

CHAPTER

24

**ELECTRICAL
POWER**



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210	Sep 15/2021		602	Sep 15/2021		603	May 15/2022	
211	Sep 15/2021		603	Sep 15/2021		604	May 15/2022	
212	BLANK		604	Sep 15/2021		605	May 15/2022	
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403	Sep 15/2021		513	Jan 15/2023		402	Sep 15/2021	
404	Sep 15/2022		514	BLANK		403	Sep 15/2022	
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403	Sep 15/2021		206	Sep 15/2021		R 403	Sep 15/2023	
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402	Sep 15/2021		212	Sep 15/2021		24-31-11		
403	Jan 15/2023		213	Sep 15/2021		201	Jan 15/2023	
404	Jan 15/2023		214	BLANK		202	Jan 15/2023	
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401	May 15/2023		408	Sep 15/2021		403	Sep 15/2021	
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605	Sep 15/2021		402	Sep 15/2021				
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DC Generation System - Deactivation TASK 24-31-00-040-801			201	SIA ALL
DC Generation System - Activation TASK 24-31-00-440-801			205	SIA ALL
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ELECTRICAL POWER - CIRCUIT BREAKER LISTS

1. General

- A. The list of circuit breakers can be found in the AMM Introduction.

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ELECTRICAL POWER - DDG MAINTENANCE PROCEDURES

1. General

- A. This procedure has the maintenance tasks for the Master Minimum Equipment List (MMEL) maintenance requirements as shown in the Dispatch Deviations Guide (DDG). These tasks prepare the airplane for flight with systems/components that are inoperative.
- B. This procedure also has the tasks that put the airplane back to its usual condition.
- C. These are the tasks for the components in the electrical power system:
 - (1) DDG 24-11-01 Engine Driven Generator Systems Inoperative - Preparation
 - (2) DDG 24-11-01 Engine Driven Generator Systems Inoperative - Restoration

TASK 24-00-00-040-809

2. DDG 24-11-01 Engine Driven Generator Systems Inoperative - Preparation

A. General

- (1) This task gives the maintenance steps which prepare the airplane for flight with one of the engine driven generator systems inoperative.

NOTE: During the authorized repair interval, if the applicable engine is operated for more than 50 hours with the engine driven generator disconnected, then the engine driven generator must be removed for shop inspection before returning the airplane to service.

B. References

Reference	Title
12-13-21-200-801	IDG Oil Level Check (P/B 301)
24-22-00-860-803	Supply External Power (P/B 201)
71-00-00-910-802-G00	Start the Engine (Selection) (P/B 201)
71-00-00-910-806-G00	Stop the Engine (Usual Engine Stop) (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
411	Engine 1 - Engine
421	Engine 2 - Engine

D. Integrated Drive Generator (IDG) Deactivation

SUBTASK 24-00-00-040-001

- (1) Do the steps that follow to disconnect the Integrated Drive Generator (IDG):
 - (a) Make sure that the generator's oil level is correct to decrease possible damage (TASK 12-13-21-200-801).
 - (b) Do this task: Supply External Power, TASK 24-22-00-860-803.
 - (c) If the engine operates with the IDG disconnected for more than 50 hours, the IDG input shaft ball bearing assembly must remove and examine for worn areas.
 - (d) Start the applicable engine (TASK 71-00-00-910-802-G00).

NOTE: The DRIVE light must go off when the engine gets idle speed.
 - (e) Set the AC meter selector switch on the P5-13 panel to the applicable GEN position.
 - (f) Lift the applicable DISCONNECT switch guard on the P5-5 panel.

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DO NOT ACTUATE THE DISCONNECT SWITCH FOR MORE THAN 3 SECONDS. ALLOW A MINIMUM OF 60 SECONDS BETWEEN ACTUATION PERIODS. FAILURE TO FOLLOW THIS PROCEDURE CAN CAUSE DAMAGE TO IDG.

- (g) Push the DISCONNECT switch to the DISCONNECT position when the engine is at or above idle speed.
- (h) Make sure that the DRIVE light comes on.
- (i) Make sure that the AC meter shows these values:
 - 1) AC VOLTS = 0
 - 2) CPS FREQ = BLANK
- (j) Stop the engine (TASK 71-00-00-910-806-G00).

SUBTASK 24-00-00-930-001

- (2) Install an INOP placard on the applicable GEN control switch on the P5-4 panel.

SUBTASK 24-00-00-020-001

- (3) Remove the lamp from the applicable generator DRIVE light on the P5-5 panel. Install an INOP placard.

SUBTASK 24-00-00-020-002

- (4) Remove the lamp from the applicable GEN OFF BUS light on the P5-4 panel. Install an INOP placard

————— END OF TASK —————

TASK 24-00-00-440-809

3. DDG 24-11-01 Engine Driven Generator Systems Inoperative - Restoration

A. General

- (1) This task puts the airplane back to its usual condition after operation with one of the engine driven generator systems inoperative.

B. References

Reference	Title
24-22-00-860-802	Remove Electrical Power (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
411	Engine 1 - Engine
421	Engine 2 - Engine

D. Integrated Drive Generator (IDG) Activation

SUBTASK 24-00-00-840-001

- (1) Remove the INOP placard from the applicable GEN control switch.

SUBTASK 24-00-00-840-002

- (2) Install the lamp on the applicable GEN OFF BUS light on the P5-4 panel and remove the INOP placard.

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SUBTASK 24-00-00-840-003

- (3) Install the lamp on the applicable generator DRIVE light on the P5-5 panel and remove the INOP placard.

SUBTASK 24-00-00-840-004

- (4) If the Integrated Drive Generator (IDG) is disconnected, connect the IDG to the engine.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 24-00-00-860-001

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-802.

———— **END OF TASK** ————

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AC GENERATOR DRIVE SYSTEM - MAINTENANCE PRACTICES

1. General

- A. This procedure has four tasks:
- (1) IDG Deactivation
 - (2) IDG Activation
 - (3) IDG Oil System Static Leak Check
 - (4) IDG Push-to-Vent Valve replacement.

TASK 24-11-00-040-801

2. IDG - Deactivation

(Figure 201)

A. **General**

- (1) This procedure removes electrical power from the IDG.

B. **References**

Reference	Title
71-00-00-910-806-G00	Stop the Engine (Usual Engine Stop) (P/B 201)

C. **Location Zones**

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

D. **Access Panels**

Number	Name/Location
117A	Electronic Equipment Access Door

E. **IDG - Deactivation**

SUBTASK 24-11-00-860-001

- (1) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
F	10	C01283	GENERATOR CONT UNIT 1
F	11	C01284	GENERATOR CONT UNIT 2

F. **IDG - Tryout**

NOTE: This tryout is to make sure that the IDG is in a zero energy state.

SUBTASK 24-11-00-860-002

- (1) Make sure that these circuit breakers are open and have safety tags:

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
F	10	C01283	GENERATOR CONT UNIT 1
F	11	C01284	GENERATOR CONT UNIT 2

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SUBTASK 24-11-00-700-001

NOTE: Engines should not be operating during the tryout procedure.

- (2) Make sure that the engines are not operating, if the engines are operating, then do this task:
Stop the Engine (Usual Engine Stop), TASK 71-00-00-910-806-G00.

SUBTASK 24-11-00-700-002

- (3) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

- (a) Make sure that the LED lights on the front panel of the Generator Control Unit are not illuminated.

———— **END OF TASK** ————

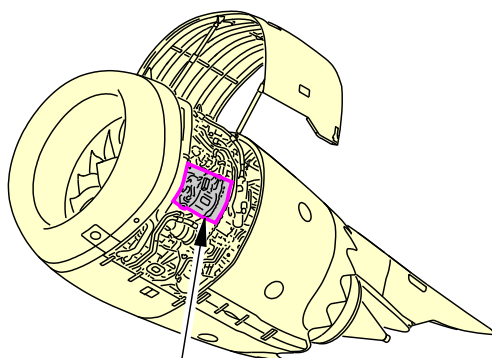
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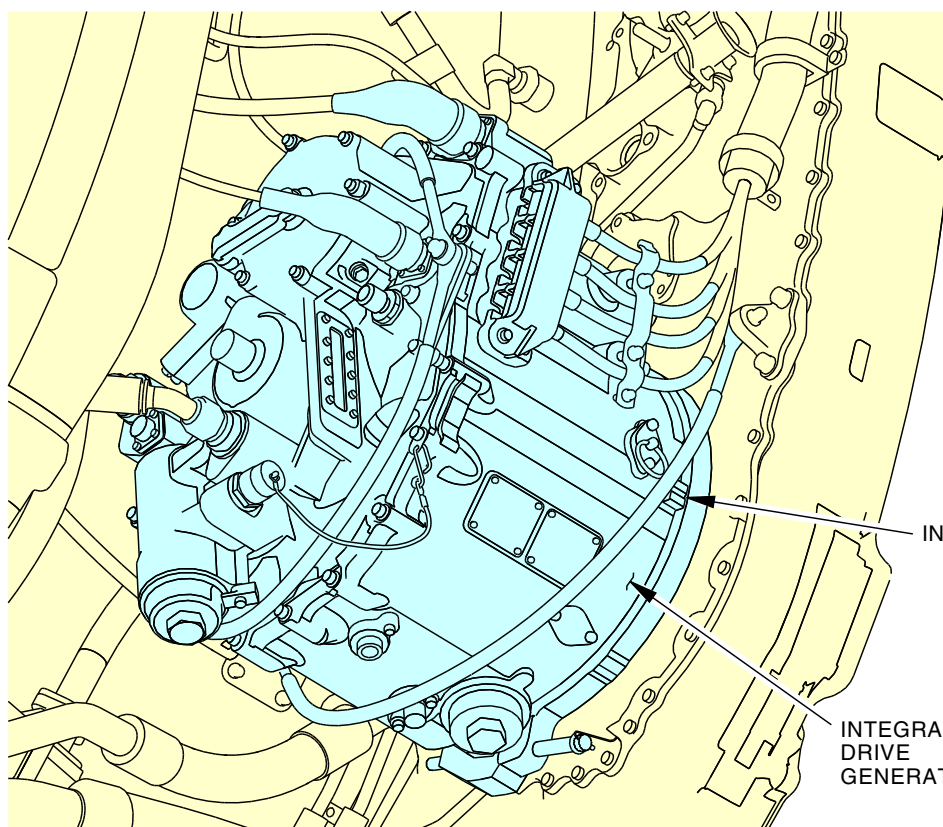
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INTEGRATED
DRIVE
GENERATOR (IDG)



INTEGRATED DRIVE GENERATOR
(EXAMPLE)

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Integrated Drive Generator
Figure 201/24-11-00-990-801

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TASK 24-11-00-440-801

3. IDG - Activation

(Figure 201)

A. General

- (1) This procedure adds electrical power to the IDG.

B. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

C. IDG - Activation

SUBTASK 24-11-00-860-003

- (1) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
F	10	C01283	GENERATOR CONT UNIT 1
F	11	C01284	GENERATOR CONT UNIT 2

————— END OF TASK —————

TASK 24-11-00-700-801

4. IDG Oil System Static Leak Check

(Figure 202)

A. General

- (1) The static leak check applies compressed air or nitrogen to the Integrated Drive Generator (IDG) oil system through the IDG pressure fill fitting. The pressure is monitored to see if it starts to decrease. A continuous decrease in pressure indicates there is a leak in the system.

B. References

Reference	Title
12-13-21-200-801	IDG Oil Level Check (P/B 301)
71-00-00-910-802-G00	Start the Engine (Selection) (P/B 201)
71-11-04-010-801-G00	Open the Fan Cowl Panels (Selection) (P/B 201)
71-11-04-410-801-G00	Close the Fan Cowl Panels (Selection) (P/B 201)
71-71-00-200-801-G00	Engine Vents and Drains Inspection (P/B 601)

C. Tools/Equipment

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

Reference	Description
SPL-8912	Test Equipment- Engine Generator Pressure Part #: J24015-23 Supplier: 81205 Opt Part #: J24015-1 Supplier: 81205
STD-3940	Air Source - Regulated, Dry Filtered, 0-150 psig

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D. Location Zones

Zone	Area
410	Subzone - Engine 1
420	Subzone - Engine 2

E. Prepare for check

SUBTASK 24-11-00-010-001

- (1) Do this task: Open the Fan Cowl Panels (Selection), TASK 71-11-04-010-801-G00.

F. IDG Oil System Static Leak Check

SUBTASK 24-11-00-710-001



WARNING

DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.



WARNING

DO NOT LET HOT OIL GET ON YOU. PUT ON CLOTHES, GOGGLES, AND OTHER EQUIPMENT FOR PROTECTION, OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.

- (1) Do the static leak check as follows:



WARNING

MAKE SURE THAT YOU PUSH THE PUSH-TO-VENT VALVE. IF YOU DO NOT DO THIS, IT CAN CAUSE HOT OIL TO SPRAY. THIS CAN CAUSE INJURY TO PERSONS.

- (a) Push the PUSH-TO-VENT VALVE on the IDG to relieve internal IDG pressure.
- (b) Use the engine generator pressure test equipment, SPL-8912.
- (c) Set the shutoff valve on the test equipment to the off position.
- (d) Set the regulator valve on the test equipment to the off position.
- (e) Remove the cover from the IDG pressure fill fitting.
- (f) Connect the hose adapter on the test equipment to the IDG pressure fill fitting.
- (g) Connect the other end of the test equipment to a regulated, dry filtered regulated air source, STD-3940 or a regulated nitrogen source.



CAUTION

DO NOT APPLY MORE THAN 30 PSI TO THE IDG. TOO MUCH PRESSURE CAN CAUSE DAMAGE TO THE IDG.

- (h) Turn the shutoff valve to the on position and adjust the regulator valve to 25 psi (172 kPa).
- (i) Turn the shutoff valve to the off position.
NOTE: The pressure will decrease a small quantity, then the pressure gage should become stable.
- (j) If the pressure gage continues to decrease, do these steps:

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- 1) Visually examine the IDG and the external cooling circuit for leaks.

NOTE: For leakage limits, refer to the Engine Vents and Drains Inspection, TASK 71-71-00-200-801-G00.

- 2) If you do not find a leak, do a leak check with leak detector fluid or a soap solution.



MAKE SURE THAT YOU PUSH THE PUSH-TO-VENT VALVE. IF YOU DO NOT DO THIS, IT CAN CAUSE HOT OIL TO SPRAY. THIS CAN CAUSE INJURY TO PERSONS.

- 3) Push the PUSH-TO-VENT VALVE to relieve the IDG internal pressure.
- 4) Repair any leaks that you found.
- 5) Repeat the Static leak check.



MAKE SURE THAT YOU PUSH THE PUSH-TO-VENT VALVE. IF YOU DO NOT DO THIS, IT CAN CAUSE HOT OIL TO SPRAY. THIS CAN CAUSE INJURY TO PERSONS.

- (k) Push the PUSH-TO-VENT VALVE to relieve the IDG internal pressure.
- (l) Remove the hose on the test equipment from the IDG pressure fill fitting.
- (m) Do this task: IDG Oil Level Check, TASK 12-13-21-200-801.

NOTE: IDG oil level can rise above FULL level during the static leak check. If it is necessary, motor the engine or operate the engine at idle speed to redistribute the IDG oil, then do the IDG oil level check.

- 1) If it is necessary, motor the engine or operate the engine at idle speed (TASK 71-00-00-910-802-G00).
- (n) Install the cover on the IDG pressure fill fitting.

G. Put the Airplane Back to its Usual Condition

SUBTASK 24-11-00-410-001

- (1) Do this task: Close the Fan Cowl Panels (Selection), TASK 71-11-04-410-801-G00.

————— **END OF TASK** —————

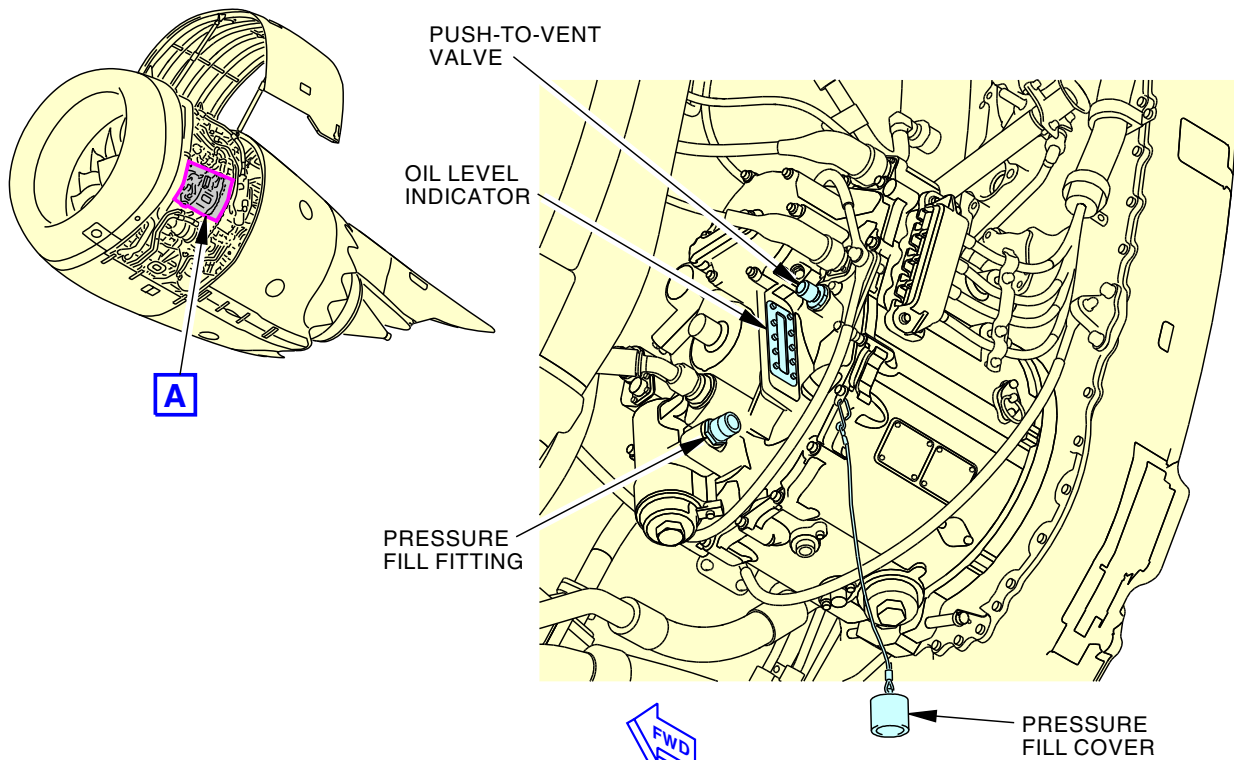
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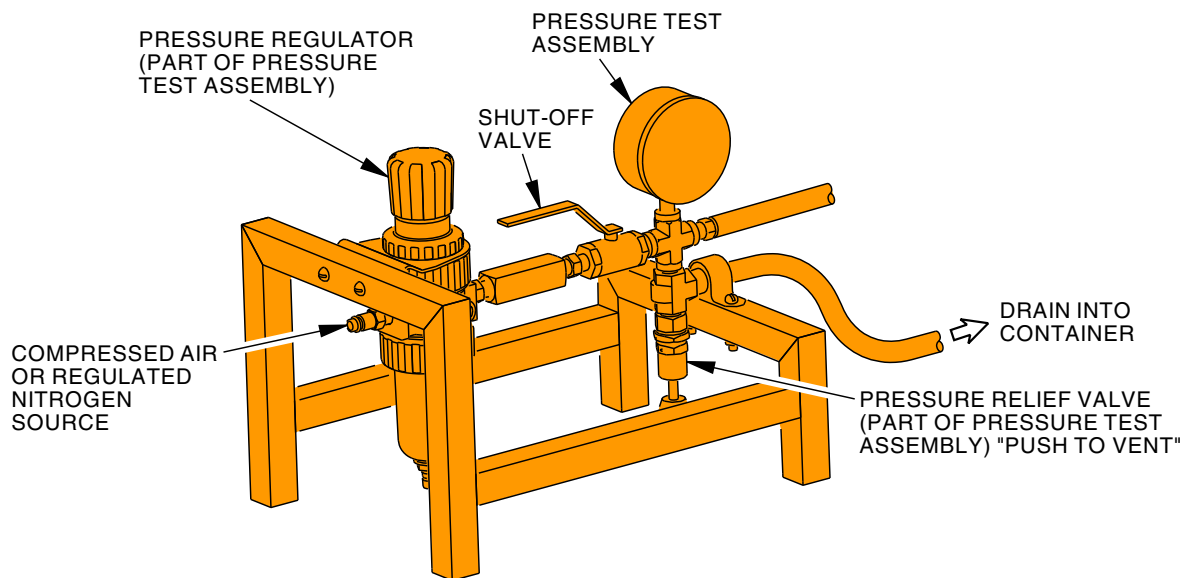
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(EXAMPLE)

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IDG Oil System Static Leak Check
Figure 202/24-11-00-990-802

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TASK 24-11-00-700-802

5. **IDG Push-to-Vent Valve Replacement**

(Figure 203)

A. General

- (1) This task removes and installs the IDG push-to-vent valve. The push-to-vent valve is on the IDG next to the sightglass. After replacement of the valve, it is necessary to do a leak check.

B. References

Reference	Title
12-13-21-600-801	IDG Servicing (Oil Fill) (P/B 301)
71-00-00-910-808-G00	Dry Motor Procedure (P/B 201)
71-11-04-010-801-G00	Open the Fan Cowl Panels (Selection) (P/B 201)
71-11-04-410-801-G00	Close the Fan Cowl Panels (Selection) (P/B 201)

C. Tools/Equipment

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

Reference	Description
COM-1537	Dispenser - Servicing, Engine Oil Part #: 7011 Supplier: K6057 Part #: 7036 Supplier: K6057 Part #: BOB02 Supplier: D2029 Part #: BOB05 Supplier: D2029 Part #: BOB20 Supplier: D2029 Part #: MODEL 150 Supplier: 94861 Part #: PF53361-2PWS Supplier: 94861 Part #: PF53361-8PWS Supplier: 94861 Part #: PF53481-3P Supplier: 94861 Part #: PF53481-5PWS Supplier: 94861 Part #: PF53481-8PWS Supplier: 94861 Part #: PF55451-2WS Supplier: 94861 Part #: PF55451-7WS Supplier: 94861 Part #: WF150-1 Supplier: 94861 Opt Part #: 150-3 Supplier: 94861 Opt Part #: UZ/7/1826 Supplier: K6057 Opt Part #: WF174410 Supplier: 94861

D. Consumable Materials

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
21	Push-to-vent valve	24-11-11-05-235	SIA ALL
22	O-ring	24-11-11-05-240	SIA ALL

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F. Location Zones

Zone	Area
------	------

410	Subzone - Engine 1
-----	--------------------

420	Subzone - Engine 2
-----	--------------------

G. Prepare to remove the Push-to-Vent Valve

SUBTASK 24-11-00-010-002

- (1) Do this task: Open the Fan Cowl Panels (Selection), TASK 71-11-04-010-801-G00.

H. IDG Push-to-Vent Valve Replacement

SUBTASK 24-11-00-780-001



WARNING

MAKE SURE THAT YOU PUSH THE PUSH-TO-VENT VALVE. IF YOU DO NOT DO THIS, IT CAN CAUSE HOT OIL TO SPRAY. THIS CAN CAUSE INJURY TO PERSONS.

- (1) Release the IDG case pressure as follows:
- (a) Push the push-to-vent valve [21] on the IDG for a minimum of 15 seconds to relieve internal IDG pressure.
 - (b) If you cannot push the push-to-vent valve [21] to release the pressure, do these steps:
 - 1) Remove the pressure fill cover from the pressure fill fitting on the IDG.
 - 2) Put the container below the pressure fill hose.
 - 3) Connect the pressure fill hose from the engine oil servicing dispenser, COM-1537, to the pressure fill fitting on the IDG.

SUBTASK 24-11-00-020-001

- (2) Remove the IDG push-to-vent valve [21] as follows:
- (a) Remove the lockwire from the push-to-vent valve [21].
 - (b) Put an approved container under the vent valve port to catch the oil that drains.



WARNING

DO NOT OPEN THE IDG OIL SYSTEM UNTIL THE PRESSURE GOES TO ZERO. A PRESSURIZED OIL SYSTEM CAN CAUSE INJURY TO PERSONS.

- (c) Remove the push-to-vent valve [21].
- (d) Remove and discard the old o-ring [22].

SUBTASK 24-11-00-420-001

- (3) Install the IDG push-to-vent valve [21] as follows:
- (a) Lubricate a new o-ring [22] with oil, D00068 or oil, D00071.
 - (b) Put the new o-ring [22] in correct position on the push-to-vent valve [21].
 - (c) Install the push-to-vent valve [21] on the IDG and torque to 110 in-lb (12 N·m) - 150 in-lb (17 N·m).
 - (d) Safety the push-to-vent valve with MS20995C32 lockwire, G01048.

SUBTASK 24-11-00-610-001

- (4) Do this task: IDG Servicing (Oil Fill), TASK 12-13-21-600-801.

SUBTASK 24-11-00-790-001

- (5) Do this task: Dry Motor Procedure, TASK 71-00-00-910-808-G00.

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(a) Check for leaks.

I. Put the Airplane Back to its Usual Condition

SUBTASK 24-11-00-410-002

(1) Do this task: Close the Fan Cowl Panels (Selection), TASK 71-11-04-410-801-G00.

———— **END OF TASK** ————

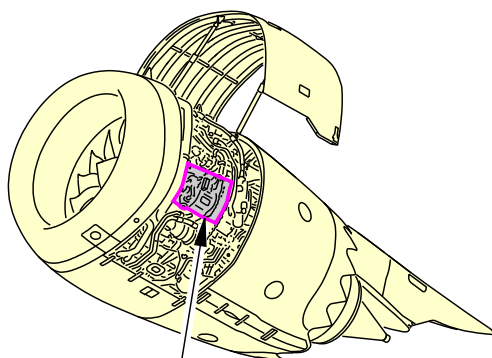
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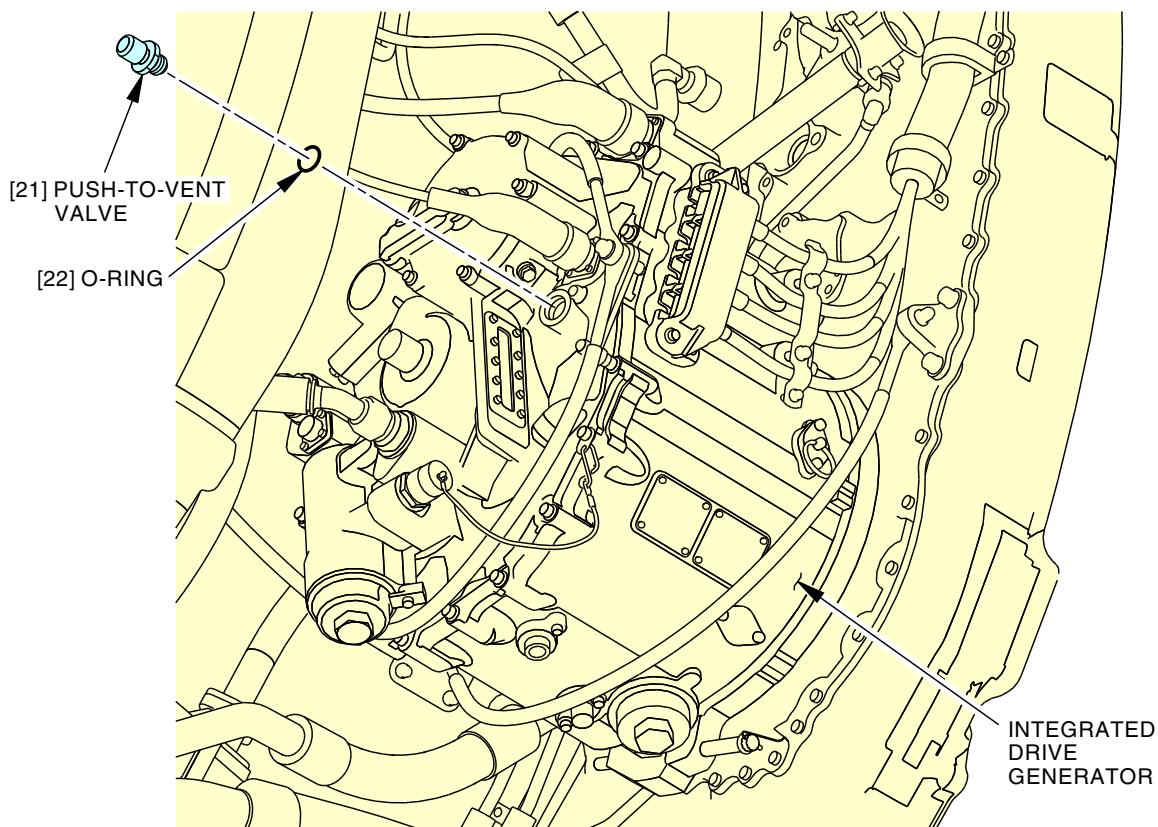
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A



(EXAMPLE)

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IDG Push-To-Vent Valve Replacement
Figure 203/24-11-00-990-803

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GENERATOR DRIVE SYSTEM - ADJUSTMENT/TEST

1. **General**

A. This procedure has two tasks:

- (1) The Operational Test For The Number 1 IDG.
- (2) The Operational Test For The Number 2 IDG.

TASK 24-11-00-700-803

2. **Number 1 IDG Operational Test**

(Figure 501, Figure 502, and Figure 503)

A. **General**

(1) This procedure does these tests:

- (a) An operational test
- (b) A load test
- (c) An Integrated Drive Generator (IDG) disconnect and connect test.

NOTE: If the airplane was in active storage, the IDGs were not removed, and the engines were run every 7 to 14 days, the IDG disconnect and connection test is not required.

(2) Operate the engines to do an operational test of the IDG.

B. **References**

Reference	Title
24-11-11-000-801	Integrated Drive Generator (IDG) Removal (P/B 401)
24-11-11-400-801	Integrated Drive Generator (IDG) Installation (P/B 401)
24-22-00-860-803	Supply External Power (P/B 201)
24-22-00-860-804	Remove External Power (P/B 201)
71-00-00-800-801-G00	Engine Ground Safety Precautions (P/B 201)
71-00-00-910-802-G00	Start the Engine (Selection) (P/B 201)
71-00-00-910-806-G00	Stop the Engine (Usual Engine Stop) (P/B 201)
71-11-04-010-801-G00	Open the Fan Cowl Panels (Selection) (P/B 201)
71-11-04-410-801-G00	Close the Fan Cowl Panels (Selection) (P/B 201)

C. **Location Zones**

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
410	Subzone - Engine 1

D. **Prepare for the Operational Test**

SUBTASK 24-11-00-860-013

(1) Do this task: Supply External Power, TASK 24-22-00-860-803.

E. **Operational Test**

SUBTASK 24-11-00-710-002

(1) Do the operational test as follows:

- (a) Set the AC meter selector switch, on the P5 overhead panel, to the GEN 1 position.
- (b) Make sure that the AC meter, on the P5 overhead panel, shows these values:

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- 1) AC VOLTS = 0
- 2) CPS FREQ = BLANK.

NOTE: When the AC voltage goes below approximately 12 VAC, the CPS FREQ will become blank.

- (c) Obey all safety precautions around the running engines (TASK 71-00-00-800-801-G00).
- (d) Start the No. 1 engine (TASK 71-00-00-910-802-G00).



THE DRIVE LIGHT ON THE P5 PANEL MUST GO OFF AFTER THE ENGINE GETS UP TO IDLE SPEED. IF THE DRIVE LIGHT DOES NOT GO OFF OR COMES ON WHEN THE ENGINE IS AT OR ABOVE IDLE SPEED, YOU MUST PUSH THE DISCONNECT SWITCH ON THE P5 PANEL. IF YOU DO NOT PUSH THE DISCONNECT SWITCH, DAMAGE CAN OCCUR TO THE IDG.

- (e) Make sure that the number 1 DRIVE light, on the P5 overhead panel, goes off after number 1 engine reaches idle speed.
- (f) Set the GEN 1 switch, on the P5 overhead panel, to the ON position.
- (g) Make sure that the 1 GEN OFF BUS light, on the P5 overhead panel, goes off.
- (h) Make sure that the AC meter, on the P5 overhead panel, shows these values:
 - 1) AC VOLTS = 110-120
 - 2) CPS FREQ = 395-405.
- (i) Set the GRD PWR switch, on the P5 overhead panel, to the OFF position.
- (j) Make sure that both TRANSFER BUS OFF lights, on the P5 overhead panel, goes off.

F. Load Test

SUBTASK 24-11-00-710-003

- (1) Do the load test as follows:



DO NOT OPERATE THE BOOST PUMPS WITH THE FUEL TANKS EMPTY. DAMAGE TO THE BOOST PUMPS CAN OCCUR.

- (a) Make sure that these switches, on the P5 fuel system panel, are in the ON position:
 - 1) 1 AFT FUEL PUMP
 - 2) 1 FWD FUEL PUMP
 - 3) 2 AFT FUEL PUMP
 - 4) 2 FWD FUEL PUMP
 - 5) L CTR FUEL PUMP
 - 6) R CTR FUEL PUMP.



KEEP PERSONS AND EQUIPMENT CLEAR OF THE FLIGHT CONTROL SURFACES, THE THRUST REVERSERS, AND THE LANDING GEAR. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (b) Make sure that these switches, on the P5 hydraulic pump panel, are in the ON position:

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- 1) A ELEC 2 HYD PUMP
- 2) B ELEC 1 HYD PUMP.
- (c) Set these switches, on the P5 exterior light control panel, to the ON position:
 - 1) L LANDING
 - 2) R LANDING.
- (d) Make sure that the AC meter, on the P5 overhead panel, shows these values:
 - 1) AC VOLTS = 110-120
 - 2) CPS FREQ = 395-405.
- (e) Set these switches, on the P5 exterior light control panel, to the OFF position:
 - 1) L LANDING
 - 2) R LANDING.

G. IDG Disconnect and Connect Test

NOTE: If the airplane was in active storage, the IDGs were not removed, and the engines were run every 7 to 14 days, the IDG disconnect and connection test is not required.

SUBTASK 24-11-00-710-004

- (1) Do the disconnect and connect test as follows:
 - (a) Set the GRD PWR switch, on the P5 overhead panel, to the ON position.
 - (b) Make sure that the 1 GEN OFF BUS light, on the P5 overhead panel, comes on.
 - (c) Make sure that the AC meter, on the P5 overhead panel, shows these values:
 - 1) AC VOLTS = 110-120
 - 2) CPS FREQ = 395-405.



CAUTION

DO NOT ACTUATE THE DISCONNECT SWITCH FOR MORE THAN 3 SECONDS. ALLOW A MINIMUM OF 60 SECONDS BETWEEN ACTUATION PERIODS. FAILURE TO FOLLOW THIS PROCEDURE CAN CAUSE DAMAGE TO IDG.

- (d) Set the 1 DISCONNECT switch, on the P5 overhead panel, to the DISCONNECT position.
- (e) Make sure that the 1 DRIVE light, on the P5 overhead panel, comes on.
- (f) Make sure that the 1 GEN OFF BUS light, on the P5 overhead panel, comes on.
- (g) Make sure that the AC meter, on the P5 overhead panel, shows these values:
 - 1) AC VOLTS = 0
 - 2) CPS FREQ = BLANK.

NOTE: When the AC voltage goes below approximately 12 VAC, the CPS FREQ will become blank.

- (h) Stop the No. 1 engine (TASK 71-00-00-910-806-G00).
- (i) Do this task: Open the Fan Cowl Panels (Selection), TASK 71-11-04-010-801-G00.



WARNING

DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

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(WARNING PRECEDES)



DO NOT LET HOT OIL GET ON YOUR SKIN. PUT ON CLOTHES, GOGGLES, AND EQUIPMENT FOR PROTECTION OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.



DO NOT RE-SET THE IDG IF THE INPUT SPEED OF THE ENGINE GEARBOX IS MORE THAN 100 REVOLUTIONS PER MINUTE (RPM). IF THE IDG IS RE-SET WITH THE ENGINE GEARBOX SPEED GREATER THAN 100 RPM, DAMAGE TO THE IDG WILL OCCUR.

- (j) Slowly pull the IDG disconnect reset ring on the IDG to the outward travel limit.
 - 1) Monitor the hand force necessary to pull the ring.
- (k) Make sure that a click can be felt in the IDG disconnect reset ring as it gets near the outward limit of travel.

NOTE: Operation of the IDG disconnect reset ring should be smooth with moderate force necessary and no indication of binding.
- (l) Let the IDG disconnect reset ring slowly return to the maximum inward position.
- (m) Slowly pull the IDG disconnect reset ring on the IDG to the outward travel limit.
 - 1) Monitor the hand force necessary to pull the ring.
- (n) Make sure that the quantity of hand force necessary is less than the quantity necessary in the previous pull.
- (o) Make sure that no click is felt in the IDG disconnect reset ring during the second pull.
 - 1) If a click is produced during the second pull of the IDG disconnect reset ring, replace the IDG, do these tasks:
 - Integrated Drive Generator (IDG) Removal, TASK 24-11-11-000-801
 - Integrated Drive Generator (IDG) Installation, TASK 24-11-11-400-801.
- (p) Let the IDG disconnect reset ring slowly return to the maximum inward position.

SUBTASK 24-11-00-710-005

- (2) Do a check of the IDG disconnect inhibit function:

NOTE: The IDG disconnect function is inhibited when the engine is below idle speed.



DO NOT ACTUATE THE DISCONNECT SWITCH FOR MORE THAN 3 SECONDS. ALLOW A MINIMUM OF 60 SECONDS BETWEEN ACTUATION PERIODS. FAILURE TO FOLLOW THIS PROCEDURE CAN CAUSE DAMAGE TO IDG.

- (a) Push the 1 DISCONNECT switch, on the P5 overhead panel, to the DISCONNECT position.
 - 1) Put a person near the IDG to listen for no click and feel no movement while lightly holding the IDG disconnect reset ring.
 - 2) Make sure that there is no click and no movement at the IDG when the 1 DISCONNECT switch is pushed.
- (b) Make sure that the 1 DRIVE light, on the P5 overhead panel, stays on.
- (c) Slowly pull the IDG disconnect reset ring on the IDG to the outward travel limit.
 - 1) Make a note of the quantity of hand force necessary.

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- (d) Make sure that the force necessary is light.
- (e) Make sure that no click is felt when pulling the IDG disconnect reset ring.
- (f) Let the IDG disconnect reset ring slowly return to the maximum inward position.
- (g) Do this task: Close the Fan Cowl Panels (Selection), TASK 71-11-04-410-801-G00.
- (h) Do this task: Remove External Power, TASK 24-22-00-860-804.
- (i) Open these circuit breakers:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	8	C01286	GENERATOR DISC 1
F	9	C01287	GENERATOR DISC 2

- (j) Obey all safety precautions around the running engines (TASK 71-00-00-800-801-G00).
- (k) Start the applicable engine (TASK 71-00-00-910-802-G00).
 - 1) Let the applicable engine operate at idle power.
- (l) Make sure that the AC voltage is 115 ± 5 and the frequency is 400 ± 5 .
- (m) Close these circuit breakers:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	8	C01286	GENERATOR DISC 1
F	9	C01287	GENERATOR DISC 2

- (n) Make sure that the AC voltage and the frequency do not change.
- (o) Shut down the applicable engine (TASK 71-00-00-910-806-G00).

SUBTASK 24-11-00-700-003

- (3) Do the test of the Generator Control Unit (GCU) (Figure 503):
 - (a) Make sure that the STANDBY POWER switch, on the P5 overhead panel, is set to the AUTO position.
 - (b) Set the BAT switch, on the P5 overhead panel, to the ON position.
 - (c) Push the GCU TEST switch on the GCU for at least one second and then release it.
 - (d) Make sure that all seven of the indicator lights on the GCU come on for approximately three seconds.
 - (e) Make sure that all seven of the indicator lights on the GCU go off for approximately three seconds.
 - (f) Make sure that the green GCU PASS light on the GCU comes on for approximately seven seconds.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 24-11-00-860-012

- (1) Make sure that these circuit breakers are closed:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	8	C01286	GENERATOR DISC 1
F	9	C01287	GENERATOR DISC 2

————— **END OF TASK** —————

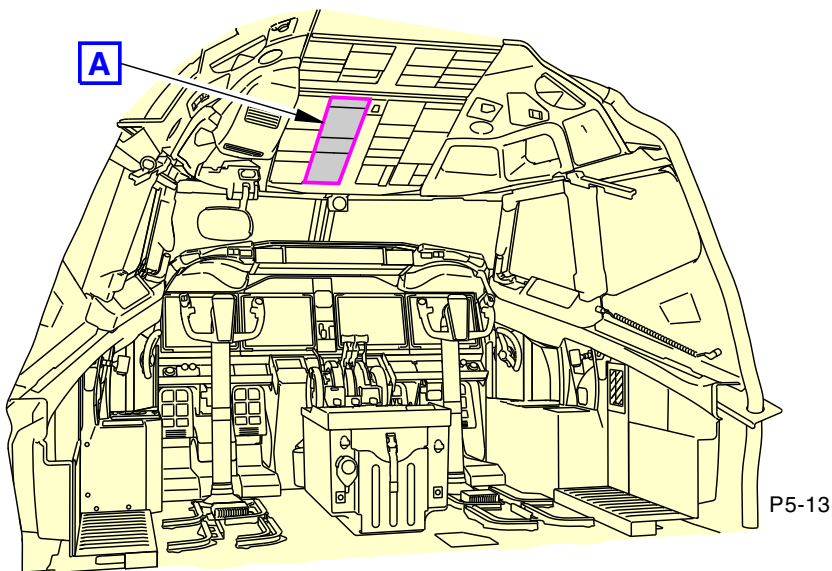
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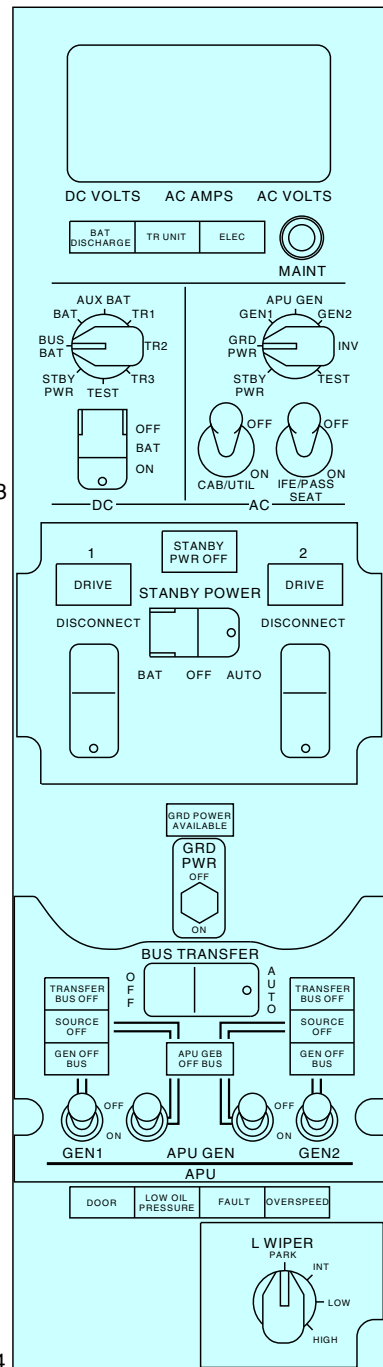
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FLIGHT COMPARTMENT



A

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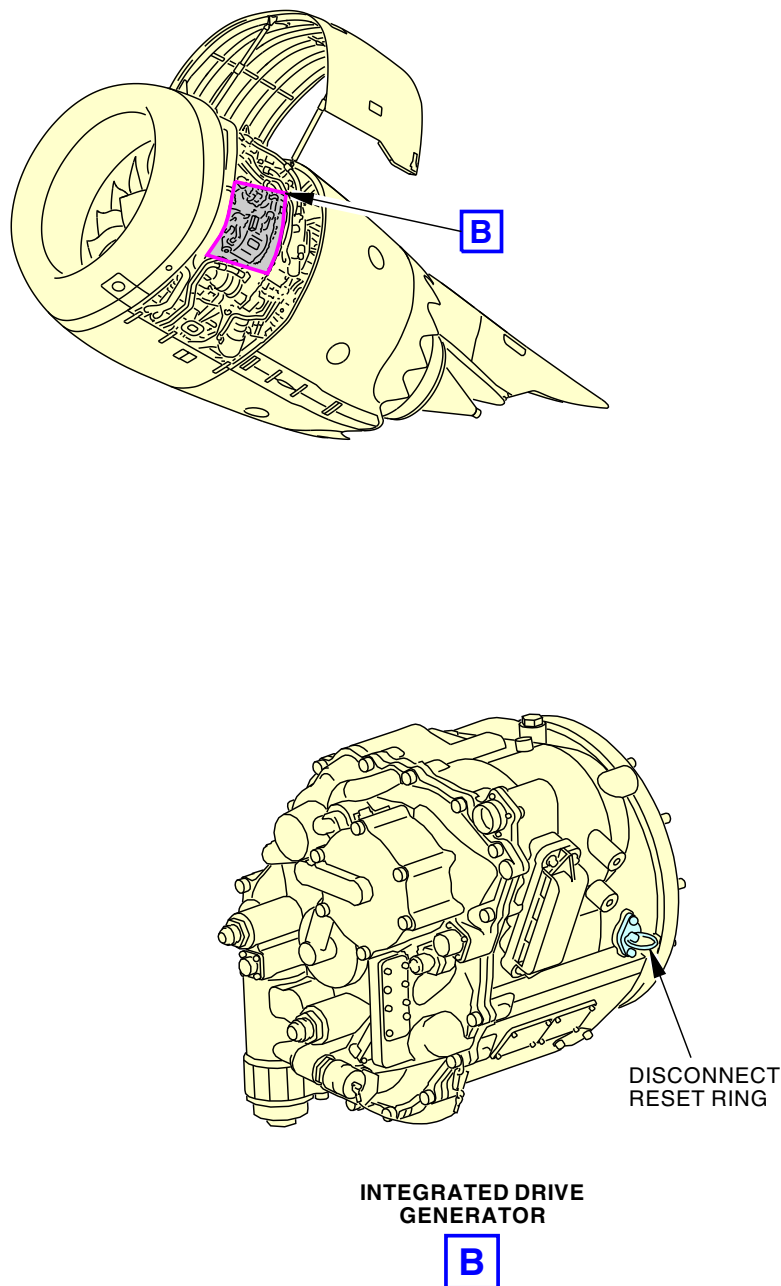
AC/DC Power Control and Display Panels
Figure 501/24-11-00-990-804

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IDG Disconnect Reset
Figure 502/24-11-00-990-805

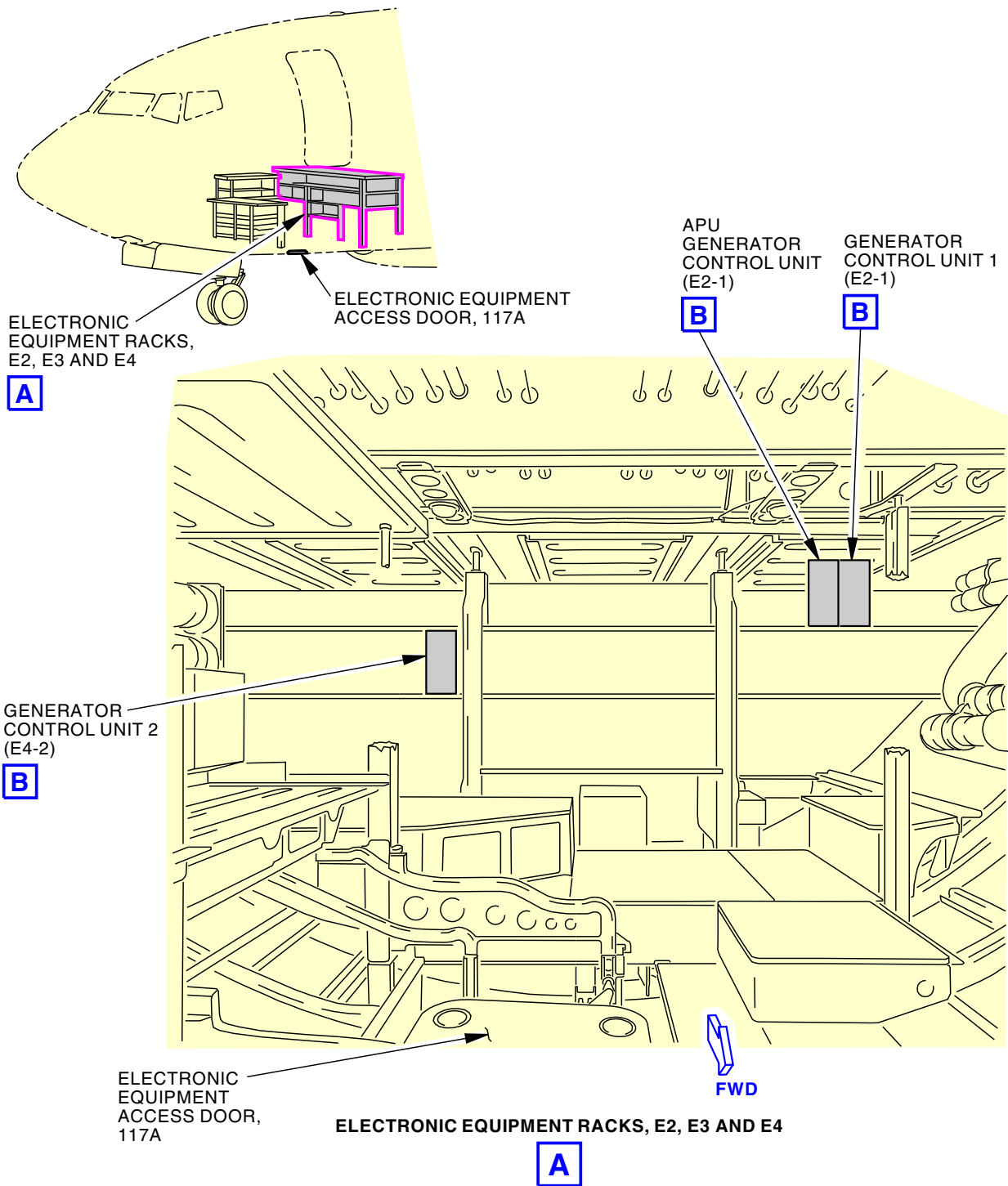
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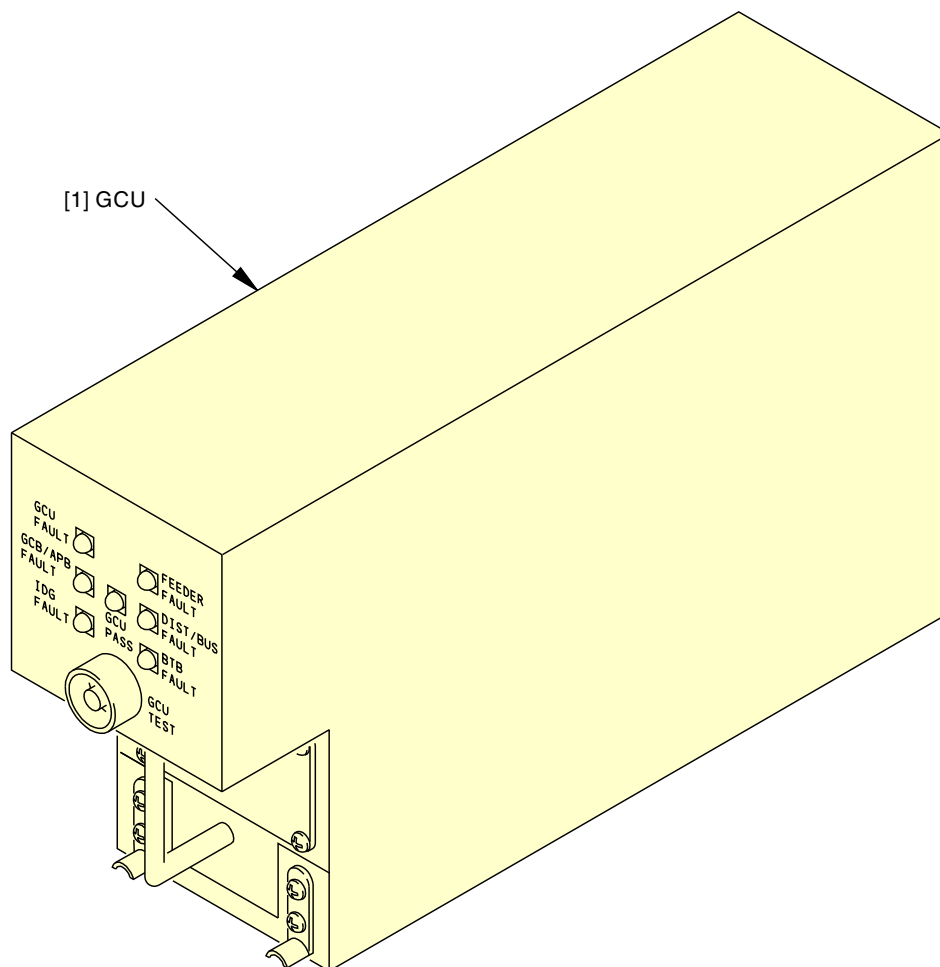
Generator Control Unit (GCU)
Figure 503/24-11-00-990-806 (Sheet 1 of 2)

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GENERATOR CONTROL UNIT

B

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Generator Control Unit (GCU)
Figure 503/24-11-00-990-806 (Sheet 2 of 2)

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TASK 24-11-00-700-804

3. **Number 2 IDG Operational Test**

(Figure 501, Figure 502, and Figure 503)

A. General

(1) This procedure does these tests:

- (a) An operational test
- (b) A load test
- (c) An Integrated Drive Generator (IDG) disconnect and connect test.

NOTE: If the airplane was in active storage, the IDGs were not removed, and the engines were run every 7 to 14 days, the IDG disconnect and connection test is not required.

(2) Operate the engines to do an operational test of the IDG.

B. References

Reference	Title
24-11-11-000-801	Integrated Drive Generator (IDG) Removal (P/B 401)
24-11-11-400-801	Integrated Drive Generator (IDG) Installation (P/B 401)
24-22-00-860-803	Supply External Power (P/B 201)
24-22-00-860-804	Remove External Power (P/B 201)
71-00-00-910-801-G00	Prepare the Engine for Operation (P/B 201)
71-00-00-910-802-G00	Start the Engine (Selection) (P/B 201)
71-00-00-910-806-G00	Stop the Engine (Usual Engine Stop) (P/B 201)
71-11-04-010-801-G00	Open the Fan Cowl Panels (Selection) (P/B 201)
71-11-04-410-801-G00	Close the Fan Cowl Panels (Selection) (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
420	Subzone - Engine 2

D. Prepare for the Operational Test

SUBTASK 24-11-00-860-014

(1) Do this task: Supply External Power, TASK 24-22-00-860-803.

E. Operational Test

SUBTASK 24-11-00-710-006

(1) Do the operational test as follows:

- (a) Set the AC meter selector switch, on the P5 overhead panel, to the GEN 2 position.
- (b) Make sure that the AC meter, on the P5 overhead panel, shows these values:
 - 1) AC VOLTS = 0
 - 2) CPS FREQ = BLANK.

NOTE: When the AC voltage goes below approximately 12 VAC, the CPS FREQ will become blank.

- (c) Obey all safety precautions around the running engines (TASK 71-00-00-910-801-G00).
- (d) Start the No. 2 engine (TASK 71-00-00-910-802-G00).

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THE DRIVE LIGHT ON THE P5 PANEL MUST GO OFF AFTER THE ENGINE GETS UP TO IDLE SPEED. IF THE DRIVE LIGHT DOES NOT GO OFF OR COMES ON WHEN THE ENGINE IS AT OR ABOVE IDLE SPEED, YOU MUST PUSH THE DISCONNECT SWITCH ON THE P5 PANEL. IF YOU DO NOT PUSH THE DISCONNECT SWITCH, DAMAGE CAN OCCUR TO THE IDG.

- (e) Make sure that the number 2 DRIVE light, on the P5 overhead panel, goes off after number 2 engine reaches idle speed.
- (f) Set the GEN 2 switch, on the P5 overhead panel, to the ON position.
- (g) Make sure that the 2 GEN OFF BUS light, on the P5 overhead panel, goes off.
- (h) Make sure that the AC meter, on the P5 overhead panel, shows these values:
 - 1) AC VOLTS = 110-120
 - 2) CPS FREQ = 395-405.
- (i) Set the GRD PWR switch, on the P5 overhead panel, to the OFF position.
- (j) Make sure that both TRANSFER BUS OFF lights, on the P5 overhead panel, stay off.

F. Load Test

SUBTASK 24-11-00-410-003

- (1) Do the load test as follows:



DO NOT OPERATE THE BOOST PUMPS WITH THE FUEL TANKS EMPTY. DAMAGE TO THE BOOST PUMPS CAN OCCUR.

- (a) Make sure that these switches, on the P5 fuel system panel, are in the ON position:
 - 1) 1 AFT FUEL PUMP
 - 2) 1 FWD FUEL PUMP
 - 3) 2 AFT FUEL PUMP
 - 4) 2 FWD FUEL PUMP
 - 5) L CTR FUEL PUMP
 - 6) R CTR FUEL PUMP.



KEEP PERSONS AND EQUIPMENT CLEAR OF THE FLIGHT CONTROL SURFACES, THE THRUST REVERSERS, AND THE LANDING GEAR. THESE COMPONENTS CAN MOVE SUDDENLY WHEN YOU SUPPLY HYDRAULIC POWER. THIS CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

- (b) Make sure that these switches, on the P5 hydraulic pump panel, are in the ON position:
 - 1) A ELEC 2 HYD PUMP
 - 2) B ELEC 1 HYD PUMP.
- (c) Set these switches, on the P5 exterior light control panel, to the ON position:
 - 1) L LANDING
 - 2) R LANDING.
- (d) Make sure that the AC meter, on the P5 overhead panel, shows these values:

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- 1) AC VOLTS = 110-120
 - 2) CPS FREQ = 395-405.
- (e) Set these switches, on the P5 exterior light control panel, to the OFF position:
- 1) L LANDING
 - 2) R LANDING.

G. IDG Disconnect and Connect Test

NOTE: If the airplane was in active storage, the IDGs were not removed, and the engines were run every 7 to 14 days, the IDG disconnect and connection test is not required.

SUBTASK 24-11-00-710-007

- (1) Do the disconnect and connect test as follows:
- (a) Set the GRD PWR switch, on the P5 overhead panel, to the ON position.
 - (b) Make sure that the 2 GEN OFF BUS light, on the P5 overhead panel, comes on.
 - (c) Make sure the AC meter, on the P5 overhead panel, shows these values:
 - 1) AC VOLTS = 110-120
 - 2) CPS FREQ = 395-405.



CAUTION

DO NOT ACTUATE THE DISCONNECT SWITCH FOR MORE THAN 3 SECONDS. ALLOW A MINIMUM OF 60 SECONDS BETWEEN ACTUATION PERIODS. FAILURE TO FOLLOW THIS PROCEDURE CAN CAUSE DAMAGE TO IDG.

- (d) Set the 2 DISCONNECT switch, on the P5 overhead panel, to the DISCONNECT position.
- (e) Make sure that the 2 DRIVE light, on the P5 overhead panel, comes on.
- (f) Make sure that the 2 GEN OFF BUS light, on the P5 overhead panel, comes on.
- (g) Make sure that the AC meter, on the P5 overhead panel, shows these values:
 - 1) AC VOLTS = 0
 - 2) CPS FREQ = BLANK.

NOTE: When the AC voltage goes below approximately 12 VAC, the CPS FREQ will become blank.
- (h) Stop the No. 2 engine (TASK 71-00-00-910-806-G00).
- (i) Do this task: Open the Fan Cowl Panels (Selection), TASK 71-11-04-010-801-G00.



WARNING

DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.



WARNING

DO NOT LET HOT OIL GET ON YOUR SKIN. PUT ON CLOTHES, GOGGLES, AND EQUIPMENT FOR PROTECTION OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.

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CAUTION

DO NOT RE-SET THE IDG IF THE INPUT SPEED OF THE ENGINE GEARBOX IS MORE THAN 100 REVOLUTIONS PER MINUTE (RPM). IF THE IDG IS RE-SET WITH THE ENGINE GEARBOX SPEED GREATER THAN 100 RPM, DAMAGE TO THE IDG WILL OCCUR.

- (j) Slowly pull the IDG disconnect reset ring on the IDG to the outward travel limit.
 - 1) Monitor the hand force necessary to pull the ring.
- (k) Make sure that a click can be felt in the IDG disconnect reset ring as it gets near the outward limit of travel.

NOTE: Operation of the IDG disconnect reset ring should be smooth with moderate force necessary and no indication of binding.
- (l) Let the IDG disconnect reset ring slowly return to the maximum inward position.
- (m) Slowly pull the IDG disconnect reset ring on the IDG to the outward travel limit.
 - 1) Monitor the hand force necessary to pull the ring.
- (n) Make sure that the quantity of hand force necessary is less than the quantity necessary in the previous pull.
- (o) Make sure that no click is felt in the IDG disconnect reset ring during the second pull.
 - 1) If a click is produced during the second pull of the IDG disconnect reset ring, replace the IDG, do these tasks:
 - Integrated Drive Generator (IDG) Removal, TASK 24-11-11-000-801
 - Integrated Drive Generator (IDG) Installation, TASK 24-11-11-400-801.
- (p) Let the IDG disconnect reset ring slowly return to the maximum inward position.

SUBTASK 24-11-00-710-008

- (2) Make a check of the IDG disconnect inhibit function:

NOTE: The IDG disconnect function is inhibited when the engine is below idle speed.



CAUTION

DO NOT ACTUATE THE DISCONNECT SWITCH FOR MORE THAN 3 SECONDS. ALLOW A MINIMUM OF 60 SECONDS BETWEEN ACTUATION PERIODS. FAILURE TO FOLLOW THIS PROCEDURE CAN CAUSE DAMAGE TO IDG.

- (a) Push the 2 DISCONNECT switch, on the P5 overhead panel, to the DISCONNECT position.
 - 1) Put a person near the IDG to listen for no click and feel no movement while lightly holding the IDG Disconnect Reset Ring.
 - 2) Make sure that there is no click and no movement at IDG when the 2 DISCONNECT switch is pushed.
- (b) Make sure that the 2 DRIVE light, on the P5 overhead panel, stays on.
- (c) Slowly pull the IDG disconnect reset ring on the IDG to the outward travel limit.
 - 1) Make a note of the quantity of hand force necessary.
- (d) Make sure that the force necessary is light.
- (e) Make sure that no click is felt when pulling the IDG disconnect reset ring.
- (f) Let the IDG disconnect reset ring slowly return to the maximum inward position.

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- (g) Do this task: Close the Fan Cowl Panels (Selection), TASK 71-11-04-410-801-G00.
- (h) Do this task: Remove External Power, TASK 24-22-00-860-804.
- (i) Open these circuit breakers:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	8	C01286	GENERATOR DISC 1
F	9	C01287	GENERATOR DISC 2

- (j) Obey all safety precautions around the running engines (TASK 71-00-00-910-801-G00).
- (k) Start the applicable engine (TASK 71-00-00-910-802-G00).
 - 1) Let the applicable engine operate at idle power.
- (l) Make sure that the AC voltage is 115 ± 5 and the frequency is 400 ± 5 .
- (m) Close these circuit breakers:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	8	C01286	GENERATOR DISC 1
F	9	C01287	GENERATOR DISC 2

- (n) Make sure that the AC voltage and the frequency do not change.
- (o) Shut down the applicable engine (TASK 71-00-00-910-806-G00).

SUBTASK 24-11-00-700-004

- (3) Do a test of the Generator Control Unit (GCU) (Figure 503).
 - (a) Make sure that the STANDBY POWER switch, on the P5 overhead panel, is set to the AUTO position.
 - (b) Set the BAT switch, on the P5 overhead panel, to the ON position.
 - (c) Push the GCU TEST switch on the GCU for at least one second and then release it.
 - (d) Make sure that all seven of the indicator lights on the GCU come on for approximately three seconds.
 - (e) Make sure that all seven of the indicator lights on the GCU go off for approximately three seconds.
 - (f) Make sure that the green GCU PASS light on the GCU comes on for approximately seven seconds.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 24-11-00-860-010

- (1) Make sure that these circuit breakers are closed:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	8	C01286	GENERATOR DISC 1
F	9	C01287	GENERATOR DISC 2

———— **END OF TASK** ————

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INTEGRATED DRIVE GENERATOR (IDG) - REMOVAL/INSTALLATION

1. **General**

A. This procedure has these tasks:

- (1) A removal of the IDG
- (2) An Installation of the IDG.

TASK 24-11-11-000-801

2. **Integrated Drive Generator (IDG) Removal**

(Figure 401)

A. **General**

- (1) The Integrated Drive Generator (IDG) is found on the accessory gearbox on the left side of the engine fan case.

B. **References**

Reference	Title
70-00-01-910-803-G00	Electrical Connector Disconnection and Connection (P/B 201)
71-11-04-010-801-G00	Open the Fan Cowl Panels (Selection) (P/B 201)

C. **Tools/Equipment**

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

Reference	Description
COM-1443	Jack - Hydraulic, General Low Profile, Capacity: 2000 lbs, Lift: 10 to 44 Inches, or Equivalent Jack Capable of Lifting 300 lbs. Part #: HW93718 Supplier: 28047 Opt Part #: W93718 Supplier: 36251
SPL-1626	Eye - Lifting, Generator Part #: A49002-2 Supplier: 81205
SPL-1634	Jack Adapter - VSCF and IDG Part #: C24002-77 Supplier: 81205 Part #: C24002-78 Supplier: 81205
SPL-20425	Blanking Plates - IDG, LEAP-1B Engine Series Part #: 956A8985G01 Supplier: 07482
STD-1055	Container - Oil Resistant, 5 Gallon (19 Liter)

D. **Consumable Materials**

Reference	Description	Specification
B00666	Solvent - Methyl Propyl Ketone	BMS11-9
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3
D50369	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class HTS (High Thermal Stability)
G00252	Film - Polyethylene Film And Sheeting	ASTM D2103 (Supersedes L-P-512)

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Reference	Description	Specification
G00253	Material - Barrier Materials, Greaseproofed, Waterproof, Flexible, Heat-Sealable	MIL-PRF-121 (Supersedes MIL-B-121)
G00834	Cloth - Lint-free Cotton	
G00920	Tape - Waterproof, Packaging	ASTM D5486
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995
G51576	Tape - Pressure Sensitive Adhesive - BA6866	BAC5034-4
G51663	Tape - Duct, Outdoor - 3M 8979	BAC5034-4
G51664	Tape - Duct, Outdoor - 3M 8979N (MIL-STD-2041 Compliant)	BAC5034-4

E. Location Zones

Zone	Area
410	Subzone - Engine 1
411	Engine 1 - Engine
420	Subzone - Engine 2
421	Engine 2 - Engine

F. Prepare for the Removal

SUBTASK 24-11-11-860-001

- (1) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
F	10	C01283	GENERATOR CONT UNIT 1
F	11	C01284	GENERATOR CONT UNIT 2

NOTE: No corrective action is necessary if these maintenance messages show: AUX BAT CHGR INOP or BAT CHGR INOP. These maintenance messages are nuisance faults that will show when only battery power is supplied to the airplane.

SUBTASK 24-11-11-010-001

- (2) Do this task: Open the Fan Cowl Panels (Selection), TASK 71-11-04-010-801-G00.

G. IDG Removal

SUBTASK 24-11-11-610-001



DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.



DO NOT OPEN THE OIL SYSTEM UNTIL THE PRESSURE GOES TO ZERO. THE PRESSURE GOES TO ZERO APPROXIMATELY 5 MINUTES AFTER AN ENGINE STOPS. A PRESSURIZED OIL SYSTEM CAN RELEASE A SPRAY OF HOT OIL THAT CAN BURN YOU.

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(WARNING PRECEDES)



WARNING

DO NOT LET HOT OIL GET ON YOU. PUT ON CLOTHES, GOGGLES, AND OTHER EQUIPMENT FOR PROTECTION, OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.



CAUTION

DO NOT LET OIL GET ON THE ENGINE, OR OTHER COMPONENTS. IMMEDIATELY CLEAN THE AREAS THAT OIL FALLS ON. OIL CAN CAUSE DAMAGE TO PAINT AND RUBBER.

- (1) Do these steps to drain the IDG oil:
- (a) Push the push-to-vent valve [15] on the IDG [10] for a minimum of 15 seconds.
 - (b) Remove the lockwire from the IDG case drain plug [17].
 - (c) Put an oil resistant container (5 gal)(19 Liter), STD-1055, below the IDG to catch the oil.
 - (d) Remove the drain plug [17].
 - (e) Remove and discard the O-ring [18] from the drain plug [17].
 - (f) Let the IDG oil drain into the container.



CAUTION

USE ONLY M83485 O-RING WHEN USING HIGH THERMAL STABILITY (HTS) OIL CONFORMING TO MILSPEC-23699 IN THE ENGINE (EXAMPLE: BP/EASTMAN TURBO OIL 2197, AEROSHELL TURBINE OIL 560, MOBIL JET OIL 254). USE OF OTHER O-RING STANDARDS (EXAMPLE: M83248 OR AS3209) WITH HTS OIL WILL RESULT IN REDUCED O-RING LIFE, ENGINE OIL LEAKAGE, AND POTENTIAL ENGINE SHUTDOWN.

- (g) Apply oil, D00071, or oil, D00068, or oil, D50369, to the new O-ring [18].
- (h) Install the O-ring [18] onto IDG case drain plug [17].
- (i) Install the drain plug [17] on the IDG [10].
- (j) Tighten the case drain plug [17] to 65 ± 10 in-lb (7 ± 1 N·m) and secure case drain plug [17] with MS20995C32 lockwire, G01048.

SUBTASK 24-11-11-020-001

- (2) Disconnect the electrical connector [4], DP101, and electrical connector [13], DP103, from the IDG receptacles:

NOTE: For the specific steps to disconnect and give protection to these electrical connectors, refer to Electrical Connector Disconnection and Connection, TASK 70-00-01-910-803-G00.

SUBTASK 24-11-11-020-003



CAUTION

USE TWO WRENCHES WHEN YOU LOOSEN OR TIGHTEN THE CONNECTION. ONE WRENCH WILL HOLD ONE SIDE OF THE CONNECTION IN ITS POSITION. ONE WRENCH WILL TURN THE OTHER SIDE OF THE CONNECTION. IF YOU DO NOT OBEY THIS TWO-WRENCH PROCEDURE, YOU CAN CAUSE DAMAGE TO THE CONNECTION COMPONENTS.

- (3) Disconnect the oil-in line [14] and oil-out line [1] from the IDG [10]:
- (a) Disconnect the oil-in line [14] and oil-out line [1] from the oil-in union and oil-out union on the IDG [10].

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- 1) Let the oil drain from the lines into a oil resistant container (5 gal)(19 Liter), STD-1055.
- (b) Cap the oil-in line and oil-out line.

SUBTASK 24-11-11-020-004

- (4) Remove the power feeder leads [5] from the IDG [10]:
 - (a) Remove the screws [6] that attach the bracket assembly or fanning strip and the ground wires to the IDG [10].
 - 1) Keep the screws [6] for the installation.
 - (b) Remove the screws [8] to remove the cover [7] from the IDG [10].
 - (c) Remove the nuts [9] from the power feeder terminals on the IDG [10].
 - (d) Remove the power feeder leads [5].
 - (e) Loosely install the nuts [9] on the power feeder terminals of the IDG [10].
 - 1) If the new IDG [10] does not have four nuts [9], keep the nuts [9] for reuse.
 - 2) Tighten the nuts [9] with your hand only.
 - (f) Loosely attach the cover [7] to the IDG [10] with the two screws [8].

SUBTASK 24-11-11-020-005

- (5) Do these steps to remove the IDG [10]:
 - (a) Make sure that the VSCF and IDG jack adapter, SPL-1634, is installed on the low profile hydraulic jack, COM-1443.
 - (b) Put the jack under the IDG [10] and raise the jack until the adapter engages with the IDG [10].
 - (c) Use the strap to attach the IDG [10] to the adapter.



CAUTION

MAKE SURE THAT YOU APPLY ONLY SUFFICIENT PRESSURE WITH THE JACK TO HOLD THE WEIGHT OF THE IDG. TOO MUCH PRESSURE ON THE IDG OR FAILURE TO HOLD THE IDG CORRECTLY CAN CAUSE DAMAGE TO THE INPUT SEAL.

- (d) Continue to raise the jack until the weight of the IDG [10] is held by the jack.
- (e) Remove the lockwire and loosen the QAD tension bolt on the QAD ring.
- (f) Loosen the QAD tension bolt until the alignment marks on the QAD ring and IDG housing align.

NOTE: In this position, the QAD ring is in the open position and the clamping lugs will be disengaged.

NOTE: If the QAD ring turns off the alignment marks on the adapter plate, the IDG cannot be removed. If this occurs, turn the QAD tension bolt to keep the alignment during the IDG removal.

- (g) Move the IDG [10] forward until the input shaft is free of the accessory gearbox and QAD ring, then move the IDG [10] outboard and away from the power plant.
- (h) Remove the O-ring [16] from the input shaft on the IDG [10].
 - 1) Discard the O-ring [16].
- (i) Put the IDG [10] on a cart or pallet.

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- 1) To lift the IDG [10] from jack/adaptor assembly after removal, install the eyebolt generator lifting eye, SPL-1626, on the IDG [10] housing to facilitate hoist or crane usage.
- 2) Use the hoist or crane to move IDG [10] to the jack/adaptor assembly before installation.

SUBTASK 24-11-11-910-001

- (6) If the IDG [10] will not be immediately installed, install protective covers to protect the accessory gearbox.
 - (a) Install the blanking plate, SPL-20425.
 - (b) If the blanking plate, SPL-20425, is not available, install barrier material, G00253 (preferred), polyethylene film, G00252 (alternate), or an equivalent 6 MIL, or thicker material.
 - 1) Use 3M 8979 tape, G51663 (preferred), or 3M 8979N tape, G51664 (alternate), or tape, G51576 (alternate), or tape, G00920 (alternate).
 - 2) Use a lint-free cloth, G00834, and solvent, B00666, to wipe the area where the tape will be used.

NOTE: The tooling must fully cover the Accessory Gear Box (AGB) mount pad to reduce the risk of corrosion.

———— **END OF TASK** ————

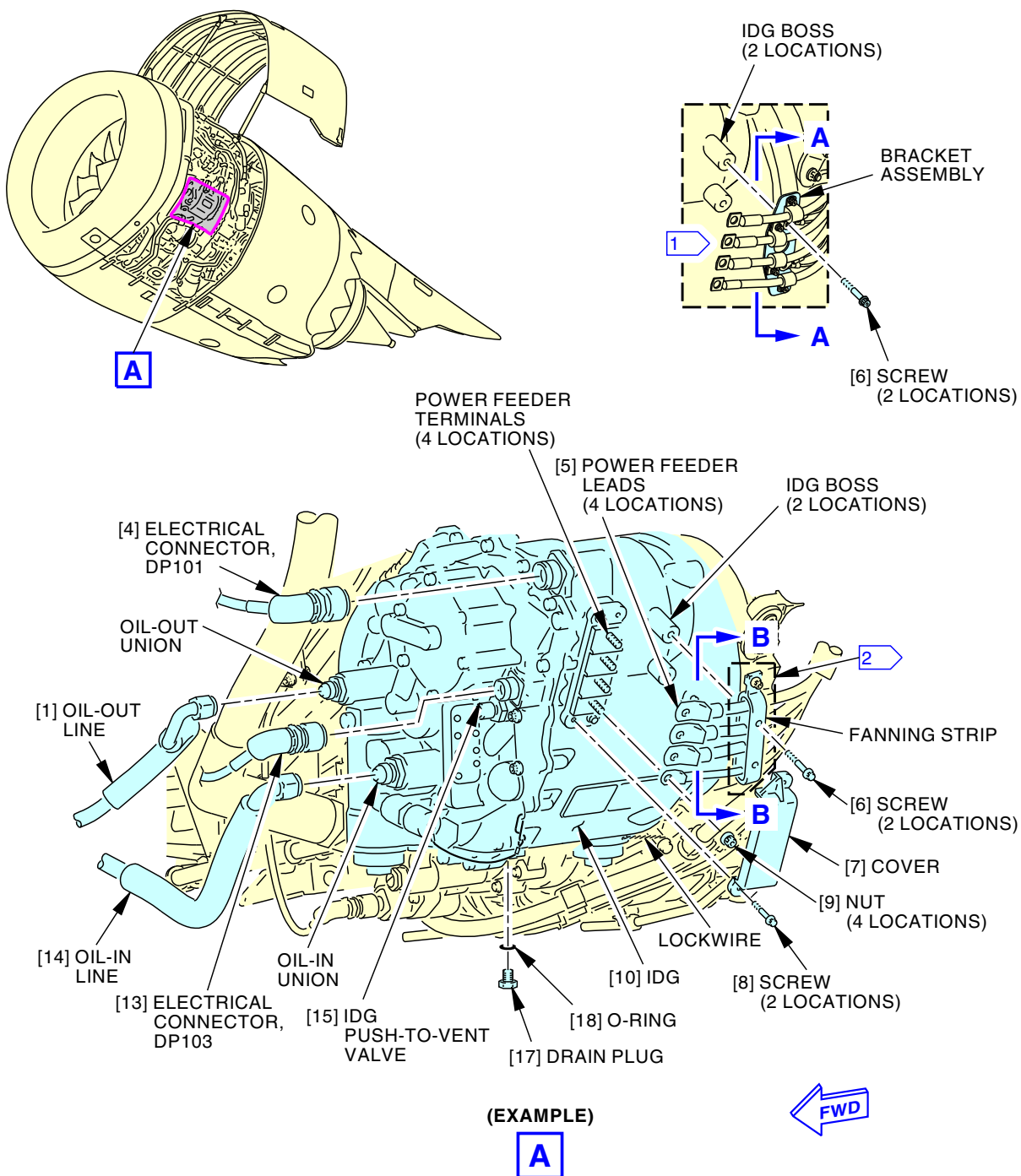
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- 1 CONFIGURATION WITH BRACKET ASSEMBLY
- 2 CONFIGURATION WITH FANNING STRIP

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Integrated Drive Generator (IDG) Installation
Figure 401/24-11-11-990-801 (Sheet 1 of 4)

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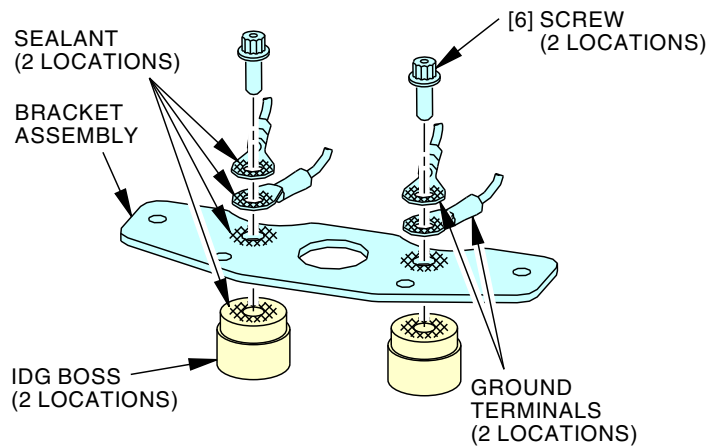
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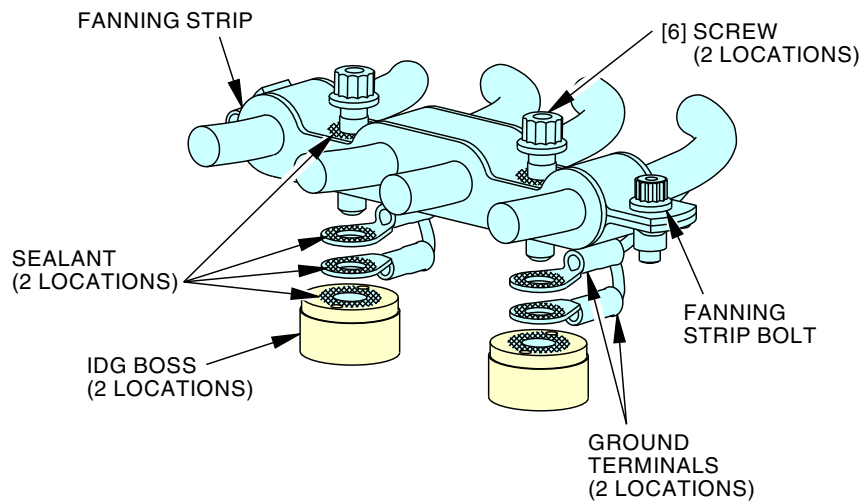
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(CONFIGURATION WITH BRACKET ASSEMBLY)
(CLAMPS AND WIRE NOT SHOWN)

A-A



(CONFIGURATION WITH FANNING STRIP)

B-B

3018358 S0000790546_V1

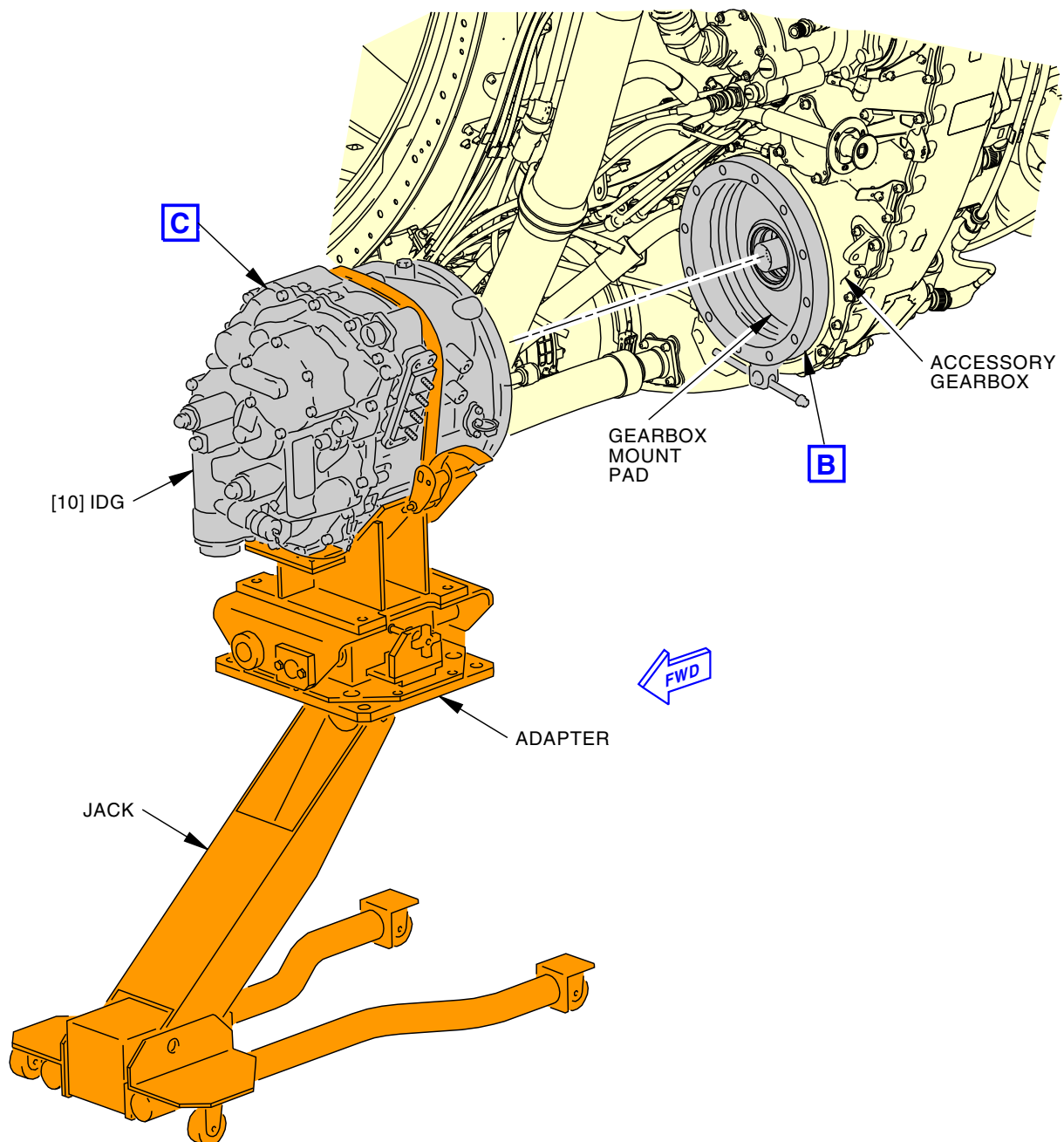
Integrated Drive Generator (IDG) Installation
Figure 401/24-11-11-990-801 (Sheet 2 of 4)

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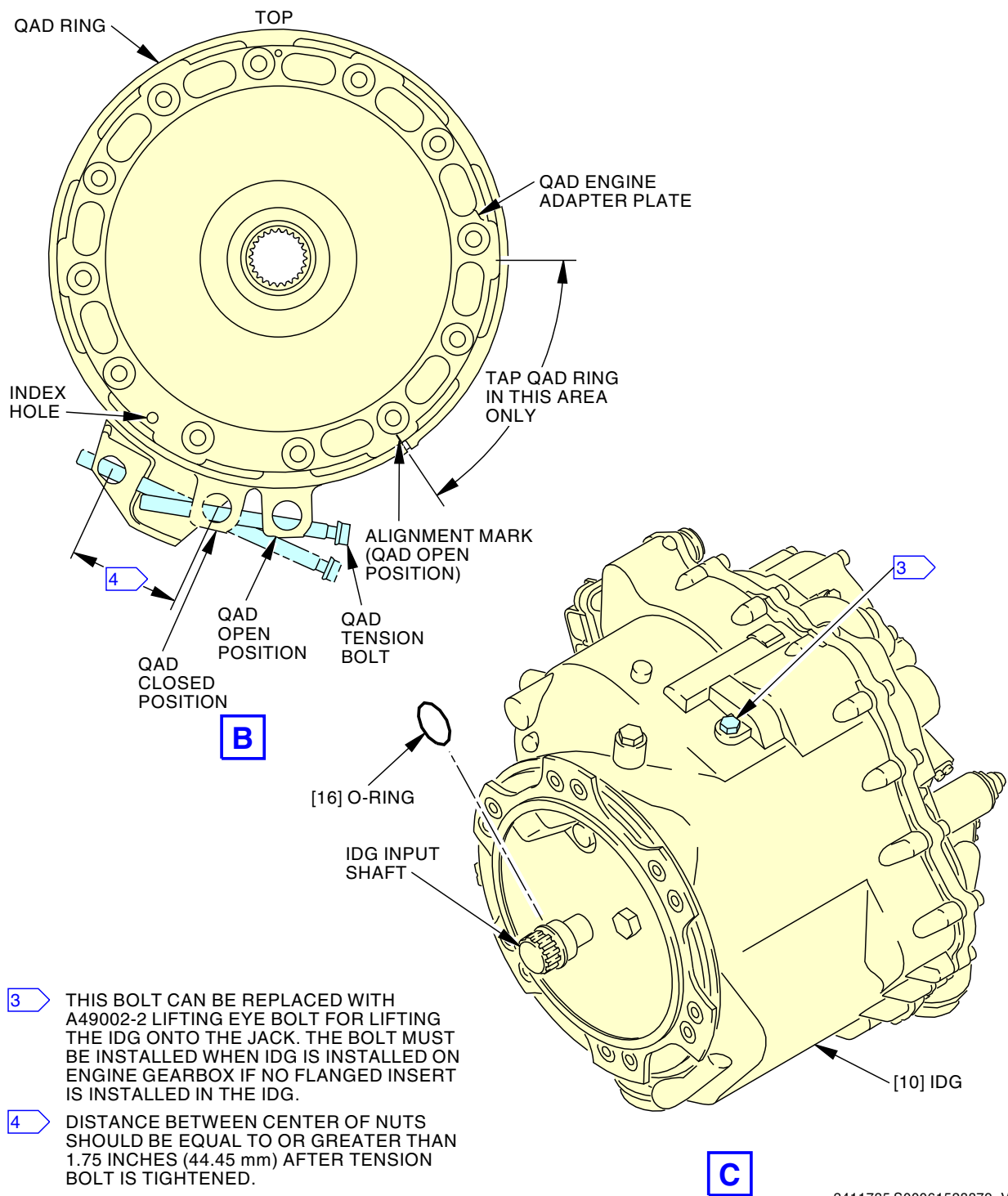
Integrated Drive Generator (IDG) Installation
Figure 401/24-11-11-990-801 (Sheet 3 of 4)

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Integrated Drive Generator (IDG) Installation
Figure 401/24-11-11-990-801 (Sheet 4 of 4)

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TASK 24-11-11-400-801

3. Integrated Drive Generator (IDG) Installation

(Figure 401)

A. General

- (1) The Integrated Drive Generator (IDG) is found on the accessory gearbox on the left side of the engine fan case.

B. References

Reference	Title
12-13-21-600-801	IDG Servicing (Oil Fill) (P/B 301)
24-11-00-700-803	Number 1 IDG Operational Test (P/B 501)
24-11-00-700-804	Number 2 IDG Operational Test (P/B 501)
24-11-61 P/B 401	QUICK ATTACH/DETACH (QAD) ADAPTER - REMOVAL/INSTALLATION
70-00-01-910-803-G00	Electrical Connector Disconnection and Connection (P/B 201)
70-41-00-400-801-G00	Lockwire Installation (P/B 201)
71-00-00-800-804-G00	Power Plant Test Reference Table (P/B 501)
71-11-04-410-801-G00	Close the Fan Cowl Panels (Selection) (P/B 201)

C. Tools/Equipment

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

Reference	Description
COM-1443	Jack - Hydraulic, General Low Profile, Capacity: 2000 lbs, Lift: 10 to 44 Inches, or Equivalent Jack Capable of Lifting 300 lbs. Part #: HW93718 Supplier: 28047 Opt Part #: W93718 Supplier: 36251
SPL-1626	Eye - Lifting, Generator Part #: A49002-2 Supplier: 81205
SPL-1634	Jack Adapter - VSCF and IDG Part #: C24002-77 Supplier: 81205 Part #: C24002-78 Supplier: 81205
SPL-20425	Blanking Plates - IDG, LEAP-1B Engine Series Part #: 956A8985G01 Supplier: 07482

D. Consumable Materials

Reference	Description	Specification
A50096	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63 Type II
B00074	Solvent - Degreasing	MIL-PRF-680 (Supersedes P-D-680)
B00083	Solvent - VM&P Naphthas	TT-N-95 Type II, ASTM D-3735 Type III
B01041 [C04-208]	Solvent - Degreaser - Turco 5948 DPM	
B50200 [C04-152]	Cleaner - Turco 5948-R Mild Alkaline	
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT	

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Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3
D50369	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class HTS (High Thermal Stability)
G01912	Lockwire - MS20995NC32, Monel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
10	IDG	24-11-11-02-015	SIA ALL
16	O-ring	24-11-11-05-035	SIA ALL

F. Location Zones

Zone	Area
410	Subzone - Engine 1
411	Engine 1 - Engine
420	Subzone - Engine 2
421	Engine 2 - Engine

G. Prepare for the IDG Installation

SUBTASK 24-11-11-860-002

- (1) Make sure that these circuit breakers are open and have safety tags:

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
F	10	C01283	GENERATOR CONT UNIT 1
F	11	C01284	GENERATOR CONT UNIT 2

NOTE: No corrective action is necessary if these maintenance messages show: AUX BAT CHGR INOP or BAT CHGR INOP. These maintenance messages are nuisance faults that will show when only battery power is supplied to the airplane.

SUBTASK 24-11-11-840-001

- (2) Do these steps to prepare the IDG [10] for the installation:

- (a) If installed, remove the blanking plate, SPL-20425, or other protective coverings from the gearbox mount pad.
- 1) If alternate materials were used, remove any remaining residue.
- a) Use Turco 5948-R cleaner, B50200 [C04-152], or Turco 5948 DPM solvent, B01041 [C04-208], to clean the remaining tape residue.
- (b) Examine the IDG [10], QAD ring, and input seal for signs of damage or unwanted material.
- 1) Nicks and dents on the outer edge of the QAD ring are permitted to a maximum of 0.030 in. (0.762 mm) in depth.

NOTE: Operators can refer to the CMM for additional inspection and repair instructions.

- (c) Clean all grease from the IDG input shaft with solvent, B00074.

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- (d) Apply a thin layer of oil, D00068, or oil, D00071, or oil, D50369, to the lugs of the QAD ring and threads of the QAD tension bolt.



USE ONLY M83485 O-RING WHEN USING HIGH THERMAL STABILITY (HTS) OIL CONFORMING TO MILSPEC-23699 IN THE ENGINE (EXAMPLE: BP/EASTMAN TURBO OIL 2197, AEROSHELL TURBINE OIL 560, MOBIL JET OIL 254). USE OF OTHER O-RING STANDARDS (EXAMPLE: M83248 OR AS3209) WITH HTS OIL WILL RESULT IN REDUCED O-RING LIFE, ENGINE OIL LEAKAGE, AND POTENTIAL ENGINE SHUTDOWN.

- (e) Lubricate a new O-ring [16] with oil, D00068, or oil, D00071, or oil, D50369.
- (f) Install the O-ring [16] on the input shaft of the IDG [10].

H. IDG Installation

SUBTASK 24-11-11-420-001

- (1) Do these steps to install the IDG [10]:
 - (a) Make sure that the VSCF and IDG jack adapter, SPL-1634, is installed on the low profile hydraulic jack, COM-1443.
 - (b) Install the generator lifting eye, SPL-1626, on the IDG [10] to facilitate hoist or crane usage.
 - (c) Put the IDG [10] on the jack.
 - (d) Remove the generator lifting eye, SPL-1626, from the IDG [10] and install a bolt on the IDG [10].
 - (e) If not already done, turn the QAD tension bolt to put the QAD ring in the open position.
 - 1) Make sure that the mark on the QAD ring aligns with the mark on the QAD engine adapter plate.

NOTE: The mark on the QAD ring is inside the gearbox pad and is found on the adapter plate.



DO NOT LET THE IDG HANG ON THE INPUT SHAFT DURING THE INSTALLATION. FAILURE TO GIVE SUFFICIENT SUPPORT TO THE IDG CAN CAUSE DAMAGE TO THE INPUT SHAFT AND CARBON SEALS.

- (f) Align the IDG [10] with the gearbox mount pad.
- (g) Adjust the IDG [10] until the lugs on the IDG input flange engage with the QAD ring openings.
 - 1) Make sure that the index pin on the IDG [10] aligns with the index hole on the QAD engine adapter plate.
 - 2) Make sure that the clearance between the IDG [10] and QAD ring is equivalent for all points around the IDG [10].
- (h) Tighten the QAD tension bolt so that the QAD ring lugs fully engage the input flange lugs on the IDG [10].
 - 1) Make sure that the QAD ring moves smoothly and does not bind or snag.
- (i) Tighten the QAD tension bolt:
 - 1) Tighten the QAD tension bolt to 252 ±8 in-lb (28.5 ±0.9 N·m).



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- 2) Tap the QAD in the specific area with a soft mallet or brass drift to prevent an incorrect torque value (View B, Figure 401).
- 3) Do a check of the torque value of the QAD tension bolt and if the torque is less than 180 in-lb (20 N·m), do these steps:
 - a) Tighten the QAD tension bolt to 252 ±8 in-lb (28.5 ±0.9 N·m).
 - b) Repeat tapping and torquing to 252 ±8 in-lb (28.5 ±0.9 N·m) until the torque of the QAD tension bolt does not drop below 180 in-lb (20 N·m) after tapping on the QAD.
 - c) Tighten the QAD tension bolt to 252 ±8 in-lb (28.5 ±0.9 N·m).
- 4) If the first check of the torque of the QAD tension bolt is above 180 in-lb (20 N·m), do these steps:
 - a) Tap on the QAD ring and do a check of the torque again.
 - b) If the second check of the torque is above 180 in-lb (20 N·m), tighten the QAD tension bolt to 252 ±8 in-lb (28.5 ±0.9 N·m).

SUBTASK 24-11-11-220-001

- (2) Measure the distance between the center of the nuts on the QAD tension bolt.
 - (a) If the distance is less than 1.75 in. (4.44 cm), replace the QAD (PAGEBLOCK 24-11-61/401).

SUBTASK 24-11-11-910-002

- (3) Install a 0.032 in. (0.813 mm) diameter MS20995NC32 lockwire, G01912, on the QAD tension bolt (TASK 70-41-00-400-801-G00).

SUBTASK 24-11-11-080-001

- (4) Lower the jack with the attached adapter and remove it from the engine.

SUBTASK 24-11-11-420-002

- (5) Connect the power feeder leads [5] to the IDG [10].
 - (a) Remove the screws [8] that attach the cover [7] to the IDG [10].
 - (b) Remove the nuts [9].



CAUTION

DO NOT INSTALL ANY WASHERS UNDER THE POWER FEEDER LEADS. LOCALIZED RESISTANCE HEATING CAN OCCUR WHICH COULD CAUSE THE TERMINAL BLOCK TO BURN.

- (c) Install the power feeder leads [5] on the power feeder terminals.
 - 1) Make sure that the power feeder leads [5] are on the correct terminal.
- (d) Install the 12-point nuts [9] or 6-point Spiralock nuts (recommended) and tighten to 156 ±12 in-lb (18 ±2 N·m).

NOTE: For the 6-point Spiralock nut, the nut should have no resistance while it spins down the terminal stud. If resistance is felt, do a check for galling on the stud. If galling is found, the terminal block should be replaced.

- 1) Shake the power feeder leads [5] in the vertical direction near the IDG [10] to make sure that they are secure.

NOTE: The power feeder leads that are not secure can become loose during high vibrations.

- a) If the power feeder leads [5] are not secure, loosen the nuts [9], re-position the power feeder leads [5], and re-tighten to 156 ±12 in-lb (18 ±2 N·m).

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- (e) Attach the cover [7] to the IDG [10] with the screws [8].
- 1) Make sure that the cover is correctly aligned with the power feeder leads [5].
 - 2) Make sure that the cover orientation is correct.
 - a) Make sure that the terminal plug and cover [7] do not touch.
 - b) Make sure that the cover [7] is installed correctly.

NOTE: The cover can accidentally be installed incorrectly by 180 degrees.
 - 3) Tighten the screws [8] to 21 ± 1 in-lb (2 ± 0 N·m).
- (f) Attach the bracket assembly or fanning strip, and ground wires to the IDG [10] (View A-A or B-B, Figure 401).
- NOTE: The bracket assembly or fanning strip are attached to the power feeder leads.
- 1) Clean the mating surfaces of the IDG boss, bracket assembly or fanning strip, and ground terminals with solvent, B00083.
 - 2) Apply sealant, A50096, to the mating surfaces of the IDG boss, bracket assembly or fanning strip, and ground terminals.
 - 3) Apply a light coating of Never-Seez NSBT compound, D00006, to the threads of the screws [6].
 - 4) Position the bracket assembly or fanning strip and the ground terminals on the IDG boss surfaces and install the screws [6].
 - a) If it is necessary to adjust the position of the fanning strip, loosen the fanning strip bolt.

<1> If it was loosened, tighten the fanning strip bolt to 17 ± 1 in-lb (1.9 ± 0.1 N·m).
 - 5) Tighten the screws [6] to 50.5 ± 2.5 in-lb (6 ± 1 N·m).

SUBTASK 24-11-11-420-003



USE TWO WRENCHES WHEN YOU LOOSEN OR TIGHTEN THE CONNECTION. ONE WRENCH WILL HOLD ONE SIDE OF THE CONNECTION IN ITS POSITION. ONE WRENCH WILL TURN THE OTHER SIDE OF THE CONNECTION. IF YOU DO NOT OBEY THIS TWO-WRENCH PROCEDURE, YOU CAN CAUSE DAMAGE TO THE CONNECTION COMPONENTS.

- (6) Install the oil-in line [14] and oil-out line [1]:
- (a) Remove the protective covers from the oil-in line [14] and oil-out line [1].
 - (b) Connect the oil-in line [14] to the oil-in union.
 - (c) Connect the oil-out line [1] to the oil-out union.
 - (d) Tighten the oil-in line [14] to 700 ± 35 in-lb (79 ± 4 N·m).
 - (e) Tighten the oil-out line [1] to 500 ± 25 in-lb (56 ± 3 N·m).

SUBTASK 24-11-11-420-005

- (7) Connect the electrical connector [4], DP101, and electrical connector [13], DP103, to the IDG [10].

NOTE: For the specific steps to connect, clean and remove protection to the electrical connectors, refer to Electrical Connector Disconnection and Connection, TASK 70-00-01-910-803-G00.

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SUBTASK 24-11-11-610-002

- (8) Do this task: IDG Servicing (Oil Fill), TASK 12-13-21-600-801.

SUBTASK 24-11-11-860-003

- (9) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	10	C01283	GENERATOR CONT UNIT 1
F	11	C01284	GENERATOR CONT UNIT 2

I. IDG Installation Test

SUBTASK 24-11-11-790-001

- (1) Do the test listed in the Power Plant Test Reference Table, TASK 71-00-00-800-804-G00.

SUBTASK 24-11-11-710-001

- (2) If the Number 1 IDG was replaced, do this task: Number 1 IDG Operational Test, TASK 24-11-00-700-803.

SUBTASK 24-11-11-710-002

- (3) If the Number 2 IDG was replaced, do this task: Number 2 IDG Operational Test, TASK 24-11-00-700-804.

J. Put the Airplane Back to Its Usual Condition

SUBTASK 24-11-11-860-004

- (1) Do this task: Close the Fan Cowl Panels (Selection), TASK 71-11-04-410-801-G00.

———— **END OF TASK** ————

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INTEGRATED DRIVE GENERATOR (IDG) - INSPECTION/CHECK

1. **General**

A. This task:

- (1) The IDG Disconnect and Reset Check

TASK 24-11-11-700-801

2. **Integrated Drive Generator Disconnect and Reset - Check**

(Figure 601)

A. **General**

- (1) The IDG is found on the accessory gearbox on the left side of the engine fan case.
- (2) A disconnected IDG that remains mounted to an engine for about 50 flight hours can receive damage to the ball bearing assembly for the IDG input shaft.

B. **References**

Reference	Title
12-13-21-200-801	IDG Oil Level Check (P/B 301)
71-11-04-010-801-G00	Open the Fan Cowl Panels (Selection) (P/B 201)
71-11-04-410-801-G00	Close the Fan Cowl Panels (Selection) (P/B 201)

C. **Location Zones**

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
410	Subzone - Engine 1
411	Engine 1 - Engine
420	Subzone - Engine 2
421	Engine 2 - Engine

D. **Prepare for the Check**

SUBTASK 24-11-11-210-002

- (1) Do this task: Open the Fan Cowl Panels (Selection), TASK 71-11-04-010-801-G00.

SUBTASK 24-11-11-210-001

- (2) Do this task: IDG Oil Level Check, TASK 12-13-21-200-801.

E. **Integrated Drive Generator Disconnect and Reset Check**

SUBTASK 24-11-11-710-003

- (1) Do the check as follows:
 - (a) Push the BAT switch on the P5 panel to the ON position.
 - (b) Make sure that the applicable DRIVE light on the P5 panel is on.

SUBTASK 24-11-11-710-004

- (2) Do a check of the IDG disconnect inhibit function as follows:

NOTE: The IDG disconnect function is inhibited when the engine is below idle speed.

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CAUTION

DO NOT ACTUATE THE DISCONNECT SWITCH FOR MORE THAN 3 SECONDS. ALLOW A MINIMUM OF 60 SECONDS BETWEEN ACTUATION PERIODS. FAILURE TO FOLLOW THIS PROCEDURE CAN CAUSE DAMAGE TO IDG.

- (a) Push the applicable DISCONNECT switch on the P5 panel to the DISCONNECT position.

NOTE: Put a person near the IDG listening for no click and feeling for no movement while lightly holding the IDG Disconnect Reset Ring. There should be no click and no movement at IDG when the applicable DISCONNECT switch is pushed.

- (b) Make sure the DRIVE light on the P5 panel stays on.
- (c) Slowly pull the IDG Disconnect Reset Ring to the outward travel limit. Make a note of the amount of hand force necessary.
- (d) Make sure that the force necessary to pull the ring is light.
- (e) Make sure that no click is felt when pulling the IDG Disconnect Reset Ring.

SUBTASK 24-11-11-710-005

- (3) Do a check of the IDG disconnect function as follows:

- (a) Simulate an engine run as follows:

NOTE: The IDG disconnect function is inhibited when the engine is below idle speed.

- 1) Open these circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
B	1	C01316	ENGINE 1 START LEVER CHAN A

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C01318	ENGINE 2 START LEVER CHAN A
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C00360	FUEL SPAR VALVE ENG 2
B	4	C00359	FUEL SPAR VALVE ENG 1
B	5	C00540	FUEL SPAR VALVE IND
E	3	C01321	ENGINE FUEL ENGINE 2 HPSOV CONT
E	4	C01396	ENGINE FUEL ENGINE 2 HPSOV IND
E	5	C01320	ENGINE FUEL ENGINE 1 HPSOV CONT
E	6	C01395	ENGINE FUEL ENGINE 1 HPSOV IND

- 2) Make sure that these circuit breakers are closed:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	2	C01317	ENGINE 1 START LEVER CHAN B

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F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	7	C01319	ENGINE 2 START LEVER CHAN B

- 3) Push the applicable ENGINE START LEVER to the IDLE position.



CAUTION

DO NOT ACTUATE THE DISCONNECT SWITCH FOR MORE THAN 3 SECONDS. ALLOW A MINIMUM OF 60 SECONDS BETWEEN ACTUATION PERIODS. FAILURE TO FOLLOW THIS PROCEDURE CAN CAUSE DAMAGE TO IDG.

- (b) Push the DISCONNECT switch on the P5 panel to the DISCONNECT position.

NOTE: Put a person near the IDG listening for a click and feeling for a movement while lightly holding the IDG Disconnect Reset Ring. There should be a click and movement should be felt when the applicable DISCONNECT switch is pushed.

- (c) Make sure the DRIVE light on the P5 panel stays on.
(d) Push the BAT switch on the P5 panel to the OFF position.
(e) Put the ENGINE START LEVER in the CUTOFF position.
(f) Close these circuit breakers:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	1	C00458	ENGINE 1 IGNITION RIGHT
A	3	C00153	ENGINE 1 IGNITION LEFT
B	1	C01316	ENGINE 1 START LEVER CHAN A

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	6	C01318	ENGINE 2 START LEVER CHAN A
D	4	C00459	ENGINE 2 IGNITION RIGHT
D	6	C00151	ENGINE 2 IGNITION LEFT

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	3	C00360	FUEL SPAR VALVE ENG 2
B	4	C00359	FUEL SPAR VALVE ENG 1
B	5	C00540	FUEL SPAR VALVE IND
E	3	C01321	ENGINE FUEL ENGINE 2 HPSOV CONT
E	4	C01396	ENGINE FUEL ENGINE 2 HPSOV IND
E	5	C01320	ENGINE FUEL ENGINE 1 HPSOV CONT
E	6	C01395	ENGINE FUEL ENGINE 1 HPSOV IND

SUBTASK 24-11-11-710-006



CAUTION

THE IDG INPUT SHAFT MUST BE RECONNECTED PRIOR TO ENGINE START. WHEN THE IDG IS DISCONNECTED WITH THE ENGINE SHUT DOWN OR BELOW IDLE SPEED, THERE WILL NOT BE COMPLETE SEPARATION OF THE IDG DOG TEETH. IF YOU DO NOT RECONNECT THE IDG PRIOR TO ENGINE START DAMAGE TO THE IDG CAN OCCUR.

- (4) Reconnect the IDG drive shaft as follows:

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- (a) Slowly pull the IDG Disconnect Reset Ring to the outward travel limit.
 - 1) Make a note of the amount of hand force necessary.
- (b) Make sure that a click is felt in the Disconnect Reset Ring as it gets near the outward limit of travel.

NOTE: Operation of the Reset Ring should be smooth with moderate force necessary and no indication of binding.
- (c) Allow the Disconnect Reset Ring to slowly return to the maximum inward position.

NOTE: Operation of the Reset Ring should be smooth with moderate force required and no indication of binding.
- (d) Slowly pull the IDG Disconnect Reset Ring to the outward travel limit.
 - 1) Make a note of the amount of hand force necessary.
- (e) Make sure that the amount of hand force necessary is less than the amount used in the previous step.
- (f) Make sure that there is no click during the second pull of the Disconnect Reset Ring.
 - 1) If the hand force does not decrease, or a click is produced during the second pull of the Disconnect Reset Ring, replace the IDG.
- (g) Allow the Disconnect Reset Ring to slowly return to the maximum inward position.

SUBTASK 24-11-11-700-001

- (5) Do a test of the GCU as follows:
 - (a) Make sure the STANDBY POWER switch on the P5-5 panel is set to the AUTO position.
 - (b) Set the BAT switch on the P5-13 panel to the ON position.
 - (c) Push the GCU TEST switch on the GCU for at least one second.
 - (d) Make sure all seven of the indicator lights on the GCU come on for approximately three seconds.
 - (e) Make sure all seven of the indicator lights on the GCU go off for approximately three seconds.
 - (f) Make sure the green GCU PASS light on the GCU comes on for approximately seven seconds.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 24-11-11-410-001

- (1) Do this task: Close the Fan Cowl Panels (Selection), TASK 71-11-04-410-801-G00.

————— **END OF TASK** —————

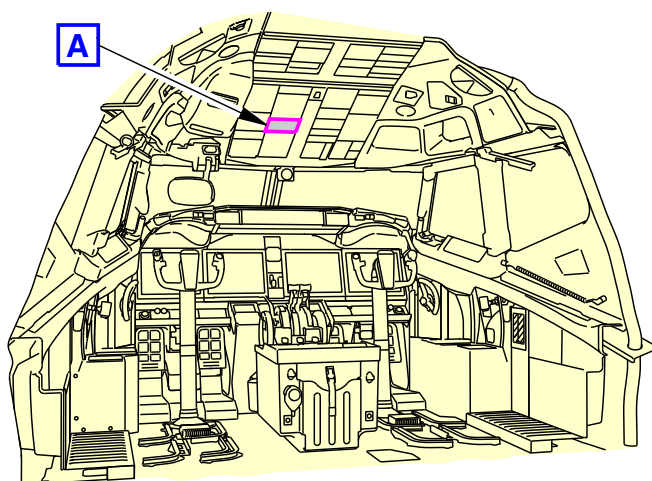
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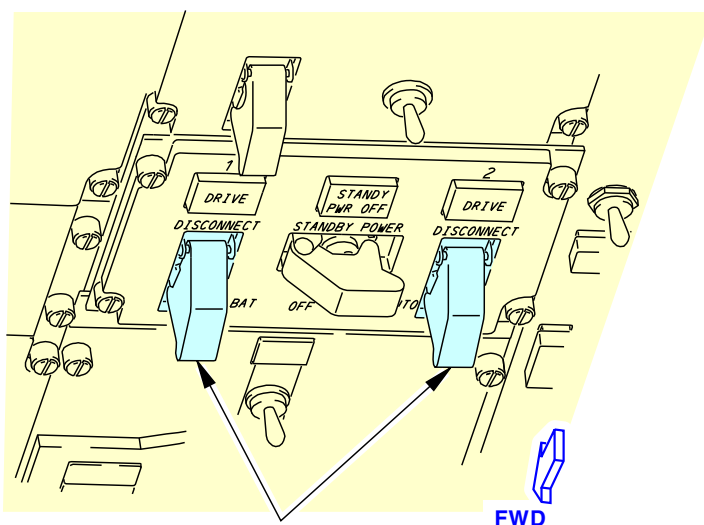
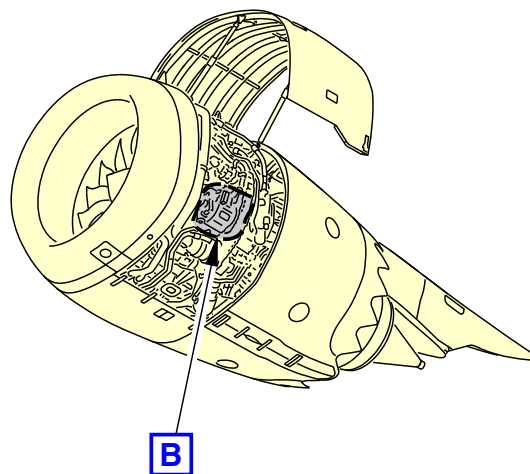
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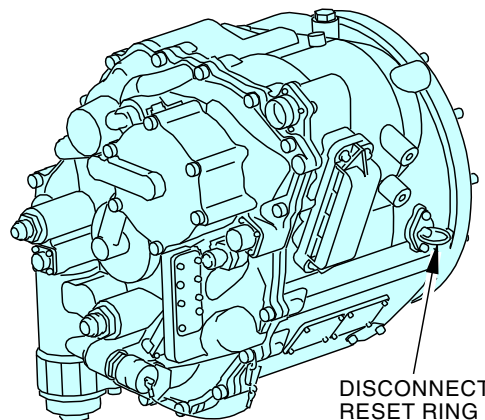
FLIGHT COMPARTMENT



**GENERATOR DRIVE
DISCONNECT SWITCHES**

**GENERATOR DRIVE AND
STANDBY POWER MODULE (P5-5)**

A



**INTEGRATED DRIVE
GENERATOR**

B

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**IDG Disconnect Drive System
Figure 601/24-11-11-990-802**

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INTEGRATED DRIVE GENERATOR AIR/OIL HEAT EXCHANGER - REMOVAL/INSTALLATION

1. **General**

A. This procedure has these tasks:

- (1) Integrated Drive Generator Air/Oil Heat Exchanger (Left) Removal
- (2) Integrated Drive Generator Air/Oil Heat Exchanger (Left) Installation
- (3) Integrated Drive Generator Air/Oil Heat Exchanger (Right) Removal
- (4) Integrated Drive Generator Air/Oil Heat Exchanger (Right) Installation.

TASK 24-11-13-000-801

2. **Integrated Drive Generator Air/Oil Heat Exchanger (Left) Removal**

(Figure 401)

A. General

- (1) This task gives the instructions to remove the Integrated Drive Generator (IDG) air/oil heat exchanger (left).

B. References

Reference	Title
12-13-21-600-802	IDG Oil Change (P/B 301)
71-11-04-010-801-G00	Open the Fan Cowl Panels (Selection) (P/B 201)
78-31-00-010-801-G00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-801-G00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

C. Tools/Equipment

Reference	Description
STD-203	Container - Oil Resistant, 1 U.S.-Gal (3.8 l)
STD-858	Tag - DO NOT OPERATE

D. Location Zones

Zone	Area
410	Subzone - Engine 1
420	Subzone - Engine 2

E. Access Panels

Number	Name/Location
413	Left Fan Cowl, Engine 1
415	Left Thrust Reverser, Engine 1
423	Left Fan Cowl, Engine 2
425	Left Thrust Reverser, Engine 2

F. Prepare for the Removal

SUBTASK 24-11-13-860-001

- (1) Do these steps to make sure that the ENGINE START switch and the START LEVER switch are not operated:
 - (a) Make sure that the applicable ENGINE START switch, on the P5 overhead panel, is in the AUTO or OFF position.
 - 1) Put a DO NOT OPERATE tag, STD-858, on the applicable ENGINE START switch.

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- (b) Make sure that the applicable START LEVER switch, on the P10 control stand, is in the CUTOFF position.
- 1) Put a DO NOT OPERATE tag, STD-858, on the applicable START LEVER switch.

SUBTASK 24-11-13-860-003

- (2) Do these tasks in sequence to safely open the left thrust reverser on the applicable engine:



WARNING

DO THE DEACTIVATION PROCEDURE FOR THE THRUST REVERSER TO PREVENT THE OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (a) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-801-G00.
- (b) Open the applicable left fan cowl panel (TASK 71-11-04-010-801-G00).
- 1) Open these access panels:

<u>Number</u>	<u>Name/Location</u>
413	Left Fan Cowl, Engine 1
423	Left Fan Cowl, Engine 2



WARNING

OBEY THE INSTRUCTIONS IN THE PROCEDURE TO OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (c) Open the applicable left thrust reverser (TASK 78-31-00-010-801-G00).
- 1) Open these access panels:

<u>Number</u>	<u>Name/Location</u>
415	Left Thrust Reverser, Engine 1
425	Left Thrust Reverser, Engine 2

SUBTASK 24-11-13-680-003

- (3) Drain the IDG oil, do the applicable steps in this task: IDG Oil Change, TASK 12-13-21-600-802.

G. Integrated Drive Generator Air/Oil Heat Exchanger (Left) Removal

SUBTASK 24-11-13-010-001



WARNING

BE CAREFUL WHEN YOU DO WORK ON THE ENGINE PARTS AFTER THE ENGINE IS STOPPED. THE ENGINE PARTS CAN STAY HOT FOR ALMOST ONE HOUR. DO NOT TOUCH HOT PARTS WITHOUT APPLICABLE GLOVES. HOT PARTS CAN CAUSE INJURIES TO PERSONNEL.



WARNING

DO NOT OPEN THE OIL SYSTEM UNTIL THE PRESSURE GOES TO ZERO. THE PRESSURE GOES TO ZERO APPROXIMATELY 5 MINUTES AFTER AN ENGINE STOPS. A PRESSURIZED OIL SYSTEM CAN RELEASE A SPRAY OF HOT OIL THAT CAN BURN YOU.



WARNING

DO NOT LET HOT OIL GET ON YOU. PUT ON CLOTHES, GOGGLES, AND OTHER EQUIPMENT FOR PROTECTION, OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.

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(WARNING PRECEDES)



WARNING

DO NOT LET THE OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.



CAUTION

DO NOT LET OIL GET ON THE ENGINE OR OTHER COMPONENTS. IMMEDIATELY CLEAN THE OIL WHEN IT FALLS ON THEM. OIL CAN CAUSE DAMAGE TO EQUIPMENT.

- (1) Remove the IDG air/oil heat exchanger (left) [1] as follows:
 - (a) Disconnect the oil tube [2] from the IDG air/oil heat exchanger (left) [1] as follows:
 - 1) Loosen the coupling nut [3] that attaches the oil tube [2] to the IDG air/oil heat exchanger (left) [1].
 - 2) Disconnect the oil tube [2] from the IDG air/oil heat exchanger (left) [1].
 - (b) Disconnect the oil tube [4] from the IDG air/oil heat exchanger (left) [1] as follows:
 - 1) Loosen the coupling nut [5] that attaches the oil tube [4] to the IDG air/oil heat exchanger (left) [1].
 - 2) Disconnect the oil tube [4] from the IDG air/oil heat exchanger (left) [1].
 - (c) Remove the two bolts [6] with spacers that attach the IDG air/oil heat exchanger (left) [1] to the fan frame.

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- (d) Remove the six bolts [8] with plate that attach the IDG air/oil heat exchanger (left) [1] to the fan frame.

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- (e) Remove the six bolts [8] with integrated washers that attach the IDG air/oil heat exchanger (left) [1] to the fan frame.

SIA ALL

- (f) Remove the two screws [10] that attach the attachment clamp [11] to the bracket [14].
- (g) Remove the attachment clamp [11] that hold the IDG air/oil heat exchanger (left) [1].



WARNING

BE VERY CAREFUL WHEN YOU REMOVE THE IDG AIR/OIL HEAT-EXCHANGER. HOT OIL CAN FLOW FROM THE HEAT-EXCHANGER. HOT OIL CAN CAUSE INJURIES.

- (h) Remove the IDG air/oil heat exchanger (left) [1] from the engine.



WARNING

BE VERY CAREFUL WHEN YOU DRAIN THE IDG OIL. USE GOGGLES, INSULATED GLOVES, AND PROTECTION GEAR. HOT OIL CAN CAUSE INJURIES.

- (i) Drain the oil from the IDG air/oil heat exchanger (left) [1] into a 1 U.S.-gal (3.81 l) oil resistant container, STD-203.
- (j) Install the protective covers on the oil tube [2] port and oil tube [4] port on the IDG air/oil heat exchanger (left) [1].

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- (k) Install the protective caps on the oil tube [2] and oil tube [4].

———— **END OF TASK** ————

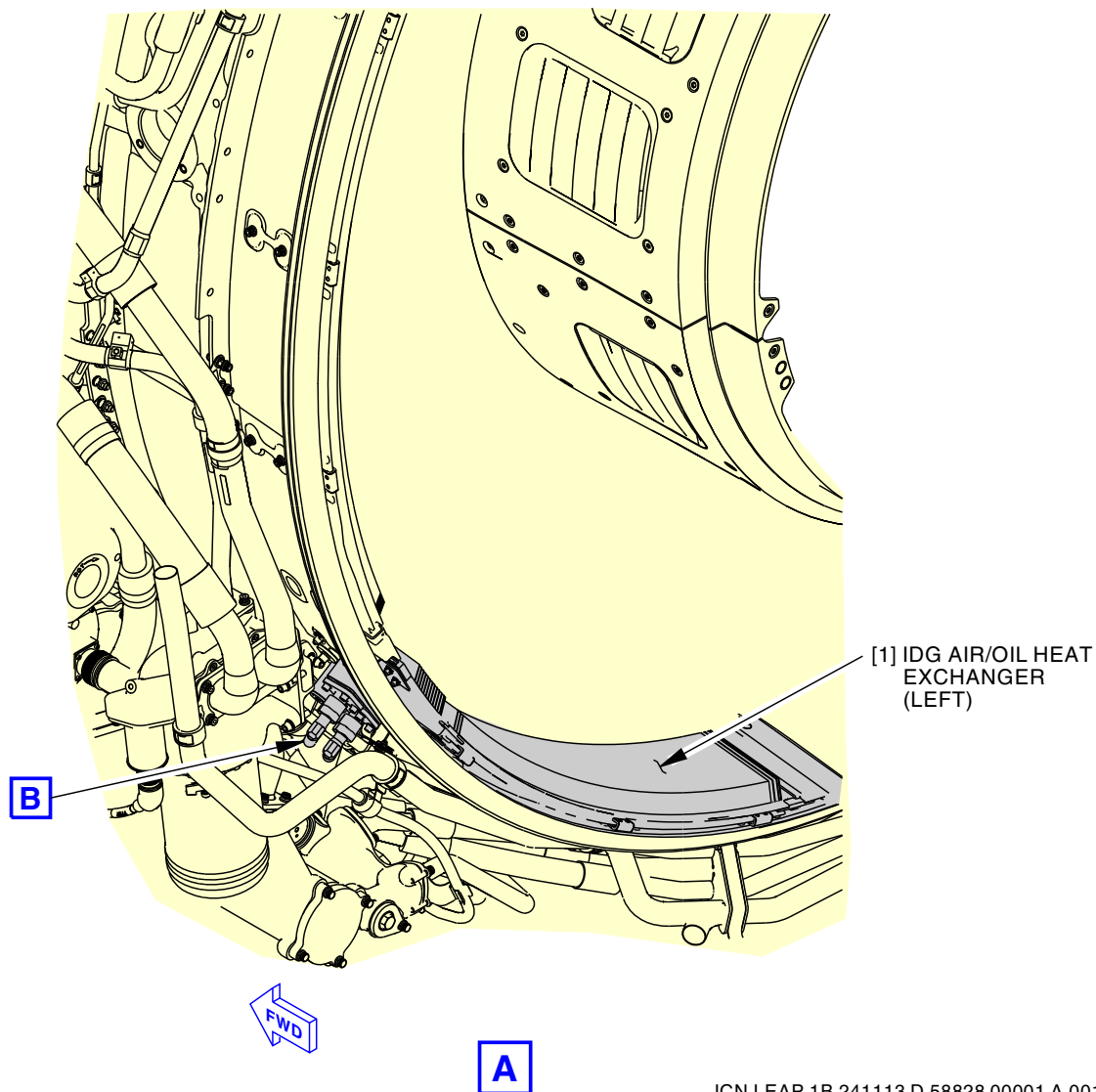
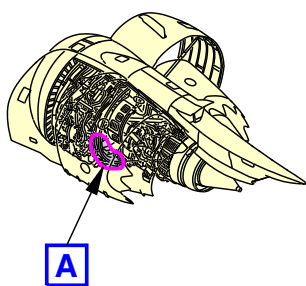
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ICN LEAP 1B 241113 D 58828 00001 A 001 01
2437875 S0000565732_V5

Integrated Drive Generator Air/Oil Heat Exchanger (Left) Installation
Figure 401/24-11-13-990-801 (Sheet 1 of 7)

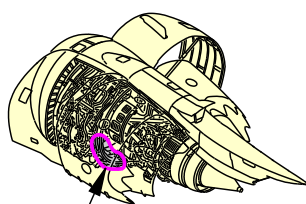
EFFECTIVITY
SIA ALL; PRE LEAP-1B SERVICE BULLETIN 72-0021

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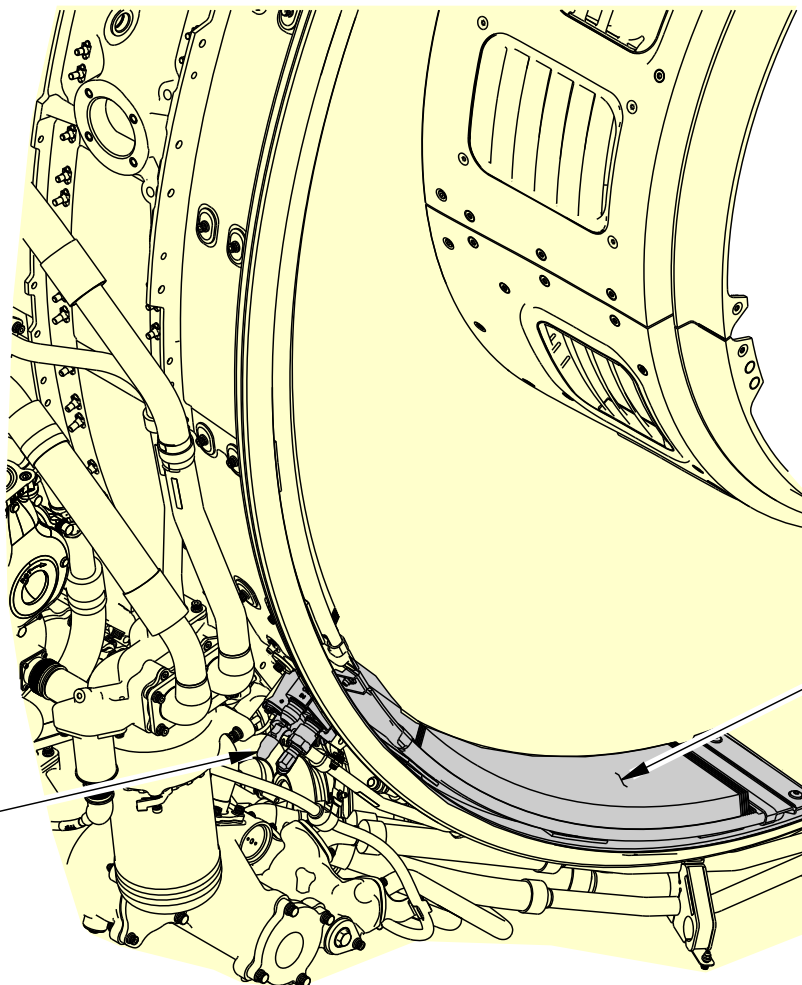
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A



[1] IDG AIR/OIL HEAT EXCHANGER (LEFT)



A

ICN LEAP 1B 241113 D 58828 00008 A 001 01
2824393 S0000653670_V3

Integrated Drive Generator Air/Oil Heat Exchanger (Left) Installation
Figure 401/24-11-13-990-801 (Sheet 2 of 7)

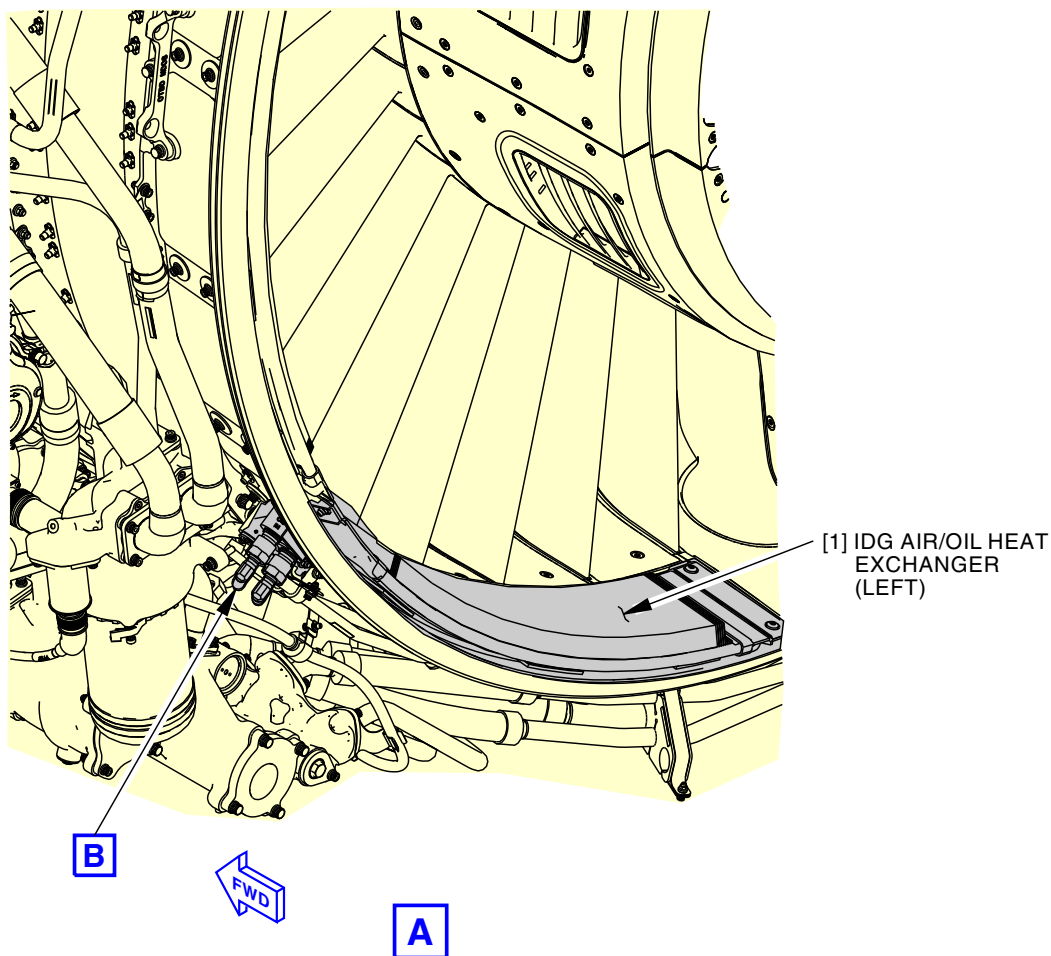
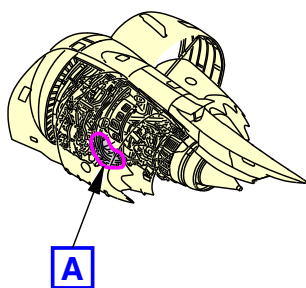
EFFECTIVITY
SIA ALL; POST LEAP-1B SERVICE BULLETIN
72-0021

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ICN LEAP 1B 241113 D 58828 00009 A 001 01
2840697 S0000662894_V2

Integrated Drive Generator Air/Oil Heat Exchanger (Left) Installation
Figure 401/24-11-13-990-801 (Sheet 3 of 7)

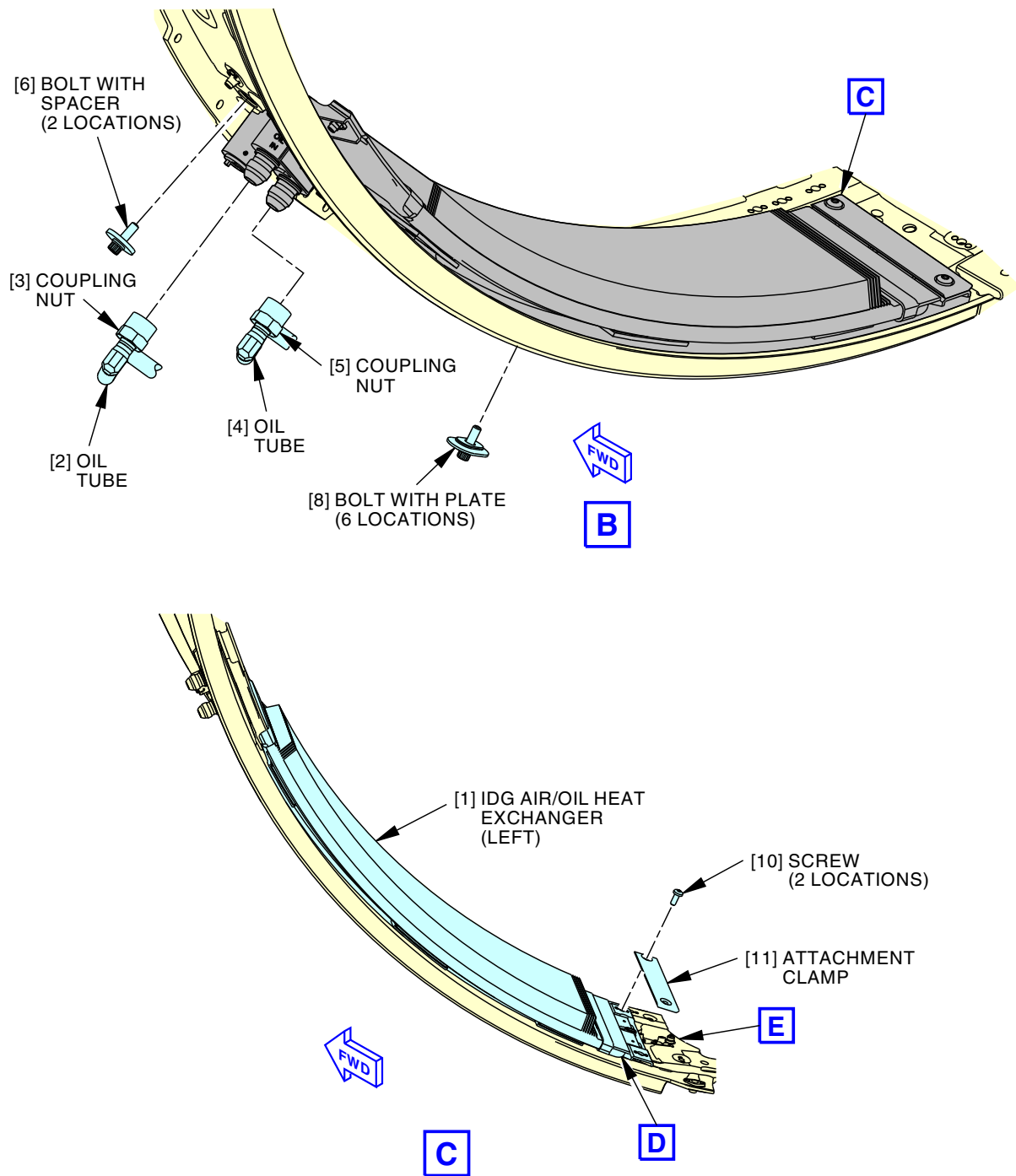
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SIA ALL; POST LEAP-1B SERVICE BULLETIN
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ICN LEAP 1B 241113 D 58828 00002 A 003 01
2437886 S0000565733_V6

Integrated Drive Generator Air/Oil Heat Exchanger (Left) Installation
Figure 401/24-11-13-990-801 (Sheet 4 of 7)

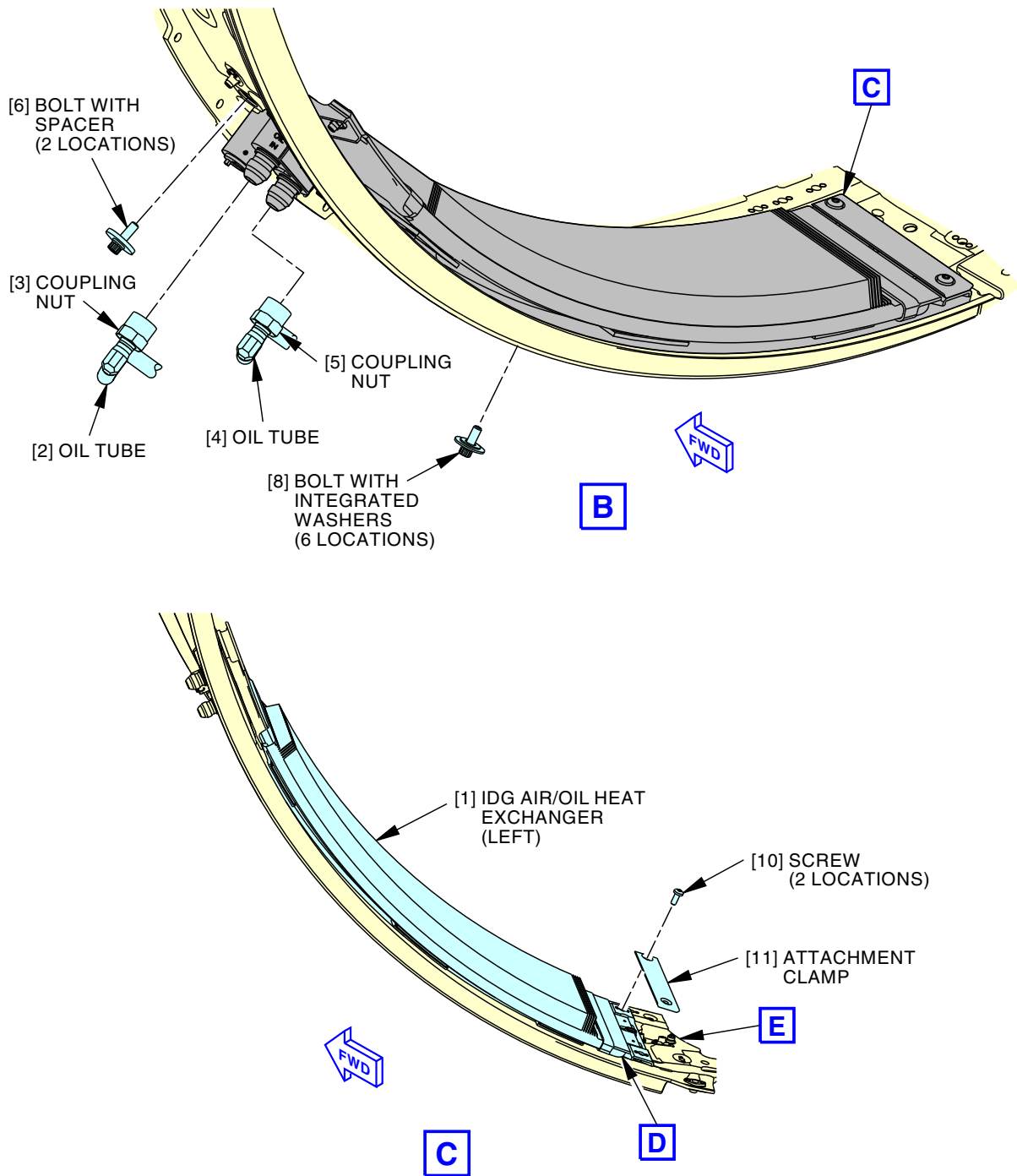
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ICN LEAP 1B 241113 D 58828 00010 A002 01
2840888 S0000662895_V2

Integrated Drive Generator Air/Oil Heat Exchanger (Left) Installation
Figure 401/24-11-13-990-801 (Sheet 5 of 7)

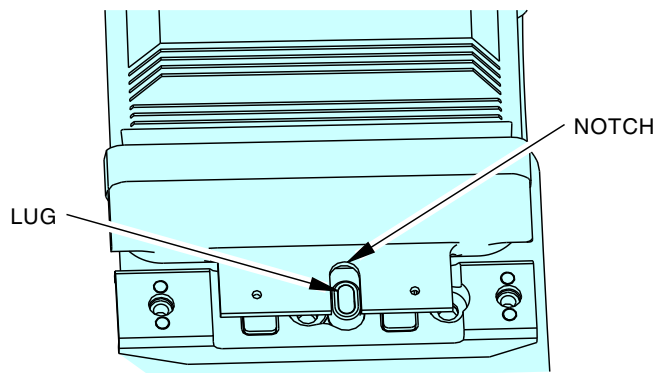
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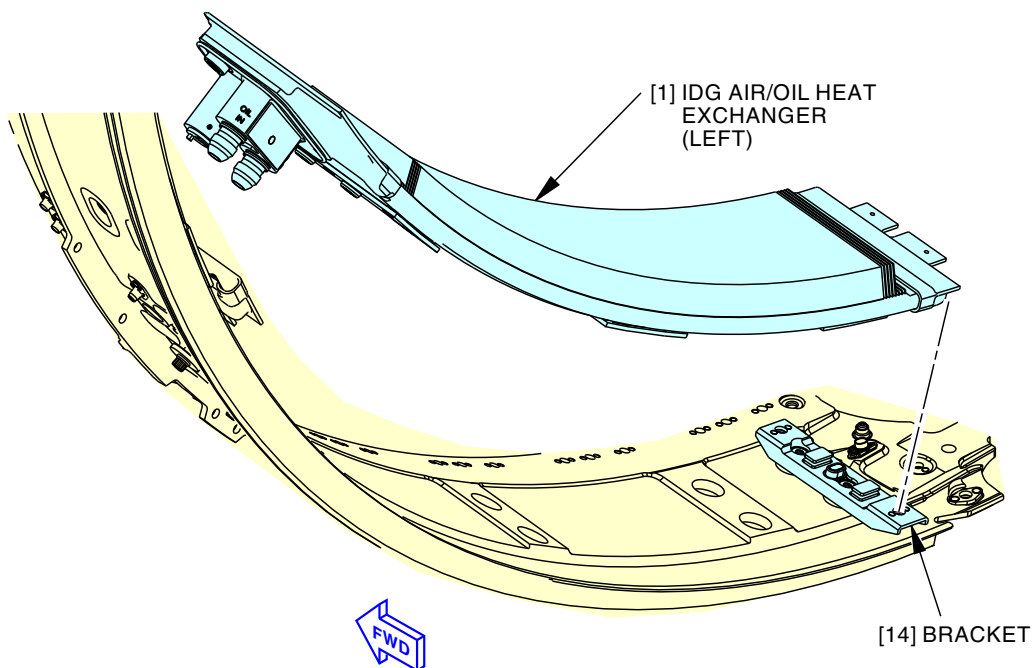
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D



E

ICN LEAP 1B 241113 D 58828 00005 A001 01
3012517 S0000786135_V1

Integrated Drive Generator Air/Oil Heat Exchanger (Left) Installation
Figure 401/24-11-13-990-801 (Sheet 6 of 7)

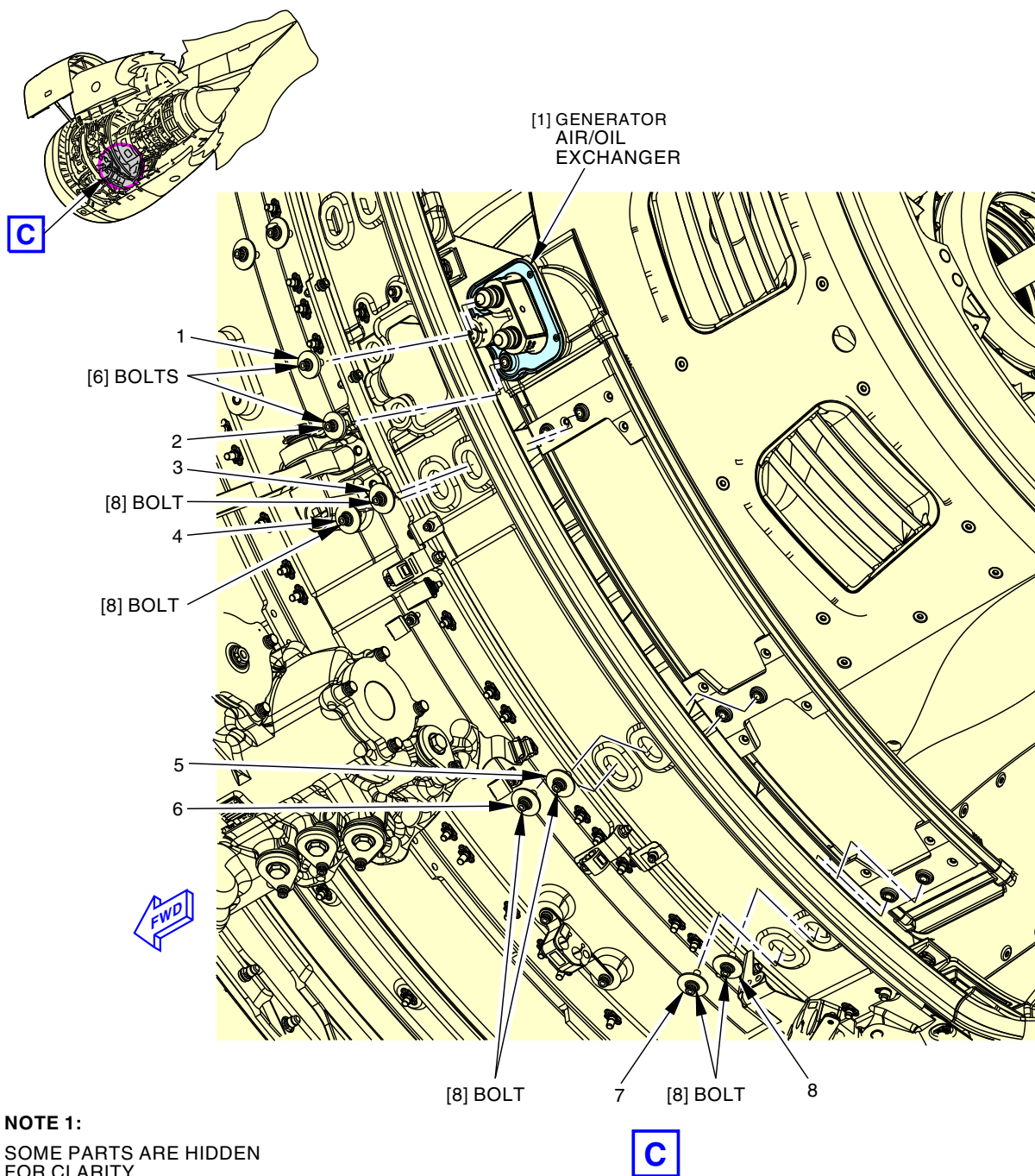
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NOTE 1:

SOME PARTS ARE HIDDEN
FOR CLARITY

NOTE 2:

NUMBERS FROM 1 TO 8 ARE THESE
OF THE TORQUING SEQUENCE

ICNLEAP1B241113D5882800014A00101

2946934 S0000723179_V1

Integrated Drive Generator Air/Oil Heat Exchanger (Left) Installation
Figure 401/24-11-13-990-801 (Sheet 7 of 7)

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TASK 24-11-13-400-801

3. Integrated Drive Generator Air/Oil Heat Exchanger (Left) Installation

(Figure 401)

A. General

- (1) This task gives the instructions to install the Integrated Drive Generator (IDG) air/oil heat exchanger (left).
- (2) You must do the tests that are listed in the power plant test reference table after you install the IDG air/oil heat exchanger (left).

B. References

Reference	Title
12-13-21-600-801	IDG Servicing (Oil Fill) (P/B 301)
71-00-00-800-804-G00	Power Plant Test Reference Table (P/B 501)
71-11-04-410-801-G00	Close the Fan Cowl Panels (Selection) (P/B 201)
78-31-00-010-802-G00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-801-G00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Consumable Materials

Reference	Description	Specification
D00599 [CP2442]	Oil - Engine	
D00601 [CP2101]	Vaseline - Graphite Mineral	

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	IDG air/oil heat exchanger (left)	72-00-00-05-133	SIA ALL

F. Location Zones

Zone	Area
410	Subzone - Engine 1
420	Subzone - Engine 2

G. Access Panels

Number	Name/Location
413	Left Fan Cowl, Engine 1
415	Left Thrust Reverser, Engine 1
423	Left Fan Cowl, Engine 2
425	Left Thrust Reverser, Engine 2

H. Integrated Drive Generator Air/Oil Heat Exchanger (Left) Installation

SUBTASK 24-11-13-410-001



WARNING

BE CAREFUL WHEN YOU DO WORK ON THE ENGINE PARTS AFTER THE ENGINE IS STOPPED. THE ENGINE PARTS CAN STAY HOT FOR ALMOST ONE HOUR. DO NOT TOUCH HOT PARTS WITHOUT APPLICABLE GLOVES. HOT PARTS CAN CAUSE INJURIES TO PERSONNEL.

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(WARNING PRECEDES)



WARNING

DO NOT OPEN THE OIL SYSTEM UNTIL THE PRESSURE GOES TO ZERO. THE PRESSURE GOES TO ZERO APPROXIMATELY 5 MINUTES AFTER AN ENGINE STOPS. A PRESSURIZED OIL SYSTEM CAN RELEASE A SPRAY OF HOT OIL THAT CAN BURN YOU.



WARNING

DO NOT LET HOT OIL GET ON YOU. PUT ON CLOTHES, GOGGLES, AND OTHER EQUIPMENT FOR PROTECTION, OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.



WARNING

DO NOT LET THE OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.



CAUTION

DO NOT LET OIL GET ON THE ENGINE OR OTHER COMPONENTS. IMMEDIATELY CLEAN THE OIL WHEN IT FALLS ON THEM. OIL CAN CAUSE DAMAGE TO EQUIPMENT.

- (1) Install the IDG air/oil heat exchanger (left) [1] as follows:
 - (a) Make sure that the mating faces are clean and clear of unwanted materials.
 - (b) Remove the protective caps from the oil tube [2] and oil tube [4].
 - (c) Remove the protective covers from the oil tube [2] port and oil tube [4] port on the IDG air/oil heat exchanger (left) [1].



CAUTION

MAKE SURE THAT THE LUG OF THE BRACKET CORRECTLY ALIGNS WITH THE NOTCH OF THE INTEGRATED DRIVE GENERATOR AIR/OIL HEAT EXCHANGER. IF YOU DO NOT OBEY THE INSTRUCTION, THE DAMAGE TO THE EQUIPMENT CAN OCCUR.

- (d) Install the IDG air/oil heat exchanger (left) [1] in a correct position on the engine.

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- (e) Lubricate the threads of the two bolts [6], six bolts [8] with plate, and two screws [10] with the graphite mineral vaseline, D00601 [CP2101].

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- (f) Lubricate the threads of the two bolts [6], six bolts [8] with integrated washers, and two screws [10] with the graphite mineral vaseline, D00601 [CP2101].

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- (g) Install the six bolts [8] with plate and the two bolts [6] with spacers that attach the IDG air/oil heat exchanger (left) [1] to the fan frame, from the top to the bottom, follow the sequence 1 to 8.

SIA ALL; POST LEAP-1B SERVICE BULLETIN 72-0181

- (h) Install the six bolts [8] with integrated washers and the two bolts [6] with spacers that attach the IDG air/oil heat exchanger (left) [1] to the fan frame, from the top to the bottom, follow the sequence 1 to 8.

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- (i) Tighten the bolts from the top to the bottom, follow the sequence 1 to 8, then re-tighten the bolts a second time following the same sequence order, as follows:
 - 1) Tighten the two bolts [6], follow the specific sequence (start by 1 and finish by 2), to 110.6 in-lb (12.5 N·m) - 119.5 in-lb (13.5 N·m).
 - 2) Tighten the six bolts [8], follow the specific sequence (start by 3 and finish by 8), to 110.6 in-lb (12.5 N·m) - 119.5 in-lb (13.5 N·m).
 - 3) Tighten again the bolts [6] and bolts [8] in accordance with the requested torque value, follow the sequence order from the top to the bottom.
- (j) Install the attachment clamp [11] in a correct position on the IDG air/oil heat exchanger (left) [1].
 - 1) Install the two screws [10] that attach the attachment clamp [11] to the bracket [14].
 - 2) Tighten the screws [10] to 84.08 in-lb (9.5 N·m) - 92.93 in-lb (10.5 N·m).
- (k) Connect the oil tube [4] to the IDG air/oil heat exchanger (left) [1] as follows:
 - 1) Make sure that the mating faces are clean and clear of unwanted materials.
 - 2) Lubricate the threads of the coupling nut [5] with oil, D00599 [CP2442].
 - 3) Connect the oil tube [4] in a correct position on the IDG air/oil heat exchanger (left) [1].
 - 4) Tighten the coupling nut [5] of the oil tube [4] to 443 in-lb (50 N·m) - 531 in-lb (60 N·m).
- (l) Connect the oil tube [2] to the IDG air/oil heat exchanger (left) [1] as follows:
 - 1) Make sure that the mating faces are clean and clear of unwanted materials.
 - 2) Lubricate the threads of the coupling nut [3] with oil, D00599 [CP2442].
 - 3) Connect the oil tube [2] in a correct position on the IDG air/oil heat exchanger (left) [1].
 - 4) Tighten the coupling nut [3] of the oil tube [2] to 443 in-lb (50 N·m) - 531 in-lb (60 N·m).
- (m) Clean the work area and clear the tools and other items.

SUBTASK 24-11-13-610-001

- (2) Do this task: IDG Servicing (Oil Fill), TASK 12-13-21-600-801.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 24-11-13-860-004



OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the left thrust reverser:
 - (a) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-802-G00.
 - 1) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
415	Left Thrust Reverser, Engine 1
425	Left Thrust Reverser, Engine 2
 - (b) Close the applicable left Fan Cowl Panel (TASK 71-11-04-410-801-G00).

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- 1) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
413	Left Fan Cowl, Engine 1
423	Left Fan Cowl, Engine 2

- (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-801-G00.

SUBTASK 24-11-13-860-006

- (2) Do these steps to remove the DO NOT OPERATE tags, STD-858, from the applicable ENGINE START switch and START LEVER switch:
- (a) On the P5 overhead panel, remove the DO NOT OPERATE tag, STD-858, from the applicable ENGINE START switch.
- (b) On the P10 control stand, remove the DO NOT OPERATE tag, STD-858, from the applicable START LEVER switch.

J. Integrated Drive Generator Air/Oil Heat Exchanger (Left) Installation Test

SUBTASK 24-11-13-710-001

- (1) Do the test(s) that are given in the Power Plant Test Reference Table (TASK 71-00-00-800-804-G00).

————— END OF TASK —————

TASK 24-11-13-000-802

4. Integrated Drive Generator Air/Oil Heat Exchanger (Right) Removal

(Figure 402)

A. General

- (1) This task gives the instructions to remove the Integrated Drive Generator (IDG) air/oil heat exchanger (right).

B. References

<u>Reference</u>	<u>Title</u>
12-13-21-600-802	IDG Oil Change (P/B 301)
71-11-04-010-801-G00	Open the Fan Cowl Panels (Selection) (P/B 201)
78-31-00-010-801-G00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-801-G00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

C. Tools/Equipment

<u>Reference</u>	<u>Description</u>
STD-203	Container - Oil Resistant, 1 U.S.-Gal (3.8 l)
STD-858	Tag - DO NOT OPERATE

D. Location Zones

<u>Zone</u>	<u>Area</u>
410	Subzone - Engine 1
420	Subzone - Engine 2

E. Access Panels

<u>Number</u>	<u>Name/Location</u>
413	Left Fan Cowl, Engine 1

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(Continued)

Number	Name/Location
414	Right Fan Cowl, Engine 1
416	Right Thrust Reverser, Engine 1
423	Left Fan Cowl, Engine 2
424	Right Fan Cowl, Engine 2
426	Right Thrust Reverser, Engine 2

F. Prepare for the Removal

SUBTASK 24-11-13-860-007

- (1) Do these steps to make sure that the ENGINE START switch and the START LEVER switch are not operated:
 - (a) Make sure that the applicable ENGINE START switch, on the P5 overhead panel, is in the AUTO or OFF position.
 - 1) Put a DO NOT OPERATE tag, STD-858, on the applicable ENGINE START switch.
 - (b) Make sure that the applicable START LEVER switch, on the P10 control stand, is in the CUTOFF position.
 - 1) Put a DO NOT OPERATE tag, STD-858, on the applicable START LEVER switch.

SUBTASK 24-11-13-860-009

- (2) Do these tasks in sequence to safely open the right thrust reverser on the applicable engine:



DO THE DEACTIVATION PROCEDURE FOR THE THRUST REVERSER TO PREVENT THE OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (a) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-801-G00.



IF FAN COWLS ARE INSTALLED, MAKE SURE THAT LEFT AND RIGHT FAN COWLS ARE IN THE FULL OPEN POSITION. MAKE SURE THAT THE SPRING DOOR OPENING-SYSTEM (SDOS) AND HOLD OPEN RODS (HOR) ARE LOCKED IN THEIR POSITION. IF YOU DO NOT, STRUCTURAL DAMAGE TO THE FAN COWL AND THRUST REVERSER CAN OCCUR.

- (b) Open both fan cowl panels (TASK 71-11-04-010-801-G00).

NOTE: Because the center line of the thrust reversers is off 6:00 o'clock position, both fan cowl panels must be opened to prevent damaging the fan cowl panel if either thrust reverser needs to be opened.

- 1) Open these access panels:

Number	Name/Location
413	Left Fan Cowl, Engine 1
414	Right Fan Cowl, Engine 1
423	Left Fan Cowl, Engine 2
424	Right Fan Cowl, Engine 2

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WARNING

OBEY THE INSTRUCTIONS IN THE PROCEDURE TO OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(c) Open the applicable right thrust reverser (TASK 78-31-00-010-801-G00).

1) Open these access panels:

<u>Number</u>	<u>Name/Location</u>
416	Right Thrust Reverser, Engine 1
426	Right Thrust Reverser, Engine 2

SUBTASK 24-11-13-680-004

(3) Drain the IDG oil (do the applicable steps in: IDG Oil Change, TASK 12-13-21-600-802).

G. Integrated Drive Generator Air/Oil Heat Exchanger (Right) Removal

SUBTASK 24-11-13-010-002



WARNING

BE CAREFUL WHEN YOU DO WORK ON THE ENGINE PARTS AFTER THE ENGINE IS STOPPED. THE ENGINE PARTS CAN STAY HOT FOR ALMOST ONE HOUR. DO NOT TOUCH HOT PARTS WITHOUT APPLICABLE GLOVES. HOT PARTS CAN CAUSE INJURIES TO PERSONNEL.



WARNING

DO NOT OPEN THE OIL SYSTEM UNTIL THE PRESSURE GOES TO ZERO. THE PRESSURE GOES TO ZERO APPROXIMATELY 5 MINUTES AFTER AN ENGINE STOPS. A PRESSURIZED OIL SYSTEM CAN RELEASE A SPRAY OF HOT OIL THAT CAN BURN YOU.



WARNING

DO NOT LET HOT OIL GET ON YOU. PUT ON CLOTHES, GOGGLES, AND OTHER EQUIPMENT FOR PROTECTION, OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.



WARNING

DO NOT LET THE OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.



CAUTION

DO NOT LET OIL GET ON THE ENGINE OR OTHER COMPONENTS. IMMEDIATELY CLEAN THE OIL WHEN IT FALLS ON THEM. OIL CAN CAUSE DAMAGE TO EQUIPMENT.

(1) Remove the IDG air/oil heat exchanger (right) [1] as follows:

(a) Disconnect the oil tube [2] from the IDG air/oil heat exchanger (right) [1] as follows:

- 1) Loosen the coupling nut [3] that attaches the oil tube [2] to the IDG air/oil heat exchanger (right) [1].
- 2) Disconnect the oil tube [2] from the IDG air/oil heat exchanger (right) [1].

(b) Disconnect the oil tube [4] from the IDG air/oil heat exchanger (right) [1] as follows:

- 1) Loosen the coupling nut [5] that attaches the oil tube [4] to the IDG air/oil heat exchanger (right) [1].
- 2) Disconnect the oil tube [4] from the IDG air/oil heat exchanger (right) [1].

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- (c) Remove the two bolts [6] with spacers that attach the IDG air/oil heat exchanger (right) [1] to the fan frame.

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- (d) Remove the six bolts [8] with plate that attach the IDG air/oil heat exchanger (right) [1] to the fan frame.

SIA ALL; POST LEAP-1B SERVICE BULLETIN 72-0181

- (e) Remove the six bolts [8] with integrated washers that attach the IDG air/oil heat exchanger (right) [1] to the fan frame.

SIA ALL

- (f) Remove the two screws [10] that attach the attachment clamp [11] to the bracket [14].
(g) Remove the attachment clamp [11] that hold the IDG air/oil heat exchanger (right) [1].



WARNING

BE VERY CAREFUL WHEN YOU REMOVE THE IDG AIR/OIL HEAT-EXCHANGER. HOT OIL CAN FLOW FROM THE HEAT-EXCHANGER. HOT OIL CAN CAUSE INJURIES.

- (h) Remove the IDG air/oil heat exchanger (right) [1] from the engine.



WARNING

BE VERY CAREFUL WHEN YOU DRAIN THE IDG OIL. USE GOGGLES, INSULATED GLOVES, AND PROTECTION GEAR. HOT OIL CAN CAUSE INJURIES.

- (i) Drain the oil from the IDG air/oil heat exchanger (right) [1] into a 1 U.S.-gal (3.81 l) oil resistant container, STD-203.
(j) Install the protective covers on the oil tube [2] port and oil tube [4] port on the IDG air/oil heat exchanger (right) [1].
(k) Install the protective caps on the oil tube [2] and oil tube [4].

———— **END OF TASK** ————

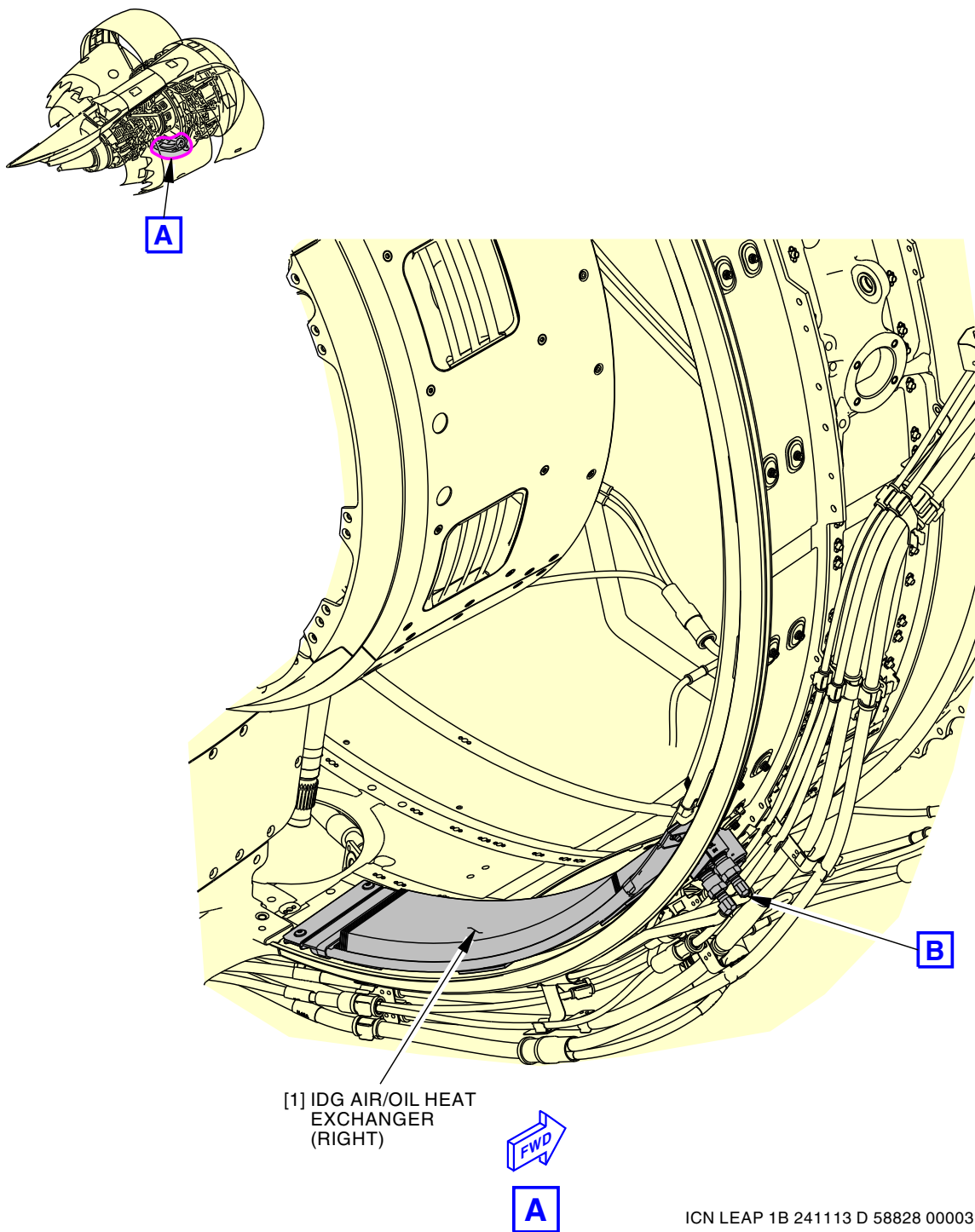
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ICN LEAP 1B 241113 D 58828 00003 A001 01
2437957 S0000565734_V3

Integrated Drive Generator Air/Oil Heat Exchanger (Right) Installation
Figure 402/24-11-13-990-803 (Sheet 1 of 6)

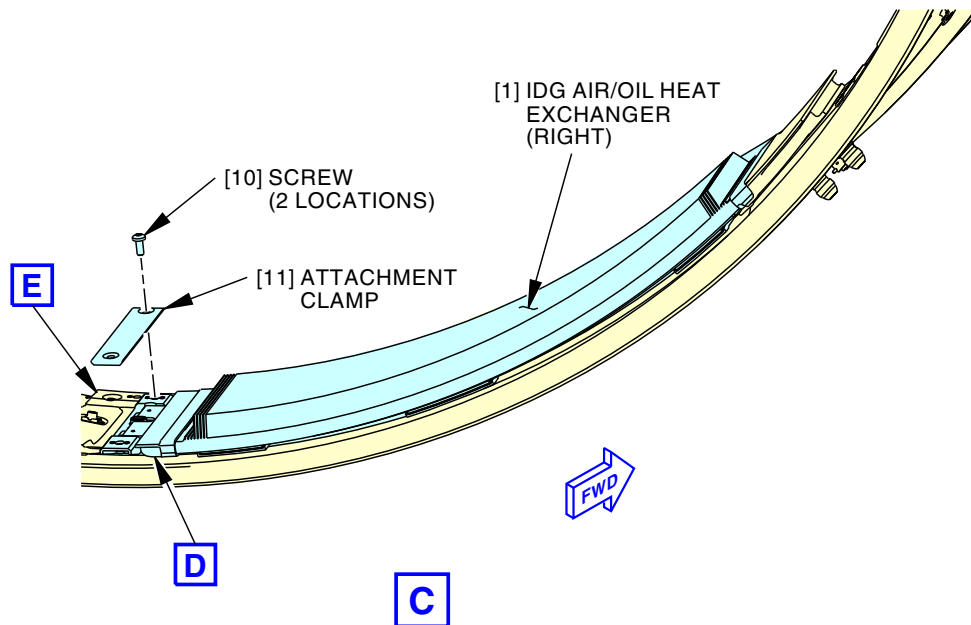
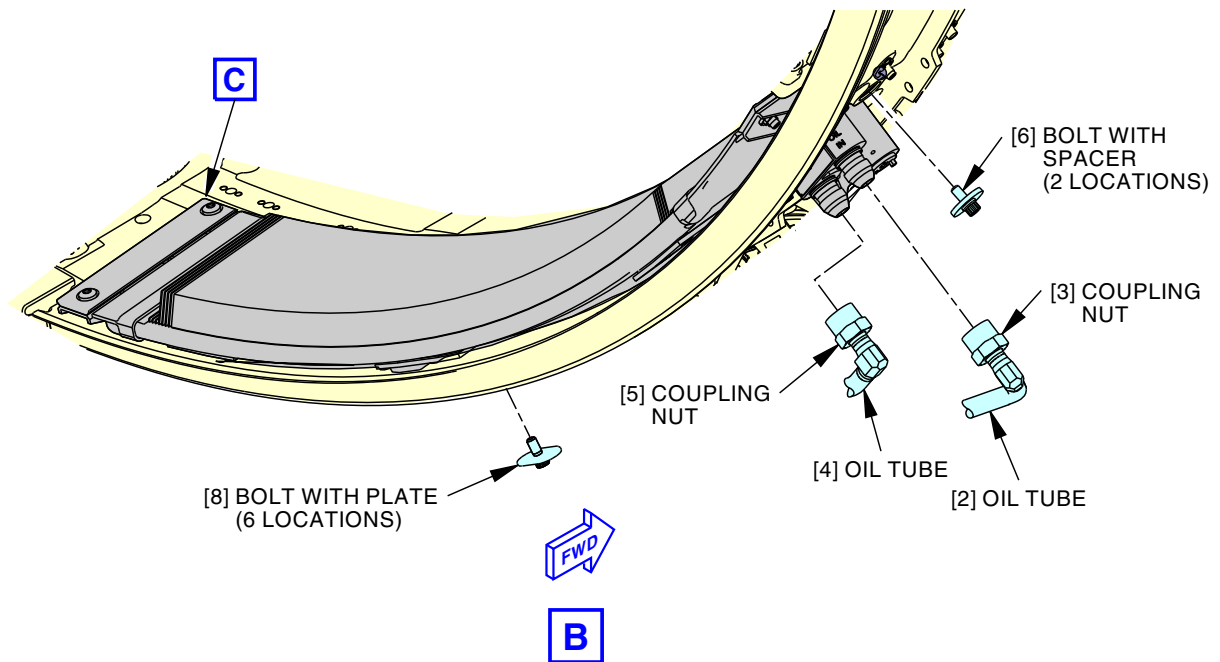
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ICN LEAP 1B 241113 D 58828 00004 A003 01
2437860 S0000565735_V6

Integrated Drive Generator Air/Oil Heat Exchanger (Right) Installation
Figure 402/24-11-13-990-803 (Sheet 2 of 6)

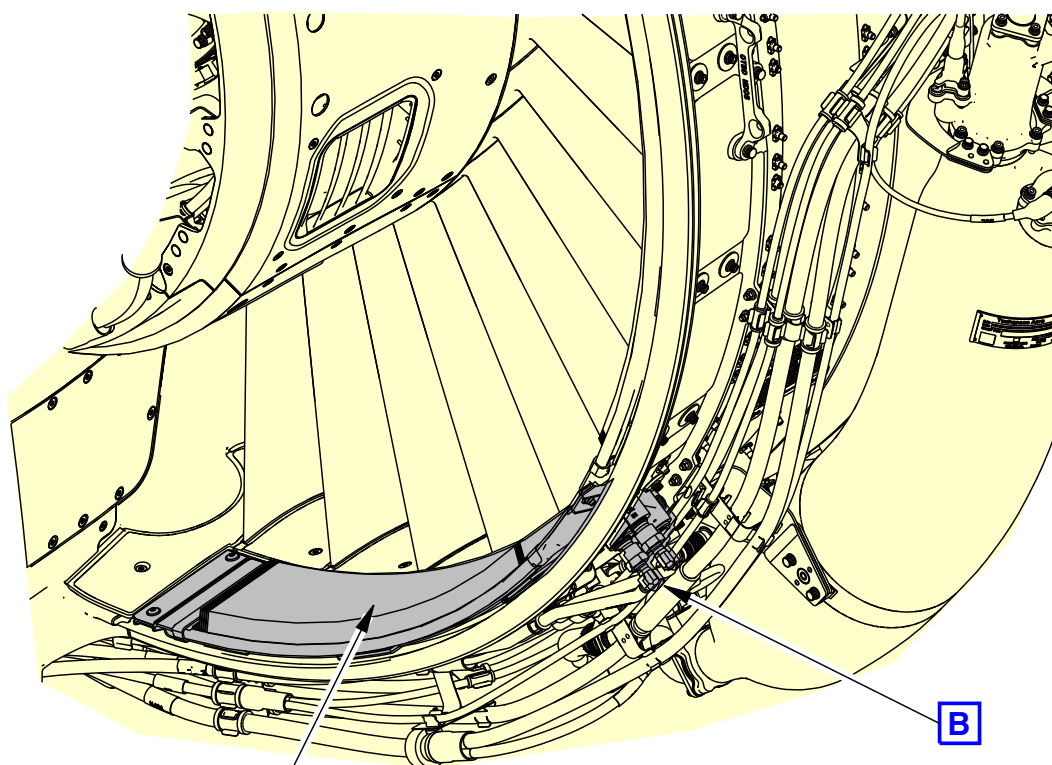
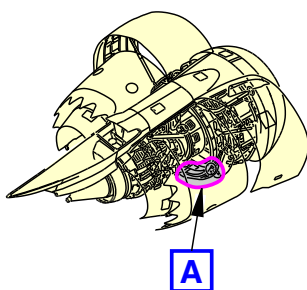
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[1] IDG AIR/OIL HEAT EXCHANGER (RIGHT)



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2840939 S0000662913_V1

Integrated Drive Generator Air/Oil Heat Exchanger (Right) Installation
Figure 402/24-11-13-990-803 (Sheet 3 of 6)

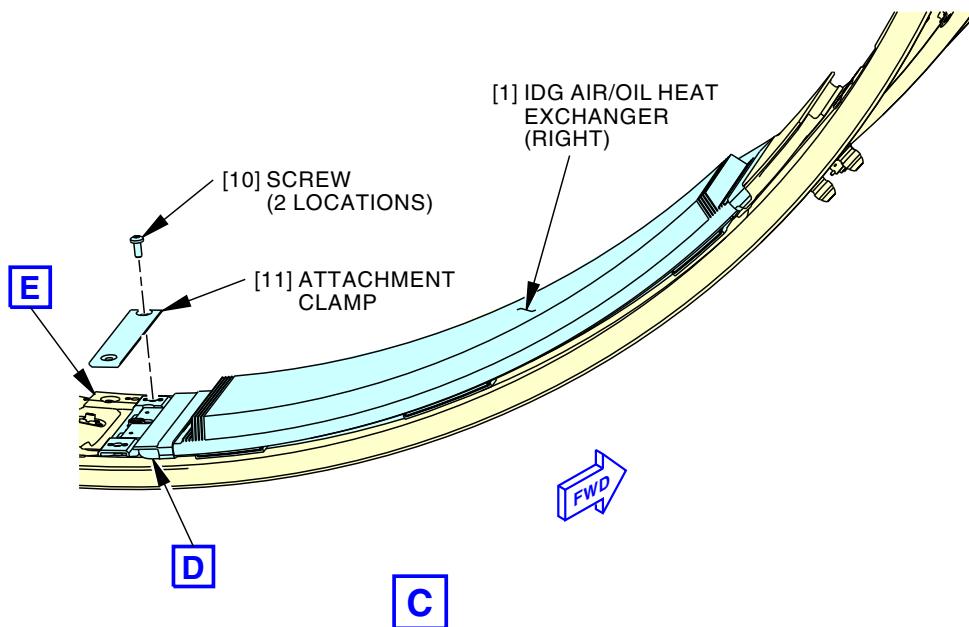
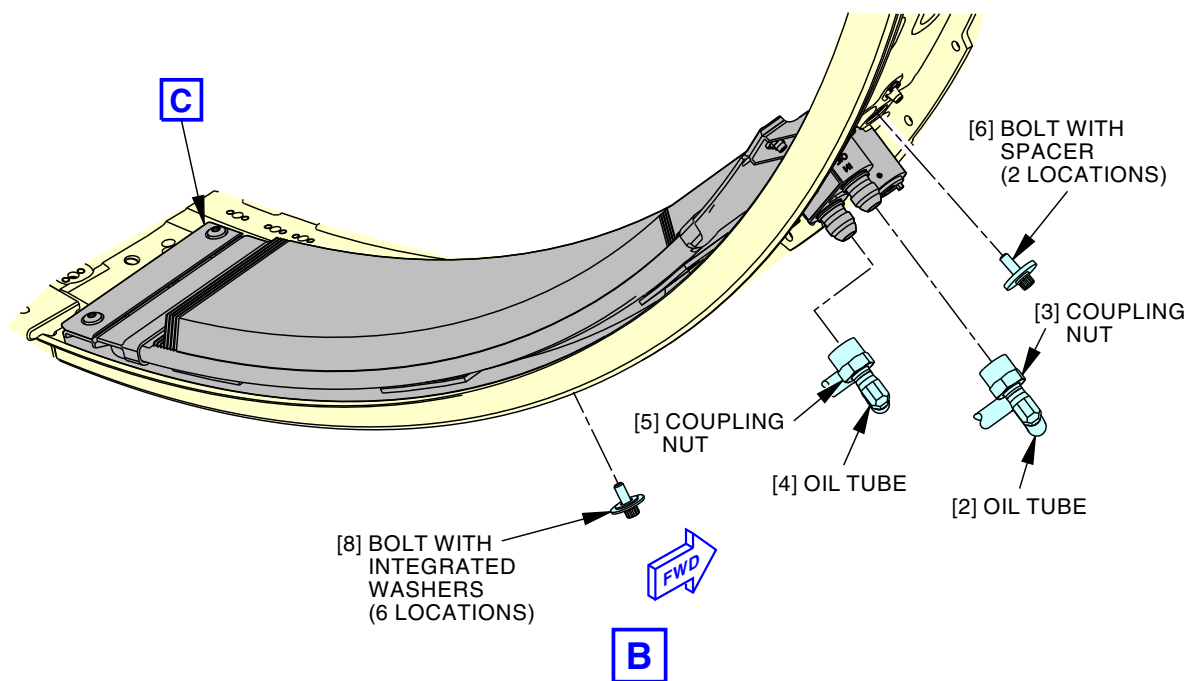
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72-0181

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ICN LEAP 1B 241113 D 58828 00012 A002 01
2840941 S0000662914_V2

Integrated Drive Generator Air/Oil Heat Exchanger (Right) Installation
Figure 402/24-11-13-990-803 (Sheet 4 of 6)

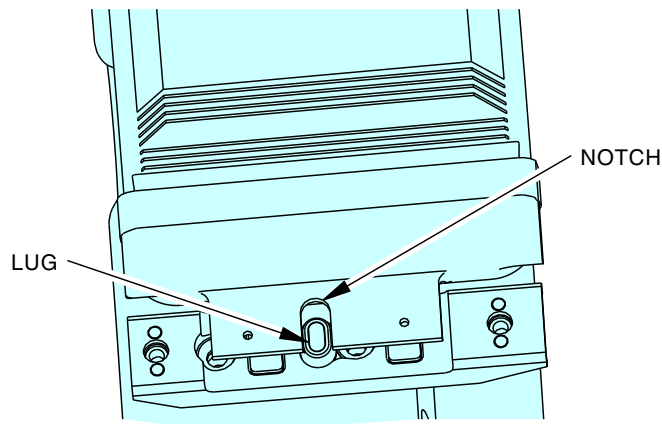
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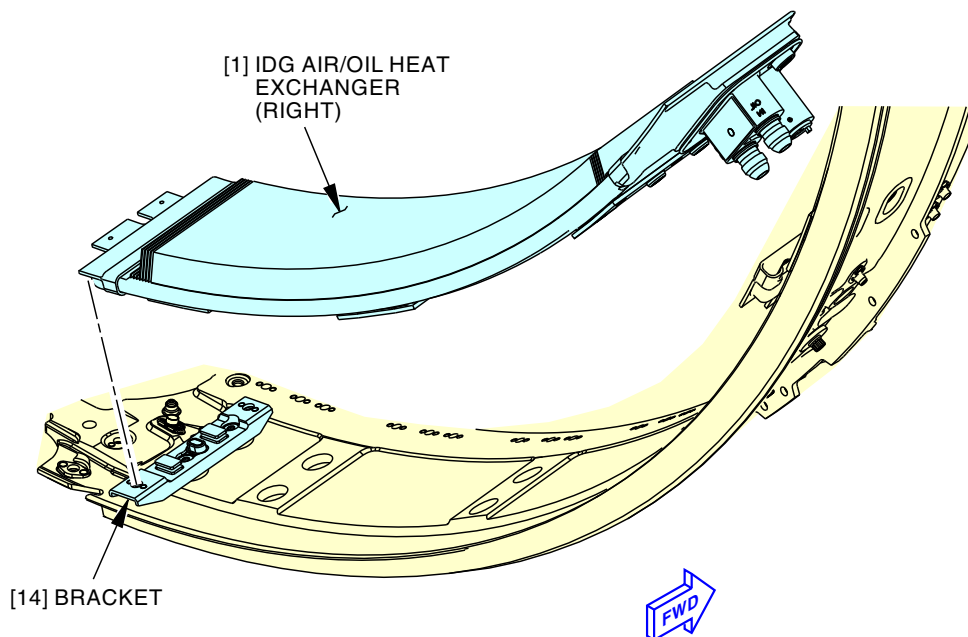
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D



E

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3012520 S0000786139_V1

Integrated Drive Generator Air/Oil Heat Exchanger (Right) Installation
Figure 402/24-11-13-990-803 (Sheet 5 of 6)

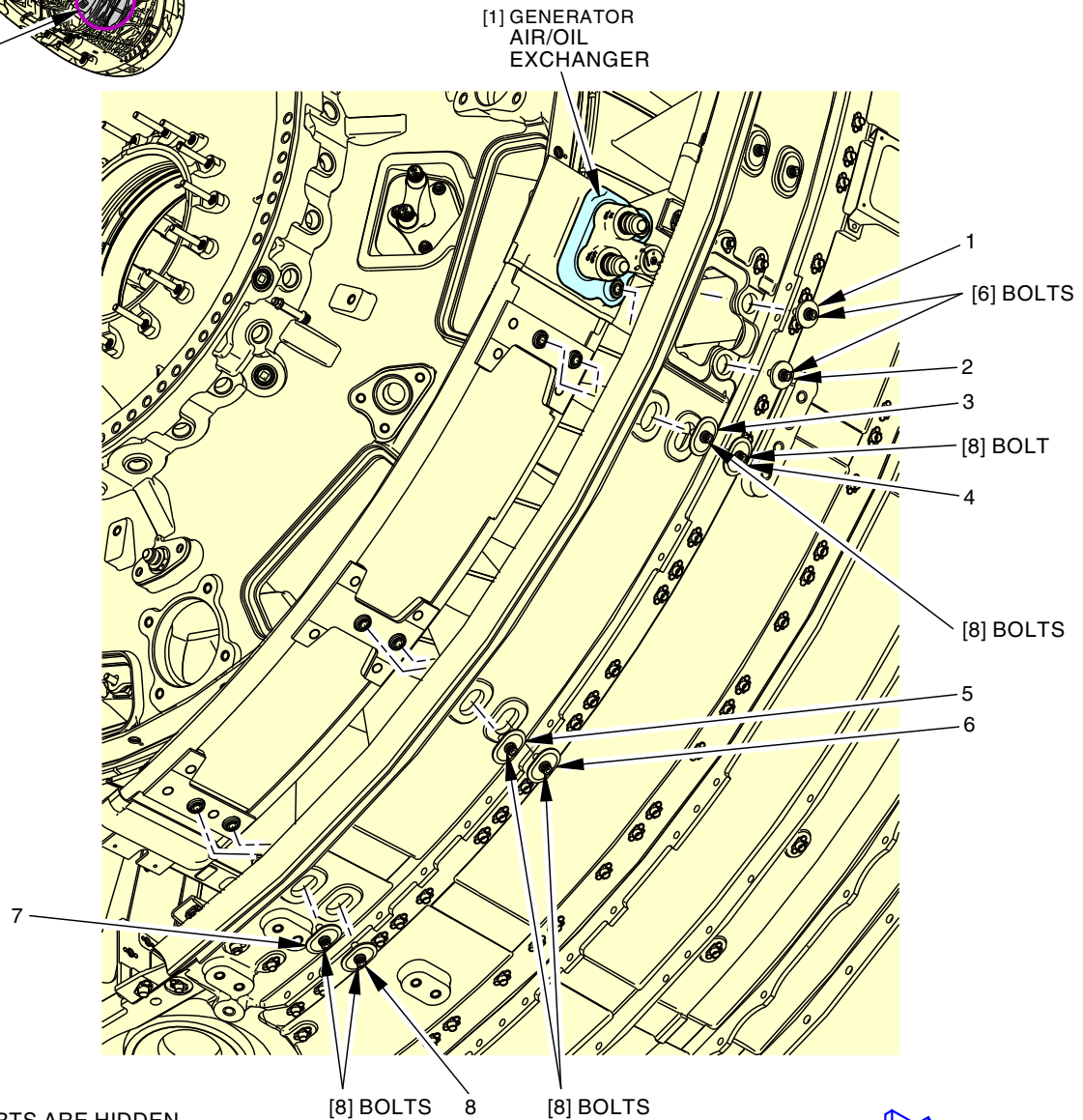
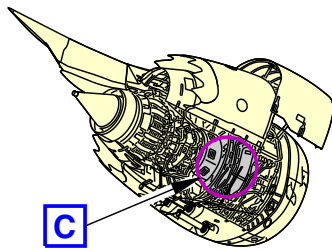
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NOTE 1:
SOME PARTS ARE HIDDEN
FOR CLARITY

NOTE 2:
NUMBERS FROM 1 TO 8 ARE THESE
OF THE TORQUING SEQUENCE



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2946932 S0000723180_V1

Integrated Drive Generator Air/Oil Heat Exchanger (Right) Installation
Figure 402/24-11-13-990-803 (Sheet 6 of 6)

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TASK 24-11-13-400-802

5. Integrated Drive Generator Air/Oil Heat Exchanger (Right) Installation

(Figure 402)

A. General

- (1) This task gives the instructions to install the Integrated Drive Generator (IDG) air/oil heat exchanger (right).
- (2) You must do the tests that are listed in the power plant test reference table after you install the IDG air/oil heat exchanger (right).

B. References

Reference	Title
12-13-21-600-801	IDG Servicing (Oil Fill) (P/B 301)
71-00-00-800-804-G00	Power Plant Test Reference Table (P/B 501)
71-11-04-410-801-G00	Close the Fan Cowl Panels (Selection) (P/B 201)
78-31-00-010-802-G00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-801-G00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Consumable Materials

Reference	Description	Specification
D00599 [CP2442]	Oil - Engine	
D00601 [CP2101]	Vaseline - Graphite Mineral	

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	IDG air/oil heat exchanger (right)	72-00-00-05-263	SIA ALL

F. Location Zones

Zone	Area
410	Subzone - Engine 1
420	Subzone - Engine 2

G. Access Panels

Number	Name/Location
413	Left Fan Cowl, Engine 1
414	Right Fan Cowl, Engine 1
416	Right Thrust Reverser, Engine 1
423	Left Fan Cowl, Engine 2
424	Right Fan Cowl, Engine 2
426	Right Thrust Reverser, Engine 2

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H. Integrated Drive Generator Air/Oil Heat Exchanger (Right) Installation

SUBTASK 24-11-13-410-002



BE CAREFUL WHEN YOU DO WORK ON THE ENGINE PARTS AFTER THE ENGINE IS STOPPED. THE ENGINE PARTS CAN STAY HOT FOR ALMOST ONE HOUR. DO NOT TOUCH HOT PARTS WITHOUT APPLICABLE GLOVES. HOT PARTS CAN CAUSE INJURIES TO PERSONNEL.



DO NOT OPEN THE OIL SYSTEM UNTIL THE PRESSURE GOES TO ZERO. THE PRESSURE GOES TO ZERO APPROXIMATELY 5 MINUTES AFTER AN ENGINE STOPS. A PRESSURIZED OIL SYSTEM CAN RELEASE A SPRAY OF HOT OIL THAT CAN BURN YOU.



DO NOT LET HOT OIL GET ON YOU. PUT ON CLOTHES, GOGGLES, AND OTHER EQUIPMENT FOR PROTECTION, OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.



DO NOT LET THE OIL STAY ON YOUR SKIN. YOU CAN ABSORB POISONOUS MATERIALS FROM THE OIL THROUGH YOUR SKIN.



DO NOT LET OIL GET ON THE ENGINE OR OTHER COMPONENTS. IMMEDIATELY CLEAN THE OIL WHEN IT FALLS ON THEM. OIL CAN CAUSE DAMAGE TO EQUIPMENT.

- (1) Install the IDG air/oil heat exchanger (right) [1] as follows:
- (a) Make sure that the mating faces are clean and clear of unwanted materials.
 - (b) Remove the protective caps from the oil tube [2] and oil tube [4].
 - (c) Remove the protective covers from the oil tube [2] port and oil tube [4] port on the IDG air/oil heat exchanger (right) [1].



MAKE SURE THAT THE LUG OF THE BRACKET CORRECTLY ALIGNS WITH THE NOTCH OF THE INTEGRATED DRIVE GENERATOR AIR/OIL HEAT EXCHANGER. IF YOU DO NOT OBEY THE INSTRUCTION, THE DAMAGE TO THE EQUIPMENT CAN OCCUR.

- (d) Install the IDG air/oil heat exchanger (right) [1] in a correct position on the engine.

SIA ALL; PRE LEAP-1B SERVICE BULLETIN 72-0181

- (e) Lubricate the threads of the two bolts [6], six bolts [8] with plate, and two screws [10] with the graphite mineral vaseline, D00601 [CP2101].

SIA ALL; POST LEAP-1B SERVICE BULLETIN 72-0181

- (f) Lubricate the threads of the two bolts [6], six bolts [8] with integrated washers, and two screws [10] with the graphite mineral vaseline, D00601 [CP2101].

SIA ALL; PRE LEAP-1B SERVICE BULLETIN 72-0181

- (g) Install the six bolts [8] with plate and the two bolts [6] with spacers that attach the IDG air/oil heat exchanger (right) [1] to the fan frame, from the top to the bottom, follow the sequence 1 to 8.

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SIA ALL; POST LEAP-1B SERVICE BULLETIN 72-0181

- (h) Install the six bolts [8] with integrated washers and the two bolts [6] with spacers that attach the IDG air/oil heat exchanger (right) [1] to the fan frame, from the top to the bottom, follow the sequence 1 to 8.

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- (i) Tighten the bolts from the top to the bottom, follow the sequence 1 to 8 then re-tighten the bolts a second time following the same sequence order, as follows:
- 1) Tighten the two bolts [6], follow the specific sequence (start by 1 and finish by 2), to 110.6 in-lb (12.5 N·m) - 119.5 in-lb (13.5 N·m).
 - 2) Tighten the six bolts [8], follow the specific sequence (start by 3 and finish by 8), to 110.6 in-lb (12.5 N·m) - 119.5 in-lb (13.5 N·m).
 - 3) Tighten the bolts [6] and bolts [8] again in accordance with the requested torque value, follow the sequence order from the top to the bottom.
- (j) Install the attachment clamp [11] in a correct position on the IDG air/oil heat exchanger (right) [1].
- 1) Install the two screws [10] that attach the attachment clamp [11] to the bracket [14].
 - 2) Tighten the screws [10] to 84.08 in-lb (9.5 N·m) - 92.93 in-lb (10.5 N·m).
- (k) Connect the oil tube [4] to the IDG air/oil heat exchanger (right) [1] as follows:
- 1) Make sure that the mating faces are clean and clear of unwanted materials.
 - 2) Lubricate the threads of the coupling nut [5] with oil, D00599 [CP2442].
 - 3) Connect the oil tube [4] in a correct position on the IDG air/oil heat exchanger (right) [1].
 - 4) Tighten the coupling nut [5] of the oil tube [4] to 443 in-lb (50 N·m) - 531 in-lb (60 N·m).
- (l) Connect the oil tube [2] to the IDG air/oil heat exchanger (right) [1] as follows:
- 1) Make sure that the mating faces are clean and clear of unwanted materials.
 - 2) Lubricate the threads of the coupling nut [3] with oil, D00599 [CP2442].
 - 3) Connect the oil tube [2] in a correct position on the IDG air/oil heat exchanger (right) [1].
 - 4) Tighten the coupling nut [3] of the oil tube [2] to 443 in-lb (50 N·m) - 531 in-lb (60 N·m).
- (m) Clean the work area and clear the tools and other items.

SUBTASK 24-11-13-610-002

- (2) Do this task: IDG Servicing (Oil Fill), TASK 12-13-21-600-801.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 24-11-13-860-010



OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the right thrust reverser:
- (a) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-802-G00.

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- 1) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
416	Right Thrust Reverser, Engine 1
426	Right Thrust Reverser, Engine 2

- (b) Close the fan cowl panels (TASK 71-11-04-410-801-G00).

- 1) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
413	Left Fan Cowl, Engine 1
414	Right Fan Cowl, Engine 1
423	Left Fan Cowl, Engine 2
424	Right Fan Cowl, Engine 2

- (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-801-G00.

SUBTASK 24-11-13-860-012

- (2) Do these steps to remove the DO NOT OPERATE tags, STD-858, from the applicable ENGINE START switch and START LEVER switch:
- (a) On the P5 overhead panel, remove the DO NOT OPERATE tag, STD-858, from the applicable ENGINE START switch.
- (b) On the P10 control stand, remove the DO NOT OPERATE tag, STD-858, from the applicable START LEVER switch.

J. Integrated Drive Generator Air/Oil Heat Exchanger (Right) Installation Test

SUBTASK 24-11-13-710-002

- (1) Do the test(s) that are given in the Power Plant Test Reference Table (TASK 71-00-00-800-804-G00).

———— **END OF TASK** ————

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INTEGRATED DRIVE GENERATOR AIR/OIL HEAT EXCHANGER - INSPECTION/CHECK

1. General

A. This procedure has one task:

- (1) IDG Air/Oil Heat Exchanger Inspection.

TASK 24-11-13-210-801

2. IDG Air/Oil Heat Exchanger - Inspection

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) The Integrated Drive Generator (IDG) air/oil heat exchangers use bypass fan air to cool the IDG cooling oil system.
- (2) The IDG air/oil heat exchangers are located inside the fan case and to the left and right of the 6 o'clock strut.
- (3) For the procedure that IDG air/oil heat exchanger will be referred to as the heat exchanger.
- (4) Mild debris in the heat exchanger fins can trap water and contaminants that will promote corrosion. This is especially true in the winter months and during storage. Some runway deicers will attract water to the surface of parts and result in accelerated corrosion. Performing this cleaning task when mild debris is found or on a regular basis as determined by airline policy can help reduce the corrosion and extend the life of the heat exchangers.
- (5) Other inspection and cleaning methods may be used depending on airline policy.

B. References

Reference	Title
24-11-13 P/B 401	INTEGRATED DRIVE GENERATOR AIR/OIL HEAT EXCHANGER - REMOVAL/INSTALLATION
71-00-00-800-802-G00	Engine Operation Limits (P/B 201)
78-31-00-010-801-G00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-802-G00	Close the Thrust Reverser (Selection) (P/B 201)

C. Tools/Equipment

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

Reference	Description
COM-21826	Fine India Oil Stone Part #: FF724 Supplier: 44197
STD-1081	Flashlight - Explosion Proof
STD-3907	Mirror - Dental
STD-21746	Set - Carbide Bur

D. Consumable Materials

Reference	Description	Specification
G51791	Cloth - Abrasive, Silicon Carbide, 500 Grit	

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E. Location Zones

Zone	Area
410	Subzone - Engine 1
411	Engine 1 - Engine
420	Subzone - Engine 2
421	Engine 2 - Engine

F. Prepare for the Inspection

SUBTASK 24-11-13-010-003



DO ALL OF THE SPECIFIED TASKS IN THE CORRECT SEQUENCE TO PREPARE THE THRUST REVERSERS FOR THE INSPECTION. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-G00.

G. IDG Air/Oil Heat Exchanger Inspection

SUBTASK 24-11-13-210-001

- (1) With a flashlight (explosion proof flashlight, STD-1081) that is less than 6 inches long, access the forward face of the heat exchanger to shine the light through the heat exchanger fins and look for these conditions:

- (a) Make sure that no bird debris are present before you continue (TASK 71-00-00-800-802-G00).
- (b) Debris in the heat exchanger fins.

NOTE: The most likely area of damage is the forward facing surface of the heat exchanger. You will need a small hand held mirror (dental mirror, STD-3907) to see the forward face of the heat exchanger.

- 1) If you find debris, clean to remove debris.

NOTE: If little to no light is seen through the heat exchanger fins during the check with a flashlight, this indicates that airflow is significantly obstructed and the cooling capability could be diminished. The Cleaning Procedure may be done to remove debris and improve airflow.

- (c) Inspection of the fins.
 - 1) Broken, teared or cracked fins are not permitted.
 - a) If broken, teared or cracked fins are present, replace the IDG air/oil heat exchangers (PAGEBLOCK 24-11-13/401).
 - 2) Missing fins.
 - a) Maximum serviceable limit: Not permitted.
 - b) Maximum repairable limit: Not repairable.
 - c) Repair method: Replace or send to manufacturer.
 - 3) Nick, scratch, gouge or dent on the fin.
 - a) Permitted up to 0.01 in. (0.254 mm) in depth for the nick or scratch and gouge without loss of the protective layer.
 - b) Permitted up to 0.1 in. (2.54 mm) in depth for the dent without loss of the protective layer.
 - c) Raised metal or cracks are not permitted.

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- d) If raised metal is present, do these steps:

NOTE: Dents indication types on fins are considered as bent fins indication type, therefore the maximum number of cumulated finding to be considered on fins is 6 findings on both IDG air/oil heat exchangers.

- <1> If 7 fins are found with findings, replace the IDG air/oil heat exchangers (PAGEBLOCK 24-11-13/401).
- <2> Use a carbide bur set, STD-21746, and hand grind out findings to remove heavy burrs or raised metal.
- <3> Use an India oil stone, COM-21826, to remove light burrs.
- <4> Use a 500 grit abrasive cloth, G51791, to remove edges of repaired surfaces smoothly into adjacent surfaces.
- <5> Do not remove more material than necessary.

NOTE: No high metal must remain. The transition with the non-blended area shall be smooth.

NOTE: After blending, the maximum depth on the blended area must be not over than 0.1 in. (2.54 mm).

- 4) The first and last three rows of fins are removed.

- a) If the surface cooler is found with missing fins, replace it with a new surface cooler assembly.

NOTE: The first and last three rows of fins are removed for manufacturing purposes and will not adversely affect the function of the coolers.

- 5) Bent fins.

- a) A total of 6 bent fins, without loss of the protective layer, are acceptable on both generator air-oil exchangers.

- <1> If cracks are visible, remove and replace the part.

- b) If there are more than 3 bent fins on 1 air-oil exchanger, do the following repair steps:

- <1> Insert a locally manufactured straightening tool between the bent fins and gently apply force to straighten the fins back to approximately 90 degrees to the cooler body.

- <a> Make sure that the fins have a gap of 0.085 in. (2.159 mm) (reference) between them.

- If the fins that are straightened are damaged, remove the surface cooler.

- <c> If you damage any fins when you straighten it, remove the surface cooler.

- <2> If it is necessary, use needle nose pliers or similar type tool to straighten small localized areas of fin deformation.

- <3> Continue the same process to repair all the bent fins.

NOTE: Fins can become loose or dislodged from repeated or over bending. After straightening all fins, check to assure the fins are secure. You should not be able to move the individual fins with your fingers. If the fins move easily with just finger pressure, the surface cooler should be replaced.

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- (d) Inspection of the sealing surfaces in zone A, B, and C.
- 1) Examine all the sealing surfaces of the cooler for evidence of scratches, raised metal, nicks, gouges, cracks, and dents.
 - 2) The requirements of inspection criteria apply to all sealing surfaces.
 - a) Any number up to 0.001 in. (0.025 mm) is permitted.
 - b) Do a check for scratches, raised metal, nicks, gouges, and cracks.
 - <1> Permitted up to 0.010 in. (0.254 mm) in depth of scratches and gouges.
 - <2> No raised metal or cracks are permitted.
 - <3> Maximum repairable limit: Not repairable.
 - <4> If it is necessary, replace or send to manufacturer.
 - c) Do a check for dents in zone A.
 - <1> Permitted up to 0.01 in. (0.254 mm) in depth without loss of the protective layer.
 - <2> Raised metal or cracks are not permitted.
 - <3> If raised metal is present, do these steps:
 - <a> Use a carbide bur set, STD-21746, and hand grind out findings to remove heavy burrs or raised metal.
 - Use an India oil stone, COM-21826, to remove light burrs.
 - <c> Use a 500 grit abrasive cloth, G51791, to remove edges of repaired surfaces smoothly into adjacent surfaces.
 - <d> Do not remove more material than necessary.

NOTE: No high metal must remain. The transition with the non-blended area shall be smooth.

NOTE: After blending, the maximum depth on the blended area must be less than 0.032 in. (0.81 mm).
 - <4> If it is necessary replace or send to manufacturer.
- (e) Oil stains or leakage.
- 1) Oil stains or leakage are not permitted.
 - a) If you find them, replace the IDG air/oil heat exchangers (PAGEBLOCK 24-11-13/401).

H. Put the Airplane Back to Its Usual Condition

SUBTASK 24-11-13-410-003

- (1) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-802-G00.

———— **END OF TASK** ————

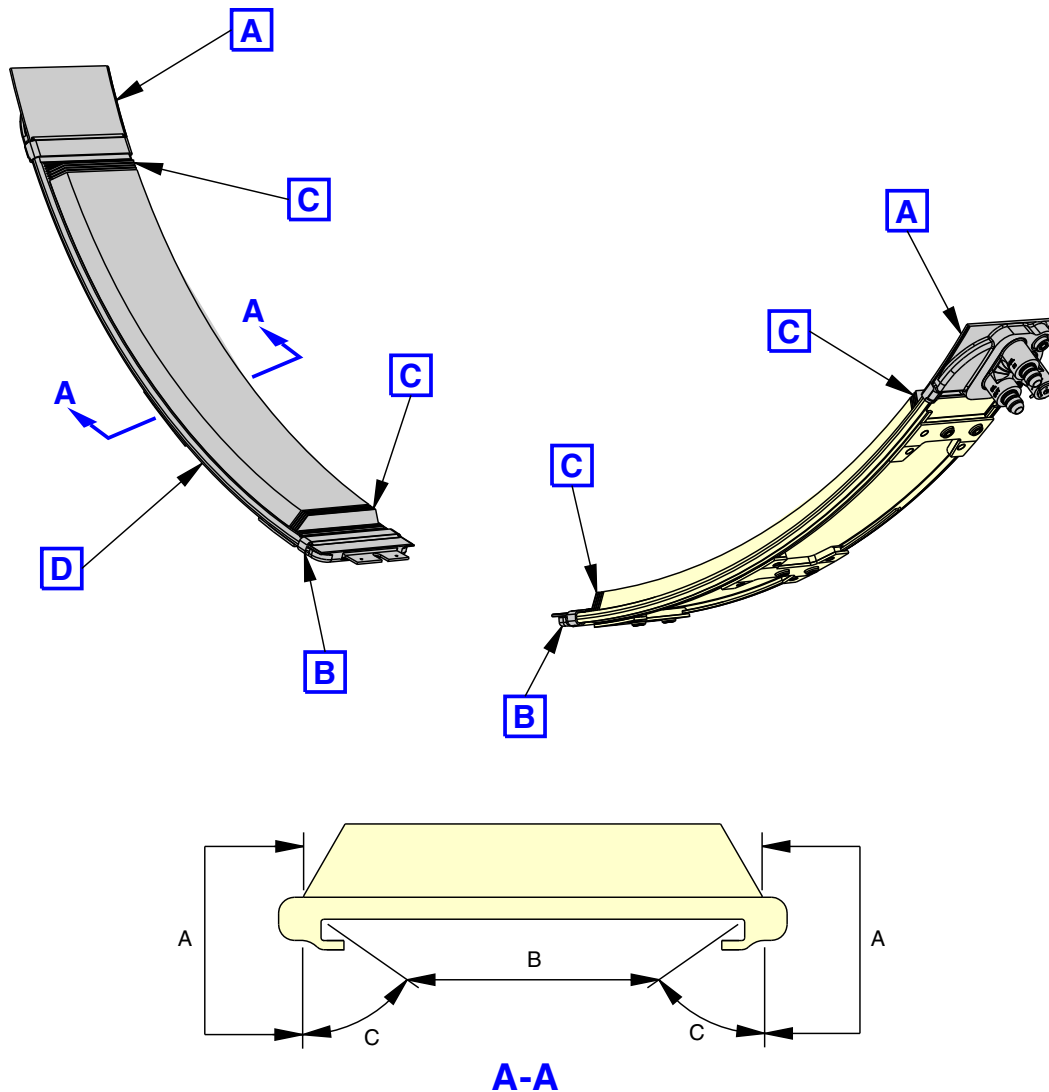
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ZONE ALLOWABLE SCRATCH/GOUGE:

ZONE A: 0.010 INCH (0.254 mm) SCRATCH/GOUGE DEPTH

ZONE B: 0.010 INCH (0.254 mm) SCRATCH/GOUGE DEPTH

ZONE C: 0.010 INCH (0.254 mm) SCRATCH/GOUGE DEPTH

NO HIGH METAL POINTS ON BOTH SIDES OF THE RAIL

NO MISSING FIN ALLOWED 0.010 INCH (0.254 mm) SCRATCH/GOUGE DEPTH ALLOWABLE ON FIN

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Integrated Drive Generator (IDG) Air/Oil Heat Exchanger Inspection
Figure 601/24-11-13-990-804 (Sheet 1 of 3)

EFFECTIVITY
SIA ALL

D633AM101-SIA

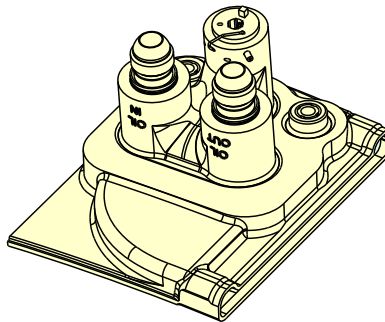
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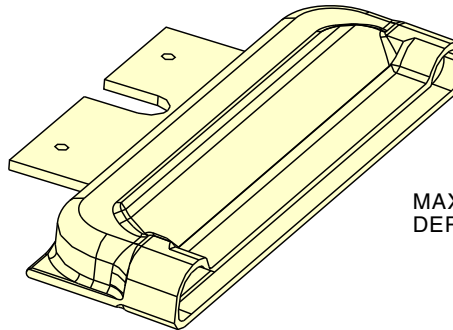
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MAXIMUM SCRATCH / GOUGE
DEPTH 0.010 INCH (0.254 mm)

ALLOWABLE SCRATCH / GOUGE DEPTH ON THE INLET / OUTLET MANIFOLDS

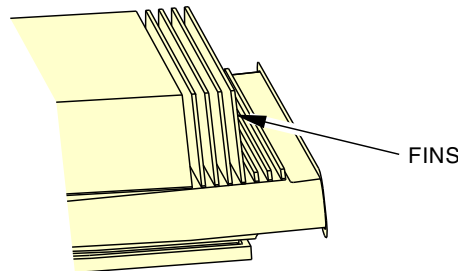
A



MAXIMUM SCRATCH / GOUGE
DEPTH 0.010 INCH (0.254 mm)

ALLOWABLE SCRATCH / GOUGE DEPTH ON THE RETURN MANIFOLDS

B



FINS

C

ICN-LEAP-1B-241113-B-F0301-A0006-A-001-01
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Integrated Drive Generator (IDG) Air/Oil Heat Exchanger Inspection
Figure 601/24-11-13-990-804 (Sheet 2 of 3)

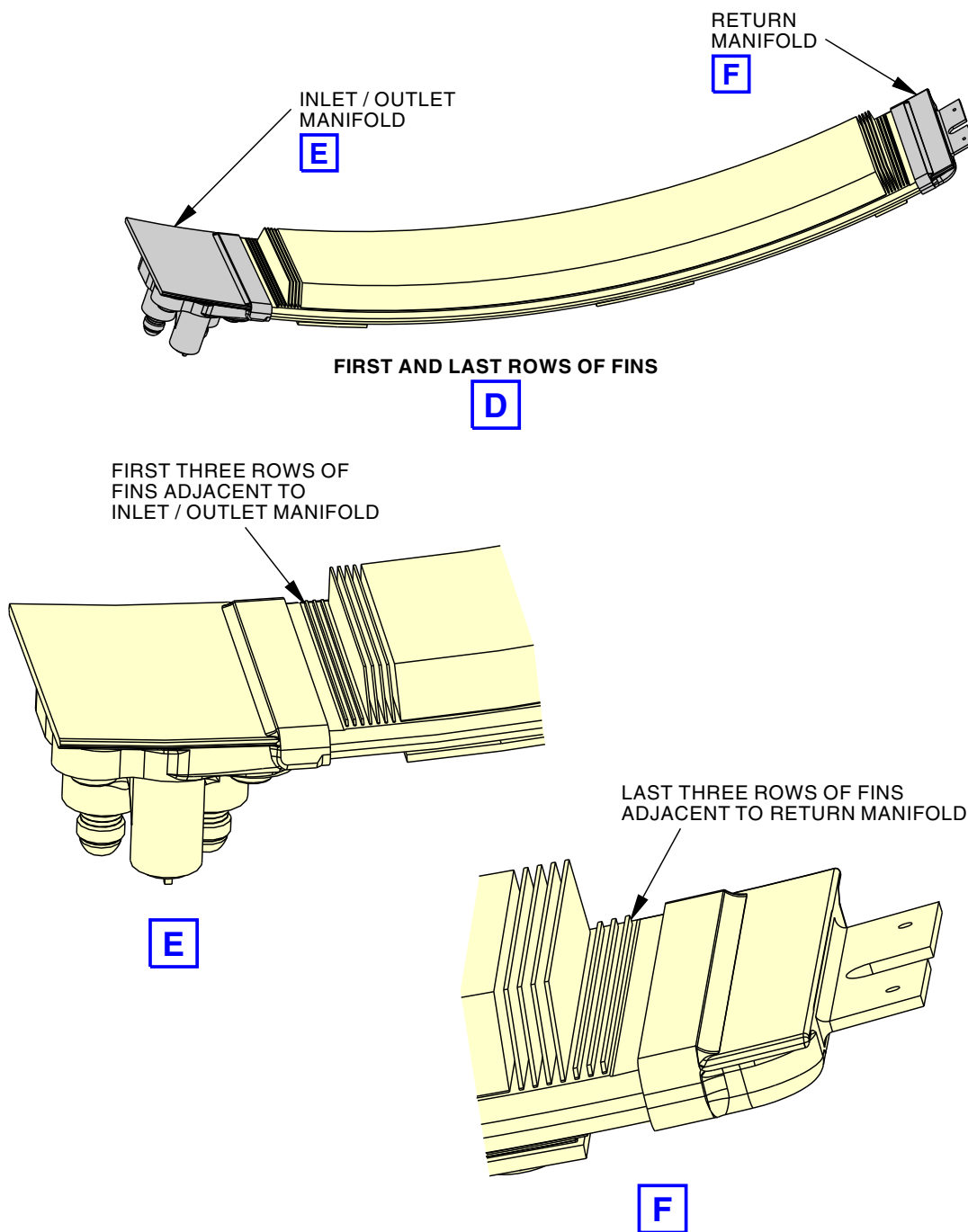
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Integrated Drive Generator (IDG) Air/Oil Heat Exchanger Inspection
Figure 601/24-11-13-990-804 (Sheet 3 of 3)

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IDG SCAVENGE/CHARGE OIL FILTER - MAINTENANCE PRACTICES

1. **General**

A. This procedure has these tasks:

- (1) A removal of the IDG scavenge and charge filter
- (2) An inspection/check of the IDG scavenge and charge filter
- (3) An installation of the IDG scavenge and charge filter.

TASK 24-11-41-000-801

2. **IDG Scavenge and Charge Filter Removal**

(Figure 201)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) Identify the filter element that came out of the scavenge cavity and the charge cavity on the Integrated Drive Generator (IDG).
- (2) If the IDG is to be replaced, put the element back into the cavity that it was removed from and install the filter cover finger tight before the IDG is sent to the repair shop.
- (3) The IDG scavenge filter and charge filter elements are the same.

B. References

Reference	Title
71-11-04-010-801-G00	Open the Fan Cowl Panels (Selection) (P/B 201)

C. Tools/Equipment

Reference	Description
STD-205	Container - Oil Resistant, 5 U.S. Gallon (19 Liter)

D. Location Zones

Zone	Area
410	Subzone - Engine 1
411	Engine 1 - Engine
420	Subzone - Engine 2
421	Engine 2 - Engine

E. Prepare for the Removal

SUBTASK 24-11-41-010-001

- (1) Do this task: Open the Fan Cowl Panels (Selection), TASK 71-11-04-010-801-G00.

F. IDG Scavenge and Charge Filter Removal

SUBTASK 24-11-41-020-001



WARNING

DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.

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(WARNING PRECEDES)



WARNING

DO NOT LET HOT OIL GET ON YOU. PUT ON CLOTHES, GOGGLES, AND OTHER EQUIPMENT FOR PROTECTION, OR LET THE ENGINE BECOME COOL. HOT OIL CAN BURN YOU.

- (1) Remove the scavenge filter or charge filter as follows:



WARNING

MAKE SURE THAT YOU PUSH THE PUSH-TO-VENT VALVE. IF YOU DO NOT DO THIS, IT CAN CAUSE HOT OIL TO SPRAY. THIS CAN CAUSE INJURY TO PERSONS.

- (a) Push the PUSH-TO-VENT VALVE on the IDG for a minimum of 15 seconds.
- (b) Remove the lockwire from the filter cover [4].
- (c) Place the oil resistant container (5 gal), STD-205, under IDG filter to catch the oil.
- (d) Remove the filter cover [4].

NOTE: Inspect the oil in the filter cover for bright metal particles before the oil is discarded.

- (e) Remove the O-ring [3] from the filter cover [4] and discard.



CAUTION

DO NOT INSTALL THE USED SCAVENGE FILTER OR CHARGE FILTER ELEMENTS. PROCEDURES TO CLEAN AND INSTALL THE USED SCAVENGE FILTER OR CHARGE FILTER ELEMENTS ARE NOT PERMITTED. IF YOU INSTALL A USED FILTER ELEMENT, DAMAGE TO THE EQUIPMENT CAN OCCUR.

- (f) Remove the element [2].
- (g) Remove the O-ring [1] from the element [2] and discard.
- (h) Do this task: IDG Scavenge and Charge Filter Inspection/Check, TASK 24-11-41-200-801.

————— **END OF TASK** —————

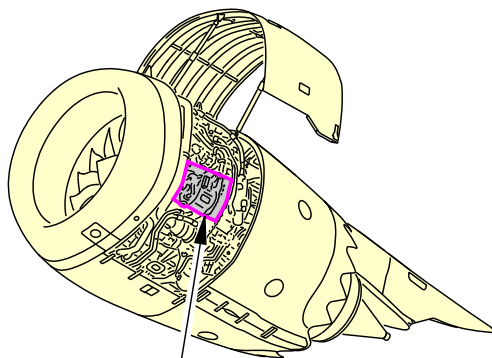
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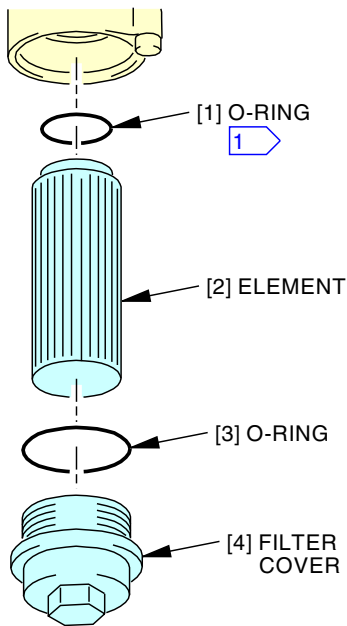
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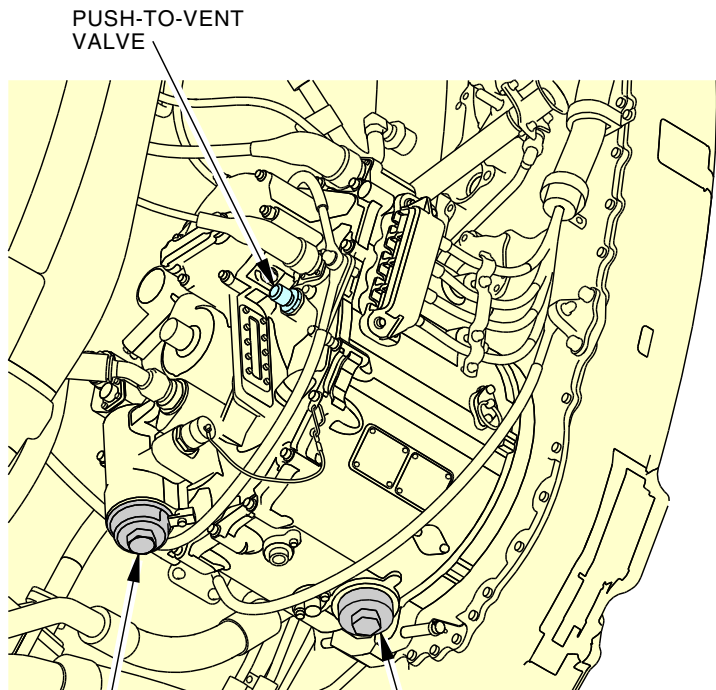


A



FILTER
(EXAMPLE)

B



PUSH-TO-VENT
VALVE

SCAVENGE
FILTER

B

CHARGE
FILTER

B



(EXAMPLE)

A

1 O-RING CAN COME INSTALLED
IN FILTER ELEMENT

2411740 S00061528896_V2

IDG Scavenge Filter and Charge Filter Installation
Figure 201/24-11-41-990-801

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TASK 24-11-41-200-801

3. **IDG Scavenge and Charge Filter Inspection/Check**

(Figure 202)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) When the differential pressure indicator (DPI) on the IDG is extended, the scavenge filter and the IDG oil must be examined.
- (2) If the scavenge filter and the IDG oil condition are not satisfactory, or the DPI Resets decal (if installed) shows it is the 4th extension, the IDG must be replaced.
- (3) If the scavenge filter and the IDG oil condition are satisfactory, and the DPI Resets decal (if installed) shows it is not the 4th extension, the DPI can be reset.

NOTE: The DPI can be reset up to three times without removing the IDG, provided:

1. The filters are removed and the filter and filter covers are examined for metal debris.
 2. No other indications of electrical power system problems are present, for example, IDG fault indication or DP (feeder) fault.
 3. The filters and oil are changed prior to resetting the DPI.
 4. The DPI is inspected every 100 hours.
 5. For any given IDG, the IDG is removed upon the discovery of the fourth DPI extension.
 6. Prior to implementation of this procedure on a new airplane, operators perform a one-time oil and filter change, at some time between 125 and 500 operating hours.
- (4) If the scavenge/charge filter and IDG oil condition are satisfactory, and the DPI Resets decal (if installed) shows it is the 1st extension, replace the DPI.

B. References

Reference	Title
12-13-21 P/B 301	INTEGRATED DRIVE GENERATOR (IDG) - SERVICING
12-13-21-600-802	IDG Oil Change (P/B 301)
24-11-11 P/B 401	INTEGRATED DRIVE GENERATOR (IDG) - REMOVAL/INSTALLATION
24-11-13 P/B 401	INTEGRATED DRIVE GENERATOR AIR/OIL HEAT EXCHANGER - REMOVAL/INSTALLATION
24-11-42-000-801	IDG Differential Pressure Indicator Removal (P/B 401)
24-11-42-400-801	IDG Differential Pressure Indicator Installation (P/B 401)

C. Tools/Equipment

Reference	Description
STD-205	Container - Oil Resistant, 5 U.S. Gallon (19 Liter)

D. Location Zones

Zone	Area
410	Subzone - Engine 1
411	Engine 1 - Engine
420	Subzone - Engine 2
421	Engine 2 - Engine

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E. Prepare for inspection/check

SUBTASK 24-11-41-010-002

- (1) If the filter is not already removed, do this task: IDG Scavenge and Charge Filter Removal, TASK 24-11-41-000-801.

SUBTASK 24-11-41-860-001

- (2) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
F	8	C01286	GENERATOR DISC 1
F	9	C01287	GENERATOR DISC 2

F. Procedure

SUBTASK 24-11-41-210-004

- (1) Do these steps to visually examine the differential pressure indicator (DPI):

NOTE: The DPI is the red button adjacent to the scavenge/charge filter on the IDG.

- (a) If the DPI is in the up position, examine the scavenge/charge filter condition, the IDG oil condition and do actions in the DPI extension table below.

NOTE: When the DPI is in the up position and if the DPI resets decal (if installed) shows it is the 4th DPI extension, the IDG must be replaced.

- 1) If the IDG was replaced, no more work is necessary.
 - 2) If the IDG was not replaced, check the DPI resets decal (if installed) on the scavenge/charge filter cover for the number of DPI resets that has been done.

NOTE: When the DPI is in the up position and if the actions in the DPI extension table does not require to replace the IDG, the DPI can be reset 3 times.

NOTE: When the DPI is set, an inspection must occur at an interval of 100 flight hours.

NOTE: After four consecutive 100 flight hour check without DPI extension, the DPI check can revert back to the normal interval.

- a) If the DPI resets decal (if installed) shows it is the fourth (4th) DPI extension, replace the IDG (INTEGRATED DRIVE GENERATOR (IDG) - REMOVAL/INSTALLATION, PAGEBLOCK 24-11-11/401).
 - b) If the DPI resets decal (if installed) shows it is not the fourth (4th) DPI extension, use a blunt tool to rub out the next number on the DPI resets decal and use finger to push the DPI red button down.
 - c) If there is no scavenge filter/charge condition and IDG oil condition, and it is the first (1st) DPI extension, do these steps:

NOTE: Table 201 shows the scavenge/charge filter condition and IDG oil condition.

<1> Do this task: IDG Differential Pressure Indicator Removal, TASK 24-11-42-000-801.

<2> Do this task: IDG Differential Pressure Indicator Installation, TASK 24-11-42-400-801.

- (b) If the button is in the down position, do these steps:

- 1) If other regular IDG service maintenance is not required, no more work is necessary.

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2) If other regular IDG service maintenance tasks are required, do those tasks.

Table 201/24-11-41-993-801 DPI EXTENSION

SCAVENGE/CHARGE FILTER CONDITION	IDG OIL CONDITION	ACTION
No visible magnetic or non-metallic particles (See NOTE for more scavenge/charge filter data) ^{*[1]}	No oil discoloration. No sign of over-heating. No chemical contamination of the oil is suspected.	1. Drain the oil in the oil resistant container (5 gal), STD-205. 2. Replace the scavenge/charge filter (IDG SCAVENGE/CHARGE OIL FILTER - MAINTENANCE PRACTICES, 24-11-41/201). 3. Service with oil (INTEGRATED DRIVE GENERATOR (IDG) - SERVICING, PAGEBLOCK 12-13-21/301).
No visible magnetic or non-metallic particles (See NOTE for more scavenge/charge filter data) ^{*[1]}	Oil discoloration, signs of overheating or chemical contamination of the oil is suspected (Hydraulic fluid and water)	1. Drain the oil in the oil resistant container (5 gal), STD-205. 2. Replace the scavenge/charge filter (IDG SCAVENGE/CHARGE OIL FILTER - MAINTENANCE PRACTICES, 24-11-41/201). 3. Service with oil (INTEGRATED DRIVE GENERATOR (IDG) - SERVICING, PAGEBLOCK 12-13-21/301). 4. Run the engine for 5 minutes to raise the temperature of the oil. 5. Drain the oil in the oil resistant container (5 gal), STD-205. 6. Replace the scavenge/charge filter (IDG SCAVENGE/CHARGE OIL FILTER - MAINTENANCE PRACTICES, 24-11-41/201). 7. Service with oil (INTEGRATED DRIVE GENERATOR (IDG) - SERVICING, PAGEBLOCK 12-13-21/301).
Visible magnetic or non-metallic particles in the scavenge/charge filter and the scavenge/charge filter is not breached. (See NOTE for more scavenge/charge filter data) ^{*[1]}	No oil discoloration. No sign of over-heating. No chemical contamination of the oil is suspected.	1. Replace the IDG (INTEGRATED DRIVE GENERATOR (IDG) - REMOVAL/INSTALLATION, PAGEBLOCK 24-11-11/401).
Visible magnetic or non-metallic particles in the scavenge/charge filter and the scavenge/charge filter is not breached. (See NOTE for more scavenge/charge filter data) ^{*[1]}	Oil discoloration, signs of overheating or chemical contamination of the oil is suspected (Hydraulic fluid and water)	1. Flush the IDG oil system (IDG Oil Change, TASK 12-13-21-600-802).

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Table 201/24-11-41-993-801 DPI EXTENSION (Continued)

SCAVENGE/CHARGE FILTER CONDITION	IDG OIL CONDITION	ACTION
Visible magnetic or non-metallic particles in the scavenge/charge filter and the scavenge/charge filter is breached. (See NOTE for more scavenge/charge filter data)* ^[1]	Oil condition is not a factor	1. Remove the IDG (INTEGRATED DRIVE GENERATOR (IDG) - REMOVAL/INSTALLATION, PAGEBLOCK 24-11-11/401). 2. Replace the IDG air/oil heat exchanger (INTEGRATED DRIVE GENERATOR AIR/OIL HEAT EXCHANGER - REMOVAL/INSTALLATION, PAGEBLOCK 24-11-13/401). 3. Replace the IDG oil heat exchanger lines (INTEGRATED DRIVE GENERATOR AIR/OIL HEAT EXCHANGER - REMOVAL/INSTALLATION, PAGEBLOCK 24-11-13/401). 4. Install the IDG (INTEGRATED DRIVE GENERATOR (IDG) - REMOVAL/INSTALLATION, PAGEBLOCK 24-11-11/401).

*[1] If the scavenge/charge filter element or filter cover shows a number of moderately scattered, small metallic flakes (bronze or silver colored metal), flakes of generator insulation, black epoxy flakes, or sleeving, do not replace the IDG. These products are normal wear during IDG operation. If the filter element shows bright metal deposits that can be clearly specified as chunks or pieces caused by breakage, or a large number of small metallic flakes (bronze or silver-colored metal), replace the IDG. These are indications of IDG internal damage. The filter is breached if the filter is damaged or missing, the O-ring is damaged or missing, or the filter cap is damaged or loose.

SUBTASK 24-11-41-860-002

(2) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	8	C01286	GENERATOR DISC 1
F	9	C01287	GENERATOR DISC 2

————— END OF TASK —————

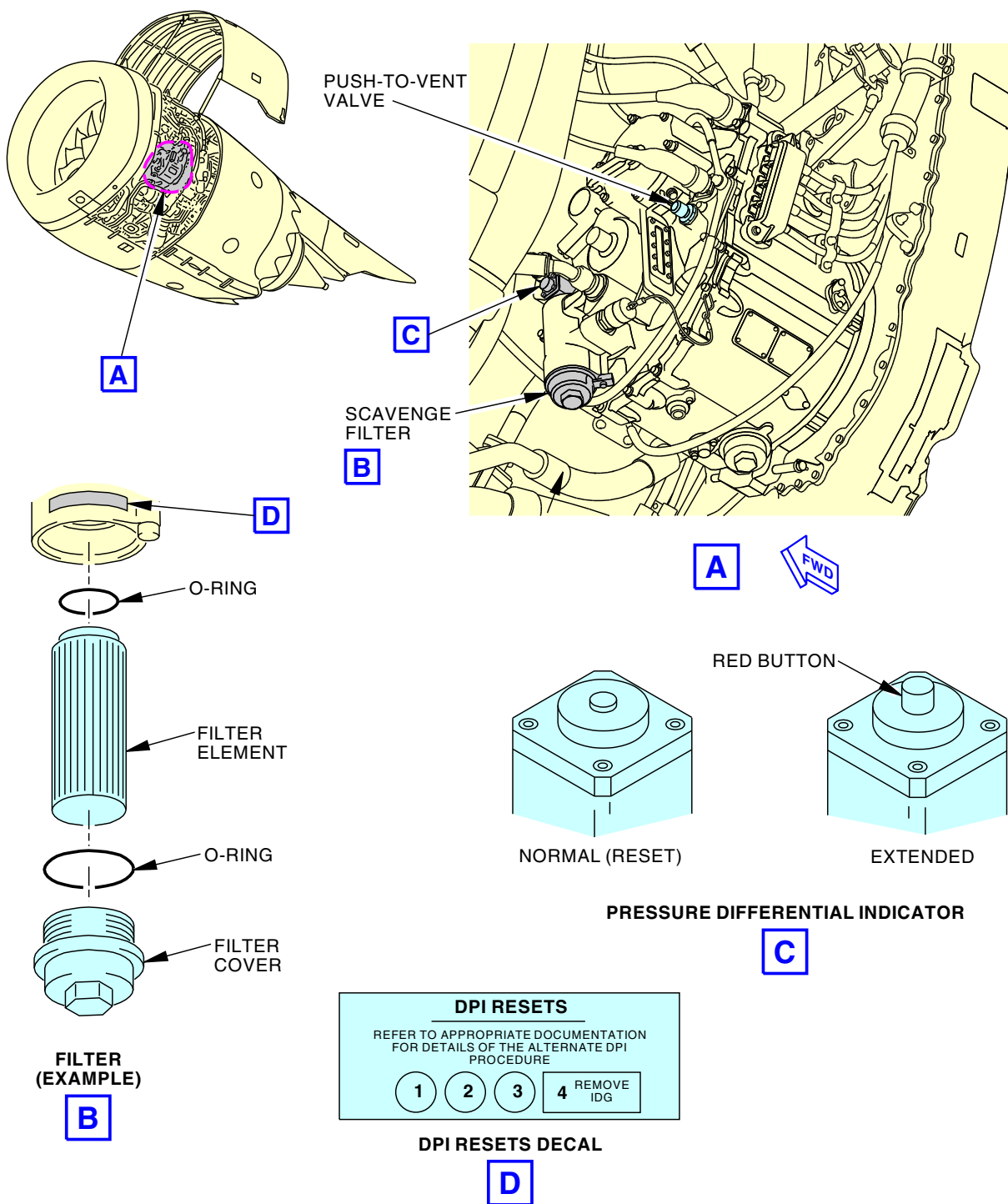
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DPI Reset Procedure
Figure 202/24-11-41-990-802

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TASK 24-11-41-400-801

4. **IDG Scavenge and Charge Filter Installation**

(Figure 201)

NOTE: This procedure is a scheduled maintenance task.

A. **General**

- (1) The Integrated Drive Generator (IDG) scavenge filter and charge filter elements are the same.
- (2) Make sure that the part numbers of the O-ring [1], element [2], and O-ring [3] are applicable to installed IDG.
- (3) Do not reinstall a used filter element, even if it looks clean. Always install a new filter element.

B. **References**

Reference	Title
12-13-21-600-801	IDG Servicing (Oil Fill) (P/B 301)
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
71-00-00-790-802-G00	Test No. 2 - Dry Motor Leak Test (P/B 501)
71-11-04-410-801-G00	Close the Fan Cowl Panels (Selection) (P/B 201)

C. **Consumable Materials**

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3
D50369	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class HTS (High Thermal Stability)
G01048	Lockwire - MS20995C32, Corrosion Resistant Steel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

D. **Expendables/Parts**

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	O-ring	24-11-41-01-025	SIA ALL
		24-11-41-01A-070	SIA ALL
2	Element	24-11-41-01-020	SIA ALL
		24-11-41-01A-065	SIA ALL
3	O-ring	24-11-41-01-015	SIA ALL
		24-11-41-01A-060	SIA ALL

E. **IDG Scavenge and Charge Filter Installation**

SUBTASK 24-11-41-420-001

- (1) Install the scavenge filter or charge filter as follows:
 - (a) Apply oil, D00071, oil, D00068, or oil, D50369, on the new O-ring [3].
 - (b) Install the O-ring [3] on the filter cover [4].
 - (c) Make sure that the O-ring [1] is on the new element [2].

NOTE: The O-ring can be pre-installed in the element.
 - (d) Apply oil, D00071, oil, D00068, or oil, D50369, on the new O-ring [1].
 - (e) Install the element [2] in the cavity on the IDG until O-ring [1] on element [2] makes a seal.

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- 1) Make sure that the element [2] is properly seated into the IDG cavity before the filter cover [4] is installed.



CAUTION

DO NOT TIGHTEN THE FILTER COVER TO PUSH THE FILTER ELEMENT INTO THE HOUSING. IF YOU DO, DAMAGE TO THE FILTER ELEMENT CAN OCCUR.

- (f) Install the filter cover [4].
- (g) Tighten the filter cover [4] to 156 in-lb (17.6 N·m) - 180 in-lb (20.3 N·m).
- (h) Install a 0.032 in. (0.813 mm) diameter MS20995C32 lockwire, G01048, onto the filter cover [4] (TASK 20-10-44-400-801).
- (i) Do this task: IDG Servicing (Oil Fill), TASK 12-13-21-600-801.
- (j) Do this task: Test No. 2 - Dry Motor Leak Test, TASK 71-00-00-790-802-G00.
- (k) Check for leaks.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 24-11-41-410-001

- (1) Do this task: Close the Fan Cowl Panels (Selection), TASK 71-11-04-410-801-G00.

————— **END OF TASK** —————

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IDG DIFFERENTIAL PRESSURE INDICATOR - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the Differential Pressure Indicator (DPI).
- (2) An installation of the DPI.

B. The DPI can be replaced for the first (1st) DPI extension with no scavenge filter or IDG oil condition.

C. The DPI is located on the IDG scavenge oil system and senses pressure upstream and downstream of the filter element.

TASK 24-11-42-000-801

2. IDG Differential Pressure Indicator Removal

(Figure 401)

A. General

- (1) This task gives the instructions to remove the Differential Pressure Indicator (DPI).

B. References

Reference	Title
71-11-04-010-801-G00	Open the Fan Cowl Panels (Selection) (P/B 201)

C. Tools/Equipment

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

Reference	Description
COM-1537	Dispenser - Servicing, Engine Oil Part #: 7011 Supplier: K6057 Part #: 7036 Supplier: K6057 Part #: BOB02 Supplier: D2029 Part #: BOB05 Supplier: D2029 Part #: BOB20 Supplier: D2029 Part #: MODEL 150 Supplier: 94861 Part #: PF53361-2PWS Supplier: 94861 Part #: PF53361-8PWS Supplier: 94861 Part #: PF53481-3P Supplier: 94861 Part #: PF53481-5PWS Supplier: 94861 Part #: PF53481-8PWS Supplier: 94861 Part #: PF55451-2WS Supplier: 94861 Part #: PF55451-7WS Supplier: 94861 Part #: WF150-1 Supplier: 94861 Opt Part #: 150-3 Supplier: 94861 Opt Part #: UZ/7/1826 Supplier: K6057 Opt Part #: WF174410 Supplier: 94861
STD-195	Container - 1 Quart, Oil/Fuel Resistant
STD-1055	Container - Oil Resistant, 5 Gallon (19 Liter)

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

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E. Prepare for the Removal

SUBTASK 24-11-42-010-001

- (1) Do this task: Open the Fan Cowl Panels (Selection), TASK 71-11-04-010-801-G00.

SUBTASK 24-11-42-780-001



DO NOT TOUCH THE COMPONENTS OF THE OIL SYSTEM IF THE ENGINE IS HOT. THESE COMPONENTS STAY HOTTER THAN OTHER COMPONENTS. HOT COMPONENTS CAN BURN YOU.



DO NOT LET HOT OIL GET ON YOU. PUT ON PROTECTIVE CLOTHES, GOGGLES, AND EQUIPMENT OR LET THE APU BECOME COOL. HOT OIL CAN BURN YOU.



DO NOT OPEN THE OIL SYSTEM UNTIL THE PRESSURE GOES TO ZERO. THE PRESSURE GOES TO ZERO APPROXIMATELY 5 MINUTES AFTER AN ENGINE STOPS. A PRESSURIZED OIL SYSTEM CAN RELEASE A SPRAY OF HOT OIL THAT CAN BURN YOU.



MAKE SURE THAT YOU PUSH THE PUSH-TO-VENT VALVE. IF YOU DO NOT DO THIS, IT COULD CAUSE HOT OIL TO SPRAY AND CAN CAUSE INJURY TO PERSONS.



DO NOT LET OIL GET ON THE ENGINE, OR OTHER COMPONENTS. IMMEDIATELY CLEAN THE AREAS THAT OIL FALLS ON. OIL CAN CAUSE DAMAGE TO PAINT AND RUBBER.

- (2) Release the Integrated Drive Generator (IDG) case pressure as follows:
- (a) Push the push-to-vent valve on the IDG for a minimum of 15 seconds to relieve the internal IDG pressure.
 - (b) If you cannot push the push-to-vent valve to release the pressure, do these steps:
 - 1) Remove the pressure fill cover from the pressure fill fitting on the IDG.
 - 2) Put a oil resistant container (5 gal)(19 Liter), STD-1055, below the pressure fill hose.
 - 3) Connect the pressure fill hose from an engine oil servicing dispenser, COM-1537, to the pressure fill fitting on the IDG.

F. IDG Differential Pressure Indicator Removal

SUBTASK 24-11-42-480-001

- (1) Put a 1 quart oil/fuel resistant container, STD-195, below the IDG to collect the oil from the DPI cavity.

SUBTASK 24-11-42-020-001

- (2) Remove the screws [2] that attach the DPI [1] to the IDG.

SUBTASK 24-11-42-020-002

- (3) Remove the DPI [1] from the IDG.
- (a) If necessary, carefully put a small screwdriver between the flange on the DPI [1] and the IDG housing.

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SUBTASK 24-11-42-020-003

- (4) Remove and discard the O-ring [3] and O-ring [4].

————— END OF TASK —————

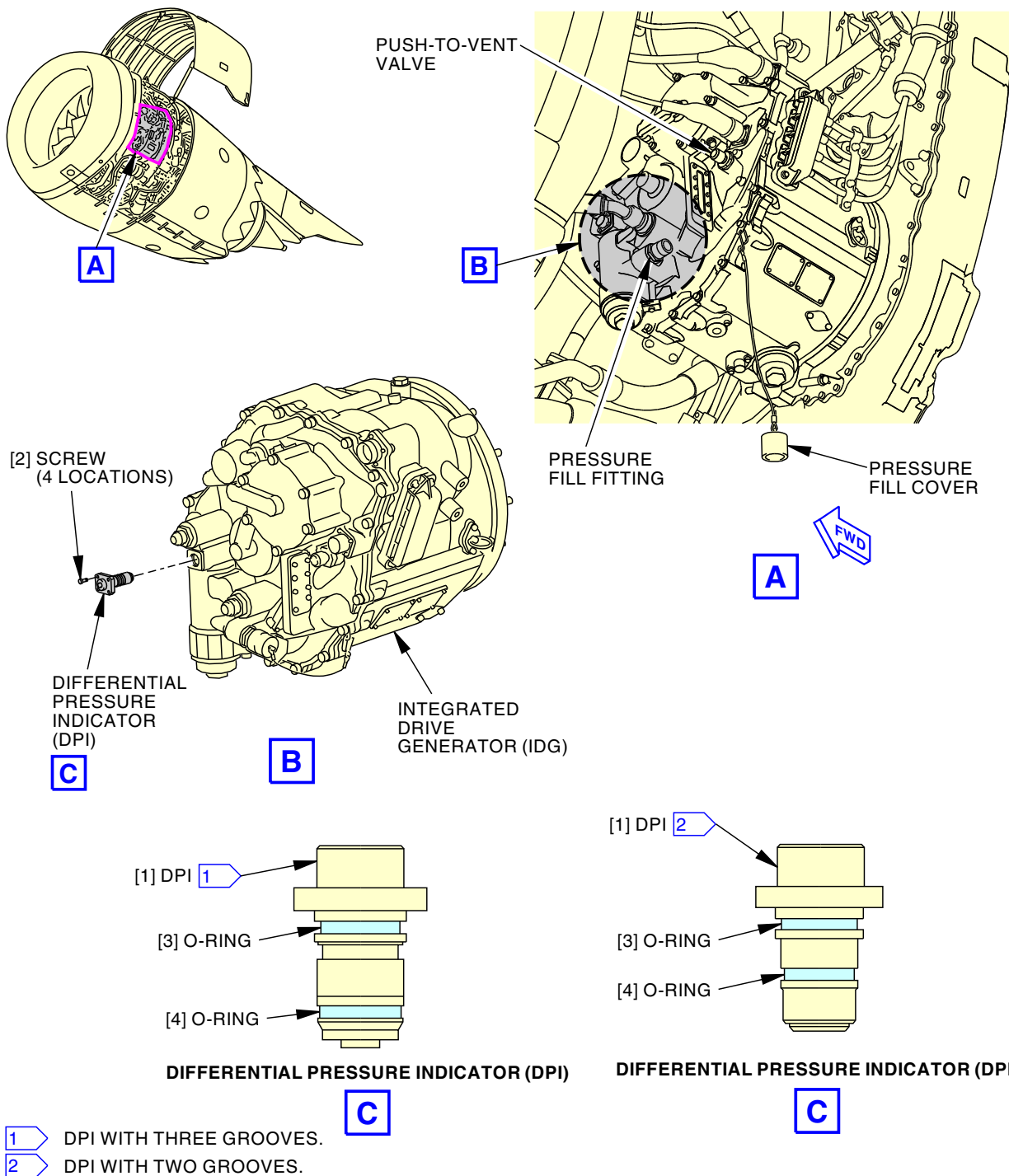
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IDG Differential Pressure Indicator Installation
Figure 401/24-11-42-990-801

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TASK 24-11-42-400-801

3. **IDG Differential Pressure Indicator Installation**

(Figure 401)

A. General

(1) This task gives the instructions to install the Differential Pressure Indicator (DPI).

B. References

Reference	Title
12-13-21-200-801	IDG Oil Level Check (P/B 301)
71-00-00-910-808-G00	Dry Motor Procedure (P/B 201)
71-11-04-410-801-G00	Close the Fan Cowl Panels (Selection) (P/B 201)

C. Tools/Equipment

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

Reference	Description
COM-23626	Bullet Part #: AGE13207 Supplier: 99167

D. Consumable Materials

Reference	Description	Specification
D00068	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class STD (Standard)
D00071	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-7808 Grade 3
D50369	Oil - Aircraft Turbine Engine, Synthetic Base	MIL-PRF-23699 Class HTS (High Thermal Stability)

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	DPI	24-11-11-05-130	SIA ALL
		24-11-11-05A-160	SIA ALL
3	O-ring	24-11-11-05-140	SIA ALL
		24-11-11-05A-170	SIA ALL
4	O-ring	24-11-11-05-145	SIA ALL
		24-11-11-05A-175	SIA ALL

F. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

G. IDG Differential Pressure Indicator Installation

SUBTASK 24-11-42-640-001

(1) Lubricate the new O-ring [3] and new O-ring [4] with oil, D00071, oil, D00068, or oil, D50369.

SUBTASK 24-11-42-420-001

(2) Install the O-ring [3] and O-ring [4] in the top and bottom grooves of the DPI [1] as follows:

(a) If the DPI [1] has three grooves, do not install the O-ring in the middle groove.

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- (b) Use a bullet, COM-23626, to install the O-ring [3].
- (c) Install the O-ring [4] with your hand.

SUBTASK 24-11-42-420-002

- (3) Install the DPI [1] in the position on the Integrated Drive Generator (IDG).

SUBTASK 24-11-42-420-003

- (4) Install the screws [2] to attach the DPI [1] to the IDG.
 - (a) Tighten the screws [2] to 7.5 in-lb (0.85 N·m) - 8 in-lb (0.90 N·m).

SUBTASK 24-11-42-610-001

- (5) Do this task: IDG Oil Level Check, TASK 12-13-21-200-801.

SUBTASK 24-11-42-860-001

- (6) Do this task: Dry Motor Procedure, TASK 71-00-00-910-808-G00.

SUBTASK 24-11-42-790-001

- (7) Wait for five minutes while the oil level becomes stable.

SUBTASK 24-11-42-790-002

- (8) Do a check for oil leaks around the DPI [1].

H. Put the Airplane Back to Its Usual Condition

SUBTASK 24-11-42-410-001

- (1) Do this task: Close the Fan Cowl Panels (Selection), TASK 71-11-04-410-801-G00.

———— **END OF TASK** ————

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QUICK ATTACH/DETACH (QAD) ADAPTER - REMOVAL/INSTALLATION

1. **General**

- A. This procedure has two tasks:
- (1) Quick Attach/Detach (QAD) Adapter Removal
 - (2) Quick Attach/Detach (QAD) Adapter Installation.

TASK 24-11-61-000-801

2. **Quick Attach/Detach (QAD) Adapter Removal**

(Figure 401)

A. **General**

- (1) This task removes the QAD adapter from the engine accessory gearbox. You must remove the IDG before you can remove the QAD adapter.

B. **References**

Reference	Title
24-11-11-000-801	Integrated Drive Generator (IDG) Removal (P/B 401)
71-11-04-010-801-G00	Open the Fan Cowl Panels (Selection) (P/B 201)

C. **Tools/Equipment**

Reference	Description
STD-3906	Mallet - Rubber

D. **Location Zones**

Zone	Area
410	Subzone - Engine 1
413	Engine 1 - Fan Cowl, Left
420	Subzone - Engine 2
423	Engine 2 - Fan Cowl, Left

E. **Prepare for the Removal**

SUBTASK 24-11-61-010-001

- (1) Do this task: Open the Fan Cowl Panels (Selection), TASK 71-11-04-010-801-G00.

SUBTASK 24-11-61-010-002

- (2) If the IDG is installed, do this task: Integrated Drive Generator (IDG) Removal, TASK 24-11-11-000-801.

F. **Quick Attach/Detach (QAD) Adapter Removal**

SUBTASK 24-11-61-020-001

- (1) Do the following steps to remove the QAD adapter [1]:
 - (a) Remove the twelve screws [3] that attach the QAD adapter [1] to the gearbox mount pad.
 - (b) Pull the QAD adapter [1] away from the pad.

NOTE: If the QAD adapter does not release easily from the pad, lightly tap it with a rubber mallet, STD-3906.
 - (c) Remove the QAD adapter [1].
 - (d) Remove and discard the gasket [2].

————— **END OF TASK** —————

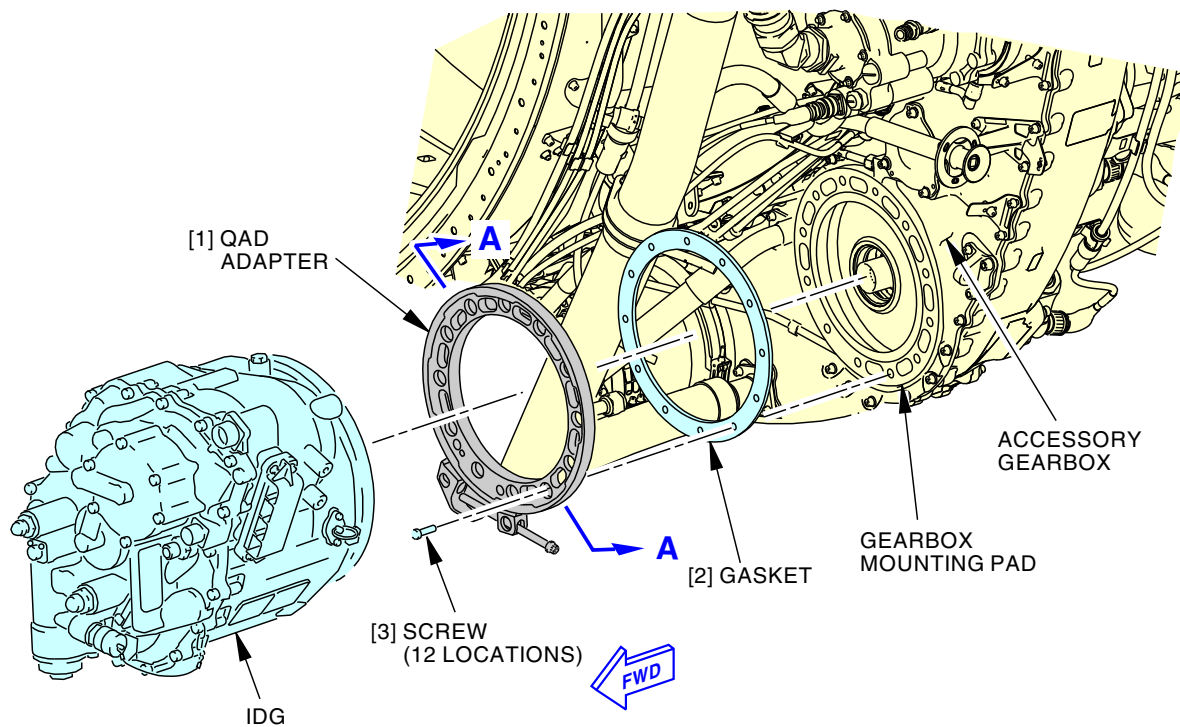
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Quick Attach/Detach Adapter Installation
Figure 401/24-11-61-990-801 (Sheet 1 of 2)

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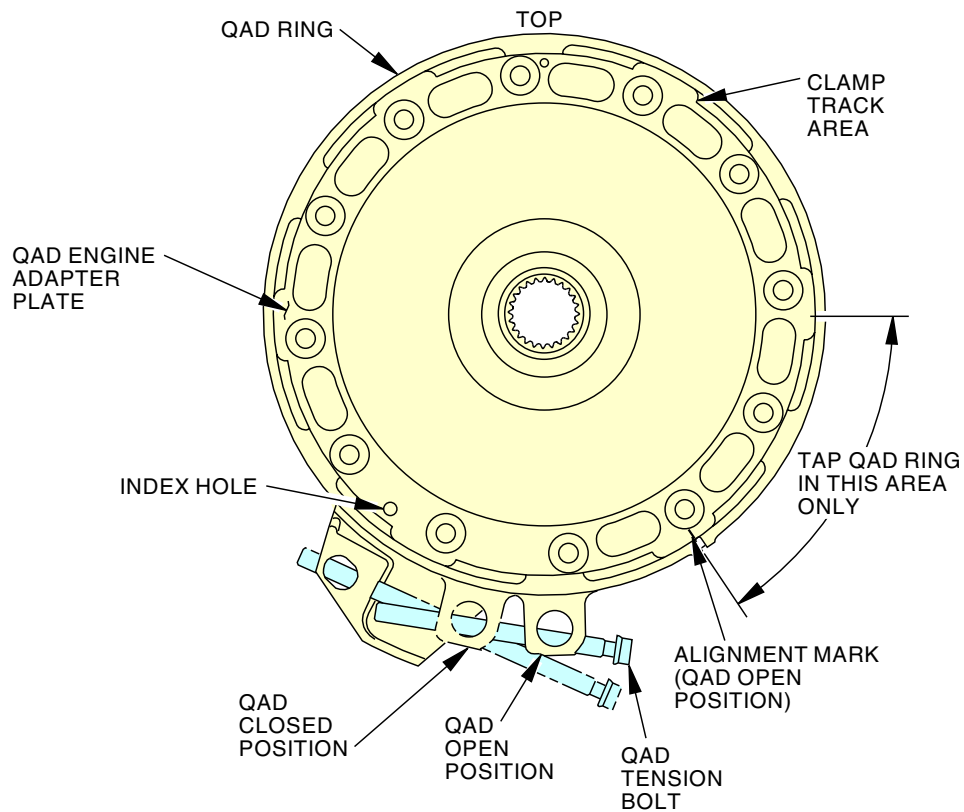
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A-A

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Quick Attach/Detach Adapter Installation
Figure 401/24-11-61-990-801 (Sheet 2 of 2)

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TASK 24-11-61-400-801

3. **Quick Attach/Detach (QAD) Adapter Installation**

(Figure 401)

A. General

- (1) This task installs the QAD adapter to the engine accessory gearbox.

B. References

Reference	Title
24-11-11-400-801	Integrated Drive Generator (IDG) Installation (P/B 401)
71-11-04-410-801-G00	Close the Fan Cowl Panels (Selection) (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT	
D00254	Compound - Silicone	SAE AS8660 (NATO S-736) (Supersedes MIL-S-8660)

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	QAD adapter	24-11-61-01-015	SIA ALL
2	Gasket	24-11-61-01-025	SIA ALL

E. Location Zones

Zone	Area
410	Subzone - Engine 1
413	Engine 1 - Fan Cowl, Left
420	Subzone - Engine 2
423	Engine 2 - Fan Cowl, Left

F. Prepare for the Installation

SUBTASK 24-11-61-210-001

- (1) Visually examine the mating surfaces of the QAD adapter and the gearbox mounting pad.

NOTE: The surfaces must be smooth and clean.

G. Quick Attach/Detach (QAD) Adapter Installation

SUBTASK 24-11-61-420-001

- (1) Install the QAD adapter [1] per the steps that follow:



CAUTION

KEEP GREASE OUT OF THE DOWEL PIN HOLES AND SCREW HOLES. IF THERE IS GREASE IN THE HOLES, IT CAN CAUSE TOO MUCH PRESSURE ON THE GEARBOX WHEN YOU INSTALL THE SCREWS. THE PRESSURE CAN CAUSE DAMAGE TO THE GEARBOX.

- (a) Apply a light coat of silicone compound, D00254 to the QAD flange and gearbox pad where they contact the gasket [2].
- (b) Position the new gasket [2] on the side of the QAD adapter that mates up with the gearbox pad.
- (c) Make sure the hole pattern of the gasket [2] aligns with the hole pattern of the QAD adapter [1].

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- (d) Apply a thin layer of Never-Seez NSBT compound, D00006, to the twelve flathead screws [3].
- (e) Position the QAD adapter [1] to the gearbox mounting pad.
- (f) Make sure that the QAD coupling is in the correct position (Figure 401).
- (g) Install the twelve flathead screws [3].
- (h) Tighten the screws [3] to 288 ± 8 in-lb (33 ± 1 N·m).

SUBTASK 24-11-61-410-001

- (2) Do this task: Integrated Drive Generator (IDG) Installation, TASK 24-11-11-400-801.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 24-11-61-410-002

- (1) Do this task: Close the Fan Cowl Panels (Selection), TASK 71-11-04-410-801-G00.

———— **END OF TASK** ————

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QUICK ATTACH/DETACH (QAD) ADAPTER - INSPECTION/CHECK

1. General

A. This procedure has this task:

- (1) A check of the Quick Attach/Detach (QAD) adapter torque.

TASK 24-11-61-200-801

2. QAD Adapter Torque Check

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. **General**

- (1) This procedure does a check of the torque on the Quick Attach/Detach (QAD) tension bolt with the Integrated Drive Generator (IDG) installed.

B. **References**

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
24-11-61-000-801	Quick Attach/Detach (QAD) Adapter Removal (P/B 401)
24-11-61-400-801	Quick Attach/Detach (QAD) Adapter Installation (P/B 401)
71-11-04-010-801-G00	Open the Fan Cowl Panels (Selection) (P/B 201)
71-11-04-410-801-G00	Close the Fan Cowl Panels (Selection) (P/B 201)

C. **Consumable Materials**

Reference	Description	Specification
G01912	Lockwire - MS20995NC32, Monel - 0.032 Inch (0.8128 mm) Diameter	NASM20995

D. **Location Zones**

Zone	Area
410	Subzone - Engine 1
413	Engine 1 - Fan Cowl, Left
420	Subzone - Engine 2
423	Engine 2 - Fan Cowl, Left

E. **Prepare for the Torque Check**

SUBTASK 24-11-61-010-003

- (1) Do this task: Open the Fan Cowl Panels (Selection), TASK 71-11-04-010-801-G00.

F. **QAD Adapter Torque Check**

SUBTASK 24-11-61-200-001

- (1) Do the steps that follow to check the torque of the QAD adapter tension bolt:
 - (a) Remove the lockwire from the tension bolt on the QAD adapter.
 - (b) Tap the QAD in the special area with a soft mallet or brass drift to prevent an incorrect torque value (Figure 601).

SUBTASK 24-11-61-200-002

- (2) Do a check of the torque value of the QAD tension bolt.
 - (a) If the torque is less than 180 in-lb (20 N·m), then do these steps:
 - 1) Tighten the QAD tension bolt to 240 in-lb (27 N·m) - 264 in-lb (30 N·m).

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- 2) Repeat tapping and torquing to 240 in-lb (27 N·m) - 264 in-lb (30 N·m) until the torque of the QAD tension bolt does not drop below 180 in-lb (20 N·m) after tapping on the QAD.
- 3) Tighten the QAD tension bolt to 240 in-lb (27 N·m) - 264 in-lb (30 N·m).
- (b) If first check of the torque of the QAD tension bolt is above 180 in-lb (20 N·m), then do these steps:
 - 1) Tap on the QAD ring in the special area with a soft mallet or brass drift to prevent an incorrect torque value (Figure 601).
 - 2) Check of the torque value of the QAD tension bolt again.
- (c) If second check of the torque is above 180 in-lb (20 N·m), then do this step:
 - 1) Tighten the QAD tension bolt to 240 in-lb (27 N·m) - 264 in-lb (30 N·m).

SUBTASK 24-11-61-200-004

- (3) Measure the distance between the center of the nuts on the QAD tension bolt.
 - (a) If the distance is less than 1.75 in. (4.44 cm), replace the QAD.
 - Quick Attach/Detach (QAD) Adapter Removal, TASK 24-11-61-000-801
 - Quick Attach/Detach (QAD) Adapter Installation, TASK 24-11-61-400-801.

SUBTASK 24-11-61-400-001

- (4) Install a 0.032 in. (0.813 mm) diameter MS20995NC32 lockwire, G01912, on QAD tension bolt (TASK 20-10-44-400-801).

G. Put the Airplane Back to Its Usual Condition

SUBTASK 24-11-61-410-003

- (1) Do this task: Close the Fan Cowl Panels (Selection), TASK 71-11-04-410-801-G00.

— END OF TASK —

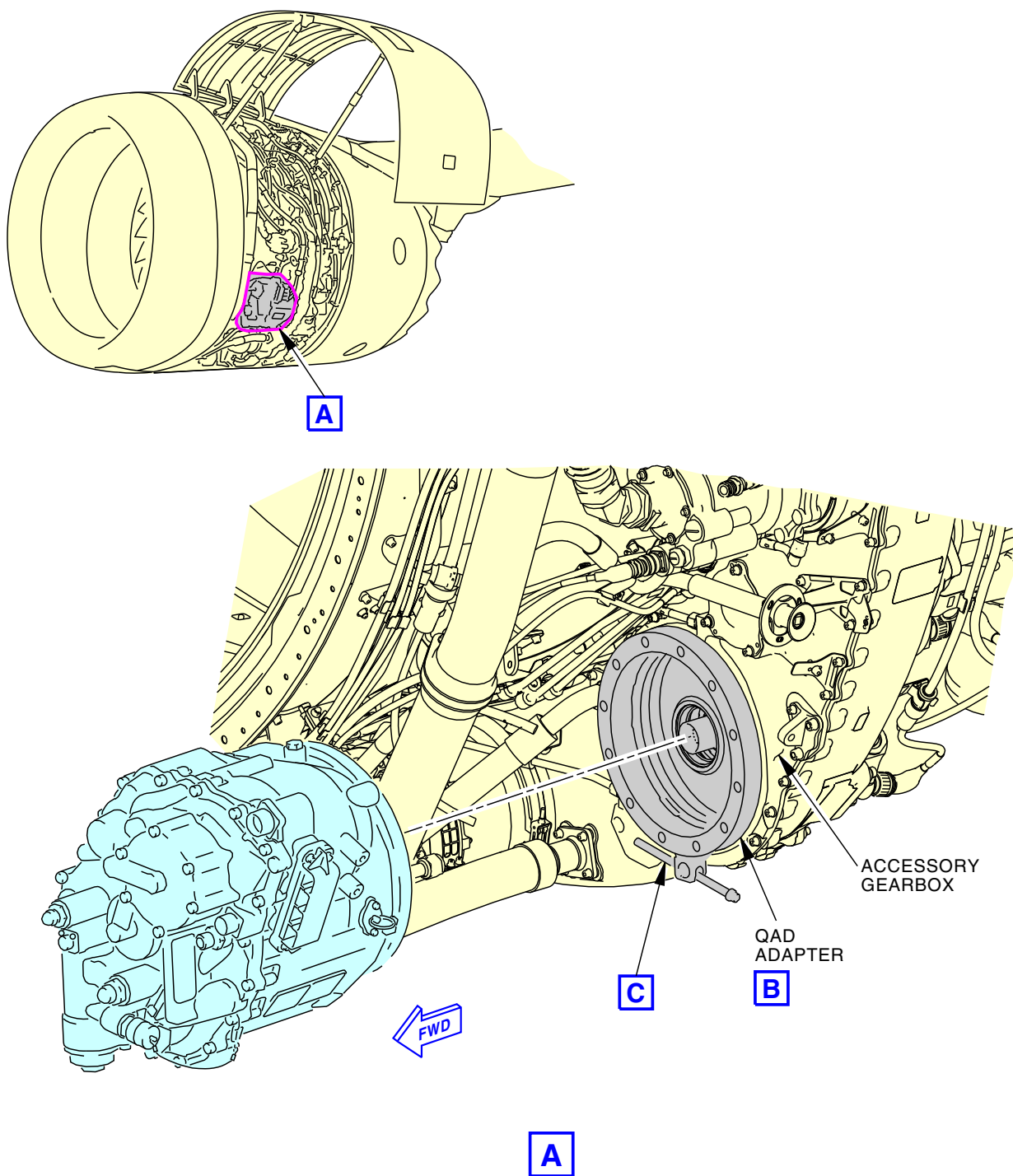
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Quick Attach/Detach Adapter Inspection
Figure 601/24-11-61-990-802 (Sheet 1 of 2)

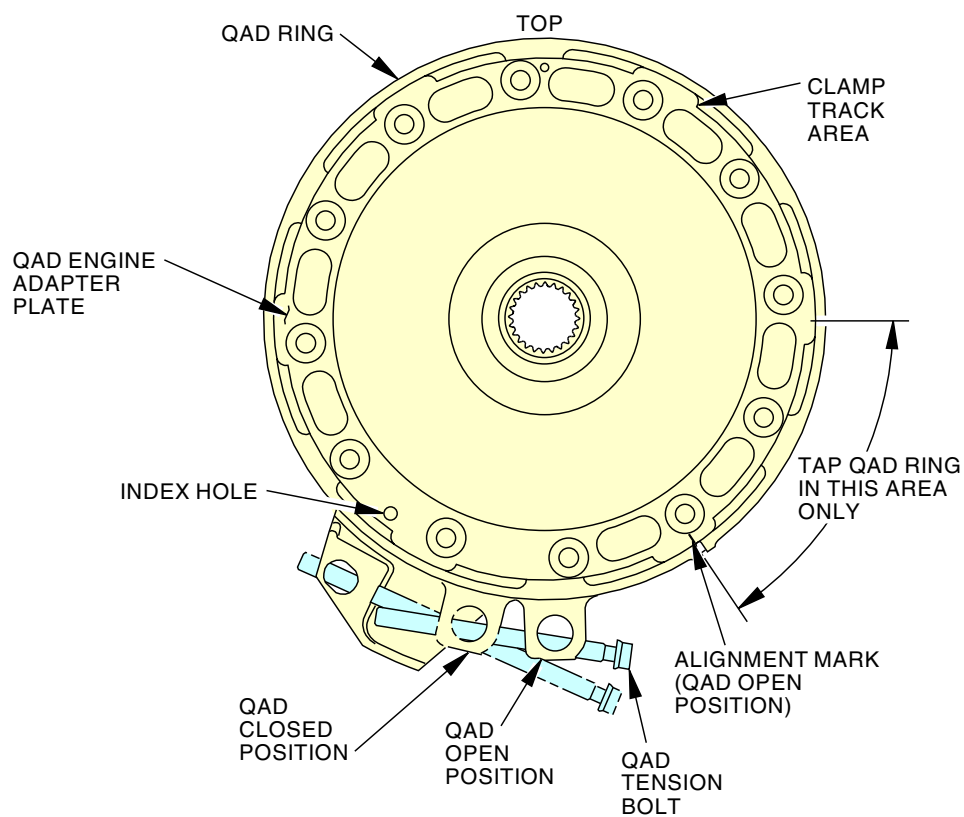
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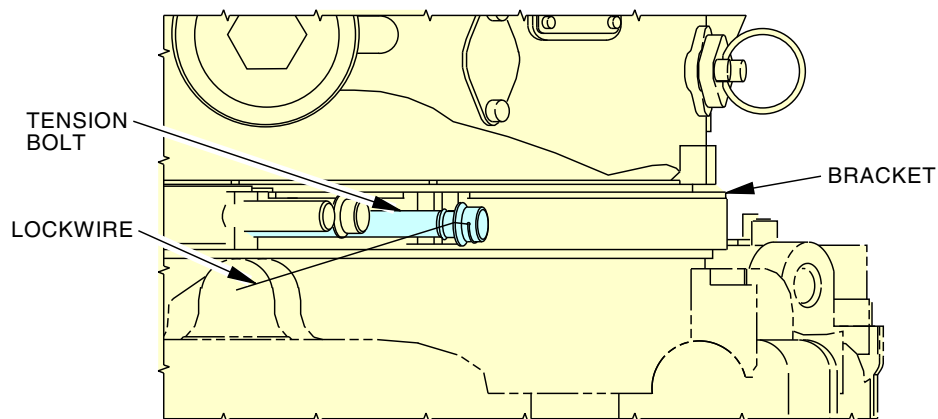
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B



TENSION BOLT WITH LOCKWIRE

C

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Quick Attach/Detach Adapter Inspection
Figure 601/24-11-61-990-802 (Sheet 2 of 2)

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IDG TERMINAL BLOCK - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
- (1) IDG Terminal Block Removal
 - (2) IDG Terminal Block Installation.

TASK 24-11-62-000-801

2. IDG Terminal Block Removal

(Figure 401)

A. **General**

- (1) This task includes the steps to remove the IDG terminal block.

B. **References**

Reference	Title
71-11-04-010-801-G00	Open the Fan Cowl Panels (Selection) (P/B 201)

C. **Location Zones**

Zone	Area
410	Subzone - Engine 1
420	Subzone - Engine 2

D. **Prepare for the Removal**

SUBTASK 24-11-62-860-001

- (1) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
F	10	C01283	GENERATOR CONT UNIT 1
F	11	C01284	GENERATOR CONT UNIT 2

NOTE: No corrective action is necessary if the following maintenance messages display: AUX BAT CHGR INOP or BAT CHGR INOP. These maintenance messages are nuisance faults that will display when only battery power is supplied to the airplane.

SUBTASK 24-11-62-010-001

- (2) Do this task: Open the Fan Cowl Panels (Selection), TASK 71-11-04-010-801-G00.

E. **IDG Terminal Block Removal**

SUBTASK 24-11-62-000-001

- (1) Do these steps to remove the terminal block [9] from the IDG [1]:
 - (a) Remove the screws [2] and washers [3] to remove the terminal block cover [4].
 - (b) Remove the captive washer nuts [5] from the power feeder leads.
 - (c) Remove the power feeder leads from the terminal block [9].

NOTE: Place identification tags on the power feeder leads before removing, if necessary.
 - (d) Remove the screws [6] and washers [7] that hold the terminal block [9] to the IDG [1].
 - (e) Remove the terminal block [9] by sliding it to the input end of the IDG [1] to remove it from the through leads.

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- (f) Remove the square washers [8] from the terminal block [9].

NOTE: The square washers are installed between the through lead straps and the terminal block.

———— **END OF TASK** ————

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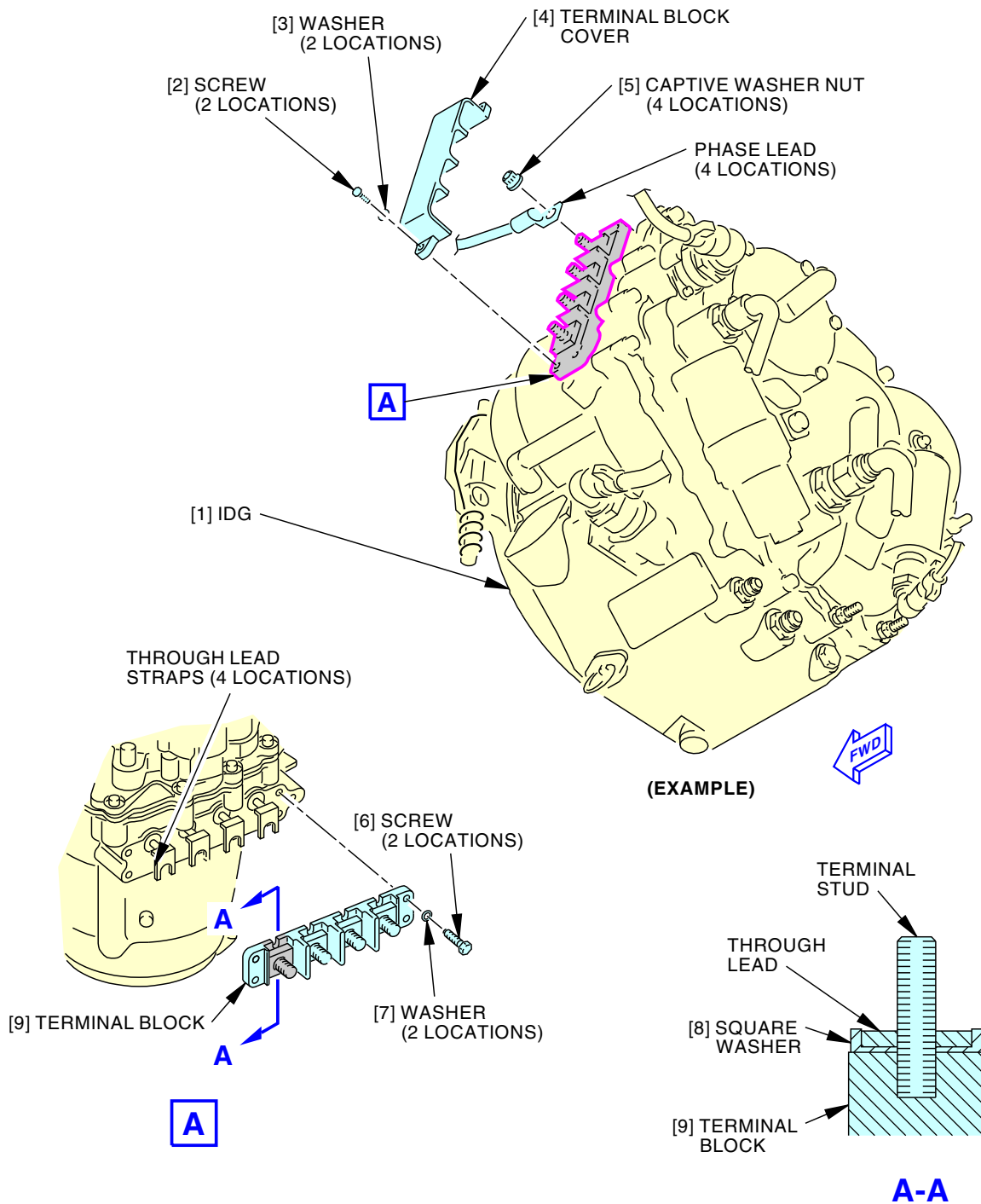
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IDG Terminal Block Installation
Figure 401/24-11-62-990-801

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TASK 24-11-62-400-801

3. **IDG Terminal Block Installation**

(Figure 401)

A. General

- (1) This task includes the steps to install the IDG terminal block.

B. References

Reference	Title
24-11-11 P/B 401	INTEGRATED DRIVE GENERATOR (IDG) - REMOVAL/INSTALLATION
24-22-00-860-807	Supply IDG Power (P/B 201)
71-11-04-410-801-G00	Close the Fan Cowl Panels (Selection) (P/B 201)

C. Location Zones

Zone	Area
410	Subzone - Engine 1
420	Subzone - Engine 2

D. Prepare for the Installation

SUBTASK 24-11-62-860-002

- (1) Make sure that these circuit breakers are open and have safety tags:

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
F	10	C01283	GENERATOR CONT UNIT 1
F	11	C01284	GENERATOR CONT UNIT 2

NOTE: No corrective action is necessary if the following maintenance messages display: AUX BAT CHGR INOP or BAT CHGR INOP. These maintenance messages are nuisance faults that will display when only battery power is supplied to the airplane.

SUBTASK 24-11-62-910-001

- (2) Use a dry clean cloth to wipe any oil or debris from the surface of IDG [1] where terminal block mates with the IDG [1].

E. IDG Terminal Block Installation

SUBTASK 24-11-62-400-001

- (1) Do these steps to install the terminal block [9] on the IDG [1]:
- (a) Install the square washer [8] on each of the four studs of the terminal block [9].



CAUTION

MAKE SURE THAT THE WASHERS ARE INSTALLED IN THE CORRECT LOCATIONS. INCORRECT INSTALLATION OF THE WASHERS CAN CAUSE DAMAGE TO THE EQUIPMENT.

- (b) Position the terminal block [9] on the IDG [1] with the four square washers [8] under the through lead straps.
- 1) Make sure that the square washers [8] are under the through lead straps (View A-A, Figure 401).
- 2) Make sure that the through lead straps are between the raised edges of the square washers [8].
- (c) Install the screws [6] and washers [7] that hold the terminal block [9] to the IDG [1].

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- 1) Tighten the screws [6] to 20 in-lb (2 N·m) - 22 in-lb (2 N·m).



CAUTION

MAKE SURE THAT YOU CONNECT THE GENERATOR WIRES TO THE CORRECT TERMINAL STUDS ON THE IDG. AN INCORRECT INSTALLATION CAN CAUSE DAMAGE TO ELECTRICAL EQUIPMENT.

- (d) Install the power feeder leads on the correct terminal studs of the terminal block [9].
 - 1) Install the captive washer nuts [5].
 - a) Tighten the captive washer nuts [5] to 144 in-lb (16 N·m) - 168 in-lb (19 N·m).

NOTE: For the 6-point Spiralock nut, the nut should have no resistance while it spins down the terminal stud. If resistance is felt, do a check for galling on the stud. If galling is found, the terminal block should be replaced.
- (e) Attach the terminal block cover [4] to the IDG [1] with the screws [2] and washers [3] (PAGEBLOCK 24-11-11/401).
 - 1) Make sure that the cover is correctly aligned with the power feeder leads.
 - 2) Make sure that the cover orientation is correct.
 - a) Make sure that the terminal plug and the terminal block cover [4] do not touch.
 - b) Make sure that the terminal block cover [4] is installed correctly.

NOTE: The cover can accidentally be installed incorrectly by 180 degrees.
 - 3) Tighten the screws [2] to 20 in-lb (2 N·m) - 22 in-lb (2 N·m).

F. Put the Airplane Back to Its Usual Condition

SUBTASK 24-11-62-410-001

- (1) Do this task: Close the Fan Cowl Panels (Selection), TASK 71-11-04-410-801-G00.

SUBTASK 24-11-62-860-003

- (2) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	10	C01283	GENERATOR CONT UNIT 1
F	11	C01284	GENERATOR CONT UNIT 2

NOTE: No corrective action is necessary if the following maintenance messages display: AUX BAT CHGR INOP or BAT CHGR INOP. These maintenance messages are nuisance faults that will display when only battery power is supplied to the airplane.

G. IDG Terminal Block Installation Test

SUBTASK 24-11-62-700-001

- (1) For the applicable IDG, do this task: Supply IDG Power, TASK 24-22-00-860-807.

————— **END OF TASK** —————

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AIRCRAFT MAINTENANCE MANUAL

W100 ENGINE WIRING HARNESS

1. **General**

A. This procedure has two tasks:

- (1) A removal of the W100 EDP and IDG Engine Wiring Harness
- (2) An installation of the W100 EDP and IDG Engine Wiring Harness.

TASK 24-11-63-000-801

2. **W100 EDP and IDG Engine Wiring Harness Removal**

(Figure 401)

A. **General**

- (1) This task gives the instructions on how to remove the engine wiring harness (W100).

B. **References**

Reference	Title
70-00-01-910-803-G00	Electrical Connector Disconnection and Connection (P/B 201)
71-11-04-010-801-G00	Open the Fan Cowl Panels (Selection) (P/B 201)
78-31-00-010-801-G00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-040-801-G00	Thrust Reverser Deactivation For Ground Maintenance (P/B 201)

C. **Tools/Equipment**

Reference	Description
STD-664	Pliers - Teflon-jawed (or Equivalent Soft-Jawed)
STD-858	Tag - DO NOT OPERATE

D. **Location Zones**

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. **Access Panels**

Number	Name/Location
413	Left Fan Cowl, Engine 1
414	Right Fan Cowl, Engine 1
415	Left Thrust Reverser, Engine 1
416	Right Thrust Reverser, Engine 1
423	Left Fan Cowl, Engine 2
424	Right Fan Cowl, Engine 2
425	Left Thrust Reverser, Engine 2
426	Right Thrust Reverser, Engine 2

F. **Prepare for the Removal**

SUBTASK 24-11-63-860-005

- (1) Do these steps to make sure that the ENGINE START switch and the START LEVER switch are not operated:
 - (a) Make sure that the applicable ENGINE START switch, on the P5 overhead panel, is in the AUTO or OFF position.
 - 1) Put a DO NOT OPERATE tag, STD-858, on the applicable ENGINE START switch.

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- (b) Make sure that the applicable START LEVER switch, on the P10 control stand, is in the CUTOFF position.
- 1) Put a DO NOT OPERATE tag, STD-858, on the applicable START LEVER switch.

SUBTASK 24-11-63-860-006

- (2) Open these applicable circuit breakers and install safety tags:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C04008	ENGINE 1 ALTN PWR CHAN B
A	5	C04007	ENGINE 1 ALTN PWR CHAN A
B	3	C01312	ENGINE 1 RUN/PWR

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	5	C01313	ENGINE 2 RUN/PWR
D	7	C04010	ENGINE 2 ALTN PWR CHAN B
D	8	C04009	ENGINE 2 ALTN PWR CHAN A

F/O Electrical System Panel, P6-5

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	3	C04018	ENG 1 STBY ALTN PWR RELAY CHAN A
E	4	C04019	ENG 1 STBY ALTN PWR CHAN A

SUBTASK 24-11-63-860-007

- (3) For the left engine, open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	8	C01103	ENGINE 1 START VALVE

SUBTASK 24-11-63-860-008

- (4) For the right engine, open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	4	C00154	ENGINE 2 START VALVE

SUBTASK 24-11-63-860-012

- (5) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	17	C04001	HYD SYS ENG PUMP DEPRESS VALVE 2
B	15	C04000	HYD SYS ENG PUMP DEPRESS VALVE 1

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	10	C01283	GENERATOR CONT UNIT 1
F	11	C01284	GENERATOR CONT UNIT 2

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SUBTASK 24-11-63-010-001

- (6) Do these tasks in sequence to safely open the left and right thrust reversers on the applicable engine:



WARNING

DO THE DEACTIVATION PROCEDURE FOR THE THRUST REVERSER TO PREVENT THE OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (a) Do this task: Thrust Reverser Deactivation For Ground Maintenance, TASK 78-31-00-040-801-G00.
- (b) Open the applicable left or right fan cowl panels (TASK 71-11-04-010-801-G00).
- 1) Open these access panels:
- | <u>Number</u> | <u>Name/Location</u> |
|---------------|--------------------------|
| 413 | Left Fan Cowl, Engine 1 |
| 414 | Right Fan Cowl, Engine 1 |
| 423 | Left Fan Cowl, Engine 2 |
| 424 | Right Fan Cowl, Engine 2 |



WARNING

OBEY THE INSTRUCTIONS IN THE PROCEDURE TO OPEN THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (c) Open the applicable left or right thrust reversers (TASK 78-31-00-010-801-G00).
- 1) Open these access panels:
- | <u>Number</u> | <u>Name/Location</u> |
|---------------|---------------------------------|
| 415 | Left Thrust Reverser, Engine 1 |
| 416 | Right Thrust Reverser, Engine 1 |
| 425 | Left Thrust Reverser, Engine 2 |
| 426 | Right Thrust Reverser, Engine 2 |

G. W100 EDP and IDG Engine Wiring Harness Removal

SUBTASK 24-11-63-020-001



CAUTION

MAKE SURE THAT THE ELECTRICAL CONNECTORS ARE CLEAN BEFORE YOU DISCONNECT OR CONNECT THEM. CONTAMINATION OF ELECTRICAL CONNECTORS CAN CAUSE DAMAGE TO EQUIPMENT.



CAUTION

USE TEFLON-JAWED PLIERS TO LOOSEN ELECTRICAL CONNECTORS. DO NOT USE METAL-JAWED PLIERS. DAMAGE TO THE ELECTRICAL CONNECTORS COULD OCCUR.

- (1) Remove the engine wiring harness (W100) [1] as follows:
- (a) Use the teflon-jawed pliers, STD-664, to disconnect the engine wiring harness (W100) [1] as follows (TASK 70-00-01-910-803-G00):
- 1) Disconnect the POS 2 DP100 connector [2] from the W100 channel receptacle.
 - 2) Disconnect the DP104 connector [3] from the EDP receptacle.
 - 3) Disconnect the DP101 connector [4] from the IDG-J1 receptacle.

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- 4) Disconnect the DP103 connector [5] from the IDG-J2 receptacle.
- (b) Remove the bolt [6] and loop clamp [7] that attach the engine wiring harness (W100) [1] to the bracket assembly.
- (c) Remove the clip nut [8] from the bracket assembly.
- (d) Remove the engine wiring harness (W100) [1] from the 11 spring clips [9] along its routing.
- (e) Carefully remove the engine wiring harness (W100) [1] from the engine.
- (f) Install the protective covers on all of the harness connectors and the component receptacles.

———— **END OF TASK** ————

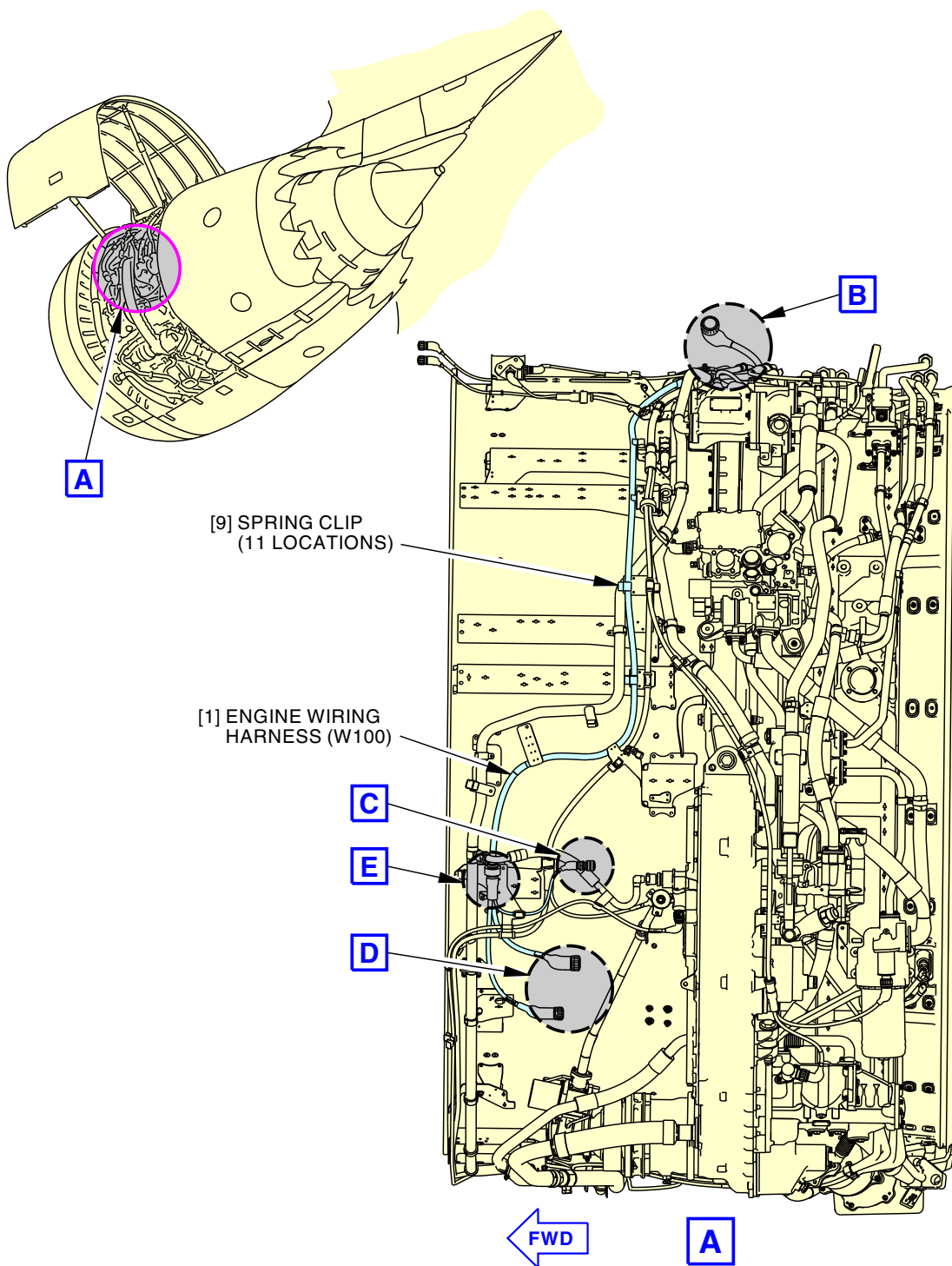
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W100 EDP and IDG Engine Wiring Harness Installation
Figure 401/24-11-63-990-801 (Sheet 1 of 3)

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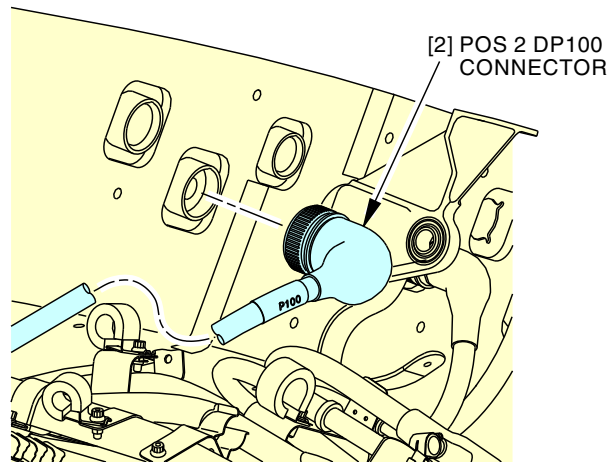
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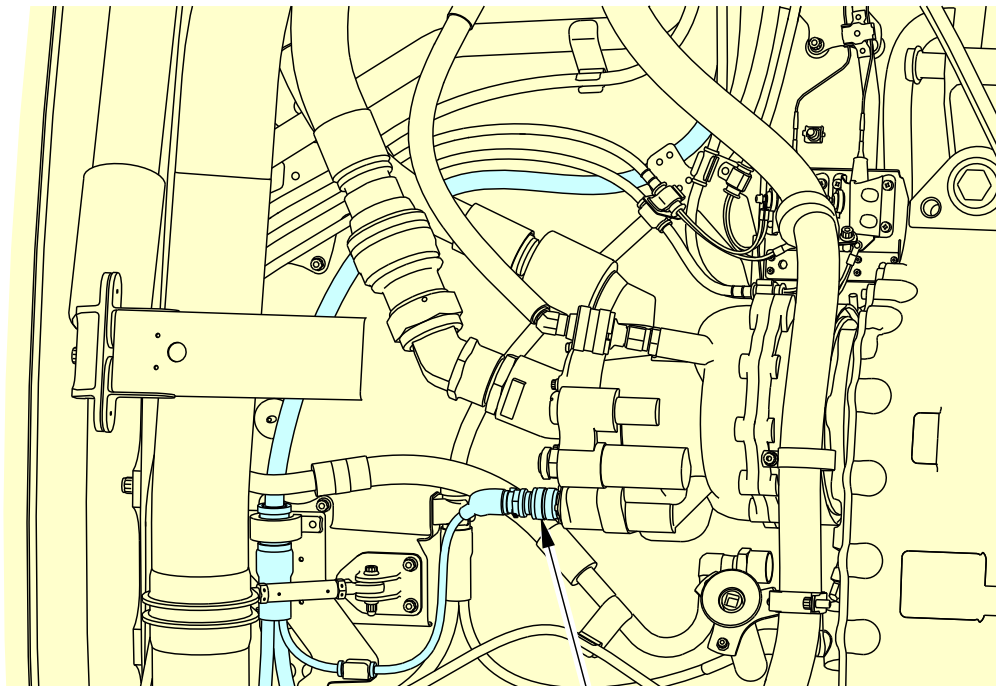
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B



C

[3] DP104 CONNECTOR

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W100 EDP and IDG Engine Wiring Harness Installation
Figure 401/24-11-63-990-801 (Sheet 2 of 3)

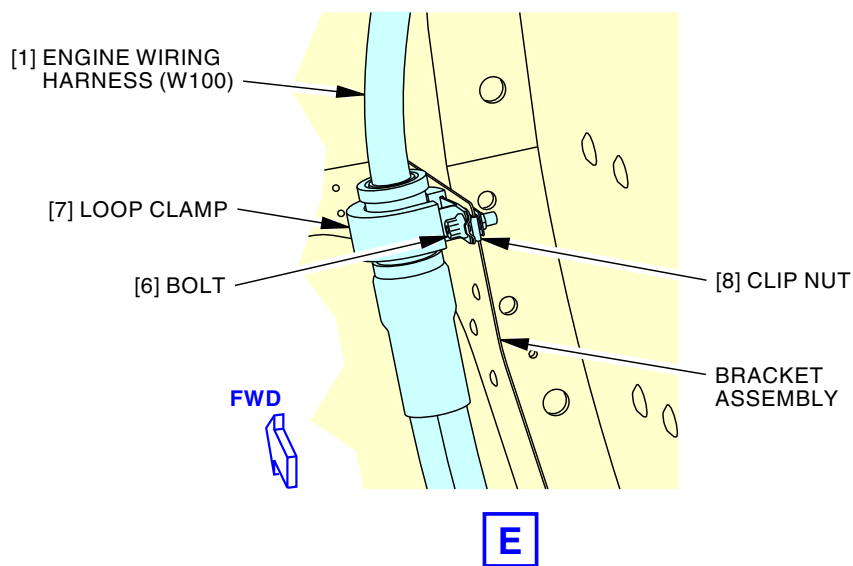
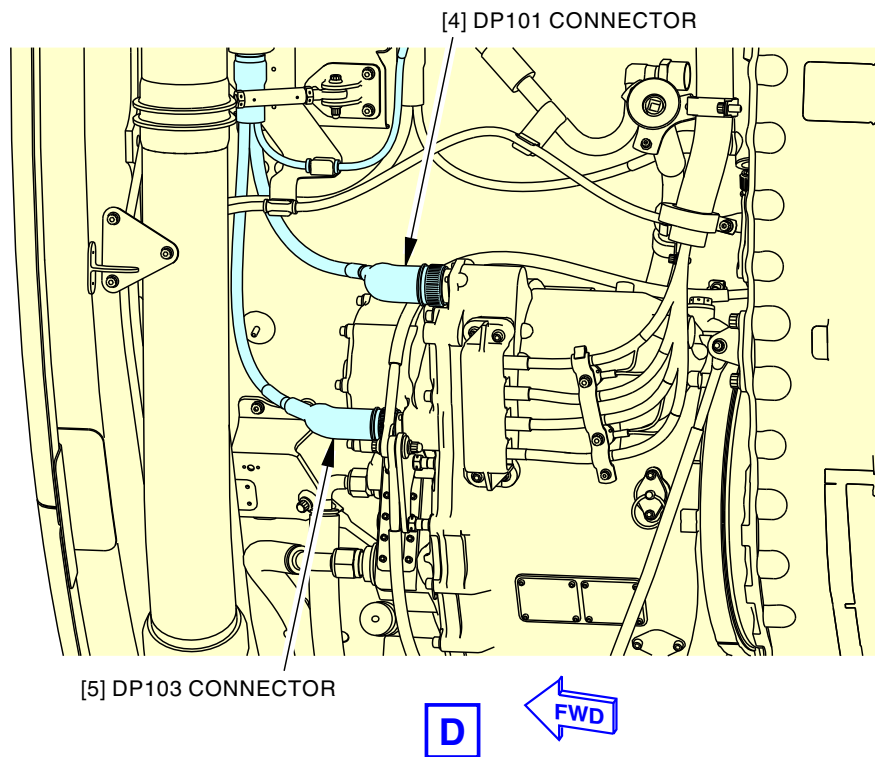
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W100 EDP and IDG Engine Wiring Harness Installation
Figure 401/24-11-63-990-801 (Sheet 3 of 3)

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TASK 24-11-63-400-801

3. **W100 EDP and IDG Engine Wiring Harness Installation**

(Figure 401)

A. General

(1) This task gives the instructions on how to install the engine wiring harness (W100).

B. References

Reference	Title
70-00-01-910-803-G00	Electrical Connector Disconnection and Connection (P/B 201)
71-00-00-800-804-G00	Power Plant Test Reference Table (P/B 501)
71-11-04-410-801-G00	Close the Fan Cowl Panels (Selection) (P/B 201)
78-31-00-010-802-G00	Close the Thrust Reverser (Selection) (P/B 201)
78-31-00-440-801-G00	Thrust Reverser Activation After Ground Maintenance (P/B 201)

C. Tools/Equipment

Reference	Description
STD-664	Pliers - Teflon-jawed (or Equivalent Soft-Jawed)
STD-858	Tag - DO NOT OPERATE

D. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine

E. Access Panels

Number	Name/Location
413	Left Fan Cowl, Engine 1
414	Right Fan Cowl, Engine 1
415	Left Thrust Reverser, Engine 1
416	Right Thrust Reverser, Engine 1
423	Left Fan Cowl, Engine 2
424	Right Fan Cowl, Engine 2
425	Left Thrust Reverser, Engine 2
426	Right Thrust Reverser, Engine 2

F. W100 EDP and IDG Engine Wiring Harness Installation

SUBTASK 24-11-63-410-001



MAKE SURE THAT THE ELECTRICAL CONNECTORS AND RECEPTACLES ARE CLEAN AND CLEAR OF UNWANTED MATERIALS BEFORE YOU DISCONNECT, OR CONNECT THEM. CONTAMINATION OF THE ELECTRICAL CONNECTORS AND RECEPTACLES CAN CAUSE DAMAGE TO EQUIPMENT.



USE PLIERS THAT HAVE TEFLON JAWS TO TIGHTEN THE ELECTRICAL CONNECTORS. DO NOT USE PLIERS THAT HAVE METAL JAWS. METAL JAWS CAN CAUSE DAMAGE TO THE ELECTRICAL CONNECTORS.

(1) Install the engine wiring harness (W100) [1] as follows:

(a) Make sure that the mating faces are clean and free of unwanted materials.

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- (b) Remove the protective covers on the connectors and receptacles.
- (c) Install the engine wiring harness (W100) [1] in the correct position with the 11 spring clips [9] along its routing.
 - 1) Do not turn or pull the engine wiring harness (W100) [1].
- (d) Make sure that the engine wiring harness (W100) [1] is not stressed or twisted.
- (e) Put the clip nut [8] on the bracket assembly.
- (f) Attach the engine wiring harness (W100) [1] to the bracket assembly with the loop clamp [7] and the bolt [6].
 - 1) Tighten the bolt [6] with hand.
- (g) Make sure that the engine wiring harness (W100) [1] is not stressed or twisted.
- (h) Tighten the bolt [6] to 42 in-lb (4.75 N·m) - 46 in-lb (5.20 N·m).



CAUTION

MAKE SURE THAT THE ELECTRICAL CONNECTORS AND RECEPTACLES ARE CLEAN AND CLEAR OF UNWANTED MATERIALS BEFORE YOU DISCONNECT, OR CONNECT THEM. CONTAMINATION OF THE ELECTRICAL CONNECTORS AND RECEPTACLES CAN CAUSE DAMAGE TO EQUIPMENT.



CAUTION

USE PLIERS THAT HAVE TEFLON JAWS TO TIGHTEN THE ELECTRICAL CONNECTORS. DO NOT USE PLIERS THAT HAVE METAL JAWS. METAL JAWS CAN CAUSE DAMAGE TO THE ELECTRICAL CONNECTORS.

- (i) Use the teflon-jawed pliers, STD-664, to connect the engine wiring harness (W100) [1] as follows (TASK 70-00-01-910-803-G00):
 - 1) Connect the POS 2 DP100 connector [2] to the channel W100 receptacle.
 - 2) Connect the DP104 connector [3] to the EDP receptacle.
 - 3) Connect the DP101 connector [4] to the IDG-J1 receptacle.
 - 4) Connect the DP103 connector [5] to the IDG-J2 receptacle.
- (j) Make sure that the work area is clean of all tools and other items.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 24-11-63-410-002



WARNING

OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSERS. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (1) Do these tasks in sequence to safely close the applicable left or right thrust reversers:
 - (a) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-802-G00.
 - 1) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
415	Left Thrust Reverser, Engine 1
416	Right Thrust Reverser, Engine 1
425	Left Thrust Reverser, Engine 2
426	Right Thrust Reverser, Engine 2
 - (b) Do this task: Close the Fan Cowl Panels (Selection), TASK 71-11-04-410-801-G00.

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- 1) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
413	Left Fan Cowl, Engine 1
414	Right Fan Cowl, Engine 1
423	Left Fan Cowl, Engine 2
424	Right Fan Cowl, Engine 2

- (c) Do this task: Thrust Reverser Activation After Ground Maintenance, TASK 78-31-00-440-801-G00.

SUBTASK 24-11-63-860-001

- (2) Remove the safety tags and close these circuit breakers:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C04008	ENGINE 1 ALTN PWR CHAN B
A	5	C04007	ENGINE 1 ALTN PWR CHAN A
B	3	C01312	ENGINE 1 RUN/PWR

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	5	C01313	ENGINE 2 RUN/PWR
D	7	C04010	ENGINE 2 ALTN PWR CHAN B
D	8	C04009	ENGINE 2 ALTN PWR CHAN A

F/O Electrical System Panel, P6-5

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	3	C04018	ENG 1 STBY ALTN PWR RELAY CHAN A
E	4	C04019	ENG 1 STBY ALTN PWR CHAN A

SUBTASK 24-11-63-860-002

- (3) For the left engine, remove the safety tag and close this circuit breaker:

CAPT Electrical System Panel, P18-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	8	C01103	ENGINE 1 START VALVE

SUBTASK 24-11-63-860-003

- (4) For the right engine, remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	4	C00154	ENGINE 2 START VALVE

SUBTASK 24-11-63-860-011

- (5) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-2

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	17	C04001	HYD SYS ENG PUMP DEPRESS VALVE 2
B	15	C04000	HYD SYS ENG PUMP DEPRESS VALVE 1

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F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	10	C01283	GENERATOR CONT UNIT 1
F	11	C01284	GENERATOR CONT UNIT 2

SUBTASK 24-11-63-860-004

- (6) Do these steps to remove the DO NOT OPERATE tags, STD-858, from the applicable ENGINE START switch and START LEVER switch:
- (a) On the P5 overhead panel, remove the DO NOT OPERATE tag, STD-858, from the applicable ENGINE START switch.
 - (b) On the P10 control stand, remove the DO NOT OPERATE tag, STD-858, from the applicable START LEVER switch.

SUBTASK 24-11-63-730-001

- (7) Do the test(s) that are given in the Power Plant Test Reference Table (TASK 71-00-00-800-804-G00).

———— **END OF TASK** ————

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AC GENERATION SYSTEM - MAINTENANCE PRACTICES

1. General

A. This procedure has two tasks:

NOTE: Deactivation and Activation procedures are for the Generator Control Unit (GCU) and Electric Control Panels, P91 and P92.

- (1) AC Generation and Load System Deactivation
- (2) AC Generation and Load System Activation.

TASK 24-21-00-040-801

2. AC Generation and Load System - Deactivation

(Figure 201)

A. **General**

- (1) This task has these procedures:
 - (a) Remove external power from the ground service buses
 - (b) Remove external power from the 115V AC transfer buses.

B. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. **Location Zones**

Zone	Area
116	Nose Landing Gear Wheel Well - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

D. **Access Panels**

Number	Name/Location
117A	Electronic Equipment Access Door

E. **Procedure**

SUBTASK 24-21-00-010-001

- (1) Do these steps to remove external power from the ground service buses:
 - (a) Push the GROUND SERVICE switch on the FWD ATTENDANT panel, P13.
 - 1) Make sure that the light in the GROUND SERVICE switch goes off.
 - (b) Remove power from the external power cable.
 - (c) Make sure that these lights on the P19 panel go off:
 - 1) EXTERNAL PWR CONN
 - 2) EXTERNAL PWR NOT IN USE



WARNING

REMOVE ELECTRICAL POWER FROM THE EXTERNAL POWER SOURCE. IF YOU DO NOT REMOVE ELECTRICAL POWER, YOU CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (d) Remove the external power cable.
- (e) Close the External Power Receptacle Door.

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SUBTASK 24-21-00-010-002

- (2) Do these steps to remove external power from the 115V AC transfer buses:
 - (a) Set the GRD PWR switch on the P5-4 panel to the OFF position.
 - (b) Make sure that the GRD PWR AVAILABLE light on the P5-4 stays on.
 - (c) Make sure that these lights on the P5-4 panel come on:
 - 1) 1 SOURCE OFF
 - 2) 2 SOURCE OFF
 - 3) 1 TRANSFER BUS OFF
 - 4) 2 TRANSFER BUS OFF
 - (d) Make sure that the EXTERNAL POWER NOT IN USE light on the P19 panel comes on.
 - (e) Remove power from the external power cable.
 - (f) Make sure that the EXTERNAL POWER CONN light on the P19 panel goes off.



WARNING

REMOVE ELECTRICAL POWER FROM THE EXTERNAL POWER SOURCE. IF YOU DO NOT REMOVE ELECTRICAL POWER, YOU CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (g) Remove the external power cable.
- (h) Make sure that the EXTERNAL POWER NOT IN USE light on the P19 panel goes off.
- (i) Close the External Power Receptacle Door.

SUBTASK 24-21-00-480-001



WARNING

PUT A DO-NOT-OPERATE TAG ON THE EXTERNAL POWER RECEPTACLE. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS CAN OCCUR.

- (3) Attach a DO NOT OPERATE tag, STD-858 to the external power receptacle.

F. AC Generation and Load System - Tryout

NOTE: This tryout is to make sure that the AC Generation and Load system is in a zero energy state.

SUBTASK 24-21-00-211-001

- (1) Make sure that the External Power Plug is removed from the receptacle and a DO NOT OPERATE tag, STD-858 is installed.

SUBTASK 24-21-00-010-003

- (2) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

SUBTASK 24-21-00-211-002

- (3) Make sure that the power warning lights are off on the power distribution panels (P91, P92)

————— **END OF TASK** —————

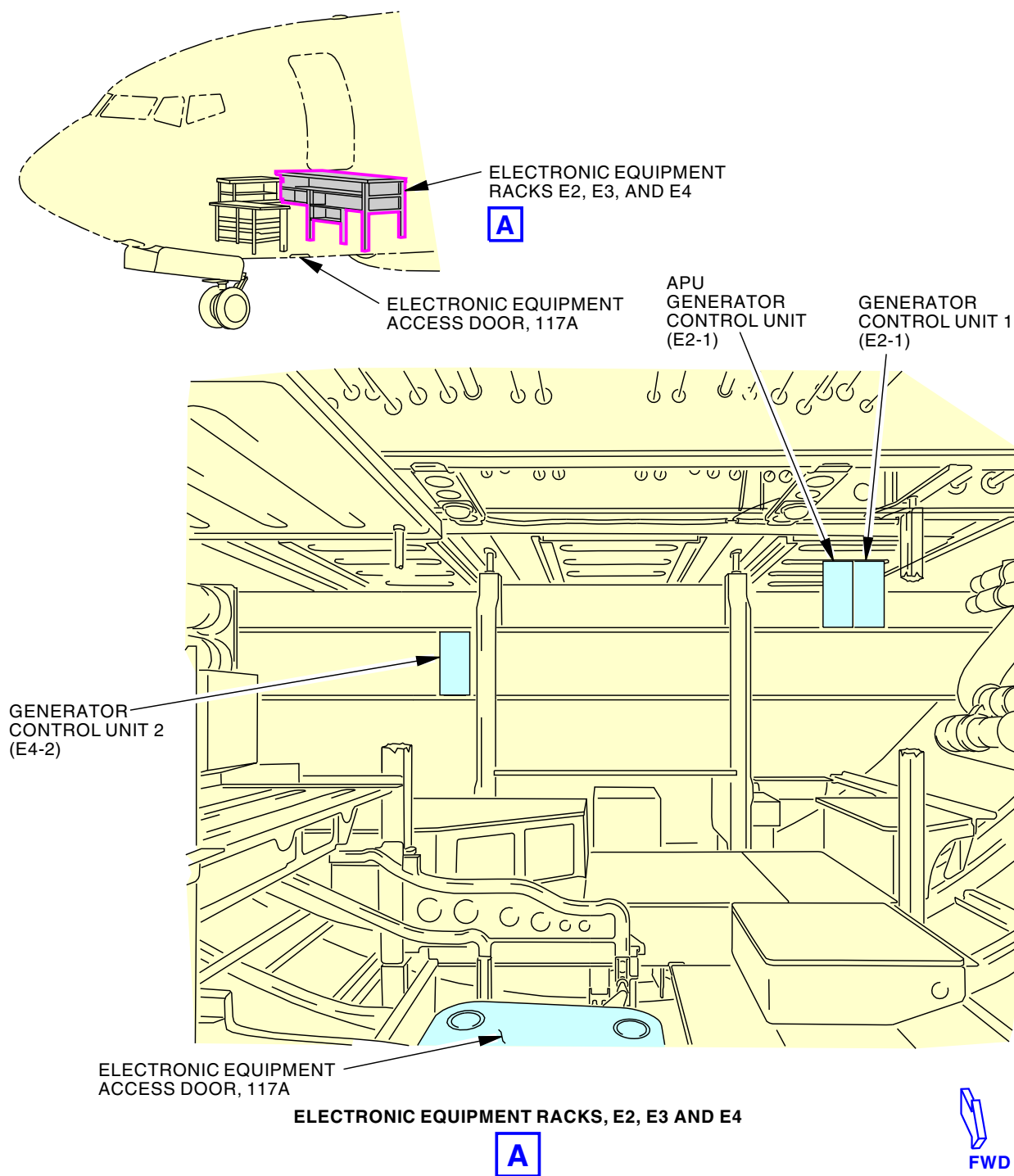
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Generator Control Unit and Electrical Control Panels P91, P92
Figure 201/24-21-00-990-801 (Sheet 1 of 2)

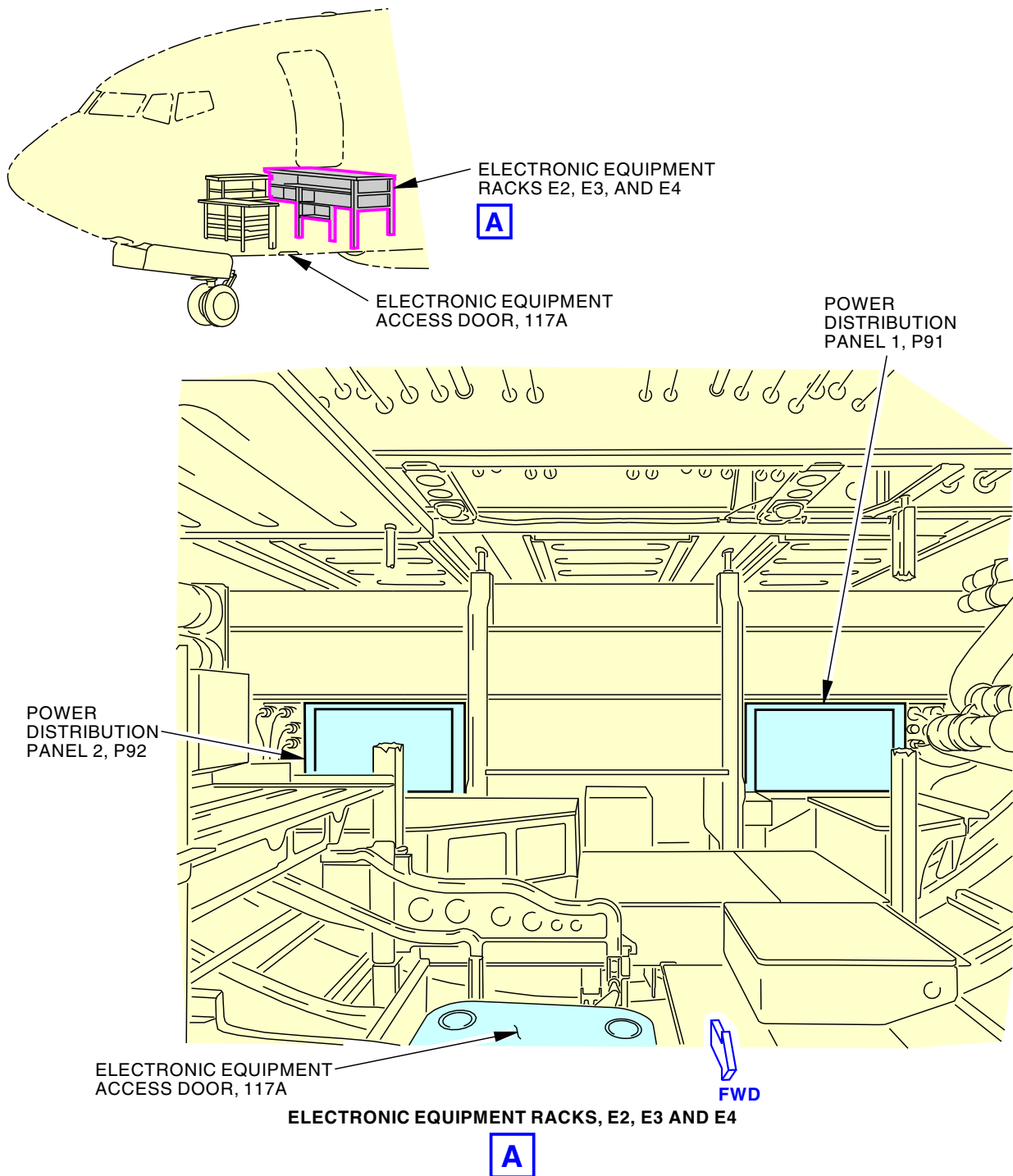
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Generator Control Unit and Electrical Control Panels P91, P92
Figure 201/24-21-00-990-801 (Sheet 2 of 2)

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TASK 24-21-00-440-801

3. **AC Generation and Load System - Activation**

(Figure 201)

A. General

- (1) This task has these procedures:
 - (a) Supply external power from the ground service buses
 - (b) Supply external power from the 115V AC transfer buses.
- (2) Use the applicable procedure to energize the necessary buses.

B. References

Reference	Title
20-40-11-910-801	Static Grounding (P/B 201)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Location Zones

Zone	Area
116	Nose Landing Gear Wheel Well - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

E. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

F. Procedure

SUBTASK 24-21-00-860-001

- (1) Do these steps to supply external power to the ground service and 115V AC transfer buses:
 - (a) Open the External Power Receptacle Door.



WARNING

MAKE SURE THAT THERE IS NO OPEN OR FLOATING GROUND IN THE NEUTRAL CIRCUIT OF THE POWER SUPPLY OR THE AIRCRAFT. AN OPEN OR FLOATING GROUND CAN CAUSE ELECTRICAL SHOCK TO PERSONNEL WHO TOUCH THE AIRCRAFT.

- (b) Make sure that the external power supply operates correctly before you supply external power to the airplane.
 - 1) If the ground return (neutral) circuit on the external power supply or the external power receptacle do not operate correctly, do this task: Static Grounding, TASK 20-40-11-910-801



WARNING

REMOVE ELECTRICAL POWER FROM THE EXTERNAL POWER SOURCE. IF YOU DO NOT REMOVE ELECTRICAL POWER, YOU CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (c) Install the power cable to the external power receptacle.
- (d) Energize the external power cable.
- (e) Make sure that these lights on the external power panel, P19 are on:

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- 1) EXTERNAL PWR CONN
- 2) EXTERNAL PWR NOT IN USE
- (f) Make sure that the GRD POWER AVAILABLE light on the P5-4 panel comes on.
- (g) Push the GROUND SERVICE switch on the FWD ATTENDANT panel, P13.
 - 1) Make sure that the light in the GROUND SERVICE switch comes on.
- (h) Make sure that the EXTERNAL PWR NOT IN USE light on the P19 panel is off.
- (i) Remove the DO NOT OPERATE tag, STD-858 from the receptacle.

SUBTASK 24-21-00-410-001

- (2) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

————— **END OF TASK** —————

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AC GENERATION SYSTEM - ADJUSTMENT/TEST

1. General

- A. This procedure has three tasks:
- (1) Operational Test for the AC Generation and Control System
 - (2) System Test for the AC Generation and Control System
 - (3) BITE Procedure for the Generator Control Unit (GCU).
- B. It is necessary to operate the engines and the APU when you do these tests.

TASK 24-21-00-700-801

2. Operational Test for the AC Generation and Control System

(Figure 501)

A. **General**

- (1) This procedure does these tests:
- (a) Auxiliary Power Unit (APU) Start with External Power and Switch Check
 - (b) Engine Start with APU Power and Switch Check
 - (c) Bus Tie Breaker and Generator Control Breaker Check
 - (d) Switch Check with External Power and Integrated Drive Generator (IDG) Power.

B. **References**

Reference	Title
24-22-00-860-803	Supply External Power (P/B 201)
24-22-00-860-804	Remove External Power (P/B 201)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
71-00-00-800-801-G00	Engine Ground Safety Precautions (P/B 201)
71-00-00-910-802-G00	Start the Engine (Selection) (P/B 201)
71-00-00-910-806-G00	Stop the Engine (Usual Engine Stop) (P/B 201)

C. **Location Zones**

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

D. **Prepare for the Operational Test**

SUBTASK 24-21-00-860-011

- (1) Do this task: Supply External Power, TASK 24-22-00-860-803.

E. **APU Start with External Power and Switch Check**

SUBTASK 24-21-00-710-001

- (1) Do the check as follows:
- (a) Make sure the BAT switch on the P5-13 panel is set to the ON position.
 - (b) Make sure the BUS TRANS switch on the P5-4 panel is set to the AUTO position.
 - (c) Make sure the GRD POWER AVAILABLE light on the P5-4 panel is on.
 - (d) Make sure these lights on the P5-4 panel are off:
 - 1) 1 TRANSFER BUS OFF

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- 2) 1 SOURCE OFF
- 3) 2 TRANSFER BUS OFF
- 4) 2 SOURCE OFF
- (e) Make sure these lights on the P5-4 panel are on:
 - 1) 1 GEN OFF BUS
 - 2) 2 GEN OFF BUS
- (f) Set the AC meter selector switch on the P5-13 panel to the GRD PWR position.
- (g) Make sure the AC meter on the P5-13 panel shows these values:
 - 1) AC VOLTS = 110-120
 - 2) CPS FREQ = 390-410
- (h) Make sure the APU GEN OFF BUS light on the P5-4 panel is off
- (i) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
- (j) Make sure the APU GEN OFF BUS light on the P5-4 panel comes on.
NOTE: The APU GEN OFF BUS light should come on approximately 50 seconds after the APU is started.
- (k) Set the 1 APU GEN switch on the P5-4 panel to the ON position.
- (l) Make sure the APU GEN OFF BUS light goes off.
- (m) Make sure the GRD POWER AVAILABLE light stays on.
- (n) Make sure these lights on the P5-4 panel stay off:
 - 1) 1 TRANSFER BUS OFF
 - 2) 1 SOURCE OFF
 - 3) 2 TRANSFER BUS OFF
- (o) Set the 2 APU GEN switch on the P5-4 panel to the ON position.
- (p) Make sure the 2 SOURCE OFF light goes off.
- (q) Set the AC meter selector switch on the P5-13 panel to the APU GEN position.
- (r) Make sure the AC meter on the P5-13 panel shows these values:
 - 1) AC VOLTS = 110-120
 - 2) CPS FREQ = 390-410
- (s) Set the GRD PWR switch to the ON position.
- (t) Make sure the APU GEN OFF BUS light comes on.
- (u) Make sure the GRD POWER AVAILABLE light stays on.
- (v) Make sure these lights on the P5-4 panel stay off:
 - 1) 1 TRANSFER BUS OFF
 - 2) 1 SOURCE OFF
 - 3) 2 TRANSFER BUS OFF
 - 4) 2 SOURCE OFF
- (w) Set both of the APU GEN switches to the ON position.
- (x) Make sure the APU GEN OFF BUS light goes off.
- (y) Make sure the GRD POWER AVAILABLE light stays on.

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- (z) Make sure these lights on the P5-4 panel stay off:
 - 1) 1 TRANSFER BUS OFF
 - 2) 1 SOURCE OFF
 - 3) 2 TRANSFER BUS OFF
 - 4) 2 SOURCE OFF

F. Engine Start with APU Power and Switch Check

SUBTASK 24-21-00-710-002

- (1) Do the check as follows:
 - (a) Obey all safety precautions around running the engines TASK 71-00-00-800-801-G00.
 - (b) Start the No. 1 engine. To start it, do this task: TASK 71-00-00-910-802-G00.



CAUTION

THE DRIVE LIGHT ON THE P5 PANEL MUST GO OFF AFTER THE ENGINE GETS UP TO IDLE SPEED. IF THE DRIVE LIGHT DOES NOT GO OFF OR COMES ON WHEN THE ENGINE IS AT OR ABOVE IDLE SPEED, YOU MUST PUSH THE DISCONNECT SWITCH ON THE P5 PANEL. IF YOU DO NOT PUSH THE DISCONNECT SWITCH, DAMAGE CAN OCCUR TO THE IDG.

- (c) Make sure the number 1 DRIVE light on the P5-5 panel goes off after number 1 engine reaches idle speed.
- (d) Set the GEN 1 switch on the P5-4 panel to the ON position.
- (e) Make sure the 1 GEN OFF BUS light on the P5-4 panel goes off.
- (f) Make sure these lights stay off:
 - 1) APU GEN OFF BUS
 - 2) 1 TRANSFER BUS OFF
 - 3) 1 SOURCE OFF
 - 4) 2 TRANSFER BUS OFF
 - 5) 2 SOURCE OFF
- (g) Set the AC meter selector switch on the P5-13 panel to the GEN 1 position.
- (h) Make sure the AC meter shows these values:
 - 1) AC VOLTS = 110-120
 - 2) CPS FREQ = 390-410
- (i) Obey all safety precautions around running the engines TASK 71-00-00-800-801-G00.
- (j) Start the No. 2 engine. To start it, do this task: Start the Engine (Selection), TASK 71-00-00-910-802-G00.



CAUTION

THE DRIVE LIGHT ON THE P5 PANEL MUST GO OFF AFTER THE ENGINE GETS UP TO IDLE SPEED. IF THE DRIVE LIGHT DOES NOT GO OFF OR COMES ON WHEN THE ENGINE IS AT OR ABOVE IDLE SPEED, YOU MUST PUSH THE DISCONNECT SWITCH ON THE P5 PANEL. IF YOU DO NOT PUSH THE DISCONNECT SWITCH, DAMAGE CAN OCCUR TO THE IDG.

- (k) Make sure the number 2 DRIVE light on the P5-5 panel goes off after number 2 engine reaches idle speed.

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- (l) Set the GEN 2 switch on the P5-4 panel to the ON position.
- (m) Make sure the 2 GEN OFF BUS light on the P5-4 panel goes off.
- (n) Make sure the APU GEN OFF BUS light comes on.
- (o) Make sure these lights stay off:
 - 1) 1 TRANSFER BUS OFF
 - 2) 1 SOURCE OFF
 - 3) 1 GEN OFF BUS
 - 4) 2 TRANSFER BUS OFF
 - 5) 2 SOURCE OFF
- (p) Set the AC meter selector switch on the P5-13 panel to the GEN 2 position.
- (q) Make sure the AC meter shows these values:
 - 1) AC VOLTS = 110-120
 - 2) CPS FREQ = 390-410
- (r) Set the APU GEN 1 switch to the ON position.
- (s) Make sure the APU GEN OFF BUS light goes off.
- (t) Make sure the 1 GEN OFF BUS light comes on.
- (u) Make sure these lights stay off:
 - 1) 1 TRANSFER BUS OFF
 - 2) 1 SOURCE OFF
 - 3) 2 TRANSFER BUS OFF
 - 4) 2 SOURCE OFF
 - 5) 2 GEN OFF BUS
- (v) Set the APU GEN 2 switch to the ON position.
- (w) Make sure the 2 GEN OFF BUS light comes on.
- (x) Make sure these lights stay off:
 - 1) APU GEN OFF BUS
 - 2) 1 TRANSFER BUS OFF
 - 3) 1 SOURCE OFF
 - 4) 2 TRANSFER BUS OFF
 - 5) 2 SOURCE OFF
- (y) Set the GEN 1 switch on the P5-4 panel to the ON position.
- (z) Make sure the 1 GEN OFF BUS light on the P5-4 panel goes off.
- (aa) Make sure these lights stay off:
 - 1) APU GEN OFF BUS
 - 2) 1 TRANSFER BUS OFF
 - 3) 1 SOURCE OFF
 - 4) 2 TRANSFER BUS OFF
 - 5) 2 SOURCE OFF
- (ab) Set the GEN 2 switch on the P5-4 panel to the ON position.

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- (ac) Make sure the 2 GEN OFF BUS light on the P5-4 panel goes off.
- (ad) Make sure the APU GEN OFF BUS light comes on.
- (ae) Make sure these lights stay off:
 - 1) 1 TRANSFER BUS OFF
 - 2) 1 SOURCE OFF
 - 3) 1 GEN OFF BUS
 - 4) 2 TRANSFER BUS OFF
 - 5) 2 SOURCE OFF

G. Bus Tie Breaker and Generator Control Breaker Check

SUBTASK 24-21-00-710-003

- (1) Do the check as follows:

NOTE: The #1 and #2 Transfer Buses will de-energize during parts of this test. Some equipment connected to the related bus will de-energize. This will cause Flight Deck Effect (FDE).

- (a) Set the GEN 1 switch to the OFF position.
- (b) Make sure these lights come on:
 - 1) 1 GEN OFF BUS
 - 2) 1 SOURCE OFF
- (c) Make sure these lights stay off:
 - 1) 1 TRANSFER BUS OFF
 - 2) 2 TRANSFER BUS OFF
 - 3) 2 GEN OFF BUS
 - 4) 2 SOURCE OFF
- (d) Set the BUS TRANS switch to the OFF position.
- (e) Make sure this light comes on:
 - 1) 1 TRANSFER BUS OFF
- (f) Make sure these lights stay off:
 - 1) 2 TRANSFER BUS OFF
 - 2) 2 GEN OFF BUS
 - 3) 2 SOURCE OFF
- (g) Set the GEN 1 switch to the ON position.
- (h) Make sure these lights go off:
 - 1) 1 TRANSFER BUS OFF
 - 2) 1 GEN OFF BUS
 - 3) 1 SOURCE OFF
- (i) Set the BUS TRANS switch to the AUTO position.
- (j) Set the GEN 2 switch to the OFF position.
- (k) Make sure these lights come on:
 - 1) 2 GEN OFF BUS
 - 2) 2 SOURCE OFF

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- (l) Make sure these lights stay off:
 - 1) 2 TRANSFER BUS OFF
 - 2) 1 TRANSFER BUS OFF
 - 3) 1 GEN OFF BUS
 - 4) 1 SOURCE OFF
- (m) Set the BUS TRANS switch to the OFF position.
- (n) Make sure these light comes on:
 - 1) 2 TRANSFER BUS OFF
- (o) Make sure these lights stay off:
 - 1) 1 TRANSFER BUS OFF
 - 2) 1 GEN OFF BUS
 - 3) 1 SOURCE OFF
- (p) Set the GEN 2 switch to the ON position.
- (q) Make sure these lights go off:
 - 1) 2 TRANSFER BUS OFF
 - 2) 2 GEN OFF BUS
 - 3) 2 SOURCE OFF
- (r) Set the BUS TRANS switch to the AUTO position.

H. Switch Check with External Power and IDG Power

SUBTASK 24-21-00-710-004

- (1) Do the check as follows:
 - (a) Make sure the GRD POWER AVAILABLE light on the P5-4 panel is on.
 - (b) Set the GRD PWR switch to the ON position.
 - (c) Make sure these lights stay off:
 - 1) 1 TRANSFER BUS OFF
 - 2) 1 SOURCE OFF
 - 3) 2 TRANSFER BUS OFF
 - 4) 2 SOURCE OFF
 - (d) Make sure these lights come on:
 - 1) 1 GEN OFF BUS
 - 2) 2 GEN OFF BUS
 - (e) Set the GEN 1 switch on the P5-4 panel to the ON position.
 - (f) Make sure the 1 GEN OFF BUS light on the P5-4 panel goes off.
 - (g) Make sure these lights stay off:
 - 1) 1 TRANSFER BUS OFF
 - 2) 1 SOURCE OFF
 - 3) 2 TRANSFER BUS OFF
 - 4) 2 SOURCE OFF
 - (h) Set the GEN 2 switch on the P5-4 panel to the ON position.

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- (i) Make sure the 2 GEN OFF BUS light on the P5-4 panel goes off.
- (j) Make sure these lights stay off:
 - 1) 1 TRANSFER BUS OFF
 - 2) 1 SOURCE OFF
 - 3) 1 GEN OFF BUS
 - 4) 2 TRANSFER BUS OFF
 - 5) 2 SOURCE OFF

I. Engine and APU Shutdown

SUBTASK 24-21-00-860-003

- (1) Shut down the number 1 engine. Do this task: TASK 71-00-00-910-806-G00.

SUBTASK 24-21-00-860-004

- (2) Shut down the number 2 engine. Do this task: TASK 71-00-00-910-806-G00.

SUBTASK 24-21-00-860-005

- (3) Shut down the APU. Do this task: TASK 49-11-00-860-802.

J. Put the Airplane Back to Its Usual Condition

SUBTASK 24-21-00-860-012

- (1) Do this task: Remove External Power, TASK 24-22-00-860-804.

————— **END OF TASK** —————

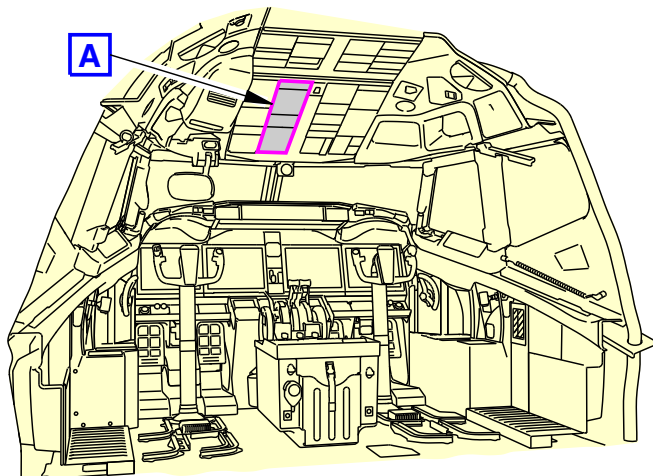
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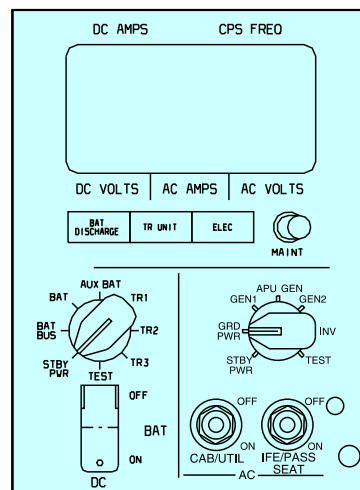
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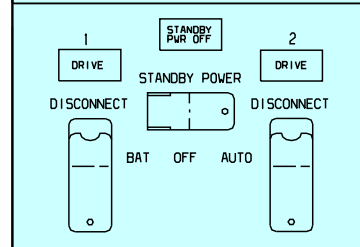


FLIGHT COMPARTMENT

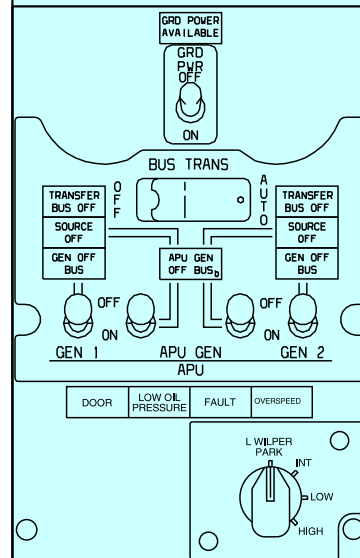
P5-13



P5-5



P5-4



A

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AC Generator and Control System
Figure 501/24-21-00-990-802

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TASK 24-21-00-740-801

3. **Generator Control Unit (GCU) BITE Procedure**

(Figure 502)

A. General

- (1) You do the BITE procedure at the front panel of the Generator Control Unit (GCU). There are three GCU's on the airplane and they are installed as follows:
 - (a) GCU 1, G10 located on the E2-1 Rack.
 - (b) GCU 2, G12 located on the E4-2 Rack.
 - (c) APU GCU, G14 located on the E2-1 Rack.
- (2) The GCU performs a self test after it is powered up, or manually by pushing the GCU TEST switch. The GCU has six fault indicator lights, one GCU PASS light and one test switch on the front panel. The fault indicator lights will be referred to as maintenance messages throughout this procedure.
- (3) The seven indicator lights are listed in order below, with the highest priority indicator listed first:
 - (a) GCU FAULT
 - (b) IDG FAULT - (Not applicable for APU GCU, G14)
 - (c) GCB/APB FAULT
 - (d) BTB FAULT - (Not applicable for APU GCU, G14)
 - (e) FEEDER FAULT
 - (f) DIST/BUS FAULT
 - (g) GCU PASS
- (4) The GCU will detect external faults when the applicable generator is supplying power.

NOTE: If there is more than one fault condition, only the highest priority fault indicator will be on.
- (5) Use the manual BITE procedure to clear the fault indications from the GCU memory.

B. References

Reference	Title
24-22-00-860-806	Remove APU Generator Power (P/B 201)
24-22-00-860-808	Remove IDG Power (P/B 201)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

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E. Prepare for the BITE Procedure

SUBTASK 24-21-00-040-001

- (1) Record any maintenance messages before you do the BITE procedure.

NOTE: Most faults can only be detected by the GCU when the applicable generator is supplying power. If you remove power from the GCU, the faults will not be erased. However, if the fault is not presently detectable, (applicable generator not supplying power), and the GCU TEST switch is pushed, the fault will be cleared.

- (2) Set the BAT switch on the P5-13 panel to the ON position.
- (3) Remove power from the applicable generator for the GCU being tested:
 - (a) If you are performing the BITE on the GCU 1, G10, do this task: Remove IDG Power, TASK 24-22-00-860-808.
 - (b) If you are performing the BITE on the GCU 2, G12, do this task: Remove IDG Power, TASK 24-22-00-860-808.
 - (c) If you are performing the BITE on the APU GCU, G14, do this task: Remove APU Generator Power, TASK 24-22-00-860-806.

SUBTASK 24-21-00-010-004

- (4) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door
(a)	Go to the applicable GCU (Figure 502)

F. GCU BITE Procedure

SUBTASK 24-21-00-740-001

- (1) Do these steps to do the BITE procedure for the Generator Control Unit:
 - (a) Push and hold the GCU TEST switch on the generator control unit for a minimum of one second and then release it.
 - (b) Make sure all seven of the indicator lights come on for approximately three seconds:
 - 1) GCU FAULT - (red)
 - 2) IDG FAULT - (red)
 - 3) GCB/APB FAULT - (red)
 - 4) BTB FAULT - (red)
 - 5) FEEDER FAULT - (red)
 - 6) DIST/BUS FAULT - (red)
 - 7) GCU PASS - (green)
 - (c) Make sure all seven of the indicator lights go off for approximately three seconds.
 - 1) If a fault is detected, the applicable red fault indicator light will come on.
 - a) Go to the IFIM and do the applicable procedure(s) for each maintenance message.
 - 2) If the fault indicator lights fail to respond per the steps listed above, then do the applicable GCU FAULT Task.
 - 3) If no faults are detected, the GCU PASS light will come on for approximately seven seconds.

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G. Put the Airplane Back to its Usual Condition

SUBTASK 24-21-00-410-002

(1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

————— **END OF TASK** —————

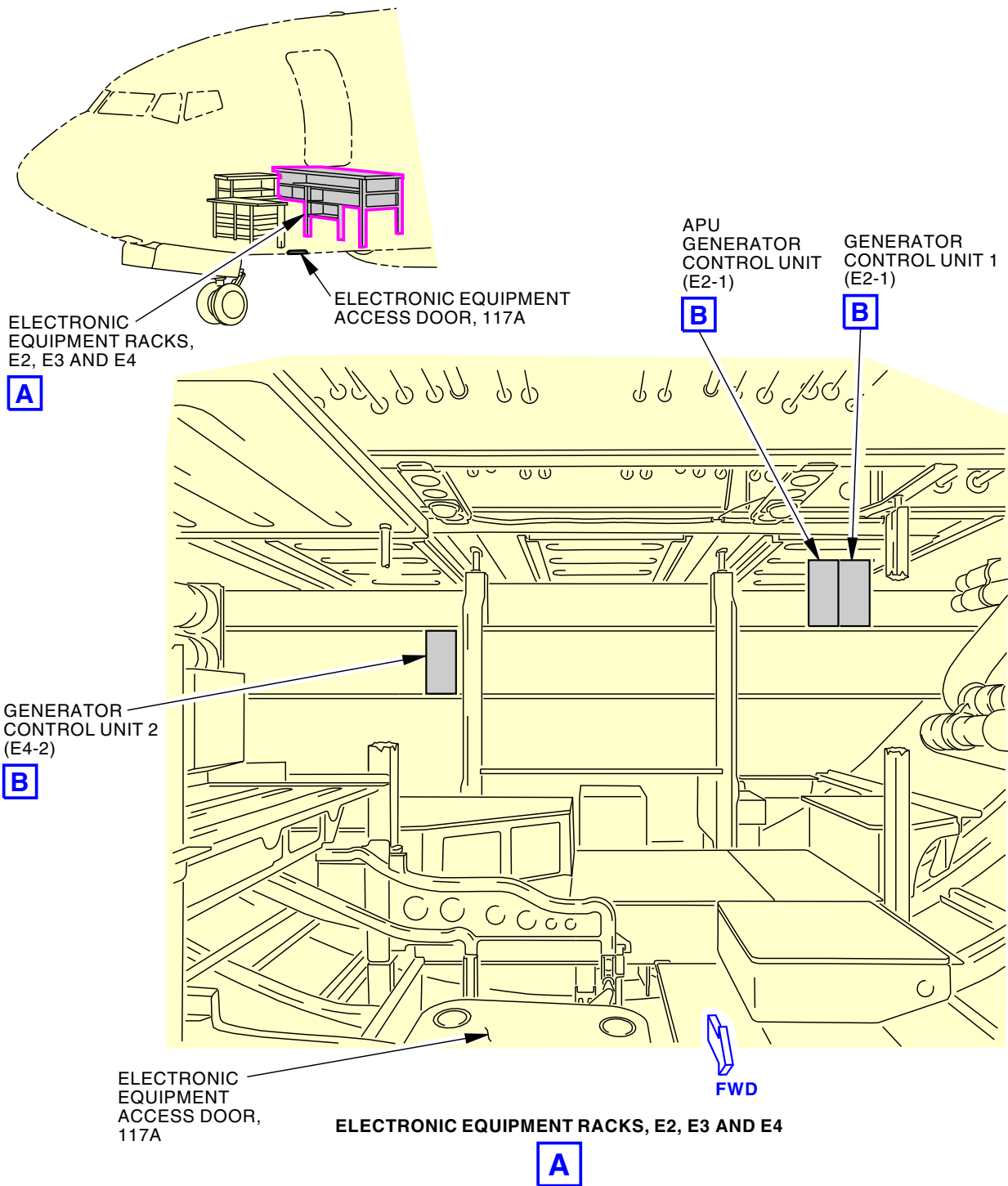
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Generator Control Units
Figure 502/24-21-00-990-803 (Sheet 1 of 2)

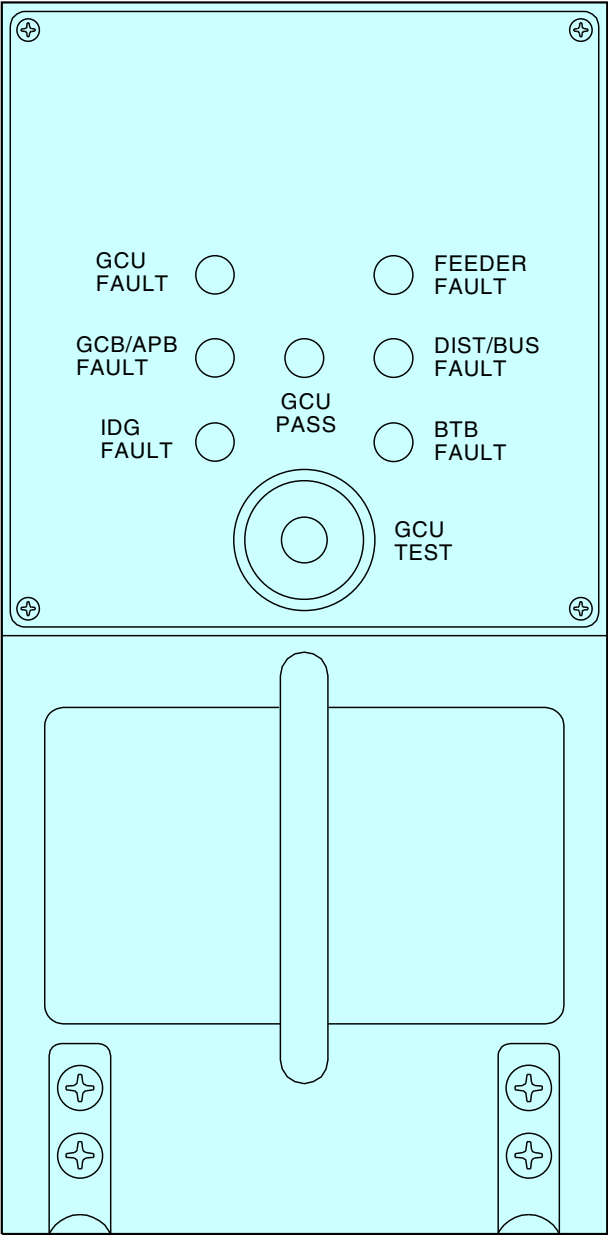
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GENERATOR CONTROL UNIT
(EXAMPLE)

B

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Generator Control Units
Figure 502/24-21-00-990-803 (Sheet 2 of 2)

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POWER DISTRIBUTION PANEL - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
- (1) A removal of the Power Distribution Panel (PDP)
 - (2) An installation of the Power Distribution Panel (PDP).
- B. You must remove the PDP from the rack for some components. When necessary to remove a PDP component, remove the PDP from the rack. Replace the internal component in a clean, dry area. Complete the replacement and assemble the PDP. Install it on the rack. Do the installation test in this procedure.

TASK 24-21-21-000-801

2. Power Distribution Panel Removal

(Figure 401)

A. General

- (1) There are two power distribution panels (PDP), P91 and P92 installed in the electronic equipment area.
- (2) It is necessary to get access to the front and the rear of the power distribution panels to remove and install them.
- (3) You get access to the front of the PDP from the electronic equipment area.
- (4) You get access to the rear of the PDP from the forward cargo area.

B. References

Reference	Title
24-22-00-860-802	Remove Electrical Power (P/B 201)

C. Tools/Equipment

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

Reference	Description
SPL-1635	Equipment - Installation, Power Distribution Panels Part #: C24004-43 Supplier: 81205

D. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
121	Forward Cargo Compartment - Left
122	Forward Cargo Compartment - Right

E. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

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F. Prepare for removal.

SUBTASK 24-21-21-860-001



REMOVE ELECTRICAL POWER BEFORE YOU REMOVE OR INSTALL COMPONENTS IN THE POWER DISTRIBUTION PANELS. THERE ARE HIGH VOLTAGES THAT CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-802.
 - (a) Make sure that all of the power warning lights on the power distribution panel are off.

SUBTASK 24-21-21-010-001

- (2) Open this access panel to get access to the main equipment center.

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

G. Procedure

SUBTASK 24-21-21-010-002

- (1) Get access to the forward cargo area and do the steps that follow:
 - (a) Remove the applicable forward bulkhead liner to get access to the rear of the power distribution panel.

SUBTASK 24-21-21-020-001

- (2) Remove the power feeders from the power distribution panel, do the steps that follow:
 - (a) Install identification tags on the power feeders before removal.
 - (b) Remove the nuts [6] and washers [7] from each terminal stud.
 - (c) Remove the power feeders from the terminal studs.

SUBTASK 24-21-21-020-002

- (3) Remove the cooling duct from the power distribution panel per the steps that follow:
 - (a) Remove the four screws [8] and washers [9] that hold the cooling duct to the power distribution panel.
 - (b) Pull the duct away from the panel and remove the gasket [10].

SUBTASK 24-21-21-020-003

- (4) Remove the electrical connectors from the power distribution panels.

SUBTASK 24-21-21-020-004

- (5) Remove the two ground straps from the power distribution panel per the steps that follow:
 - (a) Remove the two nuts [2] and washers [3] from the ground studs on the power distribution panel.

NOTE: Do not remove the other end of the ground strap attached to the airplane structure.
 - (b) Remove the ground strap from the ground stud on the power distribution panel.

NOTE: Move the strap or use tape to hold the strap so that it does not interfere with the panel when it is removed.

SUBTASK 24-21-21-020-005

- (6) Remove the Power Distribution Panel [1], do the steps that follow:
 - (a) Remove the four bolts [5] and washers [4] located at the corners of the power distribution panel.

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- (b) Pull the Power Distribution Panel [1] out from the rack onto the equipment, SPL-1635.

———— **END OF TASK** ————

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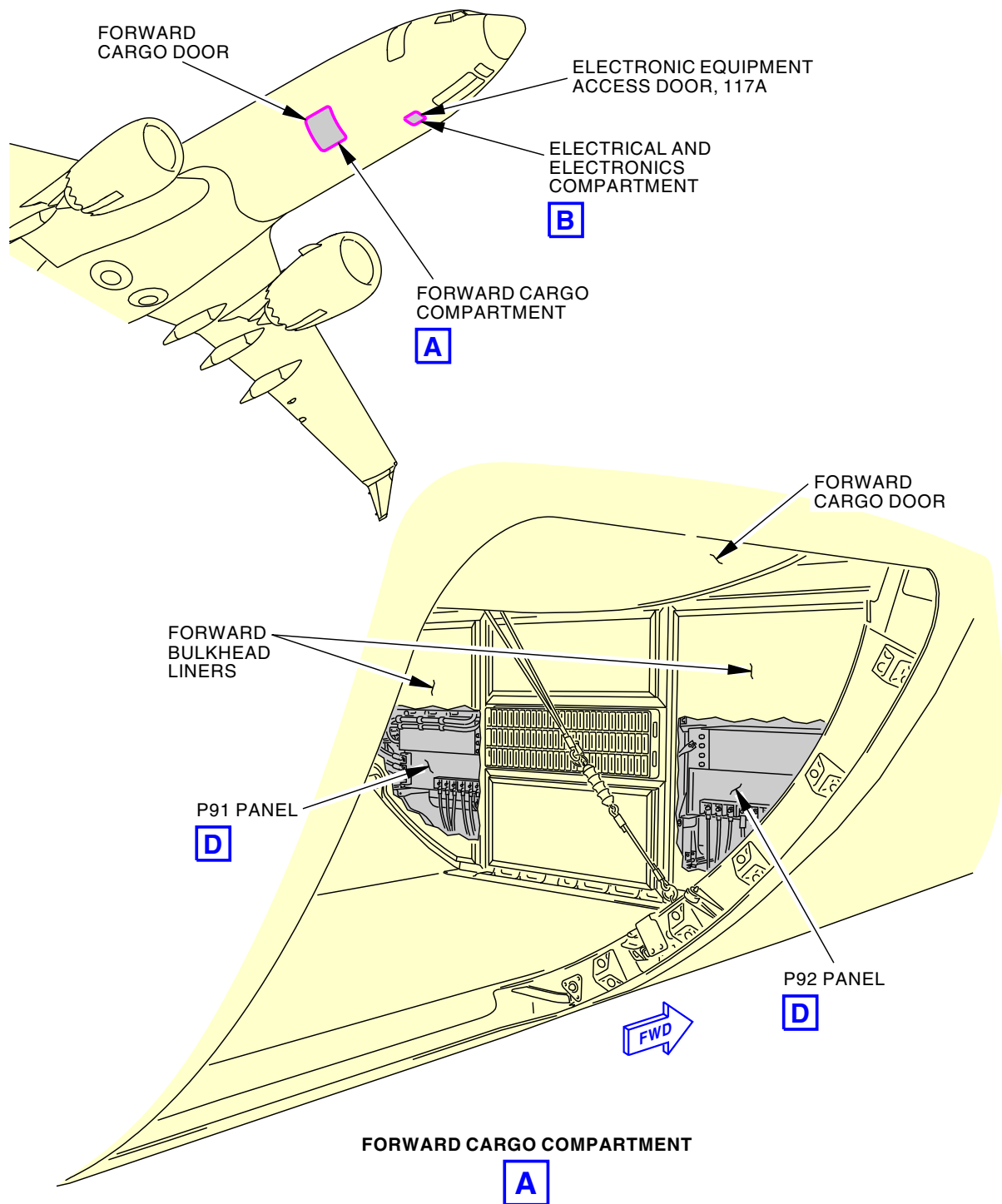
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2411749 S00061528928_V1

Power Distribution Panel Installation
Figure 401/24-21-21-990-801 (Sheet 1 of 4)

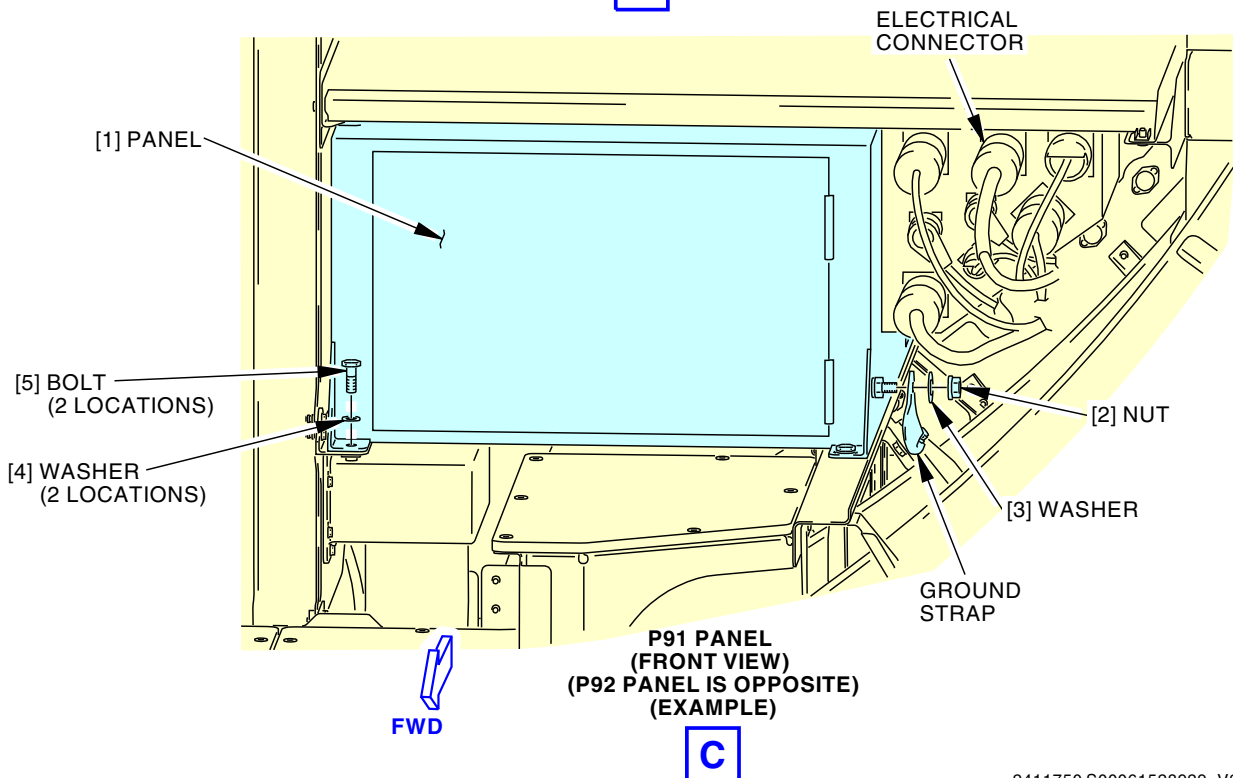
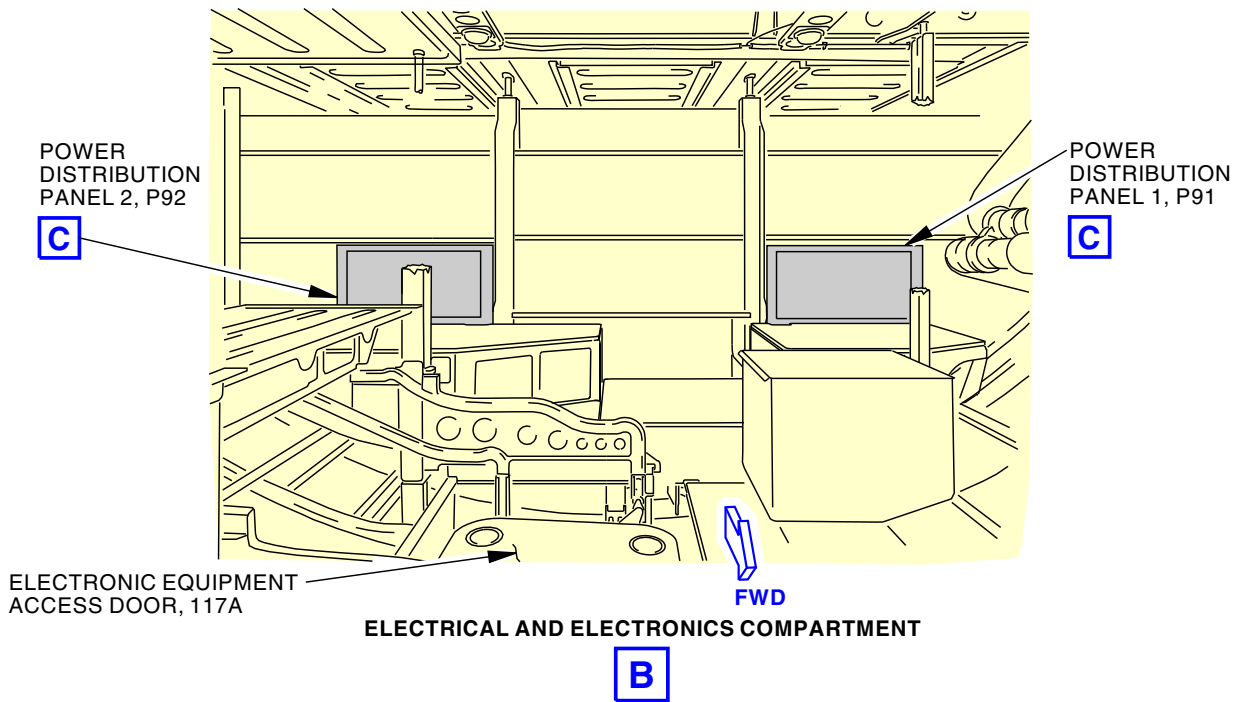
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2411750 S00061528929_V2

Power Distribution Panel Installation
Figure 401/24-21-21-990-801 (Sheet 2 of 4)

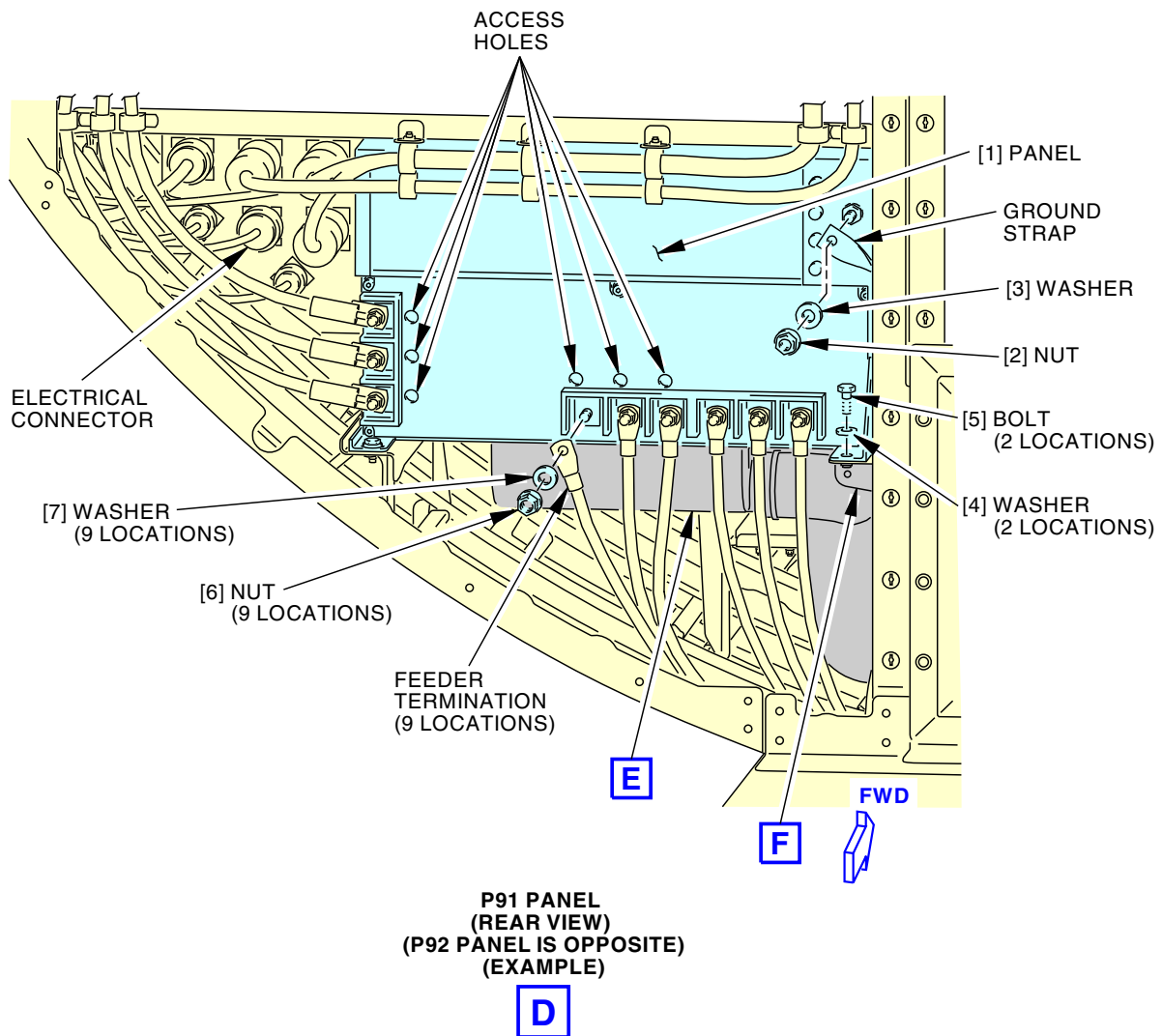
EFFECTIVITY
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2411751 S00061528930_V2

Power Distribution Panel Installation
Figure 401/24-21-21-990-801 (Sheet 3 of 4)

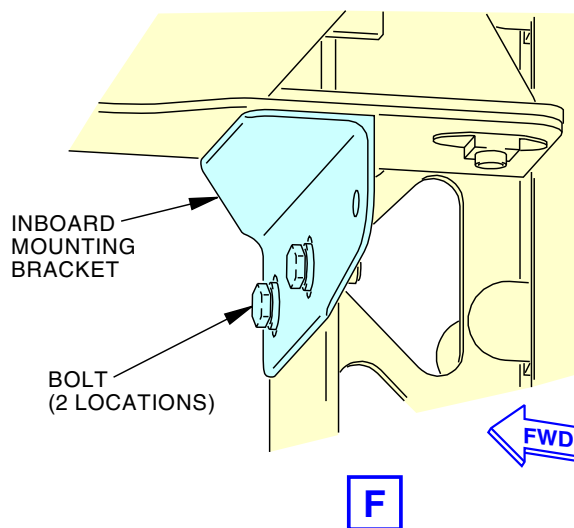
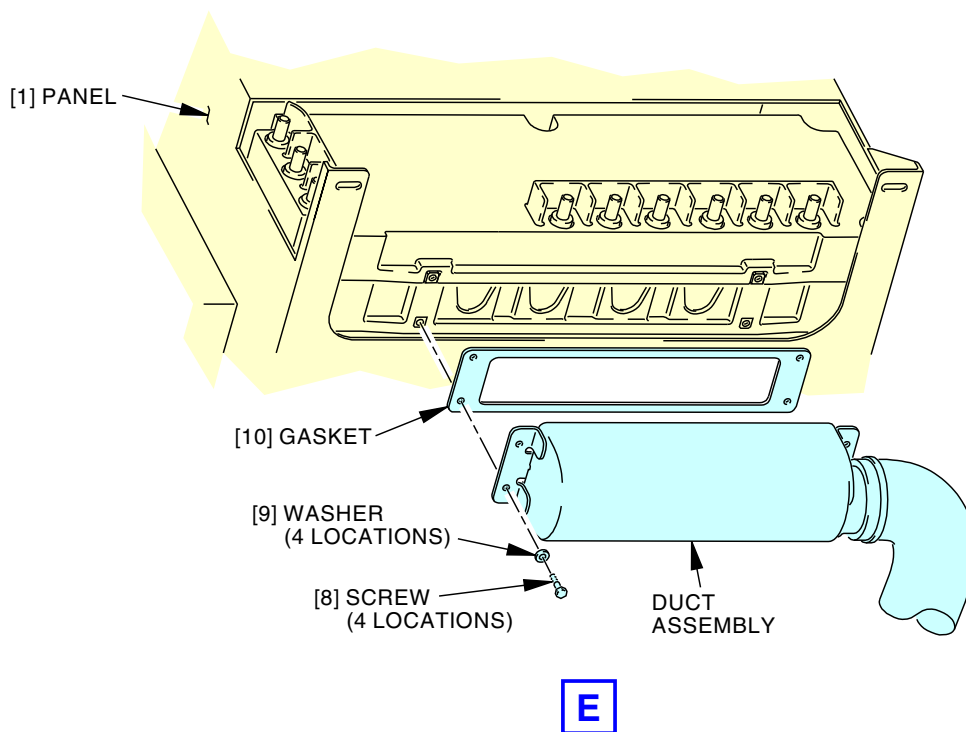
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2411752 S00061528931_V1

Power Distribution Panel Installation
Figure 401/24-21-21-990-801 (Sheet 4 of 4)

EFFECTIVITY
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TASK 24-21-21-400-801

3. **Power Distribution Panel Installation**

(Figure 401)

A. General

- (1) There are two power distribution panels (PDP), P91 and P92 installed in the electronic equipment area.
- (2) It is necessary to get access to the front and the rear of the power distribution panels to remove and install them.
- (3) You get access to the front of the PDP from the electronic equipment area.
- (4) You get access to the rear of the PDP from the forward cargo area.

B. References

Reference	Title
21-27-00-700-802	Equipment Cooling Fans - Operational Test (P/B 501)
24-21-00-700-801	Operational Test for the AC Generation and Control System (P/B 501)
24-31-00-700-801	DC System - Operational Test (P/B 501)
28-22-00-730-801	Engine Fuel Feed Pumps - Functional Test (P/B 501)
29-11-00-700-801	Operational Test of the Hydraulic Systems A and B (P/B 501)
29-21-00-700-801	Operational Test of the Standby Hydraulic System (P/B 501)
38-42-00-800-803	Water Tank Pressurization System - Operational Test (P/B 501)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Power Distribution Panel	24-21-21-01-050	SIA ALL
		24-21-21-20-050	SIA ALL

D. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
121	Forward Cargo Compartment - Left
122	Forward Cargo Compartment - Right

E. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

F. Prepare for installation

SUBTASK 24-21-21-860-002



REMOVE ELECTRICAL POWER BEFORE YOU REMOVE OR INSTALL COMPONENTS IN THE POWER DISTRIBUTION PANELS. THERE ARE HIGH VOLTAGES THAT CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Make sure that electrical power is removed from airplane.
 - (a) Make sure that all of the power warning lights on the power distribution panel are off.

NOTE: Look at opposite power distribution panel if it is installed.

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G. Procedure

SUBTASK 24-21-21-420-001

- (1) Do these steps to install the Power Distribution Panel [1]:
 - (a) Move the Power Distribution Panel [1] into position on the rack.
NOTE: The door on the panel must face forward.
 - (b) Loosen the two bolts on the inboard mounting bracket. The bracket is located at the inboard corner of the panel when you view the rear of the panel from the forward cargo area.
NOTE: This step is done to get the required flat mounting surface for the power distribution panel.
 - (c) Install the four bolts [5] and washers [4] that hold the panel at the corners.
 - (d) Tighten the four bolts [5] to 82 ± 18 in-lb (9 ± 2 N·m).
 - 1) Make sure you tighten the bolt located at the same corner as the inboard mounting bracket last.
 - (e) Tighten the two bolts on the inboard mounting bracket to 32 ± 2 in-lb (4 ± 1 N·m).

SUBTASK 24-21-21-420-002

- (2) Install the two ground straps on the power distribution panel, do the steps that follow:
 - (a) Install the straps on the ground stud on the power distribution panel.
 - (b) Install the two nuts [2] and washers [3] on the ground studs.
 - (c) Tighten the nuts to 190 ± 10 in-lb (21 ± 2 N·m).

SUBTASK 24-21-21-420-003

- (3) Install the electrical connectors on the power distribution panels.

SUBTASK 24-21-21-420-004

- (4) Do these steps to install the cooling duct on the power distribution panel:
 - (a) Install the gasket [10] on the duct and put the duct in position on the power distribution panel.
 - (b) Install the four screws [8] and washers [9] that hold the cooling duct to the power distribution panel.
 - (c) Tighten the screws [8].

SUBTASK 24-21-21-420-005

- (5) Do these steps to install the power feeders on the power distribution panel:
 - (a) Use the identification tags to install the power feeders on the correct terminal studs.
 - (b) Install the nuts [6] and washers [7] on each terminal stud.
 - (c) Tighten the nuts to 190 ± 10 in-lb (21 ± 2 N·m).
NOTE: When you install and tighten the power feeders to the rigid bus assembly, there may be some axial movement of the terminal studs (particularly TB5004 and TB5008). A small amount of movement is normal and should not affect the tightening of the nuts to the specified torque.

H. Installation Test

SUBTASK 24-21-21-710-001

- (1) Do this task: Operational Test for the AC Generation and Control System, TASK 24-21-00-700-801.

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SUBTASK 24-21-21-710-002

(2) Do this task: DC System - Operational Test, TASK 24-31-00-700-801.

SUBTASK 24-21-21-710-003

(3) Do this task: Equipment Cooling Fans - Operational Test, TASK 21-27-00-700-802.

SUBTASK 24-21-21-710-004

(4) Do this task: Engine Fuel Feed Pumps - Functional Test, TASK 28-22-00-730-801.

SUBTASK 24-21-21-710-005

(5) Do this task: Operational Test of the Hydraulic Systems A and B, TASK 29-11-00-700-801.

SUBTASK 24-21-21-710-006

(6) Do this task: Operational Test of the Standby Hydraulic System, TASK 29-21-00-700-801.

SUBTASK 24-21-21-710-007

(7) Do this task: Water Tank Pressurization System - Operational Test, TASK 38-42-00-800-803.

I. Put the airplane back to its usual condition

SUBTASK 24-21-21-410-001

(1) Install the forward bulkhead liner.

SUBTASK 24-21-21-410-002

(2) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

———— **END OF TASK** ————

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RIGID BUS ASSEMBLY - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

- (1) A removal of the rigid bus assembly
- (2) An installation of the rigid bus assembly.

TASK 24-21-22-000-801

2. Rigid Bus Assembly Removal

(Figure 401)

A. General

- (1) There is one rigid bus assembly located at the rear of each of the P91 and P92 Power Distribution Panel (PDP).

NOTE: If the troubleshooting points to a defective current transformer, the airline must remove and send back the rigid bus assembly to Honeywell. Write or speak to Honeywell for more data.

- (2) It is necessary to get access to the front and the rear of the PDPs to remove and install the rigid bus assembly [1].
- (3) You get access to the front of the PDP from the electronic equipment area.
- (4) You get access to the rear of the PDP from the forward cargo area.

B. References

Reference	Title
24-21-41-000-801	Breaker Removal (P/B 401)
24-22-00-860-802	Remove Electrical Power (P/B 201)
24-41-12-000-801	External Power Contactor Removal (P/B 401)

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
121	Forward Cargo Compartment - Left
122	Forward Cargo Compartment - Right

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

E. Prepare for the Removal

SUBTASK 24-21-22-860-001



REMOVE THE ELECTRICAL POWER BEFORE YOU REMOVE OR INSTALL THE RIGID BUS ASSEMBLY. HIGH VOLTAGES CAN CAUSE INJURY TO PERSONS.

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-802.
 - (a) Make sure that all of the power warning lights on the PDP are off.

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SUBTASK 24-21-22-010-001

- (2) Open this access panel to get access to the main equipment center:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

F. Rigid Bus Assembly Removal

SUBTASK 24-21-22-020-001

- (1) To remove the rigid bus assembly from the P91 PDP 1, do the steps that follow:

NOTE: These steps are done at the front of the PDP, in the electronic equipment area.

- (a) Remove the breakers listed below (TASK 24-21-41-000-801).



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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) These are the circuit breakers:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
---	---	C00803	AUXILIARY POWER BREAKER
---	---	C00804	BUS TIE BREAKER 1
---	---	C00801	GENERATOR BREAKER 1

- (b) Loosen the screws that hold the electrical connectors to the rigid bus assembly.
(c) Remove the two electrical connectors from the rigid bus assembly.
(d) Remove the nuts [9], lockwashers [10] and washers [11] that hold the bus bars to the rigid bus assembly.

SUBTASK 24-21-22-020-002

- (2) To remove the rigid bus assembly from the P92 PDP 2, do the steps that follow:

NOTE: These steps are done at the front of the PDP, in the electronic equipment area.

- (a) Remove the breakers listed below (TASK 24-21-41-000-801).

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WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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) These are the circuit breakers:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
---	---	C00805	BUS TIE BREAKER 2
---	---	C00802	GENERATOR BREAKER 2

- (b) Do this task: External Power Contactor Removal, TASK 24-41-12-000-801.
- (c) Loosen the screws that hold the electrical connectors to the rigid bus assembly.
- (d) Remove the two electrical connectors from the rigid bus assembly.
- (e) Remove the nuts [9], lockwashers [10] and washers [11] that hold the bus bars to the rigid bus assembly.
- (f) Remove the bolts [12] and washers [13] that hold the wires to the terminal posts on the rigid bus assembly.
- (g) Install the identification tags on wires before removing these wires.

SUBTASK 24-21-22-010-002

- (3) Get access to the forward cargo area and do the steps that follow:
 - (a) Remove the applicable forward bulkhead liner to get access to the rear of the PDP.

SUBTASK 24-21-22-020-003

- (4) Remove the power feeders from the PDP per the steps that follow:
 - (a) Install the identification tags on the power feeders before removal.
 - (b) Remove the nuts [4] and washers [5] from each terminal stud.
 - (c) Remove the power feeders from terminal studs.

SUBTASK 24-21-22-020-004

- (5) Remove the cooling duct from the PDP per the steps that follow:
 - (a) Remove the screws [6] and washers [7] that hold the cooling duct to the PDP.
 - (b) Pull the duct away from the panel and remove the gasket [8].

SUBTASK 24-21-22-020-005

- (6) Do these steps to remove the rigid bus assembly [1]:
 - (a) Remove the screws [3] and washers [2] that hold the rigid bus assembly [1] to the PDP.

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- (b) Remove the rigid bus assembly [1].

———— **END OF TASK** ————

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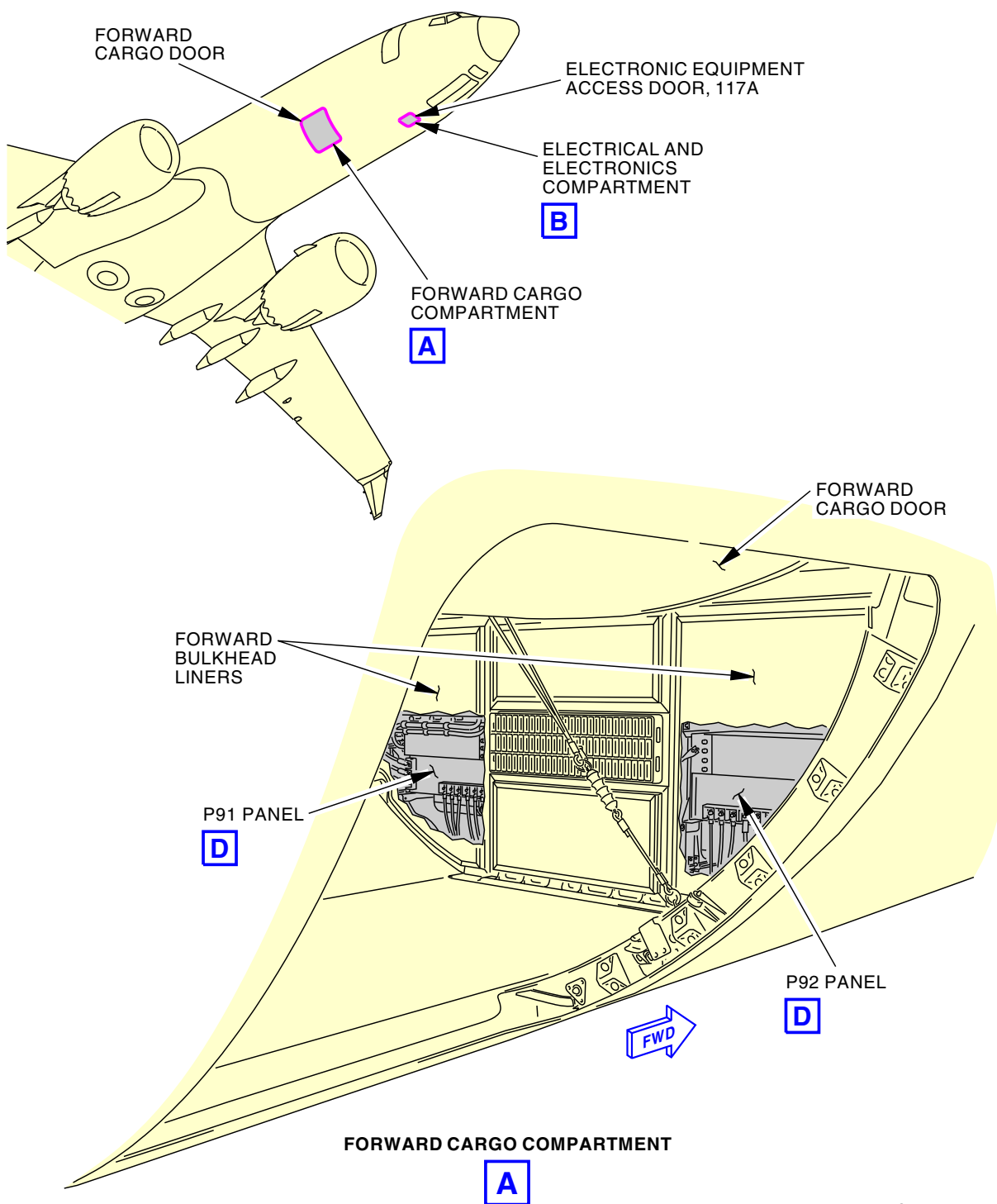
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Rigid Bus Assembly Installation
Figure 401/24-21-22-990-801 (Sheet 1 of 4)

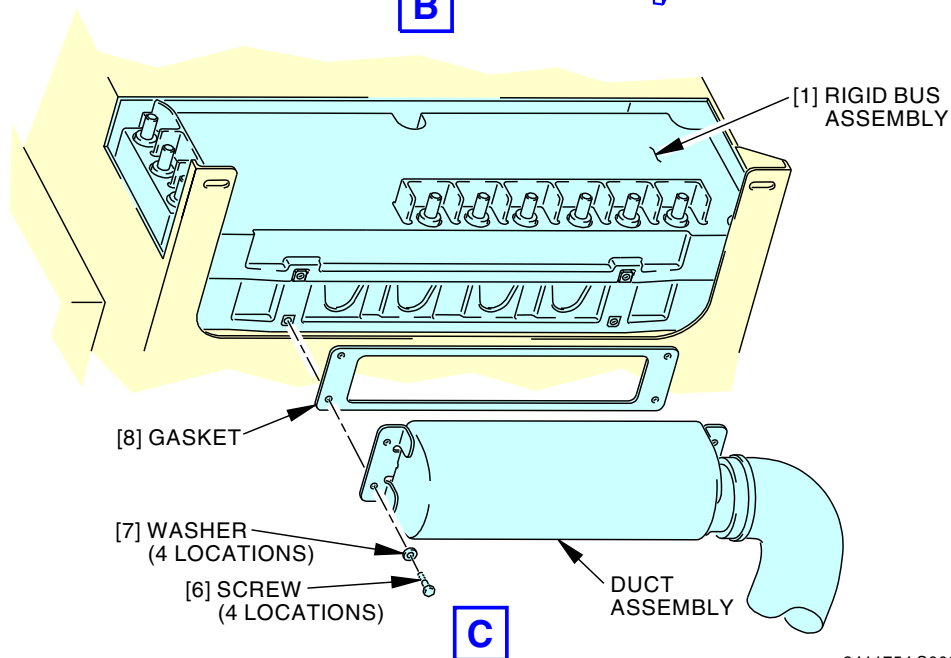
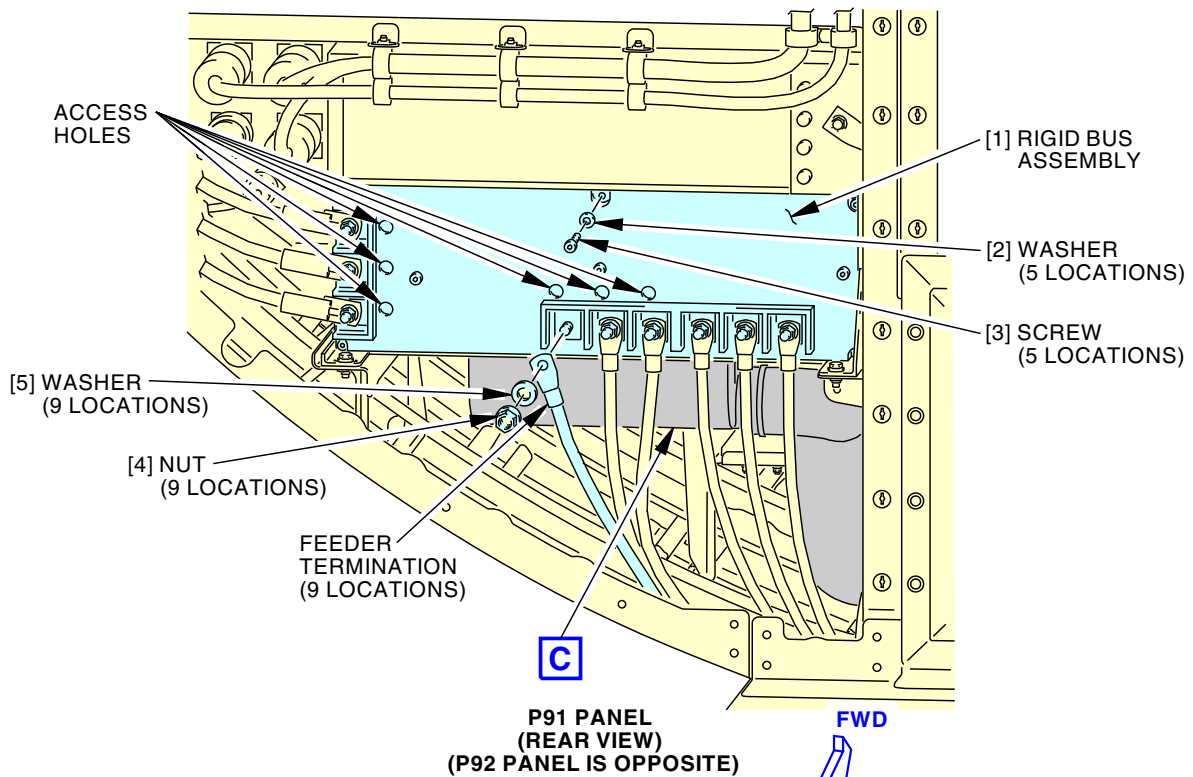
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Rigid Bus Assembly Installation
Figure 401/24-21-22-990-801 (Sheet 2 of 4)

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SIA ALL

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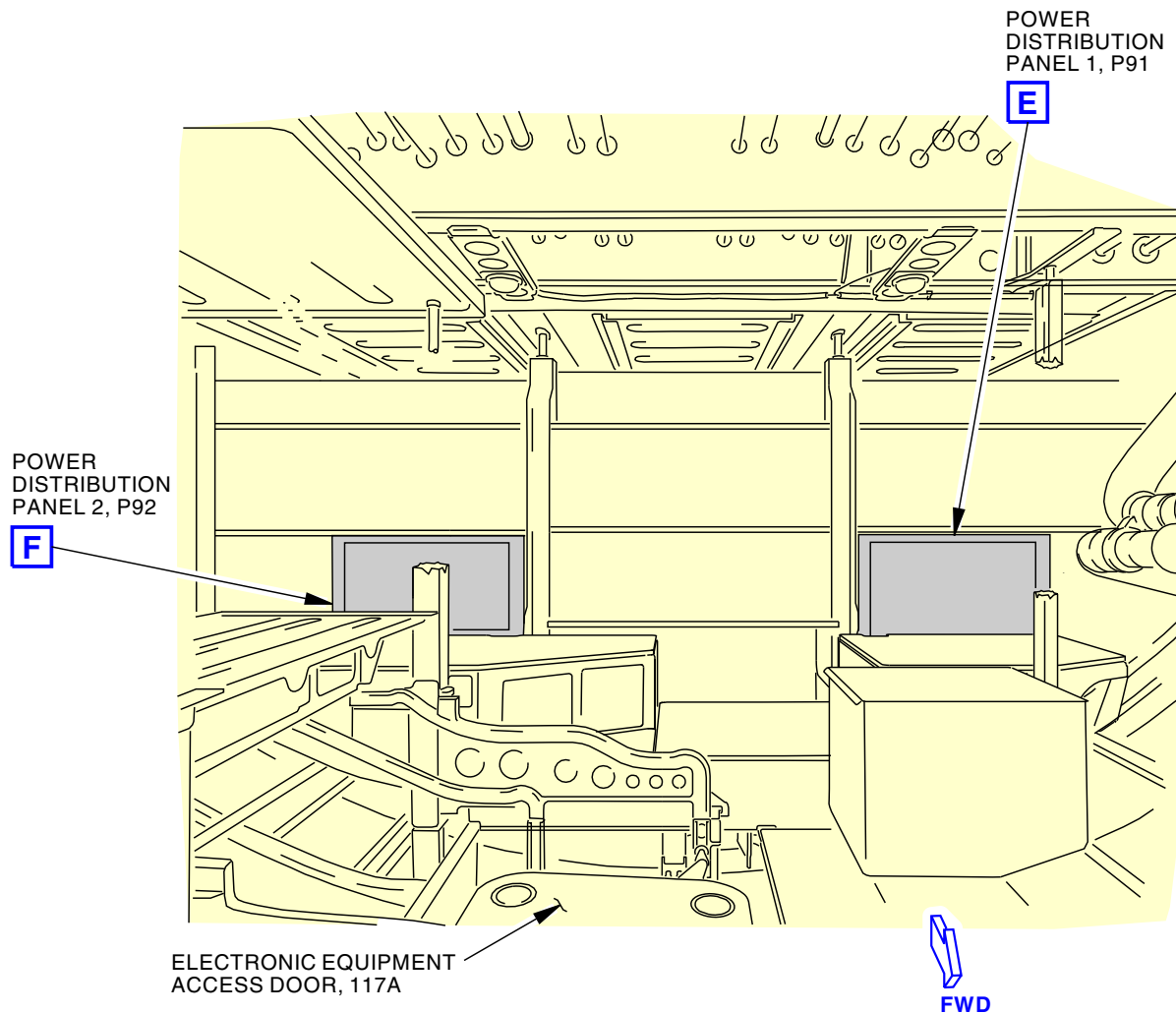
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ELECTRICAL AND ELECTRONICS COMPARTMENT

D

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Rigid Bus Assembly Installation
Figure 401/24-21-22-990-801 (Sheet 3 of 4)

EFFECTIVITY
SIA ALL

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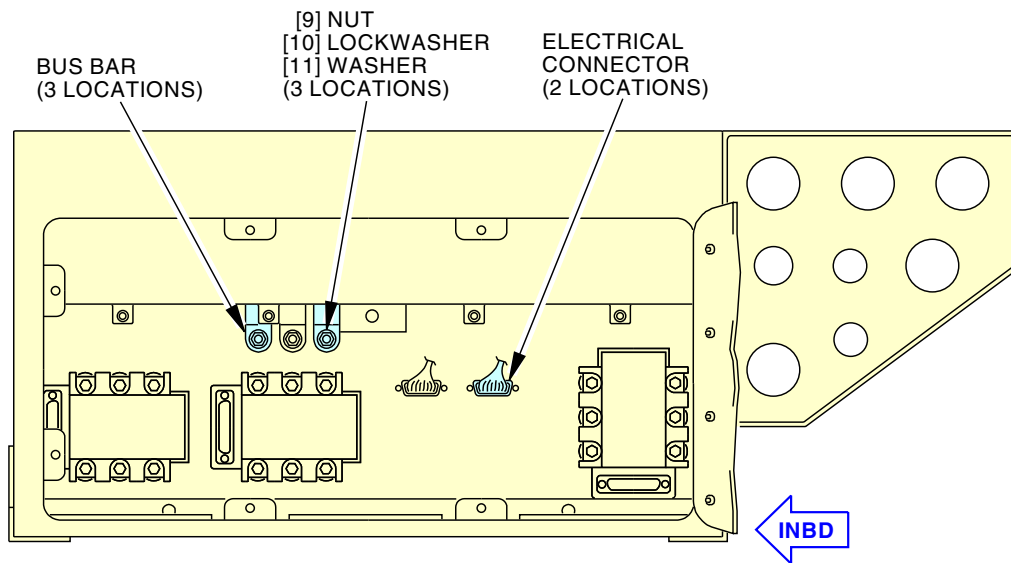
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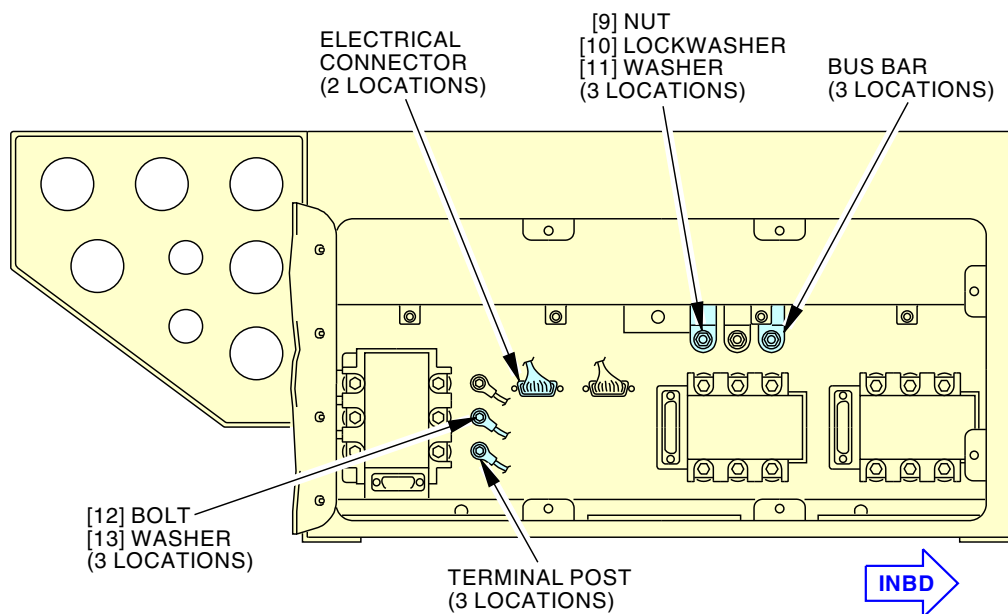


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POWER DISTRIBUTION PANEL 1, P91

E



POWER DISTRIBUTION PANEL 2, P92

F

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Rigid Bus Assembly Installation
Figure 401/24-21-22-990-801 (Sheet 4 of 4)

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TASK 24-21-22-400-801

3. Rigid Bus Assembly Installation

(Figure 401)

A. General

- (1) There is one rigid bus assembly located at the rear of each of the P91 and P92 Power Distribution Panel (PDP).
- (2) It is necessary to get access to the front and the rear of the PDPs to remove and install the rigid bus assembly.
- (3) You get access to the front of the PDP from the electronic equipment area.
- (4) You get access to the rear of the PDP from the forward cargo area.

B. References

Reference	Title
24-21-00-700-801	Operational Test for the AC Generation and Control System (P/B 501)
24-21-41-400-801	Breaker Installation (P/B 401)
24-41-12-400-801	External Power Contactor Installation (P/B 401)

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
121	Forward Cargo Compartment - Left
122	Forward Cargo Compartment - Right

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

E. Prepare for the Installation

SUBTASK 24-21-22-860-002



REMOVE THE ELECTRICAL POWER BEFORE YOU REMOVE OR INSTALL THE RIGID BUS ASSEMBLY. HIGH VOLTAGES CAN CAUSE INJURY TO PERSONS.

- (1) Make sure that electrical power is removed from airplane.
 - (a) Make sure that all of the power warning lights on the PDP are off.

F. Rigid Bus Assembly Installation

SUBTASK 24-21-22-420-001

- (1) Do these steps to install the rigid bus assembly [1]:
 - (a) Hold the rigid bus assembly [1] in position.
 - (b) Install the five screws [3] and washers [2].
 - (c) Tighten the screws [3] to 123 ±8 in-lb (14 ±1 N·m).

SUBTASK 24-21-22-420-002

- (2) Do these steps to install the cooling duct on the PDP:
 - (a) Install the gasket [8] on the duct and put the duct in position on the PDP.

EFFECTIVITY
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- (b) Install the screws [6] and washers [7] that hold the cooling duct to the PDP.
- (c) Tighten the screws [6].

SUBTASK 24-21-22-420-003

- (3) Do these steps to install the power feeders on the PDP:
 - (a) Use the identification tags to install the power feeders on the correct terminal studs.
 - (b) Install the nuts [4] and washers [5] on each terminal stud.
 - (c) Tighten the nuts [4] to 190 ± 10 in-lb (21 ± 2 N·m).

NOTE: When you install and tighten the power feeders to the rigid bus assembly, there may be some axial movement of the terminal studs (particularly TB5004 and TB5008). A small amount of movement is normal and should not affect the tightening of the nuts to the specified torque.

SUBTASK 24-21-22-420-004

- (4) To install the rigid bus assembly on P91 PDP 1, do the steps that follow:
 - (a) Install the two electrical connectors on the rigid bus assembly and tighten the two screws.
 - (b) Install the nuts [9], lockwashers [10] and washers [11] that hold the bus bars to the rigid bus assembly.
 - (c) Tighten the nuts [9] to 22 ± 2 in-lb (2 ± 1 N·m).
 - (d) Install the breakers listed below (TASK 24-21-41-400-801).



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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) These are the circuit breakers:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
---	---	C00803	AUXILIARY POWER BREAKER
---	---	C00804	BUS TIE BREAKER 1
---	---	C00801	GENERATOR BREAKER 1

SUBTASK 24-21-22-420-005

- (5) To install the rigid bus assembly on P92 PDP 2, do the steps that follow:
 - (a) Install the two electrical connectors on the rigid bus assembly and tighten the two screws.
 - (b) Install the three nuts [9], lockwashers [10] and washers [11] that hold the bus bars to the rigid bus assembly.

EFFECTIVITY
SIA ALL

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- (c) Tighten the nuts [9] to 22 ±2 in-lb (2 ±1 N·m).
- (d) Install the three bolts [12] and washers [13] that hold wires to the terminal posts on the rigid bus assembly.

NOTE: Use identification tags on wires for correct installation.

- (e) Install the breakers listed below (TASK 24-21-41-400-801).



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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) These are the circuit breakers:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
---	---	C00805	BUS TIE BREAKER 2
---	---	C00802	GENERATOR BREAKER 2

- (f) Do this task: External Power Contactor Installation, TASK 24-41-12-400-801.

G. Installation Test

SUBTASK 24-21-22-710-001

- (1) Do this task: Operational Test for the AC Generation and Control System, TASK 24-21-00-700-801.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 24-21-22-410-001

- (1) Install the applicable forward bulkhead liner.

SUBTASK 24-21-22-410-002

- (2) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

————— **END OF TASK** —————

EFFECTIVITY
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GENERATOR, BUS TIE AND AUXILIARY POWER BREAKERS - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

(1) A removal of any of the following breakers:

- (a) GENERATOR CONTROL BREAKER 1 (GCB)
- (b) GENERATOR CONTROL BREAKER 2 (GCB)
- (c) AUXILIARY POWER BREAKER (APB)
- (d) BUS TIE BREAKER 1 (BTB)
- (e) BUS TIE BREAKER 2 (BTB)

(2) An installation of any of these breakers.

B. These power breakers are the same. This procedure is applicable to all of these power breakers.

TASK 24-21-41-000-801

2. Breaker Removal

(Figure 401)

A. General

(1) The breakers are located as follows:

- (a) GENERATOR CONTROL BREAKER 1, C801 - P91
- (b) GENERATOR CONTROL BREAKER 2, C802 - P92
- (c) AUXILIARY POWER BREAKER, C803 - P91
- (d) BUS TIE BREAKER 1, C804 - P91
- (e) BUS TIE BREAKER 2, C805 - P92.

B. References

Reference	Title
24-22-00-860-802	Remove Electrical Power (P/B 201)

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

E. Prepare for the Removal

SUBTASK 24-21-41-860-001



WARNING

REMOVE ELECTRICAL POWER BEFORE YOU REPLACE THE CIRCUIT BREAKERS IN THE POWER DISTRIBUTION PANELS. HIGH VOLTAGES CAN CAUSE INJURIES TO PERSONNEL.

(1) Do this task: Remove Electrical Power, TASK 24-22-00-860-802.

- (a) Make sure that all of the power warning lights on the power distribution panel are off.

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SUBTASK 24-21-41-010-001

- (2) Open this access panel to get access to the main equipment center:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

F. Breaker Removal

SUBTASK 24-21-41-020-001



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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 steps to remove the breaker [1]:
- (a) Open the applicable panel for the breaker [1] to be removed.
 - (b) Loosen two screws and remove the electrical connector from the breaker [1].
 - (c) Remove the bolts [2] and washers [3] that hold the breaker [1].
 - (d) Remove the breaker [1].

————— **END OF TASK** —————

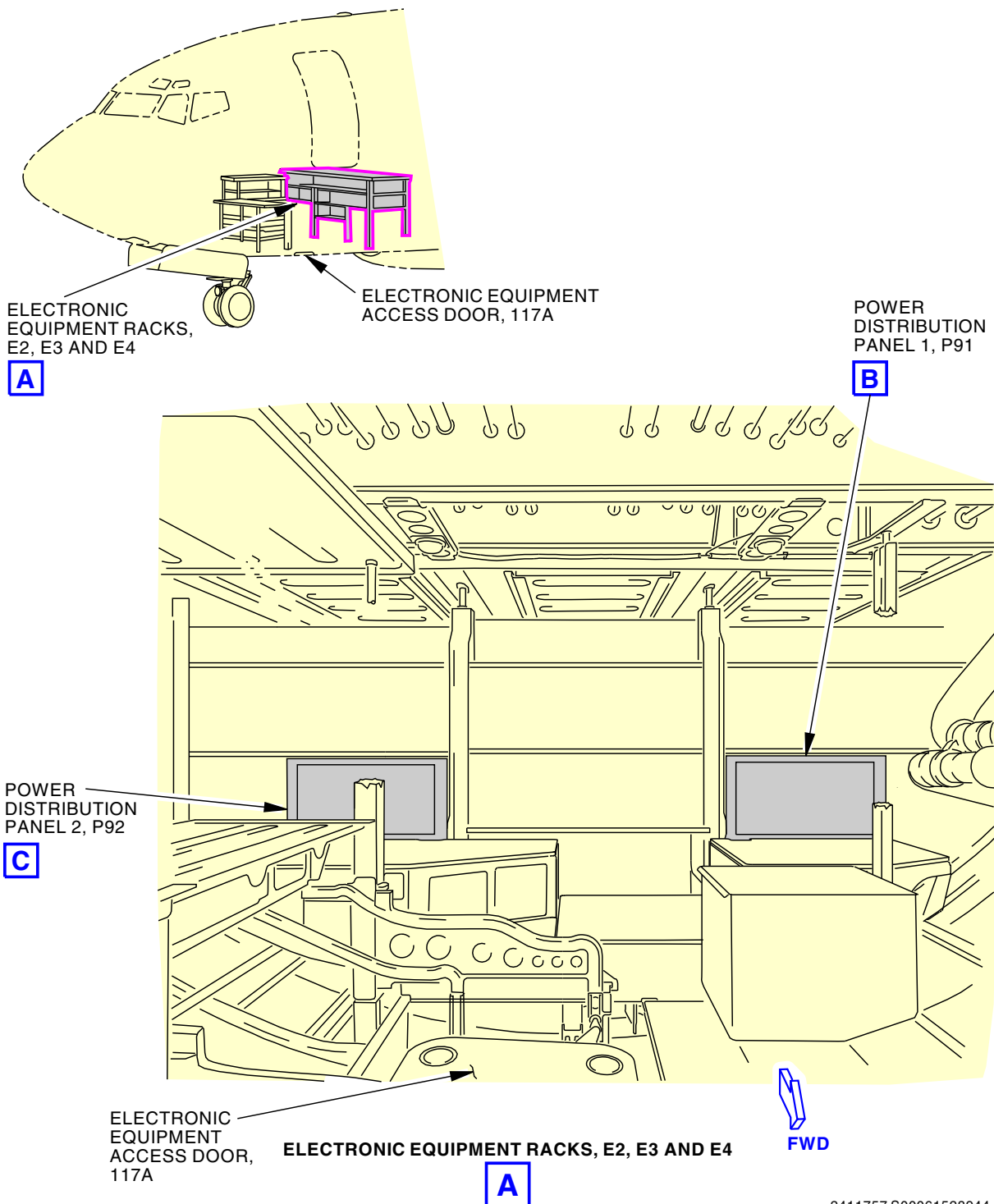
EFFECTIVITY
SIA ALL

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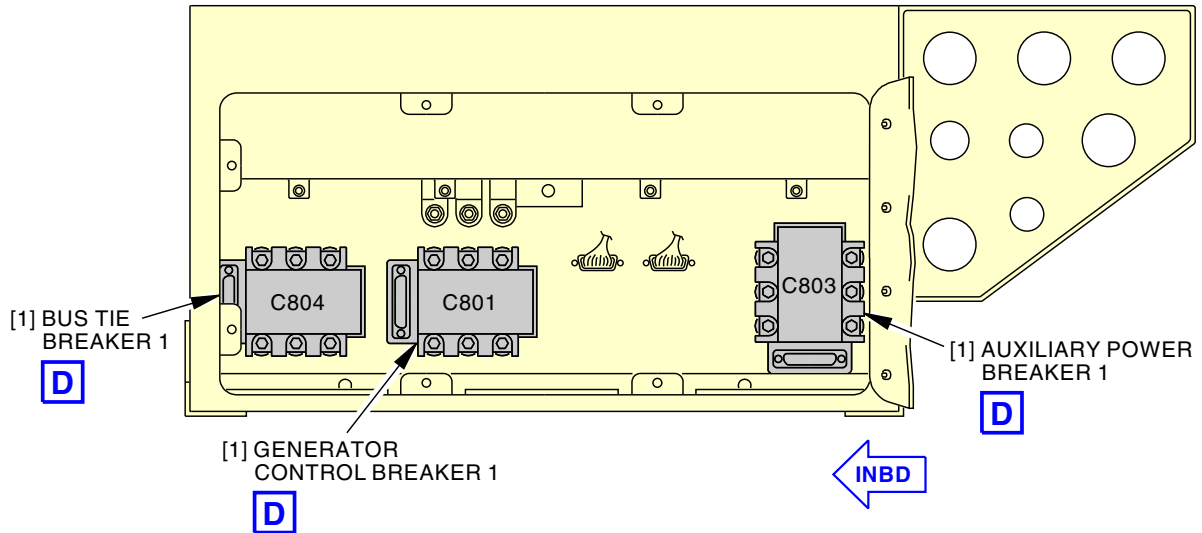
Main Power Breaker Installation
Figure 401/24-21-41-990-801 (Sheet 1 of 3)

EFFECTIVITY
SIA ALL

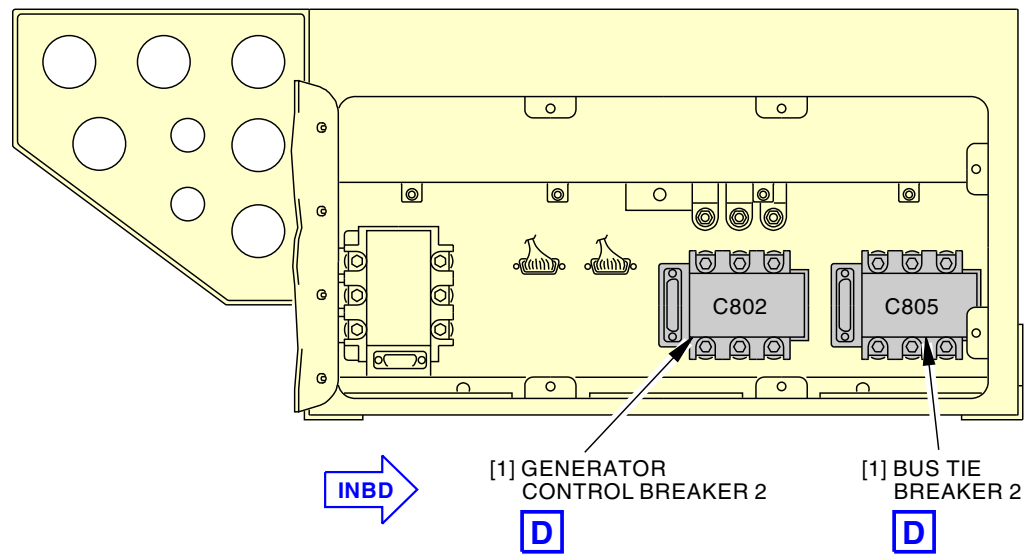
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POWER DISTRIBUTION PANEL 1, P91



POWER DISTRIBUTION PANEL 2, P92

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Main Power Breaker Installation
Figure 401/24-21-41-990-801 (Sheet 2 of 3)

EFFECTIVITY
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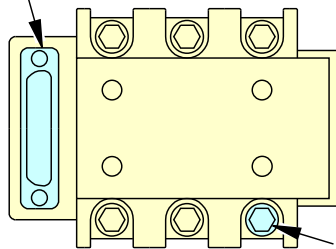
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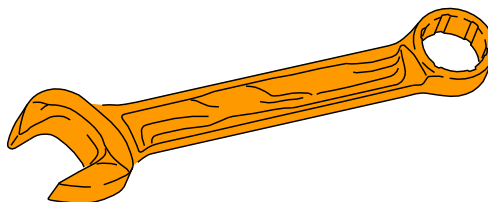
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ELECTRICAL
CONNECTOR

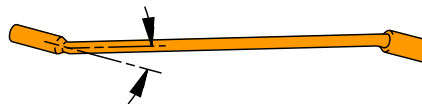


[2] BOLT
[3] WASHER
(6 LOCATIONS)

(EXAMPLE)



APPROXIMATE 15°



5mm-WRENCH 1

- 1 USE 5mm-WRENCH TO HOLD THE SPACER NUTS IN PLACE WHILE LOOSENING THE SCREWS ON THE ELECTRICAL CONNECTOR. FAILURE TO USE WRENCH COULD RESULT IN DAMAGE TO HARDWARE.

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Main Power Breaker Installation
Figure 401/24-21-41-990-801 (Sheet 3 of 3)

EFFECTIVITY
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TASK 24-21-41-400-801

3. **Breaker Installation**

(Figure 401)

A. General

- (1) The breakers are located as follows:
- (a) GENERATOR CONTROL BREAKER 1, C801 - P91
 - (b) GENERATOR CONTROL BREAKER 2, C802 - P92
 - (c) AUXILIARY POWER BREAKER, C803 - P91
 - (d) BUS TIE BREAKER 1, C804 - P91
 - (e) BUS TIE BREAKER 2, C805 - P92.

B. References

Reference	Title
24-22-00-860-801	Supply Electrical Power (P/B 201)
24-22-00-860-803	Supply External Power (P/B 201)
24-22-00-860-804	Remove External Power (P/B 201)
24-22-00-860-806	Remove APU Generator Power (P/B 201)
49-11-00-860-801	APU Starting and Operation (P/B 201)
71-00-00-910-802-G00	Start the Engine (Selection) (P/B 201)
71-00-00-910-806-G00	Stop the Engine (Usual Engine Stop) (P/B 201)

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

E. Prepare for the Installation

SUBTASK 24-21-41-860-002



WARNING

REMOVE ELECTRICAL POWER BEFORE YOU REPLACE THE CIRCUIT BREAKERS IN THE POWER DISTRIBUTION PANELS. HIGH VOLTAGES CAN CAUSE INJURIES TO PERSONNEL.

- (1) Make sure that electrical power is removed from airplane.
- (a) Make sure that all of the power warning lights on the power distribution panel are off.

F. Breaker Installation

SUBTASK 24-21-41-420-001



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

EFFECTIVITY
SIA ALL

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I (WARNING PRECEDES)



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 steps to install the breaker [1]:
 - (a) Hold the breaker [1] in place and install the bolts [2] and washers [3].
 - (b) Tighten the bolts [2] to 48 ± 4 in-lb (5 ± 1 N·m).
 - (c) Install the electrical connector on the breaker [1] and tighten the two screws on the electrical connector.
 - (d) Close the access door on the panel.

G. Breaker Installation Test

SUBTASK 24-21-41-700-001

- (1) If one of the Generator Control Breakers was replaced, do these steps:
 - (a) Start the applicable engine, do this task: Start the Engine (Selection), TASK 71-00-00-910-802-G00.
 - (b) Make sure that the blue GEN OFF BUS light, on the P5-4 panel, is on.
 - (c) Set the GEN control switch, on the P5-4 panel, to the ON position.
 - (d) Make sure that the blue GEN OFF BUS light, on the P5-4 panel, goes off.
 - (e) Stop the engine, do this task: Stop the Engine (Usual Engine Stop), TASK 71-00-00-910-806-G00.

SUBTASK 24-21-41-700-002

- (2) If one of the Bus Tie Breakers was replaced, do these steps:
 - (a) Do this task: Supply External Power, TASK 24-22-00-860-803.
 - (b) Make sure that the BAT switch, on the P5-13 panel, is in the ON position.
 - (c) Set the BUS TRANS switch, on the P5-4 panel, to the AUTO position.
 - (d) Make sure that the both amber TRANSFER BUS OFF lights, on the P5-4 panel, are on.
 - (e) Connect external power to the P19 panel.
 - (f) Make sure that the blue GRD POWER AVAILABLE light, on the P5-4 panel, is on.
 - (g) Set the GRD PWR switch, on the P5-4 panel, to the ON position.
 - (h) Make sure that the both amber TRANSFER BUS OFF lights, on the P5-4 panel, go off.
 - (i) Do this task: Remove External Power, TASK 24-22-00-860-804.

SUBTASK 24-21-41-700-003

- (3) If the Auxiliary Power Breaker was replaced, do these steps:
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (b) Make sure that the blue APU GEN OFF BUS light, on the P5-4 panel, comes on (approximately 50 seconds) after Auxiliary Power Unit (APU) start.
 - (c) Set either of the APU GEN switches, on the P5-4 panel, to the ON position.
 - (d) Make sure that the blue APU GEN OFF BUS light, on the P5-4 panel, goes off.

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(e) Do this task: Remove APU Generator Power, TASK 24-22-00-860-806.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 24-21-41-410-001

(1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

SUBTASK 24-21-41-860-003

(2) Do this task: Supply Electrical Power, TASK 24-22-00-860-801.

———— **END OF TASK** ————

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AC SYSTEM GENERATOR AND APU MODULE (P5-4) - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

- (1) Removal of the AC System Generator and APU Module
- (2) Installation of the AC System Generator and APU Module.

TASK 24-21-51-000-801

2. AC System Generator and APU Module - Removal

(Figure 401)

A. **General**

- (1) The AC System Generator and APU Module, P5-4, is located on the P5 Overhead Panel in the flight compartment.

B. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. **Location Zones**

Zone	Area
211	Flight Compartment - Left

D. **Prepare for the Removal**

SUBTASK 24-21-51-860-002

- (1) Make sure that the APU master switch, on the P5 forward overhead panel, is in the OFF position and install a DO NOT OPERATE tag, STD-858.

SUBTASK 24-21-51-860-003

- (2) 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

E. **AC System Generator and APU Module Removal**

SUBTASK 24-21-51-020-001

- (1) Do these steps to remove the module [1]:
 - (a) Unlatch the P5 overhead panel and let the panel hinge down to the open position.
 - (b) Disconnect the electrical connectors from the module [1].
 - (c) Put protective covers on the electrical connectors.
 - (d) Loosen the quarter turn fasteners on the module [1].

NOTE: Hold the module when you loosen the quarter turn fasteners so that the module does not fall.
 - (e) Carefully pull the module [1] out from the P5 overhead panel.

————— **END OF TASK** —————

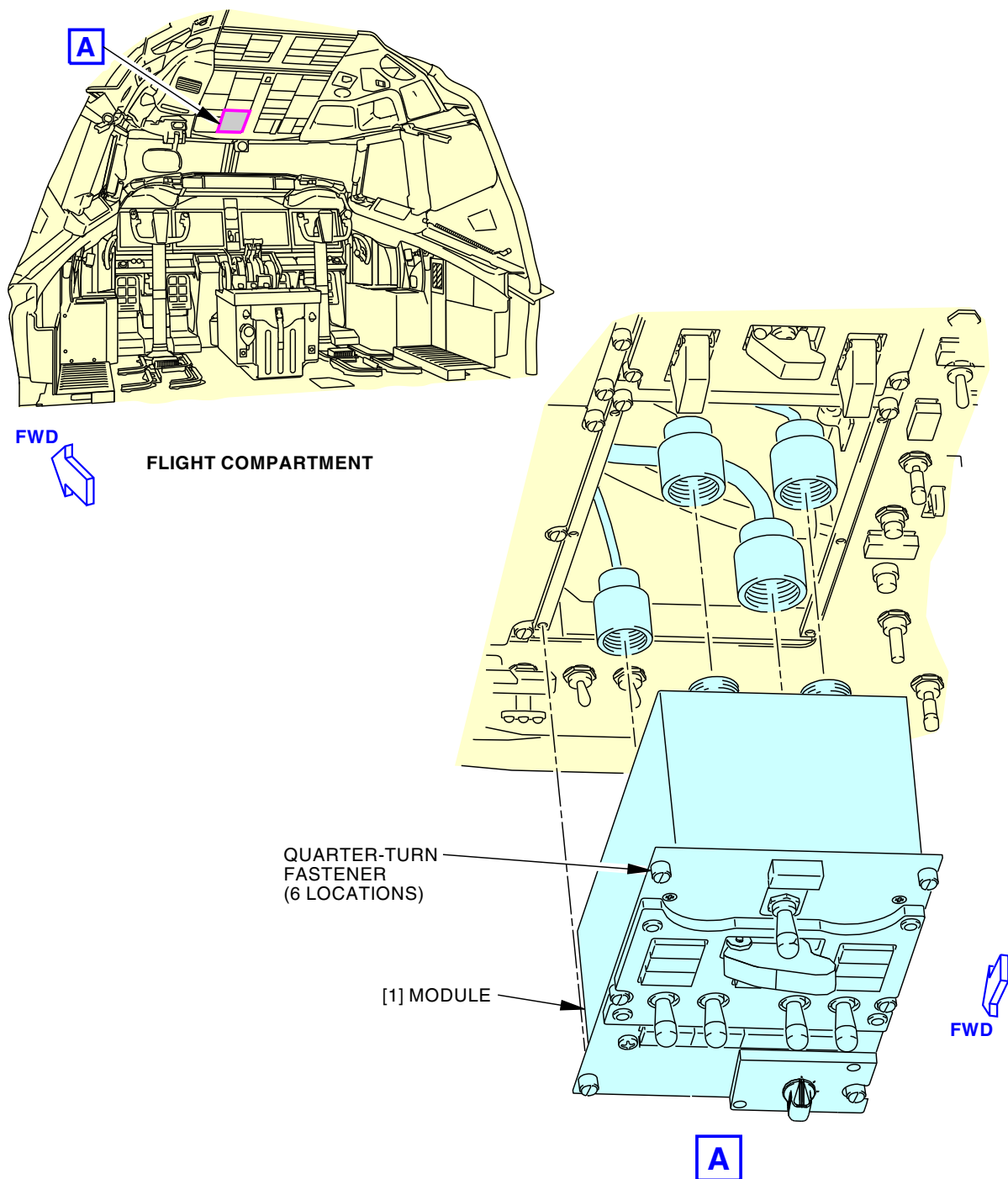
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AC System Generator and APU Module Installation
Figure 401/24-21-51-990-801

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TASK 24-21-51-400-801

3. **AC System Generator and APU Module - Installation**

(Figure 401)

A. General

- (1) The AC System Generator and APU Module, P5-4, is located on the P5 Overhead Panel in the flight compartment.

B. References

Reference	Title
24-21-00-700-801	Operational Test for the AC Generation and Control System (P/B 501)
30-42-00-700-801	Windshield Wiper System - Operational Test (P/B 501)

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Module	24-21-51-01-050	SIA ALL

E. Location Zones

Zone	Area
211	Flight Compartment - Left

F. AC System Generator and APU Module Installation

SUBTASK 24-21-51-420-001

- (1) Do these steps to install the module [1]:
- (a) Put the module [1] carefully into position in the P5 overhead panel.
 - (b) Tighten the quarter turn fasteners on the module [1].
 - (c) Remove the protective covers from the electrical connectors.
 - (d) Examine the electrical connectors for bent or broken pins, dirt and damage.
 - 1) Clean or repair the electrical connectors if it is necessary.
 - (e) Connect the electrical connectors to the module [1].
 - (f) Push the P5 overhead panel up to the closed position and latch it.

G. Installation Test of the AC System Generator and APU Module

SUBTASK 24-21-51-860-004

- (1) Remove the safety tags and close these circuit breakers:

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

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SUBTASK 24-21-51-710-003

- (2) Remove the DO NOT OPERATE tag, STD-858, from the APU master switch on the P5 forward overhead panel.

SUBTASK 24-21-51-710-001

- (3) Do this task: Operational Test for the AC Generation and Control System, TASK 24-21-00-700-801.

SUBTASK 24-21-51-700-001

- (4) If the module [1] has a L-Wiper switch attached, do this task: Windshield Wiper System - Operational Test, TASK 30-42-00-700-801.

———— END OF TASK ————

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GENERATOR DRIVE AND STANDBY POWER MODULE (P5-5) - REMOVAL/INSTALLATION

1. **General**

A. This procedure has two tasks:

- (1) Removal of the Generator Drive and Standby Power Module
- (2) Installation of the Generator Drive and Standby Power Module.

TASK 24-21-52-000-801

2. **Generator Drive and Standby Power Module Removal**

(Figure 401)

A. **General**

- (1) The Generator Drive and Standby Power Module, P5-5, is located on the P5 Overhead Panel in the flight compartment.

B. **References**

Reference	Title
20-40-12-000-802	ESDS Handling for Metal Encased Unit Removal (P/B 201)
24-22-00-860-802	Remove Electrical Power (P/B 201)

C. **Tools/Equipment**

Reference	Description
STD-7394	Cap - Dust, Electrical Connector

D. **Location Zones**

Zone	Area
211	Flight Compartment - Left

E. **Prepare for the Removal**

SUBTASK 24-21-52-860-001

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-802.

F. **Generator Drive and Standby Power Module Removal**

SUBTASK 24-21-52-910-001



DO NOT TOUCH THE CONNECTOR PINS, OR OTHER CONDUCTORS. IF YOU TOUCH THESE CONDUCTORS, ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE COMPONENTS.

- (1) Do this task: ESDS Handling for Metal Encased Unit Removal, TASK 20-40-12-000-802.

SUBTASK 24-21-52-010-001

- (2) Open the P5 overhead panel:
 - (a) Loosen the quarter-turn fasteners on the bottom corners of the P5 overhead panel.



HOLD THE PANEL TIGHTLY BEFORE YOU RELEASE THE LATCH. THE PANEL IS HEAVY. INJURIES CAN OCCUR IF IT HITS YOU.

- (b) Release the panel safety latch.

SUBTASK 24-21-52-020-001

- (3) Do these steps to remove the module [1]:

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- (a) Disconnect the electrical connectors from the module [1].
- (b) Put dust caps, STD-7394, on the electrical connectors.
- (c) Loosen the quarter-turn fasteners on the module [1].
 - 1) Hold the panel while loosening quarter-turn fasteners so the panel does not fall.
- (d) Carefully pull the module [1] out from the P5 overhead panel.

———— **END OF TASK** ————

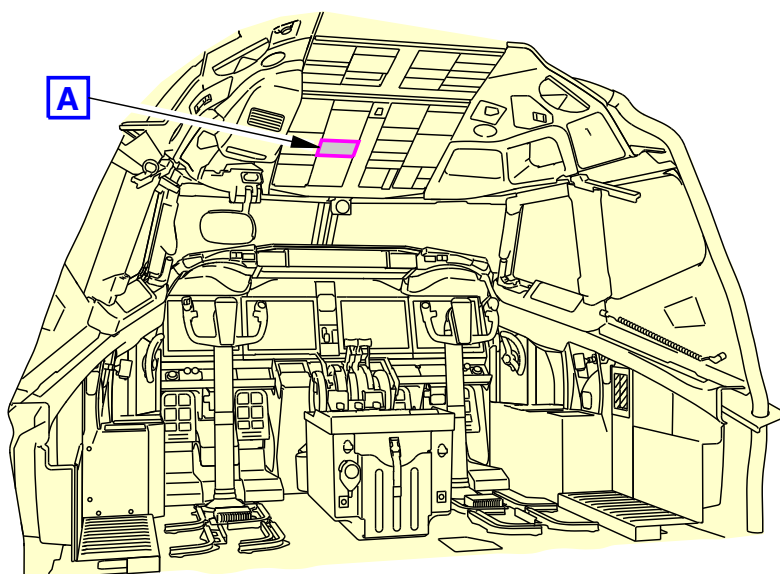
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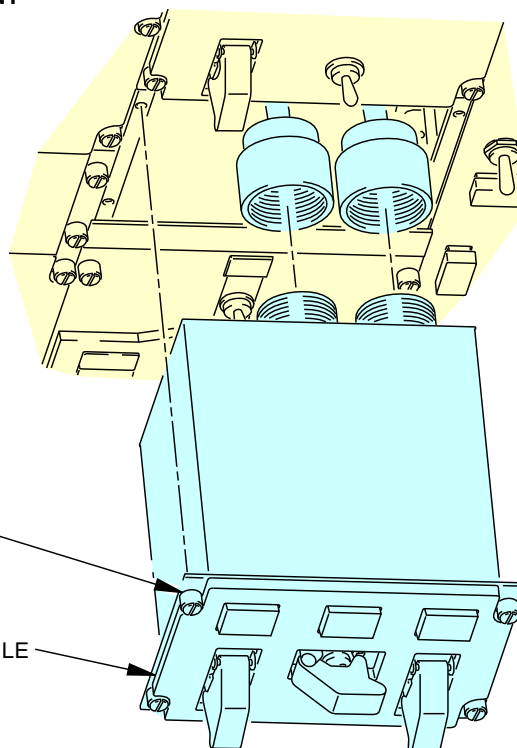
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FLIGHT COMPARTMENT

QUARTER-TURN
FASTENER
(4 LOCATIONS)

[1] MODULE



FWD

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Generator Drive and Standby Power Module Installation
Figure 401/24-21-52-990-801

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TASK 24-21-52-400-801

3. **Generator Drive and Standby Power Module Installation**

(Figure 401)

A. General

- (1) The Generator Drive and Standby Power Module, P5-5, is located on the P5 Overhead Panel in the flight compartment.

B. References

Reference	Title
20-40-12-400-802	ESDS Handling for Metal Encased Unit Installation (P/B 201)
24-11-00-700-803	Number 1 IDG Operational Test (P/B 501)
24-11-00-700-804	Number 2 IDG Operational Test (P/B 501)
24-34-00-710-802	Standby Power System - Operational Test (P/B 501)

C. Tools/Equipment

Reference	Description
STD-7394	Cap - Dust, Electrical Connector

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Module	24-21-52-01-050	SIA ALL

E. Location Zones

Zone	Area
211	Flight Compartment - Left

F. Generator Drive and Standby Power Module Installation

SUBTASK 24-21-52-910-002



CAUTION

DO NOT TOUCH THE CONNECTOR PINS, OR OTHER CONDUCTORS. IF YOU TOUCH THESE CONDUCTORS, ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE COMPONENTS.

- (1) Do this task: ESDS Handling for Metal Encased Unit Installation, TASK 20-40-12-400-802.

SUBTASK 24-21-52-010-002

- (2) If closed, open the P5 overhead panel:
(a) Loosen the quarter-turn fasteners on the bottom corners of the P5 overhead panel.



WARNING

HOLD THE PANEL TIGHTLY BEFORE YOU RELEASE THE LATCH. THE PANEL IS HEAVY. INJURIES CAN OCCUR IF IT HITS YOU.

- (b) Release the panel safety latch.

SUBTASK 24-21-52-420-001

- (3) Do these steps to install the module [1]:

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WARNING

DO NOT TOUCH OVERHEAD PANEL TERMINALS. HIGH VOLTAGE MAY BE PRESENT AND CAUSE INJURY TO PERSONNEL OR DAMAGE TO EQUIPMENT CAN OCCUR.

- (a) Put the module [1] carefully into position in the P5 overhead panel.
- (b) Tighten the quarter-turn fasteners on the module [1].
- (c) Remove the dust caps, STD-7394, from the electrical connectors.
- (d) Examine the electrical connectors for bent or broken pins, dirt and damage.
 - 1) Clean or repair the electrical connectors if it is necessary.
- (e) Connect the electrical connectors to the module [1].

SUBTASK 24-21-52-410-001

- (4) Do these steps to close the P5 overhead panel:
 - (a) Raise the P5 overhead panel.



WARNING

HOLD THE PANEL TIGHTLY BEFORE YOU RELEASE THE LATCH. THE PANEL IS HEAVY. INJURIES CAN OCCUR IF IT HITS YOU.

- (b) Make sure the safety latch is in the correct position.
- (c) Tighten the quarter-turn fasteners on the bottom corners of the P5 overhead panel.

G. Generator Drive and Standby Power Module Installation Test

SUBTASK 24-21-52-710-001

- (1) Do these tasks: Number 1 IDG Operational Test, TASK 24-11-00-700-803 and Number 2 IDG Operational Test, TASK 24-11-00-700-804.

SUBTASK 24-21-52-710-002

- (2) Do this task: Standby Power System - Operational Test, TASK 24-34-00-710-802.

———— **END OF TASK** ————

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ELECTRICAL METERS, BATTERY, CABIN UTILITY AND INFLIGHT ENTERTAINMENT POWER MODULE
(P5-13) - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

- (1) Removal of the Electrical Meters, Battery, Cabin Utility and Inflight Entertainment Power Module
- (2) Installation of the Electrical Meters, Battery, Cabin Utility and Inflight Entertainment Power Module.

TASK 24-21-53-000-801

2. Electrical Meters, Battery, Cabin Utility and In-flight Entertainment Power Module Removal

(Figure 401)

A. General

- (1) The Electrical Meters, Battery and Galley Power Module, P5-13, is located on the P5 overhead panel in the flight compartment.

B. References

Reference	Title
24-22-00-860-802	Remove Electrical Power (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment - Left

D. Electrical Meters, Battery, Cabin Utility and In-flight Entertainment Power Module Removal

SUBTASK 24-21-53-860-004

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-802.

SUBTASK 24-21-53-860-002

- (2) Make sure that the BAT switch, on the P5-13 panel, is in the OFF position.

SUBTASK 24-21-53-020-002

- (3) Release the P5 overhead panel and let the panel hinge down to the open position.

SUBTASK 24-21-53-020-003

- (4) Disconnect the electrical connectors from the module [1].

SUBTASK 24-21-53-020-004

- (5) Put protective covers on the electrical connectors.

SUBTASK 24-21-53-020-005

- (6) Loosen the quarter turn fasteners on the module [1].

NOTE: Hold the module when you loosen the quarter turn fasteners so that the module does not fall.

SUBTASK 24-21-53-020-006

- (7) Carefully pull the module [1] out from the P5 overhead panel.

———— **END OF TASK** ————

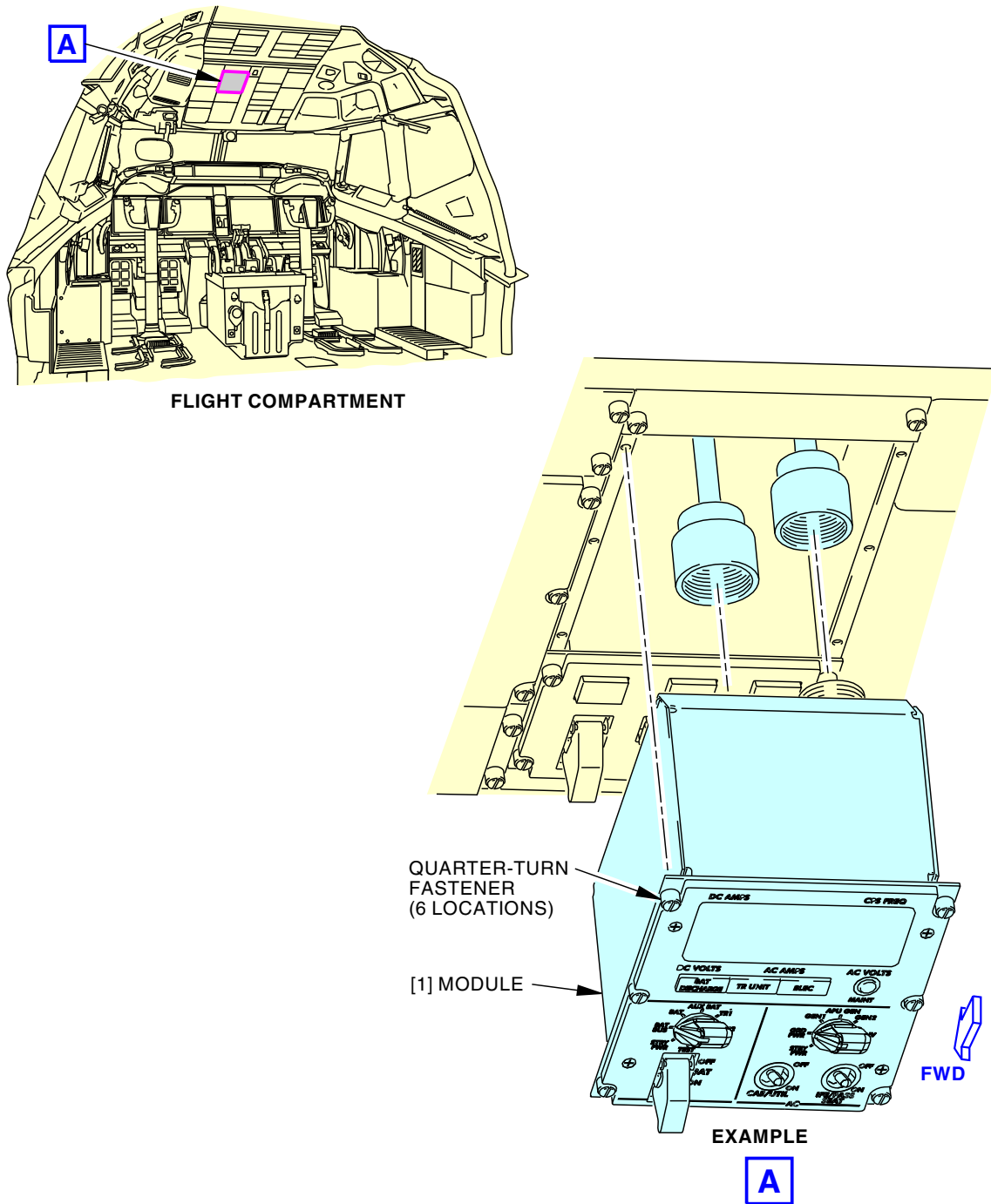
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Electrical Meters, Battery, Cabin Utility and Inflight Entertainment Power Module Installation
Figure 401/24-21-53-990-801

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TASK 24-21-53-400-801

3. **Electrical Meters, Battery, Cabin Utility and In-flight Entertainment Power Module Installation**
(Figure 401)

A. General

- (1) The Electrical Meters, Battery, Cabin Utility and In-flight Entertainment Power Module, P5-13, is located on the P5 overhead panel in the flight compartment.

B. References

Reference	Title
24-22-00-860-803	Supply External Power (P/B 201)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Module	24-21-53-01-050	SIA ALL

D. Location Zones

Zone	Area
211	Flight Compartment - Left

E. **Electrical Meters, Battery, Cabin Utility and In-flight Entertainment Power Module Installation**

SUBTASK 24-21-53-940-001

- (1) Make sure that the BAT switch, on the P5-13 panel, is in the OFF position.

SUBTASK 24-21-53-420-002

- (2) Put the module [1] carefully into position, in the P5 overhead panel.

SUBTASK 24-21-53-420-003

- (3) Tighten the quarter turn fasteners on the module [1].

SUBTASK 24-21-53-420-004

- (4) Remove the protective covers from the electrical connectors.

SUBTASK 24-21-53-420-005

- (5) Examine the electrical connectors for bent or broken pins, dirt, and damage.

- (a) Clean or repair the electrical connectors if it is necessary.

SUBTASK 24-21-53-420-006

- (6) Connect the electrical connectors to the module [1].

SUBTASK 24-21-53-420-007

- (7) Push the P5 overhead panel up to the closed position and latch it.

F. **Installation Test of the Electrical Meters, Battery, Cabin Utility and In-flight Entertainment Power Module**

SUBTASK 24-21-53-860-003

- (1) Do this task: Supply External Power, TASK 24-22-00-860-803.

SUBTASK 24-21-53-710-003

- (2) Do the installation test of the electrical meters, battery, cabin utility and in-flight entertainment power module, do the following steps:

- (a) Set both the DC Meter and the AC Meter selector switches, on the P5-13 panel, to the STBY PWR position.

- (b) Make sure that the BAT switch, on the P5-13 panel, is in the ON position.

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- 1) The P5-13 panel should power up after a few seconds and show the following values on the display:
 - a) DC VOLTS = 23 - 33
 - b) AC VOLTS = 110 - 120
 - c) CPS FREQ = 395 Hz - 405 Hz
 - d) DC AMPS = Blank
 - e) AC AMPS = Blank
- (c) Make sure that the BAT DISCHARGE light, on the P5-13 panel, is ON.
- (d) Make sure that the ELEC light, on the P5-13 panel, stays OFF.
- (e) If the ELEC light, on the P5-13 panel, is on do the steps that follow:

NOTE: The P5-13 panel may have fault messages latched in from the previous shop test. Do these steps to clear any fault messages.

 - 1) Set the AC meter selector switch and the DC meter selector switch, on the P5-13 panel, to the TEST position.
 - 2) Push and release the MAINT switch, on the P5-13 panel, to start the display test.

NOTE: The display test will exercise all of the segments of the alphanumeric display to allow the operator to verify the functionality of the display. The display test is automatically terminated after a complete test cycle.
 - 3) After completion of the display test the fault messages, (if there are any), will be displayed on the meter. The fault messages will be displayed one at a time. Press the MAINT switch again to step to the next message.
 - 4) After the last message has been displayed, the following message will be displayed:
 - a) HOLD BUTTON CLEAR FAULTS
 - 5) To clear the fault messages, push and hold the MAINT switch for 6 seconds. The following message will be displayed if the faults have been successfully cleared:
 - a) FAULTS CLEARED
- (f) Make sure that the ELEC light, on the P5-13 panel, is off.
- (g) Set the following positions with the DC Meter selector switch, on the P5-13 panel, and make sure that the following values show.
 - 1) BAT BUS: DC VOLTS = 23 - 33; DC AMPS = Blank
 - 2) BAT: DC VOLTS = 23 - 33; DC AMPS = Minus Amps
 - 3) AUX BAT: DC VOLTS = 23 - 33; DC AMPS = Minus Amps
 - 4) TR1: DC VOLTS = 0; DC AMPS = 0
 - 5) TR2: DC VOLTS = 0; DC AMPS = 0
 - 6) TR3: DC VOLTS = 0; DC AMPS = 0
- (h) Set the following positions with the AC Meter selector switch, on the P5-13 panel, and make sure that the following values show.
 - 1) GRD PWR: AC VOLTS = 0; AC AMPS = Blank; CPS FREQ = Blank
 - 2) GEN1: AC VOLTS = 0; AC AMPS = 0; CPS FREQ = Blank
 - 3) GEN2: AC VOLTS = 0; AC AMPS = 0; CPS FREQ = Blank
 - 4) APU GEN: AC VOLTS = 0; AC AMPS = 0; CPS FREQ = Blank
 - 5) INV: AC VOLTS = 110 - 120; AC AMPS = Blank; CPS FREQ = 395 Hz - 405 Hz

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- (i) Connect the external electrical power source to the airplane.
- (j) Set the GRD PWR switch, on the P5-4 panel, to the ON position.
- (k) Set the following positions with the DC Meter selector switch, on the P5-13 panel, and make sure that the following values show.
 - 1) TR1: DC VOLTS = 22 - 30; DC AMPS > 5 amps
 - 2) TR2: DC VOLTS = 22 - 30; DC AMPS > 5 amps
 - 3) TR3: DC VOLTS = 22 - 30; DC AMPS > 5 amps
- (l) Set the following positions with the AC Meter selector switch, on the P5-13 panel, and make sure that the following values show.
 - 1) GRD PWR: AC VOLTS = 110 - 120; AC AMPS = Blank; CPS FREQ = 395 Hz - 405 Hz
 - 2) GEN1: AC VOLTS = 0; AC AMPS = 0; CPS FREQ = Blank
 - 3) GEN2: AC VOLTS = 0; AC AMPS = 0; CPS FREQ = Blank
 - 4) APU GEN: AC VOLTS = 0; AC AMPS = 0; CPS FREQ = Blank
- (m) Set the AC Meter selector switch to the APU GEN position.
- (n) Start the APU.
- (o) Make sure that the P5-13 panel shows zero AC AMPS and zero AC VOLTS during the APU Start procedure.
- (p) Set the APU GEN NO.1 and NO.2 switches, on the P5-4 panel, to the ON position.
- (q) Set the following positions with the AC Meter selector switch, on the P5-13 panel, and make sure that the following values show.
 - 1) GEN1: AC VOLTS = 0; AC AMPS = 0; CPS FREQ = Blank
 - 2) GEN2: AC VOLTS = 0; AC AMPS = 0; CPS FREQ = Blank
 - 3) APU GEN: AC VOLTS = 110 - 120; AC AMPS > 10 amps; CPS FREQ = 395 Hz - 405 Hz
- (r) Start Engine 1.
- (s) Set the GEN 1 switch, on the P5-4 panel, to the ON position.
- (t) Set the following positions with the AC Meter selector switch, on the P5-13 panel, and make sure that the following values show.
 - 1) GEN1: AC VOLTS = 110 - 120; AC AMPS > 10 amps; CPS FREQ = 395 Hz - 405 Hz
 - 2) GEN2: AC VOLTS = 0; AC AMPS = 0; CPS FREQ = Blank
- (u) Start Engine 2.
- (v) Set the GEN 2 switch, on the P5-4 panel, to the ON position.
- (w) Set the AC Meter selector switch, on the P5-13 panel, to GEN 2 and make sure that the following values show.
 - 1) AC VOLTS = 110 - 120
 - 2) AC AMPS > 10 amps
 - 3) CPS FREQ = 395 Hz - 405 Hz
- (x) Make sure that the GRD PWR switch, on the P5-4 panel, is in the ON position.

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- (y) Stop Engine 1, Engine 2, and APU.

NOTE: If P5-13 panel ELEC light is ON, do the fault clearing process as specified in the step (e) above.

- (z) Set the CAB/UTIL switch, on the P5-13 panel, to the ON position.
- (aa) Set the GALLEY light switch in each galley to BRT.
- (ab) Make sure that the galley lights come on to the bright mode.
- (ac) Set the galley light switch in each galley to OFF if lights are no longer needed.
- (ad) Set the IFE/PSS SEAT switch, on the P5-13 panel, to the ON position.
- (ae) Make sure that the in-seat Audio system is operational.

———— **END OF TASK** ————

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CURRENT TRANSFORMER - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

- (1) The first task removes any of the following current transformers:
 - (a) GEN 1 DIFFERENTIAL PROTECTION CURRENT TRANSFORMER (DPCT), T374
 - (b) GEN 2 DIFFERENTIAL PROTECTION CURRENT TRANSFORMER (DPCT), T375
 - (c) APU DIFFERENTIAL PROTECTION CURRENT TRANSFORMER (DPCT), T376
 - (d) EXT PWR CURRENT TRANSFORMER (CT), T378
- (2) The second task installs any of these current transformers.

TASK 24-21-71-000-801

2. Current Transformer Removal

(Figure 401)

A. General

- (1) These current transformers are located in the Rigid Bus Assemblies which are installed in the back of the P91 and P92 Power Distribution Panels.

NOTE: If the troubleshooting points to a defective current transformer, the airline must remove and send back the rigid bus assembly to Honeywell. Write or speak to Honeywell for more data.

(2) You get access to the current transformers from the forward cargo area.

(3) The current transformers are located as follows:

- (a) GEN 1 DPCT, T374 - P91 Panel
- (b) GEN 2 DPCT, T375 - P92 Panel
- (c) APU DPCT, T376 - P91 Panel
- (d) EXT PWR CT, T378 - P92 Panel

B. References

Reference	Title
24-22-00-860-802	Remove Electrical Power (P/B 201)

C. Location Zones

Zone	Area
121	Forward Cargo Compartment - Left
122	Forward Cargo Compartment - Right

D. Prepare for Removal

SUBTASK 24-21-71-860-001



WARNING

REMOVE ELECTRICAL POWER BEFORE YOU REMOVE OR INSTALL THE CURRENT TRANSFORMERS IN THE POWER DISTRIBUTION PANELS. HIGH VOLTAGES CAN CAUSE INJURY TO PERSONS.

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-802.
 - (a) Make sure that all of the power warning lights on the power distribution panel are off.

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SUBTASK 24-21-71-010-001

- (2) Remove the applicable forward bulkhead liner in the forward cargo area to get access to the back of the power distribution panel.

SUBTASK 24-21-71-010-002

- (3) Do the following steps to remove the power feeders from the power distribution panel:
 - (a) Install identification tags on the power feeders before removing them.
 - (b) Remove the nuts [2] and washers [1] from each terminal stud.
 - (c) Remove power feeders from terminal studs.

E. Procedure

SUBTASK 24-21-71-020-001

- (1) Do the steps that follow to remove the current transformer [10]:
 - (a) Remove the three screws [4] and washers [5] that hold the cover [3] on the rigid bus assembly.
 - (b) Remove the aft two bolts and washers that hold the cooling duct assembly to the bottom of the cover [3].

NOTE: You can loosen the fwd two bolts to make removal of the cover [3] easier.
 - (c) Remove the four screws [13] that hold the cover [3] and the retainer [14] together.
 - (d) Remove the cover [3].

NOTE: Be careful when removing the cover. There are bushings [6] installed between the terminal studs and the cover that could fall out when the cover is removed.
 - (e) Install identification tags on the three wires connected to the terminal studs [7].
 - (f) Remove the three screws [12] and washers [11] that hold the terminal studs [7] and the wires to the rigid bus assembly.
 - (g) Remove the terminal studs [7] and the retainer [14] from the current transformer in one piece.

NOTE: Leave retainer [14] attached to the terminal stud [7]. If these items show any damage, then they should be replaced.
 - (h) Loosen the two screws that hold the electrical connector to the current transformer.
 - (i) Remove the electrical connector.
 - (j) Remove the screw [8] and washer [9] that hold the current transformer to the rigid bus assembly.
 - (k) Remove the current transformer [10].

————— END OF TASK —————

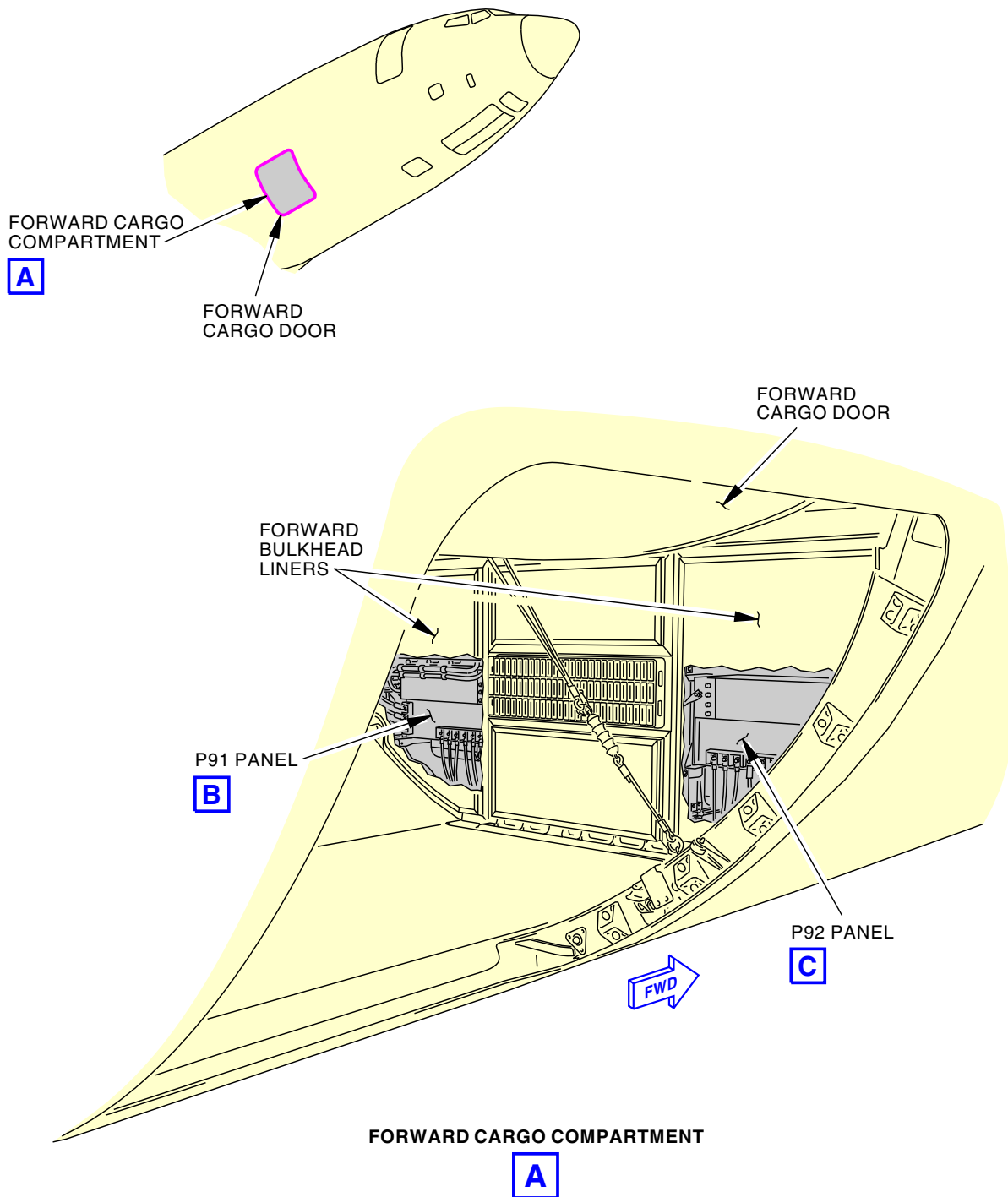
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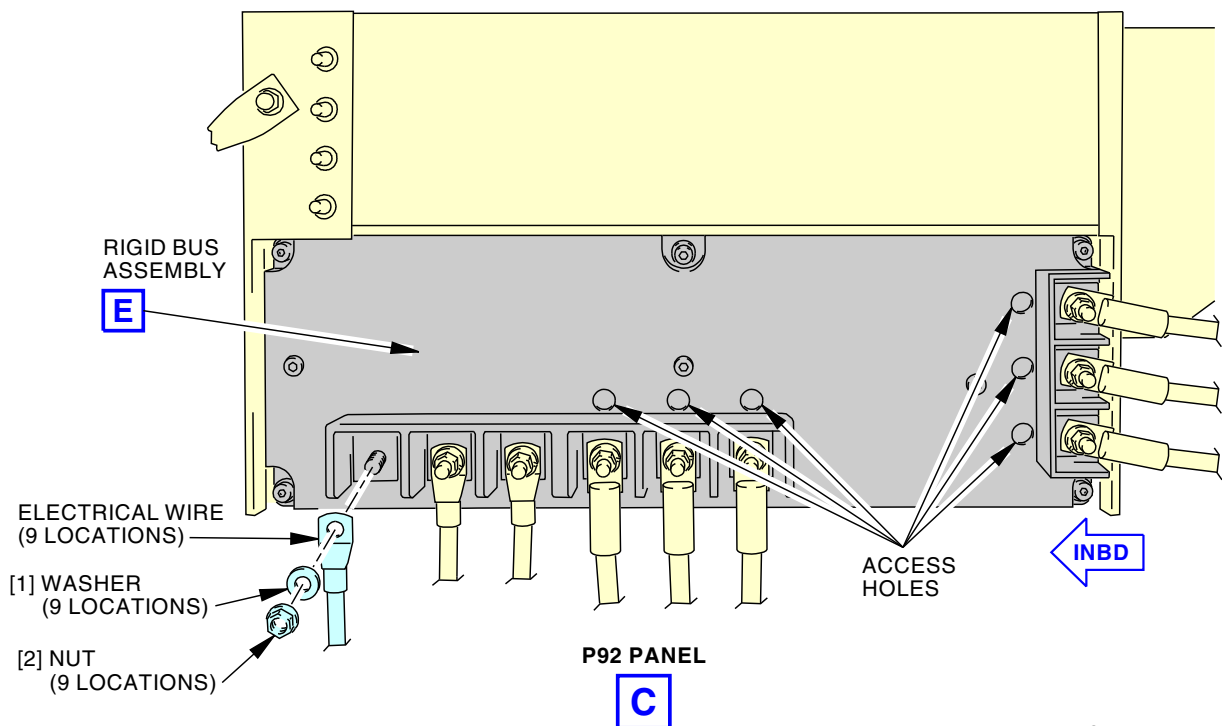
Current Transformer Installation
Figure 401/24-21-71-990-801 (Sheet 1 of 4)

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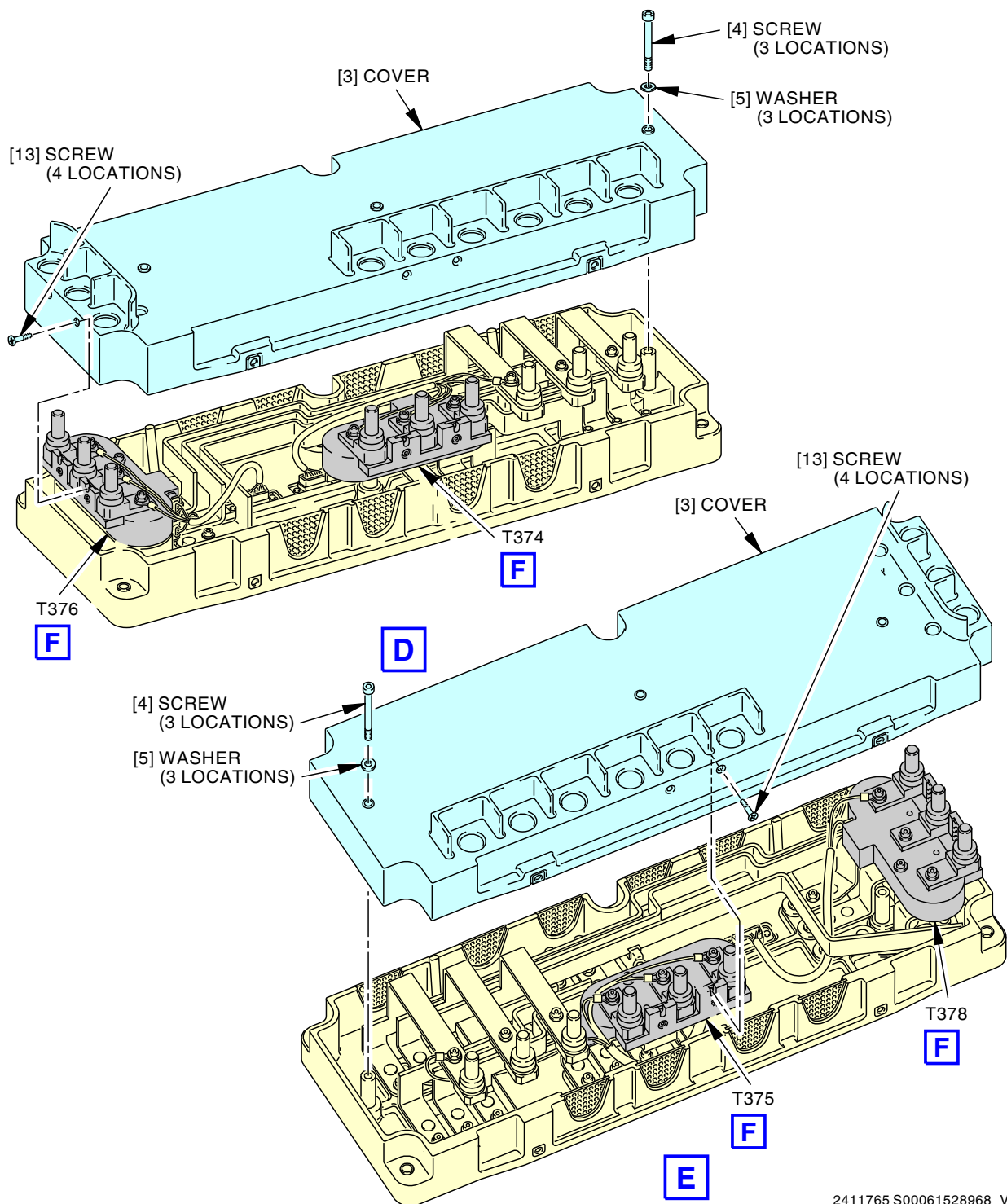
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Current Transformer Installation
Figure 401/24-21-71-990-801 (Sheet 2 of 4)

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Current Transformer Installation
Figure 401/24-21-71-990-801 (Sheet 3 of 4)

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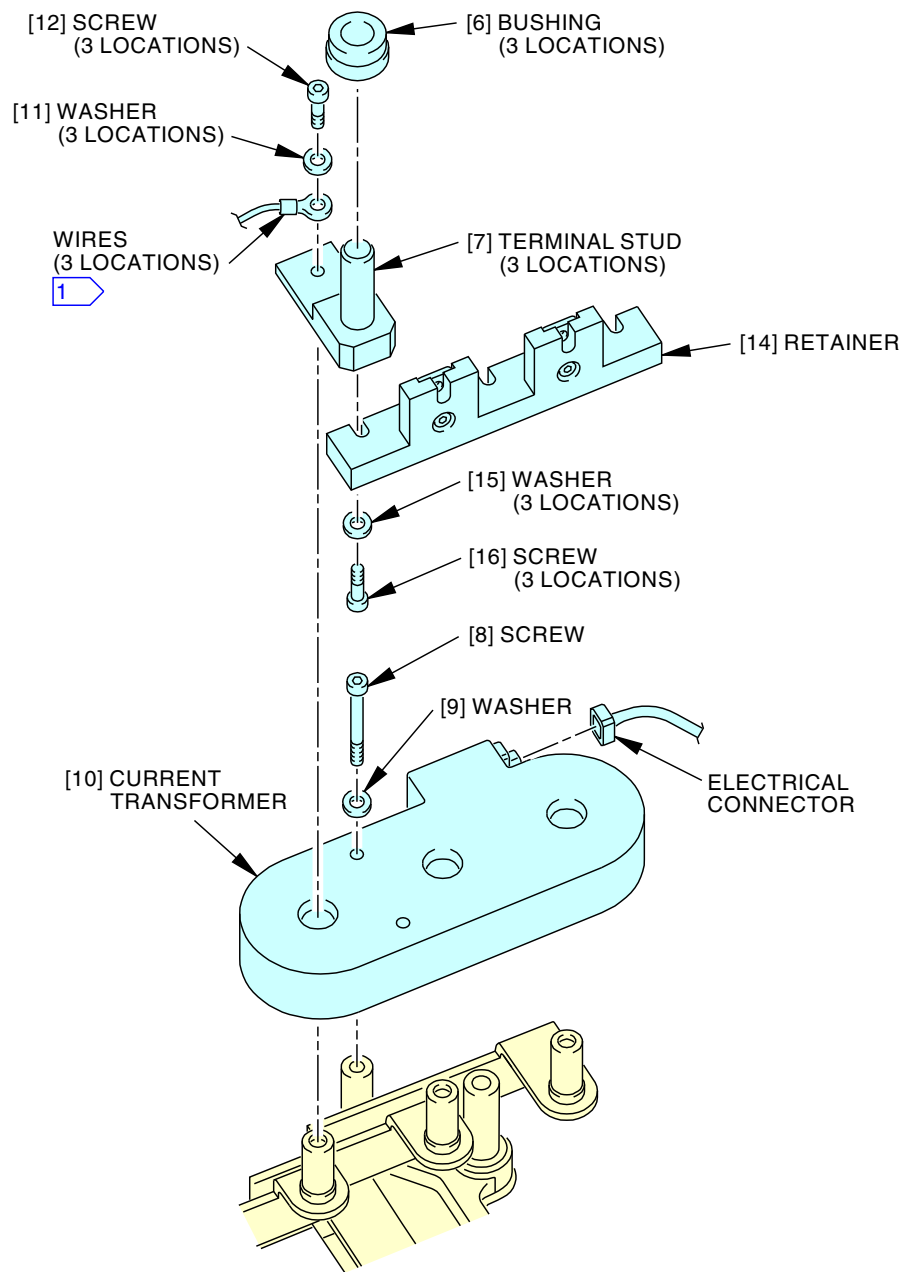
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(EXAMPLE)

F

1 EXTERNAL POWER CURRENT TRANSFORMER, T378 HAS ONE WIRE

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**Current Transformer Installation
Figure 401/24-21-71-990-801 (Sheet 4 of 4)**

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TASK 24-21-71-400-801

3. Current Transformer Installation

(Figure 401)

A. General

- (1) These current transformers are located in the Rigid Bus Assemblies which are installed in the back of the P91 and P92 Power Distribution Panels.
- (2) You get access to the current transformers from the forward cargo area.
- (3) The current transformers are located as follows:
 - (a) GEN 1 DPCT, T374 - P91 Panel
 - (b) GEN 2 DPCT, T375 - P92 Panel
 - (c) APU DPCT, T376 - P91 Panel
 - (d) EXT PWR CT, T378 - P92 Panel

B. References

Reference	Title
24-22-00-860-804	Remove External Power (P/B 201)
24-22-00-860-806	Remove APU Generator Power (P/B 201)
49-11-00-860-801	APU Starting and Operation (P/B 201)
71-00-00-910-802-G00	Start the Engine (Selection) (P/B 201)
71-00-00-910-806-G00	Stop the Engine (Usual Engine Stop) (P/B 201)

C. Location Zones

Zone	Area
121	Forward Cargo Compartment - Left
122	Forward Cargo Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Prepare for Installation

SUBTASK 24-21-71-860-002



WARNING

REMOVE ELECTRICAL POWER BEFORE YOU REMOVE OR INSTALL THE CURRENT TRANSFORMERS IN THE POWER DISTRIBUTION PANELS. HIGH VOLTAGES CAN CAUSE INJURY TO PERSONS.

- (1) Make sure that electrical power is removed from airplane.
 - (a) Make sure that all of the power warning lights on the power distribution panel are off.

E. Procedure

SUBTASK 24-21-71-420-001

- (1) Do the steps that follow to install the current transformer [10]:
 - (a) Hold the current transformer [10] in position.
 - (b) Install the screw [8] and washer [9] that hold the current transformer to the rigid bus assembly.
 - (c) Tighten the screw [8] to 19 ±1 in-lb (2 ±0 N·m).
 - (d) Install the electrical connector on the current transformer and tighten the two screws.

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- (e) Put the three terminal studs [7] and retainer [14] in position. Install the wires, screws [12] and washers [11].

NOTE: Loosely install the screws [12], they will be tightened after the cover [3] is installed.

NOTE: The torque for the three Screws [16] that hold the retainer [14] to the terminal studs [7] is 1.5 ± 0.5 in-lb (0.2 ± 0.1 N·m).

- (f) Install the cover [3] on the rigid bus assembly so that all of the terminal studs [7] fit through the holes in the cover [3].

NOTE: Make sure that the bushings [6] are installed between each terminal stud [7] and the cover [3].

- (g) Install the three screws [4] and washers [5] that hold the cover [3].

- (h) Tighten the screws [4] to 48 ± 2 in-lb (5 ± 1 N·m).

- (i) Tighten the three screws [12] to 22 ± 1 in-lb (2 ± 1 N·m).

NOTE: Use the access holes in the cover [3] located just above the terminal studs, to tighten these screws.

- (j) Install the four screws [13] that hold the cover [3] and the retainer [14] together.

- (k) Tighten the screws [13] to 11 ± 1 in-lb (1 ± 0 N·m).

- (l) Install the aft two screws and washers that hold the cooling duct assembly to the bottom of the cover [3]. Tighten all four screws that hold the duct to the rigid bus assembly.

SUBTASK 24-21-71-420-002

- (2) Do the following steps to install the power feeders on the power distribution panel:

- (a) Use the identification tags to install the power feeders on the correct terminal studs.
(b) Install the nuts [2] and washers [1] on each terminal stud.
(c) Tighten the nuts to 190 ± 10 in-lb (21 ± 2 N·m).

NOTE: When you install and tighten the power feeders to the rigid bus assembly, there may be some axial movement of the terminal studs (particularly TB5004 and TB5008). A small amount of movement is normal and should not affect the tightening of the nuts to the specified torque.

SUBTASK 24-21-71-410-001

- (3) Install the applicable forward bulkhead liner.

F. The Installation Test of the Current Transformer

SUBTASK 24-21-71-700-001

- (1) If you replaced the GEN 1 DPCT, T374 or GEN 2 DPCT, T375 do this test:

- (a) Start the applicable engine, do this task: Start the Engine (Selection), TASK 71-00-00-910-802-G00.
(b) Make sure that the applicable GEN OFF BUS light on the P5-4 panel is on.
(c) Set the applicable GEN control switch on the P5-4 panel to the ON position.
(d) Make sure that the applicable GEN OFF BUS light on the P5-4 panel goes off.
(e) Stop the engine, do this task: Stop the Engine (Usual Engine Stop), TASK 71-00-00-910-806-G00.

SUBTASK 24-21-71-700-002

- (2) If you replaced the EXT PWR CT, T378 do this test:

- (a) Make sure that the BAT switch on the P5-13 panel is in the ON position.

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- (b) Set the BUS TRANS switch on the P5-4 panel to the AUTO position.
- (c) Make sure that both TRANSFER BUS OFF lights on the P5-4 panel are on.
- (d) Connect external power to the P19 panel.
- (e) Make sure that the GRD POWER AVAILABLE light on the P5-4 panel is on.
- (f) Set the GRD PWR switch on the P5-4 panel to the ON position.
- (g) Make sure that both TRANSFER BUS OFF lights on the P5-4 panel go OFF.
- (h) Do this task: Remove External Power, TASK 24-22-00-860-804.

SUBTASK 24-21-71-700-003

- (3) If you replaced the APU DPCT, T376 do this test:
 - (a) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (b) Make sure that the APU GEN OFF BUS light on the P5-4 panel comes on (approximately 50 seconds) after APU start.
 - (c) Set either of the APU GEN switches on the P5-4 panel to the ON position.
 - (d) Make sure that the APU GEN OFF BUS light on the P5-4 panel goes off.
 - (e) Do this task: Remove APU Generator Power, TASK 24-22-00-860-806.

———— **END OF TASK** ————

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GENERATOR CONTROL UNIT - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the Generator Control Unit
- (2) An Installation of the Generator Control Unit

TASK 24-21-81-000-801

2. Generator Control Unit Removal

(Figure 401)

A. **General**

- (1) There are three GCU's installed:
 - (a) GCU 1, G10 - located on the E2-1 Rack
 - (b) GCU 2, G12 - located on the E4-2 Rack
 - (c) APU GCU, G14 - located on the E2-1 Rack

B. **References**

Reference	Title
20-10-07-000-801	E/E Box Removal (P/B 401)
20-40-12-000-802	ESDS Handling for Metal Encased Unit Removal (P/B 201)
24-22-00-860-806	Remove APU Generator Power (P/B 201)
24-22-00-860-808	Remove IDG Power (P/B 201)

C. **Location Zones**

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right

D. **Access Panels**

Number	Name/Location
117A	Electronic Equipment Access Door

E. **Prepare for the Removal**

SUBTASK 24-21-81-010-001

- (1) Open this access door to get access to the main equipment center:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 24-21-81-860-001

- (2) If you are going to remove the APU GCU [1], G14, do the steps that follow:
 - (a) Remove power from APU generator (TASK 24-22-00-860-806).
 - (b) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
F	12	C01285	GENERATOR APU GEN CONT UNIT

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WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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.

- (c) Open this circuit breaker and install safety tag:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	9	C01326	APU GEN CONT UNIT

SUBTASK 24-21-81-860-002

- (3) If you are going to remove GCU [1], G10, do the steps that follow:

- (a) Remove power from IDG 1 (TASK 24-22-00-860-808).
(b) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	10	C01283	GENERATOR CONT UNIT 1

SUBTASK 24-21-81-860-003

- (4) If you are going to remove GCU [1], G12, do the steps that follow:

- (a) Remove power from IDG 2 (TASK 24-22-00-860-808).
(b) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
F	11	C01284	GENERATOR CONT UNIT 2

F. Generator Control Unit Removal

SUBTASK 24-21-81-910-001



DO NOT TOUCH THE UNIT BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE UNIT.

- (1) Before you touch the GCU, do this task: ESDS Handling for Metal Encased Unit Removal, TASK 20-40-12-000-802.

SUBTASK 24-21-81-020-001

- (2) Remove the GCU [1] (TASK 20-10-07-000-801).

————— END OF TASK —————

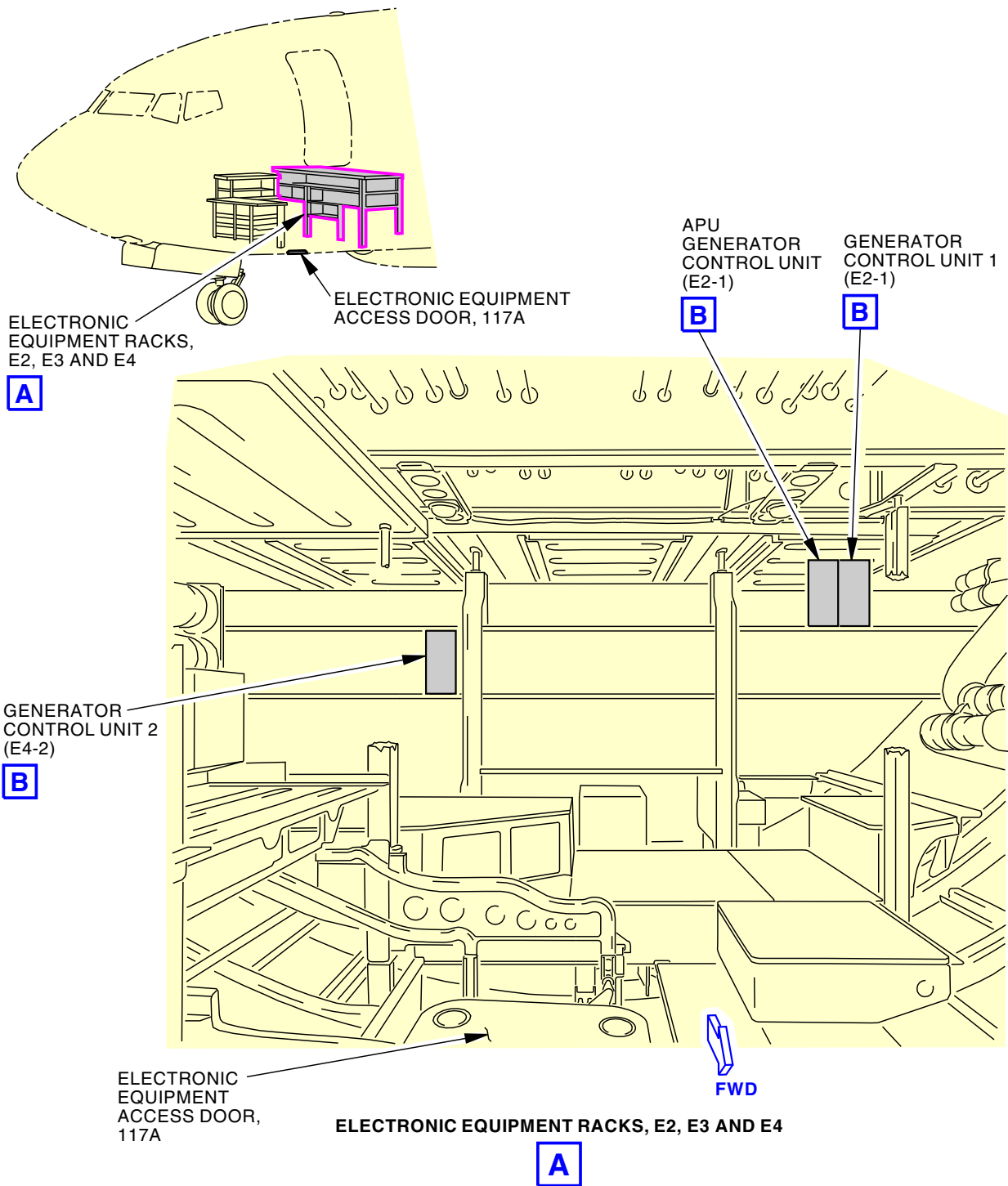
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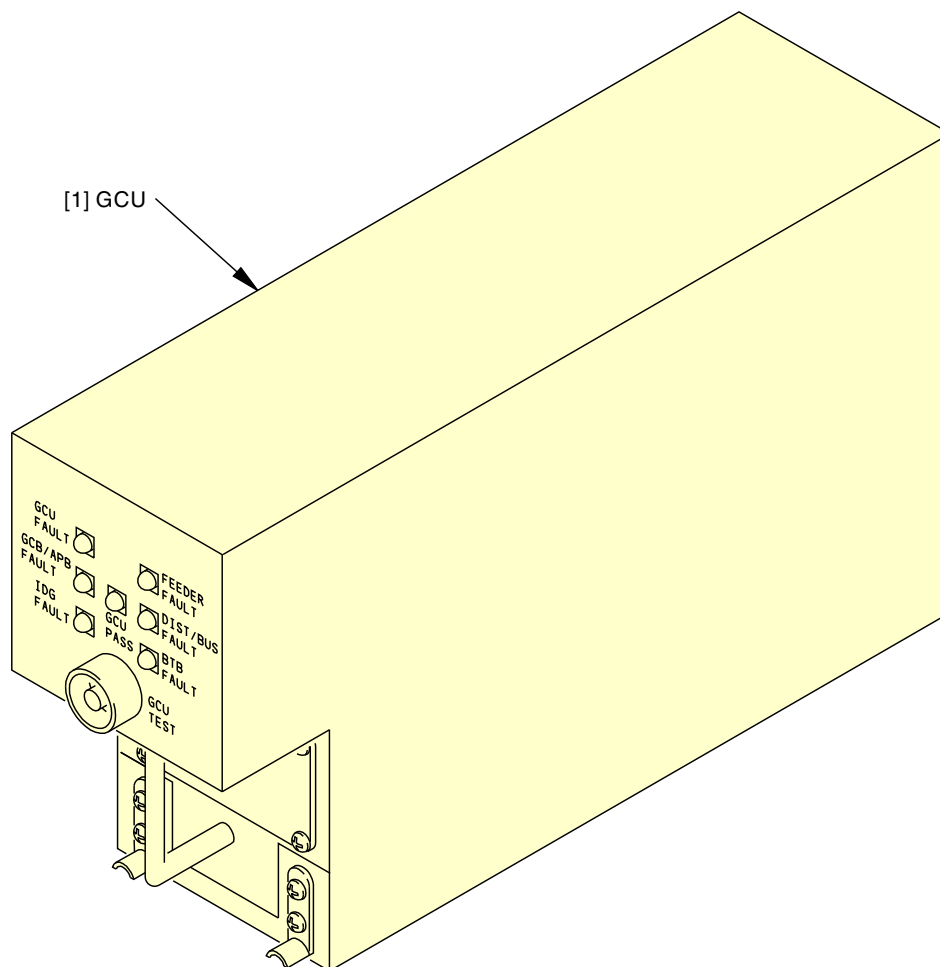
Generator Control Unit (GCU) Installation
Figure 401/24-21-81-990-801 (Sheet 1 of 2)

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GENERATOR CONTROL UNIT

B

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Generator Control Unit (GCU) Installation
Figure 401/24-21-81-990-801 (Sheet 2 of 2)

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TASK 24-21-81-400-801

3. Generator Control Unit Installation

(Figure 401)

A. General

- (1) There are three GCU's installed:
- (a) GCU 1, G10 - located on the E2-1 Rack
 - (b) GCU 2, G12 - located on the E4-2 Rack
 - (c) APU GCU, G14 - located on the E2-1 Rack

B. References

Reference	Title
20-10-07-400-801	E/E Box Installation (P/B 401)
20-40-12-400-802	ESDS Handling for Metal Encased Unit Installation (P/B 201)
24-31-00-740-801	P5-13 ELEC Light Message BITE Procedure (P/B 501)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	GCU	24-21-81-01-010	SIA ALL
		24-21-81-05-010	SIA ALL

D. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right

E. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

F. Generator Control Unit Installation

SUBTASK 24-21-81-910-002



CAUTION

DO NOT TOUCH THE UNIT BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE UNIT.

- (1) Before you touch the GCU [1], do this task: ESDS Handling for Metal Encased Unit Installation, TASK 20-40-12-400-802.

SUBTASK 24-21-81-420-001

- (2) Install the GCU [1] (TASK 20-10-07-400-801).

SUBTASK 24-21-81-860-004

- (3) Close applicable circuit breaker:
- (a) Remove the safety tags and close these circuit breakers:

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
F	10	C01283	GENERATOR CONT UNIT 1
F	11	C01284	GENERATOR CONT UNIT 2
F	12	C01285	GENERATOR APU GEN CONT UNIT

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WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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.

- (b) Remove the safety tag and close this circuit breaker:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	9	C01326	APU GEN CONT UNIT

G. Generator Control Unit Installation Test

SUBTASK 24-21-81-700-001

- (1) Do a test of the GCU:

NOTE: Electrical power must be OFF while you replace the GCU from the E2-1 shelf or E4-2 shelf.

- (a) Make sure that the BAT switch on the P5-13 panel is in the OFF position.
- (b) Connect the external electrical power source to the airplane.
- (c) Set the BAT switch on the P5-13 panel to the ON position.
- (d) Make sure that the STANDBY POWER switch on the P5-13 panel is in the AUTO position.
- (e) Push the GCU TEST button on front of the GCU for at least one second.
- (f) Make sure that all seven of the indicator lights on the GCU front panel turn on for 3 ± 1 seconds.
- (g) Make sure that the green GCU PASS light on the GCU turns on for 7 ± 1 seconds.

SUBTASK 24-21-81-210-001

- (2) If the TR UNIT and ELEC lights on the P5-13 panel are on, do the steps that follow:

NOTE: If either GCU 1, G10 or GCU 2, G12 is replaced with only battery power supplied (no power on the 115 VAC TRANSFER BUSES) and the STANDBY POWER switch in the AUTO position, the TR UNIT and ELEC lights on the P5-13 panel will come on.

- (a) Make sure that the TR UNIT light goes off after the GCU's are installed and their associated circuit breakers are closed.
- (b) Make sure that the ELEC light stays on until you clear the BAT CHGR INOP or AUX BAT CHGR INOP message.
 - 1) To clear the BAT CHGR INOP or AUX BAT CHGR INOP message, do this task:
P5-13 ELEC Light Message BITE Procedure, TASK 24-31-00-740-801.

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H. Put the Airplane Back to Its Usual Condition

SUBTASK 24-21-81-010-002

(1) Close this access door:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

SUBTASK 24-21-81-860-005

(2) Set the BAT switch on the P5-13 panel to the OFF position.

————— END OF TASK —————

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MANUAL CONTROL - MAINTENANCE PRACTICES

1. General

- A. This procedure has eight tasks:
- (1) Supply Electrical Power
 - (2) Remove Electrical Power
 - (3) Supply External Power
 - (4) Remove External Power
 - (5) Supply APU Power
 - (6) Remove APU Power
 - (7) Supply IDG Power
 - (8) Remove IDG Power
- B. Most of the switches you use to control the electrical power system are on the electrical system control panel. The electrical system control panel is on the P5 overhead panel.
- C. It is recommended that you put the BAT switch on the P5-13 panel to the ON position when you transfer power sources on the airplane.
- D. Status messages could show after the electrical power is supplied. If these messages continue to show until airplane operation, flight delays can occur.

TASK 24-22-00-860-801

2. Supply Electrical Power

A. **References**

Reference	Title
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

B. **Location Zones**

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

C. **Procedure**

SUBTASK 24-22-00-860-001



SET THE WEATHER RADAR (WXR) SWITCH ON THE P8-52 PANEL TO TEST BEFORE YOU SUPPLY POWER TO THE AIRCRAFT. RADIATION CAN CAUSE INJURIES TO PERSONNEL.

- (1) Set the Weather Radar (WXR) switch on the Weather Radar (WXR) control panel to TEST.
- (2) Do the applicable task(s) to supply electrical power to the airplane:
 - (a) Do this task: Supply External Power, TASK 24-22-00-860-803.
 - (b) Do this task: Supply APU Generator Power, TASK 24-22-00-860-805.
 - (c) Do this task: Supply IDG Power, TASK 24-22-00-860-807.

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- (3) If status message "STALL WARNING SYS L" shows on the Onboard Maintenance Function (OMF) status page, go to IFIM and do the applicable procedure(s).

NOTE: If this status message continues to show until airplane operation, flight delays can occur.

————— END OF TASK —————

TASK 24-22-00-860-802

3. Remove Electrical Power

A. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

B. Procedure

SUBTASK 24-22-00-860-002

- (1) Do the applicable task(s) to remove electrical power from the airplane:
- (a) Do this task: Remove External Power, TASK 24-22-00-860-804.
 - (b) Do this task: Remove APU Generator Power, TASK 24-22-00-860-806.
 - (c) Do this task: Remove IDG Power, TASK 24-22-00-860-808.

————— END OF TASK —————

TASK 24-22-00-860-803

4. Supply External Power

(Figure 201, Figure 202)

A. General

- (1) This task has these procedures:
- (a) Supply external power to the ground service buses
 - (b) Supply external power to the 115V AC transfer buses
- (2) Use the applicable procedure to energize the necessary buses.

B. References

Reference	Title
20-40-11-910-801	Static Grounding (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Procedure

SUBTASK 24-22-00-860-003

- (1) Do these steps to supply external power to the ground service buses:
- (a) Open the External Power Receptacle Door.

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IF THE EXTERNAL POWER SUPPLY HAS AN EARTH GROUNDED NEUTRAL, THERE MUST NOT BE AN OPEN OR FLOATING GROUND IN THE NEUTRAL CIRCUIT WIRE OF THE SUPPLY OR THE AIRPLANE. IF AN OPEN OR FLOATING GROUND IS PRESENT, THE AIRPLANE CAN BE PUT AT AN ELECTRICAL POTENTIAL ABOVE EARTH GROUND. THIS ELECTRICAL POTENTIAL CAN CAUSE ELECTRIC SHOCK WITH POSSIBLE DANGEROUS INJURY TO PERSONNEL WHO TOUCH THE AIRPLANE.

- (b) Make sure that the external power supply operates correctly before you supply external power to the airplane.
- 1) If the ground return (neutral) circuit on the external power supply or the external power receptacle do not operate correctly, do this task: Static Grounding, TASK 20-40-11-910-801.



REMOVE THE ELECTRICAL POWER FROM THE EXTERNAL POWER BEFORE YOU CONNECT THE CABLE TO THE AIRPLANE. IF YOU DO NOT, INJURY TO PERSONS CAN OCCUR.

- (c) Install the power cable to the external power receptacle.
- (d) Energize the external power cable.
- (e) Make sure that these lights on the external power panel, P19 are on:
- 1) EXTERNAL PWR CONN
 - 2) EXTERNAL PWR NOT IN USE
- (f) Make sure that the GRD POWER AVAILABLE light on the P5-4 panel comes on.
- (g) Push the GROUND SERVICE switch on the FWD ATTENDANT panel, P13.
- 1) Make sure that the light in the GROUND SERVICE switch comes on.
- (h) Make sure that the EXTERNAL PWR NOT IN USE light on the P19 panel is off.
- NOTE: The ground service buses energizes when the external power is supplied to the receptacle and the GROUND SERVICE switch is set to ON.

SUBTASK 24-22-00-860-004

- (2) Do these steps to supply external power to the 115V AC transfer buses:

NOTE: The ground service buses are energized automatically when external power is supplied to the 115V AC transfer bus 1 and the 115V AC transfer bus 2.

- (a) Open the External Power Receptacle Door.



IF THE EXTERNAL POWER SUPPLY HAS AN EARTH GROUNDED NEUTRAL, THERE MUST NOT BE AN OPEN OR FLOATING GROUND IN THE NEUTRAL CIRCUIT WIRE OF THE SUPPLY OR THE AIRPLANE. IF AN OPEN OR FLOATING GROUND IS PRESENT, THE AIRPLANE CAN BE PUT AT AN ELECTRICAL POTENTIAL ABOVE EARTH GROUND. THIS ELECTRICAL POTENTIAL CAN CAUSE ELECTRIC SHOCK WITH POSSIBLE DANGEROUS INJURY TO PERSONNEL WHO TOUCH THE AIRPLANE.

- (b) Make sure that the external power supply operates correctly before you supply external power to the airplane.

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- 1) If the ground return (neutral) circuit on the external power supply or the external power receptacle do not operate correctly, do this task: Static Grounding, TASK 20-40-11-910-801.



WARNING

REMOVE THE ELECTRICAL POWER FROM THE EXTERNAL POWER BEFORE YOU CONNECT THE CABLE TO THE AIRPLANE. IF YOU DO NOT, INJURY TO PERSONS CAN OCCUR.

- (c) Install the power cable to the external power receptacle.
- (d) Energize the external power cable.
- (e) Make sure that these lights on the external power panel, P19 are on:
 - 1) EXTERNAL PWR CONN
 - 2) EXTERNAL PWR NOT IN USE
- (f) Set the BAT switch located on the P5-13 panel to the ON position.
- (g) Make sure that the GRD POWER AVAILABLE light on the P5-4 panel is on.



WARNING

USE CAUTION WHEN YOU APPLY 115V AC (400HZ), EXTERNAL OR APU GENERATOR POWER. THE STANDBY HYDRAULIC PUMP CAN OPERATE APPROXIMATELY 4 SECONDS AND CAN MOVE THE RUDDER AND THRUST REVERSERS. TO PREVENT POSSIBLE INJURY, MAKE SURE THAT THE RUDDER AND THRUST REVERSERS ARE CLEAR OF PERSONNEL BEFORE YOU APPLY POWER.

- (h) Set the GRD POWER switch on the P5-4 panel to the ON position.
- (i) Make sure that these lights on the P5-4 panel go off:
 - 1) 1 SOURCE OFF
 - 2) 2 SOURCE OFF
 - 3) 1 TRANSFER BUS OFF
 - 4) 2 TRANSFER BUS OFF
- (j) Make sure that the EXTERNAL PWR NOT IN USE light on the P19 panel is off.

———— **END OF TASK** ————

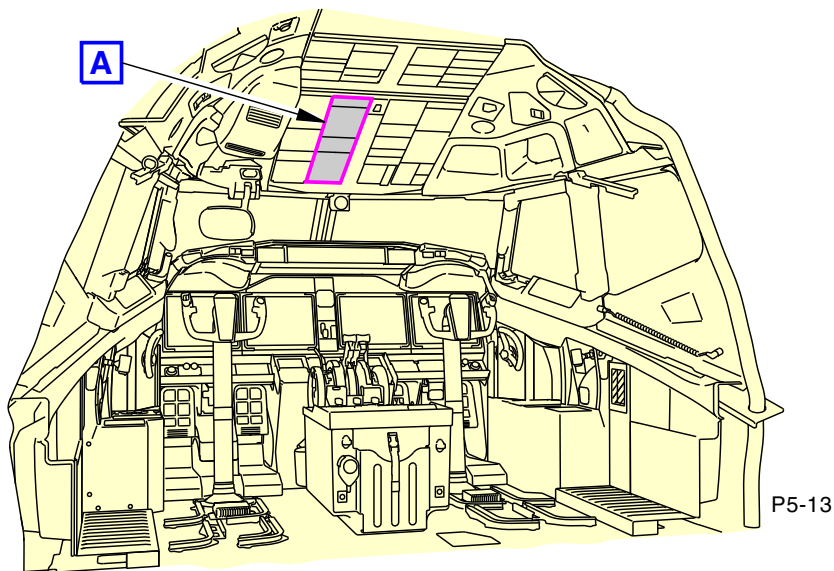
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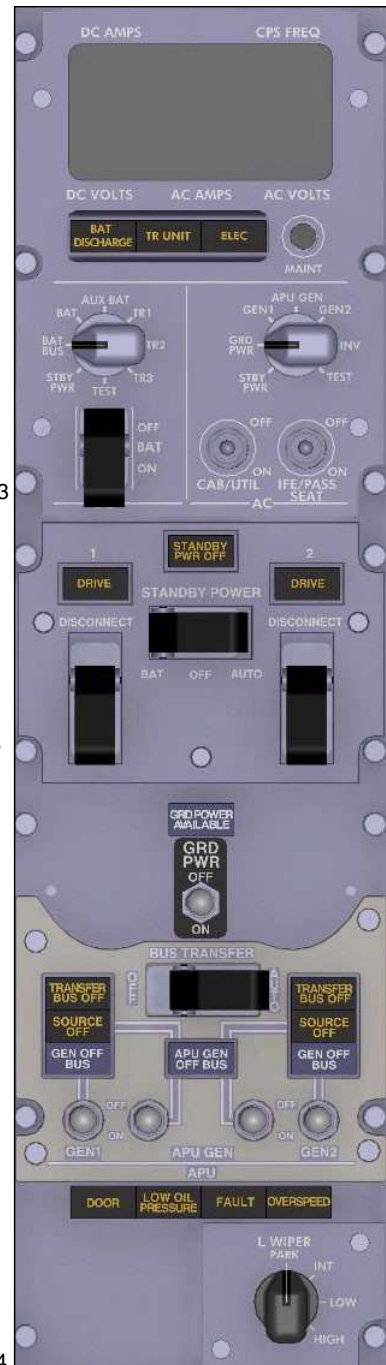
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FLIGHT COMPARTMENT



P5-13

P5-5

P5-4



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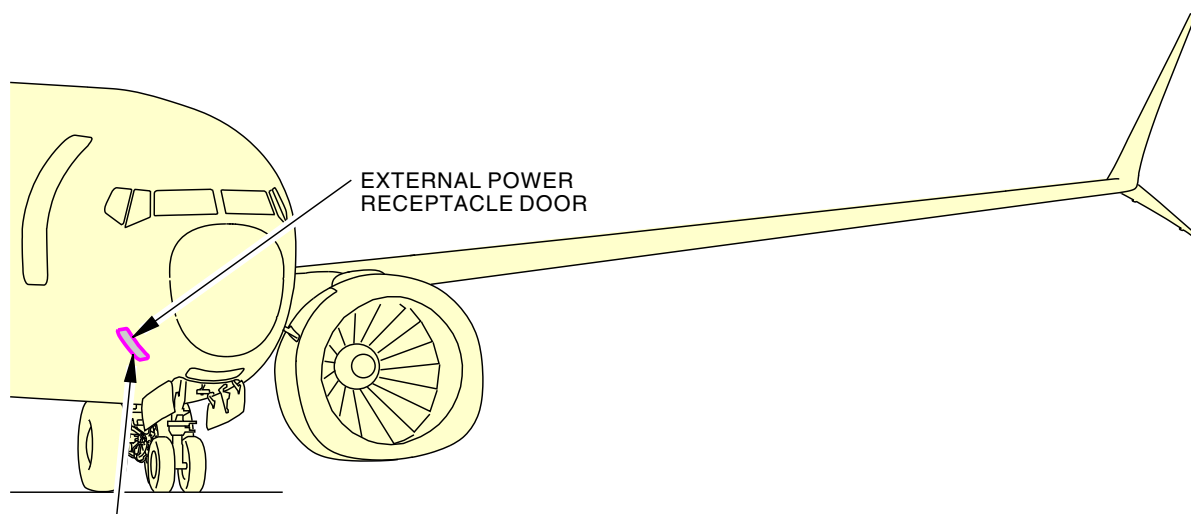
AC Generator and Bus Control
Figure 201/24-22-00-990-801

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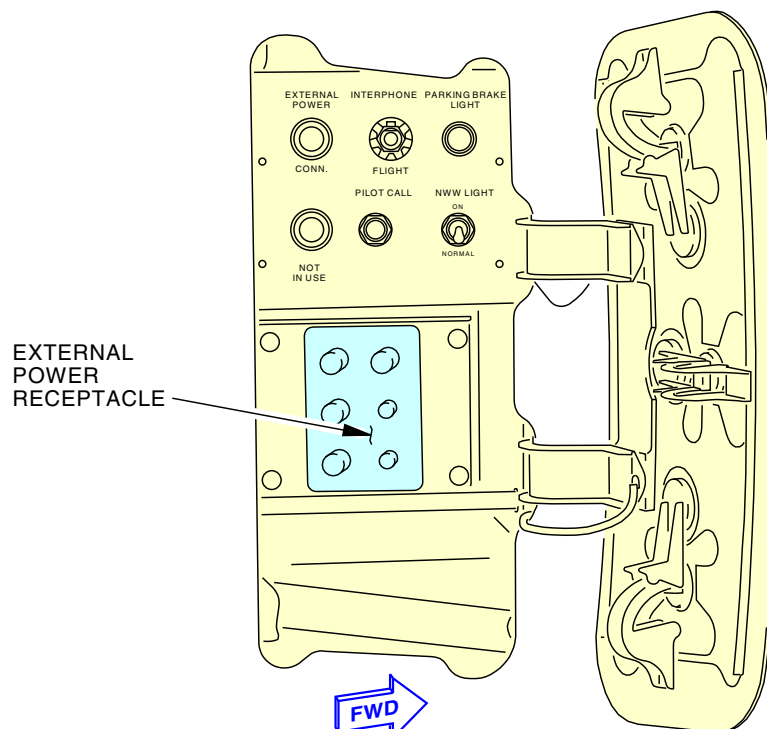
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EXTERNAL POWER
RECEPTACLE
PANEL (P19)

A



EXTERNAL POWER RECEPTACLE PANEL (P19)

A

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External Power Receptacle and Indication
Figure 202/24-22-00-990-802

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TASK 24-22-00-860-804

5. Remove External Power

(Figure 201, Figure 202)

A. General

- (1) This task has these procedures:
 - (a) Remove external power from the ground service buses.
 - (b) Remove external power from the 115V AC transfer buses.

B. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Remove External Power

SUBTASK 24-22-00-860-005

- (1) Do these steps to remove external power from the ground service buses:
 - (a) Push the GROUND SERVICE switch on the FWD ATTENDANT panel, P13.
 - 1) Make sure the light in the GROUND SERVICE switch goes off.
 - (b) Remove power from the external power cable.
 - (c) Make sure these lights on the P19 panel go off:
 - 1) EXTERNAL POWER CONN
 - 2) EXTERNAL POWER NOT IN USE



WARNING

REMOVE ELECTRICAL POWER FROM THE EXTERNAL POWER CABLE BEFORE YOU REMOVE THE CABLE FROM THE AIRPLANE. INJURY TO PERSONS CAN BE CAUSED BY AN ELECTRICAL SHOCK.

- (d) Remove the external power cable.
- (e) Close the External Power Receptacle Door.

SUBTASK 24-22-00-860-006

- (2) Do these steps to remove external power from the 115V AC transfer buses:
 - (a) Set the GRD PWR switch on the P5-4 panel to the OFF position.
 - (b) Make sure the GRD POWER AVAILABLE light on the P5-4 stays on.
 - (c) Make sure these lights on the P5-4 panel come on:
 - 1) 1 SOURCE OFF
 - 2) 2 SOURCE OFF
 - 3) 1 TRANSFER BUS OFF
 - 4) 2 TRANSFER BUS OFF
 - (d) Make sure the EXTERNAL POWER NOT IN USE light on the P19 panel comes on.
 - (e) Remove power from the external power cable.
 - (f) Make sure the EXTERNAL POWER CONN light on the P19 panel goes off.

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WARNING

REMOVE ELECTRICAL POWER FROM THE EXTERNAL POWER CABLE BEFORE YOU REMOVE THE CABLE FROM THE AIRPLANE. INJURY TO PERSONS CAN BE CAUSED BY AN ELECTRICAL SHOCK.

- (g) Remove the external power cable.
- (h) Make sure the EXTERNAL POWER NOT IN USE light on the P19 panel goes off.
- (i) Close the External Power Receptacle Door.

D. Put the Airplane Back to Its Usual Condition

SUBTASK 24-22-00-860-007

- (1) Set the BAT switch on the P5-13 panel to the OFF position.

————— **END OF TASK** —————

TASK 24-22-00-860-805

6. Supply APU Generator Power

(Figure 201)

A. General

- (1) This task has this procedure:
 - (a) Supply the APU generator power to the 115V AC transfer buses

B. References

Reference	Title
49-11-00-860-801	APU Starting and Operation (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Procedure

SUBTASK 24-22-00-860-008

- (1) Do these steps to supply the APU generator power to the 115V AC transfer buses:
 - (a) Set the BAT switch on the P5-13 panel to the ON position.
 - (b) Set the BUS TRANS switch on the P5-4 panel to the AUTO position.
 - (c) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - (d) Make sure the APU GEN OFF BUS light on the P5-4 panel comes on.

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WHEN APPLYING 115V AC, 400HZ EXTERNAL OR APU GENERATOR POWER, THE STANDBY HYDRAULIC PUMP CAN OPERATE FOR APPROX 4 SECONDS AND MAY MOVE THE RUDDER AND THRUST REVERSERS. TO PREVENT POSSIBLE INJURY, MAKE SURE THE RUDDER AND THRUST REVERSERS ARE CLEAR OF PERSONNEL BEFORE APPLYING POWER.

- (e) To energize the 115V AC transfer buses, set both of the APU GEN switches on the P5-4 panel to the ON position.

NOTE: Either of the APU GEN switches will connect the APU generator to both TRANSFER BUSES. However both of the APU GEN switches must be set to the ON position to make both of the SOURCE OFF lights go off.

NOTE: The APU exhaust gas temperature (EGT) indicator on the P5 forward overhead panel can spike (move) quickly to half scale (400°C-500°C) when you put an electrical load on the APU starter-generator and then move down to zero after a few bounces. This APU condition is satisfactory.

- (f) Make sure these lights on the P5-4 panel go off:
- 1) APU GEN OFF BUS
 - 2) 1 SOURCE OFF
 - 3) 2 SOURCE OFF
 - 4) 1 TRANSFER BUS OFF
 - 5) 2 TRANSFER BUS OFF

————— END OF TASK —————

TASK 24-22-00-860-806

7. Remove APU Generator Power

(Figure 201)

A. General

- (1) This task has this procedure:
- (a) Remove the APU generator power from the 115V AC buses.

B. References

Reference	Title
49-11-00-860-802	APU Usual Shutdown (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Remove APU Generator Power

SUBTASK 24-22-00-860-009

- (1) Do these steps to remove the APU generator power from the 115V AC transfer buses:
- (a) To remove power from the 115V AC transfer buses, set both of the APU GEN switches on the P5-4 panel to the OFF position.
- (b) Make sure these lights on the P5-4 panel come on:
- 1) APU GEN OFF BUS

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- 2) 1 SOURCE OFF
- 3) 2 SOURCE OFF
- 4) 1 TRANSFER BUS OFF
- 5) 2 TRANSFER BUS OFF.

(c) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

E. Put the Airplane into Its Usual Condition

SUBTASK 24-22-00-860-010

- (1) Set the BAT switch on the P5-13 panel to the OFF position.

————— **END OF TASK** —————

TASK 24-22-00-860-807

8. Supply IDG Power

(Figure 201)

A. General

- (1) This task has three procedures to supply IDG power to the transfer buses:
 - (a) Supply IDG 1 power to both 115V AC transfer buses
 - (b) Supply IDG 2 power to both 115V AC transfer buses
 - (c) Supply IDG 1 power to the 115V AC TRANSFER BUS 1 and IDG 2 power to the 115 AC TRANSFER BUS 2

B. References

Reference	Title
71-00-00-910-802-G00	Start the Engine (Selection) (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Supply IDG Power

SUBTASK 24-22-00-860-011

- (1) Do these steps to supply power to the 115V AC TRANSFER BUS 1 and 2 from IDG 1:
 - (a) Set the BAT switch on the P5-13 panel to the ON position.
 - (b) Set the BUS TRANS switch on the P5-4 panel to the OFF position.
 - (c) Start the Number 1 engine (TASK 71-00-00-910-802-G00).



THE DRIVE LIGHT ON THE P5 PANEL SHOULD GO OFF AFTER THE ENGINE GETS UP TO IDLE SPEED. IF THE DRIVE LIGHT COMES ON WHEN THE ENGINE IS AT OR ABOVE IDLE SPEED, THE DISCONNECT SWITCH ON THE P5 PANEL MUST BE PUSHED. FAILURE TO PUSH THE DISCONNECT SWITCH CAN CAUSE DAMAGE TO THE IDG.

- (d) Make sure the 1 DRIVE light on the P5-5 panel goes off after number 1 engine reaches idle speed.
- (e) Set the GEN 1 switch on the P5-4 panel to the ON position.
- (f) Make sure these lights on the P5-4 panel go off:

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- 1) 1 GEN OFF BUS
 - 2) 1 SOURCE OFF
 - 3) 1 TRANSFER BUS OFF.
- (g) Set the BUS TRANS switch on the P5-4 panel to the AUTO position.
- (h) Make sure the 2 TRANSFER BUS OFF light on the P5-4 panel goes off.
- (i) Remove IDG power (TASK 24-22-00-860-808)

SUBTASK 24-22-00-860-012

- (2) Do these steps to supply power to the 115V AC TRANSFER BUS 1 and 2 from IDG 2:
- (a) Set the BAT switch on the P5-13 panel to the ON position.
 - (b) Set the BUS TRANS switch on the P5-4 panel to the OFF position.
 - (c) Start the Number 2 engine (TASK 71-00-00-910-802-G00).



THE DRIVE LIGHT ON THE P5 PANEL SHOULD GO OFF AFTER THE ENGINE GETS UP TO IDLE SPEED. IF THE DRIVE LIGHT COMES ON WHEN THE ENGINE IS AT OR ABOVE IDLE SPEED, THE DISCONNECT SWITCH ON THE P5 PANEL MUST BE PUSHED. FAILURE TO PUSH THE DISCONNECT SWITCH CAN CAUSE DAMAGE TO THE IDG.

- (d) Make sure the 2 DRIVE light on the P5-5 panel goes off after number 2 engine reaches idle speed.
- (e) Set the GEN 2 switch on the P5-4 panel to the ON position.
- (f) Make sure these lights on the P5-4 panel go off:
- 1) 2 GEN OFF BUS
 - 2) 2 SOURCE OFF
 - 3) 2 TRANSFER BUS OFF.
- (g) Set the BUS TRANS switch on the P5-4 panel to the AUTO position.
- (h) Make sure the 1 TRANSFER BUS OFF light on the P5-4 panel goes off.
- (i) Remove IDG power (TASK 24-22-00-860-808).

SUBTASK 24-22-00-860-013

- (3) Do these steps to supply power to the 115V AC TRANSFER BUS 1 from IDG 1 and the 115V AC TRANSFER BUS 2 from IDG 2:
- (a) Set the BAT switch on the P5-13 panel to the ON position.
 - (b) Set the BUS TRANS switch on the P5-4 panel to the AUTO position.
 - (c) Start the Number 1 engine (TASK 71-00-00-910-802-G00).



THE DRIVE LIGHT ON THE P5 PANEL SHOULD GO OFF AFTER THE ENGINE GETS UP TO IDLE SPEED. IF THE DRIVE LIGHT COMES ON WHEN THE ENGINE IS AT OR ABOVE IDLE SPEED, THE DISCONNECT SWITCH ON THE P5 PANEL MUST BE PUSHED. FAILURE TO PUSH THE DISCONNECT SWITCH CAN CAUSE DAMAGE TO THE IDG.

- (d) Make sure the 1 DRIVE light on the P5-5 panel goes off after number 1 engine reaches idle speed.
- (e) Set the GEN 1 switch on the P5-4 panel to the ON position.
- (f) Make sure these lights on the P5-4 panel go off:

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- 1) 1 GEN OFF BUS
 - 2) 1 SOURCE OFF
 - 3) 1 TRANSFER BUS OFF
 - 4) 2 TRANSFER BUS OFF.
- (g) Start the Number 2 engine (TASK 71-00-00-910-802-G00).



CAUTION

THE DRIVE LIGHT ON THE P5 PANEL SHOULD GO OFF AFTER THE ENGINE GETS UP TO IDLE SPEED. IF THE DRIVE LIGHT COMES ON WHEN THE ENGINE IS AT OR ABOVE IDLE SPEED, THE DISCONNECT SWITCH ON THE P5 PANEL MUST BE PUSHED. FAILURE TO PUSH THE DISCONNECT SWITCH CAN CAUSE DAMAGE TO THE IDG.

- (h) Make sure the 2 DRIVE light on the P5-5 panel goes off after number 2 engine reaches idle speed.
- (i) Set the GEN 2 switch on the P5-4 panel to the ON position.
- (j) Make sure the 2 GEN OFF BUS and 2 SOURCE OFF lights on the P5-4 panel go off.
- (k) Remove IDG power (TASK 24-22-00-860-808).

————— **END OF TASK** —————

TASK 24-22-00-860-808

9. Remove IDG Power

(Figure 201)

A. General

- (1) This task has these procedures:
- (a) Remove IDG 1 power from the 115V AC transfer buses.
 - (b) Remove IDG 2 power from the 115V AC transfer buses.

B. References

Reference	Title
71-00-00-910-806-G00	Stop the Engine (Usual Engine Stop) (P/B 201)

C. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Remove IDG Power

SUBTASK 24-22-00-860-014

- (1) Do these steps to remove IDG 1 power from the 115V AC transfer buses:
- (a) Set the GEN 1 switch on the P5-4 panel to the OFF position.
NOTE: It is sufficient to shut down the engine without setting the GEN 1 switch to OFF.
 - (b) Make sure the 1 GEN OFF BUS light on the P5-4 panel comes on.
 - (c) Stop the number 1 engine (TASK 71-00-00-910-806-G00)

SUBTASK 24-22-00-860-015

- (2) Do these steps to remove IDG 2 power from the 115V AC transfer buses:

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- (a) Set the GEN 2 control switch on the P5-4 panel to the OFF position.

NOTE: It is sufficient to shut down the engine without setting the GEN 2 switch to OFF.

- (b) Make sure the 2 GEN OFF BUS light on the P5-4 panel comes on.

- (c) Stop the number 2 engine (TASK 71-00-00-910-806-G00).

E. Put the Airplane into Its Usual Condition

SUBTASK 24-22-00-860-016

- (1) Set the BAT switch on the P5-13 panel to the OFF position.

———— **END OF TASK** ————

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DC GENERATION SYSTEM - MAINTENANCE PRACTICES

1. General

- A. This procedure has two tasks:
- (1) DC Generation System Deactivation
 - (2) DC Generation System Activation.

TASK 24-31-00-040-801

2. DC Generation System - Deactivation

(Figure 201)

A. **General**

- (1) This procedure removes electrical power from the DC Generation System.

B. **Location Zones**

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

C. **Access Panels**

Number	Name/Location
117A	Electronic Equipment Access Door

D. **DC Generation System Deactivation**

SUBTASK 24-31-00-010-001

- (1) Open this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 24-31-00-860-001



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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) Open these circuit breakers and install safety tags:

Battery Shield, J9

Row	Col	Number	Name
A	3	C01209	AUX BAT CHARGER

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Battery Shield, J9

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C00142	BATTERY CHARGER
A	5	C01340	BATTERY BUS

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	3	C00922	AUX BAT CHGR

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	1	C00809	BAT CHGR

Standby Power Control Unit, M01720

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C01410	SPCU NORMAL

E. DC Generation System - Tryout

NOTE: This tryout is to make sure the DC Generation System is in a zero energy state.

SUBTASK 24-31-00-860-002



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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) Make sure that these circuit breakers are open and have safety tags:

Battery Shield, J9

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C01209	AUX BAT CHARGER
A	4	C00142	BATTERY CHARGER
A	5	C01340	BATTERY BUS

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	3	C00922	AUX BAT CHGR

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Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	1	C00809	BAT CHGR

Standby Power Control Unit, M01720

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C01410	SPCU NORMAL

SUBTASK 24-31-00-410-003

- (2) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

SUBTASK 24-31-00-700-001

- (3) Do the steps that follow:
- (a) Make sure the BAT switch on the P5-13 panel to the ON position.
 - (b) Set the DC meter selector switch on the P5-13 panel to the BAT position.
 - (c) Make sure the DC meter on the P5-13 panel shows no value and the screen is blank.

————— END OF TASK —————

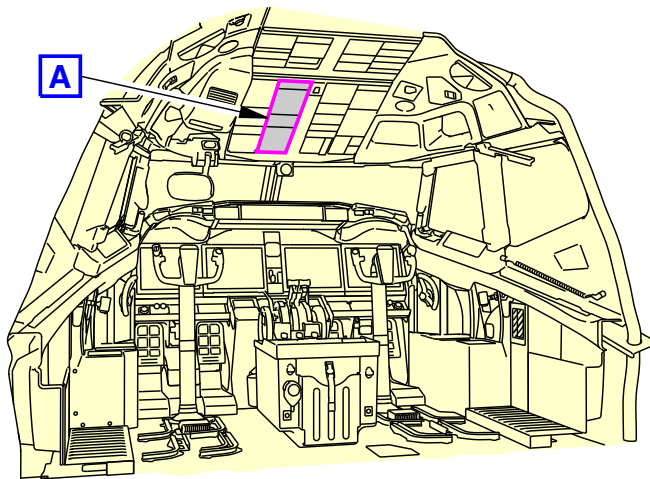
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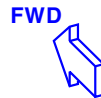
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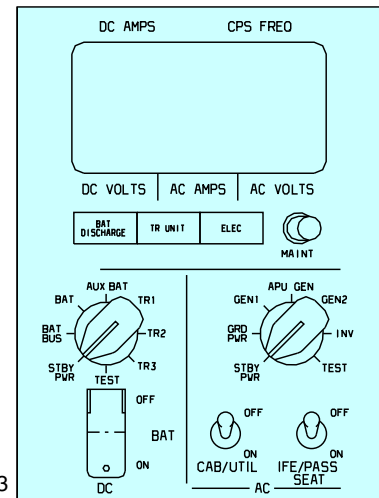
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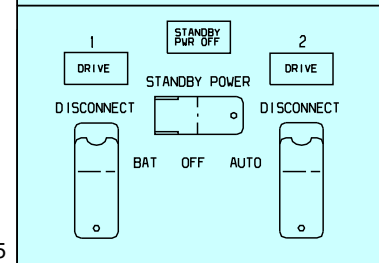
FLIGHT COMPARTMENT



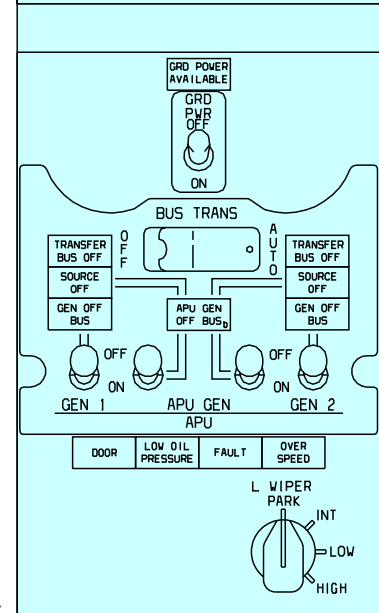
P5-13



P5-5



P5-4



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AC/DC Power Controls and Display Panels
Figure 201/24-31-00-990-801

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TASK 24-31-00-440-801

3. DC Generation System - Activation

(Figure 201)

A. General

- (1) This procedure adds electrical power to the DC Generation System.

B. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

D. DC Generation System Activation

SUBTASK 24-31-00-010-002

- (1) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

SUBTASK 24-31-00-860-003



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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) Remove the safety tags and close these circuit breakers:

Battery Shield, J9

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C01209	AUX BAT CHARGER
A	4	C00142	BATTERY CHARGER
A	5	C01340	BATTERY BUS

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	3	C00922	AUX BAT CHGR

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Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	1	C00809	BAT CHGR

Standby Power Control Unit, M01720

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C01410	SPCU NORMAL

SUBTASK 24-31-00-410-001

- (3) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

————— END OF TASK —————

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DC GENERATION SYSTEM - ADJUSTMENT/TEST

1. General

A. This procedure has two tasks:

- (1) An Operational Test of the DC System.
- (2) A BITE Procedure for the P5-13 ELEC Light Message.

TASK 24-31-00-700-801

2. DC System - Operational Test

(Figure 501)

A. **General**

- (1) This procedure does an Operational Test of the DC System.

B. **Location Zones**

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

C. **Access Panels**

Number	Name/Location
117A	Electronic Equipment Access Door

D. **DC System Operational Test**

SUBTASK 24-31-00-010-003

- (1) Open this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 24-31-00-710-001



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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 check of the Transformer Rectifier Units (TRU) and the DC Bus Tie Relay as follows:

- (a) Make sure the BAT switch on the P5-13 panel is set to the ON position.
- (b) Make sure the BUS TRANS switch on the P5-4 panel is set to the AUTO position.
- (c) Set the DC Meter Selector Switch on the P5-13 panel to the TR 3 position.

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- (d) Make sure the DC meter on the P5-13 panel shows this value:
 - 1) DC VOLTS = 22-30
- (e) Set the DC Meter Selector Switch on the P5-13 panel to the TR 2 position.
- (f) Make sure the DC meter on the P5-13 panel shows this value:
 - 1) DC VOLTS = 22-30
- (g) Set the DC Meter Selector Switch on the P5-13 panel to the TR 1 position.
- (h) Make sure the DC meter on the P5-13 panel shows this value:
 - 1) DC VOLTS = 22-30
- (i) Open this circuit breaker:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	6	C00806	TRU 1

- (j) Make sure the DC meter on the P5-13 panel shows these values:
 - 1) DC VOLTS = 22-30
 - 2) DC AMPS = 0
- (k) Make sure the TR UNIT light on the P5-13 panel comes on.
- (l) Set the BUS TRANS switch on the P5-4 panel to the OFF position.
- (m) Make sure the DC meter on the P5-13 panel shows these values:
 - 1) DC VOLTS = 0
 - 2) DC AMPS = 0
- (n) Set the BUS TRANS switch on the P5-4 panel to the AUTO position.
- (o) Make sure the DC meter on the P5-13 panel shows these values:
 - 1) DC VOLTS = 22-30
 - 2) DC AMPS = 0
- (p) Close this circuit breaker:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	6	C00806	TRU 1

- (q) Make sure the TR UNIT light on the P5-13 panel goes off.
- (r) Set the DC Meter Selector Switch on the P5-13 panel to the TR 2 position.
- (s) Make sure the DC meter on the P5-13 panel shows this value:
 - 1) DC VOLTS = 22-30
- (t) Open this circuit breaker:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C00807	TRU 2

- (u) Make sure the DC meter on the P5-13 panel shows these values:
 - 1) DC VOLTS = 22-30
 - 2) DC AMPS = 0



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- (v) Make sure the TR UNIT light on the P5-13 panel comes on.
- (w) Close this circuit breaker:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C00807	TRU 2

- (x) Make sure the TR UNIT light on the P5-13 panel goes off.

SUBTASK 24-31-00-710-002



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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.

- (3) Do a check of the TR3 Transfer Relay as follows:
 - (a) Set the DC Meter Selector Switch on the P5-13 panel to the TR 3 position.
 - (b) Make sure the DC meter on the P5-13 panel shows this value:
 - 1) DC VOLTS = 22-30
 - (c) Open this circuit breaker:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	6	C00808	TRU 3

- (d) Make sure the DC meter on the P5-13 panel shows this value:
 - 1) DC VOLTS = 22-30
- (e) Open this circuit breaker:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C00941	TRU 3 ALTN

- (f) Make sure the DC meter on the P5-13 panel shows this value:
 - 1) DC VOLTS = Less than 10
- (g) Make sure the TR UNIT light on the P5-13 panel comes on.
- (h) Close this circuit breaker:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	6	C00808	TRU 3

- (i) Make sure the DC meter on the P5-13 panel shows this value:

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- 1) DC VOLTS = 22-30
- (j) Make sure the TR UNIT light on the P5-13 panel goes off.
- (k) Close this circuit breaker:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C00941	TRU 3 ALTN

SUBTASK 24-31-00-710-003



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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.

- (4) Do a check of the battery bus transfer relays as follows:
 - (a) Set the DC Meter Selector Switch on the P5-13 panel to the BAT position.
 - (b) Make sure the DC meter on the P5-13 panel shows this value:
 - 1) DC VOLTS = 30 ± 3
 - (c) Set the DC Meter Selector Switch on the P5-13 panel to the BAT BUS position.
 - (d) Make sure the DC meter on the P5-13 panel shows this value:
 - 1) DC VOLTS = 22-30
 - (e) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C00941	TRU 3 ALTN

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	6	C00808	TRU 3

- (f) Make sure the DC meter on the P5-13 panel shows this value:
 - 1) DC VOLTS = 22-30
- (g) Set the DC Meter Selector Switch on the P5-13 panel to the TR 3 position.
- (h) Make sure the DC meter on the P5-13 panel shows this value:
 - 1) DC VOLTS = Less than 10

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- (i) Close these circuit breakers:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C00941	TRU 3 ALTN

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	6	C00808	TRU 3

E. Put the Airplane to Its Usual Condition

SUBTASK 24-31-00-860-005



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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) Make sure that these circuit breakers are closed:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C00941	TRU 3 ALTN
A	6	C00806	TRU 1

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C00807	TRU 2
A	6	C00808	TRU 3

SUBTASK 24-31-00-410-002

- (2) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

————— **END OF TASK** —————

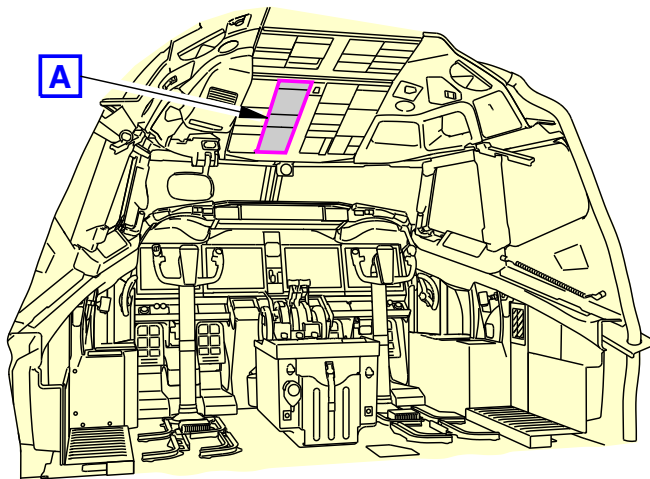
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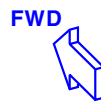
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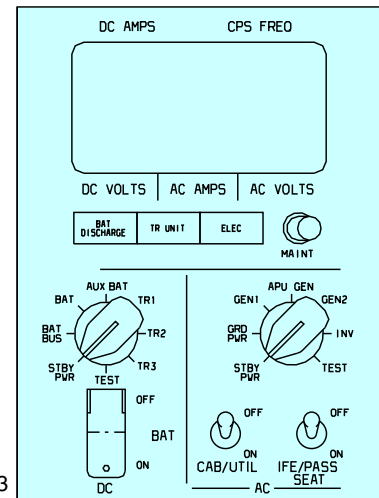
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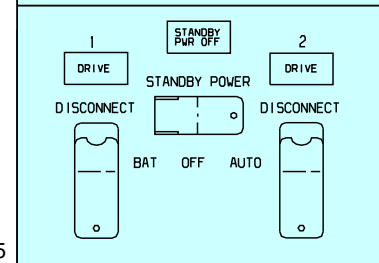
FLIGHT COMPARTMENT



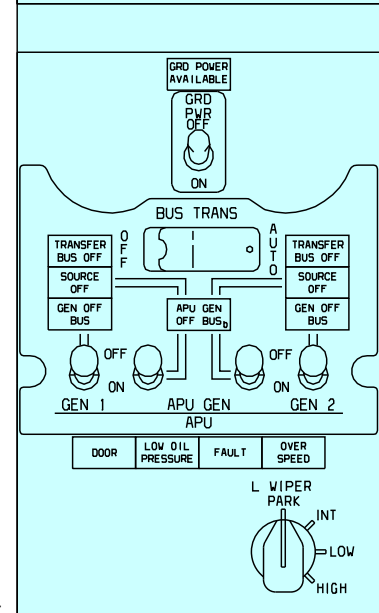
P5-13



P5-5



P5-4



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AC/DC Power Control and Display Panels
Figure 501/24-31-00-990-802

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TASK 24-31-00-740-801

3. **P5-13 ELEC Light Message BITE Procedure**

(Figure 502)

A. General

- (1) You do the BITE procedure at the front panel of the electrical meters, battery and galley power module (P5-13). The P5-13 module is located on the P5 overhead panel in the flight compartment.
- (2) The P5-13 module does not do a self-test at power up. The meter will display dashes when the module cannot internally determine the correct rotary switch position.
- (3) The P5-13 module has an ELEC light which indicates that faults are detected and that the associated maintenance messages are stored in the P5-13.
- (4) The maintenance messages show in the order that they occur, except for INTERFACE FAILURE which will show first. The maintenance messages are listed as follows:

NOTE: There can be multiple effects of ELEC light related maintenance messages due to the same root cause.

NOTE: For multiple ELEC light related maintenance messages, start by troubleshooting the first maintenance message indicated.

- (a) INTERFACE FAILURE
 - (b) BAT CHGR INOP
 - (c) AUX BAT CHGR INOP
 - (d) STAT INV INOP
 - (e) SPCU INOP
 - (f) VOLT FILTER 1.
- (5) If any of the maintenance messages are intermittent and no longer exist, the maintenance message is followed by a blank space and the letter "I".
 - (6) The ELEC light comes on if a fault is detected and the airplane is on the ground. The ELEC light will not come on when the airplane is in air mode.
 - (7) The maintenance messages are stored in memory even when power is removed from the panel. Messages are cleared manually by using the MAINT switch.

NOTE: Maintenance messages can not be cleared if the fault condition still exists.

B. References

Reference	Title
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

C. Location Zones

Zone	Area
211	Flight Compartment - Left

D. BITE Procedure

SUBTASK 24-31-00-740-001

- (1) Do the BITE procedure for the P5-13 module:
 - (a) Set the AC meter selector switch and the DC meter selector switch on the P5-13 front panel to the TEST position.

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- (b) Push and release the MAINT switch on the P5-13 front panel to start the display test.

NOTE: The display test makes all of the segments of the alphanumeric display show. This lets you make sure the display operates correctly. The display test automatically stops after a complete test cycle.

- 1) After the display test, the maintenance messages (if there are any), will show on the meter. The maintenance messages show one at a time.
- 2) Record all ELEC light related maintenance messages.
- 3) Press the MAINT switch again to go to the next maintenance message.

NOTE: Cycling through the maintenance messages more than once will help to make sure all faults are recorded.

- 4) After the last maintenance message, make sure this message shows: HOLD
BUTTON CLEAR FAULTS.

- (c) To save the maintenance messages, do these steps:

- 1) Push and release the MAINT switch.

NOTE: With the AC and DC meter selector switches still in the TEST position, momentarily pressing the MAINT switch will show FAULTS NOT CLEARED. Afterwards, pressing and releasing the MAINT switch will start the display test again followed by showing the maintenance messages.

- 2) Make sure the display changes to meter format.

- (d) To clear the maintenance messages, do these steps:

- 1) Push and hold the MAINT switch for 6 +/- 0.2 seconds.
- 2) Make sure this message shows: FAULTS CLEARED.

NOTE: Maintenance messages can not be cleared if the fault condition still exists.

NOTE: If there is a trend of a specific INOP-I message, perform the related IFIM task even though the fault can be cleared.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 24-31-00-810-001

- (1) Go to the IFIM and do the applicable procedure(s) for each maintenance message.

————— **END OF TASK** —————

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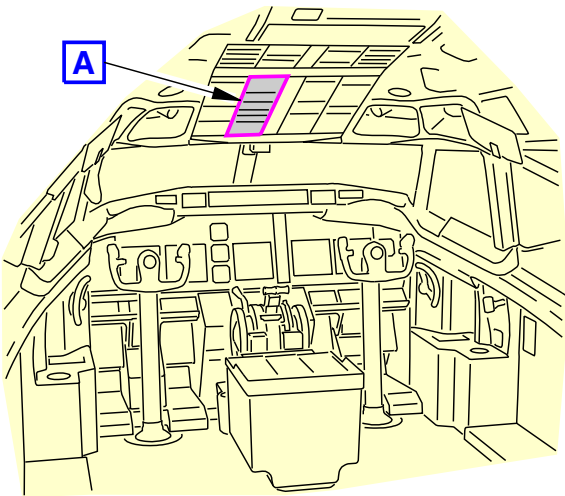
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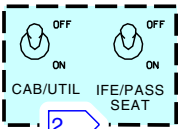
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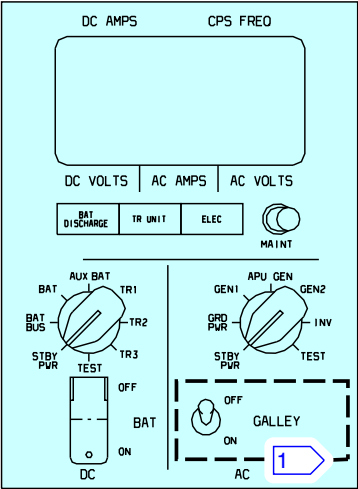
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FLIGHT COMPARTMENT



P5-13



A

- 1 AIRPLANES WITH GALLEY SWITCH
- 2 AIRPLANES WITH CABIN UTILITY AND IFE SWITCHES

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Electrical Meters, Battery and Galley Power Module, P5-13
Figure 502/24-31-00-990-803

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TRANSFORMER RECTIFIER UNIT - MAINTENANCE PRACTICES

1. General

A. This procedure has two tasks:

- (1) A deactivation of the Transformer Rectifier Unit (TRU)
- (2) An activation of the TRU.

TASK 24-31-05-040-801

2. Transformer Rectifier Unit - Deactivation

(Figure 201)

A. **General**

- (1) This procedure removes electrical power to the Transformer Rectifier Unit (TRU).

B. **Location Zones**

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

C. **Access Panels**

Number	Name/Location
117A	Electronic Equipment Access Door

D. **TRU Deactivation**

SUBTASK 24-31-05-010-001

- (1) Open this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 24-31-05-860-001



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

Row	Col	Number	Name
A	4	C00941	TRU 3 ALTN

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(Continued)

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	6	C00806	TRU 1

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C00807	TRU 2

E. TRU - Tryout

NOTE: This tryout is to make sure that the TRU are in a zero energy state.

SUBTASK 24-31-05-860-002



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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) Make sure that these circuit breakers are open and have safety tags:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C00941	TRU 3 ALTN
A	6	C00806	TRU 1

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C00807	TRU 2

SUBTASK 24-31-05-410-003

- (2) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

SUBTASK 24-31-05-700-001

- (3) Do the following steps at the P5-13 panel:
- (a) Turn the DC meter selector switch, on the P5-13 Electrical Meters, Battery, Cable Utility, and Inflight Entertainment Power module, to the TR 1 position.
 - 1) Make sure that the DC meter, on the P5-13 panel, shows no value and is blank.
 - 2) Make sure that the amber TRU fail light, on the P5-13 panel, is on.

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- (b) Turn the DC meter selector switch, on the P5-13 Electrical Meters, Battery, Cable Utility, and Inflight Entertainment Power module, to the TR 2 position.
 - 1) Make sure that the DC meter, on the P5-13 panel, shows no value and is blank.
 - 2) Make sure that the amber TRU fail light, on the P5-13 panel, is on.
- (c) Turn the DC meter selector switch, on the P5-13 Electrical Meters, Battery, Cable Utility, and Inflight Entertainment Power module, to the TR 3 position.
 - 1) Make sure that the DC meter, on the P5-13 panel, shows no value and is blank.
 - 2) Make sure that the amber TRU fail light, on the P5-13 panel, is on.

———— **END OF TASK** ————

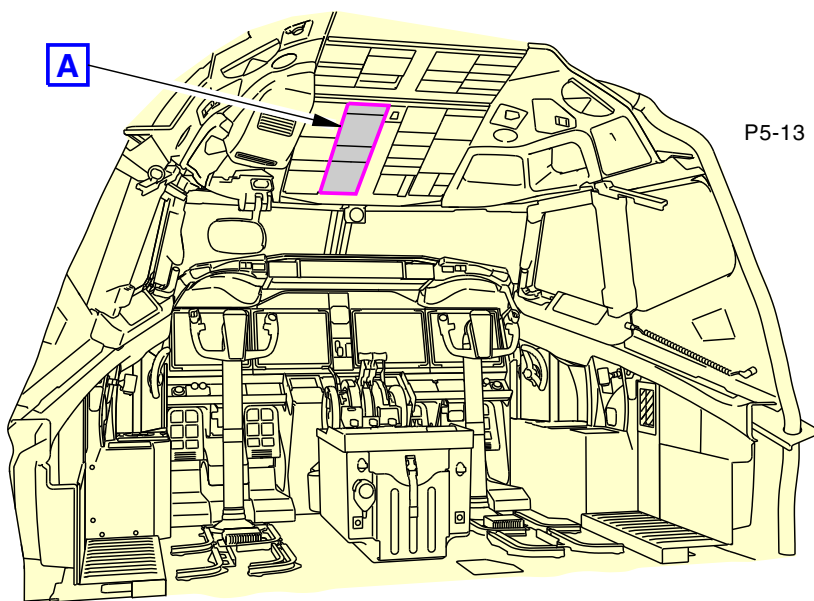
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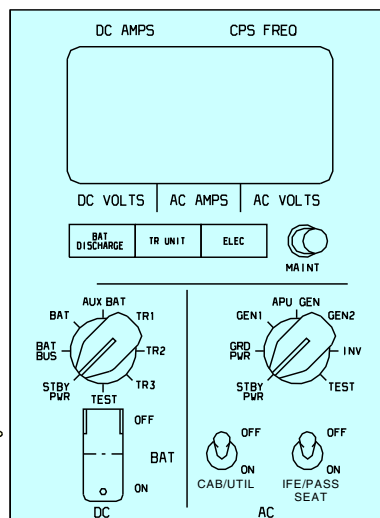
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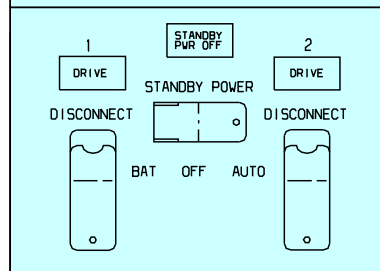


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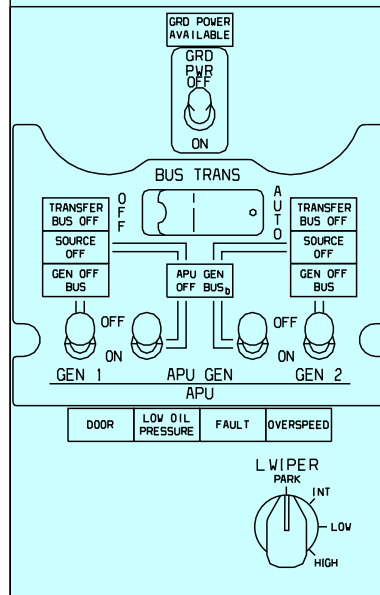
P5-13



P5-5



P5-4



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AC/DC Power Controls and Display Panels
Figure 201/24-31-05-990-801

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TASK 24-31-05-440-801

3. Transformer Rectifier Unit - Activation

(Figure 201)

A. General

- (1) This procedure adds the electrical power to the Transformer Rectifier Unit (TRU).

B. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

D. TRU Activation

SUBTASK 24-31-05-410-004

- (1) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

SUBTASK 24-31-05-860-003



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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) Make sure that these circuit breakers are closed:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C00941	TRU 3 ALTN
A	6	C00806	TRU 1

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C00807	TRU 2

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SUBTASK 24-31-05-410-001

(3) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

————— END OF TASK —————

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TRANSFORMER RECTIFIER UNIT - REMOVAL/INSTALLATION

1. **General**

A. This procedure has two tasks:

- (1) A removal of the TRU
- (2) An installation of the TRU.

B. The removal and installation procedures are the same for all of the units.

TASK 24-31-05-000-801

2. **Transformer Rectifier Unit Removal**

(Figure 401)

A. **General**

(1) There are 3 Transformer Rectifier Unit (TRU)s in the electrical power system. The TRUs are located as follows:

- (a) The transformer rectifier unit 1 [3], T11 is located on the E2-1 Equipment Rack
- (b) The transformer rectifier unit 2 [2], T12 is located on the E4-2 Equipment Rack
- (c) The transformer rectifier unit 3 [1], T13 is located on the E4-2 Equipment Rack

B. **References**

Reference	Title
20-10-07-000-801	E/E Box Removal (P/B 401)
20-40-12-000-802	ESDS Handling for Metal Encased Unit Removal (P/B 201)

C. **Location Zones**

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right

D. **Access Panels**

Number	Name/Location
117A	Electronic Equipment Access Door

E. **Prepare for the Removal**

SUBTASK 24-31-05-010-002

(1) Open this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 24-31-05-860-004



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

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(WARNING PRECEDES)



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) Before you remove the transformer rectifier unit 1 [3], do this step:
- (a) Open this circuit breaker and install safety tag:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	6	C00806	TRU 1

SUBTASK 24-31-05-860-005



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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.

- (3) Before you remove the transformer rectifier unit 2 [2], do this step:
- (a) Open this circuit breaker and install safety tag:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C00807	TRU 2

SUBTASK 24-31-05-860-006



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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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.

- (4) Before you remove the transformer rectifier unit 3 [1], do this step:
- (a) Open these circuit breakers and install safety tags:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C00941	TRU 3 ALTN

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	6	C00808	TRU 3

F. TRU Removal

SUBTASK 24-31-05-010-004



DO NOT TOUCH THE UNIT BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE UNIT.

- (1) Before you touch the TRU, do this task: ESDS Handling for Metal Encased Unit Removal, TASK 20-40-12-000-802.

SUBTASK 24-31-05-020-001

- (2) To remove the transformer rectifier unit 1 [3], transformer rectifier unit 2 [2], or transformer rectifier unit 3 [1], do this task: E/E Box Removal, TASK 20-10-07-000-801.

————— **END OF TASK** —————

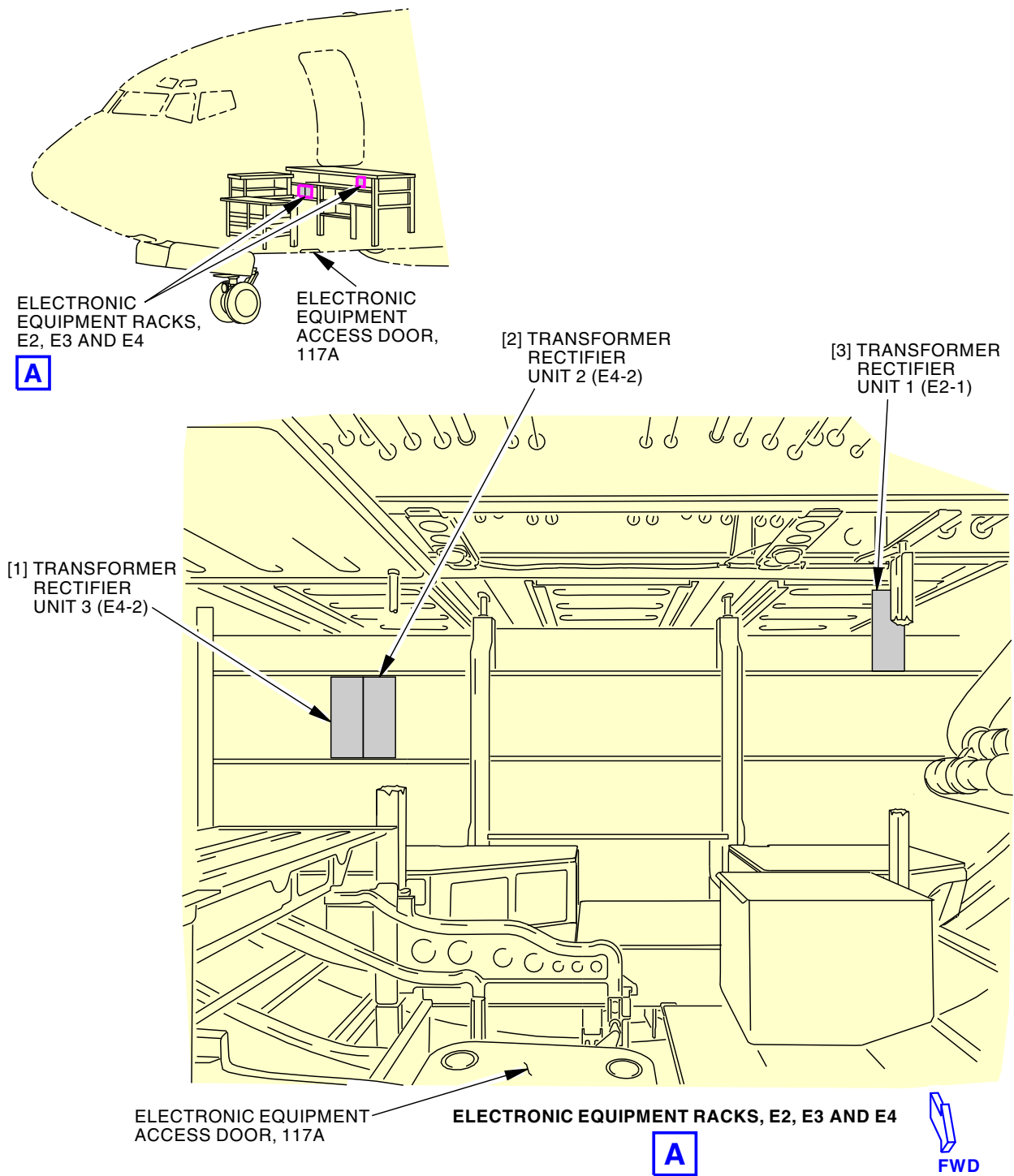
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Transformer Rectifier Units (TRU) Installation
Figure 401/24-31-05-990-802

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TASK 24-31-05-400-801

3. Transformer Rectifier Unit Installation

(Figure 401)

A. General

- (1) There are 3 Transformer Rectifier Unit (TRU)s in the electrical power system. The TRUs are located as follows:
 - (a) The transformer rectifier unit 1 [3], T11 is located on the E2-1 Equipment Rack.
 - (b) The transformer rectifier unit 2 [2], T12 is located on the E4-2 Equipment Rack.
 - (c) The transformer rectifier unit 3 [1], T13 is located on the E4-2 Equipment Rack.

B. References

Reference	Title
20-10-07-400-801	E/E Box Installation (P/B 401)
20-40-12-400-802	ESDS Handling for Metal Encased Unit Installation (P/B 201)

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

E. TRU Installation

SUBTASK 24-31-05-010-003

- (1) Open the applicable access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 24-31-05-010-005



CAUTION

DO NOT TOUCH THE UNIT BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE UNIT.

- (2) Before you touch the TRU, do this task: ESDS Handling for Metal Encased Unit Installation, TASK 20-40-12-400-802.

SUBTASK 24-31-05-420-001

- (3) To install the transformer rectifier unit 1 [3], transformer rectifier unit 2 [2], or transformer rectifier unit 3 [1], do this task: E/E Box Installation, TASK 20-10-07-400-801.

SUBTASK 24-31-05-860-007



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

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(WARNING PRECEDES)



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.

- (4) If you installed the transformer rectifier unit 1 [3], do this step:
- (a) Remove the safety tag and close this circuit breaker:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	6	C00806	TRU 1

SUBTASK 24-31-05-860-008



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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.

- (5) If you installed transformer rectifier unit 2 [2], do this step:
- (a) Remove the safety tag and close this circuit breaker:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C00807	TRU 2

SUBTASK 24-31-05-860-009



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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(WARNING PRECEDES)



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.

- (6) If you installed transformer rectifier unit 3 [1], do this step:
- (a) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C00941	TRU 3 ALTN

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	6	C00808	TRU 3

SUBTASK 24-31-05-410-002

- (7) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

F. TRU Installation Test

SUBTASK 24-31-05-700-002

- (1) Do a test of the TRU as follows:
- (a) If you replaced transformer rectifier unit 1 [3], set the DC Meter Selector switch, on the P5-13 Electrical Meters, Battery, Cable Utility, and Inflight Entertainment Power module, to the TR 1 position.
- (b) If you replaced transformer rectifier unit 2 [2], set the DC Meter Selector switch, on the P5-13 Electrical Meters, Battery, Cable Utility, and Inflight Entertainment Power module, to the TR 2 position.
- (c) If you replaced transformer rectifier unit 3 [1], set the DC Meter Selector switch, on the P5-13 Electrical Meters, Battery, Cable Utility, and Inflight Entertainment Power module, to the TR 3 position.
- (d) Make sure that the DC meter, on the P5-13 panel, shows this value:
- 1) DC VOLTS = 22-30
- NOTE:** The total current drawn is almost shared equally by all 3 TRUs.
- (e) Make sure that the amber TRU fail light, on the P5-13 panel, is off.

————— **END OF TASK** —————

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BATTERY - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

- (1) A removal of the main battery and the auxiliary battery
- (2) An installation of main battery and the auxiliary battery.

TASK 24-31-11-000-801-002

2. Battery Removal

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) The main battery, M6 is located below the E3 equipment rack in the main equipment area. The auxiliary battery, M3054 is located just forward of the main battery.
- (2) The main battery must be removed before you can remove the auxiliary battery. You do not have to remove the auxiliary battery to replace the main battery. The two batteries are the same part number.
- (3) The batteries are removed and installed through a liner in the forward cargo area. The circuit breakers for the two batteries are installed on the J9 panel in the main equipment center.

B. Tools/Equipment

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

Reference	Description
SPL-1633	Equipment - Battery Installation Part #: C24003-9 Supplier: 81205 Opt Part #: C24003-1 Supplier: 81205

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
121	Forward Cargo Compartment - Left
122	Forward Cargo Compartment - Right

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

E. Prepare for the Removal

SUBTASK 24-31-11-860-001-002

- (1) Make sure that the BAT switch, on the P5-13 panel, is set to the OFF position.

SUBTASK 24-31-11-860-002-002

- (2) Make sure that the STANDBY POWER switch, on the P5-5 panel, is set to the AUTO position.

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SUBTASK 24-31-11-860-003-002

- (3) Open this circuit breaker and install safety tag:

Standby Power Control Unit, M01720

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C01410	SPCU NORMAL

SUBTASK 24-31-11-010-001-002

- (4) To get access to the main equipment center, do this step:

Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

SUBTASK 24-31-11-020-001-002

- (5) Remove the access cover on top of the J39 shield to get access to the circuit breakers.

SUBTASK 24-31-11-860-004-002

- (6) Open these circuit breakers and install safety tags:

Battery Shield, J9

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C01209	AUX BAT CHARGER
A	4	C00142	BATTERY CHARGER
A	5	C01340	BATTERY BUS

SUBTASK 24-31-11-010-002-002

- (7) Get access to the forward cargo area through the forward cargo door.

- (a) Remove the forward bulkhead liner to get access to the battery [1].

F. Battery Removal

SUBTASK 24-31-11-020-002-002

- (1) Remove the main battery [1] as follows:

- (a) Cut and remove the safety lockwire from the main battery connector.
- (b) Disconnect the connector from the main battery [1].
- (c) Disconnect the electrical connector from the main battery [1].
- (d) Remove the bolts [2] and washers [3] from the battery mounting brackets.
- (e) Slide the skid plate equipment, SPL-1633, under the main battery [1].

NOTE: The skid plate is used so that the battery will not touch the capstrip just below it.



CAUTION

DO NOT LET THE BATTERY TOUCH THE CAPSTRIP IMMEDIATELY BELOW THE BATTERY-MOUNTING-RACK. IF THE BATTERY TOUCHES THE CAPSTRIP, THEN IT CAN SCRATCH IT. THIS CAN CAUSE SEAL DAMAGE THAT FORMS WHEN YOU INSTALL THE CLOSE-OUT PANEL.

- (f) Slide the main battery [1] out from the battery rack to the forward cargo area.

SUBTASK 24-31-11-020-003-002

- (2) Remove the auxiliary battery [1] as follows:

- (a) Cut and remove the safety lockwire from the auxiliary battery connector.
- (b) Disconnect the connector from the auxiliary battery [1].
- (c) Disconnect the electrical connector from the auxiliary battery [1].

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- (d) Remove the bolts [2] and washers [3] from the battery mounting brackets.
 - (e) Slide the skid plate equipment, SPL-1633, under the auxiliary battery [1].
- NOTE: The skid plate is used so that the battery will not touch the capstrip just below it.



CAUTION

DO NOT LET THE BATTERY TOUCH THE CAPSTRIP IMMEDIATELY BELOW THE BATTERY-MOUNTING-RACK. IF THE BATTERY TOUCHES THE CAPSTRIP, THEN IT CAN SCRATCH IT. THIS CAN CAUSE SEAL DAMAGE THAT FORMS WHEN YOU INSTALL THE CLOSE-OUT PANEL.

- (f) Slide the auxiliary battery [1] out from the battery rack to the forward cargo area.

———— **END OF TASK** ————

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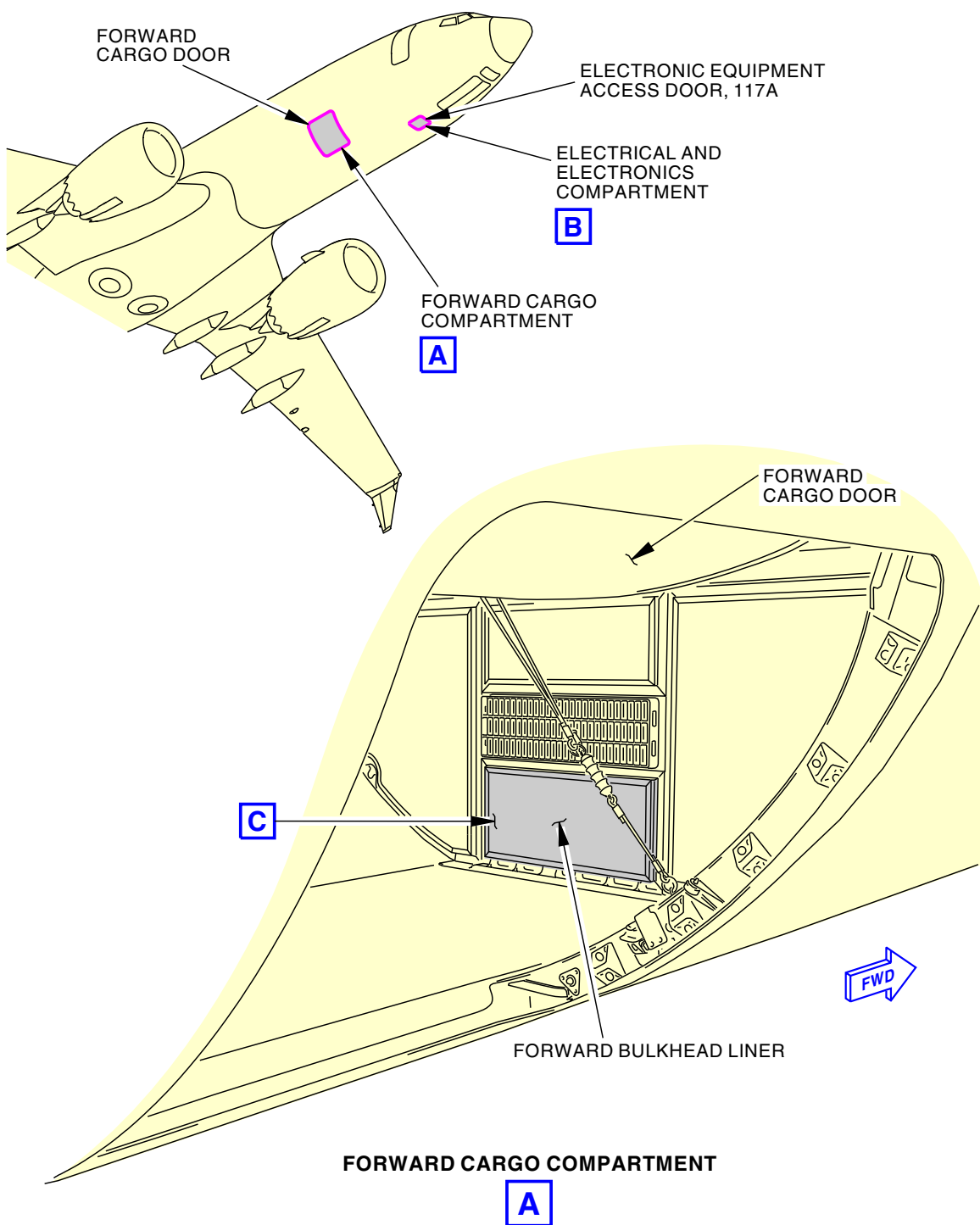
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Battery Installation
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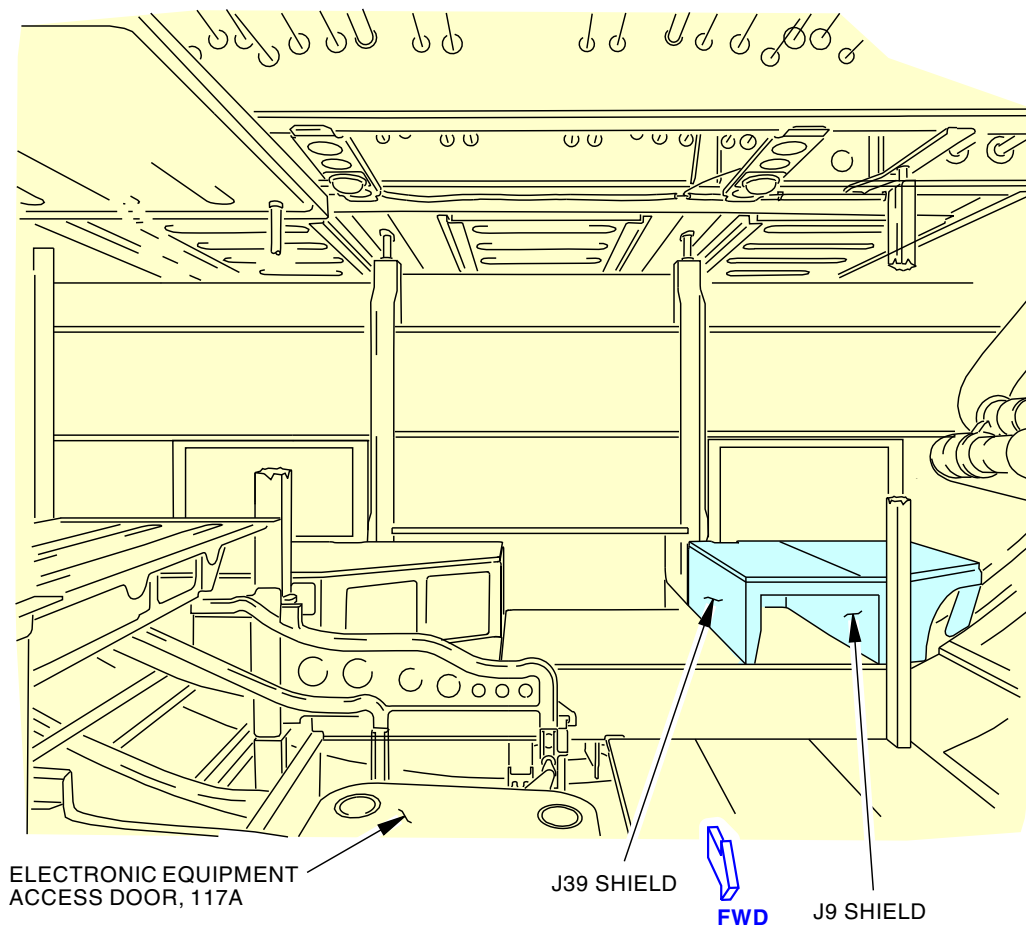
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ELECTRICAL AND ELECTRONICS COMPARTMENT

B

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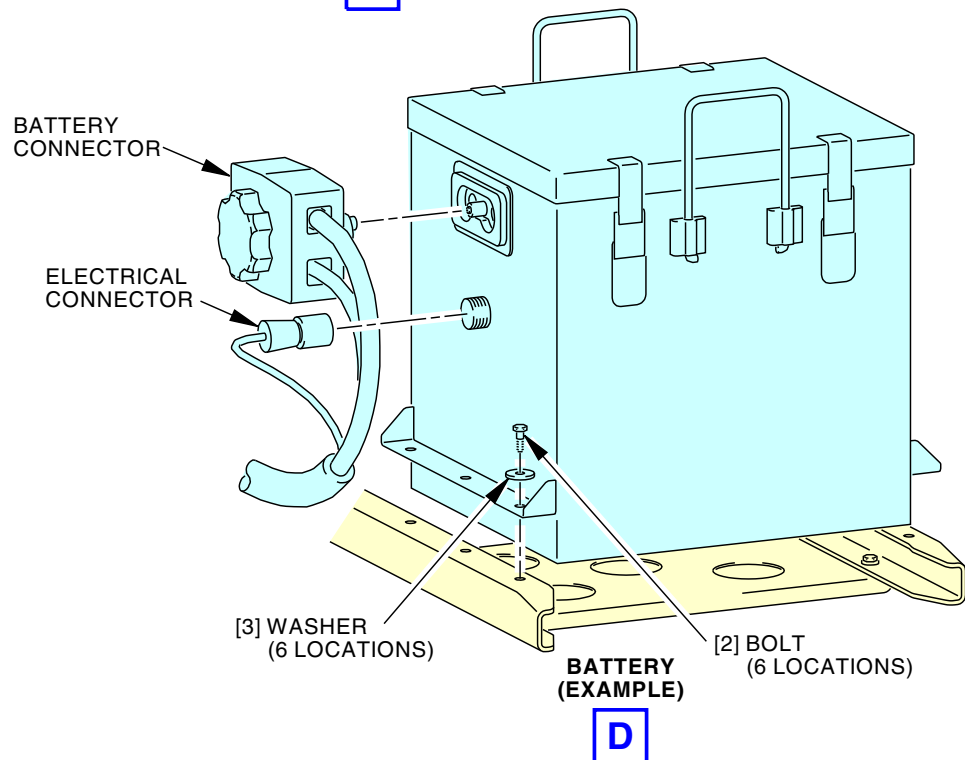
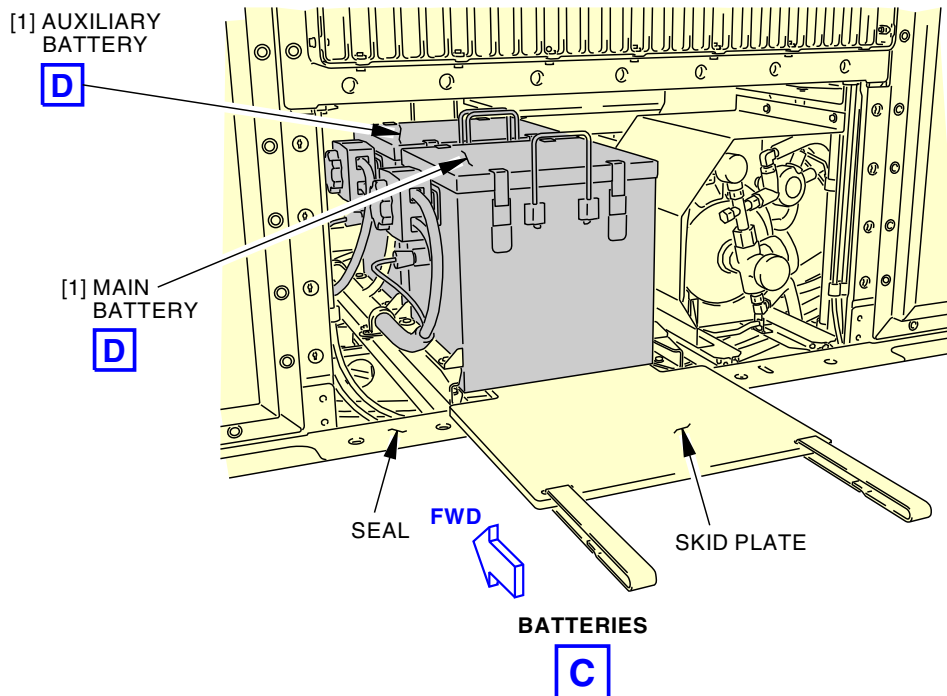
Battery Installation
Figure 401/24-31-11-990-801-002 (Sheet 2 of 3)

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Battery Installation
Figure 401/24-31-11-990-801-002 (Sheet 3 of 3)

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TASK 24-31-11-400-801-002

3. **Battery Installation**

(Figure 401)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) The main battery, M6 is located below the E3 equipment rack in the main equipment area. The auxiliary battery, M3054 is located just forward of the main battery.
- (2) The main battery must be removed before you can remove the auxiliary battery. You do not have to remove the auxiliary battery to replace the main battery. The two batteries are the same part number.
- (3) The batteries are removed and installed through a liner in the forward cargo area. The circuit breakers for the two batteries are installed on the J9 panel in the main equipment center.

B. References

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
24-31-00-740-801	P5-13 ELEC Light Message BITE Procedure (P/B 501)
31-65-00-970-804	Airplane Config Data (ACD) Page Function (P/B 201)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)

C. Tools/Equipment

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

Reference	Description
SPL-1633	Equipment - Battery Installation Part #: C24003-9 Supplier: 81205 Opt Part #: C24003-1 Supplier: 81205

D. Consumable Materials

Reference	Description	Specification
G02479	Lockwire - MS20995CY20, Copper - 0.020 Inch (0.508 mm) Diameter	NASM20995

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Battery	24-31-11-02-105	SIA ALL

F. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
121	Forward Cargo Compartment - Left
122	Forward Cargo Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

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G. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

H. Battery Installation

SUBTASK 24-31-11-420-001-002

(1) Install the auxiliary battery [1] as follows:

(a) Put the skid plate equipment, SPL-1633, in its position (Figure 401).



CAUTION

DO NOT LET THE BATTERY TOUCH THE CAPSTRIP IMMEDIATELY BELOW THE BATTERY-MOUNTING-RACK. IF THE BATTERY TOUCHES THE CAPSTRIP, THEN IT CAN SCRATCH IT. THIS CAN CAUSE SEAL DAMAGE THAT FORMS WHEN YOU INSTALL THE CLOSE-OUT PANEL.

(b) Lift the auxiliary battery [1] onto the skid plate.

NOTE: Two persons may hold each of the battery handles.

(c) Slide the auxiliary battery [1] into position.

1) Make sure that the terminals point left.

(d) Remove the skid plate.

NOTE: You may have to tilt the battery back some to remove the skid plate.

(e) Install the bolts [2] and washers [3] on the battery mounting brackets.

(f) Connect the electrical connector to the auxiliary battery [1].

(g) Connect the battery connector to the auxiliary battery [1].

1) Safety wire the battery connector with a 0.020 in. (0.508 mm) copper MS20995CY20 lockwire, G02479 (TASK 20-10-44-400-801).

SUBTASK 24-31-11-420-002-002

(2) Install the main battery [1] as follows:

(a) Put the skid plate equipment, SPL-1633, in its position (Figure 401).



CAUTION

DO NOT LET THE BATTERY TOUCH THE CAPSTRIP IMMEDIATELY BELOW THE BATTERY-MOUNTING-RACK. IF THE BATTERY TOUCHES THE CAPSTRIP, THEN IT CAN SCRATCH IT. THIS CAN CAUSE SEAL DAMAGE THAT FORMS WHEN YOU INSTALL THE CLOSE-OUT PANEL.

(b) Lift the main battery [1] onto the skid plate.

NOTE: Two persons may hold each of the battery handles.

(c) Slide the main battery [1] into position.

1) Make sure that the terminals point left.

(d) Remove the skid plate.

NOTE: You may have to tilt the battery back some to remove the skid plate.

(e) Install the bolts [2] and washers [3] on the battery mounting brackets.

(f) Connect the electrical connector to the main battery [1].

(g) Connect the battery connector to the main battery [1].

1) Safety wire the battery connector with a 0.020 in. (0.508 mm) copper MS20995CY20 lockwire, G02479 (TASK 20-10-44-400-801).

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SUBTASK 24-31-11-860-005-002

- (3) Remove the safety tags and close these circuit breakers:

Battery Shield, J9

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C01209	AUX BAT CHARGER
A	4	C00142	BATTERY CHARGER
A	5	C01340	BATTERY BUS

SUBTASK 24-31-11-420-003-002

- (4) Install the access cover on top of the J39 shield.

SUBTASK 24-31-11-860-006-002

- (5) Remove the safety tag and close this circuit breaker:

Standby Power Control Unit, M01720

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C01410	SPCU NORMAL

I. Battery Installation Test

SUBTASK 24-31-11-860-008-002

- (1) Make sure that the STANDBY POWER switch, on the P5-5 panel, is in the AUTO position.

SUBTASK 24-31-11-210-001-002

- (2) Make sure that the ELEC light, on the P5-13 panel, is off.

- (a) Clear ELEC light messages, do this task: P5-13 ELEC Light Message BITE Procedure, TASK 24-31-00-740-801.

SUBTASK 24-31-11-710-001-002

- (3) Do these steps to test the main battery [1]:

- (a) Set the GRD PWR switch, on the P5-4 panel, to the OFF position.
- (b) Make sure that the BAT switch, on the P5-13 panel, is set to the ON position.
- (c) Set the DC meter selector switch, on the P5-13 panel, to the BAT position.
- (d) Make sure that the DC meter on the, P5-13 panel, shows these values:
 - 1) DC VOLTS = 22-28
 - 2) DC AMPS = a negative value.

NOTE: The battery current is negative when the battery is discharging.

- (e) Make sure that the BAT DISCHARGE light, on the P5-13 panel, comes on.
 - 1) This light will come on when any of these conditions are met:
 - a) The battery current is greater than 5 Amps for more than 95 seconds.
 - b) The battery current is greater than 15 Amps for more than 25 seconds.
 - c) The battery current is greater than 100 Amps for more than 1.2 seconds.

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- (f) For a new or recently re-conditioned batteries, allow the battery to discharge for 5 minutes.

NOTE: This will help to prevent battery discharge messages after the battery sets to the TR mode.

NOTE: New or re-conditioned batteries can hold capacitance better when you set from main mode charge (31.5V) to the TR mode charger output (27.5V +/- 3%, 26.675 - 28.325V). The battery can have a discharge of more than 5 Amps for more than 95 seconds until the battery voltage equals the TR mode charger output (27.5V +/- 3%, 26.675 - 28.325V).

- (g) Set the GRD PWR switch to the ON position.
- (h) Make sure that the DC AMPS value goes to 45 ± 10 Amps and then goes down to less than 5 Amps within 180 minutes.

NOTE: When the battery is charging at 45 ± 10 Amps the battery voltage will be increasing to 31.5 ± 2 Volts.

NOTE: 180 minutes is the maximum. It can take less time depending the state of the battery.

- (i) Make sure that the DC VOLTS value goes to 27.5 ± 2 Volts.

NOTE: After main mode charge the battery will decrease from 31.5V to 27.5V.

- (j) Make sure that the BAT DISCHARGE light goes off.

NOTE: For a new or re-conditioned batteries, the BAT DISCHARGE light may come on 95 seconds after the battery charger goes into the TR mode. This condition will continue until the battery decreases under 5 Amps of discharge for one second. A discharge will show on the P5-13 panel (DC meter selector switch set to BAT) until the battery voltage equals the TR mode charger output (27.5V +/- 3%, 26.675 - 28.325V).

- 1) If the BAT DISCHARGE light stays on, then do these steps:
- Set the GRD PWR switch, on the P5-4 panel, to the OFF position.
 - Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - Do the above test again.

SUBTASK 24-31-11-710-002-002

- (4) Do these steps to test auxiliary battery [1]:

- Set the GRD PWR switch, on the P5-4 panel, to the OFF position.
- Make sure that the BAT switch, on the P5-13 panel, is set to the ON position.
- Set the DC meter selector switch, on the P5-13 panel, to the AUX BAT position.
- Make sure that the DC meter, on the P5-13 panel, shows these values:

- DC VOLTS = 22-28
- DC AMPS = a negative value.

NOTE: The battery current is negative when the battery is discharging.

- Make sure that the BAT DISCHARGE light, on the P5-13 panel, comes on.
 - This light will come on when any of these conditions are met:
 - The battery current is greater than 5 Amps for more than 95 seconds.
 - The battery current is greater than 15 Amps for more than 25 seconds.

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- c) The battery current is greater than 100 Amps for more than 1.2 seconds.
- (f) For a new or recently re-conditioned batteries, allow the battery to discharge for 5 minutes.
NOTE: This will help to prevent battery discharge messages after the battery sets to the TR Mode.
NOTE: New or re-conditioned batteries can hold capacitance better when you set from main mode charge (31.5V) to the TR mode charger output (27.5V +/- 3%, 26.675 - 28.325V). The battery can have a discharge of more than 5 Amps for more than 95 seconds until the battery voltage equals the TR mode charger output (27.5V +/- 3%, 26.675 - 28.325V).
- (g) Set the GRD PWR switch to the ON position.
- (h) Make sure that the DC AMPS value goes to 45 ±10 Amps and then goes down to less than 5 Amps within 180 minutes.
NOTE: When the battery is charging at 45 ±10 Amps the battery voltage will be increasing to 31.5 ±2 Volts.
NOTE: 180 minutes is the maximum. It can take less time depending the state of the battery.
- (i) Make sure that the DC VOLTS value goes to 27.5 ±2 Volts.
NOTE: After main mode charge the battery will decrease from 31.5V to 27.5V.
- (j) Make sure that the BAT DISCHARGE light goes off.
NOTE: For a new or re-conditioned batteries, the BAT DISCHARGE light may come on 95 seconds after the battery charger goes into the TR mode. This condition will continue until the battery decreases under 5 Amps of discharge for one second. A discharge will show on the P5-13 panel (DC meter selector switch set to BAT) until the battery voltage equals the TR mode charger output (27.5V +/- 3%, 26.675 - 28.325V).
- 1) If the BAT DISCHARGE light stays on, then do these steps:
 - a) Set the GRD PWR switch, on the P5-4 panel, to the OFF position.
 - b) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - c) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - d) Do the above test again.

SUBTASK 24-31-11-860-009-002

- (5) Make sure that the clock resets after Global Positioning System (GPS) is re-established with the airplane.
NOTE: The UTC Time and Date are editable only if there is not an active Multi-Mode Receiver (MMR), GPS source.
- (a) If it is necessary, set the clock manually, do this task: Airplane Config Data (ACD) Page Function, TASK 31-65-00-970-804.

SUBTASK 24-31-11-860-010-002

- (6) Get access to the main equipment center.
 - (a) Make sure that the BATTERY and CHARGER lights on the front of the main battery charger and auxiliary battery charger are on.

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J. Put the Airplane Back to its Usual Condition

SUBTASK 24-31-11-410-001-002

- (1) Install the forward bulkhead liner.

SUBTASK 24-31-11-410-002-002

- (2) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

————— **END OF TASK** —————

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BATTERY CONNECTOR - INSPECTION/CHECK

1. General

- A. This procedure contains one task:
- (1) Battery Connector Inspection.
- B. The main battery, M6, is located below the E3 equipment rack in the main equipment area.
- C. The auxiliary battery, M3054, is located just forward of the main battery.
- D. The main battery must be removed before you can remove the auxiliary battery. You do not have to remove the auxiliary battery to replace the main battery.

TASK 24-31-11-200-801

2. Battery Connector Inspection

(Figure 601)

A. **References**

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
20-50-11 P/B 201	STANDARD TORQUE VALUES - MAINTENANCE PRACTICES
24-31-00-740-801	P5-13 ELEC Light Message BITE Procedure (P/B 501)
49-11-00-860-801	APU Starting and Operation (P/B 201)
49-11-00-860-802	APU Usual Shutdown (P/B 201)
50-11-01-000-801	Forward Cargo Compartment Forward Bulkhead Liner Removal (P/B 401)
50-11-01-400-801	Forward Cargo Compartment Forward Bulkhead Liner Installation (P/B 401)
SWPM 20-30-11	Standard Wiring Practices Manual
SWPM 20-62-25	Standard Wiring Practices Manual

B. **Tools/Equipment**

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

Reference	Description
SPL-12292	Gage Tool - Battery Inspection Part #: J24016-1 Supplier: 81205

C. **Consumable Materials**

Reference	Description	Specification
G02479	Lockwire - MS20995CY20, Copper - 0.020 Inch (0.508 mm) Diameter	NASM20995

D. **Location Zones**

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
121	Forward Cargo Compartment - Left
122	Forward Cargo Compartment - Right

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E. Access Panels

Number	Name/Location
--------	---------------

117A	Electronic Equipment Access Door
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F. Prepare for the Battery Connector Inspection

SUBTASK 24-31-11-860-012

- (1) Make sure that the BAT switch on the P5-13 panel is set to the OFF position.

SUBTASK 24-31-11-860-013

- (2) Make sure that the STANDBY POWER switch on the P5-5 panel is set to the AUTO position.

SUBTASK 24-31-11-860-014

- (3) Open this circuit breaker and install safety tag:

Standby Power Control Unit, M01720

Row	Col	Number	Name
B	1	C01410	SPCU NORMAL

SUBTASK 24-31-11-010-003

- (4) To get access to the main equipment center, do this step:

Open this access panel:

Number	Name/Location
--------	---------------

117A	Electronic Equipment Access Door
------	----------------------------------

SUBTASK 24-31-11-010-004

- (5) Remove the access cover on top of the J39 shield to get access to the circuit breakers.

SUBTASK 24-31-11-860-015

- (6) Open these circuit breakers and install safety tags:

Battery Shield, J9

Row	Col	Number	Name
A	3	C01209	AUX BAT CHARGER
A	4	C00142	BATTERY CHARGER
A	5	C01340	BATTERY BUS

SUBTASK 24-31-11-010-005

- (7) Get access to the forward cargo area through the forward cargo door.

- (a) Remove the forward bulkhead liner to get access to the battery, do this task: Forward Cargo Compartment Forward Bulkhead Liner Removal, TASK 50-11-01-000-801.

SUBTASK 24-31-11-020-004

- (8) Disconnect the connectors from the battery:

- (a) Remove the sealing wire from the connector jackscrew knob [12].
- (b) Turn the jackscrew knob [12] on the battery power connector counterclockwise until the connector is free from the battery receptacle.
- (c) Disconnect the battery sensor connector from the battery receptacle.

G. Battery Connector Inspection

SUBTASK 24-31-11-210-002

- (1) Examine the battery sensor connector:

- (a) If you find one of these conditions below, repair or replace the connector.
- 1) Corrosion or pitting of the contacts

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- 2) Burn marks on the contacts
- 3) Bent or pushed back contacts
- 4) Damage or corrosion to the connector body.

SUBTASK 24-31-11-210-004

- (2) Do this check of the battery power connector:
 - (a) Disassemble the battery power connector:
 - 1) Remove the screws [3], washers [4], and nuts [5] that attach the housing [1] to the housing [2].
 - 2) Remove the housing [1] from the housing [2].
 - (b) Examine the battery power connector:
 - 1) If you find one of the conditions below, replace the battery power connector (SWPM 20-62-25):
 - a) Corrosion and pitting of the power contacts [11] or terminal lug [9] mating surfaces
 - b) Excessive free play or broken pins on the handwheel-worm assembly
 - c) Burn marks on the power contacts [11], or the mating surfaces between the terminal lug [9] and the contact bar [6] or terminal stud [8].

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- (c) Use the battery inspection gage tool, SPL-12292 to do a check of the battery connector power contactor as follows:
 - 1) Put the 0.385 end of the tool into the power contact [11].
 - a) Make sure that the fit is snug and it requires at least 1 lbf (4 N) to remove the tool.

NOTE: Attach the force gage through the hole in the tool.

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- (d) Use the battery inspection gage tool, SPL-12292 to do a check of the power contact [11] to connect with a worn or incorrect pin as follows:
 - 1) Put the 0.370 end of the tool in the power contact.
 - a) Make sure that the fit is snug and it requires at least 0.8 lbf (3.6 N) to remove the tool.

NOTE: Attach the force gage through the hole in the tool.

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- (e) Do a check of the contact bar [6]:
 - 1) If the contact bar [6] is held on with a screw [7], make sure that screw [7] is tight and the contact bar [6] is tight.
 - a) Use standard torque values for the screw [7] (PAGEBLOCK 20-50-11/201).
 - 2) If the contact bar [6] is held with a rivet, make sure that the contact bar [6] can not be removed from the housing [1].

NOTE: The contact bar [6] is loose on the housing [1].
- (f) If the terminal lug [9] or terminal stud [8] is damaged, deformed, discolored or annealed, repair or replace the terminal lug [9] (SWPM 20-62-25).

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- 1) Use a high temperature terminal lug to replace an annealed terminal lug [9] (SWPM 20-30-11).
- (g) Torque the nuts [10] to 145 ±10 in-lb (16.4 ±1.1 N·m) (SWPM 20-62-25).
 - 1) Do not pull or move the wires after the nuts [10] are tightened.
- (h) If shipping plugs [13] are installed, remove the shipping plugs [13].

NOTE: Wire type contacts have less contact surface.
- (i) Assemble the battery power connector (SWPM 20-62-25).
 - 1) Put the housing [1] on the housing [2].
 - 2) Make sure that the housing [1] and housing [2] touch on all sides of the connector.
 - a) If housing [1] and housing [2] do not touch on all sides of the connector, adjust the connector (SWPM 20-62-25).
 - 3) Install the screws [3], washers [4], and nuts [5] that attach the housing [1] to the housing [2].
 - 4) Torque the screws [3] to 32 in-lb (4 N·m).
- (j) Make sure that the wires are centered in the connector openings.
- (k) Connect the battery sensor connector to the battery.
- (l) Put the battery power connector into the battery receptacle on the battery.
 - 1) Turn the jackscrew knob [12] on the connector clockwise with your hand until it is tight.
 - 2) Use the double twist method to install the MS20995CY20 lockwire, G02479 from the battery power connector jackscrew knob [12] to one of the connector bolts (Lockwire, Cotter Pins, and Lockrings - Installation, TASK 20-10-44-400-801).

SUBTASK 24-31-11-860-016

- (3) Remove the safety tags and close these circuit breakers:

Battery Shield, J9

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C01209	AUX BAT CHARGER
A	4	C00142	BATTERY CHARGER
A	5	C01340	BATTERY BUS

SUBTASK 24-31-11-410-003

- (4) Install the access cover on top of the J39 shield.

SUBTASK 24-31-11-860-017

- (5) Remove the safety tag and close this circuit breaker:

Standby Power Control Unit, M01720

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	1	C01410	SPCU NORMAL

H. Battery Installation Test

SUBTASK 24-31-11-860-019

- (1) Make sure that the STANDBY POWER switch on the P5-5 panel is in the AUTO position.

SUBTASK 24-31-11-210-005

- (2) Make sure that the ELEC light on the P5-13 panel is OFF.

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- (a) To clear ELEC light messages, do this task: P5-13 ELEC Light Message BITE Procedure, TASK 24-31-00-740-801.

SUBTASK 24-31-11-710-003

- (3) Do these steps to test the main battery:
- (a) Set the GRD PWR switch on the P5-4 panel to the OFF position.
 - (b) Make sure that the BAT switch on the P5-13 panel is set to the ON position.
 - (c) Set the DC meter selector switch on the P5-13 panel to the BAT position.
 - (d) Make sure that the DC meter on the P5-13 panel shows these values:
 - 1) DC VOLTS = 22-28
 - 2) DC AMPS = a negative value

NOTE: The battery current is negative when the battery is discharging.
 - (e) Make sure that the BAT DISCHARGE light on the P5-13 panel comes on. This light will come on when any of these conditions are met:
 - 1) The battery current is greater than 5 Amps for more than 95 seconds.
 - 2) The battery current is greater than 15 Amps for more than 25 seconds.
 - 3) The battery current is greater than 100 Amps for more than 1.2 seconds.
 - (f) Set the GRD PWR switch to the ON position.
 - (g) Make sure that the DC AMPS value goes to 45 ± 10 AMPS and then goes down to less than 5 AMPS within 180 minutes.

NOTE: 180 minutes is the maximum. It can take less time depending the state of the battery.
 - (h) Make sure that the DC VOLTS value goes to 30 ± 3 VOLTS.
 - (i) Make sure that the BAT DISCHARGE light goes off.
 - 1) If the BAT DISCHARGE light stays on, then do these steps:
 - a) Set the GRD PWR switch on the P5-4 panel to the OFF position.
 - b) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - c) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - d) Do the above test again.

SUBTASK 24-31-11-710-004

- (4) Do these steps to test auxiliary battery:
- (a) Set the GRD PWR switch on the P5-4 panel to the OFF position.
 - (b) Make sure that the BAT switch on the P5-13 panel is set to the ON position.
 - (c) Set the DC meter selector switch on the P5-13 panel to the AUX BAT position.
 - (d) Make sure that the DC meter on the P5-13 panel shows these values:
 - 1) DC VOLTS = 22-28
 - 2) DC AMPS = a negative value

NOTE: The battery current is negative when the battery is discharging.
 - (e) Make sure that the BAT DISCHARGE light on the P5-13 panel comes on. This light will come on when any of these conditions are met:
 - 1) The battery current is greater than 5 Amps for more than 95 seconds.
 - 2) The battery current is greater than 15 Amps for more than 25 seconds.

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- 3) The battery current is greater than 100 Amps for more than 1.2 seconds.
- (f) Set the GRD PWR switch to the ON position.
- (g) Make sure that the DC AMPS value goes to 45 ± 10 AMPS and then goes down to less than 5 AMPS within 180 minutes.

NOTE: 180 minutes is the maximum. It can take less time depending the state of the battery.

- (h) Make sure that the DC VOLTS value goes to 30 ± 3 VOLTS.
- (i) Make sure that the BAT DISCHARGE light goes off.
 - 1) If the BAT DISCHARGE light stays on, then do these steps:
 - a) Set the GRD PWR switch on the P5-4 panel to the OFF position.
 - b) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.
 - c) Do this task: APU Usual Shutdown, TASK 49-11-00-860-802.
 - d) Do the above test again.

SUBTASK 24-31-11-860-020

- (5) Set the clocks to the correct date and Greenwich Mean Time (GMT).

SUBTASK 24-31-11-860-023

- (6) Get access to the main equipment center.

SUBTASK 24-31-11-860-026

- (7) Make sure that the BATTERY and CHARGER lights on the front of the main battery charger and auxiliary battery charger are on.

I. Put the Airplane Back to its Usual Condition

SUBTASK 24-31-11-410-004

- (1) Install the forward bulkhead liner, do this task: Forward Cargo Compartment Forward Bulkhead Liner Installation, TASK 50-11-01-400-801.

SUBTASK 24-31-11-410-005

- (2) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

———— **END OF TASK** ————

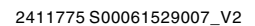
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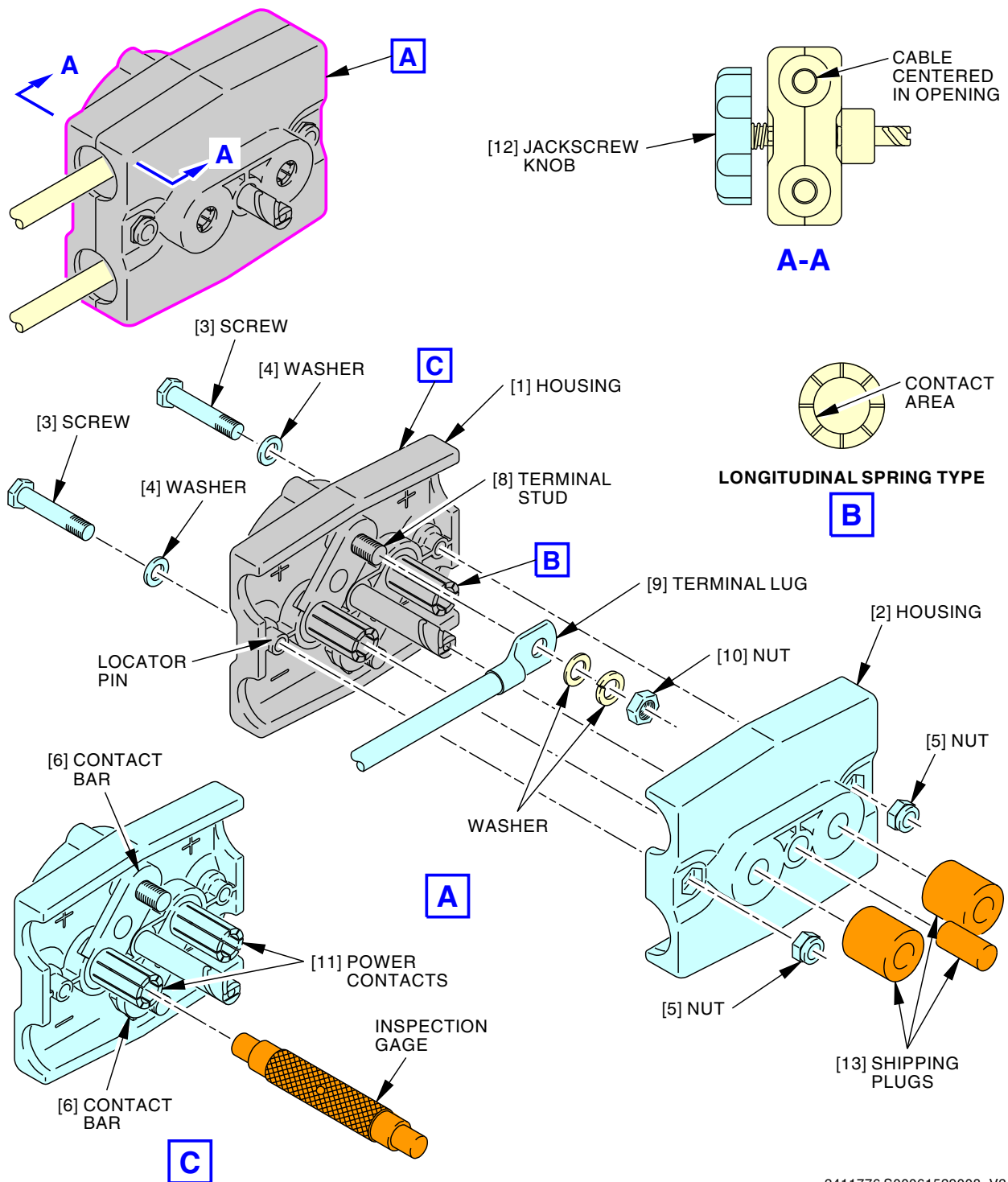


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Battery Connector Inspection/Check
Figure 601/24-31-11-990-802 (Sheet 2 of 2)

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BATTERY - INSPECTION/CHECK

1. General

- A. This procedure contains this task:
 - (1) Battery Discharge Check
- B. The main battery, M6, is located below the E3 equipment rack in the main equipment area.
- C. The auxiliary battery, M3054, is located just forward of the main battery.
- D. The main battery must be removed before you can remove the auxiliary battery. You do not have to remove the auxiliary battery to replace the main battery.

TASK 24-31-11-710-801

2. Battery Discharge Check

A. General

- (1) This procedure contains steps to functionally check the main and if applicable, auxiliary battery, to determine their state of charge.
 - (a) When batteries are found to be in a low state of charge, this procedure contains steps to evaluate them and will refer the operator to accomplish a battery installation test if necessary.
 - (b) When batteries discharge at an excessively high rate, this procedure contains steps to evaluate and will refer the user to the applicable fault isolation procedure.
- (2) This procedure does not test the battery capacitance.
- (3) This test covers the following 737MAX model single and dual battery configurations:
 - (a) 737-8
 - 1) Single Battery System
 - a) 42A Nominal Amp draw.
 - 2) Dual Battery System
 - a) 21A Nominal Amp draw per battery.
 - (b) 737-9
 - 1) Single Battery System
 - a) 45A Nominal Amp draw.
 - 2) Dual Battery System
 - a) 22A Nominal Amp draw per battery.
- (4) Battery System Evaluation Criteria
 - (a) Dual Battery System
 - 1) If unbalanced, one battery's amperage reading is low (< 30% of nominal draw), while the other battery is high (> 30% of nominal draw), it is recommended to follow the steps to accomplish the battery installation test TASK 24-31-11-400-801-002.
 - 2) If an individual battery amperage reading is > 30% nominal draw, recommend following procedural steps to isolate source of excessive draw.

B. References

Reference	Title
24-31-00-740-801	P5-13 ELEC Light Message BITE Procedure (P/B 501)

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(Continued)

Reference	Title
24-31-11-400-801-002	Battery Installation (P/B 401)
24-34-00-710-802	Standby Power System - Operational Test (P/B 501)
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual
WDM 24-31-11	Wiring Diagram Manual
WDM 24-31-12	Wiring Diagram Manual
WDM 24-61-11	Wiring Diagram Manual

C. Prepare for the Check

SUBTASK 24-31-11-860-027

- (1) Make sure that the STANDBY POWER switch on the P5-5 panel is in the AUTO position.

SUBTASK 24-31-11-860-028

- (2) Make sure that both select switches on the Inertial Reference System (IRS) Mode Select Unit (MSU) are set to the OFF position

SUBTASK 24-31-11-210-006

- (3) Make sure that the ELEC light on the P5-13 panel is OFF.
 - (a) To clear ELEC light messages, do this task: P5-13 ELEC Light Message BITE Procedure, TASK 24-31-00-740-801.

D. Battery Discharge Check

SUBTASK 24-31-11-710-005

- (1) Do the following steps to test the main battery:
 - (a) Set the GRD PWR switch on the P5-4 panel to the OFF position.
 - (b) Select BAT switch on the P5-13 panel to the ON position.
 - (c) Wait for the BAT DISCHARGE light on the P5-13 panel to come on.

NOTE: The light should appear after approximately 25 seconds.
 - (d) Set the DC meter selector switch on the P5-13 panel to the BAT position.
 - (e) Make sure that the DC meter on the P5-13 panel indicates a negative value within the following range in the table below.

NOTE: A negative DC AMP value indicates that the battery is discharging.
- (2) Do the following steps to test the auxiliary battery on a dual battery system:
 - (a) Set the DC meter selector switch on the P5-13 panel to the AUX BAT position.
 - (b) Make sure that the DC meter on the P5-13 panel indicates a negative value within the following range in the table below.

NOTE: A negative DC AMP value indicates that the battery is discharging

E. Evaluation

SUBTASK 24-31-11-700-001

- (1) If a battery reading is lower than the value in Table 501; then the battery is less than optimally charged. In order to determine the condition of the battery and battery charger system do the following:

NOTE: For example; 737-9 amperage is -13.

 - (a) Accomplish a battery installation test for the battery which recorded low current draw during the test (TASK 24-31-11-400-801-002).

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- (b) Repeat test.

NOTE: If the battery installation test or this battery discharge test fails again, either the battery or battery charger system is degraded. Refer to the IFIM and do the applicable procedure(s).

NOTE: For the Main Battery: BAT CHGR INOP Message - Fault Isolation

NOTE: For the Auxiliary Battery: AUX CHGR INOP Message - Fault Isolation

- (2) If a battery reading is higher than the value in Table 501; then the amperage draw is excessive. To fault isolate, do the following:

NOTE: For example; 737-9 amperage is -32.

- (a) Cycle STANDBY POWER switch on the P5-5 panel from AUTO to OFF then back to AUTO position.
- 1) If amperage remains high, check the Battery Current Sensing per BAT DISCHARGE Light - Fault Isolation Initial Evaluation Task.
 - 2) If amperage immediately returned to within nominal range, the Standby Power Control Unit (SPCU) may have intermittently sticking relay contacts, do this task: Standby Power System - Operational Test, TASK 24-34-00-710-802.
 - 3) If amperage remains high, fault isolate individual branch circuit by alternately pulling the Standby Power Control Unit (SPCU) circuit breakers (WDM 24-31-11, WDM 24-31-12, WDM 24-61-11)

NOTE: By de-energizing individual circuits, the user can isolate to the defective branch circuit component or to the Standby Power Control Unit (SPCU).

Table 501/24-31-11-993-801 Battery Discharge Table

Battery Configuration	Airplane Models	
	737 - 8	737 - 9
Dual Battery System Main & Auxiliary Battery (30% Deviation Range)	-15 to -27	-15 to -29

———— **END OF TASK** ————

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MAIN BATTERY-MAINTENANCE PRACTICES

1. General

- A. This procedure contains one task:
 - (1) Battery Electrolyte Spillage.
- B. In all cases of an electrolyte spill, an incident report should be completed detailing the area affected, the level of cleansing effected (units/cables removed, etc.) and calling for the area to be re-inspected after 14 days for signs of corrosive attack following the local regulatory protocols.
- C. Should corrosion be evident after the 14 days, appropriate action must be taken into consideration to repeat the inspection at a later date.

TASK 24-31-11-100-801

2. Battery Electrolyte Spillage

A. General

- (1) If battery fluid is dropped in the airplane, do these steps immediately.

B. Consumable Materials

Reference	Description	Specification
B00095	Compound - Sodium Bicarbonate	ASTM D928
B00636	Acid, Acetic (Vinegar) (5%-10% Acetic Acid)	Commercially available product
B50113	Acid, Acetic (10% / 100 grain)	JAN-A-465
G50412	Paper - Litmus (Used to find the acidity or alkalinity of a liquid solution)	

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right

D. Procedure

SUBTASK 24-31-11-100-001



MAKE SURE THAT YOU DO NOT LET THE ELECTROLYTE TOUCH YOUR SKIN. IF YOU DO NOT OBEY, INJURY TO PERSONNEL CAN OCCUR.



DO NOT LET THE BATTERY TOUCH THE CAPSTRIP IMMEDIATELY BELOW THE BATTERY-MOUNTING-RACK. IF THE BATTERY TOUCHES THE CAPSTRIP, THEN IT CAN SCRATCH IT. THIS CAN CAUSE SEAL DAMAGE THAT FORMS WHEN YOU INSTALL THE CLOSE-OUT PANEL.

- (1) Do these steps to remove the electrolyte spillage:
 - (a) Use a clean rag and water to remove the accessible pools of the electrolyte.
 - 1) Make sure that you do not let the electrolyte spread.
 - (b) Rinse the rag in water frequently to prevent the spread of the electrolyte contamination.
 - (c) If the electrolyte is not trapped in a complex structure, rinse the area with clean cold water.

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- 1) Make sure that you do not spread the contamination to the electrical equipment that is in the area.

NOTE: Be careful of electrical wires and equipment that you may find below the floor.

- (d) If the electrolyte is on the carpet, remove the carpet from the airplane as soon as possible.

- 1) Clean the area where the carpet was removed.

NOTE: If the carpet was left in place for some time, examine the area for evidence of corrosion.

- (e) Use a clean rag to dry the affected area.

SUBTASK 24-31-11-200-001

- (2) If the electrolyte is on the control cables of the airplane, replace the cables.

- (a) Send the cables to the cable workshop.

NOTE: The cable workshop will clean and examine the cables for damage.

SUBTASK 24-31-11-110-001

- (3) If you have lead/acid electrolyte (dilute sulphuric acid), do these steps if you think the electrolyte is in a complex (blind) structure:

- (a) Put compound, B00095 powder on the area.
 - (b) Rinse the area with a saturated solution of compound, B00095.
 - (c) Rinse the area with clean water.

NOTE: Be careful of electrical wires and equipment that you may find below the floor.

- (d) Use a clean rag to dry the area as thoroughly as possible.

SUBTASK 24-31-11-110-002

- (4) If you have NiCad electrolyte (potassium hydroxide solution), do these steps if you think the electrolyte is in a complex (blind) structure:

- (a) Rinse the area with acid, B50113 or acid, B00636.

NOTE: If the acetic acid is not available, use household white vinegar.

- (b) Rinse the area with clean water.

NOTE: Be careful of electrical wires and equipment that you may find below the floor.

- (c) Use a clean rag to dry the area as thoroughly as possible.

SUBTASK 24-31-11-960-001

- (5) If you do not think that these procedures were effective, replace the suspect components.

- (a) Send the components that you removed to the workshop to be cleaned and examined.

SUBTASK 24-31-11-200-002

- (6) Examine the cleaned area with a piece of litmus paper, G50412.

NOTE: The acetic acid, the vinegar, and the sodium bicarbonate (alkali) are all mildly corrosive to light alloys. A residual of the sulphuric acid, the acetic acid, or the vinegar will cause the PH test to go red. A residual of the potassium hydroxide or the sodium bicarbonate will cause the PH test to go blue.



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SUBTASK 24-31-11-970-001

- (7) Complete an incident report that describes the electrolyte spill following the local regulatory protocol.

————— **END OF TASK** —————

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MAIN BATTERY CHARGER - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
- (1) A removal of the Main Battery Charger
 - (2) An installation of the Main Battery Charger.

TASK 24-31-21-000-801

2. Main Battery Charger Removal

(Figure 401)

A. **General**

- (1) The M5 Battery Charger is located on the E2-1 equipment rack in the main equipment center.

B. **References**

Reference	Title
20-10-07-000-801	E/E Box Removal (P/B 401)
20-40-12-000-802	ESDS Handling for Metal Encased Unit Removal (P/B 201)

C. **Location Zones**

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left

D. **Access Panels**

Number	Name/Location
117A	Electronic Equipment Access Door

E. **Prepare for the Removal**

SUBTASK 24-31-21-010-001

- (1) Set the BAT switch, on the P5-13 panel, to the OFF position.

SUBTASK 24-31-21-010-002

- (2) To get access to the main equipment center, open this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

SUBTASK 24-31-21-020-001

- (3) Remove the access cover on top of the J39 shield to get access to the circuit breaker.

SUBTASK 24-31-21-860-001



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

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(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.



CAUTION

DO NOT DISCONNECT THE BATTERY CHARGER BEFORE YOU OPEN THE CIRCUIT BREAKERS. WITH THE BATTERY SWITCH IN THE OFF POSITION, THE BATTERY WILL CONTINUE TO ENERGIZE THE POSITIVE TERMINAL OF THE BATTERY CHARGER. IF YOU DISCONNECT THE BATTERY CHARGER BEFORE YOU OPEN THE CIRCUIT BREAKERS, YOU CAN CAUSE DAMAGE TO THE BATTERY CHARGER.

- (4) Open these circuit breakers and install safety tags:

Battery Shield, J9

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C00142	BATTERY CHARGER

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	1	C00809	BAT CHGR

NOTE: When these circuit breakers are opened the battery will supply power to the hot battery bus. You can remove the main battery connector to stop the drain on the battery.

F. Main Battery Charger Removal

SUBTASK 24-31-21-910-001



CAUTION

DO NOT TOUCH THE UNIT BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE UNIT.

- (1) Before you touch the battery charger [1], do this task: ESDS Handling for Metal Encased Unit Removal, TASK 20-40-12-000-802.

SUBTASK 24-31-21-020-002

- (2) Remove the battery charger [1] per the steps that follow:
- (a) Remove the electrical connector from the front of the battery charger [1].
 - (b) Remove the screw [9], washers [8], and washer [11] to remove the terminal block cover [10] from the battery charger [1].
 - (c) Remove the terminal block cover [10] from the front of the battery charger [1].
 - (d) Remove the nut [2], lockwasher [3], and washer [4] from the terminal stud.
 - (e) Remove the nut [7], lockwasher [6], and washer [5] from the terminal stud.
 - (f) Remove the wires from the terminals.
 - (g) Remove the battery charger [1], do this task: E/E Box Removal, TASK 20-10-07-000-801.

————— **END OF TASK** —————

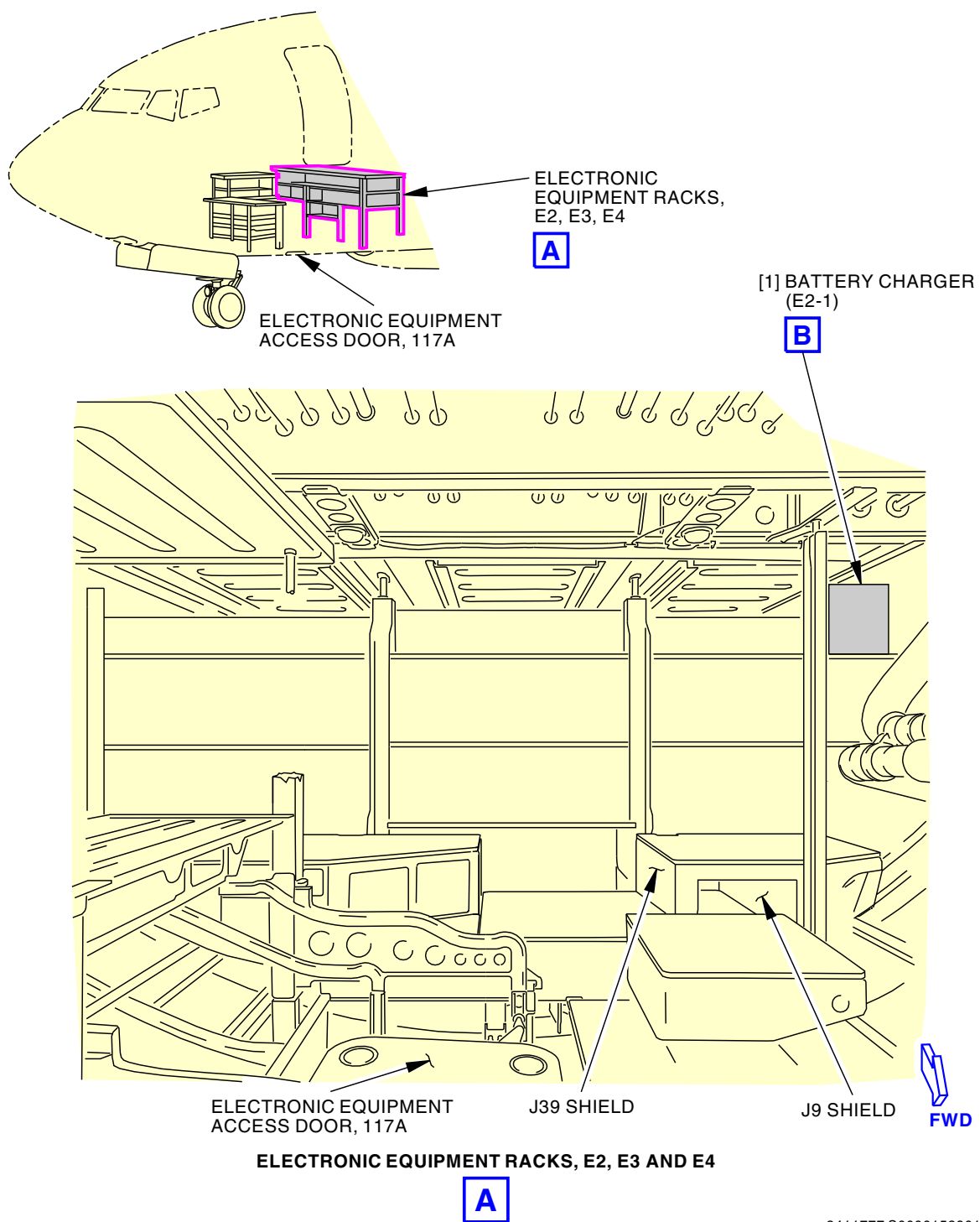
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**Main Battery Charger Installation
Figure 401/24-31-21-990-801 (Sheet 1 of 2)**

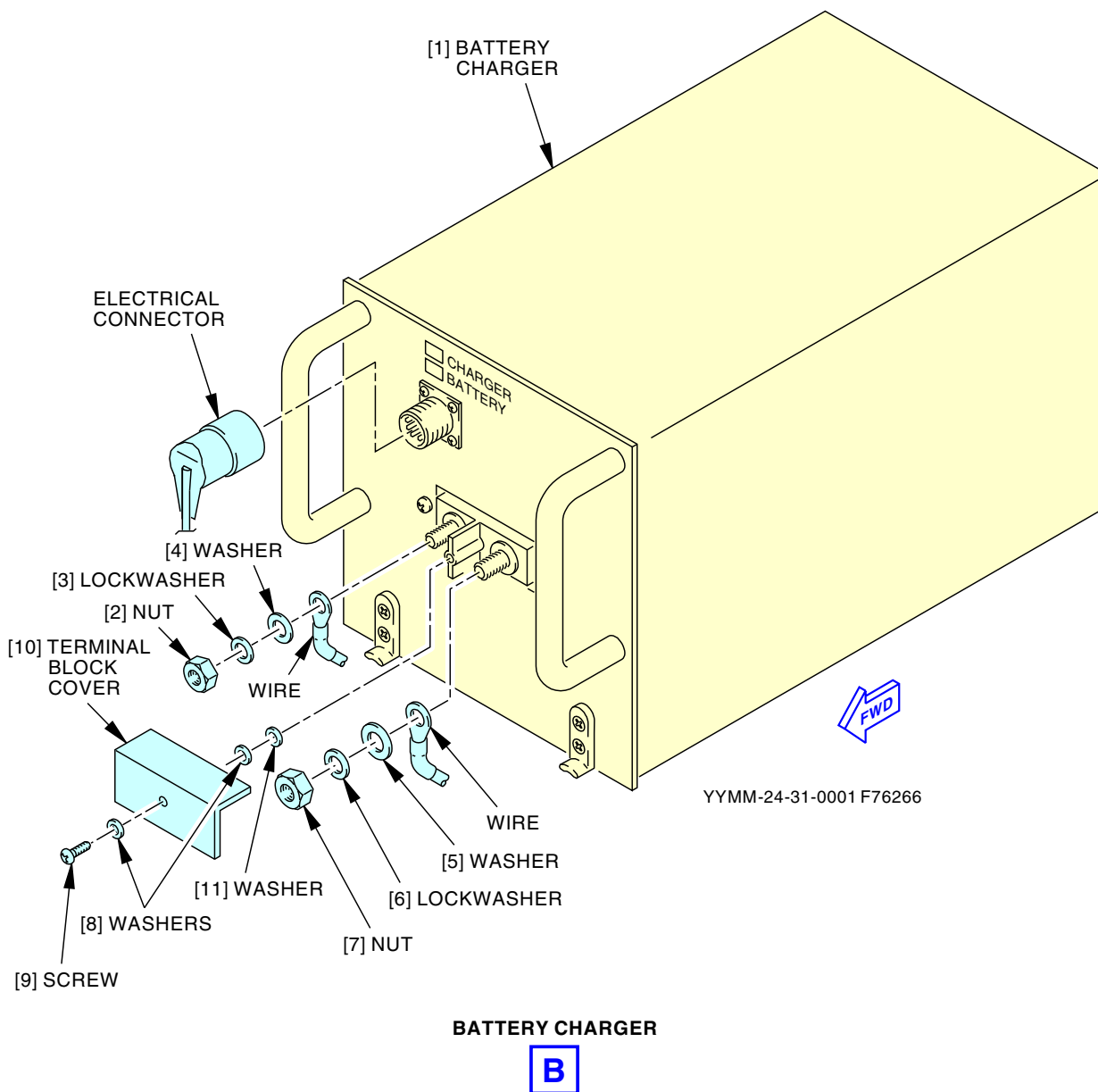
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Main Battery Charger Installation
Figure 401/24-31-21-990-801 (Sheet 2 of 2)

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TASK 24-31-21-400-801

3. Main Battery Charger Installation

(Figure 401)

A. References

Reference	Title
20-10-07-400-801	E/E Box Installation (P/B 401)
20-40-12-400-802	ESDS Handling for Metal Encased Unit Installation (P/B 201)
24-31-21-710-801	Main Battery Charger Operational Test (P/B 501)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Battery charger	24-31-21-01-015	SIA ALL
		24-31-21-01-017	SIA ALL

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

E. Main Battery Charger Installation

SUBTASK 24-31-21-910-002



DO NOT TOUCH THE BATTERY CHARGER BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE BATTERY CHARGER.

- (1) Before you touch the battery charger [1], do this task: ESDS Handling for Metal Encased Unit Installation, TASK 20-40-12-400-802.

SUBTASK 24-31-21-420-001

- (2) Install the battery charger [1] on the E2-1 shelf, do this task: E/E Box Installation, TASK 20-10-07-400-801.

SUBTASK 24-31-21-420-002

- (3) Connect the battery charger [1], do these steps:
- (a) Install the wires on the terminal studs of the battery charger [1].
 - (b) Install the nut [2], lockwasher [3], and washer [4] on the terminal stud.
 - (c) Tighten the nut [2] to 145 ± 10 in-lb (16 ± 1 N·m).
 - (d) Install the nut [7], lockwasher [6], and washer [5] on the terminal stud.
 - (e) Tighten the nut [7] to 185 ± 15 in-lb (21 ± 2 N·m).
 - (f) Install the washer [11], washers [8], terminal block cover [10], and screw [9].

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- (g) Tighten the screw [9] to 13.5 ± 1.5 in-lb (1.5 ± 0.2 N·m).

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- (h) Tighten the screw [9] to 14 $\pm$ 2 in-lb (1.6 $\pm$ 0.2 N·m).

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- (i) Install the electrical connector on the battery charger [1].

SUBTASK 24-31-21-860-002



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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.

- (4) Remove the safety tags and close these circuit breakers:

Battery Shield, J9

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C00142	BATTERY CHARGER

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	1	C00809	BAT CHGR

SUBTASK 24-31-21-420-003

- (5) Install the access cover on top of the J39 shield.

F. Main Battery Charger Installation Test

SUBTASK 24-31-21-710-001

- (1) Do this task: Main Battery Charger Operational Test, TASK 24-31-21-710-801.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 24-31-21-410-001

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

————— END OF TASK —————

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MAIN BATTERY CHARGER - ADJUSTMENT/TEST

1. General

- A. This procedure has one task:
- (1) The Main Battery Charger Operational Test.

TASK 24-31-21-710-801

2. Main Battery Charger Operational Test

A. **General**

- (1) The Battery Charger, M5 is located on the E2-1 equipment rack in the main equipment center.

B. **Location Zones**

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

C. **Access Panels**

Number	Name/Location
117A	Electronic Equipment Access Door

D. **Prepare for Test**

SUBTASK 24-31-21-860-005

- (1) Make sure that the BUS TRANS switch on the panel, P5-4, is in the AUTO position.

SUBTASK 24-31-21-860-006

- (2) Make sure that the STANDBY POWER switch on the panel, P5-5, is in the AUTO position.

SUBTASK 24-31-21-210-001

- (3) Make sure that the ELEC light on the panel, P5-13, is off.

SUBTASK 24-31-21-010-003

- (4) To get access to the P92 Power Distribution Panel, open this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

E. **Main Battery Charger Operational Test**

SUBTASK 24-31-21-710-004

- (1) Do a check of the battery charger per the steps that follow:
 - (a) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
B	12	C01940	BAT SW ON ALARM

- (b) Set the GRD PWR switch on the panel, P5-4, to the OFF position.
- (c) Make sure that the BAT switch on the panel, P5-13, is set to the ON position.
- (d) Set the DC meter selector switch on the panel, P5-13, to the BAT position.
- (e) Make sure that the DC meter on the panel, P5-13, shows these values:
 - 1) DC VOLTS = 22-28

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2) DC AMPS = a negative value

NOTE: The battery current is negative when the battery is discharging.

(f) Make sure that the BAT DISCHARGE light on the panel, P5-13, comes on. This light will come on when any of these conditions are met:

- 1) The battery current is greater than 5 Amps for more than 95 seconds.
- 2) The battery current is greater than 15 Amps for more than 25 seconds.
- 3) The battery current is greater than 100 Amps for more than 1.2 seconds.

(g) Set the GRD PWR switch to the ON position.

(h) Make sure that the DC AMPS value goes to 45 ± 10 AMPS and then goes down to less than 5 AMPS within 180 minutes.

NOTE: 180 minutes is the maximum. It can take less time depending on the state of charge of the battery.

(i) Make sure the DC VOLTS value goes to 30 ± 3 VOLTS.

(j) Make sure the BAT DISCHARGE light goes off.

(k) Make sure that the BATTERY and CHARGER lights on the front panel of the battery charger are on.



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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.

(l) Open this circuit breaker:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	1	C00809	BAT CHGR

NOTE: Leave the circuit breaker open for more than 60 seconds.

(m) Close this circuit breaker:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	1	C00809	BAT CHGR

(n) Get access to the flight compartment, make sure that the ELEC light on the panel, P5-13, is on.

(o) Set both the AC meter selector switch and the DC meter selector switch to the TEST positions.

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- (p) Push and release the MAINT switch on the panel, P5-13, to start the display test.
- (q) After the display test is complete, push the MAINT switch to view the messages.
- (r) Make sure that this message appears: BAT CHGR INOP I.
- (s) Push the MAINT switch until this message appears: HOLD BUTTON CLEAR FAULTS.
- (t) To clear the message push and hold the MAINT switch for 6 seconds.
- (u) Make sure that this message appears: FAULTS CLEARED.
- (v) Set the BAT switch on the panel, P5-13, to the OFF position.

SUBTASK 24-31-21-710-003

- (2) Do a check of the battery discharge warning as follows:
 - (a) Set the GRD PWR switch on the panel, P5-4, to the OFF position.
 - (b) Set BAT switch on the panel, P5-13, to the ON position.
 - (c) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	15	C01355	LANDING GEAR AIR/GND SYS 2

- (d) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	12	C01940	BAT SW ON ALARM

- (e) Wait for 2 minutes +/- 20 seconds.
- (f) Make sure that the Ground Crew Horn in the nose wheel well does not sound.
- (g) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	15	C01355	LANDING GEAR AIR/GND SYS 2

- (h) Wait for 2 minutes +/- 20 seconds.
- (i) Make sure that the Ground Crew Horn in the nose wheel well sounds.
- (j) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	12	C01940	BAT SW ON ALARM

- (k) Make sure that the Ground Crew Horn in the nose wheel well stops sounding.
- (l) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	12	C01940	BAT SW ON ALARM

- (m) Wait for 2 minutes +/- 20 seconds.
- (n) Make sure that the Ground Crew Horn in the nose wheel well sounds.



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- (o) Open these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	1	C01399	PSEU PRI
D	2	C01400	PSEU ALTN

- (p) Make sure that the Ground Crew Horn in the nose wheel well stops sounding.

- (q) Close these circuit breakers:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
D	1	C01399	PSEU PRI
D	2	C01400	PSEU ALTN

- (r) Wait for 2 minutes +/- 20 seconds.
- (s) Make sure that the Ground Crew Horn in the nose wheel well sounds.
- (t) Set the BAT switch on the panel, P5-13, to the OFF position.
- (u) Set the GRD PWR switch on the panel, P5-4, to the ON position.
- (v) Make sure that the Ground Crew Horn in the nose wheel well stops sounding.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 24-31-21-860-008

- (1) Make sure that these circuit breakers are closed:

F/O Electrical System Panel, P6-3

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	15	C01355	LANDING GEAR AIR/GND SYS 2

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
B	12	C01940	BAT SW ON ALARM

SUBTASK 24-31-21-860-009



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

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(WARNING PRECEDES)



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) Make sure that this circuit breaker is closed:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	1	C00809	BAT CHGR

SUBTASK 24-31-21-410-003

- (3) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

————— **END OF TASK** —————

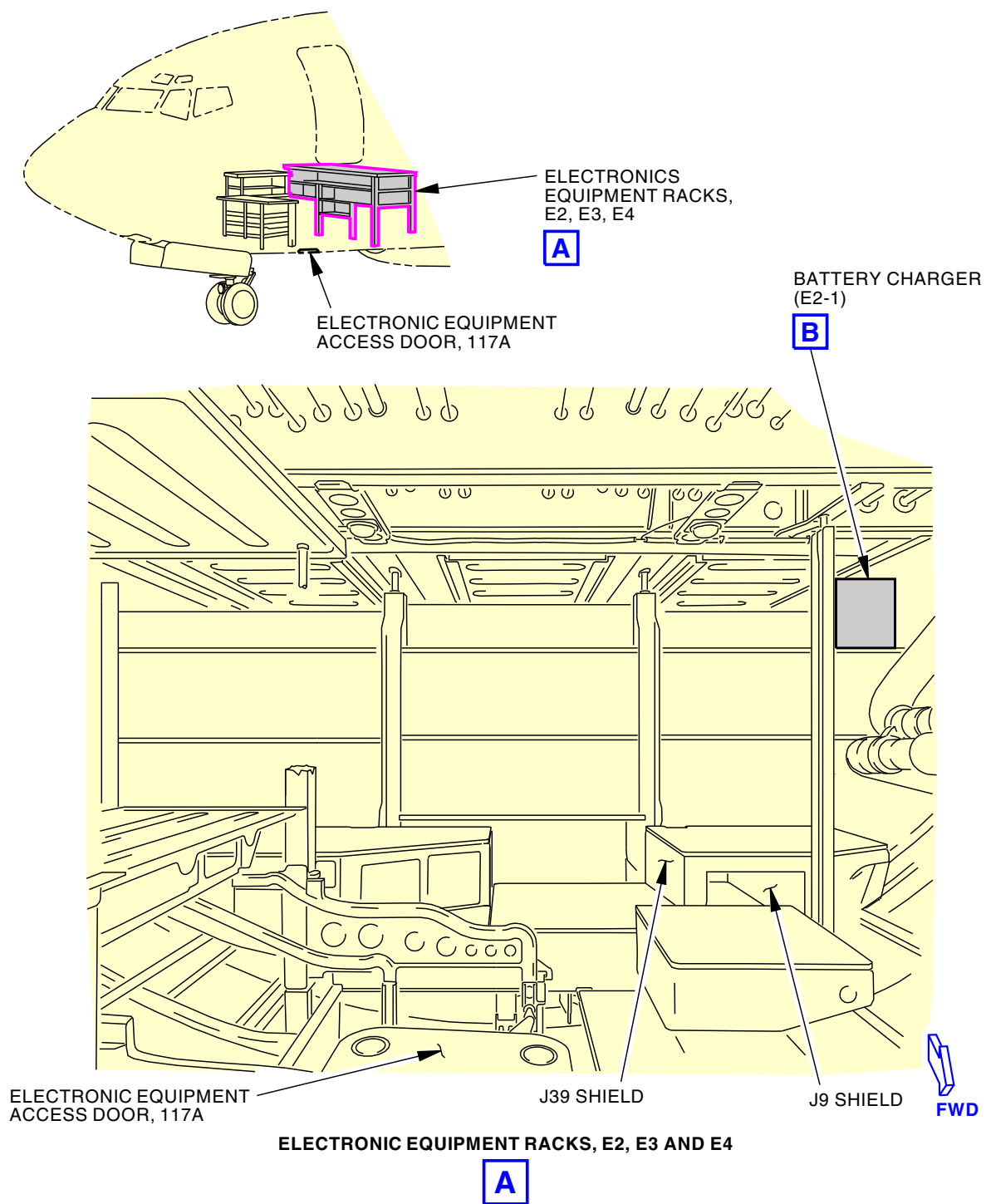
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Battery Charger Adjustment/Test
Figure 501/24-31-21-990-802 (Sheet 1 of 2)

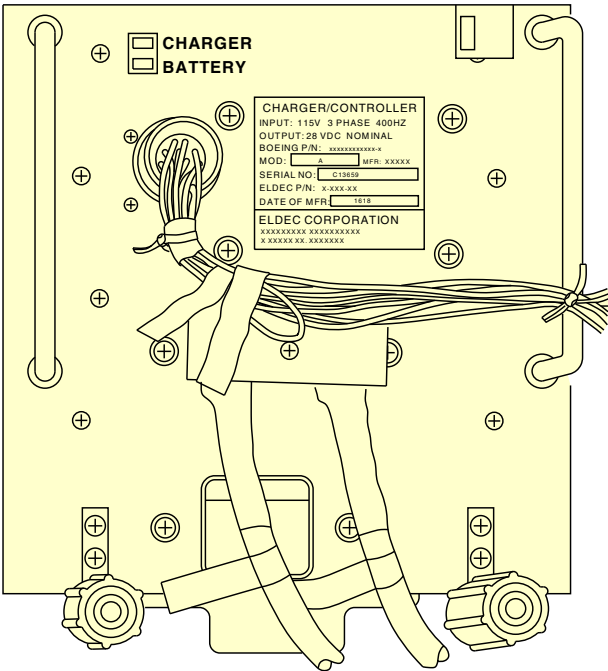
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BATTERY CHARGER

B

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Battery Charger Adjustment/Test
Figure 501/24-31-21-990-802 (Sheet 2 of 2)

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AIRCRAFT MAINTENANCE MANUAL

AUXILIARY BATTERY CHARGER - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
- (1) A removal of the Auxiliary Battery Charger
 - (2) An installation of the Auxiliary Battery Charger.

TASK 24-31-31-000-801

2. Auxiliary Battery Charger Removal

(Figure 401)

A. **General**

- (1) The Auxiliary Battery Charger, M3055, is located on the E3-3 equipment rack in the main equipment center.

B. **References**

Reference	Title
20-10-07-000-801	E/E Box Removal (P/B 401)
20-40-12-000-802	ESDS Handling for Metal Encased Unit Removal (P/B 201)

C. **Location Zones**

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left

D. **Access Panels**

Number	Name/Location
117A	Electronic Equipment Access Door

E. **Prepare for the Removal**

SUBTASK 24-31-31-860-001

- (1) Set the BAT switch, on the P5-13 panel, to the OFF position.

SUBTASK 24-31-31-010-001

- (2) To get access to the main equipment center, open this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 24-31-31-020-001

- (3) Remove the access cover on top of the J39 shield to get access to the circuit breakers.

SUBTASK 24-31-31-860-002



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

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(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.



CAUTION

DO NOT DISCONNECT THE BATTERY CHARGER BEFORE YOU OPEN THE CIRCUIT BREAKERS. WITH THE BATTERY SWITCH IN THE OFF POSITION, THE BATTERY WILL CONTINUE TO ENERGIZE THE POSITIVE TERMINAL OF THE BATTERY CHARGER. IF YOU DISCONNECT THE BATTERY CHARGER BEFORE YOU OPEN THE CIRCUIT BREAKERS, YOU CAN CAUSE DAMAGE TO THE BATTERY CHARGER.

- (4) Open these circuit breakers and install safety tags:

Battery Shield, J9

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C01209	AUX BAT CHARGER

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	3	C00922	AUX BAT CHGR

F. Auxiliary Battery Charger Removal

SUBTASK 24-31-31-910-001



CAUTION

DO NOT TOUCH THE UNIT BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE UNIT.

- (1) Before you touch the auxiliary battery charger [1], do this task: ESDS Handling for Metal Encased Unit Removal, TASK 20-40-12-000-802.

SUBTASK 24-31-31-020-002

- (2) Remove the auxiliary battery charger [1], do these steps:
- (a) Remove the electrical connector from the front of the auxiliary battery charger [1].
 - (b) Remove the screw [9], washers [8], and washer [11] to remove the terminal block cover [10] from the auxiliary battery charger [1].
 - (c) Remove the nut [2], lockwasher [3], and washer [4] from the terminal stud.
 - (d) Remove the nut [7], lockwasher [6], and washer [5] from the terminal stud.
 - (e) Remove the wires from the terminals.
 - (f) Remove the auxiliary battery charger [1], do this task: E/E Box Removal, TASK 20-10-07-000-801.

————— **END OF TASK** —————

EFFECTIVITY
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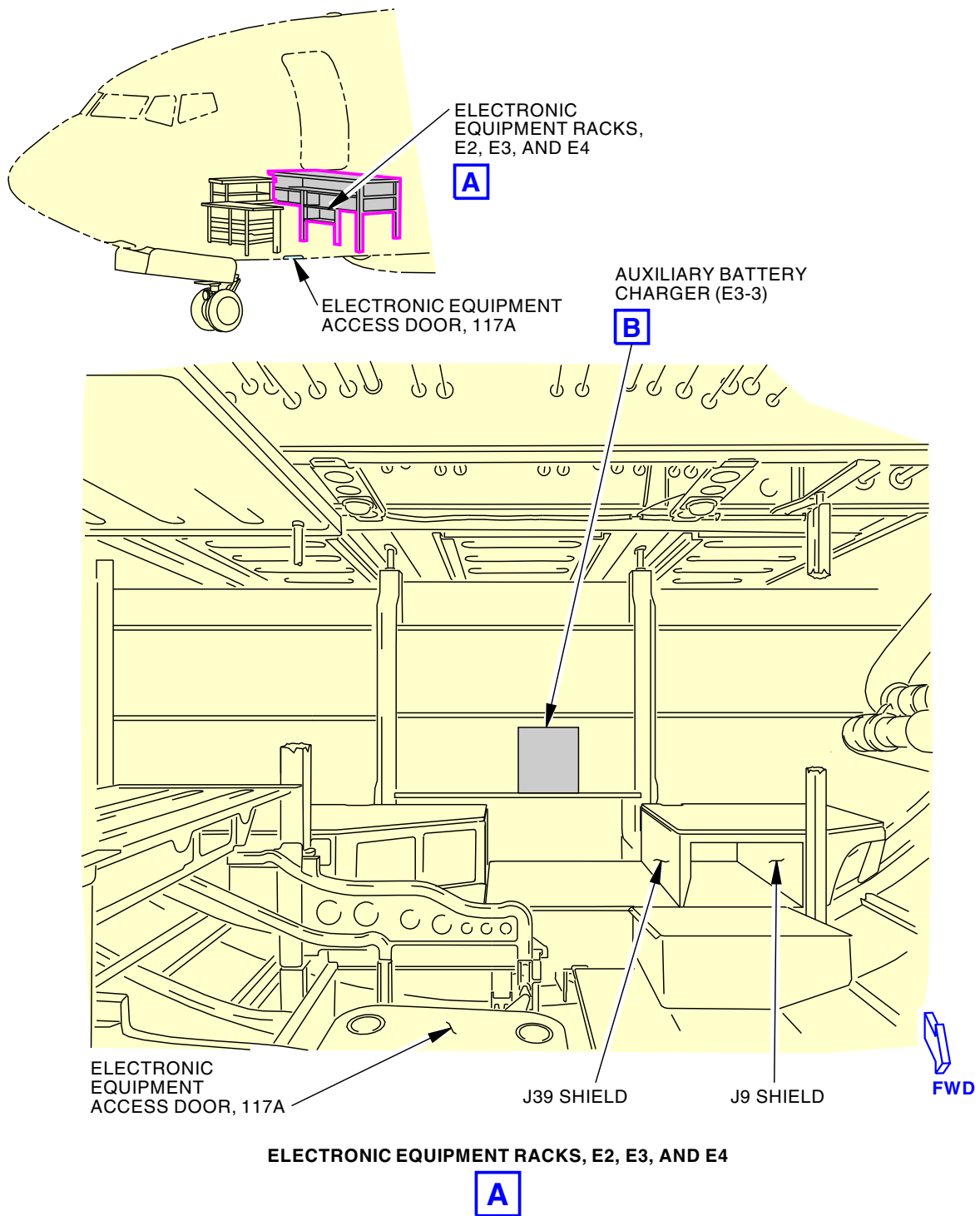
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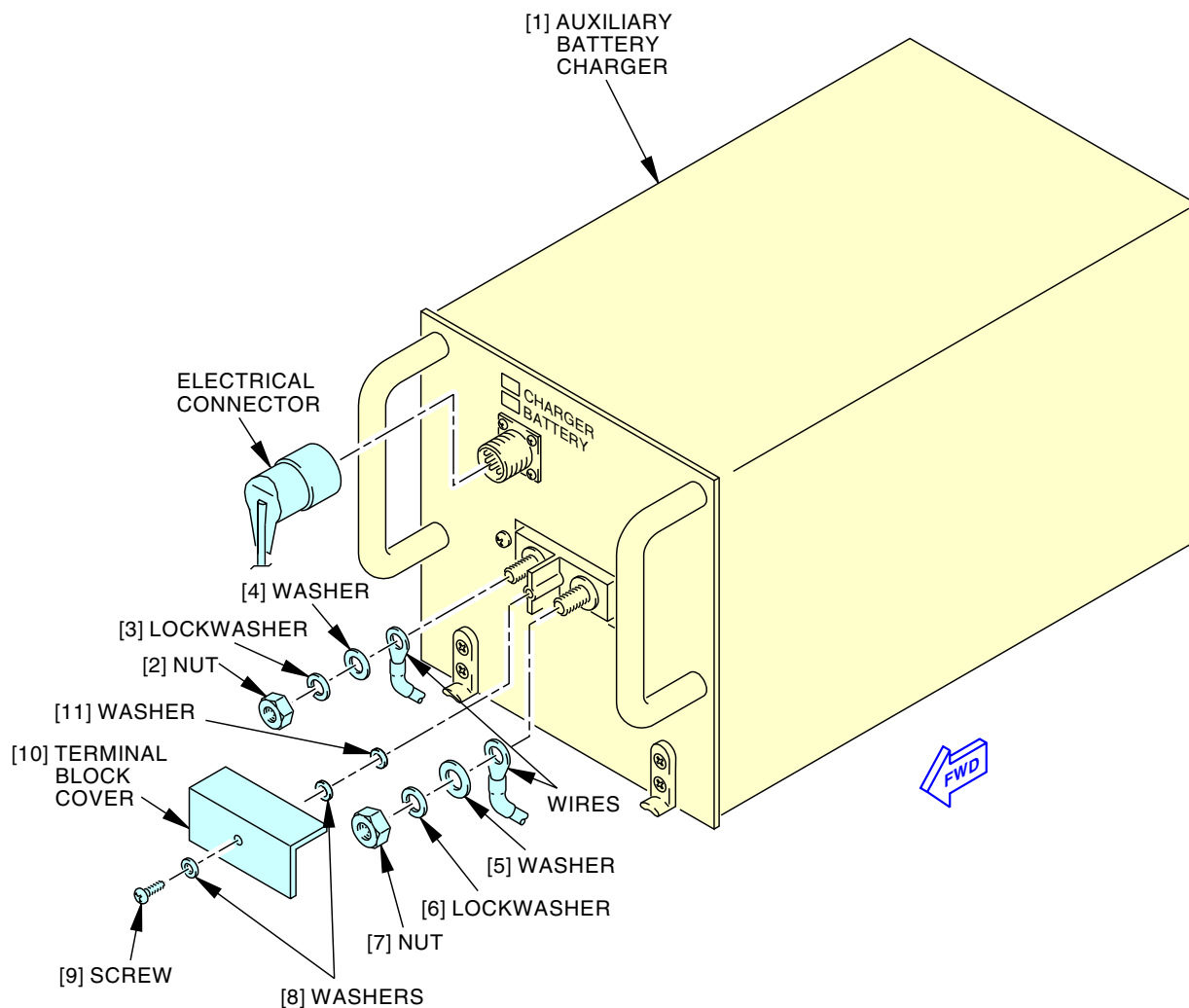
**Auxiliary Battery Charger Installation
Figure 401/24-31-31-990-801 (Sheet 1 of 2)**

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AUXILIARY BATTERY CHARGER

B

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Auxiliary Battery Charger Installation
Figure 401/24-31-31-990-801 (Sheet 2 of 2)

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TASK 24-31-31-400-801

3. Auxiliary Battery Charger Installation

(Figure 401)

A. References

Reference	Title
20-10-07-400-801	E/E Box Installation (P/B 401)
20-40-12-400-802	ESDS Handling for Metal Encased Unit Installation (P/B 201)
24-31-31-710-801	Auxiliary Battery Charger Operational Test (P/B 501)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Auxiliary battery charger	24-31-31-01-005	SIA ALL

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

E. Auxiliary Battery Charger Installation

SUBTASK 24-31-31-910-002



DO NOT TOUCH THE AUXILIARY BATTERY CHARGER BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE BATTERY CHARGER.

- (1) Before you touch the auxiliary battery charger [1], do this task: ESDS Handling for Metal Encased Unit Installation, TASK 20-40-12-400-802.

SUBTASK 24-31-31-420-001

- (2) Install the auxiliary battery charger [1] on the E3-3 shelf (TASK 20-10-07-400-801).

SUBTASK 24-31-31-420-002

- (3) Connect the auxiliary battery charger [1], do these steps:
- (a) Install the wires on the terminal studs of the auxiliary battery charger [1].
 - (b) Install the nut [2], lockwasher [3], and washer [4] on the terminal stud.
 - (c) Tighten the nut [2] to 145 ±10 in-lb (16 ±1 N·m).
 - (d) Install the nut [7], lockwasher [6], and washer [5] on the terminal stud.
 - (e) Tighten the nut [7] to 185 ±15 in-lb (21 ±2 N·m).
 - (f) Install the washer [11], washers [8], terminal block cover [10], and screw [9].

SIA 001-010

- (g) Tighten the screw [9] to 13.5 ±1.5 in-lb (1.5 ±0.2 N·m).

SIA 011-999

- (h) Tighten the screw [9] to 14 ±2 in-lb (1.6 ±0.2 N·m).

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- (i) Install the electrical connector on the auxiliary battery charger [1].

SUBTASK 24-31-31-860-003



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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.

- (4) Remove the safety tags and close these circuit breakers:

Battery Shield, J9

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C01209	AUX BAT CHARGER

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	3	C00922	AUX BAT CHGR

SUBTASK 24-31-31-420-003

- (5) Install the access cover on top of the J39 shield.

F. Auxiliary Battery Charger Installation Test

SUBTASK 24-31-31-710-001

- (1) Do this task: Auxiliary Battery Charger Operational Test, TASK 24-31-31-710-801.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 24-31-31-410-001

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

————— END OF TASK —————

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AUXILIARY BATTERY CHARGER - ADJUSTMENT/TEST

1. General

- A. This procedure has one task:
- (1) The Auxiliary Battery Charger Operational Test.

TASK 24-31-31-710-801

2. Auxiliary Battery Charger Operational Test

(Figure 501)

A. **General**

- (1) The Auxiliary Battery Charger, M3055 is located on the E3-3 equipment rack in the main equipment center.

B. **Location Zones**

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

C. **Access Panels**

Number	Name/Location
117A	Electronic Equipment Access Door

D. **Prepare for the Test**

SUBTASK 24-31-31-860-006

- (1) Make sure that the BUS TRANS switch, on the P5 forward overhead panel, is in the AUTO position.

SUBTASK 24-31-31-860-007

- (2) Make sure that the STANDBY POWER switch, on the P5 forward overhead panel, is in the AUTO position.

SUBTASK 24-31-31-210-001

- (3) Make sure that the ELEC light, on the P5 forward overhead panel, goes off.

E. **Operational Test**

SUBTASK 24-31-31-710-002

- (1) Do a check of the auxiliary battery charger per the steps that follow:
 - (a) Set the GRD PWR switch, on the P5 forward overhead panel, to the OFF position.
 - (b) Make sure that the BAT switch, on the P5 forward overhead panel, is set to the ON position.
 - (c) Set the DC meter selector switch, on the P5 forward overhead panel, to the AUX BAT position.
 - (d) Make sure that the DC meter, on the P5 forward overhead panel, shows these values:
 - 1) DC VOLTS = 22-28
 - 2) DC AMPS = a negative value

NOTE: The auxiliary battery current is negative when the battery is discharging.

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- (e) Make sure that the BAT DISCHARGE light, on the P5 forward overhead panel, comes on.

NOTE: This light will come on when any of the following conditions are met.

- 1) Auxiliary or main battery current is greater than 5 Amps for more than 95 seconds.
- 2) Auxiliary or main battery current is greater than 15 Amps for more than 25 seconds.
- 3) Auxiliary or main battery current is greater than 100 Amps for more than 1.2 seconds.

- (f) Set the GRD PWR switch to the ON position.

- (g) Make sure that the DC AMPS value goes to 45 ± 10 AMPS and then goes down to less than 5 AMPS within 180 minutes.

NOTE: 180 minutes is the maximum. It can take less time depending the state of the auxiliary battery.

- (h) Make sure that the DC VOLTS value goes to 30 ± 3 VOLTS.

- (i) Make sure that the BAT DISCHARGE light goes off.

- (j) To get access to the main equipment center, open this access panel:

Number Name/Location

117A Electronic Equipment Access Door

- (k) Make sure that the BATTERY and CHARGER lights on the front panel of the auxiliary battery charger are on.



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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.

- (l) Open this circuit breaker:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	3	C00922	AUX BAT CHGR

NOTE: Leave the circuit breaker open for more than 60 seconds.

- (m) Close this circuit breaker:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	3	C00922	AUX BAT CHGR

- (n) Get access to the flight compartment, make sure that the ELEC light, on the P5 forward overhead panel, comes on.

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- (o) Set both the AC meter selector switch and the DC meter selector switch to the TEST positions.
- (p) Push and release the MAINT switch, on the P5 forward overhead panel, to start the display test.
- (q) After the display test is complete, push the MAINT switch to view the messages.
- (r) Make sure that this message appears: AUX BAT CHGR INOP I.
- (s) Push the MAINT switch until this message appears: HOLD BUTTON CLEAR FAULTS.
- (t) To clear the message push and hold the MAINT switch for 6 seconds.
- (u) Make sure that this message appears: FAULTS CLEARED.
- (v) Set the BAT switch, on the P5 forward overhead panel, to the OFF position.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 24-31-31-860-008



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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) Make sure that this circuit breaker is closed:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	3	C00922	AUX BAT CHGR

SUBTASK 24-31-31-410-003

- (2) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

————— **END OF TASK** —————

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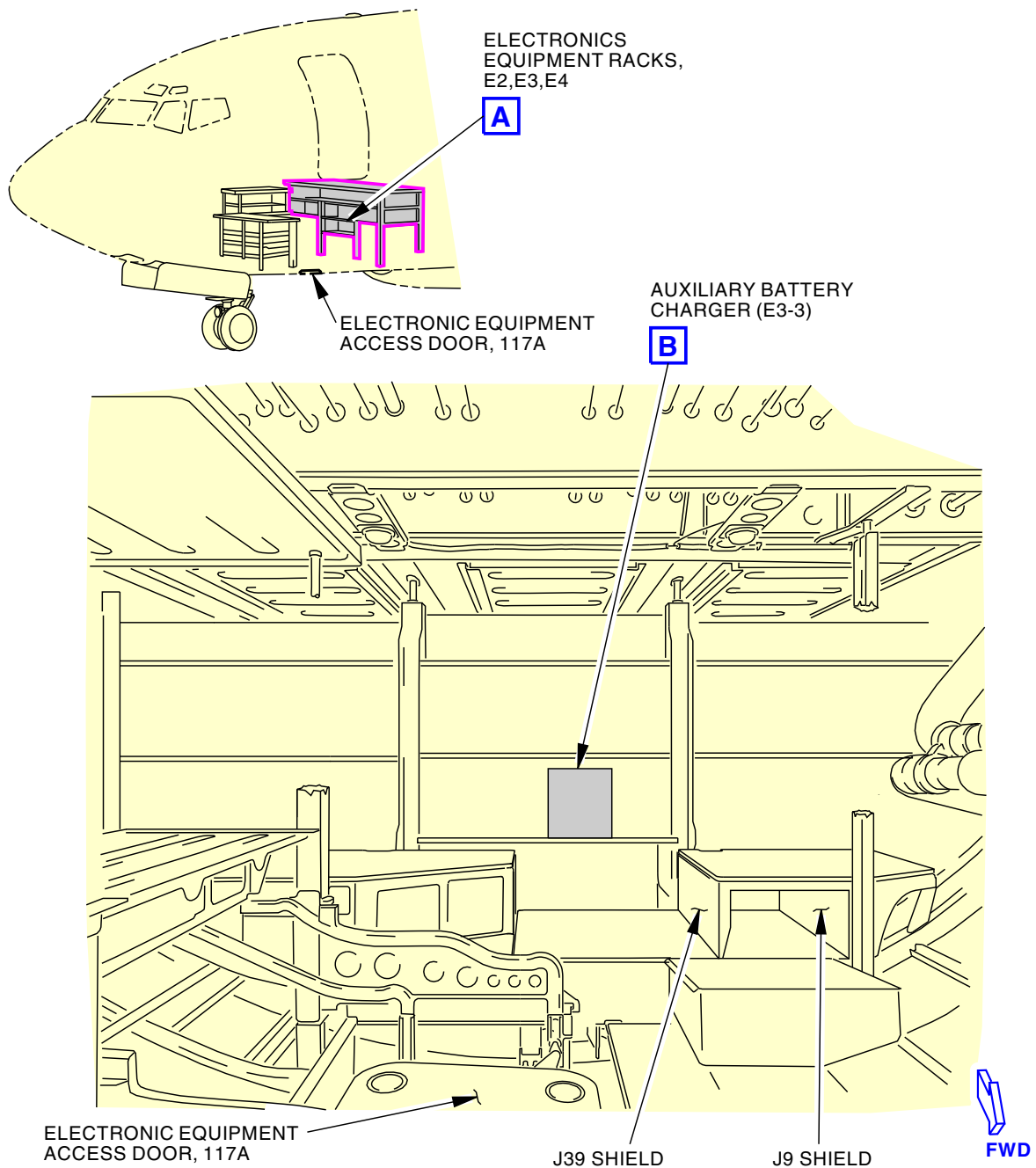
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ELECTRONIC EQUIPMENT RACKS, E2, E3 AND E4

A

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**Auxiliary Battery Charger Adjustment/Test
Figure 501/24-31-31-990-802 (Sheet 1 of 2)**

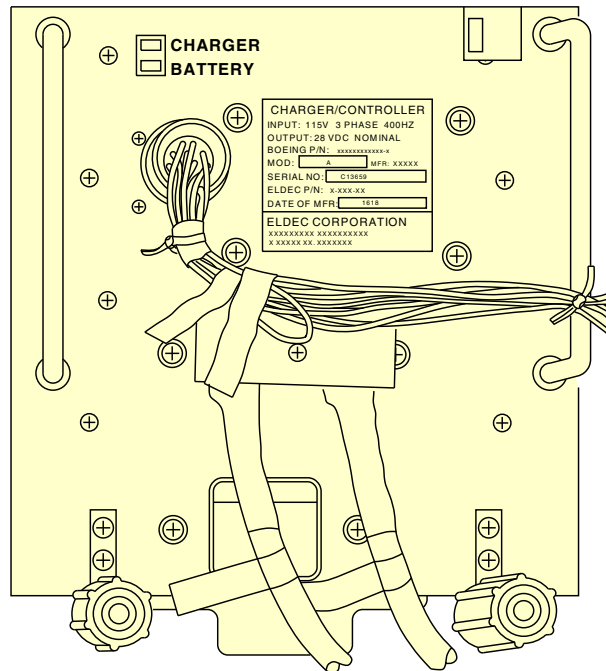
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AUXILIARY BATTERY CHARGER

B

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Auxiliary Battery Charger Adjustment/Test
Figure 501/24-31-31-990-802 (Sheet 2 of 2)

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DUAL BATTERY REMOTE CONTROL CIRCUIT BREAKER (RCCB) - REMOVAL/INSTALLATION

1. **General**

- A. This procedure has two tasks:
- (1) Dual Battery RCCB Removal
 - (2) Dual Battery RCCB Installation.

TASK 24-31-41-000-801

2. **Dual Battery RCCB Removal**

(Figure 401, Figure 402)

A. **General**

- (1) The Dual Battery Remote Controlled Circuit Breaker (RCCB), C1212, is located on the J9 Battery Shield in the Main Equipment Center.

B. **References**

Reference	Title
SWPM 20-83-00	Standard Wiring Practices Manual

C. **Location Zones**

Zone	Area
117	Electrical and Electronics Compartment - Left
121	Forward Cargo Compartment - Left
122	Forward Cargo Compartment - Right

D. **Access Panels**

Number	Name/Location
117A	Electronic Equipment Access Door

E. **Prepare for the Removal**

SUBTASK 24-31-41-860-001

- (1) Set the STANDBY POWER switch on the P5-5 panel to the OFF position and attach a DO-NOT-OPERATE tag to it.

SUBTASK 24-31-41-860-002

- (2) Set the BAT switch on the P5-13 panel to the OFF position and attach a DO-NOT-OPERATE tag to it.

SUBTASK 24-31-41-010-001

- (3) Open this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 24-31-41-010-003

- (4) Remove the access cover on top of the J39 shield to get access to the circuit breakers.

SUBTASK 24-31-41-010-004

- (5) Open these circuit breakers and install safety tags:

Battery Shield, J9

Row	Col	Number	Name
A	3	C01209	AUX BAT CHARGER
A	4	C00142	BATTERY CHARGER

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(Continued)

Battery Shield, J9

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	5	C01340	BATTERY BUS

SUBTASK 24-31-41-020-001

- (6) Disconnect the battery connectors from the main and auxiliary batteries per the steps that follow:

- (a) Gain access to the forward cargo area.
- (b) Remove the access panel that covers the batteries.
- (c) Cut and remove the safety lockwire from the battery connectors.
- (d) Disconnect the battery connectors from both batteries.

NOTE: Do not let the terminals on the connector rest against the airplane structure.

F. Dual Battery RCCB Removal

SUBTASK 24-31-41-020-002

- (1) Do these steps to remove the Dual Battery RCCB [1]:
- (a) Remove the access cover on top of the J9 shield to get access to the Dual Battery RCCB [1].
 - (b) Install identification tags on all wires attached to the Dual Battery RCCB [1] before removing them.
 - (c) Remove the two nuts [2], two lockwashers [3] and two washers [4] from both terminal studs on the Dual Battery RCCB [1].
 - (d) Remove the nut [2], lockwasher [3] and washer [4] from the top terminal stud on the Static Inverter RCCB.

NOTE: This step must be done because the terminals are close together on the same wire.

- (e) Remove the wires from the terminal studs.
- (f) Remove the control wires from the connector on the Dual Battery RCCB [1] (SWPM 20-83-00).

NOTE: Be sure to install an identification tag on wire so that you can install the wire into the correct socket later.

- (g) Remove the two screws [5] that hold the Dual Battery RCCB [1] to the panel.
- (h) Remove the Dual Battery RCCB [1].

————— **END OF TASK** —————

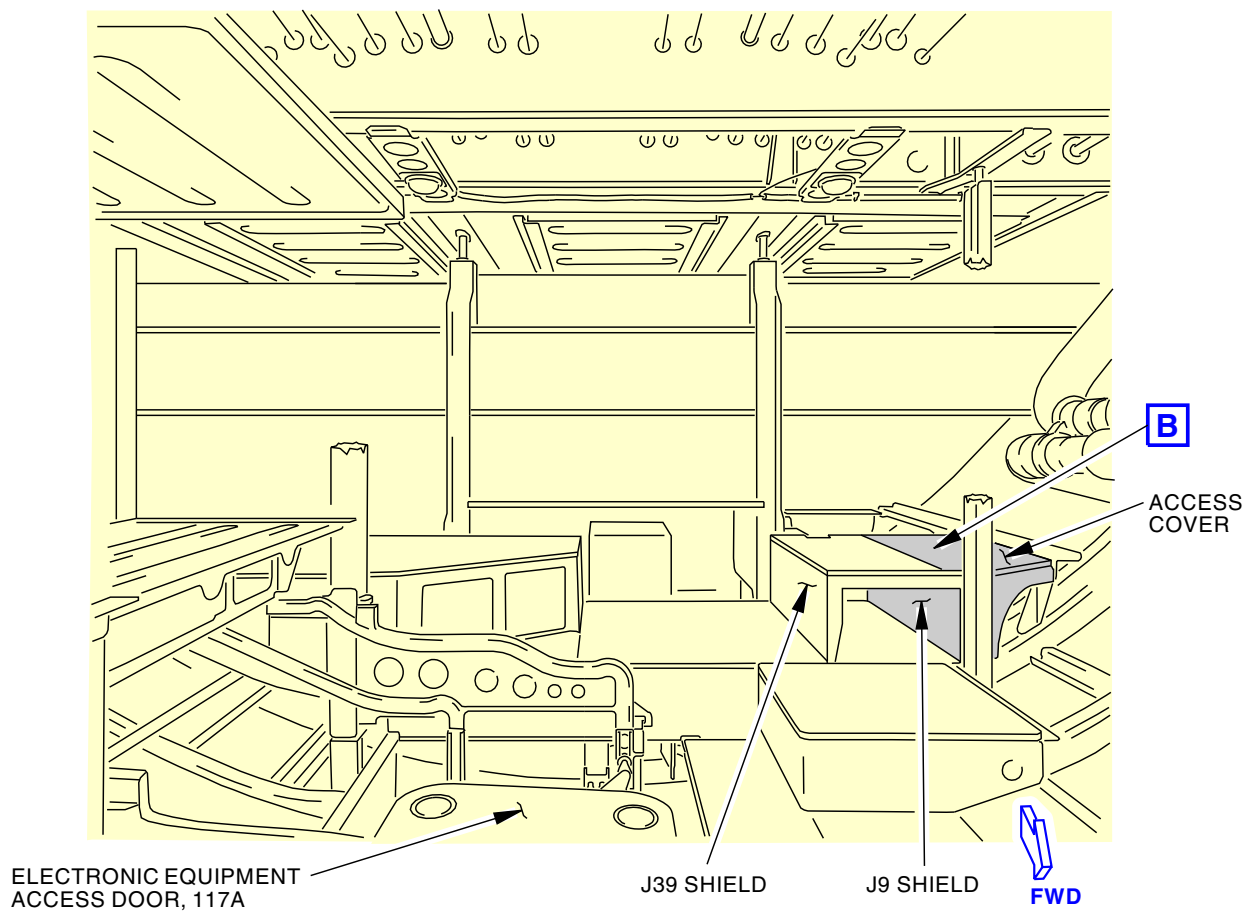
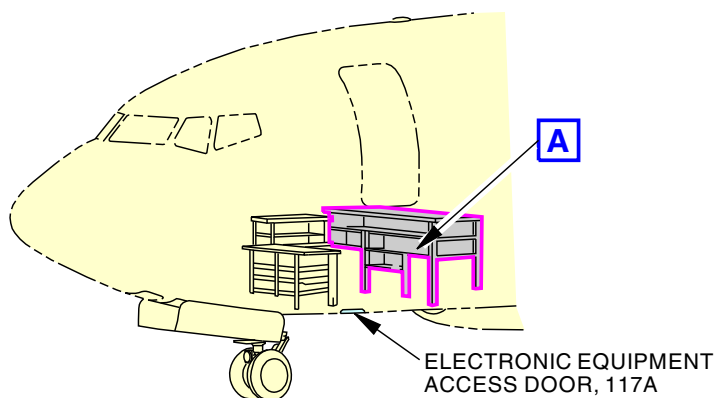
EFFECTIVITY
SIA ALL

24-31-41

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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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ELECTRICAL AND ELECTRONICS COMPARTMENT

A

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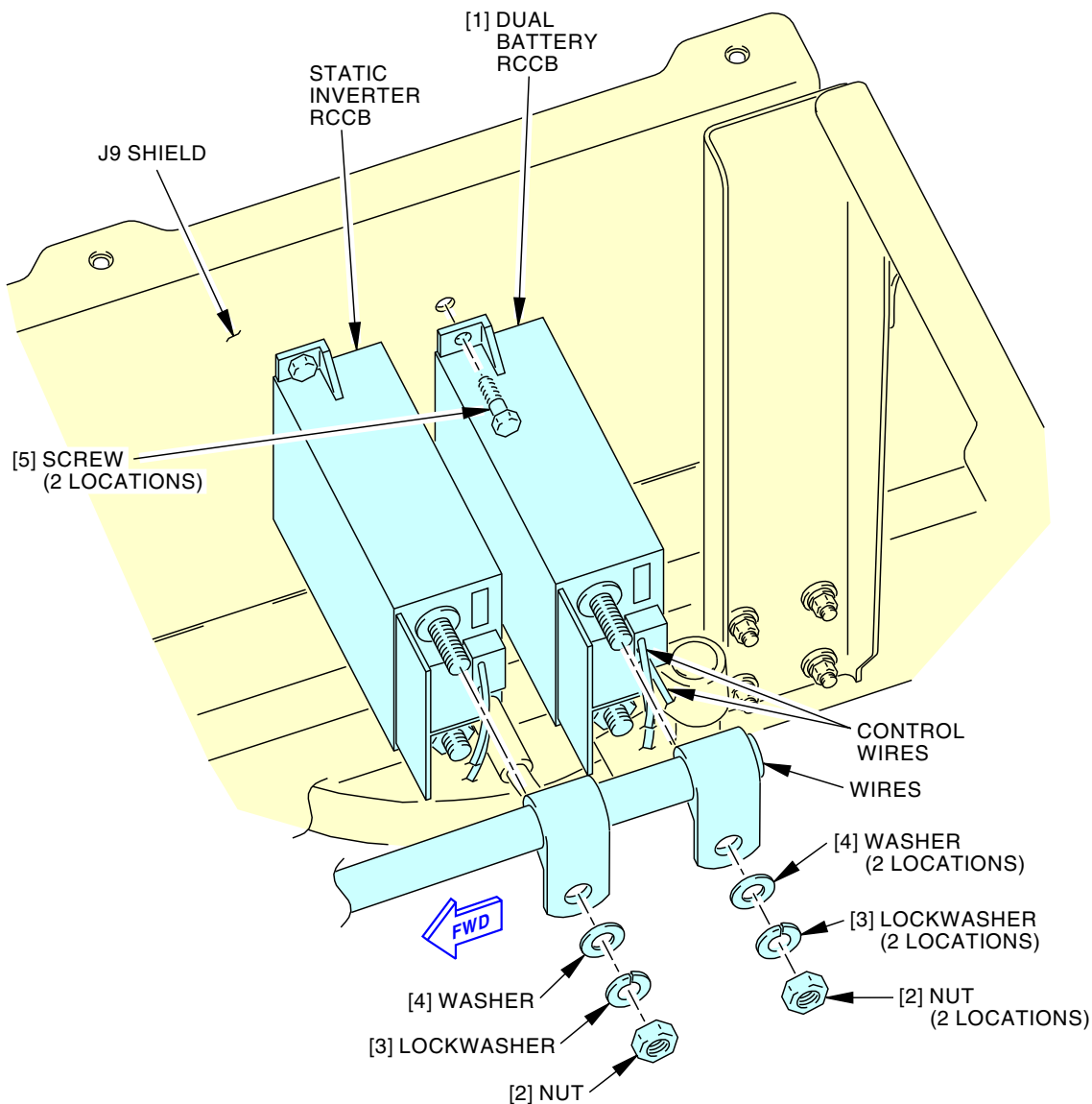
Dual Battery Remote Control Circuit Breaker (RCCB) Installation
Figure 401/24-31-41-990-801 (Sheet 1 of 2)

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DUAL BATTERY RCCB

B

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Dual Battery Remote Control Circuit Breaker (RCCB) Installation
Figure 401/24-31-41-990-801 (Sheet 2 of 2)

EFFECTIVITY
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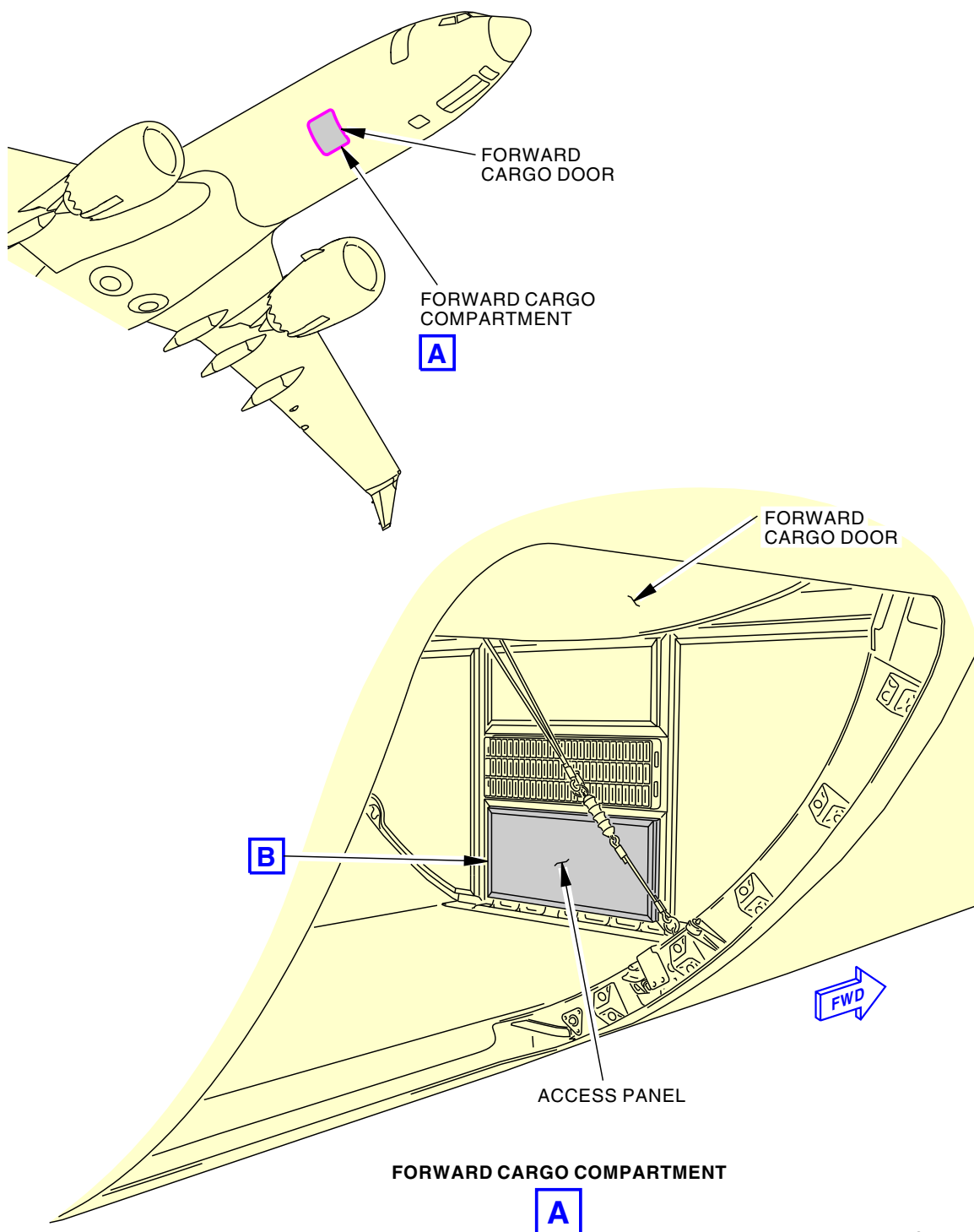
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Battery Installation
Figure 402/24-31-41-990-802 (Sheet 1 of 2)

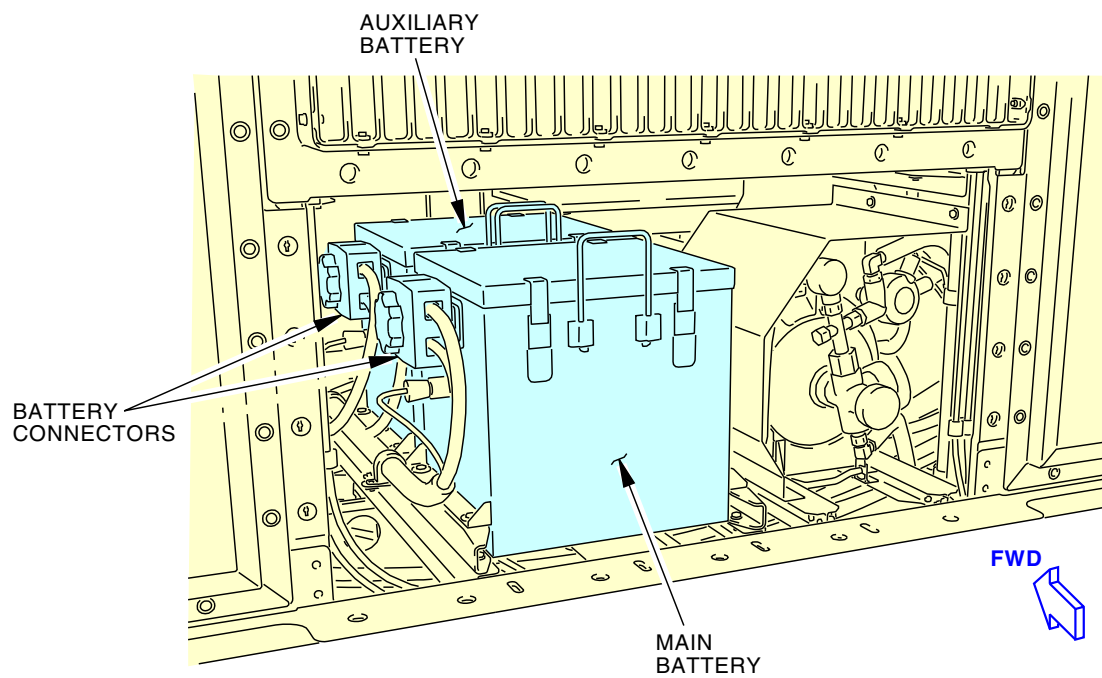
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BATTERIES

B

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Battery Installation
Figure 402/24-31-41-990-802 (Sheet 2 of 2)

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TASK 24-31-41-400-801

3. **Dual Battery RCCB Installation**

(Figure 401, Figure 402)

A. General

- (1) The Dual Battery Remote Controlled Circuit Breaker (RCCB), C1212, is located on the J9 Battery Shield in the Main Equipment Center.

B. References

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
24-22-00-860-803	Supply External Power (P/B 201)
24-22-00-860-804	Remove External Power (P/B 201)
24-31-21-710-801	Main Battery Charger Operational Test (P/B 501)
24-31-31-710-801	Auxiliary Battery Charger Operational Test (P/B 501)
SWPM 20-83-00	Standard Wiring Practices Manual

C. Consumable Materials

Reference	Description	Specification
G02479	Lockwire - MS20995CY20, Copper - 0.020 Inch (0.508 mm) Diameter	NASM20995

D. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
121	Forward Cargo Compartment - Left
122	Forward Cargo Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

E. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

F. Procedure

SUBTASK 24-31-41-420-001

- (1) Do these steps to install the Dual Battery RCCB [1]:
- Hold the Dual Battery RCCB [1] in position.
 - Install the two screws [5] that hold the Dual Battery RCCB [1].
 - Install the wires on the terminal studs.
 - Install the two nuts [2], two lockwashers [3] and two washers [4] on both terminal studs on the Dual Battery RCCB [1].
 - Install the nut [2], lockwasher [3] and washer [4] on the top terminal stud on the Static Inverter RCCB.
 - Torque the nuts [2] to 43 $\pm$ 2 in-lb (5 $\pm$ 0 N·m).
 - Install the control wires into sockets on the Dual Battery RCCB [1] per the identification tags (SWPM 20-83-00).
 - Install the access cover on top of the J9 shield.

EFFECTIVITY
SIA ALL

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SUBTASK 24-31-41-420-002

- (2) Re-connect the battery connector to the main battery per the steps that follow:

NOTE: Do not connect the battery connector to the auxiliary battery until after the check of the Dual Battery RCCB [1] is complete.

- (a) Gain access to the forward cargo area.
- (b) Re-connect the battery connector to the main battery.
- (c) Safety wire the battery connector with a 0.020 in. (0.508 mm) copper MS20995CY20 lockwire, G02479 (TASK 20-10-44-400-801).
- (d) Remove the safety tags and close these circuit breakers:

Battery Shield, J9

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	4	C00142	BATTERY CHARGER
A	5	C01340	BATTERY BUS

NOTE: Do not close the AUX BATTERY CHARGER circuit breaker until after the check of the Dual Battery RCCB [1] is complete.

G. Dual Battery RCCB Installation Test

SUBTASK 24-31-41-710-001

- (1) Do a check of the Dual Battery RCCB [1] per the steps that follow:
- (a) Do this task: Supply External Power, TASK 24-22-00-860-803.
 - (b) Set the DC Meter Selector Switch on the P5-13 panel to the AUX BAT position.
 - (c) Set the BAT switch on the P5-13 panel to the ON position.
 - (d) Make sure the DC meter on the P5-13 panel shows this value:
 - 1) DC VOLTS = 0
 - (e) Set the STANDBY POWER switch on the P5-5 panel to the BAT position.
 - (f) Make sure the DC meter on the P5-13 panel shows this value:
 - 1) DC VOLTS = 20-26
 - (g) Set the STANDBY POWER switch on the P5-5 panel to the AUTO position.
 - (h) Make sure the DC meter on the P5-13 panel shows this value:
 - 1) DC VOLTS = 0

SUBTASK 24-31-41-420-003

- (2) Re-connect the battery connector to the auxiliary battery per the steps that follow:
- (a) Gain access to the forward cargo area.
 - (b) Re-connect the battery connector to the auxiliary battery.
 - (c) Safety wire the battery connector with a 0.020 in. (0.508 mm) copper MS20995CY20 lockwire, G02479 (TASK 20-10-44-400-801).
 - (d) Install the access panel that covers the batteries.

SUBTASK 24-31-41-860-003

- (3) Remove the safety tag and close this circuit breaker:

Battery Shield, J9

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C01209	AUX BAT CHARGER

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SUBTASK 24-31-41-420-004

- (4) Install the access cover on top of the J39 shield.

SUBTASK 24-31-41-710-002

- (5) Do a check of the main battery charger per the steps that follow:
(a) Do this task: Main Battery Charger Operational Test, TASK 24-31-21-710-801.

SUBTASK 24-31-41-710-003

- (6) Do a check of the auxiliary battery charger per the steps that follow:
(a) Do this task: Auxiliary Battery Charger Operational Test, TASK 24-31-31-710-801.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 24-31-41-410-001

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

SUBTASK 24-31-41-860-004

- (2) Do this task: Remove External Power, TASK 24-22-00-860-804.

———— **END OF TASK** ————

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DUAL BATTERY REMOTE CONTROL CIRCUIT BREAKER (RCCB) - ADJUSTMENT/TEST

1. General

A. This procedure has this task:

- (1) The Operational Test of the Dual Battery RCCB.

TASK 24-31-41-710-801

2. Operational Test for the Dual Battery RCCB

(Figure 501)

NOTE: This procedure is a scheduled maintenance task.

A. **References**

Reference	Title
24-22-00-860-803	Supply External Power (P/B 201)
24-22-00-860-804	Remove External Power (P/B 201)

B. **Location Zones**

Zone	Area
117	Electrical and Electronics Compartment - Left
121	Forward Cargo Compartment - Left
122	Forward Cargo Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

C. **Access Panels**

Number	Name/Location
117A	Electronic Equipment Access Door

D. **Prepare for the Test**

SUBTASK 24-31-41-860-005

- (1) Do this task: Supply External Power, TASK 24-22-00-860-803.

SUBTASK 24-31-41-860-006

- (2) Set the STANDBY POWER switch on the P5-5 panel to the OFF position.

SUBTASK 24-31-41-860-007

- (3) Set the BAT switch on the P5-13 panel to the OFF position.

SUBTASK 24-31-41-010-002

- (4) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

- (a) Remove the access cover on top of the J39 shield to get access to the circuit breakers.



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

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I (WARNING PRECEDES)



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.

- (b) Open these circuit breakers and install safety tags:

Battery Shield, J9

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C01209	AUX BAT CHARGER

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	3	C00922	AUX BAT CHGR

SUBTASK 24-31-41-020-003

- (5) Disconnect the battery connector from the auxiliary battery per the steps that follow:

NOTE: Do not disconnect the battery connector from the main battery. The applicable connector can be access through the Electrical and Electronics compartment (EE Bay) or the forward cargo access panel.

- (a) Gain access to the forward cargo area or the Electrical and Electronics compartment (EE Bay).
- 1) If you access in the forward cargo area, then remove the access panel that covers the batteries.
- (b) Disconnect the battery connector from the auxiliary battery.

NOTE: Do not let the terminals on the connector rest against the airplane structure.

E. Dual Battery RCCB Operational Test

SUBTASK 24-31-41-710-004

- (1) Do a check of the Dual Battery RCCB per the steps that follow:
- (a) Set the DC Meter Selector Switch on the P5-13 panel to the AUX BAT position.
- (b) Set the BAT switch on the P5-13 panel to the ON position.
- (c) Make sure the DC meter on the P5-13 panel shows this value:
- 1) DC VOLTS = 0
- (d) Set the STANDBY POWER switch on the P5-5 panel to the BAT position.
- (e) Make sure the DC meter on the P5-13 panel shows this value:
- 1) DC VOLTS = 22-26
- (f) Set the STANDBY POWER switch on the P5-5 panel to the AUTO position.
- (g) Make sure the DC meter on the P5-13 panel shows this value:
- 1) DC VOLTS = 0

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F. Put the Airplane Back to Its Usual Condition

SUBTASK 24-31-41-420-005

- (1) Re-connect the battery connector to the auxiliary battery per the steps that follow:
 - (a) Gain access to the forward cargo area or the EE Bay.
 - (b) Re-connect the battery connector to the auxiliary battery.
 - (c) If you access in the forward cargo area, then install the access panel that covers the batteries.

SUBTASK 24-31-41-860-008



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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) Remove the safety tags and close these circuit breakers:

Battery Shield, J9

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C01209	AUX BAT CHARGER

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	3	C00922	AUX BAT CHGR

SUBTASK 24-31-41-860-009

- (3) Install the access cover on top of the J39 shield.

SUBTASK 24-31-41-410-002

- (4) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

SUBTASK 24-31-41-860-010

- (5) Do this task: Remove External Power, TASK 24-22-00-860-804.

SUBTASK 24-31-41-860-011

- (6) Set the BAT switch on the P5-13 panel to the OFF position.

————— **END OF TASK** —————

EFFECTIVITY
SIA ALL

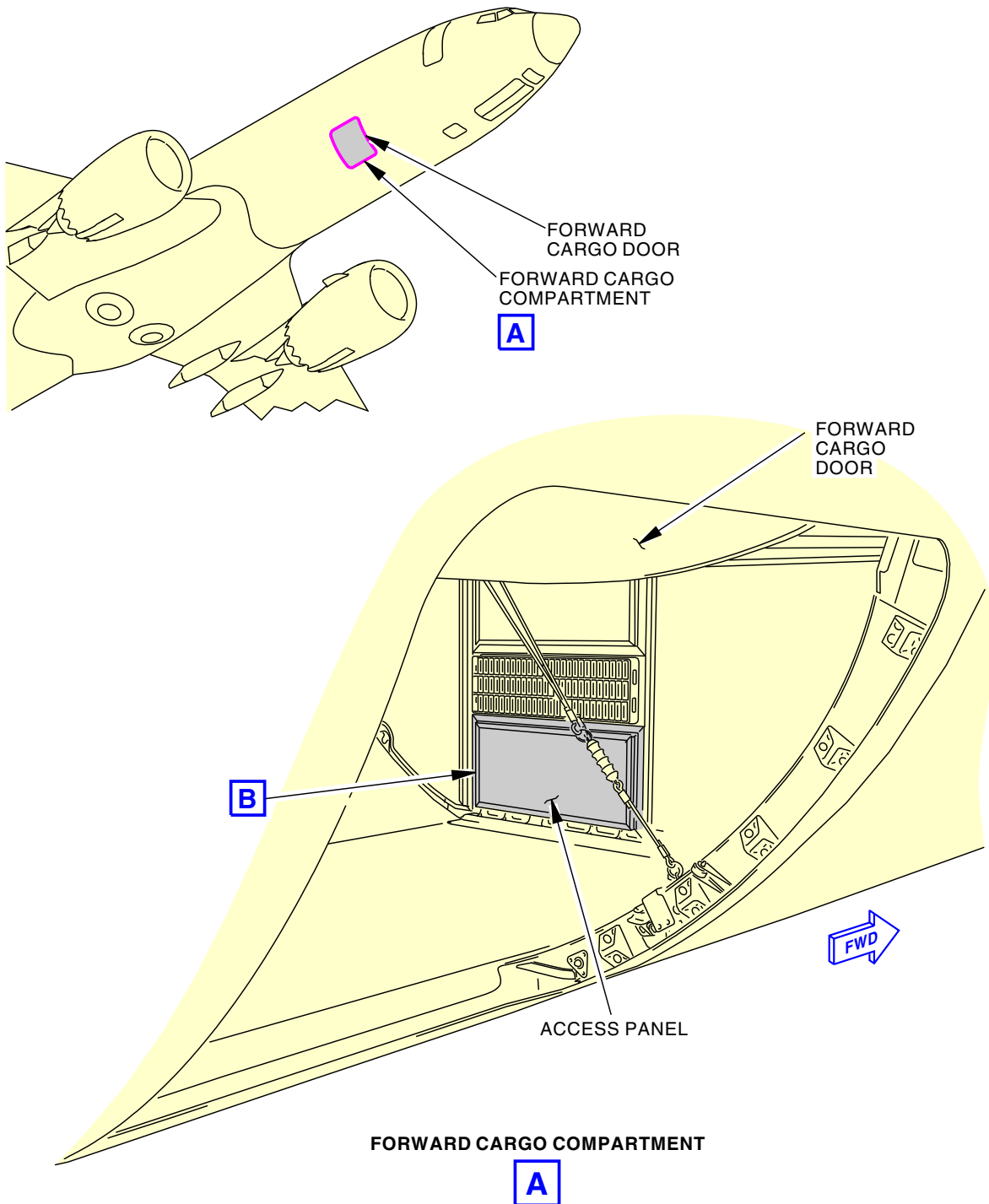
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BOEING
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Batteries
Figure 501/24-31-41-990-803 (Sheet 1 of 2)

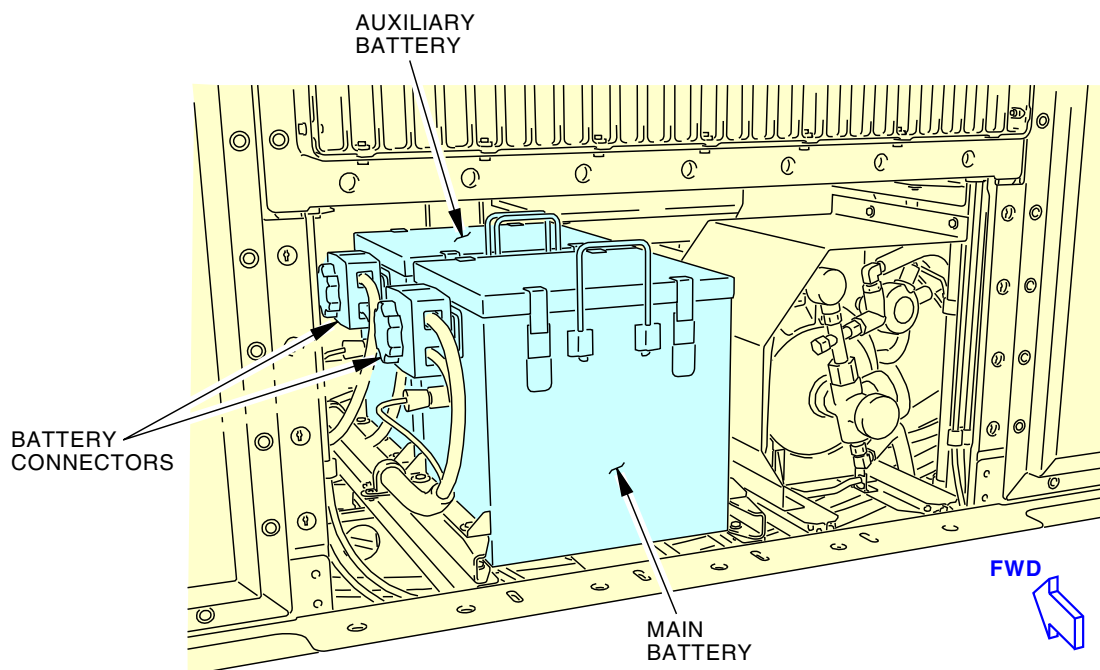
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BATTERIES

B

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Batteries
Figure 501/24-31-41-990-803 (Sheet 2 of 2)

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STANDBY POWER SYSTEM - MAINTENANCE PRACTICES

1. General

- A. This procedure has these tasks:
- (1) Standby Power System Deactivation
 - (2) Standby Power System Activation.

TASK 24-34-00-040-801

2. Standby Power System - Deactivation

(Figure 201)

A. **General**

- (1) This procedure removes electrical power from the Standby Power System.

B. **Location Zones**

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

C. **Access Panels**

Number	Name/Location
117A	Electronic Equipment Access Door

D. **Procedure**

SUBTASK 24-34-00-010-001

- (1) Open this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 24-34-00-010-002

- (2) Remove the access cover on top of the J39 shield to get access to the circuit breaker.

SUBTASK 24-34-00-860-001

- (3) Open these circuit breakers and install safety tags:

Battery Shield, J9

Row	Col	Number	Name
A	4	C00142	BATTERY CHARGER
A	5	C01340	BATTERY BUS

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
D	18	C02029	AC BUS AC STBY BUS PWR

E. **Standby Power System - Tryout**

NOTE: This tryout is to make sure that the Standby Power System is in a zero energy state.

SUBTASK 24-34-00-710-001

- (1) Do the following steps at the P5-5 panel:
 - (a) Make sure that the STANDBY POWER switch on the P5-5 panel is in the AUTO position.

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- (b) Make sure that the STANDBY PWR OFF light on the P5-5 panel is off.
- (c) Set both the AC meter selector switch and the DC meter selector switch on the P5-13 panel to the STBY PWR position.
- (d) Make sure that the AC meter shows no values.
- (e) Make sure that the DC meter shows no values
- (f) Set the STANDBY POWER switch to the OFF position.
- (g) Make sure that the STANDBY POWER OFF light does not come on.

———— **END OF TASK** ————

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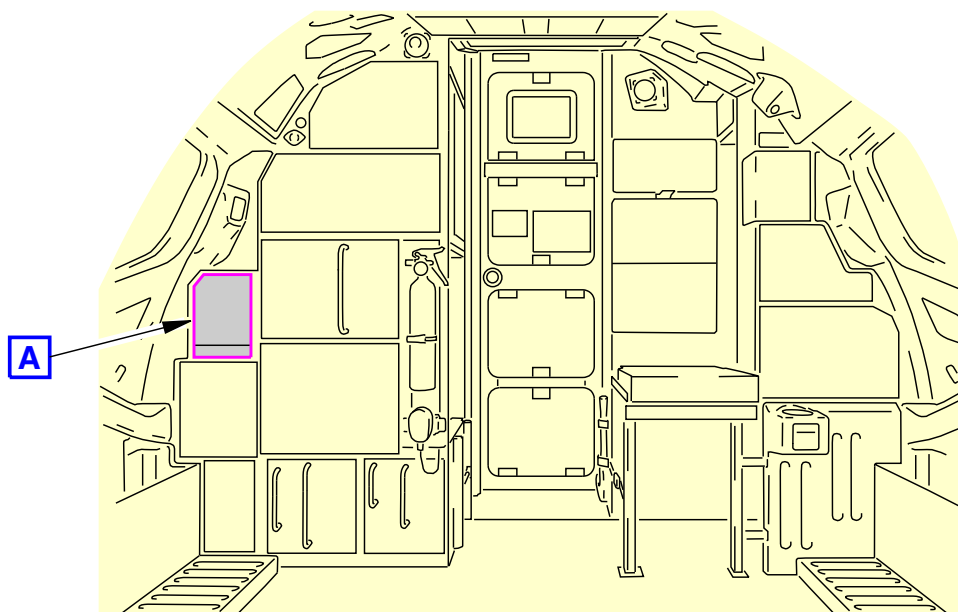
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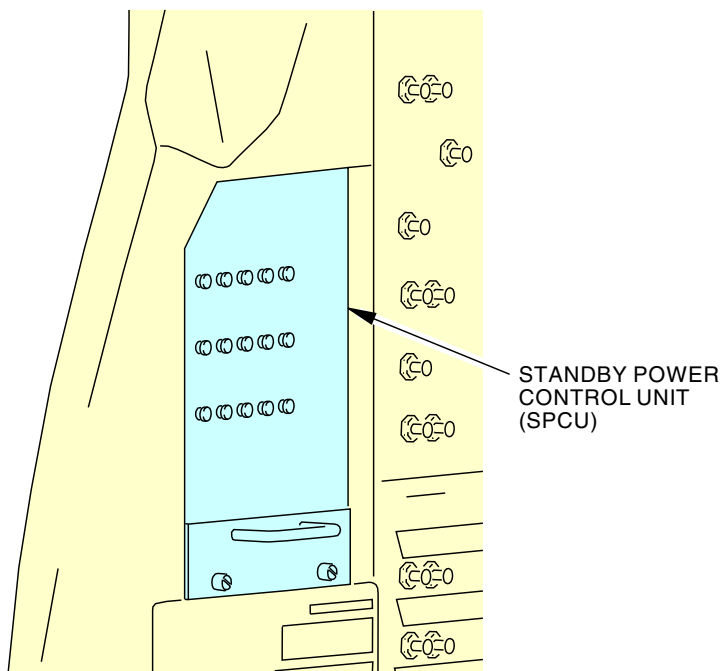
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FLIGHT COMPARTMENT
(VIEW IN THE AFT DIRECTION)



STANDBY POWER
CONTROL UNIT
(SPCU)

A

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Standby Power Control Unit
Figure 201/24-34-00-990-801

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TASK 24-34-00-440-801

3. **Standby Power System - Activation**

(Figure 201)

A. General

- (1) This procedure adds electrical power to the Standby Power System.

B. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

D. Procedure

SUBTASK 24-34-00-860-003

- (1) Remove the safety tags and close these circuit breakers:

Battery Shield, J9

Row	Col	Number	Name
A	4	C00142	BATTERY CHARGER
A	5	C01340	BATTERY BUS

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
D	18	C02029	AC BUS AC STBY BUS PWR

SUBTASK 24-34-00-410-001

- (2) Install the access cover on top of the J39 shield.

SUBTASK 24-34-00-410-002

- (3) Close this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

————— **END OF TASK** —————

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STANDBY POWER SYSTEM - ADJUSTMENT/TEST

1. General

A. This procedure has the task to do the operational test for the standby power system:

TASK 24-34-00-710-802

2. Standby Power System - Operational Test

(Figure 501)

NOTE: This procedure is a scheduled maintenance task.

A. General

(1) This procedure does an Operational Test of the Standby Power System.

B. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right

C. Standby Power System - Operational Test

SUBTASK 24-34-00-710-003

- (1) Do an operational test of the Standby Power System:
- (a) Make sure that the BAT switch on the P5-13 panel is set to the ON position.
 - (b) Make sure that the STANDBY POWER switch on the P5-5 panel is set to the AUTO position.
 - (c) Make sure that the STANDBY PWR OFF light on the P5-5 panel is off.
 - (d) Set the AC meter selector switch and the DC meter selector switch on the P5-13 panel to the STBY PWR position.
 - (e) Make sure that the AC meter shows these values:
 - 1) AC VOLTS = 110-120
 - 2) CPS FREQ = 395-405
 - (f) Make sure that the DC meter shows this value:
 - 1) DC VOLTS = 20-28
 - (g) Set the STANDBY POWER switch on the P5-5 panel to the OFF position.
NOTE: Ignore the flight deck effects that are not specified in this test procedure.
 - (h) Make sure that the STANDBY PWR OFF light on the P5-5 panel comes on.
 - (i) Make sure that the AC meter shows these values:
 - 1) AC VOLTS = 0
 - 2) CPS FREQ = BLANK
NOTE: When the AC voltage goes below approximately 12 VAC, the CPS FREQ will become blank.
 - (j) Make sure that the DC meter shows this value:
 - 1) DC VOLTS = 0
 - (k) Set the STANDBY POWER switch on the P5-5 panel to the BAT position.
 - (l) Make sure that the STANDBY PWR OFF light on the P5-5 panel goes off.
 - (m) Make sure that the AC meter shows these values:

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- 1) AC VOLTS = 110-120
- 2) CPS FREQ = 395-405
- (n) Make sure that the DC meter shows this value:
 - 1) DC VOLTS = 20-28
- (o) Set the STANDBY POWER switch on the P5-5 panel to the AUTO position.
- (p) Set the applicable switches on the P5-4 panel to the OFF position:

NOTE: This step is to remove power from the 115 VAC Transfer Buses.

 - 1) GRD POWER control switch
 - 2) APU GEN control switches
 - 3) GEN 1 and GEN 2 control switches
- (q) Make sure that the two TRANSFER BUS OFF lights on the P5-4 panel are on.
- (r) Set the DC meter selector switch on the P5-13 panel to the BAT position.
- (s) Make sure that the DC meter shows these values:
 - 1) DC VOLTS = 20-28
 - 2) DC AMPS = a negative value

NOTE: A negative DC AMP value indicates that the battery is discharging.
- (t) Set the DC meter selector switch on the P5-13 panel to the AUX BAT position.
- (u) Make sure that the DC meter shows these values:
 - 1) DC VOLTS = 20-28
 - 2) DC AMPS = a negative value

NOTE: A negative DC AMP value shows that the battery is discharging.
- (v) Make sure that the BAT DISCHARGE light on the P5-13 panel comes on. The light will come on when any of these conditions are met:
 - 1) The battery current is greater than 5 Amps for more than 95 seconds.
 - 2) The battery current is greater than 15 Amps for more than 25 seconds.
 - 3) The battery current is greater than 100 Amps for more than 1.2 seconds.
- (w) Make sure that the ELEC light on the P5-13 panel is OFF.
- (x) Set the applicable switches on the P5-4 panel to the ON position:
 - 1) GRD POWER control switch
 - 2) APU GEN control switches
 - 3) GEN 1 and GEN 2 control switches
- (y) Make sure that the BAT DISCHARGE light on the P5-13 panel goes off.

————— **END OF TASK** —————

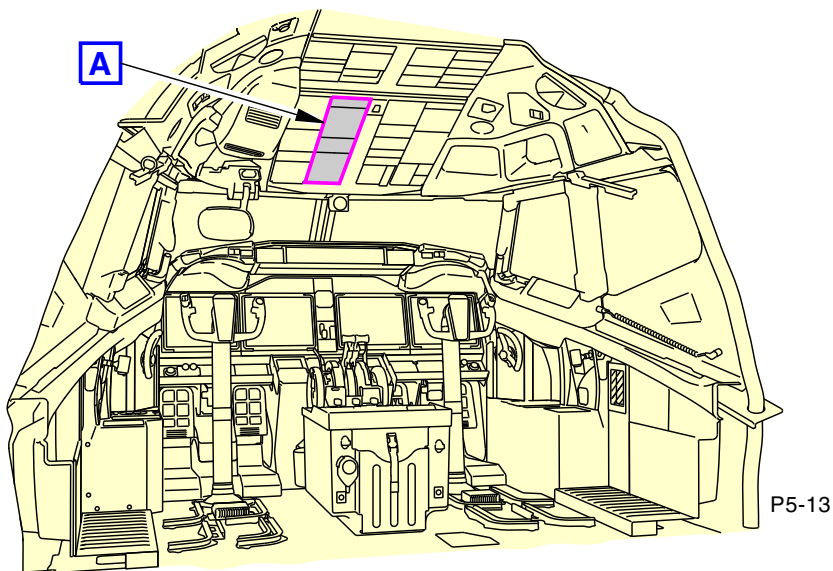
EFFECTIVITY
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ECCN 9E991 BOEING PROPRIETARY - See title page for details

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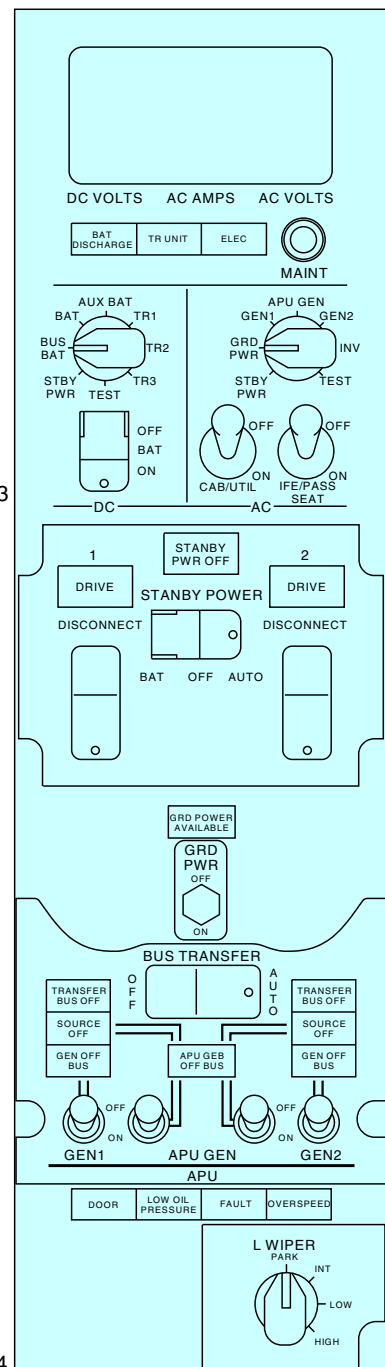


FLIGHT COMPARTMENT

P5-13

P5-5

P5-4



2411731 S00061528871_V2

AC/DC Power Control and Display Panels
Figure 501/24-34-00-990-803

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AIRCRAFT MAINTENANCE MANUAL

STANDBY POWER CONTROL UNIT (SPCU) - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the Standby Power Control Unit (SPCU)
- (2) An installation of the SPCU.

TASK 24-34-11-000-801

2. SPCU Removal

(Figure 401)

A. **General**

- (1) The Standby Power Control Unit (SPCU), M1720 is located on the P6 panel.

B. **References**

Reference	Title
20-40-12-000-802	ESDS Handling for Metal Encased Unit Removal (P/B 201)

C. **Location Zones**

Zone	Area
212	Flight Compartment - Right

D. **Prepare for the Removal**

SUBTASK 24-34-11-010-002

- (1) Remove the access cover on top of the J39 shield to get access to the circuit breaker.

SUBTASK 24-34-11-860-002

- (2) Open this circuit breaker and install safety tag:

Battery Shield, J9

Row	Col	Number	Name
A	5	C01340	BATTERY BUS

E. **SPCU Removal**

SUBTASK 24-34-11-910-001

 CAUTION	DO NOT TOUCH THE CONTROL UNIT BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE CONTROL UNIT.
---	--

- (1) Before you touch the SPCU [1], do this task: ESDS Handling for Metal Encased Unit Removal, TASK 20-40-12-000-802.

SUBTASK 24-34-11-020-001

- (2) To remove the SPCU [1] from the P6 panel, do these steps:
 - (a) Loosen the captive screws [2] from the front of the SPCU [1] to remove it from the P6 panel.
 - (b) Remove the electrical connectors from the back of the SPCU [1].
 - (c) Put the protective covers on the electrical connectors.

———— **END OF TASK** ————

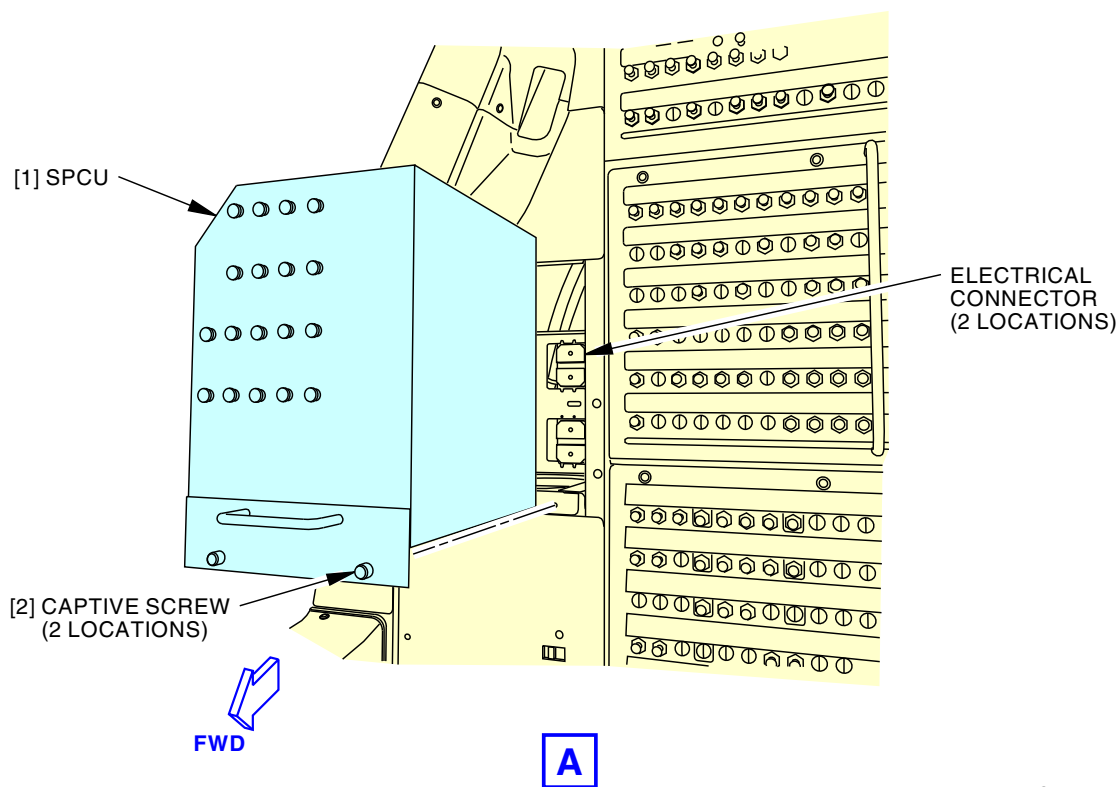
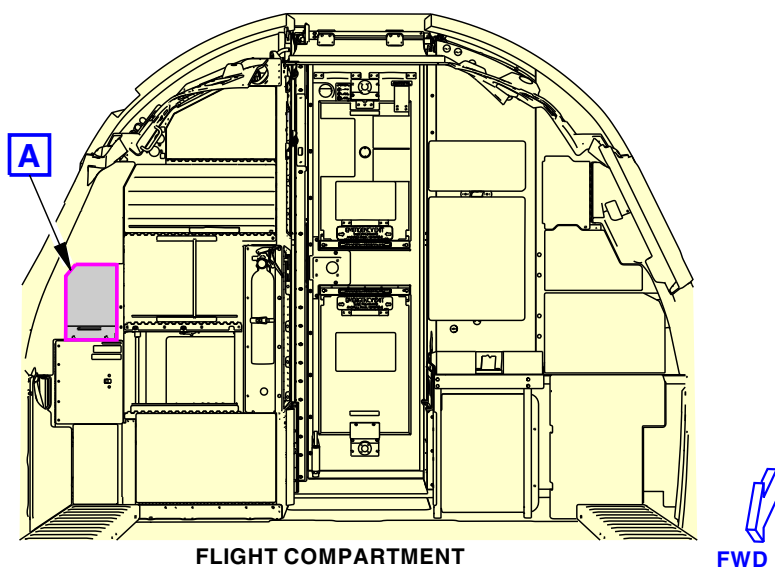
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Standby Power Control Unit (SPCU) Installation
Figure 401/24-34-11-990-801

EFFECTIVITY
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AIRCRAFT MAINTENANCE MANUAL

TASK 24-34-11-400-801

3. **SPCU Installation**

(Figure 401)

A. General

- (1) The Standby Power Control Unit (SPCU), M1720 is located on the P6 panel.

B. References

Reference	Title
20-40-12-400-802	ESDS Handling for Metal Encased Unit Installation (P/B 201)
31-65-00-970-804	Airplane Config Data (ACD) Page Function (P/B 201)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	SPCU	24-34-11-01-010	SIA ALL

D. Location Zones

Zone	Area
212	Flight Compartment - Right

E. SPCU Installation

SUBTASK 24-34-11-910-002



DO NOT TOUCH THE CONTROL UNIT BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE CONTROL UNIT.

- (1) Before the SPCU [1] is touched, do this task: ESDS Handling for Metal Encased Unit Installation, TASK 20-40-12-400-802.

SUBTASK 24-34-11-420-001

- (2) To install the SPCU [1] on the P6 panel, do these steps:
- (a) Remove the protective covers from the electrical connectors.
 - (b) Install the electrical connectors to the back of the SPCU [1].
 - (c) Tighten the captive screws [2] at the front of the SPCU [1].

SUBTASK 24-34-11-860-003

- (3) Remove the safety tag and close this circuit breaker:

Battery Shield, J9

Row	Col	Number	Name
A	5	C01340	BATTERY BUS

SUBTASK 24-34-11-410-001

- (4) Install the access cover on top of the J39 shield.

F. SPCU Installation Test

SUBTASK 24-34-11-710-001

- (1) Do a test of the SPCU, as follows:
- (a) Make sure that the STANDBY POWER switch, on the P5-5 panel, is in the AUTO position.
 - (b) Make sure that the STANDBY PWR OFF light, on the P5-5 panel, is off.

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- (c) Set both the AC meter selector switch and DC meter selector switch, on the P5-13 panel, to the STBY PWR position.
- (d) Make sure that the AC meter shows these values:
 - 1) AC VOLTS = 110 - 120
 - 2) CPS FREQ = 395 - 405.
- (e) Make sure that the DC meter shows this value:
 - 1) DC VOLTS = 22 - 30.
- (f) Set the STANDBY POWER switch to the OFF position.
- (g) Make sure that the STANDBY POWER OFF light comes on.
- (h) Make sure that the AC meter shows these values:
 - 1) AC VOLTS = 0
 - 2) CPS FREQ = BLANK.

NOTE: When the AC voltage goes below approximately 12 VAC, the CPS FREQ will become blank.
- (i) Make sure that the DC meter shows this value:
 - 1) DC VOLTS = 0.
- (j) Put the GRD PWR and BAT switches to the OFF position.
 - 1) Make sure that the electrical power is removed from the airplane.
 - a) Make sure that the STANDBY PWR OFF light is off.
- (k) Set the STANDBY POWER switch to the BAT position.
- (l) Make sure that the STANDBY POWER OFF light goes off.
- (m) Make sure that the AC meter shows these values:
 - 1) AC VOLTS = 110 - 120
 - 2) CPS FREQ = 395 - 405.
- (n) Make sure that the DC meter shows this value:
 - 1) DC VOLTS = 22 - 30.
- (o) Set the STANDBY POWER switch to the AUTO position.
- (p) If it is necessary, set the clocks manually to the correct Universal Time Coordinated (UTC) time and date (TASK 31-65-00-970-804).

———— **END OF TASK** ————

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AIRCRAFT MAINTENANCE MANUAL
STATIC INVERTER - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
- (1) Static Inverter Removal
 - (2) Static Inverter Installation.

TASK 24-34-21-000-801

2. Static Inverter Removal

(Figure 401)

A. General

- (1) The M9 Static Inverter is located on the E2-2 equipment rack in the main equipment center.

B. References

Reference	Title
20-10-07-000-801	E/E Box Removal (P/B 401)
20-40-12-000-802	ESDS Handling for Metal Encased Unit Removal (P/B 201)

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

E. Prepare for the Removal

SUBTASK 24-34-21-860-001



CAUTION

DO NOT DISCONNECT THE BATTERY CHARGER BEFORE YOU OPEN THE CIRCUIT BREAKERS. WITH THE BATTERY SWITCH IN THE OFF POSITION, THE BATTERY WILL CONTINUE TO ENERGIZE THE POSITIVE TERMINAL OF THE BATTERY CHARGER. IF YOU DISCONNECT THE BATTERY CHARGER BEFORE YOU OPEN THE CIRCUIT BREAKERS, YOU CAN CAUSE DAMAGE TO THE BATTERY CHARGER.

- (1) Open this circuit breaker and install safety tag:

Standby Power Control Unit, M01720

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	5	C01343	INVERTER REMOTE

SUBTASK 24-34-21-860-002

- (2) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

EFFECTIVITY
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F. Static Inverter Removal

SUBTASK 24-34-21-910-001



DO NOT TOUCH THE CONTROL UNIT BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE CONTROL UNIT.

- (1) Before you touch the static inverter [1], do this task: ESDS Handling for Metal Encased Unit Removal, TASK 20-40-12-000-802.

SIA ALL; AIRPLANES WITHOUT STATIC INVERTER P/N 1-002-0102-2170

SUBTASK 24-34-21-020-001

- (2) Do these steps to disconnect the static inverter [1]:
- (a) Remove the electrical connector from the static inverter.
 - (b) Remove the screws [8], lockwashers [9] and washers [10] that hold the terminal block covers [11].
 - (c) Remove the terminal block covers [11].
 - (d) Put tags on the wires to identify them for installation.
 - (e) Remove the nut [2], lockwasher [3], and washer [4] from the terminal stud.
 - (f) Remove the nut [5], lockwasher [6], and washer [7] from the terminal stud.
 - (g) Remove the wires from the terminal studs.

SIA ALL; AIRPLANES WITH STATIC INVERTER P/N 1-002-0102-2170

SUBTASK 24-34-21-020-003

- (3) Do these steps to disconnect the static inverter [1]:
- (a) Remove the electrical connector from the static inverter.
 - (b) Remove the screws [13] that hold the terminal block cover [11] and terminal block cover [12].
 - (c) Remove the terminal block cover [11] and terminal block cover [12].
 - (d) Put tags on the wires to identify them for installation.
 - (e) Remove the nut [2], lockwasher [3], and washer [4] from the terminal stud.
 - (f) Remove the nut [5], lockwasher [6], and washer [14] from the terminal stud.
 - (g) Remove the wires from the terminal studs.

SIA ALL

SUBTASK 24-34-21-020-002

- (4) Remove the static inverter [1] (TASK 20-10-07-000-801).

————— **END OF TASK** —————

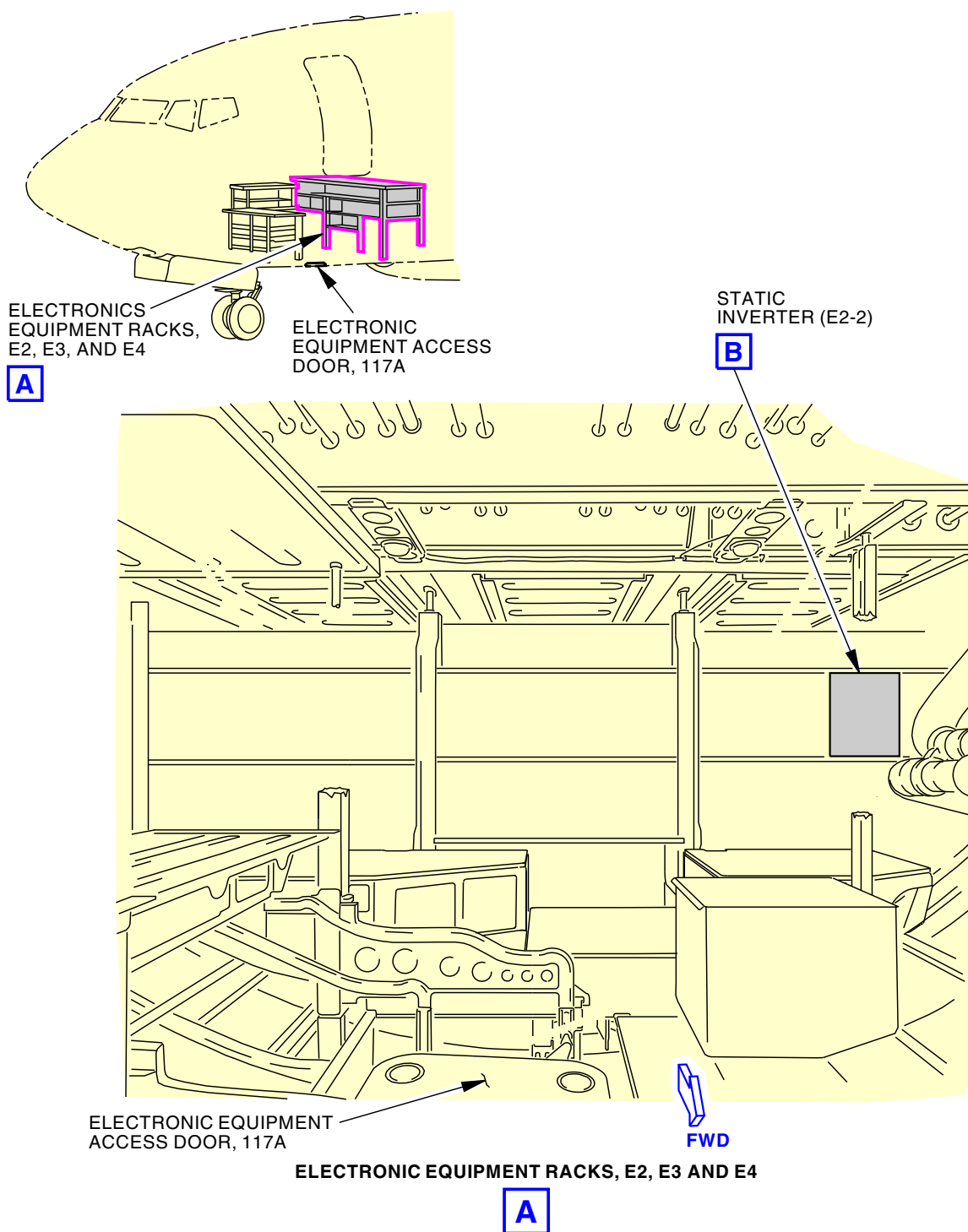
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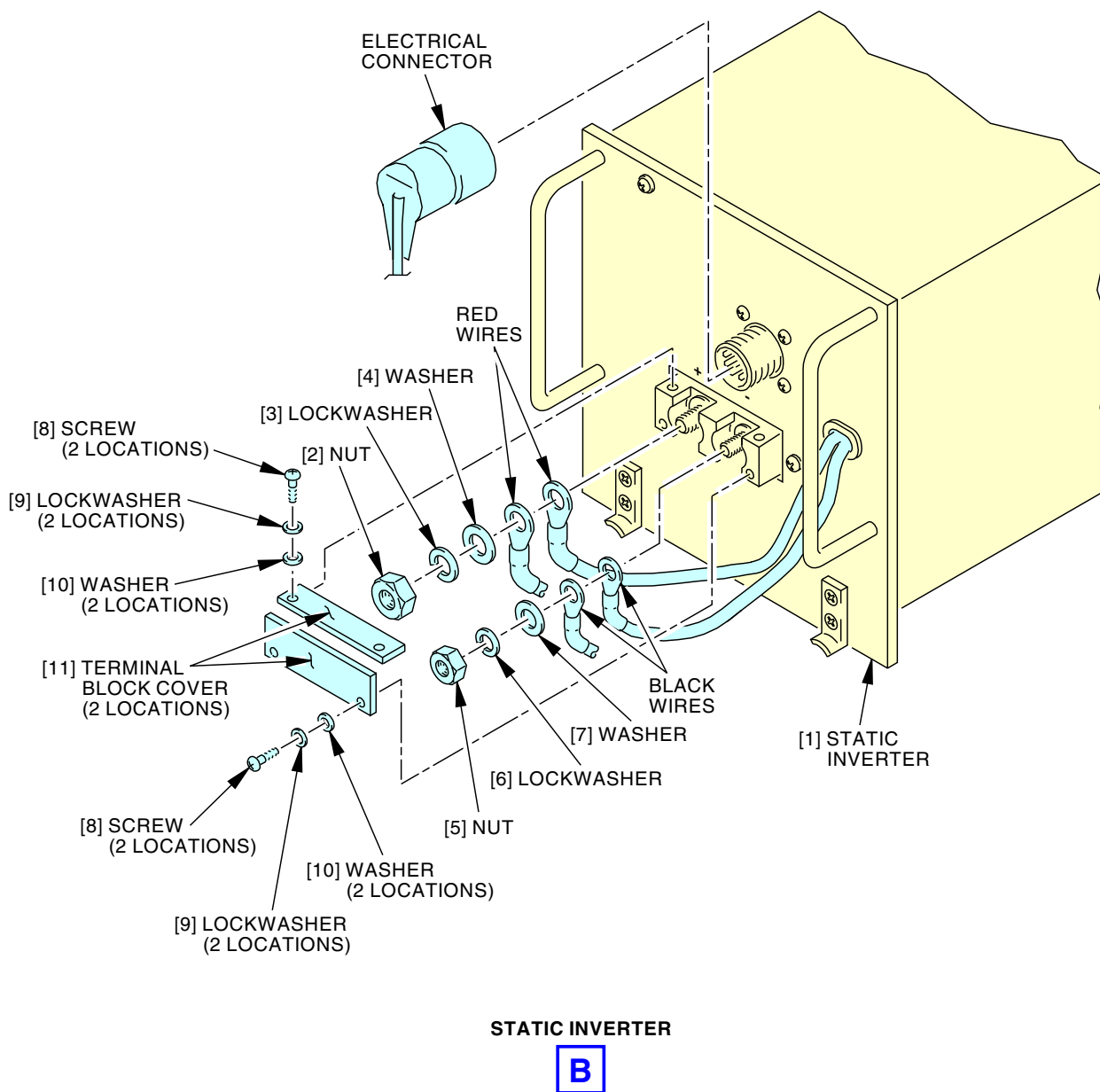
Static Inverter Installation
Figure 401/24-34-21-990-801 (Sheet 1 of 3)

EFFECTIVITY
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Static Inverter Installation
Figure 401/24-34-21-990-801 (Sheet 2 of 3)

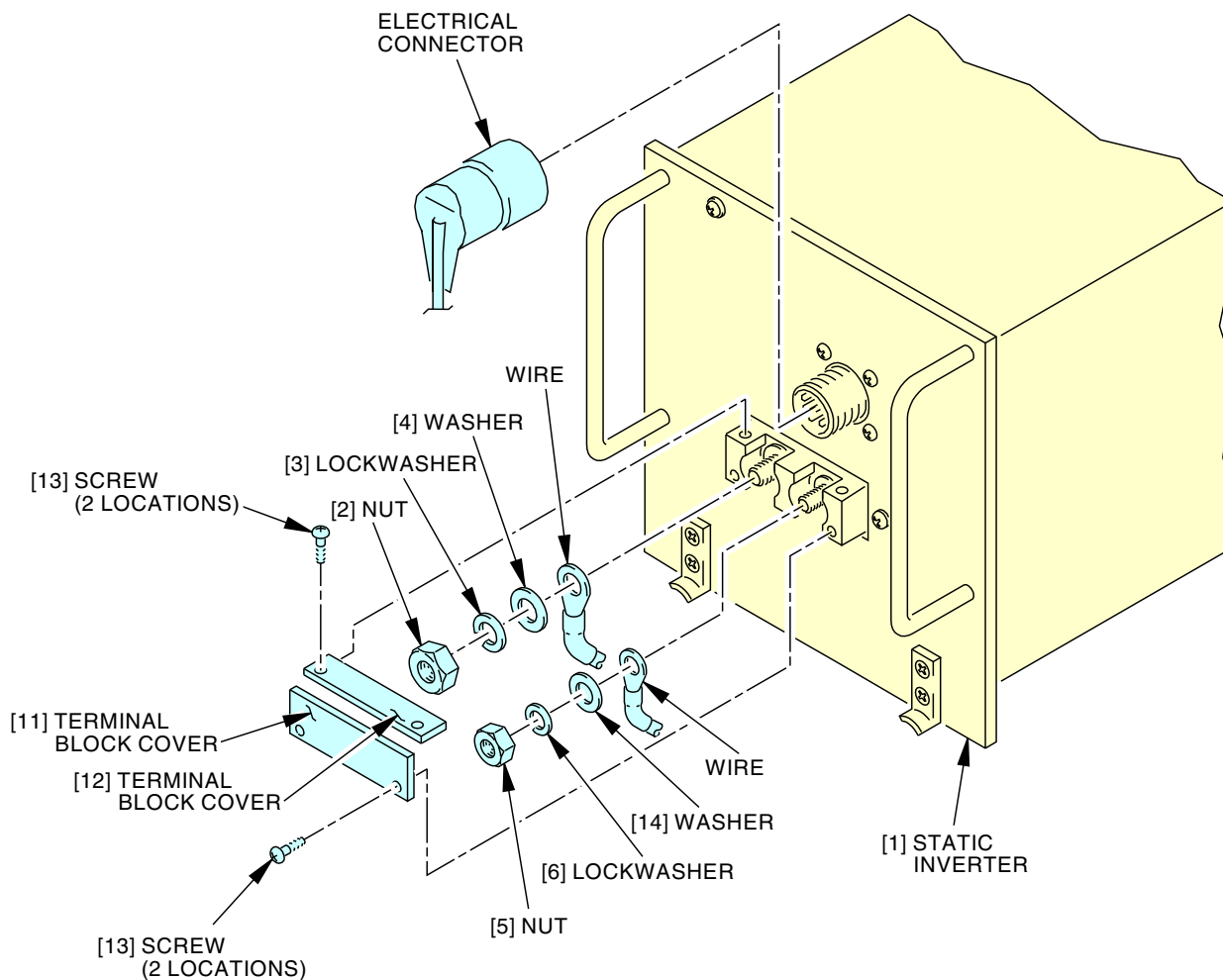
EFFECTIVITY
SIA ALL; AIRPLANES WITHOUT STATIC INVERTER
P/N 1-002-0102-2170

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STATIC INVERTER



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Static Inverter Installation
Figure 401/24-34-21-990-801 (Sheet 3 of 3)

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TASK 24-34-21-400-801

3. Static Inverter Installation

(Figure 401)

A. General

- (1) The M9 Static Inverter is located on the E2-2 equipment rack in the main equipment center.

B. References

Reference	Title
20-10-07-400-801	E/E Box Installation (P/B 401)
20-40-12-400-802	ESDS Handling for Metal Encased Unit Installation (P/B 201)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Static inverter	24-34-21-02-100	SIA ALL

D. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left

E. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

F. Static Inverter Installation

SUBTASK 24-34-21-480-001



WARNING

MAKE SURE THAT YOU REMOVE POWER FROM STATIC-INVERTER WIRE-BUNDLE BEFORE YOU INSTALL STATIC INVERTER. WIRES WITH POWER CAN CAUSE INJURY TO PERSONS.



CAUTION

DO NOT TOUCH THE CONTROL UNIT BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE CONTROL UNIT.

- (1) Do this task: ESDS Handling for Metal Encased Unit Installation, TASK 20-40-12-400-802.

SUBTASK 24-34-21-420-001

- (2) Install the static inverter [1] (TASK 20-10-07-400-801).

SIA ALL; AIRPLANES WITHOUT STATIC INVERTER P/N 1-002-0102-2170

SUBTASK 24-34-21-420-002

- (3) Do these steps to connect the static inverter [1]:
- Put the wires on the terminal studs of the static inverter [1].
 - Install the nut [2], lockwasher [3], and washer [4] on the terminal stud.
 - Tighten the nut [2] to 145 ±10 in-lb (16 ±1 N·m).
 - Install the nut [5], lockwasher [6], and washer [7] on the terminal stud.
 - Tighten the nut [5] to 75 ±10 in-lb (8.5 ±1.2 N·m).
 - Do these steps to install the terminal block covers:
 - Hold the terminal block covers [11] in their positions.

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SIA ALL; AIRPLANES WITHOUT STATIC INVERTER P/N 1-002-0102-2170 (Continued)

- 2) Install the screws [8], lockwashers [9], and washers [10] that hold the terminal block covers [11].
- (g) Install the electrical connector on the static inverter [1].

SIA ALL; AIRPLANES WITH STATIC INVERTER P/N 1-002-0102-2170

SUBTASK 24-34-21-420-003

- (4) Do these steps to connect the static inverter [1]:
 - (a) Put the wires on the terminal studs of the static inverter [1].
 - (b) Install the nut [2], lockwasher [3], and washer [4] on the terminal stud.
 - (c) Tighten the nut [2] to 145 ± 10 in-lb (16 ± 1 N·m).
 - (d) Install the nut [5], lockwasher [6], and washer [14] on the terminal stud.
 - (e) Tighten the nut [5] to 75 ± 10 in-lb (8.5 ± 1.2 N·m).
 - (f) Do these steps to install the terminal block covers:
 - 1) Hold the terminal block cover [11] and terminal block cover [12] in their positions.
 - 2) Install the four screws [13] that hold the terminal block cover [11] and terminal block cover [12].
 - (g) Install the electrical connector on the static inverter [1].

SIA ALL

G. Static Inverter Installation Test

SUBTASK 24-34-21-910-002

- (1) Do these steps to check the static inverter [1]:
 - (a) Remove the safety tag and close this circuit breaker:
Standby Power Control Unit, M01720

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	5	C01343	INVERTER REMOTE
 - (b) Set the AC Meter Selector Switch on the P5-13 panel to the INV position.
 - (c) Make sure that the AC meter shows these values:
 - 1) AC VOLTS = 110 - 120
 - 2) CPS FREQ = 395 - 405

H. Put the Airplane Back to Its Usual Condition

SUBTASK 24-34-21-410-001

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

————— END OF TASK —————

EFFECTIVITY
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STATIC INVERTER REMOTE CONTROL CIRCUIT BREAKER (RCCB) - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
- (1) Static Inverter RCCB Removal
 - (2) Static Inverter RCCB Installation.

TASK 24-34-31-000-801

2. Static Inverter RCCB - Removal

(Figure 401, Figure 402)

A. General

- (1) The Static Inverter Remote Controlled Circuit Breaker (RCCB), C1341, is located on the J9 Battery Shield in the Main Equipment Center.

B. References

Reference	Title
SWPM 20-83-00	ASSEMBLY OF INTEGRATED WIRING TERMINATION SYSTEMS

C. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
121	Forward Cargo Compartment - Left
122	Forward Cargo Compartment - Right

E. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

F. Prepare for the Removal

SUBTASK 24-34-31-860-001

- (1) Set the STANDBY POWER switch on the P5-5 panel to the OFF position and attach a DO NOT OPERATE tag, STD-858.

SUBTASK 24-34-31-860-002

- (2) Set the BAT switch on the P5-13 panel to the OFF position and attach a DO NOT OPERATE tag, STD-858.

SUBTASK 24-34-31-010-001

- (3) Open this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

- (a) Remove the access cover on top of the J39 shield to get access to the circuit breakers.

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- (b) Open these circuit breakers and install safety tags:

Battery Shield, J9

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C01209	AUX BAT CHARGER
A	4	C00142	BATTERY CHARGER
A	5	C01340	BATTERY BUS

SUBTASK 24-34-31-020-001

- (4) Remove the battery connectors from the main and auxiliary batteries as follows:

- (a) Gain access to the forward cargo area.
- (b) Remove the forward bulkhead liner that covers the batteries.
- (c) Cut and remove the safety lockwire from the battery connectors.
- (d) Remove the battery connectors from both batteries.

NOTE: Do not let the terminals on the connector rest against the airplane structure.

G. Static Inverter RCCB Removal

SUBTASK 24-34-31-020-002

- (1) Do these steps to remove the static inverter RCCB [1]:

- (a) Remove the access cover on top of the J9 shield to get access to the RCCB.
- (b) Install identification tags on all wires attached to the RCCB before removing them.
- (c) Remove the two nuts [2], two lockwashers [3], and two washers [4] from both terminal studs on the static inverter RCCB [1].
- (d) Remove the nut [2], lockwasher [3], and washer [4] from the top terminal stud on the Dual Battery RCCB.

NOTE: This step must be done because the terminals are close together on the same wire.

- (e) Remove the wires from the terminal studs.
- (f) Remove the control wires from the connector on the RCCB (SWPM 20-83-00).
- (g) Install an identification tag on the wire so it can be installed into the correct socket later.
- (h) Remove the two screws [5] that hold the RCCB to the panel.
- (i) Remove the RCCB.

———— **END OF TASK** ————

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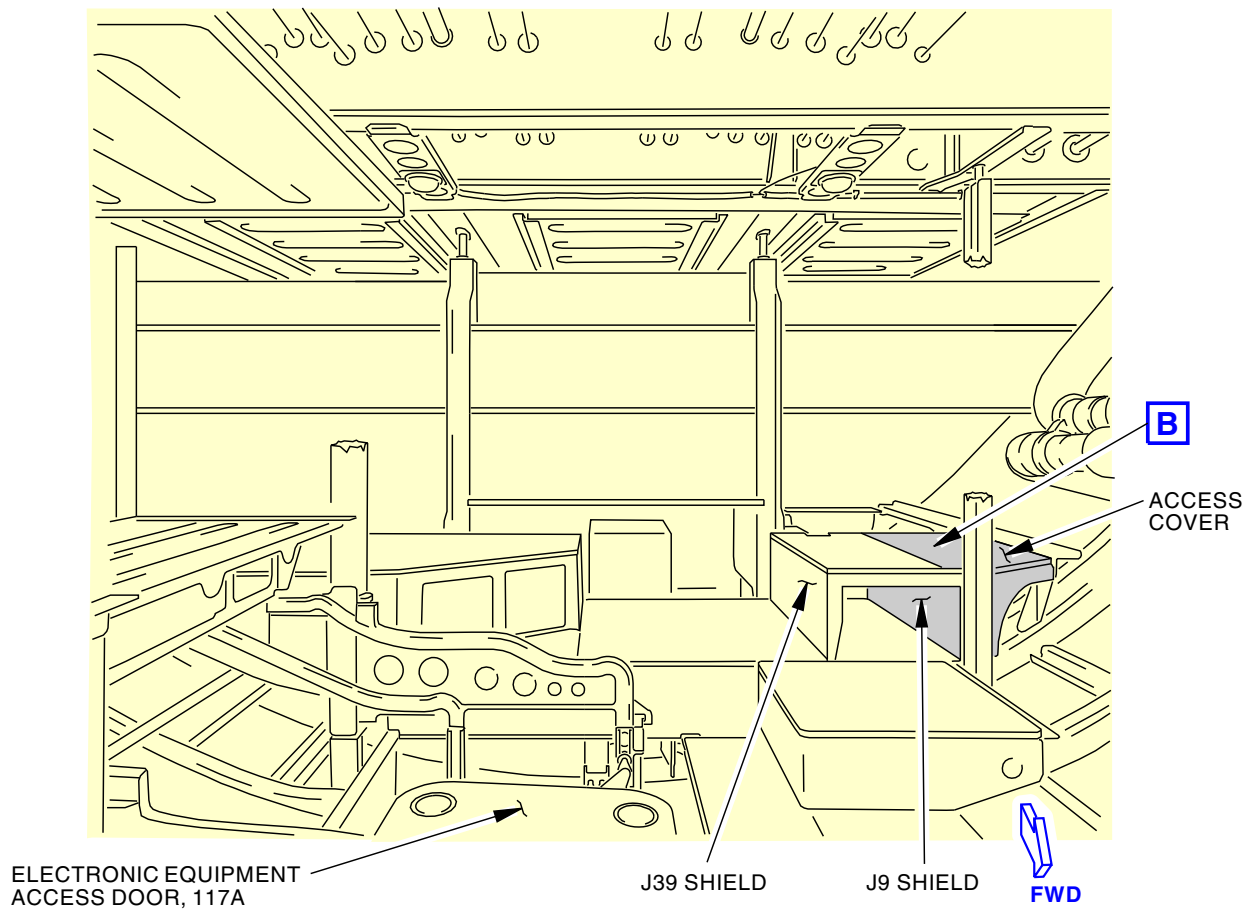
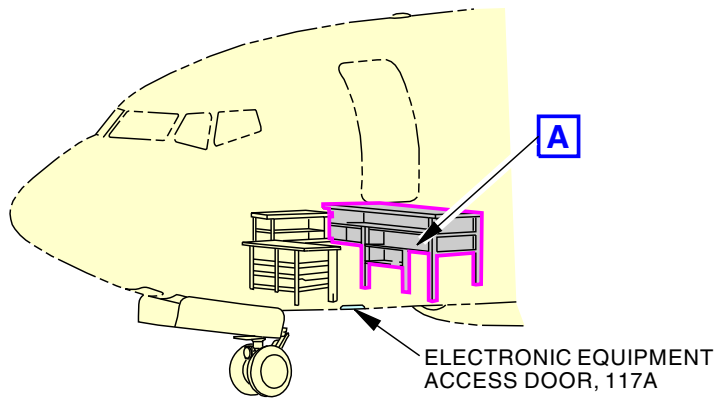
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ELECTRICAL AND ELECTRONICS COMPARTMENT



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Static Inverter Remote Control Circuit Breaker (RCCB) Installation
Figure 401/24-34-31-990-801 (Sheet 1 of 3)

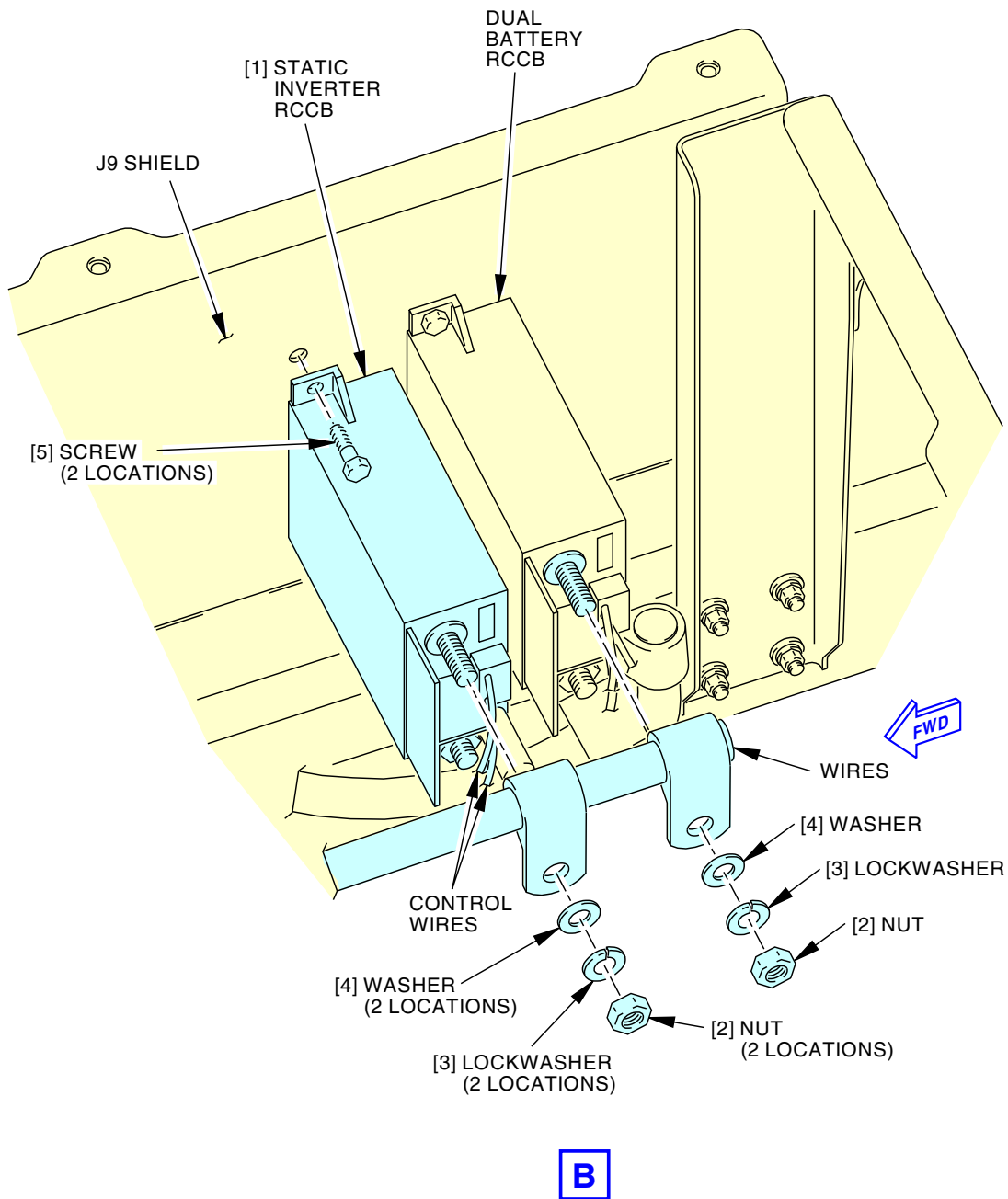
EFFECTIVITY
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Static Inverter Remote Control Circuit Breaker (RCCB) Installation
Figure 401/24-34-31-990-801 (Sheet 2 of 3)

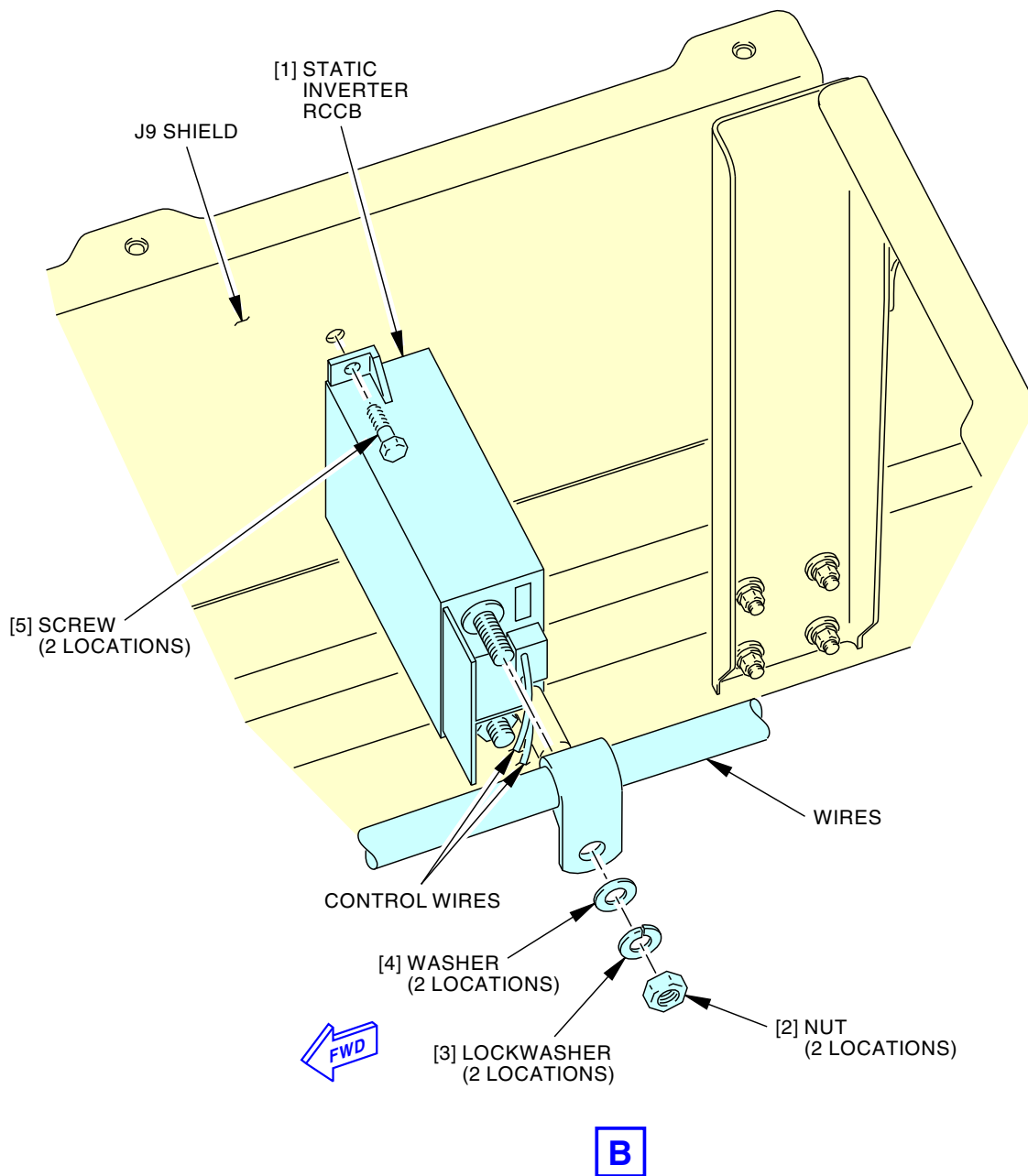
EFFECTIVITY
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Static Inverter Remote Control Circuit Breaker (RCCB) Installation
Figure 401/24-34-31-990-801 (Sheet 3 of 3)

EFFECTIVITY
SIA ALL

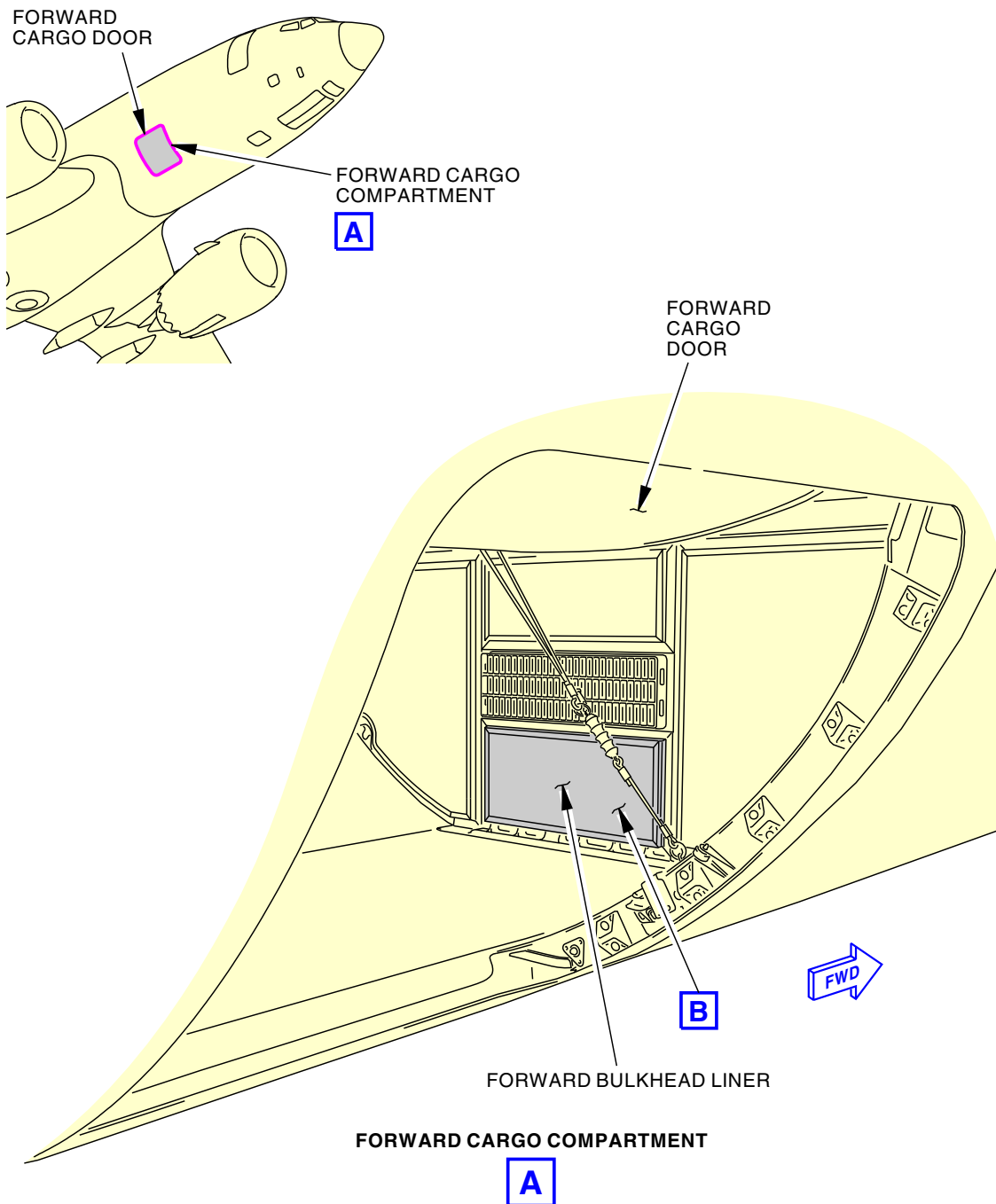
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Battery Installation
Figure 402/24-34-31-990-802 (Sheet 1 of 2)

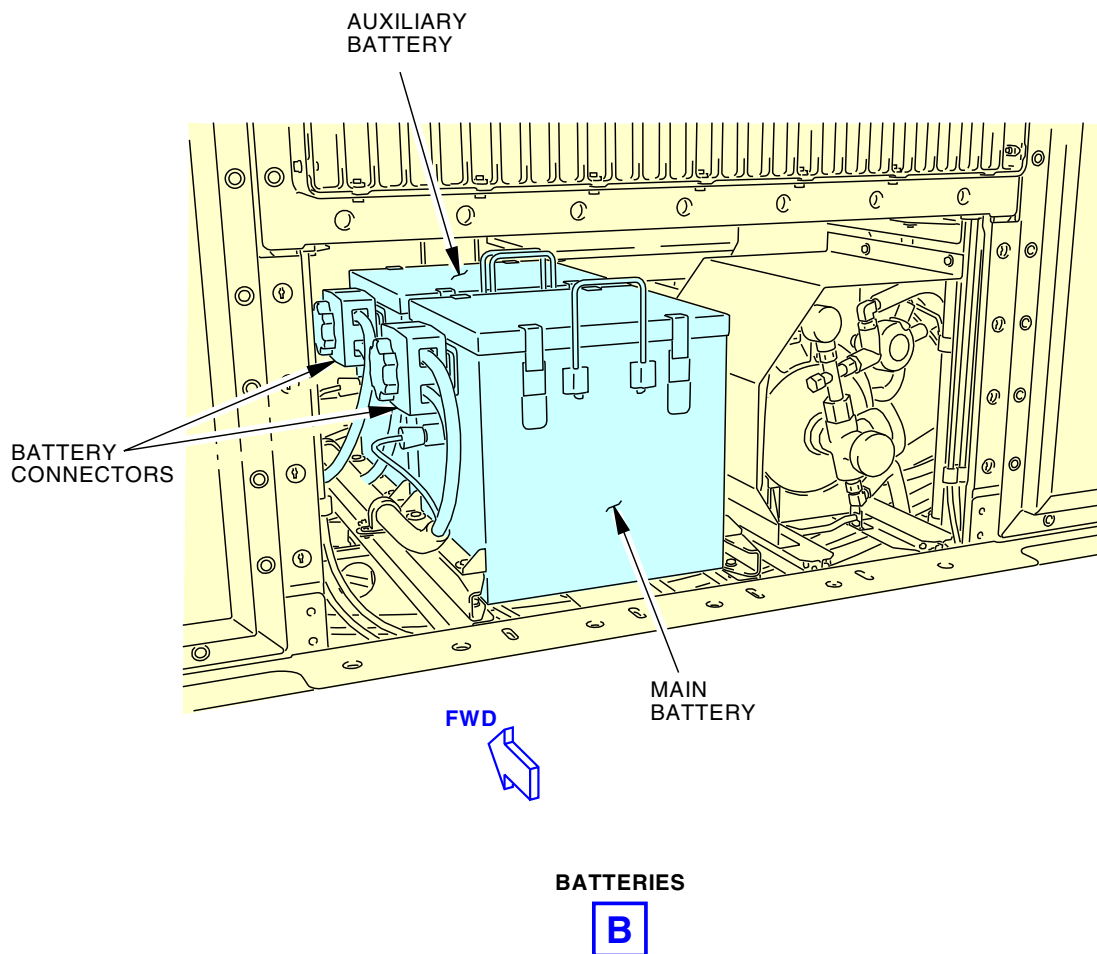
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Battery Installation
Figure 402/24-34-31-990-802 (Sheet 2 of 2)

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TASK 24-34-31-400-801

3. **Static Inverter RCCB - Installation**

(Figure 401, Figure 402)

A. General

- (1) The Static Inverter Remote Controlled Circuit Breaker (RCCB), C1341, is located on the J9 Battery Shield in the Main Equipment Center.

B. References

Reference	Title
20-10-44-400-801	Lockwire, Cotter Pins, and Lockrings - Installation (P/B 401)
24-31-21-710-801	Main Battery Charger Operational Test (P/B 501)
24-31-31-710-801	Auxiliary Battery Charger Operational Test (P/B 501)
SWPM 20-83-00	ASSEMBLY OF INTEGRATED WIRING TERMINATION SYSTEMS

C. Consumable Materials

Reference	Description	Specification
G02479	Lockwire - MS20995CY20, Copper - 0.020 Inch (0.508 mm) Diameter	NASM20995

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Static inverter RCCB	24-34-31-02-015	SIA ALL

E. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
121	Forward Cargo Compartment - Left
122	Forward Cargo Compartment - Right

F. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

G. Static Inverter RCCB Installation

SUBTASK 24-34-31-420-001

- (1) Do these steps to install the static inverter RCCB [1]:
- Hold the RCCB in position.
 - Install the two screws [5] that hold the RCCB.
 - Install the wires on the RCCB terminal studs.
 - Install the two nuts [2], two lockwashers [3], and two washers [4] on both terminal studs on the static inverter RCCB [1].
 - Install the nut [2], lockwasher [3], and washer [4] on the top terminal stud on the Dual Battery RCCB.
 - Torque the nuts to 40 in-lb (4.5 N·m) - 45 in-lb (5.1 N·m).
 - Install the control wires into the sockets on the RCCB per the identification tags (SWPM 20-83-00).
 - Install the access cover on top of the J9 shield.

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SUBTASK 24-34-31-420-002

- (2) Install the battery connectors on the main and auxiliary batteries as follows:
 - (a) Gain access to the forward cargo area.
 - (b) Install the battery connectors on both batteries.
 - (c) Safety wire the battery connectors with a 0.020 in. (0.508 mm) copper MS20995CY20 lockwire, G02479 (TASK 20-10-44-400-801).
 - (d) Install the forward bulkhead liner.

SUBTASK 24-34-31-860-003

- (3) Remove the safety tags and close these circuit breakers:

Battery Shield, J9

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	3	C01209	AUX BAT CHARGER
A	4	C00142	BATTERY CHARGER
A	5	C01340	BATTERY BUS

SUBTASK 24-34-31-410-001

- (4) Install the access cover on top of the J39 shield.

H. Static Inverter RCCB Installation Test

SUBTASK 24-34-31-710-001

- (1) Do a check of the static inverter RCCB [1] as follows:
 - (a) Make sure that the BAT switch on the P5-13 panel is in the OFF position.
 - (b) Set the STANDBY POWER switch on the P5-5 panel to the AUTO position.
 - (c) Set the AC Meter Selector Switch on the P5-13 panel to the INV position.
 - (d) Make sure that the AC meter shows these values:
 - 1) AC VOLTS = 0
 - 2) CPS FREQ = BLANK

NOTE: When the AC voltage goes below approximately 12 VAC, the CPS FREQ will become blank.
 - (e) Set the BAT switch on the P5-13 panel to the ON position.
 - (f) Make sure that the AC meter shows these values:
 - 1) AC VOLTS = 110 - 120
 - 2) CPS FREQ = 395 - 405

SUBTASK 24-34-31-710-002

- (2) Do this task: Main Battery Charger Operational Test, TASK 24-31-21-710-801.

SUBTASK 24-34-31-710-003

- (3) Do this task: Auxiliary Battery Charger Operational Test, TASK 24-31-31-710-801.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 24-34-31-410-002

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

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SUBTASK 24-34-31-860-004

- (2) Set the BAT switch on the P5-13 panel to the OFF position.

———— **END OF TASK** ————

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AC EXTERNAL POWER - MAINTENANCE PRACTICES

1. General

- A. This procedure has two tasks:
- (1) AC External Power Deactivation
 - (2) AC External Power Activation.

TASK 24-41-00-040-801

2. AC External Power - Deactivation

(Figure 201)

A. **General**

- (1) This task has these procedures:
- (a) Remove external power from the ground service buses.
 - (b) Remove external power from the 115V AC transfer buses.

B. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. **Location Zones**

Zone	Area
116	Nose Landing Gear Wheel Well - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

D. **Procedure**

SUBTASK 24-41-00-010-001

- (1) Do these steps to remove external power from the ground service buses:
- (a) Push the GROUND SERVICE switch on the FWD ATTENDANT panel, P13.
 - 1) Make sure the light in the GROUND SERVICE switch goes off.
 - (b) Remove power from the external power cable.
 - (c) Make sure these lights on the P19 panel go off:
 - 1) EXTERNAL PWR CONN
 - 2) EXTERNAL PWR NOT IN USE



WARNING

REMOVE ELECTRICAL POWER FROM THE EXTERNAL POWER SOURCE. IF YOU DO NOT REMOVE ELECTRICAL POWER, YOU CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (d) Remove the external power cable.
- (e) Close the External Power Receptacle Door.

SUBTASK 24-41-00-010-002

- (2) Do these steps to remove external power from the 115V AC transfer buses:
- (a) Make sure APU and engines are not running.
 - (b) Set the GRD PWR switch on the P5-4 panel to the OFF position.
 - (c) Make sure the GRD PWR AVAILABLE light on the P5-4 stays off.

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- (d) Make sure these lights on the P5-4 panel come on:
 - 1) 1 SOURCE OFF
 - 2) 2 SOURCE OFF
 - 3) 1 TRANSFER BUS OFF
 - 4) 2 TRANSFER BUS OFF
- (e) Set the BATTERY switch on the P5-13 Panel to the off position.
- (f) Remove power from the external power cable.
- (g) Make sure these lights on the P19 panel go off:
 - 1) EXTERNAL PWR CONN
 - 2) EXTERNAL PWR NOT IN USE



WARNING

REMOVE ELECTRICAL POWER FROM THE EXTERNAL POWER SOURCE. IF YOU DO NOT REMOVE ELECTRICAL POWER, YOU CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (h) Remove the external power cable from the aircraft.
- (i) Close the External Power Receptacle Door.

SUBTASK 24-41-00-480-001



WARNING

PUT A DO-NOT-OPERATE TAG ON THE EXTERNAL POWER RECEPTACLE. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS CAN OCCUR.

- (3) Attach a DO NOT OPERATE tag, STD-858 to the external power receptacle.

E. AC External Power - Tryout

NOTE: This tryout is to make sure the AC External Power system is in a zero energy state.

SUBTASK 24-41-00-211-001

- (1) Make sure the External Power Plug is removed from the receptacle and a DO NOT OPERATE tag, STD-858 is installed.

SUBTASK 24-41-00-211-002

- (2) Make sure the EXTERNAL PWR CONN light on the P19 panel is off.

———— **END OF TASK** ————

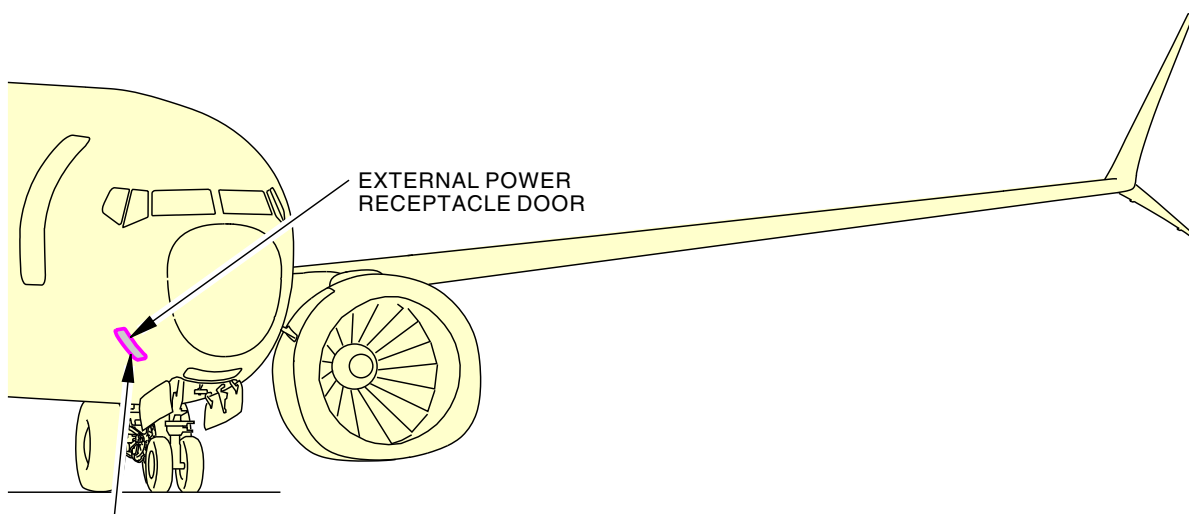
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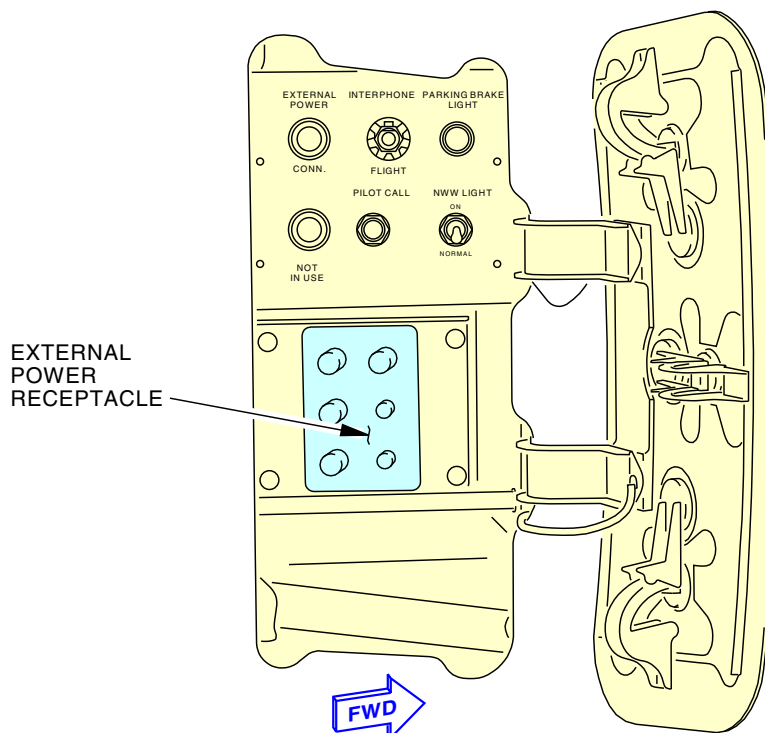
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EXTERNAL POWER
RECEPTACLE DOOR

EXTERNAL POWER
RECEPTACLE
PANEL (P19)

A



EXTERNAL
POWER
RECEPTACLE

EXTERNAL POWER RECEPTACLE PANEL (P19)

A

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External Power Receptacle
Figure 201/24-41-00-990-801

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TASK 24-41-00-440-801

3. **AC External Power - Activation**

(Figure 201)

A. General

- (1) This task has these procedures:
 - (a) Supply external power from the ground service buses.
 - (b) Supply external power from the 115V AC transfer buses.

B. Tools/Equipment

Reference	Description
STD-858	Tag - DO NOT OPERATE

C. Location Zones

Zone	Area
116	Nose Landing Gear Wheel Well - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

D. Procedure

SUBTASK 24-41-00-860-001

- (1) Do these steps to supply external power to the ground service and 115V AC transfer buses:
 - (a) Open the External Power Receptacle Door.



WARNING

MAKE SURE THAT THERE IS NO OPEN OR FLOATING GROUND IN THE NEUTRAL CIRCUIT OF THE POWER SUPPLY OR THE AIRCRAFT. AN OPEN OR FLOATING GROUND CAN CAUSE ELECTRICAL SHOCK TO PERSONNEL WHO TOUCH THE AIRCRAFT.

- (b) Make sure the external power supply operates correctly before you supply external power to the airplane.
- (c) Remove the DO NOT OPERATE tag, STD-858 from the receptacle.
- (d) Install external power source to the airplane.

———— **END OF TASK** ————

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AC EXTERNAL POWER - ADJUSTMENT/TEST

1. General

- A. This procedure has two tasks:
- (1) AC External Power Operational Test
 - (2) Bus Power Control Unit BITE Procedure.

TASK 24-41-00-700-801

2. AC External Power Operational Test

(Figure 501, Figure 502)

A. **References**

Reference	Title
20-40-11-910-801	Static Grounding (P/B 201)
24-22-00-860-802	Remove Electrical Power (P/B 201)

B. **Location Zones**

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left
212	Flight Compartment - Right

C. **Access Panels**

Number	Name/Location
117A	Electronic Equipment Access Door

D. **Prepare for the Operational Test**

SUBTASK 24-41-00-860-002

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-802.

SUBTASK 24-41-00-860-003

- (2) Make sure that the BAT switch on the P5-13 panel is set to the ON position.

SUBTASK 24-41-00-860-004

- (3) Make sure that the STANDBY POWER switch on the P5-5 panel is set to the AUTO position.

SUBTASK 24-41-00-860-005

- (4) Make sure that the BUS TRANSFER switch on the P5-4 panel is set to the AUTO position.

SUBTASK 24-41-00-860-006

- (5) Make sure that these circuit breakers are closed:

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
E	13	C01328	ELECTRICAL GND SERV CONT
F	13	C01290	GENERATOR BUS PWR CONT UNIT

SUBTASK 24-41-00-010-003

- (6) To get access to the main equipment center, open this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

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SUBTASK 24-41-00-860-007



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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.

- (7) Make sure that these circuit breakers are closed:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	10	C01327	BUS PWR CONT UNIT

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	12	C00936	EXT PWR BPCU

E. AC External Power Operational Test

SUBTASK 24-41-00-860-008

- (1) Do a check of the external power system as follows:

- (a) Open the External Power Receptacle Door.



IF THE EXTERNAL POWER SUPPLY HAS AN EARTH GROUND NEUTRAL, THERE MUST NOT BE AN OPEN OR FLOATING GROUND IN THE NEUTRAL CIRCUIT WIRE OF THE SUPPLY OR THE AIRPLANE. IF AN OPEN OR FLOATING GROUND IS PRESENT, THE AIRPLANE CAN BE PUT AT AN ELECTRICAL POTENTIAL ABOVE EARTH GROUND. THIS ELECTRICAL POTENTIAL CAN CAUSE ELECTRIC SHOCK WITH POSSIBLE DANGEROUS INJURY TO PERSONNEL WHO TOUCH THE AIRPLANE.

- (b) Make sure that the external power supply operates correctly before you supply external power to the airplane.
- 1) If the ground return (neutral) circuit on the external power source or the external power receptacle do not operate correctly, do this task: Static Grounding, TASK 20-40-11-910-801.



REMOVE THE ELECTRICAL POWER FROM THE EXTERNAL POWER SOURCE BEFORE YOU CONNECT THE CABLE TO THE AIRPLANE. INJURY TO PERSONS CAN BE CAUSED BY AN ELECTRICAL SHOCK.

- (c) Install the power cable to the external power receptacle.
- (d) Energize the external power cable.

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- (e) Make sure that these lights on the external power panel (P19) are on:
 - 1) EXTERNAL PWR CONN
 - 2) EXTERNAL PWR NOT IN USE
- (f) Make sure that the GRD POWER AVAILABLE light on the P5-4 panel comes on.
- (g) Set the AC meter selector switch on the P5-13 panel to the GRD PWR position.
- (h) Make sure that the AC meter on the P5-13 panel shows these values:
 - 1) AC VOLTS = 110-120
 - 2) CPS FREQ = 395-405
- (i) Push the GROUND SERVICE switch on the FWD ATTENDANT panel, P13.
 - 1) Make sure that the ON light in the GROUND SERVICE switch comes on.
NOTE: The ground service buses are energized when external power is supplied to the receptacle and the GROUND SERVICE switch is set to ON. The transfer buses do not need to be powered to supply power ground service busses.
 - 2) Make sure that the EXTERNAL PWR NOT IN USE light on the P19 panel goes off.
- (j) Push the GROUND SERVICE switch again.
 - 1) Make sure that the ON light in the GROUND SERVICE switch goes off.
 - 2) Make sure that the EXTERNAL PWR NOT IN USE light on the P19 panel comes on.
- (k) Set the GRD POWER switch on the P5-4 panel to the ON position.
NOTE: The ground service buses are automatically powered when power is supplied to the transfer buses.
- (l) Make sure that the GRD POWER AVAILABLE light on the P5-4 panel stays on.
- (m) Make sure that these lights on the P5-4 panel go off:
 - 1) 1 SOURCE OFF
 - 2) 2 SOURCE OFF
 - 3) 1 TRANSFER BUS OFF
 - 4) 2 TRANSFER BUS OFF
- (n) Make sure that the EXTERNAL PWR NOT IN USE light on the P19 panel goes off.
- (o) Set the GRD PWR switch on the P5-4 panel to the OFF position.
- (p) Make sure that the GRD POWER AVAILABLE light on the P5-4 stays on.
- (q) Make sure that these lights on the P5-4 panel come on:
 - 1) 1 SOURCE OFF
 - 2) 2 SOURCE OFF
 - 3) 1 TRANSFER BUS OFF
 - 4) 2 TRANSFER BUS OFF
- (r) Make sure that the EXTERNAL POWER NOT IN USE light on the P19 panel comes on.
- (s) Remove power from the external power cable.
- (t) Make sure that the EXTERNAL POWER CONN light on the P19 panel goes off.



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WARNING

REMOVE THE ELECTRICAL POWER FROM THE EXTERNAL POWER SOURCE BEFORE YOU CONNECT THE CABLE TO THE AIRPLANE. INJURY TO PERSONS CAN BE CAUSED BY AN ELECTRICAL SHOCK.

- (u) Remove the external power cable.
- (v) Make sure that the EXTERNAL POWER NOT IN USE light on the P19 panel goes off.
- (w) Close the External Power Receptacle Door.

F. Put the Airplane Back to Its Usual Condition

SUBTASK 24-41-00-860-009

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

SUBTASK 24-41-00-860-010

- (2) Set the BAT switch on the P5-13 panel to the OFF position.

———— **END OF TASK** ————

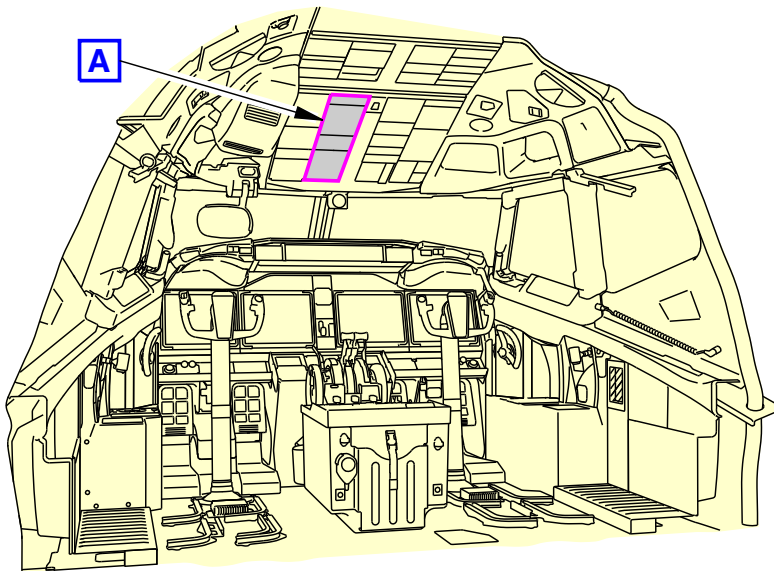
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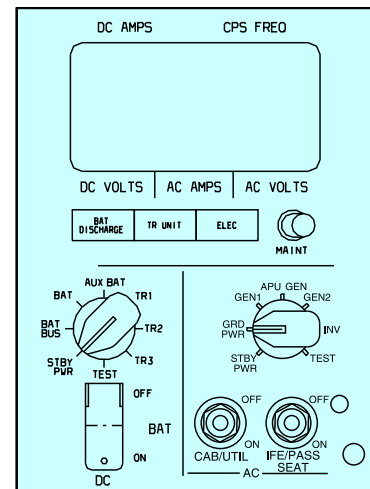
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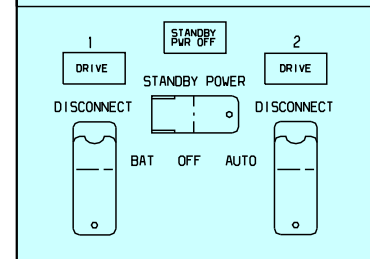


FLIGHT COMPARTMENT

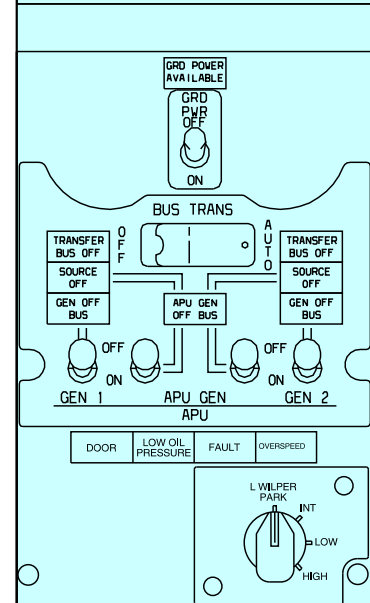
P5-13



P5-5



P5-4



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AC Power and Bus Control
Figure 501/24-41-00-990-802

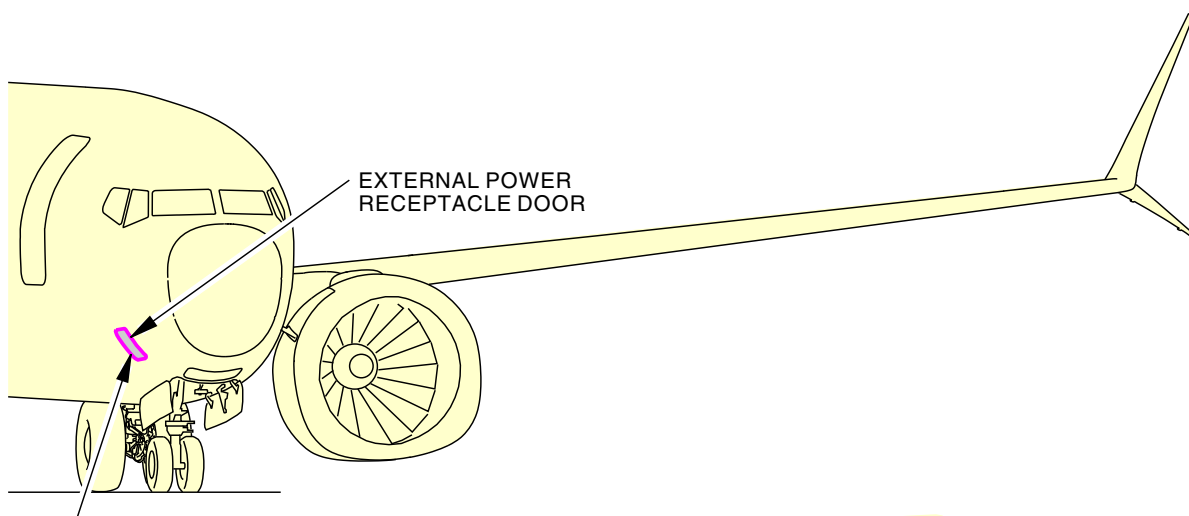
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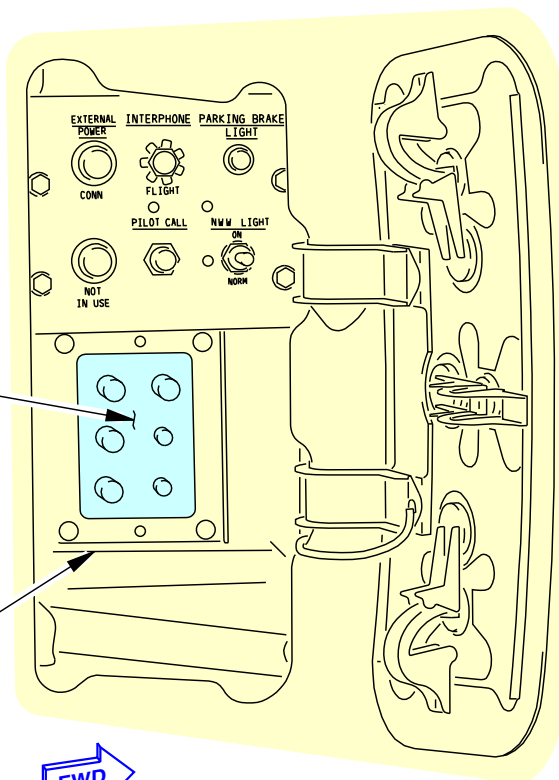
EXTERNAL POWER
RECEPTACLE DOOR

EXTERNAL POWER
RECEPTACLE
PANEL (P19)

A

EXTERNAL POWER
RECEPTACLE

SAFETY
GUIDE



EXTERNAL POWER RECEPTACLE PANEL (P19)

A

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External Power Receptacle and Indication
Figure 502/24-41-00-990-803

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TASK 24-41-00-740-801

3. **Bus Power Control Unit BITE Procedure**

(Figure 503)

A. General

- (1) You do the BITE procedure at the front panel of the Bus Power Control Unit (BPCU).
- (2) The BPCU, G15 is installed on the E4-2 rack in the main equipment center.
- (3) The BPCU performs a self test after it is powered up or manually by pushing the BPCU TEST switch. The BPCU has three fault indicator lights, one BPCU PASS light and one BPCU TEST switch on the front panel. The fault indicator lights will be referred to as maintenance messages throughout this procedure.
- (4) The four indicator lights are listed in order below, with the highest priority indicator listed first.
NOTE: If there is more than one fault condition, only the highest priority fault indicator light will be on.
 - (a) BPCU FAULT
 - (b) EP DIST/BUS FAULT
 - (c) EPC FAULT
 - (d) BPCU PASS
- (5) The BPCU will detect the external faults when external power is being supplied.
NOTE: The EP DIST/BUS FAULT can be detected and shown by the BPCU when the APU generator is supplying power.
- (6) Use the manual BITE procedure to clear the fault indications from the BPCU memory.
NOTE: Record the maintenance messages (if any) before you do the manual BITE procedure.

B. References

Reference	Title
IFIM and do the applicable procedure(s)	Interactive Fault Isolation Manual

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
211	Flight Compartment - Left

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

E. Prepare for the BITE procedure

SUBTASK 24-41-00-040-001

- (1) Turn the BAT switch on the P5-13 panel to the ON position.
NOTE: The BPCU BITE procedure can be run with external power. If you unable to apply external power the procedure can be run with battery power.

SUBTASK 24-41-00-010-004

- (2) Open this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

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(3) Go to the applicable BPCU (Figure 503).

F. BITE Procedure

SUBTASK 24-41-00-740-001

(1) Do these steps to do the BITE procedure for the BPCU:

- (a) Record any maintenance messages (if there are any) before you push the BPCU TEST switch.

NOTE: If you remove and reapply power, this will not erase any of the faults that were detected by the BPCU. However, if the fault is no longer present and the BPCU TEST switch is pushed, the fault will be cleared.

- (b) Push and hold the BPCU TEST switch on the BPCU for a minimum of one second and then release it.

(c) Make sure all four of the indicator lights come on for approximately three seconds:

- 1) BPCU FAULT - (red)
- 2) EP DIST/BUS FAULT - (red)
- 3) EPC FAULT - (red)
- 4) BPCU PASS - (green)

(d) Make sure all four of the indicator lights go off for approximately three seconds.

- 1) If a fault is detected, then the applicable red fault indicator light will come on.
 - a) Go to the IFIM and do the applicable procedure(s) for each maintenance message.
- 2) If the fault indicator lights fail to respond per the steps listed above, then do the applicable BPCU FAULT Task.
- 3) If no faults were detected, the BPCU PASS light will come on for approximately seven seconds.

G. Put the Airplane Back to its Usual Condition

SUBTASK 24-41-00-810-001

(1) Go to the IFIM and do the applicable procedure(s) for each maintenance message.

SUBTASK 24-41-00-410-001

(2) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

————— **END OF TASK** —————

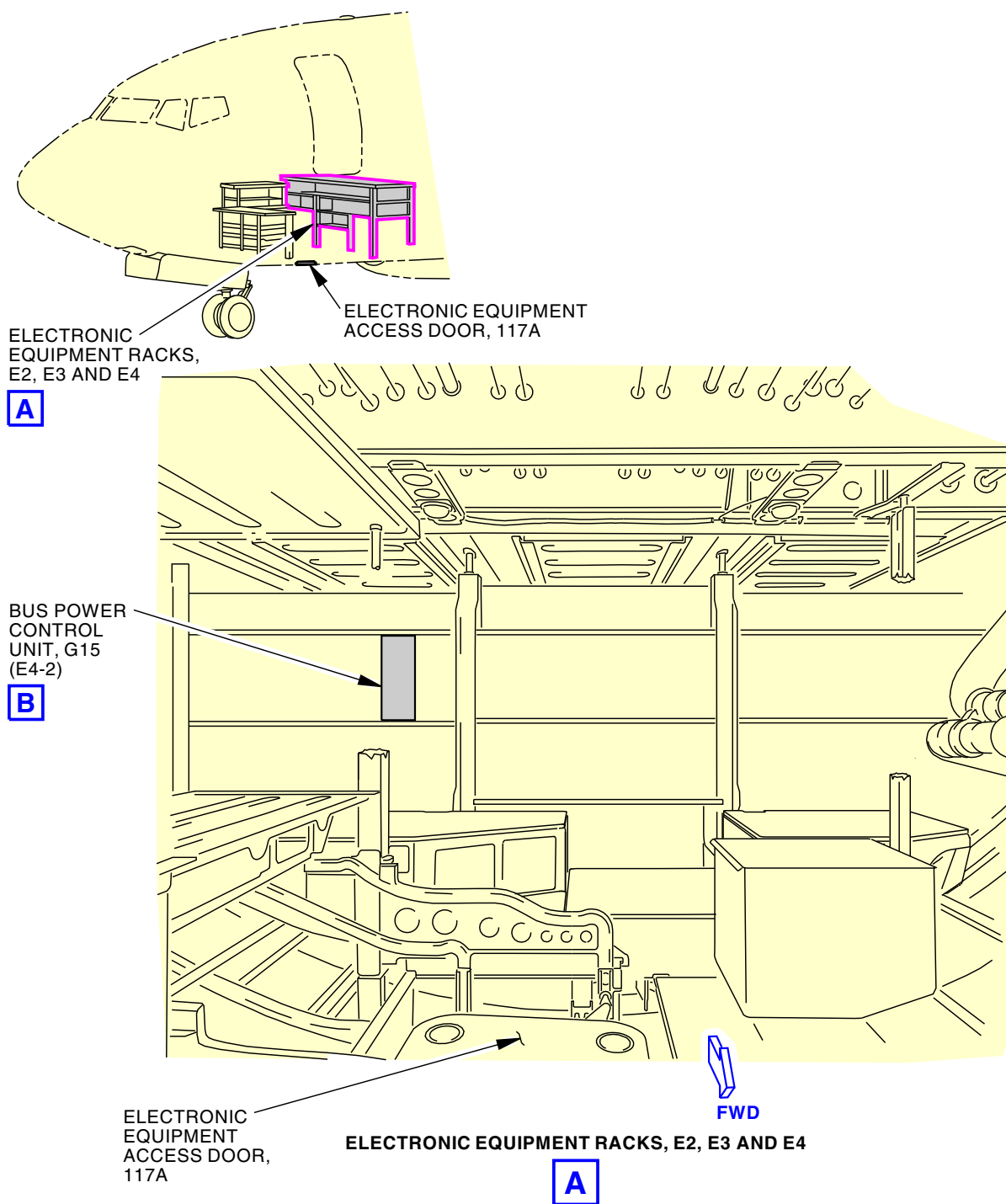
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Bus Power Control Unit (BPCU)
Figure 503/24-41-00-990-804 (Sheet 1 of 2)

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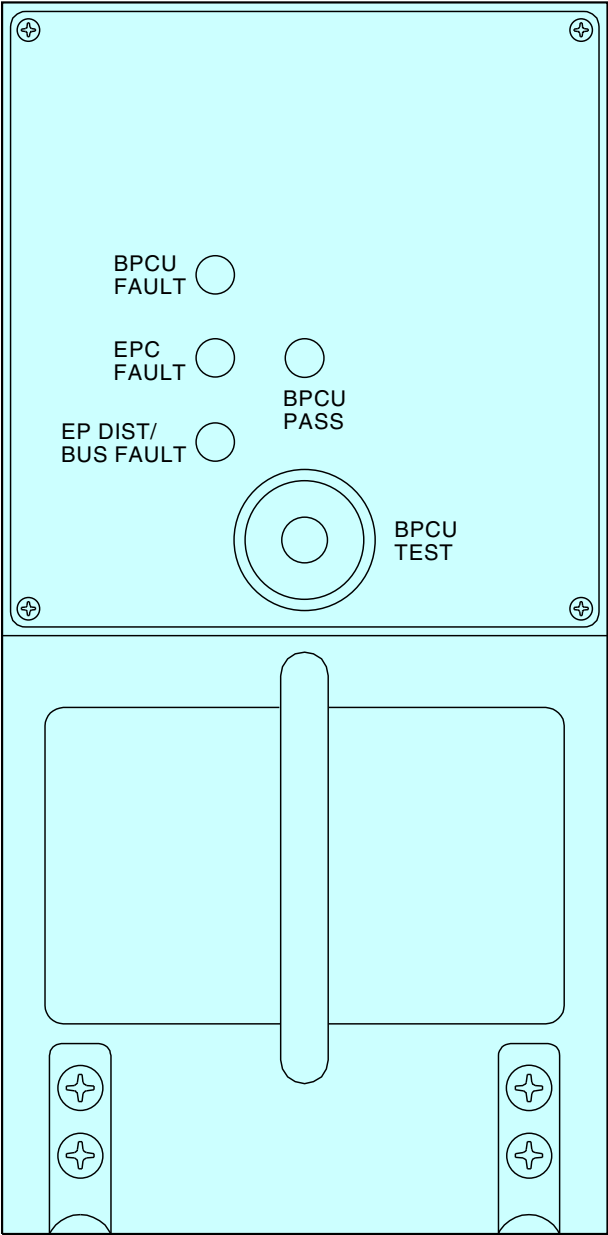
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BUS POWER CONTROL UNIT, G15

B

2526241 S0000596499_V1

Bus Power Control Unit (BPCU)
Figure 503/24-41-00-990-804 (Sheet 2 of 2)

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EXTERNAL POWER RECEPTACLE - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) A removal of the external power receptacle
- (2) An installation of the external power receptacle.

TASK 24-41-11-000-801

2. External Power Receptacle Removal

(Figure 401)

A. **General**

- (1) The External Power Receptacle is located on the lower right hand side of the airplane. It is installed forward of the nose gear wheel well.

B. **References**

Reference	Title
24-22-00-860-802	Remove Electrical Power (P/B 201)
53-14-01-020-801	Nose Wheel Well Access Panels Removal (P/B 401)

C. **Tools/Equipment**

Reference	Description
STD-858	Tag - DO NOT OPERATE

D. **Consumable Materials**

Reference	Description	Specification
A50419	Sealant - Pressure And Environmental-Chromate, Type I, Class B-2	BMS5-95 Type I Class B-2

E. **Location Zones**

Zone	Area
114	Area Above and Outboard of Nose Landing Gear Wheel Well - Right

F. **Access Panels**

Number	Name/Location
114AR	External Power Receptacle Door

G. **Prepare for the Removal**

SUBTASK 24-41-11-860-001

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-802.

SUBTASK 24-41-11-010-001

- (2) Open this access panel if it is closed:

<u>Number</u>	<u>Name/Location</u>
114AR	External Power Receptacle Door

SUBTASK 24-41-11-010-002

- (3) Remove External Power Plug from the external power receptacle [1], if it is installed.

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SUBTASK 24-41-11-930-001



WARNING

PUT A DO-NOT-OPERATE TAG ON THE EXTERNAL POWER RECEPTACLE. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS CAN OCCUR.

- (4) Put a DO NOT OPERATE tag, STD-858, to the external power receptacle [1].

SUBTASK 24-41-11-010-003

- (5) Open access panel on forward right hand side of nose gear wheel well:

- (a) To get access to the back of the external power receptacle [1], do this task: Nose Wheel Well Access Panels Removal, TASK 53-14-01-020-801.

H. External Power Receptacle Removal

SUBTASK 24-41-11-020-001



CAUTION

PUT AN IDENTIFIER ON THE WIRES ON EACH SIDE OF THE ELECTRICAL CONNECTION BEFORE YOU DISCONNECT. IF YOU CONNECT THEM AT AN INCORRECT LOCATION, DAMAGE TO THE COMPONENTS WILL OCCUR.



CAUTION

DO NOT INSTALL WASHERS BELOW THE ELECTRICAL LEAD TERMINAL LUGS. THIS WILL CAUSE HEAT AND DAMAGE TO THE TERMINAL STUDS.

- (1) Do these steps to remove the electrical leads from the external power receptacle [1]:
- (a) Remove the nuts [11] and washers [12].
 - (b) Remove the cover assembly [10].
 - (c) Remove the washers [13].
 - (d) Attach an identification tag to each electrical lead.
 - (e) Remove the nuts [6], lockwashers [5], and washers [4].
 - (f) Remove the nuts [9], lockwashers [8], and washers [7].
 - (g) Remove the electrical leads from the studs.

SUBTASK 24-41-11-020-002

- (2) Do these steps to remove the external power receptacle [1]:

NOTE: This step works best with two people, one outside the airplane and one inside the wheel well access. However if only one person is available, you can put tape over the bolts to prevent them from falling out when the nuts are removed.

- (a) Remove the nuts [14], nuts [15], and washers [16].
- (b) Remove the bolts [2] and washers [3].
- (c) Remove the shield [17].
 - 1) If it is necessary, remove the sealant, A50419, from the shield [17].

————— END OF TASK —————

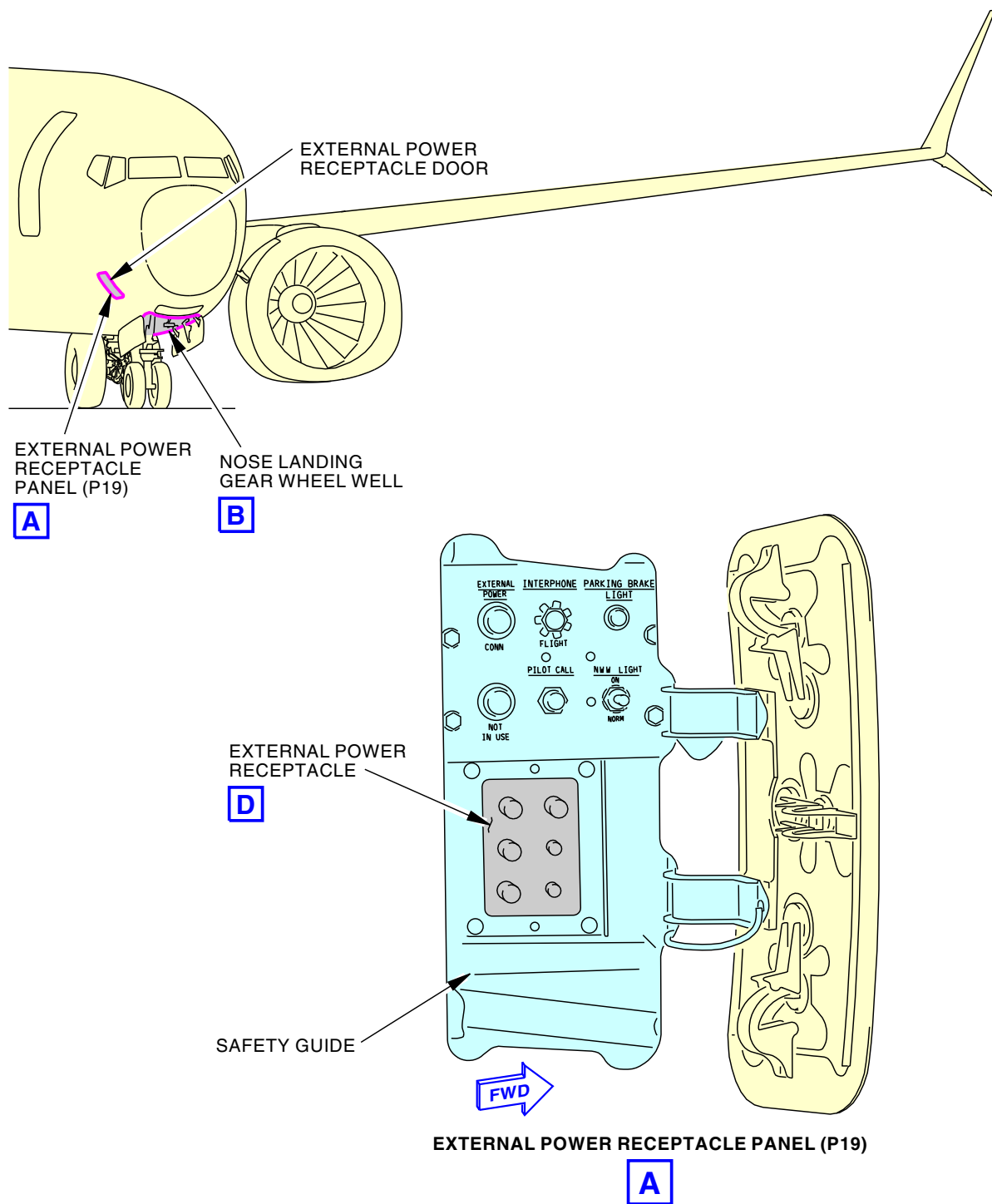
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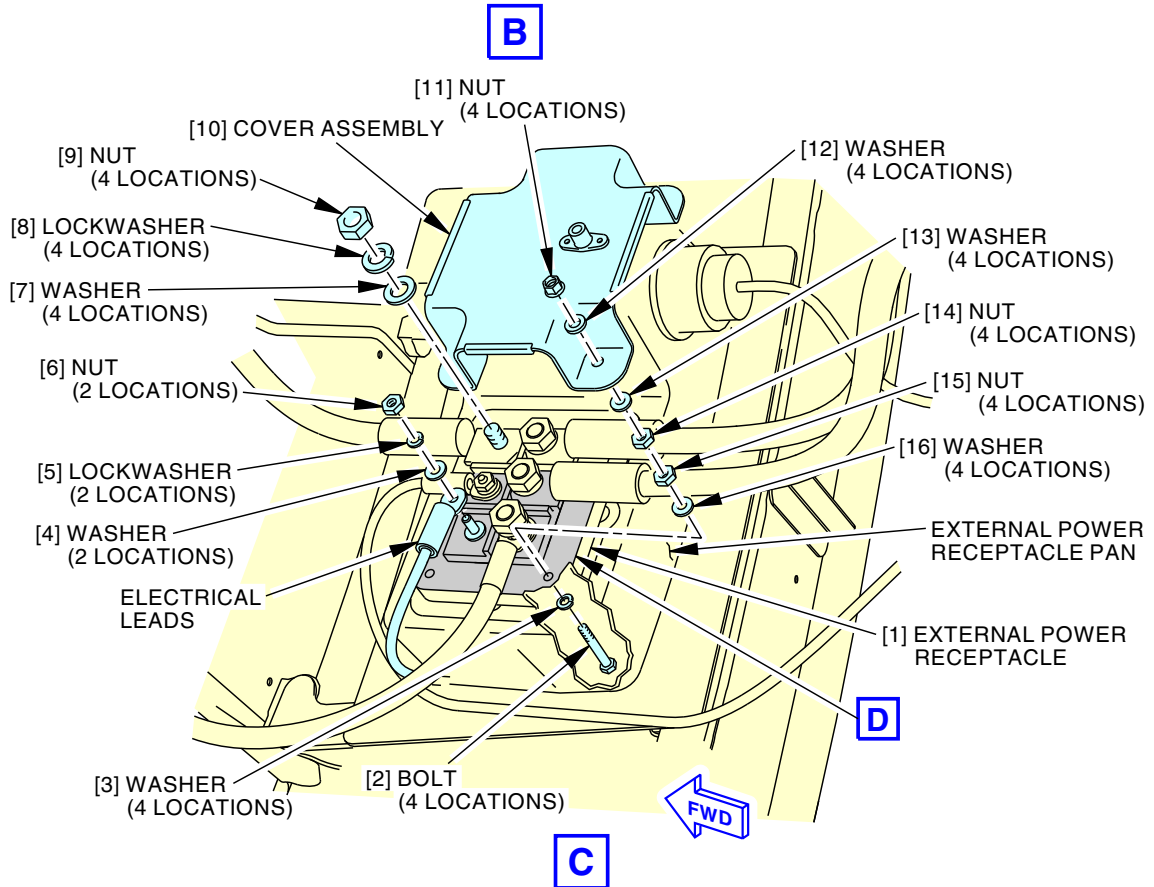
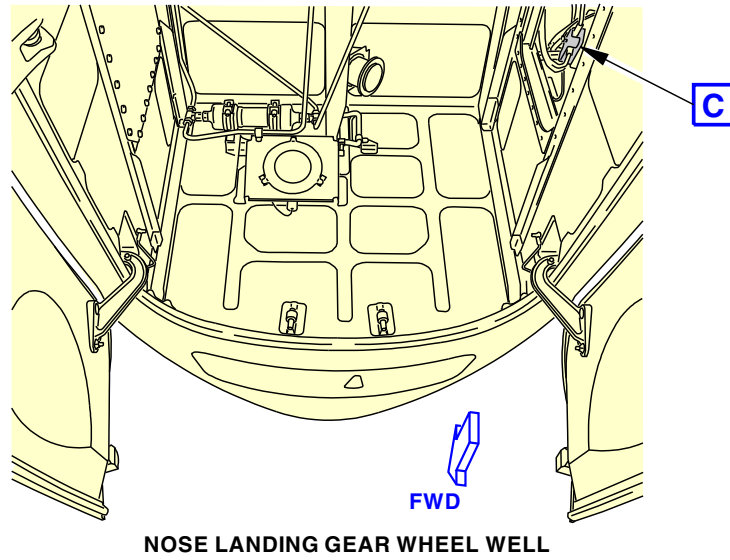
External Power Receptacle Installation
Figure 401/24-41-11-990-801 (Sheet 1 of 3)

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External Power Receptacle Installation
Figure 401/24-41-11-990-801 (Sheet 2 of 3)

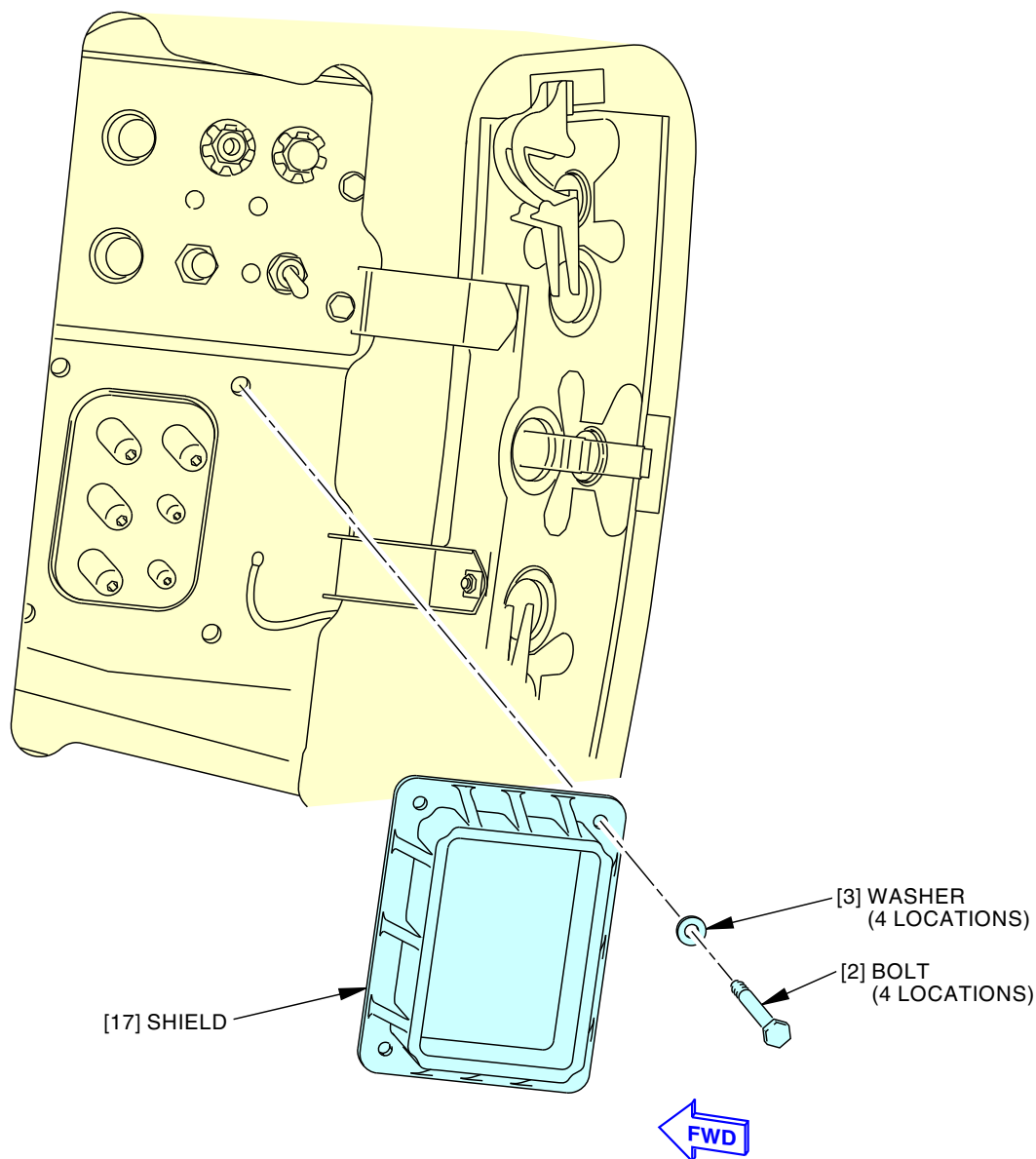
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**EXTERNAL POWER RECEPTACLE
(BACK SIDE)
(EXAMPLE)**

D

2411801 S00061529088_V3

**External Power Receptacle Installation
Figure 401/24-41-11-990-801 (Sheet 3 of 3)**

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TASK 24-41-11-400-801

3. External Power Receptacle Installation

(Figure 401)

A. General

- (1) The External Power Receptacle is located on the lower right hand side of the airplane. It is installed forward of the nose gear wheel well.
- (2) The External Power Receptacle is part of the pressure seal of the airplane. You must seal the receptacle when installing it.

B. References

Reference	Title
05-51-91-790-801	Cabin Pressure Leak Test (P/B 201)
24-22-00-860-803	Supply External Power (P/B 201)
51-22-00-390-802	Removable Faying (Mated) Surface Seal Application (P/B 201)
51-22-00-390-806	Fillet Seal Application (P/B 201)
53-14-01-420-801	Nose Wheel Well Access Panels Installation (P/B 401)

C. Consumable Materials

Reference	Description	Specification
A00247	Sealant - Pressure And Environmental - Chromate Type	BMS5-95
A02315	Sealant - Low Density, Synthetic Rubber. 2 Part	BMS5-142 Type II
G50365	Agent - Peelable Parting (AC Products - AC962-73C) Production discontinued, use stock until depleted.	BAC5000
G50366	Agent - Parting, Peelable, AZ 534-2B (0A3C8 - Aztec Chemical, Inc., El Monte, CA)	BAC5000, PSD 6-187
G50367	Agent - Peelable Parting (Aztec Chemical AZ 634-2)	MIL-PRF-6799, BAC5000
G50368	Agent - Peelable Parting (Rexco Chemical Company - Partall Coverall Film)	BAC5000
G50369	Coating - Alkaline Removable, Water Resistant	BMS15-12 Type I Class 1
G51368	Agent - Protective, Sprayable Strippable Coating - Spraylat SC-1071H-1 (Blue Color)	BAC5000

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	External power receptacle	24-41-11-01C-080	SIA ALL

E. Location Zones

Zone	Area
114	Area Above and Outboard of Nose Landing Gear Wheel Well - Right

F. Access Panels

Number	Name/Location
114AR	External Power Receptacle Door

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G. External Power Receptacle Installation

SUBTASK 24-41-11-420-001

- (1) Do these steps to install the external power receptacle [1]:
 - (a) Apply one of the parting agents listed to the surface of the external power receptacle [1] that touches the receptacle pan:
 - 1) AC962-73C peelable parting agent, G50365
 - 2) peelable parting agent, G50366
 - 3) AZ 634-2 peelable parting agent, G50367
 - 4) Spraylat SC-1071H-1 agent, G51368
 - 5) Rexco Partall Coverall Film peelable parting agent, G50368
 - 6) temporary coating, G50369.
 - (b) When the parting agent is dry to touch, apply sealant, A00247, to the surface of the external power receptacle [1] that touches the receptacle pan to make a removable faying surface seal (TASK 51-22-00-390-802).
 - (c) Put the external power receptacle [1] in its position on the receptacle pan.
 - (d) Apply sealant, A00247, to the bolts [2].
 - (e) Put the shield [17] in its position.
 - (f) Install the bolts [2], washers [3], and washers [16] through the external power receptacle [1], shield [17], and receptacle pan.
 - (g) Install the nuts [15].
 - 1) Tighten the nuts [15].
 - (h) Install the nuts [14].
 - 1) Tighten the nuts [14].
 - (i) Apply sealant, A02315, to the edge of the external power receptacle [1] to make a fillet seal (TASK 51-22-00-390-806).

SUBTASK 24-41-11-420-002



PUT AN IDENTIFIER ON THE WIRES ON EACH SIDE OF THE ELECTRICAL CONNECTION BEFORE YOU DISCONNECT. IF YOU CONNECT THEM AT AN INCORRECT LOCATION, DAMAGE TO THE COMPONENTS WILL OCCUR.



DO NOT INSTALL WASHERS BELOW THE ELECTRICAL LEAD TERMINAL LUGS. THIS WILL CAUSE HEAT AND DAMAGE TO THE TERMINAL STUDS.

- (2) Do these steps to connect the electrical leads to the external power receptacle [1]:
 - (a) Install the electrical leads onto receptacle studs.
 - (b) Install the washers [4], lockwashers [5], and nuts [6].
 - 1) Tighten the nuts [6] to 21 ± 1 in-lb (2.37 ± 0.12 N·m).
 - (c) Install the washers [7], lockwashers [8], and nuts [9].
 - 1) Tighten the nuts [9] to 122.5 ± 2.5 in-lb (13.84 ± 0.28 N·m).
 - (d) Remove the identification tags from the electrical leads.
 - (e) Install the washers [13].

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- (f) Put the cover assembly [10] in its position.
- (g) Install the washers [12] and nuts [11].
 - 1) Tighten the nuts [11].

SUBTASK 24-41-11-420-003

- (3) Close the access panel on the forward right hand side of the nose gear wheel well, do this task: Nose Wheel Well Access Panels Installation, TASK 53-14-01-420-801.

H. External Power Receptacle Installation Test

SUBTASK 24-41-11-860-002

- (1) Do this task: Supply External Power, TASK 24-22-00-860-803.

SUBTASK 24-41-11-860-003

- (2) Make sure that external power comes on line and operates correctly.

I. Cabin Pressure Leak Test

SUBTASK 24-41-11-700-001

- (1) Make sure that there are no air leaks, do this task: Cabin Pressure Leak Test, TASK 05-51-91-790-801.

J. Put the Airplane Back to Its Usual Condition

SUBTASK 24-41-11-410-001

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
114AR	External Power Receptacle Door

————— **END OF TASK** —————

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EXTERNAL POWER RECEPTACLE - INSPECTION/CHECK

1. General

A. This procedure has these tasks:

- (1) External Power Receptacle - Internal Inspection.
- (2) External Power Receptacle - External Inspection.
- (3) External Power Receptacle Pin Inspection.
- (4) External Power Receptacle Neutral Pin To Ground Continuity Check.

TASK 24-41-11-200-801

2. External Power Receptacle - Internal Inspection

(Figure 601)

A. **General**

- (1) The External Power Receptacle is located on the lower right hand side of the airplane. It is installed forward of the nose gear wheel well.
- (2) The External Power Receptacle Inspection looks for visual wear such as cracks in the base and corroded and pitted pins. This inspection also makes sure that the terminals are correctly installed on the studs and that the torque is correct.

B. **References**

Reference	Title
24-22-00-860-802	Remove Electrical Power (P/B 201)
53-14-01-020-801	Nose Wheel Well Access Panels Removal (P/B 401)
53-14-01-420-801	Nose Wheel Well Access Panels Installation (P/B 401)

C. **Location Zones**

Zone	Area
114	Area Above and Outboard of Nose Landing Gear Wheel Well - Right

D. **Access Panels**

Number	Name/Location
114AR	External Power Receptacle Door

E. **Prepare for Inspection**

SUBTASK 24-41-11-860-005

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-802.

SUBTASK 24-41-11-010-006

- (2) Open this access panel:

Number	Name/Location
114AR	External Power Receptacle Door

SUBTASK 24-41-11-010-007

- (3) Remove external power plug from receptacle, if it is installed.

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SUBTASK 24-41-11-930-003



PUT A DO-NOT-OPERATE TAG ON THE EXTERNAL POWER RECEPTACLE. IF YOU DO NOT OBEY THIS INSTRUCTION, INJURIES TO PERSONS CAN OCCUR.

- (4) Attach a DO-NOT-OPERATE tag to the external power receptacle.

SUBTASK 24-41-11-010-008

- (5) Remove the access panel on forward right hand side of nose gear wheel well:
- (a) To get access to the back of the receptacle, do this task: Nose Wheel Well Access Panels Removal, TASK 53-14-01-020-801.

SUBTASK 24-41-11-010-009

- (6) Remove the cover assembly [1] as follows:
- (a) Remove the four nuts [2] and washers [3] that hold the cover assembly [1].
- (b) Remove cover assembly [1] for access to receptacle.

F. External Power Receptacle Internal Inspection

SUBTASK 24-41-11-210-001

- (1) Inspect the external power receptacle from the outside of airplane as follows:
- (a) Look for cracks or other damage on the receptacle base.
- (b) Look for loose, bent or cracked pins.
- (c) Look for discolored, corroded or pitted pins.

NOTE: Discoloration of pins is due to excessive heat, which is caused by excessive corrosion and poor contact between pin and socket. The receptacle should be replaced if this is found.

SUBTASK 24-41-11-210-002

- (2) Inspect the external power receptacle from the inside of airplane as follows:
- (a) Look for discoloration of the receptacle studs and electrical leads.



DO NOT INSTALL WASHERS BELOW THE ELECTRICAL LEAD TERMINAL LUGS. THIS WILL CAUSE HEAT AND SUBSEQUENT DAMAGE TO RECEPTACLE STUDS.

- (b) Make sure that the electrical leads are correctly installed onto receptacle studs.
- (c) Look for loose nuts on receptacle studs.
- 1) Make sure that the nuts from the receptacle studs A, B, C, and N are tightened to 122.5 ± 2.5 in-lb (13.84 ± 0.28 N·m).
- 2) Make sure that the nuts from the receptacle studs E and F are tightened to 21 ± 1 in-lb (2.37 ± 0.12 N·m).

SUBTASK 24-41-11-410-003

- (3) Install the cover assembly [1] as follows:
- (a) Put the cover assembly [1] in its position.
- (b) Install the washers [3] and nuts [2].
- (c) Tighten the nuts.

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SUBTASK 24-41-11-410-004

- (4) Do this task to close the access panel on the forward right hand side of the nose gear wheel well: Nose Wheel Well Access Panels Installation, TASK 53-14-01-420-801.

SUBTASK 24-41-11-410-005

- (5) Remove the DO-NOT-OPERATE tag from the external power receptacle, and close this access panel:

<u>Number</u>	<u>Name/Location</u>
114AR	External Power Receptacle Door

————— **END OF TASK** —————

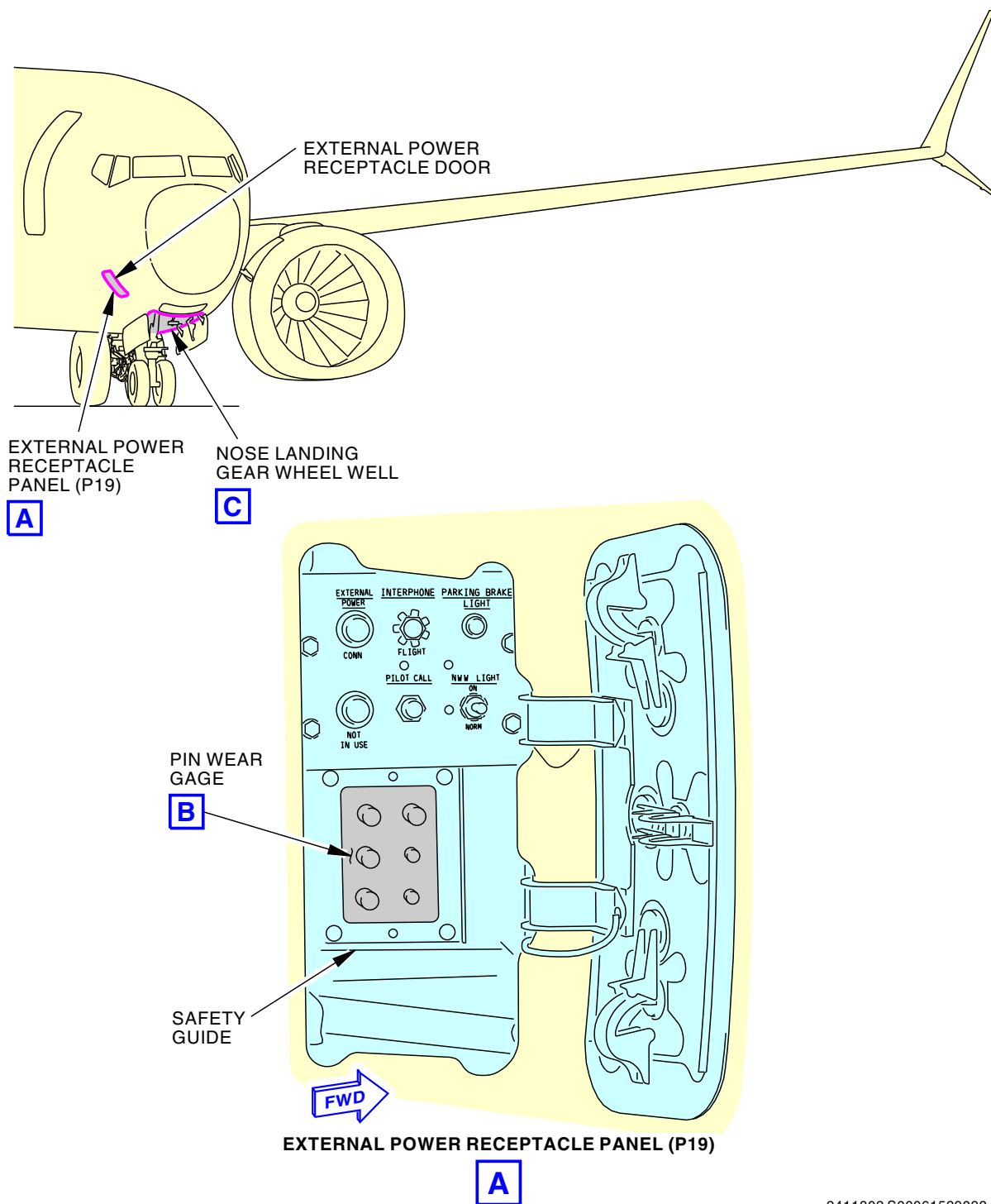
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External Power Receptacle Inspection
Figure 601/24-41-11-990-802 (Sheet 1 of 4)

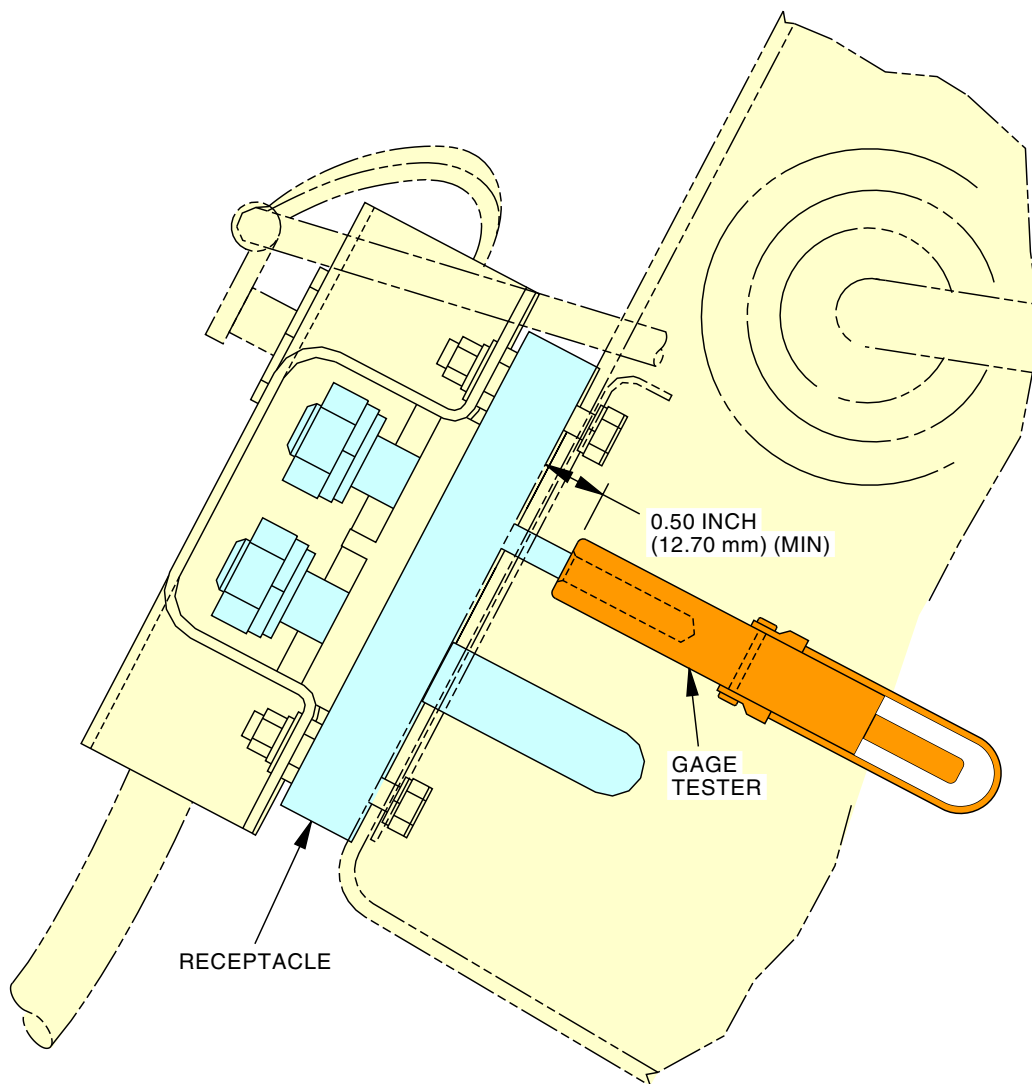
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PIN WEAR GAGE

B

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External Power Receptacle Inspection
Figure 601/24-41-11-990-802 (Sheet 2 of 4)

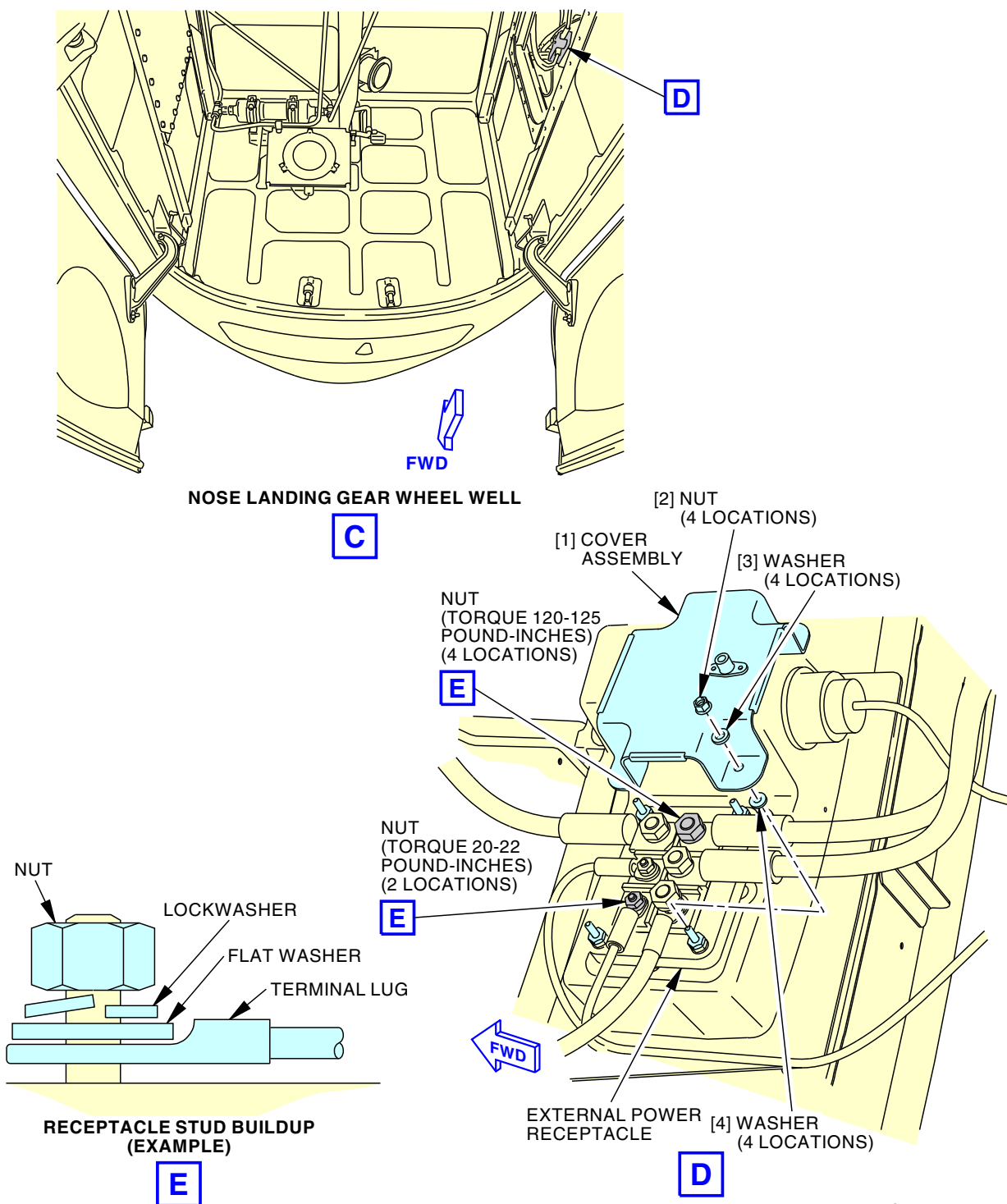
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External Power Receptacle Inspection
Figure 601/24-41-11-990-802 (Sheet 3 of 4)

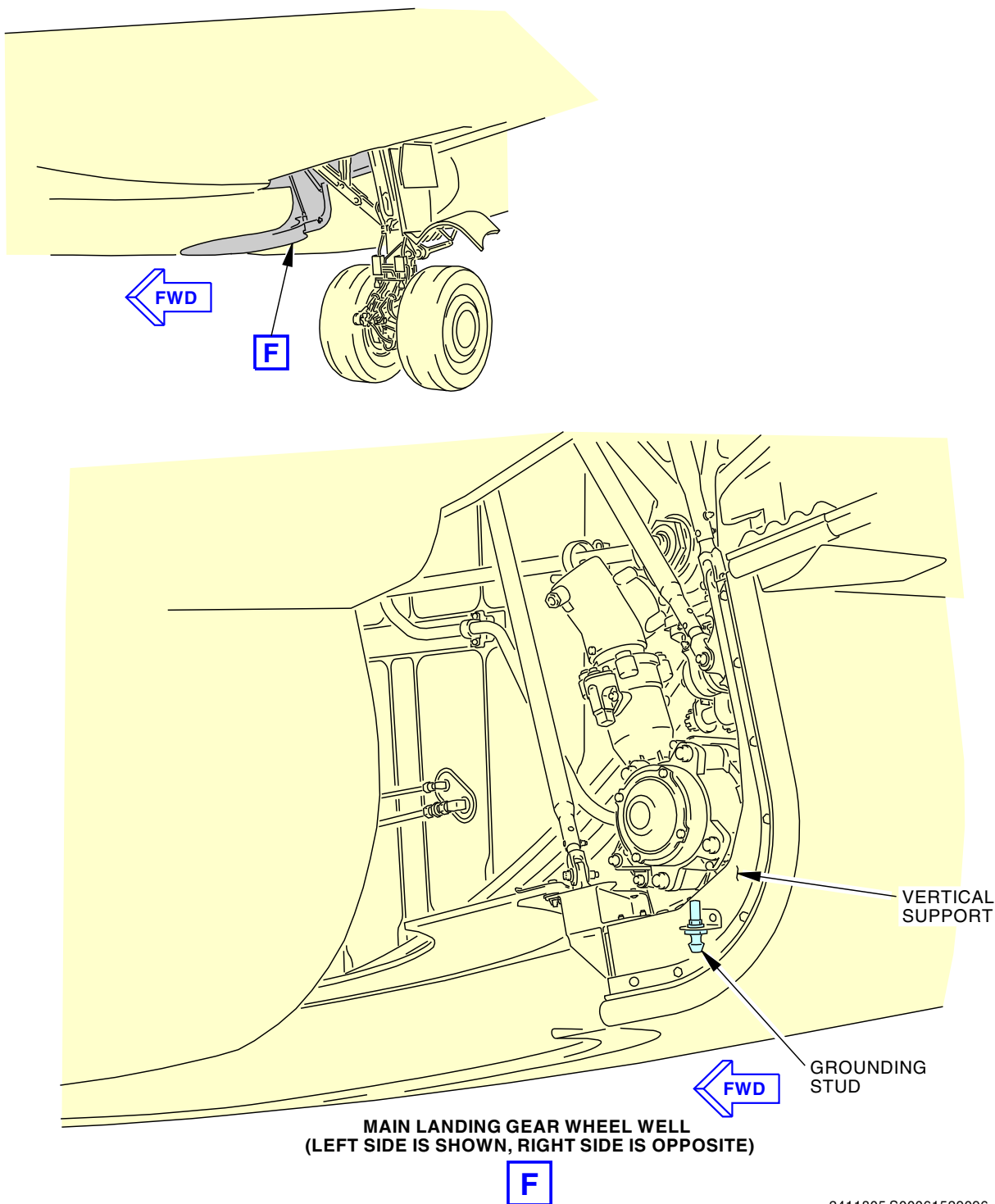
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**External Power Receptacle Inspection
Figure 601/24-41-11-990-802 (Sheet 4 of 4)**

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TASK 24-41-11-200-802

3. External Power Receptacle - External Inspection

(Figure 602)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) The external power receptacle is located on the lower right hand side of the airplane. It is installed forward of the nose gear wheel well.

B. References

Reference	Title
24-22-00-860-802	Remove Electrical Power (P/B 201)
24-41-11-000-801	External Power Receptacle Removal (P/B 401)
24-41-11-400-801	External Power Receptacle Installation (P/B 401)

C. Location Zones

Zone	Area
114	Area Above and Outboard of Nose Landing Gear Wheel Well - Right

D. Access Panels

Number	Name/Location
114AR	External Power Receptacle Door

E. External Power Receptacle External Inspection

SUBTASK 24-41-11-860-006

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-802.

SUBTASK 24-41-11-010-010

- (2) Open this access panel:

Number	Name/Location
114AR	External Power Receptacle Door

SUBTASK 24-41-11-860-007

- (3) If it is installed, remove external power plug from receptacle.

SUBTASK 24-41-11-210-003

- (4) Do these steps to examine the receptacles from the outer side of the airplane:
- (a) Make sure that the pins are not loose.
 - (b) Look for pins that are bent or have a crack.
 - (c) Look for damage or cracks on the base insulation.
 - (d) Look for discolored, burned, or pitted pins.
 - (e) If the pins are loose or damaged, do these tasks:
 - External Power Receptacle Removal, TASK 24-41-11-000-801
 - External Power Receptacle Installation, TASK 24-41-11-400-801.

SUBTASK 24-41-11-410-006

- (5) Close this access panel:

Number	Name/Location
114AR	External Power Receptacle Door

————— END OF TASK —————

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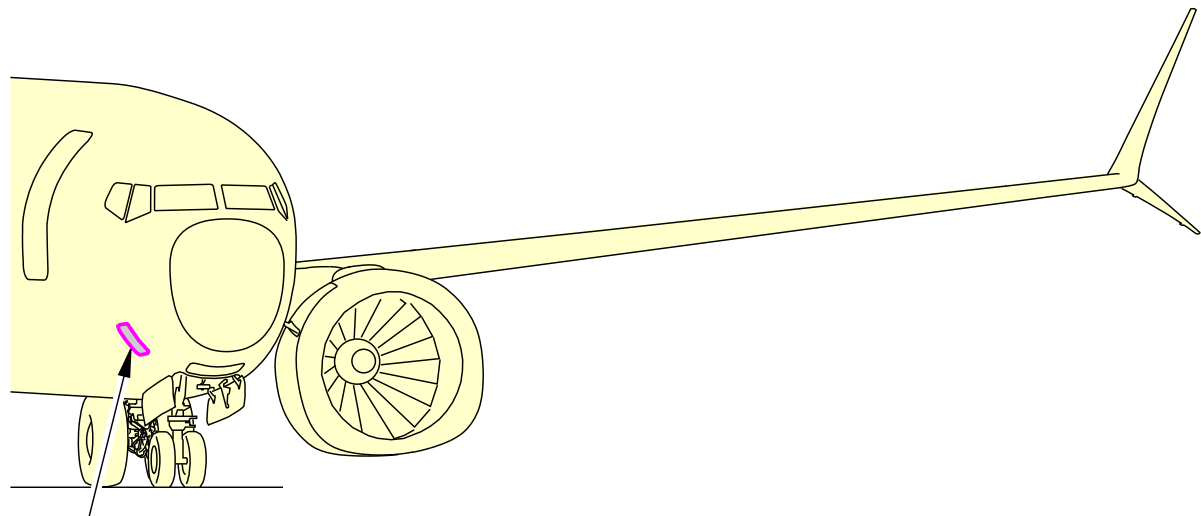
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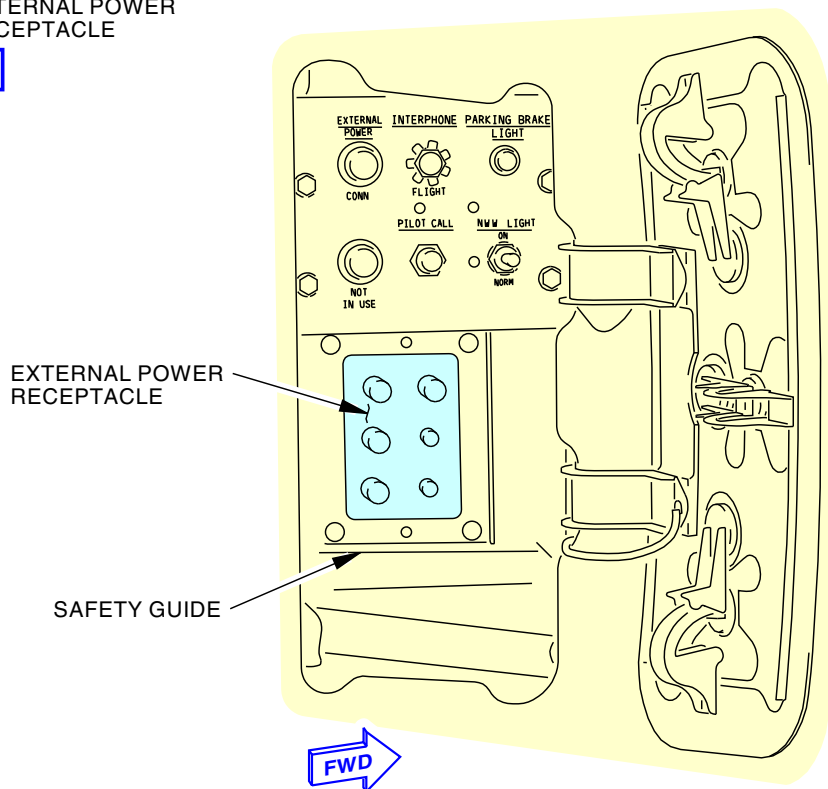
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BOEING
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EXTERNAL POWER
RECEPTACLE

A



EXTERNAL POWER
RECEPTACLE

SAFETY GUIDE



EXTERNAL POWER RECEPTACLE

A

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External Power Receptacle Inspection
Figure 602/24-41-11-990-803

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TASK 24-41-11-200-803

4. External Power Receptacle Pin Inspection

(Figure 601)

NOTE: This procedure is a scheduled maintenance task.

A. General

- (1) The external power receptacle is located on the lower right hand side of the airplane. It is installed forward of the nose gear wheel well.
- (2) The external power receptacle pin inspection uses a GO/NO-GO gauge to make sure that the pins are not worn. If the pins are worn, the external power receptacle should be replaced.

B. References

Reference	Title
24-22-00-860-802	Remove Electrical Power (P/B 201)
24-41-11-000-801	External Power Receptacle Removal (P/B 401)
24-41-11-400-801	External Power Receptacle Installation (P/B 401)

C. Tools/Equipment

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

Reference	Description
SPL-1625	Wear Gage Set - Ground Power Plug and Receptacle Part #: F70284-1 Supplier: 81205

D. Location Zones

Zone	Area
114	Area Above and Outboard of Nose Landing Gear Wheel Well - Right

E. Access Panels

Number	Name/Location
114AR	External Power Receptacle Door

F. Procedure

SUBTASK 24-41-11-860-008

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-802.

SUBTASK 24-41-11-010-011

- (2) Open this access panel:

Number	Name/Location
114AR	External Power Receptacle Door

SUBTASK 24-41-11-010-012

- (3) Remove external power plug from receptacle, if it is installed.

SUBTASK 24-41-11-220-001

- (4) Inspect the external power receptacle pins for wear as follows:

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DO NOT USE TOO MUCH FORCE WHEN PUSHING THE WEAR GAGE ONTO THE PINS. THE WEAR GAGE IS A GO/NO GO TOOL AND SHOULD NOT FIT OVER THE PINS. THE USE OF TOO MUCH FORCE COULD CAUSE DAMAGE TO PINS.

- (a) Try to slide the wear gage set, SPL-1625 over the external power receptacle pins.

NOTE: The F70284-1 is a gage set. Use the -2 on the four large pins A, B, C and N. Use the -3 on the two small pins E and F.

- (b) Make sure the gage does not slide over the pins. If the gage slides over the pins to within 0.50 inch of the face of the receptacle, do the applicable tasks:

- 1) External Power Receptacle Removal, TASK 24-41-11-000-801.

External Power Receptacle Installation, TASK 24-41-11-400-801.

SUBTASK 24-41-11-410-007

- (5) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
114AR	External Power Receptacle Door

————— END OF TASK —————

TASK 24-41-11-200-804

5. External Power Receptacle Neutral Pin to Ground Continuity Check

(Figure 601)

A. General

- (1) The External Power Receptacle is located on the lower right hand side of the airplane. It is installed forward of the nose gear wheel well.
- (2) The External Power Receptacle Neutral Pin to Ground Continuity Check uses a low resistance ohm meter to measure the resistance between the neutral pin and a ground stud located on the main landing gear wheel well.

B. References

<u>Reference</u>	<u>Title</u>
24-22-00-860-802	Remove Electrical Power (P/B 201)

C. Tools/Equipment

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

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Reference	Description
COM-1793	Multimeter - Digital/Analog (or equivalent meter meets task requirements) Part #: 117 Supplier: 89536 Part #: 260-8XPI Supplier: 55026 Part #: 287 Supplier: 89536 Part #: 289 Supplier: 89536 Part #: 87V Supplier: 89536 Part #: FLUKE 27 II Supplier: 89536 Part #: FLUKE-77-4 Supplier: 89536 Opt Part #: 187 Supplier: 89536 Opt Part #: 189 Supplier: 89536 Opt Part #: 21 Supplier: 89536 Opt Part #: 27 Supplier: 89536 Opt Part #: 77 SERIES III Supplier: 89536 Opt Part #: 87 Supplier: 89536 Opt Part #: FLUKE 27 Supplier: 89536 Opt Part #: MODEL 27 Supplier: 89536

D. Location Zones

Zone	Area
114	Area Above and Outboard of Nose Landing Gear Wheel Well - Right

E. Access Panels

Number	Name/Location
114AR	External Power Receptacle Door

F. Procedure

SUBTASK 24-41-11-860-009

(1) Do this task: Remove Electrical Power, TASK 24-22-00-860-802.

SUBTASK 24-41-11-010-013

(2) Open this access panel if it is closed:

Number	Name/Location
114AR	External Power Receptacle Door

SUBTASK 24-41-11-010-014

(3) Remove External Power Plug from receptacle, if it is installed.

SUBTASK 24-41-11-760-001

(4) Do the Neutral Pin to Ground Continuity Check as follows:

- Use a low resistance digital/analog multimeter, COM-1793, to measure the resistance between the neutral pin on the external power receptacle and the ground stud located on the main landing gear wheel well.
- Make sure that the resistance does not exceed 0.1 ohms.
- If the Resistance measurement exceeds 0.1 ohms, do the steps that follow:
 - Do this task: External Power Receptacle - Internal Inspection, TASK 24-41-11-200-801.
 - Do this task: External Power Receptacle Pin Inspection, TASK 24-41-11-200-803.
 - If the problem continues repair the wiring between the external power receptacle neutral pin and airplane ground.

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G. Put airplane back to its usual condition.

SUBTASK 24-41-11-410-008

(1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
114AR	External Power Receptacle Door

————— END OF TASK —————

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EXTERNAL POWER CONTACTOR - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
- (1) A removal of the External Power Contactor
 - (2) An installation of the External Power Contactor.

TASK 24-41-12-000-801

2. External Power Contactor Removal

(Figure 401)

A. **General**

- (1) The External Power Contactor (EPC), C937 is located in the P92 Power Distribution Panel.

B. **References**

Reference	Title
24-22-00-860-802	Remove Electrical Power (P/B 201)

C. **Location Zones**

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right

D. **Access Panels**

Number	Name/Location
114AR	External Power Receptacle Door
117A	Electronic Equipment Access Door

E. **Prepare for the Removal**

SUBTASK 24-41-12-860-001



WARNING

REMOVE ELECTRICAL POWER BEFORE YOU REMOVE OR INSTALL COMPONENTS IN THE POWER DISTRIBUTION PANELS. THERE ARE HIGH VOLTAGES THAT CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-802.

SUBTASK 24-41-12-010-001

- (2) Open this access panel and attach a DO-NOT-OPERATE tag to External Power Receptacle:

<u>Number</u>	<u>Name/Location</u>
114AR	External Power Receptacle Door

SUBTASK 24-41-12-010-002

- (3) Open this access panel to get access to the main equipment center:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

F. **External Power Contactor Removal**

SUBTASK 24-41-12-020-001

- (1) Do these steps to remove the external power contactor [1]:

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WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



MAKE SURE THAT ALL OF THE POWER WARNING LIGHTS ON THE POWER DISTRIBUTION PANEL ARE OFF. THERE ARE HIGH VOLTAGES IN THE POWER DISTRIBUTION PANEL THAT CAN CAUSE INJURIES TO PERSONNEL.



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.

- (a) Make sure that all of the power warning lights, on the P92 power distribution panel, are off.
- (b) Open the P92 panel for access to the external power contactor [1].
- (c) Loosen the two screws and remove the electrical connector from the external power contactor [1].
- (d) Remove the six bolts [2] and washers [3] that hold the external power contactor [1].
- (e) Remove the external power contactor [1].

————— **END OF TASK** —————

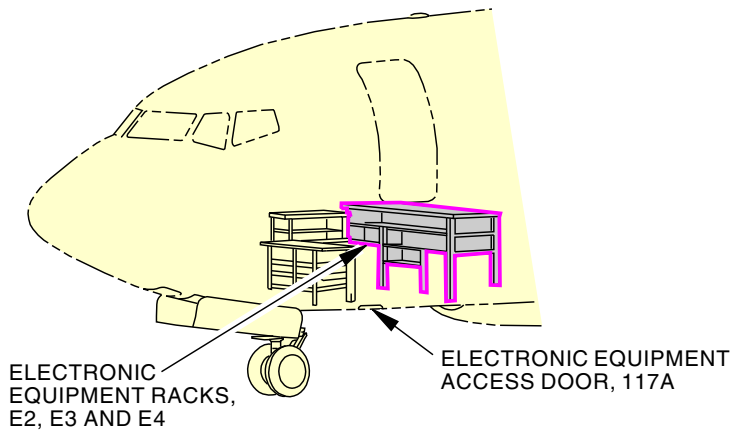
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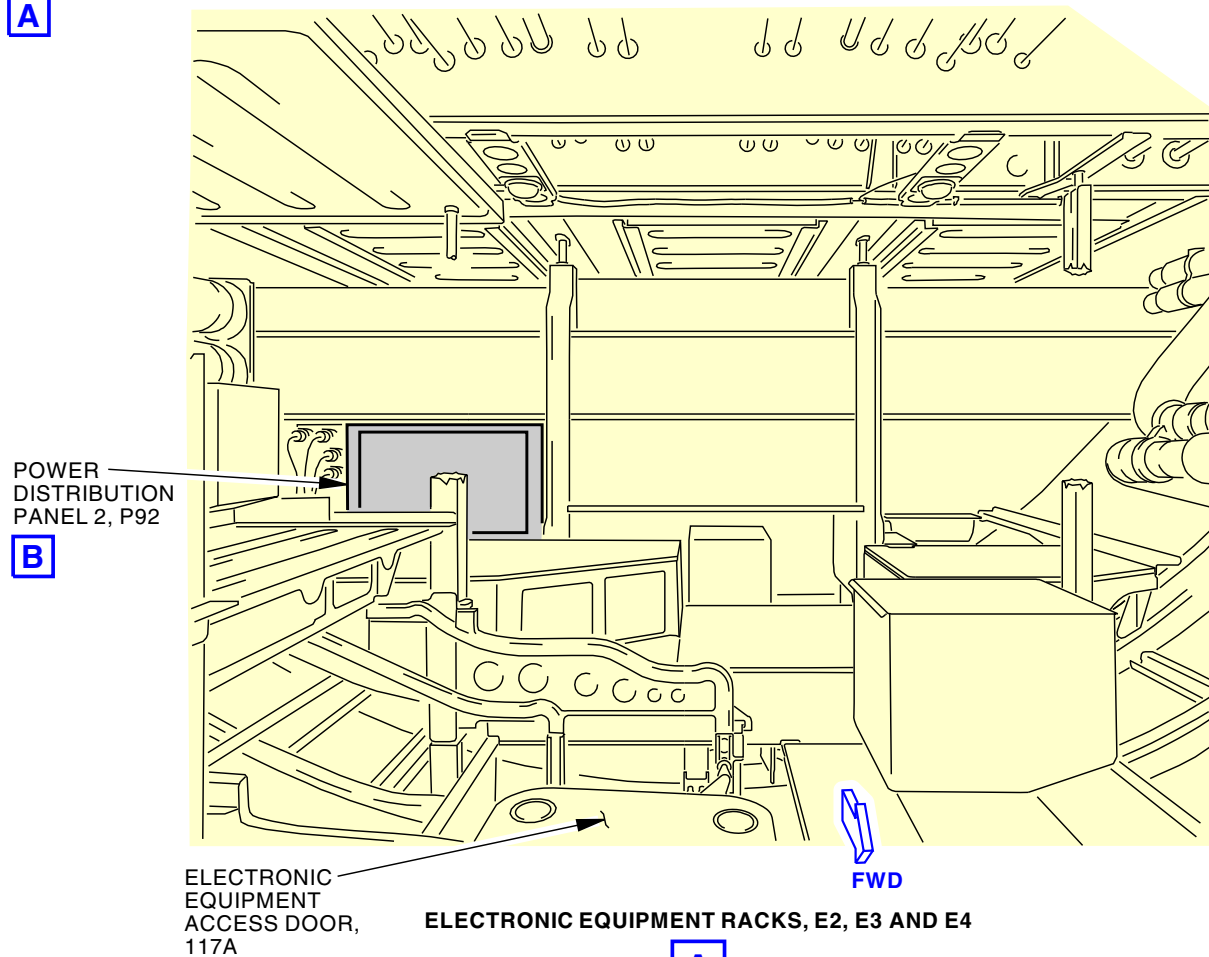
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A



B

A

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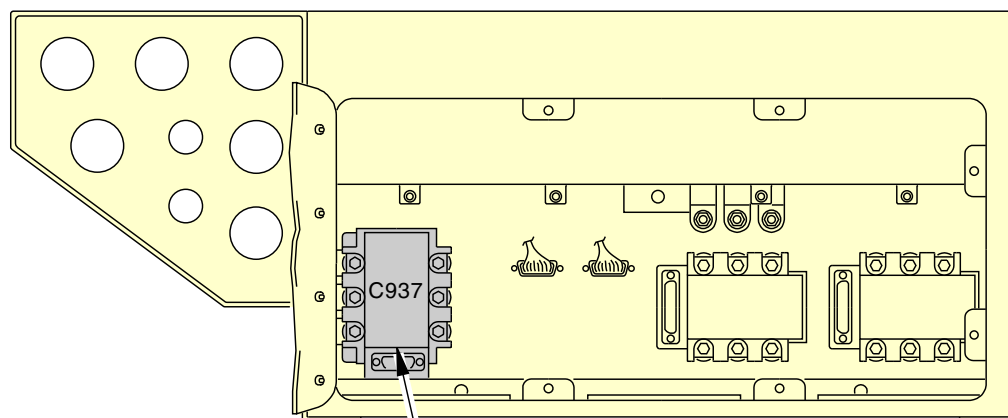
External Power Contactor Installation
Figure 401/24-41-12-990-801 (Sheet 1 of 2)

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[1] EXTERNAL POWER
CONTACTOR

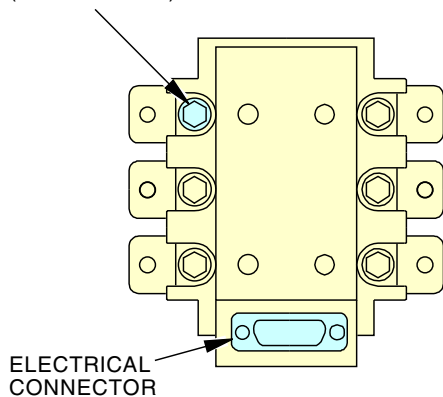
C



POWER DISTRIBUTION PANEL 2, P92

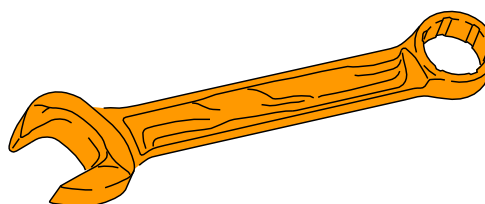
B

[2] BOLT
[3] WASHER
(6 LOCATIONS)

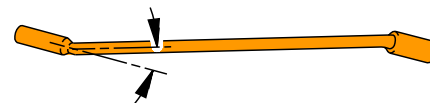


ELECTRICAL
CONNECTOR

C



APPROXIMATE 15°



5mm-WRENCH **1**

1 USE 5mm-WRENCH TO HOLD THE SPACER NUTS IN PLACE WHILE
LOOSENING THE SCREWS ON THE ELECTRICAL CONNECTOR.
FAILURE TO USE WRENCH COULD RESULT IN DAMAGE TO HARDWARE.

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External Power Contactor Installation
Figure 401/24-41-12-990-801 (Sheet 2 of 2)

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TASK 24-41-12-400-801

3. External Power Contactor Installation

(Figure 401)

A. General

- (1) The External Power Contactor (EPC), C937 is located in the P92 Power Distribution Panel.

B. References

Reference	Title
24-22-00-860-802	Remove Electrical Power (P/B 201)

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right

D. Access Panels

Number	Name/Location
114AR	External Power Receptacle Door
117A	Electronic Equipment Access Door

E. Prepare for the Installation

SUBTASK 24-41-12-860-002



WARNING

REMOVE ELECTRICAL POWER BEFORE YOU REMOVE OR INSTALL COMPONENTS IN THE POWER DISTRIBUTION PANELS. THERE ARE HIGH VOLTAGES THAT CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Make sure that the electrical power is removed.

F. External Power Contactor Installation

SUBTASK 24-41-12-420-001

- (1) Do these steps to install the external power contactor [1]:



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



WARNING

MAKE SURE THAT ALL OF THE POWER WARNING LIGHTS ON THE POWER DISTRIBUTION PANEL ARE OFF. THERE ARE HIGH VOLTAGES IN THE POWER DISTRIBUTION PANEL THAT CAN CAUSE INJURIES TO PERSONNEL.

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(WARNING PRECEDES)



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.

- (a) Make sure that all of the power warning lights, on the P92 power distribution panel, are off.
- (b) Hold the external power contactor [1] in its position and install the six bolts [2] and washers [3].
- (c) Tighten the bolts to 48 ± 4 in-lb (5 ± 1 N·m).
- (d) Install the electrical connector on the external power contactor [1] and tighten the two screws on the connector.
- (e) Close the access door on the P92 panel.

SUBTASK 24-41-12-410-001

- (2) Remove the DO-NOT-OPERATE tag from External Power Receptacle and close this access panel:

<u>Number</u>	<u>Name/Location</u>
114AR	External Power Receptacle Door

G. External Power Contactor Installation Test

SUBTASK 24-41-12-700-001

- (1) Do a check of the External Power Contactor as follows:
 - (a) Connect an external power source to the external power receptacle on the P19 panel.
 - (b) Make sure that the EXTERNAL POWER CONN and NOT IN USE lights on the P19 panel come on.
 - (c) Make sure that the BAT switch on the P5-13 panel set to the ON position.
 - (d) Make sure that the GRD POWER AVAILABLE light on the P5-4 panel is ON.
 - (e) Set the GRD PWR switch on the P5-4 panel to the ON position.
 - (f) Make sure that the GRD POWER AVAILABLE light on the P5-4 panel stays on.
 - (g) Make sure that the two TRANSFER BUS OFF lights on the P5-4 panel go off.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 24-41-12-410-002

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

SUBTASK 24-41-12-860-003

- (2) Do this task: Remove Electrical Power, TASK 24-22-00-860-802.

————— END OF TASK —————

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BUS POWER CONTROL UNIT (BPCU) - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
- (1) A removal of the BPCU
 - (2) An installation of the BPCU.

TASK 24-41-21-000-801

2. Bus Power Control Unit (BPCU) - Removal

(Figure 401)

A. **General**

- (1) The BPCU, G15 is on the E4-2 equipment rack in the main equipment center.

B. **References**

Reference	Title
20-10-07-000-801	E/E Box Removal (P/B 401)
20-40-12-000-802	ESDS Handling for Metal Encased Unit Removal (P/B 201)

C. **Expendables/Parts**

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	BPCU	24-41-21-01-010	SIA ALL

D. **Location Zones**

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left

E. **Access Panels**

Number	Name/Location
117A	Electronic Equipment Access Door

F. **Prepare for Removal**

SUBTASK 24-41-21-010-001

- (1) Open this access panel to get access to the main equipment center:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

SUBTASK 24-41-21-860-002

- (2) Make sure the BAT switch on the P5-13 panel is set to the OFF position.

SUBTASK 24-41-21-860-003



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

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| (WARNING PRECEDES)



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.

- (3) Open this circuit breaker and install safety tag:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	12	C00936	EXT PWR BPCU

G. Bus Power Control Unit (BPCU) Removal

SUBTASK 24-41-21-910-001



DO NOT TOUCH THE CONTROL UNIT BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE CONTROL UNIT.

- (1) Before you touch the BPCU [1], do this task: ESDS Handling for Metal Encased Unit Removal, TASK 20-40-12-000-802.

SUBTASK 24-41-21-020-001

- (2) To remove the BPCU [1], do this task: E/E Box Removal, TASK 20-10-07-000-801.

————— **END OF TASK** —————

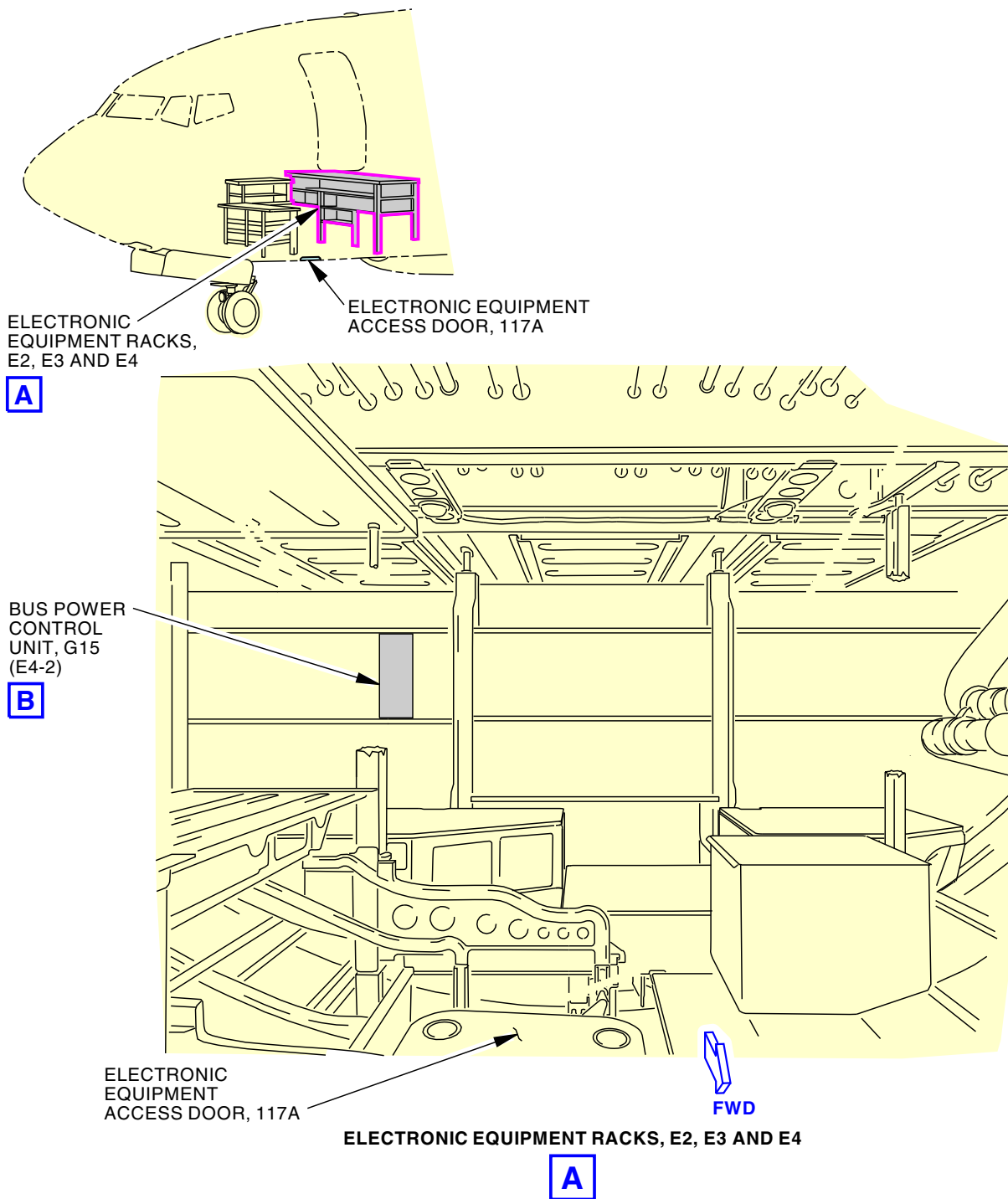
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Bus Power Control Unit (BPCU) Installation
Figure 401/24-41-21-990-801 (Sheet 1 of 2)

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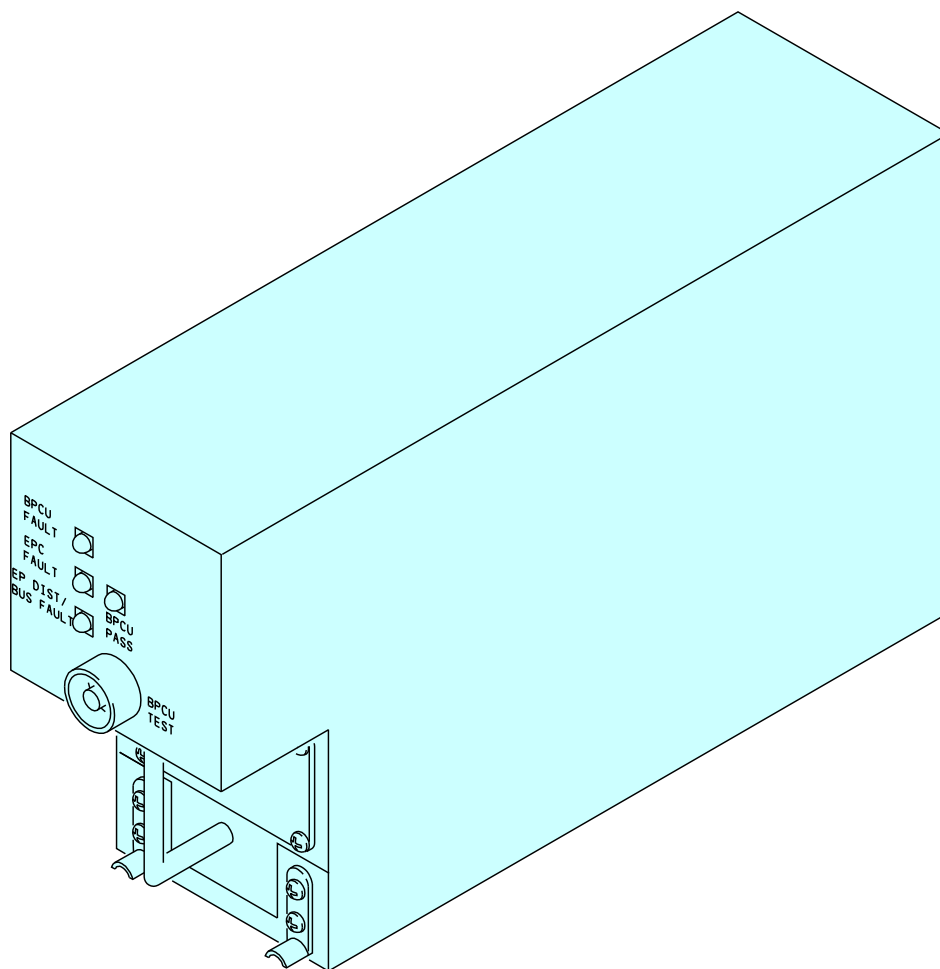
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[1] BUS POWER CONTROL UNIT

B

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Bus Power Control Unit (BPCU) Installation
Figure 401/24-41-21-990-801 (Sheet 2 of 2)

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TASK 24-41-21-400-801

3. **Bus Power Control Unit (BPCU) - Installation**

(Figure 401)

A. General

- (1) The BPCU, G15 is on the E4-2 equipment rack in the main equipment center.

B. References

Reference	Title
20-10-07-400-801	E/E Box Installation (P/B 401)
20-40-12-400-802	ESDS Handling for Metal Encased Unit Installation (P/B 201)
24-22-00-860-803	Supply External Power (P/B 201)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	BPCU	24-41-21-01-010	SIA ALL

D. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
211	Flight Compartment - Left

E. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

F. Bus Power Control Unit (BPCU) Installation

SUBTASK 24-41-21-010-002

- (1) Open this access panel if it is closed:

Number	Name/Location
117A	Electronic Equipment Access Door

SUBTASK 24-41-21-910-002



DO NOT TOUCH THE CONTROL UNIT BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE CONTROL UNIT.

- (2) Before you touch the BPCU [1], do this task: ESDS Handling for Metal Encased Unit Installation, TASK 20-40-12-400-802.

SUBTASK 24-41-21-420-001

- (3) To install the BPCU [1], do this task: E/E Box Installation, TASK 20-10-07-400-801.

SUBTASK 24-41-21-860-004



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

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(WARNING PRECEDES)



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.

- (4) Remove the safety tag and close this circuit breaker:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	12	C00936	EXT PWR BPCU

G. BPCU Installation Test

SUBTASK 24-41-21-860-006

- (1) Do this task: Supply External Power, TASK 24-22-00-860-803.

SUBTASK 24-41-21-700-001

- (2) Do a check of the BPCU [1] as follows:
- (a) Make sure that the STANDBY POWER switch on the P5-5 panel is set to the AUTO position.
 - (b) Set the BAT switch on the P5-13 panel to the ON position.
 - (c) Push the BPCU TEST switch on the BPCU [1] front panel for at least one second.
 - (d) Make sure that all four of the indicator lights on the BPCU [1] come on for approximately three seconds.
 - (e) Make sure that all four of the indicator lights on the BPCU [1] go off for approximately three seconds.
 - (f) Make sure that the green BPCU PASS light comes on for approximately seven seconds.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 24-41-21-410-001

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

SUBTASK 24-41-21-860-005

- (2) Set the BAT switch on the P5-13 panel to the OFF position.

————— **END OF TASK** —————

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LOAD SHED RELAY - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

- (1) A removal of the Load Shed Relay
- (2) An installation of the Load Shed Relay.

TASK 24-51-11-000-801

2. Load Shed Relay Removal

(Figure 401)

A. General

- (1) The load shed relays are installed in the rear part of the P91 and P92 panels. The relays are removed and installed through the forward bulkhead liners in the forward cargo area that give access to the back of the P91 and P92 panels.
- (2) There is a minimum of one or a maximum of three, (depending on airplane configuration), load shed relays installed in each of the power distribution panels (P91 and P92). Refer to Wiring Diagrams WDM 24-51-11, WDM 24-51-21.
- (3) The maximum number of load shed relays that could be installed in the P91 panel are as follows:
 - (a) R561 - MAIN BUS 1
 - (b) R605 - GALLEY BUS D
 - (c) R606 - GALLEY BUS C
- (4) The maximum number of load shed relays that could be installed in the P92 panel are as follows:
 - (a) R562 - MAIN BUS 2
 - (b) R603 - GALLEY BUS A
 - (c) R604 - GALLEY BUS B

B. References

Reference	Title
24-22-00-860-802	Remove Electrical Power (P/B 201)
WDM 24-51-11	D000534460
WDM 24-51-21	D000534461

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
121	Forward Cargo Compartment - Left
122	Forward Cargo Compartment - Right

EFFECTIVITY
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D. Prepare for Removal

SUBTASK 24-51-11-860-005



REMOVE ELECTRICAL POWER BEFORE YOU REMOVE OR INSTALL COMPONENTS IN THE POWER DISTRIBUTION PANELS. THERE ARE HIGH VOLTAGES THAT CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-802.

SUBTASK 24-51-11-010-001

- (2) Get access to the forward cargo area through the forward cargo door.
- (a) Remove the applicable forward bulkhead liner to get access to the rear-side of the power distribution panel.

E. Procedure

SUBTASK 24-51-11-020-001

- (1) Do these steps to remove the relay [1]:



MAKE SURE THAT ALL OF THE POWER WARNING LIGHTS ON THE POWER DISTRIBUTION PANEL ARE OFF. THERE ARE HIGH VOLTAGES IN THE POWER DISTRIBUTION PANEL THAT CAN CAUSE INJURIES TO PERSONNEL.

- (a) Make sure that all of the power warning lights on the power distribution panel are off.
- (b) Remove the panel cover on the rear of the power distribution panel to get access to the load shed relay.
- (c) Remove the two screws [2] that hold the terminal cover [3].
- (d) Remove the terminal cover [3].
- (e) Identify and tag the wires before you remove them.
- (f) Remove the nut [6] and lockwasher [7] from each electrical wire.
- (g) Remove the electrical wires.
- (h) Remove the four nuts [4] and washers [5] that hold the relay to the power distribution panel.
- (i) Remove the relay [1].

————— **END OF TASK** —————

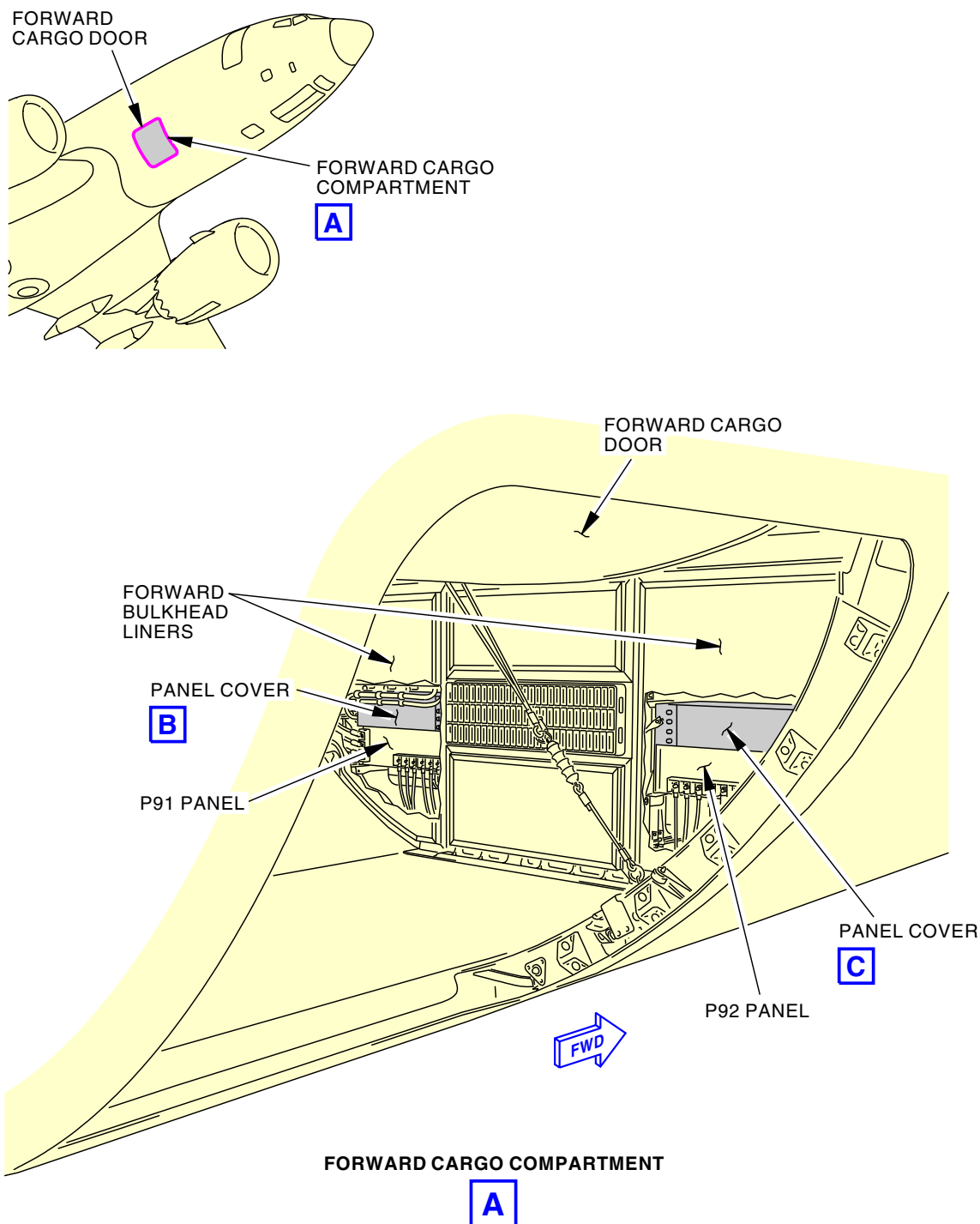
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Load Shed Relay Installation
Figure 401/24-51-11-990-801 (Sheet 1 of 3)

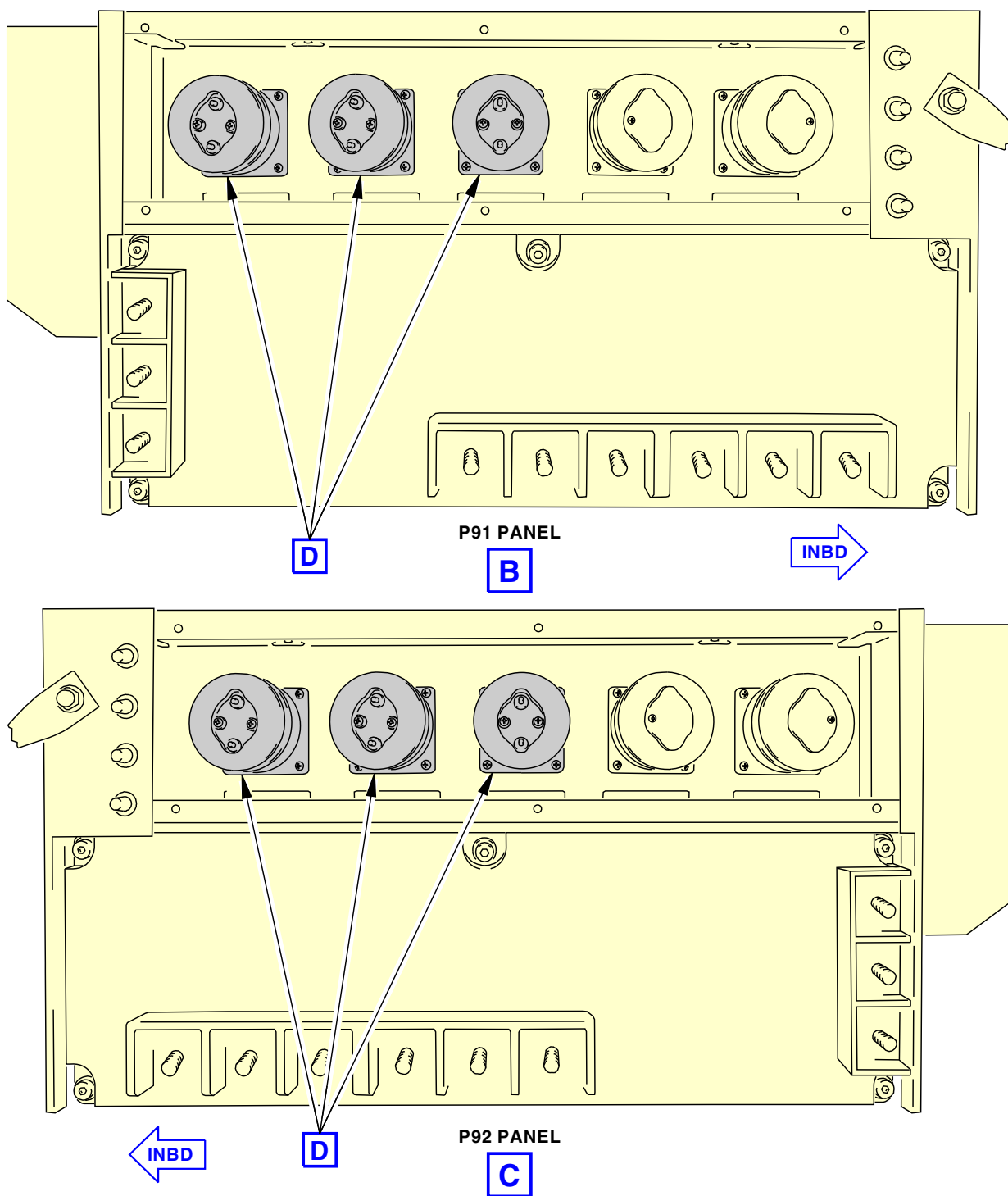
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2411811 S00061529117_V1

Load Shed Relay Installation
Figure 401/24-51-11-990-801 (Sheet 2 of 3)

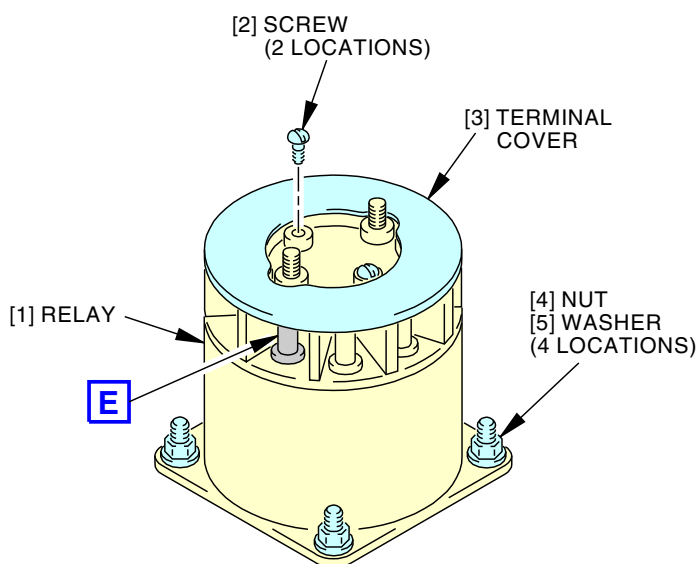
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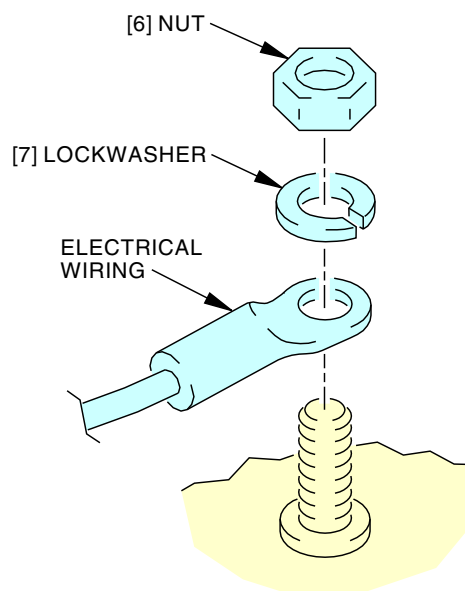
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**LOAD SHED RELAY
(EXAMPLE)**

D



**TERMINAL STUD BUILDUP
(EXAMPLE)**

2411812 S00061529118_V1

Load Shed Relay Installation
Figure 401/24-51-11-990-801 (Sheet 3 of 3)

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TASK 24-51-11-400-801

3. Load Shed Relay Installation

(Figure 401)

A. General

- (1) The load shed relays are installed in the rear part of the P91 and P92 panels. The relays are removed and installed through the forward bulkhead liners in the forward cargo area that give access to the back of the P91 and P92 panels.
- (2) There is a minimum of one or a maximum of three, (depending on airplane configuration), load shed relays installed in each of the power distribution panels (P91 and P92). Refer to Wiring Diagrams WDM 24-51-11, WDM 24-51-21.
- (3) The maximum number of load shed relays that could be installed in the P91 panel are as follows:
 - (a) R561 - MAIN BUS 1
 - (b) R605 - GALLEY BUS D
 - (c) R606 - GALLEY BUS C
- (4) The maximum number of load shed relays that could be installed in the P92 panel are as follows:
 - (a) R562 - MAIN BUS 2
 - (b) R603 - GALLEY BUS A
 - (c) R604 - GALLEY BUS B

B. References

Reference	Title
24-22-00-860-803	Supply External Power (P/B 201)
WDM 24-51-11	D000534460
WDM 24-51-21	D000534461

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Relay	30-31-51-10-015	SIA 001, 002
		30-31-51-11-015	SIA 003-999

D. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
118	Electrical and Electronics Compartment - Right
121	Forward Cargo Compartment - Left
122	Forward Cargo Compartment - Right
211	Flight Compartment - Left

E. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

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F. Prepare for Installation

SUBTASK 24-51-11-860-002



REMOVE ELECTRICAL POWER BEFORE YOU REMOVE OR INSTALL COMPONENTS IN THE POWER DISTRIBUTION PANELS. THERE ARE HIGH VOLTAGES THAT CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Make sure that electrical power is removed.

SUBTASK 24-51-11-010-002

- (2) To get access to the P91 and P92 panels, open this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

G. Load Shed Relay Installation

SUBTASK 24-51-11-420-001

- (1) Do these steps to install the relay [1]:



MAKE SURE THAT ALL OF THE POWER WARNING LIGHTS ON THE POWER DISTRIBUTION PANEL ARE OFF. THERE ARE HIGH VOLTAGES IN THE POWER DISTRIBUTION PANEL THAT CAN CAUSE INJURIES TO PERSONNEL.

- (a) Make sure that all of the power warning lights on the power distribution panel are off.
- (b) Install the relay [1] in its position.
- (c) Install the four nuts [4] and washers [5] that hold the relay to the power distribution panel.
- (d) Install the electrical wires on the terminal studs as specified by the identification tags.
- (e) Install the nut [6] and lockwasher [7] on each electrical wire.
- (f) Remove the identification tags from the wires.
- (g) Install the terminal cover [3].
- (h) Install the two screws [2] that hold the terminal cover [3].
- (i) Install the panel cover on the rear of the power distribution panel.

H. Load Shed Relay Installation Test

SUBTASK 24-51-11-860-006

- (1) Do this task: Supply External Power, TASK 24-22-00-860-803.

SUBTASK 24-51-11-710-001

- (2) If the MAIN BUS 1 or MAIN BUS 2 load shed relay was replaced, do a check as follows:

- (a) Reference the wiring diagrams to find an electrical load for the load shed relay that was replaced:

NOTE: Select a load that is easy to make sure that power is on, or that the load does not have power.

- 1) WDM 24-51-11
- 2) WDM 24-51-21
- (b) Make sure that the applicable load has power.
- (c) If the MAIN BUS 1 load shed relay was replaced in the P91 panel:

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WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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) Open this circuit breaker and install safety tag:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	7	C01288	GEN 1 LOAD SHED

- (d) If the MAIN BUS 2 load shed relay was replaced in the P92 panel:



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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) Open this circuit breaker and install safety tag:

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	7	C01289	GEN 2 LOAD SHED

- (e) Make sure that the applicable load does not have power.

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WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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) Remove the safety tags and close these circuit breakers:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	7	C01288	GEN 1 LOAD SHED

Power Distribution Panel Number 2, P92

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	7	C01289	GEN 2 LOAD SHED

SUBTASK 24-51-11-710-002

- (3) If a GALLEY BUS load shed relay was replaced, do a check as follows:
 - (a) Set the CAB/UTIL switch on the P5-13 panel to the ON position.
 - (b) Make sure that the applicable galley has power.

NOTE: There may be a power switch on the galley module that needs to be set to the ON position also.
 - (c) Set the CAB/UTIL switch on the P5-13 panel to the OFF position.
 - (d) Make sure that the applicable galley does not have power.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 24-51-11-410-002

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

SUBTASK 24-51-11-410-001

- (2) Install the forward bulkhead liner.

————— END OF TASK —————

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28-VOLT AC TRANSFORMER - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
- (1) A removal of the 28-Volt AC Transformer
 - (2) An installation of the 28-Volt AC Transformer.

TASK 24-52-01-000-801

2. 28-Volt AC Transformer Removal

Figure 401

A. **General**

- (1) The 28-Volt AC Transformer, T38 is installed in the P18 Circuit Breaker Panel. Refer to Wiring Diagram WDM 24-53-11.

B. **References**

Reference	Title
WDM 24-53-11	D000534462

C. **Location Zones**

Zone	Area
221	Passenger Compartment - Aft of Control Compartment to Forward Entry Door - Left

D. **Prepare for Removal**

SUBTASK 24-52-01-860-001

- (1) Open this circuit breaker and install safety tag:

CAPT Electrical System Panel, P18-3

Row	Col	Number	Name
C	5	C02046	28V AC XFR BUS 1 SECT 2

SUBTASK 24-52-01-010-001

- (2) Open the P18 Circuit Breaker Panel to access the transformer [1].

E. **Procedure**

SUBTASK 24-52-01-020-001

- (1) Do these steps to remove the transformer [1]:
 - (a) Remove the nuts [4] and washers [3] that attach the wire terminals [2] to the transformer [1].
 - (b) Attach an identification tag to each wire terminal.
 - (c) Remove the wire terminals [2] from the transformer [1].
 - (d) Remove the four bolts [6] and washers [5] that attach the transformer [1] to the panel.
 - (e) Remove the transformer [1].

———— **END OF TASK** ————

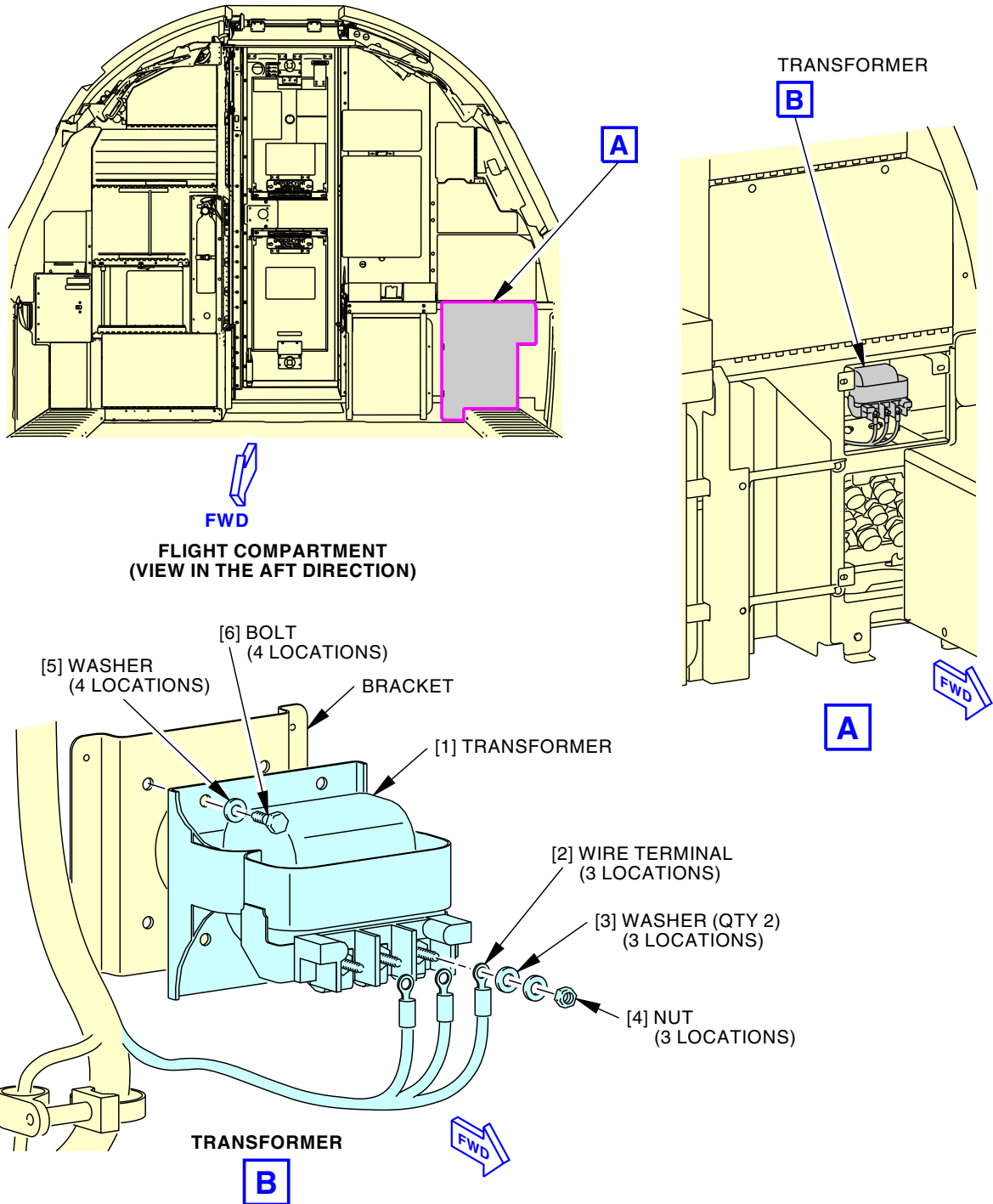
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2411813 S00061529124_V1

28-Volt AC Transformer Installation
Figure 401/24-52-01-990-801

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TASK 24-52-01-400-801

3. 28-Volt AC Transformer Installation

Figure 401

A. General

- (1) The 28-Volt AC Transformer, T38 is installed in the P18 Circuit Breaker Panel. Refer to Wiring Diagram WDM 24-53-11.

B. References

Reference	Title
WDM 24-53-11	D000534462

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Transformer	24-52-01-01-010	SIA ALL

D. Location Zones

Zone	Area
221	Passenger Compartment - Aft of Control Compartment to Forward Entry Door - Left

E. Procedure

SUBTASK 24-52-01-420-001

- (1) Do these steps to install the transformer [1]:
- Install the transformer [1] in its position on the panel.
 - Install the four bolts [6] and washers [5] that attach the transformer [1] to the panel.
 - Tighten the bolts [6].
 - Connect the wire terminals [2] to the terminal studs on the transformer [1].
 - Install the washers [3] and nuts [4] that attach the wire terminals [2] to the transformer [1].
 - Tighten the nuts [4].
 - Remove the identification tags from the wire terminals.

SUBTASK 24-52-01-860-002

- (2) Remove the safety tag and close this circuit breaker:

CAPT Electrical System Panel, P18-3

Row	Col	Number	Name
C	5	C02046	28V AC XFR BUS 1 SECT 2

F. 28-Volt AC Transformer Installation Test

SUBTASK 24-52-01-710-001

- (1) Do a test of each lavatory-occupied sign:

NOTE: Use two persons to do this part of the test.

- Make sure that the lights behind the occupied symbol are off.
- Go in the lavatory and lock the door.

NOTE: For an airplane with multiple lavatories in the aft cabin, the lavatory-occupied sign comes on when all lavatories in the aft cabin are locked.

- 1) Make sure that the lights behind the occupied symbol come on.
- Leave the lavatory and close the lavatory door.
 - Make sure that the lights behind the occupied symbol go off.

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G. Put the Airplane Back to Its Usual Condition

SUBTASK 24-52-01-410-001

- (1) Close the P18 Circuit Breaker Panel.

———— **END OF TASK** ————

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CROSS BUS TIE RELAY - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
- (1) A removal of the Cross Bus Tie Relay
 - (2) An installation of the Cross Bus Tie Relay.

TASK 24-61-01-000-801

2. Cross Bus Tie Relay Removal

(Figure 401)

A. **General**

- (1) The cross bus tie relay, R9 is installed in the rear part of the P91 panel. The relay is removed and installed through the forward bulkhead liner in the forward cargo area that gives access to the back of the P91 panel. Refer to Wiring Diagrams WDM 24-32-11 and WDM 24-61-11.

B. **References**

Reference	Title
24-22-00-860-802	Remove Electrical Power (P/B 201)
WDM 24-32-11	D000534464
WDM 24-61-11	D000534463

C. **Location Zones**

Zone	Area
117	Electrical and Electronics Compartment - Left
121	Forward Cargo Compartment - Left

D. **Prepare for Removal**

SUBTASK 24-61-01-860-001



REMOVE ELECTRICAL POWER BEFORE YOU REMOVE OR INSTALL COMPONENTS IN THE POWER DISTRIBUTION PANELS. THERE ARE HIGH VOLTAGES THAT CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Do this task: Remove Electrical Power, TASK 24-22-00-860-802.

SUBTASK 24-61-01-010-001

- (2) Get access to the forward cargo area through the forward cargo door.
 - (a) Remove the left-side forward bulkhead liner to get access to the rear-side of the power distribution panel, P91.

E. **Procedure**

SUBTASK 24-61-01-020-001

- (1) Do these steps to remove the relay [1]:



MAKE SURE THAT ALL OF THE POWER WARNING LIGHTS ON THE POWER DISTRIBUTION PANEL ARE OFF. THERE ARE HIGH VOLTAGES IN THE POWER DISTRIBUTION PANEL THAT CAN CAUSE INJURIES TO PERSONNEL.

- (a) Make sure that all of the power warning lights on the power distribution panel, P91, are off.

EFFECTIVITY
SIA ALL

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- (b) Remove the panel cover on the rear of the power distribution panel to get access to the cross bus tie relay.
- (c) Remove the two screws [2] that hold the terminal cover [3].
- (d) Remove the terminal cover [3] .
- (e) Identify and tag the wires before you remove them.
- (f) Remove the nut [6] and lockwasher [7] from each electrical wire.
- (g) Remove the electrical wires.
- (h) Remove the four nuts [4] and washers [5] that hold the relay to the power distribution panel.
- (i) Remove the relay [1].

———— **END OF TASK** ————

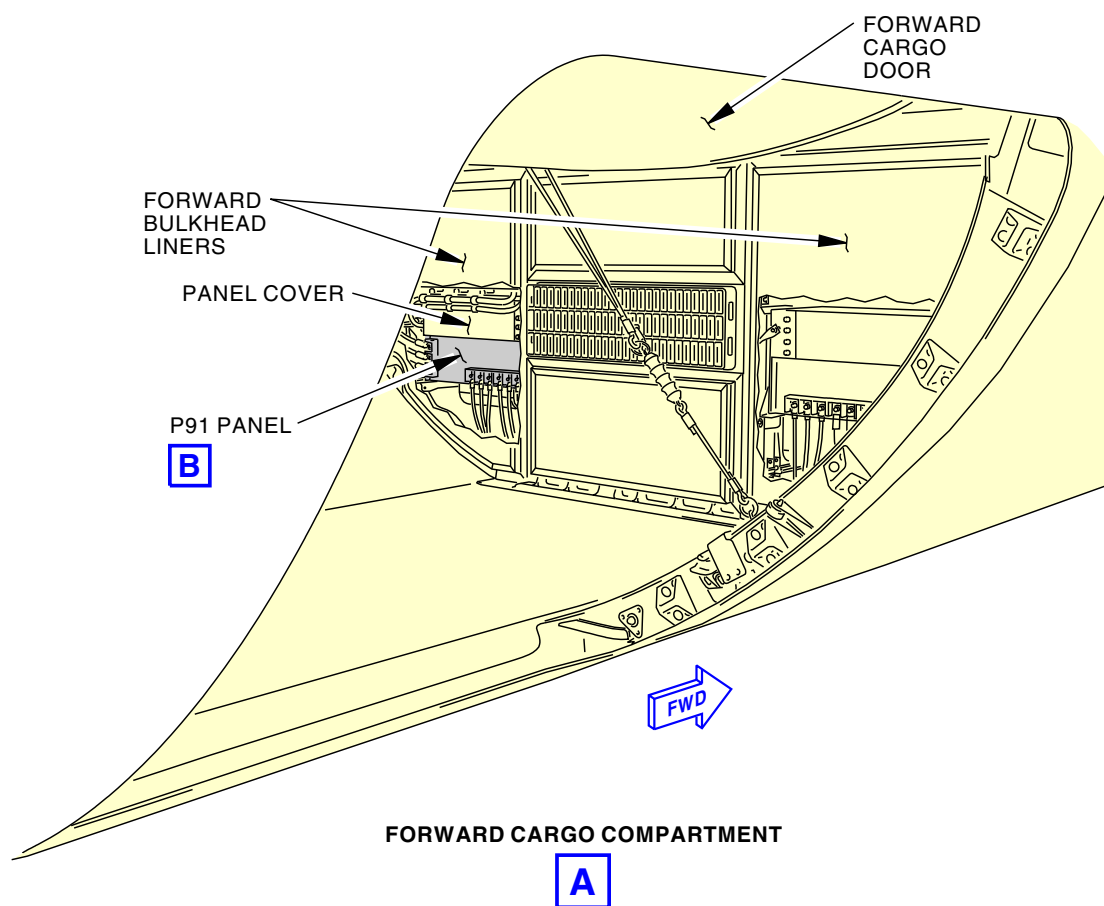
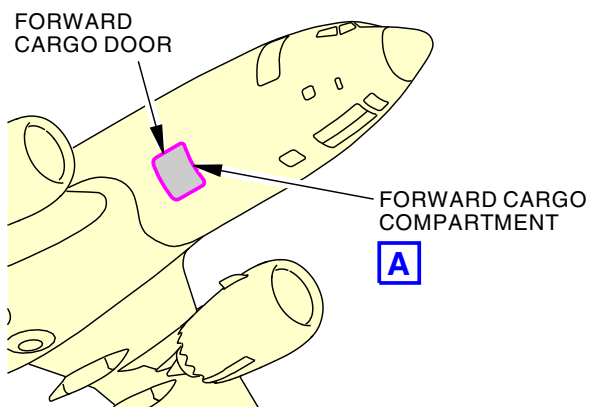
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Cross Bus Tie Relay Installation
Figure 401/24-61-01-990-801 (Sheet 1 of 2)

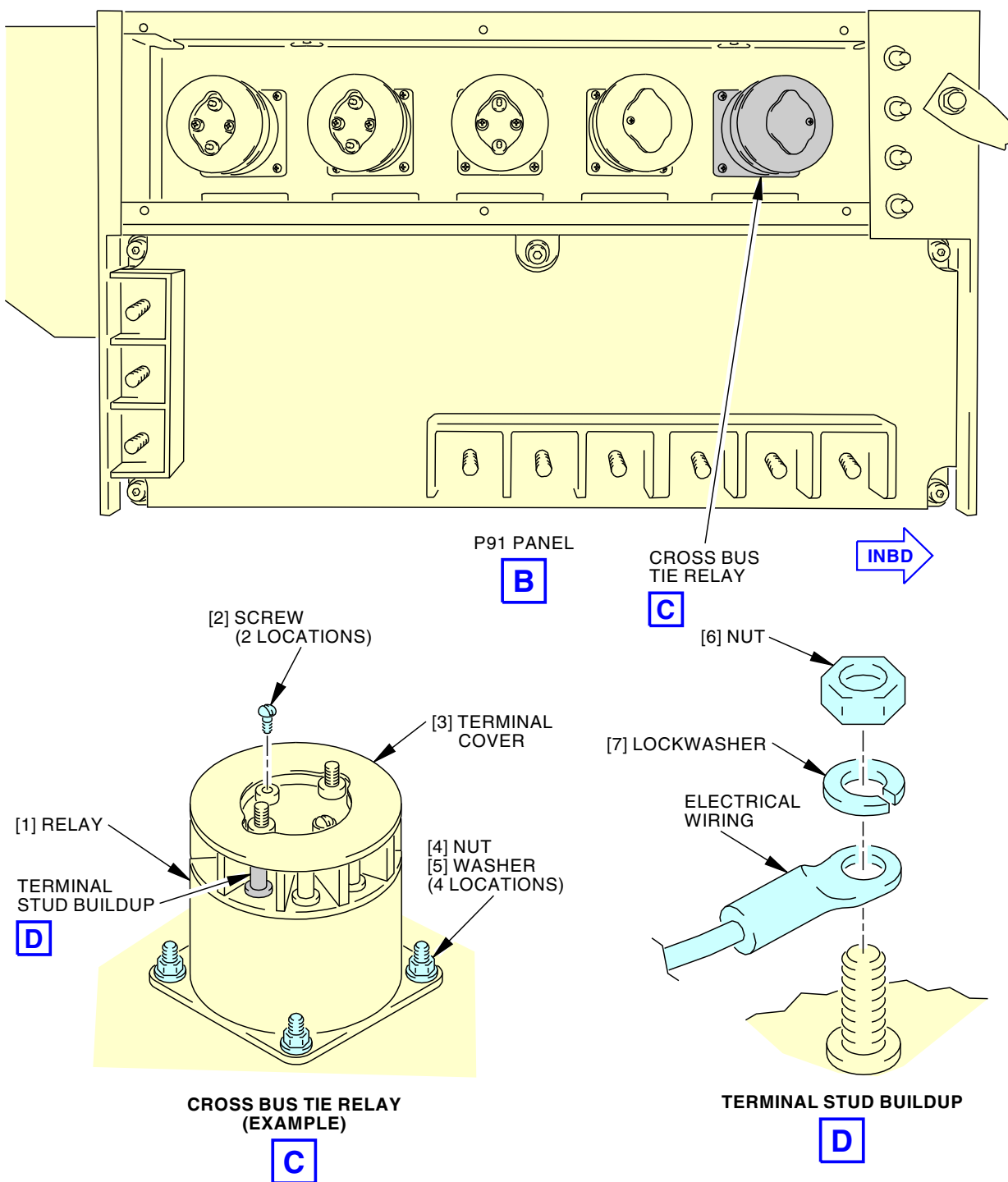
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Cross Bus Tie Relay Installation
Figure 401/24-61-01-990-801 (Sheet 2 of 2)

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TASK 24-61-01-400-801

3. Cross Bus Tie Relay Installation

(Figure 401)

A. General

- (1) The cross bus tie relay, R9 is installed in the rear part of the P91 panel. The relay is removed and installed through the forward bulkhead liner in the forward cargo area that gives access to the back of the P91 panel. Refer to Wiring Diagrams WDM 24-32-11 and WDM 24-61-11.

B. References

Reference	Title
24-22-00-860-803	Supply External Power (P/B 201)
WDM 24-32-11	D000534464
WDM 24-61-11	D000534463

C. Location Zones

Zone	Area
117	Electrical and Electronics Compartment - Left
121	Forward Cargo Compartment - Left
211	Flight Compartment - Left

D. Access Panels

Number	Name/Location
117A	Electronic Equipment Access Door

E. Prepare for Installation

SUBTASK 24-61-01-860-002



REMOVE ELECTRICAL POWER BEFORE YOU REMOVE OR INSTALL COMPONENTS IN THE POWER DISTRIBUTION PANELS. THERE ARE HIGH VOLTAGES THAT CAN CAUSE INJURIES TO PERSONNEL AND DAMAGE TO EQUIPMENT.

- (1) Make sure that electrical power is removed.

SUBTASK 24-61-01-010-002

- (2) To get access to the P91 panel, open this access panel:

Number	Name/Location
117A	Electronic Equipment Access Door

F. Cross Bus Tie Relay Installation

SUBTASK 24-61-01-420-001

- (1) Do these steps to install the relay [1]:



MAKE SURE THAT ALL OF THE POWER WARNING LIGHTS ON THE POWER DISTRIBUTION PANEL ARE OFF. THERE ARE HIGH VOLTAGES IN THE POWER DISTRIBUTION PANEL THAT CAN CAUSE INJURIES TO PERSONNEL.

- (a) Make sure that all of the power warning lights on the power distribution panel, P91, are off.
- (b) Install the relay [1] in its position.
- (c) Install the four nuts [4] and washers [5] that hold the relay to the power distribution panel.

EFFECTIVITY
SIA ALL

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- (d) Install the electrical wires on the terminal studs as specified by the identification tags.
- (e) Install the nut [6] and lockwasher [7] on each electrical wire.
- (f) Remove the identification tags from the wires.
- (g) Install the terminal cover [3].
- (h) Install the two screws [2] that hold the terminal cover [3].
- (i) Install the panel cover on the rear of the power distribution panel.

G. Cross Bus Tie Relay Installation Test

SUBTASK 24-61-01-860-003

- (1) Do this task: Supply External Power, TASK 24-22-00-860-803.

SUBTASK 24-61-01-710-001

- (2) Do a check of the Cross Bus Tie Relay as follows:
 - (a) Make sure that the BAT switch on the P5-13 panel is set to the ON position.
 - (b) Make sure that the BUS TRANS switch on the P5-4 panel is set to the AUTO position.
 - (c) Set the DC Meter Selector Switch on the P5-13 panel to the TR 1 position.
 - (d) Make sure that the DC meter on the P5-13 panel shows this value:
 - 1) DC VOLTS = 22-30



WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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.

- (e) Open this circuit breaker and install safety tag:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	6	C00806	TRU 1

- (f) Make sure that the DC meter on the P5-13 panel shows these values:
 - 1) DC VOLTS = 22-30
 - 2) DC AMPS = 0
- (g) Make sure that the TR UNIT light on the P5-13 panel comes on.
- (h) Set the BUS TRANS switch on the P5-4 panel to the OFF position.
- (i) Make sure that the DC meter on the P5-13 panel shows these values:
 - 1) DC VOLTS = 0
 - 2) DC AMPS = 0

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- (j) Set the BUS TRANS switch on the P5-4 panel to the AUTO position.
- (k) Make sure that the DC meter on the P5-13 panel shows these values:
 - 1) DC VOLTS = 22-30
 - 2) DC AMPS = 0



WARNING

WHEN YOU OPEN THE P91 AND P92 PANELS, MAKE SURE THAT THE OUTER DOOR STAYS AS OPEN AS POSSIBLE. IF THE OUTER DOOR TURNS IN, THE ATTACHED DOOR COMPONENTS COULD TOUCH THE INNER DOOR COMPONENTS. THIS CAN CAUSE AN ARC CONDITION WHEN YOU SUPPLY POWER. IF YOU DO NOT OBEY, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.



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.

- (l) Remove the safety tag and close this circuit breaker:

Power Distribution Panel Number 1, P91

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	6	C00806	TRU 1

- (m) Make sure that the TR UNIT light on the P5-13 panel goes off.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 24-61-01-410-002

- (1) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
117A	Electronic Equipment Access Door

SUBTASK 24-61-01-410-001

- (2) Install the left-side forward bulkhead liner.

———— **END OF TASK** ————

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