CHAPTER

28

FUEL

CHAPTER 28
FUEL

A = Added, R = Revised, D = Deleted, O = Overflow, C = Customer Originated Change

28-EFFECTIVE PAGES

Subject/Page	Date	COC
28-22 TASKS (cont)		
229	Jun 15/2022	
230	Jun 15/2022	
231	Jun 15/2022	
232	Jun 15/2022	
233	Jun 15/2023	
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R 245	Oct 15/2023	
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R 264	Oct 15/2023	
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298.5	Feb 15/2023	
298.6	Feb 15/2023	
298.7	Feb 15/2023	
298.8	Feb 15/2023	
298.9	Feb 15/2023	
298.10	Feb 15/2023	
298.11	Feb 15/2023	
298.12	Feb 15/2023	
298.13	Feb 15/2023	
298.14	Feb 15/2023	
298.15	Feb 15/2023	
298.16	Feb 15/2023	
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202	Oct 15/2021	
203	Oct 15/2021	
204	Oct 15/2021	
205	Oct 15/2021	
206	Oct 15/2021	
28-41 TASKS		
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202	Oct 15/2021	
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206	Oct 15/2021	
207	Oct 15/2021	
R 208	Oct 15/2023	
R 209	Oct 15/2023	
210	Oct 15/2021	
211	Oct 15/2021	
212	Oct 15/2021	
213	Oct 15/2021	
R 214	Oct 15/2023	
R 215	Oct 15/2023	

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28-EFFECTIVE PAGES

Subject/Page	Date	COC
28-41 TASKS (cont)		
R 216	Oct 15/2023	
217	Oct 15/2021	
218	Oct 15/2021	
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R 222	Oct 15/2023	
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225	Oct 15/2021	
226	Oct 15/2021	
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R 228	Oct 15/2023	
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R 236	Oct 15/2023	
237	Oct 15/2021	
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R 240	Oct 15/2023	
R 241	Oct 15/2023	
242	Oct 15/2021	
243	Oct 15/2021	
244	Oct 15/2021	
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O 249	Oct 15/2023	
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28-41 TASKS (cont)		
R 252	Oct 15/2023	
253	Jun 15/2022	
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R 265	Oct 15/2023	
R 266	Oct 15/2023	
R 267	Oct 15/2023	
268	Jun 15/2022	
269	Jun 15/2022	
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271	Oct 15/2021	
R 272	Oct 15/2023	
273	Oct 15/2021	
274	Oct 15/2021	
275	Oct 15/2021	
276	BLANK	
28-43 TASKS		
201	Oct 15/2021	
202	Oct 15/2021	
203	Oct 15/2021	
204	BLANK	

Subject/Page	Date	COC

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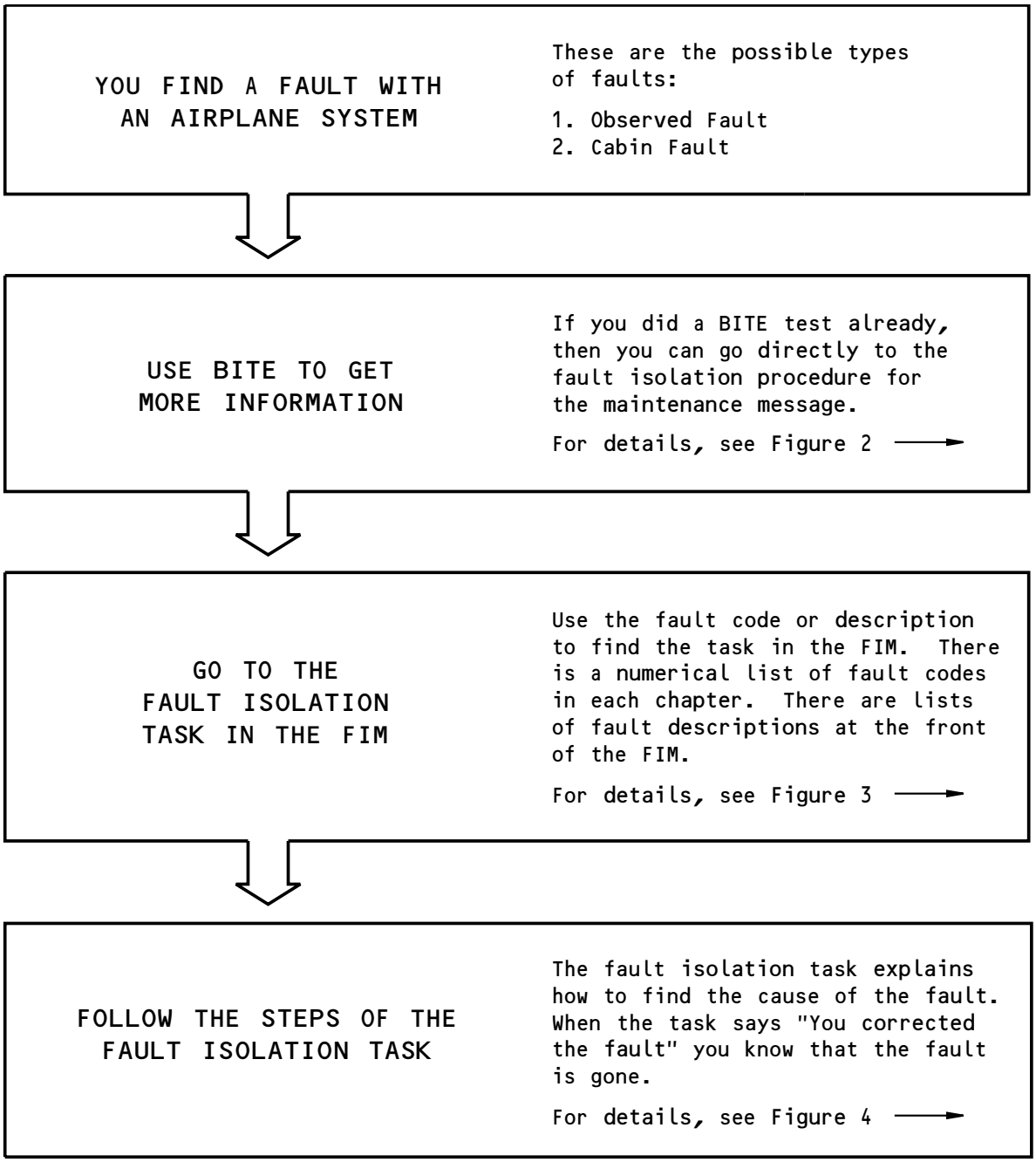
28-EFFECTIVE PAGES



G04902 S0000148576_V1

Basic Fault Isolation Process
Figure 1

Some airplane systems have built-in test equipment (BITE). IF the system finds a fault when you do a BITE test, it will give you a maintenance message.

A maintenance message can be any of these:

- a code
- a text message
- a light
- an indication.

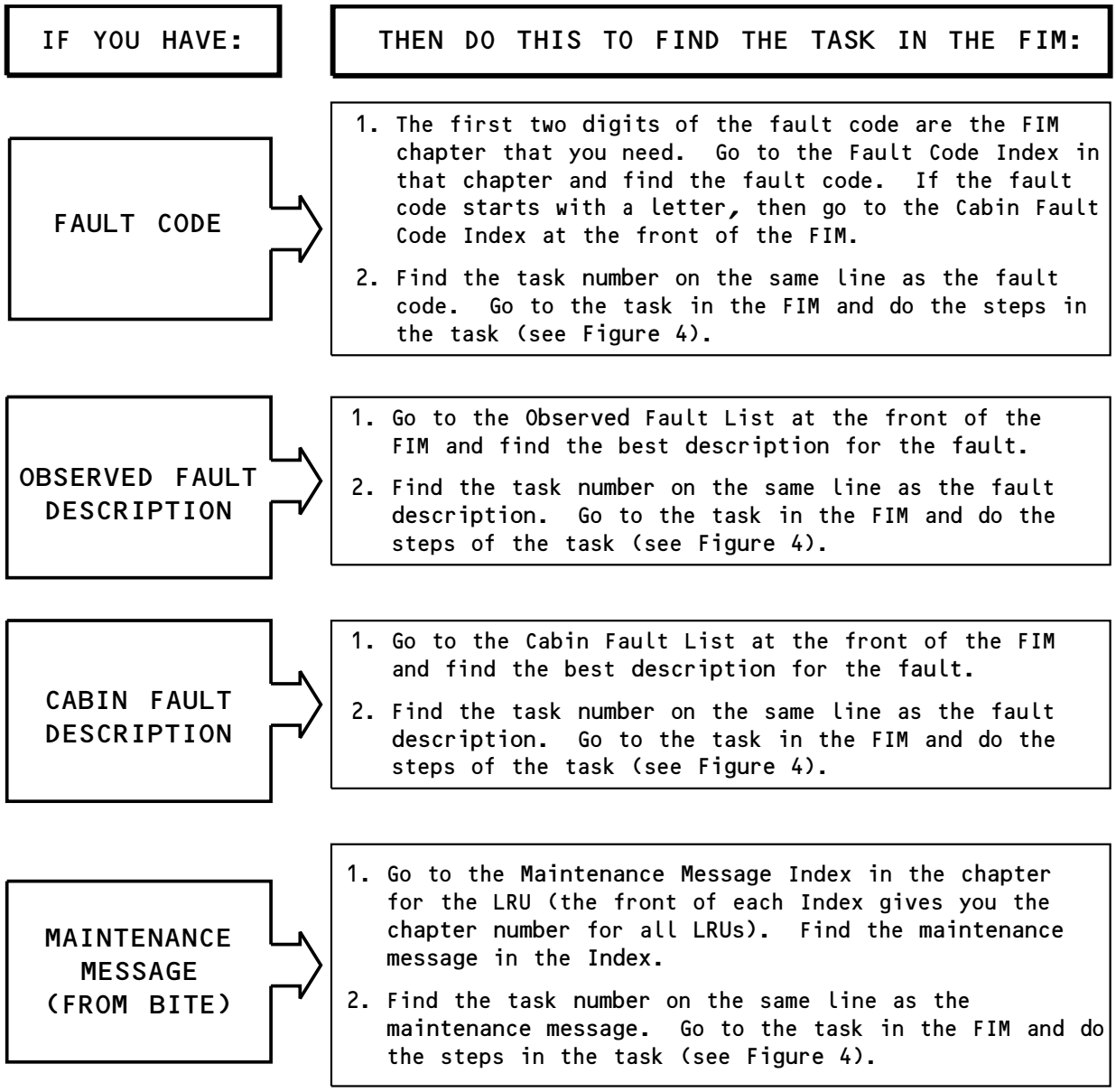
To find the fault isolation task for a maintenance message, go to the Maintenance Message Index in the chapter for the applicable system.

If you do not know which chapter is the correct one, look at the list at the front of any Maintenance Message Index. For each system or component (LRU) that has BITE, this list gives the chapter number where you can find the Index that you need.

Find the maintenance message for the applicable LRU or system in the Index. Then find the task number on the same line as the maintenance message. Go to the task in the FIM and do the steps of the task (see Figure 4).

G04950 S0000148578_V1

Getting Fault Information from BITE
Figure 2



G04979 S0000148579_V2

Finding the Fault Isolation Task in the FIM
Figure 3

ASSUMED CONDITIONS AT START OF TASK

- External electrical power is ON
- Hydraulic power and pneumatic power are OFF
- Engines are shut down
- No equipment in the system is deactivated

POSSIBLE CAUSES

- The list of possible causes has the most likely cause first and the least likely cause last.
- You can use the maintenance records of your airline to determine if the fault occurred before. Compare the list of possible causes to the past maintenance actions. This will help prevent repetition of the same maintenance actions.

INITIAL EVALUATION PARAGRAPH

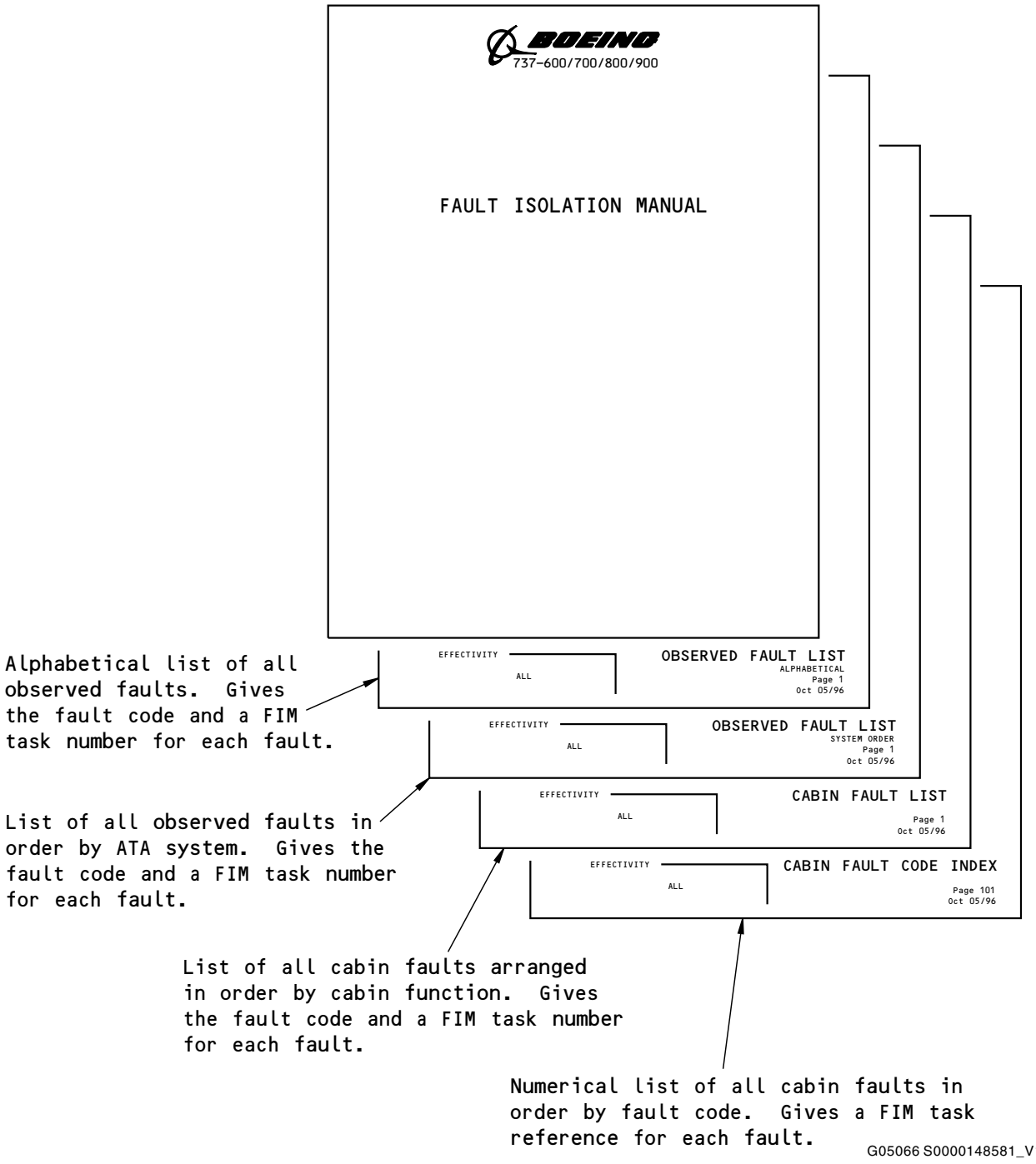
- The primary purpose of the Initial Evaluation paragraph at the start of the task is to help you find out if you can detect the fault right now:
  - If you cannot detect the fault right now, then the task cannot isolate the fault and the Initial Evaluation paragraph will say that there was an intermittent fault.
  - If you have an intermittent fault, you must use your judgement (and follow your airline's policy) to decide which maintenance action to take. Then monitor the airplane to see if the fault happens again on subsequent flights.
- The Initial Evaluation paragraph can also help you find out which Fault Isolation Procedure to use to isolate and correct the fault.

FAULT ISOLATION STEPS

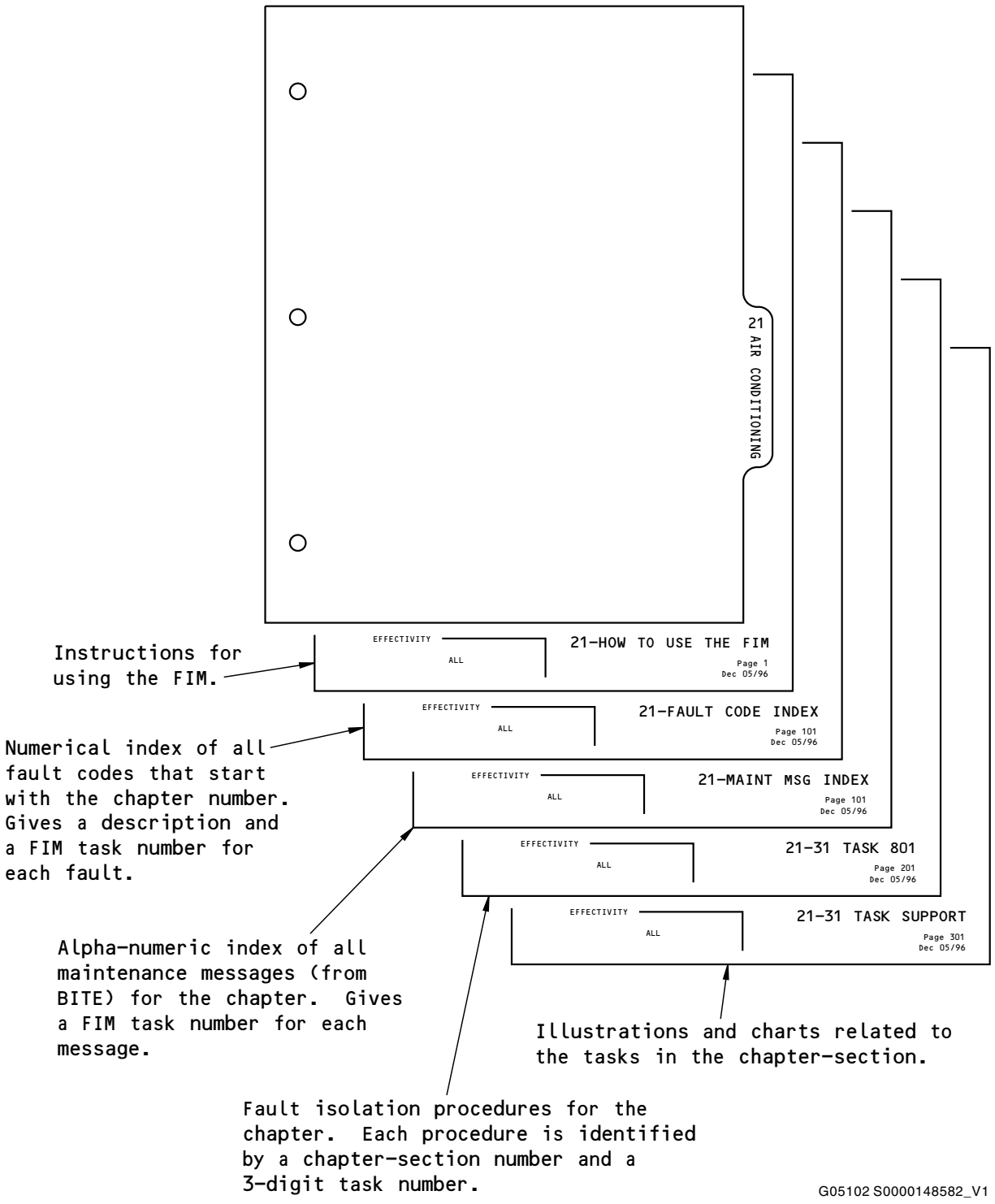
- The FIM task steps are presented in a specified order. The "If... then" statements will guide you along a logical path. But if you do not plan to follow the FIM task exactly, make sure that you read it before you start to isolate the fault. Some FIM procedures start with important steps that have an effect on the other steps in the procedure.
- When you are at the endpoint of the path, the step says "...you corrected the fault." Complete the step and exit the procedure.

G05009 S0000148580_V3

Doing the Fault Isolation Task
Figure 4



Subjects at Front of FIM
Figure 5



Subjects in Each FIM Chapter
Figure 6

FAULT CODE	FAULT DESCRIPTION	GO TO FIM TASK
282 010 01	Refuel quantity indicator: blank - tank no. 1.	28-21 TASK 804
282 010 02	Refuel quantity indicator: blank - tank no. 2.	28-21 TASK 804
282 010 43	Refuel quantity indicator: blank - center tank.	28-21 TASK 804
282 010 48	Refuel quantity indicator: blank - all tanks.	28-21 TASK 804
282 011 01	Refuel quantity indicator: Display is not correct with switch at TEST GAGES - tank no. 1.	28-21 TASK 802
282 011 02	Refuel quantity indicator: Display is not correct with switch at TEST GAGES - tank no. 2.	28-21 TASK 802
282 011 43	Refuel quantity indicator: Display is not correct with switch at TEST GAGES - center tank.	28-21 TASK 802
282 011 48	Refuel quantity indicator: Display is not correct with switch at TEST GAGES - all tanks.	28-21 TASK 802
282 012 01	Refuel quantity indicator: Shows Id FAIL - tank no. 1.	28-21 TASK 805
282 012 02	Refuel quantity indicator: Shows Id FAIL - tank no. 2.	28-21 TASK 805
282 012 43	Refuel quantity indicator: Shows Id FAIL - center tank.	28-21 TASK 805
282 012 48	Refuel quantity indicator: Shows Id FAIL - all tanks.	28-21 TASK 805
282 013 01	Refuel quantity indicator: shows ARINC error message - tank no. 1.	28-21 TASK 817
282 013 02	Refuel quantity indicator: shows ARINC error message - tank no. 2.	28-21 TASK 817
282 013 43	Refuel quantity indicator: shows ARINC error message - center tank.	28-21 TASK 817
282 013 48	Refuel quantity indicator: shows ARINC error message - all tanks.	28-21 TASK 817
282 015 01	Refuel quantity indicator: flashes - tank no. 1.	28-21 TASK 816
282 015 02	Refuel quantity indicator: flashes - tank no. 2.	28-21 TASK 816
282 015 43	Refuel quantity indicator: flashes - center tank.	28-21 TASK 816
282 020 01	REFUEL VALVE Light: light does not go off after pressing the press-to-test switch - tank no. 1.	28-21 TASK 806
282 020 02	REFUEL VALVE Light: light does not go off after pressing the press-to-test switch - tank no. 2.	28-21 TASK 806
282 020 43	REFUEL VALVE Light: light does not go off after pressing the press-to-test switch - center tank.	28-21 TASK 806
282 020 48	REFUEL VALVE Light: light does not go off after pressing the press-to-test switch - all tanks.	28-21 TASK 806
282 030 01	Refuel valve position indicator light does not come on with valves selected open and refueling manifold pressurized - tank no. 1.	28-21 TASK 807
282 030 02	Refuel valve position indicator light does not come on with valves selected open and refueling manifold pressurized - tank no. 2.	28-21 TASK 807

FAULT CODE	FAULT DESCRIPTION	GO TO FIM TASK
282 030 43	REFUEL VALVE Light: light does not come on with valves selected open and refueling manifold pressurized - center tank.	28-21 TASK 807
282 030 48	REFUEL VALVE Light: light does not come on with valves selected open and refueling manifold pressurized - all tanks.	28-21 TASK 807
282 040 00	Refueling: Refueling (all) is prevented.	28-21 TASK 808
282 050 00	Refueling: fuel spill at surge tank.	28-21 TASK 801
282 051 00	Refueling: Fuel Tank Auto-Shutoff is inoperative.	28-21 TASK 801
282 070 01	Refueling: Valve does not close with switch at CLOSED - tank no. 1.	28-21 TASK 806
282 070 02	Refueling: Valve does not close with switch at CLOSED - tank no. 2.	28-21 TASK 806
282 070 43	Refueling: Valve does not close with switch at CLOSED - center tank.	28-21 TASK 806
282 070 48	Refueling: Valve does not close with switch at CLOSED - all tanks.	28-21 TASK 806
282 080 00	Refueling panel light: light does not come on with ground power on the airplane.	28-21 TASK 810
282 090 00	Refueling does not stop at the preselected quantity.	28-21 TASK 811
282 100 01	Fuel tank: unwanted fuel transfer from a main tank to the center tank - from tank 1.	28-21 TASK 803
282 100 02	Fuel tank: unwanted fuel transfer from a main tank to the center tank - from tank 2.	28-21 TASK 813
282 101 00	Fuel transfer (migration): Unwanted fuel transfer from the center tank to the No. 1 tank.	28-21 TASK 814
282 102 00	Fuel transfer (migration): Unwanted fuel transfer from the center tank to the No. 2 tank.	28-21 TASK 815
282 110 00	Crossfeed VALVE OPEN light: Stays ON bright when the Crossfeed Selector is moved to the ON position.	28-22 TASK 807
282 120 00	Crossfeed VALVE OPEN light: Stays ON bright when the Crossfeed Selector is moved to the OFF position.	28-22 TASK 807
282 125 00	Crossfeed VALVE OPEN light: does not come on bright when the valve is in transit.	28-22 TASK 808
282 130 43	LOW PRESSURE light for the fuel pump: light on - center tank, left pump.	28-22 TASK 801
282 140 43	LOW PRESSURE light for the fuel pump: light on - center tank, right pump.	28-22 TASK 802
282 150 01	LOW PRESSURE light for the fuel pump: light on - no. 1 aft fuel pump.	28-22 TASK 803
282 150 02	LOW PRESSURE light for the fuel pump: light on - no. 2 aft fuel pump.	28-22 TASK 805

FAULT CODE	FAULT DESCRIPTION	GO TO FIM TASK
282 160 01	LOW PRESSURE light for the fuel pump: light on - no. 1 fwd and aft fuel pumps.	28-22 TASK 803
282 160 02	LOW PRESSURE light for the fuel pump: light on - no. 2 fwd and aft fuel pumps.	28-22 TASK 805
282 170 01	LOW PRESSURE light for the fuel pump: light on - no. 1 fwd fuel pump.	28-22 TASK 804
282 170 02	LOW PRESSURE light for the fuel pump: light on - no. 2 fwd fuel pump.	28-22 TASK 806
282 180 51	SPAR VALVE CLOSED light: slow to go from Bright to Dim when the Start Lever is moved to CUTOFF - engine 1.	28-22 TASK 809
282 180 52	SPAR VALVE CLOSED light: slow to go from Bright to Dim when the Start Lever is moved to CUTOFF - engine 2.	28-22 TASK 810
282 190 51	SPAR VALVE CLOSED light: slow to go from Bright to OFF when the Start Lever is moved to IDLE - engine 1.	28-22 TASK 809
282 190 52	SPAR VALVE CLOSED light: slow to go from Bright to OFF when the Start Lever is moved to IDLE - engine 2.	28-22 TASK 810
282 200 51	SPAR VALVE CLOSED light: Stays ON bright when the Start Lever is moved to CUTOFF - engine 1.	28-22 TASK 809
282 200 52	SPAR VALVE CLOSED light: Stays ON bright when the Start Lever is moved to CUTOFF - engine 2.	28-22 TASK 810
282 210 51	SPAR VALVE CLOSED light: Stays ON bright when the Start Lever is moved to IDLE - engine 1.	28-22 TASK 809
282 210 52	SPAR VALVE CLOSED light: Stays ON bright when the Start Lever is moved to IDLE - engine 2.	28-22 TASK 810
282 240 51	SPAR VALVE CLOSED light: does not come on bright when the valve is in transit - engine 1.	28-22 TASK 811
282 240 52	SPAR VALVE CLOSED light: does not come on bright when the valve is in transit - engine 2.	28-22 TASK 812
282 251 00	Fuel suction feed: engine does not continue running the full five minutes during Engine Fuel Suction Feed Operational Test.	28-22 TASK 819
282 301 02	Fuel tank: boost pump circuit breaker open - No. 2 tank, aft pump.	28-22 TASK 816
282 301 43	Fuel tank: boost pump circuit breaker open - center tank, left pump.	28-22 TASK 817
282 302 01	Fuel tank: boost pump circuit breaker open - No. 1 tank, forward pump.	28-22 TASK 813
282 302 02	Fuel tank: boost pump circuit breaker open - No. 2 tank, forward pump.	28-22 TASK 815
282 302 43	Fuel tank: boost pump circuit breaker open - center tank, right pump.	28-22 TASK 818

FAULT CODE	FAULT DESCRIPTION	GO TO FIM TASK
282 311 41	LOW PRESSURE light for the fuel pump: light does not come on during boost pump auto-shutoff functional test - center tank, left pump.	28-22 TASK 820
282 311 42	LOW PRESSURE light for the fuel pump: light does not come on during boost pump auto-shutoff functional test - center tank, right pump.	28-22 TASK 821
282 312 41	LOW PRESSURE light for the fuel pump: light comes on, but not in the specified time (15 +/-2 seconds) during boost pump auto-shutoff functional test - center tank, left pump.	28-22 TASK 820
282 312 42	LOW PRESSURE light for the fuel pump: light comes on, but not in the specified time (15 +/-2 seconds) during boost pump auto-shutoff functional test - center tank, right pump.	28-22 TASK 821
282 315 00	Hydraulic fluid leakage in fuel tank.	28-21 TASK 818
284 010 01	Fuel quantity indication, flight compartment: fluctuates or is too high or too low - no. 1 tank.	28-41 TASK 814
284 010 02	Fuel quantity indication, flight compartment: fluctuates or is too high or too low - no. 2 tank.	28-41 TASK 814
284 010 43	Fuel quantity indication, flight compartment: fluctuates or is too high or too low - center tank.	28-41 TASK 814
284 020 01	Fuel quantity indication, flight compartment: error or blank - no. 1 tank.	28-41 TASK 813
284 020 02	Fuel quantity indication, flight compartment: error or blank - no. 2 tank.	28-41 TASK 813
284 020 43	Fuel quantity indication, flight compartment: error or blank - center tank.	28-41 TASK 813
284 020 48	Fuel quantity indication, flight compartment: error or blank - all tanks.	28-41 TASK 813
284 022 00	Fuel quantity indication, flight compartment: CONFIG message shows.	28-41 TASK 820
284 023 00	Fuel quantity indication, flight compartment: IMBAL message shows.	28-41 TASK 820
284 024 00	Fuel quantity indication, flight compartment: LOW message shows.	28-41 TASK 820
284 030 00	Fuel temperature indicator: does not operate correctly.	28-43 TASK 801
284 101 00	FQIS BITE INOP message: Shows on CDU.	28-41 TASK 819

LRU/SYSTEM	SHORT NAME	CHAPTER
Air Data Inertial Reference System	ADIRS	34
Air Traffic Controller Transponder - 1 (Left)	ATC XPDR - 1 (L)	34
Air Traffic Controller Transponder - 2 (Right)	ATC XPDR - 2 (R)	34
Airborne Vibration Monitor System Signal Conditioner	AVM SIG COND	77
Antiskid Control Unit	ANTISKID	32
Attendant Control Panel	ACP	23
Automatic Direction Finder Receiver - 1	ADF RECVR - 1	34
Automatic Direction Finder Receiver - 2	ADF RECVR - 2	34
Autothrottle Computer	A/T COMPUTER	22
Auxiliary Power Unit	APU	49
Auxiliary Power Unit Generator Control Unit	APU GCU	24
Bus Power Control Unit	BPCU	24
Cabin Pressure Controller	CAB PRESS CON	21
Cargo Electronic Unit - Lower Aft	CEU - LWR AFT	26
Cargo Electronic Unit - Lower Forward	CEU - LWR FWD	26
Cargo Electronic Unit - Main Aft	CEU - MAIN AFT	26
Cargo Fire Control Panel	CFCP	26
Common Display System	CDS	31
Compartment Overheat Detection Control Module	WING/BODY OHT	26
Digital Flight Control System	DFCS	22
Distance Measurement Equipment Interrogator	DME INTRROGTR	34
Electrical Meters, Battery, and Galley Power Module	P5-13	24
Electronic Engine Controller - 1	ENGINE - 1	73
Electronic Engine Controller - 2	ENGINE - 2	73
Emergency Locator Transmitter	ELT	23
Engine Accessory Unit	EAU	78
Engine Accessory Unit/TR DEPLOY ENG 1	EAU/TR DPLOY-ENG 1	78
Engine Accessory Unit/TR DEPLOY ENG 2	EAU/TR DPLOY-ENG 2	78
Engine Accessory Unit/TR STOW ENG 1	EAU/TR STOW-ENG 1	78
Engine Accessory Unit/TR STOW ENG 2	EAU/TR STOW-ENG 2	78
Engine and Auxiliary Power Unit Fire Detection Control Module	ENG/APU FIRE	26
Enhanced Digital Flight Control Computer-A	EDFCC-A	22
Enhanced Digital Flight Control System	EDFCS	22
Flap/Slat Electronics Unit	FSEU	27
Flight Data Acquisition Unit	FDAU	31

LRU/SYSTEM	SHORT NAME	CHAPTER
Flight Management Computer System	FMCS	34
Fuel Quantity Indicating System	FQIS	28
Generator Control Unit - 1	GCU - 1	24
Generator Control Unit - 2	GCU - 2	24
Ground Proximity Computer	GROUND PROX	34
High Frequency Transceiver	HF XCVR	23
Multi-Mode Receiver	MMR	34
Nitrogen Generation System BITE Display Unit	NGS	47
Pack Flow Temperature Controller	PFTC	21
Pack/Zone Temperature Controller - Left	PACK/ZN CON - L	21
Pack/Zone Temperature Controller - Right	PACK/ZN CON - R	21
Proximity Switch Electronics Unit	PSEU	32
Radio Altimeter Receiver/Transmitter	RADIO ALTIMTR	34
Satellite Communications System	SATCOM	23
Stall Management Yaw Damper Computer - 1	SMYD - 1	27
Stall Management Yaw Damper Computer - 2	SMYD - 2	27
Traffic Alert and Collision Avoidance System Computer	TCAS COMPUTER	34
VHF Omnidirectional Ranging Marker Beacon Receiver	VOR/MKR RCVR	34
Very High Frequency Transceiver	VHF XCVR	23
Waste Tank Logic Control Module	WASTE TANK	38
Weather Radar Receiver/Transmitter	WEATHER RADAR	34
Window Heat Control Unit - Left Forward	WHCU - L FWD	30
Window Heat Control Unit - Left Side	WHCU - L SIDE	30
Window Heat Control Unit - Right Forward	WHCU - R FWD	30
Window Heat Control Unit - Right Side	WHCU - R SIDE	30
Window Heat Control Unit 1 - Left Forward and Right Side	WHCU1 - L FWD/R SIDE	30
Window Heat Control Unit 2 - Right Forward and Left Side	WHCU2 - R FWD/L SIDE	30

LRU/SYSTEM	MAINTENANCE MESSAGE	GO TO FIM TASK
FQIS	28-41001 NO FMC DATA ON FQIS 6	28-41 TASK 812
FQIS	28-41002 PROCESSOR FAULT	28-41 TASK 809
FQIS	28-41101 1 OR MORE TANK UNIT OPEN	28-41 TASK 818
FQIS	28-41102 TANK UNIT LO-Z OPEN/GND	28-41 TASK 802
FQIS	28-41103 TANK UNIT SHORT/>FULL	28-41 TASK 803
FQIS	28-41104 TANK UNIT LO RESISTANCE	28-41 TASK 804
FQIS	28-41105 HI-Z OP/SHORT TO SHIELD	28-41 TASK 816
FQIS	28-41106 COMPENSATOR LO-Z OP/GND	28-41 TASK 805
FQIS	28-41107 COMPENSATOR SHORTED	28-41 TASK 806
FQIS	28-41108 COMPENSATOR DATA BAD	28-41 TASK 807
FQIS	28-41109 PROCESSOR FAILED	28-41 TASK 808
FQIS	28-41110 PROCESSOR FAULT	28-41 TASK 809
FQIS	28-41111 PROGRAM PINS INVALID	28-41 TASK 811
FQIS	28-41113 PROGRAM PINS INVALID	28-41 TASK 811
FQIS	28-41114 PROCESSOR FAULT	28-41 TASK 809
FQIS	28-41115 ARINC OUTPUT BUS FAILED	28-41 TASK 810
FQIS	28-41201 1 OR MORE TANK UNIT OPEN	28-41 TASK 818
FQIS	28-41202 TANK UNIT LO-Z OPEN/GND	28-41 TASK 802
FQIS	28-41203 TANK UNIT SHORT/>FULL	28-41 TASK 803
FQIS	28-41204 TANK UNIT LO RESISTANCE	28-41 TASK 804
FQIS	28-41205 HI-Z OP/SHORT TO SHIELD	28-41 TASK 816
FQIS	28-41206 COMPENSATOR LO-Z OP/GND	28-41 TASK 805
FQIS	28-41207 COMPENSATOR SHORTED	28-41 TASK 806
FQIS	28-41208 COMPENSATOR DATA BAD	28-41 TASK 807
FQIS	28-41209 PROCESSOR FAILED	28-41 TASK 808
FQIS	28-41210 PROCESSOR FAULT	28-41 TASK 809
FQIS	28-41211 PROGRAM PINS INVALID	28-41 TASK 811
FQIS	28-41213 PROGRAM PINS INVALID	28-41 TASK 811
FQIS	28-41214 PROCESSOR FAULT	28-41 TASK 809
FQIS	28-41215 ARINC OUTPUT BUS FAILED	28-41 TASK 810
FQIS	28-41301 1 OR MORE TANK UNIT OPEN	28-41 TASK 818
FQIS	28-41302 TANK UNIT LO-Z OPEN/GND	28-41 TASK 802
FQIS	28-41303 TANK UNIT SHORT/>FULL	28-41 TASK 803
FQIS	28-41304 TANK UNIT LO RESISTANCE	28-41 TASK 804
FQIS	28-41305 HIZ OPEN/SHORT TO SHIELD	28-41 TASK 816

LRU/SYSTEM	MAINTENANCE MESSAGE	GO TO FIM TASK
FQIS	28-41306 COMPENSATOR LO-Z OP/GND	28-41 TASK 805
FQIS	28-41307 COMPENSATOR SHORTED	28-41 TASK 806
FQIS	28-41308 COMPENSATOR DATA BAD	28-41 TASK 807
FQIS	28-41309 PROCESSOR FAILED	28-41 TASK 808
FQIS	28-41310 PROCESSOR FAULT	28-41 TASK 809
FQIS	28-41311 PROGRAM PINS INVALID	28-41 TASK 811
FQIS	28-41313 PROGRAM PINS INVALID	28-41 TASK 811
FQIS	28-41314 PROCESSOR FAULT	28-41 TASK 809
FQIS	28-41315 ARINC OUTPUT BUS FAILED	28-41 TASK 810
FQIS	28-41415 ARINC OUTPUT BUS FAILED	28-41 TASK 810

801. Fuel Spill at Surge Tank or Fuel Tank Auto-Shutoff Inoperative - Fault Isolation

A. Description

(1) Fuel spills out of the fuel vent at one of the surge tanks during the refueling operation.

(2) (SDS SUBJECT 28-21-00)

B. Possible Causes

(1) Fueling float switch, S574 (No. 1 tank), S576 (center tank), or S578 (No. 2 tank)

(2) Fueling shutoff valve, V44 (No. 1 tank), V45 (No. 2 tank), or V46 (center tank)

(3) Airplane is not level

(4) NGS float valve in the center tank has failed open.

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

(2) These are the primary circuit breakers related to the fault:

CAPT Electrical System Panel, P18-3

Row	Col	Number	Name
D	17	C01657	NITROGEN GENERATION CONTROL
E	15	C01680	NGS ALT PWR

D. Related Data

(1) (SSM 28-44-11)

(2) (WDM 28-44-11)

E. Initial Evaluation

(1) Make sure the airplane has a ground attitude of 1.14 degrees nose-down pitch and 0.0 degree roll.

NOTE: This attitude permits you to put the maximum quantity of fuel in the tanks.

(2) Make sure the shutoff valves are clean. If necessary do the following task:

- Fueling Shutoff Valve - Maintenance Practices, AMM TASK 28-21-51-100-801

(3) Obey all precautions for pressure refueling (AMM TASK 12-11-00-650-801).

(4) Put a 20 gallon (76 liter) container, STD-1158 under each of the surge tanks.

(5) Do the pressure refueling procedure for the center tank only. To do it, do this task: Pressure Refuel Procedure, AMM TASK 12-11-00-650-802.

(a) Make sure the other two fueling shutoff valves are closed.

(b) Monitor the fuel quantity in the center tank.

(c) Make sure automatic shutoff occurs (the VALVE POSITION LIGHT goes off and all fuel flow stops) before the fuel quantity increases to approximately 30,000 lb (13,608 kg).

(d) If automatic shutoff does not occur, then do the Fault Isolation Procedure below for the center tank.

(e) If automatic shutoff occurs as expected, then continue.

(6) Transfer fuel from the center tank to the No. 1 tank until automatic shutoff occurs. To do it, do this task: Tank to Tank Fuel Transfer, AMM TASK 28-26-00-650-802.

(a) Make sure automatic shutoff occurs (the No. 1 tank VALVE POSITION LIGHT goes off and all fuel flow stops) before the fuel quantity in the No. 1 tank increases to approximately 9000 lb (4082 kg).

(b) If automatic shutoff does not occur, then do the Fault Isolation Procedure below for the No. 1 tank.

(c) If automatic shutoff occurs as expected, then continue.

(7) Transfer fuel from the center tank to the No. 2 tank until automatic shutoff occurs. To do it, do this task: Tank to Tank Fuel Transfer, AMM TASK 28-26-00-650-802.

(a) Make sure automatic shutoff occurs (the No. 2 tank VALVE POSITION LIGHT goes off and all fuel flow stops) before the fuel quantity in the No. 2 tank increases to approximately 9000 lb (4082 kg).

(b) If automatic shutoff does not occur, then do the Fault Isolation Procedure below for the No. 2 tank.

(c) If automatic shutoff occurs as expected, then there was an intermittent fault.

NOTE: It is possible that the fault was caused by an unusual airplane attitude during the refueling operation or by fuel expansion.

F. Fault Isolation Procedure

(1) If the VALVE POSITION LIGHT for the fueling shutoff valve did not go off, then do these steps:

(a) Replace the fueling float switch for the applicable tank, S574 (No. 1 tank), S576 (center tank), or S578 (No. 2 tank).

These are the tasks:

Float Switch Removal, AMM TASK 28-21-71-020-801,

Float Switch Installation, AMM TASK 28-21-71-400-802.

(b) Examine the mounting bracket for the fueling float switch to see if it is bent or at the incorrect level.

1) Repair the mounting bracket if it is necessary.

(c) Do the Repair Confirmation at the end of this task.

(2) Do a check of the NGS float valve in the center tank.

NOTE: It is possible that the NGS float valve in the center tank has failed open.

(a) If the float valve has failed open, then replace the float valve.

These are the tasks:

Float Valve Removal, AMM TASK 47-21-02-000-801,

Float Valve Installation, AMM TASK 47-21-02-420-801.

(b) Do the Repair Confirmation at the end of this task.

(3) If the applicable VALVE POSITION LIGHT is off, then do these steps:

(a) Push the VALVE POSITION LIGHT to make sure it is OK.

NOTE: The lights are "press-to-test".

(b) Replace the VALVE POSITION LIGHT if it does not come on when you push it.

(c) If the VALVE POSITION LIGHT is OK, then replace the applicable fueling shutoff valve.
These are the tasks:
Fueling Shutoff Valve - Removal, AMM TASK 28-21-51-000-801,
Fueling Shutoff Valve - Installation, AMM TASK 28-21-51-400-801.

(d) Do the Repair Confirmation at the end of this task.

G. Repair Confirmation

(1) Obey all precautions for pressure refueling (AMM TASK 12-11-00-650-801).

(2) Put a 20 gallon (76 liter) container, STD-1158 under each of the surge tanks.

(3) Do the pressure refueling procedure for the applicable tank. To do it, do this task: Pressure Refuel Procedure, AMM TASK 12-11-00-650-802.

(a) Make sure the other two fueling shutoff valves are closed.

(b) Monitor the fuel quantity in the applicable tank.

(c) Make sure automatic shutoff occurs (the VALVE POSITION LIGHT goes off and all fuel flow stops) before the fuel quantity increases to its full capacity (approximately 30,000 lb (13,608 kg) for the center tank, 9000 lb (4082 kg) for the No. 1 or No. 2 tank).

1) If the automatic shutoff occurs, then you corrected the fault.

(4) If solution is unsatisfactory, then continue the Fault Isolation Procedure at the subsequent step.

(5) Set all of the refuel valve switches to the CLOSE position.

(6) Stop the fuel truck pump.

(7) Disconnect the fuel hose nozzle.

(8) Disconnect the bonding cable that you connected between the fueling source and the airplane.

(9) If there is some unwanted fuel at the refuel station, remove the unwanted fuel.

(10) Close this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

(11) Disconnect the ground cables for the fuel truck.

(12) Disconnect the ground cables for the airplane.

(13) Remove electrical power if it is not necessary for other tasks (AMM TASK 24-22-00-860-812).

——— END OF TASK ———

802. Refuel Quantity Indicator Displays Incorrectly When Test Switch is Pressed - Fault Isolation

A. Description

(1) You push the FUELING INDICATION TEST SWITCH, S160 on the P15 Fueling Control Panel to the TEST GAGES position and one or more or the indicators does not enter the test mode as expected (all segments alternating on then off at two second intervals). If one of the indicators shows Id FAIL, this shows an internal fault in the applicable indicator. The indicators can also be blank or show one or more missing segments. If the SWITCH is held for more than twenty (20) seconds, the test stops automatically and the indicators go back to indicating mode.

(2) (SDS SUBJECT 28-41-00)

B. Possible Causes

(1) Refuel Quantity Indicator, N193 (No. 1 tank), N194 (No. 2 tank), or N195 (center tank)

(2) The FUELING INDICATION TEST SWITCH, S160

(3) The wiring in the P15 Panel

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

D. Related Data

(1) (SSM 28-44-11)

(2) (WDM 28-44-11)

E. Initial Evaluation

(1) Open this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

(2) Set the FUELING INDICATION TEST SWITCH on the P15 Fueling Control Panel to the TEST GAGES position.

(a) On each of the refuel quantity indicators do a check to see if all segments on the display come on for approximately two seconds and then go off for two seconds alternately until the FUELING INDICATION TEST SWITCH is released.

NOTE: If the SWITCH is held for more than twenty (20) seconds, the test stops automatically and the indicators go back to indicating mode.

(b) If all segments on each display do not come on for approximately two seconds and then go off for approximately two seconds, then do the Fault Isolation Procedure below.

(c) If all segments on each display come on for approximately two seconds and then go off for approximately two seconds, then there was an intermittent fault.

F. Fault Isolation Procedure

(1) Do this check of the wiring:

(a) Remove the refuel quantity indicator, N193 (No. 1 tank), N194 (No. 2 tank), or N195 (center tank). To remove it, do this task: Refuel Quantity Indicator Removal, AMM TASK 28-41-61-000-801.

(b) For tank No. 1, do these voltage checks:

1) Do a check for 28 VDC between pin 24 and pin 19 (ground) of connector D11318.

2) Do a check for 28 VDC between pin 24 and pin 23 (ground) of connector D11318.

3) If there is not 28 VDC at pin 24, then do these steps:

a) Repair the wiring from pin 24 on connector D11318 to pin 21 on connector D4578 on the P15 refueling panel.

b) Re-install the refuel quantity indicator, N193. To install it, do this task: Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801.

c) Do the Repair Confirmation at the end of this task.

(c) For tank No. 2, do these voltage checks:

1) Do a check for 28 VDC between pin 24 of connector D11320 and pin 19 (ground).

2) Do a check for 28 VDC between pin 24 of connector D11320 and pin 23 (ground).

3) If there is not 28 VDC at pin 24, then do these steps:

a) Repair the wiring from pin 24 on connector D11320 to pin 21 on connector D4578 on the P15 refueling panel.

b) Re-install the refuel quantity indicator, N194. To install it, do this task: Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801.

c) Do the Repair Confirmation at the end of this task.

(d) For the center tank, do these voltage checks:

1) Do a check for 28 VDC between pin 24 and pin 19 (ground) of connector D11322.

2) Do a check for 28 VDC between pin 24 and pin 23 (ground) of connector D11322.

3) If there is not 28 VDC at pin 24, then do these steps:

a) Repair the wiring from pin 24 on connector D11322 to pin 21 on connector D4578 on the P15 refueling panel.

b) Re-install the refuel quantity indicator, N195. To install it, do this task: Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801.

c) Do the Repair Confirmation at the end of this task.

(e) If there is 28 VDC at pin 24, then continue.

(2) Do this check of the FUELING INDICATION TEST SWITCH:

(a) For tank No. 1, do a check for a short circuit between these pins of connector D11318:

1) Do a check for a short circuit between pin 2 and pin 19 of connector D11318.

2) Do a check for a short circuit between pin 2 and pin 23 of connector D11318.

3) If there is a short circuit from pin 2 to pin 19 or from pin 2 to pin 23, then do these steps:

a) Replace the FUELING INDICATION TEST SWITCH, S160.

b) Re-install the refuel quantity indicator, N193. To install it, do this task: Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801.

c) Do the Repair Confirmation at the end of this task.

(b) For tank No. 2, do a check for a short circuit between these pins of connector D11320:

1) Do a check for a short circuit between pin 2 and pin 19 of connector D11320.

2) Do a check for a short circuit between pin 2 and pin 23 of connector D11320.

3) If there is a short circuit from pin 2 to pin 19 or from pin 2 to pin 23, then do these steps:

a) Replace the FUELING INDICATION TEST SWITCH, S160.

b) Re-install the refuel quantity indicator, N194. To install it, do this task: Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801.

c) Do the Repair Confirmation at the end of this task.

(c) For the center tank, do a check for a short circuit between these pins of connector D11322:

1) Do a check for a short circuit between pin 2 and pin 19 of connector D11322.

2) Do a check for a short circuit between pin 2 and pin 23 of connector D11322.

3) If there is a short circuit from pin 2 to pin 19 or from pin 2 to pin 23, then do these steps:

a) Replace the FUELING INDICATION TEST SWITCH, S160.

b) Re-install the refuel quantity indicator, N195. To install it, do this task: Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801.

c) Do the Repair Confirmation at the end of this task.

(d) If there is not a short circuit from pin 2 to pin 19 or from pin 2 to pin 23, then continue.

(3) Do this check of the FUELING INDICATION TEST SWITCH:

(a) Push and hold the FUELING INDICATION TEST SWITCH in the TEST GAGES position.

(b) For tank No. 1, with the FUELING INDICATION TEST SWITCH in the TEST GAGES position, do a check for an open circuit between these pins of connector D11318:

1) Do a check for an open circuit between pin 2 and pin 19 of connector D11318.

2) Do a check for an open circuit between pin 2 and pin 23 of connector D11318.

3) If there is an open circuit from pin 2 to pin 19 or from pin 2 to pin 23, then do these steps:.

a) Release the FUELING INDICATION TEST SWITCH.

b) Replace the FUELING INDICATION TEST SWITCH, S160.

c) Re-install the refuel quantity indicator, N193. To install it, do this task: Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801.

d) Do the Repair Confirmation at the end of this task.

(c) For tank No. 2, with the FUELING INDICATION TEST SWITCH in the TEST GAGES position, do these checks for an open circuit between these pins of connector D11320:

1) Do a check for an open circuit between pin 2 and pin 19 of connector D11320.

2) Do a check for an open circuit between pin 2 and pin 23 of connector D11320.

3) If there is an open circuit from pin 2 to pin 19 or from pin 2 to pin 23, then do these steps:.

a) Release the FUELING INDICATION TEST SWITCH.

b) Replace the FUELING INDICATION TEST SWITCH, S160.

c) Re-install the refuel quantity indicator, N194. To install it, do this task: Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801.

d) Do the Repair Confirmation at the end of this task.

(d) For the center tank, with the FUELING INDICATION TEST SWITCH in the TEST GAGES position, do a check for an open circuit between these pins of connector D11322:

1) Do a check for an open circuit between pin 2 and pin 19 of connector D11322.

2) Do a check for an open circuit between pin 2 and pin 23 of connector D11322.

3) If there is an open circuit from pin 2 to pin 19 or from pin 2 to pin 23, then do these steps:.

a) Release the FUELING INDICATION TEST SWITCH.

b) Replace the FUELING INDICATION TEST SWITCH, S160.

c) Re-install the refuel quantity indicator, N195. To install it, do this task: Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801.

d) Do the Repair Confirmation at the end of this task.

(e) If there is not an open circuit from pin 2 to pin 19 or from pin 2 to pin 23, then continue.

(4) Install a new refuel quantity indicator, N193 (tank No. 1), N194 (tank No. 4), or N195 (center tank). To install it, do this task: Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801.

(a) Do the Repair Confirmation at the end of this task.

G. Repair Confirmation

(1) Set the FUELING INDICATION TEST SWITCH on the P15 Fueling Control Panel to the TEST GAGES position.

(a) On each of the refuel quantity indicators, make sure all segments on the display come on for approximately two seconds and then go off for two seconds alternately until the FUELING INDICATION TEST SWITCH is released.

NOTE: If the SWITCH is held for more than twenty (20) seconds, the test stops automatically and the indicators go back to indicating mode.

(b) If all segments on each display come on for approximately two seconds and then go off for approximately two seconds, then you corrected the fault.

(c) Close this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

——— END OF TASK ———

803. Unwanted Fuel Transfer from the No. 1 Tank to the Center Tank - Fault Isolation

A. Description

(1) Fuel moved from the No. 1 tank to the center tank without a commanded fuel transfer.

(2) Unwanted particles (debris) in the fuel tank is a common cause of unwanted fuel transfer. Even small particles can cause a valve not to seal correctly. This can cause a large quantity of fuel to transfer. Note that debris in the fuel tank can cause leakage in more than one valve at a time.

(3) Problems with the fuel scavenge system can also cause unwanted transfer from the No. 1 tank to the center tank.

(4) (SDS SUBJECT 28-21-00)

B. Possible Causes

(1) Unwanted particles (debris) in the fuel tank

(2) Leakage in the fuel scavenge system

(3) Leakage in one of the boost pumps

(4) Leakage in the engine fuel-feed manifold

(5) Leakage in the fueling manifold

(6) Leakage in the tank wall (Rib No. 5)

C. Initial Evaluation

(1) Transfer all of the fuel from the center tank and the No. 2 tank into the No. 1 tank. To do this, do this task: Tank to Tank Fuel Transfer, AMM TASK 28-26-00-650-802

(2) Drain the center tank down to the level of the sumps. To do this, do this task: Drain the Fuel from the Sumps after Defueling, AMM TASK 12-11-00-650-804.

NOTE: It is helpful if the airplane is as close as possible to the nominal attitude, roll = 0 degrees, pitch = -1.14 degrees, as specified in (AMM TASK 12-11-00-650-804).

(a) Wait for the fuel to stop draining from the sump completely.

(b) Leave the center tank sump drain open (as a diagnostic tool).

(3) Fill the No. 1 tank to its full capacity.

(4) Make sure the crossfeed valve is closed.

(5) Monitor the center tank sump drain for 5 minutes with no boost pumps operating.

(a) Note the drip rate (if any) from the center tank sump drain with all boost pumps off.

1) If a large fuel quantity drains out of the center tank sump drain, close the center tank sump drain and monitor the center tank fuel quantity.

(6) Set the L FWD and the L AFT boost pumps to ON.

(7) Monitor the center tank sump drain for 5 minutes with the two boost pumps operating.

(a) Note the drip rate (if any) from the center tank sump drain with all boost pumps off.

1) If a large fuel quantity drains out of the center tank sump drain, close the center tank sump drain and monitor the center tank fuel quantity.

(8) If fuel does not drip from the center tank sump drain under any conditions, then there was an intermittent fault.

(9) If fuel drips from the center tank sump drain, then do the Fault Isolation Procedure below.

D. Fault Isolation Procedure

NOTE: You must do the steps in the Initial Evaluation before you do these steps.

(1) Do these steps to look for leakage in the fuel scavenge system and in the output tubing of the L FWD boost pump:

(a) Set the L FWD PUMP switch, on the P5 Overhead Panel, to the ON position.

(b) Let the pump operate for 15 minutes.

(c) Monitor the center tank sump drain (still open) for drops of fuel.

1) If a large fuel quantity drains out of the center tank sump drain, close the center tank sump drain and monitor the center tank fuel quantity.

(d) Monitor the No. 1 tank fuel quantity to see if it decreases.

(e) Set the L FWD PUMP switch, on the P5 Overhead Panel, to the OFF position.

(f) If fuel started to drip from the center tank sump drain or if the drip rate increased while the L FWD PUMP was on, then do these steps:

1) Do this task: Nozzle Assembly of the Fuel Scavenge Jet Pump Removal, AMM TASK 28-22-17-020-801.

2) Examine the nozzle of the fuel scavenge jet pump for unwanted particles (debris).

a) If you find unwanted particles on the nozzle of the fuel scavenge jet pump, do these steps:

WARNING OBEY THE FUEL TANK ENTRY PRECAUTIONS. FAILURE TO OBEY THE FUEL TANK ENTRY PRECAUTIONS CAN CAUSE INJURY OR DAMAGE.

b) Prepare to go into the fuel tank. To do this, do this task: Fuel Tank - Purging and Tank Entry, AMM TASK 28-11-00-910-802.

c) Do this task: Fuel Scavenge Jet Pump Removal, AMM TASK 28-22-17-000-801.

d) Examine the fuel scavenge jet pump for unwanted particles.

NOTE: Do a careful check for particles that keep the outlet check valve open.

e) If it is necessary, install a new fuel scavenge jet pump. To do this, do this task: Fuel Scavenge Jet Pump Installation, AMM TASK 28-22-17-400-801

f) Do this task: Fuel Scavenge Float-Operated Shutoff Valve Removal, AMM TASK 28-22-16-000-801.

g) Examine the float-operated shutoff valve for unwanted particles.

NOTE: Do a careful check for particles that keep the valve open.

h) If it is necessary, install a new float-operated shutoff valve. To do this, do this task: Fuel Scavenge Float-Operated Shutoff Valve Installation, AMM TASK 28-22-16-400-801

i) If it is necessary, replace the applicable couplings in the fuel scavenge system.

These are the tasks:

Fuel Line, Fitting and Coupling Removal, AMM TASK 28-22-15-000-801,

Fuel Line, Fitting and Coupling Installation, AMM TASK 28-22-15-400-801.

j) Do the Repair Confirmation at the end of this task.

3) If there is no indication of unwanted particles on the fuel scavenge nozzle, do a check for leakage at these locations in the tank:

a) The fuel scavenge jet pump

b) The couplings of the fuel scavenge tubing

c) The engine fuel feed tubing and couplings downstream of the L FWD boost pump

d) If you find problems, repair the problems that you find. Do the Repair Confirmation at the end of this task.

(g) If fuel did not start to drip from the center tank sump drain and the drip rate did not increase while the L FWD PUMP was on, then continue:

(2) Do these steps to look for leakage in the output tubing for the L AFT boost pump:

(a) Set the L AFT PUMP switch, on the P5 Overhead Panel, to the ON position.

(b) Let the pump operate for 15 minutes.

(c) Monitor the center tank sump drain (still open) for drops of fuel.

1) If a large fuel quantity drains out of the center tank sump drain, close the center tank sump drain and monitor the center tank fuel quantity.

(d) Monitor the No. 1 tank fuel quantity to see if it decreases.

(e) Set the L AFT PUMP switch, on the P5 Overhead Panel, to the OFF position.

(f) If fuel started to drip from the center tank sump drain or if the drip rate increased while the L AFT PUMP was on, then do these steps:

WARNING OBEY THE FUEL TANK ENTRY PRECAUTIONS. FAILURE TO OBEY THE FUEL TANK ENTRY PRECAUTIONS CAN CAUSE INJURY OR DAMAGE.

1) Prepare to go into the fuel tank. To do this, do this task: Fuel Tank - Purging and Tank Entry, AMM TASK 28-11-00-910-802.
2) Pressurize the engine fuel-feed manifold to 4 psig. To do this, do this task: Engine Fuel Feed Manifold - Leak Test, AMM TASK 28-22-15-710-801.

   NOTE: Do the steps in (AMM TASK 28-22-15-710-801) but only pressurize to 4 psig.
3) Do a check for leakage in the engine fuel feed tubing and couplings downstream of the L AFT boost pump.
4) If you find problems, repair the problems that you find.
5) Do the Repair Confirmation at the end of this task.

(g) If fuel did not start to drip from the center tank sump drain and if the drip rate did not increase while the L AFT PUMP was on, then continue.

(3) Do these steps to examine the boost pumps for indications of leakage:

WARNING OBEY THE FUEL TANK ENTRY PRECAUTIONS. FAILURE TO OBEY THE FUEL TANK ENTRY PRECAUTIONS CAN CAUSE INJURY OR DAMAGE.

(a) Prepare to go into the fuel tank. To do this, do this task: Fuel Tank - Purging and Tank Entry, AMM TASK 28-11-00-910-802.

(b) Examine the boost pump discharge check valves for the center tank. To do this, do this task: Discharge Check Valve Removal, AMM TASK 28-22-71-000-801.

(c) If there are indications of leakage, then repair the problems that you find.
1) Do the Repair Confirmation at the end of this task.
2) If the Repair Confirmation is not OK, then continue.

(d) If there are no indications of leakage, then continue.

(4) Do these steps to look for indications of leakage in the fueling manifold and the fuel-feed manifold:

WARNING OBEY THE FUEL TANK ENTRY PRECAUTIONS. FAILURE TO OBEY THE FUEL TANK ENTRY PRECAUTIONS CAN CAUSE INJURY OR DAMAGE.

(a) Do this task: Fuel Tank - Purging and Tank Entry, AMM TASK 28-11-00-910-802.

(b) Pressurize the engine fuel-feed manifold and the fueling manifold to 4 psig. To do this, do this task: Engine Fuel Feed Manifold - Leak Test, AMM TASK 28-22-15-710-801.

NOTE: Do the steps in (AMM TASK 28-22-15-710-801) but open the defuel valve and only pressurize to 4 psig.

(c) Do an inspection of the full length of the fueling manifold and the couplings of the fuel-feed manifold for indications of leakage.

1) Listen for air leakage or use soap solution if it is necessary.

(d) If you find leakage, repair the problem that you find. To do it, do this task: Fuel Line, Fitting and Coupling Removal, AMM TASK 28-22-15-000-801.

1) Do the Repair Confirmation at the end of this task.

a) If the Repair Confirmation is not OK, then continue.

(e) If you do not find leakage, then continue.

(5) Examine the fuel tank sealant on Rib No. 5 (the tank wall between the center tank and the No. 1 tank) for indication of leakage.

(a) If you find indications of leakage, repair the bad sealant. To do it, do this task: Repair of Sealant Leaks in the Fuel Tank Structure, AMM TASK 28-11-00-300-803.

(b) Do the Repair Confirmation at the end of this task.

E. Repair Confirmation (Recommended)

(1) Close the fuel tanks that you opened to do the leak detection. To do it, do this task: Fuel Tank - Purging and Tank Entry, AMM TASK 28-11-00-910-802.

(2) Close the center tank sump drain valve if it is open.

(3) Do these steps to make sure there is no unwanted fuel transfer:

(a) Transfer all of the fuel out of the center tank. To do it, do this task: Tank to Tank Fuel Transfer, AMM TASK 28-26-00-650-802.

(b) Fill the No. 1 and the No. 2 tank with fuel. To do it, do this task: Pressure Refuel Procedure, AMM TASK 12-11-00-650-802.

(c) Let the airplane stand for four hours.

1) Monitor the center tank fuel quantity for indications of fuel transfer to the center tank.

2) If there is no fuel in the center tank after the four hours, then you corrected the fault.

F. Repair Confirmation (alternative)

(1) Close the fuel tanks that you opened to do the leak detection. To do it, do this task: Fuel Tank - Purging and Tank Entry, AMM TASK 28-11-00-910-802.

(2) Close the center tank sump drain valve if it is open.

(3) If there is no indication of unwanted fuel transfer on subsequent flights, then you corrected the fault.

——— END OF TASK ———

804. Refuel Quantity Indicator Is Blank - Fault Isolation

A. Description

(1) One or all of the refuel quantity indicators is blank when it would usually show the fuel quantity in the applicable tank.

(2) (SDS SUBJECT 28-21-00)

(3) (SDS SUBJECT 28-41-00)

B. Possible Causes

(1) Fuel Quantity Indicating System (FQIS) in-tank wire harness

(2) FQIS tank unit or compensator

(3) Refuel quantity indicator, N193 (tank No. 1), N194 (tank No. 2), N195 (center tank)

(4) Wiring to the refuel quantity indicator.

(5) Fuel quantity processor unit (FQPU), M1827

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

D. Related Data

(1) (SSM 28-44-11)

(2) (WDM 28-44-11)

E. Initial Evaluation

(1) Open this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

(2) Make sure the refueling panel floodlights are on.

(a) If the refueling panel floodlights are not on, then do this task: Fueling Station Flood Light Does Not Come On - Fault Isolation, 28-21 TASK 810.

(b) If the refuel quantity indicator is blank, then do the Fault Isolation Procedure below.

(c) If the refuel quantity indicator is not blank, then there was an intermittent fault.

F. Fault Isolation Procedure

(1) Do this check of the refuel quantity indicator:

(a) Set the FUELING INDICATION TEST SWITCH to the TEST GAGES position.

(b) On each of the refuel quantity indicators do a check to see if all segments on the display come on for approximately two seconds and then go off for two seconds alternately until the FUELING INDICATION TEST SWITCH is released.

NOTE: If the SWITCH is held for more than twenty (20) seconds, the test stops automatically and the indicators go back to indicating mode.

(c) If all segments on each display do not come on for approximately two seconds and then go off for approximately two seconds, then, do this task: Refuel Quantity Indicator Displays Incorrectly When Test Switch is Pressed - Fault Isolation, 28-21 TASK 802.

(d) If all segments on each display come on for approximately two seconds and then go off for approximately two seconds, then continue.

(2) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

(a) If the FQIS BITE test shows a maintenance message, then do the corrective action for that message.

1) Look at the refuel indicators to see if they show the fuel quantity correctly.

2) If the refuel indicators show the fuel quantity correctly, then you corrected the fault.

a) If it is necessary, do this task: Pressure Refuel Procedure, AMM TASK 12-11-00-650-802

b) Close this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

3) If the refuel indicators do not show the fuel quantity correctly, then continue.

(b) If the FQIS BITE test does not show a maintenance message, then continue.

(3) Do this check of the wiring:

(a) Remove the refuel quantity indicator, N193 (tank No. 1), N194 (tank No. 2), or N195 (center tank). To remove it, do this task: Refuel Quantity Indicator Removal, AMM TASK 28-41-61-000-801.

(b) For tank No. 1, do these voltage checks for 28 VDC between these pins of connector D11318:

1) Do a check for 28 VDC between pin 24 and pin 19 (ground) of connector D11318

2) Do a check for 28 VDC between pin 24 and pin 23 (ground) of connector D11318

3) If there is 28 VDC at pin 24, then do these steps:

a) Install a new refuel quantity indicator, N193. To install it, do this task: Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801.

b) Look at the refuel quantity indicators to see if they show the fuel quantity correctly.

c) If the refuel quantity indicators show the fuel quantity correctly, then you corrected the fault.

4) If there is not 28 VDC at pin 24, then do these steps:

a) Repair the wiring from pin 24 on connector D11318 to pin 21 on connector D4578 on the P15 refueling panel.

b) Re-install the refuel quantity indicator, N193. To install it, do this task: Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801

c) Look at the refuel quantity indicators to see if they show the fuel quantity correctly.

d) If the refuel quantity indicators show the fuel quantity correctly, then you corrected the fault.

(c) For tank No. 2, do a check for 28 VDC between these pins of connector D11320:

1) Do a check for 28 VDC between pin 24 and pin 19 (ground) of connector D11320

2) Do a check for 28 VDC between pin 24 and pin 23 (ground) of connector D11320

3) If there is 28 VDC at pin 24, then do these steps:

a) Install a new refuel quantity indicator, N194. To install it, do this task: Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801.

b) Look at the refuel quantity indicators to see if they show the fuel quantity correctly.

c) If the refuel quantity indicators show the fuel quantity correctly, then you corrected the fault.

4) If there is not 28 VDC at pin 24, then do these steps:

a) Repair the wiring from pin 24 on connector D11320 to pin 21 on connector D4578 on the P15 refueling panel.

b) Re-install the refuel quantity indicator, N194. To install it, do this task: Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801

c) Look at the refuel quantity indicators to see if they show the fuel quantity correctly.

d) If the refuel quantity indicators show the fuel quantity correctly, then you corrected the fault.

(d) For the center tank, do a check for 28 VDC between these pins of connector D11322:

1) Do a check for 28 VDC between pin 24 and pin 19 (ground) of connector D11322

2) Do a check for 28 VDC between pin 24 and pin 23 (ground) of connector D11322

3) If there is 28 VDC at pin 24, then do these steps:

a) Install a new refuel quantity indicator, N195. To install it, do this task: Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801.

b) Look at the refuel quantity indicators to see if they show the fuel quantity correctly.

c) If the refuel quantity indicators show the fuel quantity correctly, then you corrected the fault.

4) If there is not 28 VDC at pin 24, then do these steps:

a) Repair the wiring from pin 24 on connector D11318 to pin 21 on connector D4578 on the P15 refueling panel.

b) Re-install the refuel quantity indicator, N193. To install it, do this task: Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801

c) Look at the refuel quantity indicators to see if they show the fuel quantity correctly.

d) If the refuel quantity indicators show the fuel quantity correctly, then you corrected the fault.

(e) If it is necessary, do this task: Pressure Refuel Procedure, AMM TASK 12-11-00-650-802.

(f) Close this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

END OF TASK

805. Refuel Quantity Indicator Shows Id FAIL - Fault Isolation

A. Description

(1) A refuel quantity indicator shows Id FAIL on the display instead of the correct fuel quantity.

(2) (SDS SUBJECT 28-21-00)

(3) (SDS SUBJECT 28-41-00)

B. Possible Causes

(1) Refuel quantity indicator, N193 (tank No. 1), N194 (tank No. 2), N195 (center tank)

(2) Refuel quantity indicator electrical connector, D11318 (tank No. 1), D11320 (tank No. 2), D11322 (center tank)

C. Related Data

(1) SSM 28-44-11

(2) WDM 28-44-11

D. Fault Isolation Procedure

(1) Open this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

(2) Do this check of the electrical connector:

(a) Remove the refuel quantity indicator, N193 (tank No. 1), N194 (tank No. 2), or N195 (center tank) (AMM TASK 28-41-61-000-801).

(b) Examine the applicable electrical connector for damage or corrosion (WDM 28-44-11).

1) Repair all damage that you find.

(c) For tank No. 1, do these continuity checks between these pins of connector D11318:

1) Do a check for continuity between these pins (WDM 28-44-11):

D11318	D11318
pin 6	pin 15
pin 8	pin 15
pin 14	pin 15
pin 7	pin 16

2) If there is not continuity between these pins, then repair the connector.

3) If there is continuity, then replace the tank No. 1 refuel quantity indicator (AMM TASK 28-41-61-400-801).

(d) For tank No. 2, do these continuity checks between these pins of connector D11320:

1) Do a check for continuity between these pins (WDM 28-44-11):

D11320	D11320
pin 6	pin 7
pin 6	pin 14
pin 7	pin 14
pin 8	pin 15
pin 8	pin 16
pin 15	pin 16

2) If there is not continuity between these pins, then repair the connector.

3) If there is continuity, then replace the tank No. 2 refuel quantity indicator (AMM TASK 28-41-61-400-801).

(e) For the center tank, do these continuity checks between these pins of connector D11322:

1) Do a check for continuity between these pins (WDM 28-44-11):

D11322		D11322
pin 6	. . . . .	pin 15
pin 7	. . . . .	pin 15
pin 14	. . . . .	pin 15
pin 8	. . . . .	pin 16

2) If there is not continuity between these pins, then repair the connector.

3) If there is continuity, then replace the center tank refuel quantity indicator (AMM TASK 28-41-61-400-801).

(3) If it is necessary, do this task: Pressure Refuel Procedure, AMM TASK 12-11-00-650-802.

(4) Close this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

——— END OF TASK ———

806. VALVE POSITION LIGHT for the Fueling Shutoff Valve Does Not Go Off When The Valve Switch Is Set To CLOSED - Fault Isolation

A. Description

(1) The VALVE POSITION LIGHT for a fueling shutoff valve does not go off when you set the switch for that valve to the CLOSED position.

(2) (SDS SUBJECT 28-21-00)

B. Possible Causes

(1) Fueling shutoff valve, V44 (tank No. 1), V45 (tank No. 2), or V46 (center tank)

(2) Switch for the fueling shutoff valve, S157 (tank No. 1), S158 (tank No. 2), or S159 (center tank)

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

(a) These are the circuit breakers:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

D. Related Data

(1) (SSM 28-44-11)

(2) (WDM 28-44-11)

E. Initial Evaluation

(1) Open this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

(2) Make sure the shutoff valves are clean. If necessary do the following task:
- Fueling Shutoff Valve - Maintenance Practices, AMM TASK 28-21-51-100-801

(3) Make sure all of the fueling shutoff valve switches are in the CLOSED position.

(4) Do this check of the VALVE POSITION LIGHT for the fueling shutoff valve:
(a) Set the applicable switch for the fueling shutoff valve to OPEN.
(b) Make sure the applicable VALVE POSITION LIGHT comes on.
(c) Set the applicable switch for the fueling shutoff valve to CLOSED.
(d) Do a check to see if the applicable VALVE POSITION LIGHT goes off.
1) If the VALVE POSITION LIGHT does not go off, then do the Fault Isolation Procedure below.
2) If the VALVE POSITION LIGHT goes off, then there was an intermittent fault.

F. Fault Isolation Procedure

(1) Do this check for electrical power to the fueling shutoff valve:
(a) For tank No. 1, do these steps:
1) Disconnect the electrical connector D890 from the fueling shutoff valve that shows the problem.
2) Set the switch for the fueling shutoff valve for the No. 1 tank to the OPEN position.
3) Do a check for 28 VDC from pins 3 and 2 (ground) of the connector D890.
4) Set the switch for the fueling shutoff valve for the No. 1 tank to the CLOSED position.
5) Do a check for 0 VDC between pins 3 and 2 of D890.
6) If there is 0 VDC between pins 3 and 2 with the switch set to CLOSED, then do these steps:
a) Replace the fueling shutoff valve, V44.
These are the tasks:
Fueling Shutoff Valve - Removal, AMM TASK 28-21-51-000-801,
Fueling Shutoff Valve - Installation, AMM TASK 28-21-51-400-801.
b) Do the Repair Confirmation at the end of this task.
7) If there is not 0 VDC between pins 3 and 2 of D890, then continue.
a) Re-connect connector D890 to the fueling shutoff valve.
(b) For tank No. 2, do these steps:
1) Disconnect the electrical connector D894 from the fueling shutoff valve that shows the problem.
2) Set the switch for the fueling shutoff valve for the No. 2 tank to the OPEN position.
3) Do a check for 28 VDC from pins 3 and 2 (ground) of the connector D894.
4) Set the switch for the fueling shutoff valve for the No. 2 tank to the CLOSED position.
5) Do a check for 0 VDC between pins 3 and 2 of D894.
6) If there is 0 VDC between pins 3 and 2 with the switch set to CLOSED, then do these steps:
a) Replace the fueling shutoff valve V45.

These are the tasks:

Fueling Shutoff Valve - Removal, AMM TASK 28-21-51-000-801,

Fueling Shutoff Valve - Installation, AMM TASK 28-21-51-400-801.

b) Do the Repair Confirmation at the end of this task.

7) If there is not 0 VDC between pins 3 and 2 of D894, then continue.

a) Re-connect connector D894 to the fueling shutoff valve.

(c) For the center tank, do these steps:

1) Disconnect the electrical connector D892 from the fueling shutoff valve that shows the problem.

2) Set the switch for the fueling shutoff valve for the center tank to the OPEN position.

3) Do a check for 28 VDC from pins 3 and 2 (ground) of the connector D892.

4) Set the switch for the fueling shutoff valve for the center tank to the CLOSED position.

5) Do a check for 0 VDC between pins 3 and 2 of D892.

6) If there is 0 VDC between pins 3 and 2 with the switch set to CLOSED, then do these steps:

a) Replace the fueling shutoff valve V46.

These are the tasks:

Fueling Shutoff Valve - Removal, AMM TASK 28-21-51-000-801,

Fueling Shutoff Valve - Installation, AMM TASK 28-21-51-400-801.

b) Do the Repair Confirmation procedure at the end of this task.

7) If there is not 0 VDC between pins 3 and 2 of D892, then continue.

a) Re-connect connector D892 to the fueling shutoff valve.

(2) Replace the applicable switch for the fueling shutoff valve, S157 (tank No. 1), S158 (tank No. 2), or S159 (center tank).

(a) Do the Repair Confirmation at the end of this task.

G. Repair Confirmation

(1) Do this check of the VALVE POSITION LIGHT for the fueling shutoff valve:

(a) Set the applicable switch for the fueling shutoff valve to OPEN.

(b) Make sure the applicable VALVE POSITION LIGHT comes on.

(c) Set the applicable switch for the fueling shutoff valve to CLOSED.

(d) Make sure the applicable VALVE POSITION LIGHT goes off.

1) If the indication light goes off, then you corrected the fault.

(2) If solution is unsatisfactory, then continue the Fault Isolation Procedure at the subsequent step.

——— END OF TASK ———

807. Fueling Shutoff Valve Position Indicator Light Does not Come ON when the Valve Switch is set to OPEN - Fault Isolation

A. Description

(1) The VALVE POSITION LIGHT for the Fueling Shutoff Valve shows that the valve solenoid is energized. The Fueling Shutoff Valve is enabled to open when more than 6 psi of fuel pressure is supplied.

(2) The VALVE POSITION LIGHT does not necessarily show that the Fueling Shutoff Valve is open.

(a) For each Fueling Shutoff Valve, the applicable VALVE POSITION LIGHT must come ON when the applicable valve switch is set to the OPEN position and the applicable fuel tank is not full.

(b) The VALVE POSITION LIGHT will not come ON if the applicable tank is full.

B. Possible Causes

(1) Tank 1 (2, CTR) Fueling Shutoff Valve, V44 (V45, V46)

(2) Tank 1 (2, CTR) Fueling Shutoff Valve Control Switch, S157 (S158, S159)

(3) Tank 1 (2, CTR) Refuel Float Switch, S574 (S578, S576)

(4) Tank 1 (2, CTR) VALVE POSITION LIGHT Light, L282 (L283, L284)

(5) Tank 1 (2, CTR) Refuel Quantity Indicator, N193 (N194, N195)

(6) Wiring

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

D. Related Data

(1) SDS SUBJECT 28-21-00

(2) SSM 28-44-11

(3) WDM 28-44-11

E. Initial Evaluation

(1) Open this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

(2) Make sure the shutoff valves are clean. If necessary do the following task:

- Fueling Shutoff Valve - Maintenance Practices, AMM TASK 28-21-51-100-801

(3) Make sure that the floodlights for the Fueling Control Panel are ON.

(a) If the floodlights for the Fueling Control Panel are not ON, then, do this task: Fueling Station Flood Light Does Not Come On - Fault Isolation, 28-21 TASK 810.

(b) If the floodlights for the Fueling Control Panel are ON, then continue.

(4) Make sure that the applicable tank for the Fueling Shutoff Valve with the problem is not full.

(5) Do this check of the VALVE POSITION LIGHT Indication Light:

(a) Set the applicable Fueling Shutoff Valve Control Switch to OPEN.

(b) Make sure that the applicable VALVE POSITION LIGHT comes ON.

1) If the VALVE POSITION LIGHT does not come ON, then do the Fault Isolation Procedure below.

2) If the VALVE POSITION LIGHT comes ON, then there was an intermittent fault.

F. Fault Isolation Procedure

(1) Do this check of the VALVE POSITION LIGHT for the Fueling Shutoff Valve:

(a) Push the applicable VALVE POSITION LIGHT that shows the fueling valve position and make sure that it comes ON.

NOTE: The lights are PUSH-TO-TEST.

(b) If the light does not come ON, then replace the applicable Tank 1 (Tank 2, CTR Tank) VALVE POSITION LIGHT, L282 (L283, L284).

(c) If the light comes ON, then continue.

(2) Do these steps to do a check of the wiring in the Wing Refuel Panel and the Refuel Quantity Indicators, N193, N194, and N195 (WDM 28-44-11):

(a) For the Tank 1, do these steps:

1) Set the Tank 1 Refuel Valve Control Switch to OPEN.

2) Remove the Tank 1 Refuel Quantity Indicator. This is the task: Refuel Quantity Indicator Removal, AMM TASK 28-41-61-000-801.

a) Do a continuity check from pin 11 on connector D11318 to pin 1 on connector D4578P.

<1> If there is no continuity, repair the wiring.

<2> Re-install the Refuel Quantity Indicator. This is the task: Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801.

<3> Do the Repair Confirmation at the end of this task.

b) Do a continuity check from pin 10 on connector D11318 to pin 12 on connector D4578P.

<1> If there is no continuity, replace the switch S157.

<2> If the problem continues, repair the related wiring.

<3> Re-install the Refuel Quantity Indicator. This is the task: Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801.

<4> Do the Repair Confirmation at the end of this task.

c) Install a new Refuel Quantity Indicator. This is the task: Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801.

(b) For Tank 2, do these steps:

1) Set the Tank 2 Refuel Valve Control Switch to OPEN.

2) Remove the Refuel Quantity Indicator, N194. This is the task: Refuel Quantity Indicator Removal, AMM TASK 28-41-61-000-801.

a) Do a continuity check from pin 11 on connector D11320 to pin 7 on connector D4578P.

<1> If there is no continuity, repair the wiring.

<2> Re-install the Refuel Quantity Indicator. This is the task: Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801.

<3> Do the Repair Confirmation at the end of this task.

b) Do a continuity check from pin 10 on connector D11320 to pin 12 on connector D4578P.

<1> If there is no continuity, replace switch S158.

<2> If the problem continues, repair the related wiring.

<3> Re-install the Refuel Quantity Indicator. This is the task: Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801.

<4> Do the Repair Confirmation at the end of this task.

c) Install a new Refuel Quantity Indicator. This is the task: Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801.

(c) For the Center Tank, do these steps:

1) Set the CTR Tank Refuel Valve Control Switch to OPEN.

2) Remove the CTR Tank Refuel Quantity Indicator, N195. This is the task: Refuel Quantity Indicator Removal, AMM TASK 28-41-61-000-801.

a) Do a continuity check from pin 11 on connector D11322 to pin 14 on connector D4578P.

<1> If there is no continuity, repair the wiring.

<2> Re-install the Refuel Quantity Indicator. This is the task: Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801.

<3> Do the Repair Confirmation at the end of this task.

b) Do a continuity check from pin 10 on connector D11322 to pin 12 on connector D4578P.

<1> If there is no continuity, replace switch S159.

<2> If the problem continues, repair the related wiring.

<3> Re-install the Refuel Quantity Indicator. This is the task: Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801.

<4> Do the Repair Confirmation at the end of this task.

c) Install a new Refuel Quantity Indicator. This is the task: Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801.

(3) Do this check for electrical power to the Fueling Shutoff Valve (WDM 28-44-11):

(a) For Tank 1, do these steps:

1) Disconnect the electrical connector D890 from the Fueling Shutoff Valve.

2) Disconnect electrical connector D4578J from the Wing Refuel Panel.

3) Do a continuity check as follows:

Refuel Valve D890		Wing Refuel Panel D4578J
pin 3	. . . . .	pin 8

4) If there is no continuity, repair the wiring.
   a) Re-connect connector D890 to the Fueling Shutoff Valve.
   b) Re-connect connector D4578J to the Wing Refuel Panel.
   c) Do the Repair Confirmation at the end of the task.
5) Re-connect connector D4578J to the Wing Refuel Panel.
6) Set the switch for the Tank 1 Fueling Shutoff Valve to the OPEN position.
7) Do a check for 28V DC from pins 3 and 2 (ground) of the connector D890.
8) Set the switch for the Tank 1 Fueling Shutoff Valve to the CLOSED position.
9) If there is 28V DC between pins 3 and 2 of D890, then do these steps:
   a) Replace the Fueling Shutoff Valve, V44. These are the tasks:
      • Fueling Shutoff Valve - Removal, AMM TASK 28-21-51-000-801
      • Fueling Shutoff Valve - Installation, AMM TASK 28-21-51-400-801
   b) Do the Repair Confirmation at the end of this task.
10) If there is not 28V DC between pins 3 and 2 of D890, then continue.
   a) Reconnect connector D890 to the Fueling Shutoff Valve.

(b) For Tank 2, do these steps:
1) Disconnect the electrical connector D894 from the Fueling Shutoff Valve.
2) Disconnect electrical connector D4578J from the Wing Refuel Panel.
3) Do a continuity check as follows:

Refuel Valve D894		Wing Refuel Panel D4578J
pin 3	. . . . .	pin 9

4) If there is no continuity, repair the wiring.
   a) Re-connect connector D894 to the Fueling Shutoff Valve.
   b) Re-connect connector D4578J to the Wing Refuel Panel.
   c) Do the Repair Confirmation at the end of the task.
5) Re-connect connector D4578J to the Wing Refuel Panel.
6) Set the switch for the Tank 2 Fueling Shutoff Valve to the OPEN position.
7) Do a check for 28V DC from pins 3 and 2 (ground) of the connector D894.
8) Set the switch for the Tank 2 Fueling Shutoff Valve to the CLOSED position.
9) If there is 28V DC between pins 3 and 2 of D894, then do these steps:
   a) Replace the Fueling Shutoff Valve, V45. These are the tasks:
      • Fueling Shutoff Valve - Removal, AMM TASK 28-21-51-000-801

- Fueling Shutoff Valve - Installation, AMM TASK 28-21-51-400-801

b) Do the Repair Confirmation at the end of this task.

10) If there is not 28V DC between pins 3 and 2 of D894, then continue.

a) Reconnect connector D894 to the Fueling Shutoff Valve.

(c) For the Center Tank, do these steps:

1) Disconnect the electrical connector D892 from the Fueling Shutoff Valve.

2) Disconnect electrical connector D4578J from the Wing Refuel Panel.

3) Do a continuity check as follows:

Refuel Valve D892		Wing Refuel Panel D4578J
pin 3	. . . . .	pin 18

4) If there is no continuity, repair the wiring.

a) Re-connect connector D892 to the Fueling Shutoff Valve.

b) Re-connect connector D4578J to the Wing Refuel Panel.

c) Do the Repair Confirmation at the end of the task.

5) Re-connect connector D4578J to the Wing Refuel Panel.

6) Set the switch for the Center Fueling Shutoff Valve to the OPEN position.

7) Do a check for 28V DC from pins 3 and 2 (ground) of the connector D892.

8) Set the switch for the Center Fueling Shutoff Valve to the CLOSED position.

9) If there is 28 V DC between pins 3 and 2 of D892, then do these steps:

a) Replace the Fueling Shutoff Valve, V46. These are the tasks:

- Fueling Shutoff Valve - Removal, AMM TASK 28-21-51-000-801
- Fueling Shutoff Valve - Installation, AMM TASK 28-21-51-400-801

b) Do the Repair Confirmation at the end of this task.

10) If there is not 28V DC between pins 3 and 2 of D892, then continue.

a) Reconnect connector D892 to the Fueling Shutoff Valve.

(4) Do this check of the Refuel Float Switch and the related wiring (WDM 28-44-11):

(a) For Tank 1, do these steps:

1) Disconnect connector D4578J on the Wing Refuel Panel, P15.

2) Do a check for an open circuit between these pins:

D4578J		D4578J
pin 1	. . . . .	pin 8

3) If there is an open circuit (the Refuel Float Switch is open and in the FULL position) and Tank 1 is not full, then do these steps:

a) Do a check for continuity between these pins (WDM 28-44-11):

D4578J		D39905
pin 1	. . . . .	pin 20
pin 8	. . . . .	pin 21

b) If there is no continuity between these pins, then repair the wiring.

<1> Do the Repair Confirmation at the end of this task.

c) Remove the Refuel Float Switch, S574. This is the task: Float Switch Removal, AMM TASK 28-21-71-020-801

d) Do a continuity check of wire 2001B-20 from the location where you cut the wire to remove the float switch to pin 21 on connector D39907.

e) Do a continuity check of wire 2001R-20 from the location where you cut the wire to remove the float switch to pin 20 on connector D39907.

f) If there is not continuity from the cut wires to connector D39907, then repair the wiring.

<1> Install the Refuel Float Switch again. This is the task: Float Switch Installation, AMM TASK 28-21-71-400-802

<2> Do the Repair Confirmation at the end of this task.

g) If there is continuity from the cut wires to connector D39907, then install a new Refuel Float Switch, S574. This is the task: Float Switch Installation, AMM TASK 28-21-71-400-802

<1> Do the Repair Confirmation at the end of this task.

4) If there is continuity between pins 1 and 8, then continue.

a) Re-connect connector D4578J.

(b) For Tank 2, do these steps:

1) Disconnect connector D4578J on the Wing Refuel Panel, P15.

2) Do a check for an open circuit between these pins:

D4578J		D4578J
pin 7	. . . . .	pin 9

3) If there is an open circuit (the Refuel Float Switch is open and in the FULL position) and the Tank 2 is not full, then do these steps:

a) Remove the Refuel Float Switch, S578. This is the task: Float Switch Removal, AMM TASK 28-21-71-020-801

b) Do a continuity check of wire 1024-20 from the location where you cut the wire to remove the float switch to pin 9 on connector D4578J.

c) Do a continuity check of wire 1018-20 from the location where you cut the wire to remove the float switch to pin 7 on connector D4578J.

d) If there is no continuity from the cut wires to connector D4578J, then repair the wiring. Install the float switch again.

<1> If there is no continuity, repair the wiring.

<2> Install the Refuel Quantity Indicator again. This is the task: Float Switch Installation, AMM TASK 28-21-71-400-802

<3> Do the Repair Confirmation at the end of this task.

e) If there is continuity from the cut wires to connector D39907, then install a new Refuel Float Switch, S574. This is the task: Float Switch Installation, AMM TASK 28-21-71-400-802

<1> Do the Repair Confirmation at the end of this task.

4) If there is continuity between pins 7 and 9, then continue.

a) Re-connect connector D4578J.

(c) For the Center Tank, do these steps:

1) Disconnect connector D4578J on the Wing Refuel Panel, P15.

2) Do a check for an open circuit between these pins:

D4578J	D4578J
pin 14	pin 18

3) If there is an open circuit (the Refuel Float Switch is open and in the FULL position) and the Center Tank is not full, then do these steps:

a) Remove the Refuel Float Switch, S576. This is the task: Float Switch Removal, AMM TASK 28-21-71-020-801,

b) Do a continuity check of wire 1019-20 from the location where you cut the wire to remove the float switch to pin 14 on connector D4578J.

c) Do a continuity check of wire 1026-20 from the location where you cut the wire to remove the float switch to pin 18 on connector D4578J.

d) If there is no continuity from the cut wires to connector D4578J, then repair the wiring.

<1> Install the Refuel Float Switch again. This is the task: Float Switch Installation, AMM TASK 28-21-71-400-802

<2> Do the Repair Confirmation at the end of this task.

e) If there is continuity from the cut wires to connector D39907, then install a new Refuel Float Switch, S576. This is the task: Float Switch Installation, AMM TASK 28-21-71-400-802

<1> Do the Repair Confirmation at the end of this task.

4) Re-connect connector D4578J.

G. Repair Confirmation

(1) Do this check of the VALVE POSITION LIGHT for the Fueling Shutoff Valve.

(a) Set the applicable switch for the Fueling Shutoff Valve to OPEN.

(b) Make sure the applicable VALVE POSITION LIGHT comes ON.

1) If the VALVE POSITION LIGHT comes ON, then you corrected the problem.

a) Set the applicable switch back to the CLOSED position.

b) Make sure that the VALVE POSITION LIGHT goes OFF again.

c) Close this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

2) If the VALVE POSITION LIGHT does not come ON, then continue the Fault Isolation Procedure at the applicable subsequent step.

——— END OF TASK ———

808. Fuel Does Not Flow Into The Fuel Tank With Fueling Shutoff Valve Switch in the OPEN Position and Refueling Manifold Pressurized

A. Description

(1) Fuel pressure from a pressurized fuel source is applied to the fueling receptacle and the fueling shutoff valve switch is set to the OPEN position (AMM TASK 12-11-00-650-802), but fuel does not flow into the applicable fuel tank. That is, you do not see the fuel quantity in the applicable tank increase on the indicator or the flowmeter on the fuel source shows no fuel flow.

B. Possible Causes

(1) Fueling shutoff valve, V44 (tank No. 1), V45 (tank No. 2), or V46 (center tank)

(2) Switch for the fueling shutoff valve, S157 (tank No. 1), S158 (tank No. 2), or S159 (center tank)

(3) Fueling float switch, S574 (tank No. 1), S576 (center tank), or S578 (tank No. 2)

(4) Fueling receptacle (if fuel does not flow into all three fuel tanks)

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

(a) These are the circuit breakers:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

D. Related Data

(1) (SSM 28-44-11)

(2) (WDM 28-44-11)

E. Initial Evaluation

(1) Open this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

(2) Do a check make sure the fuel tank with the problem is not full.

(3) Make sure the shutoff valves are clean. If necessary do the following task:

- Fueling Shutoff Valve - Maintenance Practices, AMM TASK 28-21-51-100-801

(4) Do a check to see if the VALVE POSITION LIGHT for the fueling shutoff valve comes on when the fueling shutoff valve switch is set to the OPEN position.

(a) If the VALVE POSITION LIGHT does not come on when the fueling shutoff valve switch is set to the OPEN position, then, do this task: Fueling Shutoff Valve Position Indicator Light Does not Come ON when the Valve Switch is set to OPEN - Fault Isolation, 28-21 TASK 807

(5) Do these steps to prepare for pressure fueling if you did not do them before:

(a) Do this task: Precautions and Limits for the Refuel Operation, AMM TASK 12-11-00-650-801.

WARNING

MAKE SURE THERE IS ELECTRICAL CONTINUITY BETWEEN THE FUEL SOURCE AND THE AIRPLANE. A FIRE OR AN EXPLOSION CAN OCCUR.

(b) Attach the bonding cable on the nozzle of the fuel hose to the ground jack on the wing.

NOTE: The bonding cable is not necessary if there is electrical continuity between the nozzle and the receptacle.

(c) Attach the nozzle on the fuel hose to the fueling receptacle.

1) Open the valve in the nozzle on the fuel hose.

2) Make sure the nozzle and the fueling receptacle have a good seal.

WARNING

MAKE SURE THE FUEL SOURCE DOES NOT HAVE MORE THAN A MAXIMUM PRESSURE OF 55 PSI (379 KPA). INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(6) Do these steps to do a check for a fueling shutoff valve that does not open during the refuel operation:

(a) Make sure all of the fueling shutoff valve switches are set to the CLOSED position and the VALVE POSITION lights are off.

(b) Start the pump on the fuel truck or the fuel source.

(c) Monitor the fuel source to make sure the pressure is not more than 55 psi (379 kPa).

(d) The flowmeter on the fuel truck or the fuel source must show no fuel flow.

(e) Set the fueling shutoff valve switch for the tank(s) that has the problem to OPEN.

(f) If the flowmeter on the fuel source shows fuel flow and the fuel tank quantity increases at the usual rate, then there was an intermittent fault.

(g) If there is no fuel flow on the flowmeter or if the fuel flow is much slower than usual, then do these steps:

1) Stop the fuel pump on the truck.

2) Do the Fault Isolation Procedure below.

F. Fault Isolation Procedure

(1) If only one tank will not accept fuel when the fueling shutoff valve switch is in the OPEN position, then replace the applicable fueling shutoff valve, V44 (tank No. 1), V45 (tank No. 2), or V46 (center tank).

These are the tasks:

Fueling Shutoff Valve - Removal, AMM TASK 28-21-51-000-801,

Fueling Shutoff Valve - Installation, AMM TASK 28-21-51-400-801.

(a) Do the Repair Confirmation at the end of this task.

(2) If all three tanks will not accept fuel when the fueling shutoff valve switch is in the OPEN position, then replace the fueling receptacle.

These are the tasks:

Fueling Receptacle Removal, AMM TASK 28-21-11-000-801,

Fueling Receptacle Installation, AMM TASK 28-21-11-400-801.

(a) Do the Repair Confirmation at the end of this task.

G. Repair Confirmation

(1) Do these steps to prepare for pressure fueling if you did not do them before:

(a) Do this task: Precautions and Limits for the Refuel Operation, AMM TASK 12-11-00-650-801.

WARNING MAKE SURE THERE IS ELECTRICAL CONTINUITY BETWEEN THE FUEL SOURCE AND THE AIRPLANE. A FIRE OR AN EXPLOSION CAN OCCUR.

(b) Attach the bonding cable on the nozzle of the fuel hose to the ground jack on the wing.

NOTE: The bonding cable is not necessary if there is electrical continuity between the nozzle and the receptacle.

(c) Attach the nozzle on the fuel hose to the fueling receptacle.

1) Open the valve in the nozzle on the fuel hose.

2) Make sure the nozzle and the fueling receptacle have a good seal.

WARNING MAKE SURE THE FUEL SOURCE DOES NOT HAVE MORE THAN A MAXIMUM PRESSURE OF 55 PSI (379 KPA). INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(2) Do these steps to do a check for a fueling shutoff valve that does not open during the refuel operation:

(a) Make sure all of the fueling shutoff valve switches are set to the CLOSED position and the VALVE POSITION lights are off.

(b) Start the pump on the fuel truck or the fuel source.

(c) Monitor the fuel source to make sure the pressure is not more than 55 psi.

(d) The flowmeter on the fuel truck or the fuel source must show no fuel flow.

(e) Set the fueling shutoff valve switch for the tank(s) that has the problem to OPEN.

(f) If the flowmeter on the fuel source shows fuel flow and the fuel tank quantity increases at the usual rate, then you corrected the fault.

(3) If solution is unsatisfactory, then continue the Fault Isolation Procedure at the subsequent step.

——— END OF TASK ———

809. Fuel Flow Into The Fuel Tank Does Not Stop With Fueling Shutoff Valve Switch in the CLOSED Position

A. Description

(1) You did the pressure fueling operation (AMM TASK 12-11-00-650-802), but fuel continued to flow into one [or more] of the tanks when the applicable fueling shutoff valve switch is set to the CLOSED position. That is, the fuel quantity in the applicable tank continues to increase on the indicator or the flowmeter on the fuel source continues to show fuel flow.

B. Possible Causes

(1) Fueling shutoff valve, V44 (tank No. 1), V45 (tank No. 2), or V46 (center tank)

(2) Switch for the fueling shutoff valve, S157 (tank No. 1), S158 (tank No. 2), or S159 (center tank)

(3) Fueling float switch, S574 (tank No. 1), S576 (center tank), or S578 (tank No. 2)

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

(a) These are the circuit breakers:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

D. Related Data

(1) (SSM 28-44-11)

(2) (WDM 28-44-11)

E. Initial Evaluation

(1) Open this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

(2) Make sure the shutoff valves are clean. If necessary do the following task:

- Fueling Shutoff Valve - Maintenance Practices, AMM TASK 28-21-51-100-801

(3) Do a check to see if the VALVE POSITION LIGHT for the fueling shutoff valve goes off when the fueling shutoff valve switch is set to the CLOSED position.

(a) If the VALVE POSITION LIGHT does not go off when the fueling shutoff valve switch is set to the closed position, then, do this task: VALVE POSITION LIGHT for the Fueling Shutoff Valve Does Not Go Off When The Valve Switch Is Set To CLOSED - Fault Isolation, 28-21 TASK 806.

(4) Do these steps to prepare for pressure fueling if you did not do them before:

(a) Do this task: Precautions and Limits for the Refuel Operation, AMM TASK 12-11-00-650-801.

WARNING

MAKE SURE THERE IS ELECTRICAL CONTINUITY BETWEEN THE FUEL SOURCE AND THE AIRPLANE. A FIRE OR AN EXPLOSION CAN OCCUR.

(b) Attach the bonding cable on the nozzle of the fuel hose to the ground jack on the wing.

NOTE: The bonding cable is not necessary if there is electrical continuity between the nozzle and the receptacle.

(c) Attach the nozzle on the fuel hose to the fueling receptacle.

1) Open the valve in the nozzle on the fuel hose.

2) Make sure the nozzle and the fueling receptacle have a good seal.

WARNING MAKE SURE THE FUEL SOURCE DOES NOT HAVE MORE THAN A MAXIMUM PRESSURE OF 55 PSI (379 KPA). INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(5) Do these steps to do a check for an open fueling shutoff valve of the pressure fueling system during the refuel operation:

(a) Make sure all of the fueling shutoff valve switches are set to the CLOSED position and the VALVE POSITION lights are off.

(b) Start the pump on the fuel truck or the fuel source.

(c) Monitor the fuel source to make sure the pressure is not more than 55 psi (379 kPa).

(d) The flowmeter on the fuel truck or the fuel source must show no fuel flow.

(e) If there is no fuel flow on the flowmeter, then there was an intermittent fault.

(f) If there is some fuel flow shown on the flowmeter, then do these steps:

1) Monitor the fuel quantity in each tank until you see an increase in the fuel quantity in one of the tanks.

2) Stop the fuel pump on the truck.

3) Do the Fault Isolation Procedure below.

F. Fault Isolation Procedure

(1) Replace the applicable fueling shutoff valve, V44 (tank No. 1), V45 (tank No. 2), or V46 (center tank).

These are the tasks:

Fueling Shutoff Valve - Removal, AMM TASK 28-21-51-000-801,

Fueling Shutoff Valve - Installation, AMM TASK 28-21-51-400-801.

(a) Do the Repair Confirmation at the end of this task.

G. Repair Confirmation

(1) Make sure the VALVE POSITION LIGHT for the fueling shutoff valve goes off when the fueling shutoff valve switch is set to the CLOSED position.

(2) Do these steps to prepare for pressure fueling if you did not do them before:

(a) Do this task: Precautions and Limits for the Refuel Operation, AMM TASK 12-11-00-650-801.

WARNING MAKE SURE THERE IS ELECTRICAL CONTINUITY BETWEEN THE FUEL SOURCE AND THE AIRPLANE. A FIRE OR AN EXPLOSION CAN OCCUR.

(b) Attach the bonding cable on the nozzle of the fuel hose to the ground jack on the wing.

NOTE: The bonding cable is not necessary if there is electrical continuity between the nozzle and the receptacle.

(c) Attach the nozzle on the fuel hose to the fueling receptacle.

1) Open the valve in the nozzle on the fuel hose.

2) Make sure the nozzle and the fueling receptacle have a good seal.

WARNING MAKE SURE THE FUEL SOURCE DOES NOT HAVE MORE THAN A MAXIMUM PRESSURE OF 55 PSI (379 KPA). INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(3) Do these steps to do a check for an open fueling shutoff valve of the pressure fueling system during the refuel operation:

(a) Make sure all of the fueling shutoff valve switches are set to the CLOSED position and the VALVE POSITION lights are off.

(b) Start the pump on the fuel truck or the fuel source.

(c) Monitor the fuel source to make sure the pressure is not more than 55 psi (379 kPa).

(d) The flowmeter on the fuel truck or the fuel source must show no fuel flow.

(e) If there is no fuel flow on the flowmeter, then you corrected the fault.

END OF TASK

810. Fueling Station Flood Light Does Not Come On - Fault Isolation

A. Description

(1) There are two flood lights at the refueling station. One flood light lights the fueling receptacle. The other flood light lights the P15 refueling panel. If power is supplied to the fueling station, these two flood lights should come one when the Refuel Acces Panel - Slat Station 143.27, 621GB is opened.

B. Possible Causes

(1) Flood lights, L279 or L280

(2) Refueling Power Control Relay, R11

(3) Fueling Power Control Switch, S156

(4) Wiring from the R11 relay to the flood lights, L279 and L280

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

(a) These are the circuit breakers:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

D. Related Data

(1) (SSM 28-44-11)

(2) (WDM 28-44-11)

E. Initial Evaluation

(1) Open this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

(a) If one floodlight for the refueling panel is not on, then do the Fault Isolation Procedure - One Floodlight Not On below.

(b) If both floodlights for the refueling panel are not on, then do the Fault Isolation Procedure - Both Floodlights Not On below.

(c) If both floodlights are on, then there was an intermittent fault.

F. Fault Isolation Procedure - One Floodlight Not On

(1) Replace the applicable floodlight L279 or L280.

(a) If the two floodlights come on when the following access panel is opened, then you corrected the fault:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

1) Close this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

G. Fault Isolation Procedure - Both Floodlights Not On

(1) Do this test to find out if there is 28 VDC power to the floodlights:

(a) Set the switch for the fueling shutoff valve for the No. 2 tank to OPEN.

(b) If the VALVE POSITION LIGHT for the No. 2 tank comes on, then do these steps:

1) Replace the two floodlights, L279 and L280.

2) If the two floodlights come on when the following access panel is opened, then you corrected the fault:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

(c) If the VALVE POSITION LIGHT does not come on, then continue.

1) Set the switch for the fueling shutoff valve for the No. 2 tank back to CLOSED.

(2) Do this test of the fueling power control switch:

(a) Set the FUELING INDICATION TEST SWITCH to FUEL DOOR SWITCH BYPASS.

(b) If the two floodlights, L279 and L280, come on, then do these steps:

1) Make sure the magnet for the fueling power control switch, S156 is correctly installed on the actuator bracket.

2) If the magnet is not installed correctly, then do these steps:

a) Remove and re-install the magnet.

These are the tasks:

Remove the Fueling Power Control Switch Sensor Magnet, AMM TASK 28-21-81-000-801,

Install the Fueling Power Control Switch Sensor Magnet, AMM TASK 28-21-81-400-801.

b) If the two floodlights come on when the following access panel is opened, then you corrected the fault:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

c) Close this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

3) Make sure there is the correct gap between the magnet face and the switch sensor when you move the following access panel from the closed to the open position:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

a) To do a check of the gap, do this task: Remove the Actuator Switch for the Fueling Power Control Switch, AMM TASK 28-21-81-350-801

4) If the gap between the magnet face and the switch sensor is not correct, then do these steps:

a) Adjust the gap to make it correct. To adjust it, do this task: Remove the Actuator Switch for the Fueling Power Control Switch, AMM TASK 28-21-81-350-801.

b) If the two floodlights come on when the following access panel is opened, then you corrected the fault:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

c) Close this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

(c) If the two floodlights do not come on, then continue.

(3) Replace the refueling power control relay, R11.

NOTE: The R11 relay is on the P6 panel.

(a) If the two floodlights come on when the following access panel is opened, then you corrected the fault:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

1) Close this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

(b) If the two floodlights do not come on, then continue.

(4) Do this check of the wiring:

(a) Remove the refueling power control relay, R11.

(b) Disconnect connector D4578J at the refuel panel, P15.

(c) Do a check for an open circuit between these pins of connector D944 on the P6 panel and connector D4578J at the refuel panel:

D944		D4578J
pin A2	. . . . .	pin 12

(d) If there is an open circuit, then do these steps:

1) Repair the wiring.
2) Re-install the refueling power control relay, R11.
3) Re-connect connector D4578J at the refuel panel.
4) If the two floodlights are on when the refuel access door is open, then you corrected the fault.

Close this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

END OF TASK

811. Refueling Does Not Stop at Preselected Quantity - Fault Isolation

A. Description

(1) The fuel quantity was selected on the bottom display of one of the refueling indicators. The fueling operation did not stop at the specified quantity. Usually the preselect indicators close the applicable fueling shutoff valve within 100 lb (45 kg) of the specified preselect quantity. The preselect indicators operate in manual mode until the preselect knob is turned.

B. Possible Causes

(1) Refuel Quantity Indicator, N193, N194, or N195
(2) Fueling Shutoff Valve, V44, V45, or V46

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

(a) These are the circuit breakers:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

D. Related Data

(1) (SSM 28-44-11)
(2) (WDM 28-44-11)

E. Initial Evaluation

(1) Do these steps to do a check of the electrical operation of the fueling shutoff valve:

(a) Set the switch for the fueling shutoff valve for the applicable tank to OPEN.

(b) Make sure the VALVE POSITION LIGHT for the fueling shutoff valve for the applicable tank comes on.

1) If the VALVE POSITION LIGHT for the applicable fueling shutoff valve does not come on, then, do this task: Fueling Shutoff Valve Position Indicator Light Does not Come ON when the Valve Switch is set to OPEN - Fault Isolation, 28-21 TASK 807.

WARNING MAKE SURE THE FUEL SOURCE DOES NOT HAVE MORE THAN A MAXIMUM PRESSURE OF 50 PSI. YOU CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do these steps to do a check for correct operation of the applicable fueling shutoff valve during the refuel operation:

(a) Prepare the airplane for pressure refueling. To do this, do this task: Pressure Refuel Procedure, AMM TASK 12-11-00-650-802.

(b) Make sure all of the fueling shutoff valves are closed.

(c) Start the pump on the fuel truck or the fuel source.

(d) Monitor the fuel source to make sure the pressure is not more than 50 psi.

(e) Make sure there is no leakage at these locations:

1) The seal between the fuel nozzle and the fueling receptacle

2) The fueling receptacle

3) The fittings on the manifold

4) The fueling shutoff valves

(f) With the manual override switch, slowly open the applicable fueling shutoff and close it again.

1) Make sure the applicable fueling shutoff valve moves freely.

NOTE: The fueling shutoff valves must open and close freely with the conditions of pressure fueling.

2) If the applicable fueling shutoff does not move freely, then, do this task: VALVE POSITION LIGHT for the Fueling Shutoff Valve Does Not Go Off When The Valve Switch Is Set To CLOSED - Fault Isolation, 28-21 TASK 806.

(g) Make sure all of the fueling shutoff valves are closed before you continue this procedure.

1) If the applicable fueling shutoff does not close, then, do this task: VALVE POSITION LIGHT for the Fueling Shutoff Valve Does Not Go Off When The Valve Switch Is Set To CLOSED - Fault Isolation, 28-21 TASK 806.

(h) The flowmeter on the fuel truck or the fuel source must show no fuel flow.

1) If there is fuel flow, then, do this task: Fuel Flow Into The Fuel Tank Does Not Stop With Fueling Shutoff Valve Switch in the CLOSED Position, 28-21 TASK 809.

(3) FOR A PROBLEM WITH THE NO. 1 TANK OR THE NO. 2 TANK, do this step:

(a) Set the bottom display on the applicable indicator to a quantity more than the present fuel quantity in the tank (a minimum of 2200 lb (998 kg), but not greater than 6160 lb (2794 kg)).

(b) If it is necessary, defuel the tank that has the problem. To do this, do this task: Tank to Tank Fuel Transfer, AMM TASK 28-26-00-650-802

or, do this task: Fuel Tank Defueling, AMM TASK 28-26-00-650-801.

(4) FOR A PROBLEM WITH THE CENTER TANK, do this step:

(a) Set the bottom display on the center tank indicator to a quantity more than the present quantity of fuel in the tank (a minimum of 6700 lb (3039 kg)).

(b) If it is necessary, defuel the tank that has the problem. To do this, do this task: Tank to Tank Fuel Transfer, AMM TASK 28-26-00-650-802

or, do this task: Fuel Tank Defueling, AMM TASK 28-26-00-650-801.

(5) Put fuel into the applicable tank. To do this, do this task: Pressure Refuel Procedure, AMM TASK 12-11-00-650-802.

(6) If the fuel flow stops (the fueling shutoff valve closes) when the fuel quantity in the applicable tank is within 100 lb (45 kg) of the quantity on the bottom display that you selected, then there was an intermittent fault.

(7) If the fuel flow does not stop (the fueling shutoff valve does not close) when the fuel quantity is within 100 lb (45 kg) of the quantity on the bottom display that you selected, then do the Fault Isolation Procedure below.

F. Fault Isolation Procedure

(1) Do these steps to replace the applicable refuel panel indicator and confirm that you corrected the fault:

(a) Replace the applicable refuel panel indicator.

These are the tasks:

Refuel Quantity Indicator Removal, AMM TASK 28-41-61-000-801,

Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801.

(b) FOR A PROBLEM WITH THE NO. 1 TANK OR THE NO. 2 TANK, do this step:

1) Set the bottom display on the applicable indicator to a quantity more than the present quantity of fuel in the tank (a minimum of 2200 lb (998 kg), but less than 6160 lb (2794 kg)).

(c) FOR A PROBLEM WITH THE CENTER TANK, do this step:

1) Set the bottom display on the center tank indicator to a quantity more than the present quantity of fuel in the tank (a minimum of 6700 lb (3039 kg), but less than 20,000 lb (9072 kg)).

(d) Put fuel into the applicable tank. To do this, do this task: Pressure Refuel Procedure, AMM TASK 12-11-00-650-802.

(e) If the fuel flow stops (the fueling shutoff valve closes) when the fuel quantity in the applicable tank is within 100 lb (45 kg) of the quantity on the bottom display that you selected, then you corrected the fault.

——— END OF TASK ———

812. Unwanted Fuel Transfer into the Center Tank - Source Unknown - Fault Isolation

A. Description

(1) Fuel moved from the No. 1 or the No. 2 tank to the center tank without a commanded fuel transfer.

(2) Unwanted particles (debris) in the fuel tank is a common cause of unwanted fuel transfer. Even small particles can cause a valve not to seal correctly. This can cause a large quantity of fuel to transfer. Note that debris in the fuel tank can cause leakage in more than one valve at a time.

(3) Problems with the fuel scavenge system are only applicable to unwanted transfer from the No. 1 tank to the center tank.

(4) (SDS SUBJECT 28-21-00)

B. Possible Causes

(1) Unwanted particles (debris) in the fuel tank

(2) Leakage in the fuel scavenge system (cause of transfer from No. 1 tank only)

(3) Leakage in one of the boost pumps

(4) Leakage in the engine fuel-feed manifold

(5) Leakage in the fueling manifold

(6) Leakage in the tank wall (Rib No. 5)

C. Initial Evaluation

(1) Transfer all of the fuel from the center tank and No. 2 tank into the No. 1 tank. To do this, do this task: Tank to Tank Fuel Transfer, AMM TASK 28-26-00-650-802

(2) Fill the No. 1 tank to its full capacity.

(3) Drain the center tank down to the level of the sumps. To do this, do this task: Drain the Fuel from the Sumps after Defueling, AMM TASK 12-11-00-650-804.

NOTE: It is helpful if the airplane is as close as possible to the nominal attitude, roll = 0 degrees, pitch = -1.14 degrees, as specified in (AMM TASK 12-11-00-650-804).

(a) Wait for the fuel to stop draining from the sump completely.

(b) Leave the center tank sump drain open (as a diagnostic tool).

(4) Make sure the crossfeed valve is closed.

(5) Monitor the center tank sump drain for 5 minutes with no boost pumps operating.

(a) Note the drip rate (if any) from the center tank sump drain with all boost pumps off.

1) If a large fuel quantity (more than a U.S. gallon) drains out of the center tank sump drain, do these steps:

a) Close the center tank sump drain and monitor the center tank fuel quantity.

b) Do this task: Unwanted Fuel Transfer from the No. 1 Tank to the Center Tank - Fault Isolation, 28-21 TASK 803.

(b) Set the L FWD boost pump switch and the L AFT boost pump switch, on the P5 overhead panel, to the ON position.

(6) Monitor the center tank sump drain for 5 minutes with the two boost pumps operating.

(a) Note the drip rate (if any) from the center tank sump drain with the two boost pumps operating.

1) If a large fuel quantity (more than one U.S. gallon) drains out of the center tank sump drain, then do these steps:

a) Close the center tank sump drain and monitor the center tank fuel quantity.

b) Do this task: Unwanted Fuel Transfer from the No. 1 Tank to the Center Tank - Fault Isolation, 28-21 TASK 803.

(b) Set the L FWD boost pump switch and the L AFT boost pump switch, on the P5 overhead panel, to the OFF position.

(7) Transfer all of the fuel from the No. 1 tank into the No. 2 tank. To do this, do this task: Tank to Tank Fuel Transfer, AMM TASK 28-26-00-650-802

(a) Make sure the No. 2 tank is filled to its full capacity.

(b) Make sure the center tank is still empty.

(c) Make sure the center tank sump drain is still open.

(8) Monitor the center tank sump drain for 5 minutes with no boost pumps operating.

(a) Note the drip rate (if any) from the center tank sump drain with all boost pumps off.

1) If a large fuel quantity (more than a U.S. gallon) drains out of the center tank sump drain, then do these steps:

a) Close the center tank sump drain and monitor the center tank fuel quantity.

b) Do this task: Unwanted Fuel Transfer from the No. 2 Tank to the Center Tank - Fault Isolation, 28-21 TASK 813.

(b) Set the R FWD boost pump switch and the R AFT boost pump switch, on the P5 overhead panel, to the ON position.

(9) Monitor the center tank sump drain for 5 minutes with the two boost pumps operating.

(a) Note the drip rate (if any) from the center tank sump drain with the two boost pumps operating.

1) If a large fuel quantity (more than one U.S. gallon) drains out of the center tank sump drain, do these steps:

a) Close the center tank sump drain and monitor the center tank fuel quantity.

b) Do this task: Unwanted Fuel Transfer from the No. 2 Tank to the Center Tank - Fault Isolation, 28-21 TASK 813.

(b) Set the R FWD boost pump switch and the R AFT boost pump switch, on the P5 overhead panel, to the OFF position.

(10) If the drip rate from center tank sump drain was more when the No. 1 tank was full than when the No. 2 tank was full, then, do this task: Unwanted Fuel Transfer from the No. 1 Tank to the Center Tank - Fault Isolation, 28-21 TASK 803

(11) If the drip rate from the center tank sump drain was more when the No. 2 tank was full than when the No. 1 tank was full, then, do this task: Unwanted Fuel Transfer from the No. 2 Tank to the Center Tank - Fault Isolation, 28-21 TASK 813

(12) If the drip rate from the center tank sump drain was the same when the No. 1 tank was full as when the No. 2 tank was full under all conditions, then there was an intermittent fault.

——— END OF TASK ———

813. Unwanted Fuel Transfer from the No. 2 Tank to the Center Tank - Fault Isolation

A. Description

(1) Fuel moved from the No. 2 tank to the center tank without a commanded fuel transfer.

(2) Unwanted particles (debris) in the fuel tank is a common cause of unwanted fuel transfer. Even small particles can cause a valve not to seal correctly. This can cause a large quantity of fuel to transfer. Note that the debris in the fuel tank can cause leakage in more than one valve at a time.

(3) Problems with the fuel scavenge system are not applicable to unwanted transfer from the No. 2 tank to the center tank.

(4) (SDS SUBJECT 28-21-00)

B. Possible Causes

(1) Unwanted particles (debris) in the fuel tank

(2) Leakage in one of the boost pumps

(3) Leakage in the engine fuel-feed manifold

(4) Leakage in the fueling manifold

(5) Leakage in the tank wall (Rib No. 5)

C. Initial Evaluation

(1) Transfer all of the fuel from the center tank and the No. 1 tank into the No. 2 tank. To do this, do this task: Tank to Tank Fuel Transfer, AMM TASK 28-26-00-650-802

(2) Drain the center tank down to the level of the sumps. To do this, do this task: Drain the Fuel from the Sumps after Defueling, AMM TASK 12-11-00-650-804.

NOTE: It is helpful if the airplane is as close as possible to the nominal attitude, roll = 0 degrees, pitch = -1.14 degrees, as specified in (AMM TASK 12-11-00-650-804).

(a) Wait for the fuel to stop draining from the sump completely.

(b) Leave the center tank sump drain open (as a diagnostic tool).

(3) Fill the No. 2 tank to its full capacity.

(4) Make sure the crossfeed valve is closed.

(5) Monitor the center tank sump drain for 5 minutes with no boost pumps operating.

(a) Note the drip rate (if any) from the center tank sump drain with all boost pumps off.

1) If a large fuel quantity drains out of the center tank sump drain, close the center tank sump drain and monitor the center tank fuel quantity.

(6) If fuel does not drip from the center tank sump drain under any conditions, then there was an intermittent fault.

(7) If fuel drips from the center tank sump drain, then do the Fault Isolation Procedure below.

D. Fault Isolation Procedure

NOTE: You must do the steps in the Initial Evaluation before you do these steps.

(1) Do these steps to look for leakage in the output tubing for the R AFT boost pump:

(a) Set the R AFT PUMP switch, on the P5 Overhead Panel, to the ON position.

(b) Let the pump operate for 15 minutes.

(c) Monitor the center tank sump drain (still open) for drops of fuel.

1) If a large fuel quantity drains out of the center tank sump drain, close the center tank sump drain and monitor the center tank fuel quantity.

(d) Monitor the No. 2 tank fuel quantity to see if it decreases.

(e) Set the R AFT PUMP switch, on the P5 Overhead Panel, to the OFF position.

(f) If fuel started to drip from the center tank sump drain or if the drip rate increased while the R AFT PUMP was on, then do these steps:

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) Prepare to go into the center fuel tank. To do this, do this task: Fuel Tank - Purging and Tank Entry, AMM TASK 28-11-00-910-802.
2) Pressurize the engine fuel-feed manifold to 4 psig. To do this, do this task: Engine Fuel Feed Manifold - Leak Test, AMM TASK 28-22-15-710-801.

   NOTE: Do the steps in (AMM TASK 28-22-15-710-801) but only pressurize to 4 psig.
3) Do a check for leakage at the engine fuel feed tubing and couplings downstream of the R FWD boost pump.
4) If you find problems, repair the problems that you find.
   a) Do the Repair Confirmation at the end of this task.

(g) If fuel did not start to drip from the center tank sump drain and if the drip rate did not increase while the R FWD pump was on, then continue.

(2) Do these steps to look for leakage in the output tubing of the R FWD boost pump:

(a) Set the R FWD PUMP switch, on the P5 Overhead Panel, to the ON position.

(b) Let the pump operate for 15 minutes.

(c) Monitor the center tank sump drain (still open) for drops of fuel.
1) If a large fuel quantity drains out of the center tank sump drain, close the center tank sump drain and monitor the center tank fuel quantity.

(d) Monitor the No. 2 tank fuel quantity to see if it decreases.

(e) Set the R FWD PUMP switch, on the P5 Overhead Panel, to the OFF position.

(f) If fuel started to drip from the center tank sump drain or if the drip rate increased while the R FWD PUMP was on, then do these steps:

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) Prepare to go into the center fuel tank. To do this, do this task: Fuel Tank - Purging and Tank Entry, AMM TASK 28-11-00-910-802.
2) Pressurize the engine fuel-feed manifold to 4 psig. To do this, do this task: Engine Fuel Feed Manifold - Leak Test, AMM TASK 28-22-15-710-801.

   NOTE: Do the steps in (AMM TASK 28-22-15-710-801) but only pressurize to 4 psig.
3) Do a check for leakage in the engine fuel feed tubing and couplings downstream of the R AFT boost pump.
4) If you find problems, repair the problems that you find.
   a) Do the Repair Confirmation at the end of this task.

(g) If fuel did not start to drip from the center tank sump drain and if the drip rate did not increase while the R AFT PUMP was on, then continue.

(3) Do these steps to examine the boost pumps for indications of leakage:

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) Prepare to go into the center fuel tank. To do this, do this task: Fuel Tank - Purging and Tank Entry, AMM TASK 28-11-00-910-802.

(b) Examine the boost pump discharge check valves for the center tank. To do this, do this task: Discharge Check Valve Removal, AMM TASK 28-22-71-000-801.

(c) If there are indications of leakage, then repair the problems that you find.

1) Do the Repair Confirmation at the end of this task.

a) If the Repair Confirmation is not OK, then continue.

(d) If there are no indications of leakage, then continue.

(4) Do these steps to look for indications of leakage in the fueling manifold and the fuel-feed manifold:

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) Do this task: Fuel Tank - Purging and Tank Entry, AMM TASK 28-11-00-910-802.

(b) Pressurize the engine fuel-feed manifold and the fueling manifold to 4 psig. To do this, do this task: Engine Fuel Feed Manifold - Leak Test, AMM TASK 28-22-15-710-801.

NOTE: Do the steps in (AMM TASK 28-22-15-710-801) but open the defuel valve and only pressurize to 4 psig.

(c) Do an inspection of the full length of the fueling manifold and the couplings of the fuel-feed manifold for indications of leakage.

1) Listen for air leakage or use soap solution if it is necessary.

(d) If you find leakage, repair the problem that you find. To do it, do this task: Fuel Line, Fitting and Coupling Removal, AMM TASK 28-22-15-000-801.

1) Do the Repair Confirmation at the end of this task.

a) If the Repair Confirmation is not OK, then continue.

(e) If you do not find leakage, then continue.

(5) Examine the fuel tank sealant on Rib No. 5 (the tank wall between the center tank and the No. 2 tank) for indication of leakage.

(a) If you find indications of leakage, repair the bad sealant. To do it, do this task: Repair of Sealant Leaks in the Fuel Tank Structure, AMM TASK 28-11-00-300-803.

(b) Do the Repair Confirmation at the end of this task.

E. Repair Confirmation (Recommended)

(1) Close the fuel tanks that you opened to do the leak detection. To do it, do this task: Fuel Tank - Purging and Tank Entry, AMM TASK 28-11-00-910-802.

(2) Close the center tank sump drain valve if it is open.

(3) Do these steps to make sure there is no unwanted fuel transfer:

(a) Transfer all of the fuel out of the center tank. To do it, do this task: Tank to Tank Fuel Transfer, AMM TASK 28-26-00-650-802.

(b) Fill the No. 1 and the No. 2 tank with fuel. To do it, do this task: Pressure Refuel Procedure, AMM TASK 12-11-00-650-802.

(c) Let the airplane stand for four hours.

1) Monitor the center tank fuel quantity for indications of fuel transfer to the center tank.

2) If there is no fuel in the center tank after the four hours, then you corrected the fault.

F. Repair Confirmation (alternative)

(1) Close the fuel tanks that you opened to do the leak detection. To do it, do this task: Fuel Tank - Purging and Tank Entry, AMM TASK 28-11-00-910-802.

(2) Close the center tank sump drain valve if it is open.

(3) If there is no indication of unwanted fuel transfer on subsequent flights, then you corrected the fault.

——— END OF TASK ———

814. Unwanted Fuel Transfer from the Center Tank to the No. 1 Tank - Fault Isolation

A. Description

(1) Fuel moved from the Center Tank to the No. 1 Tank without a commanded fuel transfer.

(2) Usually, fuel transfer into the No. 1 Tank is observed during flight, while the boost pumps operate. Fuel transfer from the Center Tank to the No. 1 tank is usually caused by failure of the Fuel Scavenge Float Valve to close completely, or by leakage in the Left Boost Pump Bypass Valve when it is pressurized by the Center Tank Boost Pump (Override Pump). Unwanted particles (debris) can cause the Boost Pump Bypass Valve to leak fuel into No. 1 Tank. Even small particles can cause a valve not to seal correctly. This can cause a large quantity of fuel to transfer. Unwanted fuel transfer can also be caused by leakage in the Boost Pump Discharge Check Valves, other parts of the Engine Fuel-Feed Manifold, the Fueling Manifold or the tank wall.

(3) The Fuel Scavenge System has a minimum transfer rate of 220 pounds/hour (100 kilograms/hour). Usually, fuel scavenge transfer rates are between approximately 220 pounds/hour (100 kilograms/hour) and 450 pounds/hour (200 kilograms/hour).

B. Possible Causes

(1) Fuel Scavenge Float Operated Shutoff Valve

(2) Leakage in the Boost Pump Bypass Valve

(3) Leakage in the Boost Pump Discharge Check Valves for one of the No. 1 Tank Boost Pumps

(4) Leakage in the Engine Fuel-Feed Manifold

(5) Leakage in the Fueling Manifold

(6) Leakage in the tank wall (Rib No. 5)

C. Related Data

(1) SDS SUBJECT 28-21-00

(2) SDS SUBJECT 28-22-00

D. Initial Evaluation

(1) Make sure that the No. 1 Tank contains more than 6500 lb (2948 kg) of fuel.

NOTE: This will make sure that the Fuel Scavenge Float Operated Shutoff Valve is closed if it is operating correctly.

(2) Make sure that the Center Tank contains more than 1000 lb (454 kg) of fuel.

NOTE: This will make sure that there is sufficient fuel in the Center Tank to transfer into the No. 1 Tank for troubleshooting.

(3) Make sure that the Crossfeed Valve is closed.

(4) Do these steps to do a check for leakage through the Float Operated Shutoff Valve:

NOTE: When it is operating normally, the Fuel Scavenge System has a minimum transfer rate of 220 pounds/hour (100 kilograms/hour). Usually, fuel scavenge transfer rates are between approximately 220 pounds/hour (100 kilograms/hour) and 450 pounds/hour (200 kilograms/hour).

(a) Set the FUEL PUMP TANK 1 - FWD switch, on the P5 Overhead Panel, to ON.

(b) Let the FWD pump for the No. 1 Tank operate for thirty minutes.

(c) Monitor the fuel quantity in the No. 1 Tank to see if it increases.

(d) Monitor the fuel quantity in the Center Tank to see if it decreases.

(e) Set the FUEL PUMP TANK 1 - FWD Switch, on the P5 Overhead Panel, to the OFF position.

(f) If the fuel quantity in the No. 1 Tank increases or if the fuel quantity in the Center Tank decreases, then do the Fault Isolation Procedure - Fuel Transfer through Fuel Scavenge System below.

(g) If the fuel quantity in the No. 1 Tank does not increase and the fuel quantity in the Center Tank does not decrease, then continue.

(5) Do these steps to do a check for leakage through the Fuel Boost Pump Bypass Valve or the Engine Fuel-Feed System:

(a) Set the FUEL PUMP CENTER TANK - LEFT switch, on the P5 Overhead Panel, to ON.

(b) Let the Left Center Boost Pump (Override Pump) operate for thirty minutes.

(c) Monitor the fuel quantity in the No. 1 Tank to see if it increases.

(d) Monitor the fuel quantity in the Center Tank to see if it decreases.

(e) Set the FUEL PUMP CENTER TANK - LEFT Switch, on the P5 Overhead Panel, to OFF.

(f) If the fuel quantity in the No. 1 Tank increases or if the fuel quantity in the Center Tank decreases, then do the Fault Isolation Procedure - Fuel Transfer Through Engine Fuel-Feed System below.

(g) If the fuel quantity in the No. 1 Tank does not increase and the fuel quantity in the Center Tank does not decrease, then continue.

(6) If there is no indication of unwanted fuel transfer on subsequent flights, then there was an intermittent problem.

E. Fault Isolation Procedure - Fuel Transfer through Fuel Scavenge System

NOTE: You must do the steps in the Initial Evaluation before you do these steps.

(1) Do these steps to look for leakage in the Fuel Scavenge System:

WARNING

OBEY THE FUEL TANK ENTRY PRECAUTIONS. FAILURE TO OBEY THE FUEL TANK ENTRY PRECAUTIONS CAN CAUSE INJURY OR DAMAGE.

(a) Prepare to go into the No. 1 Tank. To do it, do this task: Fuel Tank - Purging and Tank Entry, AMM TASK 28-11-00-910-802.

(b) Examine the Float-Operated Shutoff Valve to see if it operates correctly.

NOTE: Do a careful check for particles that keep the valve open.

(c) If there are problems with the Float-Operated Shutoff Valve, then replace it. These are the tasks:

- Fuel Scavenge Float-Operated Shutoff Valve Removal, AMM TASK 28-22-16-000-801
- Fuel Scavenge Float-Operated Shutoff Valve Installation, AMM TASK 28-22-16-400-801

1) Do the Repair Confirmation procedure at the end of this task.

(d) If there are no problems with the Float-Operated Shutoff Valve, then do these steps:

1) Do a check for leakage at the couplings of the fuel scavenge tubing in the No. 1 Tank.

a) If it is necessary, replace the applicable couplings in the Fuel Scavenge System. These are the tasks:

- Fuel Line, Fitting and Coupling Removal, AMM TASK 28-22-15-000-801
- Fuel Line, Fitting and Coupling Installation, AMM TASK 28-22-15-400-801

2) Do a check for leakage in the tubing of the Fuel Scavenge System in the No. 1 Tank.

a) If you find problems, repair the problems that you find. Do the Repair Confirmation at the end of this task.

F. Fault Isolation Procedure - Fuel Transfer Through Leakage in the Engine Fuel Feed System

NOTE: You must do the steps in the Initial Evaluation before you do these steps.

WARNING

MAKE SURE TO PUT THE BOOST PUMP IMPELLER IMMEDIATELY BACK INTO ITS POSITION TO STOP FUEL FLOW. IF THERE IS A FUEL LEAK AT THE DISCHARGE CHECK VALVE, FUEL CAN CONTINUOUSLY FLOW FROM THE PUMP. IF YOU DO NOT OBEY, THE FUEL LEAK CAN CAUSE DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL.

(1) Do these steps to look for a leak in the AFT Boost Pump Discharge Check Valve for the No. 1 Tank:

(a) Loosen the mounting screws for the Aft Boost Pump Impeller. To do it, do this task: Motor Impeller Removal, AMM TASK 28-22-41-000-801.

(b) Carefully pull the impeller unit away from the boost pump housing to see if there is any fuel leakage from the Discharge Check Valve.

(c) If there is indication of fuel leakage, immediately install the impeller unit that you removed.

(d) If there is no indication of fuel leakage, set the FUEL PUMP CENTER TANK - LEFT switch, on the P5 Overhead Panel, to ON.

NOTE: This applies the pressure of the Left Center Tank Boost Pump to the AFT Boost Pump Discharge Check Valve.

(e) If there is indication of leakage, immediately turn OFF the FUEL PUMP CENTER TANK - LEFT switch and install the impeller unit that you removed. Do these steps:

1) Replace the Aft Boost Pump Discharge Check Valve for the No. 1 Tank. These are the tasks:

- Discharge Check Valve Removal, AMM TASK 28-22-71-000-801
- Discharge Check Valve Installation, AMM TASK 28-22-71-400-801

2) Do the Repair Confirmation procedure at the end of this task.

(f) If there is no indication of leakage from the Aft Boost Pump Discharge Check Valve, then continue. Re-install the Boost Pump that you removed and tighten the mounting screws. To do it, do this task: Motor Impeller Installation, AMM TASK 28-22-41-400-801.

WARNING

MAKE SURE TO PUT THE BOOST PUMP IMPELLER IMMEDIATELY BACK INTO ITS POSITION TO STOP FUEL FLOW. IF THERE IS A FUEL LEAK AT THE DISCHARGE CHECK VALVE, FUEL CAN CONTINUOUSLY FLOW FROM THE PUMP. IF YOU DO NOT OBEY, THE FUEL LEAK CAN CAUSE DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL.

(2) Do these steps to look for a leak in the FWD Boost Pump Discharge Check Valve for the No. 1 Tank:

(a) Loosen the mounting screws for the Fwd Boost Pump Impeller. To do it, do this task: Motor Impeller Removal, AMM TASK 28-22-41-000-801.

(b) Carefully pull the impeller unit away from the boost pump housing to see if there is any fuel leakage from the Discharge Check Valve.

(c) If there is indication of fuel leakage, immediately install the impeller unit that you removed.

(d) If there is no indication of fuel leakage, set the FUEL PUMP CENTER TANK - LEFT switch, on the P5 Overhead Panel, to ON.

NOTE: This applies the pressure of the Left Center Tank Boost Pump to the FWD Boost Pump Discharge Check Valve.

(e) If there is indication of leakage, immediately turn OFF the FUEL PUMP CENTER TANK - LEFT switch and install the impeller unit that you removed. Do these steps:

1) Replace the Fwd Boost Pump Discharge Check Valve for the No. 1 Tank. These are the tasks:

- Discharge Check Valve Removal, AMM TASK 28-22-71-000-801
- Discharge Check Valve Installation, AMM TASK 28-22-71-400-801

2) Do the Repair Confirmation procedure at the end of this task.

(f) If there is no indication of leakage, then continue. Re-install the Boost Pump that you removed and tighten the mounting screws. To do it, do this task: Motor Impeller Installation, AMM TASK 28-22-41-400-801

(3) Do these steps to look for indications of leakage in the Fueling Manifold and the Fuel-Feed Manifold:

WARNING

OBEY THE FUEL TANK ENTRY PRECAUTIONS. FAILURE TO OBEY THE FUEL TANK ENTRY PRECAUTIONS CAN CAUSE INJURY OR DAMAGE.

(a) Do this task: Fuel Tank - Purging and Tank Entry, AMM TASK 28-11-00-910-802.

(b) Pressurize the Engine Fuel-Feed Manifold and the Fueling Manifold to 40 psig (276 kPa). To do this, do this task: Engine Fuel Feed Manifold - Leak Test, AMM TASK 28-22-15-710-801.

(c) Do an inspection of the Fuel Boost Pump Bypass Valve to see if there is leakage.

1) If there is leakage in the Fuel Boost Pump Bypass Valve, replace the Fuel Boost Pump Bypass Valve. These are the tasks:

- Fuel Boost Pump Bypass Valve Removal, AMM TASK 28-22-61-000-801
- Fuel Boost Pump Bypass Valve Installation, AMM TASK 28-22-61-400-801

a) Do the Repair Confirmation at the end of this task.

2) If there is no leakage in the Fuel Boost Pump Bypass Valve, then continue.

(d) Do an inspection of the full length of the fueling manifold and the couplings of the Fuel-Feed Manifold in the No. 1 Tank for indications of leakage.

1) Listen for air leakage or use soap solution if it is necessary.

(e) If you find leakage, repair the problem that you find. To do it, do this task: Fuel Line, Fitting and Coupling Removal, AMM TASK 28-22-15-000-801.

1) Do the Repair Confirmation at the end of this task.

a) If the Repair Confirmation is not OK, then continue.

(f) If you do not find leakage, then continue.

(4) Do a check for signs of leakage between the Center Tank and the No. 1 Tank.

(a) Transfer all of the fuel out of the Center Tank. This is the task: Tank to Tank Fuel Transfer, AMM TASK 28-26-00-650-802.

(b) Fill the No. 1 Tank with fuel. This is the task: Pressure Refuel Procedure, AMM TASK 12-11-00-650-802

(c) Let the airplane stand for four hours.

1) Monitor the Center Tank fuel quantity for indications of fuel transfer to the Center Tank.

a) If no fuel is found in the Center Tank, then there was an intermittent problem.

b) If fuel is found in the Center Tank, then continue.

(5) Examine the fuel tank sealant on Rib No. 5 (the tank wall between the Center Tank and the No. 1 Tank) for indication of leakage.

(a) If you find indications of leakage, repair the bad sealant. To do it, do this task: Repair of Sealant Leaks in the Fuel Tank Structure, AMM TASK 28-11-00-300-803.

(b) Do the Repair Confirmation at the end of this task.

G. Repair Confirmation (Recommended)

(1) Close the fuel tanks that you opened to do the leak detection or repairs. To do it, do this task: Fuel Tank - Purging and Tank Entry, AMM TASK 28-11-00-910-802.

(2) Make sure that the No. 1 Tank contains more than 6500 lb (2948 kg) of fuel.

NOTE: This will make sure that the Fuel Scavenge Float Operated Shutoff Valve is closed if it is operating correctly.

(3) Make sure that the Center Tank contains more than 1000 lb (454 kg) of fuel.

NOTE: This will make sure that there is sufficient fuel in the Center Tank to transfer into the No. 1 Tank for troubleshooting.

(4) Make sure that the Crossfeed Valve is closed.

(5) Do these steps to make sure that there is no leakage through the Float Operated Shutoff Valve:

(a) Set the FUEL PUMP TANK 1 - FWD Switch, on the P5 Overhead Panel, to ON.

(b) Let the FWD pump for the No. 1 Tank operate for thirty minutes.

(c) Monitor the fuel quantity in the No. 1 Tank to see if it increases.

(d) Monitor the fuel quantity in the Center Tank to see if it decreases.

(e) Set the FUEL PUMP TANK 1 - FWD Switch, on the P5 Overhead Panel, to the OFF position.

(f) Make sure that the fuel quantity in the No. 1 Tank does not increase and the fuel quantity in the Center Tank does not decrease.

(6) Do these steps to make sure that there is no leakage through the Fuel Boost Pump Bypass Valve or the Engine Fuel-Feed System:

(a) Set the FUEL PUMP CENTER TANK - LEFT Switch, on the P5 Overhead Panel, to ON.

(b) Let the Left Center Boost Pump (Override Pump) operate for thirty minutes.

(c) Monitor the fuel quantity in the No. 1 Tank to see if it increases.

(d) Monitor the fuel quantity in the Center Tank to see if it decreases.

(e) Set the FUEL PUMP CENTER TANK - LEFT Switch, on the P5 Overhead Panel, to OFF.

(f) If the fuel quantity in the No. 1 Tank does not increase and the fuel quantity in the Center Tank does not decrease, then you corrected the problem.

H. Repair Confirmation (alternative)

(1) Close the fuel tanks that you opened to do the leak detection or repairs. To do it, do this task: Fuel Tank - Purging and Tank Entry, AMM TASK 28-11-00-910-802.

(2) If there is no indication of unwanted fuel transfer on subsequent flights, then you corrected the problem.

END OF TASK

815. Unwanted Fuel Transfer from the Center Tank to the No. 2 Tank - Fault Isolation

A. Description

(1) Fuel moved from the Center Tank to the No. 2 Tank without a commanded fuel transfer.

(2) Usually, fuel transfer into the No. 2 Tank is observed during flight, while the Boost Pumps operate. Fuel transfer from the Center Tank to the No. 2 Tank is usually caused by leakage in the Right Boost Pump Bypass Valve when it is pressurized by the Center Tank Boost Pump (Override Pump). Unwanted particles (debris) can cause the Boost Pump Bypass Valve to leak fuel into No. 2 Tank. Even small particles can cause a valve not to seal correctly. This can cause a large quantity of fuel to transfer. Unwanted fuel transfer can also be caused by leakage in the Boost Pump Discharge Check Valves, other parts of the Engine Fuel-Feed Manifold, the Fueling Manifold or the tank wall.

B. Possible Causes

(1) Leakage in the Boost Pump Bypass Valve

(2) Leakage in the Boost Pump Discharge Check Valves for one of the No. 2 Tank Boost Pumps

(3) Leakage in the Engine Fuel-Feed Manifold

(4) Leakage in the Fueling Manifold

(5) Leakage in the tank wall (Rib No. 5)

C. Related Data

(1) SDS SUBJECT 28-21-00

(2) SDS SUBJECT 28-22-00

D. Initial Evaluation

(1) Make sure that the No. 2 Tank contains more than 100 lb (45 kg) of fuel.

NOTE: This will make sure that an increase in No. 2 Tank fuel quantity can be measured by the Fuel Quantity Indication System (FQIS).

(2) Make sure that the Center Tank contains more than 1000 lb (454 kg) of fuel.

NOTE: This will make sure that there is sufficient fuel in the Center Tank to transfer into the No. 2 Tank for troubleshooting.

(3) Make sure that the Crossfeed Valve is closed.

(4) Do these steps to do a check for leakage through the Fuel Boost Pump Bypass Valve or the Engine Fuel-Feed System:

(a) Set the FUEL PUMP CENTER TANK - RIGHT Switch, on the P5 Overhead Panel, to ON.

(b) Let the Right Center Boost Pump (Override Pump) operate for thirty minutes.

(c) Monitor the fuel quantity in the No. 2 Tank to see if it increases.

(d) Monitor the fuel quantity in the Center Tank to see if it decreases.

(e) Set the FUEL PUMP CENTER TANK - RIGHT Switch, on the P5 Overhead Panel, to OFF.

(f) If the fuel quantity in the No. 2 Tank increases or if the fuel quantity in the Center Tank decreases, then do the Fault Isolation Procedure below.

(g) If the fuel quantity in the No. 2 Tank does not increase and the fuel quantity in the Center Tank does not decrease, then continue.

(5) If there is no indication of unwanted fuel transfer on subsequent flights, then there was an intermittent problem.

E. Fault Isolation Procedure

WARNING MAKE SURE TO PUT THE BOOST PUMP IMPELLER IMMEDIATELY BACK INTO ITS POSITION TO STOP FUEL FLOW. IF THERE IS A FUEL LEAK AT THE DISCHARGE CHECK VALVE, FUEL CAN CONTINUOUSLY FLOW FROM THE PUMP. IF YOU DO NOT OBEY, THE FUEL LEAK CAN CAUSE DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL.

(1) Do these steps to look for a leak in the AFT Boost Pump Discharge Check Valve for the No. 2 Tank:

(a) Loosen the mounting screws for the Aft Boost Pump Impeller. This is the task: Motor Impeller Removal, AMM TASK 28-22-41-000-801.

(b) Carefully pull the impeller unit away from the Boost Pump Housing to see if there is any fuel leakage from the Discharge Check Valve.

(c) If there is indication of fuel leakage, immediately install the impeller unit that you removed.

(d) If there is no indication of fuel leakage, set the FUEL PUMP CENTER TANK - RIGHT Switch, on the P5 Overhead Panel, to ON.

NOTE: This applies the pressure of the Right Center Tank Boost Pump to the AFT Boost Pump Discharge Check Valve.

(e) If there is indication of leakage, immediately turn OFF the FUEL PUMP CENTER TANK - RIGHT switch and install the impeller unit that you removed. Do these steps:

1) Replace the Aft Boost Pump Discharge Check Valve for the No. 2 Tank. These are the tasks:

- Discharge Check Valve Removal, AMM TASK 28-22-71-000-801
- Discharge Check Valve Installation, AMM TASK 28-22-71-400-801

2) Do the Repair Confirmation procedure at the end of this task.

(f) If there is no indication of leakage from the Aft Boost Pump Discharge Check Valve, then continue. Re-install the Boost Pump that you removed and tighten the mounting screws. This is the task: Motor Impeller Installation, AMM TASK 28-22-41-400-801.

WARNING MAKE SURE TO PUT THE BOOST PUMP IMPELLER IMMEDIATELY BACK INTO ITS POSITION TO STOP FUEL FLOW. IF THERE IS A FUEL LEAK AT THE DISCHARGE CHECK VALVE, FUEL CAN CONTINUOUSLY FLOW FROM THE PUMP. IF YOU DO NOT OBEY, THE FUEL LEAK CAN CAUSE DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL.

(2) Do these steps to look for a leak in the FWD Boost Pump Discharge Check Valve for the No. 2 Tank:

(a) Loosen the mounting screws for the Fwd Boost Pump Impeller. This is the task: Motor Impeller Removal, AMM TASK 28-22-41-000-801.

(b) Carefully pull the impeller unit away from the Boost Pump Housing to see if there is any fuel leakage from the Discharge Check Valve.

(c) If there is indication of fuel leakage, immediately install the impeller unit that you removed.

(d) If there is no indication of fuel leakage, set the FUEL PUMP CENTER TANK - RIGHT Switch, on the P5 Overhead Panel, to ON.

NOTE: This applies the pressure of the Right Center Tank Boost Pump to the FWD Boost Pump Discharge Check Valve.

(e) If there is indication of leakage, immediately turn OFF the FUEL PUMP CENTER TANK - RIGHT Switch and install the impeller unit that you removed. Do these steps:

1) Replace the Fwd Boost Pump Discharge Check Valve for the No. 2 Tank. These are the tasks:

- Discharge Check Valve Removal, AMM TASK 28-22-71-000-801
- Discharge Check Valve Installation, AMM TASK 28-22-71-400-801

2) Do the Repair Confirmation procedure at the end of this task.

(f) If there is no indication of leakage, then continue. Re-install the Boost Pump that you removed and tighten the mounting screws. This is the task: Motor Impeller Installation, AMM TASK 28-22-41-400-801.

(3) Do these steps to look for indications of leakage in the Fueling Manifold and the Fuel-Feed Manifold:

WARNING

OBEY THE FUEL TANK ENTRY PRECAUTIONS. FAILURE TO OBEY THE FUEL TANK ENTRY PRECAUTIONS CAN CAUSE INJURY OR DAMAGE.

(a) Do this task: Fuel Tank - Purging and Tank Entry, AMM TASK 28-11-00-910-802.

(b) Pressurize the Engine Fuel-Feed Manifold and the Fueling Manifold to 40 psi (276 kPa). This is the task: Engine Fuel Feed Manifold - Leak Test, AMM TASK 28-22-15-710-801.

(c) Do an inspection of the Fuel Boost Pump Bypass Valve to see if there is leakage.

1) If there is leakage in the Fuel Boost Pump Bypass Valve, replace the Fuel Boost Pump Bypass Valve. These are the tasks:

- Fuel Boost Pump Bypass Valve Removal, AMM TASK 28-22-61-000-801
- Fuel Boost Pump Bypass Valve Installation, AMM TASK 28-22-61-400-801

a) Do the Repair Confirmation at the end of this task.

2) If there is no leakage in the Fuel Boost Pump Bypass Valve, then continue.

(d) Do an inspection of the full length of the fueling manifold and the couplings of the Fuel-Feed Manifold in the No. 2 Tank for indications of leakage.

1) Listen for air leakage or use soap solution if it is necessary.

(e) If you find leakage, repair the problem that you find. This is the task: Fuel Line, Fitting and Coupling Removal, AMM TASK 28-22-15-000-801.

1) Do the Repair Confirmation at the end of this task.

a) If the Repair Confirmation is not OK, then continue.

(f) If you do not find leakage, then continue.

(4) Do a check for signs of leakage between the Center Tank and the No. 2 Tank.

(a) Transfer all of the fuel out of the Center Tank. This is the task: Tank to Tank Fuel Transfer, AMM TASK 28-26-00-650-802.

(b) Fill the No. 2 Tank with fuel. This is the task: Pressure Refuel Procedure, AMM TASK 12-11-00-650-802.

(c) Let the airplane stand for four hours.

1) Monitor the Center Tank fuel quantity for indications of fuel transfer to the Center Tank.

a) If no fuel is found in the Center Tank, then there was an intermittent problem.

b) If fuel is found in the Center Tank, then continue.

(5) Examine the fuel tank sealant on Rib No. 5 (the tank wall between the Center Tank and the No. 2 Tank) for indication of leakage.

(a) If you find indications of leakage, repair the bad sealant. This is the task: Repair of Sealant Leaks in the Fuel Tank Structure, AMM TASK 28-11-00-300-803.

(b) Do the Repair Confirmation at the end of this task.

F. Repair Confirmation (Recommended)

(1) Close the fuel tanks that you opened to do the leak detection or repairs. This is the task: Fuel Tank - Purging and Tank Entry, AMM TASK 28-11-00-910-802.

(2) Make sure that the No. 2 Tank contains more than 100 lb (45 kg) of fuel.

NOTE: This will make sure that an increase in No. 2 Tank fuel quantity can be measured by the FQIS.

(3) Make sure that the Center Tank contains more than 1000 lb (454 kg) of fuel.

NOTE: This will make sure that there is sufficient fuel in the Center Tank to transfer into the No. 2 tank for troubleshooting.

(4) Make sure that the Crossfeed Valve is closed.

(5) Do these steps to make sure that there is no leakage through the Fuel Boost Pump Bypass Valve or the Engine Fuel-Feed System:

(a) Set the FUEL PUMP CENTER TANK - RIGHT Switch, on the P5 Overhead Panel, to ON.

(b) Let the Right Center Boost Pump (Override Pump) operate for thirty minutes.

(c) Monitor the fuel quantity in the No. 2 Tank to see if it increases.

(d) Monitor the fuel quantity in the Center Tank to see if it decreases.

(e) Set the FUEL PUMP CENTER TANK - RIGHT Switch, on the P5 Overhead Panel, to OFF.

(f) If the fuel quantity in the No. 2 Tank does not increase and the fuel quantity in the Center Tank does not decrease, then you corrected the problem.

G. Repair Confirmation (alternative)

(1) Close the fuel tanks that you opened to do the leak detection or repairs. This is the task: Fuel Tank - Purging and Tank Entry, AMM TASK 28-11-00-910-802.

(2) If there is no indication of unwanted fuel transfer on subsequent flights, then you corrected the problem.

END OF TASK

816. Refuel Quantity Indicator Flashes - Fault Isolation

A. Description

(1) One of the refuel quantity indicators flashes at an interval of approximately one second and shows the fuel quantity in the applicable tank.

(2) The flashing shows that the fuel quantity (as calculated by the fuel quantity processor) is more than the expected full tank shutoff quantity (total tank volume minus 2 percent expansion volume). The fueling float switch is designed to close the applicable fueling shutoff valve during pressure fueling when the applicable tank has an expansion volume of 2 percent. The fuel quantity processor causes the applicable refuel quantity indicator to flash when it calculates a fuel quantity of more than the full tank shutoff quantity. The design tolerance of the Fuel Quantity Indicating System (FQIS) is +/- 2 percent. Thus, because of variations in fuel density and in the rate of closure of the fueling shutoff valve, it is possible for a tank to contain more (or in a few cases less) than the expected full tank shutoff quantity and cause the fuel quantity display on the refuel panel to flash.

(3) AIRPLANES WITH FUEL QUANTITY PROCESSOR S345A001-010; This condition can occur because it is possible for processor S345A001-010 to read a fuel quantity that is more than the overfill quantity when the actual fuel quantity is less than the overfill quantity. If it is possible, replace processor S345A001-010 with S345A001-011 (for standard 737-600, -700, and -800) or S345A001-015 (for 737-700 Increased Gross Weight or the Boeing Business Jet) before you do more troubleshooting (AMM TASK 28-41-81-000-801).

(4) (SDS SUBJECT 28-21-00)

(5) (SDS SUBJECT 28-41-00)

B. Possible Causes

(1) Airplane is not level

(2) Fueling float switch, S574 (No. 1 tank), S576 (center tank), or S578 (No. 2 tank)

(3) Fueling shutoff valve, V44 (No. 1 tank), V45 (No. 2 tank), or V46 (center tank)

(4) Fuel quantity processor unit (FQPU), M1827

(5) Wiring

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

D. Related Data

(1) (SSM 28-44-11)

(2) (WDM 28-44-11)

E. Initial Evaluation

(1) Make sure the airplane has a ground attitude of 1.14 degrees nose-down pitch and 0.0 degree roll.

NOTE: This attitude permits you to put the maximum quantity of fuel in the tanks.

(2) Make sure the shutoff valves are clean. If necessary do the following task:

- Fueling Shutoff Valve - Maintenance Practices, AMM TASK 28-21-51-100-801

(3) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

(a) If the FQIS BITE test shows a maintenance message, then do the Fault Isolation procedure below.

(4) Do the pressure refueling procedure for the applicable tank. To do it, do this task: Pressure Refuel Procedure, AMM TASK 12-11-00-650-802.

(a) Make sure the other two fueling shutoff valves are closed.

(b) Monitor the fuel quantity in the applicable tank.

(c) Make sure automatic shutoff occurs (the VALVE POSITION LIGHT goes off and all fuel flow stops) before the fuel quantity increases to its full capacity (approximately 30,000 pounds (13,600 kilograms) for the center tank, 9000 pounds (4090 kilograms) for the No. 1 or No. 2 tank).

1) If automatic shutoff does not occur, then, do this task: Fuel Spill at Surge Tank or Fuel Tank Auto-Shutoff Inoperative - Fault Isolation, 28-21 TASK 801.

2) If the automatic shutoff occurs, then continue.

(5) Look at the P15 refueling panel with the following access panel fully open and power on.

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

(a) If the refuel quantity indicator for the applicable tank flashes, then do the Fault Isolation Procedure below.

(b) If the refuel quantity indicator does not flash and shows the correct fuel quantity, then there was an intermittent fault.

F. Fault Isolation Procedure

NOTE: You must do the steps in the Initial Evaluation before you do these steps.

(1) Do these steps to look for a problem with the FQIS:

(a) If the FQIS BITE test showed a maintenance message in the Initial Evaluation, then do the corrective action for that message to correct the fault.

1) Look at the refuel indicators to see if they show the fuel quantity correctly.

2) If the refuel indicators show the fuel quantity correctly, then you corrected the fault.

a) If it is necessary, do this task: Pressure Refuel Procedure, AMM TASK 12-11-00-650-802

b) Close this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

3) If the refuel indicators flash or do not show the fuel quantity correctly, then continue.

(b) If the FQIS BITE test did not show a maintenance message, then continue.

(2) If the VALVE POSITION LIGHT for the fueling shutoff valve did not go off, then do these steps:

(a) Replace the fueling float switch for the applicable tank, S574 (No. 1 tank), S576 (center tank), or S578 (No. 2 tank).

These are the tasks:

Float Switch Removal, AMM TASK 28-21-71-020-801,

Float Switch Installation, AMM TASK 28-21-71-400-802.

(b) Examine the mounting bracket for the fueling float switch to see if it is bent or at the incorrect level.

1) Repair the mounting bracket if it is necessary.

(c) Do the Repair Confirmation at the end of this task.

(3) If the applicable VALVE POSITION LIGHT went off, then do these steps:

(a) Replace the fueling shutoff valve.

These are the tasks:

Fueling Shutoff Valve - Removal, AMM TASK 28-21-51-000-801,

Fueling Shutoff Valve - Installation, AMM TASK 28-21-51-400-801.

(b) Do the Repair Confirmation at the end of this task.

G. Repair Confirmation

(1) Obey all precautions for pressure refueling (AMM TASK 12-11-00-650-801).

(2) Do the pressure refueling procedure for the applicable tank. To do it, do this task: Pressure Refuel Procedure, AMM TASK 12-11-00-650-802.

(a) Make sure the other two fueling shutoff valves are closed.

(b) Monitor the fuel quantity in the applicable tank.

(c) Make sure automatic shutoff occurs (the VALVE POSITION LIGHT goes off and all fuel flow stops) before the fuel quantity increases to its full capacity (approximately 30,000 pounds (13,600 kilograms) for the center tank, 9000 pounds (4090 kilograms for the No. 1 or No. 2 tank).

1) If the automatic shutoff occurs, then you corrected the fault.

2) Look at the refuel indicators to see if they show the fuel quantity correctly.

3) If the refuel indicators show the fuel quantity correctly (without flashing), then you corrected the fault.

a) If it is necessary, do this task: Pressure Refuel Procedure, AMM TASK 12-11-00-650-802

b) Close this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

4) If solution is unsatisfactory, then continue the Fault Isolation Procedure at the subsequent step.

(3) Remove electrical power if it is not necessary for other tasks (AMM TASK 24-22-00-860-812).

——— END OF TASK ———

817. Lower Refuel Quantity Indicator Display Shows the Message

A. Description

(1) The upper display of one or more of the refuel quantity indicators is blank. The related lower display shows the message "ARINC".

(2) (SDS SUBJECT 28-41-00)

B. Possible Causes

(1) The wiring from the Fuel Quantity Processor Unit (FQPU), M1827 to the Refueling Panel, P15

(2) Fuel Quantity Processor Unit (FQPU), M1827

(3) Refuel Quantity Indicator, N193, N194, or N195

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

(a) These are the circuit breakers:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

D. Related Data

(1) (SSM 28-41-11)

(2) (SSM 28-44-11)

(3) (WDM 28-41-11)

(4) (WDM 28-44-11)

E. Initial Evaluation

(1) Open this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

(2) If the upper display of one or more of the indicators is blank and the lower display shows the message "ARINC", then do the Fault Isolation Procedure below.

(3) If the upper display of each of the indicators shows the correct fuel quantity, then do these steps:

(a) Set the FUELING INDICATION TEST SWITCH on the P15 Fueling Control Panel to the TEST GAGES position.

(b) On each of the refuel quantity indicators do a check to see if all segments on the display come on for approximately two seconds and then go off for two seconds alternately until the FUELING INDICATION TEST SWITCH is released.

NOTE: If the SWITCH is held for more than twenty (20) seconds, the test stops automatically and the indicators go back to indicating mode.

(c) If the upper display of one or more of the indicators is blank and the lower display shows the message "ARINC", then do the Fault Isolation Procedure below.

(d) If all segments on each display come on for approximately two seconds and then go off for approximately two seconds, then there was an intermittent fault.

F. Fault Isolation Procedure

(1) For a problem shown on the No. 1 tank refuel quantity indicator, do this check of the wiring:

(a) Remove the No. 1 tank refuel indicator, N193. To remove it, do this task: Refuel Quantity Indicator Removal, AMM TASK 28-41-61-000-801.

SIA 702-710

(b) Do a check for an open circuit from pin 17 on connector D11318 for the No. 1 tank refuel indicator to pin 24 on connector D11306.

SIA 711-714, 716-999

(c) Do a check for an open circuit from pin 17 on connector D11318 for the No. 1 tank refuel indicator to pin 4 on connector D15806.

SIA 702-710

(d) Do a check for an open circuit from pin 18 on connector D11318 for the No. 1 tank refuel indicator to pin 25 on connector D11306.

SIA 711-714, 716-999

(e) Do a check for an open circuit from pin 18 on connector D11318 for the No. 1 tank refuel indicator to pin 12 on connector D15806.

SIA ALL

(f) If you find a problem with the wiring, repair the problem.

1) Re-install the fueling indicator for the No. 1 tank again. To do this, do this task: Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801

2) Do the Repair Confirmation procedure below.

(g) If you do not find a problem with the wiring, then replace the fuel quantity processor.

These are the tasks:

Fuel Quantity Processor Unit Removal, AMM TASK 28-41-81-000-801,

Fuel Quantity Processor Unit Installation, AMM TASK 28-41-81-400-801.

1) Do the Repair Confirmation procedure below.

(h) If the problem continues, then replace the No. 1 tank refuel quantity indicator, N193.

These are the tasks:

Refuel Quantity Indicator Removal, AMM TASK 28-41-61-000-801

Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801

1) Do the Repair Confirmation procedure below.

(2) For a problem shown on the No. 2 tank refuel quantity indicator, do this check of the wiring:

(a) Remove the No. 2 tank refuel indicator, N194. To remove it, do this task: Refuel Quantity Indicator Removal, AMM TASK 28-41-61-000-801.

SIA 702-710

(b) Do a check for an open circuit from pin 17 on connector D11320 for the No. 2 tank refuel indicator to pin 24 on connector D11306.

SIA 711-714, 716-999

(c) Do a check for an open circuit from pin 17 on connector D11320 for the No. 2 tank refuel indicator to pin 4 on connector D15806.

SIA 702-710

(d) Do a check for an open circuit from pin 18 on connector D11320 for the No. 2 tank refuel indicator to pin 25 on connector D11306.

SIA 711-714, 716-999

(e) Do a check for an open circuit from pin 18 on connector D11320 for the No. 2 tank refuel indicator to pin 12 on connector D15806.

SIA ALL

(f) If you find a problem with the wiring, repair the problem.

1) Re-install the No. 2 tank fueling indicator. To do this, do this task: Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801

2) Do the Repair Confirmation procedure below.

(g) If you do not find a problem with the wiring, then replace the fuel quantity processor.

These are the tasks:

Fuel Quantity Processor Unit Removal, AMM TASK 28-41-81-000-801,

Fuel Quantity Processor Unit Installation, AMM TASK 28-41-81-400-801.

1) Do the Repair Confirmation procedure below.

(h) If the problem continues, then replace the No. 2 tank refuel quantity indicator, N194.

These are the tasks:

Refuel Quantity Indicator Removal, AMM TASK 28-41-61-000-801

Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801

1) Do the Repair Confirmation procedure below.

(3) For a problem shown on the center tank refuel quantity indicator, do this check of the wiring:

(a) Remove the center tank refuel indicator, N195. To remove it, do this task: Refuel Quantity Indicator Removal, AMM TASK 28-41-61-000-801.

SIA 702-710

(b) Do a check for an open circuit from pin 17 on connector D11322 for the center tank refuel indicator to pin 24 on connector D11306.

SIA 711-714, 716-999

(c) Do a check for an open circuit from pin 17 on connector D11322 for the center tank refuel indicator to pin 4 on connector D15806.

SIA 702-710

(d) Do a check for an open circuit from pin 18 on connector D11322 for the center tank refuel indicator to pin 25 on connector D11306.

SIA 711-714, 716-999

(e) Do a check for an open circuit from pin 18 on connector D11322 for the center tank refuel indicator to pin 12 on connector D15806.

SIA ALL

(f) If you find a problem with the wiring, repair the problem.

1) Re-install the center tank fueling indicator. To do this, do this task: Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801

2) Do the Repair Confirmation procedure below.

(g) If you do not find a problem with the wiring, then replace the fuel quantity processor.

These are the tasks:

Fuel Quantity Processor Unit Removal, AMM TASK 28-41-81-000-801,

Fuel Quantity Processor Unit Installation, AMM TASK 28-41-81-400-801.

1) Do the Repair Confirmation procedure below.

(h) If the problem continues, then replace the center tank refuel quantity indicator, N195.

These are the tasks:

Refuel Quantity Indicator Removal, AMM TASK 28-41-61-000-801

Refuel Quantity Indicator Installation, AMM TASK 28-41-61-400-801

1) Do the Repair Confirmation procedure below.

G. Repair Confirmation

(1) If the upper display of each of the indicators shows the correct fuel quantity, then do these steps:

(a) Set the FUELING INDICATION TEST SWITCH on the P15 Fueling Control Panel to the TEST GAGES position.

(b) On each of the refuel quantity indicators do a check to see if all segments on the display come on for approximately two seconds and then go off for two seconds alternately until the FUELING INDICATION TEST SWITCH is released.

NOTE: If the SWITCH is held for more than twenty (20) seconds, the test stops automatically and the indicators go back to indicating mode.

(c) If all segments on each display come on for approximately two seconds and then go off for approximately two seconds, then you corrected the fault.

——— END OF TASK ———

818. Hydraulic Fluid Leakage in Fuel Tank - Fault Isolation

A. Description

(1) Hydraulic fluid can get into the fuel tanks through leakage in the hydraulic system. Hydraulic fluid heat exchangers are in the left and right main tanks, and the center tank has several hydraulic lines. A hydraulic fluid leak is more likely to occur with the heat exchangers in the main tanks, than with the hydraulic lines in the center tank.

(2) Hydraulic fluid stays in solution in fuel at concentrations up to 5% at temperatures more than -22°F (-30°C).

B. Possible Causes

(1) Leakage in the hydraulic system.

C. Related Data

(1) SSM 29-00-00

D. Initial Evaluation

(1) Find how long the airplane operated with the contaminated fuel.

(a) Review the maintenance records and find the maximum hydraulic fluid contamination level reached in the fuel by dividing the quantity of hydraulic fluid lost from the hydraulic system by the quantity of fuel the fluid leaked into.

NOTE: If the fuel leak occurred for more than one flight, use the smallest fuel load during the affected flights as the fuel quantity.

(2) A fuel sample can be used as an alternate option to fuel tank entry to find if there is fuel tank contamination.

NOTE: Hydraulic fluid, D00153, stays in solution in fuel at concentrations up to 5% at temperatures more than -22°F (-30°C).

(a) Get a fuel sample from the applicable tank(s): Fuel System Sumping, AMM TASK 12-11-00-680-801.

(b) Send the samples to a certified testing facility to determine if hydraulic fluid is present.

NOTE: ASTM D7111 or an equivalent test method can be used to determine the phosphorous content in the fuel sample.

(c) If no hydraulic fluid is found, no further maintenance is required.

(d) If hydraulic fluid is found, do the Fault Isolation procedure below.

(3) If fuel tank entry is necessary do the following steps.

(a) Defuel the applicable fuel tank(s) to isolate the hydraulic leak , do this task: Fuel Tank Defueling, AMM TASK 28-26-00-650-801.

NOTE: Hydraulic fluid heat exchangers are found in the left and right main tanks, and the center tank has several hydraulic lines. A hydraulic leak is more likely to occur with the heat exchanger in the main tanks, than with the hydraulic lines in the center tank.

WARNING

CAREFULLY DO ALL OF THE SAFETY PROCEDURES TO PREPARE TO GO INTO THE FUEL TANK. IF YOU DO NOT OBEY THE SAFETY PROCEDURES, YOU CAN CAUSE AN EXPLOSION. AN EXPLOSION WILL CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

(b) Do this task: Fuel Tank - Purging and Tank Entry, AMM TASK 28-11-00-910-802.

(c) Enter the applicable fuel tank and do this step:

1) Wipe all traces of fuel from the heat exchanger, all parts of the tubing attached to the heat exchanger and all other tubing that penetrates the fuel tank walls.

(d) Exit the applicable fuel tank and close the access door to the tank.

(e) Pressurize the applicable hydraulic system with a portable hydraulic cart. Do this task: Hydraulic System A or B Pressurization with a Portable Hydraulic Cart, AMM TASK 29-11-00-860-802.

(f) Remove the pressure from the portable hydraulic cart. Do this task: Bleed the Hydraulic Systems, AMM TASK 29-00-00-870-801.

(g) Enter the applicable fuel tank and look for leaks at the heat exchanger, all parts of the tubing attached to the heat exchanger and all other tubing that penetrates the fuel tank walls.

1) If it is necessary, remove all traces of hydraulic fluid from the fuel tank.
2) If no hydraulic fluid is found, no further maintenance is required.
3) If you find evidence of a hydraulic leak, then do the Fault Isolation procedure below.

E. Fault Isolation Procedure

(1) Repair the hydraulic fluid leak.

NOTE: Hydraulic fluid stays in solution in fuel at concentrations up to 5% at temperatures more than -22°F (-30°C). The affect of hydraulic fluid contamination is dependant upon the concentration of the hydraulic fluid and the time of exposure.

(2) Contact the applicable engine manufacturer with the calculated hydraulic fluid contamination level and length of time the airplane was operated with the leak to get further evaluation of specific condition and case-by-case support.

(3) Refuel the fuel system with uncontaminated fuel, do this task: Pressure Refuel Procedure, AMM TASK 12-11-00-650-802.

NOTE: Hydraulic fluid contamination of less than 1 parts per million will not cause damage to the airplane fuel system seals or the fuel tank sealant for time periods less than three days. If the contamination is more than 1 parts million or if the hydraulic fluid was in the fuel tank for more than three days, some seals in the fuel system and fuel pumps could be affected.

(4) If the contamination was more than 1 parts per million or if the hydraulic fluid was in the tank for more than three days, do this task: Engine Fuel Feed Manifold - Leak Test, AMM TASK 28-22-15-710-801.

(5) If the hydraulic fluid leak is in the left main tank, the APU is affected if it operated during the time period when the hydraulic fluid leakage occurred.

NOTE: The left main tank supplies fuel to the APU.

(a) If the APU is affected, do this task: APU Operates with Hydraulic Contaminated Fuel - Fault Isolation, 49-10 TASK 811.

——— END OF TASK ———

801. Center Tank Left Fuel Pump LOW PRESSURE Light is ON - Fault Isolation

A. Description

(1) The LOW PRESSURE Light for the Center Tank Left Boost Pump (Override Pump) is ON. This means that the Center Tank Left Boost Pump does not pressurize the Fuel Feed Manifold.

(a) If one or both LOW PRESSURE Lights for the Center Tank come ON for at least 10 seconds, then the FUEL Light on the Master Caution System Annunciator also comes ON.

(2) This fault condition occurs during flight when the Center Tank becomes empty. The Auto Shutoff System will turn OFF the Center Boost Pumps after a 15 second time delay if the CTR FUEL PUMP Switches are in the ON position. When this happens, the pilot usually turns OFF the Center Tank Boost Pumps.

(a) The LOW PRESSURE Lights for the Center Tank Boost Pumps normally goes OFF when the CTR FUEL PUMP Switches are in the OFF position.

(3) This fault condition occurs during flight when the Center Tank becomes empty. The pilot usually turns off the Center Boost Pumps at this time.

(a) If the Center Boost Pump continues to operate when it has been commanded OFF, a secondary in-series connected Pump Relay, R962, will inhibit the Fuel Pump through redundancy and turn it OFF.

(4) This fault condition can also occur if the Center Boost Pump loses its prime or is not primed correctly.

(a) If the Center Tank is filled to 14,000 lb (6350 kg), as described in the Initial Evaluation that follows, the Boost Pump will become primed.

(b) You can also use one of the alternative Boost Pump Priming Procedures given in Fuel Boost Pump and Override Pump Priming, AMM TASK 28-22-41-420-801.

(5) Refer to SDS SUBJECT 28-22-00 for a detailed description of the Fuel Feed System.

B. Possible Causes

(1) Center Tank Left Boost Pump Low Pressure Switch, S154

(2) Center Tank Left Boost Pump Relay, R54

(3) Center Tank Left Boost Pump (Override Pump), M234

(4) Left Auto Shutoff Time Delay (TD) Relay, R934

(5) Left Auto Shutoff 115V AC Relay, R936

(6) Center Tank Left Boost Pump Secondary Relay, R962

(7) Wiring

C. Circuit Breakers

(1) This is the primary circuit breaker related to the fault:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	5	C00845	FUEL BOOST PUMP CTR TANK LEFT

D. Related Data

(1) WDM 28-23-11

(2) WDM 28-43-11

(3) SSM 28-23-11

(4) SSM 28-43-11

E. Initial Evaluation

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) Obey these precautions at all times during this task:

(a) To operate a fuel pump, you must be in the Flight Compartment to continuously monitor the fuel quantity and the LOW PRESSURE indication for the applicable tank.

(b) Immediately put the applicable FUEL PUMP Switch(es) to OFF if the LOW PRESSURE Light comes ON and stays ON.

WARNING DO NOT CLOSE A GFI RELAY FOR A FUEL PUMP THAT OPENED (TRIPPED) UNTIL YOU CORRECT THE PROBLEM. THIS CONDITION CAN CAUSE A FIRE OR EXPLOSION.

WARNING DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

(2) Do a visual inspection of the Center Tank Left Boost Pump GFI Relay, R54:

NOTE: The GFI Relay, R54, is on the P91 Panel, in the Electronic Equipment (EE) Compartment. You will need to open the panel to get access to the GFI Relay.

28-AWL-18: CDCCL

(a) If the RESET button is out, and you can see the white band, then do the “Fault Isolation Procedure - Center Tank Left Boost Pump GFI Relay Open” below.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: The RESET button, found at the top edge of the GFI Relay, moves out to show a narrow white band when the GFI circuit turns off the relay due to a ground fault, or when you push the TEST button found on the top surface of the relay.

(b) If the RESET button on the Left Boost Pump GFI Relay, R54, is not out and you cannot see the white band, then continue.

(3) Do a check of this circuit breaker:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	5	C00845	FUEL BOOST PUMP CTR TANK LEFT

(a) If the FUEL BOOST PUMP CTR TANK LEFT circuit breaker is open, do this task: Center Tank, Left Boost Pump Circuit Breaker Open - Fault Isolation, 28-22 TASK 817.

(b) If the FUEL BOOST PUMP CTR TANK LEFT circuit breaker is closed, then continue.

(4) Make sure that the Center Tank has a minimum of 14,000 lb (6350 kg) of fuel.

NOTE: This step makes sure that the Boost Pump is correctly primed.

(a) If it is not possible to add 14,000 lb (6350 kg) to the Center Tank, then do this task: Fuel Boost Pump and Override Pump Priming, AMM TASK 28-22-41-420-801.

(5) Make sure that these circuit breakers are closed:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
C	3	C01637	BOOST PMP CTR TNK L AUTO SHUT OFF-DC
D	7	C01659	AT S-O/UCPO BST PMP CTR TNK L AC

(6) On the P5 Forward Overhead Panel, put the L CTR FUEL PUMP Switch to ON.

(a) If the LOW PRESSURE Light for the Center Left Boost Pump comes ON and then goes OFF (after a maximum of 90 seconds), then there was an intermittent fault.

NOTE: Refer to the Description Section above for a possible cause of the intermittent fault.

(b) If the LOW PRESSURE Light for the Center Tank Left Boost Pump comes ON and stays ON (for a minimum of 90 seconds), then do these steps:

1) With the L CTR FUEL PUMP Switch at ON, listen to the Center Tank Left Boost Pump and touch it to make sure it operates.

2) If the Center Left Boost Pump operates, then do the ”Fault Isolation Procedure - Boost Pump Operates” below.

3) If the Center Left Boost Pump does not operate, then do the “Fault Isolation Procedure - Boost Pump Does Not Operate” below.

F. Fault Isolation Procedure - Center Tank Left Boost Pump GFI Relay Open

WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

28-AWL-18: CDCCL

(1) Before you reset the GFI, you must isolate the fault that opened (tripped) the GFI and correct it.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: The GFI Relay, R54, is on the P91 Panel in the EE Compartment. You will need to open the panel to get access to the GFI Relay.

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 a fuel pump, you must be in the Flight Compartment to continuously monitor the fuel quantity and the low pressure indication for the applicable tank.

(b) Immediately set the applicable FUEL PUMP Switch(es) to OFF if the LOW PRESSURE Light comes ON and stays ON.

(3) Make sure that you do the Initial Evaluation before you start the Fault Isolation Procedure.

(4) Make sure that the Center Tank has a minimum of 14,000 lb (6350 kg) of fuel.

NOTE: This step makes sure that the Boost Pump is correctly primed.

WARNING OBEY THE PROCEDURE FOR THE INSTALLATION OF THE DOWNLOCK PINS. IF YOU MOVE THE CONTROL LEVER FOR THE LANDING GEAR TO THE UP POSITION, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

(5) If the Downlock Pins are not installed, do this task: Landing Gear Downlock Pins Installation, AMM TASK 32-00-01-480-801.

(6) Get access to the Center Tank Left Fuel Boost Pump (Motor Impeller Removal, AMM TASK 28-22-41-000-801).

(7) Examine the Fuel Boost Pump and the area around it for fuel leakage.

(a) If there are signs of fuel leakage, find the source of the fuel leakage and repair it.

(8) Do these steps to do a check of the electrical connector and the Boost Pump:

(a) Disconnect the electrical connector D802 from the Fuel Boost Pump (WDM 28-23-11).

(b) Examine the airplane and pump sides of the electrical connector D802 for damage.

1) Repair all damage that you find.

(c) Make sure that the electrical connector D802 is disconnected.

(d) Make sure the RESET button on the Left Boost Pump GFI Relay, R54, is pushed in.

(e) On the P5 Overhead Panel, put the L CTR FUEL PUMP Switch to ON.

(f) After five minutes, put the L CTR FUEL PUMP Switch on the P5 Overhead Panel, to OFF.

(g) If the RESET button on the Center Tank Left Boost Pump GFI Relay, R54, is not out and you cannot see the white band, then do one of these steps:

NOTE: The circuit on the airplane side of the electrical connector is good.

1) For the Center Tank Left Fuel Boost Pump, M234, do this task: Fuel Boost Pump - Insulation Resistance Test, AMM TASK 28-22-00-760-802.

a) If the Insulation Resistance Test is not OK, then replace the Center Tank Left Fuel Boost Pump Impeller. These are the tasks:

- Motor Impeller Removal, AMM TASK 28-22-41-000-801
- Motor Impeller Installation, AMM TASK 28-22-41-400-801

<1> Do the Repair Confirmation at the end of this task.

2) If the problem continues, then replace the Center Tank Left Fuel Boost Pump, M234. These are the tasks:

- Motor Impeller Removal, AMM TASK 28-22-41-000-801
- Motor Impeller Installation, AMM TASK 28-22-41-400-801

a) Do the Repair Confirmation at the end of this task.

(h) If the RESET button on the GFI Relay is out, and you can see the white band, then continue.

NOTE: The circuit on the airplane side of the electrical connector is bad.

(i) Make sure to re-connect the connector D802.

G. Fault Isolation Procedure - Boost Pump Does Not Operate

(1) Make sure that you do the Initial Evaluation before you start the Fault Isolation Procedure.

WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

(2) Do these checks of the Center Tank Left Boost Pump Relay, R54, the Center Tank Left Boost Pump Switch, S8, and the Left Auto Shutoff TD Relay, R934 (WDM 28-23-11, SSM 28-23-11):

(a) Make sure that the L CTR FUEL PUMP Switch is ON.

(b) Do a check for 115 VAC between pins X1 and X2 of the Center Tank Left Boost Pump Relay, R54, connector, D12286.

NOTE: The Center Tank Left Boost Pump Relay, R54 is on the P91 Panel in the EE Compartment.

(c) If you find 115 VAC, then do these steps:

1) Replace the Relay R54.

2) Do the Repair Confirmation at the end of this task.

(d) If you do not find 115 VAC between pins X1 and X2 at connector D12286 of Relay R54, then do these steps:

1) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
C	3	C01637	BOOST PMP CTR TNK L AUTO SHUT OFF-DC
D	7	C01659	AT S-O/UCPO BST PMP CTR TNK L AC

2) Disconnect the connector D626 from the P5-2 Overhead Panel in the Flight Compartment.

3) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
C	3	C01637	BOOST PMP CTR TNK L AUTO SHUT OFF-DC
D	7	C01659	AT S-O/UCPO BST PMP CTR TNK L AC

4) Do a check for 115 VAC between pins 35 and 34 of connector D626.
   a) If you find 115 VAC, replace the Center Tank Left Boost Pump Switch, S8.
      NOTE: The Center Tank Left Boost Pump Switch, S8, is on the P5 Forward Overhead Panel, in the Flight Compartment.
   b) If you do not find 115 VAC, replace the Left Auto Shutoff 115V AC Relay, R936, in the J20 Junction Box.
5) Re-connect the connector D626 to the P5-2 Overhead Panel.
6) Make sure that these circuit breakers are closed:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
C	3	C01637	BOOST PMP CTR TNK L AUTO SHUT OFF-DC
D	7	C01659	AT S-O/UCPO BST PMP CTR TNK L AC

7) Do the Repair Confirmation at the end of this task.
   a) If the problem continues, and there was 115V AC between pins 35 and 34 of the Fuel System Module connector D626, replace the Left Auto Shutoff T/D Relay, R934. Also, examine the wiring from the TD Relay connector D13794, pin A3 to pin X2 of the Center Tank Left Boost Pump Relay connector D12286.
      <1> Repair the wiring.
      <2> Do the Repair Confirmation at the end of this task.
   b) If the problem continues, and there was not 115V AC between pins 35 and 34 of the Fuel System Module connector D626, then examine the wiring from connector D626, pin 35 through the Left Auto Shutoff T/D Relay, R934 to the Load Control Center - Right connector D40750P, pin 26. Also, examine the wiring from pin 34 of connector D626 to Ground.
      <1> Repair the wiring.
      <2> Do the Repair Confirmation at the end of this task.

(3) Replace the Center Tank Left Boost Pump Secondary Relay, R962
   (a) Do this task: Center Tank Fuel Boost Pump Power Failed On - Functional Test, AMM TASK 28-22-00-720-806.
   (b) Do the Repair Confirmation at the end of this task.

(4) Do this check of the wiring (WDM 28-23-11):
   (a) Make sure that the L CTR FUEL PUMP Switch is OFF.
   (b) Disconnect the connector D802 from the Center Tank Left Boost Pump, M234.
   (c) Do a check for an open circuit in the wiring between the Secondary Center Tank Left Boost Pump Relay, R962 and the Center Tank Left Boost Pump, M234 as follows:

CTR TNK L BOOST PMP D802		CTR TNK L BOOST PMP SEC RLY R962
pin 1	. . . . .	pin A1
pin 2	. . . . .	pin B1
pin 3	. . . . .	pin C1

(d) Do a check for an open circuit in the wiring between the Secondary Center Tank Left Boost Pump Relay, R962 and the Center Tank Left Boost Pump Relay, R54 as follows:

CTR TNK L BOOST PMP SEC RLY R962		RELAY R54 D12286
pin A2	. . . . .	pin A1
pin B2	. . . . .	pin B1
pin C2	. . . . .	pin C1

(e) If you find a fault with the wiring, then do these steps:

1) Repair the wiring.
2) Re-connect connector D802.
3) Do the Repair Confirmation at the end of this task.

H. Fault Isolation Procedure - Boost Pump Operates

(1) Make sure that you do the Initial Evaluation before you start the Fault Isolation Procedure.

(a) This procedure isolates the fault to one of these possible causes:

1) Low Pressure Switch, S154
2) P5-2 Module
3) Wiring

(2) Do this check of the Low Pressure Switch, S154:

NOTE: The Low Pressure Switch, S154, is on the rear spar of the Wing Center Section in the Left Main Landing Gear Wheel Well.

(a) Make sure that the L CTR FUEL PUMP Switch is ON.

(b) Disconnect the connector D876 from the Low Pressure Switch, S154.

1) If the Center Tank Left Boost Pump LOW PRESSURE Light goes OFF, replace the Low Pressure Switch, S154. These are the tasks:

- Fuel Boost Pump Pressure Switch Removal, AMM TASK 28-42-11-000-801
- Fuel Boost Pump Pressure Switch Installation, AMM TASK 28-42-11-420-801

a) Do the Repair Confirmation at the end of this task.

(3) Examine the wiring from the Low Pressure Switch to the LOW PRESSURE Light as follows (WDM 28-43-11):

(a) Make sure that the L CTR FUEL PUMP Switch is ON.

(b) Do a check for a short circuit between pins 2 (GND) and 3 of connector D876.

(c) If there is a short circuit between pins 2 and 3, then do these steps:

1) Repair the wiring.
2) Re-connect connector D876.
3) Do the Repair Confirmation at the end of this task.

(d) If there is not a short circuit between pins 2 and 3, then re-connect connector D876 and continue.

(4) Replace the P5-2 Module on the P5 Forward Overhead Panel.

(a) Do the Repair Confirmation at the end of this task.

I. Repair Confirmation

(1) Make sure that the RESET button on the Center Tank Left Boost Pump GFI Relay, R54, is not out and you cannot see the white band.

(2) On the P5-2 Panel, put the L CTR FUEL PUMP Switch to ON.

(a) If the LOW PRESSURE Light Indication for the Center Tank Left Boost Pump comes ON and then goes OFF, then you corrected the problem.

1) Put the L CTR FUEL PUMP Switch to OFF.

(b) If the LOW PRESSURE Light Indication for the Center Tank Left Boost Pump comes ON and stays ON, then continue the applicable Fault Isolation Procedure at the subsequent step.

——— END OF TASK ———

802. Center Tank Right Fuel Pump LOW PRESSURE Light is ON - Fault Isolation

A. Description

(1) The LOW PRESSURE Light for the Center Tank Right Boost Pump (Override Pump) is ON. This means that the Center Tank Right Boost Pump does not pressurize the Fuel Feed Manifold.

(a) If one or both LOW PRESSURE Lights for the Center Tank come ON for at least 10 seconds, then the FUEL Light on the Master Caution System Annunciator also comes ON.

(2) This fault condition occurs during flight when the Center Tank becomes empty. The Auto Shutoff System will turn OFF the Center Boost Pumps after a 15 second time delay if the CTR FUEL PUMP Switches are in the ON position. When this happens, the pilot usually turns OFF the Center Tank Boost Pumps.

(a) The LOW PRESSURE Lights for the Center Tank Boost Pumps should go OFF when the CTR FUEL PUMP Switches are in the OFF position.

(3) This fault condition occurs during flight when the Center Tank becomes empty. The pilot usually turns off the Center Boost Pumps at this time.

(a) If the Center Boost Pump continues to operate when it has been commanded OFF, a secondary in-series connected Pump Relay, R963, will inhibit the Fuel Pump through redundancy and turn it OFF.

(4) This fault condition can also occur when the Center Boost Pump loses its prime or is not primed correctly.

(a) If the Center Tank is filled to 14,000 lb (6350 kg), as described in the Initial Evaluation that follows, the Boost Pump will become primed.

(b) You can also use one of the alternative Boost Pump Priming Procedures given in Fuel Boost Pump and Override Pump Priming, AMM TASK 28-22-41-420-801.

(5) Refer to SDS SUBJECT 28-22-00 for a detailed description of the Fuel Feed System.

B. Possible Causes

(1) Center Tank Right Boost Pump Low Pressure Switch, S155

(2) Center Tank Right Boost Pump Relay, R55

(3) Center Tank Right Boost Pump (Override Pump), M235

(4) Right Auto Shutoff Time Delay (TD) Relay, R935

(5) Right Auto Shutoff 115V AC Relay, R937

(6) Center Tank Right Boost Pump Secondary Relay, R963

(7) Wiring

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
C	7	C01638	BOOST PMP CTR TNK R AUTO SHUT OFF-DC
E	7	C01658	FUEL AT S-O/UCPO BST PMP CTR TNK R AC

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	5	C00846	FUEL BOOST PUMP CTR TANK RIGHT

D. Related Data

(1) WDM 28-23-11

(2) WDM 28-43-11

(3) SSM 28-23-11

(4) SSM 28-43-11

E. Initial Evaluation

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) Obey these precautions at all times during this task:

(a) To operate a fuel pump, you must be in the flight compartment to continuously monitor the fuel quantity and the LOW PRESSURE indication for the applicable tank.

(b) Immediately put the applicable FUEL PUMP Switch(es) to OFF if the LOW PRESSURE Light comes ON and stays ON.

WARNING DO NOT CLOSE A GFI RELAY FOR A FUEL PUMP THAT OPENED (TRIPPED) UNTIL YOU CORRECT THE PROBLEM. THIS CONDITION CAN CAUSE A FIRE OR EXPLOSION.

WARNING DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

(2) Do a visual inspection of the Center Tank Right Boost Pump GFI Relay, R55:

NOTE: The GFI Relay, R55, is on the P92 panel in the Electronic Equipment Compartment. You will need to open the panel to get access to the GFI Relay.

28-AWL-18: CDCCL

(a) If the RESET button is out, and you can see the white band, then do the “Fault Isolation Procedure - Center Tank Right Boost Pump GFI Relay Open” below.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: The RESET button, found at the top edge of the GFI relay, moves out to show a narrow white band when the GFI circuit turns off the relay due to a ground fault, or when you push the TEST button found on the top surface of the relay.

(b) If the RESET button on the Right Boost Pump GFI Relay, R55, is not out and you cannot see the white band, then continue.

(3) Do a check of this circuit breaker:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	5	C00846	FUEL BOOST PUMP CTR TANK RIGHT

(a) If the FUEL BOOST PUMP CTR TANK RIGHT circuit breaker is open, then do this task: Center Tank, Right Boost Pump Circuit Breaker Open - Fault Isolation, 28-22 TASK 818.

(b) If the FUEL BOOST PUMP CTR TANK RIGHT circuit breaker is closed, then continue.

(4) Make sure that the Center Tank has a minimum of 14,000 lb (6350 kg) of fuel.

NOTE: This step makes sure that the Boost Pump is correctly primed.

(a) If it is not possible to add 14,000 lb (6350 kg) to the Center Tank, then do this task: Fuel Boost Pump and Override Pump Priming, AMM TASK 28-22-41-420-801.

(5) Make sure that these circuit breakers are closed:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
C	7	C01638	BOOST PMP CTR TNK R AUTO SHUT OFF-DC
E	7	C01658	FUEL AT S-O/UCPO BST PMP CTR TNK R AC

(6) On the P5 Forward Overhead Panel, put the R CTR FUEL PUMP Switch to ON.

(a) If the LOW PRESSURE Light for the Center Right Boost Pump comes ON and then goes OFF (after a maximum of 90 seconds), then there was an intermittent fault.

NOTE: Refer to the Description Section above for a possible cause of the intermittent fault.

(b) If the LOW PRESSURE Light for the Center Tank Right Boost Pump comes ON and stays ON (for a minimum of 90 seconds), then do these steps:

1) With the R CTR FUEL PUMP Switch at ON, listen to the Center Right Boost Pump and touch it to make sure it operates.

a) If the Center Right Boost Pump operates, then do the “Fault Isolation Procedure - Boost Pump Operates” below.

b) If the Center Right Boost Pump does not operate, then do the “Fault Isolation Procedure - Boost Pump Does Not Operate” below.

F. Fault Isolation Procedure - Center Tank Right Boost Pump GFI Relay Open

WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

28-AWL-18: CDCCL

(1) Before you reset the GFI, you must isolate the fault that opened (tripped) the GFI and correct it.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: The GFI relay, R55, is on the P92 panel in the Electronic Equipment Compartment. You will need to open the panel to get access to the GFI relay.

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 a fuel pump, you must be in the flight compartment to continuously monitor the fuel quantity and the LOW PRESSURE Light Indication for the applicable tank.

(b) Immediately set the applicable FUEL PUMP Switch(es) to OFF if the LOW PRESSURE Light comes ON and stays ON.

(3) Make sure that you do the Initial Evaluation above before you start the Fault Isolation Procedure.

(4) Make sure that the Center Tank has a minimum of 14,000 lb (6350 kg) of fuel.

NOTE: This step makes sure that the Boost Pump is correctly primed.

WARNING

OBEY THE PROCEDURE FOR THE INSTALLATION OF THE DOWNLOCK PINS. IF YOU MOVE THE CONTROL LEVER FOR THE LANDING GEAR TO THE UP POSITION, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

(5) If the Downlock Pins are not installed, do this task: Landing Gear Downlock Pins Installation, AMM TASK 32-00-01-480-801.

(6) Get access to the Center Tank Right Fuel Boost Pump (Motor Impeller Removal, AMM TASK 28-22-41-000-801).

(7) Examine the Fuel Boost Pump and the area around it for fuel leakage.

(a) If there are signs of fuel leakage, find the source of the fuel leakage and repair it.

(8) Do these steps to do a check of the electrical connector and the Boost Pump:

(a) Disconnect the electrical connector D804, from the Fuel Boost Pump (WDM 28-23-11).

(b) Examine the airplane and pump sides of the electrical connector D804 for damage.

1) Repair all damage that you find.

(c) Make sure that the electrical connector D804 is disconnected.

(d) Make sure the RESET button on the Right Boost Pump GFI Relay, R55, is pushed in.

(e) On the P5 Overhead Panel, put the R CTR FUEL PUMP Switch to ON.

(f) After five minutes, put the R CTR FUEL PUMP Switch to OFF.

(g) If the RESET button on the Right Boost Pump GFI Relay, R55, is not out and you cannot see the white band, then do one of these steps:

NOTE: The circuit on the airplane side of the electrical connector is good.

1) For the Center Tank Right Boost Pump, M235, do this task: Fuel Boost Pump - Insulation Resistance Test, AMM TASK 28-22-00-760-802.

a) If the Insulation Resistance Test is not OK, then replace the Center Tank Right Boost Pump Impeller. These are the tasks:

- Motor Impeller Removal, AMM TASK 28-22-41-000-801
- Motor Impeller Installation, AMM TASK 28-22-41-400-801

<1> Do the Repair Confirmation at the end of this task.

2) If the problem continues, then replace the Center Tank Right Fuel Boost Pump, M235. These are the tasks:

- Motor Impeller Removal, AMM TASK 28-22-41-000-801
- Motor Impeller Installation, AMM TASK 28-22-41-400-801

a) Do the Repair Confirmation at the end of this task.

(h) If the RESET button on the GFI Relay is out, and you can see the white band, then continue.

NOTE: The circuit on the airplane side of the electrical connector is bad.

1) Make sure to re-connect connector D804.

G. Fault Isolation Procedure - Boost Pump Does Not Operate

(1) Make sure that you do the Initial Evaluation above before you start the Fault Isolation Procedure.

WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

(2) Do these checks of the Center Tank Right Boost Pump Relay, R55, the Center Tank Right Boost Pump Switch, S9, and the Right Auto Shutoff TD Relay, R935 (WDM 28-23-11, SSM 28-23-11):

(a) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
C	7	C01638	BOOST PMP CTR TNK R AUTO SHUT OFF-DC

(b) Make sure that the R CTR FUEL PUMP Switch is ON.

(c) Do a check for 115 VAC between pins X1 and X2 of the Center Tank Right Boost Pump Relay, R55 connector D12288.

NOTE: The Center Tank Right Boost Pump Relay, R55, is on the P92 Panel in the Electronic Equipment Compartment.

(d) If you find 115 VAC, then do these steps:

1) Replace the Center Tank Right Boost Pump Relay, R55.

2) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
C	7	C01638	BOOST PMP CTR TNK R AUTO SHUT OFF-DC

3) Do the Repair Confirmation at the end of this task.

(e) If you do not find 115 VAC between pins X1 and X2 at connector D12288 of Relay R55, then do these steps:

1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
E	7	C01658	FUEL AT S-O/UCPO BST PMP CTR TNK R AC

2) Disconnect connector D628 from the P5-2 Overhead Panel in the Flight Compartment.

3) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
E	7	C01658	FUEL AT S-O/UCPO BST PMP CTR TNK R AC

4) Do a check for 115 VAC between pins 35 and 34 of connector D628.

a) If you find 115 VAC, replace the Center Tank Right Boost Pump Switch, S9.

NOTE: The Center Tank Right Boost Pump Switch, S9, is on the P5 Forward Overhead Panel, in the Flight Compartment.

b) If you do not find 115 VAC, replace the Right Auto Shutoff 115V AC Relay, R937, in the J4 Junction Box.

5) Re-connect connector D628 to the P5-2 Overhead Panel.

6) Make sure that these circuit breakers are closed:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
C	7	C01638	BOOST PMP CTR TNK R AUTO SHUT OFF-DC
E	7	C01658	FUEL AT S-O/UCPO BST PMP CTR TNK R AC

7) Do the Repair Confirmation at the end of this task.

a) If the problem continues, and there was 115V AC between pins 35 and 34 of the Fuel System Module connector D628, replace the Right Auto Shutoff T/D Relay, R935. Also, examine the wiring from the TD Relay connector D13798, pin A3 to pin X2 of the Center Tank Right Boost Pump Relay connector D12288.

<1> Repair the wiring.

<2> Do the Repair Confirmation at the end of this task.

b) If the problem continues, and there was not 115V AC between pins 35 and 34 of the Fuel System Module connector D628, then examine the wiring from connector D628, pin 35 through the Right Auto Shutoff 115V AC Relay, R937 to the Load Control Center - Right connector D40822P, pin 15. Also, examine the wiring from pin 34 of connector D628 to Ground.

<1> Repair the wiring.

<2> Do the Repair Confirmation at the end of this task.

(3) Replace the Center Tank Right Boost Pump Secondary Relay, R963.

(a) Do this task: Center Tank Fuel Boost Pump Power Failed On - Functional Test, AMM TASK 28-22-00-720-806.

(b) Do the Repair Confirmation at the end of this task.

(4) Do this check of the wiring (WDM 28-23-11):

(a) Make sure that the R CTR FUEL PUMP Switch is OFF.

(b) Disconnect connector D804 from the Center Tank Right Boost Pump, M235.

(c) Do a check for an open circuit in the wiring between the Secondary Center Tank Right Boost Pump Relay, R963 and the Center Tank Right Boost Pump, M235 as follows:

CTR TNK R BOOST PMP D804		**CTR TNK R BOOST PMP SEC RLY R963**
pin 1	. . . . .	pin A1
pin 2	. . . . .	pin B1
pin 3	. . . . .	pin C1

(d) Do a check for an open circuit in the wiring between the Secondary Center Tank Right Boost Pump Relay, R963 and the Center Tank Right Boost Pump Relay, R55, as follows:

CTR TNK R BOOST PMP SEC RLY R963		**RELAY R55 D12288**
pin A2	. . . . .	pin A1
pin B2	. . . . .	pin B1
pin C2	. . . . .	pin C1

(e) If you find a problem with the wiring, then do these steps:

1) Repair the wiring.

2) Re-connect connector D804.

3) Do the Repair Confirmation at the end of this task.

H. Fault Isolation Procedure - Boost Pump Operates

(1) Make sure that you do the Initial Evaluation before you start the Fault Isolation Procedure.

(a) This procedure isolates the problem to one of these possible causes:

1) Low Pressure Switch, S155

2) P5-2 Module

3) Wiring

(2) Do this check of the Low Pressure Switch, S155:

NOTE: The Low Pressure Switch, S155, is on the rear spar of the Wing Center Section, in the Right Main Landing Gear Wheel Well.

(a) Make sure that the R CTR FUEL PUMP Switch is ON.

(b) Disconnect connector D878 from the Low Pressure Switch.

1) If the Center Tank Right Boost Pump LOW PRESSURE Light goes OFF, replace the Low Pressure Switch, S155. These are the tasks:

- Fuel Boost Pump Pressure Switch Removal, AMM TASK 28-42-11-000-801
- Fuel Boost Pump Pressure Switch Installation, AMM TASK 28-42-11-420-801

a) Do the Repair Confirmation at the end of this task.

(3) Examine the wiring from the Low Pressure Switch to the LOW PRESSURE Light as follows (WDM 28-43-11):

(a) Make sure that the R CTR FUEL PUMP Switch is ON.

(b) Do a check for a short circuit between pins 2 (GND) and 3 of connector D878.

(c) If there is a short circuit between pins 2 and 3, then do these steps:

1) Repair the wiring.

2) Re-connect connector D878.

3) Do the Repair Confirmation at the end of this task.

(d) If there is not a short circuit between pins 2 and 3, then re-connect connector D878 and continue.

(4) Replace the P5-2 Module on the P5 Forward Overhead Panel.

(a) Do the Repair Confirmation at the end of this task.

I. Repair Confirmation

(1) Make sure that the RESET button on the Right Boost Pump GFI Relay, R55, is not out and you cannot see the white band.

(2) On the P5-2 Panel, put the R CTR FUEL PUMP Switch to ON.

(a) If the LOW PRESSURE Light Indication for the Center Tank Right Boost Pump comes ON and then goes OFF, you corrected the problem.

1) Put the R CTR FUEL PUMP Switch to OFF.

(b) If the LOW PRESSURE Light Indication for the Center Tank Right Boost Pump comes ON and stays ON, then continue the applicable Fault Isolation Procedure at the subsequent step.

END OF TASK

803. Tank 1 AFT Pump LOW PRESSURE Light is ON - Fault Isolation

A. Description

(1) On the P5 Panel, the Tank 1 AFT LOW PRESSURE Light is ON.

(a) This means that the Tank 1 Aft Boost Pump does not pressurize the Fuel Feed Manifold.

(b) When the two LOW PRESSURE Lights for Tank 1 come ON, then the FUEL Light on the Master Caution System Annunciator also comes ON.

(2) The Tank 1 AFT LOW PRESSURE Light normally comes ON when the Tank 1 Aft Boost Pump is OFF.

(3) This fault condition can also occur if the Tank 1 Aft Boost Pump loses its prime or is not primed correctly.

(a) If the Tank 1 is filled to 500 lb (227 kg), as described in the Initial Evaluation that follows, the Boost Pump will become primed.

(b) You can also use one of the alternative Boost Pump Priming Procedures given in Fuel Boost Pump and Override Pump Priming, AMM TASK 28-22-41-420-801.

(4) Refer to SDS SUBJECT 28-22-00 for a detailed description of the Fuel Feed System.

B. Possible Causes

(1) Tank 1 Aft Boost Pump Switch, S4

(2) Tank 1 Aft Boost Pump Low Pressure Switch, S150

(3) Tank 1 Aft Boost Pump Relay, R18

(4) Tank 1 Aft Boost Pump, M46

(5) P5-2 Module Wiring or Logic

(6) Wiring

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
E	11	C00313	INDICATOR MASTER DIM SECT 1
F	12	C00318	INDICATOR MASTER DIM SECT 6

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	1	C00826	FUEL BOOST PUMP TANK 1 AFT

D. Related Data

(1) WDM 28-23-11

(2) WDM 28-43-11

(3) SSM 28-23-11

(4) SSM 28-43-11

E. Initial Evaluation

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) Obey these precautions at all times during this task:

(a) To operate a Fuel Pump, you must be in the flight compartment to continuously monitor the fuel quantity and the LOW PRESSURE indication for the applicable tank.

(b) Immediately put the applicable FUEL PUMP Switch(es) to OFF if the LOW PRESSURE Light comes ON and stays ON.

WARNING DO NOT CLOSE A GFI RELAY FOR A FUEL PUMP THAT OPENED (TRIPPED) UNTIL YOU CORRECT THE PROBLEM. THIS CONDITION CAN CAUSE A FIRE OR EXPLOSION.

WARNING DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

(2) Do a visual inspection of the BOOST PUMP TANK 1 AFT GFI relay, R18:

NOTE: The GFI Relay, R18, is on the P92 Panel in the Electronic Equipment Compartment. You will need to open the panel to get access to the GFI Relay.

28-AWL-18: CDCCL

(a) If the RESET button is out, and you can see the white band, then do the “Fault Isolation Procedure - Tank 1 Aft Boost Pump GFI Relay Open” below.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: The RESET button, found at the top edge of the GFI Relay, moves out to show a narrow white band when the GFI circuit turns off the relay due to a ground fault, or when you push the TEST button found on the top surface of the relay.

(b) If the RESET button on the Tank 1 Aft Boost Pump GFI Relay, R18, is not out and you cannot see the white band, then continue.

(3) Do a check of this circuit breaker:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	1	C00826	FUEL BOOST PUMP TANK 1 AFT

(a) If the FUEL BOOST PUMP TANK 1 AFT circuit breaker is open, do this task: No. 1 Tank, Aft Boost Pump Circuit Breaker Open - Fault Isolation, 28-22 TASK 814.

(b) If the FUEL BOOST PUMP TANK 1 AFT circuit breaker is closed, then continue.

(4) Make sure that Tank 1 has a minimum of 500 lb (227 kg) of fuel.

NOTE: This step makes sure that the Boost Pump is primed correctly.

(a) If it is not possible to add 500 lb (227 kg) to the Tank 1, then, do this task: Fuel Boost Pump and Override Pump Priming, AMM TASK 28-22-41-420-801.

(5) On the P5 Forward Overhead Panel, put the AFT 1 FUEL PUMP Switch to ON.

(a) If the LOW PRESSURE Light for the Aft Boost Pump comes ON and then goes OFF (after a maximum of 90 seconds), then there was an intermittent fault.

(b) If the LOW PRESSURE Light for the Aft Boost Pump comes ON and stays ON (for a minimum of 90 seconds), then do these steps:

1) With the AFT 1 FUEL PUMP Switch at ON, listen to the Tank 1 Aft Boost Pump and touch it to make sure it operates.

2) If the Boost Pump operates, then do the “Fault Isolation Procedure - Boost Pump Operates” below.

3) If the Boost Pump does not operate, then do the “Fault Isolation Procedure - Boost Pump Does Not Operate” below.

F. Fault Isolation Procedure - Tank 1 Aft Boost Pump GFI Relay Open

WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

28-AWL-18: CDCCL

(1) Before you reset the GFI, you must isolate the fault that opened (tripped) the GFI and correct it.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: The GFI Relay, R18, is on the P92 Panel in the Electronic Equipment Compartment. You will need to open the panel to get access to the GFI Relay.

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 a Fuel Pump, you must be in the flight compartment to continuously monitor the fuel quantity and the LOW PRESSURE indication for the applicable tank.

(b) Immediately put the applicable FUEL PUMP Switch(es) to OFF if the LOW PRESSURE Light comes ON and stays ON.

(3) Make sure that you do the Initial Evaluation before you start the Fault Isolation Procedure.

(4) Make sure that there is minimum of 500 lb (227 kg) of fuel in the Tank 1.

NOTE: This step makes sure that the Boost Pump is correctly primed.

(5) Get access to the Tank 1 Aft Boost Pump (AMM TASK 28-22-41-000-801).

(6) Examine the Fuel Boost Pump and the area around it for fuel leakage.

(a) If there are signs of fuel leakage, find the source of the fuel leakage and repair it.

(7) Do these steps to do a check of the electrical connector and the Boost Pump:

(a) Disconnect the electrical connector D70 from the Tank 1 Aft Boost Pump (WDM 28-23-11).

(b) Examine the airplane and pump sides of the electrical connector D70 for damage.

1) Repair all damage that you find.

(c) Make sure that the electrical connector D70 is disconnected.

(d) Make sure that the RESET button on the Tank 1 Aft Boost Pump GFI Relay, R18, is pushed in.

(e) On the P5 Overhead Panel, put the AFT 1 FUEL PUMP Switch to ON.

(f) After five minutes, put the AFT 1 FUEL PUMP Switch to OFF.

(g) If the RESET button on the Tank 1 Aft Boost Pump GFI Relay, R18, is not out and you cannot see the white band, then do one of these steps:

NOTE: The circuit on the airplane side of the electrical connector is good.

1) For the Tank 1 Aft Boost Pump, M46, do this task: Fuel Boost Pump - Insulation Resistance Test, AMM TASK 28-22-00-760-802.

a) If the Insulation Resistance Test is not OK, then replace the Tank 1 Aft Fuel Boost Pump Impeller. These are the tasks:

- Motor Impeller Removal, AMM TASK 28-22-41-000-801
- Motor Impeller Installation, AMM TASK 28-22-41-400-801

<1> Do the Repair Confirmation at the end of this task.

2) If the problem continues, then replace the Tank 1 Aft Fuel Boost Pump, M46. These are the tasks:

- Motor Impeller Removal, AMM TASK 28-22-41-000-801
- Motor Impeller Installation, AMM TASK 28-22-41-400-801

a) Do the Repair Confirmation at the end of this task.

(h) If the RESET button on the GFI Relay is out, and you can see the white band, then continue.

NOTE: The circuit on the airplane side of the electrical connector is bad.

(i) Make sure to reconnect the connector D70.

G. Fault Isolation Procedure - Boost Pump Does Not Operate

(1) Make sure that you do the Initial Evaluation before you start the Fault Isolation Procedure.

WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

(2) Do these checks of the Tank 1 Aft Boost Pump Relay, R18, and the Tank 1 Aft Boost Pump Switch, S4 (WDM 28-23-11) (SSM 28-23-11):

(a) Make sure that the AFT 1 FUEL PUMP Switch is set to ON.

(b) Do a check for 115V AC between pins X1 and X2 of the Tank 1 Aft Boost Pump Relay R18 connector D12278.

NOTE: The Tank 1 Aft Boost Pump Relay, R18, is on the P92 Panel in the Electronic Equipment Compartment.

(c) If you do not find 115 VAC, then do these steps:

1) Replace the Tank 1 Aft Boost Pump Switch, S4.

NOTE: The Tank 1 Aft Boost Pump Switch, S4, is on the P5 Forward Overhead Panel, in the flight compartment.

2) Do the Repair Confirmation at the end of this task.

3) If the Repair Confirmation is not OK, then do these steps:

a) Do a check for an open circuit from pin 37 of the Fuel System Module connector D628 (P5-2 Panel) to pin X2 of Relay R18 connector D12278.

b) Repair the wiring.

c) Do the Repair Confirmation at the end of this task.

(d) If you find 115 VAC between pins X1 and X2 of the Relay connector D12278, then do these steps:

1) Replace the Tank 1 Aft Boost Pump Relay, R18.

2) Do the Repair Confirmation procedure at the end of this task.

(3) Do this check of the wiring (WDM 28-23-11):

(a) Make sure that the AFT 1 FUEL PUMP Switch is OFF.

(b) Disconnect the connector D70 from the Tank 1 Aft Boost Pump.

(c) Do a check for an open circuit in the wiring between the Tank 1 Aft Boost Pump, M46 and the Tank 1 Aft Boost Pump Relay, R18 as follows:

TNK 1 AFT BOOST PMP D70		**RELAY R18 D12278**
pin 1	. . . . .	pin A1
pin 2	. . . . .	pin B1
pin 3	. . . . .	pin C1

(d) If you find a problem with the wiring, then do these steps:

1) Repair the wiring.
2) Reconnect connector D70.
3) Do the Repair Confirmation at the end of this task.

H. Fault Isolation Procedure - Boost Pump Operates

(1) Make sure that you do the Initial Evaluation before you start the Fault Isolation Procedure.

(2) Do this check of the Tank 1 Aft Boost Pump Low Pressure Switch, S150:

NOTE: The Tank 1 Aft Boost Pump Low Pressure Switch, S150, is on the rear spar in the Left Main Landing Gear Wheel Well.

(a) Make sure that the AFT 1 FUEL PUMP Switch is ON.

(b) Disconnect the connector D868 from the Tank 1 Aft Boost Pump Low Pressure Switch, S150.

1) If the Tank 1 Aft Boost Pump LOW PRESSURE Light goes OFF, replace the Tank 1 Aft Boost Pump Low Pressure Switch, S150. These are the tasks:

- Fuel Boost Pump Pressure Switch Removal, AMM TASK 28-42-11-000-801
- Fuel Boost Pump Pressure Switch Installation, AMM TASK 28-42-11-420-801

a) Do the Repair Confirmation at the end of this task.

(3) Examine the wiring from the Low Pressure Switch to the LOW PRESSURE Light as follows (WDM 28-43-11):

(a) Make sure that the AFT 1 FUEL PUMP Switch is ON.

(b) Do a check for a short circuit between pins 2 (GND) and 3 of connector D868.

(c) If there is a short circuit between pins 2 and 3, then do these steps:

1) Repair the wiring.
2) Re-connect connector D868.
3) Do the Repair Confirmation at the end of this task.

(d) If there is not a short circuit between pins 2 and 3, then reconnect connector D868 and continue.

(4) Replace the P5-2 Module on the P5 Forward Overhead Panel.

(a) Do the Repair Confirmation at the end of this task.

I. Repair Confirmation

(1) Make sure that the RESET button on the Tank 1 Aft Boost Pump GFI Relay, R18, is not out and you cannot see the white band.

(2) On the P5-2 Panel, put the AFT 1 FUEL PUMP Switch to ON.

(a) If the LOW PRESSURE Light for the Tank 1 Aft Boost Pump goes OFF (after a maximum of 90 seconds), then you corrected the problem.

1) Put the AFT 1 FUEL PUMP Switch to OFF.

(b) If the LOW PRESSURE Light Indication for the Tank 1 Aft Boost Pump comes ON and stays ON, then continue the applicable Fault Isolation Procedure at the subsequent step.

END OF TASK

804. Tank 1 FWD Pump LOW PRESSURE Light is ON - Fault Isolation

A. Description

(1) On the P5 Panel, the Tank 1 FWD LOW PRESSURE Light is ON.

(a) This means that the Tank 1 Fwd Boost Pump does not pressurize the Fuel Feed Manifold.

(b) When the two LOW PRESSURE Lights for Tank 1 come ON, then the FUEL Light on the Master Caution System Annunciator also comes ON.

(2) The Tank 1 FWD LOW PRESSURE Light normally comes ON when the Tank 1 Fwd Boost Pump is OFF.

(3) This fault condition can also occur when the Tank 1 Forward Boost Pump loses its prime or is not primed correctly.

(a) If the Tank 1 is filled to 500 lb (227 kg), as described in the Initial Evaluation that follows, the Boost Pump will become primed.

(b) You can also use one of the alternative Boost Pump Priming Procedures given in Fuel Boost Pump and Override Pump Priming, AMM TASK 28-22-41-420-801.

(4) Refer to SDS SUBJECT 28-22-00 for a detailed description of the Fuel Feed System.

B. Possible Causes

(1) Tank 1 FWD Boost Pump Low Pressure Switch, S151

(2) Tank 1 FWD Boost Pump Relay, R19

(3) Tank 1 FWD Boost Pump, M47

(4) P5-2 Module Wiring or Logic

(5) Wiring

C. Circuit Breakers

(1) This is the primary circuit breaker related to the fault:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	1	C00827	FUEL BOOST PUMP TANK 1 FWD

D. Related Data

(1) WDM 28-23-11

(2) WDM 28-43-11

(3) SSM 28-23-11

(4) SSM 28-43-11

E. Initial Evaluation

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) Obey these precautions at all times during this task:

(a) To operate a Fuel Pump, you must be in the flight compartment to continuously monitor the fuel quantity and the LOW PRESSURE indication in the applicable tank.

(b) Immediately put the applicable FUEL PUMP Switch(es) to OFF if the LOW PRESSURE Light comes ON and stays ON.

WARNING DO NOT CLOSE A GFI RELAY FOR A FUEL PUMP THAT OPENED (TRIPPED) UNTIL YOU CORRECT THE PROBLEM. THIS CONDITION CAN CAUSE A FIRE OR EXPLOSION.

WARNING DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

(2) Do a visual inspection of the Tank 1 FWD Boost Pump GFI Relay, R19:

NOTE: The GFI Relay, R19, is on the P91 panel in the Electronic Equipment Compartment. You will need to open the panel to get access to the GFI Relay.

28-AWL-18: CDCCL

(a) If the RESET button is out, and you can see the white band, then do the “Fault Isolation Procedure - Tank 1 FWD Boost Pump GFI Relay Open” below.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: The RESET button, found at the top edge of the GFI Relay, moves out to show a narrow white band when the GFI circuit turns off the relay due to a ground fault, or when you push the TEST button found on the top surface of the relay.

(b) If the RESET button on the Tank 1 Fwd Boost Pump GFI Relay, R19, is not out and you cannot see the white band, then continue.

(3) Do a check of this circuit breaker:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	1	C00827	FUEL BOOST PUMP TANK 1 FWD

(a) If the FUEL BOOST PUMP TANK 1 FWD circuit breaker is open, do this task: No. 1 Tank, Forward Boost Pump Circuit Breaker Open - Fault Isolation, 28-22 TASK 813.

(b) If the FUEL BOOST PUMP TANK 1 FWD circuit breaker is closed, then continue.

(4) Make sure that the Tank 1 has a minimum of 500 lb (227 kg) of fuel.

NOTE: This step makes sure that the Boost Pump is primed correctly.

(a) If it is not possible to add 500 lb (227 kg) to the Tank 1, then, do this task: Fuel Boost Pump and Override Pump Priming, AMM TASK 28-22-41-420-801.

(5) On the P5 Forward Overhead Panel, put the FWD 1 FUEL PUMP Switch to ON.

(a) If the LOW PRESSURE Light for the Fwd Boost Pump comes ON and then goes OFF (after a maximum of 90 seconds), then do these steps:

1) Monitor the LOW PRESSURE Light for the Fwd Boost Pump while the throttle lever is moved forward and rearward.

2) If the LOW PRESSURE Light for the Fwd Boost Pump comes ON when the throttle lever is moved forward and goes OFF when the throttle lever is moved rearward, then do the "Fault Isolation Procedure - Boost Pump degraded" below.

3) If the LOW PRESSURE Light for the Fwd Boost Pump stays OFF while the throttle lever is moved forward and moved rearward, then there was an intermittent fault.

(b) If the LOW PRESSURE Light for the Fwd Boost Pump comes ON and stays ON (for a minimum of 90 seconds), then do these steps:

1) With the FWD 1 FUEL PUMP Switch ON, listen to the Tank 1 Fwd Boost Pump and touch it to make sure it operates.

2) If the Boost Pump operates, then do the “Fault Isolation Procedure - Boost Pump Operates” below.

3) If the Boost Pump does not operate, then do the “Fault Isolation Procedure - Boost Pump Does Not Operate” below.

F. Fault Isolation Procedure - Tank 1 FWD Boost Pump GFI Relay Open

WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

28-AWL-18: CDCCL

(1) Before you reset the GFI, you must isolate the fault that opened (tripped) the GFI and correct it.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: The GFI Relay, R19, is on the P91 panel in the Electronic Equipment Compartment. You will need to open the panel to get access to the GFI Relay.

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 a Fuel Pump, you must be in the flight compartment to continuously monitor the fuel quantity and the LOW PRESSURE indication for the applicable tank.

(b) Immediately put the applicable FUEL PUMP Switch(es) to OFF if the LOW PRESSURE Light comes ON and stays ON.

(3) Make sure that you do the Initial Evaluation before you start the Fault Isolation Procedure.

(4) Make sure that there is minimum of 500 lb (227 kg) of fuel in the Tank 1.

NOTE: This step makes sure that the Boost Pump is correctly primed.

(5) Get access to the Tank 1 Fwd Boost Pump (AMM TASK 28-22-41-000-801).

(6) Examine the Fuel Boost Pump and the area around it for fuel leakage.

(a) If there are signs of fuel leakage, find the source of the fuel leakage and repair it.

(7) Do these steps to do a check of the electrical connector and the Boost Pump:

(a) Disconnect the electrical connector D72 from the Fuel Boost Pump (WDM 28-23-11).

(b) Examine the airplane and pump sides of the electrical connector D72 for damage.

1) Repair all damage that you find.

(c) Make sure that the electrical connector D72, is disconnected.

(d) Make sure the RESET button on the Tank 1 Fwd Boost Pump GFI Relay, R19, is pushed in.

(e) On the P5 Overhead Panel, put the FWD 1 FUEL PUMP Switch to ON.

(f) After five minutes, put the FWD 1 FUEL PUMP Switch on the P5 Overhead Panel, to OFF.

(g) If the RESET button on the Tank 1 Fwd Boost Pump GFI Relay, R19, is not out and you cannot see the white band, then do one of these steps:

NOTE: The circuit on the airplane side of the electrical connector is good.

1) For the Tank 1 Fwd Boost Pump, M47, do this task: Fuel Boost Pump - Insulation Resistance Test, AMM TASK 28-22-00-760-802.

a) If the Insulation Resistance Test is not OK, then replace the Tank 1 Fwd Fuel Boost Pump Impeller. These are the tasks:

- Motor Impeller Removal, AMM TASK 28-22-41-000-801
- Motor Impeller Installation, AMM TASK 28-22-41-400-801

<1> Do the Repair Confirmation at the end of this task.

2) If the problem continues, then replace the Tank 1 Fwd Fuel Boost Pump, M47. These are the tasks:

- Motor Impeller Removal, AMM TASK 28-22-41-000-801
- Motor Impeller Installation, AMM TASK 28-22-41-400-801

a) Do the Repair Confirmation at the end of this task.

(h) If the RESET button on the GFI Relay is out, and you can see the white band, then continue.

NOTE: The circuit on the airplane side of the electrical connector is bad.

(i) Make sure to reconnect the connector D72.

G. Fault Isolation Procedure - Boost Pump Does Not Operate

(1) Make sure that you do the Initial Evaluation before you start the Fault Isolation Procedure.

WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

(2) Do these checks of the Tank 1 Fwd Boost Pump Relay, R19, and the Tank 1 Fwd Boost Pump Switch, S5 (WDM 28-23-11) (SSM 28-23-11):

(a) Make sure that the FWD 1 FUEL PUMP Switch is ON.

(b) Do a check for 115V AC between pins X1 and X2 of the Tank 1 Fwd Boost Pump Relay R19 connector D12280.

NOTE: The Tank 1 Fwd Boost Pump Relay, R19, is on the P91 Panel, in the Electronic Equipment Compartment.

(c) If you do not find 115 VAC, then do these steps:

1) Replace the Tank 1 Fwd Boost Pump Switch, S5.

NOTE: The Tank 1 Fwd Boost Pump Switch, S5, is on the P5 Forward Overhead Panel, in the flight compartment.

2) Do the Repair Confirmation procedure at the end of this task.

3) If the Repair Confirmation is not OK, then do these steps:

a) Do a check for an open circuit from pin 37 of the Fuel System Module connector D626 (P5-2 Panel) to pin X2 of Relay R19 connector D12280

b) Repair the wiring.

c) Do the Repair Confirmation at the end of this task.

(d) If you find 115 VAC between pins X1 and X2 of the Relay connector D12280, then do these steps:

1) Replace the Tank 1 Fwd Boost Pump Relay, R19.

2) Do the Repair Confirmation at the end of this task.

(3) Do this check of the wiring (WDM 28-23-11):

(a) Make sure that the FWD 1 FUEL PUMP Switch is OFF.

(b) Disconnect the connector D72 from the Tank 1 Fwd Boost Pump.

(c) Do a check for an open circuit in the wiring between the Tank 1 Fwd Boost Pump, M47 and the Tank 1 Fwd Boost Pump Relay, R19 as follows:

TNK 1 FWD BOOST PMP D72		**RELAY R19 D12280**
pin 1	. . . . .	pin A1
pin 2	. . . . .	pin B1
pin 3	. . . . .	pin C1

(d) If you find a problem with the wiring, then do these steps:

1) Repair the wiring.
2) Reconnect connector D72.
3) Do the Repair Confirmation at the end of this task.

H. Fault Isolation Procedure - Boost Pump Degraded

(1) Replace the Tank 1 Fwd Fuel Boost Pump, M47. These are the tasks:
- Motor Impeller Removal, AMM TASK 28-22-41-000-801
- Motor Impeller Installation, AMM TASK 28-22-41-400-801

(a) Do the Repair Confirmation at the end of this task.

I. Fault Isolation Procedure - Boost Pump Operates

(1) Make sure that you do the Initial Evaluation before you start the Fault Isolation Procedure.

(2) Do this check of the Tank 1 Fwd Boost Pump Low Pressure Switch, S151 (WDM 28-43-11):

NOTE: The Tank 1 Fwd Boost Pump Low Pressure Switch, S151, is on the front spar behind the Krueger flaps on the Left Wing.

(a) Make sure that the FWD 1 FUEL PUMP Switch is ON.

(b) Disconnect the connector D870 from the Tank 1 Fwd Boost Pump Low Pressure Switch, S151 (WDM 28-43-11).

1) If the Tank 1 Fwd Boost Pump LOW PRESSURE Light goes OFF, replace the Tank 1 Fwd Boost Pump Low Pressure Switch, S151. These are the tasks:
- Fuel Boost Pump Pressure Switch Removal, AMM TASK 28-42-11-000-801
- Fuel Boost Pump Pressure Switch Installation, AMM TASK 28-42-11-420-801

a) Do the Repair Confirmation at the end of this task.

(3) Examine the wiring from the Low Pressure Switch to the LOW PRESSURE Light as follows (WDM 28-43-11):

(a) Make sure that the FWD 1 FUEL PUMP Switch is ON.

(b) Disconnect connector D870 from the Tank 1 Fwd Boost Pump Low Pressure Switch, S151.

(c) Do a check for a short circuit between pins 2 (GND) and 3 of connector D870.

(d) If there is a short circuit between pins 2 and 3, then do these steps:

1) Repair the wiring.
2) Re-connect connector D870.
3) Do the Repair Confirmation at the end of this task.

(e) If there is not a short circuit between pins 2 and 3, then continue.

(4) Replace the P5-2 Module on the P5 Forward Overhead Panel.

(a) Do the Repair Confirmation at the end of this task.

J. Repair Confirmation

(1) Make sure that the RESET button on the Tank 1 FWD Boost Pump GFI Relay, R19, is not out and you cannot see the white band.

(2) On the P5-2 Panel, put the FWD 1 FUEL PUMP Switch to ON.

(a) If the LOW PRESSURE Light for the Tank 1 Fwd Boost Pump goes OFF (after a maximum of 90 seconds), then you corrected the problem.

1) Put the FWD 1 FUEL PUMP Switch to OFF.

(b) If the LOW PRESSURE Light Indication for the Tank 1 Fwd Boost Pump comes ON and stays ON, then continue the applicable Fault Isolation Procedure at the subsequent step.

——— END OF TASK ———

805. Tank 2 AFT Pump LOW PRESSURE Light is ON - Fault Isolation

A. Description

(1) On the P5 Panel, the Tank 2 AFT LOW PRESSURE Light is ON.

(a) This means that the Tank 2 Aft Boost Pump does not pressurize the Fuel Feed Manifold.

(b) When the two LOW PRESSURE Lights for Tank 2 come ON, then the FUEL Light on the Master Caution System Annunciator also comes ON.

(2) The Tank 2 AFT LOW PRESSURE Light normally comes ON when the Tank 2 Aft Boost Pump is OFF.

(3) This problem condition can also occur when the Tank 2 Aft Boost Pump loses its prime or is not primed correctly.

(a) If the Tank 2 is filled to 500 lb (227 kg), as described in the Initial Evaluation that follows, the Boost Pump will become primed.

(b) You can also use one of the alternative Boost Pump Priming Procedures given in Fuel Boost Pump and Override Pump Priming, AMM TASK 28-22-41-420-801.

(4) Refer to SDS SUBJECT 28-22-00 for a detailed description of the Fuel Feed System.

B. Possible Causes

(1) Tank 2 Aft Boost Pump Low Pressure Switch, S152

(2) Tank 2 Aft Boost Pump Relay, R20

(3) Tank 2 Aft Boost Pump, M48

(4) P5-2 Module Wiring or Logic

(5) Wiring

C. Circuit Breakers

(1) This is the primary circuit breaker related to the fault:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	3	C00828	FUEL BOOST PUMP TANK 2 AFT

D. Related Data

(1) WDM 28-23-11

(2) WDM 28-43-11

(3) SSM 28-23-11

(4) SSM 28-43-11

E. Initial Evaluation

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) Obey these precautions at all times during this task:

(a) To operate a Fuel Pump, you must be in the flight compartment to continuously monitor the fuel quantity and the LOW PRESSURE indication of the applicable tank.

(b) Immediately put the applicable FUEL PUMP Switch(es) to OFF if the LOW PRESSURE Light comes ON and stays ON.

WARNING DO NOT CLOSE A GFI RELAY FOR A FUEL PUMP THAT OPENED (TRIPPED) UNTIL YOU CORRECT THE PROBLEM. THIS CONDITION CAN CAUSE A FIRE OR EXPLOSION.

WARNING DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

28-AWL-18: CDCCL

(2) Do a visual inspection of the Tank 2 Aft Boost Pump GFI Relay, R20:

NOTE: The GFI Relay, R20, is on the P91 Panel in the Electronic Equipment Compartment. You will need to open the Panel to get access to the GFI Relay.

(a) If the RESET button is out, and you can see the white band, then do the “Fault Isolation Procedure - Tank 2 Aft Boost Pump GFI Relay Open” below.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: The RESET button, found at the top edge of the GFI Relay, moves out to show a narrow white band when the GFI circuit turns OFF the Relay due to a ground fault, or when you push the TEST button found on the top surface of the Relay.

(b) If the RESET button on the Tank 2 Aft Boost Pump GFI Relay, R20, is not out and you cannot see the white band, then continue.

(3) Do a check of this circuit breaker:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	3	C00828	FUEL BOOST PUMP TANK 2 AFT

(a) If the FUEL BOOST PUMP TANK 2 AFT circuit breaker is open, do this task: No. 2 Tank, Aft Boost Pump Circuit Breaker Open - Fault Isolation, 28-22 TASK 816.

(b) If the FUEL BOOST PUMP TANK 2 AFT circuit breaker is closed, then continue.

(4) Make sure that the Tank 2 has a minimum of 500 lb (227 kg) of fuel.

NOTE: This step makes sure that the Boost Pump is primed correctly.

(a) If it is not possible to add 500 lb (227 kg) to the Tank 2, then, do this task: Fuel Boost Pump and Override Pump Priming, AMM TASK 28-22-41-420-801.

(5) On the P5 Forward Overhead Panel, put the AFT 2 FUEL PUMP Switch to ON.

(a) If the LOW PRESSURE Light for the Tank 2 Aft Boost Pump comes ON and then goes OFF (after a maximum of 90 seconds), then there was an intermittent fault.

(b) If the LOW PRESSURE Light for the Tank 2 Aft Boost Pump comes ON and stays ON (for a minimum of 90 seconds), then do these steps:

1) With the AFT 2 FUEL PUMP Switch ON, listen to the Tank 2 Aft Boost Pump and touch it to make sure it operates.

2) If the Boost Pump operates, then do the “Fault Isolation Procedure - Boost Pump Operates” below.

3) If the Boost Pump does not operate, then do the “Fault Isolation Procedure - Boost Pump Does Not Operate” below.

F. Fault Isolation Procedure - Tank 2 Aft Boost Pump GFI Relay Open

WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

28-AWL-18: CDCCL

(1) Before you reset the GFI, you must isolate the fault that opened (tripped) the GFI and correct it.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: The GFI Relay, R20, is on the P91 Panel in the Electronic Equipment Compartment. You will need to open the Panel to get access to the GFI Relay.

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 a Fuel Pump, you must be in the flight compartment to continuously monitor the Fuel Quantity and the Low Pressure Indication of the applicable Tank.

(b) Immediately put the applicable FUEL PUMP Switch(es) to OFF if the LOW PRESSURE Light comes ON and stays ON.

(3) Make sure that you do the Initial Evaluation before you start the Fault Isolation Procedure.

(4) Make sure that there is minimum of 500 lb (227 kg) of fuel in the Tank 2.

NOTE: This step makes sure that the Boost Pump is correctly primed.

(5) Get access to the Tank 2 Aft Boost Pump (AMM TASK 28-22-41-000-801).

(6) Examine the fuel Boost Pump and the area around it for fuel leakage.

(a) If there are signs of fuel leakage, find the source of the fuel leakage and repair it.

(7) Do these steps to do a check of the Electrical Connector and the Fuel Boost Pump:

(a) Disconnect the Electrical Connector D74 from the Fuel Boost Pump (WDM 28-23-11).

(b) Examine the airplane and pump sides of the Electrical Connector D74 for damage.

1) Repair the damage that you find.

(c) Make sure that the Electrical Connector D74 is disconnected.

(d) Make sure that the RESET button on the Tank 2 Aft Boost Pump GFI Relay, R20, is pushed IN.

(e) On the P5 Overhead Panel, put the AFT 2 FUEL PUMP Switch to ON.

(f) After five minutes, put the AFT 2 FUEL PUMP Switch on the P5 Overhead Panel to OFF.

(g) If the RESET button on the Tank 2 Aft Boost Pump GFI Relay, R20, is not out and you cannot see the white band, then do one of these steps:

NOTE: The circuit on the airplane side of the Electrical Connector is good.

1) For the Tank 2 Aft Boost Pump, M48, do this task: Fuel Boost Pump - Insulation Resistance Test, AMM TASK 28-22-00-760-802.

a) If the Insulation Resistance Test is not OK, then replace the Tank 2 Aft Fuel Boost Pump Impeller. These are the tasks:

- Motor Impeller Removal, AMM TASK 28-22-41-000-801
- Motor Impeller Installation, AMM TASK 28-22-41-400-801

<1> Do the Repair Confirmation at the end of this task.

2) If the problem continues, then replace the Tank 2 Aft Fuel Boost Pump, M48. These are the tasks:

- Motor Impeller Removal, AMM TASK 28-22-41-000-801
- Motor Impeller Installation, AMM TASK 28-22-41-400-801

a) Do the Repair Confirmation at the end of this task.

(h) If the RESET button on the GFI Relay, R20, is out, and you can see the white band, then continue.

NOTE: The circuit on the airplane side of the Electrical Connector is bad.

(i) Make sure to reconnect the Electrical connector D74.

G. Fault Isolation Procedure - Boost Pump Does Not Operate

(1) Make sure that you do the Initial Evaluation before you start the Fault Isolation Procedure.

WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

(2) Do these checks of the Tank 2 Aft Boost Pump Relay, R20, and the Tank 2 Aft Boost Pump Switch, S7 (WDM 28-23-11) (SSM 28-23-11):

(a) Do a check for 115V AC between pins X1 and X2 of the Tank 2 Aft Boost Pump Relay R20 connector D12282.

NOTE: The No. 2 Tank Aft Boost Pump Relay, R20, is on the P91 Panel in the Electronic Equipment Compartment.

(b) If you do not find 115 VAC, then do these steps:

1) Replace the Tank 2 Aft Boost Pump Switch, S7.

NOTE: The Tank 2 Aft Boost Pump Switch, S7, is on the P5-2 Module, in the flight compartment.

2) Do the Repair Confirmation at the end of this task.

3) If the Repair Confirmation is not OK, then do these steps:

a) Do a check for an open circuit from pin 39, of the Fuel System Module connector D626 (P5-2 Panel) to pin X2 of Relay R20 connector D12282.

b) Repair the wiring.

c) Do the Repair Confirmation at the end of this task.

(c) If you find 115 VAC between pins X1 and X2 of the Relay connector D12282, then do these steps:

1) Replace the Tank 2 Aft Boost Pump Relay, R20.

2) Do the Repair Confirmation at the end of this task.

(3) Do this check of the Wiring (WDM 28-23-11):

(a) Make sure the AFT 2 FUEL PUMP Switch is OFF.

(b) Disconnect the connector D74 from the Tank 2 Aft Boost Pump.

(c) Do a check for an open circuit in the wiring between the Tank 2 Aft Boost Pump, M48 and the Tank 2 Aft Boost Pump Relay, R20 as follows:

TNK 2 AFT BOOST PMP D74		**Relay R20 D12282**
pin 1	. . . . .	pin A1
pin 2	. . . . .	pin B1
pin 3	. . . . .	pin C1

(d) If you find a problem with the Wiring, then do these steps:

1) Repair the Wiring.

2) Reconnect Electrical connector D74.

3) Do the Repair Confirmation at the end of this task.

H. Fault Isolation Procedure - Boost Pump Operates

(1) Make sure that you do the Initial Evaluation before you start the Fault Isolation Procedure.

(2) Do this check of the Tank 2 Aft Boost Pump Low Pressure Switch, S152 (WDM 28-43-11):

NOTE: The Low Pressure Switch, S152, is on the rear spar in the right main landing gear wheel well.

(a) Make sure that the AFT 2 FUEL PUMP Switch is ON.

(b) Disconnect the Electrical Connector D872 from the Tank 2 Aft Boost Pump Low Pressure Switch, S152.

1) If the Tank 2 Aft Boost Pump LOW PRESSURE Light goes OFF, replace the Tank 2 Aft Boost Pump Low Pressure Switch, S152. These are the tasks:

- Fuel Boost Pump Pressure Switch Removal, AMM TASK 28-42-11-000-801
- Fuel Boost Pump Pressure Switch Installation, AMM TASK 28-42-11-420-801

a) Do the Repair Confirmation at the end of this task.

(3) Examine the wiring from the Low Pressure Switch to the LOW PRESSURE Light as follows (WDM 28-43-11):

(a) Make sure that the AFT 2 FUEL PUMP Switch is ON.

(b) Do a check for a short circuit between pins 2 (GND) and 3 of connector D872.

(c) If there is a short circuit between pins 2 and 3, then do these steps:

1) Repair the wiring.

2) Re-connect Electrical Connector D872.

3) Do the Repair Confirmation at the end of this task.

(d) If there is not a short circuit between pins 2 and 3, then continue.

(4) Replace the P5-2 Module on the P5 Forward Overhead Panel.

(a) Do the Repair Confirmation at the end of this task.

I. Repair Confirmation

(1) Make sure that the RESET button on the Tank 2 Aft Boost Pump GFI Relay, R20, is not out and you cannot see the white band.

(2) On the P5 Forward Overhead Panel, put the AFT 2 FUEL PUMP Switch to ON.

(a) If the LOW PRESSURE Light for the Tank 2 Aft Boost Pump goes OFF (after a maximum of 90 seconds), then you corrected the problem.

1) Put the AFT 2 FUEL PUMP Switch to OFF.

(b) If the LOW PRESSURE Light Indication for the Tank 2 Aft Boost Pump comes ON and stays ON, then continue the applicable Fault Isolation Procedure at the subsequent step.

END OF TASK

806. Tank 2 FWD Pump LOW PRESSURE Light is ON - Fault Isolation

A. Description

(1) On the P5 Panel, the Tank 2 FWD LOW PRESSURE Light is ON.

(a) This means that the Tank 2 Fwd Boost Pump does not pressurize the Fuel Feed Manifold.

(b) When the two LOW PRESSURE Lights for Tank 2 come ON, then the FUEL Light on the Master Caution System Annunciator also comes ON.

(2) The Tank 2 FWD LOW PRESSURE Light normally comes ON when the Tank 2 Fwd Boost Pump is OFF.

(3) This problem condition can also occur when the Tank 2 Forward Boost Pump loses its prime or is not primed correctly.

(a) If the Tank 2 is filled to 500 lb (227 kg), as described in the Initial Evaluation that follows, the Boost Pump will become primed.

(b) You can also use one of the alternative Boost Pump Priming Procedures given in Fuel Boost Pump and Override Pump Priming, AMM TASK 28-22-41-420-801.

(4) Refer to SDS SUBJECT 28-22-00 for a detailed description of the Fuel Feed System.

B. Possible Causes

(1) Tank 2 FWD Boost Pump Low Pressure Switch, S153

(2) Tank 2 FWD Boost Pump Relay, R21

(3) Tank 2 FWD Boost Pump, M49

(4) P5-2 Module Wiring or Logic

(5) Wiring

C. Circuit Breakers

(1) This is the primary circuit breaker related to the fault:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	3	C00829	FUEL BOOST PUMP TANK 2 FWD

D. Related Data

(1) WDM 28-23-11

(2) WDM 28-43-11

(3) SSM 28-23-11

(4) SSM 28-43-11

E. Initial Evaluation

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) Obey these precautions at all times during this task:

(a) To operate a Fuel Pump, you must be in the flight compartment to continuously monitor the fuel quantity and the LOW PRESSURE indication of the applicable tank.

(b) Immediately put the applicable FUEL PUMP Switch(es) to OFF if the LOW PRESSURE Light comes ON and stays ON.

WARNING DO NOT CLOSE A GFI RELAY FOR A FUEL PUMP THAT OPENED (TRIPPED) UNTIL YOU CORRECT THE PROBLEM. THIS CONDITION CAN CAUSE A FIRE OR EXPLOSION.

WARNING DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

(2) Do a visual inspection of the BOOST PUMP TANK 2 FWD GFI Relay, R21:

NOTE: The GFI Relay, R21, is on the P92 panel in the Electronic Equipment Compartment. You will need to open the panel to get access to the GFI Relay.

28-AWL-18: CDCCL

(a) If the RESET button is out, and you can see the white band, then do the “Fault Isolation Procedure - Tank 2 FWD Boost Pump GFI Relay” below.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: The RESET button, found at the top edge of the GFI Relay, moves out to show a narrow white band when the GFI circuit turns off the relay due to a ground fault, or when you push the TEST button found on the top surface of the relay.

(b) If the RESET button on the BOOST PUMP TANK 2 FWD GFI Relay, R21, is not out and you cannot see the white band, then continue.

(3) Do a check of this circuit breaker:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	3	C00829	FUEL BOOST PUMP TANK 2 FWD

(a) If the FUEL BOOST PUMP TANK 2 FWD circuit breaker is open, do this task: No. 2 Tank, Forward Boost Pump Circuit Breaker Open - Fault Isolation, 28-22 TASK 815.

(b) If the FUEL BOOST PUMP TANK 2 FWD circuit breaker is closed, then continue.

(4) Make sure that the Tank 2 has a minimum of 500 lb (227 kg) of fuel.

NOTE: This step makes sure that the Boost Pump is primed correctly.

(a) If it is not possible to add 500 lb (227 kg) to the Tank 2, then, do this task: Fuel Boost Pump and Override Pump Priming, AMM TASK 28-22-41-420-801.

(5) On the P5 Forward Overhead Pane, put the FWD 2 FUEL PUMP Switch to ON.

(a) If the LOW PRESSURE Light for the Fwd Boost Pump comes ON and then goes OFF (after a maximum of 90 seconds), then there was an intermittent fault.

(b) If the (for a minimum of 90 seconds), then do these steps:

1) With the FWD 2 FUEL PUMP Switch ON, listen to the Tank 2 Fwd Boost Pump and touch it to make sure it operates.

2) If the Boost Pump operates, then do the “Fault Isolation Procedure - Boost Pump Operates” below.

3) If the Boost Pump does not operate, then do the “Fault Isolation Procedure - Boost Pump Does Not Operate” below.

F. Fault Isolation Procedure - Tank 2 FWD Boost Pump GFI Relay

WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

28-AWL-18: CDCCL

(1) Before you reset the GFI, you must isolate the fault that opened (tripped) the GFI and correct it.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: The GFI Relay, R21, is on the P92 panel in the Electronic Equipment Compartment. You will need to open the panel to get access to the GFI Relay.

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 a Fuel Pump, you must be in the flight compartment to continuously monitor the fuel quantity and the low pressure indication of the applicable tank.

(b) Immediately put the applicable FUEL PUMP Switch(es) to OFF if the LOW PRESSURE Light comes ON and stays ON.

(3) Make sure that you do the Initial Evaluation before you start the Fault Isolation Procedure.

(4) Make sure that there is minimum of 500 lb (227 kg) of fuel in the Tank 2.

NOTE: This step makes sure that the Boost Pump is correctly primed.

(5) Get access to the Tank 2 Fwd Boost Pump (AMM TASK 28-22-41-000-801).

(6) Examine the Fuel Boost Pump and the area around it for fuel leakage.

(a) If there are signs of fuel leakage, find the source of the fuel leakage and repair it.

(7) Do these steps to do a check of the electrical connector and the Fuel Boost Pump:

(a) Disconnect the electrical connector D76 from the Fuel Boost Pump (WDM 28-23-11).

(b) Examine the airplane and pump sides of the electrical connector D76 for damage.

1) Repair all damage that you find.

(c) Make sure that the electrical connector D76 is disconnected.

(d) Make sure the RESET button on the Tank 2 Fwd Boost Pump GFI Relay, R21, is pushed in.

(e) On the P5 Overhead Panel, put the FWD 2 FUEL PUMP Switch to ON.

(f) After five minutes, put the FWD 2 FUEL PUMP Switch on the P5 Overhead Panel, to OFF.

(g) If the RESET button on the Tank 2 Fwd Boost Pump GFI Relay, R21, is not out and you cannot see the white band, then do one of these steps:

NOTE: The circuit on the airplane side of the electrical connector is good.

1) For the Tank 2 Fwd Boost Pump, M49, do this task: Fuel Boost Pump - Insulation Resistance Test, AMM TASK 28-22-00-760-802.

a) If the Insulation Resistance Test is not OK, then replace the Tank 2 Fwd Fuel Boost Pump Impeller. These are the tasks:

- Motor Impeller Removal, AMM TASK 28-22-41-000-801
- Motor Impeller Installation, AMM TASK 28-22-41-400-801

<1> Do the Repair Confirmation at the end of this task.

2) If the problem continues, then replace the Tank 2 Fwd Fuel Boost Pump, M49. These are the tasks:

- Motor Impeller Removal, AMM TASK 28-22-41-000-801
- Motor Impeller Installation, AMM TASK 28-22-41-400-801

a) Do the Repair Confirmation at the end of this task.

(h) If the RESET button on the GFI Relay R21 is out, and you can see the white band, then continue.

NOTE: The circuit on the airplane side of the electrical connector is bad.

(i) Make sure to reconnect the connector D76.

G. Fault Isolation Procedure - Boost Pump Does Not Operate

WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

(1) Do these checks of the Tank 2 Fwd Boost Pump Relay, R21, and the Tank 2 Fwd Boost Pump Switch, S6 (WDM 28-23-11) (SSM 28-23-11):

(a) Make sure that the FWD 2 FUEL PUMP Switch is ON.

(b) Do a check for 115V AC between pins X1 and X2 of the Tank 2 Fwd Boost Pump Relay R21 connector D12284.

NOTE: The Tank 2 Fwd Boost Pump Relay, R21, is on the P92 Panel, in the Electronic Equipment Compartment.

(c) If you do not find 115V AC, then do these steps:

1) Replace the Tank 2 Fwd Boost Pump Switch, S6.

NOTE: The Tank 2 Fwd Boost Pump Switch, S6, is on the P5 Forward Overhead Panel, in the flight compartment.

2) Do the Repair Confirmation at the end of this task.

3) If the Repair Confirmation is not OK, then do these steps:

a) Do a check for an open circuit from pin 39, of the Fuel System Module connector D626 (P5-2 Panel) to pin X2 of Relay R21 connector D12284.

b) Repair the wiring.

c) Do the Repair Confirmation at the end of this task.

(d) If you find 115V AC between pins X1 and X2 of the Relay connector D12284, then do these steps:

1) Replace the Tank 2 Fwd Boost Pump Relay, R21.

2) Do the Repair Confirmation at the end of this task.

(2) Do this check of the wiring (WDM 28-23-11):

(a) Make sure that the FWD 2 FUEL PUMP Switch is OFF.

(b) Disconnect the connector D76 from the Tank 2 Fwd Boost Pump.

(c) Do a check for an open circuit in the wiring between the Tank 2 Fwd Boost Pump, M49 and the Tank 2 Fwd Boost Pump Relay, R21 as follows:

TNK 2 FWD BOOST PMP D76		**Relay R21 D12284**
pin 1	. . . . .	pin A1
pin 2	. . . . .	pin B1
pin 3	. . . . .	pin C1

(d) If you find a problem with the wiring, then do these steps:

1) Repair the wiring.

2) Reconnect connector D76.

3) Do the Repair Confirmation at the end of this task.

H. Fault Isolation Procedure - Boost Pump Operates

(1) Make sure that you do the Initial Evaluation before you start the Fault Isolation Procedure.

(2) Do this check of the Tank 2 Fwd Boost Pump Low Pressure Switch, S153:

NOTE: The Tank 2 Fwd Boost Pump Low Pressure Switch, S153, is on the front spar behind the Krueger flaps on the Right Wing.

(a) Make sure that the FWD 2 FUEL PUMP Switch is ON.

(b) Disconnect the connector D874 from the Tank 2 Fwd Boost Pump Low Pressure Switch, S153.

1) If the Tank 2 Fwd Boost Pump LOW PRESSURE Light goes OFF, replace the Tank 2 Fwd Boost Pump Low Pressure Switch, S153. These are the tasks:

- Fuel Boost Pump Pressure Switch Removal, AMM TASK 28-42-11-000-801
- Fuel Boost Pump Pressure Switch Installation, AMM TASK 28-42-11-420-801

a) Do the Repair Confirmation at the end of this task.

(3) Examine the wiring from the Low Pressure Switch to the LOW PRESSURE Light as follows (WDM 28-43-11):

(a) Make sure that the FWD 2 FUEL PUMP Switch is ON.

(b) Do a check for a short circuit between pins 2 (GND) and 3 of connector D874.

(c) If there is a short circuit between pins 2 and 3, then do these steps:

1) Repair the wiring.

2) Re-connect connector D874.

3) Do the Repair Confirmation at the end of this task.

(d) If there is not a short circuit between pins 2 and 3, then continue.

(4) Replace the P5-2 Module on the P5 Forward Overhead Panel.

(a) Do the Repair Confirmation at the end of this task.

I. Repair Confirmation

(1) Make sure that the RESET button on the Tank 2 FWD Boost Pump GFI Relay, R21, is not out and you cannot see the white band.

(2) On the P5-2 Panel, put the FWD 2 FUEL PUMP Switch to ON.

(a) If the LOW PRESSURE Light for the Tank 2 Fwd Boost Pump goes OFF (after a maximum of 90 seconds), then you corrected the problem.

1) Put the FWD 2 FUEL PUMP Switch to OFF.

(b) If the LOW PRESSURE Light Indication for the Tank 2 Fwd Boost Pump comes ON and stays ON, then continue the applicable Fault Isolation Procedure at the subsequent step.

——— END OF TASK ———

807. VALVE OPEN Light for the Crossfeed Valve Stays on Bright - Fault Isolation

A. Description

(1) The VALVE OPEN light for the crossfeed valve stays on bright when you turn the CROSSFEED switch to the valve-open or the valve-closed position. When the valve operates correctly, the VALVE OPEN light comes on bright while the crossfeed valve changes position. The light stays on dim when the valve is open. The light is off when the valve is closed.

(2) The switches in the actuator send data about the valve position to the P5-2 module. The valve position is shown on the actuator by the position of the manual override lever.

(3) (SDS SUBJECT 28-22-00)

B. Possible Causes

(1) Crossfeed valve actuator, V39

(2) Crossfeed valve body

(3) Crossfeed valve switch, S3

(4) Wiring from the P5-2 module to the crossfeed valve actuator

(5) Crossfeed valve indication (VALVE OPEN) light, L3

(6) The wiring or logic in the P5-2 module

C. Circuit Breakers

(1) This is the primary circuit breaker related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	7	C00361	FUEL CROSS FEED VALVE

D. Related Data

(1) (SSM 28-22-11)

(2) (WDM 28-22-11)

E. Initial Evaluation

(1) Turn the CROSSFEED switch on the P5 panel to the valve-open position.

(a) Do a check to see if the VALVE OPEN light comes on bright while the valve changes position and then stays on dim when the valve is fully open.

(b) If the VALVE OPEN light stays on bright and does not become dim, then do the Fault Isolation Procedure below.

(c) If the VALVE OPEN light comes on bright and then stays on dim, then continue.

(2) Turn the CROSSFEED switch on the P5 panel to the valve-closed position.

(a) Do a check to see if the VALVE OPEN light comes on bright while the valve changes position and then goes off when the valve is fully closed.

(b) If the VALVE OPEN light stays on bright and does not go off, then do the Fault Isolation Procedure below.

(c) If the VALVE OPEN light comes on bright and then goes off, then there was an intermittent fault.

F. Fault Isolation Procedure

(1) Do this check of the crossfeed valve actuator, V39 and the crossfeed valve body while the valve opens:

(a) Do a check to see if the manual override handle on the crossfeed valve actuator changes from the closed to the open position when you turn the CROSSFEED switch in the flight compartment to the valve-open position.

(b) If the manual override handle stays in the closed position, then do these steps:

1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	7	C00361	FUEL CROSS FEED VALVE

2) Disconnect the electrical connector, D792, from the actuator.

3) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	7	C00361	FUEL CROSS FEED VALVE

4) With the CROSSFEED switch in the valve-open position:

a) Do a check for 27 +/– 9 VDC between pin 2 and pin 4 (ground) of connector, D792.

b) If there is not 27 +/- 9 VDC between pins 2 and 4 with the switch in the valve-open position, then inspect the wiring and the fuel crossfeed valve switch, S3.

c) If there is 27 +/- 9 VDC between pins 2 and 4, then continue.

d) Do a check for 0 +/- 5 VDC between pin 5 and pin 4 (ground) of connector, D792.

e) If there is not 0 +/- 5 VDC between pins 5 and 4 with the switch in the valve-open position, then inspect the wiring and the fuel crossfeed valve switch, S3.

f) If there is 0 +/- 5 VDC between pins 5 and 4, then do these steps:

<1> Replace the crossfeed valve actuator, V39.

These are the tasks:

Actuator of the Engine Fuel Crossfeed Valve Removal, AMM TASK 28-22-21-000-804

Actuator of the Engine Fuel Crossfeed Valve Installation, AMM TASK 28-22-21-400-804

g) Do the Repair Confirmation at the end of this task.

(c) If the VALVE OPEN light comes on bright and does not dim, and the manual override handle moves to the open position, then do these steps:

1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	7	C00361	FUEL CROSS FEED VALVE

2) Disconnect the electrical connector, D792, from the actuator.

3) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	7	C00361	FUEL CROSS FEED VALVE

4) With the CROSSFEED switch in the valve-open position:

a) Do a check for 27 +/– 9 VDC between pin 2 and pin 4 (ground) of connector, D792.

b) If there is not 27 +/- 9 VDC between pins 2 and 4 with the switch in the valve-open position, then inspect the wiring for an open circuit.

c) If there is 27 +/- 9 VDC between pins 2 and 4, then continue.

d) Install a jumper between pin 2 and pin 3 of connector, D792.

e) Make sure the VALVE OPEN light goes dim.

f) If the VALVE OPEN light stays on and bright and does not become dim, then inspect the wiring for an open circuit.

g) Remove the jumper between pin 2 and pin 3 of connector, D792.

h) Make sure the VALVE OPEN light comes on bright.

i) If the VALVE OPEN light does not come on bright, then do these steps:

<1> Replace the crossfeed valve actuator, V39.

These are the tasks:

Actuator of the Engine Fuel Crossfeed Valve Removal, AMM TASK 28-22-21-000-804

Actuator of the Engine Fuel Crossfeed Valve Installation, AMM TASK 28-22-21-400-804

j) Do the Repair Confirmation at the end of this task.

k) If the VALVE OPEN light comes on bright, then continue.

(d) If the manual override handle moved completely to the open position when you set the CROSSFEED switch in the flight compartment to the valve-open position and the VALVE OPEN light came on bright in transit and then became dim, then continue.

(2) Do this check of the crossfeed valve actuator, V39 and the valve body while the valve closes.

(a) Do a check to see if the manual override handle on the crossfeed valve actuator changes from the open to the closed position when you set the CROSSFEED switch in the flight compartment to the valve-close position.

(b) Carefully try to move the manual override handle to the closed position with your hand to make sure it is fully closed.

(c) If the manual override handle did not move completely to the closed position when you set the CROSSFEED switch to the valve-closed postion, then do these steps:

1) Remove the actuator from the valve body. To remove the actuator, do this task: Actuator of the Engine Fuel Crossfeed Valve Removal, AMM TASK 28-22-21-000-804.

a) Do not disconnect connector D792 from the actuator.

2) With the actuator disconnected from the mounting plate, set the CROSSFEED switch to the valve-open position and then to the valve-closed position.

3) If the manual override handle moves completely to the closed position, then do these steps:

a) Replace the valve body.

These are the tasks:

Engine Fuel Crossfeed Valve Body Removal, AMM TASK 28-22-21-000-803,

Install the Engine Fuel Crossfeed Valve Body, AMM TASK 28-22-21-400-803.

b) Do the Repair Confirmation at the end of this task.

4) If the manual override handle does not move completely to the closed position, then do these steps:

a) Replace the valve actuator.

These are the tasks:

Actuator of the Engine Fuel Crossfeed Valve Removal, AMM TASK 28-22-21-000-804,

Actuator of the Engine Fuel Crossfeed Valve Installation, AMM TASK 28-22-21-400-804.

b) Do the Repair Confirmation at the end of this task.

G. Repair Confirmation

(1) Turn the CROSSFEED switch on the P5 panel to the valve-open position.

(a) Make sure the VALVE OPEN light comes on bright while the valve changes position and then stays on dim when the valve is fully open.

(2) Turn the CROSSFEED switch on the P5 panel to the valve-closed position.

(a) Make sure the VALVE OPEN light comes on bright while the valve changes position and then goes off when the valve is fully closed.

(3) If VALVE OPEN light had these conditions, then you corrected the fault:

(a) The VALVE OPEN light came on bright while the valve went from closed to open.

(b) The VALVE OPEN light stayed on dim while the valve was open.

(c) The VALVE OPEN light came on bright while the valve went from open to closed.

(d) The VALVE OPEN light went off again when the valve was closed.

——— END OF TASK ———

808. VALVE OPEN Light for the Crossfeed Valve Does Not Come On During Valve Transit - Fault Isolation

A. Description

(1) You set the CROSSFEED switch on the P5 panel to the OPEN position and the VALVE OPEN light does not come on to show that the valve is changing its position. Or you set the CROSSFEED switch to on the P5 panel to the CLOSED position and the VALVE OPEN light does not come on to show that the valve is changing its position. When the valve operates correctly, the VALVE OPEN light comes on bright while the crossfeed valve changes position. The light stays on dim when the valve is open. The light is off when the valve is closed.

(2) (SDS SUBJECT 28-22-00)

B. Possible Causes

(1) Crossfeed valve switch, S3

(2) Crossfeed valve indication light, L3

(3) Crossfeed valve actuator, V39

(4) The wiring or logic in the P5-2 panel

C. Circuit Breakers

(1) This is the primary circuit breaker related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	7	C00361	FUEL CROSS FEED VALVE

D. Related Data

(1) (SSM 28-22-11)

(2) (WDM 28-22-11)

E. Initial Evaluation

(1) Push and hold the VALVE OPEN light for the crossfeed valve on the P5-2 module to make sure the VALVE OPEN light operates correctly.

(a) Make sure the VALVE OPEN light comes on bright.

(b) If the VALVE OPEN light does not come on bright, then replace the VALVE OPEN light.

(2) Turn the CROSSFEED switch on the P5 panel to the valve-open position.

(a) Do a check to see if the VALVE OPEN light comes on bright while the valve changes position and then stays on dim when the valve is fully open.

(b) If the VALVE OPEN light does not come on, then do the Fault Isolation Procedure below.

(c) If the VALVE OPEN light comes on bright and then stays on dim, then continue.

(d) If the VALVE OPEN light comes on dim while the valve is in transit and stays dim when the valve is open, then continue.

(3) Turn the CROSSFEED switch on the P5 panel to the valve-closed position.

(a) Do a check to see if the VALVE OPEN light comes on bright while the valve changes position and then goes off when the valve is fully closed.

(b) If the VALVE OPEN light does not come on in transit, but remains dim, then do these steps:

1) Replace the valve actuator.

These are the tasks:

Actuator of the Engine Fuel Crossfeed Valve Removal, AMM
TASK 28-22-21-000-804

Actuator of the Engine Fuel Crossfeed Valve Installation, AMM
TASK 28-22-21-400-804

2) Do the Repair Confirmation at the end of this task.

(c) If the VALVE OPEN light does not come on, then do the Fault Isolation Procedure below.

(d) If the VALVE OPEN light comes on bright and then goes off, then there was an intermittent fault.

F. Fault Isolation Procedure

(1) Turn the CROSSFEED switch on the P5 panel to the valve-open position.

(a) Do a check to see if the manual override handle on the crossfeed valve actuator moves to the open position.

1) If the manual override handle moves to the open position, then replace the P5-2 module.

2) If the manual override handle does not move to the open position, then replace the CROSSFEED switch, S3 on the P5-2 module.

3) Do the Repair Confirmation at the end of this task.

G. Repair Confirmation

(1) Set the CROSSFEED switch on the P5 panel to the valve-open position.

(a) The VALVE OPEN light must come on bright while the valve changes position and then stay on dim when the valve is fully open.

(2) Turn the CROSSFEED switch on the P5 panel to the valve-closed position.

(a) The VALVE OPEN light must come on bright while the valve changes position and then go off when the valve is fully closed.

(3) If VALVE OPEN light showed these conditions, then you corrected the fault:

(a) The VALVE OPEN light came on bright while the valve went from closed to open.

(b) The VALVE OPEN light stayed on dim while the valve was open.

(c) The VALVE OPEN light came on bright while the valve went from open to closed.

(d) The VALVE OPEN light went off again when the valve was closed.

——— END OF TASK ———

809. Engine No. 1 SPAR VALVE CLOSED Light Stays ON Bright - Fault Isolation

A. Description

(1) This task is for this observed condition (SDS SUBJECT 28-22-00):

(a) The ENG 1 SPAR VALVE CLOSED Light stays ON bright when the ENG 1 Start Lever is set to IDLE or RUN or CUTOFF, or the ENG 1 Fire Handle is pulled.

(2) When the valve operates correctly:

(a) The SPAR VALVE CLOSED Light comes ON bright when the Spar Valve is changing position.

(b) The light stays ON dim when the valve is closed.

(c) The light is OFF when the valve is open.

(3) The switches in the actuator send data about the valve position to the P5-2 Module.

(a) The valve position is shown on the actuator by the position of the Manual Override Lever.

(4) If the engine did not start per Start the Engine Procedure (Normal Start), AMM TASK 71-00-00-800-808-F00 along with this fault condition, then you must replace the Engine Fuel Pump after correcting this fault. Reference this task: 80-06 TASK 802.

NOTE: The Fuel Pump and the Hydro Mechanical Unit are fuel lubricated, zero fuel pressure can cause damage to the Fuel Pump and the Hydro Mechanical Unit.

B. Possible Causes

(1) ENG 1 Spar Valve Actuator, V37

(2) ENG 1 Spar Valve Body

SIA 702-714

(3) ENG 1 Start Switch Module, M1824

SIA 716-999

(4) ENG 1 Start Lever, S1221

SIA ALL

(5) ENG 1 Fire Switch, S8

(6) ENG 1 SPAR VALVE CLOSED Indication Light

(7) Logic in the P5-2 Module

(8) ENG 1 Fuel Spar Valve Blocking Diode, R692

(9) Wiring

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	3	C00360	FUEL SPAR VALVE ENG 2
B	4	C00359	FUEL SPAR VALVE ENG 1

(Continued)

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	5	C00540	FUEL SPAR VALVE IND
C	4	C01471	FUEL SHUTOFF VALVES PWR PACK
C	6	C01472	FUEL SHUTOFF VALVES BUS

D. Related Data

(1) WDM 28-21-11

(2) WDM 28-21-21

(3) SSM 28-21-11

(4) SSM 28-21-21

E. Initial Evaluation

(1) Do this check of the SPAR VALVE CLOSED Light indication:

(a) On the Control Stand, put the ENG 1 Start Lever to IDLE or RUN.

(b) Make sure that the SPAR VALVE CLOSED Light comes ON bright while the valve changes position and then goes OFF when the valve is fully open.

1) If the SPAR VALVE CLOSED Light stays ON bright and does not go OFF, then do the Fault Isolation Procedure below.

2) If the SPAR VALVE CLOSED Light comes ON bright and then goes OFF, then continue.

CAUTION

DO NOT TURN THE FIRE HANDLE. YOU WILL CAUSE THE FIRE BOTTLES TO RELEASE THEIR CONTENTS IF YOU TURN THE HANDLE.

(c) On the P8 Panel, pull the ENG 1 Fire Switch to the FIRE position.

(d) Make sure the SPAR VALVE CLOSED Light comes ON bright while the valve changes position and then becomes dim when the valve is fully closed.

1) If the SPAR VALVE CLOSED Light stays ON bright and does not become dim, then do the Fault Isolation Procedure below.

2) If the SPAR VALVE CLOSED Light comes ON bright and then goes dim, then continue.

CAUTION

DO NOT TURN THE FIRE HANDLE. YOU WILL CAUSE THE FIRE BOTTLES TO RELEASE THEIR CONTENTS IF YOU TURN THE HANDLE.

(e) On the P8 Panel, set the ENG 1 Fire Switch back to the NORMAL position.

(f) Make sure that the SPAR VALVE CLOSED Light comes ON bright while the valve changes position and then goes OFF when the valve is fully open.

1) If the SPAR VALVE CLOSED Light stays ON bright and does not go OFF, then do the Fault Isolation Procedure below.

2) If the SPAR VALVE CLOSED Light comes ON bright and then goes OFF, then continue.

(g) On the Control Stand, put the ENG 1 Start Lever to the CUTOFF position.

(h) Make sure that the SPAR VALVE CLOSED Light comes ON bright while the valve changes position and then stays ON dim when the valve is fully closed.

1) If the SPAR VALVE CLOSED Light stays ON bright and does not become dim, then do the Fault Isolation Procedure below.

2) If the SPAR VALVE CLOSED Light comes ON bright and then stays ON dim, then there was an intermittent problem.

F. Fault Isolation Procedure

(1) Do this check of the Spar Valve Actuator operation:

(a) Open this access panel:

Number	Name/Location
521BB	Engine Fuel Valve Shutoff Access Panel - Slat Station 36.02

on the front spar.

(b) On the Control Stand, put the ENG 1 Start Lever to IDLE or RUN.

(c) Make sure that the Manual Override Handle on the Spar Valve Actuator changes from the CLOSED to the OPEN position.

(d) If the Manual Override Handle stays in the CLOSED position, then do these steps:

1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	4	C00359	FUEL SPAR VALVE ENG 1

2) Disconnect connector D788 from the actuator.

3) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	4	C00359	FUEL SPAR VALVE ENG 1

4) With the ENG 1 Start Lever in the IDLE or RUN position:

a) Do a check for 27 ± 9 VDC between pin 2 and pin 4 (Ground) of connector D788.

<1> If the Voltage is not correct, then examine the wiring.

<a> Do the Repair Confirmation at the end of this task.

<2> If the Voltage is correct, continue.

b) Do a check for 0 ± 5 VDC between pin 5 and pin 4 (Ground) of connector D788.

<1> If the Voltage is not correct, then examine the wiring.

<2> If the Voltage is correct, replace the Spar Valve Actuator, V37. These are the tasks:

- Actuator of the Spar Valve Removal, AMM TASK 28-22-11-000-804
- Actuator of the Spar Valve Installation, AMM TASK 28-22-11-400-804

<a> Do the Repair Confirmation at the end of this task.

(e) If the SPAR VALVE CLOSED Light stays bright, and the Manual Override Handle moves to the OPEN position, then do these steps:

1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	4	C00359	FUEL SPAR VALVE ENG 1

2) Disconnect connector D788 from the actuator.

3) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	4	C00359	FUEL SPAR VALVE ENG 1

4) With the ENG 1 Start Lever in the IDLE or RUN position:

a) Do a check for 27 ± 9 VDC between pin 2 and pin 4 (Ground) of connector D788.

<1> If the Voltage is not correct, then examine the wiring for an open circuit.

<a> Do the Repair Confirmation at the end of this task.

<2> If the Voltage is correct, continue.

b) Install a jumper between pin 2 and pin 3 of connector D788.

c) Make sure that the SPAR VALVE CLOSED Light is OFF.

<1> If the SPAR VALVE CLOSED Light stays ON, then examine the wiring for an open circuit.

d) Remove the jumper between pin 2 and pin 3 of connector D788.

e) Make sure the SPAR VALVE CLOSED Light comes ON bright.

<1> If the SPAR VALVE CLOSED Light does not come ON bright, then replace the Spar Valve Actuator, V37. These are the tasks:

- Actuator of the Spar Valve Removal, AMM TASK 28-22-11-000-804
- Actuator of the Spar Valve Installation, AMM TASK 28-22-11-400-804

<a> Do the Repair Confirmation at the end of this task.

<2> If the SPAR VALVE CLOSED Light comes ON bright, then continue.

(2) Do this check of the Spar Valve Actuator operation:

(a) On the Control Stand, put the ENG 1 Start Lever to CUTOFF.

(b) Make sure that the Manual Override Handle on the Spar Valve Actuator changes from the OPEN to the CLOSED position.

(c) Carefully try to move the Override Handle to the CLOSED position with your hand to make sure it is fully closed.

(d) If the Override Handle does not move completely to the CLOSED position when you put the ENG 1 Start Lever to the CUTOFF position, then do these steps:

1) Remove the actuator from the Valve Body. This is the task: Valve Body of the Spar Valve Removal, AMM TASK 28-22-11-000-803.

NOTE: Do not disconnect D788 from the actuator.

2) With the actuator disconnected from the mounting plate, do these steps:

a) Set the ENG 1 Start Lever to IDLE or RUN.

b) Wait for the Manual Override Handle on the Spar Valve Actuator to move to the OPEN position.

c) Set the ENG 1 Start Lever to CUTOFF.

d) If the Override Handle moves completely to the CLOSED position, then replace the Valve Body. These are the tasks:

- Valve Body of the Spar Valve Removal, AMM TASK 28-22-11-000-803
- Valve Body of the Spar Valve Installation, AMM TASK 28-22-11-400-803

<1> Do the Repair Confirmation at the end of this task.

e) If the Override Handle does not move completely to the CLOSED position, then replace the Spar Valve Actuator. These are the tasks:

- Actuator of the Spar Valve Removal, AMM TASK 28-22-11-000-804
- Actuator of the Spar Valve Installation, AMM TASK 28-22-11-400-804

<1> Do the Repair Confirmation at the end of this task.

(e) If the Override Handle moved completely to the CLOSED position when you set the ENG 1 Start Lever in the Flight Compartment to CUTOFF, then continue.

(3) Do this check of the ENG 1 Fuel Spar Valve Blocking Diode, R692 (WDM 28-21-11):

(a) Remove the ENG 1 Fuel Spar Valve Blocking Diode, R692.

(b) Connect an ohmmeter to do the diode check in the forward direction:

1) Connect the positive probe of the meter to terminal A of the ENG 1 Fuel Spar Valve Blocking Diode, R692.

2) Connect the negative probe of the meter to terminal B of the ENG 1 Fuel Spar Valve Blocking Diode, R692.

3) There will be continuity between the pins if the forward direction is good.

(c) Connect the ohmmeter to do the diode check in the reverse direction:

1) Connect the negative probe of the meter to terminal A of the ENG 1 Fuel Spar Valve Blocking Diode, R692.

2) Connect the positive probe of the meter to terminal B of the ENG 1 Fuel Spar Valve Blocking Diode, R692.

3) There will be no continuity between the pins if the reverse direction is good.

(d) If the diode check was not good in the forward direction or the reverse direction, then do these steps:

1) Install a new ENG 1 Fuel Spar Valve Blocking Diode, R692.

2) Do the Repair Confirmation at the end of this task.

(e) If the diode check was good in the forward and the reverse directions, then continue.

(4) Do this check of the wiring (WDM 28-21-11):

(a) Disconnect connector D626 from the P5-2 Module.

(b) Do a wiring check as follows:

MDL-FUEL SYSTEM, P5-2 D626	TERM BLK, TB261Y
pin 23	term B11

1) If you find a problem with the wiring, then do these steps:
   a) Repair the wiring.
   b) Re-install the ENG 1 Fuel Spar Valve Blocking Diode, R692.
   c) Re-connect connector D626 to the P5-2 Module.
   d) Do the Repair Confirmation at the end of this task.
2) If you do not find a problem with the wiring, then do this step and continue:
   a) Re-connect connector D626 to the P5-2 Module.

(5) Do this check of the wiring (WDM 28-21-11):
   (a) Disconnect connector D11288 from the Disconnect Bracket, AF0213A.
   (b) Do a wiring check as follows:

DISCONNECT BRACKET, AF0213A D11288	TERM BLK, TB261Y
pin 7	term A11

1) If you find a problem with the wiring, then do these steps:
   a) Repair the wiring.
   b) Re-install the ENG 1 Fuel Spar Valve Blocking Diode, R692.
   c) Re-connect connector D11288 to the Disconnect Bracket, AF0213A.
   d) Do the Repair Confirmation at the end of this task.

G. Repair Confirmation

(1) Do this check of the SPAR VALVE CLOSED Light indication:
   (a) Make sure that the ENG 1 Start Lever is in the CUTOFF position.
   (b) On the Control Stand, put the ENG 1 Start Lever to IDLE or RUN.
      1) Make sure that the SPAR VALVE CLOSED Light comes ON bright while the valve changes position and then goes OFF when the valve is fully open.

CAUTION

DO NOT TURN THE FIRE HANDLE. YOU WILL CAUSE THE FIRE BOTTLES TO RELEASE THEIR CONTENTS IF YOU TURN THE HANDLE.

   (c) On the P8 Panel, pull the ENG 1 Fire Switch to the FIRE position.
      1) Make sure that the SPAR VALVE CLOSED Light comes ON bright while the valve changes position and then becomes dim when the valve is fully closed.

CAUTION DO NOT TURN THE FIRE HANDLE. YOU WILL CAUSE THE FIRE BOTTLES TO RELEASE THEIR CONTENTS IF YOU TURN THE HANDLE.

(d) On the P8 Panel, put the ENG 1 Fire Switch back to the NORMAL position.

1) Make sure that the SPAR VALVE CLOSED Light comes ON bright while the valve changes position and then goes OFF when the valve is fully open.

(e) On the Control Stand, put the ENG 1 Start Lever to the CUTOFF position.

1) Make sure that the SPAR VALVE CLOSED Light comes ON bright while the valve changes position and then stays ON dim when the valve is fully closed.

(f) If the ENG 1 SPAR VALVE CLOSED Light showed these conditions when the valve was operated by the ENG 1 Start Lever and by the ENG 1 Fire Switch, then you corrected the problem:

- The SPAR VALVE CLOSED Light came ON bright while the valve went from OPEN to CLOSED.
- The SPAR VALVE CLOSED Light stayed ON dim while the valve was closed.
- The SPAR VALVE CLOSED Light came ON bright while the valve went from CLOSED to OPEN.
- The SPAR VALVE CLOSED Light went OFF again when the valve was opened.

1) Close this access panel:

Number	Name/Location
521BB	Engine Fuel Valve Shutoff Access Panel - Slat Station 36.02

(g) If the engine did not start per Start the Engine Procedure (Normal Start), AMM TASK 71-00-00-800-808-F00, then you must replace the Engine Fuel Pump after correcting this fault. Reference this task: 80-06 TASK 802.

- Fuel Pump Package Removal, AMM TASK 73-11-01-000-801-F00
- Fuel Pump Package Installation, AMM TASK 73-11-01-400-801-F00

NOTE: The Fuel Pump and the Hydro Mechanical Unit are fuel lubricated, zero fuel pressure can cause damage to the Fuel Pump and the Hydro Mechanical Unit.

(h) If the ENG 1 SPAR VALVE CLOSED Light did not operate as specified, when the valve was operated by the ENG 1 Start Lever and by the ENG 1 Fire Switch, then continue the Fault Isolation Procedure at the subsequent step.

END OF TASK

810. Engine No. 2 SPAR VALVE CLOSED Light Stays ON Bright - Fault Isolation

A. Description

(1) This task is for this observed condition (SDS SUBJECT 28-22-00):

(a) The ENG 2 SPAR VALVE CLOSED Light stays ON bright when the ENG 2 Start Lever is set to IDLE or RUN or CUTOFF, or the ENG 2 Fire Handle is pulled.

(2) When the valve operates correctly:

(a) The SPAR VALVE CLOSED Light comes ON bright when the Spar Valve is changing position.

(b) The light stays ON dim when the valve is closed.

(c) The light is OFF when the valve is open.

(3) The switches in the actuator send data about the valve position to the P5-2 Module.

(a) The valve position is shown on the actuator by the position of the Manual Override Lever.

(4) If the engine did not start per Start the Engine Procedure (Normal Start), AMM TASK 71-00-00-800-808-F00 along with this fault condition, then you must replace the Engine Fuel Pump after correcting this fault. Reference this task: 80-06 TASK 802.

NOTE: The Fuel Pump and the Hydro Mechanical Unit are fuel lubricated, zero fuel pressure can cause damage to the Fuel Pump and the Hydro Mechanical Unit.

B. Possible Causes

(1) ENG 2 Spar Valve Actuator, V38

(2) ENG 2 Spar Valve Body

I **SIA 702-714**

(3) ENG 2 Start Switch Module, M1825

SIA 716-999

(4) ENG 2 Start Lever, S1222

SIA ALL

(5) ENG 2 SPAR VALVE CLOSED Indication Light

(6) Logic in the P5-2 Module

(7) ENG 2 Fuel Spar Valve Blocking Diode, R693

(8) Wiring

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	3	C00360	FUEL SPAR VALVE ENG 2
B	4	C00359	FUEL SPAR VALVE ENG 1
B	5	C00540	FUEL SPAR VALVE IND
C	4	C01471	FUEL SHUTOFF VALVES PWR PACK
C	6	C01472	FUEL SHUTOFF VALVES BUS

D. Related Data

(1) WDM 28-21-11

(2) WDM 28-21-21

(3) SSM 28-21-11

(4) SSM 28-21-21

E. Initial Evaluation

(1) Do this check of the SPAR VALVE CLOSED Light indication:

(a) On the Control Stand, put the ENG 2 Start Lever to IDLE or RUN.

(b) Make sure that the SPAR VALVE CLOSED Light comes ON bright while the valve changes position and then goes OFF when the valve is fully open.

1) If the SPAR VALVE CLOSED Light stays ON bright and does not go OFF, then do the Fault Isolation Procedure below.

2) If the SPAR VALVE CLOSED Light comes ON bright and then goes OFF, then continue.

CAUTION DO NOT TURN THE FIRE HANDLE. YOU WILL CAUSE THE FIRE BOTTLES TO RELEASE THEIR CONTENTS IF YOU TURN THE HANDLE.

(c) On the P8 Panel, pull the ENG 2 Fire Switch to the FIRE position.

(d) Make sure the SPAR VALVE CLOSED Light comes ON bright while the valve changes position and then becomes dim when the valve is fully closed.

1) If the SPAR VALVE CLOSED Light stays ON bright and does not become dim, then do the Fault Isolation Procedure below.

2) If the SPAR VALVE CLOSED Light comes ON bright and then goes dim, then continue.

CAUTION DO NOT TURN THE FIRE HANDLE. YOU WILL CAUSE THE FIRE BOTTLES TO RELEASE THEIR CONTENTS IF YOU TURN THE HANDLE.

(e) On the P8 Panel, set the ENG 2 Fire Switch back to the NORMAL position.

(f) Make sure that the SPAR VALVE CLOSED Light comes ON bright while the valve changes position and then goes OFF when the valve is fully open.

1) If the SPAR VALVE CLOSED Light stays ON bright and does not go OFF, then do the Fault Isolation Procedure below.

2) If the SPAR VALVE CLOSED Light comes ON bright and then goes OFF, then continue.

(g) On the Control Stand, put the ENG 2 Start Lever to the CUTOFF position.

(h) Make sure that the SPAR VALVE CLOSED Light comes ON bright while the valve changes position and then stays ON dim when the valve is fully closed.

1) If the SPAR VALVE CLOSED Light stays ON bright and does not become dim, then do the Fault Isolation Procedure below.

2) If the SPAR VALVE CLOSED Light comes ON bright and then stays ON dim, then there was an intermittent problem.

F. Fault Isolation Procedure

(1) Do this check of the Spar Valve Actuator operation:

(a) Open this access panel:

Number	Name/Location
621BB	Engine Fuel Spar Valve Access Panel - Slat Station 36.02

on the front spar.

(b) On the Control Stand, put the ENG 2 Start Lever to IDLE or RUN.

(c) Make sure that the Manual Override Handle on the Spar Valve Actuator changes from the CLOSED to the OPEN position.

(d) If the Manual Override Handle stays in the CLOSED position, then do these steps:

1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	3	C00360	FUEL SPAR VALVE ENG 2

2) Disconnect connector D790 from the actuator.

3) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	3	C00360	FUEL SPAR VALVE ENG 2

4) With the ENG 2 Start Lever in the IDLE or RUN position:

a) Do a check for 27 ± 9 VDC between pin 2 and pin 4 (Ground) of connector D790.

<1> If the Voltage is not correct, then examine the wiring.

<a> Do the Repair Confirmation at the end of this task.

<2> If the Voltage is correct, continue.

b) Do a check for 0 ± 5 VDC between pin 5 and pin 4 (Ground) of connector D790.

<1> If the Voltage is not correct, then examine the wiring.

<2> If the Voltage is correct, replace the Spar Valve Actuator, V38. These are the tasks:

- Actuator of the Spar Valve Removal, AMM TASK 28-22-11-000-804
- Actuator of the Spar Valve Installation, AMM TASK 28-22-11-400-804

<a> Do the Repair Confirmation at the end of this task.

(e) If the SPAR VALVE CLOSED Light stays bright, and the Manual Override Handle moves to the OPEN position, then do these steps:

1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	3	C00360	FUEL SPAR VALVE ENG 2

2) Disconnect connector D790 from the actuator.

3) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	3	C00360	FUEL SPAR VALVE ENG 2

4) With the ENG 2 Start Lever in the IDLE or RUN position:

a) Do a check for 27 ± 9 VDC between pin 2 and pin 4 (Ground) of connector D790.

<1> If the Voltage is not correct, then examine the wiring for an open circuit.

<a> Do the Repair Confirmation at the end of this task.

<2> If the Voltage is correct, continue.

b) Install a jumper between pin 2 and pin 3 of connector D790.

c) Make sure that the SPAR VALVE CLOSED Light is OFF.

<1> If the SPAR VALVE CLOSED Light stays ON, then examine the wiring for an open circuit.

d) Remove the jumper between pin 2 and pin 3 of connector D790.

e) Make sure the SPAR VALVE CLOSED Light comes ON bright.

<1> If the SPAR VALVE CLOSED Light does not come ON bright, then replace the Spar Valve Actuator, V38. These are the tasks:

- Actuator of the Spar Valve Removal, AMM TASK 28-22-11-000-804
- Actuator of the Spar Valve Installation, AMM TASK 28-22-11-400-804

<a> Do the Repair Confirmation at the end of this task.

<2> If the SPAR VALVE CLOSED Light comes ON bright, then continue.

(2) Do this check of the Spar Valve Actuator operation:

(a) On the Control Stand, put the ENG 2 Start Lever to CUTOFF.

(b) Make sure that the Manual Override Handle on the Spar Valve Actuator changes from the OPEN to the CLOSED position.

(c) Carefully try to move the Override Handle to the CLOSED position with your hand to make sure it is fully closed.

(d) If the Override Handle does not move completely to the CLOSED position when you put the ENG 2 Start Lever to the CUTOFF position, then do these steps:

1) Remove the actuator from the Valve Body. This is the task: Valve Body of the Spar Valve Removal, AMM TASK 28-22-11-000-803.

NOTE: Do not disconnect D790 from the actuator.

2) With the actuator disconnected from the mounting plate, do these steps:

a) Set the ENG 2 Start Lever to IDLE or RUN.

b) Wait for the Manual Override Handle on the Spar Valve Actuator to move to the OPEN position.

c) Set the ENG 2 Start Lever to CUTOFF.

d) If the Override Handle moves completely to the CLOSED position, then replace the Valve Body. These are the tasks:

- Valve Body of the Spar Valve Removal, AMM TASK 28-22-11-000-803
- Valve Body of the Spar Valve Installation, AMM TASK 28-22-11-400-803

<1> Do the Repair Confirmation at the end of this task.

e) If the Override Handle does not move completely to the CLOSED position, then replace the Spar Valve Actuator. These are the tasks:

- Actuator of the Spar Valve Removal, AMM TASK 28-22-11-000-804
- Actuator of the Spar Valve Installation, AMM TASK 28-22-11-400-804

<1> Do the Repair Confirmation at the end of this task.

(e) If the Override Handle moved completely to the CLOSED position when you set the ENG 2 Start Lever in the Flight Compartment to CUTOFF, then continue.

(3) Do these checks of the switches in the Spar Valve Actuator (WDM 28-21-11):

(a) Make sure the ENG 2 Start Lever on the Control Stand is at CUTOFF.

(b) Disconnect connector D790 from the actuator.

(c) Do a continuity check between these pins on the receptacle of the actuator for connector D790:

MDL-FUEL SYSTEM, P5-2 D790		MDL-FUEL SYSTEM, P5-2 D790
pin 3	. . . . .	pin 5
pin 3	. . . . .	pin 6

1) If there is not continuity between the pairs of pins above, then do these steps:

a) Replace the Spar Valve Actuator. These are the tasks:

- Actuator of the Spar Valve Removal, AMM TASK 28-22-11-000-804
- Actuator of the Spar Valve Installation, AMM TASK 28-22-11-400-804

b) Do the Repair Confirmation at the end of this task.

2) If there is continuity between the pairs of pins above, then continue.

(d) Re-connect connector D790.

(e) Move the ENG 2 Start Lever to IDLE or RUN.

(f) Disconnect connector D790 from the actuator.

(g) Do a continuity check between these pins on the receptacle of the actuator for connector D790:

MDL-FUEL SYSTEM, P5-2 D790		MDL-FUEL SYSTEM, P5-2 D790
pin 2	. . . . .	pin 3

1) If there is not continuity between the pair of pins above, then do these steps:

a) Replace the Spar Valve Actuator. These are the tasks:

- Actuator of the Spar Valve Removal, AMM TASK 28-22-11-000-804
- Actuator of the Spar Valve Installation, AMM TASK 28-22-11-400-804

b) Do the Repair Confirmation at the end of this task.

2) If there is continuity between the pairs of pins above, then do this step and continue:

a) Re-connect connector D790.

(4) Do this check of the wiring (WDM 28-22-11):

(a) Make sure the ENG 2 Start Lever is in CUTOFF position.

(b) Disconnect connector D628 from the P5-2 Module.

(c) With the positive voltage probe on pin 30 and the ground probe on pin 23, do a continuity check from pin 23 to pin 30 of connector D628.

NOTE: Do this check with the positive voltage probe on pin 30 and the ground probe on pin 23. Diode R693 will block current in the opposite direction, thus there will appear to be no continuity.

1) If there is no continuity from pin 23 to pin 30 of connector D628, then repair the wiring from connector D628, pin 23 to D790, pin 30 or from connector D628, pin 23 to D790, pin 5 and pin 6.
   a) Re-connect connector D628.
   b) Do the Repair Confirmation at the end of this task.
2) If there is continuity from pin 23 to pin 30 of connector D628, then do this step and continue:
   a) Re-connect connector D628.

(5) Do this wiring check (WDM 28-21-11):
   (a) Set the ENG 2 Start Lever to the IDLE or RUN position.
   (b) Disconnect connector D628 from the P5-2 Module.
   (c) With the positive voltage probe on pin 29 and the ground probe on pin 23, do a continuity check from pin 23 to pin 29 of connector D628.

   NOTE: Do this check with the positive voltage probe on pin 29 and the ground probe on pin 23. Diode R693 will block current in the opposite direction, thus there will appear to be no continuity.

   1) If there is no continuity from pin 23 to pin 29 of connector D628, then do these steps:
      a) Repair the wiring from connector D628, pin 23 to D790, pin 3 or from connector D628, pin 29 to D790, pin 2.
      b) Re-connect connector D628.
      c) Do the Repair Confirmation at the end of this task.
   2) If there is continuity from pin 23 to pin 29 of connector D628, then do these steps:
      a) Replace the P5-2 Module of the P5 panel.
      b) Do the Repair Confirmation at the end of this task.

(6) Do this check of the ENG 2 Fuel Spar Valve Blocking Diode, R693 (WDM 28-21-11):
   (a) Remove the ENG 2 Fuel Spar Valve Blocking Diode, R693.
   (b) Connect an ohmmeter to do the diode check in the forward direction:
      1) Connect the positive probe of the meter to terminal A of the ENG 2 Fuel Spar Valve Blocking Diode, R693.
      2) Connect the negative probe of the meter to terminal B of the ENG 2 Fuel Spar Valve Blocking Diode, R693.
      3) There will be continuity between the pins if the forward direction is good.
   (c) Connect the ohmmeter to do the diode check in the reverse direction:
      1) Connect the negative probe of the meter to terminal A of the ENG 2 Fuel Spar Valve Blocking Diode, R693.
      2) Connect the positive probe of the meter to terminal B of the ENG 2 Fuel Spar Valve Blocking Diode, R693.
      3) There will be no continuity between the pins if the reverse direction is good.
   (d) If the diode check was not good in the forward direction or the reverse direction, then do these steps:
      1) Install a new ENG 2 Fuel Spar Valve Blocking Diode, R693.

2) Do the Repair Confirmation at the end of this task.

(e) If the diode check was good in the forward and the reverse directions, then continue.

(7) Do this check of the wiring (WDM 28-21-11):

(a) Disconnect connector D628 from the P5-2 Module.

(b) Do a wiring check as follows:

MDL-FUEL SYSTEM, P5-2 D628	**TERM BLK, TB262Y**
pin 23	term B11

1) If you find a problem with the wiring, then do these steps:

a) Repair the wiring.

b) Re-install the ENG 2 Fuel Spar Valve Blocking Diode, R693.

c) Re-connect connector D628 to the P5-2 Module.

d) Do the Repair Confirmation at the end of this task.

2) If you do not find a problem with the wiring, then do this step and continue:

a) Re-connect connector D628 to the P5-2 Module.

(8) Do this check of the wiring (WDM 28-21-11):

(a) Disconnect connector D11292 from the Disconnect Bracket, AF0222A.

(b) Do a wiring check as follows:

DISCONNECT BRACKET, AF0222A D11292	**TERM BLK, TB262Y**
pin 7	term A11

1) If you find a problem with the wiring, then do these steps:

a) Repair the wiring.

b) Re-install the ENG 2 Fuel Spar Valve Blocking Diode, R693.

c) Re-connect connector D11292 to the Disconnect Bracket, AF0222A.

d) Do the Repair Confirmation at the end of this task.

G. Repair Confirmation

(1) Do this check of the SPAR VALVE CLOSED Light indication:

(a) Make sure that the ENG 2 Start Lever is in the CUTOFF position.

(b) On the Control Stand, put the ENG 2 Start Lever to IDLE or RUN.

1) Make sure that the SPAR VALVE CLOSED Light comes ON bright while the valve changes position and then goes OFF when the valve is fully open.

CAUTION DO NOT TURN THE FIRE HANDLE. YOU WILL CAUSE THE FIRE BOTTLES TO RELEASE THEIR CONTENTS IF YOU TURN THE HANDLE.

(c) On the P8 Panel, pull the ENG 2 Fire Switch to the FIRE position.

1) Make sure that the SPAR VALVE CLOSED Light comes ON bright while the valve changes position and then becomes dim when the valve is fully closed.

CAUTION DO NOT TURN THE FIRE HANDLE. YOU WILL CAUSE THE FIRE BOTTLES TO RELEASE THEIR CONTENTS IF YOU TURN THE HANDLE.

(d) On the P8 Panel, put the ENG 2 Fire Switch back to the NORMAL position.

1) Make sure that the SPAR VALVE CLOSED Light comes ON bright while the valve changes position and then goes OFF when the valve is fully open.

(e) On the Control Stand, put the ENG 2 Start Lever to the CUTOFF position.

1) Make sure that the SPAR VALVE CLOSED Light comes ON bright while the valve changes position and then stays ON dim when the valve is fully closed.

(f) If the ENG 2 SPAR VALVE CLOSED Light showed these conditions when the valve was operated by the ENG 2 Start Lever and by the ENG 2 Fire Switch, then you corrected the problem:

- The SPAR VALVE CLOSED Light came ON bright while the valve went from OPEN to CLOSED.
- The SPAR VALVE CLOSED Light stayed ON dim while the valve was closed.
- The SPAR VALVE CLOSED Light came ON bright while the valve went from CLOSED to OPEN.
- The SPAR VALVE CLOSED Light went OFF again when the valve was opened.

1) Close this access panel:

Number	Name/Location
621BB	Engine Fuel Spar Valve Access Panel - Slat Station 36.02

(g) If the engine did not start per Start the Engine Procedure (Normal Start), AMM TASK 71-00-00-800-808-F00, then you must replace the Engine Fuel Pump after correcting this fault. Reference this task: 80-06 TASK 802.

- Fuel Pump Package Removal, AMM TASK 73-11-01-000-801-F00
- Fuel Pump Package Installation, AMM TASK 73-11-01-400-801-F00

NOTE: The Fuel Pump and the Hydro Mechanical Unit are fuel lubricated, zero fuel pressure can cause damage to the Fuel Pump and the Hydro Mechanical Unit.

(h) If the ENG 2 SPAR VALVE CLOSED Light did not operate as specified, when the valve was operated by the ENG 2 Start Lever and by the ENG 2 Fire Switch, then continue the Fault Isolation Procedure at the subsequent step.

END OF TASK

811. Engine No. 1 SPAR VALVE CLOSED Light Does Not Come On Bright During Valve Transit or Dim When the Valve is Closed - Fault Isolation

A. Description

(1) You set the engine start lever 1 to IDLE or RUN or CUTOFF or you pull the engine No. 1 fire handle and the engine No. 1 SPAR VALVE CLOSED light does not come on to show that the valve is changing its position. When the valve operates correctly, the SPAR VALVE CLOSED light comes on bright while the spar valve changes position. The light stays on dim when the valve is closed. The light is off when the valve is open.

(2) (SDS SUBJECT 28-22-00)

B. Possible Causes

(1) Engine No. 1 Spar Valve Actuator, V37

I **SIA 702-714**

(2) Engine No. 1 start switch module, M1824

SIA 716-999

(3) Engine start lever 1, S1221

SIA ALL

(4) Engine No. 1 fire switch, S8 on the P8-1 fire protection panel

(5) The wiring or logic in the P5-2 module

(6) The wiring from the engine No. 1 start switch module or the engine No. 1 fire switch to the P5-2 module.

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	4	C00359	FUEL SPAR VALVE ENG 1
B	5	C00540	FUEL SPAR VALVE IND
C	4	C01471	FUEL SHUTOFF VALVES PWR PACK
C	6	C01472	FUEL SHUTOFF VALVES BUS

D. Related Data

(1) (SSM 28-21-11)

(2) (WDM 28-21-11)

E. Initial Evaluation

(1) Do this check of the SPAR VALVE CLOSED indication:

(a) Push and hold the SPAR VALVE CLOSED light for the engine No. 1 spar valve on the P5-2 module.

(b) Make sure the SPAR VALVE CLOSED light comes on bright.

1) If the SPAR VALVE CLOSED light does not come on bright, then replace the SPAR VALVE CLOSED light.

(c) Set the engine start lever 1 on the control stand to IDLE or RUN.

(d) Make sure the SPAR VALVE CLOSED light comes on bright while the valve changes position and then goes off when the valve is fully open.

1) If the SPAR VALVE CLOSED light does not come on, then do the Fault Isolation Procedure below.

2) If the SPAR VALVE CLOSED light comes on bright and then goes off, then continue.

CAUTION

DO NOT TURN THE FIRE HANDLE. YOU WILL CAUSE THE FIRE BOTTLES TO RELEASE THEIR CONTENTS IF YOU TURN THE HANDLE.

(e) On the P8 panel, pull the No. 1 engine fire switch to the FIRE position.

(f) Make sure the SPAR VALVE CLOSED light comes on bright while the valve changes position and then becomes dim when the valve is fully closed.

1) If the SPAR VALVE CLOSED light does not come on, then do the Fault Isolation Procedure below.

2) If the SPAR VALVE CLOSED light comes on bright and then goes dim, then continue.

CAUTION

DO NOT TURN THE FIRE HANDLE. YOU WILL CAUSE THE FIRE BOTTLES TO RELEASE THEIR CONTENTS IF YOU TURN THE HANDLE.

(g) On the P8 panel, set the No. 1 engine fire switch back to the NORMAL position.

(h) Make sure the SPAR VALVE CLOSED light comes on bright while the valve changes position and then goes off when the valve is fully open.

1) If the SPAR VALVE CLOSED light does not come on, then do the Fault Isolation Procedure below.

2) If the SPAR VALVE CLOSED light comes on bright and then goes off, then continue.

(i) Set the engine start lever 1 on the control stand to the CUTOFF position.

(j) Make sure the SPAR VALVE CLOSED light comes on bright while the valve changes position and then stays on dim when the valve is fully closed.

1) If the SPAR VALVE CLOSED light does not come on, then do the Fault Isolation Procedure below.

2) If the SPAR VALVE CLOSED light comes on bright and then stays on dim, then there was an intermittent fault.

F. Fault Isolation Procedure

(1) Do this check of the engine start lever 1:

(a) Set the engine start lever 1 on the control stand to the IDLE or RUN position.

(b) Make sure the No. 1 engine SPAR VALVE CLOSED light comes on bright and then goes off.

1) If the No. 1 engine SPAR VALVE CLOSED light does not come on bright during transit and then go off, then do these steps:

a) Set the engine start lever 1 on the control stand to the CUTOFF position.

b) If the No. 1 engine SPAR VALVE CLOSED light comes on dim, while the valve is in transit and stays on dim, then replace the spar valve actuator, V37.

These are the tasks:

Actuator of the Spar Valve Removal, AMM TASK 28-22-11-000-804

Actuator of the Spar Valve Installation, AMM TASK 28-22-11-400-804

c) Set the engine start lever 1 on the control stand to the IDLE or RUN position.

d) Do the Repair Confirmation at the end of this task.

2) If the No. 1 engine SPAR VALVE CLOSED light comes on bright and then goes off, then continue.

(2) Do this check of the engine No. 1 fire switch:

CAUTION

DO NOT TURN THE FIRE HANDLE. YOU WILL CAUSE THE FIRE BOTTLES TO RELEASE THEIR CONTENTS IF YOU TURN THE HANDLE.

(a) With the engine start lever 1 in the IDLE or RUN position, pull the engine No. 1 fire switch on the P8-1 panel to the FIRE position.

(b) Make sure the No. 1 engine SPAR VALVE CLOSED light comes on bright and then goes dim.

1) If the No. 1 engine SPAR VALVE CLOSED light does not come on bright and then go dim, then do these steps:

a) Replace the engine No. 1 fire switch, S8, on the P8-1 panel.

b) Do the Repair Confirmation at the end of this task.

2) If the No. 1 engine SPAR VALVE CLOSED light comes on bright and then becomes dim, then continue. Move the engine No. 1 fire switch back to the NORMAL position.

(3) Do these checks of the wiring and the P5-2 module:

(a) Set the engine start lever 1 to the CUTOFF position.

(b) On the front spar, make sure the manual override handle on the engine No. 1 spar valve moves to the closed position.

NOTE: Open the Engine Fuel Valve Shutoff Access Panel - Slat Station 36.02, 521BB to get access to the engine No. 1 spar valve on the front spar.

1) If the manual override handle moves to the closed position, then replace the P5-2 module.

a) Replace the P5-2 module.

b) Do the Repair Confirmation at the end of this task.

2) If the manual override handle does not move to the closed position, then continue.

(c) Do a continuity check of the wiring from these pins on connector D11288 on the engine No. 1 start switch module to connector D788 on the engine No. 1 spar valve actuator:

D788		D11288
pin 2	. . . . .	pin 8
pin 5	. . . . .	pin 7

1) If there is no continuity between these pins, then do these steps:

a) Repair the wiring.

b) Re-connect connectors D788 and D11288.

c) Do the Repair Confirmation at the end of this task.

2) If there is continuity between these pins, then continue.

(d) Set the engine start lever 1 to the IDLE or RUN position.

(e) Set the engine No. 1 fire switch back to the FIRE position.

(f) On the front spar, make sure the manual override handle on the engine No. 1 spar valve moves to the closed position.

1) If the manual override handle moves to the closed position, then do these steps:

a) Replace the P5-2 module.

b) Do the Repair Confirmation at the end of this task.

2) If the manual override handle does not move to the closed position, then continue.

(g) Do a continuity check of the wiring from these pins on connector D576 on the engine No. 1 fire switch module to connector D788 on the engine No. 1 spar valve actuator:

D788		D576
pin 6	. . . . .	pin 21
pin 2	. . . . .	pin 23

1) Repair the wiring.

2) Re-connect connectors D788 and D576.

3) Do the Repair Confirmation at the end of this task.

G. Repair Confirmation

(1) Do this check of the SPAR VALVE CLOSED indication:

(a) Set the engine start lever 1 on the control stand to IDLE or RUN.

(b) Make sure the SPAR VALVE CLOSED light comes on bright while the valve changes position and then goes off when the valve is fully open.

CAUTION

DO NOT TURN THE FIRE HANDLE TO THE RIGHT OR LEFT. THE FIRE BOTTLES WILL DISCHARGE.

(c) On the P8 panel, pull the No. 1 engine fire switch to the FIRE position.

(d) Make sure the SPAR VALVE CLOSED light comes on bright while the valve changes position and then becomes dim when the valve is fully closed.

CAUTION

DO NOT TURN THE FIRE HANDLE TO THE RIGHT OR LEFT. THE FIRE BOTTLES WILL DISCHARGE.

(e) On the P8 panel, set the No. 1 engine fire switch back to the NORMAL position.

(f) Make sure the SPAR VALVE CLOSED light comes on bright while the valve changes position and then goes off when the valve is fully open.

(g) Set the engine start lever 1 on the control stand to the CUTOFF position.

(h) Make sure the SPAR VALVE CLOSED light comes on bright while the valve changes position and then stays on dim when the valve is fully closed.

(i) If the engine No. 1 SPAR VALVE CLOSED light showed these conditions while the valve was operated by the engine start lever 1 and by the engine No. 1 fire switch, then you corrected the fault:

1) The SPAR VALVE CLOSED light came on bright while the valve went from open to closed.
2) The SPAR VALVE CLOSED light stayed on dim while the valve was closed.
3) The SPAR VALVE CLOSED light came on bright while the valve went from closed to open.
4) The SPAR VALVE CLOSED light went off again when the valve was opened.

(j) Close this access panel:

Number	Name/Location
521BB	Engine Fuel Valve Shutoff Access Panel - Slat Station 36.02

——— END OF TASK ———

812. Engine No. 2 SPAR VALVE CLOSED Light Does Not Come On Bright During Valve Transit or Dim When the Valve is Closed - Fault Isolation

A. Description

(1) You set the engine start lever 2 to IDLE or RUN or CUTOFF or you pull the engine No. 2 fire handle and the engine No. 2 SPAR VALVE CLOSED light does not come on to show that the valve is changing its position. When the valve operates correctly, the SPAR VALVE CLOSED light comes on bright while the spar valve changes position. The light stays on dim when the valve is closed. The light is off when the valve is open.

(2) (SDS SUBJECT 28-22-00)

B. Possible Causes

(1) Engine No. 2 spar valve actuator, V38

I **SIA 702-714**

(2) Engine No. 2 start switch module, M1825

SIA 716-999

(3) Engine start lever, S1222

SIA ALL

(4) Engine No. 2 fire switch, S9 on the P8-1 fire protection panel

(5) The wiring or logic in the P5-2 module

(6) The wiring from the engine No. 2 start switch module or the engine No. 2 fire switch to the P5-2 module.

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
B	3	C00360	FUEL SPAR VALVE ENG 2
B	5	C00540	FUEL SPAR VALVE IND
C	4	C01471	FUEL SHUTOFF VALVES PWR PACK

(Continued)

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
C	6	C01472	FUEL SHUTOFF VALVES BUS

D. Related Data

(1) (SSM 28-21-11)

(2) (WDM 28-21-11)

E. Initial Evaluation

(1) Do this check of the SPAR VALVE CLOSED indication:

(a) Push and hold the SPAR VALVE CLOSED light for the engine No. 2 spar valve on the P5-2 module.

(b) Make sure the SPAR VALVE CLOSED light comes on bright.

1) If the SPAR VALVE CLOSED light does not come on bright, then replace the SPAR VALVE CLOSED light.

(c) Set the engine start lever 2 on the control stand to IDLE or RUN.

(d) Make sure the SPAR VALVE CLOSED light comes on bright while the valve changes position and then goes off when the valve is fully open.

1) If the SPAR VALVE CLOSED light does not come on, then do the Fault Isolation Procedure below.

2) If the SPAR VALVE CLOSED light comes on bright and then goes off, then continue.

CAUTION

DO NOT TURN THE FIRE HANDLE. YOU WILL CAUSE THE FIRE BOTTLES TO RELEASE THEIR CONTENTS IF YOU TURN THE HANDLE.

(e) On the P8 panel, pull the No. 2 engine fire switch to the FIRE position.

(f) Make sure the SPAR VALVE CLOSED light comes on bright while the valve changes position and then becomes dim when the valve is fully closed.

1) If the SPAR VALVE CLOSED light does not come on, then do the Fault Isolation Procedure below.

2) If the SPAR VALVE CLOSED light comes on bright and then goes dim, then continue.

CAUTION

DO NOT TURN THE FIRE HANDLE. YOU WILL CAUSE THE FIRE BOTTLES TO RELEASE THEIR CONTENTS IF YOU TURN THE HANDLE.

(g) On the P8 panel, set the No. 2 engine fire switch back to the NORMAL position.

(h) Make sure the SPAR VALVE CLOSED light comes on bright while the valve changes position and then goes off when the valve is fully open.

1) If the SPAR VALVE CLOSED light does not come on, then do the Fault Isolation Procedure below.

2) If the SPAR VALVE CLOSED light comes on bright and then goes off, then continue.

(i) Set the engine start lever 2 on the control stand to the CUTOFF position.

(j) Make sure the SPAR VALVE CLOSED light comes on bright while the valve changes position and then stays on dim when the valve is fully closed.

1) If the SPAR VALVE CLOSED light does not come on, then do the Fault Isolation Procedure below.

2) If the SPAR VALVE CLOSED light comes on bright and then stays on dim, then there was an intermittent fault.

F. Fault Isolation Procedure

(1) Do this check of the engine start lever 2:

(a) Set the engine start lever 2 on the control stand to the IDLE or RUN position.

(b) Make sure the No. 2 engine SPAR VALVE CLOSED light comes on bright and then goes off.

1) If the No. 2 engine SPAR VALVE CLOSED light does not come on bright during transit and then go off, then do these steps:

a) Set the engine start lever 2 on the control stand to the CUTOFF position.

b) If the No. 2 engine SPAR VALVE CLOSED light comes on dim, while the valve is in transit and stays on dim, then replace the spar valve actuator, V38.

These are the tasks:

Actuator of the Spar Valve Removal, AMM TASK 28-22-11-000-804

Actuator of the Spar Valve Installation, AMM TASK 28-22-11-400-804

c) Set the engine start lever 2 on the control stand to the IDLE or RUN position.

d) Do the Repair Confirmation at the end of this task.

2) If the No. 2 engine SPAR VALVE CLOSED light comes on bright and then goes off, then continue.

(2) Do this check of the engine No. 2 fire switch:

CAUTION

DO NOT TURN THE FIRE HANDLE. YOU WILL CAUSE THE FIRE BOTTLES TO RELEASE THEIR CONTENTS IF YOU TURN THE HANDLE.

(a) With the engine start lever 2 in the IDLE or RUN position, pull the engine No. 2 fire switch on the P8-1 panel to the FIRE position.

(b) Make sure the No. 2 engine SPAR VALVE CLOSED light comes on bright and then goes dim.

1) If the No. 2 engine SPAR VALVE CLOSED light does not come on bright and then go dim, then do these steps:

a) Replace the engine No. 2 fire switch, S9, on the P8-1 panel.

b) Do the Repair Confirmation at the end of this task.

2) If the No. 2 engine SPAR VALVE CLOSED light comes on bright and then becomes dim, then continue. Move the engine No. 2 fire switch back to the NORMAL position.

(3) Do these checks of the wiring and the P5-2 module:

(a) Set the engine start lever 2 to the CUTOFF position.

(b) On the front spar, make sure the manual override handle on the engine No. 2 spar valve moves to the closed position.

NOTE: Open the Engine Fuel Valve Shutoff Access Panel - Slat Station 36.02, 621BB to get access to the engine No. 2 spar valve on the front spar.

1) If the manual override handle moves to the closed position, then do these steps:

a) Replace the P5-2 module.

b) Do the Repair Confirmation at the end of this task.

2) If the manual override handle does not move to the closed position, then continue.

(c) Do a continuity check of the wiring from these pins on connector D11292 on the engine No. 2 start switch module to connector D790 on the engine No. 2 spar valve actuator:

D790		D11292
pin 2	. . . . .	pin 8
pin 5	. . . . .	pin 7

1) If there is no continuity between these pins, then do these steps:

a) Repair the wiring.

b) Re-connect connectors D790 and D11292.

c) Do the Repair Confirmation at the end of this task.

2) If there is continuity between these pins, then continue.

(d) Set the engine start lever 2 to the IDLE or RUN position.

(e) Set the engine No. 2 fire switch back to the FIRE position.

(f) On the front spar, make sure the manual override handle on the engine No. 2 spar valve moves to the closed position.

1) If the manual override handle moves to the closed position, then do these steps:

a) Replace the P5-2 module.

b) Do the Repair Confirmation at the end of this task.

2) If the manual override handle does not move to the closed position, then continue.

(g) Do a continuity check of the wiring from these pins on connector D578 on the engine No. 2 fire switch module to connector D790 on the engine No. 2 spar valve actuator:

D790		D578
pin 6	. . . . .	pin 21
pin 2	. . . . .	pin 23

1) Repair the wiring.

2) Re-connect connectors D790 and D578.

3) Do the Repair Confirmation at the end of this task.

G. Repair Confirmation

(1) Do this check of the SPAR VALVE CLOSED indication:

(a) Set the engine start lever 2 on the control stand to IDLE or RUN.

(b) Make sure the SPAR VALVE CLOSED light comes on bright while the valve changes position and then goes off when the valve is fully open.

CAUTION

DO NOT TURN THE FIRE HANDLE TO THE RIGHT OR LEFT. THE FIRE BOTTLES WILL DISCHARGE.

(c) On the P8 panel, pull the No. 2 engine fire switch to the FIRE position.

(d) Make sure the SPAR VALVE CLOSED light comes on bright while the valve changes position and then becomes dim when the valve is fully closed.

CAUTION

DO NOT TURN THE FIRE HANDLE TO THE RIGHT OR LEFT. THE FIRE BOTTLES WILL DISCHARGE.

(e) On the P8 panel, set the No. 2 engine fire switch back to the NORMAL position.

(f) Make sure the SPAR VALVE CLOSED light comes on bright while the valve changes position and then goes off when the valve is fully open.

(g) Set the engine start lever 2 on the control stand to the CUTOFF position.

(h) Make sure the SPAR VALVE CLOSED light comes on bright while the valve changes position and then stays on dim when the valve is fully closed.

(i) If the engine No. 2 SPAR VALVE CLOSED light showed these conditions while the valve was operated by the engine start lever 2 and by the engine No. 2 fire switch, then you corrected the fault:

1) The SPAR VALVE CLOSED light came on bright while the valve went from open to closed.
2) The SPAR VALVE CLOSED light stayed on dim while the valve was closed.
3) The SPAR VALVE CLOSED light came on bright while the valve went from closed to open.
4) The SPAR VALVE CLOSED light went off again when the valve was opened.

(j) Close this access panel:

Number	Name/Location
621BB	Engine Fuel Spar Valve Access Panel - Slat Station 36.02

——— END OF TASK ———

813. No. 1 Tank, Forward Boost Pump Circuit Breaker Open - Fault Isolation

A. Description

28-AWL-18: CDCCL

(1) The circuit breaker, FUEL BOOST PUMP TANK 1 FWD, is found to be open during flight or on the ground. Do not reset this circuit breaker before you do the Initial Evaluation below. This problem can be caused by a short circuit in the wiring for the boost pump, a damaged boost pump, or a damaged circuit breaker or relay.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

B. Possible Causes

(1) 115V AC Wiring

(2) No. 1 tank forward boost pump relay, R19

(3) No. 1 tank forward boost pump, M47

(4) Circuit breaker, C00827, FUEL BOOST PUMP TANK 1 FWD

C. Circuit Breakers

(1) This is the primary circuit breaker related to the fault:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	1	C00827	FUEL BOOST PUMP TANK 1 FWD

D. Related Data

(1) (SDS SUBJECT 28-22-00)

(2) (SSM 28-23-11)

(3) (WDM 28-23-11)

E. Initial Evaluation

NOTE: If you make a decision to dispatch the airplane with an open circuit breaker, do the steps in the MEL to deactivate the forward boost pump for the No. 1 tank. Operate the airplane per MEL procedures.

WARNING DO NOT CLOSE A GFI RELAY FOR A FUEL PUMP THAT OPENED (TRIPPED) UNTIL YOU CORRECT THE PROBLEM. THIS CONDITION CAN CAUSE A FIRE OR EXPLOSION.

WARNING DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

(1) Do a visual inspection of the BOOST PUMP TANK 1 FWD GFI relay, R19:

NOTE: The GFI relay, R19, is on the P91 panel in the Electronic Equipment Compartment. You will need to open the panel to get access to the GFI relay.

28-AWL-18: CDCCL

(a) If the RESET button is out, and you can see the white band, then do the “Fault Isolation Procedure - BOOST PUMP TANK 1 FWD GFI Relay Open” in 28-22 TASK 804.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: The RESET button, found at the top edge of the GFI relay, moves out to show a narrow white band when the GFI circuit turns off the relay due to a ground fault, or when you push the TEST button found on the top surface of the relay.

(b) If the RESET button on the BOOST PUMP TANK 1 FWD GFI relay, R19, is not out and you cannot see the white band, then continue.

(2) Do a check of this circuit breaker:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	1	C00827	FUEL BOOST PUMP TANK 1 FWD

(3) If the circuit breaker is closed, do this task: Tank 1 FWD Pump LOW PRESSURE Light is ON - Fault Isolation, 28-22 TASK 804.

WARNING DO NOT CLOSE A CIRCUIT BREAKER FOR A FUEL PUMP THAT OPENED (TRIPPED) UNTIL YOU CORRECT THE PROBLEM. THIS CONDITION CAN CAUSE A FIRE OR EXPLOSION.

28-AWL-18: CDCCL

(4) If the circuit breaker is open, do these steps:

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

28-AWL-18: CDCCL

(a) Install an approved for flight, open position circuit breaker lock, STD-1062, and safety tag on the circuit breaker.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

28-AWL-18: CDCCL

(b) Do the fault isolation steps in this procedure.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

F. Fault Isolation Procedure

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) Obey these precautions at all times during this task:

(a) To operate any of the fuel pumps, one person 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(es) to OFF if the LOW PRESSURE light comes on and stays on.

(2) Make sure there is minimum of 20,000 lb (9072 kg) of fuel in the center tank and 1000 lb (454 kg) of fuel in the No. 1 tank.

NOTE: This will cover the boost pump and boost pump inlet with fuel.

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) Do this task: Leading Edge Flaps and Slats Extension, AMM TASK 27-81-00-860-803.

(4) Get access to the forward fuel boost pump for the No. 1 tank (AMM TASK 28-22-41-000-801).

(5) Examine the fuel boost pump and the area around it for fuel leakage.

(a) If there are signs of fuel leakage, find the source of the fuel leakage and repair it

(6) Do these steps to do a check of the 115V AC wiring, the circuit breaker, the relay, and the boost pump:

(a) Disconnect the electrical connector, D72, from the fuel boost pump (WDM 28-23-11).

(b) Examine the airplane and pump sides of the electrical connector, D72, for damage.

1) Repair all damage that you find.

(c) Make sure that the electrical connector, D72, is disconnected.

(d) Remove the circuit breaker lock and safety tag, and close this circuit breaker:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	1	C00827	FUEL BOOST PUMP TANK 1 FWD

(e) On the P5 Overhead Panel, set the switch FUEL PUMP - TANK 1 - FWD to ON for 5 minutes.

(f) If the circuit breaker stays closed, do the subsequent steps:

1) Do a check for 3-phase 115V AC power between pins 1, 2, and 3 of electrical connector, D72 (WDM 28-23-11).

2) If there is 3-phase 115V AC power between pins 1, 2, and 3 of electrical connector, D72, do one of these steps:

a) For the No. 1 forward boost pump, M47, do this task: Fuel Boost Pump - Insulation Resistance Test, AMM TASK 28-22-00-760-802.

<1> If the insulation resistance test is not OK, replace the forward boost pump, M47, for the No. 1 tank.

These are the tasks:

Motor Impeller Removal, AMM TASK 28-22-41-000-801,

Motor Impeller Installation, AMM TASK 28-22-41-400-801.

<2> On the P5 Overhead Panel, set the switch FUEL PUMP - TANK 1 - FWD to OFF.

<3> Do the Repair Confirmation at the end of this task.

b) Replace the forward boost pump, M47, for the No. 1 tank.

These are the tasks:

Motor Impeller Removal, AMM TASK 28-22-41-000-801,

Motor Impeller Installation, AMM TASK 28-22-41-400-801.

<1> Do the Repair Confirmation at the end of the task.

3) If there is not 3-phase 115V AC power between pins 1, 2, and 3 of electrical connector, D72, do these steps:

a) Replace the BOOST PUMP TANK 1 FWD relay, R19 (WDM 28-23-11).

<1> On the P5 Overhead Panel, set the switch FUEL PUMP - TANK 1 - FWD to OFF.

<2> Do the Repair Confirmation at the end of this task.

(g) If the circuit breaker opened, then continue.

(7) Do these steps to do a check of the BOOST PUMP TANK 1 FWD relay, R19:

(a) On the P5 Overhead Panel, set the switch FUEL PUMP - TANK 1 - FWD to OFF.

(b) Replace the BOOST PUMP TANK 1 FWD relay, R19 (WDM 28-23-11).

(c) Make sure that the electrical connector, D72, is disconnected.

(d) Close this circuit breaker:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	1	C00827	FUEL BOOST PUMP TANK 1 FWD

(e) On the P5 Overhead Panel, set the switch FUEL PUMP - TANK 1 - FWD to ON.

(f) After five minutes, set the switch FUEL PUMP - TANK 1 - FWD, on the P5 Overhead Panel, to OFF.

(g) If this circuit breaker stays closed, then do the Repair Confirmation at the end of this task.

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	1	C00827	FUEL BOOST PUMP TANK 1 FWD

(h) If this circuit breaker opened, then continue.

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	1	C00827	FUEL BOOST PUMP TANK 1 FWD

(8) Do these steps to do a check of the circuit breaker:

(a) Replace this circuit breaker:

(WDM 28-23-11)

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	1	C00827	FUEL BOOST PUMP TANK 1 FWD

(b) Make sure that the electrical connector, D72, is disconnected.

(c) Close this circuit breaker:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	1	C00827	FUEL BOOST PUMP TANK 1 FWD

(d) On the P5 Overhead Panel, set the switch FUEL PUMP - TANK 1 - FWD to ON.

(e) After five minutes, set the switch FUEL PUMP - TANK 1 - FWD, on the P5 Overhead Panel, to OFF.

(f) If this circuit breaker stays closed, then do the Repair Confirmation at the end of this task.

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	1	C00827	FUEL BOOST PUMP TANK 1 FWD

(g) If this circuit breaker opened, then continue.

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	1	C00827	FUEL BOOST PUMP TANK 1 FWD

(9) Do these steps to do a check of the 115V AC wiring for the boost pump:

(a) Do a wiring check between these pins of connector, D72, at the Tank No. 1 forward boost pump, M47, and the circuit breaker, FUEL BOOST PUMP TANK 1 FWD (SSM 28-23-11):

D72		C00827
pin 1	. . . . .	pin A2
pin 2	. . . . .	pin B2
pin 3	. . . . .	pin C2

(b) Find the problem and repair the wiring.

(c) Make sure that the electrical connector, D72, is disconnected.

(d) Close this circuit breaker:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	1	C00827	FUEL BOOST PUMP TANK 1 FWD

(e) Do not re-connect the electrical connector, D72, to the boost pump.

(f) On the P5 Overhead Panel, set the switch FUEL PUMP - TANK 1 - FWD to ON.

(g) After five minutes, set the switch FUEL PUMP - TANK 1 - FWD, on the P5 Overhead Panel, to OFF.

(h) Make sure this circuit breaker stays closed:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	1	C00827	FUEL BOOST PUMP TANK 1 FWD

(i) Do the Repair Confirmation at the end of this task.

G. Repair Confirmation

(1) Connect the electrical connector, D72, to the Tank No. 1 forward boost pump (WDM 28-23-11).

(2) On the P5 Overhead Panel, set the switch FUEL PUMP - TANK 1 - FWD to ON.

(3) On the P5 Overhead Panel, make sure that the amber PRESS light FUEL PUMP TANK 1 - FWD goes off.

(4) After five minutes, set the switch FUEL PUMP - TANK 1 - FWD, on the P5 Overhead Panel, to OFF.

(5) If this circuit breaker stays closed, then you corrected the fault.

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	1	C00827	FUEL BOOST PUMP TANK 1 FWD

——— END OF TASK ———

814. No. 1 Tank, Aft Boost Pump Circuit Breaker Open - Fault Isolation

A. Description

28-AWL-18: CDCCL

(1) The circuit breaker, FUEL BOOST PUMP TANK 1 AFT, is found to be open during flight or on the ground. Do not reset this circuit breaker before you do the Initial Evaluation below. This problem can be caused by a short circuit in the wiring for the boost pump, a damaged boost pump, or a damaged circuit breaker or relay.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

B. Possible Causes

(1) 115V AC Wiring

(2) No. 1 tank aft boost pump relay, R18

(3) No. 1 tank aft boost pump, M46

(4) Circuit breaker, C00826, FUEL BOOST PUMP TANK 1 AFT

C. Circuit Breakers

(1) This is the primary circuit breaker related to the fault:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	1	C00826	FUEL BOOST PUMP TANK 1 AFT

D. Related Data

(1) (SDS SUBJECT 28-22-00)

(2) (SSM 28-23-11)

(3) (WDM 28-23-11)

E. Initial Evaluation

NOTE: If you make a decision to dispatch the airplane with an open circuit breaker, do the steps in the MEL to deactivate the aft boost pump for the No. 1 tank. Operate the airplane per MEL procedures.

WARNING DO NOT CLOSE A GFI RELAY FOR A FUEL PUMP THAT OPENED (TRIPPED) UNTIL YOU CORRECT THE PROBLEM. THIS CONDITION CAN CAUSE A FIRE OR EXPLOSION.

(WARNING PRECEDES)

WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

(1) Do a visual inspection of the BOOST PUMP TANK 1 AFT GFI relay, R18:

NOTE: The GFI relay, R18, is on the P92 panel in the Electronic Equipment Compartment. You will need to open the panel to get access to the GFI relay.

28-AWL-18: CDCCL

(a) If the RESET button is out, and you can see the white band, then do the “Fault Isolation Procedure - BOOST PUMP TANK 1 AFT GFI Relay Open” in 28-22 TASK 803.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: The RESET button, found at the top edge of the GFI relay, moves out to show a narrow white band when the GFI circuit turns off the relay due to a ground fault, or when you push the TEST button found on the top surface of the relay.

(b) If the RESET button on the BOOST PUMP TANK 1 AFT GFI relay, R18, is not out and you cannot see the white band, then continue.

(2) Do a check of this circuit breaker:

(a) This is the circuit breaker:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	1	C00826	FUEL BOOST PUMP TANK 1 AFT

(3) If the circuit breaker is closed, do this task: Tank 1 AFT Pump LOW PRESSURE Light is ON - Fault Isolation, 28-22 TASK 803.

WARNING

DO NOT CLOSE A CIRCUIT BREAKER FOR A FUEL PUMP THAT OPENED (TRIPPED) UNTIL YOU CORRECT THE PROBLEM. THIS CONDITION CAN CAUSE A FIRE OR EXPLOSION.

28-AWL-18: CDCCL

(4) If the circuit breaker is open, do these steps:

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

28-AWL-18: CDCCL

(a) Install an approved for flight, open position circuit breaker lock, STD-1062, and safety tag on the circuit breaker.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

28-AWL-18: CDCCL

(b) Do the fault isolation steps in this procedure.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

F. Fault Isolation Procedure

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) Obey these precautions at all times during this task:

(a) To operate any of the fuel pumps, one person 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(es) to OFF if the LOW PRESSURE light comes on and stays on.

(2) Make sure there is minimum of 20,000 lb (9072 kg) of fuel in the center tank and 1000 lb (454 kg)) of fuel in the No. 1 tank.

NOTE: This will cover the boost pump and boost pump inlet with fuel.

(3) Get access to the aft fuel boost pump for the No. 1 tank (AMM TASK 28-22-41-000-801).

(4) Examine the fuel boost pump and the area around it for fuel leakage.

(a) If there are signs of fuel leakage, find the source of the fuel leakage and repair it.

(5) Do these steps to do a check of the 115V AC wiring, the circuit breaker, the relay, and the fuel boost pump:

(a) Disconnect the electrical connector, D70, from the fuel boost pump (WDM 28-23-11).

(b) Examine the airplane and pump sides of the electrical connector, D70, for damage.

1) Repair all damage that you find.

(c) Make sure that the electrical connector, D70, is disconnected.

(d) Remove the circuit breaker lock and safety tag, and close this circuit breaker:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	1	C00826	FUEL BOOST PUMP TANK 1 AFT

(e) On the P5 Overhead Panel, set the switch FUEL PUMP - TANK 1 - AFT to ON.

(f) After five minutes, set the switch FUEL PUMP - TANK 1 - AFT, on the P5 Overhead Panel, to OFF.

(g) If the circuit breaker stays closed, then do the subsequent steps:

1) Do a check for 3-phase 115V AC power between pins 1, 2, and 3 of electrical connector, D70 (WDM 28-23-11).

2) If there is 3-phase 115V AC power between pins 1, 2, and 3 of electrical connector, D70, do one of these steps:

a) For the No.1 aft boost pump, M46, do this task: Fuel Boost Pump - Insulation Resistance Test, AMM TASK 28-22-00-760-802.

<1> If the insulation resistance check is not OK, then replace the aft boost pump, M46, for the No. 1 tank.

These are the tasks:

Motor Impeller Removal, AMM TASK 28-22-41-000-801,

Motor Impeller Installation, AMM TASK 28-22-41-400-801.

<2> Do the Repair Confirmation at the end of this task.

b) Replace the aft boost pump, M46, for the No. 1 tank.

These are the tasks:

Motor Impeller Removal, AMM TASK 28-22-41-000-801,

Motor Impeller Installation, AMM TASK 28-22-41-400-801.

<1> Do the Repair Confirmation at the end of this task.

3) If there is not 3-phase 115V AC power between pins 1, 2, and 3 of electrical connector, D70, do these steps:

a) Replace the BOOST PUMP TANK 1 AFT relay, R18 (WDM 28-23-11).

<1> Do the Repair Confirmation at the end of this task.

(h) If the circuit breaker opened, then continue.

(6) Do these steps to do a check of the BOOST PUMP TANK 1 AFT relay, R18:

(a) Replace the BOOST PUMP TANK 1 AFT relay, R18 (WDM 28-23-11).

(b) Make sure that the electrical connector, D70, is disconnected.

(c) Close this circuit breaker:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	1	C00826	FUEL BOOST PUMP TANK 1 AFT

(d) On the P5 Overhead Panel, set the switch FUEL PUMP - TANK 1 - AFT to ON.

(e) After five minutes, set the switch FUEL PUMP - TANK 1 - AFT, on the P5 Overhead Panel, to OFF.

(f) If this circuit breaker stays closed, then do the Repair Confirmation at the end of this task.

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	1	C00826	FUEL BOOST PUMP TANK 1 AFT

(g) If this circuit breaker opened, then continue.

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	1	C00826	FUEL BOOST PUMP TANK 1 AFT

(7) Do these steps to do a check of the circuit breaker:

(a) Replace this circuit breaker:

(WDM 28-23-11)

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	1	C00826	FUEL BOOST PUMP TANK 1 AFT

(b) Make sure that the electrical connector, D70, is disconnected.

(c) Close this circuit breaker:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	1	C00826	FUEL BOOST PUMP TANK 1 AFT

(d) On the P5 Overhead Panel, set the switch FUEL PUMP - TANK 1 - AFT to ON.

(e) After five minutes, set the switch FUEL PUMP - TANK 1 - AFT, on the P5 Overhead Panel, to OFF.

(f) If this circuit breaker stays closed, then do the Repair Confirmation at the end of this task.

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	1	C00826	FUEL BOOST PUMP TANK 1 AFT

(g) If this circuit breaker opened, then continue.

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	1	C00826	FUEL BOOST PUMP TANK 1 AFT

(8) Do these steps to do a check of the 115V AC wiring for the boost pump:

(a) Do a wiring check between these pins of connector, D70, at the Tank No. 1 aft boost pump M46, and the circuit breaker, FUEL BOOST PUMP TANK 1 AFT (SSM 28-23-11):

D70		C00826
pin 1	. . . . .	pin A2
pin 2	. . . . .	pin B2
pin 3	. . . . .	pin C2

(b) Find the problem and repair the wiring.

(c) Make sure that the electrical connector, D70, is disconnected.

(d) Close this circuit breaker:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	1	C00826	FUEL BOOST PUMP TANK 1 AFT

(e) Do not re-connect electrical connector, D70, to the boost pump.

(f) On the P5 Overhead Panel, set the switch FUEL PUMP - TANK 1 - AFT to ON.

(g) After five minutes, set the switch FUEL PUMP - TANK 1 - AFT, on the P5 Overhead Panel, to OFF.

(h) Make sure this circuit breaker stays closed:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	1	C00826	FUEL BOOST PUMP TANK 1 AFT

(i) Do the Repair Confirmation at the end of this task.

G. Repair Confirmation

(1) Connect the electrical connector, D70, to the Tank No. 1 aft boost pump (WDM 28-23-11).

(2) On the P5 Overhead Panel, set the switch FUEL PUMP - TANK 1 - AFT to ON.

(3) On the P5 Overhead Panel, make sure that the amber PRESS light FUEL PUMP TANK 1 - AFT goes off.

(4) After five minutes, set the switch FUEL PUMP - TANK 1 - AFT, on the P5 Overhead Panel, to OFF.

(5) If this circuit breaker stays closed, then you corrected the fault.

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	1	C00826	FUEL BOOST PUMP TANK 1 AFT

——— END OF TASK ———

815. No. 2 Tank, Forward Boost Pump Circuit Breaker Open - Fault Isolation

A. Description

28-AWL-18: CDCCL

(1) The circuit breaker, FUEL BOOST PUMP TANK 2 FWD is found to be open during flight or on the ground. Do not reset this circuit breaker before you do the Initial Evaluation below. This problem can be caused by a short circuit in the wiring for the boost pump, a damaged boost pump, or a damaged circuit breaker or relay.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

B. Possible Causes

(1) 115V AC Wiring

(2) No. 2 tank forward boost pump relay, R21

(3) No. 2 tank forward boost pump, M49

(4) Circuit breaker, C00829, FUEL BOOST PUMP TANK 2 FWD

C. Circuit Breakers

(1) This is the primary circuit breaker related to the fault:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	3	C00829	FUEL BOOST PUMP TANK 2 FWD

D. Related Data

(1) (SDS SUBJECT 28-22-00)

(2) (SSM 28-23-11)

(3) (WDM 28-23-11)

E. Initial Evaluation

NOTE: If you make a decision to dispatch the airplane with an open circuit breaker, do the steps in the MEL to deactivate the forward boost pump for the No. 2 tank. Operate the airplane per MEL procedures.

WARNING

DO NOT CLOSE A GFI RELAY FOR A FUEL PUMP THAT OPENED (TRIPPED) UNTIL YOU CORRECT THE PROBLEM. THIS CONDITION CAN CAUSE A FIRE OR EXPLOSION.

WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

(1) Do a visual inspection of the BOOST PUMP TANK 2 FWD GFI relay, R21:

NOTE: The GFI relay, R21, is on the P92 panel in the Electronic Equipment Compartment. You will need to open the panel to get access to the GFI relay.

28-AWL-18: CDCCL

(a) If the RESET button is out, and you can see the white band, then do the “Fault Isolation Procedure - BOOST PUMP TANK 2 FWD GFI Relay Open” in 28-22 TASK 806.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: The RESET button, found at the top edge of the GFI relay, moves out to show a narrow white band when the GFI circuit turns off the relay due to a ground fault, or when you push the TEST button found on the top surface of the relay.

(b) If the RESET button on the BOOST PUMP TANK 2 FWD GFI relay, R21, is not out and you cannot see the white band, then continue.

(2) Do a check of this circuit breaker:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	3	C00829	FUEL BOOST PUMP TANK 2 FWD

(3) If the circuit breaker is closed, do this task: Tank 2 FWD Pump LOW PRESSURE Light is ON - Fault Isolation, 28-22 TASK 806.

WARNING DO NOT CLOSE A CIRCUIT BREAKER FOR A FUEL PUMP THAT OPENED (TRIPPED) UNTIL YOU CORRECT THE PROBLEM. THIS CONDITION CAN CAUSE A FIRE OR EXPLOSION.

28-AWL-18: CDCCL

(4) If the circuit breaker opened, do these steps:

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

28-AWL-18: CDCCL

(a) Install an approved for flight, open position circuit breaker lock, STD-1062, and safety tag on the circuit breaker.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

28-AWL-18: CDCCL

(b) Do the troubleshooting steps in this procedure.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

F. Fault Isolation Procedure

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) Obey these precautions at all times during this task:

(a) To operate any of the fuel pumps, on person 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(es) to OFF if the LOW PRESSURE light comes on and stays on.

(2) Make sure there is minimum of 20,000 lb (9072 kg) of fuel in the center tank and 1000 lb (454 kg)) of fuel in the No. 2 tank.

NOTE: This will cover the boost pump and boost pump inlet with fuel.

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) Do this task: Leading Edge Flaps and Slats Extension, AMM TASK 27-81-00-860-803.

(4) Get access to the forward fuel boost pump for the No. 2 tank (AMM TASK 28-22-41-000-801).

(5) Examine the fuel boost pump and the area around it for fuel leakage.

(a) If there are signs of fuel leakage, find the source of the fuel leakage and repair it.

(6) Do these steps to do a check of the 115V AC wiring, the circuit breaker, the relay, and the fuel boost pump:

(a) Disconnect the electrical connector, D76, from the fuel boost pump (WDM 28-23-11).

(b) Examine the airplane and pump sides of the electrical connector, D76, for damage.

1) Repair all damage that you find.

(c) Make sure that the electrical connector, D76, is disconnected.

(d) Remove the circuit breaker lock and safety tag, and close this circuit breaker:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	3	C00829	FUEL BOOST PUMP TANK 2 FWD

(e) On the P5 Overhead Panel, set the switch FUEL PUMP - TANK 2 - FWD to ON.

(f) After five minutes, set the switch FUEL PUMP - TANK 2 - FWD, on the P5 Overhead Panel, to OFF.

(g) If the circuit breaker stays closed, then do the subsequent steps:

1) Do a check for 3-phase 115V AC power between pins 1, 2, and 3 of electrical connector, D76 (WDM 28-23-11).

2) If there is 3-phase 115V AC power between pins 1, 2, and 3 of electrical connector, D76, do one of these steps:

a) For the No. 2 forward boost pump, M49, do this task: Fuel Boost Pump - Insulation Resistance Test, AMM TASK 28-22-00-760-802.

<1> If the insulation resistance test is not OK, replace the forward boost pump, M49, for the No. 2 tank.

These are the tasks:

Motor Impeller Removal, AMM TASK 28-22-41-000-801,

Motor Impeller Installation, AMM TASK 28-22-41-400-801.

<2> Do the Repair Confirmation at the end of this task.

b) Replace the forward boost pump, M49, for the No. 2 tank.

These are the tasks:

Motor Impeller Removal, AMM TASK 28-22-41-000-801,

Motor Impeller Installation, AMM TASK 28-22-41-400-801.

<1> Do the Repair Confirmation at the end of the task.

3) If there is not 3-phase 115V AC power between pins 1, 2, and 3 of electrical connector, D76, do these steps:

a) Replace the BOOST PUMP TANK 2 FWD relay, R21 (WDM 28-23-11).

<1> Do the Repair Confirmation at the end of this task.

(h) If the circuit breaker opened, then continue.

(7) Do these steps to do a check of the BOOST PUMP TANK 2 FWD relay, R21:

(a) Replace the BOOST PUMP TANK 2 FWD relay, R21 (SSM 28-23-11).

(b) Make sure that the electrical connector, D76, is disconnected.

(c) Close this circuit breaker:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	3	C00829	FUEL BOOST PUMP TANK 2 FWD

(d) On the P5 Overhead Panel, set the switch FUEL PUMP - TANK 2 - FWD to ON.

(e) After five minutes, set the switch FUEL PUMP - TANK 2 - FWD, on the P5 Overhead Panel, to OFF.

(f) If this circuit breaker stays closed, then do the Repair Confirmation at the end of this task.

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	3	C00829	FUEL BOOST PUMP TANK 2 FWD

(g) If this circuit breaker opened, then continue.

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	3	C00829	FUEL BOOST PUMP TANK 2 FWD

(8) Do these steps to do a check of the circuit breaker:

(a) Replace this circuit breaker:

(WDM 28-23-11)

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	3	C00829	FUEL BOOST PUMP TANK 2 FWD

(b) Make sure that the electrical connector, D76, is disconnected.

(c) Close this circuit breaker:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	3	C00829	FUEL BOOST PUMP TANK 2 FWD

(d) On the P5 Overhead Panel, set the switch FUEL PUMP - TANK 2 - FWD to ON.

(e) After five minutes, set the switch FUEL PUMP - TANK 2 - FWD, on the P5 Overhead Panel, to OFF.

(f) If this circuit breaker stays closed, then do the Repair Confirmation at the end of this task.

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	3	C00829	FUEL BOOST PUMP TANK 2 FWD

(g) If this circuit breaker opened, then continue.

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	3	C00829	FUEL BOOST PUMP TANK 2 FWD

(9) Do these steps to do a check of the 115V AC wiring for the boost pump:

(a) Do a wiring check between these pins of connector, D76, at the Tank No. 2 aft boost pump, M49, and the circuit breaker, FUEL BOOST PUMP TANK 2 FWD (SSM 28-23-11):

D76		C00829
pin 1	. . . . .	pin A2
pin 2	. . . . .	pin B2
pin 3	. . . . .	pin C2

(b) Find the problem and repair the wiring.

(c) Make sure that the electrical connector, D76, is disconnected.

(d) Close this circuit breaker:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	3	C00829	FUEL BOOST PUMP TANK 2 FWD

(e) Do not re-connect electrical connector, D76, to the boost pump.

(f) On the P5 Overhead Panel, set the switch FUEL PUMP - TANK 2 - FWD to ON.

(g) After five minutes, set the switch FUEL PUMP - TANK 2 - FWD, on the P5 Overhead Panel, to OFF.

(h) Make sure this circuit breaker stays closed:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	3	C00829	FUEL BOOST PUMP TANK 2 FWD

(i) Do the Repair Confirmation at the end of this task.

G. Repair Confirmation

(1) Connect the electrical connector, D76, to the Tank No. 2 forward boost pump (WDM 28-23-11).

(2) On the P5 Overhead Panel, set the switch FUEL PUMP - TANK 2 - FWD to ON.

(3) On the P5 Overhead Panel, make sure that the amber PRESS light FUEL PUMP TANK 2 - FWD goes off.

(4) After five minutes, set the switch FUEL PUMP - TANK 2 - FWD, on the P5 Overhead Panel, to OFF.

(5) If this circuit breaker stays closed, then you corrected the fault.

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	3	C00829	FUEL BOOST PUMP TANK 2 FWD

——— END OF TASK ———

816. No. 2 Tank, Aft Boost Pump Circuit Breaker Open - Fault Isolation

A. Description

28-AWL-18: CDCCL

(1) The circuit breaker, FUEL BOOST PUMP TANK 2 AFT, is found to be open during flight or on the ground. Do not reset this circuit breaker before you do the Initial Evaluation below. This problem can be caused by a short circuit in the wiring for the boost pump, a damaged boost pump, or a damaged circuit breaker or relay.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

B. Possible Causes

(1) 115V AC Wiring

(2) No. 2 tank aft boost pump relay, R20

(3) No. 2 tank aft boost pump, M48

(4) Circuit breaker, C00828, FUEL BOOST PUMP TANK 2 AFT

C. Circuit Breakers

(1) This is the primary circuit breaker related to the fault:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	3	C00828	FUEL BOOST PUMP TANK 2 AFT

D. Related Data

(1) (SDS SUBJECT 28-22-00)

(2) (SSM 28-23-11)

(3) (WDM 28-23-11)

E. Initial Evaluation

NOTE: If you make a decision to dispatch the airplane with an open circuit breaker, do the steps in the MEL to deactivate the aft boost pump for the No. 2 tank. Operate the airplane per MEL procedures.

WARNING DO NOT CLOSE A GFI RELAY FOR A FUEL PUMP THAT OPENED (TRIPPED) UNTIL YOU CORRECT THE PROBLEM. THIS CONDITION CAN CAUSE A FIRE OR EXPLOSION.

(WARNING PRECEDES)

WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

(1) Do a visual inspection of the BOOST PUMP TANK 2 AFT GFI relay, R20:

NOTE: The GFI relay, R20, is on the P91 panel in the Electronic Equipment Compartment. You will need to open the panel to get access to the GFI relay.

28-AWL-18: CDCCL

(a) If the RESET button is out, and you can see the white band, then do the “Fault Isolation Procedure - BOOST PUMP TANK 2 AFT GFI Relay Open” in 28-22 TASK 805.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: The RESET button, found at the top edge of the GFI relay, moves out to show a narrow white band when the GFI circuit turns off the relay due to a ground fault, or when you push the TEST button found on the top surface of the relay.

(b) If the RESET button on the BOOST PUMP TANK 2 AFT GFI relay, R20, is not out and you cannot see the white band, then continue.

(2) Do a check of this circuit breaker:

(a) This is the circuit breaker:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	3	C00828	FUEL BOOST PUMP TANK 2 AFT

(3) If the circuit breaker is closed, do this task: Tank 2 AFT Pump LOW PRESSURE Light is ON - Fault Isolation, 28-22 TASK 805.

WARNING

DO NOT CLOSE A CIRCUIT BREAKER FOR A FUEL PUMP THAT OPENED (TRIPPED) UNTIL YOU CORRECT THE PROBLEM. THIS CONDITION CAN CAUSE A FIRE OR EXPLOSION.

28-AWL-18: CDCCL

(4) If the circuit breaker is open, then do these steps:

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

28-AWL-18: CDCCL

(a) Install an approved for flight, open position circuit breaker lock, STD-1062, and safety tag on the circuit breaker.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

28-AWL-18: CDCCL

(b) Do the troubleshooting steps in this procedure.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

F. Fault Isolation Procedure

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) Obey these precautions at all times during this task:

(a) To operate any of the fuel pumps, one person 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(es) to OFF if the LOW PRESSURE light comes on and stays on.

(2) Make sure there is minimum of 20,000 lb (9072 kg) of fuel in the center tank and 1000 lb (454 kg)) of fuel in the No. 2 tank.

NOTE: This will cover the boost pump and boost pump inlet with fuel.

(3) Get access to the aft fuel boost pump for the No. 2 tank (AMM TASK 28-22-41-000-801).

(4) Examine the fuel boost pump and the area around it for fuel leakage.

(a) If there are signs of fuel leakage, find the source of the fuel leakage and repair it.

(5) Do these steps to do a check of the 115V AC wiring, the circuit breaker, the relay, and the boost pump:

(a) Disconnect the electrical connector, D74, from the fuel boost pump (WDM 28-23-11).

(b) Examine the airplane and pump sides of the electrical connector, D74, for damage.

1) Repair all damage that you find.

(c) Make sure that the electrical connector, D74, is disconnected.

(d) Remove the circuit breaker lock and safety tag, and close this circuit breaker:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	3	C00828	FUEL BOOST PUMP TANK 2 AFT

(e) On the P5 Overhead Panel, set the switch FUEL PUMP - TANK 2 - AFT to ON.

(f) After five minutes, set the switch FUEL PUMP - TANK 2 - AFT, on the P5 Overhead Panel, to OFF.

(g) If the circuit breaker stays closed, then do the subsequent steps:

1) Do a check for 3-phase 115V AC power between pins 1, 2, and 3 of electrical connector, D74 (WDM 28-23-11).

2) If there is 3-phase 115V AC power between pins 1, 2, and 3 of electrical connector, D74, do one of these steps:

a) For the No. 2 aft boost pump, M48, do this task: Fuel Boost Pump - Insulation Resistance Test, AMM TASK 28-22-00-760-802.

<1> If the insulation resistance test is not OK, replace the aft boost pump, M48, for the No. 2 tank.

These are the tasks:

Motor Impeller Removal, AMM TASK 28-22-41-000-801,

Motor Impeller Installation, AMM TASK 28-22-41-400-801.

<2> Do the Repair Confirmation at the end of this task.

b) Replace the aft boost pump, M48, for the No. 2 tank.

These are the tasks:

Motor Impeller Removal, AMM TASK 28-22-41-000-801,

Motor Impeller Installation, AMM TASK 28-22-41-400-801.

<1> Do the Repair Confirmation at the end of this task.

3) If there is not 3-phase 115V AC power between pins 1, 2, and 3 of electrical connector, D74, do these steps:

a) Replace the BOOST PUMP TANK 2 AFT relay, R20 (WDM 28-23-11).

<1> Do the Repair Confirmation at the end of this task.

(h) If the circuit breaker opened, then continue.

(6) Do these steps to do a check of the BOOST PUMP TANK 2 AFT relay, R20:

(a) Replace the BOOST PUMP TANK 2 AFT relay, R20 (SSM 28-23-11).

(b) Make sure that the electrical connector, D74, is disconnected.

(c) Close this circuit breaker:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	3	C00828	FUEL BOOST PUMP TANK 2 AFT

(d) On the P5 Overhead Panel, set the switch FUEL PUMP - TANK 2 - AFT to ON.

(e) After five minutes, set the switch FUEL PUMP - TANK 2 - AFT, on the P5 Overhead Panel, to OFF.

(f) If this circuit breaker stays closed, then do the Repair Confirmation at the end of this task.

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	3	C00828	FUEL BOOST PUMP TANK 2 AFT

(g) If this circuit breaker opened, then continue.

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	3	C00828	FUEL BOOST PUMP TANK 2 AFT

(7) Do these steps to do a check of the circuit breaker:

(a) Replace this circuit breaker:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	3	C00828	FUEL BOOST PUMP TANK 2 AFT

(WDM 28-23-11).

(b) Make sure that the electrical connector, D74, is disconnected.

(c) Close this circuit breaker:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	3	C00828	FUEL BOOST PUMP TANK 2 AFT

(d) On the P5 Overhead Panel, set the switch FUEL PUMP - TANK 2 - AFT to ON.

(e) After five minutes, set the switch FUEL PUMP - TANK 2 - AFT, on the P5 Overhead Panel, to OFF.

(f) If this circuit breaker stays closed, then do the Repair Confirmation at the end of this task.

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	3	C00828	FUEL BOOST PUMP TANK 2 AFT

(g) If this circuit breaker opened, then continue.

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	3	C00828	FUEL BOOST PUMP TANK 2 AFT

(8) Do these steps to do a check of the 115V AC wiring for the boost pump:

(a) Do a wiring check between these pins of connector, D74, at the Tank No. 2 aft boost pump, M48, and the circuit breaker, FUEL BOOST PUMP TANK 2 AFT (SSM 28-23-11):

D74		C00828
pin 1	. . . . .	pin A2
pin 2	. . . . .	pin B2
pin 3	. . . . .	pin C2

(b) Find the problem and repair the wiring.

(c) Make sure that the electrical connector, D74, is disconnected.

(d) Close this circuit breaker:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	3	C00828	FUEL BOOST PUMP TANK 2 AFT

(e) Do not re-connect electrical connector, D74, to the boost pump.

(f) On the P5 Overhead Panel, set the switch FUEL PUMP - TANK 2 - AFT to ON.

(g) After five minutes, set the switch FUEL PUMP - TANK 2 - AFT, on the P5 Overhead Panel, to OFF.

(h) Make sure this circuit breaker stays closed:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	3	C00828	FUEL BOOST PUMP TANK 2 AFT

(i) Do the Repair Confirmation at the end of this task.

G. Repair Confirmation

(1) Connect the electrical connector, D74, to the Tank No. 2 aft boost pump (WDM 28-23-11).

(2) On the P5 Overhead Panel, set the switch FUEL PUMP - TANK 2 - AFT to ON.

(3) On the P5 Overhead Panel, make sure that the amber PRESS light FUEL PUMP TANK 2 - AFT goes off.

(4) After five minutes, set the switch FUEL PUMP - TANK 2 - AFT, on the P5 Overhead Panel, to OFF.

(5) If this circuit breaker stays closed, then you corrected the fault.

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	3	C00828	FUEL BOOST PUMP TANK 2 AFT

——— END OF TASK ———

817. Center Tank, Left Boost Pump Circuit Breaker Open - Fault Isolation

A. Description

28-AWL-18: CDCCL

(1) The circuit breaker, BOOST PUMP CTR TANK LEFT, is found to be open during flight or on the ground. Do not reset this circuit breaker before you do the Initial Evaluation below. This problem can be caused by a short circuit in the wiring for the boost pump, a damaged boost pump, or a damaged circuit breaker or relay.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

B. Possible Causes

(1) 115V AC Wiring

(2) Center Tank Left Boost Pump Relay, R54

(3) Center Tank Left Boost Pump, M234

(4) Circuit breaker, C00845, BOOST PUMP CENTER TANK LEFT

C. Circuit Breakers

(1) This is the primary circuit breaker related to the fault:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	5	C00845	FUEL BOOST PUMP CTR TANK LEFT

D. Related Data

(1) SDS SUBJECT 28-22-00

(2) SSM 28-23-11

(3) WDM 28-23-11

E. Initial Evaluation

NOTE: If you make a decision to dispatch the airplane with an open circuit breaker, do the steps in the Minimum Equipment List (MEL) to deactivate the Left Boost Pump for the Center Tank. Operate the airplane per MEL procedures.

WARNING DO NOT CLOSE A GFI RELAY FOR A FUEL PUMP THAT OPENED (TRIPPED) UNTIL YOU CORRECT THE PROBLEM. THIS CONDITION CAN CAUSE A FIRE OR EXPLOSION.

WARNING DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

(1) Do a visual inspection of the left boost pump GFI relay, R54:

NOTE: The GFI relay, R54, is on the P91 panel in the Electronic Equipment Compartment. You will need to open the panel to get access to the GFI relay.

28-AWL-18: CDCCL

(a) If the RESET button is out, and you can see the white band, then do the “Fault Isolation Procedure - Left Boost Pump GFI Relay Open” in 28-22 TASK 801.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: The RESET button, found at the top edge of the GFI relay, moves out to show a narrow white band when the GFI circuit turns off the relay due to a ground fault, or when you push the TEST button found on the top surface of the relay.

(b) If the RESET button on the left boost pump GFI relay, R54, is not out and you cannot see the white band, then continue.

(2) Do a check of this circuit breaker:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	5	C00845	FUEL BOOST PUMP CTR TANK LEFT

(3) If the circuit breaker is closed, do this task: Center Tank Left Fuel Pump LOW PRESSURE Light is ON - Fault Isolation, 28-22 TASK 801.

WARNING

DO NOT CLOSE A CIRCUIT BREAKER FOR A FUEL PUMP THAT OPENED (TRIPPED) UNTIL YOU CORRECT THE PROBLEM. THIS CONDITION CAN CAUSE A FIRE OR EXPLOSION.

28-AWL-18: CDCCL

(4) If the circuit breaker is open, do these steps:

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

28-AWL-18: CDCCL

(a) Install an approved for flight, open position circuit breaker lock, STD-1062, and safety tag on the circuit breaker.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

28-AWL-18: CDCCL

(b) Do the troubleshooting steps in this procedure.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

F. Fault Isolation Procedure

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) Obey these precautions at all times during this task:

(a) To operate any of the fuel pumps, one person 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(es) to OFF if the LOW PRESSURE Light comes ON and stays ON.

(2) Make sure that there is minimum of 20,000 lb (9072 kg) of fuel in the Center Tank.

NOTE: This will cover the boost pump with fuel.

WARNING

OBEY THE PROCEDURE FOR THE INSTALLATION OF THE DOWNLOCK PINS. IF YOU MOVE THE CONTROL LEVER FOR THE LANDING GEAR TO THE UP POSITION, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

(3) If the downlock pins are not installed, do this task: Landing Gear Downlock Pins Installation, AMM TASK 32-00-01-480-801.

(4) Get access to the Left Fuel Boost Pump for the Center Tank (AMM TASK 28-22-41-000-801).

(5) Examine the Left Fuel Boost Pump and the area around it for fuel leakage.

(a) If there are signs of fuel leakage, find the source of the fuel leakage and repair it.

(6) Do these steps to do a check of the 115V AC wiring, the circuit breaker, the relay, and the boost pump:

(a) Disconnect the electrical connector D802 from the Left Fuel Boost Pump (WDM 28-23-11).

(b) Examine the airplane and pump sides of the electrical connector D802 for damage.

1) Repair all damage that you find.

(c) Make sure that the electrical connector D802 is disconnected.

(d) Remove the circuit breaker lock and safety tag, and close this circuit breaker:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	5	C00845	FUEL BOOST PUMP CTR TANK LEFT

(e) On the Overhead Panel, P5, set the CTR FUEL PUMPS - L Switch to ON.

(f) After five minutes, set the CTR FUEL PUMPS - L Switch, on the Overhead Panel, P5, to OFF.

(g) If the circuit breaker stays closed, set the CTR FUEL PUMPS - L Switch, on the Overhead Panel, P5, to ON and do the subsequent steps:

NOTE: For aircraft with Auto Shutoff System, 115V AC check must be carried out within 15 seconds of switching the pumps on otherwise the pump will turn off if the pump pressure switch still provides low pressure signal.

1) Do a check for 3-phase 115V AC power between pins 1, 2, and 3 of electrical connector D802 (WDM 28-23-11).

2) If there is 3-phase 115V AC power between pins 1, 2, and 3 of electrical connector D802, do one of these steps:

a) For the Center Tank Left Boost Pump, M234, do this task: Fuel Boost Pump - Insulation Resistance Test, AMM TASK 28-22-00-760-802.

<1> If the insulation resistance test is not OK, replace the Center Tank Left Boost Pump, M234. These are the tasks:

- Motor Impeller Removal, AMM TASK 28-22-41-000-801
- Motor Impeller Installation, AMM TASK 28-22-41-400-801

<2> Do the Repair Confirmation at the end of this task.

b) Replace the Center Tank Left Boost Pump, M234. These are the tasks:

- Motor Impeller Removal, AMM TASK 28-22-41-000-801
- Motor Impeller Installation, AMM TASK 28-22-41-400-801

<1> Do the Repair Confirmation at the end of this task.

3) If there is not 3-phase 115V AC power between pins 1, 2, and 3 of electrical connector D802, do these steps:

a) Replace the Center Tank Left Boost Pump Relay, R54 (WDM 28-23-11).

<1> Do the Repair Confirmation at the end of this task.

(h) If the circuit breaker opened, then continue.

(7) Do these steps to do a check of the Center Tank Left Boost Pump Relay, R54:

(a) Replace the Center Tank Left Boost Pump Relay, R54 (SSM 28-23-11).

(b) Make sure that the electrical connector D802 is disconnected.

(c) Close this circuit breaker:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	5	C00845	FUEL BOOST PUMP CTR TANK LEFT

(d) On the Overhead Panel, P5, set the CTR FUEL PUMPS - L Switch to ON.

(e) After five minutes, set the CTR FUEL PUMPS - L Switch, on the Overhead Panel, P5, to OFF.

(f) If this circuit breaker stays closed, then do the Repair Confirmation at the end of this task.

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	5	C00845	FUEL BOOST PUMP CTR TANK LEFT

(g) If this circuit breaker opened, then continue.

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	5	C00845	FUEL BOOST PUMP CTR TANK LEFT

(8) Do these steps to do a check of the circuit breaker:

(a) Replace this circuit breaker:

(WDM 28-23-11)

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	5	C00845	FUEL BOOST PUMP CTR TANK LEFT

(b) Make sure that the electrical connector D802 is disconnected.

(c) Close this circuit breaker:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	5	C00845	FUEL BOOST PUMP CTR TANK LEFT

(d) On the Overhead Panel, P5, set the CTR FUEL PUMPS - L Switch to ON.

(e) After five minutes, set the CTR FUEL PUMPS - L Switch, on the Overhead Panel, P5, to OFF.

(f) If this circuit breaker stays closed, then do the Repair Confirmation at the end of this task.

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	5	C00845	FUEL BOOST PUMP CTR TANK LEFT

(g) If this circuit breaker opened, then continue.

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	5	C00845	FUEL BOOST PUMP CTR TANK LEFT

(9) Do these steps to do a check of the 115V AC wiring for the boost pump:

(a) Do a wiring check between these pins of connector D802 at the Center Tank Left Boost Pump, M234 and the circuit breaker, BOOST PUMP CTR TANK LEFT (SSM 28-23-11):

CTR TNK L BOOST PMP D802		FUEL BOOST PUMP CTR TANK LEFT C00845
pin 1	. . . . .	pin A2
pin 2	. . . . .	pin B2
pin 3	. . . . .	pin C2

(b) Find the problem and repair the wiring.

(c) Make sure that the electrical connector D802 is disconnected.

(d) Close this circuit breaker:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	5	C00845	FUEL BOOST PUMP CTR TANK LEFT

(e) Do not re-connect electrical connector D802 to the boost pump.

(f) On the Overhead Panel, P5, set the CTR FUEL PUMPS - L Switch to ON.

(g) After five minutes, set the CTR FUEL PUMPS - L Switch, on the Overhead Panel, P5, to OFF.

(h) Make sure this circuit breaker stays closed:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	5	C00845	FUEL BOOST PUMP CTR TANK LEFT

(i) Do the Repair Confirmation at the end of this task.

G. Repair Confirmation

(1) Connect the electrical connector D802 to the Left Center Tank Boost Pump (WDM 28-23-11).

(2) On the Overhead Panel, P5, set the CTR FUEL PUMPS - L Switch to ON.

(a) You must be in the Flight Compartment and continuously monitor for the amber PRESS Light CTR FUEL PUMPS - L.

(3) On the Overhead Panel, P5, make sure that the amber PRESS Light CTR FUEL PUMPS - L goes OFF.

(a) If the amber PRESS Light CTR FUEL PUMPS - L stays ON, immediately set the CTR FUEL PUMPS - L Switch, on the Overhead Panel, P5, to OFF.

(4) After five minutes, set the CTR FUEL PUMPS - L Switch, on the Overhead Panel, P5, to OFF.

(5) If this circuit breaker stays closed, then you corrected the problem.

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	5	C00845	FUEL BOOST PUMP CTR TANK LEFT

——— END OF TASK ———

818. Center Tank, Right Boost Pump Circuit Breaker Open - Fault Isolation

A. Description

28-AWL-18: CDCCL

(1) The circuit breaker, BOOST PUMP CTR TANK RIGHT, is found to be open during flight or on the ground. Do not reset this circuit breaker before you do the Initial Evaluation below. This problem can be caused by a short circuit in the wiring for the boost pump, a damaged boost pump, or a damaged circuit breaker or relay.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

B. Possible Causes

(1) 115V AC Wiring

(2) Center Tank Right Boost Pump Relay, R55

(3) Center Tank Right Boost Pump, M235

(4) Circuit breaker, C00846, BOOST PUMP CENTER TANK RIGHT

C. Circuit Breakers

(1) This is the primary circuit breaker related to the fault:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	5	C00846	FUEL BOOST PUMP CTR TANK RIGHT

D. Related Data

(1) SDS SUBJECT 28-22-00

(2) SSM 28-23-11

(3) WDM 28-23-11

E. Initial Evaluation

NOTE: If you make a decision to dispatch the airplane with an open circuit breaker, do the steps in the MEL to deactivate the Right Boost Pump for the Center Tank. Operate the airplane per MEL procedures.

WARNING

DO NOT CLOSE A GFI RELAY FOR A FUEL PUMP THAT OPENED (TRIPPED) UNTIL YOU CORRECT THE PROBLEM. THIS CONDITION CAN CAUSE A FIRE OR EXPLOSION.

WARNING

DO NOT TOUCH THE CONDUCTORS IN THE P91 AND P92 PANELS. BE CAREFUL WHEN YOU GET ACCESS TO THE CIRCUIT BREAKERS ON THE INNER SIDE OF THE P91 AND P92 PANELS (ROW F). IF IT IS POSSIBLE, REMOVE AIRPLANE ELECTRICAL POWER FIRST. THE P91 AND P92 PANELS HAVE HIGH VOLTAGES AND CURRENTS. ELECTRICAL VOLTAGE AND CURRENT CAN KILL YOU OR CAUSE INJURIES.

(1) Do a visual inspection of the right boost pump GFI relay, R55:

NOTE: The GFI relay, R55, is on the P92 panel in the Electronic Equipment Compartment. You will need to open the panel to get access to the GFI relay.

28-AWL-18: CDCCL

(a) If the RESET button is out, and you can see the white band, then do the “Fault Isolation Procedure - Right Boost Pump GFI Relay Open” in 28-22 TASK 802.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

NOTE: The RESET button, found at the top edge of the GFI relay, moves out to show a narrow white band when the GFI circuit turns off the relay due to a ground fault, or when you push the TEST button found on the top surface of the relay.

(b) If the RESET button on the right boost pump GFI relay, R55, is not out and you cannot see the white band, then continue.

(2) Do a check of this circuit breaker:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	5	C00846	FUEL BOOST PUMP CTR TANK RIGHT

(3) If the circuit breaker is closed, do this task: Center Tank Right Fuel Pump LOW PRESSURE Light is ON - Fault Isolation, 28-22 TASK 802.

WARNING DO NOT CLOSE A CIRCUIT BREAKER FOR A FUEL PUMP THAT OPENED (TRIPPED) UNTIL YOU CORRECT THE PROBLEM. THIS CONDITION CAN CAUSE A FIRE OR EXPLOSION.

28-AWL-18: CDCCL

(4) If the circuit breaker is open, do these steps:

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

28-AWL-18: CDCCL

(a) Install an approved for flight, open position circuit breaker lock, STD-1062, and safety tag on the circuit breaker.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

28-AWL-18: CDCCL

(b) Do the troubleshooting steps in this procedure.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-18.

F. Fault Isolation Procedure

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) Obey these precautions at all times during this task:

(a) To operate any of the fuel pumps, one person 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(es) to OFF if the LOW PRESSURE Light comes ON and stays ON.

(2) Make sure that there is minimum of 20,000 lb (9072 kg) of fuel in the Center Tank.

NOTE: This will cover the boost pump with fuel.

WARNING OBEY THE PROCEDURE FOR THE INSTALLATION OF THE DOWNLOCK PINS. IF YOU MOVE THE CONTROL LEVER FOR THE LANDING GEAR TO THE UP POSITION, THE LANDING GEAR CAN RETRACT. THIS CAN CAUSE INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT.

(3) If the downlock pins are not installed, do this task: Landing Gear Downlock Pins Installation, AMM TASK 32-00-01-480-801.

(4) Get access to the Right Fuel Boost Pump for the Center Tank (AMM TASK 28-22-41-000-801).

(5) Examine the Right Fuel Boost Pump and the area around it for fuel leakage.

(a) If there are signs of fuel leakage, find the source of the fuel leakage and repair it.

(6) Do these steps to do a check of the 115V AC wiring, the circuit breaker, the relay, and the boost pump:

(a) Disconnect the electrical connector D804 from the Right Fuel Boost Pump (WDM 28-23-11).

(b) Examine the airplane and pump sides of the electrical connector D804 for damage.

1) Repair all damage that you find.

(c) Make sure that the electrical connector D804 is disconnected.

(d) Remove the circuit breaker lock and safety tag, and close this circuit breaker:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	5	C00846	FUEL BOOST PUMP CTR TANK RIGHT

(e) On the Overhead Panel, P5, set the CTR FUEL PUMPS - R Switch to ON.

(f) After five minutes, set the CTR FUEL PUMPS - R Switch, on the Overhead Panel, P5, to OFF.

(g) If the circuit breaker stays closed, set the CTR FUEL PUMPS - R Switch, on the Overhead Panel, P5, to ON and do the subsequent steps:

NOTE: For aircraft with Auto Shutoff System, 115V AC check must be carried out within 15 seconds of switching the pumps on otherwise the pump will turn off if the pump pressure switch still provides low pressure signal.

1) Do a check for 3-phase 115V AC power between pins 1, 2, and 3 of electrical connector D804 (WDM 28-23-11).

2) If there is 3-phase 115V AC power between pins 1, 2, and 3 of electrical connector D804, do one of these steps:

a) For the Center Tank Right Boost Pump, M235, do this task: Fuel Boost Pump - Insulation Resistance Test, AMM TASK 28-22-00-760-802.

<1> If the insulation resistance test is not OK, replace the Center Tank Right Boost Pump, M235. These are the tasks:

- Motor Impeller Removal, AMM TASK 28-22-41-000-801
- Motor Impeller Installation, AMM TASK 28-22-41-400-801

<2> Do the Repair Confirmation at the end of this task.

b) Replace the Center Tank Right Boost Pump, M235. These are the tasks:

- Motor Impeller Removal, AMM TASK 28-22-41-000-801

- Motor Impeller Installation, AMM TASK 28-22-41-400-801

<1> Do the Repair Confirmation at the end of this task.

3) If there is not 3-phase 115V AC power between pins 1, 2, and 3 of electrical connector D804, do these steps:

a) Replace the Center Tank Right Boost Pump Relay, R55 (WDM 28-23-11).

<1> Do the Repair Confirmation at the end of this task.

(h) If the circuit breaker opened, then continue.

(7) Do these steps to do a check of the Center Tank Right Boost Pump Relay, R55:

(a) Replace the Center Tank Right Boost Pump Relay, R55 (SSM 28-23-11).

(b) Make sure that the electrical connector D804 is disconnected.

(c) Close this circuit breaker:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	5	C00846	FUEL BOOST PUMP CTR TANK RIGHT

(d) On the Overhead Panel, P5, set the CTR FUEL PUMPS - R Switch to ON.

(e) After five minutes, set the CTR FUEL PUMPS - R Switch, on the Overhead Panel, P5, to OFF.

(f) If this circuit breaker stays closed, then do the Repair Confirmation at the end of this task.

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	5	C00846	FUEL BOOST PUMP CTR TANK RIGHT

(g) If this circuit breaker opened, then continue.

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	5	C00846	FUEL BOOST PUMP CTR TANK RIGHT

(8) Do these steps to do a check of the circuit breaker:

(a) Replace this circuit breaker:

(WDM 28-23-11)

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	5	C00846	FUEL BOOST PUMP CTR TANK RIGHT

(b) Make sure that the electrical connector D804 is disconnected.

(c) Close this circuit breaker:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	5	C00846	FUEL BOOST PUMP CTR TANK RIGHT

(d) On the Overhead Panel, P5, set the CTR FUEL PUMPS - R Switch to ON.

(e) After five minutes, set the CTR FUEL PUMPS - R Switch, on the Overhead Panel, P5, to OFF.

(f) If this circuit breaker stays closed, then do the Repair Confirmation at the end of this task.

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	5	C00846	FUEL BOOST PUMP CTR TANK RIGHT

(g) If this circuit breaker opened, then continue.

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	5	C00846	FUEL BOOST PUMP CTR TANK RIGHT

(9) Do these steps to do a check of the 115V AC wiring for the boost pump:

(a) Do a wiring check between these pins of connector D804 at the Center Tank Right Boost Pump, M235 and the circuit breaker, BOOST PUMP CTR TANK RIGHT (SSM 28-23-11):

CTR TNK R BOOST PMP D804		FUEL BOOST PUMP CTR TANK RIGHT C00846
pin 1	. . . . .	pin A2
pin 2	. . . . .	pin B2
pin 3	. . . . .	pin C2

(b) Find the problem and repair the wiring.

(c) Make sure that the electrical connector D804 is disconnected.

(d) Close this circuit breaker:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	5	C00846	FUEL BOOST PUMP CTR TANK RIGHT

(e) Do not re-connect electrical connector D804 to the boost pump.

(f) On the Overhead Panel, P5, set the CTR FUEL PUMPS - R Switch to ON.

(g) After five minutes, set the CTR FUEL PUMPS - R Switch, on the Overhead Panel, P5, to OFF.

(h) Make sure this circuit breaker stays closed:

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	5	C00846	FUEL BOOST PUMP CTR TANK RIGHT

(i) Do the Repair Confirmation at the end of this task.

G. Repair Confirmation

(1) Connect the electrical connector D804, to the Right Center Tank Boost Pump (WDM 28-23-11).

(2) On the Overhead Panel, P5, set the CTR FUEL PUMPS - R Switch to ON.

(a) You must be in the Flight Compartment and continuously monitor for the amber PRESS Light CTR FUEL PUMPS - R.

(3) On the Overhead Panel, P5, make sure that the amber PRESS Light CTR FUEL PUMPS - R goes OFF.

(a) If the amber PRESS Light CTR FUEL PUMPS - R stays ON, immediately set the CTR FUEL PUMPS - R Switch, on the Overhead Panel, P5, to OFF.

(4) After five minutes, set the CTR FUEL PUMPS - R Switch, on the Overhead Panel, P5, to OFF.

(5) If this circuit breaker stays closed, then you corrected the problem.

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	5	C00846	FUEL BOOST PUMP CTR TANK RIGHT

——— END OF TASK ———

819. Engine Fuel Suction Feed Operational Test Failed - Fault Isolation

A. Description

(1) If engine No. 1 or 2 fails the suction feed operational test, this procedure can help to isolate the problem.

NOTE: The procedure refers to the engine that failed the suction feed test as the applicable engine.

(2) This procedure opens circuit breakers to keep the high pressure shutoff valve (HPSOV) on the engine in the closed position. It then opens the engine fuel spar shutoff valve. The aft fuel boost pump from the opposite tank is then used to pressurize the fuel feed line. If a tank fuel level increases, this confirms a leak in the fuel feed tubing in that tank.

(3) It also does a visual check for leaks in the fuel line from the front spar to the engine-driven fuel pump.

B. Possible Causes

(1) Leak in the fuel feed line

(2) Main tank fuel boost pump bypass valve

(3) Center tank discharge check valve

(4) Engine-driven fuel pump

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
E	3	C01321	ENGINE FUEL ENGINE 2 HPSOV CONT

(Continued)

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
E	5	C01320	ENGINE FUEL ENGINE 1 HPSOV CONT

D. Fault Isolation Procedure

(1) Do this check of the fuel feed manifold and the engine fuel supply line:

(a) Prepare the fuel tanks:

1) Make sure that there is a minimum of 1,870 lbs (850 kgs) of fuel in the main tank opposite the applicable engine (AMM TASK 12-11-00-650-802).

2) Make sure that there is 30 lbs (20 kgs) or less of fuel in the center tank (AMM TASK 28-26-00-650-801, AMM TASK 28-26-00-650-802).

3) If this access panel is open, make sure that the DEFUELING VALVE HANDLE is set to CLOSED:

Number	Name/Location
621EB	Defuel Access Panel - Slat Station 95.15

Close this access panel:

Number	Name/Location
621EB	Defuel Access Panel - Slat Station 95.15

(b) Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

(c) Do these tasks to get access to the fuel feed line from the front spar to the engine-driven fuel pump on the engine:

1) Forward Fairing Removal, AMM TASK 54-52-01-010-801

2) Wing Junction Fairing - Removal, AMM TASK 54-52-03-010-801

(d) Put the fuel valves in the necessary positions:

1) Make sure that the engine start levers are in the CUTOFF position.

2) Make sure that the ENGINE START switches, on the P5 Overhead Panel, are in the OFF position.

3) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
E	3	C01321	ENGINE FUEL ENGINE 2 HPSOV CONT
E	5	C01320	ENGINE FUEL ENGINE 1 HPSOV CONT

NOTE: This step makes sure that the two engine high pressure shutoff valves will not open.

4) For the applicable engine:

a) Move the engine start lever to the IDLE or RUN position.

NOTE: This opens the spar shutoff valve without opening the engine HPSOV.

b) Make sure that the corresponding SPAR VALVE CLOSED light, on the P5 Overhead Panel, is OFF.

5) Set the CROSSFEED switch, on the P5 Overhead Panel, to the open position.

6) Make sure that the VALVE OPEN light, on the P5 Overhead Panel, is on dim to show that the crossfeed valve is open.

(e) Record the quantity of fuel in the No. 1, Center, and No. 2 fuel tanks.

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.

(f) Operate the aft fuel pump of the main tank opposite the applicable engine.

1) For the right engine, set the FUEL PUMPS 1 AFT switch, on the P5 Overhead Panel, to the ON position.

2) For the left engine, set the FUEL PUMPS 2 AFT switch, on the P5 Overhead Panel, to the ON position.

(g) Do a check for leaks in the fuel feed line:

NOTE: The time necessary for the test can change with the size and number of possible leaks.

1) Monitor the center tank fuel level.

a) If it increases, there is a leak in the fuel feed manifold in the center tank. The leak is between the crossfeed valve and the main tank of the applicable engine.

2) Monitor the fuel level of the main tank of the applicable engine.

a) If the main tank fuel level increases, there is a leak in the fuel feed manifold in the main tank.

3) Visually examine the fuel feed line from the front spar to the engine-driven fuel pump on the engine, for fuel leaks.

(h) Turn off the fuel pump by setting the applicable switch, on the P5 Overhead Panel, to the OFF position.

(i) Put the fuel valves in the necessary positions:

1) For the applicable engine, move the engine start lever to the CUTOFF position.

a) Make sure that the corresponding SPAR VALVE CLOSED light is on dim.

b) Make sure that the corresponding ENG VALVE CLOSED light is on dim.

2) Set the CROSSFEED switch, on the P5 Overhead Panel, to the closed position.

(j) If you found leaks, make the necessary repairs:

1) If you found leaks in the fuel feed line between the front spar and the engine-driven fuel pump, do these tasks where necessary:
   a) Fuel Supply Hose Removal, AMM TASK 73-11-10-000-801-F00
      Fuel Supply Hose Installation, AMM TASK 73-11-10-400-801-F00
   b) Fuel Line, Fitting and Coupling Removal, AMM TASK 28-22-15-000-801
      Fuel Line, Fitting and Coupling Installation, AMM TASK 28-22-15-400-801
2) If you found leaks in the fuel feed manifold in the center tank or main tank, make the necessary repairs:
   a) To find the locations of leaks in these tanks, do this task or a different applicable task: Engine Fuel Feed Manifold - Leak Test, AMM TASK 28-22-15-710-801.
      NOTE: It is not necessary to do a check for leaks in the fuel feed manifold in the main tank opposite the applicable engine.
   b) To remove the necessary parts of the fuel feed manifold, do this task: Fuel Line, Fitting and Coupling Removal, AMM TASK 28-22-15-000-801.
   c) To install replacement components for parts of the fuel feed manifold that you removed, do this task: Fuel Line, Fitting and Coupling Installation, AMM TASK 28-22-15-400-801.
3) Return the airplane to its usual condition:
   a) Do these tasks:
      <1> Forward Fairing Installation, AMM TASK 54-52-01-410-801
      <2> Wing Junction Fairing - Installation, AMM TASK 54-52-03-410-801
   b) Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
E	3	C01321	ENGINE FUEL ENGINE 2 HPSOV CONT
E	5	C01320	ENGINE FUEL ENGINE 1 HPSOV CONT

4) Do the Repair Confirmation at the end of this task.
   a) If the Repair Confirmation is OK, then you corrected the fault.
   b) If the Repair Confirmation is not OK, then continue.

(k) If you did not find leaks, then continue.
   1) If you did not do it before this step, return the airplane to its usual condition:
      a) Do these tasks:

<1> Forward Fairing Installation, AMM TASK 54-52-01-410-801

<2> Wing Junction Fairing - Installation, AMM TASK 54-52-03-410-801

b) Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
E	3	C01321	ENGINE FUEL ENGINE 2 HPSOV CONT
E	5	C01320	ENGINE FUEL ENGINE 1 HPSOV CONT

(2) Do these steps to replace the applicable main tank fuel boost pump bypass valve:

(a) Do these tasks:

1) Fuel Boost Pump Bypass Valve Removal, AMM TASK 28-22-61-000-801

2) Fuel Boost Pump Bypass Valve Installation, AMM TASK 28-22-61-400-801

(b) Do the Repair Confirmation at the end of this task.

(c) If the Repair Confirmation is not OK, then continue.

(3) Do these steps to replace the discharge check valve on the applicable center tank fuel boost pump:

(a) Determine which discharge check valve to replace:

1) If engine 1 failed the suction feed test, replace the discharge check valve on the center tank left boost pump.

2) If engine 2 failed the suction feed test, replace the discharge check valve on the center tank right boost pump.

(b) Do these tasks:

1) Discharge Check Valve Removal, AMM TASK 28-22-71-000-801

2) Discharge Check Valve Installation, AMM TASK 28-22-71-400-801

(c) Do the Repair Confirmation at the end of this task.

(d) If the Repair Confirmation is not OK, then continue.

(4) Do a check of the engine-driven fuel pump on the applicable engine:

(a) Do this task: The Visual Inspection of the Impeller Rotation, AMM TASK 73-11-01-200-801-F00.

(b) Do the Repair Confirmation at the end of this task.

E. Repair Confirmation

(1) Do this task: Engine Fuel Suction Feed - Operational Test, AMM TASK 28-22-00-710-802.

(a) If the test passes, then you corrected the fault.

(b) If solution is unsatisfactory, then continue the Fault Isolation at the subsequent step.

——— END OF TASK ———

820. Center Tank Empty, LOW PRESSURE Light is not ON with L CTR FUEL PUMP Switch ON - Fault Isolation

A. Description

(1) The LOW PRESSURE Light for the L CTR FUEL PUMP is not ON when the Center Tank is empty and the L CTR FUEL PUMP Switch is ON.

(2) The LOW PRESSURE Light for the L CTR FUEL PUMP should come ON when the pump fuel pressure is below the minimum permitted pressure.

B. Possible Causes

(1) Left Center Tank Low Pressure Light, L14

(2) Left Center Tank Boost Pump Pressure Switch, S154

(3) Wiring

(4) Left Auto Shutoff Test Switch, S1

(5) Left Auto Shutoff Time Delay Relay, R934

(6) Left Auto Shutoff Relay, R936

(7) Left Center Tank Boost Pump Switch, S8

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
C	3	C01637	BOOST PMP CTR TNK L AUTO SHUT OFF-DC
D	7	C01659	AT S-O/UCPO BST PMP CTR TNK L AC

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
D	5	C00845	FUEL BOOST PUMP CTR TANK LEFT

D. Related Data

(1) SSM 28-23-11

(2) SSM 28-43-11

(3) WDM 28-23-11

(4) WDM 28-43-11

E. Initial Evaluation

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) 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.

NOTE: Two people are necessary to do this step. One person will operate the Switch in the flight deck, and the other person will monitor the boost pump in the wheel well.

(b) Immediately put the applicable Fuel Pump Switch to OFF if the LOW PRESSURE Light comes ON and stays ON.

(2) Make sure that the Center Tank has a minimum of 14000 lb (6400 kg) of fuel.

NOTE: This step makes sure that the Boost Pump is correctly primed.

(a) If necessary, refuel the fuel tanks. This is the task: Pressure Refuel Procedure, AMM TASK 12-11-00-650-802.

(b) If it is not possible to add 14000 lb (6400 kg) to the Center Tank, then do this task: Fuel Boost Pump and Override Pump Priming, AMM TASK 28-22-41-420-801.

F. Fault Isolation Procedure

(1) Do this task: Master Dim and Test - Operational Test, AMM TASK 33-18-00-710-802.

(a) Make sure that the Left Center Tank Low Pressure Light operates correctly.

1) If the Left Center Tank Low Pressure Light does not come ON, then replace the Left Center Tank Low Pressure Light, L14.

a) Do the Repair Confirmation at the end of this task.

2) If the Left Center Tank Low Pressure Light comes ON, then continue.

(2) On the P5 Overhead Panel, put the L CTR FUEL PUMP Switch to ON. Listen to the Left Center Tank Boost Pump and touch it to make sure it operates.

NOTE: Two people are necessary to do this step. One person will operate the Switch in the flight deck, and the other person will monitor the boost pump in the wheel well.

(a) If the Left Center Tank Boost Pump operates, then do these steps:

1) Replace the Left Center Tank Boost Pump Pressure Switch, S154. These are the tasks:

- Fuel Boost Pump Pressure Switch Removal, AMM TASK 28-42-11-000-801
- Fuel Boost Pump Pressure Switch Installation, AMM TASK 28-42-11-420-801

a) Do the Repair Confirmation at the end of this task.

2) Do this check of the wiring (WDM 28-43-11):

a) Make sure that the L CTR FUEL PUMP Switch is OFF.

b) Disconnect the connector, D876, from the Left Center Tank Boost Pump Low Pressure Switch, S154.

c) Disconnect the connector, D626, from the Left Center Tank Boost Pump Switch, S8, on the P5 Overhead Panel.

d) Do a wiring check between this pin of connector, D876, and this pin of connector, D626.

D876		D626
pin 3	. . . . .	pin 26

D876
pin 2 . . . . . GD320-DC

e) If you find a problem with the wiring, then do these steps:
<1> Repair the wiring.
<2> Re-connect the connectors, D876 and D626.
<3> Do the Repair Confirmation at the end of this task.

f) If you do not find a problem with the wiring, then continue.

3) Re-connect the connectors, D876 and D626.

4) Put the L CTR FUEL PUMP Switch to ON.

5) Disconnect the connector, D13790, from the Left Auto Shutoff Test Switch, S1, on the P61 panel (WDM 28-23-11).

6) Do a check for 28V DC at pin 15 of connector, D13790.

a) If you find 28V DC at pin 15, then replace the Left Auto Shutoff Test Switch, S1.
<1> Do the Repair Confirmation at the end of this task.
<2> Do a wiring check between pin 1 of the Left Auto Shutoff Test Switch, S1, and ground, GD642-DC.
<a> Repair the wiring.
<b> Do the Repair Confirmation at the end of this task.

b) If you do not find 28V DC at pin 15, then do a check for 28V DC at pin X1 of the Left Auto Shutoff TD Relay, R934.
<1> If you find 28V DC at pin X1, then replace the Left Auto Shutoff TD Relay, R934.
<2> If you do not find 28V DC at pin X1, then replace the Left Auto Shutoff 115V AC Relay, R936.
<3> Do the Repair Confirmation at the end of this task.

7) Do this check of the wiring (WDM 28-23-11):

a) If you found 28V DC at pin X1 of the Left Auto Shutoff TD Relay, then do a wiring check between the Left Auto Shutoff TD Relay and the Left Auto Shutoff Test Switch, S1, as follows:

D13794 **D13790**
pin X2 . . . . . pin 15

D13790
pin 1 . . . . . GD642-DC

<1> Repair the wiring.
<2> Do the Repair Confirmation at the end of this task.

b) If you did not find 28V DC at pin X1 of the Left Auto Shutoff TD Relay, then do these steps:

<1> Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
C	3	C01637	BOOST PMP CTR TNK L AUTO SHUT OFF-DC
D	7	C01659	AT S-O/UCPO BST PMP CTR TNK L AC

<2> Do a wiring check between the Left Auto Shutoff TD Relay, R934, and this circuit breaker.

D13794
pin X1 . . . . . C1637

<3> Do a wiring check between the Left Center Tank Boost Pump Switch, S8, and this circuit breaker.

D626
pin 35 . . . . . C1659

<4> Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
C	3	C01637	BOOST PMP CTR TNK L AUTO SHUT OFF-DC
D	7	C01659	AT S-O/UCPO BST PMP CTR TNK L AC

<5> Repair the wiring.

<6> Do the Repair Confirmation at the end of this task.

(b) If the Left Center Tank Boost Pump does not operate, then do these steps:

1) Replace the Left Center Tank Boost Pump Switch, S8, on the P5 Overhead Panel.

a) Do the Repair Confirmation at the end of this task.

G. Repair Confirmation

(1) Do the Left Center Boost Pump section of this task: Center Tank Boost Pump Auto Shutoff Functional Test, AMM TASK 28-22-00-720-805.

(a) If the Left Center Tank Low Pressure Light comes ON in the specified time of 15±2 seconds, then you corrected the problem.

(b) If the Left Center Tank Low Pressure Light does not come ON or comes ON, but not in the specified time of 15±2 seconds, then continue the Fault Isolation Procedure at the subsequent step.

——— END OF TASK ———

821. Center Tank Empty, LOW PRESSURE Light is not ON with R CTR FUEL PUMP Switch ON - Fault Isolation

A. Description

(1) The LOW PRESSURE Light for the R CTR FUEL PUMP is not ON when the Center Tank is empty and the R CTR FUEL PUMP Switch is ON.

(2) The LOW PRESSURE Light for the R CTR FUEL PUMP is should come ON when the pump fuel pressure is below the minimum permitted pressure.

B. Possible Causes

(1) Right Center Tank Low Pressure Light, L15

(2) Right Center Tank Boost Pump Pressure Switch, S155

(3) Wiring

(4) Right Auto Shutoff Test Switch, S2

(5) Right Auto Shutoff Time Delay Relay, R935

(6) Right Auto Shutoff Relay, R937

(7) Right Center Tank Boost Pump Switch, S9

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
C	7	C01638	BOOST PMP CTR TNK R AUTO SHUT OFF-DC
E	7	C01658	FUEL AT S-O/UCPO BST PMP CTR TNK R AC

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	5	C00846	FUEL BOOST PUMP CTR TANK RIGHT

D. Related Data

(1) SSM 28-23-11

(2) SSM 28-43-11

(3) WDM 28-23-11

(4) WDM 28-43-11

E. Initial Evaluation

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) 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.

NOTE: Two people are necessary to do this step. One person will operate the Switch in the flight deck, and the other person will monitor the boost pump in the wheel well.

(b) Immediately put the applicable Fuel Pump Switch to OFF if the LOW PRESSURE Light comes ON and stays ON.

(2) Make sure that the Center Tank has a minimum of 14000 lb (6400 kg) of fuel.

NOTE: This step makes sure that the Boost Pump is correctly primed.

(a) If necessary, refuel the fuel tanks. This is the task: Pressure Refuel Procedure, AMM TASK 12-11-00-650-802.

(b) If it is not possible to add 14000 lb (6400 kg) to the Center Tank, then do this task: Fuel Boost Pump and Override Pump Priming, AMM TASK 28-22-41-420-801.

F. Fault Isolation Procedure

(1) Do this task: Master Dim and Test - Operational Test, AMM TASK 33-18-00-710-802.

(a) Make sure that the Right Center Tank Low Pressure Light operates correctly.

1) If the Right Center Tank Low Pressure Light does not come ON, then replace the Right Center Tank Low Pressure Light, L15.

a) Do the Repair Confirmation at the end of this task.

2) If the Right Center Tank Low Pressure Light comes ON, then continue.

(2) On the P5 Overhead Panel, put the R CTR FUEL PUMP Switch to ON. Listen to the Right Center Tank Boost Pump and touch it to make sure it operates.

NOTE: Two people are necessary to do this step. One person will operate the Switch in the flight deck, and the other person will monitor the boost pump in the wheel well.

(a) If the Right Center Tank Boost Pump operates, then do these steps:

1) Replace the Right Center Tank Boost Pump Pressure Switch, S155. These are the tasks:

- Fuel Boost Pump Pressure Switch Removal, AMM TASK 28-42-11-000-801
- Fuel Boost Pump Pressure Switch Installation, AMM TASK 28-42-11-420-801

a) Do the Repair Confirmation at the end of this task.

2) Do this check of the wiring (WDM 28-43-11):

a) Make sure that the R CTR FUEL PUMP Switch is OFF.

b) Disconnect the connector, D878, from the Right Center Tank Boost Pump Low Pressure Switch, S155.

c) Disconnect the connector, D628, from the Right Center Tank Boost Pump Switch, S9, on the P5 Overhead Panel.

d) Do a wiring check between this pin of connector, D878, and this pin of connector, D628.

D878		D628
pin 3	. . . . .	pin 26

D878
pin 2 . . . . . GD314-DC

e) If you find a problem with the wiring, then do these steps:
<1> Repair the wiring.
<2> Re-connect the connectors, D878 and D628.
<3> Do the Repair Confirmation at the end of this task.

f) If you do not find a problem with the wiring, then continue.

3) Re-connect the connectors, D878 and D628.

4) Put the R CTR FUEL PUMP Switch to ON.

5) Disconnect the connector, D13792, from the Right Auto Shutoff Test Switch, S2, on the P61 panel (WDM 28-23-11).

6) Do a check for 28V DC at pin 14 of connector, D13792.

a) If you find 28V DC at pin 14, then replace the Right Auto Shutoff Test Switch, S2.
<1> Do the Repair Confirmation at the end of this task.
<2> Do a wiring check between pin 1 of the Right Auto Shutoff Test Switch, S2, and ground, GD638-DC.
<a> Repair the wiring.
<b> Do the Repair Confirmation at the end of this task.

b) If do not find 28V DC at pin 14, then do a check for 28V DC at pin X1 of the Right Auto Shutoff TD Relay, R935.
<1> If you find 28V DC at pin X1, then replace the Right Auto Shutoff TD Relay, R935.
<2> If you do not find 28V DC at pin X1, then replace the Right Auto Shutoff 115V AC Relay, R937.
<3> Do the Repair Confirmation at the end of this task.

7) Do this check of the wiring (WDM 28-23-11):

a) If you found 28V DC at pin X1 of the Right Auto Shutoff TD Relay, then do a wiring check between the Right Auto Shutoff TD Relay and the Right Auto Shutoff Test Switch, S2, as follows:

D13798	**D13792**
pin X2	pin 14

D13792
pin 1 . . . . . GD638-DC

<1> Repair the wiring.
<2> Do the Repair Confirmation at the end of this task.

b) If you did not find 28V DC at pin X1 of the Right Auto Shutoff TD Relay, then do these steps:

<1> Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
C	7	C01638	BOOST PMP CTR TNK R AUTO SHUT OFF-DC
E	7	C01658	FUEL AT S-O/UCPO BST PMP CTR TNK R AC

<2> Do a wiring check between the Right Auto Shutoff TD Relay, R935, and this circuit breaker.

D13798
pin X1 . . . . . C1638

<3> Do a wiring check between the Right Center Tank Boost Pump Switch, S9, and this circuit breaker.

D628
pin 35 . . . . . C1658

<4> Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
C	7	C01638	BOOST PMP CTR TNK R AUTO SHUT OFF-DC
E	7	C01658	FUEL AT S-O/UCPO BST PMP CTR TNK R AC

<5> Repair the wiring.

<6> Do the Repair Confirmation at the end of this task.

(b) If the Right Center Tank Boost Pump does not operate, then do these steps:

1) Replace the Right Center Tank Boost Pump Switch, S8, on the P5 Overhead Panel.

a) Do the Repair Confirmation at the end of this task.

G. Repair Confirmation

(1) Do the Right Center Boost Pump section of this task: Center Tank Boost Pump Auto Shutoff Functional Test, AMM TASK 28-22-00-720-805.

(a) If the Right Center Tank Low Pressure Light comes ON in the specified time of 15±2 seconds, then you corrected the problem.

(b) If the Right Center Tank Low Pressure Light does not come ON or comes ON, but not in the specified time of 15±2 seconds, then continue the Fault Isolation Procedure at the subsequent step.

END OF TASK

801. Fuel Flow to the APU is not Sufficient - Fault Isolation

A. Description

(1) The APU fuel-feed system does not supply sufficient fuel flow to the APU, as shown by (AMM TASK 49-31-00-700-802) or by other problems with the APU.

B. Possible Causes

(1) Blockage in the APU fuel line

(2) APU fuel valve does not open sufficiently

(3) Check valve near the bypass inlet does not open sufficiently

(4) Check valve is stuck in the open position

(5) Leakage in the APU fuel line

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

D. Initial Evaluation

(1) Make sure the No. 1 tank contains a minimum of 350 pounds (159 kilograms) of fuel.

(2) Do this task: APU Fuel Supply Flow Check, AMM TASK 49-31-00-700-802.

(a) If there is not sufficient fuel flow, then do the Fault Isolation procedure below.

(b) If there is sufficient fuel flow, then continue.

(3) Do this task: APU BITE Procedure, 49-60 TASK 801.

(a) If the BITE test shows a fault message, then do the Fault Isolation for the fault message shown.

(b) If the BITE test shows no fault messages, then continue.

(4) Do this test of the APU:

(a) Do this task: APU Starting and Operation, AMM TASK 49-11-00-860-801.

(b) Operate the APU for a minimum of five minutes.

(c) Do this task: APU Usual Shutdown, AMM TASK 49-11-00-860-802.

(d) Set the APU master switch to the ON position.

(e) Look at the CURRENT STATUS page on the CDU display to see if a maintenance message shows.

(f) If a maintenance message shows, then go to the fault isolation task for the message that shows.

(g) If the CDU display does not show a maintenance message, then there was an intermittent fault.

E. Fault Isolation

(1) Do this check of the APU fuel valve:

(a) On the P5 panel, set the APU master switch to ON.

(b) On the rear spar in the left main wheel well, make sure the override handle on the APU fuel valve goes to the open position.

(c) Carefully try to move the override handle to the open position to make sure it is fully open.

(d) If the override handle did not completely move to the open position when you set the APU master switch to ON, then do these steps:

1) Remove the APU shutoff valve actuator, V43, from the mounting plate (AMM TASK 28-25-02-000-801), but do not remove the electrical connector, D920 from the actuator.

2) With the actuator disconnected from the mounting plate, set the APU master switch to OFF, and then back to ON.

3) If the override handle now moves completely to the open position when the APU master switch is set to ON, then replace the valve body.

These are the tasks:

APU Shutoff Valve Body Assembly Removal, AMM TASK 28-25-02-000-802,

APU Shutoff Valve Body Assembly Installation, AMM TASK 28-25-02-400-802.

4) If the override handle does not move completely to the open position when the APU master switch is set to ON, then replace the valve actuator.

These are the tasks:

APU Shutoff Valve Actuator Assembly Removal, AMM TASK 28-25-02-000-801,

APU Shutoff Valve Actuator Assembly Installation, AMM TASK 28-25-02-400-801.

5) Do the Repair Confirmation at the end of this task.

(e) If the override handle moved completely to the open position when you set the APU master switch to ON, then continue.

(2) Do these steps to do a test for leakage in the APU fuel line from the top of the center tank to the APU inlet:

(a) Do these steps to open the APU shutoff valve:

1) Make sure that this circuit breaker is closed:

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

2) Set the BATTERY SWITCH to ON.

3) Set the APU master switch to ON.

(b) Set the switch for the forward boost pump for the No. 1 tank to ON.

NOTE: This will pressurize the APU fuel line from the No. 1 tank to the APU.

(c) On the P5 Panel, make sure the FWD 1 LOW PRESSURE indicator light goes off.

1) If the FWD 1 LOW PRESSURE indicator light does not go off (after 90 seconds), then, do this task: Tank 1 FWD Pump LOW PRESSURE Light is ON - Fault Isolation, 28-22 TASK 804.

(d) Monitor the APU drain mast for 10 minutes to look for fuel leakage in the APU fuel line.

(e) Monitor the flexible APU fuel line in the APU compartment for 10 minutes to look for fuel leakage.

(f) Set the switch for the forward boost pump for the No. 1 tank to OFF.

(g) Set the APU master switch to OFF.

(h) If there was indication of fuel leakage, then do these steps:

1) Replace the section of the APU fuel line that has the leak (AMM TASK 28-25-04-000-802).

2) Do the Repair Confirmation procedure at the end of this task.

(i) If there is no indication of fuel leakage, then continue.

(3) Do these steps to do a check for blockage from the forward boost pump to the APU fuel line:

(a) Do the APU fuel supply check again with the aft No. 1 boost pump used to pressurize the APU Fuel Line (AMM TASK 49-31-00-700-802).

(b) If the APU fuel supply check is satisfactory, then do these steps:

1) For the center tank and the No. 1 tank, do this task: Fuel Tank - Purging and Tank Entry, AMM TASK 28-11-00-910-802

2) Look for a blockage problem with the inlet for the forward No. 1 tank boost pump, the discharge check valve for the forward No. 1 tank boost pump or with the fuel-feed line from the discharge check valve to the APU fuel line.

3) Repair the problems that you find.

4) Do the Repair Confirmation procedure at the end of this task.

(c) If the APU fuel supply check is not satisfactory, then continue. Do not reconnect the APU fuel line at the APU firewall.

(4) With the APU fuel line disconnected at the APU firewall, do these steps to do a check for APU fuel line blockage:

(a) For the center tank and the No. 1 tank, do this task: Fuel Tank - Purging and Tank Entry, AMM TASK 28-11-00-910-802

(b) Disconnect the connection between the APU fuel line and the engine fuel-feed manifold.

(c) Permit the fuel to drain from the APU fuel line into a 5-gallon (19-liter) fuel resistant container, STD-1054.

(d) Apply air pressure to the APU fuel line from the end that you disconnected from the engine fuel-feed manifold.

(e) Use the air flow at the open end of the APU fuel line in the APU compartment to look for indications of blockage in the APU fuel line. Note the air flow from the APU fuel line in the APU compartment.

(f) Stop the air pressure to the APU fuel line.

(g) Disconnect the APU fuel line from the center tank adapter fitting on the top of the center tank (AMM TASK 28-25-04-000-802).

(h) Apply air pressure again to the APU fuel line from the end that you disconnected in the center tank.

1) Use the air flow at the open end of the APU fuel line on the top of the tank to look for indications of blockage in the APU fuel line.

2) If there is significantly more air flow from the center tank adapter fitting than there was from the open connection at the APU firewall, then do these steps:

a) Replace the APU fuel line from the center tank adapter fitting to the APU firewall.

These are the tasks:

APU Fuel Line (Center Wing Section to APU Firewall) Removal, AMM TASK 28-25-04-000-802,

APU Fuel Line (Center Wing Section to APU Firewall) Installation, AMM TASK 28-25-04-400-803.

b) Do the Repair Confirmation procedure at the end of this task.

3) If the air flow from the center tank adapter fitting is approximately the same as the air flow noted at the APU firewall, then do these steps:

a) Replace the part of the APU fuel line in the center tank from the connection to the engine fuel-feed manifold to the top of the center tank.

These are the tasks:

APU Fuel Line (No. 1 Tank and Center Tank) Removal, AMM TASK 28-25-04-000-801,

APU Fuel Feed Line (No. 1 Tank and Center Tank) Installation, AMM TASK 28-25-04-400-801.

b) Do the Repair Confirmation procedure at the end of this task.

F. Repair Confirmation

(1) Do this task: APU Fuel Supply Flow Check, AMM TASK 49-31-00-700-802.

(a) Make sure there is sufficient fuel flow.

(2) Do this task: APU BITE Procedure, 49-60 TASK 801.

(a) Make sure the BITE test shows no maintenance messages.

(3) Do this test of the APU:

(a) Do this task: APU Starting and Operation, AMM TASK 49-11-00-860-801.

(b) Operate the APU for a minimum of five minutes.

(c) Do this task: APU Usual Shutdown, AMM TASK 49-11-00-860-802.

(d) Set the APU master switch to the ON position.

(e) Make sure the CURRENT STATUS page on the CDU display shows no maintenance messages.

(f) If the CDU display does not show a maintenance message, then you corrected the fault.

END OF TASK

802. Indication of Fuel Leakage at APU Shroud Drain Mast - Fault Isolation

A. Initial Evaluation

(1) Examine the APU shroud drain mast for five minutes.

(2) If there is no fuel leakage or if the fuel leakage rate is less than one drop per minute, then the APU fuel line is OK.

(3) If the fuel leakage rate is more than one drop per minute, then continue.

(4) Do these steps to do a leak check of the APU fuel line while it is pressurized:

(a) Make sure that these circuit breakers are closed:

Battery Shield, J9

Row	Col	Number	Name
A	5	C01340	BATTERY BUS

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

Power Distribution Panel Number 2, P92

Row	Col	Number	Name
D	1	C00826	FUEL BOOST PUMP TANK 1 AFT

Standby Power Control Unit, M01720

Row	Col	Number	Name
B	4	C00169	SW HOT BAT BUS

(b) Make sure the No. 1 tank has a minimum of 500 pounds (250 kilograms) of fuel (AMM TASK 12-11-00-650-802).

(c) Set the APU start switch, on the Overhead Panel P5, to the ON position.

(d) Set the FUEL PUMP TANK 1 - AFT switch, on the P5 Overhead Panel, to the ON position.

NOTE: This step pressurizes the APU fuel line.

(e) With the APU fuel line pressurized, examine the APU shroud drain mast for 30 minutes to do a check for leakage.

(f) If the fuel leakage rate is less than 60 drops (3 milliliters or 0.1 fluid ounce) in 30 minutes, then do these steps:

1) Set the FUEL PUMP TANK 1 - AFT switch, on the P5 Overhead Panel, back to OFF.
2) Set the APU start switch, on the P5 Overhead Panel, back to OFF.
3) Continue with normal operation of the APU in service.
4) Do this pressure check of the APU fuel line every day until you repair the APU fuel line or replace it.
5) When it is possible, do the Fault Isolation procedure below.

(g) If the fuel leakage rate is more than 60 drops (3 milliliters or 0.1 fluid ounce) in 30 minutes, then deactivate the APU until the fuel line is repaired (AMM TASK 49-11-00-600-802)

1) When it is possible, do the Fault Isolation procedure below.

B. Fault Isolation

(1) Make sure the landing gear downlock pins for the nose and main landing gear are installed, do this task: Landing Gear Downlock Pins Installation, AMM TASK 32-00-01-480-801.

(2) For fuel leakage at the APU shroud drain mast, fuel must be leaking from the APU fuel supply line somewhere between the APU firewall bulkhead fitting and the forward wall of the aft cargo compartment.

(3) To get access to the APU fuel supply line and connection fittings open the applicable access panels.

(4) Make sure there is more than 800 LB (400 KG) of fuel in the left main fuel tank (AMM TASK 12-11-00-650-802).

(5) Make sure the APU start switch on the overhead panel P5, is in the off position.

(6) Attach a DO-NOT-OPERATE tag to the APU start switch.

(7) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

Row	Col	Number	Name
B	19	C01344	APU FIRE SW POWER

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	14	C00033	AUX POWER UNIT CONT

(8) Move the manual override handle on the APU fuel shutoff valve to the OPEN position.

(9) Set the FUEL PUMP TANK 1 - AFT switch, on the P5 Overhead Panel, to the ON position.

NOTE: This step pressurizes the APU fuel supply line.

(10) Make sure the PRESS light for the left aft boost pump goes off.

(11) Look for leakage at the supply line and/or connection fittings.

(12) Do this check at each APU fuel supply line connection until you find the leak.

(13) When you find the leak, do these steps:

(a) Set the FUEL PUMP TANK 1 - AFT switch, on the overhead panel P5, to the OFF position.

(b) Move the manual override handle on the APU fuel shutoff valve to the CLOSED position.

(c) Replace the supply line and/or repair the connection as follows:

1) Replace the APU Fuel line (Wing Center Section to the APU fire wall) if it is necessary.

These are the tasks:

APU Fuel Line (Center Wing Section to APU Firewall) Removal, AMM TASK 28-25-04-000-802,

APU Fuel Line (Center Wing Section to APU Firewall) Installation, AMM TASK 28-25-04-400-803.

(14) Close all of the access panels.

(15) Do the Repair Confirmation procedure below.

C. Repair Confirmation

(1) Examine the APU shroud drain mast for five minutes.

(a) If there is no fuel leakage or if the fuel leakage rate is less than one drop per minute, then you corrected the fault.

END OF TASK

801. FQIS BITE Procedure

A. General

(1) You do the FQIS BITE Test from the control display unit (CDU) in the flight compartment. There are two CDUs on the forward electronics panel in the flight compartment.

(2) The FQIS BITE procedure uses these functions from the FQIS BITE TEST Main Menu:

(a) CURRENT STATUS

(b) INFLIGHT FAULTS/FAULT HISTORY

(c) GROUND TEST

(3) CURRENT STATUS

(a) The CURRENT STATUS display shows faults which are currently present in the FQIS system.

(4) INFLIGHT FAULTS/FAULT HISTORY.

(a) This test will sort faults (if any) by LEG or faults.

(5) GROUND TEST

(a) The GROUND TEST function does a complete system test of the FQIS.

B. Fuel Quantity BITE Test Procedure

(1) Do the BITE procedure for the FQIS (Figure 201):

(a) If you are not at one of the FQIS BITE TEST displays, then do these steps:

1) Push the INIT REF function key.

2) If the POS INIT display shows, then push the line select key next to the INDEX prompt.

NOTE: This makes the INIT/REF INDEX show.

3) Push the line select key next to the MAINT prompt.

(b) From the MAINT BITE INDEX, push the line select key next to the FQIS prompt.

(c) Do these steps to look for maintenance messages in CURRENT STATUS:

1) Push the line select key next to the CURRENT STATUS prompt.

2) Make a written record of the maintenance message numbers for all of the faults shown on the CURRENT STATUS display.

a) If there is more than one page of faults in CURRENT STATUS, then use the NEXT PAGE key and the PREV PAGE key to see all of the maintenance messages.

NOTE: The number of pages of faults in CURRENT STATUS are shown in the upper right corner of the display.

If a fault shows the message FAULT NO LONGER PRESENT, then the fault was corrected while the CURRENT STATUS display was on.

b) Refer to the table at the end of this task to find the fault isolation tasks for the maintenance messages that you find.

3) If NO PRESENT FAULTS shows on the CURRENT STATUS display, then continue. No current faults are found in the system.

4) Push the line select key next to the INDEX prompt.

NOTE: This will bring you back to the FQIS BITE TEST main menu.

(d) Do these steps to look for maintenance messages in INFLIGHT FAULTS/FAULT HISTORY.

1) Push the line select key next to the INFLIGHT FAULTS/FAULT HISTORY prompt.

2) Make a written record of the maintenance message numbers for all of the faults shown on the INFLIGHT FAULTS/FAULT HISTORY display.

a) If there is more than one page of faults in the INFLIGHT FAULTS/FAULT HISTORY, push the NEXT PAGE key and the PREV PAGE key to see all of the maintenance messages.

NOTE: The number of pages of faults in INFLIGHT FAULTS/FAULT HISTORY are shown in the upper right corner of the display.

NOTE: Fault records and maintenance actions from INFLIGHT FAULTS/FAULT HISTORY and CURRENT STATUS maintenance messages help correct intermittent faults.

b) Refer to the table at the end of this task to find the fault isolation tasks for the maintenance messages that you find.

3) If NO FAULTS show on the INFLIGHT FAULTS/FAULT HISTORY display, then continue. No faults are found in the fault history.

4) Push the line select key next to the INDEX prompt.

NOTE: This will move you back to the FQIS BITE TEST main menu.

(e) Do these steps to do the FQIS ground test:

NOTE: If a fault was found in INFLIGHT FAULTS/FAULT HISTORY, do the GROUND test after maintenance actions to correct the fault.

1) Push the line select key next to the GROUND TEST prompt.

a) Push the line select key next the YES prompt to verify that you want to do the ground test.

2) When the ground test is complete, the display will show GROUND TEST COMPLETE PASS or FAIL.

3) If the display shows GROUND TEST COMPLETE PASS, then there are no faults found in the FQIS.

NOTE: If faults show in INFLIGHT FAULTS/FAULT HISTORY, then keep a record of the faults for later fault isolation of intermittent faults. The corrective action given for each fault found in INFLIGHT FAULTS/FAULT HISTORY can also be used to correct intermittent faults that occur frequently.

4) If the display shows GROUND TEST COMPLETE FAIL, then push the line select key next to the DISPLAY FAULTS prompt.

5) Make a written record of the message numbers for all of the faults shown on the GROUND TEST FAULTS display.

a) If there is more than one page of faults in GROUND TEST FAULTS, then use the NEXT PAGE key and the PREV PAGE key to see all of the maintenance messages.

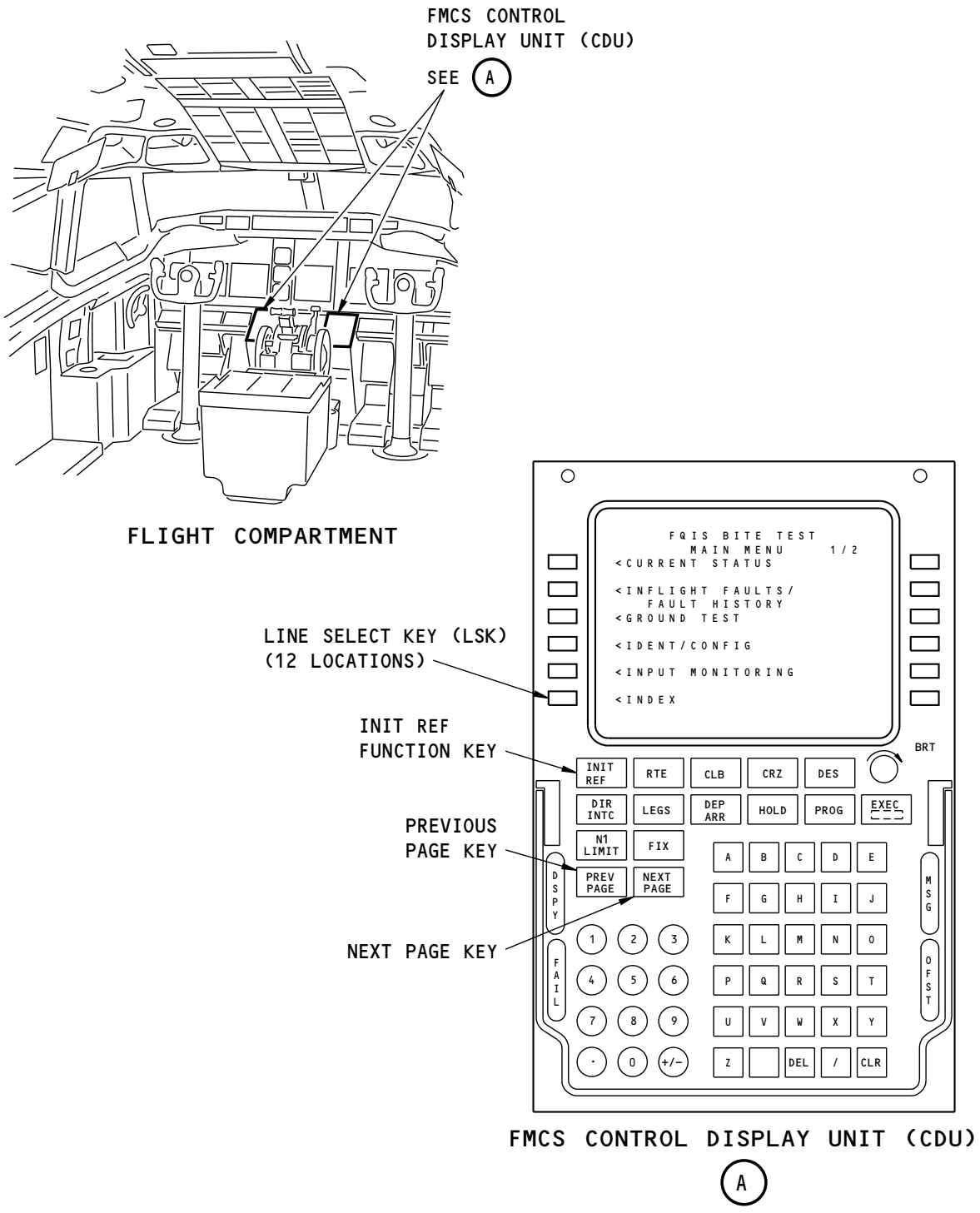
NOTE: The number of pages of faults in GROUND TEST FAULTS are shown in the upper right corner of the display.

6) Refer to the table at the end of this task to find the fault isolation task for the applicable maintenance message.

LRU/SYSTEM	MAINTENANCE MESSAGE	GO TO FIM TASK
FQIS	28-41001 NO FMC DATA ON FQIS 6	28-41 TASK 812
FQIS	28-41002 PROCESSOR FAULT	28-41 TASK 809
FQIS	28-41101 1 OR MORE TANK UNIT OPEN	28-41 TASK 818
FQIS	28-41102 TANK UNIT LO-Z OPEN/GND	28-41 TASK 802
FQIS	28-41103 TANK UNIT SHORT/>FULL	28-41 TASK 803
FQIS	28-41104 TANK UNIT LO RESISTANCE	28-41 TASK 804
FQIS	28-41105 HI-Z OP/SHORT TO SHIELD	28-41 TASK 816
FQIS	28-41106 COMPENSATOR LO-Z OP/GND	28-41 TASK 805
FQIS	28-41107 COMPENSATOR SHORTED	28-41 TASK 806
FQIS	28-41108 COMPENSATOR DATA BAD	28-41 TASK 807
FQIS	28-41109 PROCESSOR FAILED	28-41 TASK 808
FQIS	28-41110 PROCESSOR FAULT	28-41 TASK 809
FQIS	28-41111 PROGRAM PINS INVALID	28-41 TASK 811
FQIS	28-41113 PROGRAM PINS INVALID	28-41 TASK 811
FQIS	28-41114 PROCESSOR FAULT	28-41 TASK 809
FQIS	28-41115 ARINC OUTPUT BUS FAILED	28-41 TASK 810
FQIS	28-41201 1 OR MORE TANK UNIT OPEN	28-41 TASK 818
FQIS	28-41202 TANK UNIT LO-Z OPEN/GND	28-41 TASK 802
FQIS	28-41203 TANK UNIT SHORT/>FULL	28-41 TASK 803
FQIS	28-41204 TANK UNIT LO RESISTANCE	28-41 TASK 804
FQIS	28-41205 HI-Z OP/SHORT TO SHIELD	28-41 TASK 816
FQIS	28-41206 COMPENSATOR LO-Z OP/GND	28-41 TASK 805
FQIS	28-41207 COMPENSATOR SHORTED	28-41 TASK 806
FQIS	28-41208 COMPENSATOR DATA BAD	28-41 TASK 807
FQIS	28-41209 PROCESSOR FAILED	28-41 TASK 808
FQIS	28-41210 PROCESSOR FAULT	28-41 TASK 809
FQIS	28-41211 PROGRAM PINS INVALID	28-41 TASK 811
FQIS	28-41213 PROGRAM PINS INVALID	28-41 TASK 811
FQIS	28-41214 PROCESSOR FAULT	28-41 TASK 809
FQIS	28-41215 ARINC OUTPUT BUS FAILED	28-41 TASK 810
FQIS	28-41301 1 OR MORE TANK UNIT OPEN	28-41 TASK 818
FQIS	28-41302 TANK UNIT LO-Z OPEN/GND	28-41 TASK 802
FQIS	28-41303 TANK UNIT SHORT/>FULL	28-41 TASK 803
FQIS	28-41304 TANK UNIT LO RESISTANCE	28-41 TASK 804
FQIS	28-41305 HIZ OPEN/SHORT TO SHIELD	28-41 TASK 816

LRU/SYSTEM	MAINTENANCE MESSAGE	GO TO FIM TASK
FQIS	28-41306 COMPENSATOR LO-Z OP/GND	28-41 TASK 805
FQIS	28-41307 COMPENSATOR SHORTED	28-41 TASK 806
FQIS	28-41308 COMPENSATOR DATA BAD	28-41 TASK 807
FQIS	28-41309 PROCESSOR FAILED	28-41 TASK 808
FQIS	28-41310 PROCESSOR FAULT	28-41 TASK 809
FQIS	28-41311 PROGRAM PINS INVALID	28-41 TASK 811
FQIS	28-41313 PROGRAM PINS INVALID	28-41 TASK 811
FQIS	28-41314 PROCESSOR FAULT	28-41 TASK 809
FQIS	28-41315 ARINC OUTPUT BUS FAILED	28-41 TASK 810
FQIS	28-41415 ARINC OUTPUT BUS FAILED	28-41 TASK 810

——— END OF TASK ———



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FQIS BITE Main Menu
Figure 201/28-41-00-990-804

802. FQIS Fault Message - TANK UNIT LO-Z OPEN/GND - Fault Isolation

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. A 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 Limitations 28-AWL-03 and 28-AWL-37.

(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. A 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, AMM TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitations 28-AWL-04, 28-AWL-09, and 28-AWL-38.

B. Description

(1) This task is for these maintenance messages:

(a) 28-41102 TANK UNIT LO-Z OPEN/GND

1) This message indicates a problem with the No. 1 Tank.

(b) 28-41202 TANK UNIT LO-Z OPEN/GND

1) This message indicates a problem with the No. 2 tank.

(c) 28-41302 TANK UNIT LO-Z OPEN/GND

1) This message indicates a problem with the center tank.

(2) One or more of the Tank Unit Lo-Z wires is shorted to ground, or the common Tank Unit Lo-Z wire is open.

(3) These messages show if the measured (total) Tank Unit Capacitance is less than 13 percent of the Tank Unit empty Capacitance.

(4) These messages can also show if the Compensator Lo-Z wire is shorted to ground through less than 100 Ohms (FQIS Fault Message - COMPENSATOR LO-Z OP/GND - Fault Isolation, 28-41 TASK 805).

(5) These messages cause the FQIS Display and the Refuel Panel Indicator for the tank that has the fault to become blank.

C. Possible Causes

(1) FQIS Wire Harness (includes in-tank connector and internal and external tank penetration connector pins)

(2) FQIS Tank Unit or Compensator (including connections)

(3) Out-of-tank wiring (wire bundle) from the Wing Spar to the Fuel Quantity Processor Unit (FQPU) including the bussing plug)

D. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT

(Continued)

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

E. Related Data

(1) SSM 28-41-11

(2) WDM 28-41-11

F. Initial Evaluation

(1) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

(2) If the GROUND TEST shows PASS, then there was an intermittent fault.

(3) If the CURRENT STATUS, GROUND TEST, or INFLIGHT FAULTS/FAULT HISTORY shows TANK UNIT LO-Z OPEN/GND for the applicable tank, then do the Fault Isolation Procedure below.

G. Fault Isolation

(1) Disconnect the applicable bussing plug and examine the pins for corrosion or damage. This is the task: Bussing Plug Removal, AMM TASK 28-41-41-000-801.

(a) If you find corrosion or damage, then do these steps:

1) Repair the pins that have damage.

2) If you find corrosion, clean the connector as necessary (SWPM 20-60-01).

3) Re-connect the bussing plug (Bussing Plug Installation, AMM TASK 28-41-41-400-801).

4) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

5) If the GROUND TEST shows PASS, then you corrected the fault, do the steps to erase the faults in the BITE.

a) Refer to the steps at the end of this task.

6) If the GROUND TEST shows TANK UNIT LO-Z OPEN/GND for the applicable tank, then continue.

(b) If there is no corrosion or damage, then continue.

(2) For the applicable tank, do this task: Tank and Compensator Units - Resistance and Capacitance Check, AMM TASK 28-41-21-710-801.

(3) If the Tank and Compensator Unit Test does not show problems, then do this test of the out-of-tank wiring (wire bundle) from the bussing plug to the Fuel Quantity Processor Unit (FQPU) in the radar bay:

(a) FOR A FAULT IN THE No. 1 TANK, do these steps:

1) Disconnect connector D11304 on the FQPU, M1827 in the Radar Bay (WDM 28-41-11).

2) Do a continuity check between these pins of connector D11312 on the front spar and connector D11304 on the FQPU, M1827 in the Radar Bay:

SIA 702-710

D11312		D11304
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 22
pin 3	. . . . .	pin 23

SIA 711-714, 716-999

D11312		D11304
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 21
pin 3	. . . . .	pin 17

SIA ALL

3) Make sure that connector D11304 is disconnected.

4) Make sure the Resistance from D11312, pin 1 to structure ground is more than 1 Megohm.

5) Make sure the Resistance from D11312, pin 3 to structure ground is more than 1 Megohm.

6) Re-connect connectors D11304 and D11312. This is the task: Bussing Plug Installation, AMM TASK 28-41-41-400-801.

(b) FOR A FAULT IN THE No. 2 TANK, do these steps (WDM 28-41-11):

1) Disconnect connector D11306 on the FQPU, M1827 in the Radar Bay.

2) Do a continuity check between these pins of connector D11314 on the front spar and connector D11306 on the FQPU, M1827 in the Radar Bay:

SIA 702-710

D11314		D11306
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 22
pin 3	. . . . .	pin 23

SIA 711-714, 716-999

D11314		D11306
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 21
pin 3	. . . . .	pin 17

SIA ALL

3) Make sure that connector D11306 is disconnected.

4) Make sure the Resistance from D11314, pin 1 to structure ground is more than 1 Megohm.

5) Make sure the Resistance from D11314, pin 3 to structure ground is more than 1 Megohm.

6) Re-connect connectors D11306 and D11314. This is the task: Bussing Plug Installation, AMM TASK 28-41-41-400-801.

(c) FOR A FAULT IN THE CENTER TANK, do these steps (WDM 28-41-11):

1) Disconnect connector D11308 on the FQPU, M1827 in the Radar Bay.

2) Do a continuity check between these pins of connector D11316 on the rear spar and connector D11308 on the FQPU, M1827 in the Radar Bay:

SIA 702-710

D11316		D11308
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 22
pin 3	. . . . .	pin 23

SIA 711-714, 716-999

D11316		D11308
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 21
pin 3	. . . . .	pin 17

SIA ALL

3) Make sure that connector D11308 is disconnected.

4) Make sure the Resistance from D11316, pin 1 to structure ground is more than 1 Megohm.

5) Make sure the Resistance from D11316, pin 3 to structure ground is more than 1 Megohm.

6) Re-connect connectors D11308 and D11316. This is the task: Bussing Plug Installation, AMM TASK 28-41-41-400-801.

(d) If you find a problem with the Out-of-Tank Wire Bundle, then repair the wiring (SWPM 20-20-00, SWPM 20-60-06).

1) Make sure that the Out-of-Tank Wire Bundle is shielded and the shield ground is terminated (SWPM 20-10-15, SWPM 20-20-00).

28-AWL-04: CDCCL

2) Do this task: FQIS - Out Tank Connectors - Electrical Bonding Resistance Check, AMM TASK 05-55-54-200-802, for the applicable side of body Fuel Quantity Indicating System (FQIS) connector D39915 or D39916, or Main Wheel Well FQIS S connector D4850P, if it is disconnected or if the coupling ring on the connector is loosened or tightened,.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, AMM TASK 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-03: ALI

3) Do this task: FQIS Wiring And Bonding - Inspection, AMM TASK 05-55-54-200-801, for the applicable wire bundle if the FQIS Wire Bundle in the unpressurized zone is replaced or the FQIS Wire Bundle shield is repaired.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-03.

(e) If an open or shorting fault to the out-tank wiring was corrected, do a check of the BITE.

(f) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

(g) If the GROUND TEST procedure shows PASS, then you corrected the fault, do the step to erase the faults in the BITE.

1) Refer to the steps at the end of this task.

(h) If the GROUND TEST procedure continues to show TANK UNIT LO-Z OPEN/GND, then continue.

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) If one or more Tank Unit or the Compensator shows problems, then go into the applicable fuel tank (Fuel Tank - Purging and Tank Entry, AMM TASK 28-11-00-910-802)and do these steps:

(a) Do an inspection of the Tank Unit and the adjacent wiring for these problems:

1) Make sure that no parts of the Tank Unit or compensator are in electrical contact with the airplane structure.

2) Make sure that there are no brackets that are bent or have other problems.

3) Make sure that there is no unwanted material in the Tank Unit or compensator.

4) Make sure that there are no loose terminal connections at either the applicable Tank Unit or the No. 2 Tank Unit.

NOTE: The No. 2 Tank Unit is the top of a daisy chain. If there is a loose connection at the number 2 Tank Unit, then a fault message can showy for other Tank Units.

a) If there are loose terminal connections, then tighten the screws to these torque ranges:

<1> LO-Z 29 ±6 in-lb (3 ±1 N·m)

<2> SHIELD 17.5 ±2.5 in-lb (2.0 ±0.3 N·m)

<3> HI-Z 13.5 ±1.5 in-lb (1.5 ±0.2 N·m)

5) Make sure that there are no other problems with the wiring near the applicable Tank Unit or the No.2 Tank Unit (for example, a wire pinched under a Tank Unit).

(b) If there are problems with the wiring, then repair or replace the wiring.

NOTE: If you find no faults in the wiring, go to the next step for two or more Tank Units.

28-AWL-09: CDCCL

1) Repair of the FQIS in-tank Wire Harness must be approved by the FAA Oversight Office.

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

   NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

2) If you repaire or replace the Tank Unit wiring, then make sure that the wire slack between the wire and components or structure maintains a clearance of 0.5 in. (12.7 mm).

28-AWL-09: CDCCL

3) If 0.5 in. (12.7 mm) is not possible, then you must maintain a minimum clearance of 0.13 in. (3.30 mm).

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

   NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

4) If an open or shorting fault to the in-tank wiring was corrected, do a check of the BITE.

   NOTE: If you found no in-tank wiring open or shorting faults, do the step to replace the Tank Unit or Compensator

5) Do this task: FQIS BITE Procedure, 28-41 TASK 801

6) If the GROUND TEST procedure shows PASS, then you corrected the fault, do the step to erase the faults in the BITE.

   a) Refer to the steps at the end of this task.

7) If the GROUND TEST procedure continues to show TANK UNIT LO-Z OPEN/GND, then replace the Tank Unit or compensator.

(c) Replace the Tank Unit or Compensator. These are the tasks:

- Tank Unit or the Compensator Unit Removal, AMM TASK 28-41-21-000-801
- Tank Unit or Compensator Unit Installation, AMM TASK 28-41-21-400-801

1) Do this task: FQIS BITE Procedure, 28-41 TASK 801

2) If the GROUND TEST procedure shows PASS, then you corrected the fault, do the step to erase the faults in the BITE.

   a) Refer to the steps at the end of this task.

3) If the GROUND TEST procedure continues to show TANK UNIT LO-Z OPEN/GND, then continue to trouble shoot and correct the faults.

(5) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

(6) Erase the faults in the BITE FAULT HISTORY.

(a) Go to the FQIS BITE TEST Main Menu.

(b) Push the next page key to go to page 2.

(c) Push the Line Select Key (LSK) adjacent to the ERASE FAULT HISTORY prompt.

(d) Push the LSK adjacent to the YES prompt to erase FAULT HISTORY.

END OF TASK

803. FQIS Fault Message - TANK UNIT SHORT/FULL - Fault Isolation

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: NOTE: This is applicable to Airworthiness Limitation 28-AWL-03.

(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, AMM TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitations 28-AWL-04 and 28-AWL-09.

B. Description

(1) This task is for these maintenance messages:

(a) 28-41103 TANK UNIT SHORT/FULL

1) This fault code shows a problem with the No. 1 tank.

(b) 28-41203 TANK UNIT SHORT/FULL

1) This fault code shows a problem with the No. 2 tank.

(c) 28-41303 TANK UNIT SHORT/FULL

1) This fault code shows a problem with the center tank.

(2) This fault can be caused by one of these three conditions:

(a) This fault shows if the measured volume is more than the volume of the tank. For example, this fault shows if the FQIS indicates more than 1400 gal (5300 l) in the No. 1 or the No. 2 tank. The fault also shows if the FQIS indicates more than 4750 gal (17,981 l) in the center tank.

(b) This fault shows if there is a resistance in parallel with the tank units that can cause an error of more than 4.5% of full tank in the indicated fuel mass.

(c) This fault also shows if an open HI-Z shield causes an FQIS indication that is more than the full tank capacity. Beyond the open point, the shield acts as an antenna for the LO-Z signal. This signal then appears on the HI-Z center conductor. The LO-Z and HI-Z wires are in the same harness so if the open point in the shield is close to the processor (which would allow an antenna of maximum length) it is possible for the added signal to increase the measured fuel quantity by more than 2000 lb (907 kg).

(3) This fault causes the FQIS display and the refuel panel indicator for the tank that has the fault to become blank.

(4) When the fault is present, the compensator capacitance can be normal or abnormal. If the fault is caused by contamination in the fuel (water, for example), then the tank unit capacitance will be too large for the quantity of fuel in the tank.

(5) If the fault is caused by an open in the HI-Z shield, do a close inspection of the shield continuity from the processor to the most distant tank unit.

(6) If the fault is caused by a low resistance in parallel with the tank units, you can measure the resistance from the tank unit LO-Z to the tank unit HI-Z center conductor to confirm the cause of the fault. In the No. 1 or No. 2 tank, the fault is caused by a resistance of less than 65 kilohms. In the center tank, the fault is caused by a resistance of less than 45 kilohms.

(7) This fault can also occur if the compensator has a short between 0 and 100 ohms.

C. Possible Causes

(1) FQIS wire harness (including an open HI-Z shield)

(2) Water contamination in the fuel tank

(3) Microbial growth in the fuel tank

(4) FQIS tank unit or compensator

(5) Out-of-tank wiring (wire bundle) from the wing spar to the FQPU (including the bussing plug or an open HI-Z shield)

(6) Fuel Quantity Processor Unit (FQPU), M1827.

D. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

E. Related Data

(1) (SSM 28-41-11)

(2) (WDM 28-41-11)

F. Initial Evaluation

(1) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

(a) If the GROUND TEST shows TANK UNIT SHORT/FULL for the applicable tank, then do the Fault Isolation Procedure below.

(b) If the GROUND TEST shows PASS, then there was an intermittent fault.

G. Fault Isolation Procedure

(1) Do these steps to do a check for water in the fuel:

(a) Get a sample of fuel at the sump of the applicable fuel tank (AMM TASK 12-11-00-680-801).

(b) Add one or two drops of water-soluble food coloring to the fuel sample.

NOTE: If there is water contamination of the fuel sample, the water in the fuel sample will be identified by the food coloring.

(c) If there is water contamination of the fuel sample, continue to get samples of fuel until no water is identified by the food coloring (AMM TASK 12-11-00-680-801).

1) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

a) If the GROUND TEST shows PASS, then you corrected the fault.

b) If the GROUND TEST shows TANK UNIT SHORT/FULL for the applicable tank, then continue.

(d) If there is no water contamination of the fuel sample, then continue.

(2) Do these steps to do a check for microbial growth in the fuel:

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) Go into the No.1 tank (No. 2 tank, center tank) (AMM TASK 28-11-00-910-802).

(b) Do a check for microbial growth (AMM TASK 28-10-00-200-802).

(c) Correct any problem that you find (AMM TASK 28-10-00-600-804).

(d) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

(e) If the GROUND TEST shows PASS, then you corrected the fault.

(f) If the GROUND TEST shows TANK UNIT SHORT/FULL for the applicable tank, then continue.

(3) If there is no microbial growth in the fuel tank, then continue.

(4) Disconnect the applicable bussing plug and examine the pins for a bent pin or other damage (AMM TASK 28-41-41-000-801).

(a) If there is damage, then do these steps:

1) Repair the pins if any of the pins have damage.

2) Clean the connector if there is any corrosion (SWPM 20-60-01).

3) Re-connect the bussing plug (AMM TASK 28-41-41-400-801).

4) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

5) If the GROUND TEST shows PASS, then you corrected the fault.

6) If the GROUND TEST shows TANK UNIT SHORT/FULL for the applicable tank, then continue.

(b) If there is no corrosion or damage, then continue.

(5) For the applicable tank, do this task: Tank and Compensator Units - Resistance and Capacitance Check, AMM TASK 28-41-21-710-801.

(6) If the Tank and Compensator Unit Test does not show problems, then do this test of the out-of-tank wiring (wire bundle) from the bussing plug to the Fuel Quantity Processor Unit (FQPU) in the radar bay:

(a) FOR A FAULT IN THE NO. 1 TANK, do these steps:

1) Disconnect connector, D11304, on the FQPU, M1827, in the radar bay.

2) Disconnect connector, D11312, at the front spar if it is not already disconnected.

3) Do a continuity check between these pins of connector, D11312, on the front spar and connector, D11304, on the FQPU, M1827, in the radar bay:

SIA 702-710

D11312		D11304
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 22
pin 3	. . . . .	pin 23

SIA 711-714, 716-999

D11312		D11304
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 21
pin 3	. . . . .	pin 17

SIA ALL

4) Do a continuity check from pin 9 on connector, D11304, to the Hi-Z shield around pin 1 on connector, D11312.

NOTE: This step does a check of the out-of-tank wiring for an open shield condition.

5) Make sure that connector, D11304, is disconnected.

6) Make sure that the resistance from D11312, pin 2, to D11312, pin 1, is more than 1 megohm.

7) Make sure that the resistance from D11312, pin 3, to D11312, pin 1, is more than 1 megohm.

8) Re-connect connectors D11304 and D11312. To re-connect connector, D11312, do this task: Bussing Plug Installation, AMM TASK 28-41-41-400-801.

(b) FOR A FAULT IN THE NO. 2 TANK, do these steps:

1) Disconnect connector, D11306, on the FQPU, M1827, in the radar bay.

2) Disconnect connector, D11314, at the front spar if it is not already disconnected.

3) Do a continuity check between these pins of connector, D11314, on the front spar and connector, D11306, on the FQPU, M1827, in the radar bay:

SIA 702-710

D11314		D11306
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 22
pin 3	. . . . .	pin 23

SIA 711-714, 716-999

D11314		D11306
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 21
pin 3	. . . . .	pin 17

SIA ALL

4) Do a continuity check from pin 9 on connector, D11306, to the Hi-Z shield around pin 1 on connector, D11314.

NOTE: This step does a check of the out-of-tank wiring for an open shield condition.

5) Make sure that connector, D11306, is disconnected.

6) Make sure that the resistance from D11314, pin 1, to D11314, pin 2, is more than 1 megohm.

7) Make sure that the resistance from D11314, pin 1, to D11314, pin 3, is more than 1 megohm.

8) Re-connect connectors D11306 and D11314. To re-connect connector, D11314, do this task: Bussing Plug Installation, AMM TASK 28-41-41-400-801.

(c) FOR A FAULT IN THE CENTER TANK, do these steps:

1) Disconnect connector, D11308, on the FQPU, M1827, in the radar bay.

2) Disconnect connector, D11316, at the front spar if it is not already disconnected.

3) Do a continuity check between these pins of connector, D11316, on the rear spar and connector, D11308, on the FQPU, M1827, in the radar bay:

SIA 702-710

D11316		D11308
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 22
pin 3	. . . . .	pin 23

SIA 711-714, 716-999

D11316		D11308
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 21
pin 3	. . . . .	pin 17

SIA ALL

4) Do a continuity check from pin 9 on connector, D11308, to the Hi-Z shield around pin 1 on connector, D11316.

NOTE: This step does a check of the out-of-tank wiring for an open shield condition.

5) Make sure that connector, D11308, is disconnected.

6) Make sure that the resistance from D11316, pin 1, to D11316, pin 2, is more than 1 megohm.

7) Make sure that the resistance from D11316, pin 1, to D11316, pin 3, is more than 1 megohm.

8) Re-connect connectors D11308 and D11316. To re-connect connector, D11316, do this task: Bussing Plug Installation, AMM TASK 28-41-41-400-801.

(d) If you find a problem with the wiring, then repair the problems that you find (SWPM 20-20-00, SWPM 20-60-06).

1) Make sure that the out-of-tank wire bundle is shielded and the shield ground is terminated (SWPM 20-10-15, SWPM 20-20-00).

28-AWL-04: CDCCL

(e) Do this task: FQIS - Out Tank Connectors - Electrical Bonding Resistance Check, AMM TASK 05-55-54-200-802, for the applicable side of body FQIS connector D39915 or D39916, or main wheel well FQIS connector D4850P, if it is disconnected or if the coupling ring on the connector is loosened or tightened.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, AMM TASK 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-03: ALI

(f) Do this task: FQIS Wiring And Bonding - Inspection, AMM TASK 05-55-54-200-801, for the applicable wire bundle if the FQIS wire bundle in the unpressurized zone is replaced or the FQIS wire bundle shield is repaired.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-03.

(g) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

1) If the GROUND TEST procedure shows PASS, then you corrected the fault.
2) If the GROUND TEST procedure continues to show TANK UNIT SHORT/>FULL, then continue.

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.

(7) If a single tank unit or compensator shows problems, then go into the applicable fuel tank (AMM TASK 28-11-00-910-802) and do these steps:

(a) Do an inspection of the tank unit and the adjacent wiring for these problems:

1) Make sure that no parts of the tank unit or compensator are in electrical contact with the airplane structure.
2) Make sure that there are no brackets that are bent or have other problems.
3) Make sure that there is no unwanted material in the tank unit or compensator.
4) Make sure that there are no loose terminal connections at either the applicable tank unit or the number 2 tank unit.

NOTE: The number 2 tank unit is the top of a daisy chain. If there is a loose connection at the number 2 tank unit, then a fault message can display for other tank units.

a) If there are loose terminal connections, then tighten the screws to these torque ranges:

<1> LO-Z 29 ±6 in-lb (3 ±1 N·m)

<2> SHIELD 17.5 ±2.5 in-lb (2.0 ±0.3 N·m)

<3> HI-Z 13.5 ±1.5 in-lb (1.5 ±0.2 N·m)

5) Make sure that there are no other problems with the wiring near the applicable tank unit or the number 2 tank unit (for example, a wire pinched under a tank unit).

(b) If there are problems with the tank unit or the adjacent wiring, then repair the problems.

28-AWL-09: CDCCL

1) Repair of the FQIS in-tank wire harness must be approved by the FAA Oversight Office.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

(c) If the tank unit wiring is repaired or replaced, then make sure the wire slack between the wire and components or structure maintains a clearance of 0.5 in. (12.7 mm).

28-AWL-09: CDCCL

(d) If 0.5 in. (12.7 mm) is not possible, then you must maintain a minimum clearance of 0.13 in. (3.30 mm).

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

(e) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

1) If the GROUND TEST procedure shows PASS, then you corrected the fault.

2) If the GROUND TEST procedure continues to show TANK UNIT SHORT/FULL, then replace the tank unit or compensator. These are the tasks:

- Tank Unit or the Compensator Unit Removal, AMM TASK 28-41-21-000-801
- Tank Unit or Compensator Unit Installation, AMM TASK 28-41-21-400-801.

3) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

a) If the GROUND TEST procedure shows PASS, then you corrected the fault.

b) If the GROUND TEST procedure continues to show TANK UNIT SHORT/FULL, then repair or replace the in-tank FQIS wire harness in the applicable tank (AMM TASK 28-41-44-400-801).

28-AWL-09: CDCCL

<1> Repair of the FQIS in-tank wire harness must be approved by the FAA Oversight Office.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

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) If two or more tank units show problems, then go into the applicable fuel tank (AMM TASK 28-11-00-910-802) and do these steps:

(a) Make sure that there are no loose terminal connections at each tank unit within the applicable tank.

NOTE: The number 2 tank unit is the top of a daisy chain. If there is a loose connection at the number 2 tank unit, then a fault message can display for other tank units.

1) If there are loose terminal connections, then tighten the screws to these torque ranges:

a) LO-Z 29 ±6 in-lb (3 ±1 N·m)

b) SHIELD 17.5 ±2.5 in-lb (2.0 ±0.3 N·m)

c) HI-Z 13.5 ±1.5 in-lb (1.5 ±0.2 N·m)

(b) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

1) If the GROUND TEST procedure shows PASS, then you corrected the fault.

2) If the GROUND TEST procedure continues to show TANK UNIT SHORT/FULL, then repair or replace the FQIS wire harness (AMM TASK 28-41-44-400-801).

28-AWL-09: CDCCL

a) Repair of the FQIS in-tank wire harness must be approved by the FAA Oversight Office.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

(c) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

1) If the GROUND TEST procedure shows PASS, then you corrected the fault.

2) If the GROUND TEST shows TANK UNIT SHORT/FULL for the applicable tank, then continue.

(9) If the problem continues, do these steps:

(a) Replace the FQPU, M1827. These are the tasks:

- Fuel Quantity Processor Unit Removal, AMM TASK 28-41-81-000-801
- Fuel Quantity Processor Unit Installation, AMM TASK 28-41-81-400-801.

(b) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

1) If the GROUND TEST procedure shows PASS, then you corrected the fault.

——— END OF TASK ———

804. FQIS Fault Message - TANK UNIT LO RESISTANCE - Fault Isolation

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: NOTE: This is applicable to Airworthiness Limitation 28-AWL-03.

(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, AMM TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitations 28-AWL-04 and 28-AWL-09.

B. Description

(1) This task is for these maintenance messages:

(a) 28-41104 TANK UNIT LO RESISTANCE

1) This fault code shows a problem with the No. 1 tank.

(b) 28-41204 TANK UNIT LO RESISTANCE

1) This fault code shows a problem with the No. 2 tank.

(c) 28-41304 TANK UNIT LO RESISTANCE

1) This fault code shows a problem with the center tank.

(2) This fault message alone does not cause the FQIS display or the refuel panel indicator to become blank. It shows that the measured fuel mass has an error additional to the baseline error which is less than +/- 5 percent of full scale fuel mass.

(3) This fault message shows if the measured resistance from the tank unit Lo-Z wire to the Hi-Z center conductor is less than approximately 253 kilohm and more than 64.8 kilohm for the No. 1 or No. 2 tank, less than approximately 177 kilohm and more than 45.1 kilohm for the center tank.

(4) This fault message is intended to show a condition that can develop into a fault indicated by the message TANK UNIT SHORT/>FULL. This fault message can indicate some contamination in one or more of the tank units or the compensator or a decrease in the resistance from the Lo-Z to the Hi-Z part of the tank unit circuit. This decrease in resistance could be caused by the start of a breakdown in the tank harness insulation or by conductivity across the tank units.

C. Possible Causes

(1) FQIS wire harness

(2) Water contamination in the fuel tank

(3) Microbial growth in the fuel tank

(4) FQIS tank unit or compensator

(5) Out-of-tank wiring (wire bundle) from the wing spar to the FQPU (including the bussing plug)

(6) M1827 FQPU Fuel Quantity Processor Unit

D. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

E. Related Data

(1) (SSM 28-41-11)

(2) (WDM 28-41-11)

F. Initial Evaluation

(1) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

(a) If the GROUND TEST shows TANK UNIT LO RESISTANCE for the applicable tank, then do the Fault Isolation Procedure below.

(b) If the GROUND TEST shows PASS, then there was an intermittent fault.

G. Fault Isolation Procedure

(1) Do these steps to do a check for water in the fuel:

(a) Get a sample of fuel at the sump of the applicable fuel tank (AMM TASK 12-11-00-680-801).

(b) Add one or two drops of water-soluble food coloring to the fuel sample.

NOTE: If there is water contamination of the fuel sample, the water in the fuel sample will be identified by the food coloring.

(c) If there is water contamination of the fuel sample, continue to get samples of fuel until no water is identified by the food coloring (AMM TASK 12-11-00-680-801).

1) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

a) If the GROUND TEST shows PASS, then you corrected the fault.

b) If the GROUND TEST shows TANK UNIT LO RESISTANCE for the applicable tank, then continue.

(d) If there is no water contamination of the fuel sample, then continue.

(2) Do these steps to do a check for microbial growth in the fuel:

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) Go into the No.1 tank (No. 2 tank, center tank) (AMM TASK 28-11-00-910-802).

(b) Do a check for microbial growth (AMM TASK 28-10-00-200-802).

(c) Correct any problem that you find (AMM TASK 28-10-00-600-804).

(d) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

(e) If the GROUND TEST shows PASS, then you corrected the fault.

(f) If the GROUND TEST shows TANK UNIT LO RESISTANCE for the applicable tank, then continue.

(3) If there is no microbial growth in the fuel tank, then continue.

(4) Disconnect the applicable bussing plug and examine the pins for a bent pin or other damage (AMM TASK 28-41-41-000-801).

(a) If there is damage, then do these steps:

1) Repair the pins if any of the pins have damage.

2) Clean the connector if there is any corrosion (SWPM 20-60-01).

3) Re-connect the bussing plug (AMM TASK 28-41-41-400-801).

4) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

5) If the GROUND TEST shows PASS, then you corrected the fault.

6) If the GROUND TEST shows TANK UNIT LO RESISTANCE for the applicable tank, then continue.

(b) If there is no corrosion or damage, then continue.

(5) For the applicable tank, do this task: Tank and Compensator Units - Resistance and Capacitance Check, AMM TASK 28-41-21-710-801.

(6) If the Tank and Compensator Unit test does not show problems, then do this test of the out-of-tank wiring (wire bundle) from the bussing plug to the Fuel Quantity Processor Unit (FQPU) in the radar bay:

(a) FOR A FAULT IN THE NO. 1 TANK, do these steps:

1) Disconnect connector D11304 on the FQPU, M1827 in the radar bay.

2) Do a continuity check between these pins of connector D11312 on the front spar and connector D11304 on the FQPU, M1827 in the radar bay:

SIA 702-710

D11312		D11304
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 22
pin 3	. . . . .	pin 23

SIA 711-714, 716-999

D11312		D11304
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 21
pin 3	. . . . .	pin 17

SIA ALL

3) Make sure that connector D11304 is disconnected.

4) Make sure that the resistance from D11312, pin 2 to D11312, pin 1 is more than 1 megohm.

5) Make sure that the resistance from D11312, pin 3 to D11312, pin 1 is more than 1 megohm.

6) Re-connect connectors D11304 and D11312. To re-connect connector D11312, do this task: Bussing Plug Installation, AMM TASK 28-41-41-400-801.

(b) FOR A FAULT IN THE NO. 2 TANK, do these steps:

1) Disconnect connector D11306 on the FQPU, M1827 in the radar bay.

2) Do a continuity check between these pins of connector D11314 on the front spar and connector D11306 on the FQPU, M1827 in the radar bay:

SIA 702-710

D11314		D11306
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 22
pin 3	. . . . .	pin 23

SIA 711-714, 716-999

D11314		D11306
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 21
pin 3	. . . . .	pin 17

SIA ALL

3) Make sure that connector D11306 is disconnected.

4) Make sure that the resistance from D11314, pin 1 to D11314, pin 2 is more than 1 megohm.

5) Make sure that the resistance from D11314, pin 1 to D11314, pin 3 is more than 1 megohm.

6) Re-connect connectors D11306 and D11314. To re-connect connector D11314, do this task: Bussing Plug Installation, AMM TASK 28-41-41-400-801.

(c) FOR A FAULT IN THE CENTER TANK, do these steps:

1) Disconnect connector D11308 on the FQPU, M1827 in the radar bay.

2) Do a continuity check between these pins of connector D11316 on the rear spar and connector D11308 on the FQPU, M1827 in the radar bay:

SIA 702-710

D11316		D11308
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 22
pin 3	. . . . .	pin 23

SIA 711-714, 716-999

D11316		D11308
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 21
pin 3	. . . . .	pin 17

SIA ALL

3) Make sure that connector D11308 is disconnected.

4) Make sure that the resistance from D11316, pin 2 to D11316, pin 1 is more than 1 megohm.

5) Make sure that the resistance from D11316, pin 3 to D11316, pin 1 is more than 1 megohm.

6) Reconnect connectors D11308 and D11316. To re-connect connector D11316, do this task: Bussing Plug Installation, AMM TASK 28-41-41-400-801.

(d) If you find a problem with the wiring, then repair the problems that you find (SWPM 20-20-00, SWPM 20-60-06).

1) Make sure that the out-of-tank wire bundle is shielded and the shield ground is terminated (SWPM 20-10-15, SWPM 20-20-00).

28-AWL-04: CDCCL

(e) Do this task: FQIS - Out Tank Connectors - Electrical Bonding Resistance Check, AMM TASK 05-55-54-200-802, for the applicable side of body FQIS connector D39915 or D39916, or main wheel well FQIS connector D4850P, if it is disconnected or if the coupling ring on the connector is loosened or tightened,.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, AMM TASK 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-03: ALI

(f) Do this task: FQIS Wiring And Bonding - Inspection, AMM TASK 05-55-54-200-801, for the applicable wire bundle if the FQIS wire bundle in the unpressurized zone is replaced or the FQIS wire bundle shield is repaired..

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-03.

(g) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

1) If the GROUND TEST procedure shows PASS, then you corrected the fault.
2) If the GROUND TEST procedure continues to show TANK UNIT LO RESISTANCE, then continue.

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.

(7) If a single tank unit or compensator shows problems, then go into the applicable fuel tank (AMM TASK 28-11-00-910-802) and do these steps:

(a) Do an inspection of the tank unit and the adjacent wiring for these problems:

1) Make sure that no parts of the tank unit or compensator are in electrical contact with the airplane structure.
2) Make sure that there are no brackets that are bent or have other problems.
3) Make sure that there is no unwanted material in the tank unit or compensator.
4) Make sure that there are no loose terminal connections at either the applicable tank unit or the number 2 tank unit.

NOTE: The number 2 tank unit is the top of a daisy chain. If there is a loose connection at the number 2 tank unit, then a fault message can display for other tank units.

a) If there are loose terminal connections, then tighten the screws to these torque ranges:

<1> LO-Z 29 ±6 in-lb (3 ±1 N·m)

<2> SHIELD 17.5 ±2.5 in-lb (2.0 ±0.3 N·m)

<3> HI-Z 13.5 ±1.5 in-lb (1.5 ±0.2 N·m)

5) Make sure that there are no other problems with the wiring near the applicable tank unit or the number 2 tank unit (for example, a wire pinched under a tank unit).

(b) If there are problems with the tank unit or the adjacent wiring, then repair the problems.

28-AWL-09: CDCCL

1) Repair of the FQIS in-tank wire harness must be approved by the FAA Oversight Office.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

(c) If the tank unit wiring is repaired or replaced, then make sure that the wire slack between the wire and components or structure maintains a clearance of 0.5 in. (12.7 mm).

28-AWL-09: CDCCL

(d) If 0.5 in. (12.7 mm) is not possible, then you must maintain a minimum clearance of 0.13 in. (3.30 mm).

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

(e) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

1) If the GROUND TEST procedure shows PASS, then you corrected the fault.

2) If the GROUND TEST procedure continues to show TANK UNIT LO RESISTANCE, then replace the tank unit or compensator.

These are the tasks:

Tank Unit or the Compensator Unit Removal, AMM TASK 28-41-21-000-801

Tank Unit or Compensator Unit Installation, AMM TASK 28-41-21-400-801

3) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

a) If the GROUND TEST procedure shows PASS, then you corrected the fault.

b) If the GROUND TEST procedure continues to show TANK UNIT LO RESISTANCE, then repair or replace the in-tank FQIS wire harness in the applicable tank (AMM TASK 28-41-44-400-801).

28-AWL-09: CDCCL

<1> Repair of the FQIS in-tank wire harness must be approved by the FAA Oversight Office.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

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) If two or more tank units show problems, then go into the applicable fuel tank (AMM TASK 28-11-00-910-802) and do these steps:

(a) Make sure that there are no loose terminal connections at each tank unit within the applicable tank.

NOTE: The number 2 tank unit is the top of a daisy chain. If there is a loose connection at the number 2 tank unit, then a fault message can display for other tank units.

1) If there are loose terminal connections, then tighten the screws to these torque ranges:

a) LO-Z 29 ±6 in-lb (3 ±1 N·m)

b) SHIELD 17.5 ±2.5 in-lb (2.0 ±0.3 N·m)

c) HI-Z 13.5 ±1.5 in-lb (1.5 ±0.2 N·m)

(b) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

1) If the GROUND TEST procedure shows PASS, then you corrected the fault.

2) If the GROUND TEST procedure continues to show TANK UNIT LO RESISTANCE, then repair or replace the FQIS wire harness (AMM TASK 28-41-44-400-801).

28-AWL-09: CDCCL

a) Repair of the FQIS in-tank wire harness must be approved by the FAA Oversight Office.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

(c) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

1) If the GROUND TEST procedure shows PASS, then you corrected the fault.

(9) If the problem continues, do these steps:

(a) Replace the FQPU. These are the tasks:

Fuel Quantity Processor Unit Removal, AMM TASK 28-41-81-000-801.

Fuel Quantity Processor Unit Installation, AMM TASK 28-41-81-400-801

(b) Do this task: Operational Test - Fuel Quantity Indicating System, AMM TASK 28-41-00-710-801.

——— END OF TASK ———

805. FQIS Fault Message - COMPENSATOR LO-Z OP/GND - Fault Isolation

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: NOTE: This is applicable to Airworthiness Limitations 28-AWL-03 and 28-AWL-37.

(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, AMM TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitations 28-AWL-04, 28-AWL-09, and 28-AWL-38.

B. Description

(1) This task is for these maintenance messages:

(a) 28-41106 COMPENSATOR LO-Z OP/GND

1) This fault code shows a problem with the No. 1 tank.

(b) 28-41206 COMPENSATOR LO-Z OP/GND

1) This fault code shows a problem with the No. 2 tank.

(c) 28-41306 COMPENSATOR LO-Z OP/GND

1) This fault code shows a problem with the center tank.

(2) The compensator Lo-Z wire is open or shorted to ground.

(3) This message is shown if the measured value of [K-1] is less than or equal to -0.85. If this fault condition causes an error in the fuel mass of less than 5 percent, then [K-1] is set to a nominal value of 1.1365.

NOTE: K is the "dielectric constant". Air, by definition has a K factor of 1. Fuel, depending on density and source, can have a K factor between approximately 2.0 and 2.2.

(4) If the fault condition is a short to ground and the magnitude of the short is sufficient to cause an error of 5 percent or more in the fuel mass calculation, the FQIS display and the refuel panel indicator for the tank that has the fault becomes blank.

(5) If the fault condition is a Lo-Z open wire or the short to ground is not sufficient to cause more than a 5 percent error in mass calculation, the fuel quantity continues to show with [K-1] set to the nominal value of 1.1365.

(6) This fault can also be shown if the tank unit Lo-Z wire is shorted to ground through less than 100 ohms (28-41 TASK 802).

C. Possible Causes

(1) FQIS wire harness (includes in-tank connector and internal and external tank penetration connector pins)

(2) Out-of-tank wiring (wire bundle) from the wing spar to the FQPU (including the bussing plug)

(3) Compensator (including connections)

D. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

E. Related Data

(1) (SSM 28-41-11)

(2) (WDM 28-41-11)

F. Initial Evaluation

(1) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

(2) If the CURRENT STATUS, GROUND TEST, or INFLIGHT FAULTS/FAULT HISTORY show COMPENSATOR LO-Z OP/GND for the applicable tank, then do the Fault Isolation Procedure below.

(3) If the GROUND TEST shows PASS, then there was an intermittent fault.

G. Fault Isolation Procedure

(1) Disconnect the applicable bussing plug and examine the pins for corrosion or damage (AMM TASK 28-41-41-000-801).

(a) If there is corrosion or damage, then do these steps:

1) Repair the pins if any of the pins have damage.

2) Clean the connector if there is any corrosion (SWPM 20-60-01).

3) Re-connect the bussing plug (AMM TASK 28-41-41-400-801).

4) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

5) If the GROUND TEST shows PASS, then you corrected the fault, do the step to erase the faults in BITE.

6) If the GROUND TEST shows COMPENSATOR LO-Z OPEN/GND for the applicable tank, then continue.

(b) If there is no corrosion or damage, then continue.

(2) For the applicable tank, do this task: Tank and Compensator Units - Resistance and Capacitance Check, AMM TASK 28-41-21-710-801

(a) If a fault is found, go to the step for a single tank unit or compensator check.

(3) If the Tank and Compensator Unit Test does not show problems, then do this test of the out-of-tank wiring (wire bundle) from the bussing plug to the Fuel Quantity Processor Unit (FQPU) in the radar bay:

(a) FOR A FAULT IN THE NO. 1 TANK, do these steps:

1) Disconnect connector D11304 on the FQPU, M1827 in the radar bay.

2) Do a continuity check between these pins of connector D11312 on the front spar and connector D11304 on the FQPU, M1827 in the radar bay:

I **SIA 702-710**

D11312		D11304
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 22
pin 3	. . . . .	pin 23

SIA 711-714, 716-999

D11312		D11304
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 21
pin 3	. . . . .	pin 17

SIA ALL

3) Make sure that connector D11304 is disconnected.

4) Make sure that the resistance from D11312, pin 1 to the shield on D11312 is more than 1 megohm.

5) Re-connect connectors D11304 and D11312. To re-connect connector D11312, do this task: Bussing Plug Installation, AMM TASK 28-41-41-400-801.

(b) FOR A FAULT IN THE NO. 2 TANK, do these steps:

1) Disconnect connector D11306 on the FQPU, M1827 in the radar bay.

2) Do a continuity check between these pins of connector D11314 on the front spar and connector D11306 on the FQPU, M1827 in the radar bay:

SIA 702-710

D11314		D11306
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 22
pin 3	. . . . .	pin 23

SIA 711-714, 716-999

D11314		D11306
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 21
pin 3	. . . . .	pin 17

SIA ALL

3) Make sure that connector D11306 is disconnected.

4) Make sure that the resistance from D11314, pin 1 to the shield on D11314 is more than 1 megohm.

5) Re-connect connectors D11306 and D11314. To re-connect connector D11314, do this task: Bussing Plug Installation, AMM TASK 28-41-41-400-801.

(c) FOR A FAULT IN THE CENTER TANK, do these steps:

1) Disconnect connector D11308 on the FQPU, M1827 in the radar bay.

2) Do a continuity check between these pins of connector D11316 on the rear spar and connector D11308 on the FQPU, M1827 in the radar bay:

SIA 702-710

D11316		D11308
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 22
pin 3	. . . . .	pin 23

SIA 711-714, 716-999

D11316		D11308
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 21
pin 3	. . . . .	pin 17

SIA 711-714, 716-999 (Continued)

SIA ALL

3) Make sure that connector D11308 is disconnected.

4) Make sure that the resistance from D11316, pin 1 to the shield on D11316 is more than 1 megohm.

5) Re-connect connectors D11308 and D11316. To re-connect connector D11316, do this task: Bussing Plug Installation, AMM TASK 28-41-41-400-801.

(d) If you find a problem with the out-tank wiring, then repair the problems that you find (SWPM 20-20-00, SWPM 20-60-06).

NOTE: If no faults are found in the out-tank wiring, go to the next step for single tank unit or compensator problems.

1) Make sure that the out-of-tank wire bundle is shielded and the shield ground is terminated (SWPM 20-10-15, SWPM 20-20-00).

28-AWL-04: CDCCL

2) Do this task: FQIS - Out Tank Connectors - Electrical Bonding Resistance Check, AMM TASK 05-55-54-200-802, for the applicable side of body FQIS connector D39915 or D39916, or main wheel well FQIS connector D4850P, if it is disconnected or if the coupling ring on the connector is loosened or tightened,.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, AMM TASK 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-03: ALI

3) Do this task: FQIS Wiring And Bonding - Inspection, AMM TASK 05-55-54-200-801, for the applicable wire bundle if the FQIS wire bundle in the unpressurized zone is replaced or the FQIS wire bundle shield is repaired.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-03.

4) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

5) If the GROUND TEST procedure shows PASS, then you corrected the fault, do the step to erase the faults in BITE.

6) If the GROUND TEST procedure continues to show COMPENSATOR LO-Z OP/GND, then continue.

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) If one or more tank units or the compensator shows problems, then go into the applicable fuel tank (AMM TASK 28-11-00-910-802) and do these steps:

(a) Do an inspection of the tank unit or compensator and the adjacent wiring for these problems:

1) Make sure that no parts of the tank unit or compensator are in electrical contact with the airplane structure.
2) Make sure that there are no brackets that are bent or have other problems.
3) Make sure that there is no unwanted material in the tank unit or compensator.
4) Make sure that there are no loose terminal connections at either the applicable tank unit or the number 2 tank unit.

   NOTE: The number 2 tank unit is the top of a daisy chain. If there is a loose connection at the number 2 tank unit, then a fault message can display for other tank units.

   a) If there are loose terminal connections, then tighten the screws to these torque ranges:

      <1> LO-Z 29 ±6 in-lb (3 ±1 N·m)

      <2> SHIELD 17.5 ±2.5 in-lb (2.0 ±0.3 N·m)

      <3> HI-Z 13.5 ±1.5 in-lb (1.5 ±0.2 N·m)
5) Make sure that there are no other problems with the wiring near the applicable tank unit or the number 2 tank unit (for example, a wire pinched under a tank unit).

(b) If there are problems with the tank unit or the adjacent wiring, then repair the problems.

28-AWL-09: CDCCL

1) Repair of the FQIS in-tank wire harness must be approved by the FAA Oversight Office.

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

   NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.
2) If the tank unit wiring is repaired or replaced, then make sure the wire slack between the wire and components or structure maintains a clearance of 0.5 in. (12.7 mm).

28-AWL-09: CDCCL

3) If 0.5 in. (12.7 mm) is not possible, then you must maintain a minimum clearance of 0.13 in. (3.30 mm).

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

   NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.
4) Do this task: FQIS BITE Procedure, 28-41 TASK 801.
5) If the GROUND TEST procedure shows PASS, then you corrected the fault, do the step to erase the faults in BITE.
6) If the GROUND TEST procedure continues to show COMPENSATOR LO-Z OP/GND, then replace the tank unit or compensator.

(c) Replace the tank unit or compensator.

1) Do this task: Tank Unit or the Compensator Unit Removal, AMM TASK 28-41-21-000-801.
2) Do this task: Tank Unit or Compensator Unit Installation, AMM TASK 28-41-21-400-801.

3) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

4) If the GROUND TEST procedure shows PASS, then you corrected the fault, do the step to erase the faults in BITE.

5) If the GROUND TEST procedure continues to show COMPENSATOR LO-Z OP/GND, then continue to trouble shoot and correct the faults.

(5) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

(6) Erase the faults in the BITE FAULT HISTORY.

(a) Go to the FQIS BITE TEST main menu.

(b) Push the next page key to go to page 2.

(c) Push the line select key next to the ERASE FAULT HISTORY prompt.

(d) Push the line select key next to the YES prompt to erase fault history.

——— END OF TASK ———

806. FQIS Fault Message - COMPENSATOR SHORTED - Fault Isolation

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: NOTE: This is applicable to Airworthiness Limitations 28-AWL-03 and 28-AWL-37.

(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, AMM TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitations 28-AWL-04, 28-AWL-09, and 28-AWL-38.

B. Description

(1) This task is for these maintenance messages:

(a) 28-41107 COMPENSATOR SHORTED

1) This fault code shows a problem with the No. 1 tank.

(b) 28-41207 COMPENSATOR SHORTED

1) This fault code shows a problem with the No. 2 tank.

(c) 28-41307 COMPENSATOR SHORTED

1) This fault code shows a problem with the center tank.

(2) This fault shows a short from the compensator Lo-Z wire to the Hi-Z center conductor.

(3) This fault is shown if the resistance from compensator Lo-Z to the Hi-Z center conductor is less than 220 Kohms (+/- 25 Kohms). If the error in fuel mass calculation caused by the fault is less than 5 percent, then [K-1] is set to the nominal value of 1.1365.

NOTE: K is the "dielectric constant". Air, by definition has a K factor of 1. Fuel, depending on density and source, can have a K factor between approximately 2.0 and 2.2.

(4) If error in fuel mass calculation caused by the fault is more than 5 percent, then the FQIS display in the flight compartment and the refuel indicator become blank. This usually occurs when the resistance from the compensator Lo-Z wire to the Hi-Z center conductor is between 0 and 10 Kohms.

(5) If the error in the fuel mass calculation is less than 5 percent, then the fuel quantity in the flight compartment and at the refueling station continues to display with [K-1] set to the nominal value of 1.1365.

(6) This fault can also be shown if the tank unit Lo-Z wire is shorted to ground through less than 100 ohms (28-41 TASK 802).

C. Possible Causes

(1) FQIS wire harness (includes in-tank connector and internal and external tank penetration connector pins)

(2) Out-of-tank wiring (wire bundle) from the wing spar to the FQPU (including the bussing plug)

(3) Compensator (including connections)

(4) Microbial growth in the fuel tank

D. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

E. Related Data

(1) (SSM 28-41-11)

(2) (WDM 28-41-11)

F. Initial Evaluation

(1) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

(a) If the CURRENT STATUS, GROUND TEST, OR INFLIGHT FAULTS/FAULT HISTORY show COMPENSATOR SHORTED for the applicable tank, then do the Fault Isolation Procedure below.

(b) If the GROUND TEST shows PASS, then there was an intermittent fault.

G. Fault Isolation

(1) Do these steps to do a check for water in the fuel:

(a) Get a sample of fuel at the sump of the applicable fuel tank (AMM TASK 12-11-00-680-801).

(b) Add one or two drops of water-soluble food coloring to the fuel sample.

NOTE: If there is water contamination of the fuel sample, the water in the fuel sample will be identified by the food coloring.

(c) If there is water contamination of the fuel sample, continue to get samples of fuel until no water is identified by the food coloring.

(d) If there is no water contamination of the fuel sample, then continue.

(2) Do these steps to do a check for microbial growth in the fuel:

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) Go into the No.1 tank (No. 2 tank, center tank) (AMM TASK 28-11-00-910-802).

(b) Do a check for microbial growth (AMM TASK 28-10-00-200-802).

(c) Correct any problem that you find (AMM TASK 28-10-00-600-804).

(3) If there is no microbial growth in the fuel tank, then continue.

(4) Disconnect the applicable bussing plug and examine the pins for corrosion or damage (AMM TASK 28-41-41-000-801).

(a) If there is corrosion or damage, then do these steps:

1) Repair the pins if any of the pins have damage.

2) Clean the connector if there is any corrosion (SWPM 20-60-01).

3) Re-connect the bussing plug (AMM TASK 28-41-41-400-801).

4) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

5) If the GROUND TEST shows PASS, then you corrected the fault, do the step to erase the faults in BITE.

6) If the GROUND TEST shows COMPENSATOR SHORTED for the applicable tank, then continue.

(b) If there is no corrosion or damage, then continue.

(5) For the applicable tank, do this task: Tank and Compensator Units - Resistance and Capacitance Check, AMM TASK 28-41-21-710-801

(a) If the Compensator test shows faults, go to the step for the compensator check.

(6) If the Tank and Compensator Unit test does not show problems, then do this test of the out-of-tank wiring (wire bundle) from the bussing plug to the Fuel Quantity Processor Unit (FQPU) in the radar bay:

(a) FOR A FAULT IN THE NO. 1 TANK, do these steps:

1) Disconnect connector D11304 on the FQPU, M1827 in the radar bay.

2) Do a continuity check between these pins of connector D11312 on the front spar and connector D11304 on the FQPU, M1827 in the radar bay:

SIA 702-710

D11312		D11304
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 22
pin 3	. . . . .	pin 23

SIA 711-714, 716-999

D11312		D11304
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 21
pin 3	. . . . .	pin 17

SIA ALL

3) Make sure that connector D11304 is disconnected.

4) Make sure that the resistance from D11312, pin 1 to the shield on D11312 is more than 1 megohm.

5) Re-connect connectors D11304 and D11312. To re-connect connector D11312, do this task: Bussing Plug Installation, AMM TASK 28-41-41-400-801.

(b) FOR A FAULT IN THE NO. 2 TANK, do these steps:

1) Disconnect connector D11314 on the FQPU, M1827 in the radar bay.

2) Do a continuity check between these pins of connector D11314 on the front spar and connector D11306 on the FQPU, M1827 in the radar bay:

SIA 702-710

D11314		D11306
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 22
pin 3	. . . . .	pin 23

SIA 711-714, 716-999

D11314		D11306
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 21
pin 3	. . . . .	pin 17

SIA ALL

3) Make sure that connector D11306 is disconnected.

4) Make sure that the resistance from D11314, pin 1 to the shield on D11314 is more than 1 megohm.

5) Re-connect connectors D11306 and D11314. To re-connect connector D11314, do this task: Bussing Plug Installation, AMM TASK 28-41-41-400-801.

(c) FOR A FAULT IN THE CENTER TANK, do these steps:

1) Disconnect connector D11308 on the FQPU, M1827 in the radar bay.

2) Do a continuity check between these pins of connector D11316 on the rear spar and connector D11308 on the FQPU, M1827 in the radar bay:

SIA 702-710

D11316		D11308
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 22
pin 3	. . . . .	pin 23

SIA 711-714, 716-999

D11316		D11308
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 21
pin 3	. . . . .	pin 17

SIA ALL

3) Make sure that connector D11308 is disconnected.

4) Make sure that the resistance from D11316, pin 1 to the shield on D11316 is more than 1 megohm.

5) Re-connect connectors D11308 and D11316.To re-connect connector D11316, do this task: Bussing Plug Installation, AMM TASK 28-41-41-400-801.

(d) If you find a problem with the out-tank wiring, then repair the problems that you find (SWPM 20-20-00, SWPM 20-60-06).

NOTE: If no faults are found in the out-tank wiring, go to the next step for the compensator check.

1) Make sure the out-of-tank wire bundle is shielded and the shield ground is terminated (SWPM 20-10-15, SWPM 20-20-00).

28-AWL-04: CDCCL

2) Do this task: FQIS - Out Tank Connectors - Electrical Bonding Resistance Check, AMM TASK 05-55-54-200-802, for the applicable side of body FQIS connector D39915 or D39916, or main wheel well FQIS connector D4850P, if it is disconnected or if the coupling ring on the connector is loosened or tightened,.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, AMM TASK 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-03: ALI

3) Do this task: FQIS Wiring And Bonding - Inspection, AMM TASK 05-55-54-200-801, for the applicable wire bundle if the FQIS wire bundle in the unpressurized zone is replaced or the FQIS wire bundle shield is repaired..

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-03.

4) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

5) If the GROUND TEST procedure shows PASS, then you corrected the fault, do the step to erase the faults in BITE.

6) If the GROUND TEST procedure continues to show COMPENSATOR SHORTED, then continue.

(7) If the compensator shows problems, or if no faults are found in the out-tank wiring, then do these steps:

(a) Do an inspection of the compensator and the adjacent wiring for these problems:

1) Make sure that no parts of the compensator are in electrical contact with the airplane structure.

2) Make sure that there are no brackets that are bent or have other problems.

3) Make sure that there is no unwanted material in the compensator.

4) Make sure that there are no loose terminal connections at the compensator.

5) Make sure that there are no other problems with the wiring near the compensator (for example, a wire pinched under a compensator).

(b) If there are problems with the adjacent wiring, then repair or replace the components to correct the faults.

NOTE: If no in-tank wiring faults are found, do the step to replace the compensator.

28-AWL-09: CDCCL

1) Repair of the FQIS in-tank wire harness must be approved by the FAA Oversight Office.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

2) If the tank unit wiring is repaired or replaced, then make sure the wire slack between the wire and components or structure maintains a clearance of 0.5 in. (12.7 mm).

28-AWL-09: CDCCL

3) If 0.5 in. (12.7 mm) is not possible, then you must maintain a minimum clearance of 0.13 in. (3.30 mm).

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

4) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

5) If the GROUND TEST procedure shows PASS, then you corrected the fault, do the step to erase the faults in BITE.

6) If the GROUND TEST continues to show COMPENSATOR SHORTED, do the next step to replace the compensator.

(c) Replace the compensator.

1) Do this task: Tank Unit or the Compensator Unit Removal, AMM TASK 28-41-21-000-801.

2) Do this task: Tank Unit or Compensator Unit Installation, AMM TASK 28-41-21-400-801.

3) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

4) If the GROUND TEST procedure shows PASS, then you corrected the fault, do the step to erase the faults in BITE.

5) If the GROUND TEST procedure continues to show COMPENSATOR SHORTED, trouble shoot and fix the fault, or deactivate the FQIS under MMEL 28-6 or MMEL 28-7 (for faults associated with only one fuel tank).

NOTE: For MMEL 28-6, refer to AMM TASK 28-00-00-040-807.

NOTE: For MMEL 28-7, refer to AMM TASK 28-00-00-040-808.

6) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

(8) Erase the faults in the BITE FAULT HISTORY.

(a) Go to the FQIS BITE TEST main menu.

(b) Push the next page key to go to page 2.

(c) Push the line select key next to the ERASE FAULT HISTORY prompt.

(d) Push the line select key next to the YES prompt to erase fault history.

——— END OF TASK ———

807. FQIS Fault Message - COMPENSATOR DATA BAD - Fault Isolation

A. Description

(1) This task is for these maintenance messages:

(a) 28-41108 COMPENSATOR DATA BAD

1) This fault code shows a problem with the No. 1 tank.

(b) 28-41208 COMPENSATOR DATA BAD

1) This fault code shows a problem with the No. 2 tank.

(c) 28-41308 COMPENSATOR DATA BAD

1) This fault code shows a problem with the center tank.

(2) This fault message is intended to show a condition that can develop into a fault indicated by the message COMPENSATOR SHORTED. This fault message can indicate some contamination in the compensator or a decrease in the resistance from the Lo-Z to the Hi-Z part of the compensator circuit. This decrease in resistance could be caused by the start of a breakdown in the tank harness insulation or by conductivity across the compensator.

(3) This fault message is shown for any one of these conditions:

(a) If the volume is above the compensator covered volume and the measured [K-1] is less than 1.000 and more than -0.85.

(b) If the volume is above the compensator covered volume and the measured [K-1] is more than 1.270.

(c) If the measured resistance from compensator Lo-Z to the Hi-Z Center conductor is less than 800 Kohms but more than 220 Kohms.

(4) If this fault is shown, the error in the fuel mass calculation is less than +/- 5 percent. The fuel quantity for the applicable tank continues to show in the flight compartment and on the refuel panel. [K-1] is set to a nominal value of 1.1365.

NOTE: K is the "dielectric constant". Air, by definition has a K factor of 1. Fuel, depending on density and source, can have a K factor between approximately 2.0 and 2.2.

B. Possible Causes

(1) FQIS wire harness

(2) Out-of-tank wiring (wire bundle) from the wing spar to the FQPU (including the bussing plug)

(3) Compensator

(4) Microbial growth in the fuel tank

(5) Fuel Quantity Processor Unit (FQPU), M1827.

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

D. Related Data

(1) (WDM 28-41-11)

(2) (SSM 28-41-11)

E. Initial Evaluation

(1) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

(2) If the GROUND TEST shows COMPENSATOR DATA BAD for the applicable tank, then do the Fault Isolation Procedure below.

(3) If the GROUND TEST shows PASS, then there was an intermittent fault.

F. Fault Isolation

(1) Do these steps to do a check for water in the fuel:

(a) Get a sample of fuel at the sump of the applicable fuel tank (AMM TASK 12-11-00-680-801).

(b) Add one or two drops of water-soluble food coloring to the fuel sample.

NOTE: If there is water contamination of the fuel sample, the water in the fuel sample will be identified by the food coloring.

(c) If there is water contamination of the fuel sample, continue to get samples of fuel until no water is identified by the food coloring.

1) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

a) If the GROUND TEST shows PASS, then you corrected the fault.

b) If the GROUND TEST shows COMPENSATOR DATA BAD for the applicable tank, then continue.

(d) If there is no water contamination of the fuel sample, then continue.

(2) Do these steps to do a check for microbial growth in the fuel:

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) Go into the No.1 tank (No. 2 tank, center tank) (AMM TASK 28-11-00-910-802).

(b) Do a check for microbial growth (AMM TASK 28-10-00-200-802).

(c) Correct any problem that you find (AMM TASK 28-10-00-600-804).

(d) Do this task: FQIS BITE Procedure, 28-41 TASK 801FQIS BITE Procedure, 28-41 TASK 801.

(e) If the GROUND TEST shows PASS, then you corrected the fault.

(f) If the GROUND TEST shows COMPENSATOR DATA BAD for the applicable tank, then continue.

(3) If there is no microbial growth in the fuel tank, then continue.

(4) Disconnect the applicable bussing plug and examine the pins for corrosion or damage. To do this, do this task: Bussing Plug Removal, AMM TASK 28-41-41-000-801.

(a) If there is corrosion or damage, then do these steps:

1) Repair the pins if any of the pins have damage.

2) Clean the connector if there is any corrosion (SWPM 20-60-01).

3) Re-connect the bussing plug (AMM TASK 28-41-41-400-801).

4) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

5) If the GROUND TEST shows PASS, then you corrected the fault.

6) If the GROUND TEST shows COMPENSATOR DATA BAD for the applicable tank, then continue.

(b) If there is no corrosion or damage, then continue.

(5) For the applicable tank, do this task: Tank and Compensator Units - Resistance and Capacitance Check, AMM TASK 28-41-21-710-801.

(6) If the Tank and Compensator Unit Test does not show problems, then do this test of the out-of-tank wiring (wire bundle) from the bussing plug to the Fuel Quantity Processor Unit (FQPU) in the radar bay:

(a) FOR A FAULT IN THE NO. 1 TANK, do these steps:

1) Disconnect connector D11304 on the FQPU, M1827 in the radar bay.

2) Do a continuity check between these pins of connector D11312 on the front spar and connector D11304 on the FQPU, M1827 in the radar bay:

SIA 702-710

D11312	D11304
pin 1	pin 8
pin 2	pin 22
pin 3	pin 23

SIA 711-714, 716-999

D11312	D11304
pin 1	pin 8
pin 2	pin 21
pin 3	pin 17

SIA ALL

3) Make sure that connector D11304 is disconnected.

4) Make sure that the resistance from D11312, pin 1 to the shield on D11312 is more than 1 megohm.

5) Reconnect connectors D11304 and D11312 To re-connect connector D11312, do this task: Bussing Plug Installation, AMM TASK 28-41-41-400-801.

(b) FOR A FAULT IN THE NO. 2 TANK, do these steps:

1) Disconnect connector D11306 on the FQPU, M1827 in the radar bay.

2) Do a continuity check between these pins of connector D11314 on the front spar and connector D11306 on the FQPU, M1827 in the radar bay:

SIA 702-710

D11314	D11306
pin 1	pin 8
pin 2	pin 22
pin 3	pin 23

SIA 711-714, 716-999

D11314	D11306
pin 1	pin 8
pin 2	pin 21
pin 3	pin 17

SIA ALL

3) Make sure that connector D11306 is disconnected.

4) Make sure that the resistance from D11314, pin 1 to the shield on D11314 is more than 1 megohm.

5) Re-connect connectors D11306 and D11314. To re-connect connector D11314, do this task: Bussing Plug Installation, AMM TASK 28-41-41-400-801.

(c) FOR A FAULT IN THE CENTER TANK, do these steps:

1) Disconnect connector D11308 on the FQPU, M1827 in the radar bay.

2) Do a continuity check between these pins of connector D11316 on the rear spar and connector D11308 on the FQPU, M1827 in the radar bay:

SIA 702-710

D11316	D11308
pin 1	pin 8
pin 2	pin 22
pin 3	pin 23

SIA 711-714, 716-999

D11316	D11308
pin 1	pin 8
pin 2	pin 21
pin 3	pin 17

SIA ALL

3) Make sure that connector D11308 is disconnected.

4) Make sure that the resistance from D11316, pin 1 to the shield on D11316 is more than 1 megohm.

5) Re-connect connectors D11308 and D11316.To re-connect connector D11316, do this task: Bussing Plug Installation, AMM TASK 28-41-41-400-801.

(d) If you find a problem with the wiring, then repair the problems that you find (SWPM 20-20-00, SWPM 20-60-06).

1) Make sure that the out-of-tank wire bundle is shielded and the shield ground is terminated (SWPM 20-10-15, SWPM 20-20-00).

28-AWL-04: CDCCL

(e) Do this task: FQIS - Out Tank Connectors - Electrical Bonding Resistance Check, AMM TASK 05-55-54-200-802, for the applicable side of body FQIS connector D39915 or D39916, or main wheel well FQIS connector D4850P, if it is disconnected or if the coupling ring on the connector is loosened or tightened.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, AMM TASK 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-03: ALI

(f) Do this task: FQIS Wiring And Bonding - Inspection, AMM TASK 05-55-54-200-801, for the applicable wire bundle if the FQIS wire bundle in the unpressurized zone is replaced or the FQIS wire bundle shield is repaired.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-03.

(g) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

1) If the GROUND TEST procedure shows PASS, then you corrected the fault.

2) If the GROUND TEST procedure continues to show COMPENSATOR DATA BAD, then continue.

(7) If only the compensator shows problems, then do these steps:

(a) Replace the compensator. These are the tasks:

- Tank Unit or the Compensator Unit Removal, AMM TASK 28-41-21-000-801
- Tank Unit or Compensator Unit Installation, AMM TASK 28-41-21-400-801.

(b) Do an inspection of the compensator and the adjacent wiring for these problems:

1) Make sure that no parts of the compensator are in electrical contact with the airplane structure.

2) Make sure that there are no brackets that are bent or have other problems.

3) Make sure that there is no unwanted material in the compensator.

4) Make sure that there are no loose terminal connections at the compensator.

5) Make sure that there are no other problems with the wiring near the compensator (for example, a wire pinched under the compensator).

(c) If there are problems with the compensator or the adjacent wiring, repair the problems.

28-AWL-09: CDCCL

1) Repair of the FQIS in-tank wire harness must be approved by the FAA Oversight Office.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

(d) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

1) If the GROUND TEST procedure shows PASS, then you corrected the fault.

2) If the GROUND TEST procedure continues to show COMPENSATOR DATA BAD, then repair or replace the in-tank FQIS wire harness in the applicable tank. To repair or replace the FQIS wire harness, do this task: FQIS Wire Harness Replacement, AMM TASK 28-41-44-400-801.

28-AWL-09: CDCCL

a) Repair of the FQIS in-tank wire harness must be approved by the FAA Oversight Office.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

3) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

a) If the GROUND TEST procedure shows PASS, then you corrected the fault.

(8) If two or more tank units show problems, then repair or replace the in-tank FQIS wire harness in the applicable tank (AMM TASK 28-41-44-400-801).

28-AWL-09: CDCCL

(a) Repair of the FQIS in-tank wire harness must be approved by the FAA Oversight Office.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

(b) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

1) If the GROUND TEST procedure shows PASS, then you corrected the fault.

2) If the GROUND TEST shows COMPENSATOR DATA BAD for the applicable tank, then continue.

(9) If the problem continues, do these steps:

(a) Replace the FQPU, M1827. These are the tasks:

- Fuel Quantity Processor Unit Removal, AMM TASK 28-41-81-000-801
- Fuel Quantity Processor Unit Installation, AMM TASK 28-41-81-400-801.

(b) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

1) If the GROUND TEST procedure shows PASS, then you corrected the fault.

END OF TASK

808. FQIS Fault Message - PROCESSOR FAILED - Fault Isolation

A. Description

(1) This task is for these maintenance messages:

(a) 28-41109 PROCESSOR FAILED

(b) 28-41209 PROCESSOR FAILED

(c) 28-41309 PROCESSOR FAILED

(2) This message is shown if the circuitry in the Fuel Quantity Processor Unit (FQPU) has failed and will cause a fuel mass calculation error of more than +/- 5 percent.

(3) The FQIS display in the flight compartment and the refuel indicator become blank when this fault message is shown.

B. Possible Causes

(1) Fuel quantity processor unit (FQPU), M1827

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

D. Related Data

(1) (SSM 28-41-11)

(2) (WDM 28-41-11)

E. Initial Evaluation

(1) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

(2) If the GROUND TEST shows PROCESSOR FAILED for the applicable tank, then do the Fault Isolation Procedure below.

(3) If the GROUND TEST shows PASS, then there was an intermittent fault.

F. Fault Isolation Procedure

(1) Do these steps to replace the processor and confirm that you corrected the fault:

(a) Replace the fuel quantity processor unit (FQPU), M1827.

These are the tasks:

Fuel Quantity Processor Unit Removal, AMM TASK 28-41-81-000-801,

Fuel Quantity Processor Unit Installation, AMM TASK 28-41-81-400-801.

(b) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

(c) If the GROUND TEST shows PASS, then you corrected the fault.

END OF TASK

809. FQIS Fault Message - PROCESSOR FAULT - Fault Isolation

A. Description

(1) This task is for these maintenance messages:

(a) 28-41002 PROCESSOR FAILED

(b) 28-41110 PROCESSOR FAILED

(c) 28-41210 PROCESSOR FAILED

(d) 28-41310 PROCESSOR FAILED

(e) 28-41114 PROCESSOR FAILED

(f) 28-41214 PROCESSOR FAILED

(g) 28-41314 PROCESSOR FAILED

(2) This message is shown if the circuitry in the Fuel Quantity Processor Unit (FQPU) has a problem that will cause a fuel mass calculation error of less than +/- 5 percent.

(3) The FQIS display in the flight compartment and the refuel indicator continue to show with an accuracy of +/- 5 percent when this fault message is shown.

B. Possible Causes

(1) Fuel quantity processor unit (FQPU), M1827

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

D. Related Data

(1) (WDM 28-41-11)

(2) (SSM 28-41-11)

E. Initial Evaluation

(1) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

(a) If the GROUND TEST shows PROCESSOR FAULT for the applicable tank, then do the Fault Isolation Procedure below.

(b) If the GROUND TEST shows PASS, then there was an intermittent fault.

F. Fault Isolation

(1) Do these steps to replace the processor and confirm that you corrected the fault:

(a) Replace the fuel quantity processor unit, M1827.

These are the tasks:

Fuel Quantity Processor Unit Removal, AMM TASK 28-41-81-000-801,

Fuel Quantity Processor Unit Installation, AMM TASK 28-41-81-400-801.

(b) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

(c) If the GROUND TEST shows PASS, then you corrected the fault.

——— END OF TASK ———

810. FQIS Fault Message - ARINC OUTPUT BUS FAILED - Fault Isolation

A. Description

(1) This task is for these maintenance messages:

(a) 28-41115 ARINC OUTPUT BUS FAILED

(b) 28-41215 ARINC OUTPUT BUS FAILED

(c) 28-41315 ARINC OUTPUT BUS FAILED

(d) 28-41415 ARINC OUTPUT BUS FAILED

NOTE: If the airplane does not have an auxiliary tank, 28-41415 is a Nuisance Fault and it does not cause problems in FQIS performance.

(2) This maintenance message shows if the ARINC Display Hardware or wiring has a problem.

B. Possible Causes

(1) Refuel Quantity Indicator, N193 (N194, N195)

(2) Display Electronic Unit (DEU)-1 (2), M1808 (M1809)

(3) FQPU, M1827

(4) Left (Right) Flight Management Computer (FMC), M1175 (M1632)

(5) Wiring

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

D. Related Data

(1) WDM 28-41-11

(2) SSM 28-41-11

E. Initial Evaluation

(1) Do the FQIS BITE Procedure, 28-41 TASK 801.

(a) If the GROUND TEST shows ARINC OUTPUT BUS FAILED, then do the Fault Isolation Procedure below.

(b) If the GROUND TEST shows PASS, then there was an intermittent fault.

F. Fault Isolation

(1) Do a check of the Refuel Quantity Indicators on the P15 panel as follows:

(a) Open this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

(b) Make sure that the display on each Load Select Indicator shows the quantity of fuel in each Fuel Tank.

(c) Push the FUELING INDICATION TEST SWITCH on the Refuel Control Panel.

1) Make sure that all Fueling Quantity Indicators operate correctly.

NOTE: The test blanks the Fueling Indicators Display for two seconds, then all LED segments go ON for two seconds. This sequence continues as long as you hold the TEST SWITCH. If you hold the TEST SWITCH for more than 20 seconds, the Test Mode will time out and the indicator will go back to its usual operating mode. If an internal fault is found during the test, the indicator will show Ind FAIL.

(d) Make sure that the display on each Load Select Indicator shows the quantity of fuel in each Fuel Tank.

(e) If the Load Select Indicators are not OK, then, do this task: Refuel Quantity Indicator Displays Incorrectly When Test Switch is Pressed - Fault Isolation, 28-21 TASK 802

(f) If the Load Select Indicators are OK, then continue. Close this access panel:

Number	Name/Location
621GB	Refuel Access Panel - Slat Station 143.27

(2) Do these steps to do a check of the DEU:

(a) For each of the two DEUs, do this task: DEU Self-Test Procedure, 31-62 TASK 802

(b) If one of the two DEUs fails the self-test, then do these steps:

1) Replace the defective DEU. These are the tasks:

- Display Electronic Unit Removal, AMM TASK 31-62-21-000-801
- Display Electronic Unit Installation, AMM TASK 31-62-21-400-801

2) Do the Repair Confirmation at the end of this task.

(c) If the two DEUs pass the self-test, then continue.

(3) Do these steps to do a check of the FMC:

(a) Do this task: Flight Management Computer System - Operational Test, AMM TASK 34-61-00-710-801.

(b) If the FMC Operational Test shows problems, do these steps:

1) Do the corrective action indicated in this task: Flight Management Computer System BITE Procedure, 34-61 TASK 801.

2) Do the Repair Confirmation at the end of this task.

(c) If the FMC Operational Test does not show problems, then continue.

(4) Replace the FQPU. These are the tasks:

- Fuel Quantity Processor Unit Removal, AMM TASK 28-41-81-000-801
- Fuel Quantity Processor Unit Installation, AMM TASK 28-41-81-400-801

(a) Do the Repair Confirmation at the end of this task.

(5) Do these steps to do a check of the ARINC Wiring from the FQPU (WDM 28-41-11):

SIA 702-710

(a) Disconnect connector D11304 on the FQPU, M1827 in the Radar Bay.

(b) Disconnect connector D3973A on DEU-1 on the E3-1 shelf in the Electronic Equipment Bay.

(c) Do a continuity check as follows:

SIA 702-710 (Continued)

D11304	D3973A
pin 24	pin K5
pin 25	pin J5

(d) Disconnect connector D3975A on DEU-2 on the E3-1 shelf in the Electronic Equipment Bay and do a continuity check as follows:

D11304	D3975A
pin 24	pin K5
pin 25	pin J5

(e) Disconnect connector D11308 on the FQPU, M1827 in the Radar Bay.

(f) Disconnect connector D3973B on DEU-1 on the E3-1 shelf in the Electronic Equipment Bay.

(g) Do a continuity check as follows:

D11308	D3973B
pin 24	pin K5
pin 25	pin J5

(h) Disconnect connector D3975B on DEU-2 on the E3-1 shelf in the Electronic Equipment Bay and do a continuity check as follows:

D11308	D3975B
pin 24	pin K5
pin 25	pin J5

(i) Disconnect connector D11306 on the FQPU, M1827 in the Radar Bay.

(j) Disconnect connector D3973D on DEU-1 on the E3-1 shelf in the Electronic Equipment Bay.

(k) Do a continuity check as follows:

D11306	D3973D
pin 24	pin K5
pin 25	pin J5

(l) Disconnect connector D3975D on DEU-2 on the E3-1 shelf in the Electronic Equipment Bay.

(m) Do a continuity check as follows:

D11306	D3975D
pin 24	pin K5
pin 25	pin J5

(n) Disconnect connector D4578J on the P15 panel on the wing.

(o) Do a continuity check as follows:

SIA 702-710 (Continued)

D11306	D4578J
pin 24	pin 5
pin 25	pin 4

(p) Disconnect connector D2179A on the E5-2 shelf in the Electronic Equipment Bay.

(q) Do a continuity check as follows:

D11306	D2179A
pin 1	pin D5
pin 3	pin E5

(r) If applicable, disconnect connector D3261A on the E5-2 shelf in the Electronic Equipment Bay.

1) Do a continuity check as follows:

D11306	D3261A
pin 1	pin D5
pin 3	pin E5

SIA 711-714, 716-999

(s) Disconnect connector D11354 on the FQPU, M1827 in the Radar Bay.

(t) Disconnect connector D3973A on DEU-1 on the E3-1 shelf in the Electronic Equipment Bay.

(u) Do a continuity check as follows:

D11354	D3973A
pin 1	pin K5
pin 3	pin J5

(v) Disconnect connector D3975A on DEU-2 on the E3-1 shelf in the Electronic Equipment Bay and do a continuity check as follows:

D11354	D3975A
pin 1	pin K5
pin 3	pin J5

(w) Disconnect connector D11352 on the FQPU, M1827 in the Radar Bay.

(x) Disconnect connector D3973B on DEU-1 on the E3-1 shelf in the Electronic Equipment Bay.

(y) Do a continuity check as follows:

D11352	D3973B
pin 8	pin K5
pin 2	pin J5

(z) Disconnect connector D3975B on DEU-2 on the E3-1 shelf in the Electronic Equipment Bay and do a continuity check as follows:

SIA 711-714, 716-999 (Continued)

D11352	D3975B
pin 8	pin K5
pin 2	pin J5

(aa) Disconnect connector D15806 on the FQPU, M1827 in the Radar Bay.

(ab) Disconnect connector D3973D on DEU-1 on the E3-1 shelf in the Electronic Equipment Bay.

(ac) Do a continuity check as follows:

D15806	D3973D
pin 4	pin K5
pin 12	pin J5

(ad) Disconnect connector D3975D on DEU-2 on the E3-1 shelf in the Electronic Equipment Bay.

(ae) Do a continuity check as follows:

D15806	D3975D
pin 4	pin K5
pin 12	pin J5

(af) Disconnect connector D4578J on the P15 panel on the wing.

(ag) Do a continuity check as follows:

D15806	D4578J
pin 4	pin 5
pin 12	pin 4

(ah) Disconnect connector D2179A on the E5-2 shelf in the Electronic Equipment Bay.

(ai) Do a continuity check as follows:

D11352	D2179A
pin 6	pin D5
pin 7	pin E5

(aj) Disconnect connector D3261A on the E5-2 shelf in the Electronic Equipment Bay.

1) Do a continuity check as follows:

D11352	D3261A
pin 6	pin D5
pin 7	pin E5

SIA ALL

(ak) Repair the wiring.

(al) Reconnect all disconnected connectors.

(am) Do the Repair Confirmation at the end of this task.

G. Repair Confirmation

(1) Do the FQIS BITE Procedure, 28-41 TASK 801.

(a) If the GROUND TEST shows PASS, then you corrected the problem.

(b) If the GROUND TEST still shows an ARINC OUTPUT BUS FAILED maintenance message, then continue the Fault Isolation Procedure at the subsequent step.

——— END OF TASK ———

811. FQIS Fault Message - PROGRAM PINS INVALID - Fault Isolation

A. Description

(1) This task is for these maintenance messages:

(a) 28-41111 PROGRAM PINS INVALID

(b) 28-41113 PROGRAM PINS INVALID

SIA 711-714, 716-999

(c) 28-41119 PROGRAM PINS INVALID

SIA ALL

(d) 28-41211 PROGRAM PINS INVALID

(e) 28-41213 PROGRAM PINS INVALID

SIA 711-714, 716-999

(f) 28-41219 PROGRAM PINS INVALID

SIA ALL

(g) 28-41311 PROGRAM PINS INVALID

(h) 28-41313 PROGRAM PINS INVALID

SIA 711-714, 716-999

(i) 28-41319 PROGRAM PINS INVALID

SIA ALL

(2) The Fuel Quantity Processor Unit (FQPU) cannot find the status of one of these:

(a) LB/KG discrete

(b) densitometer present/absent discrete

SIA 711-714, 716-999

(c) other discrete

SIA ALL

B. Possible Causes

I **SIA 702-710**

(1) Connectors D11306, D11308 and the related wiring

SIA 711-714, 716-999

(2) Connectors D11354, D15806 and the related wiring

SIA ALL

(3) Fuel quantity processor unit (FQPU), M1827

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

D. Related Data

(1) WDM 28-41-11

(2) SSM 28-41-11

E. Initial Evaluation

(1) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

(a) If the GROUND TEST shows PROGRAM PINS INVALID, then do the Fault Isolation Procedure below.

(b) If the GROUND TEST shows PASS, then there was an intermittent fault.

F. Fault Isolation Procedure

I **SIA 702-710**

(1) Do these steps to do a check of the connectors D11306 and D11308:

(a) Disconnect connectors D11306 and D11308 from the FQPU in the radar bay.

(b) AIRPLANES WITH FUEL QUANTITY INDICATION IN POUNDS;

Do a check of the continuity from connector D11308, pin 10 to connector D11308, pin 11.

(c) AIRPLANES WITH FUEL QUANTITY INDICATION IN KILOGRAMS;

Do a check of the continuity from connector D11308, pin 11 to connector D11308, pin 12.

(d) Do a check of the continuity from connector D11306, pin 11 to D11306, pin 12.

(e) If there is no continuity, then do these steps:

1) Repair the wiring.

2) Reconnect connectors D11306 and D11308.

3) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

a) If the GROUND TEST shows PASS, then you corrected the fault.

b) If the GROUND TEST continues to show PROGRAM PINS INVALID, then continue.

(f) If there is continuity, then continue.

SIA 711-714, 716-999

(2) Do these steps to do a check of the connectors D15806 and D11354:

(a) Disconnect connectors D15806 and D11354 from the FQPU in the radar bay.

(b) AIRPLANES WITH FUEL QUANTITY INDICATION IN POUNDS;

Do a check of the continuity from connector D11354, pin 7 to connector D11354, pin 6.

(c) AIRPLANES WITH FUEL QUANTITY INDICATION IN KILOGRAMS;

Do a check of the continuity from connector D11354, pin 7 to connector D11354, pin 8.

(d) Do a check of the continuity from connector D15806, pin 7 to D15806, pin 8.

SIA 711-714, 716-999 (Continued)

(e) If there is no continuity, then do these steps:

1) Repair the wiring.

2) Reconnect connectors D15806 and D11354.

3) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

a) If the GROUND TEST shows PASS, then you corrected the fault.

b) If the GROUND TEST continues to show PROGRAM PINS INVALID, then continue.

(f) If there is continuity, then continue.

SIA ALL

(3) Install a new FQPU (AMM TASK 28-41-81-400-801).

(a) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

1) If the GROUND TEST shows PASS, then you corrected the fault.

——— END OF TASK ———

812. FQIS Fault Message - NO FMC DATA ON FQIS 6 - Fault Isolation

A. Description

(1) This task is for this maintenance message:

(a) 28-41001 NO FMC DATA ON FQIS 6

(2) This condition can occur if the FMC is OFF (unpowered) while the Fuel Quantity Indicating System is ON (powered), this can happen if the airplane operates on standby or battery power only. The Fuel Quantity Processor Unit (FQPU) cannot receive data or cannot control messages from the Flight Management Computer (FMC). If the FQIS BITE TEST screen is available on the CDU, then no further maintenance action is necessary.

B. Possible Causes

(1) Wiring

(2) FMCS transfer relays, R475 (No. 1) and R476 (No. 2)

(3) Fuel quantity processor unit (FQPU), M1827

(4) Flight management computer, M1175

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

D. Related Data

(1) SSM 28-41-11

(2) WDM 28-41-11

(3) SSM 34-61-14

(4) WDM 34-61-14

E. Initial Evaluation

(1) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

(a) If the GROUND TEST shows NO FMC DATA ON FQIS 6, then do the Fault Isolation Procedure below.

(b) If the GROUND TEST shows PASS, then there was an intermittent fault.

F. Fault Isolation

(1) Do this task: Flight Management Computer System BITE Procedure, 34-61 TASK 801.

(a) If the FMCS BITE test shows problems, then do these steps:

1) Do the fault correction shown (34-61 TASK 801).

2) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

3) If the GROUND TEST shows PASS, then you corrected the fault.

(b) If the FMCS does not show problems, then continue.

(2) Replace the fuel quantity processor unit (FQPU). These are the tasks:

- Fuel Quantity Processor Unit Removal, AMM TASK 28-41-81-000-801
- Fuel Quantity Processor Unit Installation, AMM TASK 28-41-81-400-801

(a) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

1) If the GROUND TEST shows PASS, then you corrected the fault.

2) If the GROUND TEST continues to show NO FMC DATA ON FQIS 6, then continue.

(3) Replace FMCS Transfer Relays No. 1 and No. 2.

(a) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

1) If the GROUND TEST shows PASS, then you corrected the fault.

2) If the GROUND TEST continues to show NO FMC DATA ON FQIS 6, then continue.

(4) Do these steps to do a check of the ARINC 6 wiring from the FQPU:

(a) Remove the FMC. This is the task: FMCS Computer Removal, AMM TASK 34-61-02-000-801

(b) Remove the FQPU. This is the task: Fuel Quantity Processor Unit Removal, AMM TASK 28-41-81-000-801

I **SIA 702-710**

(c) Do a continuity check between these pins of connector D11306 for the FQPU and connector D2179A on the FMC:

D11306	D2179A
pin 18	pin G9
pin 31	pin H9

SIA 711-714, 716-999

(d) Do a continuity check between these pins of connector D11352 for the FQPU and connector D2179A on the FMC:

D11352	D2179A
pin 9	pin G9
pin 10	pin H9

SIA ALL

(e) Repair the wiring problems that you find.

(f) Re-install the FQPU. This is the task: Fuel Quantity Processor Unit Installation, AMM TASK 28-41-81-400-801

(g) Re-install the FMC. This is the task: FMCS Computer Installation, AMM TASK 34-61-02-400-801

(h) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

1) If the GROUND TEST shows PASS, then you corrected the fault.

——— END OF TASK ———

813. Fuel Quantity Indication Blank - Fault Isolation

A. Description

(1) The FUEL QTY Indication in the Flight Compartment for one or more of the tanks is blank.

(2) If the FUEL QTY Indicator is blank because of a problem with the FQPU, it is possible that the blank indicator will show pounds (LBS) as the Fuel Measurement Unit.

(a) This is possible even if fuel is measured in kilograms (Kgs) when the Fuel Quantity Indicating System (FQIS) operates correctly.

SIA 703-710

(3) CTR Tank Only: If the FUEL QTY Indicator blanks intermittently because of defective wire terminations to connector D4850J, this can cause erroneous FULL, EMPTY or BLANK Fuel Quantity indications.

SIA ALL

B. Possible Causes

(1) FQIS Wire Harness

(2) Out-of-Tank Wiring from the Wing Spar to the FQPU (including the bussing plug)

(3) FQIS Tank Unit or Compensator

(4) FQPU, M1827

(5) Under-torqued or Disconnected Tank Unit Terminal

SIA 703-710

(6) Damaged Wire Assembly W5580-1301-20 or incorrectly installed pins to Connector D4850J (CTR Tank only)

SIA ALL

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

D. Related Data

(1) WDM 28-41-11

(2) SSM 28-41-11

(3) SWPM 20-14-12

E. Fault Isolation Procedure

(1) Do the FQIS BITE Procedure, 28-41 TASK 801.

(a) If the GROUND TEST shows PASS, and the Fuel Quantity Indication is not blank, then there could be an intermittent fault.

1) If the Fuel Quantity Indicator blanks intermittently, continue.

(b) If the GROUND TEST shows maintenance messages for the applicable tank, refer to the table at the end of the FQIS BITE Task (or 28-MAINT MSG INDEX) to find the applicable Fault Isolation Manual (FIM) Tasks for the maintenance messages that show. Do the applicable Fault Isolation Procedures to correct the problem.

1) If the Fuel Quantity Indication is not blank, then you corrected the problem.

SIA 703-710

(c) If the GROUND TEST shows PASS, and the Fuel Quantity Indication is blank, then continue.

(2) Examine the connections to the CTR TANK connector D4850J of the Wire Assembly W5580-1301-20 (WDM 28-41-11).

(a) Make sure that all Shield Pigtails are correctly soldered and all connector pins are fully inserted into the connector.

NOTE: An open shield termination may not record a fault in the FQPU BITE Test during troubleshooting operations.

1) If necessary, repair or replace the Wire Assembly (SWPM 20-14-12).

(b) If the Fuel Quantity Indication is not blank, then you corrected the problem.

SIA ALL

——— END OF TASK ———

814. Fuel Quantity Indication Does Not Show the Correct Fuel Quantity - Fault Isolation

A. Description

(1) The FUEL QTY Indication in the Flight Compartment or on the Refueling Panel does not show the correct Fuel Quantity for one or more of the tanks.

(a) You can identify this condition with the Fuel Measuring Sticks or when there is a disagreement between the fuel added during the refueling operation and the Fuel Quantity that shows in the Flight Compartment.

B. Possible Causes

(1) FQIS Wire Harness

(2) Out-of-Tank Wiring from the Wing Spar to the FQPU (including the bussing plug)

(3) FQIS Tank Unit or Compensator

(4) FQPU, M1827

(5) Under-torqued or Disconnected Tank Unit Terminal

(6) Water Contamination in the Fuel Tank

SIA 703-710

(7) CTR Tank only: Damaged Wire Assembly W5580-1301-20 or incorrectly installed pins to Connector D4850J

SIA ALL

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

D. Related Data

(1) WDM 28-41-11

(2) SSM 28-41-11

(3) SWPM 20-14-12

E. Initial Evaluation

(1) Do the FQIS BITE Procedure, 28-41 TASK 801.

(a) If the GROUND TEST shows maintenance messages for the applicable tank, refer to 28-MAINT MSG INDEX to find and do the applicable FIM Tasks for the maintenance messages that show.

1) If the Fuel Quantity Indication is correct, then you corrected the problem.

2) If the Fuel Quantity Indication is still incorrect, then do the Fault Isolation Procedure below.

(b) If the GROUND TEST shows PASS, and the Fuel Quantity Indication is correct, then there was an intermittent fault.

(c) If the GROUND TEST shows PASS, and the Fuel Quantity Indication is incorrect, then do the Fault Isolation Procedure below.

F. Fault Isolation Procedure

(1) Do a check for water in the fuel as follows:

(a) Get a sample of fuel at the sump of the applicable Fuel Tank. This is the task: Fuel System Sumping, AMM TASK 12-11-00-680-801.

(b) Add one or two drops of water-soluble food coloring to the fuel sample.

NOTE: If there is water contamination in the fuel sample, it will be identified by the food coloring.

(c) If you find water contamination, continue to get samples of fuel until no water is identified by the food coloring (Fuel System Sumping, AMM TASK 12-11-00-680-801).

1) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

a) If the GROUND TEST shows PASS, and the FUEL QTY Indication is correct, then you corrected the problem.

SIA 703-710

(2) For the CTR TANK, examine the Shield Solder connections of Wire Assembly W5580-1301-20 to connector D4850J (WDM 28-41-11).

(a) Make sure that all Shield Pigtails are correctly soldered and all connector pins are fully inserted into the connector.

NOTE: An open shield termination may not record a fault in the FQPU BITE Test during troubleshooting operations.

(b) If necessary, repair or replace the Wire Assembly (SWPM 20-14-12).

(c) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

1) If the GROUND TEST shows PASS, and the FUEL QTY Indication is correct, then you corrected the problem.

SIA ALL

——— END OF TASK ———

816. FQIS Fault Message - HI/Z OP/SHORT TO SHIELD - Fault Isolation

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: NOTE: This is applicable to Airworthiness Limitation 28-AWL-03 and 28-AWL-37.

(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, AMM TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitations 28-AWL-04, 28-AWL-09, and 28-AWL-38.

B. Description

(1) This task is for these maintenance messages:

(a) 28-41105 HI-Z OP/SHORT TO SHIELD

1) This fault code shows a problem with the No. 1 tank.

(b) 28-41205 HI-Z OP/SHORT TO SHIELD

1) This fault code shows a problem with the No. 2 tank.

(c) 28-41305 HI-Z OP/SHORT TO SHIELD

1) This fault code shows a problem with the center tank.

(2) This fault can be caused by an open in the HI-Z center conductor or if the HI-Z center conductor is shorted to the shield. This condition can occur either in the FQIS wire harness in the fuel tank or in the wiring outside the fuel tank from the bussing plug on the wing spar to the Fuel Quantity Processor Unit (FQPU).

(3) This fault message is shown if the measured capacitance of the tank units and the compensator are both less than 50 percent of their empty tank capacitance value.

(4) This fault causes the FQIS display and the refuel panel indicator for the tank that has the fault to become blank.

(5) (SDS SUBJECT 28-41-00)

C. Possible Causes

(1) FQIS wire harness (includes in-tank connector and internal and external tank penetration connector pins)

(2) Out-of-tank wiring (wire bundle) from the wing spar to the FQPU (including the bussing plug)

(3) FQIS tank unit or compensator (including connections)

D. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	3	C00032	FUEL FUELING CONT
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

E. Related Data

(1) (SSM 28-41-11)

(2) (WDM 28-41-11)

F. Initial Evaluation

(1) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

(2) If the CURRENT STATUS, GROUND TEST, or INFLIGHT FAULT/FAULT HISTORY show HI-Z OPEN/SHORT TO SHIELD for the applicable tank, then do the Fault Isolation Procedure below.

(3) If the GROUND TEST shows PASS, then there was an intermittent fault.

G. Fault Isolation Procedure

(1) Disconnect the applicable bussing plug and examine the pins for corrosion or damage (AMM TASK 28-41-41-000-801).

(a) If there is corrosion or damage, then do these steps:

1) Repair the pins if any of the pins have damage.

2) Clean the connector if there is any corrosion (SWPM 20-60-01).

3) Re-connect the bussing plug (AMM TASK 28-41-41-400-801).

4) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

5) If the GROUND TEST shows PASS, then you corrected the fault, do the steps to erase the faults in BITE.

6) If the GROUND TEST shows HI-Z OPEN/SHORT TO SHIELD for the applicable tank, then continue.

(b) If there is no corrosion or damage, then continue.

(2) For the applicable tank, do this task: Tank and Compensator Units - Resistance and Capacitance Check, AMM TASK 28-41-21-710-801.

(a) If problems are found, do the step for the single tank unit and compensator check.

(3) If the tank and compensator unit test does not show problems, then do this test of the out-of-tank wiring (wire bundle) from the bussing plug to the Fuel Quantity Processor Unit (FQPU) in the radar bay:

(a) FOR A FAULT IN THE NO. 1 TANK, do these steps:

1) Disconnect connector D11304 on the FQPU, M1827 in the radar bay.

2) Do a continuity check between these pins of connector D11312 on the front spar and connector D11304 on the FQPU, M1827 in the radar bay:

SIA 702-710

D11312		D11304
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 22
pin 3	. . . . .	pin 23

SIA 711-714, 716-999

D11312		D11304
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 21
pin 3	. . . . .	pin 17

SIA ALL

3) Make sure that connector D11304 is disconnected.

4) Make sure that the resistance from D11312, pin 1 to the shield on D11312 is more than 1 megohm.

5) Re-connect connectors D11304 and D11312. To re-connect connector D11312, do this task: Bussing Plug Installation, AMM TASK 28-41-41-400-801.

(b) FOR A FAULT IN THE NO. 2 TANK, do these steps:

1) Disconnect connector D11314 on the FQPU, M1827 in the radar bay.

2) Do a continuity check between these pins of connector D11314 on the front spar and connector D11306 on the FQPU, M1827 in the radar bay:

SIA 702-710

D11314		D11306
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 22
pin 3	. . . . .	pin 23

SIA 711-714, 716-999

D11314		D11306
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 21
pin 3	. . . . .	pin 17

SIA ALL

3) Make sure that connector D11306 is disconnected.

4) Make sure that the resistance from D11314, pin 1 to the shield on D11314 is more than 1 megohm.

5) Re-connect connectors D11306 and D11314. To re-connect connector D11314, do this task: Bussing Plug Installation, AMM TASK 28-41-41-400-801.

(c) FOR A FAULT IN THE CENTER TANK, do these steps:

1) Disconnect connector D11308 on the FQPU, M1827 in the radar bay.

2) Do a continuity check between these pins of connector D11316 on the rear spar and connector D11308 on the FQPU, M1827 in the radar bay:

SIA 702-710

D11316		D11308
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 22
pin 3	. . . . .	pin 23

SIA 711-714, 716-999

D11316		D11308
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 21
pin 3	. . . . .	pin 17

SIA ALL

3) Make sure that connector D11308 is disconnected.

4) Make sure that the resistance from D11316, pin 1 to the shield on D11316 is more than 1 megohm.

5) Re-connect connectors D11308 and D11316. To re-connect connector D11316, do this task: Bussing Plug Installation, AMM TASK 28-41-41-400-801.

(d) If you find a problem with the out-tank wiring, then repair the problems that you find (SWPM 20-20-00, SWPM 20-60-06).

NOTE: If no faults are found in the out-tank wiring, go to the next step for single tank unit or compensator check..

1) Make sure that the out-of-tank wire bundle is shielded and the shield ground is terminated (SWPM 20-10-15, SWPM 20-20-00).

28-AWL-04: CDCCL

2) Do this task: FQIS - Out Tank Connectors - Electrical Bonding Resistance Check, AMM TASK 05-55-54-200-802, for the applicable side of body FQIS connector D39915 or D39916, or main wheel well FQIS connector D4850P, if it is disconnected or if the coupling ring on the connector is loosened or tightened,.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, AMM TASK 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-03: ALI

3) Do this task: FQIS Wiring And Bonding - Inspection, AMM TASK 05-55-54-200-801, for the applicable wire bundle if the FQIS wire bundle in the unpressurized zone is replaced or the FQIS wire bundle shield is repaired..

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-03.

4) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

5) If the GROUND TEST procedure shows PASS, then you corrected the fault, do the steps to erase the faults in BITE.

6) If the GROUND TEST procedure continues to show HI/Z OPEN/SHORT TO SHIELD, then continue.

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) If the GROUND TEST procedure continues to show HI/Z OPEN/SHORT TO SHIELD, or if the wiring fault is not found in the out-tank wiring, then go into the applicable fuel tank (AMM TASK 28-11-00-910-802) and do an inspection of the tank unit and adjacent wiring for these problems:

(a) Make sure that there is no unwanted material around the ends of the tank unit or compensator.

(b) Make sure that there is no visible damage at the terminal connections or at the wiring terminal block clamps at the compensator or at any of the tank units.

(c) Make sure that the connection between the in-tank wire harness connection to the spar feed through connector is secure.

(d) Make sure that the wires are not chafed.

1) If there are loose terminal connections, then tighten the screws to these torque ranges:

a) LO-Z 29 ±6 in-lb (3 ±1 N·m)

b) SHIELD 17.5 ±2.5 in-lb (2.0 ±0.3 N·m)

c) HI-Z 13.5 ±1.5 in-lb (1.5 ±0.2 N·m)

2) If there are no wiring faults observed, then disconnect the in-tank wire harness connector from the spar to check the connector (AMM TASK 28-41-44-400-801).

3) Reconnect the in-tank wire harness connector to the spar and check that the connector is connected correctly to the spar (AMM TASK 28-41-44-400-801).

a) Tighten the in-tank wire harness connector to 75 ±15 in-lb (8 ±2 N·m).

b) Install the lockwire.

c) Apply the sealant.

NOTE: A slight resistance should be observed from engagement of the pins to the sockets, before the connector shell is fully tightened.

NOTE: The BITE check can be run before fully completing the task to see if there was a loose connection.

4) Make sure that there are no other problems with the wiring installation near the applicable tank unit or the number 2 tank unit (for example, a wire pinched under a tank unit).

a) If there are problems with the wiring, then repair or replace the in-tank wire harness.

28-AWL-09: CDCCL

<1> Repair of the FQIS in-tank wire harness must be approved by the FAA Oversight Office.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

<2> If the tank unit wiring is repaired or replaced, then make sure the wire slack between the wire and components or structure maintains a clearance of 0.5 in. (12.7 mm).

28-AWL-09: CDCCL

<3> If 0.5 in. (12.7 mm) is not possible, then you must maintain a minimum clearance of 0.13 in. (3.30 mm).

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

<4> Do this task: FQIS BITE Procedure, 28-41 TASK 801.

<5> If the GROUND TEST procedure shows PASS, then you corrected the fault, do the step to erase the faults in BITE.

<6> If the GROUND TEST procedure continues to show HI/Z OP/SHORT TO SHIELD, then replace the tank unit or compensator.

(e) Replace the tank unit or compensator.

1) Do this task: Tank Unit or the Compensator Unit Removal, AMM TASK 28-41-21-000-801.

2) Do this task: Tank Unit or Compensator Unit Installation, AMM TASK 28-41-21-400-801.

3) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

4) If the GROUND TEST procedure shows PASS, then you corrected the fault, do the step to erase the faults in BITE.

5) If the GROUND TEST procedure continues to show HI/Z OP/SHORT TO SHIELD, then continue to trouble shoot to correct the fault, or deactivate the FQIS under MMEL 28-6 or MMEL 28-7 (for faults associated with only one fuel tank).

NOTE: For MMEL 28-6, refer to AMM TASK 28-00-00-040-807.

NOTE: For MMEL 28-7, refer to AMM TASK 28-00-00-040-808.

6) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

(5) Erase the faults in the BITE FAULT HISTORY.

(a) Go to the FQIS BITE TEST main menu.

(b) Push the next page key to go to page 2.

(c) Push the line select key next to the ERASE FAULT HISTORY prompt.

(d) Push the line select key next to the YES prompt to erase fault history.

——— END OF TASK ———

818. FQIS Fault Message - 1 OR MORE TANK UNIT OPEN - Fault Isolation

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: NOTE: This is applicable to Airworthiness Limitation 28-AWL-03 and 28-AWL-37.

(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, AMM TASK 28-00-00-910-801.

NOTE: This is applicable to Airworthiness Limitations 28-AWL-04, 28-AWL-09, and 28-AWL-38.

B. Description

(1) This task is for these maintenance messages:

(a) 28-41101 - 1 OR MORE TANK UNIT OPEN

1) This fault message shows a problem in the No. 1 tank.

(b) 28-41201 - 1 OR MORE TANK UNIT OPEN

1) This fault message shows a problem in the No. 2 tank.

(c) 28-41301 - 1 OR MORE TANK UNIT OPEN

1) This fault message shows a problem in the center tank.

(2) The capacitance from one or more of the tank units is missing from the total capacitance received at the processor.

(3) This message will show if the measured (total) tank unit capacitance is less the 97.5 percent of the (total) tank unit empty capacitance and more than 13 percent of the (total) empty tank capacitance.

(4) This fault causes the FQIS display and the refuel panel indicator for the tank that has the fault to become blank.

C. Possible Causes

(1) FQIS wire harness

(2) Out-of-tank wiring (wire bundle) from the wing spar to the FQPU (including the bussing plug)

(3) FQIS tank unit or compensator

D. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

E. Related Data

(1) (SSM 28-41-11)

(2) (WDM 28-41-11)

F. Initial Evaluation

(1) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

(a) If the GROUND TEST shows 1 OR MORE TANK UNITS OPEN for the applicable tank, then do the Fault Isolation Procedure below.

(b) If the GROUND TEST shows PASS, then there was an intermittent fault.

G. Fault Isolation

(1) Disconnect the applicable bussing plug and examine the pins for corrosion or damage (AMM TASK 28-41-41-000-801).

(a) If there is corrosion or damage, then do these steps:

1) Repair the pins if any of the pins have damage.

2) Clean the connector if there is any corrosion (SWPM 20-60-01).

3) Reconnect the bussing plug (AMM TASK 28-41-41-400-801).

4) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

5) If the GROUND TEST shows PASS, then you corrected the fault.

6) If the GROUND TEST shows 1 OR MORE TANK UNITS OPEN for the applicable tank, then continue.

(b) If there is no corrosion or damage, then continue.

(2) For the applicable tank, do this task: Tank and Compensator Units - Resistance and Capacitance Check, AMM TASK 28-41-21-710-801

(3) If the tank and compensator unit test does not show problems, then do this test of the out-of-tank wiring (wire bundle) from the bussing plug to the fuel quantity processor unit (FQPU) in the radar bay:

(a) FOR A FAULT IN THE NO. 1 TANK, do these steps:

1) Disconnect connector D11304 on the FQPU, M1827 in the radar bay.

2) Do a continuity check between these pins of connector D11312 on the front spar and connector D11304 on the FQPU, M1827 in the radar bay:

SIA 702-710

D11312		D11304
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 22
pin 3	. . . . .	pin 23

SIA 711-714, 716-999

D11312		D11304
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 21
pin 3	. . . . .	pin 17

SIA ALL

3) Make sure that connector D11304 is disconnected.

4) Make sure that the resistance from D11312, pin 1 to the shield on D11312 is more than 1 megohm.

5) Re-connect connectors D11304 and D11312 To re-connect connector D11312, do this task: Bussing Plug Installation, AMM TASK 28-41-41-400-801.

(b) FOR A FAULT IN THE NO. 2 TANK, do these steps:

1) Disconnect connector D11306 on the FQPU, M1827 in the radar bay.

2) Do a continuity check between these pins of connector D11314 on the front spar and connector D11306 on the FQPU, M1827 in the radar bay:

SIA 702-710

D11314		D11306
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 22
pin 3	. . . . .	pin 23

SIA 711-714, 716-999

D11314		D11306
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 21
pin 3	. . . . .	pin 17

SIA ALL

3) Make sure that connector D11306 is disconnected.

4) Make sure that the resistance from D11314, pin 1 to the shield on D11314 is more than 1 megohm.

5) Re-connect connectors D11314 and D11306. To re-connect connector D11314, do this task: Bussing Plug Installation, AMM TASK 28-41-41-400-801.

(c) FOR A FAULT IN THE CENTER TANK, do these steps:

1) Disconnect connector D11308 on the FQPU, M1827 in the radar bay.

2) Do a continuity check between these pins of connector D11316 on the rear spar and connector D11308 on the FQPU, M1827 in the radar bay:

SIA 702-710

D11316		D11308
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 22
pin 3	. . . . .	pin 23

SIA 711-714, 716-999

D11316		D11308
pin 1	. . . . .	pin 8
pin 2	. . . . .	pin 21
pin 3	. . . . .	pin 17

SIA ALL

3) Make sure that connector D11308 is disconnected.

4) Make sure that the resistance from D11316, pin 1 to the shield on D11316 is more than 1 megohm.

5) Re-connect connectors D11308 and D11316. To re-connect connector D11316, do this task: Bussing Plug Installation, AMM TASK 28-41-41-400-801.

(d) If you find a problem with the wiring, then do these steps:

1) Repair the the problems that you find (SWPM 20-20-00, SWPM 20-60-06).

a) Make sure the out-of-tank wire bundle is shielded and the shield ground is terminated (SWPM 20-10-15, SWPM 20-20-00).

28-AWL-04: CDCCL

2) Do this task: FQIS - Out Tank Connectors - Electrical Bonding Resistance Check, AMM TASK 05-55-54-200-802, for the applicable side of body FQIS connector D39915 or D39916, or main wheel well FQIS connector D4850P, if it is disconnected or if the coupling ring on the connector is loosened or tightened,.

NOTE: CDCCL - Refer to the task: Airworthiness Limitation Precautions, AMM TASK 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-03: ALI

3) Do this task: FQIS Wiring And Bonding - Inspection, AMM TASK 05-55-54-200-801, for the applicable wire bundle if the FQIS wire bundle in the unpressurized zone is replaced or the FQIS wire bundle shield is repaired.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-03.

4) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

a) If the GROUND TEST procedure shows PASS, then you corrected the fault.

b) If the GROUND TEST procedure continues to show 1 OR MORE TANK UNITS OPEN, then continue.

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) If a single tank unit or compensator shows problems, then go into the applicable fuel tank (AMM TASK 28-11-00-910-802) and do these steps:

(a) Do an inspection of the tank unit and the adjacent wiring for these problems:

1) Make sure that no parts of the tank unit or compensator are in electrical contact with the airplane structure.

2) Make sure that there are no brackets that are bent or have other problems.

3) Make sure that there is no unwanted material in the tank unit or compensator.

4) Make sure that there are no loose terminal connections at either the applicable tank unit or the number 2 tank unit.

NOTE: The number 2 tank unit is the top of a daisy chain. If there is a loose connection at the number 2 tank unit, then a fault message can display for other tank units.

a) If there are loose terminal connections, then tighten the screws to these torque ranges:

<1> LO-Z 29 ±6 in-lb (3 ±1 N·m)

<2> SHIELD 17.5 ±2.5 in-lb (2.0 ±0.3 N·m)

<3> HI-Z 13.5 ±1.5 in-lb (1.5 ±0.2 N·m)

5) Make sure that there are no other problems with the wiring near the applicable tank unit or the number 2 tank unit (for example, a wire pinched under a tank unit).

(b) If there are problems with the tank unit or the adjacent wiring, then repair the problems.

28-AWL-09: CDCCL

1) Repair of the FQIS in-tank wire harness must be approved by the FAA Oversight Office.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

(c) If the tank unit wiring is repaired or replaced, then make sure the wire slack between the wire and components or structure maintains a clearance of 0.5 in. (12.7 mm).

28-AWL-09: CDCCL

(d) If 0.5 in. (12.7 mm) is not possible, then you must maintain a minimum clearance of 0.13 in. (3.30 mm).

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

(e) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

1) If the GROUND TEST procedure shows PASS, then you corrected the fault.

2) If the GROUND TEST procedure continues to show 1 OR MORE TANK UNITS OPEN, then replace the tank unit or compensator.

These are the tasks:

Tank Unit or the Compensator Unit Removal, AMM TASK 28-41-21-000-801

Tank Unit or Compensator Unit Installation, AMM TASK 28-41-21-400-801

3) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

a) If the GROUND TEST procedure shows PASS, then you corrected the fault.

b) If the GROUND TEST procedure continues to show 1 OR MORE TANK UNITS OPEN, then repair or replace the in-tank FQIS wire harness in the applicable tank (AMM TASK 28-41-44-400-801).

28-AWL-09: CDCCL

<1> Repair of the FQIS in-tank wire harness must be approved by the FAA Oversight Office.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

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.

(5) If two or more tank units show problems, then go into the applicable fuel tank (AMM TASK 28-11-00-910-802) and do these steps:

(a) Make sure that there are no loose terminal connections at each tank unit within the applicable tank.

NOTE: The number 2 tank unit is the top of a daisy chain. If there is a loose connection at the number 2 tank unit, then a fault message can display for other tank units.

1) If there are loose terminal connections, then tighten the screws to these torque ranges:

a) LO-Z 29 ±6 in-lb (3 ±1 N·m)

b) SHIELD 17.5 ±2.5 in-lb (2.0 ±0.3 N·m)

c) HI-Z 13.5 ±1.5 in-lb (1.5 ±0.2 N·m)

(b) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

1) If the GROUND TEST procedure shows PASS, then you corrected the fault.

2) If the GROUND TEST procedure continues to show 1 OR MORE TANK UNITS OPEN, then repair or replace the FQIS wire harness (AMM TASK 28-41-44-400-801).

28-AWL-09: CDCCL

a) Repair of the FQIS in-tank wire harness must be approved by the FAA Oversight Office.

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

NOTE: This is applicable to Airworthiness Limitation 28-AWL-09.

(c) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

1) If the GROUND TEST procedure shows PASS, then you corrected the fault.

——— END OF TASK ———

819. FQIS BITE INOP Message Shown on the CDU - Fault Isolation

A. Description

(1) If the Flight Management Computer (FMC) does not receive a valid signal from the Fuel Quantity Processor Unit (FQPU) at any time during the FQIS BITE test, the CDU shows this message:

FQIS BITE TEST

FQIS BITE INOP

CHECK FQIS OR INTERFACE

(a) You do the FQIS BITE Test from the control display unit (CDU) in the flight compartment (28-41 TASK 801). There are two CDUs on the forward electronics panel in the flight compartment.

B. Possible Causes

(1) Fuel Quantity Processor Unit (FQPU), M1827

(2) FMCS Transfer Relay 1, R475

(3) Wiring

C. Circuit Breakers

(1) These are the primary circuit breakers related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

D. Related Data

(1) (SSM 34-61-14)

(2) (SSM 28-41-11)

(3) (WDM 34-61-14)

(4) (WDM 28-41-11)

E. Initial Evaluation

(1) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

(a) If the CDU display shows the FQIS BITE INOP message, then do the Fault Isolation Procedure below.

(b) If the CDU display does not show the FQIS BITE INOP message, then there was an intermittent fault.

F. Fault Isolation

(1) Do these steps to do a check of the FQPU, M1827:

(a) Do this task: Fuel Quantity Processor Unit Removal, AMM TASK 28-41-81-000-801.

(b) Do a check of the pins for connectors D11304, D11306, D11352, D11354 for corrosion or damage.

(c) If there is corrosion or damage to the pins, then do these steps:

1) Repair the pins if any of the pins have damage.

2) Clean the connector if there is any corrosion (SWPM 20-60-01).

(d) If there is no corrosion or damage to the pins, then continue.

(e) Install a new FQPU (AMM TASK 28-41-81-400-801).

(f) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

1) If the CDU display does not show the FQIS BITE INOP message, then you corrected the fault.

2) If the CDU display shows the FQIS BITE INOP message, then continue.

(2) Replace the FMCS Transfer Relay 1, R475 (WDM 34-61-14).

(a) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

1) If the CDU display does not show the FQIS BITE INOP message, then you corrected the fault.

2) If the CDU display shows the FQIS BITE INOP message, then continue.

(3) Do these steps to do a check of the wiring:

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

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	6	C01017	FMCS CMPTR 1

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
D	16	C01262	FMCS CMPTR 2

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

(b) Remove the two FMCs, M1175 and M1632. To remove them, do this task: FMCS Computer Removal, AMM TASK 34-61-02-000-801.

(c) Remove the fuel quantity processor unit (FQPU), M1827. To remove it, do this task: Fuel Quantity Processor Unit Removal, AMM TASK 28-41-81-000-801.

SIA 702-710

(d) Do a continuity check between these pins of connector D2179A for the left FMC or connector D3261A for the right FMC and connector D11306 for the FQPU:

D2179A OR D3261A	D11306
pin D5	pin 1
pin E5	pin 3

SIA 711-714, 716-999

(e) Do a continuity check between these pins of connector D2179A for the left FMC or connector D3261A for the right FMC and connector D11352 for the FQPU:

D2179A OR D3261A	D11352
pin D5	pin 6
pin E5	pin 7

SIA ALL

(f) If there is not continuity between these pins, then do these steps:

1) Repair the wiring.
2) Re-install the two FMCs. To install them, do this task: FMCS Computer Installation, AMM TASK 34-61-02-400-801.
3) Re-install the FQPU. To install it, do this task: Fuel Quantity Processor Unit Installation, AMM TASK 28-41-81-400-801.
4) Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

Row	Col	Number	Name
A	6	C01017	FMCS CMPTR 1

F/O Electrical System Panel, P6-1

Row	Col	Number	Name
D	16	C01262	FMCS CMPTR 2

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	4	C01441	FUEL FUELING IND
A	5	C00398	FUEL QTY 2
A	6	C00397	FUEL QTY 1

5) Do this task: FQIS BITE Procedure, 28-41 TASK 801.
   a) If the CDU display does not show the FQIS BITE INOP message, then you corrected the fault.

END OF TASK

820. Unexpected Fuel Configuration Messages - Fault Isolation

A. Description

(1) Three fuel configuration messages can show on the fuel quantity indication page of the Common Display System (CDS) during flight. It is possible that the flight crew will report these messages if they show unexpectedly:

(a) CONFIG

(b) IMBAL

(c) LOW

(2) The CONFIG message comes on if all these conditions are true:

(a) At least one of the two engines is operating.

(b) The two center tank boost pumps both show low pressure.

(c) There is a minimum of 1600 lb (726 kg) in the center tank.

(3) If the CONFIG message comes on, it continues to show until one or more of these conditions are true:

(a) The center tank quantity decreases to less than 800 lb (363 kg).

(b) A minimum of one center tank pump is producing high pressure.

(c) The two engines are not in operation.

(4) The IMBAL message comes on if there is a difference of 1000 lb (454 kg) between the No. 1 tank and No. 2 tank. The message IMBAL goes off again when the difference between the two tanks decreases to less than 200 lb (91 kg). The imbalance condition must exist for 60 seconds before the IMBAL message shows.

(5) The LOW message comes on when the No. 1 tank or the No. 2 tank has less than 2000 lb (907 kg) of fuel. This message goes off when the quantity in that tank increases to more than 2500 lb (1134 kg). The low fuel condition must exist for 30 seconds before the LOW message shows.

(6) For information on fuel imbalance exceedance (more 1000 lb (454 kg)), refer to this task: Fuel Imbalance Exceedance - Conditional Inspection, AMM TASK 05-51-48-211-801.

B. Possible Causes

(1) Unusual fuel configuration (for example, trapped fuel in the center tank, actual fuel imbalance, leaking crossfeed valve)

(2) Fuel Quantity Indicating System (FQIS)

(3) CDS.

C. Initial Evaluation

(1) Do these steps to find if the fuel configuration message (CONFIG, IMBAL or LOW) showed because of the actual fuel configuration:

(a) Examine the fuel quantities in the No. 1 tank, the No. 2 tank, and the center tank.

(b) Look at all available data related to the fuel quantities in the No. 1 tank, the No. 2 tank, and the center tank for the flight leg where the reported fault occurred.

(c) If the available fuel data explains why the fuel configuration message showed, then do the procedure below: Fault Isolation - Unexpected Fuel Configuration.

(d) If the available fuel data does not explain why the fuel configuration message showed, then do the procedure below: Fault Isolation - Configuration Indication Problem.

D. Fault Isolation Procedure - Unexpected Fuel Configuration

(1) Do these steps to look for boost pumps with low pressure:

(a) Look for more fault reports related to the fuel feed system (ATA 28-22) (for example, low pressure lights, boost pump circuit breakers).

(b) If there are fault reports for ATA 28-22 that show no corrective action taken, do the fault isolation for these faults.

(c) If there are no fault reports for ATA 28-22, then do these steps:

1) Do this task: Fuel Boost Pump Output Pressure Test, AMM TASK 28-22-00-720-803.

a) If there are problems with one or more boost pumps, replace the applicable pump(s). These are the tasks:

- Motor Impeller Removal, AMM TASK 28-22-41-000-801
- Motor Impeller Installation, AMM TASK 28-22-41-400-801

2) If there are no problems with the boost pump pressure, then do the applicable procedure to look for unwanted fuel transfer related to the fuel data that you found:

a) Do this task: Unwanted Fuel Transfer into the Center Tank - Source Unknown - Fault Isolation, 28-21 TASK 812.

b) Do this task: Unwanted Fuel Transfer from the No. 1 Tank to the Center Tank - Fault Isolation, 28-21 TASK 803.

c) Do this task: Unwanted Fuel Transfer from the No. 2 Tank to the Center Tank - Fault Isolation, 28-21 TASK 813.

d) Do this task: Unwanted Fuel Transfer from the Center Tank to the No. 1 Tank - Fault Isolation, 28-21 TASK 814.

e) Do this task: Unwanted Fuel Transfer from the Center Tank to the No. 2 Tank - Fault Isolation, 28-21 TASK 815.

3) If no problems are found, do this task: Crossfeed Valve - Functional Test, AMM TASK 28-22-00-730-802.

a) Correct any problems that you find.

4) If the problem continues, then do these steps:

a) Remove the crossfeed valve actuator. To remove it, do this task: Actuator of the Engine Fuel Crossfeed Valve Removal, AMM TASK 28-22-21-000-804.

NOTE: Do not remove the lower index plate screw. If this screw is removed, then the index plate will need to be realigned (AMM TASK 28-22-21-820-801).

b) Install the valve alignment equipment, SPL-1771.

c) Make sure the spline on the valve alignment equipment, SPL-1771, engages with the spline on the adapter shaft.

d) Turn the valve alignment equipment, SPL-1771, in the clockwise direction until the resistance decreases.

e) Turn the valve alignment equipment, SPL-1771, in the counterclockwise direction until the resistance starts to increase.

f) Record the position of the valve alignment equipment, SPL-1771.

g) Turn the valve alignment equipment, SPL-1771, in the counterclockwise direction until the resistance decreases.

h) Turn the valve alignment equipment, SPL-1771, in the clockwise direction until the resistance starts to increase.

i) Record the position of the valve alignment equipment, SPL-1771.

j) Turn the valve alignment equipment, SPL-1771, clockwise to the average position of those previously recorded above.

NOTE: This will center the valve disk within the seal near the point of maximum resistance.

k) Turn the valve alignment equipment, SPL-1771, back and forth without rotating the valve disk.

<1> Measure the free play of the driveline in degrees.

l) If the driveline free play is greater than 16 degrees, then the crossfeed valve should be replaced.

m) If the driveline free play is less than 16 degrees, then do this task: Crossfeed Valve Alignment, AMM TASK 28-22-21-820-801.

n) Remove the valve alignment equipment, SPL-1771.

o) Install the crossfeed valve actuator. To install it, do this task: Actuator of the Engine Fuel Crossfeed Valve Installation, AMM TASK 28-22-21-400-804.

E. Fault Isolation Procedure - Configuration Indication Problem

(1) Do this task: FQIS BITE Procedure, 28-41 TASK 801.

(a) If the FQIS BITE test does not show any problems, then continue.

(2) Do this task: CDS BITE Procedure, 31-62 TASK 801.

(a) If the CDS BITE test does not show any problems, then the system is OK.

END OF TASK

801. Fuel Temperature Indicator Does Not Operate Correctly - Fault Isolation

A. Description

(1) The FUEL TEMPERATURE indicator on the P5-2 panel does not show the correct fuel temperature.

B. Possible Causes

(1) Fuel temperature sensor, T434

(2) Fuel temperature indicator, N42

(3) Wiring

(4) Ground connection GD476-DC

C. Circuit Breakers

(1) This is the primary circuit breaker related to the fault:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	7	C00355	FUEL TEMP IND

D. Related Data

(1) (SSM 28-42-11)

(2) (WDM 28-42-11)

E. Initial Evaluation

(1) Do this test of the fuel temperature indicating system: Fuel Temperature Indicating System Test (Master Thermometer), AMM TASK 28-43-00-710-801.

(a) If the fuel temperature indicating system test shows a problem, then do the Fault Isolation Procedure below.

(b) If the fuel temperature indicating system test is OK, then there was an intermittent fault.

F. Fault Isolation Procedure

(1) Do this check of the fuel temperature indicator, N42:

(a) Do this task: Fuel Temperature Indicator Functional Test (Spare Temperature Indicator), AMM TASK 28-43-00-720-801.

1) If the test shows a problem, then replace the fuel temperature indicator, N42, and do the Repair Confirmation at the end of this task. To replace the fuel temperature indicator, do these tasks:

Fuel Temperature Indicator Removal, AMM TASK 28-43-21-020-801,

Fuel Temperature Indicator Installation, AMM TASK 28-43-21-020-802.

2) If the the test is OK, then continue.

(b) Open this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	7	C00355	FUEL TEMP IND

(c) Remove the fuel temperature indicator, N42, from the P5-2 panel.

(d) Close this circuit breaker:

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
A	7	C00355	FUEL TEMP IND

(e) Do a check for 28 VAC from pin 2 to pin 5 (ground) on connector D616.

1) If there is not 28 VAC from pin 2 to pin 5 (ground) on connector D616, then do these steps:

a) Repair the wiring from pin 2, connector D616 to pin 16 D40536P.

b) Do the Repair Confirmation at the end of this task.

2) If there is 28 VAC from pin 2 to pin 5 (ground) on connector D616, then continue.

(2) Do this check of the fuel temperature sensor, T434, and the related wiring:

(a) Do this task: Fuel Temperature Bulb Resistance Test, AMM TASK 28-43-00-760-801.

(b) If the resistance test is not satisfactory, then do these steps:

1) Remove the fuel temperature sensor, T434. To remove it, do this task: Fuel Temperature Bulb Removal, AMM TASK 28-43-11-000-801.

2) Disconnect connector D616 from the fuel temperature indicator.

3) Put a jumper between the two loose wires that go to the fuel temperature sensor.

4) On connector D616, do a continuity check from pin 3 to pin 4.

5) If there is no continuity between pin 3 and pin 4 on connector D616, then do these steps:

a) Repair the wiring from pin 3 to pin 4 on connector D616.

b) Remove the jumper between the loose wires that go to the temperature sensor.

c) Re-install the fuel temperature sensor, T434. To install it, do this task: Fuel Temperature Bulb Installation, AMM TASK 28-43-11-400-801.

d) Do the Repair Confirmation at the end of this task.

6) If there is continuity between pin 3 and pin 4 on connector D616, then do these steps:

a) Remove the jumper between the loose wires that go to the temperature sensor.

b) Install a new fuel temperature sensor. To install it, do this task: Fuel Temperature Bulb Installation, AMM TASK 28-43-11-400-801.

c) Do the Repair Confirmation at the end of this task.

(c) If the resistance test is satisfactory, then continue.

(3) Do this check of the ground at GD476-DC:

(a) Disconnect the connector D616 from the fuel temperature indicator.

(b) Do a continuity check from pin 4 on connector D616 to structure ground.

(c) If there is not continuity from pin 4 on connector D616 to structure ground, then repair the wiring from splice SP172 to the ground connection GD476-DC.

(d) If there is continuity from pin 4 on connector D616 to structure ground, then do these steps:

1) Install a new fuel temperature indicator, N42.

2) Do the Repair Confirmation at the end of this task.

G. Repair Confirmation

(1) Do this test of the fuel temperature indicating system: Fuel Temperature Indicating System Test (Master Thermometer), AMM TASK 28-43-00-710-801 .

(a) If the fuel temperature indicating system test is OK, then you corrected the fault.

END OF TASK