87), do these steps:

(a) Remove the bonding jumpers [35] and bonding clamps [11].

(b) Remove the lockwire [60] from each coupling [88].

(c) Remove the fuel manifold drain tube [91] and reducer [90].

(d) Loosen the coupling nuts [88] to remove the fuel tubes [103] and [112] on each side of the bulkhead fitting [87].

(e) Remove the sealant, the nut [85] and washer [86] to remove the bulkhead fitting [87] and O-ring [63] from the bulkhead.

1) Discard the O-ring [63] from the bulkhead fitting [87].

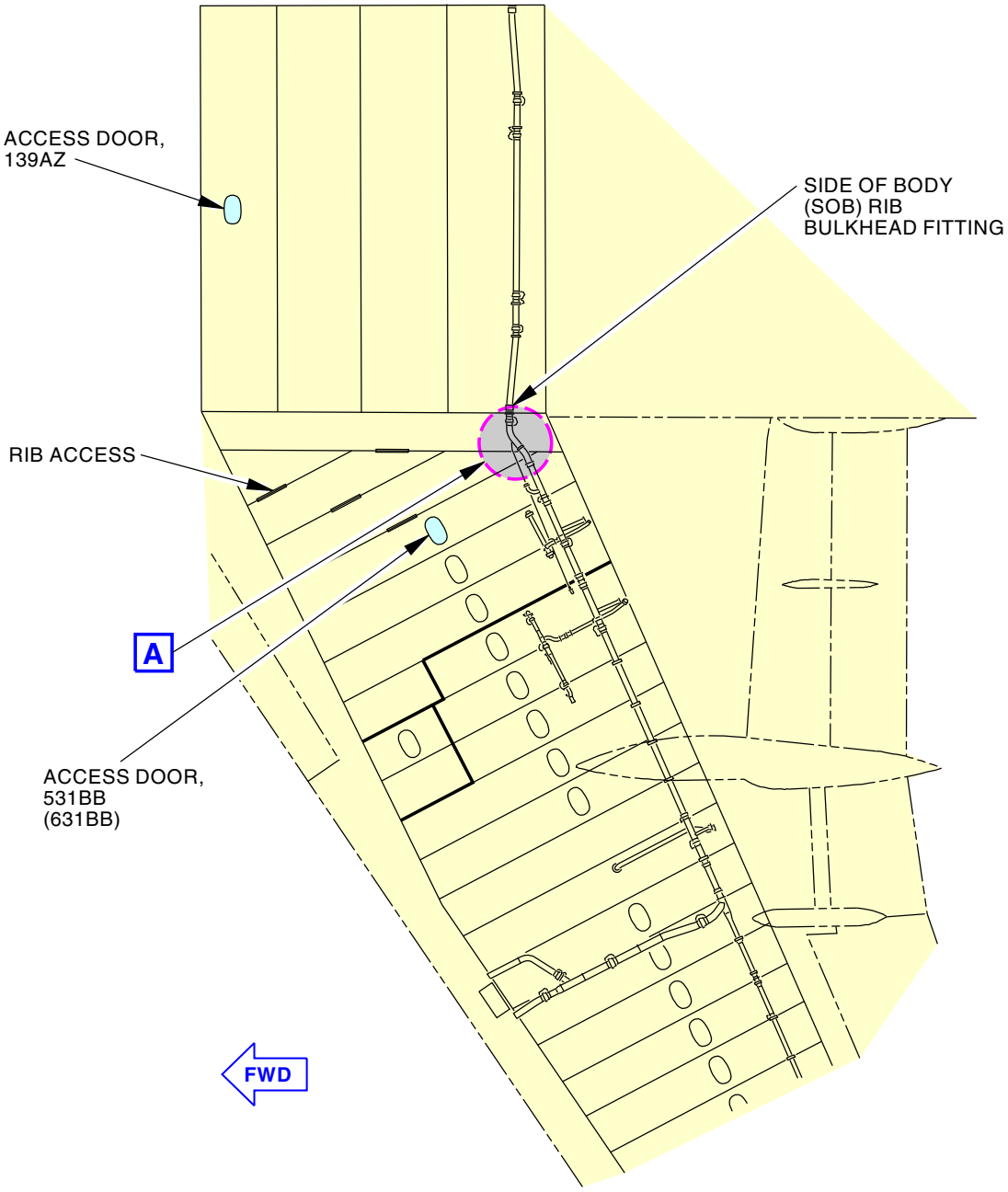
(f) Examine the retaining rings and coupling nuts for wear (Fuel Tube Damage Criteria - Inspection/Check, TASK 28-22-15-700-802-001).

1) Replace these components if it is necessary.

2) Discard the O-rings [62] from the coupling nuts.

END OF TASK

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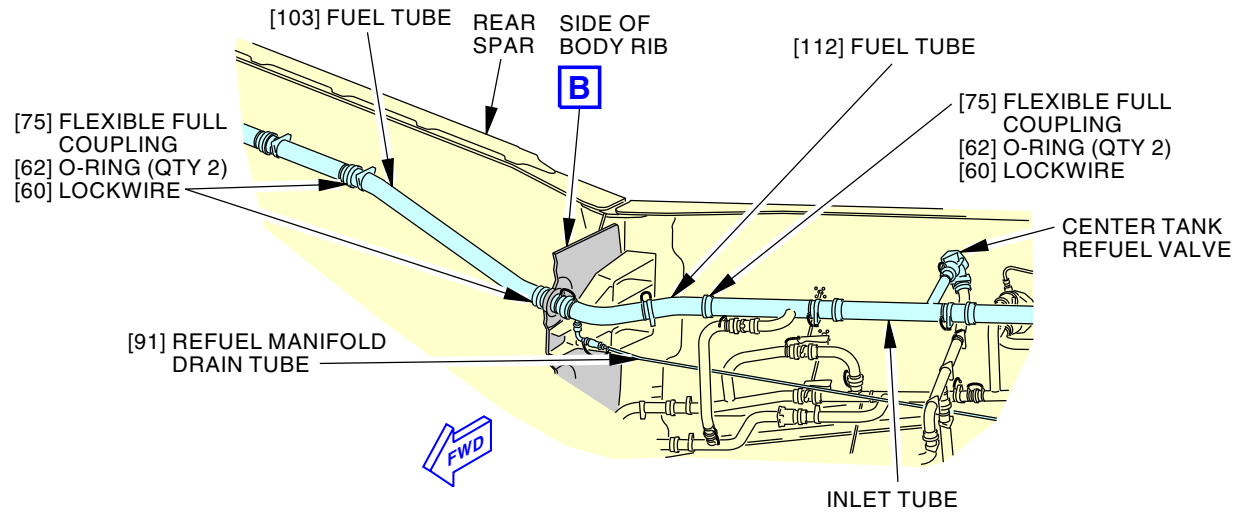


LEFT WING (TOP VIEW)
(RIGHT WING IS EQUIVALENT)

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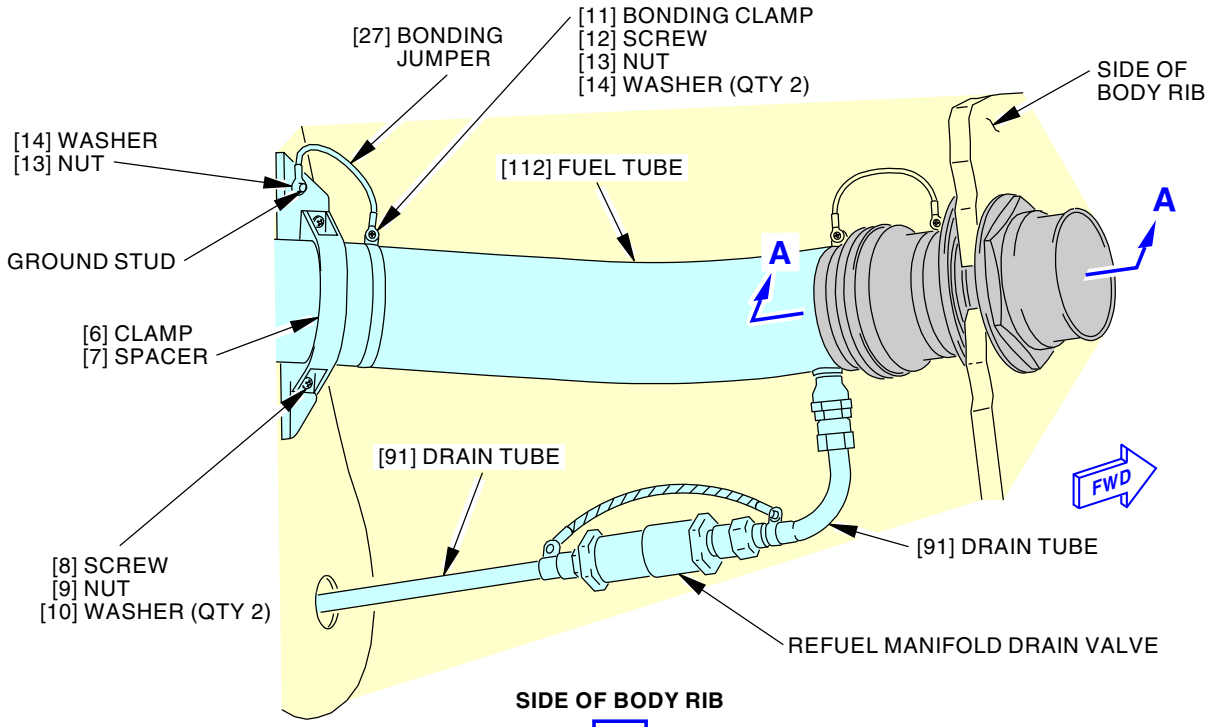
Side of Body (SOB) Rib Bulkhead Fitting Installation
Figure 408/28-21-08-990-809 (Sheet 1 of 3)

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CENTER TANK
(RIBS REMOVED FOR CLARITY)
(LEFT SIDE IS SHOWN, RIGHT SIDE IS EQUIVALENT)

A



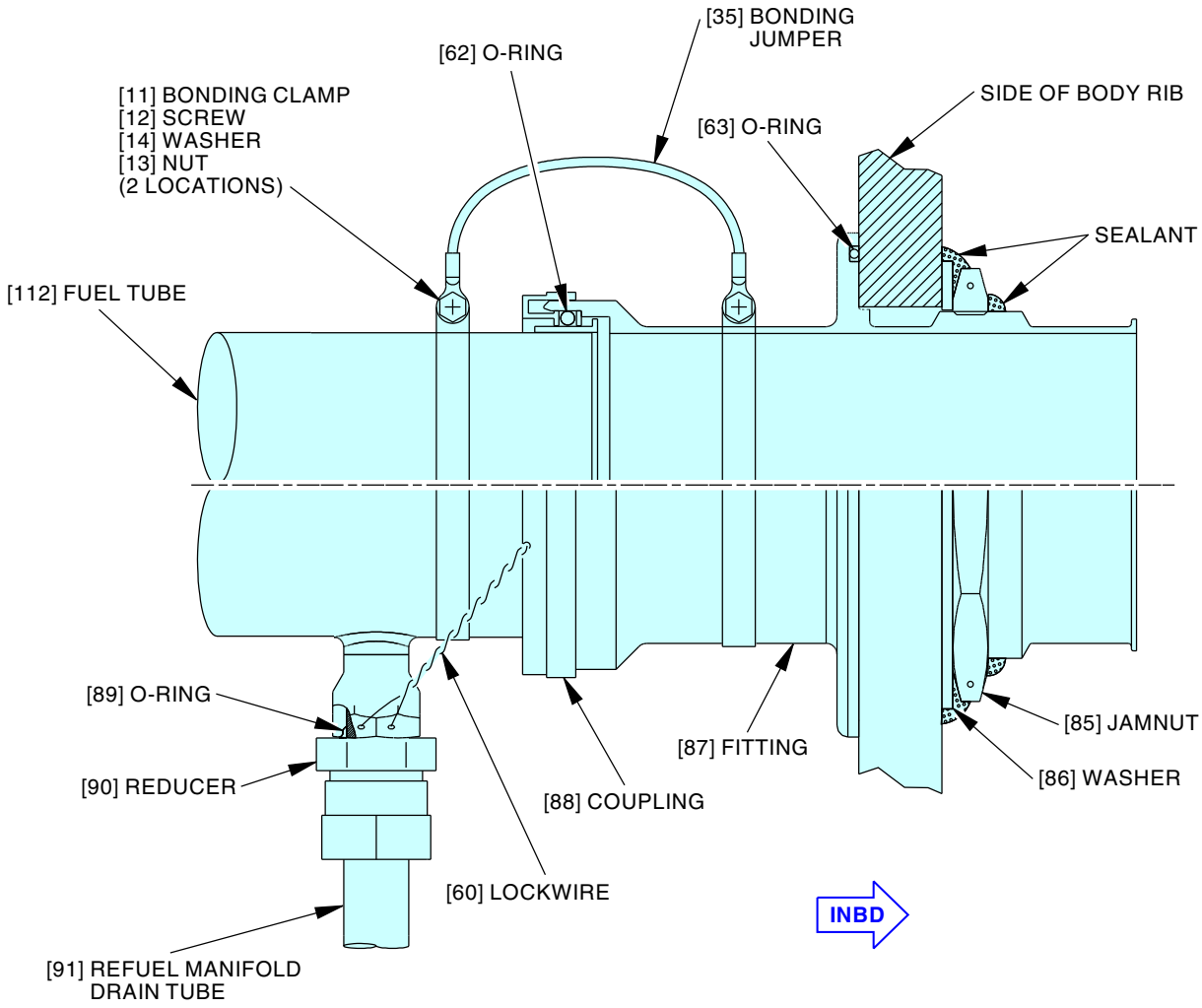
SIDE OF BODY RIB

B

W11597 S0000123007_V2

Side of Body (SOB) Rib Bulkhead Fitting Installation
Figure 408/28-21-08-990-809 (Sheet 2 of 3)

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LEFT SIDE OF BODY BULKHEAD FITTING
(RIGHT SIDE OF BODY BULKHEAD FITTING IS OPPOSITE)

A-A

W12214 S0000123008_V2

Side of Body (SOB) Rib Bulkhead Fitting Installation
Figure 408/28-21-08-990-809 (Sheet 3 of 3)

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TASK 28-21-08-400-809

17. Side of Body (SOB) Rib Bulkhead Fitting Installation

Figure 408

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
28-11-00-160-801	Examine and Close the Fuel Tank (P/B 701)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)
28-21-00-790-802	Refuel/Jettison and Fuel Feed Manifold - Leak Test (P/B 501)

B. Consumable Materials

Reference	Description	Specification
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142 Type II
D00504	Grease - Petrolatum	VV-P-236
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

C. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

D. Access Panels

Number	Name/Location
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door
531AB	Access Door
631AB	Access Door

E. General

SUBTASK 28-21-08-420-037

(1) This task provides the procedure to install the side of body (SOB) fitting.

F. Prepare for the Procedure

SUBTASK 28-21-08-010-026

WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(1) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-21-08-010-027

(2) Go into the fuel tank.

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G. Side of Body (SOB) Rib Bulkhead Fitting Installation

SUBTASK 28-21-08-420-038

(1) To install the side of body (SOB) rib bulkhead fitting [87], do these steps:

(a) Apply a thin layer of grease, D00504 to the new O-ring [63].

(b) Put the O-ring [63] on the fitting, and put the fitting [87] in its position in the bulkhead.

(c) Apply sealant, A02315 all around the first four threads of the fitting [87] that comes through the bulkhead.

(d) Install the washer [86] and nut [85] to the fitting in the bulkhead.

1) Tighten nut to 810-1030 pound-inches (91.5-116.4 newton-meters).

(e) Apply a fillet seal of sealant, A02315 between the nut and the bulkhead

(f) Put the coupling nuts [75], [88] on the ferrule of the fuel lines.

CAUTION DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

(g) Put a retaining ring on each ferrule to hold the coupling nuts on the fuel lines.

(h) Apply a thin layer of grease, D00504 to the new O-ring [62].

CAUTION DO NOT USE THE SAME O-RING FOR THE FUEL LINE FITTINGS AFTER YOU TIGHTEN THE COUPLING ONE TIME. YOU MUST INSTALL NEW O-RINGS TO PREVENT FUEL LEAKS.

(i) Install the O-rings [62] on the fuel lines.

CAUTION DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

(j) Put the second retaining ring on each ferrule of the fuel lines [103], [112].

(k) Make sure the two fuel lines align to the body of the bulkhead fitting.

CAUTION DO NOT USE TOOLS TO TIGHTEN THE FITTINGS. DAMAGE TO THE FITTING COMPONENTS COULD OCCUR. THE ADJACENT FITTINGS COULD BECOME LOOSE.

(l) Manually tighten the coupling nuts [75], [88] to connect fuel lines.

(m) Apply a thin layer of grease, D00504 to the new O-ring [89].

(n) Install the reducer [90] to the bulkhead fitting.

1) Make sure when the reducer is installed and tightened, the mating boss on the drain tube is retained by the boss hex to prevent damage to the weld or adjacent pull-out.

(o) Install the refuel manifold drain tube [91] to the bulkhead fitting reducer [90].

(p) Install the MS20995C32 lockwire, G01048 to the coupling (Lockwire, Cotter Pins, and Lockrings - Installation, TASK 20-10-23-400-801).

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H. Put The Airplane Back to Its Usual Condition

SUBTASK 28-21-08-410-013

(1) Go out of and close the applicable fuel tanks (Examine and Close the Fuel Tank, TASK 28-11-00-160-801).

(a) Close the applicable access panel.

1) To install the applicable center wing tank access door, do this task: Center Tank Access Door - Installation, TASK 28-11-02-400-801

Install the applicable access door:

Number	Name/Location
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door
531AB	Access Door
631AB	Access Door

SUBTASK 28-21-08-790-007

(2) Do a leak test of the refuel manifold Refuel/Jettison and Fuel Feed Manifold - Leak Test, TASK 28-21-00-790-802

SUBTASK 28-21-08-650-021

(3) To refuel the fuel tanks (if no more work is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

——— END OF TASK ———

TASK 28-21-08-000-810

18. Main Tank Rib 8 Bulkhead Fitting Removal

Figure 409

A. References

Reference	Title
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-22-15-700-802-001	Fuel Tube Damage Criteria - Inspection/Check (P/B 601)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

C. Access Panels

Number	Name/Location
531CB	Access Door
533AB	Access Door
631CB	Access Door
633AB	Access Door

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D. General

SUBTASK 28-21-08-020-043

(1) This task provides the procedure to remove the rib 8 bulkhead fitting.

E. Prepare for the Procedure

SUBTASK 28-21-08-650-022

(1) To defuel all of the fuel tanks, do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-21-08-010-028

WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

SUBTASK 28-21-08-010-029

(3) Get access to the rib 8 bulkhead fitting:

(a) To remove the applicable center wing tank access door, do this task: Center Tank Access Door - Removal, TASK 28-11-02-000-801

Remove the applicable access door:

Number	Name/Location
531CB	Access Door
631CB	Access Door

(b) To remove the applicable center wing tank access door, do this task:

(c) To remove the applicable main tank access door, do this task Main Tank Access Door Removal, TASK 28-11-01-000-801:

Remove the applicable access door:

Number	Name/Location
533AB	Access Door
633AB	Access Door

SUBTASK 28-21-08-010-030

(4) Go into the fuel tank.

F. Main Tank Rib 8 Bulkhead Fitting Removal

SUBTASK 28-21-08-020-044

(1) To remove rib 8 bulkhead fitting [105], do these steps:

(a) Remove the bonding jumpers [35] and bonding clamps [11].

(b) Remove the lockwire [60] from each coupling.

(c) Loosen the coupling nuts [75] to remove the fuel tubes on each side of the bulkhead fitting [105].

(d) Remove the sealant, the eight bolts [130], washers [131], [132] and nuts [134] to remove the bulkhead fitting [105].

(e) Examine the retaining rings and coupling nuts for wear (Fuel Tube Damage Criteria - Inspection/Check, TASK 28-22-15-700-802-001).

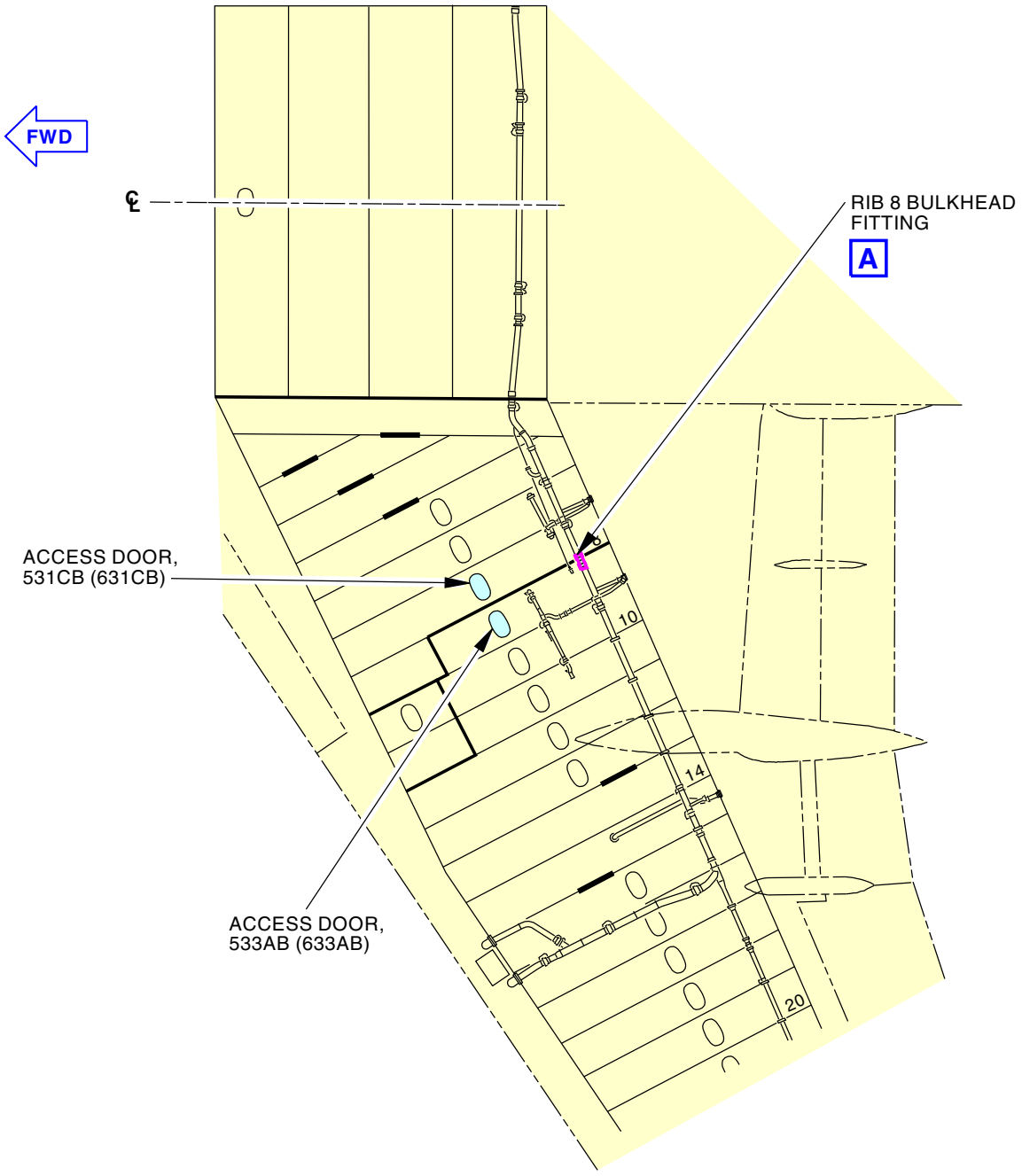
1) Replace these components if it is necessary.

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2) Discard the O-rings [62] from the coupling nuts.

——— END OF TASK ———

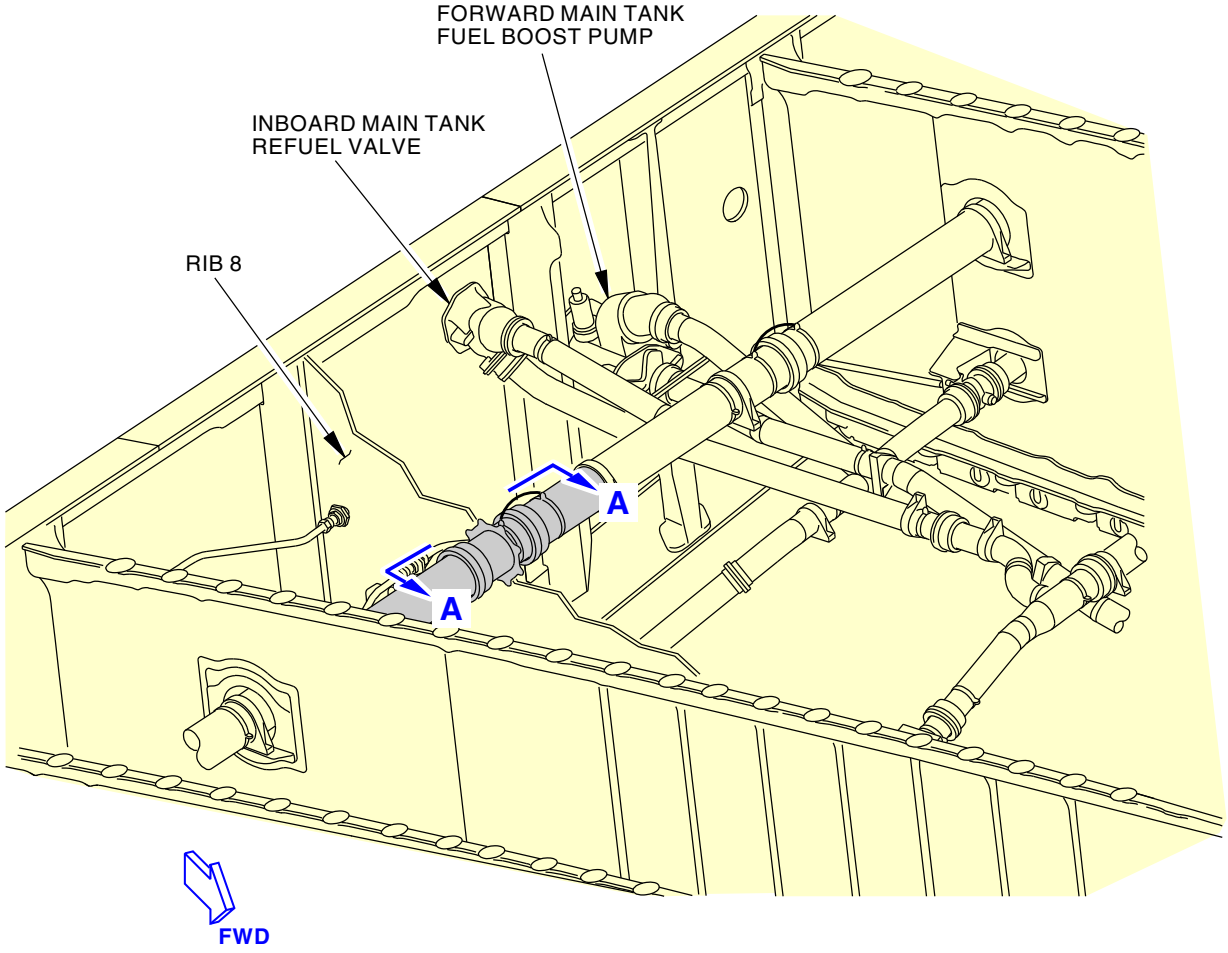
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Main Tank Rib 8 Bulkhead Fitting Installation
Figure 409/28-21-08-990-810 (Sheet 1 of 3)

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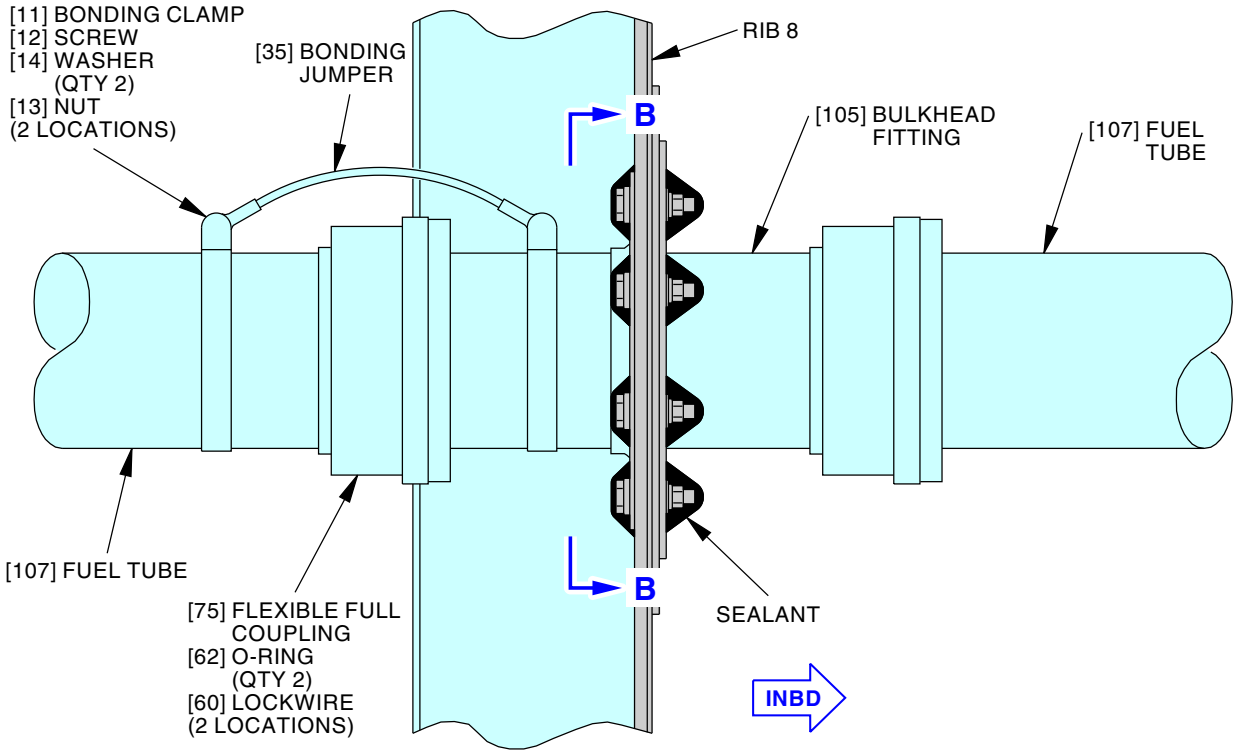
RIB 8 BULKHEAD FITTING
(RIB 8 AND 9 REMOVED FOR CLARITY)
(LEFT MAIN TANK IS SHOWN, RIGHT MAIN TANK IS OPPOSITE)

A

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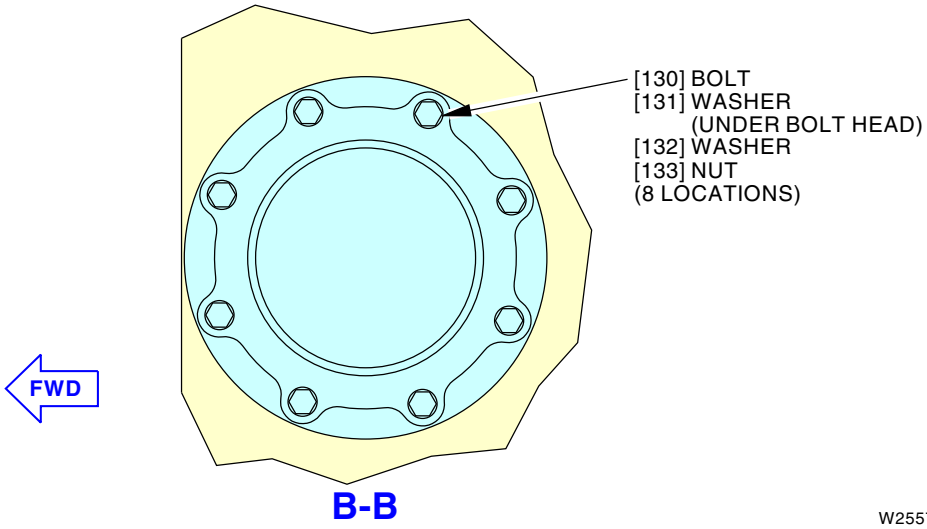
Main Tank Rib 8 Bulkhead Fitting Installation
Figure 409/28-21-08-990-810 (Sheet 2 of 3)

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(VIEW IN THE FORWARD DIRECTION)

A-A



B-B

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Main Tank Rib 8 Bulkhead Fitting Installation
Figure 409/28-21-08-990-810 (Sheet 3 of 3)

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TASK 28-21-08-400-810

19. Main Tank Rib 8 Bulkhead Fitting Installation

(Figure 409)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-160-801	Examine and Close the Fuel Tank (P/B 701)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)
28-21-00-790-802	Refuel/Jettison and Fuel Feed Manifold - Leak Test (P/B 501)

B. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
A50110	Sealant	BMS5-45 Class B-2
A50153	Sealant - Fuel Tank - Class A-2	BMS5-45 Class A-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50301	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168 Type I Class A-2
A50302	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168 Type I Class B-2
A50303	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168
D00504	Grease - Petrolatum	VV-P-236
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

C. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

D. Access Panels

Number	Name/Location
531CB	Access Door
631CB	Access Door

E. General

SUBTASK 28-21-08-420-039

(1) This task has the procedure to install the rib 8 bulkhead fitting.

(2) For applying sealants in the fuel tank structure(s), it is acceptable to use sealant, A50303, as an alternative to sealant, A00767, for Class A and B non-faying seal applications:

(a) sealant, A50153, and sealant, A50301, are mutually interchangeable.

(b) sealant, A50110, and sealant, A50302, are mutually interchangeable.

(c) sealant, A50153, cannot be used in combination with sealant, A50302, and sealant, A50301, cannot be used with sealant, A50110.

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F. Prepare for the Procedure

SUBTASK 28-21-08-860-011

> **WARNING** DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(1) Do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

SUBTASK 28-21-08-010-031

(2) Go into the fuel tank.

G. Main Tank Rib 8 Bulkhead Fitting Installation

SUBTASK 28-21-08-410-014

(1) To install the rib 8 bulkhead fitting [105], do these steps:

(a) Apply a faying surface seal of sealant, A50110, or sealant, A50155, on the outboard side of the rib and the inboard side of the tube flange.

NOTE: Alternate sealants are not approved for faying seal applications.

(b) Install the bulkhead fitting [105] through rib 8 with the flange on the outboard side of the rib.

1) Make sure the bulkhead fitting is turned so that the indicator mark “TOP” on the flange is positioned in the up position on the rib.

2) Turn the bulkhead fitting one hole position, left or right, for the best fit and to decrease the preload on the fuel tubes.

(c) Install the eight bolts [130], thick washers [131] under the bolt head, thin washers [132] under the nuts, and nuts [124] with a faying surface seal of sealant, A50110, or sealant, A50155.

NOTE: Alternate sealants are not approved for faying seal applications.

(d) Apply a fillet seal of sealant, A50110, or sealant, A50155, on and around the bolt head, washers, and nut at eight locations.

NOTE: Use the same sealant that was used for the faying surface seal.

(e) Apply a fillet seal of sealant, A50110, or sealant, A50155, around the edge of the flange.

NOTE: Use the same sealant that was used for the faying surface seal.

(f) Apply a fillet seal of sealant, A50110, or sealant, A50155, around the inboard side off the fitting tube and the rib.

NOTE: Use the same sealant that was used for the faying surface seal.

(g) Put the coupling nuts on the ferrule of the fuel lines.

> **CAUTION** DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

(h) Put a retaining ring on each ferrule to hold the coupling nuts on the fuel lines.

(i) Apply a thin layer of grease, D00504, to the new O-ring [62].

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CAUTION DO NOT USE THE SAME O-RING FOR THE FUEL LINE FITTINGS AFTER YOU TIGHTEN THE COUPLING ONE TIME. YOU MUST INSTALL NEW O-RINGS TO PREVENT FUEL LEAKS.

(j) Install the O-rings [62] on the fuel lines.

CAUTION DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

(k) Put the second retaining ring on each ferrule of the fuel lines.

(l) Make sure the two fuel lines align to the body of the bulkhead fitting.

CAUTION DO NOT USE TOOLS TO TIGHTEN THE FITTINGS. DAMAGE TO THE FITTING COMPONENTS COULD OCCUR. THE ADJACENT FITTINGS COULD BECOME LOOSE.

(m) Manually tighten the coupling nuts [75] to connect fuel lines.

(n) Install MS20995C32 lockwire, G01048, to the coupling nuts (TASK 20-10-23-400-801).

H. Put the Airplane Back To Its Usual Condition

SUBTASK 28-21-08-410-015

(1) Go out of and close the applicable fuel tanks (TASK 28-11-00-160-801).

(a) Close the applicable access panel.

1) To install the applicable center wing tank access door, do this task: Center Tank Access Door - Installation, TASK 28-11-02-400-801.

a) Install the applicable access door:

Number	Name/Location
531CB	Access Door
631CB	Access Door

SUBTASK 28-21-08-790-008

(2) Do a leak test of the refuel manifold (TASK 28-21-00-790-802).

SUBTASK 28-21-08-650-023

(3) To refuel the fuel tanks (if no more work is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

——— END OF TASK ———

TASK 28-21-08-000-811

20. Main Tank Rib 18 Bulkhead Fitting Removal

Figure 410

A. References

Reference	Title
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-22-15-700-802-001	Fuel Tube Damage Criteria - Inspection/Check (P/B 601)
28-26-00-650-801	Pressure Defueling (P/B 201)

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B. Location Zones

Zone	Area
541	Main Tank - Rib 17 to Rib 32 - Left Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing

C. Access Panels

Number	Name/Location
541AB	Access Door
541BB	Access Door
641AB	Access Door
641BB	Access Door

D. General

SUBTASK 28-21-08-020-045

(1) This task provides the procedure to remove the rib 18 bulkhead fitting.

E. Prepare for the Procedure

SUBTASK 28-21-08-650-024

(1) To defuel all of the fuel tanks, do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-21-08-860-012

WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

SUBTASK 28-21-08-010-032

(3) Get access to the rib 18 bulkhead fitting.

(a) To remove the applicable main tank access door, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801

Remove the applicable access door:

Number	Name/Location
541AB	Access Door
541BB	Access Door
641AB	Access Door
641BB	Access Door

SUBTASK 28-21-08-010-033

(4) Go into the fuel tank.

F. Main Tank Rib 18 Bulkhead Fitting Removal

SUBTASK 28-21-08-020-046

(1) To remove rib 18 bulkhead fitting [104], do these steps:

(a) Remove the bonding jumpers [35] and bonding clamps [3].

(b) Remove the lockwire [60] from each coupling.

(c) Loosen the coupling nuts [74] to remove the fuel tubes [110] bulkhead fitting.

(d) Remove the sealant, the eight bolts [134], washers [131], [132], and nuts [133] to remove the bulkhead fitting [104].

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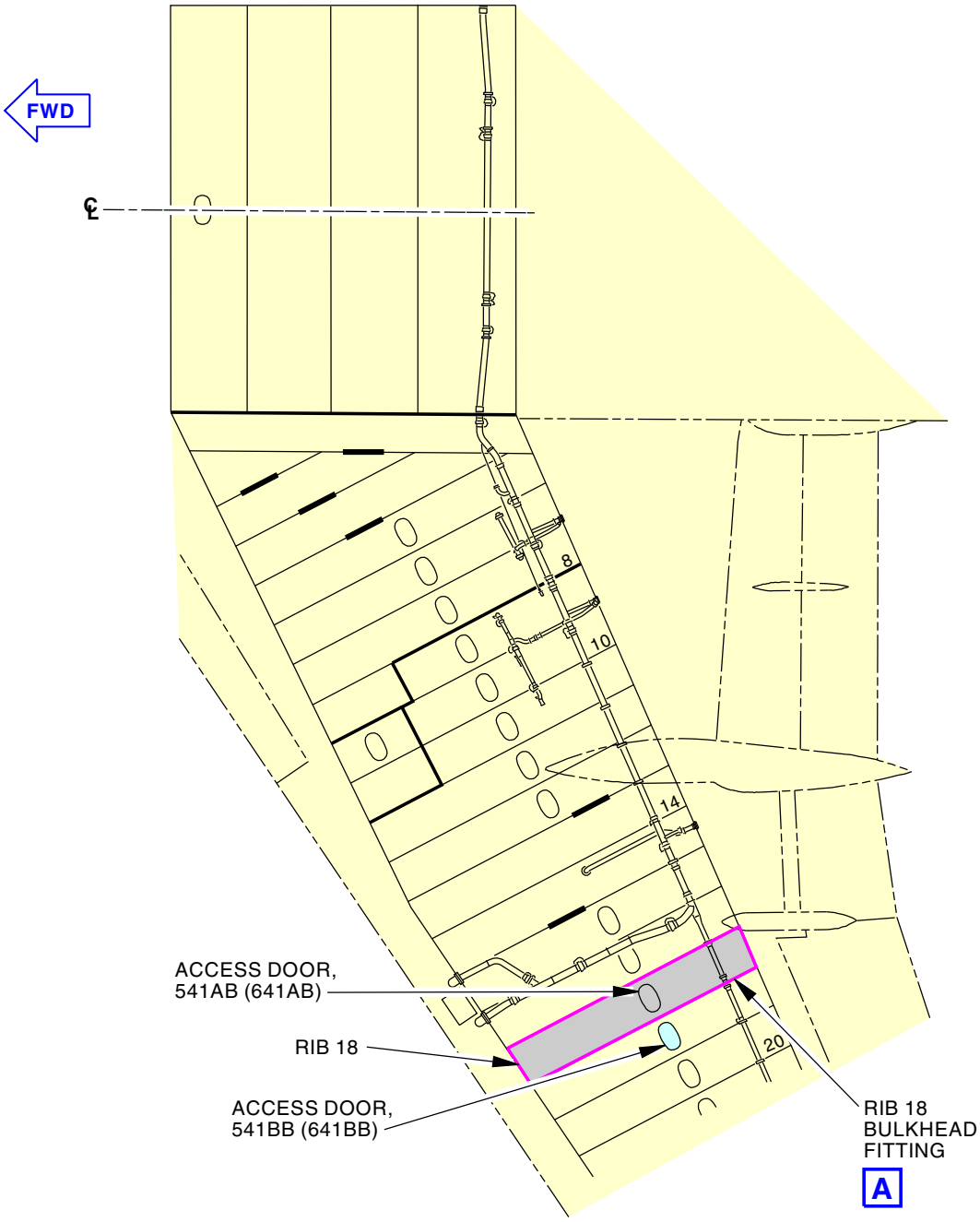
(e) Examine the retaining rings and coupling nuts for wear Fuel Tube Damage Criteria - Inspection/Check, TASK 28-22-15-700-802-001

1) Replace these components if it is necessary.

2) Discard the O-rings [61] from the coupling nuts.

——— END OF TASK ———

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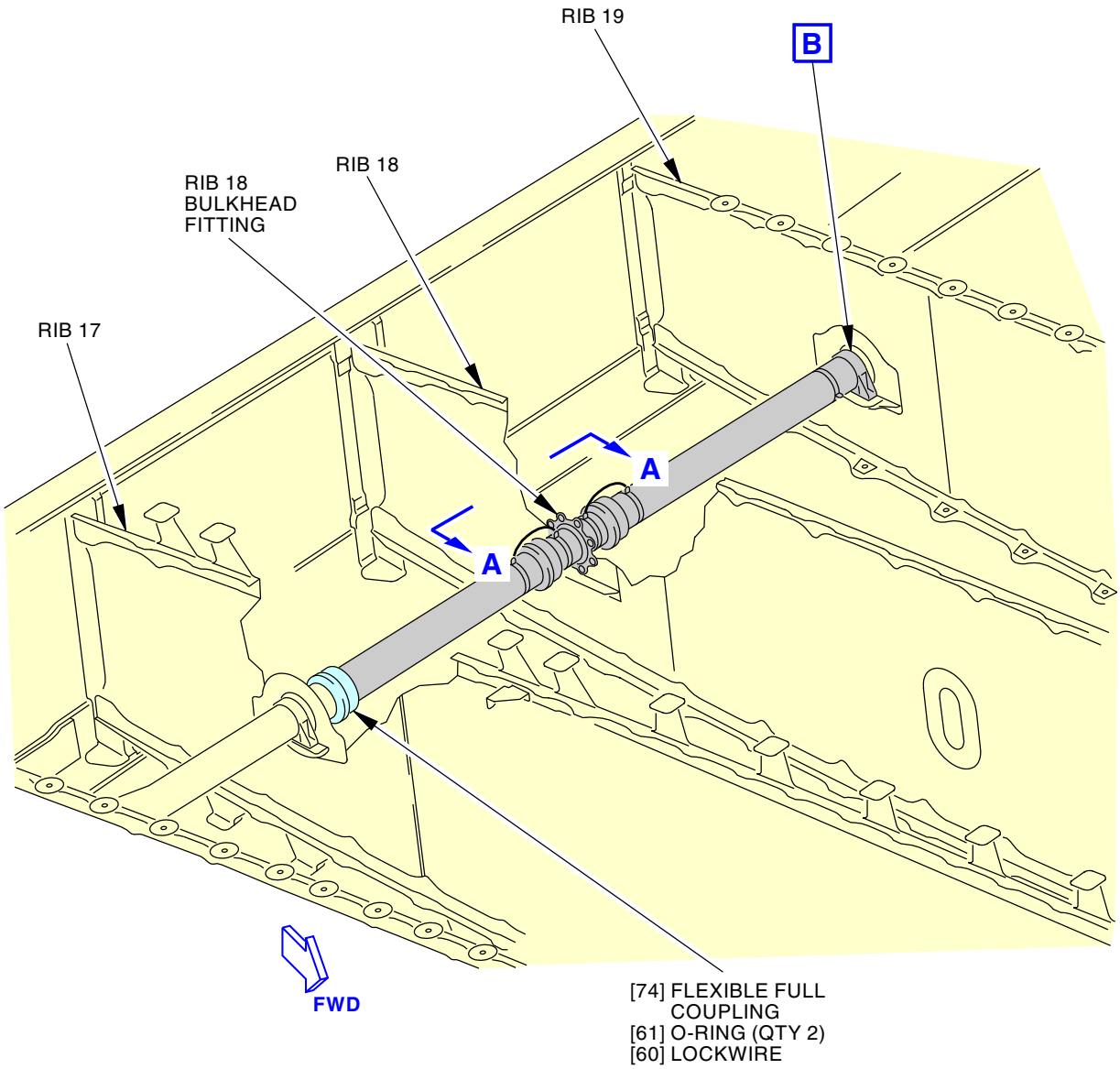


**LEFT WING
(TOP VIEW)**

J64345 S0000173173_V2

**Main Tank Rib 18 Bulkhead Fitting Installation
Figure 410/28-21-08-990-811 (Sheet 1 of 3)**

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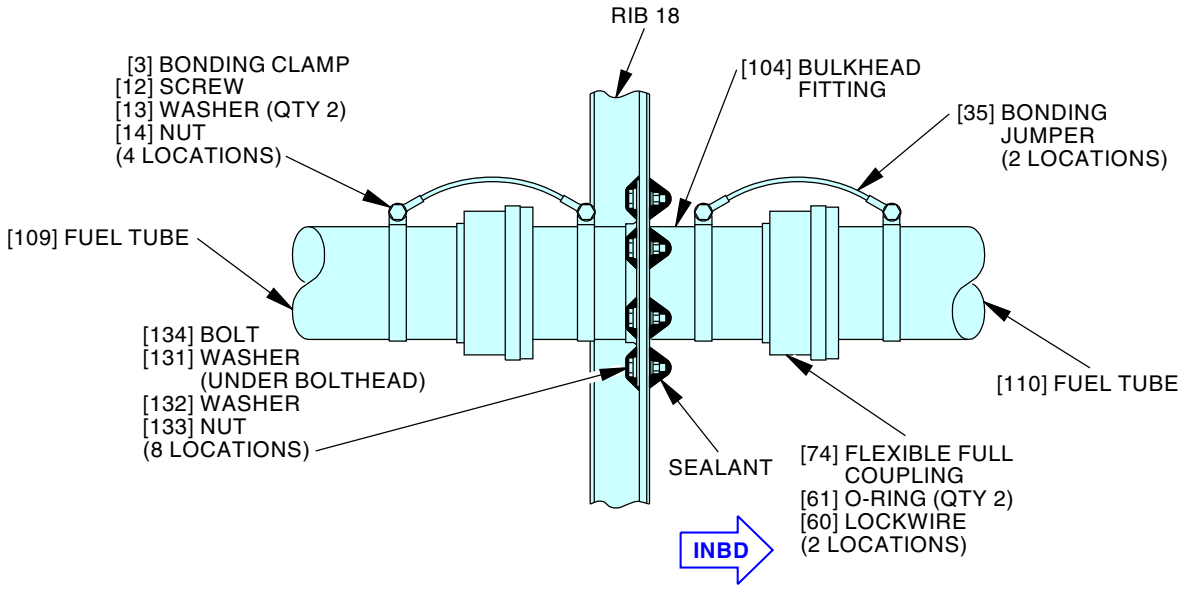
RIB 18 BULKHEAD FITTING
(LEFT OUTBOARD MAIN TANK, RIB 17 TO 19;
RIGHT OUTBOARD MAIN TANK IS OPPOSITE)

A

W24593 S0000123088_V2

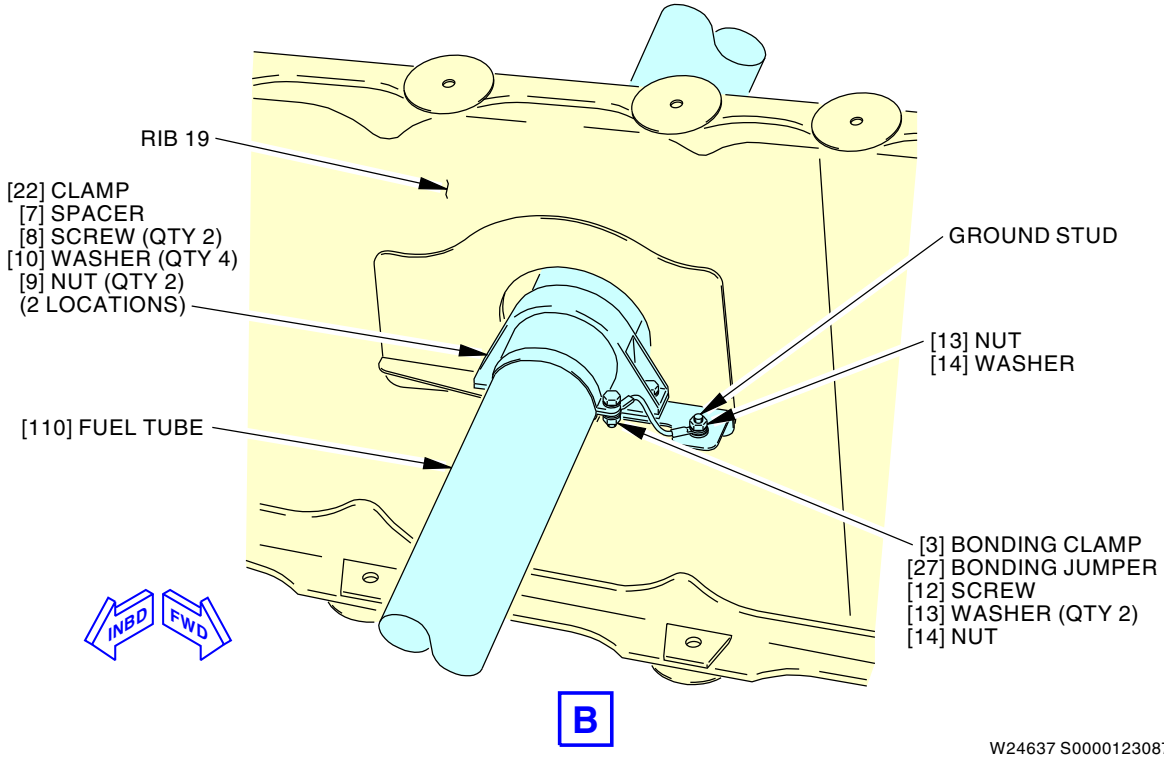
Main Tank Rib 18 Bulkhead Fitting Installation
Figure 410/28-21-08-990-811 (Sheet 2 of 3)

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(VIEW IN THE FORWARD DIRECTION)

A-A



W24637 S0000123087_V2

Main Tank Rib 18 Bulkhead Fitting Installation
Figure 410/28-21-08-990-811 (Sheet 3 of 3)

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TASK 28-21-08-400-811

21. Main Tank Rib 18 Bulkhead Fitting Installation

(Figure 410)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-160-801	Examine and Close the Fuel Tank (P/B 701)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-21-00-790-802	Refuel/Jettison and Fuel Feed Manifold - Leak Test (P/B 501)

B. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
A50110	Sealant	BMS5-45 Class B-2
A50153	Sealant - Fuel Tank - Class A-2	BMS5-45 Class A-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50301	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168 Type I Class A-2
A50302	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168 Type I Class B-2
A50303	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168
D00504	Grease - Petrolatum	VV-P-236
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

C. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

D. Access Panels

Number	Name/Location
541AB	Access Door
541BB	Access Door
641AB	Access Door
641BB	Access Door

E. General

SUBTASK 28-21-08-420-040

(1) This task provides the procedure to install the rib 18 bulkhead fitting.

(2) For applying sealants in the fuel tank structure(s), it is acceptable to use sealant, A50303, as an alternative to sealant, A00767, for Class A and B non-faying seal applications:

(a) sealant, A50153, and sealant, A50301, are mutually interchangeable.

(b) sealant, A50110, and sealant, A50302, are mutually interchangeable.

(c) sealant, A50153, cannot be used in combination with sealant, A50302, and sealant, A50301, cannot be used with sealant, A50110.

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F. Prepare for the Procedure

SUBTASK 28-21-08-860-013

WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(1) Do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

SUBTASK 28-21-08-010-034

(2) Go into the fuel tank.

G. Rib 18 Bulkhead Fitting Installation

SUBTASK 28-21-08-420-041

(1) To install the rib 18 bulkhead fitting [104], do these steps:

(a) Apply a faying surface seal of sealant, A50110, or sealant, A50155, on the inboard side of the rib and the outboard side of the tube flange.

NOTE: Alternate sealants are not approved for faying surface seals.

(b) Install the bulkhead fitting [104] through rib 18 with the flange on the inboard side of the rib.

1) Make sure the bulkhead fitting is turned so that the indicator marked “TOP” on the flange is positioned in the up position on the rib.

2) Turn the bulkhead fitting one hole position, left or right, for the best fit and to decrease the preload on the fuel tubes.

(c) Install the eight bolts [134], thick washers [131] under the bolt head, thin washers [132] under the nuts, and nuts [133] with a faying surface seal of sealant, A50110, or sealant, A50155.

NOTE: Alternate sealants are not approved for faying surface seals.

(d) Apply a fillet seal of sealant, A50110, or sealant, A50155, on and around the bolt head, washers, and nut at eight locations.

NOTE: Use the same sealant that was used for the faying surface seal.

(e) Apply a fillet seal of sealant, A50110, or sealant, A50155, around the edge of the flange.

NOTE: Use the same sealant that was used for the faying surface seal.

(f) Apply a fillet seal of sealant, A50110, or sealant, A50155, around the outboard side of the tube fitting and the rib.

NOTE: Use the same sealant that was used for the faying surface seal.

(g) Put the coupling nuts [75] on the ferrule of the fuel lines.

CAUTION DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

(h) Put retaining ring on each ferrule to hold the coupling nuts on the fuel lines.

(i) Apply a thin layer of grease, D00504, to the new O-ring [62].

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CAUTION DO NOT USE THE SAME O-RING FOR THE FUEL LINE FITTINGS AFTER YOU TIGHTEN THE COUPLING ONE TIME. YOU MUST INSTALL NEW O-RINGS TO PREVENT FUEL LEAKS.

(j) Install the O-rings [62] on the fuel lines.

CAUTION DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

(k) Put the second retaining ring on each ferrule of the fuel lines.

(l) Make sure the two fuel lines align to the body of the bulkhead fitting.

CAUTION DO NOT USE TOOLS TO TIGHTEN THE FITTINGS. DAMAGE TO THE FITTING COMPONENTS COULD OCCUR. THE ADJACENT FITTINGS COULD BECOME LOOSE.

(m) Manually tighten the coupling nuts [75] to connect fuel lines.

(n) Install the MS20995C32 lockwire, G01048, to the coupling nuts (TASK 20-10-23-400-801).

H. Put the Airplane Back to Its Usual Condition

SUBTASK 28-21-08-410-016

(1) Go out of and close the applicable fuel tanks (TASK 28-11-00-160-801).

(a) Close the applicable access panel.

1) To install the applicable main tank access door, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

a) Install the applicable access door:

Number	Name/Location
541AB	Access Door
541BB	Access Door
641AB	Access Door
641BB	Access Door

SUBTASK 28-21-08-790-009

(2) Do a leak test of the refuel manifold (TASK 28-21-00-790-802).

SUBTASK 28-21-08-650-025

(3) To refuel the fuel tanks (if no more work is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

END OF TASK

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TASK 28-21-08-000-814

22. Fuel Jettison Pump Tube Removal

Figure 411

A. References

Reference	Title
28-00-00-200-801	Inspection of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

C. Access Panels

Number	Name/Location
533EB	Access Door
533FB	Access Door
633EB	Access Door
633FB	Access Door

D. General

SUBTASK 28-21-08-020-018

(1) This task provides the procedure to remove the fuel jettison pump tubes.

E. Prepare for the Procedure

SUBTASK 28-21-08-650-010

(1) To defuel all of the fuel tanks, do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-21-08-860-001

(2) Open these circuit breakers and install safety tags:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
K	14	C28646	R FUEL JETT PUMP CTRL

SUBTASK 28-21-08-860-002

WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(3) Do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801

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SUBTASK 28-21-08-010-009

(4) To remove the applicable access doors, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(a) Remove the applicable access door:

Number	Name/Location
533EB	Access Door
533FB	Access Door
633EB	Access Door
633FB	Access Door

SUBTASK 28-21-08-860-003

(5) Go into the fuel tank.

F. Fuel Jettison Pump Tube Removal

SUBTASK 28-21-08-020-019

(1) To remove the inlet tube [102] for the fuel jettison pump, do these steps:

(a) To disconnect the bonding jumper [35] from the bonding clamp [3] on the inlet tube [102], remove the screw [12], washers [14], and nut [13].

(b) If the inlet tube [102] has two segments, disconnect the rigid coupling [76] on the inlet tube [102] (TASK 28-21-08-000-803).

1) Discard the o-ring [57] and lockwire [60].

(c) Disconnect the flexible full coupling [74] at the jettison fuel pump (TASK 28-21-08-000-803).

1) Discard the o-rings [61] and lockwire [60].

(d) Remove the screws [8], washers [10], and nuts [9] to remove the clamp [22] and spacer [7] from the structure and the tube (TASK 28-21-08-000-803).

NOTE: The u-clamp has two parts: the clamp strap and the clamp saddle.

(e) If it is necessary to remove the bonding clamp [3] and bonding jumper [35] from the inlet tube [102], remove the screw [12], washers [14], and nut [13].

(f) If it is necessary to remove the inlet screen [23], remove the screws [12] and washers [14].

(g) Remove the inlet tube [102].

SUBTASK 28-21-08-020-020

(2) To remove the outlet tube [101], do these steps:

(a) Disconnect the flexible full coupling [73] at the fuel jettison pump (TASK 28-21-08-000-803).

1) Discard the two o-rings [65] and lockwire [60].

(b) Disconnect the rigid coupling [77] on the outlet tube [101] (TASK 28-21-08-000-803).

1) Discard the two o-rings [66] and lockwire [60].

(c) Disconnect the flexible full coupling [75] on the outlet tube [101] (TASK 28-21-08-000-803).

1) Discard the two o-rings [62] and lockwire [60].

(d) To disconnect the bonding jumper [35] from the ground stud, remove the nut [13] and washer [14].

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(e) To disconnect the bonding jumper [35] and bonding clamp [11] from the outlet tube [101], remove the screw [12], washers [14], and nut [13].

(f) To disconnect the clamps [6] and spacers [7] from the structure, remove the screws [8], washers [10], and nuts [9] (TASK 28-21-08-000-803).

NOTE: The u-clamp has two parts: the clamp strap and the clamp saddle.

(g) Remove the outlet tube [101].

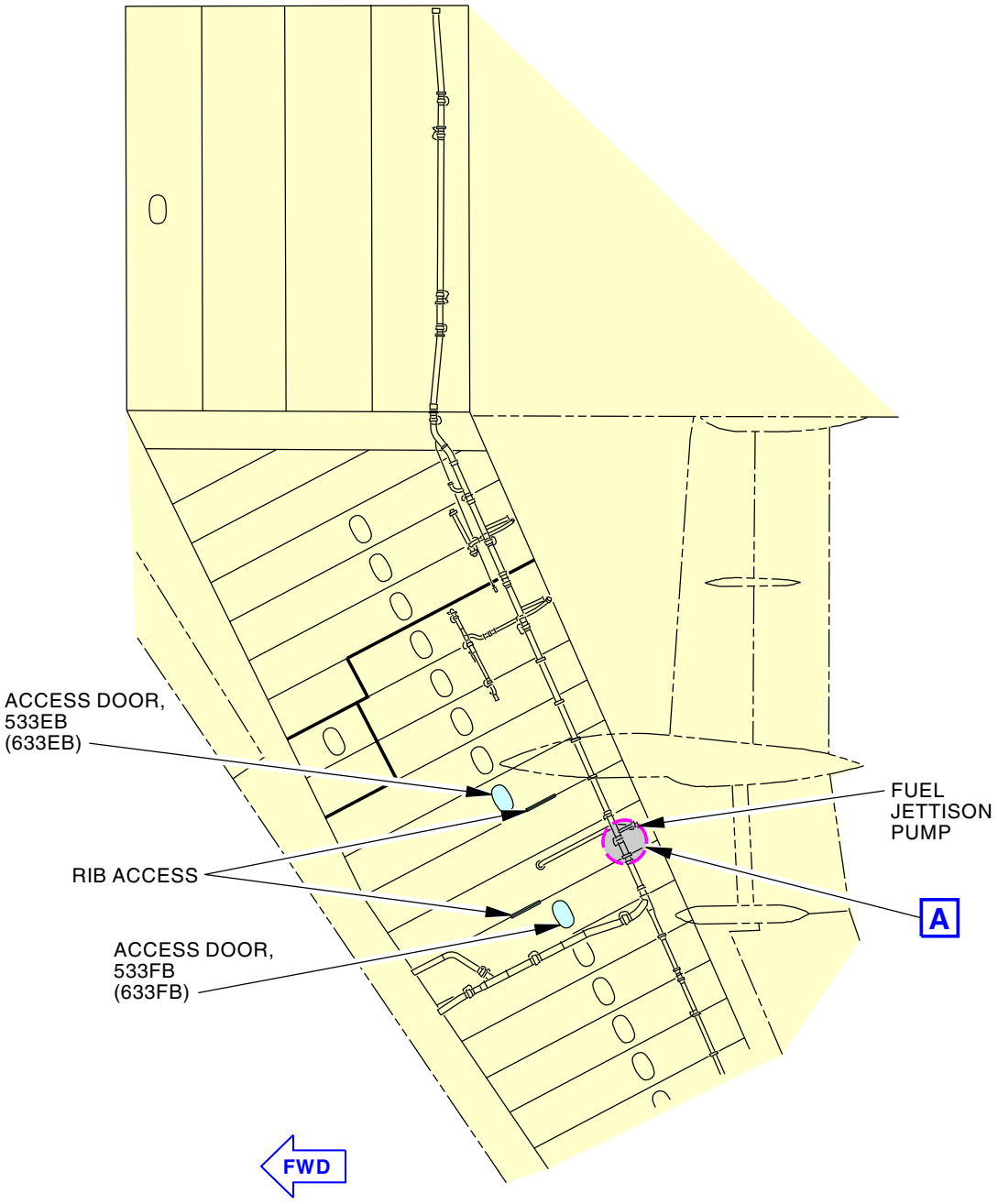
SUBTASK 28-21-08-765-001

(3) Do a check of the bonding jumpers (TASK 28-00-00-200-801).

(a) Replace the bonding jumpers as necessary.

——— END OF TASK ———

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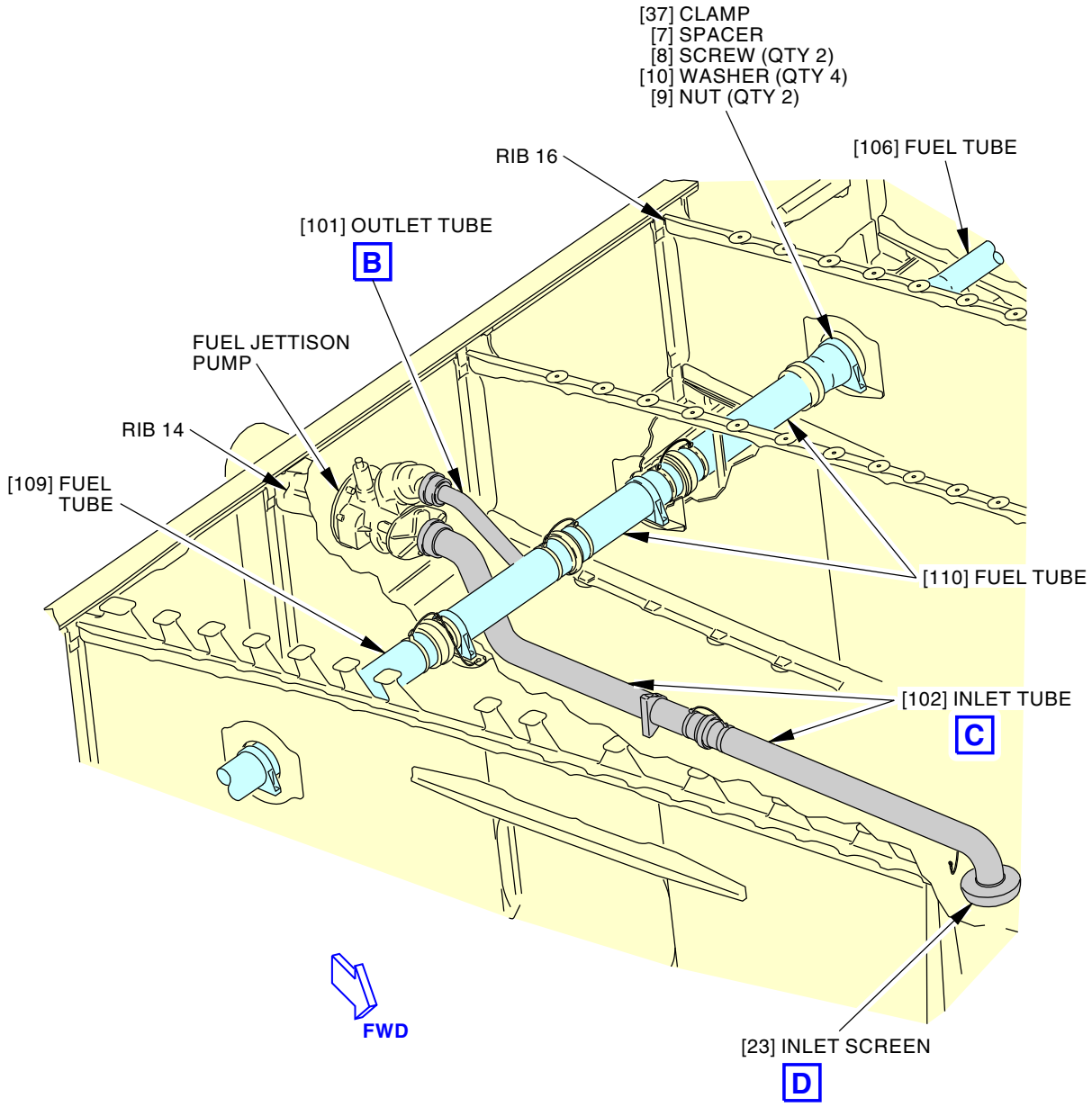


LEFT WING (TOP VIEW)
(RIGHT WING IS EQUIVALENT)

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Fuel Jettison Pump Tube Installation
Figure 411/28-21-08-990-814 (Sheet 1 of 4)

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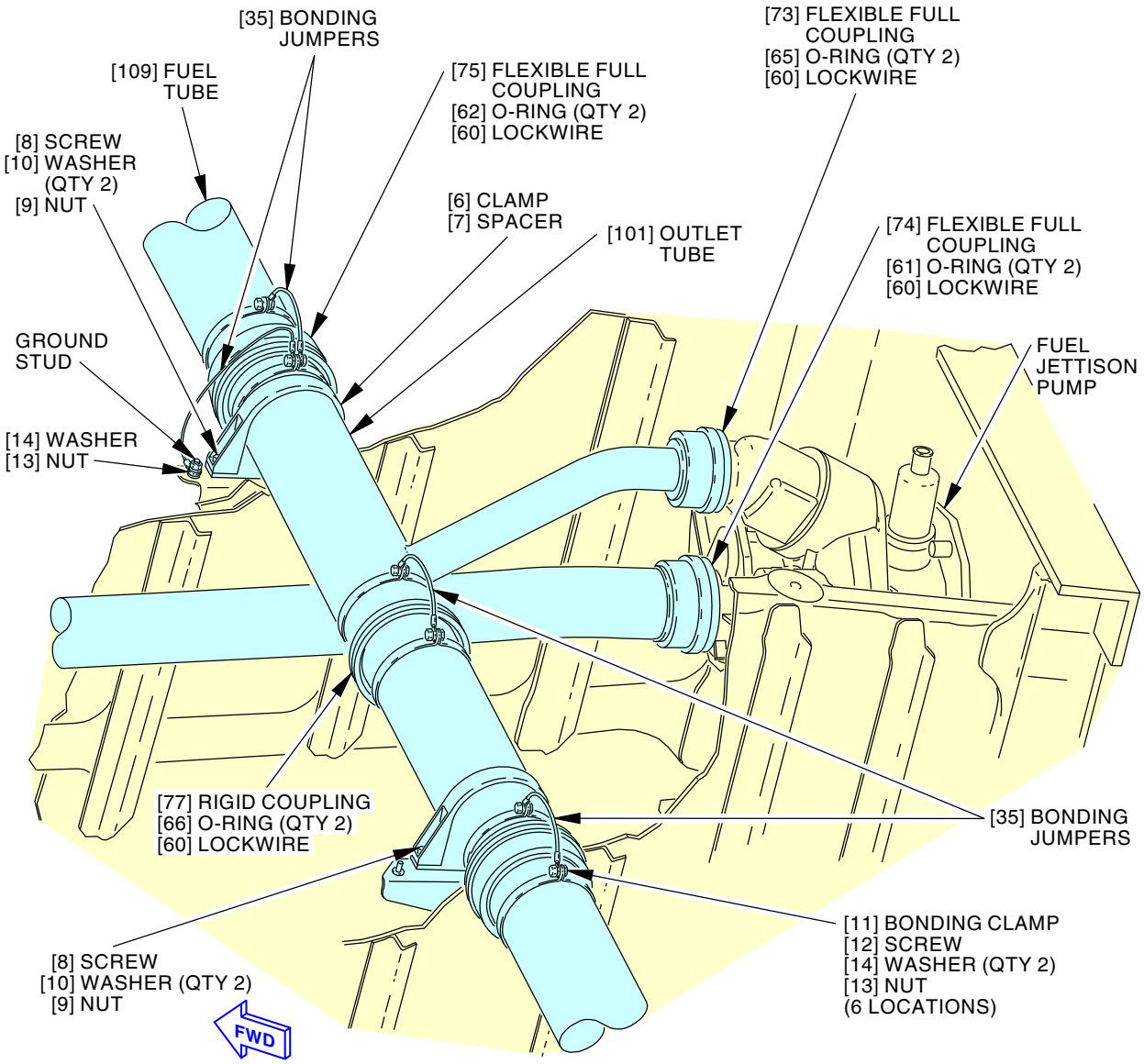
LEFT WING MAIN TANK (RIB 12 TO 16)
(RIGHT WING MAIN TANK IS OPPOSITE)

A

W41172 S0000123000_V2

Fuel Jettison Pump Tube Installation
Figure 411/28-21-08-990-814 (Sheet 2 of 4)

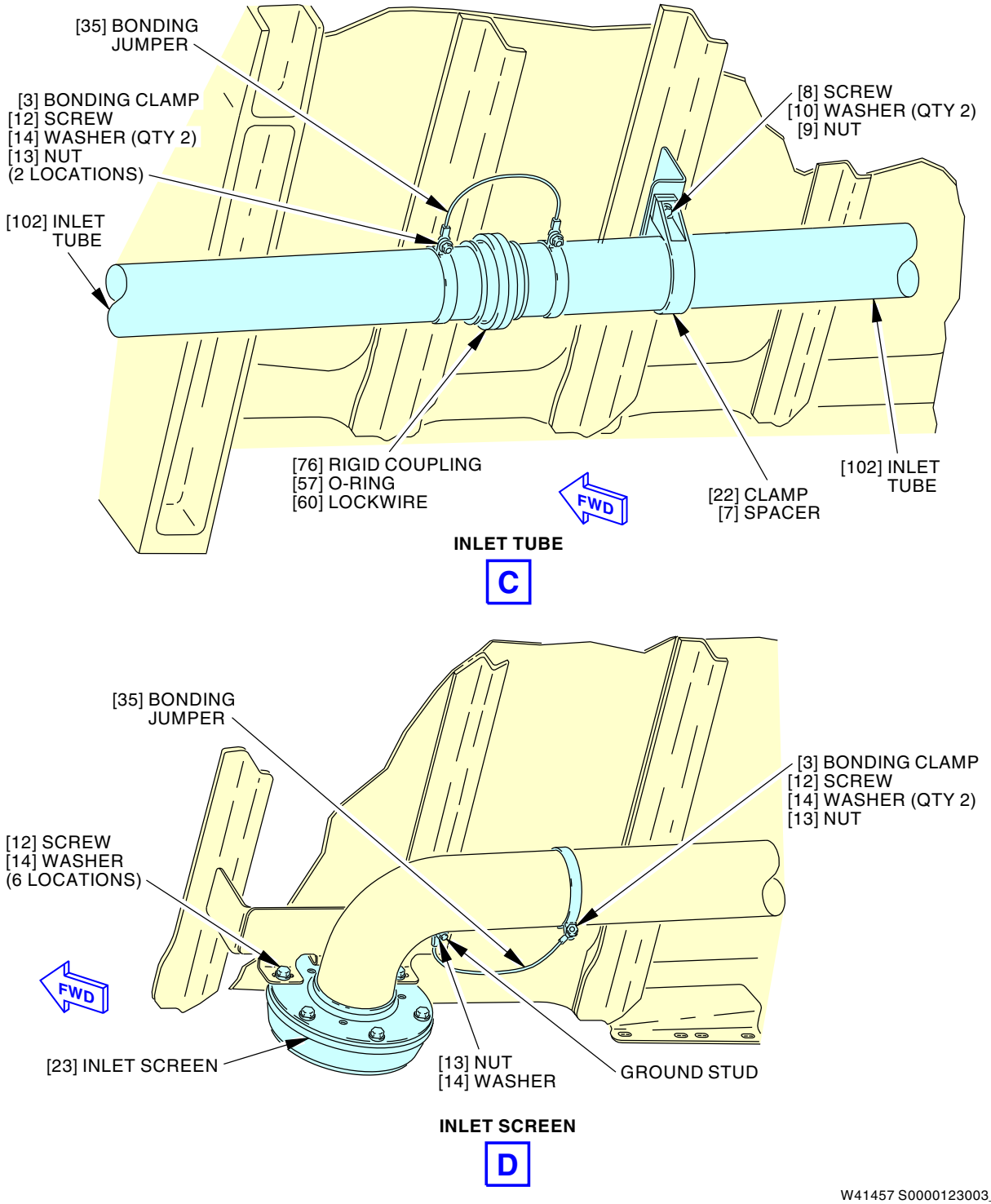
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Fuel Jettison Pump Tube Installation
Figure 411/28-21-08-990-814 (Sheet 3 of 4)

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W41457 S0000123003_V2

Fuel Jettison Pump Tube Installation
Figure 411/28-21-08-990-814 (Sheet 4 of 4)

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TASK 28-21-08-400-814

23. Fuel Jettison Pump Tube Installation

(Figure 411)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
28-00-00-200-801	Inspection of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-21-00-790-802	Refuel/Jettison and Fuel Feed Manifold - Leak Test (P/B 501)
SWPM 20-20-00	Standard Wiring Practices Manual
SWPM 20-20-10	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Location Zones

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

D. Access Panels

Number	Name/Location
533EB	Access Door
533FB	Access Door
633EB	Access Door
633FB	Access Door

E. General

SUBTASK 28-21-08-420-013

(1) This task gives the procedure to install the fuel jettison pump tubes.

F. Fuel Jettison Tube Installation

SUBTASK 28-21-08-212-001

(1) Do a check of the bonding jumpers (TASK 28-00-00-200-801).

(a) Replace the bonding jumpers as necessary.

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SUBTASK 28-21-08-420-014

(2) To install the outlet tube [101], do these steps:

(a) Put the outlet tube [101] in position.

(b) Do this task to install the clamp [6] and spacer [7] on the structure and the outlet tube [101]: TASK 28-21-08-400-803.

NOTE: The u-clamp has two parts; the clampstrap and the clamp saddle.

(c) Connect the flexible full coupling [73] at the jettison fuel pump (TASK 28-21-08-400-803).

(d) Connect the flexible full coupling [75] at fuel tube (TASK 28-21-08-400-803).

(e) Connect the rigid coupling [77] (TASK 28-21-08-400-803).

(f) Connect the bonding jumpers [35] to the bonding clamps [11] with the screws [12], washers [14], and nuts [13] (SWPM 20-20-00 and SWPM 20-20-10).

1) Measure the bonding resistance between the applicable tube and the airplane structure with an intrinsically safe approved bonding meter, COM-1550

2) Make sure the bonding resistance is 0.010 ohm (10 milliohms) or less between the applicable tube and the airplane structure.

(g) Connect the bonding jumper [35] to the ground stud with the washer [14] and nut [13] (SWPM 20-20-00 and SWPM 20-20-10).

1) Measure the bonding resistance between the applicable tube and the airplane structure with an intrinsically safe approved bonding meter, COM-1550.

2) Make sure the bonding resistance is 0.010 ohm (10 milliohms) or less between the applicable tube and the airplane structure.

SUBTASK 28-21-08-420-015

(3) To install the inlet tube [102], do these steps:

(a) Put the inlet tube [102] in position.

(b) Install the clamp [22] and spacer [7] to the structure and inlet tube [102] (TASK 28-21-08-400-803).

NOTE: The u-clamp has two parts; the clampstrap and the clamp saddle.

(c) Connect the flexible full coupling [74] at the fuel jettison pump (TASK 28-21-08-400-803).

(d) If the inlet tube [102] has two segments, connect the rigid coupling [76] (TASK 28-21-08-400-803).

(e) If the inlet tube [102] has two segments, connect the bonding jumper [35] the rigid coupling [76] with bonding clamps [11], screws [12], washers [14], and nuts [13] (SWPM 20-20-00 and SWPM 20-20-10).

1) Measure the bonding resistance between the applicable tube and the airplane structure with an intrinsically safe approved bonding meter, COM-1550

2) Make sure the bonding resistance is 0.010 ohm (10 milliohms) or less between the applicable tube and the airplane structure.

(f) If it is necessary, connect the bonding jumper [35] to the bonding clamp [3] with screw [12], washers [14], and nut [13] (SWPM 20-20-00 and SWPM 20-20-10).

(g) Connect the bonding jumper [35], near the inlet screen [23], to the ground stud with washer [14] and nut [13] (SWPM 20-20-00 and SWPM 20-20-10).

1) Measure the bonding resistance between the applicable tube and the airplane structure with an intrinsically safe approved bonding meter, COM-1550

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2) Make sure the bonding resistance is 0.010 ohm (10 milliohms) or less between the applicable tube and the airplane structure.

(h) If it is necessary, install the inlet screen [23] with the six screws [12] and washers [14].

G. Put the Airplane Back To Its Usual Condition

SUBTASK 28-21-08-410-006

(1) Go out of and close the applicable fuel tanks (TASK 28-11-00-410-801)

(a) Install the applicable access doors:

Number	Name/Location
533EB	Access Door
533FB	Access Door
633EB	Access Door
633FB	Access Door

1) Do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-21-08-865-007

(2) Remove the safety tags and close these circuit breakers:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
K	14	C28646	R FUEL JETT PUMP CTRL

SUBTASK 28-21-08-790-002

(3) Do a leak test of the refuel manifold (TASK 28-21-00-790-802).

SUBTASK 28-21-08-650-011

(4) Refuel the fuel tanks (if no more work is necessary) (TASK 12-11-01-650-801).

——— END OF TASK ———

TASK 28-21-08-000-815

24. Fuel Jettison Tube Removal

Figure 412

A. References

Reference	Title
28-22-15-700-802-001	Fuel Tube Damage Criteria - Inspection/Check (P/B 601)

B. Location Zones

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

C. General

SUBTASK 28-21-08-020-021

(1) This task provides the procedure to remove the fuel jettison tube in the left or right wing.

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D. Prepare for the Procedure

SUBTASK 28-21-08-865-008

(1) Open these circuit breakers and install safety tags:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL
L	24	C28631	L FUEL JETT ISLN VLV

Right Power Management Panel, P210

Row	Col	Number	Name
K	13	C28630	R JETT ISLN VLV
K	14	C28646	R FUEL JETT PUMP CTRL

SUBTASK 28-21-08-865-009

(2) For the left fuel jettison tube,

Open this circuit breaker and install safety tag:

Left Power Management Panel, P110

Row	Col	Number	Name
L	25	C28621	L FUEL JETT NOZ VLV

SUBTASK 28-21-08-865-010

(3) For the right fuel jettison tube,

Open this circuit breaker and install safety tag:

Right Power Management Panel, P210

Row	Col	Number	Name
K	12	C28620	R FUEL JETT NOZ VLV

SUBTASK 28-21-08-010-010

(4) Remove the wing access panels.

(a) To remove the upper wing panel [158], remove 36 bolts [191] and two bonding fasteners [192].

(b) To remove the lower wing panel [159], remove 58 bolts [191] and two bonding fasteners [192] in the flat area of the panel and 11 bolts and two bonding fasteners [192] in the tube fairing area.

(5) Go into the dry bay.

E. Fuel Jettison Tube Removal

SUBTASK 28-21-08-020-022

(1) To remove fuel jettison tube, do these steps:

(a) Remove the bonding jumper [35] and bonding clamp [3].

(b) Remove the lockwire [60] from coupling [74].

(c) Loosen the coupling nut [74] and disconnect the fuel tube [108].

(d) Remove screw [12], washers [14] and nut [13] to disconnect bonding jumper [80] from the tube [157].

(e) Remove screw [8], washers [10] and nut [9] to remove clamp [22] and spacer [7].

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(f) Remove screws [152], [156], washer [153] and nut [154] to remove clamp [22] and spacer [7].

(g) Remove tube [157]; close out fairing [155] is bonded to the upper panel wedge.

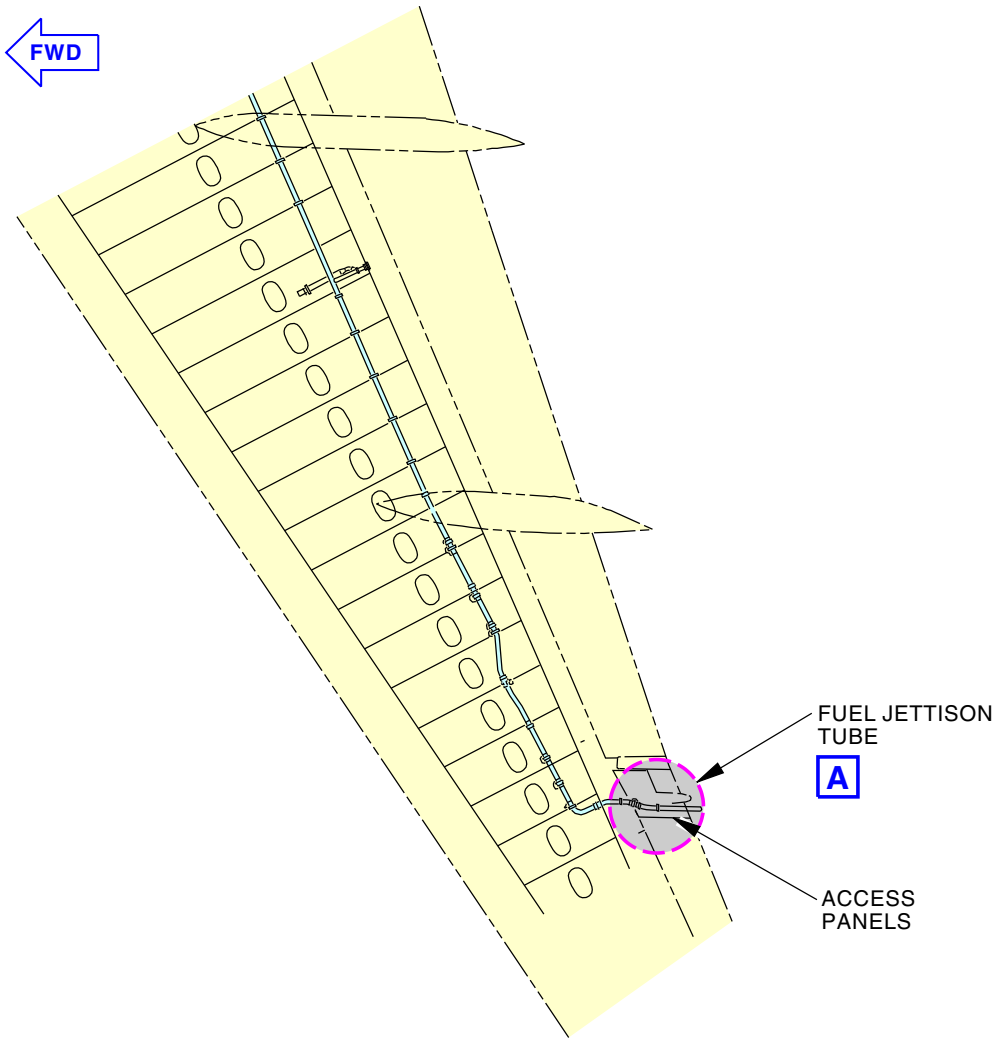
(h) Examine the retaining rings and coupling nuts for wear TASK 28-22-15-700-802-001.

1) Replace these components if it is necessary.

2) Discard the O-rings [61] from the coupling nuts.

——— END OF TASK ———

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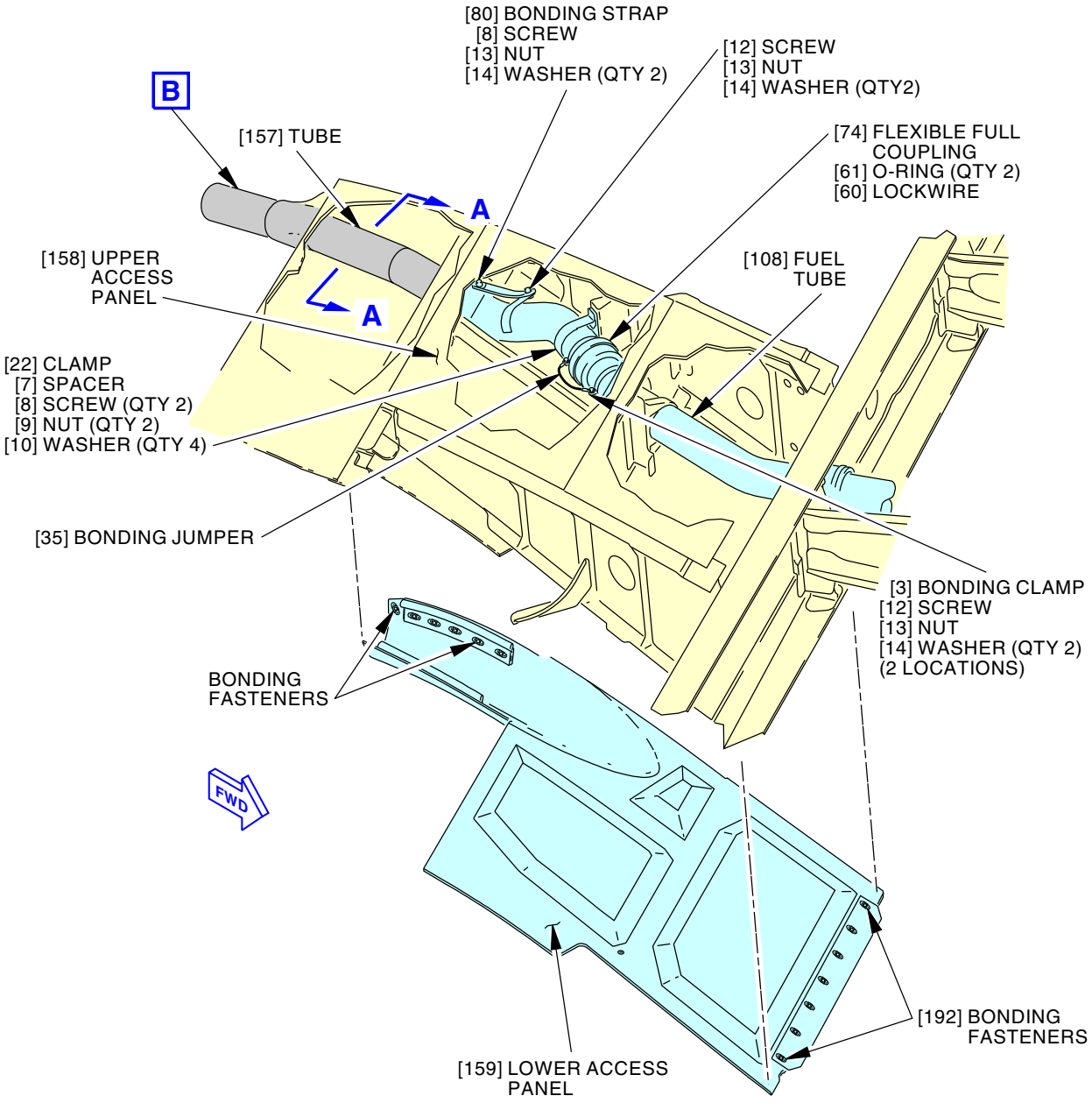


**LEFT WING
(TOP VIEW)**

W42343 S0000122990_V2

**Fuel Jettison Tube Installation
Figure 412/28-21-08-990-815 (Sheet 1 of 4)**

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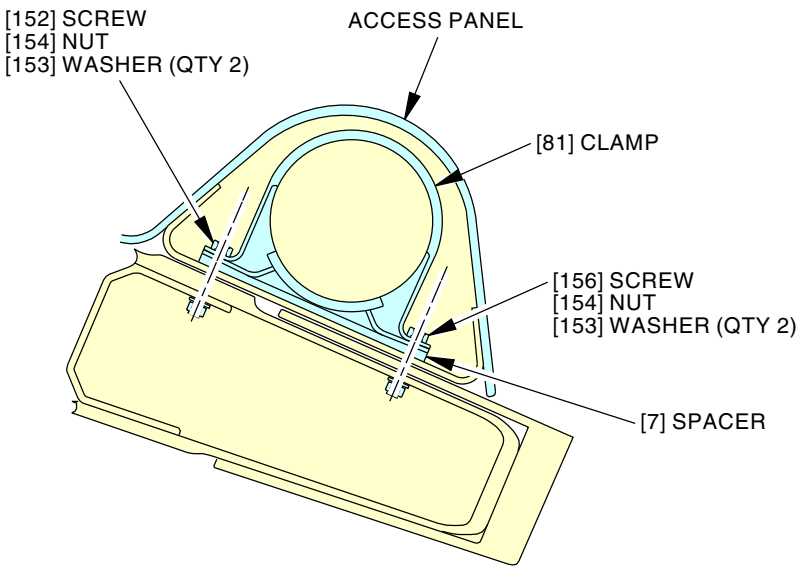
LEFT JETTISON BULKHEAD FITTING
(WING SKIN REMOVED FOR CLARITY)
(RIGHT JETTISON BULKHEAD FITTING IS OPPOSITE)

A

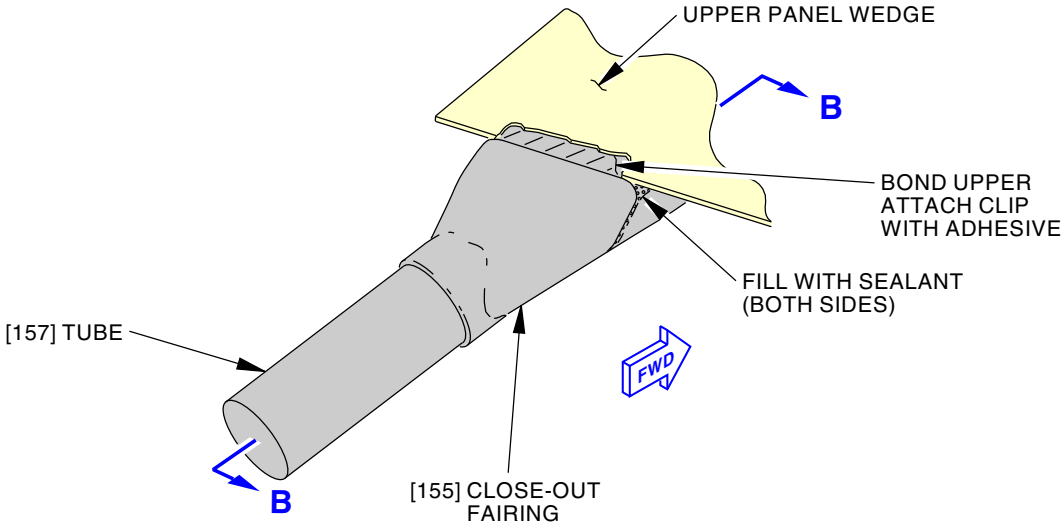
W42560 S0000122991_V2

Fuel Jettison Tube Installation
Figure 412/28-21-08-990-815 (Sheet 2 of 4)

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A-A

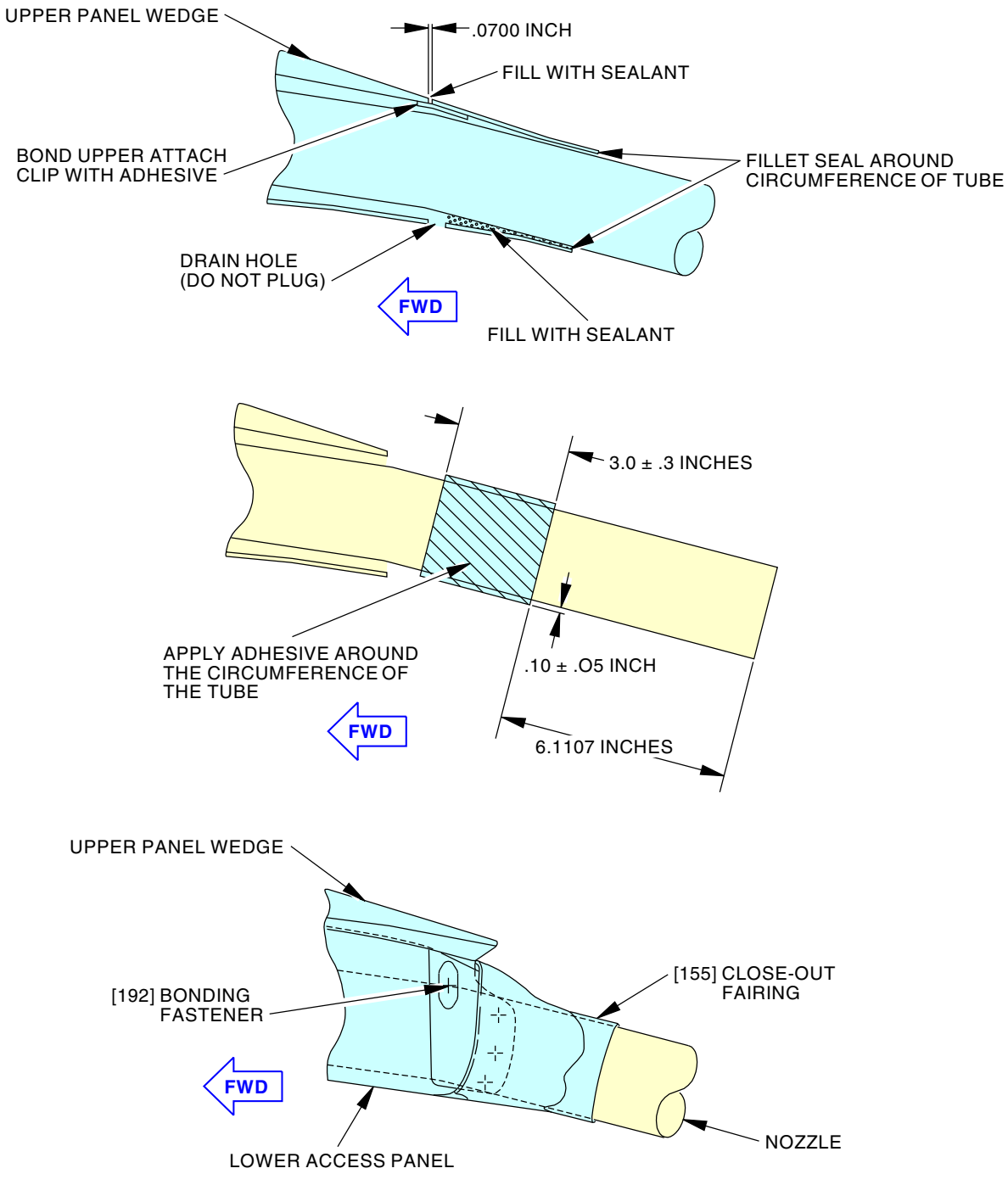


B

W42702 S0000122992_V2

Fuel Jettison Tube Installation
Figure 412/28-21-08-990-815 (Sheet 3 of 4)

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Fuel Jettison Tube Installation
Figure 412/28-21-08-990-815 (Sheet 4 of 4)

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TASK 28-21-08-400-815

25. Fuel Jettison Tube Installation

Figure 412

A. References

Reference	Title
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS5-95
A01076	Adhesive - Synthetic Rubber	BAC5010 Type 93 (BMS5-95 Class B)
C00528	Compound - Corrosion Preventive, Petroleum Hot Application (Soft Film)	MIL-C-11796 Class III
D00504	Grease - Petrolatum	VV-P-236
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

D. Location Zones

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

E. General

SUBTASK 28-21-08-420-011

(1) This task provides the procedure to install the fuel jettison tube in the left or the right wing.

(2) If the fuel jettison tube is replaced, a new close-out fairing must be bonded to the tube and the upper panel wedge.

F. Fuel Jettison Tube Installation

SUBTASK 28-21-08-420-012

(1) To install the fuel jettison tube in the wing trailing edge structure, do these steps:

(a) Position the tube [157].

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(b) Install the clamp [81] and spacer [7] on the tube [157] with screws [152] and [156], washers [153] and nuts [154].

(c) Install the clamp [22] and spacer [7] on the tube [157] with screws [8], washers [10], and nuts [9].

(d) Put the coupling nuts [74] on the ferrule of the tube [157] and fuel tube [108].

CAUTION

DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

(e) Put a retaining ring on each ferrule to hold the coupling nuts on the tubes.

(f) Apply a thin layer of petrolatum grease, D00504 to the new O-ring [61].

CAUTION

DO NOT USE THE SAME O-RING FOR THE FUEL LINE FITTINGS AFTER YOU TIGHTEN THE COUPLING ONE TIME. YOU MUST INSTALL NEW O-RINGS TO PREVENT FUEL LEAKS.

(g) Install the O-rings [61] on the tube [157] and fuel tube [108].

CAUTION

DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

(h) Put the second retaining ring on each ferruleTASK 20-10-23-400-801 of the tube [157] and the fuel tube [108].

(i) Make sure the tube [157] aligns to fuel tube [108]; turn the tube [157] along the longitudinal axis to adjust the tube.

CAUTION

DO NOT USE TOOLS TO TIGHTEN THE FITTINGS. DAMAGE TO THE FITTING COMPONENTS COULD OCCUR. THE ADJACENT FITTINGS COULD BECOME LOOSE.

(j) Manually tighten the coupling nut [74] to connect the tube [157] and the fuel tube [108].

(k) Install the MS20995C32 lockwire, G01048 to the coupling nut [74]

SUBTASK 28-21-08-410-007

(2) Install the applicable wing access panels:

(a) To install the upper wing panel [158], install 36 bolts [191] (BACN30XD3K7) and two bonding fasteners [192] (NAS8704).

1) For the bolts [191], apply corrosion preventive compound, C00528 to the countersunk hole and bore in the panel and immediately install the bolt.

2) If the fuel jettison tube [157] was replaced, do not install the bonding fasteners [192] through the closeout fairing [155] and the lower access panel [159].

3) If the fuel jettison tube [157] was installed again, install the bonding fasteners [192] through the closeout fairing [155] and the lower access panel [159].

SUBTASK 28-21-08-420-016

(3) If the fuel jettison tube [157] was replaced, install a new close-out fairing [155].

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(a) Dry fit the close-out fairing [155] on the tube [157]; align the fairing with the lower access panel [159] and the upper panel wedge.

1) If the close-out fairing [155] does not align, make adjustments to the tube [157].

(b) Apply the synthetic rubber adhesive, A01076 around the circumference of the tube [157] for the required length.

(c) Apply the synthetic rubber adhesive, A01076 to the entire length of the upper attach clip of the close-out fairing [155].

(d) Install the close-out fairing [155] on the tube [157], over the adhesive.

(e) Install the bonding fasteners [192] through the closeout fairing [155] and the lower access panel [159].

(f) Apply sealant, A00247 in the gap between the close-out fairing [155] and the lower access panel [159].

(4) Measure the bonding resistance between the access panels and the bonding fastener with a bonding intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

G. Put the Airplane Back to Its Usual Condition

SUBTASK 28-21-08-865-011

(1) For the left fuel jettison tube,

Remove the safety tag and close this circuit breaker:

Left Power Management Panel, P110

Row	Col	Number	Name
L	25	C28621	L FUEL JETT NOZ VLV

SUBTASK 28-21-08-865-012

(2) For the right fuel jettison tube,

Remove the safety tag and close this circuit breaker:

Right Power Management Panel, P210

Row	Col	Number	Name
K	12	C28620	R FUEL JETT NOZ VLV

SUBTASK 28-21-08-865-013

(3) Remove the safety tags and close these circuit breakers:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL
L	24	C28631	L FUEL JETT ISLN VLV

Right Power Management Panel, P210

Row	Col	Number	Name
K	13	C28630	R JETT ISLN VLV
K	14	C28646	R FUEL JETT PUMP CTRL

END OF TASK

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REFUEL/JETTISON MANIFOLD AND COUPLINGS - INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure contains a functional check of the bonding resistance between the structure and the refuel/jettison manifold near the jettison nozzles (outside the tank).

SFAR 88

TASK 28-21-08-200-801

2. Refuel/Jettison Manifold (Out of Tank) - Bonding Resistance Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Location Zones

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

D. Access Panels

Number	Name/Location
561JB	Lower Fuel Jettison Support Panel
561JT	Upper Fuel Jettison Support Panel
661JB	Lower Jettison Support Panel
661JT	Upper Fuel Jettison Support Panel

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E. Prepare for the Procedure

SUBTASK 28-21-08-865-016

(1) Open these circuit breakers and install safety tags:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL
L	24	C28631	L FUEL JETT ISLN VLV

Right Power Management Panel, P210

Row	Col	Number	Name
K	13	C28630	R JETT ISLN VLV
K	14	C28646	R FUEL JETT PUMP CTRL

(2) For the left fuel jettison manifold,

Open this circuit breaker and install safety tag:

Left Power Management Panel, P110

Row	Col	Number	Name
L	25	C28621	L FUEL JETT NOZ VLV

(3) For the right fuel jettison manifold,

Open this circuit breaker and install safety tag:

Right Power Management Panel, P210

Row	Col	Number	Name
K	12	C28620	R FUEL JETT NOZ VLV

SUBTASK 28-21-08-010-042

(4) Open these access panels to get access to the out of tank jettison manifold:

(a) Open these access panels for the left jettison manifold:

Number	Name/Location
561JB	Lower Fuel Jettison Support Panel
561JT	Upper Fuel Jettison Support Panel

(b) Open these access panels for the right jettison manifold:

Number	Name/Location
661JB	Lower Jettison Support Panel
661JT	Upper Fuel Jettison Support Panel

F. Electrical Bonding Measurement

SUBTASK 28-21-08-765-002

(1) Get access to the applicable out of tank fuel manifold section:

(a) Find the bonding jumper attached between the manifold and the structure.

1) Measure the bonding resistance between the bonding jumper and the structure with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

a) Make sure the resistance is 0.001 ohm (1 milliohm) or less.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 28-21-08-410-021

(1) Close the applicable access panels:

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(a) Close these access panels:

Number	Name/Location
561JB	Lower Fuel Jettison Support Panel
561JT	Upper Fuel Jettison Support Panel

(b) Close these access panels:

Number	Name/Location
661JB	Lower Jettison Support Panel
661JT	Upper Fuel Jettison Support Panel

SUBTASK 28-21-08-865-017

(2) For the left jettison manifold,

Remove the safety tag and close this circuit breaker:

Left Power Management Panel, P110

Row	Col	Number	Name
L	25	C28621	L FUEL JETT NOZ VLV

(3) For the right jettison manifold,

Remove the safety tag and close this circuit breaker:

Right Power Management Panel, P210

Row	Col	Number	Name
K	12	C28620	R FUEL JETT NOZ VLV

(4) Remove the safety tags and close these circuit breakers:

Left Power Management Panel, P110

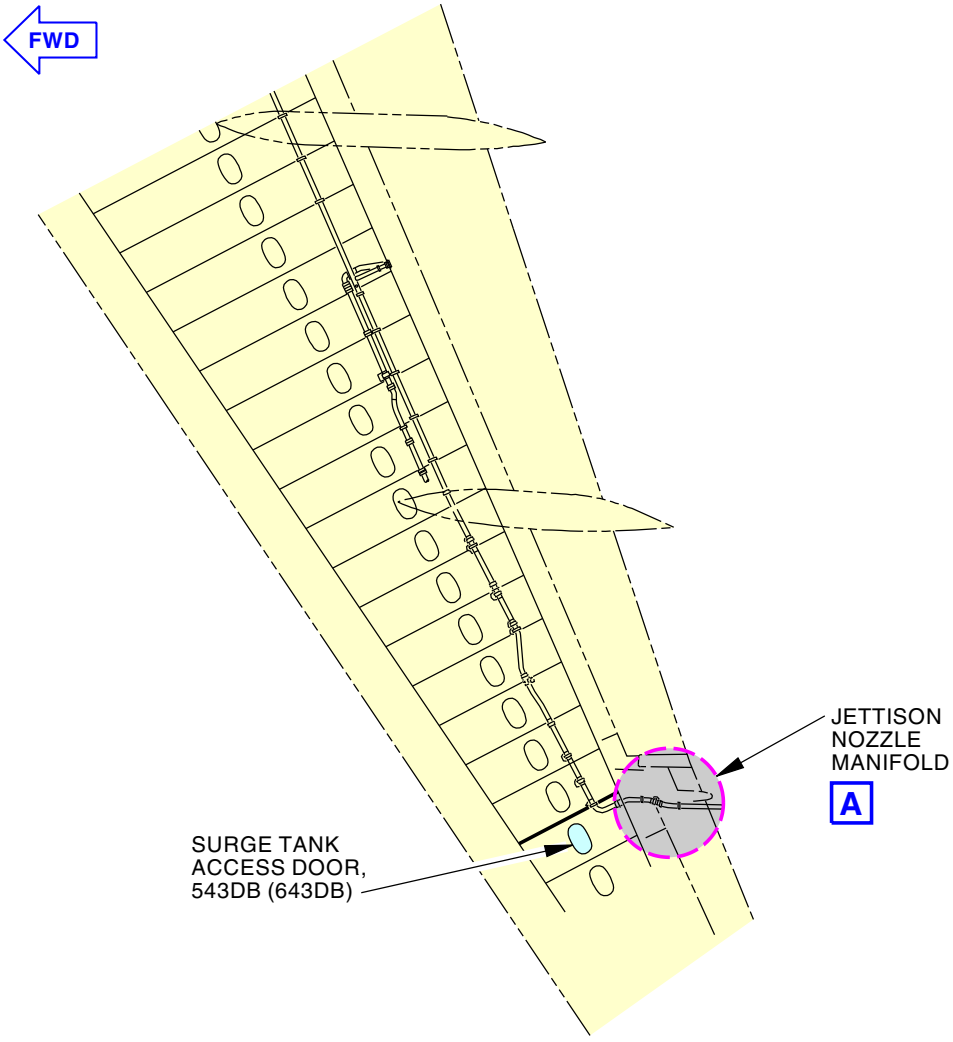
Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL
L	24	C28631	L FUEL JETT ISLN VLV

Right Power Management Panel, P210

Row	Col	Number	Name
K	13	C28630	R JETT ISLN VLV
K	14	C28646	R FUEL JETT PUMP CTRL

END OF TASK

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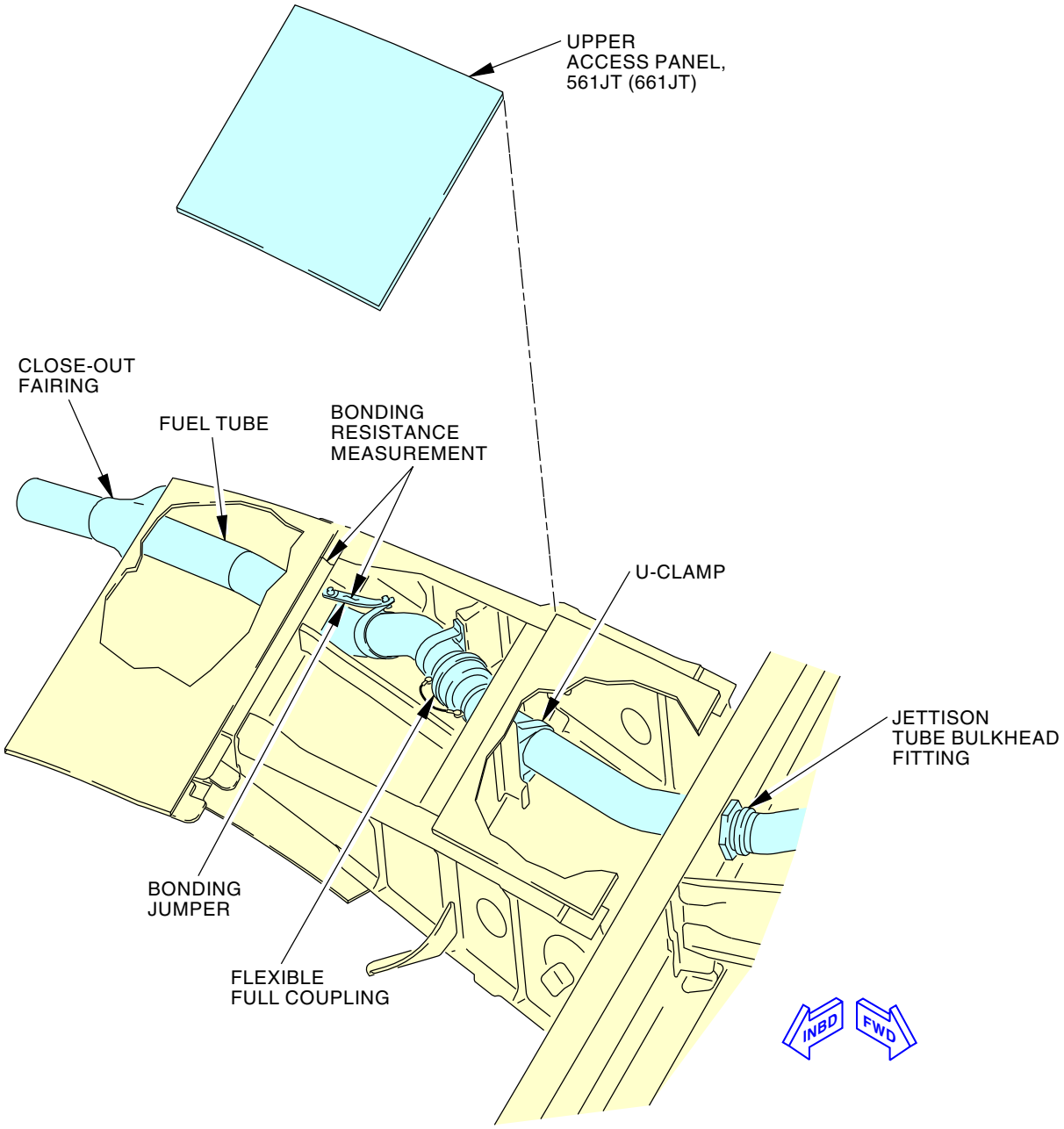


LEFT WING
(TOP VIEW)
(RIGHT WING IS ALMOST THE SAME)

1369156 S0000247207_V2

Refuel/Jettison Manifold (Out of Tank) - Bonding Resistance Check
Figure 601/28-21-08-990-821 (Sheet 1 of 2)

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JETISON NOZZLE MANIFOLD

A

1369147 S0000247213_V2

Refuel/Jettison Manifold (Out of Tank) - Bonding Resistance Check
Figure 601/28-21-08-990-821 (Sheet 2 of 2)

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INTEGRATED REFUEL PANEL (IRP) INDICATOR LIGHT - REMOVAL/INSTALLATION

1. General

A. This procedure contains two tasks. The first task removes the integrated refuel panel indicator light. The second task installs the indicator light.

TASK 28-21-09-000-801

2. Integrated Refuel Panel Indicator Light - Removal

(Figure 401)

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)

B. Location Zones

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing

C. Access Panels

Number	Name/Location
521DB	Refueling Station Door

D. Procedure

SUBTASK 28-21-09-860-002

(1) Open these circuit breakers and install safety tags:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
D	7	C28603	RFLNG CTRL GND
D	8	C28622	RFLNG QTY GND

Standby Power Management Panel, P310

Row	Col	Number	Name
A	11	C28005	RFLNG DR LTS
J	8	C28600	RFLNG CTRL
J	11	C28623	RFLNG QTY

SUBTASK 28-21-09-040-001

WARNING DO NOT OPERATE THE LEADING EDGE SLAT SYSTEM. WITH THE SLATS ACTIVATED, THE SLATS CAN MOVE QUICKLY AND CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Put a DO-NOT-OPERATE tag on the flap control lever, in the flight compartment (TASK 27-81-00-440-801).

SUBTASK 28-21-09-010-001

(3) Open this access panel:

Number	Name/Location
521DB	Refueling Station Door

(TASK 06-44-00-800-802).

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SUBTASK 28-21-09-020-001

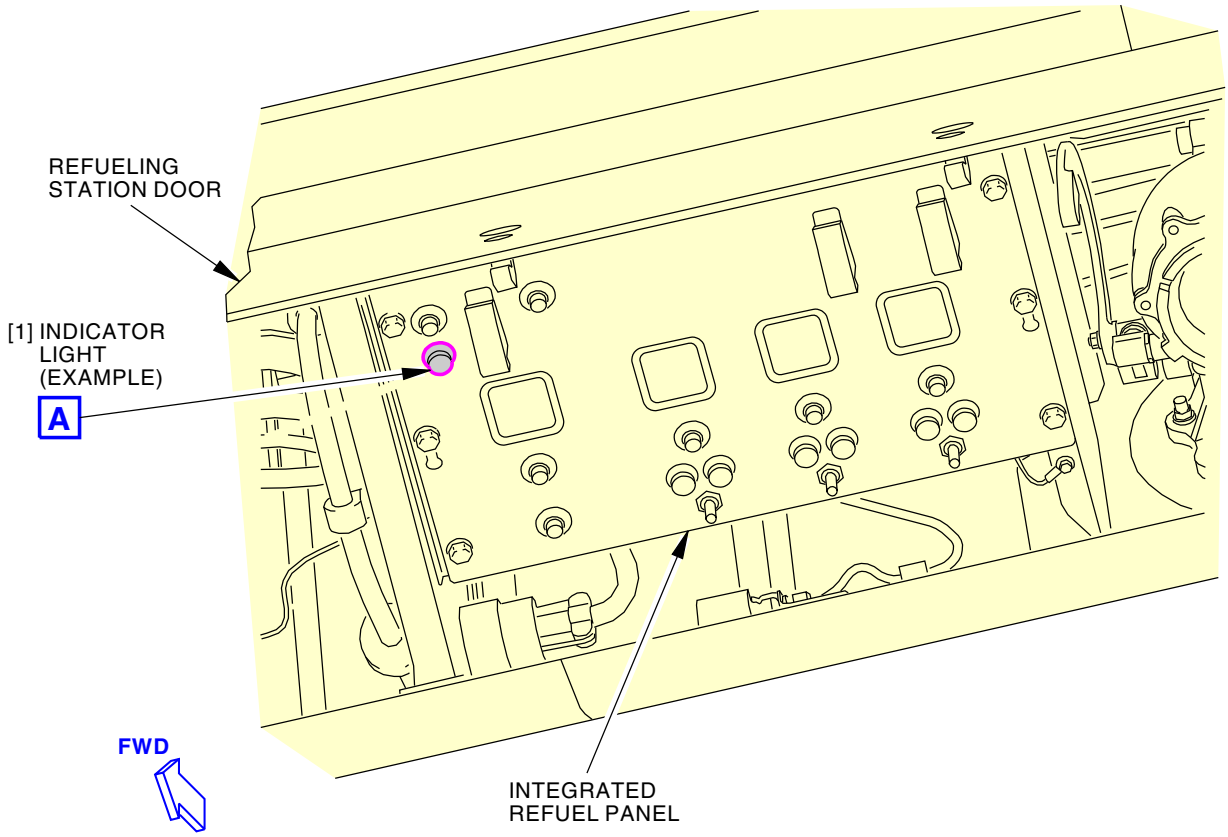
(4) Turn the indicator light cover [2] counterclockwise.

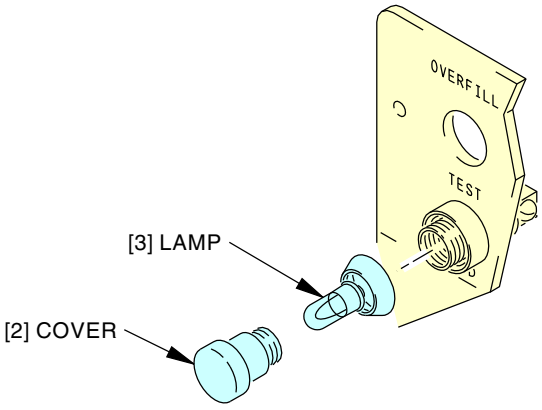
SUBTASK 28-21-09-020-002

(5) Pull the lamp [3] out of the cover.

END OF TASK

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INDICATOR LIGHT

A

G46207 S0006415059_V2

Integrated Refuel Panel Indicator Light Installation
Figure 401/28-21-09-990-801

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TASK 28-21-09-400-801

3. Integrated Refuel Panel Indicator Light - Installation

(Figure 401)

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)

B. Location Zones

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing

C. Access Panels

Number	Name/Location
521DB	Refueling Station Door

D. Procedure

SUBTASK 28-21-09-420-001

(1) Install the light in the indicator light cover.

SUBTASK 28-21-09-420-002

(2) Install the indicator light cover in the integrated refueling panel.

SUBTASK 28-21-09-860-003

(3) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-21-09-860-005

(4) Remove the safety tags and close these circuit breakers:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
D	7	C28603	RFLNG CTRL GND
D	8	C28622	RFLNG QTY GND

Standby Power Management Panel, P310

Row	Col	Number	Name
A	11	C28005	RFLNG DR LTS
J	8	C28600	RFLNG CTRL
J	11	C28623	RFLNG QTY

SUBTASK 28-21-09-210-001

(5) Make sure the fuel quantity displays (FQD) are on.

(a) The FQD will come on within 60 seconds after you close the circuit breakers.

1) Make sure the total fuel legend "TF" on the TOTAL/BACKUP display of the IRP [6] is on.

NOTE: Make sure the total fuel legend "TF" shows on the Total FQD. This shows there is 28 Vdc at the IRP [6].

2) Put the IRP power switch to the BATT position.

3) Make sure the total fuel legend "TF" is on and the refueling station lights are on.

4) Put the IRP power switch to the NORMAL position.

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SUBTASK 28-21-09-860-006

(6) Push the TEST IND switch to do a test of the fuel quantity indicators and blue valve position lights.

SUBTASK 28-21-09-210-002

(7) Make sure each blue valve position light comes on and then goes off.

NOTE: This tests the light bulb in the refuel valve light.

SUBTASK 28-21-09-720-001

(8) Push the DEFUEL VALVE light switch and make sure the light comes on.

SUBTASK 28-21-09-860-007

(9) Put the DEFUEL VALVE switch to the OPEN position.

(a) Make sure the blue valve light comes on.

(b) Put the DEFUEL VALVE switch to the CLOSED position.

(c) Make sure the blue valve light goes off.

SUBTASK 28-21-09-410-001

(10) Close this access panel:

Number	Name/Location
521DB	Refueling Station Door

(TASK 06-44-00-800-802).

SUBTASK 28-21-09-040-002

(11) Remove the DO-NOT-OPERATE tag from the flap control lever (TASK 27-81-00-440-801).

——— END OF TASK ———

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SECONDARY REFUEL VALVE - REMOVAL/INSTALLATION

1. General

A. There are two secondary refuel valves in the center tank. There is one secondary refuel valve installed on each side of the tank on the inboard side of rib 7.

B. The secondary refuel valves permit an increased fuel flow into the center tank during refueling.

C. This procedure contains two tasks. The first removes the secondary refuel valve. The second installs the secondary refuel valve.

TASK 28-21-10-000-801

2. Secondary Refuel Valve - Removal

A. General

(1) The secondary refuel valve is referred to as the valve [8] in this task.

B. References

Reference	Title
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-22-15-000-802-001	Fuel Line, Fitting and Coupling - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)

C. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

D. Access Panels

Number	Name/Location
531BB	Access Door
631BB	Access Door

E. Prepare for the Removal

SUBTASK 28-21-10-650-001

(1) Defuel the center tank (TASK 28-26-00-650-801).

SUBTASK 28-21-10-860-001



WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

SUBTASK 28-21-10-010-001

(3) Remove the applicable center tank access door and go into the tank (TASK 28-11-02-000-801)

(a) Remove the applicable access door(s):

Number	Name/Location
531BB	Access Door
631BB	Access Door

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F. Secondary Refuel Valve Removal

SUBTASK 28-21-10-020-001

(1) Disconnect the float valve tube [6].

(a) Discard the o-ring [7].

SUBTASK 28-21-10-020-002

(2) Remove the lockwire from the bolts [2].

SUBTASK 28-21-10-020-003

(3) Disconnect the rigid coupling [17] from the aft side of the valve [8] (TASK 28-22-15-000-802-001).

(a) Discard the o-ring [18].

SUBTASK 28-21-10-020-004

(4) Remove the bolts [2], washers [3], and nuts [4].

(a) Discard the gasket [5].

(b) Keep the body of the rigid coupling.

SUBTASK 28-21-10-020-005

(5) Remove the lockwire from the bolts [12].

SUBTASK 28-21-10-020-006

(6) Disconnect the rigid coupling [17] from the forward side of the valve [8] (TASK 28-22-15-000-802-001).

(a) Discard the o-ring [18].

SUBTASK 28-21-10-020-007

(7) Remove the bolts [12] and washers [13]

(a) Discard gasket [9] and gasket [11].

(b) Keep the body of the rigid coupling.

(c) Keep the orifice plate [10]

SUBTASK 28-21-10-020-009

(8) Remove the bolts [15] and washers [16].

SUBTASK 28-21-10-140-001

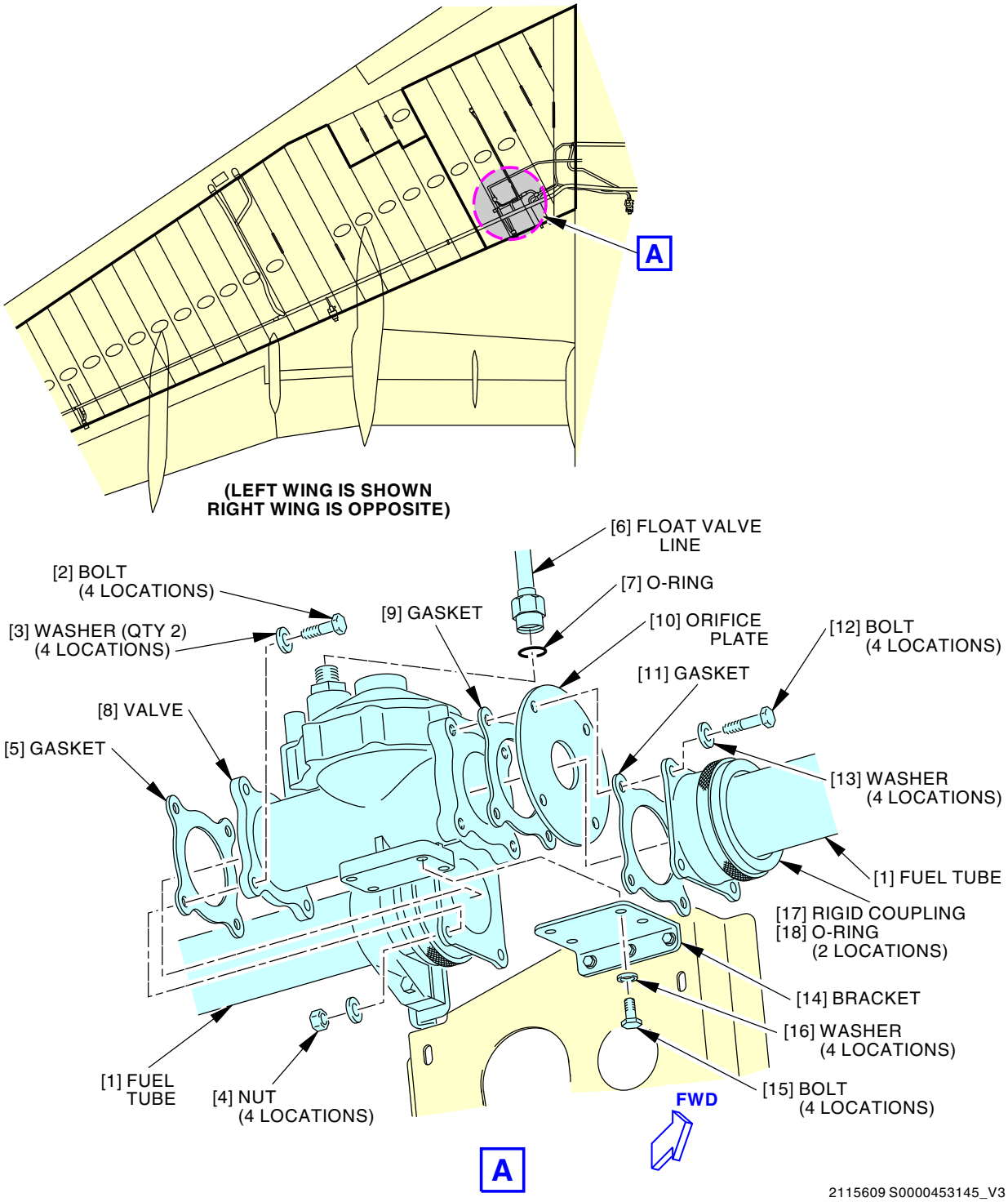
(9) Remove the sealant from the periphery of the valve [8] and bracket [14].

SUBTASK 28-21-10-020-010

(10) Remove the valve [8].

END OF TASK

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Secondary Refuel Valve Installation
Figure 401/28-21-10-990-801

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TASK 28-21-10-400-801

3. Secondary Refuel Valve - Installation

(Figure 401)

A. General

(1) The secondary refuel valve is referred to as the valve [8] in this task.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
20-30-92-910-801	Final Cleaning Prior to General Sealing (Series 92) (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)
28-22-15-400-802-001	Fuel Line, Fitting and Coupling - Installation (P/B 401)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)
51-31-01-390-804	Fillet Seal Application (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: $0855 Part #: 234350 Supplier: $0857 Part #: 311 Supplier: F6892 Part #: 411B60 Supplier: 3DN12 Part #: 411B90 Supplier: 3DN12 Part #: DAD5013 Supplier: $0856 Part #: DFD5019 Supplier: $0856 Part #: J5-0275-2010 Supplier: 435R8 Part #: SCD5019 Supplier: $0856 Part #: ST982LF-9 Supplier: 62176 Part #: TS1275-4 Supplier: 1DWR5

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(Continued)

Reference	Description
COM-4746	Handle - Sealant Removal Tool Part #: 310/1 Supplier: F6892 Part #: SHN0272 Supplier: $0856 Part #: SHR0272-T Supplier: 1DWR5 Part #: SHW0215 Supplier: $0856
STD-123	Brush - Soft Bristle

D. Consumable Materials

Reference	Description	Specification
A50110	Sealant	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
B01012	Solvent - Final Cleaning Prior To General Sealing - Series 92	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
5	Gasket	28-21-51-28-355	ARO 001-016
7	O-ring	28-21-51-28-345	ARO 001-016
8	Valve	28-21-02-02-100	ARO 001-016
9	Gasket	28-21-51-28-355	ARO 001-016
11	Gasket	28-21-51-28-355	ARO 001-016

F. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

G. Access Panels

Number	Name/Location
531BB	Access Door
631BB	Access Door

H. Prepare for the Installation

SUBTASK 28-21-10-120-001

(1) If new parts are to be installed, use an abrasive pad to remove the anodized finish from the faying surfaces of the valve [8] (SWPM 20-20-00).

NOTE: The faying surface is the surface that mates with the bracket [14].

SUBTASK 28-21-10-420-001

(2) Prepare the aft side of the valve [8]:

NOTE: These steps can be done outside of the tank.

(a) Hold a new gasket [5] on the aft side of the valve [8].

(b) Hold the body of the rigid coupling [17] on the gasket [5].

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(c) Install the four bolts [2], eight washers [3], and four nuts [4] to attach the body of the rigid coupling [17] to the valve [8].

(d) Install lockwire on the bolts [2].

SUBTASK 28-21-10-420-002

(3) Prepare the forward side of the valve [8]:

NOTE: These steps can be done outside of the tank.

(a) Hold a new gasket [9] on the forward side of the valve [8].

(b) Hold the orifice plate [10] on the gasket [9].

(c) Hold a new gasket [11] on the orifice plate [10].

(d) Hold the body of the rigid coupling [17] on the gasket [11].

(e) Install the four bolts [12] and washers [13] to attach the body of the rigid coupling [17] to the valve [8].

(f) Install lockwire on the bolts [12].

SUBTASK 28-21-10-860-002

WARNING

OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(4) Obey the fuel tank entry precautions (TASK 28-11-00-650-801)

SUBTASK 28-21-10-860-003

WARNING

DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(5) Go into the center tank to the valve location (TASK 28-11-00-010-801).

SUBTASK 28-21-10-110-001

(6) Remove the old sealant and clean the bracket [14], valve [8], and fasteners (if re-used).

(a) Use the sealant removal tool, COM-2481, and sealant removal tool handle, COM-4746 (or equivalent), to remove the old sealant from the bracket.

WARNING

DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(b) To remove the remaining sealant, grease, oil, dirt, and other contamination from the components, use one of these brushes/pads soaked with Series 92 solvent, B01012 (TASK 20-30-92-910-801):

1) soft bristle brush, STD-123

2) cotton wiper, G00034

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SUBTASK 28-21-10-110-002

(7) Do these steps to prepare the valve [8] and the bracket [14] for a sealed electrical faying surface bond:

WARNING

DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(a) Final clean the contact surfaces of the valve [8] and the bracket [14] with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

(b) Rub dry with a clean, dry cotton wiper, G00034.

(c) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

I. Secondary Refuel Valve Installation

SUBTASK 28-21-10-390-001

(1) Apply a thin continuous layer of sealant to the mounting surface of the valve [8].

(a) Use sealant, A50110, or sealant, A50155, for the faying surface seal.

(b) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

SUBTASK 28-21-10-420-003

(2) Do these steps to install the valve [8] to the bracket [14]:

(a) Install the four bolts [15] and washers [16].

(b) Make sure the sealant is continuously squeezed out along the edges of the contact surfaces.

(c) If there are gaps, bubbles or voids in the sealant squeeze out, then disassemble and apply more sealant.

(d) Shape the squeezed out sealant into a fillet seal (TASK 51-31-01-390-804).

(e) As an option, remove the extra squeezed out sealant.

NOTE: Make sure the sealant that remains is flush with the mating part edges.

(f) Measure the bonding resistance between the valve [8] and the bracket [14].

1) Use an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

2) Make sure the bonding resistance is 0.01 ohm (10 milliohms) or less.

SUBTASK 28-21-10-420-004

(3) Connect the rigid coupling [17] to the aft side of the valve [8] (TASK 28-22-15-400-802-001).

(a) Use a new o-ring [18].

SUBTASK 28-21-10-420-005

(4) Connect the rigid coupling [17] to the forward side of the valve [8] (TASK 28-22-15-400-802-001).

(a) Use a new o-ring [18].

SUBTASK 28-21-10-420-006

(5) Connect the float valve tube [6] to the valve [8].

(a) Install a new o-ring [7].

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SUBTASK 28-21-10-760-001

(6) Measure the bonding resistance between the fuel tubes [1] and the nearest primary structure.

(a) Use an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

(b) Make sure the bonding resistance is 0.10 ohm (100 milliohms) or less.

SUBTASK 28-21-10-760-002

(7) Measure the bonding resistance between the float valve tube [6] and the nearest primary structure.

(a) Use an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

(b) Make sure the bonding resistance is 0.10 ohm (100 milliohms) or less.

SUBTASK 28-21-10-410-001

(8) Install the applicable center tank access door (TASK 28-11-02-400-801)

(a) Install the applicable access door(s):

Number	Name/Location
531BB	Access Door
631BB	Access Door

J. Secondary Refuel Valve Post-Installation Test

SUBTASK 28-21-10-650-002

(1) Refuel the center tank (TASK 12-11-01-650-801).

NOTE: To do a test of the secondary refuel valve at nominal ground attitude, the center tank fuel quantity should be less than 162,000 lb (73,482 kg).

(a) Make sure the main tank refuel valves are closed.

(b) Make sure the center tank refuel valves are open.

(c) Connect fueling hoses to both refuel adapters on only one side of the plane.

SUBTASK 28-21-10-211-001

(2) Monitor the refuel rate for the center tank.

(a) Make sure both secondary refuel valves open.

NOTE: The secondary refuel valves increase the rate of refuel. At 35 psig (241 kPa) the refuel rate should be approximately 550 gpm (2082 l/min) with both secondary refuel valves operating. Without either secondary refuel valve, the refuel rate at 35 psig (241 kPa) would be approximately 400 gpm (1514 l/min)

(b) Make sure the refuel rate slows when the center tank contains between 172,000 lb (78,018 kg) and 182,000 lb (82,554 kg).

NOTE: The secondary refuel valve float valves close the secondary refuel valves at 95% of the volumetric shutoff (VSO). The fuel limit values are based on a nominal ground attitude of 0.54 degrees nose down pitch and 0.0 degree roll.

NOTE: The secondary refuel valves increase the rate of refuel. At 35 psig (241 kPa), the refuel rate should slow from approximately 550 gpm (2082 l/min) to approximately 400 gpm (1514 l/min). It is acceptable for the refuel to slow in steps if the secondary refuel valve on one side closes before the other.

K. Return the Airplane to Its Usual Condition

SUBTASK 28-21-10-650-003

(1) If it is necessary, rebalance or transfer fuel to make sure all airplane fuel loading requirements are met.

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(a) If it is necessary, do this task: Tank to Tank Transfer, TASK 28-26-00-650-802.

——— END OF TASK ———

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SECONDARY REFUEL VALVE FLOAT VALVE - REMOVAL/INSTALLATION

1. General

A. There are two secondary refuel valve float valves in the center tank. There is one secondary refuel valve float valve installed on each side of the tank on the outboard side of rib 6.

B. The secondary refuel valve float valve, opens and closes the secondary refuel valve based on the fuel level in the center tank.

C. This procedure contains two tasks. The first removes the secondary refuel valve float valve. The second installs the secondary refuel valve float valve.

TASK 28-21-11-000-801

2. Secondary Refuel Valve Float Valve - Removal

A. References

Reference	Title
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

C. Access Panels

Number	Name/Location
531BB	Access Door
631BB	Access Door

D. Prepare for the Removal

SUBTASK 28-21-11-650-001

(1) Defuel the center tank (TASK 28-26-00-650-801).

SUBTASK 28-21-11-650-002

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

SUBTASK 28-21-11-010-001

(3) Remove the applicable center tank access door and go into the tank (TASK 28-11-02-000-801)

(a) Remove the applicable access door(s):

Number	Name/Location
531BB	Access Door
631BB	Access Door

E. Secondary Refuel Valve Float Valve Removal

SUBTASK 28-21-11-020-001

(1) Disconnect the float valve tube [10].

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(a) Discard the o-ring [11].

SUBTASK 28-21-11-020-002

(2) Remove the bolt [5], three washers [6], and nut [7] to disconnect the bonding jumper [8].

SUBTASK 28-21-11-020-003

(3) Remove the bolts [2], washers [3], and nuts [4].

SUBTASK 28-21-11-140-001

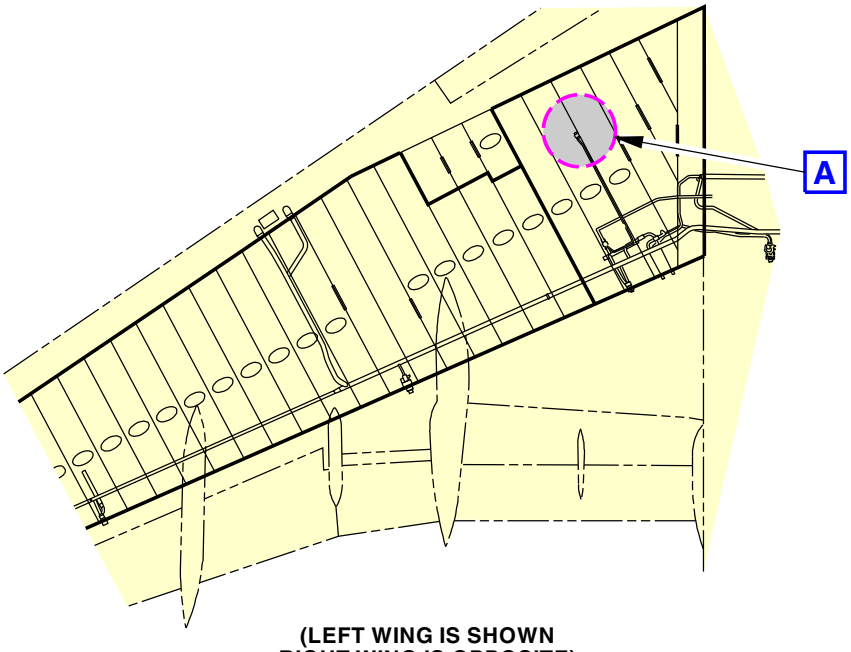
(4) Remove the sealant from the periphery of the float valve [9] and bracket [1].

SUBTASK 28-21-11-020-004

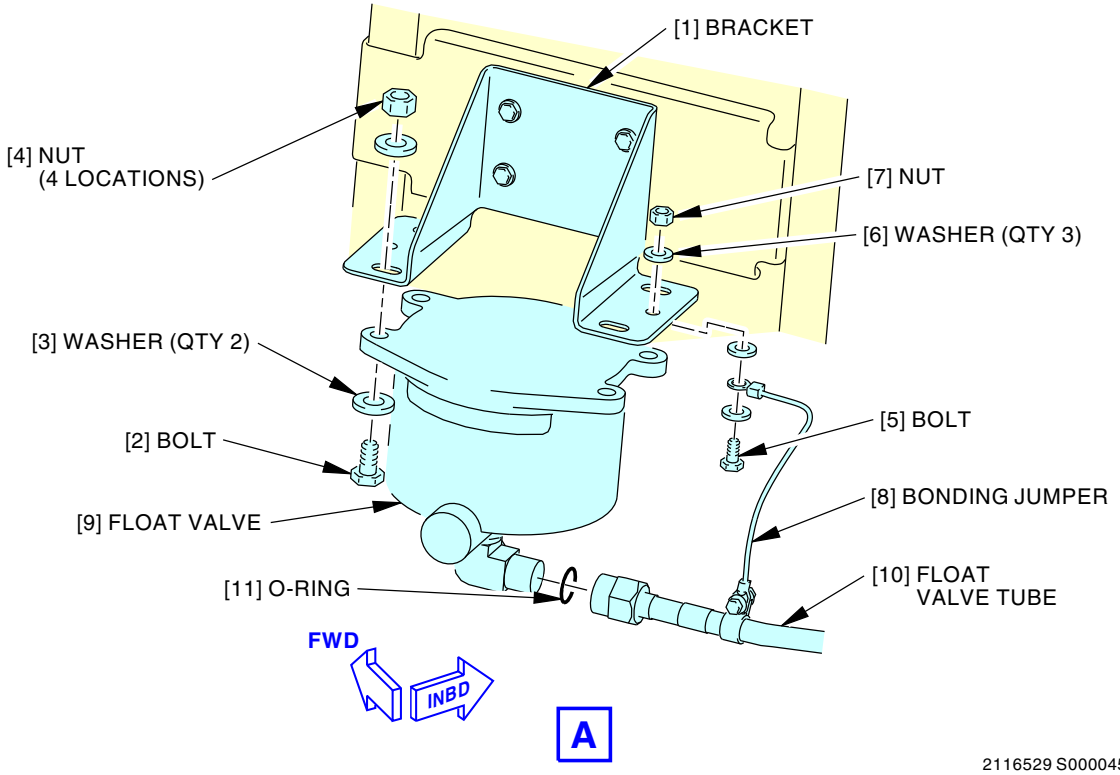
(5) Remove the float valve [9].

——— END OF TASK ———

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(LEFT WING IS SHOWN
RIGHT WING IS OPPOSITE)



Secondary Refuel Valve Float Valve Installation
Figure 401/28-21-11-990-801

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TASK 28-21-11-400-801

3. Secondary Refuel Valve Float Valve - Installation

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
20-30-92-910-801	Final Cleaning Prior to General Sealing (Series 92) (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)
51-31-01-390-804	Fillet Seal Application (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual
SWPM 20-20-10	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: $0855 Part #: 234350 Supplier: $0857 Part #: 311 Supplier: F6892 Part #: 411B60 Supplier: 3DN12 Part #: 411B90 Supplier: 3DN12 Part #: DAD5013 Supplier: $0856 Part #: DFD5019 Supplier: $0856 Part #: J5-0275-2010 Supplier: 435R8 Part #: SCD5019 Supplier: $0856 Part #: ST982LF-9 Supplier: 62176 Part #: TS1275-4 Supplier: 1DWR5
COM-4746	Handle - Sealant Removal Tool Part #: 310/1 Supplier: F6892 Part #: SHN0272 Supplier: $0856 Part #: SHR0272-T Supplier: 1DWR5 Part #: SHW0215 Supplier: $0856
STD-123	Brush - Soft Bristle

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C. Consumable Materials

Reference	Description	Specification
A50110	Sealant	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
B01012	Solvent - Final Cleaning Prior To General Sealing - Series 92	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
9	Float valve	28-21-02-02-040	ARO 001-016
11	O-ring	28-21-51-28-345	ARO 001-016

E. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

F. Access Panels

Number	Name/Location
531BB	Access Door
631BB	Access Door

G. Prepare for the Installation

SUBTASK 28-21-11-120-002

(1) If new parts are to be installed, use an abrasive pad to remove the anodized finish from the faying surfaces of the float valve [9] (SWPM 20-20-00).

NOTE: The faying surface is the surface that mates with the bracket [1].

SUBTASK 28-21-11-650-003

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Obey the fuel tank entry precautions (TASK 28-11-00-650-801).

SUBTASK 28-21-11-650-004

WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(3) Go into the center tank to the valve location (TASK 28-11-00-010-801).

SUBTASK 28-21-11-120-001

(4) Remove the old sealant and clean the float valve [9], bracket [1], and fasteners (if re-used).

(a) Use the sealant removal tool, COM-2481, and sealant removal tool handle, COM-4746 (or equivalent), to remove the old sealant from the bracket.

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WARNING

DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(b) To remove the remaining sealant, grease, oil, dirt, and other contamination from the components, use one of these brushes/pads soaked with Series 92 solvent, B01012 (TASK 20-30-92-910-801):

1) soft bristle brush, STD-123

2) cotton wiper, G00034

SUBTASK 28-21-11-110-001

(5) Do these steps to prepare the float valve [9] and the bracket [1] for a sealed electrical faying surface bond:

WARNING

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(a) Final clean the contact surfaces of the float valve [9] and the bracket [1] with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

(b) Rub dry with a clean, dry cotton wiper, G00034.

(c) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

H. Secondary Refuel Valve Float Valve Installation

SUBTASK 28-21-11-390-001

(1) Apply a thin continuous layer of sealant to the mounting surface of the float valve [9].

(a) Use sealant, A50110, or sealant, A50155, for the faying surface seal.

(b) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

SUBTASK 28-21-11-420-001

(2) Do these steps to install the float valve [9] to the bolt [2]:

(a) Install the four bolts [2], eight washers [3], and four nuts [4].

(b) Make sure the sealant is continuously squeezed out along the edges of the contact surfaces.

(c) If there are gaps, bubbles or voids in the sealant squeeze out, then disassemble and apply more sealant.

(d) Shape the squeezed out sealant into a fillet seal (TASK 51-31-01-390-804).

(e) As an option, remove the extra squeezed out sealant.

NOTE: Make sure the sealant that remains is flush with the mating part edges.

(f) Measure the bonding resistance between the float valve [9] and the bracket [1].

1) Use an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

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2) Make sure the bonding resistance is 0.01 ohm (10 milliohms) or less.

SUBTASK 28-21-11-420-002

(3) Install a new o-ring [11] on the float valve tube [10].

SUBTASK 28-21-11-420-003

(4) Connect the float valve tube [10] to the float valve [9].

SUBTASK 28-21-11-420-004

(5) Do these steps to install the bonding jumper [8] to the bracket [1] (SWPM 20-20-10):

(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

(b) Install the bolt [2], three washers [3], and nut [4] to connect the bonding jumper [8].

(c) Measure the electrical bonding resistance between the float valve tube [10] and the rib (SWPM 20-20-00).

1) Make sure the bonding resistance is 0.10 ohm (100 milliohms) or less.

SUBTASK 28-21-11-410-001

(6) Install the applicable center tank access door (TASK 28-11-02-400-801)

(a) Install the applicable access door(s):

Number	Name/Location
531BB	Access Door
631BB	Access Door

I. Secondary Refuel Valve Float Valve Post-Installation Test

SUBTASK 28-21-11-650-005

(1) Refuel the center tank (TASK 12-11-01-650-801).

NOTE: To do a test of the secondary refuel valve at nominal ground attitude, the center tank fuel quantity should be less than 162,000 lb (73,482 kg).

(a) Make sure the main tank refuel valves are closed.

(b) Make sure the center tank refuel valves are open.

(c) Connect fueling hoses to both refuel adapters on only one side of the plane.

SUBTASK 28-21-11-211-002

(2) Monitor the refuel rate for the center tank.

(a) Make sure both secondary refuel valves open.

NOTE: The secondary refuel valves increase the rate of refuel. At 35 psig (241 kPa) the refuel rate should be approximately 550 gpm (2082 l/min) with both secondary refuel valves operating. Without either secondary refuel valve, the refuel rate at 35 psig (241 kPa) would be approximately 400 gpm (1514 l/min)

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(b) Make sure the refuel rate slows when the center tank contains between 172,000 lb (78,018 kg) and 182,000 lb (82,554 kg).

NOTE: The secondary refuel valve float valves close the secondary refuel valves at 95% of the volumetric shutoff (VSO). The fuel limit values are based on a nominal ground attitude of 0.54 degrees nose down pitch and 0.0 degree roll.

NOTE: The secondary refuel valves increase the rate of refuel. At 35 psig (241 kPa) the refuel rate should slow from approximately 550 gpm (2082 l/min) to approximately 400 gpm (1514 l/min). It is acceptable for the refuel to slow in steps if the secondary refuel valve on one side closes before the other.

J. Return the Airplane to Its Usual Condition

SUBTASK 28-21-11-650-006

(1) If it is necessary, rebalance or transfer fuel to make sure all airplane fuel loading requirements are met.

(a) If it is necessary, do this task: Tank to Tank Transfer, TASK 28-26-00-650-802.

——— END OF TASK ———

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ENGINE FUEL FEED SYSTEM - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

(1) Engine fuel feed system - deactivation.

(2) Engine fuel feed system - activation.

TASK 28-22-00-040-801-001

2. Engine Fuel Feed System - Deactivation

A. General

(1) This task will deactivate the engine fuel feed system.

B. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

C. Procedure

SUBTASK 28-22-00-860-278-001

WARNING

BE CAREFUL WHEN YOU DO WORK AROUND ENERGIZED PANELS. HIGH VOLTAGES CAN KILL YOU.

(1) Open these circuit breakers and install safety tags:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
C	18	C28302	R FWD FUEL BOOST PUMP L AC SECT 2
E	2	C28303	L AFT FUEL BOOST PUMP
E	5	C28307	L FWD FUEL BOOST PUMP
L	21	C28647	CTR L OVRD FUEL PUMP CTRL
L	22	C28645	L FUEL JETT PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
E	27	C28300	R AFT FUEL BOOST PUMP
F	27	C28306	R FWD FUEL BOOST PUMP R XFR
K	14	C28646	R FUEL JETT PUMP CTRL
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

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D. Engine Fuel Feed System - Tryout

NOTE: This tryout is to make sure that the engine fuel feed system is in a zero energy state.

SUBTASK 28-22-00-860-279-001

WARNING

BE CAREFUL WHEN YOU DO WORK AROUND ENERGIZED PANELS. HIGH VOLTAGES CAN KILL YOU.

(1) Make sure that these circuit breakers are open and have safety tags:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
C	18	C28302	R FWD FUEL BOOST PUMP L AC SECT 2
E	2	C28303	L AFT FUEL BOOST PUMP
E	5	C28307	L FWD FUEL BOOST PUMP
L	21	C28647	CTR L OVRD FUEL PUMP CTRL
L	22	C28645	L FUEL JETT PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
E	27	C28300	R AFT FUEL BOOST PUMP
F	27	C28306	R FWD FUEL BOOST PUMP R XFR
K	14	C28646	R FUEL JETT PUMP CTRL
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

SUBTASK 28-22-00-700-002-001

(2) Push these pump switches in the P5 Flight Deck Overhead Panel and listen to make sure that the pumps do not operate:

NOTE: Running pumps are audible from the ground under everyday sound levels.

(a) R FWD FUEL PUMPS

(b) L FWD FUEL PUMPS

(c) R AFT FUEL PUMPS

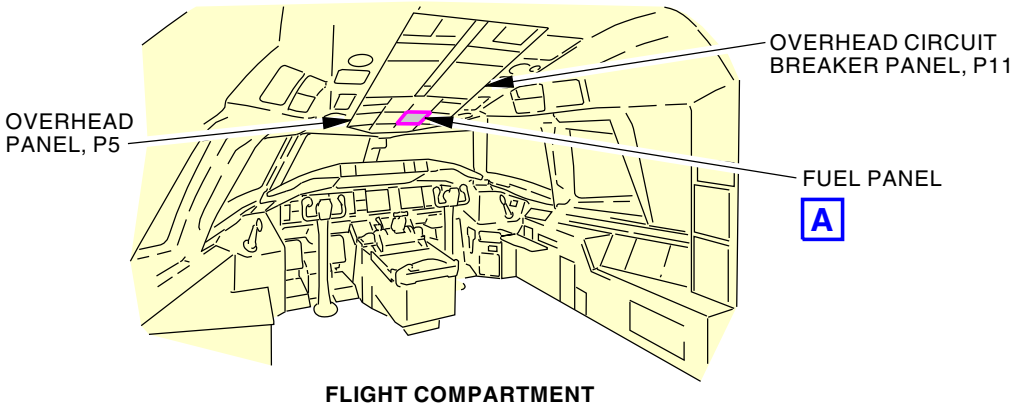
(d) L AFT FUEL PUMPS

(e) R CENTER FUEL PUMPS

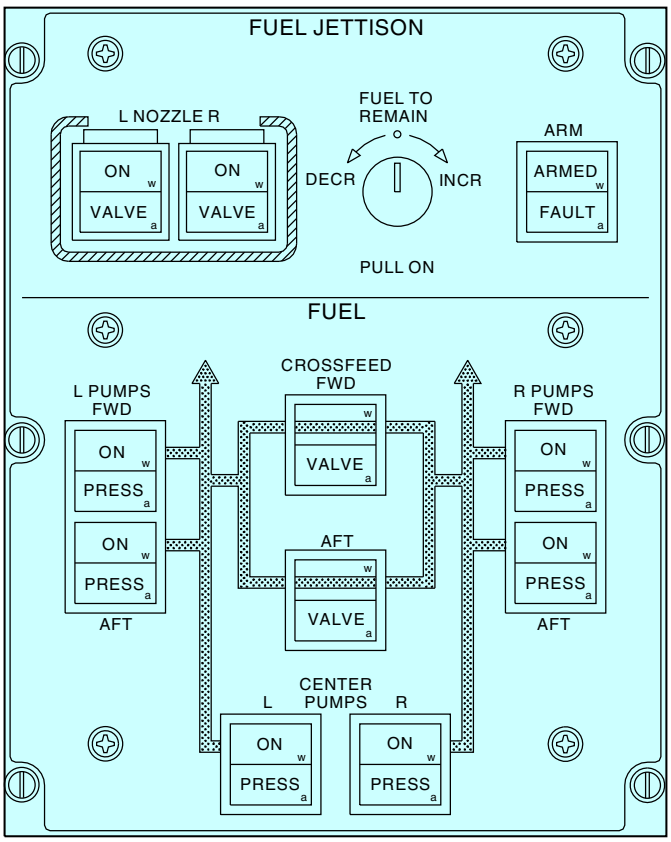
(f) L CENTER FUEL PUMPS

END OF TASK

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FLIGHT COMPARTMENT



FUEL/FUEL JETTISON PANEL, M28001

A

E14374 S0006415066_V2

Engine Fuel Feed System
Figure 201/28-22-00-990-817-001

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TASK 28-22-00-440-801-001

3. Engine Fuel Feed System - Activation

A. General

(1) This task will activate the engine fuel feed system.

B. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

C. Procedure

SUBTASK 28-22-00-860-280-001

WARNING BE CAREFUL WHEN YOU DO WORK AROUND ENERGIZED PANELS. HIGH VOLTAGES CAN KILL YOU.

(1) Remove the safety tags and close these circuit breakers:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
C	18	C28302	R FWD FUEL BOOST PUMP L AC SECT 2
E	2	C28303	L AFT FUEL BOOST PUMP
E	5	C28307	L FWD FUEL BOOST PUMP
L	21	C28647	CTR L OVRD FUEL PUMP CTRL
L	22	C28645	L FUEL JETT PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
E	27	C28300	R AFT FUEL BOOST PUMP
F	27	C28306	R FWD FUEL BOOST PUMP R XFR
K	14	C28646	R FUEL JETT PUMP CTRL
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

SUBTASK 28-22-00-700-003-001

(2) Push these pump switches in the P5 Flight Deck Overhead Panel and listen to make sure that the pumps operate:

NOTE: Running pumps are audible from the ground under everyday sound levels.

(a) R FWD FUEL PUMPS

(b) L FWD FUEL PUMPS

(c) R AFT FUEL PUMPS

(d) L AFT FUEL PUMPS

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(e) R CENTER FUEL PUMPS

(f) L CENTER FUEL PUMPS

(3) Release each switch.

END OF TASK

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ENGINE FUEL FEED SYSTEM - ADJUSTMENT/TEST

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure contains these tasks.

(1) Fuel Feed pumps and Crossfeed Valves - Functional Test

(2) Engine Fuel Spar Valve - Electrical Control and Indication Test

(3) Engine Fuel Spar Valve - Installation Test

(4) Fuel Shutoff Valve Battery - Test

(5) Fuel Scavenge System - Functional Test

ARO 001-004 PRE SB 777-28-0078

(6) Abbreviated Fuel Scavenge System - Functional Test

ARO ALL

(7) Engine Fuel Suction Feed - Operational Test

(8) Main Tank Fuel Boost Pump Ground Fault Interrupter - Operational Test

(9) Center Fuel Tank Override/Jettison Pump Ground Fault Protection - Operational Test

(10) Fuel Jettison Pump Ground Fault Protection - Operational Test

(11) AC Fuel Pumps - Insulation Resistance Test

TASK 28-22-00-730-801

2. Engine Fuel Feed Pumps and Crossfeed Valves - Functional Test

(Figure 501, Figure 502, Figure 503)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)

B. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing

C. Access Panels

Number	Name/Location
521DB	Refueling Station Door

D. Prepare for the Test

SUBTASK 28-22-00-860-001

(1) Make sure the switches are in the positions shown (Table 501):

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Table 501/28-22-00-993-806 Fuel Pump and Crossfeed Valve Test

SWITCH/CONTROL	POSITION	LOCATION
DISCH APU	NORMAL	Cargo Fire/Engine Control Module (P5 OVERHEAD PANEL)
FUEL CROSSFEED AFT	CLOSED	Fuel Panel (P5 OVERHEAD PANEL)
FUEL CROSSFEED FWD	CLOSED	Fuel Panel (P5 OVERHEAD PANEL)
FUEL L PUMPS AFT	OFF	Fuel Panel (P5 OVERHEAD PANEL)
FUEL L PUMPS FWD	OFF	Fuel Panel (P5 OVERHEAD PANEL)
FUEL R PUMPS AFT	OFF	Fuel Panel (P5 OVERHEAD PANEL)
FUEL R PUMPS FWD	OFF	Fuel Panel (P5 OVERHEAD PANEL)
FUEL CENTER PUMPS L	OFF	Fuel Panel (P5 OVERHEAD PANEL)
FUEL CENTER PUMPS R	OFF	Fuel Panel (P5 OVERHEAD PANEL)
DISCH LEFT	NORMAL	Engine Fire Control Module (P8 AISLE STAND PANEL)
DISCH RIGHT	NORMAL	Engine Fire Control Module (P8 AISLE STAND PANEL)
L FUEL CONTROL	CUTOFF	P10 CONTROL STAND
R FUEL CONTROL	CUTOFF	P10 CONTROL STAND

SUBTASK 28-22-00-860-002

(2) Make sure that these circuit breakers are closed:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
C	18	C28302	R FWD FUEL BOOST PUMP L AC SECT 2
E	2	C28303	L AFT FUEL BOOST PUMP
E	5	C28307	L FWD FUEL BOOST PUMP
L	21	C28647	CTR L OVRD FUEL PUMP CTRL
L	23	C28629	FUEL XFEED VLV FWD
L	26	C28607	L AFT FUEL BOOST PUMP CTRL
L	27	C28606	R FWD FUEL BOOST PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
E	27	C28300	R AFT FUEL BOOST PUMP
F	27	C28306	R FWD FUEL BOOST PUMP R XFR
K	11	C28609	R AFT FUEL BOOST PUMP CTRL
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

Standby Power Management Panel, P310

Row	Col	Number	Name
B	2	C28604	L FWD FUEL BOOST PUMP CTRL
G	9	C28612	FUEL XFEED VLV AFT

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SUBTASK 28-22-00-860-003

(3) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-22-00-650-001

(4) Make sure the fuel tanks have the fuel quantities as follows (Figure 501):

(a) Make sure there is 5000 lb (2268 kg) of fuel (or more) in each main fuel tank.

(b) Make sure there is 5000 lb (2268 kg) of fuel (or more) in the center fuel tank.

(c) To refuel the fuel tanks (if it is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

SUBTASK 28-22-00-860-061

(5) To get access to the integrated refuel panel (IRP) (Figure 502).

(a) Open this access panel and make sure it remains open during the test.

Number	Name/Location
521DB	Refueling Station Door

NOTE: If you operate the override/jettison pumps with the door closed, you will generate nuisance EICAS messages.

E. Test of the Fuel Boost Pumps - Control and Indication

SUBTASK 28-22-00-210-001

(1) Make sure that the amber PRESS light is on for these switch-lights, on the Fuel Panel (P5 Overhead Panel):

(a) FUEL L PUMPS AFT

(b) FUEL L PUMPS FWD

(c) FUEL R PUMPS AFT

(d) FUEL R PUMPS FWD

SUBTASK 28-22-00-210-002

(2) Make sure the FUEL PRESS ENG L+R advisory message shows on the EICAS display (Figure 501).

SUBTASK 28-22-00-860-070

WARNING DO NOT OPERATE ANY FUEL PUMP IF THE AMBER PRESS LIGHT COMES ON AND STAYS ON. FUEL VAPORS IN THE TANK MAY IGNITE AND CAUSE A FIRE OR EXPLOSION.

(3) To operate the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

(a) Immediately set the applicable fuel pump switch-light(s) to the off position if the amber PRESS light comes on and stays on.

SUBTASK 28-22-00-860-004

(4) Push the FUEL L PUMPS FWD switch-light to the ON position.

(a) Make sure that the amber PRESS light goes off, for the FUEL L PUMPS FWD switch-light.

NOTE: The amber PRESS light will go off in 5 seconds.

(b) Make sure the FUEL PRESS ENG L+R advisory message does not show on the EICAS display.

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(c) Make sure the FUEL PUMP L FWD advisory message does not show on the EICAS display.

SUBTASK 28-22-00-860-005

(5) Push the FUEL L PUMPS FWD switch-light to the off position.

(a) Make sure that the amber PRESS light is on, for the FUEL L PUMPS FWD switch-light.

(b) Make sure the FUEL PRESS ENG L+R advisory message shows on the EICAS display.

SUBTASK 28-22-00-860-006

(6) Push the FUEL L PUMPS AFT switch-light to the ON position.

(a) Make sure that the amber PRESS light goes off, for the FUEL L PUMPS AFT switch-light.

NOTE: The amber PRESS light will go off in 5 seconds.

(b) Make sure the FUEL PRESS ENG L+R advisory message does not show on the EICAS display.

(c) Make sure the FUEL PUMP L AFT advisory message does not show on the EICAS display.

SUBTASK 28-22-00-860-007

(7) Push the FUEL L PUMPS AFT switch-light to the off position.

(a) Make sure that the amber PRESS light is on, for the FUEL L PUMPS AFT switch-light.

(b) Make sure the FUEL PRESS ENG L+R advisory message shows on the EICAS display.

SUBTASK 28-22-00-860-008

(8) Push the FUEL R PUMPS FWD switch-light to the ON position.

(a) Make sure that the amber PRESS light goes off, for the FUEL R PUMPS FWD switch-light.

NOTE: The amber PRESS light will go off in 5 seconds.

(b) Make sure the FUEL PRESS ENG L+R advisory message does not show on the EICAS display.

(c) Make sure the FUEL PUMP R FWD advisory message does not show on the EICAS display.

SUBTASK 28-22-00-860-009

(9) Push the FUEL R PUMPS FWD switch-light to the off position.

(a) Make sure that the amber PRESS light is on, for the FUEL R PUMPS FWD switch-light.

(b) Make sure the FUEL PRESS ENG L+R advisory message shows on the EICAS display.

SUBTASK 28-22-00-860-010

(10) Push the FUEL R PUMPS AFT switch-light to the ON position.

(a) Make sure that the amber PRESS light goes off, for the FUEL R PUMPS AFT switch-light.

NOTE: The amber PRESS light will go off in 5 seconds.

(b) Make sure the FUEL PUMP R AFT advisory message does not show on the EICAS display.

(c) Make sure the FUEL PRESS ENG L+R advisory message does not show on the EICAS display.

SUBTASK 28-22-00-860-011

(11) Push the FUEL R PUMPS AFT switch-light to the off position.

(a) Make sure that the amber PRESS light is on, for the FUEL R PUMPS AFT switch-light.

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(b) Make sure the FUEL PRESS ENG L+R advisory message shows on the EICAS display.

SUBTASK 28-22-00-860-062

(12) Put the 28 - Fuel Management maintenance page on the EICAS lower center display.

F. Test the Override/Jettison Pumps - Control and Indication

SUBTASK 28-22-00-010-013

(1) Go to the integrated refuel panel (IRP), P28 (Figure 502).

SUBTASK 28-22-00-860-077

(2) Put the DEFUEL VALVE control switch in the OPEN position, on the IRP, P28.

SUBTASK 28-22-00-860-012

(3) Push the FUEL CENTER PUMPS L switch-light, on the Fuel Panel (P5 Overhead Panel), to the ON position.

(a) Make sure the COMMAND and STATUS indication for the L OVRD/JETT PUMP show as ON and PRESS respectively, on the 28 - Fuel Management maintenance page.

SUBTASK 28-22-00-860-013

(4) Push the FUEL CENTER PUMPS L switch-light to the off position.

(a) Make sure the COMMAND and STATUS indication for the L OVRD/JETT PUMP show as OFF and NO PRESS respectively, on the 28 - Fuel Management maintenance page.

SUBTASK 28-22-00-860-014

(5) Push the FUEL CENTER PUMPS R switch-light to the ON position.

(a) Make sure the COMMAND and STATUS indication for the R OVRD/JETT PUMP show as ON and PRESS respectively, on the 28 - Fuel Management maintenance page.

SUBTASK 28-22-00-860-015

(6) Push the FUEL CENTER PUMPS R switch-light to the off position.

(a) Make sure the COMMAND and STATUS indication for the R OVRD/JETT PUMP show as OFF and NO PRESS respectively, on the 28 - Fuel Management maintenance page.

SUBTASK 28-22-00-860-063

(7) Set the IND LTS switch to the TEST position, on the P5 Overhead Panel.

(a) Make sure that the amber PRESS lights come on for the FUEL CENTER PUMPS L and R switch-lights.

G. Test the Engine Fuel Crossfeed Valves

SUBTASK 28-22-00-860-016

(1) Go to the integrated refuel panel (IRP), P28 (Figure 502).

SUBTASK 28-22-00-860-017

(2) Put the RIGHT MAIN REFUEL VALVE CONTROL switch to the OPEN position, on the IRP, P28.

SUBTASK 28-22-00-860-018

(3) Put the DEFUEL VALVE switch to the OPEN position, on the IRP, P28.

SUBTASK 28-22-00-860-019

(4) To monitor the fuel system components on the 28 - Fuel Management maintenance page go to the EICAS lower center display (Figure 501), do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

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SUBTASK 28-22-00-860-020

(5) Push the FUEL CROSSFEED FWD switch-light, on the Fuel Panel (P5 Overhead Panel), to the open position.

(a) Make sure the COMMAND and STATUS indications for the forward crossfeed valve show as OPEN and OPEN respectively, on the 28 - Fuel Management maintenance page.

SUBTASK 28-22-00-860-071

WARNING DO NOT OPERATE ANY FUEL PUMP IF THE AMBER PRESS LIGHT COMES ON AND STAYS ON. FUEL VAPORS IN THE TANK MAY IGNITE AND CAUSE A FIRE OR EXPLOSION.

(6) To operate the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

(a) Immediately set the applicable fuel pump switch-light(s) to the off position if the amber PRESS light comes on and stays on.

SUBTASK 28-22-00-860-021

(7) Push the FUEL L PUMPS FWD switch-light, on the Fuel Panel (P5 Overhead Panel), to the ON position.

(a) Make sure 1000 lb (454 kg) of fuel is transferred from the left main tank to the right main tank.

NOTE: The fuel will transfer in approximately 2 minutes.

SUBTASK 28-22-00-860-022

(8) Push the FUEL L PUMPS FWD switch-light to the off position.

SUBTASK 28-22-00-860-023

(9) Push the FUEL CROSSFEED FWD switch-light to the closed position.

(a) Make sure the COMMAND and STATUS indications for the forward crossfeed valve show as CLOSED and CLOSED respectively, on the 28 - Fuel Management Maintenance page.

SUBTASK 28-22-00-860-024

(10) Push the FUEL CROSSFEED AFT switch-light, on the Fuel Panel (P5 Overhead Panel), to the open position.

(a) Make sure the COMMAND and STATUS indications for the aft crossfeed valve show as OPEN and OPEN respectively, on the 28 - Fuel Management Maintenance page.

SUBTASK 28-22-00-860-025

(11) Push the FUEL L PUMPS FWD switch-light to the ON position.

(a) Make sure 1000 lb (454 kg) of fuel, as shown on the EICAS display, is transferred from the left main tank to the right main tank.

NOTE: The fuel will transfer in approximately 2 minutes.

SUBTASK 28-22-00-860-026

(12) Push the FUEL L PUMPS FWD switch-light to the off position.

SUBTASK 28-22-00-860-027

(13) Push the FUEL CROSSFEED AFT switch-light to the closed position.

(a) Make sure the COMMAND and STATUS indications for the aft crossfeed valve show as CLOSED and CLOSED respectively, on the 28 - Fuel Management maintenance page.

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SUBTASK 28-22-00-860-028

(14) Push the FUEL L PUMPS FWD switch-light to the ON position.

(a) Make sure no fuel is transferred, as shown on the EICAS display, from the left main tank to the right main tank.

NOTE: Three minutes is sufficient time to make sure there is no fuel transfer.

SUBTASK 28-22-00-860-029

(15) Push the FUEL L PUMPS FWD switch-light to the off position.

SUBTASK 28-22-00-860-030

(16) Put the REFUEL VALVE CONTROL switch for the right main tank in the CLOSE position.

SUBTASK 28-22-00-860-031

(17) Put the DEFUEL VALVE switch in the CLOSE position.

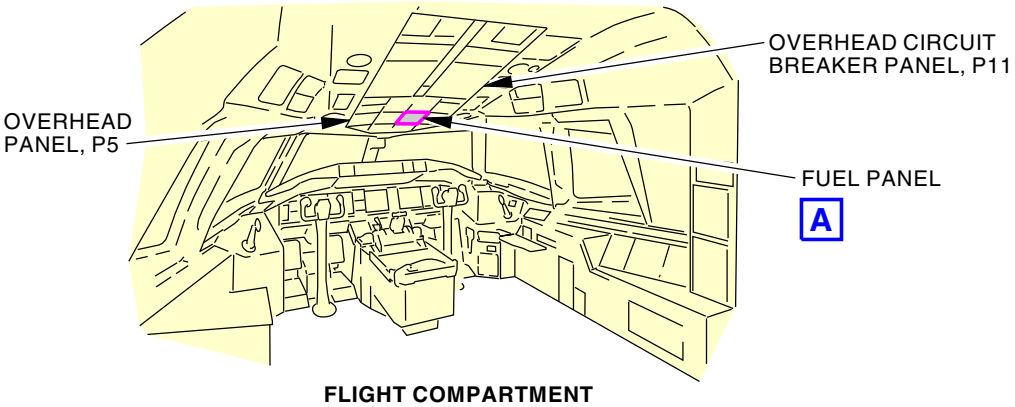
SUBTASK 28-22-00-860-032

(18) Close this access panel:

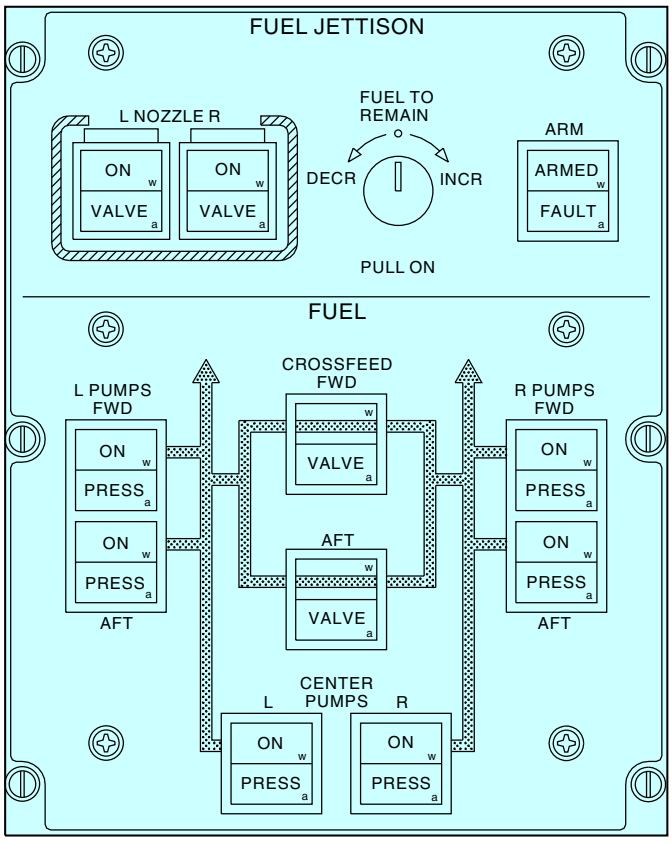
Number	Name/Location
521DB	Refueling Station Door

——— END OF TASK ———

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FLIGHT COMPARTMENT



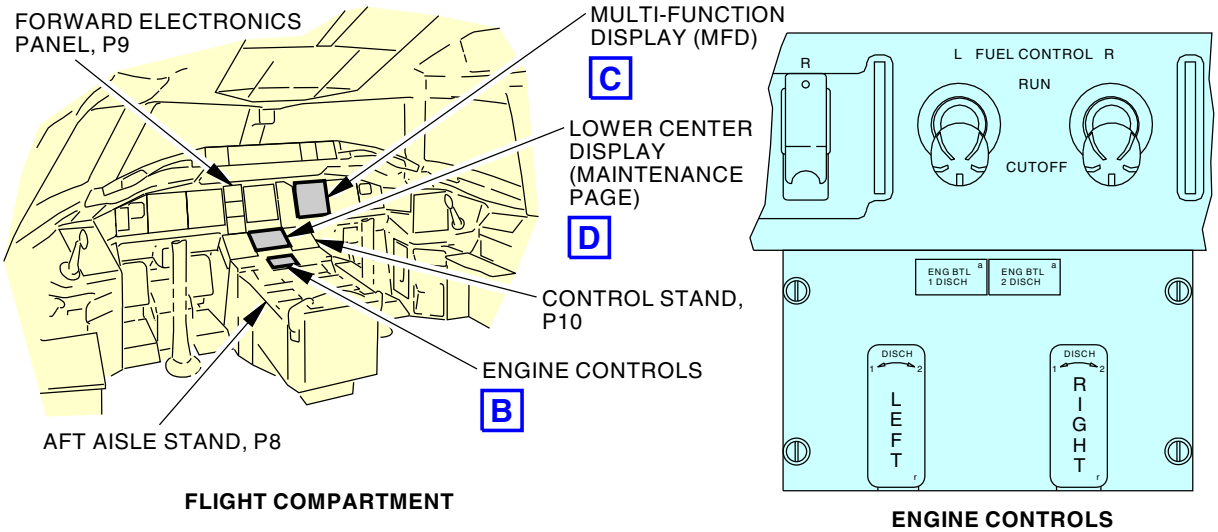
FUEL/FUEL JETTISON PANEL, M28001

A

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Engine Fuel Feed System
Figure 501/28-22-00-990-801 (Sheet 1 of 2)

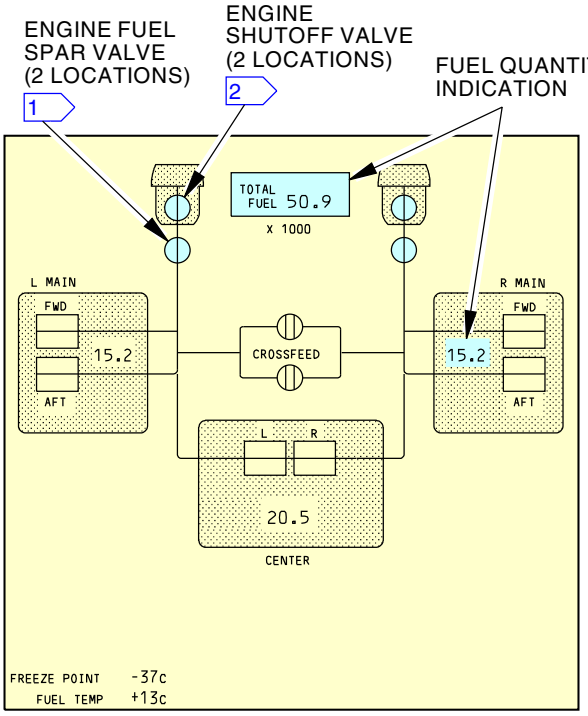
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FLIGHT COMPARTMENT

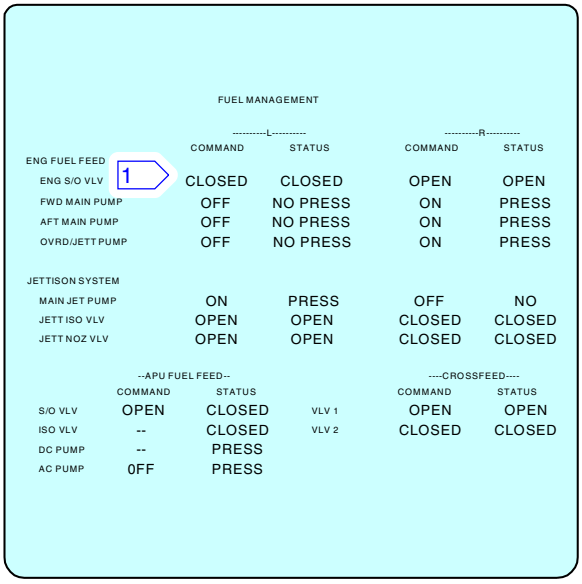
ENGINE CONTROLS

B



MULTI-FUNCTION DISPLAY (MFD)

C



LOWER CENTER DISPLAY

D

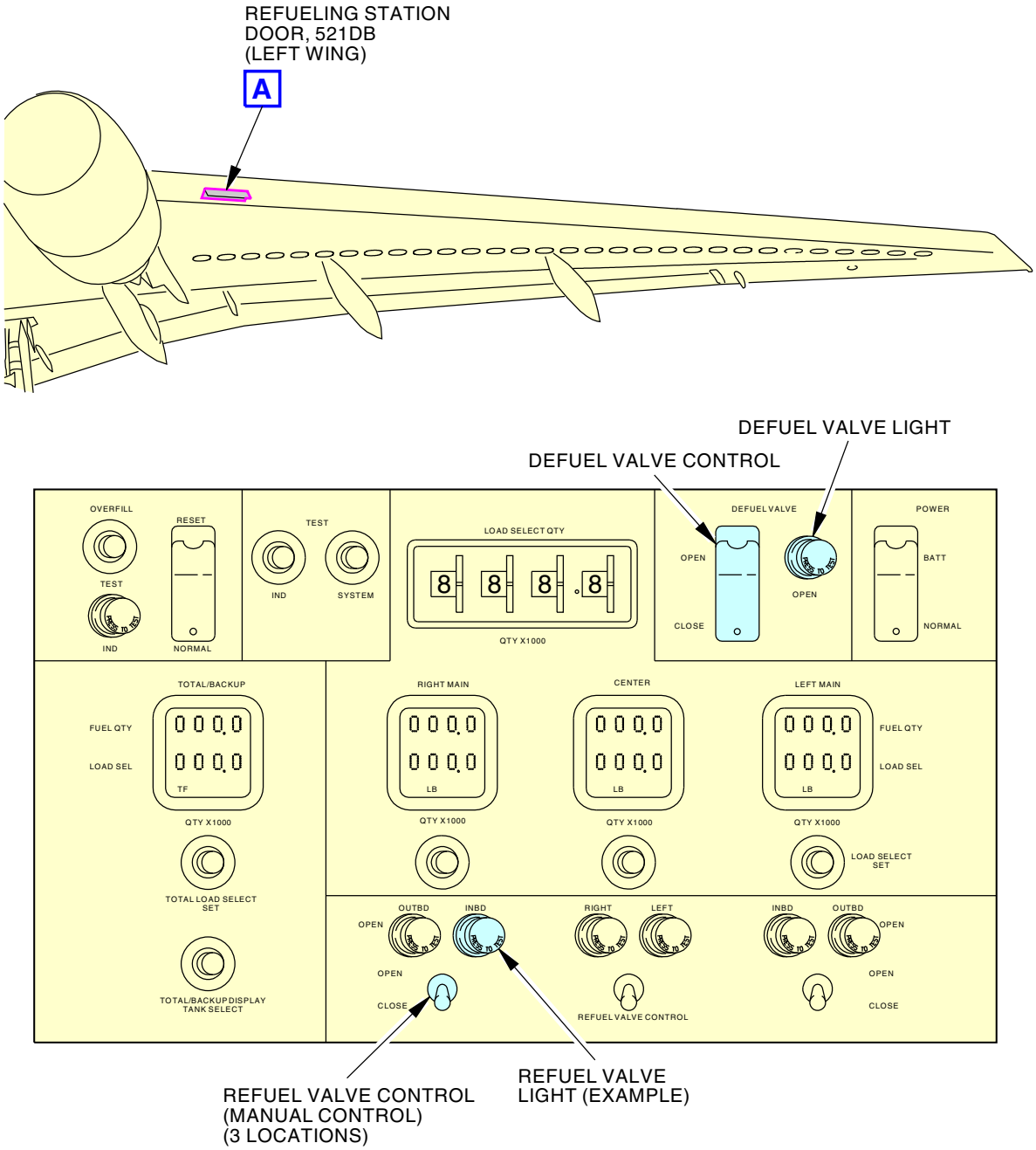
1 THESE ARE THE SAME VALVES.

2 THE ENGINE SHUTOFF VALVE IS INSTALLED ON THE ENGINE AND IS NOT SHOWN ON THE FUEL MANAGEMENT MAINTENANCE PAGE.

E14375 S0006415067_V2

Engine Fuel Feed System
Figure 501/28-22-00-990-801 (Sheet 2 of 2)

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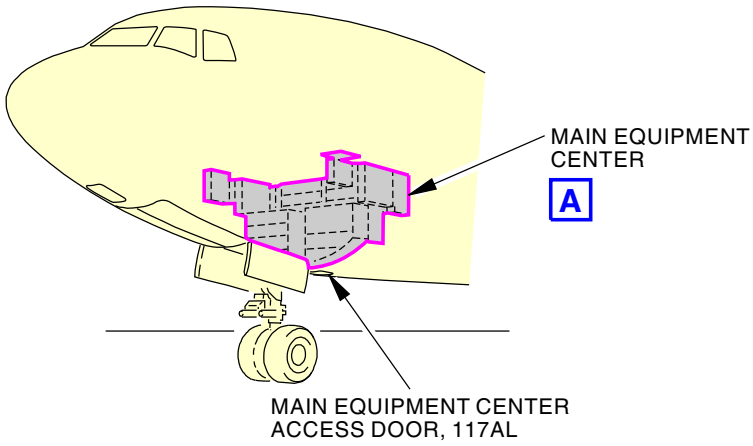
INTEGRATED REFUEL PANEL (IRP), P28

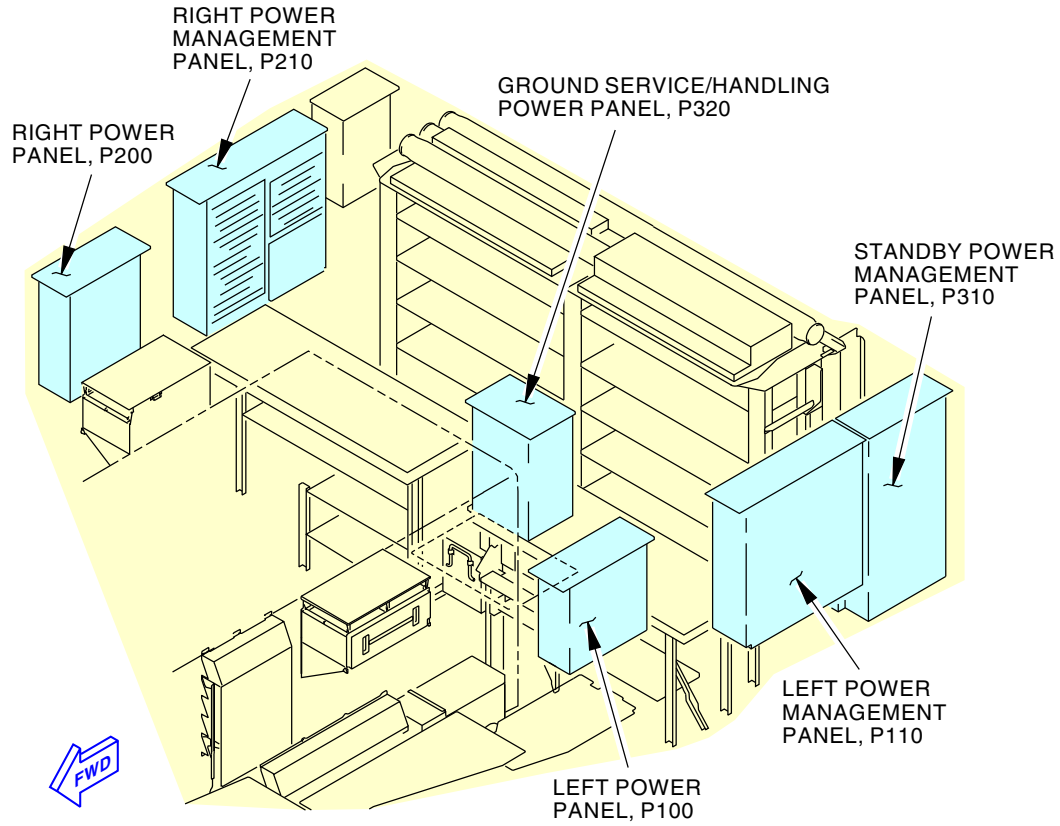
A

E16956 S0006415068_V2

Refueling Station
Figure 502/28-22-00-990-802

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MAIN EQUIPMENT CENTER

A

E23113 S0006415069_V2

Main Equipment Center Installation
Figure 503/28-22-00-990-803

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TASK 28-22-00-710-801

3. Engine Fuel Spar Valve - Electrical Control and Indication Test

(Figure 501)

A. General

(1) This test checks the left and right engine fuel spar valves indication and electrical control.

B. References

Reference	Title
71-00-00-800-835-H00	Engine Start (Selection) (P/B 201)
FIM 24-23 TASK 802	IDG Fire Switch Has Been Pulled - Fault Isolation
FIM 28-22 TASK 840	Fuel Spar Valve, Left Engine (Not In Commanded Position) - Fault Isolation
FIM 28-22 TASK 841	Fuel Spar Valve, Right Engine (Not In Commanded Position) - Fault Isolation

C. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right
426	Right Thrust Reverser - Right Engine
551	Rear Spar to Landing Gear Support Beam - Left Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

D. Access Panels

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel
651DB	Inboard Fixed Trailing Edge Panel

E. Spar Valve Electrical Control and Indication Test

SUBTASK 28-22-00-860-174

(1) Make sure that the ENGINE AUTOSTART switch-light, on the Cargo Fire/Engine Control Module (P5 Overhead Panel), is in the OFF position.

SUBTASK 28-22-00-010-029

(2) Open these access panels:

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel
651DB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-22-00-720-002

(3) Do these steps to test the spar valves:

(a) Open these circuit breakers:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	5	C28001	L ENGINE FUEL SPAR VALVE
A	19	C28002	R ENGINE FUEL SPAR VALVE
C	22	C28648	FUEL BATTERY CHARGE

(b) Make sure the STATUS message FUEL SPAR VALVE L shows on the EICAS display.

(c) Make sure the STATUS message FUEL SPAR VALVE R shows on the EICAS display.

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(d) Make sure the STATUS message FUEL SOV BATTERY shows on the EICAS display.

(e) Do these steps to do a check of the redundant wiring from the fire switches to the spar valves:

1) Disconnect the left spar valve connector, DV28164.
2) Do a check for continuity from pin 5 to pin 6 on DV28164.
3) Connect connector DV28164 again.
4) Disconnect the right spar valve connector, DV28264.
5) Do a check for continuity from pin 5 to pin 6 on DV28264.
6) Connect connector DV28264 again.

(f) Close these circuit breakers:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	5	C28001	L ENGINE FUEL SPAR VALVE
A	19	C28002	R ENGINE FUEL SPAR VALVE
C	22	C28648	FUEL BATTERY CHARGE

Open these circuit breakers and install safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	1	C74401	L ENG STBY IGN 1
A	2	C74407	L ENG STBY IGN 2
A	14	C74400	R ENG STBY IGN 1
A	15	C74406	R ENG STBY IGN 2
E	1	C74403	L ENG IGN 1
E	2	C74404	R ENG IGN 2
E	14	C74405	L ENG IGN 2
E	15	C74402	R ENG IGN 1

(g) Put the L and R FUEL CONTROL switches to the RUN position, on the P10 Control Stand (Figure 501).

(h) Make sure the COMMAND and STATUS indication for the left and right engine fuel spar valves show as OPEN and OPEN respectively, on the 28 - Fuel Management maintenance page.

(i) Go to the left and right engine fuel spar valve actuators.

1) Make sure the manual override handle moves to the OPEN position.

(j) Remove the "FUEL SPAR VALVE L" and "FUEL SPAR VALVE R" status messages from EICAS.

1) To remove the messages, select the erase function next to the message on the ATA 31 Maintenance Task screen.

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CAUTION DO NOT TURN THE ENGINE FIRE SWITCH. IF YOU TURN THE ENGINE FIRE SWITCH, THE FIRE EXTINGUISHING EQUIPMENT WILL DISCHARGE.

(k) Pull the DISCH LEFT and RIGHT switches to the FIRE position, on the Engine Fire Control Module (P8 Aisle Stand Panel) (Figure 501).

NOTE: When the DISCH LEFT switch is pulled and the L FUEL CONTROL switch is at RUN for more than 10 seconds, the EICAS Status message FUEL SPAR VALVE L will latch. When the DISCH RIGHT switch is pulled and the R FUEL CONTROL switch is at RUN for more than 10 seconds, the EICAS Status message FUEL SPAR VALVE R will latch.

(l) Make sure the COMMAND and STATUS indication for the left and right engine fuel spar valves show as CLOSED and CLOSED respectively, on the 28 - Fuel Management maintenance page.

CAUTION DO NOT TURN THE ENGINE FIRE SWITCH. IF YOU TURN THE ENGINE FIRE SWITCH, THE FIRE EXTINGUISHING EQUIPMENT WILL DISCHARGE.

(m) Push the DISCH LEFT and RIGHT switches to the NORMAL position.

(n) Make sure the COMMAND and STATUS indication for the left and right engine fuel spar valves show as OPEN and OPEN respectively, on the 28 - Fuel Management maintenance page.

(o) Put the L and R FUEL CONTROL switches to the CUTOFF position.

Remove the safety tags and close these circuit breakers:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	1	C74401	L ENG STBY IGN 1
A	2	C74407	L ENG STBY IGN 2
A	14	C74400	R ENG STBY IGN 1
A	15	C74406	R ENG STBY IGN 2
E	1	C74403	L ENG IGN 1
E	2	C74404	R ENG IGN 2
E	14	C74405	L ENG IGN 2
E	15	C74402	R ENG IGN 1

(p) Make sure the COMMAND and STATUS indication for the left and right engine fuel spar valves show as CLOSED and CLOSED respectively, on the 28 - Fuel Management maintenance page.

(q) Go to the left and right engine fuel spar valve actuators.

1) Make sure the manual override handle moves to the CLOSED position.

(r) Make sure the STATUS message FUEL SPAR VALVE L does not show on the EICAS display.

NOTE: When the DISCH LEFT switch is pulled and the L FUEL CONTROL switch is at RUN for more than 10 seconds, the EICAS Status message FUEL SPAR VALVE L will latch.

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1) If the STATUS message FUEL SPAR VALVE L is latched, unlatch the message. To do this, do this task: Fuel Spar Valve, Left Engine (Not In Commanded Position) - Fault Isolation, FIM 28-22 TASK 840

(s) Make sure the STATUS message FUEL SPAR VALVE R does not show on the EICAS display.

NOTE: When the DISCH RIGHT switch is pulled and the R FUEL CONTROL switch is at RUN for more than 10 seconds, the EICAS Status message FUEL SPAR VALVE R will latch.

1) If the STATUS message FUEL SPAR VALVE R is latched, unlatch the message. To do this, do this task: Fuel Spar Valve, Right Engine (Not In Commanded Position) - Fault Isolation, FIM 28-22 TASK 841

(t) Make sure that these maintenance messages show in the EXISTING FAULTS on the MAT:

1) For the left supply shutoff valve: 24-31531 Engine Fire Switch L is Pulled.

2) For the right supply shutoff valve: 24-31532 Engine Fire Switch R is Pulled.

(u) To clear the maintenance messages 24-31532 and 24-31531, do these steps:

1) Push the L GEN CTRL switch on the P5 panel two times.

2) Push the R GEN CTRL switch on the P5 panel two times.

3) Do this task: Engine Start (Selection), TASK 71-00-00-800-835-H00.

4) If the MAT shows NOT ACTIVE for the maintenance message while the engine operates, then you have cleared the messages.

5) If the MAT continues to show ACTIVE or LATCHED for the maintenance message while the engine operates, do this task: FIM 24-23 TASK 802.

SUBTASK 28-22-00-410-017

(4) Close these access panels:

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel
651DB	Inboard Fixed Trailing Edge Panel

——— END OF TASK ———

TASK 28-22-00-720-801

4. Engine Fuel Spar Valve Installation - Test

(Figure 501)

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This test makes sure the spar valves close and do not leak.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)

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(Continued)

Reference	Title
28-22-01 P/B 401	ENGINE FUEL SPAR VALVE AND ADAPTER/SHAFT - REMOVAL/INSTALLATION
71-00-00-800-833-H00	Power Plant Test Reference Table (P/B 501)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)

D. Consumable Materials

Reference	Description	Specification
D00552 [C02-019]	Oil - Engine Lubricating	GE Spec. D50TF1

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Packing	73-11-01-03-095	ARO ALL
4	Packing	73-11-01-03-065	ARO ALL

F. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right
414	Right Fan Cowl - Left Engine
416	Right Thrust Reverser - Left Engine
424	Right Fan Cowl - Right Engine
426	Right Thrust Reverser - Right Engine

G. Prepare for the Test

SUBTASK 28-22-00-860-034

(1) Make sure these switches are in the positions shown (Table 502):

Table 502/28-22-00-993-807 Engine Fuel Spar Valve Test

SWITCH/CONTROL	POSITION	LOCATION
DISCH APU	NORMAL	Cargo Fire/Engine Control Module (P5 OVERHEAD PANEL)
FUEL CROSSFEED AFT	CLOSED	Fuel Panel (P5 OVERHEAD PANEL)
FUEL CROSSFEED FWD	CLOSED	Fuel Panel (P5 OVERHEAD PANEL)
FUEL L PUMPS AFT	OFF	Fuel Panel (P5 OVERHEAD PANEL)
FUEL L PUMPS FWD	OFF	Fuel Panel (P5 OVERHEAD PANEL)
FUEL R PUMPS AFT	OFF	Fuel Panel (P5 OVERHEAD PANEL)

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Table 502/28-22-00-993-807 Engine Fuel Spar Valve Test (Continued)

SWITCH/CONTROL	POSITION	LOCATION
FUEL R PUMPS FWD	OFF	Fuel Panel (P5 OVERHEAD PANEL)
FUEL CENTER PUMPS L	OFF	Fuel Panel (P5 OVERHEAD PANEL)
FUEL CENTER PUMPS R	OFF	Fuel Panel (P5 OVERHEAD PANEL)
DISCH LEFT	NORMAL	Engine Fire Control Module (P8 AISLE STAND PANEL)
DISCH RIGHT	NORMAL	Engine fire Control Module (P8 AISLE STAND PANEL)
L FUEL CONTROL	CUTOFF	P10 CONTROL STAND
R FUEL CONTROL	CUTOFF	P10 CONTROL STAND
FUEL JETTISON ARM	OFF	Fuel Jettison Panel (P5 OVERHEAD PANEL)

SUBTASK 28-22-00-860-035

(2) Make sure that these circuit breakers are closed:

Left Power Management Panel, P110

Row	Col	Number	Name
E	2	C28303	L AFT FUEL BOOST PUMP
L	26	C28607	L AFT FUEL BOOST PUMP CTRL

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	5	C28001	L ENGINE FUEL SPAR VALVE
A	19	C28002	R ENGINE FUEL SPAR VALVE

Right Power Management Panel, P210

Row	Col	Number	Name
E	27	C28300	R AFT FUEL BOOST PUMP
K	11	C28609	R AFT FUEL BOOST PUMP CTRL

SUBTASK 28-22-00-650-002

(3) Make sure the fuel tanks have the fuel quantities that follow (Figure 502):

(a) Make sure there is more than 1000 lb (454 kg) of fuel in each main fuel tank.

(b) To refuel the fuel tanks (if it is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

H. Spar Valve and Adapter/Shaft Test

SUBTASK 28-22-00-860-067

WARNING BE CAREFUL WHEN YOU DO WORK ON THE ENGINE PARTS AFTER THE ENGINE IS STOPPED. THE ENGINE PARTS CAN STAY HOT FOR ALMOST 1 HOUR.

WARNING DO NOT TOUCH HOT PARTS WITHOUT APPLICABLE GLOVES. HOT PARTS CAN CAUSE AN INJURY.

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(WARNING PRECEDES)

WARNING DO NOT LET THE ENGINE FUEL STAY ON YOUR SKIN. FLUSH THE FUEL FROM YOUR SKIN WITH WATER. THE FUEL IS POISONOUS AND CAN BE ABSORBED INTO YOUR BODY.

(1) You must obey these warnings during all of the next steps.

SUBTASK 28-22-00-010-004

WARNING DO ALL OF THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do these tasks in this sequence to safely open the thrust reversers:

(a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.

(b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.

(c) Do this task: Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00.

(d) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

(e) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00.

SUBTASK 28-22-00-860-065

(3) Do these steps to do a check of the engine fuel spar valves:

NOTE: This check makes sure the spar valves close correctly.

(a) Put the 5-gallon (19-liter) fuel resistant container, STD-1054, below each fuel pump.

(b) Make sure that the L and R FUEL CONTROL switches, on the P10 Control Stand, are in the CUTOFF position.

NOTE: This step makes sure the spar valves are commanded closed.

(c) Remove the fuel pump locking drain plug [2] and bleeder drain plug [3] to remove fuel from the fuel supply lines in the struts.

(d) Let the fuel drain from the fuel supply lines completely.

NOTE: If the fuel continues to drain after approximately 5 gallons has drained, then replace the drain plugs to stop the fuel flow. It is possible that the engine fuel spar valve is open because of a damaged adapter shaft or valve body. Refer to PAGEBLOCK 28-22-01/401 to replace the adapter shaft or valve body before you continue with this task.

1) Discard the packings [1] and the packings [4].

(e) Monitor the fuel leakage from the fuel supply lines until the drops per minute is constant.

(f) Make a written record of the drops per minute.

WARNING DO NOT OPERATE ANY FUEL PUMP IF THE AMBER PRESS LIGHT COMES ON AND STAYS ON. FUEL VAPORS IN THE TANK MAY IGNITE AND CAUSE A FIRE OR EXPLOSION.

(g) To operate the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

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1) Immediately set the applicable fuel pump switch-light(s) to the off position if the amber PRESS light comes on and stays on.

(h) Push the fuel pump switch-lights that follow, on the Fuel Panel (P5 Overhead Panel), to the ON position.

1) FUEL L PUMPS AFT

2) FUEL R PUMPS AFT

(i) Make sure that the drops per minute at the left and right fuel supply lines does not increase.

(j) Push the fuel pump switch-lights that follow to the off position.

1) FUEL L PUMPS AFT

2) FUEL R PUMPS AFT

(k) Apply a layer of oil, D00552 [C02-019], to new packings [1] and new packings [4].

(l) Install the fuel pump locking drain plug [2] and the bleeder drain plug [3].

I. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-00-010-009

(1) Do these steps:

(a) Do a leak check of the main fuel supply line, refer to the Power Plant Test reference table (TASK 71-00-00-800-833-H00).

WARNING DO ALL OF THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(b) Do these tasks in this sequence to safely close the thrust reversers:

1) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00.

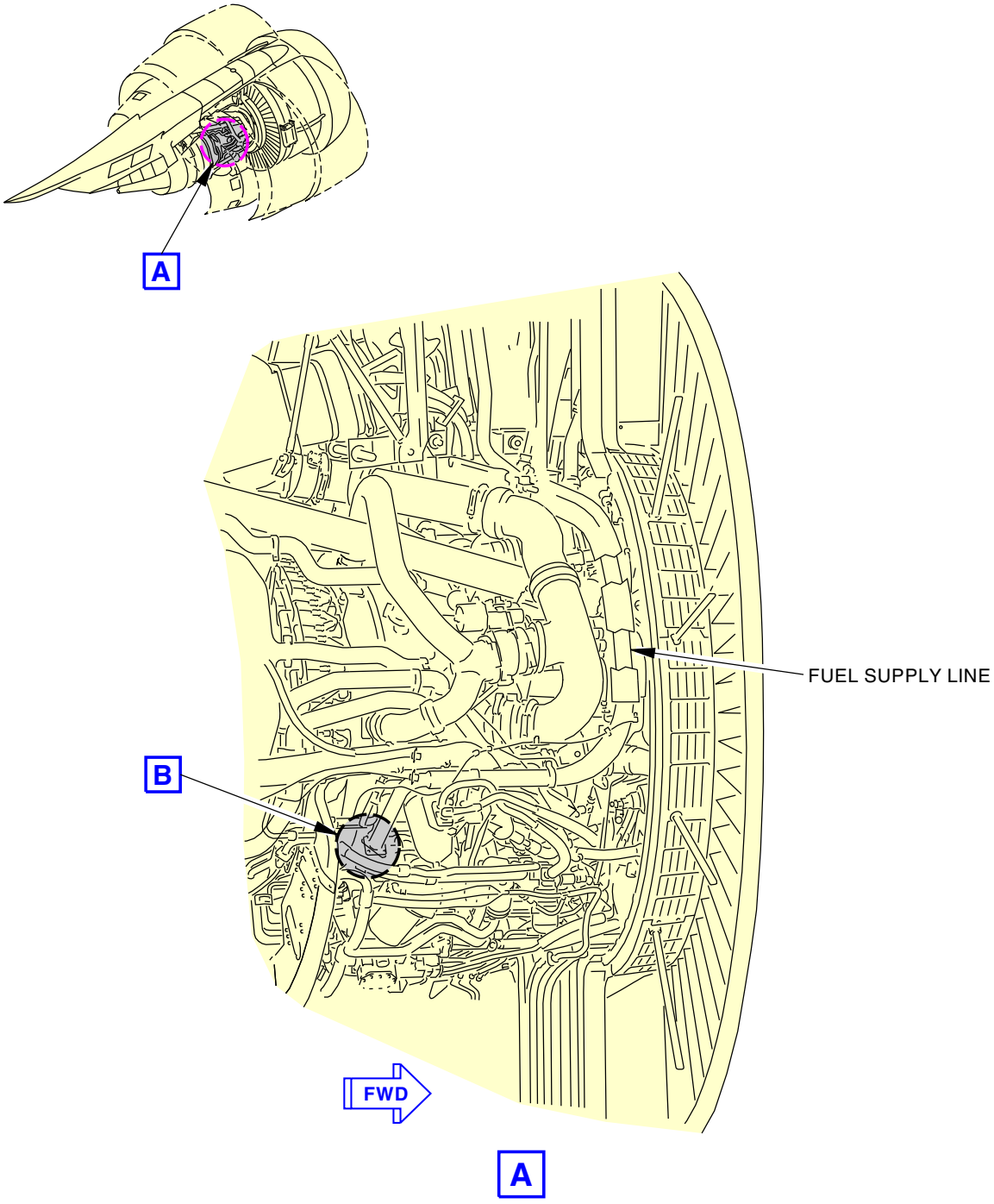
2) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

3) Do this task: Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00.

4) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

END OF TASK

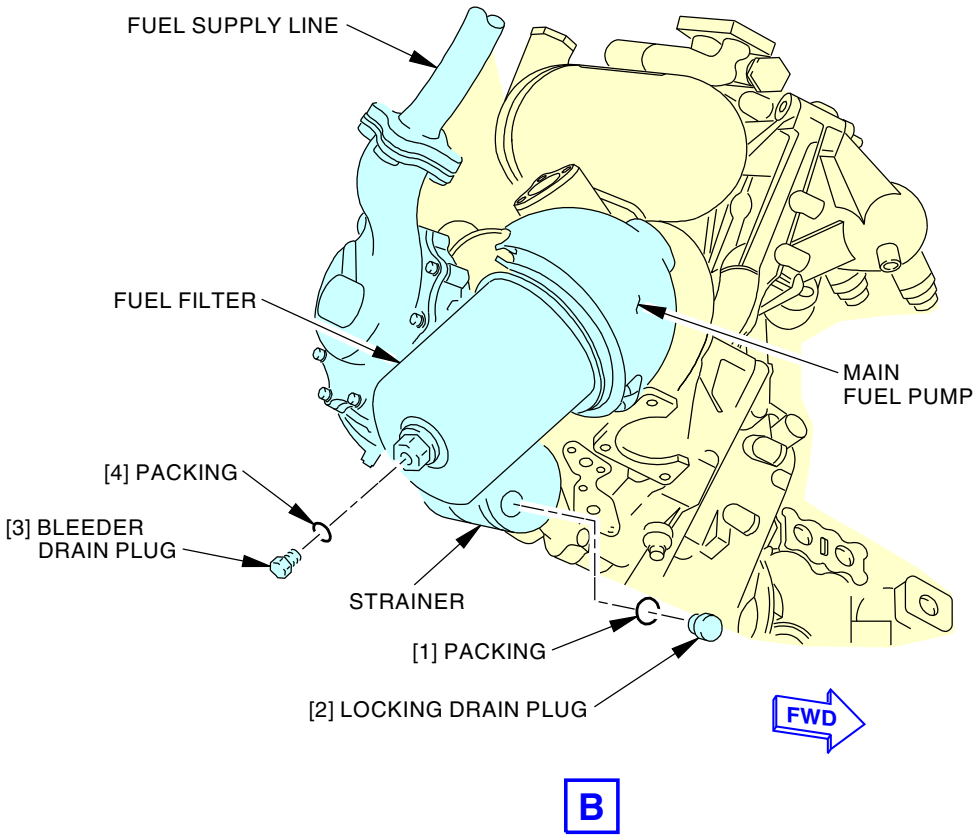
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F05985 S0006415077_V2

Engine Fuel Supply Line Installation
Figure 504/28-22-00-990-815 (Sheet 1 of 2)

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F05988 S0006415078_V2

Engine Fuel Supply Line Installation
Figure 504/28-22-00-990-815 (Sheet 2 of 2)

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TASK 28-22-00-720-803

5. Fuel Shutoff Valve Battery - Test

(Figure 501)

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This test makes sure the battery is charged correctly and wiring required for valve operation is OK.

B. References

Reference	Title
WDM 28-22-31	Wiring Diagram Manual

C. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right

D. Prepare for the Test

SUBTASK 28-22-00-860-068

(1) Make sure these switches are in the positions shown (Table 503):

Table 503/28-22-00-993-809 Fuel Shutoff Valve Battery Test

SWITCH/CONTROL	POSITION	LOCATION
DISCH APU	NORMAL	Cargo Fire/Engine Control Module (P5 OVERHEAD PANEL)
FUEL CROSSFEED AFT	CLOSED	Fuel Panel (P5 OVERHEAD PANEL)
FUEL CROSSFEED FWD	CLOSED	Fuel Panel (P5 OVERHEAD PANEL)
FUEL L PUMPS AFT	OFF	Fuel Panel (P5 OVERHEAD PANEL)
FUEL L PUMPS FWD	OFF	Fuel Panel (P5 OVERHEAD PANEL)
FUEL CENTER PUMPS L	OFF	Fuel Panel (P5 OVERHEAD PANEL)
FUEL R PUMPS AFT	OFF	Fuel Panel (P5 OVERHEAD PANEL)
FUEL R PUMPS FWD	OFF	Fuel Panel (P5 OVERHEAD PANEL)
FUEL CENTER PUMPS R	OFF	Fuel Panel (P5 OVERHEAD PANEL)
DISCH LEFT	NORMAL	Engine Fire Control Module (P8 AISLE STAND PANEL)
DISCH RIGHT	NORMAL	Engine Fire Control Module (P8 AISLE STAND PANEL)
L FUEL CONTROL	CUTOFF	P10 CONTROL STAND
R FUEL CONTROL	CUTOFF	P10 CONTROL STAND
FUEL JETTISON ARM	OFF	Fuel Jettison Panel (P5 OVERHEAD PANEL)
L ENGINE START/IGNITION	NORM	Engine Control Module (P5 OVERHEAD PANEL)
R ENGINE START/IGNITION	NORM	Engine Control Module (P5 OVERHEAD PANEL)
ENGINE AUTOSTART	OFF	Engine Control Module (P5 OVERHEAD PANEL)

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SUBTASK 28-22-00-860-069

(2) Make sure that these circuit breakers are closed:

Left Power Management Panel, P110

Row	Col	Number	Name
E	2	C28303	L AFT FUEL BOOST PUMP
L	26	C28607	L AFT FUEL BOOST PUMP CTRL

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	5	C28001	L ENGINE FUEL SPAR VALVE
A	19	C28002	R ENGINE FUEL SPAR VALVE

Right Power Management Panel, P210

Row	Col	Number	Name
E	27	C28300	R AFT FUEL BOOST PUMP
K	11	C28609	R AFT FUEL BOOST PUMP CTRL

E. Fuel Shutoff Valve Battery Test

SUBTASK 28-22-00-710-003

(1) Do these steps to test the fuel shutoff valve battery operation:

NOTE: This test makes sure the wiring and the diode R28034 operate correctly (WDM 28-22-31). If the diode or wiring are bad the battery can lose its charge without flight deck indication.

NOTE: For this test, it is only necessary to test one spar valve.

(a) Make sure that these circuit breakers are closed:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	5	C28001	L ENGINE FUEL SPAR VALVE
A	17	C28003	APU FUEL S/O VALVE
A	19	C28002	R ENGINE FUEL SPAR VALVE
C	22	C28648	FUEL BATTERY CHARGE

(b) Open this circuit breaker and install safety tag:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	20	C28649	FUEL SHUTOFF VALVE BUS

(c) Put the L or R FUEL CONTROL switch to the RUN position, on the P10 Control Stand.

(d) Make sure the applicable engine fuel spar valve (FUEL S/O VLV) is in the OPEN position on the 28 - FUEL MANAGEMENT maintenance page.

(e) Put the L or R FUEL CONTROL switch to the CUTOFF position.

(f) Make sure the applicable engine fuel spar valve (FUEL S/O VLV) is in the CLOSED position on the 28 - FUEL MANAGEMENT maintenance page.

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(g) Remove the safety tag and close this circuit breaker:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	20	C28649	FUEL SHUTOFF VALVE BUS

(h) Make sure the STATUS message FUEL SOV BATTERY does not show on the EICAS display.

NOTE: If this EICAS message shows, wait a maximum of 1 hour for the message to go off. It can take 1 hour for the battery to charge and for the EICAS message to go off.

——— END OF TASK ———

ARO 001-004 PRE SB 777-28-0078

TASK 28-22-00-720-802

6. Fuel Scavenge System - Functional Test

(Figure 501)

A. General

(1) There are four float valves in the fuel scavenge system. There are two inlet float valves in the center tank. These valves let fuel go from the center tank to the outlet float valves in each main fuel tank. The outlet float valves in each main tank let fuel into the main tanks when the fuel level is below the float valve.

(2) This procedure makes sure the float valves open and close correctly.

NOTE: Each inlet float valve can leak 17.5 ±7.5 lb (7.9 ±3.4 kg) of fuel per hour into the center tank when the boost pumps are on and the outlet or inlet float valves are closed. This quantity of fuel transfer is within the limits of the fuel scavenge system.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
24-22-00-860-801	Supply Primary External Power (P/B 201)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right

D. Prepare for the Test

SUBTASK 28-22-00-860-048

(1) Make sure the switches are in the positions shown (Table 504) (Figure 501):

Table 504/28-22-00-993-808 Fuel Scavenge System Test

SWITCH/CONTROL	POSITION	LOCATION
DISCH APU	NORMAL	Cargo Fire/Engine Control Module (P5 OVERHEAD PANEL)
FUEL CROSSFEED AFT	CLOSED	Fuel Panel (P5 OVERHEAD PANEL)
FUEL CROSSFEED FWD	CLOSED	Fuel Panel (P5 OVERHEAD PANEL)

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ARO 001-004 PRE SB 777-28-0078 (Continued)

Table 504/28-22-00-993-808 Fuel Scavenge System Test (Continued)

SWITCH/CONTROL	POSITION	LOCATION
FUEL L PUMPS AFT	OFF	Fuel Panel (P5 OVERHEAD PANEL)
FUEL L PUMPS FWD	OFF	Fuel Panel (P5 OVERHEAD PANEL)
FUEL CENTER PUMPS L	OFF	Fuel Panel (P5 OVERHEAD PANEL)
FUEL CENTER PUMPS R	OFF	Fuel Panel (P5 OVERHEAD PANEL)
FUEL R PUMPS AFT	OFF	Fuel Panel (P5 OVERHEAD PANEL)
FUEL R PUMPS FWD	OFF	Fuel Panel (P5 OVERHEAD PANEL)
DISCH LEFT	NORMAL	Engine Fire Control Module (P8 AISLE STAND PANEL)
DISCH RIGHT	NORMAL	Engine Fire Control Module (P8 AISLE STAND PANEL)
L FUEL CONTROL	CUTOFF	P10 CONTROL STAND
R FUEL CONTROL	CUTOFF	P10 CONTROL STAND

SUBTASK 28-22-00-860-049

(2) Make sure that these circuit breakers are closed:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
C	18	C28302	R FWD FUEL BOOST PUMP L AC SECT 2
E	2	C28303	L AFT FUEL BOOST PUMP
E	5	C28307	L FWD FUEL BOOST PUMP
L	26	C28607	L AFT FUEL BOOST PUMP CTRL
L	27	C28606	R FWD FUEL BOOST PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
F	27	C28306	R FWD FUEL BOOST PUMP R XFR
K	11	C28609	R AFT FUEL BOOST PUMP CTRL

Standby Power Management Panel, P310

Row	Col	Number	Name
B	2	C28604	L FWD FUEL BOOST PUMP CTRL

SUBTASK 28-22-00-860-050

(3) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.

SUBTASK 28-22-00-650-010

(4) Make sure the fuel tanks have the fuel quantities as follows (Figure 501):

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ARO 001-004 PRE SB 777-28-0078 (Continued)

(a) Make sure there is less than 53,900 lb (24,449 kg) of fuel in each main fuel tank.

NOTE: This step opens the outlet float valve, in the main fuel tank, for the fuel scavenge system.

NOTE: This value is based off nominal attitude, 0.7 degree pitch nose down and 0.0 degree wing roll. It may be necessary to defuel to 52,600 lb (23,859 kg) of fuel or less in each main tank.

(b) Make sure there is between 1000 lb (454 kg) and 48,100 lb (21,818 kg) of fuel in the center fuel tank.

NOTE: This step opens the inlet float valve, in the center fuel tank, for the fuel scavenge system.

NOTE: This value is based off nominal attitude, 0.7 degree pitch nose down and 0.0 degree wing roll. It may be necessary to defuel to 38,000 lb (17,237 kg) of fuel or less in the center tank.

(c) To refuel the fuel tanks (if it is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

(d) To defuel the fuel tanks (if it is necessary), do this task: Pressure Defueling, TASK 28-26-00-650-801.

E. Test of the Fuel Scavenge System

SUBTASK 28-22-00-860-072

WARNING DO NOT OPERATE ANY FUEL PUMP IF THE AMBER PRESS LIGHT COMES ON AND STAYS ON. FUEL VAPORS IN THE TANK MAY IGNITE AND CAUSE A FIRE OR EXPLOSION.

(1) To operate the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

(a) Immediately set the applicable fuel pump switch-light(s) to the off position if the amber PRESS light comes on and stays on.

SUBTASK 28-22-00-860-051

(2) Push the fuel pump switch-lights that follow, on the Fuel Panel (P5 Overhead Panel), to the ON position (Figure 501).

NOTE: You can do the test of the left and right fuel pumps concurrently.

(a) FUEL L PUMPS AFT

(b) FUEL L PUMPS FWD

SUBTASK 28-22-00-860-052

(3) Let the left main tank fuel quantity, on the synoptic display, increase by a minimum of 100 lb (45 kg) and then do these steps:

NOTE: Start the timer immediately after the first quantity indication of 100 lb (45 kg). If there are fuel quantity fluctuations, wait for the indication to be stable. After you get the correct indication, then go to the next step.

(a) Let the pumps operate for 30 minutes.

(b) Make sure the left main tank fuel quantity increases by a minimum of 200 lb (91 kg) within 30 minutes.

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ARO 001-004 PRE SB 777-28-0078 (Continued)

SUBTASK 28-22-00-860-053

(4) Push the fuel pump switch-lights that follow to the off position.

(a) FUEL L PUMPS AFT

(b) FUEL L PUMPS FWD

SUBTASK 28-22-00-860-205

(5) Push the fuel pump switch-lights that follow, on the Fuel Panel (P5 Overhead Panel), to the ON position (Figure 501).

(a) FUEL R PUMPS AFT

(b) FUEL R PUMPS FWD

SUBTASK 28-22-00-210-029

(6) Let the right main tank fuel quantity, on the synoptic display, increase by a minimum of 100 lb (45 kg) and then do these steps:

NOTE: Start the timer immediately after the first quantity indication of 100 lb (45 kg). If there are fuel quantity fluctuations, wait for the indication to be stable. After you get the correct indication, then go to the next step.

(a) Let the pumps operate for 30 minutes.

(b) Make sure the right main tank fuel quantity increases by a minimum of 100 lb (45 kg) within 30 minutes.

SUBTASK 28-22-00-860-206

(7) Push the fuel pump switch-lights that follow to the off position.

(a) FUEL R PUMPS AFT

(b) FUEL R PUMPS FWD

SUBTASK 28-22-00-650-008

(8) Refuel the center fuel tank to 80,000 lb (36,287 kg) of fuel, (TASK 12-11-01-650-801).

NOTE: This step closes the left and right inlet float valves. This quantity is a worst case fuel quantity intended to cover any attitude. The following tables can be used to minimize the fuel quantity added to center tank for different attitudes.

Minimum Fuel Quantity *[1] to close the left *[2] inlet float valve - Pitch = -1.7 degrees			
Roll Angle	-2.0 degrees	0.0 degrees	2.0 degrees
	74,000 lb (33,566 kg)	56,200 lb (25,492 kg)	42,200 lb (19,142 kg)

*[1] Density of 7.0 pounds/gallon (0.84 kg/liter)

*[2] To get the applicable minimum fuel quantity to close the right inlet float valve, change the sign of the roll.

Minimum Fuel Quantity *[1] to close the left*[2] inlet float valve - Pitch = -0.7 degrees			
Roll angle	-2.0 degrees	0.0 degrees	2.0 degrees
	56,200 lb (25,492 kg)	51,300 lb (23,269 kg)	46,600 lb (21,137 kg)

*[1] Density of 7.0 pounds/gallon

*[2] To get the applicable minimum fuel quantity to close the right inlet float valve, change the sign of the roll.

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ARO 001-004 PRE SB 777-28-0078 (Continued)

Minimum Fuel Quantity *[1] to close the left*[2] inlet float valve - Pitch = +0.3 degrees			
Roll angle	-2.0 degrees	0.0 degrees	2.0 degrees
	42,200 lb (19,142 kg)	37,800 lb (17,146 kg)	33,300 lb (15,105 kg)

*[1] Density of 7.0 pounds/gallon

*[2] To get the applicable minimum fuel quantity to close the right inlet float valve, change the sign of the roll.

SUBTASK 28-22-00-860-054

(9) Push the fuel pump switch-lights that follow to the ON position.

(a) FUEL L PUMPS AFT

(b) FUEL L PUMPS FWD

(c) FUEL R PUMPS AFT

(d) FUEL R PUMPS FWD

SUBTASK 28-22-00-860-055

(10) Let the pumps operate for 30 minutes.

NOTE: If there are fuel quantity fluctuations, wait for the indication to be stable. After you get the correct indication, then go to the next step.

(a) Make sure the left main tank fuel quantity does not increase.

(b) Make sure the right main tank fuel quantity does not increase.

(c) Make sure the center tank fuel quantity does not increase.

NOTE: Fuel will leak into the center tank at a rate of 35 ±15 lb (15.9 ±6.8 kg) per hour. This amount of fuel is the total fuel quantity that can come from both inlet valves. This quantity should not show on the fuel indication, for the center fuel tank, in 30 minutes.

SUBTASK 28-22-00-860-056

(11) Push the fuel pump switch-lights that follow to the off position.

(a) FUEL L PUMPS AFT

(b) FUEL L PUMPS FWD

(c) FUEL R PUMPS AFT

(d) FUEL R PUMPS FWD

SUBTASK 28-22-00-650-012

(12) Defuel or transfer fuel so that the center fuel tank level is between 1000 lb (454 kg) and 48,100 lb (21,818 kg), do this task: Pressure Defueling, TASK 28-26-00-650-801

or, do this task: Tank to Tank Transfer, TASK 28-26-00-650-802.

NOTE: This step opens the left and right inlet float valves.

NOTE: This value is based off nominal attitude, 0.7 degree pitch nose down and 0.0 degree wing roll. It may be necessary to defuel to 38,000 lb (17,237 kg) of fuel or less in the center tank.

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ARO 001-004 PRE SB 777-28-0078 (Continued)

SUBTASK 28-22-00-650-011

(13) Refuel each main fuel tank to more than 56,350 lb (25,560 kg) of fuel (TASK 12-11-01-650-801).

NOTE: This step closes the left and right outlet float valves.

NOTE: This value is based off nominal attitude, 0.7 degree pitch nose down and 0.0 degree wing roll. It may be necessary to add more fuel in each main tank.

SUBTASK 28-22-00-860-057

(14) Push the fuel pump switch-lights that follow to the ON position.

(a) FUEL L PUMPS AFT

(b) FUEL L PUMPS FWD

(c) FUEL R PUMPS AFT

(d) FUEL R PUMPS FWD

SUBTASK 28-22-00-860-058

(15) Let the pumps operate for 30 minutes.

NOTE: If there are fuel quantity fluctuations, wait for the indication to be stable. After you get the correct indication, then go to the next step.

(a) Make sure the left main tank fuel quantity does not increase.

(b) Make sure the right main tank fuel quantity does not increase.

(c) Make sure the center tank fuel quantity does not increase.

NOTE: Fuel will leak into the center tank at a rate of 35 ±15 lb (15.9 ±6.8 kg) per hour. This amount of fuel is the total fuel quantity that can come from both inlet valves. This quantity should not show on the fuel indication, for the center fuel tank, in 30 minutes.

SUBTASK 28-22-00-860-059

(16) Push the fuel pump switch-lights that follow to the off position.

(a) FUEL L PUMPS AFT

(b) FUEL L PUMPS FWD

(c) FUEL R PUMPS AFT

(d) FUEL R PUMPS FWD

F. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-00-650-007

(1) To refuel the fuel tanks (if no more work is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

——— END OF TASK ———

ARO 005-999; ARO 001-004 POST SB 777-28-0078

TASK 28-22-00-720-805

7. Fuel Scavenge System - Functional Test

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This procedure contains scheduled maintenance task data.

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ARO 005-999; ARO 001-004 POST SB 777-28-0078 (Continued)

(2) The jettison pumps supply motive flow to the fuel scavenge jet pumps in the center tank. This procedure makes sure the system transfers fuel from the center tank into the main tanks when the jettison pumps operate.

NOTE: The control of the jettison pumps is automatic in flight. This test operates the jettison pumps in ground mode to do a check of the operation of the fuel scavenge system components.

WARNING

DO NOT OPERATE A FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. THIS CONDITION CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE FUEL TANK. A FIRE OR AN EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(3) Obey these precautions at all times during this task:

(a) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

(b) Immediately set the applicable fuel pump switch-light(s) to the off position if the low pressure indication light comes on and stays on.

NOTE: The FAULT light on the ARM switch comes on to show low pressure for the jettison pumps. Set the ARM switch to the off position if this occurs.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing

D. Access Panels

Number	Name/Location
521DB	Refueling Station Door

E. Prepare for the Functional Test

SUBTASK 28-22-00-650-027

(1) Make sure the left and right fuel tanks each have between 16,000 lb (7257 kg) and 66,000 lb (29,937 kg) of fuel.

SUBTASK 28-22-00-650-028

(2) Make sure the center fuel tank has 3000 lb (1361 kg) of fuel or more.

SUBTASK 28-22-00-650-029

(3) To refuel the fuel tanks (if it is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

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ARO 005-999; ARO 001-004 POST SB 777-28-0078 (Continued)

SUBTASK 28-22-00-040-001

WARNING DO NOT OPERATE THE LEADING EDGE SLATS. ACCIDENTAL SLAT OPERATION COULD CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(4) Put a DO-NOT-OPERATE tag on the flap control lever, in the flight compartment (TASK 27-81-00-040-801).

SUBTASK 28-22-00-860-186

(5) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-22-00-860-187

(6) Make sure that the FUEL JETTISON L NOZZLE and R NOZZLE valve switch-lights, on the Fuel Jettison Panel (P5 Overhead Panel), are in the closed position.

SUBTASK 28-22-00-860-188

(7) Make sure that these circuit breakers are closed:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
K	14	C28646	R FUEL JETT PUMP CTRL

SUBTASK 28-22-00-860-189

(8) Open these circuit breakers and install safety tags:

Left Power Management Panel, P110

Row	Col	Number	Name
L	21	C28647	CTR L OVRD FUEL PUMP CTRL
L	25	C28621	L FUEL JETT NOZ VLV

Right Power Management Panel, P210

Row	Col	Number	Name
K	12	C28620	R FUEL JETT NOZ VLV
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

SUBTASK 28-22-00-860-190

(9) Open this access panel:

Number	Name/Location
521DB	Refueling Station Door

(a) Put the DEFUEL VALVE switch on the P28 Integrated Refuel Panel (IRP), to the OPEN position.

(b) Make sure the refuel valve control switches for the left main, right main, and center fuel tanks are in the CLOSED position.

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ARO 005-999; ARO 001-004 POST SB 777-28-0078 (Continued)

F. Fuel Scavenge System Functional Test

SUBTASK 28-22-00-860-191

(1) Push the JETTISON ARM switch-light on the Fuel Management Control Panel M28001, on the Overhead Panel P5, to the ARMED position.

NOTE: The fuel jettison pumps will operate.

SUBTASK 28-22-00-720-003

(2) Do these steps to monitor the fuel quantity in the left main tank:

NOTE: The fuel quantity indication can fluctuate. Measure the start and end time consistently. Take time measurements from either the start of when the fuel quantity goes up one unit or wait until the fuel quantity stabilizes at a reading.

(a) Prepare to start a stopwatch.

(b) Watch the fuel quantity indication on the Fuel Jettison Synoptic Page.

(c) Wait until the fuel quantity indication increases by 100 pounds or 100 kilograms, then start the stopwatch.

(d) Make a record of the starting fuel quantity.

(e) Wait until the fuel level in the left main tank increases by 200 lb (91 kg), then stop the stopwatch.

(f) Make a record of the ending time.

(g) Make sure the difference between the starting time and ending time is between 6 and 15 minutes.

SUBTASK 28-22-00-720-004

(3) Do these steps to monitor the fuel quantity in the right main tank:

NOTE: The fuel quantity indication can fluctuate. Measure the start and end time consistently. Take time measurements from either the start of when the fuel quantity goes up one unit or wait until the fuel quantity stabilizes at a reading.

(a) Prepare to start a stopwatch.

(b) Watch the fuel quantity indication on the Fuel Jettison Synoptic Page.

(c) Wait until the fuel quantity indication increases by 100 pounds or 100 kilograms, then start the stopwatch.

(d) Make a record of the starting fuel quantity.

(e) Wait until the fuel level in the right main tank increases by 200 lb (91 kg).

(f) Make a record of the ending time.

(g) Make sure the difference between the starting time and ending time is between 6 and 15 minutes.

SUBTASK 28-22-00-860-192

(4) Push the JETTISON ARM switch-light on the Fuel Management Control Panel M28001, on the Overhead Panel P5, to the OFF position.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-00-860-193

(1) Put the DEFUEL VALVE switch on the P28 Integrated Refuel Panel (IRP), to the CLOSED position.

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ARO 005-999; ARO 001-004 POST SB 777-28-0078 (Continued)

SUBTASK 28-22-00-860-194

(2) Close this access panel:

Number	Name/Location
521DB	Refueling Station Door

SUBTASK 28-22-00-860-195

(3) Remove the safety tags and close these circuit breakers:

Left Power Management Panel, P110

Row	Col	Number	Name
L	21	C28647	CTR L OVRD FUEL PUMP CTRL
L	25	C28621	L FUEL JETT NOZ VLV

Right Power Management Panel, P210

Row	Col	Number	Name
K	12	C28620	R FUEL JETT NOZ VLV
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

SUBTASK 28-22-00-440-001

(4) Remove the DO-NOT-OPERATE tag on the flap control lever, in the flight compartment (TASK 27-81-00-440-801).

——— END OF TASK ———

ARO 001-004 PRE SB 777-28-0078

TASK 28-22-00-720-804

8. Abbreviated Fuel Scavenge System - Functional Test

(Figure 501)

A. General

(1) This task make sure the fuel scavenge system operates correctly.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
24-22-00-860-801	Supply Primary External Power (P/B 201)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right

D. Prepare for the Test

SUBTASK 28-22-00-860-150

(1) Make sure the switches are in the positions shown (Table 505), (Figure 501):

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ARO 001-004 PRE SB 777-28-0078 (Continued)

Table 505/28-22-00-993-810 Fuel Scavenge System Test

SWITCH/CONTROL	POSITION	LOCATION
DISCH APU	NORMAL	Cargo Fire/Engine Control Module (P5 OVERHEAD PANEL)
FUEL CROSSFEED AFT	CLOSED	Fuel Panel (P5 OVERHEAD PANEL)
FUEL CROSSFEED FWD	CLOSED	Fuel Panel (P5 OVERHEAD PANEL)
FUEL L PUMPS AFT	OFF	Fuel Panel (P5 OVERHEAD PANEL)
FUEL L PUMPS FWD	OFF	Fuel Panel (P5 OVERHEAD PANEL)
FUEL R PUMPS AFT	OFF	Fuel Panel (P5 OVERHEAD PANEL)
FUEL R PUMPS FWD	OFF	Fuel Panel (P5 OVERHEAD PANEL)
FUEL CENTER PUMPS L	OFF	Fuel Panel (P5 OVERHEAD PANEL)
FUEL CENTER PUMPS R	OFF	Fuel Panel (P5 OVERHEAD PANEL)
DISCH LEFT	NORMAL	Engine Fire Control Module (P8 AISLE STAND PANEL)
DISCH RIGHT	NORMAL	Engine Fire Control Module (P8 AISLE STAND PANEL)
L FUEL CONTROL	CUTOFF	P10 CONTROL STAND
R FUEL CONTROL	CUTOFF	P10 CONTROL STAND

SUBTASK 28-22-00-865-030

(2) Make sure that these circuit breakers are closed:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
C	18	C28302	R FWD FUEL BOOST PUMP L AC SECT 2
E	2	C28303	L AFT FUEL BOOST PUMP
E	5	C28307	L FWD FUEL BOOST PUMP
L	26	C28607	L AFT FUEL BOOST PUMP CTRL
L	27	C28606	R FWD FUEL BOOST PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
F	27	C28306	R FWD FUEL BOOST PUMP R XFR
K	11	C28609	R AFT FUEL BOOST PUMP CTRL

Standby Power Management Panel, P310

Row	Col	Number	Name
B	2	C28604	L FWD FUEL BOOST PUMP CTRL

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ARO 001-004 PRE SB 777-28-0078 (Continued)

SUBTASK 28-22-00-860-151

(3) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.

SUBTASK 28-22-00-650-019

(4) Make sure the fuel tanks have the fuel quantities as follows (Figure 501):

(a) Make sure there is less than 53,900 lb (24,449 kg) of fuel in each main fuel tank.

NOTE: This step opens the outlet float valve, in the main fuel tank, for the fuel scavenge system.

NOTE: This value is based off nominal attitude, 0.7 degree pitch nose down and 0.0 degree wing roll. It may be necessary to defuel to 52,600 lb (23,859 kg) of fuel or less in each main tank.

(b) Make sure there is between 1000 lb (454 kg) and 48,100 lb (21,818 kg) of fuel in the center fuel tank.

NOTE: This step opens the inlet float valve, in the center fuel tank, for the fuel scavenge system.

NOTE: This value is based off nominal attitude, 0.7 degree pitch nose down and 0.0 degree wing roll. It may be necessary to defuel to 38,000 lb (17,237 kg) of fuel or less in the center tank.

(c) To refuel the fuel tanks (if it is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

(d) To defuel the fuel tanks (if it is necessary), do this task: Pressure Defueling, TASK 28-26-00-650-801.

E. Test of the Fuel Scavenge System

SUBTASK 28-22-00-860-152

WARNING

DO NOT OPERATE A FUEL PUMP IF THE AMBER PRESS LIGHT COMES ON AND STAYS ON. IT CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE TANK WHICH WILL CAUSE A FIRE OR EXPLOSION. FIRES AND EXPLOSIONS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(1) To operate the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

(a) Immediately set the applicable fuel pump switch-light(s) to the off position if the amber PRESS light comes on and stays on.

SUBTASK 28-22-00-860-153

(2) Push the fuel pump switch-lights that follow, on the Fuel Panel (P5 Overhead Panel), to the ON position (Figure 501).

(a) FUEL L PUMPS AFT

(b) FUEL L PUMPS FWD

(c) FUEL R PUMPS AFT

(d) FUEL R PUMPS FWD

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ARO 001-004 PRE SB 777-28-0078 (Continued)

SUBTASK 28-22-00-210-016

(3) Let the left main tank fuel quantity, on the synoptic display, increase by a minimum of 100 lb (45 kg) and then do these steps:

NOTE: Start the timer immediately after the first quantity indication of 100 lb (45 kg). If there are fuel quantity fluctuations, wait for the indication to be stable. After you get the correct indication, then go to the next step.

(a) Let the pumps operate for 30 minutes.

(b) Make sure the left main tank fuel quantity increases by a minimum of 200 lb (91 kg) within 30 minutes.

(c) Make sure the right main tank fuel quantity increases by a minimum of 200 lb (91 kg) within 30 minutes.

SUBTASK 28-22-00-860-154

(4) Push the fuel pump switch-lights that follow to the off position.

(a) FUEL L PUMPS AFT

(b) FUEL L PUMPS FWD

(c) FUEL R PUMPS AFT

(d) FUEL R PUMPS FWD

F. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-00-650-020

(1) If it is necessary, rebalance or transfer fuel to make sure all airplane fuel loading requirements are met (TASK 28-26-00-650-802).

ARO ALL

——— END OF TASK ———

TASK 28-22-00-710-808

9. Engine Fuel Suction Feed - Operational Test

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This task has one or more steps which are a means to satisfy Airworthiness Limitation Instruction (ALI) requirements. An ALI note will follow the step to which it applies. Any step or sub-step that precedes or follows an ALI identified step is not subject to the ALI requirement.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

(2) Do this operational test on one engine at time until the two engines are successfully tested.

B. References

Reference	Title
10-11-01-580-804	Park the Airplane (Normal Parking) (P/B 201)
10-11-05 P/B 201	CHOCK INSTALLATION
12-11-01-650-801	Pressure Refueling (P/B 301)
24-22-00-860-813	Supply Primary External Power to the Main 115V AC Buses (P/B 201)
24-22-00-860-816	Remove Primary External Power from the Main 115V AC Buses (P/B 201)

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(Continued)

Reference	Title
28-22-15-710-802-001	Engine Fuel Feed Manifold - Suction Feed Line Leak Check (P/B 601)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)
28-26-00-650-803	Suction Defueling (P/B 201)
71-00-00-800-801-H01	Engine Ground Safety Precautions (P/B 201)
71-00-00-800-835-H00	Engine Start (Selection) (P/B 201)
71-00-00-800-837-H00	Usual Engine Stop (P/B 201)

C. Prepare for the Test

SUBTASK 28-22-00-860-183

(1) Supply external electrical power (TASK 24-22-00-860-813).

SUBTASK 28-22-00-210-017

CAUTION

DO NOT OPERATE THE HYDRAULIC PUMPS AFTER THE HYDRAULIC PUMP TEMPERATURE INDICATION BECOMES MORE THAN 221°F (105°C), OR BLANK. ALSO, DO NOT OPERATE THE PUMPS AFTER THE PUMP FAULT LIGHT COMES ON. IF YOU CONTINUE TO OPERATE THE PUMPS, THE HYDRAULIC FLUID CAN BECOME TOO HOT.

(2) Obey these limits for the hydraulic pumps:

(a) Stop the operation of the hydraulic pump if one of these conditions occur:

1) The temperature indication for the hydraulic pump, on the EICAS display, becomes more than 221°F (105°C).

2) The fault light for the hydraulic pump comes on.

(b) Do not operate the hydraulic pump more than 10 minutes.

(c) After the operation of the hydraulic pump, let the temperature of the hydraulic pump decrease for 20 minutes with the hydraulic pump off before you operate it.

SUBTASK 28-22-00-210-018

(3) Make sure the tire chocks are in front and aft of the main landing gear (TASK 10-11-01-580-804, PAGEBLOCK 10-11-05/201).

SUBTASK 28-22-00-860-176

(4) Make sure that all fuel pump switch-lights, on the fuel panel (P5 Overhead Panel), are in the off position.

SUBTASK 28-22-00-860-164

(5) Make sure the speedbrake lever is in the DOWN position.

D. Test of the Engine Fuel Suction Feed System - Left Side (Engine No. 1)

SUBTASK 28-22-00-650-024

28-AWL-101: ALI

(1) Make sure these quantities of fuel are in the fuel tanks (Table 506):

Table 506/28-22-00-993-811 Left Engine Fuel Quantity Requirements

Tank	Fuel Quantity
Center Fuel Tank	5000 lb (2200 kg) of fuel or less

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Table 506/28-22-00-993-811 Left Engine Fuel Quantity Requirements (Continued)

Tank	Fuel Quantity
Left Main Fuel Tank	600 lb (200 kg) - 800 lb (300 kg) of fuel

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

NOTE: Unwanted fuel can be transferred to the right main tank.

NOTE: The fuel quantity given in Table 506 is below the fuel level needed to cover the hydraulic heat exchangers.

(a) To add fuel to one or more tanks, do this task: Pressure Refueling, TASK 12-11-01-650-801 or Tank to Tank Transfer, TASK 28-26-00-650-802.

(b) To remove fuel from one or more tanks, do one of these tasks: Pressure Defueling, TASK 28-26-00-650-801, Suction Defueling, TASK 28-26-00-650-803, or Tank to Tank Transfer, TASK 28-26-00-650-802.

SUBTASK 28-22-00-860-177

CAUTION

DO NOT OPERATE THE HYDRAULIC PUMPS AFTER THE HYDRAULIC PUMP TEMPERATURE INDICATION BECOMES MORE THAN 221°F (105°C), OR BLANK. ALSO, DO NOT OPERATE THE PUMPS AFTER THE PUMP FAULT LIGHT COMES ON. IF YOU CONTINUE TO OPERATE THE PUMPS, THE HYDRAULIC FLUID CAN BECOME TOO HOT.

(2) If the hydraulic pumps are on for 10 minutes, stop the hydraulic pumps.

NOTE: Follow the operating limits of the hydraulic pumps.

(a) Wait 20 minutes.

SUBTASK 28-22-00-860-165

28-AWL-101: ALI

(3) Make sure that the FUEL CROSSFEED FWD and AFT switch-lights, on the Fuel Panel (P5 Overhead Panel), are in the closed position:

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

SUBTASK 28-22-00-860-175

28-AWL-101: ALI

(4) Make sure that the APU selector switch, on the Overhead Panel P5, is in the OFF position.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

SUBTASK 28-22-00-860-166

WARNING

DO NOT OPERATE A FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. THIS CONDITION CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE FUEL TANK. A FIRE OR AN EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(5) To operate the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and low pressure indication in the left main tank.

(a) Immediately set the applicable FUEL L PUMPS FWD and AFT switch-lights to the off position if the amber PRESS light comes on and stays on.

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SUBTASK 28-22-00-860-167

(6) Push a minimum of one fuel pump switch-light, on the Fuel Panel (P5 Overhead Panel), to the ON position:

NOTE: One or two left main tank boost pumps can be operated.

(a) FUEL L PUMPS FWD

(b) FUEL L PUMPS AFT

SUBTASK 28-22-00-710-142

WARNING

OBSERVE PROPER SAFETY PRECAUTIONS AROUND RUNNING ENGINE. WEAR EAR PROTECTORS AND STAY CLEAR OF ENGINE HAZARD AREAS. SEE "ENGINE GROUND SAFETY PRECAUTIONS" FOR ENGINE HAZARD DESCRIPTION.

(7) Do these steps to do the test:

(a) Obey all safety precautions around the running engines (TASK 71-00-00-800-801-H01).

(b) Start the left engine (No. 1) (TASK 71-00-00-800-835-H00).

1) If you used the APU to start the engine, make sure that the fuel tank quantities align with Table 506.

NOTE: The fuel loads are different from the fuel loads referenced in Engine Start (Selection), TASK 71-00-00-800-835-H00.

(c) If the APU was used to start the engine, set the APU selector switch to the OFF position.

28-AWL-101: ALI

(d) Let the engine operate at idle power, with the boost pump(s) on, for a minimum of two minutes.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

NOTE: It is recommended to operate the engine for five minutes.

(e) Make a record of the initial engine parameters (N1, N2, and fuel flow).

1) Initial Values: N1_____% N2_____% Fuel flow_____

NOTE: Record the initial values after you operate the engine at idle power for a minimum of two minutes. If there is variation in the parameters, record the range.

28-AWL-101: ALI

(f) Stop the operation of the left main tank boost pumps. To do this, push these fuel pump switch-light(s) to the off position:

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

28-AWL-101: ALI

1) FUEL L PUMPS FWD

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

28-AWL-101: ALI

2) FUEL L PUMPS AFT

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

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28-AWL-101: ALI

(g) Make sure that the left engine continues to operate for a minimum of 5 minutes.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

(h) Make a record of the final engine parameters (N1, N2, and fuel flow).

1) Final Values: N1_____% N2_____% Fuel flow_____

NOTE: Record the final values after you operate the engine for a minimum of five minutes.

28-AWL-101: ALI

(i) Make sure the final engine parameters (N1, N2, or fuel flow) do not decay during the 5 minutes relative to the initial engine parameters.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

NOTE: This also means that the variation in the final engine parameters is almost the same as the variation in the initial engine parameters.

SUBTASK 28-22-00-860-168

(8) Shut down the left engine (No. 1) (TASK 71-00-00-800-837-H00).

SUBTASK 28-22-00-810-002

(9) If the left engine (No. 1) did not operate for the full 5 minutes or the engine parameters decayed, do this task: Engine Fuel Feed Manifold - Suction Feed Line Leak Check, TASK 28-22-15-710-802-001, to isolate the leak and then repeat the operational test.

NOTE: The test is considered failed if engine operation cannot be maintained or the engine parameters (N1, N2 and fuel flow) decay relative to those with the Boost Pump ON.

NOTE: A suction feed system that fails the operational test must be made operational prior to further flight.

SUBTASK 28-22-00-860-184

(10) Remove electrical power (TASK 24-22-00-860-816).

E. Test of the Engine Fuel Suction Feed System - Right Side (Engine No. 2)

SUBTASK 28-22-00-650-025

28-AWL-101: ALI

(1) Make sure these quantities of fuel are in the fuel tanks (Table 507):

Table 507/28-22-00-993-812 Right Engine Fuel Quantity Requirements

Tank	Fuel Quantity
Center Fuel Tank	5000 lb (2200 kg) of fuel or less
Right Main Fuel Tank	600 lb (200 kg) - 800 lb (300 kg) of fuel

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

NOTE: Unwanted fuel can be transferred to the left main tank.

NOTE: The fuel quantity given in Table 507 is below the fuel level needed to cover the hydraulic heat exchangers.

(a) To add fuel to one or more tanks, do this task: Pressure Refueling, TASK 12-11-01-650-801 or Tank to Tank Transfer, TASK 28-26-00-650-802.

(b) To remove fuel from one or more tanks, do one of these tasks: Pressure Defueling, TASK 28-26-00-650-801, Suction Defueling, TASK 28-26-00-650-803, or Tank to Tank Transfer, TASK 28-26-00-650-802.

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SUBTASK 28-22-00-860-169

CAUTION

DO NOT OPERATE THE HYDRAULIC PUMPS AFTER THE HYDRAULIC PUMP TEMPERATURE INDICATION BECOMES MORE THAN 221°F (105°C), OR BLANK. ALSO, DO NOT OPERATE THE PUMPS AFTER THE PUMP FAULT LIGHT COMES ON. IF YOU CONTINUE TO OPERATE THE PUMPS, THE HYDRAULIC FLUID CAN BECOME TOO HOT.

(2) If the hydraulic pumps are on for 10 minutes, stop the hydraulic pumps.

NOTE: Follow the operating limits of the hydraulic pumps.

(a) Wait 20 minutes.

SUBTASK 28-22-00-860-178

28-AWL-101: ALI

(3) Make sure that the FUEL CROSSFEED FWD and AFT switch-lights, on the Fuel Panel (P5 Overhead Panel), are in the closed position.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

SUBTASK 28-22-00-860-179

28-AWL-101: ALI

(4) Make sure that the APU selector switch, on the Overhead Panel P5, is in the OFF position.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

SUBTASK 28-22-00-860-171

WARNING

DO NOT OPERATE A FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. THIS CONDITION CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE FUEL TANK. A FIRE OR AN EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(5) To operate the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and low pressure indication in the right main tank.

(a) Immediately set the applicable FUEL R PUMPS FWD and AFT switch-lights to the off position if the amber PRESS light comes on and stays on.

SUBTASK 28-22-00-860-172

(6) Push a minimum of one fuel pump switch-light, on the Fuel Panel (P5 Overhead Panel), to the ON position:

NOTE: One or two right main tank boost pumps can be operated.

(a) FUEL R PUMPS FWD

(b) FUEL R PUMPS AFT

SUBTASK 28-22-00-710-144

WARNING

OBSERVE PROPER SAFETY PRECAUTIONS AROUND RUNNING ENGINE. WEAR EAR PROTECTORS AND STAY CLEAR OF ENGINE HAZARD AREAS. SEE "ENGINE GROUND SAFETY PRECAUTIONS" FOR ENGINE HAZARD DESCRIPTION.

(7) Do these steps to do the test:

(a) Obey all safety precautions around the running engines (TASK 71-00-00-800-801-H01).

(b) Start the right engine (No. 2): TASK 71-00-00-800-835-H00.

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1) If you used the APU to start the engine, make sure that the fuel tank quantities align with Table 507.

NOTE: The fuel loads are different from the fuel loads referenced in Engine Start (Selection), TASK 71-00-00-800-835-H00.

(c) If the APU was used to start the engine, set the APU selector switch to the OFF position.

28-AWL-101: ALI

(d) Let the right engine operate at idle power, with the boost pumps on, for a minimum of two minutes.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

NOTE: It is recommended to operate the engine for five minutes.

(e) Make a record of the initial engine parameters (N1, N2, and fuel flow).

1) Initial Values: N1_____% N2_____% Fuel flow_____

NOTE: Record the initial values after you operate the engine at idle power for a minimum of two minutes. If there is variation in the parameters, record the range.

28-AWL-101: ALI

(f) Stop the operation of the right main tank boost pumps. To do this, set these fuel pump switch-light(s) to the off position:

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

28-AWL-101: ALI

1) FUEL R PUMPS FWD

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

28-AWL-101: ALI

2) FUEL R PUMPS AFT

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

28-AWL-101: ALI

(g) Make sure that the right engine continues to operate for a minimum of 5 minutes.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

(h) Make a record of the final engine parameters (N1, N2, and fuel flow).

1) Final Values: N1_____% N2_____% Fuel flow_____

NOTE: Record the final values after you operate the engine for a minimum of five minutes.

28-AWL-101: ALI

(i) Make sure the final engine parameters (N1, N2, or fuel flow) do not decay during the 5 minutes relative to the initial engine parameters.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-101.

NOTE: This also means that the variation in the final engine parameters is almost the same as the variation in the initial engine parameters.

SUBTASK 28-22-00-860-173

(8) Shut down the right engine (No. 2) (TASK 71-00-00-800-837-H00).

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SUBTASK 28-22-00-810-003

(9) If the right engine (No. 2) did not operate for the full 5 minutes or the engine parameters decayed, do this task to isolate the leak and then repeat the operational test: Engine Fuel Feed Manifold - Suction Feed Line Leak Check, TASK 28-22-15-710-802-001.

NOTE: The test is considered failed if engine operation cannot be maintained or the engine parameters (N1, N2 and fuel flow) decay relative to those with the Boost Pump ON.

NOTE: A suction feed system that fails the operational test must be made operational prior to further flight.

SUBTASK 28-22-00-860-185

(10) Remove electrical power (TASK 24-22-00-860-816).

——— END OF TASK ———

TASK 28-22-00-710-803

10. Main Tank Fuel Boost Pump Ground Fault Interrupter - Operational Test

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This task has one or more steps which are a means to satisfy Airworthiness Limitation Instruction (ALI) requirements. An ALI note will follow the step to which it applies. Any step or sub-step that precedes or follows an ALI identified step is not subject to the ALI requirement.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
24-22-00-860-801	Supply Primary External Power (P/B 201)
24-22-00-860-807	Remove Primary External Power (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

D. Prepare for the Procedure

SUBTASK 28-22-00-861-001

(1) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.

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SUBTASK 28-22-00-865-001

(2) Make sure that these circuit breakers are closed:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
C	18	C28302	R FWD FUEL BOOST PUMP L AC SECT 2
E	2	C28303	L AFT FUEL BOOST PUMP
E	5	C28307	L FWD FUEL BOOST PUMP
L	26	C28607	L AFT FUEL BOOST PUMP CTRL
L	27	C28606	R FWD FUEL BOOST PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
E	27	C28300	R AFT FUEL BOOST PUMP
F	27	C28306	R FWD FUEL BOOST PUMP R XFR
K	11	C28609	R AFT FUEL BOOST PUMP CTRL

Standby Power Management Panel, P310

Row	Col	Number	Name
B	2	C28604	L FWD FUEL BOOST PUMP CTRL

SUBTASK 28-22-00-650-017

(3) Make sure there is a minimum of 6000 lb (2722 kg) of fuel in the each main fuel tank.

(a) To refuel the main fuel tank(s) (if it is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

E. Left Forward Fuel Boost Pump GFI Test

SUBTASK 28-22-00-710-005

WARNING DO NOT OPERATE A FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. THIS CONDITION CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE FUEL TANK. A FIRE OR AN EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(1) To operate the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

(a) Immediately set the applicable fuel pump switch-light(s) to the off position if the amber PRESS light comes on and stays on.

SUBTASK 28-22-00-710-006

(2) Push the FUEL L PUMPS FWD switch-light, on the Fuel Panel (P5 Overhead Panel), to the ON position.

SUBTASK 28-22-00-210-026

(3) Make sure the low PRESS light on the P5 overhead panel is off.

SUBTASK 28-22-00-710-007

(4) Push the BITE test button on the left forward boost pump GFI control relay, K28121 (P320 Ground Service/Handling Power Panel).

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28-AWL-18: ALI

SUBTASK 28-22-00-710-008

(5) Make sure that the RESET button on the K28121 relay has come up (white band is visible).

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: A white line should display on the side of the button.

SUBTASK 28-22-00-210-027

(6) Make sure the low PRESS light on the P5 overhead panel shows.

28-AWL-18: ALI

SUBTASK 28-22-00-710-009

(7) Make sure that the left forward fuel boost pump does not operate.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

SUBTASK 28-22-00-710-010

(8) Push the FUEL L PUMPS FWD switch-light to the off position.

SUBTASK 28-22-00-865-002

(9) Open these circuit breakers:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
E	5	C28307	L FWD FUEL BOOST PUMP

Standby Power Management Panel, P310

Row	Col	Number	Name
B	2	C28604	L FWD FUEL BOOST PUMP CTRL

SUBTASK 28-22-00-710-011

(10) Push the RESET button on the K28121 relay.

(a) Make sure that the RESET button stays in.

SUBTASK 28-22-00-865-003

(11) Close these circuit breakers:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
E	5	C28307	L FWD FUEL BOOST PUMP

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Standby Power Management Panel, P310

Row	Col	Number	Name
B	2	C28604	L FWD FUEL BOOST PUMP CTRL

SUBTASK 28-22-00-710-012

(12) Push the FUEL L PUMPS FWD switch-light to the ON position.

SUBTASK 28-22-00-710-013

(13) Make sure that the left forward fuel boost pump operates.

SUBTASK 28-22-00-710-014

(14) Push the FUEL L PUMPS FWD switch-light to the off position.

F. Left Aft Fuel Boost Pump GFI Test

SUBTASK 28-22-00-710-015

WARNING DO NOT OPERATE A FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. THIS CONDITION CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE FUEL TANK. A FIRE OR AN EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(1) To operate the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

(a) Immediately set the applicable fuel pump switch-light(s) to the off position if the amber PRESS light comes on and stays on.

SUBTASK 28-22-00-710-016

(2) Push the FUEL L PUMPS AFT switch-light, on the Fuel Panel (P5 Overhead Panel), to the ON position.

SUBTASK 28-22-00-210-020

(3) Make sure the low PRESS light on the P5 overhead panel is off.

SUBTASK 28-22-00-710-017

(4) Push the BITE test button on the left aft fuel boost pump GFI control relay, K28123 (P110 Left Power Management Panel).

28-AWL-18: ALI

SUBTASK 28-22-00-710-018

(5) Make sure that the RESET button on the K28123 relay has come up (white band is visible).

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: A white line should display on the side of the button.

SUBTASK 28-22-00-210-021

(6) Make sure the low PRESS light on the P5 overhead panel shows.

28-AWL-18: ALI

SUBTASK 28-22-00-710-019

(7) Make sure that the left aft fuel boost pump does not operate.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

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SUBTASK 28-22-00-710-020

(8) Push the FUEL L PUMPS AFT switch-light to the off position.

SUBTASK 28-22-00-865-004

(9) Open these circuit breakers:

Left Power Management Panel, P110

Row	Col	Number	Name
E	2	C28303	L AFT FUEL BOOST PUMP
L	26	C28607	L AFT FUEL BOOST PUMP CTRL

SUBTASK 28-22-00-710-021

(10) Push the RESET button on the K28123 relay.

(a) Make sure that the RESET button stays in.

SUBTASK 28-22-00-865-005

(11) Close these circuit breakers:

Left Power Management Panel, P110

Row	Col	Number	Name
E	2	C28303	L AFT FUEL BOOST PUMP
L	26	C28607	L AFT FUEL BOOST PUMP CTRL

SUBTASK 28-22-00-710-022

(12) Push the FUEL L PUMPS AFT switch-light to the ON position.

SUBTASK 28-22-00-710-023

(13) Make sure that the left aft fuel boost pump operates.

SUBTASK 28-22-00-710-024

(14) Push the FUEL L PUMPS AFT switch-light to the off position.

G. Right Forward Fuel Boost Pump GFI Test

SUBTASK 28-22-00-710-025

WARNING DO NOT OPERATE A FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. THIS CONDITION CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE FUEL TANK. A FIRE OR AN EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(1) To operate the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

(a) Immediately set the applicable fuel pump switch-light(s) to the off position if the amber PRESS light comes on and stays on.

SUBTASK 28-22-00-710-026

(2) Push the FUEL R PUMPS FWD switch-light, on the Fuel Panel, M28001 (P5 Overhead Panel), to the ON position.

SUBTASK 28-22-00-210-022

(3) Make sure the low PRESS light on the P5 overhead panel is off.

SUBTASK 28-22-00-710-027

(4) Push the BITE test button on the right forward fuel boost pump GFI control relay, K28241 (P110 Left Power Management Panel).

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28-AWL-18: ALI

SUBTASK 28-22-00-710-028

(5) Make sure that the RESET button on the K28241 relay has come up (white band is visible).

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: A white line should display on the side of the button.

SUBTASK 28-22-00-210-023

(6) Make sure the low PRESS light on the P5 overhead panel shows.

28-AWL-18: ALI

SUBTASK 28-22-00-710-029

(7) Make sure that the right forward fuel boost pump does not operate.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

SUBTASK 28-22-00-710-030

(8) Push the FUEL R PUMPS FWD switch-light to the off position.

SUBTASK 28-22-00-865-006

(9) Open these circuit breakers:

Left Power Management Panel, P110

Row	Col	Number	Name
C	18	C28302	R FWD FUEL BOOST PUMP L AC SECT 2
L	27	C28606	R FWD FUEL BOOST PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
F	27	C28306	R FWD FUEL BOOST PUMP R XFR

SUBTASK 28-22-00-710-031

(10) Push the RESET button on the K28241 relay.

(a) Make sure that the RESET button stays in.

SUBTASK 28-22-00-865-007

(11) Close these circuit breakers:

Left Power Management Panel, P110

Row	Col	Number	Name
C	18	C28302	R FWD FUEL BOOST PUMP L AC SECT 2
L	27	C28606	R FWD FUEL BOOST PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
F	27	C28306	R FWD FUEL BOOST PUMP R XFR

SUBTASK 28-22-00-710-032

(12) Push the FUEL R PUMPS FWD switch-light to the ON position.

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SUBTASK 28-22-00-710-033

(13) Make sure that the right forward fuel boost pump operates.

SUBTASK 28-22-00-710-034

(14) Push the FUEL R PUMPS FWD switch-light to the off position.

H. Right Aft Fuel Boost Pump GFI Test

SUBTASK 28-22-00-710-035

WARNING DO NOT OPERATE A FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. THIS CONDITION CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE FUEL TANK. A FIRE OR AN EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(1) To operate the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

(a) Immediately set the applicable fuel pump switch-light(s) to the off position if the amber PRESS light comes on and stays on.

SUBTASK 28-22-00-710-036

(2) Push the FUEL R PUMPS AFT switch-light, on the Fuel Panel (P5 Overhead Panel), to the ON position.

SUBTASK 28-22-00-210-024

(3) Make sure the low PRESS light on the P5 overhead panel is off.

SUBTASK 28-22-00-710-037

(4) Push the BITE test button on the right aft fuel boost pump GFI control relay, K28242 (P210 Right Power Management Panel).

28-AWL-18: ALI

SUBTASK 28-22-00-710-038

(5) Make sure that the RESET button on the K28242 relay has come up (white band is visible).

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: A white line should display on the side of the button.

SUBTASK 28-22-00-210-025

(6) Make sure the low PRESS light on the P5 overhead panel shows.

28-AWL-18: ALI

SUBTASK 28-22-00-710-039

(7) Make sure that the right aft fuel boost pump does not operate.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

SUBTASK 28-22-00-710-040

(8) Push the FUEL R PUMPS AFT switch-light to the off position.

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SUBTASK 28-22-00-865-008

(9) Open these circuit breakers:

Right Power Management Panel, P210

Row	Col	Number	Name
E	27	C28300	R AFT FUEL BOOST PUMP
K	11	C28609	R AFT FUEL BOOST PUMP CTRL

SUBTASK 28-22-00-710-041

(10) Push the RESET button on the K28242 relay.

(a) Make sure that the RESET button stays in.

SUBTASK 28-22-00-865-009

(11) Close these circuit breakers:

Right Power Management Panel, P210

Row	Col	Number	Name
E	27	C28300	R AFT FUEL BOOST PUMP
K	11	C28609	R AFT FUEL BOOST PUMP CTRL

SUBTASK 28-22-00-710-042

(12) Push the FUEL R PUMPS AFT switch-light to the ON position.

SUBTASK 28-22-00-710-044

(13) Make sure that the right aft fuel boost pump operates.

SUBTASK 28-22-00-710-043

(14) Push the FUEL R PUMPS AFT switch-light to the off position.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-00-865-010

(1) Make sure that these circuit breakers are closed:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
C	18	C28302	R FWD FUEL BOOST PUMP L AC SECT 2
E	2	C28303	L AFT FUEL BOOST PUMP
E	5	C28307	L FWD FUEL BOOST PUMP
L	26	C28607	L AFT FUEL BOOST PUMP CTRL
L	27	C28606	R FWD FUEL BOOST PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
E	27	C28300	R AFT FUEL BOOST PUMP
F	27	C28306	R FWD FUEL BOOST PUMP R XFR
K	11	C28609	R AFT FUEL BOOST PUMP CTRL

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Standby Power Management Panel, P310

Row	Col	Number	Name
B	2	C28604	L FWD FUEL BOOST PUMP CTRL

SUBTASK 28-22-00-862-001

(2) Do this task: Remove Primary External Power, TASK 24-22-00-860-807.

——— END OF TASK ———

TASK 28-22-00-710-806

11. Center Fuel Tank Override/Jettison Pump Ground Fault Protection - Operational Test

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This task has one or more steps which are a means to satisfy Airworthiness Limitation Instruction (ALI) requirements. An ALI note will follow the step to which it applies. Any step or sub-step that precedes or follows an ALI identified step is not subject to the ALI requirement.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

(2) Two persons are necessary to do this procedure: one person in the flight compartment and one person in the main wheel well.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
24-22-00-860-801	Supply Primary External Power (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
31-61-00-800-813	Showing Status Messages (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
45-10-00-740-818	How to Find Active or Latched Maintenance Messages in One ATA System (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual
WDM 28-22-13	Wiring Diagram Manual
WDM 28-22-23	Wiring Diagram Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

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Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17
SPL-10050	GFCI Tester - AC Hydraulic Pump Part #: J24014-24 Supplier: 81205

D. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

E. Access Panels

Number	Name/Location
521DB	Refueling Station Door

F. Prepare for the Operational Test

SUBTASK 28-22-00-860-180

WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Make sure that the landing gear downlocks are installed (TASK 32-00-30-480-801).

SUBTASK 28-22-00-860-181

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-22-00-860-100

(3) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.

SUBTASK 28-22-00-865-012

(4) Make sure that these circuit breakers are closed:

Left Power Management Panel, P110

Row	Col	Number	Name
L	21	C28647	CTR L OVRD FUEL PUMP CTRL

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Right Power Management Panel, P210

Row	Col	Number	Name
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

SUBTASK 28-22-00-650-015

(5) Make sure there is a minimum of 3200 lb (1451 kg) of fuel in the center fuel tank.

(a) To refuel the center fuel tank (if it is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

G. Left Center Fuel Tank Override/Jettison Pump Ground Fault Protection Operational Test

SUBTASK 28-22-00-860-101

WARNING DO NOT OPERATE A FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. THIS CONDITION CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE FUEL TANK. A FIRE OR AN EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(1) To operate the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

(a) Immediately set the applicable fuel pump switch-light(s) to the off position if the amber PRESS light comes on and stays on.

SUBTASK 28-22-00-865-013

(2) Open this circuit breaker and install safety tag:

Left Power Management Panel, P110

Row	Col	Number	Name
L	21	C28647	CTR L OVRD FUEL PUMP CTRL

SUBTASK 28-22-00-710-066

(3) Disconnect the electrical connector DM28103 from the center left override fuel pump, M28103 (WDM 28-22-13).

SUBTASK 28-22-00-710-067

(4) To make sure that Pin G on the ship-side electrical connector DM28103 has a ground, do one of these steps:

(a) Do an inspection of Pin G on the electrical connector DM28103 and make sure it is connected to airplane structure.

(b) Use an intrinsically safe approved bonding meter, COM-1550, to measure the resistance in Pin G (SWPM 20-20-00)..

1) Make sure the resistance is 2 ohms or less.

SUBTASK 28-22-00-480-003

(5) Connect electrical connector DM28103 to the GFCI Tester, SPL-10050.

SUBTASK 28-22-00-865-014

(6) Remove the safety tag and close this circuit breaker:

Left Power Management Panel, P110

Row	Col	Number	Name
L	21	C28647	CTR L OVRD FUEL PUMP CTRL

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SUBTASK 28-22-00-010-023

(7) Open this access panel:

Number	Name/Location
521DB	Refueling Station Door

(a) Put the DEFUEL VALVE switch on the P28 Integrated Refuel Panel (IRP), to the OPEN position.

NOTE: The refueling station door and the DEFUEL VALVE must stay open until instructed to close to make sure that the uncommanded on protection does not stop the operation of the pumps.

SUBTASK 28-22-00-710-069

(8) Push the FUEL CENTER PUMPS L switch-light, on the Fuel Panel (P5 Overhead Panel), to the ON position.

28-AWL-18: ALI

SUBTASK 28-22-00-710-070

CAUTION

DO NOT CONTINUE TO HOLD THE SWITCH IN THE FAULT POSITION. THE TESTER CAN GET HOT AND FAIL.

(9) Put the switch on the GFCI Tester, SPL-10050, to the FAULT position and do these steps:

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: The switch on the GFCI Tester, SPL-10050, must be put to the FAULT position within 15 seconds of pushing the FUEL CENTER PUMPS L switch-light to ON. Do not continue to hold the switch in the fault position.

28-AWL-18: ALI

(a) Make sure the EICAS status message FUEL PUMP CENTER L shows on the EICAS display (TASK 31-61-00-800-813, TASK 31-61-00-800-804).

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

28-AWL-18: ALI

(b) Make sure the correlated maintenance message 28-11055 shows on the MAT (TASK 45-10-00-740-818).

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

SUBTASK 28-22-00-710-073

(10) Push the FUEL CENTER PUMPS L switch-light to the off position.

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SUBTASK 28-22-00-865-015

(11) Open this circuit breaker and install safety tag:

Left Power Management Panel, P110

Row	Col	Number	Name
L	21	C28647	CTR L OVRD FUEL PUMP CTRL

SUBTASK 28-22-00-080-003

(12) Disconnect the electrical connector DM28103 from the GFCI Tester, SPL-10050.

SUBTASK 28-22-00-710-075

(13) Connect the electrical connector DM28103 to the center left override fuel pump, M28103 (WDM 28-22-13).

SUBTASK 28-22-00-865-029

(14) Remove the safety tag and close this circuit breaker:

Left Power Management Panel, P110

Row	Col	Number	Name
L	21	C28647	CTR L OVRD FUEL PUMP CTRL

SUBTASK 28-22-00-710-077

(15) Push the FUEL CENTER PUMPS L switch-light to the ON position.

28-AWL-18: ALI

SUBTASK 28-22-00-710-078

(16) Make sure that the center left override pump does not operate.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: Do this step for a minimum of 15 seconds.

SUBTASK 28-22-00-710-081

(17) Push the FUEL CENTER PUMPS L switch-light to the off position.

NOTE: If you do not put the FUEL CENTER PUMPS L switch-light to the off position before the ground fault latch is cleared by the steps that follow, the center left override pump will operate.

SUBTASK 28-22-00-710-082

(18) Do the ground test on the MAT for the CTR L OVRD PUMP GFP RESET.

(a) Make sure the ground test shows PASSED.

SUBTASK 28-22-00-710-083

(19) Push the FUEL CENTER PUMPS L switch-light to the ON position.

SUBTASK 28-22-00-710-084

(20) Make sure the EICAS status message FUEL PUMP CENTER L does not show on the EICAS display (TASK 31-61-00-800-813, TASK 31-61-00-800-804).

SUBTASK 28-22-00-710-085

(21) Make sure the correlated maintenance message 28-11055 does not show on the MAT (TASK 45-10-00-740-818).

SUBTASK 28-22-00-710-086

(22) Push the FUEL CENTER PUMPS L switch-light to the off position.

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SUBTASK 28-22-00-860-157

(23) Put the DEFUEL VALVE switch to the CLOSE position.

SUBTASK 28-22-00-410-013

(24) Close this access panel:

Number	Name/Location
521DB	Refueling Station Door

H. Right Center Fuel Tank Override/Jettison Pump Ground Fault Protection Operational Test

SUBTASK 28-22-00-710-087

WARNING DO NOT OPERATE A FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. THIS CONDITION CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE FUEL TANK. A FIRE OR AN EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(1) To operate the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

(a) Immediately set the applicable fuel pump switch-light(s) to the off position if the amber PRESS light comes on and stays on.

SUBTASK 28-22-00-865-016

(2) Open this circuit breaker and install safety tag:

Right Power Management Panel, P210

Row	Col	Number	Name
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

SUBTASK 28-22-00-710-088

(3) Disconnect the electrical connector DM28203 from the center right override fuel pump, M28203 (WDM 28-22-23).

SUBTASK 28-22-00-710-089

(4) To make sure that Pin G on the ship-side electrical connector DM28203 has a ground, do one of these steps:

(a) Do an inspection of Pin G on the electrical connector DM28203 and make sure it is connected to airplane structure.

(b) Use an intrinsically safe approved bonding meter, COM-1550, to measure the resistance in Pin G (SWPM 20-20-00)..

1) Make sure the resistance is 2 ohms or less.

SUBTASK 28-22-00-480-004

(5) Connect electrical connector DM28203 to the GFCI Tester, SPL-10050.

SUBTASK 28-22-00-865-017

(6) Remove the safety tag and close this circuit breaker:

Right Power Management Panel, P210

Row	Col	Number	Name
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

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SUBTASK 28-22-00-010-025

(7) Open this access panel:

Number	Name/Location
521DB	Refueling Station Door

(a) Put the DEFUEL VALVE switch on the P28 Integrated Refuel Panel (IRP), to the OPEN position.

NOTE: The refueling station door and the DEFUEL VALVE must stay open until instructed to close to make sure that the uncommanded on protection does not stop the operation of the pumps.

SUBTASK 28-22-00-710-091

(8) Push the FUEL CENTER PUMPS R switch-light, on the Fuel Panel (P5 Overhead Panel), to the ON position.

28-AWL-18: ALI

SUBTASK 28-22-00-710-092

(9) Put the switch on the GFCI Tester, SPL-10050, to the FAULT position and do these steps:

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: The switch on the GFCI Tester, SPL-10050, must be put to the FAULT position within 15 seconds of pushing the FUEL CENTER PUMPS R switch-light to ON. Do not continue to hold the switch in the fault position.

28-AWL-18: ALI

(a) Make sure the EICAS status message FUEL PUMP CENTER R shows on the EICAS display (TASK 31-61-00-800-813, TASK 31-61-00-800-804).

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

28-AWL-18: ALI

(b) Make sure the correlated maintenance message 28-12039 shows on the MAT (TASK 45-10-00-740-818).

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

SUBTASK 28-22-00-710-095

(10) Push the FUEL CENTER PUMPS R switch-light to the off position.

SUBTASK 28-22-00-865-018

(11) Open this circuit breaker and install safety tag:

Right Power Management Panel, P210

Row	Col	Number	Name
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

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SUBTASK 28-22-00-080-004

(12) Disconnect the electrical connector DM28203 from the GFCI Tester, SPL-10050.

SUBTASK 28-22-00-710-097

(13) Connect the electrical connector DM28203 to the center right override fuel pump, M28203 (WDM 28-22-23).

SUBTASK 28-22-00-865-019

(14) Remove the safety tag and close this circuit breaker:

Right Power Management Panel, P210

Row	Col	Number	Name
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

SUBTASK 28-22-00-710-098

(15) Push the FUEL CENTER PUMPS R switch-light to the ON position.

28-AWL-18: ALI

SUBTASK 28-22-00-710-099

(16) Make sure that the center right override pump does not operate.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: Do this step for a minimum of 15 seconds.

SUBTASK 28-22-00-710-102

(17) Push the FUEL CENTER PUMPS R switch-light to the off position.

NOTE: If you do not put the FUEL CENTER PUMPS R switch-light to the off position before the ground fault latch is cleared by the steps that follow, the center right override fuel pump will operate.

SUBTASK 28-22-00-710-103

(18) Do the ground test on the MAT for the CTR R OVRD PUMP GFP RESET.

(a) Make sure the ground test shows PASSED.

SUBTASK 28-22-00-710-104

(19) Push the FUEL CENTER PUMPS R switch-light to the ON position.

SUBTASK 28-22-00-710-105

(20) Make sure the EICAS status message FUEL PUMP CENTER R does not show on the EICAS display (WDM 28-22-23).

SUBTASK 28-22-00-710-106

(21) Make sure the correlated maintenance message 28-12039 does not show on the MAT (TASK 45-10-00-740-818).

SUBTASK 28-22-00-710-107

(22) Push the FUEL CENTER PUMPS R switch-light to the off position.

SUBTASK 28-22-00-860-149

(23) Put the DEFUEL VALVE switch to the CLOSE position.

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SUBTASK 28-22-00-410-012

(24) Close this access panel:

Number	Name/Location
521DB	Refueling Station Door

SUBTASK 28-22-00-860-182

WARNING OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(25) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

——— END OF TASK ———

TASK 28-22-00-710-807

12. Fuel Jettison Pump Ground Fault Protection - Operational Test

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This task has one or more steps which are a means to satisfy Airworthiness Limitation Instruction (ALI) requirements. An ALI note will follow the step to which it applies. Any step or sub-step that precedes or follows an ALI identified step is not subject to the ALI requirement.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

(2) Two persons are necessary to do this procedure: one person in the flight compartment and one person in the main wheel well.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
24-22-00-860-801	Supply Primary External Power (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
31-61-00-800-813	Showing Status Messages (P/B 201)
45-10-00-740-818	How to Find Active or Latched Maintenance Messages in One ATA System (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual
WDM 28-31-11	Wiring Diagram Manual
WDM 28-31-21	Wiring Diagram Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

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Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17
SPL-10050	GFCI Tester - AC Hydraulic Pump Part #: J24014-24 Supplier: 81205

D. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right

E. Access Panels

Number	Name/Location
521DB	Refueling Station Door
552HB	Inboard Fixed Trailing Edge Panel
652HB	Inboard Fixed Trailing Edge Panel

F. Prepare for the Operational Test

SUBTASK 28-22-00-861-002

(1) Do this task: Supply Primary External Power, TASK 24-22-00-860-801.

SUBTASK 28-22-00-865-020

(2) Make sure that these circuit breakers are closed:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
K	14	C28646	R FUEL JETT PUMP CTRL

SUBTASK 28-22-00-650-016

(3) Make sure there is a minimum of 14,000 lb (6350 kg) of fuel in the each main fuel tank.

(a) To refuel the main fuel tank(s) (if it is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

SUBTASK 28-22-00-010-030

(4) Open these access panels:

Number	Name/Location
552HB	Inboard Fixed Trailing Edge Panel
652HB	Inboard Fixed Trailing Edge Panel

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G. Left Main Fuel Tank Jettison Pump Ground Fault Protection Operational Test

SUBTASK 28-22-00-860-102

WARNING DO NOT OPERATE A FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. THIS CONDITION CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE FUEL TANK. A FIRE OR AN EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(1) To operate the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

(a) Immediately set the applicable fuel pump switch-light(s) to the off position if the amber PRESS light comes on and stays on.

SUBTASK 28-22-00-865-021

(2) Open this circuit breaker and install safety tag:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL

NOTE: The jettison pump status message FUEL JETT PUMP L (R) will show when the L (R) circuit breaker is opened and before the commanded ground fault. It will clear automatically when the pumps are commanded to run and the pressure is not low.

SUBTASK 28-22-00-710-108

(3) Disconnect the electrical connector DM28104 from the left fuel jettison pump, M28104 (WDM 28-31-11).

SUBTASK 28-22-00-710-109

(4) To make sure that Pin G on the ship-side electrical connector DM28104 has a ground, do one of these steps:

(a) Do an inspection of Pin G on the electrical connector DM28104 and make sure it is connected to airplane structure.

(b) Use an intrinsically safe approved bonding meter, COM-1550, to measure the resistance in Pin G (SWPM 20-20-00).

1) Make sure the resistance is 2 ohms or less.

SUBTASK 28-22-00-480-001

(5) Connect electrical connector DM28104 to the GFCI Tester, SPL-10050.

SUBTASK 28-22-00-865-022

(6) Remove the safety tag and close this circuit breaker:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL

SUBTASK 28-22-00-010-017

(7) Open this access panel:

Number	Name/Location
521DB	Refueling Station Door

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(a) Put the DEFUEL VALVE switch on the P28 Integrated Refuel Panel (IRP), to the OPEN position.

NOTE: The refueling station door and the DEFUEL VALVE must stay open until instructed to close so that the uncommanded on protection does not stop the operation of the pumps.

SUBTASK 28-22-00-710-110

(8) Push the FUEL JETTISON ARM switch-light, on the Fuel Jettison Panel (P5 Overhead Panel), to the ARMED position.

28-AWL-18: ALI

SUBTASK 28-22-00-710-111

CAUTION

DO NOT CONTINUE TO HOLD THE SWITCH IN THE FAULT POSITION. THE TESTER CAN GET HOT AND FAIL.

(9) Put the switch on the GFCI Tester, SPL-10050, to the FAULT position and do these steps:

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: The switch on the GFCI Tester, SPL-10050, must be put to the FAULT position within 15 seconds of pushing the FUEL JETTISON ARM switch-light to ARMED. Do not continue to hold the switch in the fault position.

28-AWL-18: ALI

(a) Make sure the EICAS status message FUEL JETT PUMP L and EICAS advisory message FUEL JETT MAIN show on the EICAS display (TASK 31-61-00-800-813).

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

28-AWL-18: ALI

(b) Make sure the correlated maintenance message 28-11056 shows on the MAT (TASK 45-10-00-740-818).

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

SUBTASK 28-22-00-710-112

(10) Push the FUEL JETTISON ARM switch-light to the off position.

SUBTASK 28-22-00-865-023

(11) Open this circuit breaker and install safety tag:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL

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SUBTASK 28-22-00-080-001

(12) Disconnect the electrical connector DM28104 from the GFCI Tester, SPL-10050.

SUBTASK 28-22-00-710-113

(13) Connect the electrical connector DM28104 to the left fuel jettison pump, M28104 (WDM 28-31-11).

SUBTASK 28-22-00-865-024

(14) Remove the safety tag and close this circuit breaker:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL

SUBTASK 28-22-00-710-114

(15) Push the FUEL JETTISON ARM switch-light to the ARMED position.

28-AWL-18: ALI

SUBTASK 28-22-00-710-115

(16) Make sure the left jettison pump does not operate.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: Do this step for a minimum of 15 seconds.

SUBTASK 28-22-00-710-118

(17) Push the FUEL JETTISON ARM switch-light to the off position.

NOTE: If you do not put the FUEL JETTISON ARM switch-light to the off position before the ground fault latch is cleared by the steps that follow, the left jettison pump will operate.

SUBTASK 28-22-00-710-119

(18) Do the ground test on the MAT for the FUEL JETTISON PUMP GFP RESET.

(a) Make sure the ground test shows PASSED.

SUBTASK 28-22-00-710-120

(19) Push the FUEL JETTISON ARM switch-light to the ARMED position.

SUBTASK 28-22-00-710-121

(20) Make sure the EICAS status message FUEL JETTISON PUMP L and EICAS advisory message FUEL JETT MAIN do not show on the EICAS display (TASK 31-61-00-800-813).

SUBTASK 28-22-00-710-122

(21) Make sure the correlated maintenance message 28-11056 does not show on the MAT (TASK 45-10-00-740-818).

SUBTASK 28-22-00-710-123

(22) Push the FUEL JETTISON ARM switch-light to the off position.

SUBTASK 28-22-00-410-018

(23) Close this access panel:

Number	Name/Location
552HB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-22-00-860-158

(24) Put the DEFUEL VALVE switch to the CLOSE position.

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SUBTASK 28-22-00-410-014

(25) Close this access panel:

Number	Name/Location
521DB	Refueling Station Door

H. Right Main Fuel Tank Jettison Pump Ground Fault Protection Operational Test

SUBTASK 28-22-00-860-103

WARNING DO NOT OPERATE A FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. THIS CONDITION CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE FUEL TANK. A FIRE OR AN EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(1) To operate the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

(a) Immediately set the applicable fuel pump switch-light(s) to the off position if the amber PRESS light comes on and stays on.

SUBTASK 28-22-00-865-025

(2) Open this circuit breaker and install safety tag:

Right Power Management Panel, P210

Row	Col	Number	Name
K	14	C28646	R FUEL JETT PUMP CTRL

NOTE: The jettison pump status message FUEL JETT PUMP L (R) will show when the L (R) circuit breaker is opened and before the commanded ground fault. It will clear automatically when the pumps are commanded to run and the pressure is not low.

SUBTASK 28-22-00-710-124

(3) Disconnect the electrical connector DM28204 from the right fuel jettison pump, M28204 (WDM 28-31-21).

SUBTASK 28-22-00-710-125

(4) To make sure that Pin G on the ship-side electrical connector DM28204 has a ground, do one of these steps:

(a) Do an inspection of Pin G on the electrical connector DM28204 and make sure it is connected to airplane structure.

(b) Use an intrinsically safe approved bonding meter, COM-1550, to measure the resistance in Pin G (SWPM 20-20-00).

1) Make sure the resistance is 2 ohms or less.

SUBTASK 28-22-00-480-002

(5) Connect electrical connector DM28204 to the GFCI Tester, SPL-10050.

SUBTASK 28-22-00-865-026

(6) Remove the safety tag and close this circuit breaker:

Right Power Management Panel, P210

Row	Col	Number	Name
K	14	C28646	R FUEL JETT PUMP CTRL

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SUBTASK 28-22-00-010-026

(7) Open this access panel:

Number	Name/Location
521DB	Refueling Station Door

(a) Put the DEFUEL VALVE switch on the P28 Integrated Refuel Panel (IRP), to the OPEN position.

NOTE: The refueling station door and the DEFUEL VALVE must stay open until instructed to close so that the uncommanded on protection does not stop the operation of the pumps.

SUBTASK 28-22-00-710-126

(8) Push the FUEL JETTISON ARM switch-light, on the Fuel Jettison Panel (P5 Overhead Panel), to the ARMED position.

28-AWL-18: ALI

SUBTASK 28-22-00-710-127

(9) Put the switch on the GFCI Tester, SPL-10050, to the FAULT position and do these steps:

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: The switch on the GFCI Tester, SPL-10050, must be put to the FAULT position within 15 seconds of pushing the FUEL JETTISON ARM switch-light to ARMED. Do not continue to hold the switch in the fault position.

28-AWL-18: ALI

(a) Make sure the EICAS status message FUEL JETT PUMP R and EICAS advisory message FUEL JETT MAIN show on the EICAS display (TASK 31-61-00-800-813).

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

28-AWL-18: ALI

(b) Make sure the correlated maintenance message 28-12047 shows on the MAT (TASK 45-10-00-740-818).

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

SUBTASK 28-22-00-710-128

(10) Push the FUEL JETTISON ARM switch-light to the off position.

SUBTASK 28-22-00-865-027

(11) Open this circuit breaker and install safety tag:

Right Power Management Panel, P210

Row	Col	Number	Name
K	14	C28646	R FUEL JETT PUMP CTRL

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SUBTASK 28-22-00-080-002

(12) Disconnect the electrical connector DM28204 from the GFCI Tester, SPL-10050.

SUBTASK 28-22-00-710-129

(13) Connect the electrical connector DM28204 to the right fuel jettison pump, M28204 (WDM 28-31-21).

SUBTASK 28-22-00-865-028

(14) Remove the safety tag and close this circuit breaker:

Right Power Management Panel, P210

Row	Col	Number	Name
K	14	C28646	R FUEL JETT PUMP CTRL

SUBTASK 28-22-00-710-130

(15) Push the FUEL JETTISON ARM switch-light to the ARMED position.

28-AWL-18: ALI

SUBTASK 28-22-00-710-131

(16) Make sure the right jettison pump does not operate.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: Do this step for a minimum of 15 seconds.

SUBTASK 28-22-00-710-134

(17) Push the FUEL JETTISON ARM switch-light to the off position.

NOTE: If you do not put the FUEL JETTISON ARM switch-light to the off position before the ground fault latch is cleared by the steps that follow, the right jettison pump will operate.

SUBTASK 28-22-00-710-135

(18) Do the ground test on the MAT for the FUEL JETTISON PUMP GFP RESET.

(a) Make sure the ground test shows PASSED.

SUBTASK 28-22-00-710-136

(19) Push the FUEL JETTISON ARM switch-light to the ARMED position.

SUBTASK 28-22-00-710-137

(20) Make sure the EICAS status message FUEL JETTISON PUMP R and EICAS advisory message FUEL JETT MAIN do not show on the EICAS display (TASK 31-61-00-800-813).

SUBTASK 28-22-00-710-138

(21) Make sure the correlated maintenance message 28-12047 does not show on the MAT (TASK 45-10-00-740-818).

SUBTASK 28-22-00-710-139

(22) Push the FUEL JETTISON ARM switch-light to the off position.

SUBTASK 28-22-00-410-024

(23) Close this access panel:

Number	Name/Location
652HB	Inboard Fixed Trailing Edge Panel

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I. Put the Airplane Back to the Usual Condition

SUBTASK 28-22-00-710-140

(1) Put the DEFUEL VALVE switch on the IRP, P28, to the CLOSE position.

SUBTASK 28-22-00-410-007

(2) Close this access panel:

Number	Name/Location
521DB	Refueling Station Door

——— END OF TASK ———

TASK 28-22-00-760-801

13. AC Fuel Pumps - Insulation Resistance Test

A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

(2) This task does an insulation resistance test of these AC fuel system pumps:

(a) Main tank boost pumps

(b) Center tank override/jettison pumps

(c) Fuel jettison pumps

(3) If this task is done because a circuit breaker, ELCU, or GFI/GFP has opened for a fuel pump, you must complete and pass this test before you reset the circuit breaker, ELCU or GFI/GFP.

(4) When you use the insulation meter, COM-6457, it is recommended that the insulation meter be insulated from any metal work stands. It is also recommended that protective clothing (rubber gloves, insulated shoes, etc.) be worn when you make these measurements. The insulation meter should be plugged into a grounded receptacle to reduce the possibility of electrical shock.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-22-05-000-801	Boost Pump Motor-Impeller - Removal (P/B 401)
28-22-05-400-801	Boost Pump Motor-Impeller - Installation (P/B 401)
28-22-06-000-801	Override/Jettison Pump Motor-Impeller - Removal (P/B 401)
28-22-06-400-801	Override/Jettison Pump Motor-Impeller - Installation (P/B 401)
28-31-01-000-801	Fuel Jettison Pump (Motor-Impeller) - Removal (P/B 401)
28-31-01-400-801	Fuel Jettison Pump (Motor-Impeller) - Installation (P/B 401)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

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(Continued)

Reference	Title
SWPM 20-60-01	Cleaning of Electrical Connectors

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17
COM-6457	Meter - Insulation (Range: 1-1,000 VDC or equivalent, select meter per test requirements) Part #: 1863-9700 Supplier: 62015 Part #: 1864-9700 Supplier: 62015 Part #: 1865PLUS Supplier: 62015 Part #: 1865PLUSCE Supplier: 62015 Opt Part #: 1865-00-CE Supplier: 62015

D. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
151	Aft Cargo Compartment, Left
152	Aft Cargo Compartment, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

E. Access Panels

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel
552HB	Inboard Fixed Trailing Edge Panel
651DB	Inboard Fixed Trailing Edge Panel
652HB	Inboard Fixed Trailing Edge Panel

F. Prepare for the Test

SUBTASK 28-22-00-860-196

(1) Supply electrical power, if it is necessary (TASK 24-22-00-860-805).

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SUBTASK 28-22-00-860-197

WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR BEFORE YOU MOVE THE CONTROL LEVER. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.

SUBTASK 28-22-00-860-198

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-22-00-010-031

(4) To get access to the applicable pump, do the applicable step:

(a) Open this access panel to get access to the left forward fuel boost pump, installed on the rear spar of the left wing:

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

(b) Open this access panel to get access to the right forward fuel boost pump, installed on the rear spar of the right wing:

Number	Name/Location
651DB	Inboard Fixed Trailing Edge Panel

(c) Remove this access panel to get access to the left fuel jettison pump, installed on the rear spar, in the left main tank:

Number	Name/Location
552HB	Inboard Fixed Trailing Edge Panel

(d) Remove this access panel to get access to the right fuel jettison pump, installed on the rear spar, in the right main tank:

Number	Name/Location
652HB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-22-00-860-199

(5) Make sure the applicable pump(s) circuit breakers are open:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
C	18	C28302	R FWD FUEL BOOST PUMP L AC SECT 2
E	2	C28303	L AFT FUEL BOOST PUMP
E	5	C28307	L FWD FUEL BOOST PUMP
L	21	C28647	CTR L OVRD FUEL PUMP CTRL
L	22	C28645	L FUEL JETT PUMP CTRL

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Left Power Management Panel, P110

Row	Col	Number	Name
L	26	C28607	L AFT FUEL BOOST PUMP CTRL
L	27	C28606	R FWD FUEL BOOST PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
E	27	C28300	R AFT FUEL BOOST PUMP
F	27	C28306	R FWD FUEL BOOST PUMP R XFR
K	11	C28609	R AFT FUEL BOOST PUMP CTRL
K	14	C28646	R FUEL JETT PUMP CTRL
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

Standby Power Management Panel, P310

Row	Col	Number	Name
B	2	C28604	L FWD FUEL BOOST PUMP CTRL

SUBTASK 28-22-00-650-031

(6) Refuel the left, right or center tank, as applicable (TASK 12-11-01-650-801).

NOTE: This step makes sure the fuel pump housing is covered in each case. This makes sure that the fuel pump is not exposed to air during the electrical test.

NOTE: These fuel requirements are only necessary for fuel pumps that are being tested on the airplane.

(a) For the override pumps, refuel the center fuel tank to 52,300 lb (23,723 kg) minimum.

(b) For the forward fuel boost pumps, refuel the left or right main fuel tank to 13,000 lb (5897 kg) minimum.

(c) For the aft fuel boost pumps, refuel the center fuel tank to 170,000 lb (77,111 kg) minimum and the left or right main fuel tank to 6000 lb (2722 kg) minimum.

(d) For the jettison pumps, refuel the left or right main fuel tank to 32,200 lb (14,606 kg) minimum.

G. Fuel Pump Wire Terminal Assembly Inspection

NOTE: It is necessary to do these procedures at each pump: Fuel Pump Wire Terminal Assembly Inspection, Fuel Pump Continuity Check, Initial Insulation Resistance Test, and the Final Insulation Resistance Test.

SUBTASK 28-22-00-010-032

(1) Go to the applicable fuel pump location.

NOTE: Refer to Table 508 below for the pump location.

SUBTASK 28-22-00-210-019

(2) At each pump, do a visual inspection of the wire terminal assembly.

NOTE: Also do these visual inspections at the airplane side of the wire terminal assembly and repair as necessary.

(a) Look for these conditions:

1) Indication that fuel has leaked from the wire terminal assembly.

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2) Indication that the terminal assembly or wire insulation is discolored because of too much heat.

a) Clean the wire bundle caps (SWPM 20-60-01).

3) Indication of damage to the wire terminal assembly, for example:

a) bulges

b) bent flanges

c) broken screws

d) medium to heavy corrosion damage

SUBTASK 28-22-00-760-001

(3) If the visual check shows the fuel pump is okay, do this procedure: Fuel Pump Continuity Check.

SUBTASK 28-22-00-900-001

(4) If the visual check shows that the fuel pump is not okay, do these steps:

(a) Replace the applicable pump motor-impeller.

NOTE: Refer to Table 508 for the AMM tasks.

Table 508/28-22-00-993-813

Fuel Pump	AMM Tasks
Main Tank Fuel Boost Pump	Boost Pump Motor-Impeller - Removal, TASK 28-22-05-000-801 Boost Pump Motor-Impeller - Installation, TASK 28-22-05-400-801
Center Fuel Tank Override/Jettison Pump	Override/Jettison Pump Motor-Impeller - Removal, TASK 28-22-06-000-801 Override/Jettison Pump Motor-Impeller - Installation, TASK 28-22-06-400-801
Fuel Jettison Pump	Fuel Jettison Pump (Motor-Impeller) - Removal, TASK 28-31-01-000-801 Fuel Jettison Pump (Motor-Impeller) - Installation, TASK 28-31-01-400-801

(b) Do the continuity/resistance checks for the replacement fuel pump.

1) Start with this procedure: Fuel Pump Continuity Check.

H. Fuel Pump Continuity Check

SUBTASK 28-22-00-020-001

(1) Disconnect the electrical connector from the pump motor/impeller.

SUBTASK 28-22-00-760-002

WARNING MAKE SURE THAT THE METER USED TO MEASURE BONDING JUMPER CONTINUITY IS RESISTANT TO EXPLOSION. IF NOT, IT IS POSSIBLE THAT AN EXPLOSION OR FIRE CAN OCCUR.

(2) Use an intrinsically safe approved bonding meter, COM-1550:

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(a) For the main tank fuel boost pumps, measure the resistance between pin 7 on the electrical connector and the braided bonding jumper on the fuel pump.

NOTE: The measurement between pin 7 and the bonding jumper is a continuity check, not a bonding resistance check.

(b) For the center fuel tank override/jettision pumps and fuel jettison pumps, measure the resistance between pin G on the electrical connector and the braided bonding jumper on the fuel pump.

NOTE: The measurement between pin G and the bonding jumper is a continuity check, not a bonding resistance check.

SUBTASK 28-22-00-760-003

(3) If the resistance is less than 5 ohms, do this procedure: Initial Insulation Resistance Test.

SUBTASK 28-22-00-760-004

(4) If the resistance is more than 5 ohms, do these steps:

(a) Replace the applicable motor-impeller (Table 508).

(b) Do the continuity/resistance checks for the replacement pump.

1) Start with this procedure: Fuel Pump Continuity Check.

I. Initial Insulation Resistance Test

SUBTASK 28-22-00-480-006

(1) Use the instructions given with the insulation meter, COM-6457, to calibrate the equipment.

28-AWL-17: CDCCL

(a) Make sure the insulation meter has 10 VDC and 500 VDC voltage supply options with a maximum short circuit current of 5 milliamperes.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

SUBTASK 28-22-00-760-005

(2) RESISTANCE TEST WITH THE FUEL PUMP REMOVED FROM THE AIRPLANE;

Do these steps to do a test of the insulation resistance:

(a) Remove the fuel pump motor-impeller(s) (Table 508).

(b) Do this procedure on the removed pumps, within two hours: Final Insulation Resistance Test.

SUBTASK 28-22-00-760-006

(3) RESISTANCE TEST WITH THE FUEL PUMP INSTALLED ON THE AIRPLANE;

Do these steps to do a test of the insulation resistance (initial test):

NOTE: These steps are done at 10 VDC to prevent arcing or overheat in a flammable leakage zone when high voltage is applied to a pump with low insulation resistance. The results of the 10 VDC test will tell you if it is safe to the 500 VDC test with the pump installed.

(a) Disconnect the electrical connector from the pump motor-impeller.

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WARNING USE THE SPECIFIED EQUIPMENT. OTHER EQUIPMENT CAN CAUSE AN EXPLOSION OR FIRE.

(b) Do these steps to connect the insulation meter, COM-6457, for the 10 VDC test:

NOTE: Keep the leads that connect to the pump connector pins as short as possible (3 ft (1 m) or less) to prevent problems with the resistance measurements.

1) Connect the insulation meter, COM-6457, into a grounded receptacle.
   a) Make sure the ground strap is connected from the grounded receptacle to the + UNKNOWN terminal.

      NOTE: This makes sure the insulation meter, COM-6457, is grounded.
2) Connect the + UNKNOWN probe to the pump connector pin ground (pin 7 or G, depending on pump).
3) Connect the - UNKNOWN probe to the pump connector pin 2 or B (depending on pump).
4) Set the multiplier dial to the lowest range (100K).

28-AWL-17: CDCCL

5) Set the TEST VOLTAGE switches to 10 VDC on the insulation meter.

   NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

   NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.
6) Set the measure switch to the MEASURE position.

(c) Do these steps to measure the resistance at the pump:

1) Turn the multiplier switch until the meter reading is less than 5.

   NOTE: The resistance is the meter reading multiplied by multiplier switch setting.

28-AWL-17: CDCCL

2) Measure the resistance between the pump 3 phase power connector contact (pin 2 or B) and the ground contact (pin 7 or G) on the pump electrical connector.

   NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

   NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

   NOTE: If the pump resistance is very high, the insulation meter, COM-6457, value will increase with time. For any resistance over 100 megohms, it is not necessary to get the actual resistance value. Stop the measurement once the insulation meter value is more than 100 megohms.
3) Make a record of the resistance measured between pin 2 or B and pin 7 or G.
4) Set the function switch to the DISCHARGE position.

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28-AWL-17: CDCCL

5) Do these steps again to measure the resistance between the remaining 3 phase power connector contact (pin 4 or D and pin 6 or F) and the ground contact (pin 7 or G) on the pump electrical connector.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

(d) Do an analysis of the test results:

28-AWL-17: CDCCL

1) Make sure each resistance measured between the 3 phase power connector contacts (pins 2 or B, 4 or D, and 6 or F) and the ground contact (pin 7 or G) on the pump electrical connector is 1 megohm or more.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

a) Do this procedure: Final Insulation Resistance Check.

2) If any resistance measured between pins 2 or B, 4 or D, and 6 or F and pin 7 or G is less than 1 megohm, do these steps:

a) Replace the pump motor-impeller (Table 508).

b) Do the continuity/resistance checks again for the replacement pump.

<1> Start with this procedure: Fuel Pump Continuity Check.

J. Final Insulation Resistance Test

SUBTASK 28-22-00-480-007

(1) Do these steps to connect the insulation meter, COM-6457, for the 500 VDC check:

NOTE: Keep the leads that connect to the pump connector pins as short as possible (3 ft (1 m) or less) to prevent problems with the resistance measurements.

NOTE: The insulation meter, COM-6457, must have a 500 VDC voltage supply option.

(a) Calibrate the insulation meter, COM-6457, if it is necessary.

1) Connect the insulation meter, COM-6457, into a grounded receptacle.

a) Make sure the ground strap is connected from the grounded receptacle to the + UNKNOWN terminal.

NOTE: This makes sure the insulation meter, COM-6457, is grounded.

2) Connect the + UNKNOWN probe to the pump connector pin ground (pin 7 or G, depending on pump).

3) Connect the - UNKNOWN probe to the pump connector pin 2 or B (depending on pump).

4) Set the multiplier dial to the lowest range (1M).

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28-AWL-17: CDCCL

5) Set the TEST VOLTAGE switches to 500 VDC on the insulation meter.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

6) Set the measure switch to the MEASURE position.

SUBTASK 28-22-00-760-007

(2) Do these steps to measure the resistance at the pump:

(a) Turn the multiplier switch until the meter reading is less than 5.

NOTE: The resistance is the meter reading multiplied by multiplier switch setting.

28-AWL-17: CDCCL

(b) Measure the resistance between the 3 phase power connector contact (pin 2 or B) and the ground contact (pin 7 or G) on the pump electrical connector.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

NOTE: If the pump resistance is very high, the insulation meter, COM-6457, value will increase with time. For any resistance over 100 megohms, it is not necessary to get the actual resistance value. Stop the measurement once the insulation meter value is more than 100 megohms.

(c) Make a record of the resistance measured between pin 2 or B and pin 7 or G.

(d) Set the function switch to the DISCHARGE position.

28-AWL-17: CDCCL

(e) Do these steps again to measure the resistance between the remaining 3 phase power connector contacts (pin 4 or D and pin 6 or F) and the ground contact (pin 7 or G) on the pump electrical connector.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

SUBTASK 28-22-00-760-008

(3) Do an analysis of the test results:

28-AWL-17: CDCCL

(a) Make sure each resistance measured between the 3 phase power connector contacts (pins 2 or B, 4 or D, and 6 or F) and the ground contact (pin 7 or G) on the pump electrical connector is 5 megohms or more.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

1) If the insulation resistance test is satisfactory, do these steps:

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a) If the motor-impeller was removed for the test, re-install the motor-impeller (Table 508).

b) If the motor-impeller was not removed for the test, connect the electrical connector for the motor-impeller and do an operational test per the pump installation task (Table 508).

2) If any resistance measured between pins 2 or B, 4 or D, and 6 or F and pin 7 or G is less than 5 megohms, do these steps:

a) Replace the pump motor-impeller (Table 508).

b) Do the continuity/resistance checks again for the replacement pump.

<1> Start with this procedure: Fuel Pump Continuity Check.

K. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-00-410-019

(1) Do the step(s) for the applicable pump:

(a) For the left forward fuel boost pump, close this access panel:

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

(b) For the right forward fuel boost pump, close this access panel:

Number	Name/Location
651DB	Inboard Fixed Trailing Edge Panel

(c) For the left fuel jettison pump, installed on the rear spar, in the left main tank, close this access panel:

Number	Name/Location
552HB	Inboard Fixed Trailing Edge Panel

(d) For the right fuel jettison pump, installed on the rear spar, in the right main tank, close this access panel:

Number	Name/Location
652HB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-22-00-860-201

(2) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 28-22-00-860-202

(3) Remove the safety tags and close the applicable pump(s) circuit breakers:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
C	18	C28302	R FWD FUEL BOOST PUMP L AC SECT 2
E	2	C28303	L AFT FUEL BOOST PUMP
E	5	C28307	L FWD FUEL BOOST PUMP
L	21	C28647	CTR L OVRD FUEL PUMP CTRL
L	22	C28645	L FUEL JETT PUMP CTRL
L	26	C28607	L AFT FUEL BOOST PUMP CTRL

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(Continued)

Left Power Management Panel, P110

Row	Col	Number	Name
L	27	C28606	R FWD FUEL BOOST PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
E	27	C28300	R AFT FUEL BOOST PUMP
F	27	C28306	R FWD FUEL BOOST PUMP R XFR
K	11	C28609	R AFT FUEL BOOST PUMP CTRL
K	14	C28646	R FUEL JETT PUMP CTRL
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

Standby Power Management Panel, P310

Row	Col	Number	Name
B	2	C28604	L FWD FUEL BOOST PUMP CTRL

——— END OF TASK ———

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ENGINE FUEL FEED SYSTEM - INSPECTION/CHECK

1. General

A. This procedure contains these tasks:

(1) Main Fuel Boost Pump Inspection

(2) Out-of-Tank Wire Bundle (Installed on Fuel Tank) - Inspection

TASK 28-22-00-750-801

2. Main Fuel Boost Pump Inspection

(Figure 601)

A. References

Reference	Title
28-22-05-000-801	Boost Pump Motor-Impeller - Removal (P/B 401)
28-22-05-400-801	Boost Pump Motor-Impeller - Installation (P/B 401)

B. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

C. Procedure

SUBTASK 28-22-00-010-012

(1) Remove the applicable boost pump impeller. To do this, do this task: Boost Pump Motor-Impeller - Removal, TASK 28-22-05-000-801.

SUBTASK 28-22-00-750-001

(2) Try to turn the inducer while you hold the impeller through the output port.

(a) If the inducer turns relative to the impeller, remove this pump from service.

SUBTASK 28-22-00-750-002

(3) With a 0.004 in. (0.102 mm) feeler gage, do a check for a 0.004 in. (0.102 mm) gap between the retaining washer and the inducer.

(a) Do this check at 90 degrees, 180 degrees, and 270 degrees around the interface between the retaining washer and the inducer.

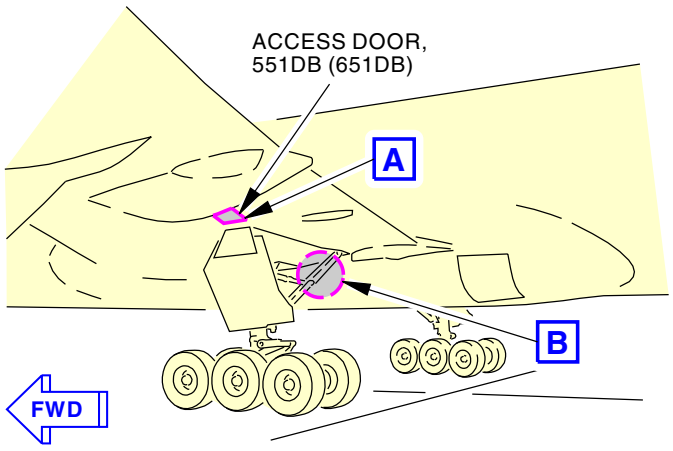
(b) If the gap is more than 0.004 in. (0.102 mm) at any point, remove this pump from service.

SUBTASK 28-22-00-410-004

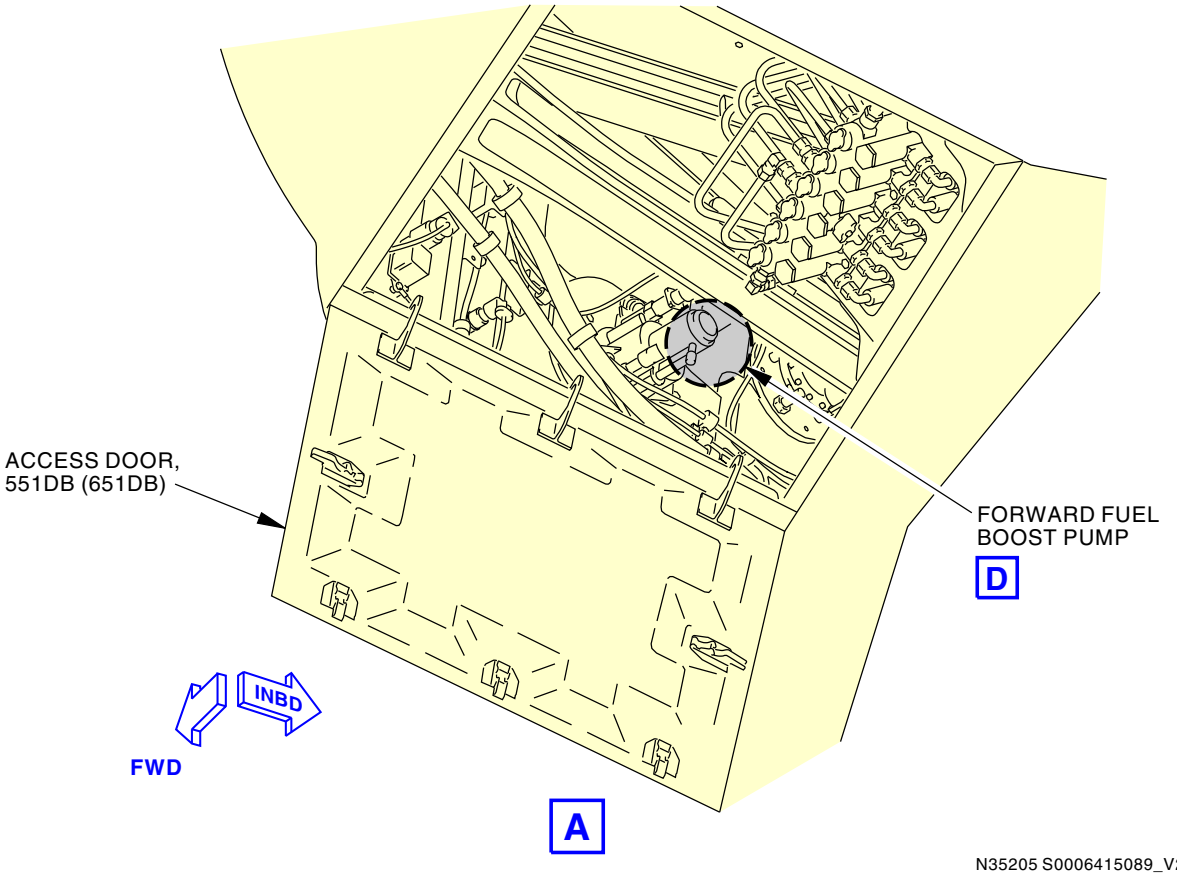
(4) Install a motor impeller unit that passes the inspection above. To do this, do this task: Boost Pump Motor-Impeller - Installation, TASK 28-22-05-400-801.

——— END OF TASK ———

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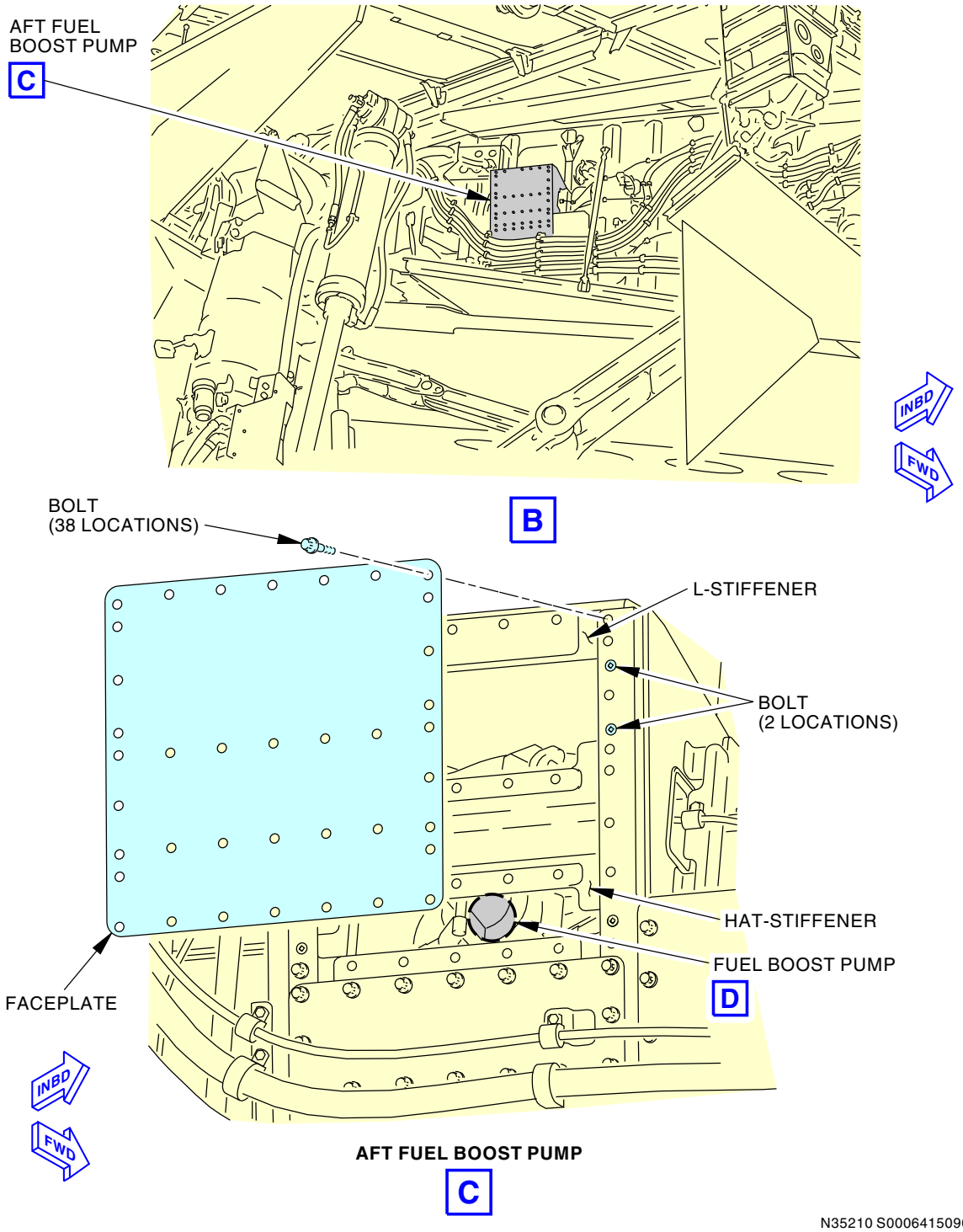
LEFT WING
(RIGHT WING IS EQUIVALENT)



N35205 S0006415089_V2

Main Fuel Tank Fuel Boost Pump Motor-Impeller Inspection
Figure 601/28-22-00-990-811 (Sheet 1 of 5)

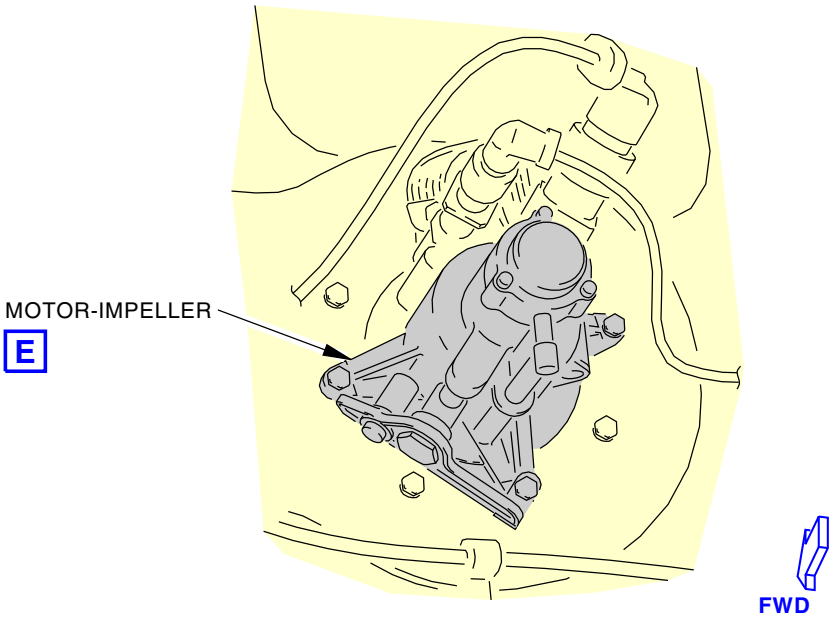
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N35210 S0006415090_V2

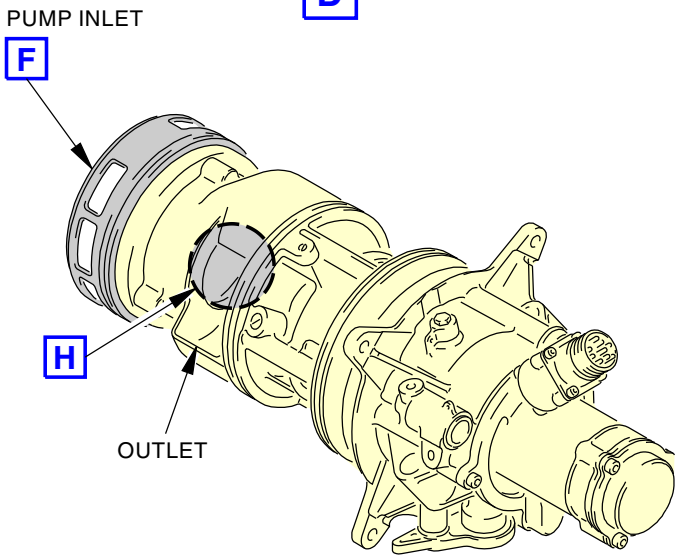
Main Fuel Tank Fuel Boost Pump Motor-Impeller Inspection
Figure 601/28-22-00-990-811 (Sheet 2 of 5)

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FUEL BOOST PUMP (EXAMPLE)

D



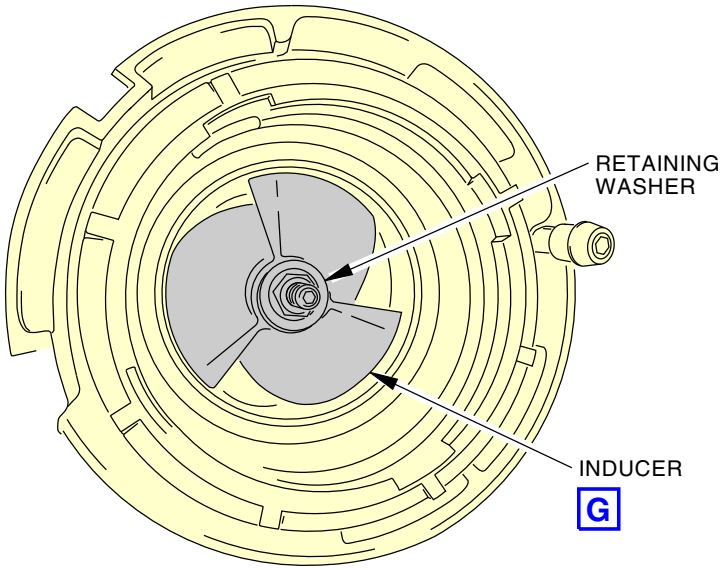
MOTOR-IMPELLER

E

N35228 S0006415091_V2

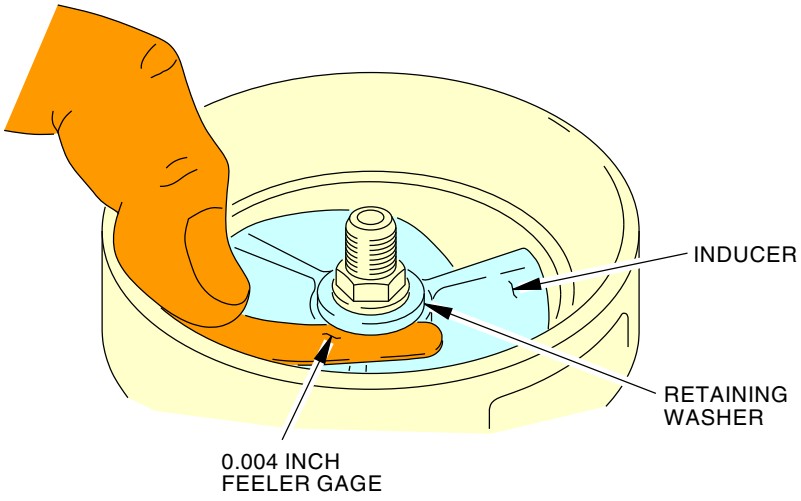
Main Fuel Tank Fuel Boost Pump Motor-Impeller Inspection
Figure 601/28-22-00-990-811 (Sheet 3 of 5)

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PUMP INLET

F



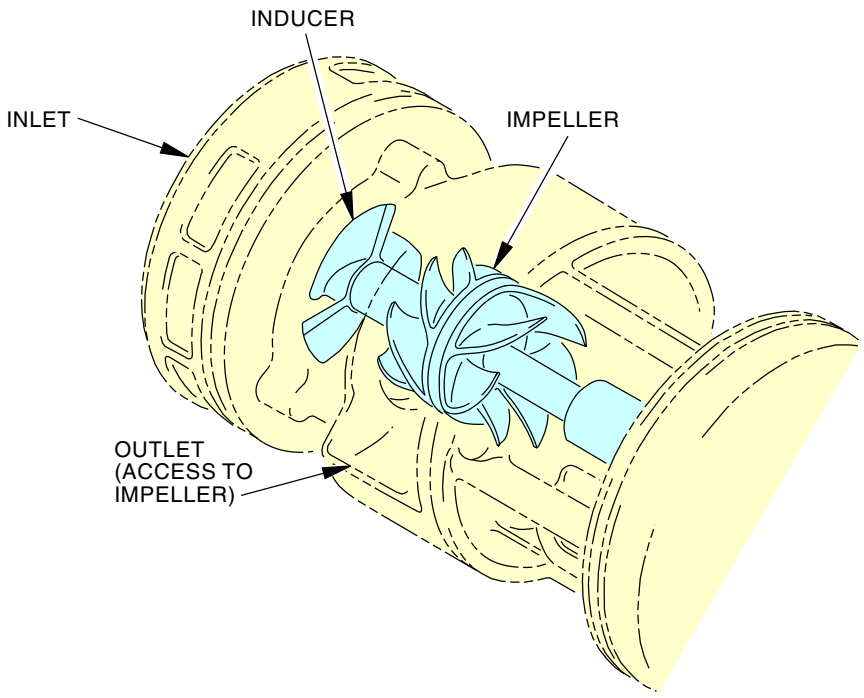
INDUCER

G

N35673 S0006415092_V2

Main Fuel Tank Fuel Boost Pump Motor-Impeller Inspection
Figure 601/28-22-00-990-811 (Sheet 4 of 5)

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H

N36070 S0006415093_V2

Main Fuel Tank Fuel Boost Pump Motor-Impeller Inspection
Figure 601/28-22-00-990-811 (Sheet 5 of 5)

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TASK 28-22-00-210-801

3. Out-of-Tank Wire Bundle (Installed on Fuel Tank) - Inspection

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This task has one or more steps which are a means to satisfy Airworthiness Limitation Instruction (ALI) requirements. An ALI note will follow the step to which it applies. Any step or sub-step that precedes or follows an ALI identified step is not subject to the ALI requirement.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-32.

B. References

Reference	Title
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
SWPM 20-10-11	WIRING ASSEMBLY AND INSTALLATION CONFIGURATION
SWPM 20-10-12	WIRE HARNESS SUPPORTS

C. Location Zones

Zone	Area
125	Area Aft of Forward Cargo Compartment, Left
126	Area Aft of Forward Cargo Compartment, Right
133	Wing Center Section, Left
134	Wing Center Section, Right
135	Environmental Control Systems Bay, Left
136	Environmental Control Systems Bay, Right
191	Forward Wing-to-Body Fairings, Left
192	Forward Wing-to-Body Fairings, Right
511	Leading Edge to Front Spar - Inboard of Nacelle Strut - Left Wing
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
526	Slat No. 2
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
532	Left Wing Dry Bay
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
551	Rear Spar to Landing Gear Support Beam - Left Wing
552	Landing Gear Support Beam & Rear Spar to Wing Trailing Edge - Left Wing
611	Leading Edge to Front Spar - Inboard of Nacelle Strut - Right Wing
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing
626	Slat No. 13
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
632	Right Wing Dry Bay
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074

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(Continued)

Zone	Area
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182
651	Rear Spar to Landing Gear Support Beam - Right Wing
652	Landing Gear Support Beam & Rear Spar to Wing Trailing Edge - Right Wing

D. Out-of-Tank Wire Bundle (Installed on Fuel Tank) Inspection

SUBTASK 28-22-00-210-030

28-AWL-32: ALI

(1) Refer to Service Bulletin 777-57A0050 for access and location information to do a detailed inspection of the specified wire bundle brackets that are mounted directly on the fuel tanks.

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-32.

28-AWL-32: ALI

(a) Make sure there is no damage to the cushion clamps around the wire bundles (SWPM 20-10-11, SWPM 20-10-12).

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-32.

28-AWL-32: ALI

(b) Make sure there is no damage to the sleeving (if applicable) around the wire bundles (SWPM 20-10-11, SWPM 20-10-12).

NOTE: ALI - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important Information on airworthiness limitation instructions (ALIs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-32.

——— END OF TASK ———

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ENGINE FUEL SPAR VALVE AND ADAPTER/SHAFT - REMOVAL/INSTALLATION

1. General

A. The engine fuel spar valve contains three parts: the actuator, the adapter/shaft and the valve body. There is one fuel spar valve for each engine.

B. This procedure contains these tasks:

(1) Removal of the adapter/shaft of the fuel spar valve

(2) Installation of the adapter/shaft of the fuel spar valve

(3) Removal of the valve body of the fuel spar valve

(4) Installation of the valve body of the fuel spar valve

(5) Adapter/Shaft Alignment

C. The procedure to remove and install the actuator of the engine fuel spar valve is contained in (TASK 28-22-02-000-802).

TASK 28-22-01-000-801

2. Engine Fuel Spar Valve (Valve Body) - Removal

(Figure 401)

A. References

Reference	Title
24-22-00-860-806	Remove Electrical Power (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-22-15-000-802-001	Fuel Line, Fitting and Coupling - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

C. Access Panels

Number	Name/Location
533BB	Access Door
633BB	Access Door

D. Procedure

SUBTASK 28-22-01-650-001

(1) Defuel the left and right main fuel tanks (TASK 28-26-00-650-801).

NOTE: You must defuel the left and the right main fuel tanks for this task.

SUBTASK 28-22-01-860-001

(2) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

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SUBTASK 28-22-01-940-005

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(3) Do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

SUBTASK 28-22-01-010-001

(4) Open the applicable access panels:

Main Tank Access Door Removal, TASK 28-11-01-000-801

Number	Name/Location
533BB	Access Door
633BB	Access Door

SUBTASK 28-22-01-940-001

(5) Go into the left or right main fuel tank to get access to the applicable valve body [1].

SUBTASK 28-22-01-020-014

(6) Disconnect the flexible coupling [4] and flexible coupling [8] from the valve body [1] (TASK 28-22-15-000-802-001).

(a) Discard the o-rings [2].

SUBTASK 28-22-01-020-015

(7) Hold the valve body [1] and remove the four bolts [6] and washers [7] that attach the valve body [1] to the support bracket.

SUBTASK 28-22-01-020-001

(8) Disengage the valve body [1] from the adapter/shaft [5].

SUBTASK 28-22-01-020-002

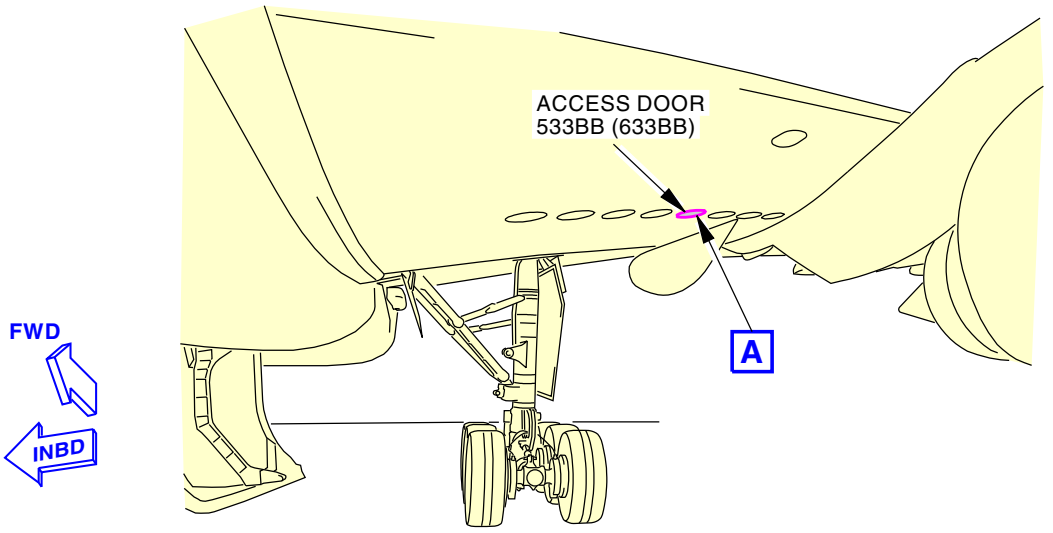
(9) Remove the valve body [1].

SUBTASK 28-22-01-480-003

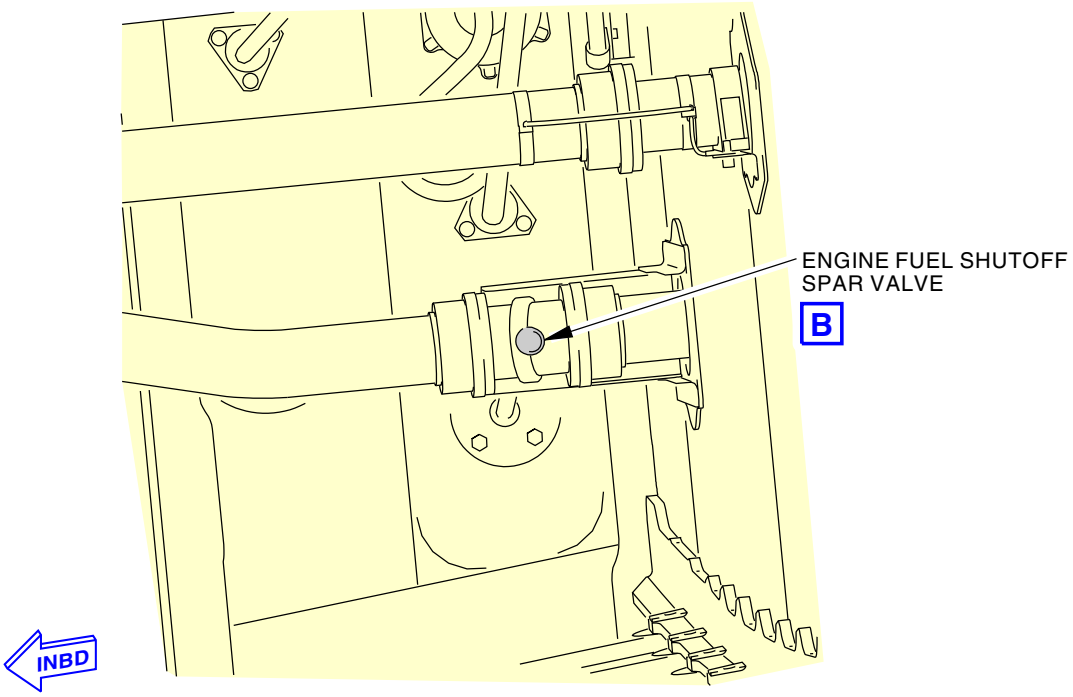
(10) Install protection covers to the fuel lines to keep unwanted materials out.

——— END OF TASK ———

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LEFT WING SHOWN
(RIGHT WING IS EQUIVALENT)



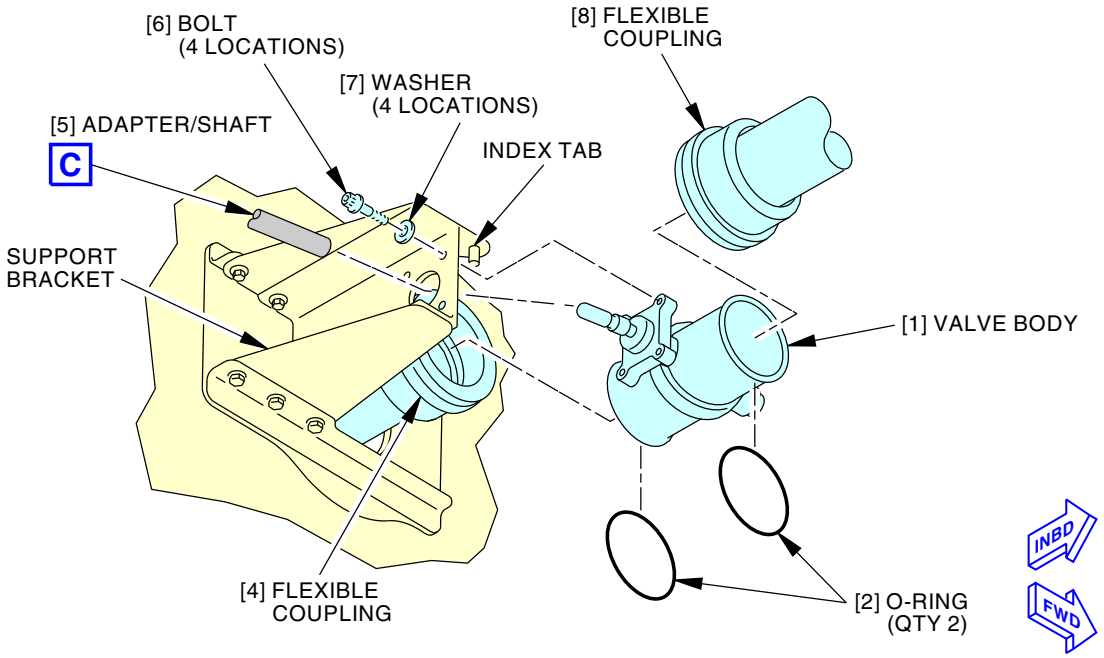
(VIEW IN THE AFT DIRECTION)

A

E13726 S0006415098_V3

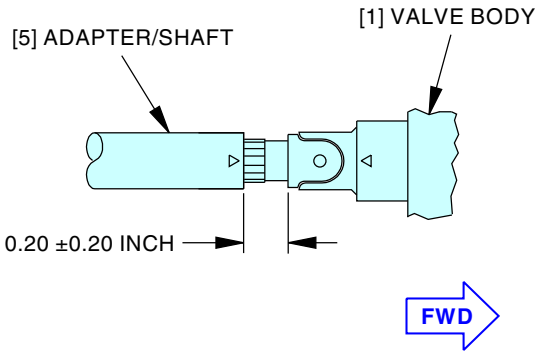
Engine Fuel Spar Valve and Adapter/Shaft Installation
Figure 401/28-22-01-990-801 (Sheet 1 of 2)

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ENGINE FUEL SPAR VALVE

B



ADAPTER/SHAFT

C

E13634 S0006415099_V4

Engine Fuel Spar Valve and Adapter/Shaft Installation
Figure 401/28-22-01-990-801 (Sheet 2 of 2)

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TASK 28-22-01-400-801

3. Engine Fuel Spar Valve (Valve Body) - Installation

(Figure 401)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-22-00-710-801	Engine Fuel Spar Valve - Electrical Control and Indication Test (P/B 501)
28-22-00-720-801	Engine Fuel Spar Valve Installation - Test (P/B 501)
28-22-01-790-801-001	Engine Fuel Spar Valve - Pressure Leak Check (P/B 601)
28-22-15-000-802-001	Fuel Line, Fitting and Coupling - Removal (P/B 401)
28-22-15-790-802-001	Engine Fuel Feed Manifold, Spar and Crossfeed Valve - Leak Check (P/B 601)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Consumable Materials

Reference	Description	Specification
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Valve body	28-22-01-01-055	ARO 001-004

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(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
1 (cont.)		28-22-01-01A-060	ARO 005-016
2	O-ring	28-22-51-20-257	ARO ALL

E. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

F. Access Panels

Number	Name/Location
533BB	Access Door
551DB	Inboard Fixed Trailing Edge Panel
633BB	Access Door
651DB	Inboard Fixed Trailing Edge Panel

G. Procedure

SUBTASK 28-22-01-940-006

WARNING

OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-22-01-010-003

(2) Open the applicable access panels:

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel
651DB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-22-01-820-001

(3) Make sure the manual override handle on the actuator is in the CLOSED position.

SUBTASK 28-22-01-940-002

(4) Go into the left or right main fuel tank (TASK 28-11-00-010-801).

SUBTASK 28-22-01-110-002

(5) Do these steps to prepare the valve body [1] and the support bracket for a faying surface bond:

WARNING

DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(a) Final clean the contact surfaces of the valve body [1] and the support bracket with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

(b) Rub dry with a clean, dry cotton wiper, G00034.

(c) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

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SUBTASK 28-22-01-080-003

(6) Remove the protection covers from the fuel lines.

SUBTASK 28-22-01-210-001

CAUTION

DO NOT REMOVE THE SUPPORT BRACKET SPACER OR DEFLECT THE SUPPORT BRACKET TO INSTALL THE VALVE BODY. THE VALVE BODY MUST BE INSTALLED CORRECTLY OR DAMAGE TO EQUIPMENT CAN OCCUR.

(7) Make sure "TOP" shows on the top of the valve body [1].

SUBTASK 28-22-01-420-032

(8) Apply a thin coating of petrolatum grease, D00504, to the new o-rings [2] before you install the o-rings [2] on the fuel lines.

SUBTASK 28-22-01-420-033

(9) Install the flexible coupling [4] and flexible coupling [8] on the fuel lines (TASK 28-22-15-000-802-001).

NOTE: Do not tighten the flexible coupling [4] and flexible coupling [8].

SUBTASK 28-22-01-420-001

(10) Engage the valve body [1] and adapter/shaft [5].

SUBTASK 28-22-01-820-002

(11) Align the valve body [1] with the support bracket holes.

SUBTASK 28-22-01-420-016

(12) Install the four washers [7] and bolts [6] through the support bracket.

(a) Install MS20995C32 lockwire, G01048, to the bolts [6] (TASK 20-10-23-400-801)..

SUBTASK 28-22-01-760-003

(13) Measure the electrical bonding resistance between the valve body [1] and the support bracket with an intrinsically safe approved bonding meter, COM-1550.

(a) Make sure the resistance is less than 0.0005 ohm (0.5 milliohm).

SUBTASK 28-22-01-760-001

(14) Measure the electrical bonding resistance between the valve body [1] and the airplane structure with an intrinsically safe approved bonding meter, COM-1550.

(a) Make sure the resistance is less than 0.010 ohm (10 milliohms).

SUBTASK 28-22-01-210-003

(15) Make sure the index marks on the adapter/shaft [5] and the valve body [1] align (Figure 401, View C).

ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS

(a) If the alignment marks do not align, refer to this task: Engine Fuel Spar Valve (Adapter/Shaft) - Installation, TASK 28-22-01-400-803.

ARO ALL

SUBTASK 28-22-01-420-017

(16) Make sure the gap between the adapter/shaft [5] and the valve body spline is 0.20 ±0.20 in. (5.08 ±5.08 mm) (Figure 401, View C).

NOTE: If you cannot get the correct gap, loosen the support bracket for the valve body [1] and adjust its position to get the correct gap.

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SUBTASK 28-22-01-420-018

(17) Tighten the flexible coupling [4] and flexible coupling [8] that attach the valve body [1] to the fuel line (TASK 28-22-15-000-802-001).

(a) Install MS20995C32 lockwire, G01048, to the flexible coupling [4] and flexible coupling [8](TASK 20-10-23-400-801).

SUBTASK 28-22-01-010-005

(18) Install the applicable access door(s):

(TASK 28-11-01-400-801)

Number	Name/Location
533BB	Access Door
633BB	Access Door

SUBTASK 28-22-01-860-002

(19) Supply electrical power (TASK 24-22-00-860-805).

SUBTASK 28-22-01-720-001

(20) Do a test of the engine fuel spar valves:

(a) To do an electrical test, do this task: Engine Fuel Spar Valve - Electrical Control and Indication Test, TASK 28-22-00-710-801.

(b) To do a test of the valve body installation, do one of these tests:

1) Engine Fuel Spar Valve Installation - Test, TASK 28-22-00-720-801.

2) Engine Fuel Feed Manifold, Spar and Crossfeed Valve - Leak Check, TASK 28-22-15-790-802-001.

3) Engine Fuel Spar Valve - Pressure Leak Check, TASK 28-22-01-790-801-001.

H. Put the Airplane Back to The Usual Condition

SUBTASK 28-22-01-010-034

(1) Close the applicable access panel(s):

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel
651DB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-22-01-650-018

(2) Refuel the airplane, if it is necessary (TASK 12-11-01-650-801).

——— END OF TASK ———

ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS

TASK 28-22-01-000-803

4. Engine Fuel Spar Valve (Adapter/Shaft) - Removal

(Figure 401, Figure 402)

A. References

Reference	Title
24-22-00-860-806	Remove Electrical Power (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

(Continued)

Reference	Title
28-22-02-000-802	Engine Fuel Spar Valve Actuator - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: $0855 Part #: 234350 Supplier: $0857 Part #: 311 Supplier: F6892 Part #: 411B60 Supplier: 3DN12 Part #: 411B90 Supplier: 3DN12 Part #: DAD5013 Supplier: $0856 Part #: DFD5019 Supplier: $0856 Part #: J5-0275-2010 Supplier: 435R8 Part #: SCD5019 Supplier: $0856 Part #: ST982LF-9 Supplier: 62176 Part #: TS1275-4 Supplier: 1DWR5
COM-4746	Handle - Sealant Removal Tool Part #: 310/1 Supplier: F6892 Part #: SHN0272 Supplier: $0856 Part #: SHR0272-T Supplier: 1DWR5 Part #: SHW0215 Supplier: $0856

C. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

D. Access Panels

Number	Name/Location
533BB	Access Door
551DB	Inboard Fixed Trailing Edge Panel
633BB	Access Door
651DB	Inboard Fixed Trailing Edge Panel

E. Procedure

SUBTASK 28-22-01-650-010

(1) Defuel the left and right main fuel tanks (TASK 28-26-00-650-801).

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SUBTASK 28-22-01-940-009

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-22-01-650-012

(3) Drain and purge the applicable main fuel tank (TASK 28-11-00-010-801).

SUBTASK 28-22-01-860-007

(4) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

SUBTASK 28-22-01-010-018

(5) Remove this access panel to get access to the actuator and adapter/shaft assembly, for the left engine fuel spar valve, on the rear spar:

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-22-01-010-019

(6) Remove this access panel to get access to the actuator and adapter/shaft assembly, for the right engine fuel spar valve, on the rear spar:

Number	Name/Location
651DB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-22-01-010-020

(7) Remove this access door to get access to the adapter/shaft [6] of the left engine fuel spar valve:

(TASK 28-11-01-000-801)

Number	Name/Location
533BB	Access Door

SUBTASK 28-22-01-010-021

(8) Remove this access door to get access to the adapter/shaft of the right engine fuel spar valve, do these task:

(TASK 28-11-01-000-801)

Number	Name/Location
633BB	Access Door

SUBTASK 28-22-01-010-022

(9) Do these steps on the outside of the fuel tank:

(a) For the applicable left or right spar valve actuator, do this task: Engine Fuel Spar Valve Actuator - Removal, TASK 28-22-02-000-802.

(b) Use a sealant removal tool to remove the old sealant from the periphery of the adapter plate.

1) Use sealant removal tool, COM-2481, and sealant removal tool handle, COM-4746, or equivalent.

SUBTASK 28-22-01-010-023

(10) Do these steps inside the fuel tank:

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(a) Go to the adapter/shaft [5] location inside the fuel tank (View B).

(b) Remove the old sealant from the four bolts [9] and the adapter/shaft [5] rear spar penetration.

(c) Remove the bolts [9] and washers [10] (four locations) to disconnect the adapter/shaft [5].

(d) Disengage the adapter/shaft [5] from the valve body [1] (View B).

SUBTASK 28-22-01-010-024

(11) Go out of the tank and remove the adapter/shaft [5].

(a) Discard the o-ring [11].

F. Remove the Index Plate

NOTE: Do these steps if you will reuse the adapter/shaft and the attached index plate or if you need to remove the index plate to align the valve body. If the task is to discard the old adapter/shaft and install a new adapter/shaft, it is not necessary to disassemble the index plate.

SUBTASK 28-22-01-020-019

(1) Do these steps to remove the index plate [31] from the adapter/shaft [5]:

(a) Remove the lockwire from screw [21] and screw [37].

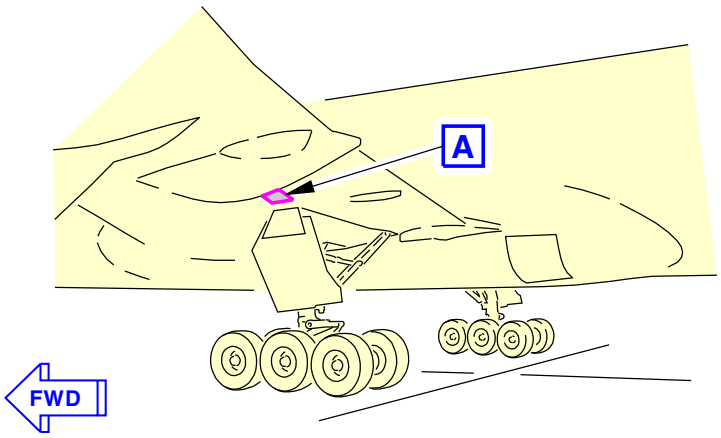
(b) Remove screw [21], washers [36], and screw [37].

(c) Carefully disassemble the index plate [31] and the adapter/shaft [5].

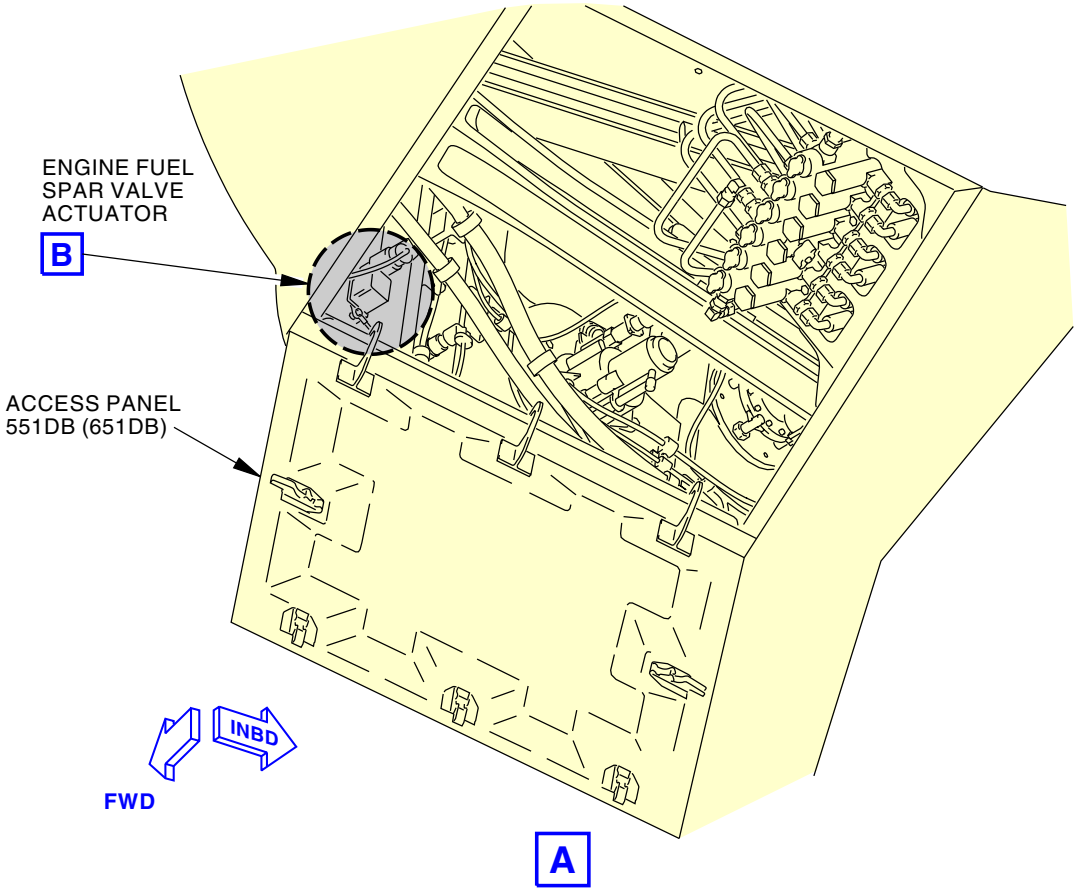
NOTE: The two surfaces are bonded with faying surface sealant.

——— END OF TASK ———

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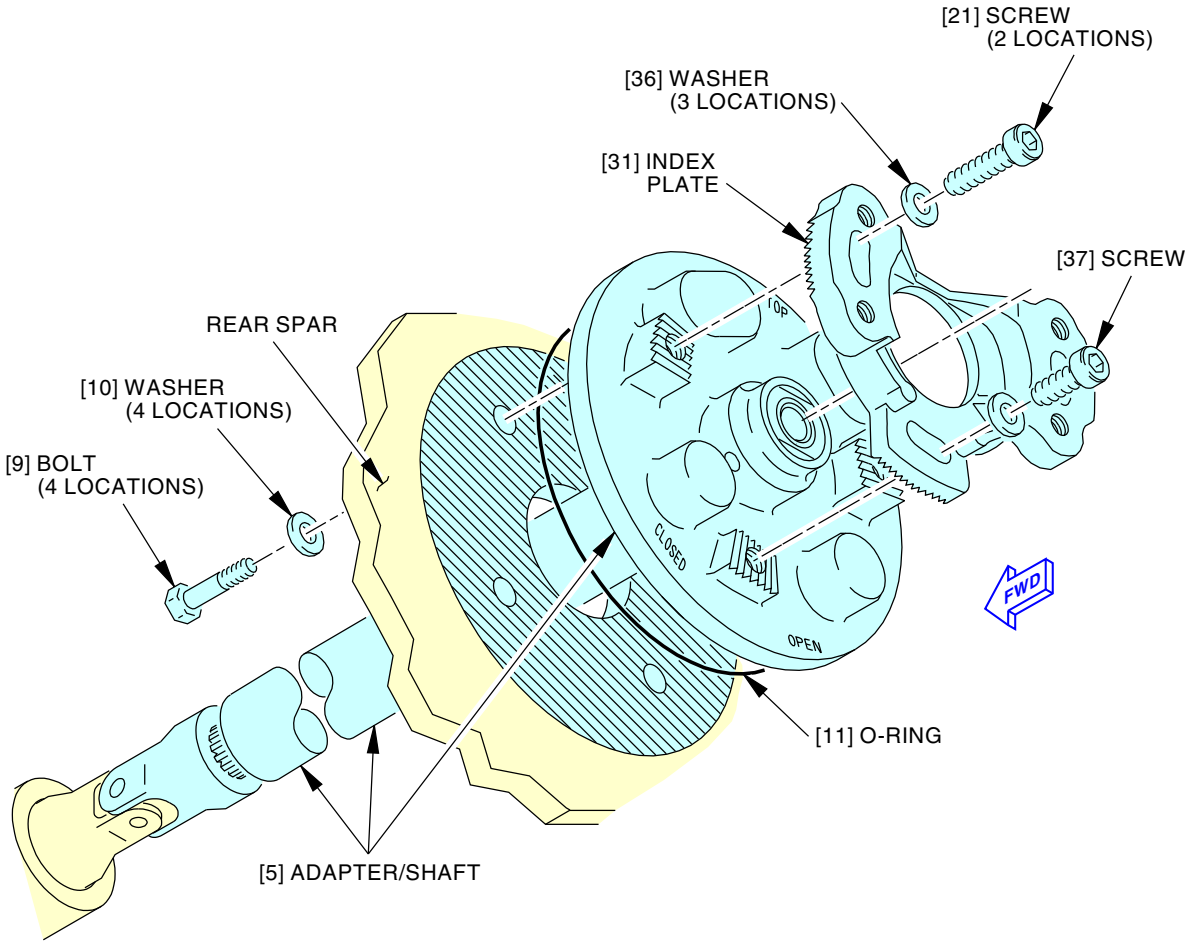
LEFT WING
(RIGHT WING IS EQUIVALENT)



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Engine Fuel Spar Valve Adapter/Shaft Installation
Figure 402/28-22-01-990-804 (Sheet 1 of 2)

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(EXAMPLE)

B

U44017 S0000195942_V4

Engine Fuel Spar Valve Adapter/Shaft Installation
Figure 402/28-22-01-990-804 (Sheet 2 of 2)

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TASK 28-22-01-400-803

5. Engine Fuel Spar Valve (Adapter/Shaft) - Installation

(Figure 401, Figure 402)

A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(2) Two mechanics are required for this task.

NOTE: To engage splines of the adapter/shaft [5] to the valve body [1], one person must be outside the tank and one person must be inside the tank.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
20-30-92-910-801	Final Cleaning Prior to General Sealing (Series 92) (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-22-00-710-801	Engine Fuel Spar Valve - Electrical Control and Indication Test (P/B 501)
28-22-00-720-801	Engine Fuel Spar Valve Installation - Test (P/B 501)
28-22-02-400-802	Engine Fuel Spar Valve Actuator - Installation (P/B 401)
28-22-15-790-802-001	Engine Fuel Feed Manifold, Spar and Crossfeed Valve - Leak Check (P/B 601)
51-31-01-390-804	Fillet Seal Application (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

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Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: $0855 Part #: 234350 Supplier: $0857 Part #: 311 Supplier: F6892 Part #: 411B60 Supplier: 3DN12 Part #: 411B90 Supplier: 3DN12 Part #: DAD5013 Supplier: $0856 Part #: DFD5019 Supplier: $0856 Part #: J5-0275-2010 Supplier: 435R8 Part #: SCD5019 Supplier: $0856 Part #: ST982LF-9 Supplier: 62176 Part #: TS1275-4 Supplier: 1DWR5
COM-4746	Handle - Sealant Removal Tool Part #: 310/1 Supplier: F6892 Part #: SHN0272 Supplier: $0856 Part #: SHR0272-T Supplier: 1DWR5 Part #: SHW0215 Supplier: $0856
STD-123	Brush - Soft Bristle

D. Consumable Materials

Reference	Description	Specification
A50110	Sealant	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
B01012	Solvent - Final Cleaning Prior To General Sealing - Series 92	
C00064	Coating - Aluminum Chemical Conversion	BAC5719 Type II Class A (MIL-DTL-5541 Class 1A)
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20 Type II
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

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E. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

F. Access Panels

Number	Name/Location
533BB	Access Door
551DB	Inboard Fixed Trailing Edge Panel
633BB	Access Door
651DB	Inboard Fixed Trailing Edge Panel

G. Install the Adapter/Shaft

SUBTASK 28-22-01-860-008

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Obey the fuel tank entry precautions (TASK 28-11-00-650-801).

SUBTASK 28-22-01-010-025

WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Go into the fuel tank to the spar valve location (TASK 28-11-00-010-801).

NOTE: One person must enter the tank and another must remain outside the tank at the rear spar.

SUBTASK 28-22-01-120-001

(3) On the outside of the tank, remove the old sealant and clean the rear spar, adapter/shaft [5], index plate [31], and fasteners (if re-used).

(a) Use sealant removal tool, COM-2481, and sealant removal tool handle, COM-4746 (or equivalent), to remove the old sealant from the rear spar.

(b) If new parts are to be installed, use an abrasive pad to remove the anodized finish from the fay surfaces of the adapter/shaft [5] and index plate [31] (SWPM 20-20-00).

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(c) To remove the remaining sealant, grease, oil, dirt, and other contamination from the components, use one of these brushes/pads soaked with Series 92 solvent, B01012 (TASK 20-30-92-910-801):

1) soft bristle brush, STD-123

2) cotton wiper, G00034

SUBTASK 28-22-01-110-001

(4) On the outside of the tank, do these steps to prepare the adapter/shaft [5] and the rear spar for a fay sealed fay surface bond:

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(a) Final clean the contact surfaces of the adapter/shaft [5] and the rear spar with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

SUBTASK 28-22-01-430-001

(5) On the outside of the airplane fuel tank, do these steps:

(a) Put a thin layer of petrolatum grease, D00504, on the o-ring [11].

(b) Put the o-ring [11] in the O-ring groove of the adapter/shaft [5].

(c) Put the shaft portion of the adapter/shaft [5] through the hole in the rear spar.

(d) Make sure the shoulder of the adapter/shaft [5] does not bind in the opening of the rear spar.

SUBTASK 28-22-01-210-009

(6) On the inside of the tank, do these steps:

(a) Make sure that the index marks on the valve body [1] and adapter/shaft [5] are aligned (Figure 401, View C).

NOTE: A small misalignment of the index marks is satisfactory.

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

SUBTASK 28-22-01-420-035

(7) Do these steps at the same time:

NOTE: The person on the inside of the tank should engage the splines as the person on the outside of the tank applies the fay sealed fay surface bond.

28-AWL-19: CDCCL

(a) On the outside of the tank, apply a fay sealed fay surface bond between the adapter/shaft [5] (valve adapter plate) and the spar (structure) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Apply a thin continuous layer of sealant, A50110, or sealant, A50155, to the mating surface of the adapter plate.

a) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

2) Make sure the sealant is continuously squeezed out along the edges of the contact surfaces.

3) If there are gaps, bubbles or voids in the sealant squeeze out, then disassemble and apply more sealant.

4) Shape the squeezed out sealant into a fillet seal.

5) As an option, remove the extra squeezed out sealant.

NOTE: Make sure the sealant that remains is flush with the mating part edges.

(b) On the inside of the tank, engage the splines of the adapter/shaft [5] with the valve body [1].

1) Make sure the shoulder of the adapter/shaft [5] does not bind in the opening of the rear spar.

SUBTASK 28-22-01-420-036

(8) On the outside of the tank, hold the adapter/shaft [5] in the correct position.

SUBTASK 28-22-01-420-023

(9) On the inside of the tank, do these steps to install the adapter/shaft [5]:

(a) Apply sealant to the shank and the threads of the four bolts [9].

1) Use sealant, A50110, or sealant, A50155, for the wet installation of the bolts [9].

NOTE: Use the same sealant that was used for the fay surface fay seal.

2) Make sure the sealant applied to the fasteners is approximately 0.060 in. (1.524 mm) thick.

(b) Install the bolts [9] and washers [10] to attach the adapter/shaft [5] to the spar.

(c) Make sure the gap between the adapter/shaft [5] and the valve body spline is 0.20 ±0.20 in. (5.08 ±5.08 mm) (Figure 401, View C).

NOTE: If the correct gap can not be obtained, loosen the support bracket for the valve body [1] and adjust its position to get the correct gap.

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SUBTASK 28-22-01-765-001

28-AWL-19: CDCCL

(10) On the outside of the fuel tank, measure the electrical bonding resistance between one of the raised surfaces of the adapter/shaft [5] (valve adapter plate) (bare metal surface) and the rear spar (structure) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

28-AWL-19: CDCCL

(a) Make sure one or both ends of the bonding jumper that attaches to the actuator is disconnected.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(b) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-19: CDCCL

(c) Make sure the electrical bonding resistance is 0.0005 ohm (0.5 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) If the bonding resistance is more than 0.0005 ohm (0.5 milliohm), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Spar Valve, TASK 28-22-01-300-801.

SUBTASK 28-22-01-420-024

(11) Use sealant, A50110, or sealant, A50155, to apply these seals:

NOTE: Use the same sealant that was used for the fay surface fay seal.

(a) On the inside of the tank, apply a fillet seal to around the periphery of the rear spar penetration and the stationary part of the adapter/shaft [5](TASK 51-31-01-390-804).

NOTE: Make sure the sealant does not touch any part of the adapter/shaft [5] that turns.

28-AWL-19: CDCCL

(b) On the inside of the tank, apply a cap seal to each of the bolts [9] (adapter plate attach bolts).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

SUBTASK 28-22-01-860-009

(12) Do this task to close the fuel tank: Fuel Tank Closure, TASK 28-11-00-410-801.

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(a) Install these access doors:

(TASK 28-11-01-400-801)

Number	Name/Location
533BB	Access Door
633BB	Access Door

SUBTASK 28-22-01-820-008

(13) Do this task: Adapter Shaft Alignment, TASK 28-22-01-820-801.

H. Install the Index Plate

SUBTASK 28-22-01-820-009

(1) Do this procedure after you have correctly aligned and marked the alignment position of the index plate and adapter plate per this task: Adapter Shaft Alignment, TASK 28-22-01-820-801.

SUBTASK 28-22-01-020-020

(2) Remove the index plate [31] from the adapter/shaft [5].

SUBTASK 28-22-01-420-026

(3) Do these steps to prepare the index plate [31] and the adapter/shaft [5] for a fay sealed fay surface bond (SWPM 20-20-00):

(a) Protect the alignment reference mark when you clean the index plate [31] and the adapter/shaft [5] for the electrical bond.

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(b) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-19: CDCCL

(c) Apply a thin continuous layer of sealant between the surfaces of the index plate [31] (three locations) and the adapter/shaft [5] (valve adapter plate) for a fay sealed fay surface bond (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296.

NOTE: Alternate sealants are not approved for fay sealed fay surface bonds.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

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(d) Apply sealant to the shank and the threads of the top two screws [21] and the bottom screw [37].

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the wet installation of screws [21] and screw [37].

NOTE: Use the same sealant that was used for the fay sealed fay surface bond.

2) Make sure the sealant applied to the fasteners is approximately 0.060 in. (1.524 mm) thick.

SUBTASK 28-22-01-420-028

(4) Do these steps to install the index plate [31]:

(a) Align the index plate [31] and the adapter/shaft [5] with the alignment reference mark that you made during the spar valve alignment procedure.

(b) Install the two screw [21] and washer [36] in the top index mounting hole positions.

(c) Install the screw [37] and washer [36] in the bottom index mounting hole position.

(d) Tighten the screws to 22 ±1 in-lb (2.5 ±0.1 N·m).

(e) Make sure the sealant is continuously squeezed out along the edges of the contact surfaces.

(f) If there are gaps, bubbles or voids in the sealant squeeze out, then disassemble and apply more sealant.

(g) Shape the squeezed out sealant into a fillet seal (TASK 51-31-01-390-804).

(h) As an option, remove the extra squeezed out sealant.

NOTE: Make sure the sealant that remains is flush with the mating part edges.

SUBTASK 28-22-01-760-004

(5) Measure the electrical bonding resistance between one of the actuator contact surfaces on the index plate [31] (bare metal surface) and the rear spar (SWPM 20-20-00).

(a) Use an intrinsically safe approved bonding meter, COM-1550.

(b) Make sure the electrical bonding resistance is 0.0020 ohm (2.0 milliohms) or less.

1) If the bonding resistance is more than 0.0020 ohm (2.0 milliohms), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Spar Valve, TASK 28-22-01-300-801.

SUBTASK 28-22-01-765-002

28-AWL-19: CDCCL

(6) Measure the electrical bonding resistance between the index plate [31] and the adapter/shaft [5] (valve adapter plate) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

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28-AWL-19: CDCCL

(a) Make sure one or both ends of the bonding jumper that attaches to the actuator is disconnected.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(b) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-19: CDCCL

(c) Make sure the electrical bonding resistance is 0.0005 ohm (0.5 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) If the bonding resistance is more than 0.0005 ohm (0.5 milliohm), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Spar Valve, TASK 28-22-01-300-801.

SUBTASK 28-22-01-420-027

(7) Lockwire the top screw [21], the bottom screw [37] and the index plate [31] together.

SUBTASK 28-22-01-790-001

(8) Do this task: Engine Fuel Spar Valve Actuator - Installation, TASK 28-22-02-400-802.

SUBTASK 28-22-01-370-001

(9) Do this task to apply protective finishes to the bare areas of the rear spar: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

NOTE: Re-apply the protective finishes to the rear spar at all bare areas not covered by the fillet seal, and where the electrical bonding probe removed the finishes.

(a) These are the protective finishes:

1) Alodine 600 coating, C00064

2) BMS 10-20 coating, C00307.

I. Spar Valve Operational Test

SUBTASK 28-22-01-720-004

(1) Do a test of the engine fuel spar valves:

(a) To do an electrical test, do this task: Engine Fuel Spar Valve - Electrical Control and Indication Test, TASK 28-22-00-710-801.

(b) To do a test of the valve body and adapter/shaft installation, do one of these tests:

1) Engine Fuel Spar Valve Installation - Test, TASK 28-22-00-720-801.

2) Engine Fuel Feed Manifold, Spar and Crossfeed Valve - Leak Check, TASK 28-22-15-790-802-001.

SUBTASK 28-22-01-650-013

(2) Refuel each of the main fuel tanks to a minimum of 30,000 lb (13,608 kg), (TASK 12-11-01-650-801).

NOTE: This is the fuel quantity necessary to make sure there are no leaks at the rear spar.

(a) Make sure there are no fuel leaks at the adapter/shaft [5] installation on the rear spar.

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

J. Put the Airplane Back to the Usual Condition

SUBTASK 28-22-01-010-026

(1) Close this access panel for the left engine fuel spar valve:

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-22-01-010-027

(2) Close this access panel for the right engine fuel spar valve:

Number	Name/Location
651DB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-22-01-650-014

(3) To refuel the airplane (if it is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

——— END OF TASK ———

TASK 28-22-01-300-801

6. Rework the Fay Sealed Fay Surface Bonds for the Spar Valve

A. General

(1) This task contains these procedures:

(a) Rework the Fay Sealed Fay Surface Bond - Actuator to Index Plate

(b) Rework the Fay Sealed Fay Surface Bond - Index Plate to Adapter/Shaft

(c) Rework the Fay Sealed Fay Surface Bond - Adapter/Shaft to Rear Spar

(d) Rework the Bonding Jumper Bond

(2) Do this task if the measurement for the electrical bonding resistance is more than the permitted resistance value.

(3) The motor operated valve uses two electrical bonding paths:

(a) One bonding path is from the upper housing of the actuator through the bonding jumper to the airplane structure.

(b) The second bonding path is from the upper housing of the actuator to the bare metal surface of the rear spar. The bond path is through the bare metal fay surfaces of the actuator (at the mounting feet), index plate, and adapter/shaft to the bare metal surface of the rear spar.

NOTE: The actuator is divided into two sections, the upper housing section and the lower housing section. The two housing sections are separated by a fay surface. You cannot repair or rework the fay surface between the housing sections at the airplane. When you do an electrical bonding measurement, make sure the measurement is done on the upper housing section of the actuator.

(4) If the electrical bonding resistance is more than the maximum permitted resistance, you must disassemble the components, rework the fay surface, assemble the components, and then re-check the electrical bonding resistance. Continue to rework the fay surfaces until the electrical resistance between the components is within permitted resistance values.

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(5) Because the build-up of the spar valve includes several fay sealed fay surface bonds, you may not know which fay sealed fay surface bond is the cause of the problem. This task will help you isolate the location of the fay sealed fay surface bond that needs to be reworked. The procedure does a check of the fay sealed fay surface bond downstream of the bond that is in question.

(6) For application of fay surface seals in this task, it is acceptable to use sealant, A50110, as an alternative to sealant, A50155.

NOTE: Sealants should not be mixed. In applications where sealants may mix, use the same sealant for both applications.

B. References

Reference	Title
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
28-22-02-000-802	Engine Fuel Spar Valve Actuator - Removal (P/B 401)
28-22-02-400-802	Engine Fuel Spar Valve Actuator - Installation (P/B 401)
28-22-02-990-802	Figure: Engine Fuel Spar Valve Actuator Installation (P/B 401)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

D. Consumable Materials

Reference	Description	Specification
A50110	Sealant	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

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E. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

F. Rework the Fay Sealed Fay Surface Bond - Actuator to Index Plate

(Figure 28-22-02-990-802, Figure 402)

NOTE: Do the steps in this procedure if the measurement for the electrical bonding resistance between the upper housing of the actuator and the rear spar is more than 0.0025 ohm (2.5 milliohms). The measurement is done with the bonding jumper and the electrical connector disconnected from the actuator.

SUBTASK 28-22-01-010-028

(1) Do this task: Engine Fuel Spar Valve Actuator - Removal, TASK 28-22-02-000-802.

SUBTASK 28-22-01-765-003

(2) Do these steps to do a check of the index plate to rear spar bonding path:

NOTE: These steps will tell you if the actuator to index plate fay sealed fay surface bond is the cause of the problem, or if the index plate to adapter/shaft fay sealed fay surface bond is the cause of the problem.

(a) Remove the sealant and clean one of the contact surfaces on the index plate.

(b) With the intrinsically safe approved bonding meter, COM-1550, measure the electrical bonding resistance between the contact surface on the index plate (bare metal surface) and the rear spar (SWPM 20-20-00) (Figure 402).

(c) Make sure the electrical bonding resistance is 0.0020 ohm (2.0 milliohms) or less.

(d) If the electrical bonding resistance is not satisfactory, then do the steps in this procedure: Rework the Fay Sealed Fay Surface Bond - Index Plate to Adapter/Shaft.

(e) If the electrical bonding resistance is satisfactory, then continue with the subsequent steps.

SUBTASK 28-22-01-040-001

(3) Do this task: Engine Fuel Spar Valve Actuator - Installation, TASK 28-22-02-400-802.

NOTE: This task will rework the fay sealed fay surface bond and re-install the actuator.

SUBTASK 28-22-01-765-004

(4) During the installation, do a check of the electrical bonding resistance between the upper housing of the actuator [15] and the rear spar (SWPM 20-20-00) (Figure 28-22-02-990-802).

(a) Do this measurement with the bonding jumper and the electrical connector disconnected.

(b) Make sure the bonding jumper does not touch the actuator [15] during the bonding measurement.

(c) Use an intrinsically safe approved bonding meter, COM-1550.

(d) Make sure the electrical bonding resistance is 0.0025 ohm (2.5 milliohms) or less.

(e) If the electrical bonding resistance is not satisfactory, then repeat the steps in this procedure.

(f) If the electrical bonding resistance is satisfactory, then continue with the steps to install the actuator [15] (TASK 28-22-02-400-802).

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SUBTASK 28-22-01-710-001

(5) If you replaced the adapter/shaft or adjusted the index plate, then continue with the steps in the Spar Valve Test procedure in this task: Engine Fuel Spar Valve Actuator - Installation, TASK 28-22-02-400-802.

G. Rework the Fay Sealed Fay Surface Bond - Index Plate to Adapter/Shaft

(Figure 402)

NOTE: Do the steps in this procedure if the measurement for the electrical bonding resistance between the index plate and the rear spar is more than 0.0020 ohm (2.0 milliohms). The measurement is done with the actuator removed.

SUBTASK 28-22-01-010-029

(1) Do this procedure: Remove the Index Plate (Engine Fuel Spar Valve (Adapter/Shaft) - Removal, TASK 28-22-01-000-803).

SUBTASK 28-22-01-765-005

(2) Do these steps to do a check of the adapter/shaft to rear spar bonding path:

NOTE: These steps will tell you if the index plate to adapter/shaft fay sealed fay surface seal bond is the cause of the problem, or if the adapter/shaft to rear spar fay sealed fay surface seal bond is the cause of the problem.

(a) Remove the sealant and clean one of the contact surfaces on the adapter/shaft.

(b) With the intrinsically safe approved bonding meter, COM-1550, measure the electrical bonding resistance between the contact surface on the adapter/shaft and the rear spar (SWPM 20-20-00).

(c) Make sure the electrical bonding resistance is 0.0015 ohm (1.5 milliohms) or less.

NOTE: This is the repair bonding resistance value. The valve adapter installation electrical bonding resistance value is 0.0005 ohm (0.5 milliohm).

(d) If the electrical bonding resistance is not satisfactory, then do the steps in this procedure: Rework the Fay Sealed Fay Surface Bond - Adapter/Shaft to Rear Spar.

(e) If the electrical bonding resistance is satisfactory, then continue with the subsequent steps.

SUBTASK 28-22-01-400-001

(3) Do these steps to install the index plate:

NOTE: These steps will re-align the spar valve, rework the fay surface, and re-install the index plate.

(a) Do this task: Adapter Shaft Alignment, TASK 28-22-01-820-801.

(b) Do the Install the Index Plate procedure in this task: Engine Fuel Spar Valve (Adapter/Shaft) - Installation, TASK 28-22-01-400-803.

SUBTASK 28-22-01-765-006

(4) During the installation, do a check of the electrical bonding resistance between the index plate and the rear spar with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00):

(a) Make sure the electrical bonding resistance is 0.0020 ohm (2.0 milliohms) or less.

(b) If the electrical bonding resistance is not satisfactory, then repeat the steps in this procedure.

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(c) If the electrical bonding resistance is satisfactory, then continue with the procedure to install the index plate in this task: Engine Fuel Spar Valve (Adapter/Shaft) - Installation, TASK 28-22-01-400-803.

SUBTASK 28-22-01-760-002

(5) After you install the index plate, do the Spar Valve Operational Test procedure in this task: Engine Fuel Spar Valve (Adapter/Shaft) - Installation, TASK 28-22-01-400-803.

H. Rework the Fay Sealed Fay Surface Bond - Adapter/Shaft to Rear Spar

(Figure 402)

NOTE: Do the steps in this procedure if the measurement for the electrical bonding resistance between the adapter/shaft and the rear spar is more than 0.0015 ohm (1.5 milliohms).

SUBTASK 28-22-01-020-021

(1) Do the Remove the Valve Adapter procedure in this task: Engine Fuel Spar Valve (Adapter/Shaft) - Removal, TASK 28-22-01-000-803.

NOTE: A fuel tank entry is necessary to rework the fay surface of the adapter/shaft.

SUBTASK 28-22-01-400-002

(2) Do the Install the Valve Adapter procedure in this task: Engine Fuel Spar Valve (Adapter/Shaft) - Installation, TASK 28-22-01-400-803.

NOTE: These steps will rework the fay surface, and re-install the adapter/shaft.

SUBTASK 28-22-01-765-007

(3) During the installation, do a check of the electrical bonding resistance between the adapter/shaft and the rear spar with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

(a) Make sure the electrical bonding resistance is 0.0005 ohm (0.5 milliohm) or less.

(b) If the electrical bonding resistance is not satisfactory, then repeat the steps in this procedure.

(c) If the electrical bonding resistance is satisfactory, then continue with the steps to install the adapter/shaft in this task: Engine Fuel Spar Valve (Adapter/Shaft) - Installation, TASK 28-22-01-400-803.

SUBTASK 28-22-01-400-003

(4) After you install the adapter/shaft, do this procedure: Engine Fuel Spar Valve (Adapter/Shaft) - Installation, TASK 28-22-01-400-803 (Install the Index Plate and Spar Valve Operational Test).

I. Rework the Bonding Jumper Bond

(Figure 28-22-02-990-802)

NOTE: Do the steps in this procedure if the measurement for the electrical bonding resistance between the bonding jumper terminal and the rear spar is more than 0.0015 ohm (1.5 milliohms). The measurement is done with the bonding jumper disconnected from the actuator.

SUBTASK 28-22-01-030-001

(1) Remove the sealant from the bonding jumper terminal attached to the structure.

SUBTASK 28-22-01-020-022

(2) Remove the nut, two washers, and the bonding jumper.

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

SUBTASK 28-22-01-420-029

(3) Do these steps to install the bonding jumper to the structure:

WARNING

DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

(b) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper terminal and the two washers.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the fay surface fay seal.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(c) Install the nut, washers, and the bonding jumper to the structure.

(d) Tighten the nut to 20 in-lb (2.3 N·m).

(e) Measure the electrical bonding resistance between the loose end of bonding jumper and the rear spar (SWPM 20-20-00).

1) Use an intrinsically safe approved bonding meter, COM-1550.

2) Make sure the electrical bonding resistance is 0.0015 ohm (1.5 milliohms) or less.

(f) Apply a cap seal of sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, over the nut and the terminal of the bonding jumper.

NOTE: Use the sealant that was used for the fay surface fay seal.

SUBTASK 28-22-01-420-030

(4) Continue with this task: Engine Fuel Spar Valve Actuator - Installation, TASK 28-22-02-400-802.

SUBTASK 28-22-01-710-002

(5) If you have replaced the adapter/shaft or adjusted the index plate, then continue with the steps in the Spar Valve Test procedure in this task: Engine Fuel Spar Valve Actuator - Installation, TASK 28-22-02-400-802.

ARO ALL

——— END OF TASK ———

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TASK 28-22-01-820-801

7. Adapter Shaft Alignment

(Figure 403)

A. References

Reference	Title
28-22-02-000-802	Engine Fuel Spar Valve Actuator - Removal (P/B 401)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1587	Wrench - Torque, 30 in-lbs (4 N-m) Part #: TE3FUA Supplier: 55719
SPL-1771	Alignment Equipment, Fuel Shutoff Valve Part #: B28009-1 Supplier: 81205

C. Location Zones

Zone	Area
551	Rear Spar to Landing Gear Support Beam - Left Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

D. Procedure

SUBTASK 28-22-01-010-017

(1) Prepare the adapter/shaft for the alignment procedure.

(a) If the actuator is not removed, do this task: Engine Fuel Spar Valve Actuator - Removal, TASK 28-22-02-000-802.

(b) If not previously removed, remove the index plate [31] from the adapter/shaft.

SUBTASK 28-22-01-480-002

(2) Do these steps to install the valve alignment equipment, SPL-1771, in the index plate [31].

(a) Put the index plate in position and align the surfaces of the index plate and adapter plate.

(b) Loosely install the bottom index screw [13] to the index plate [31].

(c) Put the alignment tool in position against the index plate with the two guide pins in the holes usually used by the top two index plate mounting screws (the scale should be on the top of the tool).

(d) Make sure the spline on the tool engages with the spline on the shaft.

SUBTASK 28-22-01-820-003

(3) Do these steps to align the adapter shaft (Procedure 1, optional to Procedure 2):

NOTE: This procedure finds the point where the internal valve butterfly engages the valve seal. The torque necessary to turn the shaft increases as the butterfly engages the seal, then decreases again as the butterfly leaves the other side of the seal. Once the edge of the seal is found, the valve shaft will then be turned to center the butterfly on the seal.

(a) Put the tool handle in the extreme counterclockwise position.

(b) Turn the handle slowly in the clockwise direction at a constant rate while you note the changes in the torque necessary to turn the handle.

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(c) Do the previous steps as many times as necessary to find the point in the rotation where the torque necessary to turn the handle increases significantly.

(d) If you cannot find the position in the rotation where the torque increases significantly, then use Procedure 2 below.

(e) Put the shaft in the extreme counterclockwise position again.

(f) Slowly and smoothly turn the handle of the tool clockwise until a distinct increase in torque is found and immediately stop turning the handle.

(g) Read the scale on the tool.

NOTE: This is the point where the valve butterfly starts to engage the edge of the seal.

(h) Turn the handle 13 degrees more in the clockwise direction (the scale is calibrated in degrees).

NOTE: The valve butterfly is now centered on the valve seal.

NOTE: If you turn the handle past the target value, do not turn the handle back in the counterclockwise direction again. You must start the procedure again with the handle in the extreme counterclockwise position.

SUBTASK 28-22-01-820-004

(4) Do these steps to align the adapter shaft (Procedure 2, optional to Procedure 1):

NOTE: A torque wrench (30 in-lbs), COM-1587, is necessary to do this procedure.

(a) Put the tool handle in the extreme counterclockwise position.

(b) Slowly and smoothly turn the tool handle to the extreme clockwise position while you monitor the torque that you apply to the handle.

(c) Write down the maximum torque that you apply to the tool while you turn it from the extreme counterclockwise position to the extreme clockwise position.

(d) Turn the tool back to the extreme counterclockwise position.

(e) Turn the shaft clockwise again at approximately the same rate that you used before.

(f) Stop at the position where the torque increases to approximately two-thirds of the maximum torque that you wrote down before.

(g) Read the scale on the tool at this position.

NOTE: This is the position where valve butterfly starts to engage the edge of the seal.

(h) Turn the handle 13 more degrees in the clockwise direction past the reading from the previous step.

NOTE: The butterfly valve is now centered on the valve seal.

NOTE: If you turn the valve past the target value, do not turn it back in the counterclockwise direction. You must start again with the tool handle in the extreme counterclockwise position.

SUBTASK 28-22-01-820-006

(5) Tighten the alignment tool lockscrew to hold the alignment tool in position on the adapter/shaft.

SUBTASK 28-22-01-820-007

(6) Turn the index plate [31] until the actuator mounting holes in the index plate [31] are aligned with the two upper holes for the alignment screws.

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SUBTASK 28-22-01-820-005

(7) Insert the two alignment screws into the holes for the actuator mounting screws to hold the index plate [31] in alignment with the adapter/shaft (this is the final adjustment of the position of the index plate [31]).

SUBTASK 28-22-01-420-012

(8) Tighten the bottom index screw.

SUBTASK 28-22-01-020-013

(9) Carefully remove the alignment screws.

SUBTASK 28-22-01-080-002

(10) Loosen the lockscrew and carefully remove the alignment tool from the index plate [31].

SUBTASK 28-22-01-420-021

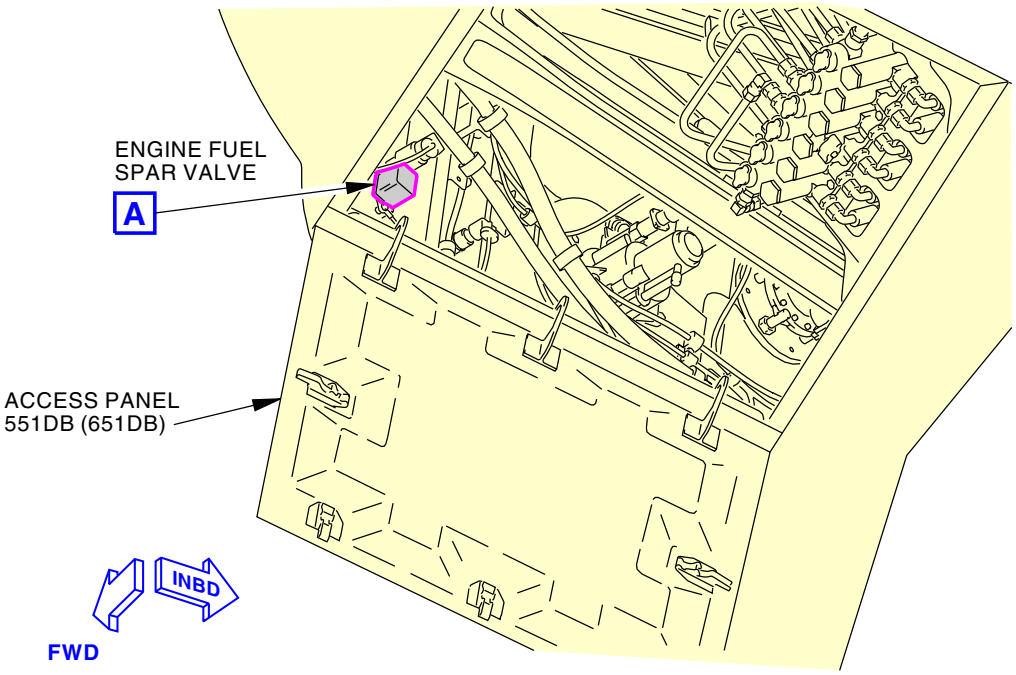
(11) Use a fine point felt pen to apply a reference mark between the index plate [31] and the adapter/shaft at one of the attachment points.

SUBTASK 28-22-01-420-022

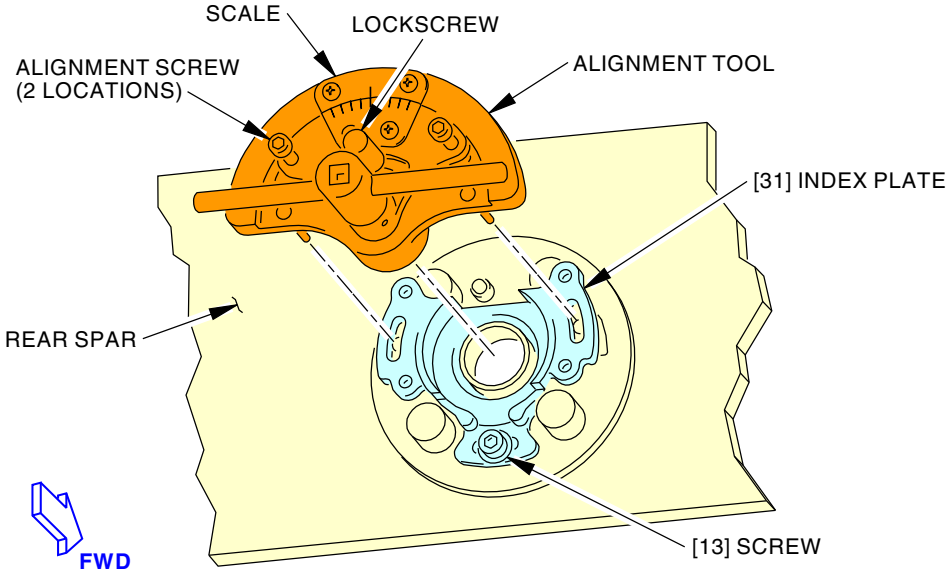
(12) Continue with the index plate installation procedure in this task: Engine Fuel Spar Valve (Adapter/Shaft) - Installation, TASK 28-22-01-400-803.

——— END OF TASK ———

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ENGINE FUEL SPAR VALVE LOCATION



ENGINE FUEL SPAR VALVE

A

G13669 S0006415106_V4

Engine Fuel Spar Valve Alignment Tool Installation
Figure 403/28-22-01-990-803

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ENGINE FUEL SPAR VALVE - INSPECTION/CHECK

1. General

A. This procedure contains an air pressure leak check of the engine fuel spar valves.

(1) There is one spar valve in each main tank, actuated by a valve actuator on the rear spar of the wing.

TASK 28-22-01-790-801-001

2. Engine Fuel Spar Valve - Pressure Leak Check

(Figure 601)

A. General

(1) This task includes the steps to do a check for the air pressure leak of the engine fuel spar valve.

(2) Make sure that there is no other maintenance done during this test.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
28-22-01-000-801	Engine Fuel Spar Valve (Valve Body) - Removal (P/B 401)
28-22-01-400-801	Engine Fuel Spar Valve (Valve Body) - Installation (P/B 401)
28-22-01-820-801	Adapter Shaft Alignment (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
71-00-00-800-833-H00	Power Plant Test Reference Table (P/B 501)
73-11-07-000-801-H01	Main Fuel Supply Hose Removal (P/B 401)
73-11-07-400-801-H01	Main Fuel Supply Hose Installation (P/B 401)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-1776	Equipment - Test, Engine Fuel Feed Manifold Part #: G28018-26 Supplier: 81205 Part #: G28018-28 Supplier: 81205 Opt Part #: J28005-1 Supplier: 81205
SPL-4913	Fitting Assembly - Manifold, Fuel Feed, GE90 Part #: G28018-2 Supplier: 81205
SPL-4914	Fitting Assembly - Manifold, Fuel Feed (GEnx-2B, CF6-80C2, PW4000, or GE9X Engines)
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)

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D. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
211	Flight Compartment, Left
212	Flight Compartment, Right
414	Right Fan Cowl - Left Engine
424	Right Fan Cowl - Right Engine
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

F. Prepare for the Pressure Leak Check

SUBTASK 28-22-01-860-038-001

(1) Supply electrical power (TASK 24-22-00-860-805).

SUBTASK 28-22-01-480-004-001

(2) Make sure the downlocks are installed on the nose and main landing gear (TASK 32-00-30-480-801) .

SUBTASK 28-22-01-480-005-001

WARNING USE THE CORRECT PROCEDURE TO INSTALL THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY. INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(3) Make sure that the door locks are installed on the landing gear doors (TASK 32-00-15-480-801).

SUBTASK 28-22-01-650-019-001

(4) Defuel the main fuel tanks (TASK 28-26-00-650-801).

(a) Operate the main tank forward and aft boost pumps until the fuel quantity and the fuel pressure indications are low.

NOTE: This will prevent residual fuel above the suction feed by-pass valves from draining into the engine supply lines.

NOTE: This occurs when the fuel pump light shows amber and there is a low fuel quantity indication. These indications are monitored from the flight compartment.

SUBTASK 28-22-01-650-031-001

(5) Defuel the center fuel tank (TASK 28-26-00-650-801).

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(a) Operate the center tank fuel pumps until the fuel quantity and the pressure indications are low.

NOTE: This will prevent the fuel from being siphoned out through the center tank pump inlet to the engine supply lines.

NOTE: This occurs when the fuel pump light shows amber and there is a low fuel quantity indication. These indications are monitored from the flight compartment.

SUBTASK 28-22-01-650-020-001

(6) Drain the fuel from the left and right engine fuel supply lines (Figure 601, Views D and F).

(a) Put a 5-gallon (19-liter) fuel resistant container, STD-1054, below the engine fuel supply lines.

NOTE: A large volume of fuel will drain from the engine fuel supply lines. To prevent a fuel spill, use a 5-gallon (19-liter) fuel resistant container, STD-1054, to catch the drained fuel.

(b) Make sure that the spar valves are open.

1) Put the L/R FUEL CONTROL RUN-CUTOFF switch, on the P10 stand, to the RUN position.

(c) Make sure that the defueling valve is closed.

1) Put the DEFUEL VALVE switch, on the Integrated Refueling Panel (IRP) P28, to the CLOSE position.

(d) Drain the fuel (TASK 73-11-07-000-801-H01).

G. Procedure

SUBTASK 28-22-01-020-023-001

(1) Disconnect the right engine fuel supply line at the strut connector on the right engine strut (TASK 73-11-07-000-801-H01) (Figure 601, View E).

NOTE: A small quantity of fuel can spill from the engine fuel supply lines. Use the cotton wiper, G00034, to absorb the fuel.

SUBTASK 28-22-01-020-024-001

(2) Disconnect the left engine fuel supply line at the strut connector on the left engine strut (TASK 73-11-07-000-801-H01) (Figure 601, View E).

NOTE: A small quantity of fuel can spill from the engine fuel supply lines. Use the cotton wiper, G00034, to absorb the fuel.

SUBTASK 28-22-01-480-007-001

(3) Install the manifold fitting assembly, SPL-4913, or manifold fitting assembly, SPL-4914, for the pressure inlet at the strut connector on the applicable engine fuel supply line (Figure 601, View G).

NOTE: The manifold fitting assembly, SPL-4913, or manifold fitting assembly, SPL-4914, for the test equipment should be installed on the same side as the engine fuel spar valve being tested.

SUBTASK 28-22-01-480-008-001

(4) Connect the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, and the engine fuel feed manifold test equipment, SPL-1776, to the manifold fitting assembly, SPL-4913, or manifold fitting assembly, SPL-4914, (Figure 601, View H).

SUBTASK 28-22-01-480-009-001

(5) Install the pressure outlet gauge assembly (part of engine fuel feed manifold test equipment, SPL-1776) on the opposite end of the engine fuel supply line.

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SUBTASK 28-22-01-860-016-001

(6) To do a test of the engine fuel spar valve, put these valves in these positions:

NOTE: The valves must be electrically commanded to the open or closed position.

(a) Make sure the APU fuel shutoff valve is closed.

1) Put the APU start switch, on the electrical panel (P5), to the OFF position (Figure 601, View B).

(b) Make sure the crossfeed valve(s) are open.

1) Put the FUEL CROSSFEED FWD and AFT switch-lights, on the P5 overhead panel, to the open position (Figure 601, View A).

NOTE: This removes the pressure from the fuel feed supply line.

NOTE: The crossfeed valve(s) are open when the flowbars are on and the VALVE lights are off.

(c) To do a test of the left engine fuel spar valve, make sure that the engine fuel shutoff valves are in the subsequent positions (Figure 601, View C):

1) Make sure that the left engine fuel shutoff valve is closed.

a) Put the L FUEL CONTROL RUN-CUTOFF switch, on the P10 stand, in the CUTOFF position.

2) Make sure that the right engine fuel shutoff valve is open.

a) Put the R FUEL CONTROL RUN-CUTOFF switch, on the P10 stand, to the RUN position.

(d) To do a test of the right engine fuel spar valve, make sure that the engine fuel shutoff valves are in the subsequent positions (Figure 601, View C):

1) Make sure that the left engine fuel shutoff valve is open.

a) Put the L FUEL CONTROL RUN-CUTOFF switch, on the P10 stand, in the RUN position.

2) Make sure that the right engine fuel shutoff valve is closed.

a) Put the R FUEL CONTROL RUN-CUTOFF switch, on the P10 stand, to the CUTOFF position.

(e) Make sure that the defueling valve is closed.

1) Put the DEFUEL VALVE switch, on the Integrated Refueling Panel (IRP) P28, to the CLOSE position.

SUBTASK 28-22-01-780-001-001

(7) Apply 41.5 ±3.5 psig (286.1 ±24.2 kPa) of air pressure to the engine fuel supply line.

(a) Make sure the pressure is stable.

SUBTASK 28-22-01-780-002-001

(8) Make sure the outlet pressure at the opposite engine disconnect is 0 psig (0 kPa).

(a) Make sure that the outlet pressure at the opposite engine disconnect should read and remains at 0 psig (0 kPa), until after you have completed the test.

NOTE: The test is completed when you have made a written record of all the pressure reduction rates for approximately 10 minutes.

SUBTASK 28-22-01-780-003-001

(9) Stop the compressed 60-105 PSIG dry filtered regulated air source, STD-1057.

(a) Make sure the test equipment pressure bleed lines are closed.

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SUBTASK 28-22-01-210-011-001

(10) Make a written record of the pressure reduction rate for the next 10 minutes.

SUBTASK 28-22-01-780-004-001

(11) If the pressure reduction rate is less than 1.5 psig (10.3 kPa) in 10 minutes, then the engine fuel spar valve does not leak.

(a) Do this procedure: Put the Airplane Back to Its Usual Condition.

SUBTASK 28-22-01-780-005-001

(12) If the pressure reduction rate is more than 1.5 psig (10.3 kPa) in 10 minutes, do the applicable task(s) and repeat the test:

(a) Adapter Shaft Alignment, TASK 28-22-01-820-801.

(b) Replace the engine fuel spar valve (TASK 28-22-01-000-801) and (TASK 28-22-01-400-801).

H. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-01-780-011-001

(1) Slowly decrease the air pressure in the engine fuel supply line to be at 0 psi (0 kPa).

SUBTASK 28-22-01-080-004-001

(2) Remove the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, from the applicable engine fuel supply line.

SUBTASK 28-22-01-080-005-001

(3) To remove the engine fuel feed manifold test equipment, SPL-1776, from the engine fuel supply lines, do these steps:

(a) Put the FUEL CROSSFEED FWD and AFT switch-lights, on the P5 overhead panel, to the closed position (Figure 601, View A).

(b) Put the L/R FUEL CONTROL RUN-CUTOFF switch, on the P10 stand, to the CUTOFF position (Figure 601, View C).

NOTE: This closes the fuel spar valves.

(c) Open the bleed valve on the engine fuel feed manifold test equipment, SPL-1776, to drain any fuel that remains in the engine fuel supply line (Figure 601, View H).

(d) Disconnect the engine fuel feed manifold test equipment, SPL-1776, from the manifold fitting assembly, SPL-4913, or manifold fitting assembly, SPL-4914.

(e) Remove the manifold fitting assembly, SPL-4913, or manifold fitting assembly, SPL-4914, from the applicable engine fuel supply line (Figure 601, View G).

(f) Remove the pressure outlet gauge assembly (part ofengine fuel feed manifold test equipment, SPL-1776), from the applicable opposite end of the engine fuel supply line.

SUBTASK 28-22-01-420-037-001

(4) Connect the left engine fuel supply line at the strut connector on the left engine strut (TASK 73-11-07-400-801-H01) (Figure 601, View E).

SUBTASK 28-22-01-420-038-001

(5) Connect the right engine fuel supply line at the strut connector on the right engine strut (TASK 73-11-07-400-801-H01) (Figure 601, View E).

SUBTASK 28-22-01-790-002-001

(6) Do a leak check of the main fuel supply line, refer to the Power Plant Test Reference Table (TASK 71-00-00-800-833-H00).

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SUBTASK 28-22-01-650-025-001

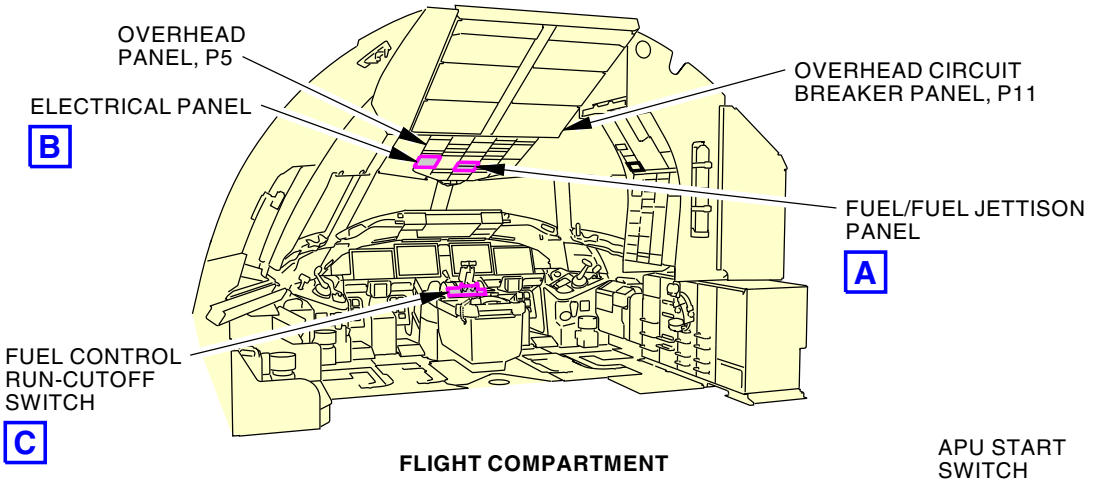
(7) Refuel the fuel tanks if no more work is necessary (TASK 12-11-01-650-801).

SUBTASK 28-22-01-860-039-001

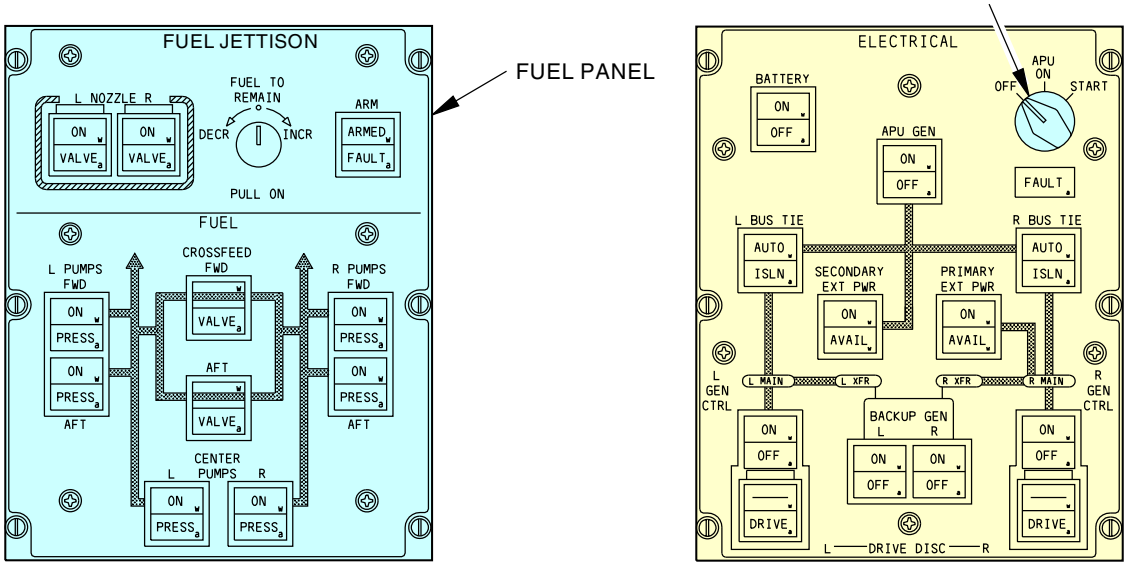
(8) Remove the electrical power if it is not necessary (TASK 24-22-00-860-806).

——— END OF TASK ———

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FLIGHT COMPARTMENT

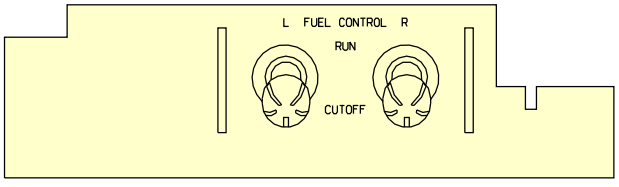


FUEL/FUEL JETTISON PANEL

A

ELECTRICAL PANEL

B



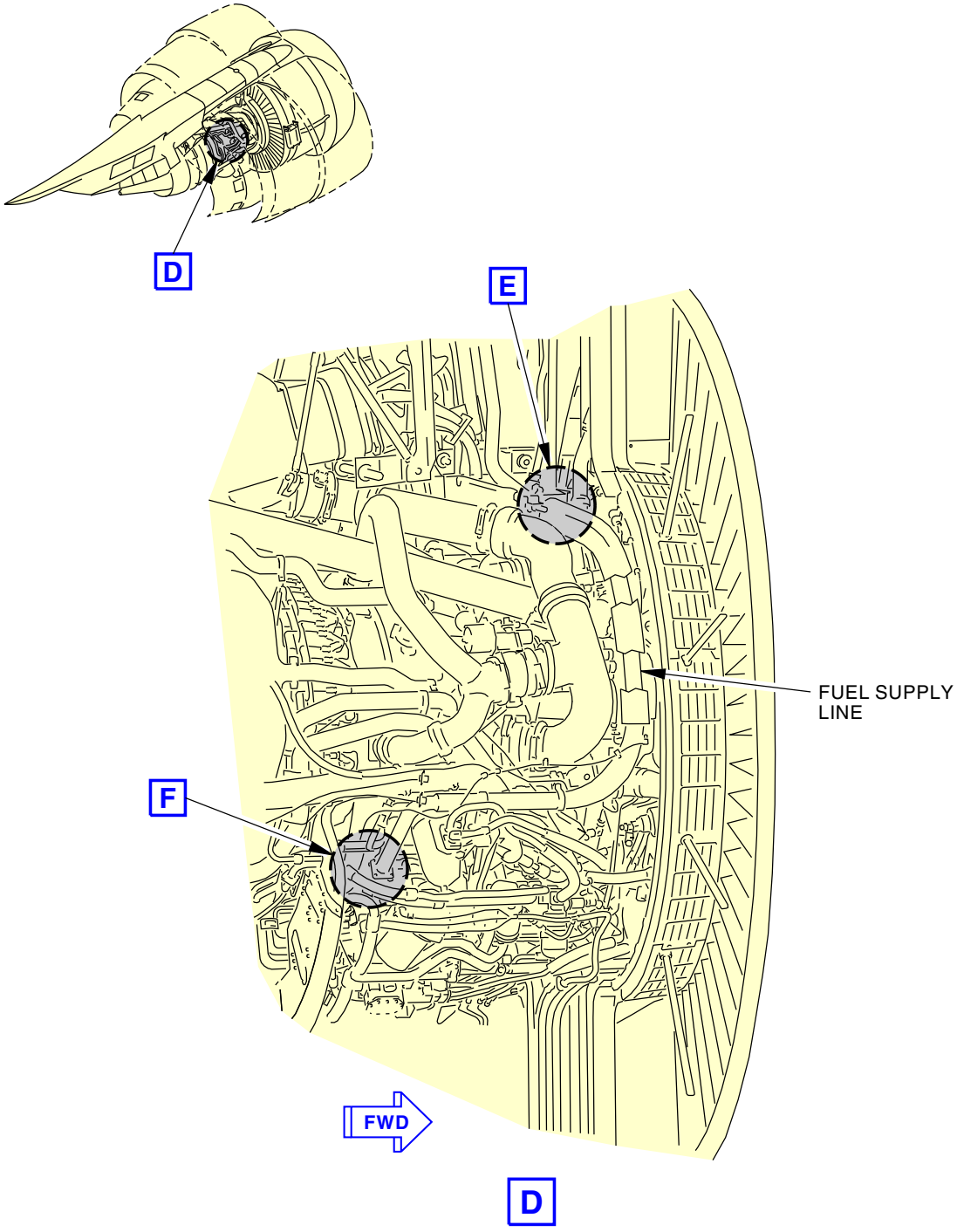
FUEL CONTROL RUN-CUTOFF SWITCH

C

2322622 S0000526148_V2

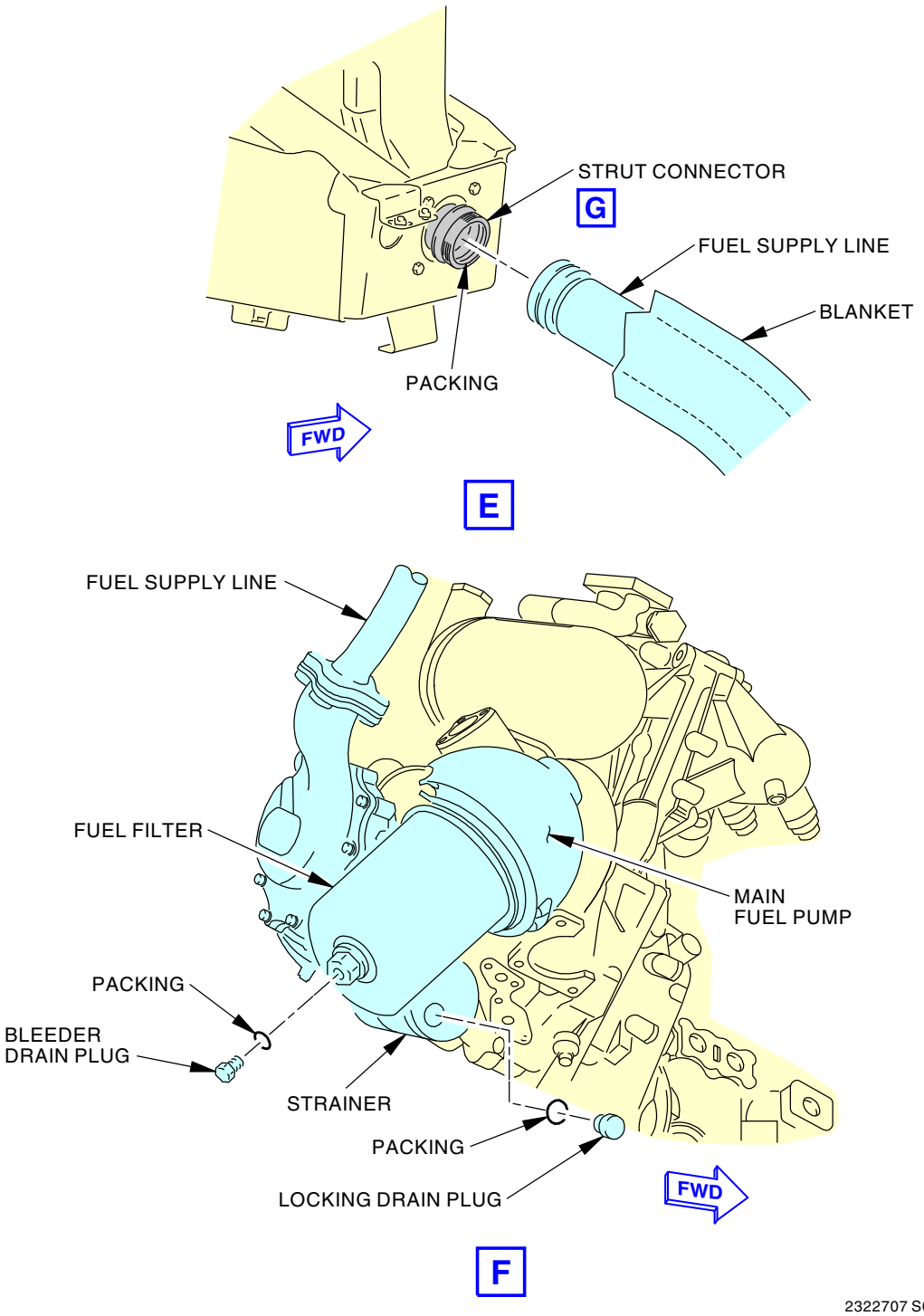
Engine Fuel Spar Valve - Pressure Leak Check
Figure 601/28-22-01-990-810-001 (Sheet 1 of 4)

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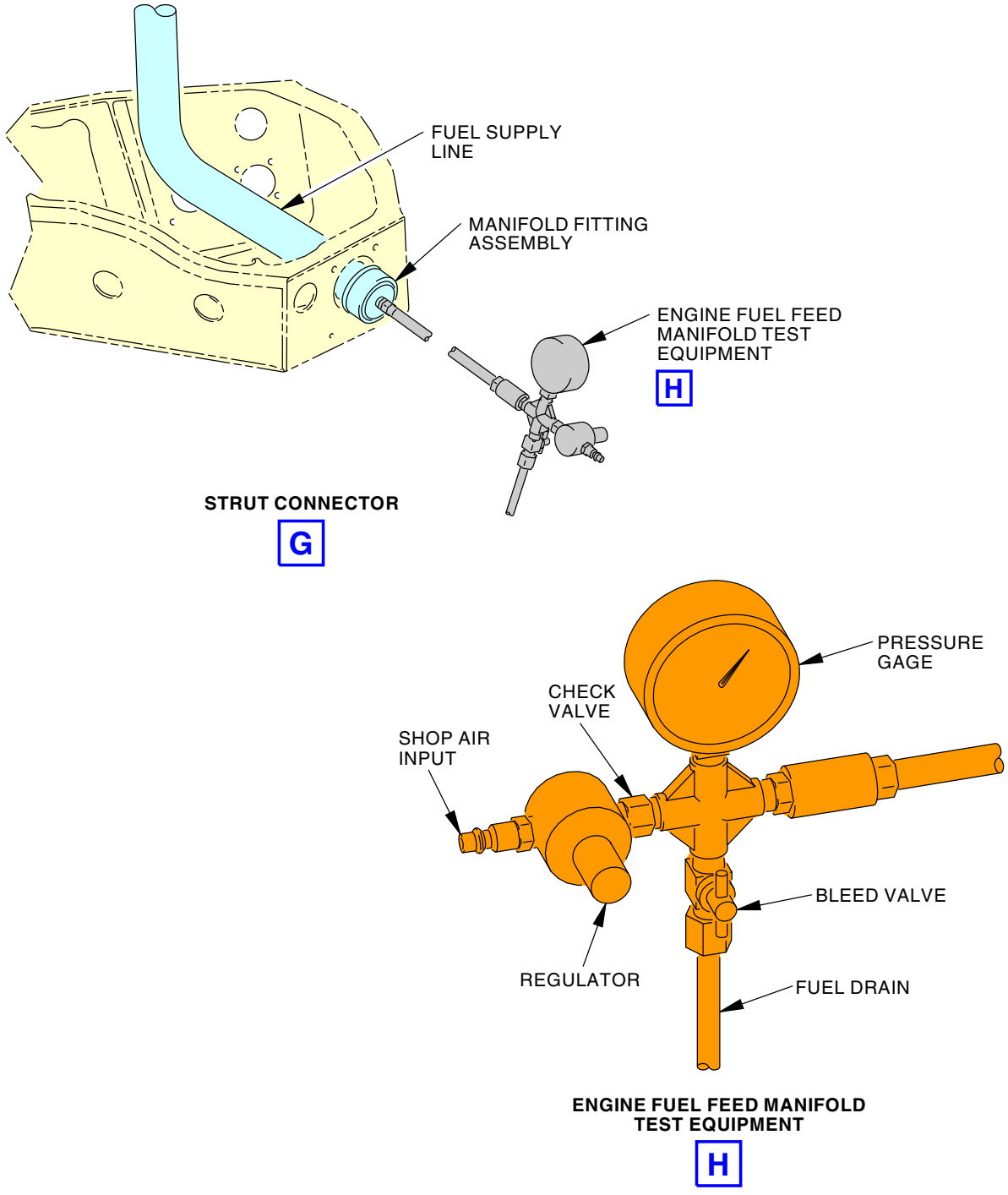
Engine Fuel Spar Valve - Pressure Leak Check
Figure 601/28-22-01-990-810-001 (Sheet 2 of 4)

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Engine Fuel Spar Valve - Pressure Leak Check
Figure 601/28-22-01-990-810-001 (Sheet 3 of 4)

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Engine Fuel Spar Valve - Pressure Leak Check
Figure 601/28-22-01-990-810-001 (Sheet 4 of 4)

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ENGINE FUEL SPAR VALVE ACTUATOR - REMOVAL/INSTALLATION

1. General

A. Each engine fuel spar valve contains three parts: an actuator, an adapter/shaft and a valve body.

B. The actuators for the engine fuel spar valves are installed on the rear spar, of the left and right main fuel tanks.

C. It is not necessary to defuel the fuel tank to remove the actuator.

D. This procedure contains two tasks. The first task removes the actuator for the engine fuel spar valve. The second task installs the actuator for the engine fuel spar valve.

ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS

TASK 28-22-02-000-802

2. Engine Fuel Spar Valve Actuator - Removal

(Figure 401)

A. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right
551	Rear Spar to Landing Gear Support Beam - Left Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

B. Access Panels

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel
651DB	Inboard Fixed Trailing Edge Panel

C. Procedure

SUBTASK 28-22-02-010-005

(1) Open this access panel to get access to the actuators [15], for the left engine fuel spar valve, on the rear spar:

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-22-02-010-006

(2) Open this access panel to get access to the actuators [15], for the right engine fuel spar valve, on the rear spar:

Number	Name/Location
651DB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-22-02-862-001

(3) For the actuator to the left engine fuel spar valve:

(a) Open this circuit breaker and install safety tag:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	5	C28001	L ENGINE FUEL SPAR VALVE

SUBTASK 28-22-02-862-002

(4) For the actuator to the right engine fuel spar valve:

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(a) Open this circuit breaker and install safety tag:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	19	C28002	R ENGINE FUEL SPAR VALVE

SUBTASK 28-22-02-010-007

(5) Make sure the manual override handle [9] of the actuator [15] is in the CLOSED position.

(a) If the manual override handle [9] is not in the CLOSED position, move the manual override handle [9] to the CLOSED position.

SUBTASK 28-22-02-030-002

(6) Disconnect the electrical connector [3].

SUBTASK 28-22-02-030-003

(7) Remove the sealant from the bonding jumper [14] and fasteners at the actuator attachment location.

SUBTASK 28-22-02-030-004

(8) Remove the screw [12], two washers [13] and bonding jumper [14] from the actuator [15].

SUBTASK 28-22-02-030-005

(9) Remove the four screws [2] and washers [1] that attach the actuator [15] to the adapter/shaft [10].

SUBTASK 28-22-02-030-006

(10) Carefully disassemble the actuator [15] from the index plate [11].

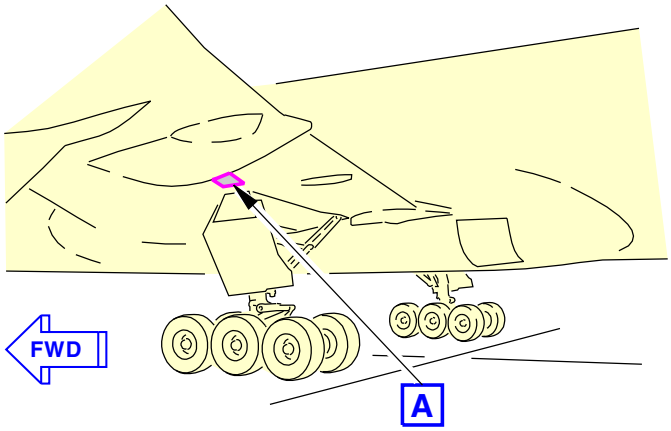
NOTE: The actuator and index plate are bonded with faying surface sealant.

SUBTASK 28-22-02-020-004

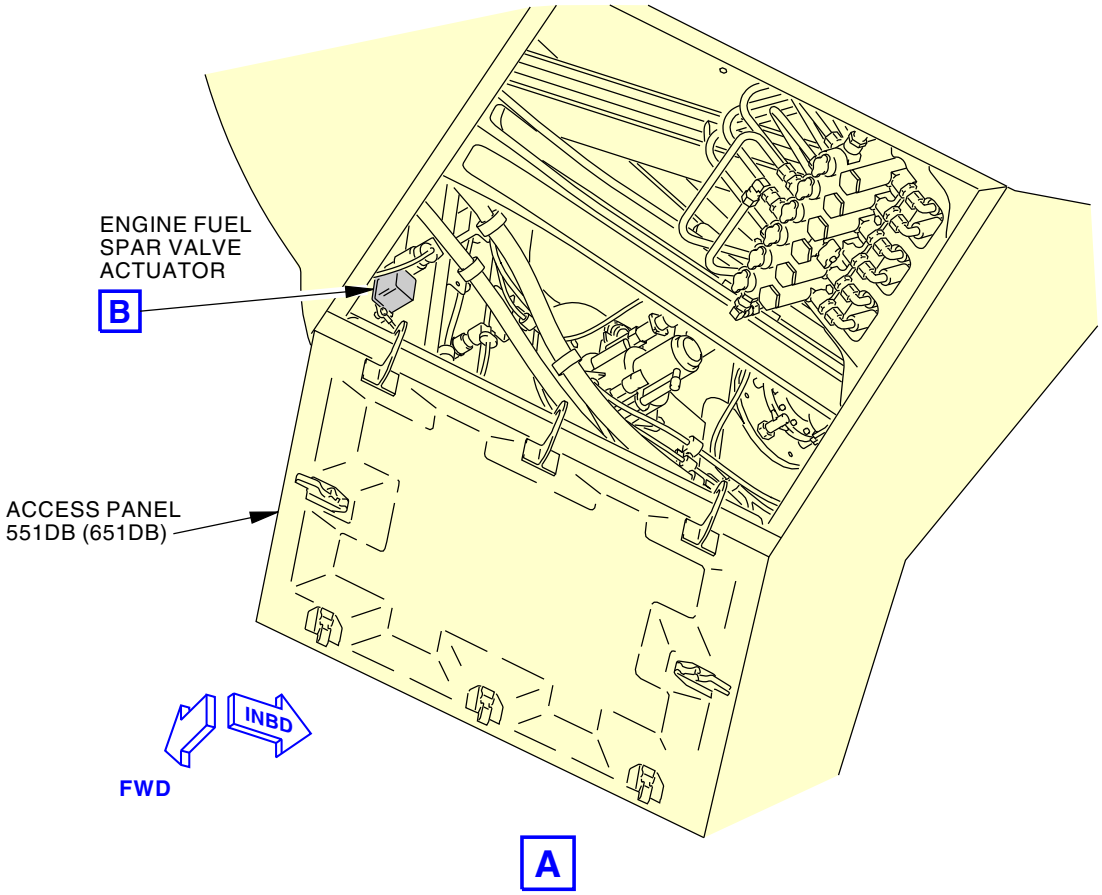
(11) Remove the actuator [15].

——— END OF TASK ———

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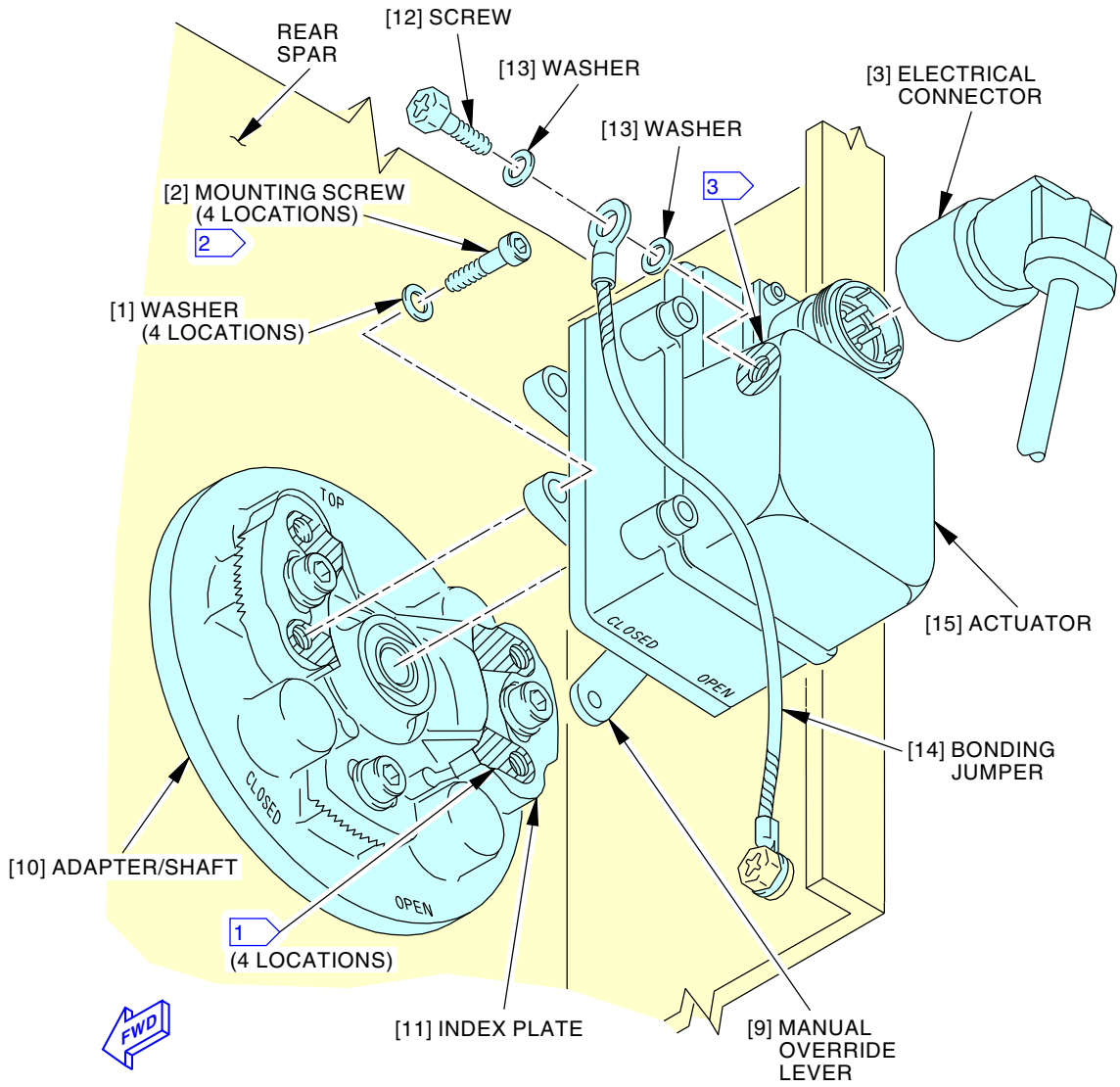
LEFT WING
(RIGHT WING IS EQUIVALENT)



E13735 S0006415110_V2

Engine Fuel Spar Valve Actuator Installation
Figure 401/28-22-02-990-802 (Sheet 1 of 2)

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(EXAMPLE)

B

1 PREPARE THE CONTACT SURFACES OF THE INDEX PLATE AND ACTUATOR MOUNTING FEET FOR AN ELECTRICAL BOND (4 LOCATIONS) (SWPM 20-20-00). INSTALL THE INDEX PLATE AND THE ACTUATOR WITH A FAY SEALED FAY SURFACE BOND.

2 APPLY SEALANT TO THE SHANK AND THREADS OF THE MOUNTING SCREW.

3 PREPARE THE CONTACT SURFACES OF ACTUATOR AND BONDING JUMPER BUILD-UP FOR AN ELECTRICAL BOND (SWPM 20-20-00). AFTER INSTALLATION, APPLY A CAP SEAL TO THE BONDING JUMPER INSTALLATION.

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Engine Fuel Spar Valve Actuator Installation
Figure 401/28-22-02-990-802 (Sheet 2 of 2)

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TASK 28-22-02-400-802

3. Engine Fuel Spar Valve Actuator - Installation

(Figure 401)

A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(2) For application of fay sealed fay surface bonds in this task, it is acceptable to use sealant, A50110, as an alternative to sealant, A50155.

NOTE: Sealants should not be mixed. In applications where sealants may mix, use the same sealant for both applications.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
20-30-92-910-801	Final Cleaning Prior to General Sealing (Series 92) (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-22-00-710-801	Engine Fuel Spar Valve - Electrical Control and Indication Test (P/B 501)
28-22-01-300-801	Rework the Fay Sealed Fay Surface Bonds for the Spar Valve (P/B 401)
51-21-04-620-801	Alodine 600, 1000, 1200, and 1200S Coating Application (P/B 701)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

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Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: $0855 Part #: 234350 Supplier: $0857 Part #: 311 Supplier: F6892 Part #: 411B60 Supplier: 3DN12 Part #: 411B90 Supplier: 3DN12 Part #: DAD5013 Supplier: $0856 Part #: DFD5019 Supplier: $0856 Part #: J5-0275-2010 Supplier: 435R8 Part #: SCD5019 Supplier: $0856 Part #: ST982LF-9 Supplier: 62176 Part #: TS1275-4 Supplier: 1DWR5
COM-4746	Handle - Sealant Removal Tool Part #: 310/1 Supplier: F6892 Part #: SHN0272 Supplier: $0856 Part #: SHR0272-T Supplier: 1DWR5 Part #: SHW0215 Supplier: $0856
STD-123	Brush - Soft Bristle

D. Consumable Materials

Reference	Description	Specification
A50110	Sealant	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
B01012	Solvent - Final Cleaning Prior To General Sealing - Series 92	
C00064	Coating - Aluminum Chemical Conversion	BAC5719 Type II Class A (MIL-DTL-5541 Class 1A)
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20 Type II
C50033	Chromated Conversion Coating for Aluminum - Alodine 1200	

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(Continued)

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
15	Actuator	28-22-02-01-105	ARO 001-004
		28-22-02-01A-035	ARO 005-016

F. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right
551	Rear Spar to Landing Gear Support Beam - Left Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

G. Access Panels

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel
651DB	Inboard Fixed Trailing Edge Panel

H. Procedure

SUBTASK 28-22-02-862-003

(1) For the actuator to the left engine fuel spar valve:

CAUTION

REMOVE POWER TO THE ACTUATOR. IF YOU DO MAINTENANCE TO THE ACTUATOR WHILE IT IS ENERGIZED, DAMAGE TO THE ACTUATOR CAN OCCUR.

(a) Open this circuit breaker and install safety tag:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	5	C28001	L ENGINE FUEL SPAR VALVE

SUBTASK 28-22-02-862-004

(2) For the actuator to the right engine fuel spar valve:

CAUTION

REMOVE POWER TO THE ACTUATOR. IF YOU DO MAINTENANCE TO THE ACTUATOR WHILE IT IS ENERGIZED, DAMAGE TO THE ACTUATOR CAN OCCUR.

(a) Open this circuit breaker and install safety tag:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	19	C28002	R ENGINE FUEL SPAR VALVE

SUBTASK 28-22-02-140-001

(3) Remove the old sealant and clean the actuator [15], index plate [11] and fasteners (if re-used).

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

(a) Use sealant removal tool, COM-2481, and sealant removal tool handle, COM-4746 (or equivalent), to remove old sealant from the actuator [15] and index plate [11].

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(b) To remove the remaining sealant, grease, oil, dirt, and other contamination from the components, use one of these items soaked with Series 92 solvent, B01012 (TASK 20-30-92-910-801):

1) soft bristle brush, STD-123

2) cotton wiper, G00034

SUBTASK 28-22-02-420-003

(4) Do these steps to prepare the actuator [15] and the index plate [11] for a fay sealed fay surface bond (SWPM 20-20-00):

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(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-19: CDCCL

(b) Apply a thin continuous layer of sealant between the actuator [15] mounting feet contact surfaces (four locations) and the index plate [11] for a fay sealed fay surface bond.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the fay sealed fay surface bond

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(c) Apply sealant to the shank and the threads of the screws [2].

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1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the wet installation of the screws [2].

NOTE: Use the sealant that was used for the fay sealed fay surface bond.

2) Make sure the sealant applied to the fasteners is approximately 0.060 in. (1.524 mm) thick.

SUBTASK 28-22-02-420-004

(5) Do these steps to install the actuator [15] to the index plate [11]:

(a) Make sure the manual override lever on the actuator [15] is in the CLOSED position.

(b) Align the actuator output shaft with the adapter/shaft [10].

(c) Make sure the two spaces for teeth on the adapter/shaft [10] align with the actuator output shaft.

(d) Put the actuator output shaft into the adapter/shaft [10].

NOTE: The contact areas of the actuator automatically align with the mounting points on the index plate.

(e) Install the four screws [2] and washers [1].

NOTE: Lockwire is not necessary for the screws [2].

(f) Tighten the screws [2] to 20 in-lb (2.3 N·m).

(g) Make sure the sealant is continuously squeezed out along the edges of the contact surfaces.

(h) If there are gaps, bubbles or voids in the sealant squeeze out, then disassemble and apply more sealant.

(i) Shape the squeezed out sealant into a fillet seal.

(j) As an option, remove the extra squeezed out sealant.

NOTE: Make sure the sealant that remains is flush with the mating part edges.

SUBTASK 28-22-02-765-001

28-AWL-19: CDCCL

(6) Measure the electrical bonding resistance between the actuator [15] upper housing and the rear spar (structure) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

28-AWL-19: CDCCL

(a) Do this measurement with the bonding jumper [14] and electrical connector [3] disconnected.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(b) Make sure the bonding jumper [14] does not touch the actuator [15] during the electrical bonding measurement.

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(c) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-19: CDCCL

(d) If the actuator [15], index plate [11] and adapter plate (part of the adapter/shaft [10]) were removed, make sure the electrical bonding resistance is 0.0030 ohm (3.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) If the electrical bonding resistance is more than 0.0030 ohm (3.0 milliohms), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Spar Valve, TASK 28-22-01-300-801.

28-AWL-19: CDCCL

(e) If theactuator [15] and index plate [11] were removed, make sure the electrical bonding resistance is 0.0040 ohm (4.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) If the electrical bonding resistance is more than 0.0040 ohm (4.0 milliohms), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Spar Valve, TASK 28-22-01-300-801.

28-AWL-19: CDCCL

(f) If only the actuator [15] was removed, make sure the electrical bonding resistance is 0.0040 ohm (4.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) If the electrical bonding resistance is more than 0.0040 ohm (4.0 milliohms), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Spar Valve, TASK 28-22-01-300-801.

SUBTASK 28-22-02-420-007

(7) If the bonding jumper [14] is disconnected from the structure, do these steps to attach the bonding jumper [14]:

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(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

(b) Rub dry with a clean, dry cotton wiper, G00034.

(c) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-19: CDCCL

(d) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper [14] terminal and the two washers for a fay sealed fay surface bond at the structure (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use sealant, A50110, or sealant, A50155.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(e) Install the screw and washers to attach the bonding jumper [14] to the structure.

1) Tighten the screw to 30 ±5 in-lb (3 ±1 N·m).

28-AWL-19: CDCCL

(f) Apply a cap seal over the screw (fastener) and the terminal of the bonding jumper [14] attached to the structure.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

NOTE: Use the sealant that was used for the fay sealed fay surface bond.

1) Use sealant, A50110 or sealant, A50155.

SUBTASK 28-22-02-420-005

(8) Do these steps to install the bonding jumper [14] to the actuator [15]:

(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

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28-AWL-19: CDCCL

(b) Measure the electrical bonding resistance between the loose end of the bonding jumper [14] and the rear spar (structure) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-19: CDCCL

2) Make sure the electrical bonding resistance is 0.0015 ohm (1.5 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

a) If the electrical bonding resistance is more than 0.0015 ohm (1.5 milliohms), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Spar Valve, TASK 28-22-01-300-801.

28-AWL-19: CDCCL

(c) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper [14] terminal and the two washers [13] for a fay sealed fay surface bond between the actuator [15] and the bonding jumper [14] terminal (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(d) Install the screw [12], two washers [13], and bonding jumper [14] to the actuator [15].

(e) AIRPLANES WITHOUT ACTUATOR MA30A1001:

Tighten the screw [12] to 20 in-lb (2.3 N·m).

(f) AIRPLANES WITH ACTUATOR MA30A1001:

Tighten the screw [12] to 35 in-lb (4.0 N·m).

28-AWL-19: CDCCL

(g) Measure the electrical bonding resistance between the upper housing of the actuator [15] and the attached bonding jumper [14] terminal (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Do not touch the screw [12] when you make the bonding measurement.

2) Use an intrinsically safe approved bonding meter, COM-1550.

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28-AWL-19: CDCCL

3) Make sure the electrical bonding resistance is 0.0010 ohm (1.0 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

28-AWL-19: CDCCL

(h) Apply a cap seal over the screw [12] (fastener) and the terminal lug of the bonding jumper [14] attached to the actuator [15].

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

NOTE: Use the sealant that was used for the fay sealed fay surface bond.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296.

SUBTASK 28-22-02-370-001

(9) Do this task to apply protective finishes to the bare areas of the rear spar: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

NOTE: Re-apply the protective finishes to the rear spar where the electrical bonding probes removed the finishes.

(a) These are the protective finishes:

1) Alodine 600 coating, C00064

2) BMS 10-20 coating, C00307.

SUBTASK 28-22-02-916-001

(10) Do this task to apply Alodine 1200 coating, C50033, to any bare areas of the actuator [15]: Alodine 600, 1000, 1200, and 1200S Coating Application, TASK 51-21-04-620-801.

NOTE: Re-apply the protective coating to the actuator [15] where the electrical bonding probe removed the finish and any bare metal areas around the bonding jumper installation that are not covered with sealant.

SUBTASK 28-22-02-420-006

(11) Connect the electrical connector [3].

I. Spar Valve Test

SUBTASK 28-22-02-865-001

(1) For the actuator to the left engine fuel spar valve:

(a) Remove the safety tag and close this circuit breaker:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	5	C28001	L ENGINE FUEL SPAR VALVE

SUBTASK 28-22-02-865-002

(2) For the actuator to the right engine fuel spar valve:

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

(a) Remove the safety tag and close this circuit breaker:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	19	C28002	R ENGINE FUEL SPAR VALVE

SUBTASK 28-22-02-861-001

(3) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-22-02-720-002

(4) To do a functional test of the engine fuel spar valves, do this task: Engine Fuel Spar Valve - Electrical Control and Indication Test, TASK 28-22-00-710-801.

J. Put the Airplane Back to the Usual Condition

SUBTASK 28-22-02-410-001

(1) For the left engine fuel spar valve actuator, close this access panel:

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-22-02-410-002

(2) For the right engine fuel spar valve actuator, close this access panel:

Number	Name/Location
651DB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-22-02-650-002

(3) To refuel the airplane (if it is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

——— END OF TASK ———

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ENGINE FUEL SPAR VALVE ACTUATOR - INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure contains a functional check of the bonding resistance between the structure and the engine fuel spar valve actuator.

SFAR 88

TASK 28-22-02-200-801

2. Engine Fuel Spar Valve Actuator - Bonding Resistance Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
28-22-02-400-802	Engine Fuel Spar Valve Actuator - Installation (P/B 401)
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Location Zones

Zone	Area
551	Rear Spar to Landing Gear Support Beam - Left Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

D. Access Panels

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel
651DB	Inboard Fixed Trailing Edge Panel

E. Prepare for the Procedure

SUBTASK 28-22-02-010-008

(1) Open this access panel to get access to the actuators, for the left engine fuel spar valve, on the rear spar:

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

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SUBTASK 28-22-02-010-009

(2) Open this access panel to get access to the actuators, for the right engine fuel spar valve, on the rear spar:

Number	Name/Location
651DB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-22-02-865-003

(3) For the actuator to the left engine fuel spar valve:

(a) Open this circuit breaker and install safety tag:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	5	C28001	L ENGINE FUEL SPAR VALVE

SUBTASK 28-22-02-865-004

(4) For the actuator to the right engine fuel spar valve:

(a) Open this circuit breaker and install safety tag:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	19	C28002	R ENGINE FUEL SPAR VALVE

F. Electrical Bonding Measurement

SUBTASK 28-22-02-862-005

(1) Disconnect the electrical connector.

SUBTASK 28-22-02-212-001

(2) Make sure the manual override handle of the actuator is in the CLOSED position.

(a) If the manual override handle is not in the CLOSED position, move the manual override handle to the CLOSED position.

SUBTASK 28-22-02-765-004

(3) Measure the bonding resistance between the actuator and the airplane structure with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

(a) Make sure the bonding resistance is 0.005 ohm (5 milliohms) or less.

SUBTASK 28-22-02-765-010

(4) Measure the bonding resistance between the bonding jumper (attached to the actuator) and the airplane structure with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

(a) Make sure the bonding resistance is 0.008 ohm (8 milliohms) or less.

SUBTASK 28-22-02-861-002

(5) Connect the electrical connector.

SUBTASK 28-22-02-860-007

(6) For the actuator to the left engine fuel spar valve:

(a) Remove the safety tag and close this circuit breaker:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	5	C28001	L ENGINE FUEL SPAR VALVE

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SUBTASK 28-22-02-860-008

(7) For the actuator to the right engine fuel spar valve:

(a) Remove the safety tag and close this circuit breaker:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	19	C28002	R ENGINE FUEL SPAR VALVE

SUBTASK 28-22-02-710-001

(8) Do the engine fuel spar valve actuator test in Engine Fuel Spar Valve Actuator - Installation, TASK 28-22-02-400-802

G. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-02-410-003

(1) For the left engine fuel spar valve actuator, close this access panel:

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-22-02-410-004

(2) For the right engine fuel spar valve actuator, close this access panel:

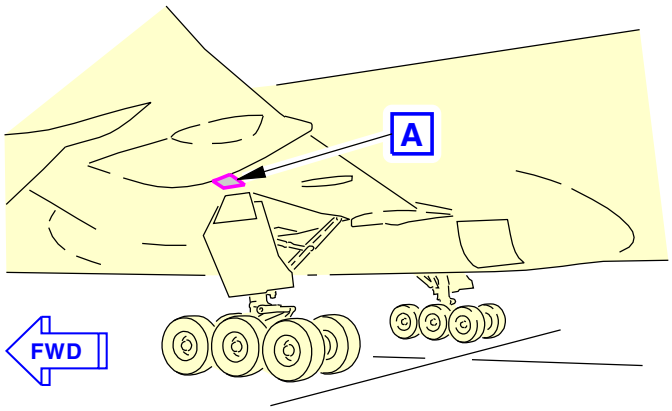
Number	Name/Location
651DB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-22-02-650-003

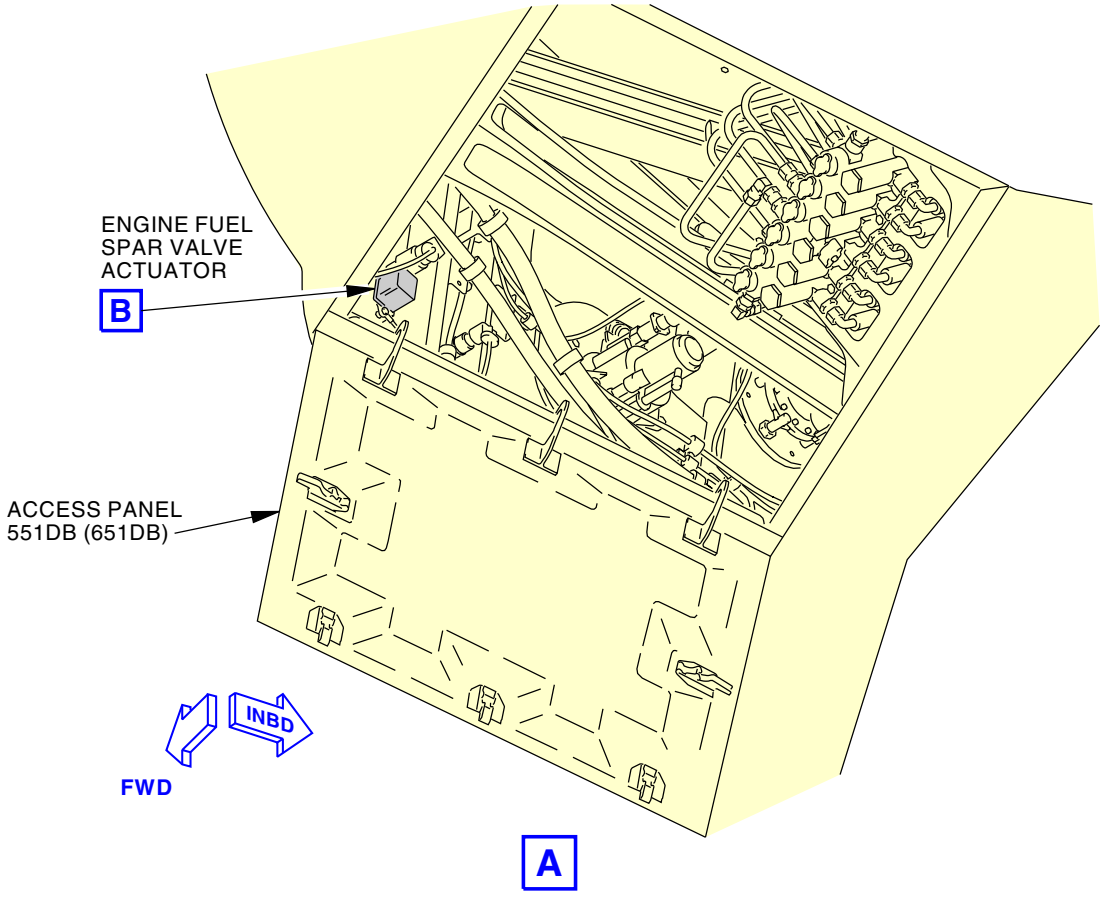
(3) To refuel the airplane (if it is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

——— END OF TASK ———

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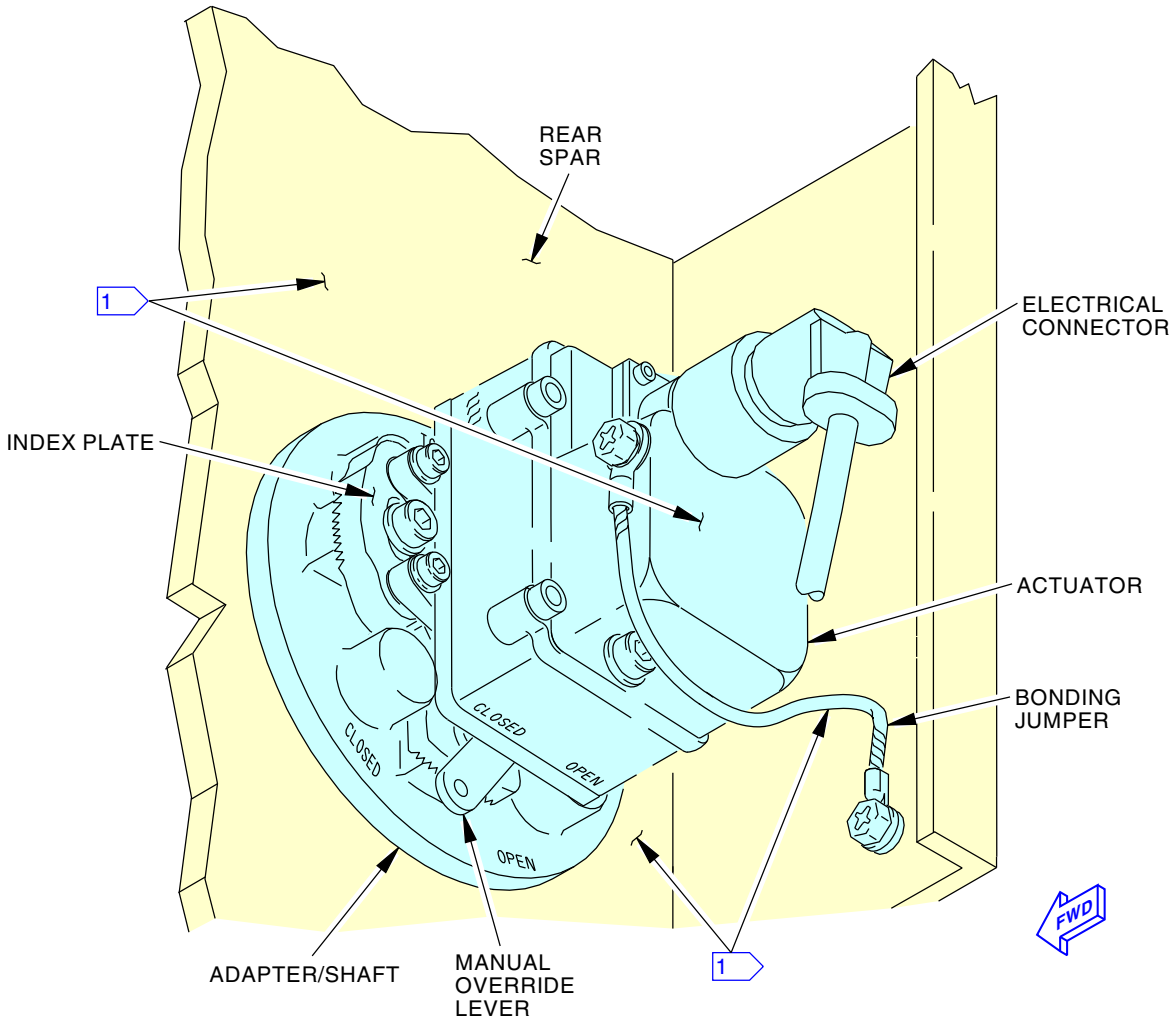
LEFT WING
(RIGHT WING IS EQUIVALENT)



1368771 S0000247171_V2

Engine Fuel Spar Valve - Bonding Resistance Measurement
Figure 601/28-22-02-990-803 (Sheet 1 of 2)

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(EXAMPLE)

B

1 BONDING RESISTANCE MEASUREMENT

1369081 S0000247173_V3

Engine Fuel Spar Valve - Bonding Resistance Measurement
Figure 601/28-22-02-990-803 (Sheet 2 of 2)

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FORWARD/AFT FUEL CROSSFEED VALVE - REMOVAL/INSTALLATION

1. General

A. The valve body and adapter/shaft, for each crossfeed valve, are installed in the left center fuel tank.

B. It is necessary to defuel the center fuel tank to remove an adapter/shaft. It is necessary to defuel all the fuel tanks to remove a valve body.

C. This procedure removes and installs one crossfeed valve, the other crossfeed valve removal/installation is the same.

D. This procedure contains these tasks:

(1) Removal of the valve body.

(2) Installation of the valve body.

(3) Removal of the adapter/shaft.

(4) Installation of the adapter/shaft.

(5) Adapter/Shaft Alignment

E. The procedure to remove the crossfeed valve actuators is in FWD/AFT Fuel Crossfeed Valve Actuator - Removal, TASK 28-22-04-000-802. The procedure to install the crossfeed valve actuators is in FWD/AFT Fuel Crossfeed Valve Actuator - Installation, TASK 28-22-04-400-802. The forward and aft actuators for the crossfeed valves are installed on the rear spar of the left center fuel tank.

TASK 28-22-03-000-801

2. FWD/AFT Fuel Crossfeed Valve (Valve Body) - Removal

(Figure 401)

A. References

Reference	Title
24-22-00-860-806	Remove Electrical Power (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-22-15-000-802-001	Fuel Line, Fitting and Coupling - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing

C. Access Panels

Number	Name/Location
531AB	Access Door

D. Procedure

SUBTASK 28-22-03-650-001

(1) Defuel all of the fuel tanks (TASK 28-26-00-650-801).

NOTE: You must defuel all of the fuel tanks for this task. The suction by-pass valves in the main tanks can cause fuel to leak into the center when the crossfeed valve is removed.

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SUBTASK 28-22-03-940-005

WARNING OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. FAILURE TO OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS COULD CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-22-03-860-001

(3) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

SUBTASK 28-22-03-650-002

(4) For the center fuel tank, do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-22-03-010-001

(5) To gain access to the forward and aft engine fuel crossfeed valves, do this task: Center Tank Access Door - Removal, TASK 28-11-02-000-801.

Open this access panel:

Number	Name/Location
531AB	Access Door

SUBTASK 28-22-03-940-001

(6) Go into the left center fuel tank to get access to the applicable valve body [1].

SUBTASK 28-22-03-020-014

(7) Disconnect the coupling [2] from each side of the applicable valve body [1] (TASK 28-22-15-000-802-001).

(a) Discard the o-rings [3].

SUBTASK 28-22-03-020-015

(8) Hold the valve body [1] and remove the four bolts [4] and washers [6] that attach the valve body [1] to the support bracket.

SUBTASK 28-22-03-020-001

(9) Disengage the valve body [1] from the adapter/shaft [5].

SUBTASK 28-22-03-020-002

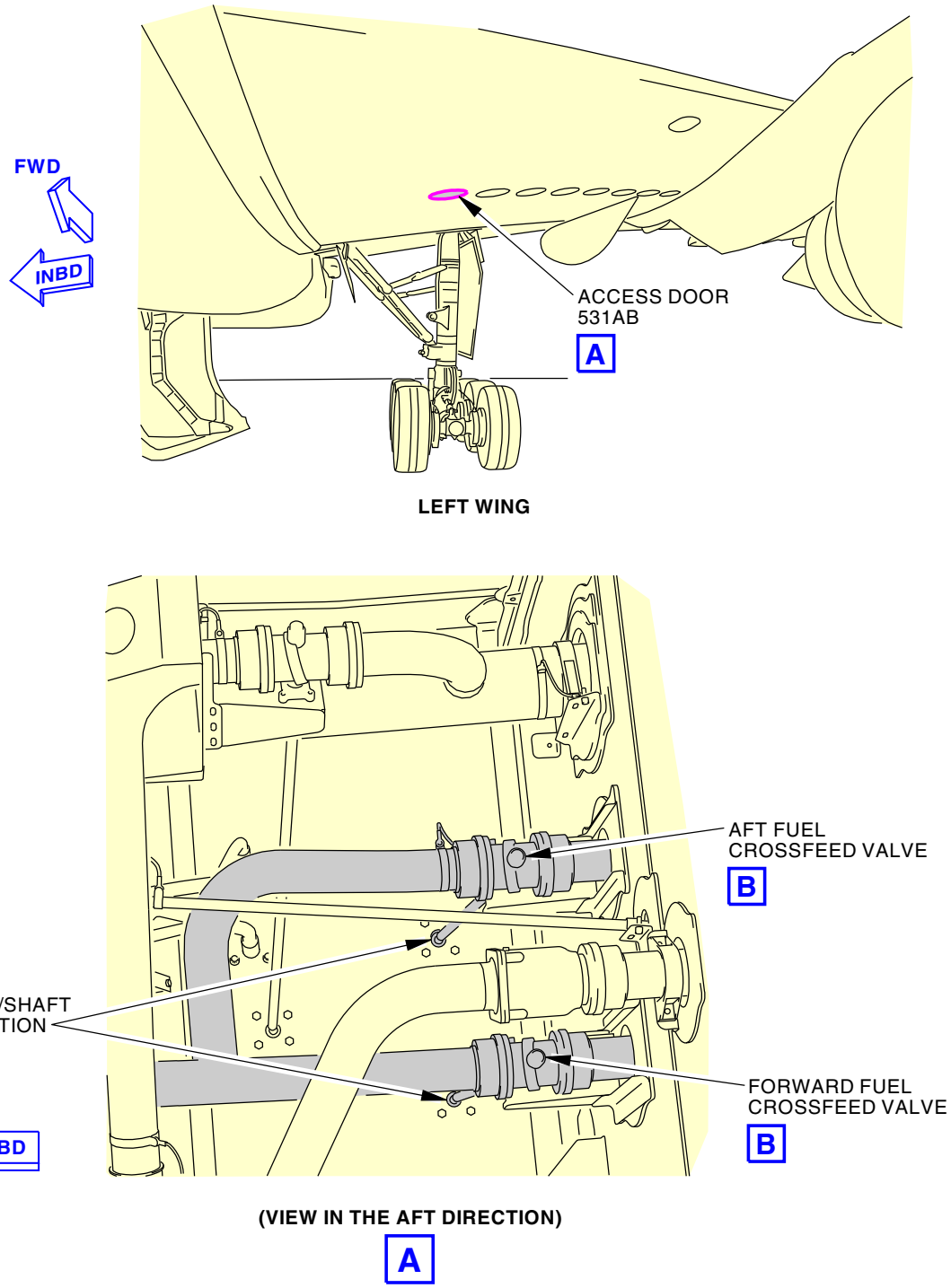
(10) Remove the valve body [1].

SUBTASK 28-22-03-480-003

(11) Install protection covers to the fuel lines to keep unwanted materials out.

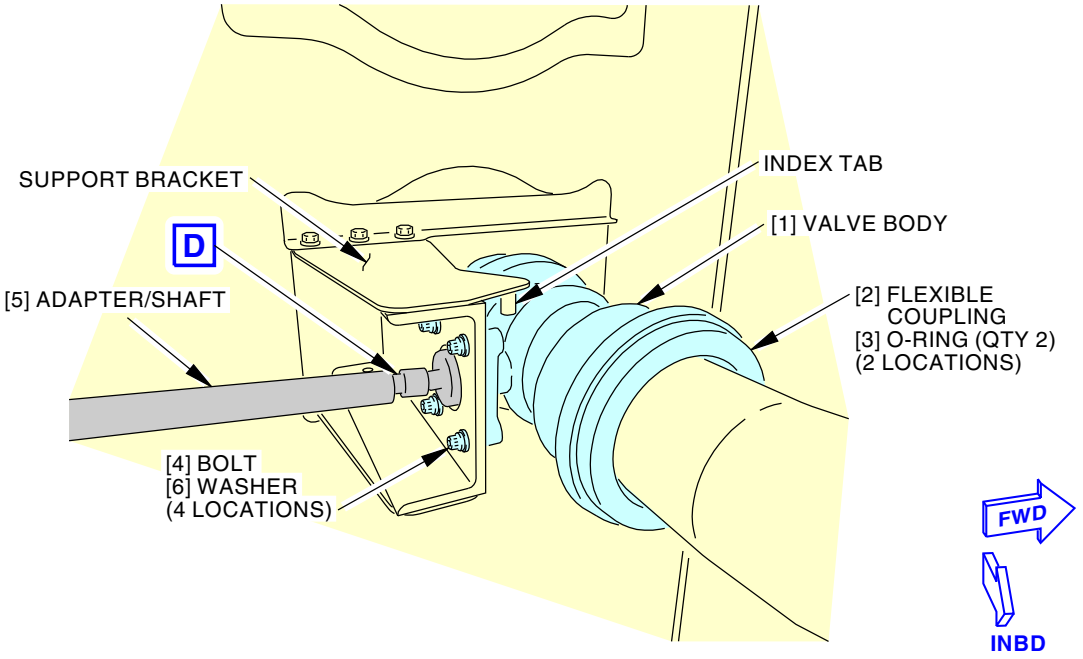
——— END OF TASK ———

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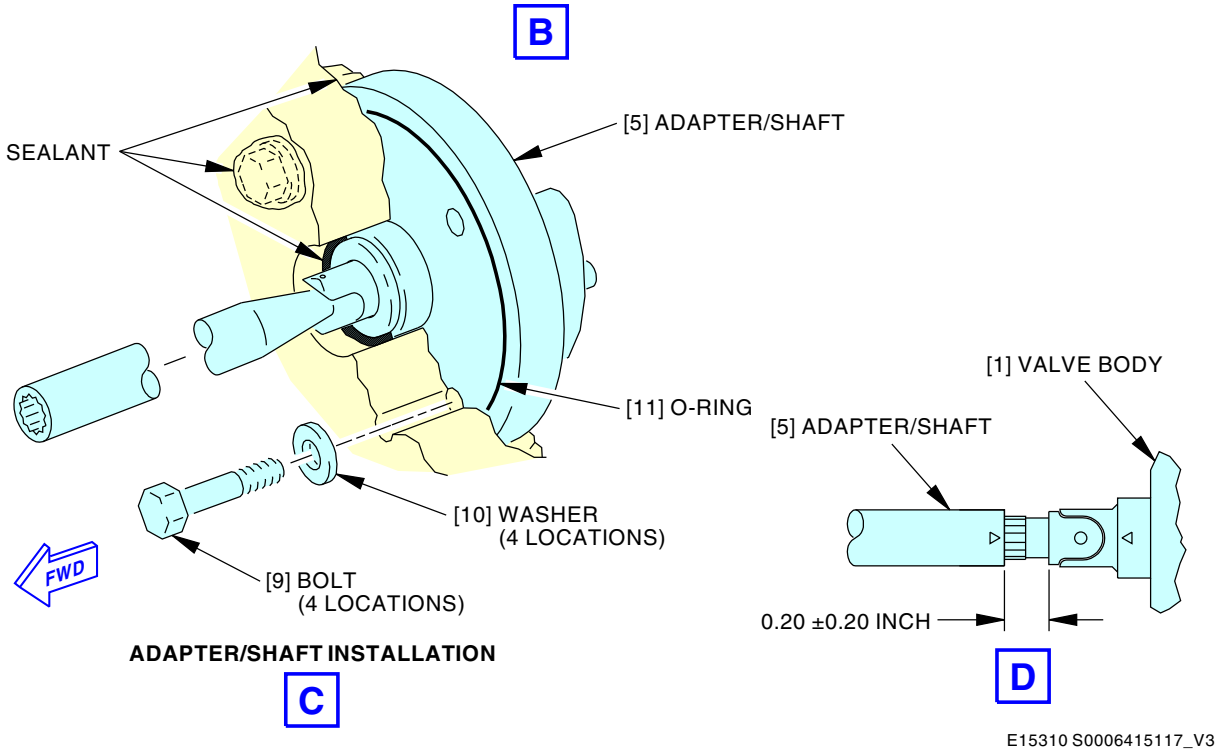


Forward/Aft Fuel Crossfeed Valve and Adapter/Shaft Installation
Figure 401/28-22-03-990-801 (Sheet 1 of 2)

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FORWARD/AFT FUEL CROSSFEED VALVE INSTALLATION



ADAPTER/SHAFT INSTALLATION

C

Forward/Aft Fuel Crossfeed Valve and Adapter/Shaft Installation
Figure 401/28-22-03-990-801 (Sheet 2 of 2)

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TASK 28-22-03-400-801

3. FWD/AFT Fuel Crossfeed Valve (Valve Body) - Installation

(Figure 401)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-21-00-790-802	Refuel/Jettison and Fuel Feed Manifold - Leak Test (P/B 501)
28-22-00-730-801	Engine Fuel Feed Pumps and Crossfeed Valves - Functional Test (P/B 501)
28-22-15-000-802-001	Fuel Line, Fitting and Coupling - Removal (P/B 401)
28-22-15-790-802-001	Engine Fuel Feed Manifold, Spar and Crossfeed Valve - Leak Check (P/B 601)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Consumable Materials

Reference	Description	Specification
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	O-ring	28-22-51-15C-410	ARO ALL

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E. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing

F. Access Panels

Number	Name/Location
531AB	Access Door

G. Procedure

SUBTASK 28-22-03-940-006

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-22-03-860-002

WARNING MAKE SURE THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR COULD RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Make sure the landing gear downlock pins are installed (TASK 32-00-30-480-801).

SUBTASK 28-22-03-860-003

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-22-03-820-001

(4) Make sure the manual override handle of the applicable crossfeed valve actuator, installed on the rear spar of the left center fuel tank, is in the CLOSED position.

SUBTASK 28-22-03-940-002

(5) Go into the left center fuel tank.

SUBTASK 28-22-03-100-001

(6) Do these steps to prepare the valve body [1] and support bracket for a faying surface bond:

WARNING DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(a) Final clean the contact surfaces of the valve body [1] and the support bracket with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

(b) Rub dry with a clean, dry cotton wiper, G00034.

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(c) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

SUBTASK 28-22-03-080-003

(7) Remove the protective covers from the fuel lines.

SUBTASK 28-22-03-420-015

(8) Apply a thin layer of petrolatum grease, D00504, to the o-ring [3] before you install the new o-rings [3] onto the fuel lines.

(a) Install the couplings [2] onto the fuel lines (TASK 28-22-15-000-802-001).

NOTE: Do not tighten the couplings [2].

SUBTASK 28-22-03-210-001

CAUTION

DO NOT REMOVE THE SUPPORT BRACKET SPACER OR DEFLECT THE SUPPORT BRACKET TO INSTALL THE VALVE BODY. THE VALVE BODY MUST BE INSTALLED CORRECTLY OR DAMAGE TO EQUIPMENT CAN OCCUR.

(9) Make sure "TOP" shows on the top of the valve body [1].

SUBTASK 28-22-03-420-001

(10) Engage the valve body [1] and the adapter/shaft [5].

SUBTASK 28-22-03-820-002

(11) Align the valve body [1] with the support bracket holes.

SUBTASK 28-22-03-420-016

(12) Install the four bolts [4] and washers [6] through the support bracket.

SUBTASK 28-22-03-210-003

(13) Make sure the index marks on the adapter/shaft [5] and the valve body [1] align (Figure 401, View D).

ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS

(a) If the index marks do not align, refer to this task: Engine Fuel Crossfeed Valve (Adapter/Shaft) - Installation, TASK 28-22-03-400-803.

ARO ALL

SUBTASK 28-22-03-420-017

(14) Make sure the gap between the adapter/shaft [5] and the valve body spline is 0.20 ±0.20 in. (5.08 ±5.08 mm) (Figure 401, View D).

NOTE: If the correct gap can not be obtained, loosen the support bracket for the valve body [1] and adjust its position to get the correct gap.

SUBTASK 28-22-03-420-018

(15) Tighten the flexible full couplings [2] that attach the valve body [1] to the fuel line (TASK 28-22-15-000-802-001).

(a) Install MS20995C32 lockwire, G01048, to the couplings [2] (TASK 20-10-23-400-801).

SUBTASK 28-22-03-760-003

(16) Measure the electrical bonding resistance between the valve body [1] and the support bracket with an intrinsically safe approved bonding meter, COM-1550.

(a) Make sure the resistance is less than 0.0005 ohm (0.5 milliohm).

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SUBTASK 28-22-03-760-001

(17) Measure the electrical bonding resistance between the valve body [1] and the airplane structure with an intrinsically safe approved bonding meter, COM-1550.

(a) Make sure the resistance is less than 0.01 ohm (10 milliohms).

SUBTASK 28-22-03-010-002

(18) To install this access door, do this task:

Main Tank Access Door Installation, TASK 28-11-01-400-801.

Number	Name/Location
531AB	Access Door

SUBTASK 28-22-03-860-004

(19) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-22-03-720-001

(20) To do a test of the engine fuel crossfeed valves, do one of these tests:

(a) Test of the engine fuel crossfeed valves (with fuel):

NOTE: You must fuel the airplane to do these tests.

1) Do a leak test of the fuel feed manifold (TASK 28-21-00-790-802).

2) Do the "Test of the Engine Fuel Crossfeed Valves" procedure in this task: Engine Fuel Feed Pumps and Crossfeed Valves - Functional Test, TASK 28-22-00-730-801.

(b) Test of the engine fuel crossfeed valves (with air):

NOTE: This test can be done before the airplane is fueled.

1) Do a test of the crossfeed valves (TASK 28-22-15-790-802-001).

SUBTASK 28-22-03-650-003

(21) To refuel the airplane (if it is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

SUBTASK 28-22-03-860-005

WARNING OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(22) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

END OF TASK

ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS

TASK 28-22-03-000-803

4. Engine Fuel Crossfeed Valve (Adapter/Shaft) - Removal

(Figure 401, Figure 402)

A. References

Reference	Title
24-22-00-860-806	Remove Electrical Power (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

(Continued)

Reference	Title
28-22-04-000-802	FWD/AFT Fuel Crossfeed Valve Actuator - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: $0855 Part #: 234350 Supplier: $0857 Part #: 311 Supplier: F6892 Part #: 411B60 Supplier: 3DN12 Part #: 411B90 Supplier: 3DN12 Part #: DAD5013 Supplier: $0856 Part #: DFD5019 Supplier: $0856 Part #: J5-0275-2010 Supplier: 435R8 Part #: SCD5019 Supplier: $0856 Part #: ST982LF-9 Supplier: 62176 Part #: TS1275-4 Supplier: 1DWR5
COM-4746	Handle - Sealant Removal Tool Part #: 310/1 Supplier: F6892 Part #: SHN0272 Supplier: $0856 Part #: SHR0272-T Supplier: 1DWR5 Part #: SHW0215 Supplier: $0856

C. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing

D. Access Panels

Number	Name/Location
531AB	Access Door

E. Procedure

SUBTASK 28-22-03-650-006

(1) To defuel the center fuel tank, do this task: Pressure Defueling, TASK 28-26-00-650-801.

NOTE: You must defuel the center fuel tank for this task.

SUBTASK 28-22-03-860-013



WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR BEFORE YOU MOVE THE CONTROL LEVER. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

SUBTASK 28-22-03-860-014

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-22-03-922-001

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(4) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-22-03-650-007

(5) Drain and purge the center fuel tank (Purging and Fuel Tank Entry, TASK 28-11-00-010-801).

SUBTASK 28-22-03-860-015

(6) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

SUBTASK 28-22-03-010-006

(7) To gain access to the adapter/shaft [6] of the engine fuel crossfeed valves, do this task: Center Tank Access Door - Removal, TASK 28-11-02-000-801.

Open this access panel:

Number	Name/Location
531AB	Access Door

SUBTASK 28-22-03-010-007

(8) Do these steps on the outside of the fuel tank:

(a) For the applicable aft or forward crossfeed valve actuator, do this task: FWD/AFT Fuel Crossfeed Valve Actuator - Removal, TASK 28-22-04-000-802.

(b) Use a sealant removal tool to scrap away the old sealant from the periphery of the adapter plate.

1) Use sealant removal tool, COM-2481 and sealant removal tool handle, COM-4746 or equivalent.

SUBTASK 28-22-03-010-008

(9) Do these steps inside the fuel tank (Figure 401):

(a) Go to the adapter/shaft [6] location inside the fuel tank (View B).

(b) Remove the old sealant from the four bolts [9] and the adapter/shaft [6] rear spar penetration.

(c) Remove the bolts [9] and washers [8] (four locations) to disconnect the adapter/shaft [6].

(d) Disengage the adapter/shaft [6] from the valve body [1] (View B).

SUBTASK 28-22-03-020-019

(10) Go out of the tank and remove the adapter/shaft [6].

(a) Discard the o-ring [11].

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

F. Remove the Index Plate

NOTE: Do these steps if you will reuse the adapter/shaft and the attached index plate or if you need to remove the index plate to align the valve body. If the task is to discard the old adapter/shaft and install a new adapter/shaft, it is not necessary to disassemble the index plate.

SUBTASK 28-22-03-030-001

(1) Do these steps to remove the index plate [31] from the adapter/shaft [6]:

(a) Remove the lockwire from screws [21] (2 locations) and screw [37].

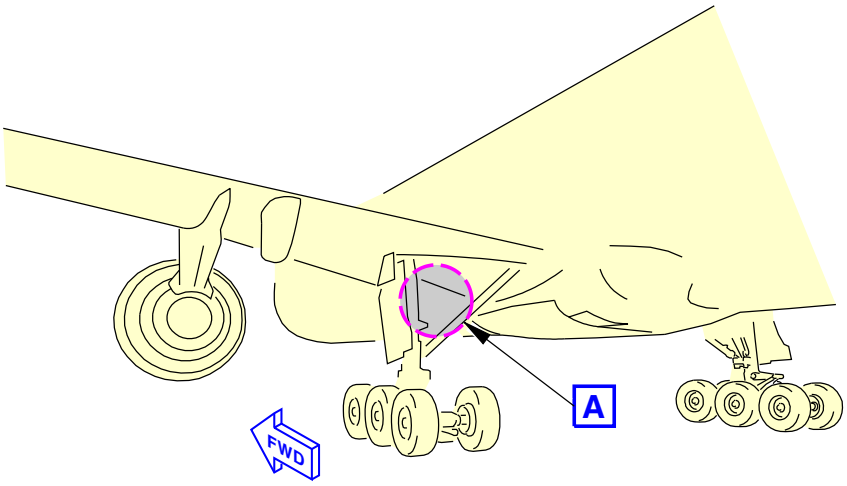
(b) Remove screw [37], screws [21] and washers [36].

(c) Carefully disassemble the index plate and the adapter/shaft.

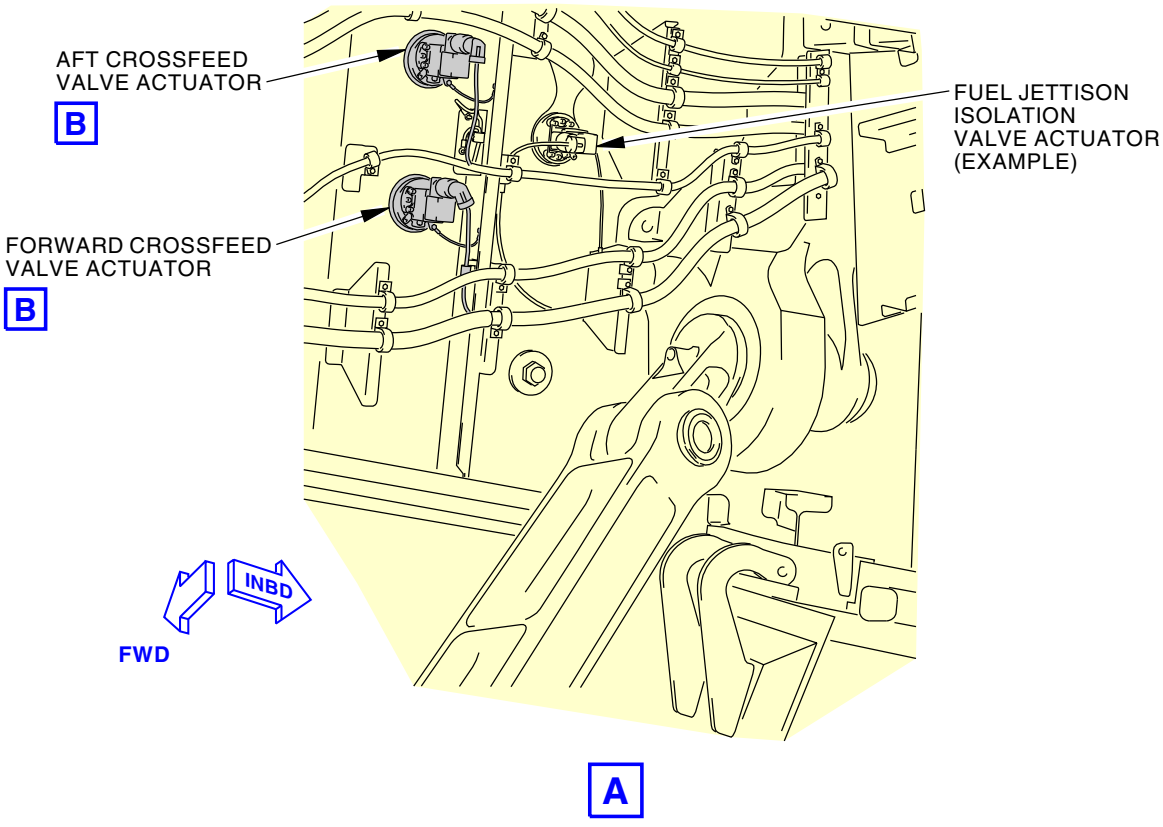
NOTE: The two surfaces are bonded with faying surface sealant.

——— END OF TASK ———

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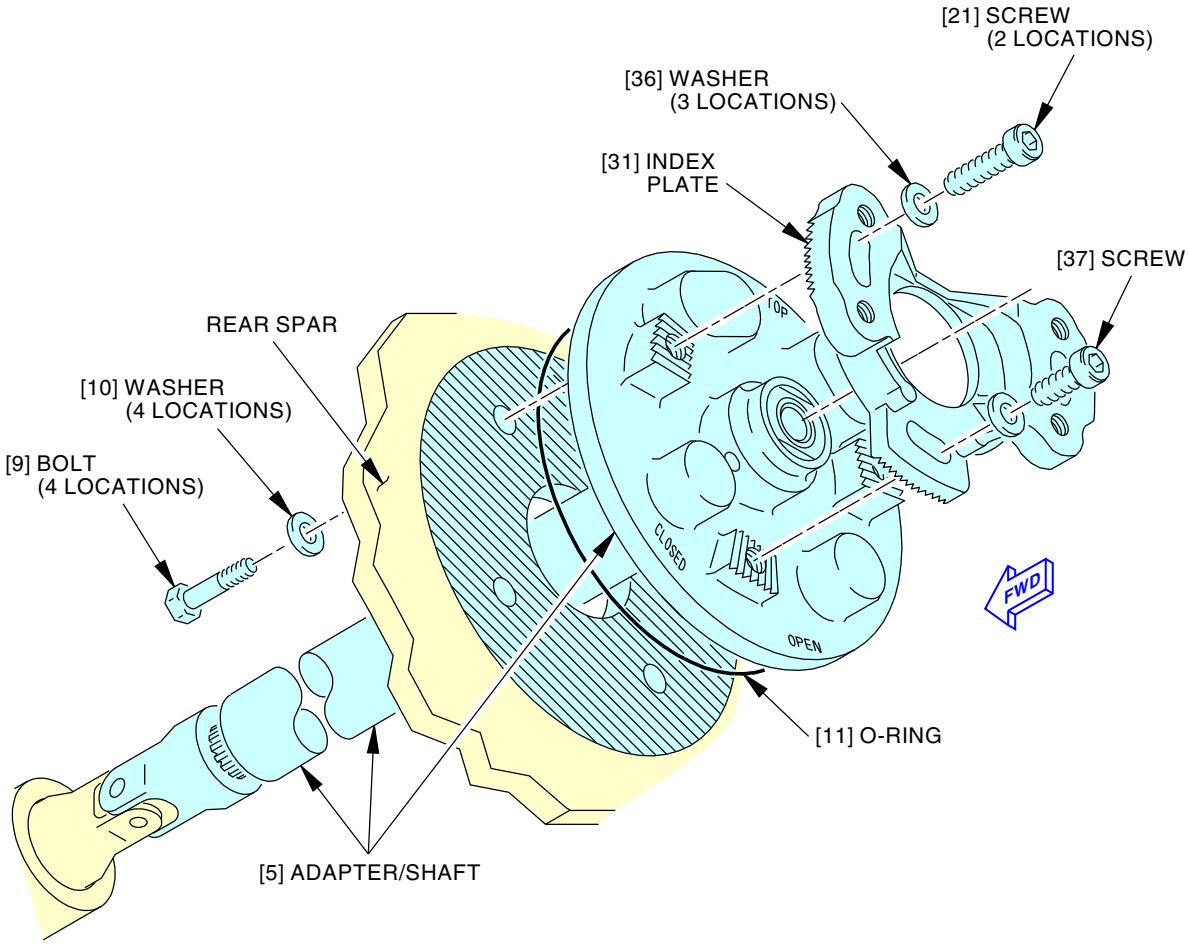
LEFT WING



E28135 S0006415119_V2

Forward/Aft Fuel Crossfeed Valve Actuator Installation
Figure 402/28-22-03-990-805 (Sheet 1 of 2)

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(EXAMPLE)

B

U44017 S0000195942_V4

Forward/Aft Fuel Crossfeed Valve Actuator Installation
Figure 402/28-22-03-990-805 (Sheet 2 of 2)

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TASK 28-22-03-400-803

5. Engine Fuel Crossfeed Valve (Adapter/Shaft) - Installation

(Figure 401, Figure 402)

A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(2) Two mechanics are necessary for this task.

NOTE: To engage splines of the adapter/shaft [5] to the valve body [1], one person must be outside the tank and one person must be inside the tank.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
20-30-92-910-801	Final Cleaning Prior to General Sealing (Series 92) (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)
28-21-00-790-802	Refuel/Jettison and Fuel Feed Manifold - Leak Test (P/B 501)
28-22-00-730-801	Engine Fuel Feed Pumps and Crossfeed Valves - Functional Test (P/B 501)
28-22-04-400-802	FWD/AFT Fuel Crossfeed Valve Actuator - Installation (P/B 401)
28-22-15-790-802-001	Engine Fuel Feed Manifold, Spar and Crossfeed Valve - Leak Check (P/B 601)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
51-31-01-390-804	Fillet Seal Application (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

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Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: $0855 Part #: 234350 Supplier: $0857 Part #: 311 Supplier: F6892 Part #: 411B60 Supplier: 3DN12 Part #: 411B90 Supplier: 3DN12 Part #: DAD5013 Supplier: $0856 Part #: DFD5019 Supplier: $0856 Part #: J5-0275-2010 Supplier: 435R8 Part #: SCD5019 Supplier: $0856 Part #: ST982LF-9 Supplier: 62176 Part #: TS1275-4 Supplier: 1DWR5
COM-4746	Handle - Sealant Removal Tool Part #: 310/1 Supplier: F6892 Part #: SHN0272 Supplier: $0856 Part #: SHR0272-T Supplier: 1DWR5 Part #: SHW0215 Supplier: $0856
STD-123	Brush - Soft Bristle

D. Consumable Materials

Reference	Description	Specification
A50110	Sealant	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
B01012	Solvent - Final Cleaning Prior To General Sealing - Series 92	
C00064	Coating - Aluminum Chemical Conversion	BAC5719 Type II Class A (MIL-DTL-5541 Class 1A)
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20 Type II
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

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E. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing

F. Access Panels

Number	Name/Location
531AB	Access Door

G. Install the Adapter/Shaft

SUBTASK 28-22-03-860-016

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Obey the fuel tank entry precautions (TASK 28-11-00-650-801).

SUBTASK 28-22-03-010-009

WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Go into the left center fuel tank to the crossfeed valve location.

NOTE: One person must enter the tank and another must remain outside the tank at the rear spar.

SUBTASK 28-22-03-120-001

(3) On the outside of the tank, remove the old sealant and clean the rear spar, adapter/shaft [5], index plate [31], and fasteners (if re-used).

(a) Use sealant removal tool, COM-2481, and sealant removal tool handle, COM-4746 (or equivalent), to remove the old sealant from the rear spar.

(b) If new parts are to be installed, use an abrasive pad to remove the anodized finish from the faying surfaces of the adapter/shaft [5] and index plate [31] (SWPM 20-20-00).

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(c) To remove the remaining sealant, grease, oil, dirt, and other contamination from the components, use one of these brushes/pads soaked with Series 92 solvent, B01012 (TASK 20-30-92-910-801):

1) soft bristle brush, STD-123,

2) cotton wiper, G00034,

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SUBTASK 28-22-03-110-001

(4) On the outside of the tank, do these steps to prepare the adapter/shaft [5] and the rear spar for an fay sealed fay surface bond:

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(a) Final clean the contact surfaces of the adapter/shaft [5] and the rear spar with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

SUBTASK 28-22-03-430-001

(5) On the outside of the airplane fuel tank, do these steps:

(a) Put a thin layer of petrolatum grease, D00504, on the new o-ring [11].

(b) Put the o-ring [11] in the o-ring groove of the adapter/shaft [5].

(c) Put the shaft portion of the adapter/shaft [5] through the hole in the rear spar.

(d) Make sure the shoulder of the adapter/shaft [5] does not bind in the opening of the rear spar.

SUBTASK 28-22-03-210-007

(6) On the inside of the tank, do these steps:

(a) Make sure that the index marks on the valve body [1] and adapter/shaft [5] are aligned (Figure 401, View D).

NOTE: A small misalignment of the index marks is satisfactory.

SUBTASK 28-22-03-420-033

(7) Do these steps at the same time:

NOTE: The person on the inside of the tank should engage the splines as the person on the outside of the tank applies the fay sealed fay surface bond.

28-AWL-19: CDCCL

(a) On the outside of the tank, apply a fay sealed fay surface bond between the adapter/shaft [5] (valve adapter plate) and the spar (structure) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Apply a thin continuous layer of sealant, A50110, or sealant, A50155, to the mating surface of the adapter plate.

a) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

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2) Make sure the sealant is continuously squeezed out along the edges of the contact surfaces.

3) If there are gaps, bubbles or voids in the sealant squeeze out, then disassemble and apply more sealant.

4) Shape the squeezed out sealant into a fillet seal.

5) As an option, remove the extra squeezed out sealant.

NOTE: Make sure the sealant that remains is flush with the mating part edges.

(b) On the inside of the tank, engage the splines of the adapter/shaft [5] with the valve body [1].

1) Make sure the shoulder of the adapter/shaft [5] does not bind in the opening of the rear spar.

SUBTASK 28-22-03-420-034

(8) On the outside of the tank, hold the adapter/shaft [5] in the correct position.

SUBTASK 28-22-03-420-021

(9) On the inside of the tank, do these steps to install the adapter/shaft [5]:

(a) Apply sealant to the shank and the threads of the four bolts [9].

1) Use sealant, A50110, or sealant, A50155, for the wet installation of the bolts [9].

NOTE: Use the same sealant that was used for the fay surface fay seal.

2) Make sure the sealant applied to the bolts [9] is approximately 0.060 in. (1.524 mm) thick.

(b) Install the bolts [9] and washers [8] to attach the adapter/shaft [5] to the spar.

(c) Make sure the gap between the adapter/shaft [5] and the valve body spline is 0.20 ±0.20 in. (5.08 ±5.08 mm) (Figure 401, View D).

NOTE: If you can not get the correct gap, loosen the support bracket for the valve body [1] and adjust its position to get the correct gap.

SUBTASK 28-22-03-765-001

28-AWL-19: CDCCL

(10) On the outside of the fuel tank, measure the electrical bonding resistance between one of the raised surfaces of the adapter/shaft [5] (valve adapter plate) (bare metal surface) and the rear spar (structure) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

28-AWL-19: CDCCL

(a) Make sure one or both ends of the bonding jumper that attaches to the actuator is disconnected.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(b) Use an intrinsically safe approved bonding meter, COM-1550.

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28-AWL-19: CDCCL

(c) Make sure the electrical bonding resistance is 0.0005 ohm (0.5 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) If the electrical bonding resistance is more than 0.0005 ohm (0.5 milliohm), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Engine Fuel Crossfeed Valve, TASK 28-22-03-300-801.

SUBTASK 28-22-03-420-022

(11) Use sealant, A50110, or sealant, A50155, to apply these seals:

NOTE: Use the same sealant that was used for the fay sealed fay surface bond.

(a) On the inside of the tank, apply a fillet seal to the periphery of the rear spar penetration and the stationary part of the adapter/shaft [5] (TASK 51-31-01-390-804).

NOTE: Make sure the sealant does not touch any part of the adapter/shaft [6] that turns.

28-AWL-19: CDCCL

(b) On the inside of the tank, apply a cap seal to each of the four bolts [9] (adapter plate attach bolts).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

SUBTASK 28-22-03-860-017

(12) Do this task to close the fuel tank: Fuel Tank Closure, TASK 28-11-00-410-801.

(a) To install this access door, do this task:

Center Tank Access Door - Installation, TASK 28-11-02-400-801

Number	Name/Location
531AB	Access Door

SUBTASK 28-22-03-820-006

(13) Do this task: Adapter Shaft Alignment, TASK 28-22-03-820-801.

H. Install the Index Plate

SUBTASK 28-22-03-820-007

(1) Do this procedure after you have correctly aligned and marked the alignment position of the index plate [31] and adapter plate per this task: Adapter Shaft Alignment, TASK 28-22-03-820-801.

SUBTASK 28-22-03-020-020

(2) Remove the index plate [31] from the adapter/shaft [5].

SUBTASK 28-22-03-420-024

(3) Do these steps to prepare the index plate [31] and the adapter/shaft [5] for a fay sealed fay surface bond (SWPM 20-20-00):

(a) Protect the alignment reference mark when you clean the index plate [31] and the adapter/shaft [5] for the fay sealed fay surface bond.

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(b) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surfaces until the dry cotton wiper, G00034, stays clean.

28-AWL-19: CDCCL

(c) Apply a thin continuous layer of sealant between the contact surfaces of the index plate [31] (three locations) and the adapter/shaft [5] (valve adapter plate) for a fay sealed fay surface bond (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296.

NOTE: Alternate sealants are not approved for fay sealed fay surface bonds.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(d) Apply sealant to the shank and the threads of the top two screws [21] and the bottom screw [37].

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the wet installation of screws [21] and screw [37].

NOTE: Use the same sealant that was used for the fay sealed fay surface bond.

2) Make sure the sealant applied to the fasteners is approximately 0.060 in. (1.524 mm) thick.

SUBTASK 28-22-03-420-025

(4) Do these steps to install the index plate [31]:

(a) Align the index plate [31] and the adapter/shaft [5] with the alignment reference mark that you made during the spar valve alignment procedure.

(b) Install the two screws [21] and washers [36] in the top index mounting hole positions.

(c) Install the screw [37] and washer [36] in the bottom index mounting hole position.

(d) Tighten the screws [21] and screw [37] to 22 ±1 in-lb (2.5 ±0.1 N·m).

(e) Make sure the sealant is continuously squeezed out along the edges of the contact surfaces.

(f) If there are gaps, bubbles or voids in the sealant squeeze out, then disassemble and apply more sealant.

(g) Shape the squeezed out sealant into a fillet seal (TASK 51-31-01-390-804).

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(h) As an option, remove the extra squeezed out sealant.

NOTE: Make sure the sealant that remains is flush with the mating part edges.

SUBTASK 28-22-03-765-002

(5) Measure the electrical bonding resistance between one of the actuator contact surfaces on the index plate [31] (bare metal surface) and the rear spar (SWPM 20-20-00).

(a) Use an intrinsically safe approved bonding meter, COM-1550.

(b) Make sure the electrical bonding resistance is 0.0020 ohm (2.0 milliohms) or less.

1) If the bonding resistance is more than 0.0020 ohm (2.0 milliohms), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Engine Fuel Crossfeed Valve, TASK 28-22-03-300-801.

SUBTASK 28-22-03-760-004

28-AWL-19: CDCCL

(6) Measure the electrical bonding resistance between the index plate [31] and the adapter/shaft [5] (valve adapter plate) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

28-AWL-19: CDCCL

(a) Make sure one or both ends of the bonding jumper that attaches to the actuator is disconnected.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(b) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-19: CDCCL

(c) Make sure the electrical bonding resistance is 0.0005 ohm (0.5 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) If the bonding resistance is more than 0.0005 ohm (0.5 milliohm), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Engine Fuel Crossfeed Valve, TASK 28-22-03-300-801.

SUBTASK 28-22-03-420-026

(7) Lockwire the top screws [21], the bottom screw [37] and the index plate [31] together.

SUBTASK 28-22-03-790-001

(8) Do this task: FWD/AFT Fuel Crossfeed Valve Actuator - Installation, TASK 28-22-04-400-802.

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

SUBTASK 28-22-03-370-001

(9) Do this task to apply protective finishes to the bare areas of the rear spar: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

NOTE: Re-apply the protective finishes to the rear spar at all bare areas not covered by the fillet seal, and where the electrical bonding probe removed the finishes.

(a) These are the protective finishes:

1) Alodine 600 coating, C00064,

2) BMS 10-20 coating, C00307.

I. Engine Fuel Crossfeed Valve Test

SUBTASK 28-22-03-700-001

(1) To do a test of the engine fuel crossfeed valves, do one of these tests:

(a) Test of the engine fuel crossfeed valves (with fuel):

NOTE: You must fuel the airplane to do these tests.

1) Do a leak test of the fuel feed manifold (TASK 28-21-00-790-802).

2) Do the test of the engine fuel crossfeed valves (TASK 28-22-00-730-801).

(b) Test of the engine fuel crossfeed valves (with air):

NOTE: This test can be done before the airplane is fueled.

1) Do a test of the crossfeed valves (TASK 28-22-15-790-802-001).

J. Put the Airplane Back to its Usual Condition

SUBTASK 28-22-03-650-008

(1) To refuel the airplane (if it is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

(a) Make sure there is no leakage at the rear spar connection.

SUBTASK 28-22-03-860-018

WARNING OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

ARO ALL

——— END OF TASK ———

TASK 28-22-03-820-801

6. Adapter Shaft Alignment

(Figure 403)

A. References

Reference	Title
28-22-04-000-802	FWD/AFT Fuel Crossfeed Valve Actuator - Removal (P/B 401)

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B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1587	Wrench - Torque, 30 in-lbs (4 N-m) Part #: TE3FUA Supplier: 55719
SPL-1771	Alignment Equipment, Fuel Shutoff Valve Part #: B28009-1 Supplier: 81205

C. Location Zones

Zone	Area
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

D. Procedure

SUBTASK 28-22-03-010-005

(1) Prepare the adapter/shaft for the alignment procedure.

(a) If it is not removed, do this task: FWD/AFT Fuel Crossfeed Valve Actuator - Removal, TASK 28-22-04-000-802

(b) If not previously removed, remove the index plate [31] from the adapter/shaft.

SUBTASK 28-22-03-480-002

(2) Do these steps to install the valve alignment equipment, SPL-1771 in the index plate [31].

(a) Position the index plate [31] and align the surfaces of the index plate [31] and adapter plate.

(b) Loosely install the bottom screw [37] to the index plate [31].

(c) Put the alignment tool in position against the index plate [31] with the two guide pins in the holes usually used by the top two index plate screws (the scale should be on the top of the tool).

(d) Make sure the spline on the tool engages with the spline on the shaft.

SUBTASK 28-22-03-820-003

(3) Do these steps to align the adapter shaft (Procedure 1, optional to Procedure 2):

NOTE: This procedure finds the point where the internal valve butterfly engages the valve seal. The torque necessary to turn the shaft increases as the butterfly engages the seal, then decreases again as the butterfly leaves the other side of the seal. Once the edge of the seal is found, the valve shaft will then be turned to center the butterfly on the seal.

(a) Put the tool handle in the extreme counterclockwise position.

(b) Turn the handle slowly in the clockwise direction at a constant rate while you note the changes in the torque necessary to turn the handle.

(c) Do the previous steps as many times as necessary to find the point in the rotation where the torque necessary to turn the handle increases significantly.

(d) If you cannot find the position in the rotation where the torque increases significantly, then use Procedure 2 below.

(e) Put the shaft in the extreme counterclockwise position again.

(f) Slowly and smoothly turn the handle of the tool clockwise until a distinct increase in torque is found and immediately stop turning the handle.

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(g) Read the scale on the tool.

NOTE: This is the point where the valve butterfly starts to engage the edge of the seal.

(h) Turn the handle 13 degrees more in the clockwise direction (the scale is calibrated in degrees).

NOTE: The valve butterfly is now centered on the valve seal.

NOTE: If you turn the handle past the target value, do not turn the handle back in the counterclockwise direction again. You must start the procedure again with the handle in the extreme counterclockwise position.

SUBTASK 28-22-03-820-004

(4) Do these steps to align the adapter shaft (Procedure 2, optional to Procedure 1):

NOTE: A torque wrench (30 in-lbs), COM-1587 is necessary to do this procedure.

(a) Put the tool handle in the extreme counterclockwise position.

(b) Slowly and smoothly turn the tool handle to the extreme clockwise position while you monitor the torque that you apply to the handle.

(c) Write down the maximum torque that you apply to the tool while you turn it from the extreme counterclockwise position to the extreme clockwise position.

(d) Turn the tool back to the extreme counterclockwise position.

(e) Turn the shaft clockwise again at approximately the same rate that you used before.

(f) Stop at the position where the torque increases to approximately two-thirds of the maximum torque that you wrote down before.

(g) Read the scale on the tool at this position.

NOTE: This is the position where valve butterfly starts to engage the edge of the seal.

(h) Turn the handle 13 more degrees in the clockwise direction past the reading from the previous step.

NOTE: The butterfly valve is now centered on the valve seal.

NOTE: If you turn the valve past the target value, do not turn it back in the counterclockwise direction. You must start again with the tool handle in the extreme counterclockwise position.

SUBTASK 28-22-03-820-008

(5) Tighten the alignment tool lockscrew to hold the alignment tool in position on the adapter/shaft.

SUBTASK 28-22-03-820-009

(6) Turn the index plate [31] until the actuator mounting holes in the index plate [31] are aligned with the two upper holes for the alignment screws.

SUBTASK 28-22-03-820-005

(7) Insert the two align screws into the holes for the actuator mounting screws to hold the index plate [31] in alignment with the mounting plate (this is the final adjustment of the position of the index plate [31]).

SUBTASK 28-22-03-420-012

(8) Tighten the bottom screw [37].

SUBTASK 28-22-03-020-013

(9) Carefully remove the alignment screws.

SUBTASK 28-22-03-080-004

(10) Loosen the lockscrew and carefully remove the alignment tool from the index plate [31].

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SUBTASK 28-22-03-420-027

(11) Use a fine point felt pen to apply a reference mark between the index plate [31] and the adapter/shaft at one of the attachment points.

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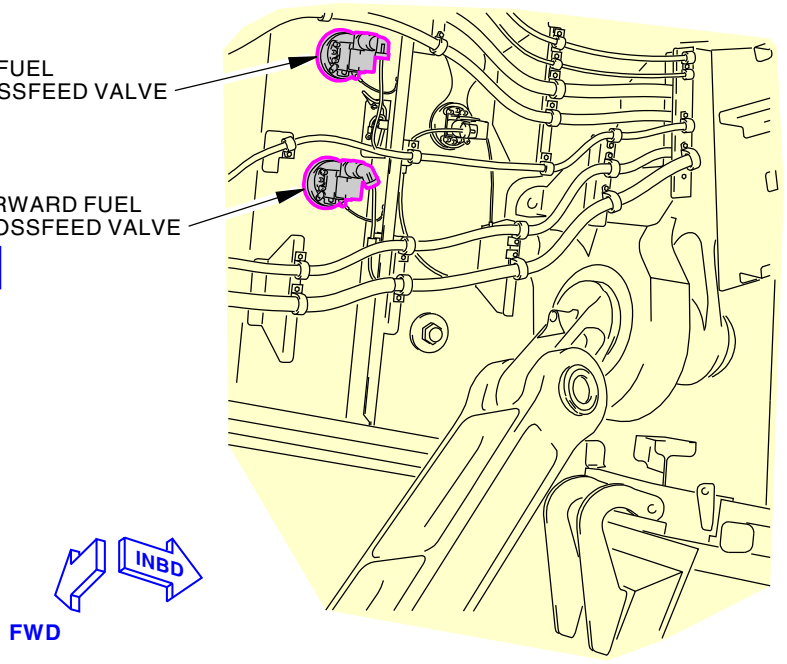
SUBTASK 28-22-03-420-028

(12) Continue with the index plate installation procedure in this task: Engine Fuel Crossfeed Valve (Adapter/Shaft) - Installation, TASK 28-22-03-400-803.

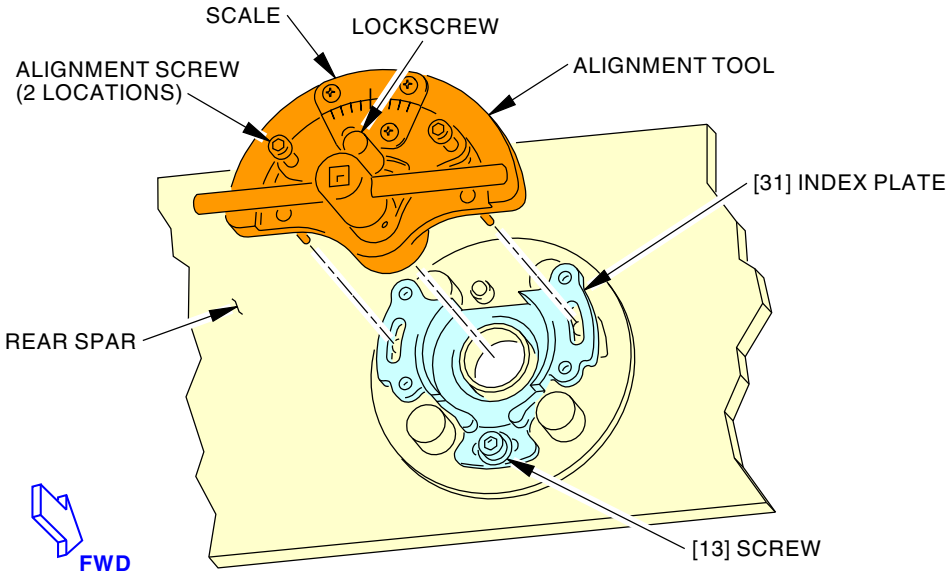
ARO ALL

——— END OF TASK ———

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FORWARD/AFT FUEL CROSSFEED VALVE LOCATION



FORWARD/AFT FUEL CROSSFEED VALVE

A

G13736 S0006415124_V3

Alignment Tool Installation
Figure 403/28-22-03-990-803

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS

TASK 28-22-03-300-801

7. Rework the Fay Sealed Fay Surface Bonds for the Engine Fuel Crossfeed Valve

A. General

(1) This task contains these procedures:

(a) Rework the Fay Sealed Fay Surface Bond - Actuator to Index Plate

(b) Rework the Fay Sealed Fay Surface Bond - Index Plate to Adapter/Shaft

(c) Rework the Fay Sealed Fay Surface Bond - Adapter/Shaft to Rear Spar

(d) Rework the Bonding Jumper Bond

(2) Do this task if the measurement for the electrical bonding resistance is more than the permitted resistance value.

(3) The motor operated valve uses two electrical bonding paths:

(a) One bonding path is from the upper housing of the actuator through the bonding jumper to the airplane structure.

(b) The second bonding path is from the upper housing of the actuator to the bare metal surface of the rear spar. The bond path is through the bare metal fay surfaces of the actuator (at the mounting feet), index plate, and adapter/shaft to the bare metal surface of the rear spar.

NOTE: The actuator is divided into two sections, the upper housing section and the lower housing section. The two housing sections are separated by a fay surface. You cannot repair or rework the fay surface between the housing sections at the airplane. When you do an electrical bonding measurement, make sure the measurement is done on the upper housing section of the actuator.

(4) If the electrical bonding resistance is more than the maximum permitted resistance, you must disassemble the components, rework the fay surface, assemble the components, and then re-check the electrical bonding resistance. Continue to rework the fay surfaces until the electrical resistance between the components is within permitted resistance values.

(5) Because the build-up of the crossfeed valve includes several fay sealed fay surface bonds, you may not know which fay sealed fay surface bond is the cause of the problem. This task will help you isolate the location of the fay sealed fay surface bond that needs to be reworked. The procedure does a check of the fay sealed fay surface bond downstream of the bond that is in question.

(6) For application of fay surface fay seals in this task, it is acceptable to use sealant, A50110, as an alternative to sealant, A50155.

NOTE: Sealants should not be mixed. In applications where sealants may mix, use the same sealant for both applications.

B. References

Reference	Title
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
28-22-04-000-802	FWD/AFT Fuel Crossfeed Valve Actuator - Removal (P/B 401)
28-22-04-400-802	FWD/AFT Fuel Crossfeed Valve Actuator - Installation (P/B 401)
SWPM 20-20-00	Standard Wiring Practices Manual

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C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

D. Consumable Materials

Reference	Description	Specification
A50110	Sealant	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
5	Adapter/shaft	28-22-03-01-035	ARO 001-004
		28-22-03-01A-040	ARO 005-016

F. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

G. Rework the Fay Sealed Fay Surface Bond - Actuator to Index Plate

(Figure 401, Figure 402)

NOTE: Do the steps in this procedure if the measurement for the electrical bonding resistance between the upper housing of the actuator and the rear spar is more than 0.0025 ohm (2.5 milliohms). The measurement is done with the bonding jumper and the electrical connector disconnected from the actuator.

SUBTASK 28-22-03-010-010

(1) Do this task: FWD/AFT Fuel Crossfeed Valve Actuator - Removal, TASK 28-22-04-000-802.

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

SUBTASK 28-22-03-765-003

(2) Do these steps to do a check of the index plate [31] to rear spar bonding path:

NOTE: These steps will tell you if the actuator to index plate fay sealed fay surface bond is the cause of the problem, or if the index plate to adapter/shaft fay sealed fay surface bond is the cause of the problem.

(a) Remove the sealant and clean one of the contact surfaces on the index plate [31].

(b) With the intrinsically safe approved bonding meter, COM-1550, measure the electrical bonding resistance between the contact surface on the index plate [31] (bare metal surface) and the rear spar (SWPM 20-20-00) (Figure 401).

(c) Make sure the electrical bonding resistance is 0.0020 ohm (2.0 milliohms) or less.

(d) If the bonding resistance is not satisfactory, then do the steps in this procedure: Rework the Fay Sealed Fay Surface Bond - Index Plate to Adapter/Shaft.

(e) If the bonding resistance is satisfactory, then continue with the subsequent steps.

SUBTASK 28-22-03-040-001

(3) Do this task: FWD/AFT Fuel Crossfeed Valve Actuator - Installation, TASK 28-22-04-400-802.

NOTE: This task will rework the fay sealed fay surface bond and re-install the actuator.

SUBTASK 28-22-03-765-004

(4) During the installation, do a check of the electrical bonding resistance between the upper housing of the actuator and the rear spar (SWPM 20-20-00) (TASK 28-22-04-400-802).

(a) Do this measurement with the bonding jumper and the electrical connector disconnected.

(b) Make sure the bonding jumper does not touch the actuator [25] during the electrical bonding measurement.

(c) Use an intrinsically safe approved bonding meter, COM-1550.

(d) Make sure the electrical bonding resistance is 0.0025 ohm (2.5 milliohms) or less.

(e) If the electrical bonding resistance is not satisfactory, then repeat the steps in this procedure.

(f) If the electrical bonding resistance is satisfactory, then continue with the steps to install the actuator [25] in this task: FWD/AFT Fuel Crossfeed Valve Actuator - Installation, TASK 28-22-04-400-802.

SUBTASK 28-22-03-710-001

(5) If you have replaced the adapter/shaft [5] or adjusted the index plate [31], then continue with the steps in this procedure: Crossfeed Valve Test (FWD/AFT Fuel Crossfeed Valve Actuator - Installation, TASK 28-22-04-400-802).

H. Rework the Fay Sealed Fay Surface Bond - Index Plate to Adapter/Shaft

(Figure 401)

NOTE: Do the steps in this procedure if the measurement for the electrical bonding resistance between the index plate and the rear spar is more than 0.002 ohm (2.0 milliohms). The measurement is done with the actuator removed.

SUBTASK 28-22-03-010-011

(1) Do the Remove the Index Plate procedure in this task: Engine Fuel Crossfeed Valve (Adapter/Shaft) - Removal, TASK 28-22-03-000-803.

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

SUBTASK 28-22-03-765-005

(2) Do these steps to do a check of the adapter/shaft to rear spar bonding path:

NOTE: These steps will tell you if the index plate to adapter/shaft fay sealed fay surface bond is the cause of the problem, or if the adapter/shaft to rear spar fay sealed fay surface bond is the cause of the problem.

(a) Remove the sealant and clean one of the contact surfaces on the adapter/shaft [5].

(b) With the intrinsically safe approved bonding meter, COM-1550, measure the electrical bonding resistance between the contact surface on the adapter/shaft [5] and the rear spar (SWPM 20-20-00).

(c) Make sure the electrical bonding resistance is 0.0015 ohm (1.5 milliohms) or less.

NOTE: This is the repair electrical bonding resistance value. The valve adapter installation electrical bonding resistance value is 0.0005 ohm (0.5 milliohm).

(d) If the electrical bonding resistance is not satisfactory, then do the steps in this procedure: Rework the Fay Sealed Fay Surface Bond - Adapter/Shaft to Rear Spar.

(e) If the bonding resistance is satisfactory, then continue with the subsequent steps.

SUBTASK 28-22-03-400-001

(3) Do these steps to install the index plate [31]:

NOTE: These steps will re-align the crossfeed valve, rework the fay surface, and re-install the index plate [31].

(a) Do this task: Adapter Shaft Alignment, TASK 28-22-03-820-801.

(b) Do the Install the Index Plate procedure in this task: Engine Fuel Crossfeed Valve (Adapter/Shaft) - Installation, TASK 28-22-03-400-803.

SUBTASK 28-22-03-765-006

(4) During the installation, do a check of the electrical bonding resistance between the index plate [31] and the rear spar with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00):

(a) Make sure the electrical bonding resistance is 0.0020 ohm (2.0 milliohms) or less.

(b) If the electrical bonding resistance is not satisfactory, then repeat the steps in this procedure.

(c) If the bonding resistance is satisfactory, then continue with the procedure to install the index plate [31] in this task: Engine Fuel Crossfeed Valve (Adapter/Shaft) - Installation, TASK 28-22-03-400-803.

SUBTASK 28-22-03-760-002

(5) After you install the index plate [31], do the Engine Fuel Crossfeed Valve Test procedure in this task: Engine Fuel Crossfeed Valve (Adapter/Shaft) - Installation, TASK 28-22-03-400-803.

I. Rework the Fay Sealed Fay Surface Bond - Adapter/Shaft to Rear Spar

(Figure 401)

NOTE: Do the steps in this procedure if the measurement for the electrical bonding resistance between the adapter/shaft and the rear spar is more than 0.0015 ohm (1.5 milliohms).

SUBTASK 28-22-03-010-012

(1) Do the Remove the Valve Adapter procedure in this task: Engine Fuel Crossfeed Valve (Adapter/Shaft) - Removal, TASK 28-22-03-000-803.

NOTE: A fuel tank entry is necessary to rework the fay surface of the valve adapter.

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SUBTASK 28-22-03-400-002

(2) Do the Install the Valve Adapter procedure in this task: Engine Fuel Crossfeed Valve (Adapter/Shaft) - Installation, TASK 28-22-03-400-803.

NOTE: These steps will rework the fay surface, and re-install the valve adapter.

SUBTASK 28-22-03-765-007

(3) During the installation, do a check of the electrical bonding resistance between the adapter/shaft [5] and the rear spar (SWPM 20-20-00).

(a) Use an intrinsically safe approved bonding meter, COM-1550.

(b) Make sure the electrical bonding resistance is 0.0005 ohm (0.5 milliohm) or less.

(c) If the electrical bonding resistance is not satisfactory, then repeat the steps in this procedure.

(d) If the electrical bonding resistance is satisfactory, then continue with the steps to install the adapter/shaft [5] (TASK 28-22-03-400-803).

SUBTASK 28-22-03-400-003

(4) After you install the adapter/shaft [5], do this procedure:Engine Fuel Crossfeed Valve (Adapter/Shaft) - Installation, TASK 28-22-03-400-803 (Install the Index Plate and Engine Fuel Crossfeed Valve Test).

J. Rework the Bonding Jumper Bond

Figure 402

NOTE: Do the steps in this procedure if the measurement for the electrical bonding resistance between the bonding jumper terminal and the rear spar is more than 0.0015 ohm (1.5 milliohms). The measurement is done with the bonding jumper disconnected from the actuator.

SUBTASK 28-22-03-030-002

(1) Remove the sealant from the bonding jumper terminal attached to the structure.

SUBTASK 28-22-03-020-021

(2) Remove the nut, two washers, and the bonding jumper.

SUBTASK 28-22-03-420-029

(3) Do these steps to install the bonding jumper to the structure:

WARNING

DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

(b) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper terminal and the two washers.

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the electrical fay surface seal.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(c) Install the nut, washers, and the bonding jumper to the structure.

(d) Tighten the nut to 20 in-lb (2.3 N·m).

(e) Measure the electrical bonding resistance between the loose end of bonding jumper and the rear spar (SWPM 20-20-00).

1) Use an intrinsically safe approved bonding meter, COM-1550.

2) Make sure the electrical bonding resistance is 0.0015 ohm (1.5 milliohms) or less.

(f) Apply a cap seal of sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, over the nut and the terminal of the bonding jumper.

NOTE: Use the sealant that was used for the fay surface fay seal.

SUBTASK 28-22-03-420-030

(4) Continue with this task: FWD/AFT Fuel Crossfeed Valve Actuator - Installation, TASK 28-22-04-400-802.

SUBTASK 28-22-03-710-002

(5) If you have replaced the adapter/shaft [5] or adjusted the index plate [31], then continue with the steps in the Crossfeed Valve Test procedure in this task: FWD/AFT Fuel Crossfeed Valve Actuator - Installation, TASK 28-22-04-400-802.

——— END OF TASK ———

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FWD/AFT FUEL CROSSFEED VALVE ACTUATOR - REMOVAL/INSTALLATION

1. General

A. Each fuel crossfeed valve contains three parts: an actuator, an adapter/shaft and a valve body.

B. The forward and aft actuators for the engine fuel crossfeed valves are installed on the rear spar of the left center fuel tank.

C. It is not necessary to defuel the center fuel tank to remove the actuators.

D. This procedure contains three tasks. The first task removes the actuator for each fuel crossfeed valve. The second task installs the actuator for each fuel crossfeed valve.

ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS

E. The procedure to remove the adapter/shaft and valve body, for each engine fuel crossfeed valve, is contained in (TASK 28-22-03-000-803). The procedure to install the adapter/shaft and valve body, for each engine fuel crossfeed valve, is contained in (TASK 28-22-03-400-803).

TASK 28-22-04-000-802

2. FWD/AFT Fuel Crossfeed Valve Actuator - Removal

(Figure 401)

A. References

Reference	Title
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Location Zones

Zone	Area
551	Rear Spar to Landing Gear Support Beam - Left Wing

C. Procedure

SUBTASK 28-22-04-860-009

WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR BEFORE YOU MOVE THE CONTROL LEVER. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(1) Make sure the landing gear downlock pins are installed (TASK 32-00-30-480-801).

SUBTASK 28-22-04-860-010

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-22-04-860-011

(3) For the forward engine fuel crossfeed valve:

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

(a) Open this circuit breaker and install safety tag:

Left Power Management Panel, P110

Row	Col	Number	Name
L	23	C28629	FUEL XFEED VLV FWD

SUBTASK 28-22-04-860-012

(4) For the aft engine fuel crossfeed valve:

(a) Open this circuit breaker and install safety tag:

Standby Power Management Panel, P310

Row	Col	Number	Name
G	9	C28612	FUEL XFEED VLV AFT

SUBTASK 28-22-04-980-002

(5) Make sure the manual override handle [9] of the actuator [15] is in the CLOSED position.

(a) If the manual override handle [9] is not in the CLOSED position, move the manual override handle [9] to the CLOSED position.

SUBTASK 28-22-04-030-001

(6) Disconnect the electrical connector [3].

SUBTASK 28-22-04-030-002

(7) Remove the sealant from the bonding jumper [14] and fasteners at the actuator attachment location.

SUBTASK 28-22-04-030-003

(8) Remove the screw [12], two washers [13], and bonding jumper [14] from the actuator [15].

SUBTASK 28-22-04-030-004

(9) Remove the four screws [2] and washer [1] that attach the actuator [15] to the adapter shaft [10].

SUBTASK 28-22-04-030-005

(10) Carefully disassemble the actuator [15] from the index plate [11].

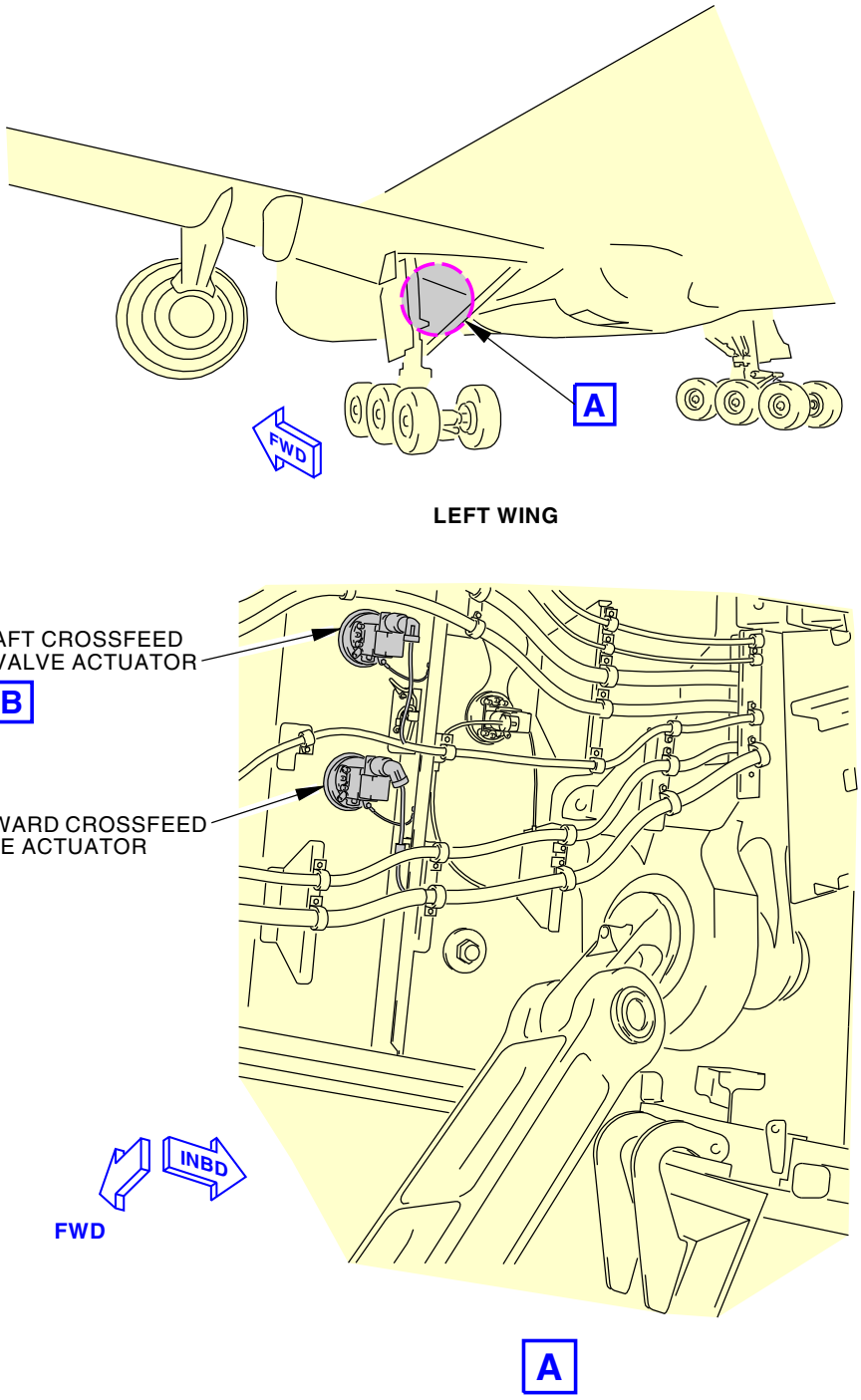
NOTE: The actuator and index plate are bonded with faying surface sealant.

SUBTASK 28-22-04-020-006

(11) Remove the actuator [15].

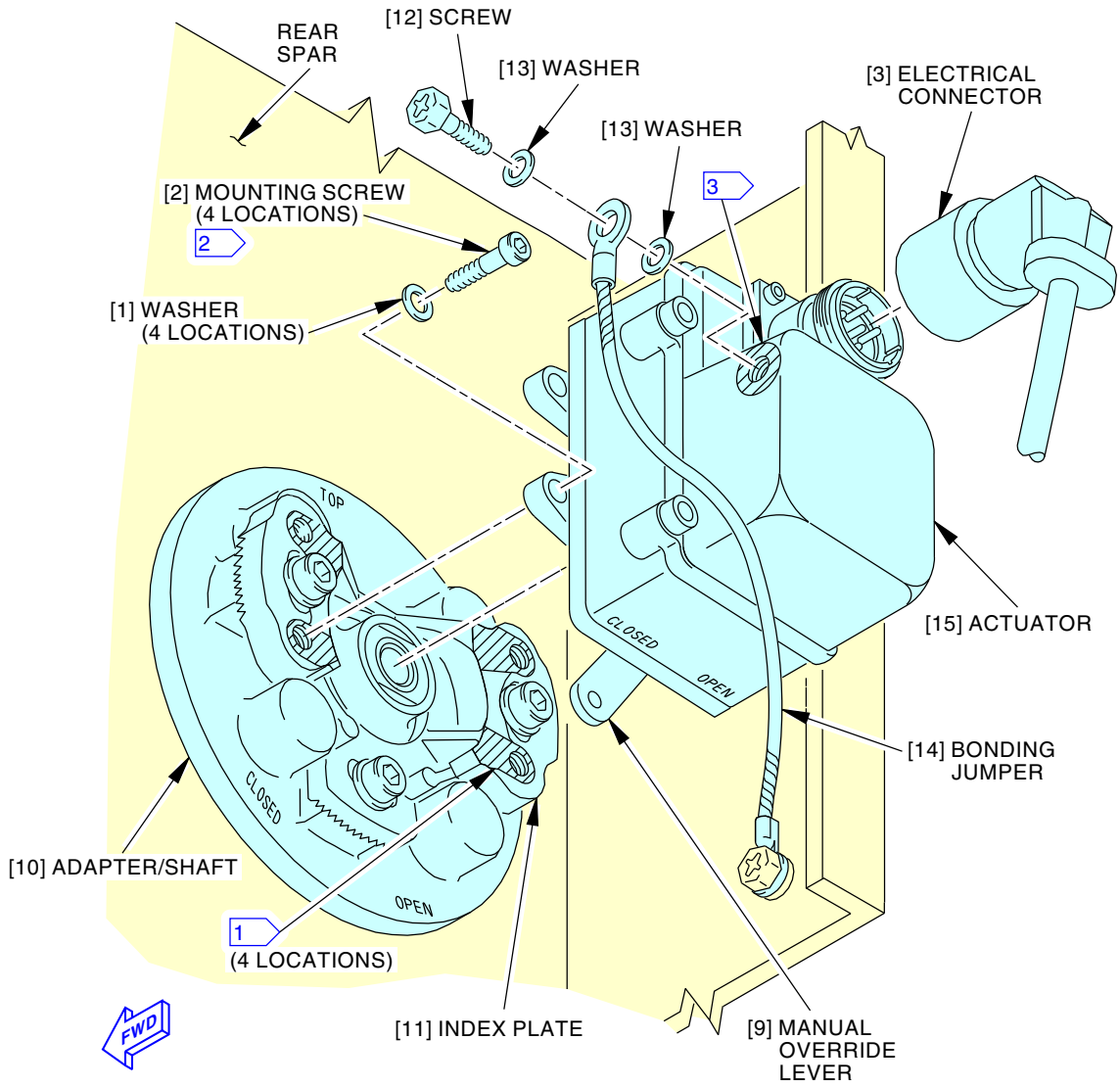
——— END OF TASK ———

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Forward/Aft Fuel Crossfeed Actuator Installation
Figure 401/28-22-04-990-802 (Sheet 1 of 2)

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(EXAMPLE)

B

1 PREPARE THE CONTACT SURFACES OF THE INDEX PLATE AND ACTUATOR MOUNTING FEET FOR AN ELECTRICAL BOND (4 LOCATIONS) (SWPM 20-20-00). INSTALL THE INDEX PLATE AND THE ACTUATOR WITH A FAY SEALED FAY SURFACE BOND.

2 APPLY SEALANT TO THE SHANK AND THREADS OF THE MOUNTING SCREW.

3 PREPARE THE CONTACT SURFACES OF ACTUATOR AND BONDING JUMPER BUILD-UP FOR AN ELECTRICAL BOND (SWPM 20-20-00). AFTER INSTALLATION, APPLY A CAP SEAL TO THE BONDING JUMPER INSTALLATION.

U41621 S0000195528_V4

Forward/Aft Fuel Crossfeed Actuator Installation
Figure 401/28-22-04-990-802 (Sheet 2 of 2)

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TASK 28-22-04-400-802

3. FWD/AFT Fuel Crossfeed Valve Actuator - Installation

(Figure 401)

A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(2) For application of fay sealed fay surface bonds in this task, it is acceptable to use sealant, A50110, as an alternative to sealant, A50155.

NOTE: Sealants should not be mixed. In applications where sealants may mix, use the same sealant for both applications.

B. References

Reference	Title
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
20-30-92-910-801	Final Cleaning Prior to General Sealing (Series 92) (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-22-01-300-801	Rework the Fay Sealed Fay Surface Bonds for the Spar Valve (P/B 401)
28-22-03-300-801	Rework the Fay Sealed Fay Surface Bonds for the Engine Fuel Crossfeed Valve (P/B 401)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
51-21-04-620-801	Alodine 600, 1000, 1200, and 1200S Coating Application (P/B 701)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

(Continued)

Reference	Description
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: $0855 Part #: 234350 Supplier: $0857 Part #: 311 Supplier: F6892 Part #: 411B60 Supplier: 3DN12 Part #: 411B90 Supplier: 3DN12 Part #: DAD5013 Supplier: $0856 Part #: DFD5019 Supplier: $0856 Part #: J5-0275-2010 Supplier: 435R8 Part #: SCD5019 Supplier: $0856 Part #: ST982LF-9 Supplier: 62176 Part #: TS1275-4 Supplier: 1DWR5
STD-123	Brush - Soft Bristle

D. Consumable Materials

Reference	Description	Specification
A50110	Sealant	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
B01012	Solvent - Final Cleaning Prior To General Sealing - Series 92	
C00064	Coating - Aluminum Chemical Conversion	BAC5719 Type II Class A (MIL-DTL-5541 Class 1A)
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20 Type II
C50033	Chromated Conversion Coating for Aluminum - Alodine 1200	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
15	Actuator	28-22-04-01-060	ARO 001-004
		28-22-04-01A-045	ARO 005-016

F. Location Zones

Zone	Area
551	Rear Spar to Landing Gear Support Beam - Left Wing

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

G. Procedure

SUBTASK 28-22-04-862-001

(1) For the aft engine fuel crossfeed valve:

> **CAUTION** REMOVE POWER TO THE ACTUATOR. IF YOU DO MAINTENANCE TO THE ACTUATOR WHILE IT IS ENERGIZED, DAMAGE TO THE ACTUATOR CAN OCCUR.

(a) Open this circuit breaker and install safety tag:

Standby Power Management Panel, P310

Row	Col	Number	Name
G	9	C28612	FUEL XFEED VLV AFT

SUBTASK 28-22-04-862-002

(2) For the forward engine fuel crossfeed valve:

> **CAUTION** REMOVE POWER TO THE ACTUATOR. IF YOU DO MAINTENANCE TO THE ACTUATOR WHILE IT IS ENERGIZED, DAMAGE TO THE ACTUATOR CAN OCCUR.

(a) Open this circuit breaker and install safety tag:

Left Power Management Panel, P110

Row	Col	Number	Name
L	23	C28629	FUEL XFEED VLV FWD

SUBTASK 28-22-04-140-001

(3) Remove the old sealant and clean the actuator [15], index plate [11] and fasteners (if re-used).

(a) Use sealant removal tool, COM-2481, or equivalent, to remove old sealant from the actuator [15] and index plate [11].

> **WARNING** DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(b) To remove the remaining sealant, grease, oil, dirt, and other contamination from the components, use one of these items soaked with Series 92 solvent, B01012 (TASK 20-30-92-910-801):

1) soft bristle brush, STD-123

2) cotton wiper, G00034

SUBTASK 28-22-04-420-003

(4) Do these steps to prepare the actuator [15] and the index plate [11] for a fay sealed fay surface bond (SWPM 20-20-00):

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WARNING DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-19: CDCCL

(b) Apply a thin continuous layer of sealant between the actuator [15] mounting feet contact surfaces and the index plate [11] for a fay sealed fay surface bond (four locations) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(c) Apply sealant to the shank and the threads of the screws [2].

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the wet installation of the screws [2].

NOTE: Use the same sealant that was used for the fay surface fay seal.

2) Make sure the sealant applied to the fasteners is approximately 0.060 in. (1.524 mm) thick.

SUBTASK 28-22-04-420-004

(5) Do these steps to install the actuator [15] to the index plate [11]:

(a) Make sure the manual override lever on the actuator [15] is in the CLOSED position.

(b) Align the actuator output shaft with the adapter shaft [10].

(c) Make sure the two spaces for teeth on the adapter shaft [10] align with the actuator output shaft.

(d) Put the actuator output shaft into the adapter shaft [10].

NOTE: The contact areas of the actuator automatically align with the mounting points on the index plate.

(e) Install the four screws [2] and washers [1].

NOTE: Lockwire is not necessary for the screws [2].

(f) Tighten the screws [2] to 20 in-lb (2.3 N·m).

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(g) Make sure the sealant is continuously squeezed out along the edges of the contact surfaces.

(h) If there are gaps, bubbles or voids in the sealant squeeze out, then disassemble and apply more sealant.

(i) Shape the squeezed out sealant into a fillet seal.

(j) As an option, remove the extra squeezed out sealant.

NOTE: Make sure the sealant that remains is flush with the mating part edges.

SUBTASK 28-22-04-765-001

28-AWL-19: CDCCL

(6) Measure the electrical bonding resistance between the actuator [15] upper housing and the rear spar (structure) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

28-AWL-19: CDCCL

(a) Do this measurement with the bonding jumper [14] and electrical connector [3] disconnected.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(b) Make sure the bonding jumper [14] does not touch the actuator [15] during the bonding measurement.

(c) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-19: CDCCL

(d) If the actuator [15], index plate [11] and adapter plate (part of the adapter shaft [10]) were removed, make sure the electrical bonding resistance is 0.0030 ohm (3.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) If the electrical bonding resistance is more than 0.0030 ohm (3.0 milliohms), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Engine Fuel Crossfeed Valve, TASK 28-22-03-300-801.

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28-AWL-19: CDCCL

(e) If the actuator [15] and index plate [11] were removed, make sure the electrical bonding resistance is 0.0040 ohm (4.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) If the electrical bonding resistance is more than 0.0040 ohm (4.0 milliohms), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Engine Fuel Crossfeed Valve, TASK 28-22-03-300-801.

28-AWL-19: CDCCL

(f) If only the actuator [15] was removed, make sure the electrical bonding resistance is 0.0040 ohm (4.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) If the electrical bonding resistance is more than 0.0040 ohm (4.0 milliohms), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Engine Fuel Crossfeed Valve, TASK 28-22-03-300-801.

SUBTASK 28-22-04-420-007

(7) If the bonding jumper [14] is disconnected from the structure, do these steps to attach the bonding jumper [14]:

WARNING

DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

(b) Rub dry with a clean, dry cotton wiper, G00034.

(c) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-19: CDCCL

(d) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper [14] terminal and the two washers for a fay sealed fay surface bond at the structure (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use sealant, A50110, or sealant, A50155.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

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(e) Install the screw and washers to attach the bonding jumper [14] to the structure.

1) Tighten the screw to 30 ±5 in-lb (3 ±1 N·m).

28-AWL-19: CDCCL

(f) Apply a cap seal over the screw (fastener) and the terminal of the bonding jumper [14] attached to the structure.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

NOTE: Use the same sealant that was used for the fay sealed fay surface bond.

1) Use sealant, A50110 or sealant, A50155.

SUBTASK 28-22-04-420-005

(8) Do these steps to install the bonding jumper [14] to the actuator [15]:

(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-19: CDCCL

(b) Measure the electrical bonding resistance between the loose end of the bonding jumper [14] and the rear spar (structure) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-19: CDCCL

2) Make sure the electrical bonding resistance is 0.0015 ohm (1.5 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

a) If the electrical bonding resistance is more than 0.0015 ohm (1.5 milliohms), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Spar Valve, TASK 28-22-01-300-801.

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28-AWL-19: CDCCL

(c) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper [14] terminal and the two washers [13] for a fay sealed fay surface bond between the actuator [15] and the bonding jumper [14] terminal.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(d) Install the screw [12], washers [13] and bonding jumper [14] to the actuator [15].

(e) AIRPLANES WITHOUT MA30A1001 ACTUATOR:

Tighten the screws [12] to 20 in-lb (2.3 N·m).

(f) AIRPLANES WITH MA30A1001 ACTUATOR:

Tighten the screws [12] to 35 in-lb (4.0 N·m).

28-AWL-19: CDCCL

(g) Measure the electrical bonding resistance between the upper housing of the actuator [15] and the attached bonding jumper [14] terminal (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Do not touch the screw [12] when you make the bonding measurement.

2) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-19: CDCCL

3) Make sure the electrical bonding resistance is 0.0010 ohm (1.0 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

28-AWL-19: CDCCL

(h) Apply a cap seal over the screw [12] (fastener) and the terminal lug of the bonding jumper [14] attached to the actuator [15].

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

NOTE: Use the same sealant that was used for the fay sealed fay surface bond.

1) Use sealant, A50110, sealant, A50155, sealant, A50231 or sealant, A50296.

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SUBTASK 28-22-04-370-001

(9) Do this task to apply protective finishes to the bare areas of the rear spar: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

NOTE: Re-apply the protective finishes to the rear spar where the electrical bonding probes removed the finishes.

(a) These are the protective finishes:

1) Alodine 600 coating, C00064

2) BMS 10-20 coating, C00307.

SUBTASK 28-22-04-916-001

(10) Apply Alodine 1200 coating, C50033, to any bare areas of the actuator [15] (TASK 51-21-04-620-801).

NOTE: Re-apply the protective coating to the actuator [15] where the electrical bonding probe removed the finish and any bare metal areas around the bonding jumper installation that are not covered with sealant.

SUBTASK 28-22-04-420-006

(11) Connect the electrical connector [3].

H. Crossfeed Valve Test

SUBTASK 28-22-04-410-001

(1) For the aft engine fuel crossfeed valve:

(a) Remove the safety tag and close this circuit breaker:

Standby Power Management Panel, P310

Row	Col	Number	Name
G	9	C28612	FUEL XFEED VLV AFT

SUBTASK 28-22-04-410-002

(2) For the forward engine fuel crossfeed valve:

(a) Remove the safety tag and close this circuit breaker:

Left Power Management Panel, P110

Row	Col	Number	Name
L	23	C28629	FUEL XFEED VLV FWD

SUBTASK 28-22-04-710-001

(3) To do a operational test of the crossfeed valve actuators, do these steps:

(a) Put the FWD and AFT CROSSFEED switch-lights, on the P5 Overhead Panel, to the OPEN position.

(b) Make sure the manual override handle [9] on the actuator [15] moves to the OPEN position (Figure 401).

(c) Put the FWD and AFT CROSSFEED switch-lights, on the P5 Overhead Panel, to the CLOSED position.

(d) Make sure the manual override handle [9] on the actuator [15] moves to the CLOSED position (Figure 401).

(e) Make sure the EICAS advisory message FUEL CROSSFEED FWD and FUEL CROSSFEED AFT, do not show on the EICAS display.

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

I. Put the Airplane Back to the Usual Condition

SUBTASK 28-22-04-860-013

WARNING OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

——— END OF TASK ———

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FWD/AFT FUEL CROSSFEED VALVE ACTUATOR - INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure contains a functional check of the bonding resistance between the structure and the fuel crossfeed valve actuator.

SFAR 88

TASK 28-22-04-200-801

2. FWD/AFT Fuel Crossfeed Valve Actuator - Bonding Resistance Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
28-22-04-400-802	FWD/AFT Fuel Crossfeed Valve Actuator - Installation (P/B 401)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Location Zones

Zone	Area
551	Rear Spar to Landing Gear Support Beam - Left Wing

D. Prepare for the Procedure

SUBTASK 28-22-04-490-001

WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR BEFORE YOU MOVE THE CONTROL LEVER. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(1) Make sure the landing gear downlock pins are installed (TASK 32-00-30-480-801).

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SUBTASK 28-22-04-490-002

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-22-04-865-001

(3) For the forward engine fuel crossfeed valve:

CAUTION REMOVE POWER TO THE ACTUATOR. IF YOU DO MAINTENANCE TO THE ACTUATOR WHILE IT IS ENERGIZED, DAMAGE TO THE ACTUATOR CAN OCCUR.

(a) Open this circuit breaker and install safety tag:

Left Power Management Panel, P110

Row	Col	Number	Name
L	23	C28629	FUEL XFEED VLV FWD

SUBTASK 28-22-04-865-002

(4) For the aft engine fuel crossfeed valve:

CAUTION REMOVE POWER TO THE ACTUATOR. IF YOU DO MAINTENANCE TO THE ACTUATOR WHILE IT IS ENERGIZED, DAMAGE TO THE ACTUATOR CAN OCCUR.

(a) Open this circuit breaker and install safety tag:

Standby Power Management Panel, P310

Row	Col	Number	Name
G	9	C28612	FUEL XFEED VLV AFT

E. Electrical Bonding Measurement

SUBTASK 28-22-04-560-001

(1) Make sure the manual override handle of the actuator is in the CLOSED position.

(a) If the manual override handle is not in the CLOSED position, move the manual override handle to the CLOSED position.

SUBTASK 28-22-04-862-003

(2) Disconnect the electrical connector.

SUBTASK 28-22-04-765-004

(3) For each of the fuel crossfeed valves, measure the bonding resistance between the actuator and the airplane structure with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

(a) Make sure the bonding resistance is 0.005 ohm (5 milliohms) or less.

SUBTASK 28-22-04-765-005

(4) For each of the fuel crossfeed valves, measure the electrical bonding resistance between the bonding jumper (attached to the actuator) and the rear spar with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

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(a) Make sure the bonding resistance is 0.008 ohm (8 milliohms) or less.

SUBTASK 28-22-04-861-001

(5) Connect the electrical connector to the actuator.

SUBTASK 28-22-04-860-014

(6) For the aft engine fuel crossfeed valve:

(a) Remove the safety tag and close this circuit breaker:

Standby Power Management Panel, P310

Row	Col	Number	Name
G	9	C28612	FUEL XFEED VLV AFT

SUBTASK 28-22-04-860-015

(7) For the forward engine fuel crossfeed valve:

(a) Remove the safety tag and close this circuit breaker:

Left Power Management Panel, P110

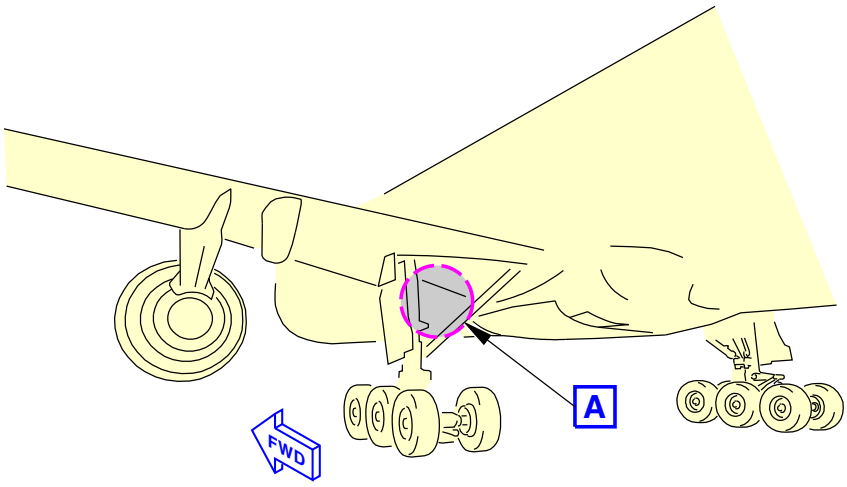
Row	Col	Number	Name
L	23	C28629	FUEL XFEED VLV FWD

SUBTASK 28-22-04-710-002

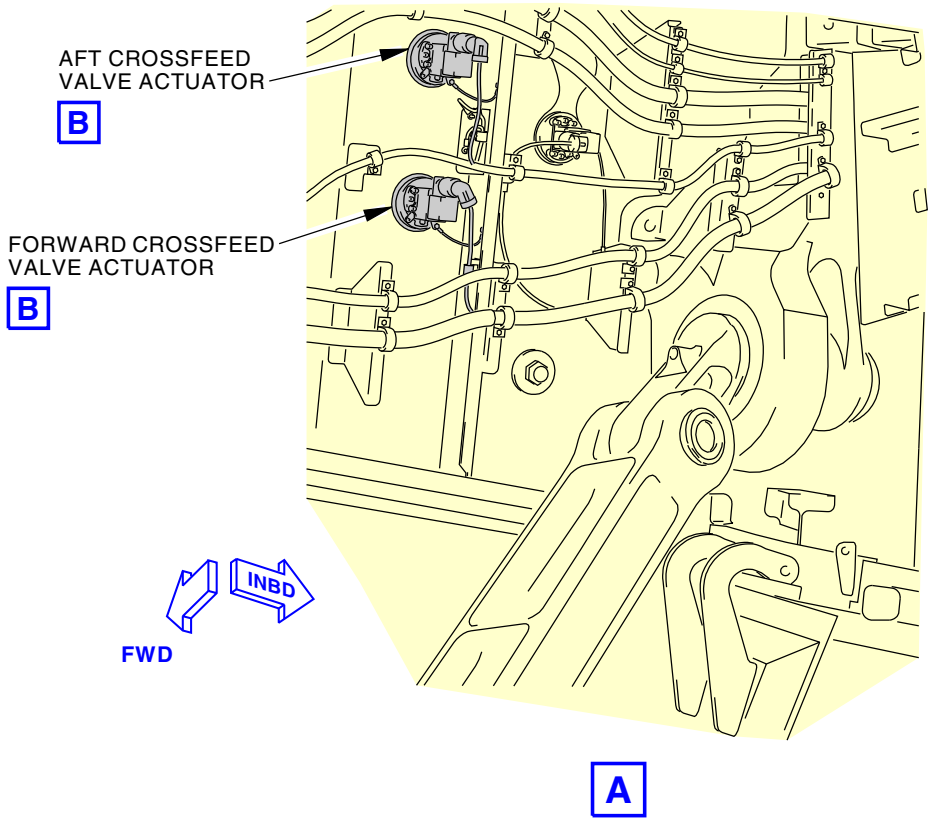
(8) Do the fuel crossfeed valve actuator test in FWD/AFT Fuel Crossfeed Valve Actuator - Installation, TASK 28-22-04-400-802.

——— END OF TASK ———

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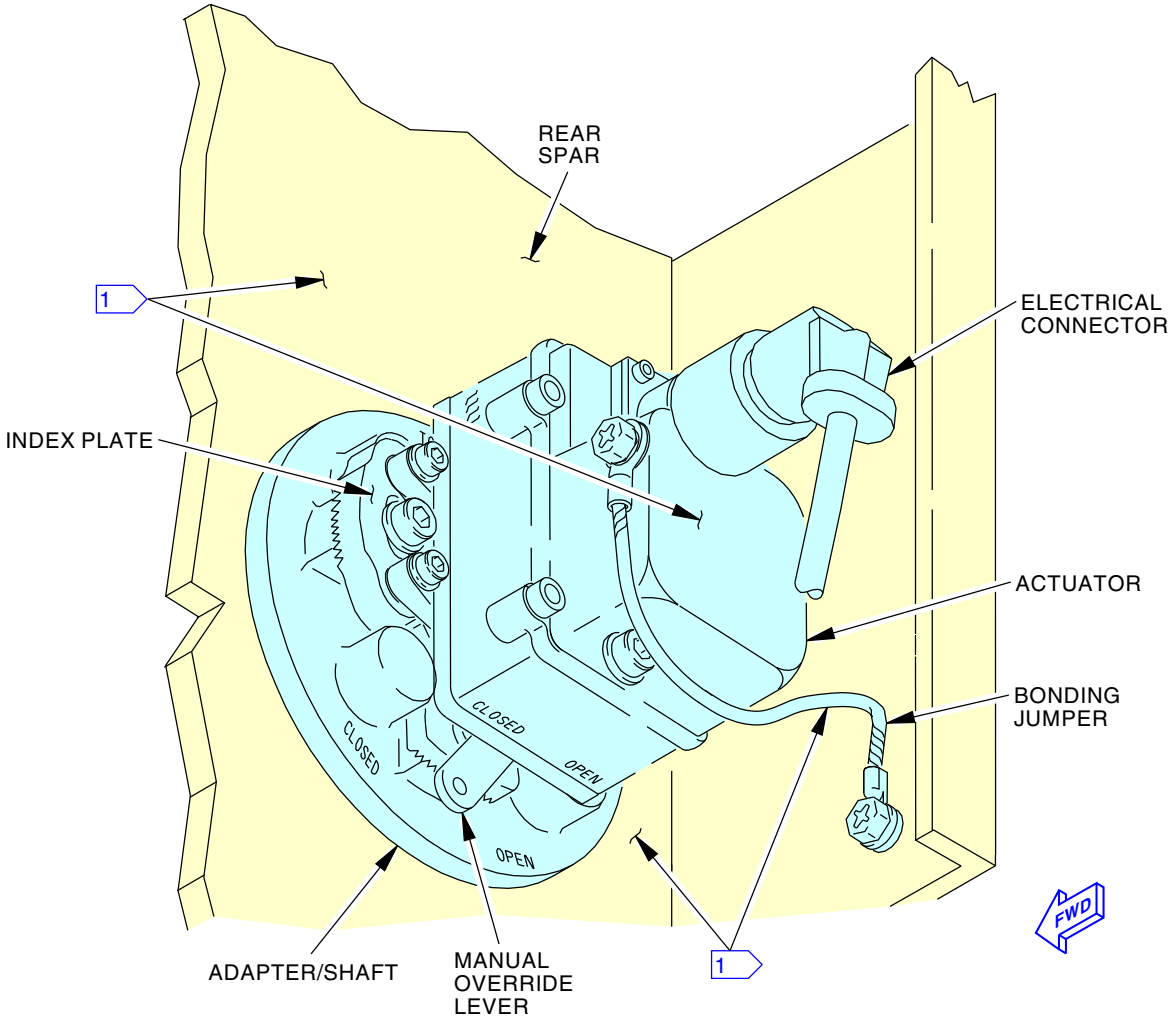
LEFT WING



1368844 S0000247125_V2

FWD/AFT Fuel Crossfeed Valve - Bonding Resistance Measurement
Figure 601/28-22-04-990-803 (Sheet 1 of 2)

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(EXAMPLE)

B

1 BONDING RESISTANCE MEASUREMENT

1369118 S0000247127_V3

FWD/AFT Fuel Crossfeed Valve - Bonding Resistance Measurement
Figure 601/28-22-04-990-803 (Sheet 2 of 2)

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MAIN TANK FUEL BOOST PUMP - REMOVAL/INSTALLATION

1. General

A. There is a left forward fuel boost pump and a left aft fuel boost pump which move fuel from the left main fuel tank. There is a right forward fuel boost pump and right aft boost pump which move fuel from the right main fuel tank. The left and right aft fuel boost pumps are installed on the center tank rear spar, inboard of the main tank end ribs (Rib No. 8). The left and right forward fuel boost pumps are installed on the main tank rear spar, outboard of the main tank rib no. 9.

B. There are left and right override/jettison fuel pumps that move fuel from the center fuel tank. The left override/jettison fuel pump and the right override/jettison fuel pump are installed on the rear spar in the left and right wheel wells for the main landing gear.

C. The main tank fuel boost pumps contain these parts:

(1) Motor-impeller

(2) Pump housing

(3) Motive flow check valve

ARO 005-999; ARO 001-004 POST SB 777-28-0078

NOTE: The motive flow check valve is installed on the forward fuel boost pump only.

ARO ALL

(4) Discharge check valve

(5) Vapor vent valve.

D. This procedure contains these tasks:

(1) Boost pump motor-impeller removal

(2) Boost pump motor-impeller installation

(3) Boost pump housing removal

(4) Boost pump housing installation

TASK 28-22-05-000-801

2. Boost Pump Motor-Impeller - Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-300-802	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-42-01-000-801	Remove the Fuel Pump Pressure Switch (P/B 401)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Tools/Equipment

Reference	Description
STD-200	Container - Fuel Resistant, 10 gallon (38 l)

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C. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

D. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

E. Access Panels

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel
651DB	Inboard Fixed Trailing Edge Panel

F. Procedure

SUBTASK 28-22-05-860-001

WARNING

MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR BEFORE YOU MOVE THE CONTROL LEVER. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(1) Make sure the landing gear downlocks are installed (TASK 32-00-30-480-801).

SUBTASK 28-22-05-860-002

WARNING

OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-22-05-860-003

(3) Open these circuit breakers and install safety tags:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
C	18	C28302	R FWD FUEL BOOST PUMP L AC SECT 2
E	2	C28303	L AFT FUEL BOOST PUMP
E	5	C28307	L FWD FUEL BOOST PUMP

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Right Power Management Panel, P210

Row	Col	Number	Name
E	27	C28300	R AFT FUEL BOOST PUMP
F	27	C28306	R FWD FUEL BOOST PUMP R XFR

SUBTASK 28-22-05-010-008

(4) To get access to the applicable forward boost pump, open these panels on the wing (TASK 06-44-00-800-802):

(a) Open this access panel to get access to the left forward fuel boost pump, installed on the rear spar of the left wing:

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

(b) Open this access panel to get access to the right forward fuel boost pump, installed on the rear spar of the right wing:

Number	Name/Location
651DB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-22-05-010-010

(5) To get access to the aft fuel boost pumps, do these steps:

(a) Remove the 38 bolts [15] to remove the faceplate assembly [19].

(b) Remove the four bolts [17] and remove the L-stiffener assembly [16], and HAT-stiffener assembly [18].

SUBTASK 28-22-05-020-022

(6) Disconnect the electrical connector [2] from the motor-impeller [7].

SUBTASK 28-22-05-020-023

(7) Disconnect the electrical connector [1] for the pressure switch [14].

SUBTASK 28-22-05-020-024

(8) Remove the four bolts [8] and washers [9].

NOTE: This will also disconnect one end of the bonding jumper [10].

(a) Do not remove the bolts [48] or bolt [63] to remove the motor-impeller [7].

SUBTASK 28-22-05-480-002

(9) Turn the motor-impeller [7] a full 35 degrees in the counter-clockwise direction.

NOTE: In order to remove the fuel boost pump without defueling the airplane, a plate must turn to cover the pump interface to the tank to contain the fuel in the tank when the pump is removed. The pump cannot physically be removed if it cannot be turned the full 35 degrees. If it is difficult to turn the pump a full 35 degrees, it is due to degraded/loosened seals in the pump housing interfering with the plate that turns to cover the pump interface. To get access to this plate and related seals to correct this interference, a tank entry is necessary to remove the fuel pump housing (TASK 28-11-00-010-801).

NOTE: Make sure the motor-impeller [7] is turned completely counterclockwise. The drain plug should be oriented straight down with respect to the housing. The motor-impeller [7] has pins inside that must align for removal.

SUBTASK 28-22-05-020-025

(10) Put a 10 gallon (38 l) fuel resistant container, STD-200, below the motor-impeller [7] to catch the fuel.

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CAUTION MAKE SURE FUEL DOES NOT CONTINUOUSLY DRAIN. IF FUEL CONTINUOUSLY DRAINS, THERE IS A LEAK IN THE PUMP HOUSING. YOU MUST INSTALL THE MOTOR-IMPELLER AND DEFUEL THE FUEL TANK TO PREVENT A FUEL SPILL.

(a) Remove the drain valve [4] from the motor-impeller [7].

NOTE: Approximately 1 qt (1 l) of fuel will drain from the motor-impeller [7].

1) If fuel drains continuously, install the drain valve [4] and defuel the fuel tank (TASK 28-26-00-650-801).

2) Replace the fuel pump housing to repair the leak (TASK 28-22-05-000-802).

(b) Discard O-ring [6] and O-ring [5], if installed.

SUBTASK 28-22-05-020-001

(11) Do these steps to remove the motor-impeller [7]:

(a) Put the cotton wiper, G00034, below the motor-impeller [7] to absorb fuel.

NOTE: Approximately 1 qt (1 l) of fuel will spill when the motor-impeller [7] is removed.

(b) Pull up on the extraction lever [3] (this will help move the motor-impeller [7]), and pull the motor-impeller [7] out to remove it fully.

1) If it is necessary, fully remove the bonding jumper [10].

NOTE: The full removal of the bonding jumper [10] is necessary if the bonding jumper interferes with the motor-impeller [7] lugs.

a) Remove the sealant from the bonding jumper [10] (TASK 28-11-00-300-802).

b) Remove the bolt [63] and washer [49] to remove the bonding jumper [10] from the structure.

c) Remove the bonding jumper [10].

(c) Discard the O-ring [11], O-ring [12], and O-ring [13].

SUBTASK 28-22-05-650-001

(12) If fuel continuously drains, do these steps:

(a) Install the motor-impeller [7].

(b) Defuel the fuel tanks (TASK 28-26-00-650-801).

(c) Remove the motor-impeller [7].

(d) Replace the fuel pump housing to repair the leak (TASK 28-22-05-000-802, TASK 28-22-05-400-802).

SUBTASK 28-22-05-210-001

(13) Do a check of the valve plate:

NOTE: The valve plate must fully cover and seal the opening in the pump housing. If the valve plate is not aligned correctly, a fuel spill can occur if the fuel tank is full. Damage to the valve plate can also occur if the valve plate is not aligned correctly during installation of the motor-impeller [7].

(a) Look into the pump housing with the motor-impeller [7] removed (View G).

(b) Make sure that the valve plate is aligned correctly (View H).

(c) If the valve plate has moved (slipped) and is not aligned correctly, then do these steps:

1) Defuel the fuel tanks (TASK 28-26-00-650-801).

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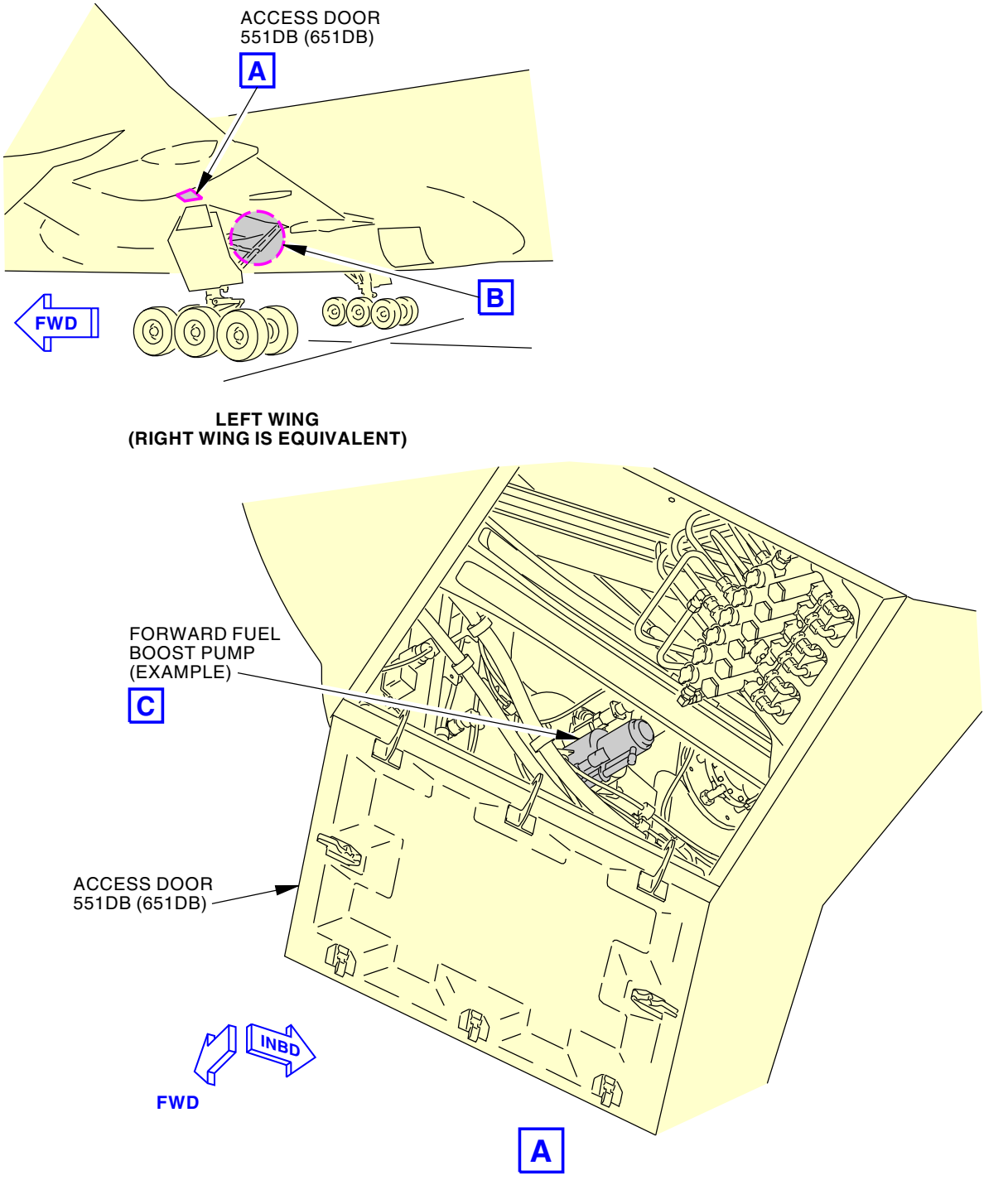
2) Replace the fuel pump housing to repair the valve plate and seal (TASK 28-22-05-000-802, TASK 28-22-05-000-802).

SUBTASK 28-22-05-020-026

(14) To remove the pressure switch [14], do this task: Remove the Fuel Pump Pressure Switch, TASK 28-42-01-000-801.

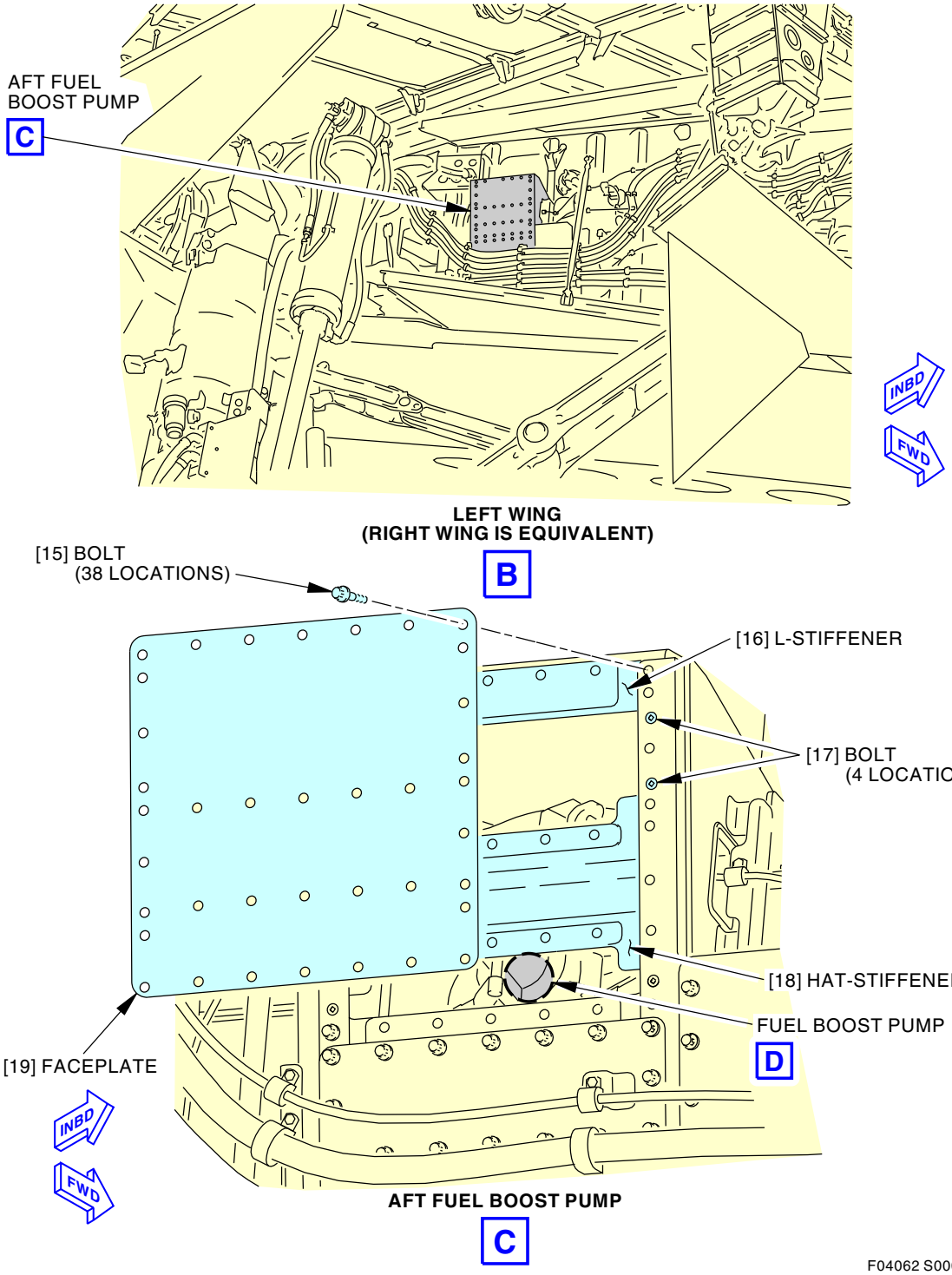
——— END OF TASK ———

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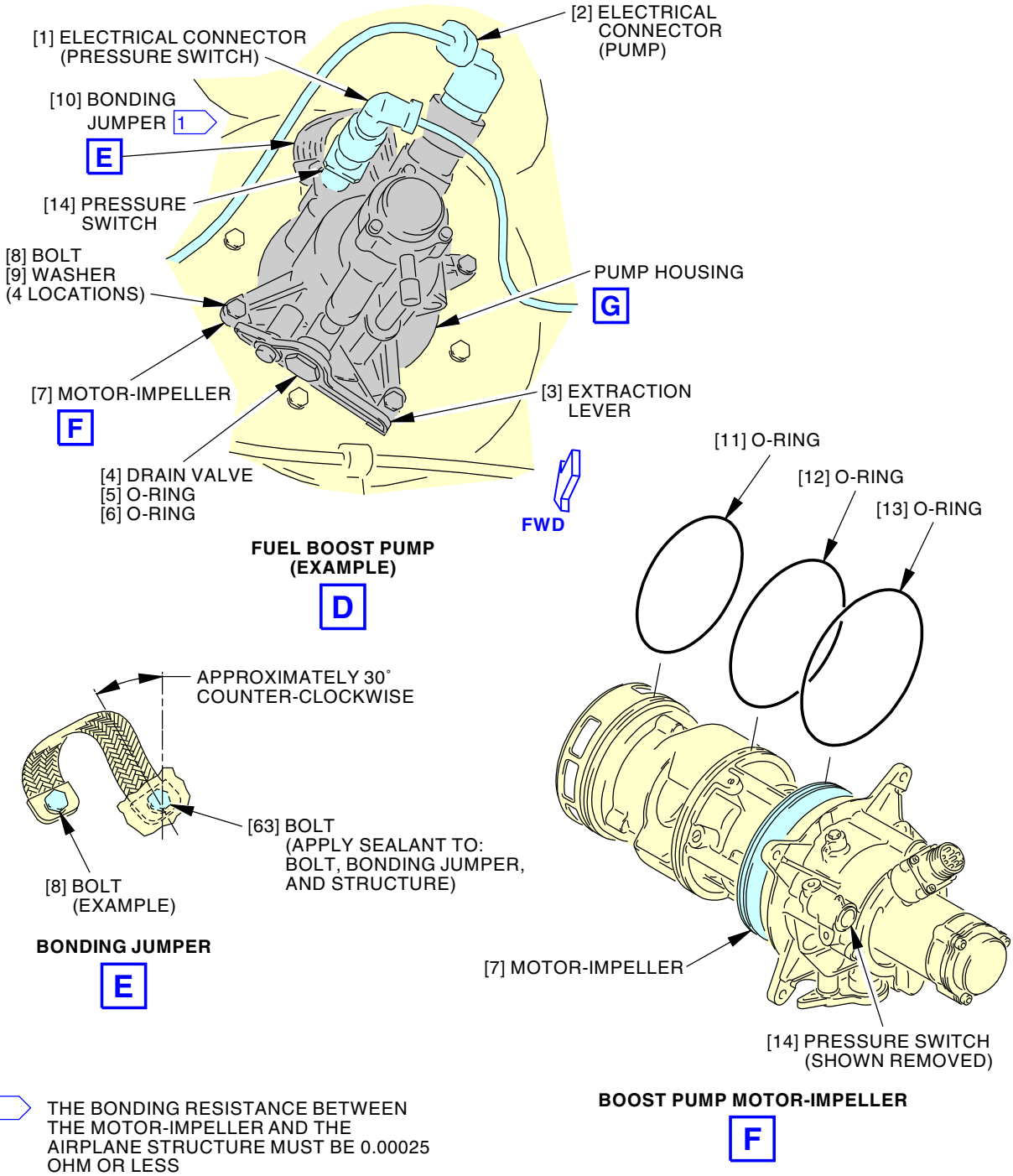
Main Fuel Tank Fuel Boost Pump Motor-Impeller Installation
Figure 401/28-22-05-990-801 (Sheet 1 of 4)

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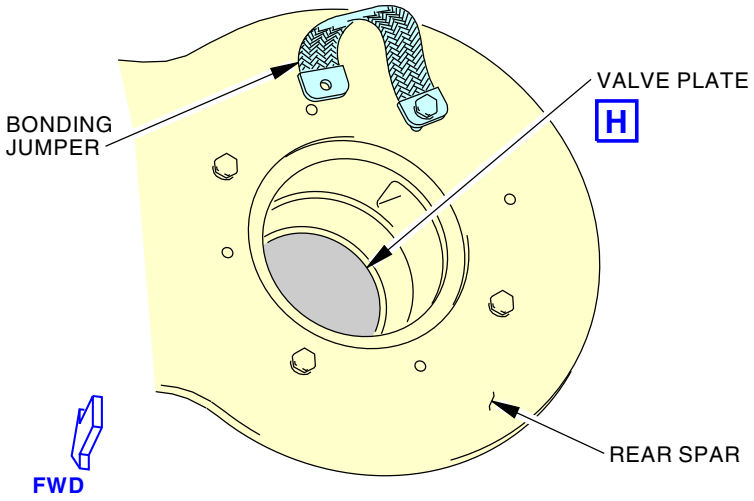
Main Fuel Tank Fuel Boost Pump Motor-Impeller Installation
Figure 401/28-22-05-990-801 (Sheet 2 of 4)

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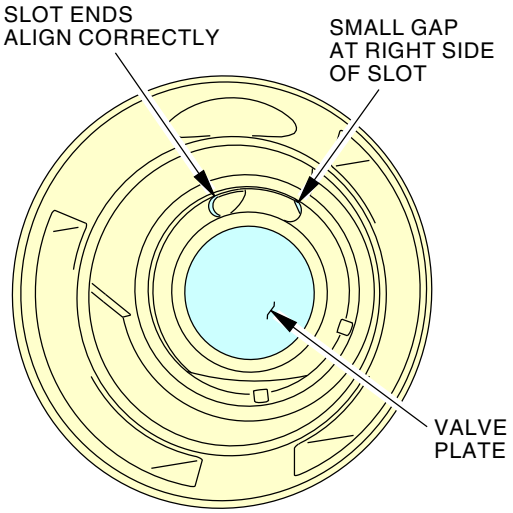
Main Fuel Tank Fuel Boost Pump Motor-Impeller Installation
Figure 401/28-22-05-990-801 (Sheet 3 of 4)

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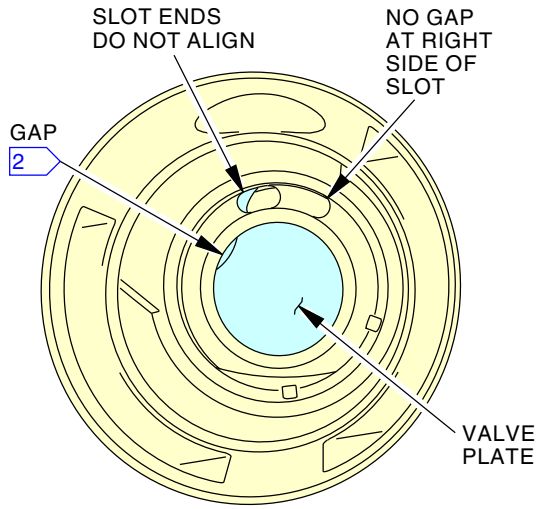
PUMP HOUSING

G



VALVE PLATE
(CORRECT ALIGNMENT)

H



VALVE PLATE
(INCORRECT ALIGNMENT)
(REF 777-SL-28-015)

H

2 GAP IN VALVE PLATE CAN CAUSE A FUEL LEAK IF THE FUEL TANK IS FULL.

U86450 S0000220669_V2

Main Fuel Tank Fuel Boost Pump Motor-Impeller Installation
Figure 401/28-22-05-990-801 (Sheet 4 of 4)

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TASK 28-22-05-400-801

3. Boost Pump Motor-Impeller - Installation

(Figure 401 and Figure 402)

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-11-00-910-801	Standard Torque Values (P/B 201)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-22-00-730-801	Engine Fuel Feed Pumps and Crossfeed Valves - Functional Test (P/B 501)
28-42-01-420-801	Install the Fuel Pump Pressure Switch (P/B 401)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual
SWPM 20-20-10	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

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(Continued)

Reference	Description
COM-2572	Wrench - Strap, Electrical Connector (for p/n's BT-BS-609/610 max dia 2.50"/1.50" with max part torque 200 in-lb; TG70 max dia 3.00" with max part torque 150 in-lb; BT-BS-611/ 618BSS max dia 4.00" with max part torque 200 in-lb) Part #: BT-BS-609 Supplier: 11851 Part #: BT-BS-610 Supplier: 11851 Part #: BT-BS-611 Supplier: 11851 Part #: BT-BS-618BSS Supplier: 11851 Part #: TG70 Supplier: 06324

D. Consumable Materials

Reference	Description	Specification
A50110	Sealant	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
C00913	Compound - Corrosion Inhibiting Material, Nondrying Resin Mix	BMS3-27
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A
G50237	Compound - Corrosion Inhibiting, Non-drying - Cor-Ban 27L	BMS3-38

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
5	O-ring	Not Specified	
6	O-ring	28-22-05-01A-265	ARO 001-004
		28-22-05-01B-235	ARO 005-016
7	Motor-impeller	28-22-05-01A-215	ARO 001-004
		28-22-05-01B-205	ARO 005-016
11	O-ring	28-22-05-01A-245	ARO 001-004
		28-22-05-01B-215	ARO 005-016
12	O-ring	28-22-05-01A-250	ARO 001-004
		28-22-05-01B-220	ARO 005-016
13	O-ring	28-22-05-01A-255	ARO 001-004
		28-22-05-01B-225	ARO 005-016

F. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right

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(Continued)

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

G. Access Panels

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel
651DB	Inboard Fixed Trailing Edge Panel

H. Procedure

SUBTASK 28-22-05-400-003

(1) If the pressure switch [14] was removed, do this task: Install the Fuel Pump Pressure Switch, TASK 28-42-01-420-801.

SUBTASK 28-22-05-160-001

(2) Clean all surfaces on the motor-impeller [7] and surfaces that touch the pump housing [37] with a clean, cotton wiper, G00034.

SUBTASK 28-22-05-640-001

(3) Apply a thin layer of grease, D00504, to new O-ring [11], O-ring [12], and O-ring [13].

SUBTASK 28-22-05-420-012

(4) Install the new O-ring [11], O-ring [12], and O-ring [13] in the grooves of the motor-impeller [7].

SUBTASK 28-22-05-420-001

(5) Put the extraction lever [3] in the stowed position.

SUBTASK 28-22-05-420-020

(6) Do these steps to install the drain valve [4]:

(a) Apply a thin layer of grease, D00504, to the new O-ring [6] and O-ring [5], if installed, and install them on the drain valve [4].

(b) Install the drain valve [4] into the motor-impeller [7].

(c) Tighten the drain valve [4] to 20 ±2 in-lb (2 ±0 N·m).

SUBTASK 28-22-05-420-002

(7) Put the motor-impeller [7] into the pump housing [37].

(a) Put the motor-impeller [7] in position with the drain plug oriented straight down when you put the motor-impeller [7] into the pump housing [37].

NOTE: Be careful not to damage the O-rings when you put the motor-impeller [7] into the pump housing [37].

(b) Push the motor-impeller [7] into the pump housing [37] until the mounting flange touches the spar.

NOTE: This will engage a pin that opens the guillotine valve in the inlet port.

(c) Turn the motor-impeller [7] 35 degrees in the clockwise direction to align the mounting bolt holes.

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SUBTASK 28-22-05-400-004

(8) If the bonding jumper was fully removed, do these steps to attach the bonding jumper [10] to the structure (SWPM 20-20-00 and SWPM 20-20-10):

(a) Do these steps to prepare the bonding jumper [10] for a fay sealed fay surface bond:

1) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

a) Rub dry with a clean, dry cotton wiper, G00034.

b) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-10: CDCCL

2) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper [10] terminal and the washer [49] for a fay sealed fay surface bond.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

a) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the fay surface fay seal.

b) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

28-AWL-10: CDCCL

(b) Install the bolt [63] and washer [49] to attach the bonding jumper [10] to the tank structure.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

(c) Apply a cap seal of sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296 to the bolt [63] that attaches the bonding jumper [10] to the tank structure.

NOTE: Use the sealant that was used for the fay surface fay seal.

SUBTASK 28-22-05-110-001

(9) Do these steps to prepare the bonding jumper [10] for a fay sealed fay surface bond:

(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-10: CDCCL

(b) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper [10] terminal and the washer [9] for a fay sealed fay surface bond.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

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1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the fay surface fay seal.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

SUBTASK 28-22-05-420-013

28-AWL-10: CDCCL

(10) Install the washer [9] and bolt [8] that attach the bonding jumper [10] and the (pump) motor-impeller [7] (Figure 401).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

(a) Make sure that the bonding surfaces are clean.

(b) Tighten the bolt [8] to 82.5 ±17.5 in-lb (9.3 ±2.0 N·m).

SUBTASK 28-22-05-420-022

(11) Install the three washers [9] and bolts [8] that attach the motor-impeller [7] (Figure 401).

(a) Make sure that the bonding surfaces are clean.

(b) Tighten the bolts [8] to 82.5 ±17.5 in-lb (9.3 ±2.0 N·m).

SUBTASK 28-22-05-390-001

(12) Apply a cap seal of sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296 to the bolt [8] that attaches the bonding jumper [10] to the motor-impeller [7].

NOTE: Use the sealant that was used for the fay surface fay seal.

SUBTASK 28-22-05-760-001

28-AWL-10: CDCCL

(13) Measure the electrical bonding resistance between the (pump) motor-impeller [7] and the airplane structure.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

(a) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-10: CDCCL

(b) Make sure the electrical bonding resistance is 0.00025 ohm (0.25 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

SUBTASK 28-22-05-420-017

(14) Install and tighten by hand the electrical connector [2] for the motor-impeller [7].

SUBTASK 28-22-05-420-018

(15) Tighten the electrical connector [2] approximately 1/8 turn more with a strap wrench, COM-2572, or equivalent.

SUBTASK 28-22-05-420-015

(16) Connect the electrical connector [1] for the pressure switch on the motor-impeller [7].

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SUBTASK 28-22-05-860-004

(17) Remove the safety tags and close these circuit breakers:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
C	18	C28302	R FWD FUEL BOOST PUMP L AC SECT 2
E	2	C28303	L AFT FUEL BOOST PUMP
E	5	C28307	L FWD FUEL BOOST PUMP

Right Power Management Panel, P210

Row	Col	Number	Name
E	27	C28300	R AFT FUEL BOOST PUMP
F	27	C28306	R FWD FUEL BOOST PUMP R XFR

SUBTASK 28-22-05-860-005

(18) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-22-05-860-010

(19) If the boost pump housing was replaced, do these steps:

(a) For the forward fuel pumps (installed on the rear spar of main tanks), refuel the applicable main fuel tank to more than 13,000 lb (5897 kg) (TASK 12-11-01-650-801).

NOTE: This fuel quantity is necessary to cover the forward pump housing.

(b) For the aft fuel boost pumps (installed on the rear spar of the center tank), refuel the applicable center fuel tank to more than 170,000 lb (77,111 kg) or until the center tank is full (Volumetric Shutoff) (TASK 12-11-01-650-801).

NOTE: This fuel quantity is necessary to cover the aft pump housing.

SUBTASK 28-22-05-720-002

(20) Do one of these tests of the fuel boost pump(s):

NOTE: Do this test before you install the L-stiffener assembly [16], HAT-stiffener assembly [18], and faceplate assembly [19]. You can see the pump to check for leaks only if these assemblies are not installed.

(a) To do a functional test of all the pumps, do this task: Engine Fuel Feed Pumps and Crossfeed Valves - Functional Test, TASK 28-22-00-730-801.

(b) To do an operational test for one pump, do these steps:

WARNING DO NOT OPERATE A FUEL PUMP IF THE AMBER PRESS LIGHT COMES ON AND STAYS ON. IT CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE TANK WHICH WILL CAUSE A FIRE OR EXPLOSION. FIRES AND EXPLOSIONS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

1) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

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a) Immediately set the applicable fuel pump switch-light(s) to OFF if the amber PRESS light comes on and stays on.

2) Make sure there is a minimum of 6000 lb (2722 kg) in the applicable main fuel tank.

NOTE: This fuel quantity is necessary to prevent dry operation of the fuel pump.

a) To refuel the fuel tanks (if it is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

3) Push the applicable fuel boost pump switch-light on the Fuel Management Control Panel M28001, on the Overhead Panel P5, to the ON position (Table 401).

Table 401/28-22-05-993-802

MAIN TANK FUEL PUMPS	
PUMP	**SWITCH-LIGHT**
Left Aft Fuel Boost Pump	L AFT PUMP
Left Fwd Fuel Boost Pump	L FWD PUMP
Right Aft Fuel Boost Pump	R AFT PUMP
Right Fwd Fuel Boost Pump	R FWD PUMP

4) Listen at the rear spar to make sure that the applicable fuel boost pump operates (Figure 401).

5) Make sure there are no fuel leaks at the rear spar for the applicable fuel pump.

6) Make sure that the applicable PRESS light on the Fuel Management Control Panel M28001, on the Overhead Panel P5, goes off.

NOTE: The PRESS light will go off in approximately 20 seconds.

7) Make sure that the applicable EICAS status message does not show on the EICAS display for the applicable pump:

a) FUEL PUMP L AFT

b) FUEL PUMP L FWD

c) FUEL PUMP R AFT

d) FUEL PUMP R FWD

8) Push the applicable fuel boost pump switch-light to the off position.

9) Listen at the rear spar to make sure that the applicable fuel boost pump does not operate (Figure 401).

10) For the applicable fuel boost pump, make sure that the PRESS light comes on.

NOTE: The PRESS light will come on in approximately 20 seconds.

SUBTASK 28-22-05-410-007

WARNING

USE NITRILE GLOVES FOR SKIN PROTECTION WHEN YOU USE COR-BAN 27L, G50237. IF IT GETS ON YOUR SKIN, IMMEDIATELY REMOVE IT WITH WATER. IF THIS MATERIAL GETS IN YOUR EYES, IMMEDIATELY FLUSH YOUR EYES WITH WATER. GET MEDICAL AID. THIS MATERIAL CONTAINS FLAMMABLE AGENTS WHICH CAN CAUSE INJURIES TO PERSONNEL.

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(WARNING PRECEDES)

WARNING

DO NOT GET THIS MATERIAL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THIS MATERIAL. PUT ON A RESPIRATOR, EYE PROTECTION (GOGGLES, OR OTHER APPROVED PROTECTION), AND GLOVES BEFORE YOU USE THIS MATERIAL. MAKE SURE THAT THERE IS SUFFICIENT AIRFLOW. KEEP THIS MATERIAL AWAY FROM SPARKS, FLAME, AND HEAT. THIS MATERIAL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

CAUTION

MAKE SURE THAT YOU INSTALL THE L-STIFFENER ASSEMBLY, HAT-STIFFENER ASSEMBLY, AND FACEPLATE ASSEMBLY. THESE ASSEMBLIES PROTECT THE FUEL BOOST PUMP FROM TIRE FRAGMENTS IF A WHEEL IN THE LANDING GEAR BURSTS.

(21) Do these steps for the aft fuel boost pumps:

(a) Apply anti-corrosion Cor-Ban 27L Compound, G50237 or Mastinox 6856 K, C00913 to the surfaces that touch between the: L-stiffener assembly [16], HAT-stiffener assembly [18], faceplate assembly [19] and support structure.

(b) Apply anti-corrosion Cor-Ban 27L Compound, G50237 or Mastinox 6856 K, C00913 to the bolts [15] and bolts [17] before installation.

(c) Put the L-stiffener assembly [16] in its position and install the two bolts [17]. Refer to Standard Torque Values, TASK 20-11-00-910-801.

(d) Put the HAT-stiffener assembly [18] in its position and install the two bolts [17]. Refer to Standard Torque Values, TASK 20-11-00-910-801.

(e) Put the faceplate assembly [19] in its position and install the 38 bolts [15]. Refer to Standard Torque Values, TASK 20-11-00-910-801.

SUBTASK 28-22-05-410-004

(22) Close these panels on the wing:

(a) For the left forward fuel boost pump, close this access panel:

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

(b) For the right forward fuel boost pump, close this access panel:

Number	Name/Location
651DB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-22-05-860-006

WARNING

OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(23) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

END OF TASK

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TASK 28-22-05-000-802

4. Boost Pump Housing - Removal

(Figure 402)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
12-11-02-650-801	Fuel Tank Sump Drain Valve - Tank Entry (P/B 301)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-300-802	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)
28-26-00-650-803	Suction Defueling (P/B 201)

B. Tools/Equipment

Reference	Description
STD-1285	Container - Fuel Resistant, 10 Gallon (38 Liter)

C. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

D. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

E. Access Panels

Number	Name/Location
531CB	Access Door
533BB	Access Door
631CB	Access Door
633BB	Access Door

F. Procedure

SUBTASK 28-22-05-650-002

(1) Do these steps to remove fuel from the applicable fuel tanks:

(a) To remove the left or right aft fuel boost pump housing, do these steps:

NOTE: The left and right aft fuel boost pump housings are installed in the left and right center fuel tanks, respectively.

1) Defuel the center fuel tank (TASK 28-26-00-650-801, TASK 28-26-00-650-802, or TASK 28-26-00-650-803).

2) Defuel the applicable left or right main fuel tank.

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3) To defuel the main tank, do one of these tasks:
   a) Transfer fuel to the opposite main fuel tank (TASK 28-26-00-650-802).
   b) Defuel the main fuel tank (TASK 28-26-00-650-801).
4) Remove the fuel that remains in the center fuel tank (TASK 12-11-02-650-801).

(b) To remove the left or right forward fuel boost pump housing, do these steps:

NOTE: The left and right forward fuel boost pump housings are installed in the left and right main fuel tanks, respectively.

1) Defuel the center fuel tank to less than 35,000 lb (15,876 kg) of fuel (TASK 28-26-00-650-801, TASK 28-26-00-650-802, or TASK 28-26-00-650-803).
2) Defuel the applicable left or right main fuel tank.
3) To defuel the fuel main tanks, do one of these tasks:
   a) Transfer fuel the opposite main fuel tank (TASK 28-26-00-650-802).
   b) Defuel the main fuel tank (TASK 28-26-00-650-801).
4) Remove the fuel that remains in the applicable main fuel tank (TASK 12-11-02-650-801).

(c) Make sure the FWD and AFT fuel crossfeed valve switches, on the P5 Overhead Panel, are in the CLOSED position.

(d) Make sure the left and right engine control switches, on the P10 Control Stand, are in the CUTOFF position.

SUBTASK 28-22-05-020-027

(2) Remove the applicable motor-impeller [7] (TASK 28-22-05-000-801).

SUBTASK 28-22-05-650-003

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(3) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-22-05-010-003

(4) To get access to left or right forward boost pump housing [37], open the applicable access doors:

(Figure 402)

Number	Name/Location
533BB	Access Door
633BB	Access Door

SUBTASK 28-22-05-010-004

(5) To get access to left or right aft boost pump housing [37], open the applicable access doors:

(Figure 402)

Number	Name/Location
531CB	Access Door
631CB	Access Door

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SUBTASK 28-22-05-940-001

(6) Go into the left or right main fuel tank to remove the forward boost pump housing [37] (TASK 28-11-00-010-801).

SUBTASK 28-22-05-010-005

(7) Go into the left or right center fuel tank to remove the aft boost pump housing [37] (TASK 28-11-00-010-801).

SUBTASK 28-22-05-020-038

(8) Put a 10 gallon (38 liter) fuel resistant container, STD-1285, below the boost pump to catch fuel.

SUBTASK 28-22-05-020-039

(9) Put cotton wipers, G00034, below the boost pump to absorb fuel.

NOTE: Count the cotton wipers, G00034, to make sure you do not leave them in the fuel tank.

SUBTASK 28-22-05-020-028

(10) For the aft fuel boost pumps, disconnect the flexible full coupling [42] to disconnect the vapor vent line [44] at the vapor vent valve [41].

NOTE: A small quantity of fuel can drain from the fuel line.

(a) Discard the O-ring [43].

ARO 001-004 PRE SB 777-28-0078

SUBTASK 28-22-05-020-029

(11) Disconnect the flexible full coupling [35] to disconnect the motive flow line [34] and motive flow line [45] at the motive flow valve [51].

NOTE: A small quantity of fuel can drain from the fuel line.

(a) Discard the O-ring [36].

ARO 005-999; ARO 001-004 POST SB 777-28-0078

SUBTASK 28-22-05-020-040

(12) For the forward pump housing, disconnect the flexible full coupling [35] to disconnect the motive flow line [34] at the motive flow valve [51].

NOTE: A small quantity of fuel can drain from the fuel line.

(a) Discard the O-ring [36].

ARO ALL

SUBTASK 28-22-05-020-030

(13) Disconnect the flexible full coupling [38] to disconnect the fuel inlet line [40], and fuel inlet line [46] from the pump housing [37].

(a) Discard the O-ring [39].

SUBTASK 28-22-05-020-031

(14) Disconnect the flexible full coupling [32] to disconnect the fuel outlet line [31], and fuel outlet line [47] from the pump housing [37].

NOTE: As much as 1 gal (4 l) of fuel can drain from the fuel line.

(a) Discard the O-ring [33].

SUBTASK 28-22-05-020-005

(15) Remove the sealant between the pump housing [37] and the rear spar, in the fuel tank (TASK 28-11-00-300-802).

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SUBTASK 28-22-05-020-006

(16) Remove the sealant from the bonding jumper [10] on rear spar, out of the fuel tank (TASK 28-11-00-300-802).

SUBTASK 28-22-05-020-002

(17) Have one person hold the pump housing [37] in its position, in the fuel tank.

SUBTASK 28-22-05-020-032

(18) Have another person remove the three bolts [48] and washers [49] and bolt [63], washer [49], and bonding jumper [10] (from out of the fuel tank) that attach the pump housing [37] to the rear spar.

SUBTASK 28-22-05-020-033

(19) Carefully remove the pump housing [37].

NOTE: Move the pump housing up or down to remove the pump housing [37] from the fuel lines.

(a) Discard the packing [62].

SUBTASK 28-22-05-020-003

(20) Remove the pump housing [37] from the fuel tank.

SUBTASK 28-22-05-020-004

(21) If it is necessary, do these steps to remove the inlet valve (Figure 402):

(a) Remove the seven bolts [56] to remove the valve cover [55].

(b) Carefully remove the valve cover [55] from the pump housing [37].

(c) Carefully remove the spring seal [58] from the valve cover [55].

(d) Remove the ring seal [57] from the spring seal [58] and discard.

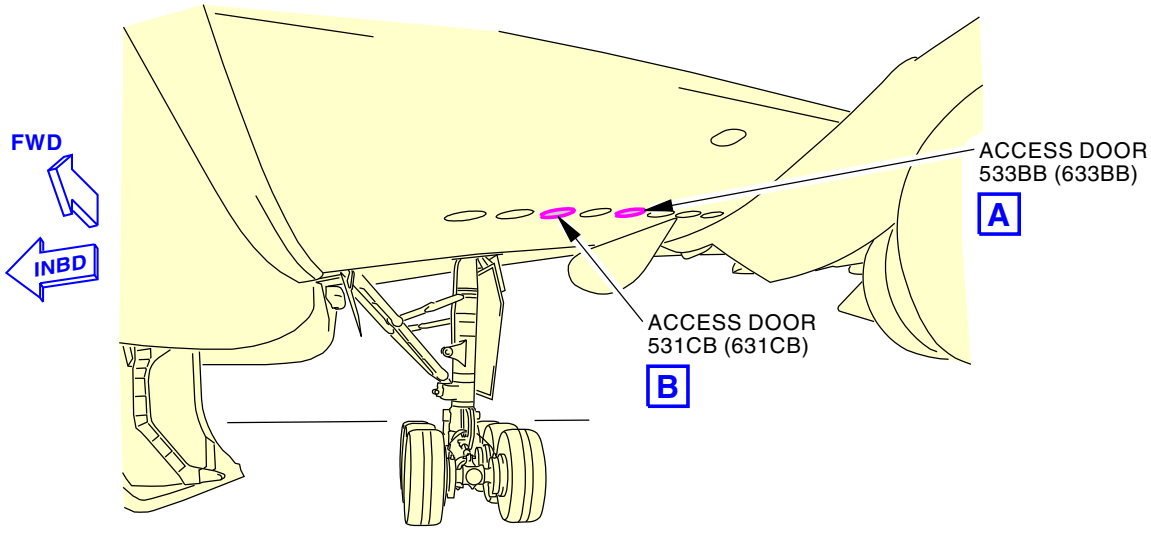
(e) Remove the valve plate [59] with the pin [54] from the pump housing [37].

(f) Remove the damper [60] and O-ring [61] with air pressure from inside the pump housing [37].

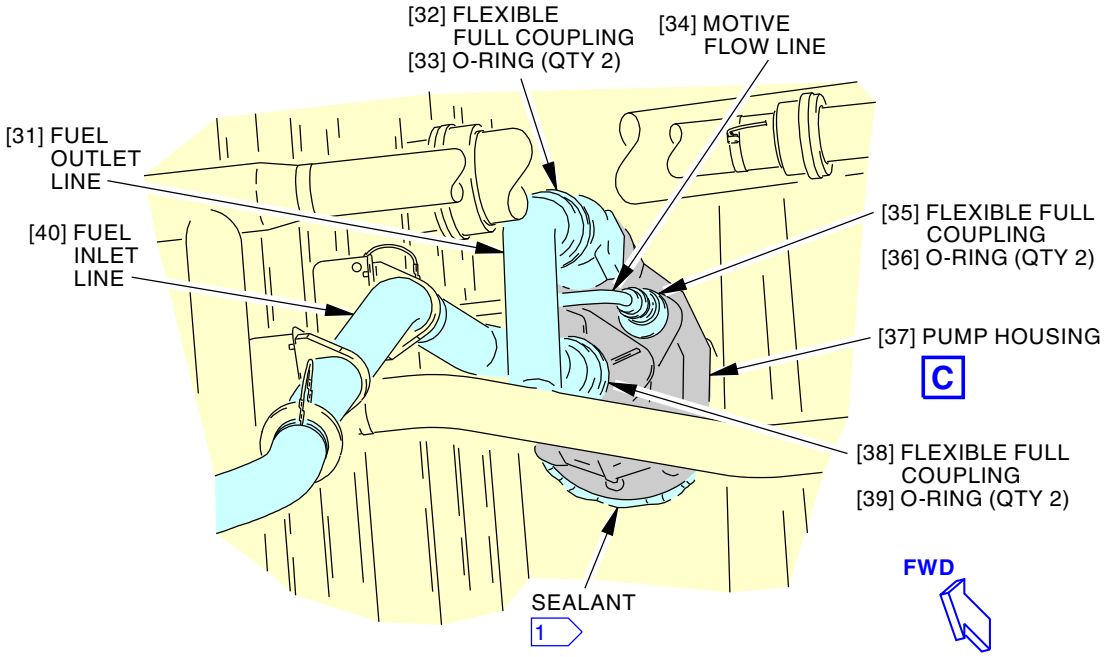
NOTE: Do not remove the support ring [53] from the pump housing [37].

——— END OF TASK ———

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LEFT WING
(RIGHT WING IS EQUIVALENT)



FORWARD FUEL BOOST PUMP HOUSING INSTALLATION

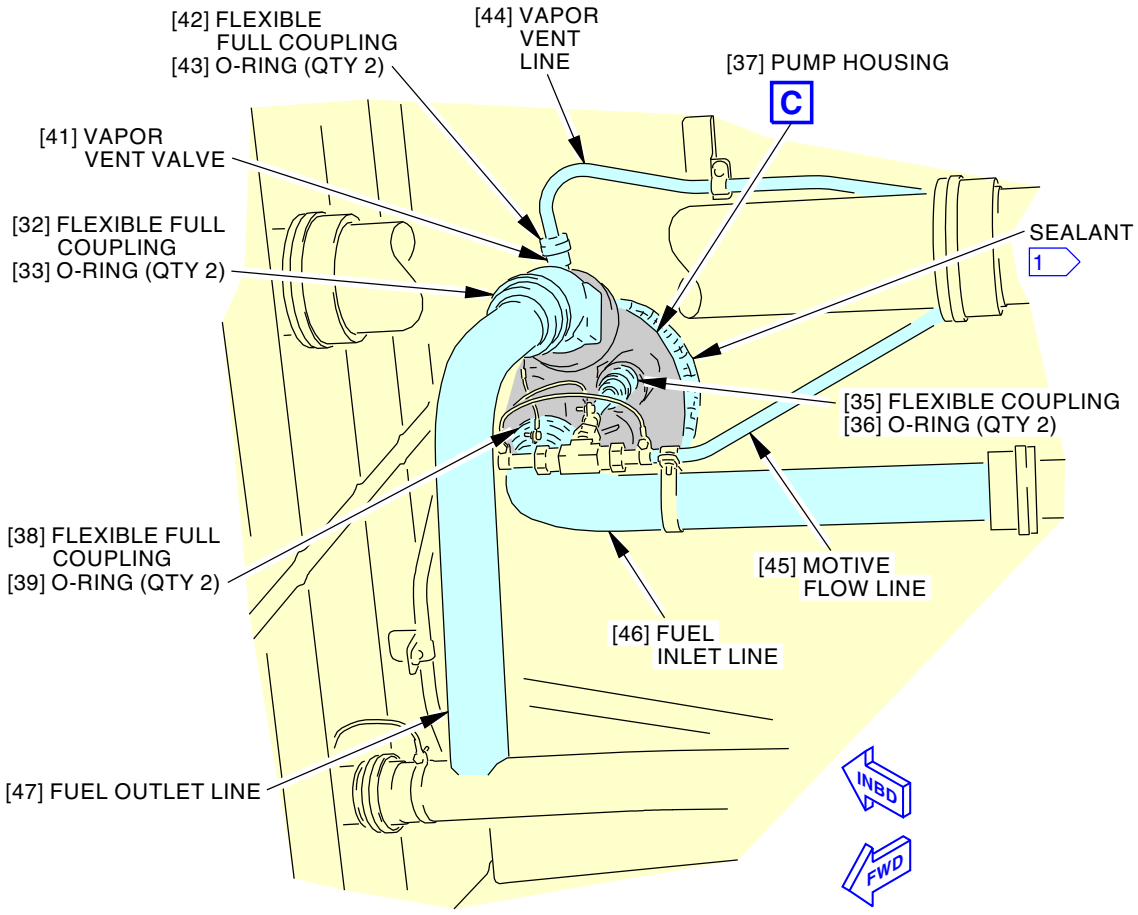
A

1 FILLET SEAL BETWEEN PUMP HOUSING AND REAR SPAR

E25805 S0006415142_V2

Main Fuel Tank Fuel Boost Pump Housing Installation
Figure 402/28-22-05-990-802 (Sheet 1 of 5)

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AFT FUEL BOOST PUMP HOUSING INSTALLATION

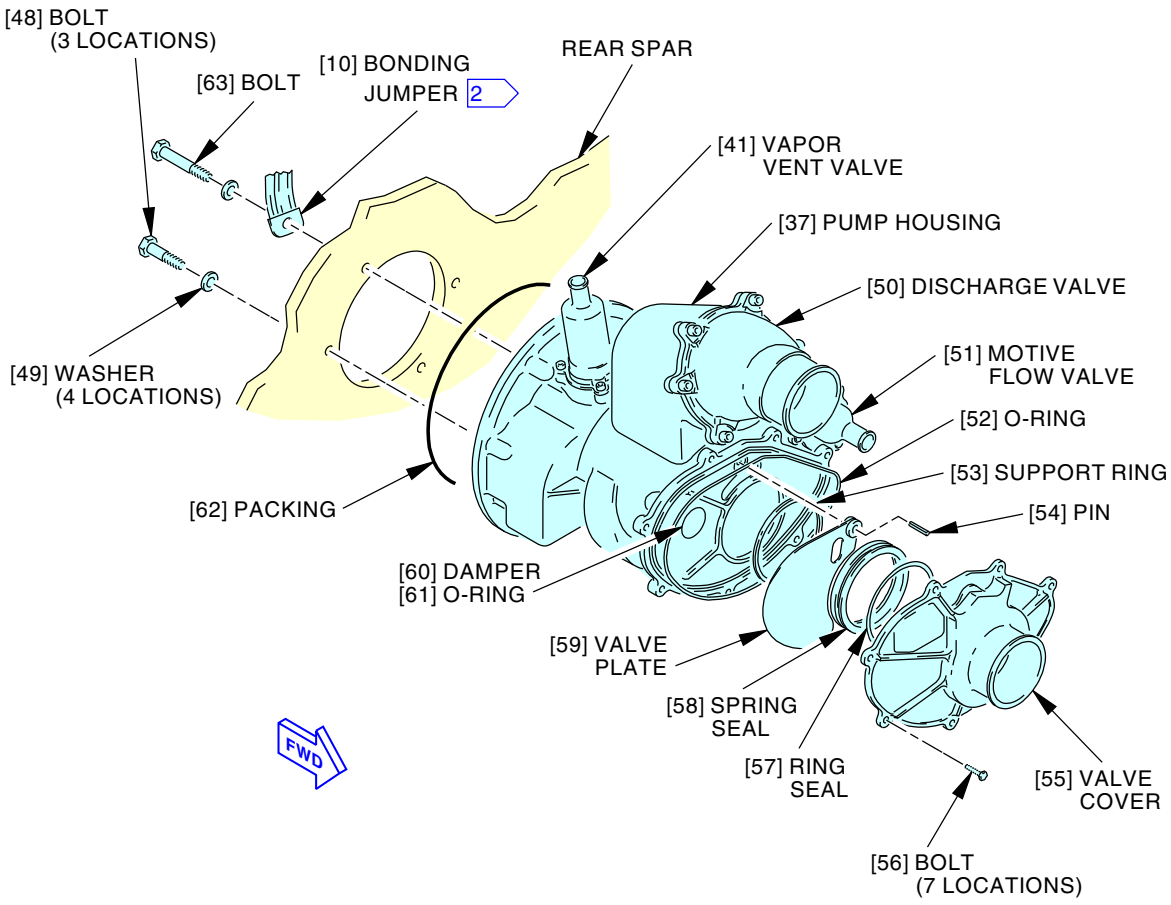
B

1 FILLET SEAL BETWEEN PUMP HOUSING AND REAR SPAR

E25684 S0006415143_V2

Main Fuel Tank Fuel Boost Pump Housing Installation
Figure 402/28-22-05-990-802 (Sheet 2 of 5)

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FUEL BOOST PUMP HOUSING

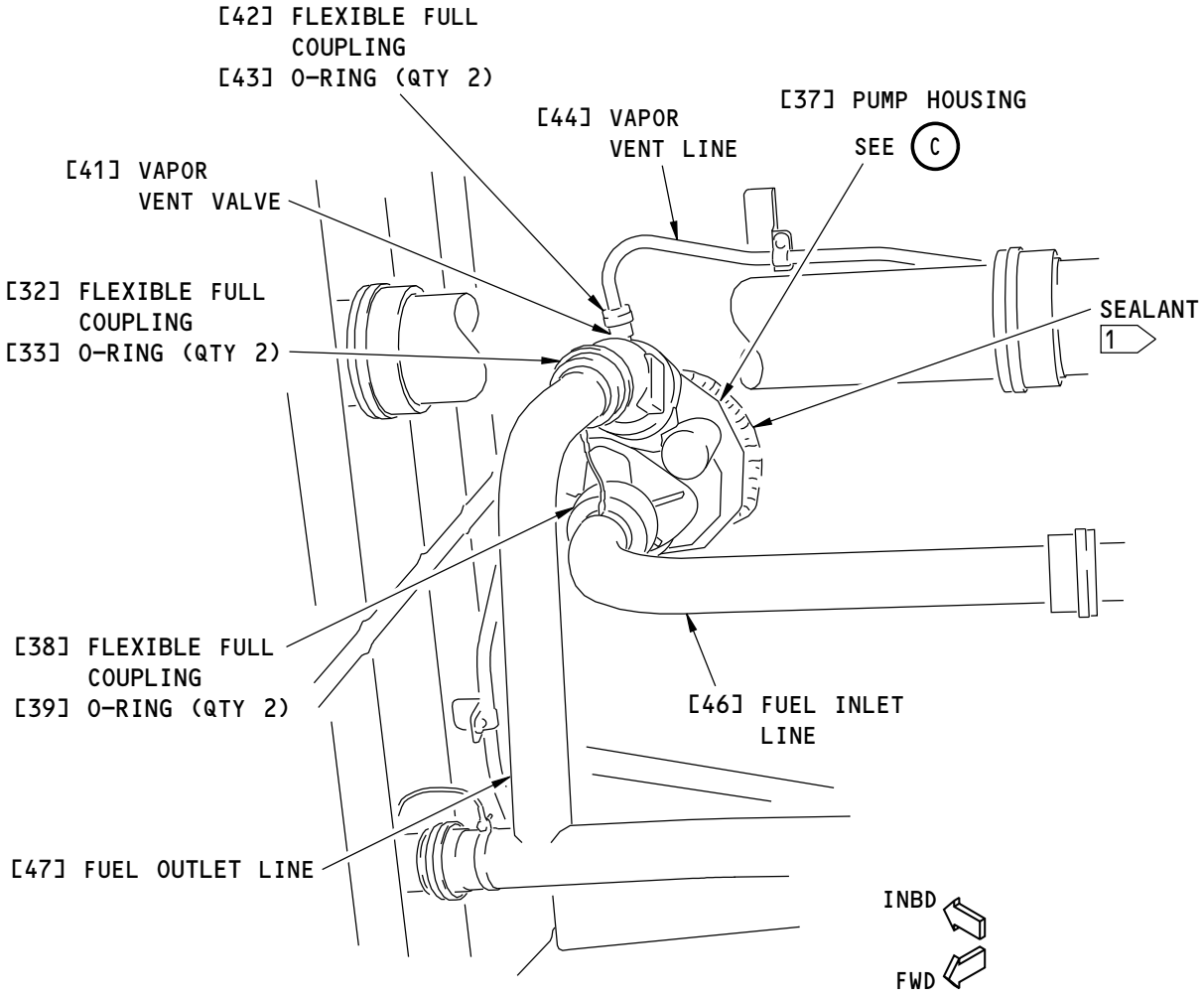
C

2 THE BONDING RESISTANCE BETWEEN THE MOTOR-IMPELLER AND THE AIRPLANE STRUCTURE MUST BE 0.00025 OHM OR LESS

E31192 S0006415144_V3

Main Fuel Tank Fuel Boost Pump Housing Installation
Figure 402/28-22-05-990-802 (Sheet 3 of 5)

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AFT FUEL BOOST PUMP HOUSING INSTALLATION

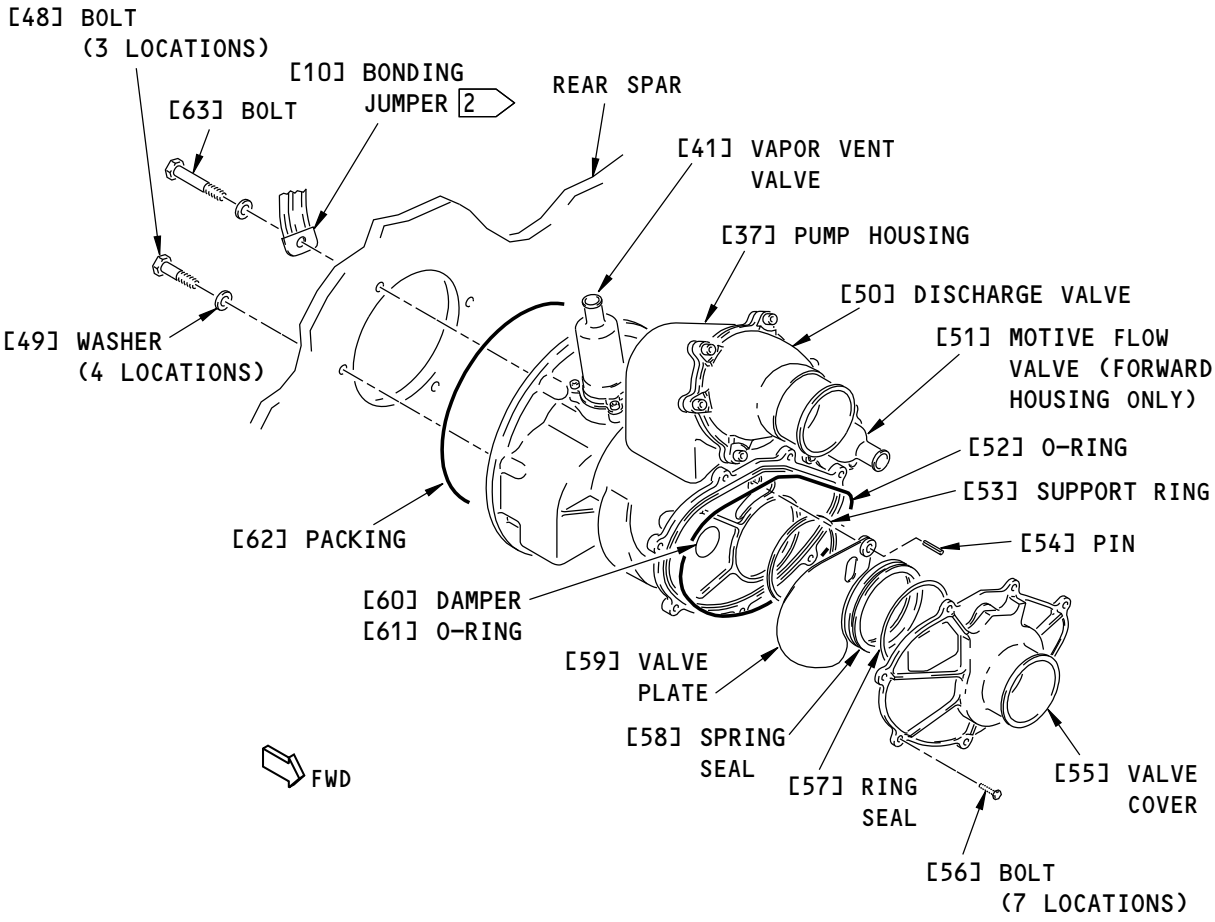
B

1 FILLET SEAL BETWEEN PUMP HOUSING AND REAR SPAR

2232528 S0000497478_V1

Main Fuel Tank Fuel Boost Pump Housing Installation
Figure 402/28-22-05-990-802 (Sheet 4 of 5)

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FUEL BOOST PUMP HOUSING
(EXAMPLE)

C

2 THE BONDING RESISTANCE BETWEEN THE MOTOR-IMPELLER AND THE AIRPLANE STRUCTURE MUST BE 0.00025 OHM OR LESS

2232547 S0000497479_V1

Main Fuel Tank Fuel Boost Pump Housing Installation
Figure 402/28-22-05-990-802 (Sheet 5 of 5)

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TASK 28-22-05-400-802

5. Boost Pump Housing - Installation

(Figure 402)

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

B. References

Reference	Title
20-10-19-400-801	O-Rings Installation (P/B 401)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-300-802	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-22-15-400-802-001	Fuel Line, Fitting and Coupling - Installation (P/B 401)
28-22-15-700-802-001	Fuel Tube Damage Criteria - Inspection/Check (P/B 601)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

D. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS5-95
A00767	Sealant - Fuel Tank	BMS5-45
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142 Type II

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(Continued)

Reference	Description	Specification
A50110	Sealant	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
B00148	Solvent - Methyl Ethyl Ketone (MEK)	ASTM D740
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
C00064	Coating - Aluminum Chemical Conversion	BAC5719 Type II Class A (MIL-DTL-5541 Class 1A)
C00259	Coating - Chemical And Solvent Resistant Finish, Corrosion Inhibiting Primer	BMS10-11 Type I
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
52	O-ring	28-22-05-01A-170	ARO 001-004
		28-22-05-01B-160	ARO 005-016
61	O-ring	28-22-05-01A-205	ARO 001-004
		28-22-05-01B-195	ARO 005-016

F. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

G. Access Panels

Number	Name/Location
531CB	Access Door
533BB	Access Door
631CB	Access Door
633BB	Access Door

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H. Procedure

SUBTASK 28-22-05-650-004

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

SUBTASK 28-22-05-420-003

(2) If the inlet valve is removed, do these steps to install it (Figure 402):

(a) Apply a thin layer of grease, D00504, to the O-ring [61].

(b) Install the damper [60] and O-ring [61] into the pump housing [37].

(c) Install the valve plate [59] with the pin [54] into the pump housing [37].

(d) Apply a thin layer of grease, D00504, to the ring seal [57].

(e) Carefully install a new spring seal [58] and ring seal [57] into the valve cover [55].

(f) Install a new O-ring [52] into the pump housing [37].

1) Apply a thin layer of grease, D00504, to the O-ring [52].

(g) Carefully install the valve cover [55] onto the pump housing [37].

(h) Install the seven bolts [56] attach the valve cover [55].

SUBTASK 28-22-05-100-001

(3) Clean the surfaces that touch between the rear spar and bonding jumper [10] with solvent, B00148, out of the fuel tank (Figure 401, View D).

SUBTASK 28-22-05-200-001

(4) Inspect these check valves in the pump housing [37] before you install the pump housing [37]:

NOTE: Manually open the check valves from, inside the pump housing [37], to make sure they are free to operate.

(a) discharge valve [50]

(b) vapor vent valve [41]

(c) motive flow valve [51]

SUBTASK 28-22-05-400-001

(5) Go into the left or right main fuel tank to install the forward boost pump housing [37].

SUBTASK 28-22-05-400-002

(6) Go into the left or right center fuel tank to install the aft boost pump housing [37].

SUBTASK 28-22-05-100-002

(7) Clean the surfaces that touch between the rear spar and the pump housing [37] with solvent, B00148, in the fuel tank.

NOTE: Make sure the surface on the rear spar is clean. If the surface is not clean, the sealant will not bond correctly.

SUBTASK 28-22-05-420-016

(8) Install a new packing [62] between the pump housing [37] and the rear spar (TASK 20-10-19-400-801).

(a) Apply a thin layer of grease, D00504, to the packing [62].

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SUBTASK 28-22-05-110-002

(9) Do these steps to prepare the bonding jumper [10] for a fay sealed fay surface bond:

(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-10: CDCCL

(b) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper [10] terminal and the washer [49] for a fay sealed fay surface bond.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the fay surface fay seal.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

SUBTASK 28-22-05-420-004

(10) Put the pump housing [37] in its position in the fuel tank and do these steps:

(a) Install the three bolts [48] and washers [49] (from out of the fuel tank).

28-AWL-10: CDCCL

(b) Install the bolt [63] and washer [49] to connect the bonding jumper [10] to structure (from out of the fuel tank).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

1) Attach the bonding jumper as shown (Figure 401, View E) to permit installation of the motor-impeller.

(c) Tighten the bolts [48] and bolt [63] for the pump housing to between 65 in-lb (7 N·m) - 100 in-lb (11 N·m).

SUBTASK 28-22-05-390-002

(11) Apply a cap seal of sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296 to the bolt [63] that attaches the bonding jumper [10] to the tank structure.

NOTE: Use the sealant that was used for the fay surface fay seal.

SUBTASK 28-22-05-420-005

(12) Do these steps to connect the vapor vent line for the aft fuel boost pumps (Figure 402, View B):

(a) Inspect the coupling [42] for wear and replace if it is necessary (TASK 28-22-15-700-802-001).

(b) Lubricate and install new O-rings [43] with a light layer of petrolatum grease, D00504.

(c) Connect the flexible full coupling [42] for the vapor vent line [44] (TASK 28-22-15-400-802-001).

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(d) Install MS20995C32 lockwire, G01048, to the coupling (TASK 20-10-23-400-801).

ARO 001-004 PRE SB 777-28-0078

SUBTASK 28-22-05-020-034

(13) Do these steps to connect the motive flow line (Figure 402, Views A and B):

(a) Inspect the coupling [35] for wear and replace if it is necessary (TASK 28-22-15-700-802-001).

(b) Lubricate and install the O-ring [36] with a light layer of petrolatum grease, D00504.

(c) Connect the flexible full coupling [35] for the motive flow line [34] and motive flow line [45] (TASK 28-22-15-400-802-001).

(d) Install MS20995C32 lockwire, G01048, to the coupling (TASK 20-10-23-400-801).

ARO 005-999; ARO 001-004 POST SB 777-28-0078

SUBTASK 28-22-05-420-021

(14) For the forward fuel boost pump housing, do these steps to connect the motive flow line (Figure 402, View A):

(a) Inspect the coupling [35] for wear and replace if it is necessary (TASK 28-22-15-700-802-001).

(b) Lubricate and install the O-ring [36] with a light layer of petrolatum grease, D00504.

(c) Connect the flexible full coupling [35] for the motive flow line [34] (TASK 28-22-15-400-802-001).

(d) Install MS20995C32 lockwire, G01048, to the coupling (TASK 20-10-23-400-801).

ARO ALL

SUBTASK 28-22-05-020-035

(15) Do these steps to connect the fuel inlet line (Figure 402, Views A and B):

(a) Inspect the coupling [38] for wear and replace if it is necessary (TASK 28-22-15-700-802-001).

(b) Lubricate and install the O-rings [39] with a light layer of petrolatum grease, D00504.

(c) Connect the flexible full coupling [38] for the fuel inlet line [40] and fuel inlet line [46] (TASK 28-22-15-400-802-001).

(d) Install MS20995C32 lockwire, G01048, to the coupling (TASK 20-10-23-400-801).

SUBTASK 28-22-05-020-036

(16) Do these steps to connect the fuel outlet line (Figure 402, Views A and B).

(a) Inspect the coupling [32] for wear and replace if it is necessary (TASK 28-22-15-700-802-001).

(b) Lubricate and install the O-ring [33] with a light layer of petrolatum grease, D00504.

(c) Connect the flexible full coupling [32] for the fuel outlet line [31] and fuel outlet line [47] (TASK 28-22-15-400-802-001).

(d) Install MS20995C32 lockwire, G01048, to the coupling (TASK 20-10-23-400-801).

SUBTASK 28-22-05-760-002

(17) Measure the electrical bonding resistance, between the pump housing [37] and the airplane structure, with an intrinsically safe approved bonding meter, COM-1550.

(a) Make sure the electrical bonding resistance is 0.00025 ohm (0.25 milliohm) or less.

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SUBTASK 28-22-05-410-001

(18) Apply a fillet seal between the pump housing [37] and the rear spar, in the fuel tank (TASK 28-11-00-300-802).

(a) Use these sealants: sealant, A00767, or equivalent. For sealant types refer to (TASK 28-11-00-300-802).

(b) If there is exposed structure, apply an alodine coating, C00064, to the exposed area on the rear spar (TASK 28-11-00-600-801).

SUBTASK 28-22-05-410-006

(19) Do these steps to apply sealant to the bonding jumper connection, between the bonding jumper [10] and the rear spar (out of the fuel tank) (Figure 401, View D):

(a) Clean the bonding jumper connection with solvent, B00148, if it is necessary.

(b) Apply sealant to the bonding jumper connection (TASK 28-11-00-300-802).

1) Use one of these sealants: sealant, A02315, or sealant, A00247.

(c) If there is exposed structure, apply primer, C00259, to the exposed areas on the rear spar.

SUBTASK 28-22-05-010-006

(20) Do these steps to close the fuel tank:

(a) Do the fuel tank closure procedure (TASK 28-11-00-410-801).

(b) For the left or right forward boost pump housing [37], close the applicable access doors: (Figure 402)

Number	Name/Location
533BB	Access Door
633BB	Access Door

(c) For the left or right aft boost pump housing [37], close the applicable access doors: (Figure 402)

Number	Name/Location
531CB	Access Door
631CB	Access Door

SUBTASK 28-22-05-420-006

(21) Install the boost pump motor-impeller [7] (TASK 28-22-05-400-801).

——— END OF TASK ———

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MAIN TANK FUEL BOOST PUMP - INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure contains a functional check of the bonding resistance between the structure and the main tank fuel boost pumps.

SFAR 88

TASK 28-22-05-200-801

2. Main Tank Fuel Boost Pump Motor-Impeller - Bonding Resistance Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
20-11-00-910-801	Standard Torque Values (P/B 201)
28-22-05-400-801	Boost Pump Motor-Impeller - Installation (P/B 401)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17
COM-2572	Wrench - Strap, Electrical Connector (for p/n's BT-BS-609/610 max dia 2.50"/1.50" with max part torque 200 in-lb; TG70 max dia 3.00" with max part torque 150 in-lb; BT-BS-611/ 618BSS max dia 4.00" with max part torque 200 in-lb) Part #: BT-BS-609 Supplier: 11851 Part #: BT-BS-610 Supplier: 11851 Part #: BT-BS-611 Supplier: 11851 Part #: BT-BS-618BSS Supplier: 11851 Part #: TG70 Supplier: 06324

C. Consumable Materials

Reference	Description	Specification
C00913	Compound - Corrosion Inhibiting Material, Nondrying Resin Mix	BMS3-27

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(Continued)

Reference	Description	Specification
G50237	Compound - Corrosion Inhibiting, Non-drying - Cor-Ban 27L	BMS3-38

D. Location Zones

Zone	Area
551	Rear Spar to Landing Gear Support Beam - Left Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

E. Access Panels

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel
651DB	Inboard Fixed Trailing Edge Panel

F. Prepare for the Procedure

SUBTASK 28-22-05-212-001

WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONS, AND DAMAGE TO EQUIPMENT.

(1) Make sure the landing gear downlocks are installed (TASK 32-00-30-480-801).

SUBTASK 28-22-05-490-001

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-22-05-865-001

(3) Open these circuit breakers and install safety tags:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
C	18	C28302	R FWD FUEL BOOST PUMP L AC SECT 2
E	2	C28303	L AFT FUEL BOOST PUMP
E	5	C28307	L FWD FUEL BOOST PUMP

Right Power Management Panel, P210

Row	Col	Number	Name
E	27	C28300	R AFT FUEL BOOST PUMP
F	27	C28306	R FWD FUEL BOOST PUMP R XFR

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SUBTASK 28-22-05-010-011

(4) To get access to the applicable forward boost pump, open these panels on the wing (TASK 06-44-00-800-802).

(a) Open this access panel to get access to the left forward fuel boost pump, installed on the rear spar of the left wing:

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

(b) Open this access panel to get access to the right forward fuel boost pump, installed on the rear spar of the right wing:

Number	Name/Location
651DB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-22-05-020-037

(5) To get access to the aft fuel boost pumps, do these steps:

(a) Remove the thirty-eight bolts and remove the faceplate assy.

(b) Remove the two bolts and remove the L-stiffener assy.

(c) Remove the two bolts and remove the Hat-stiffener assy.

G. Electrical Bonding Measurement

SUBTASK 28-22-05-862-001

(1) Disconnect the electrical connector from the motor-impeller.

SUBTASK 28-22-05-765-001

(2) Measure the bonding resistance between the motor-impeller and the airplane structure, with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

(a) Make sure the bonding resistance is 0.00025 ohm (0.25 milliohm) or less.

SUBTASK 28-22-05-765-003

(3) Measure the bonding resistance between the bonding jumper and the airplane structure with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

(a) Make sure the bonding resistance is 0.00025 ohm (0.25 milliohm) or less.

SUBTASK 28-22-05-861-001

(4) Install and tighten by hand the electrical connector for the motor-impeller.

SUBTASK 28-22-05-560-001

(5) Tighten the electrical connector approximately 1/8 turn more with the strap wrench, COM-2572, or equivalent.

SUBTASK 28-22-05-860-013

(6) Remove the safety tags and close these circuit breakers:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
C	18	C28302	R FWD FUEL BOOST PUMP L AC SECT 2
E	2	C28303	L AFT FUEL BOOST PUMP
E	5	C28307	L FWD FUEL BOOST PUMP

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Right Power Management Panel, P210

Row	Col	Number	Name
E	27	C28300	R AFT FUEL BOOST PUMP
F	27	C28306	R FWD FUEL BOOST PUMP R XFR

SUBTASK 28-22-05-420-019

WARNING

USE NITRILE GLOVES FOR SKIN PROTECTION WHEN YOU USE COR-BAN 27L, G50237. IF IT GETS ON YOUR SKIN, IMMEDIATELY REMOVE IT WITH WATER. IF THIS MATERIAL GETS IN YOUR EYES, IMMEDIATELY FLUSH YOUR EYES WITH WATER. GET MEDICAL AID. THIS MATERIAL CONTAINS FLAMMABLE AGENTS WHICH CAN CAUSE INJURIES TO PERSONNEL.

WARNING

DO NOT GET THIS MATERIAL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THIS MATERIAL. PUT ON A RESPIRATOR, EYE PROTECTION (GOGGLES, OR OTHER APPROVED PROTECTION), AND GLOVES BEFORE YOU USE THIS MATERIAL. MAKE SURE THAT THERE IS SUFFICIENT AIRFLOW. KEEP THIS MATERIAL AWAY FROM SPARKS, FLAME, AND HEAT. THIS MATERIAL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(7) Do these steps for the aft fuel boost pumps:

(a) Apply anti-corrosion Cor-Ban 27L Compound, G50237 or Mastinox 6856 K, C00913 to the surfaces that touch between the: L-stiffener assy, Hat-stiffener assy, faceplate assy and support structure.

(b) Apply anti-corrosion Cor-Ban 27L Compound, G50237 or Mastinox 6856 K, C00913 to the bolts before installation.

(c) Put the L-stiffener assembly in its position and install the two bolts. Refer to Standard Torque Values, TASK 20-11-00-910-801.

(d) Put the Hat-stiffener assembly in its position and install the two bolts. Refer to Standard Torque Values, TASK 20-11-00-910-801.

(e) Put the faceplate assembly in its position and install the thirty-eight bolts. Refer to Standard Torque Values, TASK 20-11-00-910-801.

SUBTASK 28-22-05-710-001

(8) Do the boost pump motor impeller test in Boost Pump Motor-Impeller - Installation, TASK 28-22-05-400-801.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-05-410-008

(1) Close these panels on the wing:

(a) For the left forward fuel boost pump, close this access panel:

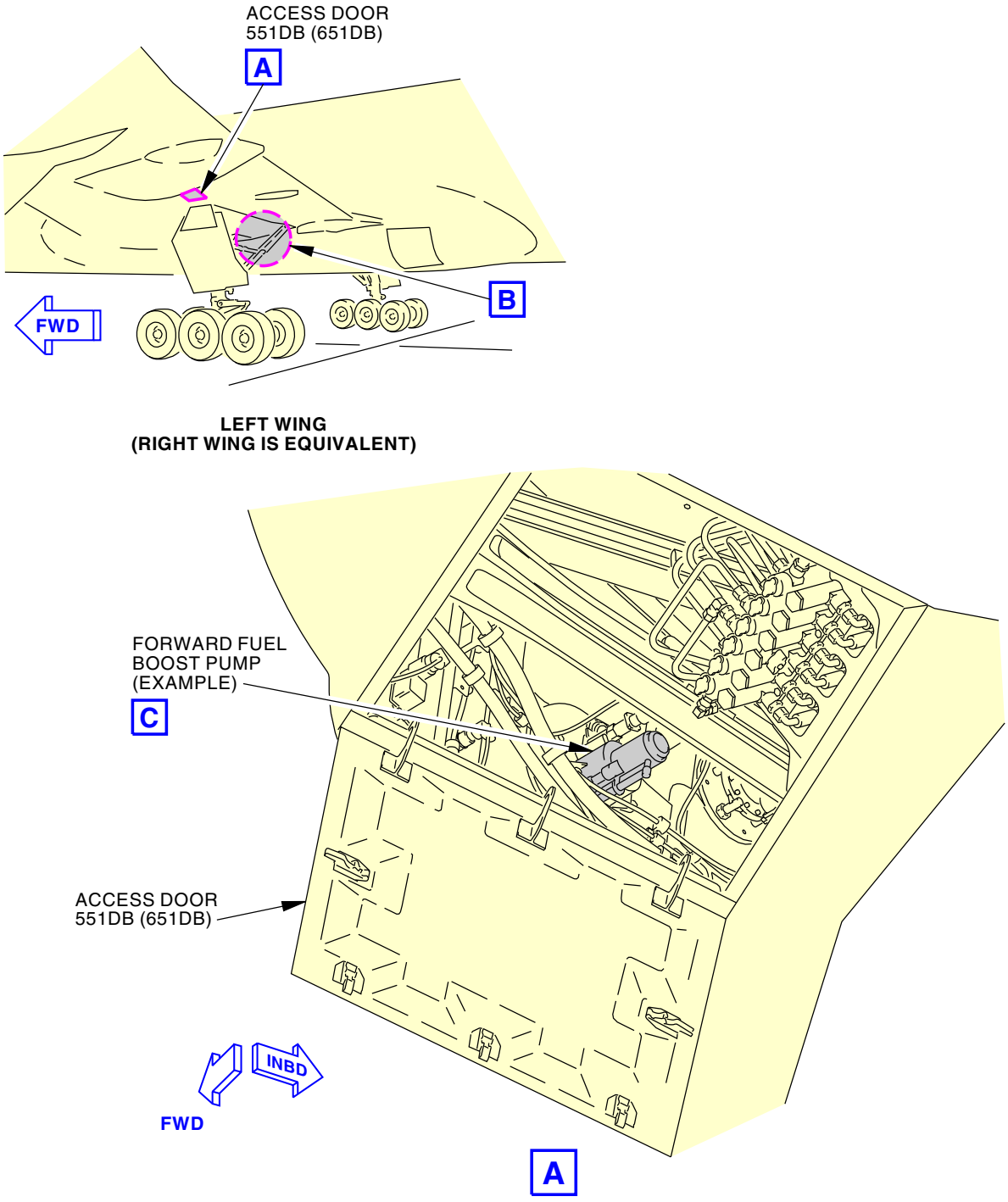
Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

(b) For the right forward fuel boost pump, close this access panel:

Number	Name/Location
651DB	Inboard Fixed Trailing Edge Panel

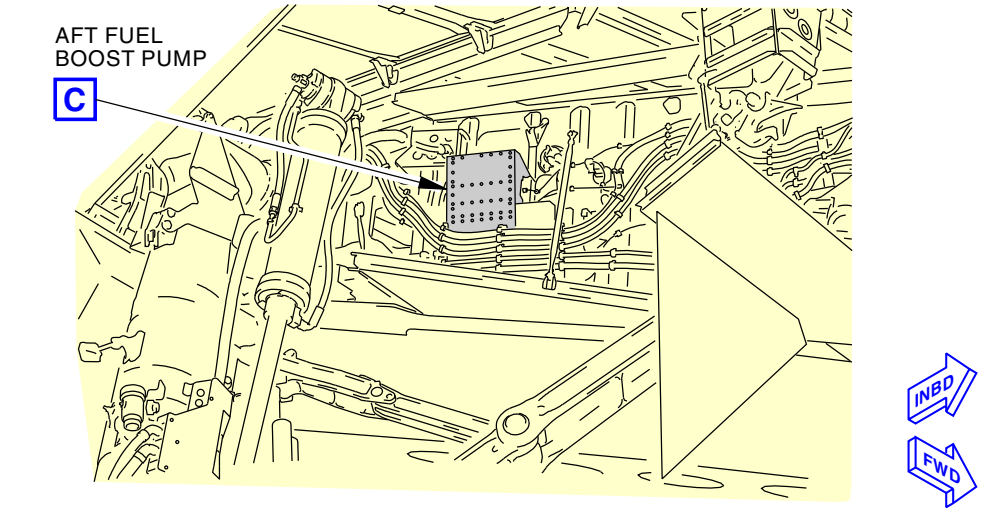
END OF TASK

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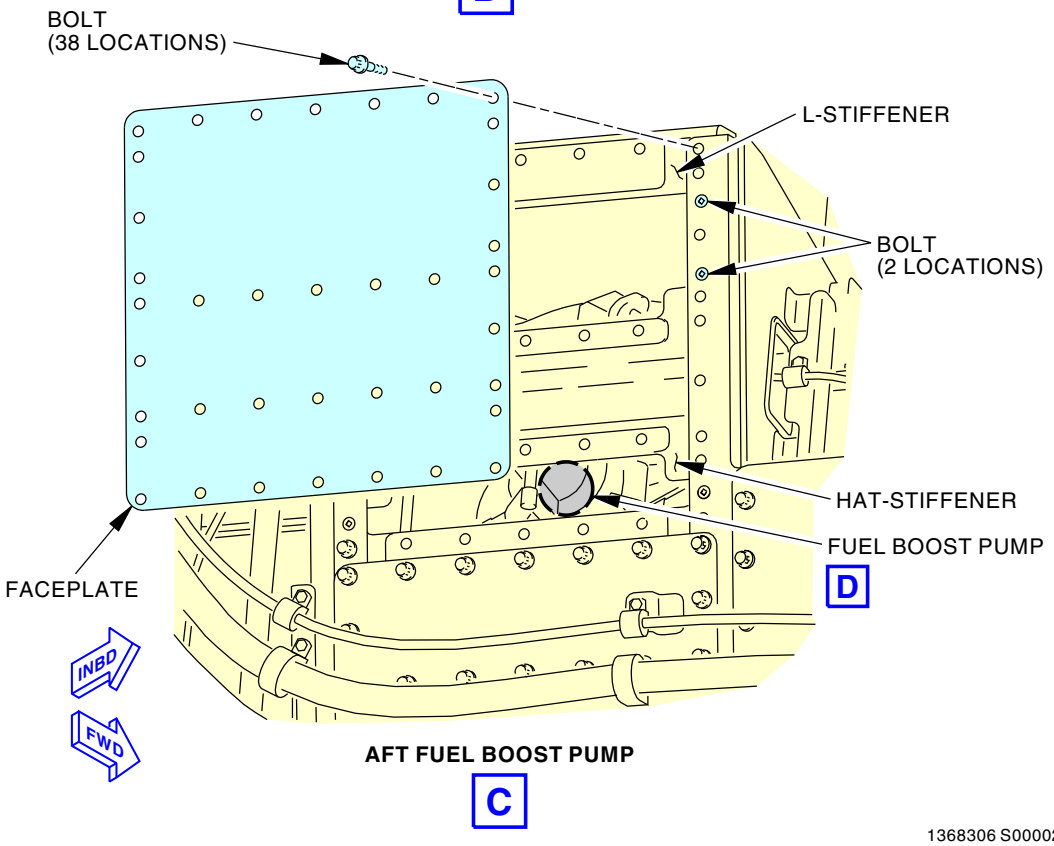
Main Tank Fuel Boost Pump - Bonding Resistance Measurement
Figure 601/28-22-05-990-805 (Sheet 1 of 3)

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LEFT WING
(RIGHT WING IS EQUIVALENT)

B



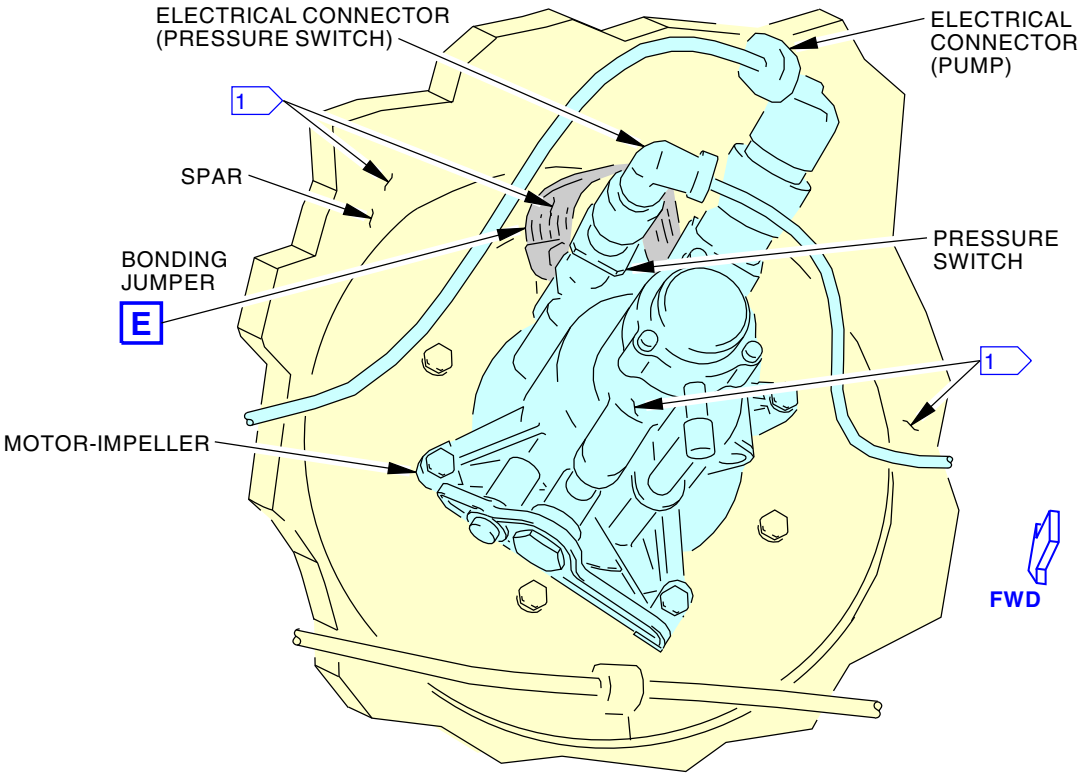
AFT FUEL BOOST PUMP

C

1368306 S0000246944_V2

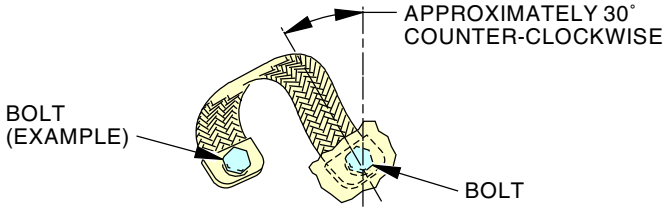
Main Tank Fuel Boost Pump - Bonding Resistance Measurement
Figure 601/28-22-05-990-805 (Sheet 2 of 3)

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**FUEL BOOST PUMP
(EXAMPLE)**

D



BONDING JUMPER

E

1 BONDING RESISTANCE MEASUREMENT

1368474 S0000246945_V2

**Main Tank Fuel Boost Pump - Bonding Resistance Measurement
Figure 601/28-22-05-990-805 (Sheet 3 of 3)**

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SFAR 88

TASK 28-22-05-200-802

3. Main Tank Fuel Boost Pump Housing - Bonding Resistance Check

(Figure 602)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
12-11-02-650-801	Fuel Tank Sump Drain Valve - Tank Entry (P/B 301)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-22-05-990-802	Figure: Main Fuel Tank Fuel Boost Pump Housing Installation (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

D. Access Panels

Number	Name/Location
531CB	Access Door
533BB	Access Door
631CB	Access Door
633BB	Access Door

E. Prepare for the Procedure

SUBTASK 28-22-05-650-005

(1) Do these steps to remove fuel from the applicable fuel tanks:

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(a) To get access to the left or right aft pump housing, do these steps:

NOTE: The left and right aft pump housings are installed in the left and right center fuel tanks, respectively.

1) Defuel the center fuel tank.
2) Defuel the applicable left or right main fuel tank.
3) To defuel the fuel a main tank, do one of these tasks:
   a) To transfer fuel the opposite main fuel tank, do this task: Tank to Tank Transfer, TASK 28-26-00-650-802.
   b) To defuel the fuel tank, do this task: Pressure Defueling, TASK 28-26-00-650-801.
4) Remove the fuel that remains in the center fuel tank (TASK 12-11-02-650-801).

(b) To get access to the left or right forward pump housing, do these steps:

NOTE: The left and right forward pump housings are installed in the left and right main fuel tanks, respectively.

1) Defuel the center fuel tank to less than 35,000 LB (16,000 KG) of fuel.
2) Defuel the applicable left or right main fuel tank.
3) To defuel the fuel main tanks, do one of these tasks:
   a) To transfer fuel the opposite main fuel tank, do this task: Tank to Tank Transfer, TASK 28-26-00-650-802.
   b) To defuel the main fuel tank, do this task: Pressure Defueling, TASK 28-26-00-650-801.
4) Remove the fuel that remains in the applicable main fuel tank (TASK 12-11-02-650-801).

(c) Make sure the FWD and AFT fuel crossfeed valve switches, on the P5 Overhead Panel, are in the CLOSED position.

(d) Make sure the left and right engine control switches, on the P10 Control Stand, are in the CUTOFF position.

F. Electrical Bonding Measurement

SUBTASK 28-22-05-171-001

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-22-05-010-012

(2) To get access to left or right forward boost pump housing, open the applicable access panels:

(Figure 28-22-05-990-802)

Number	Name/Location
533BB	Access Door
633BB	Access Door

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SUBTASK 28-22-05-010-013

(3) To get access to left or right aft boost pump housing, open the applicable access panels: (Figure 28-22-05-990-802)

Number	Name/Location
531CB	Access Door
631CB	Access Door

SUBTASK 28-22-05-869-001

(4) Go into the left or right main fuel tank to access the forward pump housing.

SUBTASK 28-22-05-869-002

(5) Go into the left or right center fuel tank to access the aft pump housing.

SUBTASK 28-22-05-765-002

(6) Measure the bonding resistance, between the pump housing and the airplane structure, with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

(a) Make sure the bonding resistance is 0.00025 ohm (0.25 milliohms) or less.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-05-410-009

(1) Do these steps to close the fuel tank:

(a) Do this task: Fuel Tank Closure, TASK 28-11-00-410-801.

(b) For the left or right forward boost pump housing, close the applicable access panels: (Figure 28-22-05-990-802)

Number	Name/Location
533BB	Access Door
633BB	Access Door

(c) For the left or right aft boost pump housing, close the applicable access panels: (Figure 28-22-05-990-802)

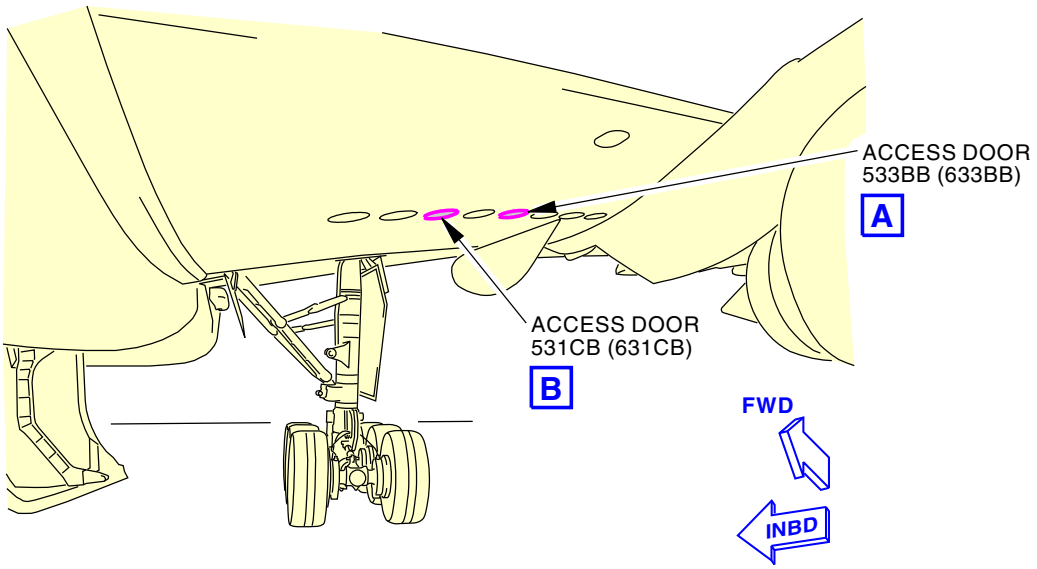
Number	Name/Location
531CB	Access Door
631CB	Access Door

SUBTASK 28-22-05-650-006

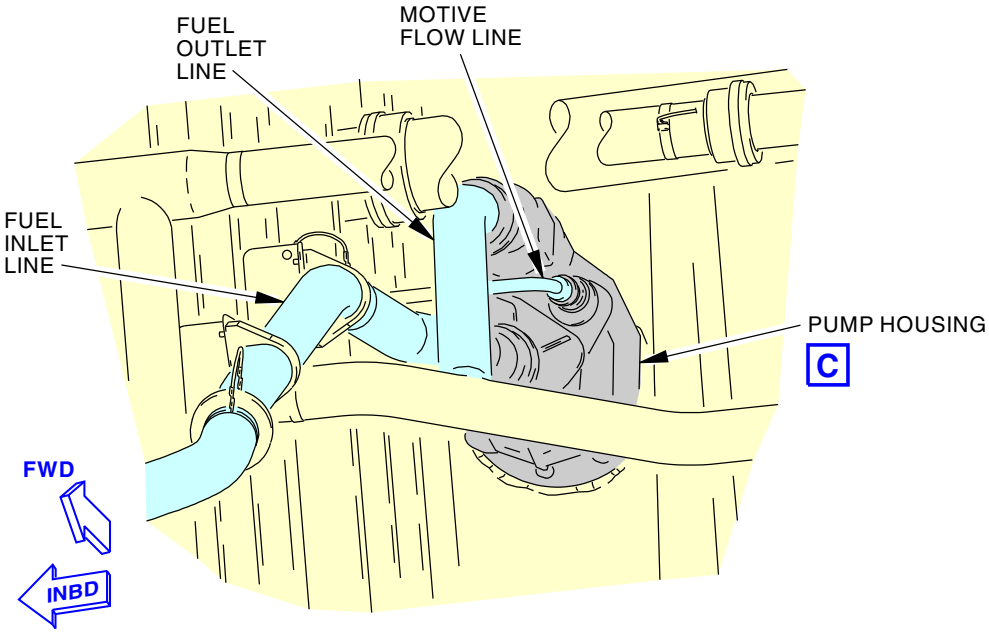
(2) Refuel the applicable fuel tank(s), if necessary (TASK 12-11-01-650-801).

——— END OF TASK ———

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LEFT WING
(RIGHT WING IS EQUIVALENT)



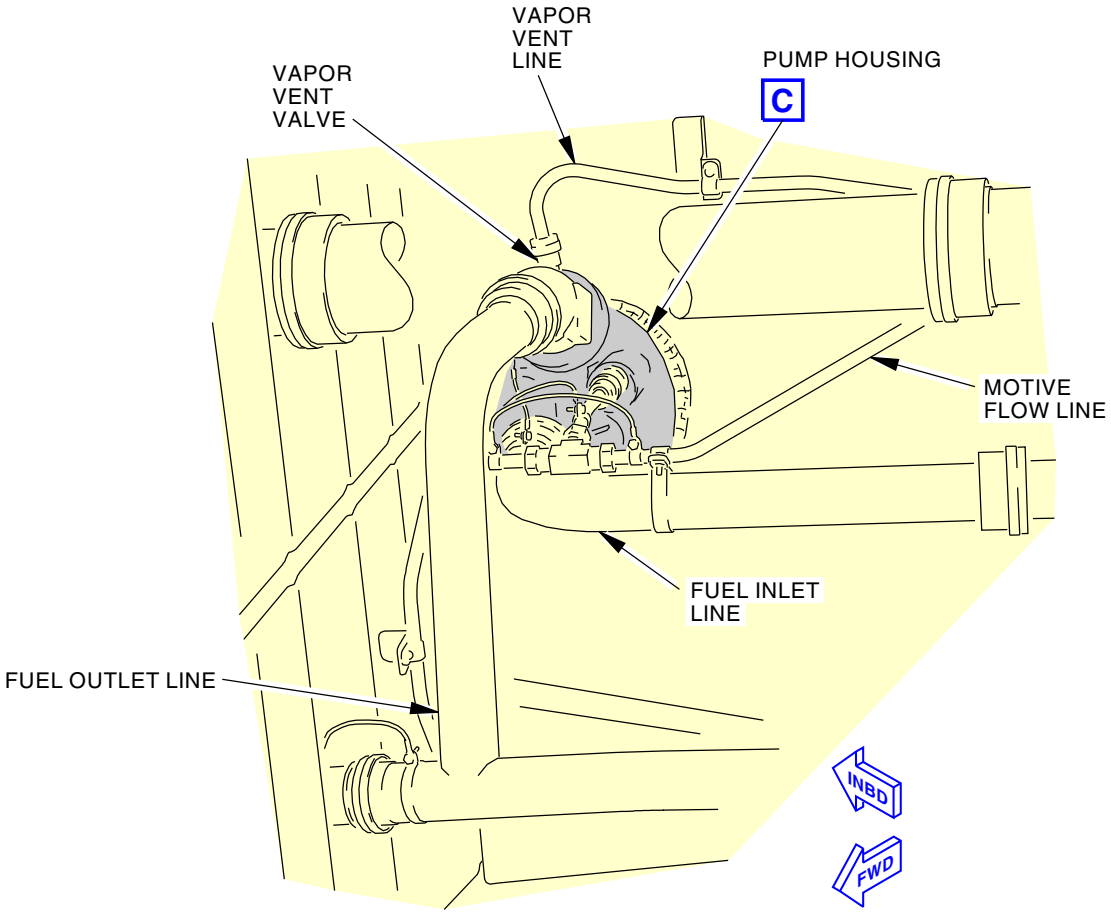
FORWARD FUEL BOOST PUMP HOUSING

A

1368256 S0000246912_V2

Main Tank Fuel Boost Pump Housing - Bonding Resistance Measurement
Figure 602/28-22-05-990-804 (Sheet 1 of 4)

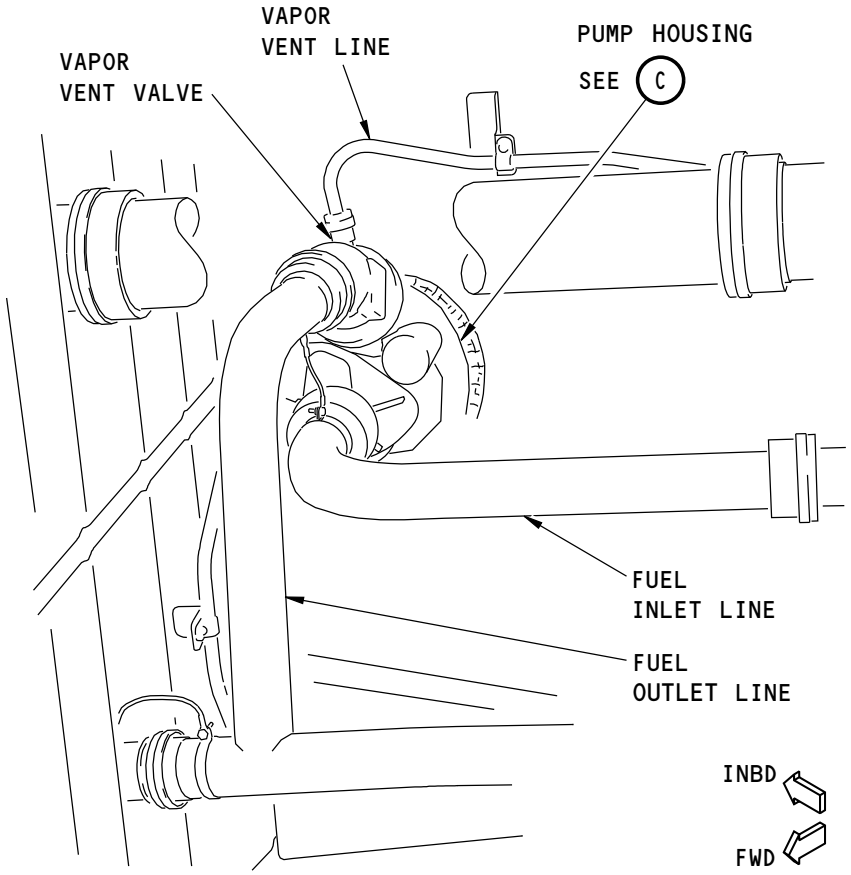
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1368267 S0000246916_V2

Main Tank Fuel Boost Pump Housing - Bonding Resistance Measurement
Figure 602/28-22-05-990-804 (Sheet 2 of 4)

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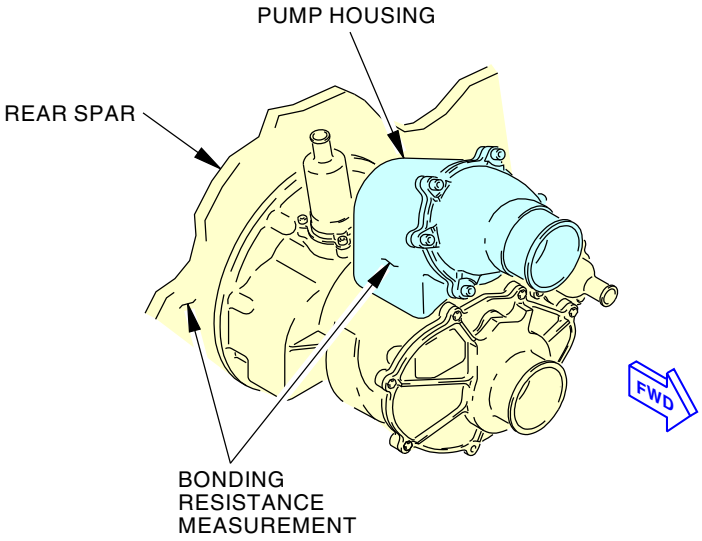


AFT FUEL BOOST PUMP HOUSING
B

2233058 S0000497904_V1

Main Tank Fuel Boost Pump Housing - Bonding Resistance Measurement
Figure 602/28-22-05-990-804 (Sheet 3 of 4)

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FUEL BOOST PUMP HOUSING

C

1368274 S0000246917_V2

Main Tank Fuel Boost Pump Housing - Bonding Resistance Measurement
Figure 602/28-22-05-990-804 (Sheet 4 of 4)

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CENTER FUEL TANK OVERRIDE/JETTISON PUMP - REMOVAL/INSTALLATION

1. General

A. There are left and right override/jettison pumps, which move fuel from the center fuel tank. The left and right override/jettison pumps are installed on the rear spar, in the left and right wheel wells for the main landing gear.

B. There are forward and aft fuel boost pumps that move fuel from the left and right main fuel tanks.

C. The override/jettison pumps in the center fuel tank contain these parts:

(1) Motor-impeller

(2) Pump housing

ARO 001-006

(3) Motive flow check valve

ARO ALL

(4) Discharge check valve

(5) Vapor vent valve.

D. It is not necessary to defuel or go into the center fuel tank to remove and install the motor-impeller for the override/jettison pumps.

ARO 001-006

E. If you remove the motor-impeller for the override/jettison pump, you can remove the discharge check valve, motive flow valve and the vapor vent valve without removing the pump housing. You must defuel the center fuel tank to remove the check valves.

F. The pump housing is installed in the fuel tank. The motor-impeller, discharge check valve, motive flow valve and the vapor vent valve are installed in the pump housing. The pump housing can be removed with discharge check valve, motive flow valve and the vapor vent valve installed in the pump housing. It is necessary to defuel the center fuel tank to remove the pump housing.

ARO 007-999

G. If you remove the motor-impeller for the override/jettison pump, you can remove the discharge check valve and the vapor vent valve without removing the pump housing. You must defuel the center fuel tank to remove the check valves.

H. The pump housing is installed in the fuel tank. The motor-impeller, discharge check valve, and the vapor vent valve are installed in the pump housing. The pump housing can be removed with discharge check valve and the vapor vent valve installed in the pump housing. It is necessary to defuel the center fuel tank to remove the pump housing.

ARO ALL

I. This procedure contains these four tasks:

(1) Override/Jettison Pump Motor-impeller - Removal

(2) Override/Jettison Pump Motor-impeller - Installation

(3) Override/Jettison Pump Housing - Removal

(4) Override/Jettison Pump Housing - Installation

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TASK 28-22-06-000-801

2. Override/Jettison Pump Motor-Impeller - Removal

(Figure 401)

A. References

Reference	Title
28-11-00-300-802	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-42-01-000-801	Remove the Fuel Pump Pressure Switch (P/B 401)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Tools/Equipment

Reference	Description
STD-200	Container - Fuel Resistant, 10 gallon (38 l)

C. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

D. Location Zones

Zone	Area
117	Main Equipment Center, Left
133	Wing Center Section, Left
134	Wing Center Section, Right

E. Procedure

SUBTASK 28-22-06-860-001

WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Make sure that the landing gear downlocks are installed (TASK 32-00-30-480-801).

SUBTASK 28-22-06-860-002

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-22-06-860-003

(3) Open these circuit breakers and install safety tags:

Left Power Management Panel, P110

Row	Col	Number	Name
L	21	C28647	CTR L OVRD FUEL PUMP CTRL

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Right Power Management Panel, P210

Row	Col	Number	Name
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

SUBTASK 28-22-06-020-023

(4) Disconnect the electrical connector [2] from the motor-impeller [4].

SUBTASK 28-22-06-020-024

(5) Disconnect the electrical connector [3] for the pressure switch [13].

SUBTASK 28-22-06-020-025

(6) Remove the four bolts [8] and washers [9].

NOTE: This step also disconnects the bonding jumper [1] at the motor-impeller [4].

(a) Do not remove other bolts [46] or bolt [61] to remove the motor-impeller [4]

SUBTASK 28-22-06-480-002

(7) Turn the motor-impeller [4] approximately 35 degrees in the counterclockwise direction.

NOTE: Make sure that the motor-impeller [4] is turned completely in the counterclockwise direction. The drain plug should be oriented straight down with respect to the housing. The motor-impeller has pins inside that must align for removal.

SUBTASK 28-22-06-020-026

(8) Put a 10 gallon (38 l) fuel resistant container, STD-200, below the motor-impeller [4] to catch the fuel.

CAUTION

MAKE SURE FUEL DOES NOT CONTINUOUSLY DRAIN. IF FUEL CONTINUOUSLY DRAINS, THERE IS A LEAK IN THE PUMP HOUSING. YOU MUST INSTALL THE MOTOR-IMPELLER AND DEFUEL THE FUEL TANK TO PREVENT A FUEL SPILL.

(a) Remove the drain valve [6] from the motor-impeller [4].

NOTE: Approximately 1 qt (1 l) of fuel will drain from the motor-impeller [4].

1) If fuel drains continuously, install the drain valve [6] and defuel the fuel tanks (TASK 28-26-00-650-801).

2) Replace the fuel pump housing to repair the leak (TASK 28-22-06-000-802).

(b) Discard the o-ring [7].

SUBTASK 28-22-06-020-001

(9) Do these steps to remove the motor-impeller [4]:

(a) Put a cotton wiper, G00034, below the motor-impeller to absorb the fuel.

NOTE: Approximately 1 qt (1 l) of fuel will spill when the motor-impeller [4] is removed.

(b) Pull up on the extraction lever [5].

NOTE: This will help move the motor-impeller [4] out.

(c) Pull the motor-impeller [4] out to remove it fully.

1) If it is necessary, fully remove the bonding jumper [1].

NOTE: The full removal of the bonding jumper [1] is necessary if the bonding jumper [1] interferes with the motor-impeller lugs.

a) Remove the sealant from the bonding jumper [1] (TASK 28-11-00-300-802).

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b) Remove the bolt [61] and washer [47] that connects the bonding jumper [1] at the structure

c) Remove the bonding jumper [1].

(d) Discard the o-ring [10], o-ring [11] and o-ring [12].

SUBTASK 28-22-06-650-001

(10) If fuel continuously drains, do these steps:

(a) Install the motor-impeller [4].

(b) Defuel the fuel tanks (TASK 28-26-00-650-801).

(c) Remove the motor-impeller [4].

(d) Do these tasks to replace the fuel pump housing to repair the leak:

1) Override/Jettison Pump Housing - Removal, TASK 28-22-06-000-802,

2) Override/Jettison Pump Housing - Installation, TASK 28-22-06-400-802.

SUBTASK 28-22-06-210-001

(11) Do a check of the valve plate:

NOTE: The valve plate must fully cover and seal the opening in the pump housing. If the valve plate is not aligned correctly, a fuel spill can occur if the fuel tank is full. Damage to the valve plate can also occur if the valve plate is not aligned correctly during installation of the motor-impeller.

(a) Look into the pump housing with the motor-impeller [4] removed (View E).

(b) Make sure that the valve plate is aligned correctly (View F).

(c) If the valve plate has moved and is not aligned correctly, then do these steps:

1) Defuel the fuel tank (TASK 28-26-00-650-801).

2) Do these tasks to replace the fuel pump housing to repair the valve plate and seal:

NOTE: Reference service letter, 777–SL-28–015 for more information regarding the alignment of the valve plate.

a) Override/Jettison Pump Housing - Removal, TASK 28-22-06-000-802

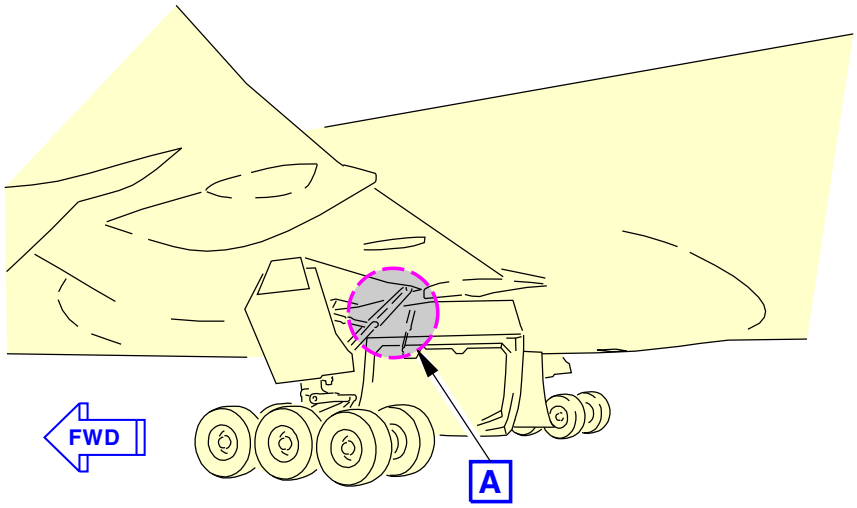
b) Override/Jettison Pump Housing - Installation, TASK 28-22-06-400-802

SUBTASK 28-22-06-020-027

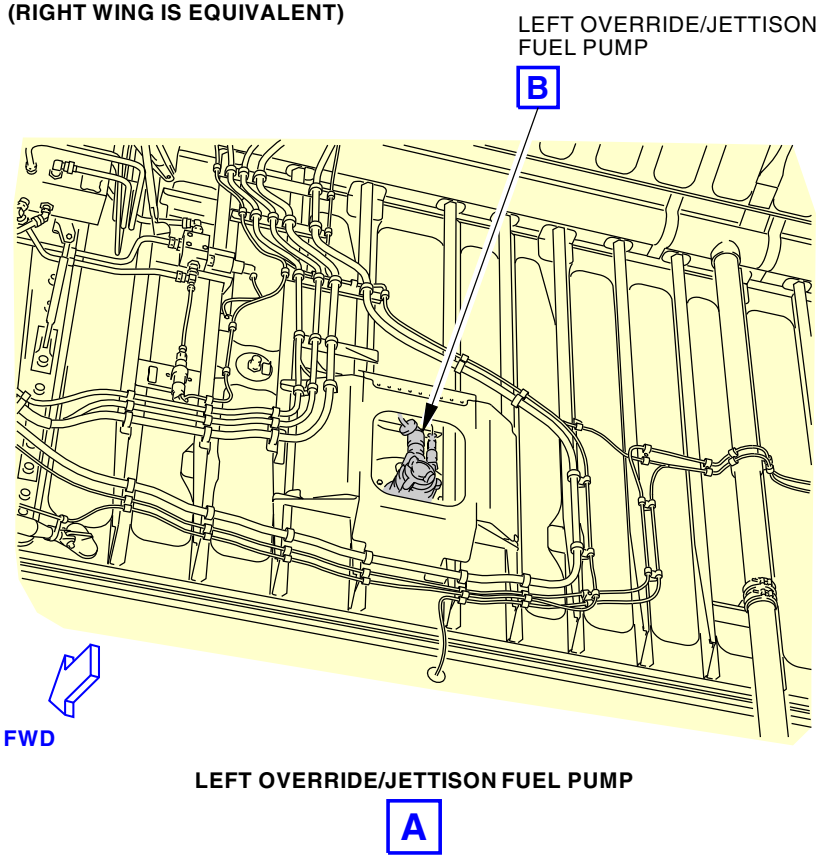
(12) To remove the pressure switch [13], do this task: TASK 28-42-01-000-801.

——— END OF TASK ———

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LEFT WING
(RIGHT WING IS EQUIVALENT)



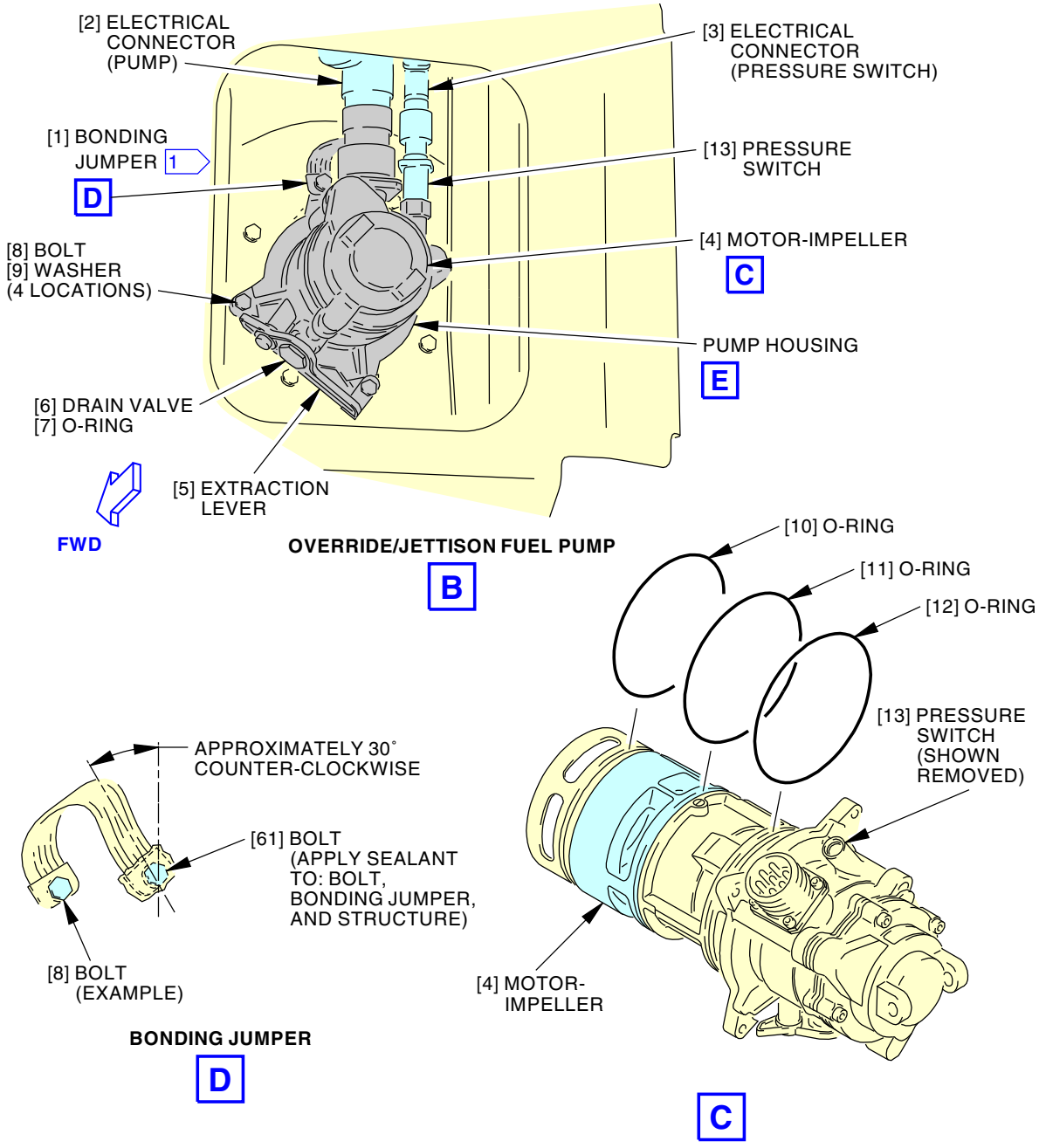
LEFT OVERRIDE/JETTISON FUEL PUMP

A

E16620 S0006415149_V2

Override/Jettison Fuel Pump Installation
Figure 401/28-22-06-990-801 (Sheet 1 of 3)

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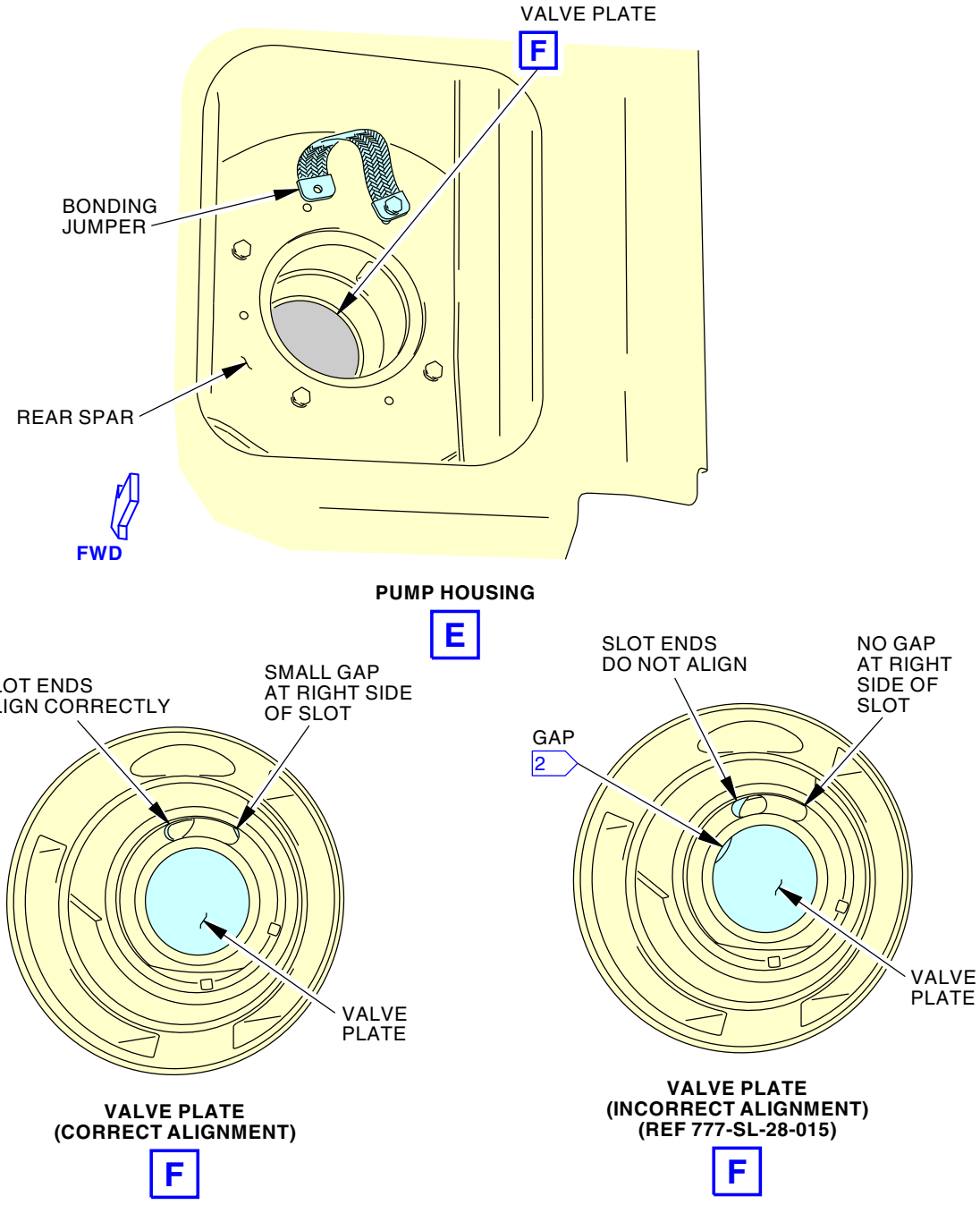


1 THE BONDING RESISTANCE BETWEEN THE MOTOR-IMPELLER AND THE AIRPLANE STRUCTURE MUST BE 0.00025 OHM OR LESS

E16622 S0006415150_V5

Override/Jettison Fuel Pump Installation
Figure 401/28-22-06-990-801 (Sheet 2 of 3)

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U90611 S0000222800_V2

Override/Jettison Fuel Pump Installation
Figure 401/28-22-06-990-801 (Sheet 3 of 3)

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TASK 28-22-06-400-801

3. Override/Jettison Pump Motor-Impeller - Installation

(Figure 401 and Figure 402)

A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-22-00-730-801	Engine Fuel Feed Pumps and Crossfeed Valves - Functional Test (P/B 501)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)
28-42-01-420-801	Install the Fuel Pump Pressure Switch (P/B 401)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual
SWPM 20-20-10	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

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(Continued)

Reference	Description
COM-2572	Wrench - Strap, Electrical Connector (for p/n's BT-BS-609/610 max dia 2.50"/1.50" with max part torque 200 in-lb; TG70 max dia 3.00" with max part torque 150 in-lb; BT-BS-611/ 618BSS max dia 4.00" with max part torque 200 in-lb) Part #: BT-BS-609 Supplier: 11851 Part #: BT-BS-610 Supplier: 11851 Part #: BT-BS-611 Supplier: 11851 Part #: BT-BS-618BSS Supplier: 11851 Part #: TG70 Supplier: 06324

D. Consumable Materials

Reference	Description	Specification
A50110	Sealant	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
7	O-ring	28-22-06-01-375	ARO ALL

F. Location Zones

Zone	Area
117	Main Equipment Center, Left
133	Wing Center Section, Left
134	Wing Center Section, Right

G. Access Panels

Number	Name/Location
521DB	Refueling Station Door

H. Procedure

SUBTASK 28-22-06-400-002

(1) If the pressure switch [13] was removed, do this task: Install the Fuel Pump Pressure Switch, TASK 28-42-01-420-801.

SUBTASK 28-22-06-160-001

(2) Clean the surfaces on the motor-impeller [4] and surfaces that touch the pump housing [41] with a clean cotton wiper, G00034.

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SUBTASK 28-22-06-420-013

(3) Apply a thin layer of petrolatum grease, D00504, to the new o-ring [10], o-ring [11] and o-ring [12].

(a) Install the o-ring [10], o-ring [11], and o-ring [12] in the grooves of the motor-impeller [4].

SUBTASK 28-22-06-420-001

(4) Put the extraction lever [5], on the motor-impeller [4], in the stowed position.

SUBTASK 28-22-06-420-020

(5) Do these steps to install the drain valve [6]:

(a) Apply a thin layer of petrolatum grease, D00504, to a new o-ring [7] and install it on the drain valve [6].

(b) Install the drain valve [6] into the motor-impeller [4].

(c) Tighten the drain valve [6] to 20 ±2 in-lb (2.3 ±0.3 N·m).

(d) Install MS20995C32 lockwire, G01048, to the drain valve [6] (TASK 20-10-23-400-801).

SUBTASK 28-22-06-420-002

(6) Put the motor-impeller [4] into the pump housing [41].

(a) Position the motor-impeller [4] with the drain valve [6] oriented straight down when you put the motor-impeller [4] into the pump housing [41].

NOTE: Be careful not to damage the o-rings when you put the motor-impeller [4] into the pump housing [41].

(b) Push the motor-impeller [4] into the housing [41] until the mounting flange touches the spar.

NOTE: This will engage a pin that opens the guillotine valve in the inlet port.

(c) Turn the motor-impeller [4] 35 degrees in the clockwise direction to align the mounting bolt holes.

SUBTASK 28-22-06-430-001

(7) If the bonding jumper [1] was fully removed, do these steps to attach the bonding jumper [1] to the structure (SWPM 20-20-00 and SWPM 20-20-10):

(a) Do these steps to prepare the bonding jumper [1] for a fay sealed fay surface bond:

1) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

a) Rub dry with a clean, dry cotton wiper, G00034.

b) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-10: CDCCL

2) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper [1] terminal and the washer [47] to apply a fay sealed fay surface bond.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

a) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the fay surface fay seal.

b) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

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28-AWL-10: CDCCL

(b) Install the bolt [61] and washer [47] to attach the bonding jumper [1] to the tank structure.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

(c) Apply a cap seal of sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, to the bolt [61] that attaches the bonding jumper [1] to the tank structure.

NOTE: Use the sealant that was used for the fay surface fay seal.

SUBTASK 28-22-06-110-001

(8) Do these steps to prepare the bonding jumper [1] for a fay sealed fay surface bond:

(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-10: CDCCL

(b) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper [1] terminal and the washer [9] for a fay sealed fay surface bond.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the fay surface fay seal.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

SUBTASK 28-22-06-420-014

28-AWL-10: CDCCL

(9) Install the washer [9] and bolt [8] that attach the bonding jumper [1] and the (pump) motor-impeller [4] (Figure 401).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

(a) Make sure that the bonding surfaces are clean.

(b) Tighten the bolt [8] to 82.5 ±17.5 in-lb (9.3 ±2.0 N·m).

SUBTASK 28-22-06-420-021

(10) Install the three washers [9] and bolts [8] that attach the motor-impeller [4] (Figure 401).

(a) Make sure that the bonding surfaces are clean.

(b) Tighten the bolts [8] to 82.5 ±17.5 in-lb (9.3 ±2.0 N·m).

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SUBTASK 28-22-06-390-001

(11) Apply a cap seal of sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, to the bolt [8] that attaches the bonding jumper [1] to the motor-impeller [4].

NOTE: Use the sealant that was used for the fay surface fay seal.

SUBTASK 28-22-06-760-001

28-AWL-10: CDCCL

(12) Measure the electrical bonding resistance between the (pump) motor-impeller [4] and the airplane structure.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

(a) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-10: CDCCL

(b) Make sure the electrical bonding resistance is 0.00025 ohm (0.25 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

SUBTASK 28-22-06-420-018

(13) Install and tighten by hand the electrical connector [2] to the motor-impeller [4].

SUBTASK 28-22-06-420-019

(14) Tighten the electrical connector [2] approximately 1/8 turn more with a strap wrench, COM-2572, or equivalent.

SUBTASK 28-22-06-420-016

(15) Connect the electrical connector [3] for the pressure switch [13] on the motor-impeller [4].

SUBTASK 28-22-06-860-004

(16) Remove the safety tags and close these circuit breakers:

Left Power Management Panel, P110

Row	Col	Number	Name
L	21	C28647	CTR L OVRD FUEL PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

SUBTASK 28-22-06-860-005

(17) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-22-06-700-001

(18) If the pump housing was replaced, refuel the center fuel tank to more than 57,000 lb (25,855 kg) (TASK 12-11-01-650-801).

NOTE: This fuel quantity is necessary to cover the pump housing.

SUBTASK 28-22-06-720-001

(19) Do one of these tests of the fuel pump(s).

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(a) To do a test of all of the fuel pumps, do this task: Engine Fuel Feed Pumps and Crossfeed Valves - Functional Test, TASK 28-22-00-730-801.

(b) To do a test one fuel pump, do these steps:

WARNING

DO NOT OPERATE A FUEL PUMP IF THE AMBER PRESS LIGHT COMES ON AND STAYS ON. IT CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE TANK WHICH WILL CAUSE A FIRE OR EXPLOSION. FIRES AND EXPLOSIONS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

1) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

   a) Immediately set the applicable fuel pump switch-light(s) to OFF if the amber PRESS light comes on and stays on.

2) Open this access door:

Number	Name/Location
521DB	Refueling Station Door

NOTE: Nuisance EICAS messages will come on if the door is not open.

3) Put the DEFUEL VALVE switch, on the P28 Integrated Refueling Panel, to the OPEN position.

4) To make sure there is enough fuel to prime the pump, do one of these steps:

NOTE: The fuel pump will operate correctly only if there is sufficient fuel inside of the pump.

   a) Make sure that there is a minimum of 30,000 lb (13,608 kg) of fuel in the center fuel tank.

      NOTE: This fuel quantity is necessary to make sure that the pump is in the fuel.

   b) Refuel the center fuel tank (TASK 12-11-01-650-801) or transfer fuel into the center fuel tank (TASK 28-26-00-650-802) to a minimum of 10,000 lb (4536 kg).

      NOTE: There is a fuel wetting line between the override/jettison pump and the nearest center tank refuel valve. When you put fuel into the center tank by pressure refueling or fuel transfer, fuel will flow through the wetting line into the override/jettison pump. 10,000 lb (4536 kg) is the fuel quantity necessary to cover the override/jettison pump inlet.

5) Push the applicable fuel pump switch-light on the Fuel Management Control Panel M28001, on the Overhead Panel P5, to the ON position. Table 401

Table 401/28-22-06-993-801

OVERRIDE/JETTISON PUMPS IN THE CENTER TANK	
PUMP	**SWITCH-LIGHT**
Left Override/Jettison Pump	L CENTER PUMP
Right Override/Jettison Pump	R CENTER PUMP

6) Make sure that the applicable EICAS status message does not show on the EICAS display for the applicable pump:

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a) FUEL PUMP CENTER L

b) FUEL PUMP CENTER R

7) Listen at the rear spar to make sure that the applicable override/jettison pump operates (Figure 401).

8) Make sure that there are no fuel leaks at the applicable override/ jettison pump, on the rear spar (Figure 401).

9) Push the applicable fuel pump switch-light to the off position.

10) Listen at the rear spar to make sure that the applicable override/jettison fuel pump does not operate (Figure 401).

11) Put the DEFUEL VALVE switch, on the P28 Integrated Refueling Panel, to CLOSED position.

12) Close this access door:

Number	Name/Location
521DB	Refueling Station Door

SUBTASK 28-22-06-860-006

WARNING OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(20) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

——— END OF TASK ———

TASK 28-22-06-000-802

4. Override/Jettison Pump Housing - Removal

(Figure 402)

A. References

Reference	Title
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-300-802	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
117	Main Equipment Center, Left
133	Wing Center Section, Left
134	Wing Center Section, Right
139	Forward Keel Beam

C. Access Panels

Number	Name/Location
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door

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D. Procedure

SUBTASK 28-22-06-860-009

(1) Make sure the left and right jettison isolation valves are in the closed position. To make sure the valves are closed, go to the 28 Fuel Management maintenance page, on the EICAS display.

NOTE: If these valves are not in the closed position, 20 gal (76 l) to 25 gal (95 l) of fuel can spill when the fuel outlet line [34] is disconnected from the housing [41].

SUBTASK 28-22-06-650-002

(2) Defuel the applicable fuel tank(s).

NOTE: The center fuel tank must be defueled for tank entry. It is recommended to defuel the same side main tank to prevent possible fuel leakage through check valves.

(a) Do this task for the applicable fuel tank(s): Pressure Defueling, TASK 28-26-00-650-801.

(b) Do these steps to remove the pressure from the refuel manifold:

NOTE: Fuel in the refuel manifold is connected to each center pump housing by the reprime line [42]. If there is less pressure and fuel is permitted to drain from the refuel manifold, less fuel will spill when the reprime line [42] is disconnected.

1) Put the left and right refuel valve control switches, at the refueling station P28, to the OPEN position.

NOTE: Do not open the center tank refuel valves, this would put more fuel in the center tank.

2) Wait 10 minutes for the fuel pressure to decrease, or until the refuel valve lights go off.

3) Put the left and right refuel valve control switches, at the refueling station P28, to the CLOSED position.

SUBTASK 28-22-06-020-028

(3) Remove the applicable motor-impeller [4] (TASK 28-22-06-000-801).

SUBTASK 28-22-06-650-003

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(4) Do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

SUBTASK 28-22-06-010-001

(5) Open this access panel:

(Figure 402)

Number	Name/Location
139AL	Forward Keel Beam Access Panel

SUBTASK 28-22-06-010-002

(6) Open this access panel:

(Figure 402)

Number	Name/Location
139AZ	Center Wing Access Door

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SUBTASK 28-22-06-020-029

(7) Disconnect the flexible full coupling [44] to disconnect the vapor vent line [31] at the vapor vent valve [43].

(a) Discard the o-rings [45].

ARO 001-006

SUBTASK 28-22-06-020-030

(8) Disconnect the flexible full coupling [37] to disconnect the motive flow line [35] at the motive flow valve [49].

NOTE: A small quantity of fuel can drain from the fuel line.

(a) Discard the o-rings [38].

ARO ALL

SUBTASK 28-22-06-020-031

(9) Disconnect the flexible full coupling [39] to disconnect the fuel inlet line [36] from the housing [41].

(a) Discard the o-rings [40].

SUBTASK 28-22-06-020-032

(10) Disconnect the coupling nut for the reprime line [42] from the housing [41].

NOTE: A small quantity of fuel can drain from the fuel line.

SUBTASK 28-22-06-020-033

(11) Disconnect the flexible full coupling [32] to disconnect the fuel outlet line [34] from the housing [41].

NOTE: 1 gal (4 l) to 2 gal (8 l) of fuel can drain from the fuel line.

(a) Discard the o-rings [33].

SUBTASK 28-22-06-020-005

(12) Remove the sealant between the housing [41] and the rear spar, in the fuel tank (TASK 28-11-00-300-802).

SUBTASK 28-22-06-020-006

(13) Remove the sealant from the bonding jumper [1] on rear spar, out of the fuel tank (TASK 28-11-00-300-802).

SUBTASK 28-22-06-020-002

(14) Have one person hold the housing [41] in its position, in the fuel tank.

SUBTASK 28-22-06-020-034

(15) Have another person remove the bolts [46], bolt [61], washers [47] and bonding jumper [1] (from out of the fuel tank) that attach the housing [41] to the rear spar.

SUBTASK 28-22-06-020-035

(16) Remove the housing [41] from the fuel tank.

(a) Discard the packing [60].

SUBTASK 28-22-06-020-004

(17) If it is necessary, do these steps to remove the inlet valve from the housing [41] (Figure 402):

(a) Remove the seven bolts [54] to remove the valve cover [53].

(b) Carefully remove the valve cover [53] from the housing [41].

(c) Carefully remove the spring seal [56] from the valve cover [53].

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(d) Remove the ring seal [55] from the spring seal [56].

(e) Remove the valve plate [57] with the pin [52] from the housing [41].

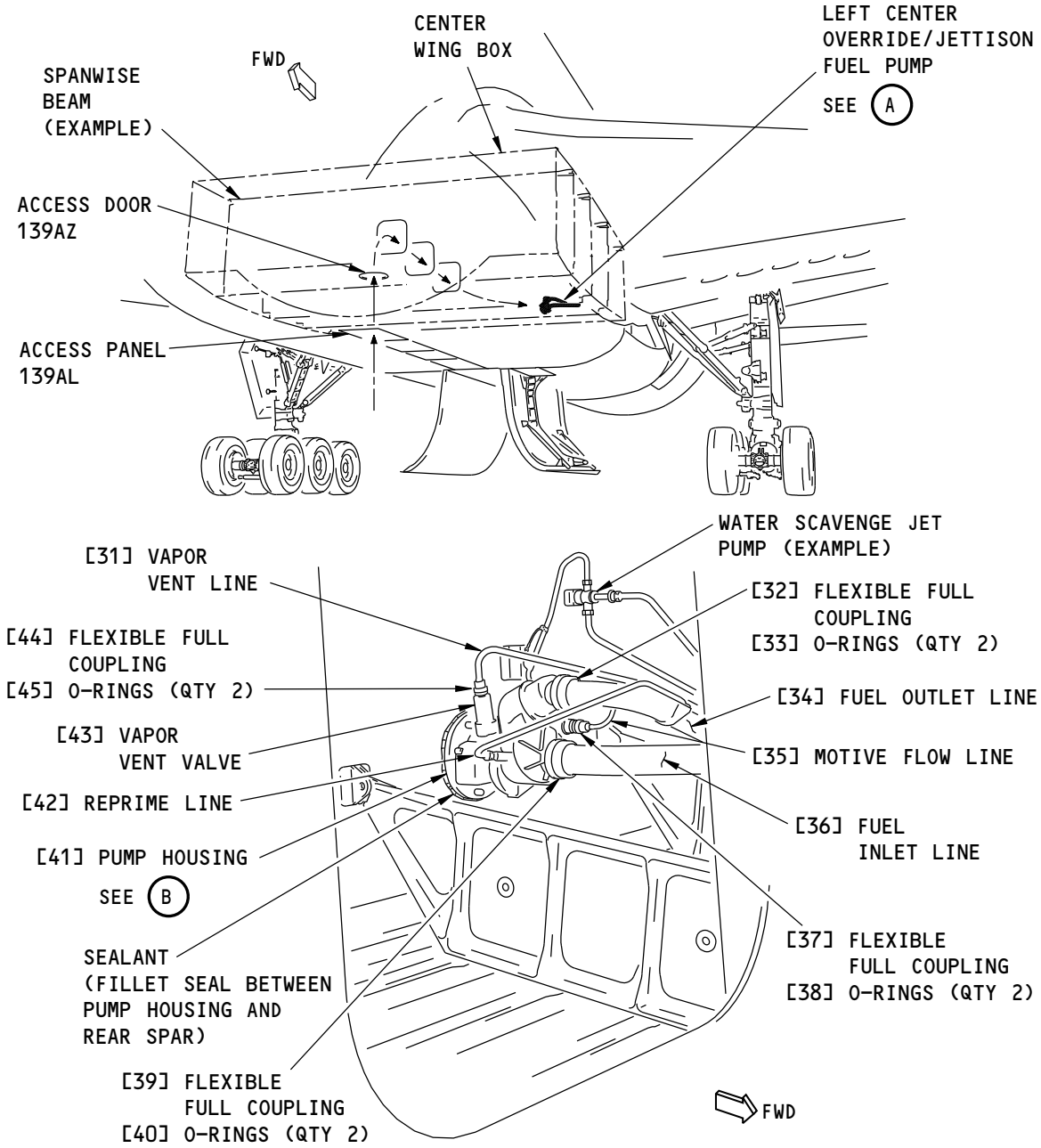
(f) Remove the damper [58] and o-ring [59] with air pressure from inside the housing [41].

(g) Remove the o-ring [50] from the housing [41].

NOTE: Do not remove the support ring [51].

——— END OF TASK ———

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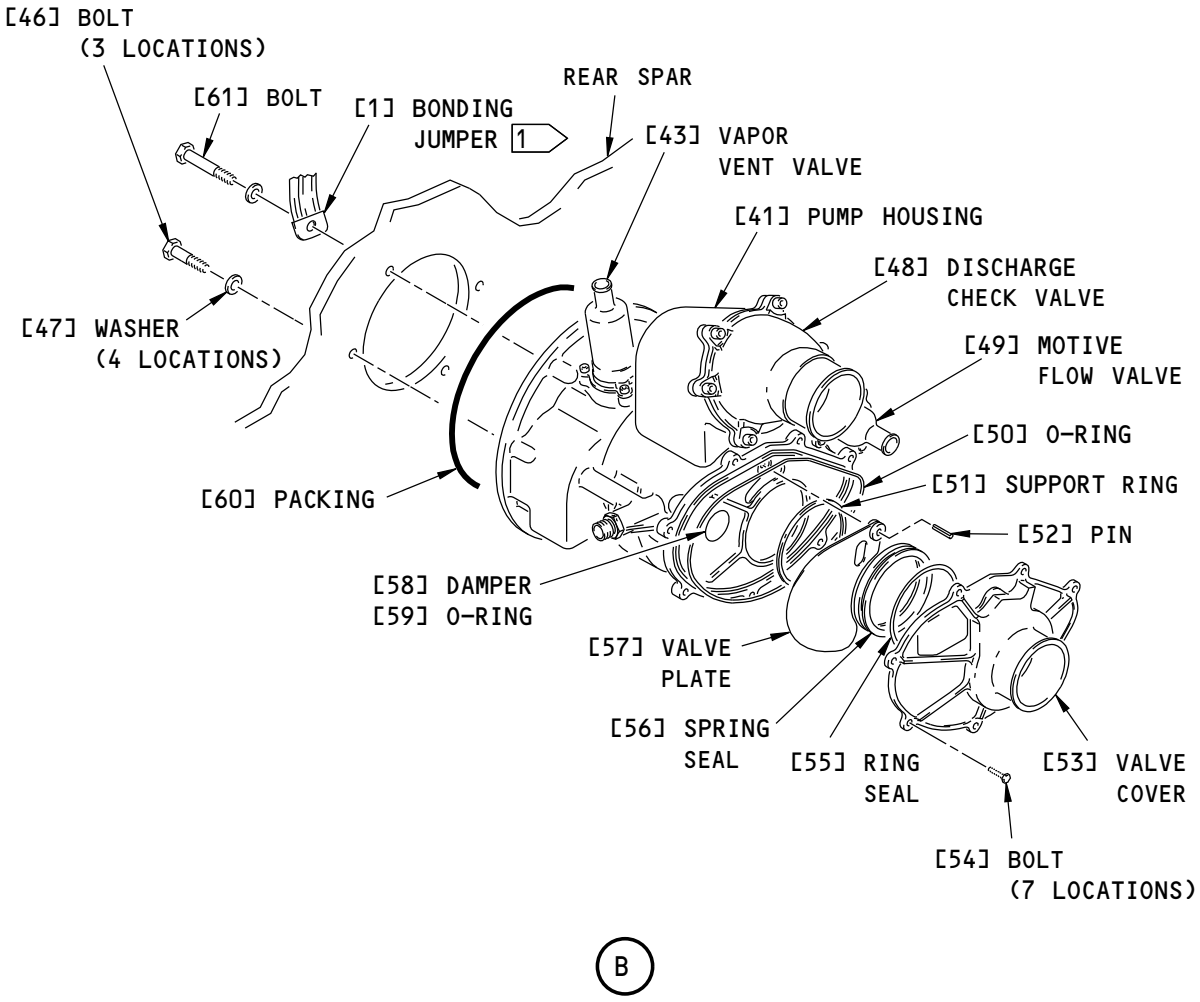
LEFT CENTER OVERRIDE/JETTISON FUEL PUMP
(RIGHT CENTER OVERRIDE/JETTISON FUEL PUMP OPPOSITE)

A

E26092 S0006415154_V1

Override/Jettison Fuel Pump Installation
Figure 402/28-22-06-990-802 (Sheet 1 of 4)

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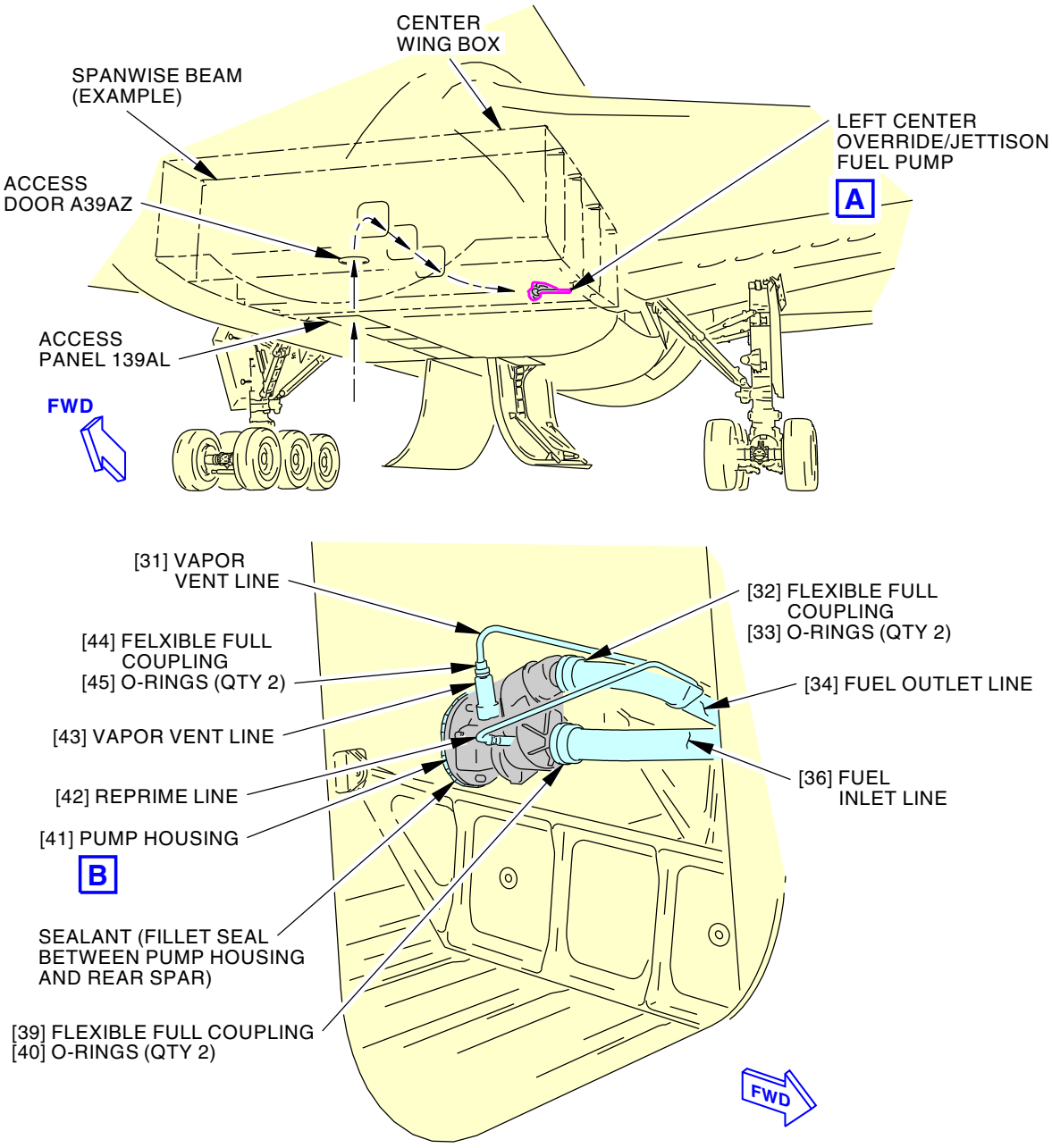


1 THE BONDING RESISTANCE BETWEEN THE MOTOR-IMPELLER AND THE AIRPLANE STRUCTURE MUST BE 0.00025 OHM OR LESS

E26103 S0006415155_V2

Override/Jettison Fuel Pump Installation
Figure 402/28-22-06-990-802 (Sheet 2 of 4)

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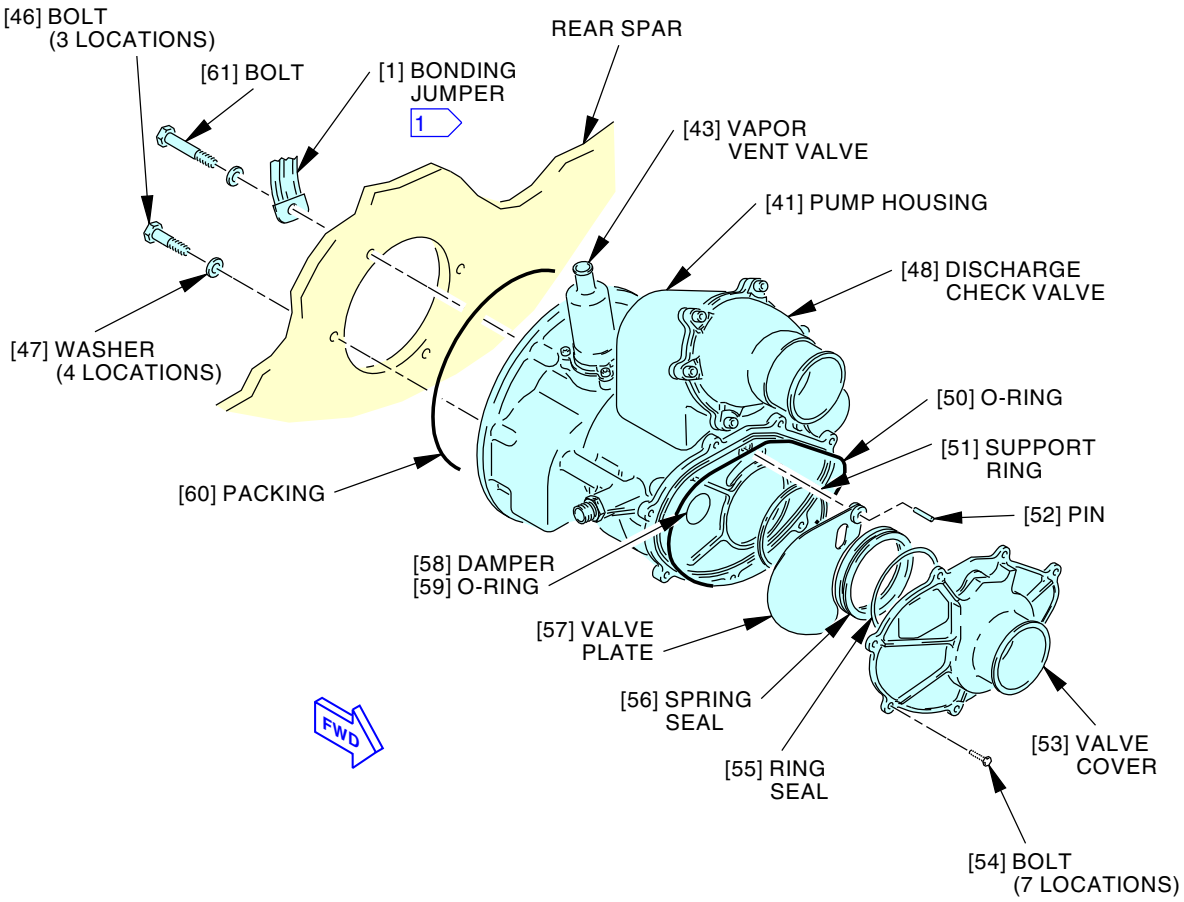
LEFT CENTER OVERRIDE/JETTISON FUEL PUMP
(RIGHT CENTER OVERRIDE/JETTISON FUEL PUMP OPPOSITE)

A

2297022 S0000520494_V2

Override/Jettison Fuel Pump Installation
Figure 402/28-22-06-990-802 (Sheet 3 of 4)

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1 THE BONDING RESISTANCE BETWEEN THE MOTOR-IMPELLER AND THE AIRPLANE STRUCTURE MUST BE 0.00025 OHM OR LESS

2297082 S0000520495_V2

Override/Jettison Fuel Pump Installation
Figure 402/28-22-06-990-802 (Sheet 4 of 4)

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TASK 28-22-06-400-802

5. Override/Jettison Pump Housing - Installation

(Figure 402)

A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

B. References

Reference	Title
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-300-802	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-22-15-400-802-001	Fuel Line, Fitting and Coupling - Installation (P/B 401)
28-22-15-700-802-001	Fuel Tube Damage Criteria - Inspection/Check (P/B 601)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

D. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS5-95
A00767	Sealant - Fuel Tank	BMS5-45
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142 Type II
A50110	Sealant	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C

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(Continued)

Reference	Description	Specification
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
B00148	Solvent - Methyl Ethyl Ketone (MEK)	ASTM D740
B00184	Solvent - Presealing, Cleaning Solvent	BMS11-7
B00666	Solvent - Methyl Propyl Ketone	BMS11-9
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
B01026	Solvent - FCC-55	
B01054	Solvent - Methyl Ethyl Ketone and sec-Butyl Alcohol Blend - (MEK:secButyl Alcohol - 42:58 Percent)	BAC5750, ASTM D740/ASTM D1007
C00064	Coating - Aluminum Chemical Conversion	BAC5719 Type II Class A (MIL-DTL-5541 Class 1A)
C00259	Coating - Chemical And Solvent Resistant Finish, Corrosion Inhibiting Primer	BMS10-11 Type I
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
38	O-ring	28-22-51-16A-190	ARO 001-006
40	O-ring	28-22-51-10A-187	ARO 001-015
45	O-ring	28-22-51-15C-425	ARO ALL
		28-22-51-15D-405	ARO ALL
50	O-ring	28-22-06-01-195	ARO ALL
55	Ring seal	28-22-06-01-200	ARO ALL
56	Spring seal	28-22-06-01-205	ARO ALL
59	O-ring	28-22-06-01-230	ARO ALL

F. Location Zones

Zone	Area
117	Main Equipment Center, Left
133	Wing Center Section, Left
134	Wing Center Section, Right
139	Forward Keel Beam

G. Access Panels

Number	Name/Location
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door

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H. Procedure

SUBTASK 28-22-06-650-004

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-22-06-420-003

(2) If the inlet valve is removed, do these steps to install it (Figure 402):

(a) Apply a thin layer of petrolatum grease, D00504, to a new o-ring [59].

(b) Install the damper [58] and new o-ring [59] into the pump housing [41].

(c) Install the valve plate [57] with the pin [52] into the housing [41].

(d) Apply a thin layer of petrolatum grease, D00504, to a new ring seal [55].

(e) Carefully install the spring seal [56] and ring seal [55] into the valve cover [53].

(f) Apply a thin layer of petrolatum grease, D00504, to a new o-ring [50].

(g) Install the o-ring [50] into the housing [41].

(h) Carefully install the valve cover [53] onto the housing [41].

(i) Install the seven bolts [54] that attach the valve cover [53].

SUBTASK 28-22-06-100-001

(3) Clean the surfaces that touch between the bonding jumper [1] and the rear spar with solvent, B00148, out of the fuel tank (Figure 401, View D).

SUBTASK 28-22-06-200-001

(4) Inspect these check valves in the housing before you install the pump housing:

NOTE: Manually open the check valves to make sure they are free to operate.

(a) discharge check valve [48]

(b) vapor vent valve [43]

ARO 001-006

(c) motive flow valve [49].

ARO ALL

SUBTASK 28-22-06-100-002

(5) Clean the surfaces that touch between the rear spar and the housing [41] with solvent, B00184, FCC-55 solvent, B01026, solvent, B01054, solvent, B00148, or solvent, B00666, in the fuel tank.

NOTE: Make sure the surface on the rear spar is clean. If the surface on the rear spar is not clean, the sealant will not bond correctly.

SUBTASK 28-22-06-420-017

(6) Apply a thin layer of petrolatum grease, D00504, to a new packing [60].

(a) Install the packing [60] in the housing [41].

SUBTASK 28-22-06-110-002

(7) Do these steps to prepare the bonding jumper [1] for a fay sealed fay surface bond:

(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

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1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-10: CDCCL

(b) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper [1] terminal and the washer [47] for a fay sealed fay surface bond.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the fay surface fay seal.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

SUBTASK 28-22-06-420-004

(8) Put the housing [41] in its position in the fuel tank and do these steps:

(a) Install the three bolts [46] and washers [47] (from out of the fuel tank).

28-AWL-10: CDCCL

(b) Install the bolt [61] and washer [47] to connect the bonding jumper [1] to the structure (from out of the fuel tank).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

1) Make sure the bonding jumper is attached as shown (Figure 401, View D).

NOTE: The bonding jumper must be attached as shown to permit installation of the motor-impeller.

(c) Tighten the bolts [46] and bolt [61] for the pump housing to between 65 in-lb (7 N·m) - 100 in-lb (11 N·m).

SUBTASK 28-22-06-390-002

(9) Apply a cap seal of sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, to the bolt [61] that attaches the bonding jumper [1] to the tank structure.

NOTE: Use the sealant that was used for the fay surface fay seal.

SUBTASK 28-22-06-420-005

(10) Connect the reprime line [42] coupling nut to the housing [41].

SUBTASK 28-22-06-420-006

(11) Do these steps to connect the vapor vent line [31] (Figure 402, View A):

(a) Inspect the flexible full coupling [44] for wear and replace if it is necessary (TASK 28-22-15-700-802-001).

(b) Apply a thin layer of petrolatum grease, D00504, to the new o-rings [45].

(c) Install the o-rings [45] and connect the flexible full coupling [44] for the vapor vent line [31] (TASK 28-22-15-400-802-001).

(d) Install MS20995C32 lockwire, G01048, to the coupling [44] (TASK 20-10-23-400-801).

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ARO 001-006

SUBTASK 28-22-06-020-036

(12) Do these steps to connect the motive flow line [35] (Figure 402, View A):

(a) Inspect the flexible full coupling [37] for wear, replace if it is necessary (TASK 28-22-15-700-802-001).

(b) Apply a thin layer of petrolatum grease, D00504, to the new o-rings [38].

(c) Install the o-rings [38] and connect the flexible full coupling [37] for the motive flow line [35] (TASK 28-22-15-400-802-001).

(d) Install MS20995C32 lockwire, G01048, to the coupling [37] (TASK 20-10-23-400-801).

ARO ALL

SUBTASK 28-22-06-020-037

(13) Do these steps to connect the fuel inlet line [36] (Figure 402, View A):

(a) Inspect the flexible full coupling [39] for wear and replace if it is necessary (TASK 28-22-15-700-802-001).

(b) Apply a thin layer of petrolatum grease, D00504, to the new o-rings [40].

(c) Install the o-rings [40] and connect the flexible full coupling [39] for the fuel inlet line [36] (TASK 28-22-15-400-802-001).

(d) Install MS20995C32 lockwire, G01048, to the coupling [39] (TASK 20-10-23-400-801).

SUBTASK 28-22-06-020-038

(14) Do these steps to connect the fuel outlet line [34] (Figure 402, View A):

(a) Inspect the flexible full coupling [32] for wear and replace if it is necessary (TASK 28-22-15-700-802-001).

(b) Apply a thin layer of petrolatum grease, D00504, to the new o-rings [33].

(c) Install the o-rings [33] and connect the flexible full coupling [32] for the fuel outlet line [34] (TASK 28-22-15-400-802-001).

(d) Install MS20995C32 lockwire, G01048, to the coupling [32] (TASK 20-10-23-400-801).

SUBTASK 28-22-06-760-002

(15) Measure the electrical bonding resistance, between the housing [41] and the airplane structure, with an intrinsically safe approved bonding meter, COM-1550.

(a) Make sure the electrical bonding resistance is 0.00025 ohm (0.25 milliohm) or less.

SUBTASK 28-22-06-410-004

(16) Apply a fillet seal between the housing [41] and the rear spar, in the fuel tank (TASK 28-11-00-300-802).

(a) Use these sealants: sealant, A00767 or equivalent. For sealant types and cure times refer to (TASK 28-11-00-300-802).

(b) If there is exposed structure, apply an alodine coating, C00064, to the exposed area on the rear spar (TASK 28-11-00-600-801).

SUBTASK 28-22-06-080-001

(17) Remove all tools and equipment from the work area.

SUBTASK 28-22-06-410-005

(18) Do these steps to apply sealant to the bonding jumper connection, between the bonding jumper [1] and the rear spar (out of the fuel tank) (Figure 401; View D):

(a) Clean the bonding jumper connection with solvent, B00148, if necessary.

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(b) Apply sealant to the bonding jumper connection (TASK 28-11-00-300-802).

1) Use one of these sealants: sealant, A02315, or sealant, A00247.

(c) If there is exposed structure, apply primer, C00259, to the exposed areas on the rear spar.

SUBTASK 28-22-06-410-001

(19) Close this access door:

(Figure 402)

Number	Name/Location
139AZ	Center Wing Access Door

SUBTASK 28-22-06-410-002

(20) Close this access panel:

(Figure 402)

Number	Name/Location
139AL	Forward Keel Beam Access Panel

SUBTASK 28-22-06-420-007

(21) Install the override/jettison motor-impeller (TASK 28-22-06-400-801).

——— END OF TASK ———

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CENTER FUEL TANK OVERRIDE/JETTISON PUMP - INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure contains a functional check of the bonding resistance between the structure and the center fuel tank override/jettison pumps.

SFAR 88

TASK 28-22-06-200-802

2. Override/Jettison Pump Motor-Impeller - Bonding Resistance Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17
COM-2572	Wrench - Strap, Electrical Connector (for p/n's BT-BS-609/610 max dia 2.50"/1.50" with max part torque 200 in-lb; TG70 max dia 3.00" with max part torque 150 in-lb; BT-BS-611/ 618BSS max dia 4.00" with max part torque 200 in-lb) Part #: BT-BS-609 Supplier: 11851 Part #: BT-BS-610 Supplier: 11851 Part #: BT-BS-611 Supplier: 11851 Part #: BT-BS-618BSS Supplier: 11851 Part #: TG70 Supplier: 06324

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
143	Main Landing Gear Wheel Well, Left
144	Main Landing Gear Wheel Well, Right

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D. Prepare for the Procedure

SUBTASK 28-22-06-212-002

WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONS, AND DAMAGE TO EQUIPMENT.

(1) Make sure the landing gear downlocks are installed (TASK 32-00-30-480-801).

SUBTASK 28-22-06-490-001

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-22-06-865-001

(3) Open these circuit breakers and install safety tags:

Left Power Management Panel, P110

Row	Col	Number	Name
L	21	C28647	CTR L OVRD FUEL PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

E. Electrical Bonding Measurement

SUBTASK 28-22-06-862-001

(1) Disconnect the electrical connector from the motor-impeller.

SUBTASK 28-22-06-765-002

(2) Measure the bonding resistance, between the motor-impeller and the airplane structure, with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

(a) Make sure the bonding resistance is 0.00025 ohm (0.25 milliohm) or less.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-06-861-001

(1) Install and tighten by hand the electrical connector for the motor-impeller.

SUBTASK 28-22-06-861-002

(2) Tighten the electrical connector approximately 1/8 turn more with the strap wrench, COM-2572.

SUBTASK 28-22-06-865-002

(3) Remove the safety tags and close these circuit breakers:

Left Power Management Panel, P110

Row	Col	Number	Name
L	21	C28647	CTR L OVRD FUEL PUMP CTRL

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Right Power Management Panel, P210

Row	Col	Number	Name
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

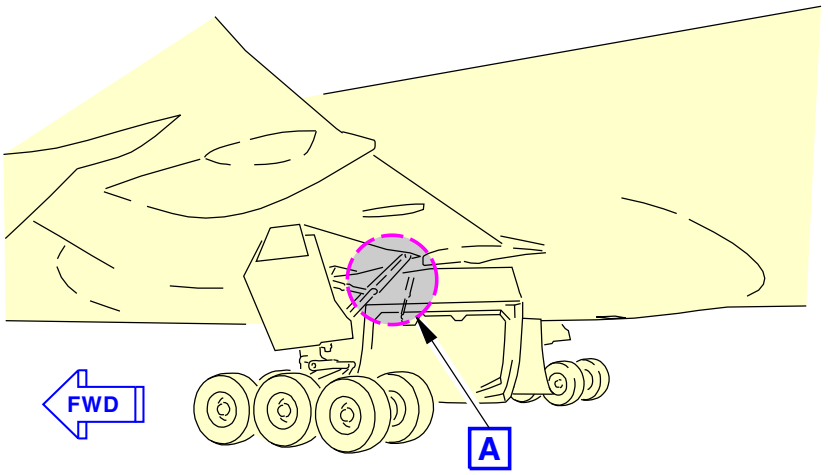
SUBTASK 28-22-06-090-001

WARNING OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

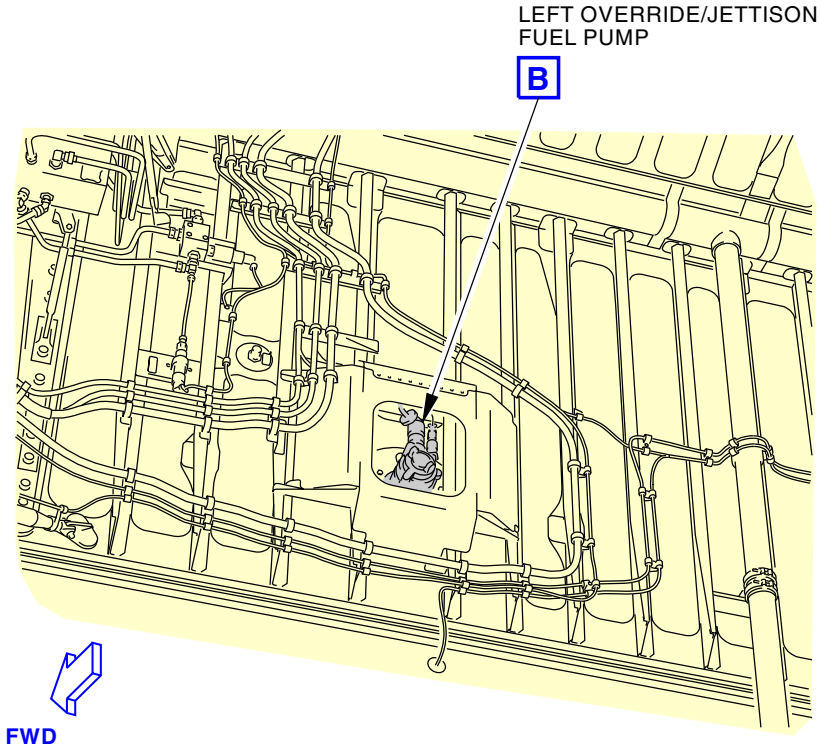
(4) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

——— END OF TASK ———

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LEFT WING
(RIGHT WING IS EQUIVALENT)



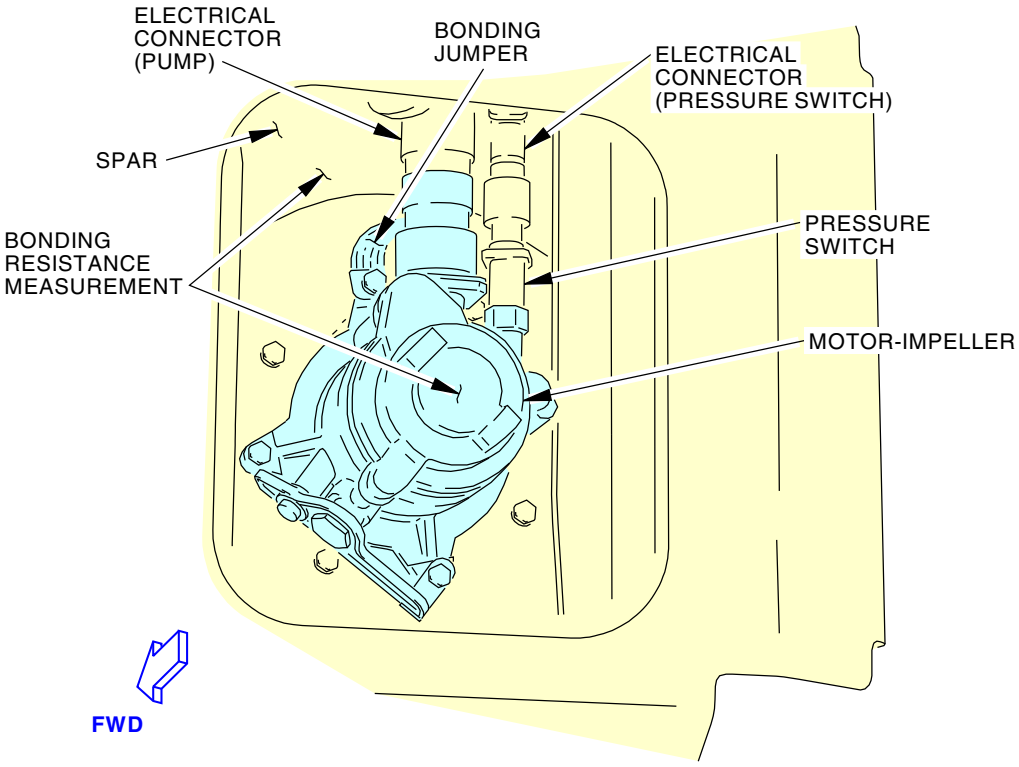
LEFT OVERRIDE/JETTISON FUEL PUMP

A

1368483 S0000246949_V2

Override/Jettison Pump - Bonding Resistance Measurement
Figure 601/28-22-06-990-803 (Sheet 1 of 2)

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OVERRRIDE/JETTISON FUEL PUMP

B

1368497 S0000246950_V2

Override/Jettison Pump - Bonding Resistance Measurement
Figure 601/28-22-06-990-803 (Sheet 2 of 2)

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MOTIVE FLOW CHECK VALVE - REMOVAL/INSTALLATION

1. General

ARO 001-004 PRE SB 777-28-0078

A. The pump housing for each fuel boost pump in the main fuel tank contains one motive flow check valve. The pump housing for each override/jettison fuel pump in the center fuel tank contains one motive flow check valve.

ARO 005-999; ARO 001-004 POST SB 777-28-0078

B. The pump housing for each forward fuel boost pump in the main fuel tank contains one motive flow check valve. The pump housing for each override/jettison fuel pump in the center fuel tank contains one motive flow check valve. The pump housing for each jettison pump in the main tank contains one motive flow check valve.

ARO 001-004 PRE SB 777-28-0078

C. The motive flow check valve for the boost pumps supplies fuel flow to operate the main tank water scavenge system and the center tank fuel scavenge system.

ARO 005-999; ARO 001-004 POST SB 777-28-0078

D. The motive flow check valve for forward boost pumps supplies fuel flow to operate the main tank water scavenge system.

ARO ALL

E. The motive flow check valve for the override/jettison pumps supplies fuel flow to operate the center tank water scavenge systems.

ARO 005-999; ARO 001-004 POST SB 777-28-0078

F. The motive flow check valve for the jettison pumps supplies fuel flow to operate the center tank fuel scavenge systems.

ARO ALL

G. The motive flow check valve can be removed from out of the fuel tank, if the motor-impeller for the applicable fuel pump is removed.

H. This procedure contains four tasks. The first task removes the motive flow check valve, from out of the fuel tank. The second task installs the motive flow check valve, from out of the fuel tank. The third task removes the motive flow check valve from the pump housing, when the pump housing is removed. The fourth task installs the motive flow check valve in the pump housing, when the pump housing is removed.

TASK 28-22-07-000-801

2. Motive Flow Check Valve (Out Of Fuel Tank) - Removal

(Figure 401)

A. References

Reference	Title
28-22-05-000-801	Boost Pump Motor-Impeller - Removal (P/B 401)
28-22-06-000-801	Override/Jettison Pump Motor-Impeller - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-31-01-000-801	Fuel Jettison Pump (Motor-Impeller) - Removal (P/B 401)

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B. Tools/Equipment

Reference	Description
STD-200	Container - Fuel Resistant, 10 gallon (38 l)

C. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
ARO 001-004 PRE SB 777-28-0078	
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
ARO ALL	
533	Main Tank - Rib 8 to Rib 17 - Left Wing
ARO 001-004 PRE SB 777-28-0078	
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
ARO ALL	
633	Main Tank, Rib 8 To Rib 17 - Right Wing

D. Procedure

ARO 001-004 PRE SB 777-28-0078

SUBTASK 28-22-07-650-001

(1) Defuel the applicable main fuel tank for the motive flow check valve in the forward or aft fuel boost pump.

(a) Do this task: Pressure Defueling, TASK 28-26-00-650-801.

ARO 005-999; ARO 001-004 POST SB 777-28-0078

SUBTASK 28-22-07-650-005

(2) Defuel the applicable main fuel tank for the motive flow check valve in the forward fuel boost pump or jettison pump.

(a) Do this task: Pressure Defueling, TASK 28-26-00-650-801.

ARO ALL

SUBTASK 28-22-07-650-002

(3) Defuel the center fuel tank for the motive flow check valve in the center override/jettison pumps.

(a) Do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-22-07-010-001

(4) To remove the motive flow check valve installed in a main tank boost pump housing [4], do this task: Boost Pump Motor-Impeller - Removal, TASK 28-22-05-000-801.

SUBTASK 28-22-07-010-002

(5) To remove the motive flow check valve installed in a center tank override/jettison fuel pump housing [4], do this task: Override/Jettison Pump Motor-Impeller - Removal, TASK 28-22-06-000-801.

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ARO 005-999; ARO 001-004 POST SB 777-28-0078

SUBTASK 28-22-07-010-005

(6) To remove the motive flow check valve installed in a main tank jettison fuel pump housing [4], do this task: Fuel Jettison Pump (Motor-Impeller) - Removal, TASK 28-31-01-000-801.

ARO ALL

SUBTASK 28-22-07-020-001

(7) Do these steps to remove the motive flow valve, View A (Figure 401).

NOTE: Fuel from the fuel feed manifold will drain from the pump housing when the motive flow valve is removed.

(a) Put a 10 gallon (38 l) fuel resistant container, STD-200 below the pump to catch the fuel.

(b) Remove the screw [1] from the valve [2].

(c) Turn the valve [2] counterclockwise to remove.

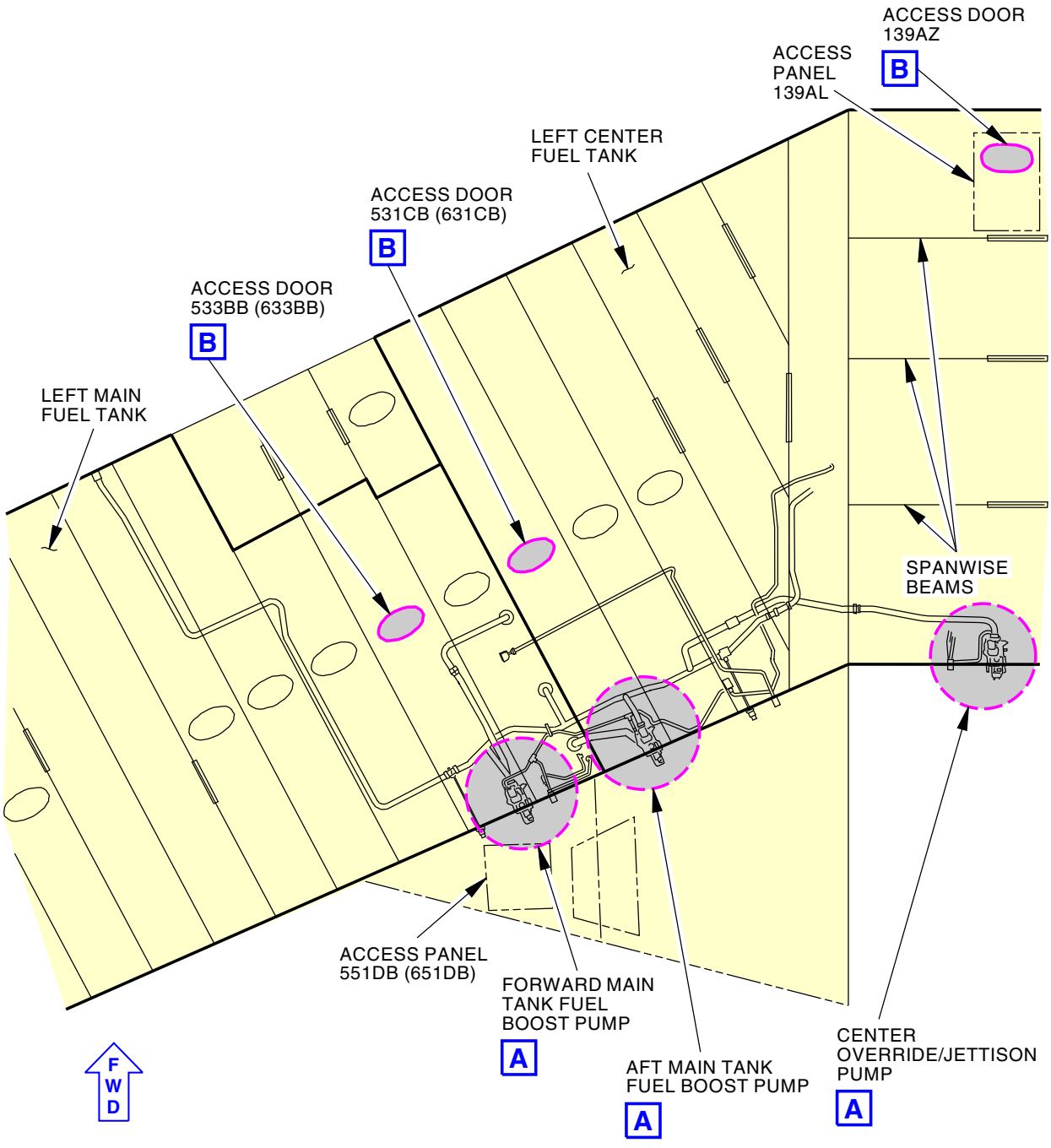
(d) Remove the valve [2] from inside the fuel pump housing [4].

NOTE: Fuel from the fuel feed manifold will drain from the pump housing when the valve is removed.

(e) Discard the o-ring [3].

——— END OF TASK ———

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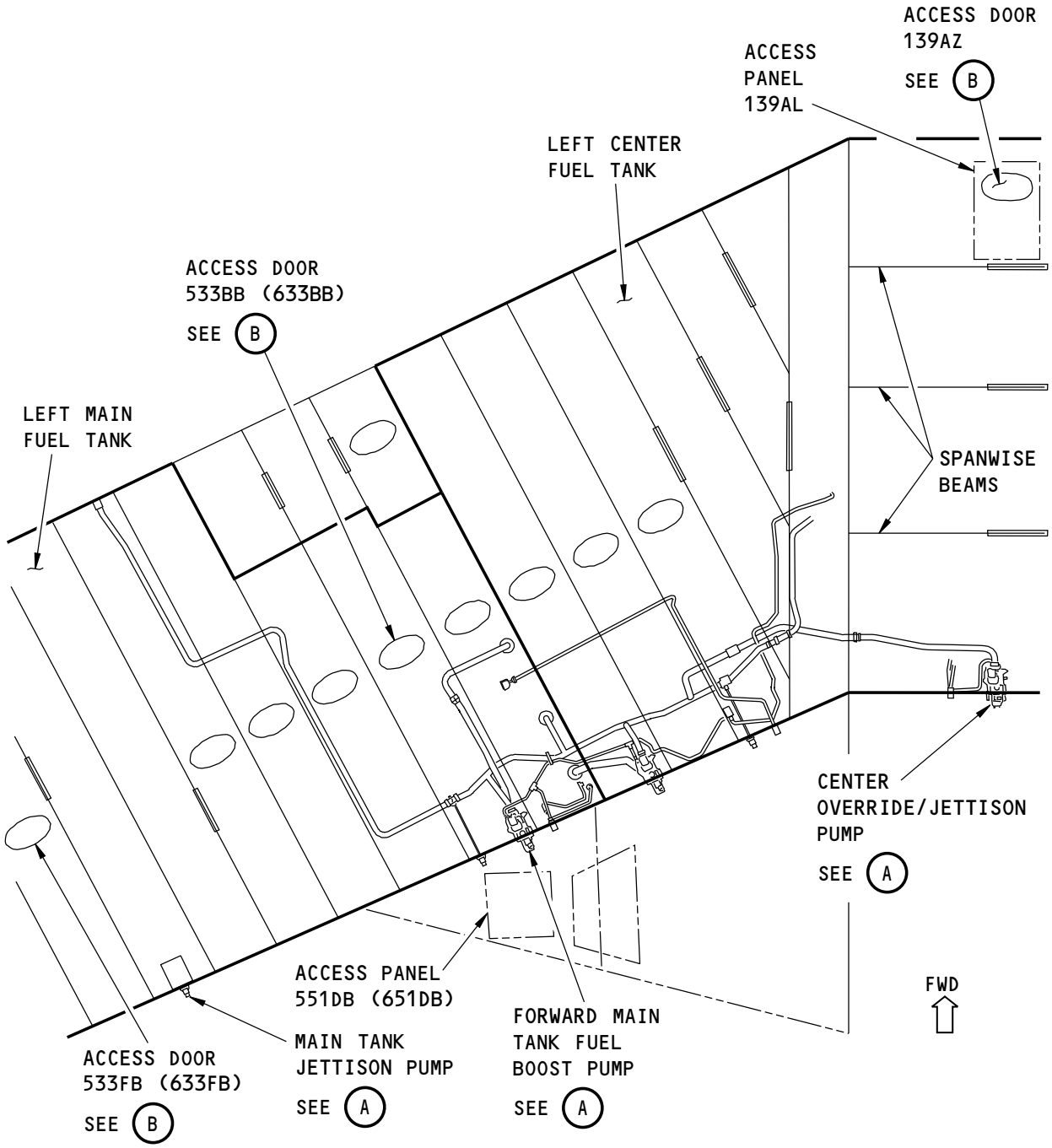


LEFT WING
(RIGHT WING IS EQUIVALENT)
(TOP VIEW)

E26886 S0006415160_V2

Motive Flow Check Valve Installation
Figure 401/28-22-07-990-801 (Sheet 1 of 3)

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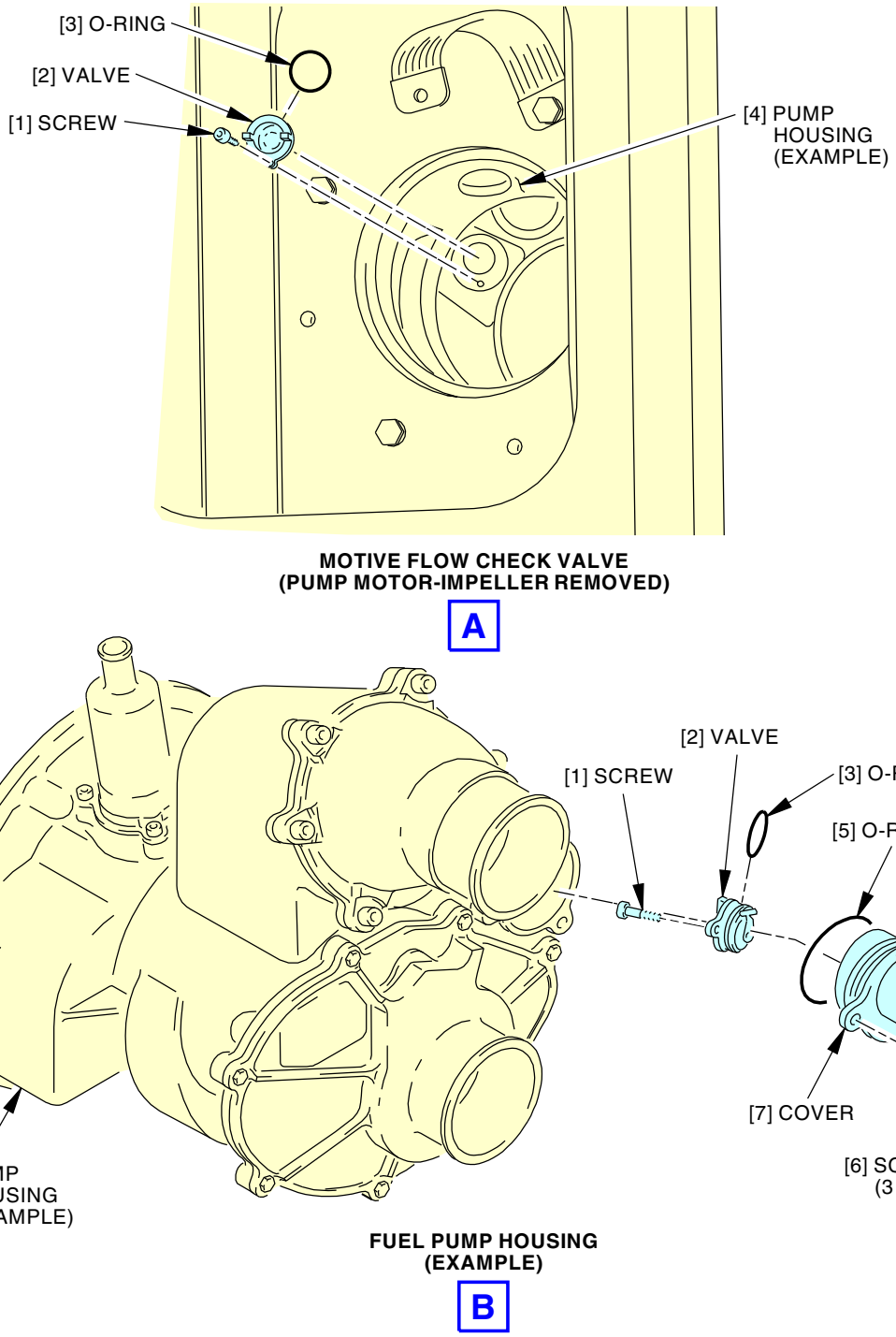


LEFT WING (TOP VIEW)
(RIGHT WING IS EQUIVALENT)

2229684 S0000497143_V1

Motive Flow Check Valve Installation
Figure 401/28-22-07-990-801 (Sheet 2 of 3)

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Motive Flow Check Valve Installation
Figure 401/28-22-07-990-801 (Sheet 3 of 3)

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TASK 28-22-07-400-801

3. Motive Flow Check Valve (Out Of Fuel Tank) - Installation

(Figure 401)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-10-19-400-801	O-Rings Installation (P/B 401)
28-22-05-400-801	Boost Pump Motor-Impeller - Installation (P/B 401)
28-22-06-400-801	Override/Jettison Pump Motor-Impeller - Installation (P/B 401)
28-31-01-400-801	Fuel Jettison Pump (Motor-Impeller) - Installation (P/B 401)

B. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Valve	28-22-05-01A-115	ARO 001-004
		28-22-05-01B-100	ARO 005-016
		28-22-06-01-155	ARO 001-006
3	O-ring	28-22-05-01A-120	ARO 001-004
		28-22-05-01B-105	ARO 005-016
		28-22-06-01-160	ARO 001-006

D. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
ARO 001-004 PRE SB 777-28-0078	
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
ARO ALL	
533	Main Tank - Rib 8 to Rib 17 - Left Wing
ARO 001-004 PRE SB 777-28-0078	
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
ARO ALL	
633	Main Tank, Rib 8 To Rib 17 - Right Wing

E. Procedure

SUBTASK 28-22-07-430-001

(1) Apply a thin layer of petrolatum grease, D00504, to a new o-ring [3].

(a) Install the o-ring [3] on the valve [2] (TASK 20-10-19-400-801).

SUBTASK 28-22-07-420-001

(2) Do these steps to install the valve [2] into the applicable pump housing [4]:

(a) Put the valve [2] into the pump housing [4].

(b) Turn the valve [2] to lock it in its position.

(c) Install the screw [1] to attach the valve [2] to the pump housing [4].

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(d) Make sure the valve [2] is free to operate.

SUBTASK 28-22-07-410-001

(3) For the applicable main tank fuel boost pump, do this task: Boost Pump Motor-Impeller - Installation, TASK 28-22-05-400-801.

SUBTASK 28-22-07-410-002

(4) For the applicable center tank override/jettison fuel pump, do this task: Override/Jettison Pump Motor-Impeller - Installation, TASK 28-22-06-400-801.

ARO 005-999; ARO 001-004 POST SB 777-28-0078

SUBTASK 28-22-07-410-005

(5) For the applicable main tank jettison fuel pump, do this task: Fuel Jettison Pump (Motor-Impeller) - Installation, TASK 28-31-01-400-801.

ARO ALL

SUBTASK 28-22-07-650-003

(6) To refuel the fuel tanks, do this task: Pressure Refueling, TASK 12-11-01-650-801.

——— END OF TASK ———

TASK 28-22-07-000-802

4. Motive Flow Check Valve (Pump Housing) - Removal

(Figure 401)

A. References

Reference	Title
28-22-05-000-802	Boost Pump Housing - Removal (P/B 401)
28-22-06-000-802	Override/Jettison Pump Housing - Removal (P/B 401)
28-31-01-000-802	Fuel Jettison Pump Housing - Removal (P/B 401)

B. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

C. Procedure

SUBTASK 28-22-07-010-003

(1) To remove the motive flow check valve installed in a main tank boost pump housing [4], do this task: Boost Pump Housing - Removal, TASK 28-22-05-000-802.

SUBTASK 28-22-07-010-004

(2) To remove the motive flow check valve installed in a center tank override/jettison fuel pump housing [4], do this task: Override/Jettison Pump Housing - Removal, TASK 28-22-06-000-802.

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ARO 005-999; ARO 001-004 POST SB 777-28-0078

SUBTASK 28-22-07-010-006

(3) To remove the motive flow check valve installed in a main tank jettison fuel pump housing [4], do this task: Fuel Jettison Pump Housing - Removal, TASK 28-31-01-000-802.

ARO ALL

SUBTASK 28-22-07-020-002

(4) Remove the three screws [6] for the cover [7] of the motive flow check valve.

SUBTASK 28-22-07-020-003

(5) Remove the cover [7] of the motive flow check valve.

(a) Discard the o-ring [5].

SUBTASK 28-22-07-020-004

(6) Remove the screw [1] to remove the valve [2] from the cover [7].

(a) Discard the o-ring [3].

——— END OF TASK ———

TASK 28-22-07-400-802

5. Motive Flow Check Valve (Pump Housing) - Installation

(Figure 401)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-10-19-400-801	O-Rings Installation (P/B 401)
28-22-05-400-802	Boost Pump Housing - Installation (P/B 401)
28-22-06-400-802	Override/Jettison Pump Housing - Installation (P/B 401)
28-31-01-400-802	Fuel Jettison Pump Housing - Installation (P/B 401)

B. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Valve	28-22-05-01A-115	ARO 001-004
		28-22-05-01B-100	ARO 005-016
		28-22-06-01-155	ARO 001-006
3	O-ring	28-22-05-01A-120	ARO 001-004
		28-22-05-01B-105	ARO 005-016
		28-22-06-01-160	ARO 001-006
5	O-ring	28-22-05-01A-125	ARO 001-004
		28-22-05-01B-110	ARO 005-016
		28-22-06-01-162	ARO ALL
		28-31-01-01-138	ARO 001-004

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D. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

E. Procedure

SUBTASK 28-22-07-430-002

(1) Apply a thin layer of petrolatum grease, D00504, to a new o-ring [3].

(a) Install the o-ring [3] on the valve [2] (TASK 20-10-19-400-801).

SUBTASK 28-22-07-420-003

(2) Install the valve [2] into the cover [7] and install the screw [1].

SUBTASK 28-22-07-430-003

(3) Apply a thin layer of petrolatum grease, D00504, to a new o-ring [5].

(a) Install the o-ring [5] on the cover [7] (TASK 20-10-19-400-801).

SUBTASK 28-22-07-420-004

(4) Install the valve [2] and cover [7] assembly into the pump housing [4].

SUBTASK 28-22-07-420-005

(5) Align the cover [7] on the pump housing [4] and install the three screws [6].

(a) Make sure the valve [2] is free to operate.

SUBTASK 28-22-07-410-003

(6) For the applicable main tank fuel boost pump, do this task: Boost Pump Housing - Installation, TASK 28-22-05-400-802.

SUBTASK 28-22-07-410-004

(7) For the applicable center tank override/jettison fuel pump, do this task: Override/Jettison Pump Housing - Installation, TASK 28-22-06-400-802.

ARO 005-999; ARO 001-004 POST SB 777-28-0078

SUBTASK 28-22-07-410-006

(8) For the applicable main tank jettison fuel pump, do this task: Fuel Jettison Pump Housing - Installation, TASK 28-31-01-400-802.

ARO ALL

SUBTASK 28-22-07-650-004

(9) To refuel the fuel tanks, do this task: Pressure Refueling, TASK 12-11-01-650-801.

——— END OF TASK ———

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DISCHARGE CHECK VALVE - REMOVAL/INSTALLATION

1. General

A. A discharge check valve is installed in the pump housing for each fuel boost pump, override/jettison pump and jettison pump. The discharge check valve prevents the flow of fuel back through the applicable fuel pump.

B. The discharge check valve can be removed from out of the fuel tank, if the motor-impeller for the applicable fuel pump is removed.

C. This procedure contains four tasks. The first task removes the discharge check valve, from out of the fuel tank. The second task installs the discharge check valve, from out of the fuel tank. The third task removes the discharge check valve from the pump housing, after the pump housing is removed. The fourth task installs the discharge check valve in the pump housing.

TASK 28-22-08-000-801

2. Discharge Check Valve (Out Of Fuel Tank) - Removal

(Figure 401)

A. References

Reference	Title
28-22-05-000-801	Boost Pump Motor-Impeller - Removal (P/B 401)
28-22-06-000-801	Override/Jettison Pump Motor-Impeller - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-31-01-000-801	Fuel Jettison Pump (Motor-Impeller) - Removal (P/B 401)

B. Tools/Equipment

Reference	Description
STD-200	Container - Fuel Resistant, 10 gallon (38 l)

C. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

D. Procedure

SUBTASK 28-22-08-650-001

(1) To remove the discharge check valve for the main tank boost pumps or the main tank jettison pumps, defuel the left and right main tanks.

(a) Do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-22-08-650-002

(2) To remove the discharge check valve for the override/jettison pumps in the center fuel tank, it is not necessary to defuel the fuel tanks.

SUBTASK 28-22-08-010-001

(3) To remove the discharge check valve, installed in a main tank boost pump housing [4], do this task: Boost Pump Motor-Impeller - Removal, TASK 28-22-05-000-801.

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SUBTASK 28-22-08-010-002

(4) To remove the discharge check valve, installed in a center tank override/jettison pump housing [4], do this task: Override/Jettison Pump Motor-Impeller - Removal, TASK 28-22-06-000-801.

SUBTASK 28-22-08-010-003

(5) To remove the discharge check valve, installed in a main tank jettison pump housing [4], do this task: Fuel Jettison Pump (Motor-Impeller) - Removal, TASK 28-31-01-000-801.

SUBTASK 28-22-08-020-004

(6) Do these steps to remove the discharge check valve, View A (Figure 401).

NOTE: Fuel from the fuel feed manifold will drain from the pump housing when the discharge check valve is removed.

(a) Put a 10 gallon (38 l) fuel resistant container, STD-200 below the pump to catch the fuel.

(b) Remove the two screws [1] from the valve [2].

(c) Turn the valve [2] counterclockwise to remove.

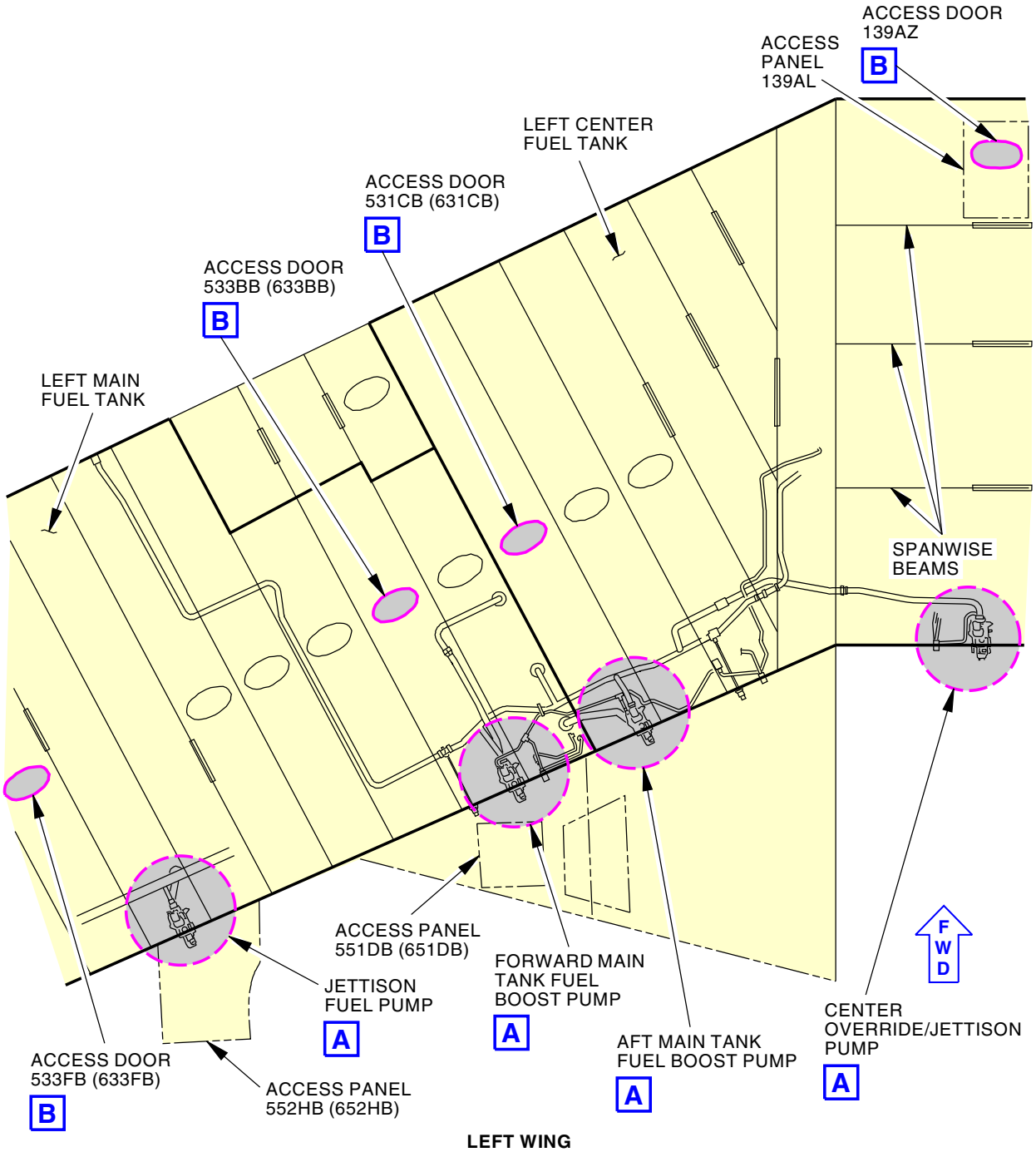
(d) Remove the valve [2] from inside the fuel pump housing [4].

NOTE: Fuel from the fuel feed manifold will drain from the pump housing when the valve is removed.

(e) Discard the o-ring [3].

END OF TASK

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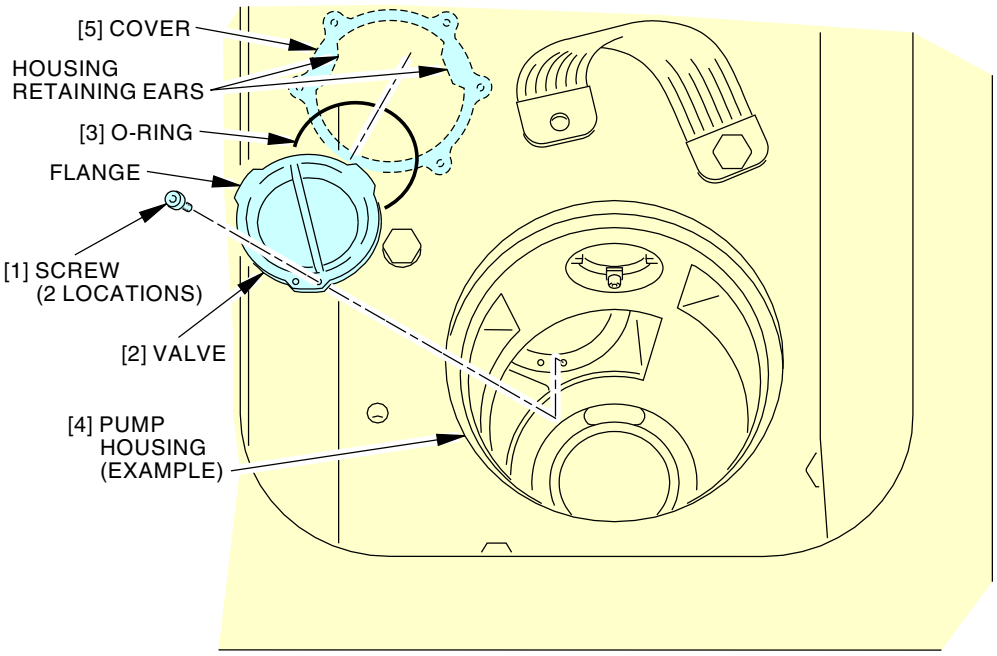


LEFT WING
(RIGHT WING IS EQUIVALENT)
(TOP VIEW)

E26910 S0006415168_V2

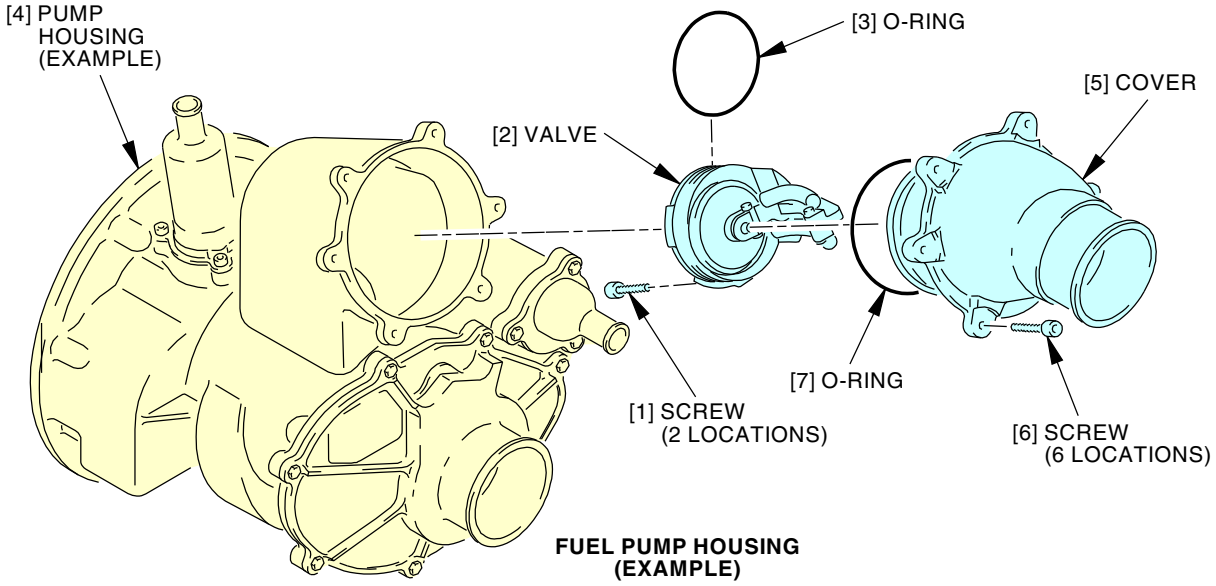
Discharge Check Valve Installation
Figure 401/28-22-08-990-801 (Sheet 1 of 2)

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DISCHARGE CHECK VALVE
(PUMP MOTOR-IMPELLER REMOVED)

A



FUEL PUMP HOUSING
(EXAMPLE)

B

E26914 S0006415169_V3

Discharge Check Valve Installation
Figure 401/28-22-08-990-801 (Sheet 2 of 2)

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TASK 28-22-08-400-801

3. Discharge Check Valve (Out Of Fuel Tank) - Installation

(Figure 401)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-10-19-400-801	O-Rings Installation (P/B 401)
28-22-05-400-801	Boost Pump Motor-Impeller - Installation (P/B 401)
28-22-06-400-801	Override/Jettison Pump Motor-Impeller - Installation (P/B 401)
28-22-08-720-801	Discharge Check Valve - Functional Test (P/B 501)
28-31-01-400-801	Fuel Jettison Pump (Motor-Impeller) - Installation (P/B 401)

B. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Valve	28-22-05-01A-090	ARO 001-004
		28-22-05-01B-070	ARO 005-016
		28-22-06-01-140	ARO ALL
		28-31-01-01-150	ARO 001-004
3	O-ring	28-22-05-01A-100	ARO 001-004
		28-22-05-01B-080	ARO 005-016
		28-22-06-01-145	ARO ALL
		28-31-01-01-155	ARO 001-004

D. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

E. Procedure

SUBTASK 28-22-08-430-001

(1) Apply a thin layer of petrolatum grease, D00504, to a new o-ring [3].

(a) Install the new o-ring [3] on the valve [2] (TASK 20-10-19-400-801).

SUBTASK 28-22-08-420-001

(2) Do these steps to install the valve [2] in the pump housing [4].

(a) Turn the valve [2] until its flanges go between the housing retaining ears.

NOTE: The valve [2] should now be flush with the mount surface of the pump housing [4].

(b) Turn the valve [2] clockwise to lock it in its position under the housing retaining ears.

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(c) Align the fastener holes on the valve [2] with the fastener holes on the pump housing [4].

1) Install the two screws [1].

(d) Make sure the valve [2] is free to operate.

SUBTASK 28-22-08-410-001

(3) For the applicable main tank fuel boost pump, do this task: Boost Pump Motor-Impeller - Installation, TASK 28-22-05-400-801.

SUBTASK 28-22-08-410-002

(4) For the applicable override/jettison pump in the center fuel tank, do this task: Override/Jettison Pump Motor-Impeller - Installation, TASK 28-22-06-400-801.

SUBTASK 28-22-08-410-003

(5) For the applicable main tank jettison pump, do this task: Fuel Jettison Pump (Motor-Impeller) - Installation, TASK 28-31-01-400-801.

SUBTASK 28-22-08-720-001

(6) Do this task to make sure the discharge check valve [2] is correctly installed: Discharge Check Valve - Functional Test, TASK 28-22-08-720-801.

SUBTASK 28-22-08-650-003

(7) To refuel the fuel tanks, do this task: Pressure Refueling, TASK 12-11-01-650-801.

——— END OF TASK ———

TASK 28-22-08-000-802

4. Discharge Check Valve (Pump Housing) - Removal

(Figure 401)

A. References

Reference	Title
28-22-05-000-802	Boost Pump Housing - Removal (P/B 401)
28-22-06-000-802	Override/Jettison Pump Housing - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-31-01-000-802	Fuel Jettison Pump Housing - Removal (P/B 401)

B. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

C. Procedure

SUBTASK 28-22-08-650-004

(1) To defuel all of the fuel tanks, do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-22-08-010-004

(2) For removal of the pump housing [4] for the main tank boost pumps, refer to (TASK 28-22-05-000-802).

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SUBTASK 28-22-08-010-005

(3) For removal of the pump housing [4] for the center tank override/jettison pumps, refer to (TASK 28-22-06-000-802).

SUBTASK 28-22-08-010-006

(4) For removal of the pump housing [4] for the main tank jettison pumps, refer to (TASK 28-31-01-000-802).

SUBTASK 28-22-08-020-001

(5) Remove the six screws [6] from the cover [5] on the discharge check valve.

SUBTASK 28-22-08-020-002

(6) Remove the cover [5] from the discharge check valve.

(a) Discard the o-ring [7].

SUBTASK 28-22-08-020-003

(7) Remove the two screws [1] to remove the valve [2] from the cover [5].

(a) Discard the o-ring [3].

——— END OF TASK ———

TASK 28-22-08-400-802

5. Discharge Check Valve (Pump Housing) - Installation

(Figure 401)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-10-19-400-801	O-Rings Installation (P/B 401)
28-22-05-400-802	Boost Pump Housing - Installation (P/B 401)
28-22-06-400-802	Override/Jettison Pump Housing - Installation (P/B 401)
28-22-08-720-801	Discharge Check Valve - Functional Test (P/B 501)
28-31-01-400-802	Fuel Jettison Pump Housing - Installation (P/B 401)

B. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Valve	28-22-05-01A-090	ARO 001-004
		28-22-05-01B-070	ARO 005-016
		28-22-06-01-140	ARO ALL
		28-31-01-01-150	ARO 001-004
3	O-ring	28-22-05-01A-100	ARO 001-004
		28-22-05-01B-080	ARO 005-016
		28-22-06-01-145	ARO ALL
		28-31-01-01-155	ARO 001-004
7	O-ring	28-22-06-01-143	ARO ALL
		28-31-01-01-157	ARO 001-004

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D. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

E. Procedure

SUBTASK 28-22-08-430-002

(1) Apply a thin layer of petrolatum grease, D00504, to a new o-ring [3].

(a) Install the new o-ring [3] on the valve [2] (TASK 20-10-19-400-801).

SUBTASK 28-22-08-420-002

(2) Do these steps to install the valve [2] into the cover [5]:

(a) Put the valve [2] on the cover [5] so that the flanges of the valve [2] go between the housing retaining ears of the cover [5].

NOTE: The valve [2] should now be flush with the housing mount surface of the cover [5].

(b) Turn the valve [2] clockwise to lock it in its position under the housing retaining ears.

(c) Align the fastener holes on the valve [2] with the housing fastener holes on the cover [5].

1) Install the two screws [1].

SUBTASK 28-22-08-430-003

(3) Apply a thin layer of petrolatum grease, D00504, to a new o-ring [7].

(a) Install the new o-ring [7] on the cover [5] (TASK 20-10-19-400-801).

SUBTASK 28-22-08-420-003

(4) Install the valve [2] and cover [5] assembly into the pump housing [4].

SUBTASK 28-22-08-420-004

(5) Align the cover [5] on the pump housing [4] and install the six screws [6].

NOTE: Make sure the two screws [1] show from inside the pump housing [4], View A (Figure 401).

(a) Make sure the valve [2] is free to operate.

SUBTASK 28-22-08-410-004

(6) To install the pump housing [4] for the main tank boost pumps, (TASK 28-22-05-400-802).

SUBTASK 28-22-08-410-005

(7) To install the pump housing [4] for the center tank override/jettison pumps, refer to (TASK 28-22-06-400-802).

SUBTASK 28-22-08-410-006

(8) To install the pump housing [4] for the main tank jettison pumps, refer to (TASK 28-31-01-400-802).

SUBTASK 28-22-08-720-002

(9) Do this task to make sure the discharge check valve [2] is correctly installed: Discharge Check Valve - Functional Test, TASK 28-22-08-720-801.

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SUBTASK 28-22-08-650-005

(10) To refuel the fuel tanks, do this task: Pressure Refueling, TASK 12-11-01-650-801.

——— END OF TASK ———

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DISCHARGE CHECK VALVE - ADJUSTMENT/TEST

1. General

A. This procedure contains a functional test of the discharge check valve.

TASK 28-22-08-720-801

2. Discharge Check Valve - Functional Test

A. General

(1) The test procedures are different for the three types of fuel pumps. This task contains separate steps for a discharge check valve in these pumps:

(a) Main tank boost pumps

NOTE: There are two procedures for testing the discharge check valves on the main tank boost pumps. One procedure makes sure the installation is by operating the override/jettison pumps in the center fuel tank, the other procedure makes sure the installation is correct by operating the opposite main tank boost pumps.

(b) Override/jettison pumps in the center fuel tank

(c) Jettison pumps

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
28-22-08-000-801	Discharge Check Valve (Out Of Fuel Tank) - Removal (P/B 401)
28-22-08-000-802	Discharge Check Valve (Pump Housing) - Removal (P/B 401)
28-22-08-400-801	Discharge Check Valve (Out Of Fuel Tank) - Installation (P/B 401)
28-22-08-400-802	Discharge Check Valve (Pump Housing) - Installation (P/B 401)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)

C. Tools/Equipment

Reference	Description
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)

D. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

E. Access Panels

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

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F. Prepare For the Test

SUBTASK 28-22-08-650-006

(1) Use the table below, to make sure that there is a sufficient quantity of fuel in the applicable tank(s):

(a) Find the pump with the discharge check valve that will be tested.

(b) The necessary fuel quantities are given to the right of that pump.

	Pump	Left Main Tank	Center Tank	Right Main Tank
Main Tank Boost Pump	L AFT	1000 lb (454 kg)	5500 lb (2495 kg)	—
	L FWD	1000 lb (454 kg)	5500 lb (2495 kg)	—
	R AFT	—	5500 lb (2495 kg)	1000 lb (454 kg)
	R FWD	—	5500 lb (2495 kg)	1000 lb (454 kg)
Main Tank Boost Pump - Alternate Procedure	L AFT	—	—	1000 lb (454 kg)
	L FWD	—	—	1000 lb (454 kg)
	R AFT	1000 lb (454 kg)	—	—
	R FWD	1000 lb (454 kg)	—	—
Override/Jettison Pump	L	13,500 lb (6123 kg)	—	—
	R	—	—	13,500 lb (6123 kg)
Jettison Pump	L	—	5500 lb (2495 kg)	—
	R	—	5500 lb (2495 kg)	—

(c) If one or more tanks contain less than this quantity of fuel, do one of these tasks:

1) Pressure Refueling, TASK 12-11-01-650-801

2) Tank to Tank Transfer, TASK 28-26-00-650-802.

G. Procedure - Main Tank Boost Pump

SUBTASK 28-22-08-860-001

(1) Do these steps to prepare for the test:

(a) Make sure that the main tank boost pumps are not operating. To do this, set these switches, on the P5 Overhead Panel, to the off position:

1) L AFT PUMP

2) L FWD PUMP

3) R AFT PUMP

4) R FWD PUMP

(b) Make sure these switches, on the P5 Overhead Panel, are in the closed (off) position:

1) CROSSFEED FWD

2) CROSSFEED AFT

SUBTASK 28-22-08-010-007

(2) Open the applicable access panel:

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

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SUBTASK 28-22-08-720-012

(3) Put the DEFUEL VALVE control switch to the OPEN position, on the IRP, P28 panel.

SUBTASK 28-22-08-860-014

WARNING DO NOT OPERATE A FUEL PUMP IF THE AMBER PRESS LIGHT COMES ON AND STAYS ON. IT CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE TANK WHICH WILL CAUSE A FIRE OR EXPLOSION. FIRES AND EXPLOSIONS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(4) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

(a) Immediately set the applicable fuel pump switch-light(s) to OFF if the amber PRESS light comes on and stays on.

SUBTASK 28-22-08-860-002

(5) Do these steps to operate the pumps for the test:

(a) Push the applicable switches, on the P5 Overhead Panel, to the ON position.

1) If you are testing one of the two left main boost pumps,

a) L FWD PUMP

b) L AFT PUMP

2) If you are testing one of the two right main boost pumps,

a) R FWD PUMP

b) R AFT PUMP

(b) Wait 1 minute.

(c) Push the applicable switch, on the P5 Overhead Panel, to the ON position:

1) If you are testing the left main boost pump,

a) CENTER PUMPS L

2) If you are testing the right main boost pump,

a) CENTER PUMPS R

SUBTASK 28-22-08-720-003

(6) Monitor the fuel quantity in the applicable main fuel tank for 10 minutes.

NOTE: The tank that you must monitor is the main tank on the same side as the discharge check valve that you are testing.

(a) After 10 minutes, turn off the main fuel tank boost pumps. To do this, push the applicable switches, on the P5 Overhead Panel, to the off position:

1) L FWD PUMP

2) L AFT PUMP

3) R FWD PUMP

4) R AFT PUMP

(b) If the fuel level in the applicable main fuel tank increased (and the level in the center tank decreased by almost the same quantity), then you must install the discharge check valve again.

1) Push these switches, on the P5 Overhead Panel, to the off position:

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a) CENTER PUMPS L

b) CENTER PUMPS R

2) Do the applicable task to remove the discharge check valve:

a) Discharge Check Valve (Out Of Fuel Tank) - Removal, TASK 28-22-08-000-801

b) Discharge Check Valve (Pump Housing) - Removal, TASK 28-22-08-000-802.

3) Do the applicable task to install the discharge check valve:

a) Discharge Check Valve (Out Of Fuel Tank) - Installation, TASK 28-22-08-400-801

b) Discharge Check Valve (Pump Housing) - Installation, TASK 28-22-08-400-802.

SUBTASK 28-22-08-720-004

(7) Continue to monitor the fuel quantity in the applicable main fuel tank for 5 more minutes.

NOTE: The tank that you must monitor is the main tank on the same side as the discharge check valve that you installed.

(a) Push these switches, on the P5 Overhead Panel, to the off position:

1) CENTER PUMPS L

2) CENTER PUMPS R

(b) If the fuel level in the applicable main fuel tank increased (and the level in the center tank decreased by almost the same quantity), then you must install the discharge check valve again.

1) Do the applicable task to remove the discharge check valve:

a) Discharge Check Valve (Out Of Fuel Tank) - Removal, TASK 28-22-08-000-801

b) Discharge Check Valve (Pump Housing) - Removal, TASK 28-22-08-000-802.

2) Do the applicable task to install the discharge check valve:

a) Discharge Check Valve (Out Of Fuel Tank) - Installation, TASK 28-22-08-400-801

b) Discharge Check Valve (Pump Housing) - Installation, TASK 28-22-08-400-802.

SUBTASK 28-22-08-720-013

(8) Put the DEFUEL VALVE control switch to the closed position, on the IRP, P28 panel.

SUBTASK 28-22-08-410-007

(9) Close the applicable access panel:

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

SUBTASK 28-22-08-860-003

(10) If fuel is not necessary in the center tank, operate the main tank boost pumps to scavenge the remaining fuel.

(a) To do this, set the applicable switches, on the P5 Overhead Panel, to the ON position:

1) L FWD PUMP

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2) L AFT PUMP
3) R FWD PUMP
4) R AFT PUMP

(b) When the center fuel tank is empty, set the applicable switches to the off position.

H. Alternate Procedure - Main Tank Boost Pump

NOTE: This procedure does a functional test of the discharge check valve on one of the main tank boost pumps. However, unlike the previous procedure which makes sure the installation is correct by operating the override/jettison pumps in the center fuel tank, this procedure makes sure the installation is correct by operating the opposite main tank boost pumps. Do this procedure to avoid scavenging fuel from the center wing tank once the functional test of the main tank boost pumps is complete.

SUBTASK 28-22-08-720-009

(1) Do these steps to prepare for the test:

(a) Make sure that the main tank boost pumps are not operating. To do this, set these switches, on the P5 Overhead Panel, to the off position:

1) L AFT PUMP
2) L FWD PUMP
3) R AFT PUMP
4) R FWD PUMP

(b) Put these switches, on the P5 Overhead Panel, to the ON (open) position:

1) CROSSFEED FWD
2) CROSSFEED AFT

SUBTASK 28-22-08-010-010

(2) Open the applicable access panel:

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

SUBTASK 28-22-08-860-015

WARNING DO NOT OPERATE A FUEL PUMP IF THE AMBER PRESS LIGHT COMES ON AND STAYS ON. IT CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE TANK WHICH WILL CAUSE A FIRE OR EXPLOSION. FIRES AND EXPLOSIONS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(3) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

(a) Immediately set the applicable fuel pump switch-light(s) to OFF if the amber PRESS light comes on and stays on.

SUBTASK 28-22-08-720-008

(4) Do these steps to operate the pumps for the test:

(a) Push the applicable switches, on the P5 Overhead Panel, to the ON position.

1) If you do a test of one of the two left main boost pumps:

a) R FWD PUMP

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b) R AFT PUMP

2) If you do a test of one of the two right main boost pumps:

a) L FWD PUMP

b) L AFT PUMP

SUBTASK 28-22-08-720-007

(5) Monitor the fuel quantity in the applicable main fuel tank for 10 minutes.

NOTE: The tank that you must monitor is the main tank on the same side as the discharge check valve that you are testing.

(a) After 10 minutes, turn off the main fuel tank boost pumps. To do this, push the applicable switches, on the P5 Overhead Panel, to the off position:

1) L FWD PUMP

2) L AFT PUMP

3) R FWD PUMP

4) R AFT PUMP

(b) If the fuel level in the applicable main fuel tank increased (and the level in the opposite main fuel tank decreased by almost the same quantity), then you must install the discharge check valve again.

1) Do the applicable task to remove the discharge check valve:

a) Discharge Check Valve (Out Of Fuel Tank) - Removal, TASK 28-22-08-000-801

b) Discharge Check Valve (Pump Housing) - Removal, TASK 28-22-08-000-802.

2) Do the applicable task to install the discharge check valve:

a) Discharge Check Valve (Out Of Fuel Tank) - Installation, TASK 28-22-08-400-801

b) Discharge Check Valve (Pump Housing) - Installation, TASK 28-22-08-400-802.

SUBTASK 28-22-08-720-011

(6) Continue to monitor the fuel quantity in the applicable main fuel tank for an additional five minutes.

NOTE: The tank that you must monitor is the main tank on the same side as the discharge check valve that you installed.

(a) Push these switches, on the P5 Overhead Panel, to the off position:

1) L FWD PUMP

2) L AFT PUMP

3) R FWD PUMP

4) R AFT PUMP

(b) If the fuel level in the applicable main fuel tank increased (and the level in the opposite main fuel tank decreased by almost the same quantity), then you must install the discharge check valve again.

1) Do the applicable task to remove the discharge check valve:

a) Discharge Check Valve (Out Of Fuel Tank) - Removal, TASK 28-22-08-000-801

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b) Discharge Check Valve (Pump Housing) - Removal, TASK 28-22-08-000-802.

2) Do the applicable task to install the discharge check valve:

a) Discharge Check Valve (Out Of Fuel Tank) - Installation, TASK 28-22-08-400-801

b) Discharge Check Valve (Pump Housing) - Installation, TASK 28-22-08-400-802.

SUBTASK 28-22-08-410-010

(7) Close the applicable access panel:

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

SUBTASK 28-22-08-720-010

(8) Put these switches, on the P5 Overhead Panel, to the off (closed) position:

(a) CROSSFEED FWD

(b) CROSSFEED AFT

I. Procedure - Override/Jettison Pump in the Center Fuel Tank

SUBTASK 28-22-08-860-004

(1) Do these steps to prepare for the test:

(a) Open these circuit breakers and install safety tags:

Left Power Management Panel, P110

Row	Col	Number	Name
L	25	C28621	L FUEL JETT NOZ VLV

Right Power Management Panel, P210

Row	Col	Number	Name
K	12	C28620	R FUEL JETT NOZ VLV

(b) If you are testing the discharge check valve for the left override/jettison pump in the center fuel tank, open this circuit breaker and install a safety tag:

Right Power Management Panel, P210

Row	Col	Number	Name
K	14	C28646	R FUEL JETT PUMP CTRL

(c) If you are testing the discharge check valve for the right override/jettison pump in the center fuel tank, open this circuit breaker and install a safety tag:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL

SUBTASK 28-22-08-010-008

(2) Open the applicable access panel:

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

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SUBTASK 28-22-08-720-014

(3) Put the DEFUEL VALVE control switch to the OPEN position, on the IRP, P28 panel.

SUBTASK 28-22-08-940-001

(4) Put 5-gallon (19-liter) fuel resistant containers, STD-1054, below the fuel jettison nozzles at the wing tips to catch any fuel that spills.

SUBTASK 28-22-08-860-016

WARNING

DO NOT OPERATE A FUEL PUMP IF THE AMBER PRESS LIGHT COMES ON AND STAYS ON. IT CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE TANK WHICH WILL CAUSE A FIRE OR EXPLOSION. FIRES AND EXPLOSIONS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(5) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

(a) Immediately set the applicable fuel pump switch-light(s) to OFF if the amber PRESS light comes on and stays on.

NOTE: The FAULT light on the ARM switch comes on to show low pressure for the jettison pumps. Set the ARM switch to the OFF position if this occurs.

SUBTASK 28-22-08-860-005

(6) Push the FUEL JETTISON ARM switch, on the P5 Overhead Panel, to the ARMED position.

NOTE: This opens the jettison isolation valves and turns on the applicable override/jettison pump.

SUBTASK 28-22-08-720-005

(7) Monitor the fuel quantity in the center fuel tank for 10 minutes.

(a) After 10 minutes, push the FUEL JETTISON ARM switch, on the P5 Overhead Panel, to the off position.

(b) If the fuel level in the center fuel tank increased (and the level in the applicable main tank decreased by almost the same quantity), then you must install the discharge check valve again.

NOTE: The main tank referred to is the main tank on the same side as the discharge check valve that you are testing.

1) Do the applicable task to remove the discharge check valve:

a) Discharge Check Valve (Out Of Fuel Tank) - Removal, TASK 28-22-08-000-801

b) Discharge Check Valve (Pump Housing) - Removal, TASK 28-22-08-000-802.

2) Do the applicable task to install the discharge check valve:

a) Discharge Check Valve (Out Of Fuel Tank) - Installation, TASK 28-22-08-400-801

b) Discharge Check Valve (Pump Housing) - Installation, TASK 28-22-08-400-802.

SUBTASK 28-22-08-720-015

(8) Put the DEFUEL VALVE control switch to the closed position, on the IRP, P28 panel.

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SUBTASK 28-22-08-410-008

(9) Close the applicable access panel:

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

SUBTASK 28-22-08-860-006

(10) Do these steps to return the airplane to its usual condition:

(a) Remove the safety tags and close these circuit breakers:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
K	14	C28646	R FUEL JETT PUMP CTRL

(b) Remove the safety tags and close these circuit breakers:

Left Power Management Panel, P110

Row	Col	Number	Name
L	25	C28621	L FUEL JETT NOZ VLV

Right Power Management Panel, P210

Row	Col	Number	Name
K	12	C28620	R FUEL JETT NOZ VLV

SUBTASK 28-22-08-860-007

(11) If fuel is not required in the center fuel tank, operate the main tank boost pumps to scavenge the remaining fuel.

(a) To do this, push the applicable switches, on the P5 Overhead Panel, to the ON position:

1) L FWD PUMP
2) L AFT PUMP
3) R FWD PUMP
4) R AFT PUMP

(b) When the center fuel tank is empty, push the applicable switches to the off position.

J. Procedure - Jettison Pump

SUBTASK 28-22-08-860-008

(1) Do these steps to prepare for the test:

(a) Open these circuit breakers and install safety tags:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL
L	25	C28621	L FUEL JETT NOZ VLV

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Right Power Management Panel, P210

Row	Col	Number	Name
K	12	C28620	R FUEL JETT NOZ VLV
K	14	C28646	R FUEL JETT PUMP CTRL

SUBTASK 28-22-08-010-009

(2) Open the applicable access panel:

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

SUBTASK 28-22-08-860-012

(3) Put the DEFUEL VALVE control switch to the OPEN position, on the IRP, P28 panel.

SUBTASK 28-22-08-940-002

(4) Put 5-gallon (19-liter) fuel resistant containers, STD-1054, below the fuel jettison nozzles at the wing tips to catch any fuel that spills.

SUBTASK 28-22-08-860-017

WARNING DO NOT OPERATE A FUEL PUMP IF THE AMBER PRESS LIGHT COMES ON AND STAYS ON. IT CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE TANK WHICH WILL CAUSE A FIRE OR EXPLOSION. FIRES AND EXPLOSIONS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(5) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

(a) Immediately set the applicable fuel pump switch-light(s) to OFF if the amber PRESS light comes on and stays on.

NOTE: The FAULT light on the ARM switch comes on to show low pressure for the jettison pumps. Set the ARM switch to the OFF position if this occurs.

SUBTASK 28-22-08-860-009

(6) Do these steps to open the jettison isolation valves and operate the applicable pump:

(a) Push the applicable switch, on the P5 Overhead Panel, to the ON position.

1) If you are testing the discharge check valve for the left jettison pump in the main fuel tank:

a) CENTER PUMPS L

2) If you are testing the discharge check valve for the right jettison pump in the main fuel tank:

a) CENTER PUMPS R

(b) Push the FUEL JETTISON ARM switch, on the P5 Overhead Panel, to the ARMED position.

NOTE: This opens the jettison isolation valves.

SUBTASK 28-22-08-720-006

(7) Monitor the fuel quantity in the applicable main fuel tank for 10 minutes.

NOTE: The main tank referred to is the main tank on the same side as the discharge check valve that you are testing.

(a) After 10 minutes, do these steps:

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1) Push the FUEL JETTISON ARM switch, on the P5 Overhead Panel, to the off position.

2) Push the applicable CENTER PUMPS switch to the off position.

(b) If the fuel level in the applicable main fuel tank increased (and the level in the center fuel tank decreased by almost the same quantity), then you must install the discharge check valve again.

(c) If the fuel level in the applicable main fuel tank increased (and the level in the center fuel tank decreased by almost the same quantity), then you must install the discharge check valve again.

1) Do the applicable task to remove the discharge check valve:

a) Discharge Check Valve (Out Of Fuel Tank) - Removal, TASK 28-22-08-000-801

b) Discharge Check Valve (Pump Housing) - Removal, TASK 28-22-08-000-802.

2) Do the applicable task to install the discharge check valve:

a) Discharge Check Valve (Out Of Fuel Tank) - Installation, TASK 28-22-08-400-801

b) Discharge Check Valve (Pump Housing) - Installation, TASK 28-22-08-400-802.

SUBTASK 28-22-08-860-013

(8) Put the DEFUEL VALVE control switch to the closed position, on the IRP, P28 panel.

SUBTASK 28-22-08-410-009

(9) Close the applicable access panel:

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

SUBTASK 28-22-08-860-010

(10) Do these steps to return the airplane to its usual condition:

Remove the safety tags and close these circuit breakers:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL
L	25	C28621	L FUEL JETT NOZ VLV

Right Power Management Panel, P210

Row	Col	Number	Name
K	12	C28620	R FUEL JETT NOZ VLV
K	14	C28646	R FUEL JETT PUMP CTRL

SUBTASK 28-22-08-860-011

(11) If fuel is not required in the center fuel tank, operate the main tank boost pumps to scavenge the remaining fuel.

(a) To do this, push the applicable switches, on the P5 Overhead Panel, to the ON position:

1) L FWD PUMP

2) L AFT PUMP

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3) R FWD PUMP

4) R AFT PUMP

(b) When the center fuel tank is empty, push the applicable switches to the off position.

——— END OF TASK ———

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VAPOR VENT VALVE - REMOVAL/INSTALLATION

1. General

A. The pump housing for each main tank fuel boost pump, center tank override/jettison pump and main tank jettison pump contains one vapor vent valve.

B. The vapor vent valve lets air out of the fuel pump and permits fuel flow to lubricate and keep the pump cool.

C. The vapor vent valve can be removed from out of the fuel tank, if the motor-impeller for the applicable fuel pump is removed.

D. This procedure contains four tasks. The first task removes the vapor vent valve, from out of the fuel tank. The second task installs the vapor vent valve, from out of the fuel tank. The third task removes the vapor vent valve from the pump housing, when the pump housing is removed. The fourth task installs the vapor vent valve in the pump housing, when the pump housing is removed.

TASK 28-22-09-000-801

2. Vapor Vent Valve (Out Of Tank) - Removal

(Figure 401)

A. References

Reference	Title
28-22-05-000-801	Boost Pump Motor-Impeller - Removal (P/B 401)
28-22-06-000-801	Override/Jettison Pump Motor-Impeller - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-31-01-000-801	Fuel Jettison Pump (Motor-Impeller) - Removal (P/B 401)

B. Tools/Equipment

Reference	Description
STD-200	Container - Fuel Resistant, 10 gallon (38 l)

C. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

D. Procedure

SUBTASK 28-22-09-650-001

(1) Defuel the applicable main fuel tank for the vapor vent valve installed on the forward and aft fuel boost pumps or a main tank jettison fuel pump.

(a) Do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-22-09-650-002

(2) Defuel the center fuel tank for the vapor vent valve installed on the center override/jettison fuel boost pumps.

(a) Do this task: Pressure Defueling, TASK 28-26-00-650-801.

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SUBTASK 28-22-09-010-001

(3) To remove the vapor vent valve, installed in a main tank boost pump housing [1], do this task: Boost Pump Motor-Impeller - Removal, TASK 28-22-05-000-801.

SUBTASK 28-22-09-010-002

(4) To remove the vapor vent valve, installed in a center tank override/jettison fuel pump housing [1], do this task: Override/Jettison Pump Motor-Impeller - Removal, TASK 28-22-06-000-801.

SUBTASK 28-22-09-010-003

(5) To remove the vapor vent valve, installed in a main tank jettison fuel pump housing [1], do this task: Fuel Jettison Pump (Motor-Impeller) - Removal, TASK 28-31-01-000-801.

SUBTASK 28-22-09-020-004

(6) Do these steps to remove the vapor vent valve, View B (Figure 401).

NOTE: Fuel from the fuel feed manifold will drain from the pump housing when the vapor vent valve is removed.

(a) Put a 10 gallon (38 l) fuel resistant container, STD-200 below the pump to catch the fuel.

(b) Remove the screw [4].

(c) Turn the vapor vent valve [2] counterclockwise to remove.

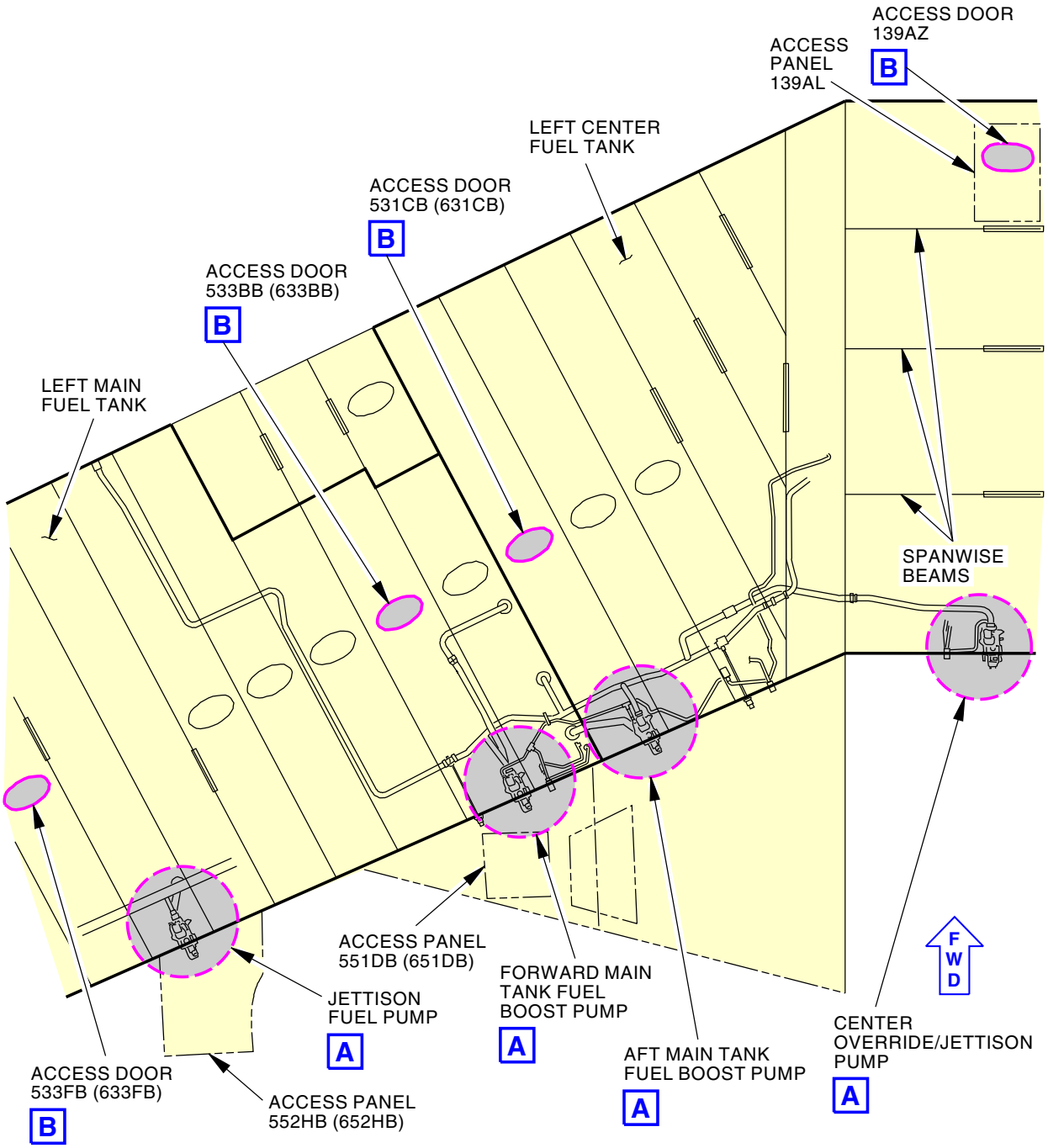
(d) Remove the valve [2] from inside the fuel pump housing [1].

NOTE: Fuel from the fuel feed manifold will drain from the pump housing when the valve is removed.

(e) Discard the O-ring [3].

END OF TASK

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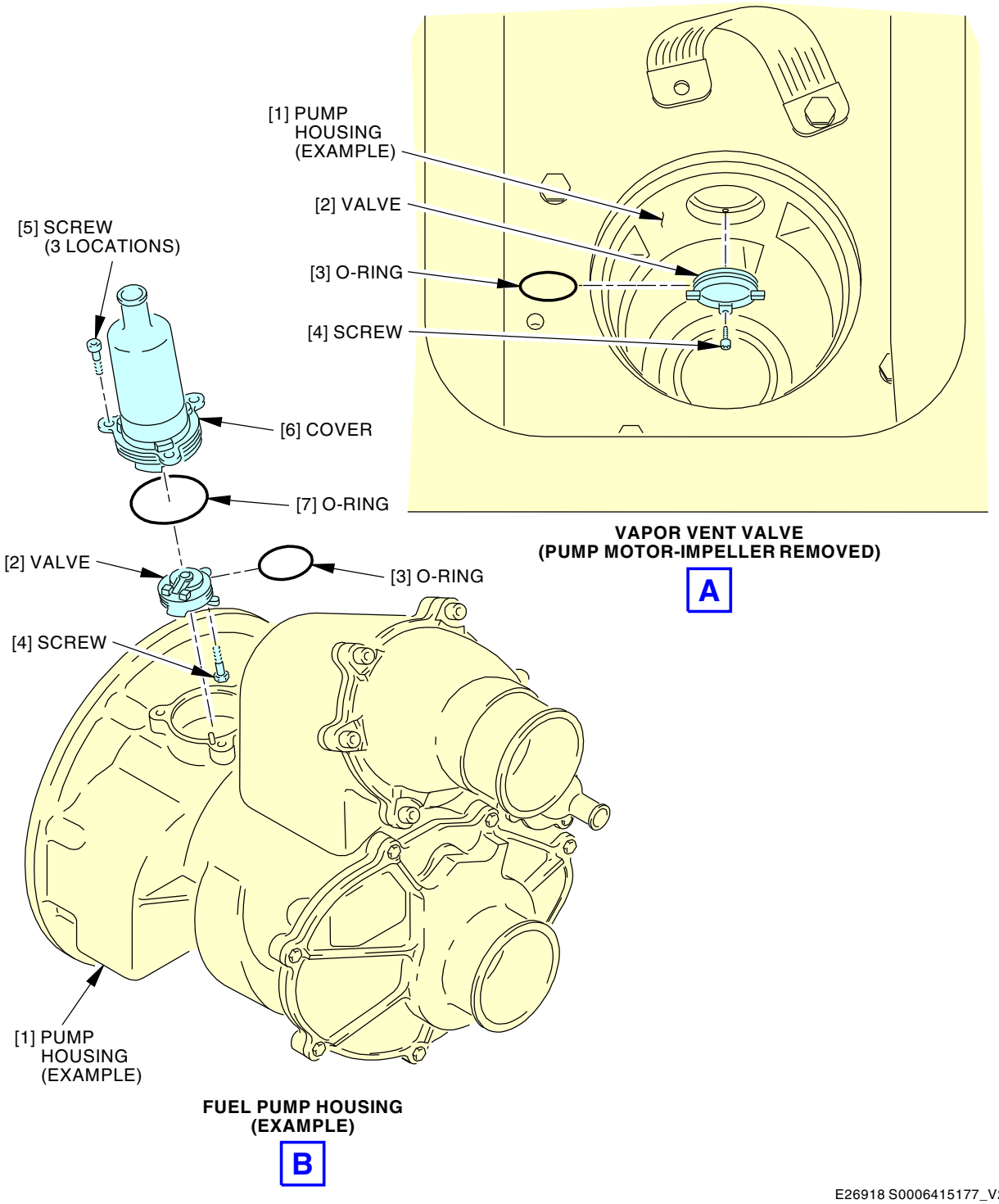


LEFT WING
(RIGHT WING IS EQUIVALENT)
(TOP VIEW)

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Vapor Vent Valve Installation
Figure 401/28-22-09-990-801 (Sheet 1 of 2)

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Vapor Vent Valve Installation
Figure 401/28-22-09-990-801 (Sheet 2 of 2)

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TASK 28-22-09-400-801

3. Vapor Vent Valve (Out Of Tank) - Installation

(Figure 401)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-10-19-400-801	O-Rings Installation (P/B 401)
28-22-05-400-801	Boost Pump Motor-Impeller - Installation (P/B 401)
28-22-06-400-801	Override/Jettison Pump Motor-Impeller - Installation (P/B 401)
28-31-01-400-801	Fuel Jettison Pump (Motor-Impeller) - Installation (P/B 401)

B. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Valve	28-22-06-01-170	ARO ALL
		28-31-01-01-180	ARO 001-004
3	O-ring	28-22-06-01-175	ARO ALL
		28-31-01-01-185	ARO 001-004

D. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

E. Procedure

SUBTASK 28-22-09-430-001

(1) Apply a thin layer of petrolatum grease, D00504, to a new O-ring [3].

(a) Install the o-ring [3] on the valve [2] (TASK 20-10-19-400-801).

SUBTASK 28-22-09-420-001

(2) Put the valve [2] into the pump housing [1].

(a) Turn the valve [2] clockwise to lock it in its position.

(b) Install the screw [4].

(c) Make sure the valve [2] is free to operate.

SUBTASK 28-22-09-410-001

(3) For the applicable main tank fuel boost pump, do this task: Boost Pump Motor-Impeller - Installation, TASK 28-22-05-400-801.

SUBTASK 28-22-09-410-002

(4) For the applicable center tank override/jettison fuel pump, do this task: Override/Jettison Pump Motor-Impeller - Installation, TASK 28-22-06-400-801.

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SUBTASK 28-22-09-410-003

(5) For the applicable main tank jettison fuel pump, do this task: Fuel Jettison Pump (Motor-Impeller) - Installation, TASK 28-31-01-400-801.

SUBTASK 28-22-09-650-003

(6) To refuel the fuel tanks, do this task: Pressure Refueling, TASK 12-11-01-650-801.

END OF TASK

TASK 28-22-09-000-802

4. Vapor Vent Valve (Pump Housing) - Removal

(Figure 401)

A. References

Reference	Title
28-22-05-000-802	Boost Pump Housing - Removal (P/B 401)
28-22-06-000-802	Override/Jettison Pump Housing - Removal (P/B 401)
28-31-01-000-802	Fuel Jettison Pump Housing - Removal (P/B 401)

B. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

C. Procedure

SUBTASK 28-22-09-010-004

(1) To remove the pump housing [1] for the main tank boost pumps, refer to (TASK 28-22-05-000-802).

SUBTASK 28-22-09-010-005

(2) To remove the pump housing [1] for the center tank override/jettison pumps, refer to (TASK 28-22-06-000-802).

SUBTASK 28-22-09-010-006

(3) To remove the pump housing for the main tank jettison pumps, refer to (TASK 28-31-01-000-802).

SUBTASK 28-22-09-020-001

(4) Remove the three screw [5] for the cover [6] of the vapor vent valve.

SUBTASK 28-22-09-020-002

(5) Remove the cover [6] of the vapor vent valve.

(a) Discard the O-ring [7].

SUBTASK 28-22-09-020-003

(6) Remove the screw [4] to remove the valve [2] from the cover [6].

(a) Discard the O-ring [3].

END OF TASK

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TASK 28-22-09-400-802

5. Vapor Vent Valve (Pump Housing) - Installation

(Figure 401)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-10-19-400-801	O-Rings Installation (P/B 401)
28-22-05-400-802	Boost Pump Housing - Installation (P/B 401)
28-22-06-400-802	Override/Jettison Pump Housing - Installation (P/B 401)
28-31-01-400-802	Fuel Jettison Pump Housing - Installation (P/B 401)

B. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	O-ring	28-22-06-01-175	ARO ALL
		28-31-01-01-185	ARO 001-004
7	O-ring	28-22-06-01-180	ARO ALL
		28-31-01-01-190	ARO 001-004

D. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

E. Procedure

SUBTASK 28-22-09-430-002

(1) Apply a thin layer of petrolatum grease, D00504, to a new O-ring [3].

(a) Install the o-ring [3] on the valve [2] (TASK 20-10-19-400-801).

SUBTASK 28-22-09-420-002

(2) Install the valve [2] into the cover [6] and install the screw [4].

SUBTASK 28-22-09-430-003

(3) Apply a thin layer of petrolatum grease, D00504, to a new O-ring [7].

(a) Install the new o-ring [7]] on the cover [6] (TASK 20-10-19-400-801).

SUBTASK 28-22-09-420-003

(4) Install the valve [2] and cover [6] assembly into the pump housing [1].

SUBTASK 28-22-09-420-004

(5) Align the cover [6] on the pump housing [1] and install the three screw [5].

(a) Make sure the valve [2] is free to operate.

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SUBTASK 28-22-09-410-004

(6) To install the pump housing [1] for the main tank boost pumps, refer to (TASK 28-22-05-400-802).

SUBTASK 28-22-09-410-005

(7) To install the pump housing for the center tank override/jettison pumps, refer to (TASK 28-22-06-400-802).

SUBTASK 28-22-09-410-006

(8) To install the pump housing [1] for the main tank jettison pumps, refer to (TASK 28-31-01-400-802).

SUBTASK 28-22-09-650-004

(9) To refuel the fuel tanks, do this task: Pressure Refueling, TASK 12-11-01-650-801.

——— END OF TASK ———

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MAIN FUEL TANK FUEL SUCTION BYPASS VALVE - REMOVAL/INSTALLATION

1. General

A. There is one suction bypass valve in each main fuel tank. The bypass valve lets suction fuel flow to the engine if the two fuel boost pumps do not operate. Each suction bypass valve is installed in the left or right main fuel tank outboard of the fuel tank end rib number 8. Each suction bypass valve is installed in the suction feed line, downstream of the inlet screen.

B. This procedure contains two tasks. The first task removes the suction bypass valve. The second task installs the suction bypass valve.

C. The suction bypass valve is referred to as the valve in this procedure.

TASK 28-22-10-020-801

2. Suction Bypass Valve - Removal

(Figure 401)

A. References

Reference	Title
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-22-15-000-802-001	Fuel Line, Fitting and Coupling - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

C. Access Panels

Number	Name/Location
533AB	Access Door
633AB	Access Door

D. Procedure

SUBTASK 28-22-10-650-001

(1) Do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-22-10-940-001

WARNING

OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-22-10-010-001

(3) Remove this access panel in the left main tank. To remove it, do this task:

Main Tank Access Door Removal, TASK 28-11-01-000-801

Number	Name/Location
533AB	Access Door

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SUBTASK 28-22-10-010-003

(4) Remove this access panel in the right main tank. To remove it, do this task:

Main Tank Access Door Removal, TASK 28-11-01-000-801

Number	Name/Location
633AB	Access Door

SUBTASK 28-22-10-940-002

(5) Go into the applicable main fuel tank.

SUBTASK 28-22-10-010-002

(6) Find the bypass valve (Figure 401).

SUBTASK 28-22-10-020-001

(7) To remove each bypass valve, do these steps:

(a) Remove the four bolts [8], washers [7], washers [6] and nuts [5] from the flange that connects the valve [2] to the suction feed line.

(b) Remove the coupling [3] between the bypass valve and the suction feed line (TASK 28-22-15-000-802-001).

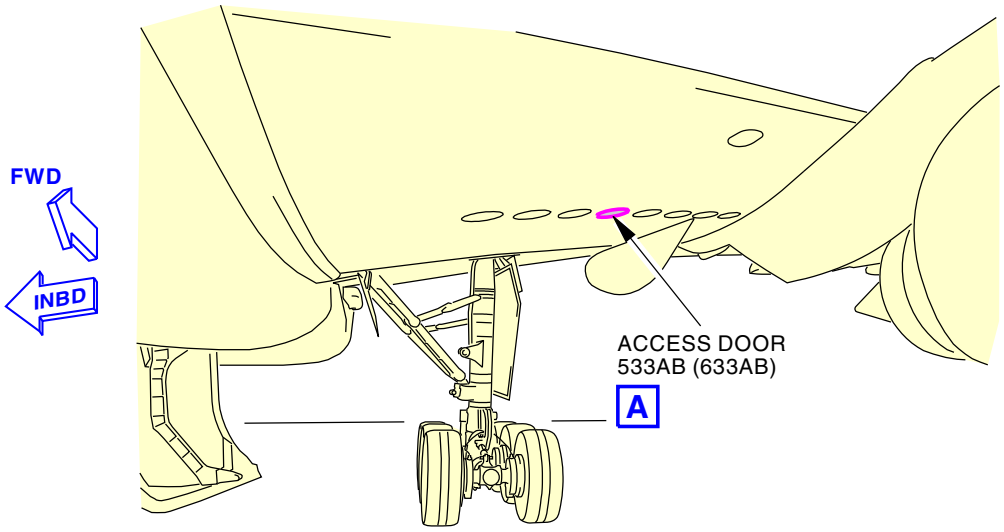
(c) Remove the valve [2].

1) Discard the two o-rings [4] and o-ring [1].

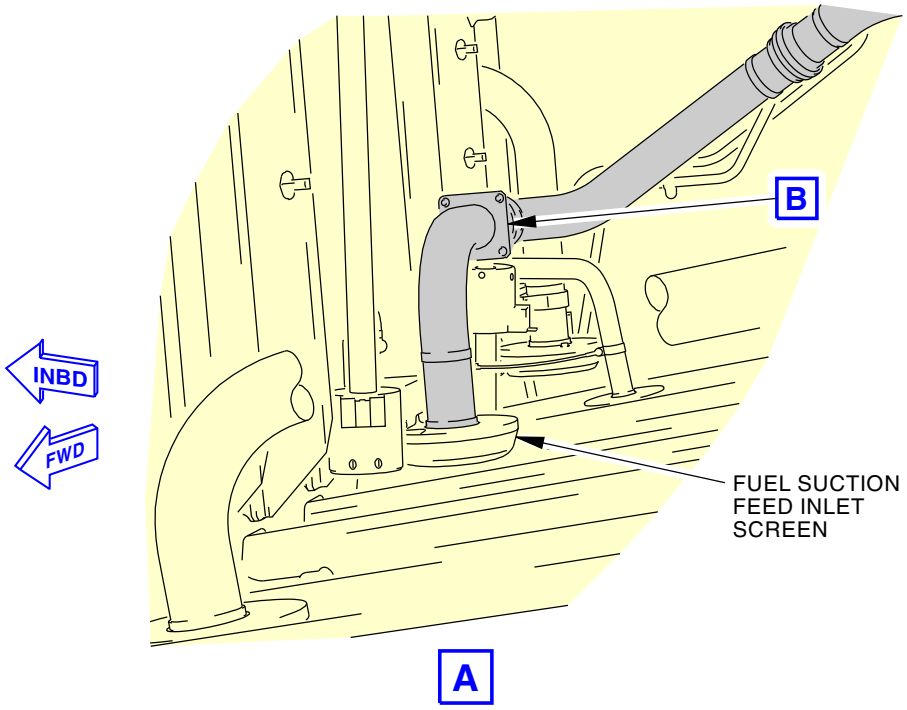
(d) Put covers on the open ends of the suction feed line to keep unwanted materials out.

——— END OF TASK ———

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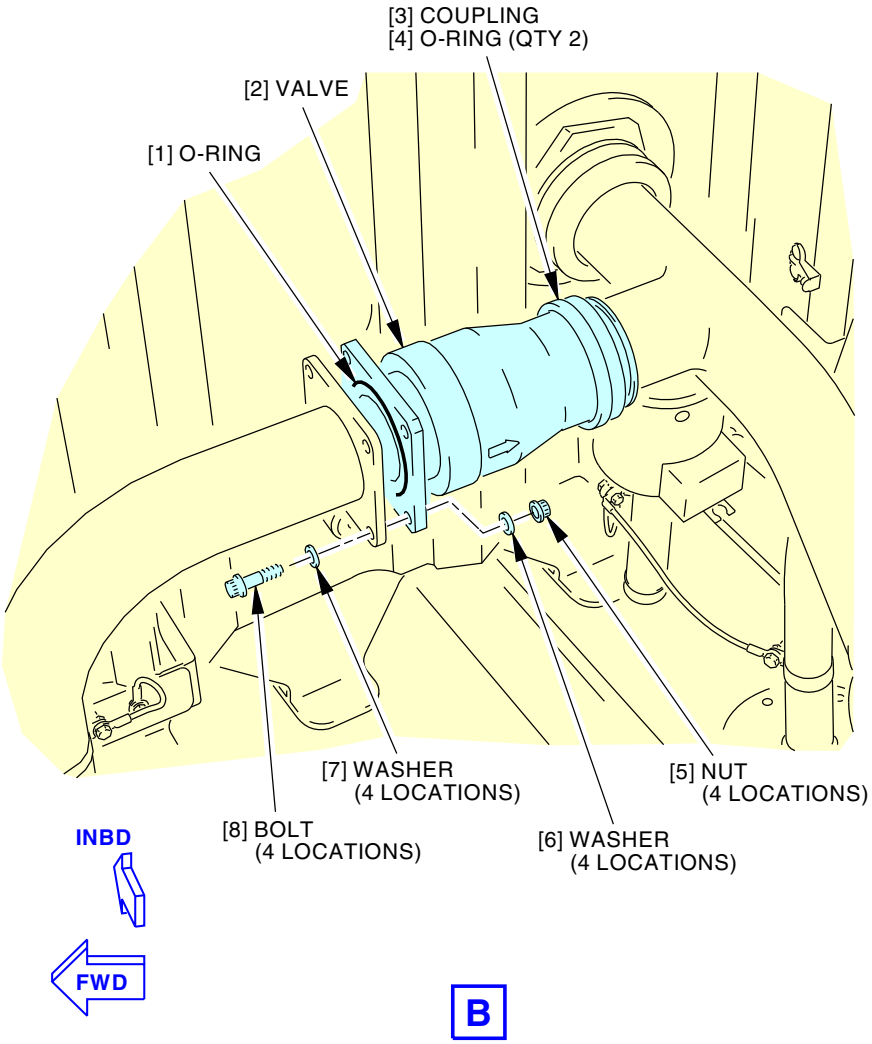
LEFT WING
(RIGHT WING IS EQUIVALENT)



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Main Fuel Tank Fuel Suction Bypass Valve Installation
Figure 401/28-22-10-990-801 (Sheet 1 of 2)

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Main Fuel Tank Fuel Suction Bypass Valve Installation
Figure 401/28-22-10-990-801 (Sheet 2 of 2)

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TASK 28-22-10-420-801

3. Suction Bypass Valve - Installation

(Figure 401)

A. References

Reference	Title
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-22-00-710-808	Engine Fuel Suction Feed - Operational Test (P/B 501)
28-22-15-000-802-001	Fuel Line, Fitting and Coupling - Removal (P/B 401)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	O-ring	28-22-10-01-020	ARO ALL
2	Valve	28-22-10-01-010	ARO ALL
4	O-ring	28-22-10-01-025	ARO ALL

E. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

F. Access Panels

Number	Name/Location
533AB	Access Door
633AB	Access Door

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G. Procedure

SUBTASK 28-22-10-420-003

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-22-10-420-001

(2) Go into the applicable main fuel tank (TASK 28-11-00-010-801).

SUBTASK 28-22-10-420-002

(3) To install each suction bypass valve, do these steps:

(a) Make sure the check valve is free to operate in the valve [2].

(b) Remove the covers from the open ends of the suction feed line.

(c) Apply a thin layer of petrolatum grease, D00504, to the new o-rings [4].

(d) Install the coupling [3] and o-rings [4] onto the suction feed line (TASK 28-22-15-000-802-001).

(e) Align the valve [2] with the suction feed line.

(f) Apply a thin layer of petrolatum grease, D00504, to a new o-ring [1].

(g) Install the o-ring [1] between the flange on the suction feed line and the flange of the valve [2].

(h) Install the four bolts [8], washers [7], washers [6] and nuts [5] to the flange that connects the valve [2] to the suction feed line.

(i) Tighten the coupling [3] between the valve [2] and the suction feed line (TASK 28-22-15-000-802-001).

1) Install lockwire to the coupling [3] (TASK 20-10-23-400-801).

(j) Measure the bonding resistance between the valve [2] and the suction feed line with an intrinsically safe approved bonding meter, COM-1550.

1) Make sure the bonding resistance is less than 0.01 ohm (10 milliohms).

(k) Make sure the screen for the suction feed inlet line is not blocked.

(l) Remove all tools and materials from the fuel tank.

SUBTASK 28-22-10-410-001

(4) Install the applicable access door(s):

(TASK 28-11-01-400-801)

Number	Name/Location
533AB	Access Door
633AB	Access Door

SUBTASK 28-22-10-710-001

(5) To do a check for leakage at the fuel suction bypass valve, do this task: Engine Fuel Suction Feed - Operational Test, TASK 28-22-00-710-808.

END OF TASK

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FLOAT-OPERATED SHUTOFF VALVES - REMOVAL/INSTALLATION

1. General

A. The float-operated shutoff valves are part of the center tank fuel scavenge system. There is an outlet float-operated shutoff valve in each main tank. There are two inlet float-operated shutoff valves in the center fuel tank. The inlet and outlet float-operated shutoff valves control the fuel flow for the center tank fuel scavenge system.

B. The outlet float-operated shutoff valves let fuel flow into the main fuel tanks when the main fuel tanks are less than full. The inlet float-operated shutoff valves let fuel flow from the center fuel tank when the center tank is less than half full.

C. The inlet and outlet float operated valves will be referred to as valves in this procedure.

D. This procedure contains four tasks. The first task removes the outlet float-operated shutoff valve. The second task installs the outlet float-operated shutoff valve. The third task removes the inlet float-operated shutoff valve. The fourth task installs the inlet float-operated shutoff valve.

TASK 28-22-11-000-803

2. Outlet Float-Operated Shutoff Valve - Removal

(Figure 401)

A. References

Reference	Title
28-00-00-200-801	Inspection of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

C. Access Panels

Number	Name/Location
541DB	Access Door
641DB	Access Door

D. Procedure

SUBTASK 28-22-11-650-005

(1) Do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-22-11-940-009

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

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SUBTASK 28-22-11-010-009

(3) To remove these access doors, do this task:

Number	Name/Location
541DB	Access Door
641DB	Access Door

Main Tank Access Door Removal, TASK 28-11-01-000-801.

SUBTASK 28-22-11-010-006

(4) Find the valve [2] near the rear spar.

SUBTASK 28-22-11-020-009

(5) Remove the four screws [3], washers [4] and nuts [5] that attach the valve [2] and the bonding jumper [7] to the support bracket.

SUBTASK 28-22-11-020-005

(6) Loosen the coupling nut [1] to disconnect the valve [2] from the tubing.

(a) Make sure the union is not loose and the tube is not cracked near the union.

SUBTASK 28-22-11-020-006

(7) Remove the valve [2] from the fuel tank.

SUBTASK 28-22-11-210-001

(8) Do a check of the bonding jumpers : (TASK 28-00-00-200-801).

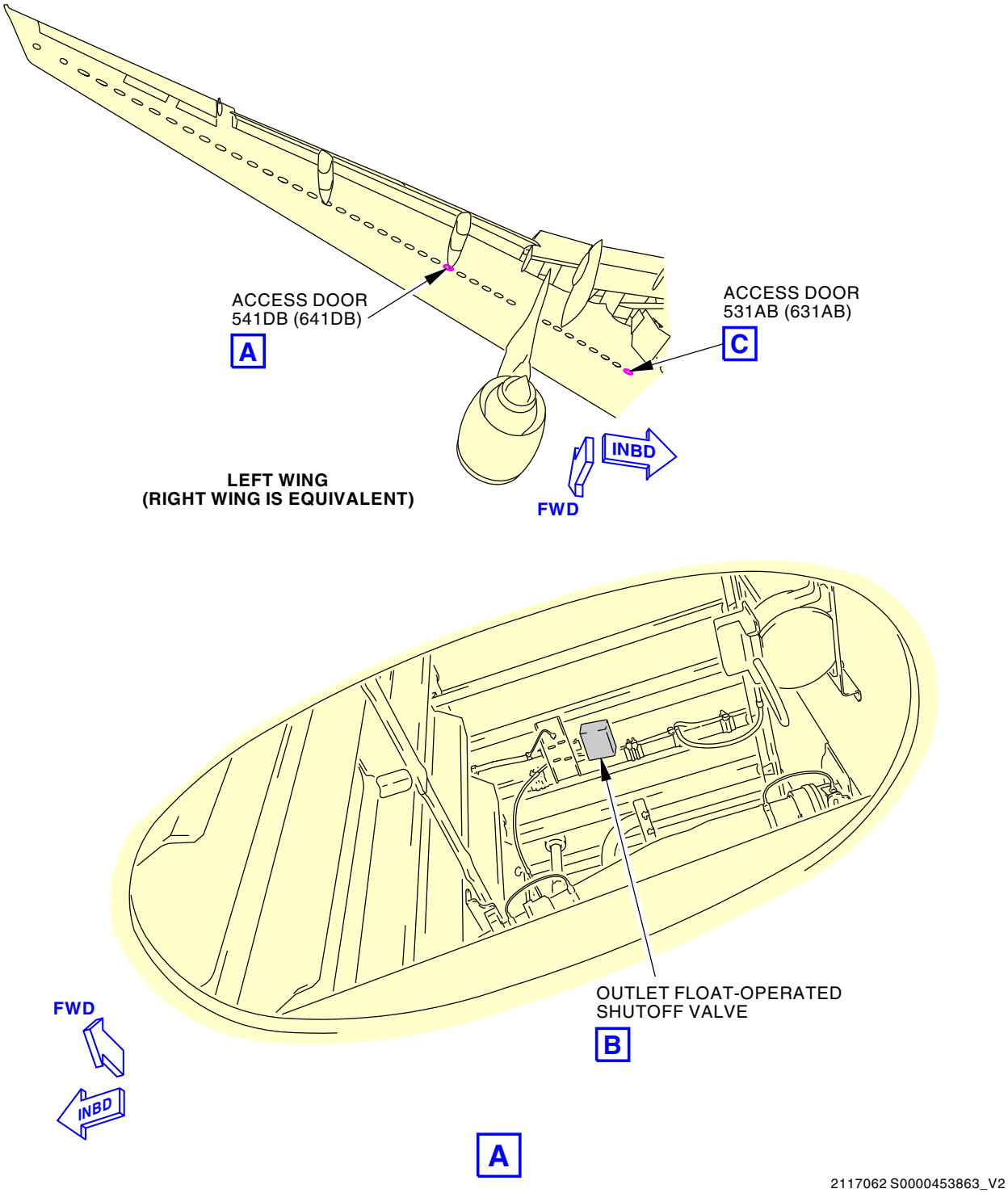
(a) Replace the bonding jumpers as necessary.

1) Remove screw [14], washer [4] and nut [5] to remove the two bonding jumpers [7] from the tube clamp.

2) Remove washer [16] and nut [5] to remove the bonding jumper [7] from the bracket ground stud.

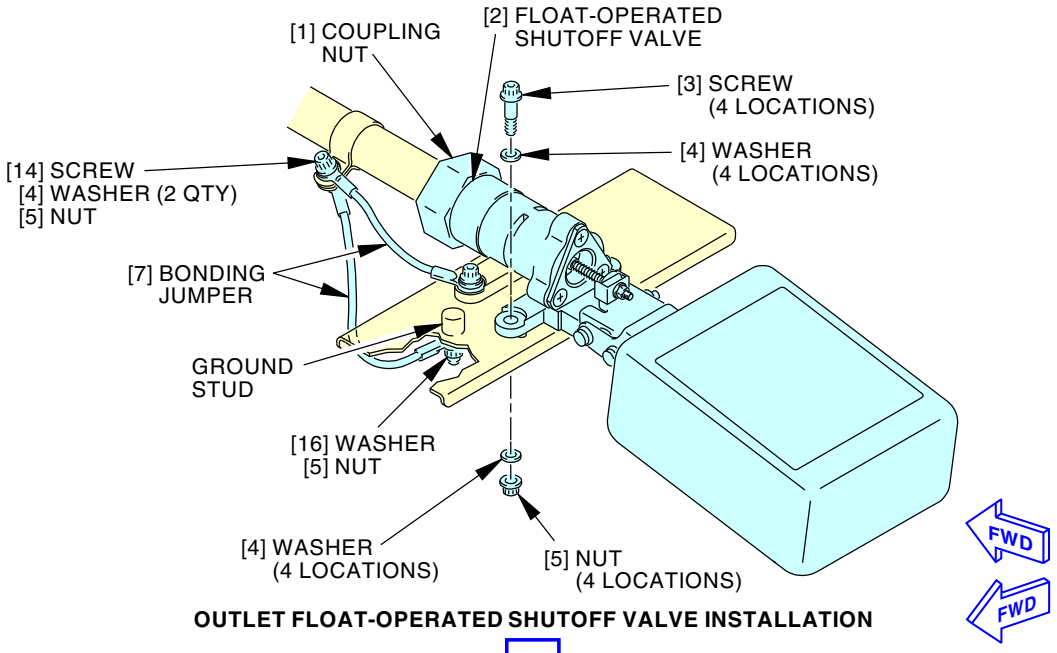
——— END OF TASK ———

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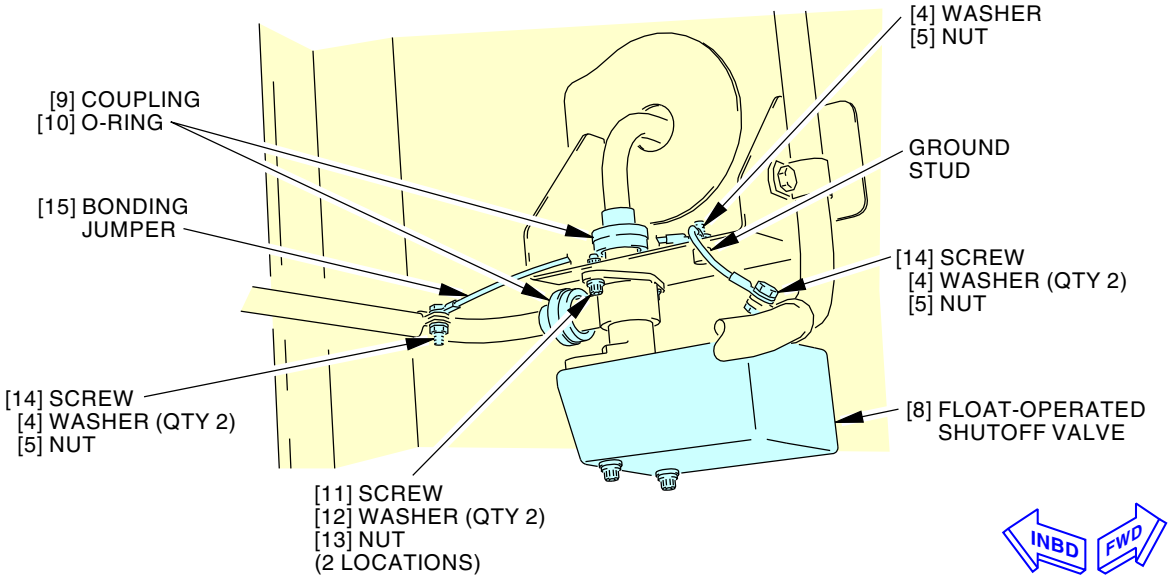
Float-Operated Shutoff Valves Installation
Figure 401/28-22-11-990-801 (Sheet 1 of 2)

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OUTLET FLOAT-OPERATED SHUTOFF VALVE INSTALLATION

B



INLET FLOAT-OPERATED SHUTOFF VALVE INSTALLATION
(VIEW IN THE AFT DIRECTION)

C

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Float-Operated Shutoff Valves Installation
Figure 401/28-22-11-990-801 (Sheet 2 of 2)

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TASK 28-22-11-400-803

3. Outlet Float-Operated Shutoff Valve - Installation

(Figure 401)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-22-00-720-802	Fuel Scavenge System - Functional Test (P/B 501)
SWPM 20-20-00	Standard Wiring Practices Manual
SWPM 20-20-10	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Valve	28-22-11-05B-040	ARO 001-004

D. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

E. Access Panels

Number	Name/Location
541DB	Access Door
641DB	Access Door

F. Procedure

SUBTASK 28-22-11-940-011

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-22-11-960-001

(2) Replace the bonding jumpers if necessary (SWPM 20-20-10).

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(a) Install the screw [14], washer [4] and nut [5] to install the two bonding jumpers [7] on the tube clamp.

(b) Install the washer [16] and nut [5] to install the bonding jumper [7] on the bracket ground stud.

SUBTASK 28-22-11-420-004

(3) Put the valve [2] in its position and install the four screws [3], washers [4] and nuts [5] and bonding jumper [7] to the support bracket.

NOTE: Make sure the bonding surfaces are clean.

SUBTASK 28-22-11-420-006

(4) Make sure the tubing is adjusted in line both axially and laterally with valve [2] to ensure no axial or lateral preload (bending) is introduced.

(a) The valve [2] support bracket is slotted to allow some adjustability prior to installing the coupling nut [1].

SUBTASK 28-22-11-420-005

(5) Tighten the coupling nut [1] to connect the valve [2] to the tubing.

SUBTASK 28-22-11-760-002

(6) Measure the bonding resistance between the valve [2] and the fuel tube with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

(a) Make sure the bonding resistance is 0.01 ohm (10 milliohms) or less.

SUBTASK 28-22-11-760-004

(7) Measure the bonding resistance between the valve [2] and the nearest primary structure with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

(a) Make sure the bonding resistance is 0.10 ohm (100 milliohms) or less.

SUBTASK 28-22-11-220-003

(8) Make sure there is 0.20 in. (5.08 mm) of clearance between the valve [2] and the fuel tank structure and wiring, in all positions.

SUBTASK 28-22-11-410-006

(9) Install these access doors:

(TASK 28-11-01-400-801)

Number	Name/Location
541DB	Access Door
641DB	Access Door

SUBTASK 28-22-11-650-006

(10) Do this task: Pressure Refueling, TASK 12-11-01-650-801.

SUBTASK 28-22-11-700-003

(11) Do this task: Fuel Scavenge System - Functional Test, TASK 28-22-00-720-802.

END OF TASK

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TASK 28-22-11-000-801

4. Inlet Float-Operated Shutoff Valve - Removal

(Figure 401)

A. References

Reference	Title
28-00-00-200-801	Inspection of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

C. Access Panels

Number	Name/Location
531AB	Access Door
631AB	Access Door

D. Procedure

SUBTASK 28-22-11-650-001

WARNING DEFUEL THE CENTER FUEL TANK, AND THE APPLICABLE MAIN FUEL TANK BEFORE YOU REMOVE THE SHUTOFF VALVE. IF YOU DO NOT DEFUEL THESE TANKS, FUEL LEAKAGE INTO THE CENTER FUEL TANK WILL OCCUR. THIS CAN CAUSE INJURIES TO PERSONNEL IN THE FUEL TANK, AND DAMAGE TO EQUIPMENT.

(1) Do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-22-11-940-005

WARNING OBEY THE FUEL TANK ENTRY PRECAUTIONS. FAILURE TO OBEY THE FUEL TANK ENTRY PRECAUTIONS COULD CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-22-11-010-001

(3) To remove these access panels, do this task:

Center Tank Access Door - Removal, TASK 28-11-02-000-801

Number	Name/Location
531AB	Access Door
631AB	Access Door

SUBTASK 28-22-11-940-001

(4) Go into the center fuel tank.

SUBTASK 28-22-11-010-002

(5) Find the valve [8] near the rear spar.

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SUBTASK 28-22-11-020-010

(6) Remove the two screws [11], washers [12] and nuts [13] that attach the valve [8] to the support bracket.

SUBTASK 28-22-11-020-001

(7) Loosen the two couplings [9] to disconnect the valve [8] from the tubing.

(a) Discard the o-ring [10].

SUBTASK 28-22-11-020-002

(8) Remove the valve [8] from the fuel tank.

SUBTASK 28-22-11-210-002

(9) Do a check of the bonding jumpers; do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(a) Replace the bonding jumpers as necessary.

1) Remove screw [14], washer [4] and nut [5] to remove the two bonding jumpers [15] from the tube clamps.

2) Remove washer [4] and nut [5] to remove the bonding jumper [15] from the bracket ground stud.

——— END OF TASK ———

TASK 28-22-11-400-801

5. Inlet Float-Operated Shutoff Valve - Installation

(Figure 401)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
20-30-82-910-801	General Cleaning of Solvent Resistant Organic Coatings (Series 82) (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)
28-22-00-720-802	Fuel Scavenge System - Functional Test (P/B 501)
28-22-15-400-802-001	Fuel Line, Fitting and Coupling - Installation (P/B 401)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

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C. Consumable Materials

Reference	Description	Specification
B01002	Solvent - General Cleaning Of Solvent Resistant Organic Coatings - Series 82	
D00504	Grease - Petrolatum	VV-P-236
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
8	Valve	28-22-11-01-025	ARO 001-004
10	O-ring	28-22-51-13-435	ARO 001-004

E. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

F. Access Panels

Number	Name/Location
531AB	Access Door
631AB	Access Door

G. Procedure

SUBTASK 28-22-11-940-002

WARNING OBEY THE FUEL TANK ENTRY PRECAUTIONS. FAILURE TO OBEY THE FUEL TANK ENTRY PRECAUTIONS COULD CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(1) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-22-11-940-006

(2) Go into the center fuel tank.

SUBTASK 28-22-11-960-002

(3) Replace the bonding jumpers as necessary.

(a) Install screw [14], washer [4] and nut [5] to install the two bonding jumpers [15] on the tube clamps.

(b) Install washer [4] and nut [5] to install the bonding jumper [15] on the bracket ground stud.

SUBTASK 28-22-11-420-001

(4) Do these steps to install the inlet float-operated shutoff valve:

(a) Clean the surfaces that touch between the float-operated shutoff valve [8] and its support bracket with Series 82 solvent, B01002 (TASK 20-30-82-910-801).

(b) Put the float-operated shutoff valve [8] in its position and install the two screws [11], washers [12] and nuts [13].

(c) Apply a thin layer of petrolatum grease, D00504, to the new o-rings [10].

(d) Install the new o-ring [10] and connect the two flexible full coupling [9] to connect the float-operated shutoff valve [8] to the tubing (TASK 28-22-15-400-802-001).

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(e) Install MS20995C32 lockwire, G01048 to each coupling [9] (TASK 20-10-23-400-801).

SUBTASK 28-22-11-760-003

(5) Measure the bonding resistance between the valve [8] and the web of the adjacent rib with an electrical bonding intrinsically safe approved bonding meter, COM-1550.

(a) Make sure the bonding resistance is not more than 0.01 ohm.

SUBTASK 28-22-11-410-001

(6) To install these access panels, do this task:

Center Tank Access Door - Installation, TASK 28-11-02-400-801

Number	Name/Location
531AB	Access Door
631AB	Access Door

SUBTASK 28-22-11-650-002

(7) Do this task: Pressure Refueling, TASK 12-11-01-650-801.

SUBTASK 28-22-11-700-001

(8) Do this task: Fuel Scavenge System - Functional Test, TASK 28-22-00-720-802.

——— END OF TASK ———

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FUEL SCAVENGE JET PUMP - REMOVAL/INSTALLATION

1. General

A. This procedure contains two tasks. The first task removes the fuel scavenge jet pump. The second task installs the fuel scavenge jet pump.

TASK 28-22-12-000-801

2. Fuel Scavenge Jet Pump - Removal

(Figure 401)

A. References

Reference	Title
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-22-15-000-802-001	Fuel Line, Fitting and Coupling - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)
28-26-00-650-803	Suction Defueling (P/B 201)

B. Location Zones

Zone	Area
ARO 005-999; ARO 001-004 POST SB 777-28-0078	
133	Wing Center Section, Left
134	Wing Center Section, Right
139	Forward Keel Beam
ARO 001-004 PRE SB 777-28-0078	
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
ARO ALL	

C. Access Panels

Number	Name/Location
139AZ	Center Wing Access Door
531AB	Access Door
631AB	Access Door

ARO 005-999; ARO 001-004 POST SB 777-28-0078

D. Prepare for the Removal

SUBTASK 28-22-12-650-004

(1) If it is necessary, do one of these tasks to defuel the center tank:

(a) Pressure Defueling, TASK 28-26-00-650-801

(b) Suction Defueling, TASK 28-26-00-650-803

(c) Tank to Tank Transfer, TASK 28-26-00-650-802

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ARO 005-999; ARO 001-004 POST SB 777-28-0078 (Continued)

SUBTASK 28-22-12-010-004

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do this task for the center tank: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

SUBTASK 28-22-12-010-005

(3) Remove this access door:

Number	Name/Location
139AZ	Center Wing Access Door

(a) Do this task: Center Tank Access Door - Removal, TASK 28-11-02-000-801.

SUBTASK 28-22-12-010-006

(4) Go into the center fuel tank.

ARO ALL

E. Procedure

SUBTASK 28-22-12-010-001

(1) To remove the nozzle assembly [12] of the fuel scavenge jet pump, do these steps:

NOTE: The nozzle assembly [12] contains two parts, the nozzle [12A] and the plug [12B]. It is not necessary to separate these parts.

ARO 001-004 PRE SB 777-28-0078

(a) Get access to the left or right fuel scavenge jet pump, installed on the rear spar, out of the fuel tank (Figure 401).

ARO 005-999; ARO 001-004 POST SB 777-28-0078

(b) Get access to the left or right fuel scavenge jet pump, installed on forward side of spanwise beam No. 1, in the center tank (Figure 401).

ARO ALL

(c) Remove the lockwire from the nozzle assembly [12].

(d) Remove the nozzle assembly [12] from the pump assembly [4].

NOTE: There is an internal check valve in the housing that will prevent a fuel spill.

(e) Discard the o-ring [13].

SUBTASK 28-22-12-010-002

(2) To remove the pump assembly [4] for the fuel scavenge jet pump, do these steps:

ARO 001-004 PRE SB 777-28-0078

(a) Defuel the center fuel tank.

1) Do this task: Pressure Defueling, TASK 28-26-00-650-801.

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(b) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

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ARO 001-004 PRE SB 777-28-0078 (Continued)

(c) Remove the applicable access door(s):

(TASK 28-11-02-000-801)

Number	Name/Location
531AB	Access Door
631AB	Access Door

(d) Remove the jamnut [11] and washer [10] from the pump assembly [4], from outside of the fuel tank.

(e) Go into the center fuel tank.

ARO 005-999; ARO 001-004 POST SB 777-28-0078

(f) Remove the jamnut [11] and two washers [10] from the pump assembly [4].

ARO ALL

(g) Disconnect the coupling [1] between the motive flow line [3] and the pump assembly [4] (TASK 28-22-15-000-802-001).

1) Discard the o-ring [2].

(h) Disconnect the coupling nut [6] between the scavenge inlet line [5] and the pump assembly [4].

(i) Disconnect the coupling nut [8] between the outlet line [7] and the pump assembly [4].

(j) Remove the pump assembly [4].

ARO 001-004 PRE SB 777-28-0078

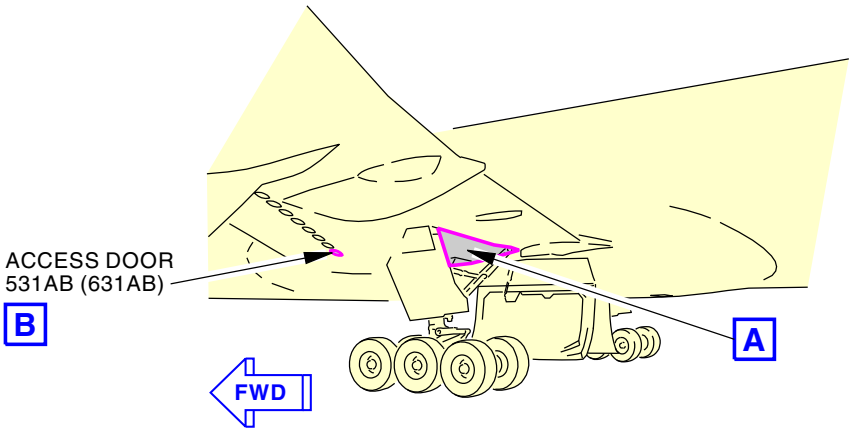
1) Discard the o-ring [9].

ARO ALL

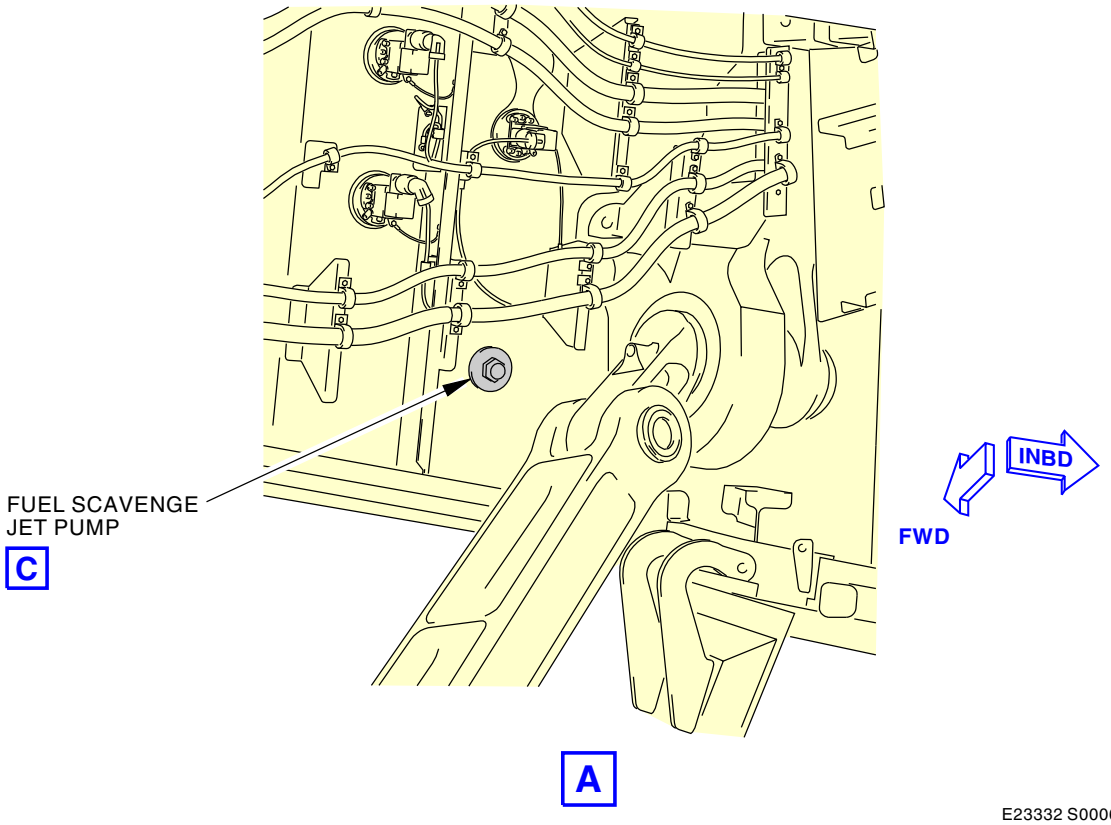
(k) Install covers on the open fuel lines to keep unwanted materials out.

——— END OF TASK ———

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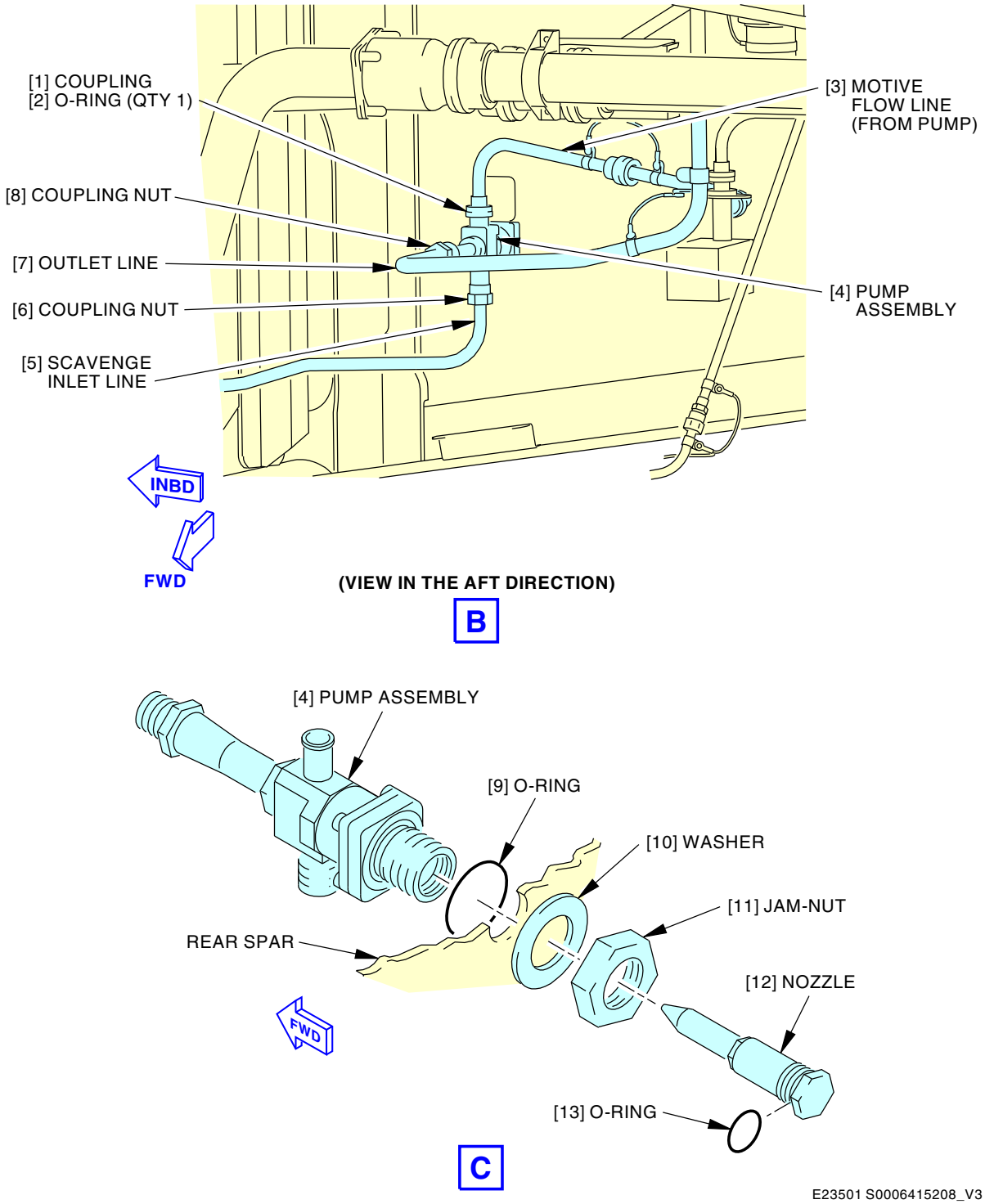
LEFT WING
(RIGHT WING IS EQUIVALENT)



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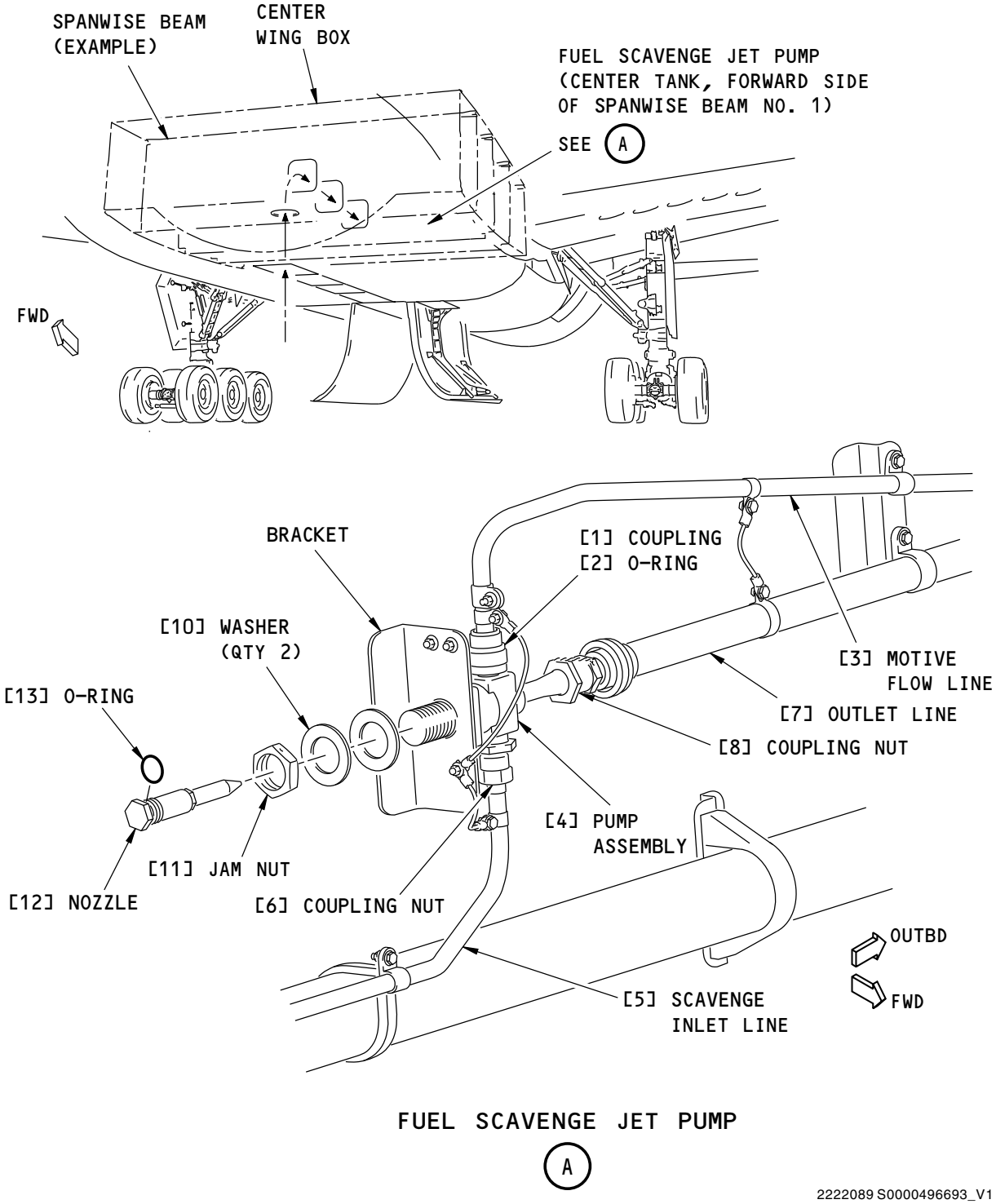
Fuel Scavenge Jet Pump Installation
Figure 401/28-22-12-990-801 (Sheet 1 of 3)

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Fuel Scavenge Jet Pump Installation
Figure 401/28-22-12-990-801 (Sheet 2 of 3)

ECCN 9E991 BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



Fuel Scavenge Jet Pump Installation
Figure 401/28-22-12-990-801 (Sheet 3 of 3)

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TASK 28-22-12-400-801

3. Fuel Scavenge Jet Pump - Installation

(Figure 401)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)
28-22-00-720-802	Fuel Scavenge System - Functional Test (P/B 501)
28-22-00-720-805	Fuel Scavenge System - Functional Test (P/B 501)
28-22-15-000-802-001	Fuel Line, Fitting and Coupling - Removal (P/B 401)
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17
STD-126	Brush - Soft-bristle, Non-metallic

C. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142 Type II
A50110	Sealant	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
B00062	Solvent - Acetone (99.5% Grade)	ASTM D 329 (Supersedes O-A-51)
B00065	Alcohol - Denatured, Ethyl (Ethanol)	AMS 3002 (Supersedes O-A-396)
B00130	Alcohol - Isopropyl	TT-I-735
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	

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(Continued)

Reference	Description	Specification
C00064	Coating - Aluminum Chemical Conversion	BAC5719 Type II Class A (MIL-DTL-5541 Class 1A)
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	O-ring	Not Specified	
4	Pump assembly	Not Specified	
9	O-ring	Not Specified	
12A	Nozzle	Not Specified	
12B	Plug	Not Specified	
13	O-ring	Not Specified	

E. Location Zones

Zone	Area
ARO 005-999; ARO 001-004 POST SB 777-28-0078	
133	Wing Center Section, Left
134	Wing Center Section, Right
139	Forward Keel Beam
ARO 001-004 PRE SB 777-28-0078	
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
ARO ALL	

F. Access Panels

Number	Name/Location
139AZ	Center Wing Access Door
531AB	Access Door
631AB	Access Door

G. Prepare for the Installation

ARO 005-999; ARO 001-004 POST SB 777-28-0078

SUBTASK 28-22-12-120-001

(1) If they are re-used, make sure all sealant has been removed from pump assembly [4] and washer [10] at the surface that mates with the bracket.

ARO ALL

SUBTASK 28-22-12-650-005

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Obey the fuel tank entry precautions (TASK 28-11-00-650-801)

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SUBTASK 28-22-12-010-007

WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(3) If it is necessary, go into the center fuel tank to the applicable fuel scavenge jet pump location.

H. Fuel Scavenge Jet Pump Assembly Installation

SUBTASK 28-22-12-370-001

(1) If the alodine coating on the mating surface under the jet pump is damaged, do these steps:

(a) Manually apply alodine 600 coating, C00064, to the damaged area.

(b) Clean the rear spar surface with a soft-bristle non-metallic brush, STD-126, and water.

1) To minimize the removal of coating, abrade only enough to scuff the surface.

(c) Clean the surface of unwanted material, with clean cotton wipers, G00034, soaked with water.

(d) Clean the surface with clean cotton wipers, G00034, alcohol, B00065, alcohol, B00130, or solvent, B00062, to remove all unwanted material.

1) Protect the surface from contamination.

ARO 005-999; ARO 001-004 POST SB 777-28-0078

SUBTASK 28-22-12-110-001

(2) Do these steps to prepare the mating surfaces of the pump assembly [4], washers [10] and the bracket for a sealed faying surface bond (SWPM 20-20-00):

WARNING DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(a) Final clean the mating surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

(b) Rub dry with a clean, dry cotton wiper, G00034.

(c) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

SUBTASK 28-22-12-390-001

(3) Prepare for a faying surface seal between the pump assembly [4] and the bracket.

(a) Apply sealant, A50155, or sealant, A50110, to the mating surface of the pump assembly [4], for the faying surface seal.

SUBTASK 28-22-12-390-002

(4) Prepare for a faying surface seal between the washer [10] and the bracket.

NOTE: The faying surface seal is only between the first washer and the mating bracket. The second washer does not need sealant.

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ARO 005-999; ARO 001-004 POST SB 777-28-0078 (Continued)

(a) Apply sealant, A50155, or sealant, A50110, to the mating surface of the washer [10], for the faying surface seal.

ARO ALL

SUBTASK 28-22-12-080-001

(5) Remove the fuel line covers installed on the open fuel lines to keep unwanted materials out.

ARO 001-004 PRE SB 777-28-0078

SUBTASK 28-22-12-420-002

(6) Do these steps to install the o-ring [9]:

(a) Apply a thin layer of petrolatum grease, D00504, to the new o-ring [9].

(b) Install the o-ring [9] onto the pump assembly [4].

SUBTASK 28-22-12-420-003

(7) Put the pump assembly [4] in its position in the fuel tank and install the washer [10]] and jamnut [11] from out of the fuel tank.

(a) Make sure the fuel lines align before you tighten the jamnut [11].

(b) Tighten the jamnut [11] to between 428 in-lb (48.4 N·m) - 472 in-lb (53.3 N·m).

ARO 005-999; ARO 001-004 POST SB 777-28-0078

SUBTASK 28-22-12-420-004

(8) Do these steps to install the pump assembly [4]: in its position and install the two washers [10] and jamnut [11].

(a) Install the first washer [10] on the pump assembly [4].

NOTE: The first washer is the one that has been prepared for a faying surface seal.

(b) Measure the bonding resistance between the washer [10] and the bracket with an intrinsically safe approved bonding meter, COM-1550.

1) Make sure the bonding resistance is less than 0.010 ohm (10 milliohms).

(c) Install the second washer [10] and jamnut [11] on the pump assembly [4].

(d) Make sure the fuel lines align before you tighten the jamnut [11].

(e) Tighten the jamnut [11] to between 428 in-lb (48.4 N·m) - 472 in-lb (53.3 N·m).

(f) Make sure the sealant is continuously squeezed out along the edges of the contact surfaces.

(g) If there are gaps, bubbles or voids in the sealant squeeze out, then disassemble and apply more sealant.

(h) Shape the squeezed out sealant into a fillet seal.

(i) As an option, remove the extra squeezed out sealant.

1) Make sure the sealant that remains is flush with the mating part edges.

ARO ALL

SUBTASK 28-22-12-760-001

(9) Measure the bonding resistance between the pump assembly [4] and airplane structure with an intrinsically safe approved bonding meter, COM-1550.

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ARO 001-004 PRE SB 777-28-0078

(a) Make the measurement between the threads that extend past the jamnut and the rear spar web.

ARO 005-999; ARO 001-004 POST SB 777-28-0078

(b) Make the measurement between the flange of the pump assembly [4] and the bracket.

ARO 001-004 PRE SB 777-28-0078

(c) Make sure the bonding resistance is less than 0.0025 ohm (2.5 milliohms).

ARO 005-999; ARO 001-004 POST SB 777-28-0078

(d) Make sure the bonding resistance is less than 0.010 ohm (10 milliohms).

ARO ALL

SUBTASK 28-22-12-420-005

(10) Do these steps to install the coupling [1]:

(a) Apply a thin layer of petrolatum grease, D00504, to the new o-ring [2].

(b) Install the o-ring [2] and connect the coupling [1] between the motive flow line [3] and the pump assembly [4] (TASK 28-22-15-000-802-001).

(c) Install lockwire to the coupling [1] (TASK 20-10-23-400-801).

SUBTASK 28-22-12-420-006

(11) Connect the coupling nut [6] between the scavenge inlet line [5] and the pump assembly [4].

SUBTASK 28-22-12-420-007

(12) Connect the coupling nut [8] between the outlet line [7] and the pump assembly [4].

ARO 005-999; ARO 001-004 POST SB 777-28-0078

(a) Install lockwire to the coupling nut [8] (TASK 20-10-23-400-801).

ARO 001-004 PRE SB 777-28-0078

SUBTASK 28-22-12-390-003

(13) Apply a fillet seal of sealant, A00767 (or equivalent), between the pump assembly [4] and the rear spar (in the fuel tank).

SUBTASK 28-22-12-390-004

(14) Do these steps to apply sealant outside of the fuel tank:

(a) Apply a fillet seal of sealant, A02315, between the jamnut [11] and the rear spar (out of the fuel tank).

ARO ALL

I. Fuel Scavenge Jet Pump Nozzle Assembly Installation

ARO 001-004 PRE SB 777-28-0078

SUBTASK 28-22-12-410-003

(1) Get access to the left or right fuel scavenge jet pump, installed on the rear spar, out of the fuel tank (Figure 401).

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ARO 005-999; ARO 001-004 POST SB 777-28-0078

SUBTASK 28-22-12-410-004

(2) Get access to the left or right fuel scavenge jet pump, installed on the forward side of spanwise beam No. 1, in the center fuel tank (Figure 401).

ARO ALL

SUBTASK 28-22-12-420-008

(3) Apply a thin layer of petrolatum grease, D00504, to the new o-ring [13] and install it on the nozzle assembly [12].

NOTE: The nozzle assembly contains two parts, the nozzle [12A] and the plug [12B]. It is not necessary to separate these parts.

SUBTASK 28-22-12-420-009

(4) Install the nozzle assembly [12] into the pump assembly [4].

(a) Tighten the nozzle assembly [12] to 200 ±10 in-lb (23 ±2 N·m).

(b) Install lockwire between the nozzle assembly [12] and the jamnut [11] so that wire tension will not let the nozzle assembly move (TASK 20-10-23-400-801).

(c) Install another lockwire between the nozzle assembly [12] and the jamnut [11].

1) Make sure the second lockwire crosses over/under the first lockwire so that wire tension will not let the jamnut move.

J. Fuel Scavenge Jet Pump Post-Installation Test

SUBTASK 28-22-12-410-005

(1) Do this task: Fuel Tank Closure, TASK 28-11-00-410-801.

ARO 001-004 PRE SB 777-28-0078

SUBTASK 28-22-12-410-002

(2) Install the applicable access door(s):

(TASK 28-11-02-400-801)

Number	Name/Location
531AB	Access Door
631AB	Access Door

ARO 005-999; ARO 001-004 POST SB 777-28-0078

SUBTASK 28-22-12-410-006

(3) Install the access door:

Number	Name/Location
139AZ	Center Wing Access Door

(a) Do this task: Center Tank Access Door - Installation, TASK 28-11-02-400-801.

ARO ALL

SUBTASK 28-22-12-720-001

(4) Do this task: Fuel Scavenge System - Functional Test, TASK 28-22-00-720-802 or Fuel Scavenge System - Functional Test, TASK 28-22-00-720-805.

ARO 001-004 PRE SB 777-28-0078

SUBTASK 28-22-12-790-001

(5) Do these steps to check for leakage at the rear spar:

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ARO 001-004 PRE SB 777-28-0078 (Continued)

(a) Do this task: Pressure Refueling, TASK 12-11-01-650-801.

(b) Make sure there is no leakage at the rear spar connection.

——— END OF TASK ———

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FUEL SCAVENGE JET PUMP - INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure contains a functional check of the bonding resistance between the structure and the fuel scavenge jet pump.

SFAR 88

ARO 001-004 PRE SB 777-28-0078

TASK 28-22-12-200-801

2. Fuel Scavenge Jet Pump - Bonding Resistance Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
28-22-12-990-801	Figure: Fuel Scavenge Jet Pump Installation (P/B 401)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Location Zones

Zone	Area
551	Rear Spar to Landing Gear Support Beam - Left Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

D. Prepare for the Procedure

SUBTASK 28-22-12-710-001

(1) Get access to the left or right fuel scavenge jet pump, installed on the rear spar, out of the fuel tank (Figure 28-22-12-990-801).

E. Electrical Bonding Measurement

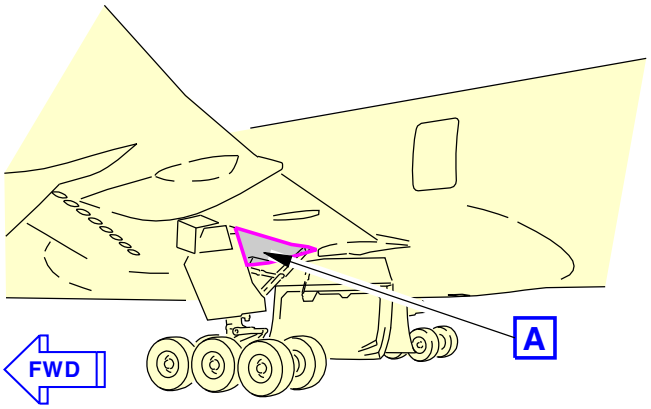
SUBTASK 28-22-12-765-002

(1) Measure the bonding resistance between the scavenge jet pump and airplane structure with an intrinsically safe approved bonding meter, COM-1550.

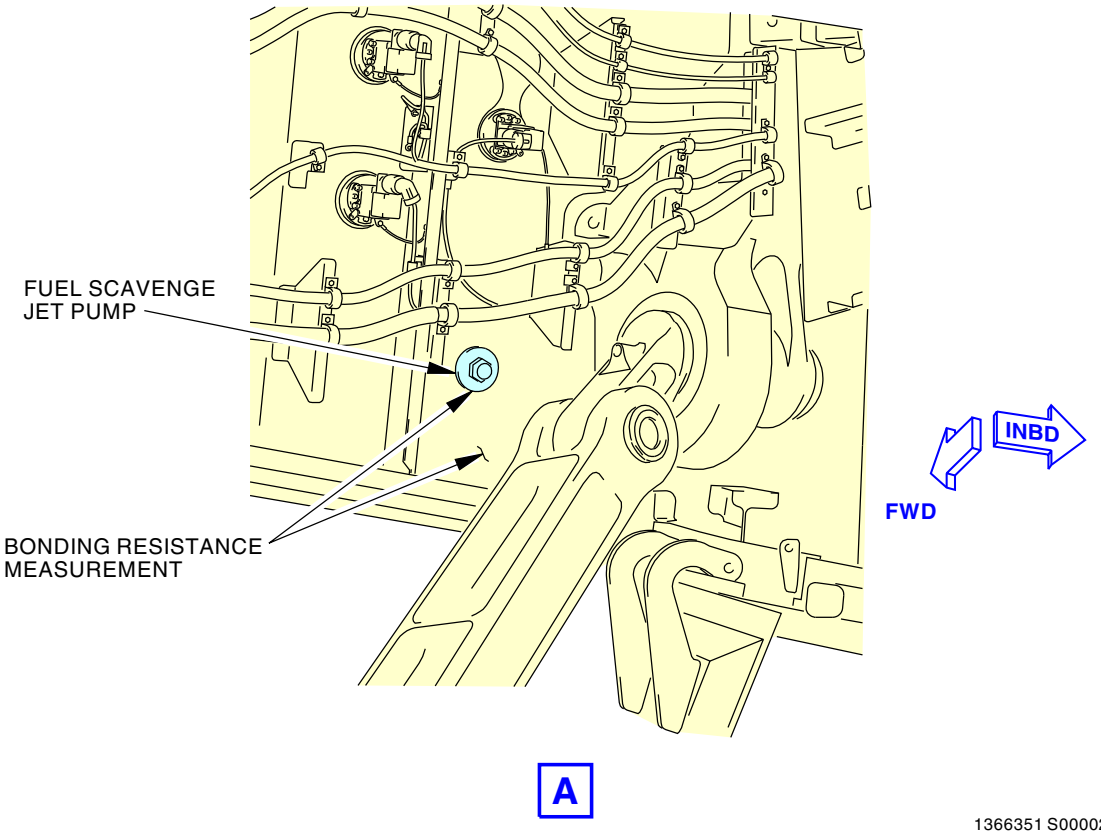
(a) Make sure the bonding resistance is 0.005 ohm (5 milliohms) or less.

END OF TASK

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LEFT WING
(RIGHT WING IS EQUIVALENT)



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Fuel Scavenge Jet Pump - Bonding Resistance Measurement
Figure 601/28-22-12-990-802

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ARO 001-004 PRE SB 777-28-0078 (Continued)

SFAR 88

ARO 005-999; ARO 001-004 POST SB 777-28-0078

TASK 28-22-12-200-802

3. Fuel Scavenge Jet Pump - Bonding Resistance Check

(Figure 602)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)
28-26-00-650-803	Suction Defueling (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
139	Forward Keel Beam

D. Access Panels

Number	Name/Location
139AZ	Center Wing Access Door

E. Prepare for the Inspection/Check

SUBTASK 28-22-12-650-006

(1) If it is necessary, do one of these tasks to defuel the center tank:

(a) Pressure Defueling, TASK 28-26-00-650-801

(b) Suction Defueling, TASK 28-26-00-650-803

(c) Tank to Tank Transfer, TASK 28-26-00-650-802

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ARO 005-999; ARO 001-004 POST SB 777-28-0078 (Continued)

SUBTASK 28-22-12-010-008

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do this task for the center tank: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

SUBTASK 28-22-12-010-009

(3) Remove this access door:

Number	Name/Location
139AZ	Center Wing Access Door

(a) Do this task: Center Tank Access Door - Removal, TASK 28-11-02-000-801.

SUBTASK 28-22-12-010-010

(4) Go into the center fuel tank.

SUBTASK 28-22-12-010-011

(5) Get access to the left or right fuel scavenge jet pump, on the forward side of spanwise beam No. 1.

F. Electrical Bonding Measurement

SUBTASK 28-22-12-760-003

(1) Measure the bonding resistance between the scavenge jet pump an the bracket with an intrinsically safe approved bonding meter, COM-1550.

(a) Make sure the bonding resistance is 0.020 ohm (20 milliohms) or less.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-12-410-007

(1) Do this task: Fuel Tank Closure, TASK 28-11-00-410-801.

SUBTASK 28-22-12-410-008

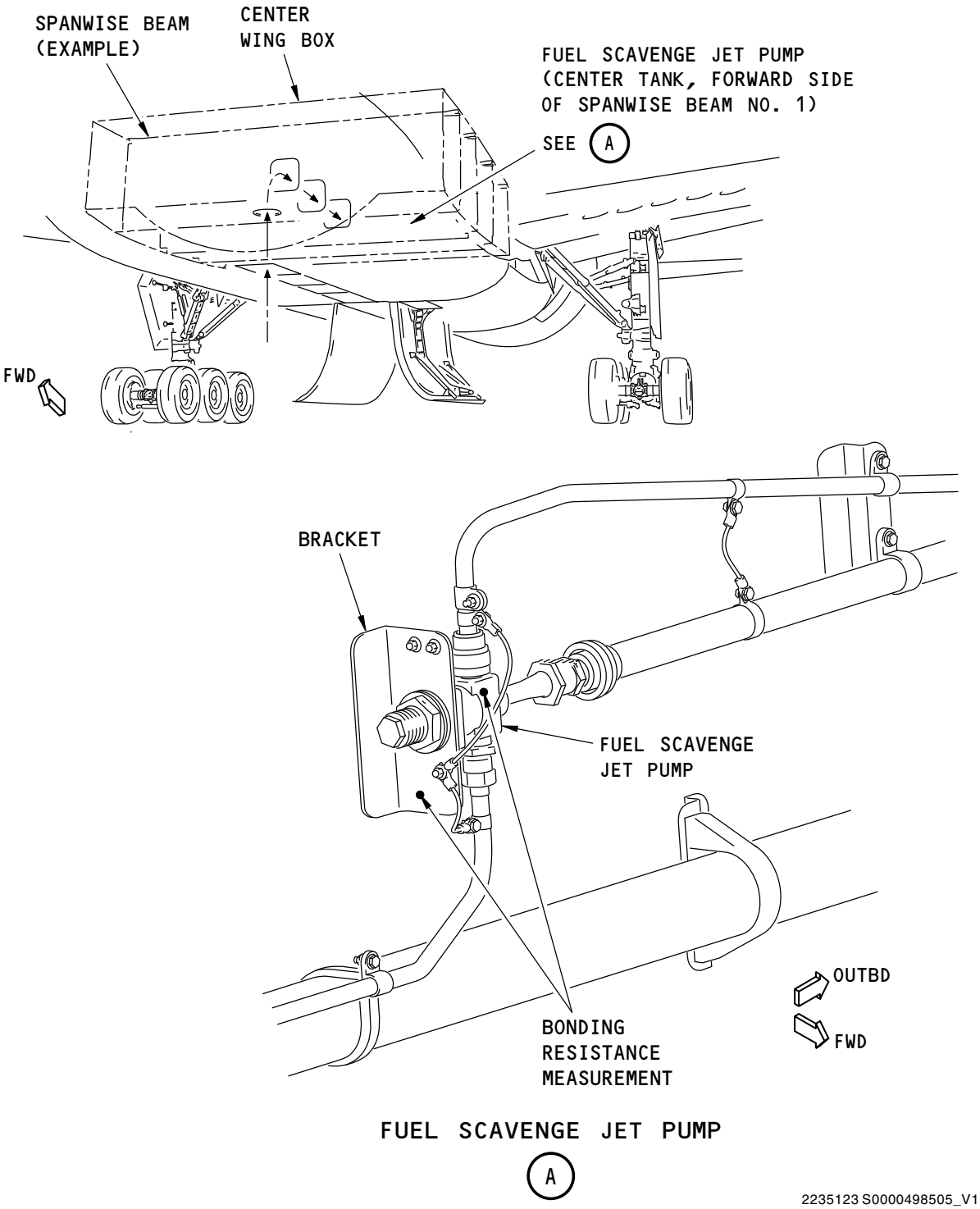
(2) Install this access door:

Number	Name/Location
139AZ	Center Wing Access Door

(a) Do this task: Center Tank Access Door - Installation, TASK 28-11-02-400-801.

——— END OF TASK ———

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Fuel Scavenge Jet Pump - Bonding Resistance Check
Figure 602/28-22-12-990-803

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WATER SCAVENGE JET PUMP - REMOVAL/INSTALLATION

1. General

ARO 001-006

A. There is one water scavenge jet pump in each main fuel tank. There are two water scavenge jet pumps in the center fuel tank.

ARO 007-999

B. There is one water scavenge jet pump in each main fuel tank.

ARO ALL

C. This procedure has two tasks: The first task removes the water scavenge jet pump. The second task installs the water scavenge jet pump.

TASK 28-22-13-000-801

2. Water Scavenge Jet Pump - Removal

(Figure 401)

A. References

Reference	Title
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
ARO 001-006	
133	Wing Center Section, Left
134	Wing Center Section, Right
ARO ALL	
139	Forward Keel Beam
533	Main Tank - Rib 8 to Rib 17 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

C. Access Panels

Number	Name/Location
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door
533AB	Access Door
633AB	Access Door

D. Procedure

SUBTASK 28-22-13-010-001

(1) To remove the nozzle assembly of the water scavenge jet pumps, do these steps:

NOTE: The nozzle assembly [11] contains two parts, the nozzle [11B] and the plug [11A]. It is not necessary to separate these parts.

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(a) Get access to the applicable water scavenge jet pump, installed on the rear spar, out of the fuel tank (Figure 401).

(b) Remove the lockwire from the nozzle [11].

(c) Remove the nozzle [11] from the pump assy [6].

NOTE: There is an internal check valve in the housing that will prevent a fuel spill.

(d) Discard the O-ring [12].

SUBTASK 28-22-13-010-002

(2) To remove the pump assy [6], do these steps:

ARO 001-006

(a) Defuel the center fuel tank to remove the center tank water scavenge jet pump.

1) To defuel, do this task: Pressure Defueling, TASK 28-26-00-650-801.

ARO ALL

(b) Defuel the applicable main tank to remove the water scavenge jet pump from the main tanks.

1) To defuel, do this task: Pressure Defueling, TASK 28-26-00-650-801.

(c) Remove the jamnut [10] and washer [9] from the pump assy [6], from out of the fuel tank.

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(d) To prepare to enter the fuel tank, do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

(e) To get access to the water scavenge jet pump in the main tank remove these access panels, do this task:

Main Tank Access Door Removal, TASK 28-11-01-000-801

Number	Name/Location
533AB	Access Door
633AB	Access Door

ARO 001-006

(f) To get access to the water scavenge jet pump in the center tank remove these access panels, do this task:

Center Tank Access Door - Removal, TASK 28-11-02-000-801

Number	Name/Location
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door

ARO ALL

(g) Disconnect the coupling nut [7] or [18] between the motive flow line [1] or [13] and the pump assy [6].

(h) Disconnect the coupling nut [5] or [17] between the scavenge inlet line [4] or [16] and the pump assy [6].

(i) Disconnect the coupling nut [2] or [14] between the outlet line [3] or [15] and the pump assy [6].

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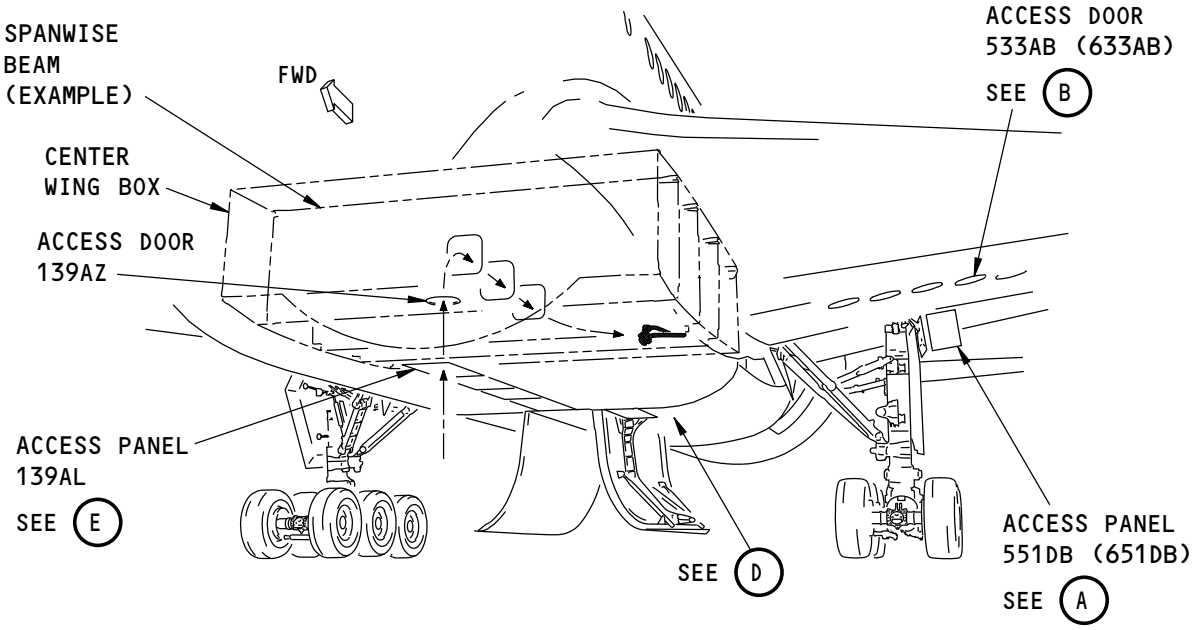
(j) Remove the pump assy [6] assembly.

1) Discard the O-ring [8].

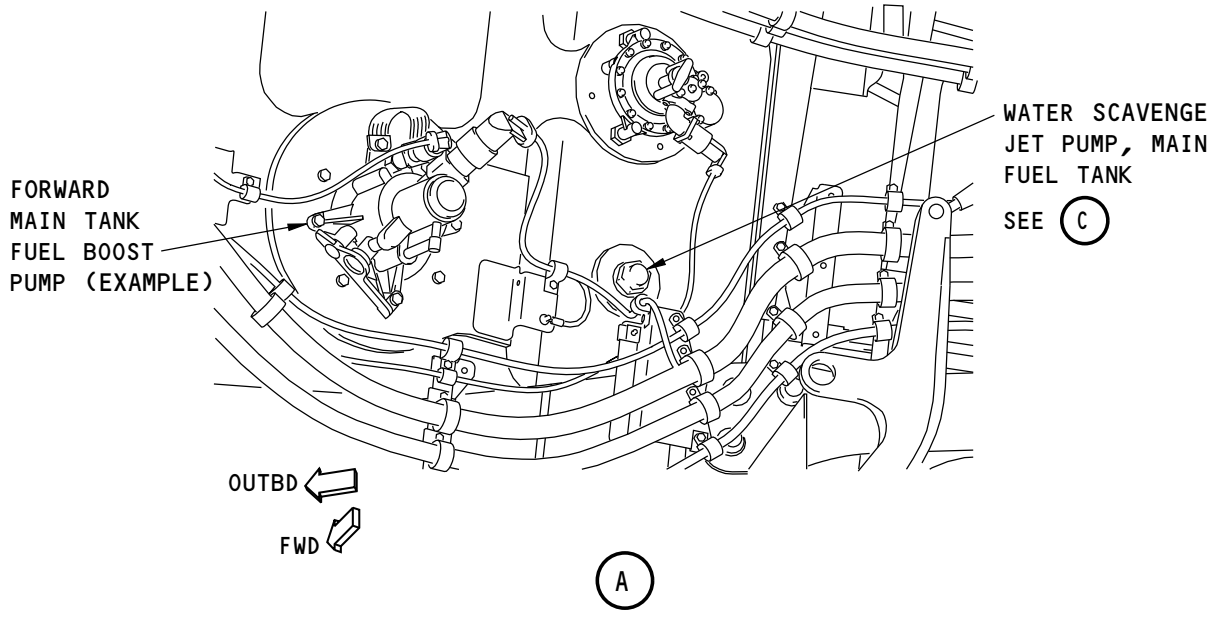
(k) Install caps on the open fuel lines to keep unwanted materials out.

——— END OF TASK ———

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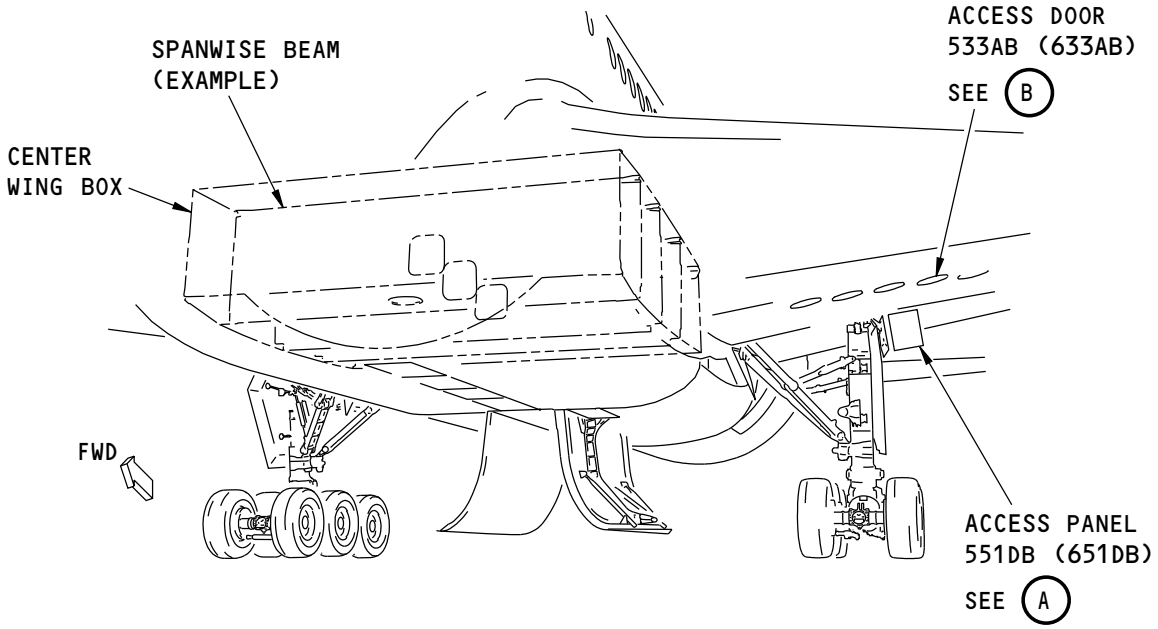
LEFT WING
(RIGHT WING IS EQUIVALENT)



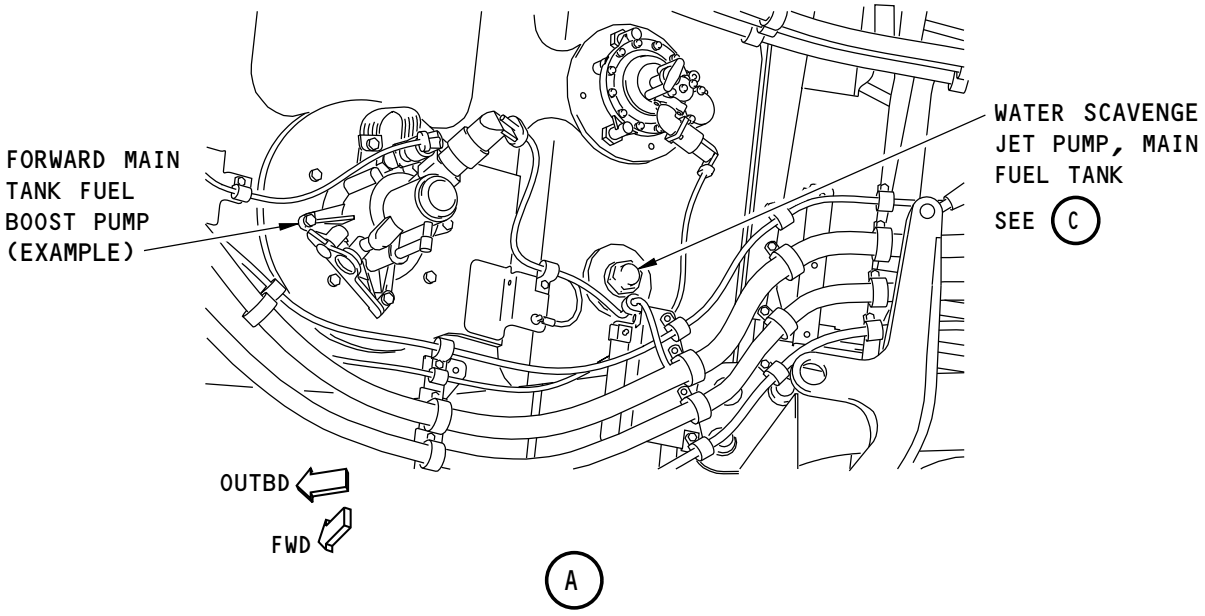
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Water Scavenge Jet Pump Installation
Figure 401/28-22-13-990-801 (Sheet 1 of 4)

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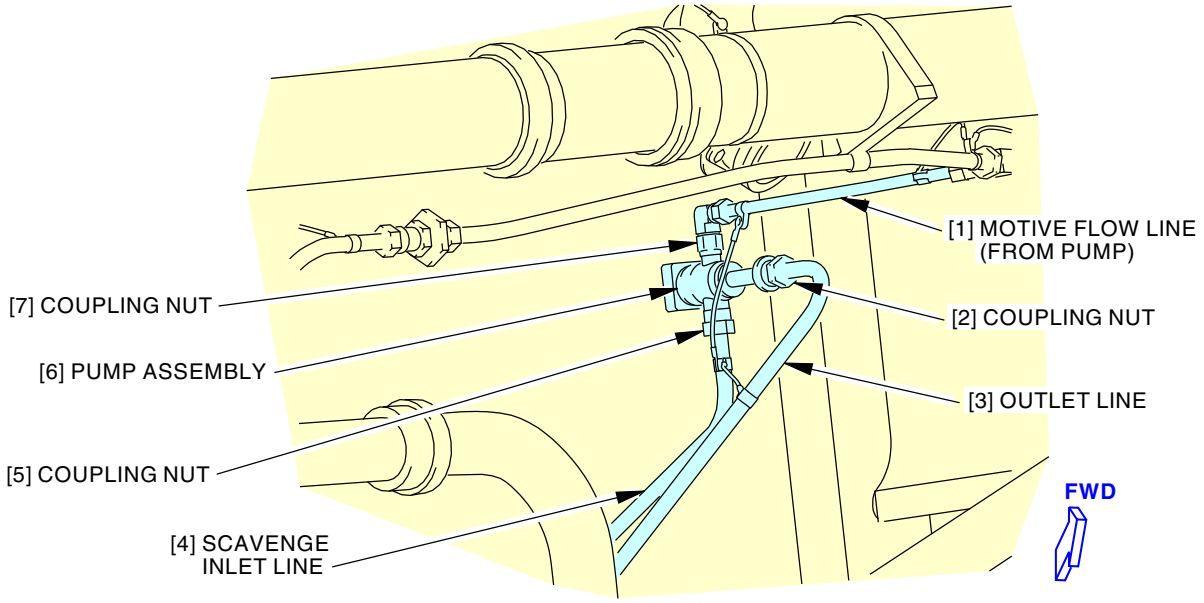
LEFT WING
(RIGHT WING IS EQUIVALENT)

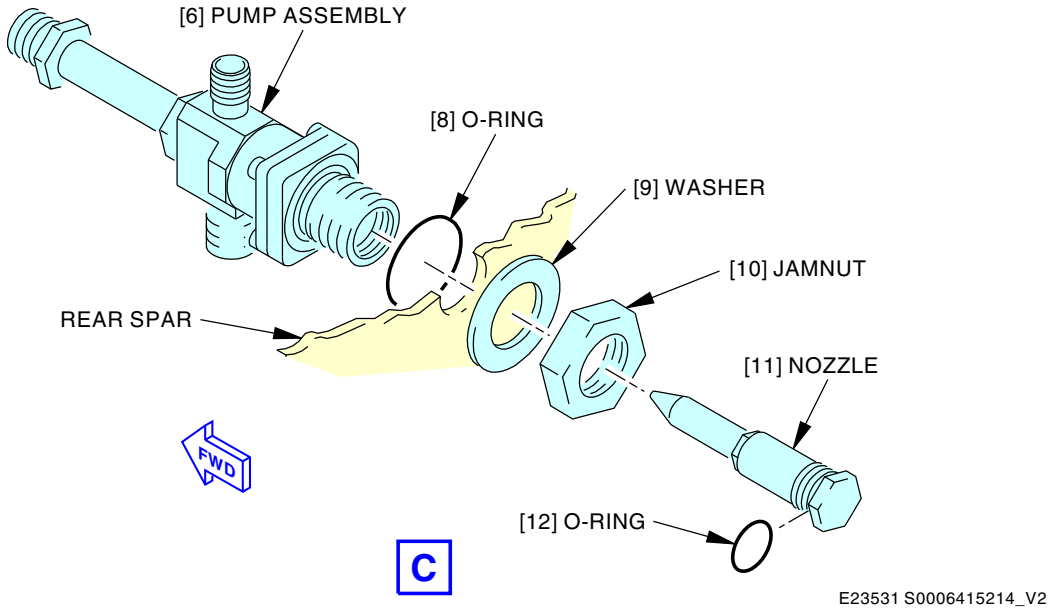


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Water Scavenge Jet Pump Installation
Figure 401/28-22-13-990-801 (Sheet 2 of 4)

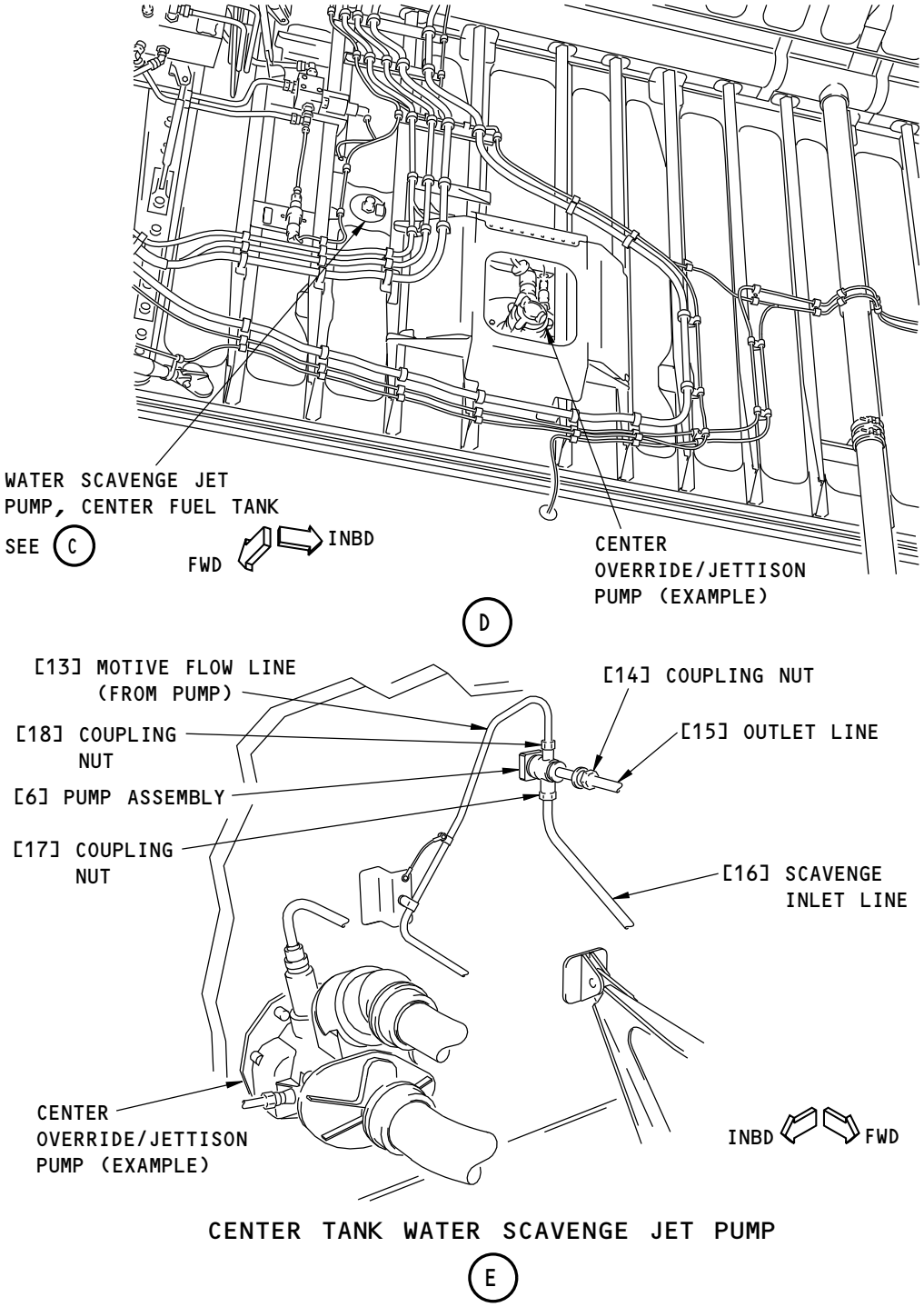
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Water Scavenge Jet Pump Installation
Figure 401/28-22-13-990-801 (Sheet 3 of 4)

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Water Scavenge Jet Pump Installation
Figure 401/28-22-13-990-801 (Sheet 4 of 4)

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TASK 28-22-13-400-801

3. Water Scavenge Jet Pump - Installation

(Figure 401)

A. General

(1) For application of sealants in the fuel tank structure(s), it is acceptable to use sealant, A50303, as an alternative to sealant, A00767, for Class A and B non-faying seal applications:

(a) sealant, A50153, and sealant, A50301, are mutually interchangeable.

(b) sealant, A50110, and sealant, A50302, are mutually interchangeable.

(c) sealant, A50153, cannot be used in combination with sealant, A50302, and sealant, A50301, cannot be used with sealant, A50110.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17
STD-126	Brush - Soft-bristle, Non-metallic

D. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142 Type II
A50110	Sealant	BMS5-45 Class B-2
A50153	Sealant - Fuel Tank - Class A-2	BMS5-45 Class A-2
A50301	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168 Type I Class A-2
A50302	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168 Type I Class B-2
A50303	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168
B00062	Solvent - Acetone (99.5% Grade)	ASTM D 329 (Supersedes O-A-51)

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(Continued)

Reference	Description	Specification
B00065	Alcohol - Denatured, Ethyl (Ethanol)	AMS 3002 (Supersedes O-A-396)
B00130	Alcohol - Isopropyl	TT-I-735
C00064	Coating - Aluminum Chemical Conversion	BAC5719 Type II Class A (MIL-DTL-5541 Class 1A)
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
8	O-ring	28-22-13-01-020	ARO 001-004
		28-22-13-01A-020	ARO 001-006
11A	Plug	28-22-13-01-030	ARO 001-004
		28-22-13-01A-035	ARO 001-006
11B	Nozzle	28-22-13-01-035	ARO 001-004
		28-22-13-01A-045	ARO 001-006
12	O-ring	28-22-13-01-033	ARO 001-004
		28-22-13-01A-040	ARO 001-006

F. Location Zones

Zone	Area
ARO 001-006	
133	Wing Center Section, Left
134	Wing Center Section, Right
ARO ALL	
139	Forward Keel Beam
533	Main Tank - Rib 8 to Rib 17 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

G. Access Panels

Number	Name/Location
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door
533AB	Access Door
633AB	Access Door

H. Procedure

SUBTASK 28-22-13-420-001

(1) To install the nozzle assembly of the water scavenge jet pump, do these steps:

(a) Get access to the applicable water scavenge jet pump, installed on the rear spar, out of the fuel tank (Figure 401).

(b) Apply a thin layer of petrolatum grease, D00504, to the new O-ring [12].

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(c) Install the nozzle [11] and o-ring [12] into the pump assy [6].

NOTE: The nozzle [11] contains two parts, the nozzle [11B] and the plug [11A].

(d) Tighten the nozzle [11] to 155-165 pound-inches (17.6-18.6 newton-meters).

(e) Install lockwire between the nozzle [11] and the jamnut [10] so that wire tension will not let the nozzle move (TASK 20-10-23-400-801).

(f) Install another lockwire between the nozzle [11] and the jamnut [10].

1) Make sure the second lockwire crosses over/under the first lockwire so that wire tension will not let the jamnut move.

SUBTASK 28-22-13-010-003

(2) To install the water scavenge jet pump assembly [6], do these steps:

ARO 001-006

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(a) To go into the main or center tank, do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

ARO 007-999

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(b) To go into the fuel tank, do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

ARO ALL

(c) If alodine coating on the rear spar surface under the jet pump is damaged, do these steps:

1) Manually apply alodine 600 coating, C00064, to damaged area.

2) Clean the rear spar surface with a soft-bristle non-metallic brush, STD-126, and water.

NOTE: Minimize removal of coating, abrade only enough to scuff the surface.

3) Rinse surface with clean cotton wipers, G00034, soaked with water; wipe area a minimum of two times until all sanding residue is removed.

4) Final clean area with a clean cotton wiper, G00034, wet with alcohol, B00065, alcohol, B00130, or solvent, B00062, to remove all oil, grease or unwanted material.

NOTE: Protect the surface from contamination.

(d) Remove the fuel line covers installed on the open fuel lines to keep unwanted materials out.

(e) Lubricate a new O-ring [8] with a thin grease, D00504, of petrolatum jelly.

(f) Install the o-ring [8] onto the pump assy [6] of the jet pump.

(g) Put the pump assy [6] in its position and install the washer [9] and jamnut [10] on the rear spar outside of the tank.

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1) Make sure the fuel lines align before you tighten the jamnut [10].
2) Tighten the jamnut [10] to between 360 ±18 in-lb (41 ±2 N·m).
3) Install lockwire between the nozzle [11] and the jamnut [10] (TASK 20-10-23-400-801).

(h) Measure the bonding resistance between the pump assy [6] and the airplane structure with an electrical bonding intrinsically safe approved bonding meter, COM-1550.

NOTE: Measurement should be taken between the threads that extend past the jamnut and the rear spar web.

1) Make sure the bonding resistance is less than 0.0025 ohm (2.5 milliohms).

(i) Connect the coupling nut [7] or [18] between the motive flow line [1] or [13] and the pump assy [6].

(j) Connect the coupling nut [5] or [17] between the scavenge inlet line [4] or [16] and the pump assy [6].

(k) Connect the coupling nut [2] or [14] between the outlet line [3] or [15] and the pump assy [6].

(l) Apply a fillet seal of sealant, A00767 (or equivalent), between the pump assy [6] and the rear spar (in the fuel tank).

(m) Apply a fillet seal of sealant, A02315, between the jamnut [10] and the rear spar (out of the fuel tank).

(n) To install the main tank access panels, do this task:

Main Tank Access Door Installation, TASK 28-11-01-400-801

Number	Name/Location
533AB	Access Door
633AB	Access Door

ARO 001-006

(o) To install the center tank access doors, do this task:

Center Tank Access Door - Installation, TASK 28-11-02-400-801

Number	Name/Location
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door

ARO ALL

SUBTASK 28-22-13-790-001

(3) Do a leak test of the water scavenge jet pump. These are the steps:

(a) Make sure that there is a minimum level of fuel in the applicable fuel tank:

NOTE: For a pump assembly [6] in the center fuel tank, a minimum of 35,000 lb (15,876 kg) of fuel in the center fuel tank is necessary.

NOTE: For a pump assembly [6] in a main fuel tank, a minimum of 6000 lb (2722 kg) of fuel in the applicable main fuel tank is necessary.

1) To refuel the airplane (if it is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

(b) Operate the applicable fuel pump (main or center tank) and look for leakage at the applicable pump assembly [6] installation.

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1) Make sure that there is no leakage from the nozzle [11B] on the rear spar.

——— END OF TASK ———

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WATER SCAVENGE JET PUMP - INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure has two tasks:

(1) Water Scavenge Jet Pump Check

(2) Water Scavenge Jet Pump - Bonding Resistance Check

ARO 001-006

C. There is one water scavenge jet pump in each main fuel tank. There are two water scavenge jet pumps in the center fuel tank.

ARO 007-999

D. There is one water scavenge jet pump in each main fuel tank.

ARO ALL

E. The Water Scavenge Jet Pump Check removes blockage of the water scavenge jet pump. Blockage of the water scavenge jet pump in one of the fuel tanks can cause excessive water accumulation in that fuel tank. This water accumulation is usually found during sumping. If a large quantity of water is collected in the fuel tank, it can cause problems in the fuel quantity indicating system or an engine flameout.

F. The Water Scavenge Jet Pump - Bonding Resistance Check contains a functional check of the bonding resistance between the structure and the water scavenge jet pump.

TASK 28-22-13-200-801

2. Water Scavenge Jet Pump Check

(Figure 601)

A. Tools/Equipment

Reference	Description
STD-123	Brush - Soft Bristle

B. Consumable Materials

Reference	Description	Specification
B00074	Solvent - Degreasing	MIL-PRF-680 (Supersedes P-D-680)

C. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
139	Forward Keel Beam
533	Main Tank - Rib 8 to Rib 17 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

D. Access Panels

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

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(Continued)

Number	Name/Location
651DB	Inboard Fixed Trailing Edge Panel

E. Prepare for the Check

SUBTASK 28-22-13-010-004

(1) To do a check of the water scavenge pump for the left main tank, open this access panel:

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-22-13-010-005

(2) To do a check of the water scavenge pump for the right main tank, open this access panel:

Number	Name/Location
651DB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-22-13-480-001

(3) Put the container below the pump to catch the fuel.

F. Procedure

SUBTASK 28-22-13-020-001

(1) Do these steps to loosen and remove the nozzle assembly [6] from the pump housing.

(a) Remove the lockwire that attaches the nozzle assembly [6] to the jamnut [5].

(b) Loosen the nozzle assembly [6] from the pump.

(c) Remove the nozzle assembly [6] from the pump housing.

NOTE: The flapper valve in the pump housing closes to prevent fuel leakage when you move the nozzle assembly [6] away from the pump.

(d) Discard the o-ring [7].

SUBTASK 28-22-13-020-002

(2) Loosen and remove the nozzle [6A] from the nozzle plug [6B].

SUBTASK 28-22-13-210-001

(3) Make sure the holes of the jet nozzle [6A] are clean and have no blockage.

SUBTASK 28-22-13-110-001

WARNING

DO NOT USE CLEANING SOLVENT NEAR AN OPEN FLAME OR IN HIGH TEMPERATURE AREAS. CLEANING SOLVENT CAN CAUSE A FIRE. INJURY TO PERSONS CAN OCCUR.

CAUTION

DO NOT USE ABRASIVE CLEANSERS, STEEL WOOL, OR SCOURING PADS ON THE NOZZLE. DAMAGE TO THE NOZZLE CAN OCCUR.

(4) If it is necessary, do these steps to clean the jet nozzle [6A]:

(a) Clean the jet nozzle [6A] with solvent, B00074 or equivalent.

(b) If necessary you can use a soft bristle brush, STD-123, to clean the jet nozzle.

(c) Dry the nozzle with moisture-free compressed air or nitrogen.

SUBTASK 28-22-13-420-002

(5) Install the new o-ring [7], lightly lubricated with fuel, into the groove on the nozzle plug [6B].

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SUBTASK 28-22-13-420-003

(6) Install the nozzle [6A] and nozzle plug [6B] and tighten it to a torque of 70 ±5 in-lb (8 ±1 N·m).

SUBTASK 28-22-13-420-004

(7) Do these steps to install the nozzle assembly [6] in the pump housing:

(a) Put the nozzle assembly [6] into the pump housing.

(b) Tighten the nozzle plug in the pump housing to a torque of 160 ±5 in-lb (18 ±1 N·m).

(c) Install lockwire from the nozzle assembly [6] to the jamnut [5].

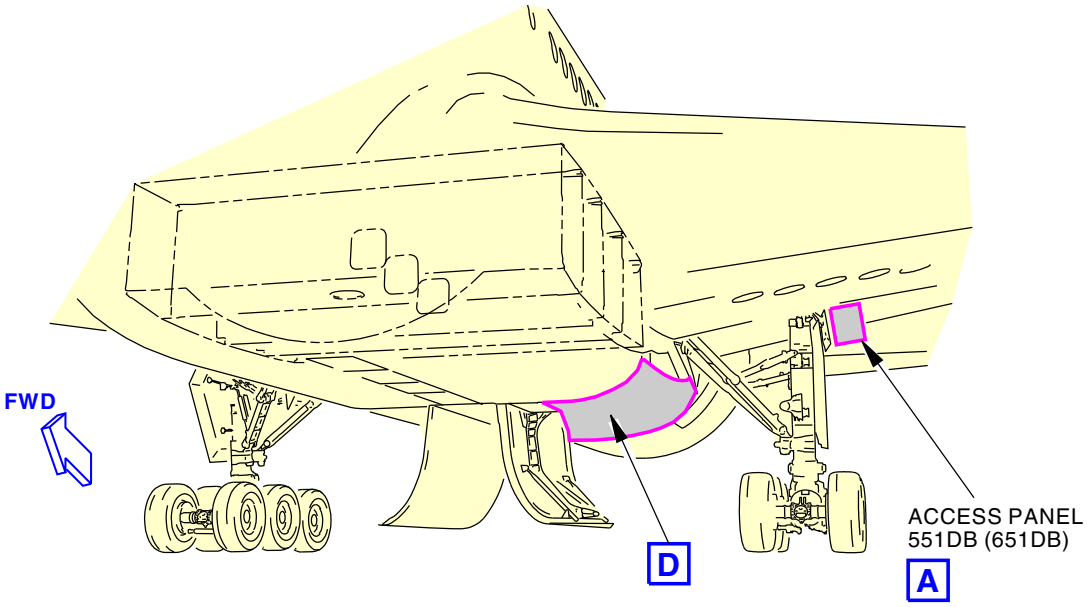
SUBTASK 28-22-13-010-006

(8) Close this access panel if you opened one of them for access:

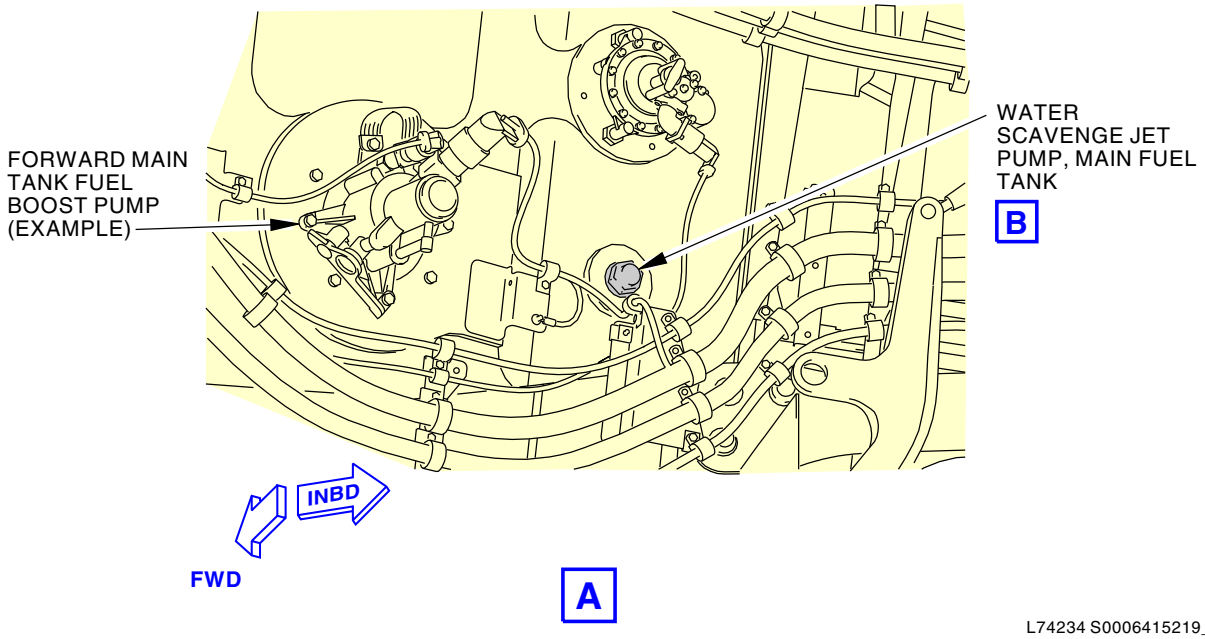
Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel
651DB	Inboard Fixed Trailing Edge Panel

——— END OF TASK ———

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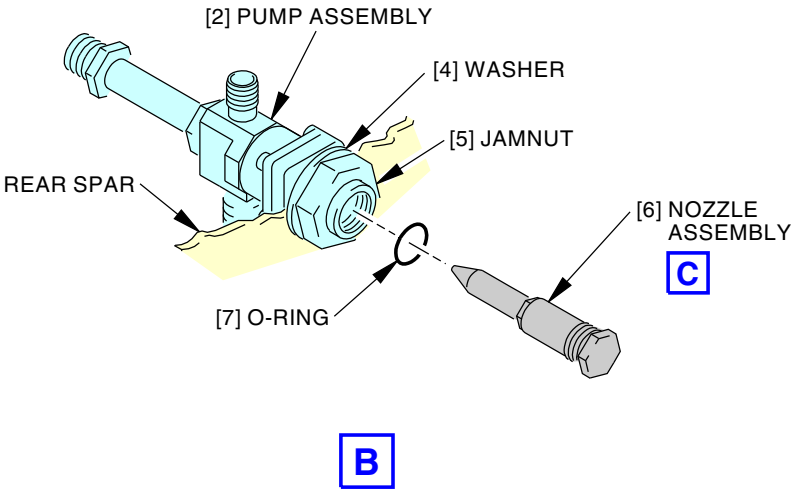
LEFT WING
(RIGHT WING IS EQUIVALENT)

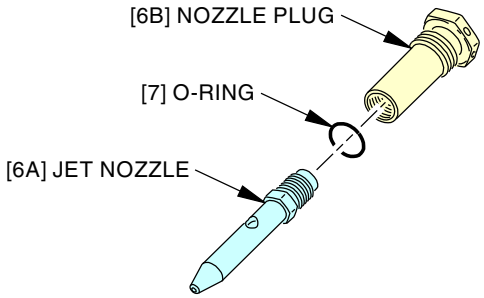


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Water Scavenge Jet Pump Inspection
Figure 601/28-22-13-990-802 (Sheet 1 of 3)

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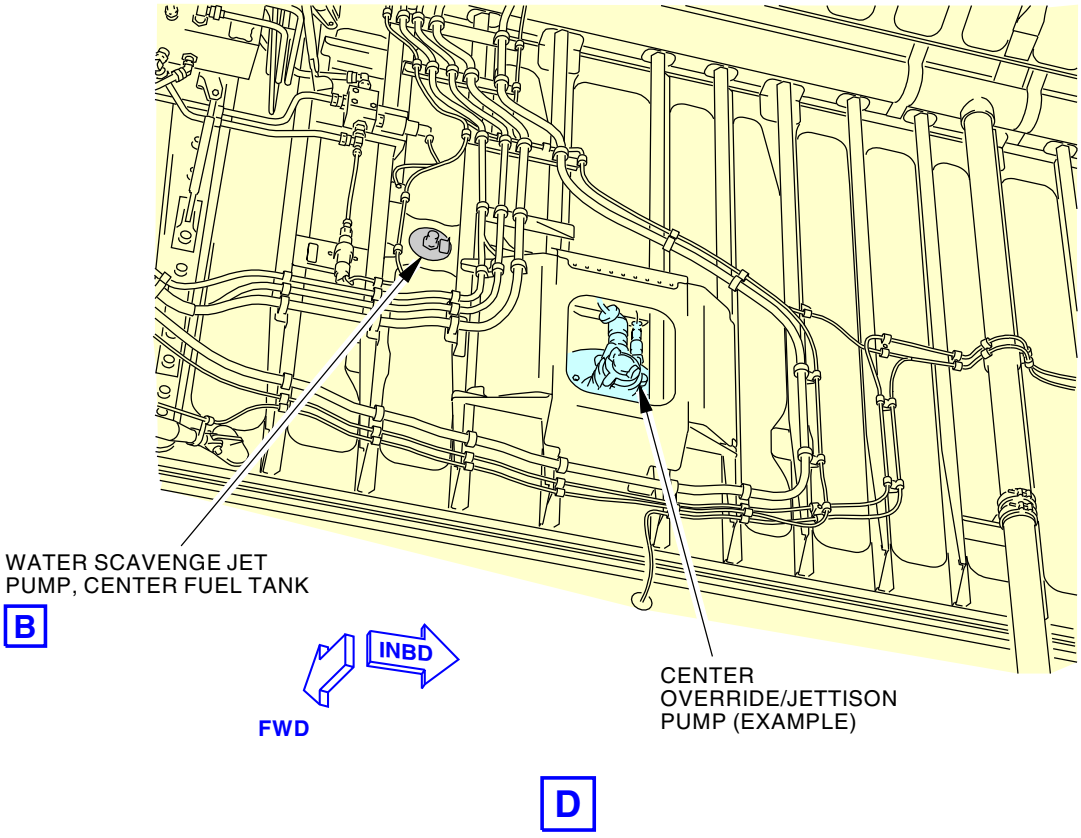
NOZZLE ASSEMBLY

C

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Water Scavenge Jet Pump Inspection
Figure 601/28-22-13-990-802 (Sheet 2 of 3)

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L74237 S0006415221_V2

Water Scavenge Jet Pump Inspection
Figure 601/28-22-13-990-802 (Sheet 3 of 3)

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SFAR 88

TASK 28-22-13-200-802

3. Water Scavenge Jet Pump - Bonding Resistance Check

(Figure 602)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
28-22-13-990-801	Figure: Water Scavenge Jet Pump Installation (P/B 401)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Location Zones

Zone	Area
143	Main Landing Gear Wheel Well, Left
144	Main Landing Gear Wheel Well, Right
551	Rear Spar to Landing Gear Support Beam - Left Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

D. Access Panels

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel
651DB	Inboard Fixed Trailing Edge Panel

E. Prepare for the Procedure

SUBTASK 28-22-13-710-001

(1) To get access to the pump assembly, do these steps:

(a) Get access to the center water scavenge jet pump, installed on the rear spar, out of the fuel tank (Figure 28-22-13-990-801).

(b) To get access to the water scavenge jet pump in the main tank remove these access panels:

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel
651DB	Inboard Fixed Trailing Edge Panel

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F. Electrical Bonding Measurement

SUBTASK 28-22-13-765-001

(1) Measure the bonding resistance between the scavenge jet pump and the airplane structure with an intrinsically safe approved bonding meter, COM-1550.

(a) Make sure the bonding resistance is 0.005 ohm (5 milliohms) or less.

G. Put the Airplane Back to Its Usual Condition

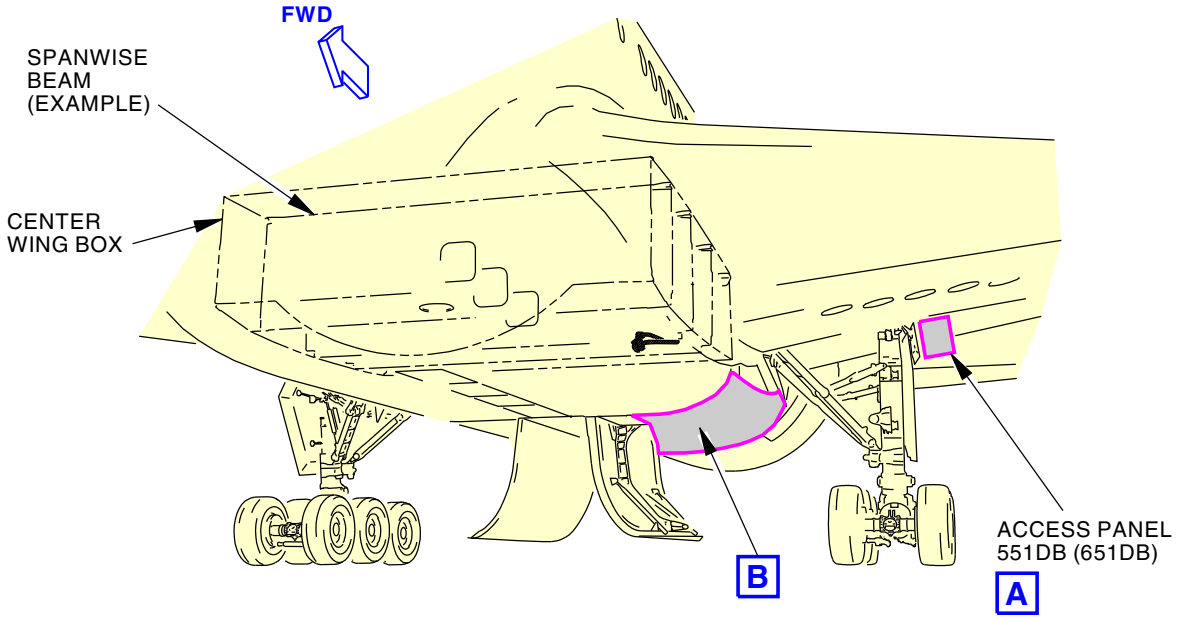
SUBTASK 28-22-13-410-001

(1) Install these access panels:

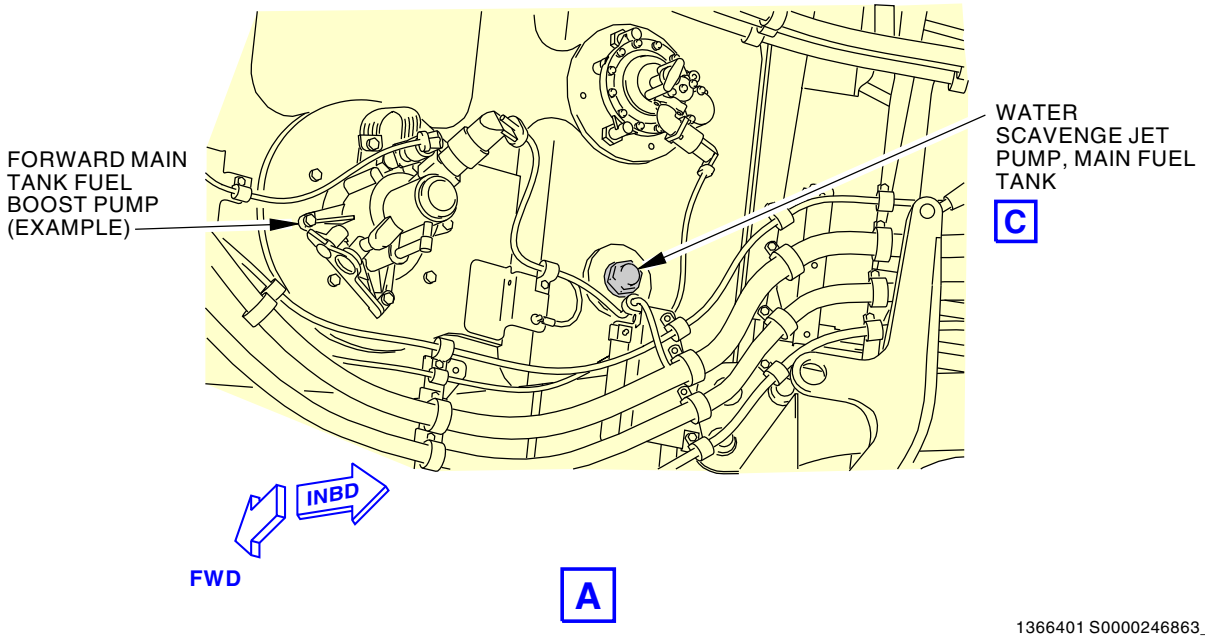
Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel
651DB	Inboard Fixed Trailing Edge Panel

——— END OF TASK ———

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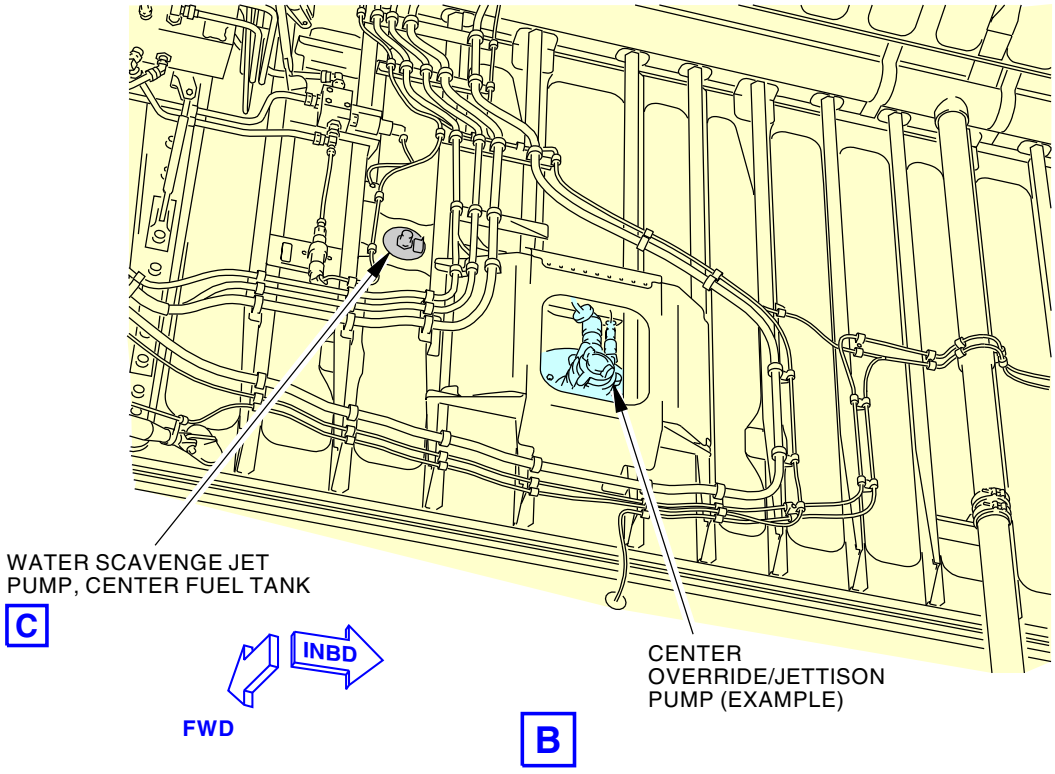
LEFT WING
(RIGHT WING IS EQUIVALENT)

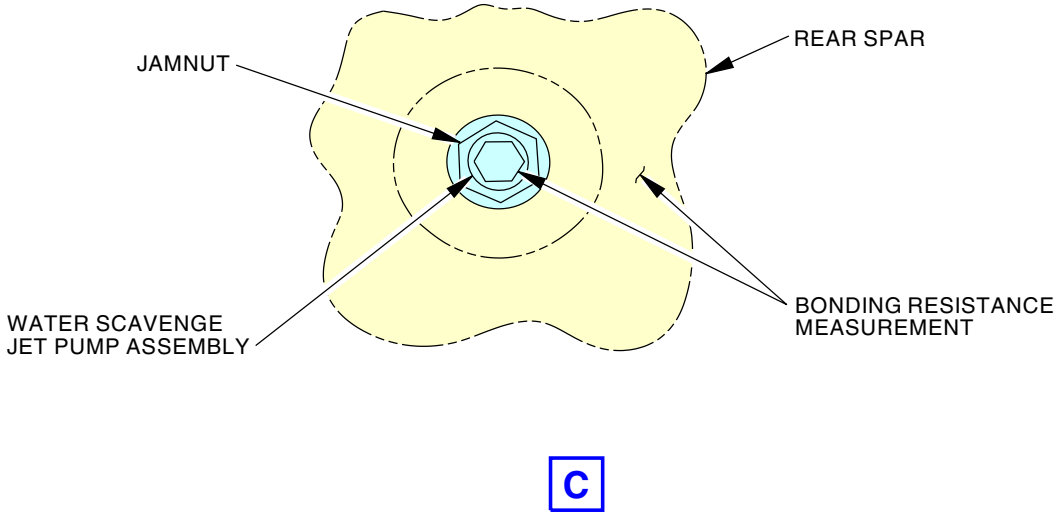


1366401 S0000246863_V2

Water Scavenge Jet Pump - Bonding Resistance Measurement
Figure 602/28-22-13-990-803 (Sheet 1 of 2)

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1366388 S0000246864_V2

Water Scavenge Jet Pump - Bonding Resistance Measurement
Figure 602/28-22-13-990-803 (Sheet 2 of 2)

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ENGINE FUEL SPAR VALVE BATTERY - REMOVAL/INSTALLATION

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure contains two tasks. The first task removes the engine fuel spar valve battery. The second tasks installs the engine fuel spar valve battery.

TASK 28-22-14-000-801

2. Engine Fuel Spar Valve Battery - Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. Location Zones

Zone	Area
212	Flight Compartment, Right

B. Procedure

SUBTASK 28-22-14-860-001

(1) Open these circuit breakers and install safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	20	C28649	FUEL SHUTOFF VALVE BUS
C	22	C28648	FUEL BATTERY CHARGE

SUBTASK 28-22-14-020-001

(2) Open the right side stowage bin, in the flight compartment.

SUBTASK 28-22-14-020-002

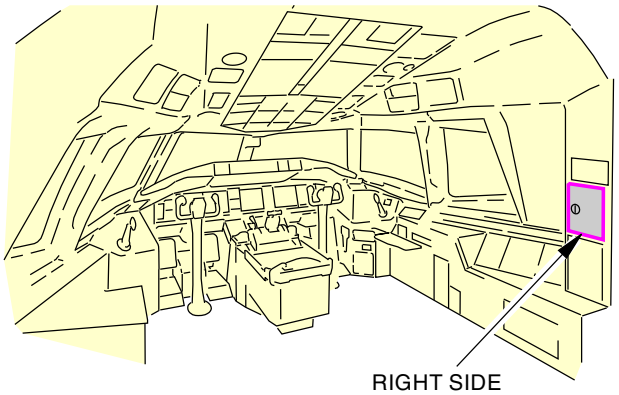
(3) Remove the four screws [1] that attach the battery [3] to the back of the stowage bin.

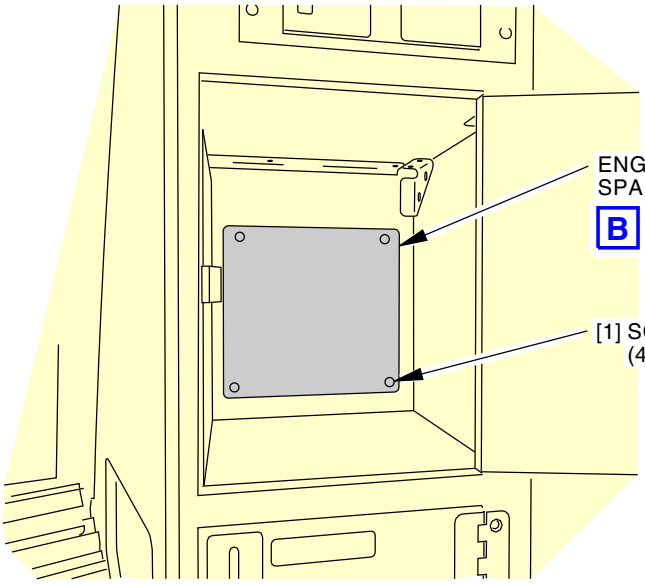
SUBTASK 28-22-14-020-003

(4) Remove the battery [3] and disconnect the electrical connector [2].

——— END OF TASK ———

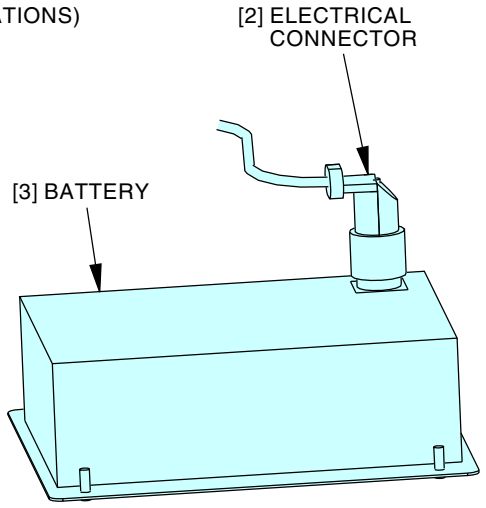
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**RIGHT SIDE STOWAGE BIN
(DOOR SHOWN OPEN)**

A



**ENGINE FUEL
SPAR VALVE BATTERY**

B

E20985 S0006415226_V2

**Engine Fuel Spar Valve Battery Installation
Figure 401/28-22-14-990-801**

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TASK 28-22-14-400-801

3. Engine Fuel Spar Valve Battery - Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
28-22-00-720-803	Fuel Shutoff Valve Battery - Test (P/B 501)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Battery	24-31-51-05-005	ARO ALL

C. Location Zones

Zone	Area
212	Flight Compartment, Right

D. Procedure

SUBTASK 28-22-14-010-001

(1) Open the right side stowage bin door (Figure 401).

SUBTASK 28-22-14-420-001

(2) Connect the electrical connector [2] to the battery [3].

SUBTASK 28-22-14-420-002

(3) Put the battery [3] in its position and install the four screws [1].

SUBTASK 28-22-14-860-002

(4) Remove the safety tags and close these circuit breakers:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	20	C28649	FUEL SHUTOFF VALVE BUS
C	22	C28648	FUEL BATTERY CHARGE

SUBTASK 28-22-14-860-003

(5) Let the battery [3] charge for 1 hour.

SUBTASK 28-22-14-710-001

(6) To test the engine fuel spar valve battery [3], do this task: Fuel Shutoff Valve Battery - Test, TASK 28-22-00-720-803.

——— END OF TASK ———

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FUEL FEED MANIFOLD AND COUPLINGS - MAINTENANCE PRACTICES

1. General

A. This procedure has an engine fuel feed and refuel manifold leak isolation task.

TASK 28-22-15-790-808

2. Engine Fuel Feed and Refuel Manifold - Leak Isolation

A. General

(1) The purpose of the Engine Fuel Feed and Refuel Manifold - Leak Isolation is to find the source of the leakage if leakage is found during this task: Engine Fuel Feed Manifold - Suction Feed Line Leak Check, TASK 28-22-15-710-802-001.

B. References

Reference	Title
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-21-01-000-801	Refuel Adapter - Removal (P/B 401)
28-21-01-400-801	Refuel Adapter - Installation (P/B 401)
28-21-08-000-802	Refuel/Jettison Manifold and Couplings - Removal (Selection) (P/B 401)
28-21-08-400-802	Refuel/Jettison Manifold and Couplings - Installation (Selection) (P/B 401)
28-22-15-000-802-001	Fuel Line, Fitting and Coupling - Removal (P/B 401)
28-22-15-400-802-001	Fuel Line, Fitting and Coupling - Installation (P/B 401)
28-22-15-710-802-001	Engine Fuel Feed Manifold - Suction Feed Line Leak Check (P/B 601)
28-22-15-790-802-001	Engine Fuel Feed Manifold, Spar and Crossfeed Valve - Leak Check (P/B 601)

C. Tools/Equipment

Reference	Description
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)

D. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236
G00091	Compound - Oxygen System Leak Detection - Snoop Leak Detector	MIL-PRF-25567

E. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
414	Right Fan Cowl - Left Engine
416	Right Thrust Reverser - Left Engine
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

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(Continued)

Zone	Area
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing

F. Leak Check

SUBTASK 28-22-15-790-005

(1) If you did not do it before, do this task: Engine Fuel Feed Manifold - Suction Feed Line Leak Check, TASK 28-22-15-710-802-001.

(a) If the fuel feed manifold and refuel manifold do not pass the leak test with the refuel adapter flapper valve in the closed position, do the procedure below.

G. Leak Isolation Procedure

SUBTASK 28-22-15-860-045

(1) Close the defuel valve.

SUBTASK 28-22-15-790-006

(2) To isolate the leak, do this task: Engine Fuel Feed Manifold, Spar and Crossfeed Valve - Leak Check, TASK 28-22-15-790-802-001.

(a) If the engine fuel feed manifold shows leakage, do the subsequent tests in Engine Fuel Feed Manifold, Spar and Crossfeed Valve - Leak Check, TASK 28-22-15-790-802-001, to isolate the leakage in the engine fuel feed manifold.

SUBTASK 28-22-15-790-007

(3) If the engine fuel feed manifold does not show leakage, do these steps:

(a) Attach compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to the refuel adapter.

(b) Make sure all refuel shutoff valves are closed.

(c) Pressurize the refuel adapter to a pressure of 41.5 ±3.5 psig (286.1 ±24.2 kPa).

(d) Isolate the air source from the refuel adapter.

(e) Monitor the air pressure.

(f) If the pressure decreases more than 1.5 psig (10.3 kPa) in 10 minutes, there is a leak in the refuel manifold.

1) Open the isolation valve on the air pressure source again and continue to keep the air pressure on the refuel manifold.

WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

2) Go into the fuel tank (TASK 28-11-00-010-801).

3) Examine the refuel manifold for leakage.

a) Examine each line and couplings for indications of leakage.

b) Listen for sounds of air leakage at each coupling and valve connection.

c) Use Snoop Leak Detector compound, G00091, bubble solution or non-corrosive soap solution at suspect areas.

4) Open the isolation valve again and continue to keep the air pressure on the refuel manifold.

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5) Go into the fuel tank (TASK 28-11-00-010-801).

6) Examine the refuel manifold for leakage.

7) If a coupling has a leak, disconnect the coupling, replace the O-rings, and then connect the coupling (TASK 28-21-08-000-802, TASK 28-21-08-400-802, TASK 28-22-15-000-802-001, TASK 28-22-15-400-802-001).

   a) Apply a thin layer of petrolatum, grease, D00504, to the new O-rings.

8) If a fuel line has a leak, or is damaged, remove it and install a new fuel line (TASK 28-21-08-000-802, TASK 28-21-08-400-802, TASK 28-22-15-000-802-001, TASK 28-22-15-400-802-001).

SUBTASK 28-22-15-790-008

(4) If the pressure in the refuel manifold does not decrease by more than 1.5 psig (10.3 kPa) in 10 minutes, then the flapper valve on the refuel adapter is the source of the leakage. Replace the refuel adapter. To do this, do these tasks:

Refuel Adapter - Removal, TASK 28-21-01-000-801

Refuel Adapter - Installation, TASK 28-21-01-400-801.

(a) Apply a thin layer of petrolatum, grease, D00504, to the flapper valve seat.

NOTE: The flapper valve cannot be replaced with the refuel adapter installed on the airplane.

——— END OF TASK ———

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FUEL FEED MANIFOLD AND COUPLINGS - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) Fuel Line, Fitting and Coupling - Removal

NOTE: This procedure gives examples for fuel line and fitting removal.

(2) Fuel Line, Fitting and Coupling - Installation

NOTE: This procedure gives examples for fuel line and fitting installation.

(3) Fuel Line, Engine Strut Coupling O-Ring - Removal

(4) Fuel Line, Engine Strut Coupling O-Ring - Installation

TASK 28-22-15-000-802-001

2. Fuel Line, Fitting and Coupling - Removal

(Figure 401)

A. General

(1) This procedure gives examples of the removal and installation procedures for the fuel feed lines and fittings. There are three types of fittings: a flexible full coupling, flexible half coupling, and a rigid coupling.

(2) It is not necessary to replace the aluminum tubing for the fuel system (Types 2024, 5052, and 6061) if the damage is not more than the damage limits in (Fuel Tube Damage Criteria - Inspection/Check, TASK 28-22-15-700-802-001.

(3) For approved repair of fuel systems aluminum tubing, refer to the task: Tube Repair, TASK 20-10-09-300-801.

B. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
20-10-09-300-801	Tube Repair (P/B 801)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
28-00-00-200-801	Inspection of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-00-00-960-801	Replacement of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-22-15-700-802-001	Fuel Tube Damage Criteria - Inspection/Check (P/B 601)
28-26-00-650-801	Pressure Defueling (P/B 201)
30-11-03-000-801	Wing Anti-Ice Valve Removal (P/B 401)
54-52-01-000-801-001	Forward Fairings Removal (P/B 401)
54-52-03-000-801	Underwing Fairing Removal (P/B 401)
54-54-01-000-803-001	Strut Forward Thermal Blanket Removal (P/B 401)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)

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(Continued)

Reference	Title
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

C. Tools/Equipment

Reference	Description
STD-764	Scraper - Non-metallic
STD-1064	Scraper - Phenolic, Hard Resin

D. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
430	Subzone 430 - Left Nacelle Strut
440	Subzone 440 - Right Nacelle Strut
513	Krueger Seal Flap/Nacelle Gap Cover Area - Left Wing
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
613	Krueger Seal Flap/Nacelle Gap Cover Area - Right Wing
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

E. Access Panels

Number	Name/Location
431DT	No. 2 Forward Fairing, Left Strut
431ET	No. 3 Forward Fairing, Left Strut
431FR	Inboard Underwing Fairing, Left Strut
432DR	Right Access Door, Left Strut
441DT	No. 2 Forward Fairing, Right Strut
441ET	No. 3 Forward Fairing, Right Strut
441FR	Outboard Underwing Fairing, Right Strut
442DR	Right Access Door, Right Strut
513BT	Upper Nacelle Strut Interface (Gap Cover) Panel
521AB	Wing Anti-Ice Valve Door
613BT	Upper Nacelle Strut Interface (Gap Cover) Panel
621AB	Wing Anti-Ice Valve Door

F. Engine Strut Fuel Line Access

SUBTASK 28-22-15-010-026-001

(1) To get access to the fuel line above the left engine strut, do these steps:

(a) Remove the applicable underwing fairing:

(Underwing Fairing Removal, TASK 54-52-03-000-801)

Number	Name/Location
431FR	Inboard Underwing Fairing, Left Strut

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(b) Remove the applicable forward fairings:

(Forward Fairings Removal, TASK 54-52-01-000-801-001)

Number	Name/Location
431DT	No. 2 Forward Fairing, Left Strut
431ET	No. 3 Forward Fairing, Left Strut

(c) Open this access panel on the strut, under the thrust reverser:

Number	Name/Location
432DR	Right Access Door, Left Strut

(d) Open this access panel on the bottom of the wing:

(Finding an Access Door or Panel on the Wings, TASK 06-44-00-800-802)

Number	Name/Location
521AB	Wing Anti-Ice Valve Door

(e) Remove this access panel on the top of the wing:

(Finding an Access Door or Panel on the Wings, TASK 06-44-00-800-802)

Number	Name/Location
513BT	Upper Nacelle Strut Interface (Gap Cover) Panel

SUBTASK 28-22-15-010-027-001

(2) To get access to the fuel line above the right engine strut, do these steps:

(a) Remove the applicable underwing fairing:

(Underwing Fairing Removal, TASK 54-52-03-000-801)

Number	Name/Location
441FR	Outboard Underwing Fairing, Right Strut

(b) Remove the applicable forward fairings:

(Forward Fairings Removal, TASK 54-52-01-000-801-001)

Number	Name/Location
441DT	No. 2 Forward Fairing, Right Strut
441ET	No. 3 Forward Fairing, Right Strut

(c) Open this access panel on the strut, under the thrust reverser:

Number	Name/Location
442DR	Right Access Door, Right Strut

(d) Open this access panel on the bottom of the wing:

(Finding an Access Door or Panel on the Wings, TASK 06-44-00-800-802)

Number	Name/Location
621AB	Wing Anti-Ice Valve Door

(e) Remove this access panel on the top of the wing:

(Finding an Access Door or Panel on the Wings, TASK 06-44-00-800-802)

Number	Name/Location
613BT	Upper Nacelle Strut Interface (Gap Cover) Panel

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SUBTASK 28-22-15-010-028-001

WARNING DO ALL OF THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(3) Do these tasks in this sequence to safely open the thrust reversers:

(a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.

(b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.

(c) Do this task: Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00.

(d) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

(e) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00.

SUBTASK 28-22-15-650-015-001

(4) To remove fuel tubing in the engine strut area defuel the main fuel tanks.

(a) Do this task: Pressure Defueling, TASK 28-26-00-650-801.

G. Fuel Tank Fuel Line Access

SUBTASK 28-22-15-650-016-001

(1) To remove tubing in the fuel tanks, defuel all of the fuel tanks.

(a) Do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-22-15-650-017-001

WARNING OBEY THE FUEL TANK PURGING AND ENTRY PRECAUTIONS. FAILURE TO OBEY THE FUEL TANK PURGING AND ENTRY PRECAUTIONS COULD CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-22-15-010-029-001

(3) To remove the applicable main fuel tank access door(s), do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

SUBTASK 28-22-15-010-030-001

(4) To remove the applicable center fuel tank access door(s), do this task: Center Tank Access Door - Removal, TASK 28-11-02-000-801.

H. Fuel Lines and Fittings Removal

SUBTASK 28-22-15-020-017-001

(1) To remove the rubber block around the upper strut fuel tube [53] penetration into the top of the strut, do these steps:

(a) Remove the screws and washers to remove the two upper hold-down brackets.

(b) Cut the fillet seal around the rubber block, the rubber block split lines and tubes with a non-metal hard resin phenolic scraper, STD-1064.

(c) Remove the rubber block.

SUBTASK 28-22-15-020-018-001

(2) To remove the lower fuel tube [54] in the core/strut disconnect panel, do these steps:

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(a) Get access through the strut access panel, open the applicable panels:

Number	Name/Location
432DR	Right Access Door, Left Strut
442DR	Right Access Door, Right Strut

(b) Cut the fillet seal around the lower fuel tube [54] with a non-metal hard resin phenolic scraper, STD-1064.

(c) Remove the strut forward thermal insulation blankets under the strut that are around the lower fuel tube [54](TASK 54-54-01-000-803-001).

(d) Remove four bolts and washers that attach the lower fuel tube [54] to the bottom of the strut.

(e) Remove the four bolts, eight washers, four nuts, two brackets, a clamp block, and two spacers that attach the lower fuel tube [54] to the core/strut disconnect panel.

(f) Remove a clamp and two screws and washers.

(g) Remove the lower fuel tube [54].

SUBTASK 28-22-15-020-019-001

(3) To disconnect the strut upper fuel tube [53] from the lower fuel tube [54] in the strut, do these steps:

(a) Get access through the strut access panel open the applicable panels under the right thrust reverser:

Number	Name/Location
432DR	Right Access Door, Left Strut
442DR	Right Access Door, Right Strut

(b) Disconnect the nut [51] on the upper fuel tube [53] to disconnect the lower fuel tube [54].

SUBTASK 28-22-15-940-004-001

(4) Go into the applicable fuel tank.

SUBTASK 28-22-15-020-020-001

(5) To remove the bonding jumpers, do these steps (View I) (Figure 401):

(a) Remove the bolts, washers and nuts to disconnect the bonding jumpers.

SUBTASK 28-22-15-020-021-001

(6) To remove the clamps to the fuel lines, do these steps (View J, K) (Figure 401):

(a) Remove the screws, washers and nuts to disconnect the clamps for the fuel lines from the airplane structure.

SUBTASK 28-22-15-020-022-001

(7) To remove flexible full and half couplings, do these steps (View G and View H) (Figure 401):

(a) Remove the lockwire from the coupling.

(b) Loosen the coupling nut [10] and coupling nut [17].

(c) Discard the o-ring [9] and o-rings [16].

(d) Inspect the retaining rings [13], retaining rings [19], retainer halves [20], coupling [15], coupling nut [10], and coupling nut [17]for wear (TASK 28-22-15-700-802-001).

1) Replace these components if it is necessary.

SUBTASK 28-22-15-020-023-001

(8) To remove the rigid couplings, do these steps (View L) (Figure 401):

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(a) Remove the lockwire from the coupling.

(b) Loosen the coupling nut [23].

(c) Discard the o-ring [28].

(d) Inspect the retaining ring [27] and coupling nut [23] for wear (TASK 28-22-15-700-802-001).

1) Replace these components if it is necessary.

SUBTASK 28-22-15-020-024-001

(9) To remove fuel line bulkhead fittings, do these steps (Views M, N) (Figure 401):

NOTE: For increased access to the front spar bulkhead fitting, the Wing Anti-Ice (WAI) valve can be removed.

(a) If necessary remove the WAI valve. Do this task: (Wing Anti-Ice Valve Removal, TASK 30-11-03-000-801).

(b) For the front spar bulkhead fitting, do these steps (View C) (Figure 401):

1) Remove the drain shroud from the exterior side of the fitting.

2) Remove the sealant from the interior side of the fitting with a non-metallic scraper, STD-764.

(c) Remove the lockwire from each coupling.

(d) Remove the coupling nuts [32] from the body [31].

(e) Discard the o-ring [33] and o-ring [37].

(f) Inspect the retaining rings [29] and coupling nuts [32] for wear (TASK 28-22-15-700-802-001).

1) Replace these components if it is necessary.

(g) Remove the nut [36] to remove the washer [39], body [31] and o-ring [35] from the bulkhead.

SUBTASK 28-22-15-420-017-001

(10) To remove the suction by-pass check valves, do these steps (View F) (Figure 401):

(a) Remove the four bolts [8], washers [7], washers [6], and nuts [5] that attach the check valve [2] to the mounting flange.

(b) Discard the o-ring [1].

(c) Remove the rigid coupling [3] and o-rings [4].

1) Discard the o-rings [4].

(d) Inspect the rigid coupling [3] for wear (TASK 28-22-15-700-802-001).

1) Replace these components if it is necessary.

SUBTASK 28-22-15-020-025-001

(11) Remove the fuel lines, support clamps, and bonding jumpers as necessary.

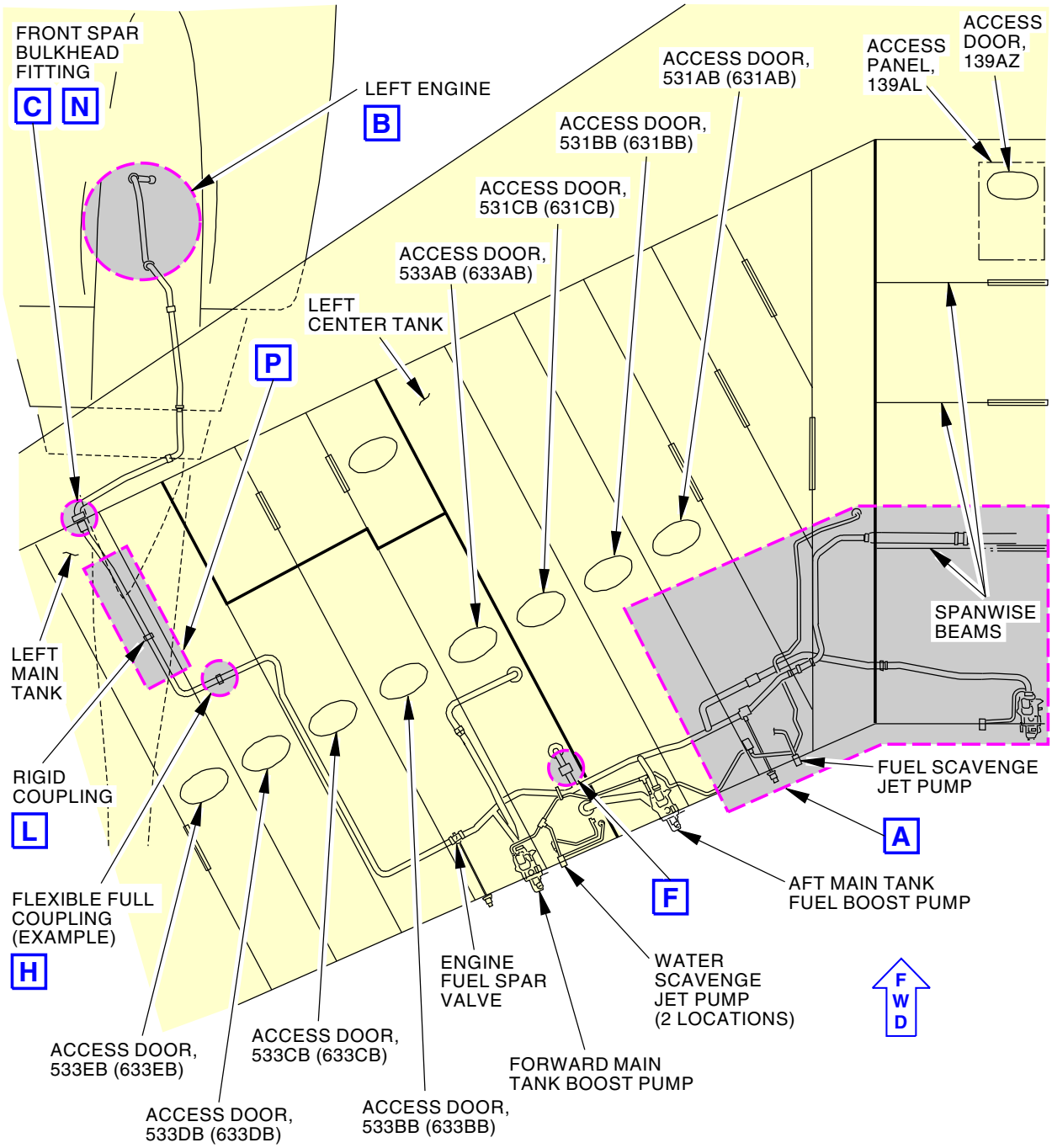
SUBTASK 28-22-15-210-007-001

(12) Do a check of the bonding jumpers; do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(a) Replace the bonding jumpers as necessary (TASK 28-00-00-960-801).

END OF TASK

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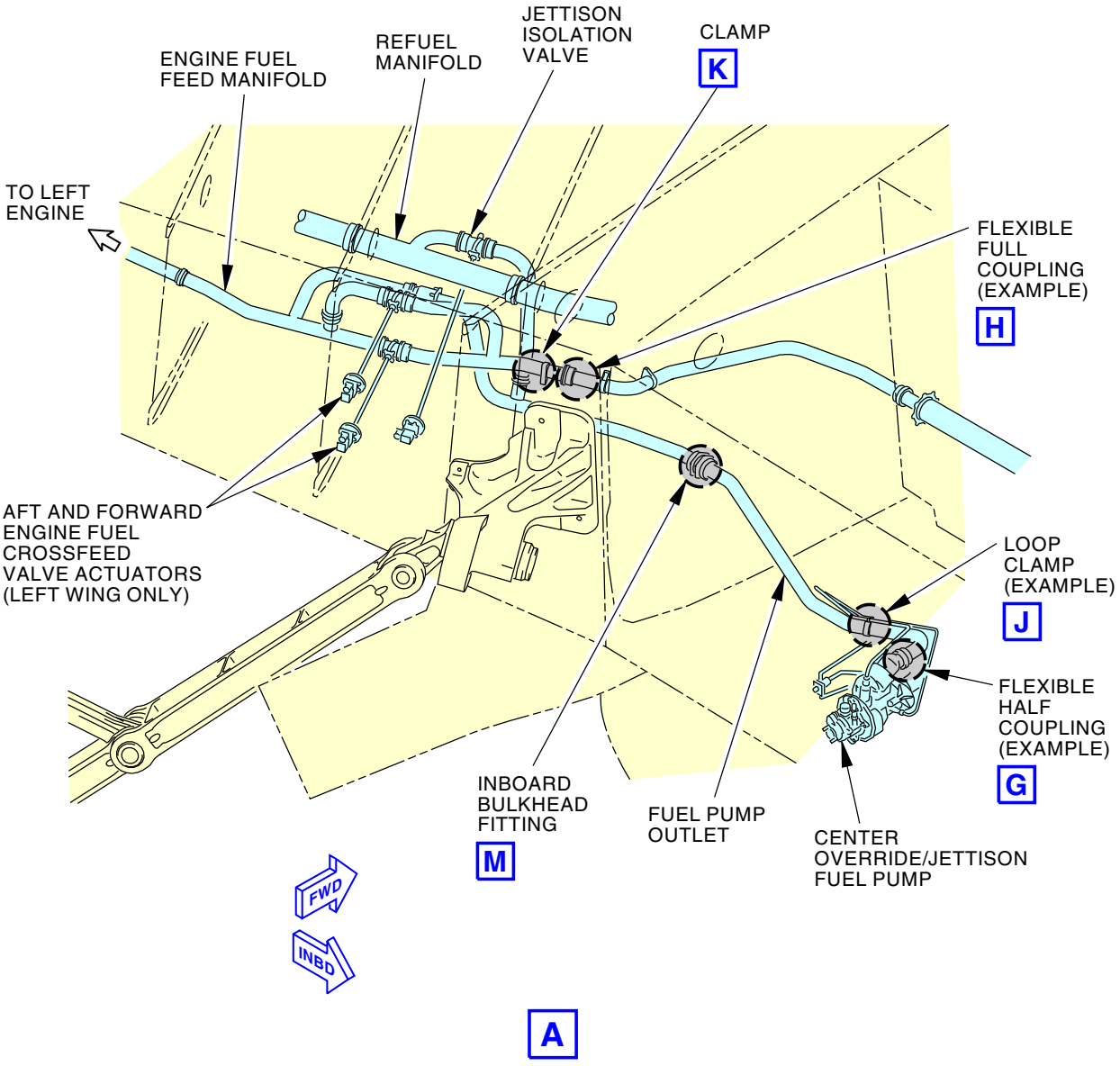


LEFT WING
(TOP VIEW)
(RIGHT WING IS ALMOST THE SAME)

M35137 S0006415231_V4

Fuel Feed Manifold and Couplings Installation
Figure 401/28-22-15-990-805-001 (Sheet 1 of 11)

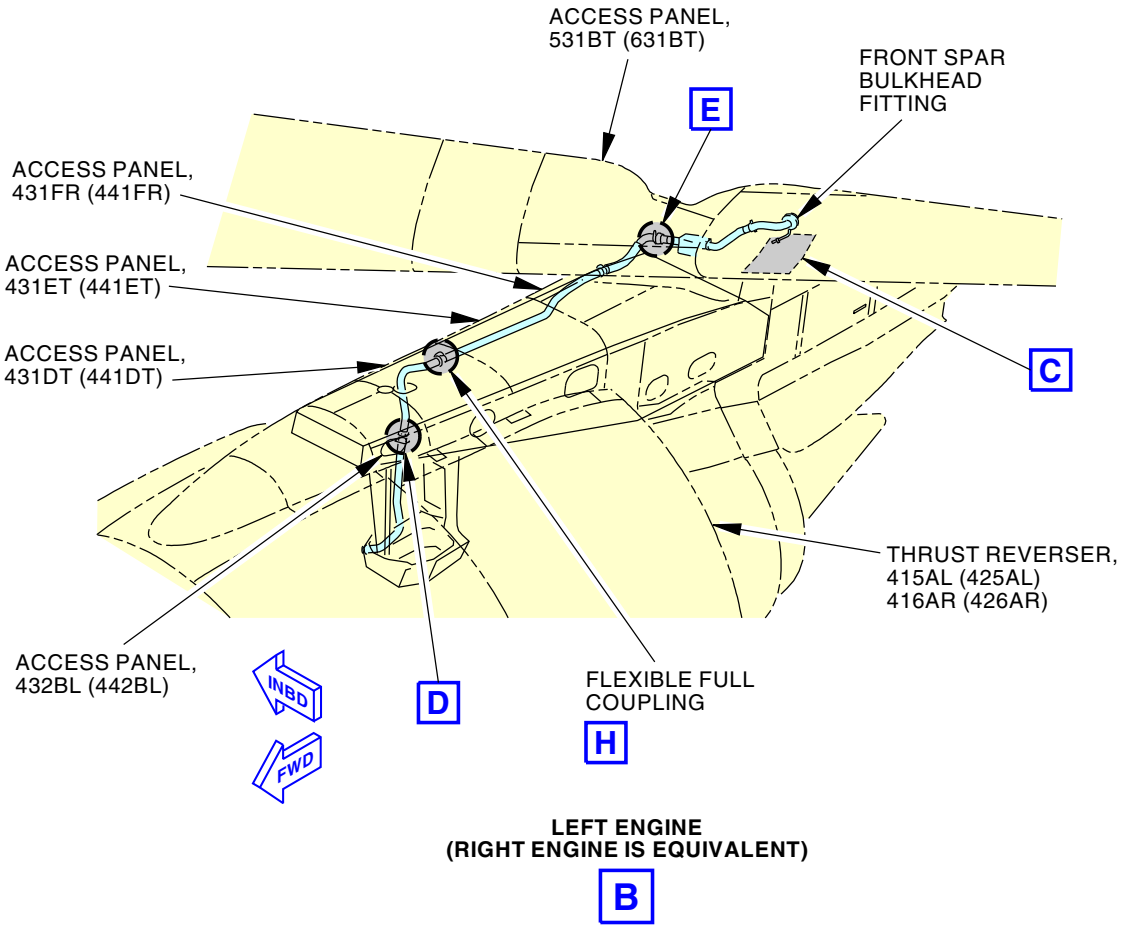
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M35140 S0006415232_V3

Fuel Feed Manifold and Couplings Installation
Figure 401/28-22-15-990-805-001 (Sheet 2 of 11)

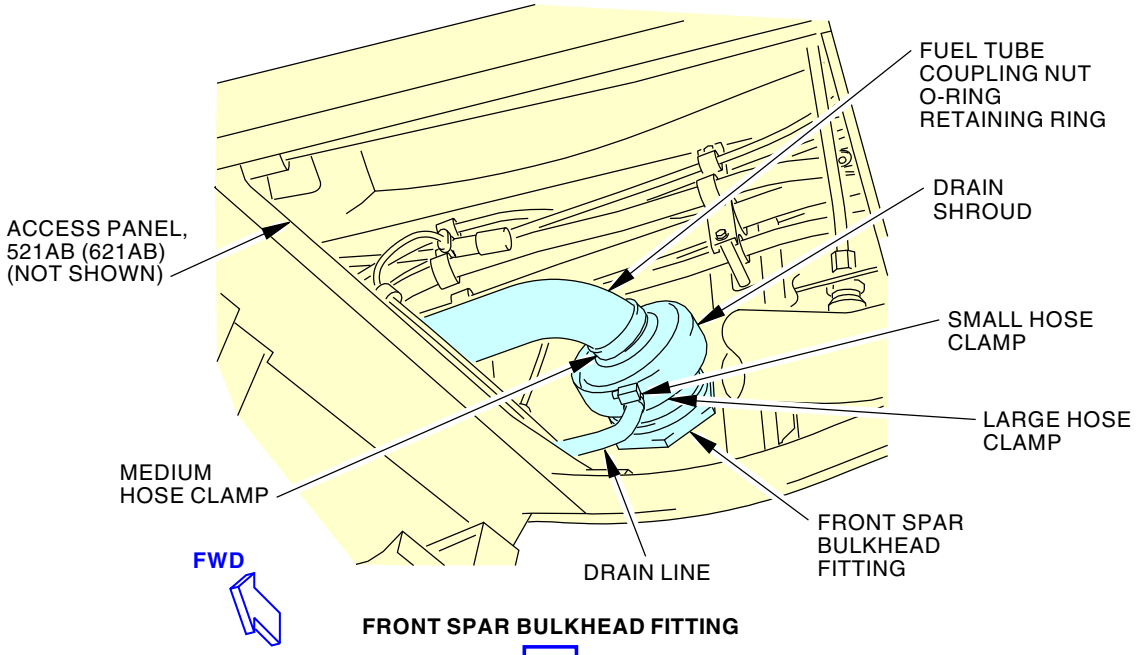
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M35145 S0006415233_V2

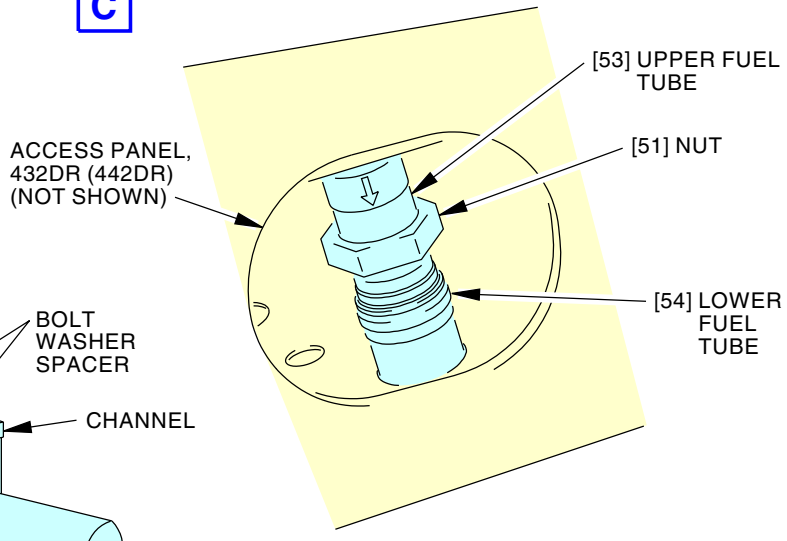
Fuel Feed Manifold and Couplings Installation
Figure 401/28-22-15-990-805-001 (Sheet 3 of 11)

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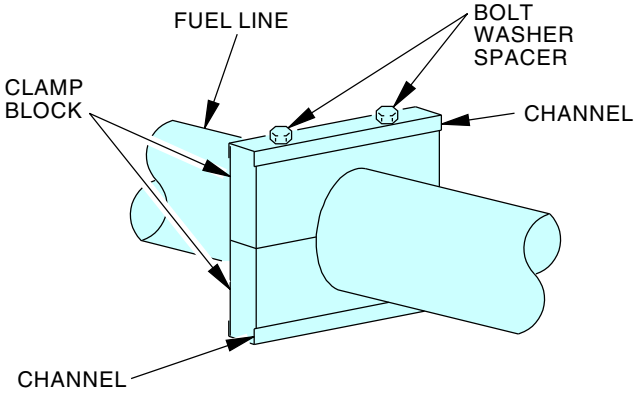


FRONT SPAR BULKHEAD FITTING

C



D



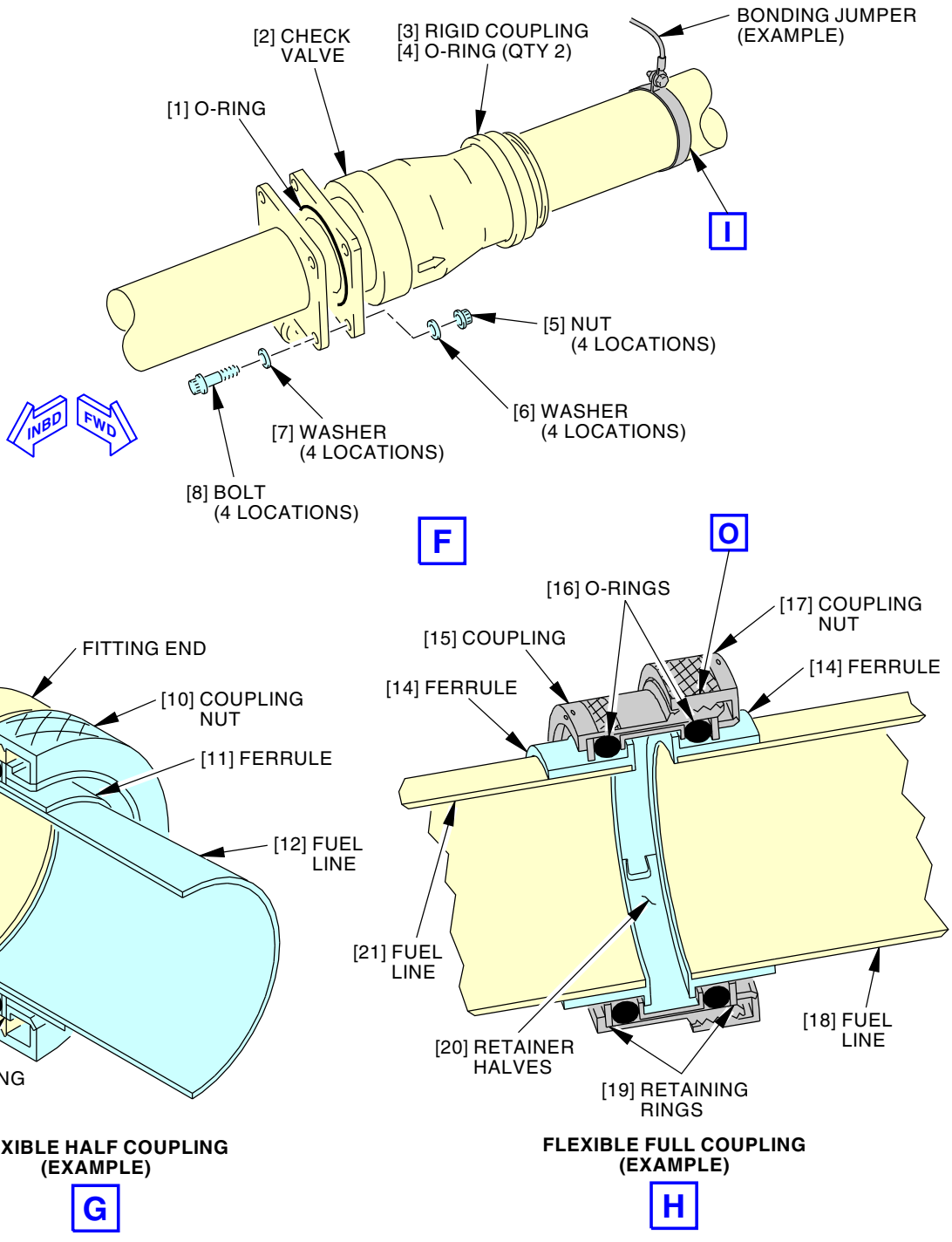
(EXAMPLE)

E

M35146 S0006415234_V3

Fuel Feed Manifold and Couplings Installation
Figure 401/28-22-15-990-805-001 (Sheet 4 of 11)

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FLEXIBLE HALF COUPLING (EXAMPLE)

G

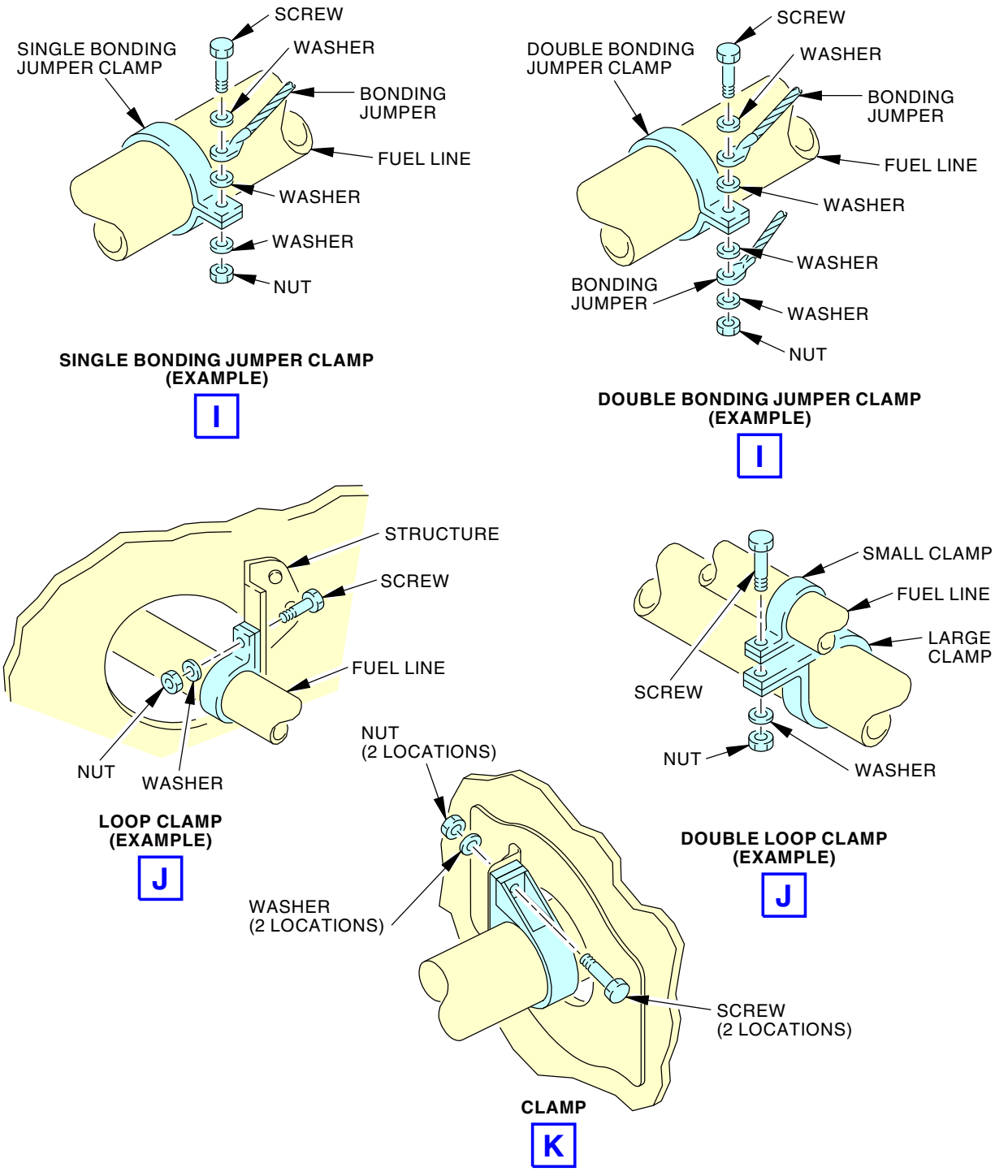
FLEXIBLE FULL COUPLING (EXAMPLE)

H

M35223 S0006415235_V4

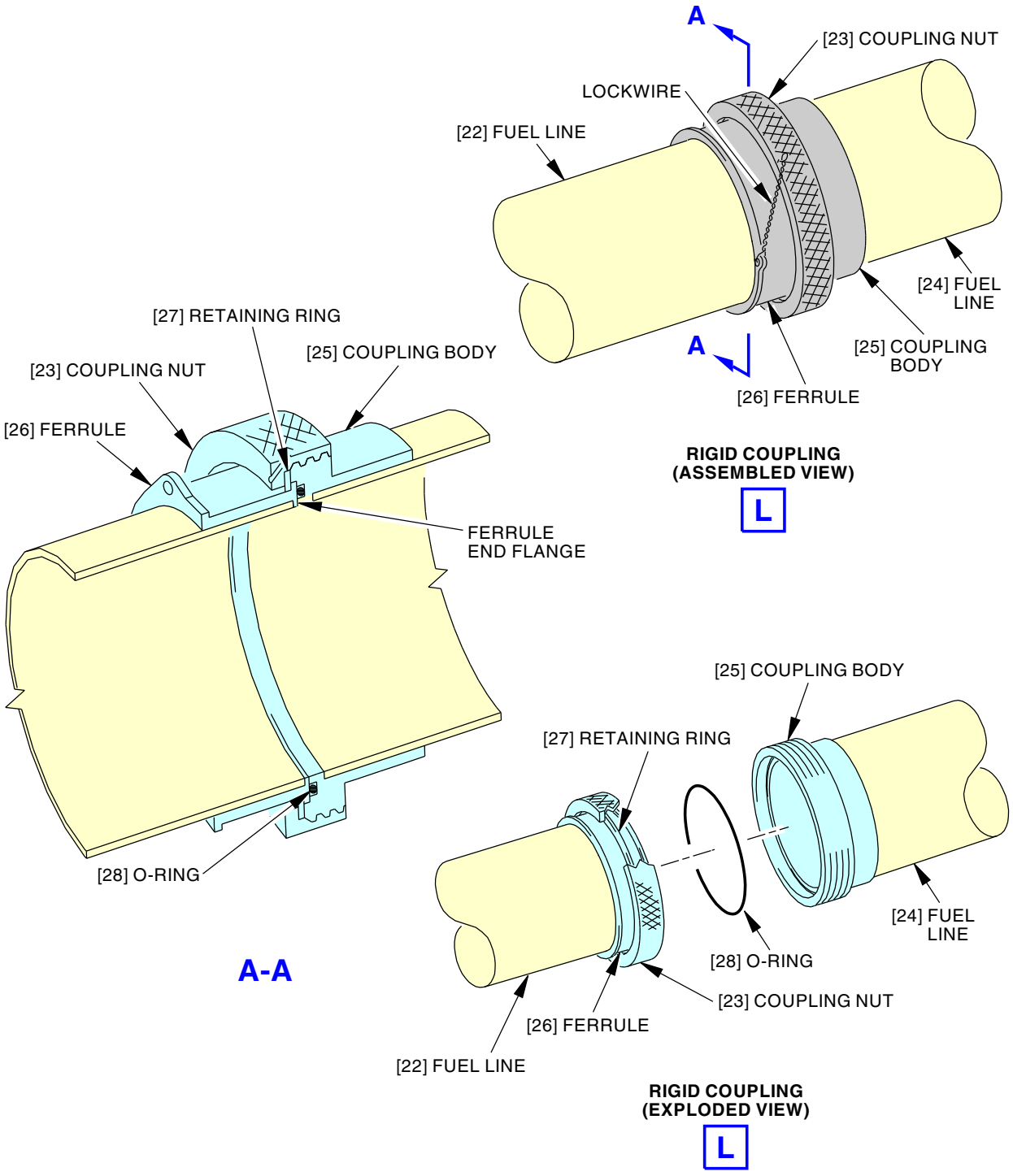
Fuel Feed Manifold and Couplings Installation
Figure 401/28-22-15-990-805-001 (Sheet 5 of 11)

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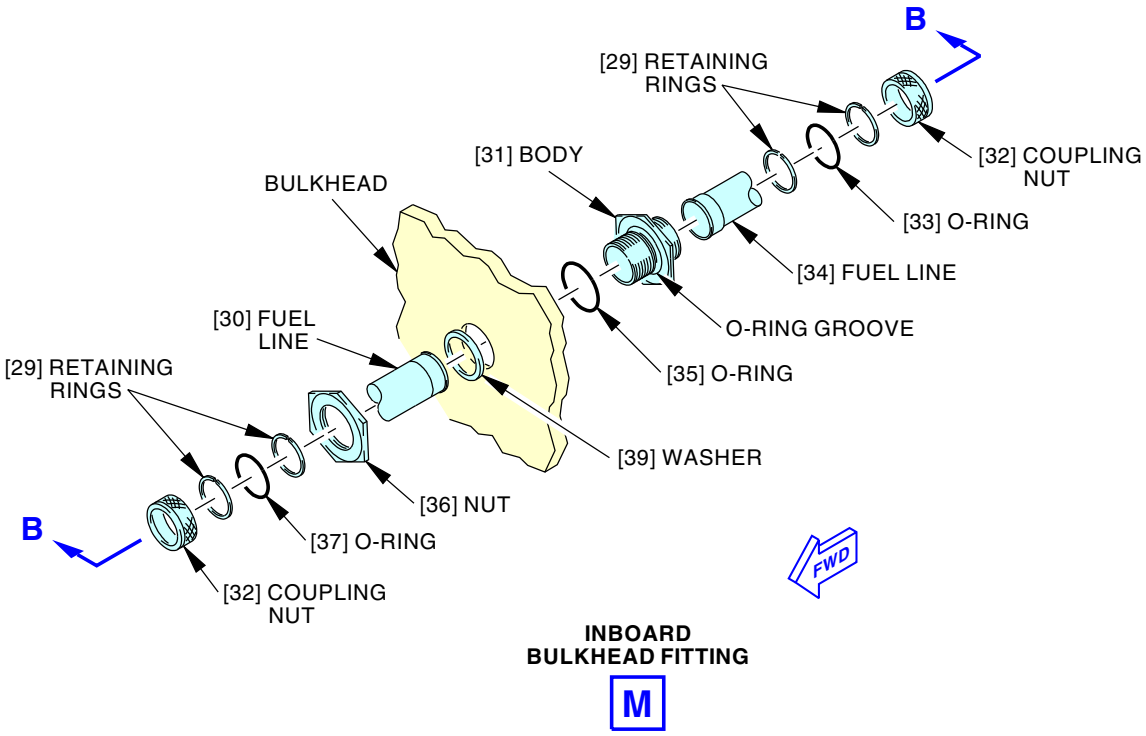
Fuel Feed Manifold and Couplings Installation
Figure 401/28-22-15-990-805-001 (Sheet 6 of 11)

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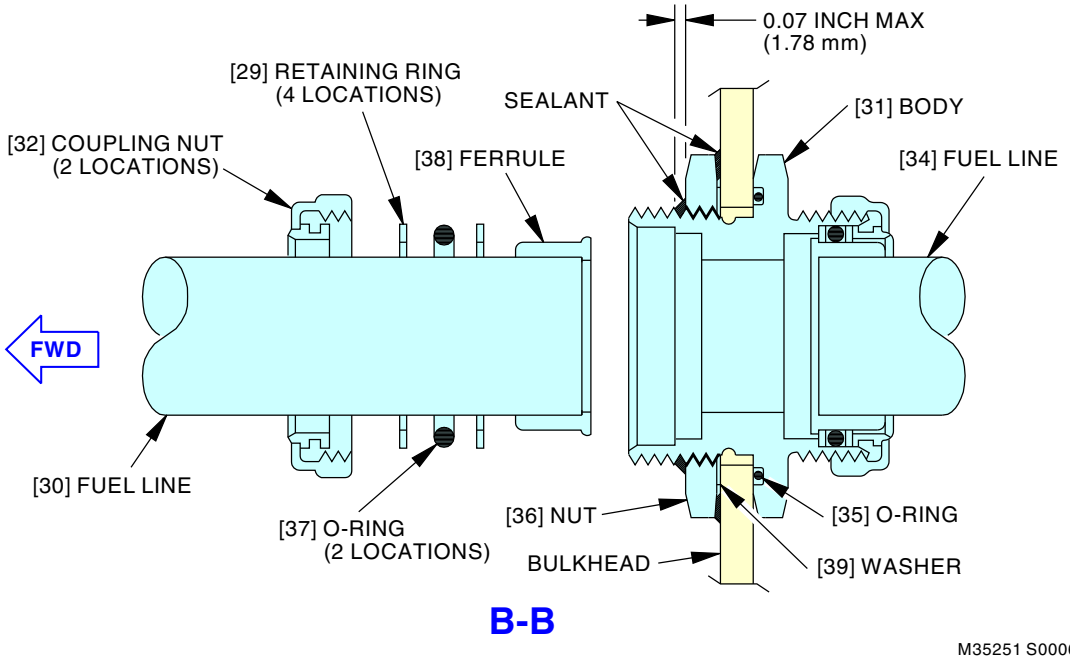
Fuel Feed Manifold and Couplings Installation
Figure 401/28-22-15-990-805-001 (Sheet 7 of 11)

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INBOARD BULKHEAD FITTING

M

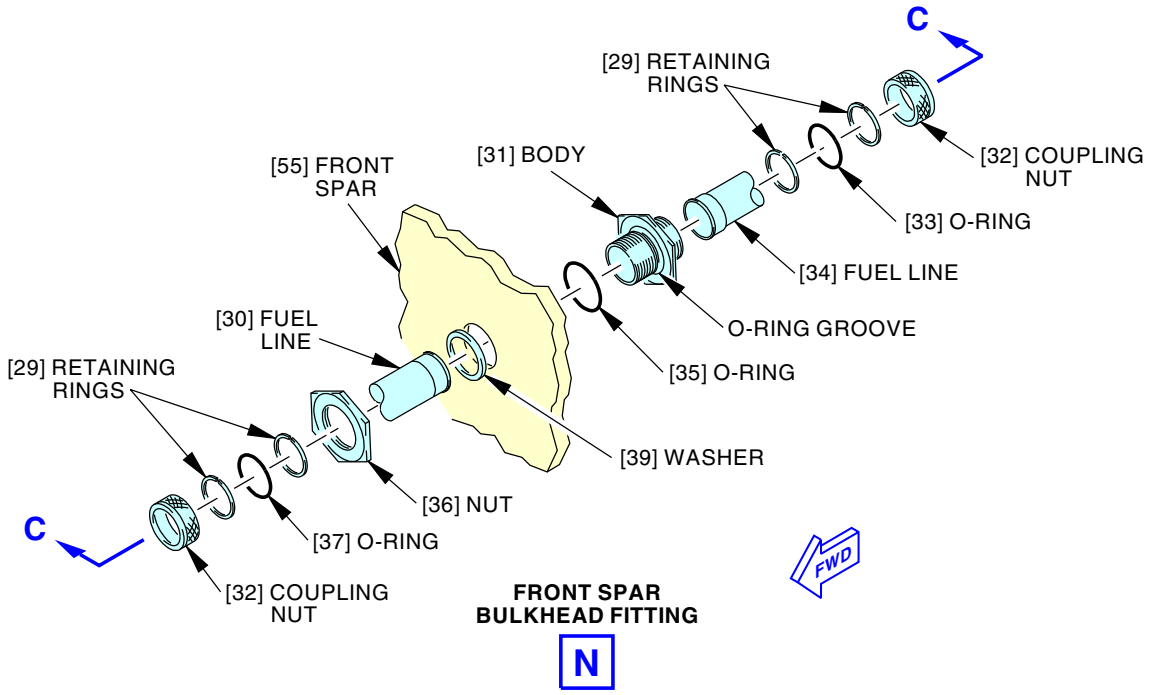


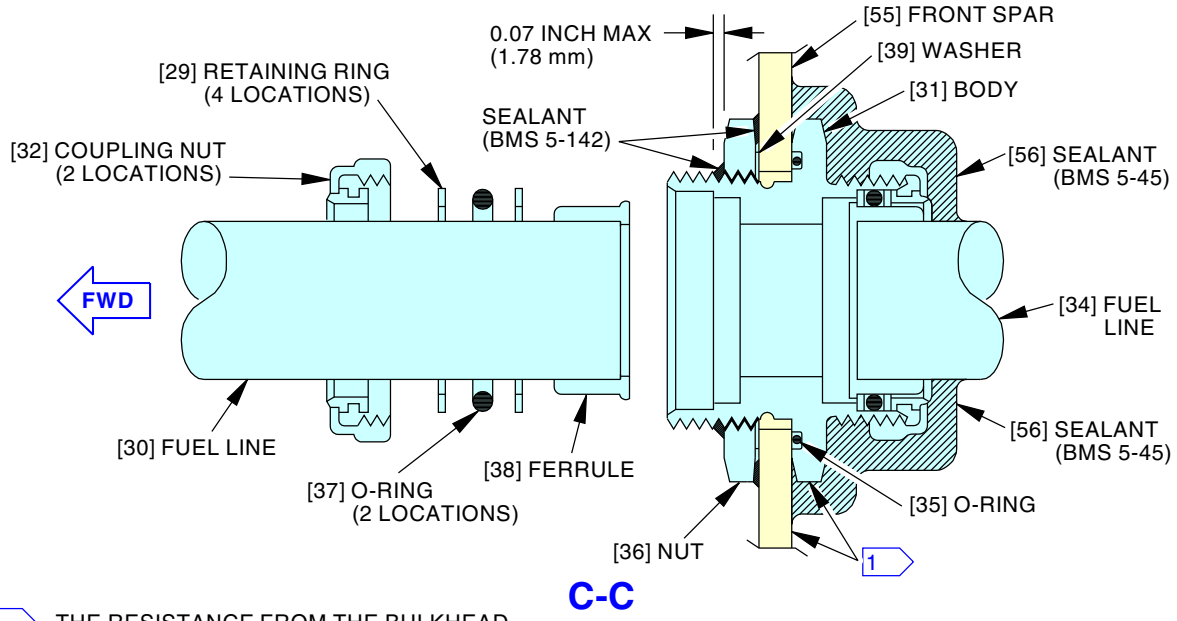
B-B

M35251 S0006415238_V4

Fuel Feed Manifold and Couplings Installation
Figure 401/28-22-15-990-805-001 (Sheet 8 of 11)

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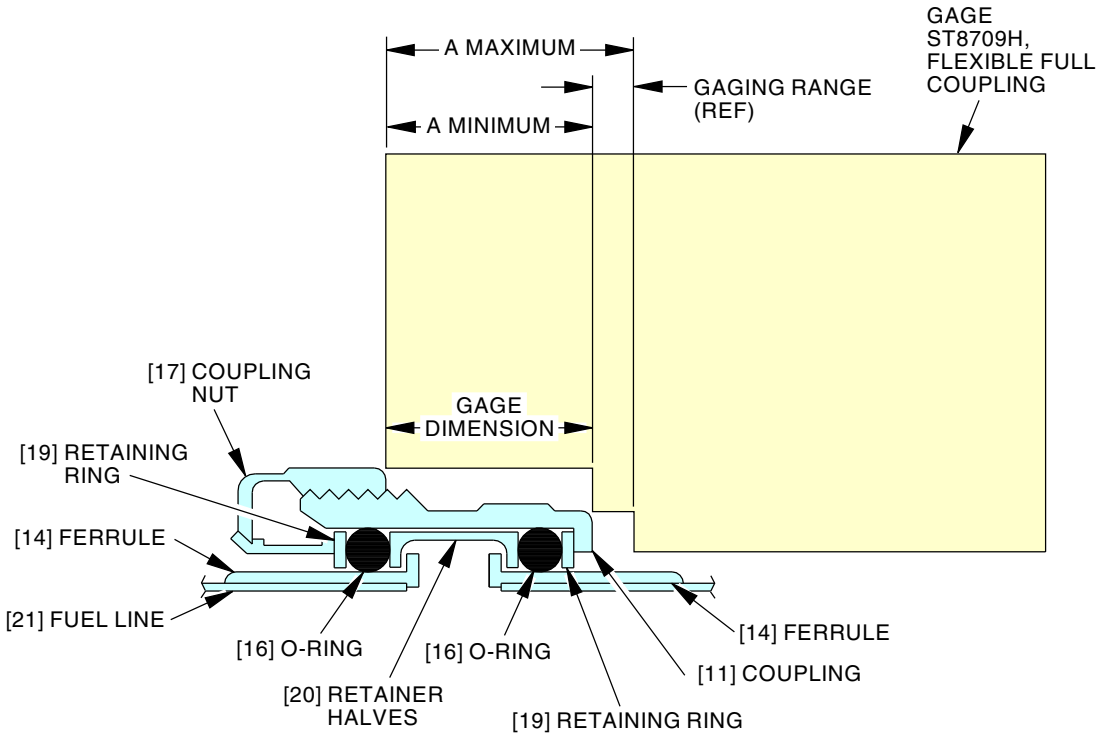


1 THE RESISTANCE FROM THE BULKHEAD FITTING TO THE FRONT SPAR MUST BE 0.001 OHM OR LESS

D40995 S0000156441_V4

Fuel Feed Manifold and Couplings Installation
Figure 401/28-22-15-990-805-001 (Sheet 9 of 11)

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FLEXIBLE FULL COUPLING WITH GAGE

O

SIZE	MAX GAGE 1	MIN GAGE 1	GAGE NO. ST8709H
08	0.59	0.47	1
10	0.59	0.47	1
12	0.69	0.55	2
16	0.75	0.60	3
20	0.75	0.60	3
24	0.93	0.76	4
28	0.93	0.76	4
32	0.93	0.76	4

SIZE	MAX GAGE 1	MIN GAGE 1	GAGE NO. ST8709H
36	0.93	0.76	4
40	0.93	0.76	4
48	0.93	0.76	4
56	1.03	0.88	5
64	1.03	0.88	5
72	1.16	0.99	6
80	1.39	1.22	7
88	1.39	1.22	7

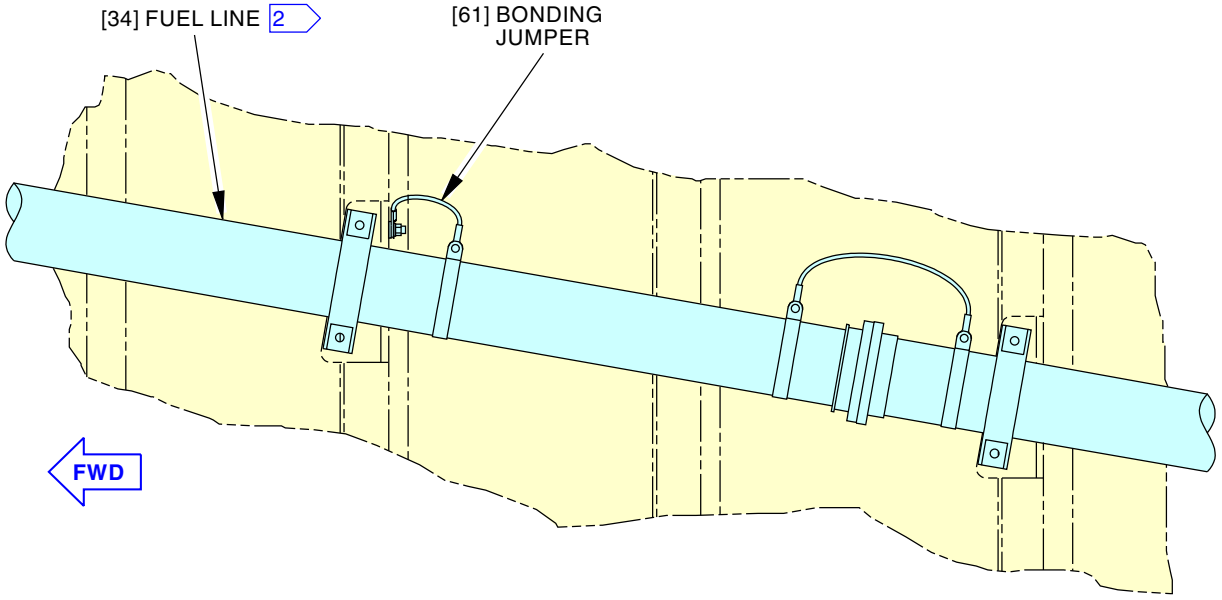
1 DIMENSIONAL REQUIREMENTS FOR ASSEMBLING FLEXIBLE FULL COUPLING

FLEXIBLE FULL COUPLING DIMENSIONS

M35252 S0006415239_V3

Fuel Feed Manifold and Couplings Installation
Figure 401/28-22-15-990-805-001 (Sheet 10 of 11)

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(VIEW IN THE INBOARD DIRECTION)

P

2 THE RESISTANCE FROM THE AIRPLANE STRUCTURE TO THE FIRST PIECE OF TUBING MUST BE 0.010 OHM OR LESS

J65498 S0000174253_V3

Fuel Feed Manifold and Couplings Installation
Figure 401/28-22-15-990-805-001 (Sheet 11 of 11)

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TASK 28-22-15-400-802-001

3. Fuel Line, Fitting and Coupling - Installation

(Figure 401)

A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-05.

B. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
12-11-01-650-801	Pressure Refueling (P/B 301)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-00-00-960-801	Replacement of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)
28-21-00-790-802	Refuel/Jettison and Fuel Feed Manifold - Leak Test (P/B 501)
28-22-15-710-802-001	Engine Fuel Feed Manifold - Suction Feed Line Leak Check (P/B 601)
30-11-03-000-801	Wing Anti-Ice Valve Removal (P/B 401)
30-11-03-400-801	Wing Anti-Ice Valve Installation (P/B 401)
54-52-01-400-801-001	Forward Fairings Installation (P/B 401)
54-52-03-400-801	Underwing Fairing Installation (P/B 401)
54-54-01-400-803-001	Strut Forward Thermal Blanket Installation (P/B 401)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

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Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17
STD-1053	Knife - Putty, Broad Blade

D. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
A00767	Sealant - Fuel Tank	BMS5-45
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142 Type II
B00062	Solvent - Acetone (99.5% Grade)	ASTM D 329 (Supersedes O-A-51)
B00130	Alcohol - Isopropyl	TT-I-735
C00944	Primer - Firewall - Dapco No. 1-100	BMS5-63 Type I
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995
G01061	Water - Distilled	

E. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
430	Subzone 430 - Left Nacelle Strut
440	Subzone 440 - Right Nacelle Strut
513	Krueger Seal Flap/Nacelle Gap Cover Area - Left Wing
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
613	Krueger Seal Flap/Nacelle Gap Cover Area - Right Wing
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

F. Access Panels

Number	Name/Location
431DT	No. 2 Forward Fairing, Left Strut
431ET	No. 3 Forward Fairing, Left Strut
431FR	Inboard Underwing Fairing, Left Strut
432DR	Right Access Door, Left Strut

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(Continued)

Number	Name/Location
441DT	No. 2 Forward Fairing, Right Strut
441ET	No. 3 Forward Fairing, Right Strut
441FR	Outboard Underwing Fairing, Right Strut
442DR	Right Access Door, Right Strut
513BT	Upper Nacelle Strut Interface (Gap Cover) Panel
521AB	Wing Anti-Ice Valve Door
613BT	Upper Nacelle Strut Interface (Gap Cover) Panel
621AB	Wing Anti-Ice Valve Door

G. Procedure

SUBTASK 28-22-15-940-005-001

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Go into the applicable fuel tank (TASK 28-11-00-650-801).

SUBTASK 28-22-15-960-002-001

(2) Replace the bonding jumpers as necessary (TASK 28-00-00-960-801).

SUBTASK 28-22-15-420-018-001

(3) Install the bolts, washers and nuts to loosely connect the clamps for the fuel lines to the structure or support brackets (Views J and K, Figure 401).

SUBTASK 28-22-15-420-019-001

(4) To install the inboard bulkhead fitting, do these steps (Figure 401, View M):

(a) Apply a thin layer of petrolatum grease, D00504, to the new o-ring [35].

(b) Put the o-ring [35] on the body [31], and put the body [31] in its position in the bulkhead.

(c) Apply sealant, A00767 (or equivalent), all around the first four threads of the body [31] that come through the bulkhead.

(d) Install the nut [36] and washer [39] to the body [31] in the bulkhead.

1) Tighten the nut [36] to a torque of 920 ±110 in-lb (104 ±12 N·m).

2) Make sure the sealant runout from the nut [36] is 0.07 in. (1.78 mm) or less.

(e) Apply a fillet seal of sealant, A00767 (or equivalent), between the nut [36] and the bulkhead.

(f) Put the coupling nuts [32] on the ferrules [38] of the fuel line [30] and the fuel line [34].

CAUTION DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

(g) Put a retaining ring [29] on each ferrule [38] to hold the coupling nuts [32] on the fuel line [30] and the fuel line [34].

(h) Apply a thin layer of petrolatum grease, D00504, to the new o-ring [33] and the o-ring [37].

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CAUTION DO NOT USE THE SAME O-RING FOR THE FUEL LINE FITTINGS AFTER YOU TIGHTEN THE COUPLING ONE TIME. YOU MUST INSTALL NEW O-RINGS TO PREVENT FUEL LEAKS.

(i) Install the o-ring [33] and the o-ring [37] on the fuel line [30] and the fuel line [34].

CAUTION DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

(j) Put the second retaining ring [29] on each ferrule [38] of the fuel line [30] and fuel line [34].

(k) Make sure the fuel line [30] and fuel line [34] align to the body [31] of the bulkhead fitting.

CAUTION DO NOT USE TOOLS TO TIGHTEN THE FITTINGS. DAMAGE TO THE FITTING COMPONENTS COULD OCCUR. THE ADJACENT FITTINGS COULD BECOME LOOSE.

(l) Manually tighten the coupling nuts [32] to connect fuel lines.

(m) Install the MS20995C32 lockwire, G01048, to the coupling nuts [32] (TASK 20-10-23-400-801).

SUBTASK 28-22-15-420-048-001

(5) To install the front spar bulkhead fitting, do these steps (Figure 401, View N):

NOTE: For increased access to the front spar bulkhead fitting, the Wing Anti-Ice (WAI) valve can be removed.

(a) If necessary remove the WAI valve. Do this task (Wing Anti-Ice Valve Removal, TASK 30-11-03-000-801).

28-AWL-05: CDCCL

(b) Install a fay sealed fay surface bond between the body [31] (of the bulkhead fitting) and the front spar inside the tank (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-05.

1) Solvent-clean the inner surface of the front spar and the flange of the body [31] (SWPM 20-20-00).

(c) Apply a thin layer of petrolatum grease, D00504, to the new o-ring [35].

(d) Put the o-ring [35] on the body [31], and put the body [31] in its position in the front spar.

(e) Install the nut [36] and washer [39] to the body [31] in the bulkhead.

1) Tighten the nut [36] to a torque of 920 ±46 in-lb (104 ±5 N·m).

(f) Put the coupling nuts [32] on the ferrules [38] of fuel line [30] and fuel line [34].

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CAUTION DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

(g) Put a retaining ring [29] on each ferrule [38] to hold the coupling nuts [32] on fuel line [30] and fuel line [34].

(h) Apply a thin layer of petrolatum grease, D00504, to the new o-ring [33] and o-ring [37].

CAUTION DO NOT USE THE SAME O-RING FOR THE FUEL LINE FITTINGS AFTER YOU TIGHTEN THE COUPLING ONE TIME. YOU MUST INSTALL NEW O-RINGS TO PREVENT FUEL LEAKS.

(i) Install o-ring [33] and o-ring [37] on fuel line [30] and fuel line [34].

CAUTION DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

(j) Put the second retaining ring [29] on each ferrule [38] of fuel line [30] and fuel line [34].

(k) Make sure the fuel line [30] and fuel line [34] align to the body [31] of the bulkhead fitting.

CAUTION DO NOT USE TOOLS TO TIGHTEN THE FITTINGS. DAMAGE TO THE FITTING COMPONENTS COULD OCCUR. THE ADJACENT FITTINGS COULD BECOME LOOSE.

(l) Manually tighten the coupling nuts [32] to connect fuel lines.

(m) Install the MS20995C32 lockwire, G01048, to the coupling nuts [32] (TASK 20-10-23-400-801).

28-AWL-05: CDCCL

(n) Measure the electrical bonding resistance across the fay surface between the body [31] (of the bulkhead fitting) and the front spar [55] inside the tank (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-05.

1) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-05: CDCCL

2) Make sure the electrical bonding resistance is 0.0010 ohm (1.0 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-05.

(o) Apply a fillet seal of sealant, A02315, between the nut [36] and the front spar [55] on the forward side of the front spar [55].

(p) Apply a fillet seal of sealant, A02315, between the nut [36] and the threads on the forward side of the front spar [55].

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(q) Use sealant, A00767 (or equivalent), at a minimum thickness of 0.12 in. (3.05 mm) to apply this fillet seal:

1) Apply a full-bodied fillet seal that encapsulates the body [31] to the front spar [55] and the coupling nut [32] interface inside of the tank (Figure 401, View C-C).

(r) If the WAI was removed for access, then install it again. Do this task (Wing Anti-Ice Valve Installation, TASK 30-11-03-400-801).

SUBTASK 28-22-15-420-020-001

(6) To install the rigid couplings on the fuel line, do these steps ((Figure 401, View L):

(a) Loosen the adjacent clamps and couplings before you install the rigid coupling.

NOTE: This will prevent a preload on the rigid coupling.

(b) Put the coupling nut [23] on the ferrule [26] of the fuel line.

CAUTION

DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

(c) Put a retaining ring [27] on the ferrule to hold the coupling nut [23] on the fuel line.

(d) Make sure that fuel line [22] and fuel line [24] align correctly.

NOTE: You must align the fuel tubes correctly for rigid couplings. If you do not align the fuel lines correctly a fuel leak will occur.

(e) Apply a thin layer of petrolatum grease, D00504, to the new o-ring [28].

CAUTION

DO NOT USE THE SAME O-RING FOR THE FUEL LINE FITTINGS AFTER YOU TIGHTEN THE COUPLING ONE TIME. YOU MUST INSTALL NEW O-RINGS TO PREVENT FUEL LEAKS.

(f) Install the o-ring [28] on the fuel line [22].

(g) Make sure fuel line [22] and fuel line [24] align end to end.

CAUTION

DO NOT USE TOOLS TO TIGHTEN THE FITTINGS. DAMAGE TO THE FITTING COMPONENTS COULD OCCUR. THE ADJACENT FITTINGS COULD BECOME LOOSE.

(h) Manually tighten the coupling nut [23] of the rigid coupling to connect fuel lines.

(i) Install the MS20995C32 lockwire, G01048, between the coupling nut [23] and the ferrule [26] (TASK 20-10-23-400-801).

(j) Tighten the adjacent clamps and couplings.

SUBTASK 28-22-15-420-021-001

(7) To install the flexible half couplings on the fuel line, do these steps (Figure 401, View G):

(a) Put the coupling nut [10] on the ferrule [11] of the fuel line [12].

CAUTION

DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

(b) Put one retaining ring [13] on the ferrule [11] ferrule to hold the coupling nut [10] to the fuel line [12].

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(c) Apply a thin layer of petrolatum grease, D00504, to the new o-ring [9].

CAUTION

DO NOT USE THE SAME O-RING FOR THE FUEL LINE FITTINGS AFTER YOU TIGHTEN THE COUPLING ONE TIME. YOU MUST INSTALL NEW O-RINGS TO PREVENT FUEL LEAKS.

(d) Put the new o-ring [9] on the ferrule [11]].

CAUTION

DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

(e) Put the second retaining ring [13] on the ferrule [11].

(f) Put the fuel line [12] into the half coupling fitting.

CAUTION

DO NOT USE TOOLS TO TIGHTEN THE FITTINGS. DAMAGE TO THE FITTING COMPONENTS COULD OCCUR. THE ADJACENT FITTINGS COULD BECOME LOOSE.

(g) Manually tighten the coupling nut [10].

(h) Install the MS20995C32 lockwire, G01048, between the coupling nut [10] and the ferrule [11] (TASK 20-10-23-400-801).

SUBTASK 28-22-15-420-022-001

(8) To install the flexible full couplings on the fuel lines, do these steps (Figure 401, View H):

(a) Put the coupling nut [17] on the ferrule [14] of the fuel line [18].

(b) Put the coupling [15] on the ferrule [14] of the opposite fuel line [21].

CAUTION

DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

(c) Put one retaining ring [19] on each ferrule [14] to hold the coupling nut [17] and the coupling [15] on the ends of fuel line [18] and fuel line [21].

(d) Apply a thin layer of petrolatum grease, D00504, to the new o-ring [16].

CAUTION

DO NOT USE THE SAME O-RING FOR THE FUEL LINE FITTINGS AFTER YOU TIGHTEN THE COUPLING ONE TIME. YOU MUST INSTALL NEW O-RINGS TO PREVENT FUEL LEAKS.

(e) Put one o-ring [16] on each ferrule [14].

(f) Align the ends of fuel line [18] and fuel line [21] with a 0.12 ±0.03 in. (3.05 ±0.76 mm) clearance between the ferrules [14].

(g) Put the retainer halves [20] together on the ferrules [14] to connect fuel line [18] and fuel line [21].

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CAUTION

DO NOT USE TOOLS TO TIGHTEN THE FITTINGS. DAMAGE TO THE FITTING COMPONENTS COULD OCCUR. THE ADJACENT FITTINGS COULD BECOME LOOSE.

(h) Manually tighten the coupling nut [17] to the necessary dimension (Figure 401, View O).

NOTE: You can use the coupling gage ST8709H to make sure a flexible full coupling is installed correctly. The flexible full couplings can catch and feel tight when the coupling nut is not fully installed. The coupling gage ST8709H will show a coupling nut that is not installed correctly.

(i) Install MS20995C32 lockwire, G01048, between the coupling nut [17] and the coupling [15] (TASK 20-10-23-400-801).

SUBTASK 28-22-15-420-023-001

(9) To install the suction bypass check valves, do these steps (Figure 401, View F):

(a) Make sure the flapper in the bypass check valve is free to operate.

(b) Apply a thin layer of petrolatum grease, D00504, to the new o-ring [1].

(c) Put the o-ring [1] on the check valve [2].

(d) Put the check valve [2] in its position on the fuel line.

(e) Install the four bolts [8], washers [7], washers [6], and nuts [5] to attach the check valve [2] to the mounting flange.

(f) Lubricate the two new o-rings [4] with a thin layer of petrolatum grease, D00504.

(g) Install the rigid coupling [3] with o-rings [4].

(h) Install the MS20995C32 lockwire, G01048, to the rigid coupling [3] (TASK 20-10-23-400-801).

SUBTASK 28-22-15-020-026-001

(10) To install the rubber block around the upper fuel tube [53] penetration into the top of the strut, do these steps:

(a) Prepare the area around the hole in the strut.

1) Remove any old sealant with a non-metal broad blade putty knife, STD-1053, or similar tool.

2) Clean around the hole in the strut to remove soil, oil, grease, or hydraulic fluid with a cotton wiper, G00034.

WARNING

DO NOT GET SOLVENTS IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. PUT ON A RESPIRATOR, PROTECTIVE SPLASH GOGGLES, AND GLOVES WHEN YOU USE SOLVENTS. KEEP THE SOLVENTS AWAY FROM SPARKS, FLAME, AND HEAT. SOLVENTS ARE POISONOUS AND FLAMMABLE. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

CAUTION

KEEP THE SOLVENT OFF THE INSULATION MATERIAL. THE SOLVENT AND OTHER FLUIDS DECREASE THE PERFORMANCE AND CAUSE THE DETERIORATION OF THE INSULATION BLANKET.

3) Clean the area a minimum of 0.5 in. (12.7 mm) in all directions around the hole in the strut.

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a) Clean the area with a clean cotton wiper, G00034, moist with solvent, B00062, or alcohol, B00130.

b) Clean the surface again with a new, clean cotton wiper, G00034, moist with solvent, B00062, or alcohol, B00130.

c) Clean and dry the area with a clean cotton wiper, G00034, before the solvent dries.

d) Clean the area with new cotton wiper, G00034, and solvent until the new cotton wiper, G00034, does not show contamination.

e) Make sure the cleaned surface is not contaminated again.

4) Use a clean cotton wiper, G00034, to apply a thin layer of Dapco No. 1-100 primer, C00944, to the surface.

a) Let the primer become dry for 1-2 hours at 72-82 degrees F (22.2-27.8 degrees C).

NOTE: The primer will have a chalky surface when dry.

(b) TWO-PIECE RUBBER BLOCK;

Install the two-piece rubber block around the upper fuel tube [53] and the other tubes.

1) Position the two-piece rubber block in the hole in the strut.

2) Install the upper hold down brackets on the rubber block with seven screws and washers.

3) No sealant is required between the rubber block and the upper hold down brackets.

(c) ONE-PIECE RUBBER BLOCK;

Install the one-piece rubber block around the upper fuel tube [53] and the other tubes.

1) Position the one-piece rubber block in the hole in the strut with the drainage slot in the rubber block positioned aft.

2) Install the two upper hold down brackets on the one-piece rubber block with six screws and washers.

3) No sealant is required between the rubber block and the upper hold down brackets.

(d) Prepare the sealant, A00160.

1) Mix the two component sealant to the correct proportions per the manufacturer's instructions.

2) Use a non-metal broad blade putty knife, STD-1053, or similar tool to mix and apply the sealant.

3) Wet the application tools with a solution of 1 part by volume of alcohol, B00130, to 5 parts by volume of distilled water, G01061.

NOTE: This will prevent the sealant adhesion to the tools.

(e) Apply a fillet seal of sealant, completely around interface between the rubber block and tubes, the rubber block split lines, tubes and the rubber block and strut structure.

1) TWO-PIECE RUBBER BLOCK;

Apply sealant on the fasteners of the upper hold down brackets.

2) ONE-PIECE RUBBER BLOCK;

Do these steps:

a) Keep the drain path between the rubber block and the upper bracket clear of sealant.

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b) No sealant is required on or around the fasteners of the upper hold down brackets.

(f) Let the sealant cure.

NOTE: Lower temperature or lower relative humidity will increase cure time. Higher temperature or higher relative humidity will decrease cure time.

1) The sealant will cure in 48 hours at a minimum temperature of 75°F (24°C) and 50 percent relative humidity.

2) The sealant will cure in 24 hours at a temperature of 95°F (35°C) and 50 percent relative humidity or a temperature of 75°F (24°C) and 65 percent relative humidity.

3) The sealant will cure in 12 hours at a temperature of 115°F (46°C) and 50 percent relative humidity or a temperature of 75°F (24°C) and 80 percent relative humidity.

SUBTASK 28-22-15-020-027-001

(11) To install the lower fuel tube [54] in the core/strut disconnect panel, do these steps:

(a) Remove any old sealant with a non-metal broad blade putty knife, STD-1053, or similar wooden tool.

(b) Install four bolts and washers that attach the lower fuel tube [54] to the bottom of the strut.

(c) Install four bolts, eight washers, four nuts, two brackets, the clamp block, and two spacers that attach the lower fuel tube [54] to the core/strut disconnect panel.

(d) Install a clamp and two screws and washers.

(e) Get access through the applicable strut access panels to fillet seal completely around the fuel tube [54] with sealant identified below.

Number	Name/Location
432DR	Right Access Door, Left Strut
442DR	Right Access Door, Right Strut

1) Fillet seal completely around the lower fuel tube [54] with sealant, A00160.

2) Use the instructions given above to prepare the area around the hole in the strut and to prepare the sealant.

(f) Let the sealant cure in-service.

NOTE: Lower temperature or lower relative humidity will increase cure time. Higher temperature or higher relative humidity will decrease cure time.

(g) Install the strut forward thermal insulation blankets under the strut that are around the lower fuel tube [54] (TASK 54-54-01-400-803-001).

SUBTASK 28-22-15-020-028-001

(12) To connect the upper fuel tube [53] to the lower fuel tube [54] in the strut, do these steps:

(a) Connect the nut [51] on the upper fuel tube [53] to connect the lower fuel tube [54].

1) Tighten the nut [51] to 100 in-lb (11 N·m).

(b) Close access through the strut access panel under the right thrust reverser.

SUBTASK 28-22-15-420-024-001

(13) Tighten the clamps on the fuel line to the structure or support brackets (Figure 401, Views J, K).

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SUBTASK 28-22-15-420-025-001

(14) Tighten the support brackets to the structure with bolts, washers, and nuts (if the support brackets are not riveted).

SUBTASK 28-22-15-210-008-001

(15) Make sure the fuel line does not touch the structure.

SUBTASK 28-22-15-210-009-001

(16) Make sure the distance between the fuel line and the structure is a minimum of 0.25 in. (6.35 mm).

NOTE: This does not include the area near the support bracket.

SUBTASK 28-22-15-420-026-001

(17) Install the bolts, washers and nuts to connect the bonding jumpers and clamps (Figure 401, View I).

SUBTASK 28-22-15-220-002-001

(18) Measure the electrical bonding resistances with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

(a) Make sure the electrical bonding resistance between the fuel lines and the airplane structure is 0.010 ohm (10 milliohms) or less.

NOTE: Do not measure at the bonding jumper/clamp.

28-AWL-05: CDCCL

(b) Make sure an electrostatic bonding jumper [61] is installed between the first fuel tube (fuel line [34]) that mates with the body [31] (of the bulkhead fitting) and the structure inside the tank (View P).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-05.

1) If the bonding jumper [61] is not installed, do this task to install it: Replacement of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-960-801.

28-AWL-05: CDCCL

2) If the bonding jumper [61] was removed and re-installed or replaced, measure the electrical bonding resistance between the airplane structure and the fuel line [34] immediately aft of the front spar [55] bulkhead fitting (first fuel tube that mates with the bulkhead fitting) inside the tank (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-05.

a) Use an intrinsically safe approved bonding meter, COM-1550.

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28-AWL-05: CDCCL

b) Make sure the electrical bonding resistance is 0.0100 ohm (10.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-05.

SUBTASK 28-22-15-080-003-001

(19) Remove all the tools and equipment from the fuel tank.

SUBTASK 28-22-15-410-022-001

(20) To install the applicable main fuel tank access doors, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

SUBTASK 28-22-15-410-023-001

(21) To install the applicable center fuel tank access doors, do this task: Center Tank Access Door - Installation, TASK 28-11-02-400-801.

SUBTASK 28-22-15-410-024-001

(22) To install the access panels for the left engine strut (if removed), do these steps:

(a) Install the applicable underwing fairing:

(TASK 54-52-03-400-801)

Number	Name/Location
431FR	Inboard Underwing Fairing, Left Strut

(b) Install the applicable forward fairings:

(TASK 54-52-01-400-801-001)

Number	Name/Location
431DT	No. 2 Forward Fairing, Left Strut
431ET	No. 3 Forward Fairing, Left Strut

(c) Install this access panel on the strut, under the thrust reverser:

Number	Name/Location
432DR	Right Access Door, Left Strut

(d) Close this access panel on the bottom of the wing:

(TASK 06-44-00-800-802)

Number	Name/Location
521AB	Wing Anti-Ice Valve Door

(e) Install this access panel on the top of the wing:

(TASK 06-44-00-800-802)

Number	Name/Location
513BT	Upper Nacelle Strut Interface (Gap Cover) Panel

SUBTASK 28-22-15-410-025-001

(23) To install the access panels to the right engine strut (if removed), do these steps:

(a) Install the applicable underwing fairing:

(TASK 54-52-03-400-801)

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Number	Name/Location
441FR	Outboard Underwing Fairing, Right Strut

(b) Install the applicable forward fairings:

(TASK 54-52-01-400-801-001)

Number	Name/Location
441DT	No. 2 Forward Fairing, Right Strut
441ET	No. 3 Forward Fairing, Right Strut

(c) Install this access panel on the strut, under the thrust reverser:

Number	Name/Location
442DR	Right Access Door, Right Strut

(d) Close this access panel on the bottom of the wing:

(TASK 06-44-00-800-802)

Number	Name/Location
621AB	Wing Anti-Ice Valve Door

(e) Install this access panel on the top of the wing:

(TASK 06-44-00-800-802)

Number	Name/Location
613BT	Upper Nacelle Strut Interface (Gap Cover) Panel

SUBTASK 28-22-15-010-031-001

WARNING DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(24) Do these tasks in this sequence to safely close the thrust reversers:

(a) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00.

(b) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

(c) Do this task: Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00.

(d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

SUBTASK 28-22-15-710-002-001

(25) To test the engine fuel feed manifold for leakage, do one of these tasks:

(a) Do this task: Engine Fuel Feed Manifold - Suction Feed Line Leak Check, TASK 28-22-15-710-802-001.

NOTE: This test is an air pressure leak test of the fuel feed manifold.

(b) Do this task: Refuel/Jettison and Fuel Feed Manifold - Leak Test, TASK 28-21-00-790-802.

NOTE: This test uses fuel pressure from the fueling source to pressurize the refuel/jettison manifold and the fuel feed manifold. This leak test checks both manifolds at the same time and incorporates the refuel/jettison manifold drain valve leak rate.

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SUBTASK 28-22-15-650-018-001

(26) To refuel the fuel tanks (if no more work is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

——— END OF TASK ———

TASK 28-22-15-000-804-001

4. Fuel Line, Engine Strut Coupling O-Ring - Removal

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
28-22-15-700-802-001	Fuel Tube Damage Criteria - Inspection/Check (P/B 601)
30-11-03-000-801	Wing Anti-Ice Valve Removal (P/B 401)
54-52-01-000-801-001	Forward Fairings Removal (P/B 401)
54-52-03-000-801	Underwing Fairing Removal (P/B 401)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
73-11-07-000-801-H01	Main Fuel Supply Hose Removal (P/B 401)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

B. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right
410	PowerPlant, Left
420	PowerPlant, Right
430	Subzone 430 - Left Nacelle Strut
440	Subzone 440 - Right Nacelle Strut
513	Krueger Seal Flap/Nacelle Gap Cover Area - Left Wing
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
613	Krueger Seal Flap/Nacelle Gap Cover Area - Right Wing
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing

C. Access Panels

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
414AR	Right Fan Cowl Panel, Left Engine
415AL	Left Thrust Reverser, Left Engine
416AR	Right Thrust Reverser, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
424AR	Right Fan Cowl Panel, Right Engine
425AL	Left Thrust Reverser, Right Engine
426AR	Right Thrust Reverser, Right Engine
431DT	No. 2 Forward Fairing, Left Strut

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(Continued)

Number	Name/Location
431ET	No. 3 Forward Fairing, Left Strut
431FR	Inboard Underwing Fairing, Left Strut
432DR	Right Access Door, Left Strut
441DT	No. 2 Forward Fairing, Right Strut
441ET	No. 3 Forward Fairing, Right Strut
441FR	Outboard Underwing Fairing, Right Strut
442DR	Right Access Door, Right Strut
513BT	Upper Nacelle Strut Interface (Gap Cover) Panel
521AB	Wing Anti-Ice Valve Door
613BT	Upper Nacelle Strut Interface (Gap Cover) Panel
621AB	Wing Anti-Ice Valve Door

D. Prepare for Procedure

SUBTASK 28-22-15-860-046

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-22-15-860-047

(2) Make sure the applicable FUEL CONTROL switch on the control stand panel P10 is in the CUTOFF position.

SUBTASK 28-22-15-210-022

(3) Push the STAT switch on the display select panel on the glareshield (P55).

(a) Make sure the applicable ENG FUEL VALVE L (R) or FUEL SPAR VALVE L (R) STATUS messages do not show.

SUBTASK 28-22-15-860-048

(4) For the left engine,

Open these circuit breakers and install safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	5	C28001	L ENGINE FUEL SPAR VALVE
B	4	C76601	L ENG FUEL VALVE

SUBTASK 28-22-15-860-049

(5) For the right engine,

Open these circuit breakers and install safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	19	C28002	R ENGINE FUEL SPAR VALVE
B	19	C76600	R ENG FUEL VALVE

SUBTASK 28-22-15-010-050

(6) To get access to the fuel line above the left engine strut, do these steps:

(a) Remove the applicable underwing fairing:

(TASK 54-52-03-000-801)

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Number	Name/Location
431FR	Inboard Underwing Fairing, Left Strut

(b) Remove the applicable forward fairings:

(Forward Fairings Removal, TASK 54-52-01-000-801-001)

Number	Name/Location
431DT	No. 2 Forward Fairing, Left Strut
431ET	No. 3 Forward Fairing, Left Strut

(c) Open this access panel on the strut, under the thrust reverser:

Number	Name/Location
432DR	Right Access Door, Left Strut

(d) Open this access panel on the bottom of the wing:

(TASK 06-44-00-800-802)

Number	Name/Location
521AB	Wing Anti-Ice Valve Door

(e) Remove this access panel on the top of the wing:

(TASK 06-44-00-800-802)

Number	Name/Location
513BT	Upper Nacelle Strut Interface (Gap Cover) Panel

SUBTASK 28-22-15-010-051

(7) To get access to the fuel line above the right engine strut, do these steps:

(a) Remove the applicable underwing fairing:

(TASK 54-52-03-000-801)

Number	Name/Location
441FR	Outboard Underwing Fairing, Right Strut

(b) Remove the applicable forward fairings:

(TASK 54-52-01-000-801-001)

Number	Name/Location
441DT	No. 2 Forward Fairing, Right Strut
441ET	No. 3 Forward Fairing, Right Strut

(c) Open this access panel on the strut, under the thrust reverser:

Number	Name/Location
442DR	Right Access Door, Right Strut

(d) Open this access panel on the bottom of the wing:

(TASK 06-44-00-800-802)

Number	Name/Location
621AB	Wing Anti-Ice Valve Door

(e) Remove this access panel on the top of the wing:

(TASK 06-44-00-800-802)

Number	Name/Location
613BT	Upper Nacelle Strut Interface (Gap Cover) Panel

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SUBTASK 28-22-15-010-052

WARNING DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

CAUTION MAKE SURE THE FORWARD HOLD OPEN ROD IS ENGAGED WITH THE ENGINE RECEIVER BEFORE THE THRUST REVERSER IS FULLY OPENED. IF YOU DO NOT OBEY THIS INSTRUCTION, THE THRUST REVERSER CAN HIT THE LEADING EDGE SLATS AND CAUSE DAMAGE.

(8) Do these tasks in sequence to safely open the left and right thrust reversers on the applicable engine:

(a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.

(b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.

(c) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

(d) For the left and right fan cowl panels, do this task:

Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00

Number	Name/Location
413AL	Left Fan Cowl Panel, Left Engine
414AR	Right Fan Cowl Panel, Left Engine
423AL	Left Fan Cowl Panel, Right Engine
424AR	Right Fan Cowl Panel, Right Engine

(e) For the left and right thrust reversers, do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00

Number	Name/Location
415AL	Left Thrust Reverser, Left Engine
416AR	Right Thrust Reverser, Left Engine
425AL	Left Thrust Reverser, Right Engine
426AR	Right Thrust Reverser, Right Engine

SUBTASK 28-22-15-030-004

(9) Do the applicable steps to drain the fuel from the fuel system in this task: Main Fuel Supply Hose Removal, TASK 73-11-07-000-801-H01

E. Procedure

SUBTASK 28-22-15-030-005

(1) If it is necessary, remove the applicable bonding jumpers (View E, Figure 402):

(a) Remove the bolts, washers and nuts to disconnect the bonding jumpers.

SUBTASK 28-22-15-030-006

(2) If it is necessary, remove the applicable clamps or clamp blocks for the fuel line (Views C, F, and G, Figure 402):

(a) Remove the bolts, screws, washers and nuts to disconnect the clamps.

SUBTASK 28-22-15-030-007

(3) To remove flexible full couplings, do these steps (View D, Figure 402):

(a) Remove the lockwire from the coupling.

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(b) Loosen the coupling nut [17].

(c) Discard the o-rings [16].

(d) Inspect the retaining rings [19], retainer halves [20], coupling [15], and coupling nut [17]for wear (TASK 28-22-15-700-802-001).

1) Replace these components if it is necessary.

SUBTASK 28-22-15-030-008

(4) To remove the rigid couplings, do these steps (View H, Figure 402):

(a) Remove the lockwire from the coupling.

(b) Loosen the coupling nut [23].

(c) Discard the o-ring [28].

(d) Inspect the retaining ring [27] and coupling nut [23] for wear (TASK 28-22-15-700-802-001).

1) Replace these components if it is necessary.

SUBTASK 28-22-15-030-009

(5) To remove the fuel line from the front spar bulkhead fitting, do these steps (Views B and I, Figure 402):

NOTE: For increased access to the front spar bulkhead fitting, the Wing Anti-Ice (WAI) valve can be removed.

(a) If necessary remove the WAI valve. Do this task (Wing Anti-Ice Valve Removal, TASK 30-11-03-000-801).

(b) Remove the drain shroud from the exterior side of the fitting.

(c) Remove the lockwire from the coupling.

(d) Remove the coupling nut [32] from the body [31].

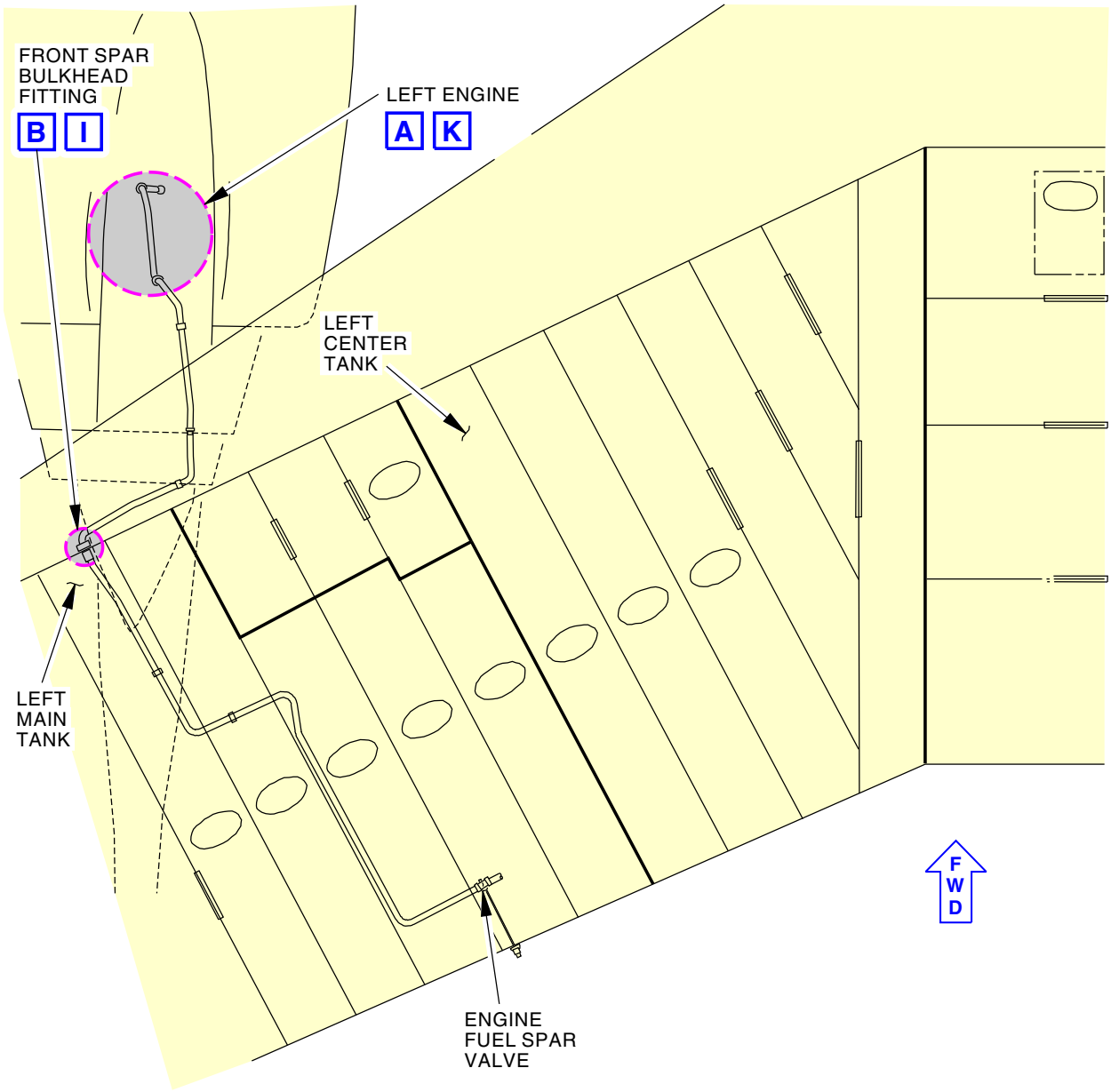
(e) Discard the o-ring [37].

(f) Inspect the retaining rings [29] and coupling nut [32] for wear (TASK 28-22-15-700-802-001).

1) Replace these components if it is necessary.

——— END OF TASK ———

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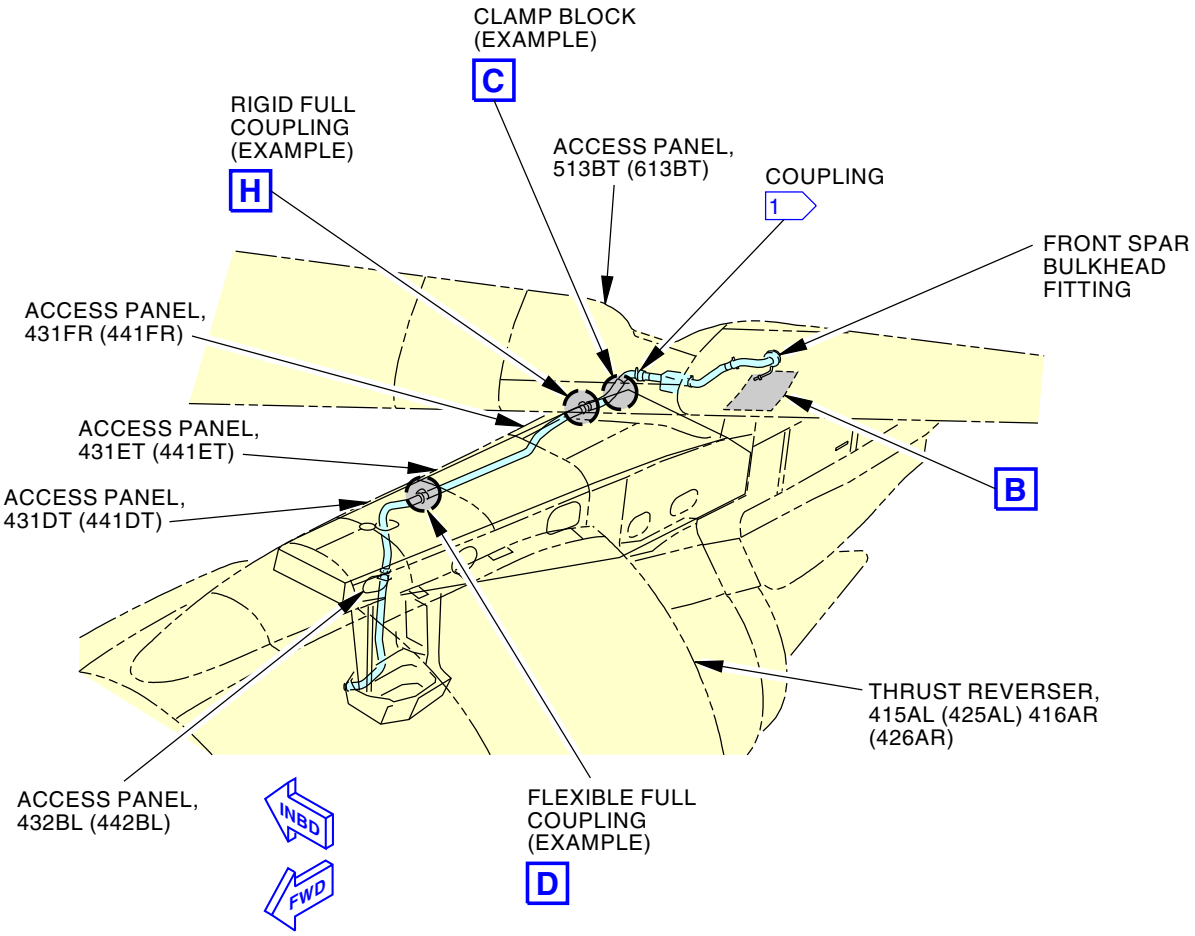


LEFT WING
(TOP VIEW)
(RIGHT WING IS ALMOST THE SAME)

1827592 S0000321213_V4

Engine Strut Fuel Feed Line Coupling O-Ring Installation
Figure 402/28-22-15-990-816-001 (Sheet 1 of 9)

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LEFT ENGINE
(RIGHT ENGINE IS EQUIVALENT)

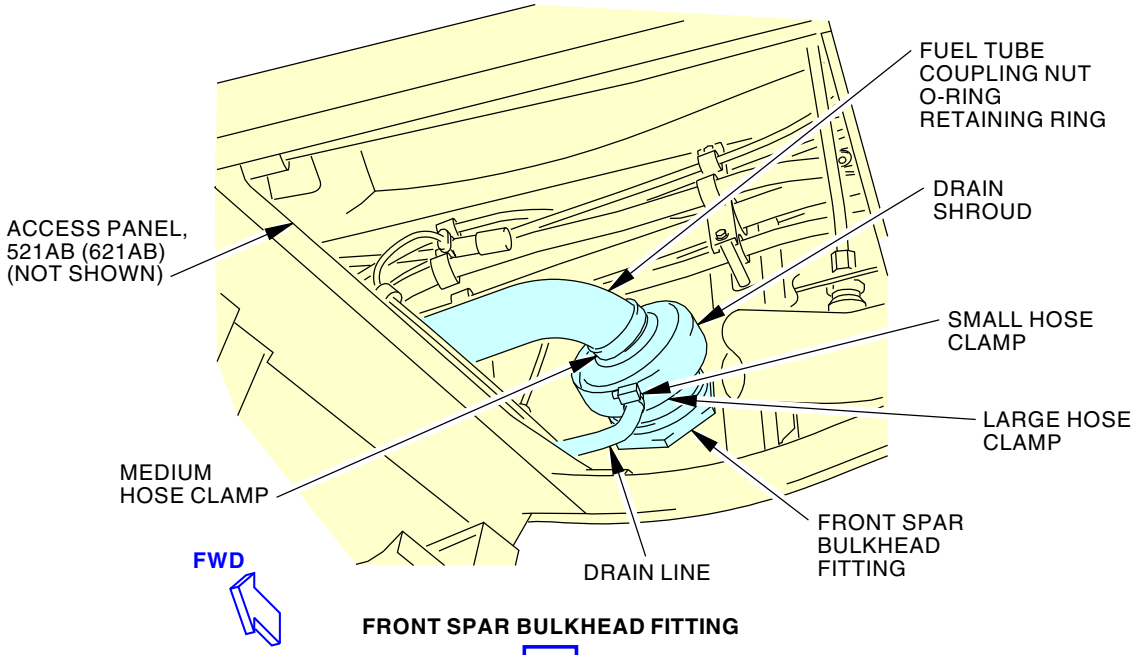
A

1 COUPLING IS ON LEFT ENGINE ONLY

1827616 S0000322380_V6

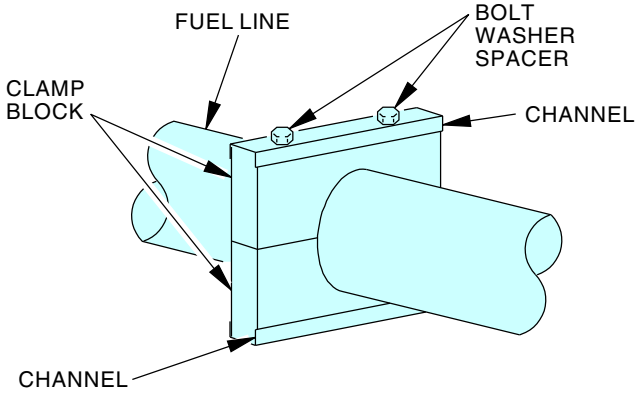
Engine Strut Fuel Feed Line Coupling O-Ring Installation
Figure 402/28-22-15-990-816-001 (Sheet 2 of 9)

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FRONT SPAR BULKHEAD FITTING

B



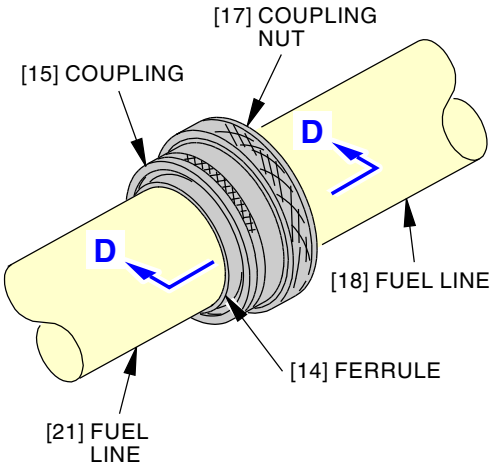
(EXAMPLE)

C

1827736 S0000322381_V2

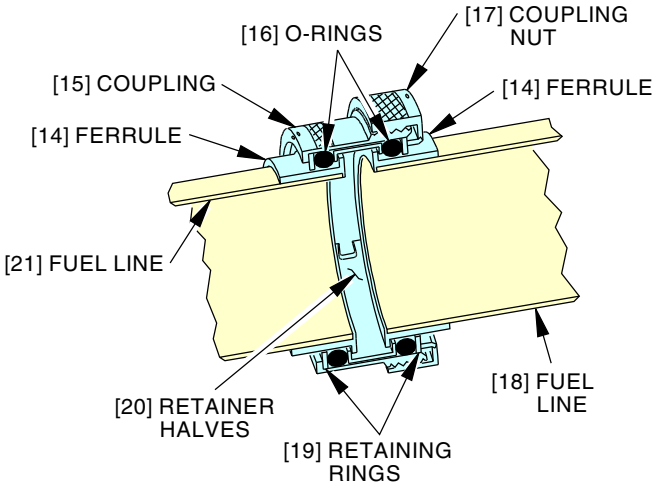
Engine Strut Fuel Feed Line Coupling O-Ring Installation
Figure 402/28-22-15-990-816-001 (Sheet 3 of 9)

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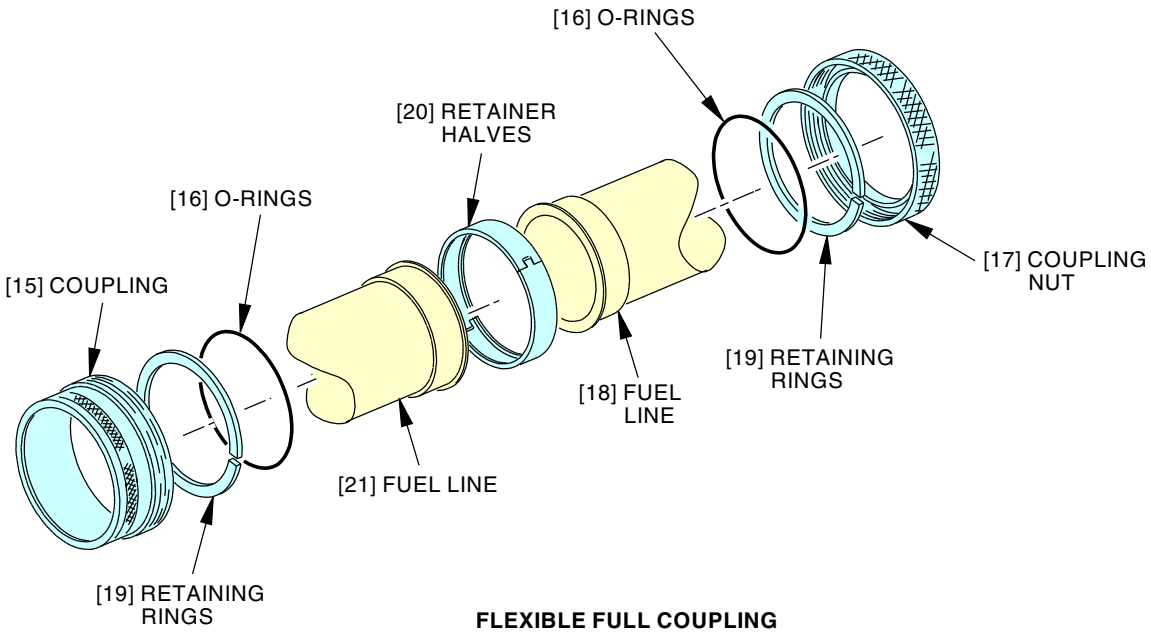


FLEXIBLE FULL COUPLING

D



D-D



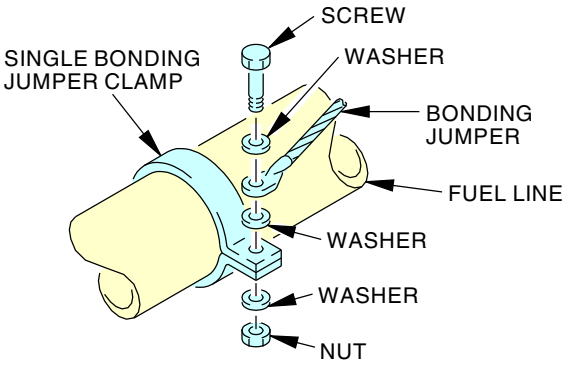
FLEXIBLE FULL COUPLING (EXPLODED VIEW)

D

1827742 S0000322383_V3

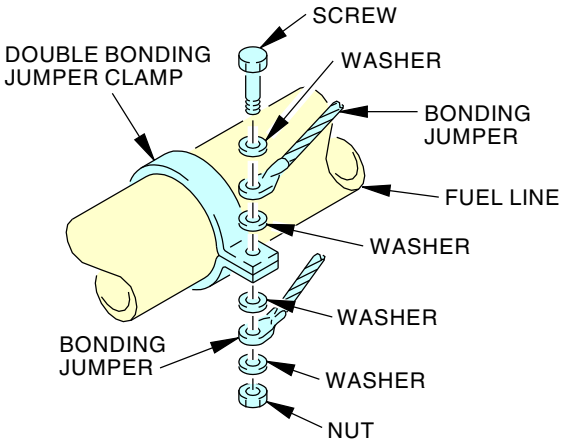
Engine Strut Fuel Feed Line Coupling O-Ring Installation
Figure 402/28-22-15-990-816-001 (Sheet 4 of 9)

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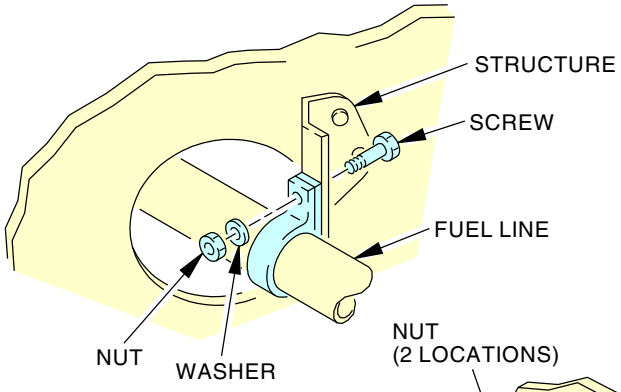
SINGLE BONDING JUMPER CLAMP (EXAMPLE)

E



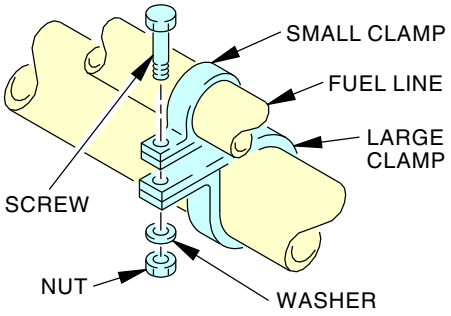
DOUBLE BONDING JUMPER CLAMP (EXAMPLE)

E



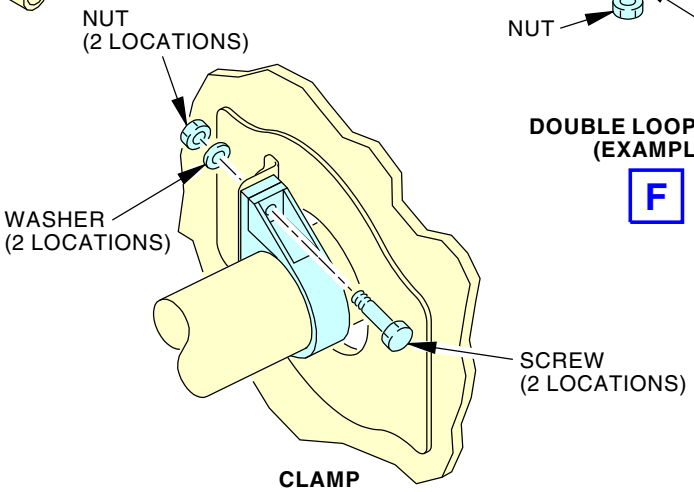
LOOP CLAMP (EXAMPLE)

F



DOUBLE LOOP CLAMP (EXAMPLE)

F



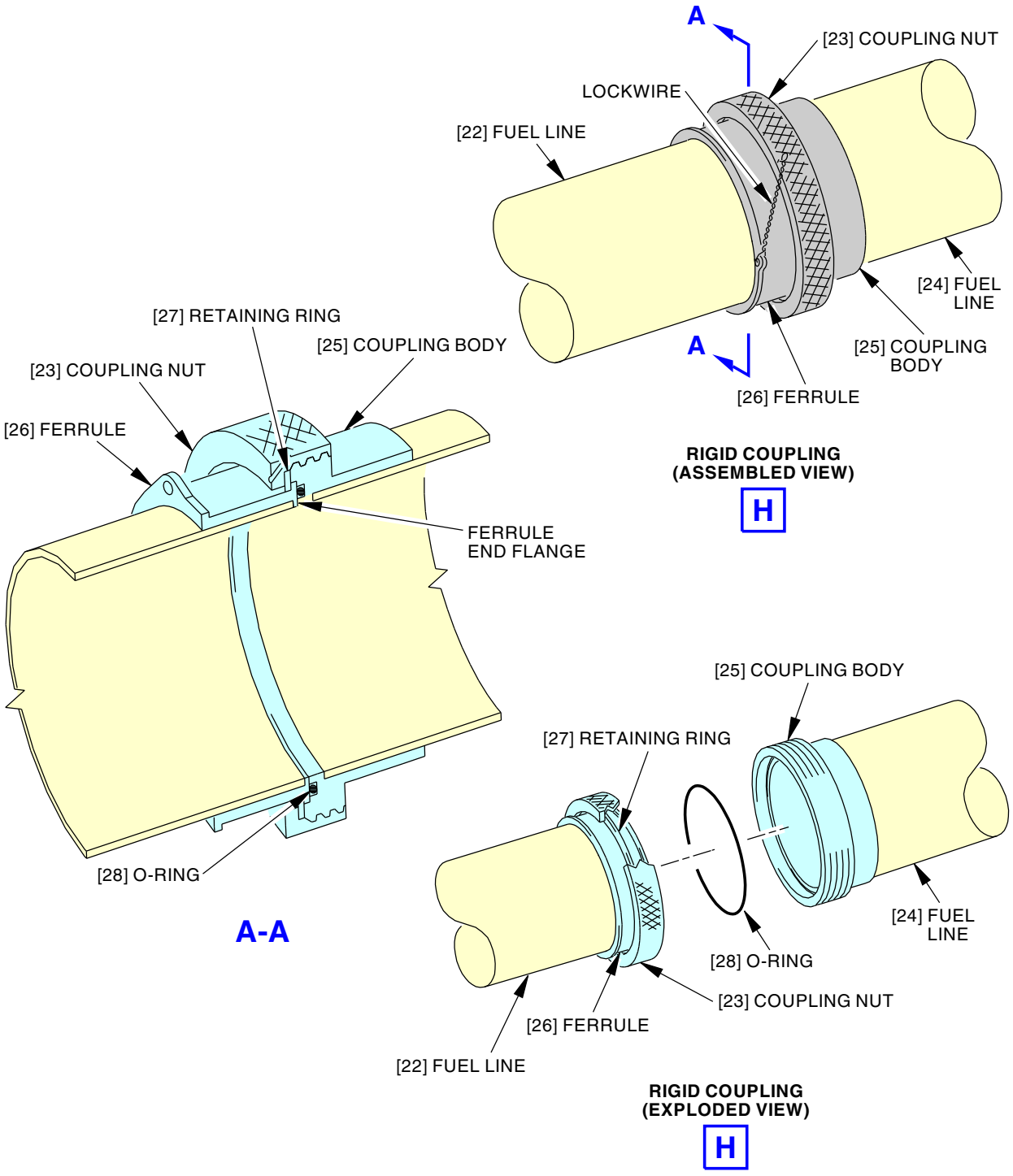
CLAMP

G

1827744 S0000322384_V2

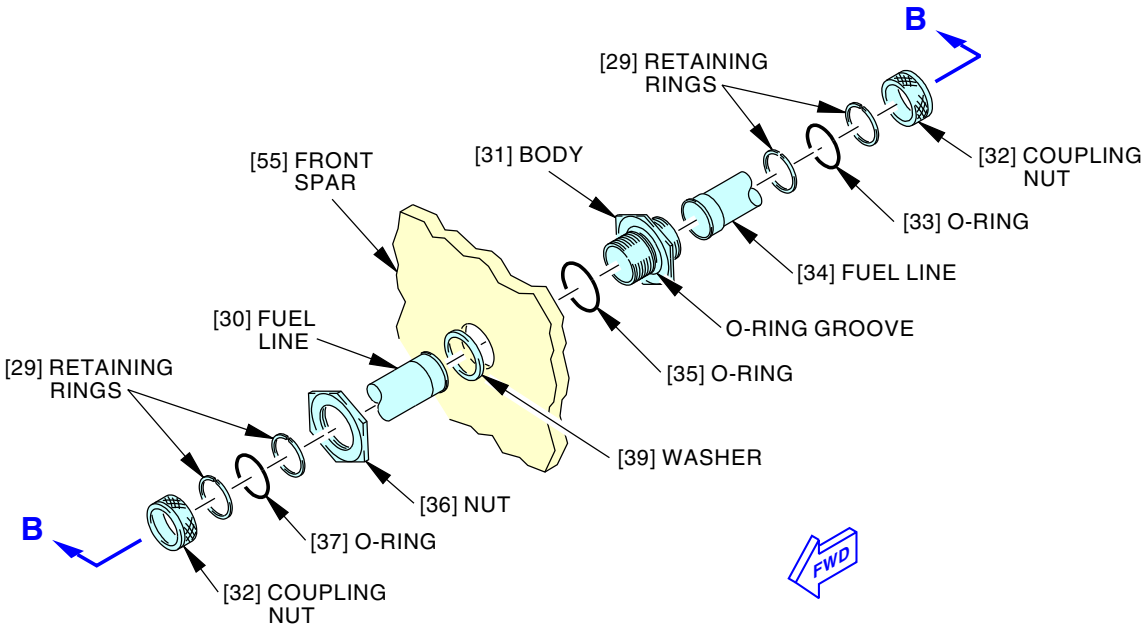
Engine Strut Fuel Feed Line Coupling O-Ring Installation
Figure 402/28-22-15-990-816-001 (Sheet 5 of 9)

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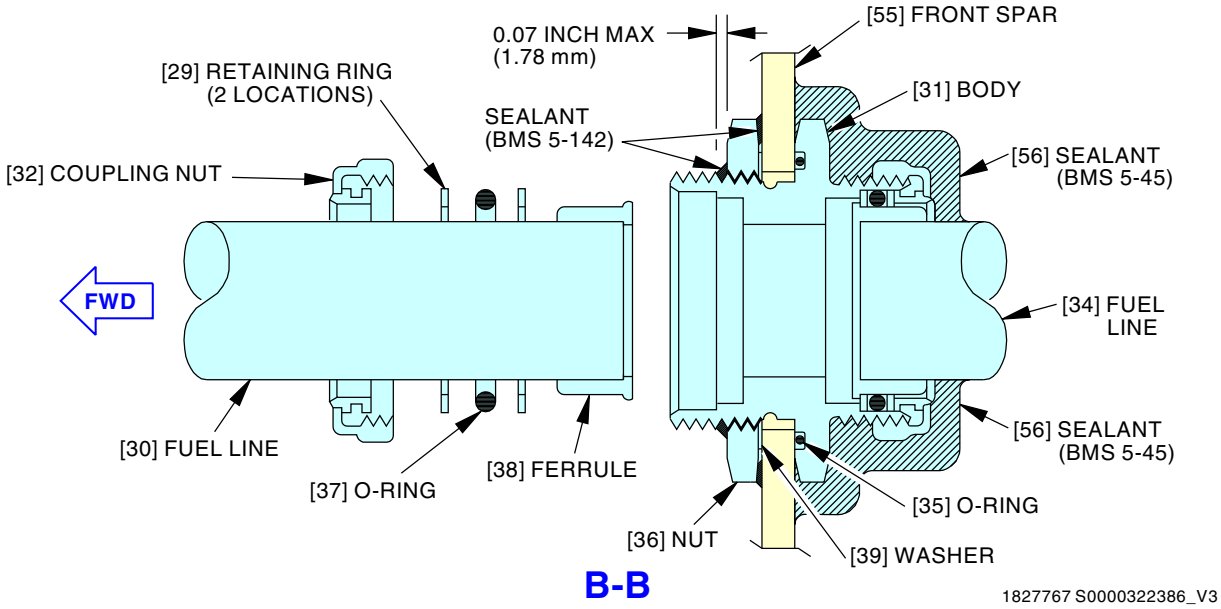
Engine Strut Fuel Feed Line Coupling O-Ring Installation
Figure 402/28-22-15-990-816-001 (Sheet 6 of 9)

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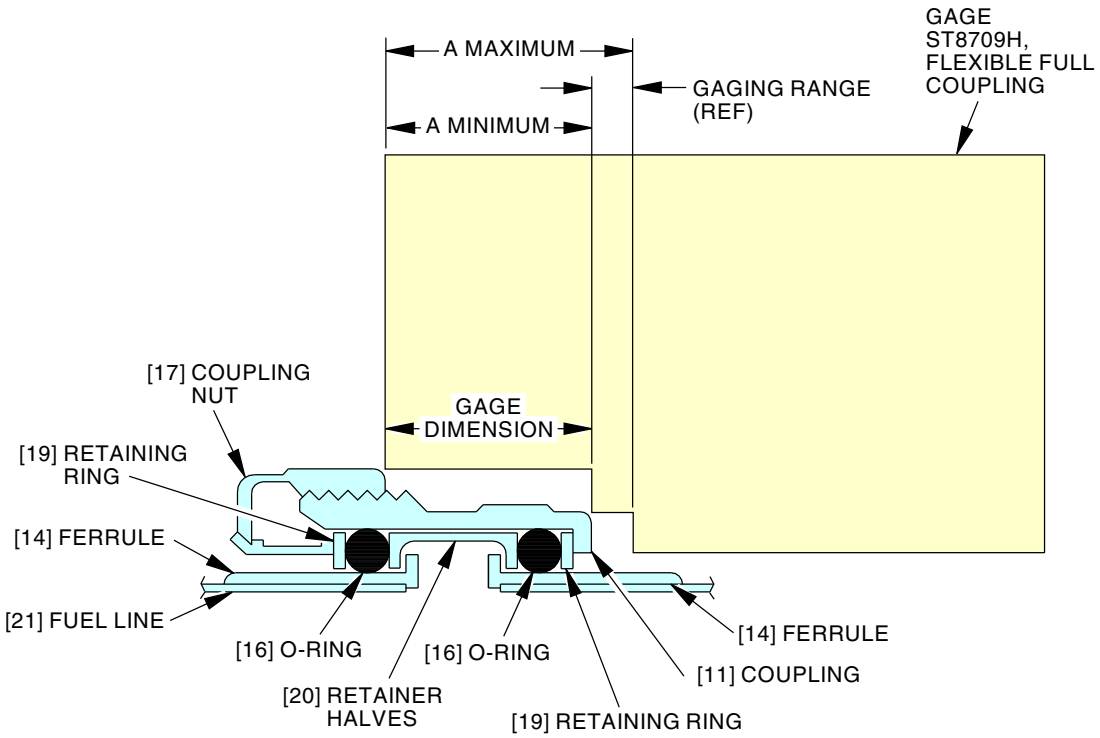
FRONT SPAR BULKHEAD FITTING

I



Engine Strut Fuel Feed Line Coupling O-Ring Installation
Figure 402/28-22-15-990-816-001 (Sheet 7 of 9)

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FLEXIBLE FULL COUPLING WITH GAGE

J

SIZE	MAX GAGE 1	MIN GAGE 1	GAGE NO. ST8709H
08	0.59	0.47	1
10	0.59	0.47	1
12	0.69	0.55	2
16	0.75	0.60	3
20	0.75	0.60	3
24	0.93	0.76	4
28	0.93	0.76	4
32	0.93	0.76	4

SIZE	MAX GAGE 1	MIN GAGE 1	GAGE NO. ST8709H
36	0.93	0.76	4
40	0.93	0.76	4
48	0.93	0.76	4
56	1.03	0.88	5
64	1.03	0.88	5
72	1.16	0.99	6
80	1.39	1.22	7
88	1.39	1.22	7

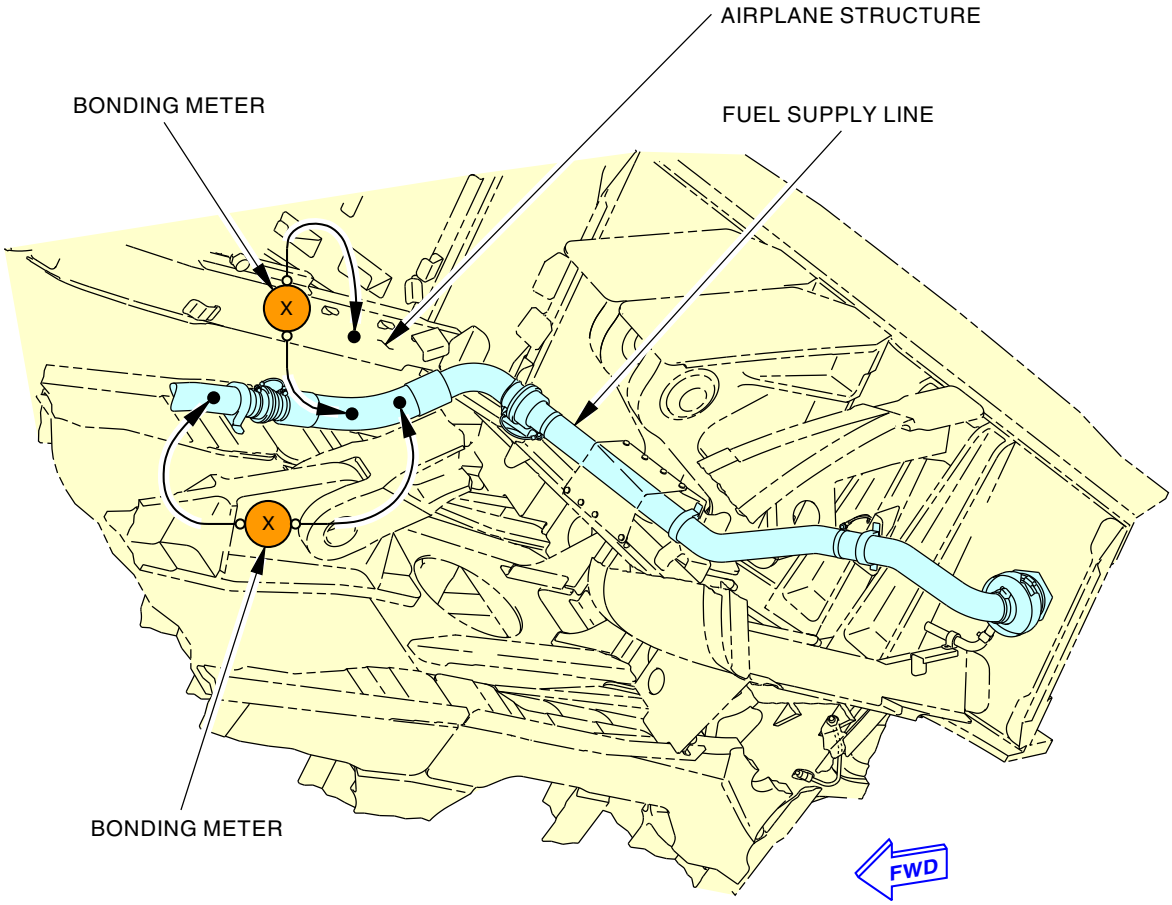
1 DIMENSIONAL REQUIREMENTS FOR ASSEMBLING FLEXIBLE FULL COUPLING

FLEXIBLE FULL COUPLING DIMENSIONS

1827778 S0000322387_V2

Engine Strut Fuel Feed Line Coupling O-Ring Installation
Figure 402/28-22-15-990-816-001 (Sheet 8 of 9)

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EXAMPLES OF BONDING RESISTANCE MEASUREMENTS

K

2322824 S0000526944_V3

Engine Strut Fuel Feed Line Coupling O-Ring Installation
Figure 402/28-22-15-990-816-001 (Sheet 9 of 9)

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TASK 28-22-15-400-804-001

5. Fuel Line, Engine Strut Coupling O-Ring - Installation

(Figure 402)

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
28-00-00-960-801	Replacement of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
30-11-03-000-801	Wing Anti-Ice Valve Removal (P/B 401)
30-11-03-400-801	Wing Anti-Ice Valve Installation (P/B 401)
54-52-01-400-801-001	Forward Fairings Installation (P/B 401)
54-52-03-400-801	Underwing Fairing Installation (P/B 401)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
73-11-07-000-801-H01	Main Fuel Supply Hose Removal (P/B 401)
73-11-07-400-801-H01	Main Fuel Supply Hose Installation (P/B 401)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17
SPL-1776	Equipment - Test, Engine Fuel Feed Manifold Part #: G28018-26 Supplier: 81205 Part #: G28018-28 Supplier: 81205 Opt Part #: J28005-1 Supplier: 81205
SPL-4913	Fitting Assembly - Manifold, Fuel Feed, GE90 Part #: G28018-2 Supplier: 81205
SPL-4914	Fitting Assembly - Manifold, Fuel Feed (GEnx-2B, CF6-80C2, PW4000, or GE9X Engines)
SPL-7464	Gage - Go/No-Go, Fuel Wiggins Coupling (BACC42R); X indicates gage number -1 to -7 Part #: ST8709H-X Supplier: 81205

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(Continued)

Reference	Description
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)

C. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

D. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right
410	PowerPlant, Left
420	PowerPlant, Right
430	Subzone 430 - Left Nacelle Strut
440	Subzone 440 - Right Nacelle Strut
513	Krueger Seal Flap/Nacelle Gap Cover Area - Left Wing
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
613	Krueger Seal Flap/Nacelle Gap Cover Area - Right Wing
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing

E. Access Panels

Number	Name/Location
431DT	No. 2 Forward Fairing, Left Strut
431ET	No. 3 Forward Fairing, Left Strut
431FR	Inboard Underwing Fairing, Left Strut
432DR	Right Access Door, Left Strut
441DT	No. 2 Forward Fairing, Right Strut
441ET	No. 3 Forward Fairing, Right Strut
441FR	Outboard Underwing Fairing, Right Strut
442DR	Right Access Door, Right Strut
513BT	Upper Nacelle Strut Interface (Gap Cover) Panel
521AB	Wing Anti-Ice Valve Door
613BT	Upper Nacelle Strut Interface (Gap Cover) Panel
621AB	Wing Anti-Ice Valve Door

F. Procedure

SUBTASK 28-22-15-430-007

(1) If necessary, install the bolts, washers and nuts to loosely connect the clamps or clamp blocks for the fuel lines to the structure or support brackets; View C, F and G (Figure 402).

SUBTASK 28-22-15-430-003

(2) To install the rigid couplings on the fuel line, do these steps (View H, Figure 402):

(a) Loosen the adjacent clamps and couplings before you install the rigid coupling.

NOTE: This will prevent a preload on the rigid coupling.

(b) Put the coupling nut [23] on the ferrule [26] of the fuel line.

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CAUTION

DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

(c) Put a retaining ring [27] on the ferrule to hold the coupling nut [23] on the fuel line.

(d) Make sure that fuel line [22] and fuel line [24] align correctly.

NOTE: You must align the fuel tubes correctly for rigid couplings. If you do not align the fuel lines correctly a fuel leak will occur.

(e) Apply a thin layer of petrolatum grease, D00504, to the new o-ring [28].

CAUTION

DO NOT USE THE SAME O-RING FOR THE FUEL LINE FITTINGS AFTER YOU TIGHTEN THE COUPLING ONE TIME. YOU MUST INSTALL NEW O-RINGS TO PREVENT FUEL LEAKS.

(f) Install the o-ring [28] on the fuel line [22].

(g) Make sure fuel line [22] and fuel line [24] align end to end.

CAUTION

DO NOT USE TOOLS TO TIGHTEN THE FITTINGS. DAMAGE TO THE FITTING COMPONENTS COULD OCCUR. THE ADJACENT FITTINGS COULD BECOME LOOSE.

(h) Manually tighten the coupling nut [23] of the rigid coupling to connect fuel lines.

(i) Install the MS20995C32 lockwire, G01048, between the coupling nut [23] and the ferrule [26] (TASK 20-10-23-400-801).

(j) Tighten the adjacent clamps and couplings.

SUBTASK 28-22-15-430-004

(3) To install the flexible full couplings on the fuel lines, do these steps (View D, Figure 402).

(a) Put the coupling nut [17] on the ferrule [14] of the fuel line [18].

(b) Put the coupling [15] on the ferrule [14] of the opposite fuel line [21].

CAUTION

DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

(c) Put one retaining ring [19] on each ferrule [14] to hold the coupling nut [17] and the coupling [15] on the ends of fuel line [18] and fuel line [21].

(d) Apply a thin layer of petrolatum grease, D00504, to the new o-ring [16].

CAUTION

DO NOT USE THE SAME O-RING FOR THE FUEL LINE FITTINGS AFTER YOU TIGHTEN THE COUPLING ONE TIME. YOU MUST INSTALL NEW O-RINGS TO PREVENT FUEL LEAKS.

(e) Put one o-ring [16] on each ferrule [14].

(f) Align the ends of fuel line [18] and fuel line [21] with a 0.12 ±0.03 in. (3.05 ±0.76 mm) clearance between the ferrules [14].

(g) Put the retainer halves [20] together on the ferrules [14] to connect fuel line [18] and fuel line [21].

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CAUTION

DO NOT USE TOOLS TO TIGHTEN THE FITTINGS. DAMAGE TO THE FITTING COMPONENTS COULD OCCUR. THE ADJACENT FITTINGS COULD BECOME LOOSE.

(h) Manually tighten the coupling nut [17] to the necessary dimension (View J, Figure 402).

(i) Use Go/No-Go Gage, SPL-7464 to make sure a flexible full coupling is installed correctly.

(j) Install MS20995C32 lockwire, G01048, between the coupling nut [17] and the coupling [15] (TASK 20-10-23-400-801).

SUBTASK 28-22-15-430-008

(4) To install the strut fuel line to the front spar bulkhead fitting, do these steps (Views B and I, Figure 402):

NOTE: For increased access to the front spar bulkhead fitting, the Wing Anti-Ice (WAI) valve can be removed.

(a) If necessary remove the WAI valve. Do this task (TASK 30-11-03-000-801).

(b) Put the coupling nut [32] on the ferrule [38] of fuel line [30].

CAUTION

DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

(c) Put a retaining ring [29] on ferrule [38] to hold the coupling nut [32] on fuel line [30].

(d) Apply a thin layer of petrolatum grease, D00504, to the new o-ring [37].

CAUTION

DO NOT USE THE SAME O-RING FOR THE FUEL LINE FITTINGS AFTER YOU TIGHTEN THE COUPLING ONE TIME. YOU MUST INSTALL NEW O-RINGS TO PREVENT FUEL LEAKS.

(e) Install o-ring [37] on fuel line [30].

CAUTION

DO NOT TWIST THE RETAINING RING OUT OF SHAPE. IF YOU TWIST THE RETAINING RING, FUEL LEAKS AT THE FITTING WILL OCCUR.

(f) Put the second retaining ring [29] on ferrule [38] of fuel line [30].

(g) Make sure the fuel line [30] aligns to the body [31] of the bulkhead fitting.

CAUTION

DO NOT USE TOOLS TO TIGHTEN THE FITTINGS. DAMAGE TO THE FITTING COMPONENTS COULD OCCUR. THE ADJACENT FITTINGS COULD BECOME LOOSE.

(h) Manually tighten the coupling nut [32] to connect fuel lines.

(i) Install the MS20995C32 lockwire, G01048, to the coupling nut [32] (TASK 20-10-23-400-801).

(j) Connect the drain shroud to the fitting.

(k) If the WAI valve was removed for access, then install it again. Do this task (Wing Anti-Ice Valve Installation, TASK 30-11-03-400-801).

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SUBTASK 28-22-15-430-009

(5) If it is necessary, tighten the clamps and clamp blocks on the fuel line to the structure or support brackets (Views C, F and G, Figure 402).

SUBTASK 28-22-15-430-010

(6) If it is necessary, tighten the support brackets to the structure with bolts, washers, and nuts (if the support brackets are not riveted).

SUBTASK 28-22-15-220-005

(7) Make sure the distance between the fuel line and the structure is a minimum of 0.25 in. (6.35 mm).

NOTE: This does not include the area near the support bracket.

SUBTASK 28-22-15-430-011

(8) If it is necessary, install the bolts, washers and nuts to connect the bonding jumpers and clamps (View E, Figure 402).

(a) Replace the bonding jumpers as necessary (TASK 28-00-00-960-801).

SUBTASK 28-22-15-765-001

(9) Measure the bonding resistances with an electrical bonding intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

(a) Make sure the bonding resistance between the fuel lines and the airplane structure is 0.010 ohm (10 milliohms) or less (View K, Figure 402 (Sheet 9).

NOTE: The measurements are made either fuel line to fuel line or fuel line to structure. Do not measure at the bonding jumper/clamp or the bonding equipment.

1) Measure the bonding resistance from fuel line to fuel line.

2) Measure the bonding resistance between the airplane structure and the fuel line.

G. Leak Check of the Fuel Line in the Strut Area

SUBTASK 28-22-15-030-010

(1) Make sure the engine fuel supply line is disconnected (TASK 73-11-07-000-801-H01).

SUBTASK 28-22-15-480-013

(2) Connect the engine fuel feed manifold test equipment, SPL-1776, and manifold fitting assembly, SPL-4913 or manifold fitting assembly, SPL-4914, to the engine fuel supply line.

SUBTASK 28-22-15-790-013

(3) Do these steps to test the fuel line in the strut area for leaks:

(a) Close the bleed valve on the engine fuel feed manifold test equipment, SPL-1776, for the applicable engine.

(b) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to apply 41.5 ±3.5 psig (286.1 ±24.2 kPa) air pressure to the fuel supply line for the applicable engine.

(c) Make sure the pressure is stable.

(d) Make sure the pressure is 41.5 ±3.5 psig (286.1 ±24.2 kPa) on the pressure gage at the fuel supply line.

(e) Make a written record of the time.

(f) Isolate the air source from the fuel supply line.

1) If there are leaks in the fuel feed manifold, the air pressure in the manifold will decrease.

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(g) Make sure the pressure at the left fuel supply line does not decrease more than 1.5 psig (10.3 kPa) in 10 minutes.

1) If the pressure does not decrease more than 1.5 psig (10.3 kPa) in 10 minutes, the fuel feed line is OK.

2) If the pressure decreases more than 1.5 psig (10.3 kPa), there is a leak in the fuel feed line.

(h) If there is a leak in the fuel feed line, do the steps that follow:

1) Apply 41.5 ±3.5 psig (286.1 ±24.2 kPa) air pressure to the fuel supply line.

2) Listen for air leaks in the fuel feed line.

3) If a coupling has a leak disconnect the coupling, replace the o-rings, inspect the coupling, and connect the coupling again.

4) If there is a leak in a fuel tube, replace the fuel tube.

SUBTASK 28-22-15-080-008

(4) Remove the engine fuel feed manifold test equipment, SPL-1776, and manifold fitting assembly, SPL-4913 or manifold fitting assembly, SPL-4914, from the fuel feed line.

SUBTASK 28-22-15-430-005

(5) Connect the engine fuel feed line (TASK 73-11-07-400-801-H01).

H. Return Airplane to Normal

SUBTASK 28-22-15-410-048

(1) To install the access panels for the left engine strut (if no more work is necessary), do these steps:

(a) Install the applicable underwing fairing:

(TASK 54-52-03-400-801)

Number	Name/Location
431FR	Inboard Underwing Fairing, Left Strut

(b) Install the applicable forward fairings:

(TASK 54-52-01-400-801-001)

Number	Name/Location
431DT	No. 2 Forward Fairing, Left Strut
431ET	No. 3 Forward Fairing, Left Strut

(c) Install this access panel on the strut, under the thrust reverser:

Number	Name/Location
432DR	Right Access Door, Left Strut

(d) Close this access panel on the bottom of the wing:

(TASK 06-44-00-800-802)

Number	Name/Location
521AB	Wing Anti-Ice Valve Door

(e) Install this access panel on the top of the wing:

(TASK 06-44-00-800-802)

Number	Name/Location
513BT	Upper Nacelle Strut Interface (Gap Cover) Panel

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SUBTASK 28-22-15-410-049

(2) To install the access panels to the right engine strut (if no more work is necessary), do these steps:

(a) Install the applicable underwing fairing:

(TASK 54-52-03-400-801)

Number	Name/Location
441FR	Outboard Underwing Fairing, Right Strut

(b) Install the applicable forward fairings:

(TASK 54-52-01-400-801-001)

Number	Name/Location
441DT	No. 2 Forward Fairing, Right Strut
441ET	No. 3 Forward Fairing, Right Strut

(c) Install this access panel on the strut, under the thrust reverser:

Number	Name/Location
442DR	Right Access Door, Right Strut

(d) Close this access panel on the bottom of the wing:

(TASK 06-44-00-800-802)

Number	Name/Location
621AB	Wing Anti-Ice Valve Door

(e) Install this access panel on the top of the wing:

(TASK 06-44-00-800-802)

Number	Name/Location
613BT	Upper Nacelle Strut Interface (Gap Cover) Panel

SUBTASK 28-22-15-410-050

WARNING DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(3) Do these tasks in this sequence to safely close the thrust reversers:

(a) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00.

(b) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

(c) Do this task: Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00.

(d) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

SUBTASK 28-22-15-860-050

(4) For the left engine,

Remove the safety tags and close these circuit breakers:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	5	C28001	L ENGINE FUEL SPAR VALVE
B	4	C76601	L ENG FUEL VALVE

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SUBTASK 28-22-15-860-051

(5) For the right engine,

Remove the safety tags and close these circuit breakers:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	19	C28002	R ENGINE FUEL SPAR VALVE
B	19	C76600	R ENG FUEL VALVE

——— END OF TASK ———

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FUEL FEED MANIFOLD COUPLINGS - INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure contains three tasks. These are the tasks:

(1) Engine Fuel Feed Manifold, Spar and Crossfeed Valve - Leak Check

(2) Engine Fuel Feed Manifold - Suction Feed Line Leak Check

(3) Fuel Tube Dent Criteria - Inspection/Check

C. The purpose of the Engine Fuel Feed Manifold, Spar and Crossfeed Valve - Leak Check is to find and isolate leaks in the engine fuel feed system. This procedure also contains leak tests for the fuel crossfeed valves and the fuel spar valves.

D. The purpose of the Engine Fuel Feed Manifold - Suction Feed Line Leak Check is to make sure the engine fuel feed manifold will operate when suction feed operation is required. This test is a positive pressure test of the engine fuel feed manifold to identify small leaks which might affect suction feed operation.

NOTE: You can do the test from the left or right side of the engine fuel feed manifold. You only need to open one side of the engine fuel feed manifold for this test. This is to make sure the airplane can be returned to service as soon as possible.

TASK 28-22-15-790-802-001

2. Engine Fuel Feed Manifold, Spar and Crossfeed Valve - Leak Check

(Figure 601, Figure 602)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
12-11-02-650-801	Fuel Tank Sump Drain Valve - Tank Entry (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)
28-22-01-000-801	Engine Fuel Spar Valve (Valve Body) - Removal (P/B 401)
28-22-01-400-801	Engine Fuel Spar Valve (Valve Body) - Installation (P/B 401)
28-22-03-000-801	FWD/AFT Fuel Crossfeed Valve (Valve Body) - Removal (P/B 401)
28-22-03-400-801	FWD/AFT Fuel Crossfeed Valve (Valve Body) - Installation (P/B 401)
28-22-15-000-802-001	Fuel Line, Fitting and Coupling - Removal (P/B 401)
28-22-15-400-802-001	Fuel Line, Fitting and Coupling - Installation (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)

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(Continued)

Reference	Title
32-09-00-860-801	Air/Ground Mode Simulation (P/B 201)
71-00-00-800-833-H00	Power Plant Test Reference Table (P/B 501)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
73-11-07-000-801-H01	Main Fuel Supply Hose Removal (P/B 401)
73-11-07-400-801-H01	Main Fuel Supply Hose Installation (P/B 401)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-1776	Equipment - Test, Engine Fuel Feed Manifold Part #: G28018-26 Supplier: 81205 Part #: G28018-28 Supplier: 81205 Opt Part #: J28005-1 Supplier: 81205
SPL-4913	Fitting Assembly - Manifold, Fuel Feed, GE90 Part #: G28018-2 Supplier: 81205
SPL-4914	Fitting Assembly - Manifold, Fuel Feed (GEnx-2B, CF6-80C2, PW4000, or GE9X Engines)
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)

C. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
5	Packing	73-11-01-03-095	ARO ALL
7	Packing	73-11-01-03-065	ARO ALL

E. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
414	Right Fan Cowl - Left Engine
424	Right Fan Cowl - Right Engine

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(Continued)

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing

F. Prepare for Test

SUBTASK 28-22-15-650-019-001

(1) Defuel the main fuel tanks to less than 2,300 LB (1,000 KG) each.

NOTE: It is not necessary to defuel the center fuel tank to do the Test 1, 2, 3 and 4 procedures. However, it is OK to defuel the center fuel tank.

(a) To defuel, do one of these tasks:

1) Do this task: Pressure Defueling, TASK 28-26-00-650-801.

2) To transfer fuel to the center tank, do this task: Tank to Tank Transfer, TASK 28-26-00-650-802.

SUBTASK 28-22-15-650-020-001

(2) Do these steps to make sure the jettison and APU fuel valves are in the correct positions:

(a) Make sure the airplane is in the ground mode.

1) If the airplane is not in the ground mode, put it in the ground mode. To put the airplane in the ground mode, do this task: Air/Ground Mode Simulation, TASK 32-09-00-860-801.

(b) Make sure the Jettison ARM switch is in the OFF position.

(c) Make sure the APU Start switch is in the OFF position.

SUBTASK 28-22-15-860-017-001

(3) To decrease pressure in the fuel feed manifold, do these steps:

(a) Put the DEFUEL VALVE switch, on the integrated refuel panel (IRP) P28, to the OPEN position.

(b) Put the forward and aft crossfeed valve switches, on the P5 overhead panel, to the OPEN position.

(c) Put the left and right engine fuel RUN-CUTOFF switches, on the P10 Control Stand, to the RUN position.

NOTE: This opens the fuel spar valves.

(d) Put the center tank refuel valve control switch to the OPEN position.

(e) Wait one (1) minute for the pressure in the manifold to vent and for the fuel to drain.

NOTE: The pressure in the refuel/jettison manifold will decrease when the valves are opened, however, the valve will automatically close when the back pressure in the manifold is not sufficient to move the spring-loaded valve poppet.

(f) Put the center tank refuel valve control switch to the CLOSE position.

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SUBTASK 28-22-15-650-021-001

(4) Wait 15 minutes to make sure the refuel/jettison manifold is fully drained.

NOTE: In this procedure, you will drain fuel through the refuel/jettison manifold into the fuel tanks.

SUBTASK 28-22-15-010-032-001

WARNING DO ALL OF THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(5) Do these tasks in this sequence to safely open the thrust reversers:

(a) Do this task: Retract the Leading Edge Slats, TASK 27-81-00-860-805.

(b) Do this task: Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.

(c) Do this task: Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00.

(d) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

(e) Open the right thrust-reverser for each engine. To open them, do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-816-H00.

SUBTASK 28-22-15-860-018-001

(6) Do these steps:

(a) To drain the fuel between the spar valves and the fuel pumps, do these steps:

1) Put the 5-gallon (19-liter) fuel resistant container, STD-1054, below each fuel pump.

NOTE: Have an extra 5-gallon (19-liter) fuel resistant container, STD-1054, at each engine to transfer fuel that drains into a larger container.

2) Put the left and right engine fuel RUN-CUTOFF switches, on the P10 Control Stand, to the CUTOFF position.

NOTE: This closes the fuel spar valves.

3) Remove the fuel pump drain plugs [4] and [6] for the left and right engines (TASK 73-11-07-000-801-H01).

NOTE: This will drain fuel from the fuel supply lines and part of the fuel feed manifold.

a) Discard the packings [5] and the packings [7].

4) Put a cotton wiper, G00034, below the strut connector to prevent engine damage from fuel, View D (Figure 601).

NOTE: You will disconnect the flexible fuel supply lines in this procedure.

5) After the fuel drains, loosen the two flexible fuel supply lines [1] for the left and right engines, View D (Figure 601).

NOTE: If there is a vacuum in the fuel line, this will release the vacuum. When you release a vacuum, an additional small quantity of fuel can spill from the fuel pump drain plugs [4] and [6].

6) Re-tighten the two flexible fuel supply lines [1] for the left and right engines, View D (Figure 601).

NOTE: This is to make sure that no fuel leaks on the engine when you open the spar valves in the subsequent step.

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7) Put the left and right engine fuel RUN-CUTOFF switches, on the P10 Control Stand, to the RUN position.

NOTE: This opens the fuel spar valves. A small quantity of fuel can drain from the drain plugs [4] and [6] when you open the spar valves.

8) Wait 5 minutes to let fuel drain from the fuel feed manifold into the fuel tanks through refuel/jettison manifold.

(b) Disconnect the two flexible fuel supply lines [1] for the left and right engines, View D (Figure 601) (TASK 73-11-07-000-801-H01).

NOTE: A small quantity of fuel can spill the fuel supply lines. Use the cotton wiper, G00034, to absorb the fuel.

(c) For each of the left and right engines, apply a thin layer of petrolatum grease, D00504, to a new packings [5] and a new packings [7] and install them on the drain plugs [4] and [6] respectively.

(d) Install the fuel pump drain plugs [4] and [6] (TASK 73-11-07-400-801-H01).

(e) Put the DEFUEL VALVE switch, on the integrated refuel panel (IRP) P28, to the CLOSED position.

SUBTASK 28-22-15-480-004-001

(7) Connect the engine fuel feed manifold test equipment, SPL-1776, and manifold fitting assembly, SPL-4913, or manifold fitting assembly, SPL-4914, to each engine fuel supply line, refer to sheet 8 (Figure 601).

G. Test 1 - Fuel Feed Manifold Leak Test

SUBTASK 28-22-15-860-019-001

(1) Do these steps to test the fuel feed manifold for leaks:

(a) Make sure the DEFUEL VALVE switch, on the integrated refuel panel (IRP) P28, is in the CLOSED position.

(b) Close the bleed valve on the engine fuel feed manifold test equipment, SPL-1776, for the right engine.

(c) Close the bleed valve on the engine fuel feed manifold test equipment, SPL-1776, for the left engine.

(d) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to apply 38 psig (262 kPa) - 45 psig (310 kPa) air pressure to the fuel supply line for the left engine.

(e) Make sure the pressure is stable.

(f) Make sure the pressure is 38 psig (262 kPa) - 45 psig (310 kPa) on the pressure gage at the right fuel supply line.

NOTE: If the pressure at the right fuel supply line is 0 psig (0 kPa), one or more of these valves/actuators are in the CLOSED position, and must be replaced:

Left Fuel Spar Valve/Actuator

Fwd/Aft Crossfeed Valve/Actuator

Right Fuel Spar Valve/Actuator

(g) Make a written record of the time.

(h) Isolate the air source from the fuel supply line.

1) If there are leaks in the fuel feed manifold, the air pressure in the manifold will decrease.

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(i) Make sure the pressure at the left fuel supply line does not decrease more than 1.5 psig (10.3 kPa) in 10 minutes.

(j) If the pressure does not decrease more than 1.5 psig (10.3 kPa) in 10 minutes, for Test 1, the fuel feed manifold is OK.

1) If you do not want to test the crossfeed or spar valves (Tests 2, 3 and 4), you can go to the paragraph "Put the Airplane Back to Its Usual Condition".

(k) If the pressure decreases more than 1.5 psig (10.3 kPa) in 10 minutes, there is a leak in the fuel feed manifold.

1) Do the tests for the crossfeed or spar valves (Tests 2, 3 and 4), to isolate the leak.

H. Test 2 - Right Fuel Spar Valve Leak Test

SUBTASK 28-22-15-860-020-001

(1) Do these steps to do a test of the right fuel spar valve:

(a) Open the bleed valve on the engine fuel feed manifold test equipment, SPL-1776, for the right engine, to remove pressure from the fuel feed manifold.

NOTE: Make sure the fuel drain line is in a container to catch the fuel that drains.

(b) Put the right engine fuel RUN-CUTOFF switch, on the P10 Control Stand, to the CUTOFF position.

NOTE: This closes the right fuel spar valve.

(c) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057 to apply 38 psig (262 kPa) - 45 psig (310 kPa) air pressure at the fuel supply line for the left engine.

(d) Make sure the pressure is stable.

(e) Make a written record of the time.

(f) Isolate the air source from the fuel supply line.

1) If there are leaks in the fuel feed manifold, the air pressure in the manifold will decrease.

(g) Make sure the pressure at the left fuel supply line does not decrease more than 1.5 psig (10.3 kPa) in 10 minutes.

(h) If the pressure does not decrease more than 1.5 psig (10.3 kPa) in 10 minutes, the right fuel spar valve is OK.

(i) If the pressure decreases more than 1.5 psig (10.3 kPa) in 10 minutes, one of these items can be the cause:

1) The right engine fuel spar valve leaks, to adjust or replace it,

These are the tasks: Engine Fuel Spar Valve (Valve Body) - Removal, TASK 28-22-01-000-801, Engine Fuel Spar Valve (Valve Body) - Installation, TASK 28-22-01-400-801.

2) The tubing for the fuel feed manifold leaks, continue to isolate the section of tubing that leaks.

I. Test 3 - FWD/AFT Crossfeed Valve Leak Test

SUBTASK 28-22-15-860-021-001

(1) Do these steps to test the forward and aft engine fuel crossfeed valves:

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(a) Put the right engine fuel RUN-CUTOFF switch, on the P10 Control Stand, to the RUN position.

NOTE: This opens the right fuel spar valve and removes pressure from the fuel feed manifold.

NOTE: Make sure the right fuel drain line is in a container to catch the fuel that drains.

(b) Put the FWD and AFT CROSSFEED switches to the CLOSED position, on the P5 overhead panel.

(c) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to apply 38 psig (262 kPa) - 45 psig (310 kPa) air pressure at the fuel supply line for the left engine.

(d) Make sure the pressure is stable.

(e) Make a written record of the time.

(f) Isolate the air source from the fuel supply line.

1) If there are leaks in the fuel feed manifold, the air pressure in the manifold will decrease.

(g) Make sure the pressure at the left engine supply line does not decrease more than 1.5 psig (10.3 kPa) in 10 minutes.

(h) If the pressure does not decrease more than 1.5 psig (10.3 kPa) in 10 minutes, the forward and aft crossfeed valves are OK.

1) If the previous test for the right spar valve showed a leak, the leak is between the right engine and the crossfeed valves (TASK 28-22-15-000-802-001).

(i) If the pressure decreases more than 1.5 psig (10.3 kPa) in 10 minutes, one of these items can be the cause:

1) The forward or aft crossfeed valve leaks, to adjust or replace them,

These are the tasks: FWD/AFT Fuel Crossfeed Valve (Valve Body) - Removal, TASK 28-22-03-000-801, FWD/AFT Fuel Crossfeed Valve (Valve Body) - Installation, TASK 28-22-03-400-801.

2) The tubing for the fuel feed manifold leaks, continue to isolate the section of tubing that leaks.

J. Test 4 - Left Fuel Spar Valve Leak Test

SUBTASK 28-22-15-860-022-001

(1) Do these steps to test the left engine fuel spar valve:

(a) Put the FWD and AFT CROSSFEED switches to the OPEN position, on the P5 overhead panel.

NOTE: This removes pressure from the fuel feed manifold.

NOTE: Make sure the right fuel drain line is in a container to catch the fuel that drains.

(b) Put the left engine fuel RUN-CUTOFF switch, on the P10 Control Stand, to the CUTOFF position.

NOTE: This closes the left fuel spar valve.

(c) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to apply 38 psig (262 kPa) - 45 psig (310 kPa) air pressure at the fuel supply line for the left engine.

(d) Make sure the pressure is stable.

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(e) Make a written record of the time.

(f) Isolate the air source from the fuel supply line.

1) If there are leaks in the fuel feed manifold, the air pressure in the manifold will decrease.

(g) Make sure the pressure at the left engine supply line does not decrease more than 1.5 psig (10.3 kPa) in 10 minutes.

(h) If the pressure does not decrease more than 1.5 psig (10.3 kPa)in 10 minutes, the left fuel spar valve is OK.

1) If the previous test for the crossfeed valves showed a leak, the leak is between the left engine spar valve and the crossfeed valves.

(i) If the pressure decreases more than 1.5 psig (10.3 kPa) in 10 minutes, one of these items can be the cause:

1) The left engine fuel spar valve leaks. Adjust or replace it.

These are the tasks: Engine Fuel Spar Valve (Valve Body) - Removal, TASK 28-22-01-000-801, Engine Fuel Spar Valve (Valve Body) - Installation, TASK 28-22-01-400-801.

2) The tubing for the fuel feed manifold leaks between the left engine and the left spar valve.

a) Do the Leak Isolation steps below to make sure the tubing does not leak.

K. Leak Isolation

SUBTASK 28-22-15-700-009-001

(1) To find a leak in the fuel feed manifold, do these steps:

NOTE: You can isolate leaks with one or two engines opened for access.

(a) Defuel the main and center fuel tanks (TASK 28-26-00-650-801).

(b) To remove all the fuel in the fuel tanks, do this task: Fuel Tank Sump Drain Valve - Tank Entry, TASK 12-11-02-650-801.

(c) Put the valves in the positions shown for Test 1 (Figure 602).

(d) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(e) Do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

(f) Pressurize the fuel feed manifold at the fuel supply line for the left engine.

(g) Go into the applicable fuel tank to isolate the leak.

NOTE: When you go into the fuel tank to look for leaks, inspect the area of the manifold that leaks

(Tests 1, 2, 3 or 4).

(h) Do a check of the applicable fuel spar valve or crossfeed valve as follows:

1) Make sure the placard "TOP" shows on the top of the applicable valve.

2) Make sure the index arrows on the adapter shaft and the valve body align correctly (TASK 28-22-01-400-801), (TASK 28-22-03-400-801).

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(i) If the valve(s) is (are) installed correctly, do a leak check of the fuel feed manifold line and couplings between the left engine fuel supply line and the applicable valve:

NOTE: A water and soap solution can be used to help isolate the leak. Make sure you remove any excess soap solution from the fuel tank.

1) Test 1 - Right Engine Fuel Supply Line
2) Test 2 - Right Fuel Spar Valve
3) Test 3 - Fwd/Aft Crossfeed Valve
4) Test 4 - Left Fuel Spar Valve

(j) If a coupling has a leak, disconnect the coupling, replace the O-rings, and then connect the coupling (TASK 28-22-15-400-802-001).

(k) If a fuel line has a leak, or is damaged, remove and install a new fuel line (TASK 28-22-15-400-802-001).

NOTE: Other leak sources could be: the valve bodies (Figure 601), the discharge check valves for the boost and override/jettison pumps, or the suction by-pass valves in the main tanks.

SUBTASK 28-22-15-700-010-001

(2) After you repair a leak, do these steps:

(a) Do Test 1 again.

1) Make sure the valves are configured correctly. Refer to the Prepare for Test section.

(b) Do the applicable test (Test 2, 3 or 4), if not passed.

(c) If the pressure does not decrease by more than 1.5 psig in 10 minutes, the system is OK.

L. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-15-410-026-001

(1) If fuel tank access doors are removed, do these steps:

(a) Do the fuel tank closure procedure (TASK 28-11-00-410-801).

(b) For the main tank access doors, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

(c) For the center tank access doors, do this task: Center Tank Access Door - Installation, TASK 28-11-02-400-801.

WARNING DO NOT SUPPLY ELECTRICAL POWER BEFORE THE FUEL TANKS ARE CLOSED. IF YOU SUPPLY POWER BEFORE THE FUEL TANKS ARE CLOSED, DAMAGE TO EQUIPMENT AND INJURIES TO PERSONS CAN OCCUR.

(d) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-22-15-410-027-001

(2) To remove the pressure check equipment from the engine fuel supply lines, do these steps:

(a) Put the FWD and AFT fuel crossfeed switches, on the P5 Overhead Panel, to the CLOSED position.

(b) Put the left and right engine fuel RUN-CUTOFF switches, on the P10 Control Stand, to the CUTOFF position.

NOTE: This closes the fuel spar valves.

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CAUTION

DRAIN ALL OF THE FUEL IN THE FUEL SUPPLY LINE. IF YOU DO NOT DRAIN ALL OF THE FUEL, FUEL WILL SPILL FROM THE FUEL SUPPLY LINE ONTO THE ENGINE.

(c) Open the bleed valve on each engine fuel feed manifold test equipment, SPL-1776, to drain any fuel that remains in the fuel supply line.

(d) Remove the engine fuel feed manifold test equipment, SPL-1776, and manifold fitting assembly, SPL-4913 or manifold fitting assembly, SPL-4914, from each fuel supply line [1].

SUBTASK 28-22-15-410-028-001

(3) Do these steps:

(a) Connect the left and right engine fuel supply lines (TASK 73-11-07-400-801-H01).

(b) Do a leak check of the main fuel supply line, refer to the Power Plant Test reference table (TASK 71-00-00-800-833-H00).

WARNING

DO ALL OF THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(c) Do these tasks in this sequence to safely close the thrust reversers:

1) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00.

2) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.

3) Do this task: Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00.

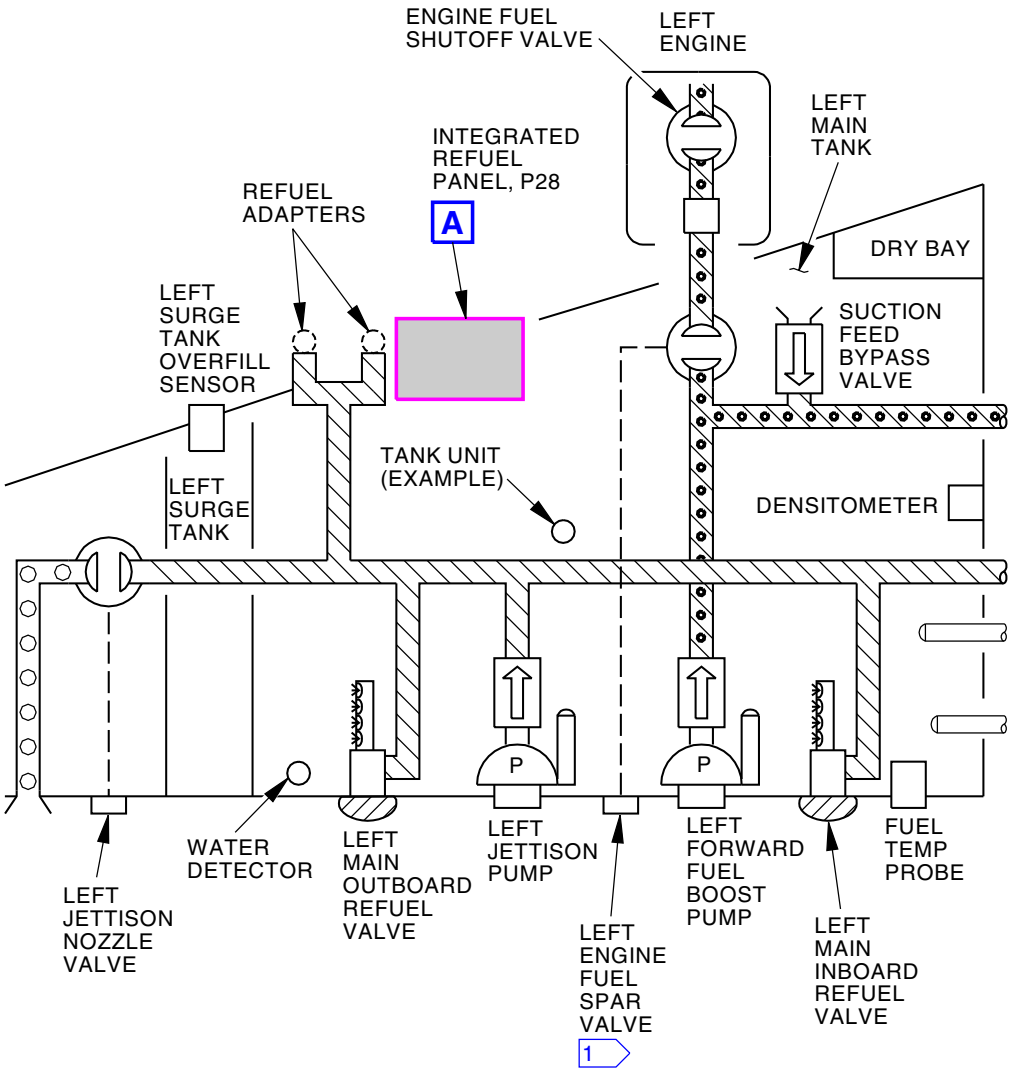
4) Do this task: Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

SUBTASK 28-22-15-650-022-001

(4) Refuel the fuel tanks (TASK 12-11-01-650-801).

END OF TASK

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LEFT MAIN FUEL TANK

LEGEND:

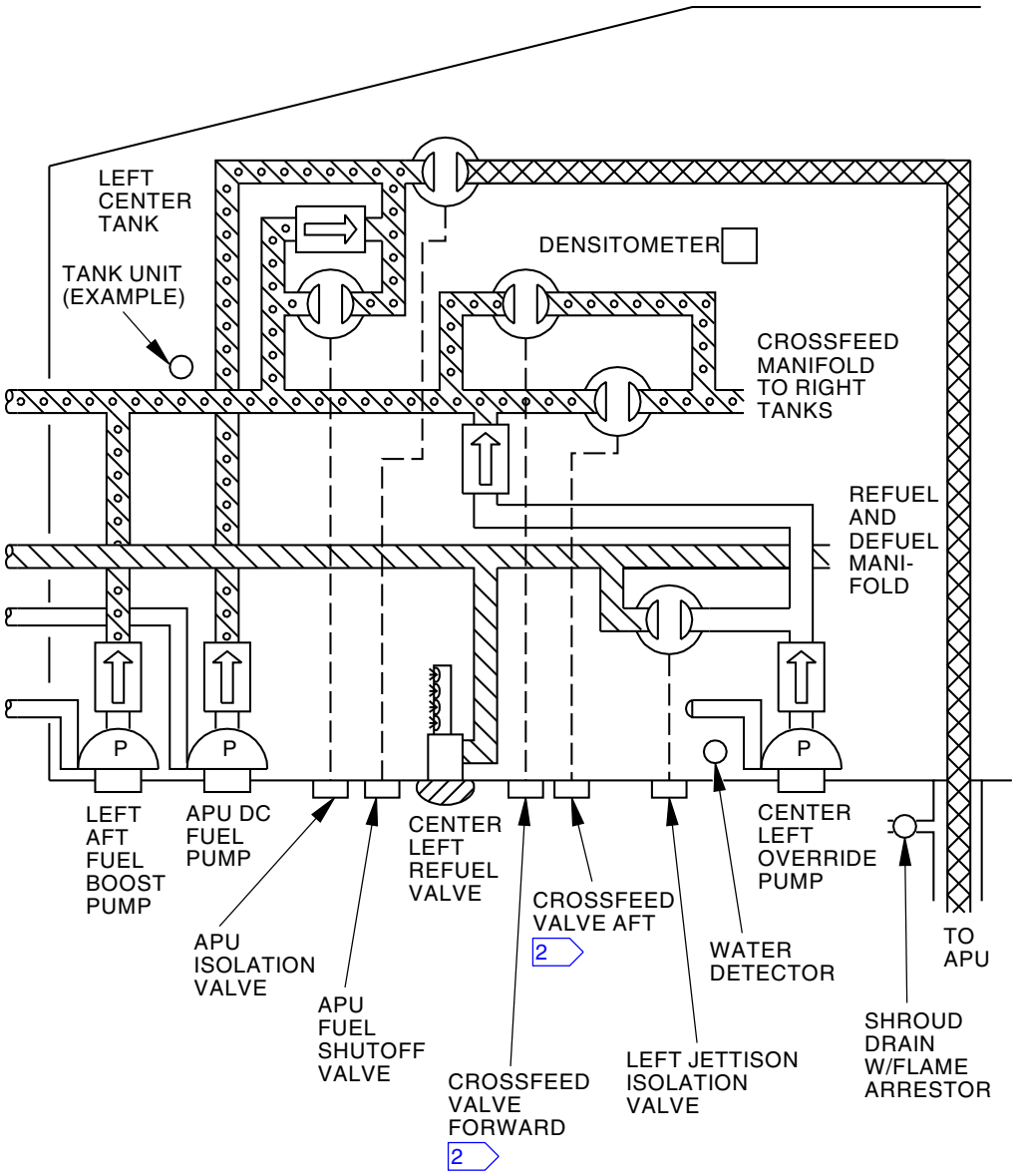
- ENGINE FUEL FEED SYSTEM (UNDER PRESSURE - TEST 1)
- REFUELING/DEFUELING
- FUEL JETTISON
- APU FUEL FEED

- 1 TEST 4
- 2 TEST 3
- 3 TEST 2

M35387 S0006415283_V2

Fuel System Inspection
Figure 601/28-22-15-990-806-001 (Sheet 1 of 8)

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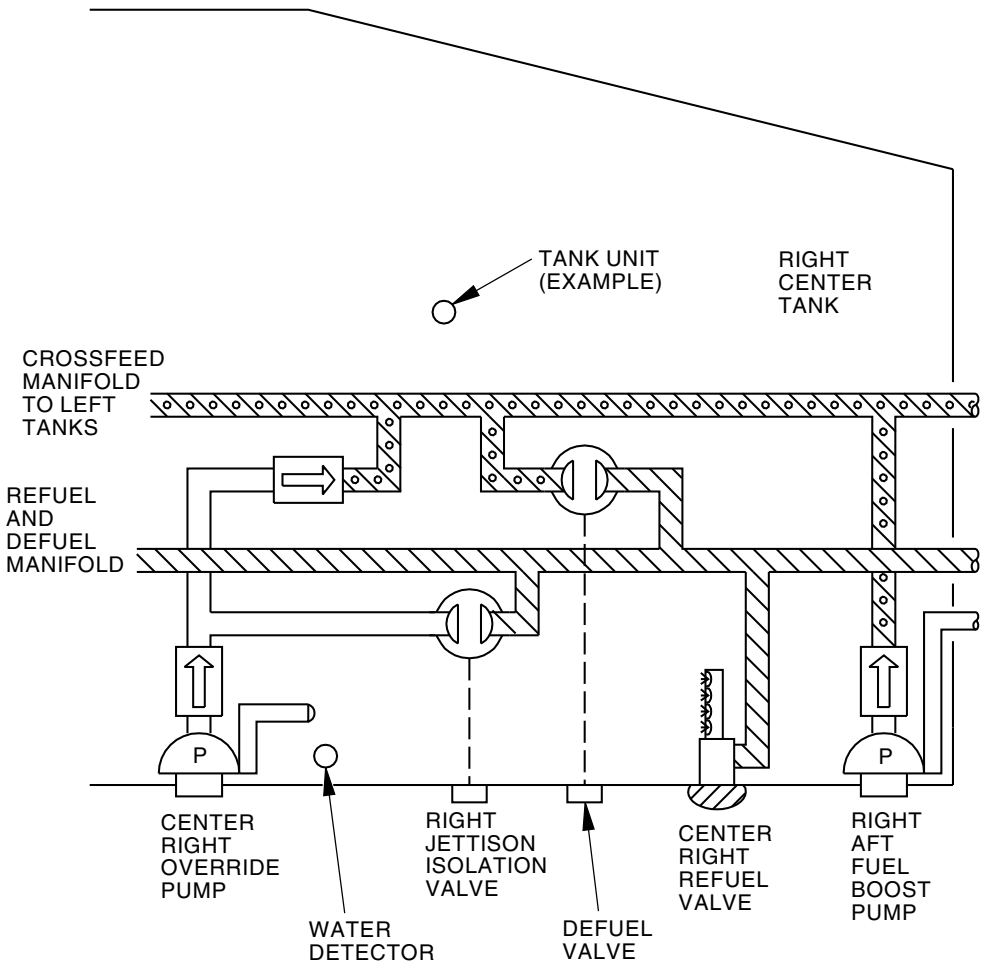


CENTER FUEL TANK

M35389 S0006415284_V2

Fuel System Inspection
Figure 601/28-22-15-990-806-001 (Sheet 2 of 8)

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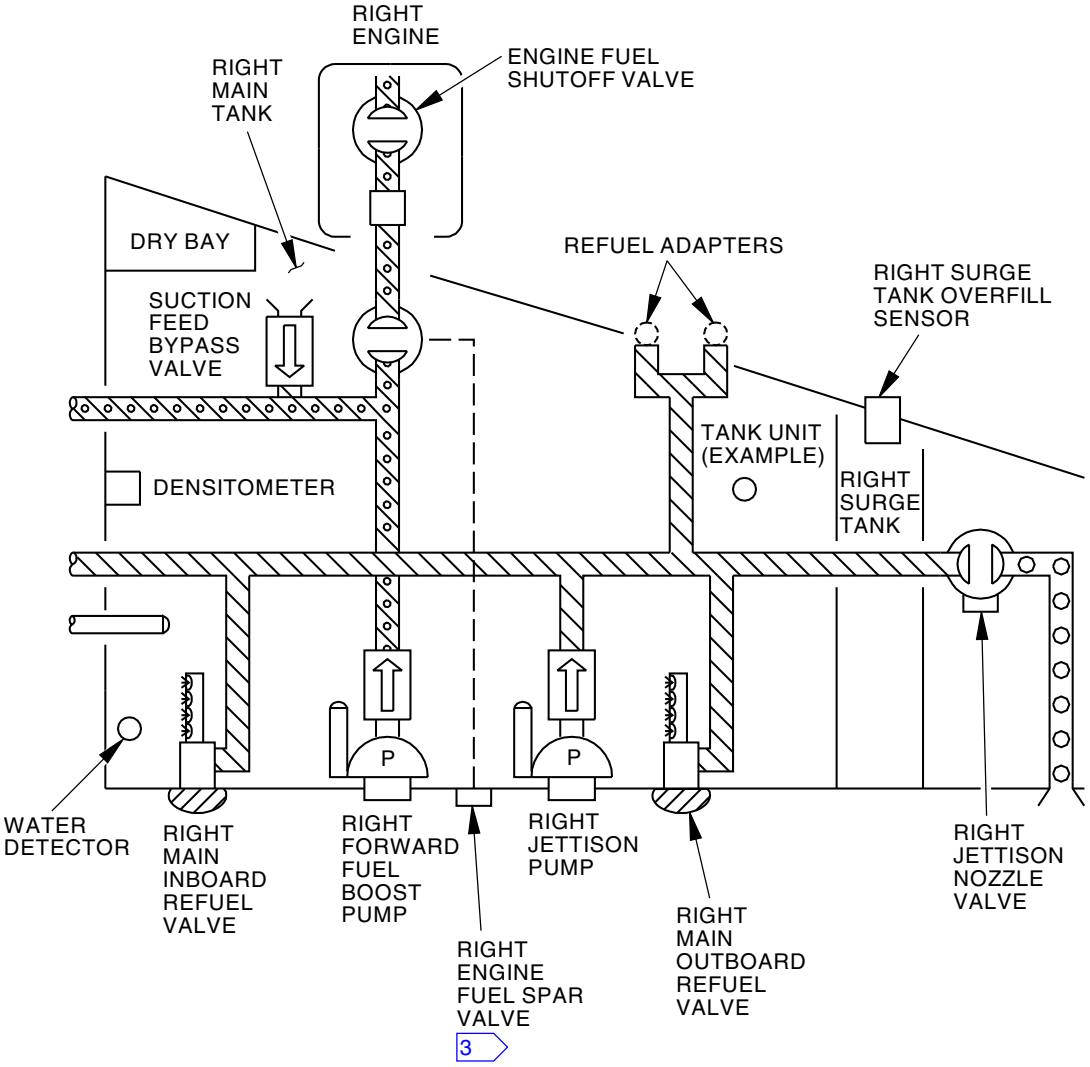


CENTER FUEL TANK

M35392 S0006415285_V2

Fuel System Inspection
Figure 601/28-22-15-990-806-001 (Sheet 3 of 8)

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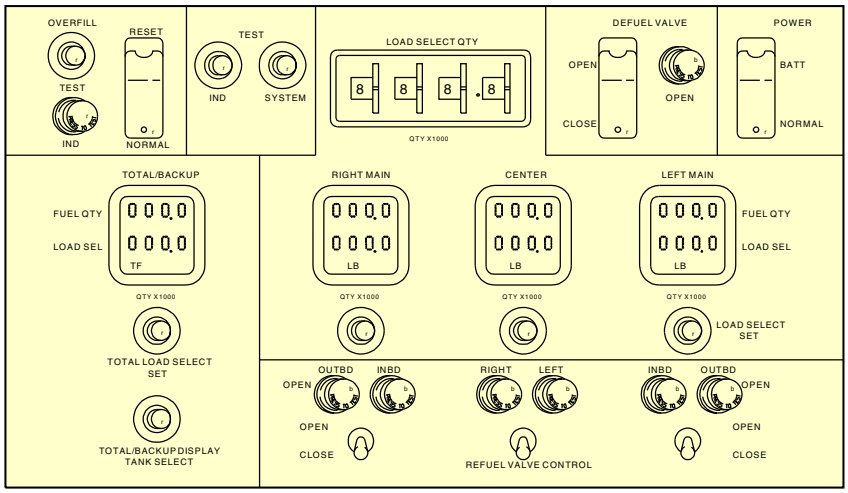


RIGHT MAIN FUEL TANK

M35393 S0006415286_V3

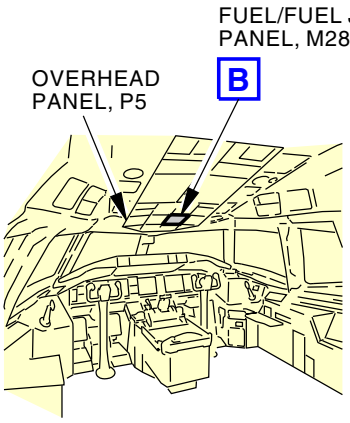
Fuel System Inspection
Figure 601/28-22-15-990-806-001 (Sheet 4 of 8)

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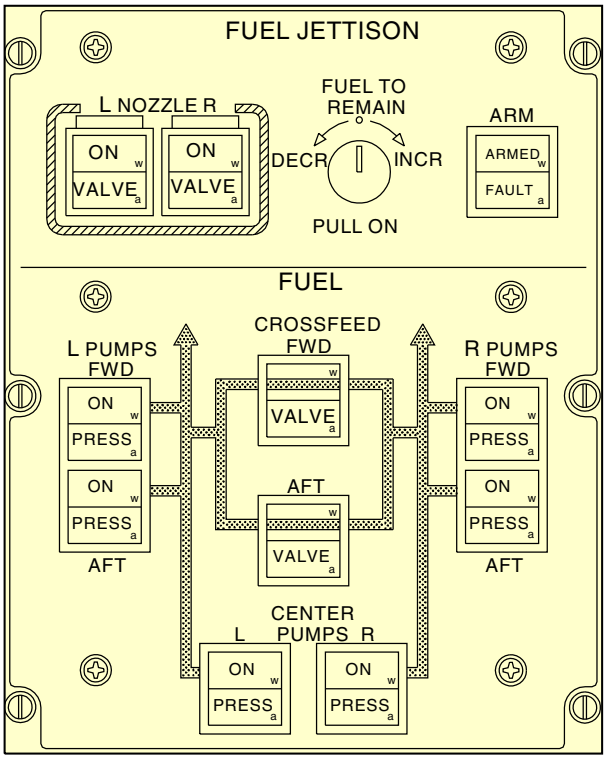


INTEGRATED REFUEL PANEL, P28

A



FLIGHT COMPARTMENT



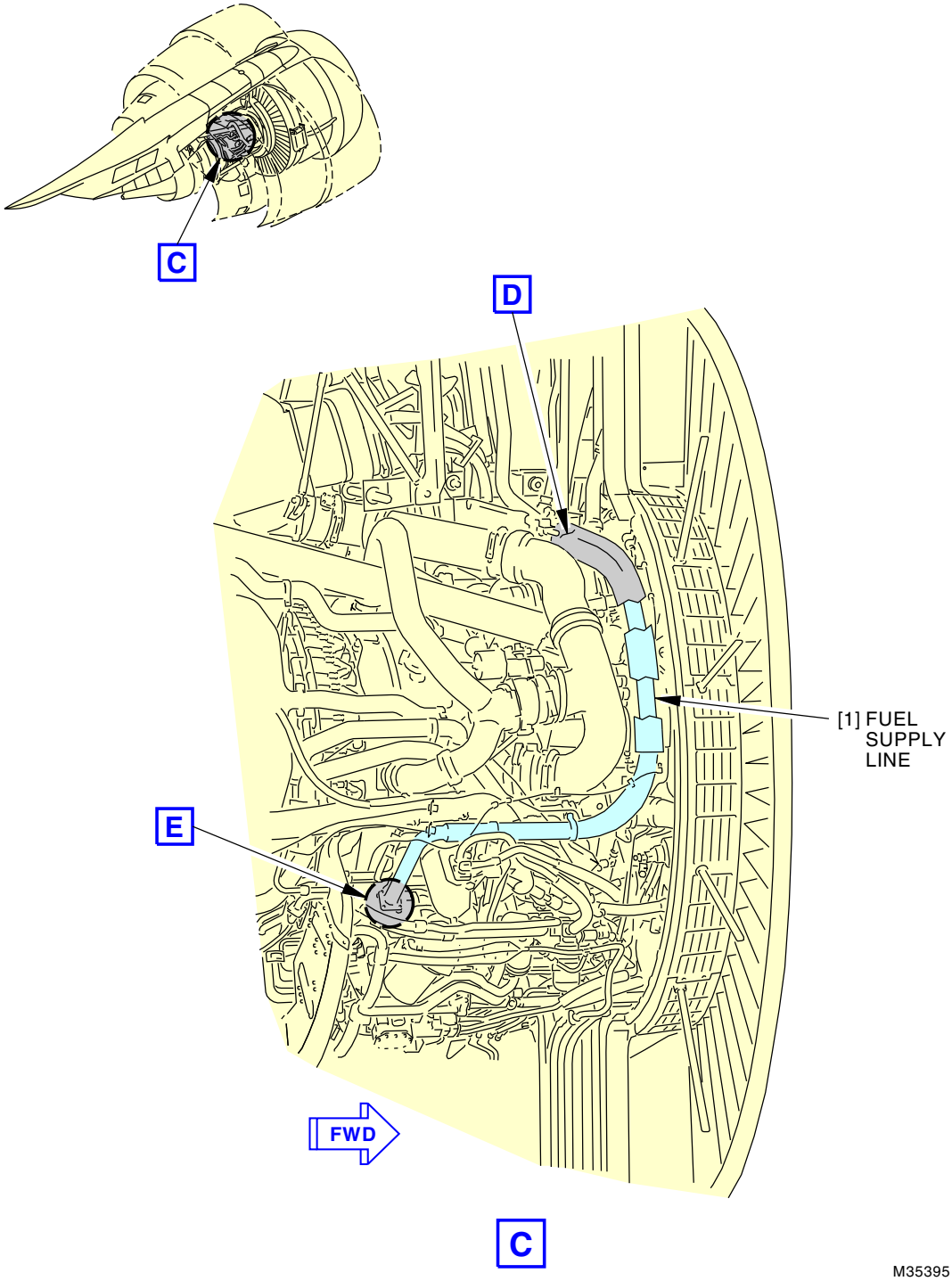
FUEL/FUEL JETTISON PANEL, M28001

B

M35394 S0006415287_V2

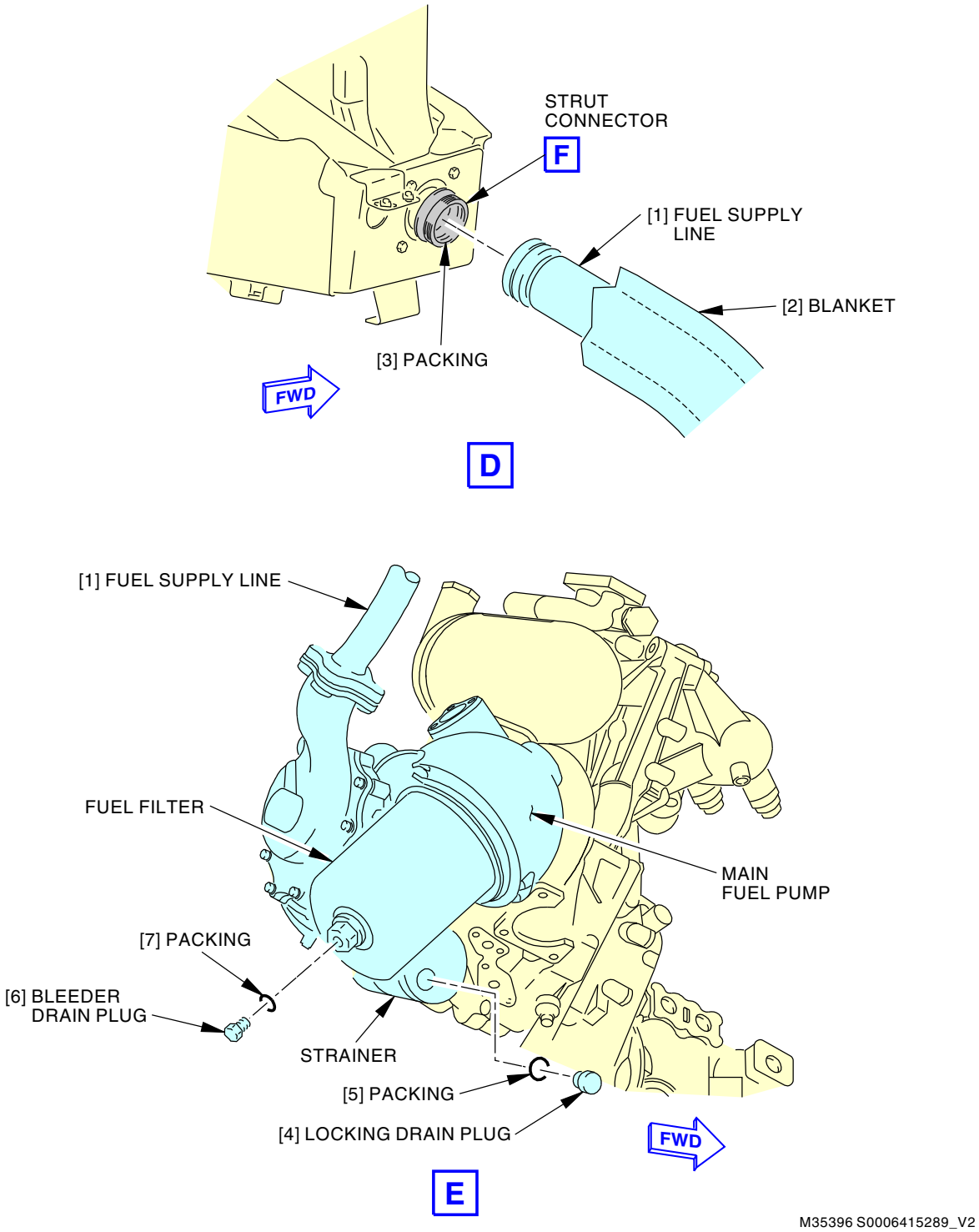
Fuel System Inspection
Figure 601/28-22-15-990-806-001 (Sheet 5 of 8)

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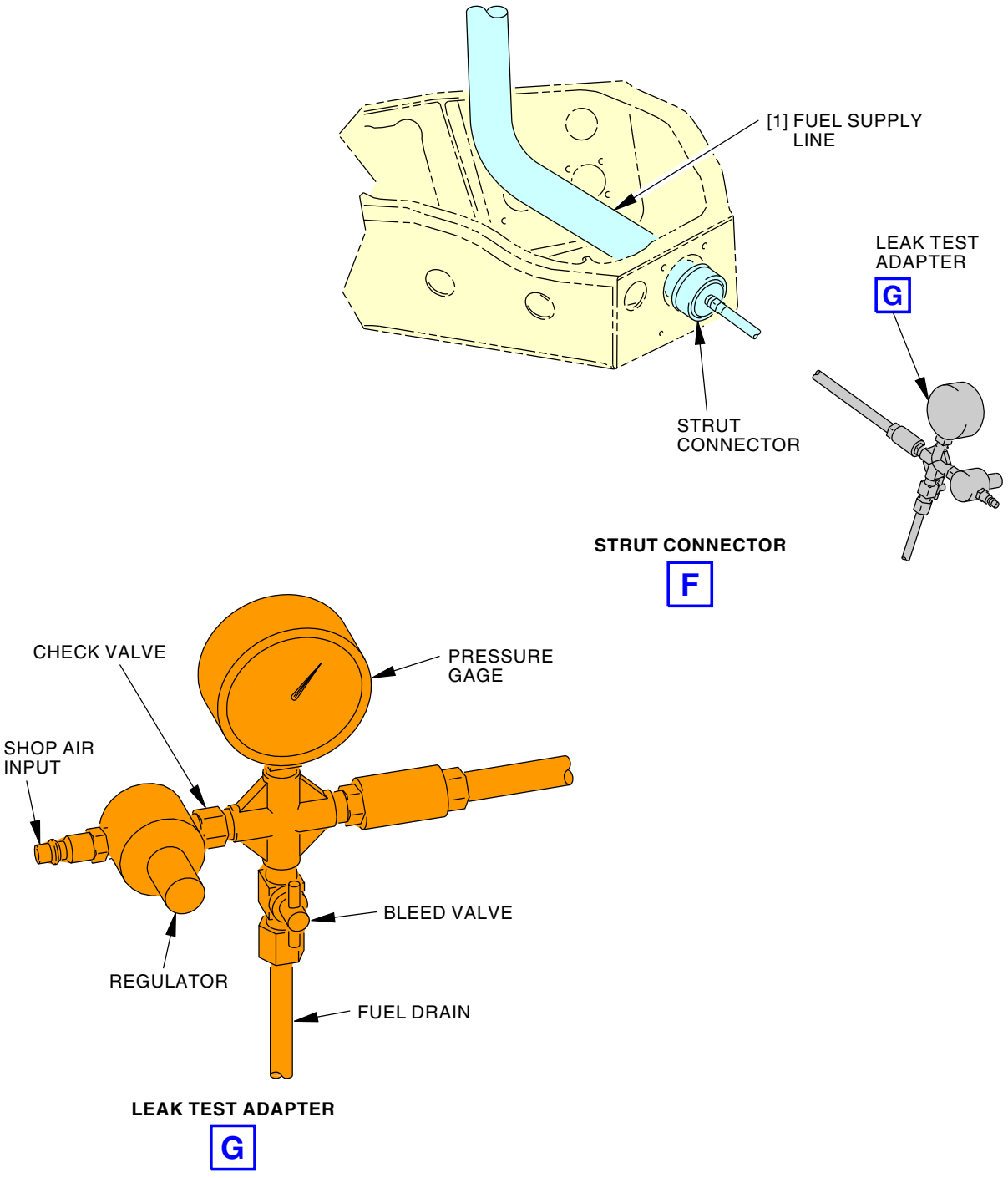
Fuel System Inspection
Figure 601/28-22-15-990-806-001 (Sheet 6 of 8)

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Fuel System Inspection
Figure 601/28-22-15-990-806-001 (Sheet 7 of 8)

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Fuel System Inspection
Figure 601/28-22-15-990-806-001 (Sheet 8 of 8)

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VALVES	VALVE POSITION							
	TEST 1 FUEL FEED MANIFOLD		TEST 2 RIGHT FUEL SPAR VALVE		TEST 3 FWD/AFT CROSSFEED VALVE		TEST 4 LEFT FUEL SPAR VALVE	
	OPEN	CLOSED	OPEN	CLOSED	OPEN	CLOSED	OPEN	CLOSED
APU FUEL SHUTOFF VALVE		X		X		X		X
CROSSFEED VALVE - AFT	X		X			X	X	
CROSSFEED VALVE - FWD	X		X			X	X	
DEFUEL VALVE		X		X		X		X
FUEL SPAR VALVE - LEFT	X		X		X			X
FUEL SPAR VALVE - RIGHT	X			X	X		X	
LEAK TEST ADAPTER, LEFT FUEL SUPPLY LINE		X		X		X		X
LEAK TEST ADAPTER, RIGHT FUEL SUPPLY LINE		X	X		X		X	

M35398 S0006415291_V2

Fuel Feed Manifold - Leak Tests
Figure 602/28-22-15-990-807-001

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TASK 28-22-15-710-802-001

3. Engine Fuel Feed Manifold - Suction Feed Line Leak Check

(Figure 601)

A. General

(1) The purpose of the Engine Fuel Feed Manifold - Suction Feed Line Leak Check is to make sure the engine fuel feed manifold will operate when suction feed operation is required. This test is a positive pressure test of the engine fuel feed manifold to identify small leaks which might affect suction feed operation.

NOTE: You can attach the test equipment to the left or right side of the engine fuel feed manifold. The fuel between the spar valve and the fuel pump for the left and right engine should be drained.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
27-81-00-860-805	Retract the Leading Edge Slats (P/B 201)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)
28-26-00-650-803	Suction Defueling (P/B 201)
32-09-00-860-801	Air/Ground Mode Simulation (P/B 201)
71-00-00-800-833-H00	Power Plant Test Reference Table (P/B 501)
71-11-04-010-814-H00	Open the Fan Cowl Panel (Selection) (P/B 201)
71-11-04-410-814-H00	Close the Fan Cowl Panel (Selection) (P/B 201)
73-11-07-000-801-H01	Main Fuel Supply Hose Removal (P/B 401)
73-11-07-400-801-H01	Main Fuel Supply Hose Installation (P/B 401)
78-31-00-010-816-H00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-806-H00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)
78-31-00-410-816-H00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-805-H00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-1776	Equipment - Test, Engine Fuel Feed Manifold Part #: G28018-26 Supplier: 81205 Part #: G28018-28 Supplier: 81205 Opt Part #: J28005-1 Supplier: 81205
SPL-4913	Fitting Assembly - Manifold, Fuel Feed, GE90 Part #: G28018-2 Supplier: 81205
SPL-4914	Fitting Assembly - Manifold, Fuel Feed (GEnx-2B, CF6-80C2, PW4000, or GE9X Engines)

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(Continued)

Reference	Description
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)
STD-1057	Air Source - Regulated, Dry Filtered, Compressed 60-105 PSIG (414-723.9 KPa)(22 SCFM)

D. Consumable Materials

Reference	Description	Specification
D00552 [C02-019]	Oil - Engine Lubricating	GE Spec. D50TF1
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
5	Packing	73-11-01-03-095	ARO ALL
7	Packing	73-11-01-03-065	ARO ALL

F. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
414	Right Fan Cowl - Left Engine
416	Right Thrust Reverser - Left Engine
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing

G. Prepare for Test

SUBTASK 28-22-15-650-023-001

(1) Defuel the main fuel tanks to less than 2,300 LB (1,000 KG) each.

NOTE: It is not necessary to defuel the center fuel tank. However, it is OK to defuel the center fuel tank.

(a) To defuel the main tanks, do one of these tasks:

1) Pressure Defueling, TASK 28-26-00-650-801.

2) To transfer fuel to the center tank, do this task: Tank to Tank Transfer, TASK 28-26-00-650-802.

SUBTASK 28-22-15-650-024-001

(2) Do these steps to make sure the jettison and APU fuel valves are in the correct positions:

(a) Make sure the airplane is in the ground mode.

1) If the airplane is not in the ground mode, put it in the ground mode. To put the airplane in the ground mode, do this task: Air/Ground Mode Simulation, TASK 32-09-00-860-801.

(b) Make sure the Jettison ARM switch is in the OFF position.

(c) Make sure the APU Start switch is in the OFF position.

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SUBTASK 28-22-15-860-063-001

(3) Make sure the speedbrake lever is in the DOWN position.

SUBTASK 28-22-15-040-002-001

(4) Open these circuit breakers and install safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	1	C74401	L ENG STBY IGN 1
A	2	C74407	L ENG STBY IGN 2
A	14	C74400	R ENG STBY IGN 1
A	15	C74406	R ENG STBY IGN 2
E	1	C74403	L ENG IGN 1
E	2	C74404	R ENG IGN 2
E	14	C74405	L ENG IGN 2
E	15	C74402	R ENG IGN 1

SUBTASK 28-22-15-650-025-001

(5) Do these steps to make sure the engine fuel valves are in the correct positions:

NOTE: There are two sets of engine fuel valves. The first set are the engine fuel shutoff valves which are installed on the engines. The second set are the engine fuel spar valves which are installed in the main fuel tanks. For this test the engine fuel shutoff valves are closed when the engine fuel spar valves are open. Do these steps to make sure the engine fuel shutoff valves are in the closed position.

(a) Make sure the engine AUTOSTART switch is in the ON position, on the P5 overhead panel.

(b) Make sure the left and right engine START/IGNITION switches are in the NORM position, on the P5 overhead panel.

(c) Put a DO-NOT-OPERATE placard on the left and right engine START/IGNITION switches, on the P5 overhead panel.

SUBTASK 28-22-15-860-023-001

(6) To decrease fuel pressures in the fuel feed manifold, do these steps:

(a) Put the DEFUEL VALVE switch, on the integrated refuel panel (IRP) P28, to the OPEN position.

(b) Put the forward and aft crossfeed valve switches, on the P5 overhead panel, to the OPEN position.

(c) Put the left and right engine fuel RUN-CUTOFF switches, on the P10 Control Stand, to the RUN position.

NOTE: This opens the fuel spar valves.

(d) Put the center tank refuel valve control switch to the OPEN position.

(e) Wait one (1) minute for the pressure in the manifold to vent and for the fuel to drain.

NOTE: The pressure in the refuel/jettison manifold will decrease when the valves are opened, however, the valve will automatically close when the back pressure in the manifold is not sufficient to move the spring-loaded valve poppet.

(f) Put the center tank refuel valve control switch to the CLOSE position.

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SUBTASK 28-22-15-650-026-001

(7) Wait 15 minutes to make sure the refuel/jettison manifold is fully drained.

NOTE: In this procedure, you will drain fuel through the refuel/jettison manifold into the fuel tanks.

SUBTASK 28-22-15-010-033-001

WARNING DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(8) Do these tasks in this sequence to safely open the thrust reversers:

(a) Retract the Leading Edge Slats, TASK 27-81-00-860-805.

(b) Leading Edge Slat - Deactivation, TASK 27-81-00-040-801.

(c) Open the Fan Cowl Panel (Selection), TASK 71-11-04-010-814-H00.

(d) Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-806-H00.

(e) Open the right thrust-reverser for each engine (TASK 78-31-00-010-816-H00).

SUBTASK 28-22-15-860-024-001

(9) Do these steps:

(a) To drain the fuel between the spar valve and the fuel pump for the left or right engine, do these steps for each engines:

NOTE: Do these steps for each engine, one engine at a time.

1) Put the 5-gallon (19-liter) fuel resistant container, STD-1054, below the fuel pump.

NOTE: Have an extra 5-gallon (19-liter) fuel resistant container, STD-1054, at each engine to transfer fuel that drains into a larger container.

2) Put the left or right engine fuel RUN-CUTOFF switches, on the P10 Control Stand, to the CUTOFF position.

NOTE: This closes the fuel spar valve before it drains.

3) Remove the fuel pump drain plugs [4] and [6] for the left or right engine (TASK 73-11-07-000-801-H01).

a) Discard the packing [5] and the packing [7].

4) Put a cotton wiper, G00034, below the strut connector to prevent engine damage from fuel (Figure 601, View D).

NOTE: You will disconnect the flexible fuel supply line in this procedure.

5) After the fuel drains, loosen the flexible fuel supply line [1] for the left or right engine (Figure 601, View D).

NOTE: If there is a vacuum in the fuel line, this will release the vacuum. When you release a vacuum, an additional small quantity of fuel can spill from the fuel pump drain plugs [4] and [6].

6) Re-tighten the flexible fuel supply line [1] for the left or right engine (Figure 601, View D).

NOTE: This is to make sure that no fuel leaks on the engine when you open the spar valve in the subsequent step.

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7) Put the left or right engine fuel RUN-CUTOFF switch, on the P10 Control Stand, to the RUN position.

NOTE: This opens the fuel spar valve. A small quantity of fuel can drain from the drain plugs [4] and [6] when you open the spar valve.

8) Wait 5 minutes to let fuel drain from the fuel feed manifold into the fuel tanks through refuel/jettison manifold.

(b) Disconnect the flexible fuel supply line [1] for the left or right engine (Figure 601, View D).

NOTE: A small quantity of fuel can spill from the fuel supply line. Use a cotton wiper, G00034, to absorb the fuel.

1) If more than a small quantity of fuel spills from the fuel supply line, do the steps that follow:

NOTE: If fuel continues to drain, the vacuum was not released from the line.

a) Put the left or right engine fuel RUN-CUTOFF switches, on the P10 Control Stand, to the CUTOFF position.

b) Re-tighten the flexible fuel supply line [1] for the left or right engine (Figure 601, View D).

c) Defuel the main tank:

<1> To defuel the main tanks, do one of these tasks:

<a> Pressure Defueling, TASK 28-26-00-650-801

<b> Suction Defueling, TASK 28-26-00-650-803

<c> Tank to Tank Transfer, TASK 28-26-00-650-802

2) Repeat the previous steps to drain the fuel from the fuel feed line.

(c) Apply a thin layer of clean oil, D00552 [C02-019], to a new packing [5] and a new packing [7] and install them on the drain plugs [4] and [6] respectively.

(d) Install the fuel pump drain plugs [4] and [6] (TASK 73-11-07-000-801-H01).

(e) Put the DEFUEL VALVE switch, on the integrated refuel panel (IRP) P28, to the CLOSED position.

SUBTASK 28-22-15-480-005-001

(10) Connect the engine fuel feed manifold test equipment, SPL-1776, and manifold fitting assembly, SPL-4913 or manifold fitting assembly, SPL-4914, to the engine fuel supply line, refer to sheet 8 (Figure 601).

H. Engine Fuel Feed Manifold - Leak Test

SUBTASK 28-22-15-860-025-001

(1) Do these steps to test the fuel feed manifold for leaks:

(a) Open these circuit breakers and install safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
B	4	C76601	L ENG FUEL VALVE
B	19	C76600	R ENG FUEL VALVE

(b) Close the bleed valve on the engine fuel feed manifold test equipment, SPL-1776, at the left or right engine.

(c) Use the compressed 60-105 PSIG dry filtered regulated air source, STD-1057, to apply 41.5 ±3.5 psig (286.1 ±24.2 kPa) air pressure to the fuel supply line at the engine.

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(d) Make sure the pressure is stable.

(e) Make a written record of the time.

(f) Isolate the air source from the fuel supply line.

1) If there are leaks in the fuel feed manifold, the air pressure in the manifold will decrease.

(g) Make sure the pressure at the fuel supply line does not decrease more than 1.5 psig (10.3 kPa) in 10 minutes.

1) If the pressure decreases more than 1.5 psig (10.3 kPa) in 10 minutes, there is a leak in the fuel feed manifold.

2) To isolate the leak, do this task: Engine Fuel Feed Manifold, Spar and Crossfeed Valve - Leak Check, TASK 28-22-15-790-802-001

(h) If the pressure does not decrease more than 1.5 psig (10.3 kPa) in 10 minutes, the fuel feed manifold is OK.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 28-22-15-410-029-001

(1) To remove the pressure check equipment from the engine fuel supply line, do these steps:

(a) Put the FWD and AFT fuel crossfeed switches, on the P5 Overhead Panel, to the CLOSED position.

(b) Remove the safety tags and close these circuit breakers:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
B	4	C76601	L ENG FUEL VALVE
B	19	C76600	R ENG FUEL VALVE

(c) Put the left and right engine fuel RUN-CUTOFF switches, on the P10 Control Stand, to the CUTOFF position.

NOTE: This closes the fuel spar valves.

CAUTION

DRAIN ALL OF THE FUEL IN THE FUEL SUPPLY LINE. IF YOU DO NOT DRAIN ALL OF THE FUEL, FUEL WILL SPILL FROM THE FUEL SUPPLY LINE ONTO THE ENGINE.

(d) Open the bleed valve on the engine fuel feed manifold test equipment, SPL-1776, to drain any fuel that remains in the fuel supply line.

(e) Remove the engine fuel feed manifold test equipment, SPL-1776, and manifold fitting assembly, SPL-4913 or manifold fitting assembly, SPL-4914, from the fuel supply line [1].

SUBTASK 28-22-15-410-030-001

(2) Do these steps:

(a) Connect the left and right engine fuel supply lines (TASK 73-11-07-400-801-H01).

(b) Do a leak check of the main fuel supply line, refer to the Power Plant Test reference table (TASK 71-00-00-800-833-H00).

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WARNING DO ALL OF THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(c) Do these tasks in this sequence to safely close the thrust reversers:

1) Close the Thrust Reverser (Selection), TASK 78-31-00-410-816-H00.
2) Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-805-H00.
3) Close the Fan Cowl Panel (Selection), TASK 71-11-04-410-814-H00.
4) Leading Edge Slat Reactivation, TASK 27-81-00-440-801.

SUBTASK 28-22-15-650-027-001

(3) Remove the DO-NOT-OPERATE placards from the left and right engine START/IGNITION switches, on the P5 overhead panel

SUBTASK 28-22-15-440-002-001

(4) Remove the safety tags and close these circuit breakers:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	1	C74401	L ENG STBY IGN 1
A	2	C74407	L ENG STBY IGN 2
A	14	C74400	R ENG STBY IGN 1
A	15	C74406	R ENG STBY IGN 2
E	1	C74403	L ENG IGN 1
E	2	C74404	R ENG IGN 2
E	14	C74405	L ENG IGN 2
E	15	C74402	R ENG IGN 1

SUBTASK 28-22-15-650-028-001

(5) Refuel the fuel tanks (TASK 12-11-01-650-801).

——— END OF TASK ———

TASK 28-22-15-700-802-001

4. Fuel Tube Damage Criteria - Inspection/Check

A. References

Reference	Title
20-10-09-300-801	Tube Repair (P/B 801)
28-22-15-000-802-001	Fuel Line, Fitting and Coupling - Removal (P/B 401)

B. Procedure

SUBTASK 28-22-15-210-010-001

(1) Visually examine all the fuel tubing to make sure it is tightly and correctly attached.

SUBTASK 28-22-15-420-028-001

(2) Adjust the installation of the tubes which are not correctly attached.

SUBTASK 28-22-15-210-011-001

(3) Visually examine all the fuel tubing for these types of damage and make sure the damage is permitted.

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(a) Make an inspection for cracks.

1) Make sure there are no cracks.

(b) Make an inspection for dents (areas that are pushed into the tubing).

NOTE: If any one of the following limitations is not met, the damage is not permitted and the part must be repaired or replaced.

1) All dents must have an area that is large compared to the depth of the dent.
2) No single dent in the tubing is permitted to decrease the diameter of the tube by more than 2.5 percent.
3) If there are multiple dents, the total dent depth (individual depths added together) in any section five times the tube diameter long, must be no more than 10 percent of the tube diameter.
4) The dents in the tubing must be farther than one diameter of the tube from the end of the tube.
5) The dents in the tubing must not have an area of more than 0.125 square inches.
6) If the dent in on the outer part of a bend in the tube, the dent must not have a depth of more than 0.015 inches.

(c) Do an inspection for nicks.

1) The nicks in the tubing must have a rounded bottom.
2) The nicks in the tubing must not have a depth of more than 0.004 inch.
3) You must remove all the burrs from the nick if there are some burrs.

(d) Do an inspection for fretting.

1) Fretting must not have a depth of more than 0.004 inch.

(e) Do an inspection for scoring.

1) If you find some small scoring, you can make it smooth again, but obey these conditions:
   a) The scoring must not be on the outer part of a bend.
   b) You must not remove more than 0.004 inch of metal.

(f) Do an inspection for tubes with a cross section that is not fully circular (tubes with ovality).

1) Calculate the percent ovality with this formula:

   percent ovality = [(OD Max - OD Min) ÷ (OD Nominal)] X 100

   a) OD Max is the maximum outer diameter of the tube
   b) OD Min is the minimum outer diameter of the tube
   c) OD Nominal is the outer diameter of the tube at a position where the tube is circular or almost circular.
2) The percent ovality must not be more than 10 percent.
3) The percent ovality must be more than 5 percent for tubes with a diameter of more than 2 inches.

(g) Do an inspection for wrinkles.

NOTE: The height of a wrinkle is the distance between a straight line that touches the high point of a wrinkle and a straight line that touches the low point of a wrinkle.

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1) Wrinkles must not have a height larger than the applicable maximum wrinkle height (Table 601):

Table 601/28-22-15-993-808-001 Allowable Wrinkle Height

Tube Diameter (inches)	Maximum Wrinkle Height (inches)
less than 1	0.020
1 to 1.99	0.030
2 to 2.99	0.040
3 or more	0.050

SUBTASK 28-22-15-350-003-001

(4) Repair or replace all the tubes which have damage that is not permitted (TASK 20-10-09-300-801) or (TASK 28-22-15-000-802-001).

SUBTASK 28-22-15-210-012-001

(5) Visually examine all the couplings for external indications of these types of damage and make sure the damage is permitted.

(a) Do an inspection for cracks.

1) No cracks are permitted.

(b) Do an inspection for scratches.

1) The scratches in the couplings must not have a depth of more than 0.004 inch.

(c) Do an inspection for nicks.

1) The nicks in the couplings must have rounded bottoms.

2) The nicks in the couplings must not have a depth of more than 0.004 inch.

3) You must remove all the burrs around the nick.

(d) Do an inspection for worn areas (galling).

1) No worn areas in the surfaces that have an O-ring seal are permitted.

SUBTASK 28-22-15-350-004-001

(6) Replace all the couplings which have damage that is not permitted (TASK 28-22-15-000-802-001).

——— END OF TASK ———

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CENTER TANK CHECK VALVE - REMOVAL/INSTALLATION

1. General

A. There are two center tank check valves.

B. This procedure contains two tasks. The first task removes the drain check valve. The second task installs the drain check valve.

TASK 28-22-16-000-801

2. Center Tank Check Valve - Removal

(Figure 401)

A. References

Reference	Title
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

C. Access Panels

Number	Name/Location
531AB	Access Door
631AB	Access Door

D. Procedure

SUBTASK 28-22-16-650-001

(1) To defuel the center fuel tank, do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-22-16-010-001

(2) To get access to the center tank check valve from the main fuel tank, do this task:

Open the left access panel

Number	Name/Location
531AB	Access Door

or the right access panel:

Number	Name/Location
631AB	Access Door

(a) To remove the applicable access door, do this task: Center Tank Access Door - Removal, TASK 28-11-02-000-801.

SUBTASK 28-22-16-650-002

WARNING OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. FAILURE TO OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS CAN CAUSE INJURY OR DAMAGE.

(3) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

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SUBTASK 28-22-16-020-001

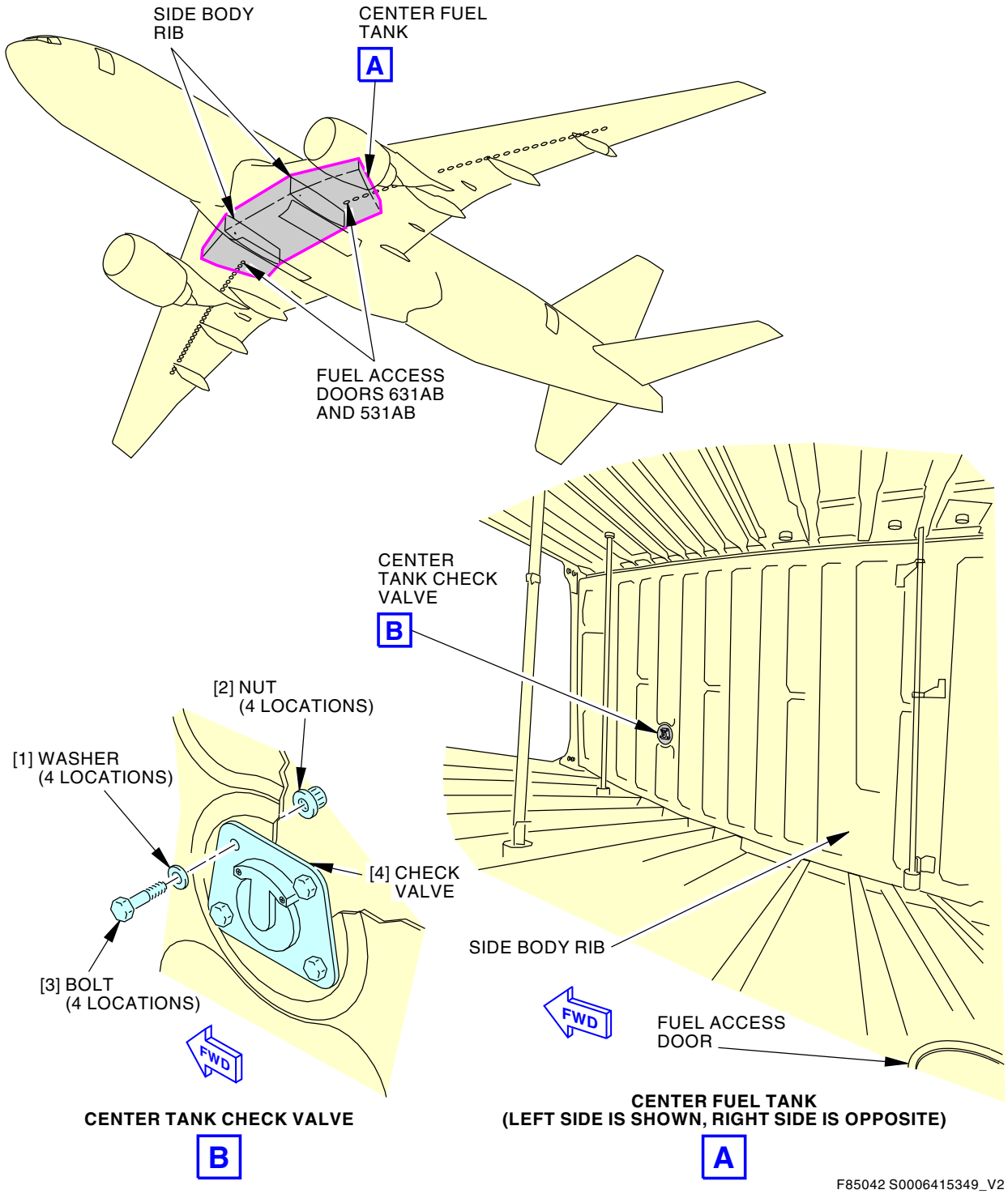
(4) Remove the four bolt [3], washer [1] and nut [2] from the center tank check valve [4].

SUBTASK 28-22-16-020-002

(5) Remove the center tank check valve [4] from the center tank.

——— END OF TASK ———

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Center Tank Check Valve Installation
Figure 401/28-22-16-990-801

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TASK 28-22-16-400-801

3. Center Tank Check Valve - Installation

(Figure 401)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
28-11-00-300-802	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-00-790-801	Fuel Leak Detection Procedures (P/B 601)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)

B. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

C. Access Panels

Number	Name/Location
531AB	Access Door
631AB	Access Door

D. Procedure

SUBTASK 28-22-16-650-003

WARNING OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. FAILURE TO OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS CAN CAUSE INJURY OR DAMAGE.

(1) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-22-16-010-002

(2) To get access to the center tank check valve,

Open the left access panel

Number	Name/Location
531AB	Access Door

or the right access panel:

Number	Name/Location
631AB	Access Door

SUBTASK 28-22-16-420-001

(3) Align the center tank check valve [4] into its position.

SUBTASK 28-22-16-650-004

(4) Make sure the flapper of the center tank check valve [4] is free to operate.

SUBTASK 28-22-16-420-002

(5) Install the bolt [3], washer [1] and nut [2] on the center tank check valve assembly [4] (TASK 28-11-00-300-802).

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SUBTASK 28-22-16-010-003

(6) Install the center tank left access panel

Number	Name/Location
531AB	Access Door

or the right access panel:

Number	Name/Location
631AB	Access Door

(a) To install the access door, do this task: Center Tank Access Door - Installation, TASK 28-11-02-400-801.

SUBTASK 28-22-16-650-005

(7) To refuel the applicable fuel tank, do this task: Pressure Refueling, TASK 12-11-01-650-801.

SUBTASK 28-22-16-210-001

(8) Make sure there are no fuel leaks at the applicable center fuel tank access door (TASK 28-11-00-790-801).

END OF TASK

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FUEL SYSTEM CONTROL PANEL - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

(1) Fuel System Module Assembly Removal

(2) Fuel System Module Assembly Installation.

TASK 28-22-17-000-801

2. Fuel System Module Assembly Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. Location Zones

Zone	Area
211	Flight Compartment, Left

B. Removal of the Fuel System Module Assembly

SUBTASK 28-22-17-020-001

(1) Do these steps to remove the module assembly [1]:

(a) Hold the fuel system module assembly.

(b) Disengage the quarter-turn fasteners.

CAUTION

CAREFULLY REMOVE THE FUEL SYSTEM MODULE ASSEMBLY. THIS WILL PREVENT DAMAGE TO THE ELECTRICAL CABLES AT THE REAR OF THE CONTROL MODULE.

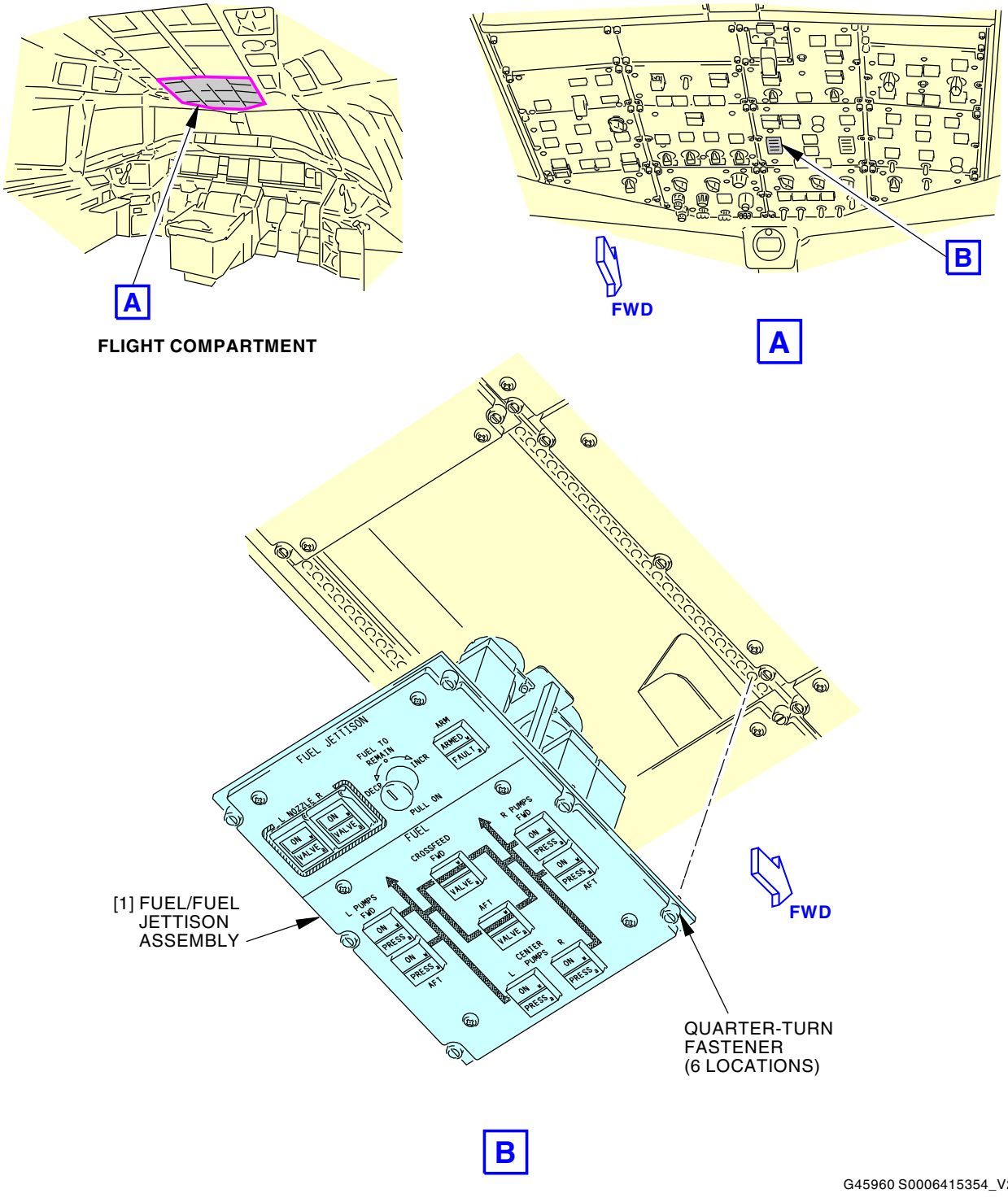
(c) Pull the module assembly [1] carefully out from the overhead panel to get access to the electrical connectors.

(d) Disconnect the electrical connectors.

(e) Put protective covers on the electrical connectors.

END OF TASK

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Fuel/Fuel Jettison Control Panel Installation
Figure 401/28-22-17-990-801

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TASK 28-22-17-400-801

3. Fuel System Module Assembly Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
28-22-00-730-801	Engine Fuel Feed Pumps and Crossfeed Valves - Functional Test (P/B 501)
28-31-00-720-801	Fuel Jettison System - Operational Test (P/B 501)

B. Location Zones

Zone	Area
211	Flight Compartment, Left

C. Installation of the Fuel System Module Assembly

SUBTASK 28-22-17-420-001

(1) Do these steps to install the electrical module assembly [1]:

(a) Remove the protective covers from the electrical connectors.

(b) Examine the electrical connectors for bent or broken pins, dirt and damage.

1) Clean or repair the electrical connectors if it is necessary.

(c) Connect the electrical connectors.

CAUTION

CAREFULLY INSTALL THE FUEL SYSTEM MODULE ASSEMBLY. THIS WILL PREVENT DAMAGE TO THE ELECTRICAL CABLES AT THE REAR OF THE CONTROL MODULE.

(d) Put the module assembly [1] carefully in its position in the overhead panel.

(e) Engage the quarter-turn fasteners.

D. Installation Test of the Fuel System Module Assembly

SUBTASK 28-22-17-720-001

(1) To do an operational test of the fuel system panel, do these steps:

(a) Put the FWD and AFT CROSSFEED switch-lights, on the P5 Overhead Panel, to the OPEN position.

(b) Make sure the manual override handles on the actuator move to the OPEN position.

(c) Put the FWD and AFT CROSSFEED switch-lights, on the P5 Overhead Panel, to the CLOSED position.

(d) Make sure the manual override handles on the move to the CLOSED position.

(e) Make sure the EICAS advisory messages, FUEL CROSSFEED FWD and FUEL CROSSFEED AFT, do not show on the EICAS display.

SUBTASK 28-22-17-710-001

(2) To do a complete test of the fuel system panel, do these procedures:

(a) Do this task: Engine Fuel Feed Pumps and Crossfeed Valves - Functional Test, TASK 28-22-00-730-801.

(b) Do this task: Fuel Jettison System - Operational Test, TASK 28-31-00-720-801.

END OF TASK

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GROUND FAULT INTERRUPTER RELAY - REMOVAL/INSTALLATION

1. General

A. There are seven ground fault interrupter (GFI) relays for the fuel boost pumps. The K28241 and K28123 GFI relays are found in the P110 power distribution panel. The K28242 GFI relay is found in the P210 power distribution panel. The K28253 and K28247 GFI relays are found in the P301 power distribution panel. The K28254 and K28248 GFI relays are found in the P302 power distribution panel. The K28121 GFI relay is found in the P320 ground service/handling panel.

B. This procedure has two tasks. The first task removes the GFI relay. The second task installs the GFI relay.

TASK 28-22-19-000-801

2. Ground Fault Interrupter (GFI) Relay - Removal

(Figure 401)

A. General

(1) This task gives instructions to remove the GFI relay.

B. References

Reference	Title
24-22-00-860-806	Remove Electrical Power (P/B 201)

C. Location Zones

Zone	Area
123	Area Below Forward Cargo Compartment, Left
124	Area Below Forward Cargo Compartment, Right

D. Access Panels

Number	Name/Location
117AL	Main Equipment Center Access Door

E. Prepare for the Removal

SUBTASK 28-22-19-040-001

WARNING REMOVE ELECTRICAL POWER BEFORE YOU REMOVE OR INSTALL COMPONENTS IN THE POWER DISTRIBUTION PANELS. THERE ARE HIGH VOLTAGES THAT CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(1) If electrical power is connected, do this task: Remove Electrical Power, TASK 24-22-00-860-806.

SUBTASK 28-22-19-210-001

(2) Make sure the applicable fuel pump switch-light on the P5 overhead panel is in the off position:

(a) L PUMPS AFT

(b) L PUMPS FWD

(c) R PUMPS AFT

(d) R PUMPS FWD

(e) CENTER PUMPS L

(f) CENTER PUMPS R.

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SUBTASK 28-22-19-860-001

(3) Open the applicable circuit breaker(s) and install safety tag(s):

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
C	18	C28302	R FWD FUEL BOOST PUMP L AC SECT 2
E	2	C28303	L AFT FUEL BOOST PUMP
E	5	C28307	L FWD FUEL BOOST PUMP
L	21	C28647	CTR L OVRD FUEL PUMP CTRL
L	22	C28645	L FUEL JETT PUMP CTRL
L	26	C28607	L AFT FUEL BOOST PUMP CTRL
L	27	C28606	R FWD FUEL BOOST PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
E	27	C28300	R AFT FUEL BOOST PUMP
F	27	C28306	R FWD FUEL BOOST PUMP R XFR
K	11	C28609	R AFT FUEL BOOST PUMP CTRL
K	14	C28646	R FUEL JETT PUMP CTRL
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

Standby Power Management Panel, P310

Row	Col	Number	Name
B	2	C28604	L FWD FUEL BOOST PUMP CTRL

SUBTASK 28-22-19-010-001

(4) Get access to the applicable GFI relay.

(a) Open this access panel:

Number	Name/Location
117AL	Main Equipment Center Access Door

F. GFI Relay Removal

SUBTASK 28-22-19-210-002

(1) Make sure that the applicable fuel pump switch-light on the P5 overhead panel is off (ON does not show).

(a) Open the applicable power distribution panel to get access to the GFI relay.

1) These GFI relays are found in the P110 panel:

a) K28241, right forward fuel boost pump

b) K28123, left aft fuel boost pump

2) This GFI relay is found in the P210 panel:

a) K28242, right aft fuel boost pump

3) These GFI relays are found in the P301 panel:

a) K28253, left override pump

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b) K28247, left jettison pump

4) These GFI relays are found in the P302 panel:

a) K28254, right override pump

b) K28248, right jettison pump

5) These GFI relays are found in the P320 panel:

a) K28121, left forward fuel boost pump

SUBTASK 28-22-19-020-001

(2) Remove the lock nuts and flat washers (four locations) from the applicable GFI relay.

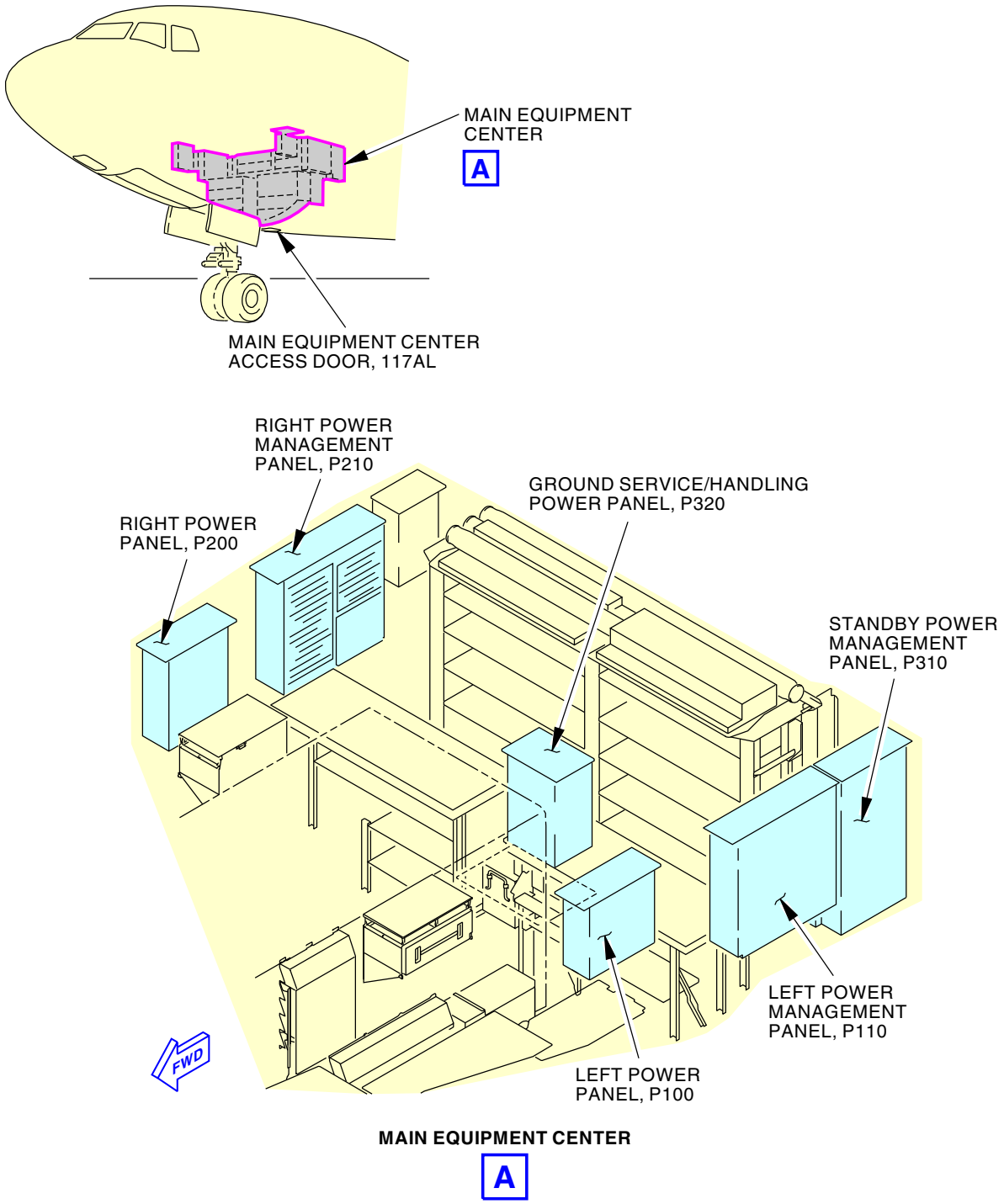
(a) Discard the four lock nuts and four washers.

SUBTASK 28-22-19-020-002

(3) Remove the applicable GFI relay.

END OF TASK

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Main Equipment Center Installation
Figure 401/28-22-19-990-801

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TASK 28-22-19-400-801

3. Ground Fault Interrupter (GFI) Relay - Installation

(Figure 401)

A. General

(1) This task gives instructions to install the GFI Relay

B. References

Reference	Title
28-22-00-710-803	Main Tank Fuel Boost Pump Ground Fault Interrupter - Operational Test (P/B 501)
28-22-00-710-806	Center Fuel Tank Override/Jettison Pump Ground Fault Protection - Operational Test (P/B 501)
28-22-00-710-807	Fuel Jettison Pump Ground Fault Protection - Operational Test (P/B 501)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

D. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Location Zones

Zone	Area
123	Area Below Forward Cargo Compartment, Left
124	Area Below Forward Cargo Compartment, Right

F. GFI Relay Installation

SUBTASK 28-22-19-010-003

(1) Get access to the applicable GFI relay on either the P110, P210, P301, P302 or P320 power panel.

SUBTASK 28-22-19-160-001

(2) Clean the contact surfaces of the mounting hardware and bonding surface for the GFI relay with a clean cotton wiper, G00034, moist with alcohol, B00130.

SUBTASK 28-22-19-820-001

(3) Put the GFI relay in its position.

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SUBTASK 28-22-19-020-003

(4) Install the supplied flat washers and lock nuts (four locations)

SUBTASK 28-22-19-020-004

(5) Tighten each lock nut 6 in-lb (0.68 N·m) to 7 in-lb (0.79 N·m) above the self-locking torque.

SUBTASK 28-22-19-760-001

(6) Measure the electrical bonding resistance between the GFI relay mounting flange to a point on the panel crossmember that is a distance of 1 in. (2.54 cm) or more from the point on the GFI relay mounting flange (SWPM 20-20-00).

(a) Use an intrinsically safe approved bonding meter, COM-1550.

(b) Make sure the resistance is 0.0025 ohm (2.5 milliohms) or less.

SUBTASK 28-22-19-860-002

(7) Remove the safety tags and close the applicable circuit breakers:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
C	18	C28302	R FWD FUEL BOOST PUMP L AC SECT 2
E	2	C28303	L AFT FUEL BOOST PUMP
E	5	C28307	L FWD FUEL BOOST PUMP
L	21	C28647	CTR L OVRD FUEL PUMP CTRL
L	22	C28645	L FUEL JETT PUMP CTRL
L	26	C28607	L AFT FUEL BOOST PUMP CTRL
L	27	C28606	R FWD FUEL BOOST PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
E	27	C28300	R AFT FUEL BOOST PUMP
F	27	C28306	R FWD FUEL BOOST PUMP R XFR
K	11	C28609	R AFT FUEL BOOST PUMP CTRL
K	14	C28646	R FUEL JETT PUMP CTRL
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

Standby Power Management Panel, P310

Row	Col	Number	Name
B	2	C28604	L FWD FUEL BOOST PUMP CTRL

G. GFI Relay Installation Test

SUBTASK 28-22-19-710-002

(1) Do the applicable task:

(a) Main Tank Fuel Boost Pump Ground Fault Interrupter - Operational Test, TASK 28-22-00-710-803

(b) Center Fuel Tank Override/Jettison Pump Ground Fault Protection - Operational Test, TASK 28-22-00-710-806

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(c) Fuel Jettison Pump Ground Fault Protection - Operational Test, TASK 28-22-00-710-807

——— END OF TASK ———

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APU FUEL FEED SYSTEM - MAINTENANCE PRACTICES

1. General

A. This procedure purges the APU fuel supply line of air and does a check of the APU fuel shutoff valve.

TASK 28-25-00-700-801

2. Purge the Air from the APU Fuel Supply Line

(Figure 201, Figure 202)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-02-010-801	APU Access Doors (Open) (P/B 201)
49-11-02-410-801	APU Access Doors (Close) (P/B 201)

B. Tools/Equipment

Reference	Description
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)

C. Location Zones

Zone	Area
315	APU Compartment, Left
316	APU Compartment, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing

D. Procedure

SUBTASK 28-25-00-650-001

(1) Make sure there is a minimum of 1000 LB (500 KG) in the left main fuel tank (TASK 12-11-01-650-801).

SUBTASK 28-25-00-210-001

(2) Make sure the APU master control switch on the overhead panel, P5, is in the OFF position and attach a DO-NOT-OPERATE tag.

SUBTASK 28-25-00-210-002

(3) Make sure all the switch-lights for the fuel pumps, on the Overhead Panel P5, are in the OFF position.

SUBTASK 28-25-00-860-001

(4) Open these circuit breakers and install safety tags:

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

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This circuit breaker is inoperative and should remain open:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
L	12	C49400	APU OIL HTR ASSY (INOP)

SUBTASK 28-25-00-860-007

(5) Open this circuit breaker and install safety tag:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	17	C28003	APU FUEL S/O VALVE

SUBTASK 28-25-00-860-008

(6) Make sure that these circuit breakers are closed:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
E	5	C28307	L FWD FUEL BOOST PUMP

Standby Power Management Panel, P310

Row	Col	Number	Name
B	2	C28604	L FWD FUEL BOOST PUMP CTRL

SUBTASK 28-25-00-010-001

(7) Do this task: APU Access Doors (Open), TASK 49-11-02-010-801.

SUBTASK 28-25-00-020-001

WARNING

DO NOT TOUCH THE APU GEARBOX HEATERS. THE GEARBOX HEATERS STAY HOT WHEN THERE IS AC POWER ON THE AIRPLANE. HOT COMPONENTS CAN BURN YOU.

(8) Disconnect the connector of the fuel supply line at the APU fuel control unit.

SUBTASK 28-25-00-860-002

(9) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-25-00-490-001

(10) Put the 5-gallon (19-liter) fuel resistant container, STD-1054 in position to catch the fuel from the fuel supply line.

SUBTASK 28-25-00-860-009

(11) Move the manual override handle, on the APU fuel shutoff valve actuator, to the OPEN position (Figure 203).

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SUBTASK 28-25-00-650-005

WARNING DO NOT OPERATE ANY FUEL PUMP IF THE AMBER PRESS LIGHT COMES ON AND STAYS ON. FUEL VAPORS IN THE TANK MAY IGNITE AND CAUSE A FIRE OR EXPLOSION.

(12) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

(a) Immediately set the applicable fuel pump switch-light(s) to OFF if the amber PRESS light comes on and stays on.

SUBTASK 28-25-00-860-003

(13) Put the L FWD PUMP switch-light, on the Overhead Panel P5, to the ON position.

SUBTASK 28-25-00-870-001

(14) Operate the left forward boost pump until a minimum of 4 gallons of fuel drains into the container.

NOTE: This purges air from the APU fuel supply line.

SUBTASK 28-25-00-860-004

(15) Put the L FWD PUMP switch-light to the OFF position.

SUBTASK 28-25-00-860-011

(16) Move the manual override handle, on the APU fuel shutoff valve actuator, to the CLOSED position (Figure 203).

SUBTASK 28-25-00-210-003

(17) Monitor the fuel leakage from the fuel line.

SUBTASK 28-25-00-200-001

(18) Make a written record of the drops per minute.

SUBTASK 28-25-00-860-012

(19) Put the L FWD PUMP switch-light, on the overhead panel P5, to the ON position.

SUBTASK 28-25-00-210-004

(20) Make sure the fuel leakage, in drops per minute, does not increase.

SUBTASK 28-25-00-860-013

(21) Put the L FWD PUMP switch-light to the OFF position.

SUBTASK 28-25-00-420-001

WARNING DO NOT TOUCH THE APU GEARBOX HEATERS. THE GEARBOX HEATERS STAY HOT WHEN THERE IS AC POWER ON THE AIRPLANE. HOT COMPONENTS CAN BURN YOU.

(22) Connect the APU fuel supply line to the APU fuel control unit.

SUBTASK 28-25-00-860-005

(23) Remove the DO-NOT-OPERATE tag from the APU master control switch on the P5 panel.

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SUBTASK 28-25-00-860-006

(24) Remove the safety tags and close these circuit breakers:

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Standby Power Management Panel, P310

Row	Col	Number	Name
B	6	C49601	APUC 1
K	8	C24652	APU CRK CTRL

This circuit breaker is inoperative and should remain open:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
L	12	C49400	APU OIL HTR ASSY (INOP)

SUBTASK 28-25-00-860-010

(25) Remove the safety tag and close this circuit breaker:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	17	C28003	APU FUEL S/O VALVE

SUBTASK 28-25-00-710-001

(26) Do these steps to test the APU fuel supply line:

(a) Put the APU start switch the ON position to pressurize the APU fuel line.

(b) Look for leaks at the fuel line connection at the APU fuel control unit.

(c) Put the APU start switch the OFF position.

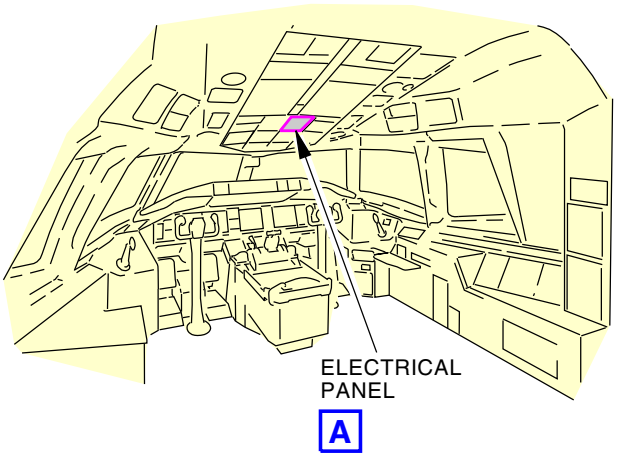
(d) Do this task: APU Starting and Operation, TASK 49-11-00-860-804.

SUBTASK 28-25-00-410-001

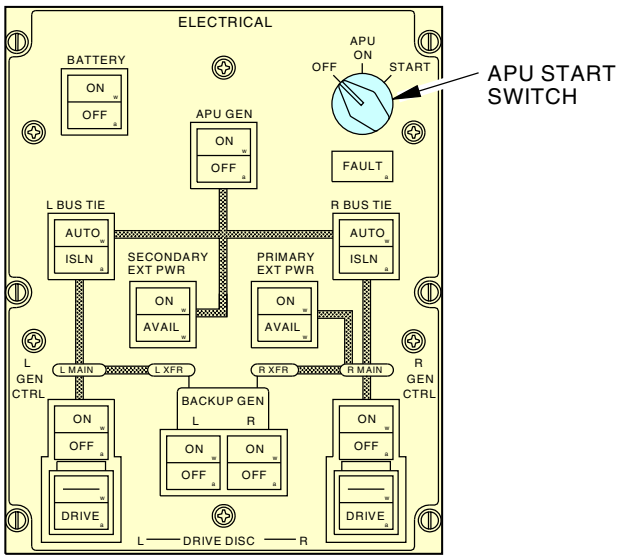
(27) Do this task: APU Access Doors (Close), TASK 49-11-02-410-801.

——— END OF TASK ———

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FLIGHT COMPARTMENT



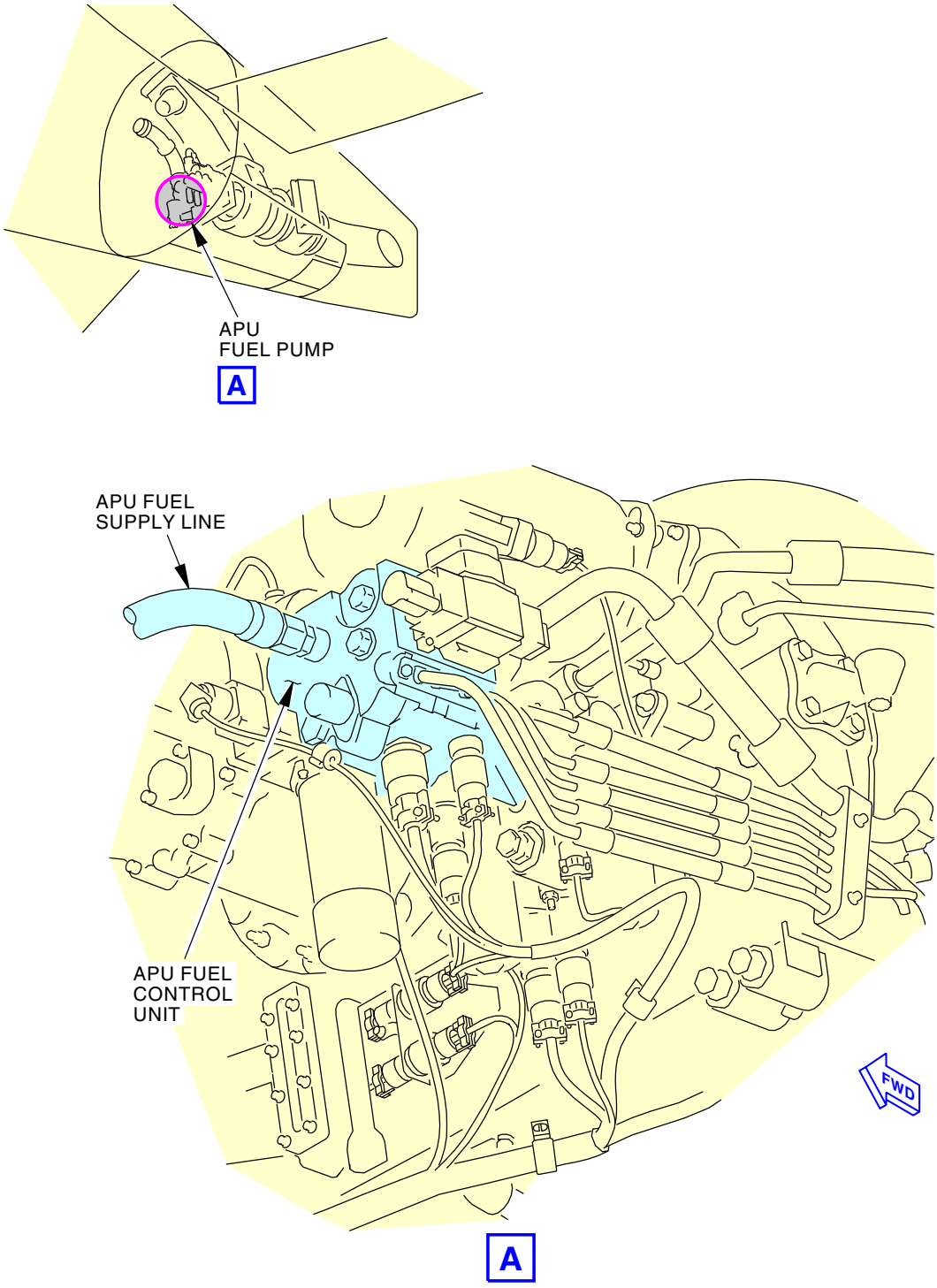
ELECTRICAL PANEL

A

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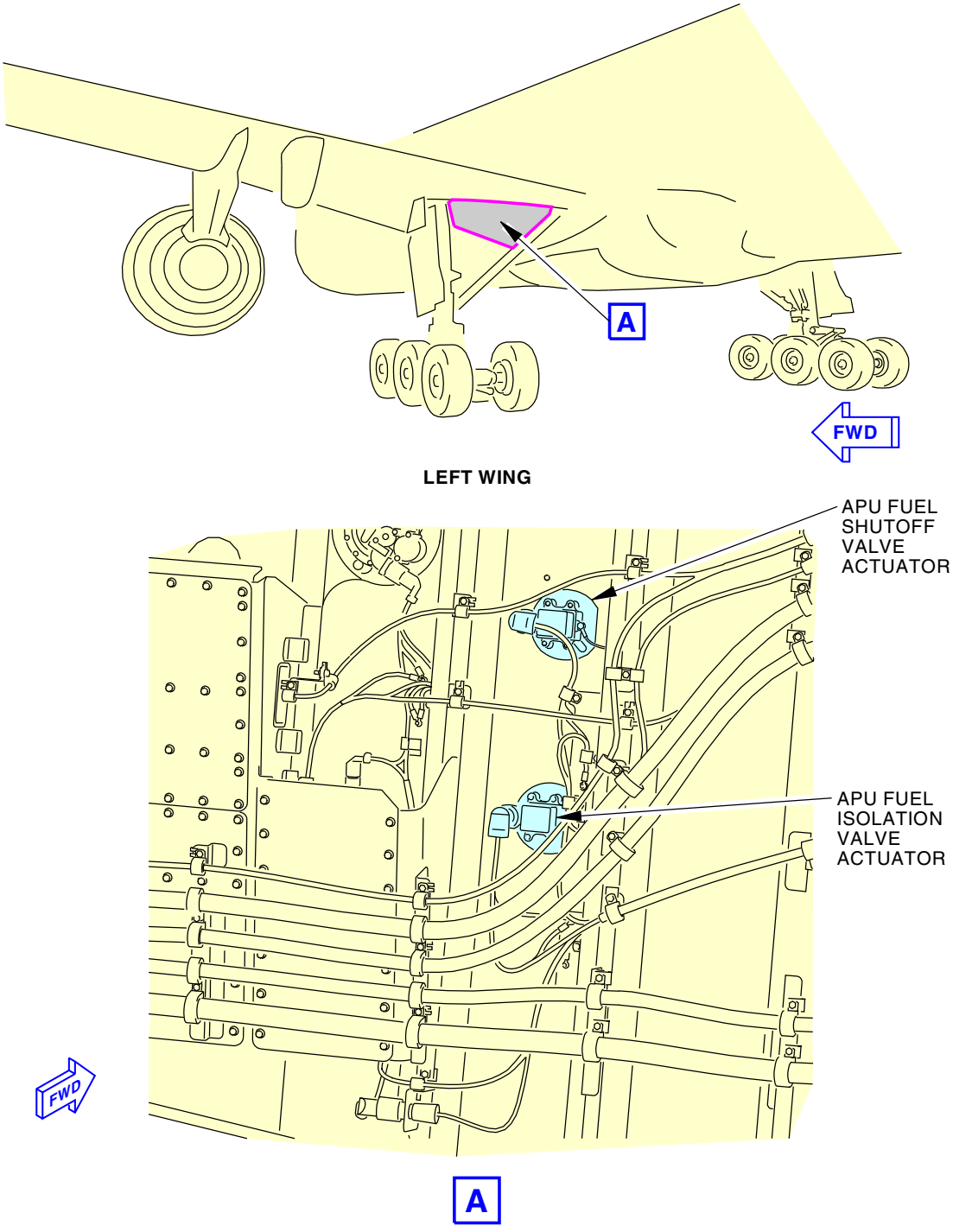
APU Start Switch
Figure 201/28-25-00-990-801

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APU Fuel Supply Line
Figure 202/28-25-00-990-802

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E52242 S0006415365_V2

APU Fuel Shutoff Valve Installation
Figure 203/28-25-00-990-803

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APU FUEL FEED SYSTEM - ADJUSTMENT/TEST

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure contains four tasks. The first task is a system test of the APU fuel feed system. The second test is an operational test of the APU DC pump and APU fuel shutoff valve. The third task is a leakage test of the APU fuel line shroud and drain. The fourth task is an insulation resistance test of the APU DC fuel pump.

C. To test the APU fuel supply line in operation, operate the APU (TASK 49-11-00-860-804).

TASK 28-25-00-710-801

2. APU Fuel Feed System - System Test

(Figure 501, Figure 502)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
32-09-00-860-801	Air/Ground Mode Simulation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)

B. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing

C. Prepare for Test

SUBTASK 28-25-00-860-036

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-25-00-860-037

(2) Make sure there is a minimum of 1000 lb (454 kg) of fuel in the left main fuel tank (TASK 12-11-01-650-801).

SUBTASK 28-25-00-860-038

(3) Make sure the APU start switch, on the P5 overhead panel, is in the OFF position.

SUBTASK 28-25-00-860-059

(4) Make sure all of the fuel pump switches, on the overhead panel P5, are in the OFF position.

D. APU Fuel Shutoff Valve and APU DC Fuel Pump Test

SUBTASK 28-25-00-860-039

(1) To deactivate the left forward boost pump:

(a) Open these circuit breakers and install safety tags:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
E	5	C28307	L FWD FUEL BOOST PUMP

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Standby Power Management Panel, P310

Row	Col	Number	Name
B	2	C28604	L FWD FUEL BOOST PUMP CTRL

SUBTASK 28-25-00-860-040

(2) Make sure that these circuit breakers are closed:

Standby Power Management Panel, P310

Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP
L	5	C26636	FIRE EXT APU
L	11	C28650	APU INLET DOOR/FUEL SOV CTRL

SUBTASK 28-25-00-860-041

(3) Open this circuit breaker:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	17	C28003	APU FUEL S/O VALVE

SUBTASK 28-25-00-860-015

(4) Make sure the EICAS message FUEL VALVE APU shows on the EICAS display.

SUBTASK 28-25-00-860-042

(5) Close this circuit breaker:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	17	C28003	APU FUEL S/O VALVE

SUBTASK 28-25-00-210-005

(6) Make sure the EICAS message FUEL VALVE APU does not show on the EICAS display.

SUBTASK 28-25-00-860-016

CAUTION DO NOT PUT THE APU START SWITCH TO THE START POSITION. IF YOU PUT THE APU START SWITCH TO THE START POSITION THE APU CAN START.

(7) Set the APU start switch, on the overhead panel P5, to the ON position.

SUBTASK 28-25-00-210-006

(8) Make sure the manual override handle on the APU shutoff valve moves to the OPEN position.

NOTE: The actuator for the APU fuel shutoff valve is installed on the rear spar of the left center fuel tank.

SUBTASK 28-25-00-700-001

(9) Listen to make sure the APU DC fuel pump operates.

NOTE: The APU fuel DC pump is installed on the rear spar of the left center fuel tank.

(a) If the low pressure indication light comes on for the APU DC fuel pump, immediately shut down the APU (TASK 49-11-00-860-805) so the pump will shut off.

NOTE: The switch for the APU DC fuel pump will not shut off the pump if the APU is operating.

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SUBTASK 28-25-00-860-017

CAUTION DO NOT PUT THE APU START SWITCH TO THE START POSITION. IF YOU PUT THE APU START SWITCH TO THE START POSITION THE APU CAN START.

(10) Set the APU start switch to the OFF position.

SUBTASK 28-25-00-210-017

(11) Make sure the EICAS status message FUEL PUMP APU does not show.

SUBTASK 28-25-00-210-007

(12) Make sure the manual override handle on the APU fuel shutoff valve moves to the CLOSED position.

SUBTASK 28-25-00-860-018

CAUTION DO NOT PUT THE APU START SWITCH TO THE START POSITION. IF YOU PUT THE APU START SWITCH TO THE START POSITION THE APU CAN START.

(13) Set the APU start switch to the ON position.

SUBTASK 28-25-00-860-019

CAUTION DO NOT TURN THE APU FIRE HANDLE. IF YOU TURN THE APU FIRE HANDLE, THE FIRE EXTINGUISHERS CAN DISCHARGE AND CAUSE DAMAGE TO EQUIPMENT.

(14) Push the APU fire handle release button and pull the fire handle out, on the overhead panel P5.

SUBTASK 28-25-00-210-008

(15) Make sure the manual override handle on the APU fuel shutoff valve moves to the CLOSED position.

SUBTASK 28-25-00-860-020

CAUTION DO NOT TURN THE APU FIRE HANDLE. IF YOU TURN THE APU FIRE HANDLE THE FIRE EXTINGUISHERS CAN DISCHARGE AND CAUSE DAMAGE TO EQUIPMENT.

(16) Push the APU fire handle in to reset.

SUBTASK 28-25-00-860-021

CAUTION DO NOT PUT THE APU START SWITCH TO THE START POSITION. IF YOU PUT THE APU START SWITCH TO THE START POSITION THE APU CAN START.

(17) Do these steps to cycle the APU start switch:

NOTE: You must do this to unlatch the electrical circuit.

(a) Set the APU start switch to the OFF position.

(b) Set the APU start switch to the ON position.

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SUBTASK 28-25-00-210-009

(18) Make sure the manual override handle on the APU fuel shutoff valve moves to the OPEN position.

SUBTASK 28-25-00-860-022

(19) Push the remote fire shutdown switch (S49003), on the P40 panel.

SUBTASK 28-25-00-210-010

(20) Make sure the manual override handle on the APU fuel shutoff valve moves to the CLOSED position.

SUBTASK 28-25-00-860-023

(21) Push the FIRE/OVHT TEST button on the Cargo Fire/Engine Control Panel, installed on the overhead panel P5.

SUBTASK 28-25-00-860-058

CAUTION DO NOT PUT THE APU START SWITCH TO THE START POSITION. IF YOU PUT THE APU START SWITCH TO THE START POSITION THE APU CAN START.

(22) Do these steps to cycle the APU start switch:

NOTE: You must do this to unlatch the electrical circuit.

(a) Set the APU start switch to the OFF position.

(b) Set the APU start switch to the ON position.

SUBTASK 28-25-00-210-011

(23) Make sure the manual override handle on the APU fuel shutoff valve moves to the OPEN position.

SUBTASK 28-25-00-860-024

(24) Set the APU start switch to the OFF position.

SUBTASK 28-25-00-860-043

(25) To activate the left forward boost pump, do these steps:

WARNING DO NOT OPERATE ANY FUEL PUMP IF THE AMBER PRESS LIGHT COMES ON AND STAYS ON. FUEL VAPORS IN THE TANK MAY IGNITE AND CAUSE A FIRE OR EXPLOSION.

(a) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

1) Immediately set the applicable fuel pump switch-light(s) to OFF if the amber PRESS light comes on and stays on.

(b) Remove the safety tags and close these circuit breakers:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
E	5	C28307	L FWD FUEL BOOST PUMP

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Standby Power Management Panel, P310

Row	Col	Number	Name
B	2	C28604	L FWD FUEL BOOST PUMP CTRL

(c) Push the forward left pump switchlight, on the P5 overhead panel, to the ON position.

(d) Make sure the EICAS message FUEL PUMP L FWD goes off.

(e) Push the forward left pump switchlight to the OFF position.

E. APU Fuel Isolation Valve Test

SUBTASK 28-25-00-860-025

(1) Open these circuit breakers and install safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	17	C28003	APU FUEL S/O VALVE
E	1	C74403	L ENG IGN 1

Standby Power Management Panel, P310

Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP
F	5	C28638	APU FUEL ISLN VLV
L	5	C26636	FIRE EXT APU
L	11	C28650	APU INLET DOOR/FUEL SOV CTRL

SUBTASK 28-25-00-860-026

(2) Put the airplane in the air mode. To put it in the air mode, do this task: Air/Ground Mode Simulation, TASK 32-09-00-860-801.

SUBTASK 28-25-00-210-020

(3) Make sure the left and right engine START switches are in the NORMAL position.

SUBTASK 28-25-00-210-021

(4) Make sure the APU is off or do these steps:

(a) Open these circuit breakers and install safety tags:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
E	5	C28307	L FWD FUEL BOOST PUMP

Standby Power Management Panel, P310

Row	Col	Number	Name
B	2	C28604	L FWD FUEL BOOST PUMP CTRL

SUBTASK 28-25-00-210-022

(5) Put the L FUEL CONTROL switch, on the aisle stand P10, to the RUN position.

SUBTASK 28-25-00-210-012

(6) Make sure the EICAS message FUEL ISLN VALVE APU shows on the EICAS display.

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SUBTASK 28-25-00-860-027

(7) Remove the safety tag and close this circuit breaker:

Standby Power Management Panel, P310

Row	Col	Number	Name
F	5	C28638	APU FUEL ISLN VLV

SUBTASK 28-25-00-210-013

(8) Make sure the manual override handle on the APU fuel isolation valve moves to the OPEN position.

SUBTASK 28-25-00-210-024

(9) Do these steps to cycle the APU fuel isolation valve:

NOTE: The APU fuel isolation valve must be closed and then opened again to clear the EICAS message.

(a) Put the L FUEL CONTROL switch, on the aisle stand P10, to the CUTOFF position.

(b) Make sure the manual override handle on the APU fuel isolation valve moves to the CLOSED position.

(c) Put the L FUEL CONTROL switch, on the aisle stand P10, to the RUN position again.

(d) Put the L FUEL CONTROL switch, on the aisle stand P10, to the CUTOFF position again.

SUBTASK 28-25-00-210-018

(10) Make sure the EICAS message FUEL ISLN VALVE APU does not show on the EICAS display.

SUBTASK 28-25-00-860-044

(11) Put the airplane in the ground mode. To put it in the ground mode, do this task: Air/Ground Mode Simulation, TASK 32-09-00-860-801.

SUBTASK 28-25-00-860-057

(12) If you opened these circuit breakers, do these steps:

(a) Remove the safety tags and close these circuit breakers:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
E	5	C28307	L FWD FUEL BOOST PUMP

Standby Power Management Panel, P310

Row	Col	Number	Name
B	2	C28604	L FWD FUEL BOOST PUMP CTRL

F. Put the Airplane Back to Its Usual Condition

SUBTASK 28-25-00-860-072

(1) Recycle the APU GEN CTRL switch by pushing the switch to the OFF position then pushing it again to the ON position.

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SUBTASK 28-25-00-860-045

(2) Remove the safety tags and close these circuit breakers:

Overhead Circuit Breaker Panel, P11

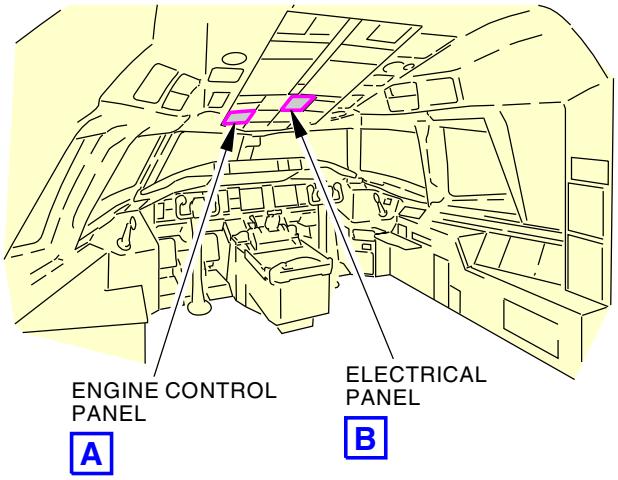
Row	Col	Number	Name
A	17	C28003	APU FUEL S/O VALVE

Standby Power Management Panel, P310

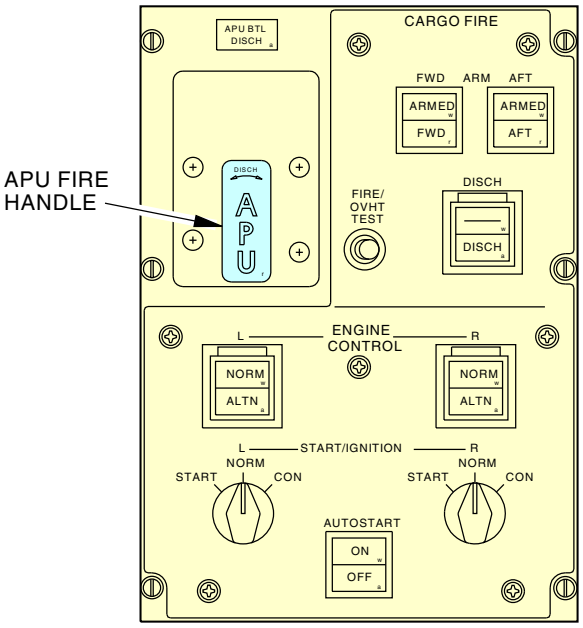
Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP
L	5	C26636	FIRE EXT APU
L	11	C28650	APU INLET DOOR/FUEL SOV CTRL

END OF TASK

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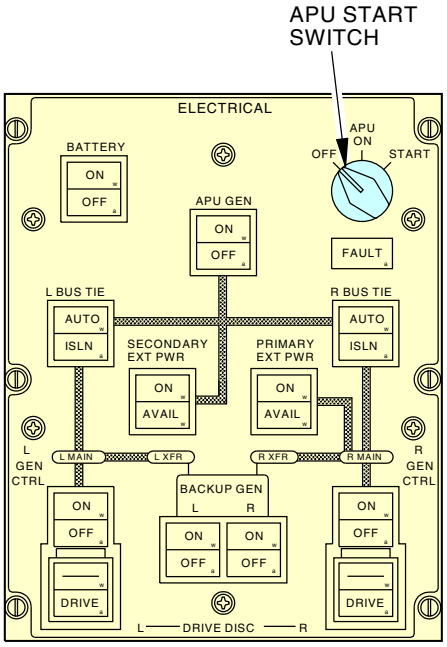


FLIGHT COMPARTMENT



ENGINE CONTROL PANEL

A



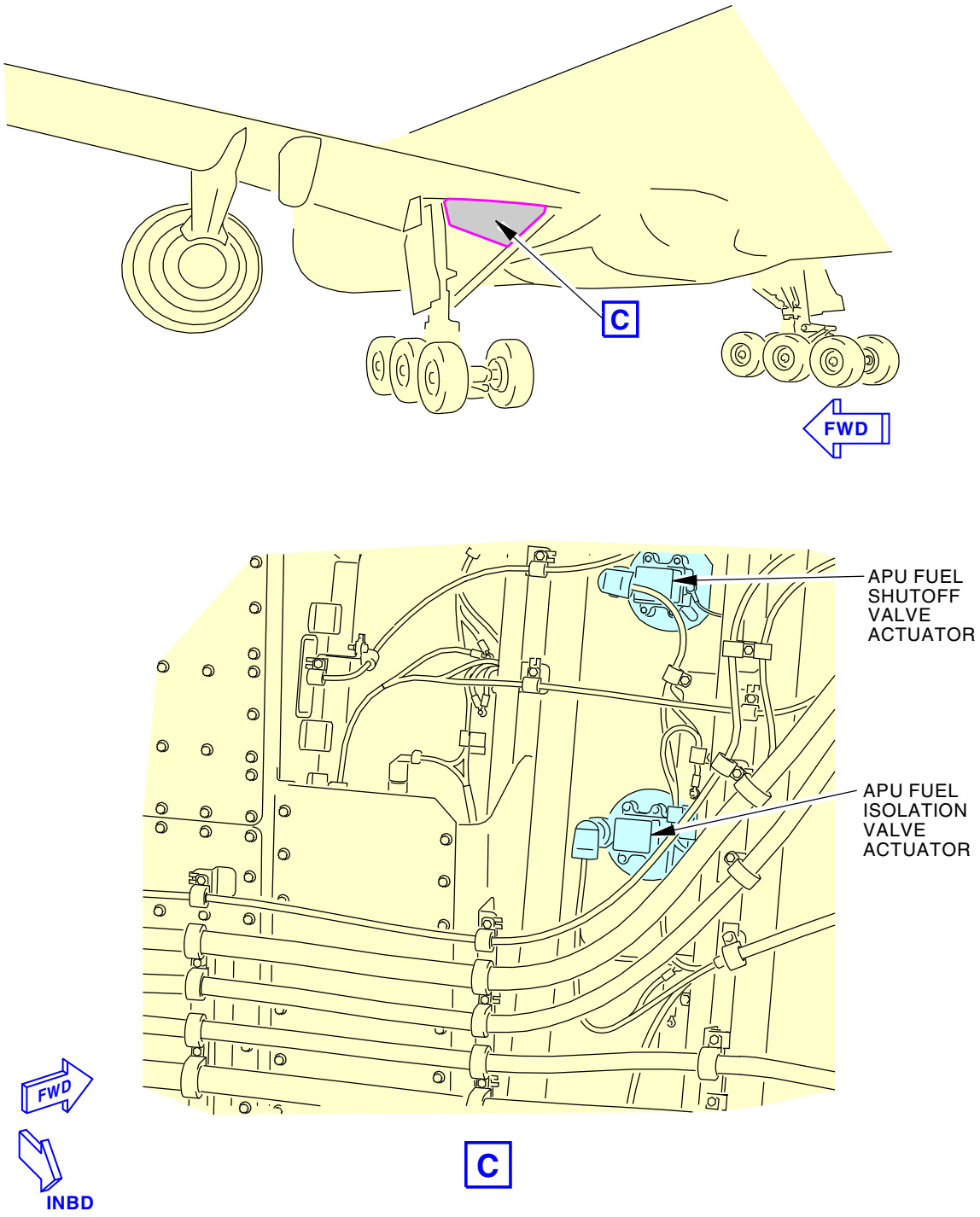
ELECTRICAL PANEL

B

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APU Fuel System
Figure 501/28-25-00-990-804 (Sheet 1 of 2)

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APU Fuel System
Figure 501/28-25-00-990-804 (Sheet 2 of 2)

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TASK 28-25-00-710-802

3. APU Fuel Shutoff Valve and DC Pump - Operational Test

(Figure 501, Figure 502)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)

B. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing

C. Prepare for Test

SUBTASK 28-25-00-860-046

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-25-00-860-047

(2) Make sure there is a minimum of 1000 LB (500 KG) of fuel in the left main fuel tank (TASK 12-11-01-650-801).

SUBTASK 28-25-00-860-048

(3) To deactivate the left forward boost pump:

(a) Open these circuit breakers and install safety tags:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
E	5	C28307	L FWD FUEL BOOST PUMP

Standby Power Management Panel, P310

Row	Col	Number	Name
B	2	C28604	L FWD FUEL BOOST PUMP CTRL

SUBTASK 28-25-00-860-049

(4) Make sure that these circuit breakers are closed:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	17	C28003	APU FUEL S/O VALVE

Standby Power Management Panel, P310

Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP

D. Procedure

SUBTASK 28-25-00-860-050

(1) Go to the EICAS maintenance page for FUEL MANAGEMENT.

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(a) Make sure the APU FUEL FEED data for the S/O VLV COMMAND and STATUS indication show as CLOSED and CLOSED respectively.

(b) Make sure the APU FUEL FEED data for the DC PUMP STATUS indication shows as NO PRESS.

SUBTASK 28-25-00-860-051

CAUTION DO NOT PUT THE APU START SWITCH TO THE START POSITION. IF YOU PUT THE APU START SWITCH TO THE START POSITION THE APU CAN START.

(2) Set the APU start switch, on the overhead panel P5, to the ON position.

SUBTASK 28-25-00-860-052

(3) Look at the EICAS maintenance page for FUEL MANAGEMENT.

(a) Make sure the APU FUEL FEED data for the S/O VLV COMMAND and STATUS indication show as OPEN and OPEN respectively.

(b) Make sure the APU FUEL FEED data for the DC PUMP STATUS indication shows as PRESS.

SUBTASK 28-25-00-860-053

CAUTION DO NOT PUT THE APU START SWITCH TO THE START POSITION. IF YOU PUT THE APU START SWITCH TO THE START POSITION THE APU CAN START.

(4) Set the APU start switch to the OFF position.

SUBTASK 28-25-00-860-054

(5) Look at the EICAS maintenance page for FUEL MANAGEMENT.

(a) Make sure the APU FUEL FEED data for the S/O VLV COMMAND and STATUS indication show as CLOSED and CLOSED respectively.

(b) Make sure the APU FUEL FEED data for the DC PUMP STATUS indication shows as NO PRESS.

SUBTASK 28-25-00-860-055

(6) To activate the left forward boost pump, do these steps:

WARNING DO NOT OPERATE ANY MAIN TANK BOOST PUMP IF THE AMBER PRESS LIGHT IS FULLY ON. FUEL VAPORS IN THE TANK MAY IGNITE AND CAUSE A FIRE OR EXPLOSION.

(a) To operate the main tank boost pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable main tank.

1) Immediately push the applicable fuel boost pump switch-light(s) to OFF if the amber PRESS light comes on for one or more of the boost pumps in that tank.

(b) Remove the safety tags and close these circuit breakers:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

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Left Power Management Panel, P110

Row	Col	Number	Name
E	5	C28307	L FWD FUEL BOOST PUMP

Standby Power Management Panel, P310

Row	Col	Number	Name
B	2	C28604	L FWD FUEL BOOST PUMP CTRL

(c) Push the forward left pump switchlight, on the P5 overhead panel, to the ON position.

(d) Make sure the EICAS message FUEL PUMP L FWD goes off.

(e) Push the forward left pump switchlight to the OFF position.

——— END OF TASK ———

TASK 28-25-00-780-801

4. Pressure Test - APU Fuel Line Shroud and Drain Tubing

(Figure 501, Figure 502)

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This procedure does a pressure decay test of the shroud for the APU fuel line and the drain line tubing.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-1767	Assembly - Adapter, APU Fuel Line Shroud Part #: A28005-81 Supplier: 81205
SPL-1782	Hose - Test, Leak, APU Fuel Line Shroud Part #: A28005-82 Supplier: 81205 Opt Part #: A28005-42 Supplier: 81205 Opt Part #: A28005-50 Supplier: 81205
STD-1082	Source - Air, Regulated, Dry Filtered, 0-50 PSIG

D. Location Zones

Zone	Area
153	Area Below Aft Cargo Compartment, Left
154	Area Below Aft Cargo Compartment, Right

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E. Procedure

SUBTASK 28-25-00-210-015

(1) Make sure the landing gear downlock pins for the nose and main landing gear are installed (TASK 32-00-30-480-801).

SUBTASK 28-25-00-910-001

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND MOVE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS.

(2) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-25-00-650-002

(3) Make sure there is more than 800 LB (400 KG) of fuel in the left main fuel tank (TASK 12-11-01-650-801).

SUBTASK 28-25-00-860-029

(4) Make sure the APU start switch on the overhead panel P5, is in the off position.

SUBTASK 28-25-00-860-030

(5) Attach a DO-NOT-OPERATE tag to the APU start switch.

SUBTASK 28-25-00-860-032

(6) Open these circuit breakers and install safety tags:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	17	C28003	APU FUEL S/O VALVE

Standby Power Management Panel, P310

Row	Col	Number	Name
L	5	C26636	FIRE EXT APU
L	11	C28650	APU INLET DOOR/FUEL SOV CTRL

SUBTASK 28-25-00-210-016

(7) Move the manual override handle on the APU fuel shutoff valve to the OPEN position (Figure 501).

SUBTASK 28-25-00-650-006

WARNING DO NOT OPERATE ANY FUEL PUMP IF THE AMBER PRESS LIGHT COMES ON AND STAYS ON. FUEL VAPORS IN THE TANK MAY IGNITE AND CAUSE A FIRE OR EXPLOSION.

(8) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

(a) Immediately set the applicable fuel pump switch-light(s) to OFF if the amber PRESS light comes on and stays on.

SUBTASK 28-25-00-860-033

(9) Push the LEFT FWD PUMP switchlight, on the overhead panel P5, to the ON position.

NOTE: This step pressurizes the APU fuel supply line.

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SUBTASK 28-25-00-480-001

CAUTION ADJUST TESTER NIPPLE FOR CORRECT FIT AND DO NOT APPLY TOO MUCH FORCE TO THE CLAMP HANDLE. YOU CAN DAMAGE THE DRAIN LINE TUBE IF YOU USE TOO MUCH FORCE.

(10) Attach the leak test APU fuel line shroud assembly adapter, SPL-1767 and APU fuel line shroud leak test hose, SPL-1782 to the APU shroud drain line at the drain mast (Figure 502).

NOTE: Hose A28005-50 did not replace A28005-42; function of these tools are the same. Hose A28005-42 can continue to be used.

SUBTASK 28-25-00-480-002

(11) Connect the 0-50 psig dry filtered regulated air source, STD-1082 to the leak test hose.

SUBTASK 28-25-00-780-001

CAUTION DO NOT APPLY MORE THAN 25 PSIG OF PRESSURE TO THE SHROUD OF THE APU FUEL LINE. TOO MUCH PRESSURE CAN DAMAGE THE HOSE OF THE APU FUEL LINE.

(12) Slowly and continuously apply pressure to the APU shroud until the pressure is 18 ± 1 psig (124 ± 7 kPa).

NOTE: Make sure the pressure is stable at 18 ± 1 psig (124 ± 7 kPa).

SUBTASK 28-25-00-210-014

(13) After the pressure is stable, remove the air pressure source and make sure the pressure does not decrease more than 0.2 psi (1.4 kPa) in 10 minutes.

SUBTASK 28-25-00-780-002

(14) Slowly and continuously decrease the pressure to zero.

SUBTASK 28-25-00-080-001

(15) Disconnect the leak test adapter from the APU shroud drain line at the drain mast.

SUBTASK 28-25-00-860-034

(16) Push the LEFT FWD PUMP switchlight to the OFF position.

SUBTASK 28-25-00-860-035

(17) Remove the safety tags and close these circuit breakers:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	17	C28003	APU FUEL S/O VALVE

Standby Power Management Panel, P310

Row	Col	Number	Name
L	5	C26636	FIRE EXT APU
L	11	C28650	APU INLET DOOR/FUEL SOV CTRL

SUBTASK 28-25-00-210-025

(18) Make sure the manual override handle on the APU fuel shutoff valve moves to the CLOSE position (Figure 501).

SUBTASK 28-25-00-860-031

(19) Remove the DO-NOT-OPERATE tag from the APU start switch.

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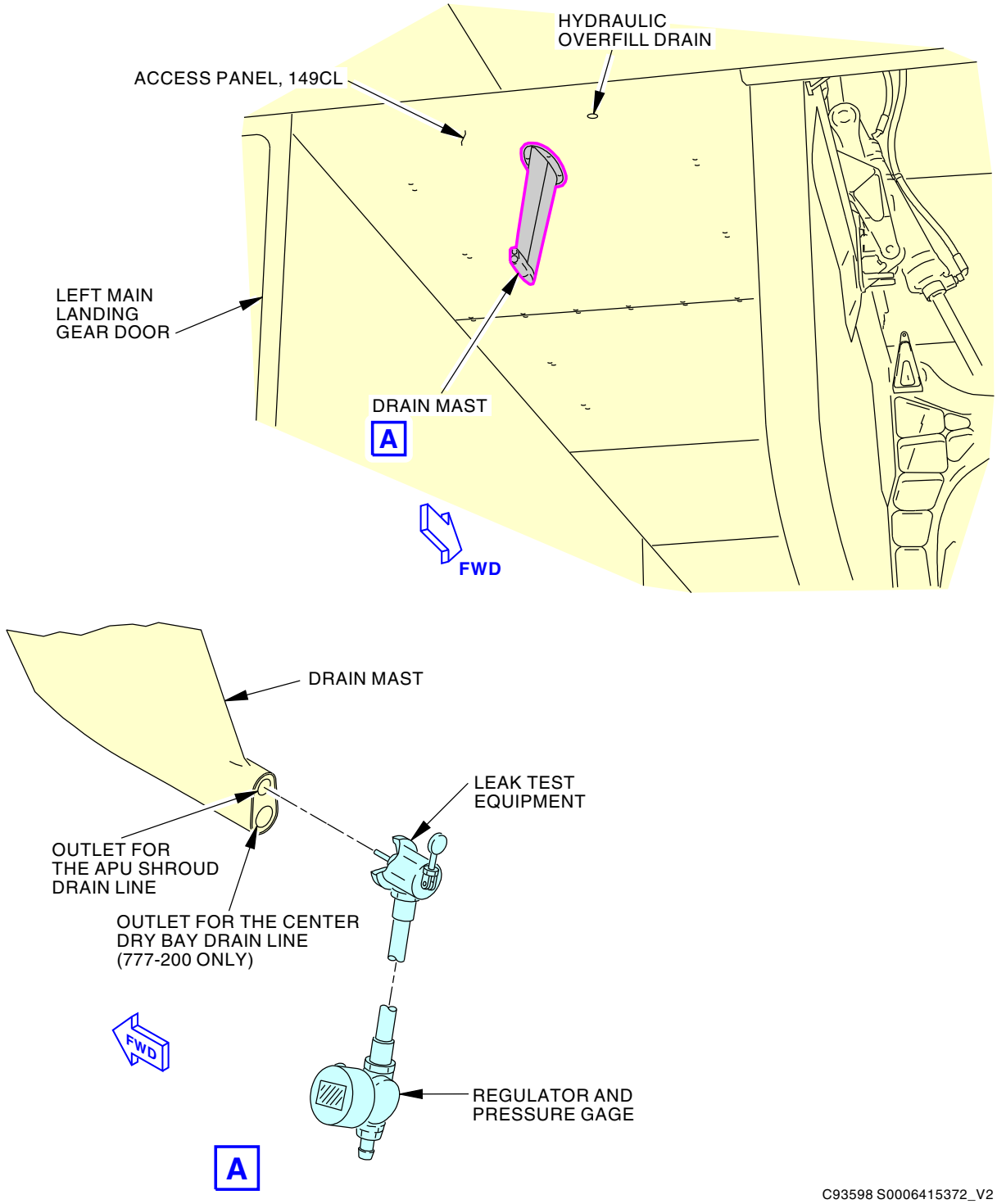
SUBTASK 28-25-00-910-002

WARNING OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND MOVE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(20) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

——— END OF TASK ———

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APU Shroud and Drain Tubing Leak Test
Figure 502/28-25-00-990-805

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TASK 28-25-00-760-801

5. APU DC Fuel Pump - Insulation Resistance Test

A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

(2) This task does an insulation resistance test of this DC fuel system pump:

(a) APU DC fuel pump

(3) If this task is done because a circuit breaker, ELCU, or GFI/GFP has opened for a fuel pump, you must complete and pass this test before you reset the circuit breaker, ELCU or GFI/GFP.

(4) When you use the insulation meter, COM-6457, it is recommended that the insulation meter be insulated from any metal work stands. It is also recommended that protective clothing (rubber gloves, insulated shoes, etc.) be worn when you make these measurements. The insulation meter should be plugged into a grounded receptacle to reduce the possibility of electrical shock.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-25-03-000-801	APU DC Fuel Pump (Motor-Impeller) - Removal (P/B 401)
28-25-03-400-801	APU DC Fuel Pump (Motor-Impeller) - Installation (P/B 401)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
SWPM 20-60-01	Cleaning of Electrical Connectors

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

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(Continued)

Reference	Description
COM-6457	Meter - Insulation (Range: 1-1,000 VDC or equivalent, select meter per test requirements) Part #: 1863-9700 Supplier: 62015 Part #: 1864-9700 Supplier: 62015 Part #: 1865PLUS Supplier: 62015 Part #: 1865PLUSCE Supplier: 62015 Opt Part #: 1865-00-CE Supplier: 62015

D. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing

E. Prepare for the Test

SUBTASK 28-25-00-860-066

(1) Supply electrical power, if it is necessary (TASK 24-22-00-860-805).

SUBTASK 28-25-00-860-067

WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR BEFORE YOU MOVE THE CONTROL LEVER. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.

SUBTASK 28-25-00-860-068

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-25-00-860-069

(4) Make sure that this circuit breaker is open and has safety tag:

Standby Power Management Panel, P310

Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP

F. Fuel Pump Wire Terminal Assembly Inspection

NOTE: It is necessary to do these procedures at the APU DC fuel pump: Fuel Pump Wire Terminal Assembly Inspection, Fuel Pump Continuity Check, Initial Insulation Resistance Test, and the Final Insulation Resistance Test.

SUBTASK 28-25-00-010-006

(1) Get access to the APU DC fuel pump.

SUBTASK 28-25-00-210-026

(2) Do a visual inspection of the wire terminal assembly.

NOTE: Also do these visual inspections at the airplane side of the wire terminal assembly and repair as necessary.

(a) Look for these conditions:

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1) Indication that fuel has leaked from the wire terminal assembly.
2) Indication that the terminal assembly or wire insulation is discolored because of too much heat.
   a) Clean the wire bundle caps (SWPM 20-60-01).
3) Indication of damage to the wire terminal assembly, for example:
   a) bulges
   b) bent flanges
   c) broken screws
   d) medium to heavy corrosion damage

SUBTASK 28-25-00-760-001

(3) If the visual check shows the APU DC fuel pump is okay, do this procedure: Fuel Pump Continuity Check.

SUBTASK 28-25-00-900-001

(4) If the visual check shows that the fuel pump is not okay, replace the APU DC fuel pump:
   (a) APU DC Fuel Pump (Motor-Impeller) - Removal, TASK 28-25-03-000-801,
   (b) APU DC Fuel Pump (Motor-Impeller) - Installation, TASK 28-25-03-400-801.

SUBTASK 28-25-00-760-002

(5) Do the continuity/resistance checks for the replacement fuel pump.
   (a) Start with this procedure: Fuel Pump Continuity Check.

G. Fuel Pump Continuity Check

SUBTASK 28-25-00-020-002

(1) Disconnect the electrical connector from the APU DC fuel pump (motor-impeller).

SUBTASK 28-25-00-760-003

WARNING MAKE SURE THAT THE METER USED TO MEASURE BONDING JUMPER CONTINUITY IS RESISTANT TO EXPLOSION. IF NOT, IT IS POSSIBLE THAT AN EXPLOSION OR FIRE CAN OCCUR.

(2) Use an intrinsically safe approved bonding meter, COM-1550:
   (a) Measure the resistance between pin C on the electrical connector and the braided bonding jumper on the APU DC fuel pump.
      NOTE: The measurement between pin C and the bonding jumper is a continuity check, not a bonding resistance check.

SUBTASK 28-25-00-760-004

(3) If the resistance is less than 5 ohms, do this procedure: Initial Insulation Resistance Test.

SUBTASK 28-25-00-760-005

(4) If the resistance is more than 5 ohms, do these steps:
   (a) Replace the APU DC fuel pump:
      1) APU DC Fuel Pump (Motor-Impeller) - Removal, TASK 28-25-03-000-801,
      2) APU DC Fuel Pump (Motor-Impeller) - Installation, TASK 28-25-03-400-801.
   (b) Do the continuity/resistance checks for the replacement APU DC fuel pump.
      1) Start with this procedure: Fuel Pump Continuity Check.

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H. Initial Insulation Resistance Test

SUBTASK 28-25-00-480-005

(1) Use the instructions given with the insulation meter, COM-6457, to calibrate the equipment.

28-AWL-17: CDCCL

(a) Make sure the insulation meter, has 10 VDC and 500 VDC voltage supply options with a maximum short circuit current of 5 milliamperes.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

SUBTASK 28-25-00-760-006

(2) RESISTANCE TEST WITH THE APU DC FUEL PUMP REMOVED FROM THE AIRPLANE;

Do these steps to do a test of the insulation resistance:

(a) Remove the APU DC fuel pump motor-impeller (TASK 28-25-03-000-801).

(b) Do this procedure on the removed pump, within two hours: Final Insulation Resistance Test.

SUBTASK 28-25-00-760-007

(3) RESISTANCE TEST WITH THE APU DC FUEL PUMP INSTALLED ON THE AIRPLANE;

Do these steps to do a test of the insulation resistance (initial test):

NOTE: These steps are done at 10 VDC to prevent arcing or overheat in a flammable leakage zone when high voltage is applied to a pump with low insulation resistance. The results of the 10 VDC test will tell you if it is safe to the 500 VDC test with the pump installed.

(a) Disconnect the electrical connector from the pump motor-impeller.

WARNING

USE THE SPECIFIED EQUIPMENT. OTHER EQUIPMENT CAN CAUSE AN EXPLOSION OR FIRE.

(b) Do these steps to connect the insulation meter, COM-6457, for the 10 VDC test:

NOTE: Keep the leads that connect to the pump connector pins as short as possible (3 ft (1 m) or less) to prevent problems with the resistance measurements.

1) Connect the insulation meter, COM-6457, into a grounded receptacle.

a) Make sure the ground strap is connected from the grounded receptacle to the + UNKNOWN terminal.

NOTE: This makes sure the insulation meter, COM-6457, is grounded.

2) Connect the + UNKNOWN probe to the pump connector pin ground (pin C).

3) Connect the - UNKNOWN probe to the pump connector pin A.

4) Set the multiplier dial to the lowest range (100K).

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28-AWL-17: CDCCL

5) Set the TEST VOLTAGE switches to 10 VDC on the insulation meter.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

6) Set the measure switch to the MEASURE position.

(c) Do these steps to measure the resistance at the pump:

1) Turn the multiplier switch until the meter reading is less than 5.

NOTE: The resistance is the meter reading multiplied by multiplier switch setting.

28-AWL-17: CDCCL

2) Measure the resistance between the pump power contact (pin A) and the ground contact (pin C) on the pump electrical connector.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

NOTE: If the pump resistance is very high, the insulation meter, COM-6457, value will increase with time. For any resistance over 100 megohms, it is not necessary to get the actual resistance value. Stop the measurement once the insulation meter value is more than 100 megohms.

3) Make a record of the resistance measured between pin C and pin A.

4) Set the function switch to the DISCHARGE position.

(d) Do an analysis of the test results:

28-AWL-17: CDCCL

1) Make sure the resistance measured between the power circuit contact (pin A) and the ground contact (pin C) on the pump electrical connector is 1 megohm or more.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

a) Do this procedure: Final Insulation Resistance Check.

2) If the resistance measured between pin A and pin C is less than 1 megohm, do these steps:

a) Replace the pump motor-impeller (TASK 28-25-03-400-801).

b) Do the continuity/resistance checks again for the replacement APU DC fuel pump.

<1> Start with this procedure: Fuel Pump Continuity Check.

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I. Final Insulation Resistance Test

SUBTASK 28-25-00-480-006

(1) Do these steps to connect the insulation meter, COM-6457, for the 500 VDC check:

NOTE: Keep the leads that connect to the pump connector pins as short as possible (3 ft (1 m) or less) to prevent problems with the resistance measurements.

NOTE: The insulation meter, COM-6457, must have a 500 VDC voltage supply option.

(a) Calibrate the insulation meter, COM-6457, if it is necessary.

(b) Connect the insulation meter, COM-6457, into a grounded receptacle.

1) Make sure the ground strap is connected from the grounded receptacle to the + UNKNOWN terminal.

NOTE: This makes sure the insulation meter, COM-6457, is grounded.

(c) Connect the + UNKNOWN probe to the pump connector pin ground (pin C).

(d) Connect the - UNKNOWN probe to the pump connector pin A.

(e) Set the multiplier dial to the lowest range (1M).

28-AWL-17: CDCCL

(f) Set the TEST VOLTAGE switches to 500 VDC on the insulation meter.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

(g) Set the measure switch to the MEASURE position.

SUBTASK 28-25-00-760-008

(2) Do these steps to measure the resistance at the APU DC fuel pump:

(a) Turn the multiplier switch until the meter reading is less than 5.

NOTE: The resistance is the meter reading multiplied by multiplier switch setting.

28-AWL-17: CDCCL

(b) Measure the resistance between the power contact (pin A) and the ground contact (pin C) on the pump electrical connector.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

NOTE: If the pump resistance is very high, the insulation meter, COM-6457, value will increase with time. For any resistance over 100 megohms, it is not necessary to get the actual resistance value. Stop the measurement once the insulation meter value is more than 100 megohms.

(c) Make a record of the resistance measured between pin A and pin C.

(d) Set the function switch to the DISCHARGE position.

SUBTASK 28-25-00-760-009

(3) Do an analysis of the test results:

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28-AWL-17: CDCCL

(a) Make sure the resistance measured between the power contact (pin A) and the ground contact (pin C) on the pump electrical connector is 1 megohm or more.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-17.

1) If the insulation resistance test is satisfactory, do these steps:

a) If the motor-impeller was removed for the test, re-install the motor-impeller (TASK 28-25-03-400-801).

b) If the motor-impeller was not removed for the test, connect the electrical connector for the motor-impeller and do an operational test per the pump installation task (TASK 28-25-03-400-801).

(b) If the resistance measured between pin A and pin C is less than 1 megohm, do these steps:

1) Replace the APU DC fuel pump motor-impeller (TASK 28-25-03-000-801, TASK 28-25-03-400-801).

2) Do the continuity/resistance checks again for the replacement APU DC fuel pump.

a) Start with this procedure: Fuel Pump Continuity Check.

(c) If the resistance measured between pin A and pin C is between 1 and 5 megohms, it is recommended that you replace the motor-impeller (TASK 28-25-03-000-801, TASK 28-25-03-400-801).

J. Put the Airplane Back to Its Usual Condition

SUBTASK 28-25-00-860-070

(1) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 28-25-00-860-071

(2) Remove the safety tag and close this circuit breaker:

Standby Power Management Panel, P310

Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP

——— END OF TASK ———

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APU FUEL SHUTOFF VALVE - REMOVAL/INSTALLATION

1. General

A. An APU fuel shutoff valve is installed on the rear spar of the left center fuel tank. The APU fuel shutoff valve lets the APU DC fuel pump or engine fuel pumps supply fuel to the APU. The APU fuel shutoff valve also prevents fuel flow to the APU when the APU is off.

B. This procedure contains two tasks. The first task removes the APU fuel shutoff valve. The second task installs the APU fuel shutoff valve.

TASK 28-25-01-000-801

2. APU Fuel Shutoff Valve - Removal

(Figure 401)

A. References

Reference	Title
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-25-02-000-802	APU Fuel Shutoff Valve Actuator - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing

C. Access Panels

Number	Name/Location
531BB	Access Door

D. Procedure

SUBTASK 28-25-01-650-001

(1) Defuel all of the fuel tanks (TASK 28-26-00-650-801).

NOTE: You must defuel the main fuel tanks to prevent fuel flow from the main tanks, thru the suction by-pass valves, into the center fuel tank when you remove the APU fuel shutoff valve.

SUBTASK 28-25-01-940-002

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) For the center fuel tank, do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-25-01-030-001

(3) Do this task: APU Fuel Shutoff Valve Actuator - Removal, TASK 28-25-02-000-802.

SUBTASK 28-25-01-020-004

(4) Remove the fillet seal of sealant from the four screws [3].

SUBTASK 28-25-01-030-002

(5) Remove the four screws [3] and sixteen washers [1], washers [2] that attach the valve [7] to the rear spar.

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SUBTASK 28-25-01-010-001

(6) Remove this access door:

Number	Name/Location
531BB	Access Door

from the left center fuel tank (TASK 28-11-02-000-801).

SUBTASK 28-25-01-010-002

(7) Go into the left center fuel tank.

SUBTASK 28-25-01-020-001

(8) Hold the valve [7] in its position.

SUBTASK 28-25-01-030-003

(9) Remove the lockwire and disconnect the flexible couplings [6] from the two sides of the valve [7].

(a) Discard the four o-rings [9].

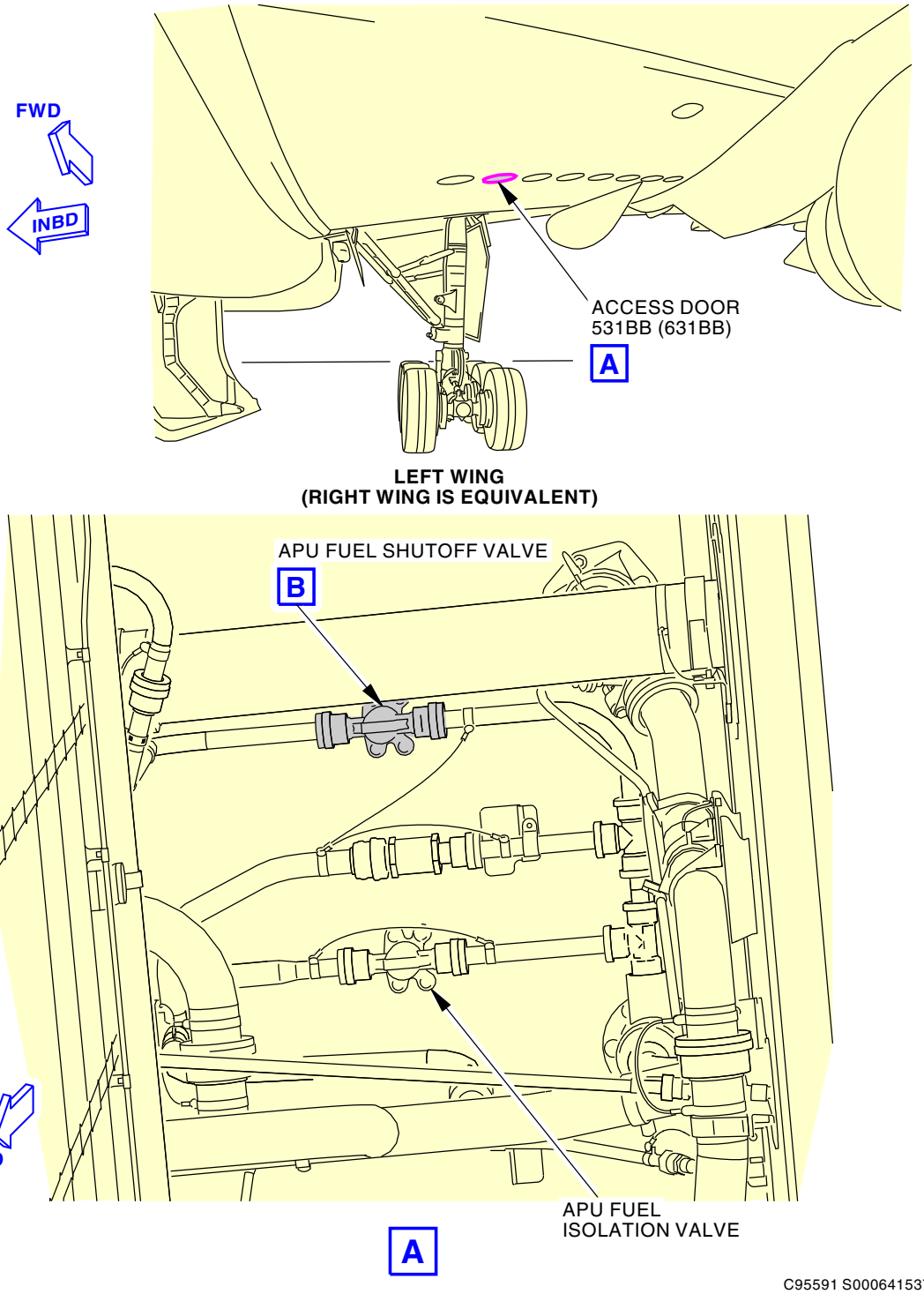
SUBTASK 28-25-01-020-002

(10) Remove the valve [7] and seal [5].

(a) Discard the seal [5].

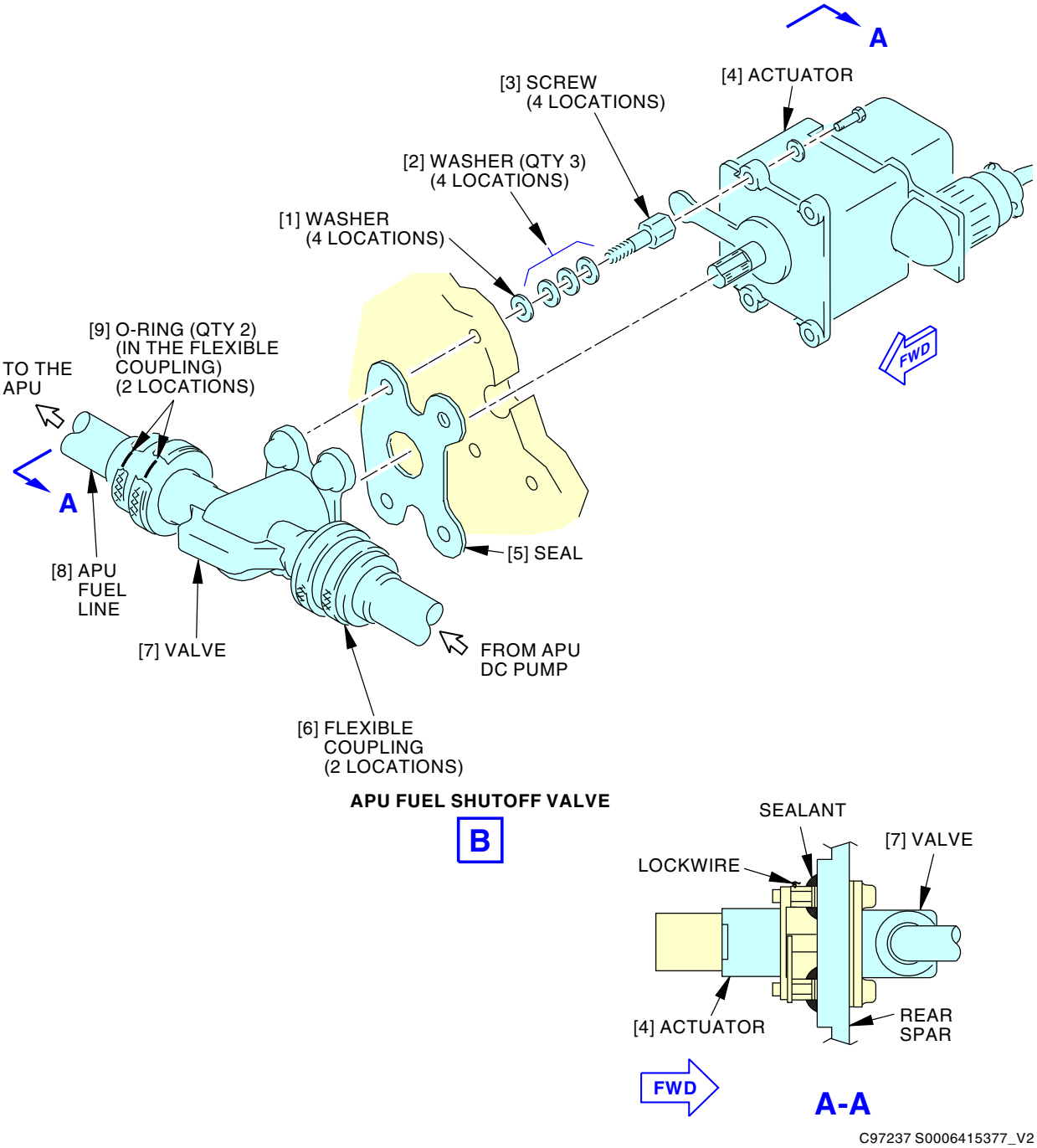
END OF TASK

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APU Fuel Shutoff Valve Installation
Figure 401/28-25-01-990-801 (Sheet 1 of 2)

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APU Fuel Shutoff Valve Installation
Figure 401/28-25-01-990-801 (Sheet 2 of 2)

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TASK 28-25-01-400-801

3. APU Fuel Shutoff Valve - Installation

(Figure 401)

A. General

(1) This task requires two persons to install the APU Fuel Shutoff Valve.

(2) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)
28-25-02-400-802	APU Fuel Shutoff Valve Actuator - Installation (P/B 401)
28-25-06-400-801	APU Fuel Supply Line (Left Main Tank, Left Center Fuel Tank and Wing Center Fuel Section) - Installation (P/B 401)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

D. Consumable Materials

Reference	Description	Specification
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142 Type II
D00504	Grease - Petrolatum	VV-P-236

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
5	Seal	28-25-01-01-020	ARO ALL
7	Valve	28-25-01-01-025	ARO ALL

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(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
9	O-ring	28-25-00-01-190	ARO ALL

F. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing

G. Access Panels

Number	Name/Location
531BB	Access Door

H. Procedure

SUBTASK 28-25-01-940-001

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-25-01-210-001

(2) Make sure the two sides of the rear spar are clean at each screw [3] hole location.

SUBTASK 28-25-01-430-001

(3) Put a new seal [5] between the rear spar and the valve [7].

SUBTASK 28-25-01-420-001

(4) Put the valve [7] in position between the APU fuel lines [8].

SUBTASK 28-25-01-430-002

(5) Have another person install the sixteen washers [1], washers [2] and four screws [3], from out of the fuel tank, to the valve [7].

28-AWL-19: CDCCL

(a) Install a fillet sealed fay surface bond between the screws [3] (valve body mounting bolts) and the rear spar (structure) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28–AWL-19.

(b) Tighten the four screws [3] to 62.5 ±12.5 in-lb (7.1 ±1.5 N·m).

28-AWL-19: CDCCL

(c) Apply a fillet seal between the screws [3] (valve body mounting bolts) and the rear spar (structure) (Figure 401, View A-A).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use BMS 5-142 sealant, A02315.

SUBTASK 28-25-01-430-003

(6) Apply a thin layer of petrolatum grease, D00504, to the new o-ring [9].

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SUBTASK 28-25-01-430-004

(7) Install the o-rings [9] and connect the flexible couplings [6] on the two sides of the valve [7] (TASK 28-25-06-400-801).

(a) Install lockwire to each coupling [6] (TASK 20-10-23-400-801).

SUBTASK 28-25-01-220-001

(8) Measure the electrical bonding resistance between the valve [7] and the airplane structure with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

(a) Make sure the electrical bonding resistance 0.0025 ohm (2.5 milliohms) or less.

SUBTASK 28-25-01-410-001

(9) Install this access panel:

Number	Name/Location
531BB	Access Door

in the left center fuel tank (TASK 28-11-02-400-801).

SUBTASK 28-25-01-430-005

(10) Do this task: APU Fuel Shutoff Valve Actuator - Installation, TASK 28-25-02-400-802.

SUBTASK 28-25-01-650-002

(11) Refuel the center tank (TASK 12-11-01-650-801):

(a) Refuel the center fuel tank to more than 155,000 LB (70,300 KG) of fuel.

(b) Make sure there is no fuel leakage at the actuator installation on the rear spar.

——— END OF TASK ———

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APU FUEL SHUTOFF VALVE ACTUATOR - REMOVAL/INSTALLATION

1. General

A. The actuator of the APU fuel shutoff valve is installed on the rear spar of the left center fuel tank. It is not necessary to defuel the fuel tank to remove the actuator of the APU fuel shutoff valve.

B. This procedure contains two tasks. The first task removes the actuator of the APU fuel shutoff valve. The second task installs the actuator of the APU fuel shutoff valve.

ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS

TASK 28-25-02-000-802

2. APU Fuel Shutoff Valve Actuator - Removal

(Figure 401)

A. References

Reference	Title
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Location Zones

Zone	Area
551	Rear Spar to Landing Gear Support Beam - Left Wing

C. Procedure

SUBTASK 28-25-02-860-006

(1) Open this circuit breaker and install safety tag:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	17	C28003	APU FUEL S/O VALVE

SUBTASK 28-25-02-210-003

(2) Make sure the downlock pins are installed on the nose and main landing gear (TASK 32-00-30-480-801).

SUBTASK 28-25-02-480-002

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-25-02-010-002

(4) Get access to the actuator [9] of the APU fuel shutoff valve on the rear spar of the left center fuel tank.

SUBTASK 28-25-02-030-003

(5) Disconnect the electrical connector [6] from the actuator [9].

SUBTASK 28-25-02-030-004

(6) Remove the screw [11] and washers [12] that attach the bonding jumper [10] to the actuator [9].

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

SUBTASK 28-25-02-860-007

(7) Make sure the manual override handle on the actuator [9] is in the CLOSED position.

SUBTASK 28-25-02-030-005

(8) Remove the lockwire from the four screws [7].

SUBTASK 28-25-02-020-003

(9) Carefully remove the four screws [7] and washers [8] that attach the actuator [9] to the rear spar.

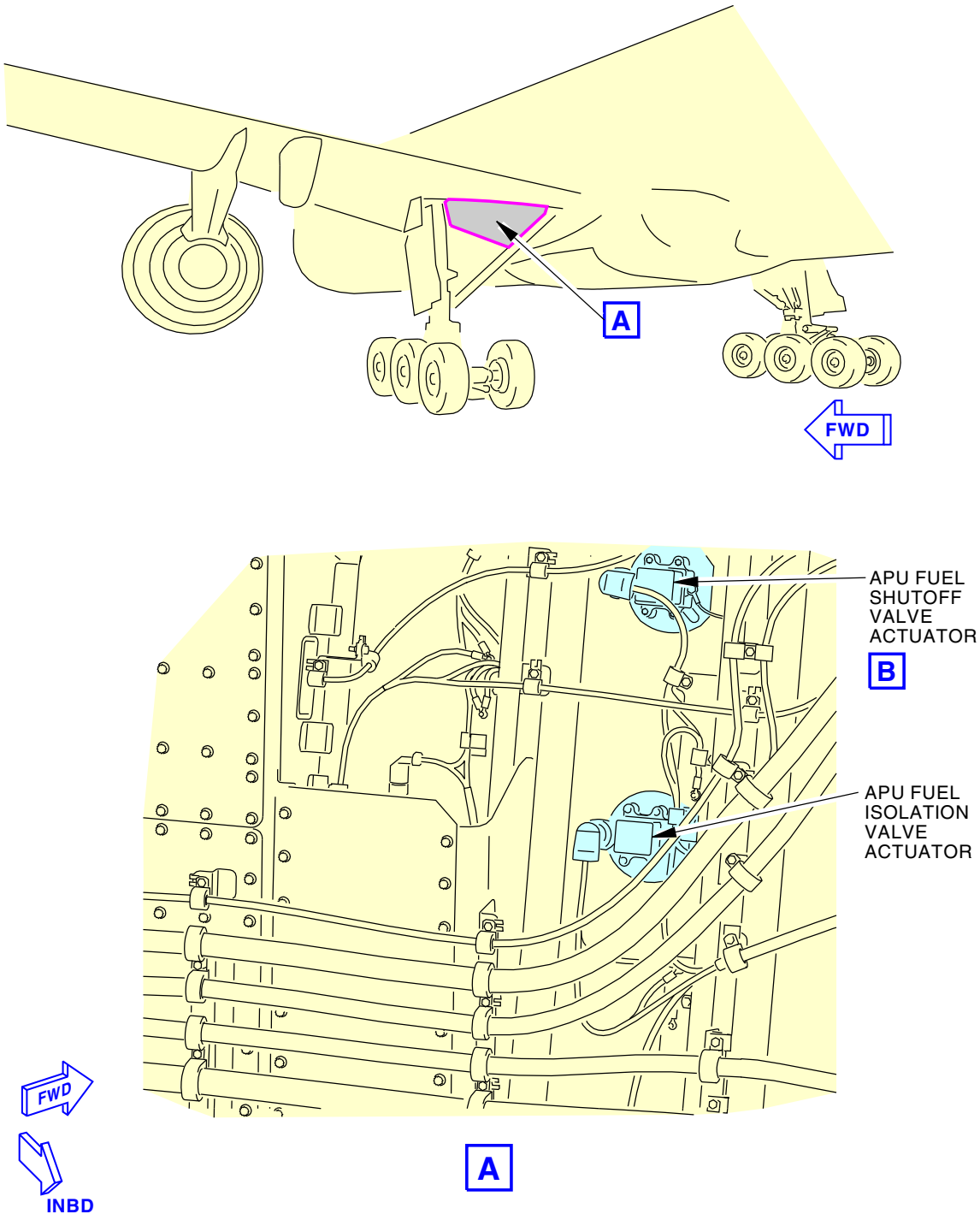
NOTE: The actuator and the mounting bolts are bonded with faying surface sealant.

SUBTASK 28-25-02-020-004

(10) Remove the actuator [9] from the rear spar.

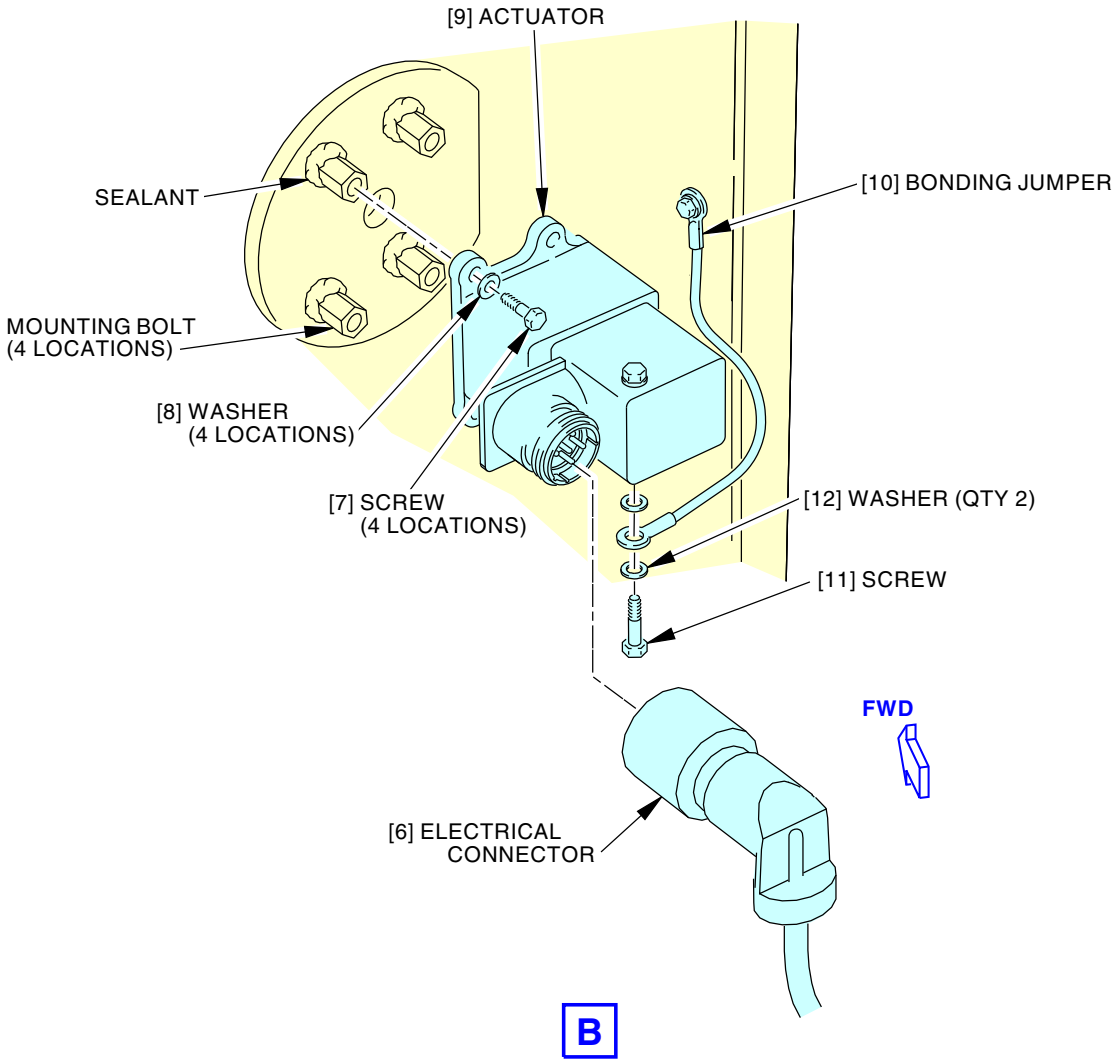
——— END OF TASK ———

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APU Fuel Shutoff Valve Actuator Installation
Figure 401/28-25-02-990-802 (Sheet 1 of 2)

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APU Fuel Shutoff Valve Actuator Installation
Figure 401/28-25-02-990-802 (Sheet 2 of 2)

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TASK 28-25-02-400-802

3. APU Fuel Shutoff Valve Actuator - Installation

(Figure 401)

A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(2) For application of the fay sealed fay surface bonds in this task, it is acceptable to use sealant, A50110, as an alternative to sealant, A50155.

NOTE: Sealants should not be mixed. In applications where sealants may mix, use the same sealant for both applications.

B. References

Reference	Title
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
20-30-92-910-801	Final Cleaning Prior to General Sealing (Series 92) (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-25-00-710-801	APU Fuel Feed System - System Test (P/B 501)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
51-21-04-620-801	Alodine 600, 1000, 1200, and 1200S Coating Application (P/B 701)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

(Continued)

Reference	Description
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: $0855 Part #: 234350 Supplier: $0857 Part #: 311 Supplier: F6892 Part #: 411B60 Supplier: 3DN12 Part #: 411B90 Supplier: 3DN12 Part #: DAD5013 Supplier: $0856 Part #: DFD5019 Supplier: $0856 Part #: J5-0275-2010 Supplier: 435R8 Part #: SCD5019 Supplier: $0856 Part #: ST982LF-9 Supplier: 62176 Part #: TS1275-4 Supplier: 1DWR5
STD-123	Brush - Soft Bristle

D. Consumable Materials

Reference	Description	Specification
A50110	Sealant	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
B01012	Solvent - Final Cleaning Prior To General Sealing - Series 92	
C00064	Coating - Aluminum Chemical Conversion	BAC5719 Type II Class A (MIL-DTL-5541 Class 1A)
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20 Type II
C50033	Chromated Conversion Coating for Aluminum - Alodine 1200	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
9	Actuator	28-25-02-01-100	ARO ALL

F. Location Zones

Zone	Area
551	Rear Spar to Landing Gear Support Beam - Left Wing

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G. Procedure

SUBTASK 28-25-02-862-001

CAUTION REMOVE POWER TO THE ACTUATOR. IF YOU DO MAINTENANCE TO THE ACTUATOR WHILE IT IS ENERGIZED, DAMAGE TO THE ACTUATOR CAN OCCUR.

(1) Open this circuit breaker and install safety tag:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	17	C28003	APU FUEL S/O VALVE

SUBTASK 28-25-02-140-001

(2) Remove the old sealant and clean the actuator [9], mounting bolt locations (on the rear spar), and fasteners (if re-used).

(a) Use sealant removal tool, COM-2481, or equivalent, to remove old sealant from the actuator [9].

WARNING DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(b) To remove the remaining sealant, grease, oil, dirt, and other contamination from the components, use one of these items soaked with Series 92 solvent, B01012 (TASK 20-30-92-910-801):

1) soft bristle brush, STD-123

2) cotton wiper, G00034

SUBTASK 28-25-02-840-001

(3) Do these steps to prepare the actuator [9] and the mounting bolt locations for a fay sealed fay surface bond (SWPM 20-20-00):

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(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

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28-AWL-19: CDCCL

(b) Apply a thin continuous layer of sealant between the actuator [9] mounting feet contact surfaces (four locations) and the (valve body) mounting bolts for a fay sealed fay surface bond (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use sealant, A50110, or sealant, A50155, for the fay sealed fay surface bond.
2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(c) Apply sealant to the shank and the threads of the screws [7].

1) Use sealant, A50110, or sealant, A50155, for the wet installation of the screws [7].

NOTE: Use the same sealant that was used for the fay sealed fay surface bond.

2) Make sure the sealant applied to the fasteners is approximately 0.060 in. (1.524 mm) thick.

SUBTASK 28-25-02-860-008

(4) Make sure the manual override handle of the actuator [9] is in the CLOSED position.

SUBTASK 28-25-02-420-003

(5) Align the splined shaft of the actuator [9] with the shaft of the valve body on the rear spar.

SUBTASK 28-25-02-210-004

(6) Make sure the teeth on the splined shaft of the actuator [9] align with the shaft of the valve body.

SUBTASK 28-25-02-420-004

(7) Install the screws [7] and washers [8] to attach the actuator [9] to the mounting bolts on the rear spar.

(a) Install the lockwire on the screw [7] (TASK 20-10-23-400-801).

SUBTASK 28-25-02-765-006

28-AWL-19: CDCCL

(8) Measure the electrical bonding resistance between the actuator mounting feet and the rear spar (structure) (SWPM 20-20-00):

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

28-AWL-19: CDCCL

(a) Do this measurement with one or both ends of the bonding jumper [10] disconnected.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(b) Do this measurement with electrical connector [6] disconnected.

(c) Use an intrinsically safe approved bonding meter, COM-1550.

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28-AWL-19: CDCCL

(d) Make sure the electrical bonding resistance is 0.0050 ohm (5.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

SUBTASK 28-25-02-420-006

(9) If the bonding jumper [10] is disconnected from the structure (spar), do these steps to attach the bonding jumper [10]:

WARNING

DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

(b) Rub dry with a clean, dry cotton wiper, G00034.

(c) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-19: CDCCL

(d) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper [10] terminal and the two washers for a fay sealed fay surface bond at the structure (spar) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use sealant, A50110, or sealant, A50155.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(e) Install the screw and the two washers to attach the bonding jumper [10] to the structure (spar).

1) Tighten the screw to 30 ±5 in-lb (3 ±1 N·m).

28-AWL-19: CDCCL

(f) Apply a cap seal over the screw (fastener) and terminal of the bonding jumper [10] attached to the structure.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

NOTE: Use the sealant that was used for the fillet sealed fay surface bond.

1) Use sealant, A50110 or sealant, A50155.

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SUBTASK 28-25-02-765-004

28-AWL-19: CDCCL

(10) Measure the electrical bonding resistance between the loose end of the bonding jumper [10] and the rear spar (structure) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(a) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-19: CDCCL

(b) Make sure the electrical bonding resistance is 0.0015 ohm (1.5 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

SUBTASK 28-25-02-420-005

(11) Do these steps to install the bonding jumper [10] to the actuator [9]:

(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-19: CDCCL

(b) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper [10] terminal and the two washers [12] for a fay sealed fay surface bond with the actuator [9] (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(c) Install the screw [11] and washers [12] to attach the bonding jumper [10] to the actuator [9].

(d) AIRPLANES WITH ACTUATOR MA30A1001:

Tighten the screw [11] to 35 in-lb (4 N·m).

(e) Make sure bonding jumper [10] does not touch the manual override handle on the actuator [9], in the OPEN or CLOSED positions.

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28-AWL-19: CDCCL

(f) Measure the electrical bonding resistance between the upper housing of the actuator [9] and the attached bonding jumper [10] terminal (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Do not touch the screw [11] when you make the electrical bonding measurement.

2) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-19: CDCCL

3) Make sure the electrical bonding resistance is 0.0010 ohm (1.0 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

28-AWL-19: CDCCL

(g) Apply a cap seal over the screw [11] (fastener) and terminal lug of the bonding jumper [10] attached to the actuator [9].

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

NOTE: Use the sealant that was used for the fillet sealed fay surface bond.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296.

SUBTASK 28-25-02-916-002

(12) Do this task to apply protective finishes to the bare areas of the rear spar: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

NOTE: Re-apply the protective finishes to the rear spar where the electrical bonding probes removed the finishes.

(a) These are the protective finishes:

1) Alodine 600 coating, C00064

2) BMS 10-20 coating, C00307.

SUBTASK 28-25-02-916-001

(13) Do this task to apply Alodine 1200 coating, C50033, to any bare areas of the actuator [9]: Alodine 600, 1000, 1200, and 1200S Coating Application, TASK 51-21-04-620-801.

NOTE: Re-apply the protective coating to the actuator [9] where the electrical bonding probe removed the finish and any bare metal areas around the bonding jumper installation that are not covered with sealant.

SUBTASK 28-25-02-430-004

(14) Connect the electrical connector [6] to the actuator [9].

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

H. APU Fuel Shutoff Valve Actuator Test

SUBTASK 28-25-02-860-009

(1) Remove the safety tag and close this circuit breaker:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	17	C28003	APU FUEL S/O VALVE

SUBTASK 28-25-02-860-010

(2) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-25-02-720-002

(3) To do a test of the APU fuel shutoff valve actuator, do this task: APU Fuel Feed System - System Test, TASK 28-25-00-710-801.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 28-25-02-080-002

WARNING OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

END OF TASK

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APU FUEL SHUTOFF VALVE ACTUATOR - INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure contains a functional check of the bonding resistance between the structure and the APU fuel shutoff valve actuator.

SFAR 88

TASK 28-25-02-200-801

2. APU Fuel Shutoff Valve Actuator - Bonding Resistance Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
28-25-02-400-802	APU Fuel Shutoff Valve Actuator - Installation (P/B 401)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Location Zones

Zone	Area
551	Rear Spar to Landing Gear Support Beam - Left Wing

D. Prepare for the Procedure

SUBTASK 28-25-02-865-001

(1) Open this circuit breaker and install safety tag:

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	17	C28003	APU FUEL S/O VALVE

SUBTASK 28-25-02-212-001

(2) Make sure the downlock pins are installed on the nose and main landing gear (TASK 32-00-30-480-801).

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SUBTASK 28-25-02-490-001

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-25-02-710-001

(4) Get access to the actuator of the APU fuel shutoff valve on the rear spar of the left center fuel tank.

E. Electrical Bonding Measurement

SUBTASK 28-25-02-710-002

(1) Move the manual override handle of the actuator to the CLOSED position.

SUBTASK 28-25-02-862-002

(2) Disconnect the electrical connector from the actuator.

SUBTASK 28-25-02-765-001

(3) Use an intrinsically safe approved bonding meter, COM-1550, to measure the bonding resistance between the actuator and the airplane structure.

(a) Make sure the bonding resistance is 5 milliohms (0.005 ohm) or less.

SUBTASK 28-25-02-765-005

(4) Use an intrinsically safe approved bonding meter, COM-1550, to measure the bonding resistance between the bonding jumper and the airplane structure.

(a) Make sure the bonding resistance is 5 milliohms (0.005 ohm) or less.

SUBTASK 28-25-02-861-001

(5) Connect the electrical connector to the actuator.

SUBTASK 28-25-02-860-011

(6) Remove the safety tag and close this circuit breaker:

Overhead Circuit Breaker Panel, P11

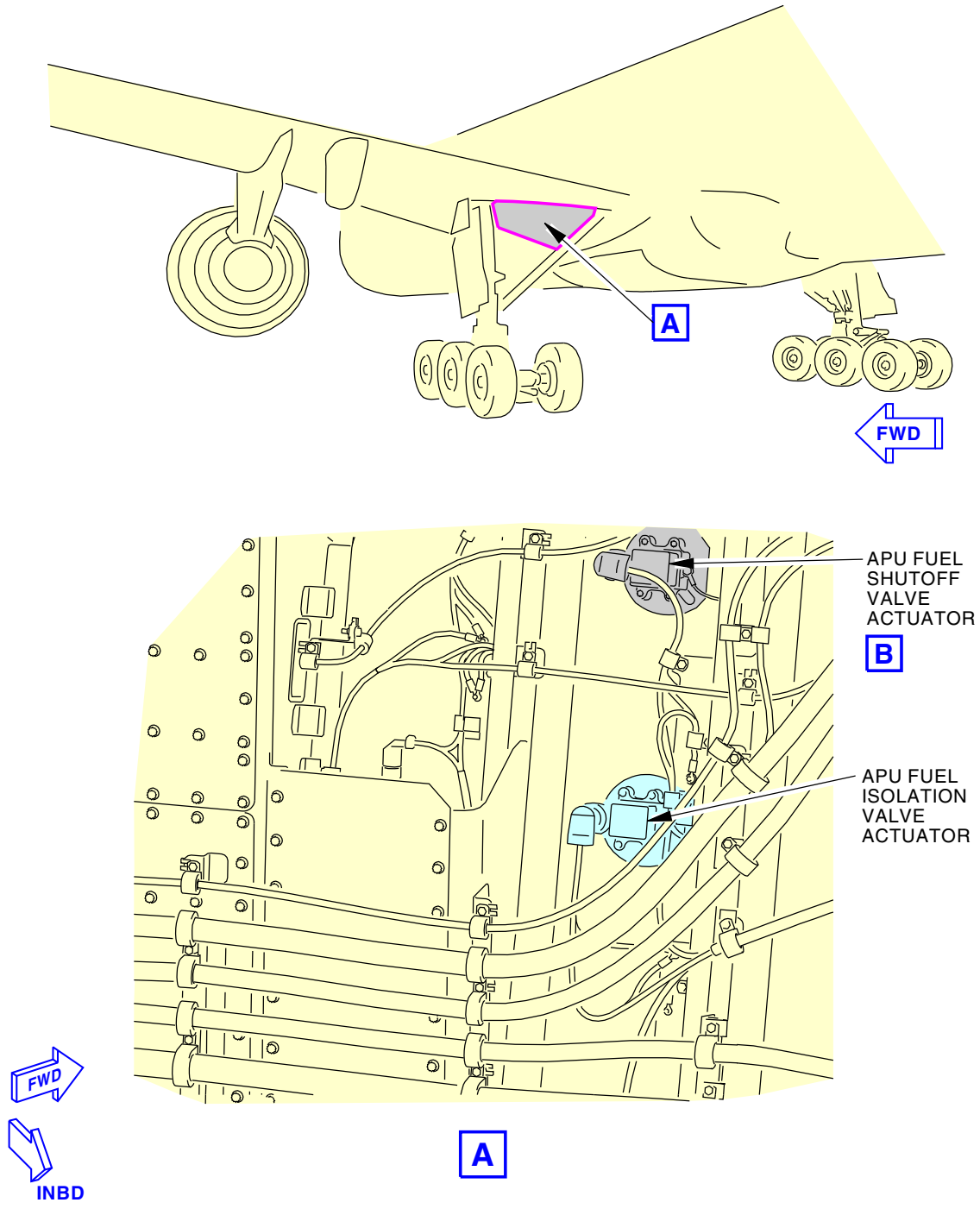
Row	Col	Number	Name
A	17	C28003	APU FUEL S/O VALVE

SUBTASK 28-25-02-710-004

(7) Do the APU fuel shutoff actuator test in APU Fuel Shutoff Valve Actuator - Installation, TASK 28-25-02-400-802.

END OF TASK

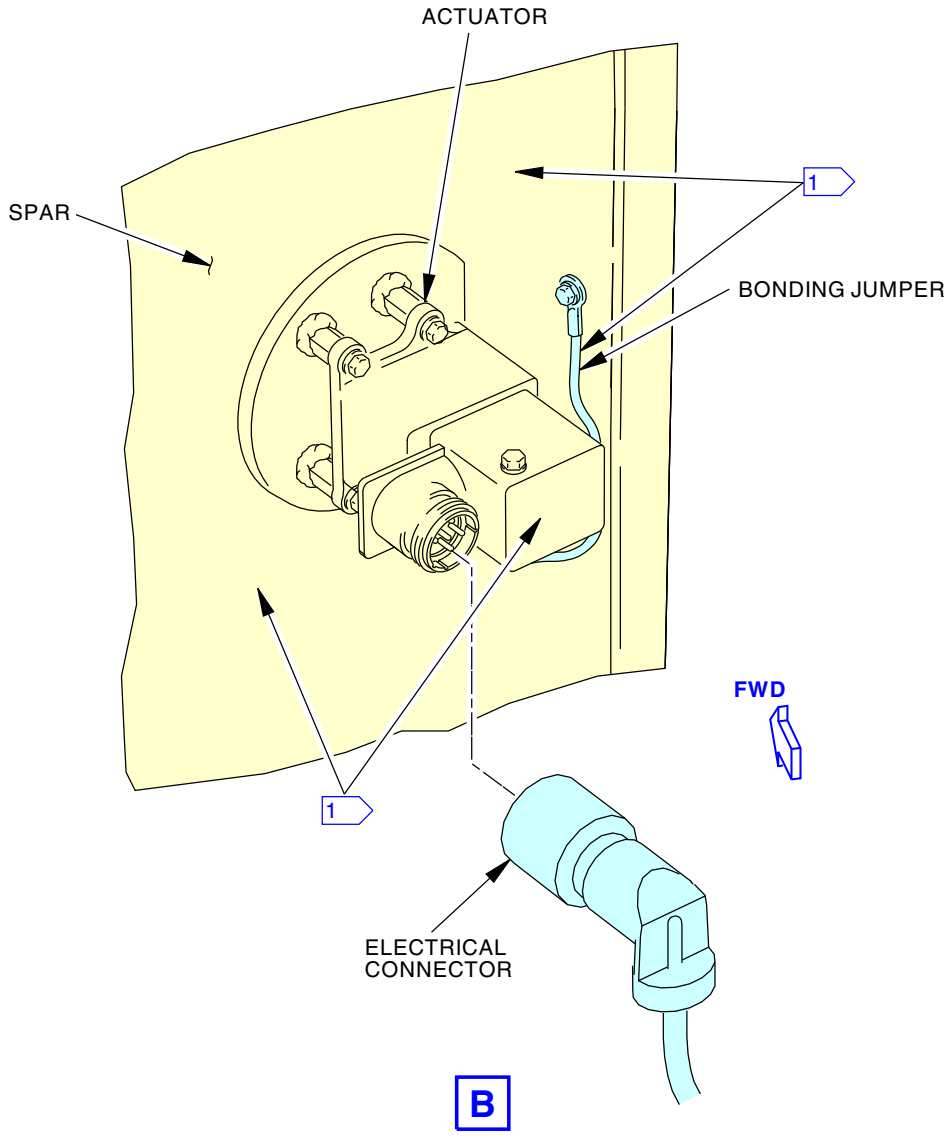
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1368066 S0000247036_V2

APU Fuel Shutoff Valve - Bonding Resistance Measurement
Figure 601/28-25-02-990-803 (Sheet 1 of 2)

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1 BONDING RESISTANCE MEASUREMENT LOCATION

1368249 S0000247038_V3

APU Fuel Shutoff Valve - Bonding Resistance Measurement
Figure 601/28-25-02-990-803 (Sheet 2 of 2)

EFFECTIVITY
ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS

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APU DC FUEL PUMP - REMOVAL/INSTALLATION

1. General

A. An APU DC fuel pump is installed on the rear spar of the left center fuel tank. The APU DC fuel pump supplies the APU with fuel when AC power is not available to operate the left forward fuel pump and the other engine fuel pumps are off.

B. This procedure contains four tasks. The first task removes the motor-impeller of the APU DC fuel pump. The second task installs the motor-impeller of the APU DC fuel pump. The third task removes the housing of the APU DC fuel pump. The fourth task installs the housing of the APU DC fuel pump.

TASK 28-25-03-000-801

2. APU DC Fuel Pump (Motor-Impeller) - Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Tools/Equipment

Reference	Description
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)

C. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing

D. Procedure

SUBTASK 28-25-03-210-001

(1) Make sure the downlocks are installed on the nose and main landing gear (TASK 32-00-30-480-801).

SUBTASK 28-25-03-480-001

WARNING OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-25-03-860-001

(3) Open this circuit breaker and install safety tag:

Standby Power Management Panel, P310

Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP

SUBTASK 28-25-03-010-005

(4) To get access to the APU DC fuel pump, do this step:

(a) Remove the fourteen bolt [52] and remove the faceplate [51].

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SUBTASK 28-25-03-030-001

(5) Disconnect the electrical connector [6] from the APU DC fuel pump [1].

SUBTASK 28-25-03-030-002

(6) Disconnect the electrical connector [9], for the pressure switch, from the APU DC fuel pump [1].

SUBTASK 28-25-03-480-002

(7) Put the 5-gallon (19-liter) fuel resistant container, STD-1054, below the APU DC fuel pump [1] to collect fuel.

SUBTASK 28-25-03-030-003

(8) Do these step to remove the APU DC fuel pump [1]:

(a) Remove the bolt [53] and washer [5] to disconnect the bonding jumper [8].

(b) Remove the two bolts [4] and washers [5].

(c) Remove the APU DC fuel pump [1].

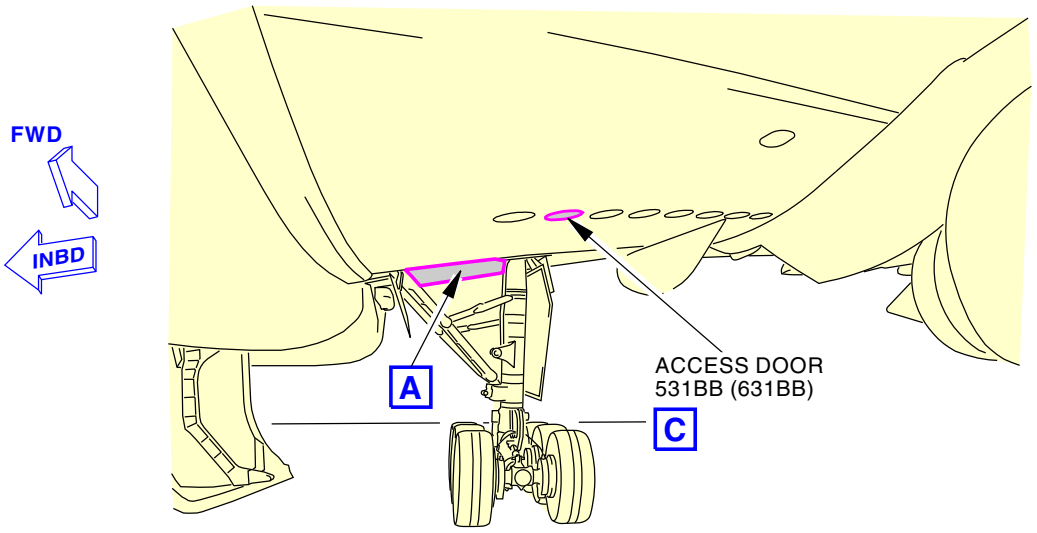
1) Remove and discard the O-ring [20] and O-ring [21].

SUBTASK 28-25-03-080-001

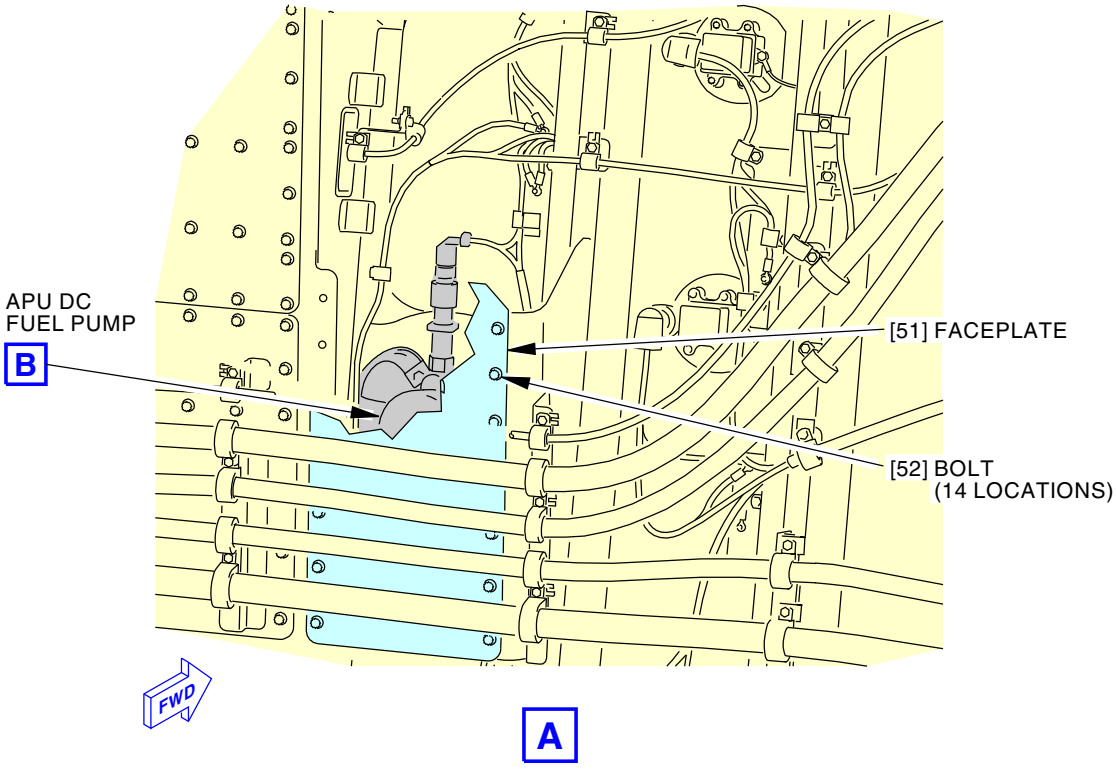
(9) Remove the 5-gallon (19-liter) fuel resistant container, STD-1054.

——— END OF TASK ———

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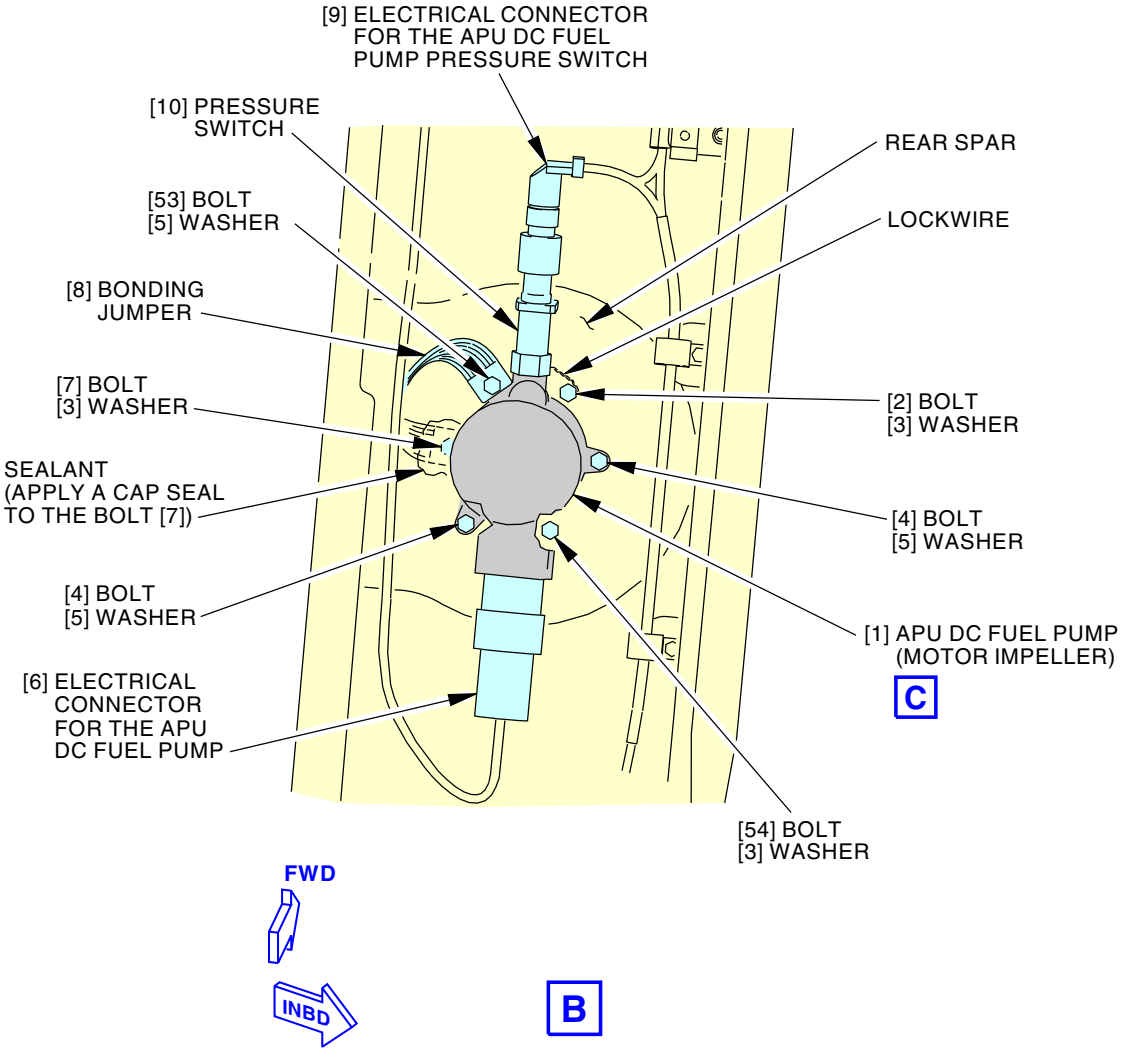
LEFT WING
(RIGHT WING IS EQUIVALENT)



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APU DC Fuel Pump Installation
Figure 401/28-25-03-990-803 (Sheet 1 of 3)

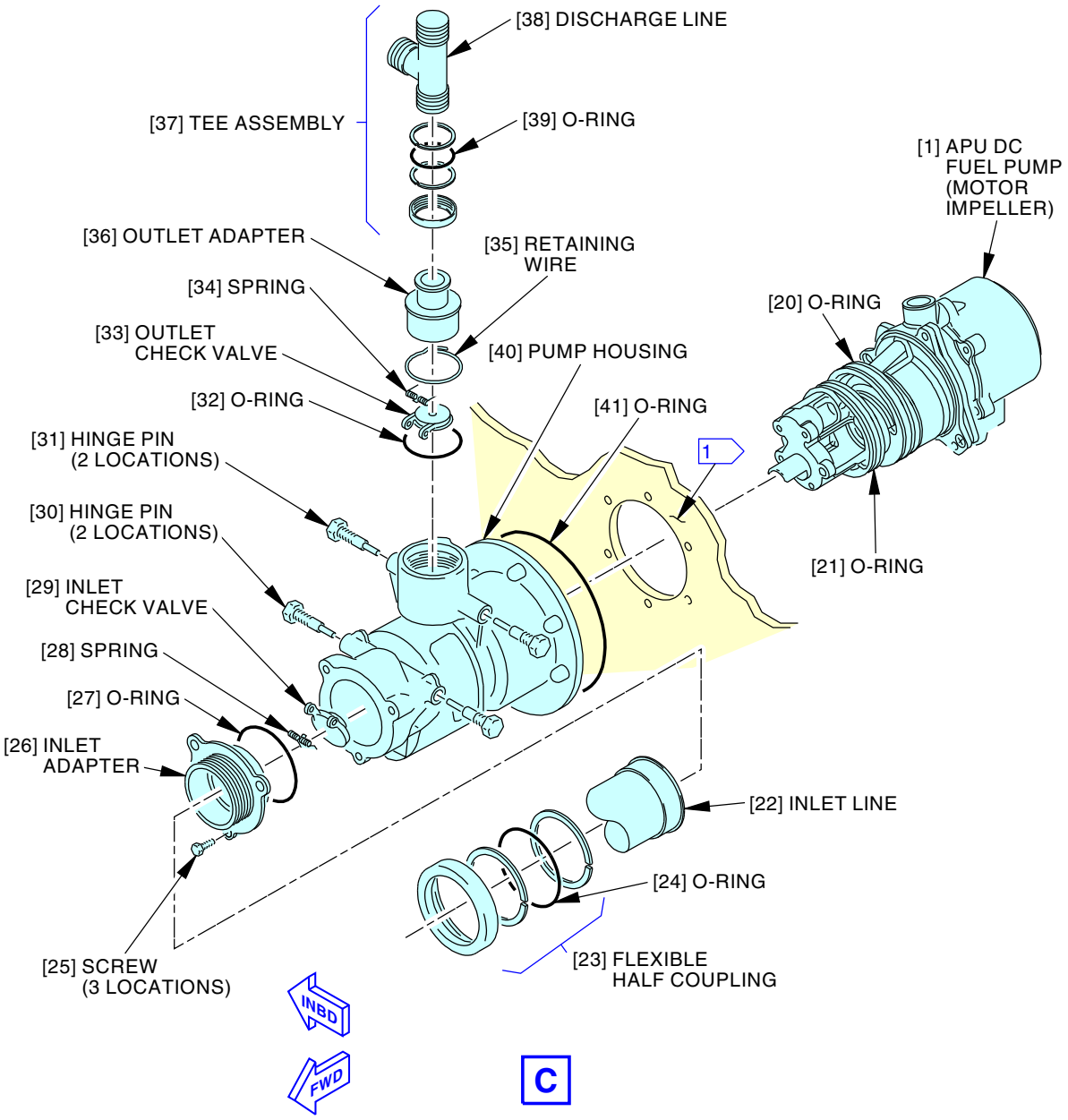
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2197561 S0000488805_V2

APU DC Fuel Pump Installation
Figure 401/28-25-03-990-803 (Sheet 2 of 3)

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1 APPLY A FILLET SEAL BETWEEN PUMP HOUSING AND REAR SPAR, AFTER PUMP HOUSING IS INSTALLED.

D03271 S0006415391_V3

APU DC Fuel Pump Installation
Figure 401/28-25-03-990-803 (Sheet 3 of 3)

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TASK 28-25-03-400-801

3. APU DC Fuel Pump (Motor-Impeller) - Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

B. References

Reference	Title
20-11-00-910-801	Standard Torque Values (P/B 201)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-25-00-710-801	APU Fuel Feed System - System Test (P/B 501)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

D. Consumable Materials

Reference	Description	Specification
A50110	Sealant	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	

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(Continued)

Reference	Description	Specification
C00064	Coating - Aluminum Chemical Conversion	BAC5719 Type II Class A (MIL-DTL-5541 Class 1A)
C00700	Coating - Protective Enamel (BAC 707 Gray Color, Gloss)	BMS10-60 Type I
C00913	Compound - Corrosion Inhibiting Material, Nondrying Resin Mix	BMS3-27
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A
G50237	Compound - Corrosion Inhibiting, Non-drying - Cor-Ban 27L	BMS3-38
G50961	Coating - Corrosion Inhibiting Epoxy Primer - (BAC 377 Yellow Color)	BMS10-11 Type I

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	APU DC fuel pump	28-25-03-01-040	ARO ALL
20	O-ring	28-25-03-01-070	ARO ALL
21	O-ring	28-25-03-01-075	ARO ALL

F. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing

G. Procedure

SUBTASK 28-25-03-420-001

(1) Apply a thin layer of petrolatum grease, D00504, to the new O-ring [20], and new O-ring [21].

(a) Install the O-ring [20] and O-ring [21] to the APU DC fuel pump [1].

SUBTASK 28-25-03-420-002

(2) Align and install the APU DC fuel pump [1] in the pump housing [40] on the rear spar of the left center fuel tank.

SUBTASK 28-25-03-110-001

(3) Do these steps to prepare the bonding jumper [8] for an electrical fay surface seal bond:

(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

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28-AWL-10: CDCCL

(b) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper [8] terminal and the upper washer [5] for a fay sealed fay surface bond.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the fay surface fay seal.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(c) Apply a thin continuous layer of sealant on the shank and threads of the bolt [53]

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the fay surface fay seal.

SUBTASK 28-25-03-420-009

28-AWL-10: CDCCL

(4) Install the bolt [53] and washer [5] to attach the bonding jumper [8] to the APU DC fuel pump [1] (pump motor-impeller).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

SUBTASK 28-25-03-430-002

(5) Install the lower two bolts [4] and washers [5].

SUBTASK 28-25-03-420-010

(6) Tighten the three bolts to 35 ±3 in-lb (4.0 ±0.4 N·m).

SUBTASK 28-25-03-220-001

28-AWL-10: CDCCL

(7) Measure the electrical bonding resistance between the APU DC fuel pump [1] (pump motor-impeller) and the airplane structure (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

(a) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-10: CDCCL

(b) Make sure the electrical bonding resistance is 0.0005 ohm (0.5 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

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SUBTASK 28-25-03-390-004

(8) Apply a cap seal of sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, to the bolt [53] that attaches the bonding jumper [8] to the APU DC fuel pump [1].

NOTE: Use the sealant that was used for the fay surface fay seal.

(a) Make sure that the sealant does not touch the flange of the APU DC fuel pump [1].

SUBTASK 28-25-03-390-005

(9) Do these steps to refinish the bare areas of the rear spar:

(a) Apply coating, C00064, around the upper left bolt.

(b) Apply coating, G50961, around the upper left bolt.

(c) Apply coating, C00700, around the upper left bolt.

SUBTASK 28-25-03-430-003

(10) Connect the electrical connector [6] to the APU DC fuel pump [1].

SUBTASK 28-25-03-430-004

(11) Connect the electrical connector [9], for the pressure switch [10], to the APU DC fuel pump [1].

SUBTASK 28-25-03-410-004

WARNING

USE NITRILE GLOVES FOR SKIN PROTECTION WHEN YOU USE COR-BAN 27L, G50237. IF IT GETS ON YOUR SKIN, IMMEDIATELY REMOVE IT WITH WATER. IF THIS MATERIAL GETS IN YOUR EYES, IMMEDIATELY FLUSH YOUR EYES WITH WATER. GET MEDICAL AID. THIS MATERIAL CONTAINS FLAMMABLE AGENTS WHICH CAN CAUSE INJURIES TO PERSONNEL.

WARNING

DO NOT GET THIS MATERIAL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THIS MATERIAL. PUT ON A RESPIRATOR, EYE PROTECTION (GOGGLES, OR OTHER APPROVED PROTECTION), AND GLOVES BEFORE YOU USE THIS MATERIAL. MAKE SURE THAT THERE IS SUFFICIENT AIRFLOW. KEEP THIS MATERIAL AWAY FROM SPARKS, FLAME, AND HEAT. THIS MATERIAL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(12) Do these steps for the APU DC fuel pump [1]:

(a) Apply anti-corrosion Cor-Ban 27L Compound, G50237 or Mastinox 6856 K, C00913 to the surfaces that touch between the faceplate [51] and the support structure.

(b) Apply anti-corrosion Cor-Ban 27L Compound, G50237 or Mastinox 6856 K, C00913 to the bolts [52] before installation.

(c) Put the faceplate [51] in its position and install the fourteen bolts [52]. Refer to Standard Torque Values, TASK 20-11-00-910-801.

SUBTASK 28-25-03-860-002

(13) Remove the safety tag and close this circuit breaker:

Standby Power Management Panel, P310

Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP

SUBTASK 28-25-03-860-003

(14) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

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SUBTASK 28-25-03-710-001

(15) To do a test of the APU DC pump, do this task: APU Fuel Feed System - System Test, TASK 28-25-00-710-801.

SUBTASK 28-25-03-080-002

WARNING OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(16) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

——— END OF TASK ———

TASK 28-25-03-000-802

4. APU DC Fuel Pump (Housing) - Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-25-06-000-801	APU Fuel Supply Line (Left Main Tank, Left Center Fuel Tank and Wing Center Fuel Section) - Removal (P/B 401)
28-26-00-650-803	Suction Defueling (P/B 201)

B. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing

C. Access Panels

Number	Name/Location
531BB	Access Door

D. Procedure

SUBTASK 28-25-03-030-004

(1) Do this task: APU DC Fuel Pump (Motor-Impeller) - Removal, TASK 28-25-03-000-801.

SUBTASK 28-25-03-650-001

(2) Defuel all of the fuel tanks (TASK 28-26-00-650-803).

SUBTASK 28-25-03-650-002

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(3) For the center fuel tank, do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-25-03-010-001

(4) Remove the access door from the left center fuel tank:

(TASK 28-11-02-000-801)

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Number	Name/Location
531BB	Access Door

SUBTASK 28-25-03-010-002

(5) Go into the left center fuel tank.

SUBTASK 28-25-03-030-005

(6) Disconnect the flexible half that attaches the inlet line [22] to the pump housing [40].

SUBTASK 28-25-03-030-006

(7) Remove the O-ring [24] from the flexible half coupling [23].

(a) Discard the O-ring [24].

SUBTASK 28-25-03-030-007

(8) Disconnect the tee assembly [37] from the APU fuel discharge line (TASK 28-25-06-000-801).

(a) Remove the O-ring [39] from the tee assembly [37].

SUBTASK 28-25-03-020-009

(9) Remove sealant at the bonding jumper [8] connection on the rear spar, out of the fuel tank.

SUBTASK 28-25-03-020-002

(10) Remove sealant around the pump housing [40] at the rear spar, in the fuel tank.

SUBTASK 28-25-03-020-003

(11) Have one person, in the fuel tank, hold the pump housing [40] of the APU DC fuel pump.

SUBTASK 28-25-03-030-008

(12) Remove the bolt [2], bolt [54], bolt [7], bonding jumper [8], and the three washers [3] that attach the pump housing [40] to the rear spar (View B).

SUBTASK 28-25-03-020-004

(13) Remove the pump housing [40] from the fuel tank.

(a) Discard the O-ring [41].

SUBTASK 28-25-03-020-005

(14) To remove the inlet check valve [29] from the pump housing [40], do the steps that follow:

(a) Remove the three screw [25] to remove the inlet adapter [26].

(b) Remove and discard the O-ring [27].

(c) Remove the two hinge pin [30] to remove the inlet check valve [29] and spring [28].

SUBTASK 28-25-03-020-006

(15) To remove the outlet check valve [33] from the pump housing [40], do the steps that follow:

(a) Remove the retaining wire [35] to remove the outlet adapter [36].

(b) Remove and discard the O-ring [32].

(c) Remove the two hinge pin [31] to remove the outlet check valve [33] and spring [34].

——— END OF TASK ———

TASK 28-25-03-400-802

5. APU DC Fuel Pump (Housing) - Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

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A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

(2) For application of sealants in the fuel tank structure(s), it is acceptable to use sealant, A50303, as an alternative to sealant, A00767, for Class A and B non-faying seal applications:

(a) The sealant, A50153, and sealant, A50301, are mutually interchangeable.

(b) The sealant, A50110, and sealant, A50302, are mutually interchangeable.

(c) The sealant, A50153, cannot be used in combination with sealant, A50302, and sealant, A50301, cannot be used with sealant, A50110.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
20-30-93-910-801	Final Cleaning Prior to Fuel Tank Sealing (Series 93) (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-300-802	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)
28-25-06-400-801	APU Fuel Supply Line (Left Main Tank, Left Center Fuel Tank and Wing Center Fuel Section) - Installation (P/B 401)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

D. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
A50110	Sealant	BMS5-45 Class B-2

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(Continued)

Reference	Description	Specification
A50153	Sealant - Fuel Tank - Class A-2	BMS5-45 Class A-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
A50301	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168 Type I Class A-2
A50302	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168 Type I Class B-2
A50303	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
B01013	Solvent - Final Cleaning Prior To Fuel Tank Sealing - Series 93	
C00064	Coating - Aluminum Chemical Conversion	BAC5719 Type II Class A (MIL-DTL-5541 Class 1A)
C00700	Coating - Protective Enamel (BAC 707 Gray Color, Gloss)	BMS10-60 Type I
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995
G50961	Coating - Corrosion Inhibiting Epoxy Primer - (BAC 377 Yellow Color)	BMS10-11 Type I

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
24	O-ring	28-25-00-01-185	ARO ALL
27	O-ring	28-25-03-01-130	ARO ALL
29	Inlet check valve	28-25-03-01-140	ARO ALL
32	O-ring	28-25-03-01-155	ARO ALL
33	Outlet check valve	28-25-03-01-165	ARO ALL
39	O-ring	28-25-00-01-190	ARO ALL
41	O-ring	28-25-03-01-080	ARO ALL

F. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing

G. Access Panels

Number	Name/Location
531BB	Access Door

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H. Procedure

SUBTASK 28-25-03-020-007

(1) If the inlet check valve [29] is removed from the pump housing [40], do the steps that follow to install it:

(a) Install the two hinge pin [30], with the inlet check inlet check valve [29] and the spring [28].

(b) Install MS20995C32 lockwire, G01048, to the two hinge pin [30] (TASK 20-10-23-400-801).

(c) Apply grease, D00504, to a new O-ring [27] and install it.

(d) Put the inlet adapter [26] in its position and install the three screws [25].

SUBTASK 28-25-03-020-008

(2) If the outlet check valve [33] is removed from the pump housing [40], do the steps that follow to install it:

(a) Install the outlet check outlet check valve [33], spring [34] and the two hinge pin [31].

(b) Install MS20995C32 lockwire, G01048, to the two hinge pin [31] (TASK 20-10-23-400-801).

(c) Apply grease, D00504, to a new O-ring [32] and install it.

(d) Install the retaining wire [35].

SUBTASK 28-25-03-940-001

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(3) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-25-03-100-001

(4) Clean the surfaces that touch at the bonding jumper [8] connection on the rear spar with Series 93 solvent, B01013, out of the fuel tank (TASK 20-30-93-910-801).

SUBTASK 28-25-03-010-003

(5) Go into the left center fuel tank.

SUBTASK 28-25-03-100-002

(6) Clean the surfaces that touch between the rear spar and the pump housing [40] with Series 93 solvent, B01013 (TASK 20-30-93-910-801).

SUBTASK 28-25-03-420-006

(7) Apply a thin layer of petrolatum grease, D00504, to the new O-ring [41].

(a) Install the O-ring [41] onto the pump housing [40].

SUBTASK 28-25-03-420-003

(8) Put the pump housing [40], with O-ring [41], in its position on the rear spar.

SUBTASK 28-25-03-420-004

(9) Align the pump housing [40] with the discharge line [38] and the inlet line [22].

SUBTASK 28-25-03-110-002

(10) Do these steps to prepare the bonding jumper [8] for a fay sealed fay surface bond:

(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

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1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-10: CDCCL

(b) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper [8] terminal and the washer [3].

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the fay surface fay seal.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(c) Apply a thin continuous layer of sealant on the shank and threads of the bolt [2], bolt [7], and bolt [54].

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the fay surface fay seal.

SUBTASK 28-25-03-420-012

28-AWL-10: CDCCL

(11) Have a person, out of the fuel tank, install the bolt [7], and washer [3] through the rear spar (structure) to attach the bonding jumper [8] and the pump housing [40].

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

SUBTASK 28-25-03-420-005

(12) Have a person, out of the fuel tank, install the bolt [2] and bolt [54] and two washers [3] through the rear spar to attach the pump housing [40].

SUBTASK 28-25-03-420-011

(13) Tighten the bolt [2], bolt [7], and bolt [54] to 35 ±3 in-lb (4.0 ±0.4 N·m).

SUBTASK 28-25-03-760-001

(14) Measure the electrical bonding resistance between the terminal on the bonding jumper [8] and the airplane structure with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

(a) Make sure the electrical bonding resistance is 0.0010 ohm (1.0 milliohm) or less.

SUBTASK 28-25-03-390-002

(15) Apply a cap seal of sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, to the bolt [7] that attaches the bonding jumper [8] to the structure.

NOTE: Use the sealant that was used for the fay surface fay seal.

(a) Make sure that the sealant does not touch the flange of the APU DC fuel pump [1].

SUBTASK 28-25-03-430-005

(16) Have the person in the fuel tank do these steps to connect the fuel lines (TASK 28-25-06-400-801):

(a) Apply a thin layer of petrolatum grease, D00504, to the new O-ring [24].

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(b) Install the O-ring [24] and connect the flexible half coupling [23] between the inlet line [22] and the pump housing [40] (TASK 28-25-06-400-801).

(c) Install MS20995C32 lockwire, G01048, to the flexible half coupling [23] (TASK 20-10-23-400-801).

(d) Apply a thin layer of petrolatum grease, D00504, to the new O-ring [39].

(e) Install the O-ring [39] and connect the tee assembly [37] between the discharge line [38] and the pump housing [40].

(f) Install MS20995C32 lockwire, G01048, to the tee assembly [37] (TASK 20-10-23-400-801).

SUBTASK 28-25-03-410-002

(17) Apply sealant as follows:

(a) Apply a fillet seal of sealant, A00767 (or equivalent), between the pump housing [40] and the rear spar, in the fuel tank (TASK 28-11-00-300-802).

SUBTASK 28-25-03-410-001

(18) Install this access door in the left center fuel tank:

(TASK 28-11-02-400-801)

Number	Name/Location
531BB	Access Door

SUBTASK 28-25-03-430-006

(19) Do this task: APU DC Fuel Pump (Motor-Impeller) - Installation, TASK 28-25-03-400-801.

SUBTASK 28-25-03-390-006

(20) Do these steps to refinish the bare areas of the rear spar:

(a) Apply coating, C00064, around the bolt.

(b) Apply coating, G50961, around the bolt.

(c) Apply coating, C00700, around the bolt.

SUBTASK 28-25-03-650-003

(21) Do this task: Pressure Refueling, TASK 12-11-01-650-801.

(a) Refuel the center fuel tank to more than 118,000 LB (53,600 KG) of fuel.

(b) Make sure there is no fuel leakage at the actuator installation on the rear spar.

——— END OF TASK ———

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APU DC FUEL PUMP - INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure contains a functional check of the bonding resistance between the structure and the APU DC Fuel Pump.

SFAR 88

TASK 28-25-03-200-801

2. APU DC Fuel Pump (Motor-Impeller Unit) - Bonding Resistance Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
20-11-00-910-801	Standard Torque Values (P/B 201)
28-25-03-400-801	APU DC Fuel Pump (Motor-Impeller) - Installation (P/B 401)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Consumable Materials

Reference	Description	Specification
C00913	Compound - Corrosion Inhibiting Material, Nondrying Resin Mix	BMS3-27
G50237	Compound - Corrosion Inhibiting, Non-drying - Cor-Ban 27L	BMS3-38

D. Location Zones

Zone	Area
551	Rear Spar to Landing Gear Support Beam - Left Wing

E. Prepare for the Procedure

SUBTASK 28-25-03-490-001

(1) Make sure the downlocks are installed on the nose and main landing gear (TASK 32-00-30-480-801).

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SUBTASK 28-25-03-490-002

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-25-03-865-001

(3) Open this circuit breaker and install safety tag:

Standby Power Management Panel, P310

Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP

SUBTASK 28-25-03-020-010

(4) To get access to the APU DC fuel pump, do this step:

(a) Remove the fourteen bolts and remove the faceplate.

F. Electrical Bonding Measurement

SUBTASK 28-25-03-862-001

(1) Disconnect the electrical connector from the motor-impeller.

SUBTASK 28-25-03-861-001

(2) Disconnect the electrical connector, for the pressure switch, from the motor-impeller.

SUBTASK 28-25-03-765-001

(3) Use an intrinsically safe approved bonding meter, COM-1550, to measure the bonding resistance between the pump motor housing and the airplane structure (SWPM 20-20-00).

(a) Make sure the bonding resistance is 0.002 ohm (2 milliohms) or less.

SUBTASK 28-25-03-765-002

(4) Use an intrinsically safe approved bonding meter, COM-1550, to measure the bonding resistance between the bonding jumper and the airplane structure (SWPM 20-20-00).

(a) Make sure the bonding resistance is 0.0010 ohm (1.0 milliohm) or less.

SUBTASK 28-25-03-861-002

(5) Connect the electrical connector to the motor-impeller.

SUBTASK 28-25-03-861-003

(6) Connect the electrical connector, for the pressure switch, to the motor-impeller.

SUBTASK 28-25-03-420-007

WARNING USE NITRILE GLOVES FOR SKIN PROTECTION WHEN YOU USE COR-BAN 27L, G50237. IF IT GETS ON YOUR SKIN, IMMEDIATELY REMOVE IT WITH WATER. IF THIS MATERIAL GETS IN YOUR EYES, IMMEDIATELY FLUSH YOUR EYES WITH WATER. GET MEDICAL AID. THIS MATERIAL CONTAINS FLAMMABLE AGENTS WHICH CAN CAUSE INJURIES TO PERSONNEL.

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(WARNING PRECEDES)

WARNING

DO NOT GET THIS MATERIAL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THIS MATERIAL. PUT ON A RESPIRATOR, EYE PROTECTION (GOGGLES, OR OTHER APPROVED PROTECTION), AND GLOVES BEFORE YOU USE THIS MATERIAL. MAKE SURE THAT THERE IS SUFFICIENT AIRFLOW. KEEP THIS MATERIAL AWAY FROM SPARKS, FLAME, AND HEAT. THIS MATERIAL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(7) Do these steps for the APU DC fuel pump:

(a) Apply anti-corrosion Cor-Ban 27L Compound, G50237 or Mastinox 6856 K, C00913 to the surfaces that touch between the faceplate and the support structure.

(b) Apply anti-corrosion Cor-Ban 27L Compound, G50237 or Mastinox 6856 K, C00913 to the bolts before installation.

(c) Put the faceplate in its position and install the fourteen bolts. Refer to Standard Torque Values, TASK 20-11-00-910-801.

SUBTASK 28-25-03-860-004

(8) Remove the safety tag and close this circuit breaker:

Standby Power Management Panel, P310

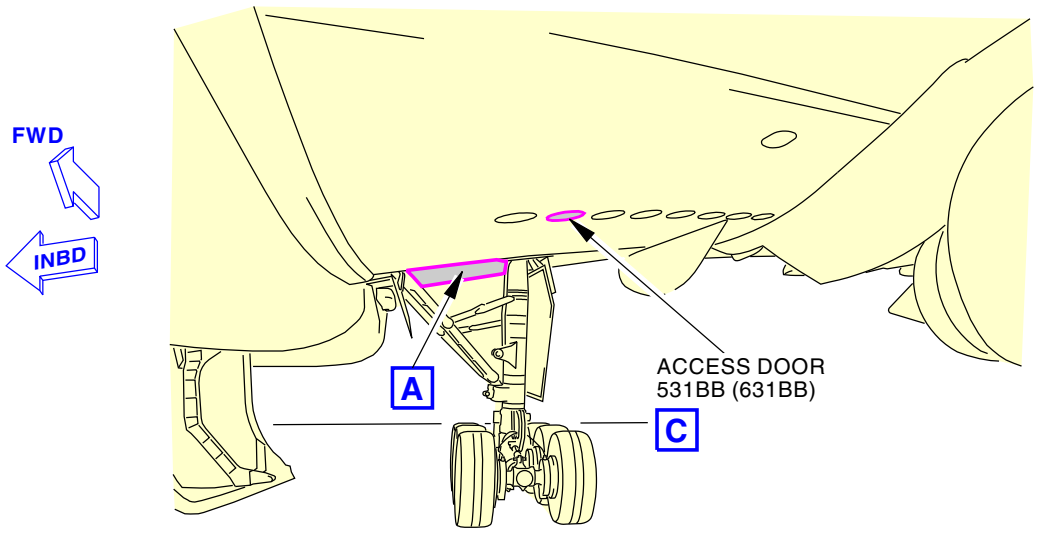
Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP

SUBTASK 28-25-03-710-002

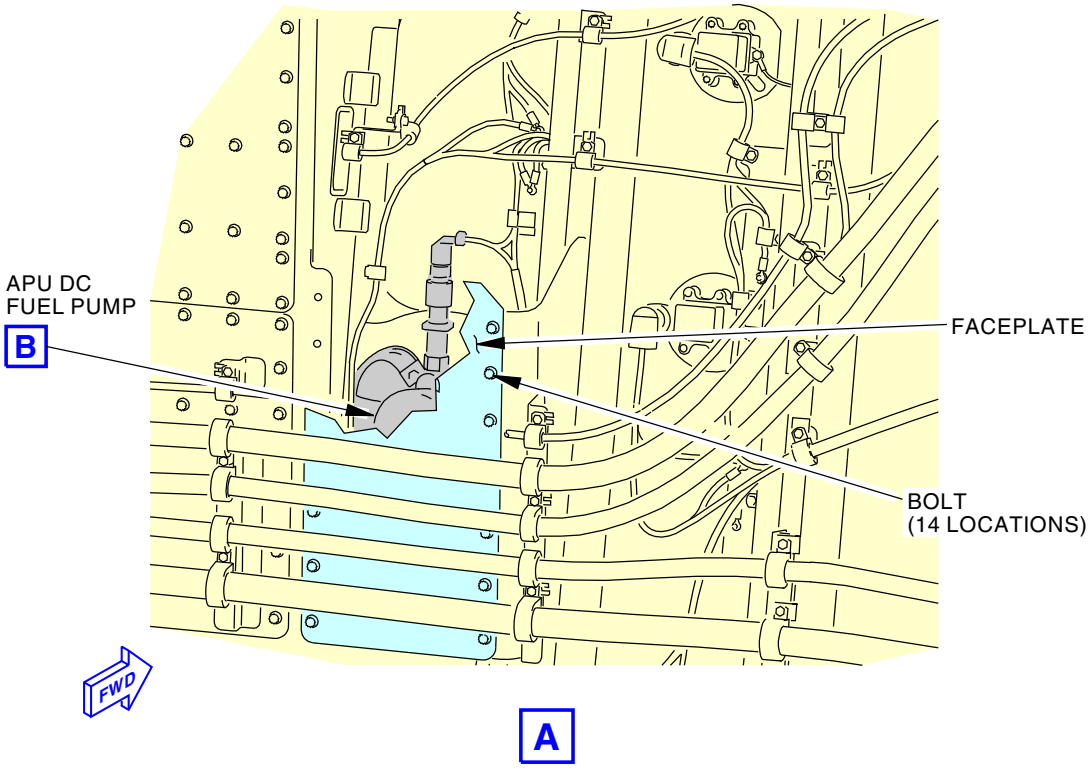
(9) Do the APU DC fuel pump test in APU DC Fuel Pump (Motor-Impeller) - Installation, TASK 28-25-03-400-801.

——— END OF TASK ———

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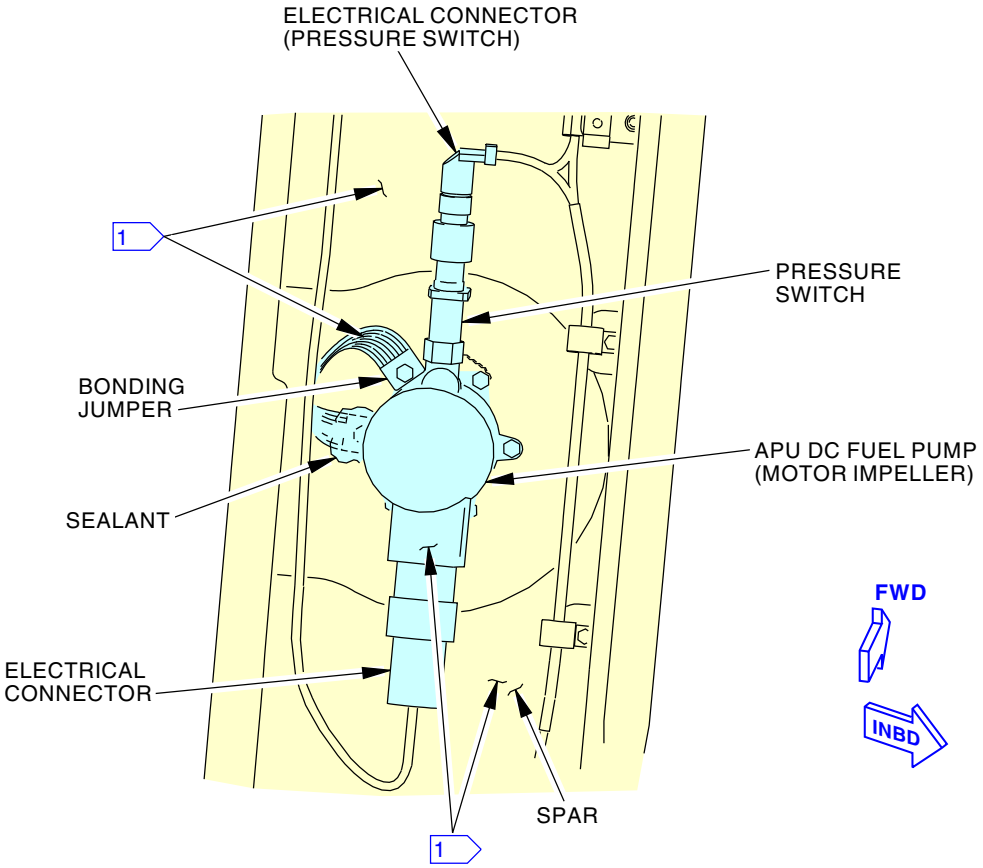
LEFT WING
(RIGHT WING IS EQUIVALENT)



1368500 S0000246966_V2

APU DC Fuel Pump - Bonding Resistance Check
Figure 601/28-25-03-990-805 (Sheet 1 of 2)

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1 BONDING RESISTANCE MEASUREMENT

1368504 S0000246968_V2

APU DC Fuel Pump - Bonding Resistance Check
Figure 601/28-25-03-990-805 (Sheet 2 of 2)

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APU FUEL ISOLATION VALVE - REMOVAL/INSTALLATION

1. General

A. The APU isolation valve is installed on the rear spar, inside of the left center fuel tank. The APU isolation valve actuator is installed on the rear spar, out of the left center fuel tank.

B. This procedure contains two tasks. The first task removes the APU fuel isolation valve. The second task installs the APU fuel isolation valve.

TASK 28-25-04-000-801

2. APU Isolation Valve - Removal

(Figure 401)

A. References

Reference	Title
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-25-05-000-802	APU Isolation Valve Actuator - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Access Panels

Number	Name/Location
531BB	Access Door

C. Procedure

SUBTASK 28-25-04-650-001

(1) Defuel all of the fuel tanks (TASK 28-26-00-650-801).

NOTE: You must defuel the main fuel tanks to prevent fuel flow from suction by-pass valves into the center fuel tank, when you remove the APU fuel isolation valve.

SUBTASK 28-25-04-940-001

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) For the center fuel tank, do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-25-04-030-001

(3) Do this task: APU Isolation Valve Actuator - Removal, TASK 28-25-05-000-802.

SUBTASK 28-25-04-030-002

(4) Remove the fillet seal of sealant from the four screws [3].

SUBTASK 28-25-04-030-003

(5) Remove the four screws [3] and sixteen washer [1], washer [2] that attach the valve [7] to the rear spar.

SUBTASK 28-25-04-010-001

(6) Remove this access door:

Number	Name/Location
531BB	Access Door

from the left center fuel tank (TASK 28-11-02-000-801).

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SUBTASK 28-25-04-010-002

(7) Go into the left center fuel tank.

SUBTASK 28-25-04-020-001

(8) Hold the valve [7] in its position.

SUBTASK 28-25-04-030-004

(9) Remove the lockwire and disconnect the flexible couplings [6] from the two sides of the valve [7].

(a) Discard the four O-rings [9].

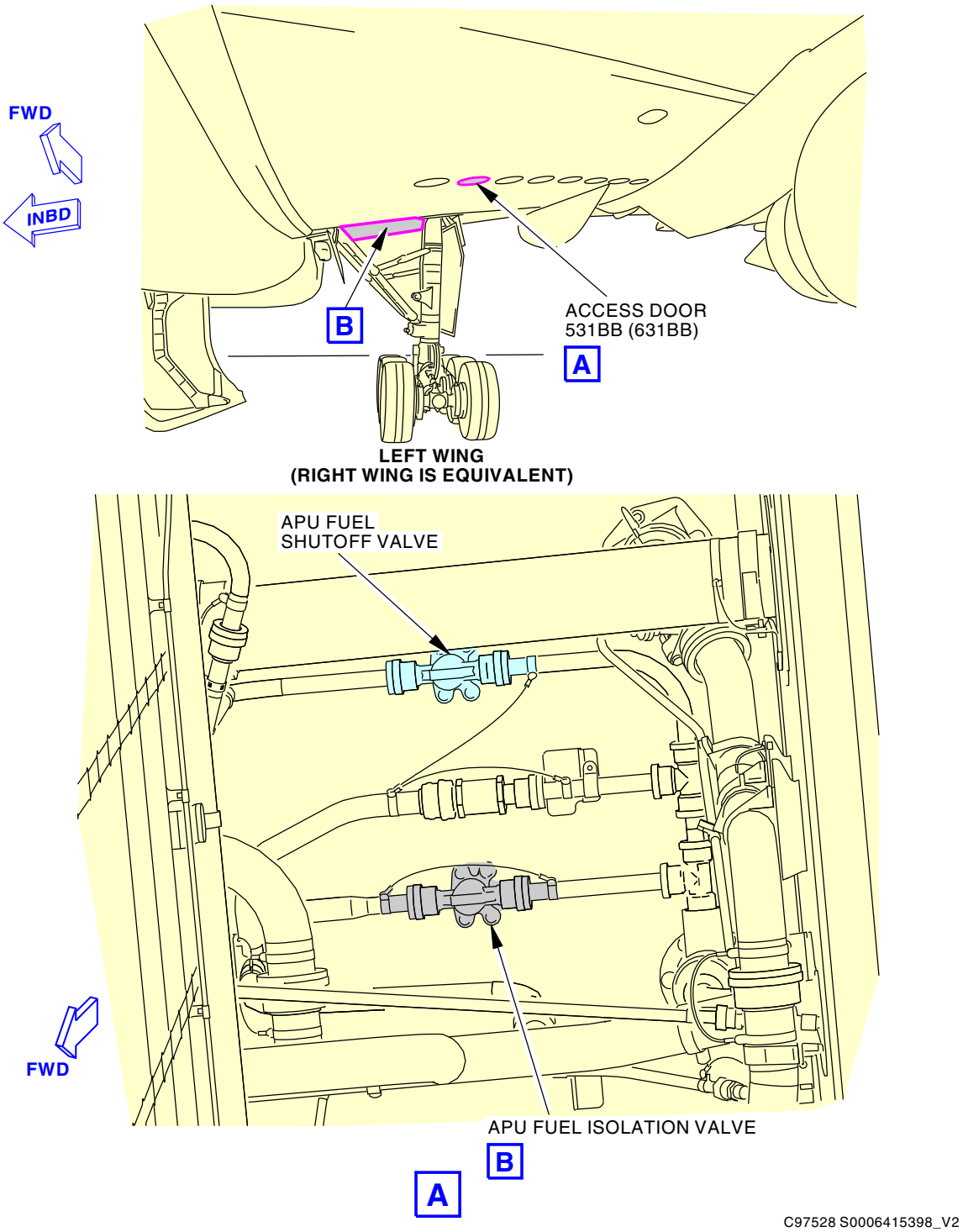
SUBTASK 28-25-04-020-002

(10) Remove the valve [7] and seal [5].

(a) Discard the seal [5].

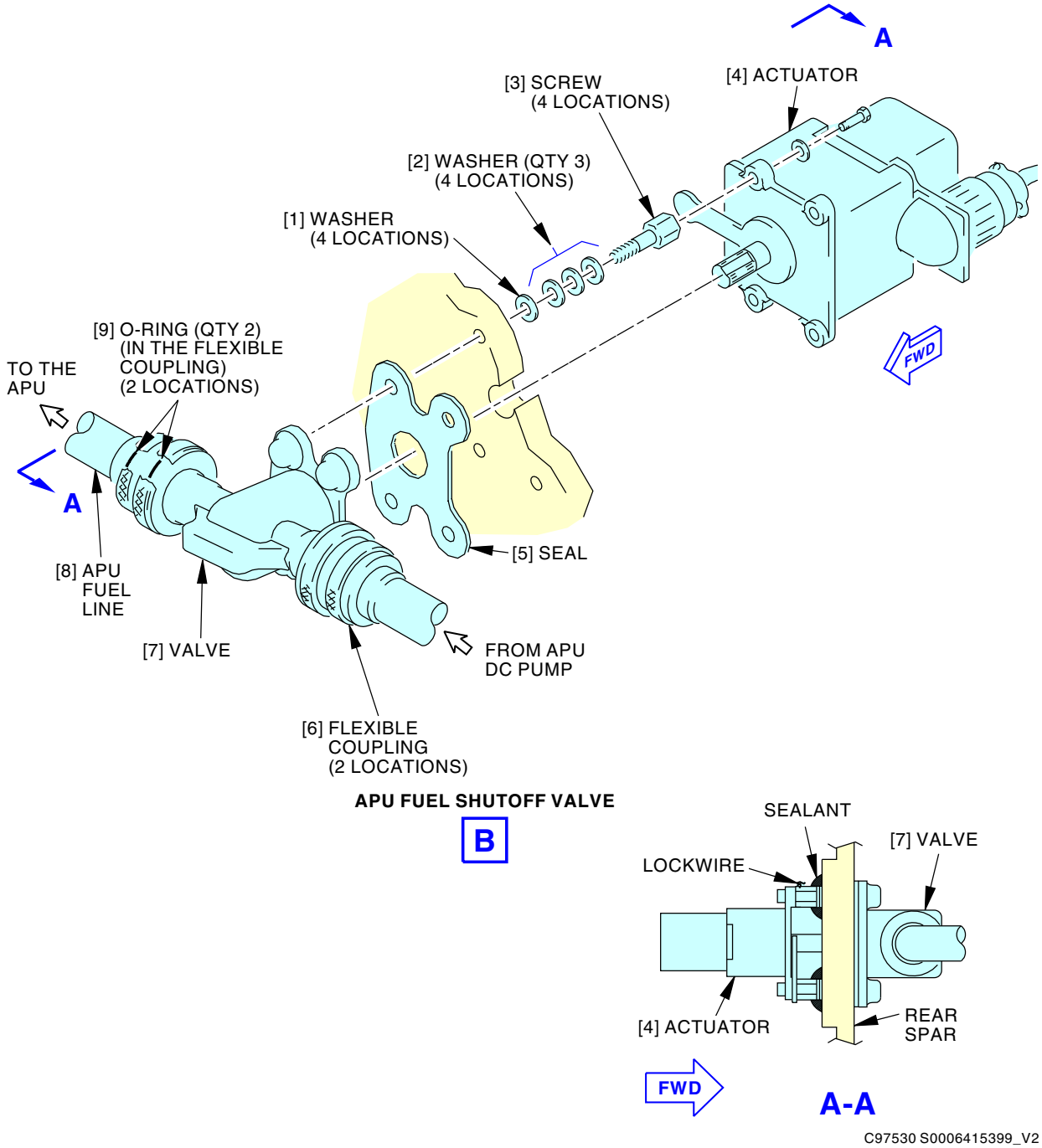
——— END OF TASK ———

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APU Fuel Isolation Valve Installation
Figure 401/28-25-04-990-801 (Sheet 1 of 2)

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APU Fuel Isolation Valve Installation
Figure 401/28-25-04-990-801 (Sheet 2 of 2)

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TASK 28-25-04-400-801

3. APU Isolation Valve - Installation

(Figure 401)

A. General

(1) This task requires two persons to install the APU Isolation Valve.

(2) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)
28-25-05-400-802	APU Isolation Valve Actuator - Installation (P/B 401)
28-25-06-400-801	APU Fuel Supply Line (Left Main Tank, Left Center Fuel Tank and Wing Center Fuel Section) - Installation (P/B 401)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

D. Consumable Materials

Reference	Description	Specification
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142 Type II
D00504	Grease - Petrolatum	VV-P-236

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
5	Seal	28-25-04-01-020	ARO ALL

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F. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing

G. Access Panels

Number	Name/Location
531BB	Access Door

H. Procedure

SUBTASK 28-25-04-940-002

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-25-04-210-001

(2) Make sure the two sides of the rear spar are clean at each screw [3] hole location.

SUBTASK 28-25-04-430-001

(3) Put a new seal [5] between the rear spar and the valve [7].

SUBTASK 28-25-04-420-001

(4) Put the valve [7] in position between the APU fuel lines [8].

SUBTASK 28-25-04-430-002

(5) Have another person install the sixteen washers [1], washers [2] and four screws [3], from out of the fuel tank, to the valve [7].

28-AWL-19: CDCCL

(a) Install a fillet sealed fay surface bond between the screws [3] (valve body mounting bolts) and the rear spar (structure) (Figure 401, View A-A) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(b) Tighten the four screws [3] to 62.5 ±12.5 in-lb (7.1 ±1.5 N·m).

28-AWL-19: CDCCL

(c) Apply a fillet seal between the screws [3] (valve body mounting bolts) and the rear spar (structure) (Figure 401, View A-A).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use sealant, A02315.

SUBTASK 28-25-04-430-003

(6) Apply a thin layer of petrolatum grease, D00504, to the new O-rings [9].

SUBTASK 28-25-04-430-004

(7) Install the o-rings [9] and connect the flexible couplings [6] on the two sides of the valve [7] (TASK 28-25-06-400-801).

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(a) Install lockwire to each coupling [6] (TASK 20-10-23-400-801).

SUBTASK 28-25-04-220-001

(8) Measure the electrical bonding resistance between the valve [7] and the airplane structure with an intrinsically safe approved bonding meter, COM-1550.

(a) Make sure the electrical bonding resistance is 0.0025 ohm (2.5 milliohms) or less.

SUBTASK 28-25-04-410-001

(9) Install this access door in the left center fuel tank:

Number	Name/Location
531BB	Access Door

(TASK 28-11-02-400-801).

ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS

SUBTASK 28-25-04-430-006

(10) Do this task: APU Isolation Valve Actuator - Installation, TASK 28-25-05-400-802.

ARO ALL

SUBTASK 28-25-04-650-002

(11) Do this task: Pressure Refueling, TASK 12-11-01-650-801.

(a) Refuel the center fuel tank to more than 125,000 LB (56,700 KG) of fuel.

(b) Make sure there is no fuel leakage at the actuator installation on the rear spar.

——— END OF TASK ———

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APU ISOLATION VALVE ACTUATOR - REMOVAL/INSTALLATION

1. General

A. The APU isolation valve actuator is installed on the rear spar of the left center fuel tank.

B. This procedure has tasks to remove and install the actuator of the APU isolation valve.

ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS

TASK 28-25-05-000-802

2. APU Isolation Valve Actuator - Removal

(Figure 401)

A. References

Reference	Title
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Location Zones

Zone	Area
551	Rear Spar to Landing Gear Support Beam - Left Wing

C. Procedure

SUBTASK 28-25-05-860-005

(1) Open this circuit breaker and install safety tag:

Standby Power Management Panel, P310

Row	Col	Number	Name
F	5	C28638	APU FUEL ISLN VLV

SUBTASK 28-25-05-210-003

(2) Make sure the downlock pins are installed on the nose and main landing gear (TASK 32-00-30-480-801).

SUBTASK 28-25-05-480-002

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-25-05-010-002

(4) Get access to the actuator [9] on the rear spar of the left center fuel tank.

SUBTASK 28-25-05-210-004

(5) Make sure the manual override handle on the actuator [9] is in the CLOSED position.

SUBTASK 28-25-05-030-004

(6) Disconnect the electrical connector [6] from the actuator [9].

SUBTASK 28-25-05-030-005

(7) Remove the screw [11] and washers [12] to disconnect the bonding jumper [10] from the actuator [9].

SUBTASK 28-25-05-020-003

(8) Remove the lockwire from the four screws [7].

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

SUBTASK 28-25-05-030-006

(9) Carefully remove the four screws [7] and washers [8] that attach the actuator [9] to the rear spar.

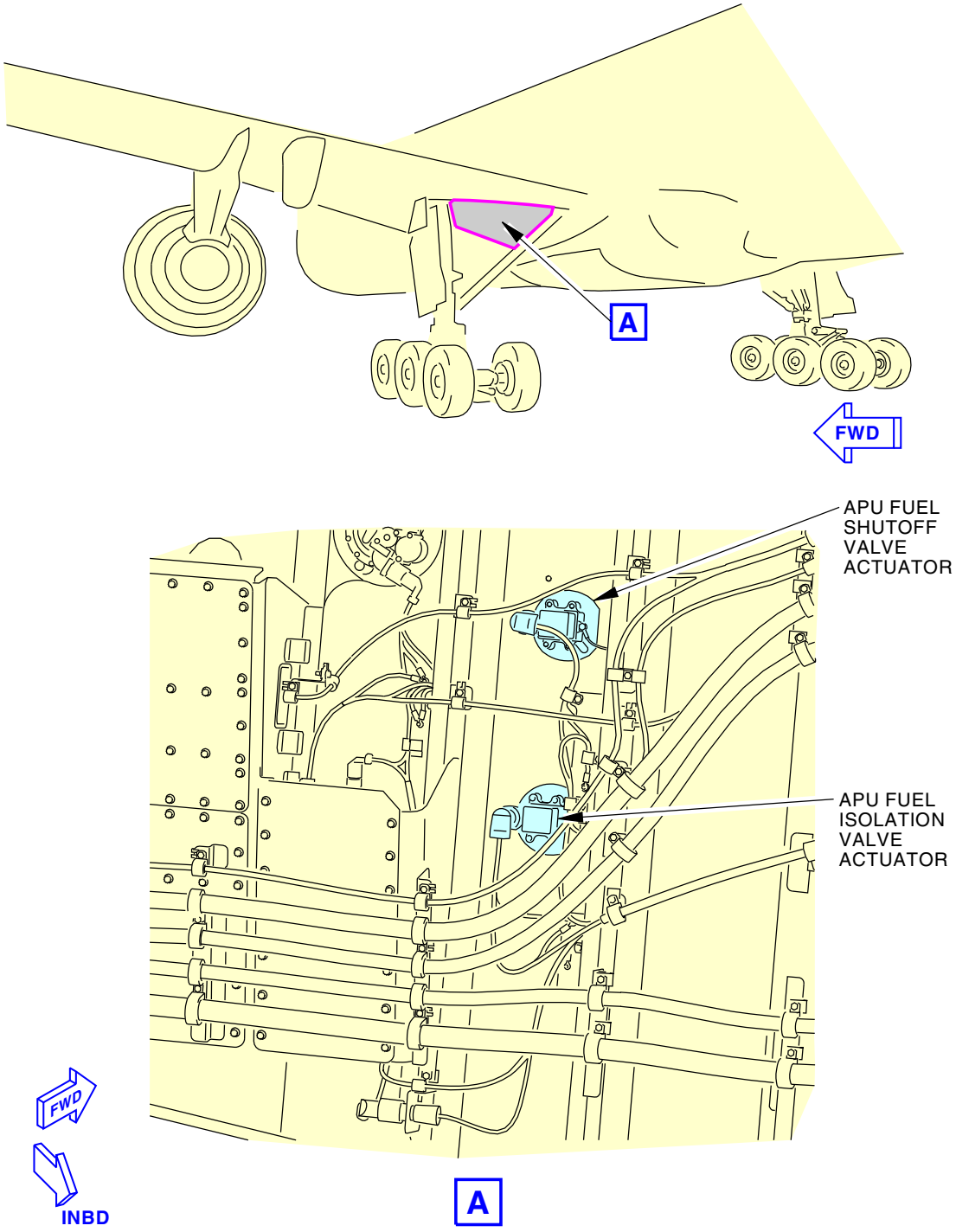
NOTE: The actuator and the mounting bolts are bonded with faying surface sealant.

SUBTASK 28-25-05-020-002

(10) Remove the actuator [9].

——— END OF TASK ———

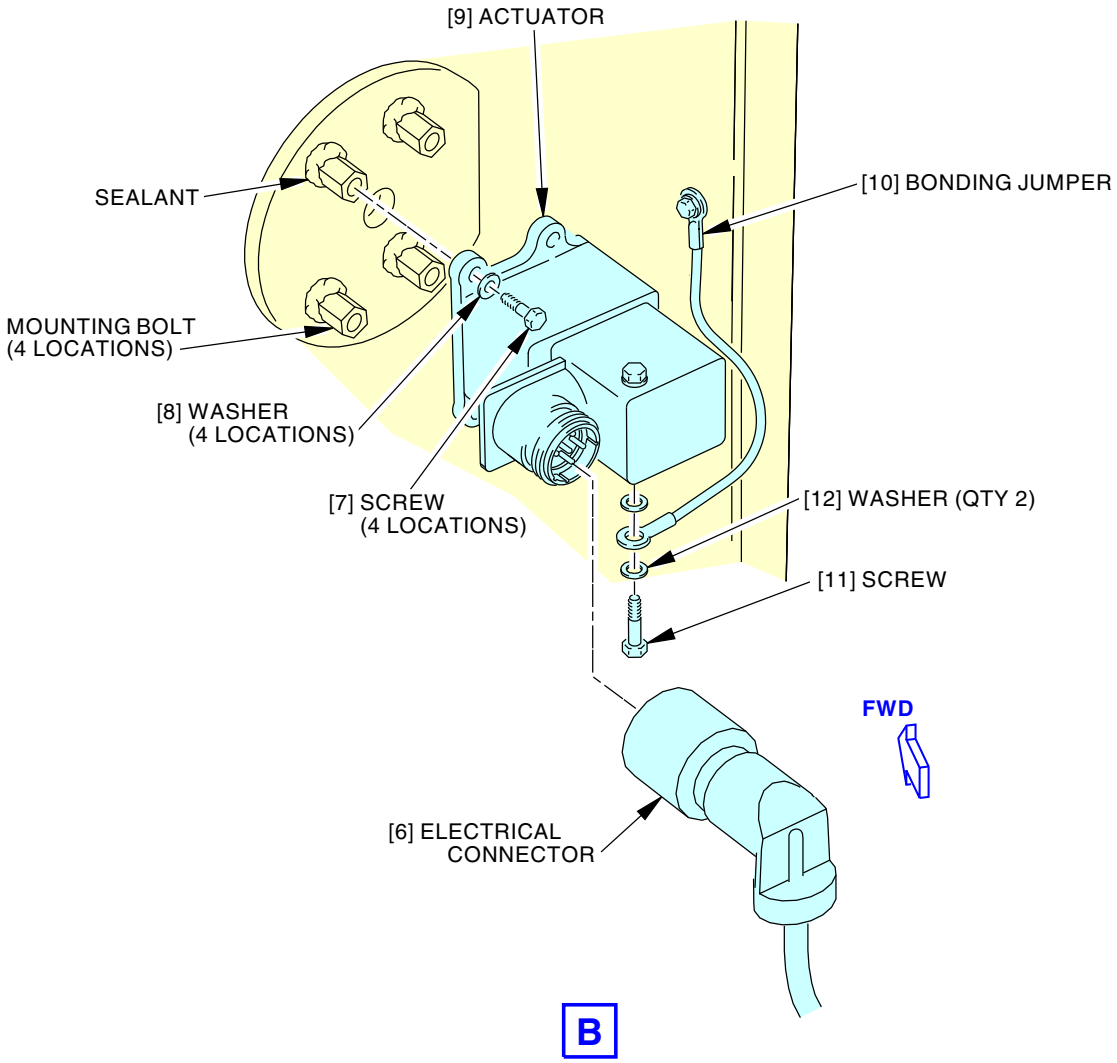
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F04923 S0006415404_V2

APU Fuel Isolation Valve Actuator Installation
Figure 401/28-25-05-990-802 (Sheet 1 of 2)

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U41923 S0000195539_V2

APU Fuel Isolation Valve Actuator Installation
Figure 401/28-25-05-990-802 (Sheet 2 of 2)

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TASK 28-25-05-400-802

3. APU Isolation Valve Actuator - Installation

(Figure 401)

A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(2) For application of fay sealed fay surface bonds in this task, it is acceptable to use sealant, A50110, as an alternative to sealant, A50155.

NOTE: Sealants should not be mixed. In applications where sealants may mix, use the same sealant for both applications.

B. References

Reference	Title
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
20-30-92-910-801	Final Cleaning Prior to General Sealing (Series 92) (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-25-00-710-801	APU Fuel Feed System - System Test (P/B 501)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
51-21-04-620-801	Alodine 600, 1000, 1200, and 1200S Coating Application (P/B 701)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

(Continued)

Reference	Description
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: $0855 Part #: 234350 Supplier: $0857 Part #: 311 Supplier: F6892 Part #: 411B60 Supplier: 3DN12 Part #: 411B90 Supplier: 3DN12 Part #: DAD5013 Supplier: $0856 Part #: DFD5019 Supplier: $0856 Part #: J5-0275-2010 Supplier: 435R8 Part #: SCD5019 Supplier: $0856 Part #: ST982LF-9 Supplier: 62176 Part #: TS1275-4 Supplier: 1DWR5
STD-123	Brush - Soft Bristle

D. Consumable Materials

Reference	Description	Specification
A50110	Sealant	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
B01012	Solvent - Final Cleaning Prior To General Sealing - Series 92	
C00064	Coating - Aluminum Chemical Conversion	BAC5719 Type II Class A (MIL-DTL-5541 Class 1A)
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20 Type II
C50033	Chromated Conversion Coating for Aluminum - Alodine 1200	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Location Zones

Zone	Area
551	Rear Spar to Landing Gear Support Beam - Left Wing

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F. Procedure

SUBTASK 28-25-05-860-006

CAUTION

REMOVE POWER TO THE ACTUATOR. IF YOU DO MAINTENANCE TO THE ACTUATOR WHILE IT IS ENERGIZED, DAMAGE TO THE ACTUATOR CAN OCCUR.

(1) Make sure that this circuit breaker is open and has safety tag:

Standby Power Management Panel, P310

Row	Col	Number	Name
F	5	C28638	APU FUEL ISLN VLV

SUBTASK 28-25-05-140-001

(2) Remove the old sealant and clean the actuator [9], mounting bolt locations (on the rear spar), and fasteners (if re-used).

(a) Use sealant removal tool, COM-2481, or equivalent, to remove old sealant from the actuator [9].

WARNING

DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(b) To remove the remaining sealant, grease, oil, dirt, and other contamination from the components, use one of these items soaked with Series 92 solvent, B01012 (TASK 20-30-92-910-801):

1) soft bristle brush, STD-123

2) cotton wiper, G00034

SUBTASK 28-25-05-840-001

(3) Do these steps to prepare the actuator [9] and the mounting bolt locations for a fay sealed fay surface bond (SWPM 20-20-00):

WARNING

DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

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28-AWL-19: CDCCL

(b) Apply a thin continuous layer of sealant between the actuator [9] mounting feet contact surfaces (four locations) and the (valve body) mounting bolts for a fay sealed fay surface bond.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use sealant, A50110, or sealant, A50155, for the fay sealed fay surface bond.
2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(c) Apply sealant to the shank and the threads of the screws [7].

1) Use sealant, A50110, or sealant, A50155, for the wet installation of the screws [7].

NOTE: Use the same sealant that was used for the fay sealed fay surface bond.

2) Make sure the sealant applied to the fasteners is approximately 0.060 in. (1.524 mm) thick.

SUBTASK 28-25-05-860-009

(4) Make sure the manual override handle of the actuator [9] is in the CLOSED position.

SUBTASK 28-25-05-820-002

(5) Align the splined shaft of the actuator [9] with the shaft of the valve body.

SUBTASK 28-25-05-210-005

(6) Make sure the teeth on the splined shaft of the actuator [9] align with the shaft of the valve body.

SUBTASK 28-25-05-430-004

(7) Install the four screws [7] and the washers [8] to attach the actuator [9] to the mounting bolts on rear spar.

(a) Install lockwire to the four screws [7] (TASK 20-10-23-400-801).

SUBTASK 28-25-05-765-003

28-AWL-19: CDCCL

(8) Measure the electrical bonding resistance between actuator [9] mounting feet and the rear spar (structure) (SWPM 20-20-00):

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

28-AWL-19: CDCCL

(a) Do this measurement with the one or both ends of the bonding jumper [10] disconnected.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(b) Do this measurement with the electrical connector [6] disconnected.

(c) Use an intrinsically safe approved bonding meter, COM-1550.

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28-AWL-19: CDCCL

(d) Make sure the electrical bonding resistance is 0.0050 ohm (5.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

SUBTASK 28-25-05-420-004

(9) If the bonding jumper [10] is disconnected from the structure, do these steps to attach the bonding jumper [10]:

WARNING

DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

(b) Rub dry with a clean, dry cotton wiper, G00034.

(c) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-19: CDCCL

(d) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper [10] terminal and the two washers for a fay sealed fay surface bond at the structure (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use sealant, A50110, or sealant, A50155, for the fay sealed fay surface bond.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(e) Install the screw and washers to attach the bonding jumper [10] to the structure.

1) Tighten the screw to 30 ±5 in-lb (3 ±1 N·m).

28-AWL-19: CDCCL

(f) Apply a cap seal over the screw (fastener) and the terminal of the bonding jumper [10] attached to the structure.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

NOTE: Use the sealant that was used for the fillet sealed fay surface bond.

1) Use sealant, A50110 or sealant, A50155.

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

SUBTASK 28-25-05-765-004

28-AWL-19: CDCCL

(10) Measure the electrical bonding resistance between the loose end of the bonding jumper [10] and the rear spar (structure) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(a) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-19: CDCCL

(b) Make sure the electrical bonding resistance is 0.0015 ohm (1.5 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

SUBTASK 28-25-05-420-003

(11) Do these steps to install the bonding jumper [10] to the actuator [9]:

(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-19: CDCCL

(b) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper [10] terminal and the two washers [12] for a fay sealed fay surface bond with the actuator [9].

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(c) Install the screw [11] and washers [12] to attach the bonding jumper [10] to the actuator [9].

(d) AIRPLANES WITH ACTUATOR MA30A1001:

Tighten the screw [11] to 35 in-lb (4 N·m).

(e) Make sure bonding jumper [10] does not touch the manual override handle on the actuator [1], in the OPEN or CLOSED positions.

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28-AWL-19: CDCCL

(f) Measure the electrical bonding resistance between the upper housing of the actuator [9] and the attached bonding jumper [10] terminal (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Do not touch the screw [11] when you make the electrical bonding measurement.

2) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-19: CDCCL

3) Make sure the electrical bonding resistance is 0.0010 ohm (1.0 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

28-AWL-19: CDCCL

(g) Apply a cap seal over the screw [11] (fastener) and the terminal lug of the bonding jumper [10] attached to the actuator [9].

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

NOTE: Use the sealant that was used for the fillet sealed fay surface bond.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296.

SUBTASK 28-25-05-916-001

(12) Do this task to apply protective finishes to the bare areas of the rear spar: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

NOTE: Re-apply the protective finishes to the rear spar where the electrical bonding probes removed the finishes.

(a) These are the protective finishes:

1) Alodine 600 coating, C00064

2) BMS 10-20 coating, C00307.

SUBTASK 28-25-05-916-002

(13) Do this task to apply Alodine 1200 coating, C50033, to any bare areas of the actuator [9]: Alodine 600, 1000, 1200, and 1200S Coating Application, TASK 51-21-04-620-801.

NOTE: Re-apply the protective coating to the actuator [9] where the electrical bonding probe removed the finish and any bare metal areas around the bonding jumper installation that are not covered with sealant.

SUBTASK 28-25-05-430-006

(14) Connect the electrical connector [6] to the actuator [9].

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

G. APU Isolation Valve Actuator Test

SUBTASK 28-25-05-860-007

(1) Remove the safety tag and close this circuit breaker:

Standby Power Management Panel, P310

Row	Col	Number	Name
F	5	C28638	APU FUEL ISLN VLV

SUBTASK 28-25-05-860-008

(2) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-25-05-700-002

(3) To do a test of the APU fuel isolation valve actuator, do this task: APU Fuel Feed System - System Test, TASK 28-25-00-710-801.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 28-25-05-080-002

WARNING OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

END OF TASK

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APU FUEL ISOLATION VALVE ACTUATOR - INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure contains a functional check of the bonding resistance between the structure and the APU fuel isolation valve actuator.

SFAR 88

TASK 28-25-05-200-801

2. APU Fuel Isolation Valve Actuator - Bonding Resistance Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
28-25-05-400-802	APU Isolation Valve Actuator - Installation (P/B 401)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Location Zones

Zone	Area
551	Rear Spar to Landing Gear Support Beam - Left Wing

D. Prepare for the Procedure

SUBTASK 28-25-05-865-001

(1) Open this circuit breaker and install safety tag:

Standby Power Management Panel, P310

Row	Col	Number	Name
F	5	C28638	APU FUEL ISLN VLV

SUBTASK 28-25-05-212-001

(2) Make sure the downlock pins are installed on the nose and main landing gear (TASK 32-00-30-480-801).

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SUBTASK 28-25-05-490-001

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-25-05-710-003

(4) Get access to the actuator on the rear spar of the left center fuel tank.

E. Electrical Bonding Measurement

SUBTASK 28-25-05-212-002

(1) Make sure the manual override handle on the actuator is in the CLOSED position.

SUBTASK 28-25-05-862-001

(2) Disconnect the electrical connector from the actuator.

SUBTASK 28-25-05-765-001

(3) Use an intrinsically safe approved bonding meter, COM-1550, to measure the bonding resistance between the actuator and the airplane structure (SWPM 20-20-00).

(a) Make sure the bonding resistance is 0.005 ohm (5 milliohms) or less.

SUBTASK 28-25-05-765-005

(4) Use an intrinsically safe approved bonding meter, COM-1550, to measure the bonding resistance between the bonding jumper and the airplane structure (SWPM 20-20-00).

(a) Make sure the bonding resistance is 0.005 ohm (5 milliohms) or less.

SUBTASK 28-25-05-861-001

(5) Connect the electrical connector to the actuator.

SUBTASK 28-25-05-860-010

(6) Remove the safety tag and close this circuit breaker:

Standby Power Management Panel, P310

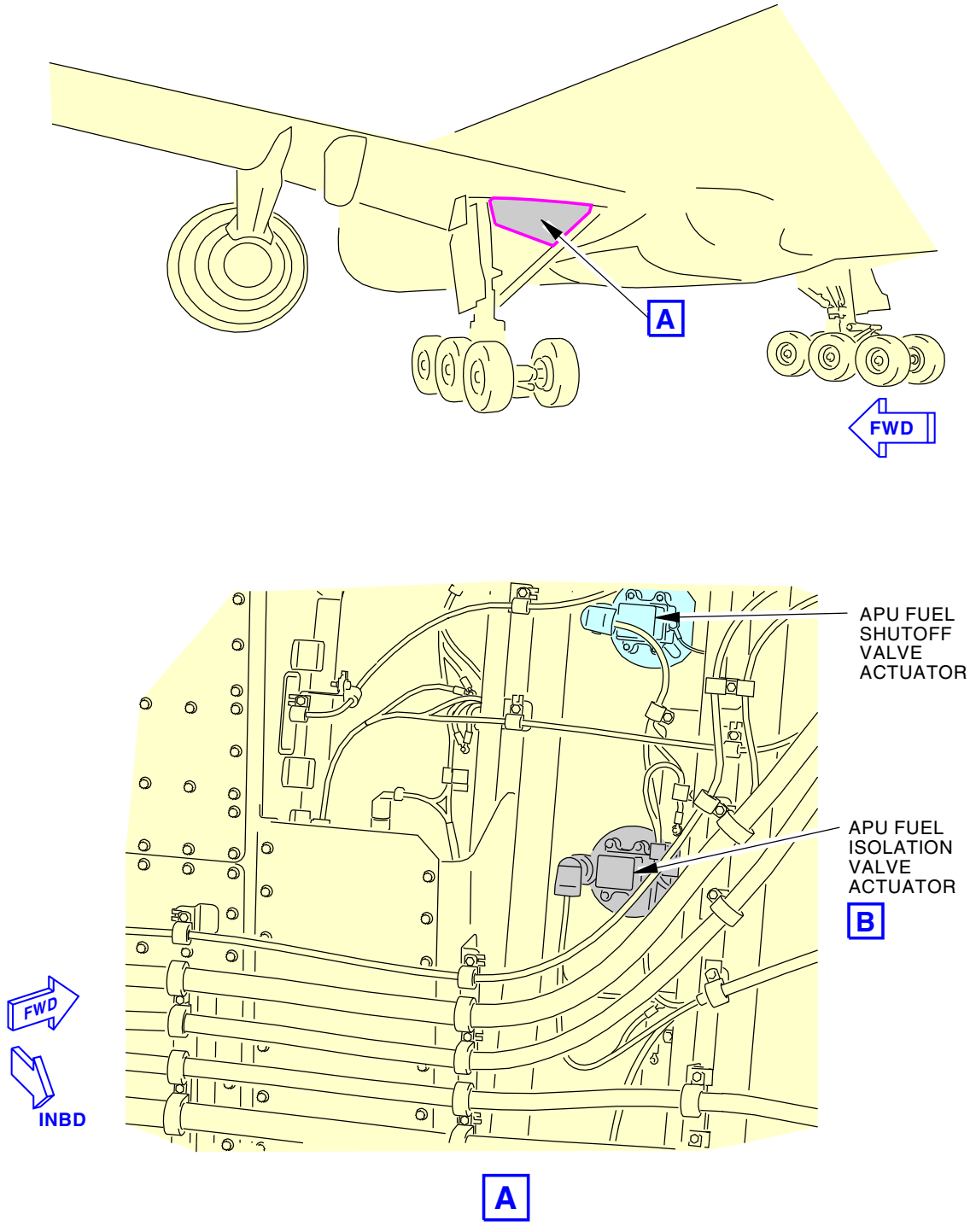
Row	Col	Number	Name
F	5	C28638	APU FUEL ISLN VLV

SUBTASK 28-25-05-710-005

(7) Do the APU isolation valve actuator test in APU Isolation Valve Actuator - Installation, TASK 28-25-05-400-802.

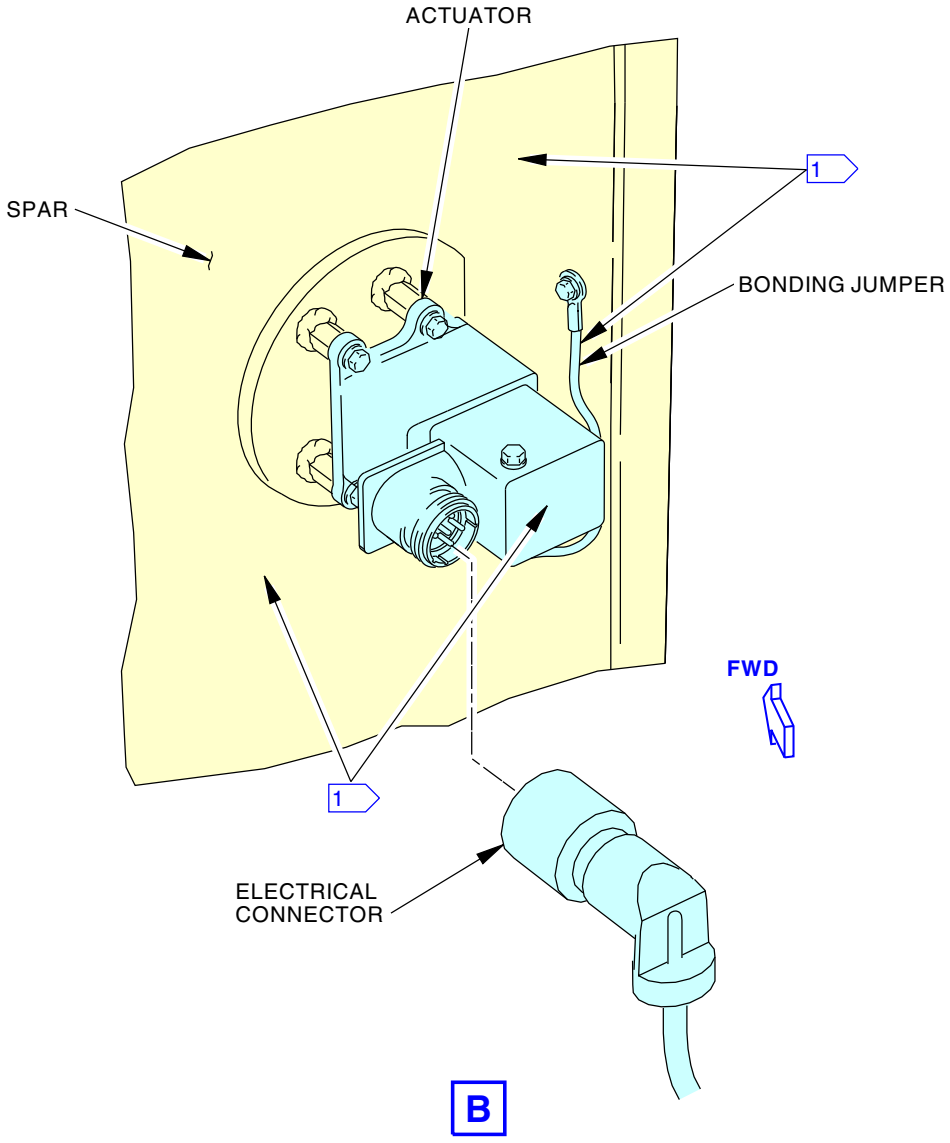
END OF TASK

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APU Fuel Isolation Valve - Bonding Resistance Measurement
Figure 601/28-25-05-990-803 (Sheet 1 of 2)

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1 BONDING RESISTANCE MEASUREMENT LOCATION

1368357 S0000247032_V2

APU Fuel Isolation Valve - Bonding Resistance Measurement
Figure 601/28-25-05-990-803 (Sheet 2 of 2)

EFFECTIVITY
ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS

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APU FUEL SUPPLY LINE AND SHROUD - REMOVAL/INSTALLATION

1. General

A. The APU fuel supply line supplies fuel to the APU. The APU fuel line is installed between the left main fuel tank and the APU. The APU fuel line has a shroud on all sides of the fuel line from the wing center fuel section to the APU firewall. The shroud for the APU fuel line prevents external leakage of fuel and fuel fumes.

B. To make the removal and installation easier, this procedure is divided into 4 tasks as follows:

(1) The APU fuel supply line in the left main tank, left center fuel tank and the wing center fuel section.

(2) The APU fuel supply line and shroud between the wing center fuel section and the aft pressure bulkhead.

(3) The APU fuel supply line and shroud between the aft pressure bulkhead and the APU firewall bulkhead.

(4) The APU shroud drain line and flame arrestor.

C. The APU fuel supply line, between the wing center fuel section and the pressure bulkhead of the aft cargo compartment, is a flexible fuel line.

D. It is not necessary to replace the aluminum tubing for the fuel system (Types 2024, 5052, and 6061) if the damage is not more than the approved limits (TASK 28-22-15-700-802-001).

TASK 28-25-06-000-801

2. APU Fuel Supply Line (Left Main Tank, Left Center Fuel Tank and Wing Center Fuel Section) - Removal

(Figure 401)

A. References

Reference	Title
28-00-00-200-801	Inspection of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-00-00-960-801	Replacement of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-22-15-700-802-001	Fuel Tube Damage Criteria - Inspection/Check (P/B 601)
28-25-02-000-802	APU Fuel Shutoff Valve Actuator - Removal (P/B 401)
28-26-00-650-803	Suction Defueling (P/B 201)

B. Tools/Equipment

Reference	Description
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)

C. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
139	Forward Keel Beam
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing

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(Continued)

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing

D. Access Panels

Number	Name/Location
139AZ	Center Wing Access Door
531AB	Access Door
531BB	Access Door
531CB	Access Door
533AB	Access Door

E. Procedure

SUBTASK 28-25-06-860-003

(1) Make sure the APU start switch, on the Overhead Panel P5, is in the off position.

SUBTASK 28-25-06-860-004

(2) Make sure the manual override handle for the APU fuel shutoff valve is in the CLOSED position (TASK 28-25-02-000-802).

SUBTASK 28-25-06-860-005

(3) Open these circuit breakers and install safety tags:

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	17	C28003	APU FUEL S/O VALVE

Standby Power Management Panel, P310

Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP
B	6	C49601	APUC 1

SUBTASK 28-25-06-650-001

(4) Defuel all of the fuel tanks.

(a) To defuel the fuel tanks, do this task: Suction Defueling, TASK 28-26-00-650-803.

SUBTASK 28-25-06-940-003

WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(5) For the left main tank and center fuel tank, do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801

SUBTASK 28-25-06-010-001

(6) Remove these access doors:

(TASK 28-11-01-000-801) (TASK 28-11-02-000-801)

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Number	Name/Location
139AZ	Center Wing Access Door
531AB	Access Door
531BB	Access Door
531CB	Access Door
533AB	Access Door

SUBTASK 28-25-06-010-002

(7) Go into the left main and center fuel tank.

SUBTASK 28-25-06-020-034

(8) Remove the flexible full couplings, flexible half couplings and couplings to disconnect the APU fuel line.

(a) Inspect the couplings for wear and replace if necessary (TASK 28-22-15-700-802-001).

(b) Discard the O-rings to which you have access on the removed couplings.

1) These O-rings can include O-ring [1], O-ring [4], O-ring [7], O-ring [12], and O-ring [13].

SUBTASK 28-25-06-650-002

(9) Drain all fuel remaining in the APU fuel line into a 5-gallon (19-liter) fuel resistant container, STD-1054.

SUBTASK 28-25-06-020-035

(10) Remove the bonding jumpers and clamps from the APU fuel line.

SUBTASK 28-25-06-020-036

(11) Disconnect the clamps from the structure if it is necessary.

SUBTASK 28-25-06-020-001

(12) Remove the APU fuel line and clamps.

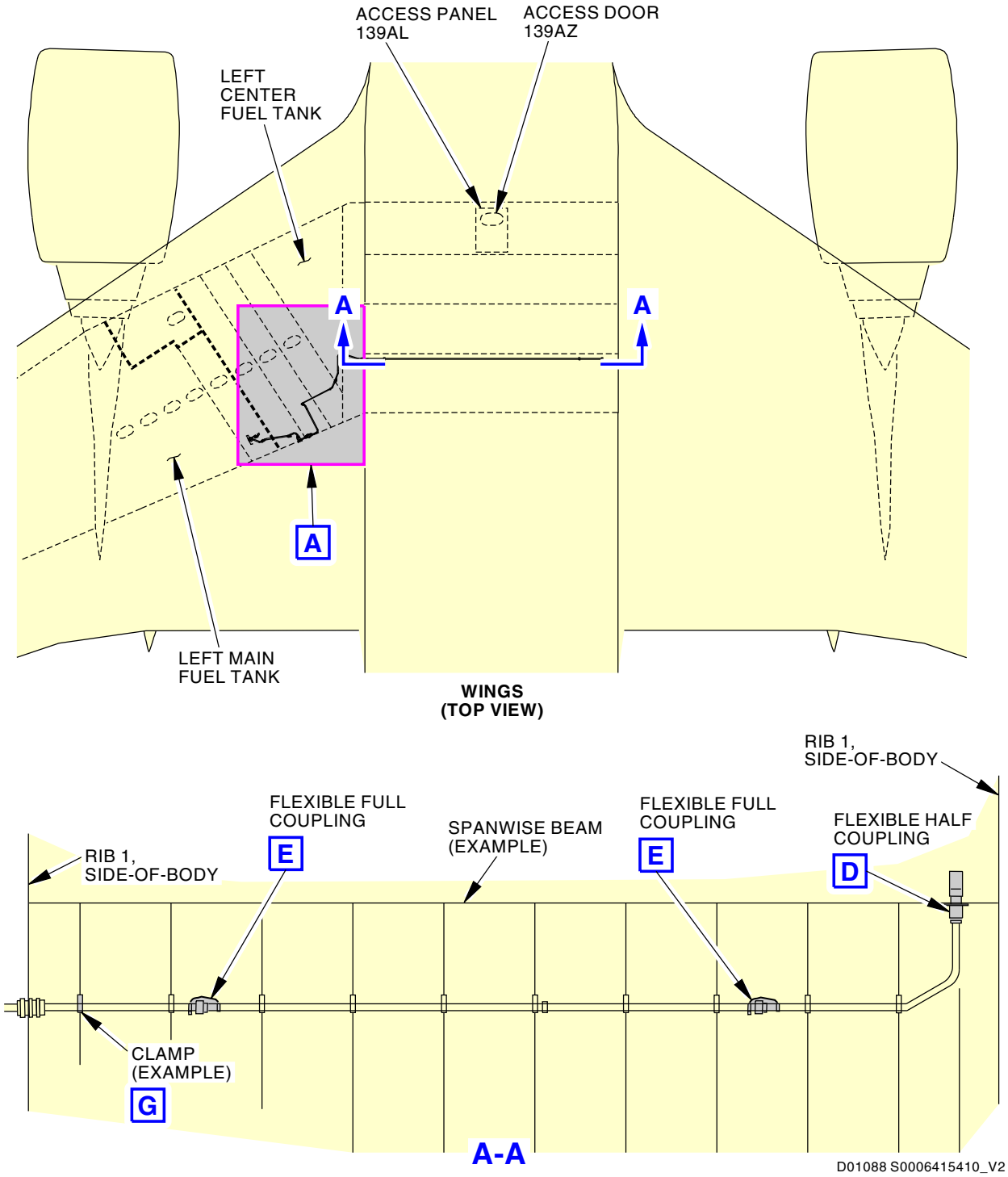
SUBTASK 28-25-06-210-001

(13) Do a check of the bonding jumpers (TASK 28-00-00-200-801).

(a) Replace the bonding jumpers as necessary (TASK 28-00-00-960-801).

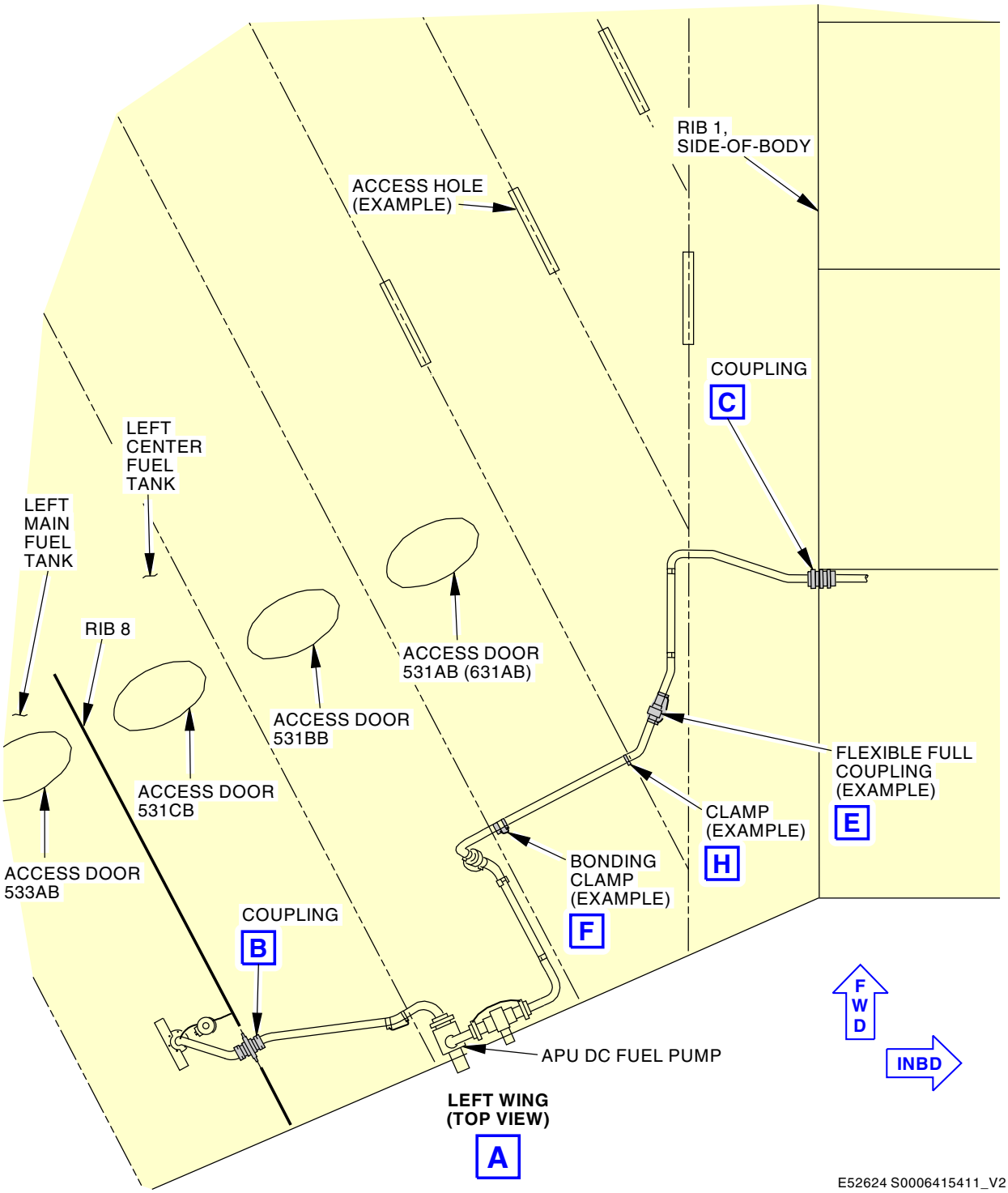
——— END OF TASK ———

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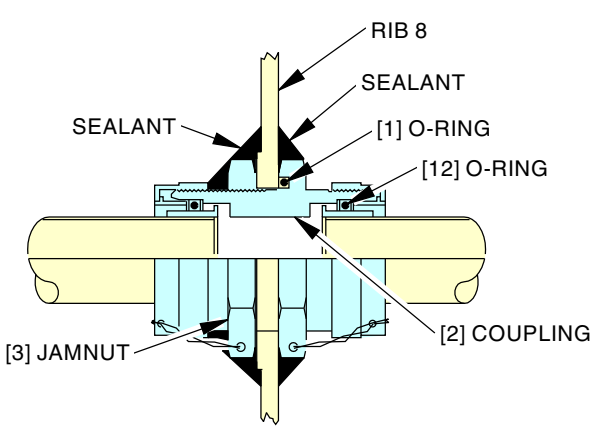
APU Fuel Supply Line and Shroud Installation (Wing)
Figure 401/28-25-06-990-801 (Sheet 1 of 4)

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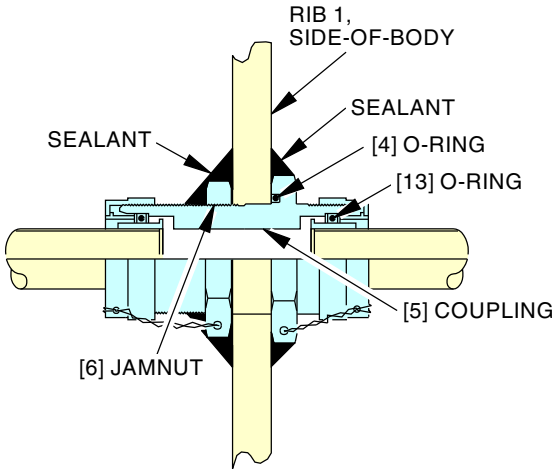
APU Fuel Supply Line and Shroud Installation (Wing)
Figure 401/28-25-06-990-801 (Sheet 2 of 4)

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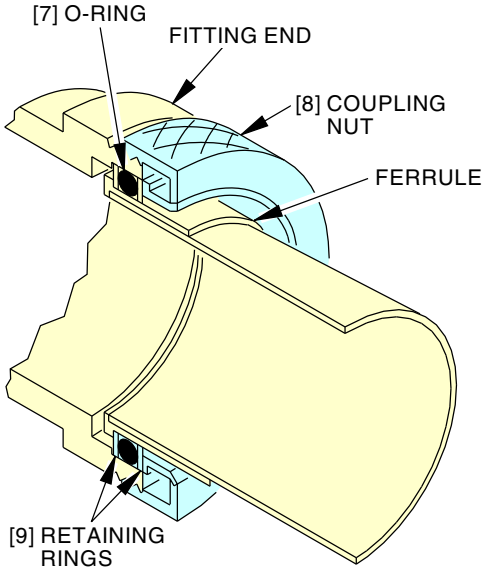
COUPLING

B



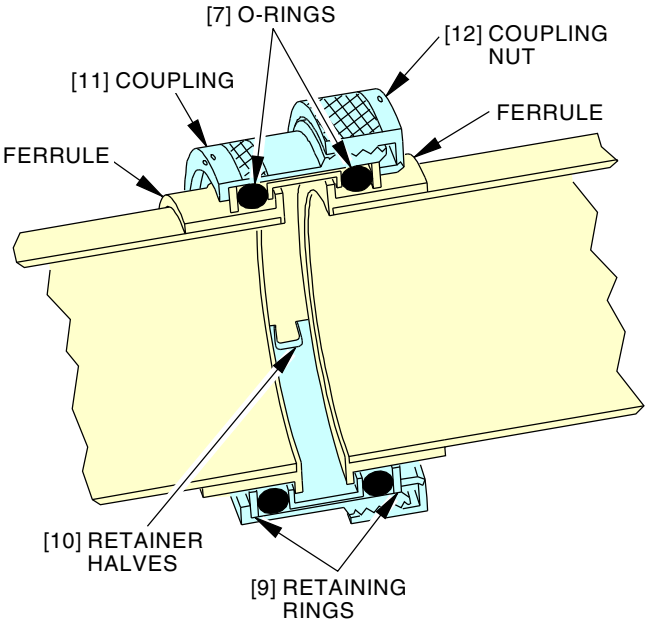
COUPLING

C



FLEXIBLE HALF COUPLING

D



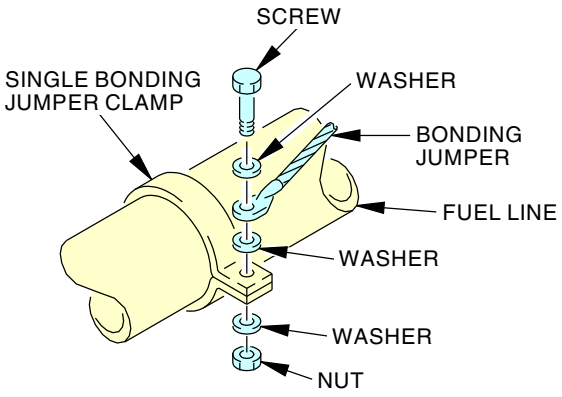
FLEXIBLE FULL COUPLING

E

D01101 S0006415412_V2

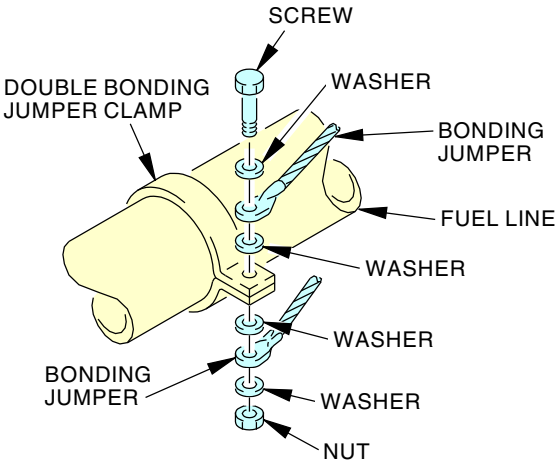
APU Fuel Supply Line and Shroud Installation (Wing)
Figure 401/28-25-06-990-801 (Sheet 3 of 4)

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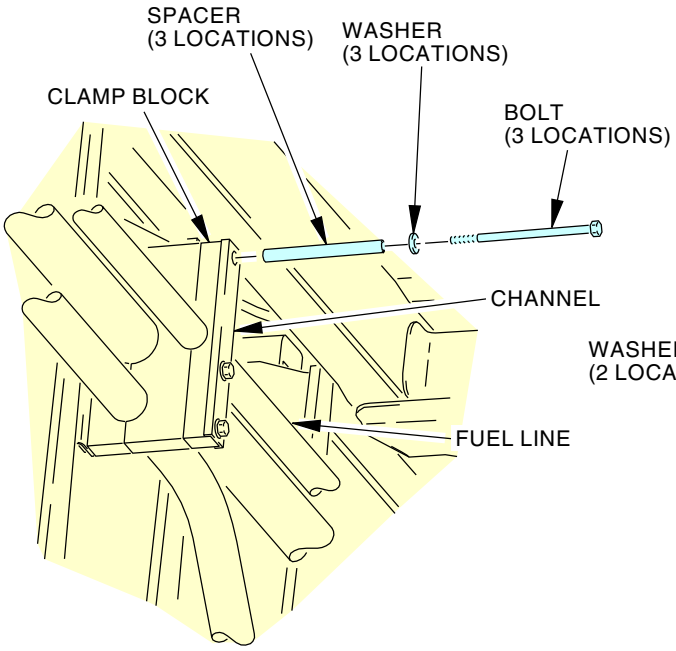
SINGLE BONDING JUMPER CLAMP (EXAMPLE)

F



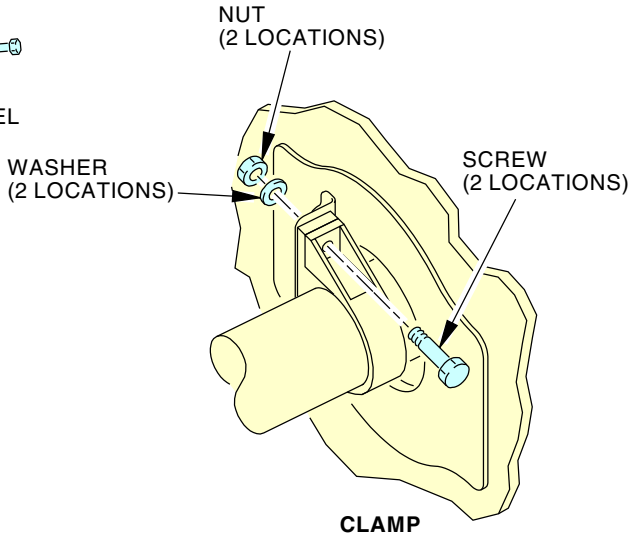
DOUBLE BONDING JUMPER CLAMP (EXAMPLE)

F



CLAMP (EXAMPLE)

G



CLAMP

H

F86949 S0006415415_V2

APU Fuel Supply Line and Shroud Installation (Wing)
Figure 401/28-25-06-990-801 (Sheet 4 of 4)

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TASK 28-25-06-400-801

3. APU Fuel Supply Line (Left Main Tank, Left Center Fuel Tank and Wing Center Fuel Section) - Installation

(Figure 401)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
28-00-00-960-801	Replacement of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)
28-22-15-700-802-001	Fuel Tube Damage Criteria - Inspection/Check (P/B 601)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	O-ring	28-25-00-01-180	ARO 001-013
4	O-ring	28-25-00-01-200	ARO ALL
7	O-ring	28-25-00-01-190	ARO ALL
		28-25-00-01-194	ARO ALL
12	O-ring	28-25-00-01-185	ARO ALL
13	O-ring	28-25-00-01-190	ARO ALL

E. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
139	Forward Keel Beam
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing

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(Continued)

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing

F. Access Panels

Number	Name/Location
139AZ	Center Wing Access Door
531AB	Access Door
531BB	Access Door
531CB	Access Door
533AB	Access Door

G. Procedure

SUBTASK 28-25-06-860-009

(1) Make sure that these circuit breakers are open and have safety tags:

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	17	C28003	APU FUEL S/O VALVE

Standby Power Management Panel, P310

Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP
B	6	C49601	APUC 1

SUBTASK 28-25-06-940-002

WARNING OBEY THE PURGING AND FUEL TANK ENTRY PRECAUTIONS. FAILURE TO OBEY THE PRECAUTIONS COULD CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) For the left main tank and center fuel tank, do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-25-06-010-003

(3) Go into the left main tank or center fuel tank.

SUBTASK 28-25-06-960-001

(4) Replace the bonding jumpers as necessary. To replace the bonding jumpers, do this task: Replacement of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-960-801.

SUBTASK 28-25-06-640-001

(5) Apply a thin layer of petrolatum grease, D00504, to the new O-rings.

(a) These O-rings can include o-ring [1], o-ring [4], o-ring [7], o-ring [12] and o-ring [13].

SUBTASK 28-25-06-420-039

(6) Install the new O-ring [1], O-ring [4], O-ring [7], O-ring [12], and O-ring [13] in the couplings.

(a) Inspect the couplings for wear and replace if necessary (TASK 28-22-15-700-802-001).

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SUBTASK 28-25-06-420-040

(7) Install the support brackets to the structure with bolts, washers, and nuts.

SUBTASK 28-25-06-420-041

(8) Install the bolts, washers and nuts to connect the bonding jumpers between APU fuel line and the support brackets.

(a) After you install a bonding jumper, measure the resistance between the two items that you bonded together with an intrinsically safe approved bonding meter, COM-1550.

NOTE: Make sure that you measure the resistance between the two items being bonded together, and not between the bonding hardware. For example, measure the resistance between two fuel line sections. Do not measure the resistance between the screws that attach a bonding jumper to the fuel line sections.

SUBTASK 28-25-06-420-042

(9) Loosely connect the clamps that hold the APU fuel line to the structure or support brackets.

SUBTASK 28-25-06-420-043

CAUTION

DO NOT USE TOOLS TO TIGHTEN THE FUEL LINE FITTINGS. DAMAGE TO THE FITTING COMPONENTS COULD OCCUR OR THE ADJACENT FITTINGS COULD LOOSEN.

(10) Install the flexible full couplings, flexible half couplings and couplings to connect the APU fuel line.

SUBTASK 28-25-06-410-001

(11) Install lockwire to the couplings (TASK 20-10-23-400-801).

SUBTASK 28-25-06-420-044

(12) Tighten the clamps on the APU fuel line.

SUBTASK 28-25-06-410-002

(13) Install these access doors:

(TASK 28-11-01-400-801) (TASK 28-11-02-400-801)

Number	Name/Location
139AZ	Center Wing Access Door
531AB	Access Door
531BB	Access Door
531CB	Access Door
533AB	Access Door

SUBTASK 28-25-06-650-005

(14) Refuel the fuel tanks (TASK 12-11-01-650-801).

END OF TASK

TASK 28-25-06-000-802

4. APU Fuel Supply Line and Shroud (Wing Center Fuel Section to the Aft Wheel Well Bulkhead) - Removal

(Figure 402)

A. References

Reference	Title
25-27-01-000-801	Carpet (Without Adhesive Back) Removal (P/B 401)

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(Continued)

Reference	Title
25-52-09-000-801	Ceiling Liner Removal (P/B 401)
28-25-02-000-802	APU Fuel Shutoff Valve Actuator - Removal (P/B 401)
53-01-01-000-801	Floor Panel Removal (P/B 401)

B. Tools/Equipment

Reference	Description
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)
STD-1090	Cord

C. Location Zones

Zone	Area
132	Area Above Wing Center Section, Right
142	Area Above Main Landing Gear Wheel Well, Right
152	Aft Cargo Compartment, Right

D. Procedure

SUBTASK 28-25-06-860-006

(1) Make sure the APU start switch, on the Overhead Panel P5, is in the off position.

SUBTASK 28-25-06-860-007

(2) Make sure the manual override handle for the APU fuel shutoff valve is in the CLOSED position (TASK 28-25-02-000-802).

SUBTASK 28-25-06-860-008

(3) Open these circuit breakers and install safety tags:

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	17	C28003	APU FUEL S/O VALVE

Standby Power Management Panel, P310

Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP
B	6	C49601	APUC 1

SUBTASK 28-25-06-010-004

(4) To get access to the APU fuel line and shroud forward of the right No. 3 passenger entry door and aft of the right No. 4 passenger entry door, do the steps that follow:

(a) Remove approximately 30 ft (9 m) of carpet as follows (TASK 25-27-01-000-801):

(b) Remove the applicable passenger floor panels in the above areas (TASK 53-01-01-000-801).

SUBTASK 28-25-06-010-005

(5) Remove the ceiling panels in the aft cargo compartment to get access to the APU intermediate connection View D (Figure 402) (TASK 25-52-09-000-801).

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SUBTASK 28-25-06-020-002

(6) Disconnect the shroud connector [41] at the center wing section connection View B, (Figure 402).

(a) Remove and discard the o-ring [33].

SUBTASK 28-25-06-020-003

(7) Pull the shroud and the shroud connector [41] away from the flexible APU fuel line connection.

SUBTASK 28-25-06-480-005

(8) Put a 5-gallon (19-liter) fuel resistant container, STD-1054, below the APU shroud drain to collect the fuel remaining in the flexible APU fuel line (Figure 405).

SUBTASK 28-25-06-020-004

(9) Disconnect the APU fuel supply line [31] at the center wing section connection.

SUBTASK 28-25-06-480-006

(10) Attach a cord, STD-1090, to the end of the APU fuel supply line [31].

NOTE: This makes it easier to install a new APU fuel line if you do not remove the shroud.

SUBTASK 28-25-06-020-005

(11) At the intermediate fuel line connection, do these steps to loosen the shroud connection (Figure 402, View D):

NOTE: The intermediate fuel line connection is forward of the No. 3 passenger entry door.

(a) Disconnect the bonding jumper on the outboard side.

(b) Remove the inboard retaining ring [42].

(c) Move the shroud connector [43] outboard to get access to the shield [38].

(d) Remove the shield [38] from the APU fuel supply line connection (Figure 402, View D).

1) Discard the shield [38].

(e) Remove and discard the inboard o-ring [40].

SUBTASK 28-25-06-020-007

(12) Disconnect the APU fuel supply line [31] from the APU fuel supply line [39].

SUBTASK 28-25-06-650-003

(13) Drain all the fuel that remains in the APU fuel supply line into a 5-gallon (19-liter) fuel resistant container, STD-1054.

SUBTASK 28-25-06-020-008

(14) Remove the APU fuel supply line [31] from the shroud at the intermediate connection(Figure 402, View D).

SUBTASK 28-25-06-020-013

(15) Disconnect couplings that attach the sections of the shroud together and remove the shroud if it is necessary (Figure 402, View C).

(a) Discard the O-rings from the shroud couplings.

SUBTASK 28-25-06-020-037

(16) Remove the bonding jumpers and clamps from the shroud (Figure 402, View C).

SUBTASK 28-25-06-020-038

(17) Disconnect the shroud clamps from the structure.

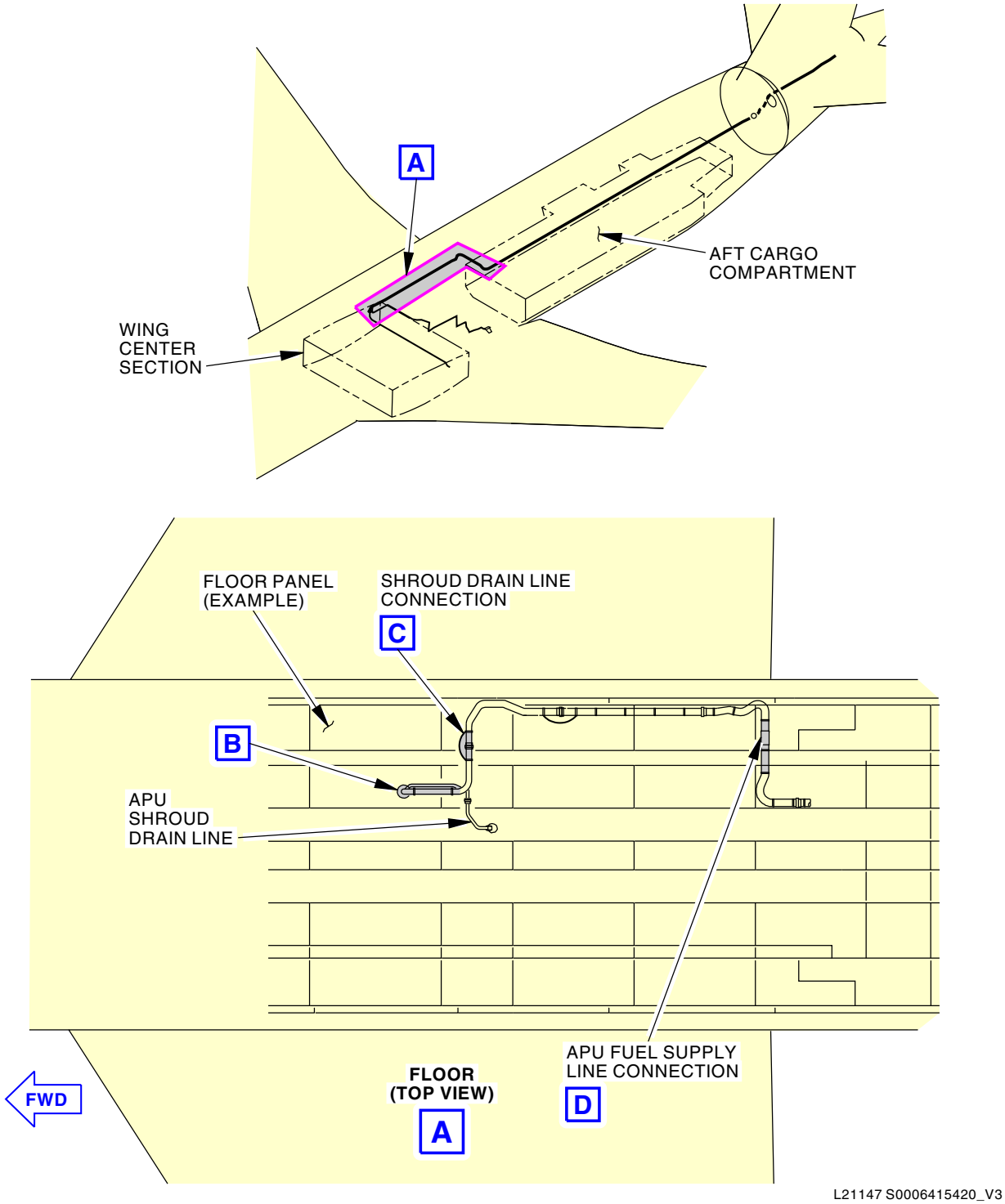
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SUBTASK 28-25-06-020-014

(18) Remove the shroud in parts.

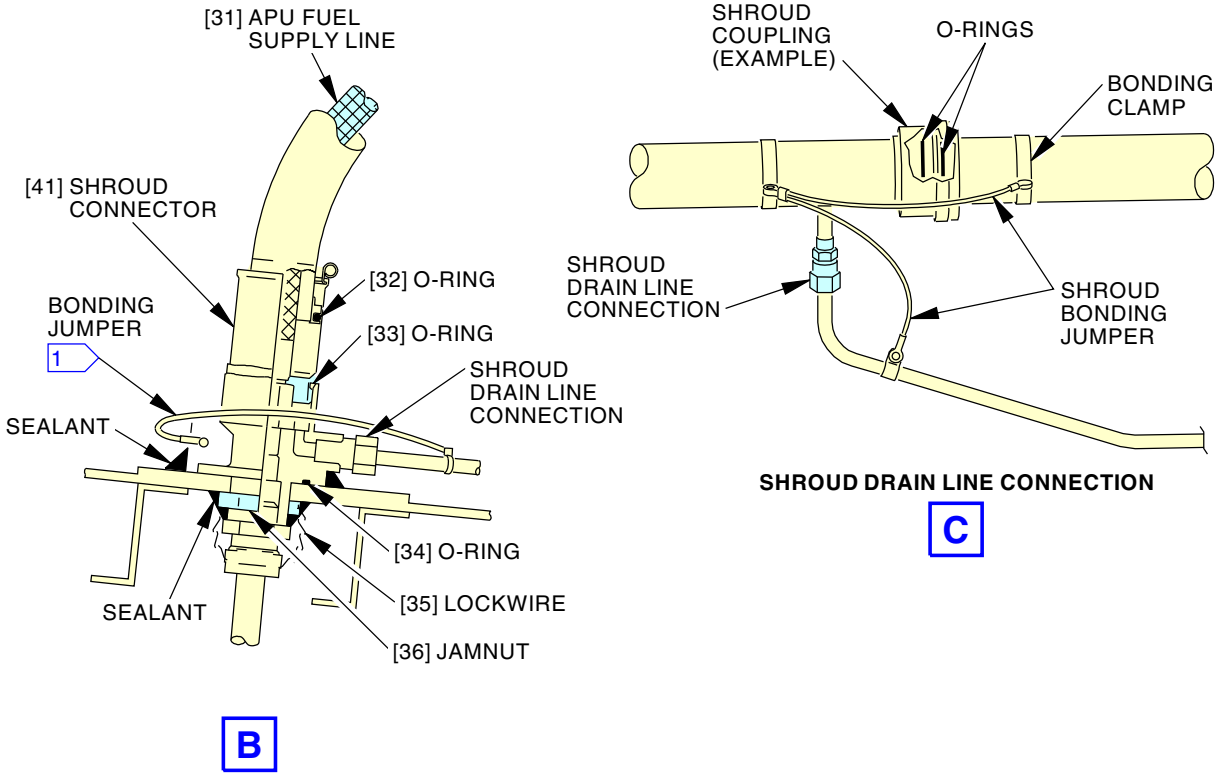
END OF TASK

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APU Fuel Supply Line and Shroud Installation (Center Wing Section to Aft Wheel Well Bulkhead)
Figure 402/28-25-06-990-802 (Sheet 1 of 2)

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APU Fuel Supply Line and Shroud Installation (Center Wing Section to Aft Wheel Well Bulkhead)
Figure 402/28-25-06-990-802 (Sheet 2 of 2)

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TASK 28-25-06-400-802

5. APU Fuel Supply Line and Shroud (Wing Center Fuel Section to Aft Wheel Well Bulkhead) - Installation

(Figure 402)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
25-27-01-400-801	Carpet (Without Adhesive Back) Installation (P/B 401)
25-52-09-400-801	Ceiling Liner - Installation (P/B 401)
28-25-00-700-801	Purge the Air from the APU Fuel Supply Line (P/B 201)
28-25-00-780-801	Pressure Test - APU Fuel Line Shroud and Drain Tubing (P/B 501)
53-01-01-400-801	Floor Panel Installation (P/B 401)
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17
STD-1090	Cord

C. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
31	Fuel supply line	28-25-06-05-130	ARO ALL
33	O-ring	28-25-06-05-335	ARO ALL
38	Shield	28-25-06-05-360	ARO ALL
40	O-ring	28-25-06-05-350	ARO ALL

E. Location Zones

Zone	Area
132	Area Above Wing Center Section, Right
142	Area Above Main Landing Gear Wheel Well, Right
152	Aft Cargo Compartment, Right

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F. Procedure

SUBTASK 28-25-06-860-010

(1) Make sure that these circuit breakers are open and have safety tags:

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	17	C28003	APU FUEL S/O VALVE

Standby Power Management Panel, P310

Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP
B	6	C49601	APUC 1

SUBTASK 28-25-06-420-001

(2) Start at the front and install the shroud in parts.

(a) Loosely attach the clamps to the parts of the shroud, View C (Figure 402).

SUBTASK 28-25-06-820-001

(3) Align the parts of the shroud.

SUBTASK 28-25-06-640-002

(4) Apply a thin layer of petrolatum grease, D00504, to the new shroud O-rings.

(a) Install the O-rings on the shroud.

SUBTASK 28-25-06-420-002

(5) Connect the couplings to attach the shroud.

SUBTASK 28-25-06-760-003

(6) Measure the resistance between the shroud sections or fittings and the nearest primary structure with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

(a) Make sure the bonding resistance is 0.10 ohm (100 milliohms) or less.

SUBTASK 28-25-06-480-008

(7) Attach the cord, STD-1090 (if installed in shroud during removal), to the new flexible APU fuel line.

SUBTASK 28-25-06-420-064

(8) Pull or push the flexible APU fuel supply line [31] into the section of the shroud (forward of the aft wheel well bulkhead) to the center wing section connection.

SUBTASK 28-25-06-420-005

(9) Connect the flexible APU fuel supply line [31] at the center wing section connection, View B (Figure 402).

(a) Tighten the fuel supply line end fitting to 360 ±18 in-lb (41 ±2 N·m).

SUBTASK 28-25-06-640-003

(10) Apply a thin layer of petrolatum grease, D00504, to a new o-ring [33].

SUBTASK 28-25-06-400-001

(11) Install the o-ring [33] on the shroud connector [41].

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SUBTASK 28-25-06-420-008

(12) Connect the shroud connector [41] at the center wing section, View B (Figure 402).

(a) Tighten the shroud connector [41] to 700 ±70 in-lb (79 ±8 N·m).

(b) Make sure the o-ring [33] is enclosed in the fitting.

SUBTASK 28-25-06-420-006

(13) Connect the flexible APU fuel supply line [31] to the union [37] at the intermediate connection (View D, Figure 402).

(a) Tighten the fuel supply line end fitting to 360 ±18 in-lb (41 ±2 N·m).

(b) Install a new rubber shield [38] over the APU fuel supply line connection (View D, Figure 402).

SUBTASK 28-25-06-640-004

(14) Apply a thin layer of petrolatum grease, D00504, to a new o-ring [40].

SUBTASK 28-25-06-400-002

(15) Install the retaining ring [42] and o-ring [40] on the inboard shroud.

SUBTASK 28-25-06-420-009

(16) Connect the shroud connector [43] at the intermediate connection (View D, Figure 402).

SUBTASK 28-25-06-420-045

(17) Tighten the clamps on the APU fuel line shroud.

SUBTASK 28-25-06-420-046

(18) Connect the bonding jumpers on the APU fuel line shroud.

SUBTASK 28-25-06-220-002

(19) After you install a bonding jumper, measure the resistance between the two items that you bonded together with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

NOTE: Make sure that you measure the resistance between the two items being bonded together, and not between the bonding hardware. For example, measure the resistance between two fuel line sections. Do not measure the resistance between the screws that attach a bonding jumper to the fuel line sections.

(a) Make sure the bonding resistance is 0.010 ohm (10 milliohms) or less.

G. APU Fuel Supply Line and Shroud Test

SUBTASK 28-25-06-710-002

(1) To make sure the APU fuel supply line and shroud are installed correctly, do these steps:

(a) Remove the safety tags and close these circuit breakers:

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	17	C28003	APU FUEL S/O VALVE

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Standby Power Management Panel, P310

Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP
B	6	C49601	APUC 1

(b) Make sure the left main fuel tank has a minimum of 800 lb (363 kg) of fuel (TASK 12-11-01-650-801).

(c) To purge the APU fuel supply line, do this task: Purge the Air from the APU Fuel Supply Line, TASK 28-25-00-700-801.

(d) To do a pressure test of the shroud, do this task: Pressure Test - APU Fuel Line Shroud and Drain Tubing, TASK 28-25-00-780-801.

(e) Put the APU start switch, on the Overhead Panel P5, to the ON position, for 120 minutes.

NOTE: This step will pressurize the APU fuel supply line.

(f) Make sure the APU fuel pressure indication, on the FUEL maintenance page, shows PRESS for the APU fuel.

(g) Make sure not more than one drop of fuel leaks, from the APU drain mast for the APU shroud, in 120 minutes (Figure 405).

(h) Put the APU start switch, on the Overhead Panel P5, to the OFF position.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 28-25-06-410-003

(1) Install the ceiling panels that you removed in the aft cargo compartment (TASK 25-52-09-400-801).

SUBTASK 28-25-06-410-004

(2) Install the passenger floor panels in the passenger compartment (TASK 53-01-01-400-801).

SUBTASK 28-25-06-410-005

(3) Install the carpets removed for access (TASK 25-27-01-400-801).

——— END OF TASK ———

TASK 28-25-06-000-805

6. APU Fuel Supply Line and Shroud (Aft Wheel Well Bulkhead to Aft Pressure Bulkhead) - Removal

(Figure 403)

A. References

Reference	Title
25-27-01-000-801	Carpet (Without Adhesive Back) Removal (P/B 401)
25-52-09-000-801	Ceiling Liner Removal (P/B 401)
25-52-19-000-801	Bulk Cargo Compartment Aft End Wall Removal (P/B 401)
28-22-15-000-802-001	Fuel Line, Fitting and Coupling - Removal (P/B 401)
28-25-02-000-802	APU Fuel Shutoff Valve Actuator - Removal (P/B 401)
53-01-01-000-801	Floor Panel Removal (P/B 401)

B. Tools/Equipment

Reference	Description
STD-1054	Container - Fuel Resistant, 5-Gallon (19-Liter)
STD-1090	Cord

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C. Location Zones

Zone	Area
152	Aft Cargo Compartment, Right
162	Bulk Cargo Compartment, Right
262	Passenger Compartment, Right - Section 47
312	Area Aft of Bulkhead, Right

D. Procedure

SUBTASK 28-25-06-940-004

(1) Make sure the APU start switch, on the Overhead Panel P5, is in the off position.

SUBTASK 28-25-06-940-005

(2) Make sure the manual override handle for the APU fuel shutoff valve is in the CLOSED position (TASK 28-25-02-000-802).

SUBTASK 28-25-06-860-012

(3) Open these circuit breakers and install safety tags:

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	17	C28003	APU FUEL S/O VALVE

Standby Power Management Panel, P310

Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP
B	6	C49601	APUC 1

SUBTASK 28-25-06-010-011

(4) Remove the ceiling panels in the aft cargo compartment to get access to the APU fuel line and shroud (TASK 25-52-09-000-801).

NOTE: When you remove the ceiling panels, you can access the fuel supply line from forward of the No. 3 passenger door to the No. 4 passenger door.

SUBTASK 28-25-06-010-012

(5) To get access to the aft pressure bulkhead connector from below the passenger cabin floor, do these steps:

NOTE: Access from the passenger cabin above is necessary if you will remove the shroud. It is possible to get access from below to disconnect the shroud and supply line at the aft pressure bulkhead and remove the APU supply line only.

(a) Do this task: Bulk Cargo Compartment Aft End Wall Removal, TASK 25-52-19-000-801.

(b) Go into the area behind the right potable water tank.

(c) Remove the aft galley chiller ducts where it is necessary to get access to the aft pressure bulkhead fitting.

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SUBTASK 28-25-06-010-013

(6) To get access to the aft pressure bulkhead connector from the passenger cabin, do these steps:

NOTE: Access from the passenger cabin above is necessary if you will remove the shroud. It is possible to get access from below to disconnect the shroud and supply line at the aft pressure bulkhead and remove the APU supply line only.

(a) Remove approximately 10 ft (3 m) of carpet as follows (TASK 25-27-01-000-801):

1) From 0 ft (0 m) to 10 ft (3 m) - Aft of the No. 4 Passenger Entry Door

2) From 3 ft (1 m) to 10 ft (3 m) - Inboard of the Right Side of Body

(b) Remove the applicable passenger floor panels in the above areas .(TASK 53-01-01-000-801)

SUBTASK 28-25-06-020-041

(7) At the intermediate fuel line connection, immediately aft of the aft wheel well bulkhead, do these steps to loosen the shroud connection View D, (Figure 402):

(a) Put a 5-gallon (19-liter) fuel resistant container, STD-1054, under the fuel line connection to catch the fuel.

(b) Disconnect the bonding jumper on the outboard side.

(c) Remove the inboard retaining ring [42].

(d) Move the shroud connector [43] outboard to get access to the shield [38].

(e) Remove the shield [38] from the APU fuel supply line connection (View D, Figure 402).

1) Discard the shield [38].

(f) Remove and discard the inboard o-ring [40].

SUBTASK 28-25-06-020-042

(8) Disconnect the APU fuel supply line [39] from the union [37].

SUBTASK 28-25-06-680-001

(9) Drain all the fuel that remains in the APU fuel supply line into a 5-gallon (19-liter) fuel resistant container, STD-1054.

SUBTASK 28-25-06-030-002

(10) At the pressure bulkhead for the aft cargo compartment, disconnect the shroud connector [75] from the bulkhead fitting (View D, Figure 403).

(a) Put a 5-gallon (19-liter) fuel resistant container, STD-1054, under the fuel line connection to catch the fuel.

(b) Cut the lockwire that attaches to the shroud connector [75].

(c) Loosen the shroud connector [75] (TASK 28-22-15-000-802-001).

NOTE: This requires a 2.25 in. (57.15 mm) open-ended wrench.

(d) Move the shroud connector back from the pressure bulkhead a sufficiently to get access to the APU fuel line connection

(e) Remove and discard the o-ring [74].

SUBTASK 28-25-06-030-001

(11) Disconnect the APU fuel supply line [39] from the bulkhead fitting (View D, Figure 403).

SUBTASK 28-25-06-680-002

(12) Drain all the fuel that remains in the APU fuel supply line into a 5-gallon (19-liter) fuel resistant container, STD-1054.

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SUBTASK 28-25-06-490-002

(13) Attach a cord, STD-1090, to the end of the APU fuel supply line [39] at the aft pressure bulkhead fitting.

NOTE: This makes it easier to install a new APU fuel supply line if you do not remove the shroud.

SUBTASK 28-25-06-030-003

(14) Remove the APU fuel supply line [39] from the shroud at the intermediate connection (View D, Figure 402).

SUBTASK 28-25-06-030-004

(15) Disconnect couplings that attach the sections of the shroud together and remove the shroud if it is necessary (View C, Figure 402, Fuel Line, Fitting and Coupling - Removal, TASK 28-22-15-000-802-001).

(a) Discard the O-rings from the shroud couplings.

SUBTASK 28-25-06-030-005

(16) Remove the bonding jumpers and clamps from the shroud (View C, Figure 402).

SUBTASK 28-25-06-030-006

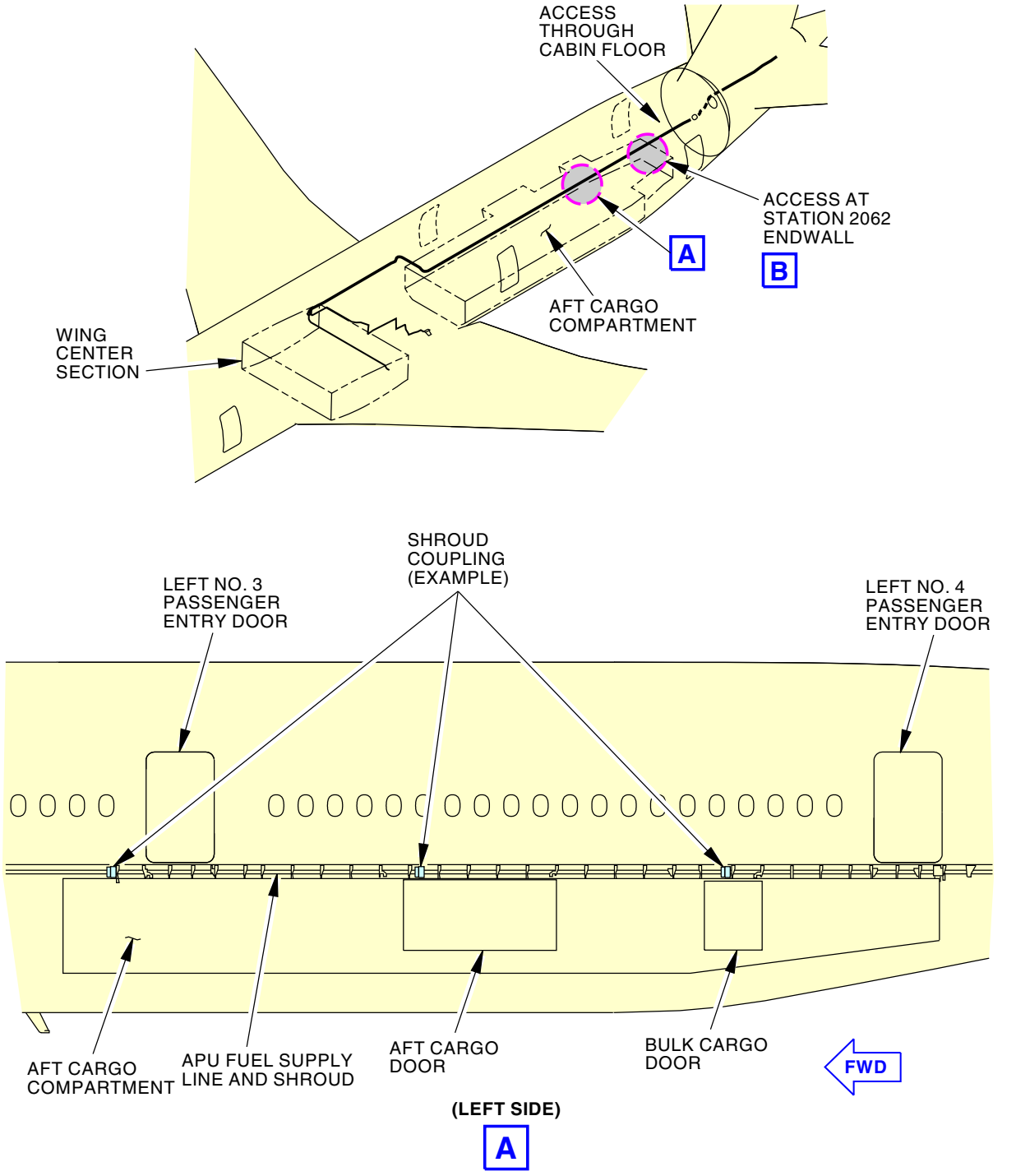
(17) Disconnect the shroud clamps from the structure.

SUBTASK 28-25-06-020-043

(18) Remove the shroud in parts.

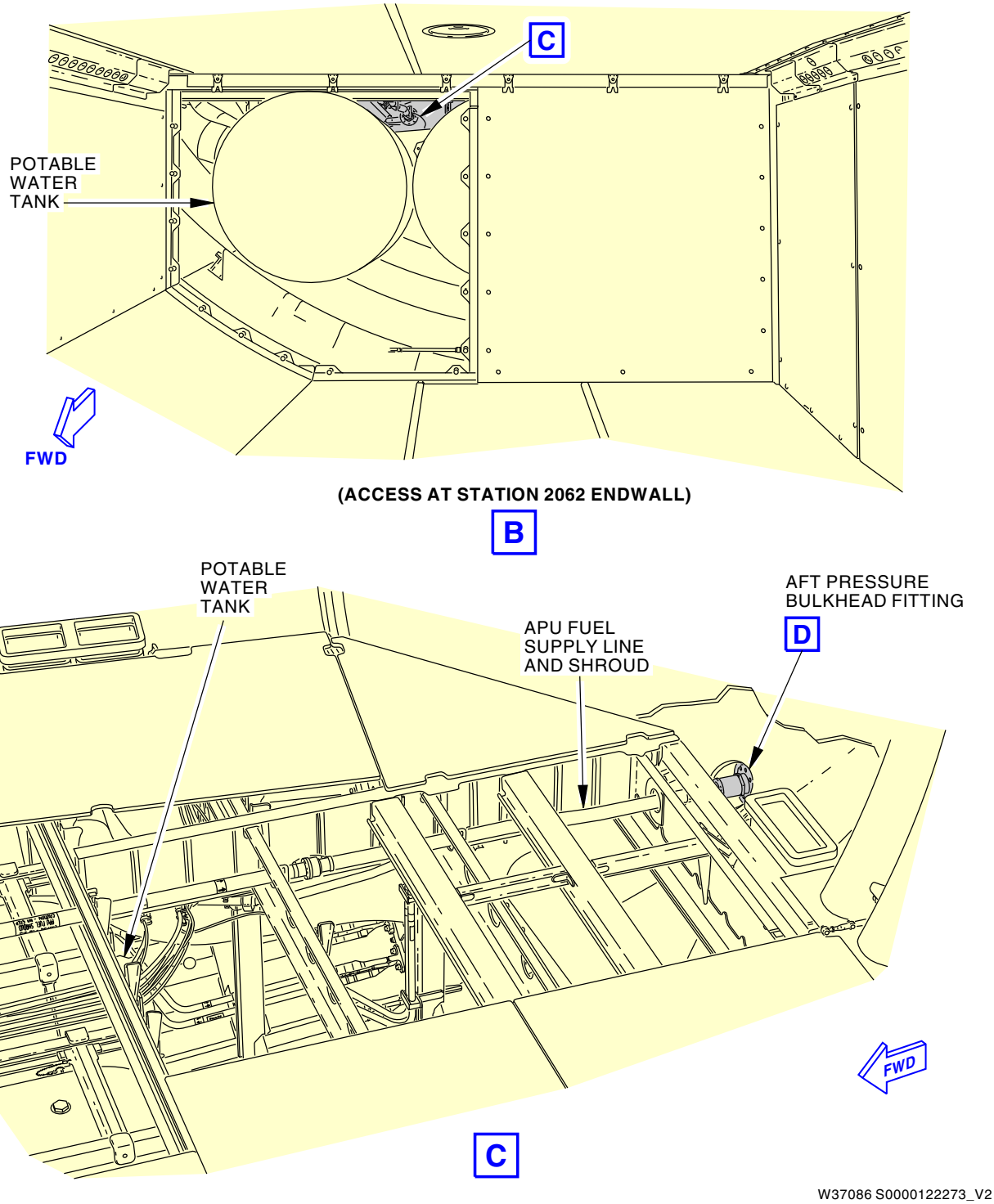
END OF TASK

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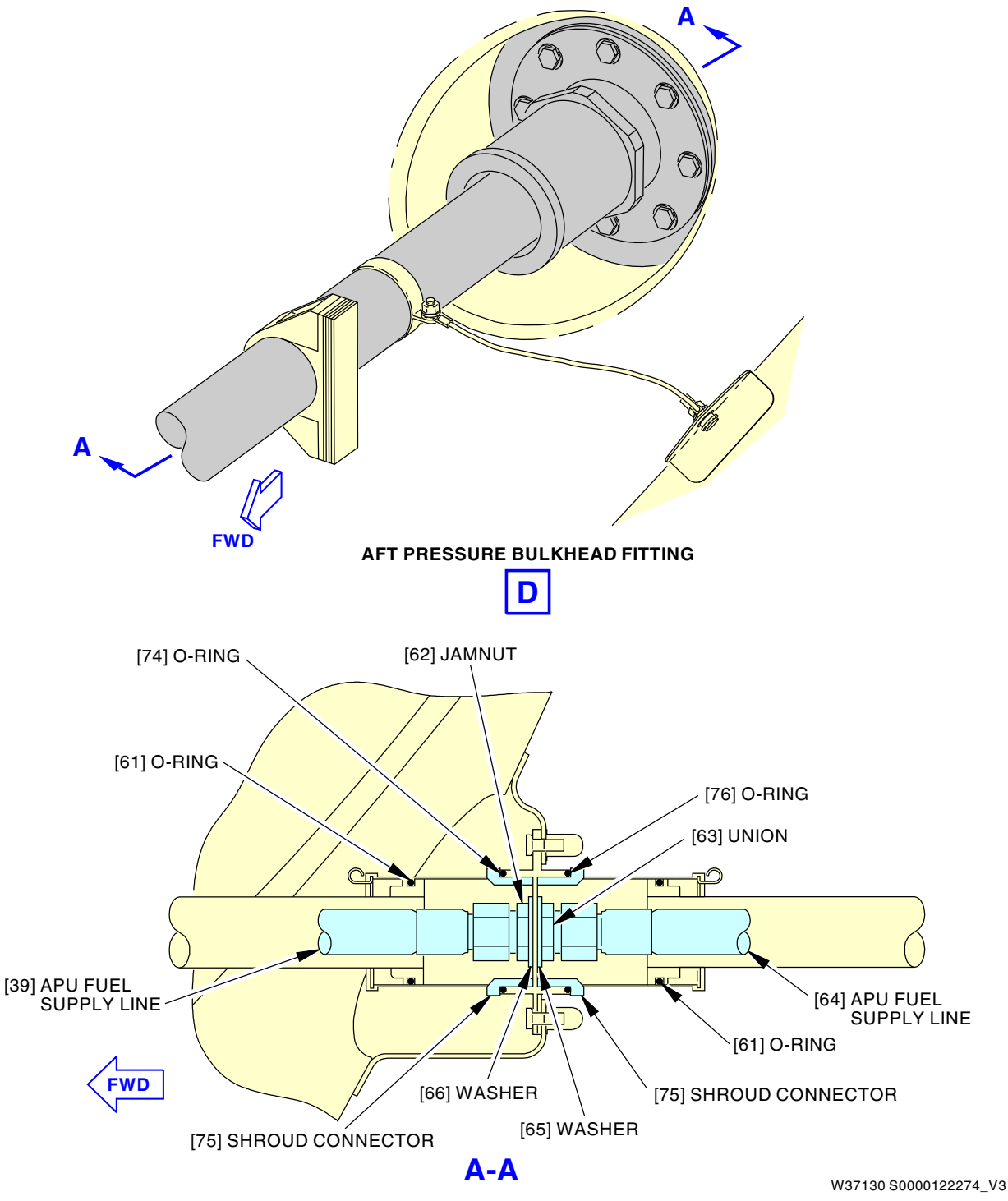
APU Fuel Supply Line and Shroud (Aft Wheel Well Bulkhead to Aft Pressure Bulkhead)
Figure 403/28-25-06-990-805 (Sheet 1 of 3)

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APU Fuel Supply Line and Shroud (Aft Wheel Well Bulkhead to Aft Pressure Bulkhead)
Figure 403/28-25-06-990-805 (Sheet 2 of 3)

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APU Fuel Supply Line and Shroud (Aft Wheel Well Bulkhead to Aft Pressure Bulkhead)
Figure 403/28-25-06-990-805 (Sheet 3 of 3)

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TASK 28-25-06-400-805

7. APU Fuel Supply Line and Shroud (Aft Wheel Well Bulkhead to Aft Pressure Bulkhead) - Installation

(Figure 402)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
25-27-01-400-801	Carpet (Without Adhesive Back) Installation (P/B 401)
25-52-09-400-801	Ceiling Liner - Installation (P/B 401)
25-52-19-400-801	Bulk Cargo Compartment Aft End Wall Installation (P/B 401)
28-22-15-400-802-001	Fuel Line, Fitting and Coupling - Installation (P/B 401)
28-25-00-700-801	Purge the Air from the APU Fuel Supply Line (P/B 201)
28-25-00-780-801	Pressure Test - APU Fuel Line Shroud and Drain Tubing (P/B 501)
53-01-01-400-801	Floor Panel Installation (P/B 401)
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17
STD-1090	Cord

C. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
38	Shield	28-25-06-05-360	ARO ALL
39	Fuel supply line	28-25-06-06-105	ARO ALL
40	O-ring	28-25-06-05-350	ARO ALL
74	O-ring	28-25-06-04-150	ARO ALL
		28-25-06-06-220	ARO ALL

E. Location Zones

Zone	Area
152	Aft Cargo Compartment, Right

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(Continued)

Zone	Area
162	Bulk Cargo Compartment, Right
262	Passenger Compartment, Right - Section 47
312	Area Aft of Bulkhead, Right

F. Procedure

SUBTASK 28-25-06-860-013

(1) Make sure that these circuit breakers are open and have safety tags:

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	17	C28003	APU FUEL S/O VALVE

Standby Power Management Panel, P310

Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP
B	6	C49601	APUC 1

SUBTASK 28-25-06-420-058

(2) Start at the front and install the shroud in parts.

(a) Loosely attach the clamps to the parts of the shroud (View C, Figure 402, Fuel Line, Fitting and Coupling - Installation, TASK 28-22-15-400-802-001).

SUBTASK 28-25-06-820-002

(3) Align the parts of the shroud.

SUBTASK 28-25-06-640-009

(4) Apply a thin layer of petrolatum grease, D00504, to the new shroud O-rings.

(a) Install the O-rings on the shroud.

SUBTASK 28-25-06-430-001

(5) Connect the couplings to attach the shroud (TASK 28-22-15-400-802-001).

(a) Secure each coupling with lockwire (TASK 20-10-23-400-801).

SUBTASK 28-25-06-760-002

(6) Measure the resistance between the shroud sections or fittings and the nearest primary structure with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

(a) Make sure the bonding resistance is 0.10 ohm (100 milliohms) or less.

SUBTASK 28-25-06-490-003

(7) Attach the cord, STD-1090 (if installed in shroud during removal), to the new flexible APU fuel line.

SUBTASK 28-25-06-420-059

(8) Pull or push the flexible APU fuel supply line [39] into the shroud from the intermediate connection, aft of the aft wheel well bulkhead, to the aft pressure bulkhead connection.

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SUBTASK 28-25-06-420-061

(9) Connect the flexible APU fuel supply line [39] at the aft pressure bulkhead connection (View D, Figure 403).

(a) Tighten the fuel supply line end fitting to 360 ±18 in-lb (41 ±2 N·m).

SUBTASK 28-25-06-640-011

(10) Apply a thin layer of petrolatum grease, D00504, to a new o-ring [74].

SUBTASK 28-25-06-430-003

(11) Install the o-ring [74] on the shroud connector [75].

SUBTASK 28-25-06-420-063

(12) Connect the shroud connector [75] at the aft pressure bulkhead fitting (View D, Figure 403, Fuel Line, Fitting and Coupling - Installation, TASK 28-22-15-400-802-001).

(a) Tighten the shroud connector [75] to 700 ±70 in-lb (79 ±8 N·m).

(b) Make sure the o-ring [74] is enclosed in the fitting.

(c) Secure the shroud connector [75] with lockwire Lockwire, Cotter Pins, and Lockrings - Installation, TASK 20-10-23-400-801

SUBTASK 28-25-06-420-060

(13) Connect the flexible APU fuel supply line [39] to the union [37] at the intermediate connection (View D, Figure 402).

(a) Tighten the fuel supply line end fitting to 360 ±18 in-lb (41 ±2 N·m).

(b) Install a new rubber shield [38] over the APU fuel supply line connection (View D, Figure 402).

SUBTASK 28-25-06-640-010

(14) Apply a thin layer of petrolatum grease, D00504, to a new o-ring [40].

SUBTASK 28-25-06-410-013

(15) Install the retaining ring [42] and o-ring [40] on the inboard shroud at the intermediate connection (View D, Figure 402).

SUBTASK 28-25-06-420-062

(16) Connect the shroud at the intermediate connection (View D, Figure 402).

SUBTASK 28-25-06-430-004

(17) Tighten the clamps on the APU fuel line shroud.

SUBTASK 28-25-06-430-005

(18) Connect the bonding jumpers on the APU fuel line shroud.

SUBTASK 28-25-06-760-001

(19) After you install a bonding jumper, measure the resistance between the two items that you bonded together with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

NOTE: Make sure that you measure the resistance between the two items being bonded together, and not between the bonding hardware. For example, measure the resistance between two fuel line sections. Do not measure the resistance between the screws that attach a bonding jumper to the fuel line sections.

(a) Make sure the bonding resistance is 0.010 ohm (10 milliohms) or less.

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G. APU Fuel Supply Line and Shroud Test

SUBTASK 28-25-06-790-001

(1) To make sure the APU fuel supply line and shroud are installed correctly, do these steps:

(a) Remove the safety tags and close these circuit breakers:

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	17	C28003	APU FUEL S/O VALVE

Standby Power Management Panel, P310

Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP
B	6	C49601	APUC 1

(b) Make sure the left main fuel tank has a minimum of 800 lb (363 kg) of fuel (TASK 12-11-01-650-801).

(c) To purge the APU fuel supply line, do this task: Purge the Air from the APU Fuel Supply Line, TASK 28-25-00-700-801.

(d) To do a pressure test of the shroud, do this task: Pressure Test - APU Fuel Line Shroud and Drain Tubing, TASK 28-25-00-780-801.

(e) Put the APU start switch, on the Overhead Panel P5, to the ON position, for 120 minutes.

NOTE: This step will pressurize the APU fuel supply line.

(f) Make sure the APU fuel pressure indication, on the FUEL maintenance page, shows PRESS for the APU fuel.

(g) Make sure not more than one drop of fuel leaks, from the APU drain mast for the APU shroud, in 120 minutes (Figure 405).

(h) Put the APU start switch, on the Overhead Panel P5, to the OFF position.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 28-25-06-410-008

(1) Install the ceiling panels in the aft cargo compartment (TASK 25-52-09-400-801).

SUBTASK 28-25-06-410-009

(2) If you got access to the aft pressure bulkhead connection from below the passenger cabin floor, through the bulk cargo compartment, do these steps:

(a) Install the aft galley chiller ducts that you removed to get access to the aft pressure bulkhead connector.

(b) Do this task: Bulk Cargo Compartment Aft End Wall Installation, TASK 25-52-19-400-801.

(3) If you got access to the aft pressure bulkhead connection from the passenger cabin, do these steps:

(a) Install the passenger floor panels that you removed in the area above the APU shroud and supply line immediately forward of the aft pressure bulkhead (TASK 53-01-01-400-801).

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(b) Install the carpet that you removed to get access to the floor panels (TASK 25-27-01-400-801).

——— END OF TASK ———

TASK 28-25-06-000-803

8. APU Fuel Supply Line and Shroud (Aft Pressure Bulkhead to the APU Firewall) - Removal

(Figure 404)

A. References

Reference	Title
06-30-00-800-804	Finding a Zone in Empennage and Body Section 48 - Major Zone 300 (P/B 201)

B. Location Zones

Zone	Area
311	Area Aft of Bulkhead, Left
312	Area Aft of Bulkhead, Right
314	Stabilizer Torsion Box Compartment, Right
315	APU Compartment, Left
316	APU Compartment, Right

C. Access Panels

Number	Name/Location
311BL	Service Access Door
313AL	Controls Bay Access Door

D. Procedure

SUBTASK 28-25-06-860-001

(1) Open these circuit breakers and install safety tags:

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	17	C28003	APU FUEL S/O VALVE

Standby Power Management Panel, P310

Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP
B	6	C49601	APUC 1

SUBTASK 28-25-06-010-006

(2) Open this panel to get access to the aft pressure bulkhead:

Number	Name/Location
311BL	Service Access Door

(TASK 06-30-00-800-804).

SUBTASK 28-25-06-020-015

(3) Disconnect the shroud at the aft pressure bulkhead fitting (Figure 404, View A).

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(a) Remove and discard the o-ring [76].

SUBTASK 28-25-06-020-016

(4) Pull the shroud away from the pressure bulkhead.

SUBTASK 28-25-06-020-017

(5) Disconnect the APU fuel line at the pressure bulkhead.

SUBTASK 28-25-06-010-007

(6) Open this panel to get access to the APU firewall:

Number	Name/Location
313AL	Controls Bay Access Door

SUBTASK 28-25-06-020-048

(7) Do the steps that follow to disconnect the shroud at the APU firewall bulkhead (Figure 404, View B).

(a) Remove the bonding jumpers and clamps from the shroud.

(b) Disconnect the coupling nut [77].

1) Remove and discard the o-ring [70].

(c) Disconnect the fitting nut [78].

(d) Remove the APU fuel supply line [64].

SUBTASK 28-25-06-020-049

(8) Remove the tube assembly [67], if it is necessary.

(a) Disconnect the fitting nut [80].

(b) Remove the clamp [79].

SUBTASK 28-25-06-020-050

(9) Remove the bellows [69], if it is necessary.

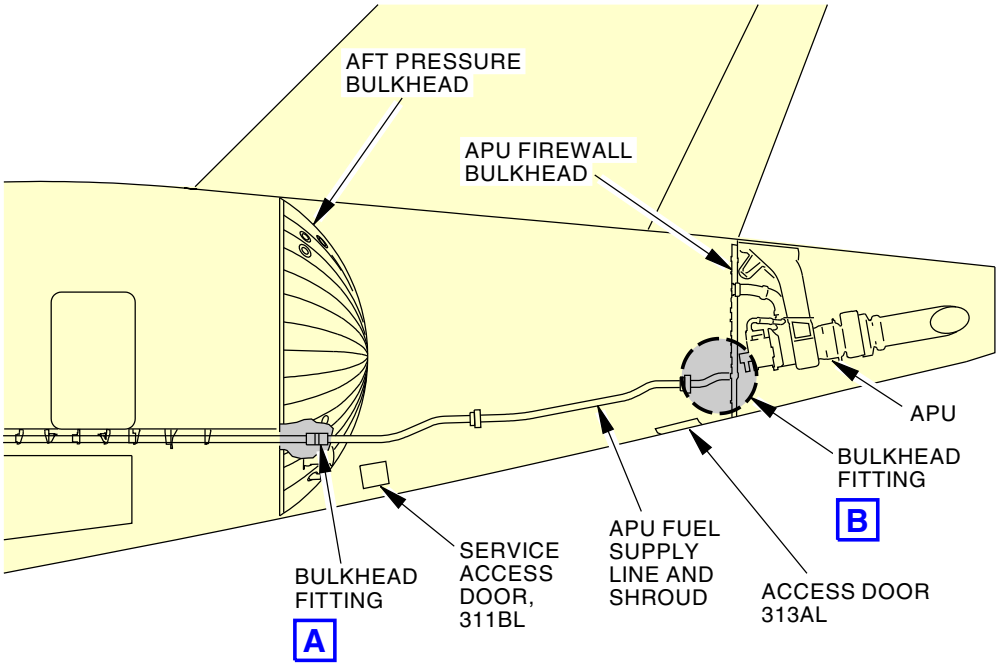
NOTE: Note: It may not be necessary to remove the bellows [69].

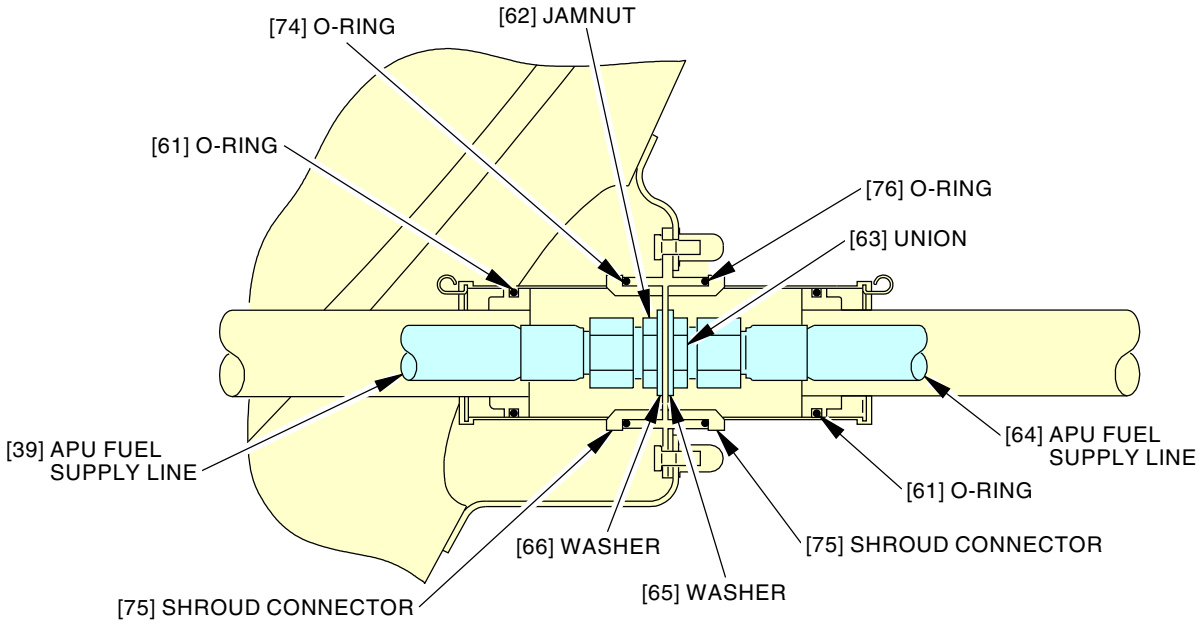
(a) Remove the eight bolts [71], nuts [73], and washers [72].

(b) Keep the o-ring, metallic [68].

END OF TASK

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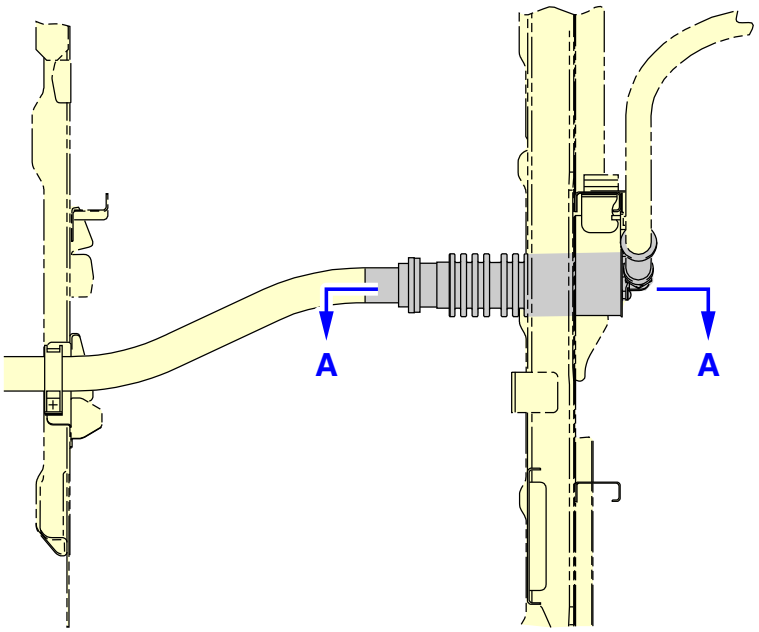
AFT PRESSURE BULKHEAD FITTING

A

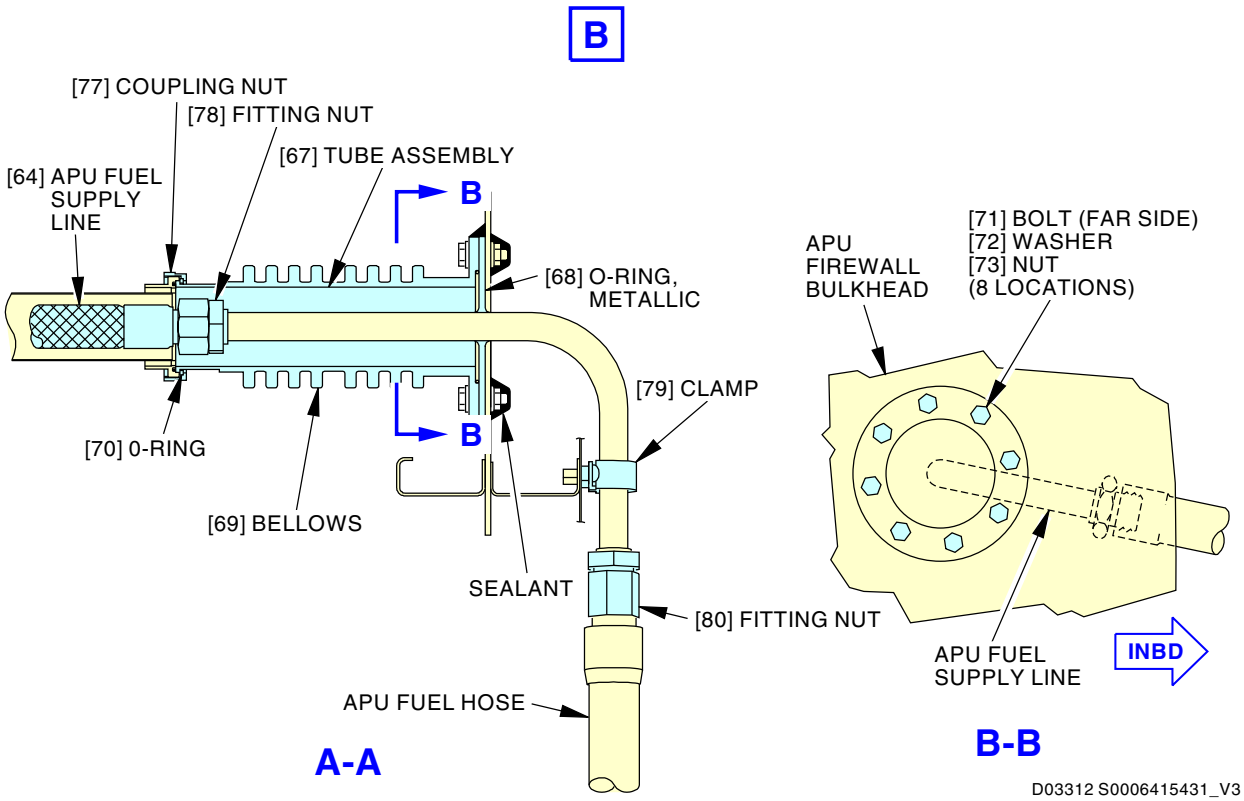
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APU Fuel Supply Line and Shroud Installation (Empennage)
Figure 404/28-25-06-990-803 (Sheet 1 of 2)

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APU FIREWALL BULKHEAD FITTING



APU Fuel Supply Line and Shroud Installation (Empennage)
Figure 404/28-25-06-990-803 (Sheet 2 of 2)

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TASK 28-25-06-400-803

9. APU Fuel Supply Line and Shroud (Aft Pressure Bulkhead to the APU Firewall) - Installation

(Figure 404)

A. References

Reference	Title
06-30-00-800-804	Finding a Zone in Empennage and Body Section 48 - Major Zone 300 (P/B 201)
12-11-01-650-801	Pressure Refueling (P/B 301)
20-11-00-910-801	Standard Torque Values (P/B 201)
28-25-00-700-801	Purge the Air from the APU Fuel Supply Line (P/B 201)
28-25-00-780-801	Pressure Test - APU Fuel Line Shroud and Drain Tubing (P/B 501)
51-31-01-390-804	Fillet Seal Application (P/B 201)
51-31-01-390-805	Fastener Seal Application (P/B 201)
51-31-01-390-810	Removable Faying (Mated) Surface Seal Application (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
D00504	Grease - Petrolatum	VV-P-236

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
64	Fuel supply line	28-25-06-04-080	ARO ALL
70	O-ring	28-25-06-04-165	ARO ALL
76	O-ring	28-25-06-04-150	ARO ALL

E. Location Zones

Zone	Area
311	Area Aft of Bulkhead, Left
312	Area Aft of Bulkhead, Right
314	Stabilizer Torsion Box Compartment, Right
315	APU Compartment, Left
316	APU Compartment, Right

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F. Access Panels

Number	Name/Location
311BL	Service Access Door
313AL	Controls Bay Access Door

G. Procedure

SUBTASK 28-25-06-860-011

(1) Make sure that these circuit breakers are open and have safety tags:

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	17	C28003	APU FUEL S/O VALVE

Standby Power Management Panel, P310

Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP
B	6	C49601	APUC 1

SUBTASK 28-25-06-420-047

(2) Loosely connect the clamps to the APU fuel line and shroud.

SUBTASK 28-25-06-420-011

(3) Connect the APU fuel line at the pressure bulkhead (Figure 404, View A).

SUBTASK 28-25-06-640-006

(4) Apply a thin layer of petrolatum grease, D00504, to a new o-ring [76].

SUBTASK 28-25-06-400-004

(5) Install the o-ring [76] on the shroud connector [75].

SUBTASK 28-25-06-420-013

(6) Connect the shroud at the pressure bulkhead (Figure 404, View A).

SUBTASK 28-25-06-420-065

(7) If the bellows [69] was removed, do the steps that follow:

(a) Apply sealant, A00160, to the faying surfaces of the o-ring, metallic [68] (TASK 51-31-01-390-810).

(b) Align the bellows [69] with the o-ring, metallic [68], on the APU firewall bulkhead.

(c) Install the eight bolts [71], washers [72], and nuts [73].

(d) To find the torque values for the bolts [71], refer to this task: Standard Torque Values, TASK 20-11-00-910-801.

(e) Apply a fillet seal of sealant, A00160, around the perimeter of the bellows [69] assembly, on the forward side of the APU firewall bulkhead (TASK 51-31-01-390-804).

(f) Apply sealant, A00160, on and around the eight bolts [71], nuts [73] and washers [72], on the aft side of the APU firewall bulkhead (TASK 51-31-01-390-805).

SUBTASK 28-25-06-420-066

(8) If the tube assembly [67] was removed, do the steps that follow:

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(a) Put the tube assembly [67] in its position.

(b) Install the clamp [79].

(c) Connect the fitting nut [80].

SUBTASK 28-25-06-420-067

(9) Connect the APU fuel supply line [64] to the tube assembly [67] at the APU firewall bulkhead (Figure 404, View B).

(a) Tighten the fitting nut [78] to 360 ±18 in-lb (41 ±2 N·m).

(b) Apply a thin layer of petrolatum grease, D00504, to a new o-ring [70].

(c) Install the o-ring [70] on the coupling nut [77].

(d) Connect the coupling nut [77].

SUBTASK 28-25-06-420-048

(10) Tighten all the clamps on the shroud.

SUBTASK 28-25-06-420-049

(11) Connect the bonding jumpers to the shroud.

SUBTASK 28-25-06-220-003

(12) After you install a bonding jumper, measure the resistance between the two items that you bonded together with an intrinsically safe approved bonding meter, COM-1550.

NOTE: Make sure that you measure the resistance between the two items being bonded together, and not between the bonding hardware. For example, measure the resistance between two fuel line sections. Do not measure the resistance between the screws that attach a bonding jumper to the fuel line sections.

(a) Make sure the bonding resistance is 0.010 ohm (10 milliohms) or less.

SUBTASK 28-25-06-710-003

(13) To make sure the APU fuel supply line and shroud are installed correctly, do these steps:

(a) Remove the safety tags and close these circuit breakers:

APU Auxiliary Panel, P49

Row	Col	Number	Name
A	3	C49602	APUC 2

Overhead Circuit Breaker Panel, P11

Row	Col	Number	Name
A	17	C28003	APU FUEL S/O VALVE

Standby Power Management Panel, P310

Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP
B	6	C49601	APUC 1

(b) Make sure the left main fuel tank has a minimum of 800 LB (400 KG) of fuel (TASK 12-11-01-650-801).

(c) To purge the APU fuel supply line, do this task: Purge the Air from the APU Fuel Supply Line, TASK 28-25-00-700-801.

(d) To do a pressure test of the shroud, do this task: Pressure Test - APU Fuel Line Shroud and Drain Tubing, TASK 28-25-00-780-801.

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(e) Put the APU start switch, on the Overhead Panel P5, to the ON position, for 120 minutes.

NOTE: This step will pressurize the APU fuel supply line.

(f) Make sure the APU fuel pressure indication, on the FUEL maintenance page, shows PRESS for the APU fuel.

(g) Make sure not more than one drop of fuel leaks, from the APU drain mast for the APU shroud, in 120 minutes (Figure 405).

(h) Put the APU start switch, on the Overhead Panel P5, to the OFF position.

SUBTASK 28-25-06-410-006

(14) Close these access panels:

(TASK 06-30-00-800-804)

Number	Name/Location
311BL	Service Access Door
313AL	Controls Bay Access Door

——— END OF TASK ———

TASK 28-25-06-000-804

10. APU Fuel Shroud Drain Line - Removal

(Figure 405)

A. References

Reference	Title
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Location Zones

Zone	Area
132	Area Above Wing Center Section, Right
142	Area Above Main Landing Gear Wheel Well, Right
144	Main Landing Gear Wheel Well, Right
149	Aft Keel Beam

C. Access Panels

Number	Name/Location
149CL	Aft Keel Beam Access Panel with Slide Joint

D. Procedure

SUBTASK 28-25-06-410-007

(1) Make sure the downlock pins are installed on the nose and main landing gear (TASK 32-00-30-480-801).

SUBTASK 28-25-06-420-015



WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-25-06-010-008

(3) To get access to the upper shroud drain lines, (TASK 28-25-06-000-802).

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SUBTASK 28-25-06-020-023

(4) Disconnect the two shroud drain line connections, View B and C (Figure 402).

SUBTASK 28-25-06-010-009

(5) Remove the couplings, clamps and bonding jumpers as necessary.

SUBTASK 28-25-06-020-024

(6) To remove the Aft Keel Beam Access Panel, 149CL, do these steps:

(a) Disconnect the hydraulic drain hose, View B (Figure 405).

(b) Remove the four screws that attach the Aft Keel Beam Access Panel, 149CL, to the drain mast.

1) Keep the four screws for the installation.

SUBTASK 28-25-06-020-025

(7) Remove this panel:

Number	Name/Location
149CL	Aft Keel Beam Access Panel with Slide Joint

over the drain mast, View A and C (Figure 405).

SUBTASK 28-25-06-010-010

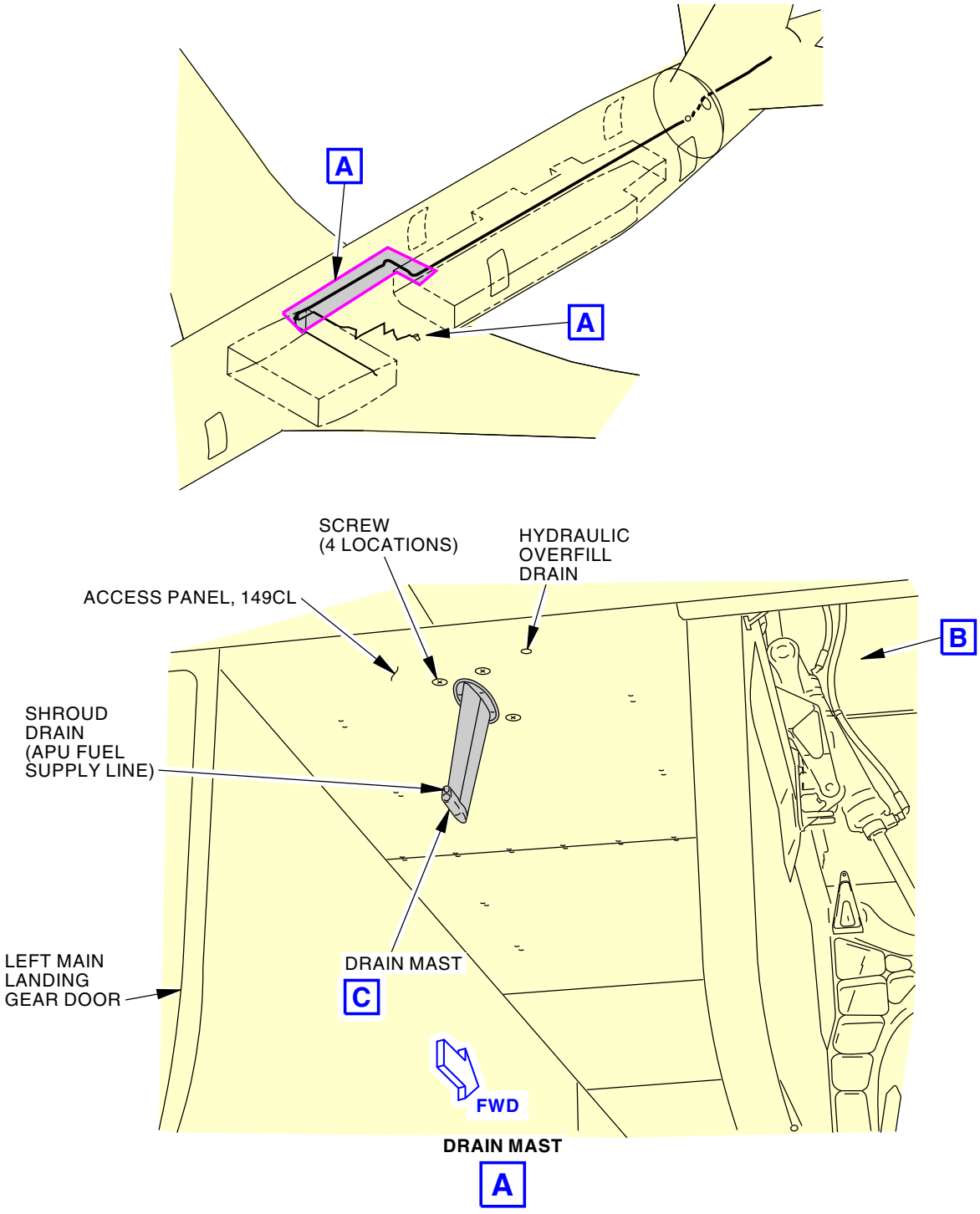
(8) Disconnect the flame arrestor coupling in the APU drain line, View C (Figure 405).

(a) Remove and discard the two o-rings [94].

(b) Remove the flame arrestor from the coupling.

——— END OF TASK ———

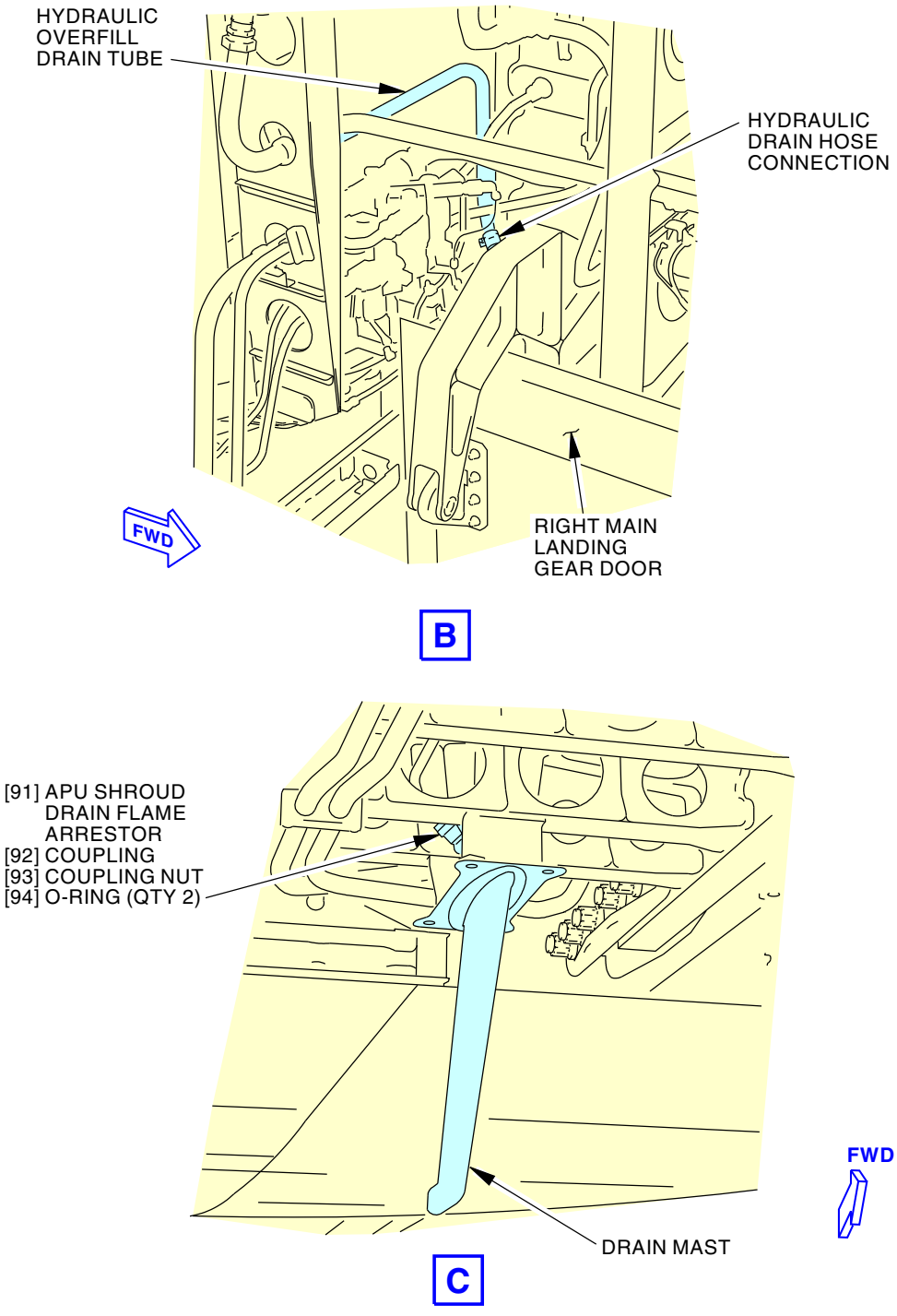
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APU Shroud Drain Line Installation
Figure 405/28-25-06-990-804 (Sheet 1 of 2)

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APU Shroud Drain Line Installation
Figure 405/28-25-06-990-804 (Sheet 2 of 2)

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TASK 28-25-06-400-804

11. APU Fuel Shroud Drain Line - Installation

(Figure 405)

A. References

Reference	Title
28-25-00-780-801	Pressure Test - APU Fuel Line Shroud and Drain Tubing (P/B 501)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
94	O-ring	28-25-06-02-155	ARO ALL

E. Location Zones

Zone	Area
132	Area Above Wing Center Section, Right
142	Area Above Main Landing Gear Wheel Well, Right
144	Main Landing Gear Wheel Well, Right
149	Aft Keel Beam

F. Access Panels

Number	Name/Location
149CL	Aft Keel Beam Access Panel with Slide Joint

G. Procedure

SUBTASK 28-25-06-420-050

(1) Loosely connect the clamps to the APU shroud drain line.

SUBTASK 28-25-06-420-016

(2) Connect the two APU shroud drain line connections, View B and C (Figure 402).

SUBTASK 28-25-06-420-017

(3) Connect the APU shroud drain line couplings.

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SUBTASK 28-25-06-420-018

(4) Connect the shroud drain line bonding clamps and jumpers as necessary.

SUBTASK 28-25-06-420-019

(5) After you install a bonding jumper, measure the resistance between the two items that you bonded together with an intrinsically safe approved bonding meter, COM-1550.

NOTE: Make sure that you measure the resistance between the two items being bonded together, and not between the bonding hardware. For example, measure the resistance between two fuel line sections. Do not measure the resistance between the screws that attach a bonding jumper to the fuel line sections.

(a) Make sure the resistance is less than 0.010 ohm.

SUBTASK 28-25-06-420-051

(6) Tighten all the clamps on the shroud drain line.

SUBTASK 28-25-06-420-052

(7) Install the flame arrestor into the drain line coupling.

SUBTASK 28-25-06-640-008

(8) Apply a thin layer of petrolatum grease, D00504, to two new O-ring [94].

SUBTASK 28-25-06-420-053

(9) Install the drain line coupling with the new o-rings [94], View C (Figure 405).

SUBTASK 28-25-06-420-054

(10) Install this panel over the drain mast, View A and C:

(Figure 405).

Number	Name/Location
149CL	Aft Keel Beam Access Panel with Slide Joint

SUBTASK 28-25-06-420-055

(11) Connect the hydraulic drain line hose, View B (Figure 405).

SUBTASK 28-25-06-420-056

(12) Do this task: Pressure Test - APU Fuel Line Shroud and Drain Tubing, TASK 28-25-00-780-801.

SUBTASK 28-25-06-420-057

(13) To install floor panels or coverings removed for access, (TASK 28-25-06-400-802).

SUBTASK 28-25-06-860-002

WARNING OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(14) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

END OF TASK

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APU FUEL SUPPLY DRAIN MAST - REMOVAL/INSTALLATION

1. General

A. This procedure contains two tasks:

(1) APU Fuel Supply Drain Mast - Removal

(2) APU Fuel Supply Drain Mast - Installation.

B. The APU fuel supply drain mast is referred to as the drain mast in this procedure.

TASK 28-25-07-000-801

2. APU Fuel Supply Drain Mast - Removal

(Figure 28-25-06-990-804, Figure 401)

A. References

Reference	Title
28-25-06-000-804	APU Fuel Shroud Drain Line - Removal (P/B 401)
28-25-06-990-804	Figure: APU Shroud Drain Line Installation (P/B 401)

B. Tools/Equipment

Reference	Description
STD-5728	Removal Tool - Fastener, Collar Splitter

C. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
149	Aft Keel Beam

D. Prepare for the Removal

SUBTASK 28-25-07-010-001

(1) To prepare for the removal of the drain mast, do this task: APU Fuel Shroud Drain Line - Removal, TASK 28-25-06-000-804.

SUBTASK 28-25-07-010-002

(2) If there is a tube in the drain mast with a cap installed, do these steps:

(a) Remove the lockwire from the tube.

(b) Remove the cap and o-ring.

1) Discard the o-ring.

(c) Remove the cap screw, washer and nut to disconnect the loop clamp and bonding jumper from the tube.

E. Remove the Drain Mast

SUBTASK 28-25-07-020-003

(1) Do these steps to remove the drain mast:

(a) Use the fastener removal tools, STD-5728, to break the two collars [2] that attach the drain mast to the keel beam ladder main landing gear support.

(b) Use the fastener removal tool, STD-5728, to break the two collars [2] that attach the drain mast to the keel beam ladder wheel well support.

(c) Use a small drift to remove the four bolts [1] from the holes.

(d) Remove the drain mast.

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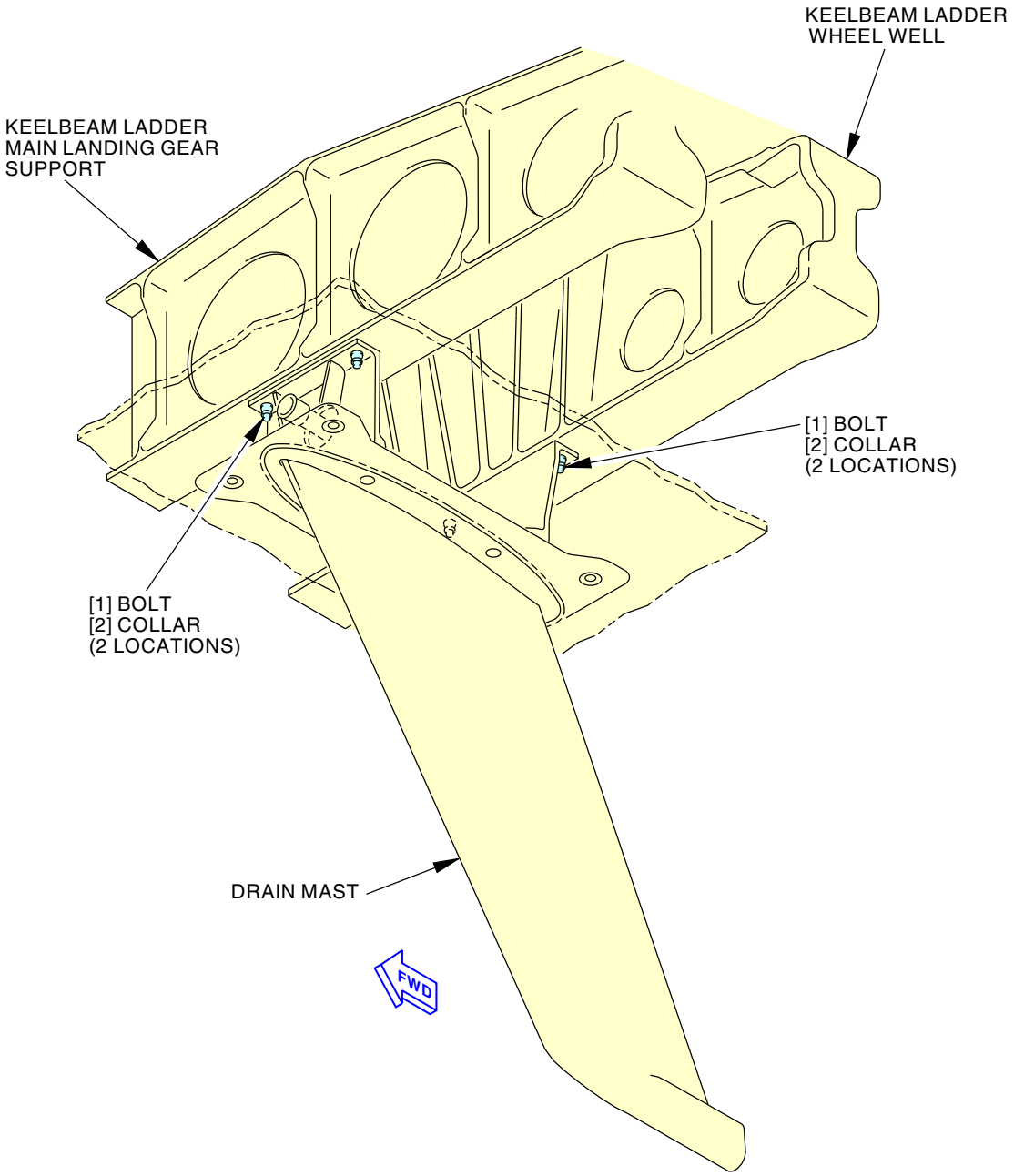
SUBTASK 28-25-07-020-002

(2) If necessary, remove the flame arrestors from the drain lines.

(a) Keep the flame arrestors for the installation.

——— END OF TASK ———

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APU Fuel Supply Drain Mast Installation
Figure 401/28-25-07-990-801

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TASK 28-25-07-400-801

3. APU Fuel Supply Drain Mast - Installation

(Figure 28-25-06-990-804, Figure 401)

A. References

Reference	Title
20-11-00-910-801	Standard Torque Values (P/B 201)
20-30-80-910-801	General Cleaning of Metal (Series 80) (P/B 201)
28-25-06-400-804	APU Fuel Shroud Drain Line - Installation (P/B 401)
28-25-06-990-804	Figure: APU Shroud Drain Line Installation (P/B 401)
SRM 51-40-02	Fastener Installation and Removal
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Consumable Materials

Reference	Description	Specification
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
C00913	Compound - Corrosion Inhibiting Material, Nondrying Resin Mix	BMS3-27
G50237	Compound - Corrosion Inhibiting, Non-drying - Cor-Ban 27L	BMS3-38

D. Location Zones

Zone	Area
144	Main Landing Gear Wheel Well, Right
149	Aft Keel Beam

E. Prepare for the Installation

SUBTASK 28-25-07-850-001

(1) To prepare a new drain mast casting, drill four holes to align with the four holes in the keel beam ladder supports.

NOTE: Do not drill the two center holes in the keel beam ladder MLG support. You will not use them to install the new drain mast.

SUBTASK 28-25-07-110-001

(2) Clean the metal surfaces (TASK 20-30-80-910-801).

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SUBTASK 28-25-07-110-002

(3) Apply sealant, A50231, to prepare these components for an electrical faying surface bond (SWPM 20-20-00):

(a) Drain mast - contact surface of brackets

(b) Keel beam ladder MLG support

(c) Keel beam ladder wheel well.

SUBTASK 28-25-07-916-001

WARNING USE NITRILE GLOVES FOR SKIN PROTECTION WHEN YOU USE COR-BAN 27L, G50237. IF IT GETS ON YOUR SKIN, IMMEDIATELY REMOVE IT WITH WATER. IF THIS MATERIAL GETS IN YOUR EYES, IMMEDIATELY FLUSH YOUR EYES WITH WATER. GET MEDICAL AID. THIS MATERIAL CONTAINS FLAMMABLE AGENTS WHICH CAN CAUSE INJURIES TO PERSONNEL.

WARNING DO NOT GET THIS MATERIAL IN YOUR MOUTH, EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM THIS MATERIAL. PUT ON A RESPIRATOR, EYE PROTECTION (GOGGLES, OR OTHER APPROVED PROTECTION), AND GLOVES BEFORE YOU USE THIS MATERIAL. MAKE SURE THAT THERE IS SUFFICIENT AIRFLOW. KEEP THIS MATERIAL AWAY FROM SPARKS, FLAME, AND HEAT. THIS MATERIAL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(4) Coat the shanks and threads of the four bolts [1] with Cor-Ban 27L Compound, G50237 or Mastinox 6856 K, C00913.

F. Install the Drain Mast

SUBTASK 28-25-07-420-002

(1) Do these steps to install the drain mast:

(a) Hold the drain mast in its position.

(b) Install the two bolts [1] and collars [2] to attach the drain mast to the keel beam ladder main landing gear support (SRM 51-40-02). Refer to Standard Torque Values, TASK 20-11-00-910-801.

NOTE: You will not use the two center holes in the keel beam ladder MLG support to install the drain mast.

(c) Install the two bolts [1] and collars [2] to attach the drain mast to the keel beam ladder wheel well support (SRM 51-40-02). Refer to Standard Torque Values, TASK 20-11-00-910-801.

SUBTASK 28-25-07-700-001

(2) Use the intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00) to measure the resistance between the drain mast and the keel beam.

(a) Make sure that the resistance is 0.0005 ohm (0.5 milliohm) or less.

G. Put the Airplane to Back to Its Usual Condition

SUBTASK 28-25-07-410-002

(1) If there is a tube in the drain mast with a cap installed, do these steps:

(a) Remove the cap from the tube.

(b) Put the tube in position on the airplane structure.

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(c) Install the cap screw, washer and nut to connect the loop clamp and bonding jumper to the tube.

(d) Install the cap and o-ring on the tube.

(e) Install the lockwire between the cap and the tube.

SUBTASK 28-25-07-410-001

(2) Do this task: APU Fuel Shroud Drain Line - Installation, TASK 28-25-06-400-804.

——— END OF TASK ———

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DEFUELING - MAINTENANCE PRACTICES

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure has these tasks::

(1) Precautions and Limits for the Defuel Operation

(a) Precautions when operating the auxiliary power unit (APU).

(2) Pressure Defueling

(a) The pressure defueling procedure uses the main tank fuel boost pumps and the center tank override/jettison pumps to remove fuel from the fuel tanks. The fuel flows through the engine fuel feed manifold through the defuel valve into the refueling manifold, and out of the refuel adapters to the fueling truck.

(b) The engine fuel crossfeed valve(s) must be opened to defuel the left main tank and to help defuel the center fuel tank.

(3) Tank to Tank Transfer

(a) To defuel a fuel tank with the tank to tank transfer procedure it is necessary to use the defuel valve, refuel shutoff valves, engine fuel crossfeed valves, main tank fuel boost pumps and center tank override/jettison pumps. To move the fuel between the fuel tanks the fuel system must be in the configuration that follows:

(b) One pump must operate in the fuel tank that supplies fuel.

(c) The defuel valve must be open.

(d) The refuel shutoff valve in the fuel tank that gets the fuel must be open.

(e) The engine fuel crossfeed valve(s) must be open to transfer fuel from the left main tank to the center or right main fuel tanks. The engine fuel crossfeed valves can be opened to transfer fuel from the center fuel tank.

(4) Suction Defueling

(a) The suction defueling procedure uses suction from the fueling truck to defuel the main and center fuel tanks. The fuel flows through the engine fuel feed manifold through the defuel valve into the refueling manifold, and out of the refuel adapters to the fueling truck. To defuel the fuel tanks completely, it can be necessary to drain the remaining fuel from the fuel tanks manually.

(b) The engine fuel crossfeed valve(s) must be opened to defuel the left main tank and to help defuel the center fuel tank.

(c) You can drain the center fuel tank through the drain valves for the fuel sump or you can remove a fuel pump motor-impeller and siphon the fuel from the fuel tank.

C. The fuel quantity indicating system lets you monitor the fuel quantity at the refueling station, P28 or on the EICAS display.

D. The fuel tanks can be defueled in any order for maintenance. The airplane wings will not touch the ground if one wing is full and the other wing is empty.

E. When thunderstorms or lightning are within a 10 mile (16 kilometer) radius of the immediate area, the defueling procedure should stop.

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F. Strong wind conditions can cause a build-up of static electricity. Large charges of static electricity can develop on support equipment while parked as a result of the movement of dust particles and air currents during strong wind conditions. Strong wind conditions also cause the unwanted movement of items or equipment which can hit the airplane or injure persons. Wind gusts can damage the airplane structure. Defueling procedures should stop if strong wind conditions are present.

G. If a fuel tank must be fully defueled, drain the remaining fuel through the drain valve of the fuel sump (TASK 12-11-02-650-801).

TASK 28-26-00-600-801

2. Precautions and Limits for the Defuel Operation

A. References

Reference	Title
49-11-00-860-801	APU Emergency Shutdown (P/B 201)
49-11-00-860-804	APU Starting and Operation (P/B 201)
49-11-00-860-805	APU Usual Shutdown (P/B 201)

B. Location Zones

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing

C. APU Operations During Defueling - Limits and Precautions

SUBTASK 28-26-00-860-060

(1) If the APU is operating during defueling, do these steps:

WARNING OBEY THE PRECAUTIONS FOR APU OPERATION WHEN YOU OPERATE THE APU DURING THE FUELING OPERATION OF THE AIRPLANE. IF YOU OPERATE THE APU INCORRECTLY, INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.

(a) Obey the limits for the operation of the APU (TASK 49-11-00-860-804).

(b) You can start the APU during defueling if the start is an initial start or a restart after a normal shutdown.

(c) You can shut down the APU (manual or automatic) during the defueling operation.

(d) If the low pressure indication light comes on for the APU DC fuel pump, immediately shut down the APU (TASK 49-11-00-860-805) so the pump will shut off.

NOTE: The switch for the APU DC fuel pump will not shutoff the pump when the APU is operating.

WARNING IF THERE IS A PROTECTIVE AUTOMATIC SHUTDOWN OF THE APU OR A FAILURE TO START CONDITION, DO NOT TRY TO START THE APU DURING THE FUELING OPERATION OF THE AIRPLANE. IF YOU TRY TO START THE APU, INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.

(e) If there is a protective automatic shutdown, or failure to start condition on the APU, do one of these two steps:

1) Complete the defuel operation before you try to start the APU again.

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2) Stop the defuel operation.

a) Disconnect the fuel hose(s) from the airplane fueling adapter(s) before you start the APU again.

WARNING DO THESE STEPS IF AN APU FIRE OCCURS WHILE YOU REFUEL THE AIRPLANE. IF YOU DO NOT OBEY THESE STEPS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(f) If an APU fire occurs, do these steps in this sequence:

1) Stop the defueling operation.

2) The APU will stop automatically.

a) If it does not shut down automatically, do this task: APU Emergency Shutdown, TASK 49-11-00-860-801.

3) Discharge the APU fire bottles (TASK 49-11-00-860-801).

4) Tell persons onboard the airplane and Airport Fire Services.

WARNING DO THESE STEPS IF YOU SPILL FUEL WHILE YOU REFUEL THE AIRPLANE. FUEL CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(g) If fuel spillage occurs, do these steps:

1) Stop the defueling operation.

2) Tell a person onboard the airplane.

3) Unload the APU and shut it down (TASK 49-11-00-860-805).

a) Do not start the APU until the spilled fuel is removed and there is no more risk of spilled fuel or vapors.

WARNING MAKE SURE THAT FUELING VEHICLES ARE NOT PARKED IN THE EXHAUST FLOW OF THE ENGINES OF THIS AIRPLANE, OR ADJACENT AIRPLANES. THE HOT EXHAUST CAN CAUSE A FIRE OR EXPLOSION.

(h) Make sure that fueling vehicles are in a position that prevents risk of coming in the path of the APU exhaust stream.

NOTE: The APU exhaust stream can interfere with the fueling vehicles for other airplanes.

END OF TASK

TASK 28-26-00-650-801

3. Pressure Defueling

(Figure 201)

A. General

(1) Do this task to pressure defuel the airplane.

(2) Pressure defueling requires AC power to operate the main or override pump switches on the flight deck overhead panel. If AC power is not available, DC power can be used to open defueling valves from the integrated refueling panel. Fuel truck pumps can then be used to defuel the airplane.

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(3) For faster defueling, you can use the jettison pumps in combination with the main boost pumps. However, jettison pumps cannot defuel the tanks completely. To prevent the pumps from dry running, the jettison pumps should be turned off when the minimum fuel quantity remains in the tanks (Prepare for the Test: Fuel Jettison System - Operational Test, TASK 28-31-00-720-801).

NOTE: The maximum allowable defuel rate per refuel adapter is 350 gpm (1325 l/min). The approximate defuel rate of a main boost pump is 100 gpm (379 l/min). The approximate defuel rate of an override/jettison pump is 175 gpm (662 l/min). Make sure that the combination of pumps used does not exceed the maximum allowable defuel rate if the defuel rate is not limited by ground equipment.

B. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
12-11-01-650-808	Pressure Refueling - With Inoperative Refuel Valves (P/B 301)
12-11-02-650-801	Fuel Tank Sump Drain Valve - Tank Entry (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
28-21-01-000-801	Refuel Adapter - Removal (P/B 401)
28-21-01-400-801	Refuel Adapter - Installation (P/B 401)
28-31-00-720-801	Fuel Jettison System - Operational Test (P/B 501)
49-11-00-860-805	APU Usual Shutdown (P/B 201)

C. Location Zones

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing

D. Access Panels

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

E. Pressure Defueling

SUBTASK 28-26-00-860-061

WARNING OBEY THE SAFETY PRECAUTIONS. IF YOU DO NOT OBEY THE SAFETY PRECAUTIONS, YOU CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(1) Read and obey the precautions (TASK 28-26-00-600-801).

SUBTASK 28-26-00-586-001

(2) If it is possible, make sure the airplane has a ground attitude of 0.7 degree nose down pitch and 0.0 degree roll.

NOTE: A ground attitude of 0.7 degree nose down pitch and 0.0 degree roll lets you defuel all the fuel in the tanks.

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SUBTASK 28-26-00-860-026

WARNING DO NOT CONNECT A HEADSET AND DO NOT TOUCH CONNECTIONS TO THE AIRPLANE DURING ATMOSPHERIC ELECTRICAL ACTIVITY OR STRONG RADIATIVE FIELDS. LIGHTNING STRIKE AND HIGH DISCHARGE CURRENTS CAN CAUSE SEVERE INJURY.

WARNING DO NOT OPERATE HF COMMUNICATION SYSTEM OR WEATHER RADAR DURING FUELING OPERATIONS. FIRE OR EXPLOSION CAN OCCUR.

WARNING DO NOT PUT GROUND EQUIPMENT BELOW THE WINGTIPS WHILE YOU REFUEL THE AIRPLANE. THE WEIGHT OF THE FUEL CAN CAUSE THE WINGS TO MOVE DOWN. BECAUSE THE FUEL TANK VENTS ARE NEAR THE WINGTIPS, EXPLOSIVE FUMES AROUND THE WINGTIP CAN OCCUR. GROUND EQUIPMENT CAN CAUSE AN EXPLOSION WHICH CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

CAUTION DO NOT REMOVE ELECTRICAL POWER DURING FUELING OPERATIONS. IF YOU REMOVE ELECTRICAL POWER WITH REFUEL VALVES OPEN, THE REFUEL VALVES WILL CLOSE AND CAN DAMAGE EQUIPMENT.

CAUTION DO NOT OPERATE THE HYDRAULIC SYSTEM IF THERE IS LESS THAN 5000 LB (2300 KG) IN THE LEFT MAIN FUEL TANK, AND 7000 LB (3200 KG) IN THE RIGHT MAIN FUEL TANK. THE HYDRAULIC SYSTEM CAN BECOME TOO HOT IF THE HEAT EXCHANGER IS NOT IN FUEL.

(3) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

NOTE: During the defuel procedure, the APU can be started or stopped.

SUBTASK 28-26-00-210-012

WARNING ATTACH BONDING CABLES ONLY TO SPECIFIED POINTS ON THE AIRPLANE. INCORRECTLY ATTACHED BONDING CABLES CAN CAUSE SCRATCHES. THESE SCRATCHES CAN CAUSE CORROSION AND CRACKS ON STRESSED PARTS. BONDING CABLES ATTACHED TO COMPOSITE DOORS OR FAIRINGS DO NOT GIVE AN ELECTRICAL BOND.

(4) Bond the fueling truck to the airplane.

NOTE: Static grounding of the airplane by positive grounding means is not necessary when performing pressure refueling or pressure defueling of the airplane. Electrical bonding between the airplane and the refueling vehicle is required.

SUBTASK 28-26-00-860-001

WARNING DO NOT OPERATE THE LEADING EDGE SLATS. ACCIDENTAL SLAT OPERATION COULD CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(5) Put a DO-NOT-OPERATE tag on the flap control lever, in the flight compartment (TASK 27-81-00-040-801).

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SUBTASK 28-26-00-210-023

(6) Make sure that the FUEL JETTISON L(R) NOZZLE switch-lights are in the closed position.

SUBTASK 28-26-00-010-001

(7) Open these access doors:

(TASK 06-44-00-800-802)

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

SUBTASK 28-26-00-210-002

(8) Make sure the refueling panel light comes on.

NOTE: This shows there is 28V DC.

SUBTASK 28-26-00-480-006

WARNING

MAKE SURE THAT THERE IS NO TENSION ON THE HOSE. THE HOSE MUST HANG FREELY FROM THE REFUEL ADAPTER, WITH NO FORCE ON IT. TENSION ON THE HOSE CAN CAUSE DAMAGE TO THE FUEL RECEPTACLE AND CAUSE THE HOSE TO DISCONNECT. INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

CAUTION

BEFORE DEFUEL OPERATIONS, MAKE SURE THE HOSE NOZZLE AND HOSE-END CONTROL VALVE (IF USED) ARE CONFIGURED PER THE SUPPLIER'S MAINTENANCE MANUAL. FAILURE TO DO SO COULD CAUSE DAMAGE TO EQUIPMENT.

(9) Connect the fueling nozzles to one or more of the refuel adapters.

(a) Make sure that the refuel adapter is clean, not damaged and there are no fuel leaks.

1) Make sure that the screws and lugs are not loose or damaged.

(b) If there is a problem with the refuel adapter, replace the refuel adapter (TASK 28-21-01-000-801 and TASK 28-21-01-400-801).

(c) Connect the fueling nozzle to the refuel adapter.

SUBTASK 28-26-00-860-064

(10) If the airplane was refueled since the last flight, do these steps to remove pressure in the refuel manifold:

(a) Put the LEFT or RIGHT MAIN REFUEL VALVE CONTROL switch to the OPEN position.

1) Make sure the applicable blue refuel valve lights come on.

a) If necessary, open the refuel valves manually. (TASK 12-11-01-650-808).

(b) Wait 1 minute to remove pressure in the refuel manifold.

1) Make sure the applicable blue refuel valve lights go off.

(c) Put the applicable LEFT or RIGHT MAIN REFUEL VALVE CONTROL switch to the CLOSE position.

SUBTASK 28-26-00-860-024

(11) Set the REFUEL/DEFUEL handle on the refuel adapters to the DEFUEL position (View C, Figure 201).

SUBTASK 28-26-00-860-002

(12) Push the TEST IND switch to do a test on the fuel quantity displays.

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ARO 001-010

SUBTASK 28-26-00-210-003

(13) Make sure the correct test patterns (###.#) show on the top and bottom displays for fuel quantity.

NOTE: A checker board pattern will show on the fuel quantity displays and the load select displays for 2 seconds, then the opposite pattern will show for 2 seconds, and then the displays will go off for 2 seconds. The test patterns will show one more time and then the displays will return to their usual condition.

ARO 011-999

SUBTASK 28-26-00-210-027

(14) Make sure that all LEDs show on the FUEL QTY displays and the LOAD SEL displays on the IRP.

NOTE: All LEDs will show on the FUEL QTY displays and the LOAD SEL displays for 2 seconds, then the dot matrix LEDs will go off for 4 seconds, and then come on for 2 seconds. Each time after the dot matrix LEDs go off, the LB/KG/RM/LM/CT/TF LEDs stay on for 2 seconds and then go off. After the test, the LEDs for each FUEL QTY display and LOAD SEL display will return to their usual condition.

ARO ALL

SUBTASK 28-26-00-860-003

(15) Push and release the DEFUEL VALVE light.

(a) Make sure the DEFUEL VALVE light comes on, then goes off.

NOTE: This shows that the light bulb operates correctly.

SUBTASK 28-26-00-860-004

(16) Put the DEFUEL VALVE switch to the OPEN position.

SUBTASK 28-26-00-210-004

(17) Make sure the DEFUEL VALVE light comes on.

SUBTASK 28-26-00-860-027

(18) Push the applicable FWD and AFT CROSSFEED switch-lights to the OPEN position, on the Overhead Panel (P5).

SUBTASK 28-26-00-860-049

WARNING

DO NOT OPERATE A FUEL PUMP IF THE AMBER PRESS LIGHT COMES ON AND STAYS ON. IT CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE TANK WHICH WILL CAUSE A FIRE OR EXPLOSION. FIRES AND EXPLOSIONS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(19) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

(a) Immediately set the applicable fuel pump switch-light(s) to off if the amber PRESS light comes on and stays on.

NOTE: When defueling or transferring fuel with minimum backpressure to the pumps, it is possible for the low pressure light(s) to come on. In this case, monitor tank quantity and set the pump switch to off if tank quantity is not changing. If the two pumps for one tank are used for defueling, the low pressure lights are usually not expected to come on until the tank is empty.

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SUBTASK 28-26-00-860-005

(20) Push the applicable FWD and AFT PUMPS, or L and R CENTER PUMPS switch-lights to the ON position.

NOTE: This starts the defueling operation. The applicable fuel pump switch-lights are installed in the flight deck overhead panel, P5.

NOTE: The maximum allowable defuel rate per refuel adapter is 350 gpm (1325 l/min). If all pumps are operating at full capacity and defueling is not limited, the maximum allowable defuel rate could be exceeded.

WARNING

DO NOT MOVE THE REFUEL/DEFUEL HANDLE TO STOP THE FLOW OF FUEL FROM THE AIRPLANE. IF YOU MOVE THE HANDLE DURING THE DEFUELING OPERATION, THE FUEL FLOW CAN CAUSE THE VALVE TO CLOSE VERY QUICKLY. THIS CAN CAUSE INJURY TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(a) To stop the defueling operation, you will have to stop the pumps and then close the defuel valves.

1) Do not stop the defueling operation with the REFUEL/DEFUEL handle.

SUBTASK 28-26-00-650-009

WARNING

DO THESE STEPS IF FUEL SPILLAGE OCCURS DURING DEFUELING. INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(21) If a fuel spill occurs, do these steps:

(a) Stop the defueling operation.

(b) Unload and shutdown the APU (TASK 49-11-00-860-805).

(c) Follow the fire department and operator provided fuel spill and fire protection emergency procedures.

(d) Find the cause of the fuel spill and correct it.

(e) Inspect enclosed areas to make sure they are free of fuel vapor.

(f) Do not start the defuel operation or start the APU again until the fire department or the person(s) in charge have given approval.

SUBTASK 28-26-00-650-008

(22) To defuel with the jettison pumps, do these steps:

(a) Make sure this minimum quantity of fuel is in the applicable main tank to prevent the pumps from dry-running: (Prepare for the Test: Fuel Jettison System - Operational Test, TASK 28-31-00-720-801)

WARNING

DO NOT PUSH THE FUEL JETTISON NOZZLE VALVE SWITCH-LIGHTS TO THE ON POSITION WHEN THE FUEL JETTISON ARM SWITCH-LIGHT IS IN THE ARMED POSITION. IF YOU PUSH THIS SWITCH, IT WILL CAUSE FUEL TO RELEASE OUTBOARD FROM THE NOZZLES. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT ON THE GROUND.

(b) Do not push the FUEL JETTISON NOZZLE valve switch-lights during this procedure.

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WARNING DO NOT OPERATE THE JETTISON PUMP IF THE FAULT LIGHT ON THE ARM SWITCH COMES ON AND STAYS ON. FUEL FUMES IN THE TANK CAN CAUSE A FIRE OR AN EXPLOSION. INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.

(c) Immediately set the FUEL JETTISON ARM switch to the off position if the FAULT light on the FUEL JETTISON ARM switch comes on and stays on.

(d) Push the FUEL JETTISON ARM switch-light, found on the Overhead Panel (P5), to the ARMED position.

NOTE: The maximum allowable defuel rate is 350 gpm (1325 l/min). If all pumps are operating at full capacity and defueling is not limited, the maximum allowable defuel rate could be exceeded.

SUBTASK 28-26-00-210-005

(23) Monitor the quantity of fuel in the fuel tanks on the fuel quantity indicators on the integrated refuel panel (P28) or on the EICAS display.

NOTE: If the center fuel tank is defueled first, the main fuel tank scavenge system will help remove the fuel that remains in the center fuel tank. This will make the center tank sump operation easier, if the center tank will be defueled completely.

SUBTASK 28-26-00-860-051

(24) If defueling with the fuel jettison pumps:

(a) Push the FUEL JETTISON ARM switch-light to the off position once the fuel level in the applicable main tank reaches 14,000 lb (6350 kg) or a higher quantity when the necessary quantity of fuel is defueled.

SUBTASK 28-26-00-860-006

(25) Push the applicable FWD and AFT PUMPS switch-lights to the off position when the necessary quantity of fuel is defueled.

NOTE: You can stop the defueling operation, if you put the DEFUEL VALVE switch to the CLOSE position.

SUBTASK 28-26-00-650-035

(26) If defueling with the center tank pumps:

(a) Push the L and R CENTER PUMPS switch-lights to the off position when the necessary quantity of fuel is removed.

(b) Keep a minimum of 5500 lb (2495 kg) of fuel in the center tank.

NOTE: This fuel quantity is necessary to make sure that the pump INLET is in the fuel.

(c) If the center tank fuel is less than 5500 lb (2495 kg), continuously monitor the fuel quantity and the low pressure indication in the center tank.

1) Immediately set the L and R CENTER PUMPS switch-lights to the off position if the amber PRESS light comes on and stays on.

NOTE: To prevent the pumps from dry running, the center tank pumps should be turned off when the minimum fuel quantity remains in the tank.

2) Make sure that the applicable EICAS status message does not show on the EICAS display for the applicable pump:

a) FUEL PUMP CENTER L.

b) FUEL PUMP CENTER R.

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SUBTASK 28-26-00-860-028

(27) Push the applicable FWD and AFT CROSSFEED switch-lights to the off position, on the Overhead Panel (P5).

SUBTASK 28-26-00-860-007

(28) Put the DEFUEL VALVE switch to the CLOSE position.

SUBTASK 28-26-00-650-001

(29) If the fuel tank must be fully defueled, drain the remaining fuel through the drain valve of the fuel sump (TASK 12-11-02-650-801).

SUBTASK 28-26-00-080-007

(30) Disconnect the fueling nozzles from the refuel adapters.

SUBTASK 28-26-00-860-059

(31) Set the REFUEL/DEFUEL handle on the refuel adapters to the REFUEL position.

SUBTASK 28-26-00-080-008

(32) Disconnect the bonding cable from the refueling station, if it is installed.

SUBTASK 28-26-00-080-009

(33) Disconnect the bonding cable between the fueling truck and airplane.

SUBTASK 28-26-00-410-001

(34) Close the applicable access door:(TASK 06-44-00-800-802)

Close these access doors:

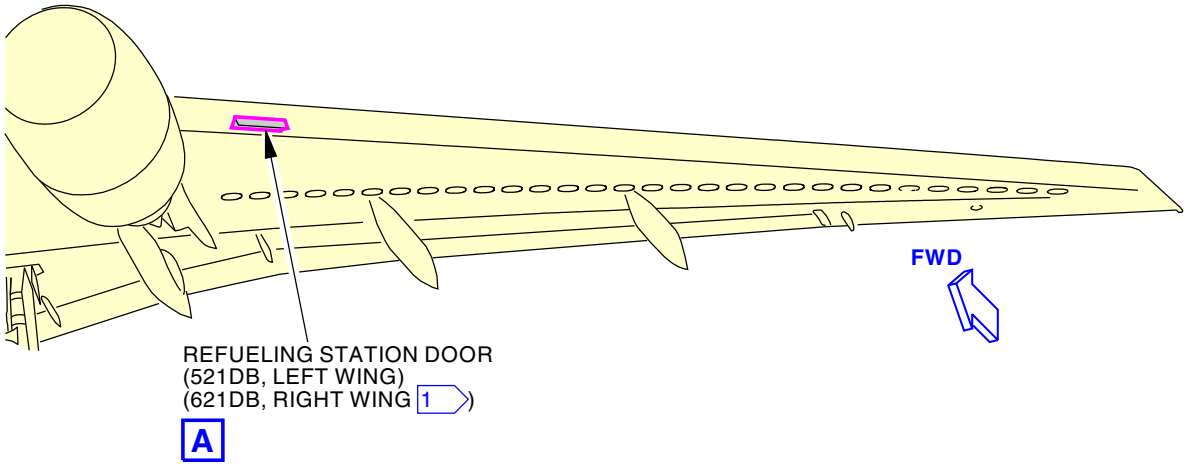
Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

SUBTASK 28-26-00-860-029

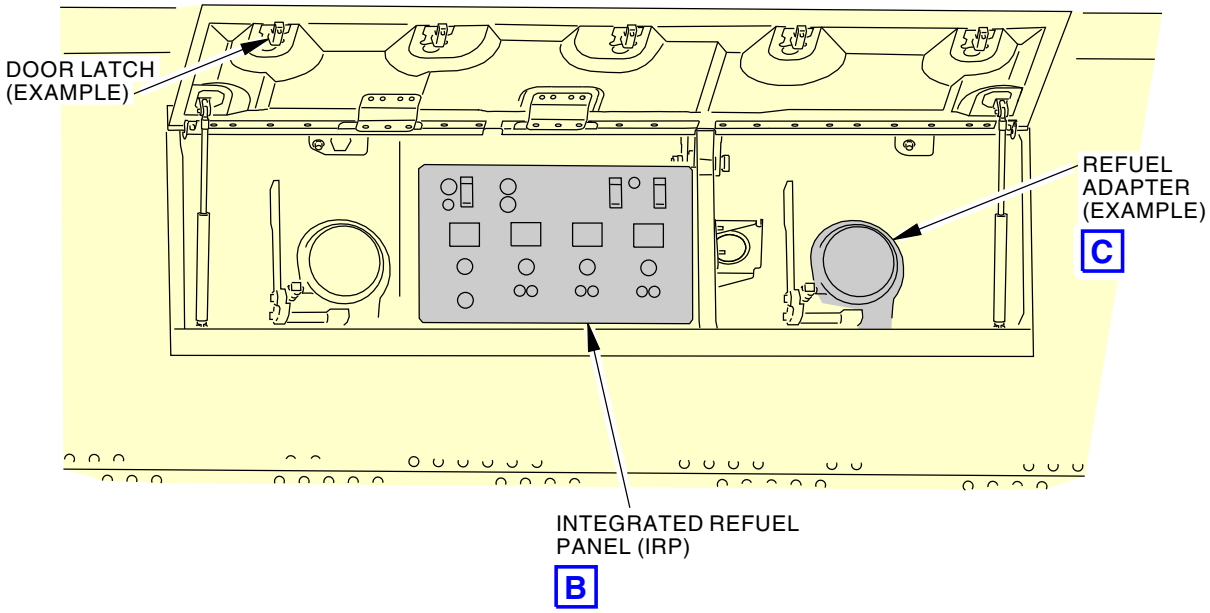
(35) Remove the DO-NOT-OPERATE tag from the flap control lever, in the flight compartment.

——— END OF TASK ———

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LEFT WING



REFUELING STATION DOOR

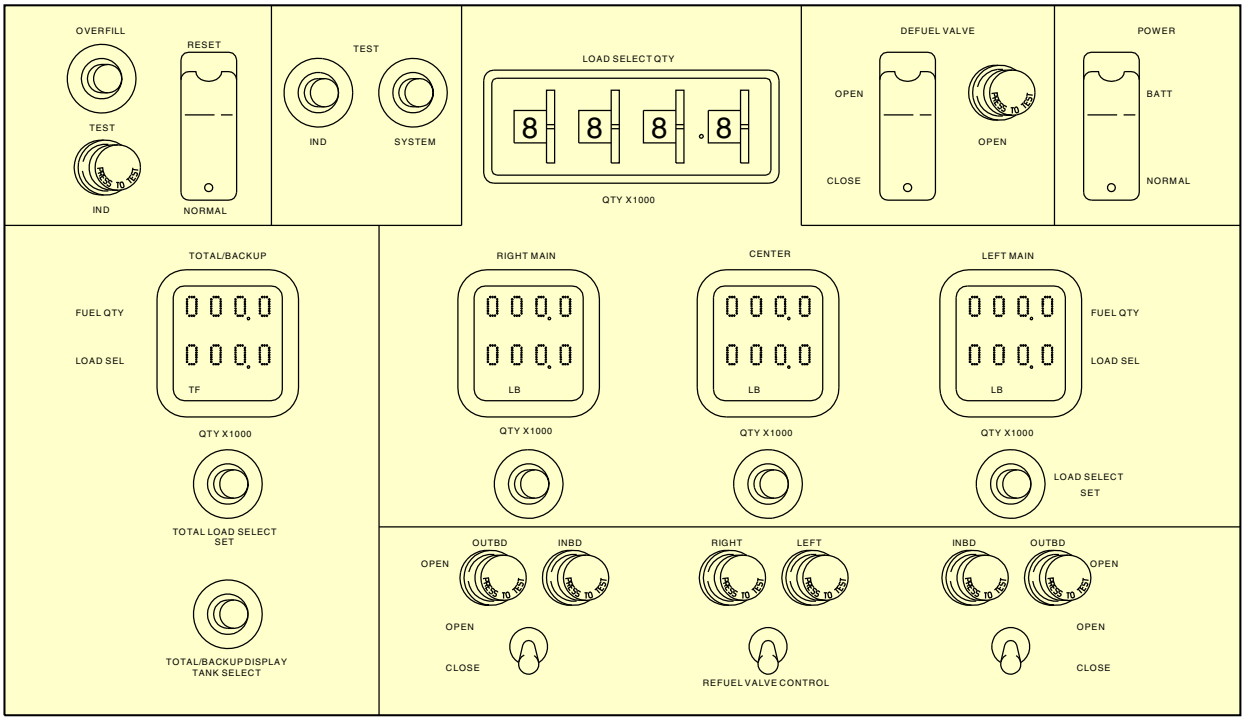
A

1 IF INSTALLED

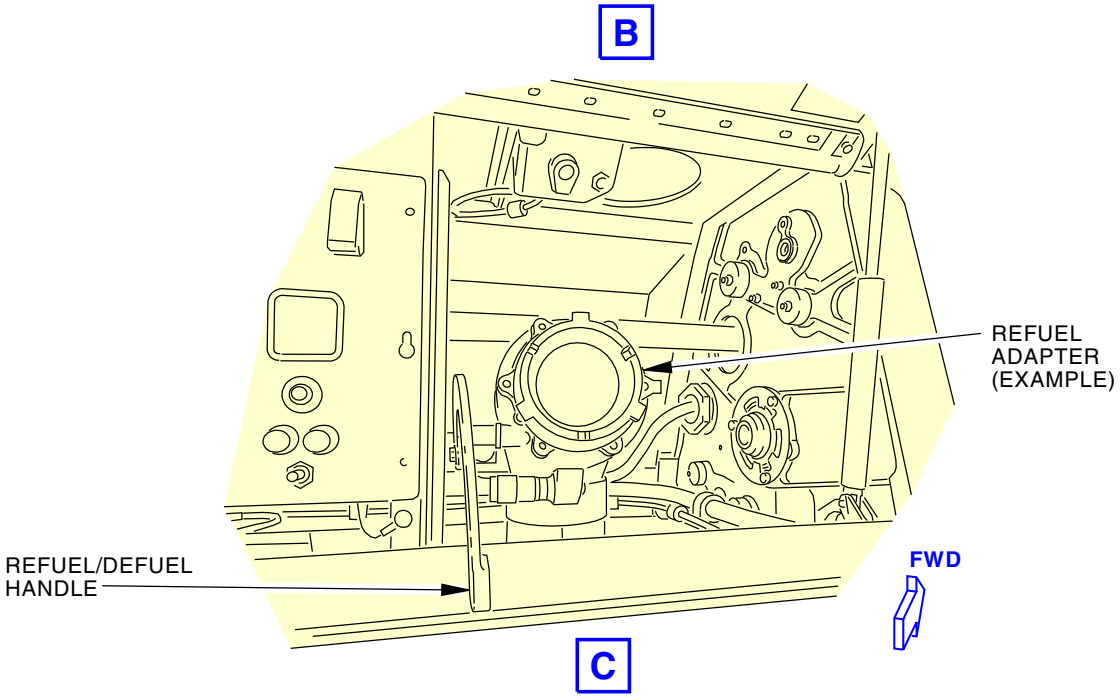
D06746 S0006415441_V2

Defueling
Figure 201/28-26-00-990-801 (Sheet 1 of 3)

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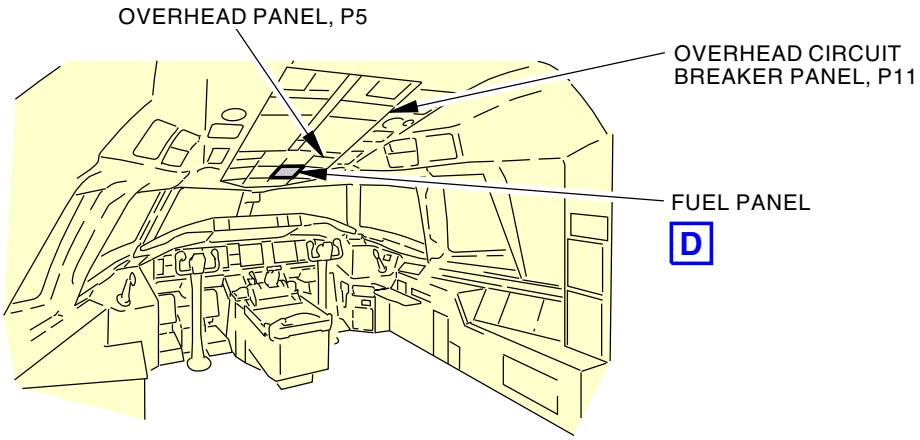


INTEGRATED REFUEL PANEL (IRP), P28

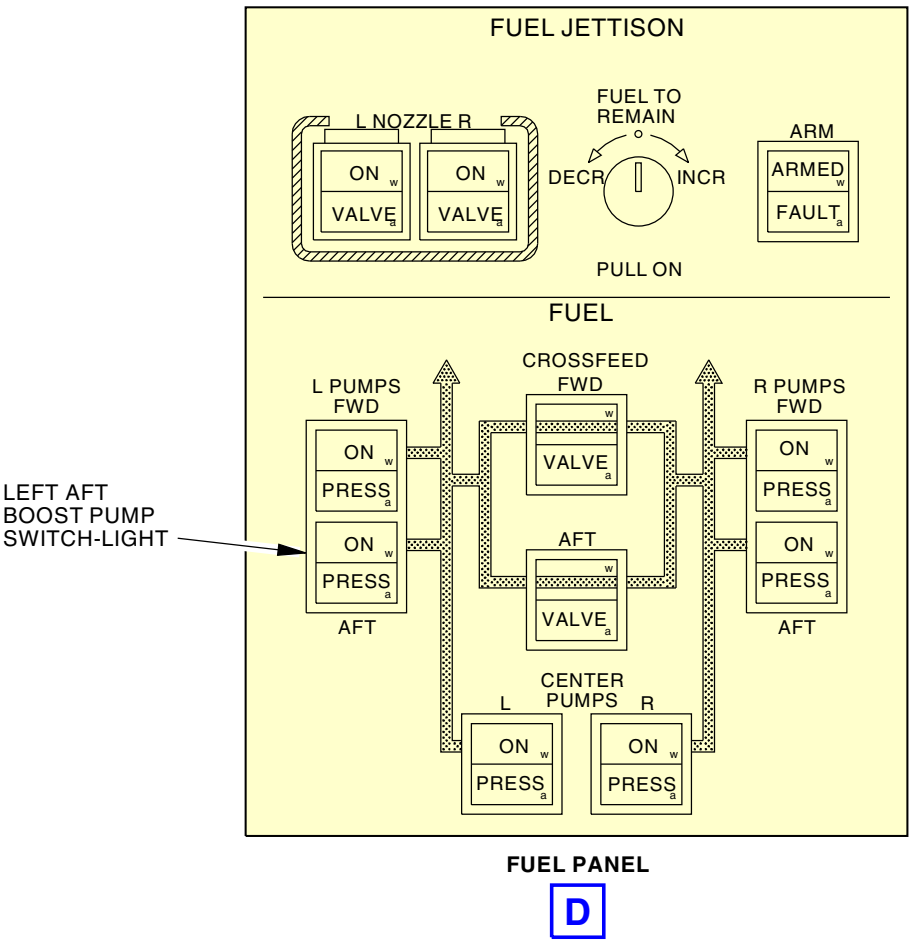


Defueling
Figure 201/28-26-00-990-801 (Sheet 2 of 3)

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FLIGHT COMPARTMENT



FUEL PANEL

D

D06750 S0006415443_V2

Defueling
Figure 201/28-26-00-990-801 (Sheet 3 of 3)

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TASK 28-26-00-650-802

4. Tank to Tank Transfer

(Figure 201)

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
12-11-02-650-801	Fuel Tank Sump Drain Valve - Tank Entry (P/B 301)
20-41-00-760-801	Electrical Bonding (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)

B. Location Zones

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing

C. Access Panels

Number	Name/Location
521DB	Refueling Station Door

D. Tank to Tank Transfer

SUBTASK 28-26-00-860-062

WARNING OBEY THE SAFETY PRECAUTIONS. IF YOU DO NOT OBEY THE SAFETY PRECAUTIONS, YOU CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(1) Read and obey the precautions (TASK 28-26-00-600-801).

SUBTASK 28-26-00-586-002

(2) Make sure the airplane has a ground attitude of 0.7 degree nose down pitch and 0.0 degree roll, if it is possible.

NOTE: A ground attitude of 0.7 degree nose down pitch and 0.0 degree roll lets you defuel all the fuel in the tanks.

SUBTASK 28-26-00-860-025

WARNING DO NOT CONNECT A HEADSET, OR TOUCH CONNECTIONS TO THE AIRPLANE WHEN THERE IS LIGHTNING, OR IN STRONG ELECTROMAGNETIC FIELDS. LIGHTNING, AND ELECTRICAL CURRENT CAN CAUSE INJURIES TO PERSONNEL.

WARNING DO NOT OPERATE THE HF COMMUNICATION SYSTEM DURING FUELING OPERATIONS. A FIRE OR EXPLOSION CAN OCCUR.

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(WARNING PRECEDES)

WARNING	DO NOT PUT GROUND EQUIPMENT BELOW THE WINGTIPS WHILE YOU REFUEL THE AIRPLANE. THE WEIGHT OF THE FUEL CAN CAUSE THE WINGS TO MOVE DOWN. BECAUSE THE FUEL TANK VENTS ARE NEAR THE WINGTIPS, EXPLOSIVE FUMES AROUND THE WINGTIP CAN OCCUR. GROUND EQUIPMENT CAN CAUSE AN EXPLOSION WHICH CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

CAUTION	DO NOT REMOVE ELECTRICAL POWER WHILE YOU REFUEL THE AIRPLANE. IF YOU REMOVE ELECTRICAL POWER, THE REFUELING VALVES WILL CLOSE AND CAN CAUSE DAMAGE TO EQUIPMENT.

CAUTION	DO NOT OPERATE THE HYDRAULIC SYSTEM IF THERE IS LESS THAN 5000 LB (2300 KG) IN THE LEFT MAIN FUEL TANK, AND 7000 LB (3200 KG) IN THE RIGHT MAIN FUEL TANK. THE HYDRAULIC SYSTEM CAN BECOME TOO HOT IF THE HEAT EXCHANGER IS NOT IN FUEL.

(3) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

NOTE: During the defuel procedure, the APU can be started or stopped.

SUBTASK 28-26-00-210-013

(4) Bond the airplane to an approved ground.

NOTE: Static grounding of the airplane by positive grounding means is recommended during overwing refueling or other fuel related activities. Electrical bonding between the airplane and the refueling source is also required.

SUBTASK 28-26-00-210-025

(5) Make sure that the FUEL JETTISON L(R) NOZZLE valve switch-lights, on the Fuel Jettison Panel (P5 Overhead Panel), are in the closed position.

SUBTASK 28-26-00-860-030

WARNING	DO NOT OPERATE THE LEADING EDGE SLATS. ACCIDENTAL SLAT OPERATION COULD CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(6) Put a DO-NOT-OPERATE tag on the flap control lever, in the flight compartment (TASK 27-81-00-040-801).

SUBTASK 28-26-00-010-002

(7) Open this access door:

(TASK 20-41-00-760-801)

Number	Name/Location
521DB	Refueling Station Door

SUBTASK 28-26-00-860-008

(8) Push the TEST IND switch to do a test of the fuel quantity displays and blue valve position lights.

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ARO 001-010

SUBTASK 28-26-00-210-006

(9) Make sure the correct test pattern (###.#) shows on the top and bottom displays for fuel quantity.

NOTE: A checker board pattern will show on the fuel quantity displays and the load select displays for 2 seconds, then the opposite pattern will show for 2 seconds, and then the displays will go off for 2 seconds. The test patterns will show one more time and then the displays will return to their usual condition.

ARO 011-999

SUBTASK 28-26-00-210-028

(10) Make sure that all LEDs show on the FUEL QTY displays and the LOAD SEL displays on the IRP.

NOTE: All LEDs will show on the FUEL QTY displays and the LOAD SEL displays for 2 seconds, then the dot matrix LEDs will go off for 4 seconds, and then come on for 2 seconds. Each time after the dot matrix LEDs go off, the LB/KG/RM/LM/CT/TF LEDs stay on for 2 seconds and then go off. After the test, the LEDs for each FUEL QTY display and LOAD SEL display will return to their usual condition.

ARO ALL

SUBTASK 28-26-00-860-010

(11) Make sure each blue valve position light comes on and then goes off.

SUBTASK 28-26-00-860-050

WARNING

DO NOT OPERATE A FUEL PUMP IF THE AMBER PRESS LIGHT COMES ON AND STAYS ON. IT CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE TANK WHICH WILL CAUSE A FIRE OR EXPLOSION. FIRES AND EXPLOSIONS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(12) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

(a) Immediately set the applicable fuel pump switch-light(s) to OFF if the amber PRESS light comes on and stays on.

NOTE: When defueling or transferring fuel with minimum backpressure to the pumps, it is possible for the low pressure light(s) to come on. In this case, monitor tank quantity and set the pump switch to OFF if tank quantity is not changing. If the two pumps for one tank are used for defueling, the low pressure lights are usually not expected to come on until the tank is empty.

SUBTASK 28-26-00-860-011

(13) If the left or right main fuel tank supplies the fuel, do the steps that follow:

(a) Put the DEFUEL VALVE switch to the OPEN position.

(b) Put the FWD or AFT CROSSFEED VALVE switch-lights to the OPEN position, on the Overhead Panel (P5).

(c) Push the applicable FWD AND AFT PUMPS switch-lights to the ON position, on the P5 Overhead Panel.

NOTE: This puts fuel pressure in the refuel manifold.

(d) To transfer fuel to the center fuel tank, put the refuel valve control switch on the IRP, P28 (for the center tank) to the OPEN position.

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(e) To transfer fuel to the opposite main fuel tank, put the refuel valve control switch on the IRP, P28 (for the opposite main tank) to the OPEN position.

SUBTASK 28-26-00-860-012

(14) If the center fuel tank supplies the fuel, do the steps that follow:

(a) Put the DEFUEL VALVE switch to the OPEN position.

(b) Put the FWD and AFT CROSSFEED VALVE switch-lights to the OPEN position, on the Overhead Panel (P5).

(c) Push the LEFT and RIGHT CENTER PUMPS switch-lights to the ON position, on the P5 Overhead Panel.

NOTE: This puts fuel pressure in the refuel manifold.

(d) To transfer fuel to the left or right main fuel tank, put the refuel valve control switch on the IRP, P28 (for the left or right main tank) to the OPEN position.

SUBTASK 28-26-00-210-007

(15) Monitor the quantity of fuel in the fuel tanks on the fuel quantity displays of the integrated refuel panel (P28) or on the EICAS display.

SUBTASK 28-26-00-860-013

(16) Push the applicable FWD and AFT PUMP to the OFF position when the necessary quantity of fuel is moved.

SUBTASK 28-26-00-650-036

(17) If defueling with the center tank pumps:

(a) Push the L and R CENTER PUMPS switch-lights to the off position when the necessary quantity of fuel is removed.

(b) Keep a minimum of 5500 lb (2495 kg), of fuel in the center tank.

NOTE: This fuel quantity is necessary to make sure that the pump INLET is in the fuel.

(c) If the center tank fuel is less than 5500 lb (2495 kg), continuously monitor the fuel quantity and the low pressure indication in the center tank.

1) Immediately set the L and R CENTER PUMPS switch-lights to the off position if the amber PRESS light comes on and stays on.

NOTE: To prevent the pumps from dry running, the center tank pumps should be turned off when the minimum fuel quantity remains in the tank.

2) Make sure that the applicable EICAS status message does not show on the EICAS display for the applicable pump:

a) FUEL PUMP CENTER L.

b) FUEL PUMP CENTER R.

SUBTASK 28-26-00-860-014

(18) Put the DEFUEL VALVE switch to the CLOSE position.

SUBTASK 28-26-00-860-015

(19) Put the applicable refuel valve control switch to the OFF position, on the IRP P28, to close the refuel valves.

SUBTASK 28-26-00-860-016

(20) Push the FORWARD and AFT FUEL CROSSFEED switch-lights on the fuel management panel to the OFF position.

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SUBTASK 28-26-00-650-002

(21) If the fuel tank must be fully defueled, drain the remaining fuel through the drain valve of the fuel sump (TASK 12-11-02-650-801).

SUBTASK 28-26-00-410-003

(22) Close this access panel:

(TASK 06-44-00-800-802)

Number	Name/Location
521DB	Refueling Station Door

SUBTASK 28-26-00-860-031

(23) Remove the DO-NOT-OPERATE tag from the flap control lever, in the flight compartment.

——— END OF TASK ———

TASK 28-26-00-650-803

5. Suction Defueling

(Figure 201)

A. General

(1) This procedure to removes fuel from the airplane without the use of the airplane fuel pumps. Some of the fuel can be removed by suction defueling with a fueling truck. The fuel that remains must be drained from the fuel tanks manually.

NOTE: The maximum permitted defuel rate per refuel adapter is 350 gpm (1325 l/min). Make sure that the defuel rate is limited below the maximum permitted defuel rate.

B. References

Reference	Title
12-11-02-650-801	Fuel Tank Sump Drain Valve - Tank Entry (P/B 301)
20-41-00-760-801	Electrical Bonding (P/B 201)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
28-21-01-000-801	Refuel Adapter - Removal (P/B 401)
28-21-01-400-801	Refuel Adapter - Installation (P/B 401)
28-22-05-000-801	Boost Pump Motor-Impeller - Removal (P/B 401)
28-22-05-400-801	Boost Pump Motor-Impeller - Installation (P/B 401)
28-22-06-000-801	Override/Jettison Pump Motor-Impeller - Removal (P/B 401)
28-22-06-400-801	Override/Jettison Pump Motor-Impeller - Installation (P/B 401)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-1779	Defuleling Fiting, Main and Override Pump Part #: J28002-13 Supplier: 81205

D. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right

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(Continued)

Zone	Area
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing

E. Access Panels

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

F. Procedure

SUBTASK 28-26-00-586-003

(1) Make sure the airplane has a ground attitude of 0.7 degree nose down pitch and 0.0 degree roll.

NOTE: A ground attitude of 0.7 degree nose down pitch and 0.0 degree roll lets you defuel the maximum quantity of fuel in the tanks.

SUBTASK 28-26-00-210-014

WARNING DO NOT CONNECT A HEADSET AND DO NOT TOUCH CONNECTIONS TO THE AIRPLANE DURING ATMOSPHERIC ELECTRICAL ACTIVITY OR STRONG RADIATIVE FIELDS. LIGHTING STRIKE AND HIGH DISCHARGE CURRENTS CAN CAUSE SEVERE INJURY.

WARNING DO NOT OPERATE THE HF COMMUNICATION SYSTEM DURING FUELING OPERATIONS. A FIRE OR EXPLOSION CAN OCCUR.

WARNING DO NOT PUT GROUND EQUIPMENT BELOW THE WINGTIPS DURING THE FUELING OPERATION. THE WEIGHT OF THE FUEL CAN CAUSE THE WINGS TO MOVE DOWN AND THE WINGTIPS MOVE THE MOST. BECAUSE THE FUEL TANKS ARE VENTED THROUGH THE WINGTIPS, A DANGEROUS AND EXPLOSIVE MIXTURE AROUND THE WINGTIP CAN OCCUR.

CAUTION DO NOT REMOVE ELECTRICAL POWER DURING FUELING OPERATIONS. IF YOU REMOVE ELECTRICAL POWER WITH REFUEL VALVES OPEN, THE REFUEL VALVES WILL CLOSE AND CAN DAMAGE EQUIPMENT.

CAUTION DO NOT OPERATE THE HYDRAULIC SYSTEM IF THERE IS LESS THAN 5000 LB (2300 KG) IN THE LEFT MAIN FUEL TANK, AND 7000 LB (3200 KG) IN THE RIGHT MAIN FUEL TANK. THE HYDRAULIC SYSTEM CAN BECOME TOO HOT IF THE HEAT EXCHANGER IS NOT IN FUEL.

(2) Bond the airplane and the fueling truck to an approved ground (TASK 20-41-00-760-801).

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SUBTASK 28-26-00-210-015

WARNING ATTACH BONDING CABLES ONLY TO SPECIFIED POINTS ON THE AIRPLANE. INCORRECTLY ATTACHED BONDING CABLES CAN CAUSE SCRATCHES. THESE SCRATCHES CAN CAUSE CORROSION AND CRACKS ON STRESSED PARTS. BONDING CABLES ATTACHED TO COMPOSITE DOORS OR FAIRINGS DO NOT GIVE AN ELECTRICAL BOND.

(3) Bond the fueling truck to the airplane.

NOTE: Static grounding of the airplane by positive grounding means is recommended during overwing refueling or other fuel related activities. Electrical bonding between the airplane and the refueling source is also required.

SUBTASK 28-26-00-210-026

(4) Make sure that the FUEL JETTISON L(R) NOZZLE valve switch-lights, on the Fuel Jettison Panel (P5 Overhead Panel), are in the closed position.

SUBTASK 28-26-00-860-032

WARNING DO NOT OPERATE THE LEADING EDGE SLATS. ACCIDENTAL SLAT OPERATION COULD CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(5) Put a DO-NOT-OPERATE tag on the flap control lever, in the flight compartment (TASK 27-81-00-040-801).

SUBTASK 28-26-00-010-003

(6) Open these access doors:

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

(TASK 20-41-00-760-801)

SUBTASK 28-26-00-210-008

(7) Make sure the refueling panel light comes on.

NOTE: This shows there is 28V DC to the panel.

SUBTASK 28-26-00-860-065

WARNING MAKE SURE THAT THERE IS NO TENSION ON THE HOSE. THE HOSE MUST HANG FREELY FROM THE REFUEL ADAPTER, WITH NO FORCE ON IT. TENSION ON THE HOSE CAN CAUSE DAMAGE TO THE FUEL RECEPTACLE AND CAUSE THE HOSE TO DISCONNECT. INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

CAUTION MAKE SURE THAT THE HOSE NOZZLE AND HOSE-END CONTROL VALVE ARE IN THE CORRECT CONFIGURATION. REFER TO THE SUPPLIER'S MAINTENANCE MANUAL FOR PROCEDURES. IF YOU DO NOT, IT COULD CAUSE DAMAGE TO THE AIRPLANE.

(8) Connect the fueling nozzles to the refuel adapters.

(a) Make sure that the refuel adapter is clean, not damaged and there are no fuel leaks.

1) Make sure that the screws and lugs are not loose or damaged.

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(b) If there is a problem with the refuel adapter, replace the refuel adapter (TASK 28-21-01-000-801 and TASK 28-21-01-400-801).

(c) Connect the fueling nozzle to the refuel adapter.

SUBTASK 28-26-00-860-033

(9) Put the REFUEL/DEFUEL handle of the refuel adapters to the DEFUEL position, View C (Figure 201).

SUBTASK 28-26-00-860-017

(10) Set the power source at the battery power switch at the refueling control panel, P28.

SUBTASK 28-26-00-860-018

(11) Push the TEST IND switch to do a test of the fuel quantity displays and the blue valve position lights.

ARO 001-010

SUBTASK 28-26-00-210-021

(12) Make sure the correct test pattern (###.#) shows on the top and bottom displays for fuel quantity.

NOTE: A checker board pattern will show on the fuel quantity displays and the load select displays for 2 seconds, then the opposite pattern will show for 2 seconds, and then the displays will go off for 2 seconds. The test patterns will show one more time and then the displays will return to their usual condition.

ARO 011-999

SUBTASK 28-26-00-210-029

(13) Make sure that all LEDs show on the FUEL QTY displays and the LOAD SEL displays on the IRP.

NOTE: All LEDs will show on the FUEL QTY displays and the LOAD SEL displays for 2 seconds, then the dot matrix LEDs will go off for 4 seconds, and then come on for 2 seconds. Each time after the dot matrix LEDs go off, the LB/KG/RM/LM/CT/TF LEDs stay on for 2 seconds and then go off. After the test, the LEDs for each FUEL QTY display and LOAD SEL display will return to their usual condition.

ARO ALL

SUBTASK 28-26-00-860-048

(14) Make sure DEFUEL VALVE light comes on and then goes off.

SUBTASK 28-26-00-860-020

(15) Put the DEFUEL VALVE switch to the OPEN position.

SUBTASK 28-26-00-210-010

(16) Make sure the DEFUEL VALVE light comes on.

SUBTASK 28-26-00-860-034

(17) Push the applicable FWD and AFT CROSSFEED switchlights to the OPEN position, on the Overhead Panel (P5).

SUBTASK 28-26-00-650-003

(18) Start the fueling truck suction.

NOTE: This starts the suction defueling operation.

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SUBTASK 28-26-00-210-011

(19) Monitor the quantity of fuel in the fuel tanks on the fuel quantity displays of the fueling control panel, P28.

NOTE: Make sure the fuel loads are balanced. This will help defuel more fuel before a fuel suction inlet is uncovered and defueling stops.

SUBTASK 28-26-00-860-021

(20) Put the DEFUEL VALVE switch to the CLOSE position when:

(a) The necessary quantity of fuel is defueled

(b) The fuel quantity does not change.

NOTE: Defueling will stop when the inlet screen for one of the suction feed bypass inlets, in each main fuel tank, is not covered with fuel. Defueling will also stop if one of the center pump inlets is not covered with fuel. Air will enter the refuel/defuel system when an inlet is not covered. You can use the fuel sumps to remove fuel in the main fuel tanks. You can use the fuel sumps and remove a center pump motor/impeller to remove the fuel that remains in the center tank. A large quantity of fuel can be in the center tank.

SUBTASK 28-26-00-860-035

(21) Push the applicable FWD and AFT CROSSFEED switchlights to the OFF position, on the Overhead Panel (P5).

SUBTASK 28-26-00-650-004

(22) Stop the fueling truck suction.

SUBTASK 28-26-00-080-011

(23) Disconnect the fueling nozzles from the refuel adapters.

SUBTASK 28-26-00-860-022

(24) Put the DEFUEL/REFUEL handle, on the refuel adapters, to the refuel position.

SUBTASK 28-26-00-860-023

(25) If the battery power switch is in the BATT position, put the battery power switch to the NORMAL position.

SUBTASK 28-26-00-410-002

(26) Close these access doors:

Number	Name/Location
521DB	Refueling Station Door
621DB	Refueling Station Door

(TASK 20-41-00-760-801)

SUBTASK 28-26-00-650-006

(27) To remove fuel from the main fuel tank(s), do these steps:

(a) Do this task: Boost Pump Motor-Impeller - Removal, TASK 28-22-05-000-801.

(b) Install the fuel drain defueling fitting, SPL-1779, and tubing to siphon the fuel from the center fuel tank.

(c) Remove the fuel drain fitting when the fuel is removed.

(d) Do this task: Boost Pump Motor-Impeller - Installation, TASK 28-22-05-400-801.

(e) For the fuel that remains, do this task: Fuel Tank Sump Drain Valve - Tank Entry, TASK 12-11-02-650-801.

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SUBTASK 28-26-00-650-005

(28) To remove the fuel in the center fuel tank:

(a) Do this task: Override/Jettison Pump Motor-Impeller - Removal, TASK 28-22-06-000-801.

(b) Install the fuel drain defueling fitting, SPL-1779, and tubing to siphon the fuel from the center fuel tank.

(c) Remove the fuel drain fitting when the fuel is removed.

(d) Do this task: Override/Jettison Pump Motor-Impeller - Installation, TASK 28-22-06-400-801.

(e) For the fuel that remains, do this task: Fuel Tank Sump Drain Valve - Tank Entry, TASK 12-11-02-650-801.

SUBTASK 28-26-00-860-036

(29) Remove the DO-NOT-OPERATE tag from the flap control lever, in the flight compartment.

——— END OF TASK ———

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DEFUELING - ADJUSTMENT/TEST

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure contains an operational test of the defuel valve.

TASK 28-26-00-720-802

2. Operational Test - Defuel Valve

(Figure 501, Figure 502 and Figure 503)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
12-11-01-650-801	Pressure Refueling (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)

B. Access Panels

Number	Name/Location
521DB	Refueling Station Door

C. Prepare for the Test

SUBTASK 28-26-00-860-037

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-26-00-860-041

WARNING DO NOT OPERATE THE LEADING EDGE SLATS. ACCIDENTAL SLAT OPERATION COULD CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Put a DO-NOT-OPERATE tag on the flap control lever, in the flight compartment (TASK 27-81-00-040-801).

SUBTASK 28-26-00-010-004

(3) Open this access panel:

Number	Name/Location
521DB	Refueling Station Door

(TASK 06-44-00-800-802).

SUBTASK 28-26-00-650-007

(4) Make sure there is a minimum of 1000 LB (500 KG) in the right main fuel tank (TASK 12-11-01-650-801).

SUBTASK 28-26-00-860-047

(5) Make sure that this circuit breaker is closed:

Standby Power Management Panel, P310

Row	Col	Number	Name
J	10	C28637	DFUEL VLVS

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D. Procedure

SUBTASK 28-26-00-860-038

(1) Put the DEFUEL VALVE switch on the refueling control panel P28, to the OPEN position.

SUBTASK 28-26-00-210-016

(2) Make sure the manual override handle on the defuel valve actuator moves to the OPEN position.

NOTE: Access to the right defueling valve actuator is through the right shock strut door for the main landing gear.

SUBTASK 28-26-00-210-017

(3) Make sure the DEFUEL VALVE light on the P28 panel comes on.

SUBTASK 28-26-00-860-039

(4) Put the DEFUEL VALVE switch to the CLOSE position.

SUBTASK 28-26-00-210-018

(5) Make sure the DEFUEL VALVE light goes off.

SUBTASK 28-26-00-210-019

(6) Make sure the manual override handle on the right defueling valve actuator moves to the CLOSED position.

NOTE: Access to the right defueling valve actuator is through the right shock strut door for the main landing gear.

SUBTASK 28-26-00-860-042

(7) Put the REFUEL VALVE control switch, for the center tank, to the OPEN position.

SUBTASK 28-26-00-860-043

(8) Put the FWD PUMP switch for the right main tank, on the overhead panel P5, to the ON position (Figure 503).

SUBTASK 28-26-00-210-020

(9) Make sure the fuel quantity for the center fuel tank does not increase.

NOTE: Wait 2 minutes to see if the fuel quantity increases. This step makes sure the defuel valve is closed.

SUBTASK 28-26-00-860-044

(10) Put the FWD PUMP switch for the right main tank, on the overhead panel P5, to the OFF position.

SUBTASK 28-26-00-860-045

(11) Put the REFUEL VALVE control switch, for the center tank, to the CLOSED position.

SUBTASK 28-26-00-410-004

(12) Close this access panel:

Number	Name/Location
521DB	Refueling Station Door

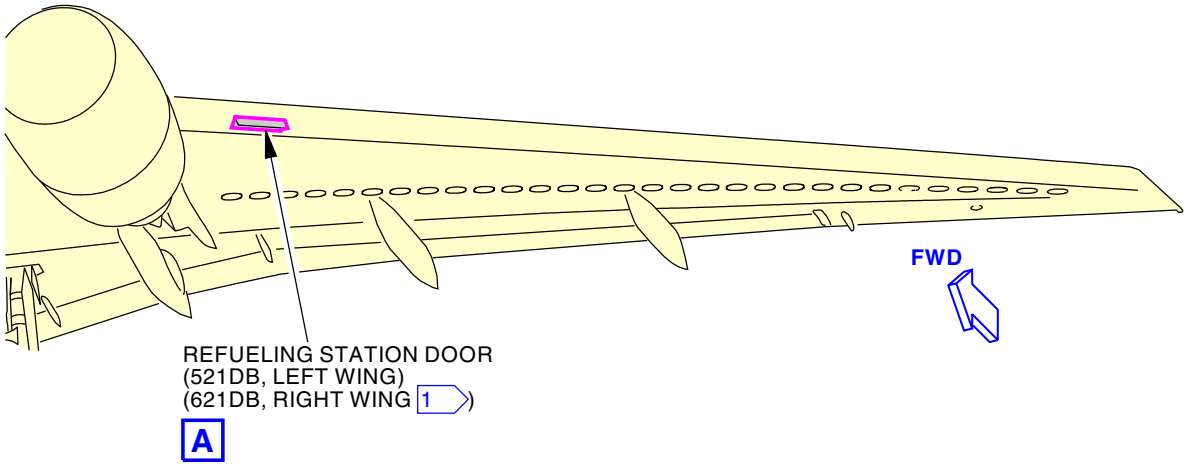
(TASK 06-44-00-800-802).

SUBTASK 28-26-00-860-046

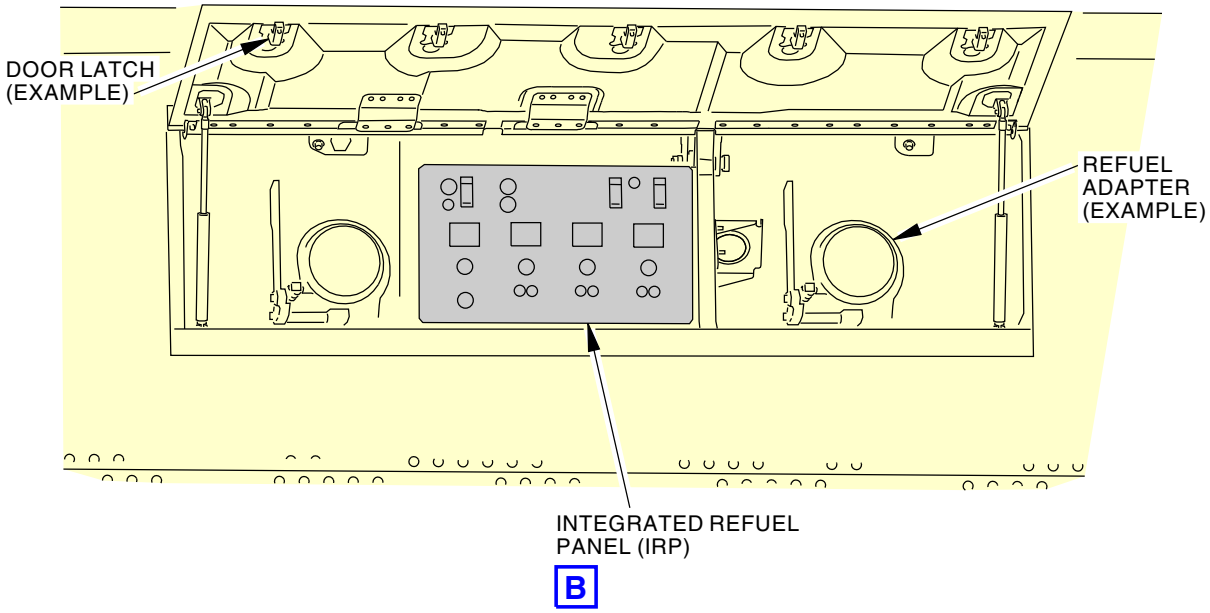
(13) Remove the DO-NOT-OPERATE tag from the flap control lever, in the flight compartment.

END OF TASK

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LEFT WING



REFUELING STATION DOOR

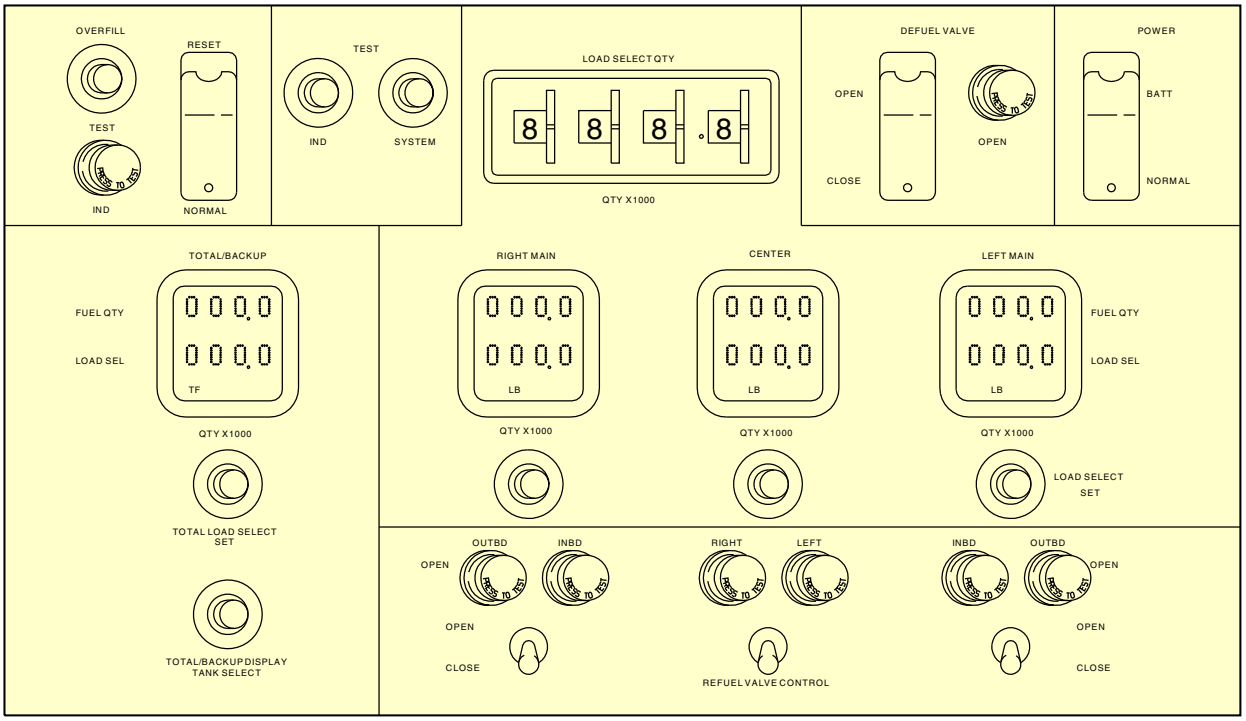
A

1 IF INSTALLED

D05479 S0006415448_V3

Defueling System - System Test
Figure 501/28-26-00-990-802 (Sheet 1 of 2)

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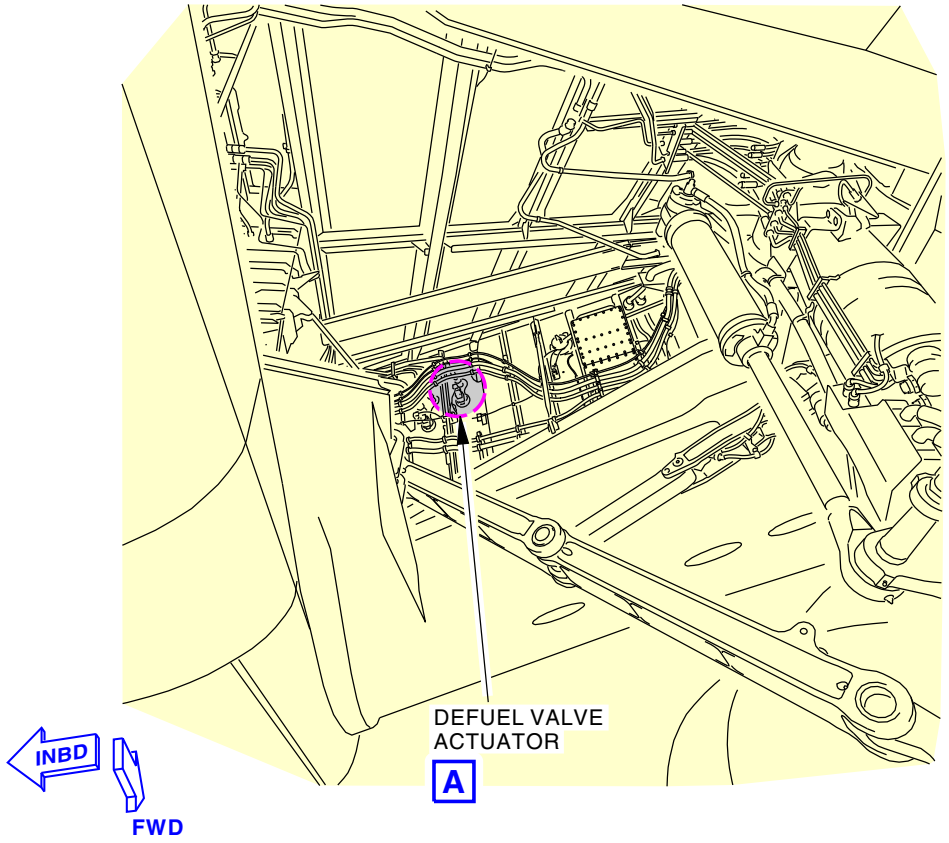
INTEGRATED REFUEL PANEL (IRP), P28

B

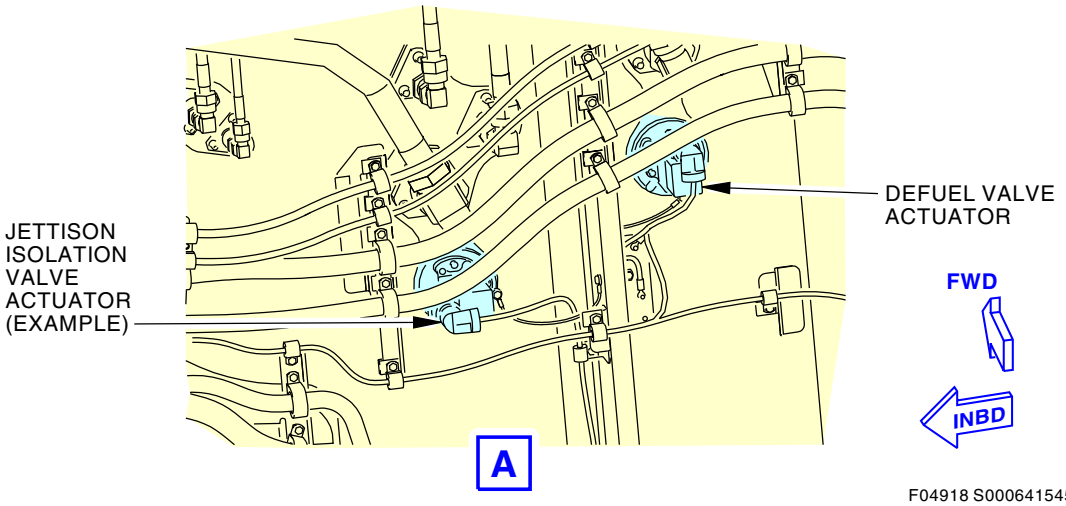
D05483 S0006415449_V3

Defueling System - System Test
Figure 501/28-26-00-990-802 (Sheet 2 of 2)

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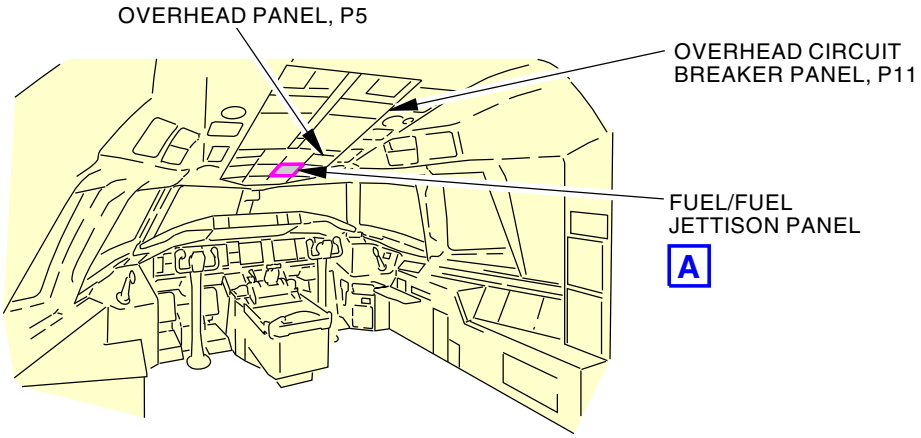
RIGHT MAIN WHEEL WELL



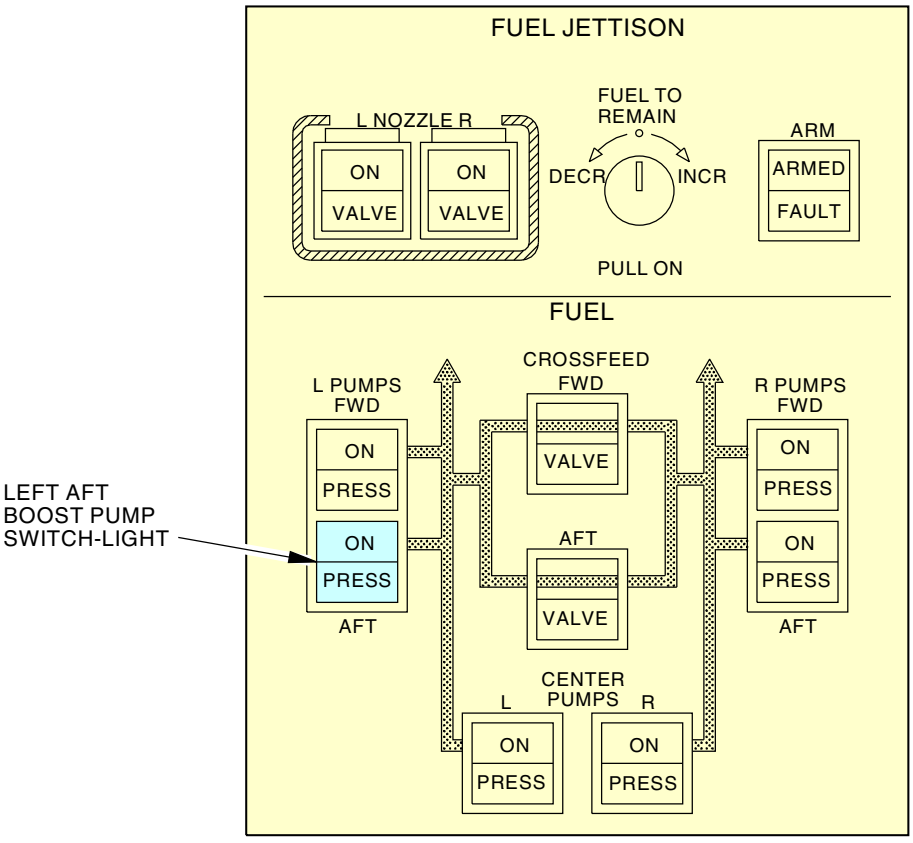
F04918 S0006415450_V2

Defuel Valve Actuator Installation
Figure 502/28-26-00-990-803

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FLIGHT COMPARTMENT



FUEL/FUEL JETTISON PANEL

A

D05497 S0006415451_V3

Fuel Pump Control
Figure 503/28-26-00-990-804

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DEFUEL VALVE - REMOVAL/INSTALLATION

1. General

A. A defuel valve actuator is found on the rear spar in the right center fuel tank. The defuel valve contains three parts: the adapter/shaft, the valve body and the actuator. The adapter/shaft connects the valve body to the actuator. The actuator is installed out of the fuel tank on the rear spar.

B. This procedure contains these tasks:

(1) Removal of the adapter/shaft of the defuel valve.

(2) Installation of the adapter/shaft of the defuel valve.

(3) Removal of the valve body for the defuel valve.

(4) Installation of the valve body for the defuel valve.

(5) Rework the electrical faying surface bonds for the defuel valve.

(6) Adapter/Shaft alignment

C. The procedure to remove and install the defuel valve actuator is in (TASK 28-26-01-000-801).

TASK 28-26-01-000-801

2. Defuel Valve (Valve Body) - Removal

(Figure 401)

A. References

Reference	Title
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-22-15-000-802-001	Fuel Line, Fitting and Coupling - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

C. Access Panels

Number	Name/Location
631AB	Access Door

D. Procedure

SUBTASK 28-26-01-860-001

(1) Open this circuit breaker and install safety tag:

Standby Power Management Panel, P310

Row	Col	Number	Name
J	10	C28637	DFUEL VLVS

SUBTASK 28-26-01-650-001

(2) Defuel all of the fuel tanks (TASK 28-26-00-650-801).

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SUBTASK 28-26-01-940-004

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(3) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-26-01-010-001

(4) Remove this access door:

Number	Name/Location
631AB	Access Door

(TASK 28-11-02-000-801).

SUBTASK 28-26-01-940-005

(5) Go into the right center fuel tank to get access to the valve body [1] (TASK 28-11-00-010-801).

SUBTASK 28-26-01-020-012

(6) Disconnect the flexible coupling [5] from each side of the valve body [1] (TASK 28-22-15-000-802-001).

(a) Remove the lockwire.

(b) Discard the o-rings [6].

SUBTASK 28-26-01-020-013

(7) Hold the valve body [1] and remove the bolts [3] and washers [4] that attach the valve body [1] to the support bracket.

SUBTASK 28-26-01-020-001

(8) Disengage the valve body [1] from the adapter/shaft [2].

SUBTASK 28-26-01-020-002

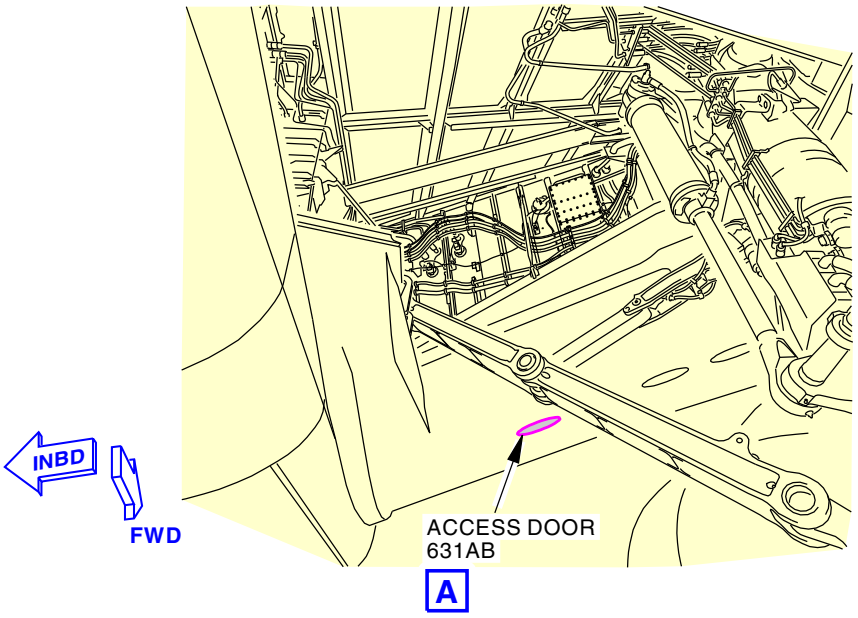
(9) Remove the valve body [1].

SUBTASK 28-26-01-480-003

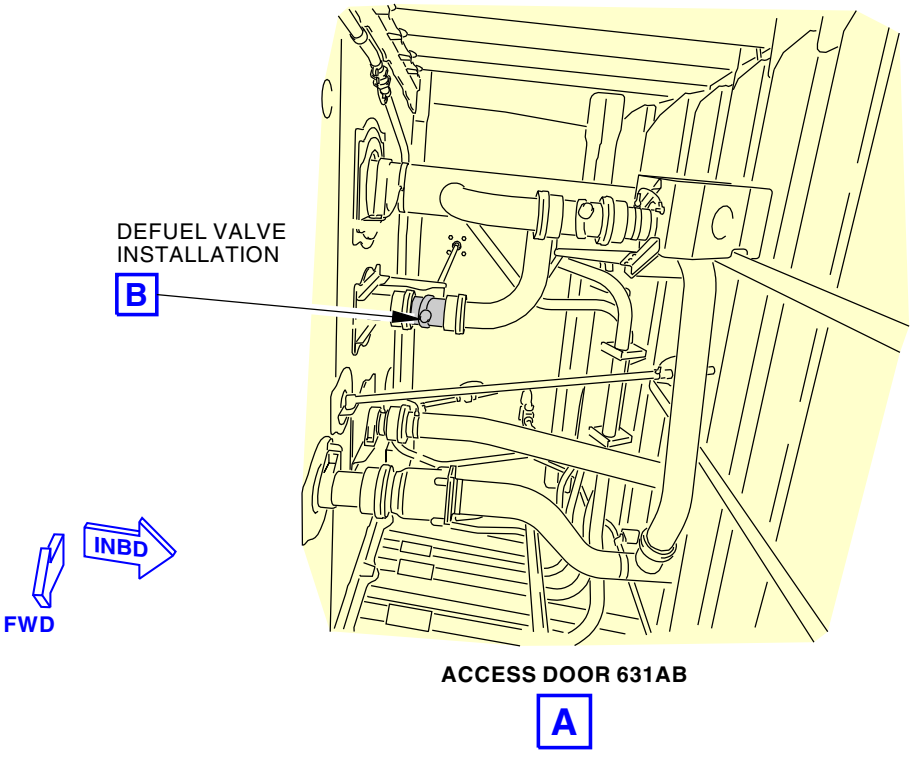
(10) Install protection covers to the fuel lines to keep unwanted materials out.

——— END OF TASK ———

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RIGHT MAIN WHEEL WELL

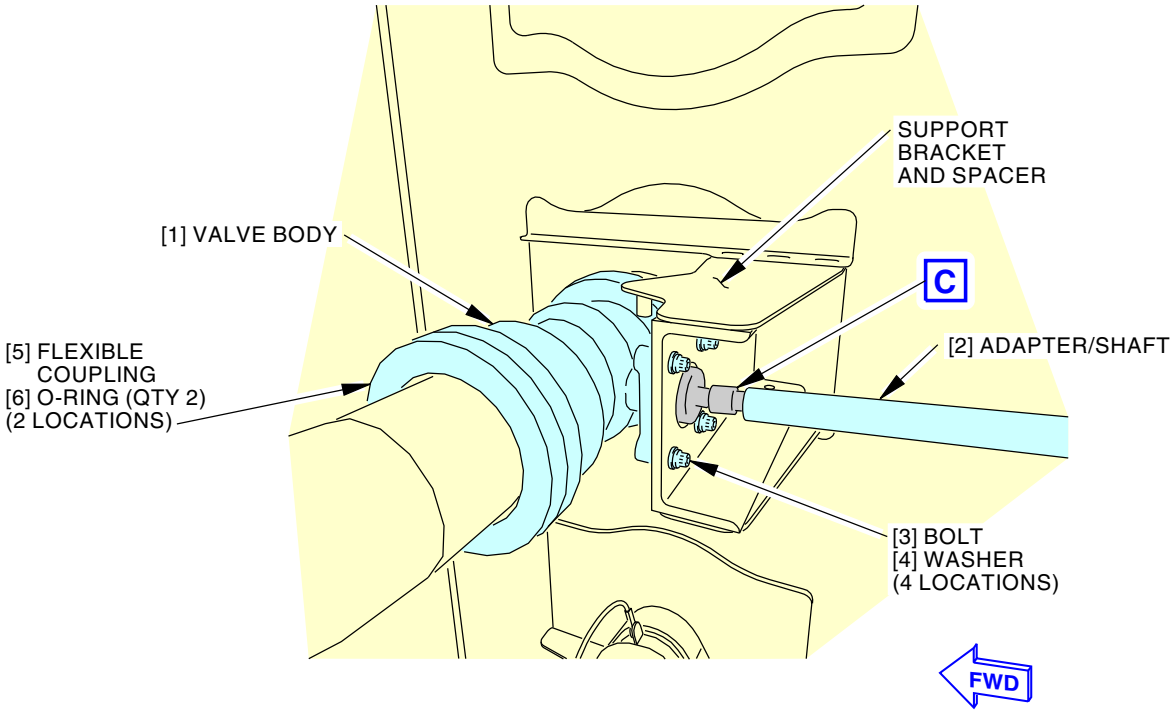


ACCESS DOOR 631AB

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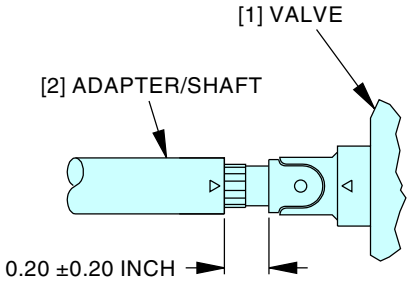
Defuel Valve Installation
Figure 401/28-26-01-990-801 (Sheet 1 of 2)

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DEFUEL VALVE INSTALLATION

B



C

D07398 S0006415456_V3

Defuel Valve Installation
Figure 401/28-26-01-990-801 (Sheet 2 of 2)

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TASK 28-26-01-400-801

3. Defuel Valve (Valve Body) - Installation

(Figure 401)

A. References

Reference	Title
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)
28-22-15-400-802-001	Fuel Line, Fitting and Coupling - Installation (P/B 401)
28-26-00-720-802	Operational Test - Defuel Valve (P/B 501)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Consumable Materials

Reference	Description	Specification
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Valve body	28-26-01-01-015	ARO ALL
6	O-ring	28-22-51-15D-390	ARO ALL

E. Location Zones

Zone	Area
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

F. Access Panels

Number	Name/Location
631AB	Access Door

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G. Procedure

SUBTASK 28-26-01-860-006

(1) Make sure that this circuit breaker is open and has safety tag:

Standby Power Management Panel, P310

Row	Col	Number	Name
J	10	C28637	DFUEL VLVS

SUBTASK 28-26-01-940-006

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-26-01-940-001

(3) Go into the right center fuel tank (TASK 28-11-00-010-801).

SUBTASK 28-26-01-110-002

(4) Do these steps to prepare the valve body [1] and the support bracket for a faying surface bond:

WARNING DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(a) Final clean the contact surfaces of the valve body [1] and the support bracket with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

(b) Rub dry with a clean, dry cotton wiper, G00034.

(c) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

SUBTASK 28-26-01-080-003

(5) Remove the protection covers from the fuel lines.

SUBTASK 28-26-01-820-001

(6) Align the index marks on the valve body [1] and the adapter/shaft [2].

SUBTASK 28-26-01-210-001

CAUTION DO NOT REMOVE THE SUPPORT BRACKET SPACER OR DEFLECT THE SUPPORT BRACKET TO INSTALL THE DEFUEL VALVE BODY. THE DEFUEL VALVE BODY MUST BE INSTALLED CORRECTLY OR DAMAGE TO EQUIPMENT CAN OCCUR.

(7) Make sure "TOP" shows on the top of the valve body [1].

SUBTASK 28-26-01-420-001

(8) Engage the valve body [1] and the adapter/shaft [2].

SUBTASK 28-26-01-820-002

(9) Align the valve body [1] with the support bracket holes.

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SUBTASK 28-26-01-420-014

(10) Install the four bolts [3] and washers [4] through the support bracket.

SUBTASK 28-26-01-211-001

(11) Make sure the gap between the adapter/shaft [2] and the valve body spline is 0.20 ±0.20 in. (5.08 ±5.08 mm) (Figure 401, View C).

NOTE: If you cannot get the correct gap, loosen the support bracket for the valve body [1] and adjust its position to get the correct gap.

SUBTASK 28-26-01-760-001

(12) Measure the electrical bonding resistance between the valve body [1] and the support bracket with an intrinsically safe approved bonding meter, COM-1550.

(a) Make sure the resistance is less than 0.0005 ohm (0.5 milliohm).

SUBTASK 28-26-01-760-002

(13) Measure the electrical bonding resistance between the valve body [1] and the airplane structure with an intrinsically safe approved bonding meter, COM-1550.

(a) Make sure the resistance is less than 0.010 ohm (10 milliohms).

SUBTASK 28-26-01-420-015

(14) Apply a thin layer of petrolatum grease, D00504, to the new o-rings [6].

(a) Install the o-rings [6] onto the fuel line.

SUBTASK 28-26-01-420-029

(15) Connect the flexible couplings [5] that attach the valve body [1] to the fuel line (TASK 28-22-15-400-802-001).

(a) Install lockwire to the coupling [5].

SUBTASK 28-26-01-410-001

(16) In the right center tank, install the access door (TASK 28-11-02-400-801).

(a) Install this access door:

Number	Name/Location
631AB	Access Door

SUBTASK 28-26-01-860-002

(17) Remove the safety tag and close this circuit breaker:

Standby Power Management Panel, P310

Row	Col	Number	Name
J	10	C28637	DFUEL VLVS

SUBTASK 28-26-01-700-002

(18) Do this task: Operational Test - Defuel Valve, TASK 28-26-00-720-802.

——— END OF TASK ———

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS

TASK 28-26-01-000-803

4. Defuel Valve (Adapter/Shaft) - Removal

(Figure 402)

A. References

Reference	Title
24-22-00-860-806	Remove Electrical Power (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-26-02-000-802	Defuel Valve (Actuator) - Removal (P/B 401)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: $0855 Part #: 234350 Supplier: $0857 Part #: 311 Supplier: F6892 Part #: 411B60 Supplier: 3DN12 Part #: 411B90 Supplier: 3DN12 Part #: DAD5013 Supplier: $0856 Part #: DFD5019 Supplier: $0856 Part #: J5-0275-2010 Supplier: 435R8 Part #: SCD5019 Supplier: $0856 Part #: ST982LF-9 Supplier: 62176 Part #: TS1275-4 Supplier: 1DWR5
COM-4746	Handle - Sealant Removal Tool Part #: 310/1 Supplier: F6892 Part #: SHN0272 Supplier: $0856 Part #: SHR0272-T Supplier: 1DWR5 Part #: SHW0215 Supplier: $0856

C. Location Zones

Zone	Area
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

D. Access Panels

Number	Name/Location
631AB	Access Door

E. Procedure

SUBTASK 28-26-01-650-005

(1) Defuel all of the fuel tanks (TASK 28-26-00-650-801).

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SUBTASK 28-26-01-650-006

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-26-01-650-007

(3) Drain and purge the right center fuel tank (TASK 28-11-00-010-801).

SUBTASK 28-26-01-860-008

(4) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

SUBTASK 28-26-01-010-005

(5) Remove this access door:

Number	Name/Location
631AB	Access Door

(TASK 28-11-02-000-801)

SUBTASK 28-26-01-010-006

(6) Do these steps on the outside of the fuel tank:

(a) To remove the defuel valve actuator, do this task: Defuel Valve (Actuator) - Removal, TASK 28-26-02-000-802.

(b) Use a sealant removal tool, COM-2481, and sealant removal tool handle, COM-4746, or equivalent, to remove the old sealant from the periphery of the adapter plate.

SUBTASK 28-26-01-010-007

(7) Do these steps inside the right center fuel tank:

(a) Go to the adapter/shaft [2] location inside the fuel tank.

(b) Remove the old sealant from the four bolts [9] and the adapter/shaft [2] rear spar penetration.

(c) Remove the bolts [9] and washers [8] (four locations) to disconnect the adapter/shaft [2].

(d) Disengage the adapter/shaft [2] from the valve body [1].

SUBTASK 28-26-01-020-019

(8) Go out of the tank and remove the adapter/shaft [2].

(a) Discard the o-ring [7].

F. Remove the Index Plate

NOTE: Do these steps if you will reuse the adapter/shaft and the attached index plate or if you need to remove the index plate to align the valve body. If the task is to discard the old adapter/shaft and install a new adapter/shaft, it is not necessary to disassemble the index plate.

SUBTASK 28-26-01-030-001

(1) Do these steps to remove the index plate [11] from the adapter/shaft [2]:

(a) Remove the lockwire from the two screws [10] and screw [20].

(b) Remove screw [20], screws [10] and washers [21].

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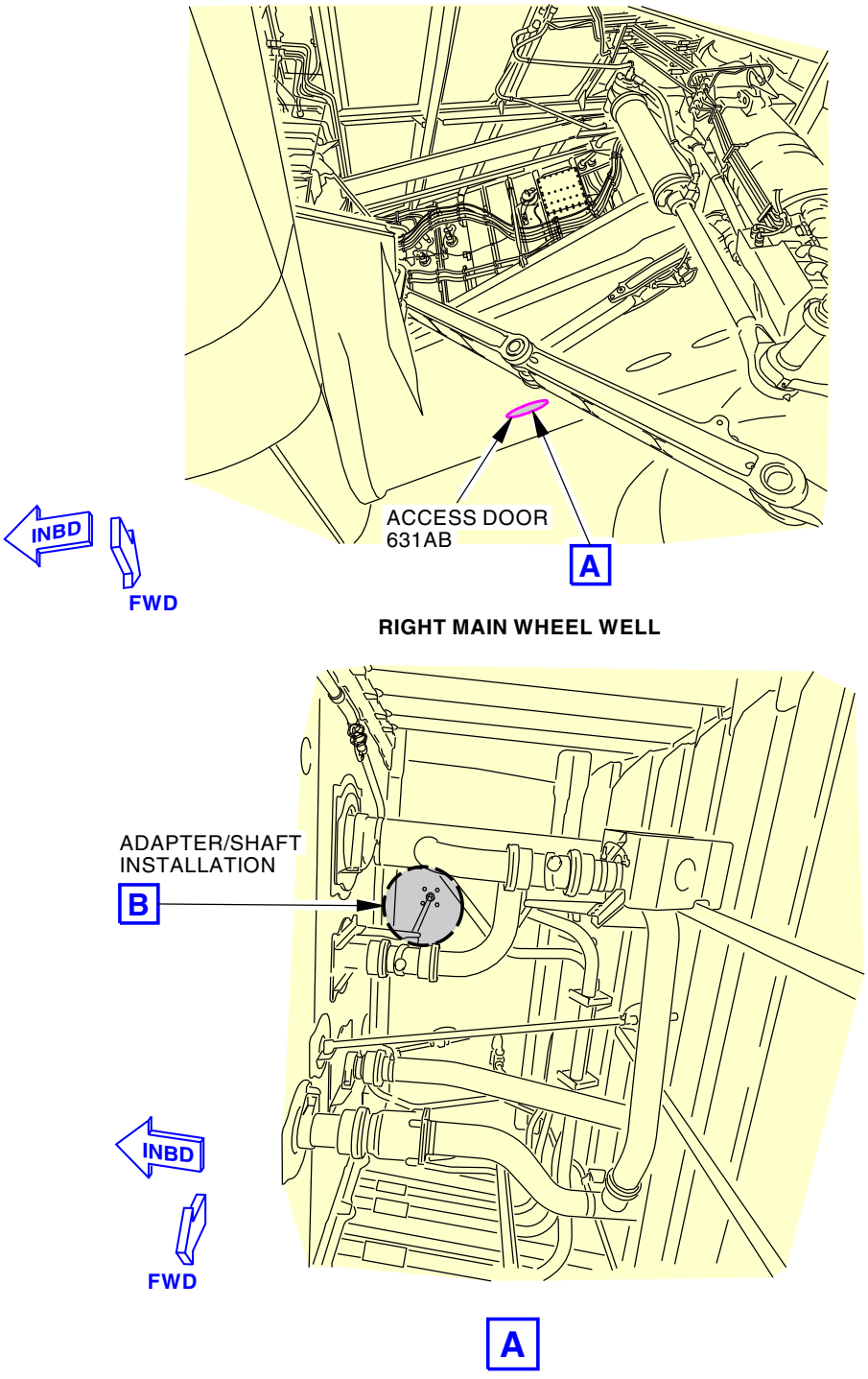
ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

(c) Carefully disassemble the index plate [11] and the adapter/shaft [2].

NOTE: The two surfaces are bonded with faying surface sealant.

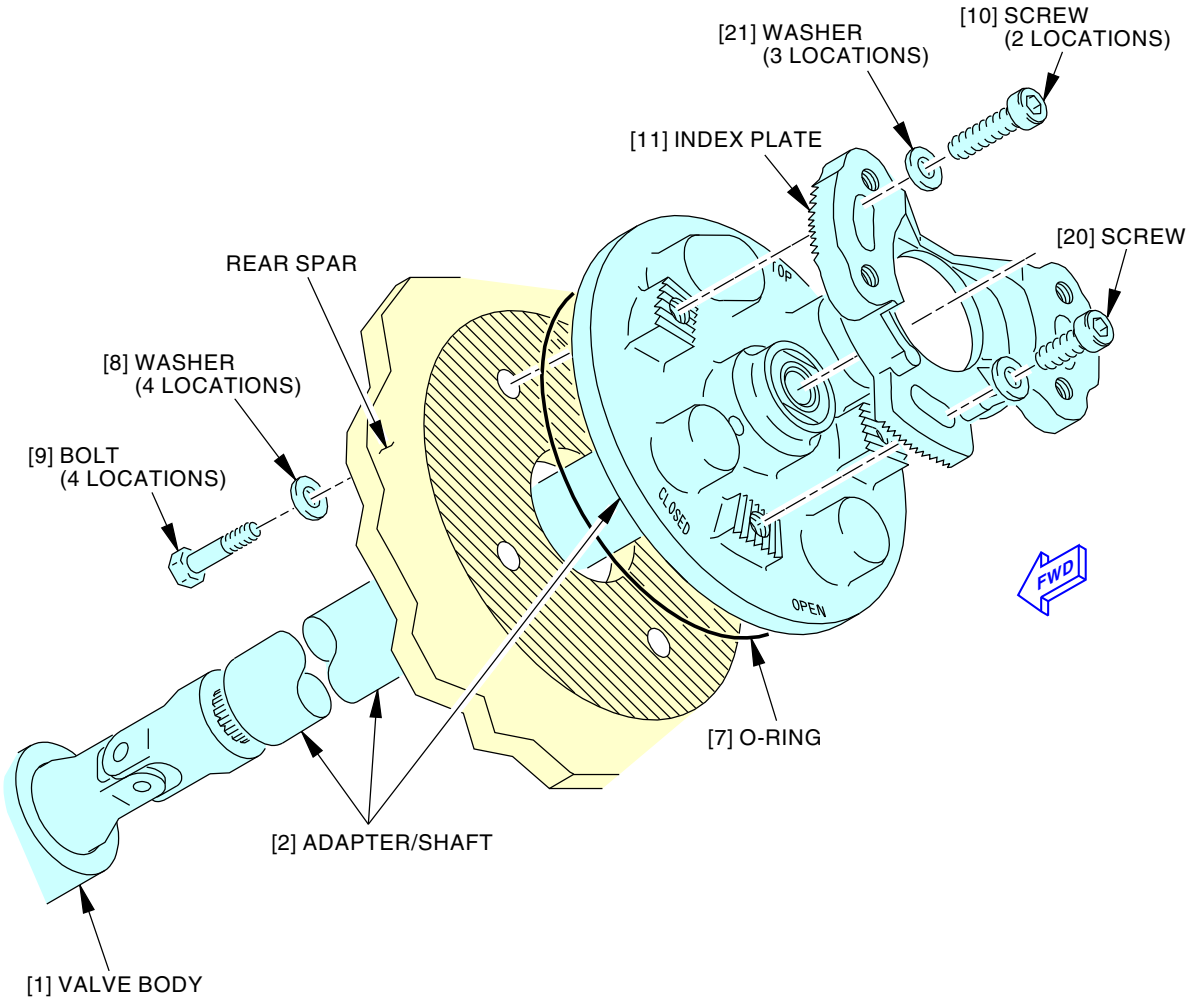
——— END OF TASK ———

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Defuel Valve Adapter Shaft Installation
Figure 402/28-26-01-990-804 (Sheet 1 of 2)

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**ADAPTER/SHAFT INSTALLATION
(EXAMPLE)**

B

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**Defuel Valve Adapter Shaft Installation
Figure 402/28-26-01-990-804 (Sheet 2 of 2)**

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TASK 28-26-01-400-803

5. Defuel Valve (Adapter/Shaft) - Installation

(Figure 402)

A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(2) Two mechanics are necessary for this task.

NOTE: To engage splines of the adapter/shaft [2] to the valve body [1], one person must be outside the tank and one person must be inside the tank.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
20-30-92-910-801	Final Cleaning Prior to General Sealing (Series 92) (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)
28-26-00-720-802	Operational Test - Defuel Valve (P/B 501)
28-26-02-400-802	Defuel Valve (Actuator) - Installation (P/B 401)
51-31-01-390-804	Fillet Seal Application (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

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(Continued)

Reference	Description
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: $0855 Part #: 234350 Supplier: $0857 Part #: 311 Supplier: F6892 Part #: 411B60 Supplier: 3DN12 Part #: 411B90 Supplier: 3DN12 Part #: DAD5013 Supplier: $0856 Part #: DFD5019 Supplier: $0856 Part #: J5-0275-2010 Supplier: 435R8 Part #: SCD5019 Supplier: $0856 Part #: ST982LF-9 Supplier: 62176 Part #: TS1275-4 Supplier: 1DWR5
COM-4746	Handle - Sealant Removal Tool Part #: 310/1 Supplier: F6892 Part #: SHN0272 Supplier: $0856 Part #: SHR0272-T Supplier: 1DWR5 Part #: SHW0215 Supplier: $0856
STD-123	Brush - Soft Bristle

D. Consumable Materials

Reference	Description	Specification
A50110	Sealant	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
B01012	Solvent - Final Cleaning Prior To General Sealing - Series 92	
C00064	Coating - Aluminum Chemical Conversion	BAC5719 Type II Class A (MIL-DTL-5541 Class 1A)
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20 Type II
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Location Zones

Zone	Area
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

F. Access Panels

Number	Name/Location
631AB	Access Door

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G. Install the Adapter/Shaft

SUBTASK 28-26-01-860-009

(1) Make sure that this circuit breaker is open and has safety tag:

Standby Power Management Panel, P310

Row	Col	Number	Name
J	10	C28637	DFUEL VLVS

SUBTASK 28-26-01-860-010

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Obey the fuel tank entry precautions (TASK 28-11-00-650-801).

SUBTASK 28-26-01-010-008

WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(3) Go into the right center fuel tank to the defuel valve location (TASK 28-11-00-010-801).

NOTE: One person must enter the tank and another must remain outside the tank at the rear spar.

SUBTASK 28-26-01-120-001

(4) On the outside of the tank, remove the old sealant and clean the rear spar, adapter/shaft [2], index plate [11], and fasteners (if re-used).

(a) Use a sealant removal tool, COM-2481, and sealant removal tool handle, COM-4746 (or equivalent), to remove the old sealant from the rear spar.

(b) If new parts are to be installed, use an abrasive pad to remove the anodized finish from the fay surfaces of the adapter/shaft [2] and index plate [11] (SWPM 20-20-00).

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(c) To remove the remaining sealant, grease, oil, dirt, and other contamination from the components, use one of these brushes/pads soaked with Series 92 solvent, B01012 (TASK 20-30-92-910-801):

1) soft bristle brush, STD-123

2) cotton wiper, G00034

SUBTASK 28-26-01-110-001

(5) On the outside of the tank, do these steps to prepare the adapter/shaft [2] and the rear spar for a fay sealed fay surface bond:

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(a) Final clean the contact surfaces of the adapter/shaft [2] and the rear spar with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

SUBTASK 28-26-01-430-001

(6) On the outside of the airplane fuel tank, do these steps:

(a) Put a thin layer of petrolatum grease, D00504, on the new o-ring [7].

(b) Put the o-ring [7] in the o-ring groove of the adapter/shaft [2].

(c) Put the shaft portion of the adapter/shaft [2] through the hole in the rear spar.

(d) Make sure the shoulder of the adapter/shaft [2] does not bind in the opening of the rear spar.

SUBTASK 28-26-01-210-008

(7) On the inside of the tank, do these steps:

(a) Make sure that the index marks on the valve body [1] and adapter/shaft [2] are aligned (Figure 401, View C).

NOTE: A small misalignment of the index marks is satisfactory.

SUBTASK 28-26-01-420-030

(8) Do these steps at the same time:

NOTE: The person on the inside of the tank should engage the splines as the person on the outside of the tank applies the fay sealed fay surface bond.

28-AWL-19: CDCCL

(a) On the outside of the tank, apply a fay sealed fay surface bond between the adapter/shaft [2] (valve adapter plate) and the spar (structure) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Apply a thin continuous layer of sealant, A50110, or sealant, A50155, to the mating surface of the adapter plate.

a) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

2) Make sure the sealant is continuously squeezed out along the edges of the contact surfaces.

3) If there are gaps, bubbles or voids in the sealant squeeze out, then disassemble and apply more sealant.

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4) Shape the squeezed out sealant into a fillet seal.

5) As an option, remove the extra squeezed out sealant.

NOTE: Make sure the sealant that remains is flush with the mating part edges.

(b) On the inside of the tank, engage the splines of the adapter/shaft [2] with the valve body [1].

1) Make sure the shoulder of the adapter/shaft [2] does not bind in the opening of the rear spar.

SUBTASK 28-26-01-420-031

(9) On the outside of the tank, hold the adapter/shaft [2] in the correct position.

SUBTASK 28-26-01-420-021

(10) Do these steps to install the adapter/shaft [2]:

(a) Apply sealant to the shank and the threads of the four bolts [9].

1) Use sealant, A50110, or sealant, A50155, for the wet installation of the bolts [9].

NOTE: Use the same sealant that was used for the electrical fay surface seal.

2) Make sure the sealant applied to the fasteners is approximately 0.060 in. (1.524 mm) thick.

(b) Install the bolts [9] and washers [8] to attach the adapter/shaft [2] to the spar.

(c) Make sure the gap between the adapter/shaft [2] and the valve body spline is 0.20 ±0.20 in. (5.08 ±5.08 mm) (Figure 401, View C).

NOTE: If you can not get the correct gap, loosen the support bracket for the valve body [1] and adjust its position to get the correct gap.

SUBTASK 28-26-01-765-001

28-AWL-19: CDCCL

(11) On the outside of the fuel tank, measure the electrical bonding resistance between one of the raised surfaces of the adapter/shaft [2] (valve adapter plate) (bare metal surface) and the rear spar (structure) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

28-AWL-19: CDCCL

(a) Make sure one or both ends of the bonding jumper that attaches to the actuator is disconnected.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(b) Use an intrinsically safe approved bonding meter, COM-1550.

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28-AWL-19: CDCCL

(c) Make sure the electrical bonding resistance is 0.0005 ohm (0.5 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) If the electrical bonding resistance is more than 0.0005 ohm (0.5 milliohm), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Defuel Valve, TASK 28-26-01-300-801.

SUBTASK 28-26-01-420-022

(12) Use sealant, A50110, or sealant, A50155, to apply these seals:

NOTE: Use the same sealant that was used for the fay sealed fay surface bond.

(a) On the inside of the tank, apply a fillet seal to the periphery of the rear spar penetration and the stationary part of the adapter/shaft [2] ((TASK 51-31-01-390-804)).

NOTE: Make sure the sealant does not touch any part of the adapter/shaft [2] that turns.

28-AWL-19: CDCCL

(b) On the inside of the tank, apply a cap seal to each of the four bolts [9] (adapter plate attach bolts).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

SUBTASK 28-26-01-860-011

(13) Do this task to close the right center fuel tank: Center Tank Access Door - Installation, TASK 28-11-02-400-801.

(a) Install this access door:

Number	Name/Location
631AB	Access Door

SUBTASK 28-26-01-820-008

(14) Do this task: Adapter Shaft Alignment, TASK 28-26-01-820-801.

H. Install the Index Plate

SUBTASK 28-26-01-820-009

(1) Do this procedure after you have correctly aligned and marked the alignment position of the index plate and adapter plate per this task: Adapter Shaft Alignment, TASK 28-26-01-820-801.

SUBTASK 28-26-01-020-020

(2) Remove the index plate [11] from the adapter/shaft [2].

SUBTASK 28-26-01-420-024

(3) Do these steps to prepare the index plate [11] and the adapter/shaft [2] for a fay sealed fay surface bond (SWPM 20-20-00):

(a) Protect the alignment reference mark when you clean the index plate [11] and the adapter/shaft [2] for the fay sealed fay surface bond.

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(b) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-19: CDCCL

(c) Apply a thin continuous layer of sealant between the surfaces of the index plate [11] (three locations) and the adapter/shaft [2] (valve adapter plate) for a fay sealed fay surface bond (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the fay surface fay seal.

NOTE: Alternative sealants are not acceptable for fay sealed fay surface bonds.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(d) Apply sealant to the shank and the threads of the top two screws [10] and the bottom screw [20].

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the wet installation of screws [10] and screw [20].

NOTE: Use the same sealant that was used for the fay sealed fay surface seal bond.

2) Make sure the sealant applied to the fasteners is approximately 0.060 in. (1.524 mm) thick.

SUBTASK 28-26-01-420-025

(4) Do these steps to install the index plate [11]:

(a) Align the index plate [11] and the adapter/shaft [2] with the alignment reference mark that you made during the spar valve alignment procedure.

(b) Install the two screws [10] and washers [21] in the top index mounting hole positions.

(c) Install the screw [20] and washer [21] in the bottom index mounting hole position.

(d) Tighten the screws [10] and screw [20] to 22 ±1 in-lb (2.5 ±0.1 N·m).

(e) Make sure the sealant is continuously squeezed out along the edges of the contact surfaces.

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(f) If there are gaps, bubbles or voids in the sealant squeeze out, then disassemble and apply more sealant.

(g) Shape the squeezed out sealant into a fillet seal (TASK 51-31-01-390-804).

(h) As an option, remove the extra squeezed out sealant.

NOTE: Make sure the sealant that remains is flush with the mating part edges.

SUBTASK 28-26-01-765-002

(5) Measure the electrical bonding resistance between one of the actuator attachment contact surfaces on the index plate [11] (bare metal surface) and the rear spar (SWPM 20-20-00).

(a) Use an intrinsically safe approved bonding meter, COM-1550.

(b) Make sure the electrical bonding resistance is 0.0020 ohm (2.0 milliohms) or less.

1) If the electrical bonding resistance is more than 0.0020 ohm (2.0 milliohms), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Defuel Valve, TASK 28-26-01-300-801.

SUBTASK 28-26-01-760-003

28-AWL-19: CDCCL

(6) Measure the electrical bonding resistance between the index plate [11] and the adapter/shaft [2] (valve adapter plate) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

28-AWL-19: CDCCL

(a) Make sure one or both ends of the bonding jumper that attaches to the actuator is disconnected.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(b) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-19: CDCCL

(c) Make sure the electrical bonding resistance is 0.0005 ohm (0.5 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) If the electrical bonding resistance is more than 0.0005 ohm (0.5 milliohm), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Defuel Valve, TASK 28-26-01-300-801.

SUBTASK 28-26-01-420-026

(7) Lockwire the top screws [10], the bottom screw [20] and the index plate [11] together.

SUBTASK 28-26-01-790-002

(8) Do this task: Defuel Valve (Actuator) - Installation, TASK 28-26-02-400-802.

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

SUBTASK 28-26-01-370-001

(9) Do this task to apply protective finishes to the bare areas of the rear spar: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

NOTE: Re-apply the protective finishes to the rear spar at all bare areas not covered by the fillet seal, and where the electrical bonding probe removed the finishes.

(a) These are the protective finishes:

1) Alodine 600 coating, C00064

2) BMS 10-20 coating, C00307.

I. Defuel Valve Test

SUBTASK 28-26-01-710-002

(1) To do a test of the defuel valve, do this task: Operational Test - Defuel Valve, TASK 28-26-00-720-802.

J. Put the Airplane Back to its Usual Condition

SUBTASK 28-26-01-650-008

(1) To refuel the airplane (if it is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

SUBTASK 28-26-01-790-003

(2) Make sure there is no leakage at the rear spar connection.

ARO ALL

——— END OF TASK ———

TASK 28-26-01-820-801

6. Adapter Shaft Alignment

(Figure 403)

A. References

Reference	Title
28-26-02-000-802	Defuel Valve (Actuator) - Removal (P/B 401)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1587	Wrench - Torque, 30 in-lbs (4 N-m) Part #: TE3FUA Supplier: 55719
SPL-1771	Alignment Equipment, Fuel Shutoff Valve Part #: B28009-1 Supplier: 81205

C. Location Zones

Zone	Area
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

D. Procedure

SUBTASK 28-26-01-010-004

(1) Prepare the adapter/shaft for the alignment procedure.

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(a) If it is not removed, do this task: Defuel Valve (Actuator) - Removal, TASK 28-26-02-000-802.

(b) If not previously removed, remove the index plate [11] from the adapter/shaft.

SUBTASK 28-26-01-480-002

(2) Do these steps to install the valve alignment equipment, SPL-1771, in the index plate [11].

(a) Put the index plate [11] in position and align the surfaces of the index plate [11] and adapter plate.

(b) Loosely install the bottom screw [20] to the index plate [11].

(c) Put the alignment tool in position against the index plate [11] with the two guide pins in the holes usually used by the top two screws [10] (the scale should be on the top of the tool).

(d) Make sure the spline on the tool engages with the spline on the shaft.

SUBTASK 28-26-01-820-003

(3) Do these steps to align the adapter shaft (Procedure 1, optional to Procedure 2):

NOTE: This procedure finds the point where the internal valve butterfly engages the valve seal. The torque necessary to turn the shaft increases as the butterfly engages the seal, then decreases again as the butterfly leaves the other side of the seal. Once the edge of the seal is found, the valve shaft will then be turned to center the butterfly on the seal.

(a) Put the tool handle in the extreme counterclockwise position.

(b) Turn the handle slowly in the clockwise direction at a constant rate while you note the changes in the torque necessary to turn the handle.

(c) Do the previous steps as many times as necessary to find the point in the rotation where the torque necessary to turn the handle increases significantly.

(d) If you cannot find the position in the rotation where the torque increases significantly, then use Procedure 2 below.

(e) Put the shaft in the extreme counterclockwise position again.

(f) Slowly and smoothly turn the handle of the tool clockwise until a distinct increase in torque is found and immediately stop turning the handle.

(g) Read the scale on the tool.

NOTE: This is the point where the valve butterfly starts to engage the edge of the seal.

(h) Turn the handle 13 degrees more in the clockwise direction (the scale is calibrated in degrees).

NOTE: The valve butterfly is now centered on the valve seal.

NOTE: If you turn the handle past the target value, do not turn the handle back in the counterclockwise direction again. You must start the procedure again with the handle in the extreme counterclockwise position.

SUBTASK 28-26-01-820-004

(4) Do these steps to align the adapter shaft (Procedure 2, optional to Procedure 1):

NOTE: A torque wrench (30 in-lbs), COM-1587, is necessary to do this procedure.

(a) Put the tool handle in the extreme counterclockwise position.

(b) Slowly and smoothly turn the tool handle to the extreme clockwise position while you monitor the torque that you apply to the handle.

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(c) Write down the maximum torque that you apply to the tool while you turn it from the extreme counterclockwise position to the extreme clockwise position.

(d) Turn the tool back to the extreme counterclockwise position.

(e) Turn the shaft clockwise again at approximately the same rate that you used before.

(f) Stop at the position where the torque increases to approximately two-thirds of the maximum torque that you wrote down before.

(g) Read the scale on the tool at this position.

NOTE: This is the position where valve butterfly starts to engage the edge of the seal.

(h) Turn the handle 13 more degrees in the clockwise direction past the reading from the previous step.

NOTE: The butterfly valve is now centered on the valve seal.

NOTE: If you turn the valve past the target value, do not turn it back in the counterclockwise direction. You must start again with the tool handle in the extreme counterclockwise position.

SUBTASK 28-26-01-820-006

(5) Tighten the alignment tool lockscrew to hold the alignment tool in position on the adapter/shaft.

SUBTASK 28-26-01-820-007

(6) Turn the index plate [11] until the actuator mounting holes in the index plate [11] are aligned with the two upper holes for the alignment screws.

SUBTASK 28-26-01-820-005

(7) Insert the two alignment screws into the holes for the actuator mounting screws to hold the index plate [11] in alignment with the adapter/shaft (this is the final adjustment of the position of the index plate [11]).

SUBTASK 28-26-01-420-011

(8) Tighten the bottom screw [20].

SUBTASK 28-26-01-020-011

(9) Carefully remove the alignment screws.

SUBTASK 28-26-01-080-004

(10) Loosen the lockscrew and carefully remove the alignment tool from the index plate [11].

SUBTASK 28-26-01-420-019

(11) Use a fine point felt pen to apply a reference mark between the index plate [11] and the adapter/shaft at one of the attachment points.

ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS

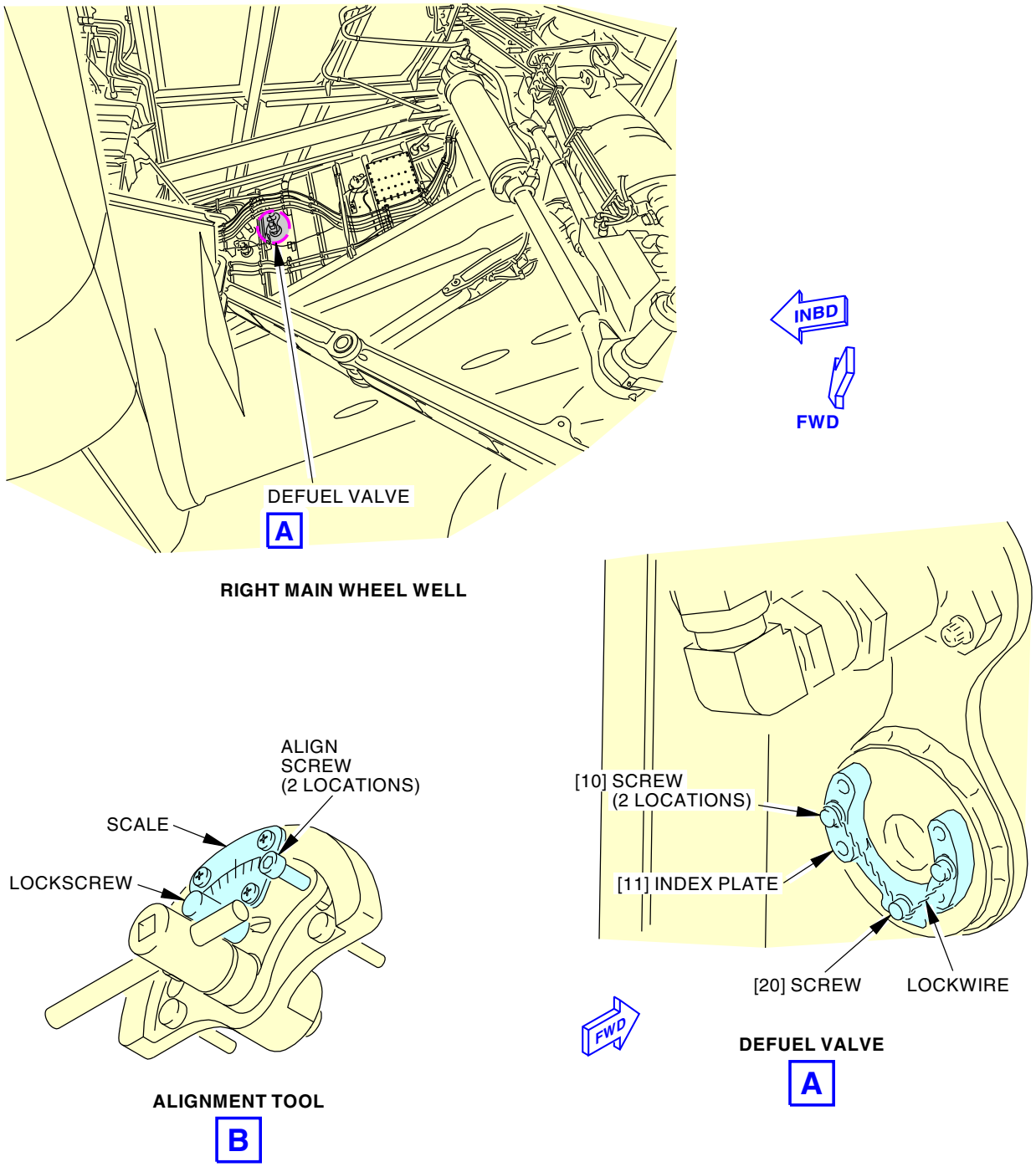
SUBTASK 28-26-01-420-020

(12) Continue with the index plate installation procedure in this task: Defuel Valve (Adapter/Shaft) - Installation, TASK 28-26-01-400-803.

ARO ALL

——— END OF TASK ———

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Alignment Tool Installation
Figure 403/28-26-01-990-803

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS

TASK 28-26-01-300-801

7. Rework the Fay Sealed Fay Surface Bonds for the Defuel Valve

A. General

(1) This task has these sections:

(a) Rework the Fay Sealed Fay Surface Bond - Actuator to Index Plate

(b) Rework the Fay Sealed Fay Surface Bond - Index Plate to Adapter/Shaft

(c) Rework the Fay Sealed Fay Surface Bond - Adapter/Shaft to Rear Spar

(d) Rework the Bonding Jumper Bond

(2) Do this task if the measurement for the electrical bonding resistance is more than the permitted resistance value.

(3) The defuel valve uses two electrical bonding paths:

(a) One bonding path is from the upper housing of the actuator through the bonding jumper to the airplane structure.

(b) The second bonding path is from the upper housing of the actuator to the bare metal surface of the rear spar. The bond path is through the bare metal fay surfaces of the actuator (at the mounting feet), index plate, and adapter/shaft to the bare metal surface of the rear spar.

NOTE: The actuator is divided into two sections, the upper housing section and the lower housing section. The two housing sections are separated by a fay surface fay seal. You cannot repair or rework the fay surface between the housing sections at the airplane. When you do an electrical bonding measurement, make sure the measurement is done on the upper housing section of the actuator.

(4) If the electrical bonding resistance is more than the maximum permitted resistance, you must disassemble the components, rework the fay surface, assemble the components, and then re-check the electrical bonding resistance. Continue to rework the fay surfaces until the electrical resistance between the components is within permitted resistance values.

(5) Because the build-up of the defuel valve includes several fay sealed fay surface bonds, you may not know which fay sealed fay surface bond is the cause of the problem. This task will help you isolate the location of the fay sealed fay surface bond that needs to be reworked. The procedure does a check of the fay sealed fay surface bond downstream of the bond that is in question.

(6) For application of fay surface fay seals in this task, it is acceptable to use sealant, A50110, as an alternative to sealant, A50155.

NOTE: Sealants should not be mixed. In applications where sealants may mix, use the same sealant for both applications.

B. References

Reference	Title
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
28-26-02-400-802	Defuel Valve (Actuator) - Installation (P/B 401)
28-26-02-990-802	Figure: Defuel Valve Actuator Installation (P/B 401)
SWPM 20-20-00	Standard Wiring Practices Manual

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

D. Consumable Materials

Reference	Description	Specification
A50110	Sealant	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Rework the Fay Sealed Fay Surface Bond - Actuator to Index Plate

(Figure 28-26-02-990-802, Figure 402)

NOTE: Do the steps in this procedure if the measurement for the electrical bonding resistance between the upper housing of the actuator and the rear spar is more than 0.0025 ohm (2.5 milliohms). The measurement is done with the bonding jumper and the electrical connector disconnected from the actuator.

SUBTASK 28-26-01-000-001

(1) Do this task: Defuel Valve (Actuator) - Installation, TASK 28-26-02-400-802.

SUBTASK 28-26-01-765-003

(2) Do these steps to do a check of the index plate to rear spar bonding path:

NOTE: These steps will tell you if the actuator to index plate fay surface fay surface bond is the cause of the problem, or if the index plate to adapter/shaft fay sealed fay surface bond is the cause of the problem.

(a) Remove the sealant and clean one of the contact surfaces on the index plate.

(b) With the intrinsically safe approved bonding meter, COM-1550, measure the electrical bonding resistance between the contact surface on the index plate (bare metal surface) and the rear spar (SWPM 20-20-00) (Figure 402).

(c) Make sure the electrical bonding resistance is 0.0020 ohm (2.0 milliohms) or less.

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(d) If the electrical bonding resistance is not satisfactory, then do the steps in this procedure: Rework the Fay Sealed Fay Surface Bond - Index Plate to Adapter/Shaft.

(e) If the electrical bonding resistance is satisfactory, then continue with the subsequent steps.

SUBTASK 28-26-01-400-001

(3) Do this task: Defuel Valve (Actuator) - Installation, TASK 28-26-02-400-802.

NOTE: This task will rework the fay surface bond and re-install the actuator.

SUBTASK 28-26-01-765-004

(4) During the installation, do a check of the electrical bonding resistance between the upper housing of the actuator and the rear spar with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00) (Figure 28-26-02-990-802).

(a) Do this measurement with the bonding jumper and the electrical connector disconnected.

(b) Make sure the bonding jumper does not touch the actuator during the electrical bonding measurement.

(c) Make sure the electrical bonding resistance is 0.0025 ohm (2.5 milliohms) or less.

(d) If the electrical bonding resistance is not satisfactory, then repeat the steps in this procedure.

(e) If the electrical bonding resistance is satisfactory, then continue with the steps to install the actuator (TASK 28-26-02-400-802).

SUBTASK 28-26-01-710-003

(5) If you have replaced the actuator or adjusted the adapter/shaft, then continue with the steps in these procedures: Defuel Valve (Actuator) - Installation, TASK 28-26-02-400-802 (Defuel Valve Test), Defuel Valve (Adapter/Shaft) - Installation, TASK 28-26-01-400-803 (Defuel Valve Test).

F. Rework the Fay Sealed Fay Surface Bond - Index Plate to Adapter/Shaft

(Figure 402)

NOTE: Do the steps in this procedure if the measurement for the electrical bonding resistance between the index plate and the rear spar is more than 0.0020 ohm (2.0 milliohms). The measurement is done with the actuator removed.

SUBTASK 28-26-01-000-002

(1) Do this task: Defuel Valve (Adapter/Shaft) - Removal, TASK 28-26-01-000-803.

SUBTASK 28-26-01-765-005

(2) Do these steps to do a check of the adapter/shaft to rear spar bonding path:

NOTE: These steps will tell you if the index plate to adapter/shaft fay sealed fay surface bond is the cause of the problem, or if the adapter/shaft to rear spar fay sealed fay surface l bond is the cause of the problem.

(a) Remove the sealant and clean one of the contact surfaces on the adapter/shaft.

(b) With the intrinsically safe approved bonding meter, COM-1550, measure the electrical bonding resistance between the contact surface on the adapter/shaft and the rear spar (SWPM 20-20-00,Figure 402).

(c) Make sure the electrical bonding resistance is 0.0015 ohm (1.5 milliohms) or less.

NOTE: This is the repair electrical bonding resistance value. The adapter/shaft installation electrical bonding resistance value is 0.0005 ohm (0.5 milliohm).

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(d) If the electrical bonding resistance is not satisfactory, then do the steps in this procedure: Rework the Fay Sealed Fay Surface Bond - Adapter/Shaft to Rear Spar.

(e) If the electrical bonding resistance is satisfactory, then continue with the subsequent steps.

SUBTASK 28-26-01-400-002

(3) Do these steps to install the index plate:

NOTE: These steps will re-align the defuel valve, rework the fay surface, and re-install the index plate.

(a) Do this task: Adapter Shaft Alignment, TASK 28-26-01-820-801.

(b) Do this procedure: Defuel Valve (Adapter/Shaft) - Installation, TASK 28-26-01-400-803 (Install the Index Plate).

SUBTASK 28-26-01-765-006

(4) During the installation, do a check of the electrical bonding resistance between the index plate and the rear spar with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00):

(a) Make sure the electrical bonding resistance is 0.0020 ohm (2.0 milliohms) or less.

(b) If the electrical bonding resistance is not satisfactory, then repeat the steps in this procedure.

(c) If the electrical bonding resistance is satisfactory, then continue with the procedure to install the index plate (TASK 28-26-01-400-803).

SUBTASK 28-26-01-710-004

(5) After you install the index plate, do this procedure: Defuel Valve (Adapter/Shaft) - Installation, TASK 28-26-01-400-803 (Defuel Valve Test).

G. Rework the Fay Sealed Fay Surface Bond - Adapter/Shaft to Rear Spar

(Figure 402)

NOTE: Do the steps in this procedure if the measurement for the electrical bonding resistance between the adapter/shaft and the rear spar is more than 0.0015 ohm (1.5 milliohms).

SUBTASK 28-26-01-010-009

(1) Do this task: Defuel Valve (Adapter/Shaft) - Removal, TASK 28-26-01-000-803.

NOTE: A fuel tank entry is necessary to rework the fay surface of the adapter/shaft.

SUBTASK 28-26-01-400-003

(2) Do this task: Defuel Valve (Adapter/Shaft) - Installation, TASK 28-26-01-400-803.

NOTE: These steps will rework the fay surface, and re-install the adapter/shaft.

SUBTASK 28-26-01-765-007

(3) During the installation, do a check of the electrical bonding resistance between the adapter/shaft and the rear spar (SWPM 20-20-00).

(a) Use an intrinsically safe approved bonding meter, COM-1550.

(b) Make sure the electrical bonding resistance is 0.0005 ohm (0.5 milliohm) or less.

(c) If the electrical bonding resistance is not satisfactory, then repeat the steps in this procedure.

(d) If the electrical bonding resistance is satisfactory, then continue with the steps to install the adapter/shaft (TASK 28-26-01-400-803).

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SUBTASK 28-26-01-710-005

(4) After you install the adapter/shaft, do this procedure:Defuel Valve (Adapter/Shaft) - Installation, TASK 28-26-01-400-803 (Install the Index Plate and Defuel Valve Test).

H. Rework the Bonding Jumper Bond

(Figure 28-26-02-990-802)

NOTE: Do the steps in this procedure if the measurement for the electrical bonding resistance between the bonding jumper terminal and the rear spar is more than 0.0015 ohm (1.5 milliohms). The measurement is done with the bonding jumper disconnected from the actuator.

SUBTASK 28-26-01-030-002

(1) Remove the sealant from the bonding jumper terminal attached to the structure.

SUBTASK 28-26-01-030-003

(2) Remove the nut, two washers, and the bonding jumper.

SUBTASK 28-26-01-430-002

(3) Do these steps to install the bonding jumper to the structure:

WARNING

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(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

(b) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper terminal and the two washers.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the fay surface fay seal.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(c) Install the nut, washers, and the bonding jumper to the structure.

(d) Tighten the nut to 20 in-lb (2.3 N·m).

(e) Measure the electrical bonding resistance between the loose end of bonding jumper and the rear spar (SWPM 20-20-00).

1) Use an intrinsically safe approved bonding meter, COM-1550.

2) Make sure the electrical bonding resistance is 0.0015 ohm (1.5 milliohms) or less.

(f) Apply a cap seal of sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, over the nut and the terminal of the bonding jumper.

NOTE: Use the sealant that was used for the fay surface fay seal.

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

SUBTASK 28-26-01-420-027

(4) Continue with this task: Defuel Valve (Actuator) - Installation, TASK 28-26-02-400-802.

SUBTASK 28-26-01-710-006

(5) If you have replaced the actuator or adjusted the index plate, then continue with the steps in the Defuel Valve Test procedure in the task: Defuel Valve (Actuator) - Installation, TASK 28-26-02-400-802, and the Defuel Valve Test procedure in the task: Defuel Valve (Adapter/Shaft) - Installation, TASK 28-26-01-400-803.

——— END OF TASK ———

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DEFUEL VALVE ACTUATOR - REMOVAL/INSTALLATION

1. General

A. The defuel valve actuator is found on the dry side of the rear spar. The defuel valve actuator is installed on the rear spar of the right center fuel tank. Access to the defuel valve actuator is through the shock strut door of the main landing gear.

B. It is not necessary to defuel the fuel tank to get access to the defuel valve actuator.

C. This procedure contains two tasks. The first task removes the defuel valve actuator. The second task installs the defuel valve actuator.

D. The procedure to remove and install the defuel valve is in AMM 28-26-01/401.

ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS

TASK 28-26-02-000-802

2. Defuel Valve (Actuator) - Removal

(Figure 401)

A. Location Zones

Zone	Area
651	Rear Spar to Landing Gear Support Beam - Right Wing

B. Procedure

SUBTASK 28-26-02-860-009

(1) Open this circuit breaker and install safety tag:

Standby Power Management Panel, P310

Row	Col	Number	Name
J	10	C28637	DFUEL VLVS

SUBTASK 28-26-02-010-001

(2) Move the manual override handle on the actuator [8] to the CLOSED position.

SUBTASK 28-26-02-030-001

(3) Remove the electrical connector [7] from the actuator [13].

SUBTASK 28-26-02-030-002

(4) Remove the sealant from the bonding jumper [14] and fasteners at the actuator attachment location.

SUBTASK 28-26-02-030-003

(5) Remove the screw [11] and washers [12] to disconnect the bonding jumper [14] from the actuator [13].

SUBTASK 28-26-02-030-004

(6) Remove the four screws [3] and washers [2] that attach the actuator [13] to the adapter/shaft [9].

SUBTASK 28-26-02-030-005

(7) Carefully disassemble the actuator [13] from the index plate [10].

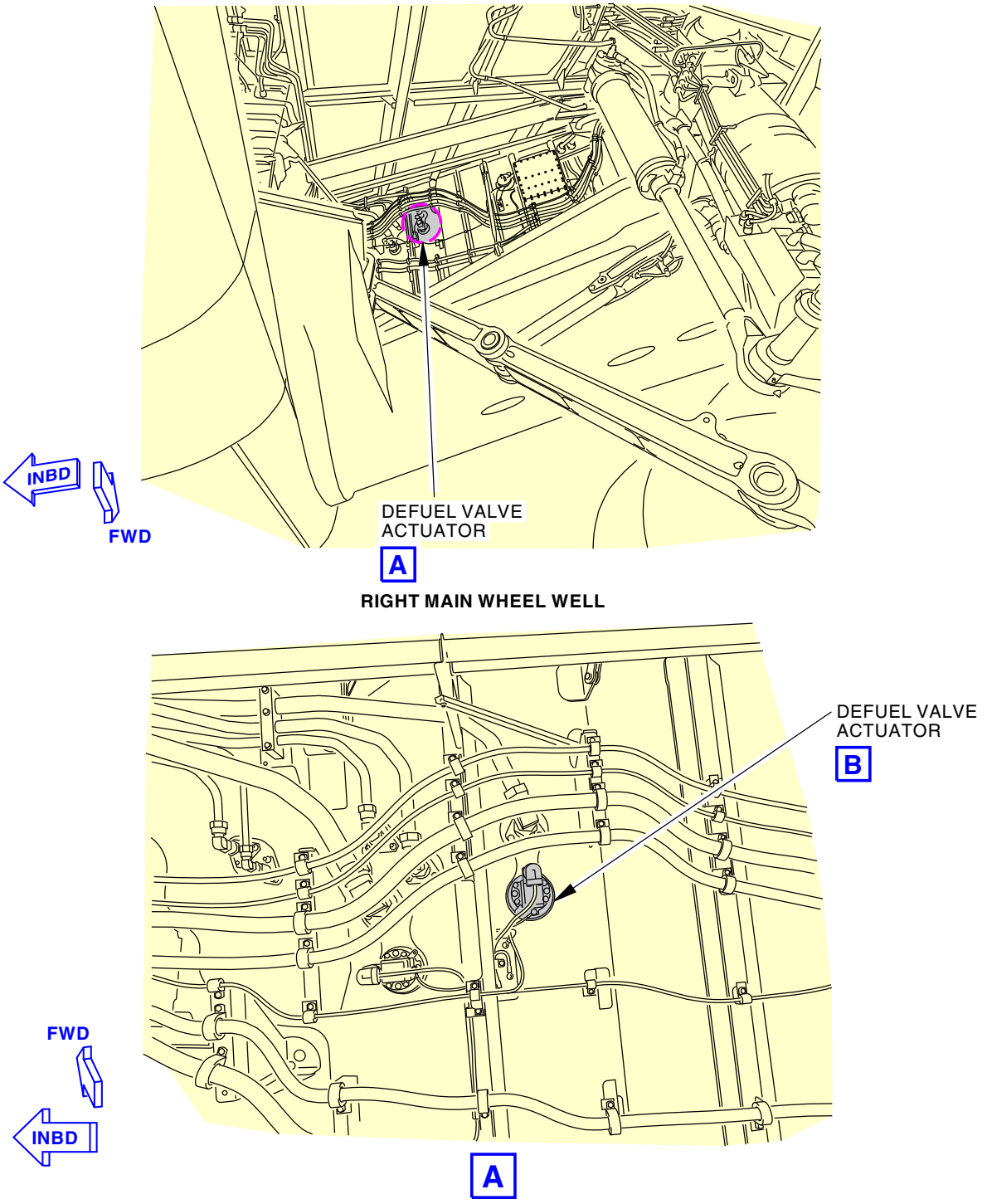
NOTE: The actuator and index plate are bonded with faying surface sealant.

SUBTASK 28-26-02-020-008

(8) Remove the actuator [13].

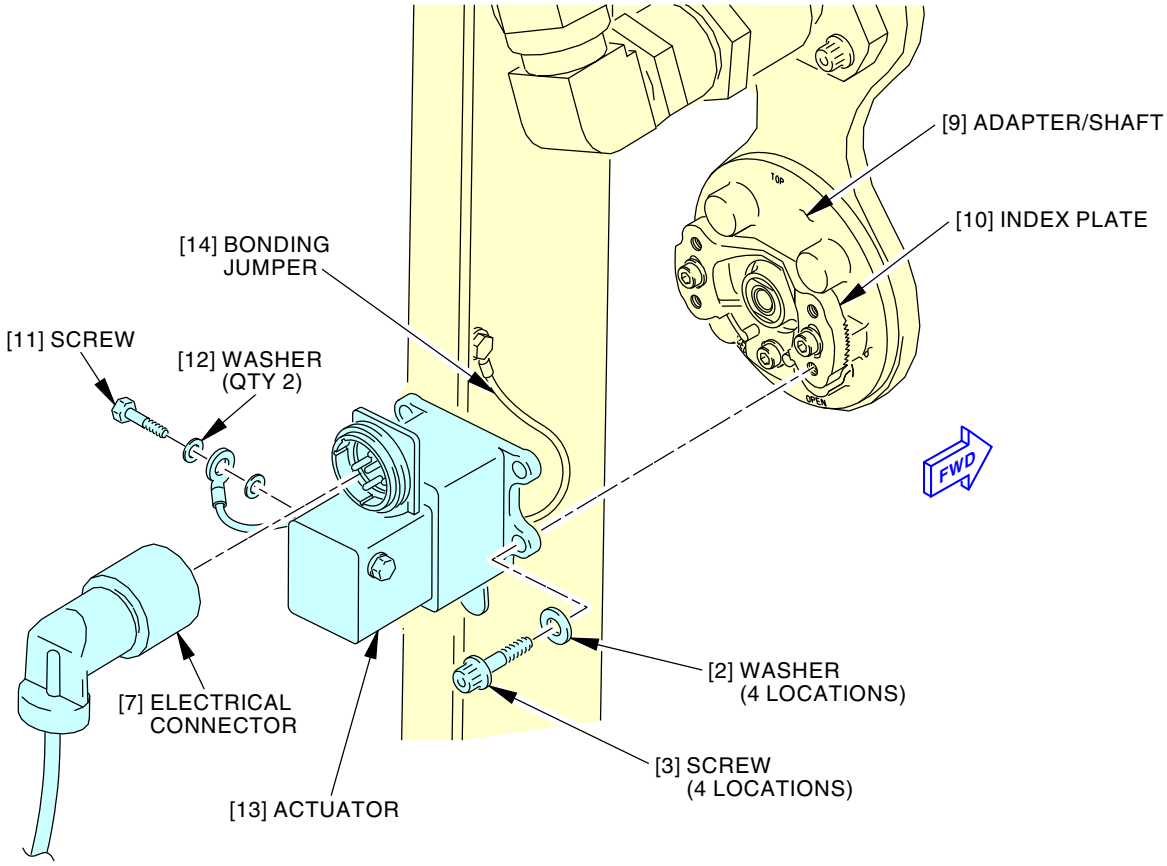
END OF TASK

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Defuel Valve Actuator Installation
Figure 401/28-26-02-990-802 (Sheet 1 of 2)

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(EXAMPLE)

B

U42225 S0000195548_V3

Defuel Valve Actuator Installation
Figure 401/28-26-02-990-802 (Sheet 2 of 2)

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TASK 28-26-02-400-802

3. Defuel Valve (Actuator) - Installation

(Figure 401)

A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(2) For application of fay sealed fay surface bonds in this task, it is acceptable to use sealant, A50110, as an alternative to sealant, A50155.

NOTE: Sealants should not be mixed. In applications where sealants may mix, use the same sealant for both applications.

B. References

Reference	Title
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
20-30-92-910-801	Final Cleaning Prior to General Sealing (Series 92) (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-22-01-300-801	Rework the Fay Sealed Fay Surface Bonds for the Spar Valve (P/B 401)
28-26-00-720-802	Operational Test - Defuel Valve (P/B 501)
28-26-01-300-801	Rework the Fay Sealed Fay Surface Bonds for the Defuel Valve (P/B 401)
51-21-04-620-801	Alodine 600, 1000, 1200, and 1200S Coating Application (P/B 701)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

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Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: $0855 Part #: 234350 Supplier: $0857 Part #: 311 Supplier: F6892 Part #: 411B60 Supplier: 3DN12 Part #: 411B90 Supplier: 3DN12 Part #: DAD5013 Supplier: $0856 Part #: DFD5019 Supplier: $0856 Part #: J5-0275-2010 Supplier: 435R8 Part #: SCD5019 Supplier: $0856 Part #: ST982LF-9 Supplier: 62176 Part #: TS1275-4 Supplier: 1DWR5
COM-4746	Handle - Sealant Removal Tool Part #: 310/1 Supplier: F6892 Part #: SHN0272 Supplier: $0856 Part #: SHR0272-T Supplier: 1DWR5 Part #: SHW0215 Supplier: $0856
STD-123	Brush - Soft Bristle

D. Consumable Materials

Reference	Description	Specification
A50110	Sealant	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
B01012	Solvent - Final Cleaning Prior To General Sealing - Series 92	
C00064	Coating - Aluminum Chemical Conversion	BAC5719 Type II Class A (MIL-DTL-5541 Class 1A)
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20 Type II
C50033	Chromated Conversion Coating for Aluminum - Alodine 1200	

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

(Continued)

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
13	Actuator	Not Specified	

F. Location Zones

Zone	Area
651	Rear Spar to Landing Gear Support Beam - Right Wing

G. Procedure

SUBTASK 28-26-02-860-006

CAUTION

REMOVE POWER TO THE ACTUATOR. IF YOU DO MAINTENANCE TO THE ACTUATOR WHILE IT IS ENERGIZED, DAMAGE TO THE ACTUATOR CAN OCCUR.

(1) Make sure that this circuit breaker is open and has safety tag:

Standby Power Management Panel, P310

Row	Col	Number	Name
J	10	C28637	DFUEL VLVS

SUBTASK 28-26-02-140-001

(2) Remove the old sealant and clean the actuator [13], index plate [10] and fasteners (if reused).

(a) Use sealant removal tool, COM-2481, and sealant removal tool handle, COM-4746 (or equivalent), to remove old sealant from the actuator [13] and index plate [10].

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(b) To remove the remaining sealant, grease, oil, dirt, and other contamination from the components, use one of these items soaked with Series 92 solvent, B01012 (TASK 20-30-92-910-801):

1) soft bristle brush, STD-123

2) cotton wiper, G00034

SUBTASK 28-26-02-420-010

(3) Do these steps to prepare the actuator [13] and the index plate [10] for a fay sealed fay surface bond (SWPM 20-20-00):

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(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-19: CDCCL

(b) Apply a thin continuous layer of sealant between the actuator [13] mounting feet contact surfaces (four locations) and the index plate [10] for a fay sealed fay surface bond.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the fay sealed fay surface bond.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(c) Apply sealant to the shank and the threads of the screws [3].

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the wet installation of the screws [3].

NOTE: Use the same sealant that was used for the fay sealed fay surface bonds.

2) Make sure the sealant applied to the fasteners is approximately 0.060 in. (1.524 mm) thick.

SUBTASK 28-26-02-420-011

(4) Do these steps to install the actuator [13] to the index plate [10]:

(a) Make sure the manual override lever on the actuator [13] is in the CLOSED position.

(b) Align the actuator output shaft with the adapter/shaft [9].

(c) Make sure the two spaces for teeth on the adapter/shaft [9] align with the actuator output shaft.

(d) Put the actuator output shaft into the adapter/shaft [9].

NOTE: The contact areas of the actuator automatically align with the mounting points on the index plate.

(e) Install the four screws [3] and washers [2] to attach the actuator [13] to the index plate [10].

NOTE: Lockwire is not necessary for the actuator mounting screws [3].

(f) Tighten the screws [3] to 20 in-lb (2.3 N·m).

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(g) Make sure the sealant is continuously squeezed out along the edges of the contact surfaces.

(h) If there are gaps, bubbles or voids in the sealant squeeze out, then disassemble and apply more sealant.

(i) Shape the squeezed out sealant into a fillet seal.

(j) As an option, remove the extra squeezed out sealant.

NOTE: Make sure the sealant that remains is flush with the mating part edges.

SUBTASK 28-26-02-765-001

28-AWL-19: CDCCL

(5) Measure the electrical bonding resistance between the actuator [13] upper housing and the rear spar (structure) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

28-AWL-19: CDCCL

(a) Do this measurement with the bonding jumper [14] and electrical connector [7] disconnected.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(b) Make sure the bonding jumper [14] does not touch the actuator [13] during the electrical bonding measurement.

(c) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-19: CDCCL

(d) If the actuator [13], index plate [10] and adapter plate (part of the adapter/shaft [9]) were removed, make sure the electrical bonding resistance is 0.0030 ohm (3.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) If the electrical bonding resistance is more than 0.0030 ohm (3.0 milliohms), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Defuel Valve, TASK 28-26-01-300-801.

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28-AWL-19: CDCCL

(e) If the actuator [13] and index plate [10] were removed, make sure the electrical bonding resistance is 0.0040 ohm (4.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) If the electrical bonding resistance is more than 0.0040 ohm (4.0 milliohms), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Defuel Valve, TASK 28-26-01-300-801.

28-AWL-19: CDCCL

(f) If only the actuator [13] was removed, make sure the electrical bonding resistance is 0.0040 ohm (4.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) If the electrical bonding resistance is more than 0.0040 ohm (4.0 milliohms), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Defuel Valve, TASK 28-26-01-300-801.

SUBTASK 28-26-02-420-013

(6) If the bonding jumper [14] is disconnected from the structure, do these steps to attach the bonding jumper [14]:

WARNING

DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

(b) Rub dry with a clean, dry cotton wiper, G00034.

(c) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-19: CDCCL

(d) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper [14] terminal and the two washers for a fay sealed fay surface bond at the structure.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use sealant, A50110, or sealant, A50155, for the fay sealed fay surface bond.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(e) Install the screw and the two washers to attach the bonding jumper [14] to the structure.

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1) Tighten the screw to 30 ±5 in-lb (3 ±1 N·m).

28-AWL-19: CDCCL

(f) Apply a cap seal over the screw (fastener) and terminal of the bonding jumper [14] attached to the structure.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

NOTE: Use the sealant that was used for the fay sealed fay surface bond.

1) Use sealant, A50110 or sealant, A50155.

SUBTASK 28-26-02-420-012

(7) Do these steps to install the bonding jumper [14] to the actuator [13]:

(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-19: CDCCL

(b) Measure the electrical bonding resistance between the loose end of the bonding jumper [14] and the rear spar (structure) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-19: CDCCL

2) Make sure the electrical bonding resistance is 0.0015 ohm (1.5 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

a) If the electrical bonding resistance is more than 0.0015 ohm (1.5 milliohms), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Spar Valve, TASK 28-22-01-300-801.

28-AWL-19: CDCCL

(c) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper [14] and the two washers [12] for a fay sealed fay surface bond between the actuator [13] and the bonding jumper [14] terminal.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

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1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the fay sealed fay surface bond.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(d) Install the screw [11], washer [12] and bonding jumper [14] to the actuator [13].

(e) AIRPLANES WITHOUT MA30A1001 ACTUATOR:

Tighten the screw [11] to 20 in-lb (2.3 N·m).

(f) AIRPLANES WITH MA30A1001 ACTUATOR:

Tighten the screw [11] to 35 in-lb (4.0 N·m).

28-AWL-19: CDCCL

(g) Measure the electrical bonding resistance between the upper housing of the actuator [13] and the attached bonding jumper [14] terminal (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Do not touch the screw [11] when you make the electrical bonding measurement.

2) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-19: CDCCL

3) Make sure the electrical bonding resistance is 0.0010 ohm (1.0 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

28-AWL-19: CDCCL

(h) Apply a cap seal over the screw [11] (fastener) and terminal of the bonding jumper [14] lug attached to the actuator [8].

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

NOTE: Use the sealant that was used for the fay sealed fay surface bond.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296.

SUBTASK 28-26-02-370-001

(8) Do this task to apply protective finishes to the bare areas of the rear spar: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

NOTE: Re-apply the protective finishes to the rear spar where the electrical bonding probes removed the finishes.

(a) These are the protective finishes:

1) Alodine 600 coating, C00064

2) BMS 10-20 coating, C00307.

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SUBTASK 28-26-02-916-001

(9) Do this task to apply Alodine 1200 coating, C50033, to any bare areas of the actuator [13]: Alodine 600, 1000, 1200, and 1200S Coating Application, TASK 51-21-04-620-801.

NOTE: Re-apply the protective coating to the actuator [13] where the electrical bonding probe removed the finish and any bare metal areas around the bonding jumper installation that are not covered with sealant.

SUBTASK 28-26-02-430-001

(10) Connect the electrical connector [7].

H. Defuel Valve Test

SUBTASK 28-26-02-860-008

(1) Remove the safety tag and close this circuit breaker:

Standby Power Management Panel, P310

Row	Col	Number	Name
J	10	C28637	DFUEL VLVS

SUBTASK 28-26-02-860-007

(2) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-26-02-710-002

(3) Do this task: Operational Test - Defuel Valve, TASK 28-26-00-720-802.

——— END OF TASK ———

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DEFUEL VALVE ACTUATOR - INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure contains a functional check of the bonding resistance between the structure and the defuel valve actuator.

SFAR 88

TASK 28-26-02-200-801

2. Defuel Valve Actuator - Bonding Resistance Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Location Zones

Zone	Area
651	Rear Spar to Landing Gear Support Beam - Right Wing

D. Prepare for the Procedure

SUBTASK 28-26-02-490-001

WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR BEFORE YOU MOVE THE CONTROL LEVER. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(1) Make sure the landing gear downlock pins are installed (TASK 32-00-30-480-801).

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SUBTASK 28-26-02-490-002

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-26-02-865-001

CAUTION REMOVE POWER TO THE ACTUATOR. IF YOU DO MAINTENANCE TO THE ACTUATOR WHILE IT IS ENERGIZED, DAMAGE TO THE ACTUATOR CAN OCCUR.

(3) Open this circuit breaker and install safety tag:

Standby Power Management Panel, P310

Row	Col	Number	Name
J	10	C28637	DFUEL VLVS

SUBTASK 28-26-02-212-001

(4) Move the manual override handle on the actuator to the CLOSED position.

SUBTASK 28-26-02-862-001

(5) Remove the electrical connector from the actuator.

E. Electrical Bonding Measurement

SUBTASK 28-26-02-765-007

(1) Use an intrinsically safe approved bonding meter, COM-1550, to measure the bonding resistance between the defuel valve and the airplane structure (SWPM 20-20-00).

(a) Make sure the bonding resistance is 5 milliohms (0.005 ohm) or less.

SUBTASK 28-26-02-765-008

(2) Use an intrinsically safe approved bonding meter, COM-1550, to measure the bonding resistance between the bonding jumper and the airplane structure (SWPM 20-20-00).

(a) Make sure the bonding resistance is 8 milliohms (0.008 ohm) or less.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 28-26-02-861-001

(1) Connect the electrical connector to the defuel valve actuator.

SUBTASK 28-26-02-865-002

(2) Remove the safety tag and close this circuit breaker:

Standby Power Management Panel, P310

Row	Col	Number	Name
J	10	C28637	DFUEL VLVS

SUBTASK 28-26-02-861-002

(3) Do this task, if it is necessary: Supply Electrical Power, TASK 24-22-00-860-805.

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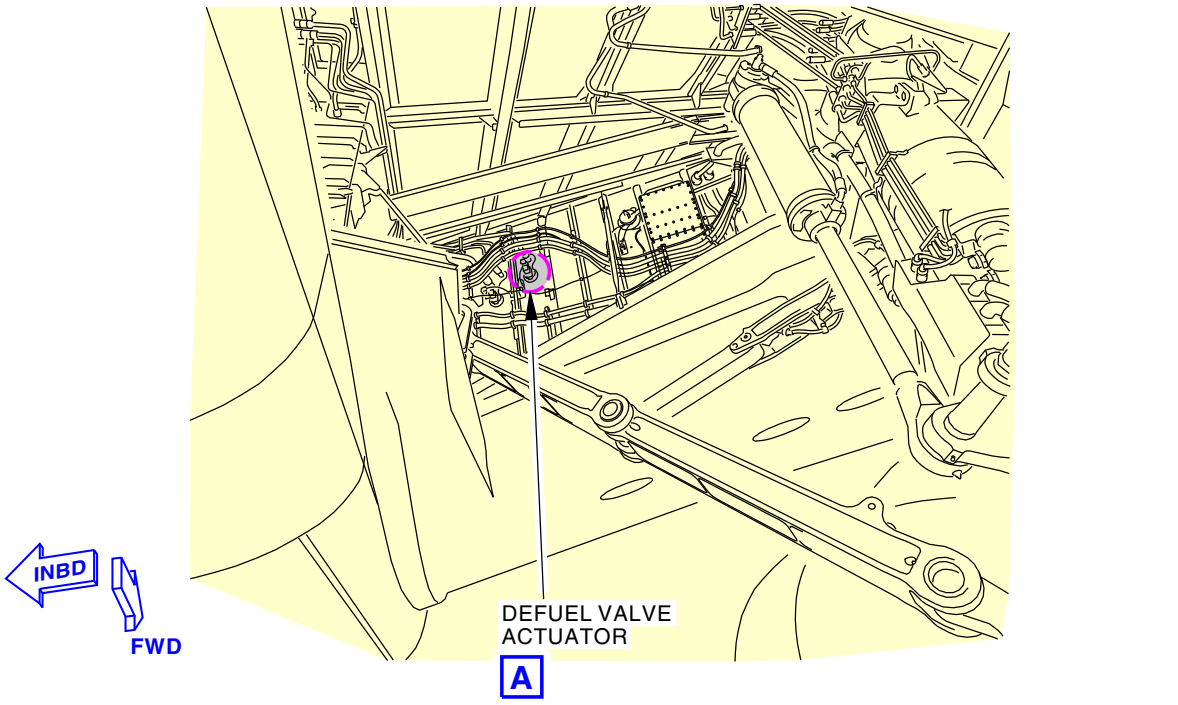
SUBTASK 28-26-02-090-001

WARNING OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

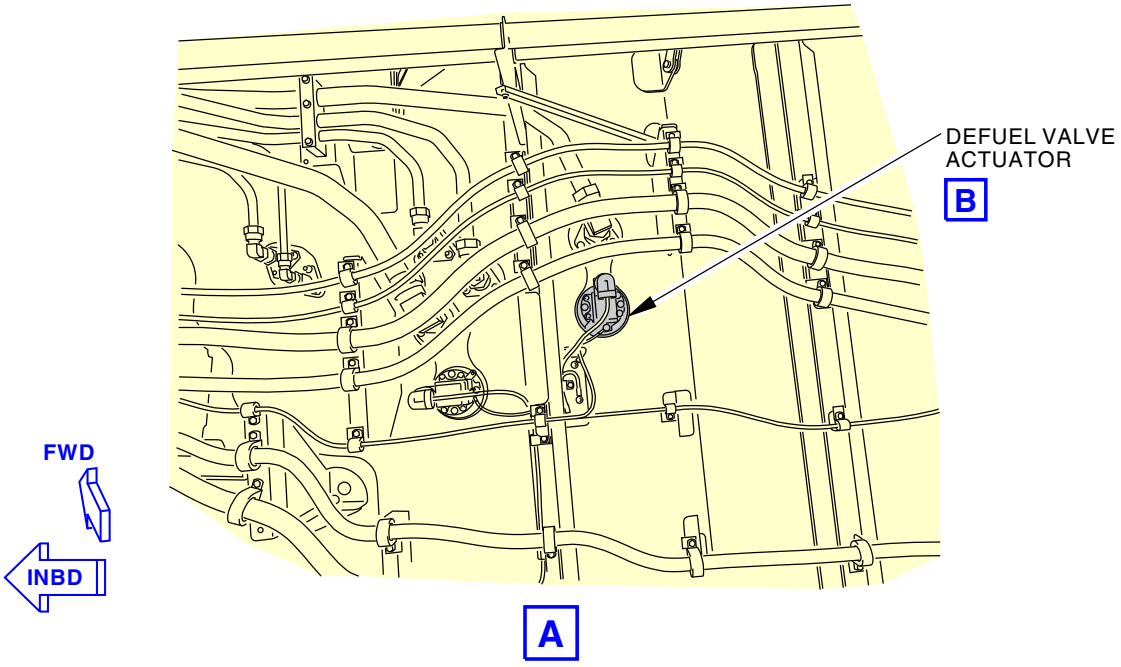
(4) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

——— END OF TASK ———

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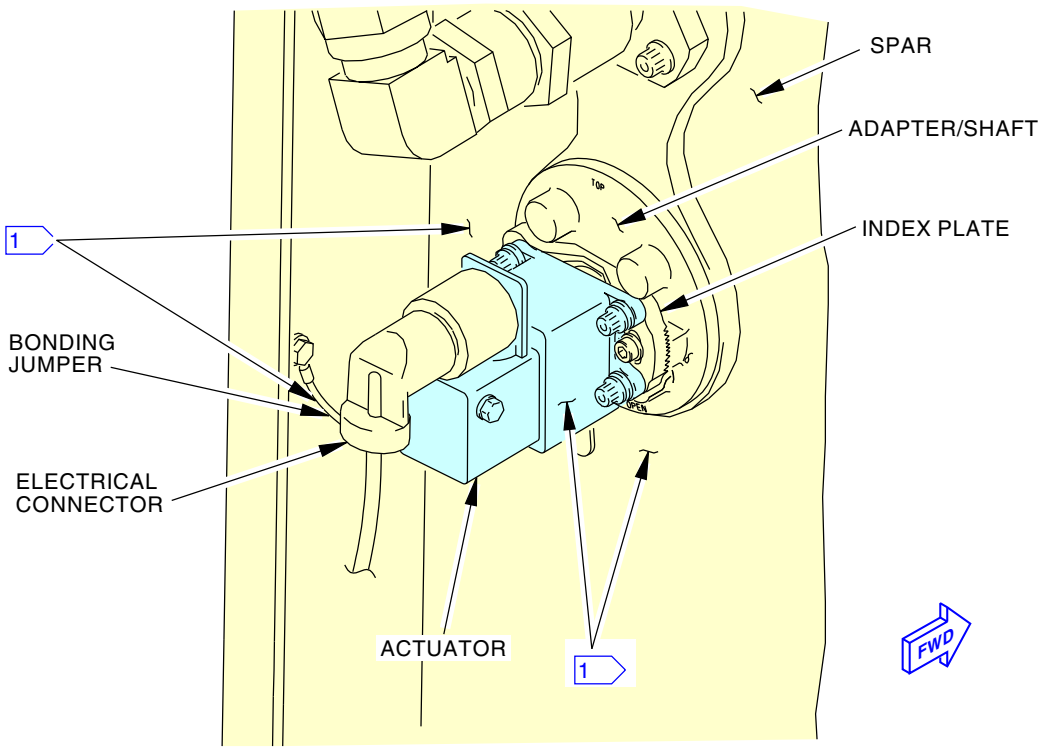
RIGHT MAIN WHEEL WELL



1367983 S0000247066_V2

Defuel Valve - Bonding Resistance Measurement
Figure 601/28-26-02-990-803 (Sheet 1 of 2)

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(EXAMPLE)

B

1 BONDING RESISTANCE MEASUREMENT LOCATION

1368064 S0000247069_V3

Defuel Valve - Bonding Resistance Measurement
Figure 601/28-26-02-990-803 (Sheet 2 of 2)

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FUEL JETTISON SYSTEM - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

(1) Fuel jettison system - deactivation.

(2) Fuel jettison system - activation.

TASK 28-31-00-040-801

2. Fuel Jettison System - Deactivation

A. General

(1) This task will deactivate the fuel jettison system.

B. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

C. Procedure

SUBTASK 28-31-00-020-001

(1) Open these circuit breakers and install safety tags:

Left Power Management Panel, P110

Row	Col	Number	Name
C	18	C28302	R FWD FUEL BOOST PUMP L AC SECT 2
E	2	C28303	L AFT FUEL BOOST PUMP
E	5	C28307	L FWD FUEL BOOST PUMP
L	21	C28647	CTR L OVRD FUEL PUMP CTRL
L	22	C28645	L FUEL JETT PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
E	27	C28300	R AFT FUEL BOOST PUMP
K	14	C28646	R FUEL JETT PUMP CTRL
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

D. Fuel Jettison System - Tryout

NOTE: This tryout is to make sure that the fuel jettison system is in a zero energy state.

SUBTASK 28-31-00-210-002

(1) Push these pump switches in the P5 Flight Deck Overhead Panel and listen to make sure that the pumps do not operate:

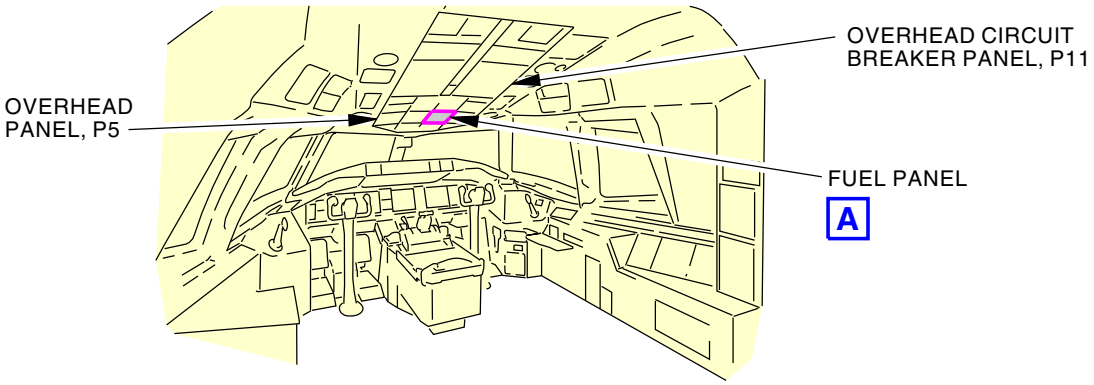
- L FWD FUEL PUMPS
- L AFT FUEL PUMPS
- R FWD FUEL PUMPS
- R AFT FUEL PUMPS

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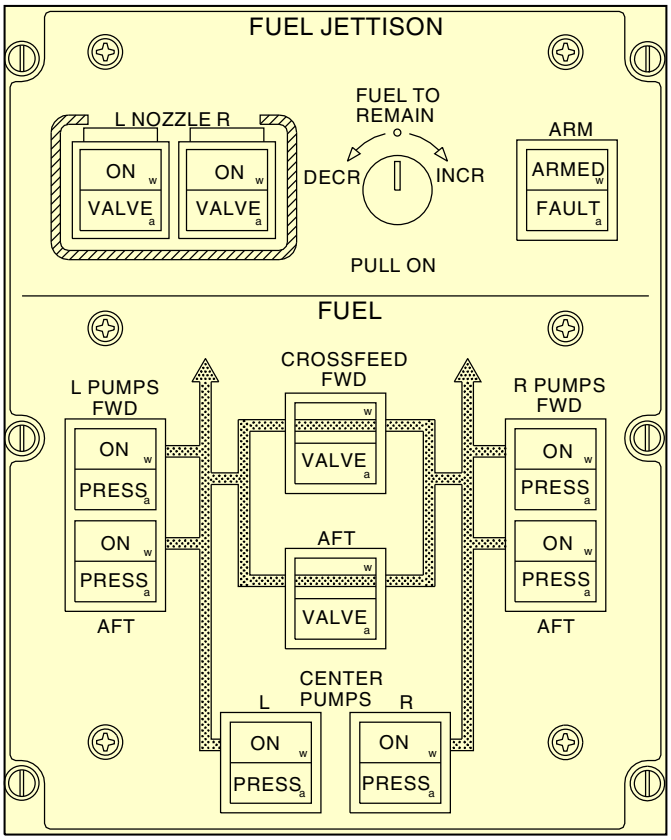
- L CENTER FUEL PUMPS
- R CENTER FUEL PUMPS

——— END OF TASK ———

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FLIGHT COMPARTMENT



FUEL/FUEL JETTISON PANEL, M28001

A

E16435 S0006415476_V2

Fuel Jettison System
Figure 201/28-31-00-990-803

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TASK 28-31-00-440-801

3. Fuel Jettison System - Activation

(Figure 201)

A. General

(1) This task will activate the fuel jettison system.

B. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

C. Procedure

SUBTASK 28-31-00-420-001

(1) Remove the safety tags and close these circuit breakers:

Left Power Management Panel, P110

Row	Col	Number	Name
C	18	C28302	R FWD FUEL BOOST PUMP L AC SECT 2
E	2	C28303	L AFT FUEL BOOST PUMP
E	5	C28307	L FWD FUEL BOOST PUMP
L	21	C28647	CTR L OVRD FUEL PUMP CTRL
L	22	C28645	L FUEL JETT PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
E	27	C28300	R AFT FUEL BOOST PUMP
K	14	C28646	R FUEL JETT PUMP CTRL
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

——— END OF TASK ———

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FUEL JETTISON SYSTEM - ADJUSTMENT/TEST

1. General

A. This procedure contains scheduled maintenance task data.

TASK 28-31-00-720-801

2. Fuel Jettison System - Operational Test

(Figure 501)

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This procedure contains one task. The task is an operational test of the fuel jettison system.

WARNING DO NOT OPERATE A FUEL PUMP IF THE LOW PRESSURE LIGHT COMES ON AND STAYS ON. THIS CONDITION CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE FUEL TANK. A FIRE OR AN EXPLOSION CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(2) Obey these precautions at all times during this task:

(a) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

(b) Immediately set the applicable fuel pump switch-light(s) to the off position if the low pressure indication light comes on and stays on.

ARO 001-004 PRE SB 777-28-0078

NOTE: The FAULT light on the ARM switch comes on to show low pressure for the jettison pumps. Set the ARM switch to the off position if this occurs.

ARO 005-999; ARO 001-004 POST SB 777-28-0078

NOTE: The FAULT light on the ARM switch comes on to show low pressure for the jettison pumps. Set the ARM switch to the off position if this occurs. In the procedure to check the operation of the jettison pumps in the ground mode a low pressure indication is caused by a jumper, the pump motors are not operated with low pressure. For this part of the procedure, do not set the ARM switch to the OFF position if the FAULT light shows low pressure.

ARO ALL

B. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
12-11-01-650-801	Pressure Refueling (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
27-81-00-040-801	Leading Edge Slat - Deactivation (P/B 201)
27-81-00-440-801	Leading Edge Slat Reactivation (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
31-61-00-800-813	Showing Status Messages (P/B 201)
31-61-00-800-816	Showing a System Synoptic Page (P/B 201)
32-09-00-860-801	Air/Ground Mode Simulation (P/B 201)
WDM 28-31-11	Wiring Diagram Manual

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(Continued)

Reference	Title
WDM 28-31-21	Wiring Diagram Manual

C. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

D. Access Panels

Number	Name/Location
521DB	Refueling Station Door

E. Prepare for the Test

SUBTASK 28-31-00-860-001

(1) Make sure that these circuit breakers are closed:

Left Power Management Panel, P110

Row	Col	Number	Name
L	21	C28647	CTR L OVRD FUEL PUMP CTRL
L	24	C28631	L FUEL JETT ISLN VLV
L	25	C28621	L FUEL JETT NOZ VLV

Right Power Management Panel, P210

Row	Col	Number	Name
K	12	C28620	R FUEL JETT NOZ VLV
K	13	C28630	R JETT ISLN VLV
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

SUBTASK 28-31-00-860-006

(2) Open these circuit breakers and install safety tags:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
K	14	C28646	R FUEL JETT PUMP CTRL

SUBTASK 28-31-00-860-002

(3) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-31-00-210-001

(4) Make sure that the FUEL JETTISON L(R) NOZZLE valve switch-lights, on the Fuel Jettison Panel (P5 Overhead Panel), are in the closed position.

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SUBTASK 28-31-00-860-007

WARNING DO NOT OPERATE THE LEADING EDGE SLATS. ACCIDENTAL SLAT OPERATION COULD CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(5) Put a DO-NOT-OPERATE tag on the flap control lever, in the flight compartment (TASK 27-81-00-040-801).

SUBTASK 28-31-00-010-001

(6) Open this access door to get access to the integrated refuel panel (IRP), P28:

(TASK 06-44-00-800-802)

Number	Name/Location
521DB	Refueling Station Door

SUBTASK 28-31-00-650-001

(7) Make sure the fuel tanks have the fuel quantities as follows:

(a) Do these steps to find the minimum quantity of fuel for each main tank:

1) If you installed a dry jettison pump in a main fuel tank before this test or if a jettison pump is not primed, make sure that the tank contains a minimum of 24,000 lb (10,886 kg) of fuel.

NOTE: When a main tank contains 24,000 lb (10,886 kg) of fuel, the fuel level is above the centerline of the jettison pump. A dry jettison pump will not prime if the fuel level is below the pump centerline.

2) If the jettison pumps in a main fuel tank are wet and primed from operation, make sure there is a minimum of 15,000 lb (6804 kg) of fuel in each main fuel tank.

NOTE: This fuel will prevent dry operation of the fuel jettison pumps because the fuel level will be above the inlets of the jettison pumps.

(b) Make sure the maximum fuel quantity for the each main tank is less than the volumetric shutoff (VSO) value [69,600 lb (31,600 kg)].

(c) Make sure there is 10,000 lb (4536 kg) of fuel (or more) in the center fuel tank.

NOTE: This fuel will prevent dry operation of the center override/jettison pumps.

(d) To refuel the fuel tanks (if it is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

SUBTASK 28-31-00-860-008

WARNING MAKE SURE THAT NO PERSONNEL OR GROUND EQUIPMENT ARE BELOW OR NEAR THE WINGTIPS. FUEL CAN SPILL FROM THE JETTISON NOZZLE OUTLETS AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

WARNING MAKE SURE THAT THERE IS NO PRESSURE IN THE REFUEL/JETTISON MANIFOLD. IF THERE IS PRESSURE IN THE MANIFOLD, A FUEL LEAKAGE CAN OCCUR. FUEL IS DANGEROUS TO PERSONNEL AND EQUIPMENT.

(8) If the refuel/jettison manifold has been pressurized in the last 30 to 60 minutes, do these steps before you continue:

(a) To remove pressure from the refuel/jettison manifold:

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1) Put the REFUEL VALVE CONTROL switches for the left, right and center fuel tanks to the OPEN position.

NOTE: This step will remove pressure from the refuel/jettison manifold.

2) Wait 5 to 10 minutes to remove the pressure in the manifold.

3) Put the refuel valve control switches to the CLOSE position.

SUBTASK 28-31-00-860-019

(9) If the refuel/jettison manifold has not been pressurized in the last 30 to 60 minutes, then continue to the next step.

SUBTASK 28-31-00-710-011

(10) Put the DEFUEL VALVE switch, on the P28 Integrated Refueling Panel, to the OPEN position.

F. Test of the Fuel Jettison System in the Air Mode

SUBTASK 28-31-00-860-003

WARNING

MAKE SURE THAT THE AIRPLANE IS IN THE CONFIGURATION SHOWN. IF THE AIRPLANE IS NOT IN THIS CONFIGURATION WHEN YOU PUT IT IN THE AIR MODE, FUEL CAN SPILL FROM THE JETTISON NOZZLES. SPILLED FUEL CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Make sure the switches are in the positions shown in Table 501:

Table 501/28-31-00-993-803 Airplanes Configuration

SWITCH/CONTROL	POSITION	LOCATION
APU START SWITCH	OFF	P5 OVERHEAD PANEL
APU FIRE SWITCH	NORMAL	P5 OVERHEAD PANEL
AFT FUEL CROSSFEED VALVE	CLOSED	P5 OVERHEAD PANEL
FWD FUEL CROSSFEED VALVE	CLOSED	P5 OVERHEAD PANEL
L AFT FUEL PUMP	OFF	P5 OVERHEAD PANEL
L FWD FUEL PUMP	OFF	P5 OVERHEAD PANEL
L CENTER FUEL PUMP	OFF	P5 OVERHEAD PANEL
L JETTISON NOZZLE VALVE	OFF	P5 OVERHEAD PANEL
R AFT FUEL PUMP	OFF	P5 OVERHEAD PANEL
R FWD FUEL PUMP	OFF	P5 OVERHEAD PANEL
R CENTER FUEL PUMP	OFF	P5 OVERHEAD PANEL
R JETTISON NOZZLE VALVE	OFF	P5 OVERHEAD PANEL
FUEL TO REMAIN SWITCH	OFF	P5 OVERHEAD PANEL
JETTISON ARM SWITCH	OFF	P5 OVERHEAD PANEL
L ENGINE FIRE SWITCH	NORMAL	P8 AISLE STAND
R ENGINE FIRE SWITCH	NORMAL	P8 AISLE STAND
L FUEL CONTROL SWITCH	CUTOFF	P10 AISLE STAND
R FUEL CONTROL SWITCH	CUTOFF	P10 AISLE STAND
DEFUEL VALVE	OPEN	P28 REFUEL PANEL

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SUBTASK 28-31-00-860-010

(2) Do these steps to set a zero fuel weight that will cause the fuel jettison system to operate:

(a) On the FMC display, do these steps as necessary to get access to the PERF INIT page:

1) When the airplane is on the ground with the ADIRU position initialized, push the INIT/REF mode key.

2) Push PERF from the INIT/REF INDEX page.

3) Push PERF INIT from the ACT RTE page or the TAKEOFF REF page.

(b) On line 3L under ZFW, enter a zero fuel weight that is 30,000 lb (13,608 kg) less than the rated maximum landing weight (MLW) for the airplane.

NOTE: This shows the FMC that the airplane gross weight is more than the maximum landing weight and permits the jettison system to operate.

SUBTASK 28-31-00-710-001

(3) To do a test of the jettison isolation valves, jettison nozzle valves and the jettison command function in the air mode, do these steps:

(a) Show the Fuel System Synoptic Page on the Multi-Function Display (TASK 31-61-00-800-816)..



WARNING OBEY THE PROCEDURE THAT PUTS THE AIRPLANE IN THE AIR MODE. IF YOU DO THE PROCEDURE INCORRECTLY, INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.

(b) Put the airplane in the air mode (TASK 32-09-00-860-801).



WARNING THESE JETTISON PUMP CIRCUIT BREAKERS MUST BE OPEN. IF YOU DO NOT OPEN THESE CIRCUIT BREAKERS, FUEL WILL SPILL FROM THE JETTISON NOZZLES AT THE WINGTIPS.

(c) Make sure that these circuit breakers are open and have safety tags:

Left Power Management Panel, P110

Row	Col	Number	Name
L	21	C28647	CTR L OVRD FUEL PUMP CTRL
L	22	C28645	L FUEL JETT PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
K	14	C28646	R FUEL JETT PUMP CTRL
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

(d) Push the JETTISON ARM switch-light, on the P5 Overhead Panel, to the ARMED position.

NOTE: Put a bucket or container below the fuel jettison nozzles at the wing tips to catch any fuel that may spill.

(e) On the upper EICAS display, look at the bottom right corner for the quantities, TOTAL FUEL and TO REMAIN.

(f) Make sure MLW is shown to the right of the TO REMAIN quantity.

(g) Make sure the total fuel quantity is a minimum of 38,000 lb (17,237 kg).

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(h) Make sure the TO REMAIN quantity is less than the total fuel quantity.

(i) Look at the Fuel System Synoptic Page on the Multi-Function Display to make sure the TOTAL FUEL quantity and the TO REMAIN quantity are the same as those shown on the EICAS display.

(j) Push the L and R JETTISON NOZZLE switch-lights, on the P5 Overhead Panel, to the ON position.

NOTE: A small quantity of fuel can spill from the fuel jettison nozzles at the wing tips when the nozzle valves open.

(k) Look at the Fuel System Synoptic Page on the Multi-Function Display to make sure the valves are in the positions shown below:

Table 502/28-31-00-993-804

Valve	Position
LEFT JETTISON ISOLATION VALVE	OPEN
LEFT JETTISON NOZZLE VALVE	OPEN
RIGHT JETTISON ISOLATION VALVE	OPEN
RIGHT JETTISON NOZZLE VALVE	OPEN

(l) Push the L and R JETTISON NOZZLE switch-lights, on the P5 Overhead Panel, to the OFF position.

(m) Push the JETTISON ARM switch-light, on the P5 Overhead Panel, to the OFF position.

(n) Look at the Fuel System Synoptic Page on the EICAS Display to make sure the valves are in the positions shown below (TASK 31-61-00-800-816):

Table 503/28-31-00-993-805

Valve	Position
LEFT JETTISON ISOLATION VALVE	CLOSED
LEFT JETTISON NOZZLE VALVE	CLOSED
RIGHT JETTISON ISOLATION VALVE	CLOSED
RIGHT JETTISON NOZZLE VALVE	CLOSED

(o) Make sure these EICAS status messages show:

1) FUEL JETT PUMP L
2) FUEL JETT PUMP R

(p) Make sure these EICAS status messages do not show:

1) FUEL JETT NOZZLE L
2) FUEL JETT NOZZLE R
3) JETT ISLN VALVE L
4) JETT ISLN VALVE R

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G. Test of the Fuel Jettison System in the Ground Mode

SUBTASK 28-31-00-860-004

WARNING MAKE SURE THAT THE AIRPLANE IS IN THE GROUND MODE. IF THE AIRPLANE IS IN THE AIR MODE, FUEL CAN SPILL FROM THE JETTISON NOZZLES. SPILLED FUEL CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Put the airplane back to the ground mode (TASK 32-09-00-860-801).

SUBTASK 28-31-00-860-005

(2) To show the Maintenance Page "Fuel Management" on the EICAS Display, do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

(a) Make sure the COMMAND and STATUS indications for the L and R JETT NOZ VLV show as CLOSED and CLOSED respectively.

SUBTASK 28-31-00-710-002

(3) Do these steps to make sure the left and right jettison isolation valves close:

NOTE: To make sure the valves are closed, fuel pressure from the center tank is applied to each isolation valve. A refuel valve in each main tank is opened to allow fuel transfer if the isolation valves are open.

(a) Make sure the JETTISON ARM switch-light, on the P5 Overhead Panel, is in the off position.

(b) Put the DEFUEL VALVE switch, on the P28 Integrated Refueling Panel, to the CLOSE position.

(c) Make sure that these circuit breakers are open and have safety tags:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
K	14	C28646	R FUEL JETT PUMP CTRL

(d) Make sure that these circuit breakers are closed:

Left Power Management Panel, P110

Row	Col	Number	Name
L	21	C28647	CTR L OVRD FUEL PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

(e) Put the REFUEL VALVE CONTROL switch, on the IRP (P28), for the right main tank to the OPEN position (Figure 502).

(f) Push the L and R CENTER PUMPS switch-lights, on the P5 Overhead Panel, to the ON position.

(g) Make sure the amber PRESS light goes off for the L and R CENTER PUMPS switch-light on the P5 Overhead Panel.

NOTE: The PRESS light will go off in approximately 10 seconds.

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(h) Make sure the fuel quantity in the right main fuel tank does not increase.

NOTE: This step makes sure the left and right jettison isolation valves are closed.

1) Wait for 2 minutes to make sure the fuel quantity in the right main fuel tank does not increase.

(i) Push the L and R CENTER PUMPS switch-lights, on the P5 Overhead Panel, to the off position.

(j) Put the REFUEL VALVE CONTROL switch, on the IRP (P28), for right main tank to the CLOSE position (Figure 502).

SUBTASK 28-31-00-710-003

(4) Do these steps to make sure the right jettison isolation valve opens:

NOTE: To make sure the valve opens, fuel is transferred from the center fuel tank through the right jettison isolation valve into the right main fuel tank.

(a) Make sure the DEFUEL VALVE switch, on the P28 Integrated Refueling Panel, is in the CLOSE position.

(b) Make sure the FUEL CROSSFEED FWD and AFT switch-lights on the P5 Overhead Panel are in the closed position.

(c) Make sure that these circuit breakers are open and have safety tags:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
K	14	C28646	R FUEL JETT PUMP CTRL

(d) Open these circuit breakers and install safety tags:

Left Power Management Panel, P110

Row	Col	Number	Name
L	21	C28647	CTR L OVRD FUEL PUMP CTRL
L	24	C28631	L FUEL JETT ISLN VLV

(e) Make sure that these circuit breakers are closed:

Right Power Management Panel, P210

Row	Col	Number	Name
K	13	C28630	R JETT ISLN VLV
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

(f) Push the JETTISON ARM switch-light, on the P5 Overhead Panel, to the ARMED position.

(g) Put the REFUEL VALVE CONTROL switch for the right main tank in the OPEN position, on the IRP (P28) (Figure 502).

(h) Push the R CENTER PUMPS switch-light, on the P5 Overhead Panel, to the ON position.

(i) Make sure the amber PRESS light goes off for the R CENTER PUMP switch-light, on the P5 Overhead Panel.

NOTE: The PRESS light will go off in approximately 10 seconds.

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(j) Make sure the fuel quantity in the right main fuel tank increases by 2000 lb (907 kg).

NOTE: The fuel quantity will transfer in approximately 2 minutes.

(k) Push the R CENTER PUMPS switch-light, on the P5 Overhead Panel, to the off position.

(l) Push the JETTISON ARM switch-light, on the P5 Overhead Panel, to the off position.

(m) Put the REFUEL VALVE CONTROL switch for the right main tank in the CLOSE position, on the IRP (P28).

SUBTASK 28-31-00-710-004

(5) Do these steps to make sure the left jettison isolation valve opens:

NOTE: To make sure the valve opens fuel is transferred from the center fuel tank through the left jettison isolation valve into the left main fuel tank.

(a) Make sure the DEFUEL VALVE switch, on the P28 Integrated Refueling Panel, is in the CLOSE position.

(b) Make sure that these circuit breakers are open and have safety tags:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
K	14	C28646	R FUEL JETT PUMP CTRL

(c) Open these circuit breakers and install safety tags:

Right Power Management Panel, P210

Row	Col	Number	Name
K	13	C28630	R JETT ISLN VLV
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

(d) Remove the safety tags and close these circuit breakers:

Left Power Management Panel, P110

Row	Col	Number	Name
L	21	C28647	CTR L OVRD FUEL PUMP CTRL
L	24	C28631	L FUEL JETT ISLN VLV

(e) Push the JETTISON ARM switch-light, on the P5 Overhead Panel, to the ARMED position.

(f) Put the REFUEL VALVE CONTROL switch for the left main tank in the OPEN position, on the IRP (P28) (Figure 502).

(g) Push the L CENTER PUMPS switch-light, on the P5 Overhead Panel, to the ON position.

(h) Make sure the amber PRESS light goes off for the L CENTER PUMPS switch-light, on the P5 Overhead Panel.

NOTE: The PRESS light will go off in approximately 10 seconds.

(i) Make sure the fuel quantity in the left main fuel tank increases by 2000 lb (907 kg).

NOTE: The fuel quantity will transfer in approximately 2 minutes.

(j) Push the L CENTER PUMPS switch-light, on the P5 Overhead Panel, to the off position.

(k) Push the JETTISON ARM switch-light, on the P5 Overhead Panel, to the off position.

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(l) Put the REFUEL VALVE CONTROL switch for the left main tank in the CLOSE position, on the IRP (P28).

(m) Put the DEFUEL VALVE switch, on the P28 Integrated Refueling Panel, to the OPEN position.

ARO 005-999; ARO 001-004 POST SB 777-28-0078

SUBTASK 28-31-00-860-023

(6) Do these steps to check the jettison pump operation:

(a) Access the Fuel Management Maintenance Page (Showing a Maintenance Page, TASK 31-61-00-800-804)

1) Verify the status of the Left and Right MAIN JETT pumps show OFF and NO PRESS.

(b) Disconnect the electrical connector DS28111 from the left fuel jettison pump pressure switch (WDM 28-31-11).

(c) Disconnect the electrical connector DS28211 from the right fuel jettison pump pressure switch (WDM 28-31-21).

(d) Access the Fuel Management Maintenance Page (Showing a Maintenance Page, TASK 31-61-00-800-804)

1) Verify the status of the Left and Right MAIN JETT pumps show OFF and PRESS.

(e) Remove the safety tags and close these circuit breakers:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
K	14	C28646	R FUEL JETT PUMP CTRL

Standby Power Management Panel, P310

Row	Col	Number	Name
J	10	C28637	DFUEL VLVS

(f) Open this access panel:

(TASK 06-44-00-800-802)

Number	Name/Location
521DB	Refueling Station Door

1) Put the DEFUEL VALVE switch, on the P28 Integrated Refueling Panel, to the OPEN position.

(g) Push the JETTISON ARM switch-light, on the P5 Overhead Panel, to the ARMED position.

(h) Listen to make sure the left and right jettison pumps operate.

(i) Access the Fuel Management Maintenance Page (Showing a Maintenance Page, TASK 31-61-00-800-804)

1) Verify the status of the Left and Right MAIN JETT pumps show ON and PRESS.

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ARO 005-999; ARO 001-004 POST SB 777-28-0078 (Continued)

(j) Open this circuit breaker and install safety tag:

Standby Power Management Panel, P310

Row	Col	Number	Name
J	10	C28637	DFUEL VLVS

(k) Listen to make sure the left and right jettison pumps operate.

(l) Install a jumper between pin 2 and 3 on the electrical connector DS28111.

NOTE: The jumper is installed on the ship side connector not the pressure switch.

1) Make a record of the time.

(m) Listen to make sure the left jettison pump turns off in 20 seconds or less.

(n) Remove the jumper between pin 2 and 3 of electrical connector DS28111.

(o) Listen to make sure the left jettison pump operates.

(p) Install a jumper between pin 2 and 3 on the electrical connector DS28211.

NOTE: The jumper is installed on the ship side connector not the pressure switch.

1) Make a record of the time.

(q) Listen to make sure the right jettison pump turns off in 20 seconds or less.

(r) Remove the jumper between pin 2 and 3 of electrical connector DS28211.

(s) Listen to make sure the right jettison pump operates.

(t) Push the JETTISON ARM switch-light, on the P5 Overhead Panel, to the OFF position.

(u) Listen to make sure left and right jettison pumps turn off.

(v) Put the DEFUEL VALVE switch, on the P28 Integrated Refueling Panel, to the CLOSED position.

(w) Remove the safety tag and close this circuit breaker:

Standby Power Management Panel, P310

Row	Col	Number	Name
J	10	C28637	DFUEL VLVS

(x) Connect the electrical connector DS28111, to the left fuel jettison pump pressure switch.

(y) Connect the electrical connector DS28211, to the right fuel jettison pump pressure switch.

ARO ALL

SUBTASK 28-31-00-860-009

(7) Do these steps to make sure the jettison pumps operate and to remove the EICAS messages for the jettison pumps and jettison isolation valves:

NOTE: Put a bucket or container below the fuel jettison nozzles at the wing tips to catch any fuel that may spill.

(a) Make sure the DEFUEL VALVE switch, on the P28 Integrated Refueling Panel, is in the OPEN position.

(b) Remove the safety tags and close these circuit breakers:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL

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Right Power Management Panel, P210

Row	Col	Number	Name
K	13	C28630	R JETT ISLN VLV
K	14	C28646	R FUEL JETT PUMP CTRL
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

(c) Make sure that these circuit breakers are closed:

Left Power Management Panel, P110

Row	Col	Number	Name
L	21	C28647	CTR L OVRD FUEL PUMP CTRL
L	24	C28631	L FUEL JETT ISLN VLV

(d) Push the JETTISON ARM switch-light, on the P5 Overhead Panel, to the ARMED position.

(e) Make sure the COMMAND and STATUS indication for the L and R MAIN JET PUMP show as ON and PRESS respectively, on the Fuel Management Maintenance Page.

NOTE: It can take 60 seconds for the maintenance page indications to change.

(f) Look to make sure fuel does not leak from the left and right fuel jettison nozzles.

(g) Push the JETTISON ARM switch-light, on the P5 Overhead Panel, to the off position.

(h) Make sure the COMMAND and STATUS indication for the L and R MAIN JET PUMP show as OFF and NO PRESS respectively, on the Fuel Management Maintenance Page.

NOTE: It can take 60 seconds for the maintenance page indications to change.

SUBTASK 28-31-00-810-003

(8) Do a check for the EICAS status messages (TASK 31-61-00-800-813).

SUBTASK 28-31-00-810-004

(9) To clear any EICAS messages, do the applicable FIM procedure for the EICAS messages shown.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 28-31-00-710-010

(1) Put the DEFUEL VALVE switch, on the P28 Integrated Refueling Panel, to the CLOSE position.

SUBTASK 28-31-00-410-001

(2) Close this access door:

(TASK 06-44-00-800-802)

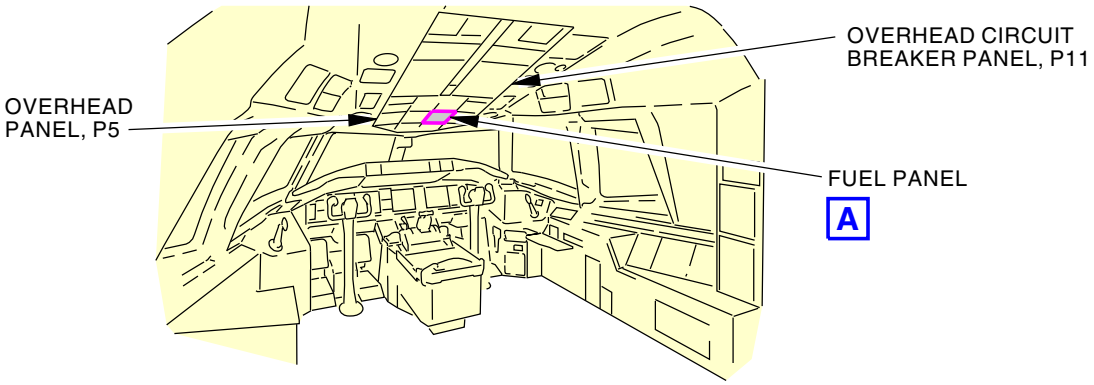
Number	Name/Location
521DB	Refueling Station Door

SUBTASK 28-31-00-440-001

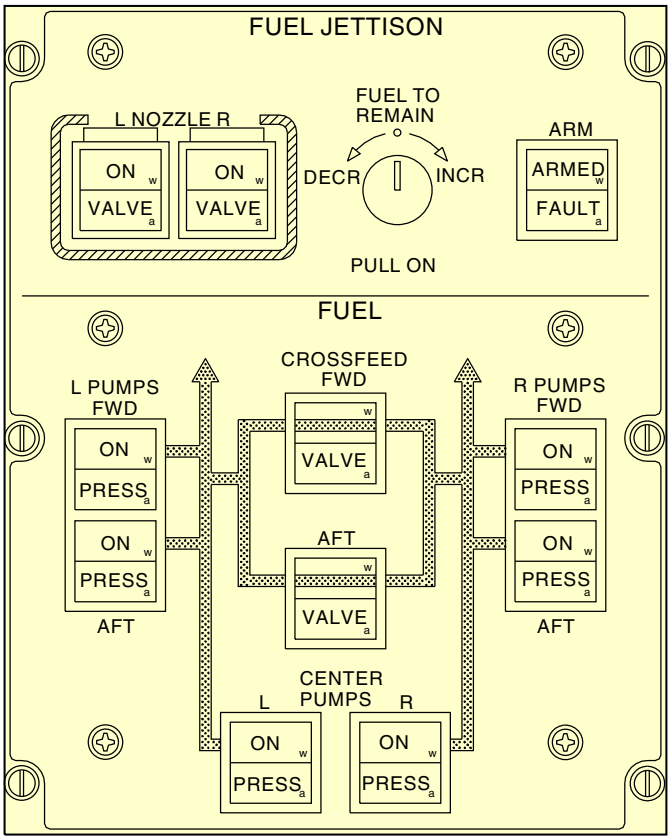
(3) Remove the DO-NOT-OPERATE tag from the flap control lever (TASK 27-81-00-440-801).

——— END OF TASK ———

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FLIGHT COMPARTMENT



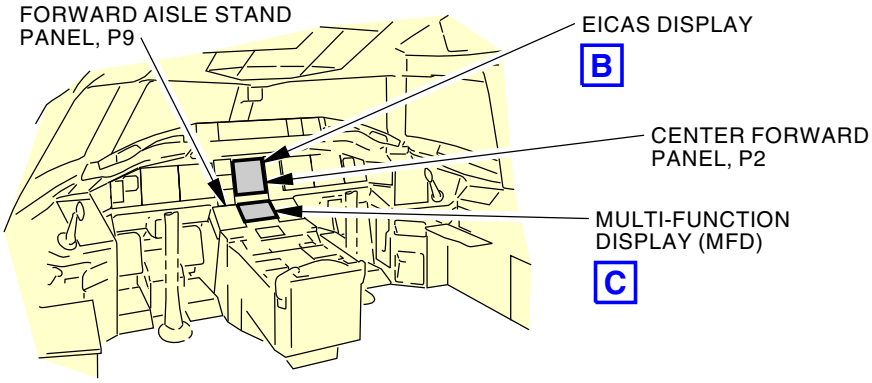
FUEL/FUEL JETTISON PANEL, M28001

A

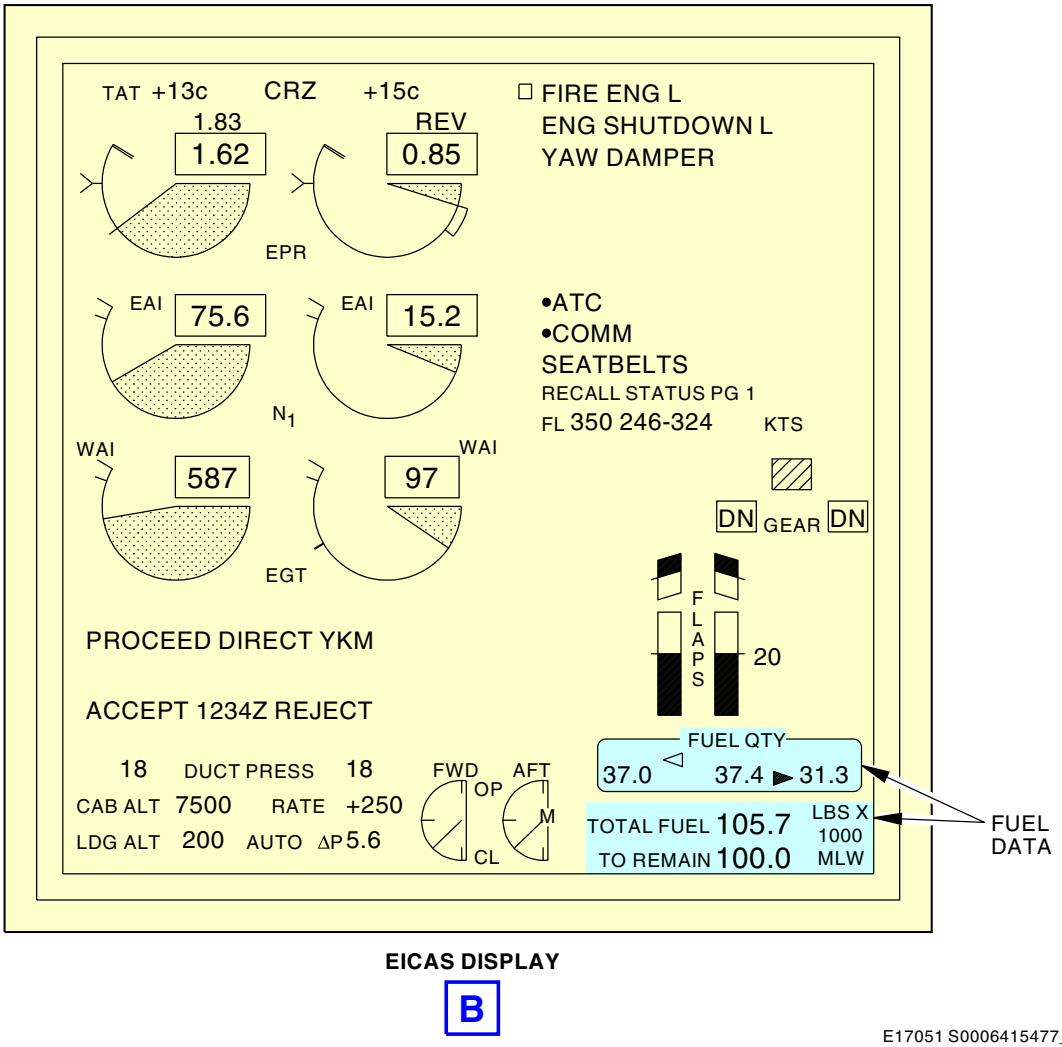
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Fuel Jettison System Test
Figure 501/28-31-00-990-801 (Sheet 1 of 7)

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FLIGHT COMPARTMENT



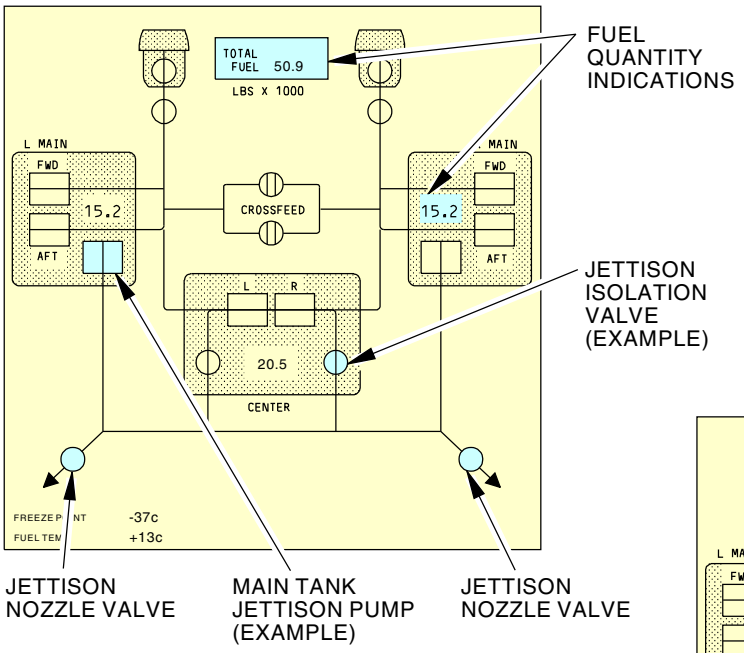
EICAS DISPLAY

B

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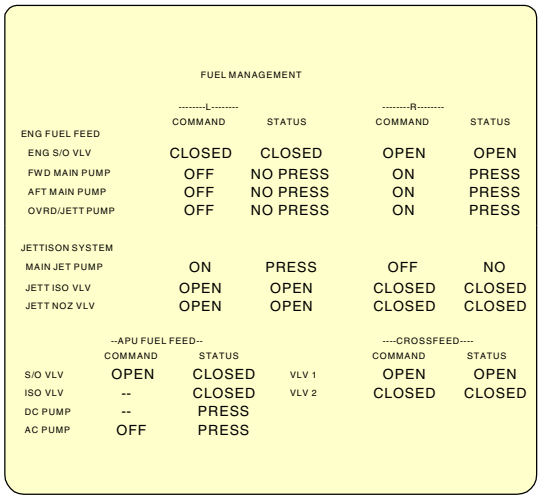
Fuel Jettison System Test
Figure 501/28-31-00-990-801 (Sheet 2 of 7)

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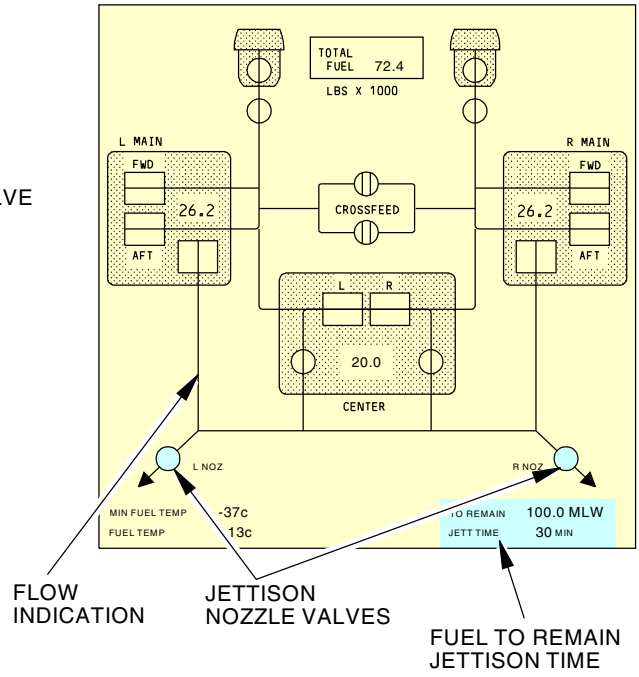
MULTI-FUNCTION DISPLAY
(FUEL SYNOPTIC PAGE - NORMAL)

C



MULTI-FUNCTION DISPLAY
(FUEL MANAGEMENT MAINTENANCE PAGE)

C



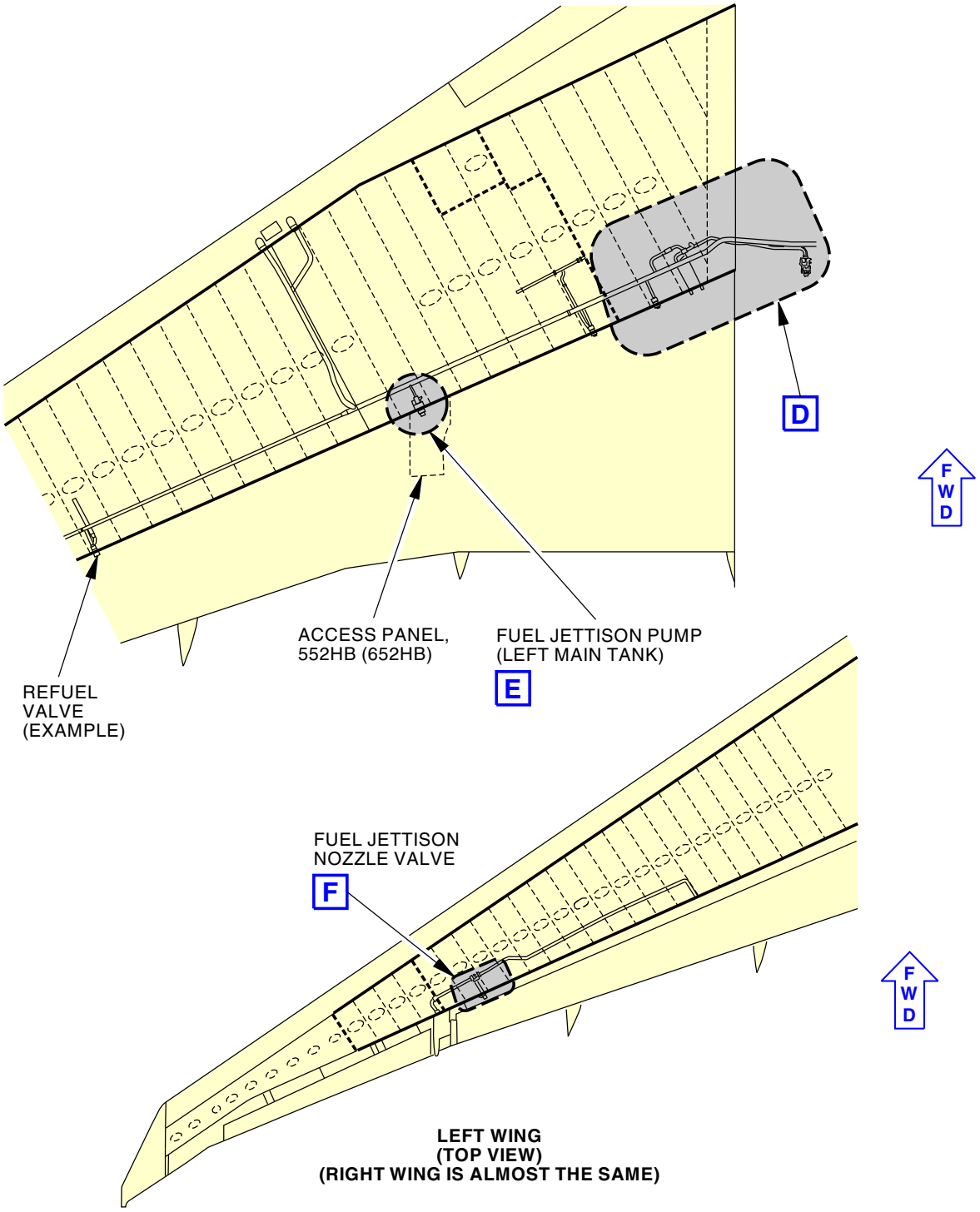
MULTI-FUNCTION DISPLAY
(FUEL SYNOPTIC PAGE - FUEL JETTISON)

C

E17052 S0006415478_V2

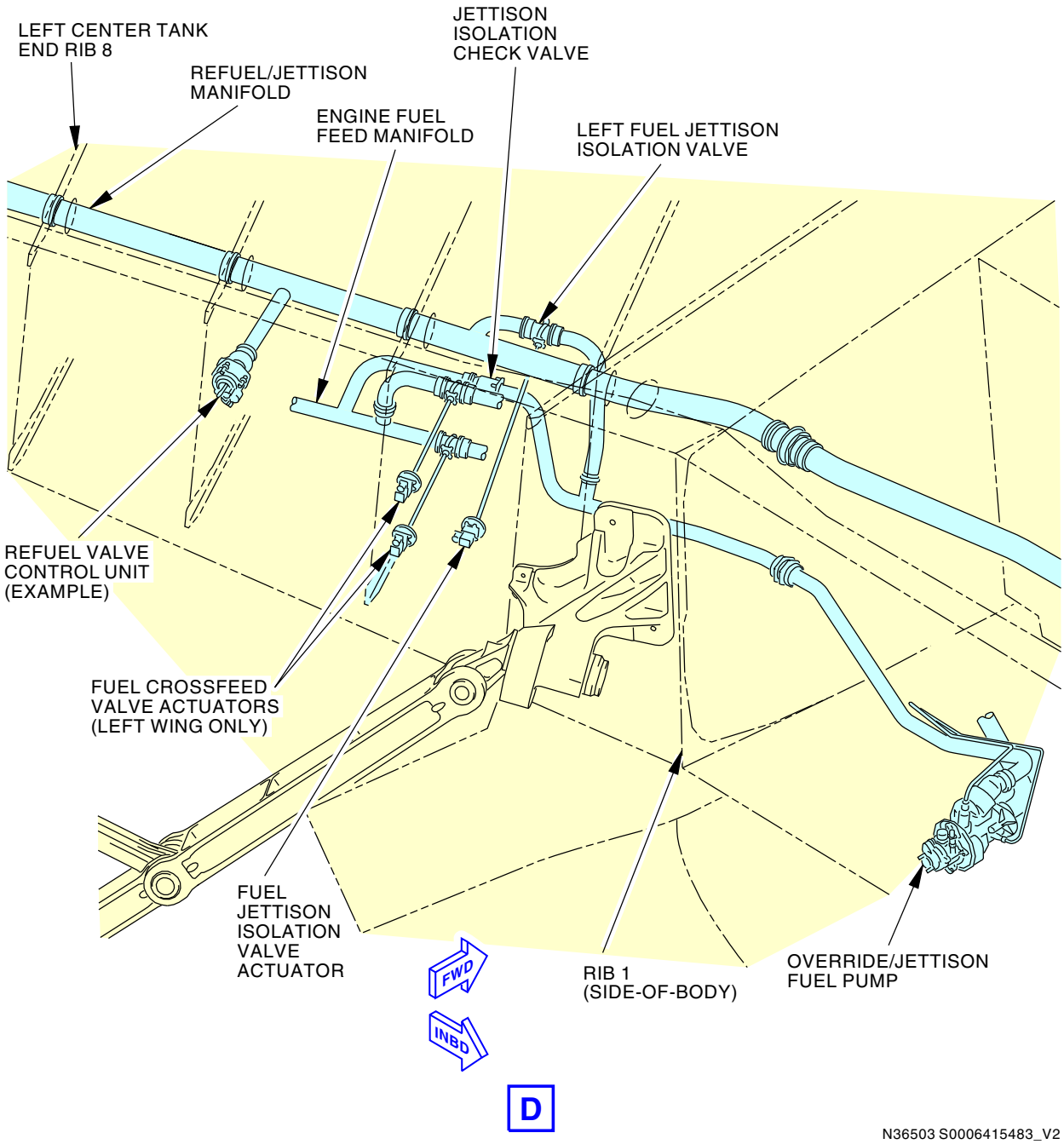
Fuel Jettison System Test
Figure 501/28-31-00-990-801 (Sheet 3 of 7)

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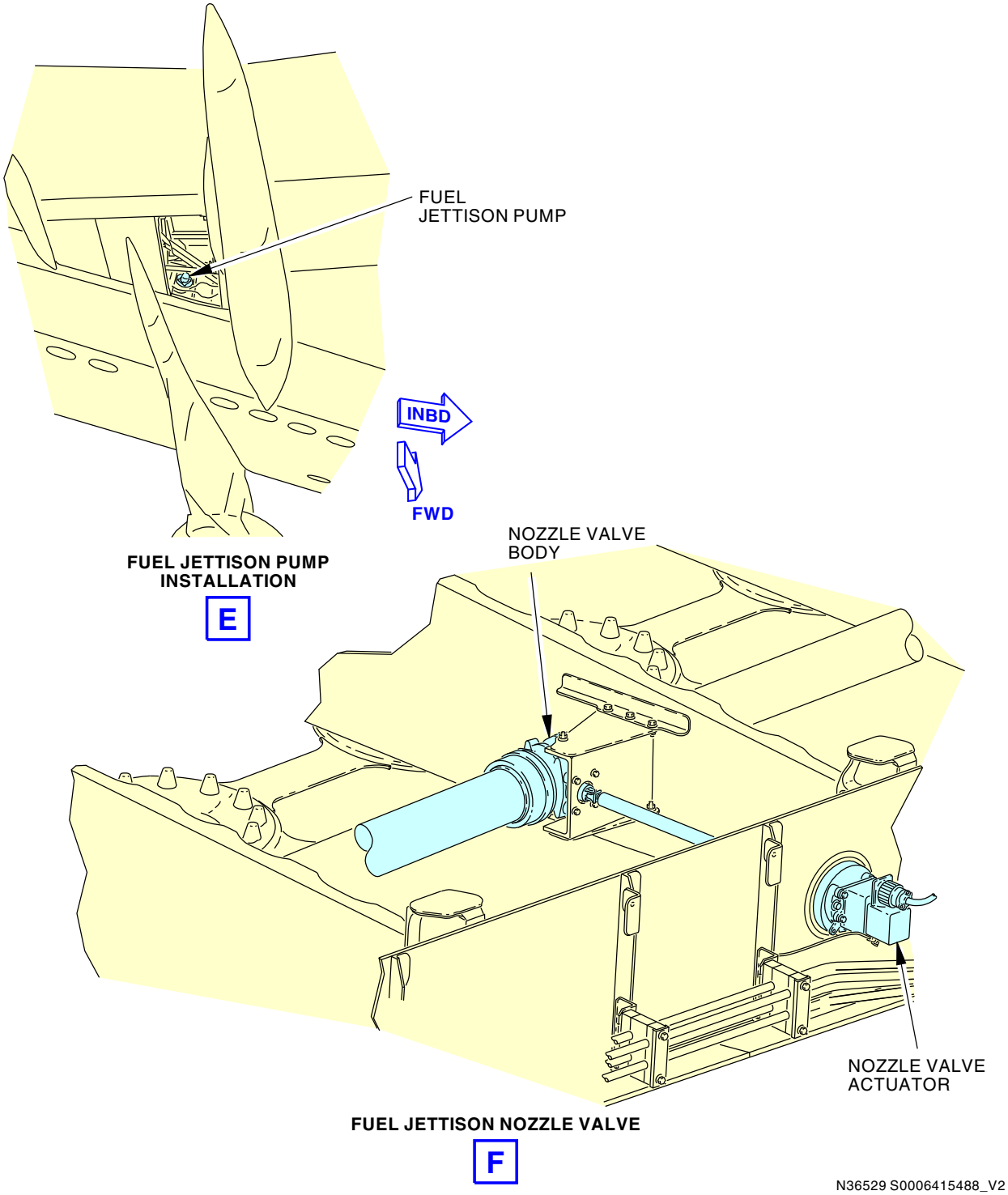
Fuel Jettison System Test
Figure 501/28-31-00-990-801 (Sheet 4 of 7)

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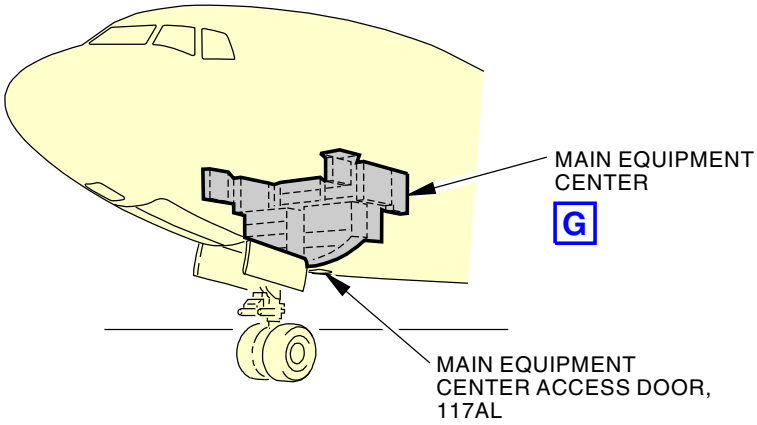
Fuel Jettison System Test
Figure 501/28-31-00-990-801 (Sheet 5 of 7)

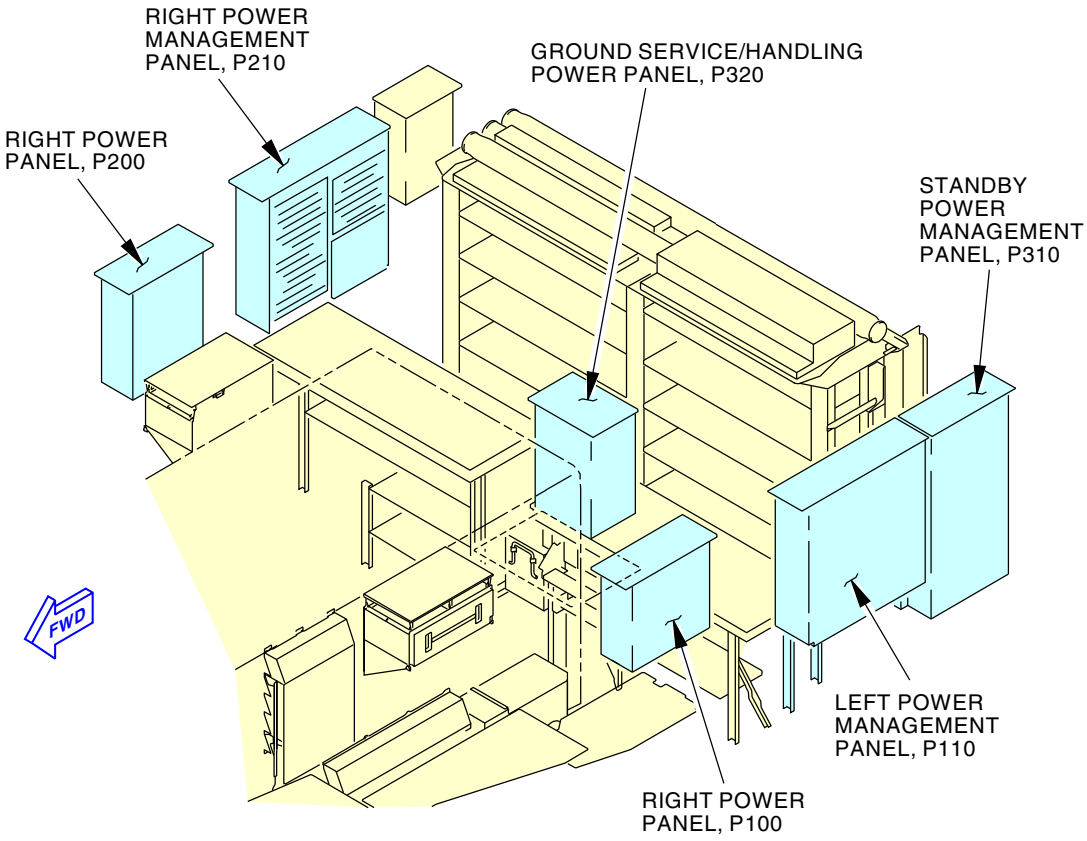
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Fuel Jettison System Test
Figure 501/28-31-00-990-801 (Sheet 6 of 7)

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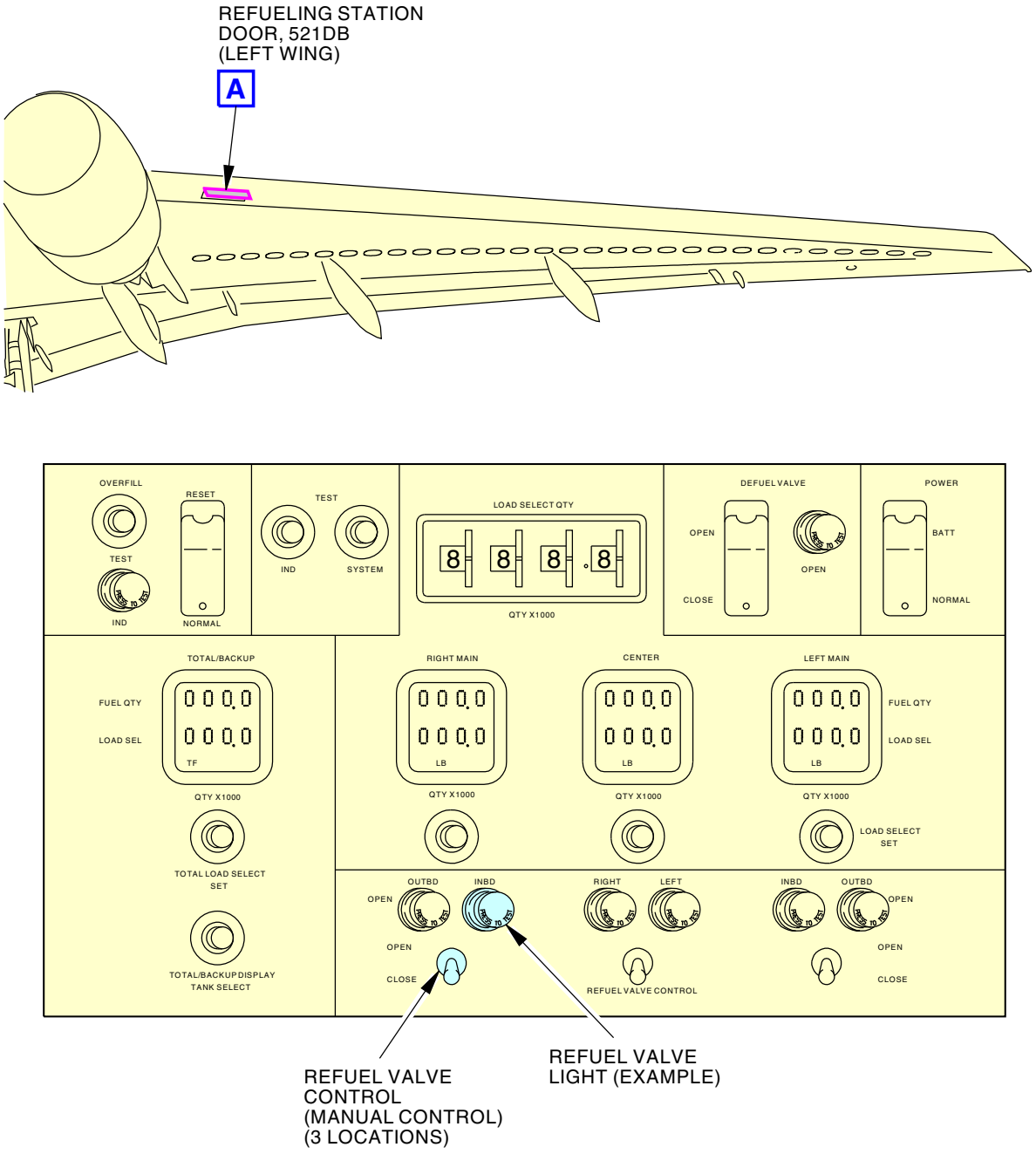
MAIN EQUIPMENT CENTER

G

N36535 S0006415489_V2

Fuel Jettison System Test
Figure 501/28-31-00-990-801 (Sheet 7 of 7)

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INTEGRATED REFUEL PANEL (IRP), P28

A

E24872 S0006415490_V2

Refueling Station
Figure 502/28-31-00-990-802

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TASK 28-31-00-710-801

3. Fuel/Fuel Jettison Panel (M28001) - Operational Test

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
31-61-00-800-802	Erasing a EICAS Status Message Latched by AIMS (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
31-61-00-800-813	Showing Status Messages (P/B 201)
31-61-00-800-816	Showing a System Synoptic Page (P/B 201)
32-09-00-860-801	Air/Ground Mode Simulation (P/B 201)

B. Location Zones

Zone	Area
117	Main Equipment Center, Left
118	Main Equipment Center, Right
211	Flight Compartment, Left
212	Flight Compartment, Right
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing

C. Access Panels

Number	Name/Location
521DB	Refueling Station Door

D. Procedure

SUBTASK 28-31-00-860-011

(1) Open these circuit breakers and install safety tags:

Left Power Management Panel, P110

Row	Col	Number	Name
L	21	C28647	CTR L OVRD FUEL PUMP CTRL
L	22	C28645	L FUEL JETT PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
K	14	C28646	R FUEL JETT PUMP CTRL
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

SUBTASK 28-31-00-860-012

(2) Make sure that these circuit breakers are closed:

Left Power Management Panel, P110

Row	Col	Number	Name
L	26	C28607	L AFT FUEL BOOST PUMP CTRL
L	27	C28606	R FWD FUEL BOOST PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
K	11	C28609	R AFT FUEL BOOST PUMP CTRL

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Standby Power Management Panel, P310

Row	Col	Number	Name
B	2	C28604	L FWD FUEL BOOST PUMP CTRL

SUBTASK 28-31-00-860-013

(3) Make sure the FUEL JETTISON ARM switch-light on the Fuel/Fuel Jettison Panel (P5 overhead panel) is in the off position.

SUBTASK 28-31-00-860-014

(4) Make sure the airplane is in the ground mode.

SUBTASK 28-31-00-650-002

(5) Make sure the fuel tanks have the fuel quantities as follows:

(a) Do these steps to find the minimum quantity of fuel for each main tank:

1) If you installed a dry jettison pump in a main fuel tank before this test or if a jettison pump is not primed, make sure that the tank contains a minimum of 24,000 lb (10,886 kg) of fuel.

NOTE: When a main tank contains 24,000 lb (10,886 kg) of fuel, the fuel level is above the centerline of the jettison pump. A dry jettison pump will not prime if the fuel level is below the pump centerline.

2) If the jettison pumps in a main fuel tank are wet and primed from operation, make sure there is a minimum of 15,000 lb (6804 kg) of fuel in each main fuel tank.

NOTE: This fuel will prevent dry operation of the fuel jettison pumps because the fuel level will be above the inlets of the jettison pumps.

(b) Make sure there is 10,000 lb (4536 kg) of fuel (or more) in the center fuel tank.

NOTE: This fuel will prevent dry operation of the center override/jettison pumps.

(c) To refuel the fuel tanks (if it is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

SUBTASK 28-31-00-860-015

WARNING MAKE SURE THAT NO PERSONNEL OR GROUND EQUIPMENT ARE BELOW OR NEAR THE WINGTIPS. FUEL CAN SPILL FROM THE JETTISON NOZZLE OUTLETS AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

CAUTION FUEL IN THE REFUEL/JETTISON MANIFOLD CAN BE PRESSURIZED 1-2 HOURS AFTER REFUELING, DEFUELING, FUEL JETTISON OR FUEL TRANSFER OPERATIONS. IF THE JETTISON NOZZLE VALVES ARE OPENED FUEL CAN SPILL FROM THE JETTISON NOZZLE OUTLETS.

(6) If the refuel/jettison manifold has been pressurized in the last 1-2 hours, do these steps before you continue:

(a) To remove pressure from the refuel/jettison manifold:

1) Put the refuel valve control switches for the left, right and center fuel tanks to the OPEN position.

NOTE: This step will remove pressure from the refuel/jettison manifold.

2) Wait 5 to 10 minutes to remove the pressure in the manifold.

3) Put the refuel valve control switches to the CLOSED position.

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SUBTASK 28-31-00-860-020

(7) If the refuel/jettison manifold has not been pressurized in the last 30 to 60 minutes, then continue to the next step.

SUBTASK 28-31-00-860-016

(8) Do these steps to set a zero fuel weight that will permit you to do a test of the fuel jettison module:

(a) On the FMC display, do these steps as necessary to get access to the PERF INIT page:

1) When the airplane is on the ground with the ADIRU position initialized, push the INIT/REF mode key.

2) Push PERF from the INIT/REF INDEX page.

3) Push PERF INIT from the ACT RTE page or the TAKEOFF REF page.

(b) On line 3L under ZFW, enter a zero fuel weight that is 30,000 pounds (14,000 kilograms) less than the rated maximum landing weight (MLW) for the airplane.

NOTE: This shows the FMC that the airplane gross weight is more than the maximum landing weight and permits the jettison system to operate.

SUBTASK 28-31-00-710-005

(9) Do these steps to do a test of the FUEL JETTISON ARM switch-light:

(a) Open this access panel:

Number	Name/Location
521DB	Refueling Station Door

1) Put the DEFUEL VALVE switch, on the Integrated Refuel Panel (IRP), P28, to the OPEN position.

(b) Push the FUEL JETTISON ARM switch-light to ARMED.

(c) On the Fuel Management MAINTENANCE PAGE, make sure the L & R JETT ISO VLV STATUS are OPEN.

(d) Push the FUEL JETTISON ARM switch-light to the off position.

(e) Put the DEFUEL VALVE switch, on the IRP, P28, to the CLOSE position.

(f) Close this access panel:

Number	Name/Location
521DB	Refueling Station Door

(g) On the Fuel Management MAINTENANCE PAGE, make sure the L & R JETT ISO VLV STATUS are CLOSED.

SUBTASK 28-31-00-860-017

(10) Do these steps to do a test of the L NOZZLE valve switch-light and the R NOZZLE valve switch-light in the ground mode:

(a) Make sure that these circuit breakers are closed:

Left Power Management Panel, P110

Row	Col	Number	Name
L	25	C28621	L FUEL JETT NOZ VLV

Right Power Management Panel, P210

Row	Col	Number	Name
K	12	C28620	R FUEL JETT NOZ VLV

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(b) Push the L NOZZLE valve switch-light on the Fuel/Fuel Jettison panel (P5 Overhead Panel) to ON.

(c) Make sure the EICAS advisory message FUEL JETT NOZZLE L shows on the EICAS display within one minute.

(d) Make sure the L NOZZLE valve switch-light VALVE light is on.

NOTE: The VALVE light shows a fault with the left nozzle valve.

(e) Push the L NOZZLE valve switch-light on the Fuel/Fuel Jettison panel (P5 Overhead Panel) to the off position.

(f) Make sure the advisory message FUEL JETT NOZZLE L is not shown on the EICAS display within one minute.

(g) Make sure the L NOZZLE valve switch-light VALVE light is off.

(h) Push the R NOZZLE valve switch-light on the Fuel/Fuel Jettison panel (P5 Overhead Panel) to ON.

(i) Make sure the EICAS advisory message FUEL JETT NOZZLE R shows on the EICAS display within one minute.

(j) Push the R NOZZLE valve switch-light on the Fuel/Fuel Jettison panel (P5 Overhead Panel) to the off position.

(k) Make sure the advisory message FUEL JETT NOZZLE R is not shown on the EICAS display within one minute.

(l) Make sure the R NOZZLE valve switch-light VALVE light is off.

WARNING

OBEY THE PROCEDURE THAT PUTS THE AIRPLANE IN THE AIR MODE. IF YOU DO THE PROCEDURE INCORRECTLY, INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.

(m) Put the airplane in the air mode. To put it in the air mode, do this task: Air/Ground Mode Simulation, TASK 32-09-00-860-801.

(n) Place a bucket or container below the fuel jettison nozzles at each wing tip.

NOTE: This is to catch fuel that comes out from the Refuel/Jettison Manifold.

(o) Push the L NOZZLE valve switch-light on the Fuel/Fuel Jettison panel (P5 Overhead Panel) to ON.

NOTE: Wait 15 seconds each time the switch position is changed, to let the valve go to the commanded position. Make sure the valve status goes to the correct position each time you push the switch.

(p) Make sure the advisory message FUEL JETT NOZZLE L is not shown on the EICAS display within one minute.

(q) Make sure the L NOZZLE valve switch-light VALVE light is off.

(r) Push the L NOZZLE valve switch-light on the Fuel/Fuel Jettison panel (P5 Overhead Panel) to the off position.

NOTE: Wait 15 seconds each time the switch position is changed, to let the valve go to the commanded position. Make sure the valve status goes to the correct position each time you push the switch.

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(s) Push the R NOZZLE valve switch-light on the Fuel/Fuel Jettison panel (P5 Overhead Panel) to ON.

NOTE: Wait 15 seconds each time the switch position is changed, to let the valve go to the commanded position. Make sure the valve status goes to the correct position each time you push the switch.

(t) Make sure the advisory message FUEL JETT NOZZLE R is not shown on the EICAS display within one minute.

(u) Make sure the R NOZZLE valve switch-light VALVE light is off.

(v) Push the R NOZZLE valve switch-light on the Fuel/Fuel Jettison panel (P5 Overhead Panel) to the off position.

NOTE: Wait 15 seconds each time the switch position is changed, to let the valve go to the commanded position. Make sure the valve status goes to the correct position each time you push the switch.

(w) Remove the bucket or container at the wing tips.

SUBTASK 28-31-00-710-006

(11) Do these steps to do a test of the FUEL TO REMAIN rotary switch:

(a) Open this access panel:

Number	Name/Location
521DB	Refueling Station Door

1) Put the DEFUEL VALVE switch, on the Integrated Refuel Panel (IRP), P28, to the OPEN position.

(b) Push the FUEL JETTISON ARM switch-light to ARMED.

(c) To show the Fuel System Synoptic Page on the Multi-Function Display, do this task: Showing a System Synoptic Page, TASK 31-61-00-800-816.

(d) On the upper EICAS display, look at the bottom right corner for the quantities, TOTAL FUEL and TO REMAIN.

(e) Make sure that MLW shows after the Fuel to Remain value in the bottom right corner of the upper EICAS and on the Fuel System Synoptic Page.

(f) Pull out the FUEL TO REMAIN rotary switch to the on position.

(g) Make sure MAN shows after the FUEL TO REMAIN value in the bottom right corner of the upper EICAS and on the Fuel System Synoptic Page.

(h) Turn the FUEL TO REMAIN switch slightly in the clockwise direction.

(i) Make sure the Fuel To Remain value increases slowly.

(j) Turn the FUEL TO REMAIN switch farther in the clockwise direction.

(k) Make sure the Fuel To Remain value increases faster.

(l) Put the FUEL TO REMAIN switch back to the neutral position (straight up).

(m) Turn the FUEL TO REMAIN switch slightly in the counterclockwise direction.

(n) Make sure the Fuel To Remain value decreases slowly.

(o) Turn the FUEL TO REMAIN switch farther in the counterclockwise direction.

(p) Make sure the Fuel To Remain value decreases faster.

(q) Put the FUEL TO REMAIN switch back to the neutral position (straight up).

(r) Push the FUEL TO REMAIN switch to the off position.

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(s) Push the FUEL JETTISON ARM switch-light to the off position.

(t) Put the DEFUEL VALVE switch, on the IRP, P28, to the CLOSE position.

(u) Close this access panel:

Number	Name/Location
521DB	Refueling Station Door

SUBTASK 28-31-00-860-021

(12) Put the airplane back to ground mode. To put the airplane in ground mode, do this task: Air/Ground Mode Simulation, TASK 32-09-00-860-801.

SUBTASK 28-31-00-710-007

(13) Do these steps to do a test of the boost pump switches:

(a) To show the FUEL MANAGEMENT Maintenance Page on the Multi-Function Display, do this task: Showing a Maintenance Page, TASK 31-61-00-800-804

(b) Make sure that these circuit breakers are closed:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
E	2	C28303	L AFT FUEL BOOST PUMP
E	5	C28307	L FWD FUEL BOOST PUMP

Right Power Management Panel, P210

Row	Col	Number	Name
E	27	C28300	R AFT FUEL BOOST PUMP
F	27	C28306	R FWD FUEL BOOST PUMP R XFR

(c) Push the L PUMPS FWD switch-light to ON.

(d) Make sure this fault message does not show on the MAT:

1) 28-13103

(e) Make sure the FUEL MANAGEMENT Maintenance Page shows the L FWD MAIN PUMP is commanded ON.

(f) Push the L PUMPS FWD switch-light to the off position.

(g) Push the L PUMPS AFT switch-light to ON.

(h) Make sure this fault message does not show on the MAT:

1) 28-11003

(i) Make sure the FUEL MANAGEMENT Maintenance Page shows the L AFT MAIN PUMP is commanded ON.

(j) Push the L PUMPS AFT switch-light to the off position.

(k) Push the R PUMPS FWD switch-light to ON.

(l) Make sure this fault message does not show on the MAT:

1) 28-11006

(m) Make sure the FUEL MANAGEMENT Maintenance Page shows the R FWD MAIN PUMP is commanded ON.

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(n) Push the R PUMPS FWD switch-light to the off position.

(o) Push the R PUMPS AFT switch-light to ON.

(p) Make sure this fault message does not show on the MAT:

1) 28-12013

(q) Make sure the FUEL MANAGEMENT Maintenance Page shows the R AFT MAIN PUMP is commanded ON.

(r) Push the R PUMPS AFT switch-light to the off position.

SUBTASK 28-31-00-710-008

(14) Do these steps to do a test of the CENTER PUMPS switches:

(a) Open this access panel:

Number	Name/Location
521DB	Refueling Station Door

NOTE: The center fuel pumps will not operate when both refueling station doors are closed.

(b) Open these circuit breakers and install safety tags:

Left Power Management Panel, P110

Row	Col	Number	Name
L	21	C28647	CTR L OVRD FUEL PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

(c) Push the L CENTER PUMPS switch-light to ON.

(d) Make sure the L CENTER PUMPS switch-light PRESS light is on.

(e) Make sure the FUEL MANAGEMENT maintenance page shows the L OVRD/JETT PUMP is commanded ON.

(f) Make sure this fault message is shown on the MAT:

1) 28-11002

(g) Remove the safety tag and close this circuit breaker:

Left Power Management Panel, P110

Row	Col	Number	Name
L	21	C28647	CTR L OVRD FUEL PUMP CTRL

(h) Make sure this fault message is not shown on the MAT:

1) 28-11002

(i) Push the L CENTER PUMPS switch-light to the off position.

(j) Push the R CENTER PUMPS switch-light to ON.

(k) Make sure the R CENTER PUMPS switch-light PRESS light is on.

(l) Make sure the FUEL MANAGEMENT maintenance page shows the R OVRD/JETT PUMP is commanded ON.

(m) Make sure this fault message is shown on the MAT:

1) 28-12011

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(n) Remove the safety tag and close this circuit breaker:

Right Power Management Panel, P210

Row	Col	Number	Name
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

(o) Make sure this fault message is not shown on the MAT:

1) 28-12011

(p) Push the R CENTER PUMPS switch-light to the off position.

(q) Close this access panel:

Number	Name/Location
521DB	Refueling Station Door

SUBTASK 28-31-00-710-009

(15) Do these steps to do a test of the crossfeed valve switches:

(a) Push the FUEL CROSSFEED FWD valve switch-light to the open position.

(b) Make sure the FUEL CROSSFEED FWD valve switch-light VALVE fault light is off.

(c) On the FUEL MANAGEMENT maintenance page, make sure the FUEL XFEED VALVE - FWD COMMAND is OPEN.

(d) Open this circuit breaker and install safety tag:

Left Power Management Panel, P110

Row	Col	Number	Name
L	23	C28629	FUEL XFEED VLV FWD

(e) Make sure the FUEL CROSSFEED FWD valve switch-light VALVE fault light comes on within one minute.

(f) Remove the safety tag and close this circuit breaker:

Left Power Management Panel, P110

Row	Col	Number	Name
L	23	C28629	FUEL XFEED VLV FWD

(g) Push the FUEL CROSSFEED FWD valve switch-light to the closed position.

(h) Make sure that this circuit breaker is closed:

Standby Power Management Panel, P310

Row	Col	Number	Name
G	9	C28612	FUEL XFEED VLV AFT

(i) Push the FUEL CROSSFEED AFT valve switch-light to the open position.

(j) Make sure the FUEL CROSSFEED AFT valve switch-light VALVE fault light is off.

(k) On the FUEL MANAGEMENT maintenance page, make sure the FUEL XFEED VALVE - AFT COMMAND is OPEN.

(l) Open this circuit breaker and install safety tag:

Standby Power Management Panel, P310

Row	Col	Number	Name
G	9	C28612	FUEL XFEED VLV AFT

(m) Make sure the FUEL CROSSFEED AFT valve switch-light VALVE fault light comes on within one minute.

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(n) Remove the safety tag and close this circuit breaker:

Left Power Management Panel, P110

Row	Col	Number	Name
L	23	C28629	FUEL XFEED VLV FWD

(o) Push the FUEL CROSSFEED AFT valve switch-light to the closed position.

SUBTASK 28-31-00-810-001

(16) Do a check for EICAS status messages. To do this, do this task: Showing Status Messages, TASK 31-61-00-800-813.

SUBTASK 28-31-00-810-002

(17) To erase an EICAS status message, do this task: Erasing a EICAS Status Message Latched by AIMS, TASK 31-61-00-800-802.

——— END OF TASK ———

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FUEL JETTISON PUMP - REMOVAL/INSTALLATION

1. General

A. There are left and right jettison fuel pumps which move fuel from the main fuel tank to the jettison/refuel manifold. The left and right jettison fuel pumps are installed on the rear spar of the left and right main fuel tanks.

B. The left and right override/jettison fuel pumps, installed in the center fuel tank, can also move fuel to the jettison manifold (TASK 28-26-00-650-802).

C. Each jettison fuel pump contains these parts:

(1) Motor-impeller

(2) Pump housing

(3) Discharge check valve (TASK 28-22-08-000-801)

(4) Vapor vent valve (TASK 28-22-09-000-801)

ARO 005-999; ARO 001-004 POST SB 777-28-0078

(5) Motive flow check valve (PAGEBLOCK 28-22-07/401)

ARO ALL

D. It is not necessary to defuel or go into the main fuel tank to remove and install the motor-impeller for the jettison fuel pumps.

E. This procedure contains these four tasks:

(1) Fuel Jettison Pump Motor-Impeller - Removal

(2) Fuel Jettison Pump Motor-Impeller - Installation

(3) Fuel Jettison Pump Housing - Removal

(4) Fuel Jettison Pump Housing - Installation

TASK 28-31-01-000-801

2. Fuel Jettison Pump (Motor-Impeller) - Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
28-11-00-300-802	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-42-01-000-801	Remove the Fuel Pump Pressure Switch (P/B 401)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Tools/Equipment

Reference	Description
STD-200	Container - Fuel Resistant, 10 gallon (38 l)

C. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing

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(Continued)

Zone	Area
633	Main Tank, Rib 8 To Rib 17 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

D. Access Panels

Number	Name/Location
552HB	Inboard Fixed Trailing Edge Panel
652HB	Inboard Fixed Trailing Edge Panel

E. Procedure

SUBTASK 28-31-01-860-001

WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.

SUBTASK 28-31-01-010-001

(2) Remove this access panel to get access to the left jettison fuel pump, installed on the rear spar, in the left main tank:

(TASK 06-44-00-800-802)

Number	Name/Location
552HB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-31-01-010-002

(3) Remove this access panel to get access to the right jettison fuel pump, installed on the rear spar, in the right main tank:

(TASK 06-44-00-800-802)

Number	Name/Location
652HB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-31-01-860-002

(4) Open these circuit breakers and install safety tags:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
K	14	C28646	R FUEL JETT PUMP CTRL

SUBTASK 28-31-01-020-008

(5) Disconnect the electrical connector [2] from the motor-impeller [4].

SUBTASK 28-31-01-020-009

(6) Disconnect the electrical connector [3] from the pressure switch [13].

(a) Remove the pressure switch [13] to get the clearance for the motor-impeller [4] removal (TASK 28-42-01-000-801).

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SUBTASK 28-31-01-020-010

(7) Remove the four bolts [8] and washers [9].

NOTE: This step also disconnects the bonding jumper [1] at the motor-impeller [4].

(a) Do not remove the other bolts [38] or bolt [53] to remove the motor-impeller [4].

SUBTASK 28-31-01-480-002

(8) Turn the motor-impeller [4] approximately 35 degrees in the counterclockwise direction.

NOTE: Make sure the motor-impeller [4] is turned completely in the counterclockwise direction. The drain plug [6] should be oriented straight down with respect to the pump housing. The motor-impeller [4] has pins inside that must align for removal.

SUBTASK 28-31-01-020-011

CAUTION

MAKE SURE FUEL DOES NOT CONTINUOUSLY DRAIN. IF FUEL CONTINUOUSLY DRAINS, THERE IS A LEAK IN THE PUMP HOUSING. YOU MUST INSTALL THE MOTOR-IMPELLER AND DEFUEL THE FUEL TANK TO PREVENT A FUEL SPILL.

(9) Remove the drain plug [6] from the motor-impeller [4].

NOTE: Approximately 1 qt (1 l) of fuel will drain from the motor-impeller [4].

(a) Put a 10 gallon (38 l) fuel resistant container, STD-200, below the motor-impeller [4] to catch the fuel.

1) If fuel drains continuously, install the drain plug [6] and defuel the fuel tanks (TASK 28-26-00-650-801).

2) Replace the fuel pump housing to repair the leak (TASK 28-31-01-000-802).

(b) Discard the o-ring [7].

SUBTASK 28-31-01-020-001

(10) Pull up on the extraction lever [5] and pull the motor-impeller [4] out to remove it completely.

(a) If it is necessary, fully remove the bonding jumper [1].

NOTE: The full removal of the bonding jumper [1] is necessary if the bonding jumper [1] interferes with the motor-impeller [4] lugs.

1) Remove the sealant from the bonding jumper [1] (TASK 28-11-00-300-802).

2) Remove the bolt [53] and washer [39] that connects the bonding jumper [1] to the structure.

3) Remove the bonding jumper [1].

(b) Discard o-ring [10], o-ring [11], and o-ring [12].

SUBTASK 28-31-01-650-001

(11) If fuel continuously drains, do these steps:

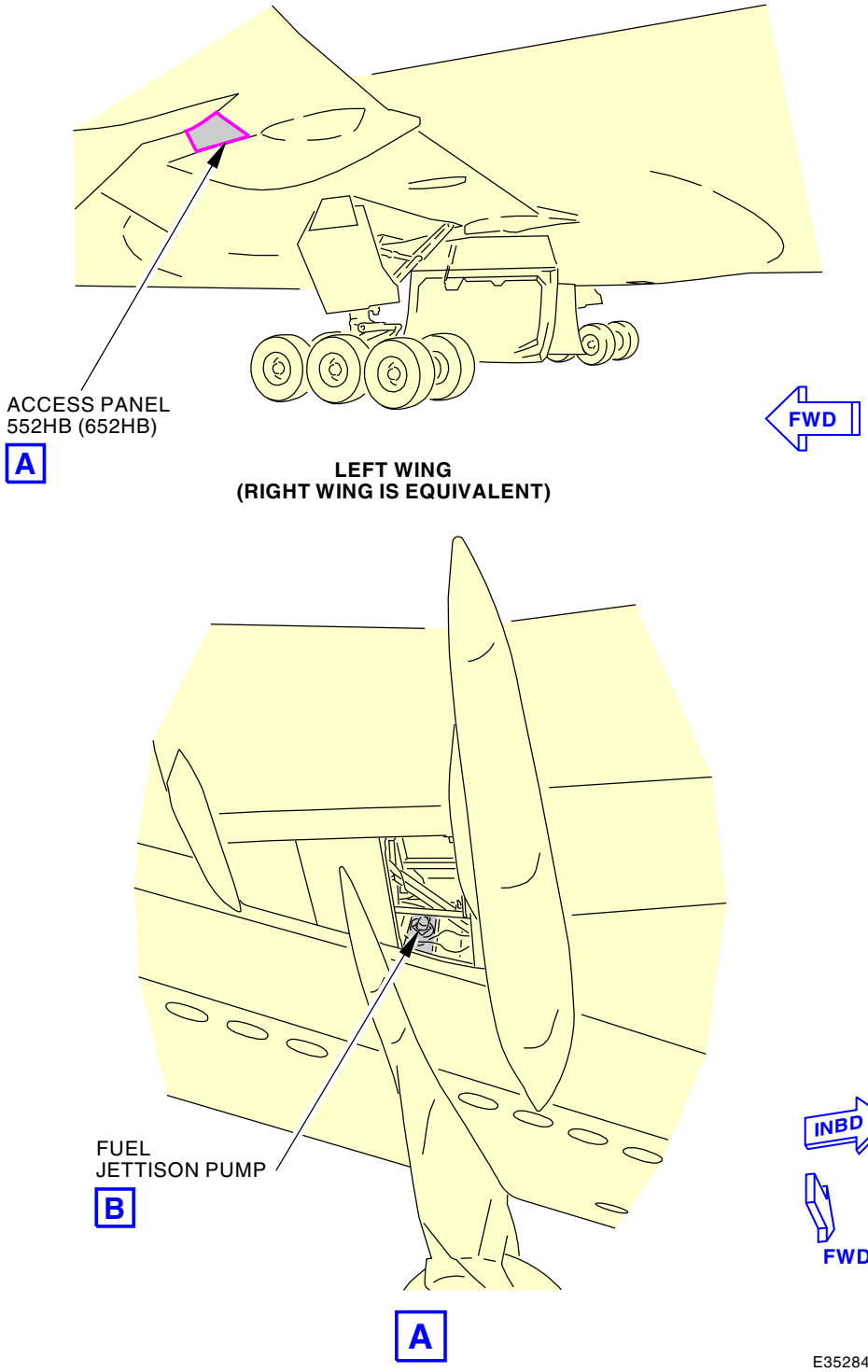
(a) Re-install the motor-impeller [4].

(b) Defuel the fuel tanks (TASK 28-26-00-650-801).

(c) Remove the motor-impeller [4].

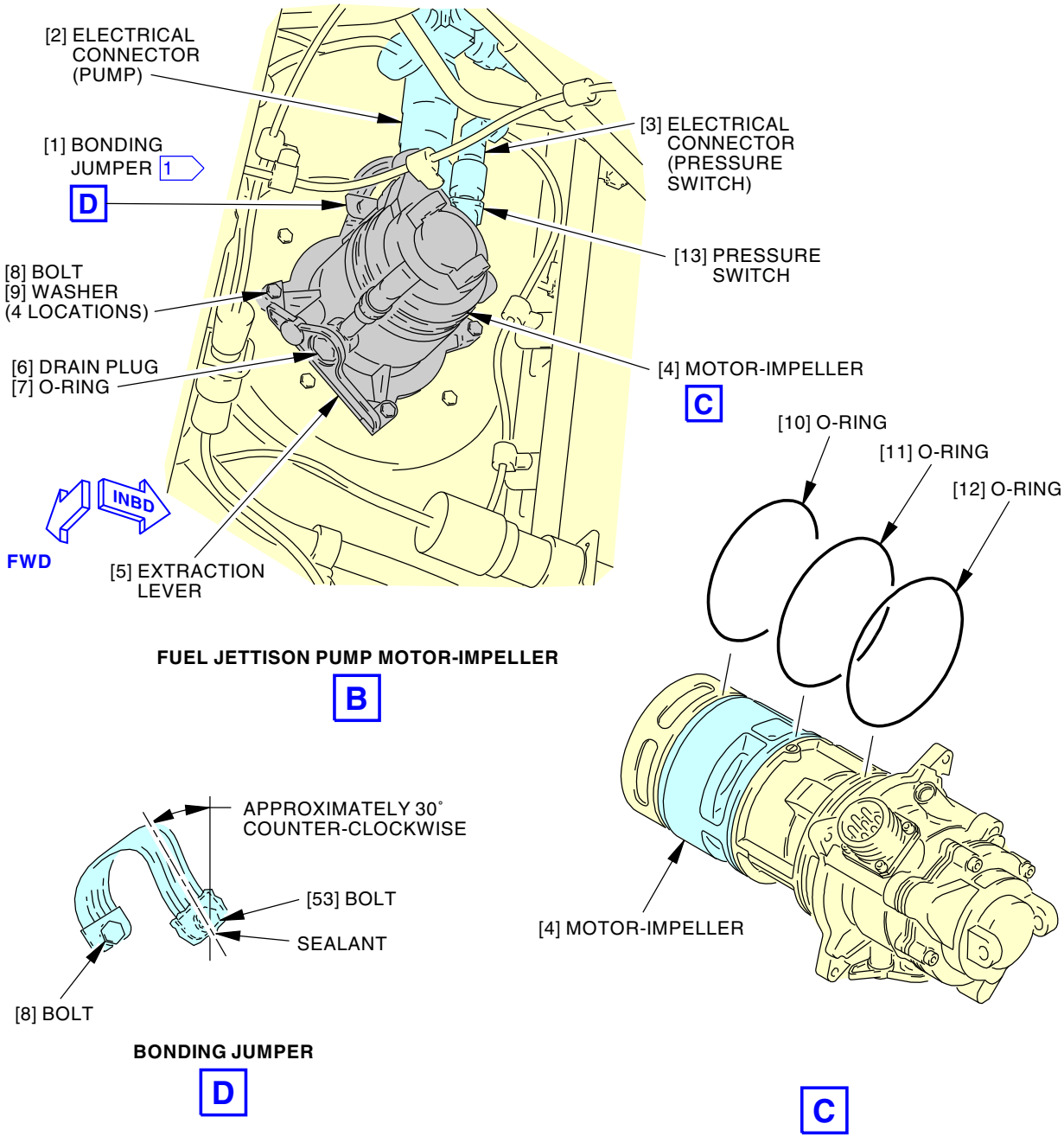
END OF TASK

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Fuel Jettison Pump Installation
Figure 401/28-31-01-990-801 (Sheet 1 of 2)

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1 THE BONDING RESISTANCE BETWEEN THE MOTOR-IMPELLER AND THE AIRPLANE STRUCTURE MUST BE 0.00025 OHM OR LESS

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Fuel Jettison Pump Installation
Figure 401/28-31-01-990-801 (Sheet 2 of 2)

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TASK 28-31-01-400-801

3. Fuel Jettison Pump (Motor-Impeller) - Installation

(Figure 401 and Figure 402)

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

B. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
12-11-01-650-801	Pressure Refueling (P/B 301)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-31-00-720-801	Fuel Jettison System - Operational Test (P/B 501)
28-42-01-420-801	Install the Fuel Pump Pressure Switch (P/B 401)
SWPM 20-20-00	Standard Wiring Practices Manual
SWPM 20-20-10	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

D. Consumable Materials

Reference	Description	Specification
A50110	Sealant	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B

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(Continued)

Reference	Description	Specification
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
A50359	Sealant - Low Density, Non-Chromate Type	BMS5-142 Type II Class B
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
4	Motor-impeller	28-31-01-01-400	ARO 001-004
		28-31-01-01A-045	ARO 005-999
7	O-ring	28-31-01-01-460	ARO 001-004
		28-31-01-01A-070	ARO 005-999
10	O-ring	28-31-01-01-520	ARO 001-004
		28-31-01-01A-130	ARO 005-999
11	O-ring	28-31-01-01-555	ARO 001-004
		28-31-01-01A-170	ARO 005-999
12	O-ring	28-31-01-01-560	ARO 001-004
		28-31-01-01A-175	ARO 005-999

F. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right
533	Main Tank - Rib 8 to Rib 17 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

G. Access Panels

Number	Name/Location
521DB	Refueling Station Door
552HB	Inboard Fixed Trailing Edge Panel
652HB	Inboard Fixed Trailing Edge Panel

H. Procedure

SUBTASK 28-31-01-420-004

(1) Put the extraction lever [5] in the stowed position on the motor-impeller.

(a) Apply a thin layer of petrolatum grease, D00504, on a new o-ring [7].

(b) Install the o-ring [7] on the drain plug [6] and install the drain plug [6].

(c) Install MS20995C32 lockwire, G01048, on the drain plug [6] (TASK 20-10-23-400-801).

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SUBTASK 28-31-01-160-001

(2) Clean all surfaces on the motor-impeller [4] and the pump housing [33] with a clean cotton wiper, G00034.

SUBTASK 28-31-01-640-001

(3) Apply a thin layer of petrolatum grease, D00504, on the new o-ring [10], o-ring [11], and o-ring [12].

SUBTASK 28-31-01-420-011

(4) Install the o-ring [10], o-ring [11], and o-ring [12] in the grooves of the motor-impeller [4].

SUBTASK 28-31-01-420-001

(5) Put the motor-impeller [4] into the pump housing [33].

(a) Position the motor-impeller [4] with the drain plug [6] oriented straight down when you put the motor-impeller [4] into the pump housing [33].

NOTE: Be careful not to damage the o-rings when you put the motor-impeller [4] into the pump housing [33].

(b) Push the motor-impeller [4] into the pump housing [33] until the mounting flange touches the spar.

NOTE: This will engage a pin that opens the guillotine valve in the inlet port.

(c) Turn the motor-impeller [4] 35 degrees in the clockwise direction to align the mounting bolt holes.

SUBTASK 28-31-01-430-001

(6) If the bonding jumper [1] was fully removed, do these steps to attach the bonding jumper [1] to the structure (SWPM 20-20-00 and SWPM 20-20-10):

(a) Do these steps to prepare the bonding jumper [1] for a fay sealed fay surface bond:

1) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

a) Rub dry with a clean, dry cotton wiper, G00034.

b) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-10: CDCCL

2) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper [1] terminal and the washer [39] for a fay sealed fay surface bond.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

a) Use sealant, A50110, sealant, A50155, sealant, A50231, sealant, A50296, or sealant, A50359, for the fay surface fay seal.

b) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

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28-AWL-10: CDCCL

(b) Install the bolt [53] and washer [39] to attach the bonding jumper [1] to the tank structure.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

(c) Apply a cap seal of sealant, A50110, sealant, A50155, sealant, A50231, sealant, A50296, or sealant, A50359, to the bolt [53] that attaches the bonding jumper [1] to the tank structure.

NOTE: Use the sealant that was used for the fay surface fay seal.

SUBTASK 28-31-01-110-001

(7) Do these steps to prepare the bonding jumper [1] for a fay sealed fay surface bond:

(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-10: CDCCL

(b) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper [1] terminal and the washer [9] for a fay sealed fay surface bond.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the fay surface fay seal.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

SUBTASK 28-31-01-420-012

28-AWL-10: CDCCL

(8) Install the bolt [8] and washer [9] that attach the bonding jumper [1] and the (pump) motor-impeller [4] (Figure 401).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

(a) Make sure the bonding surfaces are clean.

(b) Tighten the bolt [8] to 82.5 ±17.5 in-lb (9.3 ±2.0 N·m).

SUBTASK 28-31-01-420-017

(9) Install the three bolts [8] and washers [9] that attach the motor-impeller [4] (Figure 401).

(a) Make sure the bonding surfaces are clean.

(b) Tighten the bolts [8] to 82.5 ±17.5 in-lb (9.3 ±2.0 N·m).

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SUBTASK 28-31-01-390-001

(10) Apply a cap seal of sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, to the bolt [8] that attaches the bonding jumper [1] to the motor-impeller [4].

NOTE: Use the sealant that was used for the fay surface fay seal.

SUBTASK 28-31-01-760-001

28-AWL-10: CDCCL

(11) Measure the electrical bonding resistance between the pump motor-impeller [4] and the airplane structure (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

(a) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-10: CDCCL

(b) Make sure the electrical bonding resistance is 0.00025 ohm (0.25 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

SUBTASK 28-31-01-420-013

(12) Connect the electrical connector [2] to the motor-impeller [4].

SUBTASK 28-31-01-420-009

(13) Install lockwire on the electrical connector [2] (TASK 20-10-23-400-801).

SUBTASK 28-31-01-420-014

(14) Install the pressure switch [13] to the motor-impeller [4] (TASK 28-42-01-420-801).

(a) Connect the electrical connector [3] to the pressure switch on the motor-impeller [4].

SUBTASK 28-31-01-860-003

(15) Remove the safety tags and close these circuit breakers:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
K	14	C28646	R FUEL JETT PUMP CTRL

SUBTASK 28-31-01-860-004

(16) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-31-01-720-001

(17) Do one of these tests of the fuel pump(s):

(a) To do a functional test of the jettison system, do this task: Fuel Jettison System - Operational Test, TASK 28-31-00-720-801.

(b) To do an operational test for one pump, do these steps:

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1) If you installed a dry, un-primed jettison pump in a main fuel tank make sure there is a minimum of 24,000 lb (10,886 kg) in the applicable main fuel tank.

   NOTE: When a main tank contains 24,000 lb (10,886 kg) of fuel, the fuel level is above the centerline of the jettison pump. A dry jettison pump will not prime if the fuel level is below the pump centerline.

   a) Refuel the fuel tanks, if it is necessary (TASK 12-11-01-650-801).

2) If you installed a wet, primed jettison pump in a main fuel tank make sure there is a minimum of 15,000 lb (6804 kg) in the applicable main fuel tank.

   NOTE: This fuel will prevent dry operation of the fuel jettison pumps because the fuel level will be above the inlets of the jettison pumps.

   a) Refuel the fuel tanks, if it is necessary (TASK 12-11-01-650-801).

3) Open this access panel:

   (TASK 06-44-00-800-802)

Number	Name/Location
521DB	Refueling Station Door

   NOTE: Nuisance EICAS messages will come on if the door is not open.

4) Put the DEFUEL VALVE switch, on the P28 Integrated Refueling Panel, to the OPEN position.

5) Push the JETTISON ARM switch-light on the Fuel Management Control Panel M28001, on the Overhead Panel P5, to the ARMED position.

6) Listen at the rear spar to make sure the applicable jettison fuel pump operates (Figure 401).

7) Make sure fuel does not leak, at the rear spar, around the fuel pump.

8) Make sure the applicable EICAS status message does not show on the EICAS display for the applicable pump:

   a) FUEL JETT PUMP L

   b) FUEL JETT PUMP R

9) Push the JETTISON ARM switch-light to the off position.

10) Listen at the rear spar to make sure the jettison fuel pump is off.

SUBTASK 28-31-01-410-008

(18) Close this access panel:

(TASK 06-44-00-800-802)

Number	Name/Location
521DB	Refueling Station Door

SUBTASK 28-31-01-710-002

(19) Put the DEFUEL VALVE switch, on the P28 Integrated Refueling Panel, to CLOSED position.

SUBTASK 28-31-01-010-003

(20) Install this access panel:

(TASK 06-44-00-800-802)

Number	Name/Location
552HB	Inboard Fixed Trailing Edge Panel

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SUBTASK 28-31-01-010-004

(21) Install this access panel:

(TASK 06-44-00-800-802)

Number	Name/Location
652HB	Inboard Fixed Trailing Edge Panel

——— END OF TASK ———

TASK 28-31-01-000-802

4. Fuel Jettison Pump Housing - Removal

(Figure 401, Figure 402)

A. References

Reference	Title
12-11-02-650-801	Fuel Tank Sump Drain Valve - Tank Entry (P/B 301)
28-11-00-300-802	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

C. Access Panels

Number	Name/Location
533FB	Access Door
633FB	Access Door

D. Procedure

SUBTASK 28-31-01-650-002

(1) Defuel the applicable main fuel tank.

(a) To defuel the tank, do this task: Pressure Defueling, TASK 28-26-00-650-801.

(b) Remove the pressure from the refuel manifold. To remove it do these steps:

NOTE: If pressure and fuel are allowed to drain from the refuel manifold, less fuel will spill when the fuel lines are disconnected.

(c) Put the left and right refuel valve control switches, at the refueling station P28, to the OPEN position.

NOTE: Do not open the center tank refuel valves, this would put more fuel in the center tank.

(d) Wait 10 minutes for the fuel pressure to decrease, or until the refuel valve lights go off.

(e) Put the left and right refuel valve control switches, at the refueling station P28, to the CLOSED position.

(f) To remove the fuel that remains in the main fuel tank, do this task: Fuel Tank Sump Drain Valve - Tank Entry, TASK 12-11-02-650-801.

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SUBTASK 28-31-01-020-012

(2) To remove the applicable motor-impeller [4], do this task: Fuel Jettison Pump (Motor-Impeller) - Removal, TASK 28-31-01-000-801.

SUBTASK 28-31-01-650-003

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(3) For the applicable main fuel tank, do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-31-01-010-005

(4) Remove the applicable access door(s):

(Figure 402, TASK 28-11-01-000-801)

Number	Name/Location
533FB	Access Door
633FB	Access Door

SUBTASK 28-31-01-940-001

(5) Go into the left or right main fuel tank and do these steps to remove the jettison fuel pump housing [33]:

(a) Disconnect the flexible full coupling [34] to disconnect the fuel inlet line [36] from the pump housing [33].

1) Discard the o-rings [35].

(b) Disconnect the flexible full coupling [31] to disconnect the fuel outlet line [37] from the pump housing [33].

1) Discard the o-rings [32].

ARO 005-999; ARO 001-004 POST SB 777-28-0078

(c) Disconnect the coupling [55] to disconnect the motive flow line [54] from the pump housing [33].

1) Discard the o-rings [56].

ARO ALL

(d) Remove the sealant between the pump housing [33] and the rear spar, in the fuel tank (TASK 28-11-00-300-802).

(e) Remove the sealant from the bonding jumper [1] on rear spar, out of the fuel tank (TASK 28-11-00-300-802).

(f) Have one person hold the pump housing [33] in its position, in the fuel tank.

(g) Have another person remove the bolts [38], bolt [53], washers [39] and bonding jumper [1] (from out of the fuel tank) that attach the pump housing [33] to the rear spar.

(h) Carefully lower the pump housing [33] to remove it.

(i) Discard the packing [52].

(j) Remove the pump housing [33] from the fuel tank.

SUBTASK 28-31-01-020-002

(6) If it is necessary, do these steps to remove the inlet valve (Figure 402):

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(a) Remove the seven bolts [46] to remove the valve cover [45].

(b) Carefully remove the valve cover [45] from the pump housing [33].

(c) Carefully remove the spring seal [48] from the valve cover [45].

(d) Remove the ring seal [47] from the spring seal [48].

1) Discard the ring seal [47].

(e) Remove the valve plate [49], with the pin [44], from the pump housing [33].

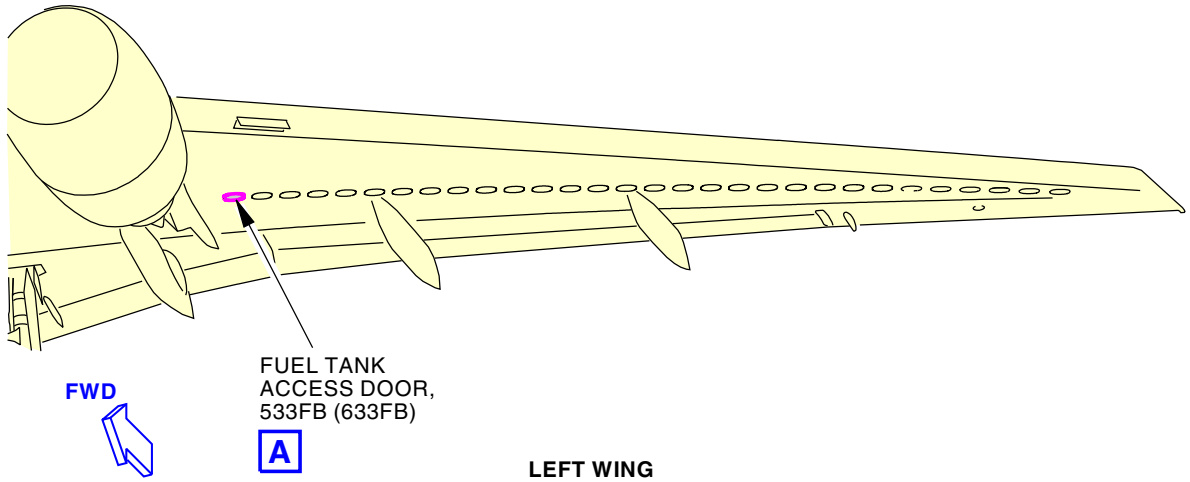
(f) Remove the damper [50] and o-ring [51] with air pressure from inside the pump housing [33].

NOTE: Do not remove the support ring [43] from the pump housing [33].

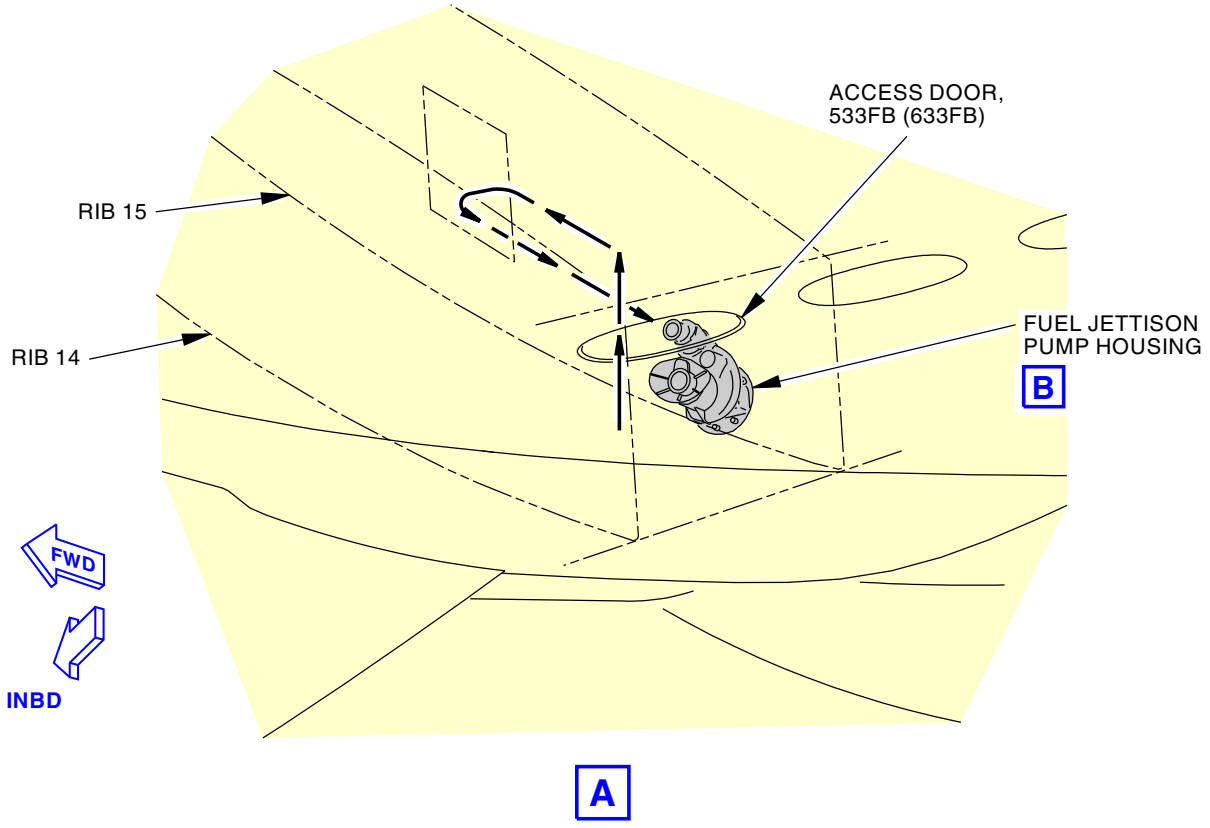
1) Discard the o-ring [51].

——— END OF TASK ———

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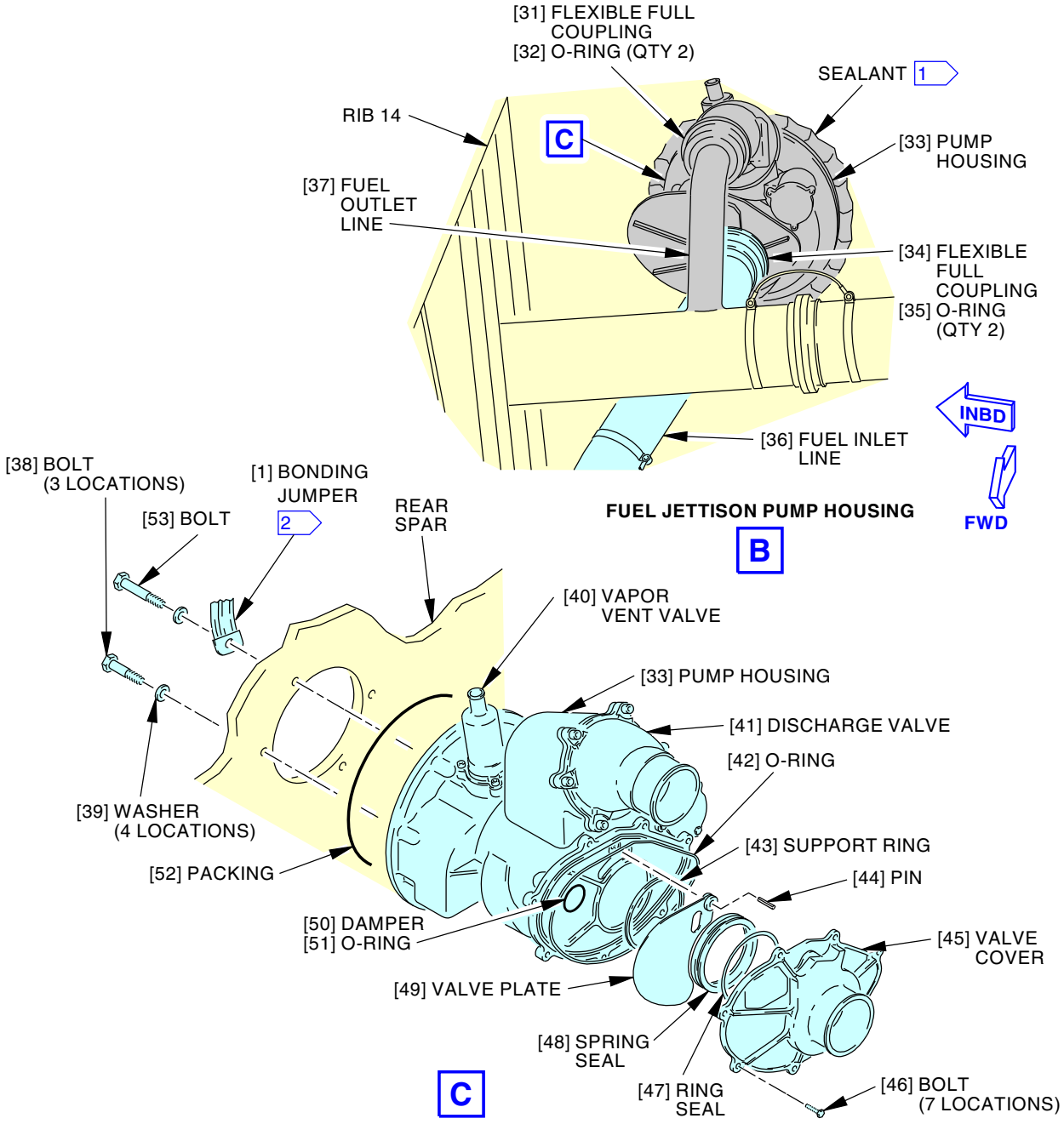
LEFT WING
(RIGHT WING IS EQUIVALENT)



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Fuel Jettison Pump Housing Installation
Figure 402/28-31-01-990-802 (Sheet 1 of 3)

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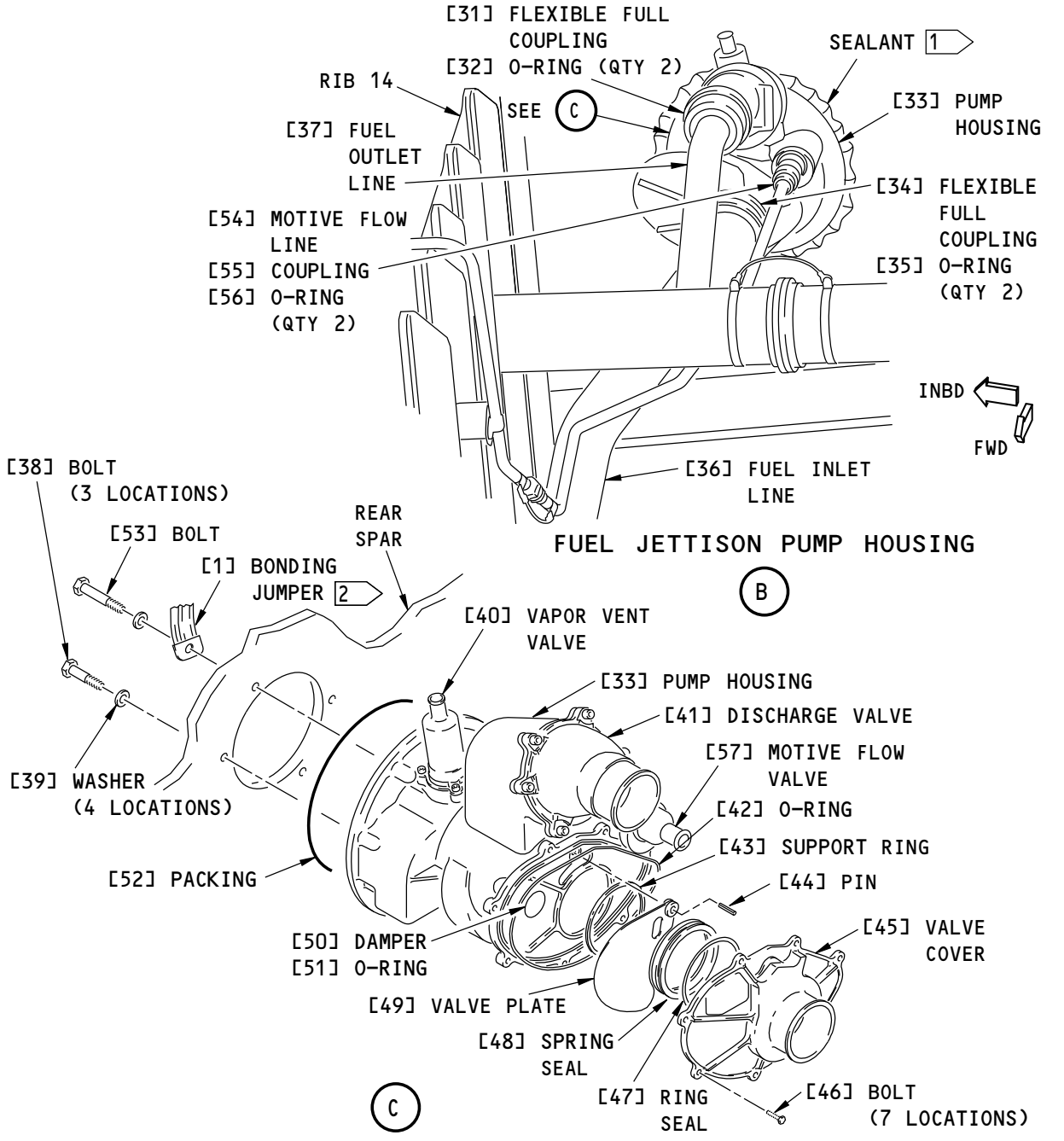
1 FILLET SEAL BETWEEN PUMP HOUSING AND REAR SPAR

2 THE BONDING RESISTANCE BETWEEN THE MOTOR-IMPELLER AND THE AIRPLANE STRUCTURE MUST BE 0.00025 OHM OR LESS

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Fuel Jettison Pump Housing Installation
Figure 402/28-31-01-990-802 (Sheet 2 of 3)

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1 FILLET SEAL BETWEEN PUMP HOUSING AND REAR SPAR

2 THE BONDING RESISTANCE BETWEEN THE MOTOR-IMPELLER AND THE AIRPLANE STRUCTURE MUST BE 0.00025 OHM OR LESS

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Fuel Jettison Pump Housing Installation
Figure 402/28-31-01-990-802 (Sheet 3 of 3)

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TASK 28-31-01-400-802

5. Fuel Jettison Pump Housing - Installation

(Figure 401, Figure 402)

A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

B. References

Reference	Title
20-10-19-400-801	O-Rings Installation (P/B 401)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-300-802	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-22-15-400-802-001	Fuel Line, Fitting and Coupling - Installation (P/B 401)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

D. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS5-95
A00767	Sealant - Fuel Tank	BMS5-45
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142 Type II

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(Continued)

Reference	Description	Specification
A50110	Sealant	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
B00148	Solvent - Methyl Ethyl Ketone (MEK)	ASTM D740
B00184	Solvent - Presealing, Cleaning Solvent	BMS11-7
B00666	Solvent - Methyl Propyl Ketone	BMS11-9
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
B01026	Solvent - FCC-55	
B01054	Solvent - Methyl Ethyl Ketone and sec-Butyl Alcohol Blend - (MEK:secButyl Alcohol - 42:58 Percent)	BAC5750, ASTM D740/ASTM D1007
C00064	Coating - Aluminum Chemical Conversion	BAC5719 Type II Class A (MIL-DTL-5541 Class 1A)
C00259	Coating - Chemical And Solvent Resistant Finish, Corrosion Inhibiting Primer	BMS10-11 Type I
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
32	O-ring	28-21-51-15D-155	ARO ALL
		28-21-51-16-300	ARO ALL
35	O-ring	28-21-51-15D-165	ARO ALL
		28-21-51-17D-070	ARO 001-016
42	O-ring	28-31-01-01-205	ARO 001-004
47	Ring seal	28-31-01-01-210	ARO 001-004
48	Seal	28-31-01-01-215	ARO 001-004
51	O-ring	28-31-01-01-240	ARO 001-004
52	Packing	28-31-01-01-100	ARO 001-004
		28-31-01-01A-035	ARO 005-999

F. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

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G. Access Panels

Number	Name/Location
533FB	Access Door
633FB	Access Door

H. Procedure

SUBTASK 28-31-01-420-002

(1) If the inlet valve is removed, do these steps to install it (Figure 402):

(a) Apply a thin layer of petrolatum grease, D00504, to the new o-ring [51].

(b) Install the damper [50] and o-ring [51] into the pump housing [33].

(c) Install the valve plate [49] with the pin [44] into the pump housing [33].

(d) Apply a thin layer of petrolatum grease, D00504, to a new ring seal [47].

(e) Carefully install a new spring seal [48] and ring seal [47] into the valve cover [45].

(f) Apply a thin layer of petrolatum grease, D00504, to the new o-ring [42].

(g) Install the o-ring [42] into the pump housing [33].

(h) Carefully install the valve cover [45] onto the pump housing [33].

(i) Install the seven bolts [46] that attach the valve cover [45].

SUBTASK 28-31-01-200-001

(2) Inspect these check valves in the housing before you install the pump housing:

NOTE: Manually open the check valves to make sure they are free to operate.

(a) discharge valve [41]

(b) vapor vent valve [40]

SUBTASK 28-31-01-400-001

WARNING

OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(3) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-31-01-100-001

(4) Clean surfaces that touch between the rear spar and the bonding jumper [1] connection with a clean cotton wiper, G00034, moist with solvent, B00184, FCC-55 solvent, B01026, solvent, B01054, solvent, B00148, or solvent, B00666, out of the fuel tank.

SUBTASK 28-31-01-400-002

(5) Go into the left or right main fuel tank and do these steps to install the jettison fuel pump housing [33]:

(a) Clean the surfaces that touch between the rear spar and the pump housing [33] with a clean cotton wiper, G00034, moist with solvent, B00184, FCC-55 solvent, B01026, solvent, B01054, solvent, B00148, or solvent, B00666, in the fuel tank.

(b) Apply a thin layer of petrolatum grease, D00504, to the new packing [52].

(c) Install the packing [52] between the pump housing [33] and the rear spar (TASK 20-10-19-400-801).

(d) Have the person in the tank put the pump housing [33] in its position.

NOTE: Make sure the bonding surfaces are clean.

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(e) Have another person install the three bolts [38] and washers [39] (from out of the fuel tank), to attach the pump housing [33] to the rear spar.

(f) Do these steps to prepare the bonding jumper [1] for a fay sealed fay surface bond:

1) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

a) Rub dry with a clean, dry cotton wiper, G00034.

b) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-10: CDCCL

2) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper [1] terminal and the washer [39] for a fay sealed fay surface bond.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

a) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the fay surface fay seal.

b) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

28-AWL-10: CDCCL

(g) Install the bolt [53] and washer [39] to connect the bonding jumper [1] to the structure (from out of the fuel tank).

NOTE: CDCCL - Refer to the task Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-10.

NOTE: Make sure the bonding surfaces are clean. Clean with solvent, if necessary.

NOTE: Make sure the bonding jumper is attached as shown (Figure 401, View D). The bonding jumper must be attached as shown to allow for installation of the motor-impeller.

(h) Tighten the bolts [38], and bolt [53] to between 87.5 ±12.5 in-lb (9.9 ±1.4 N·m).

(i) Apply a cap seal of sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, to the bolt [53] that attaches the bonding jumper [1] to the tank structure.

NOTE: Use the sealant that was used for the fay surface fay seal.

(j) Apply a thin layer of petrolatum grease, D00504, to the new o-rings [35].

(k) Install the o-rings [35] and connect the flexible full coupling [34] for the fuel inlet line [36] to the pump housing [33] (TASK 28-22-15-400-802-001).

(l) Install MS20995C32 lockwire, G01048, to the coupling [34] (TASK 20-10-23-400-801).

(m) Apply a thin layer of petrolatum grease, D00504, to the new o-rings [32] .

(n) Install the o-rings [32] and connect the flexible full coupling [31] for the fuel outlet line [37] to the pump housing [33] (TASK 28-22-15-400-802-001).

(o) Install MS20995C32 lockwire, G01048, to the coupling [31] (TASK 20-10-23-400-801).

ARO 005-999; ARO 001-004 POST SB 777-28-0078

(p) Apply a thin layer of petrolatum grease, D00504, to the two new o-rings [56].

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ARO 005-999; ARO 001-004 POST SB 777-28-0078 (Continued)

(q) Install the o-rings [56] and connect the flexible full coupling [55] for the motive flow line [54] to the pump housing [33] (TASK 28-22-15-400-802-001).

(r) Install MS20995C32 lockwire, G01048, to the coupling [55] (TASK 20-10-23-400-801).

ARO ALL

(s) Measure the electrical bonding resistance between the pump housing [33] and the airplane structure (SWPM 20-20-00).

1) Use an intrinsically safe approved bonding meter, COM-1550.

2) Make sure the electrical bonding resistance is 0.00025 ohm (0.25 milliohm) or less.

SUBTASK 28-31-01-410-002

(6) Apply a fillet seal between the pump housing [33] and the rear spar, in the fuel tank (TASK 28-11-00-300-802).

(a) Use sealant, A00767, or equivalent.

NOTE: For sealant types and cure times refer to the task: Repair of Sealant Leaks in the Fuel Tank Structure, TASK 28-11-00-300-802

(b) If there is exposed structure, apply an alodine coating, C00064, to the exposed area on the rear spar (TASK 28-11-00-600-801).

SUBTASK 28-31-01-010-006

(7) Remove all unwanted materials from the fuel tank and go out of the fuel tank (TASK 28-11-00-410-801).

SUBTASK 28-31-01-410-003

(8) Do these steps to apply sealant to the bonding jumper connection, between the bonding jumper [1] and the rear spar (out of the fuel tank) (Figure 401, View D):

(a) Clean the bonding jumper connection with a clean cotton wiper, G00034, moist with solvent, B00184, FCC-55 solvent, B01026, solvent, B01054, solvent, B00148, or solvent, B00666.

(b) Apply sealant to the bonding jumper connection ((TASK 28-11-00-300-802).

1) Use one of these sealants: sealant, A02315, or sealant, A00247.

(c) If there is exposed structure, apply primer, C00259, to the exposed areas on the rear spar.

SUBTASK 28-31-01-010-007

(9) Install this access door if applicable:

(TASK 28-11-01-400-801)

Number	Name/Location
533FB	Access Door

SUBTASK 28-31-01-010-008

(10) Install this access door if applicable:

(TASK 28-11-01-400-801)

Number	Name/Location
633FB	Access Door

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SUBTASK 28-31-01-420-003

(11) Install the motor-impeller (TASK 28-31-01-400-801).

END OF TASK

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FUEL JETTISON PUMP - INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure contains a functional check of the bonding resistance between the structure and the fuel jettison pumps.

SFAR 88

TASK 28-31-01-200-801

2. Fuel Jettison Pump (Motor-Impeller) - Bonding Resistance Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
28-31-01-400-801	Fuel Jettison Pump (Motor-Impeller) - Installation (P/B 401)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Location Zones

Zone	Area
551	Rear Spar to Landing Gear Support Beam - Left Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

D. Access Panels

Number	Name/Location
552HB	Inboard Fixed Trailing Edge Panel
652HB	Inboard Fixed Trailing Edge Panel

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E. Prepare for the Procedure

SUBTASK 28-31-01-490-001

WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONS, AND DAMAGE TO EQUIPMENT.

(1) Do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.

SUBTASK 28-31-01-865-001

(2) Open these circuit breakers and install safety tags:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
K	14	C28646	R FUEL JETT PUMP CTRL

SUBTASK 28-31-01-010-009

(3) Remove this access panel to get access to the left jettison fuel pump, installed on the rear spar, in the left main tank:

(TASK 06-44-00-800-802)

Number	Name/Location
552HB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-31-01-010-010

(4) Remove this access panel to get access to the right jettison fuel pump, installed on the rear spar, in the right main tank:

(TASK 06-44-00-800-802)

Number	Name/Location
652HB	Inboard Fixed Trailing Edge Panel

F. Electrical Bonding Measurement

SUBTASK 28-31-01-020-013

(1) Remove lockwire from the electrical connector.

SUBTASK 28-31-01-862-001

(2) Disconnect the electrical connector from the motor-impeller.

SUBTASK 28-31-01-765-001

(3) Measure the bonding resistance between the motor-impeller and the airplane structure with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

(a) Make sure the bonding resistance is 0.00025 ohm (0.25 milliohm) or less.

SUBTASK 28-31-01-860-007

(4) Connect the electrical connector to the motor-impeller.

SUBTASK 28-31-01-420-018

(5) Install lockwire on the electrical connector (TASK 20-10-23-400-801).

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SUBTASK 28-31-01-860-008

(6) Remove the safety tags and close these circuit breakers:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
K	14	C28646	R FUEL JETT PUMP CTRL

SUBTASK 28-31-01-710-003

(7) Do the fuel jettison pump motor test Fuel Jettison Pump (Motor-Impeller) - Installation, TASK 28-31-01-400-801.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 28-31-01-410-004

(1) Install this access panel:

Number	Name/Location
552HB	Inboard Fixed Trailing Edge Panel

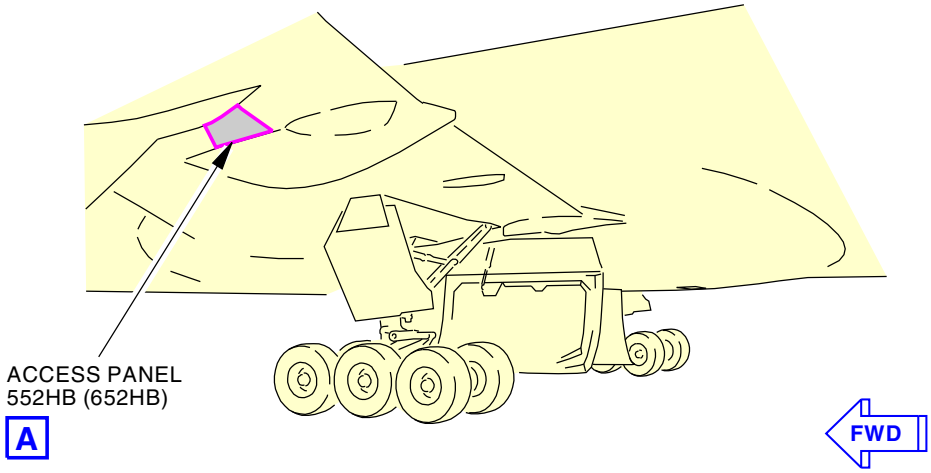
SUBTASK 28-31-01-410-005

(2) Install this access panel:

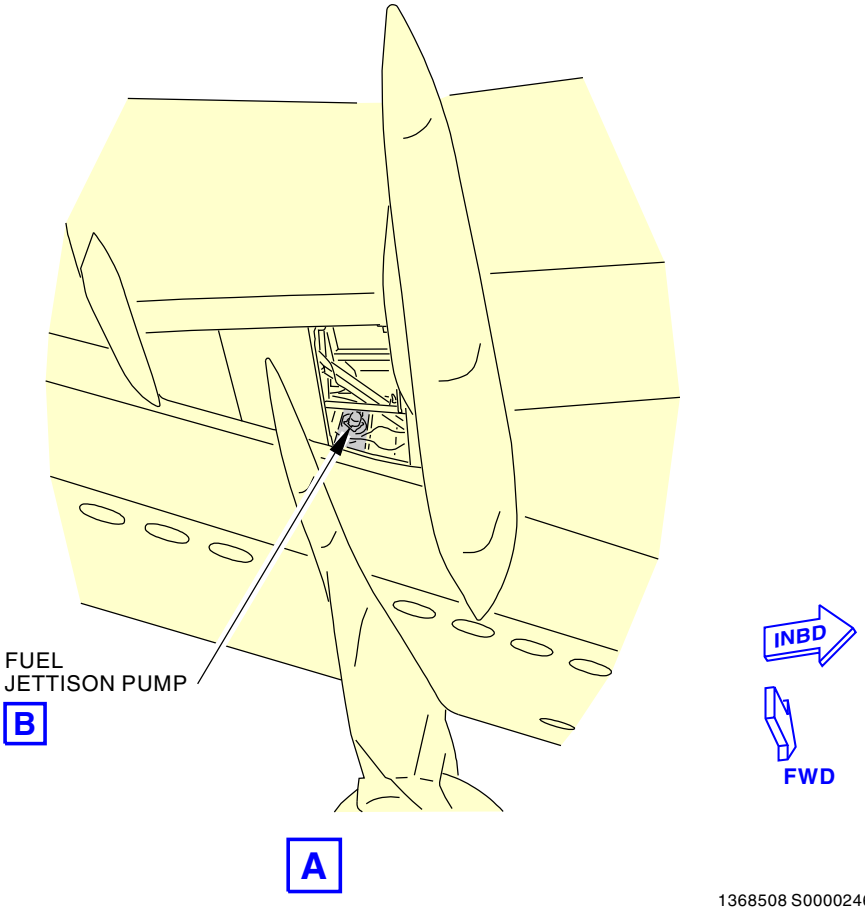
Number	Name/Location
652HB	Inboard Fixed Trailing Edge Panel

——— END OF TASK ———

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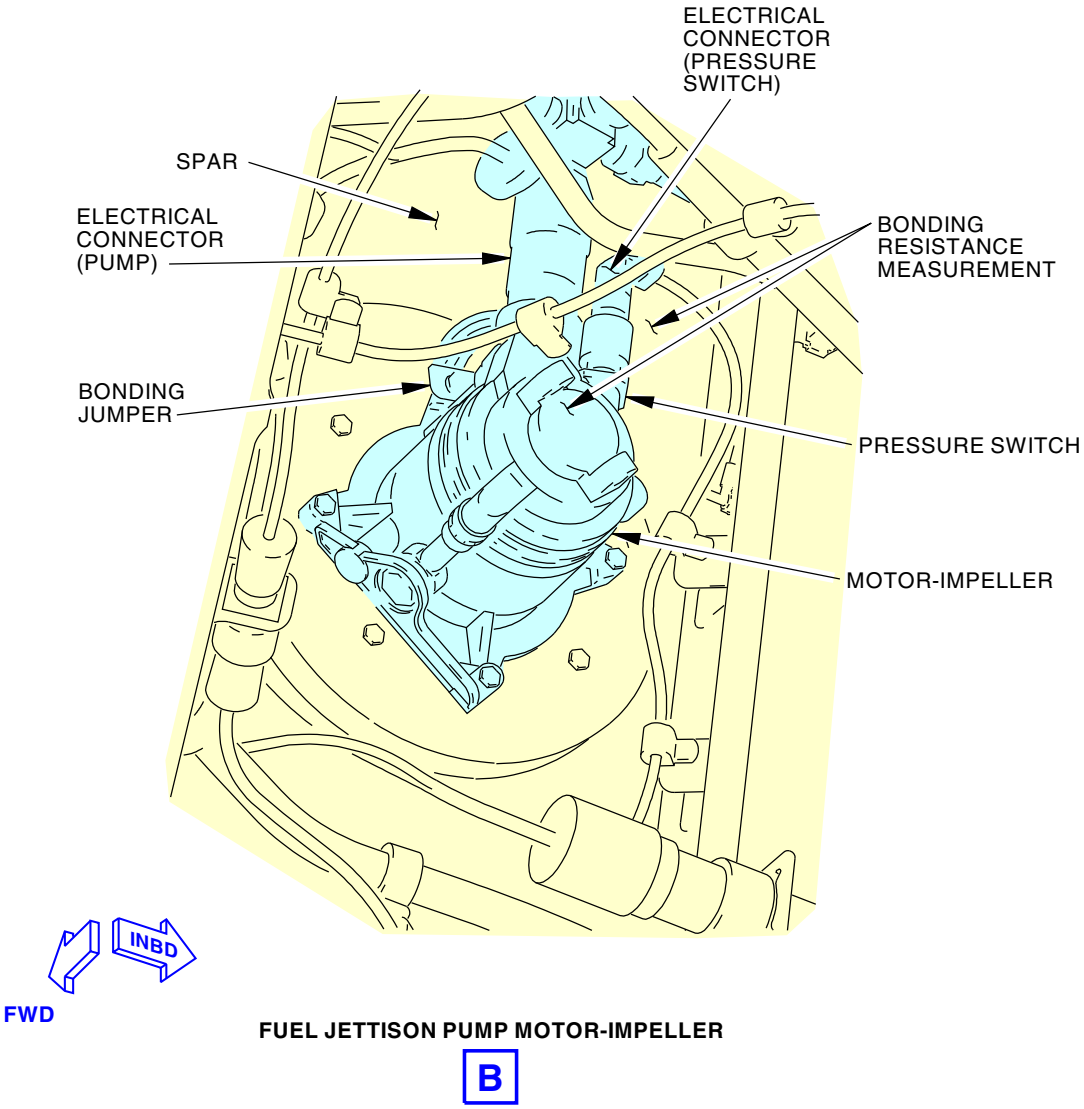
LEFT WING
(RIGHT WING IS EQUIVALENT)



1368508 S0000246956_V2

Fuel Jettison Pump - Bonding Resistance Measurement
Figure 601/28-31-01-990-803 (Sheet 1 of 2)

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FUEL JETTISON PUMP MOTOR-IMPELLER

B

1368515 S0000246958_V2

Fuel Jettison Pump - Bonding Resistance Measurement
Figure 601/28-31-01-990-803 (Sheet 2 of 2)

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FUEL JETTISON NOZZLE VALVE - REMOVAL/INSTALLATION

1. General

A. There are two jettison nozzle valves. The valves are installed outboard of rib 35 on the left and right wings.

B. This procedure contains five tasks. The first two tasks remove and install the fuel jettison nozzle valve body. The second two tasks install the fuel jettison nozzle valve adapter/shaft. The fifth task aligns the adapter/shaft.

C. The procedure to remove and install the actuator for the fuel jettison nozzle valve is in PAGEBLOCK 28-31-03/401.

TASK 28-31-02-000-802

2. Fuel Jettison Nozzle Valve (Valve Body) - Removal

(Figure 401)

A. References

Reference	Title
24-22-00-860-806	Remove Electrical Power (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-22-15-000-802-001	Fuel Line, Fitting and Coupling - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

C. Access Panels

Number	Name/Location
543BB	Access Door
643BB	Access Door

D. Procedure

SUBTASK 28-31-02-650-003

(1) To defuel the left and right main fuel tanks, do this task: Pressure Defueling, TASK 28-26-00-650-801.

NOTE: You must defuel the left and the right main fuel tanks for this task.

SUBTASK 28-31-02-940-003

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-31-02-860-007

(3) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

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SUBTASK 28-31-02-010-003

(4) Remove the applicable access doors:

(TASK 28-11-01-000-801)

Number	Name/Location
543BB	Access Door
643BB	Access Door

SUBTASK 28-31-02-650-004

(5) For the main fuel tanks, do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

SUBTASK 28-31-02-940-004

(6) Go into the left or right main fuel tank to get access to the applicable valve body [30].

SUBTASK 28-31-02-020-003

(7) Disconnect the flexible coupling [34] from each side of the applicable valve body [30] (TASK 28-22-15-000-802-001).

(a) Discard the o-rings [35].

SUBTASK 28-31-02-020-004

(8) Hold the valve body [30] and remove the four bolts [32] and washers [33] that attach the valve body [30] to the support bracket.

SUBTASK 28-31-02-020-005

(9) Disengage the valve body [30] from the adapter/shaft [31].

SUBTASK 28-31-02-020-006

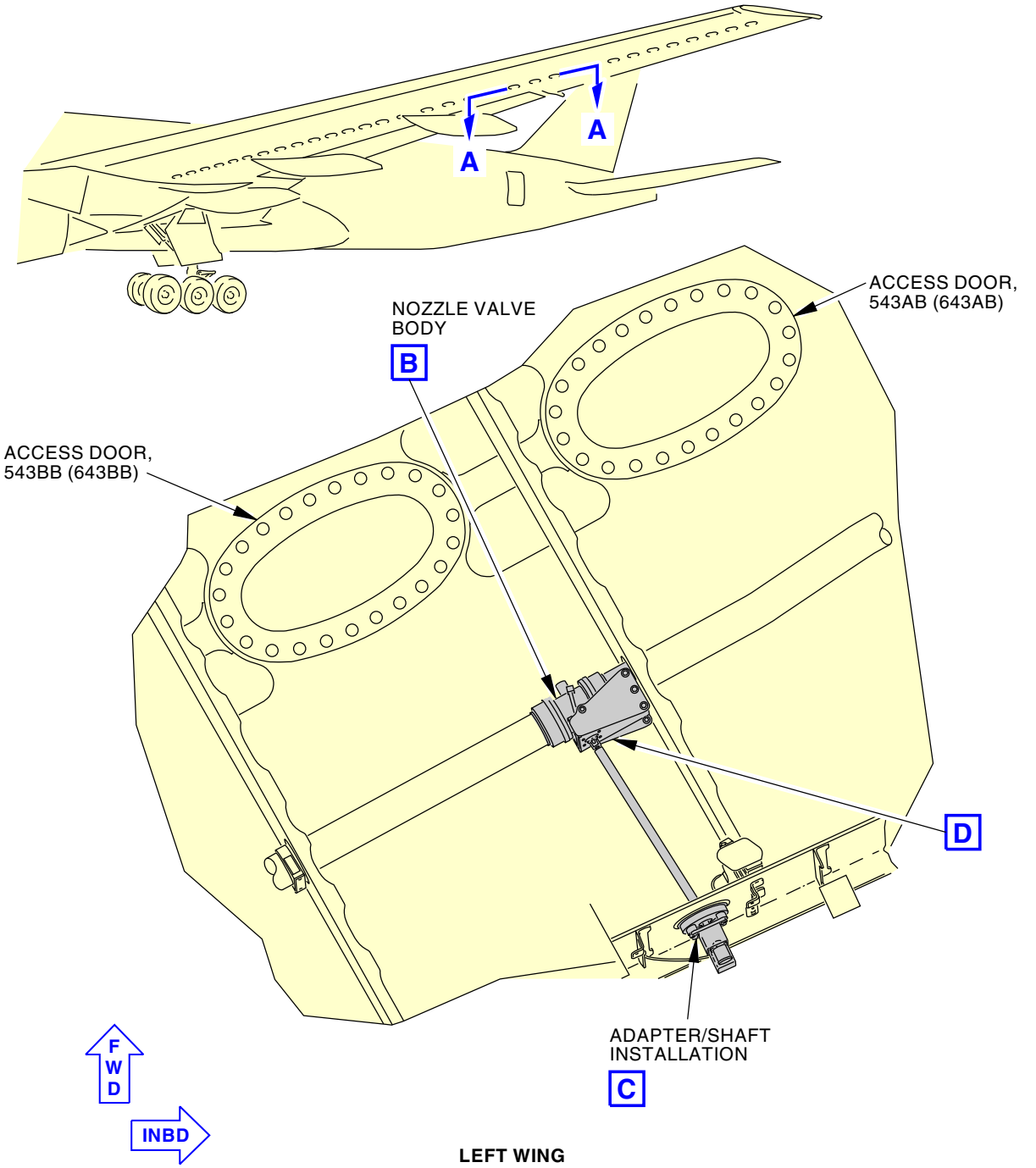
(10) Remove the valve body [30].

SUBTASK 28-31-02-480-001

(11) Install protection covers to the fuel lines to keep unwanted materials out.

——— END OF TASK ———

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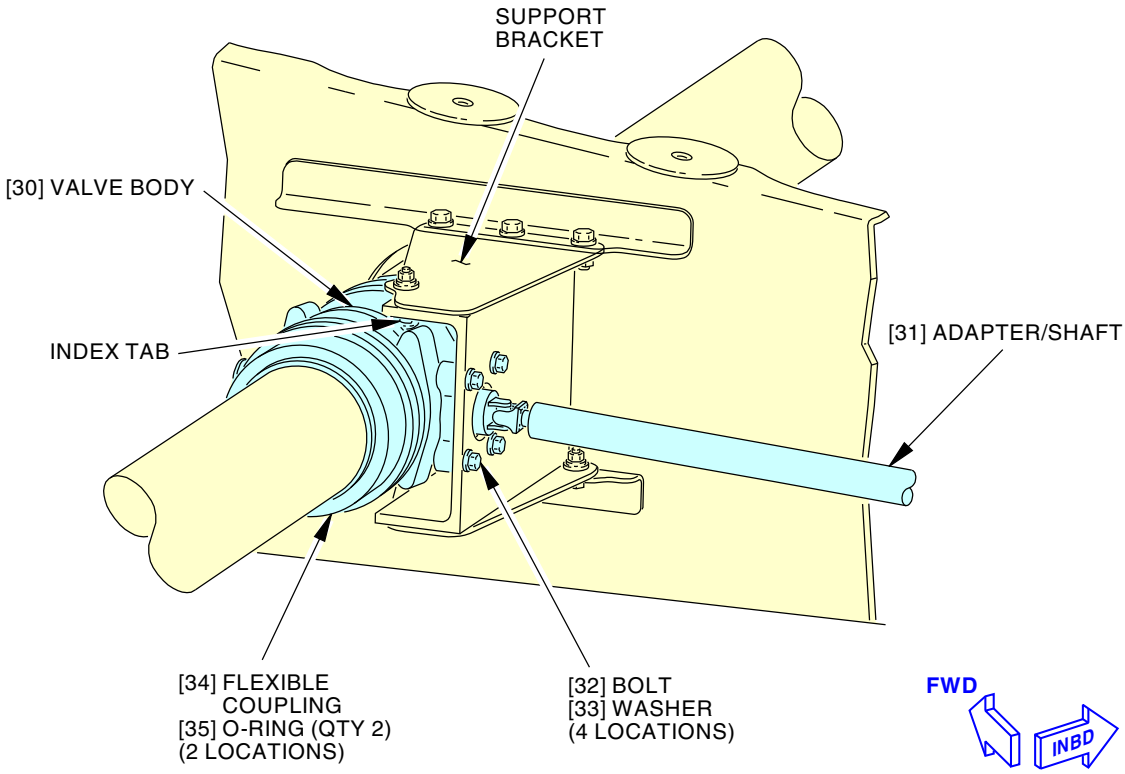
LEFT WING
(TOP VIEW)
(RIGHT WING IS EQUIVALENT)

A-A

N36557 S0006415513_V3

Fuel Jettison Nozzle Valve Installation
Figure 401/28-31-02-990-802 (Sheet 1 of 3)

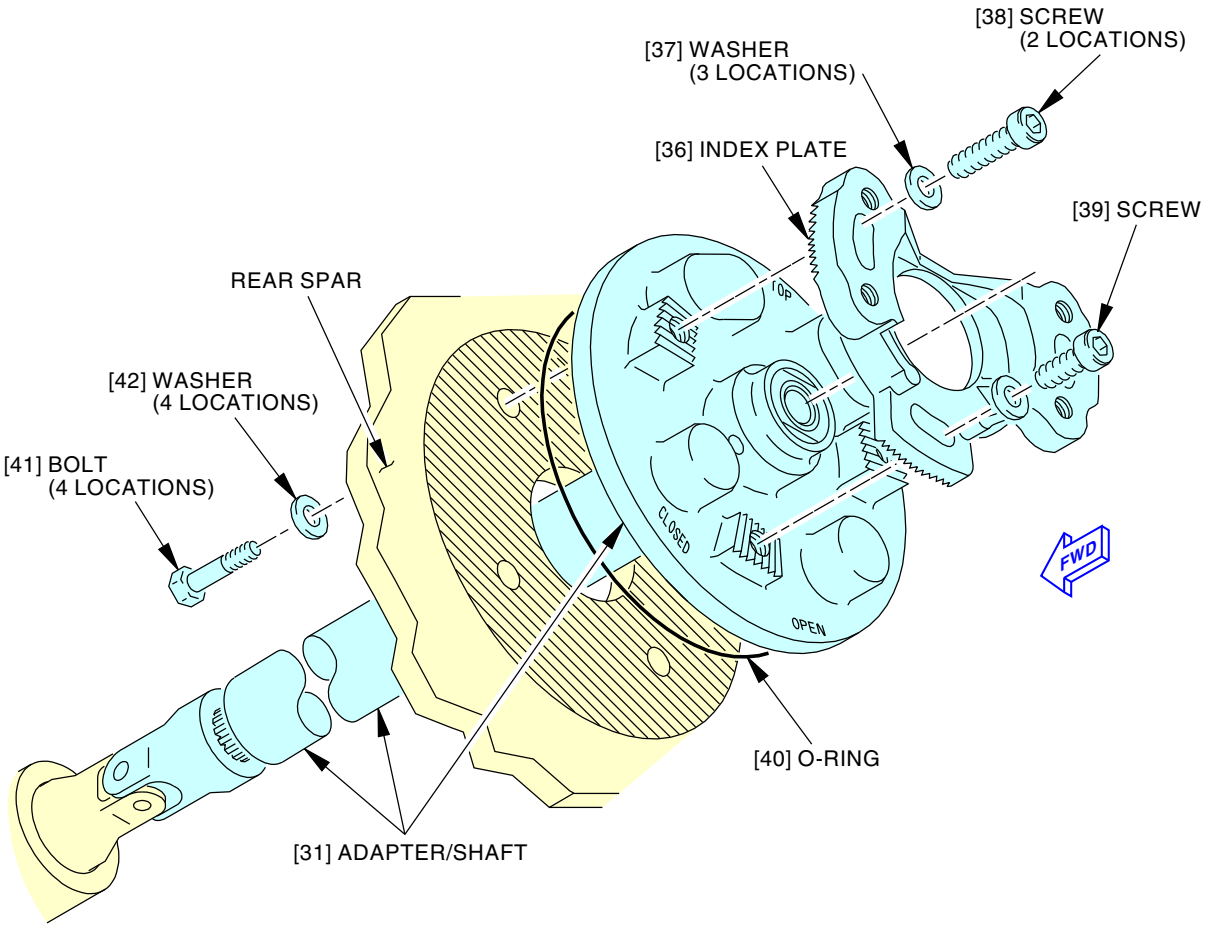
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N36560 S0006415515_V3

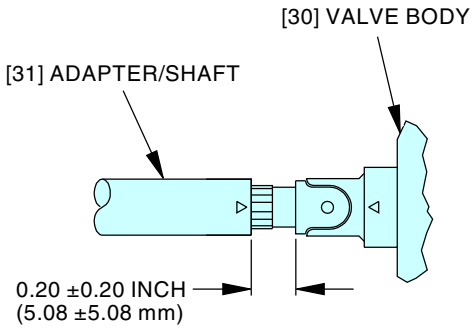
Fuel Jettison Nozzle Valve Installation
Figure 401/28-31-02-990-802 (Sheet 2 of 3)

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ADAPTER/SHAFT INSTALLATION

C



D

N71627 S0006415516_V3

Fuel Jettison Nozzle Valve Installation
Figure 401/28-31-02-990-802 (Sheet 3 of 3)

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TASK 28-31-02-400-802

3. Fuel Jettison Nozzle Valve (Valve Body) - Installation

(Figure 401)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-22-15-000-802-001	Fuel Line, Fitting and Coupling - Removal (P/B 401)
28-31-00-720-801	Fuel Jettison System - Operational Test (P/B 501)
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Consumable Materials

Reference	Description	Specification
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
30	Valve body	28-31-02-01A-042	ARO ALL
		28-31-02-10-070	ARO ALL
35	O-ring	28-31-51-03A-075	ARO ALL

E. Location Zones

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

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F. Access Panels

Number	Name/Location
543BB	Access Door
643BB	Access Door

G. Procedure

SUBTASK 28-31-02-940-005

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-31-02-940-006

(2) Go into the left or right main fuel tank.

SUBTASK 28-31-02-110-003

(3) Do these steps to prepare the valve body [30] and the support bracket for a faying surface bond:

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(a) Final clean the contact surfaces of the valve body [30] and the support bracket with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

(b) Rub dry with a clean, dry cotton wiper, G00034.

(c) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

SUBTASK 28-31-02-080-001

(4) Remove the protection covers from the fuel lines.

SUBTASK 28-31-02-210-004

(5) Align the index marks on the valve body [30] and adapter/shaft [31].

SUBTASK 28-31-02-210-002

CAUTION DO NOT REMOVE THE SUPPORT BRACKET SPACER OR DEFLECT THE SUPPORT BRACKET TO INSTALL THE VALVE BODY. THE VALVE BODY MUST BE INSTALLED CORRECTLY OR DAMAGE TO EQUIPMENT CAN OCCUR.

(6) Make sure "TOP" shows on the top of the valve body [30].

SUBTASK 28-31-02-420-004

(7) Engage the valve body [30] and the adapter/shaft [31].

SUBTASK 28-31-02-820-002

(8) Align the valve body [30] with the support bracket holes.

SUBTASK 28-31-02-420-005

(9) Install the four bolts [32] and washers [33] through the support bracket.

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SUBTASK 28-31-02-420-006

(10) Make sure the gap between the adapter/shaft [31] and the valve body [30] spline is 0.20 ±0.20 in. (5.08 ±5.08 mm) (Figure 401, View D).

NOTE: If you can not get the correct gap, loosen the support bracket for the valve body [30] and adjust its position to get the correct gap.

SUBTASK 28-31-02-760-002

(11) Measure the electrical bonding resistance between the valve body [30] and the support bracket with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

(a) Make sure the resistance is less than 0.0005 ohm (0.5 milliohm).

SUBTASK 28-31-02-760-001

(12) Measure the electrical bonding resistance between the valve body [30] and the airplane structure with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

(a) Make sure the resistance is less than 0.010 ohm (10 milliohms).

SUBTASK 28-31-02-420-003

(13) Apply a thin coating of petrolatum grease, D00504, to the o-rings [35] before you install them on the fuel lines or valve body [30].

(a) Install the new o-rings [35] on the fuel line and valve body [30] (TASK 28-22-15-000-802-001).

SUBTASK 28-31-02-420-007

(14) Connect the flexible couplings [34] that attach the valve body [30] to the fuel line (TASK 28-22-15-000-802-001).

(a) Install lockwire to the couplings [34].

SUBTASK 28-31-02-010-007

(15) Install the applicable access doors:

(TASK 28-11-01-400-801)

Number	Name/Location
543BB	Access Door
643BB	Access Door

SUBTASK 28-31-02-860-008

(16) Supply electrical power (TASK 24-22-00-860-805).

SUBTASK 28-31-02-720-001

(17) Do this task: Fuel Jettison System - Operational Test, TASK 28-31-00-720-801.

SUBTASK 28-31-02-650-005

(18) To refuel the airplane (if it is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

——— END OF TASK ———

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS

TASK 28-31-02-000-804

4. Fuel Jettison Nozzle Valve (Adapter/Shaft) - Removal

(Figure 401)

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
27-51-00-040-801	Trailing Edge Flap Deactivation (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-31-03-000-804	Fuel Jettison Nozzle Valve Actuator - Removal (P/B 401)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: $0855 Part #: 234350 Supplier: $0857 Part #: 311 Supplier: F6892 Part #: 411B60 Supplier: 3DN12 Part #: 411B90 Supplier: 3DN12 Part #: DAD5013 Supplier: $0856 Part #: DFD5019 Supplier: $0856 Part #: J5-0275-2010 Supplier: 435R8 Part #: SCD5019 Supplier: $0856 Part #: ST982LF-9 Supplier: 62176 Part #: TS1275-4 Supplier: 1DWR5
COM-4746	Handle - Sealant Removal Tool Part #: 310/1 Supplier: F6892 Part #: SHN0272 Supplier: $0856 Part #: SHR0272-T Supplier: 1DWR5 Part #: SHW0215 Supplier: $0856

C. Location Zones

Zone	Area
ARO ALL	
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS	
551	Rear Spar to Landing Gear Support Beam - Left Wing
ARO ALL	
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

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(Continued)

Zone	Area
ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS	
651	Rear Spar to Landing Gear Support Beam - Right Wing

D. Access Panels

Number	Name/Location
543BB	Access Door
561GB	Midspan Fixed Trailing Edge Panel
643BB	Access Door
661GB	Midspan Fixed Trailing Edge Panel

E. Procedure

SUBTASK 28-31-02-650-012

(1) Defuel the applicable left or right main fuel tank (TASK 28-26-00-650-801).

SUBTASK 28-31-02-040-002

WARNING

MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(2) Deactivate the trailing edge flaps (TASK 27-51-00-040-801).

SUBTASK 28-31-02-860-014

(3) Remove electrical power (TASK 24-22-00-860-806).

SUBTASK 28-31-02-650-014

WARNING

OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(4) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-31-02-010-021

(5) Open the applicable access panels:

(TASK 06-44-00-800-802)

Number	Name/Location
561GB	Midspan Fixed Trailing Edge Panel
661GB	Midspan Fixed Trailing Edge Panel

SUBTASK 28-31-02-010-023

(6) Remove the applicable access doors:

(TASK 28-11-01-000-801)

Number	Name/Location
543BB	Access Door
643BB	Access Door

SUBTASK 28-31-02-010-025

(7) Do these steps on the outside of the fuel tank:

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(a) For the applicable jettison nozzle valve actuator, do this task: Fuel Jettison Nozzle Valve Actuator - Removal, TASK 28-31-03-000-804.

(b) Use a sealant removal tool to remove the old sealant from the periphery of the adapter plate.

1) Use sealant removal tool, COM-2481, and sealant removal tool handle, COM-4746, or equivalent.

SUBTASK 28-31-02-030-001

(8) Do these steps inside the fuel tank:

(a) Go to the adapter/shaft [31] location inside the fuel tank (View C).

(b) Remove the old sealant from the four bolts [41] and the adapter/shaft [31] rear spar penetration.

(c) Remove the four bolts [41] and washers [42] to disconnect the adapter/shaft [31].

(d) Disengage the adapter/shaft [31] from the valve body [30] (View B).

SUBTASK 28-31-02-020-017

(9) Go out of the tank and remove the adapter/shaft [31].

(a) Discard the o-ring [40].

F. Remove the Index Plate

NOTE: Do these steps if you will reuse the adapter/shaft and the attached index plate or if you need to remove the index plate to align the valve body. If the task is to discard the old adapter/shaft and install a new adapter/shaft, it is not necessary to disassemble the index plate.

SUBTASK 28-31-02-020-018

(1) Do these steps to remove the index plate [36] from the adapter/shaft [31]:

(a) Remove the lockwire from two screws [38] and screw [39].

(b) Remove two screws [38], screw [39] and three washers [37].

(c) Carefully disassemble the index plate [36] and the adapter/shaft [31].

NOTE: The two surfaces are bonded with faying surface sealant.

——— END OF TASK ———

TASK 28-31-02-400-804

5. Fuel Jettison Nozzle Valve (Adapter/Shaft) - Installation

(Figure 401)

A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

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(2) Two mechanics are necessary for this task.

NOTE: To engage splines of the adapter/shaft [31] to the valve body [30], one person must be outside the tank and one person must be inside the tank.

B. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
12-11-01-650-801	Pressure Refueling (P/B 301)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
20-30-92-910-801	Final Cleaning Prior to General Sealing (Series 92) (P/B 201)
27-51-00-440-801	Trailing Edge Flap Reactivation (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-31-00-720-801	Fuel Jettison System - Operational Test (P/B 501)
28-31-03-400-804	Fuel Jettison Nozzle Valve Actuator - Installation (P/B 401)
51-31-01-390-804	Fillet Seal Application (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

(Continued)

Reference	Description
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: $0855 Part #: 234350 Supplier: $0857 Part #: 311 Supplier: F6892 Part #: 411B60 Supplier: 3DN12 Part #: 411B90 Supplier: 3DN12 Part #: DAD5013 Supplier: $0856 Part #: DFD5019 Supplier: $0856 Part #: J5-0275-2010 Supplier: 435R8 Part #: SCD5019 Supplier: $0856 Part #: ST982LF-9 Supplier: 62176 Part #: TS1275-4 Supplier: 1DWR5
COM-4746	Handle - Sealant Removal Tool Part #: 310/1 Supplier: F6892 Part #: SHN0272 Supplier: $0856 Part #: SHR0272-T Supplier: 1DWR5 Part #: SHW0215 Supplier: $0856
STD-123	Brush - Soft Bristle

D. Consumable Materials

Reference	Description	Specification
A50110	Sealant	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
B01012	Solvent - Final Cleaning Prior To General Sealing - Series 92	
C00064	Coating - Aluminum Chemical Conversion	BAC5719 Type II Class A (MIL-DTL-5541 Class 1A)
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20 Type II
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

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F. Access Panels

Number	Name/Location
543BB	Access Door
561GB	Midspan Fixed Trailing Edge Panel
643BB	Access Door
661GB	Midspan Fixed Trailing Edge Panel

G. Install the Adapter/Shaft

SUBTASK 28-31-02-860-012

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-31-02-010-020

WARNING DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Go into the fuel tank to the jettison nozzle valve location (TASK 28-11-00-010-801).

NOTE: One person must enter the tank and another must remain outside the tank at the rear spar.

SUBTASK 28-31-02-120-001

(3) On the outside of the tank, remove the old sealant and clean the rear spar, adapter/shaft [31], index plate [36], and fasteners (if re-used).

(a) Use sealant removal tool, COM-2481, and sealant removal tool handle, COM-4746 (or equivalent), to remove the old sealant from the rear spar.

(b) If new parts are to be installed, use an abrasive pad to remove the anodized finish from the faying surfaces of the adapter/shaft [31] and index plate [36] (SWPM 20-20-00).

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(c) To remove the remaining sealant, grease, oil, dirt, and other contamination from the components, use one of these brushes/pads soaked with Series 92 solvent, B01012 (TASK 20-30-92-910-801):

1) soft bristle brush, STD-123

2) cotton wiper, G00034

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SUBTASK 28-31-02-110-001

(4) On the outside of the tank, do these steps to prepare the adapter/shaft [31] and the rear spar for a fay sealed fay surface bond:

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(a) Final clean the contact surfaces of the adapter/shaft [31] and the rear spar with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

SUBTASK 28-31-02-430-001

(5) On the outside of the airplane fuel tank, do these steps:

(a) Put a thin layer of petrolatum grease, D00504, on the new o-ring [40].

(b) Put the o-ring [40] in the o-ring groove of the adapter/shaft [31].

(c) Put the shaft portion of the adapter/shaft [31] through the hole in the rear spar.

(d) Make sure the shoulder of the adapter/shaft [31] does not bind in the opening of the rear spar.

SUBTASK 28-31-02-210-009

(6) On the inside of the tank, do these steps:

(a) Make sure that the index marks on the valve body [30] and adapter/shaft [31] are aligned (View D).

NOTE: A small misalignment of the index marks is satisfactory.

SUBTASK 28-31-02-420-034

(7) Do these steps at the same time:

NOTE: The person on the inside of the tank should engage the splines as the person on the outside of the tank applies the fay sealed fay surface bond.

28-AWL-19: CDCCL

(a) On the outside of the tank, apply a fay sealed fay surface bond between the adapter/shaft [31] (valve adapter plate) and the spar (structure) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Apply a thin continuous layer of sealant, A50110, or sealant, A50155, to the mating surface of the adapter plate.

a) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

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2) Make sure the sealant is continuously squeezed out along the edges of the contact surfaces.

3) If there are gaps, bubbles or voids in the sealant squeeze out, then disassemble and apply more sealant.

4) Shape the squeezed out sealant into a fillet seal.

5) As an option, remove the extra squeezed out sealant.

NOTE: Make sure the sealant that remains is flush with the mating part edges.

(b) On the inside of the tank, engage the splines of the adapter/shaft [31] with the valve body [30].

1) Make sure the shoulder of the adapter/shaft [31] does not bind in the opening of the rear spar.

SUBTASK 28-31-02-420-035

(8) On the outside of the tank, hold the adapter/shaft [31] in the correct position.

SUBTASK 28-31-02-420-019

(9) Do these steps to install the adapter/shaft [31]:

(a) Apply sealant to the shank and the threads of the four bolts [41].

1) Use sealant, A50110, or sealant, A50155, for the wet installation of the bolts [41].

NOTE: Use the same sealant that was used for the fay surface fay seal.

2) Make sure the sealant applied to the fasteners is approximately 0.060 in. (1.524 mm) thick.

(b) Install the bolts [41] and washers [42] to attach the adapter/shaft [31] to the spar.

(c) Make sure the gap between the adapter/shaft [31] and the valve body [30] spline is 0.20 ±0.20 in. (5.08 ±5.08 mm) (Figure 401, View D).

NOTE: If you can not get the correct gap, loosen the support bracket for the valve body [30] and adjust its position to get the correct gap.

SUBTASK 28-31-02-765-001

28-AWL-19: CDCCL

(10) On the outside of the fuel tank, measure the electrical bonding resistance between one of the raised surfaces of the adapter/shaft [31] (valve adapter plate) (bare metal surface) and the rear spar (structure) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

28-AWL-19: CDCCL

(a) Make sure one or both ends of the bonding jumper that attaches to the actuator is disconnected.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(b) Use an intrinsically safe approved bonding meter, COM-1550.

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28-AWL-19: CDCCL

(c) Make sure the electrical bonding resistance is 0.0005 ohm (0.5 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) If the electrical bonding resistance is more than 0.0005 ohm (0.5 milliohm), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Fuel Jettison Nozzle Valve, TASK 28-31-02-300-801.

SUBTASK 28-31-02-420-020

(11) Use sealant, A50110, or sealant, A50155, for these seals:

NOTE: Use the same sealant that was used for the fay sealed fay surface bond.

(a) On the inside of the tank, apply a fillet seal to the periphery of the rear spar penetration and the stationary part of the adapter/shaft [31](TASK 51-31-01-390-804).

NOTE: Make sure the sealant does not touch any part of the adapter/shaft [31] that turns.

28-AWL-19: CDCCL

(b) On the inside of the tank, apply a cap seal to each of the four bolts [41] (adapter plate attach bolts).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

SUBTASK 28-31-02-860-013

(12) Do this task to close the fuel tank: Fuel Tank Closure, TASK 28-11-00-410-801.

(a) Install these access doors:

(TASK 28-11-01-400-801)

Number	Name/Location
543BB	Access Door
643BB	Access Door

SUBTASK 28-31-02-820-008

(13) Do this task: Adapter Shaft Alignment, TASK 28-31-02-820-801.

H. Install the Index Plate

SUBTASK 28-31-02-820-009

(1) Do this procedure after you have correctly aligned and marked the alignment position of the index plate [36] and adapter/shaft [31] per this task: Adapter Shaft Alignment, TASK 28-31-02-820-801.

SUBTASK 28-31-02-020-016

(2) Remove the index plate [36] from the adapter/shaft [31].

SUBTASK 28-31-02-420-022

(3) Do these steps to prepare the index plate [36] and the adapter/shaft [31] for a fay sealed fay surface bond (SWPM 20-20-00):

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(a) Protect the alignment reference mark when you clean the index plate [36] and the adapter/shaft [31] for the fay sealed fay surface bond.

WARNING

DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(b) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-19: CDCCL

(c) Apply a thin continuous layer of sealant between the surface of the index plate [36] (three locations) and the adapter/shaft [31] (valve adapter plate) for a fay sealed fay surface bond (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the fay sealed fay surface bond.

NOTE: Alternative sealants are not approved in this application.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(d) Apply sealant to the shank and the threads of the top two screws [38] and the bottom screw [39].

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the wet installation of two screws [38]and screw [39].

NOTE: Use the same sealant that was used for the fay surface fay seal.

NOTE: Alternative sealants are not approved in this application.

2) Make sure the sealant applied to the fasteners is approximately 0.060 in. (1.524 mm) thick.

SUBTASK 28-31-02-420-023

(4) Do these steps to install the index plate [36]:

(a) Align the index plate [36] and the adapter/shaft [31] with the alignment reference mark that you made during the spar valve alignment procedure.

(b) Install the two screws [38] and washers [37] in the top index mounting hole positions.

(c) Install the screw [39] and washer [37] in the bottom index mounting hole position.

(d) Tighten the screws to 22 ±1 in-lb (2.5 ±0.1 N·m).

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(e) Make sure the sealant is continuously squeezed out along the edges of the contact surfaces.

(f) If there are gaps, bubbles or voids in the sealant squeeze out, then disassemble and apply more sealant.

(g) Shape the squeezed out sealant into a fillet seal ((TASK 51-31-01-390-804)).

(h) As an option, remove the extra squeezed out sealant.

NOTE: Make sure the sealant that remains is flush with the mating part edges.

SUBTASK 28-31-02-765-002

(5) Measure the electrical bonding resistance between one of the actuator attachment contact surfaces on the index plate [36] (bare metal surface) and the rear spar (SWPM 20-20-00).

(a) Use an intrinsically safe approved bonding meter, COM-1550.

(b) Make sure the electrical bonding resistance is 0.0020 ohm (2.0 milliohms) or less.

1) If the electrical bonding resistance is more than 0.0020 ohm (2.0 milliohms), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Fuel Jettison Nozzle Valve, TASK 28-31-02-300-801.

SUBTASK 28-31-02-760-003

28-AWL-19: CDCCL

(6) Measure the electrical bonding resistance between the index plate [36] and the adapter/shaft [31] (valve adapter plate) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

28-AWL-19: CDCCL

(a) Make sure one or both ends of the bonding jumper that attaches to the actuator is disconnected.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(b) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-19: CDCCL

(c) Make sure the electrical bonding resistance is 0.0005 ohm (0.5 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) If the electrical bonding resistance is more than 0.0005 ohm (0.5 milliohms, then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Fuel Jettison Nozzle Valve, TASK 28-31-02-300-801.

SUBTASK 28-31-02-420-024

(7) Lockwire the top screws [38], the bottom screw [39] and the index plate [36] together.

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SUBTASK 28-31-02-790-001

(8) Do this task: Fuel Jettison Nozzle Valve Actuator - Installation, TASK 28-31-03-400-804.

SUBTASK 28-31-02-370-001

(9) Do this task to apply protective finishes to the bare areas of the rear spar: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

NOTE: Re-apply the protective finishes to the rear spar at all bare areas not covered by the fillet seal, and where the electrical bonding probe removed the finishes.

(a) These are the protective finishes:

1) Alodine 600 coating, C00064

2) BMS 10-20 coating, C00307.

I. Jettison Nozzle Valve Test

SUBTASK 28-31-02-710-002

(1) Do this task: Fuel Jettison System - Operational Test, TASK 28-31-00-720-801.

SUBTASK 28-31-02-650-010

(2) Refuel each of the main fuel tanks to a minimum of 30,000 lb (13,608 kg), (TASK 12-11-01-650-801).

NOTE: This is the fuel quantity necessary to make sure there are no leaks at the rear spar.

(a) Make sure there are no fuel leaks at the adapter/shaft [31] installation on the rear spar.

J. Put the Airplane Back to the Usual Condition

SUBTASK 28-31-02-410-004

(1) Close these access panels:

(TASK 06-44-00-800-802)

Number	Name/Location
561GB	Midspan Fixed Trailing Edge Panel
661GB	Midspan Fixed Trailing Edge Panel

SUBTASK 28-31-02-440-002

WARNING MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(2) To reactivate the trailing edge flaps, do this task: Trailing Edge Flap Reactivation, TASK 27-51-00-440-801.

SUBTASK 28-31-02-650-011

(3) To refuel the airplane (if it is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

END OF TASK

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ARO ALL

TASK 28-31-02-820-801

6. Adapter Shaft Alignment

(Figure 402)

A. References

Reference	Title
28-31-03-000-804	Fuel Jettison Nozzle Valve Actuator - Removal (P/B 401)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1587	Wrench - Torque, 30 in-lbs (4 N-m) Part #: TE3FUA Supplier: 55719
SPL-1771	Alignment Equipment, Fuel Shutoff Valve Part #: B28009-1 Supplier: 81205

C. Location Zones

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

D. Procedure

SUBTASK 28-31-02-010-019

(1) Prepare the adapter/shaft for the alignment procedure.

(a) If it is not removed, do this task: Fuel Jettison Nozzle Valve Actuator - Removal, TASK 28-31-03-000-804.

(b) If not previously removed, remove the index plate [36] from the adapter/shaft [31].

SUBTASK 28-31-02-480-002

(2) Do these steps to install the valve alignment equipment, SPL-1771, in the index plate [36].

(a) Put the index plate in position and align the serrated surfaces of the index plate and adapter plate.

(b) Loosely install the bottom screw [39] to the index plate [36].

(c) Put the alignment tool in position against the index plate with the two guide pins in the holes usually used by the top two screws [38] (the scale should be on the top of the tool).

(d) Make sure the spline on the tool engages with the spline on the shaft.

SUBTASK 28-31-02-820-003

(3) Do these steps to align the adapter shaft (Procedure 1, optional to Procedure 2):

NOTE: This procedure finds the point where the internal valve butterfly engages the valve seal. The torque necessary to turn the shaft increases as the butterfly engages the seal, then decreases again as the butterfly leaves the other side of the seal. Once the edge of the seal is found, the valve shaft will then be turned to center the butterfly on the seal.

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(a) Put the tool handle in the extreme counterclockwise position.

(b) Turn the handle slowly in the clockwise direction at a constant rate while you note the changes in the torque necessary to turn the handle.

(c) Do the previous steps as many times as necessary to find the point in the rotation where the torque necessary to turn the handle increases significantly.

(d) If you cannot find the position in the rotation where the torque increases significantly, then use Procedure 2 below.

(e) Put the shaft in the extreme counterclockwise position again.

(f) Slowly and smoothly turn the handle of the tool clockwise until a distinct increase in torque is found and immediately stop turning the handle.

(g) Read the scale on the tool.

NOTE: This is the point where the valve butterfly starts to engage the edge of the seal.

(h) Turn the handle 13 degrees more in the clockwise direction (the scale is calibrated in degrees).

NOTE: The valve butterfly is now centered on the valve seal.

NOTE: If you turn the handle past the target value, do not turn the handle back in the counterclockwise direction again. You must start the procedure again with the handle in the extreme counterclockwise position.

SUBTASK 28-31-02-820-004

(4) Do these steps to align the adapter shaft (Procedure 2, optional to Procedure 1):

NOTE: A torque wrench (30 in-lbs), COM-1587 is necessary to do this procedure.

(a) Put the tool handle in the extreme counterclockwise position.

(b) Slowly and smoothly turn the tool handle to the extreme clockwise position while you monitor the torque that you apply to the handle.

(c) Write down the maximum torque that you apply to the tool while you turn it from the extreme counterclockwise position to the extreme clockwise position.

(d) Turn the tool back to the extreme counterclockwise position.

(e) Turn the shaft clockwise again at approximately the same rate that you used before.

(f) Stop at the position where the torque increases to approximately two-thirds of the maximum torque that you wrote down before.

(g) Read the scale on the tool at this position.

NOTE: This is the position where valve butterfly starts to engage the edge of the seal.

(h) Turn the handle 13 more degrees in the clockwise direction past the reading from the previous step.

NOTE: The butterfly valve is now centered on the valve seal.

NOTE: If you turn the valve past the target value, do not turn it back in the counterclockwise direction. You must start again with the tool handle in the extreme counterclockwise position.

SUBTASK 28-31-02-820-006

(5) Tighten the alignment tool lockscrew to hold the alignment tool in position on the adapter/shaft.

SUBTASK 28-31-02-820-007

(6) Turn the index plate [36] until the actuator mounting holes in the index plate [36] are aligned with the two upper holes for the alignment screws.

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SUBTASK 28-31-02-820-005

(7) Insert the two alignment screws into the holes for the actuator mounting screws to hold the index plate [36] in alignment with the adapter/shaft (this is the final adjustment of the position of the index plate [36]).

SUBTASK 28-31-02-420-014

(8) Tighten the bottom screw [39].

SUBTASK 28-31-02-020-015

(9) Carefully remove the alignment screws.

SUBTASK 28-31-02-080-002

(10) Loosen the lockscrew and carefully remove the alignment tool from the index plate [36].

SUBTASK 28-31-02-420-017

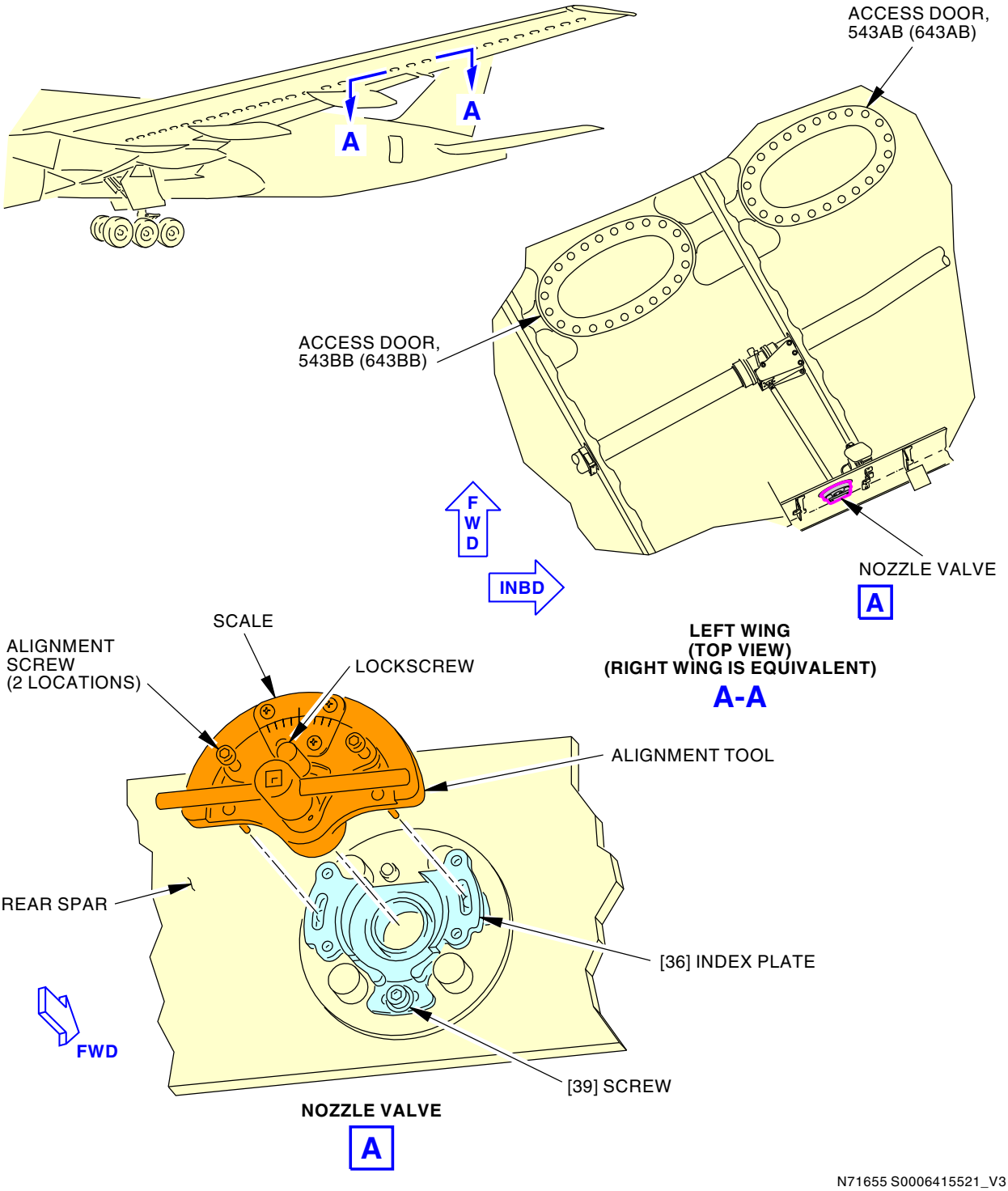
(11) Use a fine point felt pen to apply a reference mark between the index plate [36] and the adapter/shaft at one of the serrated attachment points.

SUBTASK 28-31-02-420-018

(12) Continue with the index plate installation procedure in this task: Fuel Jettison Nozzle Valve (Adapter/Shaft) - Installation, TASK 28-31-02-400-804.

——— END OF TASK ———

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Fuel Jettison Nozzle Valve Alignment Tool Installation
Figure 402/28-31-02-990-803

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TASK 28-31-02-300-801

7. Rework the Fay Sealed Fay Surface Bonds for the Fuel Jettison Nozzle Valve

A. General

(1) This task contains these procedures:

(a) Rework the Fay Sealed Fay Surface Bond - Actuator to Index Plate

(b) Rework the Fay Sealed Fay Surface Seal Bond - Index Plate to Adapter/Shaft

(c) Rework the Fay Sealed Fay Surface Bond - Adapter/Shaft to Rear Spar

(d) Rework the Bonding Jumper Bond

(2) Do this task if the measurement for the electrical bonding resistance is more than the permitted resistance value.

(3) The motor operated valve uses two electrical bonding paths:

(a) One bonding path is from the upper housing of the actuator through the bonding jumper to the airplane structure.

(b) The second bonding path is from the upper housing of the actuator to the bare metal surface of the rear spar. The bond path is through the bare metal fay surfaces of the actuator (at the mounting feet), index plate, and adapter/shaft to the bare metal surface of the rear spar.

NOTE: The actuator is divided into two sections, the upper housing section and the lower housing section. The two housing sections are separated by a fay surface. You cannot repair or rework the fay surface between the housing sections at the airplane. When you do an electrical bonding measurement, make sure the measurement is done on the upper housing section of the actuator.

(4) If the electrical bonding resistance is more than the maximum permitted resistance, you must disassemble the components, rework the fay surface, assemble the components, and then re-check the electrical bonding resistance. Continue to rework the fay surfaces until the electrical bonding resistance between the components is within the permitted resistance values.

(5) Because the build-up of the fuel jettison nozzle valve includes several fay sealed fay surface bonds, you may not know which fay sealed fay surface bond is the cause of the problem. This task will help you isolate the location of the fay sealed fay surface bond that needs to be reworked. The procedure does a check of the fay sealed fay surface bond downstream of the bond that is in question.

(6) For application of fay surface fay seals in this task, it is acceptable to use sealant, A50110, as an alternative to sealant, A50155.

NOTE: Sealants should not be mixed. In applications where sealants may mix, use the same sealant for both applications.

B. References

Reference	Title
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
28-31-03-000-804	Fuel Jettison Nozzle Valve Actuator - Removal (P/B 401)
28-31-03-400-804	Fuel Jettison Nozzle Valve Actuator - Installation (P/B 401)

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(Continued)

Reference	Title
28-31-03-990-803	Figure: Fuel Jettison Nozzle Valve Actuator Installation (P/B 401)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

D. Consumable Materials

Reference	Description	Specification
A50110	Sealant	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Rework the Fay Sealed Fay Surface Bond - Actuator to Index Plate

(Figure 28-31-03-990-803, Figure 401)

NOTE: Do the steps in this procedure if the measurement for the electrical bonding resistance between the upper housing of the actuator and the rear spar is more than 0.0025 ohm (2.5 milliohms). The measurement is done with the bonding jumper and the electrical connector disconnected from the actuator.

SUBTASK 28-31-02-000-001

(1) Do this task: Fuel Jettison Nozzle Valve Actuator - Removal, TASK 28-31-03-000-804.

SUBTASK 28-31-02-765-003

(2) Do these steps to do a check of the index plate to rear spar bonding path:

NOTE: These steps will tell you if the actuator to index plate fay sealed fay surface bond is the cause of the problem, or if the index plate to adapter/shaft fay sealed fay surface bond is the cause of the problem.

(a) Remove the sealant and clean one of the contact surfaces on the index plate.

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(b) Measure the electrical bonding resistance between the contact surface on the index plate (bare metal surface) and the rear spar (SWPM 20-20-00) (Figure 401).

(c) Make sure the electrical bonding resistance is 0.0020 ohm (2.0 milliohms) or less.

(d) If the electrical bonding resistance is not satisfactory, then do the steps in this procedure: Rework the Fay Sealed Fay Surface Bond - Index Plate to Adapter/Shaft.

(e) If the electrical bonding resistance is satisfactory, then continue with the subsequent steps.

SUBTASK 28-31-02-400-001

(3) Do this task: Fuel Jettison Nozzle Valve Actuator - Installation, TASK 28-31-03-400-804.

NOTE: This task will rework the fay sealed fay surface bond and re-install the actuator.

SUBTASK 28-31-02-765-004

(4) During the installation, do a check of the electrical bonding resistance between the upper housing of the actuator and the rear spar (SWPM 20-20-00) (Figure 28-31-03-990-803).

(a) Do this measurement with the bonding jumper and the electrical connector disconnected.

(b) Make sure the bonding jumper does not touch the actuator during the electrical bonding measurement.

(c) Make sure the electrical bonding resistance is 0.0025 ohm (2.5 milliohms) or less.

(d) If the electrical bonding resistance is not satisfactory, then repeat the steps in this procedure.

(e) If the electrical bonding resistance is satisfactory, then continue with the steps to install the actuator (TASK 28-31-03-400-804).

SUBTASK 28-31-02-710-003

(5) If you have replaced the actuator or adjusted the index plate, then continue with the steps in these procedures: Fuel Jettison Nozzle Valve Actuator - Installation, TASK 28-31-03-400-804 (Jettison Nozzle Valve Actuator Test) and Fuel Jettison Nozzle Valve (Adapter/Shaft) - Installation, TASK 28-31-02-400-804 (Jettison Nozzle Valve Test).

F. Rework the Fay Sealed Fay Surface Bond - Index Plate to Adapter/Shaft

(Figure 401)

NOTE: Do the steps in this procedure if the measurement for the electrical bonding resistance between the index plate and the rear spar is more than 0.0020 ohm (2.0 milliohms). The measurement is done with the actuator removed.

SUBTASK 28-31-02-010-026

(1) Do this task: Fuel Jettison Nozzle Valve (Adapter/Shaft) - Removal, TASK 28-31-02-000-804.

SUBTASK 28-31-02-765-005

(2) Do these steps to check the adapter/shaft to rear spar bonding path:

NOTE: These steps will tell you if the index plate to adapter/shaft fay sealed fay surface bond is the cause of the problem, or if the adapter/shaft to rear spar fay sealed fay surface bond is the cause of the problem.

(a) Remove the sealant and clean one of the contact surfaces on the adapter/shaft.

(b) Measure the electrical bonding resistance between the contact surface on the adapter/shaft and the rear spar (SWPM 20-20-00).

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(c) Make sure the electrical bonding resistance is 0.0015 ohm (1.5 milliohms) or less.

NOTE: This is the repair electrical bonding resistance value. The adapter/shaft electrical installation bonding resistance value is 0.0005 ohm (0.5 milliohm).

(d) If the electrical bonding resistance is not satisfactory, then do the steps in this procedure: Rework the Fay Sealed Fay Surface Bond - Adapter/Shaft to Rear Spar.

(e) If the electrical bonding resistance is satisfactory, then continue with the subsequent steps.

SUBTASK 28-31-02-400-002

(3) Do these steps to install the index plate:

NOTE: These steps will re-align the fuel jettison nozzle valve, rework the fay surface, and re-install the index plate.

(a) Do this task: Adapter Shaft Alignment, TASK 28-31-02-820-801.

(b) Do this procedure: Fuel Jettison Nozzle Valve (Adapter/Shaft) - Installation, TASK 28-31-02-400-804 (Install the Index Plate).

SUBTASK 28-31-02-765-006

(4) During the installation, do a check of the electrical bonding resistance between the index plate and the rear spar (SWPM 20-20-00):

(a) Make sure the electrical bonding resistance is 0.0020 ohm (2.0 milliohms) or less.

(b) If the electrical bonding resistance is not satisfactory, then repeat the steps in this procedure.

(c) If the electrical bonding resistance is satisfactory, then continue with the procedure to install the index plate (TASK 28-31-02-400-804).

SUBTASK 28-31-02-710-004

(5) After you install the index plate, do this procedure: Fuel Jettison Nozzle Valve (Adapter/Shaft) - Installation, TASK 28-31-02-400-804 (Jettison Nozzle Valve Test).

G. Rework the Fay Sealed Fay Surface Bond - Adapter/Shaft to Rear Spar

(Figure 401)

NOTE: Do the steps in this procedure if the measurement for the electrical bonding resistance between the adapter/shaft and the rear spar is more than 0.0015 ohm (1.5 milliohms).

SUBTASK 28-31-02-010-027

(1) Do this task: Fuel Jettison Nozzle Valve (Adapter/Shaft) - Removal, TASK 28-31-02-000-804.

NOTE: A fuel tank entry is necessary to rework the fay surface of the adapter/shaft.

SUBTASK 28-31-02-400-003

(2) Do this task: Fuel Jettison Nozzle Valve (Adapter/Shaft) - Installation, TASK 28-31-02-400-804.

NOTE: These steps will rework the fay surface, and re-install the adapter/shaft.

SUBTASK 28-31-02-765-007

(3) During the installation, do a check of the electrical bonding resistance between the adapter/shaft and the rear spar (SWPM 20-20-00).

(a) Make sure the electrical bonding resistance is 0.0005 ohm (0.5 milliohm) or less.

(b) If the electrical bonding resistance is not satisfactory, then repeat the steps in this procedure.

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(c) If the electrical bonding resistance is satisfactory, then continue with the steps to install the adapter/shaft (TASK 28-31-02-400-804).

SUBTASK 28-31-02-710-005

(4) After you install the adapter/shaft, do this procedure: Fuel Jettison Nozzle Valve (Adapter/Shaft) - Installation, TASK 28-31-02-400-804 (Install the Index Plate and Jettison Nozzle Valve Test).

H. Rework the Bonding Jumper Bond

(Figure 28-31-03-990-803)

NOTE: Do the steps in this procedure if the measurement for the electrical bonding resistance between the bonding jumper terminal and the rear spar is more than 0.0015 ohm (1.5 milliohms). The measurement is done with the bonding jumper disconnected from the actuator.

SUBTASK 28-31-02-030-002

(1) Remove the sealant from the bonding jumper terminal attached to the structure.

SUBTASK 28-31-02-030-003

(2) Remove the nut, two washers, and the bonding jumper.

SUBTASK 28-31-02-430-002

(3) Do these steps to install the bonding jumper to the structure:

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(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

(b) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper terminal and the two washers.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the fay surface fay seal.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(c) Install the nut, washers, and the bonding jumper to the structure.

(d) Tighten the nut to 20 in-lb (2.3 N·m).

(e) Measure the electrical bonding resistance between the loose end of bonding jumper and the rear spar (SWPM 20-20-00).

1) Use an intrinsically safe approved bonding meter, COM-1550.

2) Make sure the electrical bonding resistance is 0.0015 ohm (1.5 milliohms) or less.

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(f) Apply a cap seal of sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, over the nut and the terminal of the bonding jumper.

NOTE: Use the sealant that was used for the fay surface fay seal.

SUBTASK 28-31-02-420-025

(4) Continue with this task: Fuel Jettison Nozzle Valve Actuator - Installation, TASK 28-31-03-400-804.

SUBTASK 28-31-02-710-006

(5) If you have replaced the actuator or adjusted the index plate, then continue with the steps in the Jettison Nozzle Valve Actuator Test procedure in the task: Fuel Jettison Nozzle Valve Actuator - Installation, TASK 28-31-03-400-804, and the Jettison Nozzle Valve Test procedure in the task: Fuel Jettison Nozzle Valve (Adapter/Shaft) - Installation, TASK 28-31-02-400-804.

——— END OF TASK ———

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FUEL JETTISON NOZZLE VALVE ACTUATOR - REMOVAL/INSTALLATION

1. General

A. There are two jettison nozzle valves. The valves are installed outboard of rib 35 in the left and right wings.

B. This procedure has tasks to remove and install the actuator for the fuel jettison nozzle valve.

C. The procedure to remove and install the fuel jettison nozzle valve is in PAGEBLOCK 28-31-02/401.

ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS

TASK 28-31-03-000-804

2. Fuel Jettison Nozzle Valve Actuator - Removal

(Figure 401)

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
27-51-00-040-801	Trailing Edge Flap Deactivation (P/B 201)

B. Location Zones

Zone	Area
561	Rear Spar to Trailing Edge - Outboard of Flaperon - Left Wing
661	Rear Spar to Trailing Edge - Outboard of Flaperon - Right Wing

C. Access Panels

Number	Name/Location
561GB	Midspan Fixed Trailing Edge Panel
661GB	Midspan Fixed Trailing Edge Panel

D. Procedure

SUBTASK 28-31-03-040-002

WARNING MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(1) Deactivate the trailing edge flaps (TASK 27-51-00-040-801).

SUBTASK 28-31-03-010-009

(2) Open this access panel to get access to the actuator [34] for the jettison nozzle valve on the rear spar:

(TASK 06-44-00-800-802)

Number	Name/Location
561GB	Midspan Fixed Trailing Edge Panel

SUBTASK 28-31-03-010-008

(3) Open this access panel to get access to the actuator [34] for the right jettison nozzle valve on the rear spar:

(TASK 06-44-00-800-802)

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Number	Name/Location
661GB	Midspan Fixed Trailing Edge Panel

SUBTASK 28-31-03-862-002

(4) For the actuator to the left jettison nozzle valve:

(a) Open this circuit breaker and install safety tag:

Left Power Management Panel, P110

Row	Col	Number	Name
L	25	C28621	L FUEL JETT NOZ VLV

SUBTASK 28-31-03-862-001

(5) For the actuator to the right jettison nozzle valve:

(a) Open this circuit breaker and install safety tag:

Right Power Management Panel, P210

Row	Col	Number	Name
K	12	C28620	R FUEL JETT NOZ VLV

SUBTASK 28-31-03-010-007

(6) Make sure the manual override handle of the actuator [34] is in the CLOSED position.

(a) If the manual override handle is not in the CLOSED position, move the manual override handle to the CLOSED position.

SUBTASK 28-31-03-030-002

(7) Disconnect the electrical connector.

SUBTASK 28-31-03-030-003

(8) Remove the sealant from the bonding jumper [33] and fasteners at the actuator attachment location.

SUBTASK 28-31-03-030-004

(9) Remove the screw [31], washers [32] and the bonding jumper [33] from the actuator [34].

SUBTASK 28-31-03-030-005

(10) Remove the four screws [22] and washers [23] that attach the actuator [34] to the adapter /shaft [26].

SUBTASK 28-31-03-030-001

(11) Carefully disassemble the actuator [34] from the index plate [25].

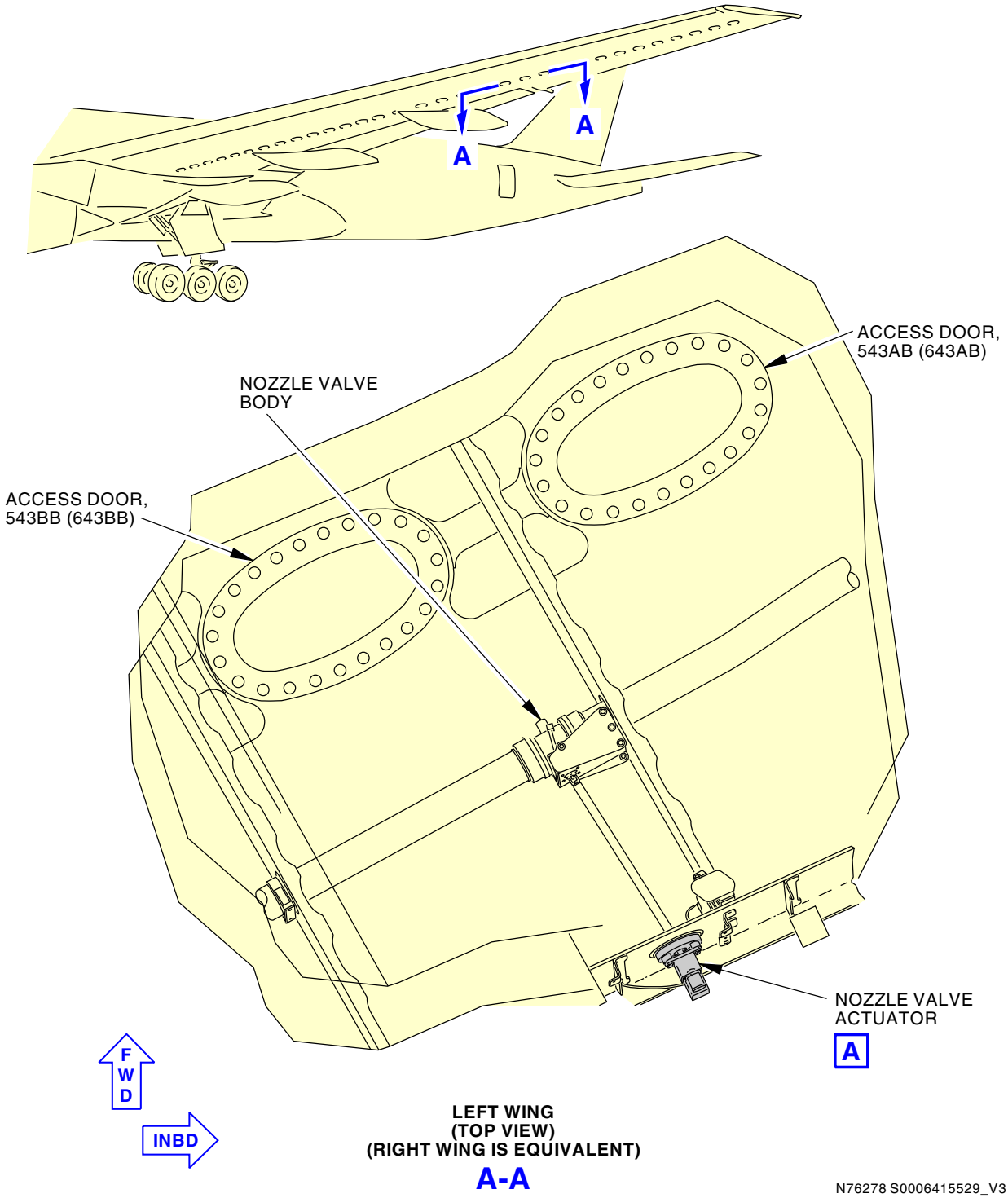
NOTE: The actuator and index plate are bonded with faying surface sealant.

SUBTASK 28-31-03-020-006

(12) Remove the actuator [34].

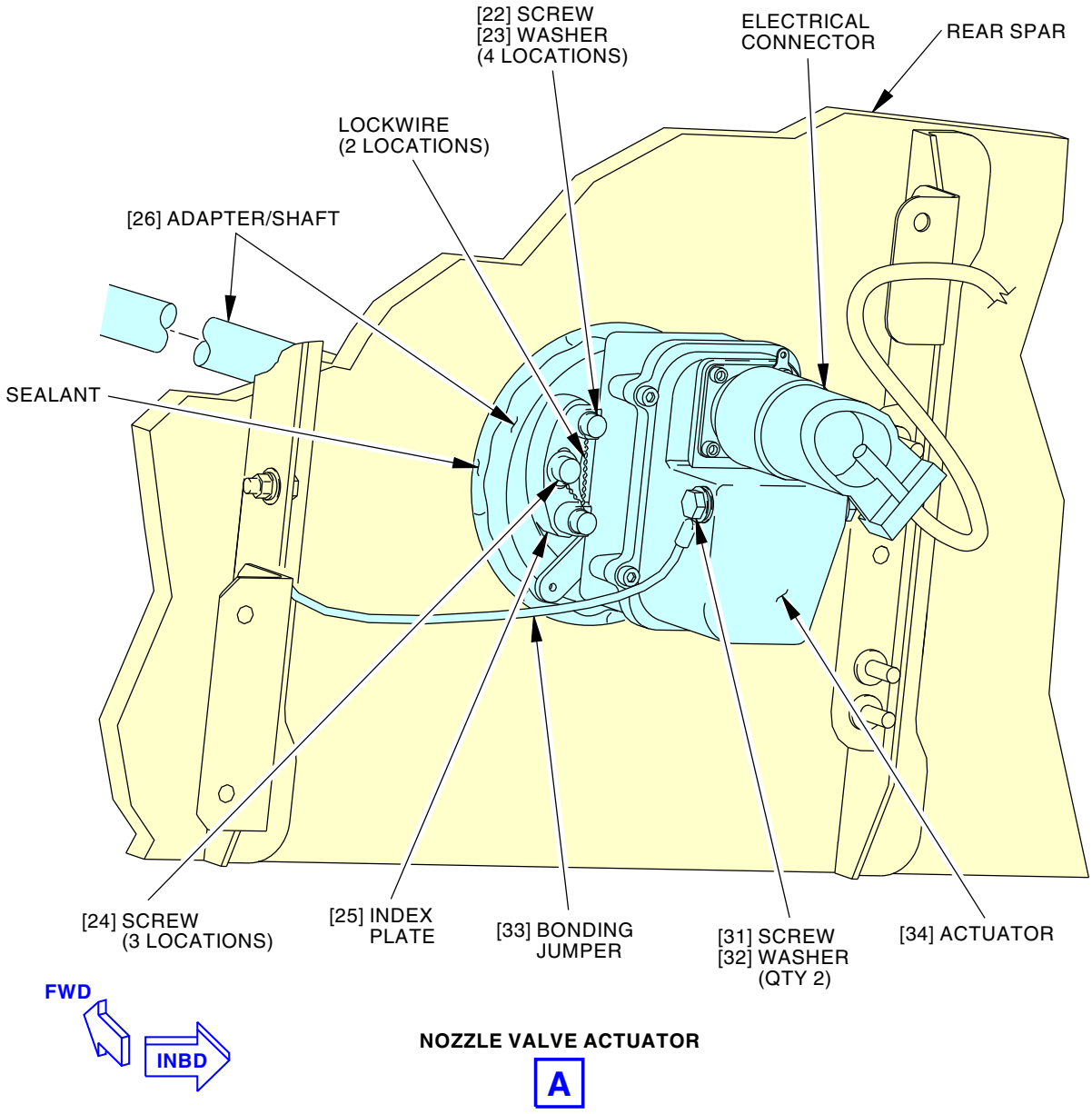
——— END OF TASK ———

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Fuel Jettison Nozzle Valve Actuator Installation
Figure 401/28-31-03-990-803 (Sheet 1 of 2)

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Fuel Jettison Nozzle Valve Actuator Installation
Figure 401/28-31-03-990-803 (Sheet 2 of 2)

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TASK 28-31-03-400-804

3. Fuel Jettison Nozzle Valve Actuator - Installation

(Figure 401)

A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(2) For application of fay sealed fay surface bonds in this task, it is acceptable to use sealant, A50110, as an alternative to sealant, A50155.

NOTE: Sealants should not be mixed. In applications where sealants may mix, use the same sealant for both applications.

B. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
12-11-01-650-801	Pressure Refueling (P/B 301)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
20-30-92-910-801	Final Cleaning Prior to General Sealing (Series 92) (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
27-51-00-440-801	Trailing Edge Flap Reactivation (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-21-00-790-802	Refuel/Jettison and Fuel Feed Manifold - Leak Test (P/B 501)
28-22-01-300-801	Rework the Fay Sealed Fay Surface Bonds for the Spar Valve (P/B 401)
28-31-02-300-801	Rework the Fay Sealed Fay Surface Bonds for the Fuel Jettison Nozzle Valve (P/B 401)
32-09-00-860-801	Air/Ground Mode Simulation (P/B 201)
51-21-04-620-801	Alodine 600, 1000, 1200, and 1200S Coating Application (P/B 701)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

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Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: $0855 Part #: 234350 Supplier: $0857 Part #: 311 Supplier: F6892 Part #: 411B60 Supplier: 3DN12 Part #: 411B90 Supplier: 3DN12 Part #: DAD5013 Supplier: $0856 Part #: DFD5019 Supplier: $0856 Part #: J5-0275-2010 Supplier: 435R8 Part #: SCD5019 Supplier: $0856 Part #: ST982LF-9 Supplier: 62176 Part #: TS1275-4 Supplier: 1DWR5
COM-4746	Handle - Sealant Removal Tool Part #: 310/1 Supplier: F6892 Part #: SHN0272 Supplier: $0856 Part #: SHR0272-T Supplier: 1DWR5 Part #: SHW0215 Supplier: $0856
STD-123	Brush - Soft Bristle

D. Consumable Materials

Reference	Description	Specification
A50110	Sealant	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
B01012	Solvent - Final Cleaning Prior To General Sealing - Series 92	
C00064	Coating - Aluminum Chemical Conversion	BAC5719 Type II Class A (MIL-DTL-5541 Class 1A)
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20 Type II
C50033	Chromated Conversion Coating for Aluminum - Alodine 1200	

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(Continued)

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
34	Actuator	28-31-03-01A-325	ARO ALL
		28-31-03-10-125	ARO ALL

F. Location Zones

Zone	Area
561	Rear Spar to Trailing Edge - Outboard of Flaperon - Left Wing
661	Rear Spar to Trailing Edge - Outboard of Flaperon - Right Wing

G. Access Panels

Number	Name/Location
561GB	Midspan Fixed Trailing Edge Panel
661GB	Midspan Fixed Trailing Edge Panel

H. Procedure

SUBTASK 28-31-03-862-003

(1) For the actuator to the left jettison nozzle valve:



CAUTION

REMOVE POWER TO THE ACTUATOR. IF YOU DO MAINTENANCE TO THE ACTUATOR WHILE IT IS ENERGIZED, DAMAGE TO THE ACTUATOR CAN OCCUR.

(a) Open this circuit breaker and install safety tag:

Left Power Management Panel, P110

Row	Col	Number	Name
L	25	C28621	L FUEL JETT NOZ VLV

SUBTASK 28-31-03-862-004

(2) For the actuator to the right jettison nozzle valve:



CAUTION

REMOVE POWER TO THE ACTUATOR. IF YOU DO MAINTENANCE TO THE ACTUATOR WHILE IT IS ENERGIZED, DAMAGE TO THE ACTUATOR CAN OCCUR.

(a) Open this circuit breaker and install safety tag:

Right Power Management Panel, P210

Row	Col	Number	Name
K	12	C28620	R FUEL JETT NOZ VLV

SUBTASK 28-31-03-140-001

(3) Remove the old sealant and clean the actuator [34], index plate [25] and fasteners (if re-used).

(a) Use sealant removal tool, COM-2481, and sealant removal tool handle, COM-4746 (or equivalent), to remove old sealant from the actuator [34] and index plate [25].

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(b) To remove the remaining sealant, grease, oil, dirt, and other contamination from the components, use one of these items soaked with Series 92 solvent, B01012 (TASK 20-30-92-910-801):

1) soft bristle brush, STD-123

2) cotton wiper, G00034

SUBTASK 28-31-03-420-004

(4) Do these steps to prepare the actuator [34] and the index plate [25] for a fay sealed fay surface bond (SWPM 20-20-00):

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(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-19: CDCCL

(b) Apply a thin continuous layer of sealant between the actuator [34] mounting feet contact areas (four locations) and the index plate [25] for a fay sealed fay surface bond.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the fay sealed fay surface bond.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(c) Apply sealant to the shank and the threads of the screws [22] for a fay sealed fay surface bond.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the wet installation of the screws [22].

NOTE: Use the same sealant that was used for the fay sealed fay surface bond.

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2) Make sure the sealant applied to the fasteners is approximately 0.060 in. (1.524 mm) thick.

SUBTASK 28-31-03-420-005

(5) Do these steps to install the actuator [34] to the index plate [25]:

(a) Make sure the manual override lever on the actuator [34] is in the CLOSED position.

(b) Align the actuator output shaft with the adapter /shaft [26].

(c) Make sure the two spaces for teeth on the adapter /shaft [26] align with the actuator output shaft.

(d) Put the actuator output shaft into the adapter/shaft.

NOTE: The contact areas of the actuator automatically align with the mounting points on the index plate.

(e) Install the four screws [22] and washers [23].

NOTE: Lockwire is not necessary for the screws [22].

(f) Tighten the screws [22] to 20 in-lb (2.3 N·m).

(g) Make sure the sealant is continuously squeezed out along the edges of the contact surfaces.

(h) If there are gaps, bubbles or voids in the sealant squeeze out, then disassemble and apply more sealant.

(i) Shape the squeezed out sealant into a fillet seal.

(j) As an option, remove the extra squeezed out sealant.

NOTE: Make sure the sealant that remains is flush with the mating part edges.

SUBTASK 28-31-03-765-001

28-AWL-19: CDCCL

(6) Measure the electrical bonding resistance between the actuator [34] upper housing and the rear spar (structure) (SWPM 20-20-00):

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

28-AWL-19: CDCCL

(a) Do this measurement with the bonding jumper [33] and electrical connector [1] disconnected.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(b) Make sure the bonding jumper [33] does not touch the actuator [34] during the bonding measurement.

(c) Use an intrinsically safe approved bonding meter, COM-1550.

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28-AWL-19: CDCCL

(d) If the actuator [34], index plate [25] and adapter plate (part of the adapter /shaft [26]) were removed, make sure the electrical bonding resistance is 0.0030 ohm (3.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) If the electrical bonding resistance is more than 0.0030 ohm (3.0 milliohms), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Fuel Jettison Nozzle Valve, TASK 28-31-02-300-801.

28-AWL-19: CDCCL

(e) If the actuator [34] and index plate [25] were removed, make sure the electrical bonding resistance is 0.0040 ohm (4.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) If the electrical bonding resistance is more than 0.0040 ohm (4.0 milliohms), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Fuel Jettison Nozzle Valve, TASK 28-31-02-300-801.

28-AWL-19: CDCCL

(f) If only the actuator [34] was removed, make sure the electrical bonding resistance is 0.0040 ohm (4.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) If the electrical bonding resistance is more than 0.0040 ohm (4.0 milliohms), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Fuel Jettison Nozzle Valve, TASK 28-31-02-300-801.

SUBTASK 28-31-03-420-011

(7) If the bonding jumper [33] is disconnected from the structure, do these steps to attach the bonding jumper [33]:

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(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

(b) Rub dry with a clean, dry cotton wiper, G00034.

(c) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

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28-AWL-19: CDCCL

(d) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper [33] terminal and the two washers for a fay sealed fay surface bond at the structure.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use sealant, A50110, or sealant, A50155, for the fay sealed fay surface bond.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(e) Install the screw and washers to attach the bonding jumper [33] to the structure.

1) Tighten the screw to 30 ±5 in-lb (3 ±1 N·m).

28-AWL-19: CDCCL

(f) Apply a cap seal over the screw (fastener) and the terminal of the bonding jumper [33] attached to the structure.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

NOTE: Use the sealant that was used for the fay sealed fay surface bond.

1) Use sealant, A50110 or sealant, A50155.

SUBTASK 28-31-03-420-006

(8) Do these steps to install the bonding jumper [33] to the actuator [34]:

(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

(b) Rub dry with a clean, dry cotton wiper, G00034.

(c) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-19: CDCCL

(d) Measure the electrical bonding resistance between the loose end of the bonding jumper [33] and the rear spar (structure) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-19: CDCCL

2) Make sure the electrical bonding resistance is 0.0015 ohm (1.5 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

a) If the electrical bonding resistance is more than 0.0015 ohm (1.5 milliohms), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Spar Valve, TASK 28-22-01-300-801.

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28-AWL-19: CDCCL

(e) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper [33] terminal and the two washers [32] for a fay sealed fay surface bond between the actuator [34] and the bonding jumper [33] terminal.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the fay sealed fay surface bond.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(f) Install the screw [31], washers [32], and bonding jumper [33] to the actuator [34].

(g) AIRPLANES WITHOUT ACTUATOR MA30A1001:

Tighten the screw [31] to 20 in-lb (2.3 N·m).

(h) AIRPLANES WITH ACTUATOR MA30A1001:

Tighten the screw [31] to 35 in-lb (4.0 N·m).

28-AWL-19: CDCCL

(i) Measure the electrical bonding resistance between the upper housing of the actuator [34] and the attached bonding jumper [33] terminal (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Do not touch the screw [31] when you make the bonding measurement.

2) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-19: CDCCL

3) Make sure the electrical bonding resistance is 0.0010 ohm (1.0 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

28-AWL-19: CDCCL

(j) Apply a cap seal over the screw [31] (fastener) and the terminal lug of the bonding jumper [33] attached to the actuator [34].

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

NOTE: Use the sealant that was used for the fay sealed fay surface bond.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296.

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SUBTASK 28-31-03-370-001

(9) Do this task to apply protective finishes to the bare areas of the rear spar: Apply the Corrosion Resistant Finish (Topcoat), TASK 28-11-00-600-801.

NOTE: Re-apply the protective finishes to the rear spar where the electrical bonding probes removed the finishes.

(a) These are the protective finishes:

1) Alodine 600 coating, C00064.

2) BMS 10-20 coating, C00307.

SUBTASK 28-31-03-916-001

(10) Do this task to apply Alodine 1200 coating, C50033, to any bare areas of the actuator [34]: Alodine 600, 1000, 1200, and 1200S Coating Application, TASK 51-21-04-620-801.

NOTE: Re-apply the protective coating to the actuator [34] where the electrical bonding probe removed the finish and any bare metal areas around the bonding jumper installation that are not covered with sealant.

SUBTASK 28-31-03-420-007

(11) Connect the electrical connector.

I. Jettison Nozzle Valve Actuator Test

SUBTASK 28-31-03-860-051

(1) Make sure that these circuit breakers are open and have safety tags:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL
L	24	C28631	L FUEL JETT ISLN VLV

Right Power Management Panel, P210

Row	Col	Number	Name
K	13	C28630	R JETT ISLN VLV
K	14	C28646	R FUEL JETT PUMP CTRL

SUBTASK 28-31-03-860-052

WARNING OBEY THE PROCEDURE THAT PUTS THE AIRPLANE IN THE AIR MODE. IF YOU DO THE PROCEDURE INCORRECTLY, INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Put the airplane in the air mode (TASK 32-09-00-860-801).

NOTE: Put a bucket or container below the fuel jettison nozzles at the wing tips to catch any fuel that may spill.

SUBTASK 28-31-03-865-001

(3) For the actuator to the left jettison nozzle valve:

(a) Remove the safety tag and close this circuit breaker:

Left Power Management Panel, P110

Row	Col	Number	Name
L	25	C28621	L FUEL JETT NOZ VLV

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

SUBTASK 28-31-03-865-002

(4) For the actuator to the right jettison nozzle valve:

(a) Remove the safety tag and close this circuit breaker:

Right Power Management Panel, P210

Row	Col	Number	Name
K	12	C28620	R FUEL JETT NOZ VLV

SUBTASK 28-31-03-861-001

(5) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-31-03-860-031

(6) Make sure the APU start switch, on the P5 overhead panel, is in the OFF position.

SUBTASK 28-31-03-860-032

(7) Make sure all of the fuel pump switches-lights, on the P5 overhead panel, are in the off position.

SUBTASK 28-31-03-710-003

(8) To do a test of the left or right fuel jettison nozzle valve, do this step:

(a) Push the applicable L or R NOZZLE switches of the FUEL JETTISON panel, on the P5 overhead panel, to the ON and off positions.

1) Wait 15 seconds each time you push the switch-light to let the fuel jettison nozzle valve go to the commanded position.

2) Make sure the manual override handle of the actuator for the fuel jettison nozzle valve status goes to the correct position (OPEN or CLOSED) each time you push the switch-light.

3) Do this two times to make sure the fuel jettison nozzle valve operates correctly.

NOTE: If EICAS status message FUEL JETT PUMP L/R is concurrently displayed with correlated maintenance messages 28-11038, 28-12024, 28-31001, and 28-31003, follow the procedure in Maintenance Tip 28-029 to reset the status message.

SUBTASK 28-31-03-860-053

(9) Put the airplane back to ground mode (TASK 32-09-00-860-801).

SUBTASK 28-31-03-860-054

(10) Remove the safety tags and close these circuit breakers:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL
L	24	C28631	L FUEL JETT ISLN VLV

Right Power Management Panel, P210

Row	Col	Number	Name
K	13	C28630	R JETT ISLN VLV
K	14	C28646	R FUEL JETT PUMP CTRL

SUBTASK 28-31-03-790-004

(11) To do a check for leakage in the refuel/jettison manifold, do the applicable steps in this task: Refuel/Jettison and Fuel Feed Manifold - Leak Test, TASK 28-21-00-790-802.

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

J. Put the Airplane Back to the Usual Condition

SUBTASK 28-31-03-410-003

(1) Close this access panel for the left jettison nozzle valve actuator:

(TASK 06-44-00-800-802)

Number	Name/Location
561GB	Midspan Fixed Trailing Edge Panel

SUBTASK 28-31-03-410-004

(2) Close this access panel for the right jettison nozzle valve actuator:

(TASK 06-44-00-800-802)

Number	Name/Location
661GB	Midspan Fixed Trailing Edge Panel

SUBTASK 28-31-03-440-002

WARNING MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(3) Reactivate the trailing edge flaps (TASK 27-51-00-440-801).

(a) Do this task:

SUBTASK 28-31-03-650-002

(4) To refuel the airplane (if it is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

——— END OF TASK ———

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FUEL JETTISON NOZZLE VALVE ACTUATOR - INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure contains a functional check of the bonding resistance between the structure and the fuel jettison nozzle valve actuator.

SFAR 88

TASK 28-31-03-200-801

2. Fuel Jettison Nozzle Valve Actuator - Bonding Resistance Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
27-51-00-040-801	Trailing Edge Flap Deactivation (P/B 201)
27-51-00-440-801	Trailing Edge Flap Reactivation (P/B 201)
28-31-03-400-804	Fuel Jettison Nozzle Valve Actuator - Installation (P/B 401)
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Location Zones

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

D. Access Panels

Number	Name/Location
561GB	Midspan Fixed Trailing Edge Panel
661GB	Midspan Fixed Trailing Edge Panel

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E. Prepare for the Procedure

SUBTASK 28-31-03-040-004

WARNING MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(1) Deactivate the trailing edge flaps (TASK 27-51-00-040-801).

SUBTASK 28-31-03-865-003

(2) Open these circuit breakers and install safety tags:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL
L	24	C28631	L FUEL JETT ISLN VLV

Right Power Management Panel, P210

Row	Col	Number	Name
K	13	C28630	R JETT ISLN VLV
K	14	C28646	R FUEL JETT PUMP CTRL

SUBTASK 28-31-03-865-004

(3) For the left fuel jettison nozzle valve, do this step:

(a) Open this circuit breaker and install safety tag:

Left Power Management Panel, P110

Row	Col	Number	Name
L	25	C28621	L FUEL JETT NOZ VLV

SUBTASK 28-31-03-865-005

(4) For the right fuel jettison nozzle valve, do this step:

(a) Open this circuit breaker and install safety tag:

Right Power Management Panel, P210

Row	Col	Number	Name
K	12	C28620	R FUEL JETT NOZ VLV

SUBTASK 28-31-03-010-016

(5) Open this access panel to get access to the actuator, for the left jettison nozzle valve, on the rear spar:

Number	Name/Location
561GB	Midspan Fixed Trailing Edge Panel

SUBTASK 28-31-03-010-017

(6) Open this access panel to get access to the actuator , for the right jettison nozzle valve, on the rear spar:

Number	Name/Location
661GB	Midspan Fixed Trailing Edge Panel

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F. Electrical Bonding Measurement

SUBTASK 28-31-03-212-001

(1) Make sure the manual override handle is in the CLOSED position.

SUBTASK 28-31-03-862-005

(2) Disconnect the electrical connector from the actuator.

SUBTASK 28-31-03-765-011

(3) Measure the electrical bonding resistance between the airplane structure and the nozzle valve actuator with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

(a) Make sure the bonding resistance is 0.005 ohm (5 milliohms) or less.

SUBTASK 28-31-03-765-012

(4) Measure the electrical bonding resistance between the airplane structure and the bonding jumper with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

(a) Make sure the bonding resistance is 0.010 ohm (10 milliohms) or less.

SUBTASK 28-31-03-861-002

(5) Connect the electrical connector.

SUBTASK 28-31-03-860-055

(6) Remove the safety tags and close these circuit breakers:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL
L	24	C28631	L FUEL JETT ISLN VLV

Right Power Management Panel, P210

Row	Col	Number	Name
K	13	C28630	R JETT ISLN VLV
K	14	C28646	R FUEL JETT PUMP CTRL

SUBTASK 28-31-03-860-056

(7) For the left fuel jettison nozzle valve, do this step:

(a) Remove the safety tag and close this circuit breaker:

Left Power Management Panel, P110

Row	Col	Number	Name
L	25	C28621	L FUEL JETT NOZ VLV

SUBTASK 28-31-03-860-057

(8) For the right fuel jettison nozzle valve, do this step:

(a) Remove the safety tag and close this circuit breaker:

Right Power Management Panel, P210

Row	Col	Number	Name
K	12	C28620	R FUEL JETT NOZ VLV

SUBTASK 28-31-03-710-008

(9) Do the jettison nozzle valve actuator test in Fuel Jettison Nozzle Valve Actuator - Installation, TASK 28-31-03-400-804.

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G. Put the Airplane Back to Its Usual Condition

SUBTASK 28-31-03-410-011

(1) Close this access panel for the left jettison nozzle valve actuator:

Number	Name/Location
561GB	Midspan Fixed Trailing Edge Panel

SUBTASK 28-31-03-410-012

(2) Close this access panel for the right jettison nozzle valve actuator:

Number	Name/Location
661GB	Midspan Fixed Trailing Edge Panel

SUBTASK 28-31-03-440-004

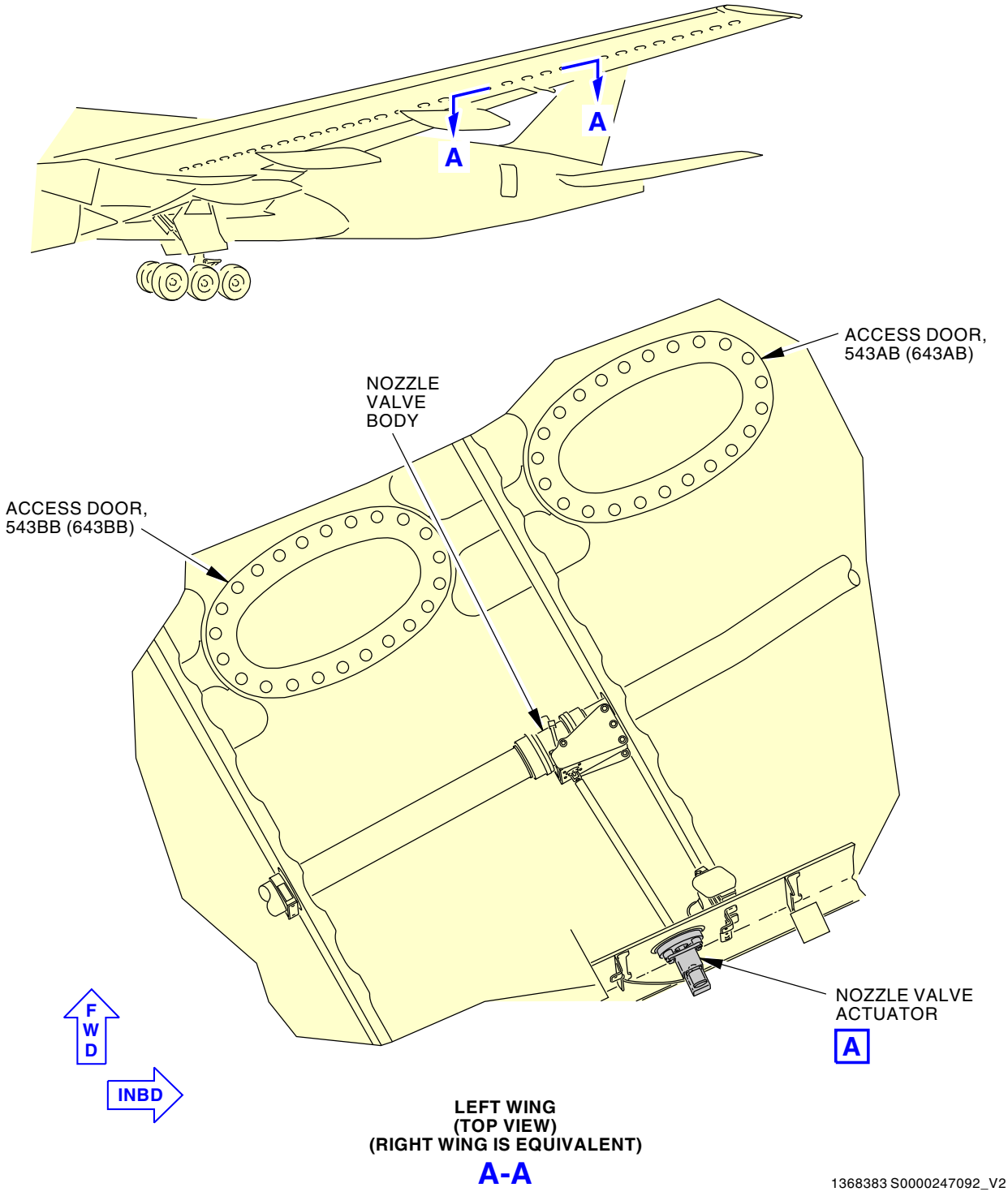
WARNING MAKE SURE THAT PERSONNEL AND EQUIPMENT STAY AWAY FROM THE LEADING EDGE SLATS, TRAILING EDGE FLAPS, AND DRIVE MECHANISMS. THE FLAPS, SLATS, AND DRIVE MECHANISMS MOVE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(3) To reactivate the trailing edge flaps, do these steps:

(a) Do this task: Trailing Edge Flap Reactivation, TASK 27-51-00-440-801.

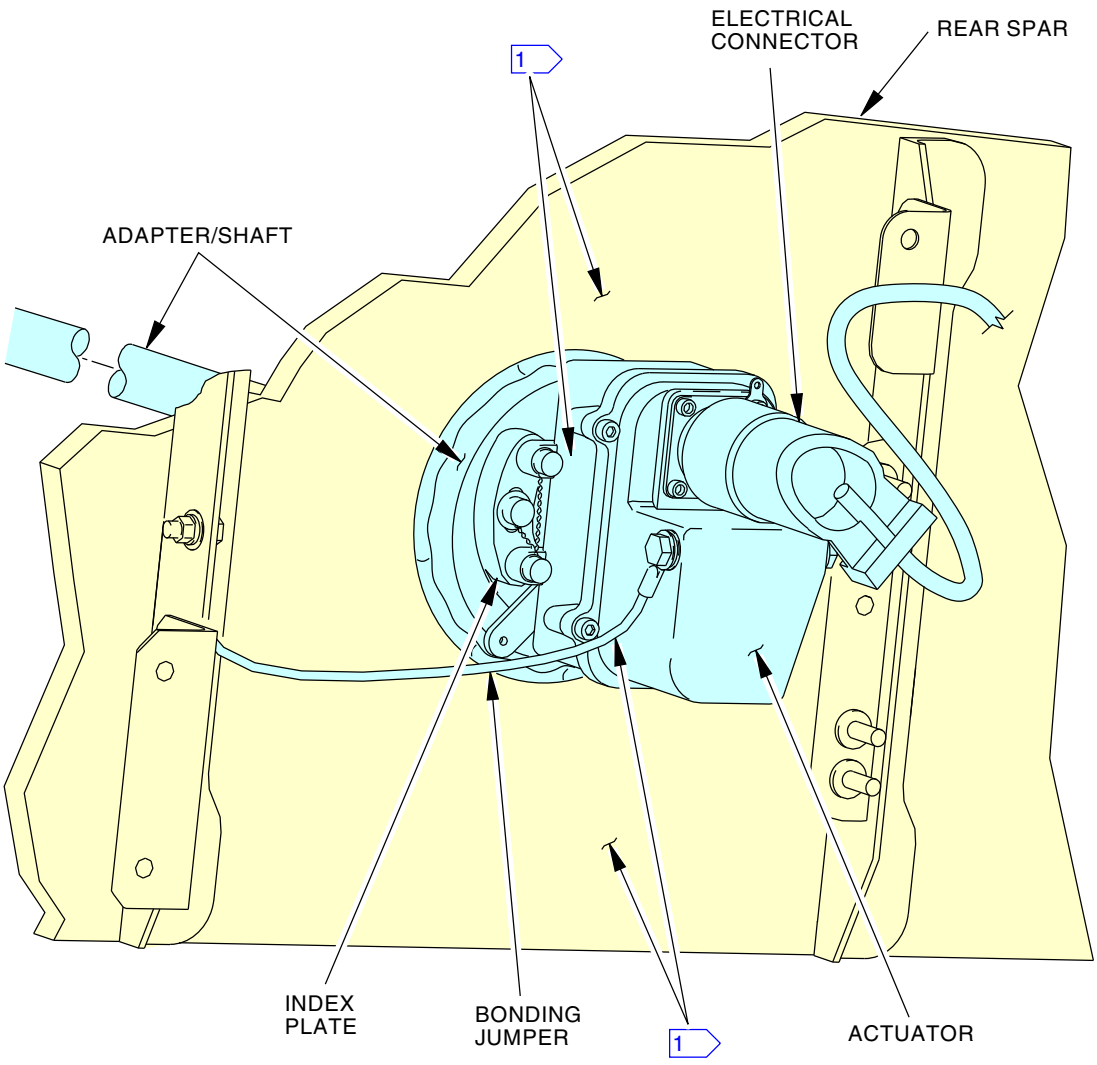
——— END OF TASK ———

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Fuel Jettison Nozzle Valve - Bonding Resistance Measurement
Figure 601/28-31-03-990-805 (Sheet 1 of 2)

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Fuel Jettison Nozzle Valve - Bonding Resistance Measurement
Figure 601/28-31-03-990-805 (Sheet 2 of 2)

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FUEL JETTISON ISOLATION VALVE - REMOVAL/INSTALLATION

1. General

A. There are two isolation valves for the fuel jettison system. Each isolation valve has these parts: the actuator, the adapter/shaft, and the valve. The actuators are installed on the rear spar of the left and right center fuel tank. The adapter/shaft and the valve are installed in the left and right center fuel tank. The fuel jettison isolation valves let center tank fuel into the refuel/fuel jettison manifold.

B. You must defuel the fuel tank before you remove the valve and the adapter/shaft.

C. This procedure contains these tasks:

(1) Removal of the jettison isolation valve

(2) Installation of the jettison isolation valve

(3) Removal of the adapter/shaft for the jettison isolation valve

(4) Installation of the adapter/shaft for the jettison isolation valve

(5) Adapter/Shaft Alignment

D. The procedure to remove and install the actuators for the jettison isolation valves is in (TASK 28-31-05-000-802).

TASK 28-31-04-000-801

2. Fuel Jettison Isolation Valve - Removal

(Figure 401)

A. References

Reference	Title
24-22-00-860-806	Remove Electrical Power (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-22-15-000-802-001	Fuel Line, Fitting and Coupling - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

C. Access Panels

Number	Name/Location
531AB	Access Door
631AB	Access Door

D. Procedure

SUBTASK 28-31-04-650-001

(1) Defuel all of the fuel tanks (TASK 28-26-00-650-801).

NOTE: You must defuel all of the fuel tanks for this task.

SUBTASK 28-31-04-860-001

(2) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

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SUBTASK 28-31-04-650-002

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(3) For the center fuel tank, do this task: Purging and Fuel Tank Entry, TASK 28-11-00-010-801.

SUBTASK 28-31-04-010-001

(4) Remove the applicable access doors:

Center Tank Access Door - Removal, TASK 28-11-02-000-801

Number	Name/Location
531AB	Access Door
631AB	Access Door

SUBTASK 28-31-04-940-001

(5) Go into the left or right center fuel tank to get access to the applicable valve [1].

SUBTASK 28-31-04-020-013

(6) Disconnect the flexible full coupling [5] from each side of the valve [1] (TASK 28-22-15-000-802-001).

(a) Discard the o-ring [6].

SUBTASK 28-31-04-020-014

(7) Hold the valve [1] and remove the four bolts [3] and washers [4] that attach the valve [1] to the support bracket.

SUBTASK 28-31-04-020-001

(8) Disengage the valve [1] from the adapter/shaft [2].

SUBTASK 28-31-04-020-002

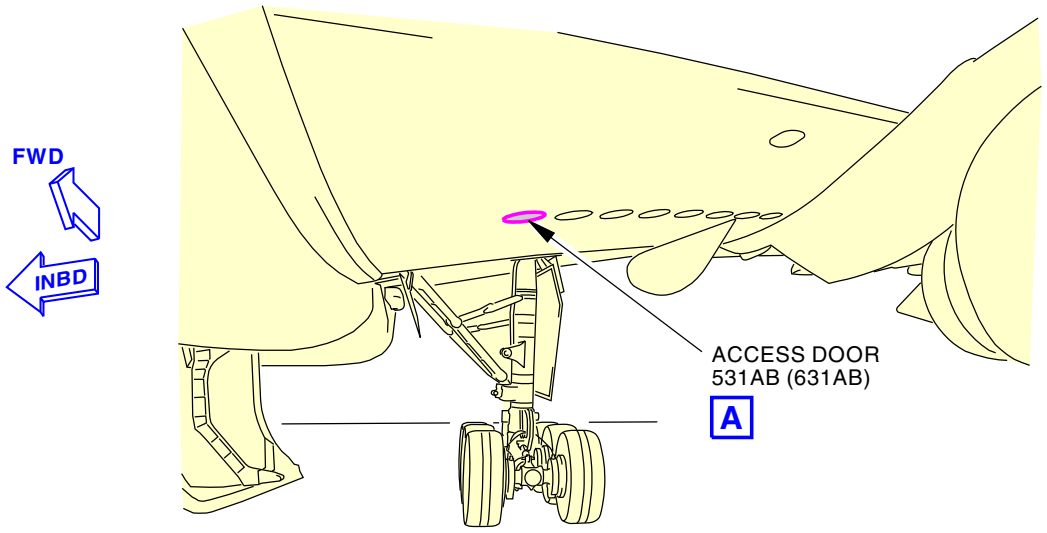
(9) Remove the valve [1].

SUBTASK 28-31-04-480-003

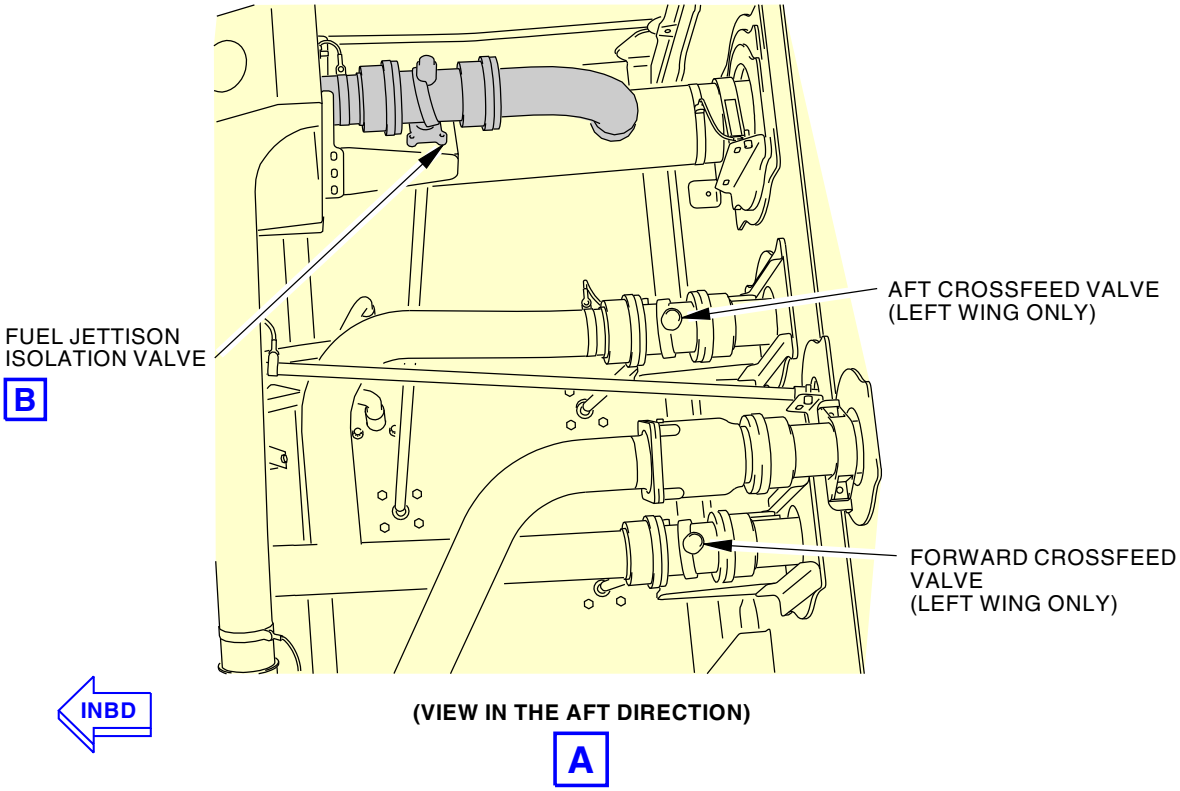
(10) Install protection covers to the fuel lines to keep unwanted materials out.

——— END OF TASK ———

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LEFT WING
(RIGHT WING IS EQUIVALENT)



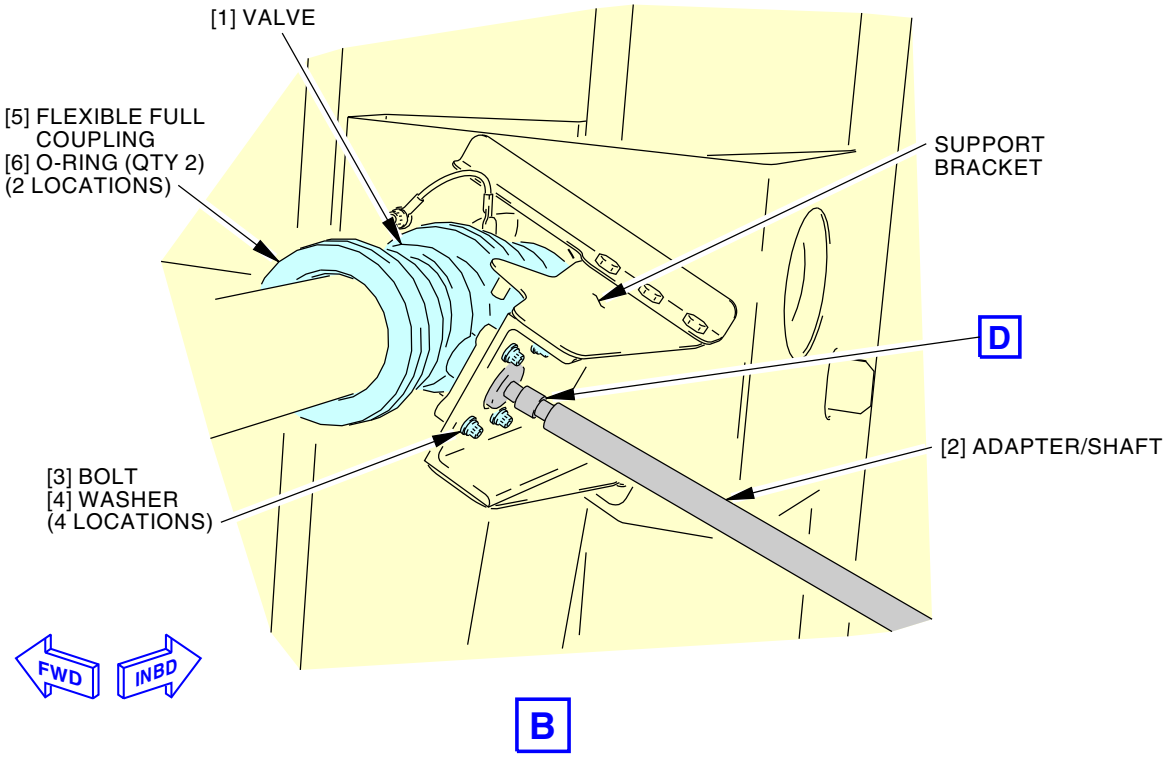
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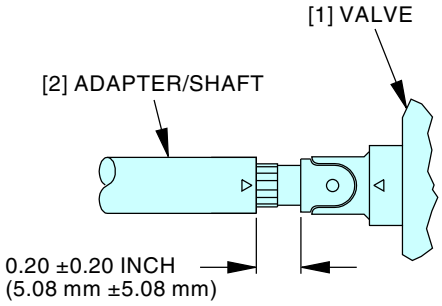
A

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Fuel Jettison Isolation Valve Installation
Figure 401/28-31-04-990-801 (Sheet 1 of 2)

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Fuel Jettison Isolation Valve Installation
Figure 401/28-31-04-990-801 (Sheet 2 of 2)

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TASK 28-31-04-400-801

3. Fuel Jettison Isolation Valve - Installation

(Figure 401)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-22-15-000-802-001	Fuel Line, Fitting and Coupling - Removal (P/B 401)
28-31-00-720-801	Fuel Jettison System - Operational Test (P/B 501)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Consumable Materials

Reference	Description	Specification
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
6	O-ring	28-22-51-15D-390	ARO ALL

E. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

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F. Access Panels

Number	Name/Location
531AB	Access Door
631AB	Access Door

G. Procedure

SUBTASK 28-31-04-940-005

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-31-04-860-002

WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED ON ALL THE LANDING GEAR. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONS, AND DAMAGE TO EQUIPMENT.

(2) Make sure the landing gear downlock pins are installed (TASK 32-00-30-480-801).

SUBTASK 28-31-04-860-003

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-31-04-820-001

(4) Make sure the manual override handle on the actuator for the left or right jettison isolation valve installed on the rear spar of the left or right center fuel tank is in the CLOSED position.

SUBTASK 28-31-04-940-002

(5) Go into the left or right center fuel tank (TASK 28-11-00-010-801).

SUBTASK 28-31-04-110-002

(6) Do these steps to prepare the valve [1] and the support bracket for a faying surface bond:

WARNING DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(a) Final clean the contact surfaces of the valve [1] and the support bracket with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

(b) Rub dry with a clean, dry cotton wiper, G00034.

(c) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

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SUBTASK 28-31-04-080-003

(7) Remove the protection covers from the fuel lines.

SUBTASK 28-31-04-820-010

(8) Align the index marks on the valve [1] with the adapter/shaft [2]

SUBTASK 28-31-04-210-001

CAUTION DO NOT REMOVE THE SUPPORT BRACKET SPACER OR MOVE THE SUPPORT BRACKET TO INSTALL THE VALVE BODY. IF YOU DO NOT ALIGN OR INSTALL THE VALVE BODY CORRECTLY, YOU CAN CAUSE DAMAGE TO EQUIPMENT.

(9) Make sure "TOP" shows on the top of the valve [1].

SUBTASK 28-31-04-420-001

(10) Engage the valve [1] and the adapter/shaft [2].

SUBTASK 28-31-04-820-002

(11) Align the valve [1] with the support bracket holes.

SUBTASK 28-31-04-420-016

(12) Install the four bolts [3] and washer [4] to attach the valve [1] to the support bracket.

SUBTASK 28-31-04-420-017

(13) Make sure the gap between the adapter/shaft [2] and the valve [1] spline is 0.20 ±0.20 in. (5.08 ±5.08 mm) (View D, Figure 401).

NOTE: If you cannot get the correct gap, loosen the support bracket for the valve [1] and adjust its position to get the correct gap.

SUBTASK 28-31-04-760-001

(14) Measure the electrical bonding resistance between the valve [1] and the support bracket with an intrinsically safe approved bonding meter, COM-1550.

(a) Make sure the resistance is less than 0.0005 ohm (0.5 milliohm).

SUBTASK 28-31-04-220-001

(15) Measure the bonding resistance between the valve [1] and the airplane structure with an intrinsically safe approved bonding meter, COM-1550.

(a) Make sure the resistance is less than 0.010 ohm (10 milliohms).

SUBTASK 28-31-04-420-015

(16) Apply a thin layer of petrolatum grease, D00504, to the o-rings [6] before you install them onto the fuel lines or valve [1].

(a) Install the flexible couplings [5], and new o-rings [6], onto the fuel lines and valve [1] (TASK 28-22-15-000-802-001).

SUBTASK 28-31-04-420-018

(17) Connect the flexible full couplings [5] to attach the valve [1] to the fuel line (TASK 28-22-15-000-802-001).

(a) Install lockwire to the couplings [5] (TASK 20-10-23-400-801).

SUBTASK 28-31-04-010-003

(18) Install these access doors:

(TASK 28-11-01-400-801)

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Number	Name/Location
531AB	Access Door
631AB	Access Door

SUBTASK 28-31-04-860-004

(19) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-31-04-720-001

(20) To test the fuel jettison isolation valves, do this task: Fuel Jettison System - Operational Test, TASK 28-31-00-720-801.

SUBTASK 28-31-04-650-003

(21) To refuel the airplane (if it is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

SUBTASK 28-31-04-860-005

WARNING OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(22) Remove the landing gear door safety pins if they are not necessary for another task (TASK 32-00-15-080-801).

——— END OF TASK ———

ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS

TASK 28-31-04-000-803

4. Fuel Jettison Isolation Valve (Adapter/Shaft) - Removal

(Figure 402)

A. References

Reference	Title
24-22-00-860-806	Remove Electrical Power (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-31-05-000-802	Fuel Jettison Isolation Valve Actuator - Removal (P/B 401)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

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Reference	Description
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: $0855 Part #: 234350 Supplier: $0857 Part #: 311 Supplier: F6892 Part #: 411B60 Supplier: 3DN12 Part #: 411B90 Supplier: 3DN12 Part #: DAD5013 Supplier: $0856 Part #: DFD5019 Supplier: $0856 Part #: J5-0275-2010 Supplier: 435R8 Part #: SCD5019 Supplier: $0856 Part #: ST982LF-9 Supplier: 62176 Part #: TS1275-4 Supplier: 1DWR5
COM-4746	Handle - Sealant Removal Tool Part #: 310/1 Supplier: F6892 Part #: SHN0272 Supplier: $0856 Part #: SHR0272-T Supplier: 1DWR5 Part #: SHW0215 Supplier: $0856

C. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

D. Access Panels

Number	Name/Location
531AB	Access Door
631AB	Access Door

E. Procedure

SUBTASK 28-31-04-860-012



WARNING MAKE SURE THE LANDING GEAR DOWNLOCK PINS ARE INSTALLED. THIS WILL PREVENT ACCIDENTAL RETRACTION OF THE LANDING GEAR, INJURY TO PERSONS, AND DAMAGE TO EQUIPMENT.

(1) Make sure the landing gear downlocks are installed (TASK 32-00-30-480-801).

SUBTASK 28-31-04-860-013



WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-31-04-650-007

(3) To defuel the center fuel tank, do this task: Pressure Defueling, TASK 28-26-00-650-801.

NOTE: You must defuel the center fuel tank for this task.

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SUBTASK 28-31-04-650-008

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(4) For the center fuel tank, do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-31-04-650-010

(5) Drain and purge the applicable center fuel tank (TASK 28-11-00-010-801).

SUBTASK 28-31-04-860-014

(6) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

SUBTASK 28-31-04-010-010

(7) Remove the applicable access doors:

(TASK 28-11-02-000-801)

Number	Name/Location
531AB	Access Door
631AB	Access Door

SUBTASK 28-31-04-010-012

(8) Do these steps on the outside of the fuel tank:

(a) For the applicable left or right jettison isolation valve actuator, do this task: Fuel Jettison Isolation Valve Actuator - Removal, TASK 28-31-05-000-802.

(b) Use a sealant removal tool to remove the old sealant from the periphery of the adapter plate.

1) Use sealant removal tool, COM-2481, and sealant removal tool handle, COM-4746, or equivalent.

SUBTASK 28-31-04-030-001

(9) Do these steps inside the left or right center fuel tank:

(a) Go to the adapter/shaft [2] location inside the fuel tank.

(b) Remove the old sealant from the four bolts [9] and the adapter/shaft [2] rear spar penetration.

(c) Remove the four bolts [9] and washers [8] to disconnect the adapter/shaft [2].

(d) Disengage the adapter/shaft [2] from the valve [1].

SUBTASK 28-31-04-020-018

(10) Go out of the tank and remove the adapter/shaft [2].

(a) Discard the o-ring [7].

F. Remove the Index Plate

NOTE: Do these steps if you will reuse the adapter/shaft and the attached index plate or if you need to remove the index plate to align the valve body. If the task is to discard the old adapter/shaft and install a new adapter/shaft, it is not necessary to disassemble the index plate.

SUBTASK 28-31-04-020-019

(1) Do these steps to remove the index plate [11] from the adapter/shaft [2]:

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

(a) Remove the lockwire from two screws [30] and screw [10].

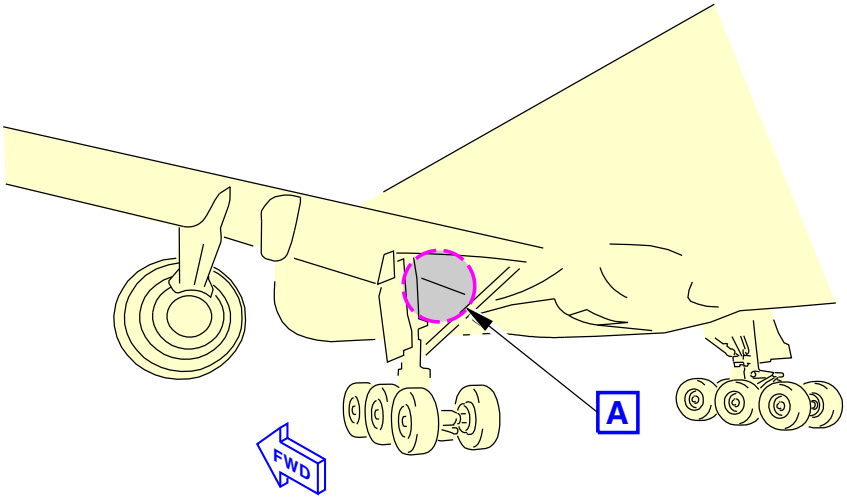
(b) Remove the screws [30], screw [10] and washers [29].

(c) Carefully disassemble the index plate [11] and the adapter/shaft [2].

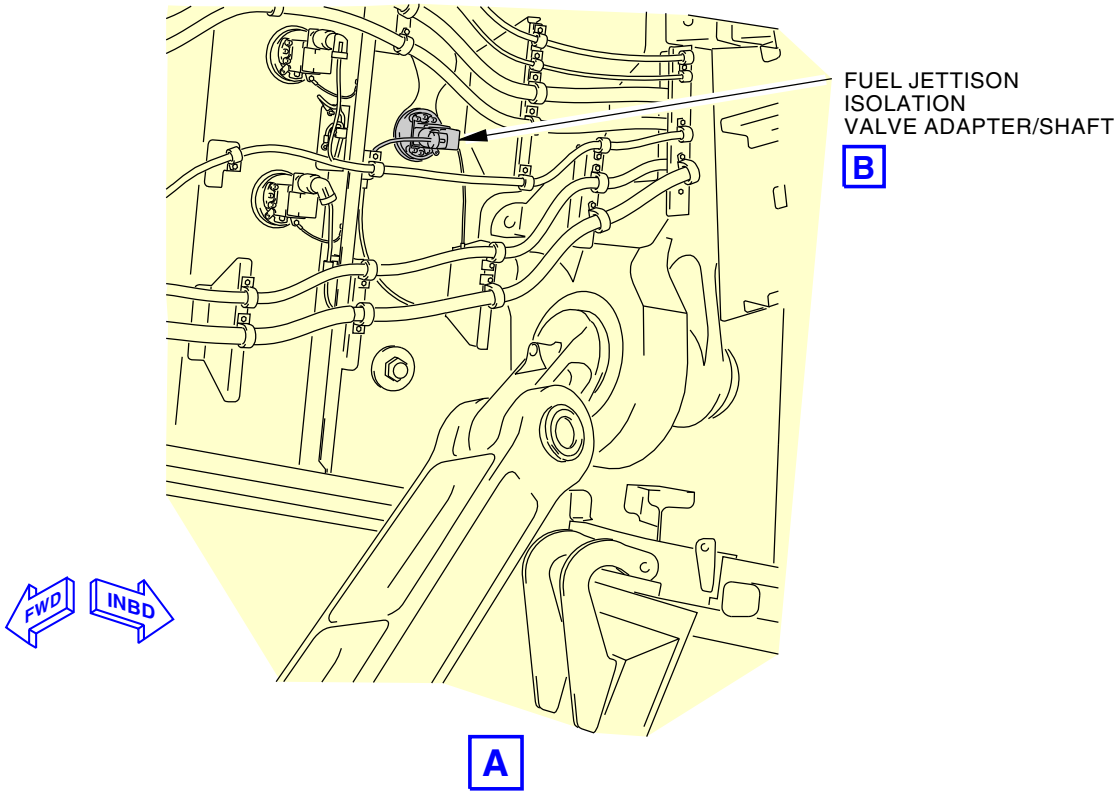
NOTE: The two surfaces are bonded with faying surface sealant.

——— END OF TASK ———

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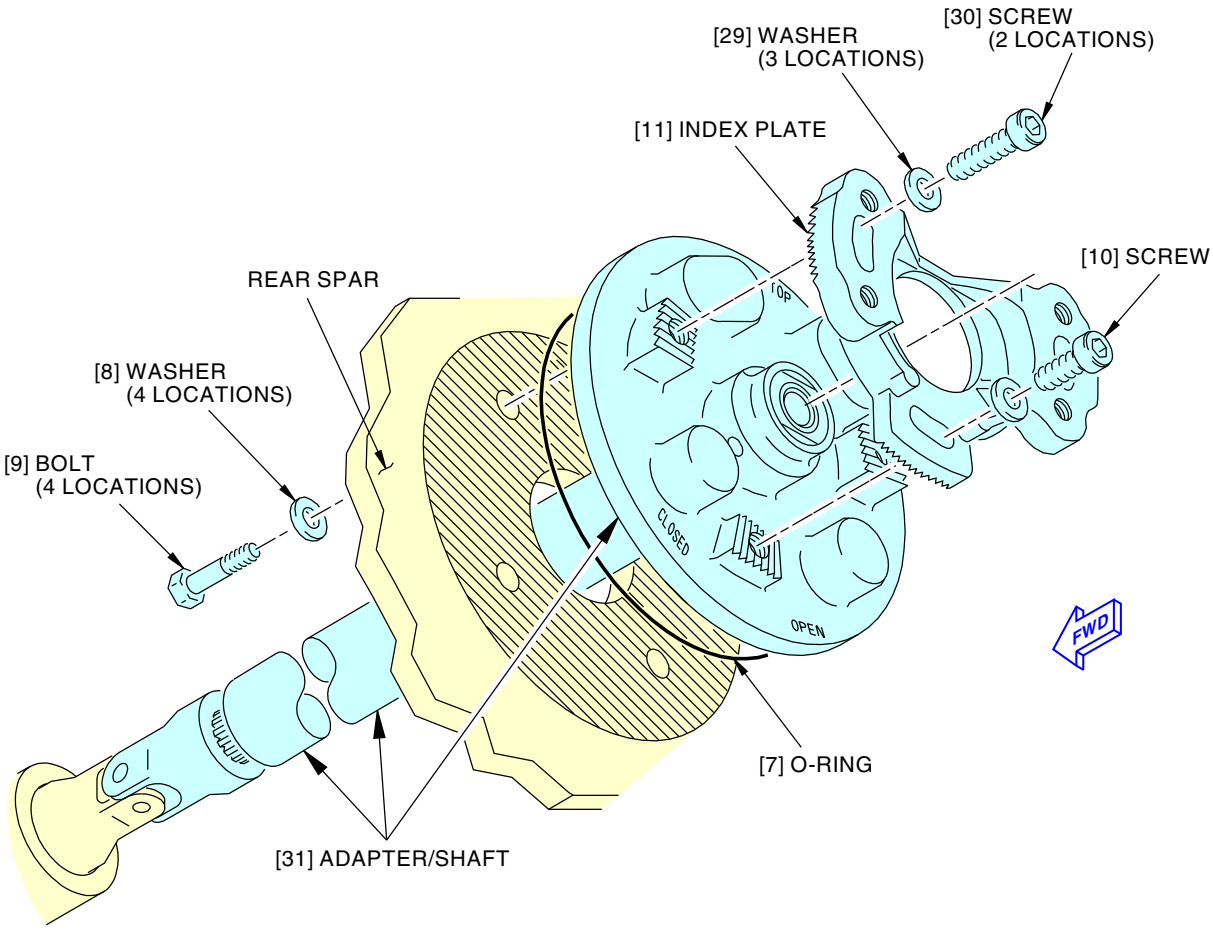
LEFT WING
(RIGHT WING IS EQUIVALENT)



E46443 S0006415538_V3

Fuel Jettison Isolation Valve Adapter/Shaft Installation
Figure 402/28-31-04-990-805 (Sheet 1 of 2)

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(EXAMPLE)

B

U47474 S0000197712_V3

Fuel Jettison Isolation Valve Adapter/Shaft Installation
Figure 402/28-31-04-990-805 (Sheet 2 of 2)

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TASK 28-31-04-400-803

5. Fuel Jettison Isolation Valve (Adapter/Shaft) - Installation

(Figure 402)

A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(2) Two mechanics are necessary for this task.

NOTE: To engage splines of the adapter/shaft [2] to the valve [1], one person must be outside the tank and one person must be inside the tank.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-30-88	AIRPLANE STRUCTURE CLEANING SOLVENTS (Series 88)
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
20-30-92-910-801	Final Cleaning Prior to General Sealing (Series 92) (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)
28-31-00-720-801	Fuel Jettison System - Operational Test (P/B 501)
28-31-05-400-802	Fuel Jettison Isolation Valve Actuator - Installation (P/B 401)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
51-31-01-390-804	Fillet Seal Application (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

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Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: $0855 Part #: 234350 Supplier: $0857 Part #: 311 Supplier: F6892 Part #: 411B60 Supplier: 3DN12 Part #: 411B90 Supplier: 3DN12 Part #: DAD5013 Supplier: $0856 Part #: DFD5019 Supplier: $0856 Part #: J5-0275-2010 Supplier: 435R8 Part #: SCD5019 Supplier: $0856 Part #: ST982LF-9 Supplier: 62176 Part #: TS1275-4 Supplier: 1DWR5
COM-4746	Handle - Sealant Removal Tool Part #: 310/1 Supplier: F6892 Part #: SHN0272 Supplier: $0856 Part #: SHR0272-T Supplier: 1DWR5 Part #: SHW0215 Supplier: $0856
STD-123	Brush - Soft Bristle

D. Consumable Materials

Reference	Description	Specification
A50110	Sealant	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
B01012	Solvent - Final Cleaning Prior To General Sealing - Series 92	
C00064	Coating - Aluminum Chemical Conversion	BAC5719 Type II Class A (MIL-DTL-5541 Class 1A)
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20 Type II
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

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E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Adapter/shaft	28-31-04-01-040	ARO 001-004
		28-31-04-01A-050	ARO 005-016
7	O-ring	28-31-04-01-042	ARO 001-004
		28-31-04-01A-052	ARO 005-016

F. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

G. Access Panels

Number	Name/Location
531AB	Access Door
631AB	Access Door

H. Install the Adapter/Shaft

SUBTASK 28-31-04-860-015

WARNING

OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) For the center fuel tank, do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-31-04-010-013

WARNING

DO THE PURGING AND FUEL TANK ENTRY PROCEDURE. FAILURE TO FOLLOW THE PURGING AND FUEL TANK ENTRY PROCEDURE COULD CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Go into the fuel tank to the jettison isolation valve location (TASK 28-11-00-010-801).

NOTE: One person must enter the tank and another must remain outside the tank at the rear spar.

SUBTASK 28-31-04-120-001

(3) On the outside of the tank, remove the old sealant and clean the rear spar, adapter/shaft [2], index plate [11], and fasteners (if re-used).

(a) Use sealant removal tool, COM-2481, and sealant removal tool handle, COM-4746 (or equivalent), to remove the old sealant from the rear spar.

(b) If new parts are to be installed, use an abrasive pad to remove the anodized finish from the faying surfaces of the adapter/shaft [2] and index plate [11] (SWPM 20-20-00).

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(c) To remove the remaining sealant, grease, oil, dirt, and other contamination from the components, use one of these brushes/pads soaked with Series 92 solvent, B01012 (TASK 20-30-92-910-801):

1) soft bristle brush, STD-123

2) cotton wiper, G00034

SUBTASK 28-31-04-110-001

(4) On the outside of the tank, do these steps to prepare the adapter/shaft [2] and the rear spar for a fay seal fay surface bond:

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(a) Final clean the contact surfaces of the adapter/shaft [2] and the rear spar with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

SUBTASK 28-31-04-430-001

(5) On the outside of the airplane fuel tank, do these steps:

(a) Put a thin layer of petrolatum grease, D00504, on the new o-ring [7].

(b) Put the o-ring [7] in the o-ring groove of the adapter/shaft [2].

(c) Put the shaft portion of the adapter/shaft [2] through the hole in the rear spar.

(d) Make sure the shoulder of the adapter/shaft [2] does not bind in the opening of the rear spar.

SUBTASK 28-31-04-210-007

(6) On the inside of the tank, do these steps:

(a) Make sure that the index marks on the valve [1] and adapter/shaft [2] are aligned (Figure 401, View D).

NOTE: A small misalignment of the index marks is satisfactory.

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SUBTASK 28-31-04-420-032

(7) Do these steps at the same time:

NOTE: The person on the inside of the tank should engage the splines as the person on the outside of the tank applies the fay sealed fay surface bond.

28-AWL-19: CDCCL

(a) On the outside of the tank, apply a fay sealed fay surface bond between the adapter/shaft [2] (valve adapter plate) and the spar (structure) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Apply a thin continuous layer of sealant, A50110, or sealant, A50155, to the mating surface of the adapter plate.

a) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

2) Make sure the sealant is continuously squeezed out along the edges of the contact surfaces.

3) If there are gaps, bubbles or voids in the sealant squeeze out, then disassemble and apply more sealant.

4) Shape the squeezed out sealant into a fillet seal.

5) As an option, remove the extra squeezed out sealant.

NOTE: Make sure the sealant that remains is flush with the mating part edges.

(b) On the inside of the tank, engage the splines of the adapter/shaft [2] with the valve [1].

1) Make sure the shoulder of the adapter/shaft [2] does not bind in the opening of the rear spar.

SUBTASK 28-31-04-420-033

(8) On the outside of the tank, hold the adapter/shaft [2] in the correct position.

SUBTASK 28-31-04-420-021

(9) Do these steps to install the adapter/shaft [2]:

(a) Apply sealant to the shank and the threads of the four bolts [9].

1) Use sealant, A50110, or sealant, A50155, for the wet installation of the bolts [9].

NOTE: Use the same sealant that was used for the fay surface fay seal.

2) Make sure the sealant applied to the fasteners is approximately 0.060 in. (1.524 mm) thick.

(b) Install the bolts [9] and washers [8] to attach the adapter/shaft [2] to the spar.

(c) Make sure the gap between the adapter/shaft [2] and the valve [1] spline is 0.20 ±0.20 in. (5.08 ±5.08 mm) (Figure 401, View D).

NOTE: If you can not get the correct gap, loosen the support bracket for the valve [1] and adjust its position to get the correct gap.

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SUBTASK 28-31-04-765-001

28-AWL-19: CDCCL

(10) On the outside of the fuel tank, measure the electrical bonding resistance between one of the raised surfaces of the adapter/shaft [2] (valve adapter plate) (bare metal surface) and the rear spar (structure) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

28-AWL-19: CDCCL

(a) Make sure one or both ends of the bonding jumper that attaches to the actuator is disconnected.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(b) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-19: CDCCL

(c) Make sure the electrical bonding resistance is 0.0005 ohm (0.5 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) If the electrical bonding resistance is more than 0.0005 ohm (0.5 milliohm), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Fuel Jettison Isolation Valve, TASK 28-31-04-300-801.

SUBTASK 28-31-04-420-022

(11) Use sealant, A50110, or sealant, A50155, to apply these seals:

NOTE: Use the same sealant that was used for the fay sealed fay surface bond.

(a) On the inside of the tank, apply a fillet seal to the periphery of the rear spar penetration and the stationary part of the adapter/shaft [2] (TASK 51-31-01-390-804).

NOTE: Make sure the sealant does not touch any part of the adapter/shaft [2] that turns.

28-AWL-19: CDCCL

(b) On the inside of the tank, apply a cap seal to each of the four bolts [9] (adapter plate attach bolts).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

SUBTASK 28-31-04-860-016

(12) Do this task to close the fuel tank: Fuel Tank Closure, TASK 28-11-00-410-801.

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(a) Install these access doors:

(TASK 28-11-02-400-801)

Number	Name/Location
531AB	Access Door
631AB	Access Door

SUBTASK 28-31-04-820-006

(13) Do this task: Adapter Shaft Alignment, TASK 28-31-04-820-801.

I. Install the Index Plate

SUBTASK 28-31-04-820-007

(1) Do this procedure after you have correctly aligned and marked the alignment position of the index plate and adapter plate per this task: Adapter Shaft Alignment, TASK 28-31-04-820-801.

SUBTASK 28-31-04-020-020

(2) Remove the index plate [11] from the adapter/shaft [2].

SUBTASK 28-31-04-420-024

(3) Do these steps to prepare the index plate [11] and the adapter/shaft [2] for a fay sealed fay surface bond (SWPM 20-20-00):

(a) Protect the alignment reference mark when you clean the index plate [11] and the adapter/shaft [2] for the fay sealed fay surface bond.

WARNING

DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(b) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (SUBJECT 20-30-88).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the cotton wiper, G00034, stays clean.

28-AWL-19: CDCCL

(c) Apply a thin continuous layer of sealant between the surface of the index plate [11] (three locations) and the adapter/shaft [2] (valve adapter plate) for a fay sealed fay surface bond.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the fay sealed fay surface bond.

NOTE: Alternative sealants are not acceptable for the fay sealed fay surface bond.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

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(d) Apply sealant to the shank and the threads of the top two screws [30] and the bottom screw [10].

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the wet installation of screws [30] and screw [10].

NOTE: Use the same sealant that was used for the fay sealed fay surface bond.

2) Make sure the sealant applied to the fasteners is approximately 0.060 in. (1.524 mm) thick.

SUBTASK 28-31-04-420-025

(4) Do these steps to install the index plate [11]:

(a) Align the index plate [11] and the adapter/shaft [2] with the alignment reference mark that you made during the spar valve alignment procedure.

(b) Install the two screws [30] and washers [29] in the top index mounting hole positions.

(c) Install the screw [10] and washer [29] in the bottom index mounting hole position.

(d) Tighten the screws to 22 ±1 in-lb (2.5 ±0.1 N·m).

(e) Make sure the sealant is continuously squeezed out along the edges of the contact surfaces.

(f) If there are gaps, bubbles or voids in the sealant squeeze out, then disassemble and apply more sealant.

(g) Shape the squeezed out sealant into a fillet seal ((TASK 51-31-01-390-804).

(h) As an option, remove the extra squeezed out sealant.

NOTE: Make sure the sealant that remains is flush with the mating part edges.

SUBTASK 28-31-04-765-002

(5) Measure the electrical bonding resistance between one of the actuator contact surfaces on the index plate [11] (bare metal surface) and the rear spar (SWPM 20-20-00) .

(a) Use an intrinsically safe approved bonding meter, COM-1550.

(b) Make sure the electrical bonding resistance is 0.0020 ohm (2.0 milliohms) or less.

1) If the electrical bonding resistance is more than 0.0020 ohm (2.0 milliohms), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Fuel Jettison Isolation Valve, TASK 28-31-04-300-801.

SUBTASK 28-31-04-760-002

28-AWL-19: CDCCL

(6) Measure the electrical bonding resistance between the index plate [11] and the adapter/shaft [2] (valve adapter plate) (SWPM 20-20-00) .

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

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28-AWL-19: CDCCL

(a) Make sure one or both ends of the bonding jumper that attaches to the actuator is disconnected.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(b) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-19: CDCCL

(c) Make sure the electrical bonding resistance is 0.0005 ohm (0.5 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) If the electrical bonding resistance is more than 0.0005 ohm (0.5 milliohm), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Fuel Jettison Isolation Valve, TASK 28-31-04-300-801.

SUBTASK 28-31-04-420-026

(7) Lockwire the top screws [30], the bottom screw [10] and the index plate [11] together.

SUBTASK 28-31-04-790-001

(8) Do this task: Fuel Jettison Isolation Valve Actuator - Installation, TASK 28-31-05-400-802.

SUBTASK 28-31-04-370-001

(9) Apply protective finishes to the bare areas of the rear spar (TASK 28-11-00-600-801).

NOTE: Re-apply the protective finishes to the rear spar at all bare areas not covered by the fillet seal, and where the electrical bonding probe removed the finishes.

(a) These are the protective finishes:

1) Alodine 600 coating, C00064

2) BMS 10-20 coating, C00307.

J. Jettison Isolation Valve Test

SUBTASK 28-31-04-710-001

(1) To do a test of the fuel jettison isolation valves, do this task: Fuel Jettison System - Operational Test, TASK 28-31-00-720-801.

K. Put the Airplane Back to the Usual Condition

SUBTASK 28-31-04-650-009

(1) To refuel the airplane (if it is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

(a) Make sure there is no leakage at the rear spar connection.

SUBTASK 28-31-04-010-014

WARNING OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

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END OF TASK

TASK 28-31-04-820-801

6. Adapter Shaft Alignment

(Figure 403)

A. References

Reference	Title
28-31-05-000-802	Fuel Jettison Isolation Valve Actuator - Removal (P/B 401)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1587	Wrench - Torque, 30 in-lbs (4 N-m) Part #: TE3FUA Supplier: 55719
SPL-1771	Alignment Equipment, Fuel Shutoff Valve Part #: B28009-1 Supplier: 81205

C. Location Zones

Zone	Area
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

D. Procedure

SUBTASK 28-31-04-010-009

(1) Prepare the adapter/shaft for the alignment procedure.

(a) If it is not removed, do this task: Fuel Jettison Isolation Valve Actuator - Removal, TASK 28-31-05-000-802.

(b) If not previously removed, remove the index plate [11] from the adapter/shaft.

SUBTASK 28-31-04-480-002

(2) Do these steps to install the valve alignment equipment, SPL-1771, in the index plate [11].

(a) Position the index plate and align the surfaces of the index plate and adapter plate.

(b) Loosely install the bottom index screw [10] to the index plate [11].

(c) Put the alignment tool in position against the index plate with the two guide pins in the holes usually used by the top two index screws (the scale should be on the top of the tool).

(d) Make sure the spline on the tool engages with the spline on the shaft.

SUBTASK 28-31-04-820-003

(3) Do these steps to align the adapter shaft (Procedure 1, optional to Procedure 2):

NOTE: This procedure finds the point where the internal valve butterfly engages the valve seal. The torque necessary to turn the shaft increases as the butterfly engages the seal, then decreases again as the butterfly leaves the other side of the seal. Once the edge of the seal is found, the valve shaft will then be turned to center the butterfly on the seal.

(a) Put the tool handle in the extreme counterclockwise position.

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(b) Turn the handle slowly in the clockwise direction at a constant rate while you note the changes in the torque necessary to turn the handle.

(c) Do the previous steps as many times as necessary to find the point in the rotation where the torque necessary to turn the handle increases significantly.

(d) If you cannot find the position in the rotation where the torque increases significantly, then use Procedure 2 below.

(e) Put the shaft in the extreme counterclockwise position again.

(f) Slowly and smoothly turn the handle of the tool clockwise until a distinct increase in torque is found and immediately stop turning the handle.

(g) Read the scale on the tool.

NOTE: This is the point where the valve butterfly starts to engage the edge of the seal.

(h) Turn the handle 13 degrees more in the clockwise direction (the scale is calibrated in degrees).

NOTE: The valve butterfly is now centered on the valve seal.

NOTE: If you turn the handle past the target value, do not turn the handle back in the counterclockwise direction again. You must start the procedure again with the handle in the extreme counterclockwise position.

SUBTASK 28-31-04-820-004

(4) Do these steps to align the adapter shaft (Procedure 2, optional to Procedure 1):

NOTE: A torque wrench (30 in-lbs), COM-1587, is necessary to do this procedure.

(a) Put the tool handle in the extreme counterclockwise position.

(b) Slowly and smoothly turn the tool handle to the extreme clockwise position while you monitor the torque that you apply to the handle.

(c) Write down the maximum torque that you apply to the tool while you turn it from the extreme counterclockwise position to the extreme clockwise position.

(d) Turn the tool back to the extreme counterclockwise position.

(e) Turn the shaft clockwise again at approximately the same rate that you used before.

(f) Stop at the position where the torque increases to approximately two-thirds of the maximum torque that you wrote down before.

(g) Read the scale on the tool at this position.

NOTE: This is the position where valve butterfly starts to engage the edge of the seal.

(h) Turn the handle 13 more degrees in the clockwise direction past the reading from the previous step.

NOTE: The butterfly valve is now centered on the valve seal.

NOTE: If you turn the valve past the target value, do not turn it back in the counterclockwise direction. You must start again with the tool handle in the extreme counterclockwise position.

SUBTASK 28-31-04-820-008

(5) Tighten the alignment tool lockscrew to hold the alignment tool in position on the adapter/shaft.

SUBTASK 28-31-04-820-009

(6) Turn the index plate [11] until the actuator mounting holes in the index plate [11] are aligned with the two upper holes for the alignment screws.

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SUBTASK 28-31-04-820-005

(7) Insert the two alignment screws into the holes for the actuator mounting screws to hold the index plate [11] in alignment with the mounting plate (this is the final adjustment of the position of the index plate [11]).

SUBTASK 28-31-04-420-012

(8) Tighten the bottom index screw [10].

SUBTASK 28-31-04-020-012

(9) Carefully remove the alignment screws.

SUBTASK 28-31-04-080-004

(10) Loosen the lockscrew and carefully remove the alignment tool from the index plate [11].

SUBTASK 28-31-04-420-027

(11) Use a fine point felt pen to apply a reference mark between the index plate [11] and the adapter/shaft at one of the attachment points.

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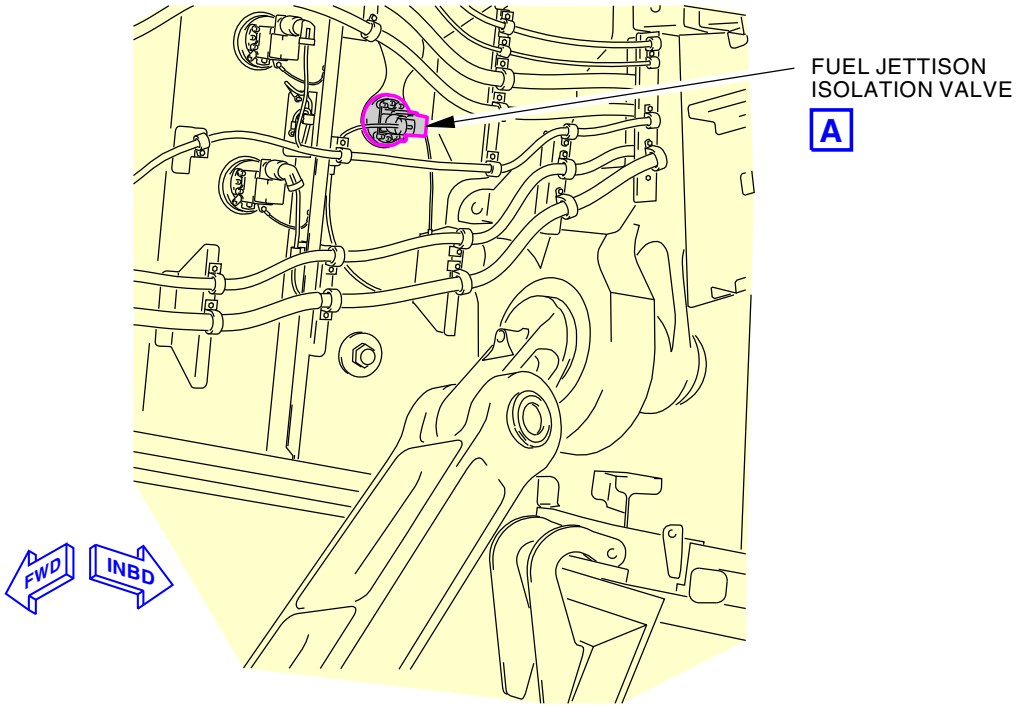
SUBTASK 28-31-04-420-028

(12) Continue with the index plate installation procedure in this task: Fuel Jettison Isolation Valve (Adapter/Shaft) - Installation, TASK 28-31-04-400-803.

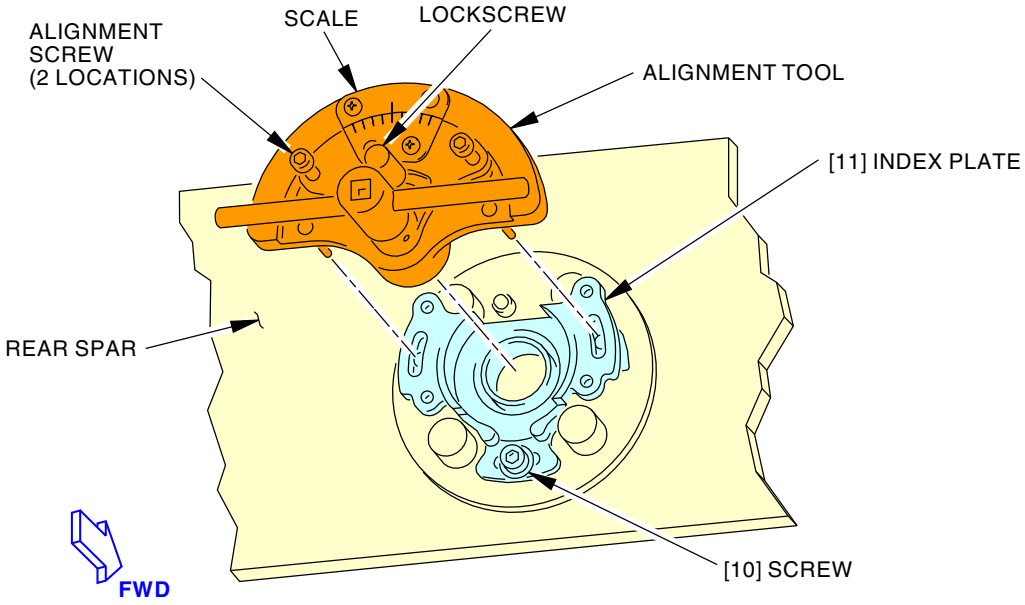
ARO ALL

——— END OF TASK ———

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FUEL JETTISON ISOLATION VALVE LOCATION



FUEL JETTISON ISOLATION VALVE

A

G13754 S0006415543_V2

Alignment Tool Installation
Figure 403/28-31-04-990-803

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TASK 28-31-04-300-801

7. Rework the Fay Sealed Fay Surface Bonds for the Fuel Jettison Isolation Valve

A. General

(1) This task contains these procedures:

(a) Rework the Fay Sealed Fay Surface Bond - Actuator to Index Plate

(b) Rework the Fay Sealed Fay Surface Bond - Index Plate to Adapter/Shaft

(c) Rework the Fay Sealed Fay Surface Bond - Adapter/Shaft to Rear Spar

(d) Rework the Bonding Jumper Bond

(2) Do this task if the measurement for the electrical bonding resistance is more than the permitted resistance value.

(3) The motor operated valve uses two electrical bonding paths:

(a) One bonding path is from the upper housing of the actuator through the bonding jumper to the airplane structure.

(b) The second bonding path is from the upper housing of the actuator to the bare metal surface of the rear spar. The bond path is through the bare metal fay surfaces of the actuator (at the mounting feet), index plate, and adapter/shaft to the bare metal surface of the rear spar.

NOTE: The actuator is divided into two sections, the upper housing section and the lower housing section. The two housing sections are separated by a fay surface. You cannot repair or rework the fay surface between the housing sections at the airplane. When you do an electrical bonding measurement, make sure the measurement is done on the upper housing section of the actuator.

(4) If the electrical bonding resistance is more than the maximum permitted resistance, you must disassemble the components, rework the fay surface, assemble the components, and then re-check the electrical bonding resistance. Continue to rework the fay surfaces until the electrical resistance between the components is within the permitted resistance values.

(5) Because the build-up of the fuel jettison isolation valve includes several fay sealed fay surface bonds, you may not know which fay sealed fay surface bond is the cause of the problem. This task will help you isolate the location of the fay sealed fay surface bond that needs to be reworked. The procedure does a check of the fay sealed fay surface bond downstream of the bond that is in question.

(6) For application of fay surface fay seals in this task, it is acceptable to use sealant, A50110, as an alternative to sealant, A50155.

NOTE: Sealants should not be mixed. In applications where sealants may mix, use the same sealant for both applications.

B. References

Reference	Title
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
28-31-05-000-802	Fuel Jettison Isolation Valve Actuator - Removal (P/B 401)
28-31-05-400-802	Fuel Jettison Isolation Valve Actuator - Installation (P/B 401)
28-31-05-990-802	Figure: Fuel Jettison Isolation Valve Actuator Installation (P/B 401)

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(Continued)

Reference	Title
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

D. Consumable Materials

Reference	Description	Specification
A50110	Sealant	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Rework the Fay Sealed Fay Surface Bond - Actuator to Index Plate

(Figure 28-31-05-990-802, Figure 402)

NOTE: Do the steps in this procedure if the measurement for the electrical bonding resistance between the upper housing of the actuator and the rear spar is more than 0.0025 ohm (2.5 milliohms). The measurement is done with the bonding jumper and the electrical connector disconnected from the actuator.

SUBTASK 28-31-04-010-015

(1) Do this task: Fuel Jettison Isolation Valve Actuator - Removal, TASK 28-31-05-000-802.

SUBTASK 28-31-04-765-003

(2) Do these steps to do a check of the index plate to rear spar bonding path:

NOTE: These steps will tell you if the actuator to index plate fay sealed fay surface bond is the cause of the problem, or if the index plate to adapter/shaft fay sealed fay surface bond is the cause of the problem.

(a) Remove the sealant and clean one of the contact surfaces on the index plate.

(b) With the intrinsically safe approved bonding meter, COM-1550, measure the electrical bonding resistance between the contact surface on the index plate (bare metal surface) and the rear spar (SWPM 20-20-00) (Figure 402).

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(c) Make sure the electrical bonding resistance is 0.0020 ohm (2.0 milliohms) or less.

(d) If the electrical bonding resistance is not satisfactory, then do the steps in this procedure: Rework the Fay Sealed Fay Surface Bond - Index Plate to Adapter/Shaft.

(e) If the electrical bonding resistance is satisfactory, then continue with the subsequent steps.

SUBTASK 28-31-04-400-001

(3) Do this task: Fuel Jettison Isolation Valve Actuator - Installation, TASK 28-31-05-400-802.

NOTE: This task will rework the fay sealed fay surface bond and re-install the actuator [14].

SUBTASK 28-31-04-765-004

(4) During the installation, do a check of the electrical bonding resistance between the upper housing of the actuator and the rear spar with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00) (Figure 28-31-05-990-802).

(a) Do this measurement with the bonding jumper and the electrical connector disconnected.

(b) Make sure the bonding jumper does not touch the actuator [14] during the bonding measurement.

(c) Make sure the electrical bonding resistance is 0.0025 ohm (2.5 milliohms) or less.

(d) If the electrical bonding resistance is not satisfactory, then repeat the steps in this procedure.

(e) If the electrical bonding resistance is satisfactory, then continue with the steps to install the actuator [14] (TASK 28-31-05-400-802).

SUBTASK 28-31-04-710-002

(5) If you have replaced the actuator or adjusted the index plate, then continue with the steps in these procedures: TASK 28-31-05-400-802 (Fuel Jettison Isolation Valve Actuator Operational Test) and TASK 28-31-04-400-803 (Jettison Isolation Valve Test).

F. Rework the Fay Sealed Fay Surface Bond - Index Plate to Adapter/Shaft

(Figure 402)

NOTE: Do the steps in this procedure if the measurement for the electrical bonding resistance between the index plate and the rear spar is more than 0.0020 ohm (2.0 milliohms). The measurement is done with the actuator removed.

SUBTASK 28-31-04-010-016

(1) Do this task: Fuel Jettison Isolation Valve (Adapter/Shaft) - Removal, TASK 28-31-04-000-803.

SUBTASK 28-31-04-765-005

(2) Do these steps to do a check of the adapter/shaft to rear spar bonding path:

NOTE: These steps will tell you if the index plate to adapter/shaft fay sealed fay surface bond is the cause of the problem, or if the adapter/shaft to rear spar fay sealed fay surface bond is the cause of the problem.

(a) Remove the sealant and clean one of the contact surfaces on the adapter/shaft.

(b) With the intrinsically safe approved bonding meter, COM-1550, measure the electrical bonding resistance between the contact surface on the adapter/shaft and the rear spar (SWPM 20-20-00).

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(c) Make sure the electrical bonding resistance is 0.0015 ohm (1.5 milliohms) or less.

NOTE: This is the repair electrical bonding resistance value. The adapter/shaft installation electrical bonding resistance value is 0.0005 ohm (0.5 milliohm).

(d) If the electrical bonding resistance is not satisfactory, then do the steps in this procedure: Rework the Fay Sealed Fay Surface Bond - Adapter/Shaft to Rear Spar.

(e) If the electrical bonding resistance is satisfactory, then continue with the subsequent steps.

SUBTASK 28-31-04-400-002

(3) Do these steps to install the index plate:

NOTE: These steps will re-align the fuel jettison isolation valve, rework the fay surface, and re-install the index plate.

(a) Do this task: Adapter Shaft Alignment, TASK 28-31-04-820-801.

(b) Do this procedure: Fuel Jettison Isolation Valve (Adapter/Shaft) - Installation, TASK 28-31-04-400-803 (Install the Index Plate).

SUBTASK 28-31-04-765-006

(4) During the installation, do a check of the electrical bonding resistance between the index plate and the rear spar (SWPM 20-20-00):

(a) Use an intrinsically safe approved bonding meter, COM-1550.

(b) Make sure the electrical bonding resistance is 0.0020 ohm (2.0 milliohms) or less.

(c) If the electrical bonding resistance is not satisfactory, then repeat the steps in this procedure.

(d) If the electrical bonding resistance is satisfactory, then continue with the procedure to install the index plate (TASK 28-31-04-400-803)

SUBTASK 28-31-04-710-003

(5) After you install the index plate, do this procedure: Fuel Jettison Isolation Valve (Adapter/Shaft) - Installation, TASK 28-31-04-400-803 (Jettison Isolation Valve Test).

G. Rework the Fay Sealed Fay Surface Bond - Adapter/Shaft to Rear Spar

(Figure 402)

NOTE: Do the steps in this procedure if the measurement for the electrical bonding resistance between the adapter/shaft and the rear spar is more than 0.0015 ohm (1.5 milliohms).

SUBTASK 28-31-04-010-017

(1) Do this task: Fuel Jettison Isolation Valve (Adapter/Shaft) - Removal, TASK 28-31-04-000-803.

NOTE: A fuel tank entry is necessary to rework the fay surface of the adapter/shaft.

SUBTASK 28-31-04-400-003

(2) Do this task: Fuel Jettison Isolation Valve (Adapter/Shaft) - Installation, TASK 28-31-04-400-803.

NOTE: These steps will rework the fay surface, and re-install the adapter/shaft.

SUBTASK 28-31-04-765-007

(3) During the installation, do a check of the electrical bonding resistance between the adapter/shaft and the rear spar (SWPM 20-20-00).

(a) Use an intrinsically safe approved bonding meter, COM-1550.

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(b) Make sure the electrical bonding resistance is 0.0005 ohm (0.5 milliohm) or less.

(c) If the electrical bonding resistance is not satisfactory, then repeat the steps in this procedure.

(d) If the electrical bonding resistance is satisfactory, then continue with the steps to install the adapter/shaft (TASK 28-31-04-400-803).

SUBTASK 28-31-04-710-004

(4) After you install the adapter/shaft, do this procedure: Fuel Jettison Isolation Valve (Adapter/Shaft) - Installation, TASK 28-31-04-400-803 (Install the Index Plate and Jettison Isolation Valve Test).

H. Rework the Bonding Jumper Bond

(Figure 28-31-05-990-802)

NOTE: Do the steps in this procedure if the measurement for the electrical bonding resistance between the bonding jumper terminal and the rear spar is more than 0.0015 ohm (1.5 milliohms). The measurement is done with the bonding jumper disconnected from the actuator.

SUBTASK 28-31-04-030-002

(1) Remove the sealant from the bonding jumper terminal attached to the structure.

SUBTASK 28-31-04-030-003

(2) Remove the nut, two washers, and the bonding jumper.

SUBTASK 28-31-04-030-004

(3) Do these steps to install the bonding jumper to the structure:

WARNING

DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

(b) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper terminal and the two washers.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the fay surface fay seal.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(c) Install the nut, washers, and the bonding jumper to the structure.

(d) Tighten the nut to 20 in-lb (2.3 N·m).

(e) Measure the electrical bonding resistance between the loose end of bonding jumper and the rear spar (SWPM 20-20-00).

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

1) Use an intrinsically safe approved bonding meter, COM-1550.

2) Make sure the electrical bonding resistance is 0.0015 ohm (1.5 milliohms) or less.

(f) Apply a cap seal over the nut and the terminal of the bonding jumper.

NOTE: Use the sealant that was used for the fay surface fay seal.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296.

SUBTASK 28-31-04-420-029

(4) Continue with this task: Fuel Jettison Isolation Valve Actuator - Installation, TASK 28-31-05-400-802.

SUBTASK 28-31-04-710-005

(5) If you have replaced the actuator or adjusted the index plate, then continue with the steps in these procedures: Fuel Jettison Isolation Valve Actuator - Installation, TASK 28-31-05-400-802 (Fuel Jettison Isolation Valve Actuator Operational Test), and Fuel Jettison Isolation Valve (Adapter/Shaft) - Installation, TASK 28-31-04-400-803 (Jettison Isolation Valve Test).

——— END OF TASK ———

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FUEL JETTISON ISOLATION VALVE ACTUATOR - REMOVAL/INSTALLATION

1. General

A. There are two isolation valves for the fuel jettison system. Each isolation valve has three parts: the actuator, the adapter/shaft, and the valve. The adapter shaft and the valve are installed in the left or right center fuel tank. The actuator is installed on the rear spar out of the left or right center fuel tank.

B. It is not necessary to defuel the fuel tanks to replace the actuator.

C. This procedure contains two tasks. The first task removes the actuator for the isolation valve. The second task installs the actuator for the isolation valve.

ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS

D. The procedure to remove and install the valve and the adapter/shaft is in TASK 28-31-04-000-803 and TASK 28-31-04-400-803.

TASK 28-31-05-000-802

2. Fuel Jettison Isolation Valve Actuator - Removal

(Figure 401)

A. References

Reference	Title
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Location Zones

Zone	Area
551	Rear Spar to Landing Gear Support Beam - Left Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

C. Procedure

SUBTASK 28-31-05-860-012

WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR BEFORE YOU MOVE THE CONTROL LEVER. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(1) Make sure the landing gear downlock pins are installed (TASK 32-00-30-480-801).

SUBTASK 28-31-05-860-013

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-31-05-860-014

(3) For the left jettison isolation valve:

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(a) Open this circuit breaker and install safety tag:

Left Power Management Panel, P110

Row	Col	Number	Name
L	24	C28631	L FUEL JETT ISLN VLV

SUBTASK 28-31-05-860-015

(4) For the right jettison isolation valve:

(a) Open this circuit breaker and install safety tag:

Right Power Management Panel, P210

Row	Col	Number	Name
K	13	C28630	R JETT ISLN VLV

SUBTASK 28-31-05-980-002

(5) Make sure the manual override handle on the actuator [14] is in the CLOSED position.

(a) If the manual override handle is not in the CLOSED position, move the manual override handle to the CLOSED position.

SUBTASK 28-31-05-030-002

(6) Disconnect the electrical connector [1] from the applicable actuator [14].

SUBTASK 28-31-05-030-003

(7) Remove the sealant from the bonding jumper [12] and fasteners at the actuator attachment location.

SUBTASK 28-31-05-030-004

(8) Remove the bolt [10], washers [11] and bonding jumper [12] from the actuator [14].

SUBTASK 28-31-05-030-005

(9) Remove the four screws [8] and washers [9] that attach the actuator [14] to the adapter/shaft [6].

SUBTASK 28-31-05-030-006

(10) Carefully disassemble the actuator [14] from the index plate [13].

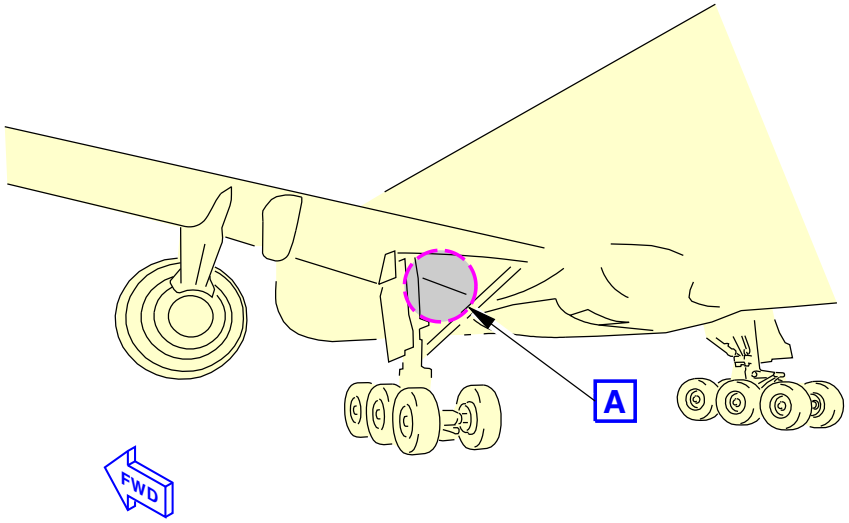
NOTE: The actuator and index plate are bonded with faying surface sealant.

SUBTASK 28-31-05-020-004

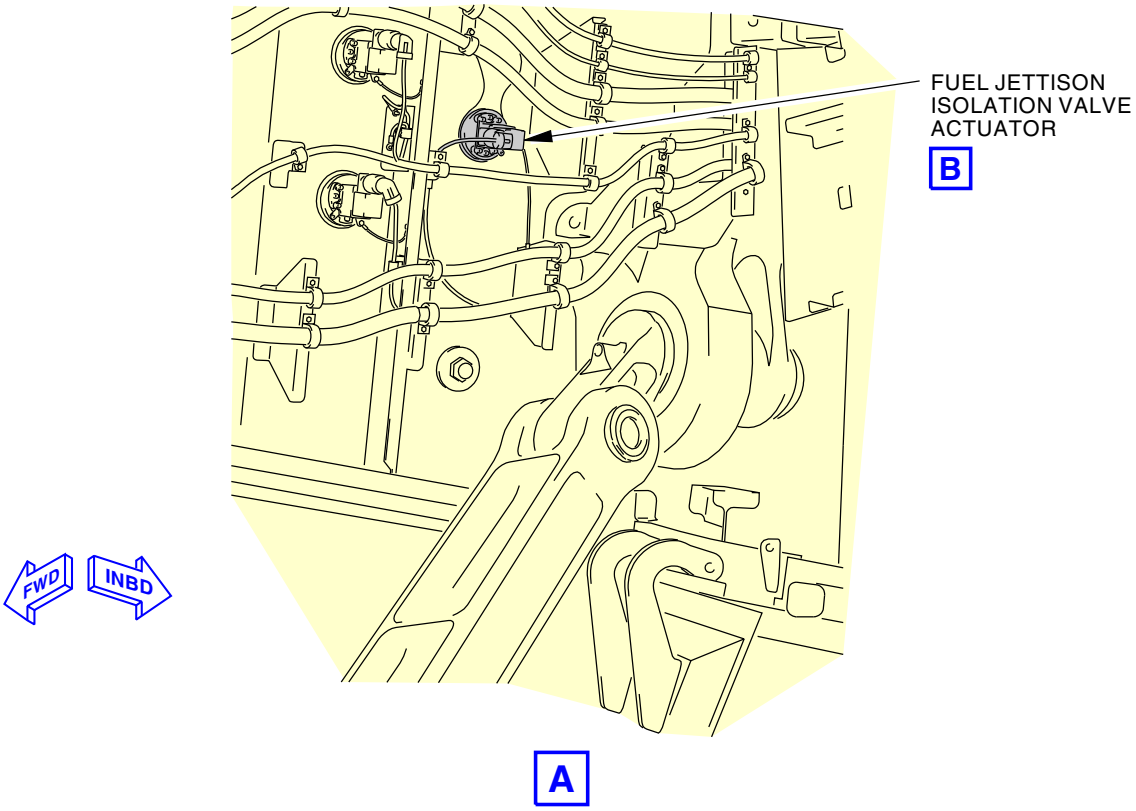
(11) Remove the actuator [14].

——— END OF TASK ———

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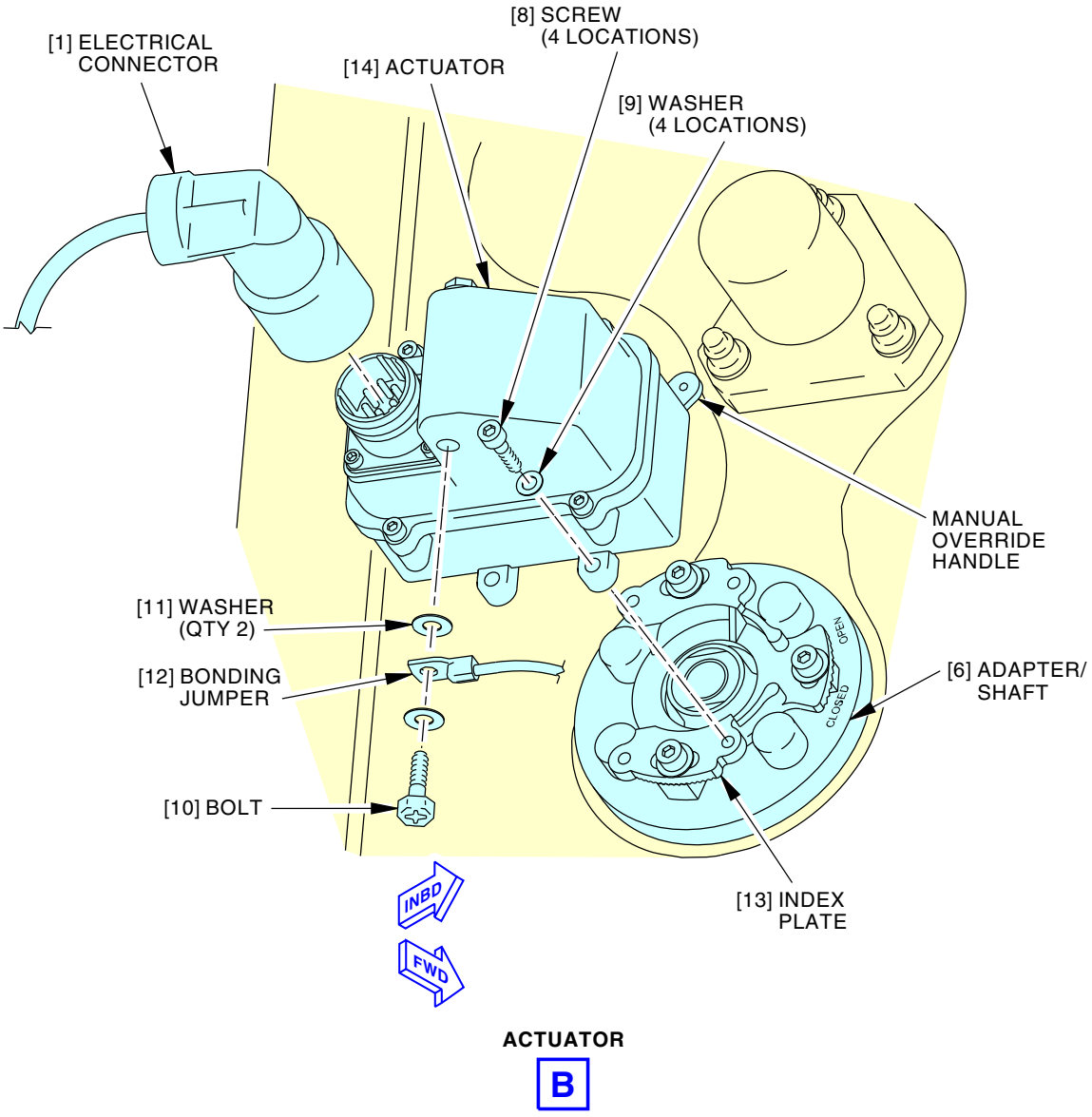


LEFT WING
(RIGHT WING IS EQUIVALENT)



Fuel Jettison Isolation Valve Actuator Installation
Figure 401/28-31-05-990-802 (Sheet 1 of 2)

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Fuel Jettison Isolation Valve Actuator Installation
Figure 401/28-31-05-990-802 (Sheet 2 of 2)

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TASK 28-31-05-400-802

3. Fuel Jettison Isolation Valve Actuator - Installation

(Figure 401)

A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(2) For application of fay sealed fay surface bonds in this task, it is acceptable to use sealant, A50110, as an alternative to sealant, A50155.

NOTE: Sealants should not be mixed. In applications where sealants may mix, use the same sealant for both applications.

B. References

Reference	Title
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
20-30-92-910-801	Final Cleaning Prior to General Sealing (Series 92) (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-22-01-300-801	Rework the Fay Sealed Fay Surface Bonds for the Spar Valve (P/B 401)
28-31-04-300-801	Rework the Fay Sealed Fay Surface Bonds for the Fuel Jettison Isolation Valve (P/B 401)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-09-00-860-801	Air/Ground Mode Simulation (P/B 201)
51-21-04-620-801	Alodine 600, 1000, 1200, and 1200S Coating Application (P/B 701)
SWPM 20-20-00	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

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Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved Part #: 1-6390-A Supplier: 63318 Part #: 10810 Supplier: $0855 Part #: 234350 Supplier: $0857 Part #: 311 Supplier: F6892 Part #: 411B60 Supplier: 3DN12 Part #: 411B90 Supplier: 3DN12 Part #: DAD5013 Supplier: $0856 Part #: DFD5019 Supplier: $0856 Part #: J5-0275-2010 Supplier: 435R8 Part #: SCD5019 Supplier: $0856 Part #: ST982LF-9 Supplier: 62176 Part #: TS1275-4 Supplier: 1DWR5
COM-4746	Handle - Sealant Removal Tool Part #: 310/1 Supplier: F6892 Part #: SHN0272 Supplier: $0856 Part #: SHR0272-T Supplier: 1DWR5 Part #: SHW0215 Supplier: $0856
STD-123	Brush - Soft Bristle

D. Consumable Materials

Reference	Description	Specification
A50110	Sealant	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
A50231	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class B
A50296	Sealant - Pressure And Environmental - Chromate Type	BMS5-95 Class C
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
B01012	Solvent - Final Cleaning Prior To General Sealing - Series 92	
C00064	Coating - Aluminum Chemical Conversion	BAC5719 Type II Class A (MIL-DTL-5541 Class 1A)
C00307	Coating - Corrosion Resistant Finish For Integral Fuel Tanks	BMS10-20 Type II
C50033	Chromated Conversion Coating for Aluminum - Alodine 1200	

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

(Continued)

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
14	Actuator	28-31-05-01-135	ARO 001-004
		28-31-05-01A-065	ARO 005-016

F. Location Zones

Zone	Area
551	Rear Spar to Landing Gear Support Beam - Left Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

G. Access Panels

Number	Name/Location
521DB	Refueling Station Door

H. Procedure

SUBTASK 28-31-05-860-016

(1) For the left jettison isolation valve:

CAUTION

REMOVE POWER TO THE ACTUATOR. IF YOU DO MAINTENANCE TO THE ACTUATOR WHILE IT IS ENERGIZED, DAMAGE TO THE ACTUATOR CAN OCCUR.

(a) Make sure that this circuit breaker is open and has safety tag:

Left Power Management Panel, P110

Row	Col	Number	Name
L	24	C28631	L FUEL JETT ISLN VLV

SUBTASK 28-31-05-860-017

(2) For the right jettison isolation valve:

CAUTION

REMOVE POWER TO THE ACTUATOR. IF YOU DO MAINTENANCE TO THE ACTUATOR WHILE IT IS ENERGIZED, DAMAGE TO THE ACTUATOR CAN OCCUR.

(a) Make sure that this circuit breaker is open and has safety tag:

Right Power Management Panel, P210

Row	Col	Number	Name
K	13	C28630	R JETT ISLN VLV

SUBTASK 28-31-05-140-001

(3) Remove the old sealant and clean the actuator [14], index plate [13], and fasteners (if re-used).

(a) Use sealant removal tool, COM-2481, and sealant removal tool handle, COM-4746 (or equivalent), to remove old sealant from the index plate [13] and the actuator [14].

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(b) To remove the remaining sealant, grease, oil, dirt, and other contamination from the components, use one of these items soaked with Series 92 solvent, B01012 (TASK 20-30-92-910-801):

1) soft bristle brush, STD-123

2) cotton wiper, G00034

SUBTASK 28-31-05-420-003

(4) Do these steps to prepare the actuator [14] and the index plate [13] for a fay sealed fay surface bond (SWPM 20-20-00):

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(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-19: CDCCL

(b) Apply a thin continuous layer of sealant between the actuator [14] mounting feet contact areas (four locations) and the index plate [13] for a fay sealed fay surface bond.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the fay sealed fay surface bond.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(c) Apply sealant to the shank and the threads of the screws [8].

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296, for the wet installation of the screws [8].

NOTE: Use the same sealant that was used for the fay sealed fay surface bond.

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2) Make sure the sealant applied to the fasteners is approximately 0.060 in. (1.524 mm) thick.

SUBTASK 28-31-05-420-004

(5) Do these steps to install the actuator [14] to the index plate [13]:

(a) Make sure the manual override handle on the actuator is in the CLOSED position.

(b) Align the actuator output shaft with the adapter/shaft [6].

(c) Make sure the two spaces for teeth on the adapter/shaft [6] align with the actuator output shaft.

(d) Put the actuator output shaft into the adapter/shaft [6].

NOTE: The contact areas of the actuator automatically align with the mounting points on the index plate.

(e) Install the screws [8] and the washers [9].

NOTE: Lockwire is not necessary for the screws [8].

(f) Tighten the screws [8] to 20 in-lb (2.3 N·m).

(g) Make sure the sealant is continuously squeezed out along the edges of the contact surfaces.

(h) If there are gaps, bubbles or voids in the sealant squeeze out, then disassemble and apply more sealant.

(i) Shape the squeezed out sealant into a fillet seal.

(j) As an option, remove the extra squeezed out sealant.

NOTE: Make sure the sealant that remains is flush with the mating part edges.

SUBTASK 28-31-05-765-001

28-AWL-19: CDCCL

(6) Measure the electrical bonding resistance between the actuator [14] upper housing and the rear spar (structure) (SWPM 20-20-00):

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

28-AWL-19: CDCCL

(a) Do this measurement with the bonding jumper [12] and electrical connector [1] disconnected.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

(b) Make sure the bonding jumper [12] does not touch the actuator [14] during the electrical bonding measurement.

(c) Use an intrinsically safe approved bonding meter, COM-1550.

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28-AWL-19: CDCCL

(d) If the actuator [14], index plate [13] and adapter plate (part of the adapter/shaft [6]) were removed, make sure the electrical bonding resistance is 0.0030 ohm (3.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801 for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) If the electrical bonding resistance is more than 0.0030 ohm (3.0 milliohms), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Fuel Jettison Isolation Valve, TASK 28-31-04-300-801.

28-AWL-19: CDCCL

(e) If the actuator [14] and index plate [13] were removed, make sure the electrical bonding resistance is 0.0040 ohm (4.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801 for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) If the electrical bonding resistance is more than 0.0040 ohm (4.0 milliohms), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Fuel Jettison Isolation Valve, TASK 28-31-04-300-801.

28-AWL-19: CDCCL

(f) If only the actuator [14] was removed, make sure the electrical bonding resistance is 0.0040 ohm (4.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801 for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) If the electrical bonding resistance is more than 0.0040 ohm (4.0 milliohms), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Fuel Jettison Isolation Valve, TASK 28-31-04-300-801.

SUBTASK 28-31-05-420-007

(7) If the bonding jumper [12] is disconnected from the structure, do these steps to attach the bonding jumper [12]:

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(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

(b) Rub dry with a clean, dry cotton wiper, G00034.

(c) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

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28-AWL-19: CDCCL

(d) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper [12] terminal and the two washers for a fay sealed fay surface bond at the structure.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use sealant, A50110, or sealant, A50155, for the fay sealed fay surface bond.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(e) Install the screw and washers to attach the bonding jumper [12] to the structure.

1) Tighten the screw to 30 ±5 in-lb (3 ±1 N·m).

28-AWL-19: CDCCL

(f) Apply a cap seal over the screw (fastener) and the terminal of the bonding jumper [12] attached to the structure.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

NOTE: Use the sealant that was used for the fay sealed fay surface bond.

1) Use sealant, A50110 or sealant, A50155.

SUBTASK 28-31-05-420-005

(8) Do these steps to install the bonding jumper [12] to the actuator [14]:

WARNING

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(a) Final clean the contact surfaces with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

1) Rub dry with a clean, dry cotton wiper, G00034.

2) Continue to clean and dry the surface until the dry cotton wiper, G00034, stays clean.

28-AWL-19: CDCCL

(b) Measure the electrical bonding resistance between the loose end of the bonding jumper [12] and the rear spar (structure) (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use an intrinsically safe approved bonding meter, COM-1550.

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28-AWL-19: CDCCL

2) Make sure the electrical bonding resistance is 0.0015 ohm (1.5 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

a) If the electrical bonding resistance is more than 0.0015 ohm (1.5 milliohms), then do the applicable procedure in this task: Rework the Fay Sealed Fay Surface Bonds for the Spar Valve, TASK 28-22-01-300-801.

28-AWL-19: CDCCL

(c) Apply a thin continuous layer of sealant to both surfaces of the bonding jumper [12] terminal and the two washers [11] for a fay sealed fay surface bond between the actuator [14] and the bonding jumper [12] terminal.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, sealant, A50296, for the fay sealed fay surface bond.

2) Make sure the sealant layer is approximately 0.005 in. (0.127 mm) thick.

(d) Install the bolt [10] and washer [11] to attach the bonding jumper [12] to the actuator [14].

(e) AIRPLANES WITHOUT ACTUATOR MA30A1001:

Tighten the bolt [10] to 20 in-lb (2.3 N·m).

(f) AIRPLANES WITH ACTUATOR MA30A1001:

Tighten the bolt [10] to 35 in-lb (4.0 N·m).

28-AWL-19: CDCCL

(g) Measure the electrical bonding resistance between the upper housing of the actuator [14] and the attached bonding jumper [12] terminal (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

1) Do not touch the bolt [10] when you make the bonding measurement.

2) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-19: CDCCL

3) Make sure the electrical bonding resistance is 0.0010 ohm (1.0 milliohm) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

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28-AWL-19: CDCCL

(h) Apply a cap seal over the bolt [10] (fastener) and the terminal lug of the bonding jumper [12] attached to the actuator [14].

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-19.

NOTE: Use the sealant that was used for the fay sealed fay surface bond.

1) Use sealant, A50110, sealant, A50155, sealant, A50231, or sealant, A50296.

SUBTASK 28-31-05-370-001

(9) Apply protective finishes to the bare areas of the rear spar (TASK 28-11-00-600-801).

NOTE: Re-apply the protective finishes to the rear spar where the electrical bonding probes removed the finishes.

(a) These are the protective finishes:

1) Alodine 600 coating, C00064

2) BMS 10-20 coating, C00307.

SUBTASK 28-31-05-916-001

(10) Apply Alodine 1200 coating, C50033, to any bare areas of the actuator [14] (TASK 51-21-04-620-801).

NOTE: Re-apply the protective coating to the actuator [14] where the electrical bonding probe removed the finish and any bare metal areas around the bonding jumper installation that are not covered with sealant.

SUBTASK 28-31-05-420-006

(11) Connect the electrical connector [1] to the actuator [14].

I. Fuel Jettison Isolation Valve Actuator Operational Test

SUBTASK 28-31-05-865-001

(1) For the left jettison isolation valve:

(a) Remove the safety tag and close this circuit breaker:

Left Power Management Panel, P110

Row	Col	Number	Name
L	24	C28631	L FUEL JETT ISLN VLV

SUBTASK 28-31-05-865-002

(2) For the right jettison isolation valve:

(a) Remove the safety tag and close this circuit breaker:

Right Power Management Panel, P210

Row	Col	Number	Name
K	13	C28630	R JETT ISLN VLV

SUBTASK 28-31-05-861-001

(3) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-31-05-710-001

(4) To do an operational test of the actuator [14] for the fuel jettison isolation valves, do these steps:

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ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS (Continued)

(a) Make sure the airplane is in the ground mode (TASK 32-09-00-860-801).

ARO ALL

(b) Open this access door:

Number	Name/Location
521DB	Refueling Station Door

1) Put the DEFUEL VALVE switch, on the Integrated Refuel Panel (IRP), P28, to the OPEN position.

ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS

(c) Operate the valve two times to clear the EICAS message. To operate the valve, do these steps two times:

1) Put the JETTISON ARM switch, on the Overhead Panel P5, to the ARMED position.
2) Make sure the manual override handles on the actuator [14] move to the OPEN position (Figure 401).
3) Put the JETTISON ARM switch, on the Overhead Panel P5, to the OFF position.
4) Make sure the manual override handles on the actuator [14] move to the CLOSED position (Figure 401).

ARO ALL

(d) Put the DEFUEL VALVE switch, on the IRP, P28, to the CLOSE position.

(e) Close this access door:

Number	Name/Location
521DB	Refueling Station Door

ARO ALL; AIRPLANES WITH MA20A2027 OR MA30A1001 OR MA30A1017 ACTUATORS

(f) Make sure the EICAS status messages JETT ISLN VLV L and JETT ISLN VLV R, do not show on the EICAS display.

J. Put the Airplane Back to the Usual Condition

SUBTASK 28-31-05-860-018

WARNING OBEY THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

END OF TASK

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FUEL JETTISON ISOLATION VALVE ACTUATOR - INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure contains a functional check of the bonding resistance between the structure and the fuel jettison isolation valve actuator.

SFAR 88

TASK 28-31-05-200-801

2. Fuel Jettison Isolation Valve Actuator - Bonding Resistance Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
28-31-03-400-804	Fuel Jettison Nozzle Valve Actuator - Installation (P/B 401)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Location Zones

Zone	Area
551	Rear Spar to Landing Gear Support Beam - Left Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

D. Prepare for the Procedure

SUBTASK 28-31-05-490-001

WARNING MAKE SURE THAT THE DOWNLOCK PINS ARE INSTALLED IN ALL OF THE LANDING GEAR BEFORE YOU MOVE THE CONTROL LEVER. WITHOUT THE DOWNLOCK PINS, THE LANDING GEAR CAN RETRACT AND CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(1) Make sure the landing gear downlock pins are installed (TASK 32-00-30-480-801).

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SUBTASK 28-31-05-490-002

WARNING OBEY THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY. THE MOVEMENT OF THE DOORS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-31-05-865-003

(3) For the left jettison isolation valve:

CAUTION REMOVE POWER TO THE ACTUATOR. IF YOU DO MAINTENANCE TO THE ACTUATOR WHILE IT IS ENERGIZED, DAMAGE TO THE ACTUATOR CAN OCCUR.

(a) Open this circuit breaker and install safety tag:

Left Power Management Panel, P110

Row	Col	Number	Name
L	24	C28631	L FUEL JETT ISLN VLV

SUBTASK 28-31-05-865-004

(4) For the right jettison isolation valve:

CAUTION REMOVE POWER TO THE ACTUATOR. IF YOU DO MAINTENANCE TO THE ACTUATOR WHILE IT IS ENERGIZED, DAMAGE TO THE ACTUATOR CAN OCCUR.

(a) Open this circuit breaker and install safety tag:

Right Power Management Panel, P210

Row	Col	Number	Name
K	13	C28630	R JETT ISLN VLV

E. Electrical Bonding Measurement

SUBTASK 28-31-05-212-001

(1) Make sure the manual override handle on the actuator is in the CLOSED position.

(a) If the manual override handle is not in the CLOSED position, move the manual override handle to the CLOSED position.

SUBTASK 28-31-05-862-001

(2) Disconnect the electrical connector from the applicable actuator, on the rear spar of the left or right center fuel tank.

SUBTASK 28-31-05-765-003

(3) Measure the bonding resistance between the actuator and the airplane structure with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

(a) Make sure the bonding resistance is 5 milliohms (0.005 ohm) or less.

SUBTASK 28-31-05-765-007

(4) Measure the bonding resistance between the bonding jumper and the airplane structure with an intrinsically safe approved bonding meter, COM-1550 (SWPM 20-20-00).

(a) Make sure the bonding resistance is 8 milliohms (0.008 ohm) or less.

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SUBTASK 28-31-05-861-002

(5) Connect the electrical connector to the actuator.

SUBTASK 28-31-05-860-019

(6) For the left jettison isolation valve:

(a) Remove the safety tag and close this circuit breaker:

Left Power Management Panel, P110

Row	Col	Number	Name
L	24	C28631	L FUEL JETT ISLN VLV

SUBTASK 28-31-05-860-020

(7) For the right jettison isolation valve:

(a) Remove the safety tag and close this circuit breaker:

Right Power Management Panel, P210

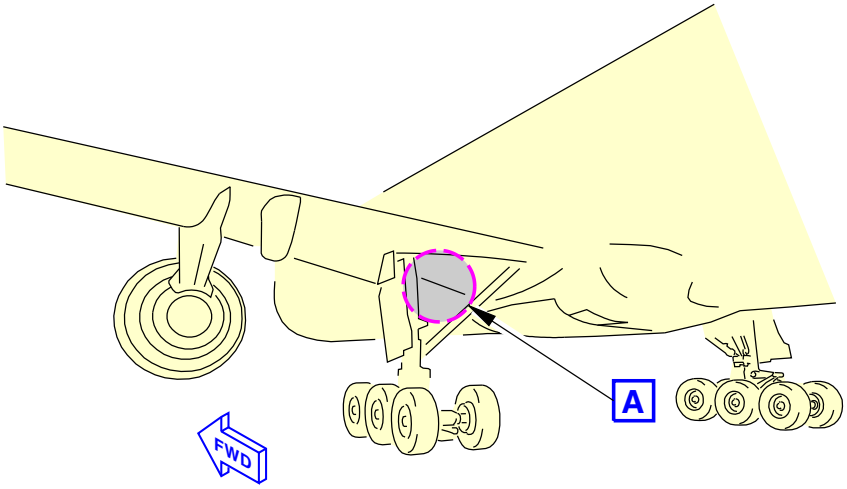
Row	Col	Number	Name
K	13	C28630	R JETT ISLN VLV

SUBTASK 28-31-05-710-002

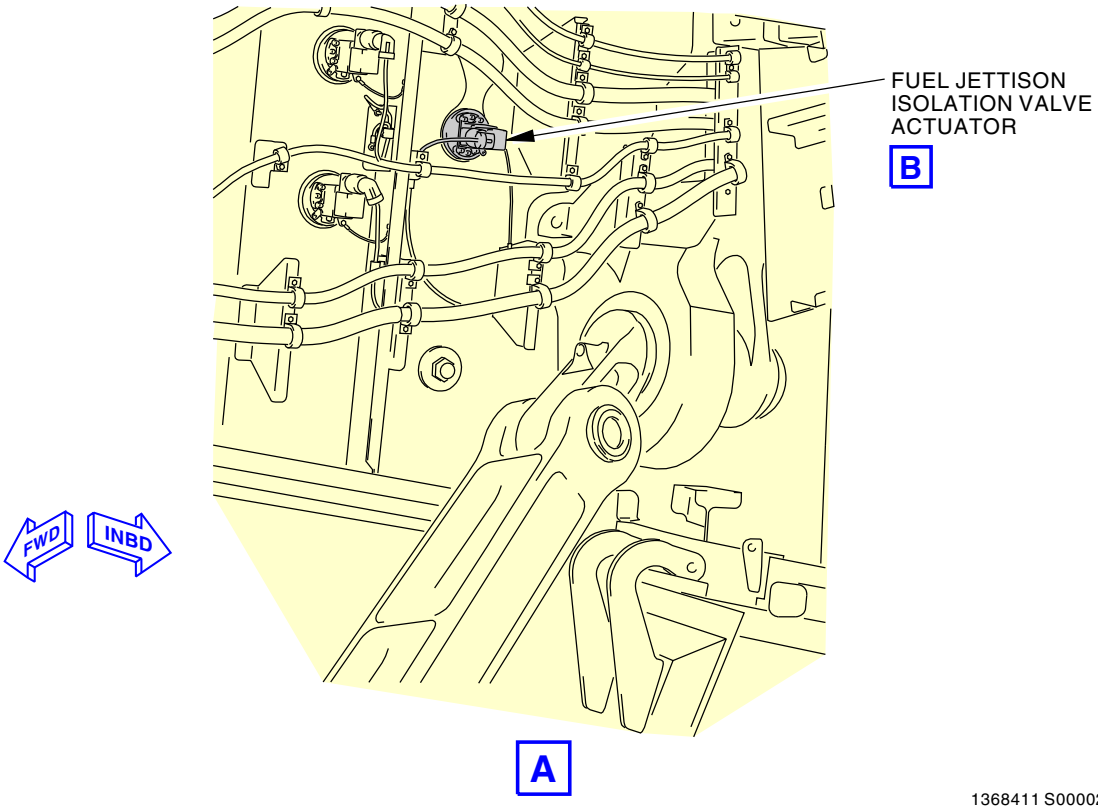
(8) Do the fuel jettison isolation valve actuator test in Fuel Jettison Nozzle Valve Actuator - Installation, TASK 28-31-03-400-804.

——— END OF TASK ———

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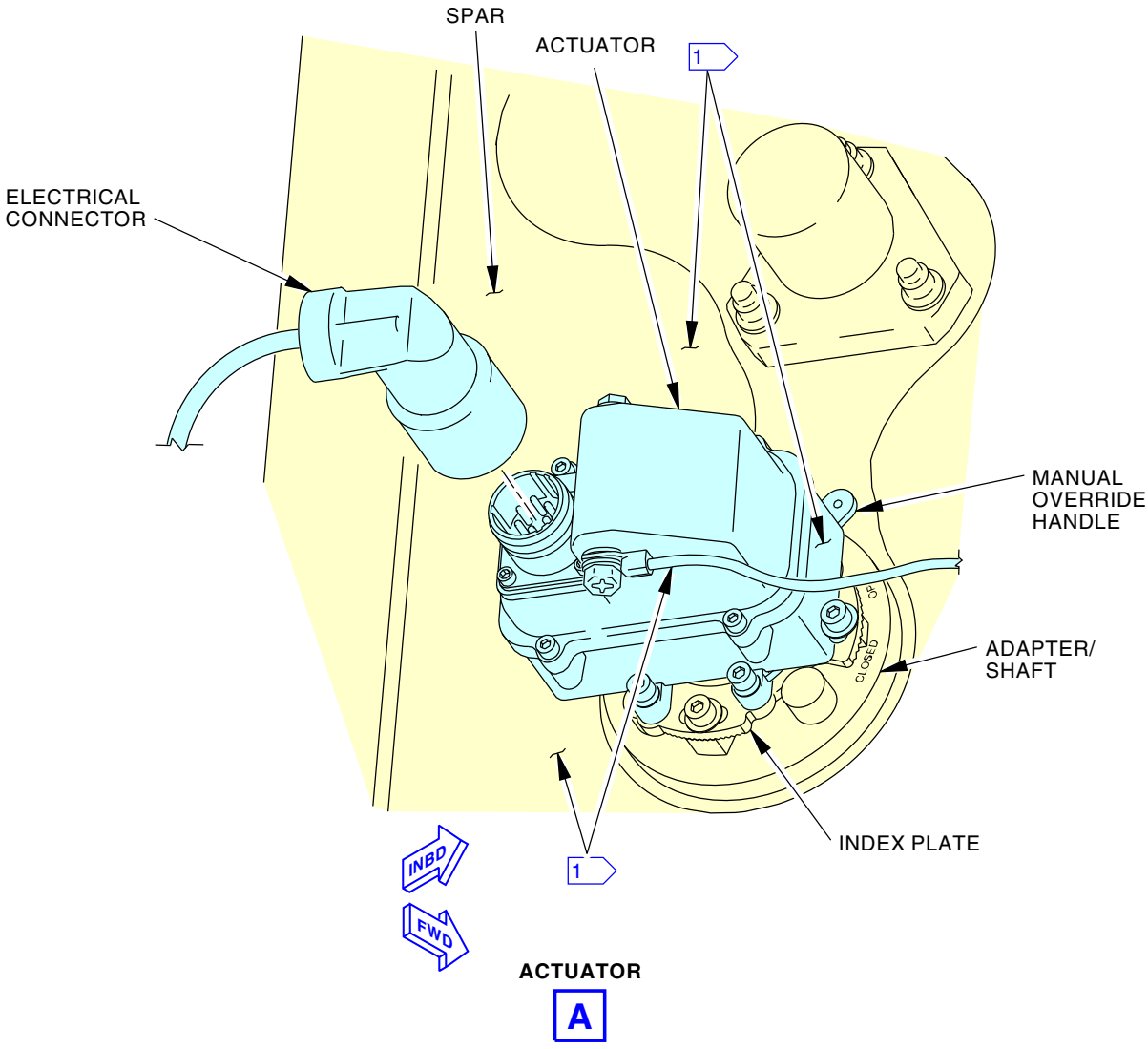
LEFT WING
(RIGHT WING IS EQUIVALENT)



1368411 S0000247099_V2

Fuel Jettison Isolation Valve - Bonding Resistance Measurement
Figure 601/28-31-05-990-803 (Sheet 1 of 2)

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1 BONDING RESISTANCE MEASUREMENT LOCATION

1368756 S0000247102_V2

Fuel Jettison Isolation Valve - Bonding Resistance Measurement
Figure 601/28-31-05-990-803 (Sheet 2 of 2)

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FUEL JETTISON ISOLATION CHECK VALVE - REMOVAL/INSTALLATION

1. General

A. There are two isolation check valves installed between the fuel feed manifold and the refuel/jettison manifold. The jettison isolation check valves prevent fuel flow from the main tank boost pumps into the fuel jettison manifold during fuel jettison.

B. You must defuel the fuel tanks before you remove the jettison isolation check valve.

C. This procedure contains two tasks. The first task removes the jettison isolation check valve. The second task installs the jettison isolation check valve.

TASK 28-31-06-000-801

2. Fuel Jettison Isolation Check Valve - Removal

(Figure 401)

A. References

Reference	Title
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-22-15-000-802-001	Fuel Line, Fitting and Coupling - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

C. Access Panels

Number	Name/Location
531AB	Access Door
631AB	Access Door

D. Procedure

SUBTASK 28-31-06-650-001

(1) Defuel all of the fuel tanks.

(a) Do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-31-06-940-001

WARNING OBEY THE FUEL TANK ENTRY PRECAUTIONS. FAILURE TO OBEY THE FUEL TANK ENTRY PRECAUTIONS COULD CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) For the center fuel tank, do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-31-06-010-002

(3) Remove the applicable access panels, to get access to the left or right center fuel tank:

(TASK 28-11-01-000-801)

Number	Name/Location
531AB	Access Door
631AB	Access Door

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SUBTASK 28-31-06-940-002

(4) Go into the left or right center fuel tank.

SUBTASK 28-31-06-010-001

(5) Find the jettison isolation check valve (Figure 401).

SUBTASK 28-31-06-020-001

(6) To remove the check valve, do these steps:

(a) Remove the four bolt [5] and washer [6] from the flange that connects the valve [3] to the fuel feed line [7].

(b) Remove the coupling [1] between the valve [3] and the fuel feed line [7] (TASK 28-22-15-000-802-001).

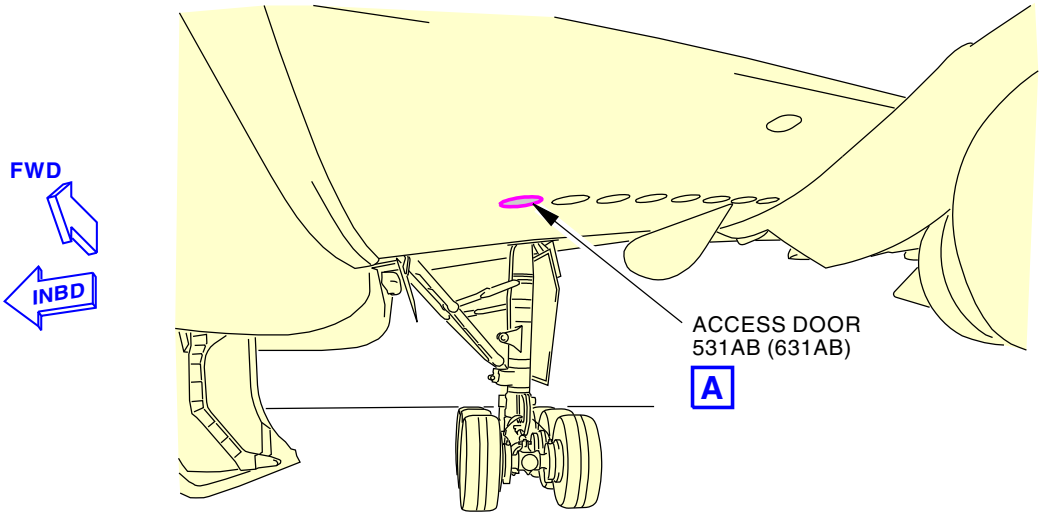
(c) Remove the valve [3].

1) Discard the O-ring [2] and gasket [4].

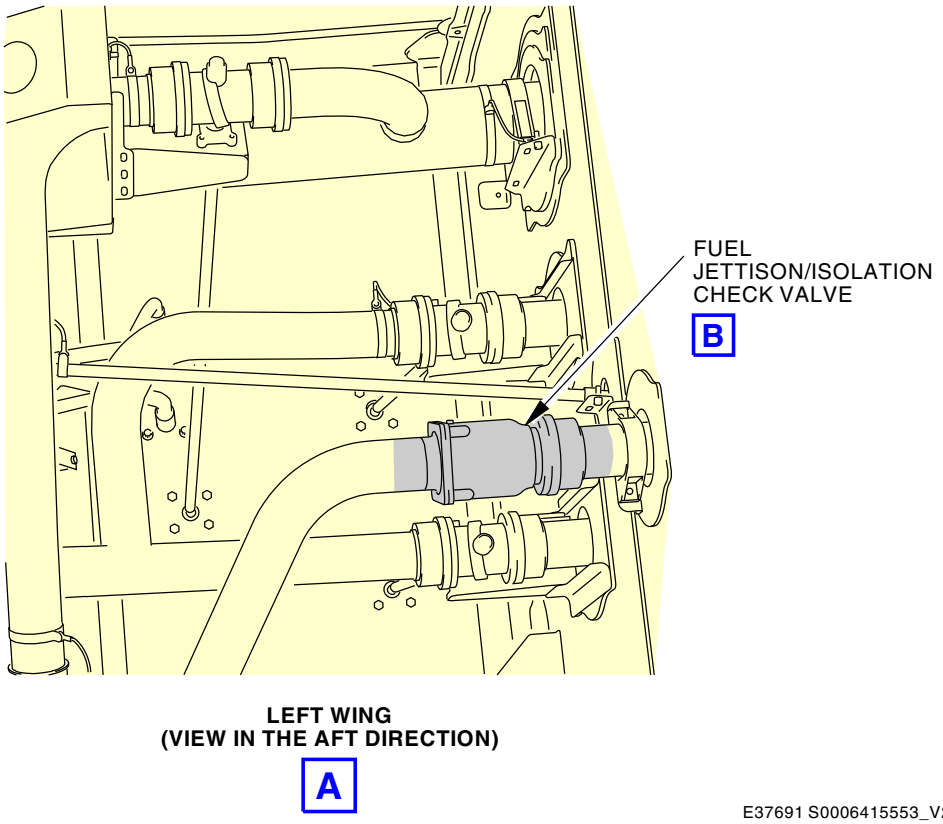
(d) Put covers on the open ends of the fuel feed line [7] to keep unwanted materials out.

——— END OF TASK ———

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LEFT WING
(RIGHT WING IS EQUIVALENT)



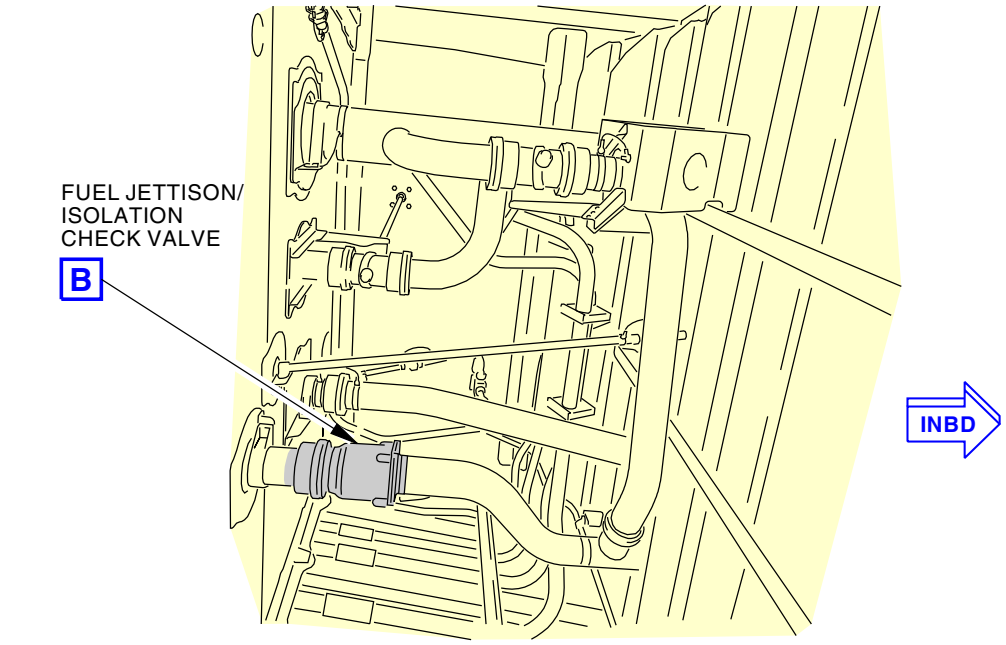
LEFT WING
(VIEW IN THE AFT DIRECTION)

A

E37691 S0006415553_V2

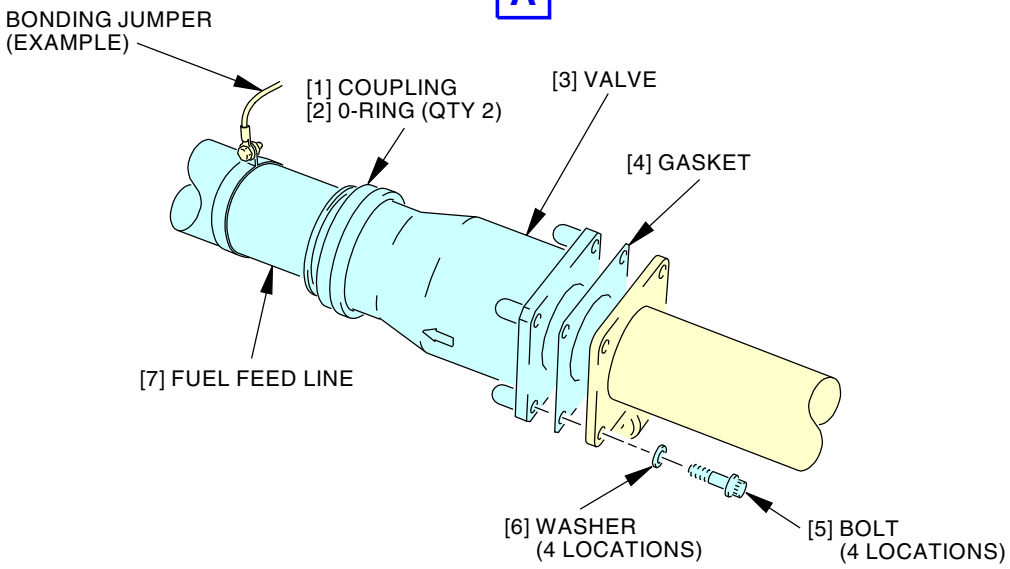
Fuel Jettison/Isolation Check Valve Installation
Figure 401/28-31-06-990-801 (Sheet 1 of 2)

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RIGHT WING
(VIEW IN THE AFT DIRECTION)

A



FUEL JETTISON/ISOLATION CHECK VALVE

B

E37797 S0006415554_V2

Fuel Jettison/Isolation Check Valve Installation
Figure 401/28-31-06-990-801 (Sheet 2 of 2)

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TASK 28-31-06-400-801

3. Fuel Jettison Isolation Check Valve - Installation

(Figure 401)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-22-15-000-802-001	Fuel Line, Fitting and Coupling - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)
28-26-00-650-803	Suction Defueling (P/B 201)
32-09-00-860-801	Air/Ground Mode Simulation (P/B 201)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	O-ring	28-31-06-02-075	ARO ALL
		28-31-06-02A-075	ARO ALL
3	Valve	28-31-06-02-050	ARO ALL
		28-31-06-02A-050	ARO ALL
4	Gasket	28-31-06-02-065	ARO ALL
		28-31-06-02A-065	ARO ALL

E. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

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F. Access Panels

Number	Name/Location
521DB	Refueling Station Door
531AB	Access Door
631AB	Access Door

G. Procedure

SUBTASK 28-31-06-940-003

WARNING OBEY THE FUEL TANK ENTRY PRECAUTIONS. FAILURE TO OBEY THE FUEL TANK ENTRY PRECAUTIONS COULD CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(1) For the center fuel tank, do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-31-06-420-001

(2) Go into the left or right center fuel tank.

SUBTASK 28-31-06-420-002

(3) To install the check valve, do these steps:

(a) Remove the covers from the open ends of the fuel feed line.

(b) Apply a thin layer of petrolatum grease, D00504, to the new O-ring [2].

(c) Put the coupling [1] and o-rings [2] onto the fuel feed line (TASK 28-22-15-000-802-001).

(d) Put a new gasket [4] between the flange on the fuel feed line and the flange of the valve [3].

(e) Align the valve [3] with the fuel feed line [7].

NOTE: Make sure you install the valve [3] with the hinge (for the flapper inside the valve) on the top.

(f) Install the four bolt [5] and washer [6] to the flange that connects the valve [3] to the fuel feed line [7].

(g) Tighten the coupling [1] between the valve [3] and the fuel feed line [7] (TASK 28-22-15-000-802-001).

(h) Install lockwire to the coupling [1] (TASK 20-10-23-400-801).

(i) Measure the bonding resistance between the valve [3] and the fuel feed line [7] with a intrinsically safe approved bonding meter, COM-1550.

1) Make sure the resistance is less than 0.01 ohm.

SUBTASK 28-31-06-410-001

(4) To install these access panels, do this task:

Main Tank Access Door Installation, TASK 28-11-01-400-801

Number	Name/Location
531AB	Access Door
631AB	Access Door

SUBTASK 28-31-06-650-002

(5) Make sure there is a minimum of these quantities of fuel are in the fuel tanks (Table 401):

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Table 401/28-31-06-993-801 Minimum Fuel Quantity Requirements

Tank	Fuel Quantity
Center Fuel Tank	5,500 lb (2,495 kg)
Left Main Fuel Tank	14000 lb (6350 kg)
Right Main Fuel Tank	14000 lb (6350 kg)

(a) To add fuel to one or more tanks, do this task: TASK 12-11-01-650-801 or TASK 28-26-00-650-802.

(b) To remove fuel from one or more tanks, do one of these tasks: TASK 28-26-00-650-801, TASK 28-26-00-650-803, TASK 28-26-00-650-802.

SUBTASK 28-31-06-710-001

(6) To do a test of the check valve (closed), do these steps:

(a) Make sure the airplane is in the ground mode (TASK 32-09-00-860-801).

(b) Make sure the DEFUEL VALVE switch, on the IRP P28, is in the CLOSED position.

(c) Open these circuit breakers and install safety tags:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
K	14	C28646	R FUEL JETT PUMP CTRL

Standby Power Management Panel, P310

Row	Col	Number	Name
J	10	C28637	DFUEL VLVS

NOTE: Verify that the DEFUEL VALVE is in the CLOSED position before pulling the circuit breaker C28637.

(d) Open this access panel:

Number	Name/Location
521DB	Refueling Station Door

(e) Put the DEFUEL VALVE switch, on the Integrated Refuel Panel (IRP), P28, to the OPEN position.

(f) Put the CENTER REFUEL VALVE CONTROL switch, on the IRP, P28, to the OPEN position.

(g) Push the FUEL JETTISON ARM switch-light, on the Overhead Panel P5, to the ARMED position.

WARNING DO NOT OPERATE ANY FUEL PUMP IF THE AMBER PRESS LIGHT COMES ON AND STAYS ON. FUEL VAPORS IN THE TANK MAY IGNITE AND CAUSE A FIRE OR EXPLOSION.

(h) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

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1) Immediately set the applicable fuel pump switch-light(s) off if the amber PRESS light comes on and stays on.

(i) Push the FWD L and R PUMPS switch-lights, on the Overhead Panel P5, to the ON position.

(j) Make sure the fuel quantity in the center fuel tank does not increase for 4 minutes.

(k) Push the FWD L and R PUMPS switch-lights to the off position.

(l) Push the FUEL JETTISON ARM switch-light to the off position.

(m) Put the CENTER REFUEL VALVE CONTROL switch to the CLOSE position.

(n) Remove the safety tags and close these circuit breakers:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
K	14	C28646	R FUEL JETT PUMP CTRL

Standby Power Management Panel, P310

Row	Col	Number	Name
J	10	C28637	DFUEL VLVS

SUBTASK 28-31-06-710-002

(7) To do a test of the check valve (open), do these steps:

(a) Put the DEFUEL VALVE switch, at the IRP, P28, to the OPEN position, if it is not.

(b) Put the RIGHT MAIN REFUEL VALVE CONTROL switch, at the IRP, P28, to the OPEN position.

(c) Push the FWD CROSSFEED valve switch-light, on the Overhead Panel P5, to the open position.

WARNING DO NOT OPERATE ANY FUEL PUMP IF THE AMBER PRESS LIGHT COMES ON AND STAYS ON. FUEL VAPORS IN THE TANK MAY IGNITE AND CAUSE A FIRE OR EXPLOSION.

(d) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

1) Immediately set the applicable fuel pump switch-light(s) to off if the amber PRESS light comes on and stays on.

(e) Push the CENTER PUMPS L switch-light, on the Overhead Panel P5, to the ON position.

(f) Make sure the fuel quantity in the right main fuel tanks increases by 100 LB (100 KG) in 4 minutes.

(g) Push the CENTER PUMPS L switch-light to the off position.

(h) Push the FWD CROSSFEED valve switch-light to the closed position.

(i) Push the CENTER PUMPS R switch-light, on the Overhead Panel P5, to the ON position.

(j) Make sure the fuel quantity in the right main fuel tanks increases by 100 LB (100 KG) in 4 minutes.

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(k) Push the CENTER PUMPS R switch-light to the OFF position.

(l) Put the RIGHT MAIN REFUEL VALVE CONTROL switch, on the IRP, P28, to the CLOSE position.

(m) Put the DEFUEL VALVE control switch, on the IRP, P28, to the CLOSE position.

(n) Close this access panel:

Number	Name/Location
521DB	Refueling Station Door

——— END OF TASK ———

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FUEL QUANTITY INDICATING SYSTEM (FQIS) - ADJUSTMENT/TEST

1. General

A. This procedure contains scheduled maintenance task data.

TASK 28-41-00-710-801

2. Fuel Quantity Indicating System (FQIS) TANK UNITS and DENSITOMETERS - Operational Check

(Figure 501)

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This task contains:

(a) A check for fuel related EICAS status messages.

(b) A check of the fuel quantity indication.

(c) A check for densitometer and tank unit related maintenance messages.

B. References

Reference	Title
45-10-00-740-818	How to Find Active or Latched Maintenance Messages in One ATA System (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right

D. Procedure

SUBTASK 28-41-00-210-001

(1) Make sure these EICAS STATUS messages do not show on the bottom display: FUEL QTY CHAN, FUEL QTY IND, FUEL TEMP IND (Figure 501).

SUBTASK 28-41-00-210-002

(2) Make sure the fuel quantity (Total, Left, Center and Right) show on the EICAS display (Figure 501).

SUBTASK 28-41-00-860-002

(3) To view the Existing Faults for ATA 28 Fuel, on the maintenance access terminal (MAT), do this task: How to Find Active or Latched Maintenance Messages in One ATA System, TASK 45-10-00-740-818.

(a) Make sure the maintenance messages for these components do not show:

1) Densitometer

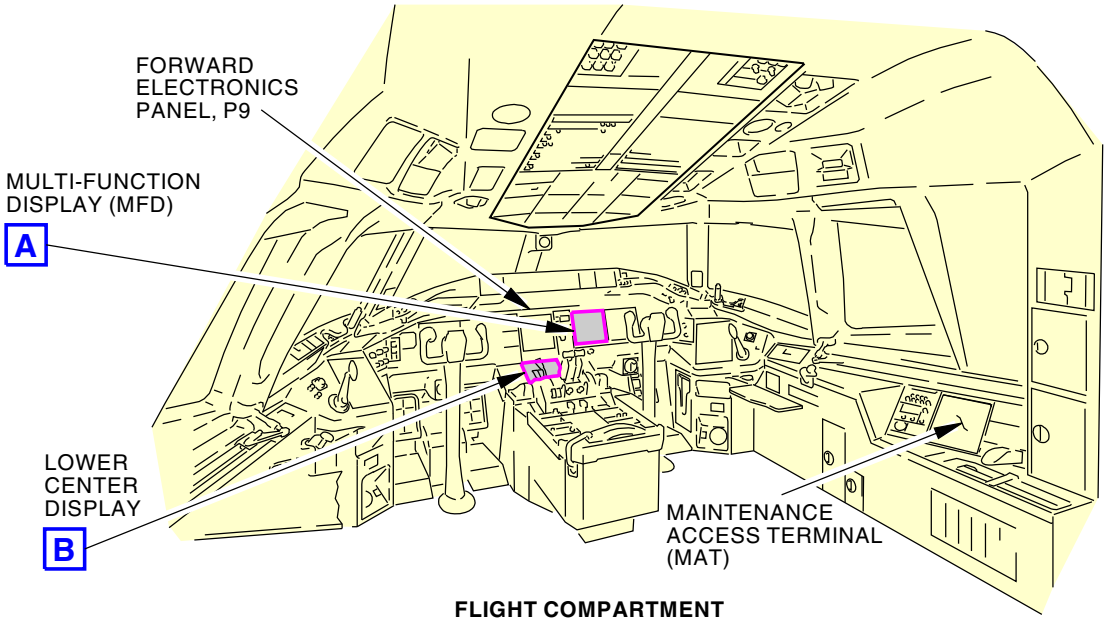
2) Tank Unit

3) Harness Assy

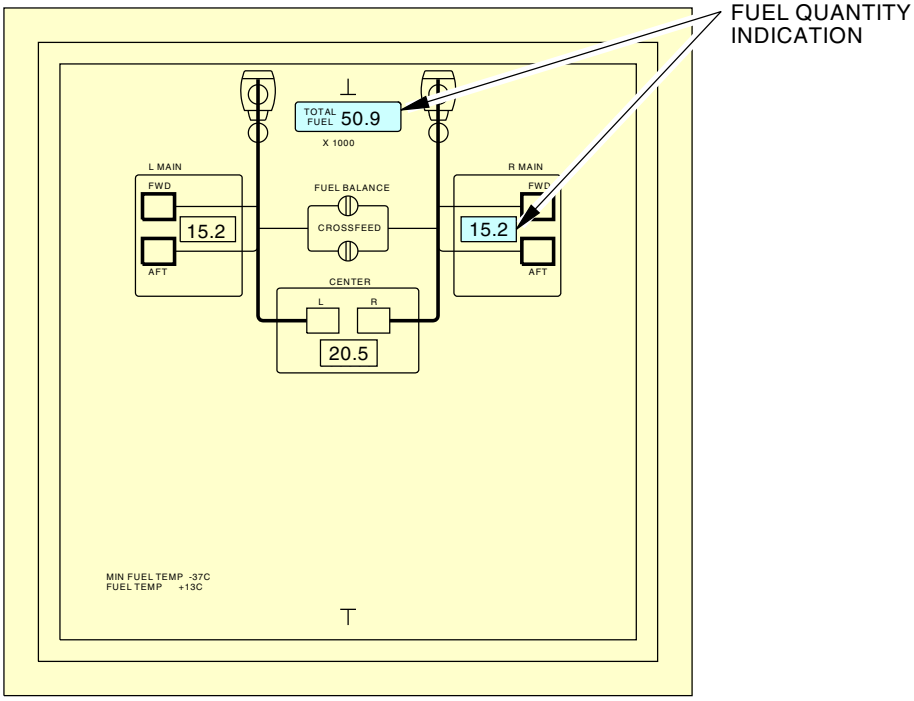
(b) To correct these or other fuel related maintenance messages refer to the Fault Code Index.

END OF TASK

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FLIGHT COMPARTMENT



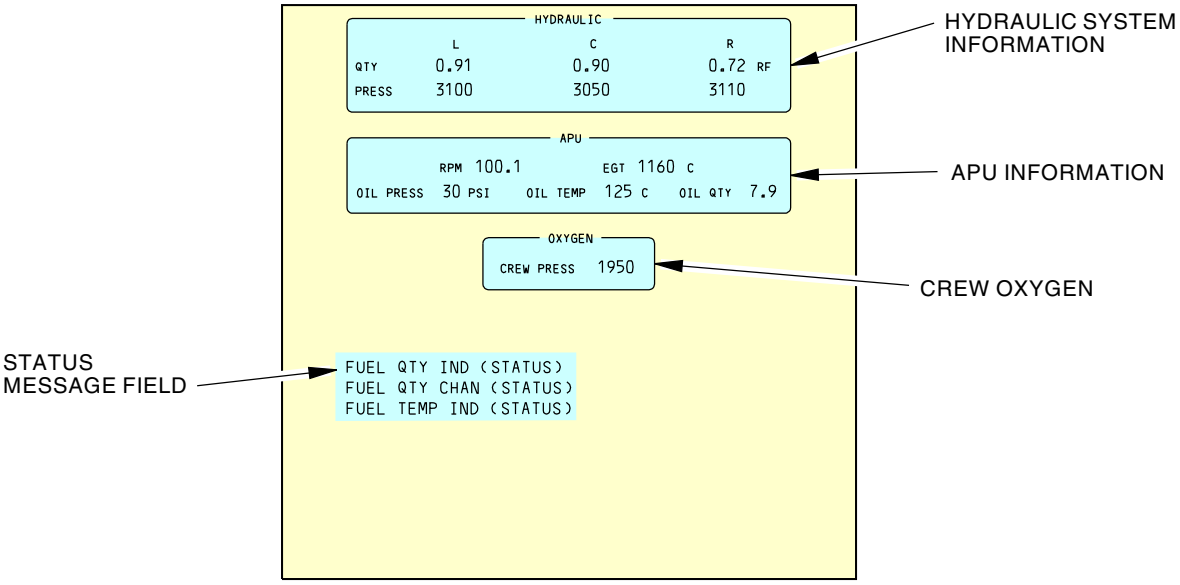
MULTI-FUNCTION DISPLAY (MFD)

A

E32709 S0006415561_V3

Fuel Quantity Indicating System Test
Figure 501/28-41-00-990-801 (Sheet 1 of 2)

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LOWER CENTER DISPLAY

B

E48723 S0006415562_V2

Fuel Quantity Indicating System Test
Figure 501/28-41-00-990-801 (Sheet 2 of 2)

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TASK 28-41-00-710-802

3. Fuel Quantity Processor Unit (FQPU) - Operational Check

(Figure 501)

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This task contains:

(a) A check for fuel related EICAS status messages.

(b) A check of the fuel quantity indication.

(c) A check for fuel quantity processor unit (FQPU) related maintenance messages.

B. References

Reference	Title
45-10-00-740-818	How to Find Active or Latched Maintenance Messages in One ATA System (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right

D. Procedure

SUBTASK 28-41-00-210-003

(1) Make sure that these EICAS STATUS messages do not show on the bottom display: FUEL QTY CHAN, FUEL QTY IND, FUEL TEMP IND (Figure 501).

SUBTASK 28-41-00-210-004

(2) Make sure that the fuel quantity (Total, Left, Center and Right) shows on the EICAS display (Figure 501).

SUBTASK 28-41-00-860-005

(3) To see the Existing Faults for ATA 28 Fuel on the maintenance access terminal (MAT), do this task: How to Find Active or Latched Maintenance Messages in One ATA System, TASK 45-10-00-740-818.

(a) Make sure that these maintenance messages do not show:

NOTE: The FQPU is on the E5-3 Shelf at the forward cargo door.

MAINTENANCE MESSAGES ON THE MAT

24-19404
24-19604
28-18801
28-18840
28-19405
28-19605
28-20001
28-20002
28-20005

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MAINTENANCE MESSAGES ON THE MAT (Continued)

28-20006
28-20049 thru 28-20052
28-20100
28-20101
28-29401
28-29601

(b) To correct these or other fuel related maintenance messages refer to the Fault Code Index.

——— END OF TASK ———

TASK 28-41-00-400-801

4. Fuel Quantity Processor Unit (FQPU) - Operational Test

A. General

(1) The installation test/configuration check makes sure that the FQPU has correct software.

NOTE: The S345W001-001, -002 FQPU has embedded software and is non-loadable.

(2) The configuration check will show a failure if the operational program software (OPS) is not installed.

(3) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

B. References

Reference	Title
24-22-00-860-805	Supply Electrical Power (P/B 201)
28-41-01-400-802	FQPU Software Installation (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Location Zones

Zone	Area
212	Flight Compartment, Right

D. Installation Test/Configuration Check

SUBTASK 28-41-00-860-006

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

E. Configuration Check

SUBTASK 28-41-00-750-001

(1) Use a maintenance access terminal (MAT) to do a software configuration check of the FQPU:

NOTE: Make sure you know the correct software part number for the FQPU when you look at the software part number on the display. For the FQPU to be an approved installation, the correct software part number must be installed.

(a) Make these selections on the MAT:

1) ONBOARD MAINTENANCE

2) LINE MAINTENANCE

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3) SYSTEM CONFIGURATION

4) 28 Fuel Quantity Indicating System

5) CONTINUE

(b) Find FQPU on the display and make sure that the software part number is correct.

NOTE: The configuration check will show a failure if the operational program software (OPS) is not installed.

(c) Select GO BACK to remove the configuration display.

SUBTASK 28-41-00-750-002

(2) If the part number is incorrect, do this task: FQPU Software Installation, TASK 28-41-01-400-802.

——— END OF TASK ———

TASK 28-41-00-720-801

5. Comparison Check - Fuel Quantity Indicating System with the Fuel Measuring Sticks

A. General

(1) This task compares the fuel quantity given by the FQIS system with the fuel quantity given by the fuel measuring sticks.

(2) To do this comparison check the airplane must be at nominal ground attitude (0.7° ±2.0° nose down; 0.0° ±2.0° wing roll).

(3) FQIS Accuracy:

(a) The accuracy of FQIS applies when the airplane is at nominal ground attitude. The accuracy values are on a per tank basis, and for total airplane fuel volume.

1) For a fully functional FQIS, free from any faults, the normal accuracy is ±1.0% for a full tank. The accuracy improves linearly to ±0.5% for an empty tank, with no positive error when completely empty.

2) For an FQIS system that has faults, the degraded accuracy is up to 4 times less accurate than the fault-free accuracy. The level of accuracy is dependent on the nature of the fault(s) in the system. Therefore, the degraded accuracy tolerance is ±4.0% for a full tank. The degraded accuracy improves linearly to ±2.0% for an empty tank, with no positive error when completely empty.

(4) Fuel Measuring Stick Accuracy:

(a) When the airplane is at nominal attitude (0.7° ±0.25° nose down; 0.0° ±0.25° wing roll), the estimated fuel stick accuracy is ±2.0% of full tank capacity. The estimated accuracy of reading each individual fuel stick is +/- 1.0 unit.

NOTE: The accuracy of 2% of full tank capacity only applies when the airplane attitude is at the nominal attitude (pitch = -0.7° ±0.25°; roll = 0.0° ±0.25°). The measurement uncertainty is expected to increase the farther from nominal attitudes the airplane is.

B. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
08-21-00-580-801	Make the Airplane Level (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)

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C. Location Zones

Zone	Area
211	Flight Compartment, Left
212	Flight Compartment, Right
500	Left Wing
521	Leading Edge to Front Spar - Outboard of Nacelle Strut - Left Wing
600	Right Wing
621	Leading Edge to Front Spar - Outboard of Nacelle Strut - Right Wing

D. Access Panels

Number	Name/Location
521DB	Refueling Station Door

E. Comparison Check of the Fuel Quantity Indicating System (FQIS) with the Fuel Measuring Sticks

SUBTASK 28-41-00-860-003

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-41-00-580-001

(2) Make sure the airplane attitude is within these limits:

(a) -2.7° to +1.3° pitch

(b) -2.0° to +2.0° roll.

(c) If the airplane is not within the above limits, do this task: Make the Airplane Level, TASK 08-21-00-580-801.

SUBTASK 28-41-00-710-001

(3) Do this task: Fuel Quantity Indicating System (FQIS) TANK UNITS and DENSITOMETERS - Operational Check, TASK 28-41-00-710-801.

NOTE: If the FQIS has faults, you can still do the comparison check, but the accuracy of the FQIS can be degraded (up to 4 times less accurate than the fault-free accuracy).

SUBTASK 28-41-00-010-002

(4) Open this access panel installed on the left wing:

(TASK 06-44-00-800-802)

Number	Name/Location
521DB	Refueling Station Door

SUBTASK 28-41-00-220-001

(5) Make sure the difference between the calculated fuel quantity (with the fuel measuring sticks) for each tank and the fuel quantity shown on the load select indicators on the P28 panel and the fuel quantity indicator on the P5 panel is in the subsequent range:

Table 501/28-41-00-993-805

Fuel Tank	Maximum Fuel Quantity Difference Between the FQIS and Fuel Measuring Stick Values
No. 1 Main Tank	2088 lb (947 kg)
No. 2 Main Tank	2088 lb (947 kg)
Center Tank	5535 lb (2511 kg)

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SUBTASK 28-41-00-410-004

(6) Close this access panel:

(TASK 06-44-00-800-802)

Number	Name/Location
521DB	Refueling Station Door

END OF TASK

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TASK 28-41-01-400-802

1. FQPU Software Installation

A. General

(1) This procedure tells you how to install software in the Fuel Quantity Processor Unit (FQPU).

(a) The name of the software part loaded into a FQPU follows:

FQPU OPS

REF: AIPC 46-00-00-28B

Using the name, the specific software part number for an aircraft can be identified in the IPC.

(2) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

(3) If you do not know if the FQPU needs new software, you can first do the software configuration check. It will save time if you only install software when the software is missing or the part number is incorrect. You can find the software configuration check in this task: FQPU Software Installation, TASK 28-41-01-400-802.

(4) You can use the GSE-Laptop, maintenance device, SPL-5704, as an alternative to the PMAT in this task.

NOTE: The GSE-Laptop and the PMAT are equivalent for all of the PMAT functions that you will use in this task.

(5) You can install the software from disks, the MAT hard drive or the PMAT hard drive (if available). It is recommended that you install software from the MAT or PMAT hard drive. To install new software on the MAT or PMAT hard drive, do this task: How to Add Software to the Hard Drive, TASK 45-10-00-860-812.

NOTE: When new software is installed in the FQPU, the load process first erases the old software and then installs the new software. If you install software directly to the FQPU from a faulty disk, the load process may erase the old software and then fail, so that no software is installed. If you install a faulty disk to the MAT or PMAT hard drive, the load may fail, but you will not erase the software from the FQPU.

(a) It is recommended that you remove old software part numbers from the MAT or PMAT hard drive after new software is installed. To remove software from the hard drive, do this task: How to Remove Software from the Hard Drive, TASK 45-10-00-860-813.

(6) The airplane must be on the ground with the engines off before you can install software.

(7) To read about the conditions and times necessary for software installation, do this task: On-Airplane Software Installation, TASK 20-15-11-400-801.

B. References

Reference	Title
20-15-11-400-801	On-Airplane Software Installation (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
32-09-00-860-801	Air/Ground Mode Simulation (P/B 201)
34-21-00-730-801	Air Data Inertial Reference System - System Test (P/B 501)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

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(Continued)

Reference	Title
45-10-00-760-801	How to Use Input Monitoring (P/B 201)
45-10-00-860-812	How to Add Software to the Hard Drive (P/B 201)
45-10-00-860-813	How to Remove Software from the Hard Drive (P/B 201)
AIPC 46-00-00-28B	Aircraft Illustrated Parts Catalog

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-5704	Device - Maintenance Part #: G45004-1 Supplier: 81205 Part #: G45004-3 Supplier: 81205 Opt Part #: G45002-20 Supplier: 81205 Opt Part #: G45002-25 Supplier: 81205 Opt Part #: G45002-29 Supplier: 81205 Opt Part #: J45001-1 Supplier: 81205 Opt Part #: J45003-1 Supplier: 81205

D. Location Zones

Zone	Area
212	Flight Compartment, Right

E. Access Panels

Number	Name/Location
521DB	Refueling Station Door

F. Prepare for Procedure

SUBTASK 28-41-01-730-001

(1) Do this task: Air Data Inertial Reference System - System Test, TASK 34-21-00-730-801

NOTE: If the ADIRU is not fully functional, the FQPU software load may be prohibited.

SUBTASK 28-41-01-860-006

(2) Make sure the airplane is in ground mode (TASK 32-09-00-860-801).

SUBTASK 28-41-01-212-001

(3) Do one of these steps:

(a) Make sure that this access panel is closed:

Number	Name/Location
521DB	Refueling Station Door

(b) Use the maintenance access terminal (MAT) to monitor the refueling station door, 521DB(TASK 45-10-00-760-801).

NOTE: The format for the signal specification follows:

"X"/629/"Bus"/"Label"/"CID"/"Word"-"Word", where

"X" = L or R,

"Bus" = the ARINC 629 Flight Control Bus,

"Label" = the ARINC 629 label,

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"CID" = Channel Identification label, and

"Word" = the ARINC 629 word.

1) Make these selections on the MAT:
   a) ONBOARD MAINTENANCE
   b) OTHER FUNCTIONS
   c) INPUT MONITORING
   d) GENERAL INPUT
   e) CONTINUE
2) Put the cursor in the first direct entry field.
3) Use the keyboard to type the signal specification,
   L/629/SYS L/F08/4/3-4.
4) On the MAT, select RUN to start the input monitoring.
5) On the MAT, make sure bit 0 of label F08, CID 4, word 3, is set to 1.

   NOTE: Bit 0 of word 3 set to 1 indicates the refueling station door is closed.

G. Procedure

SUBTASK 28-41-01-860-005

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

NOTE: Airplane data load is susceptible to power transients more than 500ms. The power transients can cause extended delays in the loading process. It is recommend that two independent power sources are available to the airplane while data load is in progress. It is not sufficient to have Primary External Power and Secondary External Power driven by the same power source.

SUBTASK 28-41-01-420-001

(2) Use a maintenance access terminal (MAT) to install software in the FQPU:

NOTE: Make sure you know the correct software part number for the FQPU before you select the software part number on the display. For the FQPU to be an approved installation, the correct software must be installed.

NOTE: Do not open the refueling station door during a software load. The FQPU software load may be inhibited.

(a) If the software is on a disk, put the correct disk in the disk drive.

(b) Make these selections on the MAT:
   1) ONBOARD MAINTENANCE
   2) EXTENDED MAINTENANCE
   3) DATA LOAD

(c) Make these selections to select the component that will receive the software:
   1) SELECT DESTINATION
   2) 28 Fuel Quantity Indicating System
   3) Fuel Quantity Processor Unit (FQPU)
   4) CONTINUE

(d) Make these selections to select the source of the software:
   1) SELECT SOURCE

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2) Select the source of the software (if Disk Drive is the only selection, it is automatically selected).

3) Select the correct software part number from the display.

4) CONTINUE

(e) Select START to start the software installation.

NOTE: The FQPU software is loaded in two stages. First, the FQPU software is loaded into one I/O card. Second, the FQPU software is distributed from the loaded I/O card to the other cards in the FQPU. During the second stage, which lasts 6-7 minutes, the MAT will show "LOAD IN PROGRESS WAIT..." and the status bar will be at 100%. When the FQPU software installation is complete, a "WAIT FOR DESTINATION LRU TO START" dialogue box will appear.

(f) When the software installation is completed, make sure the correct software part number shows on the display.

(g) Select CONTINUE to remove the configuration display.

——— END OF TASK ———

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FUEL QUANTITY PROCESSOR UNIT (FQPU) - REMOVAL/INSTALLATION

1. General

A. The fuel quantity processor unit (FQPU) collects signals from all of fuel quantity indicating system (FQIS) components, calculates the fuel quantity in each fuel tank and transmits this information to the EICAS display. The FQIS processor is installed on the E5-3 rack at the forward cargo door.

B. This procedure contains two tasks. The first task removes the FQPU. The second task installs the FQPU.

TASK 28-41-01-000-801

2. Fuel Quantity Processor Unit (FQPU) - Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
06-46-00-800-801	Finding an Access Door or Panel in the Cargo Compartment Doors or Passenger Compartment Doors (P/B 201)
20-10-01-000-801	E/E Box Removal (P/B 401)
20-41-01-000-803	ESDS Handling for Metal Encased Unit Removal (P/B 201)

B. Location Zones

Zone	Area
121	Forward Cargo Compartment, Left

C. Procedure

SUBTASK 28-41-01-860-001

(1) Open these circuit breakers and install safety tags:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
D	7	C28603	RFLNG CTRL GND

Right Power Management Panel, P210

Row	Col	Number	Name
L	1	C28625	FUEL QTY 1

Standby Power Management Panel, P310

Row	Col	Number	Name
G	10	C28624	FUEL QTY 2
J	8	C28600	RFLNG CTRL
J	11	C28623	RFLNG QTY

SUBTASK 28-41-01-010-001

(2) Open the forward cargo door (TASK 06-46-00-800-801).

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SUBTASK 28-41-01-910-001

CAUTION

DO NOT REMOVE THE FQPU UNLESS A HARD FAULT CODE SHOWS THAT IT IS FAULTY. FREQUENT REMOVALS AND INSTALLATIONS OF THE FQPU CAN ACCIDENTALLY DAMAGE THE CONNECTOR PINS AND CAUSE NUISANCE FAULT CODES AND NUISANCE STATUS CODES.

CAUTION

DO NOT TOUCH THE FQPU BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE FQIS PROCESSOR.

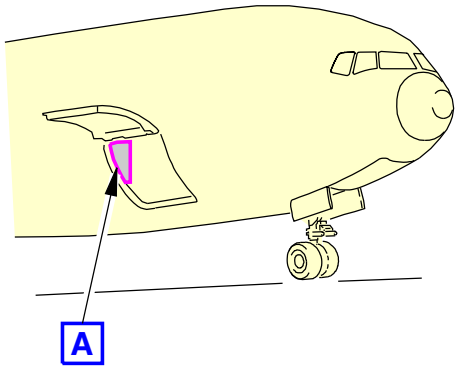
(3) Do the procedure for devices that are sensitive to electrostatic discharge (ESDS Handling for Metal Encased Unit Removal, TASK 20-41-01-000-803).

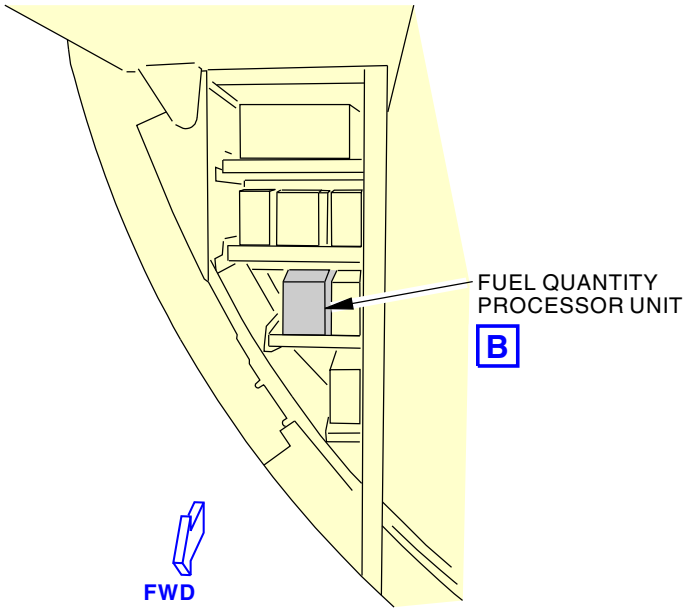
SUBTASK 28-41-01-020-001

(4) Remove the FQPU [1] (M28002) from the E5-3 rack (E/E Box Removal, TASK 20-10-01-000-801).

END OF TASK

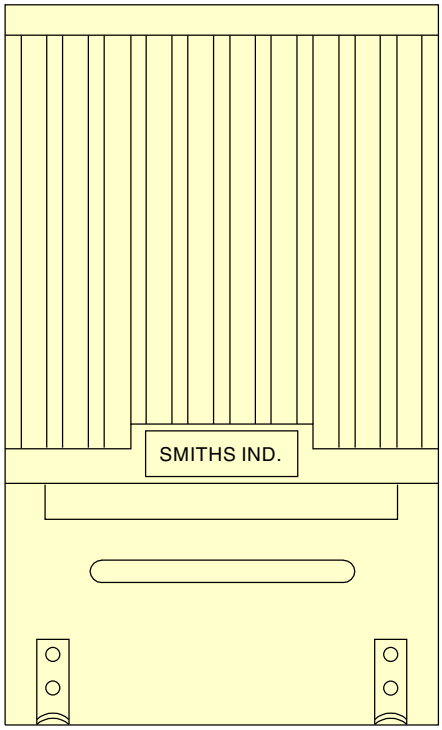
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ELECTRONIC EQUIPMENT RACK, E5

A



[1] FUEL QUANTITY PROCESSOR

B

E23172 S0006415574_V2

Fuel Quantity Processor Unit Installation
Figure 401/28-41-01-990-801

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TASK 28-41-01-400-801

3. Fuel Quantity Processor Unit (FQPU) - Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) The configuration check makes sure that the FQPU has correct software.

(2) The configuration check will show a failure if the operational program software (OPS) is not installed.

NOTE: The S345W001-001, -002 FQPU has embedded software and is non-loadable.

(3) A maintenance access terminal is necessary for this procedure. For instructions on how to use a maintenance access terminal, do this task: How to Use the Central Maintenance Computing System, TASK 45-10-00-740-808.

B. References

Reference	Title
06-46-00-800-801	Finding an Access Door or Panel in the Cargo Compartment Doors or Passenger Compartment Doors (P/B 201)
20-10-01-400-801	E/E Box Installation (P/B 401)
20-41-01-000-803	ESDS Handling for Metal Encased Unit Removal (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
28-41-00-710-801	Fuel Quantity Indicating System (FQIS) TANK UNITS and DENSITOMETERS - Operational Check (P/B 501)
28-41-00-710-802	Fuel Quantity Processor Unit (FQPU) - Operational Check (P/B 501)
28-41-01-400-802	FQPU Software Installation (P/B 201)
45-10-00-740-808	How to Use the Central Maintenance Computing System (P/B 201)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	FQPU	25-17-05-01-040	ARO ALL
		28-41-01-01-005	ARO ALL

D. Location Zones

Zone	Area
121	Forward Cargo Compartment, Left

E. Procedure

SUBTASK 28-41-01-860-004

(1) Make sure that these circuit breakers are open and have safety tags:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
D	7	C28603	RFLNG CTRL GND

Right Power Management Panel, P210

Row	Col	Number	Name
L	1	C28625	FUEL QTY 1

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Standby Power Management Panel, P310

Row	Col	Number	Name
G	10	C28624	FUEL QTY 2
J	8	C28600	RFLNG CTRL
J	11	C28623	RFLNG QTY

SUBTASK 28-41-01-210-001

(2) Make sure the connector pins for the FQPU [1], in the E5-3 rack, are not damaged.

SUBTASK 28-41-01-910-002

CAUTION

DO NOT DAMAGE THE CONNECTOR PINS WHEN YOU INSTALL THE FQPU. DAMAGE TO THE CONNECTOR PINS CAN CAUSE NUISANCE FAULT CODES AND NUISANCE STATUS CODES.

CAUTION

DO NOT TOUCH THE FQPU BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE FQPU.

(3) Do the procedure for devices that are sensitive to electrostatic discharge (ESDS Handling for Metal Encased Unit Removal, TASK 20-41-01-000-803).

SUBTASK 28-41-01-410-001

(4) Install the FQPU [1] (M28002) in the E5-3 rack, at the forward cargo door (E/E Box Installation, TASK 20-10-01-400-801).

SUBTASK 28-41-01-860-002

(5) Remove the safety tags and close these circuit breakers:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
D	7	C28603	RFLNG CTRL GND

Right Power Management Panel, P210

Row	Col	Number	Name
L	1	C28625	FUEL QTY 1

Standby Power Management Panel, P310

Row	Col	Number	Name
G	10	C28624	FUEL QTY 2
J	8	C28600	RFLNG CTRL
J	11	C28623	RFLNG QTY

SUBTASK 28-41-01-860-003

(6) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

F. Installation Test

SUBTASK 28-41-01-740-001

(1) Do this task: Fuel Quantity Processor Unit (FQPU) - Operational Check, TASK 28-41-00-710-802.

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SUBTASK 28-41-01-740-002

(2) Do this task: Fuel Quantity Indicating System (FQIS) TANK UNITS and DENSITOMETERS - Operational Check, TASK 28-41-00-710-801.

G. Configuration Check

SUBTASK 28-41-01-750-001

(1) Use a maintenance access terminal (MAT) to do a software configuration check of the FQPU:

NOTE: Make sure you know the correct software part number for the FQPU when you look at the software part number on the display. For the FQPU to be an approved installation, the correct software part number must be installed.

(a) Make these selections on the MAT:

1) ONBOARD MAINTENANCE
2) LINE MAINTENANCE
3) SYSTEM CONFIGURATION
4) 28 Fuel Quantity Indicating System
5) CONTINUE

(b) Find FQPU on the display and make sure that the software part number is correct.

NOTE: The configuration check will show a failure if the operational program software (OPS) is not installed.

(c) Select GO BACK to remove the configuration display.

SUBTASK 28-41-01-750-002

(2) If the part number is incorrect, do this task: FQPU Software Installation, TASK 28-41-01-400-802.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 28-41-01-410-002

(1) Close the forward cargo door (Finding an Access Door or Panel in the Cargo Compartment Doors or Passenger Compartment Doors, TASK 06-46-00-800-801).

——— END OF TASK ———

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TANK UNIT - REMOVAL/INSTALLATION

1. General

A. Tank units are installed in each main fuel tank and in the center fuel tank (Figure 401). All tank units are the same except for length. Tank unit length depends on the fuel tank depth at each location.

B. This procedure has these tasks:

(1) Tank unit removal

(2) Tank unit installation

TASK 28-41-02-000-801

2. Tank Unit - Removal

(Figure 401)

A. References

Reference	Title
28-00-00-200-801	Inspection of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-00-00-960-801	Replacement of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)
28-41-05-210-801	FQIS Wiring and Component Visual Inspection (P/B 601)

B. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

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C. Procedure

SUBTASK 28-41-02-860-001

(1) Open these circuit breakers and install safety tags:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
D	7	C28603	RFLNG CTRL GND

Right Power Management Panel, P210

Row	Col	Number	Name
L	1	C28625	FUEL QTY 1

Standby Power Management Panel, P310

Row	Col	Number	Name
G	10	C28624	FUEL QTY 2
J	8	C28600	RFLNG CTRL
J	11	C28623	RFLNG QTY

SUBTASK 28-41-02-650-001

(2) To defuel the applicable fuel tanks, do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-41-02-650-002

WARNING OBEY THE FUEL TANK PURGING AND ENTRY PRECAUTIONS. FAILURE TO OBEY THE FUEL TANK PURGING AND ENTRY PRECAUTIONS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-41-02-010-001

(4) Remove the applicable access door to get access to the applicable tank unit [1] ((Figure 401) for the applicable access door).

(a) To remove the access doors in the main fuel tanks, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) To remove the access doors in the center fuel tank, do this task: Center Tank Access Door - Removal, TASK 28-11-02-000-801.

SUBTASK 28-41-02-940-001

(5) Go into the applicable fuel tank.

SUBTASK 28-41-02-020-006

(6) Push the tab on the faston connectors [2] to disconnect from the tank unit [1].

(a) Pull the rubber grommet [3] from the tank unit [1] to disconnect the wiring.

SUBTASK 28-41-02-020-007

(7) To disconnect the bonding jumper [11], remove the screw [4], washer [5] and nut [10].

SUBTASK 28-41-02-020-008

(8) Remove the two screws [13] and two washers [5] that attach the tank unit [1] to the bottom structure bracket.

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SUBTASK 28-41-02-020-009

(9) Remove the screw [4] and washer [5] that attach the clamp [7] and sleeve [6] to the structure bracket (top, middle).

NOTE: Only the longer tank units have a middle clamp. The middle clamp is the same configuration as the top clamp.

SUBTASK 28-41-02-020-001

(10) Remove the tank unit [1] from the fuel tank.

SUBTASK 28-41-02-210-002

(11) Do a check of the bonding jumper [11]; do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

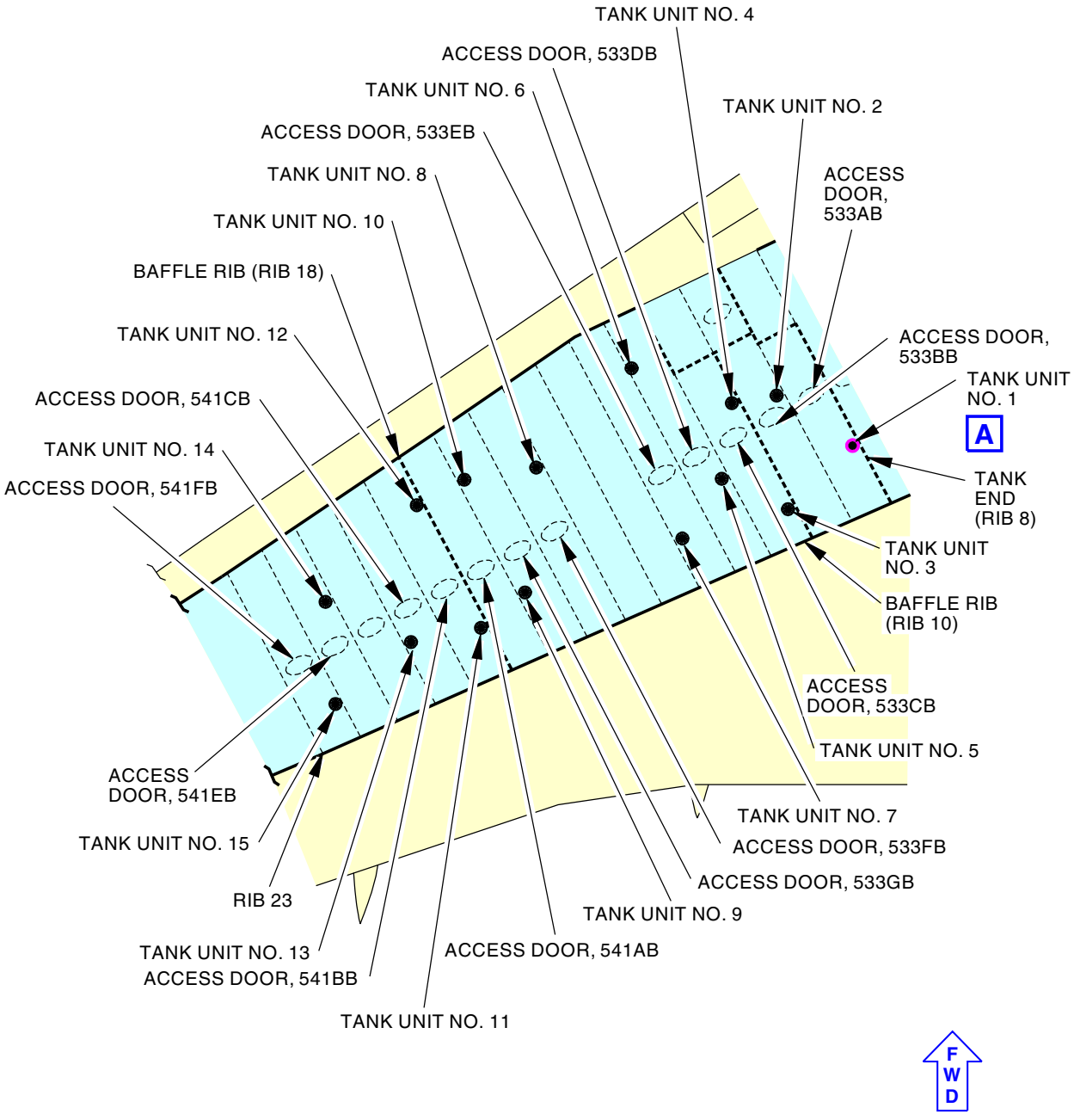
(a) Replace the bonding jumper [11] as necessary. To replace the bonding jumper [11], do this task: Replacement of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-960-801.

SUBTASK 28-41-02-210-003

(12) Do a check of the Fuel Quantity Indicating System (FQIS) wiring and component; do this task : FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

——— END OF TASK ———

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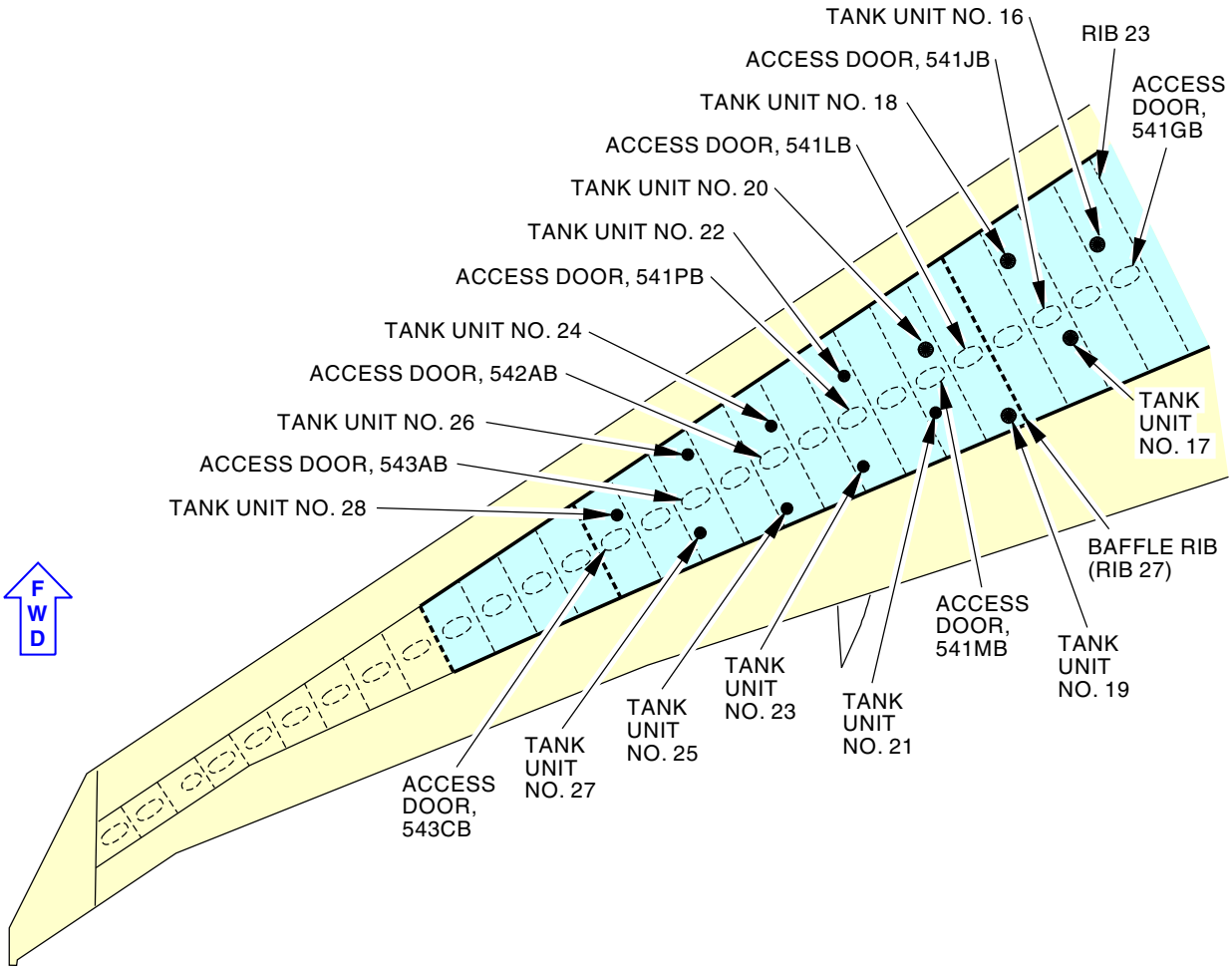


LEFT MAIN TANK
(TOP VIEW)

M45267 S0006415580_V3

Tank Unit Installation
Figure 401/28-41-02-990-801 (Sheet 1 of 7)

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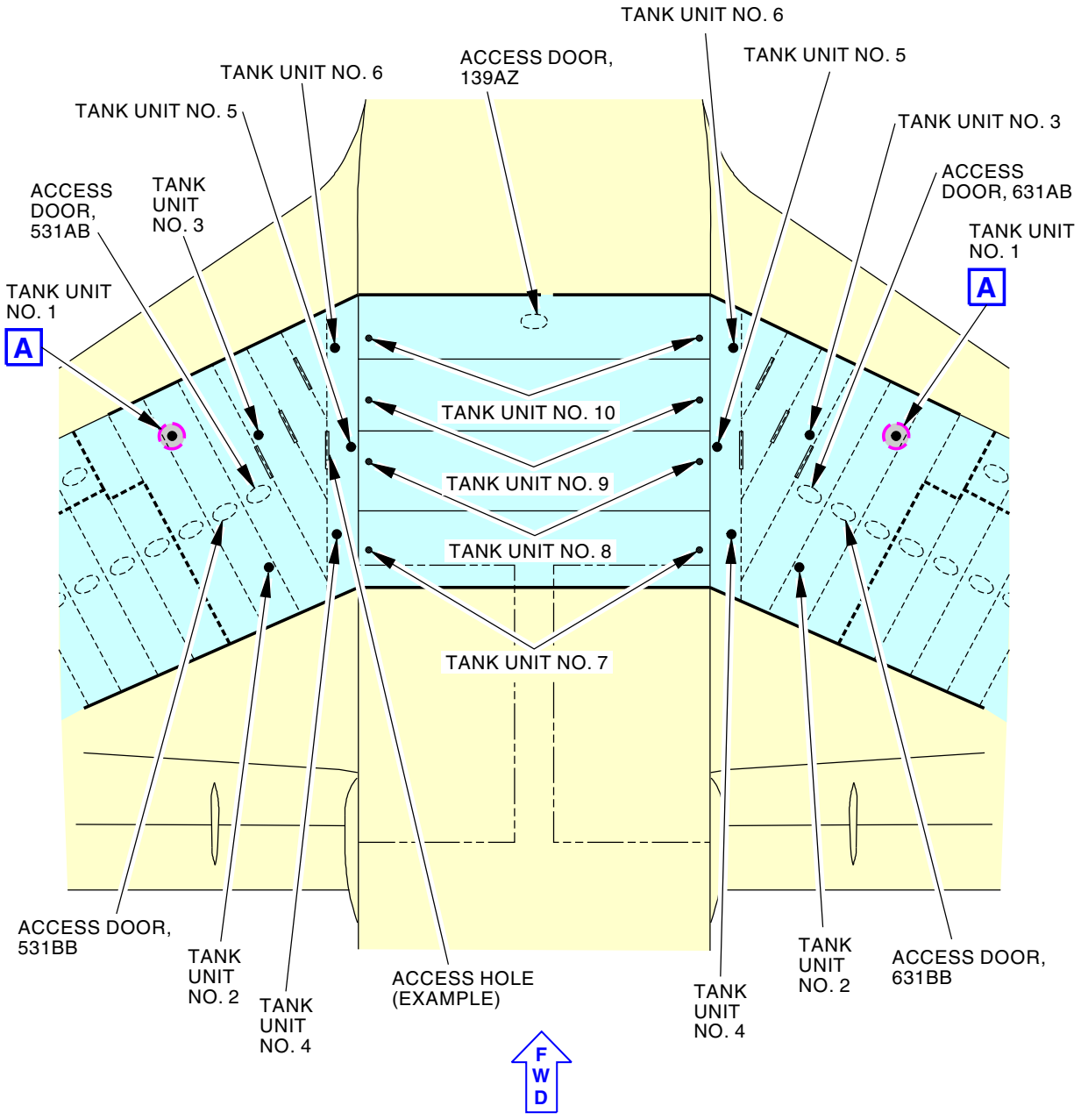


LEFT MAIN TANK
(TOP VIEW)

M45313 S0006415588_V3

Tank Unit Installation
Figure 401/28-41-02-990-801 (Sheet 2 of 7)

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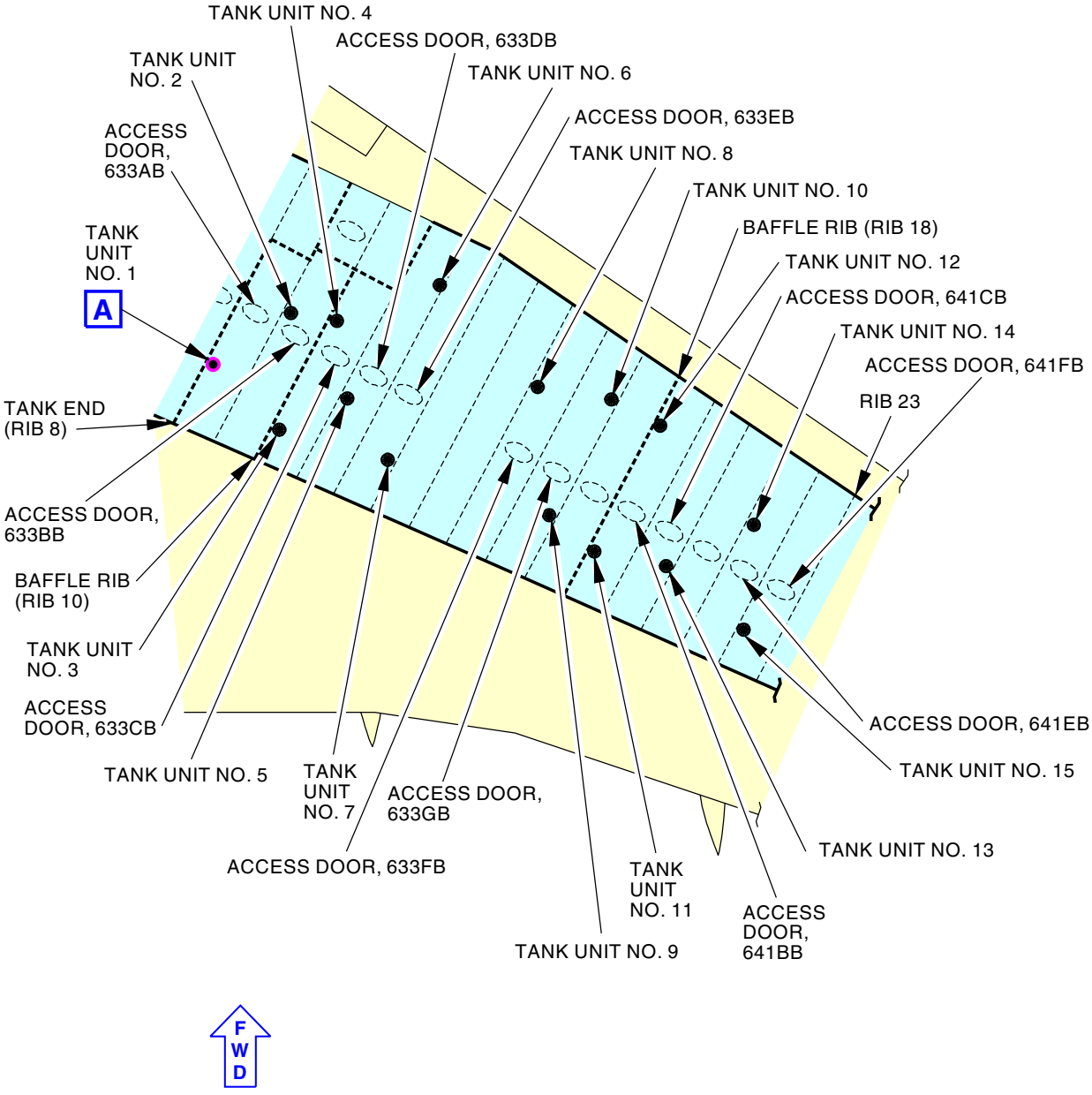


CENTER TANK (TOP VIEW)

M45331 S0006415593_V3

Tank Unit Installation
Figure 401/28-41-02-990-801 (Sheet 3 of 7)

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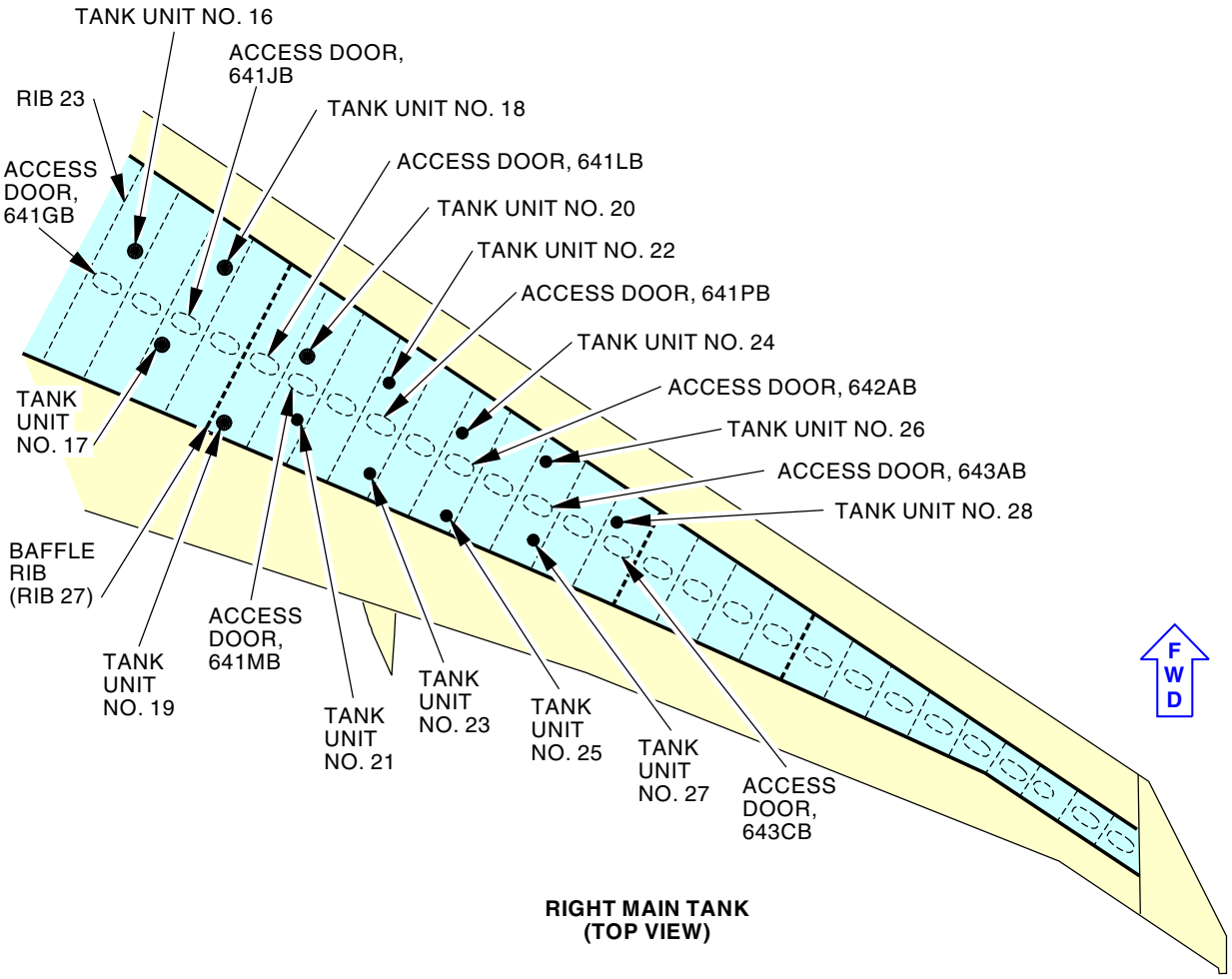


RIGHT MAIN TANK
(TOP VIEW)

M45341 S0006415595_V3

Tank Unit Installation
Figure 401/28-41-02-990-801 (Sheet 4 of 7)

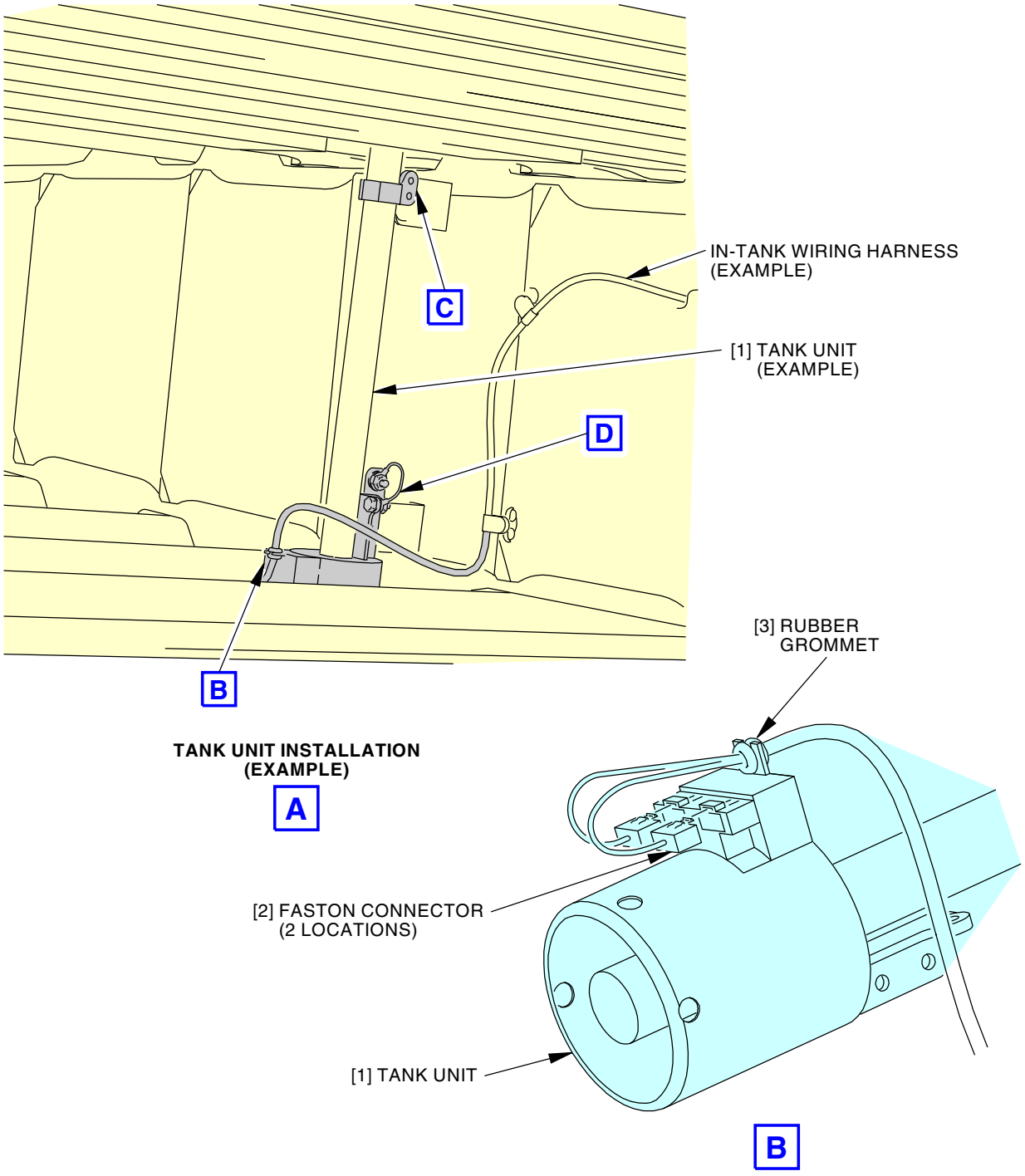
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M45403 S0006415597_V3

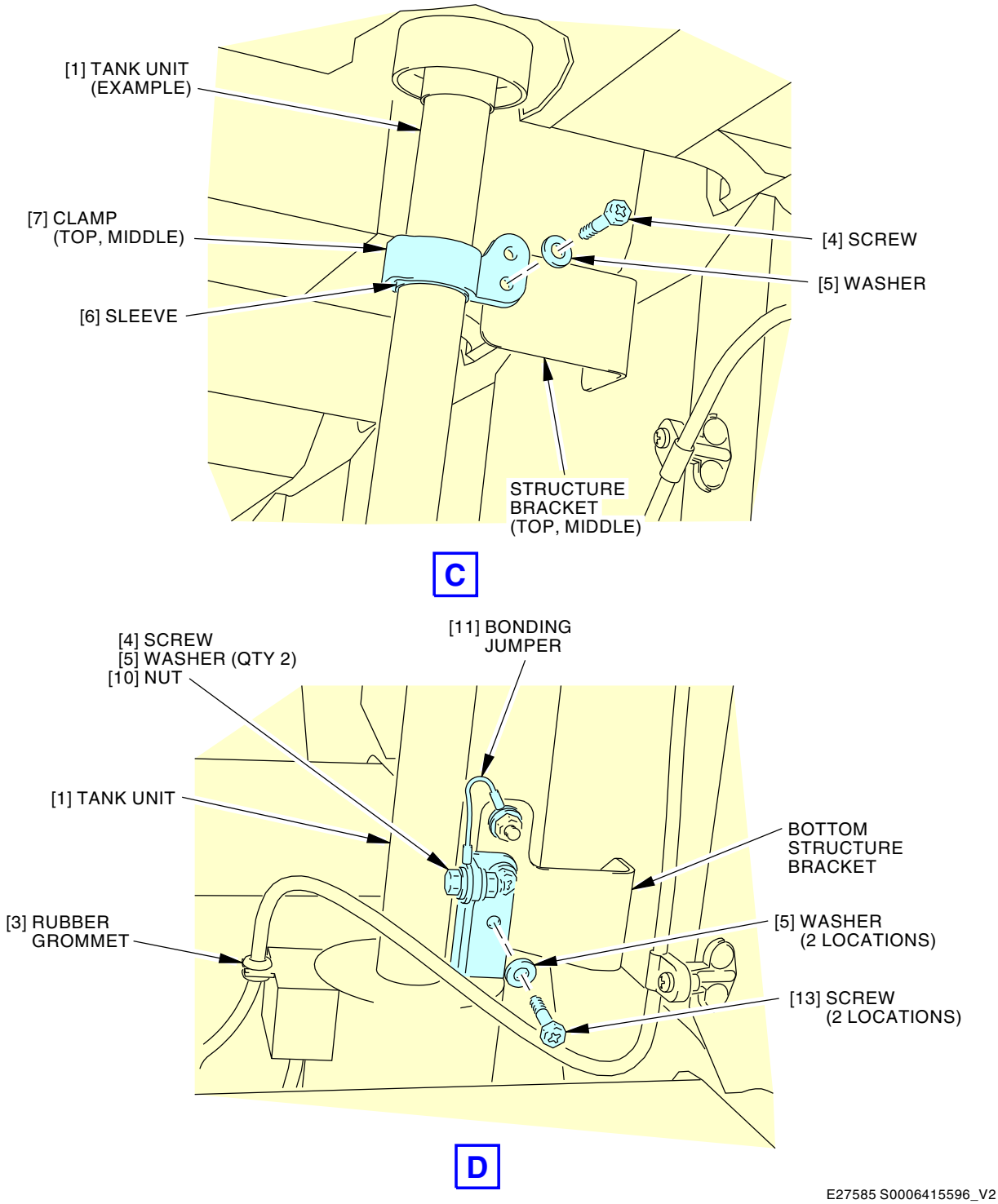
Tank Unit Installation
Figure 401/28-41-02-990-801 (Sheet 5 of 7)

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Tank Unit Installation
Figure 401/28-41-02-990-801 (Sheet 6 of 7)

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Tank Unit Installation
Figure 401/28-41-02-990-801 (Sheet 7 of 7)

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TASK 28-41-02-400-801

3. Tank Unit - Installation

(Figure 401)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
28-00-00-960-801	Replacement of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)
28-41-00-710-801	Fuel Quantity Indicating System (FQIS) TANK UNITS and DENSITOMETERS - Operational Check (P/B 501)
28-41-00-710-802	Fuel Quantity Processor Unit (FQPU) - Operational Check (P/B 501)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Tank unit	28-41-02-01-070	ARO ALL
		28-41-02-01-085	ARO ALL
		28-41-02-01-100	ARO ALL
		28-41-02-01-115	ARO ALL
		28-41-02-01-130	ARO ALL
		28-41-02-01-135	ARO ALL
		28-41-02-01-140	ARO ALL
		28-41-02-01-145	ARO ALL
		28-41-02-01-150	ARO ALL
		28-41-02-01-155	ARO ALL
		28-41-02-01-160	ARO ALL
		28-41-02-01-165	ARO ALL
		28-41-02-01-170	ARO ALL

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(Continued)

AMM Item	Description	AIPC Reference	AIPC Effectivity
1 (cont.)		28-41-02-01-175	ARO ALL
		28-41-02-01-180	ARO ALL
		28-41-02-01-195	ARO ALL
		28-41-02-02-025	ARO ALL
		28-41-02-02-030	ARO ALL
		28-41-02-02-035	ARO ALL
		28-41-02-02-040	ARO ALL
		28-41-02-02-045	ARO ALL
		28-41-02-02-050	ARO ALL
		28-41-02-05-060	ARO ALL
		28-41-02-05-065	ARO ALL
		28-41-02-05-070	ARO ALL
		28-41-02-05-075	ARO ALL
		28-41-02-05-080	ARO ALL
		28-41-02-05-085	ARO ALL

D. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

E. Procedure

SUBTASK 28-41-02-860-006

(1) Make sure that these circuit breakers are open and have safety tags:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
D	7	C28603	RFLNG CTRL GND

Right Power Management Panel, P210

Row	Col	Number	Name
L	1	C28625	FUEL QTY 1

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Standby Power Management Panel, P310

Row	Col	Number	Name
G	10	C28624	FUEL QTY 2
J	8	C28600	RFLNG CTRL
J	11	C28623	RFLNG QTY

SUBTASK 28-41-02-650-003

WARNING OBEY THE FUEL TANK PURGING AND ENTRY PRECAUTIONS. FAILURE TO OBEY THE FUEL TANK PURGING AND ENTRY PRECAUTIONS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-41-02-940-002

(3) Go into the fuel tank through the applicable access door (Figure 401).

SUBTASK 28-41-02-960-001

(4) Replace the bonding jumpers as necessary. To replace the bonding jumpers, do this task: Replacement of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-960-801.

SUBTASK 28-41-02-420-001

(5) Put the tank unit [1] in its position and install the two screw [13] and washer [5] that attach the tank unit [1] to the bottom structure bracket.

(a) TANK UNIT-EQUIPMENT NUMBERS in the LEFT MAIN FUEL TANK

1) #1-M28074, #2-M28075, #3-M28076, #4-M28077, #5-M28078, #6-M28079, #7-M28080, #8-M28081, #9-M28082, #10-M28083, #11-M28084, #12-M28085, #13-M28086, #14-M28087, #15-M28088, #16-M28089, #17-M28090, #18-M28091, #19-M28092, #20-M28093, #21-M28110, #22-M28111, #23-M28112, #24–M28113, #25-M28114, #26–M28115, #27-M28116, #28–M28117

(b) TANK UNIT-EQUIPMENT NUMBERS in the RIGHT MAIN FUEL TANK

1) #1-M28046, #2-M28047, #3-M28048, #4-M28049, #5-M28050, #6-M28051, #7-M28052, #8-M28053, #9-M28054, #10-M28055, #11-M28056, #12-M28057, #13-M28058, #14-M28059, #15-M28060, #16-M28061, #17-M28062, #18-M28063, #19-M28064, #20-M28065, #21-M28066, #22–M28067, #23-M28068, #24-M28069, #25-M28070, #26–M28071, #27-M28072, #28-M18073

(c) TANK UNIT-EQUIPMENT NUMBERS in the LEFT CENTER FUEL CHEEK TANK

1) #1-M28147, #2-M28148, #3-M28149, #4-M28150, #5-M28151, #6-M28152

(d) TANK UNIT-EQUIPMENT NUMBERS in the RIGHT CENTER FUEL CHEEK TANK

1) #1-M28247, #2-M28248, #3-M28249, #4-M28250, #5-M28251, #6-M28252

(e) TANK UNIT-EQUIPMENT NUMBERS in the WING CENTER FUEL SECTION

1) #7-M28153 and M28253, #8-M28154 and M28254, #9-M28155 and M28255, #10-M28156 and M28256.

SUBTASK 28-41-02-200-001

(6) Make sure that the lower canister of the probe is a minimum of 0.05 inches (1.27 millimeters) from adjacent structure.

SUBTASK 28-41-02-420-009

(7) Tighten the two screw [13] to 25-35 pound-inches (2.9-3.9 newton-meters).

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SUBTASK 28-41-02-420-002

(8) Align the clamp [7] and sleeve [6] (top, middle) to install the screw [4] and washer [5] that attach the tank unit [1] to the structure bracket.

NOTE: Only the longer tank units have a middle clamp. The middle clamp is the same configuration as the top clamp.

NOTE: Install the screw [4] through the center hole of each clamp [7] when it is possible. Use the off center hole only when interference with a target rivet on the tank unit prevents use of the center hole in the clamp [7]. The clamp [7] can be removed and installed upside down to change the location of the off center hole to prevent interferences.

SUBTASK 28-41-02-200-002

(9) Make sure that the top cap of the probe is a minimum of 0.15 inches (3.81 millimeters) from adjacent structure.

SUBTASK 28-41-02-420-010

(10) Tighten the screw [4] to 25-35 pound-inches (2.9-3.9 newton-meters).

SUBTASK 28-41-02-420-006

(11) To attach the bonding jumper [11] to the tank unit [1], install the screw [4], washer [5] and nut [10].

(a) Measure the bonding resistance between the tank unit and airplane structure with an electrical bonding intrinsically safe approved bonding meter, COM-1550.

(b) Make sure the bonding resistance is not more than 0.01 ohm.

SUBTASK 28-41-02-420-007

(12) Install the faston connectors [2] to the tank unit [1].

NOTE: The faston connectors [2] are keyed for correct installation.

SUBTASK 28-41-02-420-008

(13) Put the rubber grommet [3] in its position.

SUBTASK 28-41-02-210-001

CAUTION

MAKE SURE ALL UNWANTED MATERIALS ARE REMOVED FROM THE FUEL TANK. UNWANTED MATERIALS CAN CAUSE A BLOCKAGE IN A PUMP.

(14) Make sure you remove all unwanted materials from the fuel tank.

SUBTASK 28-41-02-410-001

(15) To install the applicable fuel tank access door, do these steps (Figure 401):

(a) For the main fuel tanks, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

(b) For the center fuel tank, do this task: Center Tank Access Door - Installation, TASK 28-11-02-400-801.

SUBTASK 28-41-02-860-002

(16) Remove the safety tags and close these circuit breakers:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
D	7	C28603	RFLNG CTRL GND

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Right Power Management Panel, P210

Row	Col	Number	Name
L	1	C28625	FUEL QTY 1

Standby Power Management Panel, P310

Row	Col	Number	Name
G	10	C28624	FUEL QTY 2
J	8	C28600	RFLNG CTRL
J	11	C28623	RFLNG QTY

SUBTASK 28-41-02-860-003

(17) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-41-02-700-003

(18) Do this task: Fuel Quantity Processor Unit (FQPU) - Operational Check, TASK 28-41-00-710-802.

SUBTASK 28-41-02-700-002

(19) Do this task: Fuel Quantity Indicating System (FQIS) TANK UNITS and DENSITOMETERS - Operational Check, TASK 28-41-00-710-801.

SUBTASK 28-41-02-860-004

(20) Do this task: Pressure Refueling, TASK 12-11-01-650-801.

END OF TASK

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FQIS DENSITOMETER - REMOVAL/INSTALLATION

1. General

A. Three densitometers give fuel density information to the fuel quantity processor unit (FQPU) for fuel quantity calculation. A densitometer is installed in each main fuel tank and the center fuel tank.

B. This procedure contains two tasks. The first task removes the densitometer. The second task installs the densitometer.

TASK 28-41-03-000-801

2. Densitometer - Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
133	Wing Center Section, Left
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

C. Access Panels

Number	Name/Location
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door
533AB	Access Door
633AB	Access Door

D. Procedure

SUBTASK 28-41-03-860-001

(1) Open these circuit breakers and install safety tags:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
D	7	C28603	RFLNG CTRL GND

Right Power Management Panel, P210

Row	Col	Number	Name
L	1	C28625	FUEL QTY 1

Standby Power Management Panel, P310

Row	Col	Number	Name
G	10	C28624	FUEL QTY 2

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(Continued)

Standby Power Management Panel, P310

Row	Col	Number	Name
J	8	C28600	RFLNG CTRL
J	11	C28623	RFLNG QTY

SUBTASK 28-41-03-650-001

(2) To defuel the applicable fuel tank, do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-41-03-650-002

WARNING OBEY THE FUEL TANK PURGING AND ENTRY PRECAUTIONS. FAILURE TO OBEY THE FUEL TANK PURGING AND ENTRY PRECAUTIONS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-41-03-010-001

(4) To get access to the applicable densitometer [3], do these steps (Figure 401):

(a) For the left main fuel tank, do this task: (Main Tank Access Door Removal, TASK 28-11-01-000-801).

Open this access panel:

Number	Name/Location
533AB	Access Door

(b) For the right main fuel tank, do this task: (Main Tank Access Door Removal, TASK 28-11-01-000-801).

Open this access panel:

Number	Name/Location
633AB	Access Door

(c) For the center fuel tank, do this task: Center Tank Access Door - Removal, TASK 28-11-02-000-801.

Open these access panels:

Number	Name/Location
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door

SUBTASK 28-41-03-940-001

(5) Go into the applicable fuel tank.

SUBTASK 28-41-03-020-006

(6) Push the tab on the faston connectors [4] to disconnect from the densitometer [3].

SUBTASK 28-41-03-420-005

(7) Loosen the clamp [6] to remove the wiring harness [5] from the densitometer [3].

SUBTASK 28-41-03-020-005

(8) Remove the screws [1], bolts [7], washers [2] and nuts [8] that attach the densitometer [3] to the structure.

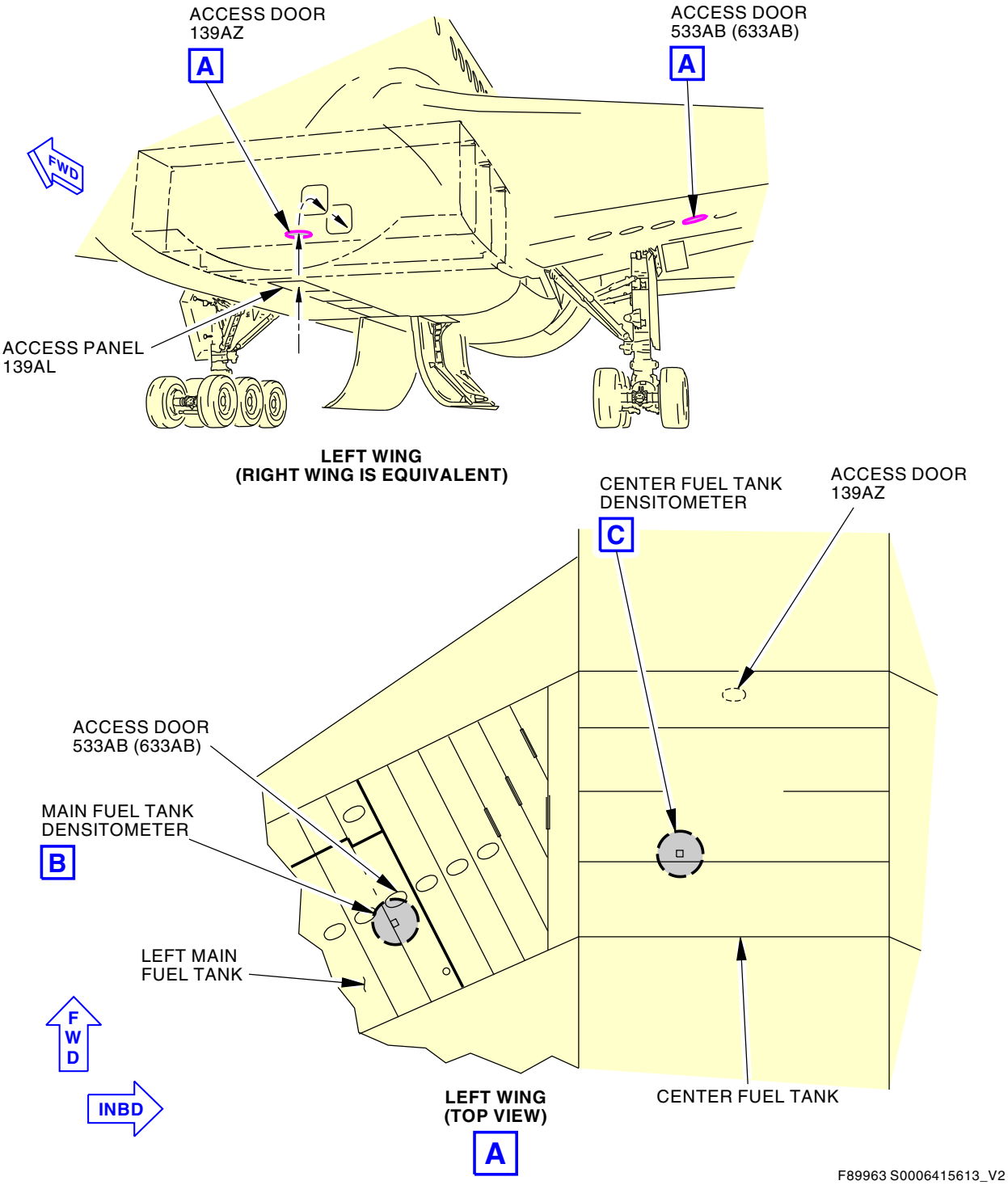
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SUBTASK 28-41-03-020-001

(9) Remove the densitometer [3] from the fuel tank.

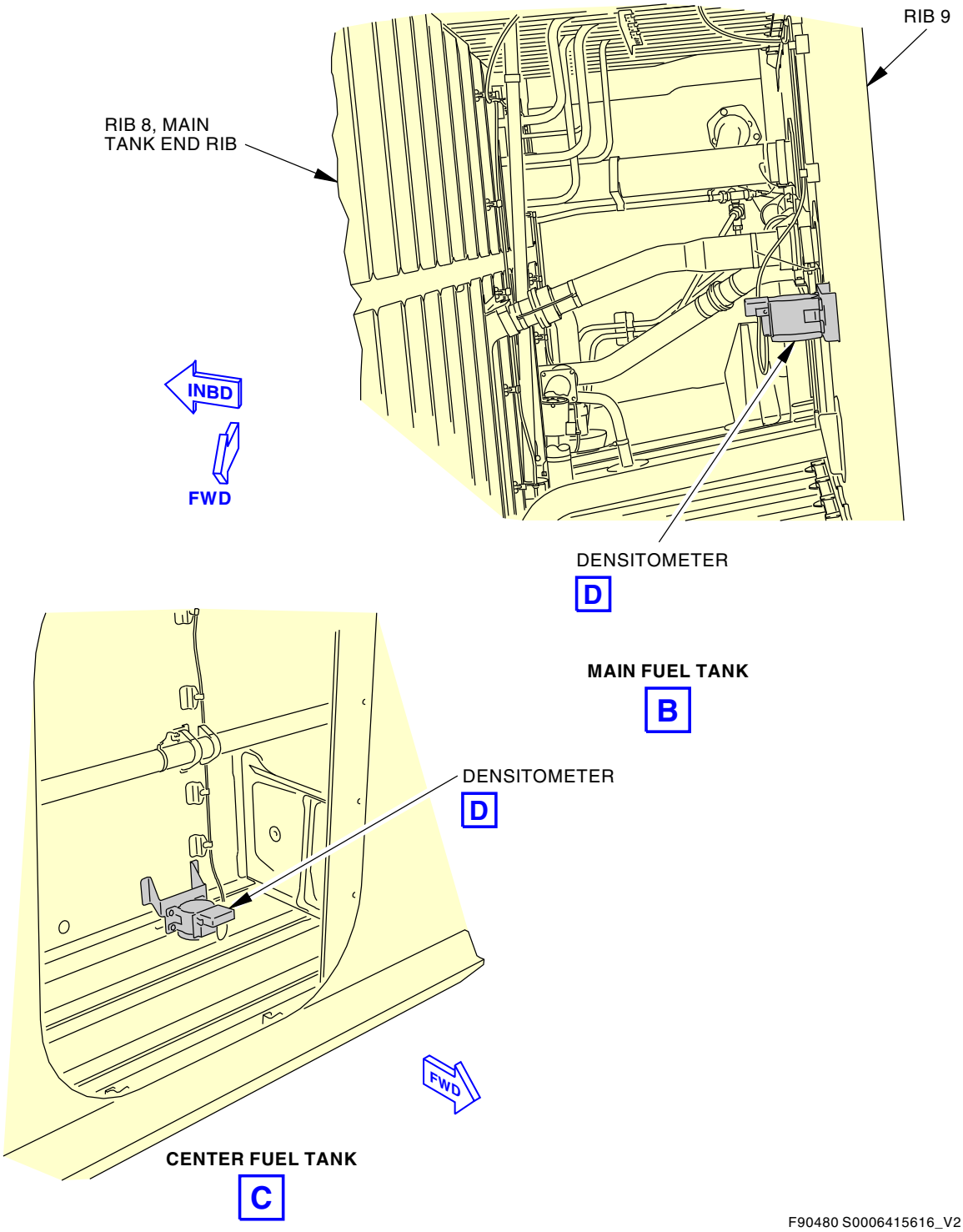
END OF TASK

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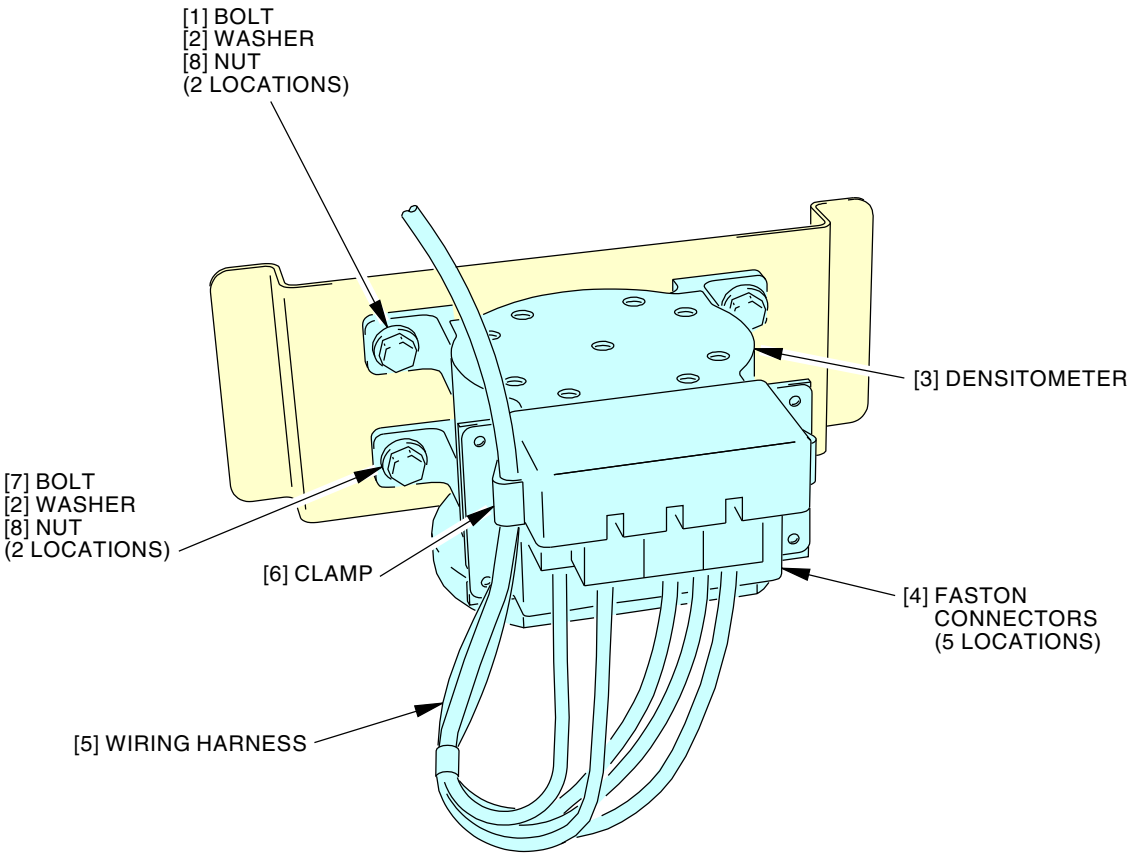
Densitometer Installation
Figure 401/28-41-03-990-801 (Sheet 1 of 3)

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Densitometer Installation
Figure 401/28-41-03-990-801 (Sheet 2 of 3)

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DENSITOMETER

D

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Densitometer Installation
Figure 401/28-41-03-990-801 (Sheet 3 of 3)

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TASK 28-41-03-400-801

3. Densitometer - Installation

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
28-11-00-600-801	Apply the Corrosion Resistant Finish (Topcoat) (P/B 701)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-41-00-710-801	Fuel Quantity Indicating System (FQIS) TANK UNITS and DENSITOMETERS - Operational Check (P/B 501)
28-41-00-710-802	Fuel Quantity Processor Unit (FQPU) - Operational Check (P/B 501)
SWPM 20-20-00	Standard Wiring Practices Manual

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
3	Densitometer	28-41-03-01-010	ARO ALL
		28-41-03-01-155	ARO ALL

D. Location Zones

Zone	Area
133	Wing Center Section, Left
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

E. Access Panels

Number	Name/Location
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door
533AB	Access Door

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(Continued)

Number	Name/Location
633AB	Access Door

F. Procedure

SUBTASK 28-41-03-860-005

(1) Make sure that these circuit breakers are open and have safety tags:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
D	7	C28603	RFLNG CTRL GND

Right Power Management Panel, P210

Row	Col	Number	Name
L	1	C28625	FUEL QTY 1

Standby Power Management Panel, P310

Row	Col	Number	Name
G	10	C28624	FUEL QTY 2
J	8	C28600	RFLNG CTRL
J	11	C28623	RFLNG QTY

SUBTASK 28-41-03-940-002

WARNING OBEY THE FUEL TANK ENTRY PRECAUTIONS. FAILURE TO OBEY THE FUEL TANK ENTRY PRECAUTIONS COULD CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-41-03-940-003

(3) Go into the applicable fuel tank.

SUBTASK 28-41-03-140-001

(4) Clean the faying surfaces between the densitometer [3] and the structure to make a good electrical bond (SWPM 20-20-00).

SUBTASK 28-41-03-420-008

(5) Put the densitometer [3] in its position and install the screws [1], bolts [7] and washers [2] and nuts [8].

(a) LEFT MAIN FUEL TANK-M28011, RIGHT MAIN FUEL TANK-M28012, CENTER FUEL TANK-M28015

SUBTASK 28-41-03-420-006

(6) Measure the bonding resistance between the densitometer [3] and the web of the adjacent spanwise beam with an electrical bonding intrinsically safe approved bonding meter, COM-1550.

(a) Make sure the bonding resistance is not more than 0.01 ohm.

SUBTASK 28-41-03-420-007

(7) Install the faston connectors [4] to the wiring terminal of the densitometer [3].

NOTE: The faston connectors are keyed for correct installation.

(a) Put the wiring harness [5] in its position on the densitometer [3] and tighten the clamp [6].

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SUBTASK 28-41-03-370-001

(8) Apply alodine and primer to exposed metal surfaces on the structure near the bonding surface for the densitometer [3], if it is necessary (TASK 28-11-00-600-801).

SUBTASK 28-41-03-210-001

CAUTION

MAKE SURE ALL UNWANTED MATERIALS ARE REMOVED FROM IN THE FUEL TANK. UNWANTED MATERIALS CAN CAUSE A BLOCKAGE IN A PUMP.

(9) Make sure you remove all unwanted materials from the fuel tank.

SUBTASK 28-41-03-410-001

(10) Install the applicable access door:

(a) For the left main fuel tank, do this task: (Main Tank Access Door Removal, TASK 28-11-01-000-801).

Close this access panel:

Number	Name/Location
533AB	Access Door

(b) For the right main fuel tank, do this task: (Main Tank Access Door Removal, TASK 28-11-01-000-801).

Close this access panel:

Number	Name/Location
633AB	Access Door

(c) For the center fuel tank, do this task: (Center Tank Access Door - Removal, TASK 28-11-02-000-801).

Close these access panels:

Number	Name/Location
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door

SUBTASK 28-41-03-860-002

(11) Remove the safety tags and close these circuit breakers:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
D	7	C28603	RFLNG CTRL GND

Right Power Management Panel, P210

Row	Col	Number	Name
L	1	C28625	FUEL QTY 1

Standby Power Management Panel, P310

Row	Col	Number	Name
G	10	C28624	FUEL QTY 2
J	8	C28600	RFLNG CTRL
J	11	C28623	RFLNG QTY

SUBTASK 28-41-03-860-003

(12) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

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SUBTASK 28-41-03-700-001

(13) Do this task: Fuel Quantity Processor Unit (FQPU) - Operational Check, TASK 28-41-00-710-802.

SUBTASK 28-41-03-700-002

(14) Do this task: Fuel Quantity Indicating System (FQIS) TANK UNITS and DENSITOMETERS - Operational Check, TASK 28-41-00-710-801.

SUBTASK 28-41-03-860-004

(15) Do this task: Pressure Refueling, TASK 12-11-01-650-801.

——— END OF TASK ———

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WATER DETECTOR - REMOVAL/INSTALLATION

1. General

A. A water detector is installed at the bottom of each main fuel tank and in the center tank.

B. This procedure contains two tasks. The first task removes the water detector. The second task installs the water detector.

TASK 28-41-04-000-801

2. Water Detector - Removal

(Figure 401)

A. References

Reference	Title
28-00-00-200-801	Inspection of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-00-00-960-801	Replacement of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
134	Wing Center Section, Right
139	Forward Keel Beam
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

C. Access Panels

Number	Name/Location
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door
533AB	Access Door
633AB	Access Door

D. Procedure

SUBTASK 28-41-04-860-001

(1) Open these circuit breakers and install safety tags:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
D	7	C28603	RFLNG CTRL GND

Right Power Management Panel, P210

Row	Col	Number	Name
L	1	C28625	FUEL QTY 1

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Standby Power Management Panel, P310

Row	Col	Number	Name
G	10	C28624	FUEL QTY 2
J	8	C28600	RFLNG CTRL
J	11	C28623	RFLNG QTY

SUBTASK 28-41-04-650-001

(2) To defuel the applicable fuel tank, do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-41-04-650-002

WARNING OBEY THE FUEL TANK PURGING AND ENTRY PRECAUTIONS. FAILURE TO OBEY THE FUEL TANK PURGING AND ENTRY PRECAUTIONS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-41-04-010-001

(4) To get access to the applicable water detector [1], do these steps (Figure 401):

(a) For the left main fuel tank, do this task: (Main Tank Access Door Removal, TASK 28-11-01-000-801).

Open this access panel:

Number	Name/Location
533AB	Access Door

(b) For the right main fuel tank, do this task: (Main Tank Access Door Removal, TASK 28-11-01-000-801).

Open this access panel:

Number	Name/Location
633AB	Access Door

(c) For the wing center fuel section, do this task: (Center Tank Access Door - Removal, TASK 28-11-02-000-801).

Open these access panels:

Number	Name/Location
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door

SUBTASK 28-41-04-940-001

(5) Go into the applicable fuel tank.

SUBTASK 28-41-04-020-005

(6) Push the tab on the faston connectors [4] to disconnect from the water detector [1].

(a) Pull the rubber grommet [3] from the water detector [1] to disconnect the wiring [2].

SUBTASK 28-41-04-020-006

(7) To disconnect the bonding jumpers [5] from the water detector [1], remove the screw [6], washer [7] and nut [8].

SUBTASK 28-41-04-420-006

(8) Move the wiring [2] away from the water detector [1].

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SUBTASK 28-41-04-020-007

(9) Remove the two screw [6] and washer [7] that attach the support bracket to structure.

SUBTASK 28-41-04-020-001

(10) Remove the water detector [1] from the fuel tank.

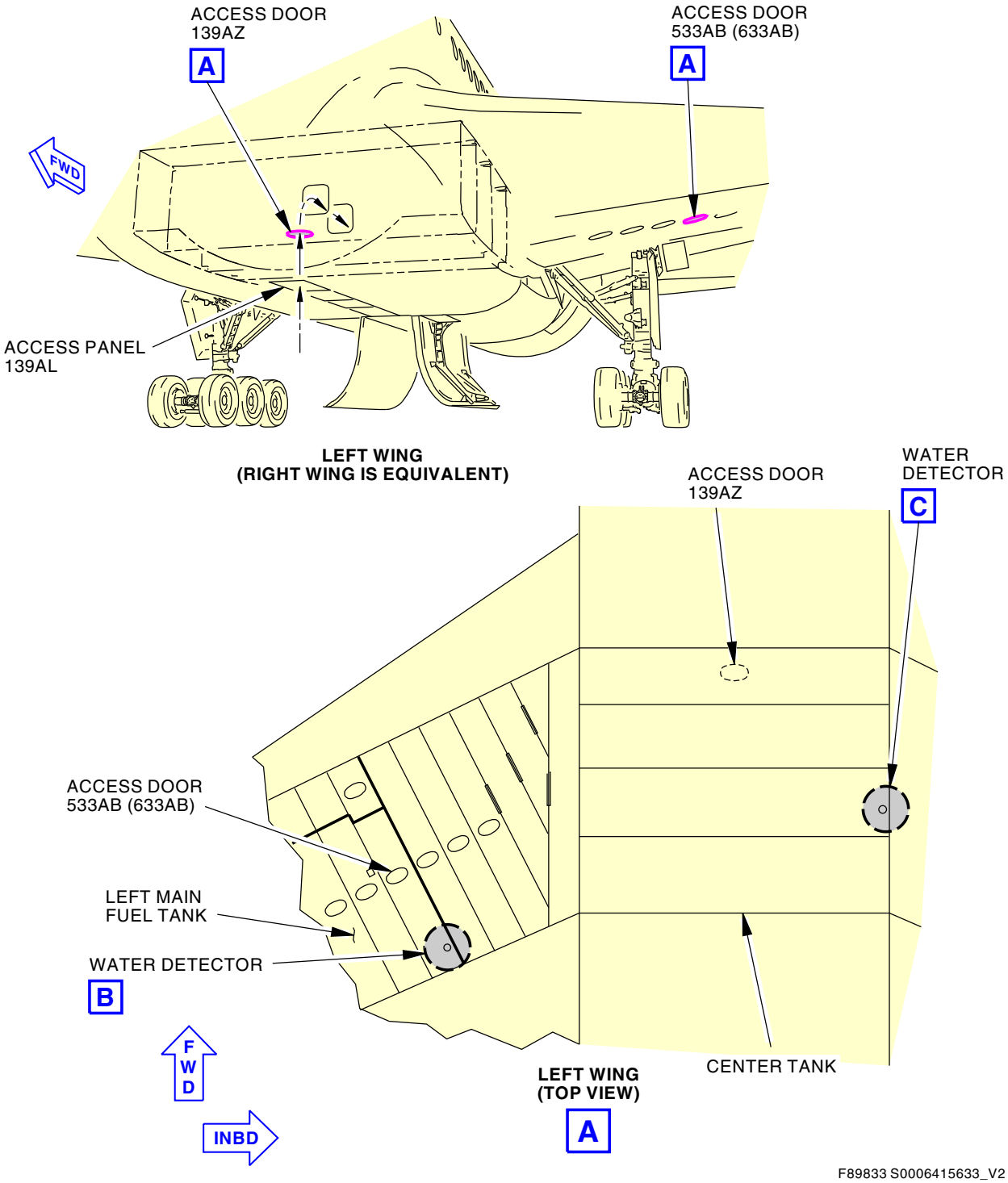
SUBTASK 28-41-04-210-002

(11) Do a check of the bonding jumper; do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(a) Replace the bonding jumper as necessary. To replace the bonding jumper, do this task: Replacement of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-960-801.

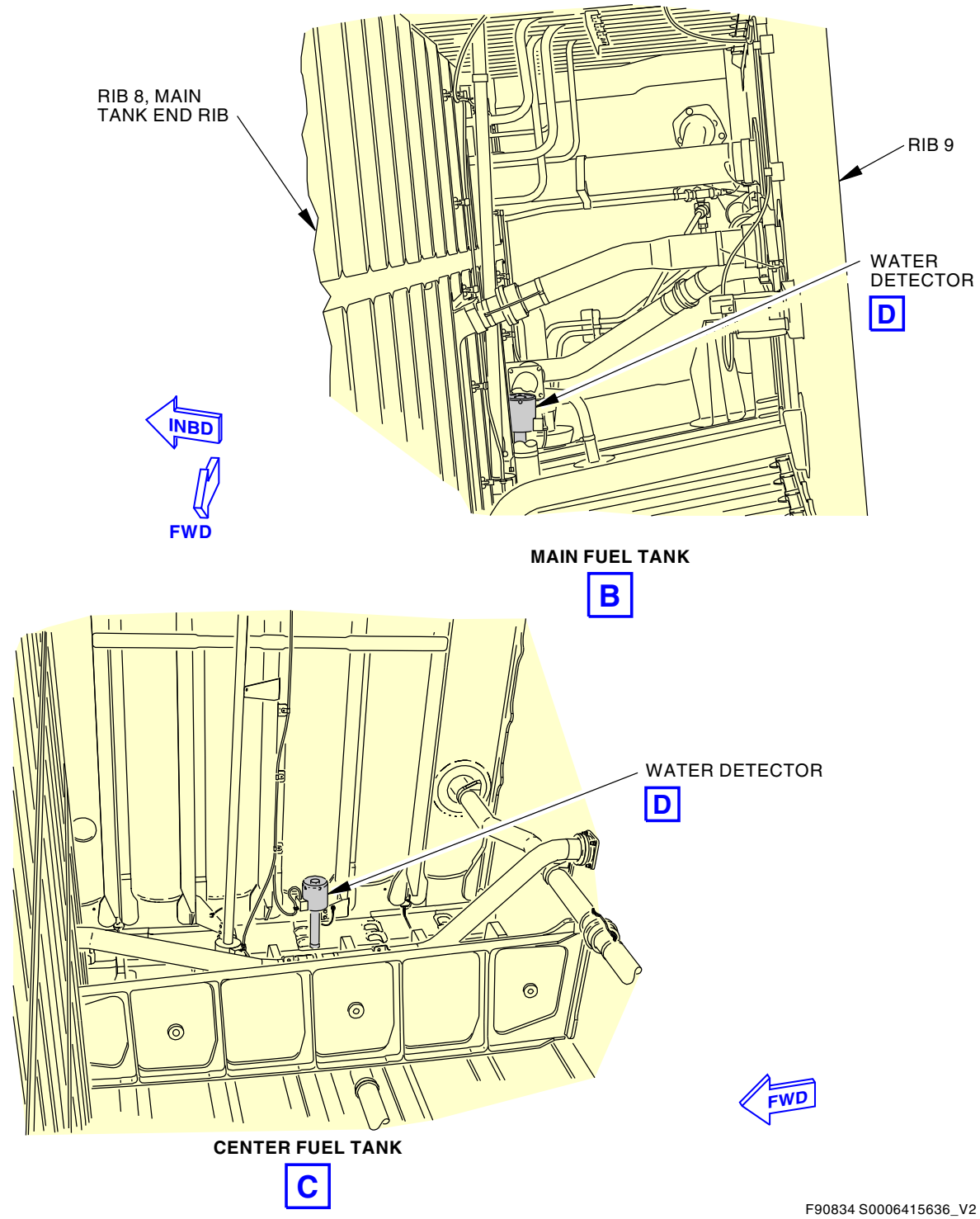
——— END OF TASK ———

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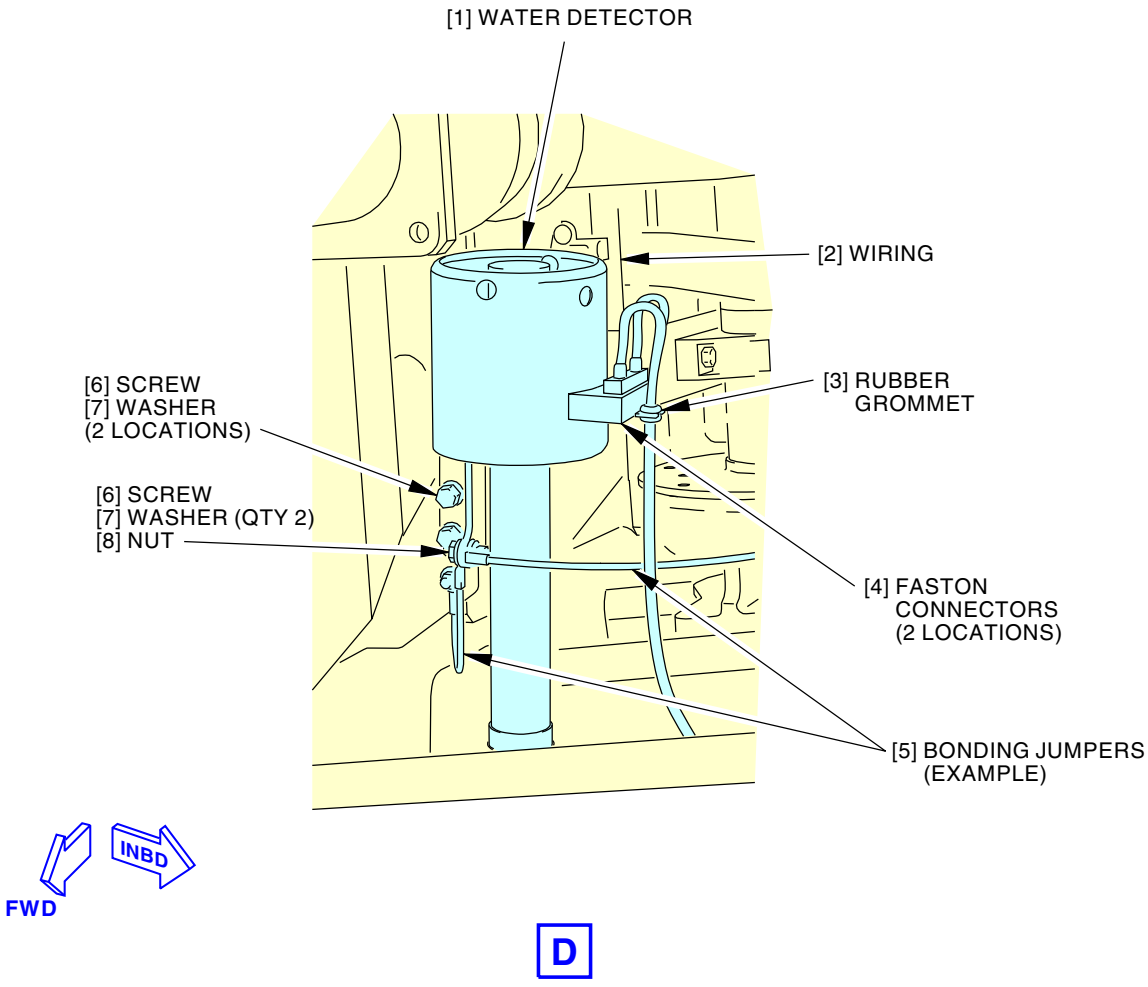
Water Detector Installation
Figure 401/28-41-04-990-801 (Sheet 1 of 3)

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Water Detector Installation
Figure 401/28-41-04-990-801 (Sheet 2 of 3)

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Water Detector Installation
Figure 401/28-41-04-990-801 (Sheet 3 of 3)

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TASK 28-41-04-400-801

3. Water Detector - Installation

(Figure 401)

A. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
28-00-00-960-801	Replacement of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Detector	28-41-04-01-030	ARO ALL
		28-41-04-01-185	ARO ALL

D. Location Zones

Zone	Area
134	Wing Center Section, Right
139	Forward Keel Beam
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing

E. Access Panels

Number	Name/Location
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door
533AB	Access Door
633AB	Access Door

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F. Procedure

SUBTASK 28-41-04-860-005

(1) Make sure that these circuit breakers are open and have safety tags:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
D	7	C28603	RFLNG CTRL GND

Right Power Management Panel, P210

Row	Col	Number	Name
L	1	C28625	FUEL QTY 1

Standby Power Management Panel, P310

Row	Col	Number	Name
G	10	C28624	FUEL QTY 2
J	8	C28600	RFLNG CTRL
J	11	C28623	RFLNG QTY

SUBTASK 28-41-04-940-002

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-41-04-940-003

(3) Go into the applicable fuel tank.

SUBTASK 28-41-04-960-001

(4) Replace the bonding jumpers as necessary (TASK 28-00-00-960-801).

SUBTASK 28-41-04-420-001

(5) Put the water detector [1] in its position and install the two screw [6] and washer [7] that attach to structure.

(a) LEFT MAIN FUEL TANK - M28017

(b) RIGHT MAIN FUEL TANK - M28016

(c) CENTER FUEL TANK - M28019

SUBTASK 28-41-04-420-007

(6) To attach the bonding jumpers [5], install the screw [6], washer [7] and nut [8].

(a) Measure the bonding resistance between the water detector [1] and airplane structure with an electrical bonding intrinsically safe approved bonding meter, COM-1550.

(b) Make sure the bonding resistance is not more than 0.1 ohm.

SUBTASK 28-41-04-420-008

(7) Install the faston connectors [4] to the wiring terminal of the water detector [1].

NOTE: The faston connectors [4] are keyed for correct installation.

SUBTASK 28-41-04-420-009

(8) Put the rubber grommet [3] in its position on the water detector [1].

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SUBTASK 28-41-04-210-001

CAUTION

MAKE SURE ALL UNWANTED MATERIALS ARE REMOVED FROM IN THE FUEL TANK. UNWANTED MATERIALS CAN CAUSE A BLOCKAGE IN A PUMP.

(9) Make sure you remove all unwanted materials from the fuel tank.

SUBTASK 28-41-04-410-001

(10) Install the applicable access door:

(a) For the left main fuel tank, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

Close this access panel:

Number	Name/Location
533AB	Access Door

(b) For the right main fuel tank, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

Close this access panel:

Number	Name/Location
633AB	Access Door

(c) For the wing center fuel section, do this task: Center Tank Access Door - Installation, TASK 28-11-02-400-801.

Close these access panels:

Number	Name/Location
139AL	Forward Keel Beam Access Panel
139AZ	Center Wing Access Door

SUBTASK 28-41-04-860-002

(11) Remove the safety tags and close these circuit breakers:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
D	7	C28603	RFLNG CTRL GND

Right Power Management Panel, P210

Row	Col	Number	Name
L	1	C28625	FUEL QTY 1

Standby Power Management Panel, P310

Row	Col	Number	Name
G	10	C28624	FUEL QTY 2
J	8	C28600	RFLNG CTRL
J	11	C28623	RFLNG QTY

SUBTASK 28-41-04-860-003

(12) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-41-04-710-001

(13) Make sure there are no WATER DETECTOR maintenance messages on the Maintenance Access Terminal (MAT).

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SUBTASK 28-41-04-860-004

(14) Do this task: Pressure Refueling, TASK 12-11-01-650-801.

——— END OF TASK ———

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FQIS IN-TANK WIRING HARNESS - REMOVAL/INSTALLATION

1. General

A. The in-tank wiring harnesses are part of the fuel quantity indicating system (FQIS). There are 6 in-tank wiring harnesses, two in each main fuel tank and two in the center fuel tank.

B. This procedure contains two tasks. The first task removes the in-tank wiring harnesses. The second task installs the in-tank wiring harnesses.

TASK 28-41-05-000-801

2. FQIS In-Tank Wiring Harness - Removal

(Figure 401)

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
20-30-82-910-801	General Cleaning of Solvent Resistant Organic Coatings (Series 82) (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
28-00-00-200-801	Inspection of the Electrical Bonding Jumpers in the Fuel System (P/B 201)
28-11-00-010-801	Purging and Fuel Tank Entry (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)
SWPM 20-10-20	Standard Wiring Practices Manual

B. Consumable Materials

Reference	Description	Specification
B01002	Solvent - General Cleaning Of Solvent Resistant Organic Coatings - Series 82	

C. Location Zones

Zone	Area
134	Wing Center Section, Right
139	Forward Keel Beam
511	Leading Edge to Front Spar - Inboard of Nacelle Strut - Left Wing
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
551	Rear Spar to Landing Gear Support Beam - Left Wing
611	Leading Edge to Front Spar - Inboard of Nacelle Strut - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074

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(Continued)

Zone	Area
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182
651	Rear Spar to Landing Gear Support Beam - Right Wing

D. Access Panels

Number	Name/Location
511FB	Inboard Fixed Leading Edge Panel
551DB	Inboard Fixed Trailing Edge Panel
611FB	Inboard Fixed Leading Edge Panel
651DB	Inboard Fixed Trailing Edge Panel

E. Procedure

SUBTASK 28-41-05-650-001

(1) To remove the left or right center fuel tank wire harness [3] and wire harness [4], defuel the center fuel tank.

(a) To defuel, do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-41-05-650-002

(2) To remove the main tank outboard wire harness [1] and inboard wire harness [2], defuel the applicable main fuel tank.

(a) To defuel, do this task: Pressure Defueling, TASK 28-26-00-650-801

SUBTASK 28-41-05-860-003

(3) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

SUBTASK 28-41-05-650-003

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(4) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-41-05-010-011

(5) To remove the applicable main tank access doors, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

SUBTASK 28-41-05-010-002

(6) To remove the applicable center tank access doors, do this task: Center Tank Access Door - Removal, TASK 28-11-02-000-801.

SUBTASK 28-41-05-940-001

(7) Go into the applicable fuel tank (TASK 28-11-00-010-801).

SUBTASK 28-41-05-020-001

(8) To disconnect the applicable wiring harness, wire harness [1], wire harness [2], wire harness [3], or wire harness [4], from the applicable tank units [17], do these steps:

(a) Disconnect the faston connectors of the wiring harness at each tank unit [17].

(b) Remove the rubber grommet that holds the wiring from each tank unit [17].

(c) Move the wiring away from all of the tank units [17].

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SUBTASK 28-41-05-020-002

(9) To disconnect the applicable wiring harness, wire harness [2], or wire harness [3] from the densitometer [15], do these steps:

(a) Disconnect the faston connectors of wiring harness at the densitometer [15].

(b) Loosen the clamp on the densitometer to remove the wiring.

SUBTASK 28-41-05-020-003

(10) To disconnect the applicable wiring harness, wire harness [2], wire harness [3], or wire harness [4], from the water detector [16], do these steps:

(a) Disconnect the faston connectors of the wiring harness at the water detector [16].

(b) Remove the rubber grommet for the wiring from the water detector [16].

(c) Move the wiring away from the water detector [16].

SUBTASK 28-41-05-020-010

(11) To disconnect the applicable wiring harness in the fuel tank, do these steps:

(a) Remove all the clamps [18] and clamps [22] that secure the wiring harness to the structure in the fuel tank.

(b) If installed, remove the seal fitting [23] with the seal ring [24] and snap ring [25] (SWPM 20-10-20).

(c) Move the wiring into the applicable bay of the spar connector.

SUBTASK 28-41-05-020-011

(12) To disconnect the wiring harness at the spar connector and remove the wiring harness from the fuel tank, do these steps:

(a) To get access to the spar connector of the left center tank wiring harness, do this step: (TASK 06-44-00-800-802):

1) Open this access panel:

Number	Name/Location
511FB	Inboard Fixed Leading Edge Panel

(b) To get access to the spar connector of the right center tank wiring harness, do this step (TASK 06-44-00-800-802):

1) Open this access panel:

Number	Name/Location
611FB	Inboard Fixed Leading Edge Panel

(c) To get access to the rear spar connector of the left main tank wiring harness, do this step (TASK 06-44-00-800-802):

1) Open this access panel:

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

(d) To get access to the rear spar connector of the right main tank wiring harness, do this step (TASK 06-44-00-800-802):

1) Open this access panel:

Number	Name/Location
651DB	Inboard Fixed Trailing Edge Panel

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(e) To disconnect the spar connector, do these steps:

NOTE: The receptacle [5] for each wiring harness can be replaced from out of the fuel tank. To replace the receptacle [5], do the steps that follow to disconnect the receptacle [5] from the spar connector. Then remove the receptacle [5] from the wiring harness.

1) Disconnect the plug [14] of the spar connector.
2) Remove the sealant from around the six nuts [13] and six washers [12] that connect the receptacle [5] to the adapter [7].
3) Remove the six nuts [13] and six washers [12] that connect the receptacle [5] to the adapter [7].
4) Remove the blue end of the bonding jumper [26] from the receptacle [5].
5) Remove the screw [51], washers [53], and nut [52] to disconnect the red end of the bonding jumper [26] from the stiffener on the spar.
6) Remove the receptacle [5] from the adapter [7].
7) Discard the o-ring [6].

(f) Remove the applicable wiring harness; wire harness [1], wire harness [2], wire harness [3], or wire harness [4], from the fuel tank through the applicable adapter [7] in the wing spar.

SUBTASK 28-41-05-020-004

(13) To remove the adapter [7] from the wing spar (if it is necessary), do these steps:

(a) Remove sealant from the adapter [7] threads, jamnut [10] and washer [9] and clean the adapter [7] with Series 82 solvent, B01002 (TASK 20-30-82-910-801).
(b) Remove the jamnut [10] and washer [9] from in the fuel tank.
(c) Remove the adapter [7] from out of the fuel tank.
(d) Discard the o-ring [8].
(e) Remove the bolts [11] if it is necessary.

SUBTASK 28-41-05-210-001

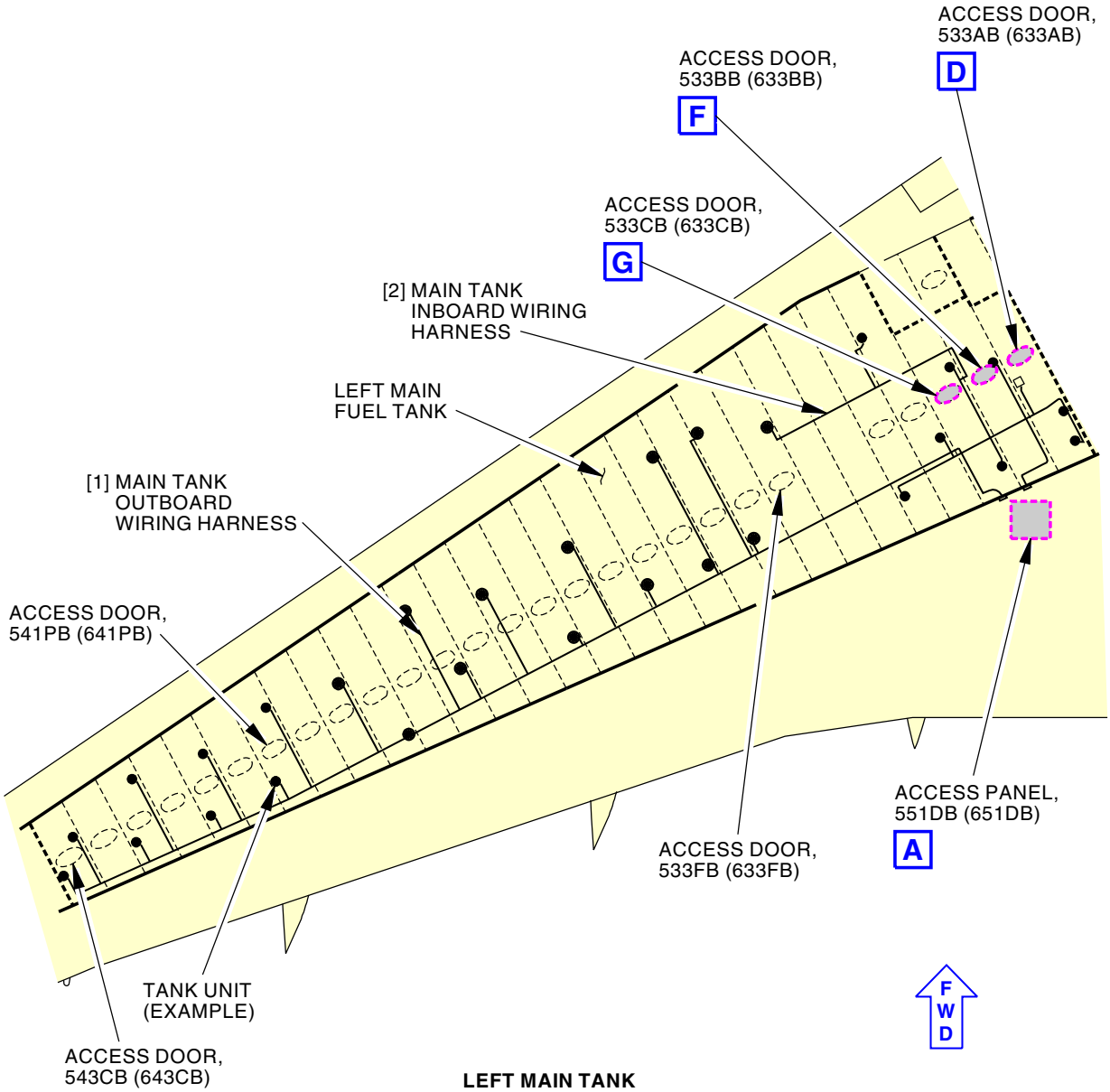
(14) Do a check of the bonding jumper; do this task: Inspection of the Electrical Bonding Jumpers in the Fuel System, TASK 28-00-00-200-801.

(a) If it is necessary, replace the bonding jumper:

1) Remove and clean the sealant from fasteners with Series 82 solvent, B01002 (TASK 20-30-82-910-801).
2) Remove the fasteners to remove the bonding jumper.

——— END OF TASK ———

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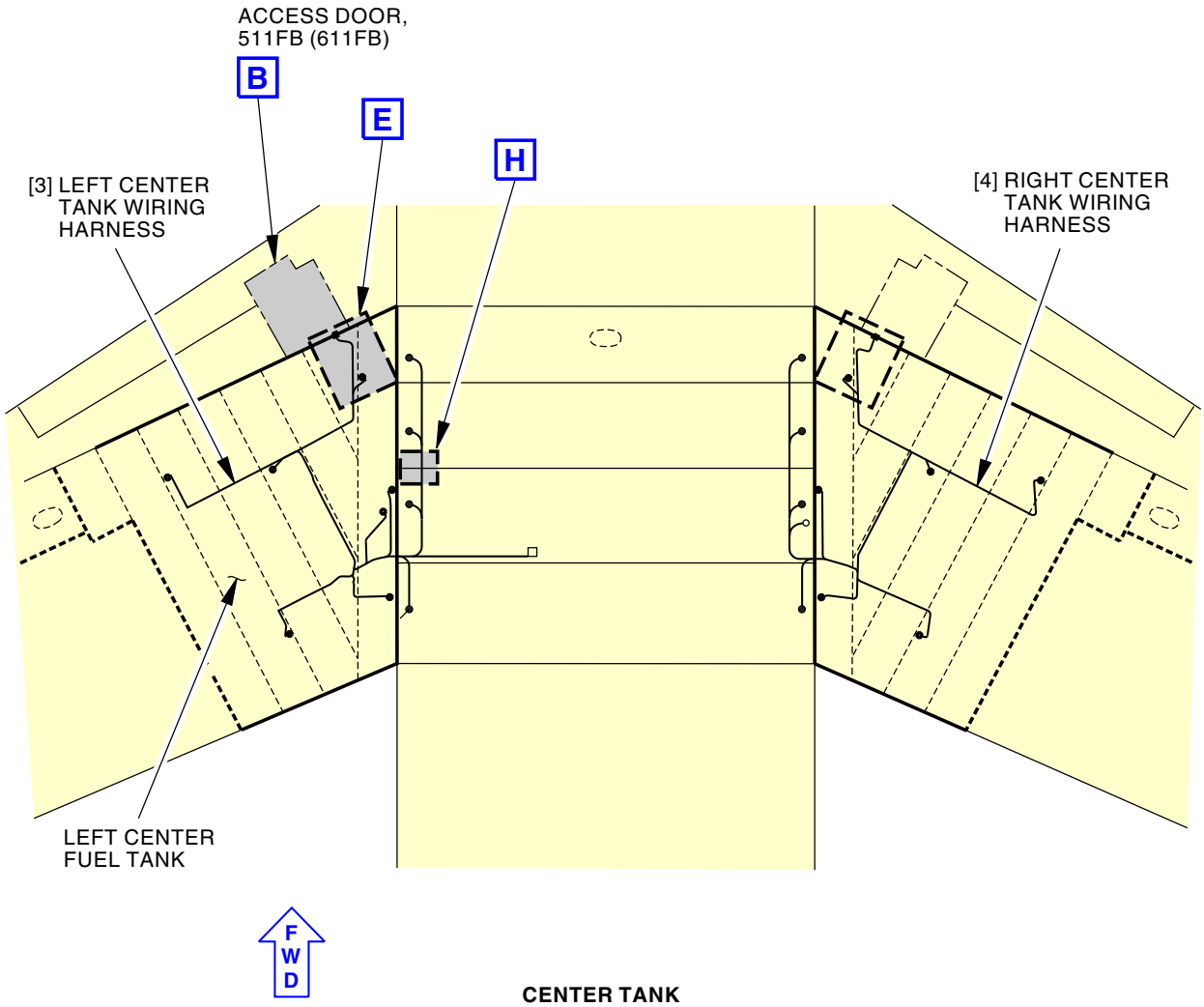


LEFT MAIN TANK
(TOP VIEW)
(RIGHT MAIN TANK IS EQUIVALENT)

M45346 S0006415648_V3

Fuel Tank Wiring Harness Installation
Figure 401/28-41-05-990-801 (Sheet 1 of 10)

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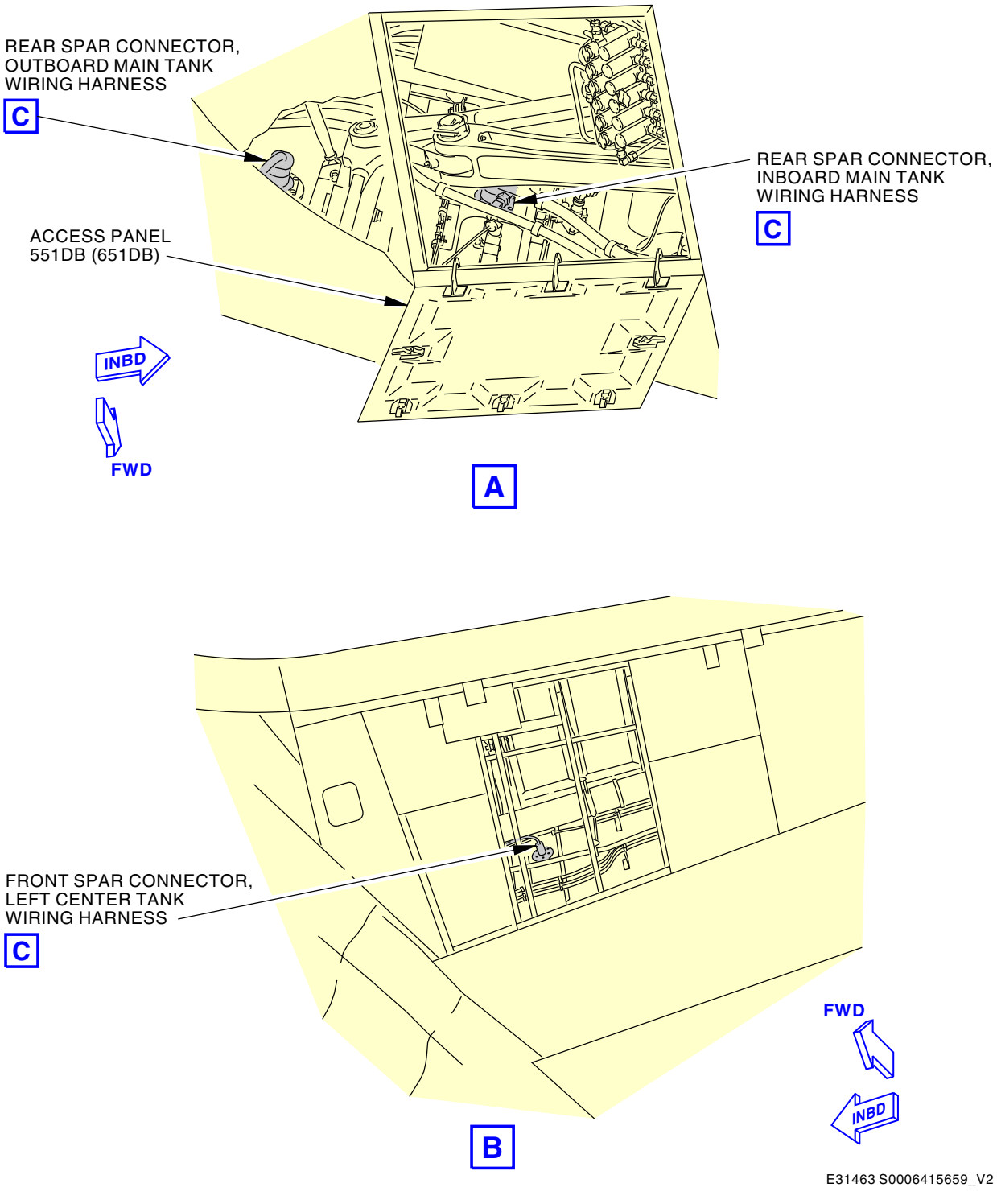


**CENTER TANK
(TOP VIEW)**

D67466 S0000162702_V2

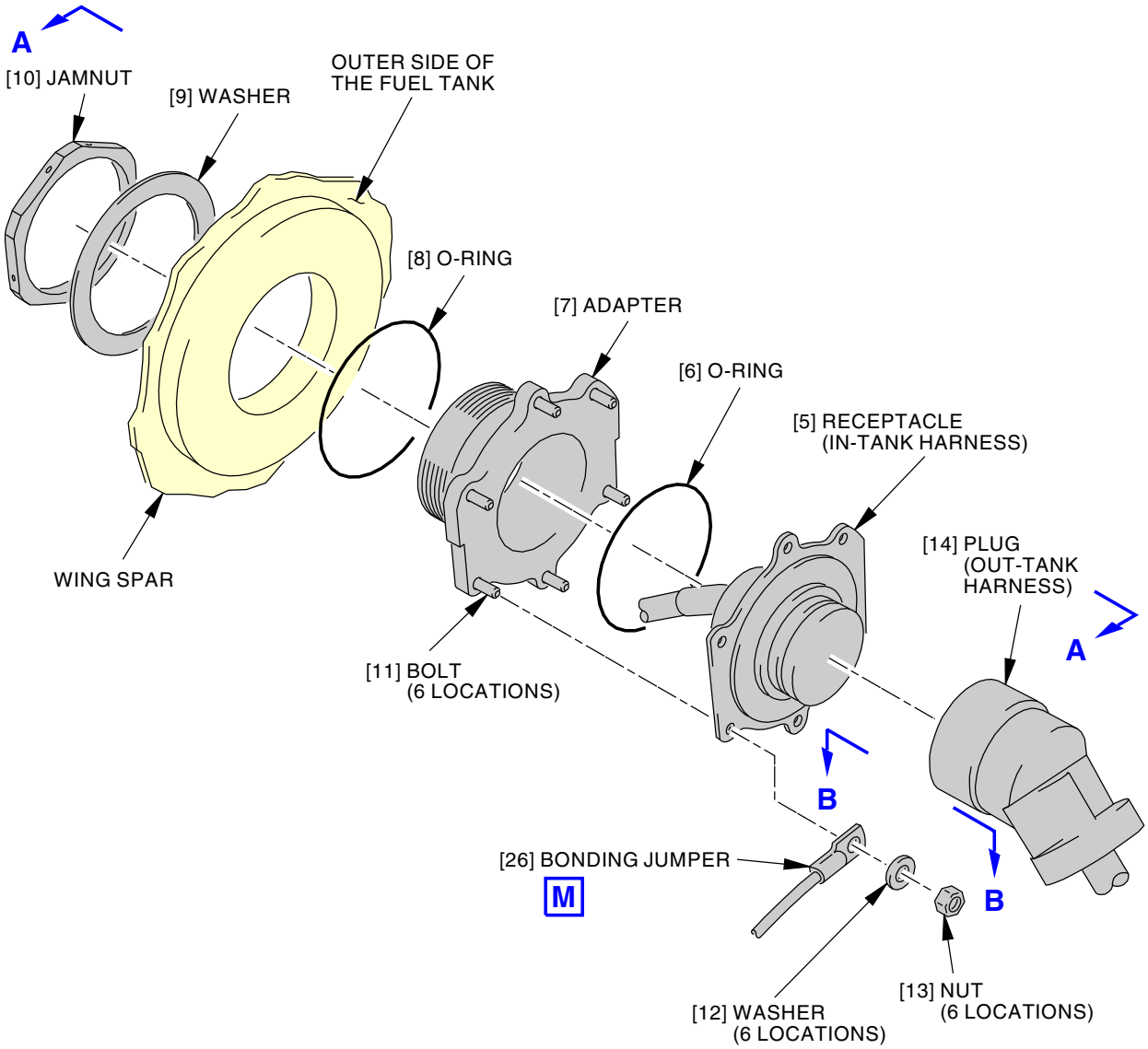
**Fuel Tank Wiring Harness Installation
Figure 401/28-41-05-990-801 (Sheet 2 of 10)**

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Fuel Tank Wiring Harness Installation
Figure 401/28-41-05-990-801 (Sheet 3 of 10)

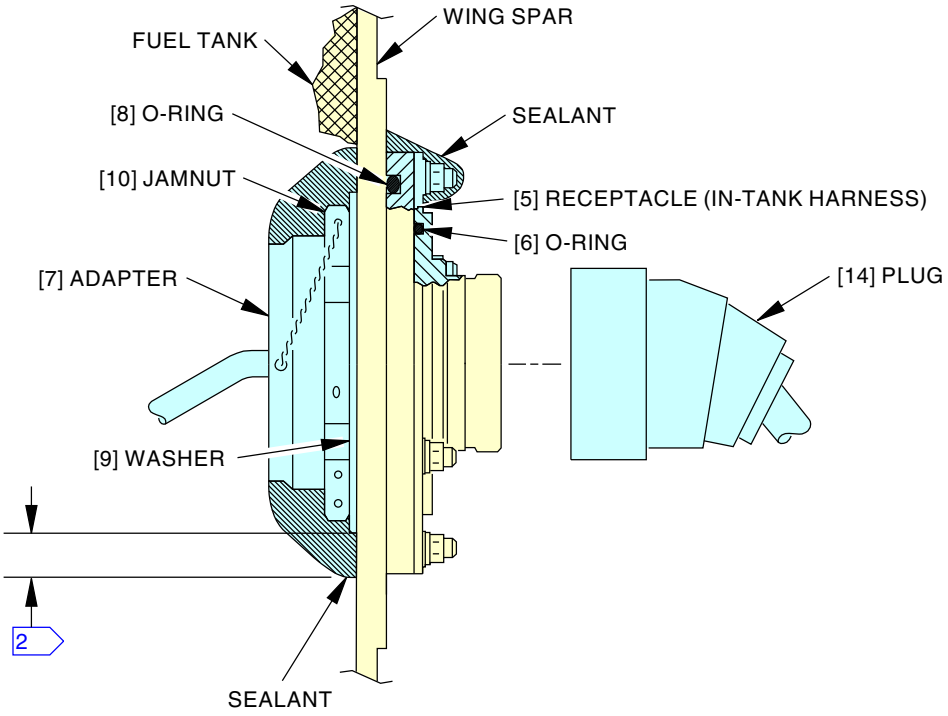
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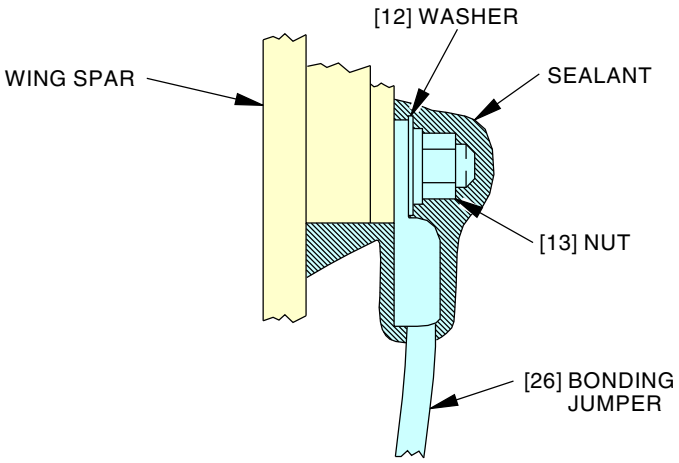
E28257 S0006415660_V2

Fuel Tank Wiring Harness Installation
Figure 401/28-41-05-990-801 (Sheet 4 of 10)

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A-A



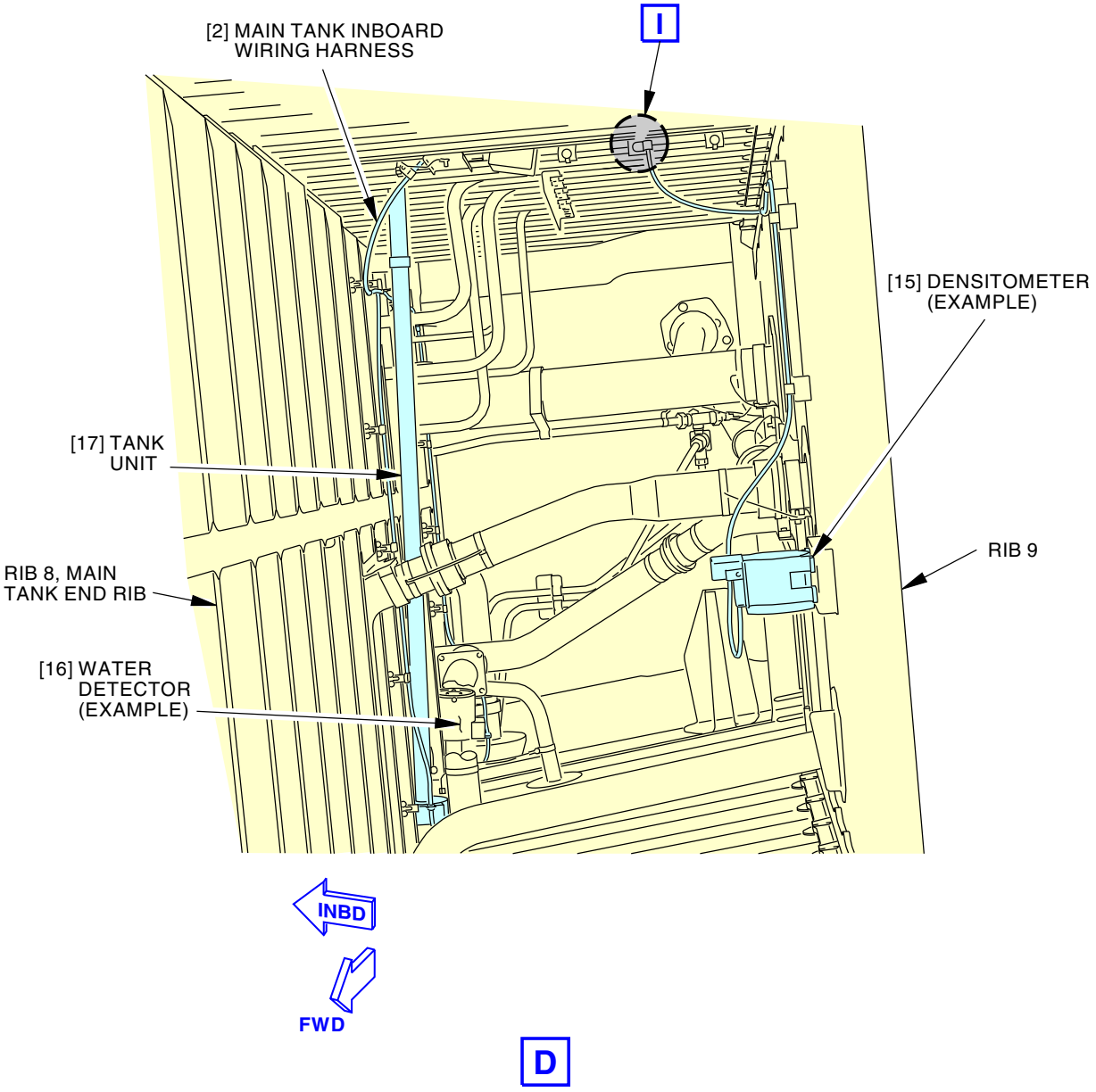
B-B

2 BUILD UP THE SEAL UNTIL THE EDGE OF THE SEAL IS A MINIMUM OF 0.25 INCH (6.4 mm) FROM THE EDGE OF THE WASHER.

E53347 S0006415662_V2

Fuel Tank Wiring Harness Installation
Figure 401/28-41-05-990-801 (Sheet 5 of 10)

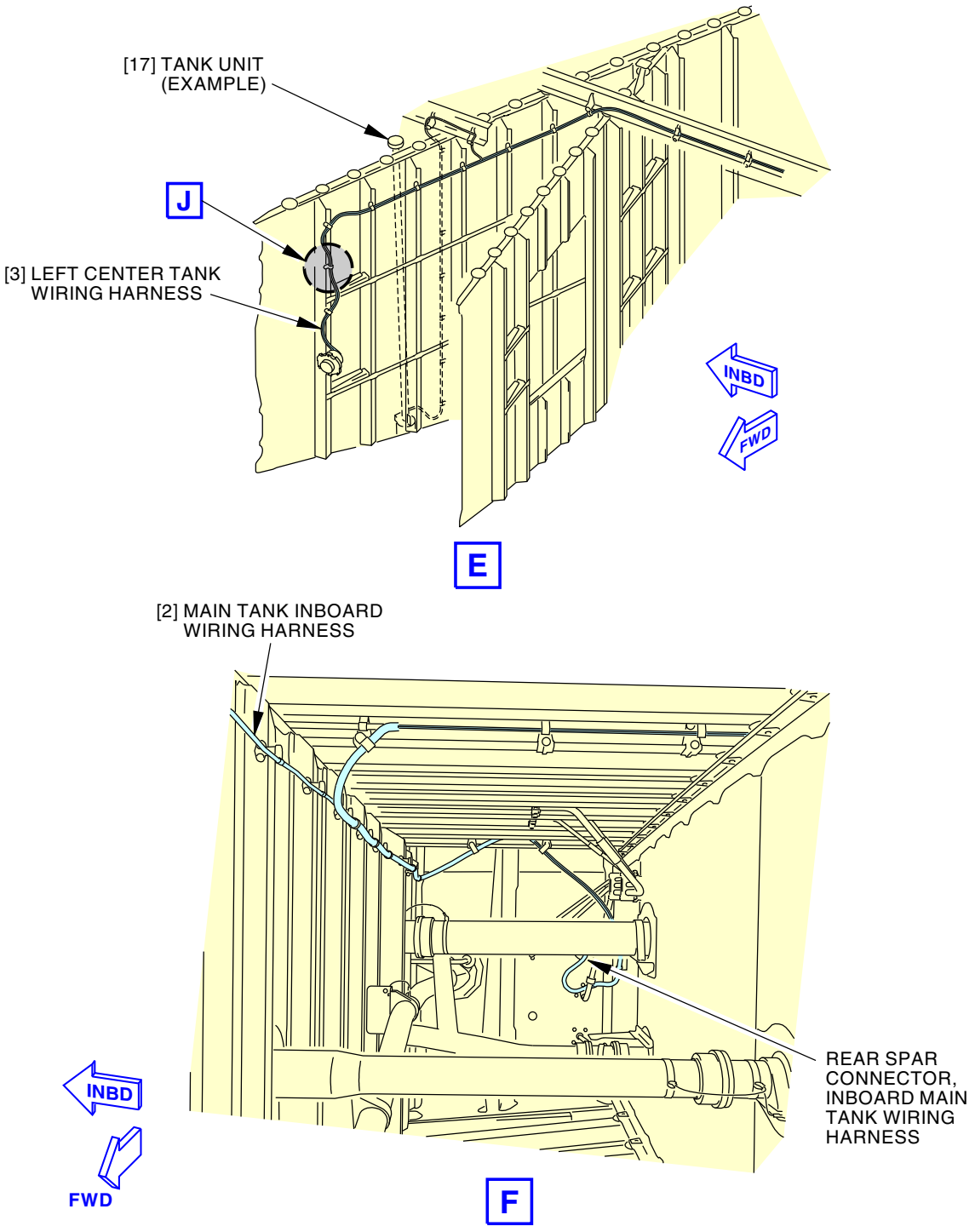
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E28242 S0006415664_V2

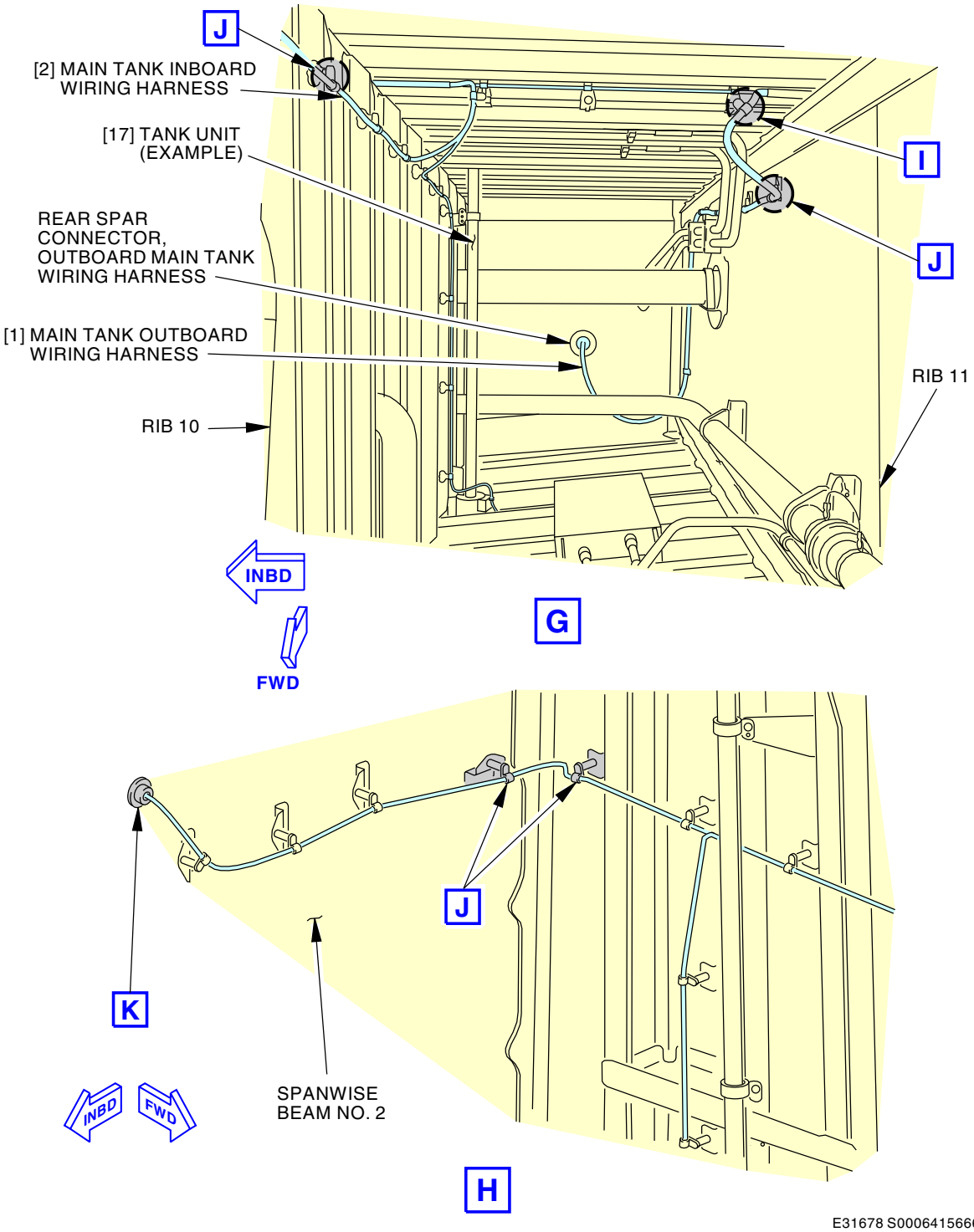
Fuel Tank Wiring Harness Installation
Figure 401/28-41-05-990-801 (Sheet 6 of 10)

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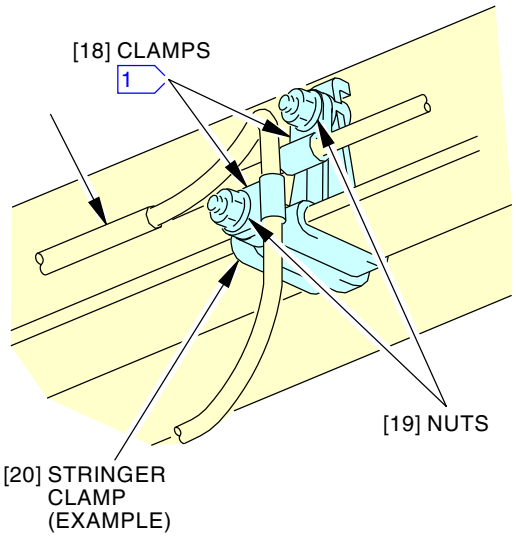
Fuel Tank Wiring Harness Installation
Figure 401/28-41-05-990-801 (Sheet 7 of 10)

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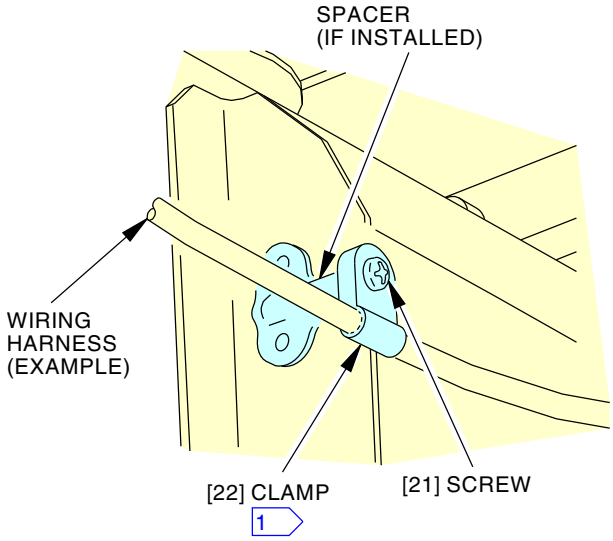


Fuel Tank Wiring Harness Installation
Figure 401/28-41-05-990-801 (Sheet 8 of 10)

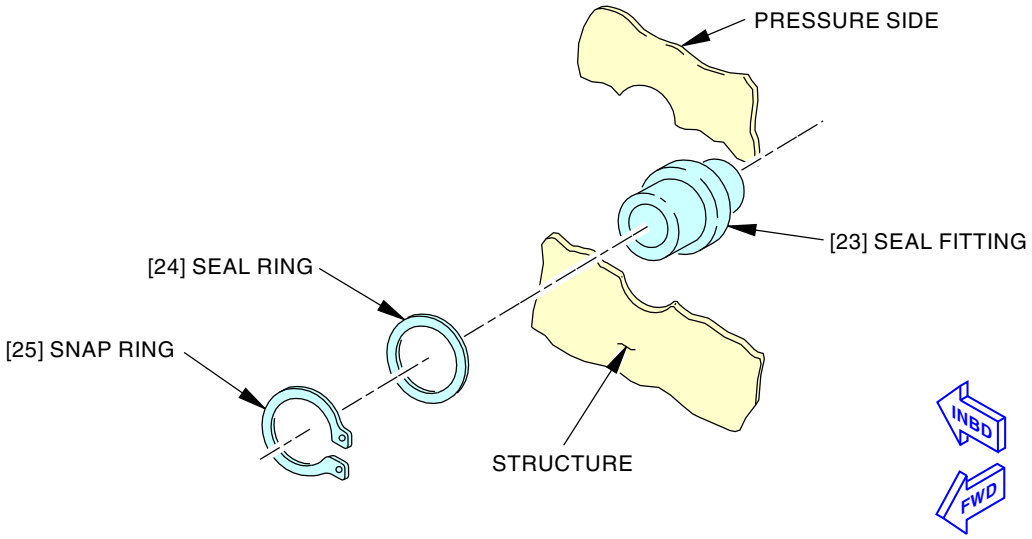
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I



J



SEAL FITTING AT SPANWISE BEAM PENETRATION

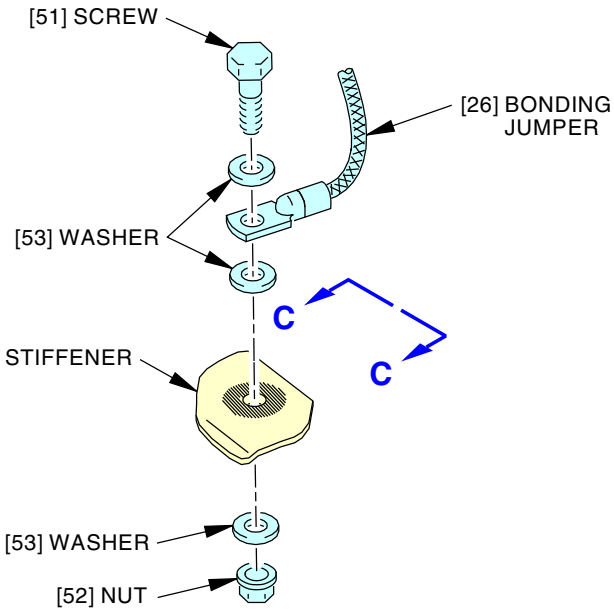
K

1 IF NECESSARY, USE AN APPLICABLE QUANTITY OF M25988-1-014 0-RINGS AS FILLER MATERIAL IN THE CLAMP TO PREVENT WIRE MOVEMENT.

H95111 S0006415667_V4

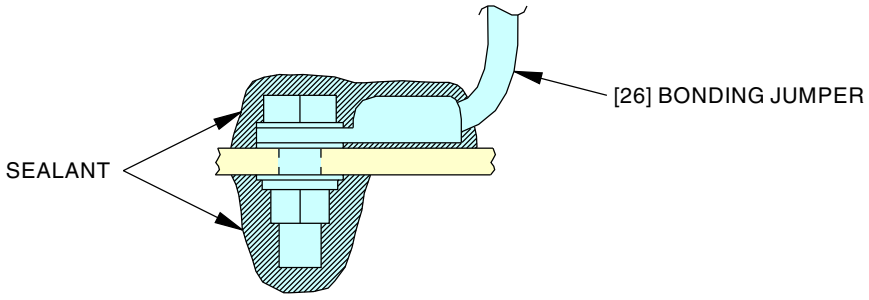
Fuel Tank Wiring Harness Installation
Figure 401/28-41-05-990-801 (Sheet 9 of 10)

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BONDING JUMPER CONNECTION TO STRUCTURE BY STIFFENER

M



(EXAMPLE - AFTER INSTALLATION)

C-C

M18077 S0006415668_V3

Fuel Tank Wiring Harness Installation
Figure 401/28-41-05-990-801 (Sheet 10 of 10)

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TASK 28-41-05-400-801

3. FQIS In-Tank Wiring Harness - Installation

(Figure 401)

A. General

(1) This task has one or more steps which are a means to satisfy Critical Design Configuration Control Limitation (CDCCL) requirements. A CDCCL note will follow the step to which it applies. Any step or sub-step that precedes or follows a CDCCL identified step is not subject to the CDCCL requirement.

(a) For important information on CDCCL requirements, refer to this task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitations 28-AWL-04 and 28-AWL-15.

(2) For applying sealants in the fuel tank structure(s), it is acceptable to use sealant, A50303, as an alternative to sealant, A00767, for Class A and B non-faying seal applications:

(a) sealant, A50153, and sealant, A50301, are mutually interchangeable.

(b) sealant, A50110, and sealant, A50302, are mutually interchangeable.

(c) sealant, A50153, cannot be used in combination with sealant, A50302, and sealant, A50301, cannot be used with sealant, A50110.

B. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
12-11-01-650-801	Pressure Refueling (P/B 301)
20-10-23-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
20-30-82-910-801	General Cleaning of Solvent Resistant Organic Coatings (Series 82) (P/B 201)
24-22-00-860-805	Supply Electrical Power (P/B 201)
28-00-00-910-801	Airworthiness Limitation Precautions (P/B 201)
28-11-00-300-802	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-11-00-410-801	Fuel Tank Closure (P/B 201)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)
28-41-00-710-801	Fuel Quantity Indicating System (FQIS) TANK UNITS and DENSITOMETERS - Operational Check (P/B 501)
28-41-00-710-802	Fuel Quantity Processor Unit (FQPU) - Operational Check (P/B 501)
SWPM 20-10-15	ASSEMBLY OF SHIELD GROUND WIRES
SWPM 20-10-20	Standard Wiring Practices Manual
SWPM 20-20-00	Standard Wiring Practices Manual
SWPM 20-60-06	Standard Wiring Practices Manual

C. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

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Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

D. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
A50110	Sealant	BMS5-45 Class B-2
A50153	Sealant - Fuel Tank - Class A-2	BMS5-45 Class A-2
A50301	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168 Type I Class A-2
A50302	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168 Type I Class B-2
A50303	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168
B00148	Solvent - Methyl Ethyl Ketone (MEK)	ASTM D740
B00184	Solvent - Presealing, Cleaning Solvent	BMS11-7
B00666	Solvent - Methyl Propyl Ketone	BMS11-9
B01002	Solvent - General Cleaning Of Solvent Resistant Organic Coatings - Series 82	
B01026	Solvent - FCC-55	
B01054	Solvent - Methyl Ethyl Ketone and sec-Butyl Alcohol Blend - (MEK:secButyl Alcohol - 42:58 Percent)	BAC5750, ASTM D740/ASTM D1007
D00504	Grease - Petrolatum	VV-P-236
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
6	O-ring	28-41-05-01-150	ARO ALL
		28-41-05-01-250	ARO ALL

F. Location Zones

Zone	Area
134	Wing Center Section, Right
139	Forward Keel Beam
511	Leading Edge to Front Spar - Inboard of Nacelle Strut - Left Wing
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182

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(Continued)

Zone	Area
551	Rear Spar to Landing Gear Support Beam - Left Wing
611	Leading Edge to Front Spar - Inboard of Nacelle Strut - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182
651	Rear Spar to Landing Gear Support Beam - Right Wing

G. Access Panels

Number	Name/Location
511FB	Inboard Fixed Leading Edge Panel
551DB	Inboard Fixed Trailing Edge Panel
611FB	Inboard Fixed Leading Edge Panel
651DB	Inboard Fixed Trailing Edge Panel

H. Procedure

SUBTASK 28-41-05-650-005



WARNING

OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-41-05-960-001

(2) Do the steps that follow to install the red end of bonding jumper [26] to the airplane structure:

(a) Clean the airplane structure or ground stud with solvent, B00184, FCC-55 solvent, B01026, solvent, B01054, solvent, B00148, or solvent, B00666, and a clean cotton wiper, G00034.

(b) Install the screw [51], washers [53] and nut [52] to attach the red end of the bonding jumper [26] to the stiffener.

(c) Measure the electrical bonding resistance between the red end of the bonding jumper [26] and the structure (SWPM 20-20-00).

1) Use an intrinsically safe approved bonding meter, COM-1550.

2) Make sure the electrical bonding resistance is 0.001 ohm (1 milliohm) or less.

SUBTASK 28-41-05-420-001

(3) To install the adapter [7] into the wing spar (if it is removed), do these steps:

(a) To get access to the spar connector, for the left center tank wiring harness (TASK 06-44-00-800-802):

1) Open this access panel:

Number	Name/Location
511FB	Inboard Fixed Leading Edge Panel

(b) To get access to the spar connector, for the right center tank wiring harness (TASK 06-44-00-800-802):

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1) Open this access panel:

Number	Name/Location
611FB	Inboard Fixed Leading Edge Panel

(c) To get access to the rear spar connector for the left main tank wiring harnesses (TASK 06-44-00-800-802):

1) Open this access panel:

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

(d) To get access to the rear spar connector, for the right main tank wiring harness (TASK 06-44-00-800-802):

1) Open this access panel:

Number	Name/Location
651DB	Inboard Fixed Trailing Edge Panel

(e) Clean the surfaces that touch between the wing spar and the adapter [7] with solvent and clean cotton wipers, G00034.

1) Use solvent, B00184, FCC-55 solvent, B01026, solvent, B01054, solvent, B00148, or solvent, B00666, to clean the surfaces.

(f) Put a new o-ring [8] on the adapter [7].

1) Apply a thin layer of petrolatum grease, D00504, to the o-ring [8].

(g) Install the bolts [11], if removed, into the adapter [7].

(h) Put the adapter [7] in its position in the wing spar, from out of the fuel tank.

(i) Apply sealant, A00767 (or equivalent), to the threads of the adapter [7], in the fuel tank (TASK 28-11-00-300-802).

NOTE: Do this before you install the washer [9] and jamnut [10].

(j) Install the washer [9] and jamnut [10] on to the adapter [7], from in the fuel tank.

(k) Tighten the jamnut [10] to between 990 ±5 in-lb (112 ±1 N·m).

(l) Measure the electrical bonding resistance between the adapter [7] and the airplane structure (SWPM 20-20-00).

1) Use an intrinsically safe approved bonding meter, COM-1550.

2) Make sure the electrical bonding resistance is 0.0005 ohm (0.5 milliohm) or less.

(m) Use a brush to apply sealant, A00767 (or equivalent), to the washer [9], the jamnut [10], the adjacent structure, and the threads of the adapter [7].

(n) Apply a fillet seal of sealant, A00767 (or equivalent), on the outer surface of the washer [9], the jamnut [10], and the threads of the adapter [7] (Figure 401, View A-A) (TASK 28-11-00-300-802).

NOTE: Build up the fillet seal until the edge of the seal is a minimum of 0.25 in. (6.35 mm) from the edge of the washer.

(o) Install lockwire to the jamnut [10] (TASK 20-10-23-400-801).

SUBTASK 28-41-05-420-002

(4) To connect the wire harness [1], wire harness [2], wire harness [3], or wire harness [4] to the spar connector and put the wiring harnesses into the fuel tank, do these steps:

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(a) Clean the surfaces that touch between the receptacle [5] and the adapter [7] with Series 82 solvent, B01002 (TASK 20-30-82-910-801).

(b) Apply a thin layer of petrolatum grease, D00504, to a new o-ring [6] and put the o-ring [6] on the receptacle [5] (over the receptacle).

(c) Put the applicable wire harness [1], wire harness [2], wire harness [3], or wire harness [4] into the applicable fuel tank (through the adapter [7] installed in the wing spar).

(d) Put the receptacle [5] on the adapter [7].

(e) Do these steps to install a bonding jumper [26] between the receptacle [5] and the spar structure:

1) Install the bonding jumper [26] on the receptacle [5].

2) Install the washer [12] and nut [13] that connects the bonding jumper [26] to the receptacle [5].

28-AWL-04: CDCCL

3) Make sure the bonding jumper [26] is installed between the bolt [11] on the receptacle [5] and a stiffener on the spar.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-04.

28-AWL-04: CDCCL

4) Make sure the red end of the bonding jumper [26] is attached to the spar stiffener.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-04.

5) Tighten the nut [13] for the bonding jumper [26] to a torque of 33 in-lb (3.7 N·m) - 40 in-lb (4.5 N·m).

6) Install the remaining five washers [12] and the five nuts [13] that connect the receptacle [5] to the adapter [7].

7) Measure the electrical bonding resistance between the blue end of the bonding jumper [26] and the receptacle [5] (SWPM 20-20-00).

a) Use an intrinsically safe approved bonding meter, COM-1550.

b) Make sure that the electrical bonding resistance is 0.001 ohm (1 milliohm) or less.

28-AWL-04: CDCCL

8) Measure the electrical bonding resistance between the receptacle [5] and the spar (SWPM 20-20-00).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-04.

a) Use an intrinsically safe approved bonding meter, COM-1550.

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28-AWL-04: CDCCL

b) Make sure the electrical bonding resistance is 0.0030 ohm (3.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-04.

28-AWL-04: CDCCL

9) Apply a cap seal over both ends of the bonding jumper [26] terminal lugs (Figure 401, View B-B and View C-C).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-04.

a) Use sealant, A00767 (or equivalent), for the cap seals.

10) Measure the bonding resistance between the receptacle [5] and the adapter [7] with an intrinsically safe approved bonding meter, COM-1550(SWPM 20-20-00).

a) Make sure that the resistance is 0.0005 ohm (0.5 milliohm) or less.

(f) Apply a fillet seal of sealant, A00767 (or equivalent), over the nuts [13], washers [12], receptacle [5], and adapter [7], down to the wing spar (Figure 401, View A-A) (TASK 28-11-00-300-802).

SUBTASK 28-41-05-020-012

(5) To connect the applicable wiring harness; wire harness [1], wire harness [2], wire harness [3], or wire harness [4], in the fuel tank, do these steps:

NOTE: If necessary, use an applicable quantity of M25988-1-014 o-rings as filler material in the clamp to prevent wire movement.

28-AWL-15: CDCCL

(a) Maintain the existing (or newly approved) wiring harness routing, clamping, and sleeving.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-15.

28-AWL-15: CDCCL

(b) Make sure the wiring harness, clamps and sleeving are not damaged.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-15.

28-AWL-15: CDCCL

(c) Make sure the wires are not chafed.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-15.

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CAUTION

MAKE SURE THAT THE WIRING DOES NOT TOUCH THE AIRPLANE STRUCTURE. IF THE WIRING TOUCHES THE AIRPLANE STRUCTURE, DAMAGE TO EQUIPMENT CAN OCCUR.

(d) Adjust wire slack to make sure the wires are not in contact with the structure.

28-AWL-15: CDCCL

1) Make sure the wire harness clearance between the wires and structure, accounting for slack in all directions), is a minimum of 0.125 in. (3.2 mm).

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-15.

(e) Put the wiring harness through each fuel bay, from the fuel bay with the spar connector (Figure 401).

NOTE: The clamp and bracket installations in the fuel tank will help find the wire installation locations.

(f) Install the seal fitting [23] with the seal ring [24] and snap ring [25] (SWPM 20-10-20).

CAUTION

MAKE SURE THAT THE WIRING DOES NOT TOUCH THE AIRPLANE STRUCTURE. IF THE WIRING TOUCHES THE AIRPLANE STRUCTURE, DAMAGE TO EQUIPMENT CAN OCCUR.

(g) Install all of the clamps [18] and clamps [22] that attach the tank wiring harness to the structure in the fuel tank.

SUBTASK 28-41-05-020-005

(6) To connect the applicable wiring harness; wire harness [1], wire harness [2], wire harness [3], or wire harness [4], to the applicable tank units [17], do these steps:

(a) Connect two faston connectors to each tank unit [17].

(b) Install the rubber grommet on the wiring to each tank unit [17].

SUBTASK 28-41-05-420-003

(7) To connect the applicable wiring harness; wire harness [2] or wire harness [4] to the densitometer [15], do these steps:

(a) Connect the faston connectors to the densitometer [15].

(b) Install the wiring in the clamp on the densitometer and tighten the clamp.

SUBTASK 28-41-05-020-006

(8) To connect the applicable wiring harness; wire harness [2], wire harness [3], or wire harness [4], to the applicable water detector [16], do these steps:

(a) Connect the two faston connectors to the water detector [16].

(b) Install the rubber grommet, on the wiring, to the water detector [16].

SUBTASK 28-41-05-800-001

(9) Make sure you remove all the unwanted materials from the fuel tank.

SUBTASK 28-41-05-800-002

(10) Go out of the applicable fuel tank (TASK 28-11-00-410-801).

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(a) To install the applicable main tank access doors, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

(b) To install the applicable center tank access doors, do this task: Center Tank Access Door - Installation, TASK 28-11-02-400-801.

SUBTASK 28-41-05-420-008

(11) Install the plug [14] for the spar connector (SWPM 20-20-00, SWPM 20-60-06).

(a) Make sure the wiring harness is shielded and that the shield ground is terminated (SWPM 20-20-00 and SWPM 20-10-15).

28-AWL-04: CDCCL

(b) Measure the electrical bonding resistance between the plug [14] backshell and the receptacle [5].

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-04.

1) Use an intrinsically safe approved bonding meter, COM-1550.

28-AWL-04: CDCCL

2) Make sure the electrical bonding resistance is 0.0030 ohm (3.0 milliohms) or less.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, TASK 28-00-00-910-801, for important information on Critical Design Configuration Control Limitations (CDCCLs).

NOTE: This is applicable to Airworthiness Limitation 28-AWL-04.

SUBTASK 28-41-05-860-001

(12) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-41-05-700-001

(13) Do this task: Fuel Quantity Indicating System (FQIS) TANK UNITS and DENSITOMETERS - Operational Check, TASK 28-41-00-710-801.

SUBTASK 28-41-05-700-003

(14) Do this task: Fuel Quantity Processor Unit (FQPU) - Operational Check, TASK 28-41-00-710-802.

SUBTASK 28-41-05-650-004

(15) Do this task: Pressure Refueling, TASK 12-11-01-650-801.

SUBTASK 28-41-05-700-002

(16) Make sure there is no fuel leakage at the applicable spar connector.

(a) For the front spar connectors to the left and right center tank wiring harnesses, close the applicable access panels:

(TASK 06-44-00-800-802)

Number	Name/Location
511FB	Inboard Fixed Leading Edge Panel
611FB	Inboard Fixed Leading Edge Panel

(b) For the rear spar connectors to the left and right main tank wiring harnesses, close the applicable access panels:

(TASK 06-44-00-800-802)

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Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel
651DB	Inboard Fixed Trailing Edge Panel

END OF TASK

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FUEL TANK WIRING HARNESS -INSPECTION/CHECK

1. General

A. This procedure contains scheduled maintenance task data.

B. This procedure contains these tasks:

(1) FQIS Wiring and Component Visual Inspection

(2) FQIS, No. 1 Tank - Inspection

(3) FQIS, No. 2 Tank - Inspection

(4) FQIS, Center Tank - Inspection

SFAR 88

TASK 28-41-05-210-801

2. FQIS Wiring and Component Visual Inspection

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

B. Procedure

SUBTASK 28-41-05-210-002

(1) Examine the wiring for these problems:

(a) Insulation that is abraded, cracked or over-stressed.

(b) Conductors or shields that are broken or exposed.

(c) Clearance from the structure that is not sufficient.

(d) Clamps that are loose, bent, or missing.

(e) Corrosion.

(f) Electrical connectors and seals for damage, wear or fuel leakage.

(g) Wiring that is routed incorrectly.

SUBTASK 28-41-05-210-003

(2) Examine the tank units, densitometers, and water detectors for these problems:

(a) Make sure the wiring is correctly attached to the terminals.

(b) Wiring to the terminals that is damaged or is incorrectly routed.

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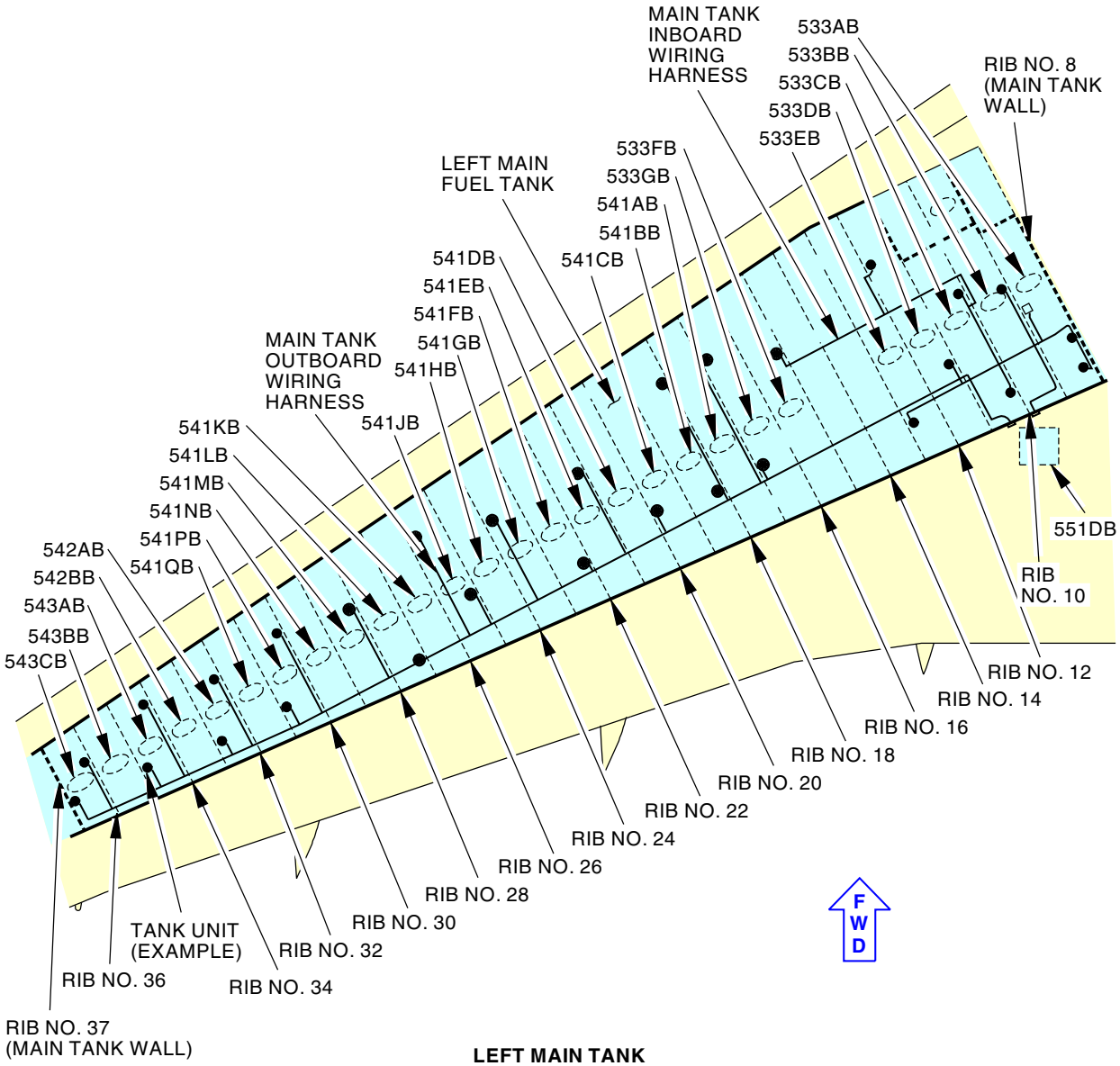
(c) An end cap that is missing (tank unit).

(d) Clearance from the structure that is not sufficient.

(e) Mounting brackets and hardware that are loose or corroded.

——— END OF TASK ———

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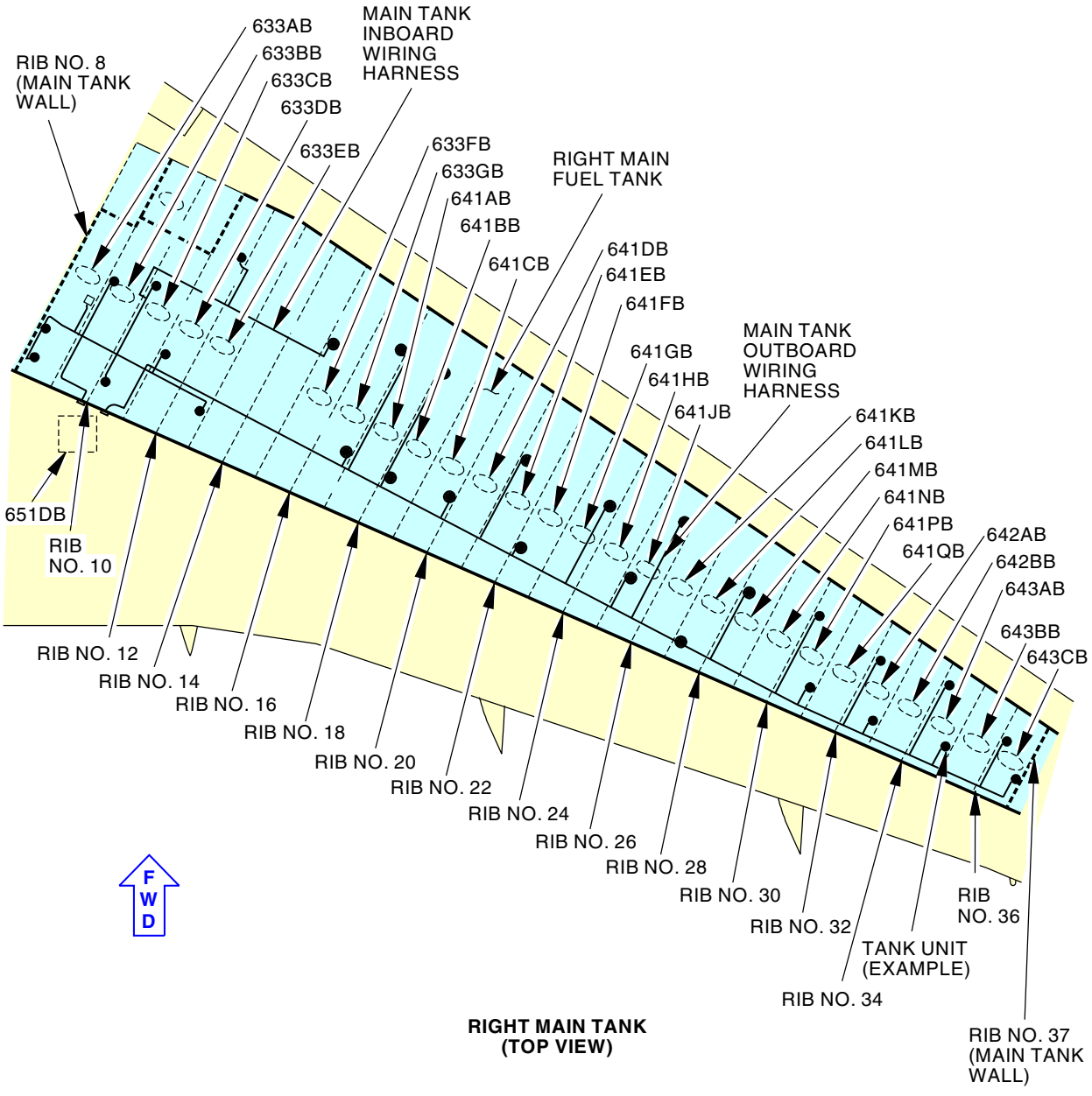


LEFT MAIN TANK (TOP VIEW)

D67994 S0000162708_V2

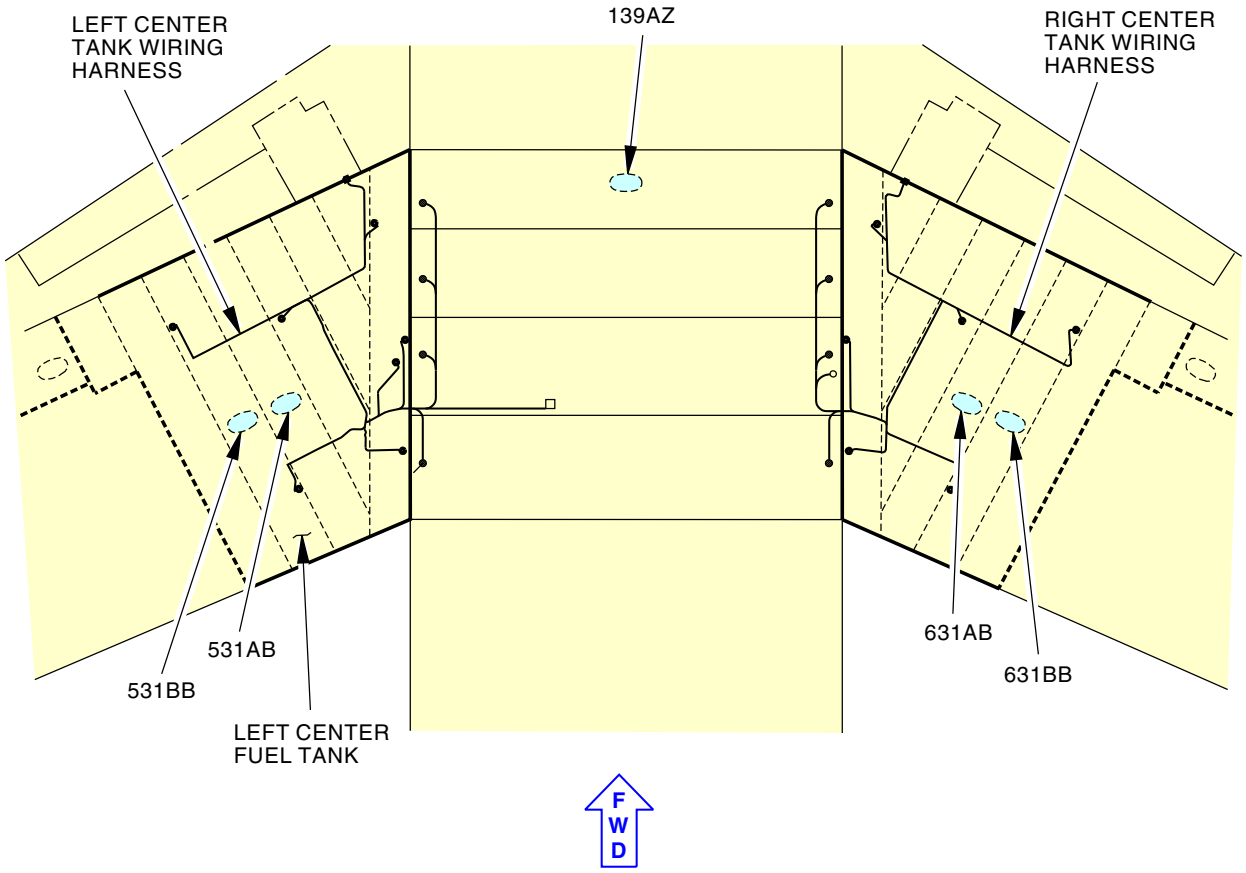
Fuel Tank Wiring Harness Location
Figure 601/28-41-05-990-802 (Sheet 1 of 3)

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Fuel Tank Wiring Harness Location
Figure 601/28-41-05-990-802 (Sheet 2 of 3)

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**CENTER TANK
(TOP VIEW)**

M45365 S0006415676_V3

**Fuel Tank Wiring Harness Location
Figure 601/28-41-05-990-802 (Sheet 3 of 3)**

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SFAR 88

TASK 28-41-05-280-801

3. FQIS, Left Main Fuel Tank - Inspection

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)

B. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182

C. Access Panels

Number	Name/Location
533AB	Access Door
533BB	Access Door
533CB	Access Door
533DB	Access Door
533EB	Access Door
533FB	Access Door
533GB	Access Door
541AB	Access Door
541BB	Access Door
541CB	Access Door
541DB	Access Door
541EB	Access Door
541FB	Access Door
541GB	Access Door
541HB	Access Door
541JB	Access Door
541KB	Access Door
541LB	Access Door
541MB	Access Door
541NB	Access Door
541PB	Access Door
541QB	Access Door
542AB	Access Door
542BB	Access Door
543AB	Access Door

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(Continued)

Number	Name/Location
543BB	Access Door
543CB	Access Door

D. Procedure

SUBTASK 28-41-05-750-001

(1) For the area in the left main fuel tank between rib No. 8 (inboard tank end) and rib No. 9, do these steps:

(a) Remove this access door.

(TASK 28-11-01-000-801)

Number	Name/Location
533AB	Access Door

(b) For all FQIS wiring and components between Rib No. 8 and Rib No. 9, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(c) Go into the opening for access door 533AB.

(d) If access is not necessary for subsequent tasks, close this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
533AB	Access Door

SUBTASK 28-41-05-750-002

(2) For the area in the left main fuel tank between rib No. 9 and rib No. 10, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
533BB	Access Door

(b) For all FQIS wiring and components between Rib No. 9 and Rib No. 10, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(c) Go into the opening for access door 533BB.

(d) If access is not necessary for subesquent tasks, close this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
533BB	Access Door

SUBTASK 28-41-05-280-001

(3) For the area in the left main fuel tank between rib No. 10 and rib No. 11, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
533CB	Access Door

(b) Go into the opening for access door 533CB.

(c) For all FQIS wiring and components between Rib No. 10 and Rib No. 11, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

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(d) If access is not necessary for subsequent tasks, close this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
533CB	Access Door

SUBTASK 28-41-05-280-002

(4) For the area in the left fuel tank between rib No. 11 and rib No. 12, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
533DB	Access Door

(b) Go into the opening for access door 533DB.

(c) For all FQIS wiring and components between Rib No. 11 and Rib No. 12, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, close this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
533DB	Access Door

SUBTASK 28-41-05-280-003

(5) For the area in the left main fuel tank between rib No. 12 and rib No. 14, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
533EB	Access Door

(b) Go into the opening for access door 533EB.

(c) For all FQIS wiring and components between Rib No. 12 and Rib No. 14, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, close this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
533EB	Access Door

SUBTASK 28-41-05-280-004

(6) For the area in the left main fuel tank between rib No. 14 and rib No. 16, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
533FB	Access Door

(b) Go into the opening for access door 533FB.

(c) For all FQIS wiring and components between Rib No. 14 and Rib No. 16, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, close this access door:

(TASK 28-11-01-400-801)

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Number	Name/Location
533FB	Access Door

SUBTASK 28-41-05-280-005

(7) For the area in the left main fuel tank between rib No. 16 and rib No. 17, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
533GB	Access Door

(b) Go into the opening for access door 533GB.

(c) For all FQIS wiring and components between Rib No. 16 and Rib No. 17, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, close this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
533GB	Access Door

SUBTASK 28-41-05-280-006

(8) For the area in the left main fuel tank between rib No. 17 and rib No. 18, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
541AB	Access Door

(b) Go into the opening for access door 541AB.

(c) For all FQIS wiring and components between Rib No. 17 and Rib No. 18, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801).

(d) If access is not necessary for subsequent tasks, close this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
541AB	Access Door

SUBTASK 28-41-05-280-007

(9) For the area in the left main fuel tank between rib No. 18 and rib No. 19, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
541BB	Access Door

(b) Go into the opening for access door 541BB.

(c) For all FQIS wiring and components between Rib No. 18 and Rib No. 19, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, close this access door:

(TASK 28-11-01-400-801)

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Number	Name/Location
541BB	Access Door

SUBTASK 28-41-05-280-008

(10) For the area in the left main fuel tank between rib No. 19 and rib No. 20, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
541CB	Access Door

(b) Go into the opening for access door 541CB.

(c) For all FQIS wiring and components between Rib No. 19 and Rib No. 20, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, close this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
541CB	Access Door

SUBTASK 28-41-05-280-009

(11) For the area in the left main fuel tank between rib No. 20 and rib No. 21, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
541DB	Access Door

(b) Go into the opening for access door 541DB.

(c) For all FQIS wiring and components between Rib No. 20 and Rib No. 21, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, close this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
541DB	Access Door

SUBTASK 28-41-05-280-010

(12) For the area in the left main fuel tank between rib No. 21 and rib No. 22, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
541EB	Access Door

(b) Go into the opening for access door 541EB.

(c) For all FQIS wiring and components between Rib No. 21 and Rib No. 22, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, close this access door:

(TASK 28-11-01-400-801)

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Number	Name/Location
541EB	Access Door

SUBTASK 28-41-05-280-011

(13) For the area in the left main fuel tank between rib No. 22 and rib No. 23, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
541FB	Access Door

(b) Go into the opening for access door 541FB.

(c) For all FQIS wiring and components between Rib No. 22 and Rib No. 23, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, close this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
541FB	Access Door

SUBTASK 28-41-05-280-012

(14) For the area in the left main fuel tank between rib No. 23 and rib No. 24, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
541GB	Access Door

(b) Go into the opening for access door 541GB.

(c) For all FQIS wiring and components between Rib No. 23 and Rib No. 24, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, close this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
541GB	Access Door

SUBTASK 28-41-05-280-013

(15) For the area in the left main fuel tank between rib No. 24 and rib No. 25, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
541HB	Access Door

(b) Go into the opening for access door 541HB.

(c) For all FQIS wiring and components between Rib No. 24 and Rib No. 25, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, close this access door:

(TASK 28-11-01-400-801)

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Number	Name/Location
541HB	Access Door

SUBTASK 28-41-05-280-014

(16) For the area in the left main fuel tank between rib No. 25 and rib No. 26, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
541JB	Access Door

(b) Go into the opening for access for access door 541JB.

(c) For all FQIS wiring and components between Rib No. 25 and Rib No. 26, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, close this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
541JB	Access Door

SUBTASK 28-41-05-280-015

(17) Remove the Access Door

For the area in the left main fuel tank between rib No. 26 and rib No. 27, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
541KB	Access Door

(b) Go into the opening for access door 541KB.

(c) For all FQIS wiring and components between Rib No. 26 and Rib No. 27, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, close this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
541KB	Access Door

SUBTASK 28-41-05-280-016

(18) For the area in the left main fuel tank between rib No. 27 and rib No. 28, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
541LB	Access Door

(b) Go into the opening for access door 541LB.

(c) For all FQIS wiring and components between Rib No. 27 and Rib No. 28, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, close this access door:

(TASK 28-11-01-400-801)

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Number	Name/Location
541LB	Access Door

SUBTASK 28-41-05-280-017

(19) For the area in the left main fuel tank between rib No. 28 and rib No. 29, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
541MB	Access Door

(b) Go into the opening for access door 541MB.

(c) For all FQIS wiring and components between Rib No. 28 and Rib No. 29, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, remove this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
541MB	Access Door

SUBTASK 28-41-05-280-018

(20) For the area in the left main fuel tank between rib No. 29 and rib No. 30, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
541NB	Access Door

(b) Go into the opening for access door 541NB.

(c) For all FQIS wiring and components between Rib No. 29 and Rib No. 30, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, close this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
541NB	Access Door

SUBTASK 28-41-05-280-019

(21) For the area in the left main fuel tank between rib No. 30 and rib No. 31, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
541PB	Access Door

(b) Go into the opening for access door 541PB.

(c) For all FQIS wiring and components between Rib No. 30 and Rib No. 31, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, close this access door:

(TASK 28-11-01-400-801)

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Number	Name/Location
541PB	Access Door

SUBTASK 28-41-05-280-045

(22) For the area in the left main fuel tank between rib No. 31 and rib No. 32, do these steps:

(a) Remove this access panel:

(TASK 28-11-01-000-801)

Number	Name/Location
541QB	Access Door

(b) Go into the opening for access door 541QB.

(c) For all FQIS wiring and components between Rib No. 31 and Rib No. 32, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access panel:

(TASK 28-11-01-400-801)

Number	Name/Location
541QB	Access Door

SUBTASK 28-41-05-280-046

(23) For the area in the left main fuel tank between rib No. 32 and rib No. 33, do these steps:

(a) Remove this access panel:

(TASK 28-11-01-000-801)

Number	Name/Location
542AB	Access Door

(b) Go into the opening for access door 542AB.

(c) For all FQIS wiring and components between Rib No. 32 and Rib No. 33, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access panel:

(TASK 28-11-01-400-801)

Number	Name/Location
542AB	Access Door

SUBTASK 28-41-05-280-047

(24) For the area in the left main fuel tank between rib No. 33 and rib No. 34, do these steps:

(a) Remove this access panel:

(TASK 28-11-01-000-801)

Number	Name/Location
542BB	Access Door

(b) Go into the opening for access door 542BB.

(c) For all FQIS wiring and components between Rib No. 33 and Rib No. 34, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access panel:

(TASK 28-11-01-400-801)

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Number	Name/Location
542BB	Access Door

SUBTASK 28-41-05-280-048

(25) For the area in the left main fuel tank between rib No. 34 and rib No. 35, do these steps:

(a) Remove this access panel:

(TASK 28-11-01-000-801)

Number	Name/Location
543AB	Access Door

(b) Go into the opening for access door 543AB.

(c) For all FQIS wiring and components between Rib No. 34 and Rib No. 35, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access panel:

(TASK 28-11-01-400-801)

Number	Name/Location
543AB	Access Door

SUBTASK 28-41-05-280-049

(26) For the area in the left main fuel tank between rib No. 35 and rib No. 36, do these steps:

(a) Remove this access panel:

(TASK 28-11-01-000-801)

Number	Name/Location
543BB	Access Door

(b) Go into the opening for access door 543BB.

(c) For all FQIS wiring and components between Rib No. 35 and Rib No. 36, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access panel:

(TASK 28-11-01-400-801)

Number	Name/Location
543BB	Access Door

SUBTASK 28-41-05-280-050

(27) For the area in the left main fuel tank between rib No. 36 and rib No. 37, do these steps:

(a) Remove this access panel:

(TASK 28-11-01-000-801)

Number	Name/Location
543CB	Access Door

(b) Go into the opening for access door 543CB.

(c) For all FQIS wiring and components between Rib No. 36 and Rib No. 37, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access panel:

(TASK 28-11-01-400-801)

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Number	Name/Location
543CB	Access Door

END OF TASK

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TASK 28-41-05-280-802

4. FQIS, Right Main Fuel Tank - Inspection

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)

B. Location Zones

Zone	Area
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

C. Access Panels

Number	Name/Location
633AB	Access Door
633BB	Access Door
633CB	Access Door
633DB	Access Door
633EB	Access Door
633FB	Access Door
633GB	Access Door
641AB	Access Door
641BB	Access Door
641CB	Access Door
641DB	Access Door
641EB	Access Door
641FB	Access Door
641GB	Access Door
641HB	Access Door
641JB	Access Door
641KB	Access Door
641LB	Access Door
641MB	Access Door
641NB	Access Door
641PB	Access Door
641QB	Access Door

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(Continued)

Number	Name/Location
642AB	Access Door
642BB	Access Door
643AB	Access Door
643BB	Access Door
643CB	Access Door

D. Procedure

SUBTASK 28-41-05-750-003

(1) For the area in the right main fuel tank between rib No. 8 (inboard tank end) and rib No. 9, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
633AB	Access Door

(b) For all FQIS wiring and components between Rib No. 8 and Rib No. 9, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(c) Go into the opening for access door 633AB.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
633AB	Access Door

SUBTASK 28-41-05-750-004

(2) For the area in the right main fuel tank between rib No. 9 and rib No. 10, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
633BB	Access Door

(b) For all FQIS wiring and components between Rib No. 9 and Rib No. 10, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801

(c) Go into the opening for access door 633BB.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
633BB	Access Door

SUBTASK 28-41-05-280-020

(3) For the area in the right main fuel tank between rib No. 10 and rib No. 11, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
633CB	Access Door

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(b) Go into the opening for access door 633CB.

(c) For all FQIS wiring and components between Rib No. 10 and Rib No. 11, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
633CB	Access Door

SUBTASK 28-41-05-280-021

(4) For the area in the right fuel tank between rib No. 11 and rib No. 12, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
633DB	Access Door

(b) Go into the opening for access door 633DB.

(c) For all FQIS wiring and components between Rib No. 11 and Rib No. 12, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
633DB	Access Door

SUBTASK 28-41-05-280-022

(5) For the area in the right main fuel tank between rib No. 12 and rib No. 14, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
633EB	Access Door

(b) Go into the opening for access door 633EB.

(c) For all FQIS wiring and components between Rib No. 12 and Rib No. 14, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
633EB	Access Door

SUBTASK 28-41-05-280-023

(6) For the area in the right main fuel tank between rib No. 14 and rib No. 16, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
633FB	Access Door

(b) Go into the opening for access door 633FB.

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(c) For all FQIS wiring and components between Rib No. 14 and Rib No. 16, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
633FB	Access Door

SUBTASK 28-41-05-280-024

(7) For the area in the right main fuel tank between rib No. 16 and rib No. 17, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
633GB	Access Door

(b) Go into the opening for access door 633GB.

(c) For all FQIS wiring and components between Rib No. 16 and Rib No. 17, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
633GB	Access Door

SUBTASK 28-41-05-280-025

(8) For the area in the right main fuel tank between rib No. 17 and rib No. 18, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
641AB	Access Door

(b) Go into the opening for access door 641AB.

(c) For all FQIS wiring and components between Rib No. 17 and Rib No. 18, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
641AB	Access Door

SUBTASK 28-41-05-280-026

(9) For the area in the right main fuel tank between rib No. 18 and rib No. 19, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
641BB	Access Door

(b) Go into the opening for access door 641BB.

(c) For all FQIS wiring and components between Rib No. 18 and Rib No. 19, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

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(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
641BB	Access Door

SUBTASK 28-41-05-280-027

(10) For the area in the right main fuel tank between rib No. 19 and rib No. 20, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
641CB	Access Door

(b) Go into the opening for access door 641CB.

(c) For all FQIS wiring and components between Rib No. 19 and Rib No. 20, do this task:FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
641CB	Access Door

SUBTASK 28-41-05-280-028

(11) For the area in the right main fuel tank between rib No. 20 and rib No. 21, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
641DB	Access Door

(b) Go into the opening for access door 641DB.

(c) For all FQIS wiring and components between Rib No. 20 and Rib No. 21, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
641DB	Access Door

SUBTASK 28-41-05-280-029

(12) For the area in the right main fuel tank between rib No. 21 and rib No. 22, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
641EB	Access Door

(b) Go into the opening for access door 641EB.

(c) For all FQIS wiring and components between Rib No. 21 and Rib No. 22, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-01-400-801)

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Number	Name/Location
641EB	Access Door

SUBTASK 28-41-05-280-030

(13) For the area in the right main fuel tank between rib No. 22 and rib No. 23, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
641FB	Access Door

(b) Go into the opening for access door 641FB.

(c) For all FQIS wiring and components between Rib No. 22 and Rib No. 23, do this task:FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
641FB	Access Door

SUBTASK 28-41-05-280-031

(14) For the area in the right main fuel tank between rib No. 23 and rib No. 24, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
641GB	Access Door

(b) Go into the opening for access door 641GB.

(c) For all FQIS wiring and components between Rib No. 23 and Rib No. 24, do this task:FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
641GB	Access Door

SUBTASK 28-41-05-280-032

(15) For the area in the right main fuel tank between rib No. 24 and rib No. 25, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
641HB	Access Door

(b) Go into the opening for access door 641HB.

(c) For all FQIS wiring and components between Rib No. 24 and Rib No. 25, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-01-400-801)

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Number	Name/Location
641HB	Access Door

SUBTASK 28-41-05-280-033

(16) For the area in the right main fuel tank between rib No. 25 and rib No. 26, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
641JB	Access Door

(b) Go into the opening for access door 641JB.

(c) For all FQIS wiring and components between Rib No. 25 and Rib No. 26, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
641JB	Access Door

SUBTASK 28-41-05-280-034

(17) For the area in the right main fuel tank between rib No. 26 and rib No. 27, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
641KB	Access Door

(b) Go into the opening for access door 641KB.

(c) For all FQIS wiring and components between Rib No. 26 and Rib No. 27, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
641KB	Access Door

SUBTASK 28-41-05-280-035

(18) For the area in the right main fuel tank between rib No. 27 and rib No. 28, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
641LB	Access Door

(b) Go into the opening for access door 641LB.

(c) For all FQIS wiring and components between Rib No. 27 and Rib No. 28, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-01-400-801)

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Number	Name/Location
641LB	Access Door

SUBTASK 28-41-05-280-036

(19) For the area in the right main fuel tank between rib No. 28 and rib No. 29, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
641MB	Access Door

(b) Go into the opening for access door 641MB.

(c) For all FQIS wiring and components between Rib No. 28 and Rib No. 29, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
641MB	Access Door

SUBTASK 28-41-05-280-037

(20) For the area in the right main fuel tank between rib No. 29 and rib No. 30, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
641NB	Access Door

(b) Go into the opening for access door 641NB.

(c) For all FQIS wiring and components between Rib No. 29 and Rib No. 30, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
641NB	Access Door

SUBTASK 28-41-05-280-038

(21) For the area in the right main fuel tank between rib No. 30 and rib No. 31, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
641PB	Access Door

(b) Go into the opening for access door 641PB.

(c) For all FQIS wiring and components between Rib No. 30 and Rib No. 31, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-01-400-801)

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Number	Name/Location
641PB	Access Door

SUBTASK 28-41-05-280-039

(22) For the area in the right main fuel tank between rib No. 31 and rib No. 32, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
641QB	Access Door

(b) Go into the opening for access door 641QB.

(c) For all FQIS wiring and components between Rib No. 31 and Rib No. 32, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
641QB	Access Door

SUBTASK 28-41-05-280-040

(23) For the area in the right main fuel tank between rib No. 32 and rib No. 33, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
642AB	Access Door

(b) Go into the opening for access door 642AB.

(c) For all FQIS wiring and components between Rib No. 32 and Rib No. 33, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
642AB	Access Door

SUBTASK 28-41-05-280-041

(24) For the area in the right main fuel tank between rib No. 33 and rib No. 34, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
642BB	Access Door

(b) Go into the opening for access door 642BB.

(c) For all FQIS wiring and components between Rib No. 33 and Rib No. 34, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-01-400-801)

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Number	Name/Location
642BB	Access Door

SUBTASK 28-41-05-280-042

(25) For the area in the right main fuel tank between rib No. 34 and rib No. 35, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
643AB	Access Door

(b) Go into the opening for access door 643AB.

(c) For all FQIS wiring and components between Rib No. 34 and Rib No. 35, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
643AB	Access Door

SUBTASK 28-41-05-280-043

(26) For the area in the right main fuel tank between rib No. 35 and rib No. 36, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
643BB	Access Door

(b) Go into the opening for access door 643BB.

(c) For all FQIS wiring and components between Rib No. 35 and Rib No. 36, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-01-400-801)

Number	Name/Location
643BB	Access Door

SUBTASK 28-41-05-280-044

(27) For the area in the right main fuel tank between rib No. 36 and rib No. 37, do these steps:

(a) Remove this access door:

(TASK 28-11-01-000-801)

Number	Name/Location
643CB	Access Door

(b) Go into the opening for access door 643CB.

(c) For all FQIS wiring and components between Rib No. 36 and Rib No. 37, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-01-400-801)

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Number	Name/Location
643CB	Access Door

END OF TASK

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TASK 28-41-05-280-803

5. FQIS, Center Fuel Tank - Inspection

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. References

Reference	Title
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)

B. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
139	Forward Keel Beam
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing

C. Access Panels

Number	Name/Location
139AZ	Center Wing Access Door
531AB	Access Door
531BB	Access Door
631AB	Access Door
631BB	Access Door

D. Procedure

SUBTASK 28-41-05-750-006

(1) For the area in the left center fuel tank between rib No. 7 and rib No. 6, do these steps:

(a) Remove this access door:

(TASK 28-11-02-000-801)

Number	Name/Location
531BB	Access Door

(b) For all FQIS wiring and components between Rib No. 7 and Rib No. 6, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(c) Go into the opening for Access Door, 531BB.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-02-400-801)

Number	Name/Location
531BB	Access Door

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SUBTASK 28-41-05-750-007

(2) For the area in the left center fuel tank between rib No. 6 and rib No. 1, do these steps:

(a) Remove this access door:

Number	Name/Location
531AB	Access Door

(TASK 28-11-02-000-801)

(b) For all FQIS wiring and components between Rib No. 6 and Rib No. 1, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(c) Go into the opening for Access Door, 531AB.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-02-400-801)

Number	Name/Location
531AB	Access Door

SUBTASK 28-41-05-750-008

(3) For the area in the wing center section (between Rib No. 1 on the left side and Rib No. 1 on the right side), do these steps:

(a) Remove this access door:

(TASK 28-11-02-000-801)

Number	Name/Location
139AZ	Center Wing Access Door

(b) For all FQIS wiring and components in the center wing section, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(c) Go into the opening for Center Wing Access Door, 139AZ.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-02-400-801)

Number	Name/Location
139AZ	Center Wing Access Door

SUBTASK 28-41-05-750-009

(4) For the area in the right center fuel tank between rib No. 1 and rib No. 6, do these steps:

(a) Remove this access door:

(TASK 28-11-02-000-801)

Number	Name/Location
631AB	Access Door

(b) For all FQIS wiring and components between Rib No. 1 and Rib No. 6, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(c) Go into the opening for access door 631AB.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-02-400-801)

Number	Name/Location
631AB	Access Door

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SUBTASK 28-41-05-750-010

(5) For the area in the right center fuel tank between rib No. 6 and rib No. 7, do these steps:

(a) Remove this access door:

(TASK 28-11-02-000-801)

Number	Name/Location
631BB	Access Door

(b) For all FQIS wiring and components between Rib No. 6 and Rib No. 7, do this task: FQIS Wiring and Component Visual Inspection, TASK 28-41-05-210-801.

(c) Go into the opening for Access Door, 631BB.

(d) If access is not necessary for subsequent tasks, install this access door:

(TASK 28-11-02-400-801)

Number	Name/Location
631BB	Access Door

——— END OF TASK ———

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FUEL PUMP PRESSURE SWITCH - REMOVAL/INSTALLATION

1. General

A. There are nine pressure switches, one for each of the subsequent pumps:

(1) APU DC fuel pump

(2) Left aft fuel boost pump

(3) Left forward fuel boost pump

(4) Left fuel override/jettison pump

(5) Right aft fuel boost pump

(6) Right forward fuel boost pump

(7) Right fuel override/jettison pump

(8) Left main jettison pump

(9) Right main jettison pump

B. This procedure contains two tasks. The first task removes the pressure switch. The second task installs the pressure switch.

TASK 28-42-01-000-801

2. Remove the Fuel Pump Pressure Switch

(Figure 401)

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
08-21-00-580-801	Make the Airplane Level (P/B 201)
12-15-02-610-805-002	Nose Landing Gear Shock Strut Servicing (P/B 301)
28-26-00-650-801	Pressure Defueling (P/B 201)
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)

B. Tools/Equipment

Reference	Description
STD-200	Container - Fuel Resistant, 10 gallon (38 l)

C. Consumable Materials

Reference	Description	Specification
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

D. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing
552	Landing Gear Support Beam & Rear Spar to Wing Trailing Edge - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing

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(Continued)

Zone	Area
652	Landing Gear Support Beam & Rear Spar to Wing Trailing Edge - Right Wing

E. Access Panels

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel
552HB	Inboard Fixed Trailing Edge Panel
651DB	Inboard Fixed Trailing Edge Panel
652HB	Inboard Fixed Trailing Edge Panel

F. Preparation for Pressure Switch Removal

SUBTASK 28-42-01-410-001

(1) Make sure the downlock pins are installed on the nose and main landing gear (Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801).

SUBTASK 28-42-01-420-001

WARNING DO THE INSTALLATION PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

SUBTASK 28-42-01-210-001

(3) To make sure fuel will not drain when you remove a pressure switch, do these steps to make sure the fuel quantity is in the limits shown (Table 401) for the applicable pressure switch.

NOTE: The fuel quantity is shown on the fuel synoptic display on the EICAS screen.

(a) Make sure the airplane is within the limits of -2.7 °and +1.3 ° Pitch, by the longitudinal inclinometer (TASK 08-21-00-580-801).

1) You can inflate or deflate the nose gear shock strut to get the airplane within the above limits (TASK 12-15-02-610-805-002).

(b) Defuel the applicable fuel tank to the limits shown (Table 401) for the applicable pressure switch, if it is necessary (TASK 28-26-00-650-801).

Table 401/28-42-01-993-802 TABLE 401. Fuel Quantities for Pressure Switch Removal (Wing Roll At 0°)

PUMP	FUEL TANK	MAX FUEL QTY -2.7° NOSE DOWN	MAX FUEL QTY -0.7° NOSE DOWN	MAX FUEL QTY +1.3° NOSE UP
APU DC FUEL	LEFT MAIN	0 LB 0 KG	0 LB 0 KG	0 LB 0 KG
AFT FUEL BOOST	L/R MAIN	1,400 LB 600 KG	1,200 LB 500 KG	1,000 LB 400 KG
FWD FUEL BOOST	L/R MAIN	4,900 LB 2,200 KG	4,200 LB 1,900 KG	3,500 LB 1,600 KG
OVERRIDE/JETT	CENTER	43,000 LB 19,400 KG	35,000 LB 15,800 KG	27,000 LB 12,200 KG
JETTISON	L/R MAIN	22,300 LB 10,100 KG	19,000 LB 8,500 KG	16,000 LB 7,200 KG

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SUBTASK 28-42-01-480-001

(4) If time does not permit changing the fuel level, do these steps to prepare for the pressure switch removal:

(a) Put a 10 gallon (38 l) fuel resistant container, STD-200 and some cotton wiper, G00034 below the pressure switch to catch fuel.

(b) Get a new pressure switch so you can quickly install it after you remove the old pressure switch.

NOTE: This will minimize the quantity of fuel that drains from the tank.

G. APU DC Pump, Left and Right Override Pumps, Left or Right Forward and Aft Boost Pumps - Pressure Switch Removal

SUBTASK 28-42-01-860-001

(1) For the APU DC pump:

Open this circuit breaker and install safety tag:

Standby Power Management Panel, P310

Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP

SUBTASK 28-42-01-860-002

(2) For the left aft boost pump:

Open this circuit breaker and install safety tag:

Left Power Management Panel, P110

Row	Col	Number	Name
E	2	C28303	L AFT FUEL BOOST PUMP

SUBTASK 28-42-01-860-003

(3) For the left forward boost pump:

Open these circuit breakers and install safety tags:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
E	5	C28307	L FWD FUEL BOOST PUMP

Standby Power Management Panel, P310

Row	Col	Number	Name
B	2	C28604	L FWD FUEL BOOST PUMP CTRL

SUBTASK 28-42-01-860-004

(4) For the left override/jettison pump:

Open this circuit breaker and install safety tag:

Left Power Management Panel, P110

Row	Col	Number	Name
L	21	C28647	CTR L OVRD FUEL PUMP CTRL

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SUBTASK 28-42-01-860-005

(5) For the right aft boost pump:

Open these circuit breakers and install safety tags:

Right Power Management Panel, P210

Row	Col	Number	Name
E	27	C28300	R AFT FUEL BOOST PUMP
K	11	C28609	R AFT FUEL BOOST PUMP CTRL

SUBTASK 28-42-01-860-006

(6) For the right forward boost pump:

Open these circuit breakers and install safety tags:

Left Power Management Panel, P110

Row	Col	Number	Name
C	18	C28302	R FWD FUEL BOOST PUMP L AC SECT 2
L	27	C28606	R FWD FUEL BOOST PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
F	27	C28306	R FWD FUEL BOOST PUMP R XFR

SUBTASK 28-42-01-860-007

(7) For the right override/jettison pump:

Open this circuit breaker and install safety tag:

Right Power Management Panel, P210

Row	Col	Number	Name
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

SUBTASK 28-42-01-010-001

(8) Get access to the pressure switch [1] through the left or right shock strut door, or main gear door, of the main landing gear.

Open this access panel:

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

Open this access panel:

Number	Name/Location
651DB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-42-01-210-005

WARNING BE CAREFUL WHEN YOU REMOVE THE PRESSURE SWITCH. IF YOU ARE NOT CAREFUL, FUEL CAN DRAIN FROM THE FUEL TANK.

(9) Make sure the fuel quantity is in the limits shown for the applicable pressure switch (Table 401) or put the 10 gallon (38 l) fuel resistant container, STD-200 and some cotton wiper, G00034 to catch the fuel.

NOTE: The fuel quantity is shown on the fuel synoptic display on the EICAS screen.

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SUBTASK 28-42-01-020-009

(10) Remove the electrical connector [5] from the pressure switch [1].

ARO 001-013

SUBTASK 28-42-01-020-018

(11) Remove the pressure switch sealing boot [6].

NOTE: Keep the pressure switch sealing boot [6] for the installation. The pressure switch sealing boot does not come with the pressure switch.

NOTE: APU DC fuel pump does not require a pressure switch sealing boot.

ARO ALL

SUBTASK 28-42-01-020-001

(12) Remove the lockwire [4] from the nut [2].

SUBTASK 28-42-01-020-002

(13) Remove the nut [2] from the boss on the fuel pump.

(a) Discard the o-ring [3].

H. Jettison Fuel Pump - Pressure Switch Removal

SUBTASK 28-42-01-860-008

(1) For the left fuel jettison pump:

Open this circuit breaker and install safety tag:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL

SUBTASK 28-42-01-860-009

(2) For the right fuel jettison pump:

Open this circuit breaker and install safety tag:

Right Power Management Panel, P210

Row	Col	Number	Name
K	14	C28646	R FUEL JETT PUMP CTRL

SUBTASK 28-42-01-010-002

(3) Get access to the left or right fuel jettison pump through the Inboard Fixed Trailing Edge Panel, do this task: (Finding an Access Door or Panel on the Wings, TASK 06-44-00-800-802)

Open this access panel:

Number	Name/Location
552HB	Inboard Fixed Trailing Edge Panel

Open this access panel:

Number	Name/Location
652HB	Inboard Fixed Trailing Edge Panel

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SUBTASK 28-42-01-210-006

WARNING

BE CAREFUL WHEN YOU REMOVE THE PRESSURE SWITCH. IF YOU ARE NOT CAREFUL, FUEL CAN DRAIN FROM THE FUEL TANK.

(4) Make sure the fuel quantity is in the limits shown for the applicable pressure switch (Table 401) or put the 10 gallon (38 l) fuel resistant container, STD-200 and some cotton wiper, G00034 to catch the fuel.

NOTE: The fuel quantity is shown on the fuel synoptic display on the EICAS screen.

SUBTASK 28-42-01-020-010

(5) Remove the electrical connector [5] from the pressure switch [1].

SUBTASK 28-42-01-020-003

(6) Remove the lockwire [4] from the nut [2].

ARO 001-013

SUBTASK 28-42-01-020-019

(7) Remove the pressure switch sealing boot [6].

NOTE: Keep the pressure switch sealing boot [6] for the installation. The pressure switch sealing boot does not come with the pressure switch.

ARO ALL

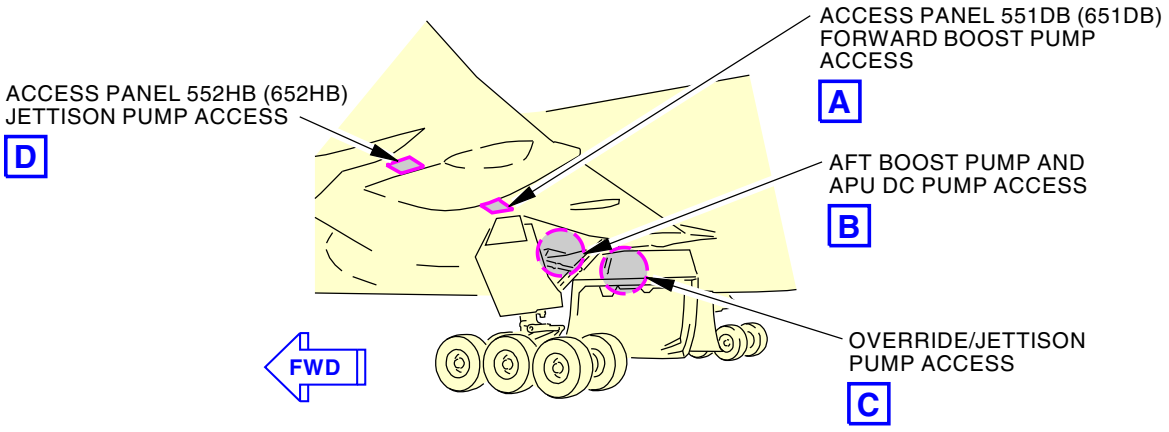
SUBTASK 28-42-01-020-004

(8) Remove the nut [2] from the boss on the fuel pump.

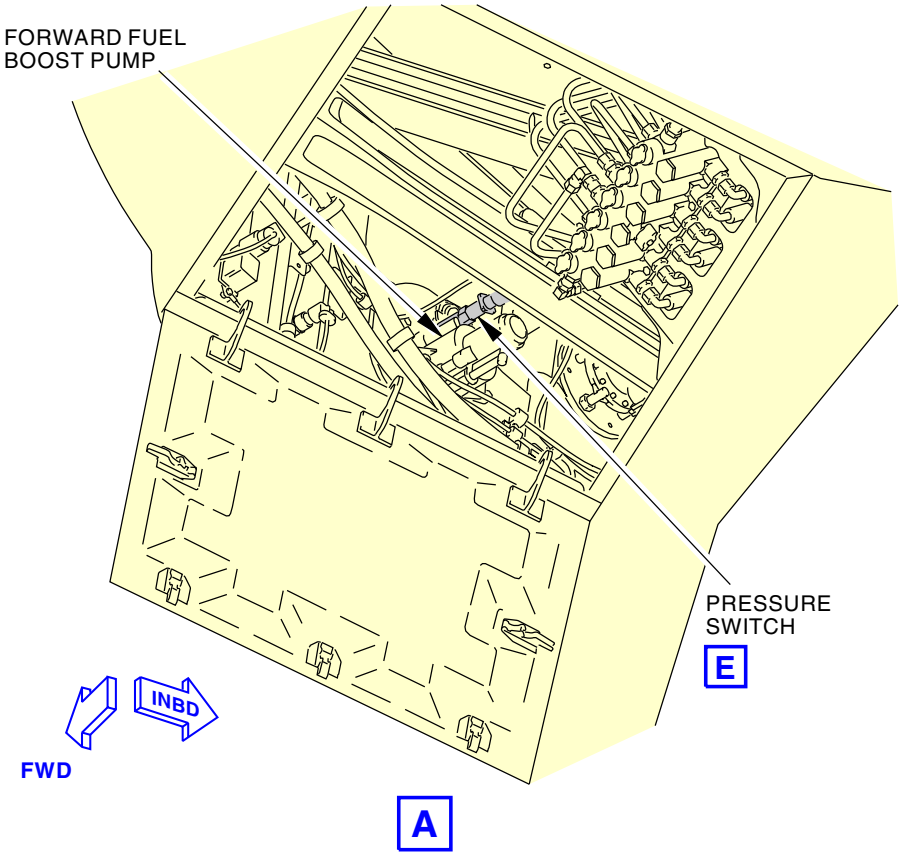
(a) Discard the o-ring [3].

——— END OF TASK ———

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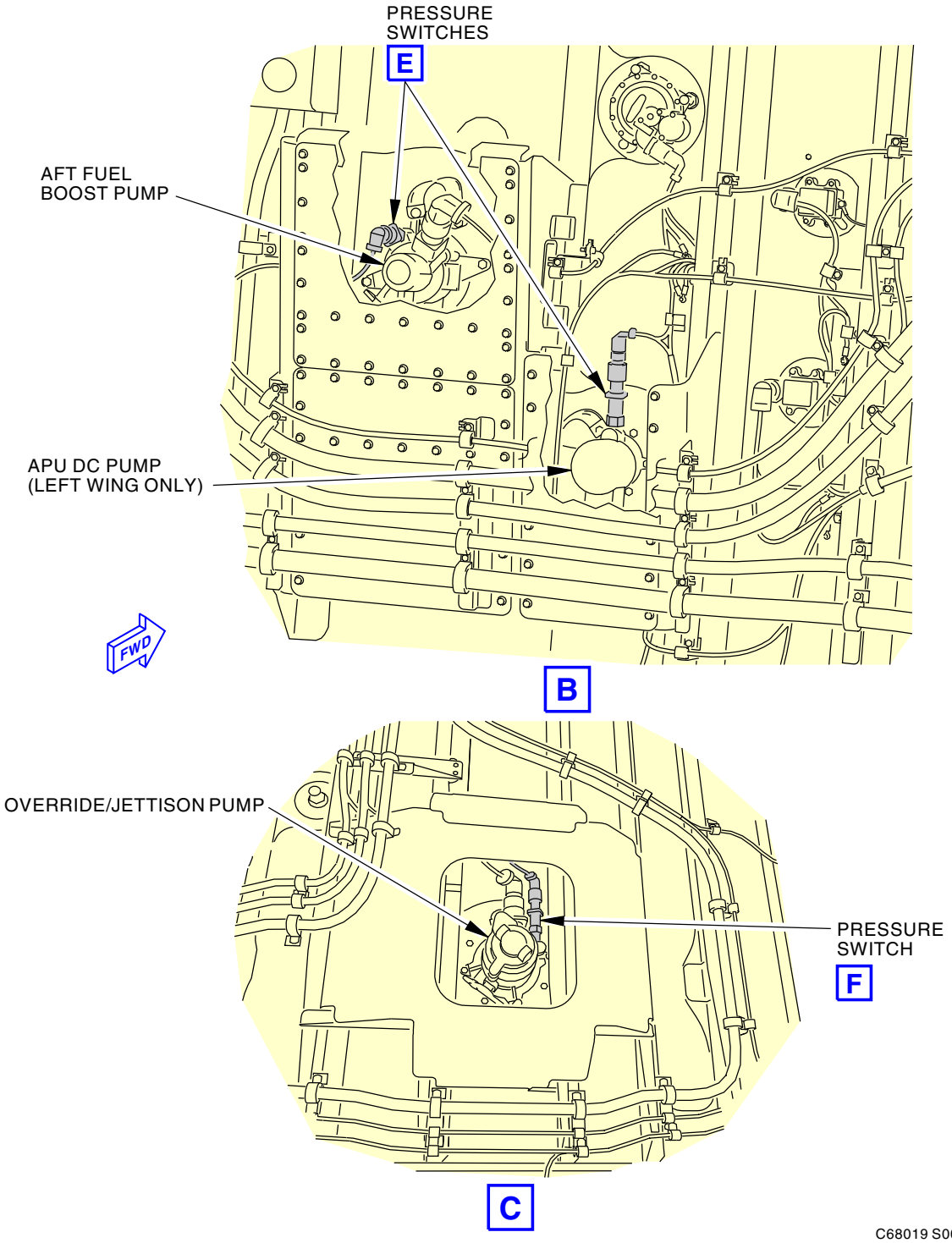
LEFT WING
(RIGHT WING IS EQUIVALENT)



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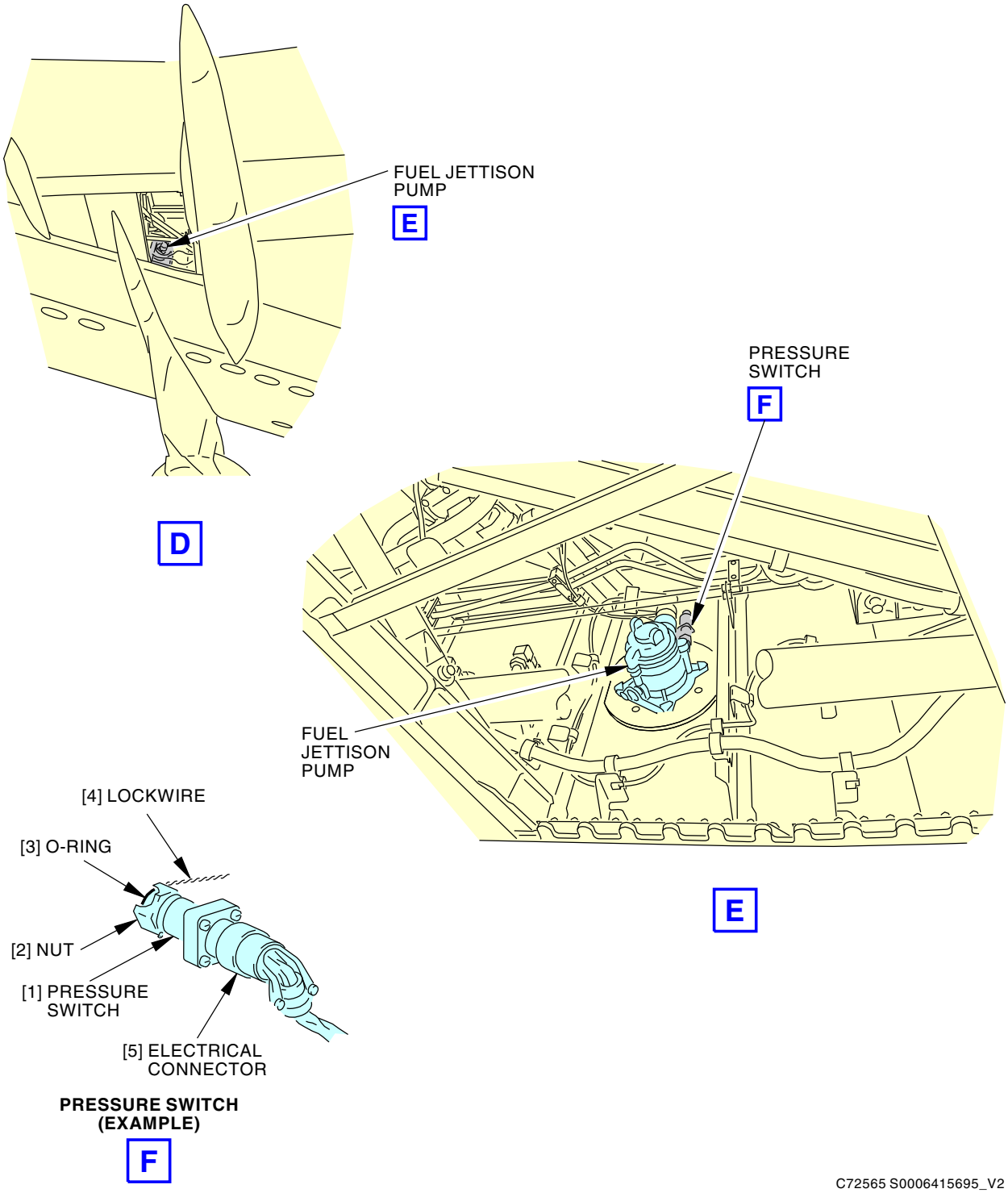
Fuel Pump Pressure Switch Installation
Figure 401/28-42-01-990-801 (Sheet 1 of 4)

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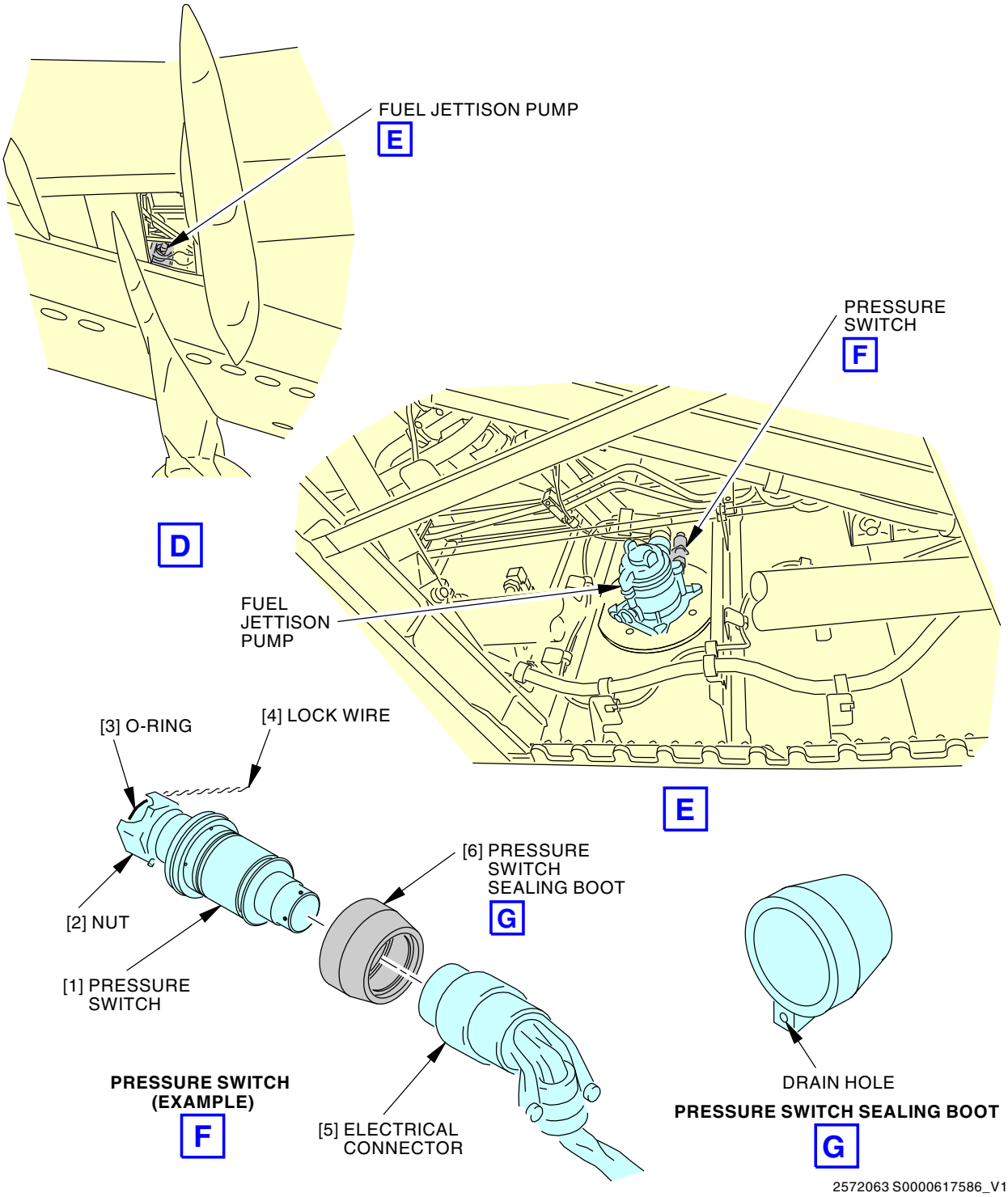
Fuel Pump Pressure Switch Installation
Figure 401/28-42-01-990-801 (Sheet 2 of 4)

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Fuel Pump Pressure Switch Installation
Figure 401/28-42-01-990-801 (Sheet 3 of 4)

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Fuel Pump Pressure Switch Installation
Figure 401/28-42-01-990-801 (Sheet 4 of 4)

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TASK 28-42-01-420-801

3. Install the Fuel Pump Pressure Switch

(Figure 401)

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)
12-11-01-650-801	Pressure Refueling (P/B 301)
24-22-00-860-805	Supply Electrical Power (P/B 201)
24-22-00-860-806	Remove Electrical Power (P/B 201)
28-25-00-710-801	APU Fuel Feed System - System Test (P/B 501)
28-26-00-650-802	Tank to Tank Transfer (P/B 201)
31-61-00-800-804	Showing a Maintenance Page (P/B 201)
31-61-00-800-813	Showing Status Messages (P/B 201)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Switch	28-42-01-01-015	ARO 001-004
		28-42-01-03-005	ARO ALL
3	O-ring	28-42-01-01-010	ARO 001-004
		28-42-01-03-010	ARO ALL

C. Location Zones

Zone	Area
133	Wing Center Section, Left
134	Wing Center Section, Right
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
551	Rear Spar to Landing Gear Support Beam - Left Wing
552	Landing Gear Support Beam & Rear Spar to Wing Trailing Edge - Left Wing
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
651	Rear Spar to Landing Gear Support Beam - Right Wing
652	Landing Gear Support Beam & Rear Spar to Wing Trailing Edge - Right Wing

D. Access Panels

Number	Name/Location
521DB	Refueling Station Door
551DB	Inboard Fixed Trailing Edge Panel
552HB	Inboard Fixed Trailing Edge Panel
651DB	Inboard Fixed Trailing Edge Panel
652HB	Inboard Fixed Trailing Edge Panel

E. APU DC Pump, Left and Right Override Pumps, Left or Right Forward and Aft Boost Pumps - Pressure Switch Installation

SUBTASK 28-42-01-420-002

(1) Install a new o-ring [3] on the pressure switch [1].

SUBTASK 28-42-01-420-003

(2) Install the pressure switch [1] on the boss of the fuel pump.

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SUBTASK 28-42-01-420-004

(3) Tighten the nut [2] to 95 in-lb (10.7 N·m)-105 in-lb (11.9 N·m).

SUBTASK 28-42-01-420-010

(4) Install the lockwire [4] to the nut [2].

ARO 001-013

SUBTASK 28-42-01-420-015

(5) Install the pressure switch sealing boot [6].

NOTE: The APU pump pressure switch does not require a pressure switch sealing boot.

(a) For pressure switches that are installed horizontally, the sealing boot must be installed with the drain hole in the downward direction. It is not necessary for the sealing boot drain hole to line up with the pressure switch vent hole.

(b) For pressure switches that are installed vertically, the sealing boot must be installed with the drain hole in the most downward direction (aft) possible. It is not necessary for the sealing boot drain hole to line up with the pressure switch vent hole.

(c) The bottom of the sealing boot must be flush with the bottom of the pressure switch and the top of the sealing boot must be seated in both housing grooves.

ARO ALL

SUBTASK 28-42-01-420-011

(6) Install the electrical connector [5] on the pressure switch [1].

SUBTASK 28-42-01-860-010

(7) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-42-01-650-001

(8) If it is necessary, refuel the applicable fuel tank (Pressure Refueling, TASK 12-11-01-650-801).

SUBTASK 28-42-01-210-004

(9) Make sure the applicable PRESS light of the fuel management panel, on the P5 overhead panel, comes on.

NOTE: The APU pump does not have a PRESS light indication.

(a) L AFT PUMP

(b) L FWD PUMP

(c) L CTR PUMP

(d) R AFT PUMP

(e) R FWD PUMP

(f) R CTR PUMP

SUBTASK 28-42-01-860-011

(10) For the APU DC pump:

Remove the safety tag and close this circuit breaker:

Standby Power Management Panel, P310

Row	Col	Number	Name
B	1	C28614	DC FUEL PUMP

SUBTASK 28-42-01-860-012

(11) For the left aft boost pump:

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Remove the safety tag and close this circuit breaker:

Left Power Management Panel, P110

Row	Col	Number	Name
E	2	C28303	L AFT FUEL BOOST PUMP

SUBTASK 28-42-01-860-013

(12) For the left forward boost pump:

Remove the safety tags and close these circuit breakers:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
G	9	C28301	L FWD FUEL BOOST PUMP GND SVCE

Left Power Management Panel, P110

Row	Col	Number	Name
E	5	C28307	L FWD FUEL BOOST PUMP

Standby Power Management Panel, P310

Row	Col	Number	Name
B	2	C28604	L FWD FUEL BOOST PUMP CTRL

SUBTASK 28-42-01-860-014

(13) For the left override/jettison pump:

Remove the safety tag and close this circuit breaker:

Left Power Management Panel, P110

Row	Col	Number	Name
L	21	C28647	CTR L OVRD FUEL PUMP CTRL

SUBTASK 28-42-01-860-015

(14) For the right aft boost pump:

Remove the safety tags and close these circuit breakers:

Right Power Management Panel, P210

Row	Col	Number	Name
E	27	C28300	R AFT FUEL BOOST PUMP
K	11	C28609	R AFT FUEL BOOST PUMP CTRL

SUBTASK 28-42-01-860-016

(15) For the right forward boost pump:

Remove the safety tags and close these circuit breakers:

Left Power Management Panel, P110

Row	Col	Number	Name
C	18	C28302	R FWD FUEL BOOST PUMP L AC SECT 2
L	27	C28606	R FWD FUEL BOOST PUMP CTRL

Right Power Management Panel, P210

Row	Col	Number	Name
F	27	C28306	R FWD FUEL BOOST PUMP R XFR

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SUBTASK 28-42-01-860-017

(16) For the right override/jettison pump:

Remove the safety tag and close this circuit breaker:

Right Power Management Panel, P210

Row	Col	Number	Name
L	2	C28644	CTR R OVRD FUEL PUMP CTRL

SUBTASK 28-42-01-860-018

(17) To test the applicable pumps:

WARNING DO NOT OPERATE A FUEL PUMP IF THE AMBER PRESS LIGHT COMES ON AND STAYS ON. IT CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE TANK WHICH WILL CAUSE A FIRE OR EXPLOSION. FIRES AND EXPLOSIONS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(a) To do an operational test of the pressure switch for one of the main tank boost pumps, do these steps:

1) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

a) Immediately set the applicable fuel pump switch-light(s) to OFF if the amber PRESS light comes on and stays on.

2) Make sure there is a minimum of 6,000 LB (2,700 KGS) in the applicable main fuel tank.

NOTE: This fuel quantity is necessary to prevent dry operation of the fuel pump.

a) To refuel the fuel tanks (if it is necessary), do this task: Pressure Refueling, TASK 12-11-01-650-801.

3) Push the applicable fuel boost pump switch-light on the Fuel Management Control Panel M28001, on the Overhead Panel P5, to the ON position.Table 402.

Table 402/28-42-01-993-803

MAIN TANK FUEL PUMPS	
PUMP	**SWITCH-LIGHT**
Left Aft Fuel Boost Pump	L AFT PUMP
Left Fwd Fuel Boost Pump	L FWD PUMP
Right Aft Fuel Boost Pump	R AFT PUMP
Right Fwd Fuel Boost Pump	R FWD PUMP

4) Make sure the applicable PRESS light on the Fuel Management Control Panel M28001, on the Overhead Panel P5, goes off.

NOTE: The PRESS light will go off in approximately 20 seconds.

5) Make sure the applicable EICAS status message does not show on the EICAS display for the applicable pump:

a) FUEL PUMP L AFT

b) FUEL PUMP L FWD

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c) FUEL PUMP R AFT

d) FUEL PUMP R FWD

6) Push the applicable fuel boost pump switch-light to the off position.

7) For the applicable fuel boost pump, make sure the PRESS light comes on.

NOTE: The PRESS light will come on in approximately 20 seconds.

WARNING

DO NOT OPERATE A FUEL PUMP IF THE AMBER PRESS LIGHT COMES ON AND STAYS ON. IT CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE TANK WHICH WILL CAUSE A FIRE OR EXPLOSION. FIRES AND EXPLOSIONS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(b) To do an operational test of a pressure switch for one of the override/jettison pumps, do these steps:

1) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

a) Immediately set the applicable fuel pump switch-light(s) to OFF if the amber PRESS light comes on and stays on.

2) Open this access panel:

Number	Name/Location
521DB	Refueling Station Door

NOTE: The center fuel pumps will not operate when both refueling station doors are closed.

3) Supply fuel to the inside of the override/jettison pump. To supply the fuel, do one of these steps:

NOTE: The fuel pump will operate correctly only if there is sufficient fuel inside of the pump.

a) Make sure that there is a minimum of 30,000 LB (15,000 KGS) of fuel in the center fuel tank.

NOTE: This fuel quantity is necessary to make sure that the pump is in the fuel.

b) Refuel the center fuel tank (TASK 12-11-01-650-801) or transfer fuel into the center fuel tank (TASK 28-26-00-650-802) to a minimum of 10,000 LB (5,000 KG).

NOTE: There is a fuel wetting line between the override/jettison pump and the nearest center tank refuel valve. When you put fuel into the center tank by pressure refueling or fuel transfer, fuel will flow through the wetting line into the override/jettison pump. 10,000 LB (5,000 KG) is the fuel quantity necessary to cover the override/jettison pump inlet.

4) Make sure that there is a minimum of 10,000 LB (5,000 KG) of fuel in the center fuel tank.

NOTE: This fuel quantity is necessary to cover the override/jettison pump inlet.

5) Put the 28 - Fuel Management maintenance page on the EICAS lower center display.

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6) Push the applicable fuel pump switch-light on the Fuel Management Control Panel M28001, on the Overhead Panel P5, to the ON position. Table 403

Table 403/28-42-01-993-804

CENTER TANK FUEL PUMPS	
PUMP	**SWITCH-LIGHT**
Left Center Fuel Pump	L CENTER PUMP
Right Center Fuel Pump	R CENTER PUMP

7) Make sure the COMMAND and STATUS indication for the L or R OVRD/JETT PUMP show as ON and PRESS respectively, on the 28 - Fuel Management maintenance page.

8) Push the applicable fuel pump switch-light to the off position.

9) Make sure the COMMAND and STATUS indication for the L or R OVRD/JETT PUMP show as OFF and NO PRESS respectively, on the 28 - Fuel Management maintenance page.

10) Close this access panel:

Number	Name/Location
521DB	Refueling Station Door

(c) For the APU DC Pump, do this task: APU Fuel Feed System - System Test, TASK 28-25-00-710-801.

SUBTASK 28-42-01-860-019

(18) Do this task: Remove Electrical Power, TASK 24-22-00-860-806.

SUBTASK 28-42-01-410-004

(19) If removed, install the Inboard Fixed Trailing Edge Panel. (Finding an Access Door or Panel on the Wings, TASK 06-44-00-800-802).

Close this access panel:

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

Close this access panel:

Number	Name/Location
651DB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-42-01-860-020

WARNING DO THE REMOVAL PROCEDURE FOR THE DOOR SAFETY PINS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(20) Do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

F. Jettison Fuel Pump - Pressure Switch Installation

SUBTASK 28-42-01-420-005

(1) Install a new o-ring [3] on the pressure switch [1].

SUBTASK 28-42-01-420-006

(2) Install the pressure switch [1] on the boss of the fuel pump.

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SUBTASK 28-42-01-420-007

(3) Tighten the nut [2] to 95 in-lb (10.7 N·m)-105 in-lb (11.9 N·m).

ARO 001-013

SUBTASK 28-42-01-420-016

(4) Install the pressure switch sealing boot [6].

NOTE: The APU pump pressure switch does not require a pressure switch sealing boot.

(a) For pressure switches that are installed horizontally, the sealing boot must be installed with the drain hole in the downward direction. It is not necessary for the sealing boot drain hole to line up with the pressure switch vent hole.

(b) For pressure switches that are installed vertically, the sealing boot must be installed with the drain hole in the most downward direction (aft) possible. It is not necessary for the sealing boot drain hole to line up with the pressure switch vent hole.

(c) The bottom of the sealing boot must be flush with the bottom of the pressure switch and the top of the sealing boot must be seated in both housing grooves.

ARO ALL

SUBTASK 28-42-01-020-011

(5) Install the lockwire [4] to the nut [2].

SUBTASK 28-42-01-020-012

(6) Install the electrical connector [5] on the pressure switch [1].

SUBTASK 28-42-01-860-021

(7) For the left fuel jettison pump:

Remove the safety tag and close this circuit breaker:

Left Power Management Panel, P110

Row	Col	Number	Name
L	22	C28645	L FUEL JETT PUMP CTRL

SUBTASK 28-42-01-860-022

(8) For the right fuel jettison pump:

Remove the safety tag and close this circuit breaker:

Right Power Management Panel, P210

Row	Col	Number	Name
K	14	C28646	R FUEL JETT PUMP CTRL

SUBTASK 28-42-01-860-023

(9) Do this task: Supply Electrical Power, TASK 24-22-00-860-805.

SUBTASK 28-42-01-410-002

WARNING

DO NOT OPERATE A FUEL PUMP IF THE AMBER PRESS LIGHT COMES ON AND STAYS ON. IT CAN CAUSE THE IGNITION OF THE FUEL FUMES IN THE TANK WHICH WILL CAUSE A FIRE OR EXPLOSION. FIRES AND EXPLOSIONS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(10) To do an operational test for a pressure switch for a jettison fuel pump, do these steps:

(a) To operate any of the fuel pumps, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication in the applicable tank.

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1) Immediately set the applicable fuel pump switch-light(s) to OFF if the amber PRESS light comes on and stays on.

(b) Make sure there is a minimum of 15,000 LB (7000 KGS) in the applicable main fuel tank.

NOTE: This fuel quantity is necessary to prevent dry operation of the fuel pumps after the pumps are drained.

(c) To show the Maintenance Page "Fuel Management" on the EICAS Display, do this task: Showing a Maintenance Page, TASK 31-61-00-800-804.

1) Make sure the COMMAND and STATUS indications for the L and R JETT NOZ VLV show as CLOSED and CLOSED respectively.

(d) Open this access panel:

Number	Name/Location
521DB	Refueling Station Door

1) Put the DEFUEL VALVE switch, on the Integrated Refuel Panel (IRP), P28, to the OPEN position.

(e) Push the JETTISON ARM switch-light on the Fuel Management Control Panel M28001, on the Overhead Panel P5, to the ARMED position.

(f) Make sure the COMMAND and STATUS indication for the L and R MAIN JET PUMP show as ON and PRESS respectively, on the Fuel Management Maintenance Page.

NOTE: It can take 60 seconds for the maintenance page indications to change.

(g) Push the JETTISON ARM switch-light to the off position.

(h) Make sure the COMMAND and STATUS indication for the L and R MAIN JET PUMP show as OFF and NO PRESS respectively, on the Fuel Management Maintenance Page.

NOTE: It can take 60 seconds for the maintenance page indications to change.

(i) Put the DEFUEL VALVE switch, on the IRP, P28, to the CLOSE position.

(j) Close this access panel:

Number	Name/Location
521DB	Refueling Station Door

(k) Do a check for EICAS status messages. To do this, do this task: Showing Status Messages, TASK 31-61-00-800-813.

SUBTASK 28-42-01-410-003

(11) Close the Inboard Fixed Trailing Edge Panel. (Finding an Access Door or Panel on the Wings, TASK 06-44-00-800-802).

Close this access panel:

Number	Name/Location
552HB	Inboard Fixed Trailing Edge Panel

Close this access panel:

Number	Name/Location
652HB	Inboard Fixed Trailing Edge Panel

END OF TASK

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FUEL TEMPERATURE SENSOR - REMOVAL/INSTALLATION

1. General

A. The fuel temperature sensor is installed through a sleeve on the rear spar of the left wing. The sleeve is not removed in this procedure.

B. This procedure contains two tasks. The first task removes the fuel temperature sensor. The second task installs the fuel temperature sensor.

TASK 28-43-01-000-801

2. Fuel Temperature Sensor - Removal

(Figure 401)

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)

B. Location Zones

Zone	Area
552	Landing Gear Support Beam & Rear Spar to Wing Trailing Edge - Left Wing

C. Access Panels

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

D. Procedure

SUBTASK 28-43-01-860-001

(1) Open these circuit breakers and install safety tags:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
D	7	C28603	RFLNG CTRL GND

Right Power Management Panel, P210

Row	Col	Number	Name
L	1	C28625	FUEL QTY 1

Standby Power Management Panel, P310

Row	Col	Number	Name
G	10	C28624	FUEL QTY 2
J	8	C28600	RFLNG CTRL
J	11	C28623	RFLNG QTY

SUBTASK 28-43-01-010-001

(2) Open this access panel on the lower surface of the wing:

(TASK 06-44-00-800-802)

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-43-01-030-001

(3) Remove the electrical connector [5] from the fuel temperature sensor [4].

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SUBTASK 28-43-01-020-001

(4) Remove the lockwire [2] from the fuel temperature sensor [4].

SUBTASK 28-43-01-020-002

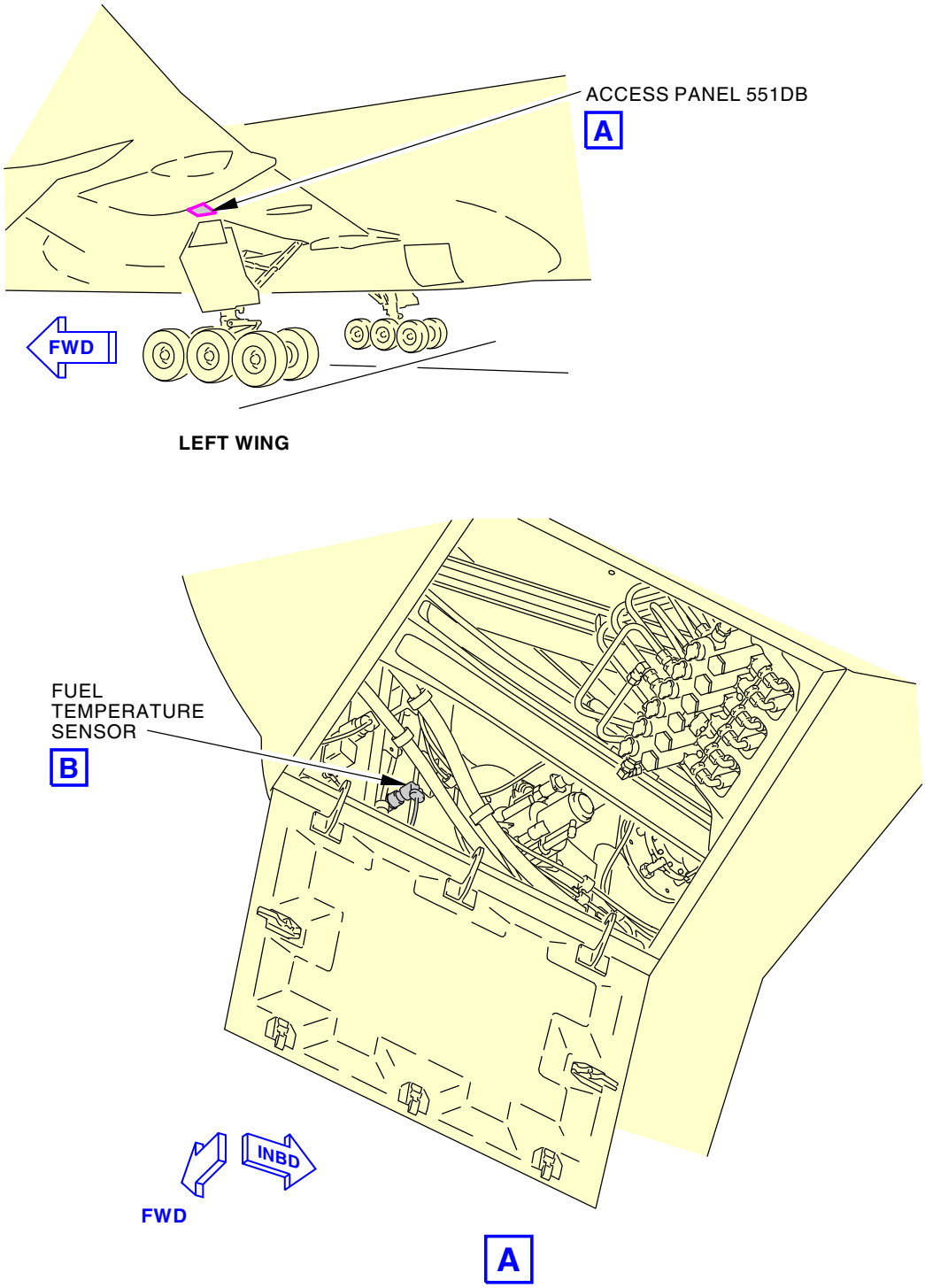
(5) Remove the fuel temperature sensor [4] from the sleeve [1].

NOTE: Do not loosen or remove the sleeve [1] or fuel can drain from the fuel tank.

(a) Discard the o-ring [3].

——— END OF TASK ———

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Fuel Temperature Sensor Installation
Figure 401/28-43-01-990-801 (Sheet 1 of 2)

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Fuel Temperature Sensor Installation
Figure 401/28-43-01-990-801 (Sheet 2 of 2)

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TASK 28-43-01-400-801

3. Fuel Temperature Sensor - Installation

(Figure 401)

(Figure 401)

A. References

Reference	Title
06-44-00-800-802	Finding an Access Door or Panel on the Wings (P/B 201)

B. Consumable Materials

Reference	Description	Specification
D00504	Grease - Petrolatum	VV-P-236

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
4	Fuel temperature sensor	28-43-01-01-025	ARO ALL

D. Location Zones

Zone	Area
552	Landing Gear Support Beam & Rear Spar to Wing Trailing Edge - Left Wing

E. Access Panels

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

F. Procedure

SUBTASK 28-43-01-860-003

(1) Make sure that these circuit breakers are open and have safety tags:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
D	7	C28603	RFLNG CTRL GND

Right Power Management Panel, P210

Row	Col	Number	Name
L	1	C28625	FUEL QTY 1

Standby Power Management Panel, P310

Row	Col	Number	Name
G	10	C28624	FUEL QTY 2
J	8	C28600	RFLNG CTRL
J	11	C28623	RFLNG QTY

SUBTASK 28-43-01-420-001

(2) Apply a thin layer of petrolatum grease, D00504, to a new o-ring [3].

(a) Install a new o-ring [3] on the fuel temperature sensor [4].

SUBTASK 28-43-01-420-002

(3) Install the fuel temperature sensor [4] into the sleeve [1].

(a) Tighten the fuel temperature sensor [4] to between 150 ±20 in-lb (17 ±2 N·m).

(b) Install the lockwire [2] between the fuel temperature sensor [4] and the sleeve [1].

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SUBTASK 28-43-01-430-001

(4) Install the electrical connector [5] to the fuel temperature sensor [4].

G. Put the Airplane Back to the Usual Condition

SUBTASK 28-43-01-860-004

(1) Remove the safety tags and close these circuit breakers:

Ground Service/Handling Power Panel, P320

Row	Col	Number	Name
D	7	C28603	RFLNG CTRL GND

Right Power Management Panel, P210

Row	Col	Number	Name
L	1	C28625	FUEL QTY 1

Standby Power Management Panel, P310

Row	Col	Number	Name
G	10	C28624	FUEL QTY 2
J	8	C28600	RFLNG CTRL
J	11	C28623	RFLNG QTY

SUBTASK 28-43-01-410-002

(2) Close this access panel:

(TASK 06-44-00-800-802)

Number	Name/Location
551DB	Inboard Fixed Trailing Edge Panel

SUBTASK 28-43-01-210-002

(3) Make sure the fuel temperature indication shows on the upper EICAS display screen.

——— END OF TASK ———

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FUEL MEASURING STICK ASSEMBLY - REMOVAL/INSTALLATION

1. General

A. Twenty fuel measuring sticks are installed in the airplane, eight in each main fuel tank, and four in the center fuel tank. Each fuel measuring stick has a housing assembly, which contains a stick subassembly. The fuel measuring sticks are numbered No. 1 to No. 10 on the left and right wings, from inboard to outboard.

B. This procedure contains six tasks. The first task removes the fuel measuring stick. The second task installs the fuel measuring stick. The third task removes the housing of the fuel measuring stick. The fourth task installs the housing of the fuel measuring stick. The fifth task removes the fuel measuring stick base attached to fuel tank access doors. The sixth task installs the fuel measuring stick base attached to fuel tank access doors.

TASK 28-44-01-000-801

2. Fuel Measuring Stick - Removal

(Figure 401)

A. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-5738	Wrench - Spanner Part #: T5-0497K Supplier: 86831

B. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

C. Procedure

SUBTASK 28-44-01-010-001

(1) Get access to the applicable fuel measuring stick.

NOTE: There are 10 fuel measuring sticks, numbered 1 through 10, installed on the bottom of the wing.

(a) Fuel stick assembly [40] is equivalent to Fuel Measuring Sticks 1 and 2.

(b) Fuel stick assembly [50] is equivalent to Fuel Measuring Sticks 3 and 4.

(c) Fuel stick assembly [60] is equivalent to Fuel Measuring Sticks 5 through 10.

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SUBTASK 28-44-01-030-001

(2) Use the spanner wrench, SPL-5738 to remove the retainer [32] from the mounting base [36] or the mounting base [3] in the lower wing surface.

(a) Discard o-ring [31] and o-ring [33].

SUBTASK 28-44-01-020-001

(3) Pull the stick subassembly [35] from the housing [26].

NOTE: You can feel a small force as the steel armature [27] on the fuel measuring stick [28] goes through the magnet [23] in the float [22].

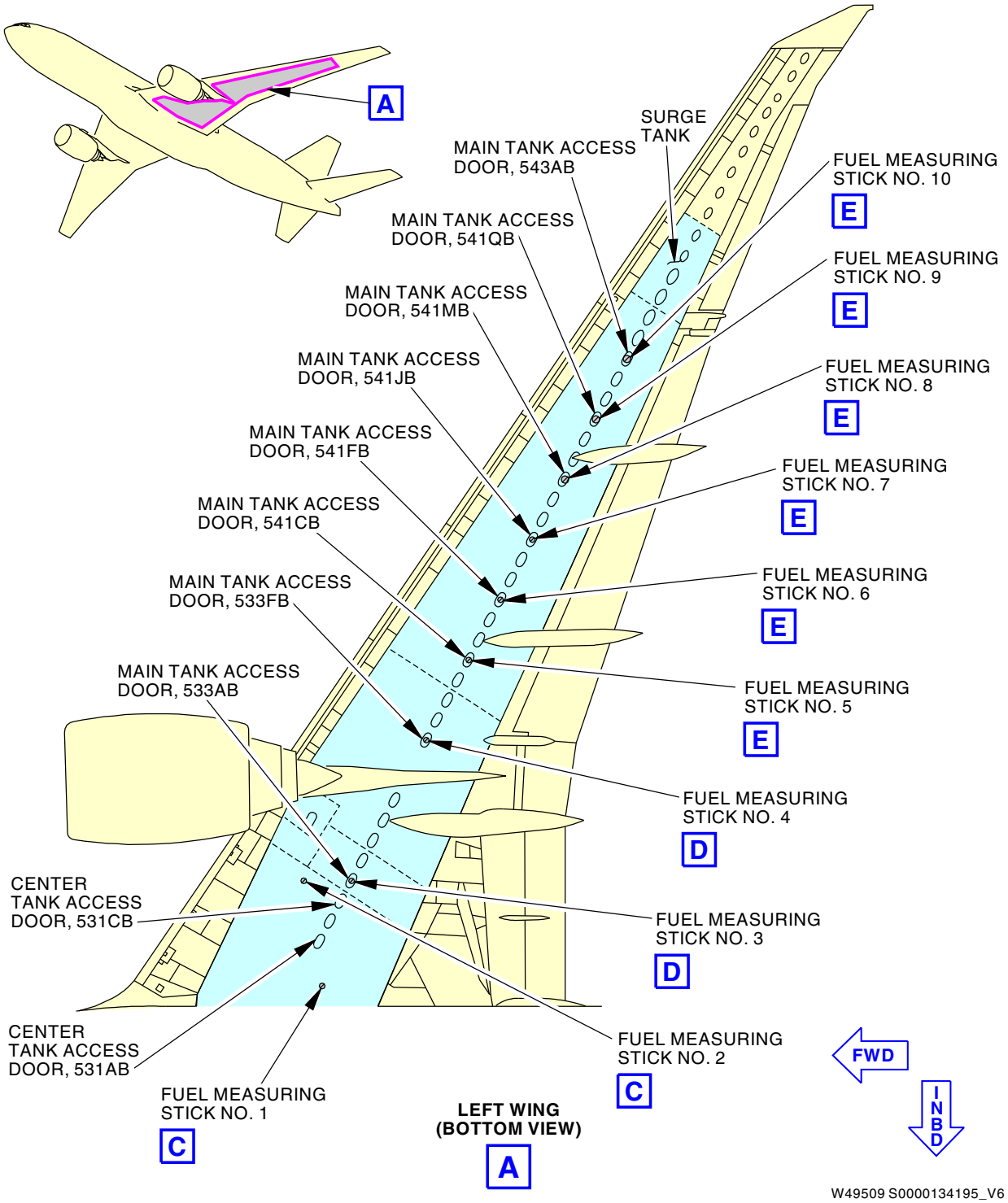
SUBTASK 28-44-01-030-002

(4) Remove the latch [34] from the fuel measuring stick [28] to disassemble the stick subassembly [35].

NOTE: Keep the latch [34] for installation of the fuel measuring stick [28].

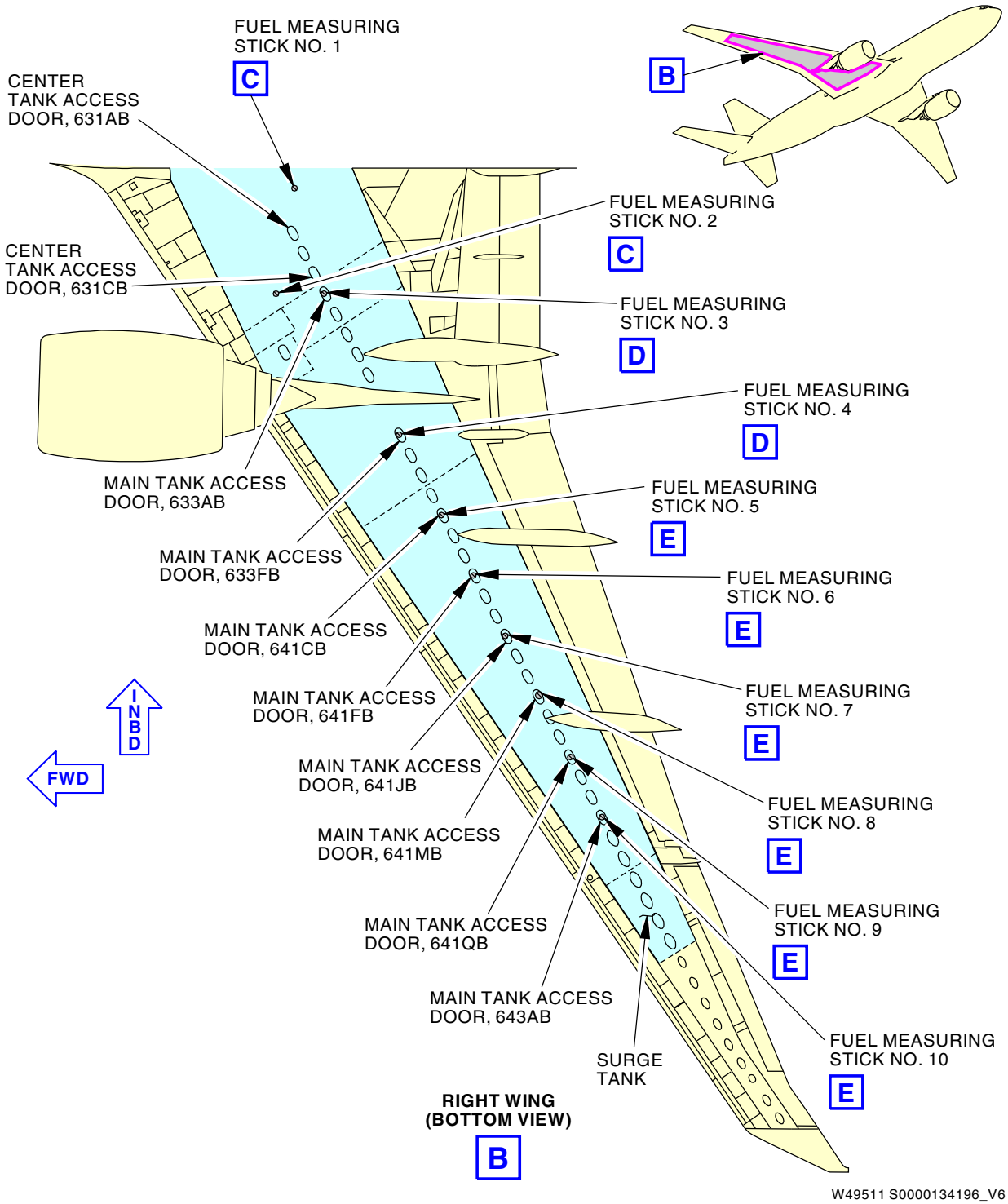
——— END OF TASK ———

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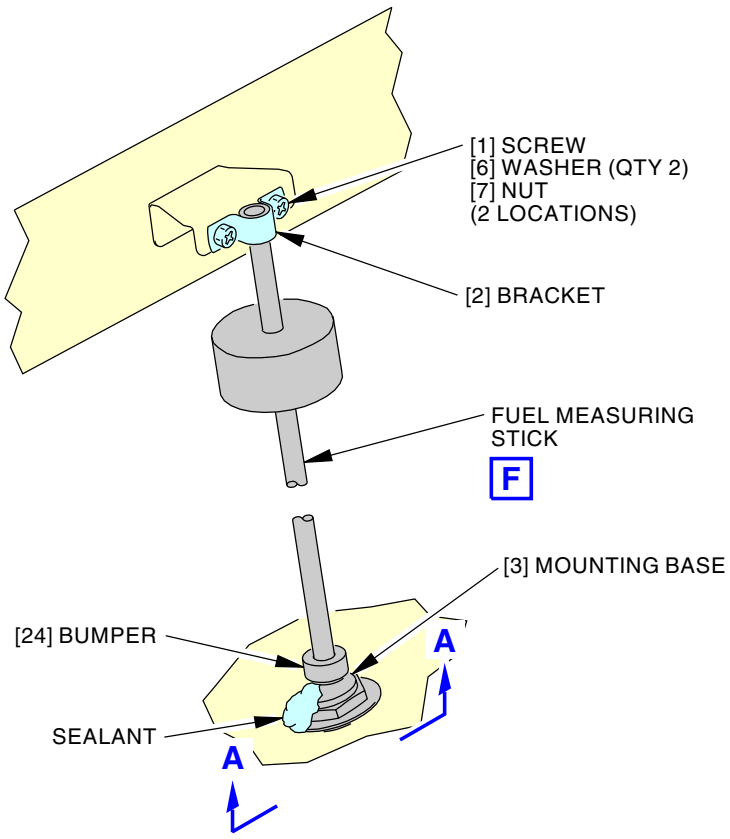
Fuel Measuring Stick Installation
Figure 401/28-44-01-990-801 (Sheet 1 of 6)

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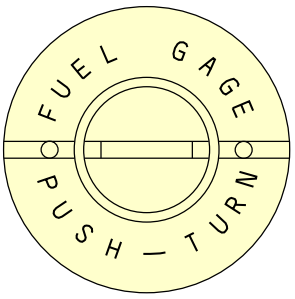
Fuel Measuring Stick Installation
Figure 401/28-44-01-990-801 (Sheet 2 of 6)

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**[40] FUEL MEASURING STICK INSTALLATION
(STICK NO. 1 AND 2)**

C



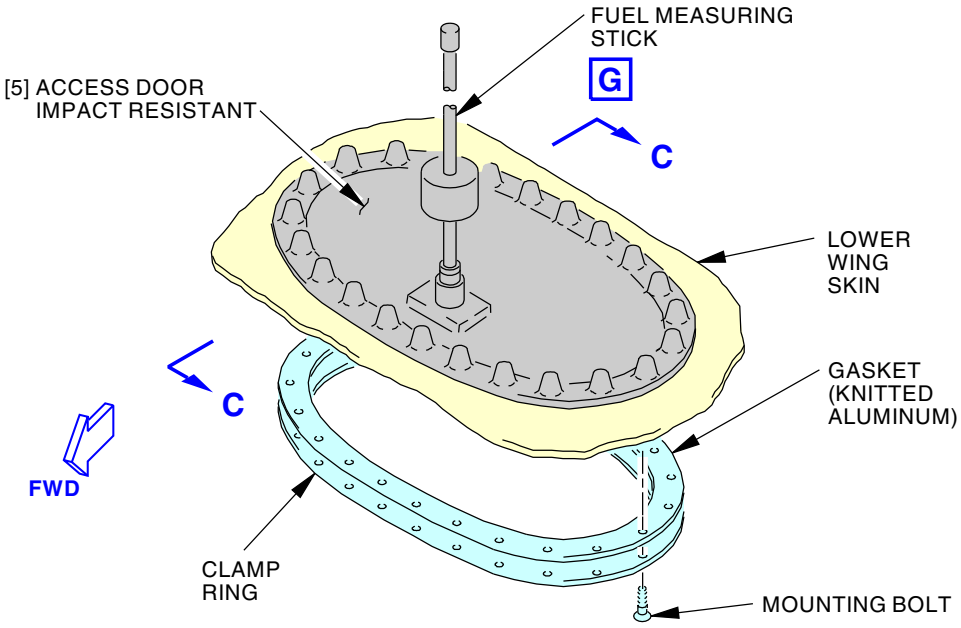
**RETAINER
(VIEW FROM BELOW WING)**

A-A

C72615 S0006415710_V2

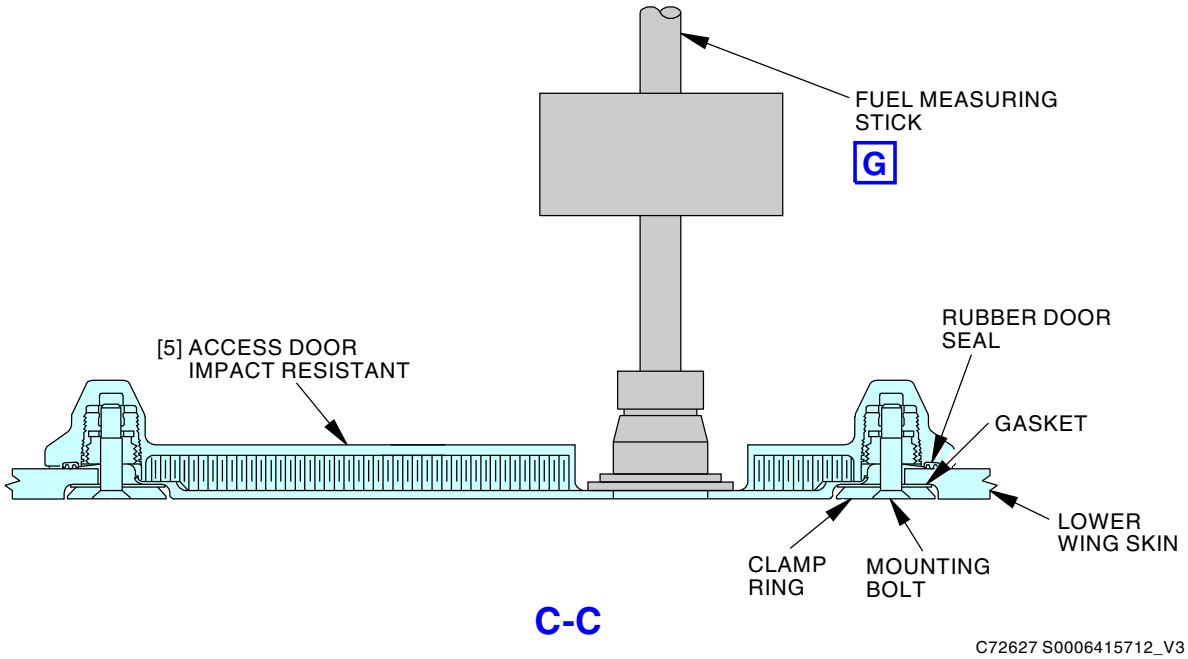
**Fuel Measuring Stick Installation
Figure 401/28-44-01-990-801 (Sheet 3 of 6)**

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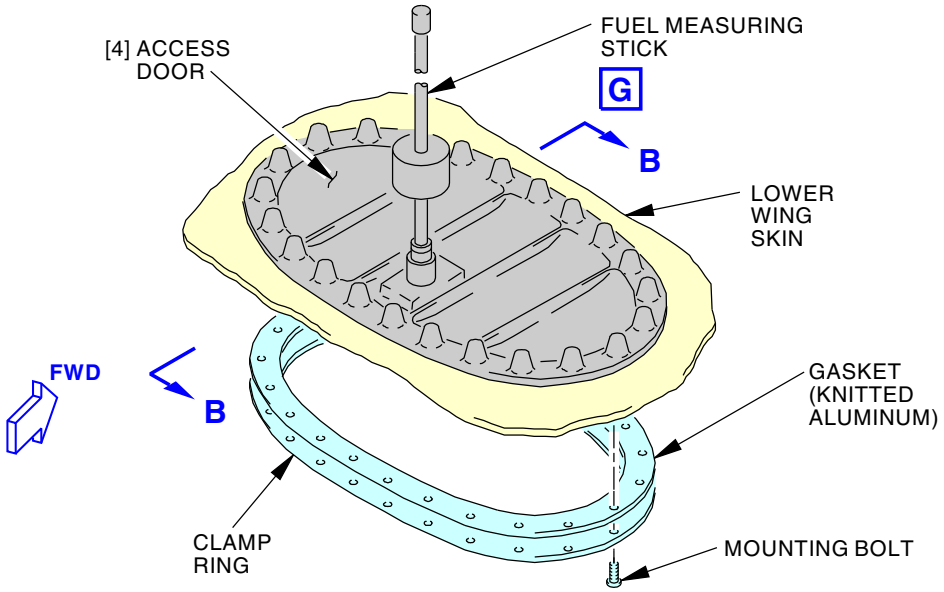
[50] FUEL MEASURING STICK INSTALLATION (STICK NO. 3 AND 4)

D



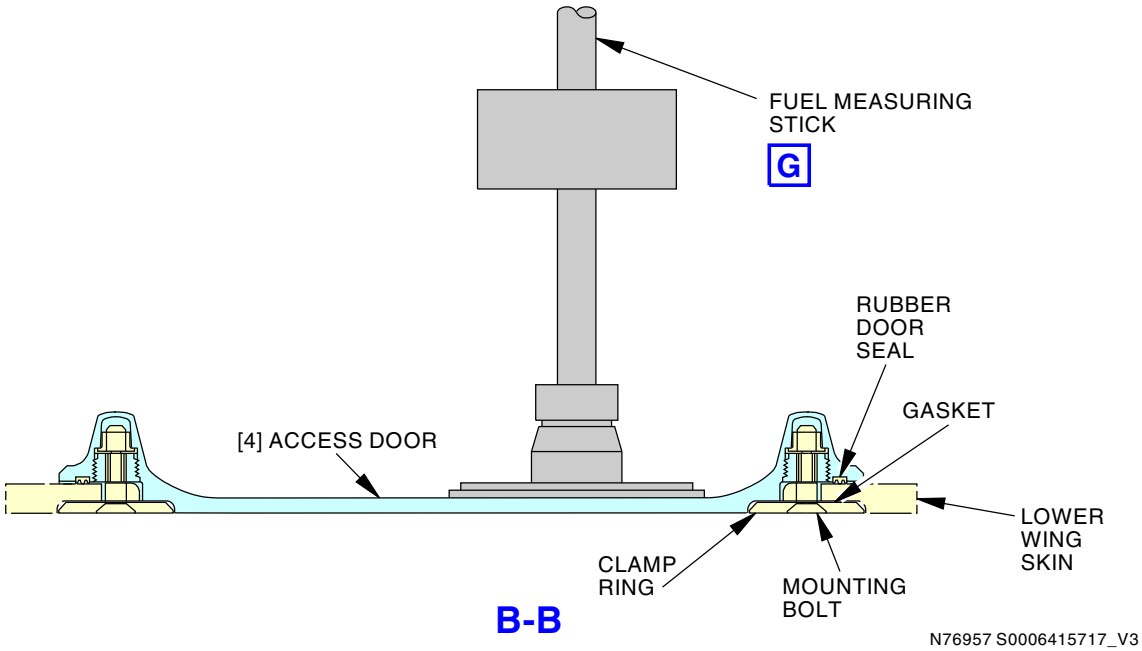
Fuel Measuring Stick Installation
Figure 401/28-44-01-990-801 (Sheet 4 of 6)

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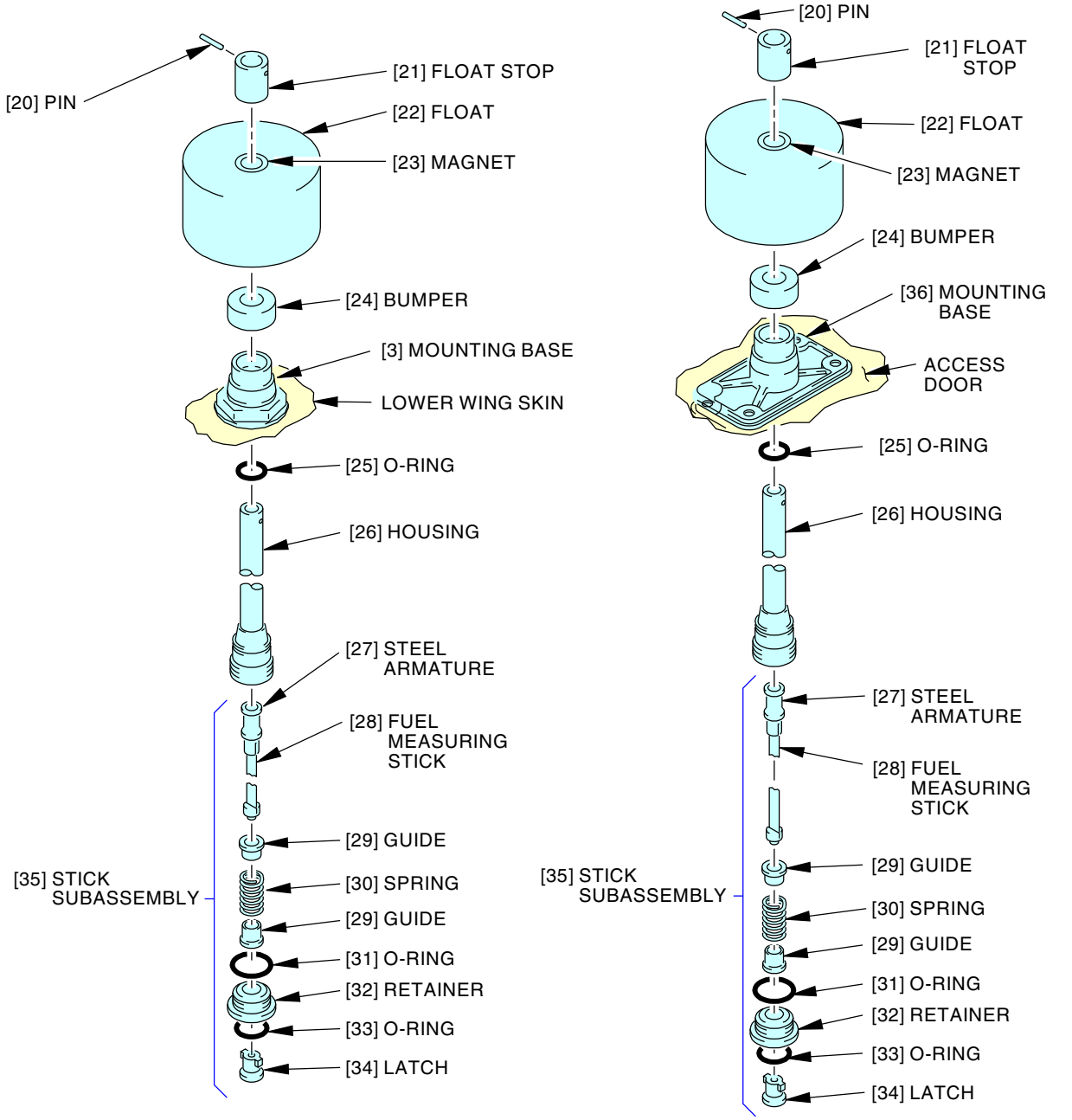
[60] FUEL MEASURING STICK INSTALLATION (STICK NO. 5, 6, 7, 8, 9, AND 10)

E



Fuel Measuring Stick Installation
Figure 401/28-44-01-990-801 (Sheet 5 of 6)

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LEFT OR RIGHT FUEL MEASURING STICK NO. 1 OR 2

F

LEFT OR RIGHT FUEL MEASURING STICK NO. 3, 4, 5, 6, 7, 8, 9, AND 10

F

N76966 S0006415719_V3

Fuel Measuring Stick Installation
Figure 401/28-44-01-990-801 (Sheet 6 of 6)

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TASK 28-44-01-400-801

3. Fuel Measuring Stick - Installation

(Figure 401)

A. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
SPL-5738	Wrench - Spanner Part #: T5-0497K Supplier: 86831

B. Consumable Materials

Reference	Description	Specification
D00062	Lubricant - Pneumatic System	SAE AMS-G-4343 (NATO G-392)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
31	O-ring	28-44-01-01-150	ARO ALL
33	O-ring	28-44-01-01-140	ARO ALL
40	Stick assembly	28-44-01-01-085	ARO ALL
		28-44-01-01-090	ARO ALL
50	Stick assembly	28-44-01-01-075	ARO ALL
		28-44-01-01-082	ARO ALL
		28-44-01-01-090	ARO ALL
		28-44-01-01-095	ARO ALL
60	Stick assembly	28-44-01-01-052	ARO ALL
		28-44-01-01-054	ARO ALL
		28-44-01-01-055	ARO ALL
		28-44-01-01-060	ARO ALL
		28-44-01-01-065	ARO ALL
		28-44-01-01-070	ARO ALL
		28-44-01-01-090	ARO ALL

D. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074

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(Continued)

Zone	Area
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

E. Procedure

SUBTASK 28-44-01-420-006

(1) For the Fuel Measuring stick assembly:

(a) Fuel stick assembly [40] is equivalent to Fuel Measuring Sticks 1 and 2.

(b) Fuel stick assembly [50] is equivalent to Fuel Measuring Sticks 3 and 4.

(c) Fuel stick assembly [60] is equivalent to Fuel Measuring Sticks 5 thru 8.

SUBTASK 28-44-01-430-001

(2) Apply lubricant, D00062, to the new o-ring [31], o-ring [33], and install on the retainer [32].

SUBTASK 28-44-01-420-001

(3) With the latch [34] removed from the stick subassembly [35], install the guides [29], spring [30], and retainer [32] onto the fuel measuring stick [28].

SUBTASK 28-44-01-430-002

(4) Install the latch [34] on the fuel measuring stick [28].

SUBTASK 28-44-01-420-002

(5) Turn the screwdriver slot on the latch [34] in the clockwise direction to lock into the retainer [32].

SUBTASK 28-44-01-420-003

(6) Push the stick subassembly [35] into the housing [26].

SUBTASK 28-44-01-430-003

(7) Tighten the retainer [32] into the housing [26] with the spanner wrench, SPL-5738 to 55 ±5 in-lb (6 ±1 N·m).

——— END OF TASK ———

TASK 28-44-01-000-802

4. Fuel Measuring Stick Housing - Removal

(Figure 401)

A. References

Reference	Title
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-000-801	Main Tank Access Door Removal (P/B 401)
28-11-02-000-801	Center Tank Access Door - Removal (P/B 401)
28-26-00-650-801	Pressure Defueling (P/B 201)

B. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074

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(Continued)

Zone	Area
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

C. Procedure

SUBTASK 28-44-01-650-001

(1) For the applicable fuel tank, do this task: Pressure Defueling, TASK 28-26-00-650-801.

SUBTASK 28-44-01-030-003

(2) Remove the applicable stick subassembly [35] from the housing [26] (TASK 28-44-01-000-801).

SUBTASK 28-44-01-010-002

CAUTION

BE CAREFUL WHEN YOU REMOVE OR INSTALL THE ACCESS DOORS THAT HAVE FUEL MEASURING STICKS. IF THE FUEL MEASURING STICKS TOUCH THE STRINGERS IN THE FUEL TANK, DAMAGE TO THE FUEL MEASURING STICKS CAN OCCUR.

(3) Remove the main or center fuel tank access door shown for the applicable fuel measuring stick (Table 401).

(a) For access to the main tanks, do this task: Main Tank Access Door Removal, TASK 28-11-01-000-801.

(b) For access to the center tank, do this task: Center Tank Access Door - Removal, TASK 28-11-02-000-801.

Table 401/28-44-01-993-802 Fuel Measuring Stick Installation

FUEL MEASURING STICK	LOCATION	ACCESS DOOR	AMM
LEFT FUEL STICK NO. 1	CENTER TANK	531AB	28-11-02/401
LEFT FUEL STICK NO. 2	CENTER TANK	531CB	28-11-02/401
LEFT FUEL STICK NO. 3	MAIN TANK	533AB	28-11-01/401
LEFT FUEL STICK NO. 4	MAIN TANK	533FB	28-11-01/401
LEFT FUEL STICK NO. 5	MAIN TANK	541CB	28-11-01/401
LEFT FUEL STICK NO. 6	MAIN TANK	541FB	28-11-01/401
LEFT FUEL STICK NO. 7	MAIN TANK	541JB	28-11-01/401
LEFT FUEL STICK NO. 8	MAIN TANK	541MB	28-11-01/401
LEFT FUEL STICK NO. 9	MAIN TANK	541QB	28-11-01/401
LEFT FUEL STICK NO. 10	MAIN TANK	543AB	28-11-01/401
RIGHT FUEL STICK NO. 1	CENTER TANK	631AB	28-11-02/401

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Table 401/28-44-01-993-802 Fuel Measuring Stick Installation (Continued)

FUEL MEASURING STICK	LOCATION	ACCESS DOOR	AMM
RIGHT FUEL STICK NO. 2	CENTER TANK	631CB	28-11-02/401
RIGHT FUEL STICK NO. 3	MAIN TANK	633AB	28-11-01/401
RIGHT FUEL STICK NO. 4	MAIN TANK	633FB	28-11-01/401
RIGHT FUEL STICK NO. 5	MAIN TANK	641CB	28-11-01/401
RIGHT FUEL STICK NO. 6	MAIN TANK	641FB	28-11-01/401
RIGHT FUEL STICK NO. 7	MAIN TANK	641JB	28-11-01/401
RIGHT FUEL STICK NO. 8	MAIN TANK	641MB	28-11-01/401
RIGHT FUEL STICK NO. 9	MAIN TANK	641QB	28-11-01/401
RIGHT FUEL STICK NO. 10	MAIN TANK	643AB	28-11-01/401

SUBTASK 28-44-01-650-003

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(4) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-44-01-940-001

(5) To remove the housing [26] of the fuel measuring Sticks No. 1 and 2, you must go into the applicable center fuel tank.

(a) Get access to the applicable fuel measuring stick assembly (No. 1 or 2) to remove the screws [1] and bracket [2].

(b) Remove the sealant from the mounting base [3] and housing [26] interface.

SUBTASK 28-44-01-030-004

(6) Remove the pin [20] that holds the float stop [21] to the housing [26].

SUBTASK 28-44-01-030-005

(7) Remove the float stop [21], the float [22] and the bumper [24] from the housing [26].

SUBTASK 28-44-01-020-002

(8) From the lower side of the wing skin use a 9/16 inch hex-head wrench and remove the housing [26] from the mounting base [3] or mounting base [36].

NOTE: The mounting base will remain attached to the lower wing skin or access door respectively.

(a) Discard o-ring [25].

END OF TASK

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TASK 28-44-01-400-802

5. Fuel Measuring Stick Housing - Installation

(Figure 401)

A. General

(1) For applying sealants in the fuel tank structure(s), it is acceptable to use sealant, A50303, as an alternative to sealant, A00767, for Class A and B non-faying seal applications:

(a) sealant, A50153, and sealant, A50301, are mutually interchangeable.

(b) sealant, A50110, and sealant, A50302, are mutually interchangeable.

(c) sealant, A50153, cannot be used in combination with sealant, A50302, and sealant, A50301, cannot be used with sealant, A50110.

B. References

Reference	Title
12-11-01-650-801	Pressure Refueling (P/B 301)
28-11-00-300-802	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)
28-11-00-300-804	Analysis of the Fuel Leak Type (P/B 601)
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-11-01-400-801	Main Tank Access Door Installation (P/B 401)
28-11-02-400-801	Center Tank Access Door - Installation (P/B 401)

C. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
A50110	Sealant	BMS5-45 Class B-2
A50153	Sealant - Fuel Tank - Class A-2	BMS5-45 Class A-2
A50301	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168 Type I Class A-2
A50302	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168 Type I Class B-2
A50303	Sealant - Fast Cure Fuel Tank Sealant	BMS5-168
D00062	Lubricant - Pneumatic System	SAE AMS-G-4343 (NATO G-392)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
25	O-ring	28-44-01-01-225	ARO ALL

E. Location Zones

Zone	Area
531	Center Fuel Tank - Rib 1 to Rib 8 - Left Wing
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
631	Center Fuel Tank - Rib 1 to Rib 8 - Right Wing
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing

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(Continued)

Zone	Area
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

F. Procedure

SUBTASK 28-44-01-650-004

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(1) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801.

SUBTASK 28-44-01-430-004

(2) Apply lubricant, D00062, and install a new o-ring [25] on the housing [26].

SUBTASK 28-44-01-420-004

(3) To install the housing [26] for the fuel measuring sticks No. 1 and 2, do the steps that follow:

(a) Put the housing [26] through the mounting base [3] from out of the center fuel tank.

(b) Have one person go into the center fuel tank (Table 402).

Table 402/28-44-01-993-803 Fuel Measuring Stick Installation

FUEL MEASURING STICK	LOCATION	ACCESS DOOR	AMM
LEFT FUEL STICK NO. 1	CENTER TANK	531AB	28-11-02/401
LEFT FUEL STICK NO. 2	CENTER TANK	531CB	28-11-02/401
RIGHT FUEL STICK NO. 1	CENTER TANK	631AB	28-11-02/401
RIGHT FUEL STICK NO. 2	CENTER TANK	631CB	28-11-02/401

(c) Install the bumper [24], the float [22] and the float stop [21] on the housing [26].

(d) Install the pin [20] through the float stop [21] and the housing [26].

(e) Make sure the float [22] moves freely on the housing [26].

(f) From outside the fuel tank, tighten the internal hex head in the housing [26] to 17.5 ±2.5 in-lb (2.0 ±0.3 N·m).

(g) Install the bracket [2] and screws [1] to the float stop [21].

(h) Apply a bead of BMS 5-45 sealant, A00767 (or equivalent), to the mounting base [3] and housing [26] (TASK 28-11-00-300-802).

1) Before the sealant cures push the bumper [24] into the sealant to hold in place.

NOTE: Remove excess sealant if it is necessary.

SUBTASK 28-44-01-420-005

(4) To install the housing [26] for the fuel measuring sticks No. 3 thru No. 8, do the steps that follow:

(a) Install the lower end of the housing [26] through the mounting base [36] on the applicable main tank access door (Table 403).

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Table 403/28-44-01-993-804 Fuel Measuring Stick Installation

FUEL MEASURING STICK	LOCATION	ACCESS DOOR	AMM
LEFT FUEL STICK NO. 3	MAIN TANK	533AB	28-11-01/401
LEFT FUEL STICK NO. 4	MAIN TANK	533FB	28-11-01/401
LEFT FUEL STICK NO. 5	MAIN TANK	541CB	28-11-01/401
LEFT FUEL STICK NO. 6	MAIN TANK	541FB	28-11-01/401
LEFT FUEL STICK NO. 7	MAIN TANK	541JB	28-11-01/401
LEFT FUEL STICK NO. 8	MAIN TANK	541MB	28-11-01/401
LEFT FUEL STICK NO. 9	MAIN TANK	541QB	28-11-01/401
LEFT FUEL STICK NO. 10	MAIN TANK	543AB	28-11-01/401
RIGHT FUEL STICK NO. 3	MAIN TANK	633AB	28-11-01/401
RIGHT FUEL STICK NO. 4	MAIN TANK	633FB	28-11-01/401
RIGHT FUEL STICK NO. 5	MAIN TANK	641CB	28-11-01/401
RIGHT FUEL STICK NO. 6	MAIN TANK	641FB	28-11-01/401
RIGHT FUEL STICK NO. 7	MAIN TANK	641JB	28-11-01/401
RIGHT FUEL STICK NO. 8	MAIN TANK	641MB	28-11-01/401
RIGHT FUEL STICK NO. 9	MAIN TANK	641QB	28-11-01/401
RIGHT FUEL STICK NO. 10	MAIN TANK	643AB	28-11-01/401

(b) Tighten the internal hex head in the housing [26], to between 15-20 pound-inches (1.7-2.2 newton-meters).

(c) Install the float [22] and the float stop [21] on the housing [26].

(d) Install the pin [20] through the float stop [21] and the housing [26].

(e) Make sure the float [22] moves freely on the housing [26].

SUBTASK 28-44-01-430-005

(5) Install the stick subassembly [35] in the housing [26] (TASK 28-44-01-400-801).

SUBTASK 28-44-01-410-001

CAUTION

BE CAREFUL WHEN YOU REMOVE OR INSTALL THE ACCESS DOORS THAT HAVE FUEL MEASURING STICKS. IF THE FUEL MEASURING STICKS TOUCH THE STRINGERS IN THE FUEL TANK, DAMAGE TO THE FUEL MEASURING STICKS CAN OCCUR.

(6) Install the main or center tank access door shown for the applicable fuel measuring stick (Table 402, Table 403).

NOTE: Make sure that the fuel stick housing is correctly installed and that no foreign object stays in the tank. Launch and sign this note on the maintenance log sheet of the concerned aircraft.

(a) For the main tanks, do this task: Main Tank Access Door Installation, TASK 28-11-01-400-801.

(b) For the center tank, do this task: Center Tank Access Door - Installation, TASK 28-11-02-400-801.

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SUBTASK 28-44-01-650-002

(7) Do this task: Pressure Refueling, TASK 12-11-01-650-801.

SUBTASK 28-44-01-700-001

(8) Make sure the fuel stick reads correctly and there is no fuel leakage at the fuel stick and access door (TASK 28-11-00-300-804).

——— END OF TASK ———

TASK 28-44-01-000-803

6. Fuel Measuring Stick Mounting Base - Removal

(Figure 402)

A. General

(1) This procedure removes the mounting base of the fuel measuring sticks No. 3–10 on the main tank access doors.

B. References

Reference	Title
28-11-00-650-801	Purging and Fuel Tank Entry Precautions (P/B 201)
28-26-00-650-801	Pressure Defueling (P/B 201)

C. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

D. Prepare for Procedure

SUBTASK 28-44-01-650-005

(1) For the applicable fuel tank, do this task: Pressure Defueling, TASK 28-26-00-650-801

SUBTASK 28-44-01-650-006

WARNING OBEY THE PRECAUTIONS FOR PURGING AND FUEL TANK ENTRY. IF YOU DO NOT OBEY THE PRECAUTIONS, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do this task: Purging and Fuel Tank Entry Precautions, TASK 28-11-00-650-801

SUBTASK 28-44-01-010-003

(3) Get access to the applicable fuel measuring stick.

SUBTASK 28-44-01-020-004

(4) For the applicable measuring stick, do this task: Fuel Measuring Stick Housing - Removal, TASK 28-44-01-000-802

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E. Procedure

(Figure 402)

SUBTASK 28-44-01-020-005

(1) Do the subsequent steps to remove the mounting base [36].

(a) Remove the sealant from the mounting base [36], bolts [71], washers [72], and collars [73].

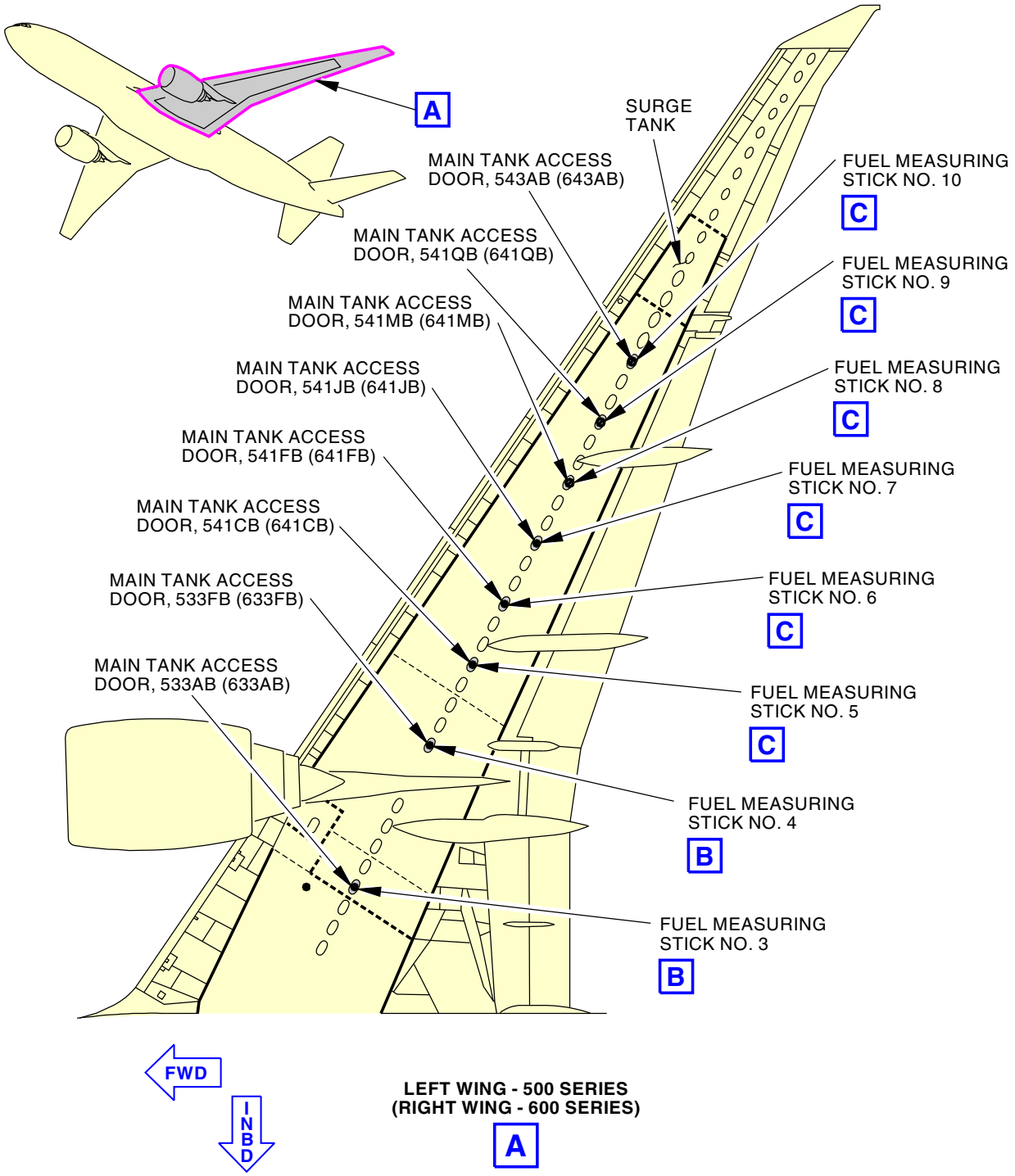
(b) Remove the bolts [71], washers [72], and collars [73] from the mounting base [36].

(c) Remove the mounting base [36] from access door [4] or impact resistant access door [5].

NOTE: The mounting base [36] and impact resistant access door [5] are bonded with faying surface sealant.

——— END OF TASK ———

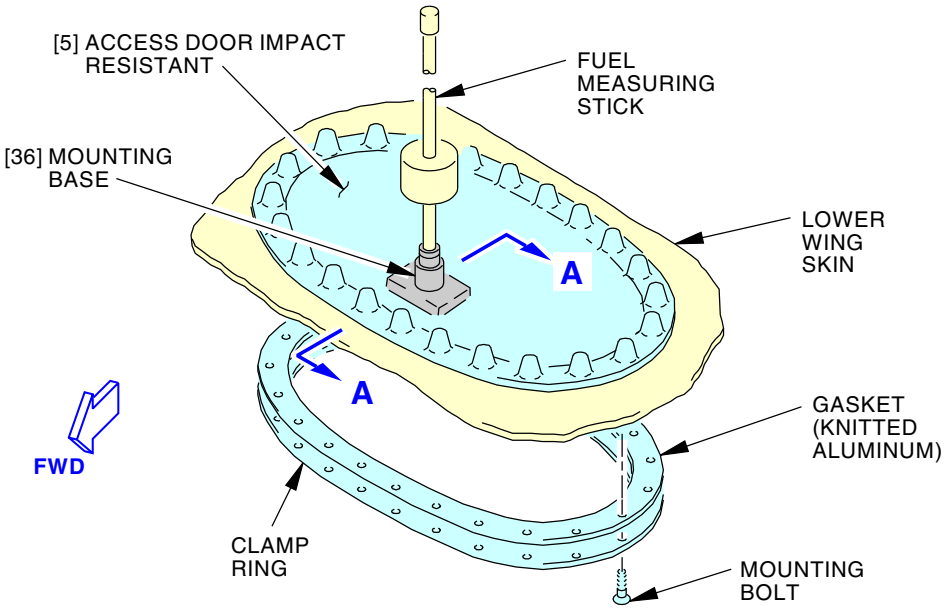
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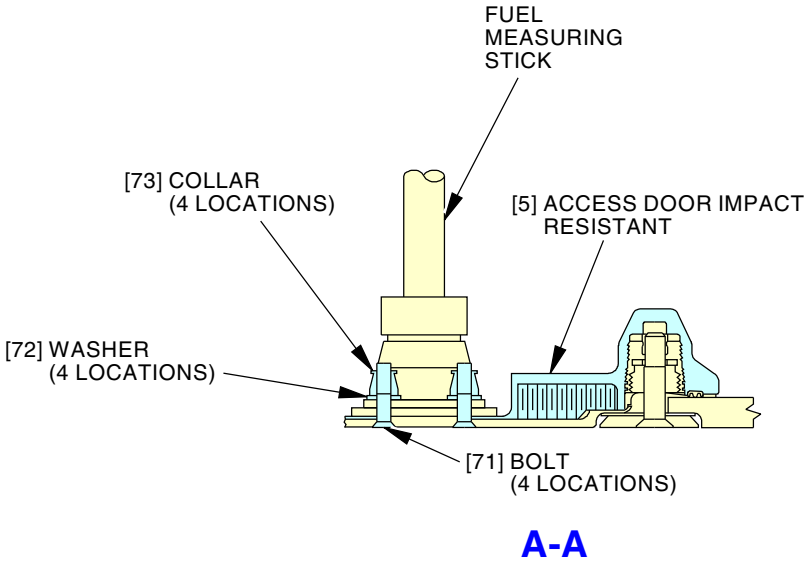
Fuel Measuring Stick Base Installation
Figure 402/28-44-01-990-806 (Sheet 1 of 3)

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FUEL MEASURING STICK INSTALLATION (STICK NO. 3 AND 4)

B

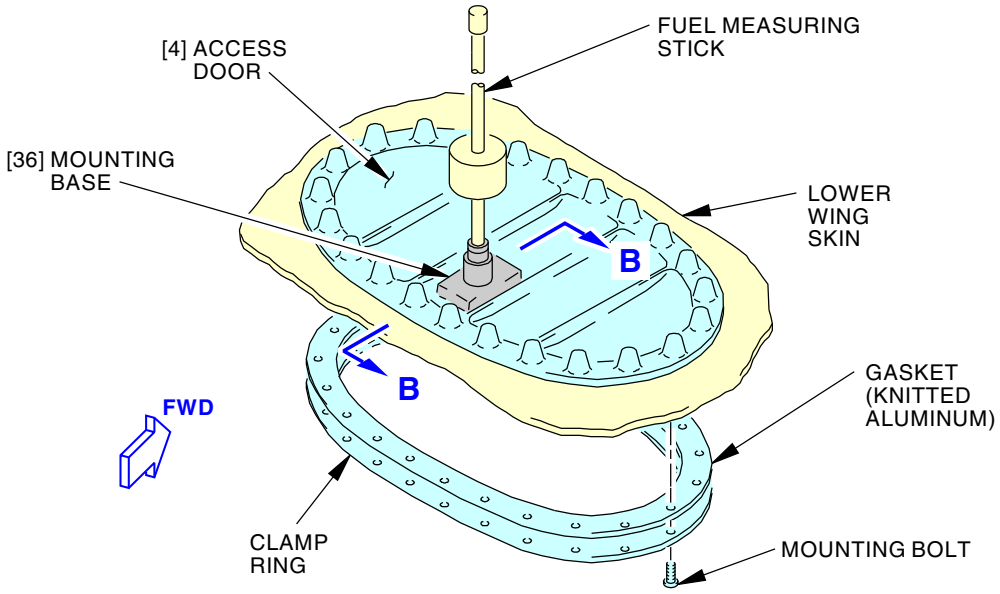


A-A

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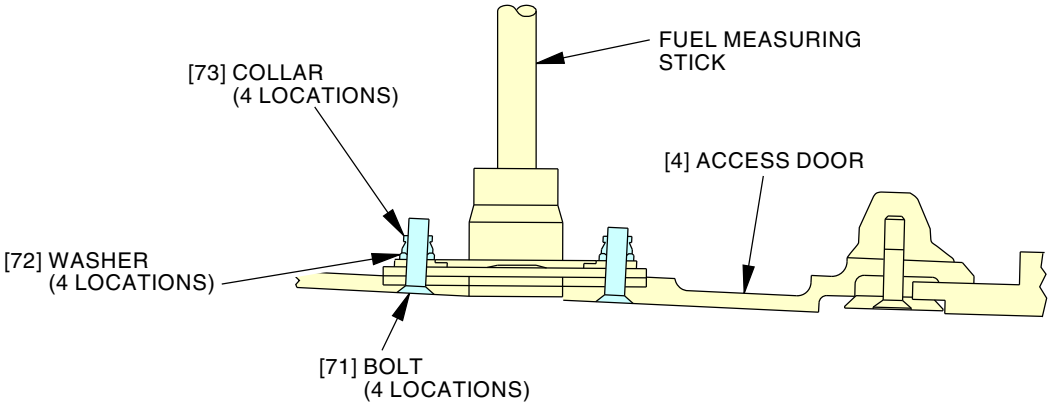
Fuel Measuring Stick Base Installation
Figure 402/28-44-01-990-806 (Sheet 2 of 3)

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FUEL MEASURING STICK INSTALLATION
(STICK NO. 5, 6, 7, 8, 9, AND 10)

C



B-B

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Fuel Measuring Stick Base Installation
Figure 402/28-44-01-990-806 (Sheet 3 of 3)

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TASK 28-44-01-400-803

7. Fuel Measuring Stick Mounting Base - Installation

A. References

Reference	Title
20-30-88-910-801	Final Cleaning of Metal Prior to Non-structural Bonding (Series 88) (P/B 201)
28-11-00-300-802	Repair of Sealant Leaks in the Fuel Tank Structure (P/B 801)

B. Tools/Equipment

NOTE: When more than one tool part number is listed under the same "Reference" number, the tools shown are alternates to each other within the same airplane series. Tool part numbers that are replaced or non-procurable are preceded by "Opt:", which stands for Optional.

Reference	Description
COM-1550	Bonding Meters - Approved, Intrinsically Safe (Approved for use in Class I, Divisions I & II hazardous (classified) locations. Outside these hazardous locations, COM-614 can be used in lieu of COM-1550). Part #: 620LK Supplier: 1CRL2 Part #: M1 Supplier: 3AD17 Part #: T477W Supplier: 01014 Opt Part #: M1B Supplier: 3AD17

C. Consumable Materials

Reference	Description	Specification
A00767	Sealant - Fuel Tank	BMS5-45
A50110	Sealant	BMS5-45 Class B-2
A50155	Sealant - Fuel Tank	BMS5-45 Class C
B01008	Solvent - Final Cleaning Of Metal Prior To Non-Structural Bonding - Series 88	
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5 Class A

D. Location Zones

Zone	Area
533	Main Tank - Rib 8 to Rib 17 - Left Wing
541	Main Tank - Rib 17 to Rib 32 - Left Wing
542	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
543	Main Tank - Rib 34 - Rib 37, WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - WS 1155 - WS 1182
633	Main Tank, Rib 8 To Rib 17 - Right Wing
641	Main Tank - Rib 17 to Rib 32 - Right Wing
642	Main Tank - rib 32 to rib 34 - WS 1021.5 to WS 1074
643	Main Tank - Rib 34 - Rib 37 - WS 1074 - WS 1155; and Surge Tank - Rib 37 - Rib 38 - Ws 1155 - WS 1182

E. Procedure

(Figure 402)

SUBTASK 28-44-01-420-007

(1) Do these steps to install a mounting base [36] on an impact resistant access door [5]:

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WARNING DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(a) Final clean the contact surfaces of the impact resistant access door [5] and the mounting base [36] with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

(b) Rub dry with a clean, dry cotton wiper, G00034.

(c) Continue to clean and dry the surfaces until the dry cotton wiper, G00034, stays clean.

(d) Apply a faying surface seal using sealant, A50110, or sealant, A50155 (TASK 28-11-00-300-802).

(e) Install bolt [71], washer [72], and collar [73] (4 locations)

NOTE: Fasteners should be installed before the end of the sealant squeeze-out life.

(f) Apply a cap seal of sealant, A50110, or sealant, A50155, to the bolts [71], washers [72], and collars [73].

NOTE: Use the same sealant that was used for the faying surface seal.

(g) Apply a fillet seal of sealant, A50110, or sealant, A50155, around the perimeter of the mounting base [36].

NOTE: Use the same sealant that was used for the faying surface seal.

(h) Use an intrinsically safe approved bonding meter, COM-1550, to measure the bonding resistance between the mounting base and the impact resistant access door [5].

1) Make sure the bonding resistance is 0.001 ohm (1 milliohm) or less.

SUBTASK 28-44-01-420-008

(2) Do these steps to install a mounting base [36] on anaccess door [4]:

WARNING DO NOT GET SOLVENTS IN YOUR MOUTH, YOUR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE DANGEROUS MATERIALS. SOLVENTS CAN BE FLAMMABLE. OBEY THE MATERIAL SAFETY DATA SHEETS (MSDS) FOR SOLVENTS. OBEY LOCAL REGULATIONS FOR THE CORRECT PROCEDURES TO USE OR DISCARD SOLVENTS. SOLVENTS CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

(a) Final clean the contact surfaces of the impact resistant access door [5] and the mounting base [36] with a cotton wiper, G00034, soaked with Series 88 solvent, B01008 (TASK 20-30-88-910-801).

(b) Rub dry with a clean, dry cotton wiper, G00034.

(c) Continue to clean and dry the surfaces until the dry cotton wiper, G00034, stays clean.

(d) Install bolt [71], washer [72], and collar [73] (4 locations)

(e) Apply a cap seal of sealant, A00767, to the bolts [71], washers [72], and collars [73].

(f) Apply a fillet seal of sealant, A00767, around the perimeter of the mounting base [36].

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(g) Use an intrinsically safe approved bonding meter, COM-1550, to measure the bonding resistance between the mounting base and the access door [4].

1) Make sure the bonding resistance is 0.001 ohm (1 milliohm) or less.

F. Return the Airplane to Normal

SUBTASK 28-44-01-420-009

(1) For the applicable fuel measuring stick, do this task: Fuel Measuring Stick Housing - Installation, TASK 28-44-01-400-802

——— END OF TASK ———

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INCLINOMETER - REMOVAL/INSTALLATION

1. General

A. The airplane has a lateral inclinometer and a longitudinal inclinometer located in the nose wheel well.

B. This procedure has two tasks. The first task removes an inclinometer. The second task installs an inclinometer.

TASK 28-44-02-000-801

2. Inclinometer - Removal

(Figure 401)

A. References

Reference	Title
32-00-15-480-801	Landing Gear Door Safety Pins Installation (P/B 201)
32-00-30-480-801	Landing Gear Downlock Pins Installation (P/B 201)
32-00-40-860-802	Landing Gear Ground Door Release System Operation (Open the Doors) (P/B 201)

B. Location Zones

Zone	Area
700	Landing Gear and Landing Gear Doors

C. Prepare for the Removal

SUBTASK 28-44-02-580-001

(1) Park the airplane in a level location.

NOTE: The airplane must be parked on a level surface before you do this procedure.

SUBTASK 28-44-02-480-001

(2) Make sure the landing gear downlock pins are installed on the nose and main landing gear, do this task: Landing Gear Downlock Pins Installation, TASK 32-00-30-480-801.

SUBTASK 28-44-02-010-001

WARNING USE THE CORRECT PROCEDURE TO OPEN THE DOORS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(3) Open the doors of the landing gear, do this task: Landing Gear Ground Door Release System Operation (Open the Doors), TASK 32-00-40-860-802.

SUBTASK 28-44-02-480-002

WARNING USE THE CORRECT PROCEDURE TO INSTALL THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(4) Install the door lock, do this task: Landing Gear Door Safety Pins Installation, TASK 32-00-15-480-801.

D. Procedure

SUBTASK 28-44-02-020-001

(1) Remove the screws [2], washers [3] and nuts [4] for the inclinometer [1].

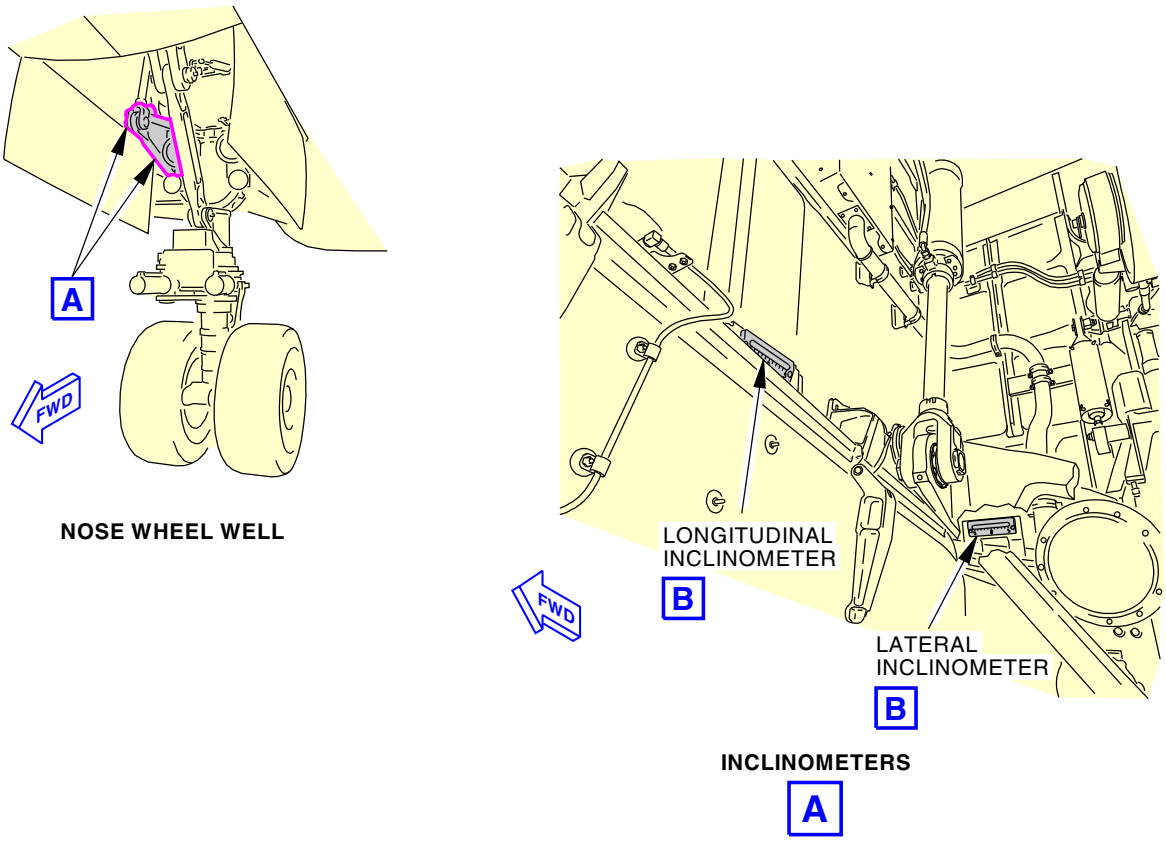
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SUBTASK 28-44-02-010-002

(2) Remove the inclinometer [1].

END OF TASK

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Airplane Leveling Inclinometers
Figure 401/28-44-02-990-801

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TASK 28-44-02-400-801

3. Inclinometer - Installation

(Figure 401)

A. References

Reference	Title
07-11-01-580-804	Lift the Airplane with Jacks (P/B 201)
07-11-01-580-805	Lower the Airplane Off of the Jacks (P/B 201)
12-15-01-610-810	Main Landing Gear Shock Strut Servicing (P/B 301)
12-15-02-610-805-002	Nose Landing Gear Shock Strut Servicing (P/B 301)
32-00-15-080-801	Landing Gear Door Safety Pins Removal (P/B 201)
32-00-40-860-801	Landing Gear Ground Door Release System Operation (Close the Doors) (P/B 201)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Inclinometer	28-44-02-01-005	ARO ALL

C. Location Zones

Zone	Area
700	Landing Gear and Landing Gear Doors

D. Procedure

SUBTASK 28-44-02-420-001

(1) Put the inclinometer [1] into its position.

SUBTASK 28-44-02-420-002

(2) Install but do not tighten the screws [2], washers [3] and nuts [4] for the inclinometer [1].

E. Installation Test

SUBTASK 28-44-02-580-002

(1) If you installed the "roll" inclinometer, do these steps to make sure the ball in the inclinometer is "zeroed":

NOTE: Airplane roll is displayed on the center lower EICAS maintenance page in the flight deck. This data is determined from the Airplane Data Inertial Reference Unit's (ADIRU) acceleration data and is displayed to the nearest tenth of a degree. The positive sense for roll displayed on the maintenance page is LEFT WING DOWN (example: 1.0 degree roll is right wing up 1.0 degree and left wing down 1.0 degree. Therefore, the right wing is -1.0 degree and the left wing is 1.0 degree).

(a) Inflate or deflate the applicable landing gear shock struts until the roll on the maintenance page is zero degrees or the plumb bob is at zero degrees.

1) Adjust the shock struts of the main landing gear, do this task: Main Landing Gear Shock Strut Servicing, TASK 12-15-01-610-810.

2) Adjust the shock strut of the nose landing gear, do this task: Nose Landing Gear Shock Strut Servicing, TASK 12-15-02-610-805-002.

(b) If you cannot get zero degrees with the landing gear use the jacks, do this task: Lift the Airplane with Jacks, TASK 07-11-01-580-804.

(c) Make sure the ball in the inclinometer is at zero and tighten the screws, washers and nuts for the inclinometer.

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SUBTASK 28-44-02-580-003

(2) If you installed the "pitch" inclinometer, do these steps to make sure the airplane is at a known pitch angle:

NOTE: Airplane pitch is displayed on the center lower EICAS maintenance page in the flight deck. This pitch is determined from the Airplane Data Inertial Reference Unit's (ADIRU) acceleration data and is displayed to the nearest tenth of a degree. The positive sense for pitch is NOSE UP.

(a) Inflate or deflate the applicable landing gear shock struts until the maintenance page pitch data or plumb bob are at a known angle.

1) Adjust the shock struts of the main landing gear, do this task: Main Landing Gear Shock Strut Servicing, TASK 12-15-01-610-810.

2) Adjust the shock strut of the nose landing gear, do this task: Nose Landing Gear Shock Strut Servicing, TASK 12-15-02-610-805-002.

(b) If you cannot get a known angle with the landing gear use the jacks, do this task: Lift the Airplane with Jacks, TASK 07-11-01-580-804.

(c) Make sure the ball in the inclinometer is at the known angle and tighten the screws, washers and nuts for the inclinometer.

F. Put the Airplane Back to Its Initial Condition

SUBTASK 28-44-02-580-004

(1) If it is necessary, lower the airplane off of the jacks, do this task: Lower the Airplane Off of the Jacks, TASK 07-11-01-580-805.

SUBTASK 28-44-02-080-001

WARNING USE THE CORRECT PROCEDURE TO REMOVE THE DOOR LOCKS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Remove the door locks, do this task: Landing Gear Door Safety Pins Removal, TASK 32-00-15-080-801.

SUBTASK 28-44-02-410-001

WARNING USE THE CORRECT PROCEDURE TO CLOSE THE DOORS. THE DOORS OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(3) Close the doors, do this task: Landing Gear Ground Door Release System Operation (Close the Doors), TASK 32-00-40-860-801.

END OF TASK

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