

CHAPTER

36

PNEUMATIC



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PNEUMATIC - MAINTENANCE PRACTICES

1. General

A. This procedure has these tasks:

- (1) Supply pressure to the pneumatic system (selection):
 - (a) Supply pressure to the pneumatic system with an external ground air source
 - (b) Supply pressure to the pneumatic system with the APU
 - (c) Supply pressure to the pneumatic system with one or both engines.
- (2) Supply pressure upstream of the PRSOV.
- (3) Remove pressure from the pneumatic system.

B. The pneumatic system supplies air to these user systems:

- (1) Air conditioning packs
- (2) Engine cowl anti-icing system
- (3) Wing thermal anti-icing system
- (4) Engine starter system
- (5) Hydraulic reservoir pressurization
- (6) Water tank pressurization

TASK 36-00-00-860-801

2. Supply Pressure to the Pneumatic System (Selection)

(Figure 201)

A. Procedure

SUBTASK 36-00-00-860-001

- (1) Do one of these tasks to supply pressure to the pneumatic system:
 - (a) Do this task: Supply Pressure to the Pneumatic System with an External Ground Air Source, TASK 36-00-00-860-802.
 - (b) Do this task: Supply Pressure to the Pneumatic System with the APU, TASK 36-00-00-860-803.
 - (c) Do this task: Supply Pressure to the Pneumatic System with One or Both Engines, TASK 36-00-00-860-804.

————— **END OF TASK** —————

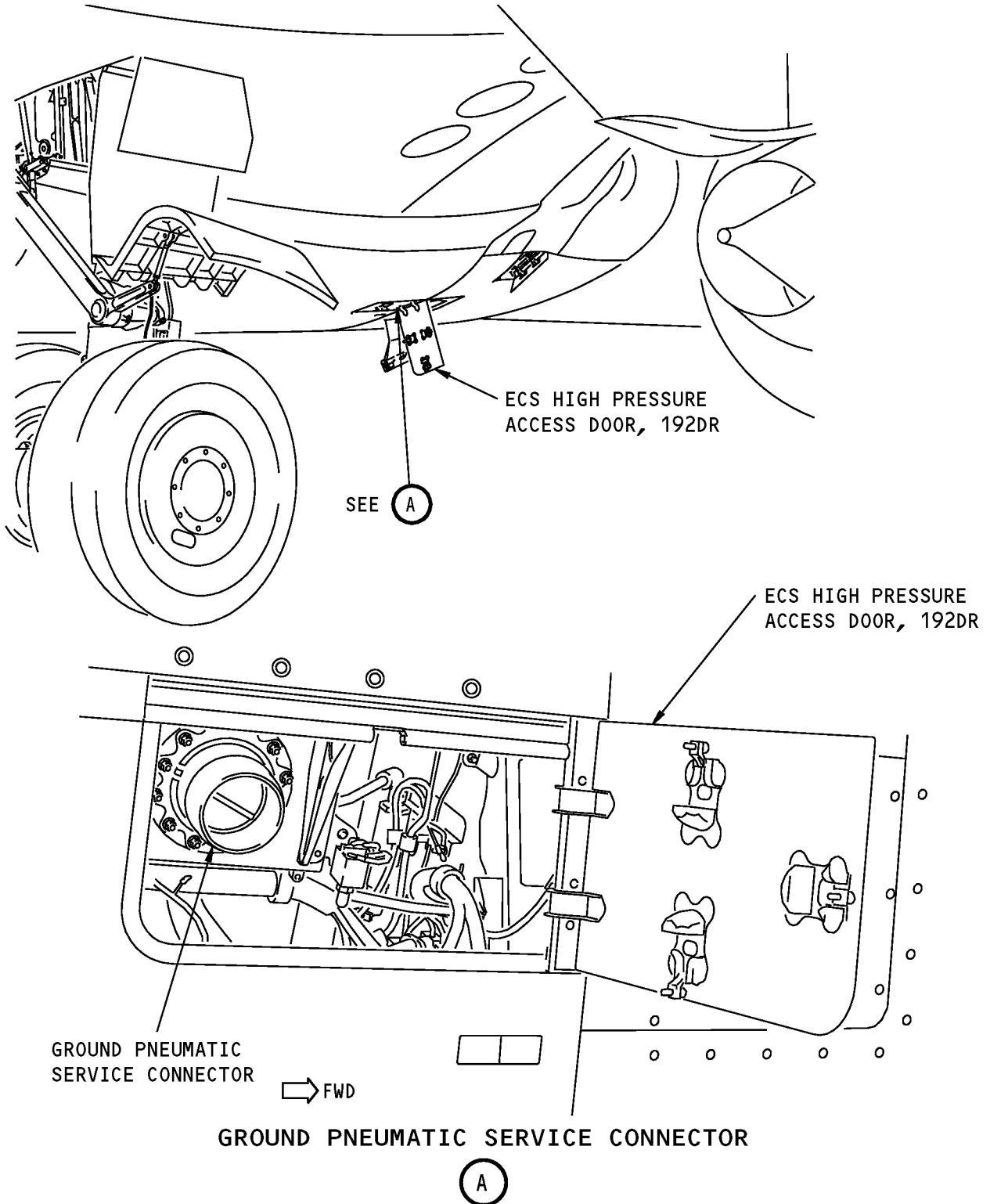
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**Pneumatic System - Maintenance Practices
Figure 201 (Sheet 1 of 2)/36-00-00-990-807**

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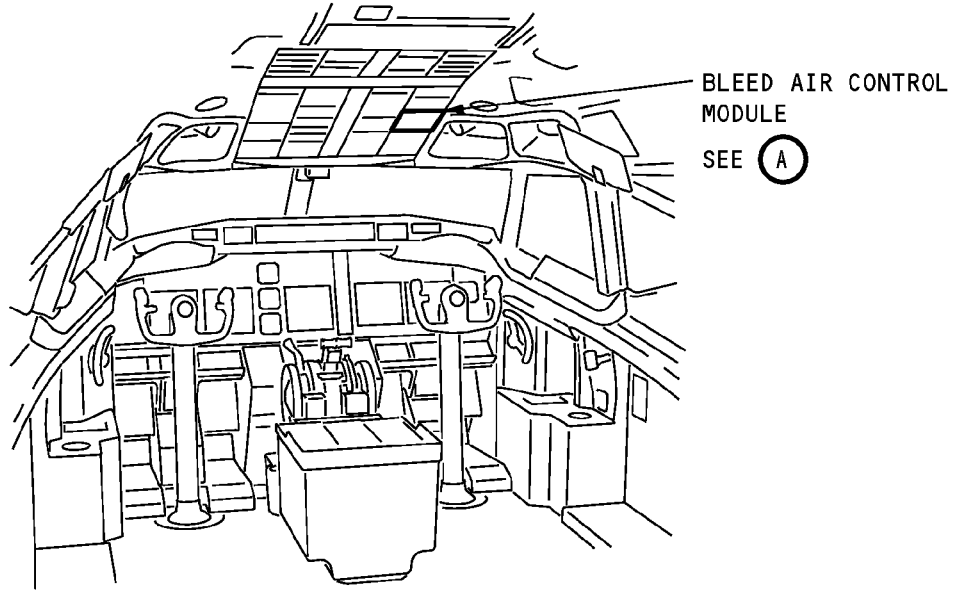
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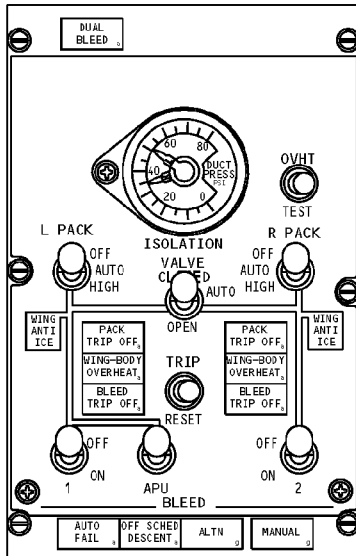
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FLIGHT COMPARTMENT



BLEED AIR CONTROL
MODULE



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TASK 36-00-00-860-802

3. Supply Pressure to the Pneumatic System with an External Ground Air Source

(Figure 201)

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)

B. Location Zones

Zone	Area
192	Lower Wing-To-Body Fairing - Under Wing Box

C. Access Panels

Number	Name/Location
192DR	ECS High Pressure Access Door

D. Procedure

SUBTASK 36-00-00-860-002

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 36-00-00-860-003

(2) To gain access to the ground pneumatic service connector, do this step:

Open this access panel:

Number	Name/Location
192DR	ECS High Pressure Access Door

SUBTASK 36-00-00-860-004

(3) Connect the ground pneumatic service line to the ground pneumatic service connector.

SUBTASK 36-00-00-860-005

WARNING: DO NOT SUPPLY MORE THAN 60 PSI OF PRESSURE TO THE PNEUMATIC SYSTEM. IF YOU SUPPLY TOO MUCH PRESSURE, DAMAGE TO EQUIPMENT AND INJURIES TO PERSONNEL CAN OCCUR.

(4) Start the external ground air source.

NOTE: Do not supply more than 60.0 psi (413.7 kPa) of pressure.

SUBTASK 36-00-00-860-006

(5) Put the ISOLATION VALVE switch on the P5-10, forward overhead panel to the OPEN position.

SUBTASK 36-00-00-860-007

(6) Monitor the dual duct pressure indicator on the P5-10, forward overhead panel.

(a) Make sure that there is movement shown by both duct pressure needles and the pressures shown are normal.

NOTE: Make sure that the duct pressure needles do not show more than 60.0 psi (413.7 kPa).

————— **END OF TASK** —————

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TASK 36-00-00-860-803

4. Supply Pressure to the Pneumatic System with the APU

(Figure 201)

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
49-11-00-860-801	APU Starting and Operation (P/B 201)

B. Location Zones

Zone	Area
212	Flight Compartment - Right

C. Procedure

SUBTASK 36-00-00-860-008

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 36-00-00-860-009

WARNING: YOU MUST FIRST ISOLATE THE PNEUMATIC USER SYSTEMS BEFORE YOU PRESSURIZE THE PNEUMATIC SYSTEM. IF THEY ARE NOT ISOLATED, THEY CAN OPERATE AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT. IT CAN ALSO CAUSE THE PNEUMATIC SYSTEM TO LOSE PRESSURE.

(2) Do this task: APU Starting and Operation, TASK 49-11-00-860-801.

(a) Let the APU become stable at the governed speed.

SUBTASK 36-00-00-860-010

(3) Put the APU BLEED switch on the P5-10, forward overhead panel to the ON position.

SUBTASK 36-00-00-860-011

(4) Put the ISOLATION VALVE switch on the P5-10, forward overhead panel to the OPEN position.

SUBTASK 36-00-00-860-012

(5) Monitor the dual duct pressure indicator on the P5-10, forward overhead panel.

(a) Make sure that the duct pressure needles indicate 12 to 26 psi without user systems in operation.

————— **END OF TASK** —————

TASK 36-00-00-860-804

5. Supply Pressure to the Pneumatic System with One or Both Engines

(Figure 201)

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
71-00-00-800-807-F00	Start the Engine Procedure (Selection) (P/B 201)

B. Location Zones

Zone	Area
212	Flight Compartment - Right

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C. Procedure

SUBTASK 36-00-00-860-013

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 36-00-00-860-014

WARNING: YOU MUST FIRST ISOLATE THE PNEUMATIC USER SYSTEMS BEFORE YOU PRESSURIZE THE PNEUMATIC SYSTEM. IF THEY ARE NOT ISOLATED, THEY CAN OPERATE AND CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT. IT CAN ALSO CAUSE TO THE PNEUMATIC SYSTEM TO LOSE PRESSURE.

(2) Do this task: Start the Engine Procedure (Selection), TASK 71-00-00-800-807-F00.

SUBTASK 36-00-00-860-015

(3) Put the applicable BLEED switch on the P5-10, forward overhead panel to the ON position.

SUBTASK 36-00-00-860-016

(4) Put the ISOLATION VALVE switch on the P5-10, forward overhead panel to the OPEN position.

SUBTASK 36-00-00-860-017

(5) Monitor the dual duct pressure indicator on the P5-10, forward overhead panel.

(a) Make sure that each duct pressure needle indicates 10-25 psi.

NOTE: The engine(s) must be at idle and there must not be a demand for pneumatic air from other user systems. If there is a demand on pneumatic air you may not see 10-25 psi.

(b) Slowly increase the engine power until the duct pressure increases to 42 ±8 psi.

1) Do not increase the engine power to more than 80% N1.

END OF TASK

TASK 36-00-00-860-805

6. Supply Pressure Upstream of the PRSOV

(Figure 201)

A. References

Table with 2 columns: Reference, Title. Row 1: 78-31-00-010-801-F00, Open the Thrust Reverser (Selection) (P/B 201)

B. Location Zones

Table with 2 columns: Zone, Area. Row 1: 212, Flight Compartment - Right; Row 2: 416, Engine 1 - Thrust Reverser, Right; Row 3: 426, Engine 2 - Thrust Reverser, Right

C. Procedure

SUBTASK 36-00-00-860-018

(1) Do one of these procedures to pressurize the pneumatic system:

(a) Do this task: Supply Pressure to the Pneumatic System with an External Ground Air Source, TASK 36-00-00-860-802.

(b) Do this task: Supply Pressure to the Pneumatic System with the APU, TASK 36-00-00-860-803.

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SUBTASK 36-00-00-010-001

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (2) For the left thrust reverser, do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

SUBTASK 36-00-00-860-019

- (3) Put the applicable engine BLEED switch on the P5-10, forward overhead panel to the ON position.

SUBTASK 36-00-00-860-020

- (4) Use a wrench on the manual override nut for the PRSOV to put it to the open position.
 - (a) Make sure that the PRSOV stays in the open position.

NOTE: The PRSOV is spring-load to the closed position. If there is pressure supplied and the PRSOV does not stay open, there may be a leakage in the PRSOV or in the sense line(s).

————— END OF TASK —————

TASK 36-00-00-860-806

7. Remove Pressure from the Pneumatic System

(Figure 201)

A. References

Reference	Title
49-11-00-860-802	APU Usual Shutdown (P/B 201)
71-00-00-700-819-F00	Stop the Engine Procedure (Usual Engine Stop) (P/B 201)
71-00-00-800-805-F00	Engine Ground Safety Precautions (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

B. Location Zones

Zone	Area
192	Lower Wing-To-Body Fairing - Under Wing Box
212	Flight Compartment - Right

C. Access Panels

Number	Name/Location
192DR	ECS High Pressure Access Door

D. Procedure

SUBTASK 36-00-00-860-021

- (1) Stop the operation of the applicable source that follows which was used to pressurize the pneumatic system:

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WARNING: DO NOT DISCONNECT THE GROUND AIR SOURCE FROM THE AIRPLANE IF ENGINE 2 OPERATES AT MORE THAN MINIMUM IDLE. IF ENGINE 2 OPERATES AT MORE THAN MINIMUM IDLE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (a) Make sure you obey the inlet hazard areas if one or both engines are in operation, do this task: Engine Ground Safety Precautions, TASK 71-00-00-800-805-F00.
- (b) If an external ground air source was used, shut down the external ground air source.
- (c) If the APU was used, do this task: APU Usual Shutdown, TASK 49-11-00-860-802
- (d) If the engine(s) was used, do this task: Stop the Engine Procedure (Usual Engine Stop), TASK 71-00-00-700-819-F00

SUBTASK 36-00-00-860-022

- (2) Make sure that the BLEED switches on the P5-10, forward overhead panel are in the OFF position.

SUBTASK 36-00-00-860-023

- (3) Make sure that both duct pressure needles on the dual duct pressure indicator show 0 psi.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 36-00-00-860-024

- (1) If an external ground air source was used, disconnect the ground pneumatic service line from the ground pneumatic service connector.

Close this access panel:

<u>Number</u>	<u>Name/Location</u>
192DR	ECS High Pressure Access Door

SUBTASK 36-00-00-860-038

- (2) If the thrust reverser was opened, close the thrust reverser.

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.

- (a) For the left thrust reverser, do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

————— END OF TASK —————

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PNEUMATIC - 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 Procedures Guide (DDPG). 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 pneumatic system:
 - (1) MMEL 36-1 (DDPG) Preparation - Bleed Air Isolation Valve Inoperative
 - (2) MMEL 36-1 (DDPG) Restoration - Bleed Air Isolation Valve Inoperative
 - (3) MMEL 36-2 (DDPG) Preparation - Ground Pneumatic Connector Check Valve Inoperative
 - (4) MMEL 36-2 (DDPG) Restoration - Ground Pneumatic Connector Check Valve Inoperative
 - (5) MMEL 36-5 (DDPG) Preparation - Pressure Regulating and Shutoff Valve (PRSOV) Inoperative
 - (6) MMEL 36-5 (DDPG) Restoration - Pressure Regulating and Shutoff Valve (PRSOV) Inoperative
 - (7) MMEL 36-9 (DDPG) Preparation - High Stage Valve Inoperative
 - (8) MMEL 36-9 (DDPG) Restoration - High Stage Valve Inoperative

TASK 36-00-00-040-801

2. MMEL 36-1 (DDPG) Preparation - Bleed Air Isolation Valve Inoperative

(Figure 901)

A. General

- (1) This task gives the maintenance steps which prepare the airplane for flight with the bleed air isolation valve inoperative.

B. Location Zones

Zone	Area
139	Keel Beam, (Part) Body Station 540.00 to Body Station 727.00

C. Access Panels

Number	Name/Location
192CL	Air Conditioning Access Door

D. Bleed Air Isolation Valve Deactivation

SUBTASK 36-00-00-860-037

- (1) Put both engine BLEED switches to the OFF position.

SUBTASK 36-00-00-860-039

- (2) Put both PACK switches to the OFF position.

SUBTASK 36-00-00-010-002

- (3) Open this access panel:

Number	Name/Location
192CL	Air Conditioning Access Door

SUBTASK 36-00-00-020-008

- (4) Remove the air conditioning duct section installed in front of the keel beam access hole from the left ECS bay.

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SUBTASK 36-00-00-010-003

- (5) Get access to the bleed air isolation valve through the keel beam access hole from the left ECS bay.

SUBTASK 36-00-00-020-001

- (6) After engine start, disconnect the electrical connector, D398 from the bleed air isolation valve.
 - (a) Put a cover over the loose electrical connector, D398 and the electrical connection on the bleed air isolation valve.
 - (b) Secure the loose electrical connector, D398 for flight.

SUBTASK 36-00-00-010-004

- (7) To manually lock closed the bleed air isolation valve, do the steps that follow:

NOTE: If the isolation valve is locked closed, you must use two separate air sources (i.e. the APU and a ground source) to start the engines. However, you can open the isolation valve during engine start to prevent having to use two air sources. Do the restoration task to open the isolation valve. After the engine is started do the steps to manually lock the isolation valve closed.

- (a) Pull the spring-loaded knob outward to disengage the manual override handle.
- (b) Push the manual override handle to the CLOSED position.
- (c) Release the spring-loaded knob to engage the manual override handle.

SUBTASK 36-00-00-410-003

- (8) Install the air conditioning duct section.

SUBTASK 36-00-00-010-005

- (9) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
192CL	Air Conditioning Access Door

END OF TASK

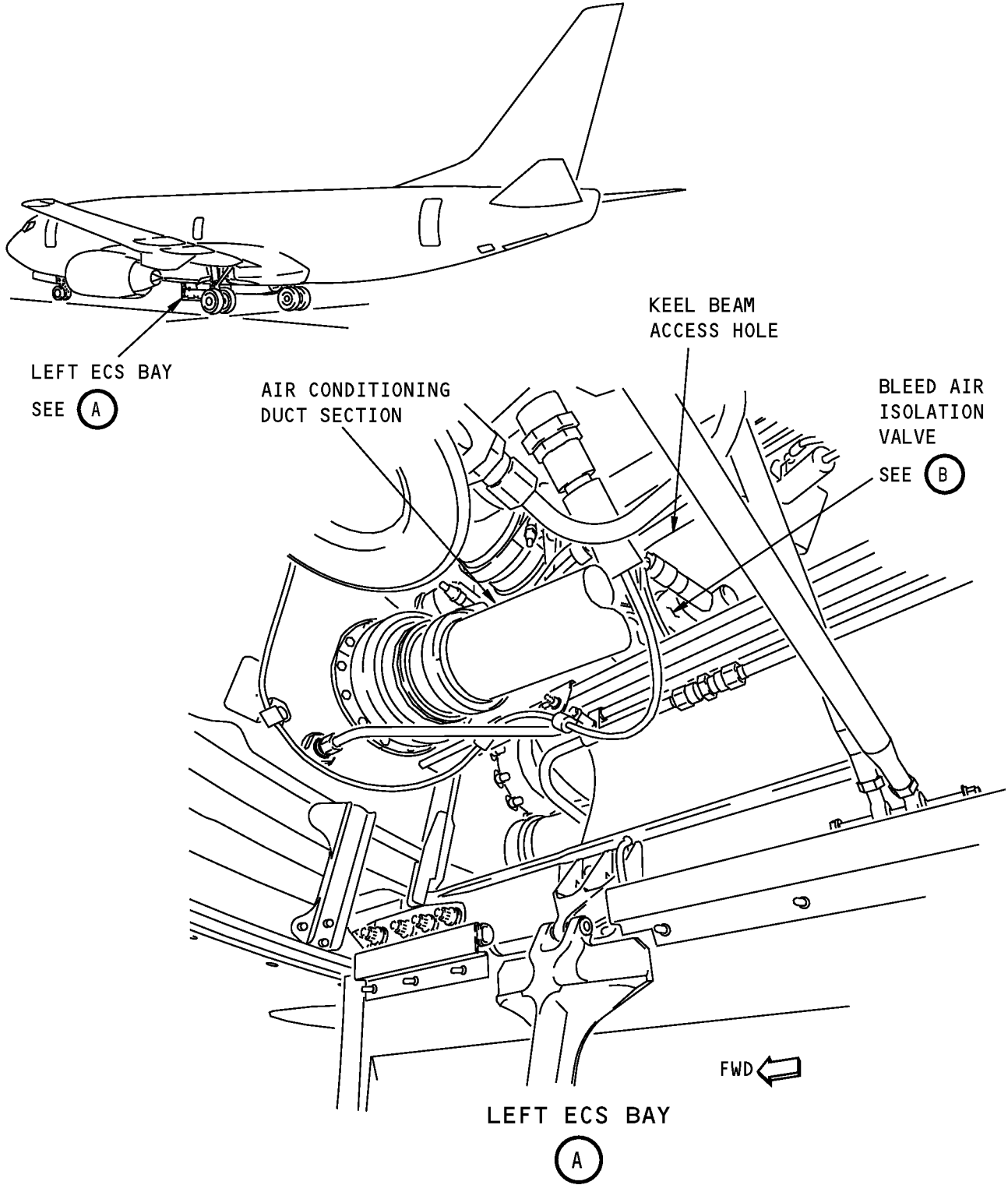
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**Bleed Air Isolation Valve Deactivation
Figure 901 (Sheet 1 of 2)/36-00-00-990-802**

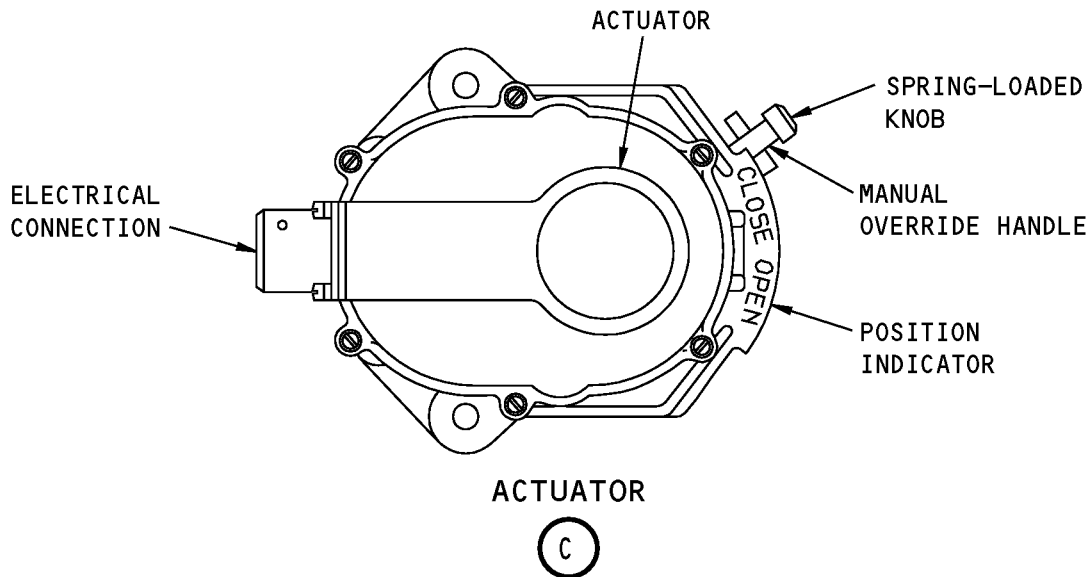
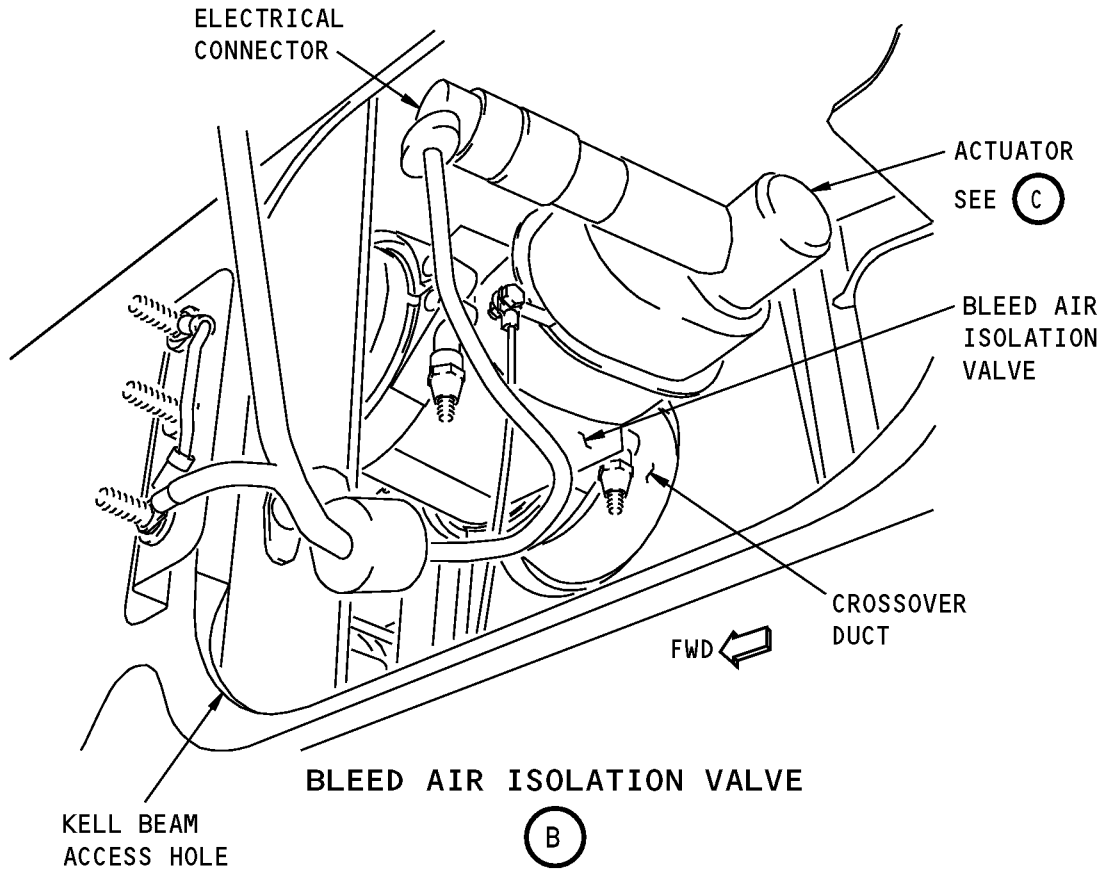
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Bleed Air Isolation Valve Deactivation
Figure 901 (Sheet 2 of 2)/36-00-00-990-802

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TASK 36-00-00-440-801

3. M MEL 36-1 (DDPG) Restoration - Bleed Air Isolation Valve Inoperative

(Figure 901)

A. General

- (1) This task puts the airplane back to its usual condition after operation with the bleed air isolation valve inoperative.

B. Location Zones

Zone	Area
139	Keel Beam, (Part) Body Station 540.00 to Body Station 727.00

C. Access Panels

Number	Name/Location
192CL	Air Conditioning Access Door

D. Bleed Air Isolation Valve Restoration

SUBTASK 36-00-00-010-006

- (1) Open this access panel:

Number	Name/Location
192CL	Air Conditioning Access Door

SUBTASK 36-00-00-020-009

- (2) Remove the air conditioning duct section installed in front of the keel beam access hole from the left ECS bay.

SUBTASK 36-00-00-010-007

- (3) Get access to the bleed air isolation valve through the keel beam access hole from the left ECS bay.

SUBTASK 36-00-00-440-001

- (4) Manually unlock the bleed air isolation valve, do the steps that follow:
 - (a) Pull the spring-loaded knob outward to disengage the manual override handle.
 - (b) Push the manual override handle to the OPEN position.
 - (c) Release the spring-loaded knob to engage the manual override handle.

SUBTASK 36-00-00-420-001

- (5) Remove the covers from the loose electrical connector, D398 and the electrical connection on the bleed air isolation valve [2].

SUBTASK 36-00-00-420-002

- (6) Connect the loose electrical connector, D398 to the electrical connection on the bleed air isolation valve.

SUBTASK 36-00-00-420-005

- (7) Install the air conditioning duct section.

SUBTASK 36-00-00-010-008

- (8) Close this access panel:

Number	Name/Location
192CL	Air Conditioning Access Door

————— END OF TASK —————

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TASK 36-00-00-040-802

4. M MEL 36-2 (DDPG) Preparation - Ground Pneumatic Connector Check Valve Inoperative

(Figure 902)

A. General

- (1) This task gives the maintenance steps which prepare the airplane for flight with the ground pneumatic connector check valve inoperative.

B. References

Reference	Title
71-00-00-800-807-F00	Start the Engine Procedure (Selection) (P/B 201)

C. Location Zones

Zone	Area
192	Lower Wing-To-Body Fairing - Under Wing Box

D. Access Panels

Number	Name/Location
192DR	ECS High Pressure Access Door

E. Ground Pneumatic Connector Check Valve Deactivation

SUBTASK 36-00-00-040-001

- (1) To get access to ground pneumatic connector check valve, do this step:
 - (a) Open this access panel:

Number	Name/Location
192DR	ECS High Pressure Access Door

SUBTASK 36-00-00-210-002

- (2) If the ground pneumatic connector check valve has failed inoperative closed, the engines cannot be started with an external ground air source.

NOTE: Use the APU to supply pneumatic pressure for engine start.

SUBTASK 36-00-00-210-001

- (3) If the ground pneumatic connector check valve has failed inoperative open, do the steps that follow:
 - (a) Install a "GROUND AIR CONNECTION VLV INOP OPEN" placard on the air conditioning/ bleed air control panel (P5-10 panel).
 - (b) Install a "GROUND AIR CONNECTION VLV INOP OPEN" placard on the inside door of the ECS Access Door, 192DR.
 - (c) Start the engine(s) with an external ground air source, do this task: Start the Engine Procedure (Selection), TASK 71-00-00-800-807-F00.
 - (d) After right engine start, do the steps that follow:
 - 1) Put the right engine BLEED switch to the OFF position.
 - 2) Shut down the pressure supply from the external ground air source when it is no longer necessary for other operation.
 - 3) Put the ISOLATION VALVE switch to the CLOSED position.

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- 4) Make sure that the right manifold duct pressure is at 0 psig on the dual duct pressure indicator (P5-10 panel).

WARNING: MAKE SURE THAT THERE IS NO PRESSURE IN THE RIGHT PNEUMATIC MANIFOLD BEFORE YOU DISCONNECT THE EXTERNAL GROUND AIR SERVICE LINE. HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- 5) Disconnect the external ground air service line from the airplane.

SUBTASK 36-00-00-410-001

- (4) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
192DR	ECS High Pressure Access Door

SUBTASK 36-00-00-420-003

- (5) Advise dispatch to inform down line stations that external ground air source will be needed, if the right engine is shutdown.

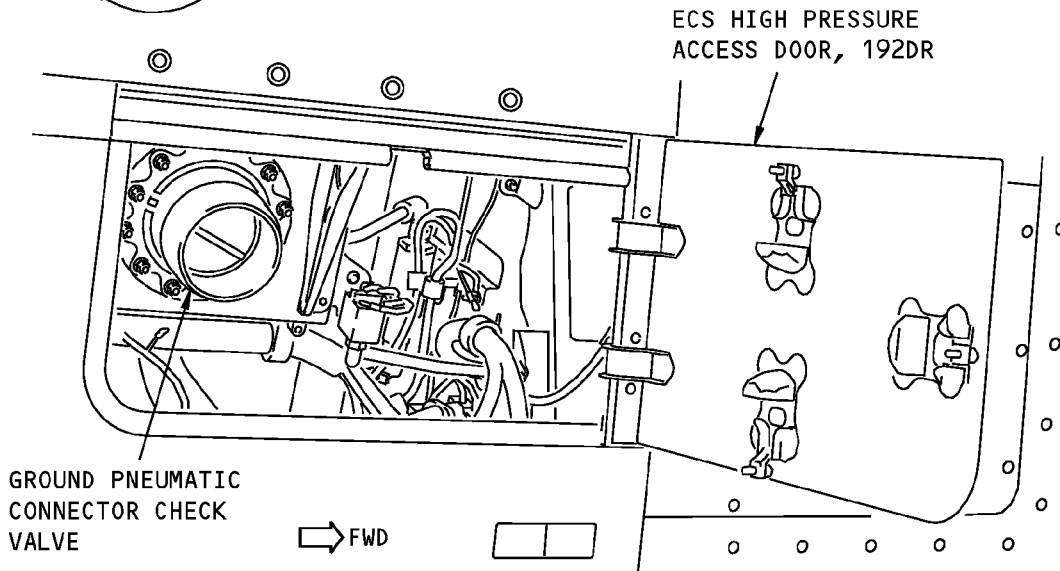
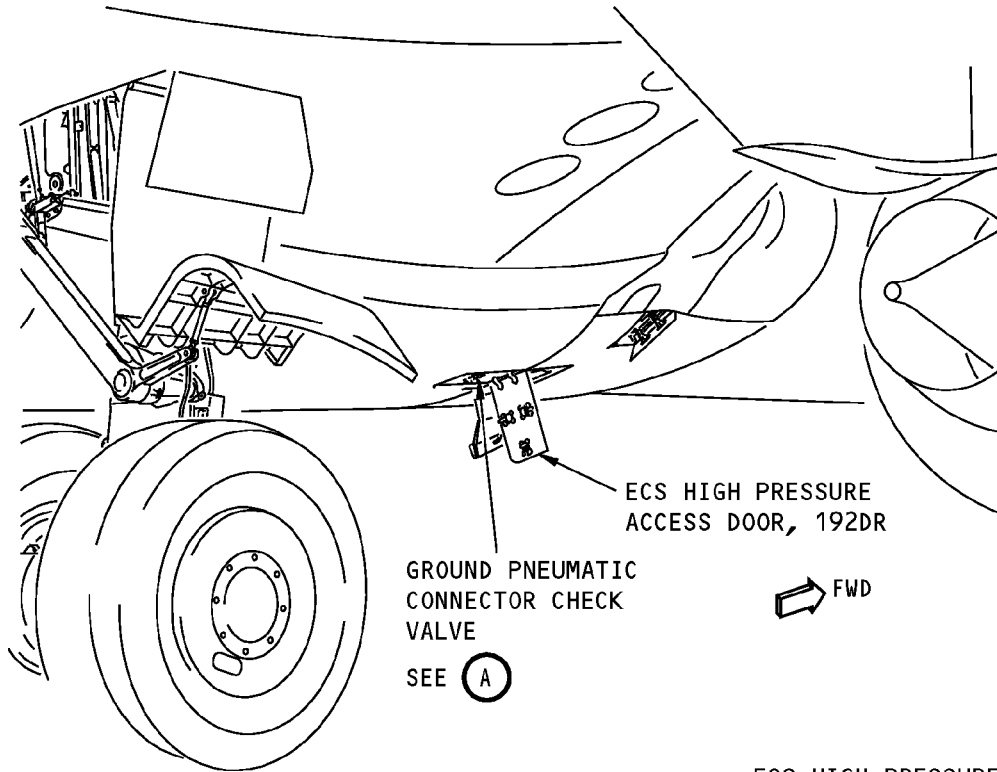
————— **END OF TASK** —————

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**GROUND PNEUMATIC CONNECTOR CHECK VALVE
(VIEW IN THE UP DIRECTION)**

(A)

**Ground Pneumatic Connector Check Valve Deactivation
Figure 902/36-00-00-990-803**

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TASK 36-00-00-440-802

5. M MEL 36-2 (DDPG) Restoration - Ground Pneumatic Connector Check Valve Inoperative

(Figure 902)

A. General

- (1) This task puts the airplane back to its usual condition after operation with the ground pneumatic connector check valve inoperative.

B. References

Reference	Title
36-13-03-000-801	Ground Pneumatic Connector Check Valve Removal (P/B 401)
36-13-03-400-801	Ground Pneumatic Connector Check Valve Installation (P/B 401)

C. Location Zones

Zone	Area
192	Lower Wing-To-Body Fairing - Under Wing Box

D. Access Panels

Number	Name/Location
192DR	ECS High Pressure Access Door

E. Ground Pneumatic Connector Check Valve Restoration

SUBTASK 36-00-00-040-003

- (1) To get access to ground pneumatic connector check valve, do this step:
 - (a) Open this access panel:

Number	Name/Location
192DR	ECS High Pressure Access Door

SUBTASK 36-00-00-420-004

- (2) To replace the ground pneumatic connector check valve, these are the tasks:
 - Ground Pneumatic Connector Check Valve Removal, TASK 36-13-03-000-801,
 - Ground Pneumatic Connector Check Valve Installation, TASK 36-13-03-400-801.

SUBTASK 36-00-00-020-010

- (3) Remove the a "GROUND AIR CONNECTION VLV INOP OPEN" placard on the inside door of the ECS Access Door, 192DR.

SUBTASK 36-00-00-020-011

- (4) Remove the "GROUND AIR CONNECTION VLV INOP OPEN" placard on the air conditioning/ bleed air control panel (P5-10 panel).

SUBTASK 36-00-00-410-002

- (5) Close this access panel:

Number	Name/Location
192DR	ECS High Pressure Access Door

————— END OF TASK —————

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TASK 36-00-00-040-804

6. M MEL 36-5 (DDPG) Preparation - Pressure Regulating and Shutoff Valve Inoperative

(Figure 903)

A. General

- (1) This task gives the maintenance steps which prepare the airplane for flight with the pressure regulator and shutoff valve (PRSOV) inoperative.

B. References

Reference	Title
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

C. Location Zones

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

D. Pressure Regulating and Shutoff Valve Deactivation

SUBTASK 36-00-00-860-029

- (1) Make sure each engine start lever is in the CUTOFF position.
 - (a) Install a DO-NOT-OPERATE tag on the each engine start lever.

SUBTASK 36-00-00-860-030

WARNING: YOU MUST REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. IF YOU DO NOT REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS, HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (2) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 36-00-00-010-013

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSERS: RETRACT THE LEADING EDGE, DEACTIVATE THE LEADING EDGE, DEACTIVATE THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANEL. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (3) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

SUBTASK 36-00-00-020-004

- (4) Manually lock closed the PRSOV, do the steps that follow:
 - (a) Turn the manual override nut to align the position indicator with the CLOSED position.

NOTE: For PRSOVs that are pre-Honeywell SB 36-1724, align the bolt with the CLOSED position.
 - (b) Loosen the bolt and push in the lock knob to lock the PRSOV closed.
 - (c) Retighten the bolt to hold the lock knob in place.

EFFECTIVITY	
HAP ALL	

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SUBTASK 36-00-00-010-014

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.

(5) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

SUBTASK 36-00-00-440-004

(6) Remove the DO-NOT-OPERATE tag from each engine start lever.

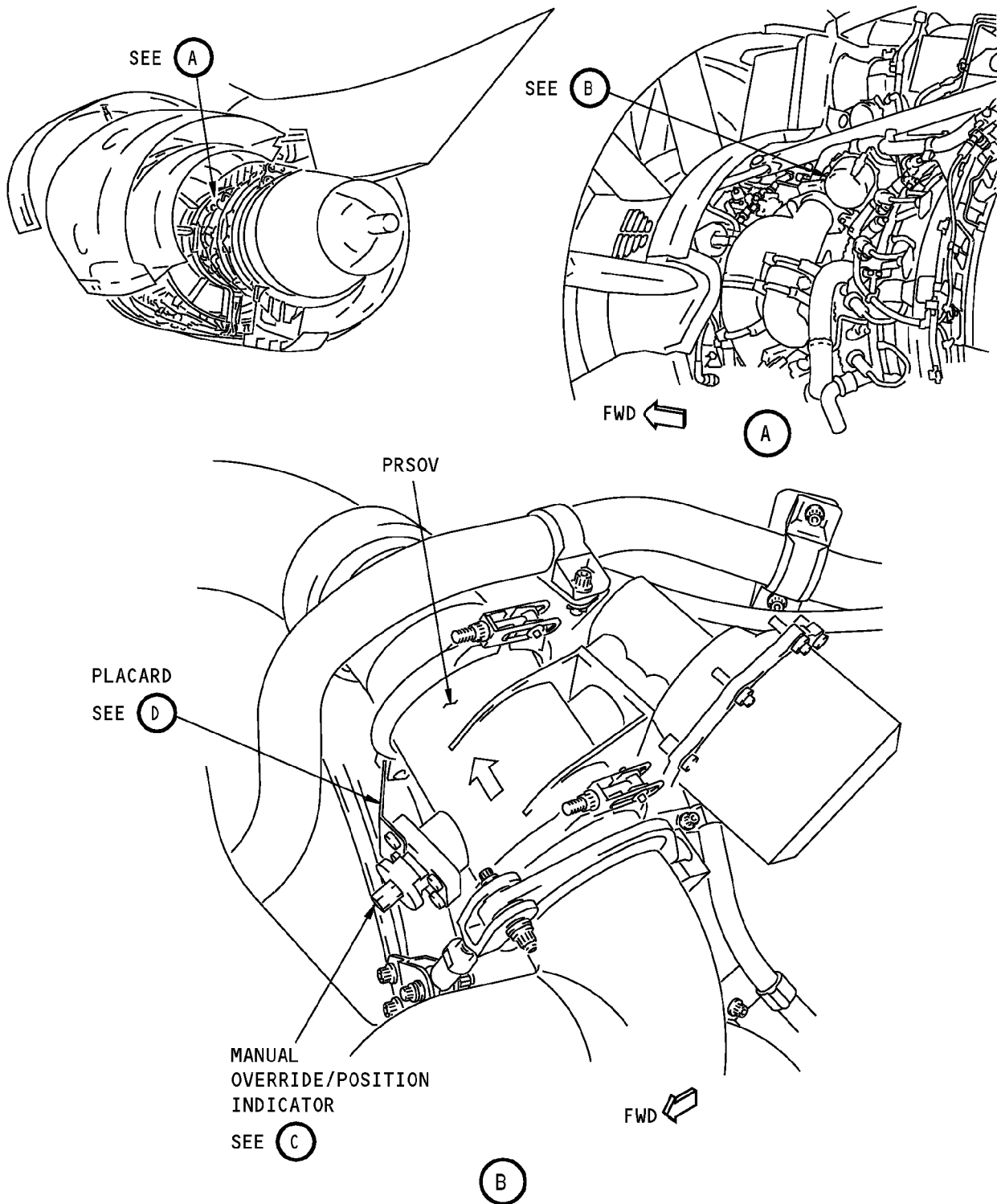
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EFFECTIVITY
HAP ALL

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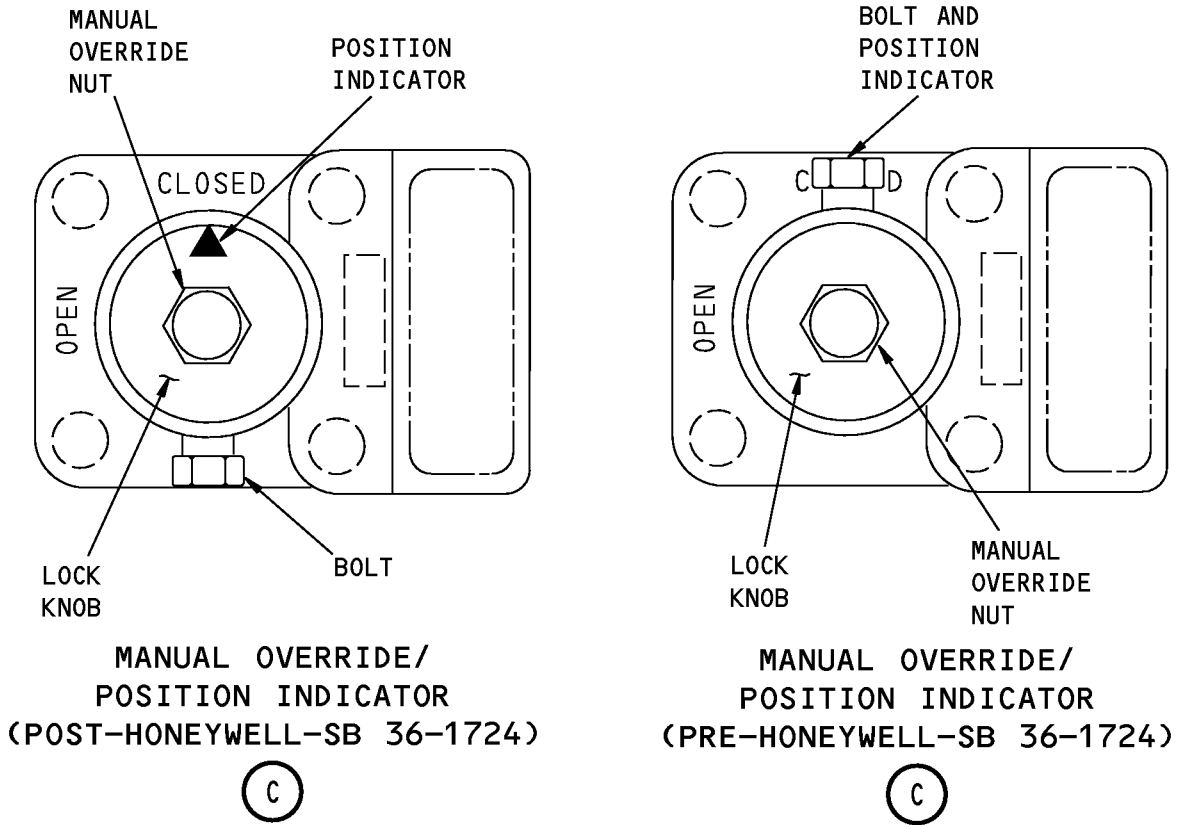


**Pressure Regulating and Shutoff Valve (PRSOV) Deactivation
Figure 903 (Sheet 1 of 2)/36-00-00-990-805**

EFFECTIVITY
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WRENCH/LATCH/LOCK
WRENCH SHAFT HEX AS REQD
UNLOCK: LOOSEN KNOB BOLT-90°CCW
LATCH: PUSH KNOB IN
UNLATCH: PULL KNOB OUT
LOCK: TIGHTEN KNOB BOLT

PLACARD

(D)

**Pressure Regulating and Shutoff Valve (PRSOV) Deactivation
Figure 903 (Sheet 2 of 2)/36-00-00-990-805**

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TASK 36-00-00-440-804

7. M MEL 36-5 (DDPG) Restoration - Pressure Regulating and Shutoff Valve Inoperative

(Figure 903)

A. General

- (1) This task puts the airplane back to its usual condition after operation with the pressure regulating and shutoff valve (PRSOV) inoperative.

B. References

Reference	Title
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

C. Location Zones

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

D. Pressure Regulating and Shutoff Valve Restoration

SUBTASK 36-00-00-860-031

- (1) Make sure each engine start lever is in the CUTOFF position.
 - (a) Install a DO-NOT-OPERATE tag on the each engine start lever.

SUBTASK 36-00-00-860-032

WARNING: YOU MUST REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. IF YOU DO NOT REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS, HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (2) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 36-00-00-010-015

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSERS: RETRACT THE LEADING EDGE, DEACTIVATE THE LEADING EDGE, DEACTIVATE THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANEL. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (3) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

SUBTASK 36-00-00-020-005

- (4) Manually unlock the PRSOV, do the steps that follow:
 - (a) Loosen the bolt that holds the lock knob in place.
 - (b) Pull the lock knob out, to unlock PRSOV.
 - (c) Retighten the bolt.

SUBTASK 36-00-00-010-016

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.

- (5) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

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HAP ALL	

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SUBTASK 36-00-00-440-005

- (6) Remove the DO-NOT-OPERATE tag from each engine start lever.

————— **END OF TASK** —————

TASK 36-00-00-040-805

8. M MEL 36-9 (DDPG) Preparation - High Stage Valve Inoperative

(Figure 904)

A. General

- (1) This task gives the maintenance steps which prepare the airplane for flight with the high stage valve inoperative.

B. References

Reference	Title
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

C. Location Zones

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

D. High Stage Valve Deactivation

SUBTASK 36-00-00-860-033

- (1) Make sure each engine start lever is in the CUTOFF position.
 - (a) Install a DO-NOT-OPERATE tag on the each engine start lever.

SUBTASK 36-00-00-860-034

WARNING: YOU MUST REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. IF YOU DO NOT REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS, HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (2) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 36-00-00-010-017

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSERS: RETRACT THE LEADING EDGE, DEACTIVATE THE LEADING EDGE, DEACTIVATE THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANEL. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (3) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

SUBTASK 36-00-00-020-006

- (4) Manually lock closed the high stage valve, do the steps that follow:
 - (a) Turn the manual override nut to align the position indicator with the CLOSED position.
 - (b) Loosen the bolt and push in the lock knob to lock the high stage valve closed.
 - (c) Retighten the bolt to hold the lock knob in place.

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SUBTASK 36-00-00-010-018

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.

(5) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

SUBTASK 36-00-00-440-006

(6) Remove the DO-NOT-OPERATE tag from each engine start lever.

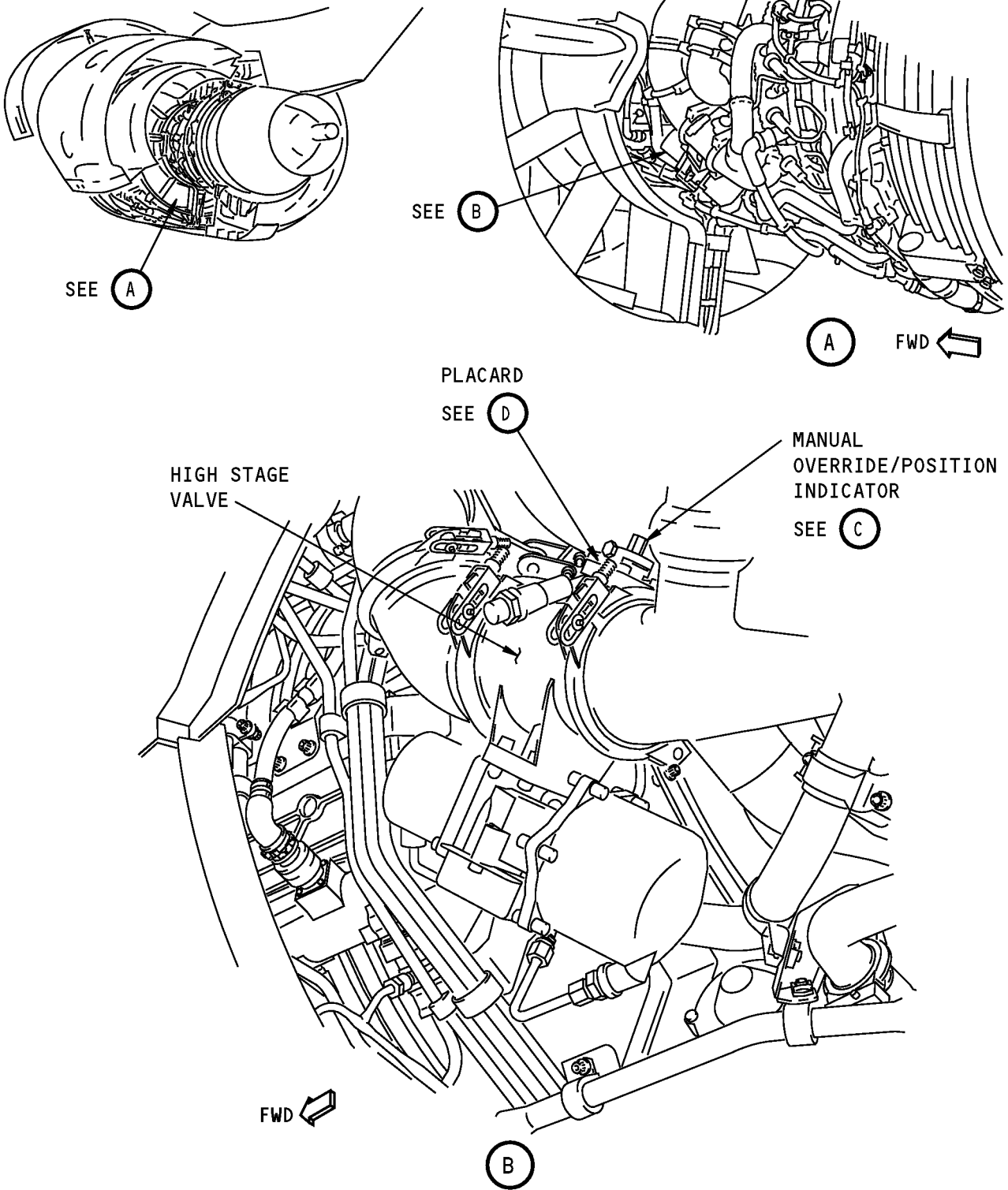
————— **END OF TASK** —————

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**High Stage Valve Deactivation
Figure 904 (Sheet 1 of 2)/36-00-00-990-808**

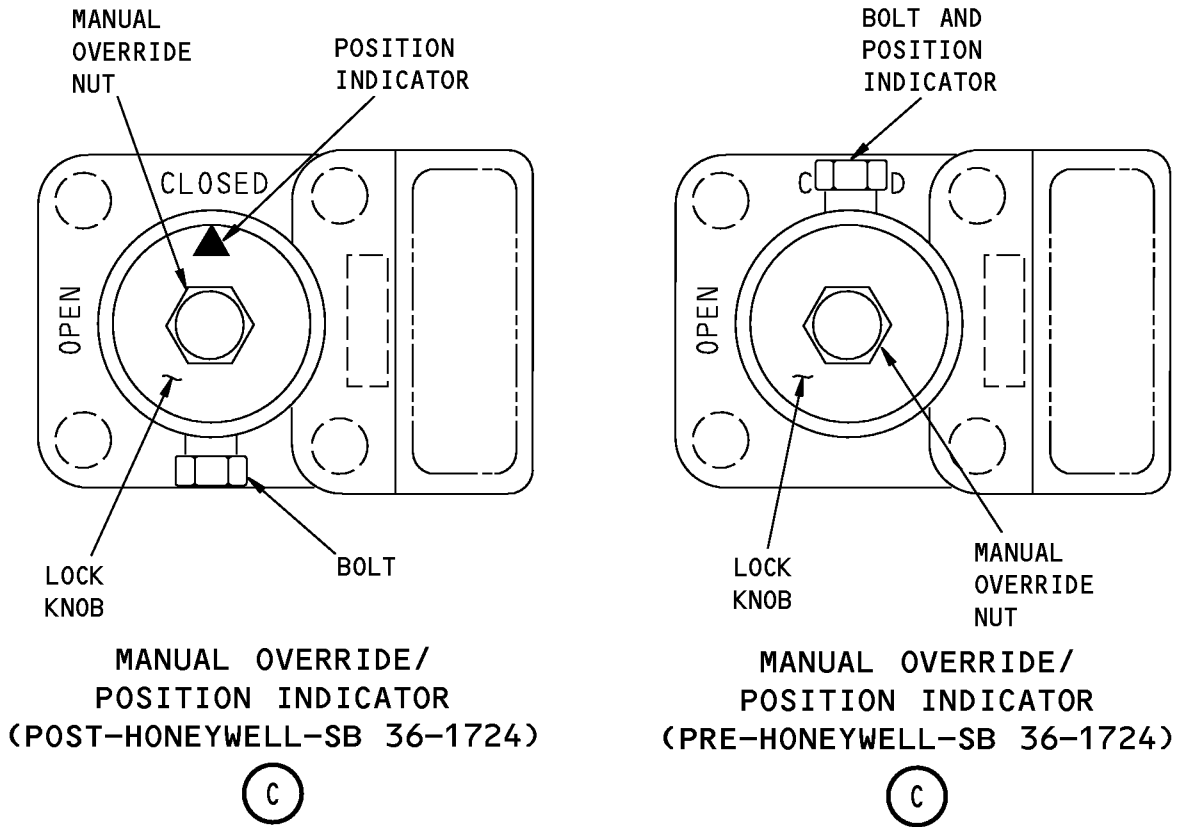
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WRENCH/LATCH/LOCK
WRENCH SHAFT HEX AS REQD
UNLOCK: LOOSEN KNOB BOLT-90°CCW
LATCH: PUSH KNOB IN
UNLATCH: PULL KNOB OUT
LOCK: TIGHTEN KNOB BOLT

PLACARD

(D)

**High Stage Valve Deactivation
Figure 904 (Sheet 2 of 2)/36-00-00-990-808**

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TASK 36-00-00-440-805

9. M MEL 36-9 (DDPG) Restoration - High Stage Valve Inoperative

(Figure 904)

A. General

- (1) This task puts the airplane back to its usual condition after operation with the high stage valve inoperative.

B. References

Reference	Title
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

C. Location Zones

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

D. High Stage Valve Restoration

SUBTASK 36-00-00-860-035

- (1) Make sure each engine start lever is in the CUTOFF position.
 - (a) Install a DO-NOT-OPERATE tag on the each engine start lever.

SUBTASK 36-00-00-860-036

WARNING: YOU MUST REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. IF YOU DO NOT REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS, HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (2) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 36-00-00-010-019

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSERS: RETRACT THE LEADING EDGE, DEACTIVATE THE LEADING EDGE, DEACTIVATE THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANEL. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (3) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

SUBTASK 36-00-00-020-007

- (4) Manually unlock the high stage valve, do the steps that follow:
 - (a) Loosen the bolt.
 - (b) Pull the lock knob out, to unlock the high stage valve.
 - (c) Tighten the bolt.

SUBTASK 36-00-00-010-020

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.

- (5) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

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SUBTASK 36-00-00-440-007

- (6) Remove the DO-NOT-OPERATE tag from each engine start lever.

————— **END OF TASK** —————

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ENGINE BLEED AIR DISTRIBUTION SYSTEM - ADJUSTMENT/TEST

1. General

A. This procedure contains six tasks. These tasks are as follows:

- Bleed Air Regulator and 490F Overtemperature Switch Functional Test
- Engine Bleed Trip Off Voltage Test
- Engine Bleed Air Crossover Operational Test
- Engine Bleed Air System Health Check
- Engine Bleed Air System Leak Check Using the APU
- Engine Bleed Air System Health Check Using a Portable Valve Actuating Test Set

B. The bleed air regulator and overtemperature switch functional test simulates a bleed trip condition with the 490°F overtemperature switch exposed to a 500°F (260°C) heat source. The bleed trip light indicator (on the P5-10 panel) and the bleed air regulator are checked for correct response in a bleed trip condition. The test also checks that the bleed air regulator solenoid operates correctly when the engine fire switch is cycled between the ON and OFF position.

C. The engine bleed trip off voltage test simulates an overtemperature condition by jumping pins across the overtemperature switch connector. The test measures the voltage across pins at the bleed air regulator connector and at the 490°F overtemperature switch connector in a simulated bleed trip condition.

D. The engine bleed air crossover operational test examines the operation of the PRSOV and the bleed air crossover function between the 9th and 5th-stage bleed with the engine in operation.

E. The engine bleed air health check uses a nitrogen pressure source and pneumatic test equipment (pressure gauges and regulators) to examine the operation state of these subsystems:

- (1) Bleed air regulator/PRSOV/450°F thermostat.
- (2) High-stage regulator/high-stage valve.

F. The engine bleed air system leak check using the APU describes how to use the APU to pressurize the system to check the sense lines and these system components for leaks:

- (1) The overpressure valve in the bleed air regulator.
- (2) The reverse flow diaphragm in the high stage regulator.

G. The engine bleed air health check using a portable valve actuating test set uses a Honeywell portable valve actuating test set (P/N 290121-3) or Boeing engine bleed air system test equipment (P/N C36001-44) to examine the operation state of these subsystems:

- (1) Bleed air regulator/PRSOV/450°F thermostat.
- (2) High-stage regulator/high-stage valve.

H. There is also a bleed air precooler system health check procedure that also uses the same type of pneumatic test equipment set-up as that of the engine bleed air health check. It can be found in the bleed air precooler system - adjustment/test section.

TASK 36-11-00-720-801

2. Bleed Air Regulator and 490F Overtemperature Switch Functional Test

A. General

- (1) The bleed air regulator and overtemperature switch functional test simulates a bleed trip condition with the 490°F overtemperature switch exposed to a 500°F (260°C) heat source. The bleed trip light indicator (on the P5-10 panel) and the bleed air regulator is checked for correct response in a bleed trip condition. The test also checks that the bleed air regulator solenoid operates correctly when the engine fire switch is cycled between the ON and OFF position.

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B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)
36-11-08-000-801	Overtemperature Switch Removal (P/B 401)
36-11-08-400-801	Overtemperature Switch Installation (P/B 401)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	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-1552	Kit - Heater Probes, TEMPCAL (Part #: BH24944-7, Supplier: 98869, A/P Effectivity: 737-600, -700, -700C, -700ER, -700QC, -800)
COM-3924	Tester - Thermo Switch, K-Type Thermocouple Switches (Part #: H294, Supplier: 98869, A/P Effectivity: 737-ALL) (Part #: H394 SERIES, Supplier: 98869, A/P Effectivity: 737-ALL)

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
411	Engine 1 - Engine
421	Engine 2 - Engine
433	Engine 1 - Strut Torque Box
443	Engine 2 - Strut Torque Box

E. Prepare for the Functional Test

SUBTASK 36-11-00-010-001

- (1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 36-11-00-860-001

- (2) Make sure that both engine BLEED switches on the P5-10 Panel are in the OFF position.

SUBTASK 36-11-00-860-002

- (3) Make sure the engine start lever is in the CUTOFF position.
 - (a) Install a DO-NOT-OPERATE tag on the applicable engine start lever.

SUBTASK 36-11-00-860-003

WARNING: YOU MUST REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. IF YOU DO NOT REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS, HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (4) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

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SUBTASK 36-11-00-010-002

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (5) Open the left thrust reverser on the Engine No. 1 (Engine No. 2). To open the thrust reverser, do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

F. Functional Test

SUBTASK 36-11-00-710-001

- (1) Push the BLEED TRIP OFF lights (2 locations) on the P5-10 Panel.
 - (a) Make sure the light comes on when you push the light.
 - (b) Make sure the light goes off when you release the light.

SUBTASK 36-11-00-710-002

- (2) Push and hold one of two master caution annunciators on the P7 glare shield.
 - (a) Make sure the MASTER CAUTION lights and master caution annunciator lights come on.

SUBTASK 36-11-00-710-003

- (3) Release the master caution annunciator.
 - (a) Make sure the MASTER CAUTION lights and master caution annunciator lights go off.

SUBTASK 36-11-00-860-004

- (4) Put the engine 1 BLEED (2 BLEED) switch, on the P5-10 Panel, to the ON position.
 - (a) Make sure the bleed air regulator solenoid goes to the ON position.

NOTE: The movement of the solenoid will make a click.

SUBTASK 36-11-00-020-001

- (5) Remove the 490°F overtemperature switch from the strut pneumatic duct. To remove the switch, do this task: Overtemperature Switch Removal, TASK 36-11-08-000-801.

SUBTASK 36-11-00-420-001

- (6) Reconnect the electrical connector to the 490°F overtemperature switch after you remove it from the strut pneumatic duct.

SUBTASK 36-11-00-750-001

CAUTION: DO NOT INCREASE THE TEMPERATURE OF THE BLEED AIR OVERHEAT SWITCH TO MORE THAN 550°F. IF THE TEMPERATURE OF THE SWITCH IS MORE THAN 550°F, IT CAN BE DAMAGED.

- (7) Use the temperature heat probe TEMPCAL heater probe kit, COM-1552 and K-Type thermocouple switch tester, COM-3924 to increase the temperature of the 490°F overtemperature switch as follows:
 - (a) Increase the temperature to 510°F ($\pm 5^\circ\text{F}$).
 - (b) Decrease the temperature to 455°F.

NOTE: This will preheat the test equipment.

- (c) If the left (right) BLEED TRIP OFF light on the P5-10 panel is on, do these steps:
 - 1) Allow the switch to cool until you can push and release the TRIP RESET switch and the BLEED TRIP OFF light goes off.

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(d) Slowly increase the temperature to 500 °F and hold this temperature for seven minutes.

1) Make sure these steps occur:

a) The bleed air regulator solenoid goes to the OFF position.

NOTE: The movement of the solenoid will make a click.

b) The left (right) BLEED TRIP OFF light on the P5-10 panel comes on.

c) The MASTER CAUTION lights (2 locations) on the P7 panel come on.

d) The AIR COND annunciator light comes on.

SUBTASK 36-11-00-720-022

(8) Slowly decrease the temperature to 470 °F and hold this temperature for seven minutes.

(a) Make sure the bleed air solenoid stays in the off position (the open winding of the solenoid does not click).

SUBTASK 36-11-00-020-002

(9) Remove the temperature heat probe TEMPCAL heater probe kit, COM-1552 from the 490°F overtemperature switch.

SUBTASK 36-11-00-860-005

(10) Push and release one of the two MASTER CAUTION lights.

(a) Make sure these steps occur:

1) The MASTER CAUTION lights go off.

2) The AIR COND annunciator light goes off.

3) The left (right) BLEED TRIP OFF light stays on.

SUBTASK 36-11-00-860-006

(11) Push and hold one of the two master caution annunciators.

(a) Make sure these lights come on:

1) The MASTER CAUTION lights (2 Locations)

2) The master caution annunciators.

SUBTASK 36-11-00-860-007

(12) Release the master caution annunciator.

(a) Make sure these lights stay on:

1) The MASTER CAUTION lights (2 Locations)

2) The AIR COND annunciator light

3) The left (right) BLEED TRIP OFF light.

SUBTASK 36-11-00-710-004

(13) Permit sufficient time for the 490°F overtemperature switch to cool.

SUBTASK 36-11-00-860-008

(14) Push and release the TRIP RESET switch on the P5-10 panel.

(a) Make sure these steps occur:

1) The bleed air regulator solenoid air goes to the ON position.

NOTE: The movement of the solenoid will make a click.

2) The MASTER CAUTION lights go off.

3) The AIR COND annunciator light goes off.

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4) The left (right) BLEED TRIP OFF light goes off.

SUBTASK 36-11-00-420-002

(15) Install the 490°F overtemperature switch. To install the switch, do this task: Overtemperature Switch Installation, TASK 36-11-08-400-801.

SUBTASK 36-11-00-860-009

(16) Put the ENGINE 1 FIRE (ENGINE 2 FIRE) switch, on the P8 panel, to the ON position.

(a) Make sure the bleed air regulator solenoid goes to the OFF position.

SUBTASK 36-11-00-860-010

(17) Put the ENGINE 1 FIRE (ENGINE 2 FIRE) switch to the NORMAL position.

(a) Make sure the bleed air regulator solenoid goes to the ON position.

SUBTASK 36-11-00-860-011

(18) Put the engine 1 BLEED (2 BLEED) switch, on the P5-10 panel, to the OFF position.

(a) Make sure the bleed air regulator solenoid goes to the OFF position.

SUBTASK 36-11-00-720-001

(19) Do this procedure for the engine no. 2, if it is necessary.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 36-11-00-010-004

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) Close the left thrust reverser for the applicable engine. To close the thrust reverser, do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

SUBTASK 36-11-00-860-012

(2) Remove the DO-NOT-OPERATE tags from the engine start levers.

END OF TASK

TASK 36-11-00-730-801

3. Engine Bleed Trip Off Voltage Test

(Figure 501)

A. General

(1) The engine bleed trip off voltage test simulates an overtemperature condition by jumping pins across the overtemperature switch connector. The test measures the voltage across pins at the bleed air regulator connector and at the 490°F overtemperature switch connector in a simulated bleed trip condition. It also examines the applicable indicators for correct operation.

B. References

Table with 2 columns: Reference, Title. Lists tasks like 24-22-00-860-811, 54-52-01-010-801, 54-52-01-410-801, 78-31-00-010-801-F00, 78-31-00-010-804-F00.

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C. Tools/Equipment

Reference	Description
STD-1231	Multimeter - Standard

D. Location Zones

Zone	Area
211	Flight Compartment - Left
212	Flight Compartment - Right
411	Engine 1 - Engine
421	Engine 2 - Engine
433	Engine 1 - Strut Torque Box
443	Engine 2 - Strut Torque Box

E. Access Panels

Number	Name/Location
431BL	Forward Strut Fairing, Left Mid Strut Fairing, Strut 1
441BL	Forward Strut Fairing, Left Mid Strut Fairing, Strut 2

F. Prepare for the Voltage Test

SUBTASK 36-11-00-860-013

- (1) Make sure the engine start lever is in the CUTOFF position.
 - (a) Install a DO-NOT-OPERATE tag on the applicable engine start lever.

SUBTASK 36-11-00-860-014

- (2) Make sure these BLEED switches on the P5-10 Panel are in the OFF position.
 - (a) BLEED 1
 - (b) BLEED 2

SUBTASK 36-11-00-010-005

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (3) Open the left thrust reverser on the applicable engine. To open the thrust reverser, do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

SUBTASK 36-11-00-010-006

- (4) Remove the applicable access panel, do this step:
 - (a) Open these access panels:
 - Forward Fairing Removal, TASK 54-52-01-010-801

Number	Name/Location
431BL	Forward Strut Fairing, Left Mid Strut Fairing, Strut 1
441BL	Forward Strut Fairing, Left Mid Strut Fairing, Strut 2

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SUBTASK 36-11-00-860-015

CAUTION: ELECTRICAL POWER MUST BE REMOVED FROM THE SYSTEM BEFORE THE ELECTRICAL CONNECTOR IS DISCONNECTED FROM THE BLEED COMPONENT.

- (5) Be prepared to disconnect these electrical connectors, as applicable to examine the voltage across the pins during the voltage test:
 - (a) D526 - 490°F overtemperature switch connector, Engine No. 1
 - (b) D528 - 490°F overtemperature switch connector, Engine No. 2
 - (c) Bleed air regulator connector, Engine No. 1 and 2

G. Voltage Test

SUBTASK 36-11-00-860-016

WARNING: WHEN YOU WORK ON ENERGIZED ELECTRICAL SYSTEMS, MAKE SURE THAT ALL PRECAUTIONS ARE TAKEN TO PREVENT SHORT CIRCUITS WHICH CAN DAMAGE EQUIPMENT AND ELECTRICAL SHOCK TO PERSONNEL.

- (1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 36-11-00-860-017

- (2) Push the two BLEED TRIP OFF lights, one at a time on the P5-10 panel.
 - (a) Make sure the two BLEED TRIP OFF lights come on when you push them.
 - (b) Make sure the two BLEED TRIP OFF lights go off when you release them.
 - (c) Open these circuit breakers:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
HAP 101-999			
C	4	C00257	AIR CONDITIONING OVERHEAT
HAP 001-013, 015-026, 028-054			
C	7	C01177	A/C PACK/ENGINE BLEED AIR OVHT RIGHT
C	8	C01176	A/C PACK/ENGINE BLEED AIR OVHT LEFT

HAP ALL

SUBTASK 36-11-00-860-019

CAUTION: ELECTRICAL POWER MUST BE REMOVED FROM THE SYSTEM BEFORE THE ELECTRICAL CONNECTOR IS DISCONNECTED FROM THE BLEED COMPONENT.

- (3) Disconnect the electrical connector DP1102, from the applicable bleed air regulator to examine the voltage with a multimeter, STD-1231 across the pins during the voltage test:
 - (a) Engine No. 1 and 2 bleed air regulator.

SUBTASK 36-11-00-860-046

- (4) Close these circuit breakers:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
HAP 101-999			
C	4	C00257	AIR CONDITIONING OVERHEAT
HAP 001-013, 015-026, 028-054			
C	7	C01177	A/C PACK/ENGINE BLEED AIR OVHT RIGHT

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HAP 001-013, 015-026, 028-054 (Continued)

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C01176	A/C PACK/ENGINE BLEED AIR OVHT LEFT

HAP ALL

SUBTASK 36-11-00-210-001

- (5) Put the applicable engine BLEED switch to the ON position.

NOTE: Keep the other engine BLEED switch in the OFF position.

SUBTASK 36-11-00-730-001

- (6) Measure the voltage between pins 5 and 6 at the electrical connector for the bleed air regulator.

(a) Make sure the voltage is 28 ± 5 VDC.

SUBTASK 36-11-00-730-002

- (7) Use a wrench to manually open and hold the applicable engine start valve to approximately 30 degrees in the open position.

SUBTASK 36-11-00-730-003

- (8) Measure the voltages between these pins at the regulator connector:

(a) Pins 5 and 6 measure 0 ± 2 VDC.

(b) Pins 6 and 7 measure 28 ± 5 VDC.

SUBTASK 36-11-00-730-004

- (9) Release the engine start valve to the full closed position.

SUBTASK 36-11-00-730-005

- (10) Measure the voltages between these pins at the regulator connector:

(a) Pins 5 and 6 measure 28 ± 5 VDC.

(b) Pins 6 and 7 measure 0 ± 2 VDC.

SUBTASK 36-11-00-730-006

- (11) Install a jumper wire between pins 9 and 10 at the regulator connector.

SUBTASK 36-11-00-730-007

- (12) Measure the voltages between these pins at the regulator connector:

(a) Pins 5 and 6 measure 0 ± 2 VDC.

(b) Pins 6 and 7 measure 28 ± 5 VDC.

SUBTASK 36-11-00-730-008

- (13) Make sure these lights come on:

(a) The applicable BLEED TRIP OFF on the P5-10 panel.

(b) The MASTER CAUTION (2 locations) on the P7 glare shield.

(c) The AIR COND annunciator on the P7 glare shield.

SUBTASK 36-11-00-730-009

- (14) Put the LIGHTS switch, on the P2 panel, to the DIM position.

(a) Make sure these lights become dim:

1) The applicable BLEED TRIP OFF on the P5-10 panel.

2) The MASTER CAUTION (2 locations) on the P7 glare shield.

3) The AIR COND annunciator on the P7 glare shield.

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SUBTASK 36-11-00-730-010

- (15) Put the LIGHTS switch, on the P2 panel, to the BRIGHT position.
- (a) Make sure these light return to their original brightness:
 - 1) The applicable BLEED TRIP OFF on the P5-10 panel.
 - 2) The MASTER CAUTION (2 locations) on the P7 glare shield.
 - 3) The AIR COND annunciator on the P7 glare shield.

SUBTASK 36-11-00-730-011

- (16) Push and release either Master Caution annunciator to cancel the Master Caution.
- (a) Make sure the MASTER CAUTION light goes off.
 - (b) Make sure the AIR COND annunciator light goes off.
 - (c) Make sure the applicable BLEED TRIP OFF light stays on.

SUBTASK 36-11-00-730-012

- (17) Push and release either Master Caution annunciator to recall the Master Caution.
- (a) Make sure the MASTER CAUTION light comes on.
 - (b) Make sure the AIR COND annunciator light comes on.

SUBTASK 36-11-00-730-013

- (18) Remove the jumper wire between the pins 9 and 10 at the regulator connector.

SUBTASK 36-11-00-730-014

- (19) Push and release the TRIP RESET switch on the P5 overhead panel.

SUBTASK 36-11-00-730-015

- (20) Measure the voltages between these pins at the regulator connector.
- (a) Pins 5 and 6 measure 28 ± 5 VDC.
 - (b) Pins 6 and 7 measure 0 ± 2 VDC.

SUBTASK 36-11-00-730-016

- (21) Make sure these lights are off:
- (a) The MASTER CAUTION (2 locations) on the P7 glare shield.

NOTE: The MASTER CAUTION light will stay on if there are other system annunciator lights on. Push and release either MASTER CAUTION light to cancel the Master Caution.
 - (b) The AIR COND annunciator on the P7 glare shield.
 - (c) The applicable BLEED TRIP OFF light on the P5-10 panel.

SUBTASK 36-11-00-730-017

- (22) Put the applicable ENGINE FIRE switch to the ON position.

SUBTASK 36-11-00-730-018

- (23) Measure the voltages between these pins at the regulator connector:
- (a) Pins 5 and 6 measure 0 ± 2 VDC.
 - (b) Pins 6 and 7 measure 28 ± 5 VDC.

SUBTASK 36-11-00-730-019

- (24) Put the applicable ENGINE FIRE switch to the NORMAL position.

SUBTASK 36-11-00-730-020

- (25) Measure the voltages between these pins at the regulator connector:

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- (a) Pins 5 and 6 measure 28 ± 5 VDC.
- (b) Pins 6 and 7 measure 0 ± 2 VDC.

SUBTASK 36-11-00-860-051

(26) Open these circuit breakers:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
------------	------------	---------------	-------------

HAP 101-999

C	4	C00257	AIR CONDITIONING OVERHEAT
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HAP 001-013, 015-026, 028-054

C	7	C01177	A/C PACK/ENGINE BLEED AIR OVHT RIGHT
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C	8	C01176	A/C PACK/ENGINE BLEED AIR OVHT LEFT
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HAP ALL

SUBTASK 36-11-00-860-022

CAUTION: ELECTRICAL POWER MUST BE REMOVED FROM THE SYSTEM BEFORE THE ELECTRICAL CONNECTOR IS DISCONNECTED FROM THE BLEED COMPONENT.

(27) Disconnect the applicable electrical connector to examine the voltage across the pins during the voltage test:

- (a) D526 - 490°F overtemperature switch connector, Engine No. 1
- (b) D528 - 490°F overtemperature switch connector, Engine No. 2

SUBTASK 36-11-00-730-021

(28) Install a jumper wire between the pins 1 and 2 at the applicable 490°F overtemperature switch, D526(D528).

SUBTASK 36-11-00-860-056

(29) Close these circuit breakers:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
------------	------------	---------------	-------------

HAP 101-999

C	4	C00257	AIR CONDITIONING OVERHEAT
---	---	--------	---------------------------

HAP 001-013, 015-026, 028-054

C	7	C01177	A/C PACK/ENGINE BLEED AIR OVHT RIGHT
---	---	--------	--------------------------------------

C	8	C01176	A/C PACK/ENGINE BLEED AIR OVHT LEFT
---	---	--------	-------------------------------------

HAP ALL

SUBTASK 36-11-00-730-022

(30) Make sure these lights come on:

- (a) The applicable BLEED TRIP OFF on the P5-10 panel.
- (b) The MASTER CAUTION (2 locations) on the P7 glare shield.
- (c) The AIR COND annunciator on the P7 glare shield.

SUBTASK 36-11-00-730-023

(31) Measure the voltages between these pins at the applicable regulator connector:

- (a) Pins 5 and 6 measure 0 ± 2 VDC.
- (b) Pins 6 and 7 measure 28 ± 5 VDC.

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SUBTASK 36-11-00-730-024

(32) Remove the jumper wire between pins 1 and 2 at the applicable 490°F overtemperature switch, D526(D528).

SUBTASK 36-11-00-730-025

(33) Push and release the TRIP RESET switch on the P5 overhead panel.

SUBTASK 36-11-00-730-026

(34) Make sure these lights go off:

- (a) The applicable BLEED TRIP OFF on the P5-10 panel.
- (b) The MASTER CAUTION (2 locations) on the P7 glare shield.

NOTE: The MASTER CAUTION light will stay on if there are other system annunciator lights on. Push and release either MASTER CAUTION light to cancel the Master Caution.

- (c) The AIR COND annunciator on the P7 glare shield.

SUBTASK 36-11-00-730-027

(35) Measure the voltages between these pins at the regulator connector:

- (a) Pins 5 and 6 measure 28 ± 5 VDC.
- (b) Pins 6 and 7 measure 0 ± 2 VDC.

SUBTASK 36-11-00-730-028

(36) Do the procedure again for the other engine if it is necessary.

H. Put the Airplane Back To Its Usual Condition

SUBTASK 36-11-00-860-024

(1) Open these circuit breakers:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	7	C00796	AIR CONDITIONING BLEED AIR VALVES LEFT
B	7	C00797	AIR CONDITIONING BLEED AIR VALVES RIGHT

SUBTASK 36-11-00-860-061

(2) Open these circuit breakers:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
HAP 101-999			
C	4	C00257	AIR CONDITIONING OVERHEAT
HAP 001-013, 015-026, 028-054			
C	7	C01177	A/C PACK/ENGINE BLEED AIR OVHT RIGHT
C	8	C01176	A/C PACK/ENGINE BLEED AIR OVHT LEFT

HAP ALL

SUBTASK 36-11-00-860-025

(3) Connect all of the electrical connectors that were disconnected for this test.

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SUBTASK 36-11-00-860-026

(4) Close these circuit breakers:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	7	C00796	AIR CONDITIONING BLEED AIR VALVES LEFT
B	7	C00797	AIR CONDITIONING BLEED AIR VALVES RIGHT

SUBTASK 36-11-00-860-066

(5) Close these circuit breakers:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
HAP 101-999			
C	4	C00257	AIR CONDITIONING OVERHEAT
HAP 001-013, 015-026, 028-054			
C	7	C01177	A/C PACK/ENGINE BLEED AIR OVHT RIGHT
C	8	C01176	A/C PACK/ENGINE BLEED AIR OVHT LEFT

HAP ALL

SUBTASK 36-11-00-410-001

(6) Install the applicable access panel, do this step:

(a) Close these access panels:

Forward Fairing Installation, TASK 54-52-01-410-801

<u>Number</u>	<u>Name/Location</u>
431BL	Forward Strut Fairing, Left Mid Strut Fairing, Strut 1
441BL	Forward Strut Fairing, Left Mid Strut Fairing, Strut 2

SUBTASK 36-11-00-410-002

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

(7) Close the left thrust reverser for the applicable engine. To close the thrust reverser, do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

SUBTASK 36-11-00-860-027

(8) Remove the DO-NOT-OPERATE tag from the engine start lever on the control stand.

————— **END OF TASK** —————

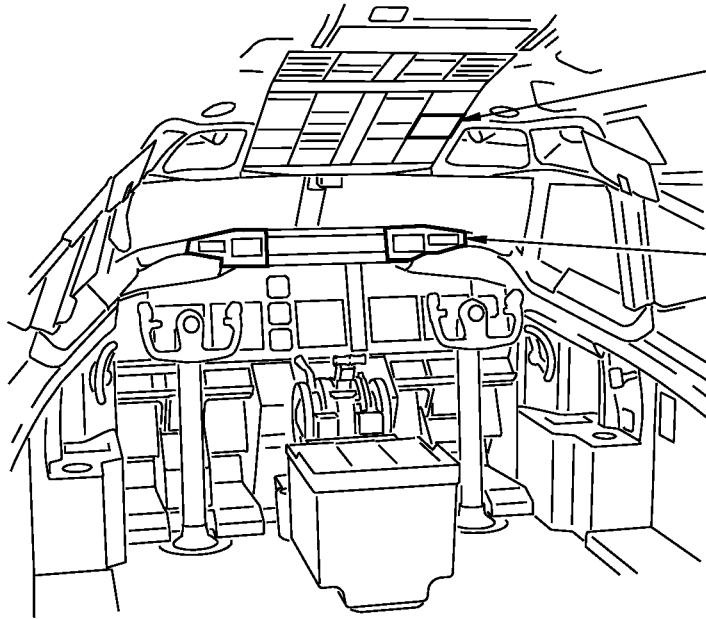
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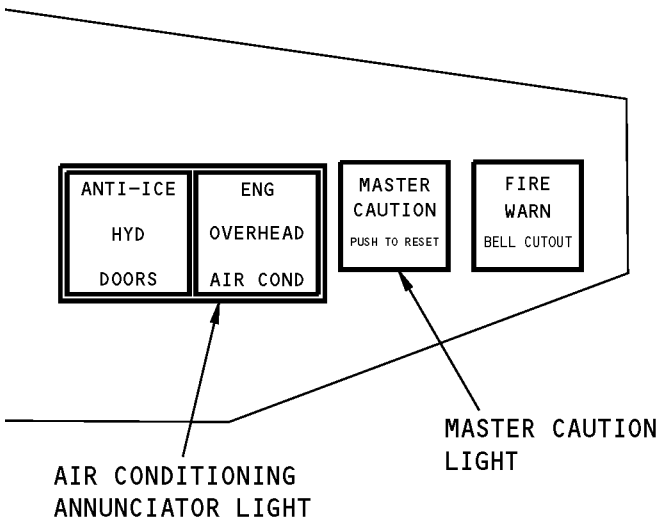
BLEED AIR CONTROL
MODULE (P5-10)

SEE (B)

MASTER CAUTION (P7)
(2 LOCATIONS)

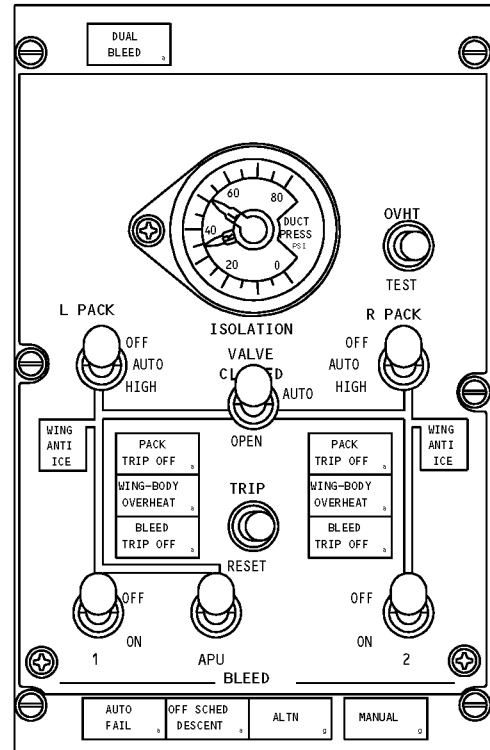
SEE (A)

FLIGHT COMPARTMENT



**MASTER CAUTION (P7)
(EXAMPLE)**

(A)



**BLEED AIR CONTROL
MODULE (P5-10)**

(B)

**Bleed Air Distribution System Test
Figure 501/36-11-00-990-801**

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TASK 36-11-00-710-801

4. Engine Bleed Air Crossover Operational Test

(Figure 502)

A. General

- (1) The minimum serviceable duct pressure must be 18 psig in order to supply sufficient air for cabin pressurization. This procedure does the operational test of the control system for the engine bleed air. These bleed system components will be tested:
 - (a) The high stage valve
 - (b) The high stage regulator
 - (c) The pressure regulator and shutoff valve (PRSOV)
 - (d) The bleed air regulator.
- (2) This procedure examines the operation of the PRSOV and the crossover between the 9th-stage and 5th-stage bleed.

B. References

Reference	Title
71-00-00-700-819-F00	Stop the Engine Procedure (Usual Engine Stop) (P/B 201)
71-00-00-800-807-F00	Start the Engine Procedure (Selection) (P/B 201)

C. Location Zones

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

D. Operational Test

SUBTASK 36-11-00-870-001

- (1) Do this task: Start the Engine Procedure (Selection), TASK 71-00-00-800-807-F00.

SUBTASK 36-11-00-860-028

- (2) Put these switches, on the P5-10 panel, to the positions that follow:
 - (a) ISOLATION VALVE - CLOSED
 - (b) 1 BLEED - OFF
 - (c) 2 BLEED - OFF
 - (d) APU BLEED - OFF
 - (e) L PACK - OFF
 - (f) R PACK - OFF

SUBTASK 36-11-00-210-002

- (3) Examine the dual duct pressure indicator on the P5-10 panel.

NOTE: Ignore the fluctuation in the dual duct pressure indicator with these conditions: you move the BLEED switch, the isolation valve is closed, or the PACK switch is in the OFF position.

- (a) Make sure the dual duct pressure indicator shows 10.0 psig or less.

SUBTASK 36-11-00-860-029

- (4) Make sure that engine is at idle.

EFFECTIVITY HAP ALL	
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SUBTASK 36-11-00-710-005

- (5) Put the engine 1 BLEED switch to the ON position.
 - (a) Permit the pressure in the pneumatic ducts to become stable.
 - (b) Make sure the dual duct pressure indicator shows 10.0 - 25.0 psig.

NOTE: Pneumatic duct pressure must be a minimum of 18 psig to supply sufficient air for cabin pressurization.

SUBTASK 36-11-00-710-006

- (6) Put the L PACK switch to the AUTO position.

SUBTASK 36-11-00-710-007

- (7) Slowly increase the engine power in 10% increments when following these steps and log the pressure values in the DUCT PRESSURE VALUES AS N1% INCREASES table below.

NOTE: The duct pressures should follow the graphs in Figure 502.

- (a) As N1 increases, make sure the duct pressure is at 32 ± 6 psig and becomes stable when N1 is at 40%.
- (b) Continue to slowly increase the engine power to 80% N1.
- (c) Make sure the duct pressure goes to 42 ± 8 psig and becomes stable.

INCREASE N1%

N1%	IDLE	20%	30%	40%
LEFT ENGINE				
RIGHT ENGINE				
PSIG RANGE	18-20	18-20	26-38	26-38

INCREASE N1%

N1%	50%	60%	70%	80%
LEFT ENGINE				
RIGHT ENGINE				
PSIG RANGE	26-38	34-50	34-50	34-50

DUCT PRESSURE VALUES AS N1% INCREASES

SUBTASK 36-11-00-710-009

- (8) Slowly decrease the engine power.
 - (a) Log the pressure values at every 10% N1 interval in the DUCT PRESSURE VALUES AS N1% DECREASES table below.
 - (b) Make sure the duct pressure goes to 32 ± 6 psig and becomes stable as shown in the graphs in Figure 502.

NOTE: When the engine bleed system goes from the 5th-stage bleed to the 9th-stage bleed, the duct pressure can decrease to approximately 20.0 psig. This can occur before the high- stage valve opens and regulates the bleed air.

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DECREASE N1%

N1%	80%	70%	60%	50%
LEFT ENGINE				
RIGHT ENGINE				
PSIG RANGE	34-50	34-50	34-50	26-38

DECREASE N1%

N1%	40%	30%	20%	IDLE
LEFT ENGINE				
RIGHT ENGINE				
PSIG RANGE	26-38	26-38	18-20	18-20

DUCT PRESSURE VALUES AS N1% DECREASES

SUBTASK 36-11-00-710-010

(9) Put the engine 1 BLEED switch to the OFF position.

SUBTASK 36-11-00-710-011

(10) Put the L PACK switch to the OFF position.

SUBTASK 36-11-00-710-012

(11) After the duct pressure is stable.

(a) Make sure the duct pressure is at 10.0 psig or less.

SUBTASK 36-11-00-710-013

(12) To stop the engine, do this task: Stop the Engine Procedure (Usual Engine Stop), TASK 71-00-00-700-819-F00.

SUBTASK 36-11-00-710-014

(13) Do this procedure again for the engine 2 bleed system, if it is necessary.

END OF TASK

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HAP ALL

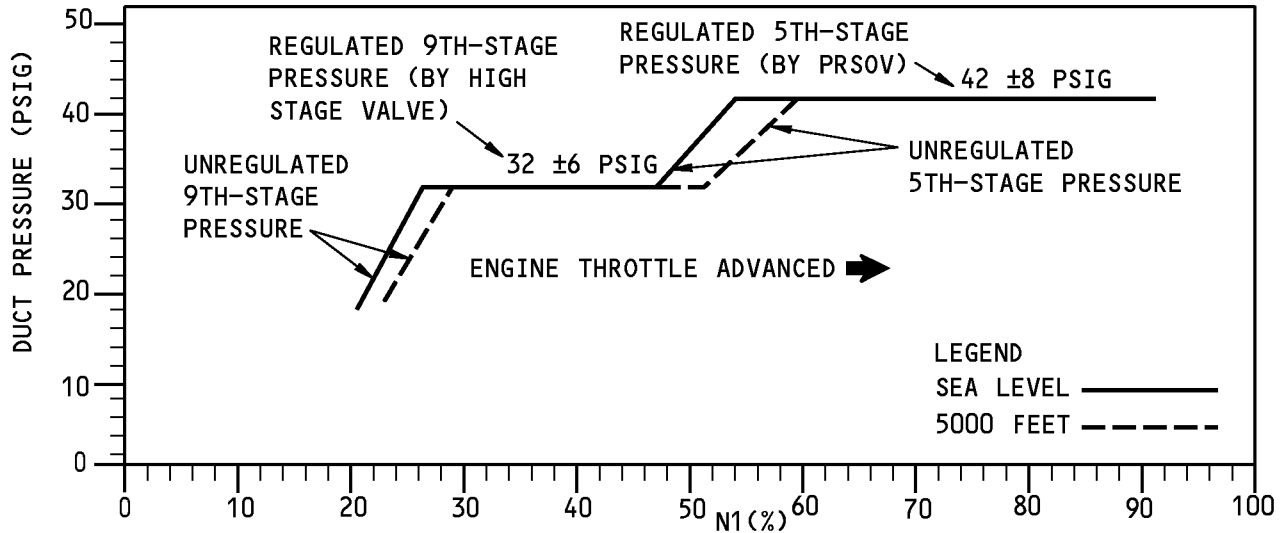
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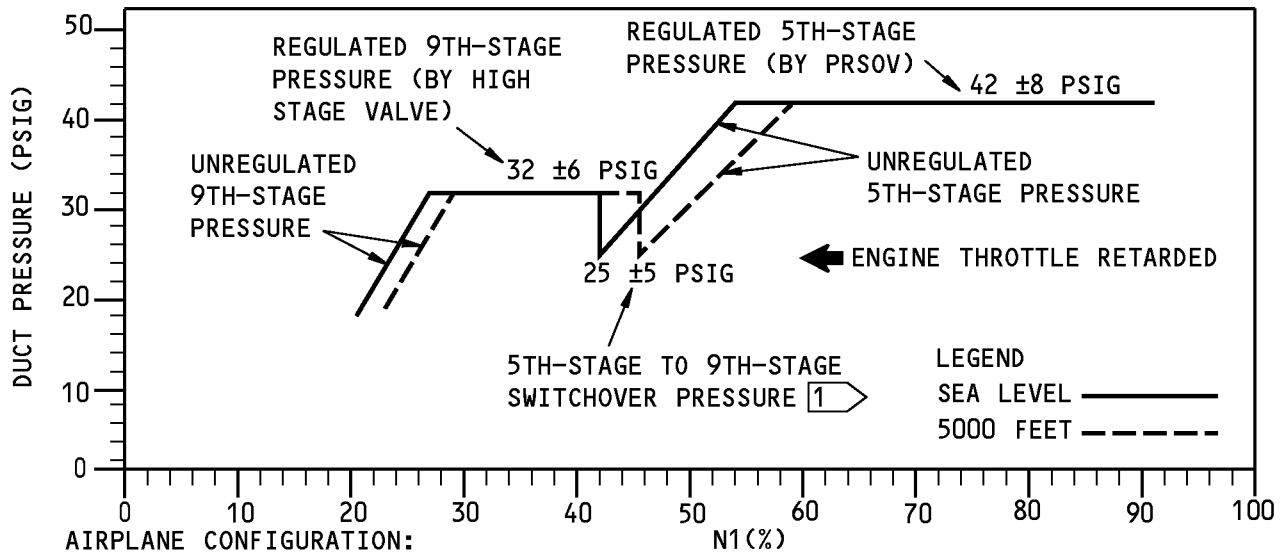
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**DUCT PRESSURE VERSUS N1 AT SEA LEVEL AND 5000 FEET
(ENGINE THROTTLE ADVANCED WITH A/C PACKS IN AUTO MODE)**



**DUCT PRESSURE VERSUS N1 AT SEA LEVEL AND 5000 FEET
(ENGINE THROTTLE RETARDED WITH A/C PACKS IN AUTO MODE)**



AIRPLANE CONFIGURATION:
 ASSOCIATED PACK: AUTO
 ASSOCIATED BLEED: ON
 ASSOCIATED CTAI: OFF
 ISOLATION VALVE: CLOSED
 WTAI: OFF

1 WHEN THE ENGINE THROTTLE IS RETARDED AND THE ENGINE BLEED SYSTEM SWITCHOVER OCCUR FROM 5TH-STAGE PRESSURE TO 9TH-STAGE PRESSURE, DUCT PRESSURE CAN DECAY TO AS LOW AS 20 PSIG BEFORE THE HIGH STAGE VALVE OPENS AND REGULATES THE DUCT PRESSURE TO NOMINAL 32 PSIG.

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**Duct Pressure Versus N1 at Sea Level and 5000 Feet
Figure 502/36-11-00-990-802**

EFFECTIVITY
HAP ALL

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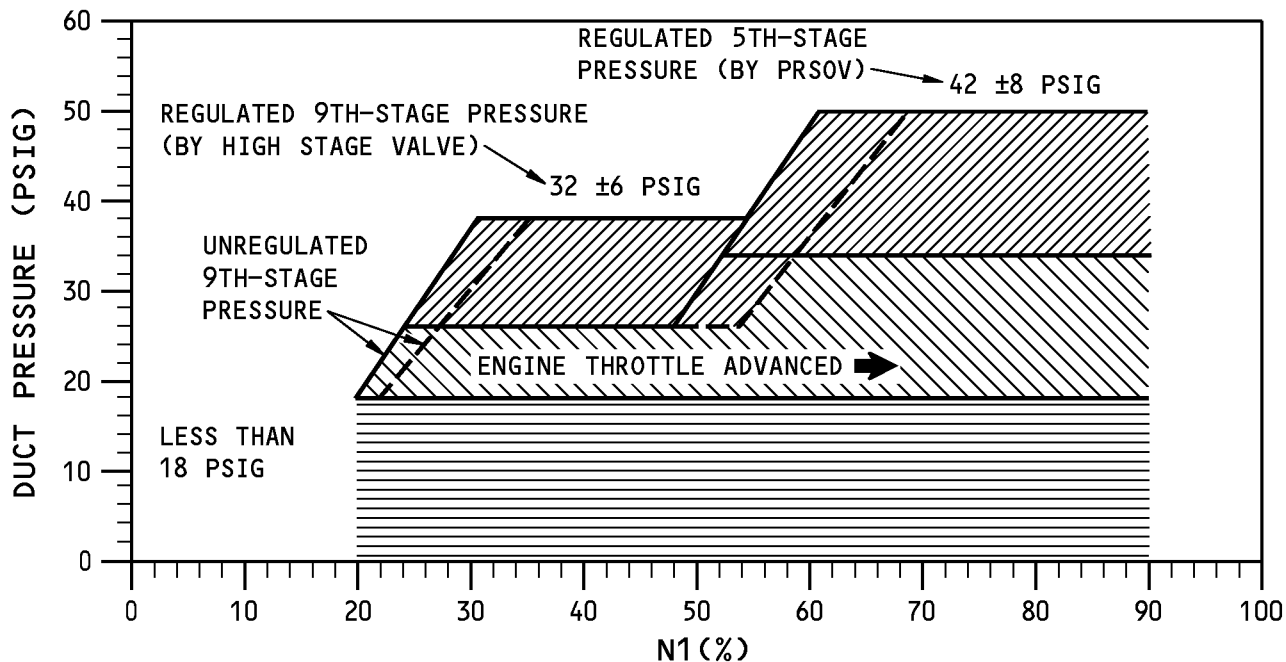


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MINIMUM SERVICEABLE PNEUMATIC DUCT PRESSURE

UNDER IN-FLIGHT AIRPLANE CONFIGURATION AND OPERATING CONDITIONS



NOTE: MINIMUM POWER IN FLIGHT IS GREATER THAN MINIMUM POWER ON THE GROUND.

LEGEND:

— SEA LEVEL

- - 5000 FEET

//// BLEED SYSTEM OPERATING NORMALLY.

\\\\ BLEED SYSTEM PERFORMANCE DRIFTING. AIRPLANE CAN BE OPERATED NORMALLY BUT ACTION TO RESTORE BLEED SYSTEM TO OPTIMUM OPERATION SHOULD BE TAKEN AT A CONVENIENT OPPORTUNITY.

==== BLEED SYSTEM INOPERATIVE. RESTORE TO NORMAL OPERATION BEFORE FLIGHT OR IMPOSE THE MEL RESTRICTION FOR CONTINUED OPERATION.

1418175 S0000255925_V2

**Minimum Serviceable Pneumatic Duct Pressure
Figure 503/36-11-00-990-810**

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TASK 36-11-00-700-801

5. Engine Bleed Air System Health Check

(Figure 504, Figure 505)

A. General

- (1) This procedure contains a task to operationally check these engine bleed components with pneumatic test equipment:
 - (a) Bleed Air Regulator (BAR)
 - (b) Pressure Regulator and Shutoff Valve (PRSOV)
 - (c) High Stage Regulator
 - (d) High Stage Valve
- (2) This procedure will check that the:
 - (a) Bleed air regulator will supply the correct pressure
 - (b) Overpressure switch in the bleed air regulator will operate at the correct pressure range
 - (c) PRSOV will open at the minimum supply pressure
 - (d) High stage regulator will supply the correct control pressure
 - (e) High stage valve will operate satisfactorily
 - (f) Reverse flow check protection in the high stage regulator operates correctly
 - (g) Sense lines have no leaks.
- (3) Engine Bleed Air System Health Check Using a Portable Valve Actuating Test Set, TASK 36-11-00-700-803 performs the same procedure but uses Boeing test set C36001-44 or a Honeywell portable valve actuating test set instead of the tools listed in this procedure.
- (4) An equivalent procedure to operationally check the bleed air precooler system components with the use of the same pneumatic test equipment can be found in the bleed air precooler system - adjustment/test section.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)
36-11-03-000-801	Bleed Air Regulator Removal (P/B 401)
36-11-03-400-801	Bleed Air Regulator Installation (P/B 401)
36-11-04-000-801	PRSOV Removal (P/B 401)
36-11-04-400-801	PRSOV Installation (P/B 401)
36-11-05-000-801	Thermostat Removal (P/B 401)
36-11-05-400-801	Thermostat Installation (P/B 401)
36-11-06-000-801	High Stage Valve Removal (P/B 401)
36-11-06-400-801	High Stage Valve Installation (P/B 401)
36-11-07-000-801	High Stage Regulator Removal (P/B 401)
36-11-07-400-801	High Stage Regulator Installation (P/B 401)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

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C. Tools/Equipment

Reference	Description
STD-1201	Gauge - Pressure, 0-75 PSIG (0-518 KPa)
STD-1453	Gauge - Pressure, 0-250 PSIG (0-1724 KPa)
STD-1454	Regulator - Pressure, 0 to 250 PSI with Pressure Gauge, 3/8 Inch ID Connections
STD-1455	Source - Nitrogen, 0-250 PSIG
STD-3942	Hose - Air, Flexible, 3/8 inch (.9525 cm) ID, Length as Needed

D. Consumable Materials

Reference	Description	Specification
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT-8N	MIL-PRF-907F
G50135	Leak Detector - Liquid, Non-Corrosive Soap Compound	MIL-PRF-25567

E. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine
430	Subzone - Engine 1, Nacelle Strut
433	Engine 1 - Strut Torque Box
440	Subzone - Engine 2, Nacelle Strut
443	Engine 2 - Strut Torque Box

F. Prepare for the System Health Check

SUBTASK 36-11-00-860-030

(1) Make sure the engine start lever is in the CUTOFF position.

(a) Install a DO-NOT-OPERATE tag on the applicable engine start lever.

SUBTASK 36-11-00-860-031

WARNING: YOU MUST REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. IF YOU DO NOT REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS, HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 36-11-00-010-007

(3) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

G. Bleed Air Regulator/PRSOV/450°F Thermostat Check

SUBTASK 36-11-00-210-003

(1) Examine the position indicator/manual override nut [6] on the PRSOV [4] (Figure 504) (View B).

NOTE: The position indicator [6] should be in the closed position.

SUBTASK 36-11-00-710-015

(2) Use a 3/8-inch wrench on the manual override nut [6] to open and close the PRSOV [4].

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SUBTASK 36-11-00-900-002

- (3) If the PRSOV [4] does not move to the open and closed positions smoothly, replace the PRSOV [4]. Do these tasks.

NOTE: Use Never-Seez NSBT-8N compound, D00006 on the threads of all fittings when connecting the sense lines.

PRSOV Removal, TASK 36-11-04-000-801,
PRSOV Installation, TASK 36-11-04-400-801.

SUBTASK 36-11-00-710-020

- (4) Supply electrical power to the airplane. Do this task.

Supply Electrical Power, TASK 24-22-00-860-811

If unable to use the airplane's electrical power, skip this step and continue with the following step.

SUBTASK 36-11-00-860-067

- (5) Put the applicable engine bleed switch to the ON position.

SUBTASK 36-11-00-860-032

- (6) If unable to use the airplane's electrical system, follow these steps to enable the bleed air regulator.

(a) Remove the electrical connector [7] from the bleed air regulator [1].

(b) Put the applicable engine bleed switch to the ON position.

(c) Wire two nine volt batteries in series and apply 18 VDC across pins 5 and 6 in the electrical connector [7] on the bleed air regulator for approximately 5 seconds.

NOTE: You should hear the OPEN solenoid click in the bleed air regulator [1].

(d) Remove the 18 VDC power supply.

(e) Reconnect the electrical connector [7] on the bleed air regulator [1].

SUBTASK 36-11-00-020-003

- (7) Disconnect the bleed air supply line [5] at the inlet to the tee at the supply pressure sense line [3] (Figure 504, View B).

SUBTASK 36-11-00-480-001

- (8) Connect a nitrogen pressure source, STD-1455, pressure regulator, STD-1454, supply pressure gauge, STD-1453 (Ps) and test 3/8 inch (.9525 cm) ID flexible air hose, length as needed, STD-3942 at the tee to the supply pressure sense line [3].

SUBTASK 36-11-00-710-016

- (9) Slowly increase Ps until the position indicator [6] on the PRSOV [4] moves to the fully open position. Record the psi on the Figure 506.

SUBTASK 36-11-00-720-016

- (10) If Ps is greater than or equal to 10 psig when the PRSOV [4] is fully open, replace the PRSOV [4]. Do these tasks:

NOTE: Use Never-Seez NSBT-8N compound, D00006 on the threads of all fittings when connecting the sense lines.

PRSOV Removal, TASK 36-11-04-000-801,

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PRSOV Installation, TASK 36-11-04-400-801.

SUBTASK 36-11-00-720-017

(11) If Ps is less than 10 psig when the PRSOV [4] is fully open, then continue.

SUBTASK 36-11-00-710-017

(12) Decrease Ps to 0 psig.

SUBTASK 36-11-00-860-034

(13) Disconnect the control pressure sense line [2] (to PRSOV/450°F thermostat) from the bleed air regulator [1] (Figure 504, View C).

SUBTASK 36-11-00-860-035

(14) Install a pressure gauge, STD-1201 between the bleed air regulator [6] and the control pressure (Pc) sense line [2].

SUBTASK 36-11-00-860-036

(15) Slowly increase Ps to 60-70 psig. Record the control pressure (Pc) psi on the Figure 506.

SUBTASK 36-11-00-210-010

(16) Pc should be 20-27 psig. If Pc is greater than or equal to 28 psig when Ps is 60-70 psig, replace the bleed air regulator [1]. To replace the regulator [1], do these tasks:

NOTE: Use Never-Seez NSBT-8N compound, D00006 on the threads of all fittings when connecting the sense lines.

Bleed Air Regulator Removal, TASK 36-11-03-000-801,

Bleed Air Regulator Installation, TASK 36-11-03-400-801.

SUBTASK 36-11-00-700-001

(17) If Pc is below 20 psig, do these steps:

(a) Use leak detector, G50135 to examine these areas for leakage and repair all leakage found:

NOTE: You may hear nitrogen leakage from the bleed air regulator [1]. This is from honest orifices in the bleed air regulator [1] and is normal.

1) Supply pressure sense line [3] to bleed air regulator [1].

2) Control pressure sense line [2] from the bleed air regulator [1] to the PRSOV [4] and 450°F thermostat.

3) Ambient vent port on the 450°F thermostat.

(b) If no leakage was found, decrease Ps to 0 psig.

(c) Disconnect the control pressure sense line [2] from the PRSOV/450°F thermostat (Figure 504, View D).

(d) Install a cap on the control pressure sense line [2] to isolate the 450°F thermostat.

(e) Increase Ps to 60 - 70 psig and check the control pressure (Pc). Record the control pressure (Pc) psi on the Figure 506.

(f) If the control pressure is between 20 and 28 psig, the 450°F thermostat must be replaced. Do these tasks:

Thermostat Removal, TASK 36-11-05-000-801,

Thermostat Installation, TASK 36-11-05-400-801.

(g) If Pc is not between 20 and 28 psig, decrease Ps to 0 psig.

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- (h) Disconnect the control pressure sense line [2] from the control pressure gauge connection (Figure 504, View E).
- (i) Install a cap on the open end of control pressure gauge connection (from the bleed air regulator [1]).
- (j) Increase Ps to 60 - 70 psig and check Pc. Record the control pressure (Pc) psi on the Figure 506.
- (k) If Pc is not between 20 and 28 psig, replace the bleed air regulator [1], Do these tasks:
NOTE: Use Never-Seez NSBT-8N compound, D00006 on the threads of all fittings when connecting the sense lines.

Bleed Air Regulator Removal, TASK 36-11-03-000-801,

Bleed Air Regulator Installation, TASK 36-11-03-400-801.

- (l) If Pc is between 20 and 28 psig, replace the PRSOV [4]. Do these tasks:

NOTE: Use Never-Seez NSBT-8N compound, D00006 on the threads of all fittings when connecting the sense lines.

PRSOV Removal, TASK 36-11-04-000-801,

PRSOV Installation, TASK 36-11-04-400-801.

SUBTASK 36-11-00-860-037

- (18) This step tests the overpressure switch in the bleed air regulator. Do this step ONLY if airplane electrical power is available.

NOTE: The airplane's electrical power is needed to activate the bleed air regulator's overpressure switch.

- (a) AIRPLANES WITH BLEED AIR REGULATORS WITH PART NUMBER 107492-5 (spec. #10-62008-40) or 107492-6 (spec. #10-62008-41).

Slowly increase Ps to 220 ± 10 psi. Record the control pressure (Pc) psi on the Figure 506.

- 1) If Pc drops to 0 - 6 psig, skip the next step and continue with step (19).
- 2) If Pc does not drop to 0 - 6 psig, replace the bleed air regulator [1]. Do these tasks:

NOTE: Use Never-Seez NSBT-8N compound, D00006 on the threads of all fittings when connecting the sense lines.

Bleed Air Regulator Removal, TASK 36-11-03-000-801,

Bleed Air Regulator Installation, TASK 36-11-03-400-801.

SUBTASK 36-11-00-710-018

- (19) Decrease Ps to 0 psig.

SUBTASK 36-11-00-080-001

- (20) Remove the nitrogen pressure source and all test equipment.

SUBTASK 36-11-00-720-003

- (21) Reconnect all sense lines that were disconnected for this procedure.

NOTE: Use Never-Seez NSBT-8N compound, D00006 on the threads of all fittings when connecting the sense lines.

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SUBTASK 36-11-00-720-004

(22) Push the trip reset switch on the P5 panel to put the bleed system to its usual condition.

H. High Stage Valve/High Stage Regulator Health Check

NOTE: This procedure checks the operation of the high stage valve and the high stage regulator's ability to regulate the control pressure to the high stage valve.

SUBTASK 36-11-00-210-005

(1) Examine the position indicator/manual override nut [15] on the high stage valve [14]. The position indicator [15] should be in the closed position (Figure 505, View E).

SUBTASK 36-11-00-710-021

(2) Use a 3/8-inch wrench on the manual override nut [15] to open and close the high stage valve [14].

SUBTASK 36-11-00-960-001

(3) If the high stage valve [14] does not move to the open and closed positions smoothly, replace the high stage valve [14]. Do these tasks:

High Stage Valve Removal, TASK 36-11-06-000-801

High Stage Valve Installation, TASK 36-11-06-400-801

SUBTASK 36-11-00-960-002

(4) Check the high stage valve for excessive gaps between the valve body and the valve plate seal which will cause excessive leakage.

(a) Remove the high stage valve by doing this task: High Stage Valve Removal, TASK 36-11-06-000-801.

(b) Hold the valve up to the light and look for gaps between the valve body and the valve plate seal.

NOTE: It is normal to see several slivers of light between the valve body and the valve plate seal in isolated locations.

(c) Excessive leakage can be expected if there is a gap around the entire circumference of the valve plate (about 0.020 inch gap).

1) If excessive gaps are found, install a new or overhauled high stage valve by doing this task: High Stage Valve Installation, TASK 36-11-06-400-801.

2) If the gaps between the valve body and valve plate seal are determined to be normal, reinstall the valve by doing this task: High Stage Valve Installation, TASK 36-11-06-400-801.

SUBTASK 36-11-00-020-005

(5) Disconnect the supply pressure sense line [12] at the high stage regulator [11].

SUBTASK 36-11-00-480-003

(6) Connect a pressure regulator, STD-1454, supply pressure gauge, STD-1453 (Ps) and a nitrogen pressure source, STD-1455 to the supply pressure port on the high stage regulator [11] (Figure 505, View B).

SUBTASK 36-11-00-020-008

(7) Disconnect the control pressure sense line [13] at the high stage regulator [11] (Figure 505, View C).

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SUBTASK 36-11-00-480-004

- (8) Install a control pressure gauge, STD-1201 (Pc) and a 3/8 inch (.9525 cm) ID flexible air hose, length as needed, STD-3942 between the control pressure sense line [13] and the control pressure port on the high stage regulator [11].

SUBTASK 36-11-00-710-026

- (9) Slowly increase Ps to the high stage regulator.

SUBTASK 36-11-00-720-023

- (10) The control pressure (Pc) should be less than 10 psig when the high stage valve moves to the fully open position. Record the control pressure (Pc) psi in Figure 506.

SUBTASK 36-11-00-960-010

- (11) If Pc is greater than or equal to 10 psig when the high stage valve moves to the fully open position, replace the valve. Do these tasks:

High Stage Valve Removal, TASK 36-11-06-000-801

High Stage Valve Installation, TASK 36-11-06-400-801

SUBTASK 36-11-00-720-005

- (12) Continue to increase Ps to the high stage regulator until 35 - 40 psig is reached. Record the control pressure (Pc) psi in the Figure 506.

SUBTASK 36-11-00-720-018

- (13) The control pressure (Pc) should be between 15 and 18 psig when Ps is 35 - 40 psig. If Pc is not between 15 and 18 psig, do the steps that follow.

(a) Slowly increase Ps to 70 psig.

(b) Use leak detector, G50135 to examine these areas for nitrogen leakage:

- 1) The connections where the supply pressure test line from the nitrogen source attach to the supply pressure regulator, the supply pressure gauge, and the high stage regulator [11] (Figure 505, View C).
- 2) The connections where the Pc air hose from the control pressure gauge attaches between the control pressure sense line [13] and the high stage regulator [11].

(c) Repair all leakage found.

NOTE: Use Never-Seez NSBT-8N compound, D00006 on the threads of all fittings when connecting the sense lines.

(d) If no leakage is found, replace the high stage regulator [11]. Do these tasks:

High Stage Regulator Removal, TASK 36-11-07-000-801

High Stage Regulator Installation, TASK 36-11-07-400-801

SUBTASK 36-11-00-720-012

- (14) Slowly increase Ps to 110 ± 10 psig while you monitor the Pc. Record the control pressure (Pc) psi in Figure 506.

SUBTASK 36-11-00-720-020

- (15) If Pc is greater than or equal to 4 psig when Ps is 110 ± 10 psig, replace the high stage regulator [11]. Do these tasks:

High Stage Regulator Removal, TASK 36-11-07-000-801,

High Stage Regulator Installation, TASK 36-11-07-400-801.

SUBTASK 36-11-00-720-025

- (16) If Pc is less than 4 psig when Ps is 110 ± 10 psig, then continue.

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SUBTASK 36-11-00-720-014

(17) Decrease Ps to 0 psig.

SUBTASK 36-11-00-080-002

(18) Check the high stage regulator's reverse flow protection mechanism by following this procedure.

- (a) Disconnect the downstream pressure sense line [16] at the high stage regulator [11] (Figure 505, View F).
- (b) Connect a downstream pressure gauge, STD-1453, nitrogen source, STD-1455, pressure regulator, STD-1454, and 3/8 inch (.9525 cm) ID flexible air hose, length as needed, STD-3942 to the downstream pressure port of the high stage regulator [11].

NOTE: You can also connect the supply pressure test line and the downstream pressure test line to a tee fitting and use a common supply line to one nitrogen pressure source.

- (c) Downstream pressure (Pd) should be at 0 psig.
- (d) Make sure the position indicator [15] on the high stage valve [14] is in the closed position.
- (e) Make sure the downstream pressure regulator and the supply pressure regulator are closed.
- (f) Supply 60 psig from the nitrogen pressure sources to the supply pressure regulator and to the downstream pressure regulator.
- (g) Slowly adjust the supply pressure regulator to increase the supply pressure (Ps) to 20 psig.
- (h) Make sure the position indicator [15] on the high stage valve [14] has moved to the open position.
- (i) Slowly adjust the downstream pressure regulator to increase downstream pressure (Pd) to 25 psig.
- (j) When downstream pressure (Pd) is equal to supply pressure (Ps), control pressure (Pc) should decrease to less than or equal to 4 psig. Record the control pressure (Pc) psi in Figure 506.
- (k) If Pc did not decrease to less than or equal to 4 psig, replace the high stage regulator [11]. Do these tasks:

High Stage Regulator Removal, TASK 36-11-07-000-801

High Stage Regulator Installation, TASK 36-11-07-400-801

- (l) Decrease the pressure from both nitrogen pressure sources to 0 psig.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 36-11-00-080-003

- (1) Remove the pressure gauges, pressure regulators, test hoses, nitrogen pressure sources and other test accessories.

SUBTASK 36-11-00-420-004

- (2) Reconnect all sense lines that were disconnected do this check procedure.

NOTE: Use Never-Seez NSBT-8N compound, D00006 on the threads of all fittings when connecting the sense lines.

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SUBTASK 36-11-00-010-009

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.

(3) Do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

SUBTASK 36-11-00-440-001

(4) Remove the DO-NOT-OPERATE tag from the applicable engine start lever.

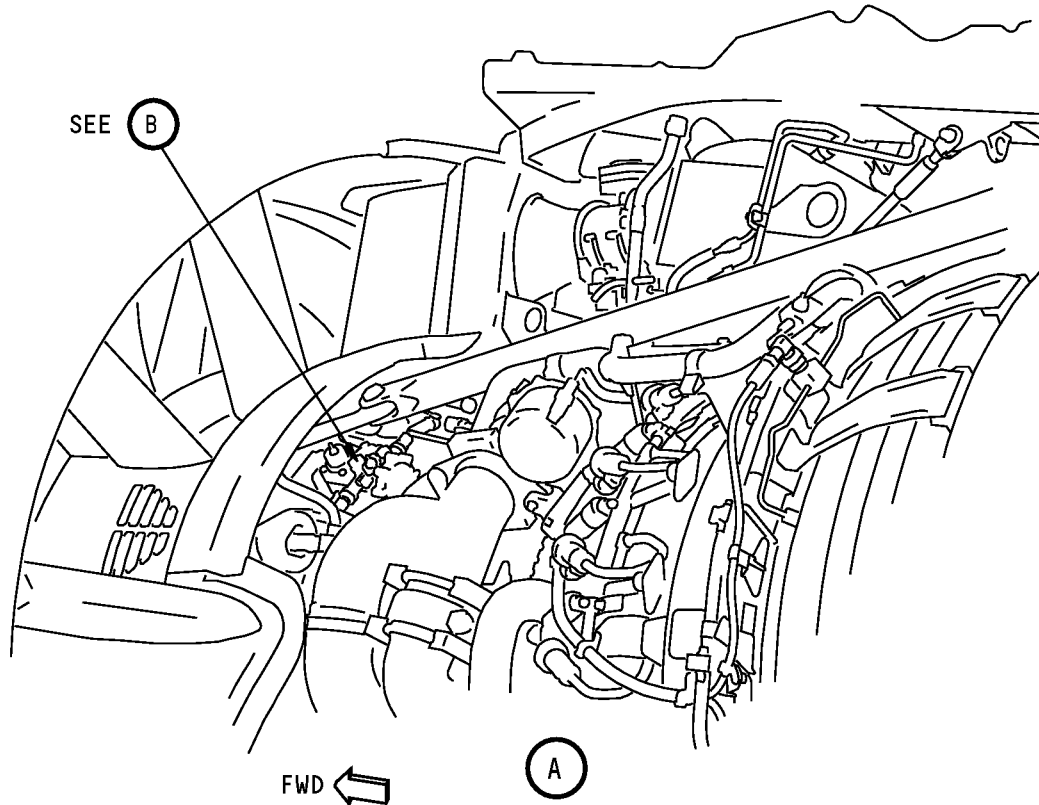
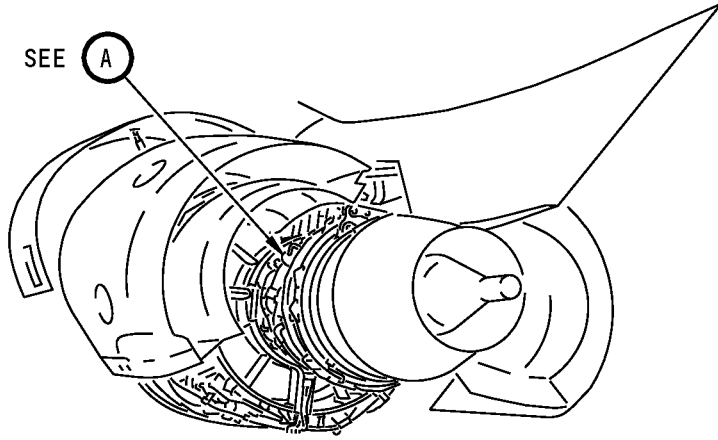
————— **END OF TASK** —————

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**Engine Bleed System Operational Test
Figure 504 (Sheet 1 of 5)/36-11-00-990-803**

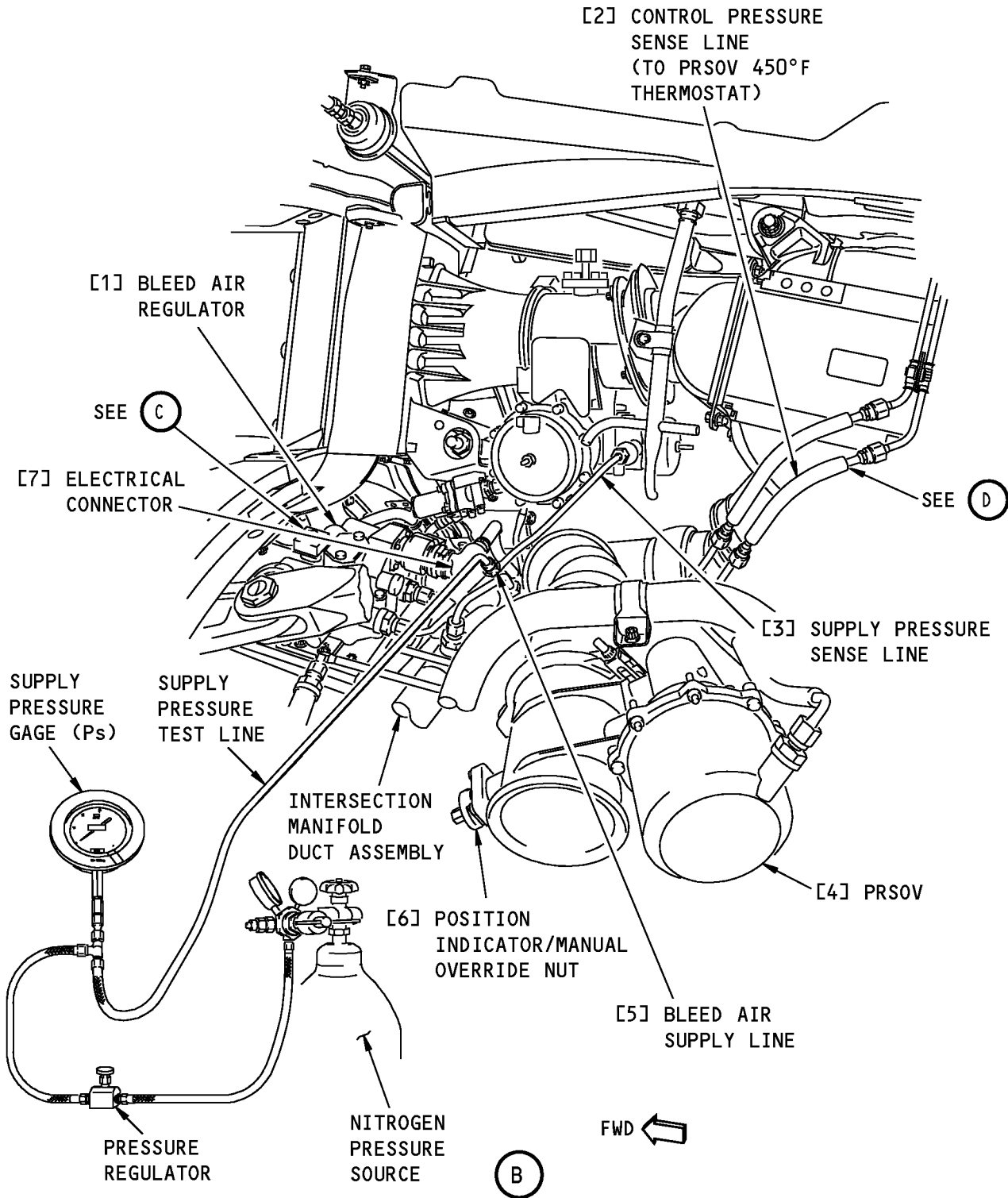
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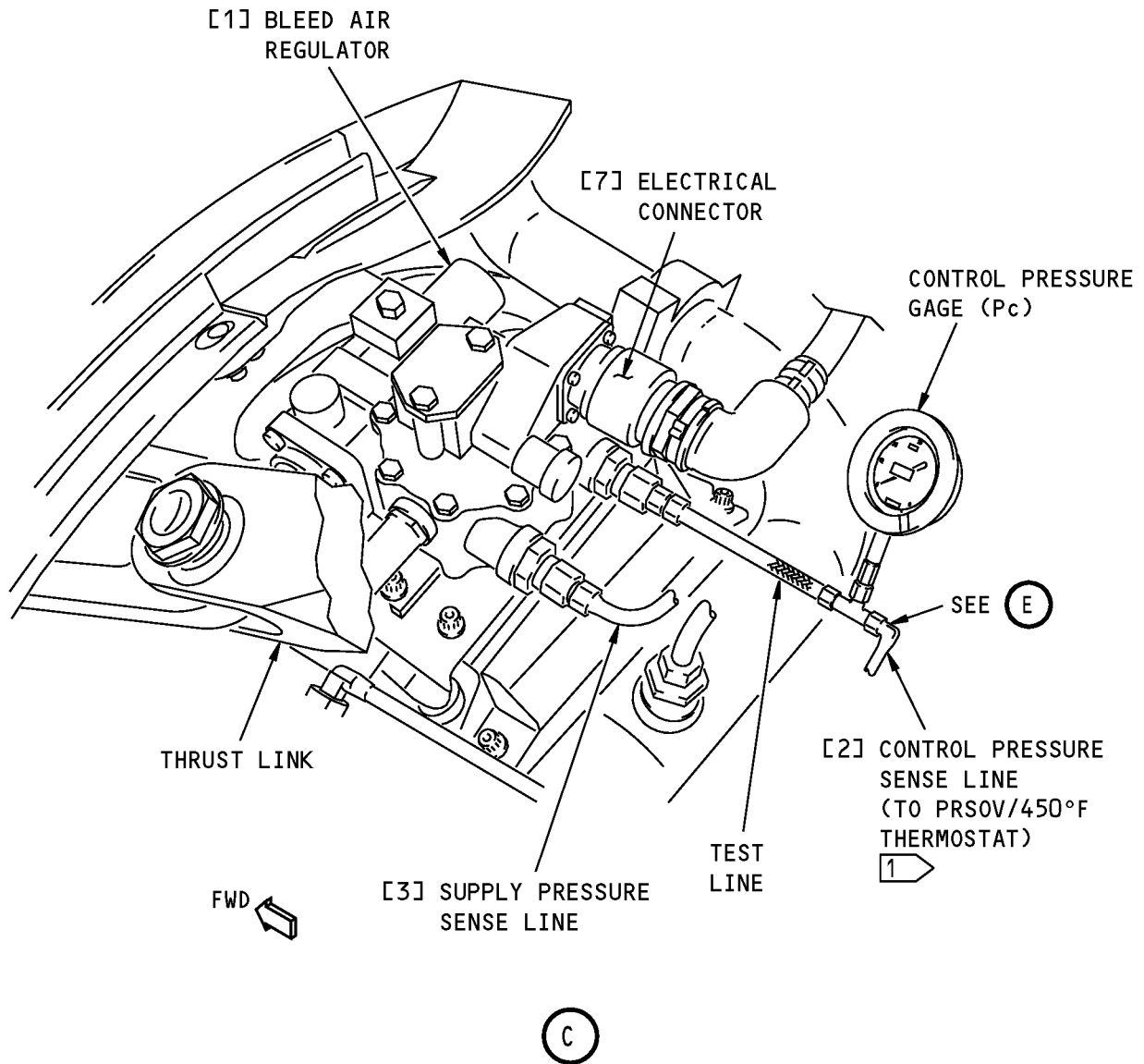
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**Engine Bleed System Operational Test
Figure 504 (Sheet 2 of 5)/36-11-00-990-803**

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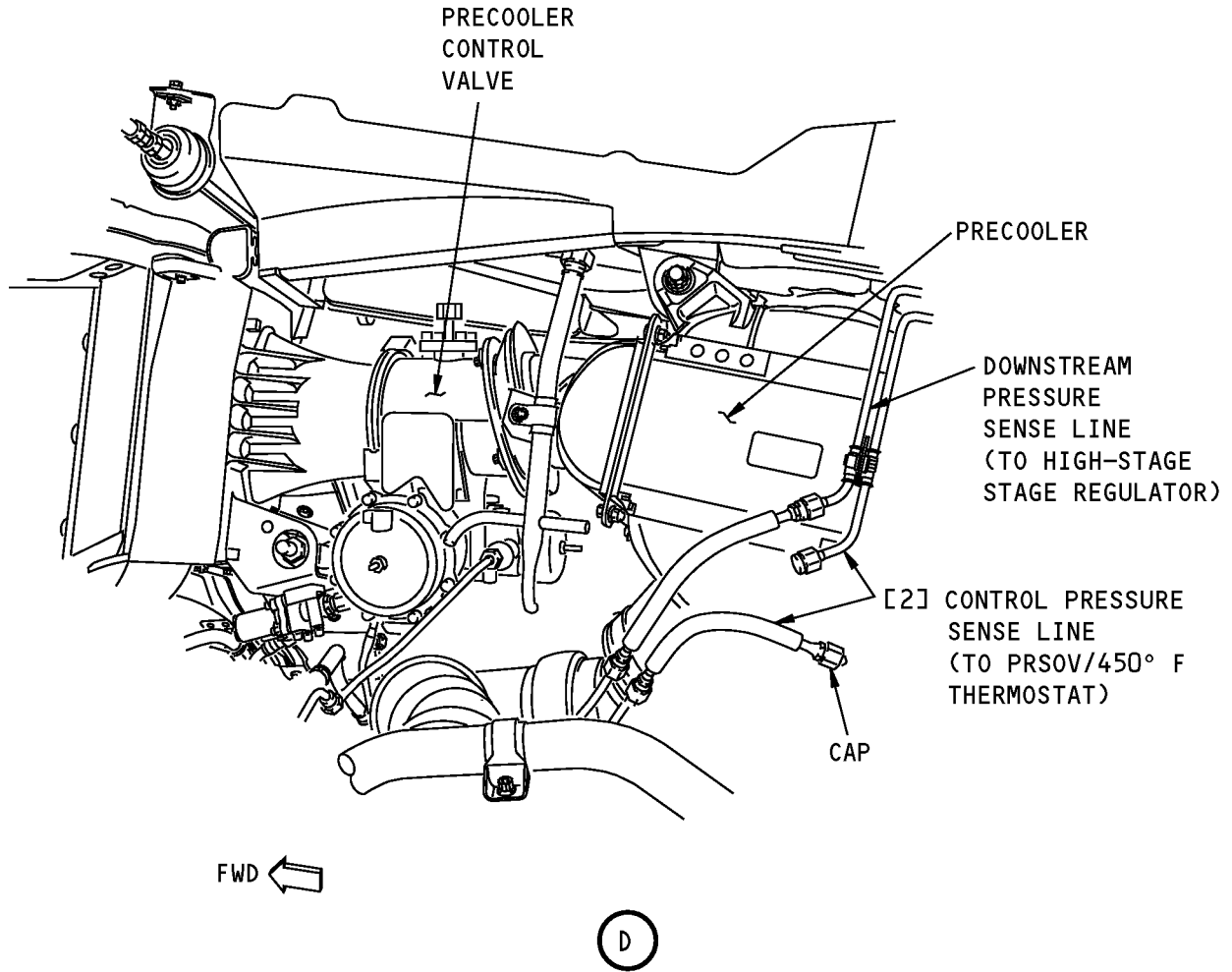
1 CONNECTION POINT SHOWN IS TYPICAL. YOU CAN CONNECT THE CONTROL PRESSURE GAGE ANYWHERE ALONG THE CONTROL PRESSURE SENSE LINE BETWEEN THE BLEED AIR REGULATOR AND THE PRSOV THAT IS CONVENIENT.

**Engine Bleed System Operational Test
Figure 504 (Sheet 3 of 5)/36-11-00-990-803**

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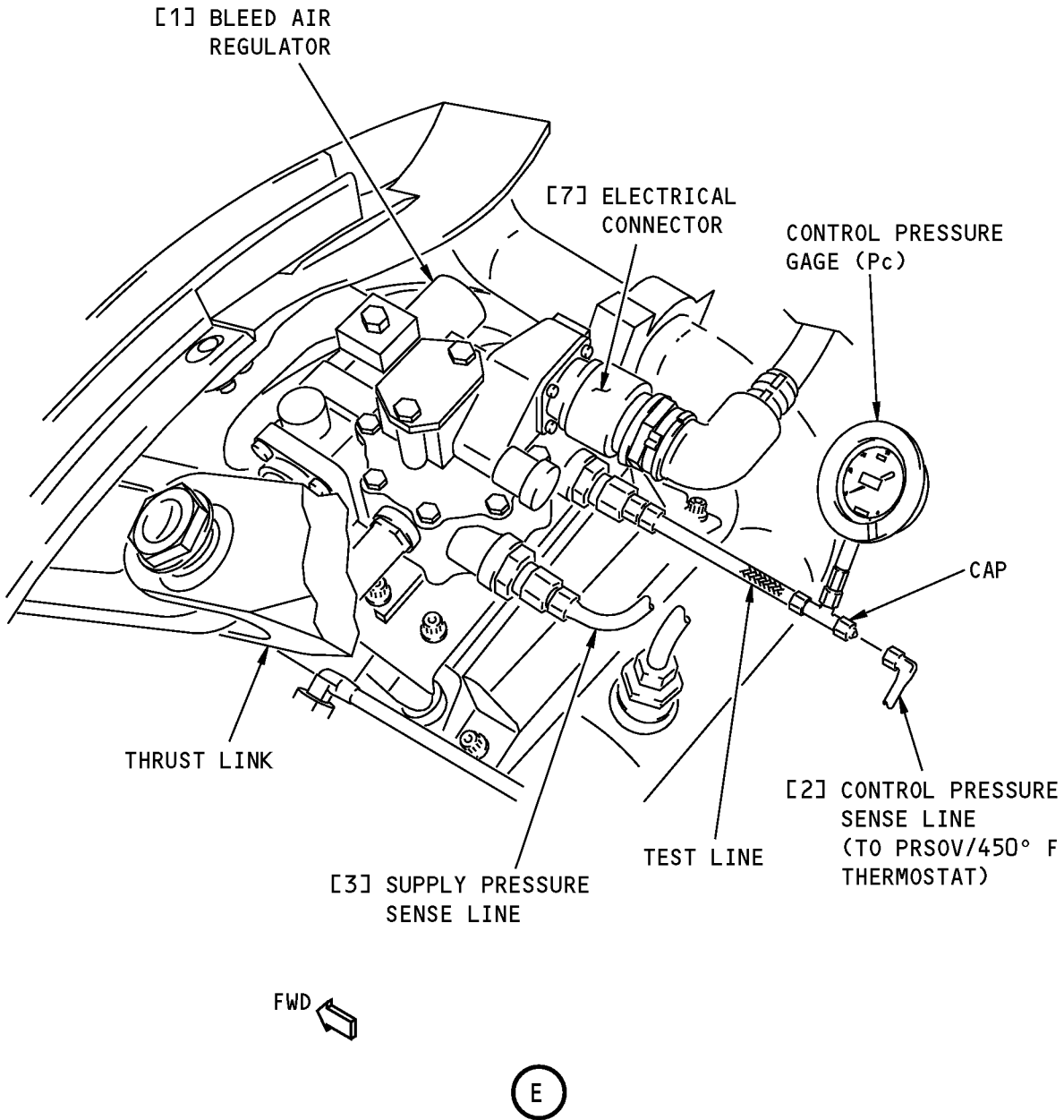
**Engine Bleed System Operational Test
Figure 504 (Sheet 4 of 5)/36-11-00-990-803**

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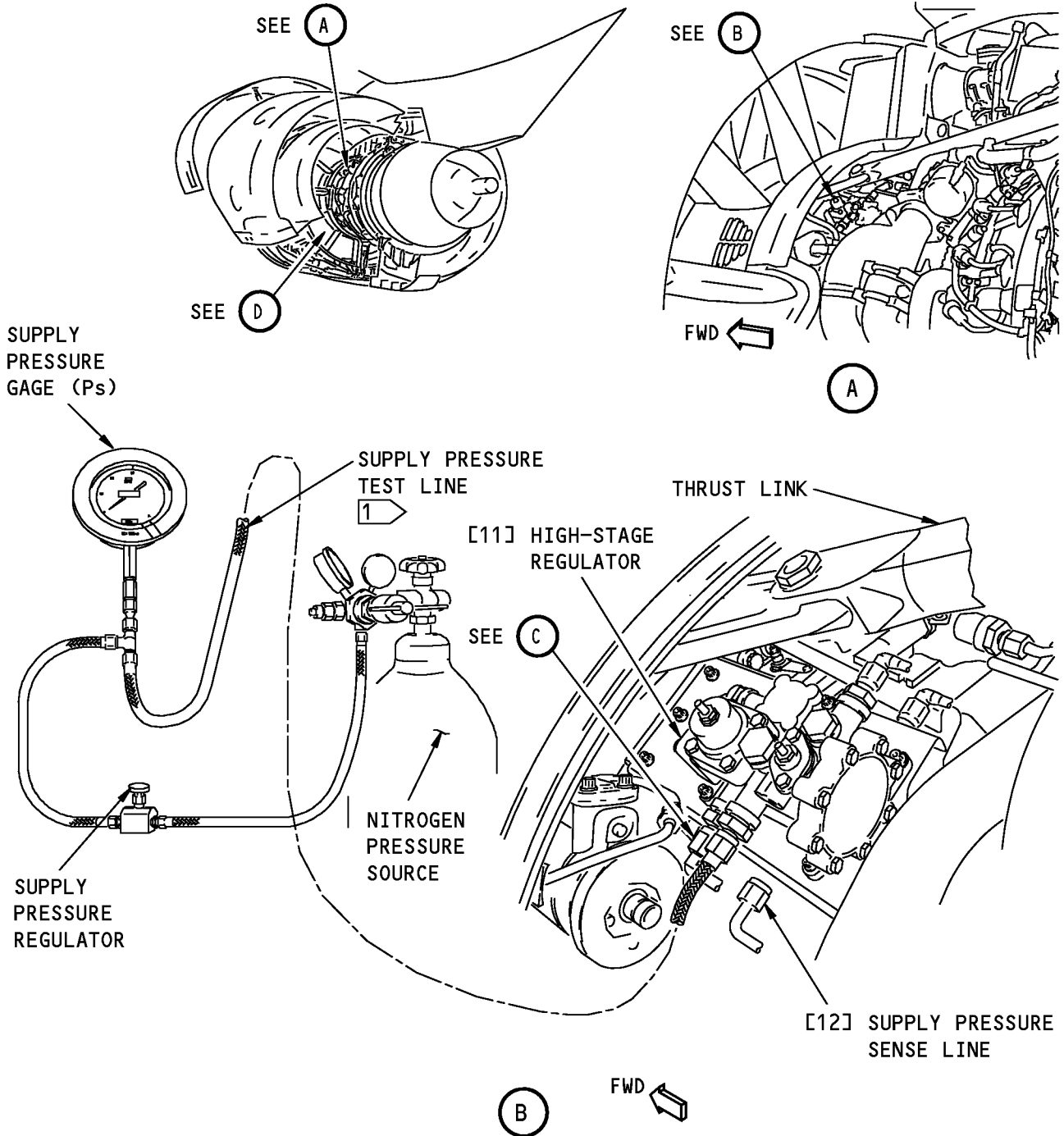


**Engine Bleed System Operational Test
Figure 504 (Sheet 5 of 5)/36-11-00-990-803**

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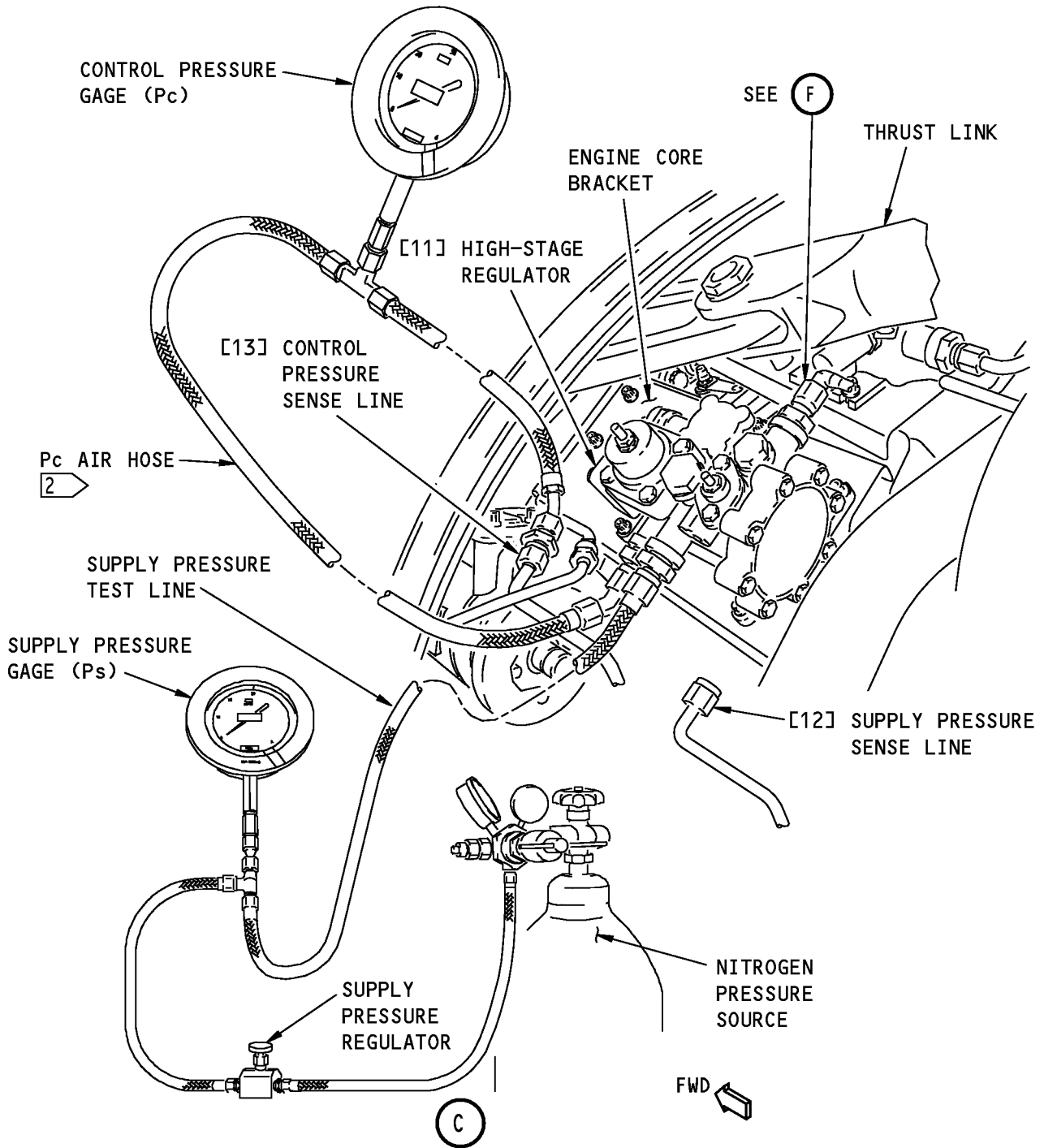
1 CONNECTION POINT SHOWN IS TYPICAL. YOU CAN CONNECT THE SUPPLY PRESSURE TEST LINE GAGE ANYWHERE ALONG THE SUPPLY PRESSURE SENSE LINE BETWEEN THE HIGH-STAGE REGULATOR AND THE 9TH-STAGE DUCT THAT IS CONVENIENT.

High-Stage Regulator/High-Stage Valve Operational Test
Figure 505 (Sheet 1 of 4)/36-11-00-990-804

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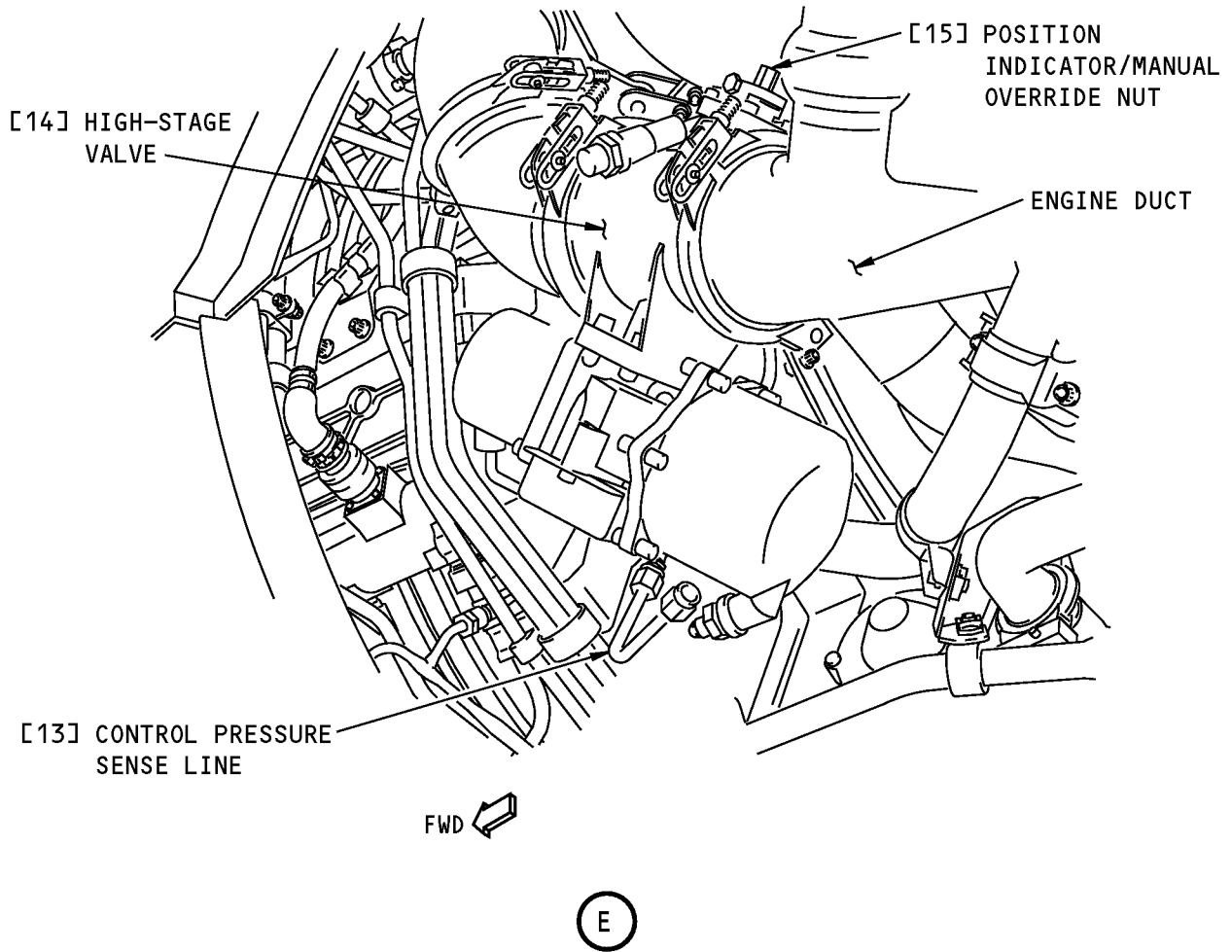
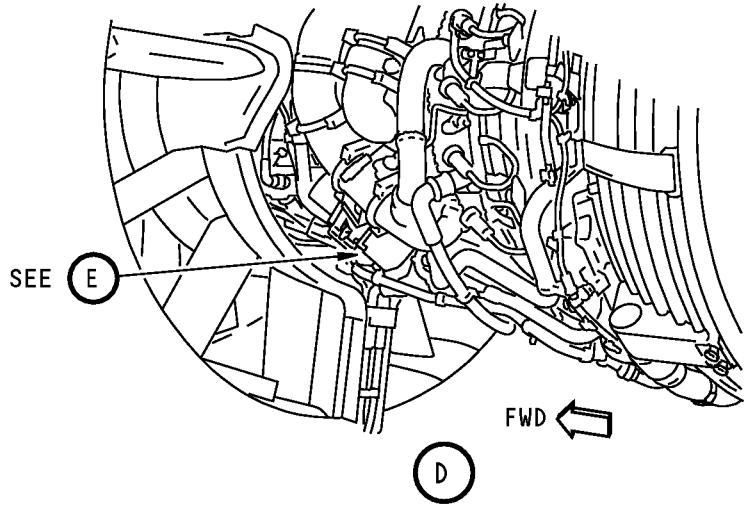


2 CONNECTION POINT SHOWN IS TYPICAL. YOU CAN CONNECT THE CONTROL PRESSURE GAGE TEST LINE ANYWHERE ALONG THE CONTROL PRESSURE SENSE LINE BETWEEN THE HIGH-STAGE REGULATOR AND THE HIGH-STAGE VALVE THAT IS CONVENIENT.

**High-Stage Regulator/High-Stage Valve Operational Test
Figure 505 (Sheet 2 of 4)/36-11-00-990-804**

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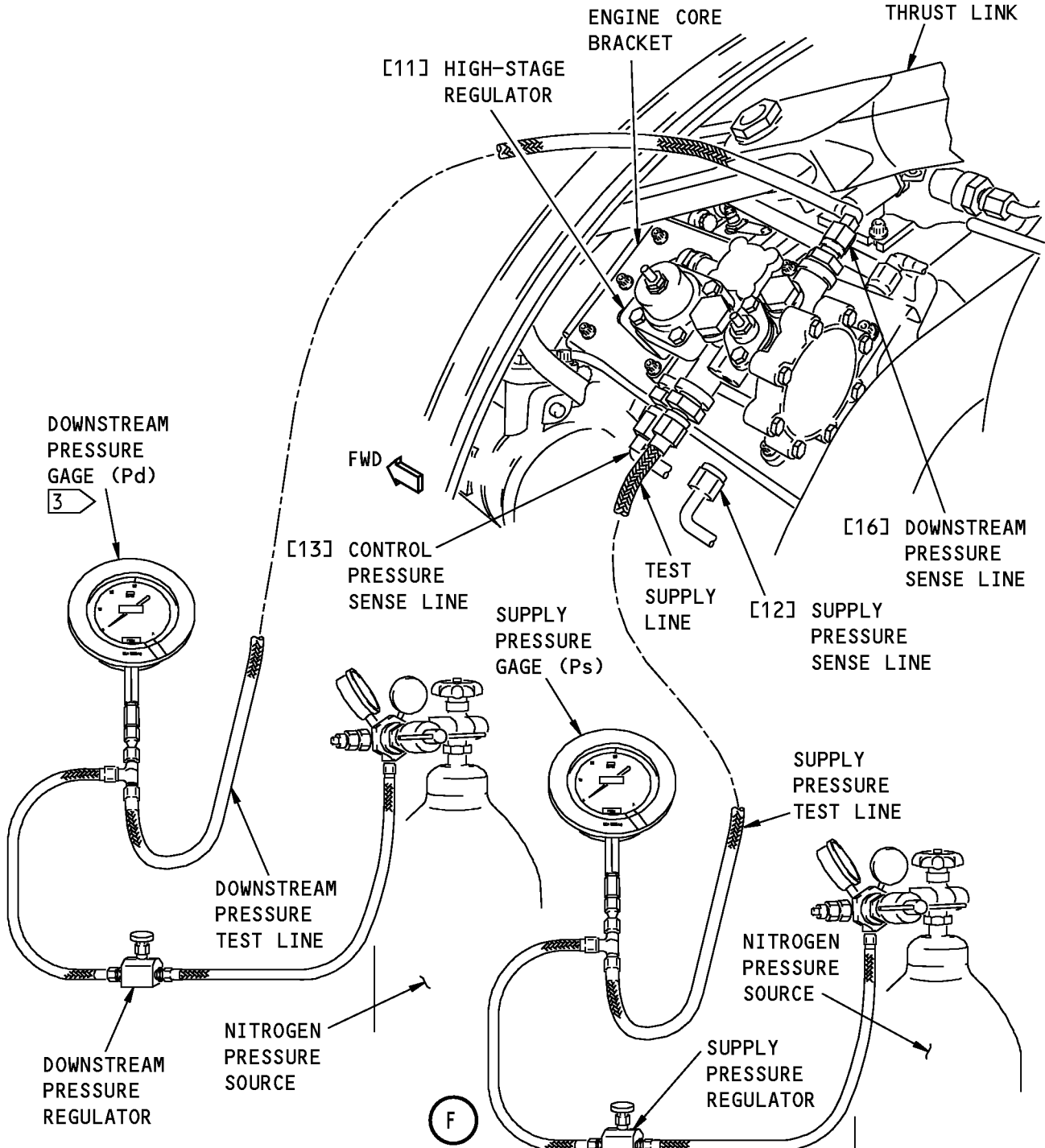


**High-Stage Regulator/High-Stage Valve Operational Test
Figure 505 (Sheet 3 of 4)/36-11-00-990-804**

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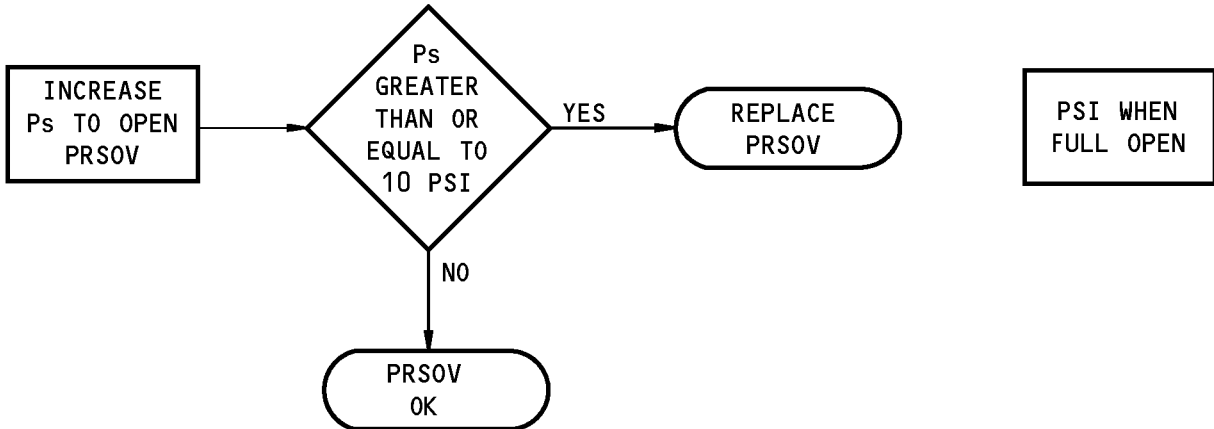
3 CONNECTION POINT SHOWN IS TYPICAL. YOU CAN CONNECT THE DOWNSTREAM PRESSURE TEST LINE GAGE ANYWHERE ALONG THE DOWNSTREAM PRESSURE SENSE LINE BETWEEN THE HIGH-STAGE REGULATOR AND THE 9TH-STAGE DUCT THAT IS CONVENIENT.

High-Stage Regulator/High-Stage Valve Operational Test
Figure 505 (Sheet 4 of 4)/36-11-00-990-804

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PRSOV OPERATIONAL CHECK



LEGEND: Pc = Control Pressure
Ps = Supply Pressure
Pd = Downstream Pressure

NOTE: When the APU is used to pressurize the bleed system, the following are normal conditions and not necessarily an indication of a faulty PRSOV.

1. The PRSOV closes and the Precooler Control Valve stays open.
2. The PRSOV and the Precooler Control Valve may both be closed.
3. The PRSOV opens and the Precooler Control Valve closes.

1541120 S0000280542_V2

Bleed Air Health Check Data Sheet
Figure 506 (Sheet 1 of 4)/36-11-00-990-811

EFFECTIVITY
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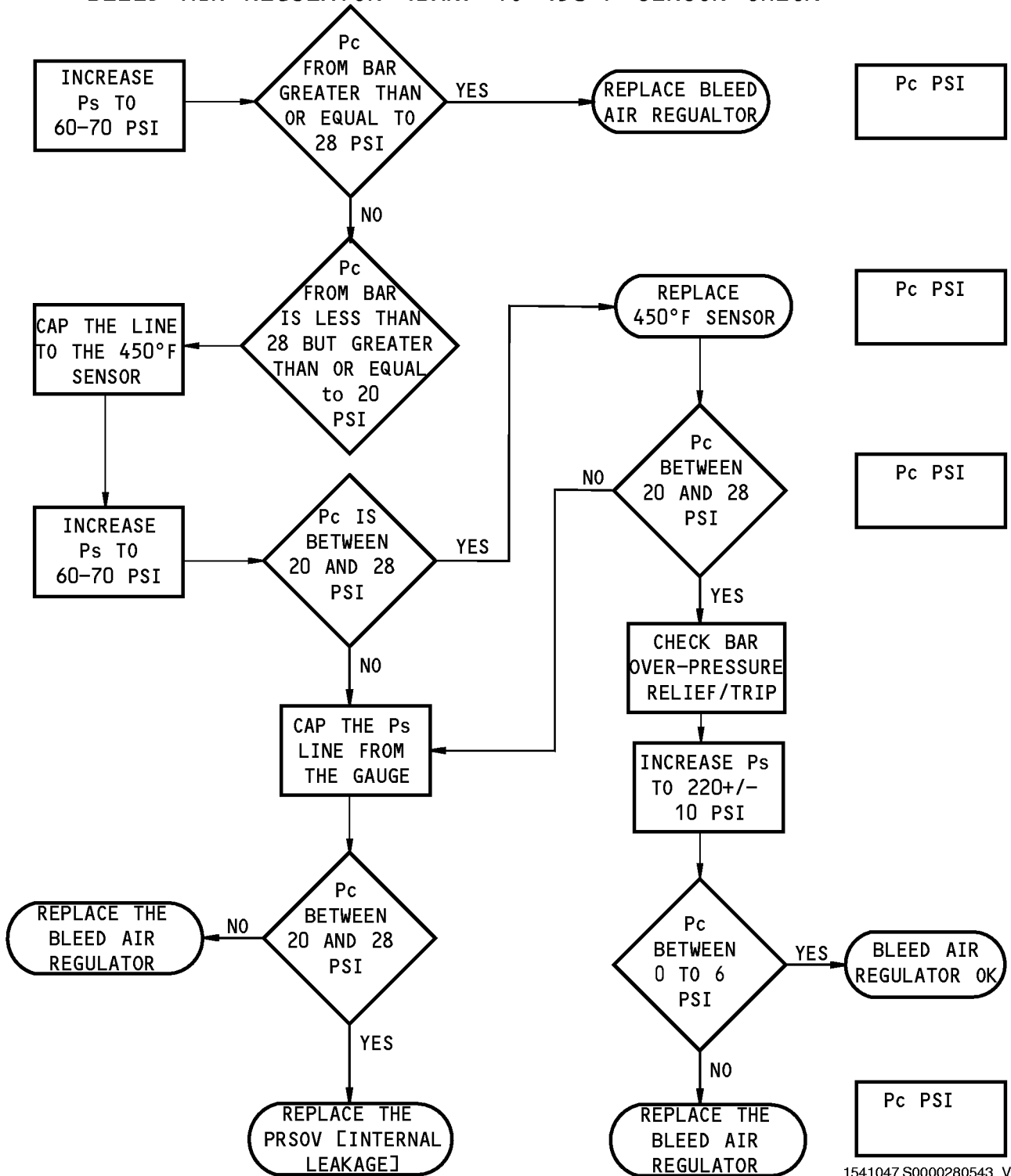
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BLEED AIR REGULATOR (BAR) TO 450°F SENSOR CHECK



1541047 S0000280543_V1

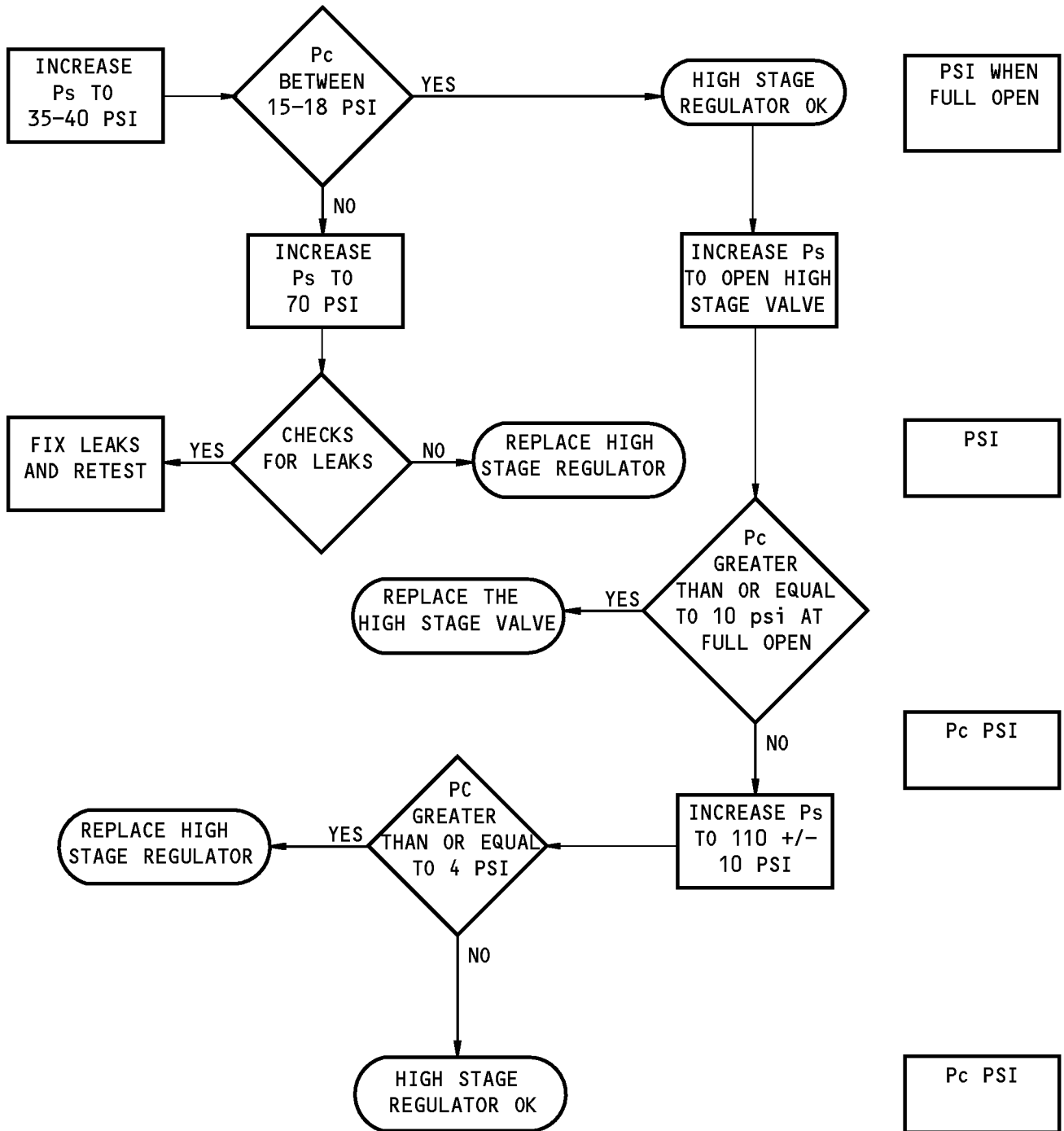
Bleed Air Health Check Data Sheet
Figure 506 (Sheet 2 of 4)/36-11-00-990-811

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AIRCRAFT MAINTENANCE MANUAL

HIGH STAGE REGULATOR & HIGH STAGE VALVE OPERATIONAL CHECK



1541106 S0000280545_V1

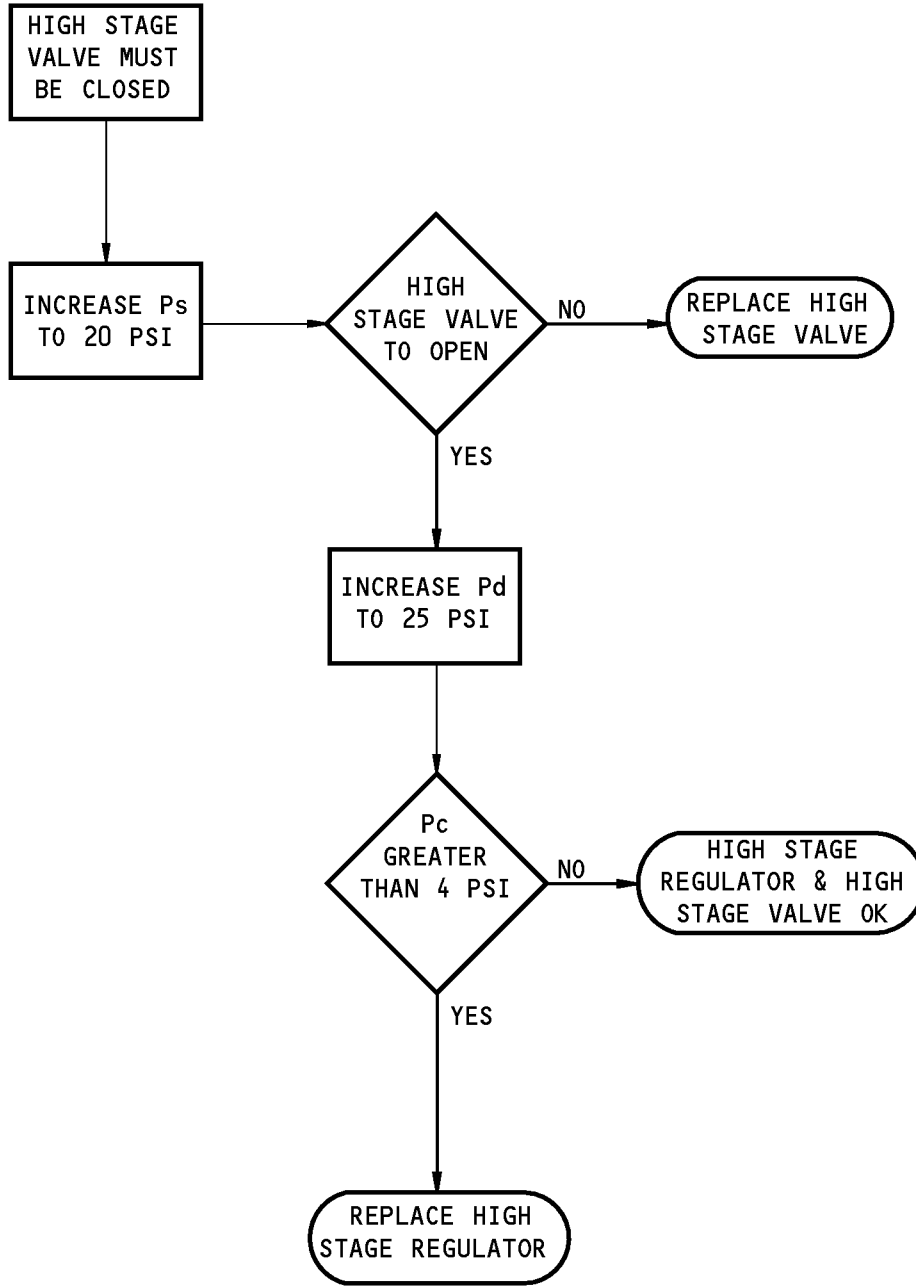
**Bleed Air Health Check Data Sheet
Figure 506 (Sheet 3 of 4)/36-11-00-990-811**

EFFECTIVITY
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AIRCRAFT MAINTENANCE MANUAL

HIGH STAGE VALVE REVERSE FLOW CHECK



Pc PSI

Pd PSI

1541116 S0000281379_V1

Bleed Air Health Check Data Sheet
Figure 506 (Sheet 4 of 4)/36-11-00-990-811

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TASK 36-11-00-700-802

6. Engine Bleed Air System Leak Check Using the APU

Figure 507 or Figure 508

A. General

- (1) This procedure uses the APU to pressurize the Engine Bleed Air System to check for leaks in the Bleed Air Regulator [3], the High Stage Regulator [7], the sense lines, and the sense line fittings. This procedure can be done in an hour or less. The Engine Bleed Air System Health Check, TASK 36-11-00-700-801 is a more thorough test of the Bleed Air System. Use that task when you have two or more hours to do the procedure or when this task does not isolate the leak in the system.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
36-00-00-860-803	Supply Pressure to the Pneumatic System with the APU (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)
36-11-03-000-801	Bleed Air Regulator Removal (P/B 401)
36-11-03-400-801	Bleed Air Regulator Installation (P/B 401)
36-11-04-000-801	PRSOV Removal (P/B 401)
36-11-04-400-801	PRSOV Installation (P/B 401)
36-11-06-000-801	High Stage Valve Removal (P/B 401)
36-11-06-400-801	High Stage Valve Installation (P/B 401)
36-11-07-000-801	High Stage Regulator Removal (P/B 401)
36-11-07-400-801	High Stage Regulator Installation (P/B 401)
36-12-02-000-801	Precooler Control Valve Removal (P/B 401)
36-12-02-400-801	Precooler Control Valve Installation (P/B 401)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

C. Tools/Equipment

Reference	Description
STD-3907	Mirror - Dental

D. Consumable Materials

Reference	Description	Specification
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT-8N	MIL-PRF-907F
G50135	Leak Detector - Liquid, Non-Corrosive Soap Compound	MIL-PRF-25567

E. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine
430	Subzone - Engine 1, Nacelle Strut
433	Engine 1 - Strut Torque Box
440	Subzone - Engine 2, Nacelle Strut

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(Continued)

Zone	Area
443	Engine 2 - Strut Torque Box

F. Prepare for the Bleed Air System Leak Check

NOTE: This procedure is given for Engine #1. Engine #2 is similar unless otherwise stated.

SUBTASK 36-11-00-860-075

(1) Make sure the applicable engine start lever is in the CUTOFF position.

(a) Install a DO-NOT-OPERATE tag on the engine start lever.

SUBTASK 36-11-00-860-076

(2) Make sure the L and R PACK switches on the P5-10 panel are in the OFF position.

SUBTASK 36-11-00-860-077

(3) Make sure the APU BLEED switch on the P5-10 panel is in the OFF position.

SUBTASK 36-11-00-860-078

(4) Make sure the ISOLATION VALVE switch on the P5-10 panel is in the CLOSE position.

NOTE: For the #2 engine, the ISOLATION VALVE switch should be in the OPEN position.

SUBTASK 36-11-00-710-031

(5) Supply electrical power to the airplane. Do this task.

(a) Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 36-11-00-010-014

(6) Open the thrust reverser. Do this task:

(a) Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

SUBTASK 36-11-00-210-020

(7) Use a dental mirror, STD-3907 to look at the Position Indicator/Manual Override Nut [5] on the Precooler Control Valve [4] to make sure it is in the OPEN position.

(a) Use a 3/4-inch wrench on the Manual Override Nut [5] to close the Precooler Control Valve [4] to make sure it moves smoothly.

(b) Remove the wrench and allow the valve to return to the OPEN position by spring force only.

(c) If the Precooler Control Valve [4] does not close smoothly or return to the OPEN position, replace the valve by following these procedures:

Precooler Control Valve Removal, TASK 36-12-02-000-801

Precooler Control Valve Installation, TASK 36-12-02-400-801

SUBTASK 36-11-00-210-021

(8) Look at the Position Indicator/Manual Override Nut [2] on the PRSOV [1] to make sure it is in the CLOSED position.

(a) Use a 3/8-inch wrench on the Manual Override Nut [2] to open the PRSOV [1] to make sure it moves smoothly.

(b) Remove the wrench and allow the valve to return to the CLOSED position by spring force only.

(c) If the PRSOV [1] does not open smoothly or return to the CLOSED position, replace the valve by following these procedures:

PRSOV Removal, TASK 36-11-04-000-801

PRSOV Installation, TASK 36-11-04-400-801

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SUBTASK 36-11-00-210-022

- (9) Look at the Position Indicator/Manual Override Nut [10] on the High Stage Valve [9] to make sure it is in the CLOSED position.
 - (a) Use a 3/8-inch wrench on the Manual Override Nut [10] to open the High Stage Valve [9] to make sure it moves smoothly.
 - (b) Remove the wrench and allow the valve to return to the CLOSED position by spring force only.
 - (c) If the High Stage Valve does not open smoothly or return to the CLOSED position, replace the valve by following these procedures:
 - High Stage Valve Removal, TASK 36-11-06-000-801
 - High Stage Valve Installation, TASK 36-11-06-400-801

G. Do the Bleed Air System Leak Check

SUBTASK 36-11-00-860-071

- (1) Use the APU to pressurize the Bleed Air System. Do this task.
 - (a) Supply Pressure to the Pneumatic System with the APU, TASK 36-00-00-860-803.

NOTE: The PRSOV [1] should be closed when pressurizing the Bleed Air System.

SUBTASK 36-11-00-860-079

- (2) Put the applicable engine BLEED switch in the ON position.

SUBTASK 36-11-00-710-032

WARNING: USE A RATCHET-TYPE WRENCH TO OPEN THE PRSOV. PRESSURE IN THE SYSTEM CAN CAUSE THE PRSOV TO OPEN QUICKLY. THIS CAN PULL THE WRENCH FROM YOUR HANDS. INJURIES TO PERSONNEL, AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (3) Use a 3/8-inch socket on a ratcheted-type wrench to turn the Manual Override Nut [2] on the PRSOV [1]. Once you begin turning the Manual Override Nut [2], the air pressure should move the PRSOV to the fully open position.

SUBTASK 36-11-00-200-003

WARNING: REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT.

- (4) If the PRSOV did not move fully open, test the Relief Valve Assembly [6] on the Bleed Air Regulator [3] for major air leakage.

NOTE: A small amount of air leakage from the Relief Valve Assembly [6] is normal.

- (a) Press down on the top of the Relief Valve Assembly [6] to stop the air flow.
- (b) If the PRSOV [1] moves fully open when the air flow stops, there is too much leakage from the Relief Valve Assembly [6]. Replace the Bleed Air Regulator [3] by doing these tasks.
 - 1) Bleed Air Regulator Removal, TASK 36-11-03-000-801
 - 2) Bleed Air Regulator Installation, TASK 36-11-03-400-801

SUBTASK 36-11-00-790-001

- (5) Apply leak detector, G50135 to the sense lines and fittings to determine if air leakage exists.

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- (a) Replace leaking sense lines and fittings as necessary.

NOTE: Apply Never-Seez NSBT-8N compound, D00006 to all male threads before connecting the pneumatic sense lines.

SUBTASK 36-11-00-960-009

- (6) Replace the PRSOV [1] if it does not go fully open when the system is pressurized and there is no major leakage from the Relief Valve Assembly [6] on the Bleed Air Regulator [3] or leaks in the sense lines. Do these tasks:

- (a) PRSOV Removal, TASK 36-11-04-000-801
(b) PRSOV Installation, TASK 36-11-04-400-801

SUBTASK 36-11-00-210-023

- (7) Make sure the Precooler Control Valve [4] moves fully closed when the PRSOV is fully open.

SUBTASK 36-11-00-200-006

- (8) If the Precooler Control Valve [4] does not move fully closed, inspect for air leaks by doing the following.

- (a) Apply leak detector, G50135 to the supply and control pressure sense lines, fittings, and the 390° sensor.
(b) Replace leaking sense lines, fittings, and the 390° sensor as necessary.

NOTE: Apply Never-Seez NSBT-8N compound, D00006 to all male threads before connecting the pneumatic sense lines.

SUBTASK 36-11-00-200-007

- (9) If the Precooler Control Valve [4] does not move fully closed and no air leaks were found, do the following.

- (a) Remove the test cap [12] on the control pressure sense line from the Precooler Control Valve [4] to the 390° sensor and make sure air flows out of the test port.
(b) If air does not flow out of the test port, do the following.
1) Reconnect the test cap [12].
2) Disconnect the sense line from the Precooler Control Valve [4] to make sure there is air flow out of the valve's control pressure port.
3) If air does not flow out of the control pressure port, replace the Precooler Control Valve [4].
a) Precooler Control Valve Removal, TASK 36-12-02-000-801
b) Precooler Control Valve Installation, TASK 36-12-02-400-801
4) If there is air flow out of the control pressure port on the Precooler Control Valve [4], there is blockage in the sense line between the test port and the valve.
a) Replace the sense line.
(c) If air flows out of the test port when the test cap is removed, do the following.
1) Reconnect the test cap [12].
2) Disconnect the sense line at the 390° sensor to make sure there is no blockage in the sense line between the test port and the sensor.
3) Replace the sense line if there is no air flow out of the end.

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SUBTASK 36-11-00-200-001

(10) Listen for air leakage in the engine.

NOTE: Air leakage in the engine is an indication that the High Stage Valve [9] is allowing air to backflow into the engine.

(a) Replace the High Stage Valve [9] if air can be heard in the engine when the system is pressurized. Do these tasks:

- 1) High Stage Valve Removal, TASK 36-11-06-000-801
- 2) High Stage Valve Installation, TASK 36-11-06-400-801

SUBTASK 36-11-00-010-015

(11) Disconnect the Supply Pressure Sense Line [8] from the High Stage Regulator [7].

SUBTASK 36-11-00-200-004

(12) Do a check for air leakage at the supply pressure inlet on the High Stage Regulator [7].

NOTE: Air leaking from the supply pressure inlet when the Bleed Air System is pressurized with the APU indicates the reverse flow diaphragm inside the High Stage Regulator [7] is damaged.

(a) Replace the High Stage Regulator [7] if air leakage is detected from the supply pressure inlet. Do these tasks.

- 1) High Stage Regulator Removal, TASK 36-11-07-000-801
- 2) High Stage Regulator Installation, TASK 36-11-07-400-801

(b) If no air leakage is detected, reconnect the Supply Pressure Sense Line [8] to the High Stage Regulator [7].

NOTE: Apply Never-Seez NSBT-8N compound, D00006 to all male threads before connecting the pneumatic sense lines.

H. Put the Airplane Back To Its Usual Condition

SUBTASK 36-11-00-860-072

(1) Remove pneumatic pressure from the Bleed Air System. Do this task:

(a) Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 36-11-00-860-080

(2) Put the ISOLATION VALVE switch on the P5-10 Air Conditioning Module in the AUTO position.

SUBTASK 36-11-00-860-081

(3) Put the L and R BLEED switches on the P5-10 panel in the OFF position.

SUBTASK 36-11-00-860-082

(4) Close the thrust reverser. Do this task:

(a) Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

SUBTASK 36-11-00-860-083

(5) Remove the electrical power from the airplane. Do this task:

(a) Remove Electrical Power, TASK 24-22-00-860-812.

————— **END OF TASK** —————

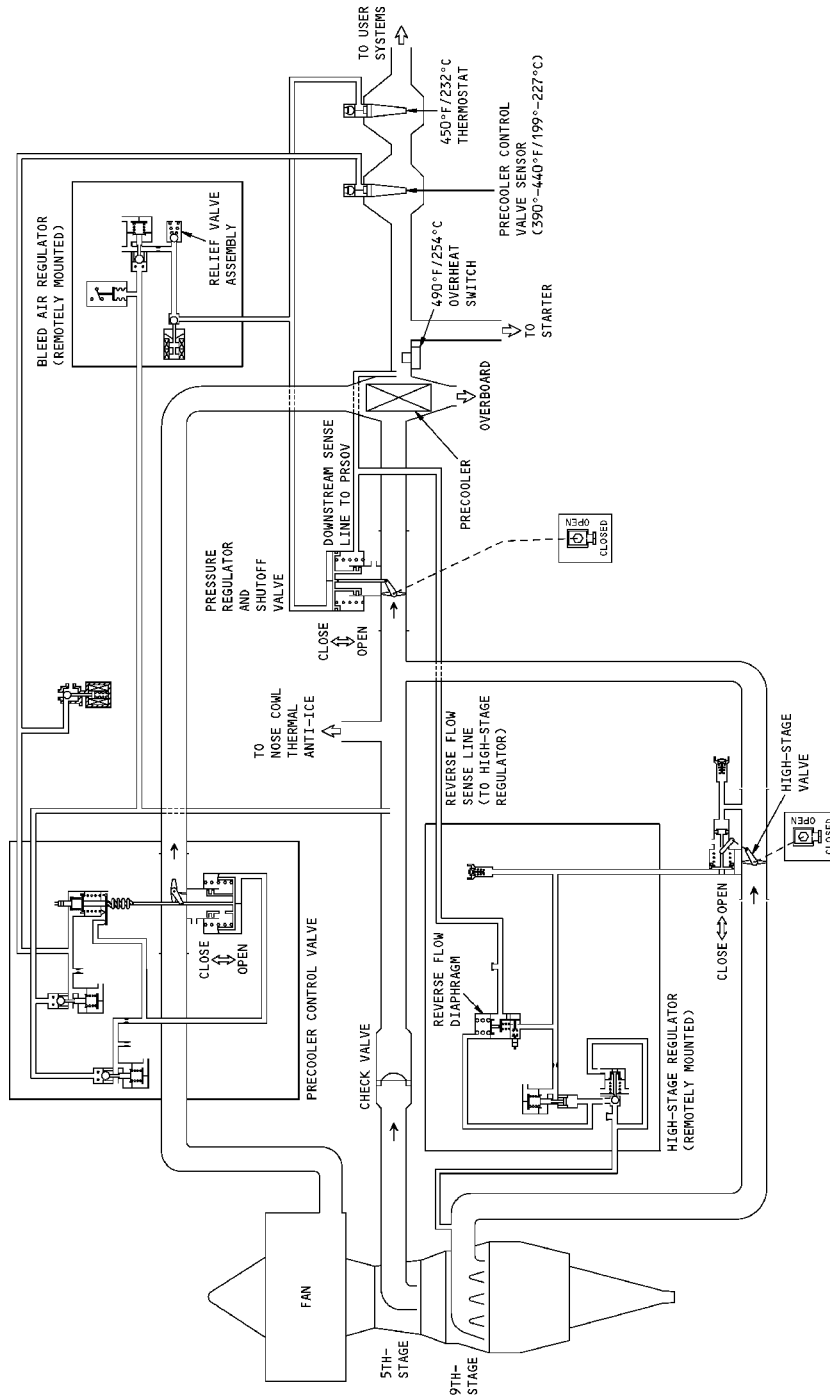
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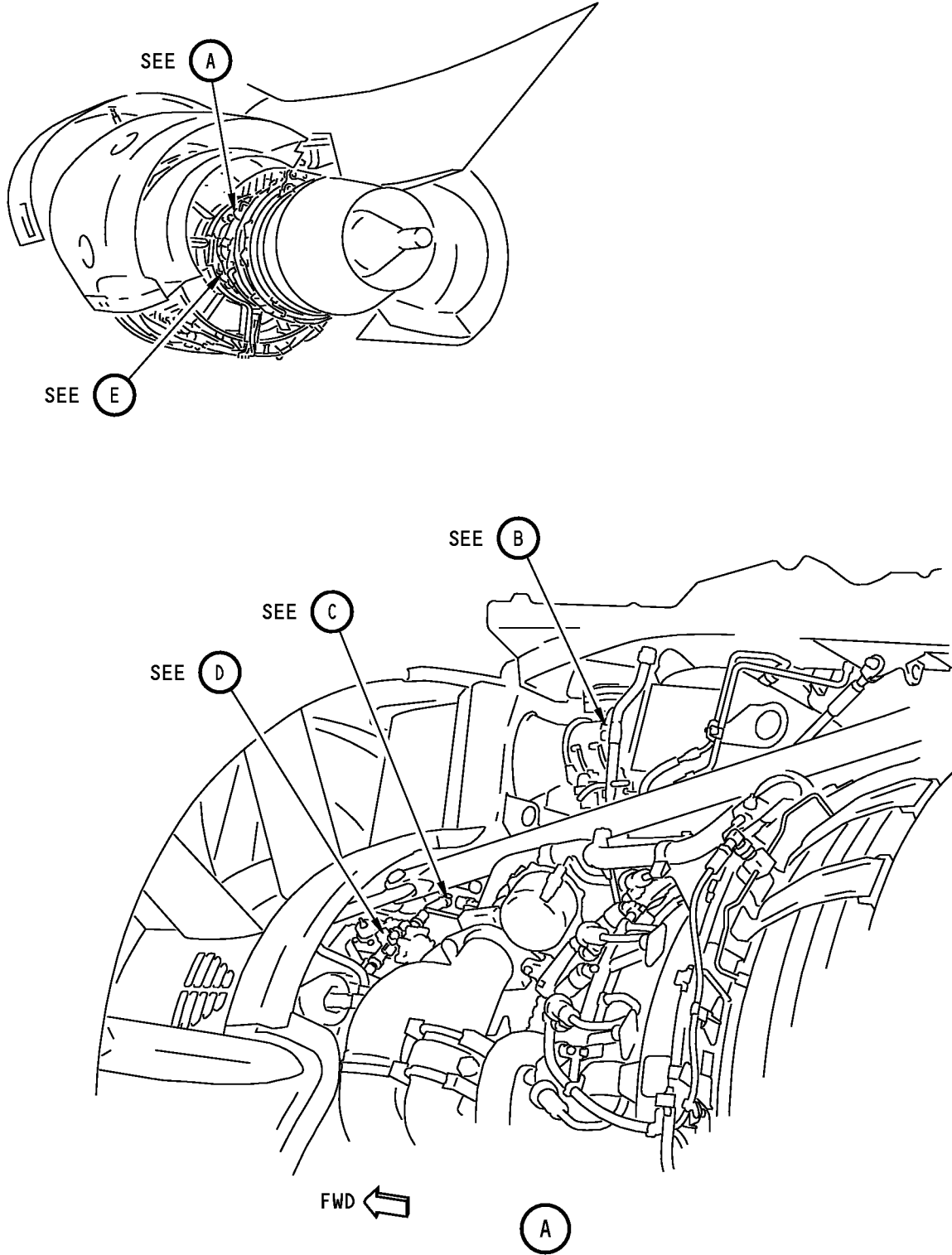
**Engine Bleed Air Distribution System Control Schematic
Figure 507/36-11-00-990-806**

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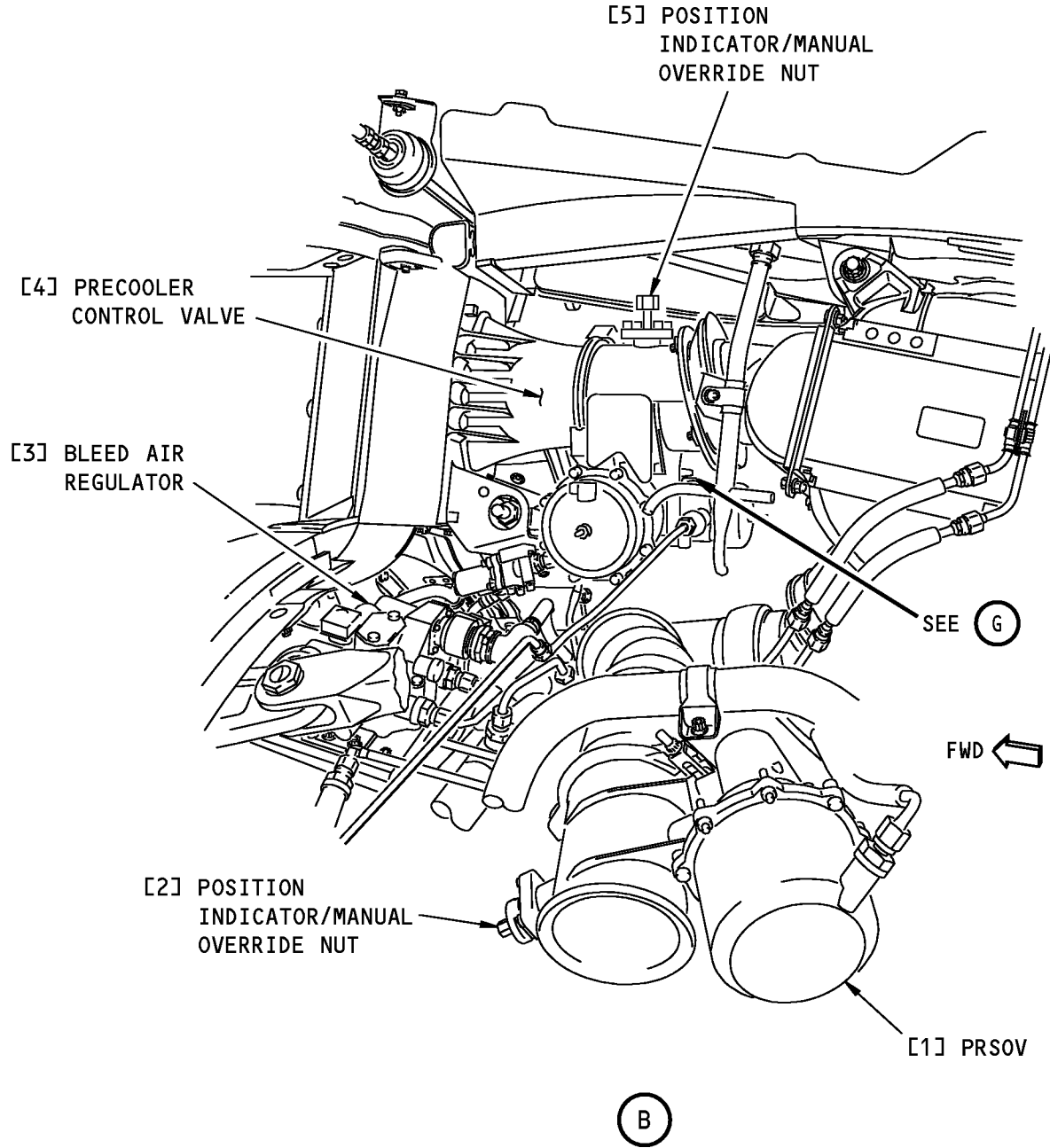
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**Engine Bleed Air System Leakage Check
Figure 508 (Sheet 1 of 6)/36-11-00-990-805**

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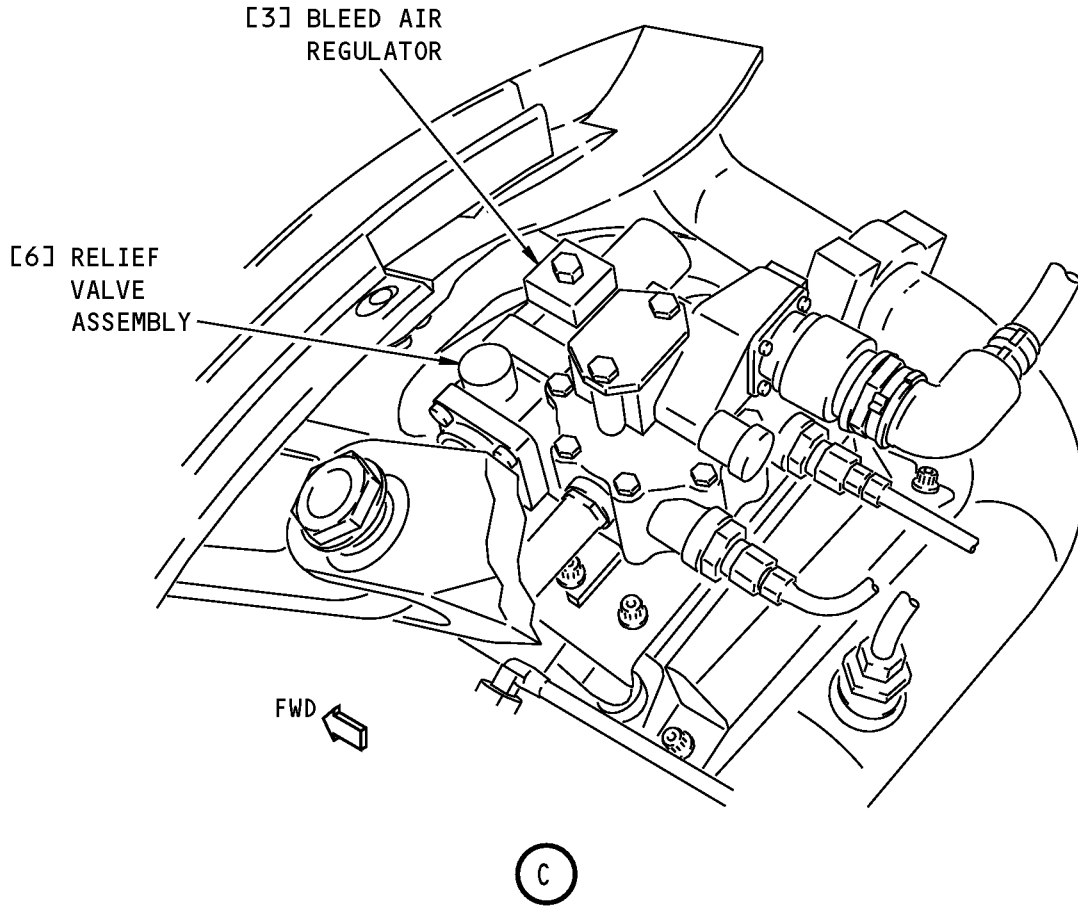
**Engine Bleed Air System Leakage Check
Figure 508 (Sheet 2 of 6)/36-11-00-990-805**

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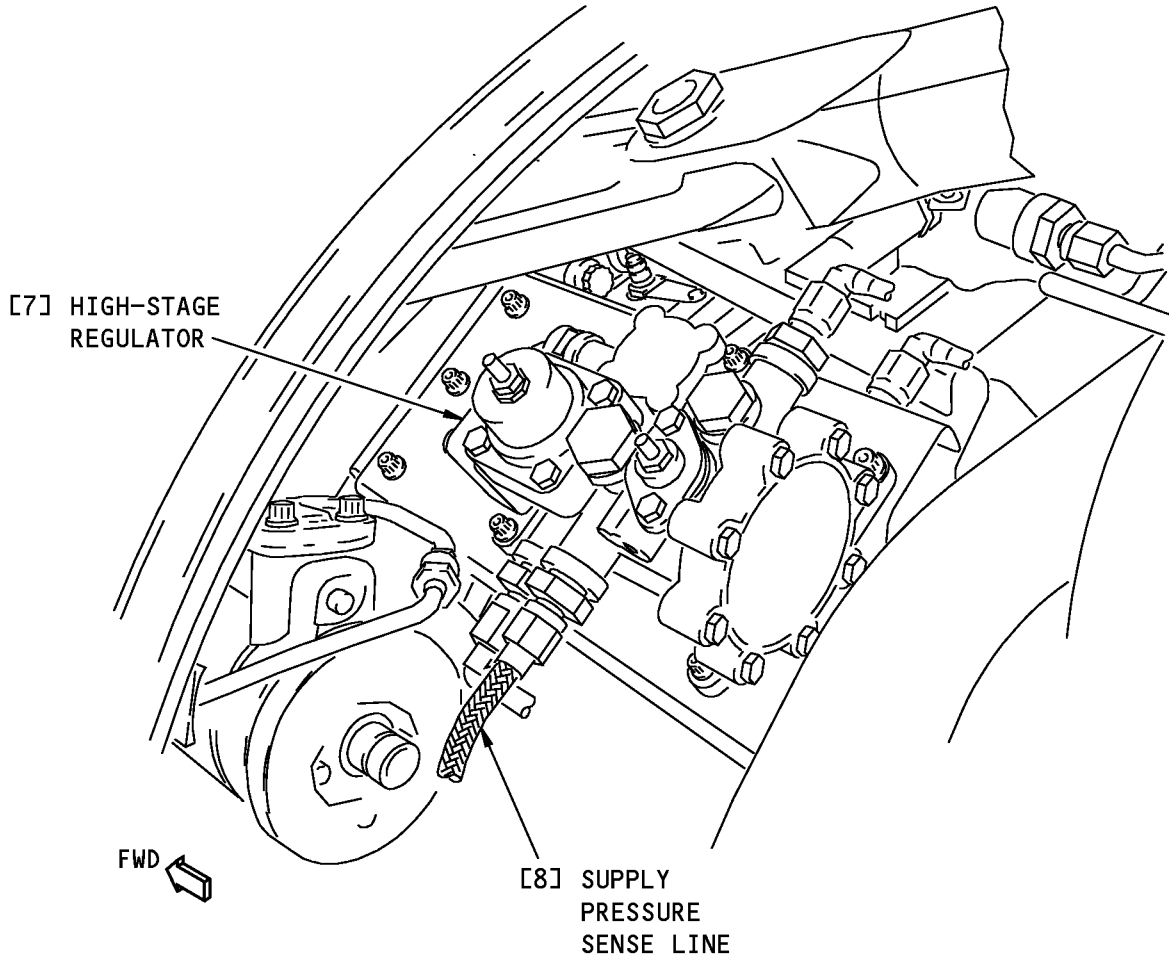
**Engine Bleed Air System Leakage Check
Figure 508 (Sheet 3 of 6)/36-11-00-990-805**

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**Engine Bleed Air System Leakage Check
Figure 508 (Sheet 4 of 6)/36-11-00-990-805**

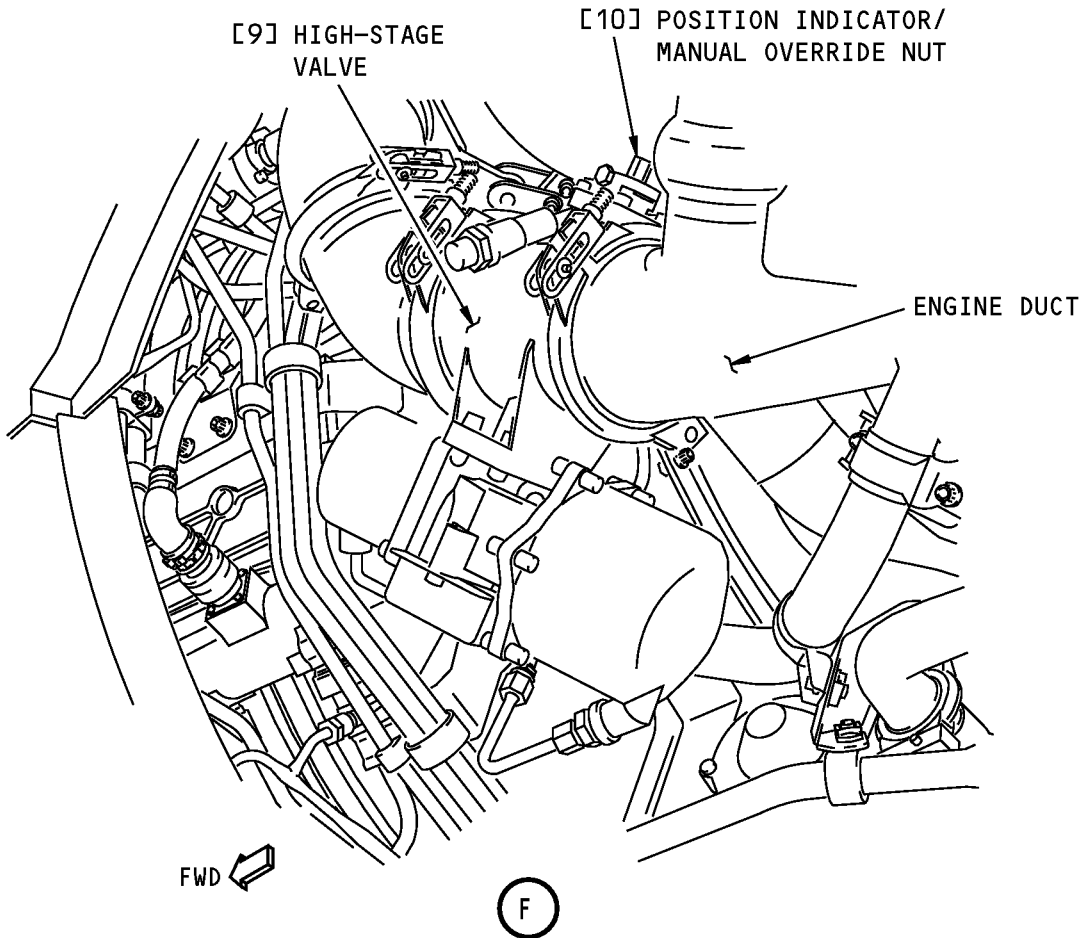
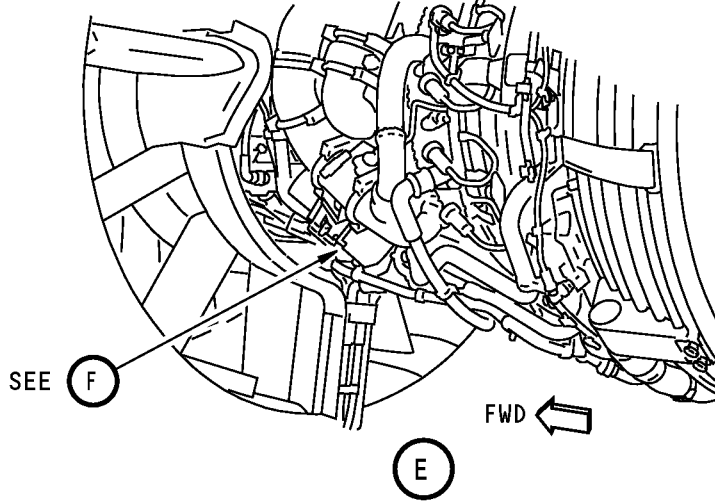
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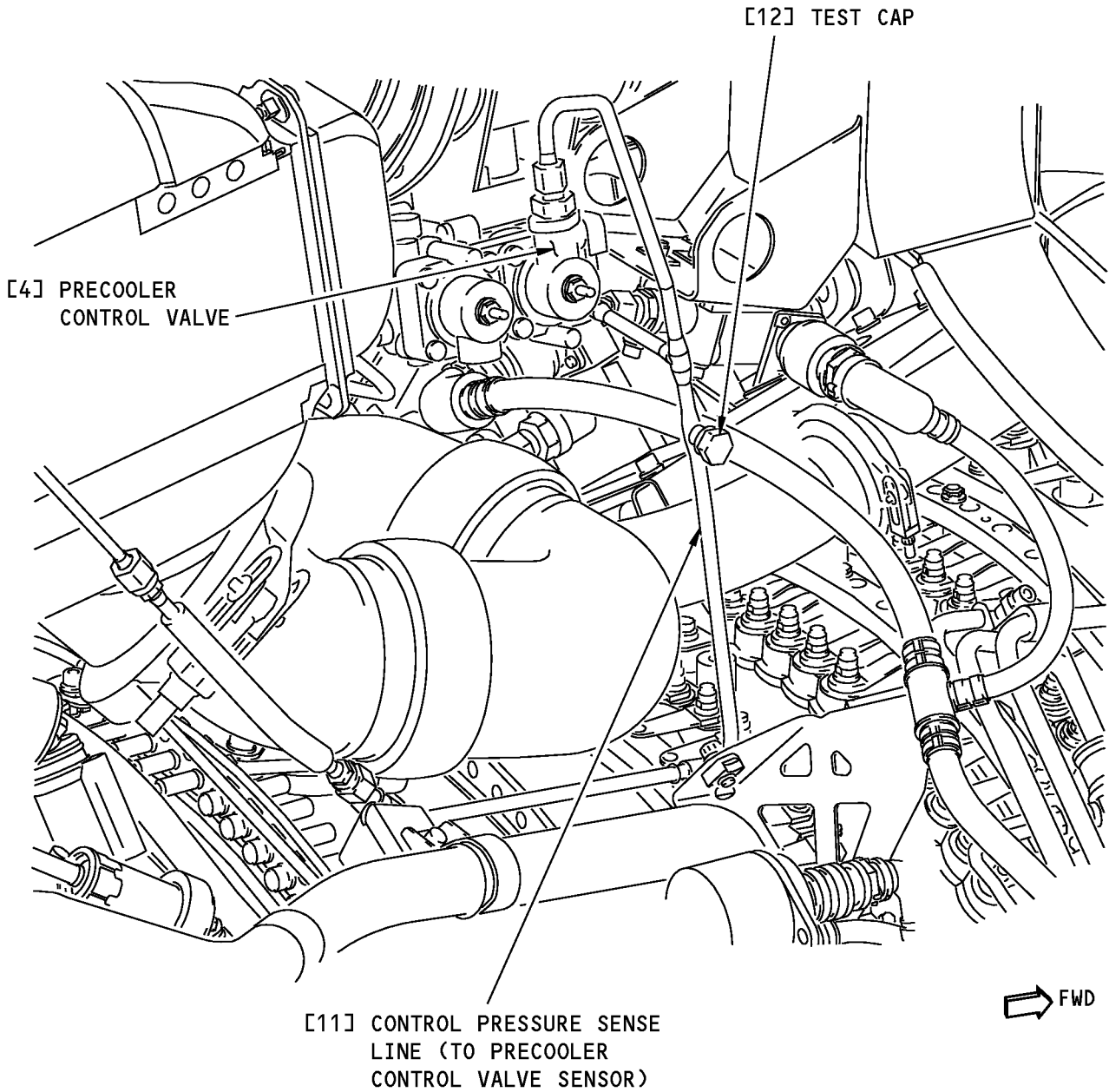
**Engine Bleed Air System Leakage Check
Figure 508 (Sheet 5 of 6)/36-11-00-990-805**

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G

**Engine Bleed Air System Leakage Check
Figure 508 (Sheet 6 of 6)/36-11-00-990-805**

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TASK 36-11-00-700-803

7. Engine Bleed Air System Health Check Using a Portable Valve Actuating Test Set

A. General

- (1) This procedure describes the use of a Honeywell 290121-3 portable valve actuating test set Figure 509 to operationally test the engine bleed air system Figure 507 or Figure 508.

NOTE: The Honeywell valve actuating tester, SPL-922 (P/N 3792195-1) and the Boeing engine bleed air system test equipment, SPL-4350 (P/N C36001-44) can also be used to do this task.

These are the components in the bleed air system that will be tested:

- (a) Bleed Air Regulator (BAR)
 - (b) Pressure Regulator and Shutoff Valve (PRSOV)
 - (c) High Stage Regulator
 - (d) High Stage Valve
- (2) This procedure will check that the:
 - (a) Bleed air regulator will supply the correct pressure
 - (b) Overpressure switch in the bleed air regulator will operate at the correct pressure range
 - (c) PRSOV will open at the minimum supply pressure
 - (d) High stage regulator will supply the correct control pressure
 - (e) High stage valve will operate satisfactorily
 - (f) Reverse flow check protection in the high stage regulator operates correctly
 - (g) Sense lines have no leaks.
 - (3) Engine Bleed Air System Health Check, TASK 36-11-00-700-801 performs the same procedure but uses nitrogen bottles, hoses, and fittings instead of a portable valve actuating test set.
 - (4) A task to operationally check the bleed air precooler system components using a portable valve actuating test set can be found in BLEED AIR PRECOOLER SYSTEM - ADJUSTMENT/TEST, PAGEBLOCK 36-12-00/501.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)
36-11-03-000-801	Bleed Air Regulator Removal (P/B 401)
36-11-03-400-801	Bleed Air Regulator Installation (P/B 401)
36-11-04-000-801	PRSOV Removal (P/B 401)
36-11-04-400-801	PRSOV Installation (P/B 401)
36-11-06-000-801	High Stage Valve Removal (P/B 401)
36-11-06-400-801	High Stage Valve Installation (P/B 401)
36-11-07-000-801	High Stage Regulator Removal (P/B 401)
36-11-07-400-801	High Stage Regulator Installation (P/B 401)
36-12-00 P/B 501	BLEED AIR PRECOOLER SYSTEM - ADJUSTMENT/TEST

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Reference	Title
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	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
SPL-922	Tester - Valve Actuating (Part #: 3792195-1, Supplier: 06848, A/P Effectivity: 737-ALL)
SPL-4350	Test Equipment - Engine Bleed Air Systems (Part #: C36001-44, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
STD-3942	Hose - Air, Flexible, 3/8 inch (.9525 cm) ID, Length as Needed

D. Consumable Materials

Reference	Description	Specification
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT-8N	MIL-PRF-907F
G50135	Leak Detector - Liquid, Non-Corrosive Soap Compound	MIL-PRF-25567

E. Prepare for the Bleed Air System Health Check

SUBTASK 36-11-00-860-068

(1) Make sure the engine start lever is in the CUTOFF position.

(a) Install a DO-NOT-OPERATE tag on the applicable engine start lever.

SUBTASK 36-11-00-860-069

WARNING: REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT.

(2) Remove pressure from the pneumatic system. Do this task:

Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806

SUBTASK 36-11-00-010-010

(3) Open the thrust reverser. Do this task:

Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00

F. Bleed Air Regulator, PRSOV, and 450° Thermostat Health Check

SUBTASK 36-11-00-210-018

(1) Examine the position indicator [2] on the PRSOV [1] Figure 510.

NOTE: The position indicator [2] should be in the closed position.

SUBTASK 36-11-00-710-027

(2) Use a 3/8-inch wrench on the manual override nut [2] to open and close the PRSOV [1].

SUBTASK 36-11-00-960-003

(3) If the PRSOV [1] does not move to the open and closed positions smoothly, replace the PRSOV [1]. Do these tasks:

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PRSOV Removal, TASK 36-11-04-000-801

PRSOV Installation, TASK 36-11-04-400-801

NOTE: Use Never-Seez NSBT-8N compound, D00006 on the threads of all fittings when connecting the sense lines.

SUBTASK 36-11-00-710-028

(4) Supply electrical power to the airplane. Do this task:

Supply Electrical Power, TASK 24-22-00-860-811

SUBTASK 36-11-00-860-073

(5) Put the applicable engine bleed switch to the ON position.

SUBTASK 36-11-00-860-074

(6) If you cannot use the airplane's electrical system, follow these steps to enable the bleed air regulator.

(a) Remove the electrical connector [4] from the bleed air regulator [3].

(b) Wire two nine volt batteries in series and apply 18 VDC across pins 5 and 6 in the electrical connector [4] on the bleed air regulator [3] for approximately 5 seconds.

NOTE: You should hear the open solenoid click in the bleed air regulator [3].

(c) Remove the 18 VDC power supply.

(d) Reconnect the electrical connector [4] on the bleed air regulator [3].

SUBTASK 36-11-00-010-011

(7) Remove the cap from fitting no. 1 on the portable valve actuating test set.

SUBTASK 36-11-00-020-009

(8) Disconnect the bleed air supply pressure sense line from the supply pressure port [5] on the bleed air regulator [3].

SUBTASK 36-11-00-480-011

(9) Connect one end of a 3/8 inch (.9525 cm) ID flexible air hose, length as needed, STD-3942 to the bleed air regulator supply pressure port [5].

SUBTASK 36-11-00-480-012

(10) Connect the other end of the hose to the portable valve actuating test set fitting no. 1.

SUBTASK 36-11-00-020-010

(11) Disconnect the control pressure sense line from the control pressure port [6] on the bleed air regulator [3].

SUBTASK 36-11-00-010-012

(12) Remove the cap from test set fitting no. 2.

SUBTASK 36-11-00-480-013

(13) Connect a 3/8 inch (.9525 cm) ID flexible air hose, length as needed, STD-3942 to the control pressure port [6] on the bleed air regulator [3].

SUBTASK 36-11-00-480-014

(14) Connect the other end of the hose to test set fitting no. 2.

SUBTASK 36-11-00-720-027

(15) Open the test set shutoff valve.

SUBTASK 36-11-00-720-028

(16) Turn the primary regulator knob on the test set until the primary system gauge indicates 70 psig.

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SUBTASK 36-11-00-720-029

(17) Set the system selector valve handle to the 'B' position.

SUBTASK 36-11-00-211-001

(18) Examine the pressure indication on test set gauge no. 4.

(a) If the pressure indicated on test set gauge no. 4 is not 20.0 to 28.0 psig, replace the bleed air regulator [3]. Do these tasks:

Bleed Air Regulator Removal, TASK 36-11-03-000-801

Bleed Air Regulator Installation, TASK 36-11-03-400-801

SUBTASK 36-11-00-864-001

(19) Turn the primary regulator until 0 psig is indicated on the primary system gauge.

SUBTASK 36-11-00-040-002

(20) Set the system selector valve handle to the OFF position.

SUBTASK 36-11-00-030-001

(21) Disconnect the 3/8 inch (.9525 cm) ID flexible air hose, length as needed, STD-3942 from test set fitting no. 2.

SUBTASK 36-11-00-030-002

(22) Disconnect the other end of the hose from the control pressure port [6] on the bleed air regulator.

SUBTASK 36-11-00-420-005

(23) Reconnect the control pressure sense line to the bleed air regulator [3].

NOTE: Use Never-Seez NSBT-8N compound, D00006 on the threads of all fittings when connecting the sense lines.

SUBTASK 36-11-00-430-001

(24) Install a cap on test set fitting no. 2.

SUBTASK 36-11-00-010-013

(25) Remove the no. 4 and no. 5 test set fitting caps.

NOTE: Test set fitting no. 5 will be a vent for test set gauge no. 2.

SUBTASK 36-11-00-030-003

(26) Disconnect the 3/8 inch (.9525 cm) ID flexible air hose, length as needed, STD-3942 from test set fitting no. 1.

SUBTASK 36-11-00-480-015

(27) Connect the hose removed from fitting no. 1 to test set fitting no. 4.

SUBTASK 36-11-00-430-002

(28) Install a cap on test set fitting no. 1.

SUBTASK 36-11-00-720-030

(29) Make sure these items on the test set are as follows:

(a) Shutoff valve no. 1 is in the CLOSED position.

(b) Shutoff valve no. 4 is in the CLOSED position.

(c) The differential selector is in the OFF position.

(d) Fittings nos. 1, 2, 3, and 6 are installed tightly on the test set and capped.

SUBTASK 36-11-00-863-001

(30) Turn the primary regulator until 50.0 ± 5.0 psig is indicated on the primary system gauge.

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SUBTASK 36-11-00-720-031

(31) Set the system selector handle to the 'A' position.

SUBTASK 36-11-00-720-032

(32) Open test set shutoff valves no. 2 and no. 3.

SUBTASK 36-11-00-863-002

(33) Turn pressure regulator no. 1 until 19.0 inches of Hg is indicated on gauge no. 2.

SUBTASK 36-11-00-700-003

(34) Examine the position indicator [2] on the PRSOV [1].

(a) If the position indicator [2] is not in the fully open position, follow these steps.

- 1) Turn pressure regulator no. 1 until 0 psig is indicated on test set gauge no. 2.
- 2) Set the system selector in the OFF position.
- 3) Disconnect the sense line at the Tee-fitting from the PRSOV [1] to the 450° F sensor.
- 4) Install a cap on the Tee-fitting at the PRSOV.
- 5) Set the system selector valve handle to the 'A' position.
- 6) Turn pressure regulator no. 1 until 19.0 inches of Hg is indicated on test set gauge no. 2.
- 7) Examine the position indicator [2] on the PRSOV [1].

a) If the position indicator [2] is NOT in the fully open position, replace the PRSOV. Do these tasks:

PRSOV Removal, TASK 36-11-04-000-801

PRSOV Installation, TASK 36-11-04-400-801

- 8) Turn pressure regulator no. 1 until 0 psig is indicated on the no. 2 test set gauge.
- 9) Set the system selector valve handle to the OFF position.
- 10) Disconnect the 3/8 inch (.9525 cm) ID flexible air hose, length as needed, STD-3942 from the supply pressure port [5] on the bleed air regulator [1] .
- 11) Attach the hose removed from the supply pressure port [5] to the sense line from the 450° F sensor.
- 12) Close test set shutoff valves no. 2 and 3.
- 13) Set the system selector handle to the 'A' position.
- 14) Turn pressure regulator no. 1 until 24.0 psig is indicated on test set gauge no. 3.
- 15) Use leak detector, G50135 to examine the 450° F thermostat, sense lines, and fittings for leakage.
 - a) Replace or repair damaged items as necessary.

NOTE: Use Never-Seez NSBT-8N compound, D00006 on the threads of all fittings when connecting the sense lines.

SUBTASK 36-11-00-040-003

(35) Turn pressure regulator no. 1 until 0 psig is indicated on test set gauges no. 2 and no. 3.

SUBTASK 36-11-00-430-003

(36) Reconnect all of the pressure sense lines disconnected during the test.

NOTE: Use Never-Seez NSBT-8N compound, D00006 on the threads of all fittings when connecting the sense lines.

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G. High Stage Valve/High Stage Regulator Health Check

SUBTASK 36-11-00-210-019

- (1) Examine the position indicator/manual override nut [8] on the high stage valve [7] Figure 511 (View B). The position indicator [8] should be in the closed position.

SUBTASK 36-11-00-710-029

- (2) Use a 3/8-inch wrench on the manual override nut [8] to open and close the high stage valve [7].

SUBTASK 36-11-00-960-004

- (3) If the high stage valve [7] does not move to the open and closed positions smoothly, replace the high stage valve [7]. Do these tasks:

High Stage Valve Removal, TASK 36-11-06-000-801

High Stage Valve Installation, TASK 36-11-06-400-801

SUBTASK 36-11-00-020-011

- (4) Disconnect the control pressure sense line [11] from the high stage regulator [9].

SUBTASK 36-11-00-030-004

- (5) Remove the cap from test set fitting no. 4.

SUBTASK 36-11-00-480-016

- (6) Connect one end of a 3/8 inch (.9525 cm) ID flexible air hose, length as needed, STD-3942 to the control pressure sense line.

SUBTASK 36-11-00-480-018

- (7) Connect the other end of the hose to test set fitting no. 4.

SUBTASK 36-11-00-720-033

- (8) Turn the primary regulator until 60.0 to 70.0 psig is indicated on the primary gauge.

NOTE: Make sure all of the test set regulators are in the OFF position.

SUBTASK 36-11-00-720-034

- (9) Set the system selector handle to the 'A' position.

SUBTASK 36-11-00-780-009

- (10) Slowly turn the no. 1 pressure regulator until a maximum pressure of 10.0 psig is indicated on test set gauge no. 3.

SUBTASK 36-11-00-780-010

- (11) Note the control pressure when the high stage valve [7] moves to the fully open position.

- (a) If the high stage valve [7] is not fully open by 10.0 psig, replace the valve. Do these steps:

High Stage Valve Removal, TASK 36-11-06-000-801

High Stage Valve Installation, TASK 36-11-06-400-801

SUBTASK 36-11-00-780-011

- (12) Turn the no. 1 pressure regulator until 0 psig is indicated on test set gauge no. 3.

SUBTASK 36-11-00-720-035

- (13) Set the system selector handle to the OFF position.

SUBTASK 36-11-00-030-005

- (14) Disconnect the 3/8 inch (.9525 cm) ID flexible air hose, length as needed, STD-3942 from the control pressure sense line [11].

SUBTASK 36-11-00-420-006

- (15) Reconnect the control pressure sense line [11] to the control pressure port on high stage regulator [9].

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SUBTASK 36-11-00-020-013

- (16) Remove the downstream pressure sense line [12] from the downstream port on the high stage regulator [9].

SUBTASK 36-11-00-010-016

- (17) Remove the cap from test set fitting no. 2.

SUBTASK 36-11-00-480-019

- (18) Connect a 3/8 inch (.9525 cm) ID flexible air hose, length as needed, STD-3942 between the downstream pressure port and test set fitting no. 2.

SUBTASK 36-11-00-030-006

- (19) Disconnect the supply pressure sense line [10] to the high stage regulator [9].

SUBTASK 36-11-00-480-020

- (20) Connect the 3/8 inch (.9525 cm) ID flexible air hose, length as needed, STD-3942 from test set fitting no. 4 to the supply pressure port on the high stage regulator [9].

SUBTASK 36-11-00-720-036

- (21) Set the system selector handle to the 'A' position.

SUBTASK 36-11-00-780-012

- (22) Turn the no. 1 pressure regulator until 55.0 psig is indicated on test set gauge no. 3.

SUBTASK 36-11-00-212-001

- (23) Examine the control pressure shown on test set gauge no. 4.

- (a) If the control pressure is NOT between 15.0 and 18.0 psig, replace the high stage regulator [9]. Do these tasks:

High Stage Regulator Removal, TASK 36-11-07-000-801

High Stage Regulator Installation, TASK 36-11-07-400-801

- (b) If the control pressure is between 15.0 and 18.0 psig, remove the downstream pressure sense line [12] from the high stage regulator [9].

- (c) Use leak detector, G50135 to check for air leakage from the downstream port.

- 1) If leakage is found, replace the high stage regulator [7]. Do these tasks:

High Stage Regulator Removal, TASK 36-11-07-000-801

High Stage Regulator Installation, TASK 36-11-07-400-801

NOTE: Use Never-Seez NSBT-8N compound, D00006 on the threads of all fittings when connecting the sense lines.

SUBTASK 36-11-00-780-013

- (24) Turn the no. 1 pressure regulator until 0 psig is indicated on test set gauge no. 3.

SUBTASK 36-11-00-720-037

- (25) Set the system selector handle to the OFF position.

SUBTASK 36-11-00-010-017

- (26) Remove the cap from test set fitting no. 1.

SUBTASK 36-11-00-030-007

- (27) Disconnect the 3/8 inch (.9525 cm) ID flexible air hose, length as needed, STD-3942 from test set fitting no. 4.

SUBTASK 36-11-00-480-021

- (28) Connect the hose removed from test set fitting no. 4 to test set fitting no. 1.

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SUBTASK 36-11-00-430-004

(29) Install a cap on test set fitting no. 4.

SUBTASK 36-11-00-030-008

(30) Disconnect the 3/8 inch (.9525 cm) ID flexible air hose, length as needed, STD-3942 from the downstream port on the high stage regulator [9] and from test set fitting no. 2.

SUBTASK 36-11-00-430-005

(31) Install a cap on test set fitting no. 2.

SUBTASK 36-11-00-430-006

(32) Reconnect the downstream pressure sense line [12] to the downstream port on the high stage regulator [9].

NOTE: Use Never-Seez NSBT-8N compound, D00006 on the threads of the fittings when connecting the sense line.

SUBTASK 36-11-00-720-038

(33) Set the system selector handle to the 'B' position.

SUBTASK 36-11-00-780-014

(34) Slowly adjust the primary regulator until 110.0 ± 5.0 psig is indicated on the primary system gauge.

SUBTASK 36-11-00-212-002

(35) Examine the position indicator [8] on the high stage valve [7].

(a) If the position indicator is NOT in the fully closed position, replace the high stage regulator [9]. Do these tasks:

High Stage Regulator Removal, TASK 36-11-07-000-801

High Stage Regulator Installation, TASK 36-11-07-400-801

SUBTASK 36-11-00-780-015

(36) Turn the primary regulator until 0 psig is indicated on the primary system gauge.

SUBTASK 36-11-00-720-039

(37) Set the system selector handle to the OFF position.

H. Put the Airplane and the Test Set Back to Their Usual Condition

SUBTASK 36-11-00-030-009

(1) Remove all hoses and test set accessories from the airplane.

SUBTASK 36-11-00-430-007

(2) Reconnect all sense lines that were disconnected to do the health check procedure.

SUBTASK 36-11-00-860-084

(3) Close the thrust reversers. Do this task:

Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00

SUBTASK 36-11-00-860-085

(4) Remove the DO-NOT-OPERATE tag from the applicable engine start lever.

SUBTASK 36-11-00-860-086

(5) Remove electrical power from the airplane. Do this task:

Remove Electrical Power, TASK 24-22-00-860-812

SUBTASK 36-11-00-080-005

(6) Put the test set back to its pre-test condition.

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- (a) Turn off the primary regulator.
- (b) Put caps on all of the test fittings.

————— **END OF TASK** —————

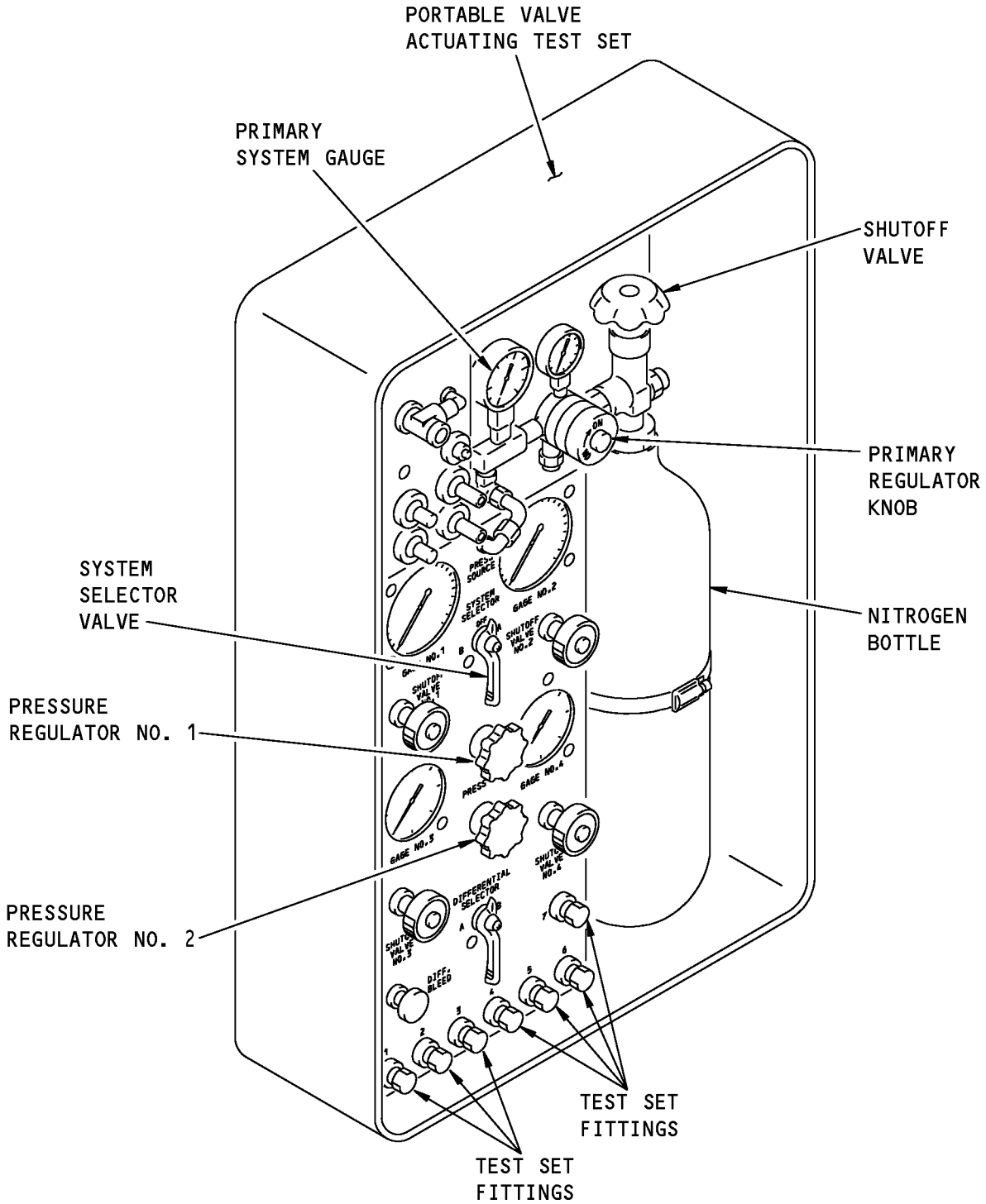
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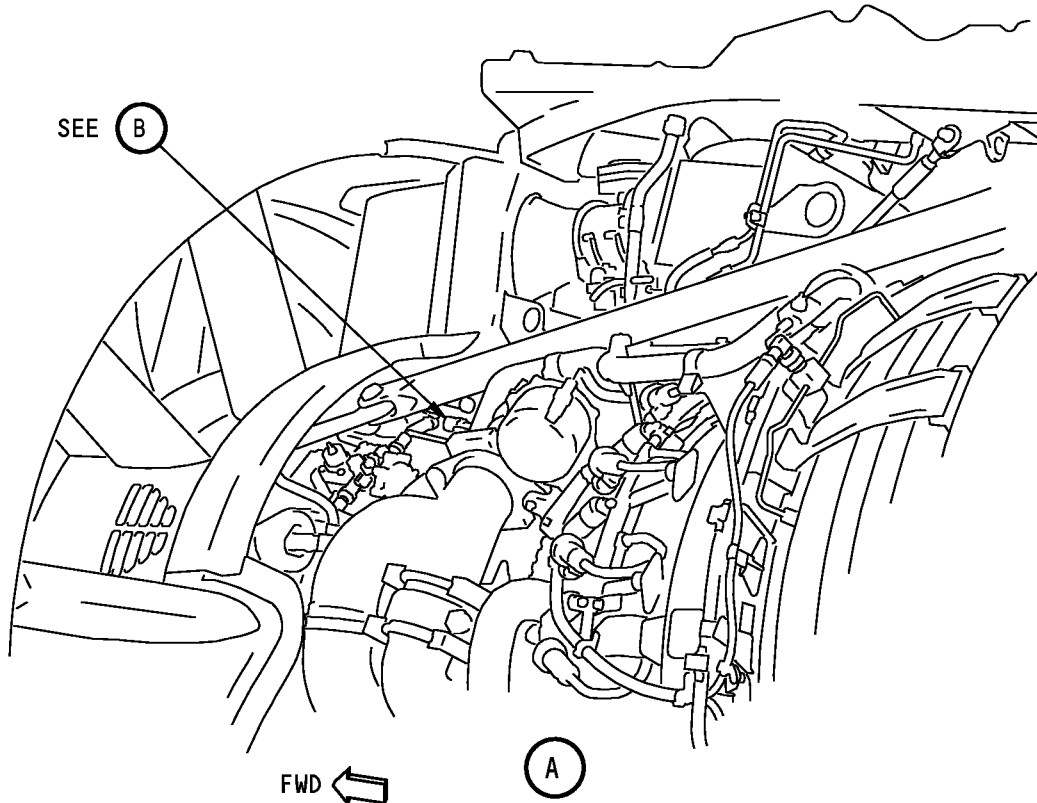
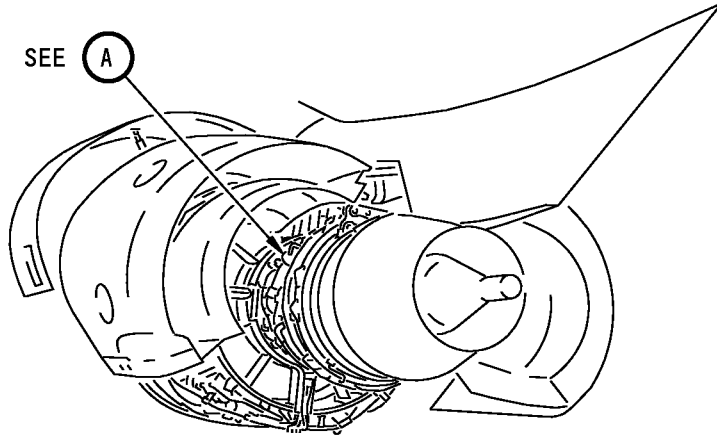


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**Portable Valve Actuation Test Set
Figure 509/36-11-00-990-807**

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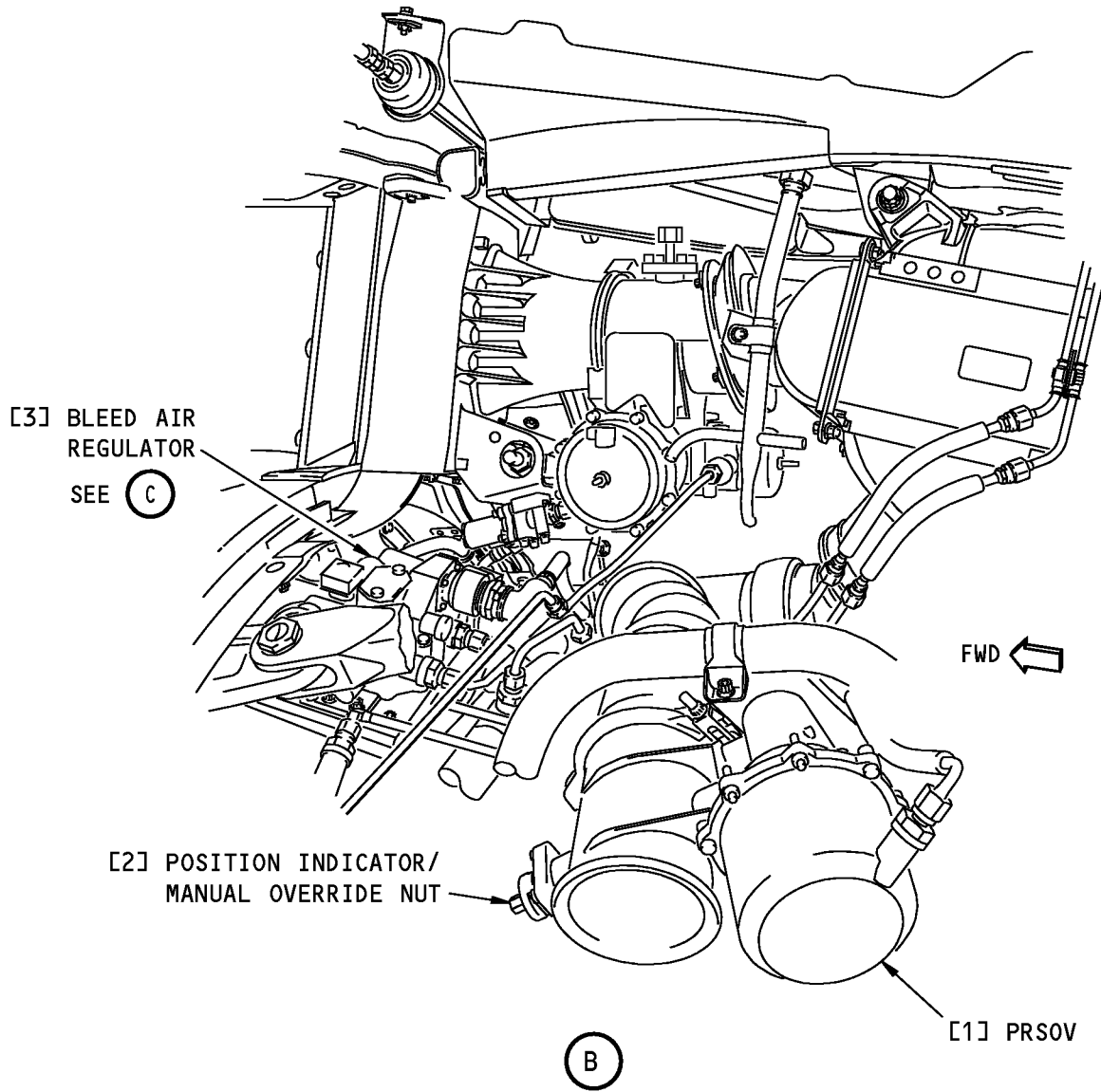
Bleed Air Regulator/PRSOV Operational Test
Figure 510 (Sheet 1 of 3)/36-11-00-990-808

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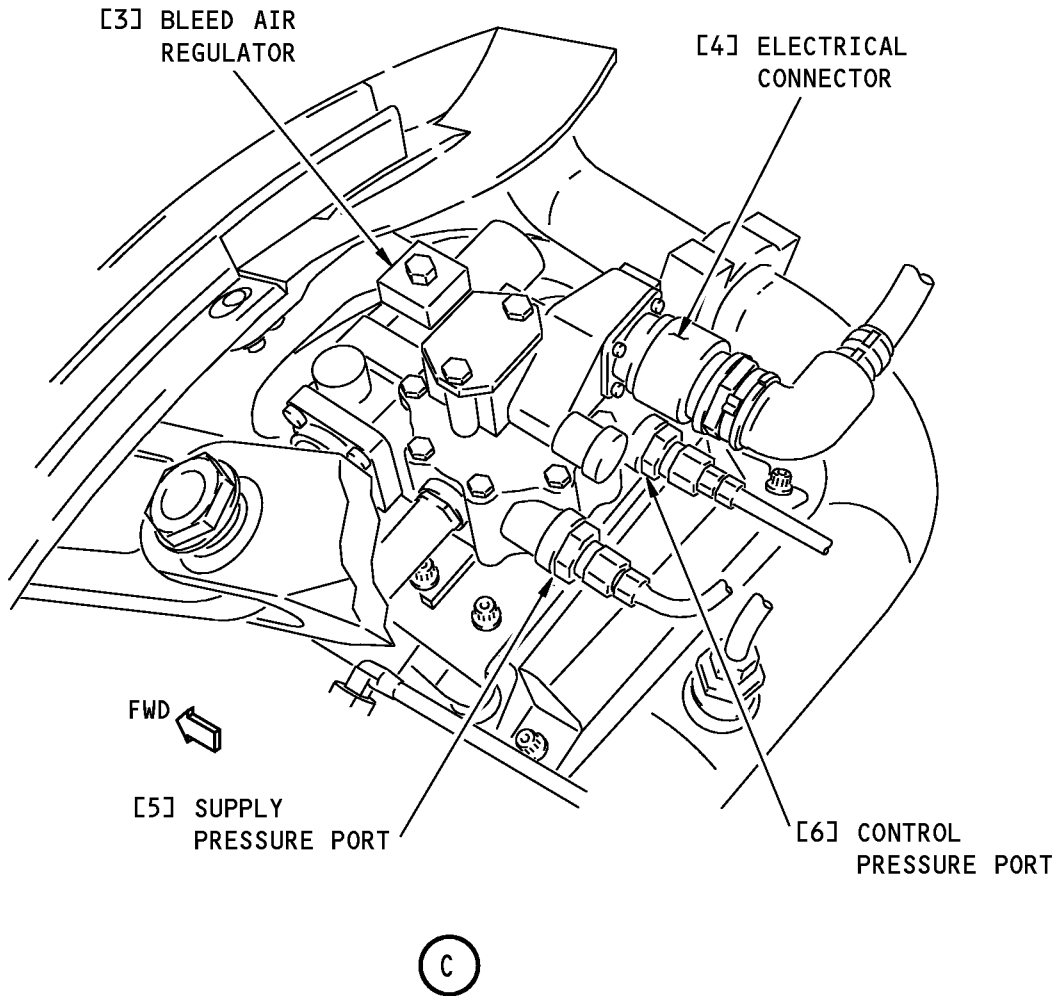
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**Bleed Air Regulator/PRSOV Operational Test
Figure 510 (Sheet 2 of 3)/36-11-00-990-808**

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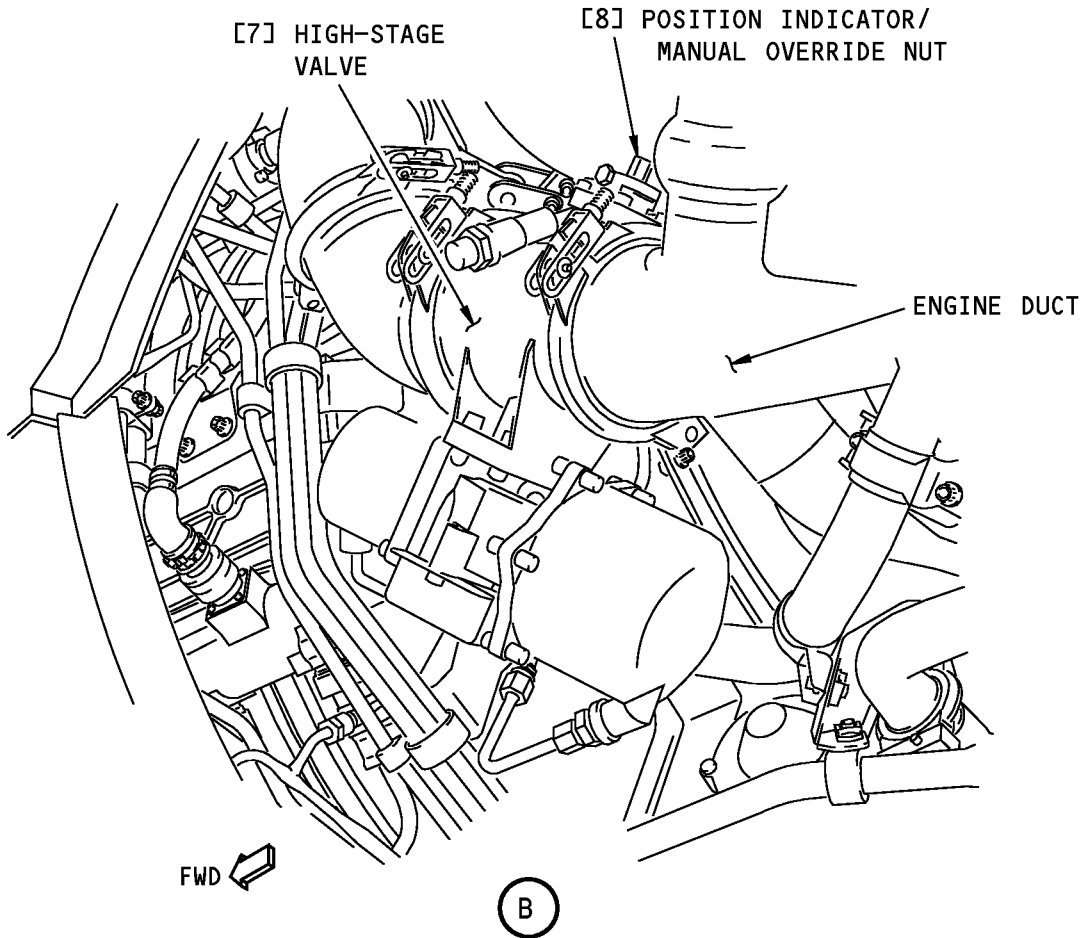
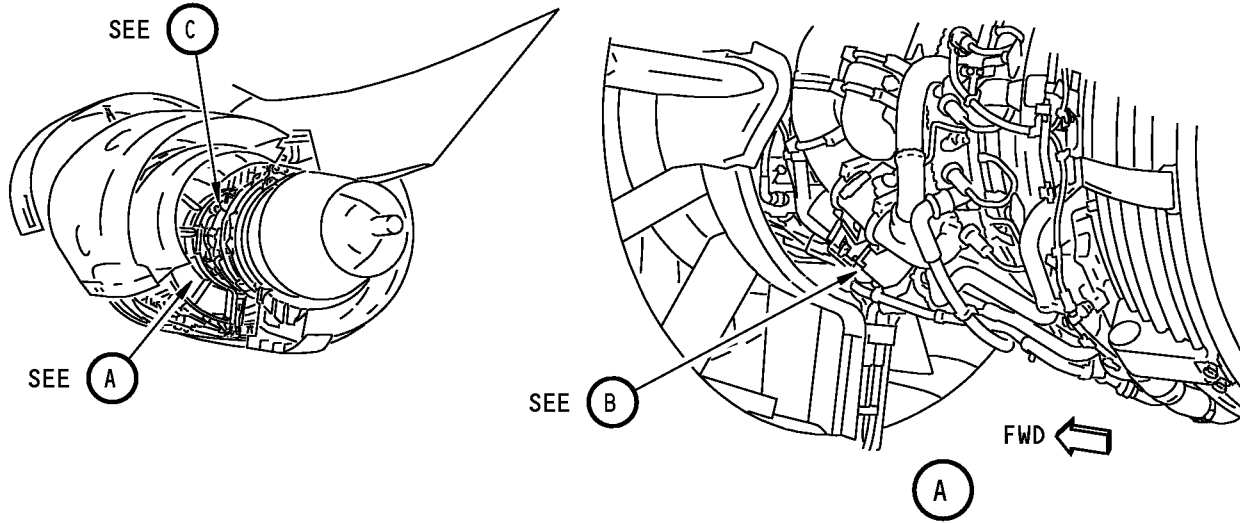


**Bleed Air Regulator/PRSOV Operational Test
Figure 510 (Sheet 3 of 3)/36-11-00-990-808**

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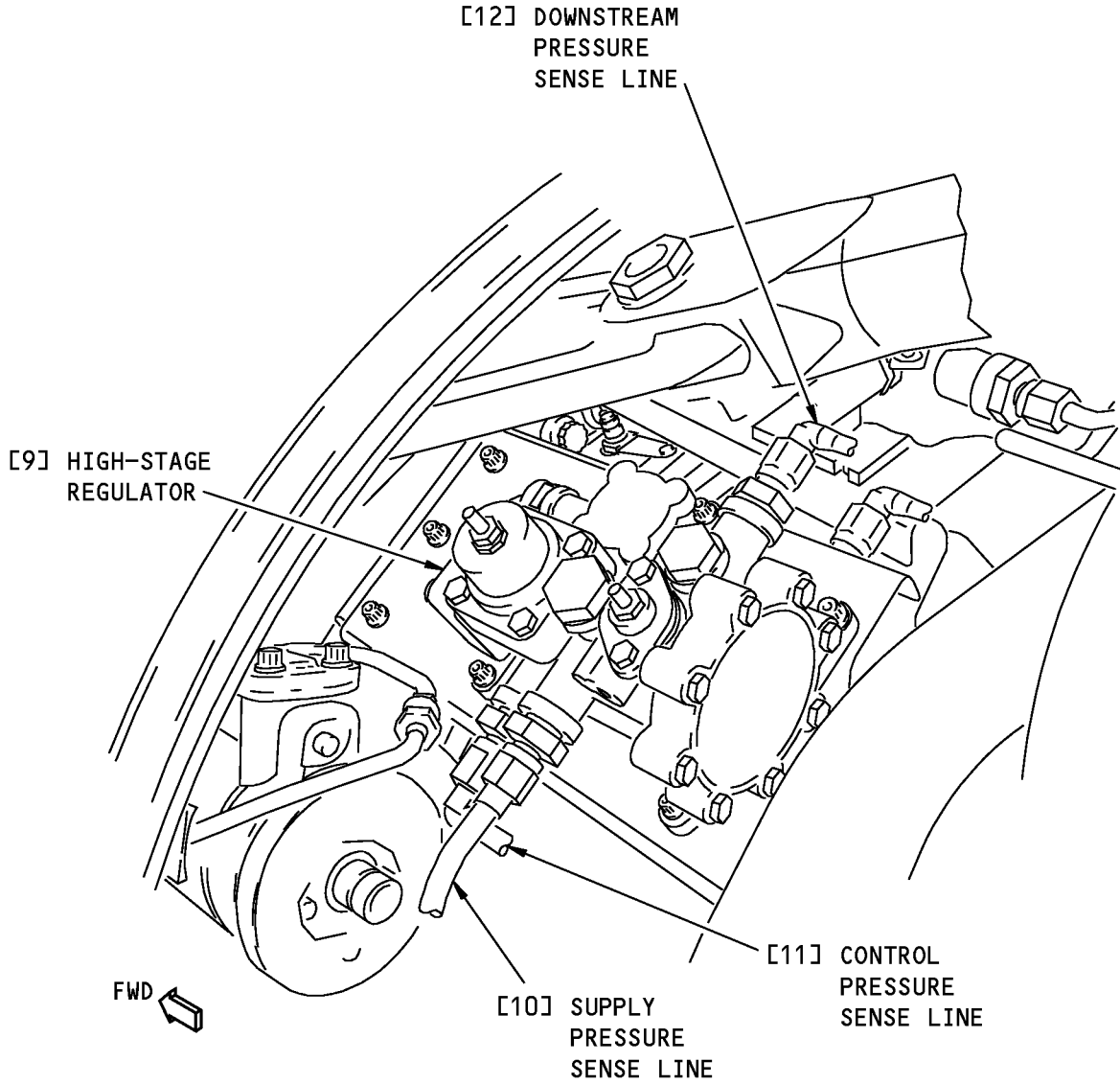
**High Stage Regulator/High Stage Valve Operational Test
Figure 511 (Sheet 1 of 2)/36-11-00-990-809**

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(C)

**High Stage Regulator/High Stage Valve Operational Test
Figure 511 (Sheet 2 of 2)/36-11-00-990-809**

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ENGINE PNEUMATIC DUCT - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

- (1) Engine pneumatic duct removal
- (2) Engine pneumatic duct installation.

TASK 36-11-01-000-802

2. Engine Pneumatic Duct Removal

(Figure 401)

A. General

(1) This procedure has instructions to remove each of these individual duct sections:

- (a) Intersection Manifold Duct
- (b) Fifth-Stage Port Duct
- (c) High-Stage Downstream Duct
- (d) Precooler Upstream Duct

B. References

Reference	Title
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)

C. Location Zones

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

D. Prepare to Remove the Duct

SUBTASK 36-11-01-860-010

WARNING: YOU MUST REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. IF YOU DO NOT REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS, HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(1) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 36-11-01-860-011

(2) Make sure the engine start lever is in the CUTOFF position.

- (a) Install a DO-NOT-OPERATE tag on the applicable engine start lever.

SUBTASK 36-11-01-860-012

(3) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	7	C00796	AIR CONDITIONING BLEED AIR VALVES LEFT
B	7	C00797	AIR CONDITIONING BLEED AIR VALVES RIGHT

SUBTASK 36-11-01-860-013

(4) Attach a DO-NOT-OPERATE tag to the applicable BLEED switch on the P5-10 panel:

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- (a) BLEED 1
- (b) BLEED 2

SUBTASK 36-11-01-010-010

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (5) For the left and right thrust reversers, do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

E. Remove the Intersection Manifold Duct

SUBTASK 36-11-01-020-033

- (1) Disconnect the bleed air supply line [2] at the pressure tap connection of the intersection manifold duct assembly [5] (Figure 401) (View B).
 - (a) Keep the union [8] attached to the bleed air supply line [2].
 - (b) Discard the O-ring [9].

SUBTASK 36-11-01-020-034

- (2) Disconnect the supply pressure sense line [1] at the connection to the bleed air regulator.

SUBTASK 36-11-01-020-035

- (3) Disconnect the control pressure sense line [7] at the connection to the bleed air regulator.

SUBTASK 36-11-01-020-036

- (4) Disconnect the downstream pressure sense line [6] at the connection to the high stage regulator.

SUBTASK 36-11-01-480-005

- (5) Put covers on all sense ports and sense line openings to keep out unwanted material.

SUBTASK 36-11-01-020-037

- (6) Remove the two bolts [3] from the two sense line support clamps.
 - (a) Keep these loose items for re-installation.

SUBTASK 36-11-01-010-011

- (7) Remove the nut [14], bolt [18], bushing [15], bushing [11] (if installed), washers [12], washers [13] and washer [17] to disconnect the duct from the engine duct support bracket [16] (Figure 401) (View C).
 - (a) Keep these loose items for re-installation.

SUBTASK 36-11-01-020-038

- (8) Remove the nut [21], bolt [26], bushing [23], washer [22] and washer [25] to disconnect the duct from the upper duct support link [24] (Figure 401) (View D).
 - (a) Keep these loose items for re-installation.

SUBTASK 36-11-01-020-039

- (9) Remove the nut [31], bolt [35], bushing [33], washer [32] and washer [34] to disconnect the duct from the lower duct support link [30] (Figure 401) (View E).
 - (a) Keep these loose items for re-installation.

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SUBTASK 36-11-01-010-012

- (10) Remove the coupling [46] at the forward 12 o'clock position connection to the CTAI duct (Figure 401) (View F).

NOTE: The E-seal [47] is to be removed at a later step.

SUBTASK 36-11-01-010-013

- (11) Remove the coupling [41] at the bottom of the PRSOV [4].

NOTE: The E-seal [42] is to be removed at a later step.

SUBTASK 36-11-01-020-040

- (12) Remove the coupling [43] at the top of the bleed air check valve [44].

NOTE: The E-seal [42] is to be removed at a later step.

SUBTASK 36-11-01-020-041

- (13) Remove the coupling [43] at the top of the high-stage downstream duct [45].

NOTE: The E-seal [42] is to be removed at a later step.

SUBTASK 36-11-01-020-042

- (14) Move all the disconnected sense lines out of the way to make room for duct removal.

SUBTASK 36-11-01-020-043

- (15) Remove the intersection manifold duct assembly [5].

SUBTASK 36-11-01-020-044

- (16) Remove E-seal [47] and E-seals [42].

- (a) Examine all the E-seals for cracks, dents or other damage.
- (b) Replace all damaged E-seals.

SUBTASK 36-11-01-480-006

- (17) Put covers on all duct and valve openings to keep out unwanted material.

F. Remove the Fifth-Stage Port Duct

SUBTASK 36-11-01-020-045

- (1) Cut the lockwire or safety cable from the bolts [53].

SUBTASK 36-11-01-020-046

- (2) Remove the four bolts [53] and four washers [52] (Figure 401) (View G).

SUBTASK 36-11-01-020-047

- (3) Remove the coupling [55] at the bottom of the bleed air check valve [44].

NOTE: The E-seal [56] is to be removed at a later step.

SUBTASK 36-11-01-020-048

- (4) Remove the fifth-stage port duct assembly [54].

SUBTASK 36-11-01-020-049

- (5) Remove the seal [51] and E-seal [56].

- (a) Examine the seals for cracks, dents or other damage.
- (b) Replace all damaged seals.

SUBTASK 36-11-01-390-002

- (6) Put a cover over the fifth-stage port [50] and bleed air check valve [44] to keep unwanted material out.

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G. Remove the High-Stage Downstream Duct

SUBTASK 36-11-01-020-050

- (1) Remove the coupling [43] at top of the duct (Figure 401) (View H).

NOTE: The E-seal [42] is to be removed at later step.

SUBTASK 36-11-01-020-051

- (2) Remove the coupling [43] at the top the high-stage valve [60].

NOTE: The E-seal [42] is to be removed at later step.

SUBTASK 36-11-01-020-052

- (3) Remove the high-stage downstream duct assembly [45].

SUBTASK 36-11-01-020-053

- (4) Remove the E-seals [42].

- (a) Examine the E-seals for cracks, dents or other damage.

- (b) Replace all damaged E-seals [42].

SUBTASK 36-11-01-480-007

- (5) Put covers on duct and valve openings to keep out unwanted material.

H. Remove the Precooler Upstream Duct

SUBTASK 36-11-01-020-054

- (1) Remove the coupling [41] at the top of the PRSOV [4] from the left side of the engine (Figure 401) (View I).

NOTE: The E-seal [42] is to be removed at later step.

SUBTASK 36-11-01-020-055

- (2) Disconnect the control pressure sense line [70] at the connection fitting [71] from the right side of the engine to get more room for duct removal (Figure 401) (View J).

SUBTASK 36-11-01-020-056

- (3) Remove the coupling [43] at the bottom of the precooler.

NOTE: The E-seal [42] is to be removed at later step.

SUBTASK 36-11-01-020-057

- (4) Remove the precooler upstream duct assembly [72] from the right side of the engine.

SUBTASK 36-11-01-020-058

- (5) Remove the E-seals [42].

- (a) Examine the E-seals for cracks, dents or other damage.

- (b) Replace all damaged the E-seals [42].

SUBTASK 36-11-01-480-008

- (6) Put covers on the precooler inlet, PRSOV [4] and sense line openings to keep out unwanted material.

————— **END OF TASK** —————

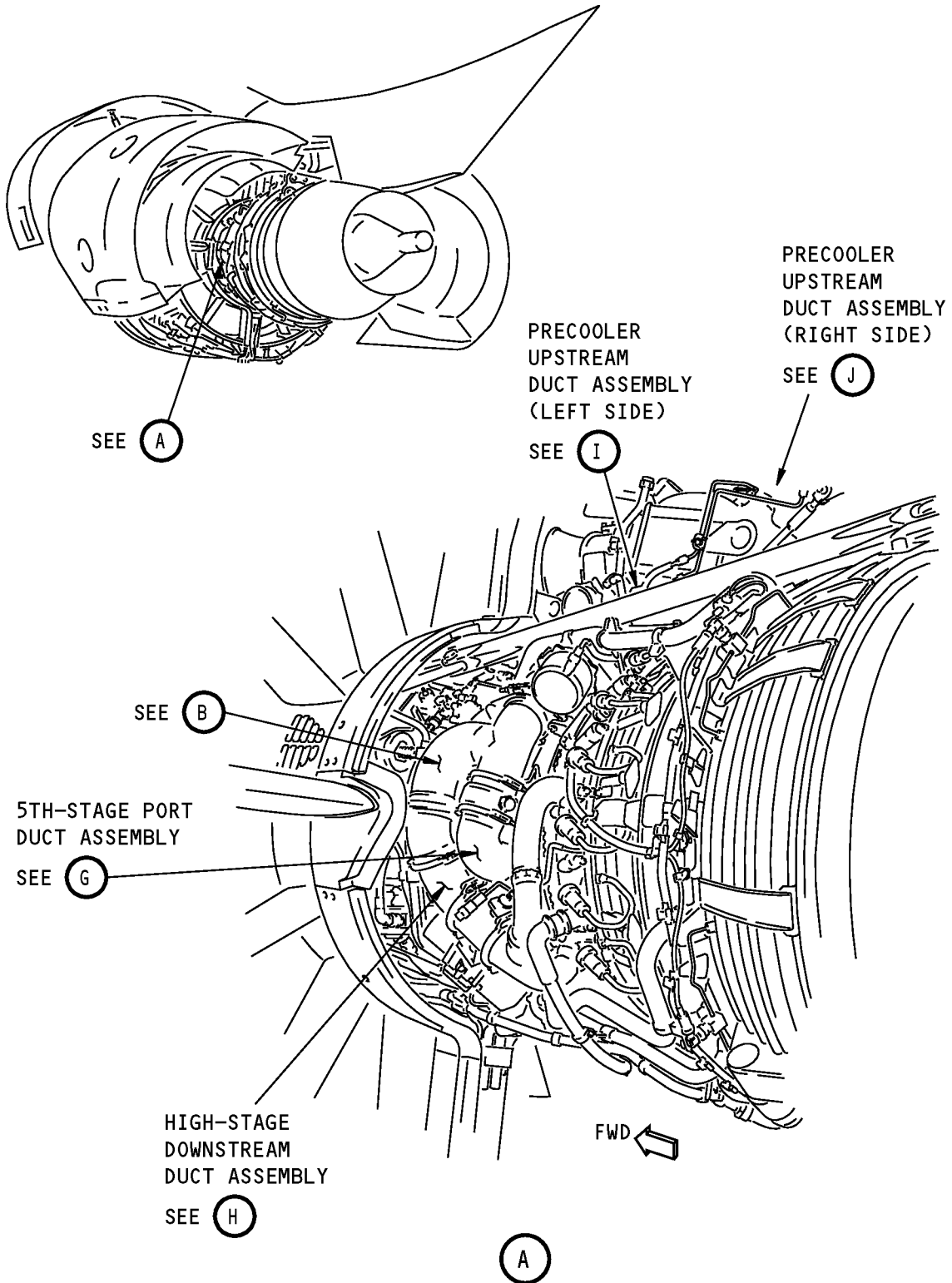
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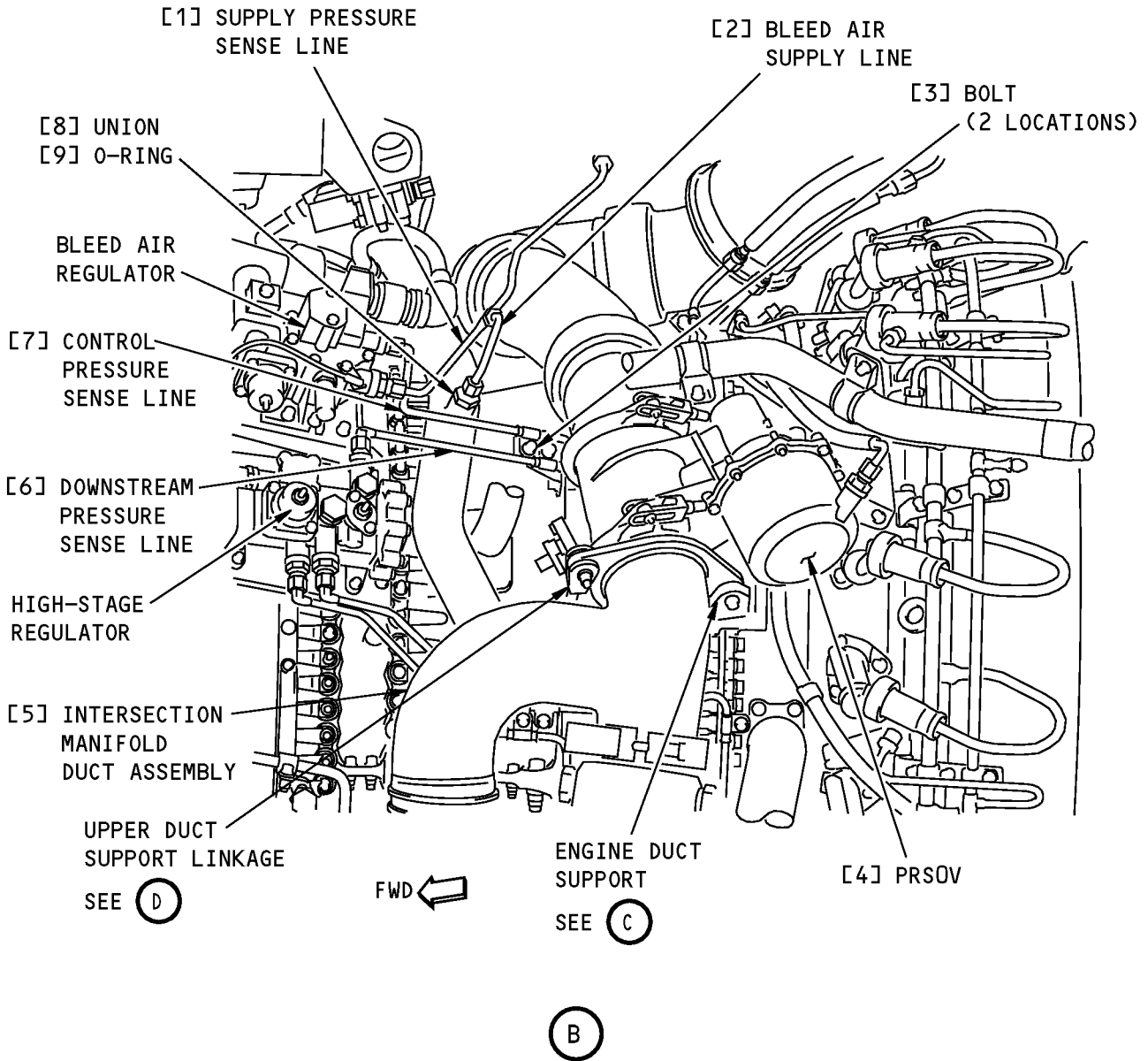
**Engine Pneumatic Duct Installation
Figure 401 (Sheet 1 of 9)/36-11-01-990-802**

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**Engine Pneumatic Duct Installation
Figure 401 (Sheet 2 of 9)/36-11-01-990-802**

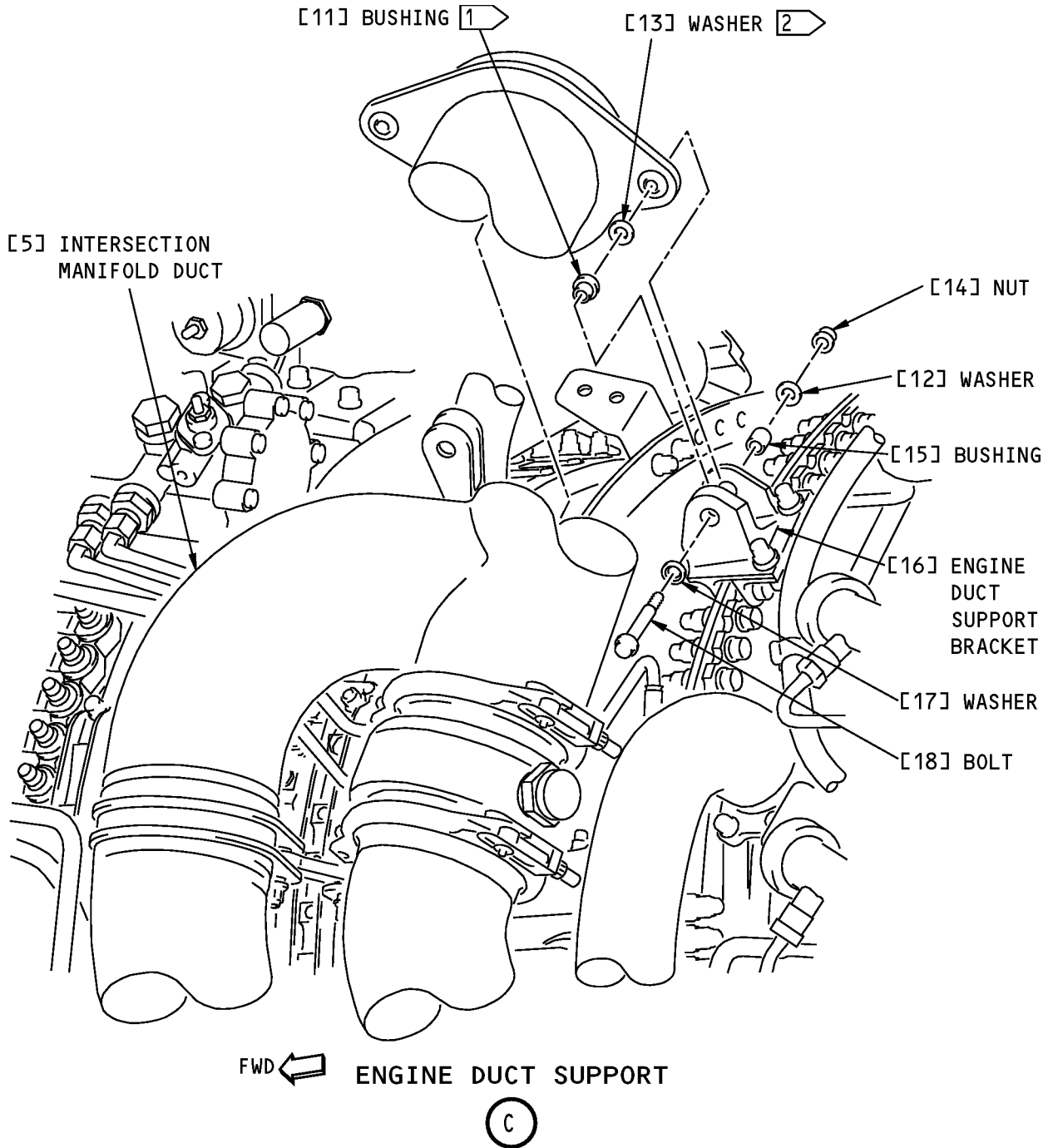
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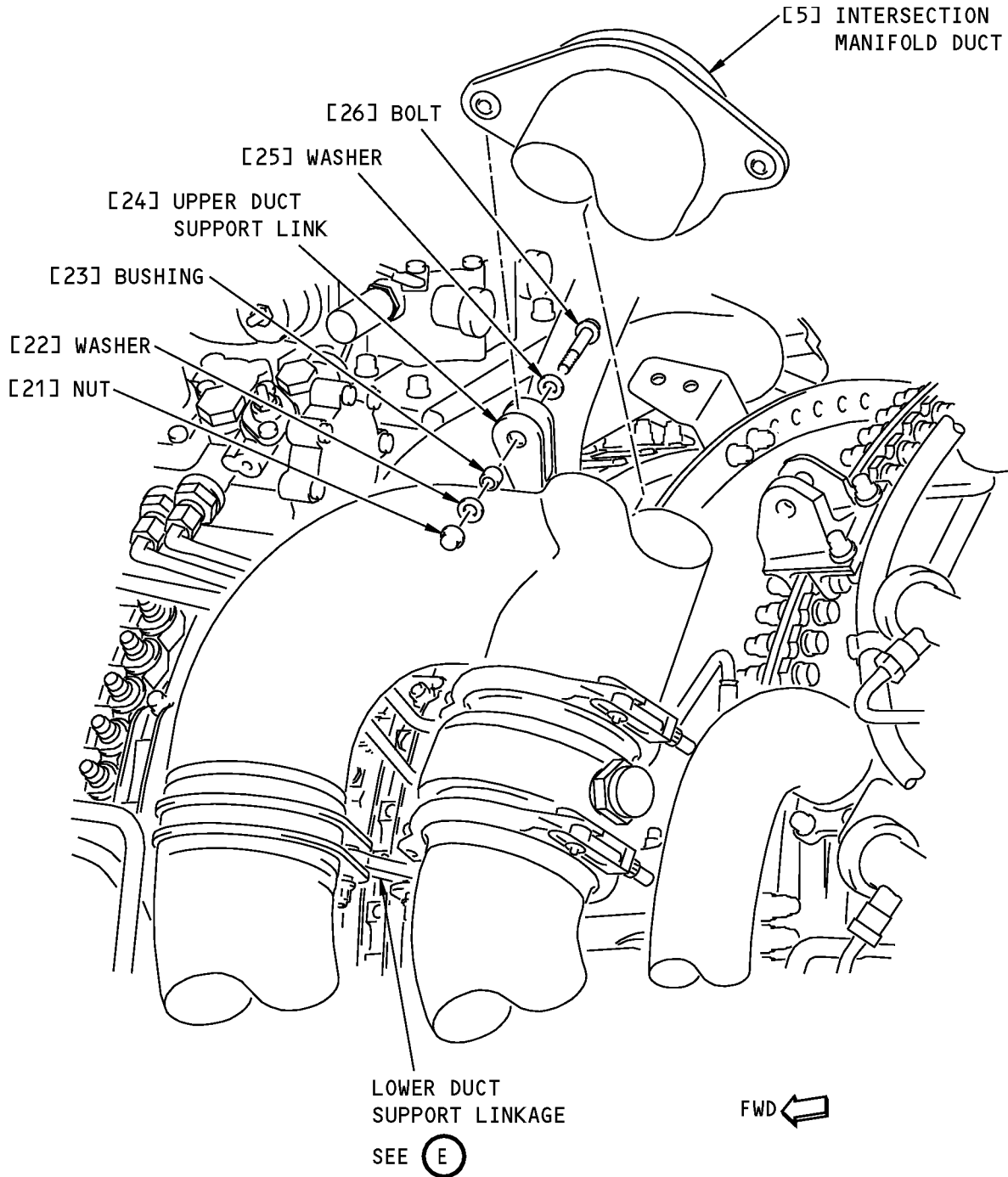
- 1 IF INSTALLED
- 2 INSTALL UP TO 4 WASHERS AS NECESSARY BETWEEN THE FLANGE AND ENGINE DUCT SUPPORT BRACKET

Engine Pneumatic Duct Installation
Figure 401 (Sheet 3 of 9)/36-11-01-990-802

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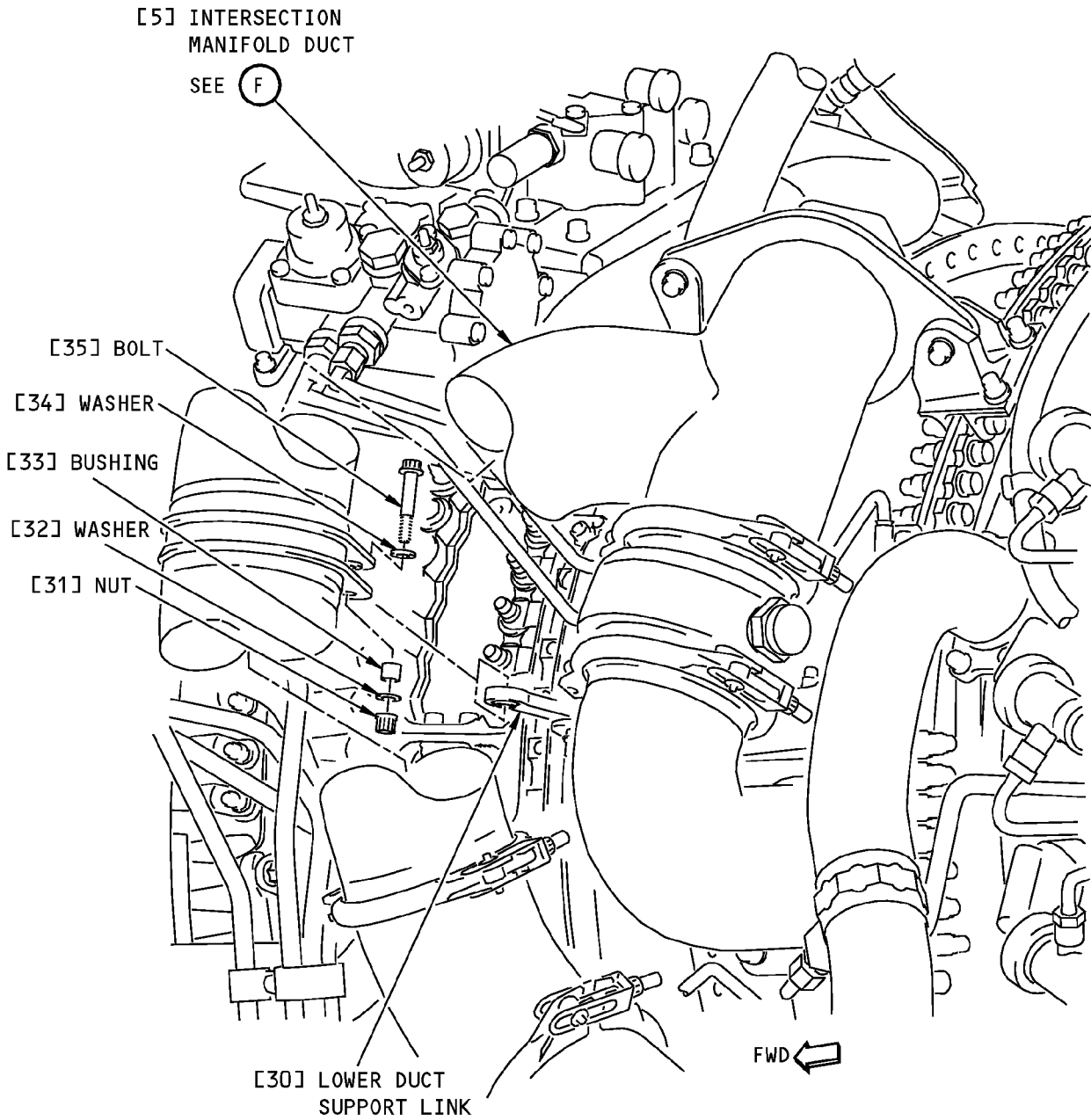
UPPER DUCT SUPPORT LINKAGE

(D)

**Engine Pneumatic Duct Installation
Figure 401 (Sheet 4 of 9)/36-11-01-990-802**

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LOWER DUCT SUPPORT LINKAGE

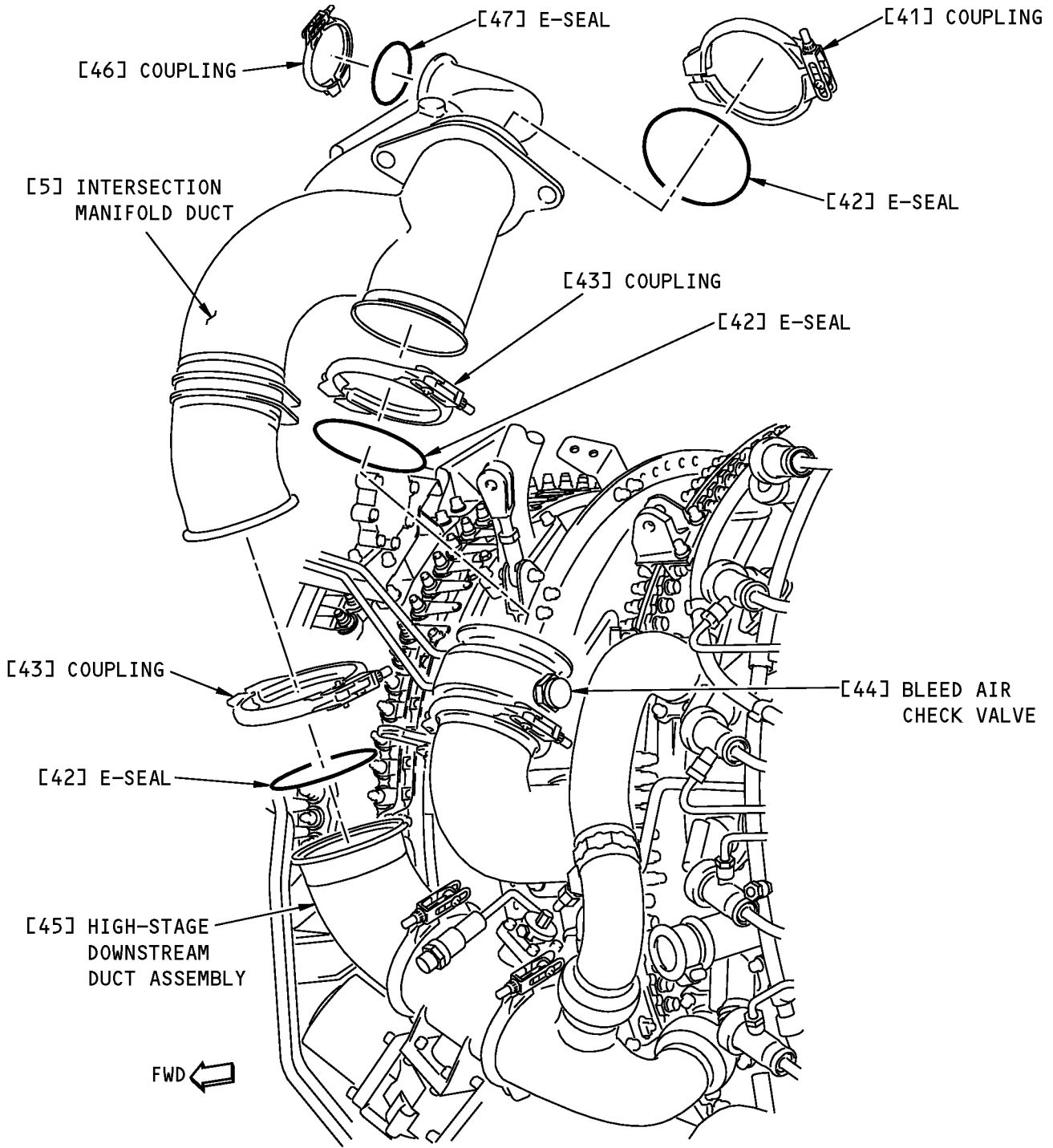
(E)

**Engine Pneumatic Duct Installation
Figure 401 (Sheet 5 of 9)/36-11-01-990-802**

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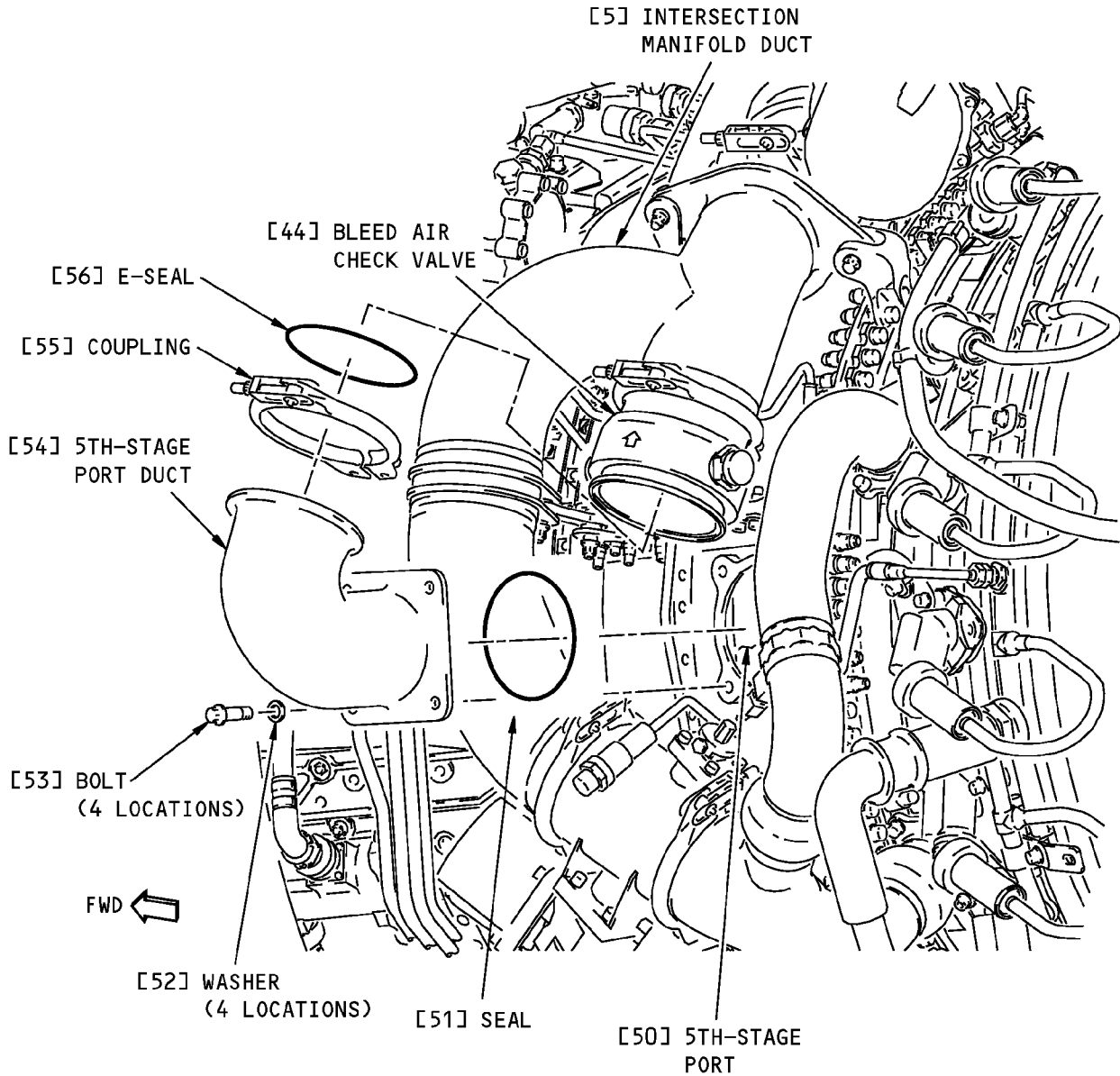
INTERSECTION MANIFOLD DUCT ASSEMBLY

F

Engine Pneumatic Duct Installation
Figure 401 (Sheet 6 of 9)/36-11-01-990-802

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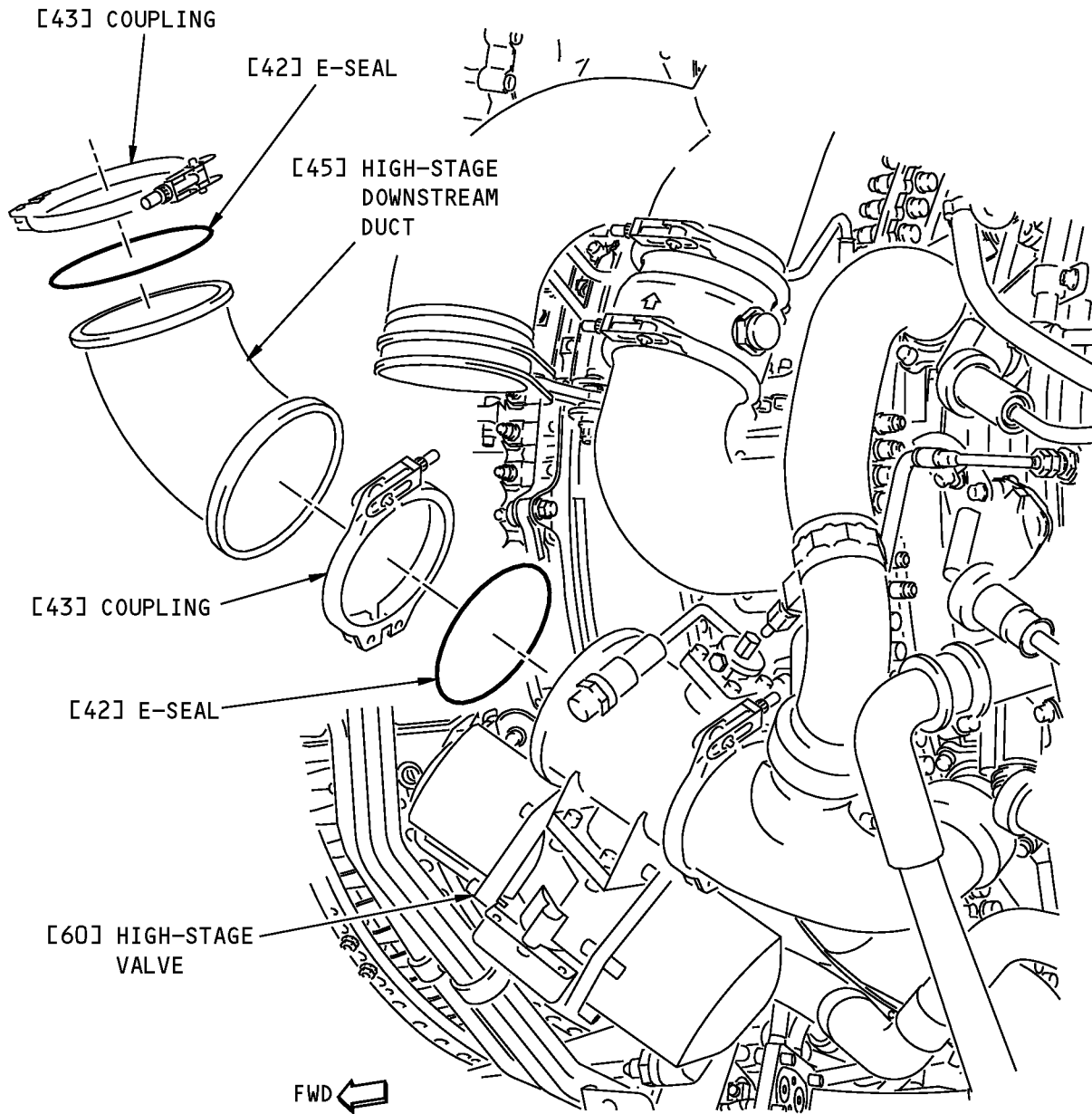
5TH-STAGE PORT DUCT ASSEMBLY

G

**Engine Pneumatic Duct Installation
Figure 401 (Sheet 7 of 9)/36-11-01-990-802**

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HIGH-STAGE DOWNSTREAM DUCT ASSEMBLY

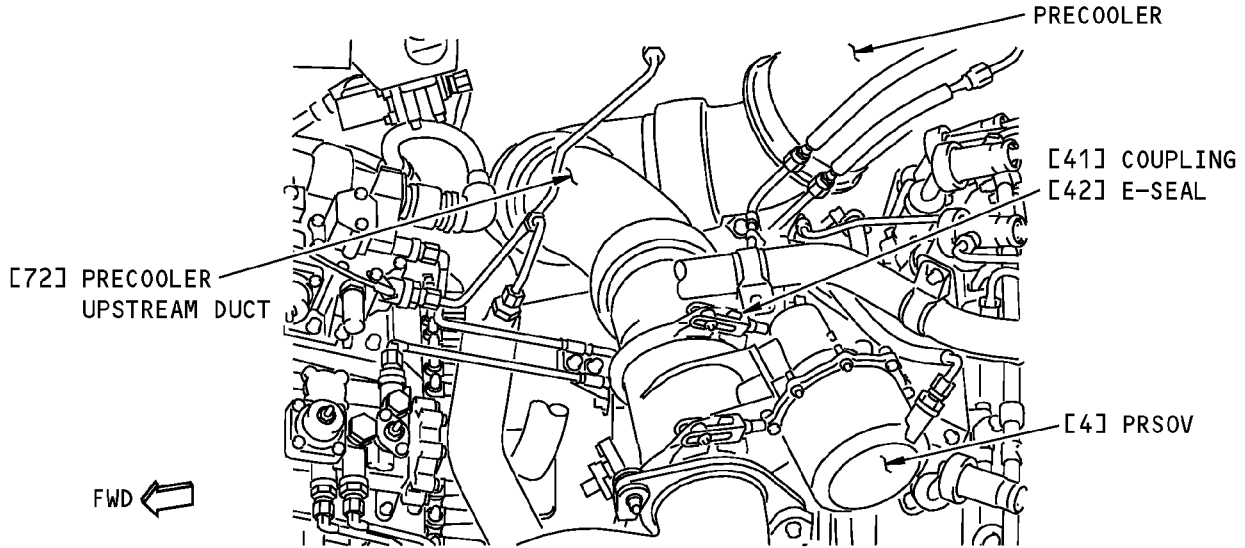
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**Engine Pneumatic Duct Installation
Figure 401 (Sheet 8 of 9)/36-11-01-990-802**

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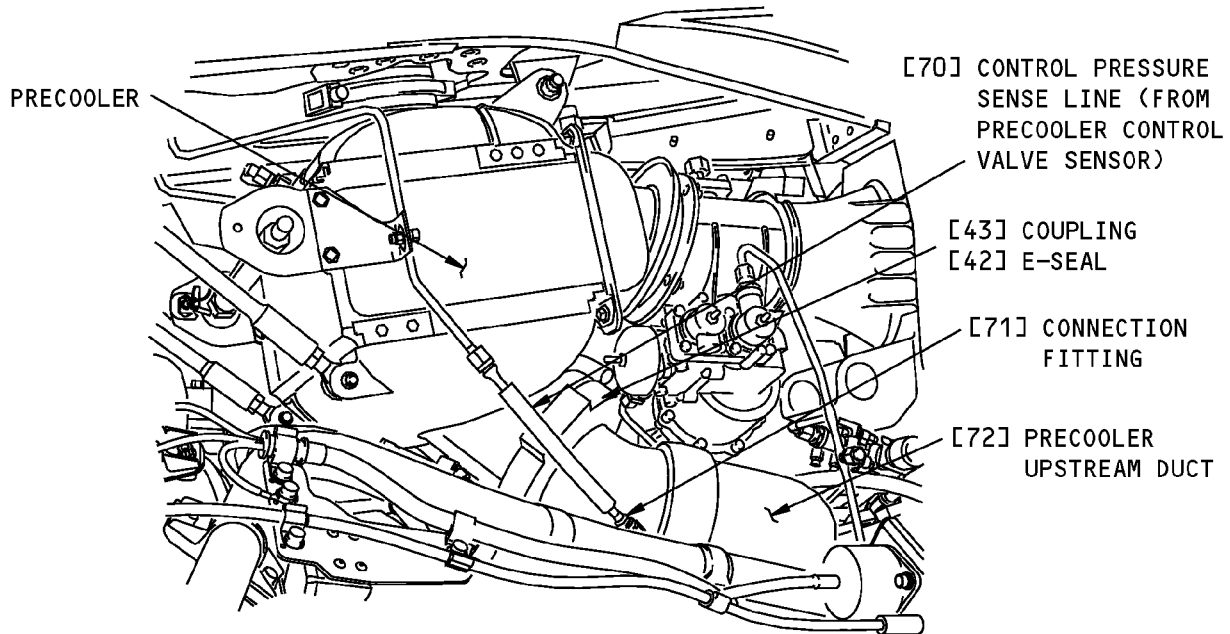
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**PRECOOLER UPSTREAM DUCT ASSEMBLY
(LEFT SIDE)**

I



**PRECOOLER UPSTREAM DUCT ASSEMBLY
(RIGHT SIDE)**

J

**Engine Pneumatic Duct Installation
Figure 401 (Sheet 9 of 9)/36-11-01-990-802**

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TASK 36-11-01-400-802

3. Engine Pneumatic Duct Installation

(Figure 401)

A. General

- (1) This procedure has instructions to install each of these individual duct sections:
 - (a) Intersection Manifold Duct
 - (b) Fifth-Stage Port Duct
 - (c) High-Stage Downstream Duct
 - (d) Precooler Upstream Duct

B. References

Reference	Title
36-00-00-860-805	Supply Pressure Upstream of the PRSOV (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

C. Tools/Equipment

Reference	Description
STD-3906	Mallet - Rubber

D. Consumable Materials

Reference	Description	Specification
D00010	Compound - Thread Antiseize, High Temperature	MIL-PRF-907F
G00091	Compound - Oxygen System Leak Detection - Snoop Leak Detector	MIL-PRF-25567

E. Location Zones

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

F. Install the Intersection Manifold Duct

SUBTASK 36-11-01-080-004

- (1) Remove the covers from duct and valve openings.

SUBTASK 36-11-01-210-005

- (2) Put the intersection manifold duct assembly [5] into position for installation.

SUBTASK 36-11-01-210-006

- (3) Loosen the engine support bracket [16] and the brackets for the upper duct support link [24] and lower duct support link [30].

SUBTASK 36-11-01-010-014

- (4) Install the bolt [18], washer [17], bushing [11] (if installed), washers [12], washers [13], bushing [15] and nut [14] to connect the duct to the engine duct support bracket [16] (Figure 401) (View C).

NOTE: Install the countersunk side of the washer [17] against the head of the bolt [18]. Do not tighten the nut [14] and bolt [18] at this time.

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SUBTASK 36-11-01-020-059

- (5) Install the bolt [26], washer [25], bushing [23], washer [22] and nut [21] to connect the duct to the upper duct support link [24] (Figure 401) (View D).

NOTE: Install the countersunk side of the washer [25] against the head of the bolt [26]. Do not tighten the nut [21] and bolt [26] at this time.

SUBTASK 36-11-01-020-060

- (6) Install the bolt [35], washer [34], bushing [33], washer [32] and nut [31] to connect the duct to the lower duct support link [30] (Figure 401) (View E).

NOTE: Install the countersunk side of the washer [34] against the head of the bolt [35]. Do not tighten the nut [31] and bolt [35] at this time.

SUBTASK 36-11-01-010-015

- (7) Install the coupling [46] and E-seal [47] at the forward 12 o'clock connection to the CTAI duct (Figure 401) (View F).

- (a) Do not tighten coupling [46] at this time.

SUBTASK 36-11-01-010-016

- (8) Install the coupling [41] and E-seal [42] at the bottom of the PRSOV [4].

- (a) Do not tighten coupling [41] at this time.

SUBTASK 36-11-01-020-061

- (9) Install the coupling [43] and E-seal [42] at the top of the bleed air check valve [44].

- (a) Do not tighten coupling [43] at this time.

SUBTASK 36-11-01-020-062

- (10) Install the coupling [43] and E-seal [42] at the top of the high-stage downstream duct [45].

- (a) Do not tighten coupling [43] at this time.

SUBTASK 36-11-01-420-022

- (11) Tighten nut [21] and nut [31] to 50.0 in-lb (5.6 N·m) - 75.0 in-lb (8.5 N·m).

SUBTASK 36-11-01-010-017

- (12) Install the washer [13] (4 maximum) between the flange of the intersection manifold duct [5] and engine duct support bracket [16] to eliminate the gap between the lower side of the duct flange and the support bracket.

NOTE: Install the washers [13] on the lower side of the flange only.

NOTE: If the gap between the bracket and the flange is more than 0.12 in. (3.0 mm), reposition the bracket.

SUBTASK 36-11-01-420-023

- (13) Tighten all the couplings to the torque shown on the part.

- (a) Use a rubber mallet, STD-3906 to lightly tap outer surface the couplings.

- (b) Re-tighten all the couplings to the torque shown on the part again.

SUBTASK 36-11-01-420-024

- (14) Connect the downstream pressure sense line [6] to the sense port on the high stage regulator (Figure 401)(View B).

- (a) Tighten the sense line connection to 133.0 in-lb (15.0 N·m) - 147.0 in-lb (16.6 N·m).

- (b) Back off the tube nut to decrease the torque.

- (c) Tighten the sense line connection again to 133.0 in-lb (15.0 N·m) - 147.0 in-lb (16.6 N·m).

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SUBTASK 36-11-01-420-025

- (15) Connect the control pressure sense line [7] to the control pressure sense port on the bleed air regulator.
 - (a) Tighten the sense line connection to 133.0 in-lb (15.0 N·m) - 147.0 in-lb (16.6 N·m).
 - (b) Back off the tube nut to decrease the torque.
 - (c) Tighten the sense line connection again to 133.0 in-lb (15.0 N·m) - 147.0 in-lb (16.6 N·m).

SUBTASK 36-11-01-420-026

- (16) Connect supply pressure sense line [1] to the supply pressure sense port on the bleed air regulator.

SUBTASK 36-11-01-420-027

- (17) Install a union [8] and a new O-ring [9] in the bleed air pressure tap of intersection manifold duct assembly [5].
 - (a) Tighten the union to 258 in-lb (29.1 N·m) – 284 in-lb (32.1 N·m).

SUBTASK 36-11-01-420-028

- (18) Connect the bleed air supply line [2] to the union [8] and the supply pressure sense line [1].
 - (a) Adjust the supply pressure sense line and the bleed air supply line to the best position.
 - (b) Tighten the bleed air supply connections to 133.0 in-lb (15.0 N·m) - 147.0 in-lb (16.6 N·m)..
 - (c) Back off the tube nut to decrease the torque.
 - (d) Tighten the bleed air supply line and the supply pressure sense line connections again to 133.0 in-lb (15.0 N·m) - 147.0 in-lb (16.6 N·m)..

SUBTASK 36-11-01-420-029

- (19) Install the two bolts [3] at the sense line support clamps.
 - (a) Tighten the bolts [3] to 110.0 in-lb (12.4 N·m) - 120.0 in-lb (13.6 N·m).

G. Install the Fifth-Stage Port Duct

SUBTASK 36-11-01-010-018

- (1) Remove the cover from the fifth-stage port [50] and bleed air check valve [44] (Figure 401) (View G).

SUBTASK 36-11-01-420-030

- (2) Install the seal [51] on the fifth-stage port [50].

SUBTASK 36-11-01-420-031

- (3) Install the fifth-stage duct assembly [54] to the fifth-stage port [50].

SUBTASK 36-11-01-420-032

- (4) Apply a thin layer of compound, D00010 to the threads on the bolts [53].

SUBTASK 36-11-01-420-033

- (5) Do these steps to install the bolts [53] and washers [52], at four locations:
 - (a) Make sure the countersunk side of the washers [52] is at the head of the bolt [53].
 - (b) Tighten the bolts [53] to 115.0 in-lb (13.0 N·m) - 125.0 in-lb (14.1 N·m).
 - (c) Install lockwire or safety cable to the forward and aft pair of bolts [53].

SUBTASK 36-11-01-420-034

- (6) Install the coupling [55] and E-seal [56].

SUBTASK 36-11-01-420-035

- (7) Tighten the coupling [55] to the torque shown on the part.

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- (a) Use a rubber mallet, STD-3906 to lightly tap outer surface the coupling.
- (b) Re-tighten all the couplings to the torque shown on the part again.

H. Install the High-Stage Downstream Duct

SUBTASK 36-11-01-080-005

- (1) Remove the covers from adjacent duct and valve (Figure 401) (View H).

SUBTASK 36-11-01-210-007

- (2) Put the high-stage downstream duct assembly [45] into position for installation.

SUBTASK 36-11-01-420-036

- (3) Install the coupling [43] and E-seal [42] at the top of the duct to the adjacent duct.

SUBTASK 36-11-01-420-037

- (4) Install the coupling [43] and E-seal [42] at the bottom of the duct to the high stage valve [60].

SUBTASK 36-11-01-420-038

- (5) Tighten the couplings [43] to the torque shown on the part.
 - (a) Use a rubber mallet, STD-3906 to lightly tap outer surface the couplings.
 - (b) Re-tighten all the couplings to the torque shown on the part again.

I. Install the Precooler Upstream Duct

SUBTASK 36-11-01-080-006

- (1) Remove the covers from the PRSOV [4] and precooler inlet.

SUBTASK 36-11-01-210-008

- (2) Put the precooler upstream duct assembly [72] into position for installation from the right side of the engine (Figure 401) (View J).

SUBTASK 36-11-01-420-039

- (3) Install the coupling [43] and E-seal [42] at the bottom of the precooler.

SUBTASK 36-11-01-420-040

- (4) Install the coupling [41] and E-seal [42] at the top of the PRSOV [4] (Figure 401) (View I).

SUBTASK 36-11-01-420-041

- (5) Tighten coupling [41] and coupling [43] to the torque shown on the part.
 - (a) Use a rubber mallet, STD-3906 to lightly tap outer surface the couplings.
 - (b) Re-tighten all the couplings to the torque shown on the part again.

SUBTASK 36-11-01-420-042

- (6) Connect the control pressure sense line [70] at the connection fitting [71] (Figure 401) (View J).
 - (a) Tighten the sense line connection to 133.0 in-lb (15.0 N·m) - 147.0 in-lb (16.6 N·m).
 - (b) Back off the tube nut to decrease the torque.
 - (c) Tighten the sense line again to 133.0 in-lb (15.0 N·m) - 147.0 in-lb (16.6 N·m).

J. Engine Pneumatic Duct Installation Test

SUBTASK 36-11-01-860-014

- (1) 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>
A	7	C00796	AIR CONDITIONING BLEED AIR VALVES LEFT
B	7	C00797	AIR CONDITIONING BLEED AIR VALVES RIGHT

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SUBTASK 36-11-01-860-015

- (2) Remove the DO-NOT-OPERATE tag from the applicable BLEED switch on the P5-10 panel:
 - (a) BLEED 1
 - (b) BLEED 2

SUBTASK 36-11-01-860-016

- (3) Do this task: Supply Pressure Upstream of the PRSOV, TASK 36-00-00-860-805.

SUBTASK 36-11-01-790-002

- (4) Look for leaks at the couplings and sense line connections.
 - (a) Small leakage is permitted at coupling joints and at the seal for the fifth-stage port.
 - 1) Large air leakage from coupling joints are not acceptable, airflow leakage you can feel with your hand at a distance of 12 in. (30 cm) or greater must be repaired.
 - 2) A small leakage of not more than 0.60 scfm is permitted at the seal [51] between the fifth-stage port [50] and the fifth-stage port duct assembly [54] (Figure 401) (View G).
 - (b) Apply leak detector Snoop Leak Detector compound, G00091 at sense line connections.
 - 1) No leakage is permitted at sense line connections.

NOTE: You must repair all leakage at the sense line connections.

SUBTASK 36-11-01-860-017

- (5) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

K. Put the Airplane Back to Its Usual Condition

SUBTASK 36-11-01-410-002

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

- (1) For the left and right thrust reverser, do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

SUBTASK 36-11-01-860-018

- (2) Remove the DO-NOT-OPERATE tag from the engine start lever on the control stand.

————— **END OF TASK** —————

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BLEED AIR CHECK VALVE (5TH-STAGE) - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

- (1) Bleed air check valve removal
- (2) Bleed air check valve installation.

B. The bleed air check valve prevents reverse flow of bleed air into the fifth-stage port on the engine.

C. The bleed air check valve is installed between the fifth-stage duct assy and the intersection manifold duct assembly on the left side of each engine at the 9 o'clock position.

TASK 36-11-02-000-801

2. Bleed Air Check Valve Removal

(Figure 401)

A. References

Reference	Title
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)

B. Location Zones

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

C. Prepare to Remove the Bleed Air Check Valve

SUBTASK 36-11-02-860-001

WARNING: YOU MUST REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. IF YOU DO NOT REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS, HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 36-11-02-860-002

- (2) Make sure the engine start lever on the control stand for the applicable engine is in the cutoff position and install DO-NOT-OPERATE tags.

SUBTASK 36-11-02-010-001

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (3) For the left thrust reverser, do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

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SUBTASK 36-11-02-860-003

(4) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	7	C00796	AIR CONDITIONING BLEED AIR VALVES LEFT
B	7	C00797	AIR CONDITIONING BLEED AIR VALVES RIGHT

SUBTASK 36-11-02-860-004

(5) Attach a DO-NOT-OPERATE tag to the applicable BLEED switch on the P5-10 panel:

- (a) BLEED 1
- (b) BLEED 2

D. Remove the Bleed Air Check Valve

SUBTASK 36-11-02-020-001

(1) Do these steps to remove the fifth-stage duct assy [8]:

- (a) Cut the lockwire or safety cable from the bolts [7].
- (b) Remove the bolts [7] and washers [6].
 - 1) Keep them for installation.
- (c) Remove the coupling [2] between the bleed air check valve [9] and the fifth-stage duct assy [8].
- (d) Remove the fifth-stage duct assy [8].
- (e) Remove the seal [5] and discard it.
- (f) Remove the E-seal [1].
 - 1) Examine the E-seal [1] for cracks, dents or other damage.
 - 2) Replace the E-seal [1], if it is damaged.

SUBTASK 36-11-02-020-004

(2) Remove the coupling [2] between the bleed air check valve [9] and the intersection manifold duct assembly [3].

SUBTASK 36-11-02-020-002

(3) Remove the E-seal [1].

- (a) Examine the E-seal [1] for cracks, dents or other damage.
- (b) Replace the E-seal [1], if it is damaged.

SUBTASK 36-11-02-020-003

(4) Remove the bleed air check valve [9].

SUBTASK 36-11-02-390-001

(5) Put a cover over the fifth-stage port [4] to keep unwanted material out.

SUBTASK 36-11-02-390-002

(6) Put a cover over the open end of the intersection manifold duct assembly [3] to keep unwanted material out.

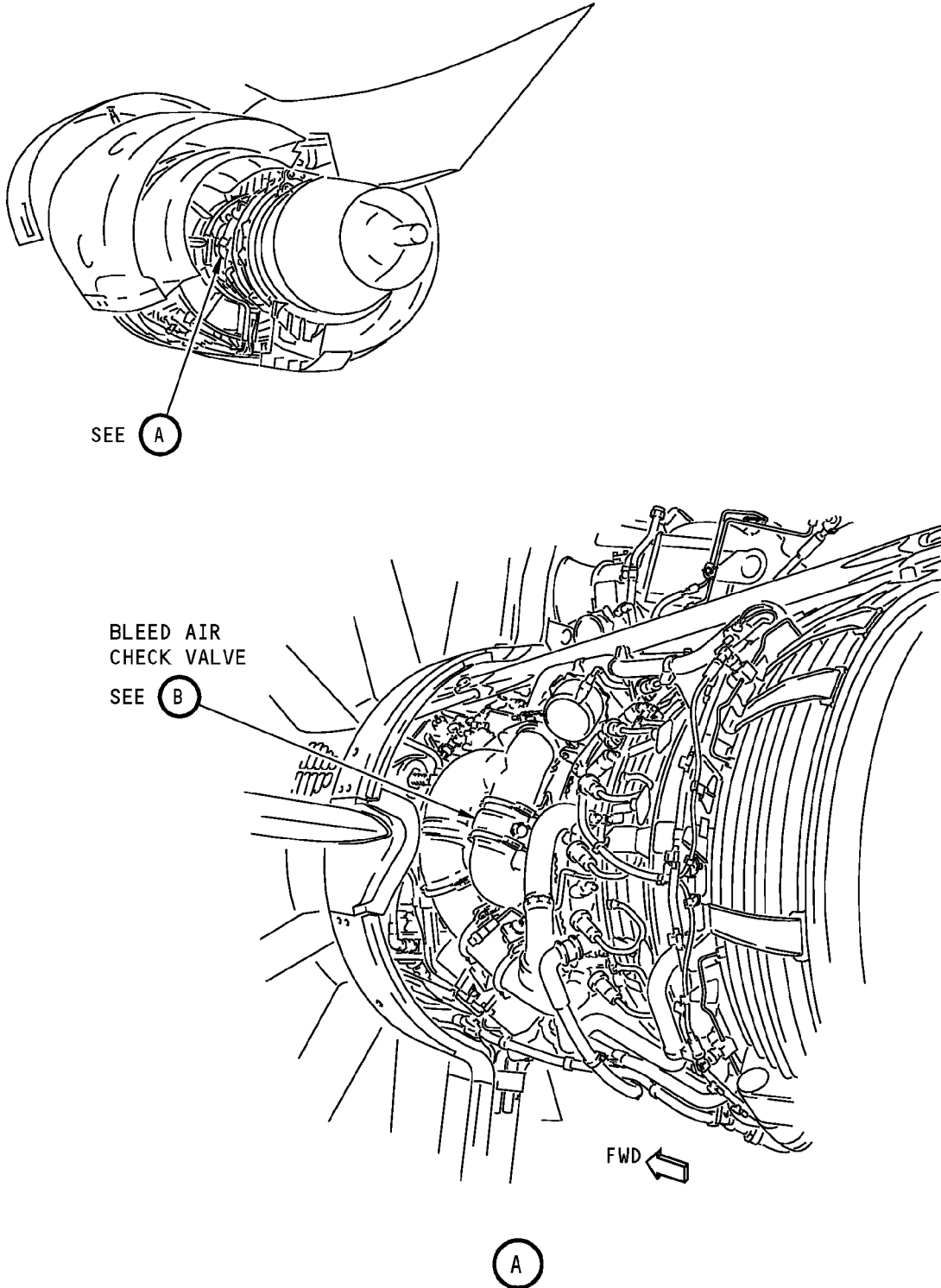
————— **END OF TASK** —————

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**Bleed Air Check Valve (5th-Stage) Installation
Figure 401 (Sheet 1 of 2)/36-11-02-990-801**

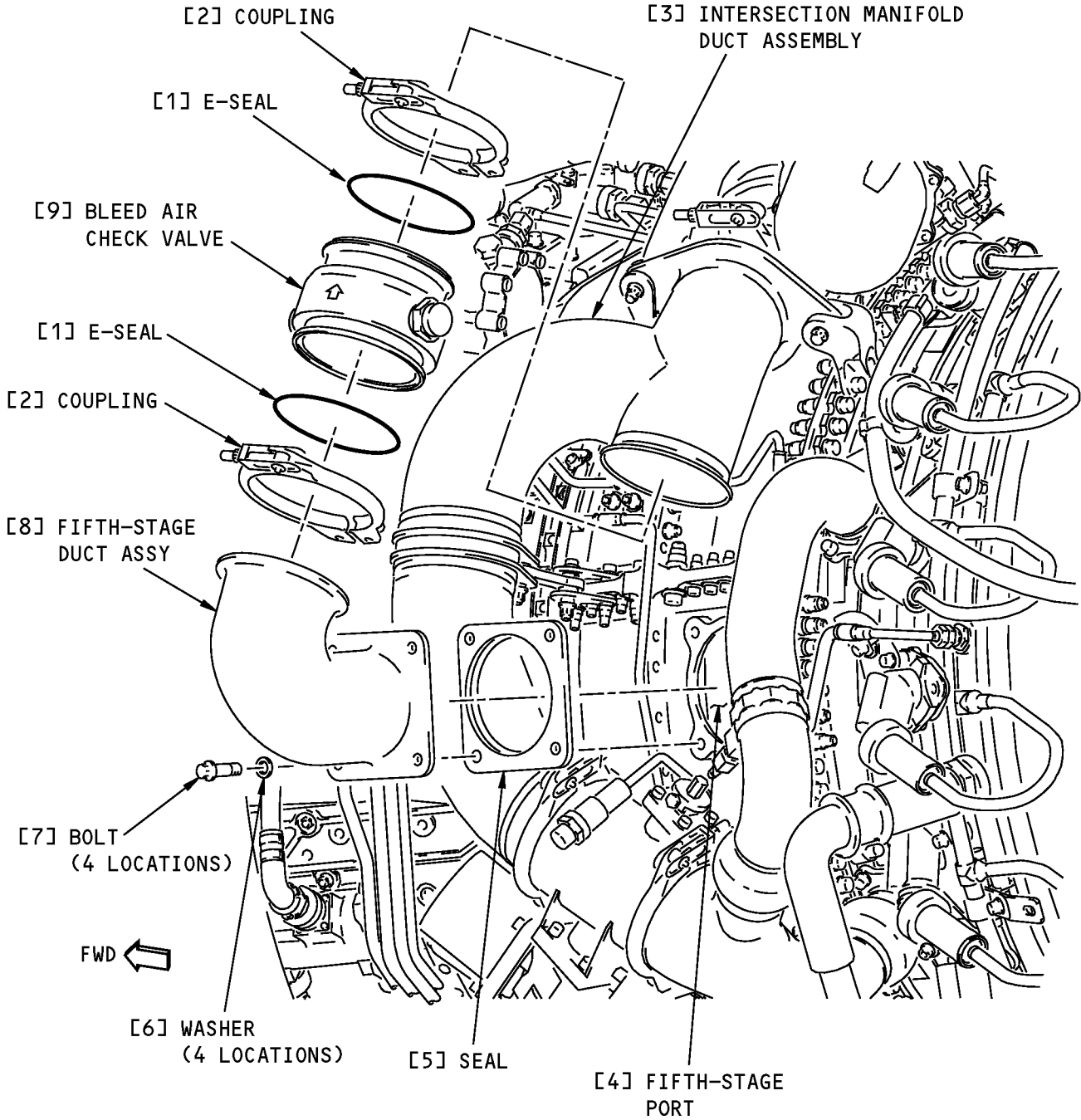
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BLEED AIR CHECK VALVE

B

Bleed Air Check Valve (5th-Stage) Installation
Figure 401 (Sheet 2 of 2)/36-11-02-990-801

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TASK 36-11-02-400-801

3. Bleed Air Check Valve Installation

(Figure 401)

A. References

Reference	Title
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

B. Tools/Equipment

Reference	Description
STD-3906	Mallet - Rubber

C. Consumable Materials

Reference	Description	Specification
D00010	Compound - Thread Antiseize, High Temperature	MIL-PRF-907F

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	E-seal	36-11-02-01-010	HAP 001-007
		36-11-02-02-010	HAP 008-013, 015-026, 028-054, 101-999
9	Bleed air check valve	36-11-02-01-015	HAP 001-007
		36-11-02-02-015	HAP 008-013, 015-026, 028-054, 101-999

E. Location Zones

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

F. Prepare to Install the Bleed Air Check Valve

SUBTASK 36-11-02-010-002

- (1) Remove the cover from the intersection manifold duct assembly [3].

SUBTASK 36-11-02-010-003

- (2) Remove the cover from the fifth-stage port [4] on the engine.

G. Install the Bleed Air Check Valve

SUBTASK 36-11-02-410-001

- (1) Do these steps to install the bleed air check valve [9] to the intersection manifold duct assembly [3]:
 - (a) Install the E-seal [1] between the bleed air check valve [9] and the intersection manifold duct assembly [3].
 - (b) Put the bleed air check valve [9] into position with the flow arrow pointed up.
 - (c) Make sure that the flapper valve shaft of the bleed air check valve [9] is parallel to the face (surface) of the fifth-stage port [4] to within +0.25 inches.

NOTE: This will help to maximize the clearance with the thrust reverser.

- (d) Connect the coupling [2] to keep the bleed air check valve [9] in position.

NOTE: Do not tighten the coupling [2] at this time.

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SUBTASK 36-11-02-420-001

- (2) Do these steps to install the fifth-stage duct assy [8] to the fifth-stage port [4] on the engine:
 - (a) Install the a new seal [5] between the fifth-stage duct assy [8] and the fifth-stage port [4] on the engine.
 - (b) Apply a thin layer of compound, D00010 to the threads on the bolts [7].
 - (c) Make sure the countersunk side on the washers [6] is at the bolt head.
 - (d) Put the bolts [7], washers [6] and fifth-stage duct assy [8] into position.
 - (e) Tighten the bolts [7] to 115 in-lb (13 N·m) - 125 in-lb (14 N·m).
 - (f) Install lockwire or safety cable on the forward and aft pairs of bolts [7].

SUBTASK 36-11-02-420-003

- (3) Install the E-seal [1] between the bleed air check valve [9] and the fifth-stage duct assy [8].

SUBTASK 36-11-02-420-004

- (4) Install the coupling [2] between the fifth-stage duct assy [8] and the bleed air check valve [9].

NOTE: Do not tighten the coupling [2] at this time.

SUBTASK 36-11-02-420-002

- (5) Do these steps to tighten the couplings [2]:
 - (a) Orient the couplings [2] to get maximum clearance away from adjacent structure.
 - (b) Tighten the couplings [2] to 115 in-lb (13 N·m) - 125 in-lb (14 N·m).
 - (c) Use a rubber mallet, STD-3906 to lightly hit around the couplings [2].
 - (d) Tighten the couplings [2] again to 115 in-lb (13 N·m) - 125 in-lb (14 N·m).

H. Put the Airplane Back To Its Usual Condition

SUBTASK 36-11-02-860-005

- (1) 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>
A	7	C00796	AIR CONDITIONING BLEED AIR VALVES LEFT
B	7	C00797	AIR CONDITIONING BLEED AIR VALVES RIGHT

SUBTASK 36-11-02-860-006

- (2) Remove the DO-NOT-OPERATE tag from the applicable BLEED switch on the P5-10 panel:
 - (a) BLEED 1
 - (b) BLEED 2

SUBTASK 36-11-02-410-002

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

- (3) For the left thrust reverser, do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

SUBTASK 36-11-02-860-007

- (4) Remove the DO-NOT-OPERATE tag from the engine start lever on the control stand.

————— **END OF TASK** —————

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BLEED AIR REGULATOR - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
(1) Bleed air regulator removal
(2) Bleed air regulator installation.
B. The bleed air regulator is found at the 11 o'clock position on the engine core area and immediately aft of the fan frame.
C. The bleed air regulator is attached to the engine core bracket with four fasteners.

TASK 36-11-03-000-801

2. Bleed Air Regulator Removal

(Figure 401)

A. References

Table with 2 columns: Reference, Title. Rows include 36-00-00-860-806 (Remove Pressure from the Pneumatic System) and 78-31-00-010-801-F00 (Open the Thrust Reverser).

B. Prepare to Remove the Bleed Air Regulator

SUBTASK 36-11-03-860-005

WARNING: YOU MUST REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. IF YOU DO NOT REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS, HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 36-11-03-860-001

- (2) Make sure the fuel shutoff lever for the applicable engine is in the cutoff position and install DO-NOT-OPERATE tags.

SUBTASK 36-11-03-010-001

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DEACTIVATE THE LEADING EDGE, DEACTIVATE THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANEL. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (3) For the left thrust reverser, do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

SUBTASK 36-11-03-860-006

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

F/O Electrical System Panel, P6-4

Table with 4 columns: Row, Col, Number, Name. Rows A and B for AIR CONDITIONING BLEED AIR VALVES LEFT and RIGHT.

SUBTASK 36-11-03-860-007

- (5) Attach a DO-NOT-OPERATE tag to the applicable BLEED switch on the P5-10 panel:
(a) BLEED 1

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(b) BLEED 2

C. Remove the Bleed Air Regulator

SUBTASK 36-11-03-020-001

- (1) Disconnect the electrical connector [2], DP1102 from the bleed air regulator [1]. To disconnect and give protection to the electrical connector [2].

SUBTASK 36-11-03-020-002

- (2) Do these steps to disconnect the pneumatic sense lines from the bleed air regulator [1]:
 - (a) Disconnect the supply pressure sense line [6].
 - (b) Disconnect the control pressure sense line [5].

SUBTASK 36-11-03-020-003

- (3) Do these steps to remove the bleed air regulator [1]:
 - (a) Remove the two bolts [9] at the inboard locations.
NOTE: The bracket has nutplates.
 - (b) Remove the one bolt [9] that attaches the bleed air regulator [1] at the forward outboard location.
NOTE: The bracket has nutplates.
 - (c) Loosen but do not remove the one bolt [9] that attaches the bleed air regulator [1] at the aft outboard location.
NOTE: It is not necessary to remove this bolt [9].
 - (d) Move the bleed regulator [1] inboard and forward until all aft connections and the aft outboard bolt [9] location are free.
 - (e) Turn the bleed air regulator [1] until the aft end faces up.
 - (f) Lift the bleed air regulator [1] up and over the thrust link.

SUBTASK 36-11-03-020-004

- (4) If the new bleed air regulator [1] does not have the union [4] and union [7] installed, do these steps:
 - (a) Remove the union [4] and the union [7] from the bleed air regulator [1].
 - (b) Remove and discard the seal [3] and seal [8].
 - (c) Keep the union [4] and the union [7] for the installation task.

SUBTASK 36-11-03-020-005

- (5) Put covers on the open sense lines and open ports on the bleed air regulator [1].

————— END OF TASK —————

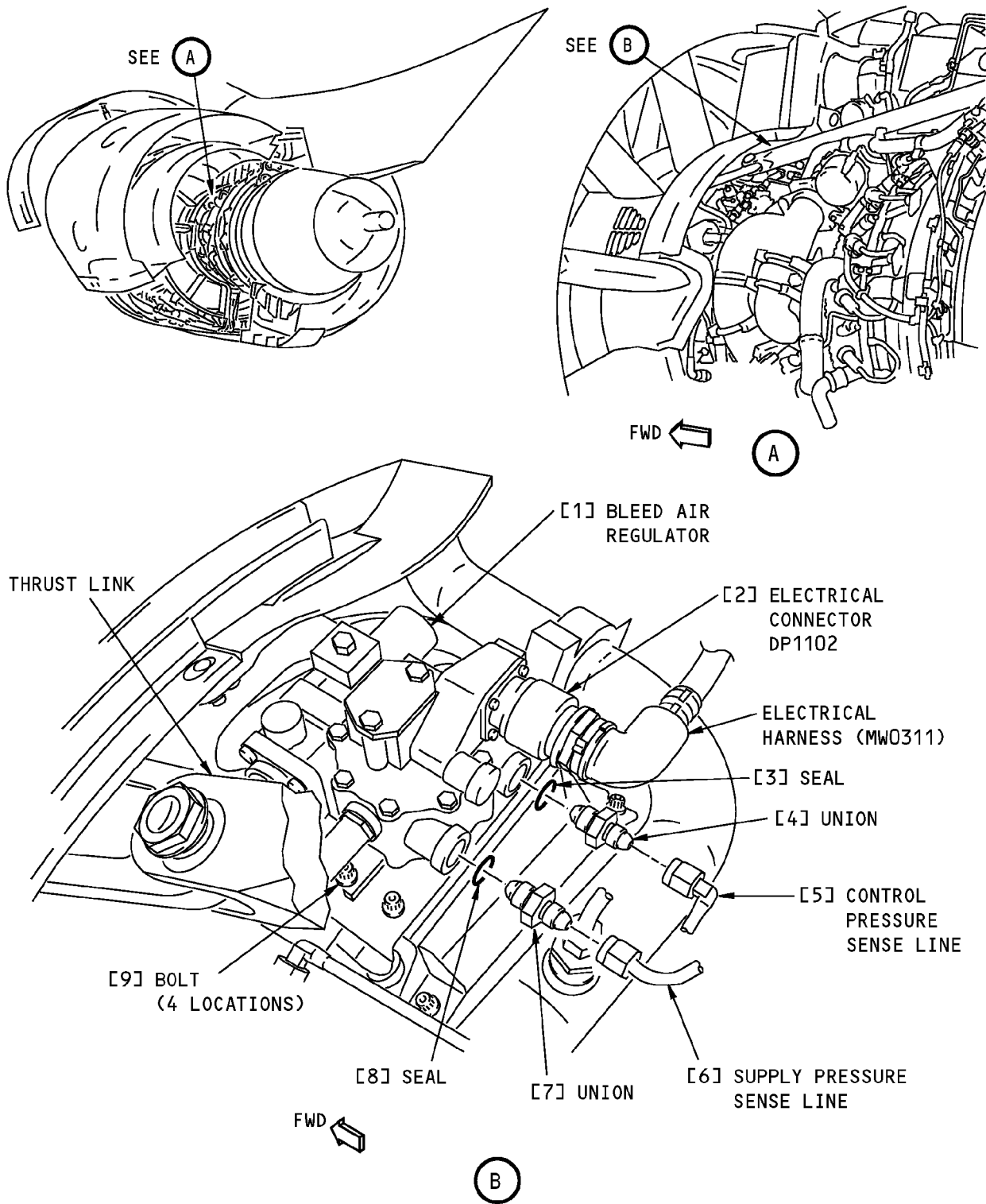
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**Bleed Air Regulator Installation
Figure 401/36-11-03-990-801**

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TASK 36-11-03-400-801

3. Bleed Air Regulator Installation

(Figure 401)

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
36-00-00-860-805	Supply Pressure Upstream of the PRSOV (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

B. Consumable Materials

Reference	Description	Specification
B00130	Alcohol - Isopropyl	TT-I-735
D00010	Compound - Thread Antiseize, High Temperature	MIL-PRF-907F

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Regulator	36-11-03-02-010	HAP 001-007
		36-11-03-02A-015	HAP 008-013, 015-026, 028-054, 101-999
3	Seal	36-11-51-02-270	HAP 001-007
		36-11-51-02A-280	HAP 008-013, 015-026, 028-054, 101-999
8	Seal	36-11-51-02-275	HAP 001-007
		36-11-51-02A-285	HAP 008-013, 015-026, 028-054, 101-999

D. Install the Bleed Air Regulator

NOTE: High temperature antiseize compound meeting specification MIL-PRF-907F should be applied to threads as specified in the procedure. Antiseize compound meeting specification MIL-PRF-907E can be used as an alternative until supplies run out. When reordering antiseize compound, make sure it meets MIL-PRF-907F specifications.

SUBTASK 36-11-03-420-001

- (1) Remove the covers from the open sense lines and open ports on the bleed air regulator [1].

SUBTASK 36-11-03-420-002

- (2) If not installed on the new bleed air regulator [1], install the union [4] and union [7] as follows:
 - (a) Install the seal [3] on the union [4].
 - (b) Install the seal [8] on the union [7].
 - (c) Lubricate the threads of unions [4] and [7] that install into the ports of the bleed air regulator with compound, D00010.

NOTE: Do not apply compound, D00010 to the threads of unions [4] and [7] where the pneumatic sense lines connect.

- (d) Install the union [4] in the top aft port.
 - 1) Tighten the union [4] to 180-200 pound-inches (20-22 Newton meters).
- (e) Install the union [7] in the bottom aft port.
 - 1) Tighten the union [7] to 270-300 pound-inches (30-34 Newton meters).

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SUBTASK 36-11-03-420-003

- (3) Do these steps to install the bleed air regulator [1]:
- (a) Clean the mating surfaces of the bleed air regulator [1] and the engine core bracket with alcohol, B00130.
 - (b) Install the bleed air regulator [1] on the bracket and engage the regulator [1] with the bolts [9].
NOTE: Make sure that the sense lines are aligned with the bleed air regulator [1].
 - (c) Loosely install the two bolts [9] that attach the bleed air regulator [1] at the inboard locations.
NOTE: The bracket has nutplates.
 - (d) Loosely install the one bolt [9] at the forward outboard location.
NOTE: The bracket has nutplates.
 - (e) Tighten the bolts [9] to 78 in-lb (9 N·m) to 82 in-lb (9 N·m).

SUBTASK 36-11-03-020-006

- (4) Do these steps to connect the pneumatic sense lines to the bleed air regulator [1]:
- (a) Loosely connect the supply pressure sense line [6].
 - (b) Loosely connect the control pressure sense line [5].
 - (c) Tighten the two sense lines to 133.0 in-lb (15.0 N·m) - 147.0 in-lb (16.6 N·m).
 - (d) Back off the tube nut to decrease the torque.
 - (e) Tighten the sense lines again to 133.0 in-lb (15.0 N·m) - 147.0 in-lb (16.6 N·m).

SUBTASK 36-11-03-020-007

- (5) Connect the electrical connector [2], DP1102, to the bleed air regulator [1]. To connect, clean and remove protection from the electrical connector [2].

E. Bleed Air Regulator Installation Test

SUBTASK 36-11-03-860-004

- (1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 36-11-03-210-001

- (2) To pressurize the pneumatic system upstream of the PRSOV, do this task: Supply Pressure Upstream of the PRSOV, TASK 36-00-00-860-805.

SUBTASK 36-11-03-210-002

- (3) Put the ISOLATION VALVE switch on the P5-10 panel to the OPEN position, if it is necessary.

SUBTASK 36-11-03-710-002

- (4) Put the applicable engine BLEED switch on the P5-10 panel to the ON position.

SUBTASK 36-11-03-700-001

- (5) Do a check for leakage at the connections for these sense lines:
- (a) Supply pressure sense line [6].
 - (b) Control pressure sense line [5].

SUBTASK 36-11-03-790-001

- (6) If there is leakage at the connection, repair it.

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SUBTASK 36-11-03-210-004

- (7) Remove the pressure from the pneumatic system, do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 36-11-03-700-002

- (8) Make sure that the manual override nut on the PRSOV moves to the CLOSED position.

SUBTASK 36-11-03-860-003

- (9) Make sure that the manual lock assembly on the PRSOV is not locked.
(a) The bolt must be tight (see the placard adjustment to the lock).

F. Put the Airplane Back to Its Usual Condition.

SUBTASK 36-11-03-010-002

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) For the left thrust reverser, do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

SUBTASK 36-11-03-860-008

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

F/O Electrical System Panel, P6-4

Table with 4 columns: Row, Col, Number, Name. Rows include AIR CONDITIONING BLEED AIR VALVES LEFT and RIGHT.

SUBTASK 36-11-03-860-009

- (3) Remove the DO-NOT-OPERATE tag from the BLEED switch on the P5-10 panel:
(a) BLEED 1
(b) BLEED 2

SUBTASK 36-11-03-860-002

- (4) Remove the DO-NOT-OPERATE tags from the fuel shutoff levers.

END OF TASK

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PRESSURE REGULATING AND SHUTOFF VALVE (PRSOV) - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
(1) Pressure regulating and shutoff valve (PRSOV) removal
(2) Pressure regulating and shutoff valve (PRSOV) installation.
B. The PRSOV is installed at the 10 o'clock location on the engine core area and below the precooler.
C. For this procedure the pressure regulating and shutoff valve will be referred to as the PRSOV.

TASK 36-11-04-000-801

2. PRSOV Removal

(Figure 401)

A. References

Table with 2 columns: Reference, Title. Rows include 36-00-00-860-806, 36-11-01-000-802, 78-31-00-010-801-F00.

B. Location Zones

Table with 2 columns: Zone, Area. Rows include 415, 425.

C. Prepare to Remove the PRSOV

SUBTASK 36-11-04-860-005

WARNING: YOU MUST REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. IF YOU DO NOT REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS, HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 36-11-04-860-001

- (2) Make sure the engine start lever for the applicable engine is in the CUTOFF position and install DO-NOT-OPERATE tags.

SUBTASK 36-11-04-010-001

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DEACTIVATE THE LEADING EDGE, DEACTIVATE THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANEL. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (3) Open the left thrust reverser for the applicable engine. To open the left thrust reverser, do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

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SUBTASK 36-11-04-860-006

(4) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	7	C00796	AIR CONDITIONING BLEED AIR VALVES LEFT
B	7	C00797	AIR CONDITIONING BLEED AIR VALVES RIGHT

SUBTASK 36-11-04-860-007

(5) Attach a DO-NOT-OPERATE tag to the applicable BLEED switch on the P5-10 panel:

- (a) BLEED 1
- (b) BLEED 2

D. Remove the PRSOV

SUBTASK 36-11-04-020-001

(1) Disconnect the control pressure sense line [3] at the PRSOV [5].

SUBTASK 36-11-04-020-006

(2) Disconnect the downstream pressure sense line [4] at the PRSOV [5].

SUBTASK 36-11-04-020-010

(3) You can remove the precooler upstream duct to make it easier to access the PRSOV. (Engine Pneumatic Duct Removal, TASK 36-11-01-000-802)

SUBTASK 36-11-04-020-007

(4) Remove the couplings [8] from the PRSOV [5].

SUBTASK 36-11-04-020-002

(5) Remove the PRSOV [5].

SUBTASK 36-11-04-020-003

(6) Remove the E-seals [7].

- (a) Examine the E-seals [7] for cracks, dents or other damage.
- (b) Replace the E-seals [7], if they are damaged.

SUBTASK 36-11-04-020-008

(7) If the new PRSOV [5] does not have a plug [11] and seal [12] installed in the port on the other side of the PRSOV from the downstream port, remove the plug and seal.

- (a) Examine the seal [12] for damage.
- (b) Replace the seal [12] if there is damage.
- (c) Keep the plug [11] for installation on the new PRSOV [5].

SUBTASK 36-11-04-020-004

(8) If the new PRSOV [5] does not have the union [2] and union [10] installed, remove the union [2] and union [10], seal [1] and seal [9].

- (a) Examine the seal [1] and seal [9] for damage.
- (b) Replace the seal [1] and seal [9], if there is damage.
- (c) Keep the union [2] and union [10] for installation on the new PRSOV [5].

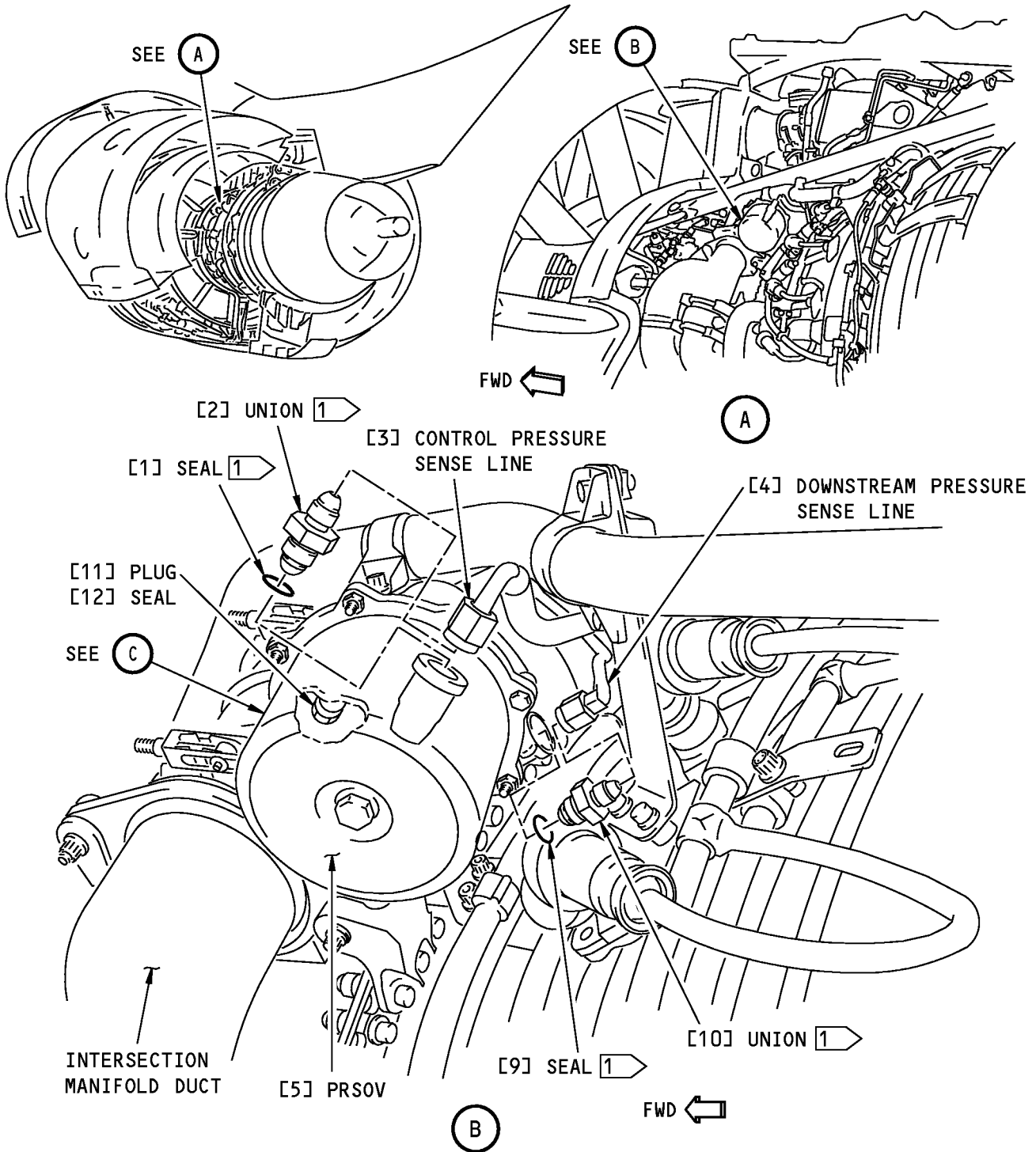
SUBTASK 36-11-04-020-005

(9) Install protective covers on the open duct sections and pressure sense lines.

————— END OF TASK —————

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1 REMOVAL OF THESE COMPONENTS IS NOT NECESSARY IF THEY ARE INSTALLED ON THE NEW PRSOV.

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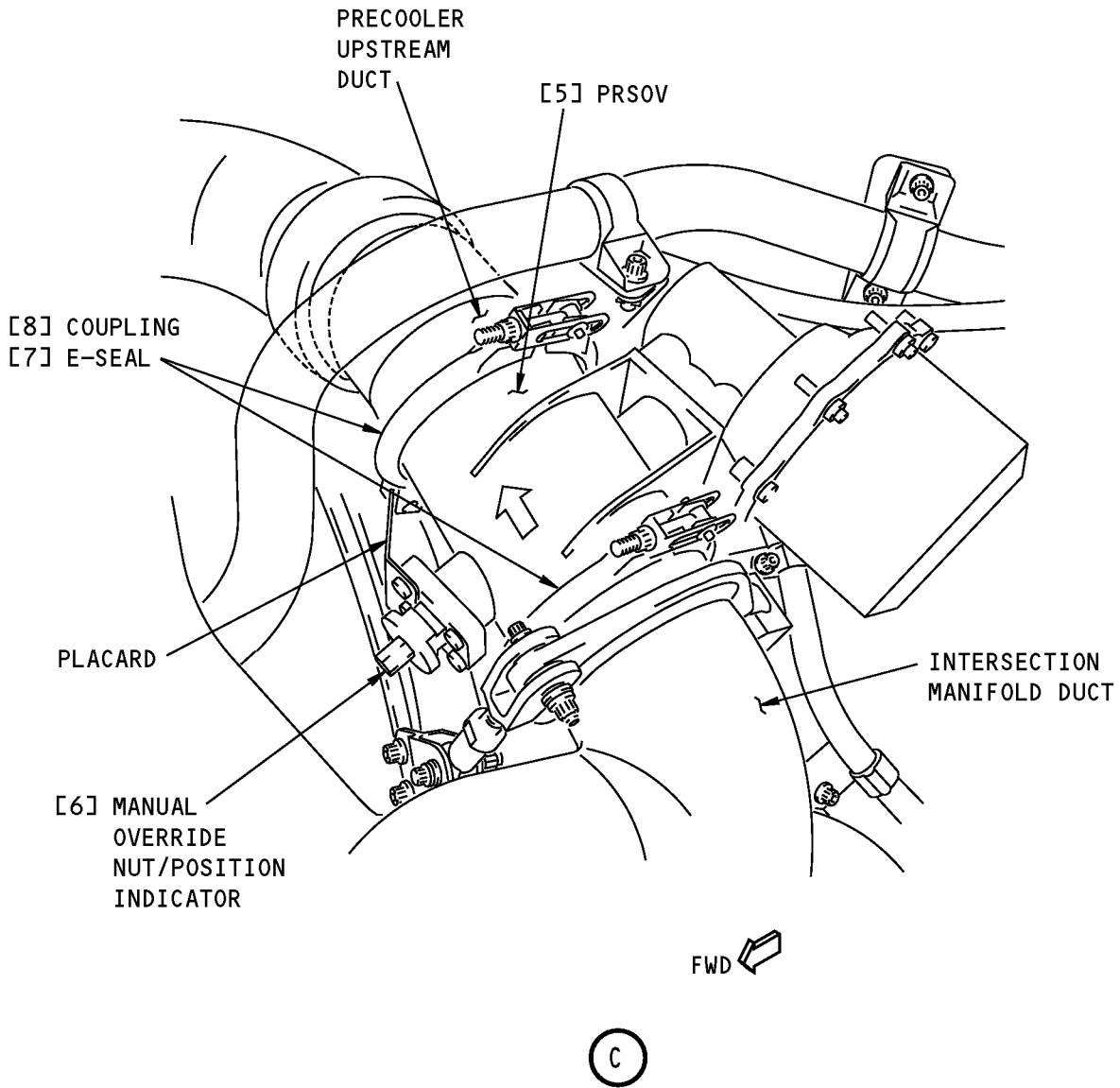
**Pressure Regulating and Shutoff Valve (PRSOV) Installation
Figure 401 (Sheet 1 of 2)/36-11-04-990-801**

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**Pressure Regulating and Shutoff Valve (PRSOV) Installation
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TASK 36-11-04-400-801

3. PRSOV Installation

(Figure 401)

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
36-00-00-860-801	Supply Pressure to the Pneumatic System (Selection) (P/B 201)
36-11-01-400-802	Engine Pneumatic Duct Installation (P/B 401)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

B. Tools/Equipment

Reference	Description
STD-3906	Mallet - Rubber

C. Consumable Materials

Reference	Description	Specification
D00010	Compound - Thread Antiseize, High Temperature	MIL-PRF-907F

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Seal	36-11-51-02-270	HAP 001-007
		36-11-51-02A-280	HAP 008-013, 015-026, 028-054, 101-999
5	PRSOV	36-11-04-01-020	HAP 001-007
		36-11-04-01A-020	HAP 008-013, 015-026, 028-054, 101-999
9	Seal	36-11-51-02-275	HAP 001-007
		36-11-51-02A-285	HAP 008-013, 015-026, 028-054, 101-999
11	Plug	36-11-51-02-263	HAP 001-007
		36-11-51-02A-270	HAP 008-013, 015-026, 028-054, 101-999
12	Seal	36-11-51-02-275	HAP 001-007
		36-11-51-02A-285	HAP 008-013, 015-026, 028-054, 101-999

E. Location Zones

Zone	Area
415	Engine 1 - Thrust Reverser, Left
425	Engine 2 - Thrust Reverser, Left

F. Prepare to Install the PRSOV

SUBTASK 36-11-04-820-002

- (1) Make sure that the manual override nut/position indicator [6] on the replacement PRSOV [5] is not in the LOCKED position.

SUBTASK 36-11-04-020-009

- (2) If the new PRSOV [5] does not have a plug [11] and seal [12] installed in the port on the other side of the PRSOV from the downstream port, do the steps that follow:

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- (a) Remove the plug [11] and seal [12] from the old PRSOV.
- (b) Examine the seal [12] and replace if damaged.
- (c) Apply compound, D00010 to the threads of the plug [11].
- (d) Install the plug [11] and seal [12] on the new PRSOV [5].

SUBTASK 36-11-04-420-008

- (3) If the union [2] and union [10] are not installed on the new PRSOV [5], do these steps:
 - (a) Apply compound, D00010 to the threads of the union [2] and union [10].
 - (b) Install the seal [1] and seal [9] and the union [2] and union [10] on the replacement PRSOV [5].
 - (c) Tighten the union [2] and union [10] to 265 in-lb (30 N·m) – 275 in-lb (31 N·m).

G. Install the PRSOV

SUBTASK 36-11-04-420-001

- (1) Remove the protective covers from the open duct sections and the pressure sense lines.

SUBTASK 36-11-04-210-001

- (2) Examine the E-seal [7] for cracks, dents or other damage.
 - (a) Replace all damaged E-seals [7].

SUBTASK 36-11-04-420-009

- (3) Do this step if the precooler upstream duct was removed in PRSOV Removal, TASK 36-11-04-000-801.
 - (a) Loosely install one end of the precooler upstream duct. (Engine Pneumatic Duct Installation, TASK 36-11-01-400-802).

SUBTASK 36-11-04-420-003

- (4) Install the E-seal [7] in the cavity on the adjacent duct flange and on the PRSOV [5].

SUBTASK 36-11-04-420-004

- (5) Install the PRSOV [5] between the pneumatic duct sections.

NOTE: Make sure the flow arrow points up.

SUBTASK 36-11-04-420-005

CAUTION: MAKE SURE YOU INSTALL THE LOCKING DEVICE OF THE COUPLING CORRECTLY. IF YOU DO NOT INSTALL THE COUPLING FINGERS IN THE LOCKING DEVICE, THE COUPLING CAN LOOSEN AND CAUSE DAMAGE TO EQUIPMENT.

- (6) Loosely install the couplings [8] to attach the PRSOV [5] to the pneumatic duct sections.

NOTE: Do not tighten the couplings [8] at this time. The final orientation of the PRSOV [5] will be done with the two pressure sense lines.

SUBTASK 36-11-04-420-006

- (7) Connect the downstream pressure sense line to union [10] and the control pressure sense line to union [2] on the PRSOV [5] as follows:
 - (a) Tighten the tube nuts on the pressure sense lines to 133.0 in-lb (15.0 N·m) - 147.0 in-lb (16.6 N·m).
 - (b) Back off the tube nuts to decrease the torque.
 - (c) Tighten the tube nut on the pressure sense lines again to 133.0 in-lb (15.0 N·m) - 147.0 in-lb (16.6 N·m).

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SUBTASK 36-11-04-420-007

- (8) Do these steps to tighten the couplings [8]:
 - (a) Orient the couplings [8] to get maximum clearance from the engine and adjacent structure.
 - (b) Tighten the couplings [8] to 115 in-lb (13.0 N·m) - 125 in-lb (14.1 N·m).
 - (c) Use a rubber mallet, STD-3906 to lightly hit around each coupling [8].
 - (d) Tighten the couplings [8] again to to 115 in-lb (13.0 N·m) - 125 in-lb (14.1 N·m).

H. PRSOV Installation Test

SUBTASK 36-11-04-860-003

- (1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 36-11-04-860-008

- (2) Close these circuit breakers:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	7	C00796	AIR CONDITIONING BLEED AIR VALVES LEFT
B	7	C00797	AIR CONDITIONING BLEED AIR VALVES RIGHT

SUBTASK 36-11-04-710-001

- (3) Use the APU or ground air source to pressurize the pneumatic system, do this task: Supply Pressure to the Pneumatic System (Selection), TASK 36-00-00-860-801.

SUBTASK 36-11-04-710-002

- (4) If it is necessary, put the ISOLATION VALVE switch on the P5-10 panel to the OPEN position.

SUBTASK 36-11-04-710-003

- (5) Put the applicable engine BLEED switch to the ON position.

SUBTASK 36-11-04-710-004

WARNING: PRESSURIZE THE BLEED AIR SYSTEM BEFORE YOU PUT THE PRSOV TO OPEN. USE A RATCHET TYPE WRENCH TO PUT THE PRSOV TO THE OPEN POSITION. THE PRSOV CAN OPEN QUICKLY AND TURN A REGULAR WRENCH HANDLE QUICKLY. THIS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (6) Use a wrench to turn the manual override nut [6] on the PRSOV [5] to the OPEN position.
 - (a) Keep the PRSOV [5] in the OPEN position, if it does not stay open.

SUBTASK 36-11-04-710-005

- (7) Make sure that there is no air leakage at the valve couplings [8].

NOTE: Diffused leakage is permitted, jet blast leakage must be repaired.

SUBTASK 36-11-04-710-006

- (8) Put the applicable engine BLEED switch to the OFF position.

SUBTASK 36-11-04-700-001

- (9) Make sure that the manual override nut [6] on the PRSOV [5] moves to the CLOSED position.

SUBTASK 36-11-04-860-004

- (10) Make sure that the manual lock assembly on the PRSOV [5] is not locked.

- (a) The bolt must be tight (see the placard adjustment to the lock).

SUBTASK 36-11-04-980-001

- (11) Manually turn the manual override nut [6] to make sure that the PRSOV [5] operates correctly.

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I. Put the Airplane Back to Its Usual Condition.

SUBTASK 36-11-04-010-002

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) Close the left thrust reverser on th applicable engine. To close the left thrust reverser, do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

SUBTASK 36-11-04-860-002

- (2) Remove the DO-NOT-OPERATE tags from the engine start levers.

————— **END OF TASK** —————

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450° F THERMOSTAT - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
 - (1) 450°F thermostat removal
 - (2) 450°F thermostat installation.
- B. The 450°F thermostat is installed on the left half of the strut torque box above each engine. It is installed aft of the precooler control valve sensor and the 490°F overtemperature switch.
- C. For this procedure, the 450°F thermostat will be referred to as the thermostat.

TASK 36-11-05-000-801

2. Thermostat Removal

(Figure 401)

A. References

Reference	Title
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)
54-52-03-010-801	Wing Junction Fairing Removal (P/B 401)

B. Location Zones

Zone	Area
433	Engine 1 - Strut Torque Box
443	Engine 2 - Strut Torque Box

C. Access Panels

Number	Name/Location
431CL	Forward Strut Fairing, Left Overwing Fairing, Strut 1
441CL	Forward Strut Fairing, Left Overwing Fairing, Strut 2

D. Prepare to Remove the Thermostat

SUBTASK 36-11-05-860-001

WARNING: YOU MUST REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. IF YOU DO NOT REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS, HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 36-11-05-860-002

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

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	5	C00259	AIR CONDITIONING BLEED AIR VALVE ISLN
A	7	C00796	AIR CONDITIONING BLEED AIR VALVES LEFT
B	7	C00797	AIR CONDITIONING BLEED AIR VALVES RIGHT

SUBTASK 36-11-05-860-003

- (3) Attach a DO-NOT-OPERATE tag to the switches that follow on the P5-10 panel:
 - (a) BLEED 1

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- (b) BLEED 2
- (c) APU BLEED

SUBTASK 36-11-05-010-001

(4) Remove the applicable access panel, do this step:

- (a) Open these access panels:

Wing Junction Fairing Removal, TASK 54-52-03-010-801

<u>Number</u>	<u>Name/Location</u>
431CL	Forward Strut Fairing, Left Overwing Fairing, Strut 1
441CL	Forward Strut Fairing, Left Overwing Fairing, Strut 2

E. Remove the Thermostat (Left Strut)

SUBTASK 36-11-05-020-001

(1) Disconnect the sense line [10].

SUBTASK 36-11-05-020-002

(2) Loosen the nut [3] from the thermostat [1].

SUBTASK 36-11-05-010-002

(3) Remove the four screws [6] from the thermostat [1].

- (a) Keep the screws [6] for installation.

SUBTASK 36-11-05-020-003

(4) Remove the thermostat [1] from the boss [4].

SUBTASK 36-11-05-020-004

(5) Remove the elbow [2] and nut [3] from the thermostat [1].

- (a) Keep the nut [3] and the elbow [2] together for installation.

SUBTASK 36-11-05-020-005

(6) Remove the retainer [9] from the elbow [2].

- (a) Keep the retainer [9] for installation.

SUBTASK 36-11-05-020-006

(7) Remove the packing [7] and packing [5]. Discard the packing.

SUBTASK 36-11-05-530-001

(8) Put a cap on the sense line [10] to keep out unwanted material.

SUBTASK 36-11-05-020-007

(9) Put a cover on the boss [4] to keep out unwanted material.

F. Remove the Thermostat (Right Strut)

SUBTASK 36-11-05-020-008

(1) Disconnect the sense line [10].

SUBTASK 36-11-05-020-009

(2) Loosen the union [8] from the thermostat [1].

SUBTASK 36-11-05-010-003

(3) Remove the four screws [6] from the thermostat [1].

- (a) Keep the screws [6] for installation.

SUBTASK 36-11-05-020-010

(4) Remove the thermostat [1] from the boss [4].

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SUBTASK 36-11-05-020-011

(5) Remove the union [8] from the thermostat [1].

(a) Keep the union [8] for installation.

SUBTASK 36-11-05-020-012

(6) Remove the packing [7] and packing [5]. Discard the packing.

SUBTASK 36-11-05-530-002

(7) Put a cap on the sense line [10] to keep out unwanted material.

SUBTASK 36-11-05-020-013

(8) Put a cover on the boss [4] to keep out unwanted material.

————— END OF TASK —————

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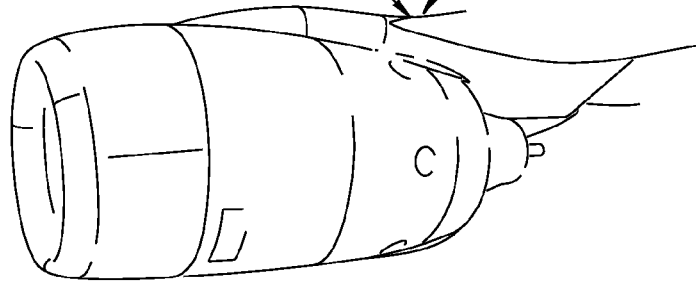
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OVERWING FAIRING ACCESS
PANEL, 431CL (441CL)

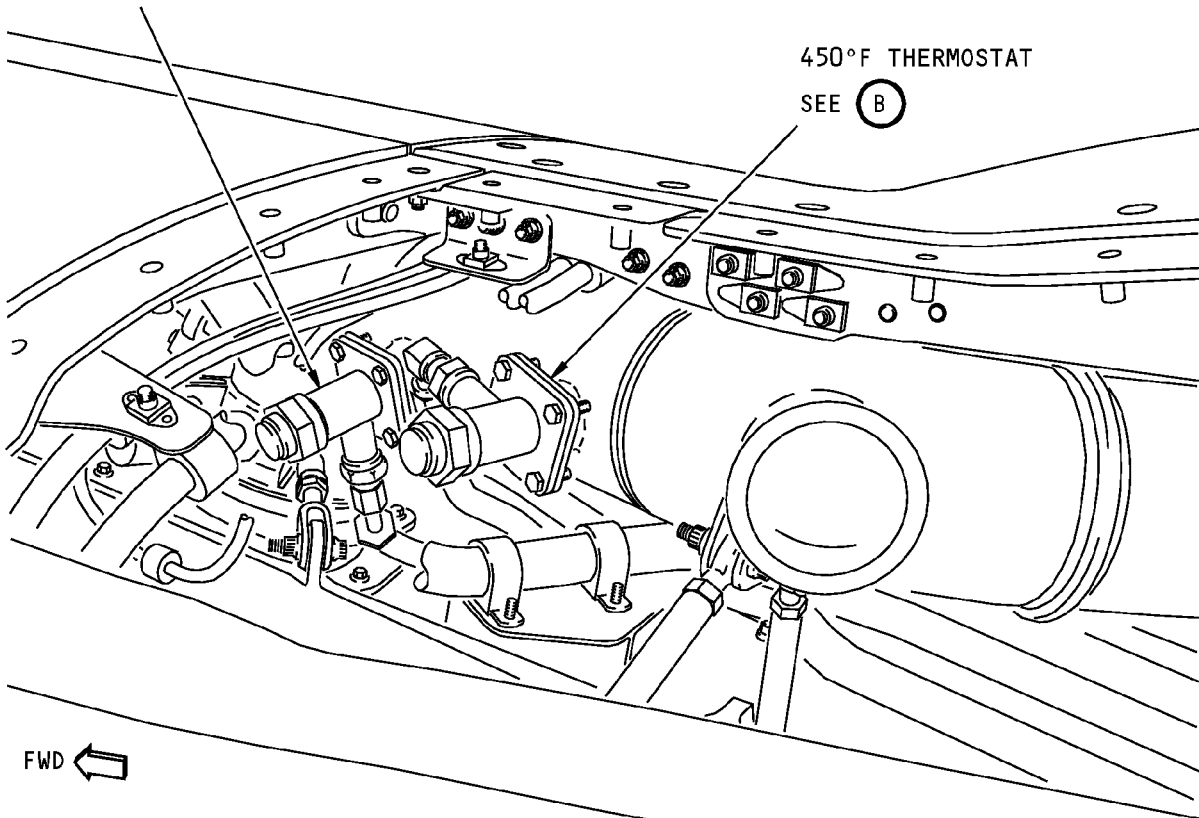
SEE (A)



PRECOOLER
CONTROL
VALVE SENSOR

450°F THERMOSTAT

SEE (B)



LEFT STRUT IS SHOWN
(RIGHT STRUT IS SIMILAR)

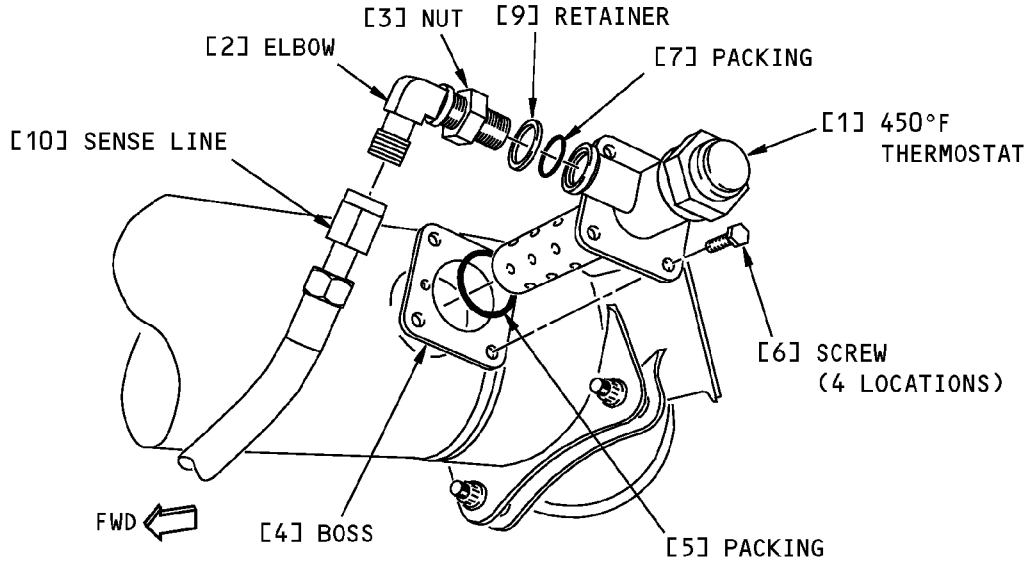
(A)

450 Degrees F Thermostat Installation
Figure 401 (Sheet 1 of 2)/36-11-05-990-802

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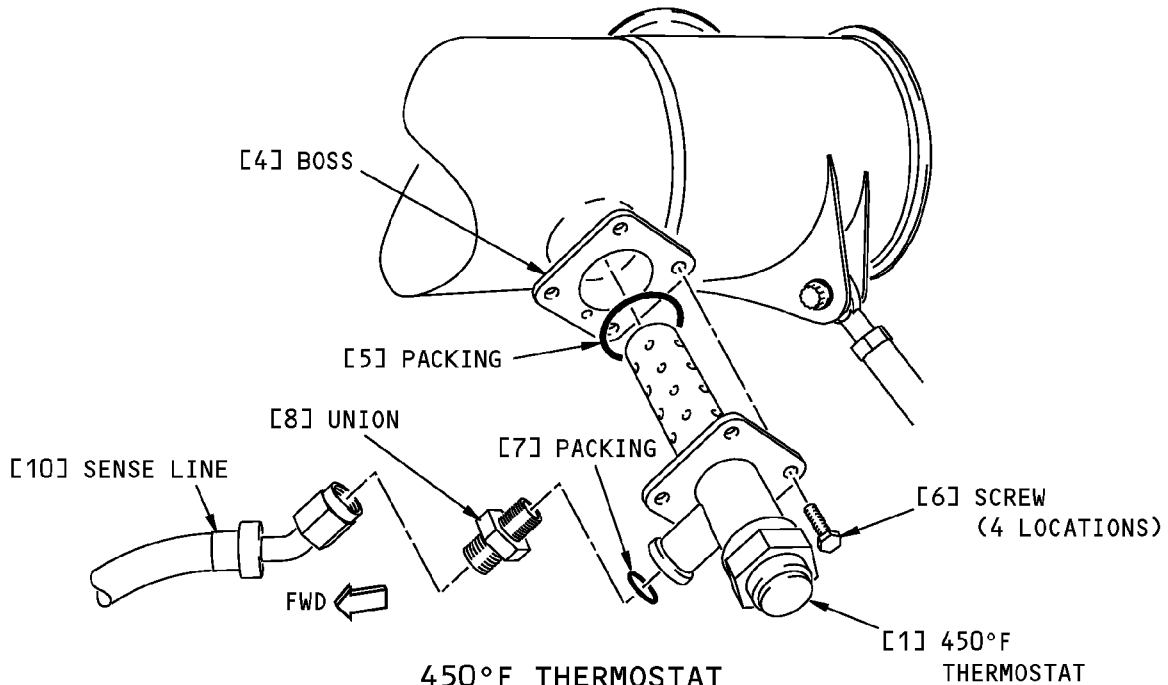
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**450°F THERMOSTAT
(LEFT STRUT)**

(B)



**450°F THERMOSTAT
(RIGHT STRUT)**

(B)

**450 Degrees F Thermostat Installation
Figure 401 (Sheet 2 of 2)/36-11-05-990-802**

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TASK 36-11-05-400-801

3. Thermostat Installation

(Figure 401)

A. References

Reference	Title
54-52-03-410-801	Wing Junction Fairing Installation (P/B 401)

B. Consumable Materials

Reference	Description	Specification
D00010	Compound - Thread Antiseize, High Temperature	MIL-PRF-907F

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Thermostat	36-11-05-01-025	HAP ALL
		36-11-05-01-050	HAP ALL
5	Packing	36-11-05-01-020	HAP 001-011
		36-11-05-01-035	HAP ALL
7	Packing	54-51-51-03-045	HAP ALL
		54-51-51-07-035	HAP ALL

D. Location Zones

Zone	Area
433	Engine 1 - Strut Torque Box
443	Engine 2 - Strut Torque Box

E. Access Panels

Number	Name/Location
431CL	Forward Strut Fairing, Left Overwing Fairing, Strut 1
441CL	Forward Strut Fairing, Left Overwing Fairing, Strut 2

F. Prepare to Install the Thermostat

SUBTASK 36-11-05-420-001

(1) Remove the cap from the sense line [10].

SUBTASK 36-11-05-420-002

(2) Remove the cover from the boss [4].

SUBTASK 36-11-05-160-001

CAUTION: THE THERMOSTAT CAN BE DAMAGED IF DROPPED OR MISHANDLED. IF THE THERMOSTAT IS DROPPED, RETURN IT TO THE SHOP OR SUPPLIER FOR CALIBRATION.

(3) Make sure that the mating surfaces of the boss [4] and the Thermostat [1] are clean.

G. Install the Thermostat (Left Strut)

SUBTASK 36-11-05-410-001

(1) Apply a thin layer of compound, D00010 on the external threads of the elbow [2].

SUBTASK 36-11-05-420-003

(2) Install the retainer [9] and a new packing [7] on the elbow [2].

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SUBTASK 36-11-05-410-002

(3) Install the elbow [2] on the Thermostat [1].

(a) Tighten the nut [3] to the Thermostat [1] by hand at this time.

SUBTASK 36-11-05-420-004

(4) Install a new Packing [5] on the Thermostat [1].

SUBTASK 36-11-05-410-003

(5) Apply a thin layer of compound, D00010 on the external threads of the screws [6].

SUBTASK 36-11-05-860-004

(6) Install the Thermostat [1] to the boss [4].

(a) Install the four screws [6] and then tighten to 22.5-27.5 pound-inches (2.5-3.1 Newton-meters).

(b) Tighten the nut [3] to 125-135 pound-inches (14.2-15.2 Newton-meters).

SUBTASK 36-11-05-420-005

(7) Install the sense line [10] to the elbow [2].

(a) Tighten the B-nut on the sense line [10] to 180.0 in-lb (20.3 N·m) - 200.0 in-lb (22.6 N·m).

H. Install the Thermostat (Right Strut)

SUBTASK 36-11-05-410-004

(1) Apply a thin layer of compound, D00010 on the external threads of the union [8].

SUBTASK 36-11-05-410-005

(2) Install the union [8] and a new packing [7] on the Thermostat [1].

SUBTASK 36-11-05-420-006

(3) Install a new Packing [5] on the Thermostat [1].

SUBTASK 36-11-05-410-006

(4) Apply a thin layer of compound, D00010 on the external threads of the screws [6].

SUBTASK 36-11-05-860-005

(5) Install the Thermostat [1] to the boss [4].

(a) Install the four screws [6] and then tighten to 20.0 in-lb (2.3 N·m) - 25.0 in-lb (2.8 N·m).

(b) Tighten the union [8] to 125-135 pound-inches (14.2-15.2 Newton-meters).

SUBTASK 36-11-05-420-007

(6) Install the sense line [10] to the union [8].

(a) Tighten the B-nut on the sense line [10] to 180.0 in-lb (20.3 N·m) - 200.0 in-lb (22.6 N·m).

I. Put the Airplane to Its Usual Condition

SUBTASK 36-11-05-860-006

(1) Install the applicable access panel, do this step:

(a) Close these access panels:

Wing Junction Fairing Installation, TASK 54-52-03-410-801

<u>Number</u>	<u>Name/Location</u>
431CL	Forward Strut Fairing, Left Overwing Fairing, Strut 1
441CL	Forward Strut Fairing, Left Overwing Fairing, Strut 2

SUBTASK 36-11-05-860-007

(2) Remove the DO-NOT-OPERATE tag from the switches that follow on the P5-10 panel:

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- (a) BLEED 1
- (b) BLEED 2
- (c) APU BLEED

SUBTASK 36-11-05-860-008

- (3) 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>
A	5	C00259	AIR CONDITIONING BLEED AIR VALVE ISLN
A	7	C00796	AIR CONDITIONING BLEED AIR VALVES LEFT
B	7	C00797	AIR CONDITIONING BLEED AIR VALVES RIGHT

————— END OF TASK —————

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HIGH STAGE VALVE - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

- (1) High stage valve removal
- (2) High stage valve installation.

B. The high stage valve is found at the 8 o'clock position on the engine core area.

TASK 36-11-06-000-801

2. High Stage Valve Removal

(Figure 401)

A. References

<u>Reference</u>	<u>Title</u>
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)

B. Prepare to Removal the High Stage Valve

SUBTASK 36-11-06-860-006

WARNING: YOU MUST REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. IF YOU DO NOT REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS, HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(1) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 36-11-06-860-001

(2) Make sure the fuel shutoff lever for the applicable engine are in the cutoff position and install DO-NOT-OPERATE tags.

SUBTASK 36-11-06-010-001

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DEACTIVATE THE LEADING EDGE, DEACTIVATE THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANEL. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(3) For the left thrust reverser, do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

SUBTASK 36-11-06-860-007

(4) Open these circuit breakers and install safety tags:

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
A	7	C00796	AIR CONDITIONING BLEED AIR VALVES LEFT
B	7	C00797	AIR CONDITIONING BLEED AIR VALVES RIGHT

SUBTASK 36-11-06-860-008

(5) Attach a DO-NOT-OPERATE tag to the applicable BLEED switch on the P5-10 panel:

- (a) BLEED 1
- (b) BLEED 2

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C. Remove the High Stage Valve

SUBTASK 36-11-06-020-001

CAUTION: USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUT. USE ONE TO HOLD THE NIPPLE, AND THE OTHER TO LOOSEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBE AND NIPPLE CAN OCCUR.

- (1) Disconnect the control pressure sense tube [9] from the high stage valve [1] as follows:
 - (a) Loosen but do not disconnect the control pressure sense tube [9] from the control pressure sense line [10].
 - (b) Disconnect the control pressure sense tube [9] from the high stage valve [1].
 - (c) Turn the control pressure sense tube [9] outward until it is clear of the high stage valve [1].

SUBTASK 36-11-06-020-002

- (2) Remove the high-stage downstream duct [2] as follows:

NOTE: The removal of this duct is necessary to disengage the flanges of the high stage valve [1].

- (a) Remove the coupling [3] installed at the top of the high-stage downstream duct [2].
- (b) Remove the coupling [5] installed between the high-stage downstream duct [2] and high stage valve [1].
- (c) Remove the high-stage downstream duct [2].
- (d) Remove the seals [4].

SUBTASK 36-11-06-020-003

- (3) Do these steps to remove the high stage valve [1]:
 - (a) Remove the coupling [5] installed at the aft end of the high stage valve [1].
 - (b) Remove the high stage valve [1].
 - (c) Remove the seal [4].

SUBTASK 36-11-06-020-004

- (4) If the new high stage valve [1] does not have the union [8] installed, do these steps:
 - (a) Remove the union [8] and the seal [7].
 - 1) Discard the seal [7] but keep the union [8] for the installation.

SUBTASK 36-11-06-020-005

- (5) Install protective covers on the open duct sections and pressure sense lines.

————— **END OF TASK** —————

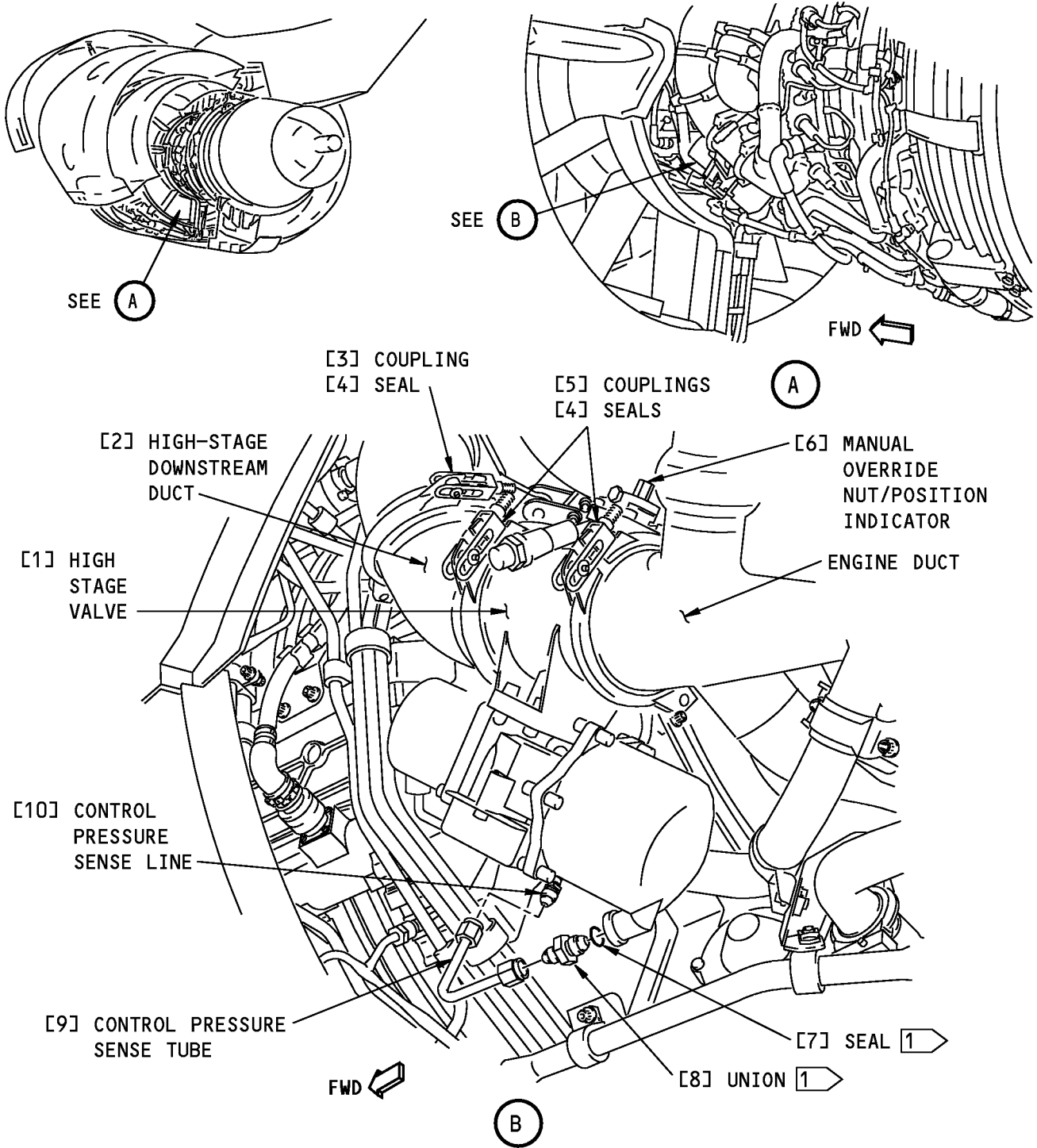
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[1] REMOVAL OF THESE COMPONENTS IS NOT NECESSARY IF THEY ARE INSTALLED ON THE NEW HIGH STAGE VALVE.

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**High Stage Valve Installation
Figure 401/36-11-06-990-801**

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TASK 36-11-06-400-801

3. High Stage Valve Installation

(Figure 401)

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
71-00-00-700-821-F00	Dry Motor the Engine (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

B. Tools/Equipment

Reference	Description
STD-3906	Mallet - Rubber

C. Consumable Materials

Reference	Description	Specification
D00010	Compound - Thread Antiseize, High Temperature	MIL-PRF-907F

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Valve	36-11-06-01-015	HAP 001-007
		36-11-06-02-015	HAP 008-013, 015-026, 028-054, 101-999
4	Seal	36-11-06-02-010	HAP 008-013, 015-026, 028-054, 101-999
7	Seal	36-11-51-02-270	HAP 001-007
		36-11-51-02A-280	HAP 008-013, 015-026, 028-054, 101-999

E. Prepare to install the High Stage Valve

SUBTASK 36-11-06-820-001

- (1) Look at the manual override nut [6] and make sure the high stage valve [1] is not in the LOCKED position.

F. Install the High Stage Valve

SUBTASK 36-11-06-420-001

- (1) Remove the protective covers from the open duct sections and the pressure sense lines.

SUBTASK 36-11-06-420-002

- (2) If the new high stage valve [1] does not have the union [8] installed, do these steps:

- (a) Install the seal [7] on the union [8].
- (b) Lubricate the threads of the union [8] with compound, D00010.
- (c) Install the union [8] on the high stage valve [1].
 - 1) Tighten the union [8] to 180 in-lb (20 N·m) – 200 in-lb (23 N·m).

SUBTASK 36-11-06-210-001

- (3) Examine the seals [4] as follows:

- (a) Make sure the seals [4] do not have cracks, dents, or other damage.
- (b) Replace all damaged seals [4] that you find.

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SUBTASK 36-11-06-420-003

- (4) Do these steps to install the high stage valve [1]:
- Install the seals [4] in the aft end of the high stage valve [1].
 - Use a coupling [5] to loosely connect the aft end of the high stage valve [1] to the engine duct.

NOTE: Do not tighten the coupling at this time. The final orientation of the high stage valve [1] will be done with the control pressure sense tube [9].

- 1) Make sure you align the flow arrow on the high stage valve [1] with the mark on the engine duct.

SUBTASK 36-11-06-420-004

- (5) Do these steps to attach the high-stage downstream duct [2]:
- Install a seal [4] in the forward side of the high-stage downstream duct [2].
 - Install a seal [4] in the forward side of the high stage valve [1].
 - Install the high-stage downstream duct [2] between the intersection manifold duct and high stage valve [1].
 - Loosely install coupling [3].
 - Loosely install coupling [5].

SUBTASK 36-11-06-420-005

- (6) Loosely connect the control pressure sense tube [9] to the high stage valve [1] as follows:
- Turn the control pressure sense tube [9] inward until you can loosely connect the tube with the union [8] on the high stage valve [1].

NOTE: Adjust the high stage valve [1] until you can install the control pressure sense tube [9] with no preload.

SUBTASK 36-11-06-420-006

- (7) Do these steps to tighten the couplings [3] and [5]:
- Orient the couplings [3] and [5] with the coupling bolt on top and coupling nut facing outboard.
 - Make sure the coupling link is centered along the tab located at the bottom of the 9th stage bleed duct.
 - Tighten the coupling [3] to 95 in-lb (11 N·m) - 110 in-lb (12 N·m).
 - Tighten the coupling [5] to 115 in-lb (13 N·m) - 125 in-lb (14 N·m).
 - Use a rubber mallet, STD-3906 to lightly tap around the coupling [3] and the coupling [5].
 - Tighten the coupling [3] again to 95 in-lb (11 N·m) - 110 in-lb (12 N·m).
 - Tighten the coupling [5] again to 115 in-lb (13 N·m) - 125 in-lb (14 N·m).

SUBTASK 36-11-06-420-007

CAUTION: USE TWO WRENCHES TO TIGHTEN THE TUBE COUPLING NUTS. USE ONE WRENCH TO HOLD THE NIPPLE FITTING. USE THE OTHER WRENCH TO TIGHTEN THE COUPLING NUT. IF THE NIPPLE FITTING TURNS, DAMAGE CAN OCCUR.

- (8) Tighten the control pressure sense tube [9] to the union [8] and control pressure sense line as follows:
- Tighten the control pressure sense tube [9] to 133.0 in-lb (15.0 N·m) - 147.0 in-lb (16.6 N·m).
 - Back off the tube nuts to decrease the torque.

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- (c) Tighten the control pressure sense tube [9] again to 133.0 in-lb (15.0 N·m) - 147.0 in-lb (16.6 N·m).

G. High Stage Valve Installation Test

SUBTASK 36-11-06-860-003

- (1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 36-11-06-860-009

- (2) Close these circuit breakers:

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	7	C00796	AIR CONDITIONING BLEED AIR VALVES LEFT
B	7	C00797	AIR CONDITIONING BLEED AIR VALVES RIGHT

SUBTASK 36-11-06-710-008

- (3) To dry motor the engine, do this task: Dry Motor the Engine, TASK 71-00-00-700-821-F00.

SUBTASK 36-11-06-710-004

- (4) Examine the control pressure sense line [10] and control pressure sense tube [9] connections leakage.

NOTE: No leakage is permitted. Leakage that is found must be repaired.

SUBTASK 36-11-06-710-005

- (5) Make sure that there is no air leakage at the couplings to high stage valve [1] and high-stage downstream duct.

NOTE: Diffused leakage is permitted, jet blast leakage must be repaired.

H. Put the Airplane Back to Its Usual Condition.

SUBTASK 36-11-06-010-003

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) For the left thrust reverser, do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

SUBTASK 36-11-06-860-005

- (2) Remove the DO-NOT-OPERATE tag from the applicable fuel shutoff lever.

————— **END OF TASK** —————

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HIGH STAGE REGULATOR - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
(1) High stage regulator removal
(2) High stage regulator installation.
B. The high stage regulator is found at the 10 o'clock position on the engine core area and immediately aft of the fan frame.
C. The high stage regulator is attached to the engine core bracket with four fasteners.

TASK 36-11-07-000-801

2. High Stage Regulator Removal

(Figure 401 or Figure 402)

A. References

Table with 2 columns: Reference, Title. Rows include 36-00-00-860-806 (Remove Pressure from the Pneumatic System) and 78-31-00-010-801-F00 (Open the Thrust Reverser).

B. Prepare to Remove the High Stage Regulator

SUBTASK 36-11-07-860-006

WARNING: YOU MUST REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. IF YOU DO NOT REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS, HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 36-11-07-860-001

- (2) Make sure the fuel shutoff lever for the applicable engine is in the cutoff position and install DO-NOT-OPERATE tags.

SUBTASK 36-11-07-010-001

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DEACTIVATE THE LEADING EDGE, DEACTIVATE THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANEL. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (3) For the left thrust reverser, do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

SUBTASK 36-11-07-860-007

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

F/O Electrical System Panel, P6-4

Table with 4 columns: Row, Col, Number, Name. Rows A and B describe bleed air valves.

SUBTASK 36-11-07-860-008

- (5) Attach a DO-NOT-OPERATE tag to the applicable BLEED switch on the P5-10 panel:
(a) BLEED 1

Effectivity table with columns for HAP ALL and a large empty box for details.

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(b) BLEED 2

C. Remove the High Stage Regulator

SUBTASK 36-11-07-020-001

(1) Do these steps to disconnect the high stage regulator [1] from the engine:

NOTE: If it is necessary to improve access to the regulator, disconnect the electrical connector, DP1008, from the VBV actuator.

- (a) Disconnect the supply pressure sense line [7] and control pressure sense line [8] from the outboard location on the high stage regulator [1].
- (b) Disconnect the downstream pressure sense line [4] from the inboard location on the high stage regulator [1].
- (c) Remove the four bolts [9] that attach the high stage regulator [1] to the engine core bracket.

NOTE: The engine core bracket has nutplates.

SUBTASK 36-11-07-020-002

(2) To remove the high stage regulator [1], move it rearward and upward until it is free of the thrust link.

SUBTASK 36-11-07-020-003

(3) Do these steps if the new high stage regulator [1] does not have the unions [3] and [6] installed:

- (a) Remove the union [6] and seal [5] from the aft outboard side of the high stage regulator [1].

NOTE: The union has a 13/16-inch wrench fitting.

- 1) Discard the seal [5] and keep the union [6] for the installation.

- (b) Remove the two unions [3] and each seal [2] from the two other locations on the high stage regulator [1].

NOTE: The unions have a 3/4-inch wrench fitting.

- 1) Discard each seal [2] and keep the unions [3] for the installation.

SUBTASK 36-11-07-020-004

(4) Put protective covers on the open pressure sense lines.

————— **END OF TASK** —————

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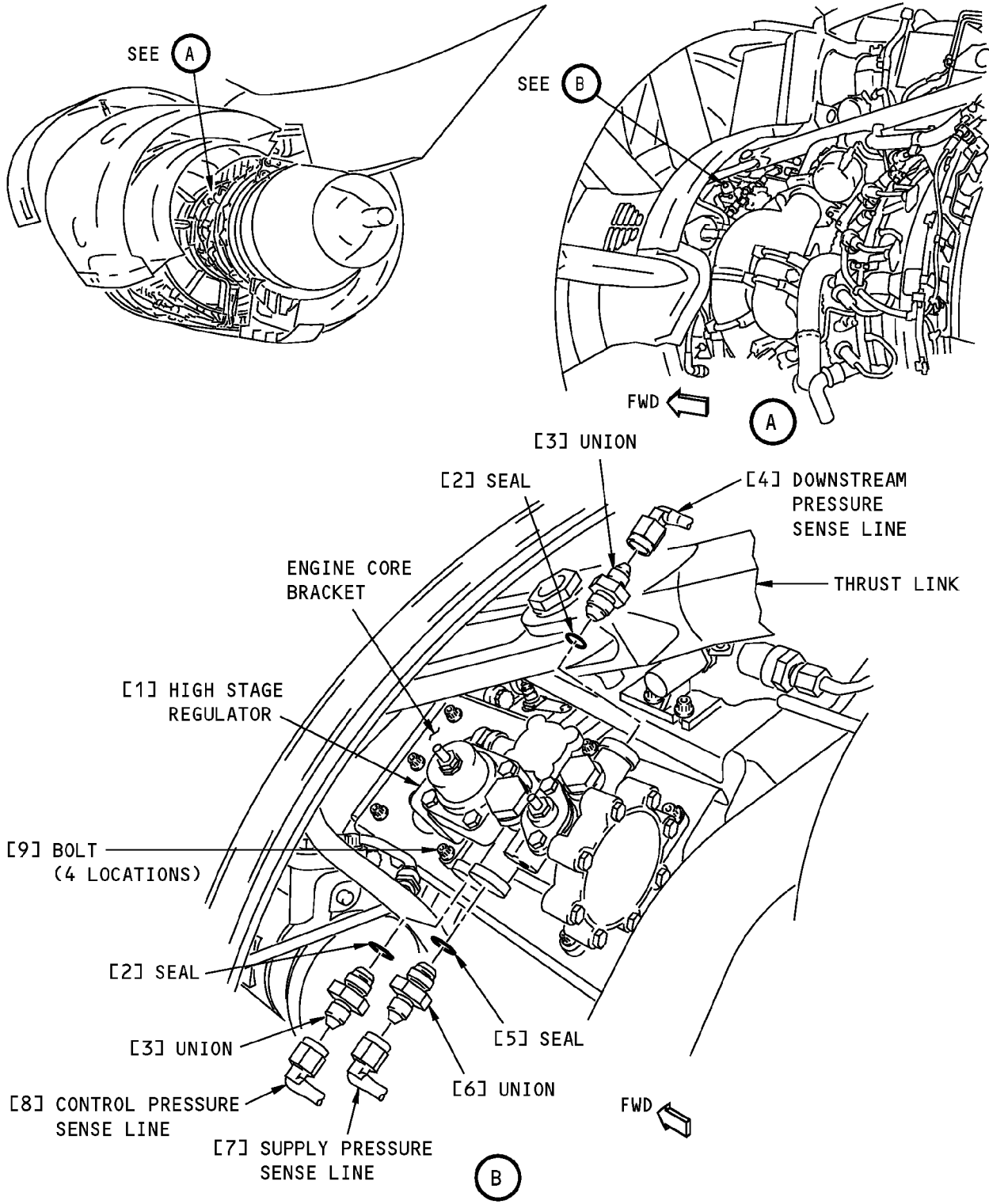
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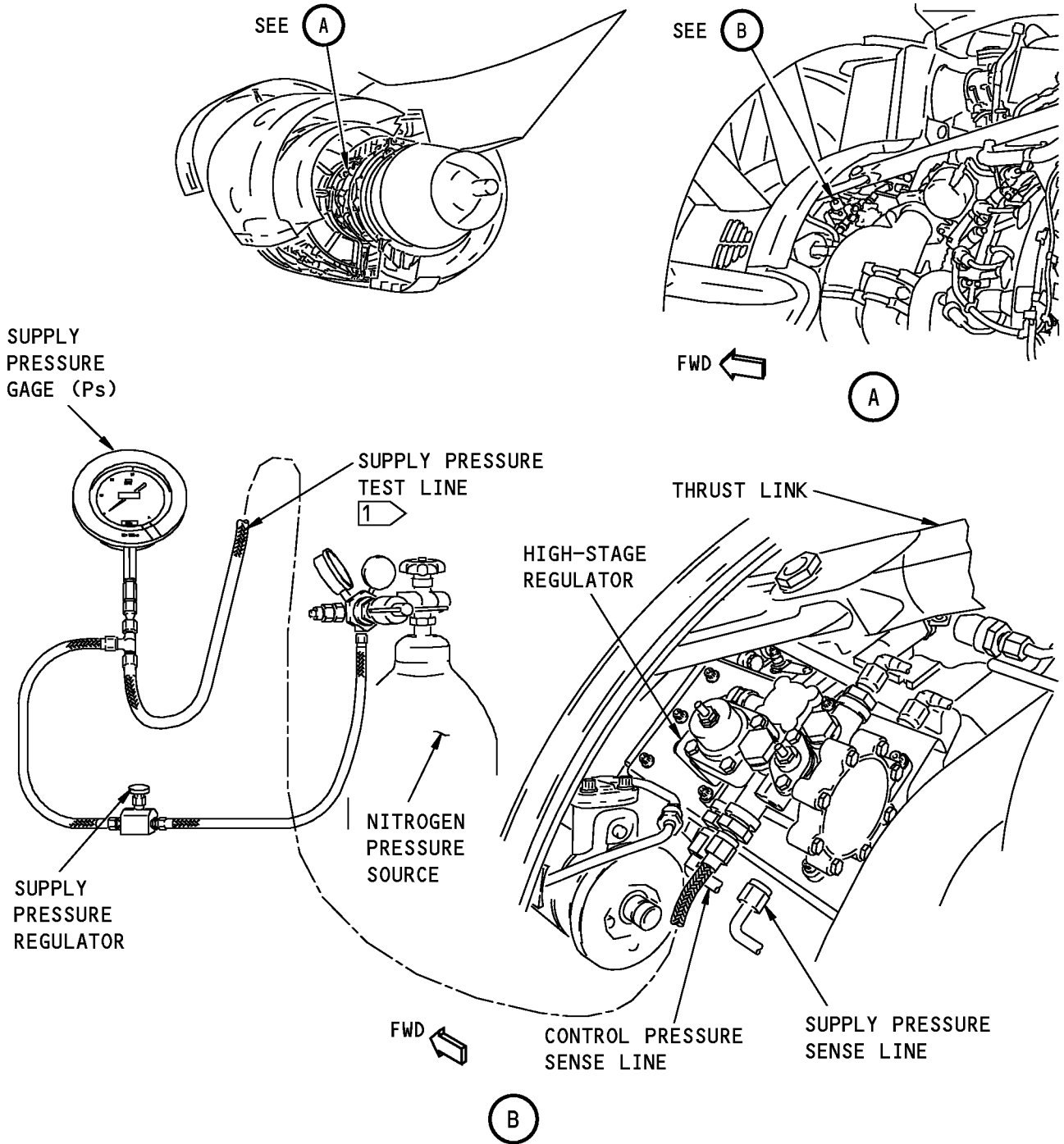


**High Stage Regulator Installation
Figure 401/36-11-07-990-801**

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1 CONNECTION POINT SHOWN IS TYPICAL. YOU CAN CONNECT THE SUPPLY PRESSURE TEST LINE GAGE ANYWHERE ALONG THE SUPPLY PRESSURE SENSE LINE BETWEEN THE HIGH-STAGE REGULATOR AND THE 9TH-STAGE DUCT THAT IS CONVENIENT.

Leakage Test of High Stage Regulator Control Pressure Sense Line
Figure 402/36-11-07-990-802

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TASK 36-11-07-400-801

3. High Stage Regulator Installation

(Figure 401 or Figure 402)

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
36-00-00-860-803	Supply Pressure to the Pneumatic System with the APU (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)
71-00-00-700-821-F00	Dry Motor the Engine (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

B. Tools/Equipment

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

Reference	Description
SPL-4350	Test Equipment - Engine Bleed Air Systems (Part #: C36001-44, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)

C. Consumable Materials

Reference	Description	Specification
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT-8N	MIL-PRF-907F
D00010	Compound - Thread Antiseize, High Temperature	MIL-PRF-907F

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Regulator	36-11-07-02-010	HAP 001-007, 031-054, 101-999
		36-11-07-02A-005	HAP 008-013, 015-026, 028-054, 101-999
2	Seal	36-11-51-02-270	HAP 001-007
		36-11-51-02A-280	HAP 008-013, 015-026, 028-054, 101-999
5	Seal	36-11-51-02-275	HAP 001-007
		36-11-51-02A-285	HAP 008-013, 015-026, 028-054, 101-999

E. Install the High Stage Regulator

SUBTASK 36-11-07-420-001

- (1) Remove the protective covers from the open pressure sense lines and open port on the high stage regulator [1].

SUBTASK 36-11-07-420-002

- (2) If not installed on the new high stage regulator [1], install the unions [3] and the union [6] as follows:
 - (a) Install each seal [2] on the two unions [3].
 - (b) Install the seal [5] on the union [6].

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- (c) Lubricate the threads of the unions [3] and the union [6] with compound, D00010.
- (d) Install the union [6] on the aft outboard location of the high stage regulator [1].

NOTE: The union has a 13/16-inch wrench fitting.

- (e) Install the two unions [3] on the two other ports.

NOTE: The unions have a 3/4-inch wrench fitting.

- 1) Tighten the unions [3] to 180 in-lb (20 N·m) – 200 in-lb (23 N·m).
- 2) Tighten the union [6] to 275 in-lb (31 N·m) - 300 in-lb (34 N·m).

SUBTASK 36-11-07-420-003

- (3) Do these steps to connect the high stage regulator [1] to the engine:

- (a) Install the high stage regulator [1] on the engine core bracket with the four bolts [9].

NOTE: Make sure all three pneumatic sense line connections are aligned with the high stage regulator [1].

- 1) Tighten the bolts [9] to 34.0 in-lb (3.8 Nm) - 36 in-lb (4.1 Nm).

SUBTASK 36-11-07-420-004

- (4) Connect the supply pressure sense line [7] and the control pressure sense line [8] to the outboard locations on the high stage regulator [1] as follows:

- (a) Apply a light coat of Never-Seez NSBT-8N compound, D00006 to the supply pressure sense line and the control pressure sense line connections.
- (b) Tighten the supply pressure sense line [7] and the control pressure sense line [8] to 133.0 in-lb (15.0 N·m) - 147.0 in-lb (16.6 N·m).
- (c) Back off the tube nut to decrease the torque.
- (d) Tighten the two sense lines again to 133.0 in-lb (15.0 N·m) - 147.0 in-lb (16.6 N·m).

SUBTASK 36-11-07-420-005

- (5) Connect the downstream pressure sense line [4] to the inboard location on the high stage regulator [1] as follows:

- (a) Apply a light coat of Never-Seez NSBT-8N compound, D00006 to the downstream pressure sense line connection.
- (b) Tighten the downstream pressure sense line [4] to 133.0 in-lb (15.0 N·m) - 147.0 in-lb (16.6 N·m).
- (c) Back off the tube nut to decrease the torque.
- (d) Tighten the sense line again to 133.0 in-lb (15.0 N·m) - 147.0 in-lb (16.6 N·m).

SUBTASK 36-11-07-410-001

- (6) If removed, connect the electrical connector, DP1008, to the VBV actuator.

F. High Stage Regulator Installation Test

SUBTASK 36-11-07-860-003

- (1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 36-11-07-860-009

- (2) Close these circuit breakers:

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	7	C00796	AIR CONDITIONING BLEED AIR VALVES LEFT
B	7	C00797	AIR CONDITIONING BLEED AIR VALVES RIGHT

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SUBTASK 36-11-07-790-001

(3) Do substep (a) below to make sure that the sense lines to the high stage regulator do not leak. If you choose not to do substep (a), as an alternative you can do substeps (b) and (c):

- (a) Dry motor the engine to do a leak check of the sense line connections as follows:
- 1) This step will enable the technician to do a leak check of the supply pressure port, the control pressure port and the downstream pressure port connections on the high stage regulator.
 - 2) To dry motor the engine, do this task: Dry Motor the Engine, TASK 71-00-00-700-821-F00.
 - 3) Put a soap solution on the connections and look for leaks.
 - a) Repair any leak that you find.

(b) Do this step to do a leak check of the downstream pressure port connection on the high stage regulator:

NOTE: This step is an alternative to dry motoring the engine for pressure.

- 1) Make sure that the BLEED 1 and 2 switches on the P5-10 air conditioning panel are set to OFF.
- 2) Make sure that the WING ANTI-ICE, ENG 1 ANTI-ICE and ENG 2 ANTI-ICE switches on the P5-11 engine and wing anti-ice control panel are set to OFF.
- 3) If the check is on the high stage regulator on the right engine, make sure that the ISOLATION VALVE switch on the P5-10 air conditioning panel is set to OPEN.
- 4) If the check is on the high stage regulator on the left engine, make sure that the ISOLATION VALVE switch on the P5-10 air conditioning panel is set to CLOSE.
- 5) Supply pressure to the pneumatic system with the APU. To supply APU pneumatic pressure, do this task: Supply Pressure to the Pneumatic System with the APU, TASK 36-00-00-860-803.
- 6) Put a soap solution on the downstream pressure port connection on the high stage regulator and look for leaks.
 - a) Repair any leak that you find.
 - < 1 > Use a light coat of Never-Seez NSBT-8N compound, D00006, when you reconnect sense line connections that have been disconnected.
- 7) Remove pressure from the pneumatic system. To remove the pressure, do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

(c) Do this step to do a leak check of the control pressure port connection on the high stage regulator: Figure 401 or Figure 402.

NOTE: This step is an alternative to dry motoring the engine for pressure.

- 1) Disconnect the supply pressure sense line at the high stage regulator.
- 2) Connect a pressure regulator, engine bleed air system test equipment, SPL-4350, supply pressure gage, engine bleed air system test equipment, SPL-4350, a supply pressure test line, engine bleed air system test equipment, SPL-4350, and a nitrogen pressure source, engine bleed air system test equipment, SPL-4350, to the supply pressure port on the high stage regulator.
- 3) Operate the nitrogen pressure source and the supply pressure regulator to slowly supply 55 psi to the regulator.
- 4) Use a soap solution on the regulator control pressure port connection and the sense line to the high stage valve and look for leaks:

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- a) Decrease the pressure to the regulator to 0 psig.
 - b) Repair any leak that you find.
 - < 1 > Use a light coat of Never-Seez NSBT-8N compound, D00006, when you reconnect sense line connections that have been disconnected.
 - c) Operate the nitrogen pressure source and the supply pressure regulator to slowly supply 55 psi to the regulator to make sure that any leak has been repaired.
- 5) Decrease the pressure to the regulator supply port to 0 psi.
 - 6) Remove the nitrogen pressure source, the supply pressure test line, the supply pressure regulator, and the supply pressure gage.
 - 7) Use a light coat of Never-Seez NSBT-8N compound, D00006, on the supply pressure sense line connection to the regulator.
 - 8) Connect the supply pressure sense line to the regulator and tighten the line to 133.0 in-lb (15.0 N·m) - 147.0 in-lb (16.6 N·m).
 - 9) Back off the tube nut to decrease the torque.
 - 10) Tighten the sense line again to 133.0 in-lb (15.0 N·m) - 147.0 in-lb (16.6 N·m).
- G. Put the Airplane Back to Its Usual Condition.

SUBTASK 36-11-07-010-003

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) For the left thrust reverser, do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

SUBTASK 36-11-07-860-005

- (2) Remove the DO-NOT-OPERATE tags from the fuel shutoff levers.

————— **END OF TASK** —————

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490° F OVERTEMPERATURE SWITCH - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
 - (1) 490°F overtemperature switch removal
 - (2) 490°F overtemperature switch installation.
- B. The 490°F overtemperature switch is found on the left half of the strut torque box above the engine. It is found forward of the precooler control valve sensor and the 450°F overtemperature switch.
- C. For this procedure, the 490°F overtemperature switch will be referred to as the overtemperature switch.

TASK 36-11-08-000-801

2. Overtemperature Switch Removal

(Figure 401)

A. References

Reference	Title
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)
54-53-02-000-802	Forward Strut Fairing Panel (Thrust Reverser Strut Fairing) Removal (P/B 401)

B. Location Zones

Zone	Area
433	Engine 1 - Strut Torque Box
443	Engine 2 - Strut Torque Box

C. Access Panels

Number	Name/Location
431CL	Forward Strut Fairing, Left Overwing Fairing, Strut 1
441CL	Forward Strut Fairing, Left Overwing Fairing, Strut 2

D. Prepare to Remove the Overtemperature Switch

SUBTASK 36-11-08-860-001

WARNING: YOU MUST REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. IF YOU DO NOT REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS, HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 36-11-08-860-004

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

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
HAP 101-999			
C	4	C00257	AIR CONDITIONING OVERHEAT
HAP 001-013, 015-026, 028-054			
C	7	C01177	A/C PACK/ENGINE BLEED AIR OVHT RIGHT

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HAP 001-013, 015-026, 028-054 (Continued)

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
C	8	C01176	A/C PACK/ENGINE BLEED AIR OVHT LEFT

HAP ALL

SUBTASK 36-11-08-010-001

(3) Remove the applicable access panel, do this step:

(a) Open these access panels:

Forward Strut Fairing Panel (Thrust Reverser Strut Fairing) Removal, TASK 54-53-02-000-802

<u>Number</u>	<u>Name/Location</u>
431CL	Forward Strut Fairing, Left Overwing Fairing, Strut 1
441CL	Forward Strut Fairing, Left Overwing Fairing, Strut 2

E. Remove the Overtemperature Switch

SUBTASK 36-11-08-020-001

(1) Disconnect the electrical connector [2] from the overtemperature switch [1].

SUBTASK 36-11-08-020-002

(2) Remove the overtemperature switch [1] from the boss [4].

SUBTASK 36-11-08-020-003

(3) Remove the packing [3].

SUBTASK 36-11-08-390-001

(4) Put a cover on the boss [4] to keep out unwanted material.

————— END OF TASK —————

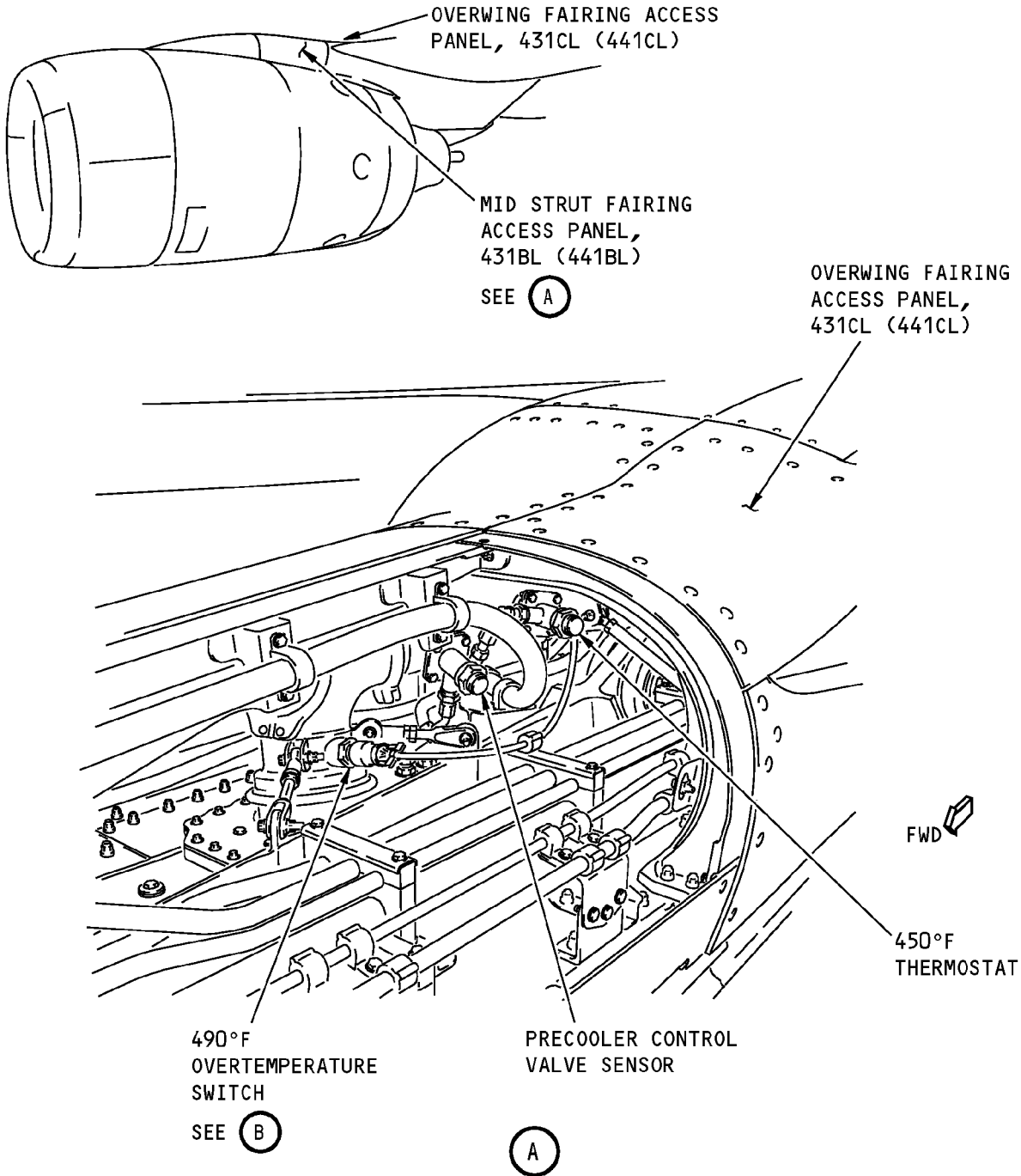
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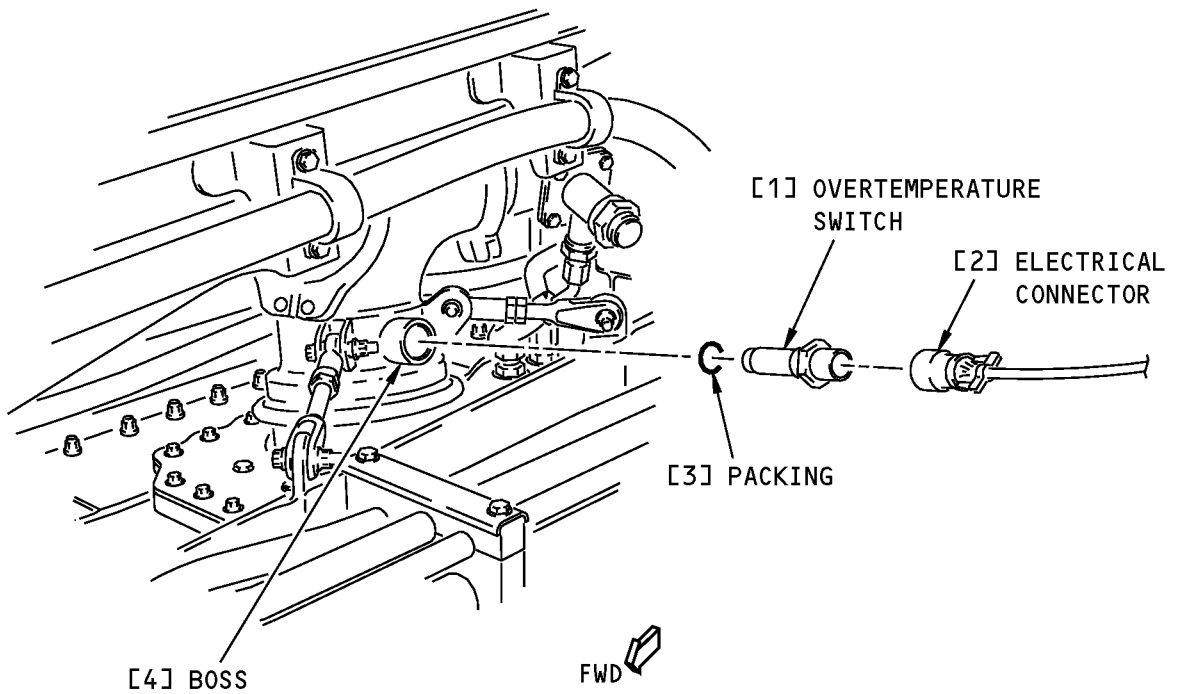


NOTE: MID STRUT FAIRING ACCESS PANEL, 431BL SHOWN REMOVED FOR CLARITY IN THIS VIEW. HOWEVER, FOR FASTER ACCESS TO SWITCH, REMOVE OVERWING FAIRING ACCESS PANEL, 431CL (441CL).

**490 Degrees F Overtemperature Switch Installation
Figure 401 (Sheet 1 of 2)/36-11-08-990-802**

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490°F OVERTEMPERATURE SWITCH

B

**490 Degrees F Overtemperature Switch Installation
Figure 401 (Sheet 2 of 2)/36-11-08-990-802**

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TASK 36-11-08-400-801

3. Overtemperature Switch Installation

(Figure 401)

A. References

Reference	Title
54-53-02-410-801	Forward Strut Fairing Panel (Thrust Reverser Strut Fairing) Installation (P/B 401)

B. Consumable Materials

Reference	Description	Specification
D00010	Compound - Thread Antiseize, High Temperature	MIL-PRF-907F

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Overtemperature switch	36-11-08-01-015	HAP ALL
3	Packing	36-11-08-01-020	HAP ALL

D. Location Zones

Zone	Area
433	Engine 1 - Strut Torque Box
443	Engine 2 - Strut Torque Box

E. Access Panels

Number	Name/Location
431CL	Forward Strut Fairing, Left Overwing Fairing, Strut 1
441CL	Forward Strut Fairing, Left Overwing Fairing, Strut 2

F. Install the Overtemperature Switch

SUBTASK 36-11-08-010-002

(1) Remove the cover from the boss [4].

SUBTASK 36-11-08-160-001

(2) Make sure that the mating surfaces of the boss [4] and the overtemperature switch [1] are clean.

SUBTASK 36-11-08-420-001

CAUTION: THE OVERTEMPERATURE SWITCH CAN BE DAMAGED IF DROPPED OR MISHANDLED. IF THE OVERTEMPERATURE SWITCH IS DROPPED, RETURN IT TO THE SHOP OR SUPPLIER FOR CALIBRATION.

(3) Install a new packing [3] on the overtemperature switch [1].

SUBTASK 36-11-08-640-001

(4) Apply a thin layer of compound, D00010 to the threads of the overtemperature switch [1].

SUBTASK 36-11-08-420-002

(5) Install the overtemperature switch [1].

(a) Tighten the overtemperature switch [1] to 530-630 pound-inches (58.9-70.1 Newton-meters).

SUBTASK 36-11-08-420-003

(6) Connect the electrical connector [2] to the overtemperature switch [1].

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G. Put the Airplane to Its Usual Condition

SUBTASK 36-11-08-410-001

(1) Install the applicable access panel, do this step:

(a) Close these access panels:

Forward Strut Fairing Panel (Thrust Reverser Strut Fairing) Installation,
TASK 54-53-02-410-801

<u>Number</u>	<u>Name/Location</u>
431CL	Forward Strut Fairing, Left Overwing Fairing, Strut 1
441CL	Forward Strut Fairing, Left Overwing Fairing, Strut 2

SUBTASK 36-11-08-860-009

(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>
HAP 101-999			
C	4	C00257	AIR CONDITIONING OVERHEAT
HAP 001-013, 015-026, 028-054			
C	7	C01177	A/C PACK/ENGINE BLEED AIR OVHT RIGHT
C	8	C01176	A/C PACK/ENGINE BLEED AIR OVHT LEFT

————— **END OF TASK** —————

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BLEED AIR PRECOOLER SYSTEM - ADJUSTMENT/TEST

1. General

- A. This procedure contains scheduled maintenance task data.
B. This procedure has a task to do an operational check of the precooler control valve with a nitrogen supply source and pneumatic test equipment.
C. The procedure will do the checks that follow:
(1) The precooler control valve will operate satisfactorily.
(2) The sense lines have no leaks.

TASK 36-12-00-700-801

2. Precooler Control Valve System Health Check

(Figure 501)

A. General

- (1) This procedure is a scheduled maintenance task.

B. References

Table with 2 columns: Reference, Title. Rows include tasks like 'Remove Pressure from the Pneumatic System (P/B 201)' and 'Precooler Control Valve Removal (P/B 401)'.

C. Tools/Equipment

Table with 2 columns: Reference, Description. Rows include 'Valve - Shutoff, 3/8 Inch ID Connections', 'Gauge - Pressure, 0-75 PSIG (0-518 KPa)', etc.

D. Consumable Materials

Table with 3 columns: Reference, Description, Specification. Rows include 'Compound - Antiseize Pure Nickel Special - Never-Seez NSBT-8N' and 'Leak Detector - Liquid, Non-Corrosive Soap Compound'.

E. Location Zones

Table with 2 columns: Zone, Area. Rows include '411 Engine 1 - Engine', '421 Engine 2 - Engine', '430 Subzone - Engine 1, Nacelle Strut', etc.

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(Continued)

Zone	Area
443	Engine 2 - Strut Torque Box

F. Prepare to do the System Health Check

SUBTASK 36-12-00-860-001

- (1) Make sure the engine start lever is in the CUTOFF position.
 - (a) Install a DO-NOT-OPERATE tag on the applicable engine start lever.

SUBTASK 36-12-00-860-002

WARNING: YOU MUST REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. IF YOU DO NOT REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS, HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (2) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 36-12-00-010-001

- (3) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

G. Do the System Health Check

(Figure 501)

SUBTASK 36-12-00-210-003

- (1) Use a dental mirror, STD-3907 to examine the position indicator [1] on the precooler control valve [7] (Figure 501, View B).

NOTE: The precooler control valve [7] is spring-loaded open when the system is off.

SUBTASK 36-12-00-200-001

- (2) If the valve has a manual override nut [1], then use a 3/4-inch wrench on the manual override nut [1] to close and open the valve. If the valve does not have a manual override nut, skip the following step.

SUBTASK 36-12-00-210-004

- (3) If the valve does not move to the closed and open position smoothly, then replace the precooler control valve [7]. Do these tasks:

Precooler Control Valve Removal, TASK 36-12-02-000-801

Precooler Control Valve Installation, TASK 36-12-02-400-801

NOTE: Apply Never-Seez NSBT-8N compound, D00006 to all male threads before connecting the pneumatic sense lines.

SUBTASK 36-12-00-210-001

- (4) Disconnect the bleed air supply line [4] at the inlet tee to the supply pressure sense line [2] on the left side of the engine (Figure 501, View B)..

SUBTASK 36-12-00-480-003

- (5) Connect a nitrogen source, STD-1290, pressure regulator, STD-1291, supply pressure gauge, STD-1292(Ps) and test line at the tee to the supply pressure sense line [2].

SUBTASK 36-12-00-020-003

- (6) Disconnect the control pressure sense line [3] from the control pressure port on the precooler control valve [7].

NOTE: Access to the control pressure port on the precooler control valve [7] is easiest from the right side of the engine.

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SUBTASK 36-12-00-480-004

- (7) Install a needle shutoff valve, STD-1197, control pressure gauge, STD-1201(Pc) and a test line to the control pressure port on the precooler control valve [7].

SUBTASK 36-12-00-720-006

- (8) With the needle shutoff valve, STD-1197 closed, open the primary regulator knob on the nitrogen source, STD-1290 until 70 psig registers on the nitrogen source gauge.

SUBTASK 36-12-00-780-001

- (9) Slowly open the pressure regulator, STD-1291 to increase the supply pressure (Ps) from the nitrogen source, STD-1290 to 12 ± 2.0 psig.

SUBTASK 36-12-00-020-004

- (10) Use a dental mirror, STD-3907 to examine the position indicator [1] on the precooler control valve [7].

SUBTASK 36-12-00-020-005

- (11) If the position indicator [1] on the precooler control valve [7] shows the valve [7] did not move to 30 degrees or less from the fully closed position, then do these steps:

- (a) Slowly open the pressure regulator, STD-1291 to increase Ps to 70 psig (3620 mm Hg gauge).
- (b) Use leak detector, G50135 to examine these areas for nitrogen leakage:
 - 1) The supply pressure sense line [2] and fitting to the precooler control valve [7]
 - 2) The test line and fittings from the nitrogen source, STD-1290 to the bleed air supply line [4]
 - 3) The test line and fittings between the precooler control valve [7] and the control pressure gauge, STD-1201 and needle shutoff valve, STD-1197
- (c) Decrease Ps to 0 psig and repair all leakage found.

NOTE: Apply Never-Seez NSBT-8N compound, D00006 to all male threads before connecting the pneumatic sense lines.

- (d) If no leakage is found, decrease Ps to 0 psig and replace the precooler control valve [7]. Do these tasks:

Precooler Control Valve Removal, TASK 36-12-02-000-801

Precooler Control Valve Installation, TASK 36-12-02-400-801

SUBTASK 36-12-00-720-007

- (12) Slowly increase Ps to 50-60 psig (2586 to 3130 mm Hg gage).

SUBTASK 36-12-00-710-005

- (13) Make sure the control pressure gauge, STD-1201 shows Pc between 6 and 12 psig. Record the control pressure (Pc) on the Figure 502.

SUBTASK 36-12-00-710-001

- (14) If Pc is not between 6 and 12 psig, then replace the precooler control valve [7]. Do these tasks:

Precooler Control Valve Removal, TASK 36-12-02-000-801

Precooler Control Valve Installation, TASK 36-12-02-400-801

NOTE: Apply Never-Seez NSBT-8N compound, D00006 to all male threads before connecting the pneumatic sense lines.

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SUBTASK 36-12-00-020-006

- (15) Slowly open the needle shutoff valve, STD-1197 to reduce Pc, and use the dental mirror, STD-3907 to watch the precooler control valve [7] position indicator [1] .

SUBTASK 36-12-00-710-006

- (16) Make sure the precooler control valve [7] moves to the fully open position before Pc reaches 3 psig. Record the control pressure (Pc) on the Figure 502 when the valve is fully open.

SUBTASK 36-12-00-710-002

- (17) If the precooler control valve [7] did not move to the fully open position before Pc reached 3 psig, then replace the precooler control valve [7]. Do these tasks:

Precooler Control Valve Removal, TASK 36-12-02-000-801,

Precooler Control Valve Installation, TASK 36-12-02-400-801.

NOTE: Apply Never-Seez NSBT-8N compound, D00006 to all male threads before connecting the pneumatic sense lines.

SUBTASK 36-12-00-864-002

- (18) Decrease Ps to 0 psig.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 36-12-00-080-001

- (1) Remove the needle shutoff valve, STD-1197, control pressure gauge, STD-1201 (Pc) and test line from the control pressure port on the precooler control valve [7].

SUBTASK 36-12-00-210-002

- (2) Reconnect the control pressure sense line [3] to the control pressure port on the precooler control valve [7].

NOTE: Apply Never-Seez NSBT-8N compound, D00006 to all male threads before connecting the pneumatic sense lines.

SUBTASK 36-12-00-080-002

- (3) Remove the nitrogen source, STD-1290, pressure regulator, STD-1291, supply pressure gauge, STD-1292 (Ps) and test line from the supply pressure sense line [2].

SUBTASK 36-12-00-420-001

- (4) Connect the bleed air supply line [4] to the supply pressure sense line [2].

NOTE: Apply Never-Seez NSBT-8N compound, D00006 to all male threads before connecting the pneumatic sense lines.

SUBTASK 36-12-00-010-003

- (5) Close the thrust reverser. Do this task:

Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00

SUBTASK 36-12-00-440-001

- (6) Remove the DO-NOT-OPERATE tag from the applicable engine start lever.

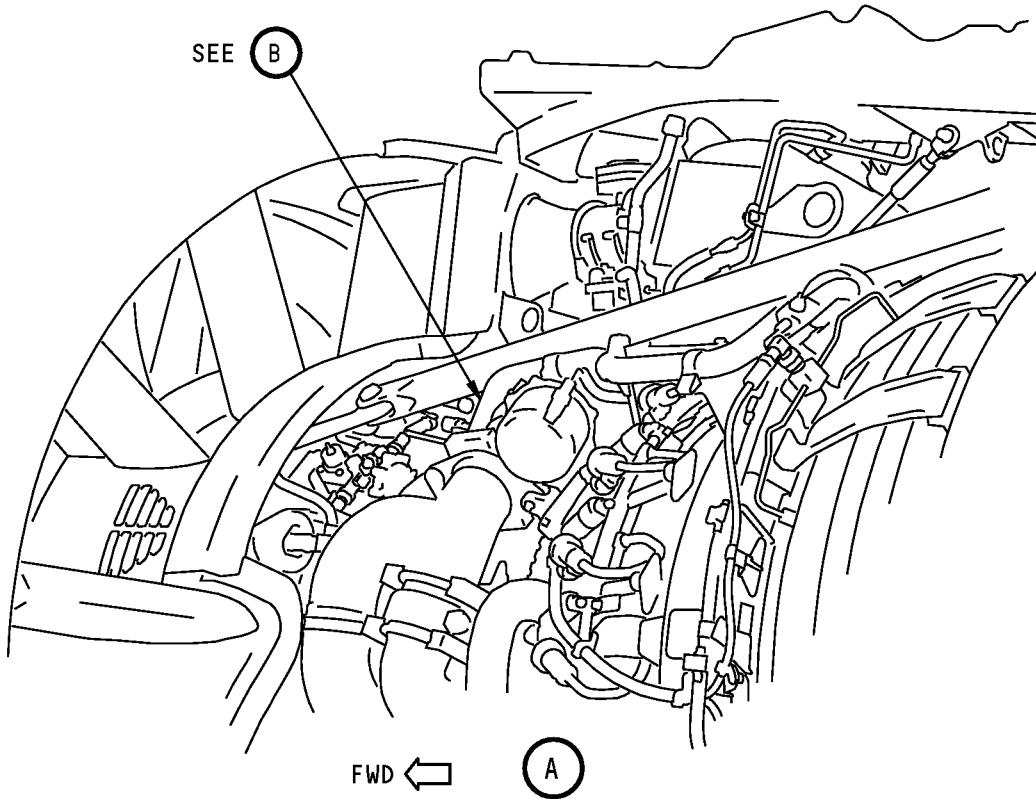
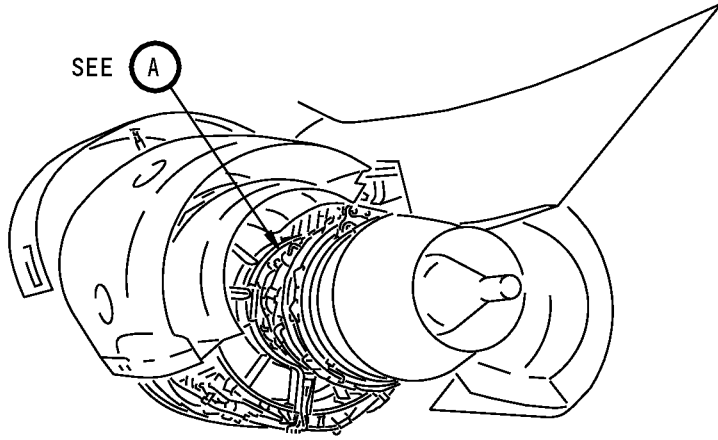
————— **END OF TASK** —————

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**Precooler Control Valve Operational Test
Figure 501 (Sheet 1 of 3)/36-12-00-990-801**

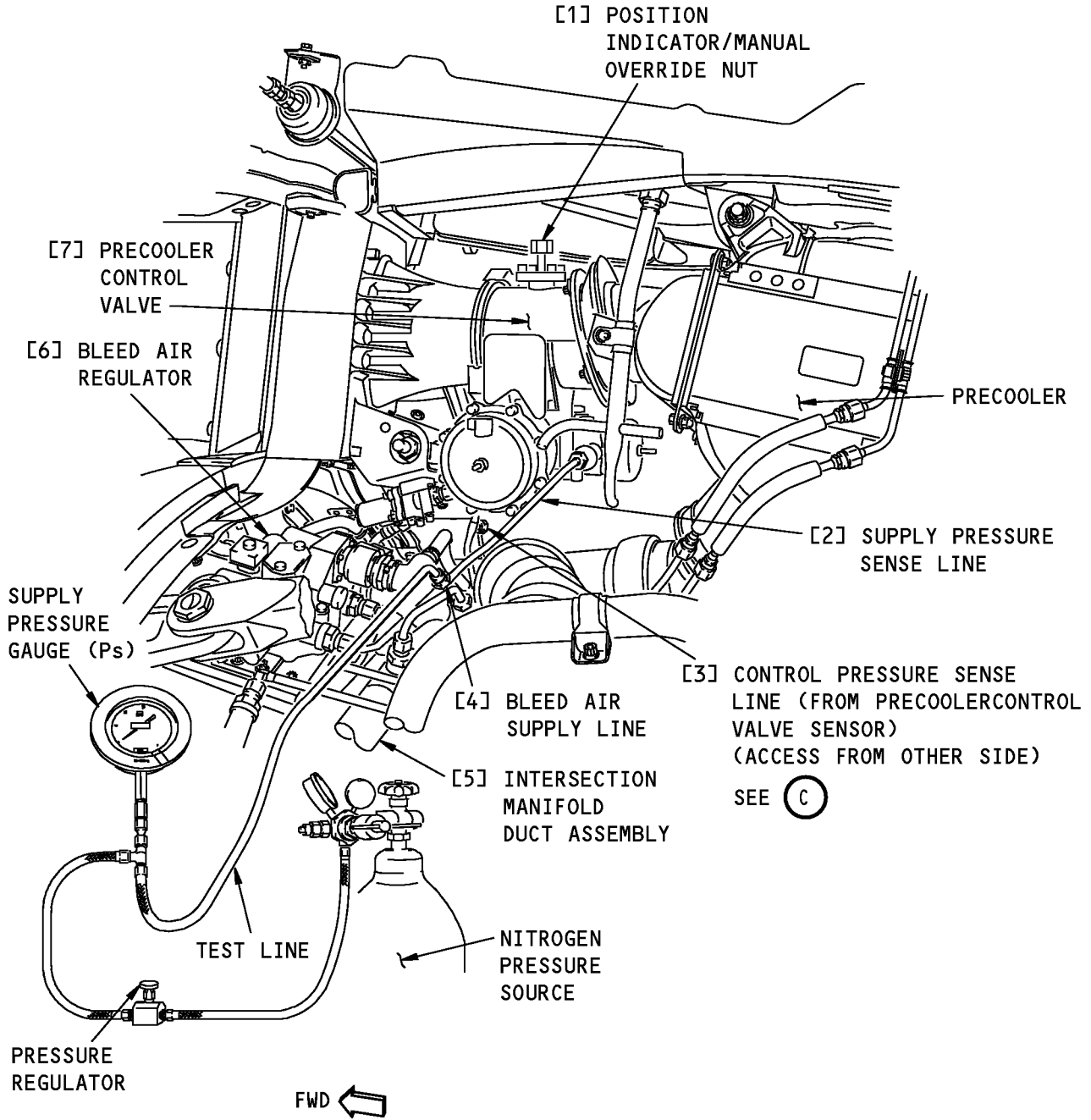
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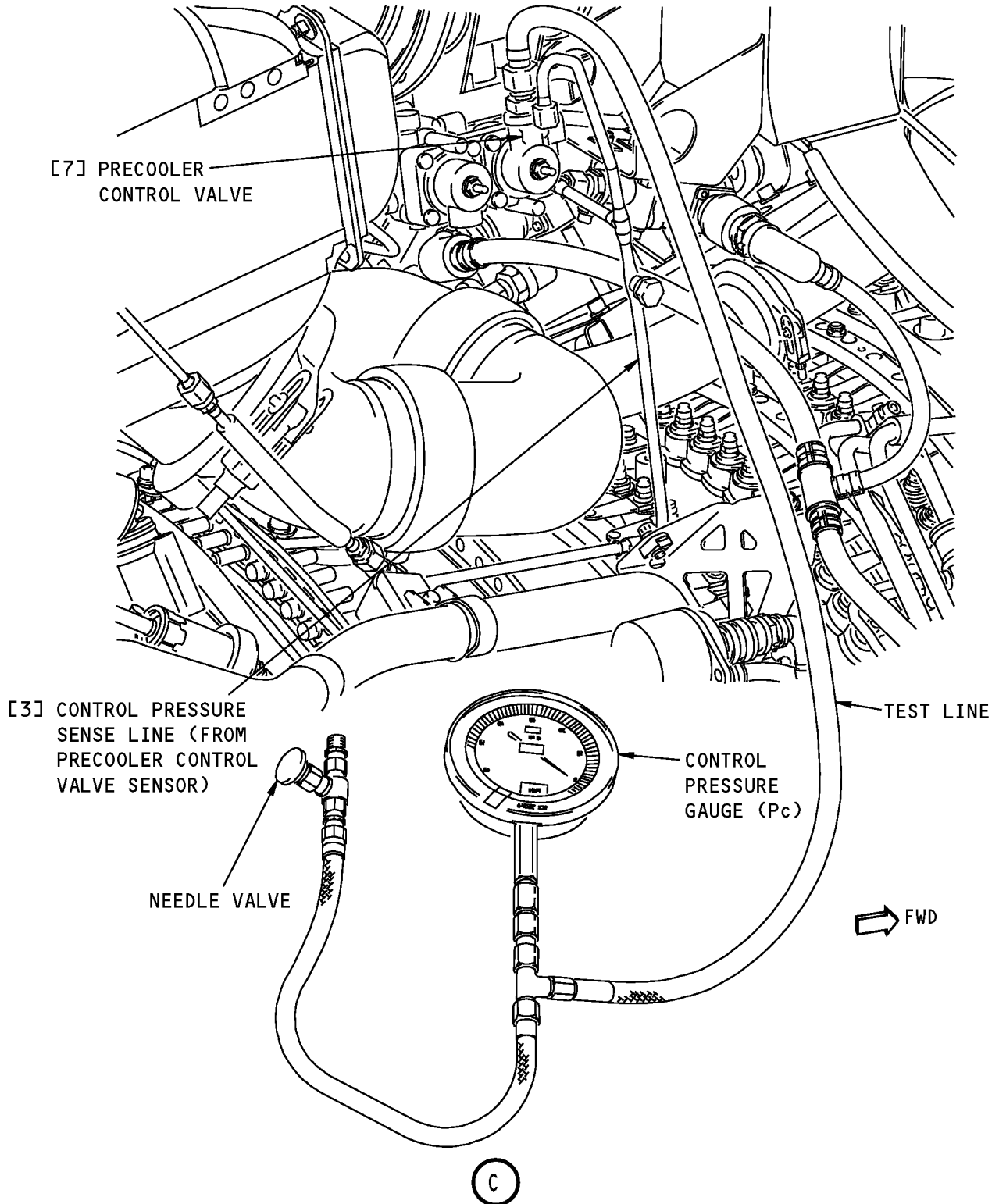
(B)

**Precooler Control Valve Operational Test
Figure 501 (Sheet 2 of 3)/36-12-00-990-801**

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Precooler Control Valve Operational Test
Figure 501 (Sheet 3 of 3)/36-12-00-990-801

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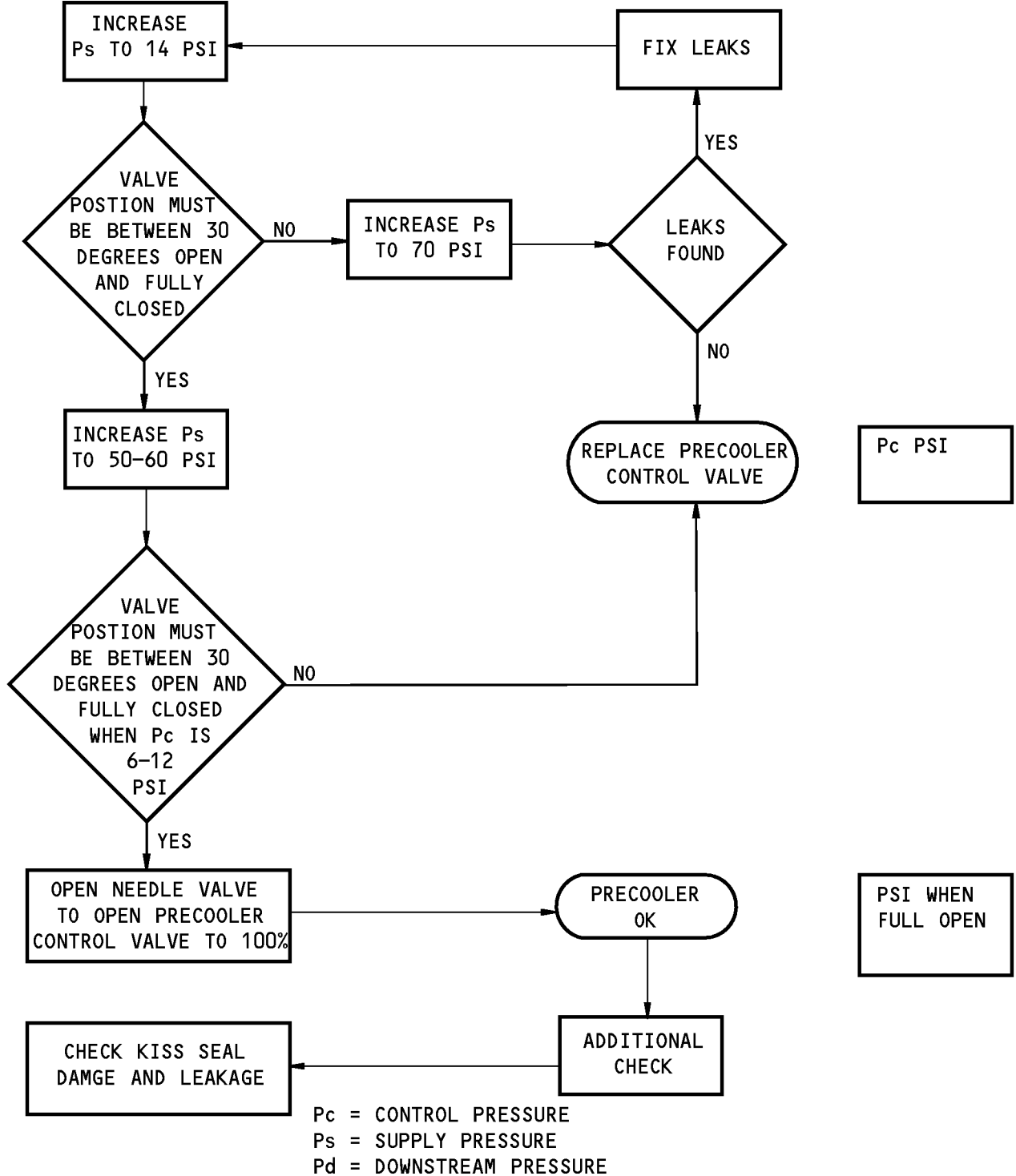
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PRECOOLER & PRECOOLER CONTROL VALVE OPERATIONAL CHECK



1542800 S0000281063_V1

Precooler Control Valve System Health Check Data Sheet
Figure 502/36-12-00-990-804

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TASK 36-12-00-700-802

3. Precooler Control Valve System Health Check Using a Portable Valve Actuating Test Set

Figure 503, Figure 504

A. General

- (1) This procedure describes the use of a Honeywell 290121-3 portable valve actuating test set to operationally check the precooler control valve and to check sense lines and fittings for leaks. The Honeywell P/N 3792195-1 valve actuating tester, SPL-922 and the Boeing C36001-44 engine bleed air system test equipment, SPL-4350 can also be used to do this task.

NOTE: Precooler Control Valve System Health Check, TASK 36-12-00-700-801 performs the same procedure but uses nitrogen bottles, hoses, and fittings instead of a portable valve actuating test set.

B. References

Reference	Title
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)
36-12-02-000-801	Precooler Control Valve Removal (P/B 401)
36-12-02-400-801	Precooler Control Valve Installation (P/B 401)
78-31-00-010-801-F00	Open 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
SPL-922	Tester - Valve Actuating (Part #: 3792195-1, Supplier: 06848, A/P Effectivity: 737-ALL)
SPL-4350	Test Equipment - Engine Bleed Air Systems (Part #: C36001-44, Supplier: 81205, A/P Effectivity: 737-300, -400, -500, -600, -700, -700C, -700ER, -700QC, -800, -900, -900ER, -BBJ)
STD-1197	Valve - Shutoff, 3/8 Inch ID Connections
STD-3907	Mirror - Dental
STD-3942	Hose - Air, Flexible, 3/8 inch (.9525 cm) ID, Length as Needed

D. Consumable Materials

Reference	Description	Specification
D00006	Compound - Antiseize Pure Nickel Special - Never-Seez NSBT-8N	MIL-PRF-907F
G50135	Leak Detector - Liquid, Non-Corrosive Soap Compound	MIL-PRF-25567

E. Prepare for the Bleed Air System Health Check

SUBTASK 36-12-00-860-004

- (1) Make sure the engine start lever is in the CUTOFF position.
 - (a) Install a DO-NOT-OPERATE tag on the applicable engine start lever.

SUBTASK 36-12-00-864-001

WARNING: REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT.

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(WARNING PRECEDES)

- (2) Remove pressure from the pneumatic system. Do this task:
Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806

SUBTASK 36-12-00-010-004

- (3) Open the thrust reverser. Do this task:
Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00

F. Do the System Health Check

SUBTASK 36-12-00-210-006

- (1) Use a dental mirror, STD-3907 to examine the precooler control valve [1] position indicator [2], (Figure 504, View B).

NOTE: The precooler control valve [1] is spring-loaded open when the system is off.

SUBTASK 36-12-00-710-007

- (2) If the precooler control valve has a manual override nut, use a wrench on the manual override nut [3] to close and open the valve. Skip the following step if the precooler control valve [1] does not have a manual override nut.

SUBTASK 36-12-00-960-001

- (3) If the precooler control valve [1] does not move to the closed and open position smoothly, replace the valve. Do these tasks:

Precooler Control Valve Removal, TASK 36-12-02-000-801

Precooler Control Valve Installation, TASK 36-12-02-400-801

NOTE: Apply Never-Seez NSBT-8N compound, D00006 to all male threads before connecting the pneumatic sense lines.

SUBTASK 36-12-00-020-007

- (4) Disconnect the bleed air supply line from the precooler control valve [1] supply pressure port [4], (Figure 504, View B).

SUBTASK 36-12-00-020-008

- (5) Remove the cap from fitting no. 4 on the portable valve actuating test set [5].

SUBTASK 36-12-00-480-005

- (6) Connect one end of a 3/8 inch (.9525 cm) ID flexible air hose, length as needed, STD-3942 to the precooler control valve [1] supply pressure port [4].

SUBTASK 36-12-00-480-006

- (7) Connect the other end of the hose to the portable valve actuating test set fitting no. 4.

SUBTASK 36-12-00-720-008

- (8) Open the test set shutoff valve.

SUBTASK 36-12-00-720-009

- (9) Turn the primary regulator knob on the test set clockwise until the primary system gauge indicates 70 psig.

SUBTASK 36-12-00-720-010

- (10) Set the system selector valve handle to the 'A' position.

SUBTASK 36-12-00-720-011

- (11) Turn the pressure regulator no. 1 knob clockwise until test set gauge no. 3 indicates 12.0 ± 2.0 psig.

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SUBTASK 36-12-00-210-007

- (12) Use a dental mirror, STD-3907 to see if the position indicator [2] on the precooler control valve [1] shows the valve moved 30 degrees or less of fully closed.

SUBTASK 36-12-00-720-012

- (13) If the position indicator [2] shows the valve did not move 30 degrees or less of fully closed, do these steps:
- Set the system selector valve handle to the OFF position.
 - Remove the 3/8 inch (.9525 cm) ID flexible air hose, length as needed, STD-3942 from the precooler control valve [1] supply pressure port [4].
 - Remove the 390° sense line from the sensor port [5] on the precooler control valve [1], (Figure 504, View C).

NOTE: Access to the 390° sense line on the precooler control valve [1] is easiest from the right side of the engine.

- Connect the 3/8 inch (.9525 cm) ID flexible air hose, length as needed, STD-3942 from the test set to the end of the 390° sense line.
- Set the system selector valve handle on the test set to the 'A' position.
- Turn the pressure regulator no. 1 knob clockwise until test set gauge no. 3 indicates 10.0 psig.
- Use leak detector, G50135 to examine these areas for nitrogen leakage:
 - 390°F sensor
 - WTAI solenoid
 - Sense lines and fittings
- If no leakage is found, decrease pressure to 0 psig and replace the precooler control valve [1]. Do these tasks:

Precooler Control Valve Removal, TASK 36-12-02-000-801
Precooler Control Valve Installation, TASK 36-12-02-400-801
- If leakage is found, decrease pressure to 0 psig.
- Repair or replace the damaged items then continue.

NOTE: Apply Never-Seez NSBT-8N compound, D00006 to all male threads before connecting the pneumatic sense lines.

SUBTASK 36-12-00-720-013

- (14) Set the system selector valve handle to the OFF position.

SUBTASK 36-12-00-080-003

- (15) Remove the 3/8 inch (.9525 cm) ID flexible air hose, length as needed, STD-3942 from the precooler control valve [1] 390° [5] sense line.

SUBTASK 36-12-00-480-007

- (16) Connect the 3/8 inch (.9525 cm) ID flexible air hose, length as needed, STD-3942 to the precooler control valve [1] supply pressure port [4].

SUBTASK 36-12-00-720-014

- (17) Turn the pressure regulator no. 1 knob counter-clockwise until 0 psig is indicated on test set gauge no. 3.

SUBTASK 36-12-00-020-009

- (18) Remove the caps from the test set fittings no. 1, no. 5, and no. 6.

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SUBTASK 36-12-00-080-004

- (19) Disconnect the 3/8 inch (.9525 cm) ID flexible air hose, length as needed, STD-3942 from test set fitting no. 4.

SUBTASK 36-12-00-410-001

- (20) Install a cap on fitting no. 4.

SUBTASK 36-12-00-480-008

- (21) Connect the 3/8 inch (.9525 cm) ID flexible air hose, length as needed, STD-3942 removed in from test set fitting no. 4 to fitting no. 1.

SUBTASK 36-12-00-480-009

- (22) Connect a 3/8 inch (.9525 cm) ID flexible air hose, length as needed, STD-3942 to the precooler control valve sensor port [5].

SUBTASK 36-12-00-480-010

- (23) Install a tee-fitting to the other end of the hose, (Figure 504View B).

SUBTASK 36-12-00-480-011

- (24) Connect a 3/8 inch (.9525 cm) ID flexible air hose, length as needed, STD-3942 to test set fitting no. 6.

SUBTASK 36-12-00-480-012

- (25) Connect the other end of the hose to the end of the tee-fitting.

SUBTASK 36-12-00-480-013

- (26) Connect a needle shutoff valve, STD-1197 valve to the end of a 3/8 inch (.9525 cm) ID flexible air hose, length as needed, STD-3942.

SUBTASK 36-12-00-480-014

- (27) Connect the other end of the hose to the tee-fitting.

SUBTASK 36-12-00-720-015

- (28) Turn the primary regulator knob on the test set clockwise until 95.0 ± 2.0 psig is indicated on the primary system gauge.

SUBTASK 36-12-00-720-016

- (29) Set the system selector valve handle to the 'B' position.

- (a) Make sure the precooler control valve [1] position indicator [2] is 30° or less of fully closed.

SUBTASK 36-12-00-720-017

- (30) Slowly open test set shutoff valve no. 2.

- (a) Make sure test set gauge no. 2 indicates 20.5 ± 2.0 inches of Hg.

SUBTASK 36-12-00-720-018

- (31) Very slowly open the needle shutoff valve, STD-1197 while watching the precooler control valve [1] position indicator [2].

SUBTASK 36-12-00-720-019

- (32) Make sure the precooler control valve [1] begins to open at a minimum pressure of $16 +0, -1$ inches of Hg as indicated on test set gauge no. 2.

- (a) If the precooler control valve [1] does not begin to open at $16 +0, -1$ inches of Hg, replace the precooler control valve [1]. Do these tasks:

Precooler Control Valve Removal, TASK 36-12-02-000-801

Precooler Control Valve Installation, TASK 36-12-02-400-801

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- (b) If the precooler control valve [1] begins to open at 16 +0, -1 inches of Hg, continue to open the needle shutoff valve, STD-1197 until the precooler control valve [1] is fully open.
- (c) Make sure the precooler control valve [1] is fully open by 7.0 inches of Hg as indicated on test set gauge no. 2.
 - 1) If the precooler control valve [1] is not fully open by 7.0 inches of Hg, replace the precooler control valve [1]. Do these tasks:
 - Precooler Control Valve Removal, TASK 36-12-02-000-801
 - Precooler Control Valve Installation, TASK 36-12-02-400-801

SUBTASK 36-12-00-720-020

- (33) Set the system selector handle to the OFF position.

G. Put the Airplane Back to its Usual Condition

SUBTASK 36-12-00-080-005

- (1) Disconnect the 3/8 inch (.9525 cm) ID flexible air hose, length as needed, STD-3942 from the precooler control valve [1].

SUBTASK 36-12-00-860-005

- (2) Reconnect the supply pressure line to the precooler control valve [1] supply pressure port [4].

NOTE: Use Never-Seez NSBT-8N compound, D00006 on all fittings when connecting the sense lines.

SUBTASK 36-12-00-860-006

- (3) Reconnect the sensor pressure hose to the precooler control valve [1] sensor port [5].

SUBTASK 36-12-00-860-007

- (4) Close the thrust reverser. Do this task:

Close the Thrust Reverser, TASK 78-31-00-010-804-F00

SUBTASK 36-12-00-860-008

- (5) Remove the DO-NOT-OPERATE tag from the engine start lever.

————— **END OF TASK** —————

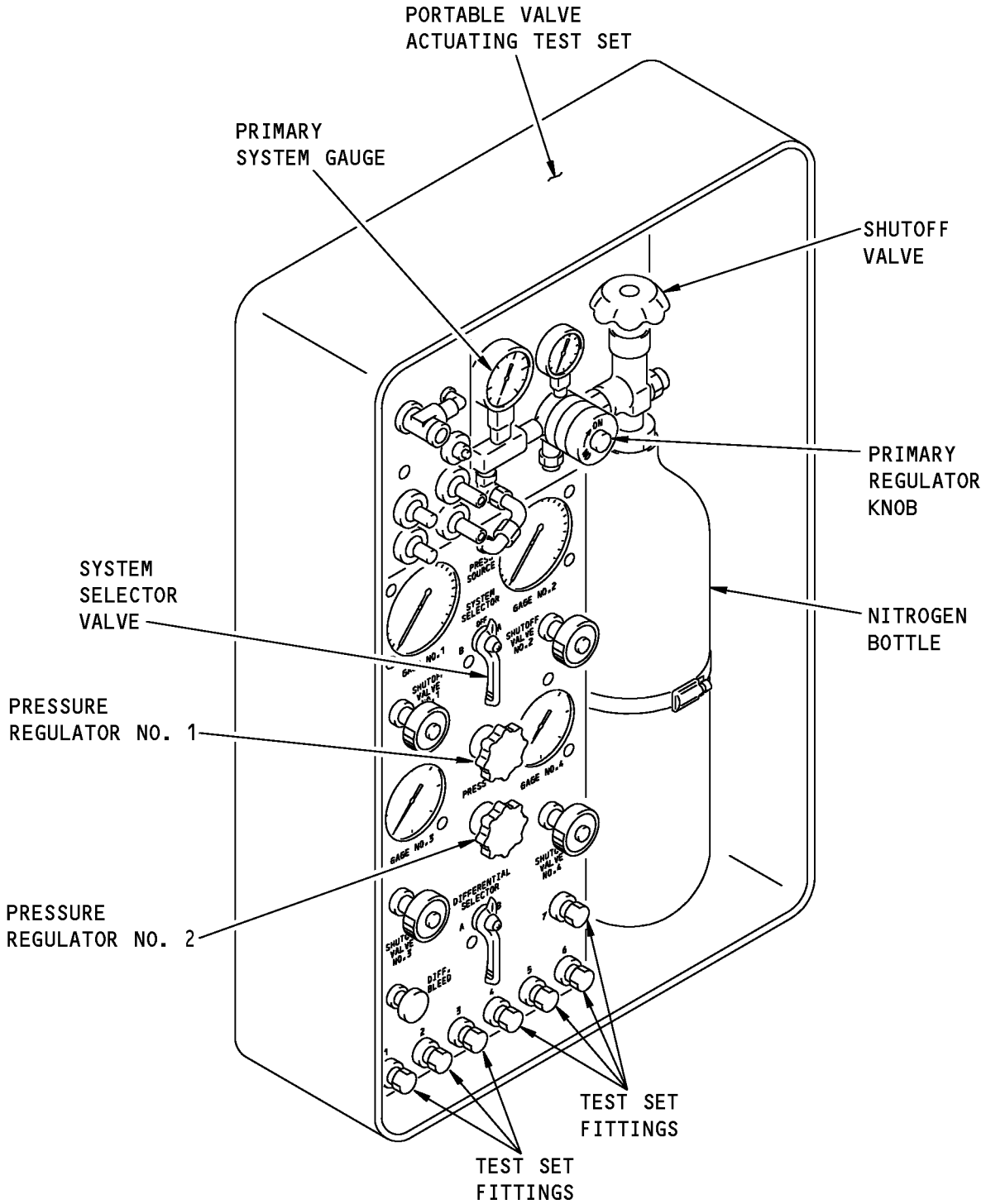
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HONEYWELL P/N 290121-3

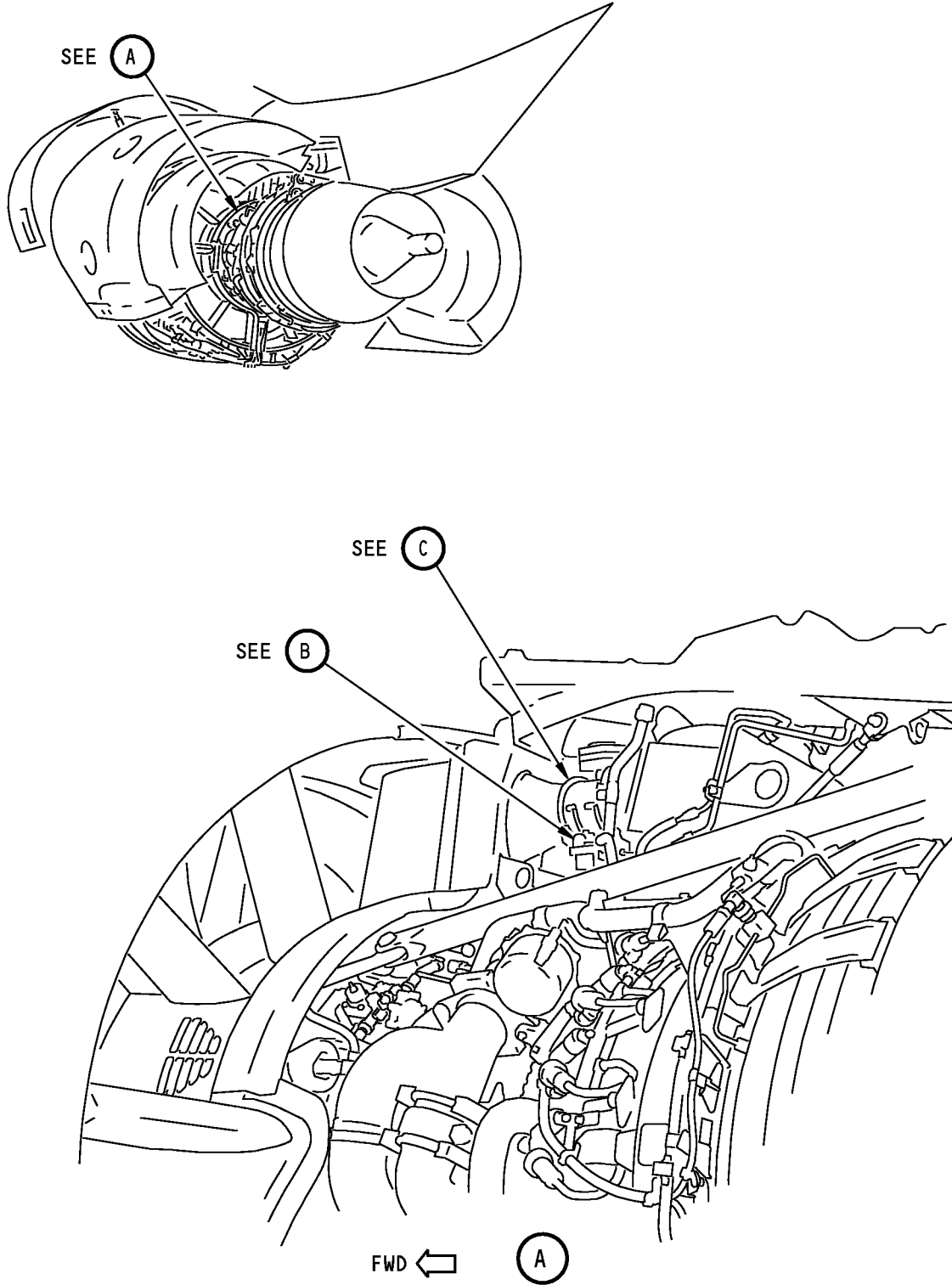
**Portable Valve Actuation Test Set
Figure 503/36-12-00-990-803**

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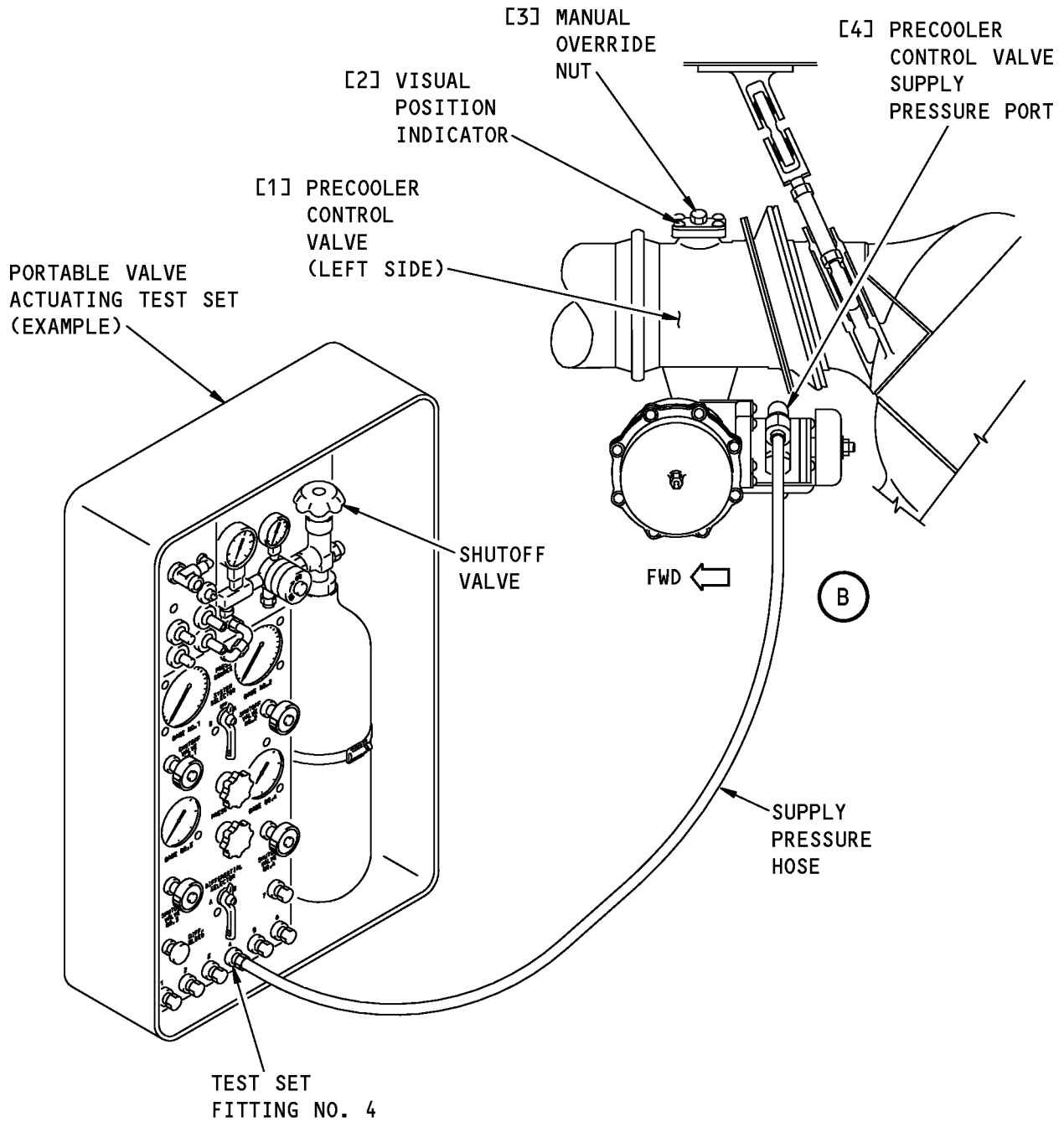
**Precooler Control Valve Operational Test with a Portable Valve Actuating Test Set
Figure 504 (Sheet 1 of 3)/36-12-00-990-802**

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**Precooler Control Valve Operational Test with a Portable Valve Actuating Test Set
Figure 504 (Sheet 2 of 3)/36-12-00-990-802**

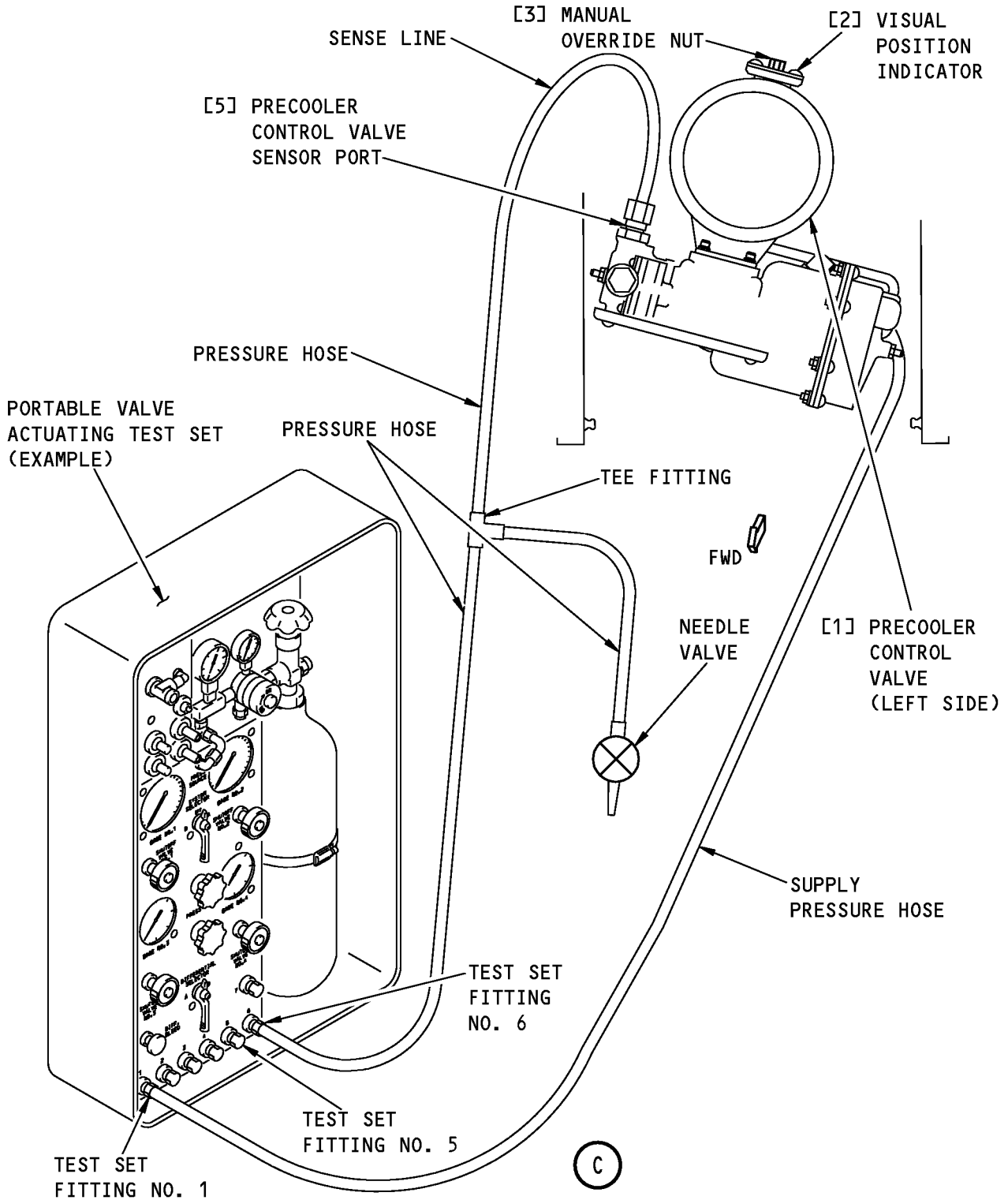
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Precooler Control Valve Operational Test with a Portable Valve Actuating Test Set
Figure 504 (Sheet 3 of 3)/36-12-00-990-802

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BLEED AIR PRECOOLER - MAINTENANCE PRACTICES

1. General

- A. This procedure has two tasks:
 - (1) Bleed air precooler disconnection (for engine component removal)
 - (2) Bleed air precooler re-connection (after engine component installation).
- B. This procedure is used to get access to the 12 o'clock engine core location for the removal of specific engine components (such as the top three fuel nozzles).
- C. If you use this procedure where indicated, you will not have to remove the bleed air precooler.
- D. Because this procedure will be referenced after all engine component access is done, it is assumed that the thrust reversers are open and all airplane safety precautions have been taken.

TASK 36-12-01-800-801

2. Bleed Air Precooler Disconnection (For Engine Component Removal)

(Figure 201, Figure 202, Figure 203)

A. General

- (1) For this procedure the bleed air precooler will be referred to as the precooler.

B. References

Reference	Title
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)
36-12-02-000-801	Precooler Control Valve Removal (P/B 401)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)

C. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine
430	Subzone - Engine 1, Nacelle Strut
440	Subzone - Engine 2, Nacelle Strut

D. Prepare to Disconnect the Precooler

SUBTASK 36-12-01-860-001

WARNING: YOU MUST REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. IF YOU DO NOT REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS, HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Make sure that there is no pressure in the pneumatic system.
 - (a) If there is pressure in the pneumatic system, do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 36-12-01-860-004

- (2) Make sure the applicable engine start lever is in the CUTOFF position.
 - (a) Install a DO-NOT-OPERATE tag on the applicable engine start lever.

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SUBTASK 36-12-01-010-007

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSERS: RETRACT THE LEADING EDGE, DEACTIVATE THE LEADING EDGE, DEACTIVATE THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANEL. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(3) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

SUBTASK 36-12-01-010-001

(4) Do this task: Precooler Control Valve Removal, TASK 36-12-02-000-801.

E. Disconnect the Precooler

SUBTASK 36-12-01-020-001

CAUTION: USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUT. USE ONE TO HOLD THE NIPPLE, AND THE OTHER TO LOOSEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBE AND NIPPLE CAN OCCUR.

- (1) Remove the disconnects from the left side of the engine as follows (Figure 201):
- (a) Do these steps to disconnect the fire extinguishing tube [5] from the precooler [6]:
 - 1) Remove the clamp [2], the bolt [3], and the nut [4] that attach the fire extinguishing tube [5] to the precooler [6].
 - 2) Disconnect the fire extinguishing tube [5] at the strut firewall.
 - 3) Remove the fire extinguishing tube [5].
 - 4) Install the protective covers on the open connections.
 - (b) Do these steps to disconnect the downstream pressure sense line and the control pressure sense line from the precooler [6]:
 - 1) Disconnect the downstream pressure sense tube from the union at the top of the precooler.
 - 2) Disconnect the control pressure sense tube (to 450°F thermostat) from the fitting at the strut firewall.
 - 3) Disconnect the downstream pressure sense line and the control pressure sense line (to 450°F thermostat) below their hose assemblies on the engine core case.
 - 4) Remove the clamps [7], clampshells [8], bolt [9] and nut [10] that attach the sense lines to the precooler [6].
 - 5) Remove the control pressure sense tube and downstream pressure sense tube (to 450°F thermostat).
 - 6) Install protective covers on the open connections.
 - (c) Remove the two bolts [12] and washers [13] that attach the left compression pad bracket [11] to the precooler [6].

NOTE: If installed, keep the compressions rod for the thrust reverser attached to the bracket.

SUBTASK 36-12-01-020-002

CAUTION: USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUTS. USE ONE TO HOLD THE NIPPLE, AND THE OTHER TO LOOSEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBE AND NIPPLE CAN OCCUR.

(2) Remove these disconnects from the right side of the engine as follows (Figure 202):

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- (a) Do these steps to disconnect the control pressure sense line (to precooler control valve sensor (390°F)):

NOTE: Do not disconnect this sense line from the right compression pad bracket.

- 1) Disconnect the control pressure sense line (to precooler control valve sensor (390°F)) at the strut firewall and below its hose assembly on the engine core case.
- 2) Remove the clamp [38], clampshells [39], bolt [40] and nut [41] that attach the control pressure sense line (to precooler control valve sensor (390°F) thermostat) to the precooler [6].
- 3) Remove the two bolts [32] and washers [33] that attach the right compression pad bracket [31] to the precooler [6].

NOTE: If installed, keep the compressions rod for the the thrust reverser attached to the bracket.

- 4) Install protective covers on the open connections.

SUBTASK 36-12-01-020-013

- (3) Do these steps to remove the precooler upstream duct [15]:

- (a) Remove the coupling [36] that attaches the precooler from the precooler upstream duct [15] (Figure 202).
- (b) Remove the coupling [16] that attaches the precooler upstream duct [15] to the PRSOV (Figure 201).
- (c) Remove the precooler upstream duct [15].
- (d) Remove the E-seal [17] from the top flange of the PRSOV.
- (e) Remove the E-seal [37] from the top flange of the precooler upstream duct [15] (Figure 202).
- (f) Install protective covers on the open duct sections.

SUBTASK 36-12-01-020-003

- (4) Do these steps to disconnect the precooler inlet header [1] from the precooler [6] (Figure 201):

- (a) Remove the six bolts [14] that attach the precooler inlet header [1] to the precooler [6].
- (b) Remove the precooler inlet header [1].

SUBTASK 36-12-01-020-014

- (5) Remove the coupling [34] at the top of the precooler [6] (Figure 202).

- (a) Remove the E-seal [35] from the top duct flange of the precooler [6].

SUBTASK 36-12-01-020-015

- (6) Do these steps to disconnect the links from the aft precooler clevises (Figure 203):

CAUTION: BE CAREFUL WHEN YOU REMOVE DISCONNECT THE LINKS FROM THE AFT PRECOOLER CLEVISES. DO NOT LET THE PRECOOLER MOVE SUDDENLY. USE PADDING OR OTHER SATISFACTORY MATERIAL TO TEMPORARILY HOLD THE PRECOOLER IN POSITION. DAMAGE TO EQUIPMENT CAN OCCUR.

- (a) Install temporary padding support or other satisfactory material in place to hold the precooler in position in preparation for the links to be disconnected.
- (b) Remove the bolts [65], the washers [64], the bushings [63], the washers [62] and the nuts [61] that attach the links to the aft precooler clevises.
- (c) Keep the links attached to the strut and lower the opposite ends until they touch the engine case.

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SUBTASK 36-12-01-820-001

CAUTION: AS YOU MOVE THE PRECOOLER, MAKE SURE THAT IT DOES NOT HIT ENGINE COMPONENTS. IF IT DOES, REMOVE OR RELOCATE THE SPECIFIC COMPONENT. DAMAGE TO EQUIPMENT CAN OCCUR.

(7) Do these steps to move the precooler [6]:

NOTE: Use two persons to move the precooler.

- (a) As you hold the precooler [6], remove the temporary padding support.
- (b) Slowly let the precooler [6] move about the top clevis axis.

NOTE: The precooler should turn approximately 45 degrees.

- (c) Install temporary padding support or other satisfactory material to hold the precooler [6] in position.

————— **END OF TASK** —————

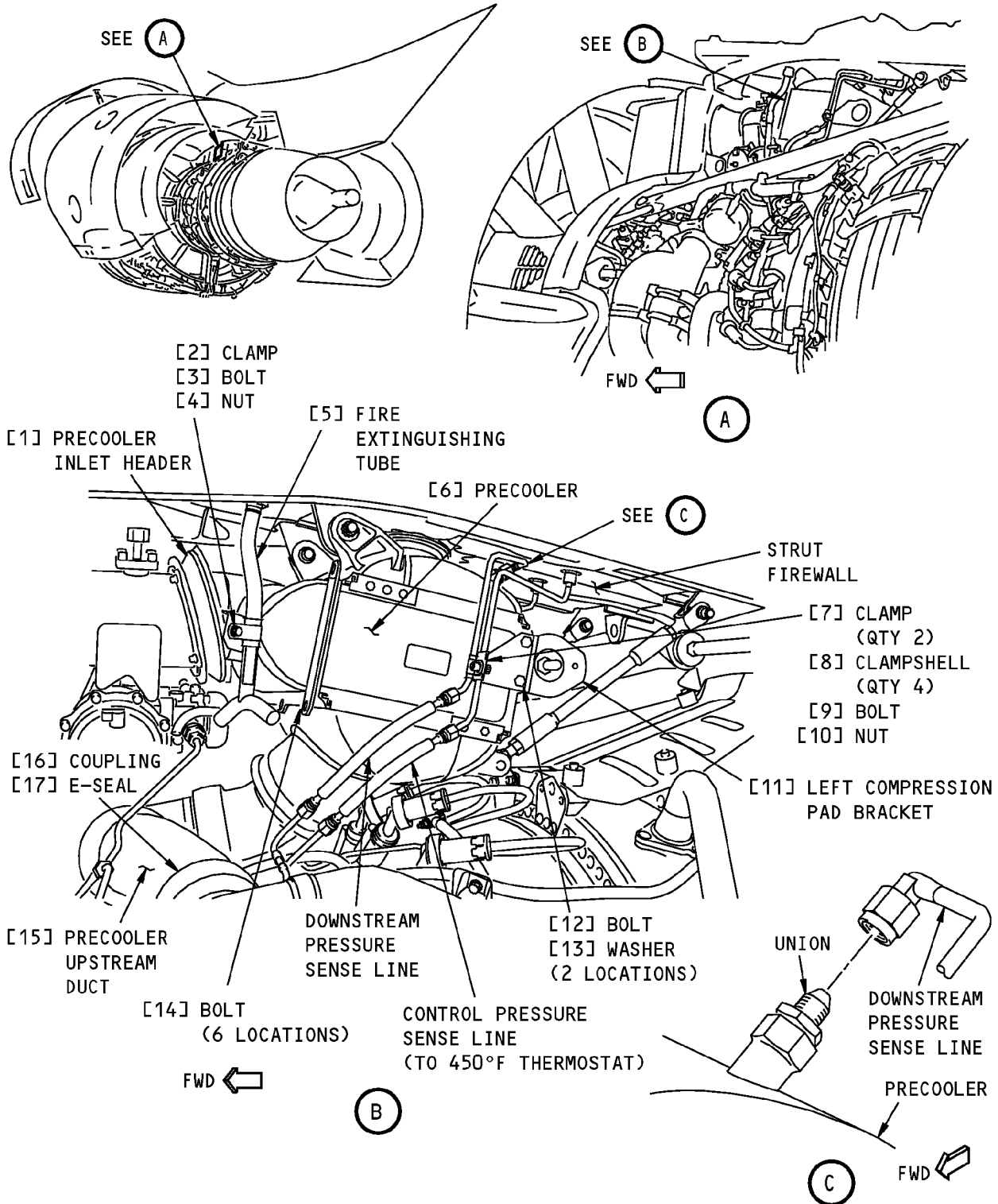
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**Precooler Maintenance Practices (left Side Connections)
Figure 201/36-12-01-990-801**

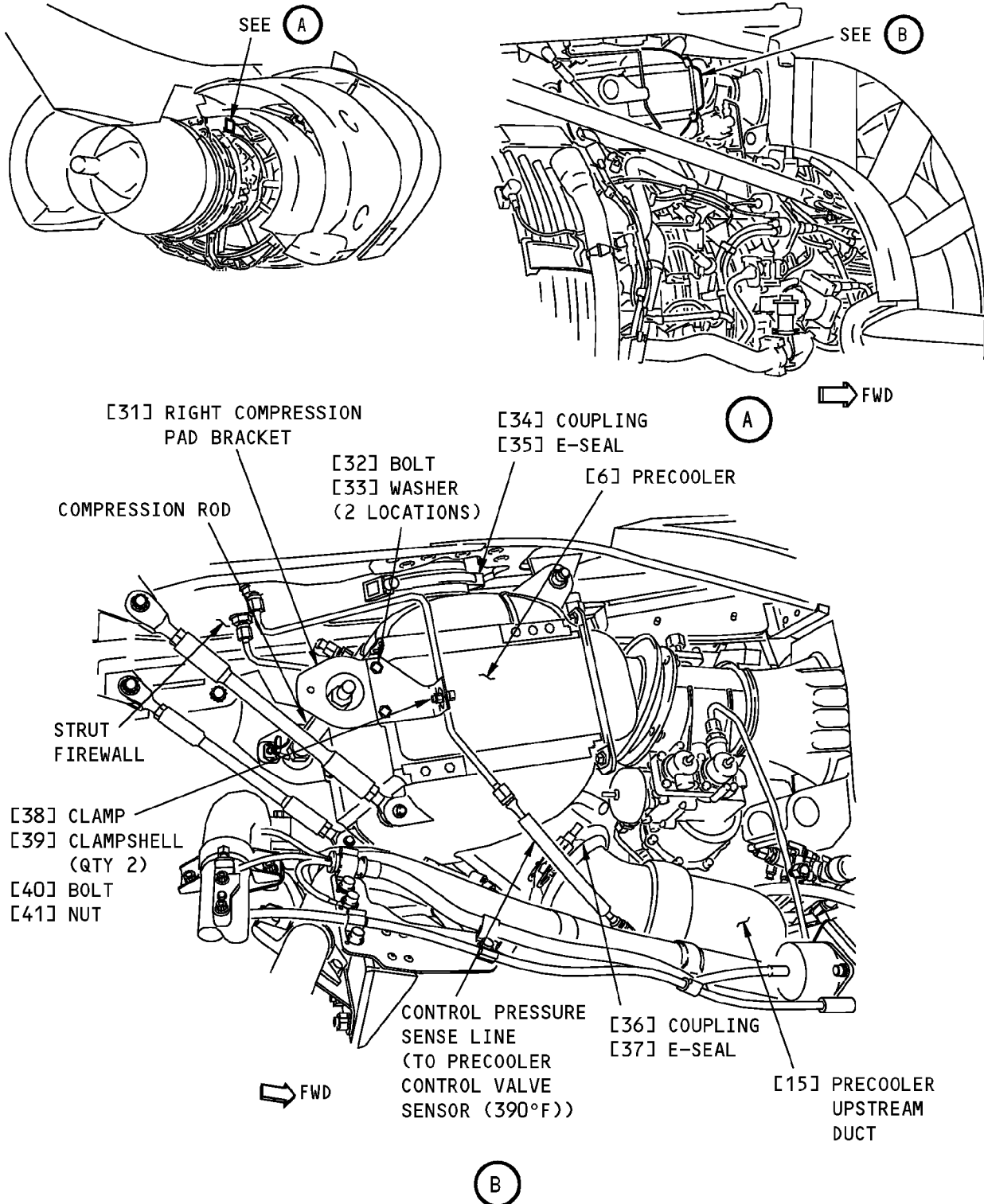
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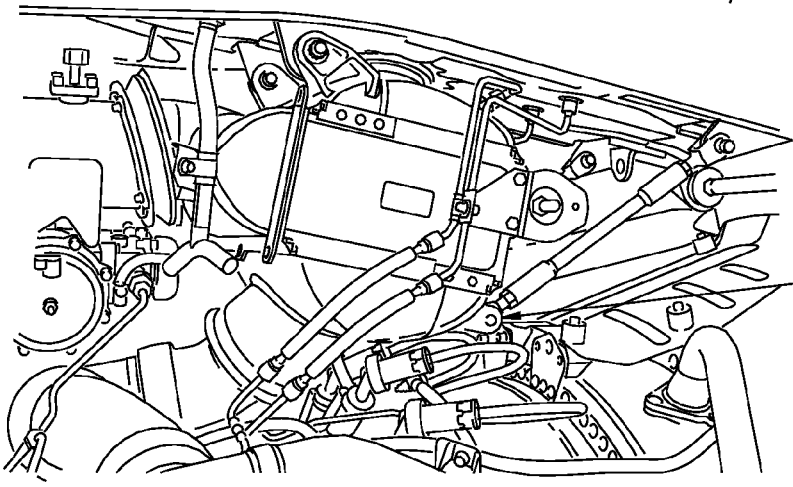
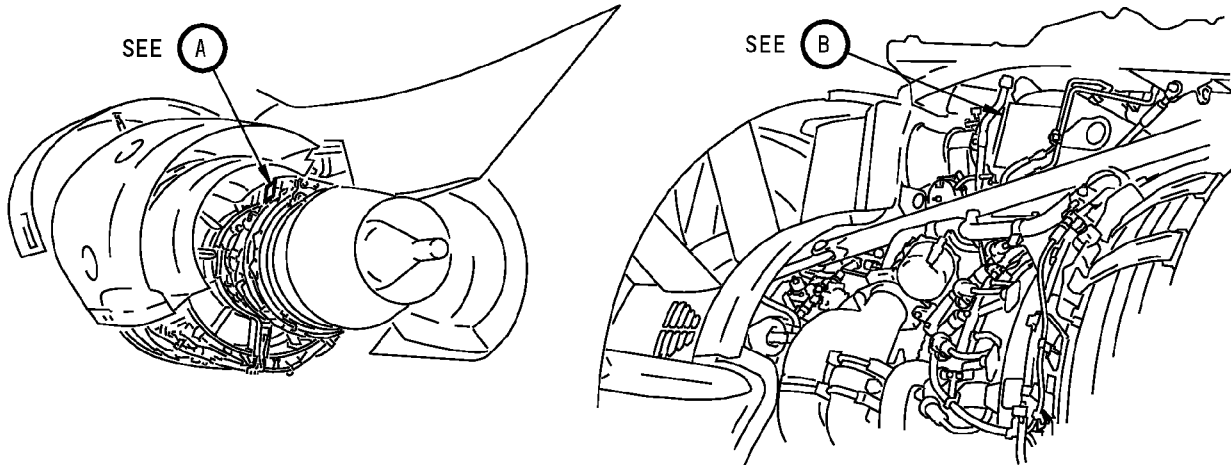


Precooler Maintenance Practices (Right Side Connections)
Figure 202/36-12-01-990-802

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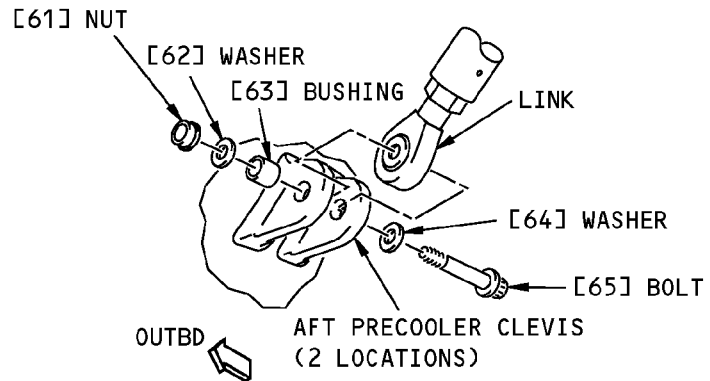
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(A) FWD ←

FWD ← (B)



NOTE: LEFT SIDE INSTALLATION IS SHOWN,
RIGHT SIDE INSTALLATION IS OPPOSITE.

**Precooler Maintenance Practices
Figure 203/36-12-01-990-803**

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TASK 36-12-01-400-801

3. Bleed Air Precooler Reconnection (After Engine Component Installation)

(Figure 201, Figure 202, Figure 203)

A. General

(1) For this procedure the bleed air precooler will be referred to as the precooler.

B. References

Reference	Title
36-12-02-400-801	Precooler Control Valve Installation (P/B 401)
70-30-01-910-802-F00	Seals (Preformed Packings and O-Rings) and Gaskets (P/B 201)

C. Tools/Equipment

Reference	Description
STD-3906	Mallet - Rubber

D. Consumable Materials

Reference	Description	Specification
D00010	Compound - Thread Antiseize, High Temperature	MIL-PRF-907F

E. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine
430	Subzone - Engine 1, Nacelle Strut
440	Subzone - Engine 2, Nacelle Strut

F. Reconnect the Precooler

SUBTASK 36-12-01-910-001

(1) If installed, remove the protective caps from the pneumatic ducts.

SUBTASK 36-12-01-840-001

(2) Do these steps to prepare the precooler [6] for the installation:

(a) Examine the E-seals [17] and [35] and [37] for cracks, dents or other damage, do this task: Seals (Preformed Packings and O-Rings) and Gaskets, TASK 70-30-01-910-802-F00.

1) Replace all damaged E-seals.

(b) Make sure the flanges to the precooler [6], precooler upstream duct [15], PRSOV and strut pneumatic duct are clean and in good condition.

SUBTASK 36-12-01-420-001

(3) Install E-seals at these locations:

(a) Install the E-seal [35] at the top duct flange of the precooler [6].

(b) Install the E-seal [37] at the top duct flange of the precooler upstream duct [15].

(c) Install the E-seal [17] at the top duct flange of the PRSOV.

SUBTASK 36-12-01-820-002

(4) Do these steps to put the precooler [6] in its correct position:

NOTE: Use two persons to move the precooler.

(a) As you hold the precooler [6], remove the temporary padding support.

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- (b) Slowly let the precooler [6] turn about its top clevis axis until the strut pneumatic duct flange is aligned with the top duct flange of the precooler [6].
- (c) Install, but do not tighten the coupling [34] between the precooler [6] and the strut pneumatic duct.

NOTE: This will hold the precooler [6] in this position and make the installation of the links easier.

NOTE: These flanges are keyed. The coupling [34] can only be installed in one position. The keys are found at the 6 and 12 o'clock positions.

SUBTASK 36-12-01-420-004

- (5) Do these steps to attach the precooler [6] to the strut (Figure 203):
 - (a) Lubricate the threads of the bolts [65] with compound, D00010.
 - (b) Attach the two links to the aft precooler clevises with the bolts [65], washers [64], bushings [63], washers [62] and nuts [61].

NOTE: Make sure the countersunk side of the washer [64] faces the bolt head.

SUBTASK 36-12-01-420-005

- (6) Attach the precooler inlet header [1] to the forward side of the precooler [6] with the six bolts [14] (Figure 201).
 - (a) Lubricate the threads of the bolts [14] with compound, D00010.

SUBTASK 36-12-01-420-006

CAUTION: USE TWO WRENCHES TO TIGHTEN THE TUBE COUPLING NUT. USE ONE TO HOLD THE NIPPLE, AND THE OTHER TO TIGHTEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBE AND NIPPLE CAN OCCUR.

- (7) Install the connections to the left side of the precooler [6] as follows (Figure 201):
 - (a) Install the two bolts [12] and washers [13] to attach the left compression pad bracket [11] to the precooler [6].

NOTE: Make sure the compression rod for the thrust reverser is correctly installed.
 - (b) Do these steps to connect the downstream pressure sense line and the control pressure sense line to the precooler [6]:
 - 1) Connect the downstream pressure sense tube to the union at the top of the precooler [6].
 - 2) Connect the control pressure sense tube (to 450°F thermostat) to the fitting at the strut firewall.
 - 3) Connect the downstream pressure sense line and the control pressure sense line (to 450°F thermostat) below their hose assemblies on the engine core case.
 - 4) Attach both sense tubes to the left compression pad bracket [11] with the clamps [7], clampshells [8], bolt [9] and nut [10].
 - 5) Make sure there is a minimum clearance between the control pressure sense line (to 450°F thermostat) and the precooler [6] of 0.10 in. (2.5 mm).
 - 6) Make sure there is a minimum clearance between the downstream pressure sense line and the precooler [6] of 0.06 in. (1.5 mm).
 - (c) Do these steps to connect the fire extinguishing tube [5] to the precooler [6]:
 - 1) Connect the fire extinguishing tube [5] to the strut firewall.

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- 2) Attach the fire extinguishing tube [5] to the precooler [6] with the clamp [2], bolt [3] and nut [4].

SUBTASK 36-12-01-420-007

CAUTION: USE TWO WRENCHES TO TIGHTEN THE TUBE COUPLING NUT. USE ONE TO HOLD THE NIPPLE, AND THE OTHER TO TIGHTEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBE AND NIPPLE CAN OCCUR.

- (8) Install the connections to the right side of the precooler [6] as follows (Figure 202):
 - (a) Install the two bolts [32] and washers [33] to attach the right compression pad bracket [31] to the precooler [6].

NOTE: Make sure the compression rod is correctly engaged in the two compression pad brackets.

- (b) Do these steps to connect the control pressure sense line (to precooler control valve sensor (390°F)):
 - 1) Attach the control pressure sense tube to the right compression pad bracket [31] with the clamp [38], clampshells [39], bolt [40] and nut [41].
 - 2) Make sure there is a minimum clearance between the sense line and the precooler [6] of 0.10 in. (2.5 mm).
- (c) Tighten the coupling [34] at the top of the precooler [6] as follows:
 - 1) Tighten the coupling [34] to the torque given on the part.
 - 2) Lightly tap the outer diameter of the coupling [34] with a rubber mallet, STD-3906.
 - 3) Tighten the coupling [34] again to the torque given on the part.
- (d) Install the precooler upstream duct [15] between the precooler [6] and the PRSOV.
 - 1) Install the coupling [36] between the precooler [6] and the precooler upstream duct [15].
 - 2) Install the coupling [16] between the PRSOV and the precooler upstream duct [15].
 - 3) Tighten the couplings [16] and [36] to the torque given on the part.
 - 4) Lightly tap the outer diameter of the couplings with a rubber mallet, STD-3906.
 - 5) Tighten the couplings [16] and [36] again to the torque given on the part.

SUBTASK 36-12-01-410-001

- (9) Do this task: Precooler Control Valve Installation, TASK 36-12-02-400-801.

————— **END OF TASK** —————

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BLEED AIR PRECOOLER - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

- (1) Precooler removal
- (2) Precooler installation.

B. The precooler is found at the 12 o'clock position on the engine core area and immediately aft of the precooler control valve.

TASK 36-12-01-000-801

2. Bleed Air Precooler Removal

(Figure 401, Figure 402, Figure 403)

A. General

- (1) To remove the bleed air precooler, obey these steps:
 - (a) It is not necessary to remove the powerplant.
 - (b) Open the outboard thrust reverser to the 65-degree extended maintenance position.
 - (c) Always remove the bleed air precooler from the outboard side of the powerplant.
- (2) For this procedure the bleed air precooler will be referred to as the precooler.

B. References

Reference	Title
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)
71-21-02-000-801-F00	Thrust Link Assembly Removal (P/B 401)
78-31-00-000-803-F00	Open the Thrust Reverser (65-Degree Maintenance Position) (P/B 201)

C. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine
430	Subzone - Engine 1, Nacelle Strut
440	Subzone - Engine 2, Nacelle Strut

D. Prepare to Remove the Precooler

SUBTASK 36-12-01-860-005

WARNING: YOU MUST REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. IF YOU DO NOT REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS, HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Make sure that there is no pressure in the pneumatic system. If there is pressure in the pneumatic system, do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 36-12-01-860-002

- (2) Make sure the applicable engine start lever is in the CUTOFF position.
 - (a) Install a DO-NOT-OPERATE tag on the applicable engine start lever.

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SUBTASK 36-12-01-010-002

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSERS: RETRACT THE LEADING EDGE, DEACTIVATE THE LEADING EDGE, DEACTIVATE THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANEL. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (3) Do this task: Open the Thrust Reverser (65-Degree Maintenance Position), TASK 78-31-00-000-803-F00.

SUBTASK 36-12-01-010-003

- (4) Remove the outboard thrust link. To remove the outboard thrust link, do this task: Thrust Link Assembly Removal, TASK 71-21-02-000-801-F00.

NOTE: To remove the precooler from the No. 1 engine, remove the left thrust link. To remove the precooler from the No. 2 engine, remove the right thrust link.

E. Remove the Precooler

SUBTASK 36-12-01-020-006

CAUTION: USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUT. USE ONE TO HOLD THE NIPPLE, AND THE OTHER TO LOOSEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBE AND NIPPLE CAN OCCUR.

- (1) Remove the disconnects from the left side of the engine as follows (Figure 401):
- (a) Do these steps to disconnect the fire extinguishing tube [5] from the precooler [6]:
- 1) Remove the clamp [2], the bolt [3], and the nut [4] that attach the fire extinguishing tube [5] to the precooler [6].
 - 2) Disconnect the fire extinguishing tube [5] at the strut firewall.
 - 3) Remove the fire extinguishing tube [5].
 - 4) Install protective covers on the open connections.
- (b) Do these steps to disconnect the downstream pressure sense line and the control pressure sense line:

NOTE: To make the removal easier, keep the sense lines attached to the left compression pad bracket.

- 1) Disconnect the downstream pressure sense line from the union [13] at the top of the precooler [6].
- 2) Disconnect the control pressure sense tube (to 450°F thermostat) from the fitting at the strut firewall.
- 3) Disconnect the downstream pressure sense line and the control pressure sense line (to 450°F thermostat) below their hose assemblies on the engine core case.
- 4) Remove the two bolts [7] and washers [8] that attach the left compression pad bracket [9] and sense lines to the precooler [6].

NOTE: To make the removal easier, keep the sense lines attached to the left compression pad bracket.

- a) If attached, keep the compression rod [31] for the thrust reverser with the left compression pad bracket [9].
- 5) Install protective covers on the open connections.

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SUBTASK 36-12-01-020-007

CAUTION: USE TWO WRENCHES TO LOOSEN THE TUBE COUPLING NUTS. USE ONE TO HOLD THE NIPPLE, AND THE OTHER TO LOOSEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBE AND NIPPLE CAN OCCUR.

(2) Remove these disconnects from the right side of the engine as follows (Figure 402):

- (a) Do these steps to disconnect the control pressure sense line (to precooler control valve sensor (390°F)):

NOTE: Do not disconnect this sense line from the right compression pad bracket.

- 1) Disconnect the control pressure sense line (to precooler control valve sensor (390°F)) at the strut firewall and below its hose assembly on the engine core case.
- 2) Remove the two bolts [33] and washers [34] that attach the right compression pad bracket [32] and sense line to the precooler [6].

NOTE: To make the removal easier, keep the sense line attached to the right compression pad bracket.

NOTE: If attached, keep the compression rod [31] for the thrust reverser with the right compression pad bracket [32].

- 3) Install protective covers on the open connections.

SUBTASK 36-12-01-020-008

(3) Do these steps to remove the precooler upstream duct [15]:

- (a) Remove the coupling [38] that attaches the precooler [6] from the precooler upstream duct [15].
- (b) Remove the coupling [11] that attaches the precooler upstream duct [15] to the PRSOV.
- (c) Remove the precooler upstream duct [15].
- (d) Remove the E-seal [12] from the top flange of the PRSOV.
- (e) Remove the E-seal [39] from the top flange of the precooler upstream duct [15].
- (f) Install protective covers on the open duct sections.

SUBTASK 36-12-01-010-004

(4) Do these steps to disconnect the precooler inlet header [1] (Figure 401):

- (a) Remove the six bolts [10] that attach the precooler inlet header [1] to the precooler [6].
- (b) Remove the precooler inlet header [1].

SUBTASK 36-12-01-020-016

(5) Remove the coupling [35] (Figure 402).

- (a) Remove the E-seal [36] from the top duct flange.

SUBTASK 36-12-01-020-009

(6) Do these steps to disconnect the precooler from the strut (Figure 403):

CAUTION: MAKE SURE YOU GIVE SUPPORT TO THE PRECOOLER BEFORE YOU REMOVE THE FOUR BOLTS. IF YOU DO NOT GIVE SUPPORT, THE PRECOOLER COULD SUDDENLY MOVE AND HIT THE ENGINE. DAMAGE TO EQUIPMENT CAN OCCUR.

- (a) Put support on the top of the engine core case before you remove the two bolts [51] and [60].
- (b) Remove the bolts [60], the washers [59], the bushings [58], the washers [57] and the nuts [56] that attach the links to the aft precooler clevises.

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- (c) Keep the links attached to the strut and lower the opposite ends until they touch the engine case.
- (d) Remove the bolts [51], the washers [55], the bushings [54], the washers [53] and the nuts [52] that attach the two forward precooler clevises to the strut attach points.

SUBTASK 36-12-01-020-010

WARNING: THE PRECOOLER WEIGHS APPROXIMATELY 56 POUNDS. MAKE SURE YOU USE A SUFFICIENT NUMBERS OF PERSONS TO REMOVE THE PRECOOLER.

- (7) Do these steps to remove the precooler [6]:

NOTE: Use a minimum of two persons to remove the precooler.

- (a) Move the precooler [6] forward approximately 1 in. (25 mm).
- (b) Turn the precooler [6] about the top clevis axis until the cool air exhaust at the rear of the precooler faces down.

NOTE: As you turn the precooler, make sure there is sufficient clearance with the 12 o'clock fuel nozzle.

- (c) Turn the precooler [6] about the centerline of the engine (in the outboard direction) until it is free of the thrust reverser.
- (d) Remove the precooler [6] from the outboard side of the engine.

SUBTASK 36-12-01-020-012

- (8) If the union [13] is not installed on the new precooler [6], remove the union [13] (Figure 401).

SUBTASK 36-12-01-910-002

- (9) If you will not immediately install a new precooler, make sure protective covers are installed on all open connections.

————— END OF TASK —————

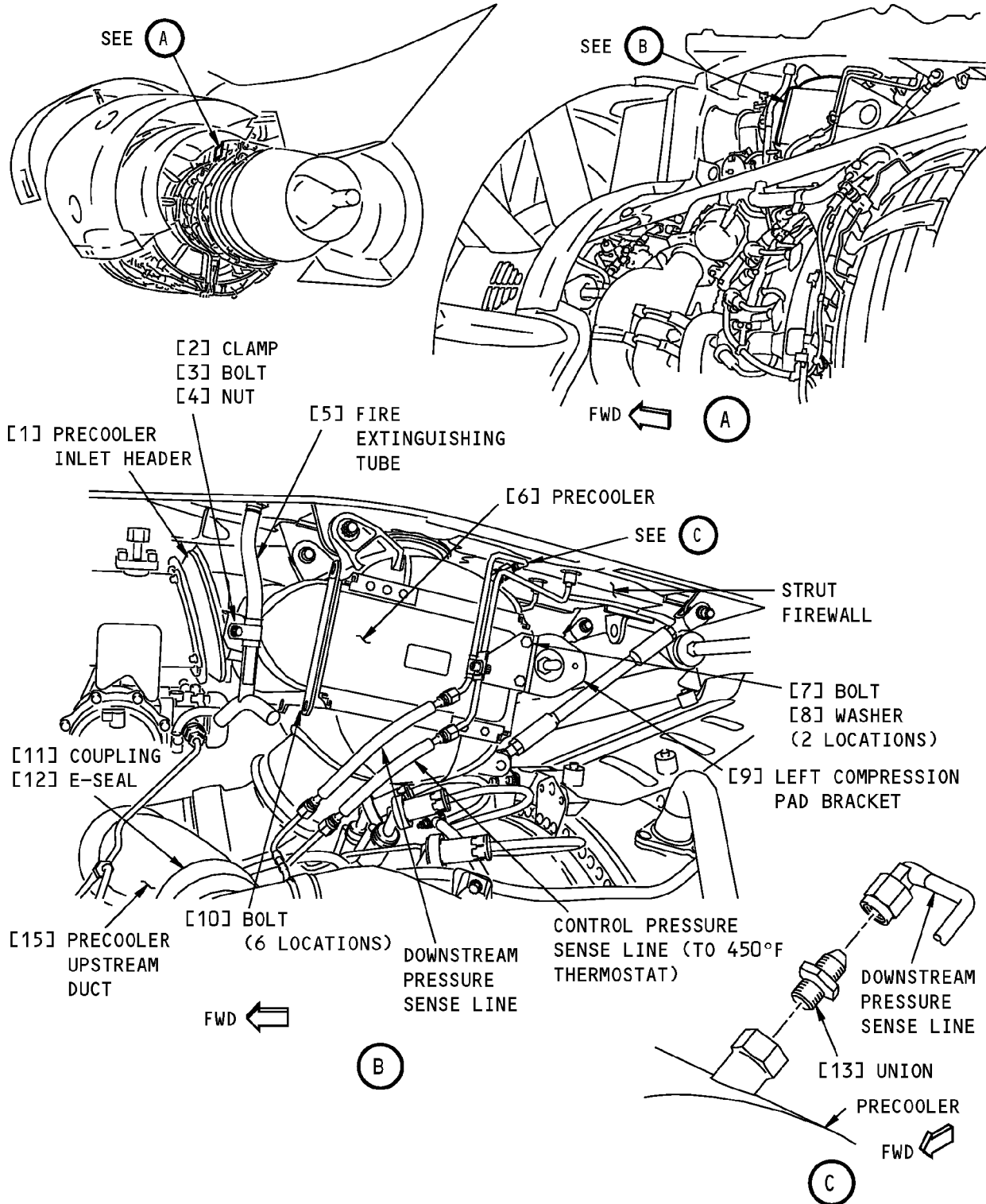
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**Precooler (Left Side Connections) Installation
Figure 401/36-12-01-990-804**

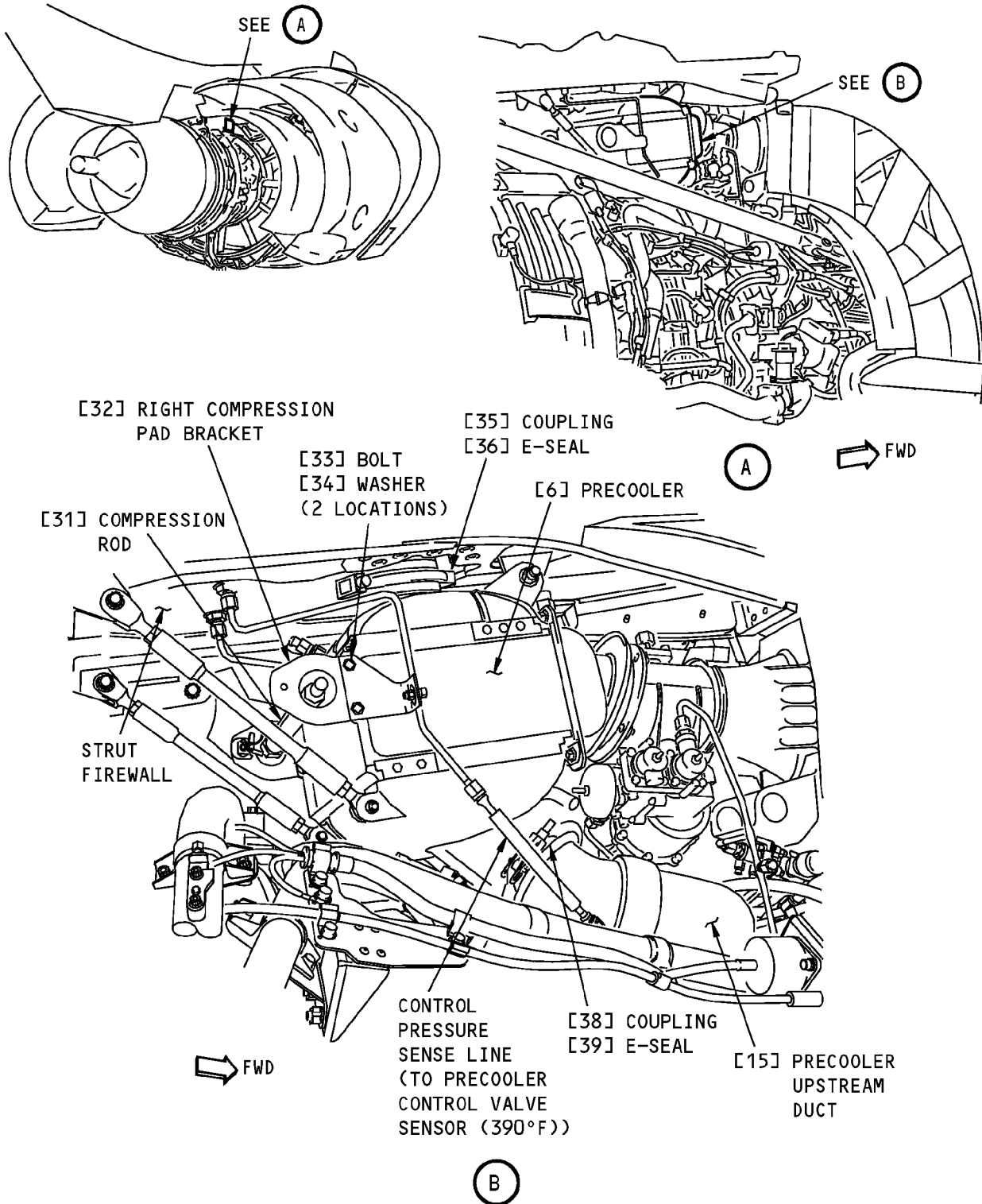
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Pre-cooler (Right Side Connections) Installation
Figure 402/36-12-01-990-805

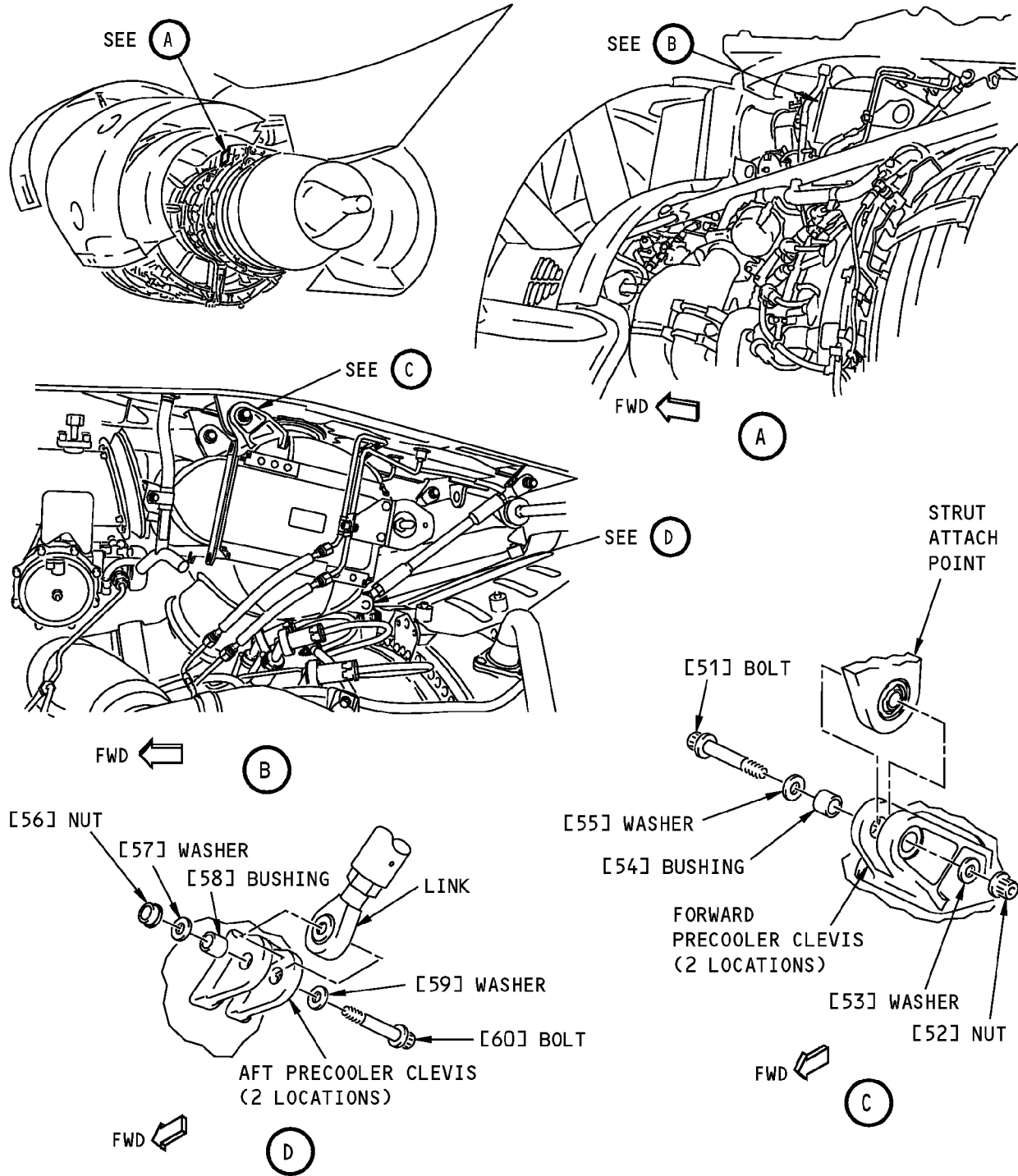
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NOTE: LEFT SIDE INSTALLATIONS ARE SHOWN,
RIGHT SIDE INSTALLATIONS ARE OPPOSITE.

**Precooler Installation
Figure 403/36-12-01-990-806**

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TASK 36-12-01-400-802

3. Bleed Air Precooler Installation

(Figure 401, Figure 402, Figure 403)

A. General

- (1) To install the bleed air precooler, obey these steps:
 - (a) It is not necessary to remove the powerplant.
 - (b) Make sure the outboard thrust reverser is open to the 65-degree extended maintenance position.
 - (c) Always install the bleed air precooler from the outboard side of the powerplant.
- (2) For this procedure the bleed air precooler will be referred to as the precooler.

B. References

Reference	Title
70-30-01-910-802-F00	Seals (Preformed Packings and O-Rings) and Gaskets (P/B 201)
71-21-02-400-801-F00	Thrust Link Assembly Installation (P/B 401)
78-31-00-410-804-F00	Close the Thrust Reverser (65-Degree Maintenance Position) (P/B 201)

C. Tools/Equipment

Reference	Description
STD-3906	Mallet - Rubber

D. Consumable Materials

Reference	Description	Specification
D00010	Compound - Thread Antiseize, High Temperature	MIL-PRF-907F
G01048	Lockwire - Corrosion Resistant Steel (0.032 In. Dia.)	NASM20995~C32

E. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
6	Precooler	36-12-01-01-230	HAP 001-007
		36-12-01-02-205	HAP 008-013, 015-026, 028-054, 101-999

F. Location Zones

Zone	Area
411	Engine 1 - Engine
421	Engine 2 - Engine
430	Subzone - Engine 1, Nacelle Strut
440	Subzone - Engine 2, Nacelle Strut

G. Install the Precooler

SUBTASK 36-12-01-910-003

- (1) If installed, remove the protective covers from the pneumatic ducts.

SUBTASK 36-12-01-840-002

- (2) Do these steps to prepare the precooler [6] for the installation:

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- (a) Examine the E-seals [12], [36] and [39] for cracks, dents or other damage. To examine the E-seals, do this task: Seals (Preformed Packings and O-Rings) and Gaskets, TASK 70-30-01-910-802-F00.
 - 1) Replace all damaged E-seals.
- (b) Make sure the flanges of the precooler [6], precooler upstream duct [15], PRSOV and strut pneumatic duct are clean and in good condition.

SUBTASK 36-12-01-420-008

- (3) If the new precooler [6] does not have a union [13] installed, install a union [13] on the top port (Figure 401).

SUBTASK 36-12-01-420-009

- (4) Install E-seals at these locations:
 - (a) Install the E-seal [36] at the top duct flange of the precooler [6] (Figure 402).
 - (b) Install the E-seal [39] at the top duct flange of the precooler upstream duct [15].
 - (c) Install the E-seal [12] at the top flange of the PRSOV (Figure 401).

SUBTASK 36-12-01-420-010

WARNING: THE PRECOOLER WEIGHS APPROXIMATELY 56 POUNDS. MAKE SURE YOU USE A SUFFICIENT NUMBER OF PERSONS TO INSTALL THE PRECOOLER. INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (5) Do these steps to install the precooler [6] (Figure 403):

NOTE: Use a minimum of two persons to install the precooler. Make sure at least one persons is on each side of the engine.

- (a) Turn the precooler [6] so that the cool air exhaust at the rear of the precooler faces down.
- (b) While you keep the above position, install the precooler [6] above the engine core case and slightly forward of the strut attach points.
- (c) Turn the precooler [6] about the top clevis axis until the cool air exhaust faces rearward.

NOTE: As you turn the precooler, make sure it does not hit the 12 o'clock fuel nozzle.

- (d) Move the precooler [6] rearward approximately 1 in. (25 mm) until the two forward precooler clevises are aligned with the strut attach points.

CAUTION: MAKE SURE YOU GIVE SUPPORT TO THE PRECOOLER. IF YOU DO NOT GIVE SUPPORT, THE PRECOOLER CAN DROP AND HIT THE ENGINE. DAMAGE TO EQUIPMENT CAN OCCUR.

- (e) Put a temporary support on top of the engine core case.

SUBTASK 36-12-01-420-011

- (6) Install, but do not tighten the coupling [35] that attaches the precooler to the strut (Figure 402).

NOTE: The flanges are keyed. The coupling [35] can only be installed in one position. The keys are found at the 6 and 12 o'clock positions on the flange.

SUBTASK 36-12-01-420-012

- (7) Do these steps to attach the precooler [6] to the strut (Figure 403):

- (a) Lubricate the threads of the bolts [51] and [60] with compound, D00010.
- (b) Install the bolts [51], washers [55], bushings [54], washers [53] and nuts [52] to attach the two forward precooler clevises to the strut attach points.

NOTE: Make sure the countersunk side of the washers [55] faces the bolt head.

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- (c) Attach the two links to the aft precooler clevises with the bolts [60], washers [59], bushings [58], washers [57] and nuts [56].

NOTE: Make sure the countersunk side of the washers [59] faces the bolt head.

- 1) If it is necessary, you can adjust the length of the links as follows:
 - a) Loosen the jamnut to free the rod end bearing and adjust the length.
 - b) After the link has been adjusted correctly, tighten the jamnut again.
 - c) Apply a lockwire, G01048 to the links.

- (d) Remove the temporary support from the engine core case.

SUBTASK 36-12-01-420-013

CAUTION: USE TWO WRENCHES TO TIGHTEN THE TUBE COUPLING NUT. USE ONE TO HOLD THE NIPPLE, AND THE OTHER TO TIGHTEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBE AND NIPPLE CAN OCCUR.

- (8) Install the connections to the right side of the precooler [6] as follows (Figure 402):

- (a) Do these steps to connect the control pressure sense line (to precooler control valve sensor (390°F)):

- 1) Connect the control pressure sense tube (to precooler control valve sensor (390°F)) to the tube fitting at the strut firewall.
- 2) Attach the right compression rod bracket [32], with the control pressure sense tube (to precooler control valve sensor (390°F)) attached, to the precooler [6] with the two bolts [33] and washers [34].
- 3) Connect the control pressure sense line (to precooler control valve sensor (390°F)) below its hose assembly on the engine core case.
- 4) Make sure there is a minimum clearance between the sense line and the precooler [6] of 0.10 in. (2.5 mm).

- (b) Attach the coupling [35] at the top of the precooler [6] as follows:

- 1) Tighten the coupling [35] to the torque given on the part.
- 2) Lightly tap the outer diameter of the coupling with a rubber mallet, STD-3906.
- 3) Tighten the coupling [35] again to the torque given on the part.

SUBTASK 36-12-01-420-014

CAUTION: USE TWO WRENCHES TO TIGHTEN THE TUBE COUPLING NUT. USE ONE TO HOLD THE NIPPLE, AND THE OTHER TO TIGHTEN THE COUPLING NUT. IF YOU DO NOT USE TWO WRENCHES, DAMAGE TO THE TUBE AND NIPPLE CAN OCCUR.

- (9) Install the connections to the left side of the precooler [6] as follows (Figure 401):

- (a) Do these steps to connect the downstream pressure sense line and the control pressure sense line (to 450°F thermostat):

- 1) Connect the downstream pressure sense line to the union [13] at the top of the precooler [6].
- 2) Connect the control pressure sense line (to 450°F thermostat) to the fitting at strut firewall.
- 3) Connect the downstream pressure sense line and the control pressure sense line (to 450°F thermostat) below their hose assemblies on the engine core case.

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- 4) Attach the left compression pad bracket [9], with the downstream pressure sense line and control pressure sense line (to 450°F thermostat) attached, to the precooler [6] with the two bolts [7] and washers [8].
 - 5) Make sure there is a minimum clearance between the control pressure sense line (to 450°F thermostat) and the precooler [6] of 0.10 in. (2.5 mm).
 - 6) Make sure there is a minimum clearance between the downstream pressure sense line and the precooler [6] of 0.06 in. (1.5 mm).
- (b) Do these steps to connect the fire extinguishing tube [5]:
- 1) Connect the fire extinguishing tube [5] to the strut firewall.
 - 2) Attach the fire extinguishing tube [5] with the clamp [2], the bolt [3], the the nut [4].

SUBTASK 36-12-01-420-016

- (10) Attach the precooler inlet header [1] to the forward side of the precooler [6] with the six bolts [10] (Figure 401).
- (a) Lubricate the threads of the bolts [10] with compound, D00010.

SUBTASK 36-12-01-420-015

- (11) Do these steps to install the precooler upstream engine duct [15]:
- (a) Attach the coupling [38] between the precooler [6] and the precooler upstream duct [15].
 - (b) Install the coupling [11] between the PRSOV and the precooler upstream duct [15].
 - (c) Tighten the coupling [11] and the coupling [38] to the torque given on the part.
 - (d) Lightly tap the outer diameter of the couplings with a rubber mallet, STD-3906.
 - (e) Tighten the coupling [11] and the coupling [38] again to the torque given on the part.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 36-12-01-410-002

- (1) Install the outboard thrust link. To install the outboard thrust link, do this task: Thrust Link Assembly Installation, TASK 71-21-02-400-801-F00.

SUBTASK 36-12-01-010-006

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.

- (2) Do this task: Close the Thrust Reverser (65-Degree Maintenance Position), TASK 78-31-00-410-804-F00.

SUBTASK 36-12-01-440-001

- (3) Remove the DO-NOT-OPERATE tag from the applicable engine start lever.

————— **END OF TASK** —————

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PRECOOLER CONTROL VALVE - REMOVAL/INSTALLATION

1. General

A. This procedure has these tasks:

- (1) The removal of the precooler control valve
(2) The installation of the precooler control valve.

B. The precooler control valve is found forward of the precooler, at the 12 o'clock position on the engine.

TASK 36-12-02-000-801

2. Precooler Control Valve Removal

(Figure 401)

A. References

Table with 2 columns: Reference, Title. Rows include 36-00-00-860-806 (Remove Pressure from the Pneumatic System) and 78-31-00-010-801-F00 (Open the Thrust Reverser).

B. Location Zones

Table with 2 columns: Zone, Area. Rows include 411 (Engine 1 - Engine) and 421 (Engine 2 - Engine).

C. Prepare to Remove the Precooler Control Valve

SUBTASK 36-12-02-860-001

- (1) Make sure each engine start lever is in the CUTOFF position.
(a) Install a DO-NOT-OPERATE tag on the each engine start lever.

SUBTASK 36-12-02-860-002

WARNING: YOU MUST REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. IF YOU DO NOT REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS, HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (2) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 36-12-02-010-001

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSERS: RETRACT THE LEADING EDGE, DEACTIVATE THE LEADING EDGE, DEACTIVATE THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANEL. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

- (3) Do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

D. Remove the Precooler Control Valve

SUBTASK 36-12-02-020-001

- (1) Disconnect the control pressure sense line [13] from the right side of the precooler control valve [2].

Effectivity table with HAP ALL and D633A101-HAP entries.

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SUBTASK 36-12-02-020-002

- (2) Disconnect the supply pressure sense line [5] installed between the bleed air regulator [7], intersection manifold duct [6] and precooler control valve [2] on the left side of the engine.

NOTE: Removal of this sense line will make the removal and installation of the precooler control valve [2] easier.

SUBTASK 36-12-02-020-003

- (3) Do these steps to remove the precooler control valve [2] from the engine:

NOTE: To make the removal easier, remove the precooler control valve [2] from the left side of the engine.

- (a) Remove the coupling [11] at the forward end of the precooler control valve [2].
- (b) Push the precooler control valve [2] aft slightly to compress the "kiss" seal [17] and disengage the duct flanges.
- (c) Move the precooler control valve [2] toward you until it touches the thrust link.
- (d) Turn the precooler control valve [2] until the aft flange faces down.
- (e) Pull the precooler control valve [2] out between the engine and the thrust reverser.

SUBTASK 36-12-02-020-004

- (4) Remove the seal [12] from the aft flange of the 12 o'clock strut [1].
 - (a) Keep the seal [12] for the installation.

SUBTASK 36-12-02-020-005

- (5) Do these steps to remove the "kiss" seal [17]:
 - (a) Remove the four bolts [8] and nuts [9] that attach the "kiss" seal [17] to the aft flange of the precooler control valve [2].
 - (b) Remove the "kiss" seal [17] and keep it for the installation.

SUBTASK 36-12-02-020-006

- (6) Remove the union [3] and the union [14] from the precooler control valve [2] and keep them for the installation.
 - (a) Discard the O-ring [4] and the O-ring [15] from the union [3] and the union [14], respectively.

SUBTASK 36-12-02-020-007

- (7) Install protective covers on the open connections (sense lines, tubes, and ducts).

————— **END OF TASK** —————

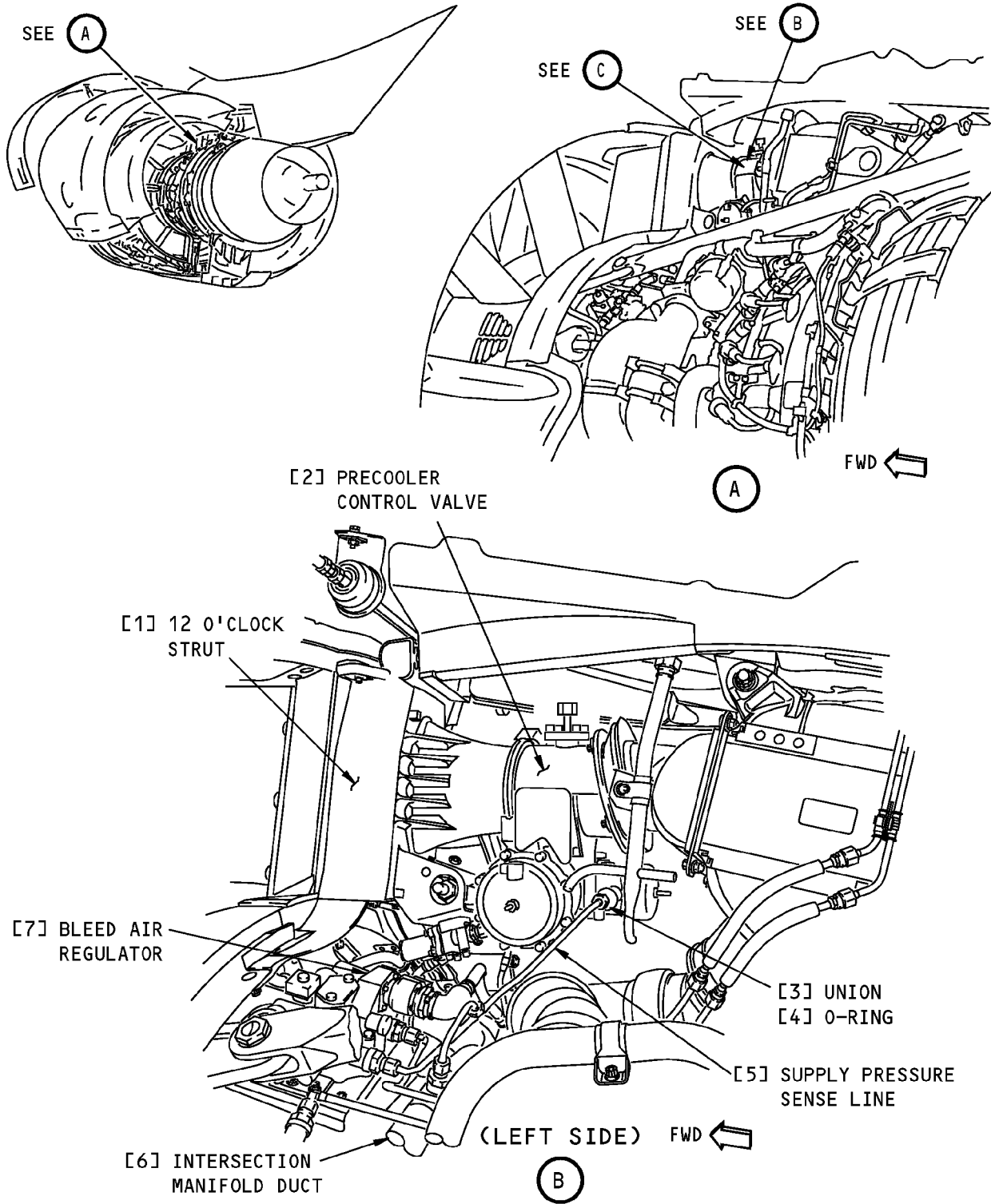
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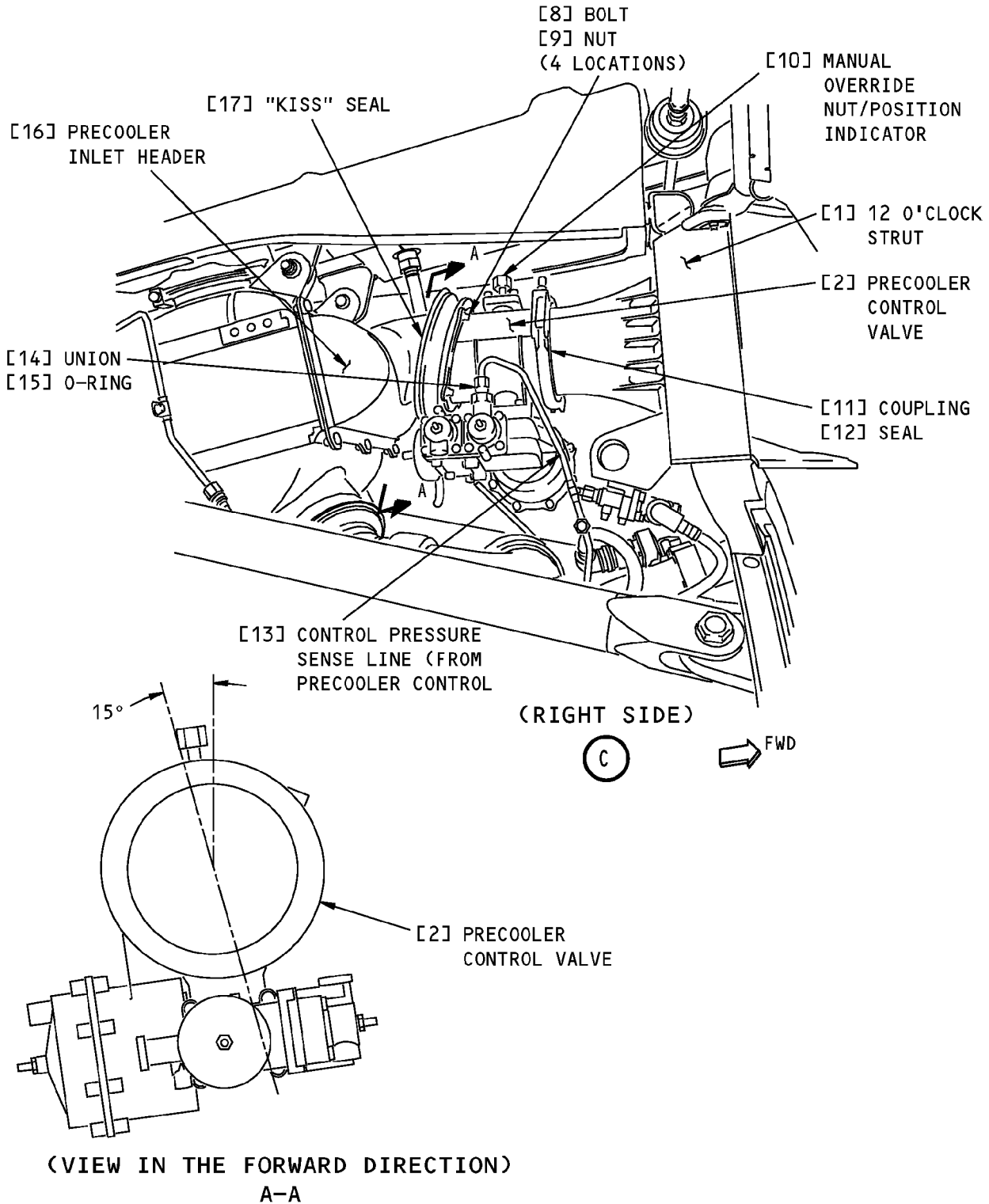


Precooler Control Valve Installation
Figure 401 (Sheet 1 of 2)/36-12-02-990-802

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Pre-cooler Control Valve Installation
Figure 401 (Sheet 2 of 2)/36-12-02-990-802

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TASK 36-12-02-400-801

3. Precooler Control Valve Installation

(Figure 401)

A. References

Reference	Title
36-00-00-860-805	Supply Pressure Upstream of the PRSOV (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)
70-30-01-910-802-F00	Seals (Preformed Packings and O-Rings) and Gaskets (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)

B. Tools/Equipment

Reference	Description
STD-3906	Mallet - Rubber

C. Consumable Materials

Reference	Description	Specification
D00010	Compound - Thread Antiseize, High Temperature	MIL-PRF-907F

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Valve	36-12-02-01-020	HAP 001-007
		36-12-02-01A-015	HAP 008-013, 015-026, 028-054, 101-999
4	O-ring	36-11-51-02-275	HAP 001-007
		36-11-51-02A-285	HAP 008-013, 015-026, 028-054, 101-999
15	O-ring	36-11-51-02-275	HAP 001-007
		36-11-51-02A-285	HAP 008-013, 015-026, 028-054, 101-999

E. Location Zones

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

F. Install the Precooler Control Valve

SUBTASK 36-12-02-980-001

- (1) Look at the manual override nut/position indicator [10] and make sure that the precooler control valve [2] is not in the LOCKED closed position.

SUBTASK 36-12-02-020-008

- (2) Remove the protective covers from connections (sense lines, tubes, and ducts).

SUBTASK 36-12-02-840-001

- (3) Do these steps to prepare the precooler control valve [2] for the installation:
 - (a) Examine the seal [12]. To examine the seal [12], do this task: Seals (Preformed Packings and O-Rings) and Gaskets, TASK 70-30-01-910-802-F00.
 - (b) Make sure that the flanges to the precooler control valve [2] and the engine duct are clean and in good condition.

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SUBTASK 36-12-02-420-001

- (4) Do these steps to install the union [3] and the union [14] on the precooler control valve [2]:
- Install a new O-ring [4] on the union [3].
 - Install a new O-ring [15] on the union [14].
 - Lightly lubricate the threads of the union [3] and the union [14] with compound, D00010.
 - Tighten the union [3] and the union [14] to 265 in-lb (30 N·m) - 275 in-lb (31 N·m).

SUBTASK 36-12-02-420-002

- (5) Install the "kiss" seal [17] on the precooler control valve [2] with the four bolts [8] and nuts [9].

NOTE: The bolt heads [8] are aft of the nuts [9].

- (a) Tighten the bolts [8] until 1-1/2 to 2 threads of each bolt extend out from each nut [9] as follows:

NOTE: One and 1/2 threads to 2 threads protrusion is equal to 3/64-inch to 1/16-inch protrusion from the nut.

- 1) Tighten the bolts [8] to 14 in-lb (1.6 Nm) - 22 in-lb (2.5 Nm).

SUBTASK 36-12-02-420-003

- (6) Install the seal [12] in the aft flange of the 12 o'clock strut [1].

SUBTASK 36-12-02-420-004

- (7) Do these steps to install the precooler control valve [2]:

- Turn the precooler control valve [2] until the aft flange faces down and slide the precooler control valve [2] into position from the left side of the engine.
- Turn the precooler control valve [2] and then install the precooler control valve [2] between the 12 o'clock strut [1] and the precooler.

NOTE: It may be necessary to lightly compress the "kiss" seal [17] to engage the duct flanges on the forward side of the precooler control valve [2].

- (c) Use the coupling [11] to loosely connect the precooler control valve [2] between the 12 o'clock strut [1] and the precooler inlet header [16].

NOTE: Do not tighten the coupling [11] at this time.

SUBTASK 36-12-02-420-005

CAUTION: MAKE SURE YOU DO NOT APPLY A PRELOAD TO THE SENSE LINES WHEN YOU TIGHTEN THE TUBE NUTS. TURN THE PRECOOLER CONTROL VALVE UNTIL YOU CAN TIGHTEN THE TUBE NUTS WITH NO APPLIED LOAD. DAMAGE TO EQUIPMENT CAN OCCUR.

- (8) Connect the control pressure sense line [13] to the right side of the precooler control valve [2].

SUBTASK 36-12-02-420-006

- (9) Connect the supply pressure sense line [5] to the bleed air regulator [7], intersection manifold duct [6] and the precooler control valve [2].

SUBTASK 36-12-02-420-007

- (10) Tighten the coupling [11] as follows:

- Tighten the coupling [11] to the torque specified on the part.
- Use a rubber mallet, STD-3906 to lightly hit the area around the coupling [11].
- Tighten the coupling [11] to the torque specified on the part.

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G. Installation Test

SUBTASK 36-12-02-720-001

(1) Do this task: Supply Pressure Upstream of the PRSOV, TASK 36-00-00-860-805.

SUBTASK 36-12-02-720-002

(2) Make sure the precooler control valve [2] is closed.

SUBTASK 36-12-02-720-003

(3) Slowly loosen the control pressure sense line [13] for the precooler control valve sensor at the precooler control valve [2].

NOTE: Loosen the sense line enough to see the precooler control valve go to the open position.

SUBTASK 36-12-02-720-004

(4) Make sure the precooler control valve [2] goes to the open position.

SUBTASK 36-12-02-720-005

(5) Tighten the sense line connection.

SUBTASK 36-12-02-720-006

(6) Make sure the precooler control valve [2] goes to the closed position.

SUBTASK 36-12-02-720-007

(7) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 36-12-02-010-002

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 this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

SUBTASK 36-12-02-440-001

(2) Remove the DO-NOT-OPERATE tag from each engine start lever.

————— **END OF TASK** —————

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PRECOOLER CONTROL VALVE SENSOR - REMOVAL/INSTALLATION

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has two tasks:
 - (1) Precooler control valve sensor removal
 - (2) Precooler control valve sensor installation.
- C. The precooler control valve sensor is installed on the left half of the strut torque box above each engine. It is installed between the 490°F overtemperature switch and the 450°F thermostat.
- D. For this procedure, the precooler control valve sensor will be referred to as the valve sensor.

TASK 36-12-03-000-801

2. Precooler Control Valve Sensor Removal

(Figure 401)

- A. General
 - (1) This procedure is a scheduled maintenance task.
- B. References

Reference	Title
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

C. Location Zones

Zone	Area
433	Engine 1 - Strut Torque Box
443	Engine 2 - Strut Torque Box

D. Access Panels

Number	Name/Location
431BL	Forward Strut Fairing, Left Mid Strut Fairing, Strut 1
441BL	Forward Strut Fairing, Left Mid Strut Fairing, Strut 2

E. Prepare to Remove the Valve Sensor

SUBTASK 36-12-03-860-001

WARNING: YOU MUST RELEASE THE PRESSURE IN THE PNEUMATIC DUCT BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. THE HOT HIGH PRESSURE AIR IN THE PNEUMATIC DUCTS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 36-12-03-860-002

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

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	5	C00259	AIR CONDITIONING BLEED AIR VALVE ISLN
A	7	C00796	AIR CONDITIONING BLEED AIR VALVES LEFT
B	7	C00797	AIR CONDITIONING BLEED AIR VALVES RIGHT

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SUBTASK 36-12-03-860-003

- (3) Attach a DO-NOT-OPERATE tag to the switches that follow on the P5-10 panel:
 - (a) BLEED 1
 - (b) BLEED 2
 - (c) APU BLEED

SUBTASK 36-12-03-010-001

- (4) Remove the applicable access panel, do this step:
 - (a) Open these access panels:

<u>Number</u>	<u>Name/Location</u>
431BL	Forward Strut Fairing, Left Mid Strut Fairing, Strut 1
441BL	Forward Strut Fairing, Left Mid Strut Fairing, Strut 2

F. Remove the Valve Sensor

SUBTASK 36-12-03-020-001

- (1) Disconnect the sense line [6].

SUBTASK 36-12-03-020-002

- (2) Loosen the union [5].

SUBTASK 36-12-03-020-003

- (3) Remove the four screws [3].
 - (a) Keep the screws [3] for installation.

SUBTASK 36-12-03-020-004

- (4) Remove the valve sensor [1].

SUBTASK 36-12-03-020-005

- (5) Remove the union [5].
 - (a) Keep the union [5] for installation.

SUBTASK 36-12-03-020-006

- (6) Remove the packing [2] and packing [4].
 - (a) Discard the packings.

SUBTASK 36-12-03-020-007

- (7) Put a cap on the sense line [6] to keep out unwanted material.

SUBTASK 36-12-03-020-008

- (8) Put a cover on the boss [7] to keep out unwanted material.

————— END OF TASK —————

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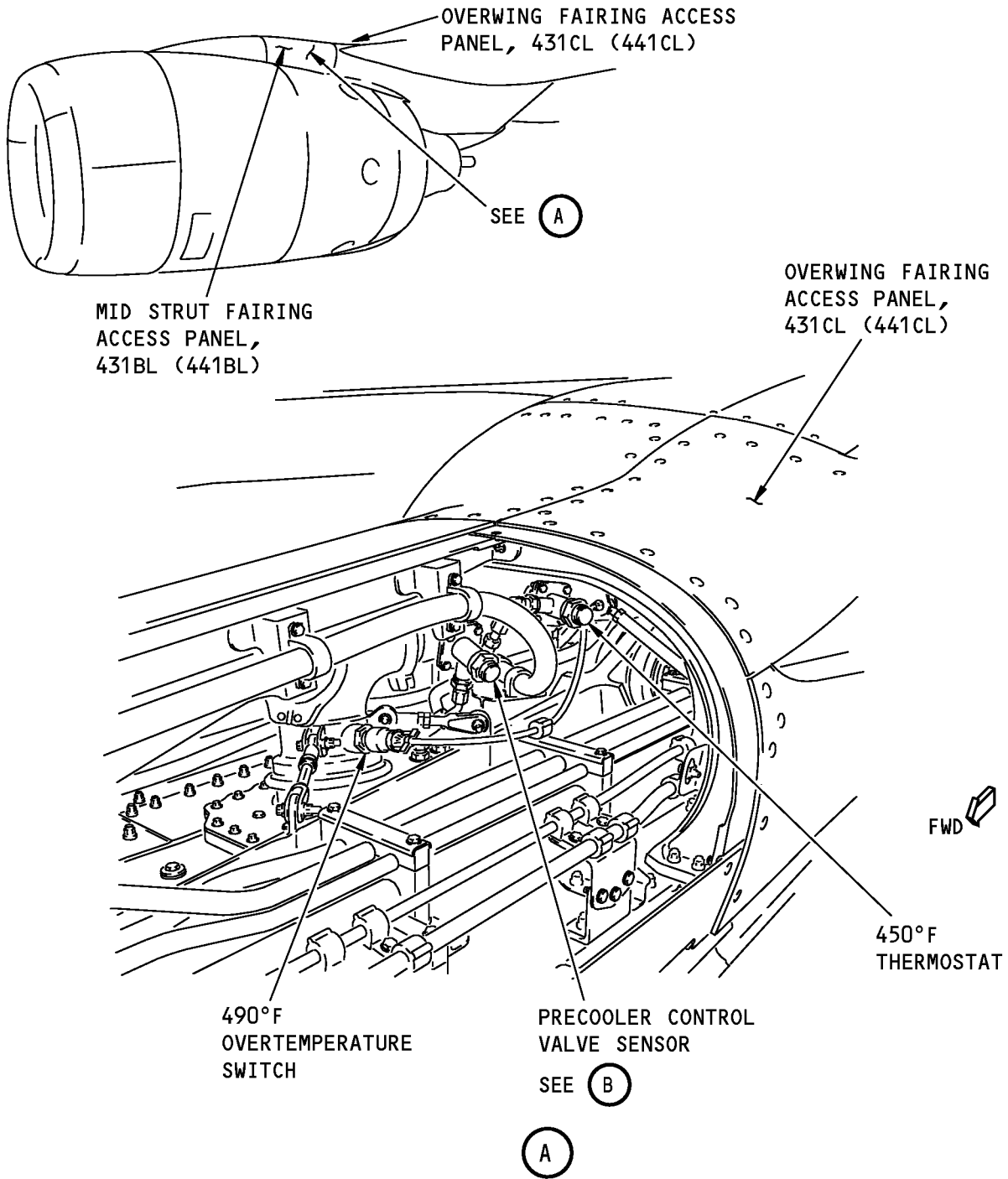
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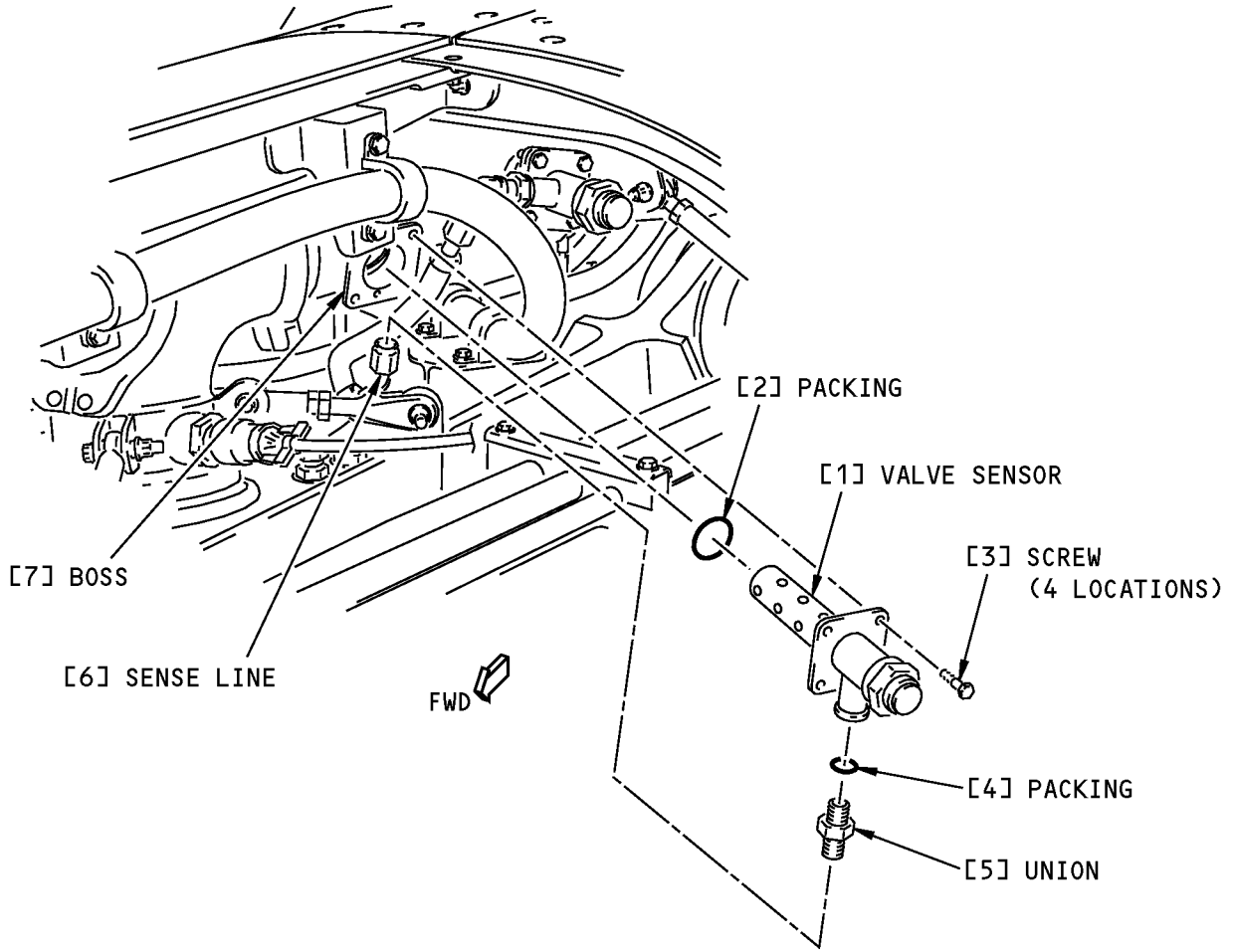
NOTE: MID STRUT FAIRING ACCESS PANEL, 431BL IS NOT SHOWN FOR CLARITY IN THIS VIEW.

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**Precooler Control Valve Sensor Installation
Figure 401 (Sheet 1 of 2)/36-12-03-990-802**

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PRECOOLER CONTROL VALVE SENSOR

(B)

**Precooler Control Valve Sensor Installation
Figure 401 (Sheet 2 of 2)/36-12-03-990-802**

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TASK 36-12-03-400-801

3. Precooler Control Valve Sensor Installation

(Figure 401)

A. General

(1) This procedure is a scheduled maintenance task.

B. References

Reference	Title
36-00-00-860-805	Supply Pressure Upstream of the PRSOV (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00010	Compound - Thread Antiseize, High Temperature	MIL-PRF-907F
G00091	Compound - Oxygen System Leak Detection - Snoop Leak Detector	MIL-PRF-25567

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
1	Valve sensor	36-12-03-01-022	HAP ALL
2	Packing	36-11-05-01-020	HAP 001-011
		36-11-05-01-035	HAP ALL
		36-11-05-01-045	HAP ALL
		36-12-03-01-020	HAP ALL
		36-12-03-01-025	HAP 001-011
4	Packing	54-51-51-03-050	HAP ALL

E. Location Zones

Zone	Area
433	Engine 1 - Strut Torque Box
443	Engine 2 - Strut Torque Box

F. Access Panels

Number	Name/Location
431BL	Forward Strut Fairing, Left Mid Strut Fairing, Strut 1
441BL	Forward Strut Fairing, Left Mid Strut Fairing, Strut 2

G. Install the Valve Sensor

SUBTASK 36-12-03-420-001

(1) Remove the cap from the sense line [6].

SUBTASK 36-12-03-420-002

(2) Remove the cover from the boss [7].

SUBTASK 36-12-03-160-001

(3) Make sure that the mating surfaces of the boss [7] and the valve sensor [1] are clean.

SUBTASK 36-12-03-640-001

(4) Apply a thin layer of compound, D00010 on the external threads of the union [5].

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SUBTASK 36-12-03-860-004

(5) Install the union [5] and a new packing [4] on the valve sensor [1] by hand at this time.

SUBTASK 36-12-03-420-003

(6) Install a new packing [2] on the valve sensor [1].

SUBTASK 36-12-03-640-002

(7) Apply a thin layer of compound, D00010 to the external threads of the screws [3].

SUBTASK 36-12-03-860-005

CAUTION: THE VALVE SENSOR CAN BE DAMAGED IF DROPPED OR MISHANDLED. IF THE VALVE SENSOR IS DROPPED, RETURN IT TO THE SHOP OR SUPPLIER FOR CALIBRATION.

(8) Install the valve sensor [1] on the boss [7].

(a) Install the four screws [3] and then tighten to 22.5-27.5 pound-inches (2.5-3.1 Newton-meters).

(b) Tighten the union [5] to 155 in-lb (17.5 N·m) - 165 in-lb (18.6 N·m).

SUBTASK 36-12-03-420-004

(9) Install the sense line [6].

(a) Tighten the B-nut on the sense line [6] to 135 in-lb (15.3 N·m) - 145 in-lb (16.4 N·m).

H. Precooler Control Valve Sensor Installation Test

SUBTASK 36-12-03-860-009

(1) 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>
A	5	C00259	AIR CONDITIONING BLEED AIR VALVE ISLN
A	7	C00796	AIR CONDITIONING BLEED AIR VALVES LEFT
B	7	C00797	AIR CONDITIONING BLEED AIR VALVES RIGHT

SUBTASK 36-12-03-860-010

(2) Do this task: Supply Pressure Upstream of the PRSOV, TASK 36-00-00-860-805.

SUBTASK 36-12-03-790-001

(3) Do these steps to look for leaks at the precooler control valve sensor sense line connections.

(a) Apply leak detector Snoop Leak Detector compound, G00091 at the sense line connections.

(b) Look to see if the sense line connections have leaks.

1) No leakage is permitted at the sense line connections.

NOTE: You must repair all leakage at the sense line connections.

SUBTASK 36-12-03-860-011

(4) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

I. Put the Airplane to Its Usual Condition

SUBTASK 36-12-03-860-006

(1) Install the applicable access panel, do this step:

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- (a) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
431BL	Forward Strut Fairing, Left Mid Strut Fairing, Strut 1
441BL	Forward Strut Fairing, Left Mid Strut Fairing, Strut 2

SUBTASK 36-12-03-860-007

- (2) Remove the DO-NOT-OPERATE tag from the switches that follow on the P5-10 panel:

- (a) BLEED 1
- (b) BLEED 2
- (c) APU BLEED

————— END OF TASK —————

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PNEUMATIC MANIFOLD SYSTEM - ADJUSTMENT/TEST

1. General

- A. This procedure has two tasks. These tasks are as follows:
 - (1) Bleed air isolation valve operational test
 - (2) Pneumatic duct leakage test.
- B. The operational test examines the actuation logic of bleed air isolation valve.
- C. The leakage test examines the pneumatic ducts downstream of the PRSOV for permitted leakage.

TASK 36-13-00-710-801

2. Bleed Air Isolation Valve Operational Test

(Figure 501)

A. General

- (1) The operational test examines the actuation logic of bleed air isolation valve. A check is done of the position of the isolation valve in relation to the position of the PACK and BLEED switches.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)

C. Location Zones

Zone	Area
192	Lower Wing-To-Body Fairing - Under Wing Box
212	Flight Compartment - Right

D. Access Panels

Number	Name/Location
192CL	Air Conditioning Access Door
192CR	Air Conditioning Access Door

E. Prepare To Do the Operational Test of the Isolation Valve

SUBTASK 36-13-00-860-001

- (1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 36-13-00-860-002

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

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
C	14	C01278	MASTER CAUTION ANNUNCIATOR CONT 4
C	15	C01355	LANDING GEAR AIR/GND SYS 2
C	16	C01356	LANDING GEAR AIR/GND SYS 1
D	12	C00310	INDICATOR MASTER DIM BAT
D	13	C00311	INDICATOR MASTER DIM BUS 1
D	14	C00312	INDICATOR MASTER DIM BUS 2
D	15	C01401	LANDING GEAR AIR/GND RELAY
E	11	C00313	INDICATOR MASTER DIM SECT 1
E	12	C00314	INDICATOR MASTER DIM SECT 2
E	13	C00315	INDICATOR MASTER DIM SECT 3

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<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
E	14	C00316	INDICATOR MASTER DIM SECT 4
F	11	C00317	INDICATOR MASTER DIM SECT 5
F	12	C00318	INDICATOR MASTER DIM SECT 6

F/O Electrical System Panel, P6-4

<u>Row</u>	<u>Col</u>	<u>Number</u>	<u>Name</u>
HAP 101-999			
A	1	C00344	AIR CONDITIONING TEMP CONTROL 35 DEG F LEFT
A	2	C00268	AIR CONDITIONING TEMP CONTROL AUTO LEFT
A	3	C00267	AIR CONDITIONING TEMP CONTROL MANUAL
HAP ALL			
A	4	C00399	AIR CONDITIONING RAM AIR MOD LEFT
A	5	C00259	AIR CONDITIONING BLEED AIR VALVE ISLN
A	7	C00796	AIR CONDITIONING BLEED AIR VALVES LEFT
HAP 101-999			
B	1	C00345	AIR CONDITIONING TEMP CONTROL 35 DEG F RIGHT
B	2	C00258	AIR CONDITIONING TEMP CONTROL AUTO RIGHT
HAP ALL			
B	4	C00400	AIR CONDITIONING RAM AIR MOD RIGHT
B	7	C00797	AIR CONDITIONING BLEED AIR VALVES RIGHT
HAP 101-999			
C	4	C00257	AIR CONDITIONING OVERHEAT
HAP ALL			
C	5	C00263	AIR CONDITIONING PACK CONT VALVES RIGHT
C	6	C00262	AIR CONDITIONING PACK CONT VALVES LEFT
HAP 101-999			
D	7	C00124	AIR CONDITIONING MIX VALVE POS IND
HAP ALL			
D	8	C00076	AIR CONDITIONING TEMP IND
HAP 101-999			
E	1	C01015	AIR CONDITIONING RECIRC FAN CONT
HAP ALL			
E	4	C00884	AIR CONDITIONING RECIRC RIGHT FAN CABIN AIR

SUBTASK 36-13-00-010-001

- (3) To get access to the isolation valve, do this step:
 - (a) Open these access panels:

<u>Number</u>	<u>Name/Location</u>
192CL	Air Conditioning Access Door
192CR	Air Conditioning Access Door

F. Do the Operational Test of the Isolation Valve

SUBTASK 36-13-00-860-004

- (1) Put the ISOLATION VALVE switch on the P5-10 overhead panel to the OPEN position.

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- (a) Make sure the isolation valve visual position indicator moves to the OPEN position.

NOTE: Access to the isolation valve is limited. A flashlight and mirror may be necessary to view the position indicator.

SUBTASK 36-13-00-860-005

- (2) Put the ISOLATION VALVE switch on the P5-10 overhead panel to the CLOSED position.

- (a) Make sure the isolation valve position indicator moves to the CLOSED position.

NOTE: Access to the isolation valve is limited. A flashlight and mirror may be necessary to view the position indicator.

SUBTASK 36-13-00-860-006

- (3) Put the ISOLATION VALVE switch to the AUTO position.

SUBTASK 36-13-00-860-007

- (4) Put the PACK switch and the BLEED switch to the sequence of positions shown and make sure that the isolation valve goes to or stays in the position shown:

Table 501/36-13-00-993-801

Table with 5 columns: L PACK SW POS, R PACK SW POS, BLEED 1 SW POS, BLEED 2 SW POS, ISOLATION VALVE POSITION. It lists various combinations of switch positions and the resulting isolation valve position.

SUBTASK 36-13-00-860-008

- (5) Put the ISOLATION VALVE switch to the CLOSED position.

- (a) Make sure the isolation valve position indicator moves to the CLOSED position.

G. Put The Airplane Back To Its Usual Condition

SUBTASK 36-13-00-410-001

- (1) Close these access panels:

Table with 2 columns: Number, Name/Location. Lists 192CL Air Conditioning Access Door and 192CR Air Conditioning Access Door.

and .

SUBTASK 36-13-00-860-009

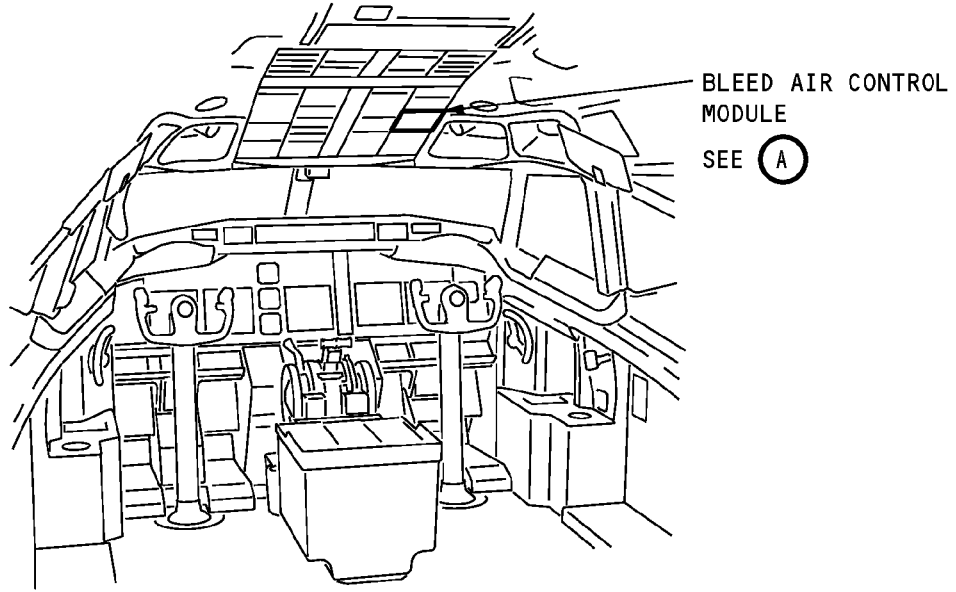
- (2) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

END OF TASK

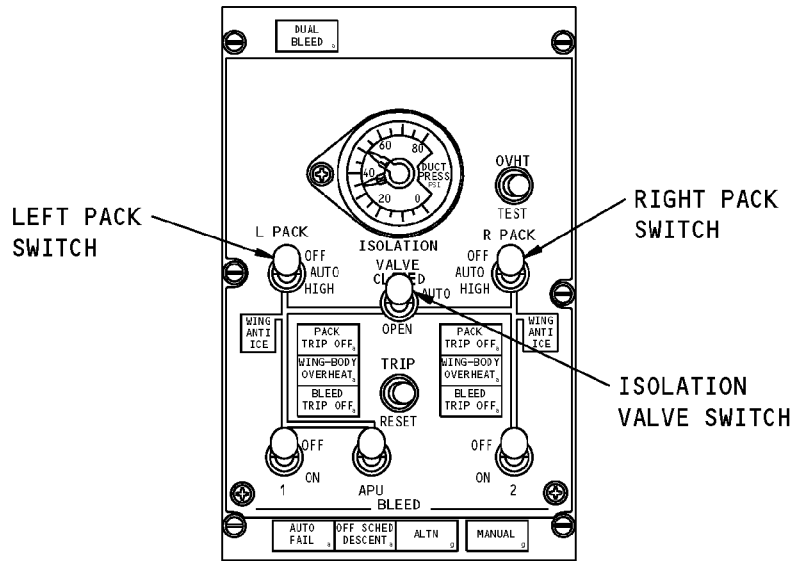
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FLIGHT COMPARTMENT



**BLEED AIR CONTROL
MODULE**

(A)

**Bleed Air Isolation Valve Operational Test
Figure 501 (Sheet 1 of 3)/36-13-00-990-802**

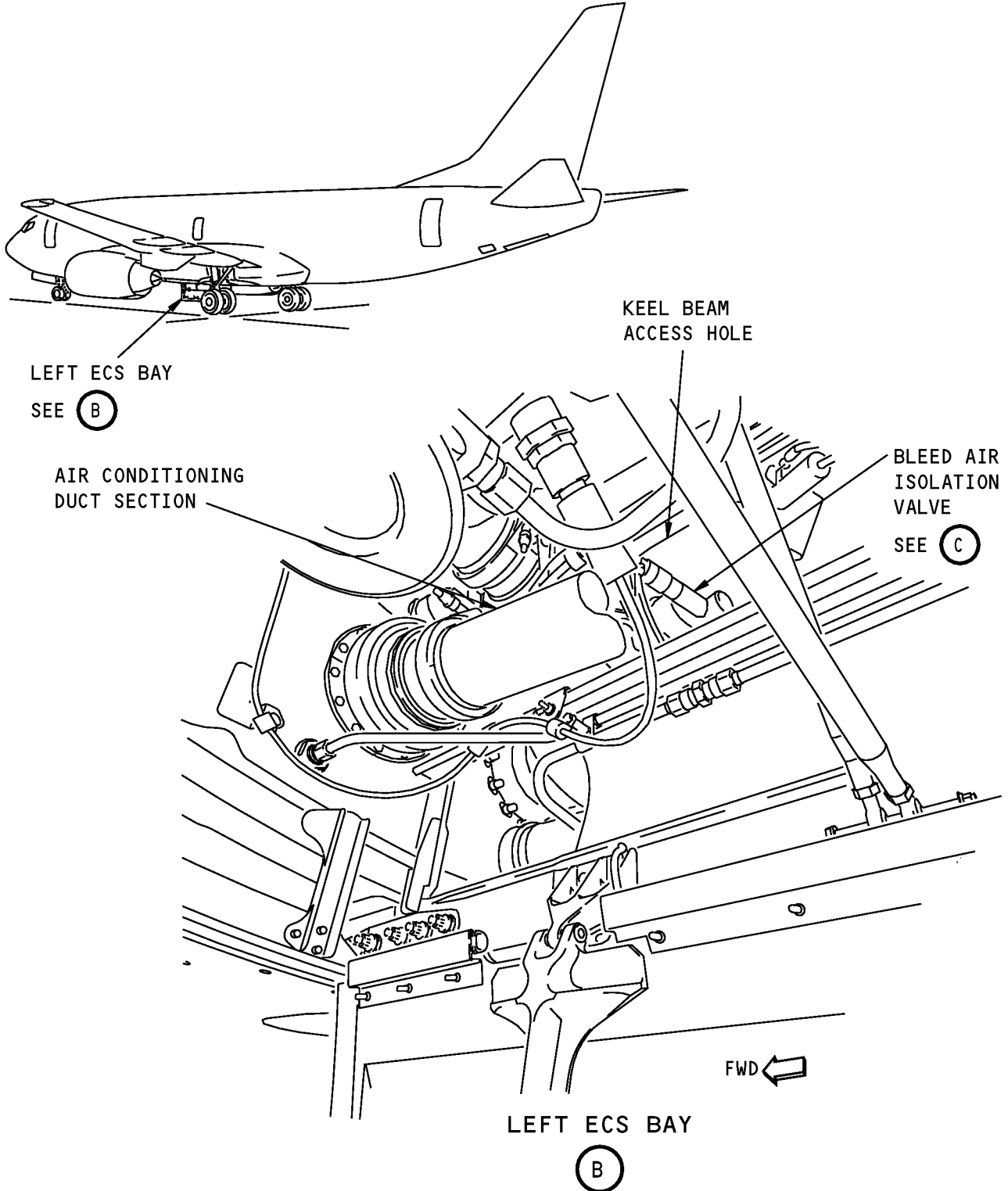
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**Bleed Air Isolation Valve Operational Test
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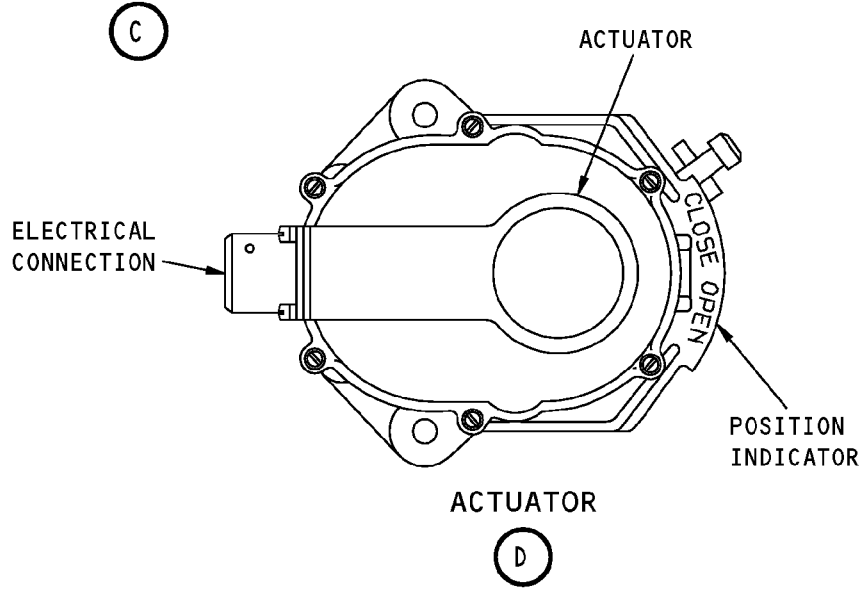
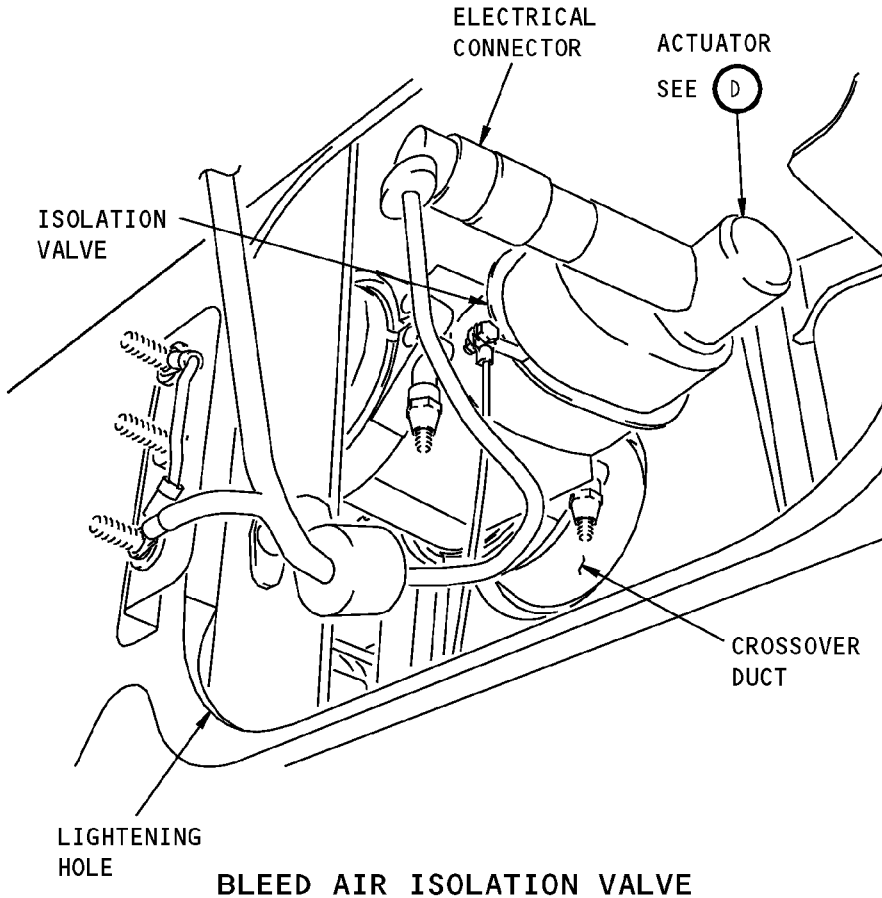
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Bleed Air Isolation Valve Operational Test
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TASK 36-13-00-700-801

3. Pneumatic System Duct Leakage Test

(Figure 501)

A. General

- (1) This procedure examines the pneumatic ducts and the components of the bleed air distribution system for leakage.

B. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
36-00-00-860-802	Supply Pressure to the Pneumatic System with an External Ground Air Source (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)
36-11-04-000-801	PRSOV Removal (P/B 401)
36-11-04-400-801	PRSOV Installation (P/B 401)
36-11-06-000-801	High Stage Valve Removal (P/B 401)
36-11-06-400-801	High Stage Valve Installation (P/B 401)
78-31-00-010-801-F00	Open the Thrust Reverser (Selection) (P/B 201)
78-31-00-010-804-F00	Close the Thrust Reverser (Selection) (P/B 201)
80-11-03-000-801-F00	Start Valve Removal (P/B 401)
80-11-03-400-801-F00	Start Valve Installation (P/B 401)

C. Location Zones

Zone	Area
141	Aft Cargo Compartment - Left
191	Lower Wing-To-Body Fairing - Forward of Wing Box
192	Lower Wing-To-Body Fairing - Under Wing Box
311	Area Aft of Pressure Bulkhead - Left
313	Stabilizer Torsion Box Compartment - Left
410	Subzone - Engine 1
420	Subzone - Engine 2
430	Subzone - Engine 1, Nacelle Strut
433	Engine 1 - Strut Torque Box
440	Subzone - Engine 2, Nacelle Strut
443	Engine 2 - Strut Torque Box
511	Left Wing - Leading Edge To Front Spar
521	Left Wing - Leading Edge to Front Spar
522	Left Wing - Slat No. 4
523	Left Wing - Slat No. 3
524	Left Wing - Slat No. 2
611	Right Wing - Leading Edge to Front Spar
621	Right Wing - Leading Edge to Front Spar
622	Right Wing - Slat No. 5
623	Right Wing - Slat No. 6
624	Right Wing - Slat No. 7

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D. Access Panels

Number	Name/Location
192CL	Air Conditioning Access Door
192CR	Air Conditioning Access Door
311BL	Stabilizer Trim Access Door

E. Prepare to do Leakage Test

SUBTASK 36-13-00-860-010

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 36-13-00-860-011

(2) Set these switches that follow to the positions shown:

- (a) 1 BLEED - OFF
- (b) 2 BLEED - OFF
- (c) APU BLEED - OFF
- (d) L PACK - OFF
- (e) R PACK - OFF
- (f) WING ANTI-ICE - OFF
- (g) 1 ENG ANTI-ICE - OFF
- (h) 2 ENG ANTI-ICE - OFF
- (i) ISOLATION VALVE - OPEN
- (j) 1 ENGINE START - OFF
- (k) 2 ENGINE START - OFF

SUBTASK 36-13-00-860-012

(3) Make sure the engine start lever on the control stand for the applicable engine is in the cutoff position and install DO-NOT-OPERATE tags.

SUBTASK 36-13-00-010-002

(4) To get access to pneumatic duct in the air conditioning bay, do these tasks:

(a) Open these access panels:

Number	Name/Location
192CL	Air Conditioning Access Door
192CR	Air Conditioning Access Door
311BL	Stabilizer Trim Access Door

SUBTASK 36-13-00-210-001

(5) Make sure that the position indicator on the isolation valve points to the OPEN position.

SUBTASK 36-13-00-010-003

WARNING: DO THESE SPECIFIED TASKS IN THE CORRECT SEQUENCE BEFORE YOU OPEN THE THRUST REVERSER: RETRACT THE LEADING EDGE, DO THE DEACTIVATION PROCEDURES FOR THE LEADING EDGE AND THE THRUST REVERSER (FOR GROUND MAINTENANCE), AND OPEN THE FAN COWL PANELS. IF YOU DO NOT OBEY THE ABOVE SEQUENCE, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(6) For the left thrust reverser, do this task: Open the Thrust Reverser (Selection), TASK 78-31-00-010-801-F00.

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SUBTASK 36-13-00-210-002

(7) Make sure that the bleed air check valves (5th-stage) on the left and right engines are installed.

SUBTASK 36-13-00-860-013

(8) Make sure that the PRSOVs on left and right engines are closed.

(a) Make sure that the position indicator on the PRSOV is in the CLOSED position.

1) If the position indicator is not in the CLOSED position, replace the PRSOV. These are the tasks:

- PRSOV Removal, TASK 36-11-04-000-801
- PRSOV Installation, TASK 36-11-04-400-801

SUBTASK 36-13-00-860-014

(9) Make sure that the high-stage valves on left and right engines are closed.

(a) Make sure that the position indicator on the high-stage valve is in the CLOSED position.

1) If the position indicator is not in the CLOSED position, replace the high stage valve. These are the tasks:

- High Stage Valve Removal, TASK 36-11-06-000-801
- High Stage Valve Installation, TASK 36-11-06-400-801

SUBTASK 36-13-00-210-003

(10) Make sure that the start valves on the left and right engines are closed.

(a) Make sure that the position indicator on start valve is in the CLOSED position.

1) If the position indicator is not in the CLOSED position, replace the engine start valve. These are the tasks:

- Start Valve Removal, TASK 80-11-03-000-801-F00
- Start Valve Installation, TASK 80-11-03-400-801-F00

SUBTASK 36-13-00-860-015

(11) Make sure that the position indicator on the left and right flow control valves point to closed.

(a) If not, manually override the valves closed.

SUBTASK 36-13-00-860-016

(12) Make sure that the position indicator on the left and right wing TAI valves point to closed.

(a) If not, manually override the valves closed.

SUBTASK 36-13-00-860-017

(13) Make sure that the position indicator on the left and right cowl TAI valves point to closed.

(a) If not, manually override the valves closed.

F. Do the Leakage Test

SUBTASK 36-13-00-860-018

(1) Put the 1 BLEED switch to the ON position.

SUBTASK 36-13-00-860-019

(2) Put the 2 BLEED switch to the ON position.

SUBTASK 36-13-00-420-001

(3) Do this task: Supply Pressure to the Pneumatic System with an External Ground Air Source, TASK 36-00-00-860-802.

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SUBTASK 36-13-00-980-001

WARNING: USE A RATCHET TYPE WRENCH TO OPEN THE PRSOV. THE PRSOV CAN OPEN QUICKLY AND CAN PULL THE WRENCH FROM YOUR HANDS IF THERE IS PRESSURE IN THE PNEUMATIC SYSTEM WHEN YOU OPEN THE PRSOV. THIS CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (4) Manually wrench the PRSOV on each engine to the OPEN position with a ratchet type wrench.

NOTE: The PRSOV will remain open when there is pneumatic pressure upstream of the PRSOV.

SUBTASK 36-13-00-780-001

WARNING: BE CAREFUL WHEN YOU PRESSURIZE THE PNEUMATIC DUCTS. IF THE DUCTS COME APART WHEN THEY ARE PRESSURIZED, THEY CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (5) Pressurize the system and maintain pressure at 42-48 psig (289-331 kPa).

SUBTASK 36-13-00-210-004

- (6) Examine all of the connections on the pneumatic duct installations for sources of concentrated leakage.

- (a) Diffused leakage is permitted.
- (b) Concentrated leakage must be repaired.

NOTE: Concentrated leakage is leakage which you can feel with your hand at a distance of 12 in. (305 mm).

SUBTASK 36-13-00-790-001

- (7) Do a test of the pneumatic ducts downstream of the crossover duct:

- (a) Put the L PACK switch to the AUTO position.
- (b) Examine the ducts downstream of the crossover ducts.
 - 1) Diffused leakage is permitted.
 - 2) Concentration leakage must be repaired.

NOTE: Concentration leakage is leakage which you can feel with your hand at a distance of 12 in. (305 mm).

- (c) Put the L PACK switch to the OFF position.
- (d) Put the R PACK switch to the AUTO position.
- (e) Examine the pneumatic ducts downstream of the crossover duct.
 - 1) Diffused leakage is permitted.
 - 2) Concentrated leakage must be repaired.

NOTE: Concentrated leakage is leakage which you can feel with your hand at a distance of 12 in. (305 mm).

- (f) Put the R PACK switch to the Off position.

SUBTASK 36-13-00-860-020

- (8) Put the 1 BLEED switch to the OFF position.

SUBTASK 36-13-00-860-021

- (9) Put the 2 BLEED switch to the OFF position.

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G. Put The Airplane Back To Its Usual Condition

SUBTASK 36-13-00-860-022

(1) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

(a) Make sure the pressure gage on the P5-10 panel shows 0.0 psi (0.0 kPa).

SUBTASK 36-13-00-010-006

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.

(2) For the left thrust reverser, do this task: Close the Thrust Reverser (Selection), TASK 78-31-00-010-804-F00.

SUBTASK 36-13-00-410-002

(3) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
192CL	Air Conditioning Access Door
192CR	Air Conditioning Access Door
311BL	Stabilizer Trim Access Door

SUBTASK 36-13-00-860-023

(4) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

SUBTASK 36-13-00-860-024

(5) Remove the DO-NOT-OPERATE tags from the fuel shutoff levers.

————— **END OF TASK** —————

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PNEUMATIC MANIFOLD DUCT - REMOVAL/INSTALLATION

1. General

- A. This procedure contains scheduled maintenance task data.
- B. This procedure has these tasks:
 - (1) Strut pneumatic duct removal
 - (2) Strut pneumatic duct installation
 - (3) Wing leading edge pneumatic duct removal
 - (4) Wing leading edge pneumatic duct installation
 - (5) Crossover pneumatic duct removal
 - (6) Crossover pneumatic duct installation
 - (7) APU pneumatic duct removal
 - (8) APU pneumatic duct installation
 - (9) APU pneumatic duct pressure seal removal
 - (10) APU pneumatic duct pressure seal installation.
- C. The duct sections for the thermal anti-icing, air conditioning and pneumatic systems are joined together with the forged couplings and V-band couplings and held in place to the airplane structure with support hardware.
- D. In some locations, it may be necessary to remove an adjacent duct section or system hardware to get access to remove or install the required section of duct.
- E. Some of the duct sections are made to be slightly short to compensate for thermal expansion allowances caused by the flow of hot air through the duct section. The duct sections are joined together in tension by a series of couplings when the pneumatic system is not in use.
- F. Some of the couplings are installed in areas where there are control cables, fuel lines, hydraulic lines, and electrical wires. Care must be taken to make sure that there are a minimum of 0.50 in. (12.7 mm) clearance between them. Precautions should also be taken make sure that sufficient clearances are available to prevent interference or chafing conditions should the duct couplings rotate around the duct joints.
- G. The removal/installation procedure for the APU bleed air duct is covered in BLEED AIR DUCT - REMOVAL/INSTALLATION, PAGEBLOCK 49-52-13/401.
- H. The removal/installation procedure for engine pneumatic ducts are covered in ENGINE PNEUMATIC DUCT - REMOVAL/INSTALLATION, PAGEBLOCK 36-11-01/401.

TASK 36-13-01-000-808

2. Pneumatic Manifold Duct Removal (Selection)

- A. Remove the Pneumatic Manifold Duct

SUBTASK 36-13-01-020-034

- (1) Do one of these tasks to remove the applicable pneumatic duct section:
 - (a) Do this task: Strut Pneumatic Duct Removal, TASK 36-13-01-000-801.
 - (b) Do this task: Wing Leading Edge Duct Removal, TASK 36-13-01-000-803.
 - (c) Do this task: Crossover Duct Removal, TASK 36-13-01-000-804.
 - (d) Do this task: APU Pneumatic Duct Removal, TASK 36-13-01-000-806.

————— **END OF TASK** —————

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TASK 36-13-01-400-802

3. Pneumatic Manifold Duct Installation (Selection)

A. Install the Pneumatic Manifold Duct

SUBTASK 36-13-01-420-036

- (1) Do one of these tasks to install the applicable pneumatic duct section:
 - (a) Do this task: Strut Pneumatic Duct Installation, TASK 36-13-01-000-802.
 - (b) Do this task: Wing Leading Edge Duct Installation, TASK 36-13-01-400-801.
 - (c) Do this task: Crossover Duct Installation, TASK 36-13-01-000-805.
 - (d) Do this task: APU Pneumatic Duct Installation, TASK 36-13-01-000-807.

————— **END OF TASK** —————

TASK 36-13-01-000-801

4. Strut Pneumatic Duct Removal

(Figure 401)

A. General

- (1) This procedure is written to provide general information to assist with the removal of the strut pneumatic duct sections. Do only the steps that are necessary to remove the required section of duct.

B. References

Reference	Title
27-81-00-480-801	Leading Edge Flap and Slat Locks Installation (P/B 201)
27-81-00-860-803	Leading Edge Flaps and Slats Extension (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)
36-11-05-000-801	Thermostat Removal (P/B 401)
36-11-08-000-801	Overtemperature Switch Removal (P/B 401)
36-12-03-000-801	Precooler Control Valve Sensor Removal (P/B 401)
54-53-02-000-802	Forward Strut Fairing Panel (Thrust Reverser Strut Fairing) Removal (P/B 401)

C. Location Zones

Zone	Area
433	Engine 1 - Strut Torque Box
443	Engine 2 - Strut Torque Box
510	Subzone - Left Wing: Leading Edge, Fwd of Front Spar, Inbd of Strut and Nacelle Gap Cover Area
610	Subzone - Right Wing: Leading Edge, Forward of Front Spar, Inboard of Nacelle Strut, Including Gap Cover Area

D. Access Panels

Number	Name/Location
431BL	Forward Strut Fairing, Left Mid Strut Fairing, Strut 1
431BR	Forward Strut Fairing, Right Mid Strut Fairing, Strut 1
431CL	Forward Strut Fairing, Left Overwing Fairing, Strut 1
431CR	Forward Strut Fairing, Right Overwing Fairing, Strut 1
441BL	Forward Strut Fairing, Left Mid Strut Fairing, Strut 2

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Number	Name/Location
441BR	Forward Strut Fairing, Right Mid Strut Fairing, Strut 2
441CL	Forward Strut Fairing, Left Overwing Fairing, Strut 2
441CR	Forward Strut Fairing, Right Overwing Fairing, Strut 2

E. Prepare to Remove the Duct Section

SUBTASK 36-13-01-860-001

- (1) Make sure the engine, APU and ground air pneumatic source is not in operation.

SUBTASK 36-13-01-860-002

WARNING: YOU MUST REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. IF YOU DO NOT REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS, HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (2) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 36-13-01-010-006

WARNING: MAKE SURE PERSONS AND EQUIPMENT ARE CLEAR OF THE LEADING EDGE AND TRAILING EDGE CONTROL SURFACES. THE LEADING EDGE AND TRAILING EDGE CONTROL SURFACES CAN EXTEND AND RETRACT QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

CAUTION: MAKE SURE THE INBOARD FAN DUCT COWL AND THE THRUST REVERSERS ARE CLOSED OR REMOVED BEFORE YOU EXTEND THE LEADING EDGE FLAPS. THERE IS NOT SUFFICIENT CLEARANCE FOR THE FLAPS TO EXTEND IF THE INBOARD FAN DUCT COWL AND THE THRUST REVERSERS ARE IN THE OPEN POSITION. THIS CAN CAUSE DAMAGE TO EQUIPMENT.

- (3) To extend and lock the wing leading edge flaps to get access to a duct section for removal:
 - (a) Do this task: Leading Edge Flaps and Slats Extension, TASK 27-81-00-860-803.
 - (b) Do this task: Leading Edge Flap and Slat Locks Installation, TASK 27-81-00-480-801.

SUBTASK 36-13-01-010-007

- (4) Remove the applicable access panel, do this task: Forward Strut Fairing Panel (Thrust Reverser Strut Fairing) Removal, TASK 54-53-02-000-802.

- (a) For the left engine strut, do this step:

- 1) Open these access panels:

Number	Name/Location
431BL	Forward Strut Fairing, Left Mid Strut Fairing, Strut 1
431BR	Forward Strut Fairing, Right Mid Strut Fairing, Strut 1
431CL	Forward Strut Fairing, Left Overwing Fairing, Strut 1
431CR	Forward Strut Fairing, Right Overwing Fairing, Strut 1

- (b) For the right engine strut, do this step:

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1) Open these access panels:

<u>Number</u>	<u>Name/Location</u>
441BL	Forward Strut Fairing, Left Mid Strut Fairing, Strut 2
441BR	Forward Strut Fairing, Right Mid Strut Fairing, Strut 2
441CL	Forward Strut Fairing, Left Overwing Fairing, Strut 2
441CR	Forward Strut Fairing, Right Overwing Fairing, Strut 2

SUBTASK 36-13-01-020-001

(5) If it is necessary to remove the precooler control valve sensor [2], do this task: Precooler Control Valve Sensor Removal, TASK 36-12-03-000-801.

SUBTASK 36-13-01-020-002

(6) If it is necessary to remove the 450°F thermostat [1], do this task: Thermostat Removal, TASK 36-11-05-000-801.

SUBTASK 36-13-01-020-003

(7) If it is necessary to remove the 490°F overtemperature switch [3], do this task: Overtemperature Switch Removal, TASK 36-11-08-000-801.

SUBTASK 36-13-01-020-004

(8) Remove or move other system hardwares (tubing, wiring, support brackets, and wiring harnesses) that are in the way of the duct section removal.

F. Remove the Duct Section

SUBTASK 36-13-01-020-005

(1) Disconnect the duct support links [9] which hold the duct section to the support structure.

NOTE: Make sure you keep track of the fastener build-up for installation.

(a) Remove the bolt [12], washer [13], bushing [14], washer [15] and nut [16].

(b) Move the duct support links [9] out of the way.

SUBTASK 36-13-01-020-006

(2) Remove the forged couplings [4] and/or V-band coupling [7].

SUBTASK 36-13-01-020-007

(3) Remove the applicable duct section:

NOTE: It may be necessary to remove the adjacent duct section to get access to remove the duct section you want to remove.

(a) Strut duct [10]

(b) Aft strut duct [6]

(c) Wing-to-strut interface duct [8]

(d) Precooler outlet duct [11].

SUBTASK 36-13-01-020-008

(4) Remove the E-seals [5].

(a) Examine the E-seals [5] for dents, cracks or other damage.

(b) Replace all damaged E-seals [5].

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SUBTASK 36-13-01-530-001

(5) Put covers on the duct and sense line openings to keep unwanted material out.

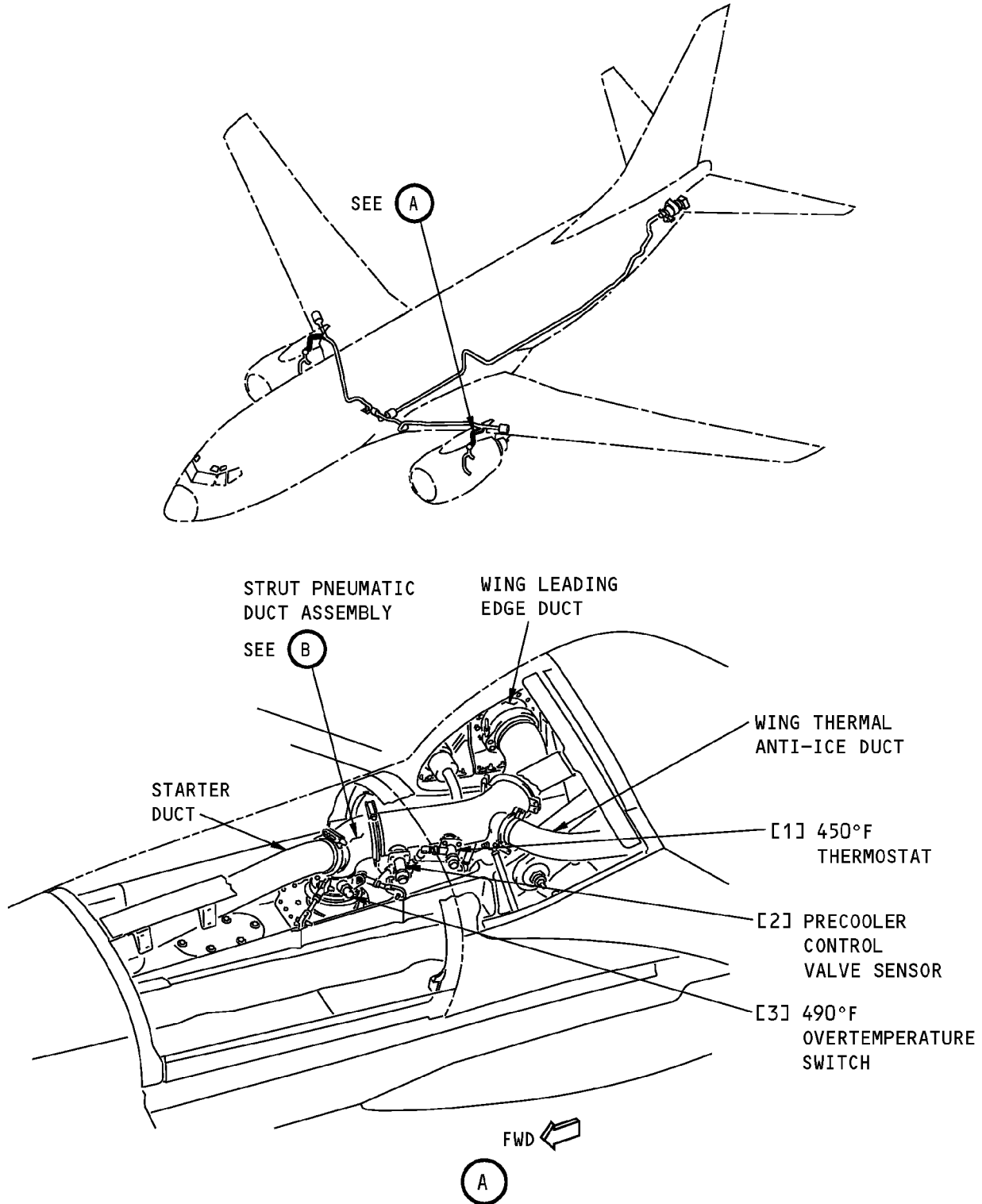
————— **END OF TASK** —————

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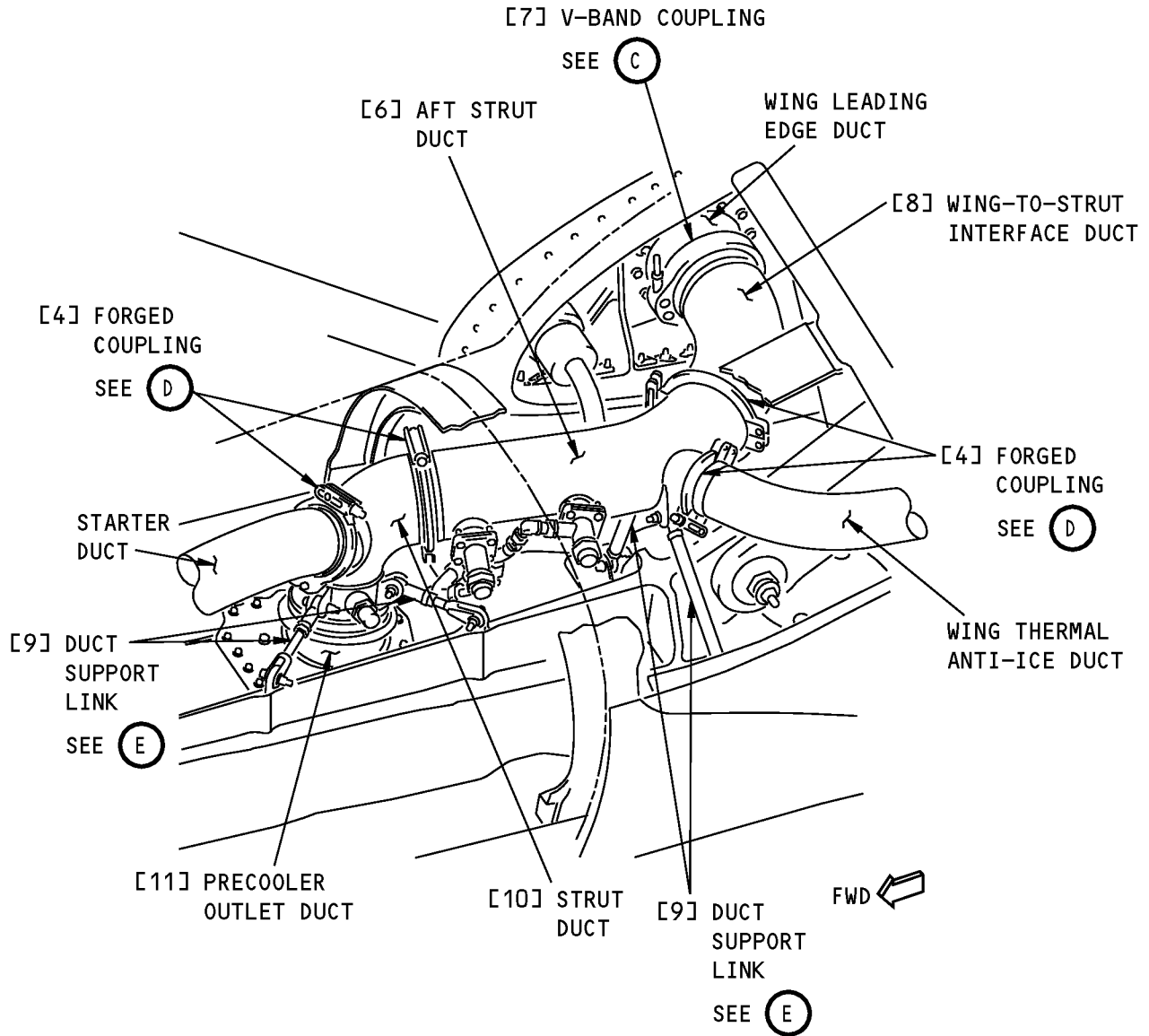


**Strut Pneumatic Duct Installation
Figure 401 (Sheet 1 of 3)/36-13-01-990-802**

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STRUT PNEUMATIC DUCT ASSEMBLY

(B)

NOTE: LEFT STRUT INSTALLATION IS SHOWN,
RIGHT STRUT INSTALLATION IS EQUIVALENT.

Strut Pneumatic Duct Installation
Figure 401 (Sheet 2 of 3)/36-13-01-990-802

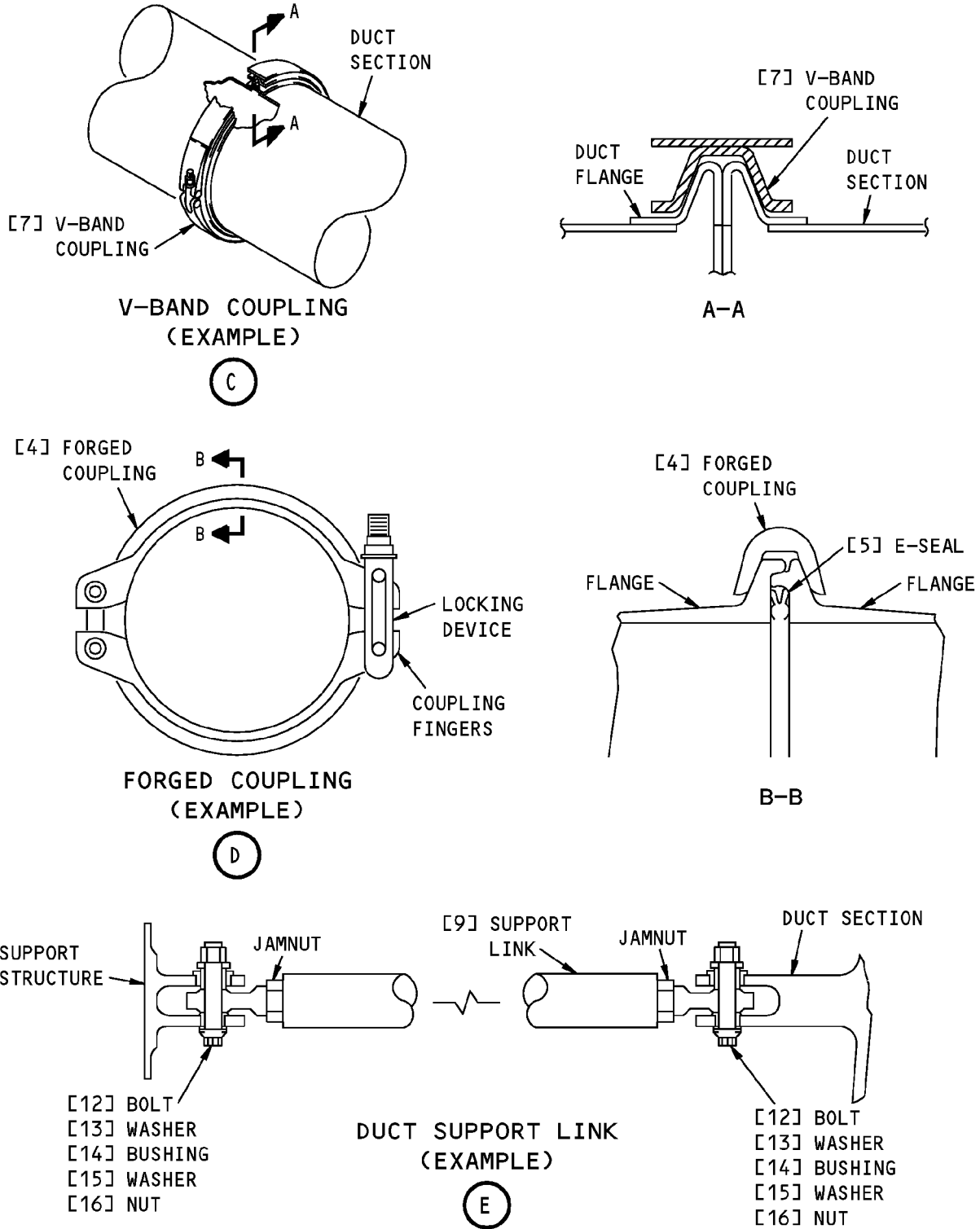
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Strut Pneumatic Duct Installation
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TASK 36-13-01-000-802

5. Strut Pneumatic Duct Installation

(Figure 401)

A. General

- (1) This procedure is written to provide general information to assist with the installation of the strut pneumatic duct sections. Do only the steps that are necessary to install the required section of duct.

B. References

Reference	Title
20-10-44-400-801	Lockwires Installation (P/B 401)
27-81-00-080-801	Leading Edge Flap and Slat Locks Removal (P/B 201)
27-81-00-860-804	Leading Edge Flaps and Slats Retraction (P/B 201)
36-11-05-400-801	Thermostat Installation (P/B 401)
36-11-08-400-801	Overtemperature Switch Installation (P/B 401)
36-12-03-400-801	Precooler Control Valve Sensor Installation (P/B 401)

C. Tools/Equipment

Reference	Description
STD-3906	Mallet - Rubber

D. Location Zones

Zone	Area
433	Engine 1 - Strut Torque Box
443	Engine 2 - Strut Torque Box
510	Subzone - Left Wing: Leading Edge, Fwd of Front Spar, Inbd of Strut and Nacelle Gap Cover Area
610	Subzone - Right Wing: Leading Edge, Forward of Front Spar, Inboard of Nacelle Strut, Including Gap Cover Area

E. Access Panels

Number	Name/Location
431BL	Forward Strut Fairing, Left Mid Strut Fairing, Strut 1
431BR	Forward Strut Fairing, Right Mid Strut Fairing, Strut 1
431CL	Forward Strut Fairing, Left Overwing Fairing, Strut 1
431CR	Forward Strut Fairing, Right Overwing Fairing, Strut 1
441BL	Forward Strut Fairing, Left Mid Strut Fairing, Strut 2
441BR	Forward Strut Fairing, Right Mid Strut Fairing, Strut 2
441CL	Forward Strut Fairing, Left Overwing Fairing, Strut 2
441CR	Forward Strut Fairing, Right Overwing Fairing, Strut 2

F. Prepare to Install the Duct Section

SUBTASK 36-13-01-210-001

- (1) Remove the covers from the duct and sense line openings.
 - (a) Make sure that there are no unwanted material inside.

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SUBTASK 36-13-01-210-002

- (2) Make sure that the replacement duct section is clean and not damaged.

NOTE: If a new duct section is to be installed, make sure that the part number of the new duct section is the correct replacement part for the duct section that you will replace.

SUBTASK 36-13-01-420-002

- (3) Install the E-seals [5].

NOTE: Do not install E-seals [5] that are damaged.

G. Install the Duct Section

SUBTASK 36-13-01-420-003

- (1) Put the applicable duct section in the correct position and orientation for installation:

- (a) Strut duct [10]
- (b) Aft strut duct [6]
- (c) Wing-to-strut interface duct [8]
- (d) Precooler outlet duct [11].

SUBTASK 36-13-01-860-003

- (2) Loosely install the applicable forged couplings [4] and/or V-band coupling [7].

NOTE: Do not tighten the couplings. All of the duct sections must be aligned before the couplings are tightened.

SUBTASK 36-13-01-210-003

- (3) Make sure that there is a minimum of 0.10 in. (2.54 mm) clearance between the duct section and the adjacent system equipment or structure to prevent interference or chafing condition.

SUBTASK 36-13-01-860-004

- (4) Connect the duct support links [9] to the duct section.

NOTE: Make sure you that the fastener build-up are correct.

- (a) Loosen the jamnut to adjust the length of the duct support link [9], if it is necessary.
- (b) Loosely install the bolt [12], washer [13], bushing [14], washer [15] and nut [16].

NOTE: Install the countersunk side of the washer [13] against the head of the bolt [12].

- (c) Tighten the jamnut if you have adjusted the length of the duct support link [9].

SUBTASK 36-13-01-420-004

CAUTION: DO NOT TIGHTEN THE COUPLINGS UNTIL ALL OF THE DUCT SECTIONS ARE ALIGNED. IF THE DUCT SECTIONS ARE NOT ALIGNED CORRECTLY, LEAKS CAN OCCUR AND CAUSE DAMAGE TO EQUIPMENT.

- (5) Tighten the forged couplings [4] to the torque value shown on the part.

- (a) Lightly tap around each forged coupling [4] with a rubber mallet, STD-3906.

NOTE: This will make sure you engage the coupling and flanges correctly.

- (b) Re-tighten all the forged couplings [4] to the torque value shown on the part again.

SUBTASK 36-13-01-420-005

CAUTION: DO NOT TIGHTEN THE COUPLINGS UNTIL ALL OF THE DUCT SECTIONS ARE ALIGNED. IF THE DUCT SECTIONS ARE NOT ALIGNED CORRECTLY, LEAKS CAN OCCUR AND CAUSE DAMAGE TO EQUIPMENT.

- (6) Tighten the V-band coupling [7] to 45-55 pound-inches (5.1-6.2 newton meters).

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- (a) Lightly tap around the V-band coupling [7] with a rubber mallet, STD-3906.

NOTE: This will make sure you engage the coupling and flanges correctly.

- (b) Re-tighten the V-band coupling [7] to 45-55 pound-inches (5.1-6.2 newton meters) again.

SUBTASK 36-13-01-020-009

- (7) Tighten the bolts [12] and nuts [16] on duct support links [9].

- (a) To install a lockwire on the duct support link [9], do this task: Lockwires Installation, TASK 20-10-44-400-801.

SUBTASK 36-13-01-420-006

- (8) If the precooler control valve sensor [2] is to be installed, do this task: Precooler Control Valve Sensor Installation, TASK 36-12-03-400-801.

SUBTASK 36-13-01-420-007

- (9) If the 450°F thermostat [1] is to be installed, do this task: Thermostat Installation, TASK 36-11-05-400-801.

SUBTASK 36-13-01-420-008

- (10) If the 490°F overtemperature switch [3] is to be installed, do this task: Overtemperature Switch Installation, TASK 36-11-08-400-801.

SUBTASK 36-13-01-420-009

- (11) Install or reposition the other system hardwares (tubing, wiring, support brackets, and wiring harnesses) that were moved out of the way to make room for the duct installation.

H. Put the Airplane Back to Its Usual Condition

SUBTASK 36-13-01-010-008

- (1) Close the applicable access panels that you opened to get access to the duct section.

- (a) For the left engine strut, do this step:

- 1) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
431BL	Forward Strut Fairing, Left Mid Strut Fairing, Strut 1
431BR	Forward Strut Fairing, Right Mid Strut Fairing, Strut 1
431CL	Forward Strut Fairing, Left Overwing Fairing, Strut 1
431CR	Forward Strut Fairing, Right Overwing Fairing, Strut 1

- (b) For the right engine strut, do this step:

- 1) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
441BL	Forward Strut Fairing, Left Mid Strut Fairing, Strut 2
441BR	Forward Strut Fairing, Right Mid Strut Fairing, Strut 2
441CL	Forward Strut Fairing, Left Overwing Fairing, Strut 2
441CR	Forward Strut Fairing, Right Overwing Fairing, Strut 2

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SUBTASK 36-13-01-860-005

WARNING: MAKE SURE PERSONS AND EQUIPMENT ARE CLEAR OF THE LEADING EDGE AND TRAILING EDGE CONTROL SURFACES. THE LEADING EDGE AND TRAILING EDGE CONTROL SURFACES CAN EXTEND AND RETRACT QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

CAUTION: MAKE SURE THE INBOARD FAN DUCT COWL AND THE THRUST REVERSERS ARE CLOSED OR REMOVED BEFORE YOU RETRACT THE LEADING EDGE FLAPS. THERE IS NOT SUFFICIENT CLEARANCE FOR THE FLAPS TO RETRACT IF THE INBOARD FAN DUCT COWL AND THE THRUST REVERSERS ARE IN THE OPEN POSITION. THIS CAN CAUSE DAMAGE TO EQUIPMENT.

- (2) To retract the wing leading edge flaps and remove the lock:
 - (a) Do this task: Leading Edge Flap and Slat Locks Removal, TASK 27-81-00-080-801.
 - (b) Do this task: Leading Edge Flaps and Slats Retraction, TASK 27-81-00-860-804.

————— **END OF TASK** —————

TASK 36-13-01-000-803

6. Wing Leading Edge Duct Removal

(Figure 402)

A. General

- (1) This procedure is written to provide general information to assist with the removal of the wing leading edge pneumatic duct sections. Do only the steps that are necessary to remove the required section of duct.

B. References

Reference	Title
27-81-00-480-801	Leading Edge Flap and Slat Locks Installation (P/B 201)
27-81-00-860-803	Leading Edge Flaps and Slats Extension (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

C. Location Zones

Zone	Area
510	Subzone - Left Wing: Leading Edge, Fwd of Front Spar, Inbd of Strut and Nacelle Gap Cover Area
610	Subzone - Right Wing: Leading Edge, Forward of Front Spar, Inboard of Nacelle Strut, Including Gap Cover Area

D. Access Panels

Number	Name/Location
431CL	Forward Strut Fairing, Left Overwing Fairing, Strut 1
441CR	Forward Strut Fairing, Right Overwing Fairing, Strut 2
621GB	Refuel Access Panel - Slat Station 143.27

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E. Prepare to Remove the Duct Section

SUBTASK 36-13-01-860-006

WARNING: RELEASE THE PRESSURE IN THE PNEUMATIC DUCT BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. THE HOT, HIGH-PRESSURE AIR CAN CAUSE INJURY TO PERSONS.

(1) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 36-13-01-010-009

WARNING: MAKE SURE PERSONS AND EQUIPMENT ARE CLEAR OF THE LEADING EDGE AND TRAILING EDGE CONTROL SURFACES. THE LEADING EDGE AND TRAILING EDGE CONTROL SURFACES CAN EXTEND AND RETRACT QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

CAUTION: MAKE SURE THE INBOARD FAN DUCT COWL AND THE THRUST REVERSERS ARE CLOSED OR REMOVED BEFORE YOU EXTEND THE LEADING EDGE FLAPS. THERE IS NOT SUFFICIENT CLEARANCE FOR THE FLAPS TO EXTEND IF THE INBOARD FAN DUCT COWL AND THE THRUST REVERSERS ARE IN THE OPEN POSITION. THIS CAN CAUSE DAMAGE TO EQUIPMENT.

(2) To extend and lock the wing leading edge to get access to a duct section for removal:

(a) Do this task: Leading Edge Flaps and Slats Extension, TASK 27-81-00-860-803.

(b) Do this task: Leading Edge Flap and Slat Locks Installation, TASK 27-81-00-480-801.

SUBTASK 36-13-01-010-010

(3) To get access to a duct section for removal, do this step, if it is necessary:

(a) Open these access panels:

<u>Number</u>	<u>Name/Location</u>
431CL	Forward Strut Fairing, Left Overwing Fairing, Strut 1
441CR	Forward Strut Fairing, Right Overwing Fairing, Strut 2
621GB	Refuel Access Panel - Slat Station 143.27

F. Remove the Duct Section

SUBTASK 36-13-01-020-010

(1) Remove the V-band couplings [24] at each end of the duct section.

SUBTASK 36-13-01-020-011

(2) Remove the duct support clamp [30] that supports one end of the duct section.

NOTE: Make sure you keep track of the fastener build up to make the installation correct.

(a) Remove the nuts [28] and washers [29].

SUBTASK 36-13-01-020-012

(3) If there is a cable assembly attached to the duct section, disconnect the cable assembly [42] at the duct section.

NOTE: Make sure you keep track of the fastener build-up for installation.

(a) Remove the bolt [39], washers [40] and nut [41].

SUBTASK 36-13-01-020-013

(4) If there is a boot seal attached to the duct section, loosen the clamp [22] on the boot seal [21].

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- (a) Remove the boot seal [21], if it is necessary to ease duct removal.

NOTE: Make sure you keep track of the fastener build-up for installation.

- 1) Remove the bolts [26], washers [27] and seal ring [20].

SUBTASK 36-13-01-020-014

- (5) Remove the applicable duct section:

- (a) Inboard leading edge duct [25]
- (b) Center wing leading edge duct [23]
- (c) Outboard leading edge duct [38].
- (d) Wing Anti-Ice Duct [43]

SUBTASK 36-13-01-480-001

- (6) Install covers on the adjacent duct openings to keep unwanted material out.

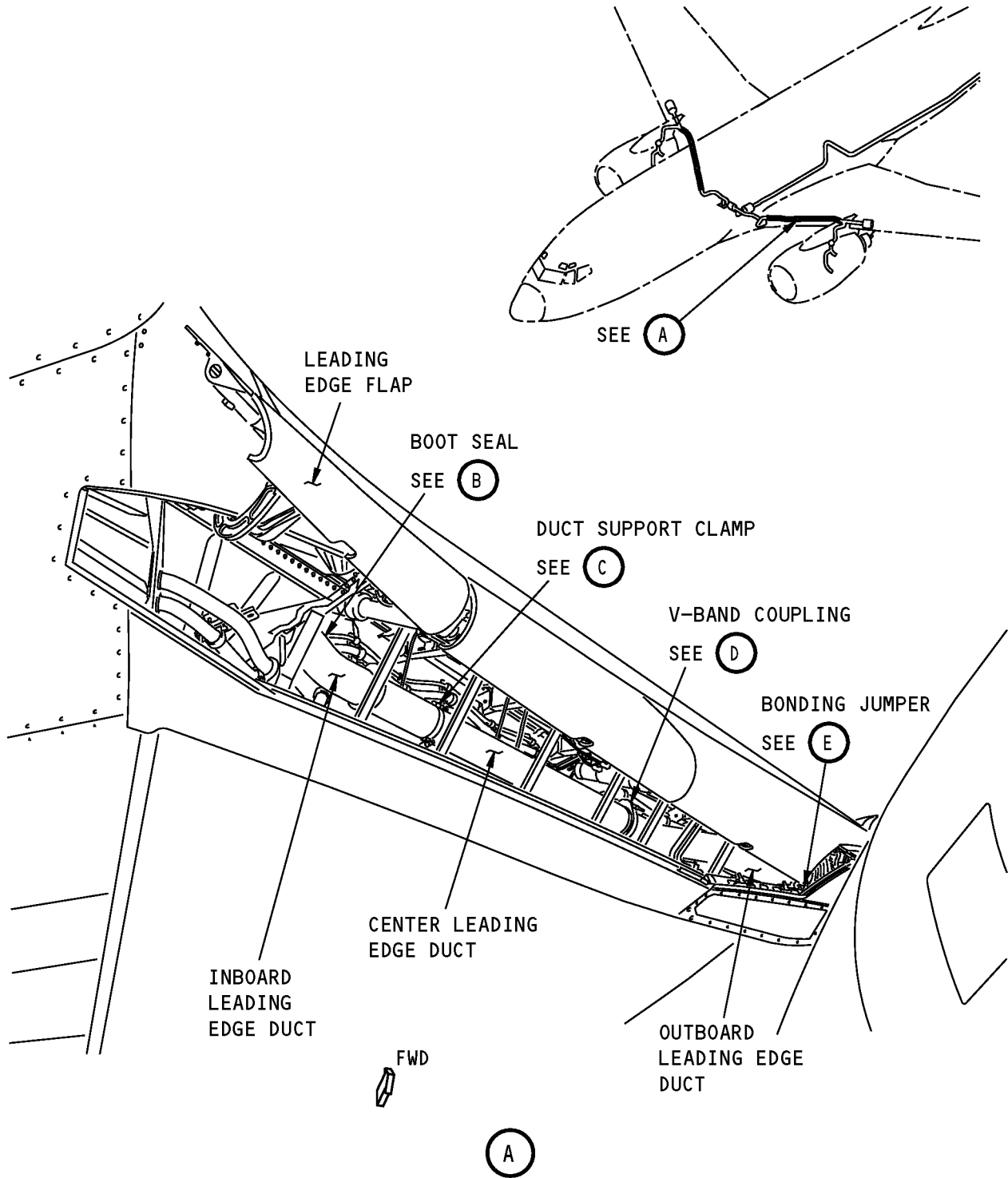
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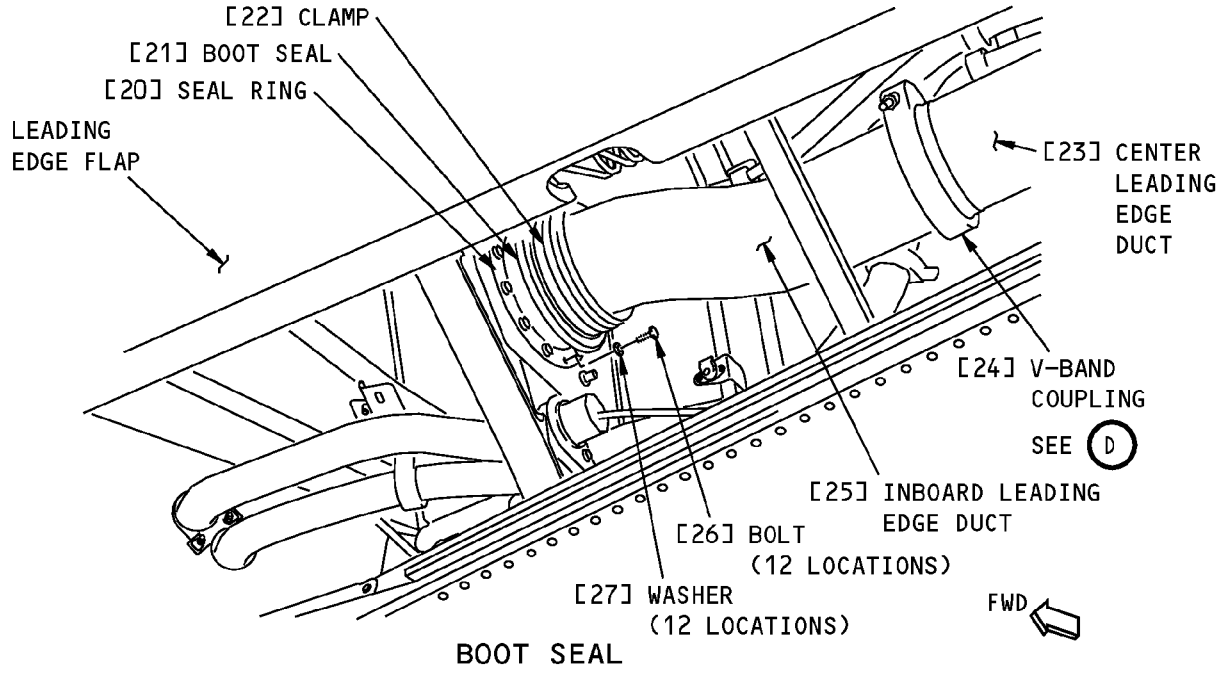


**Wing Leading Edge Pneumatic Duct Installation
Figure 402 (Sheet 1 of 4)/36-13-01-990-803**

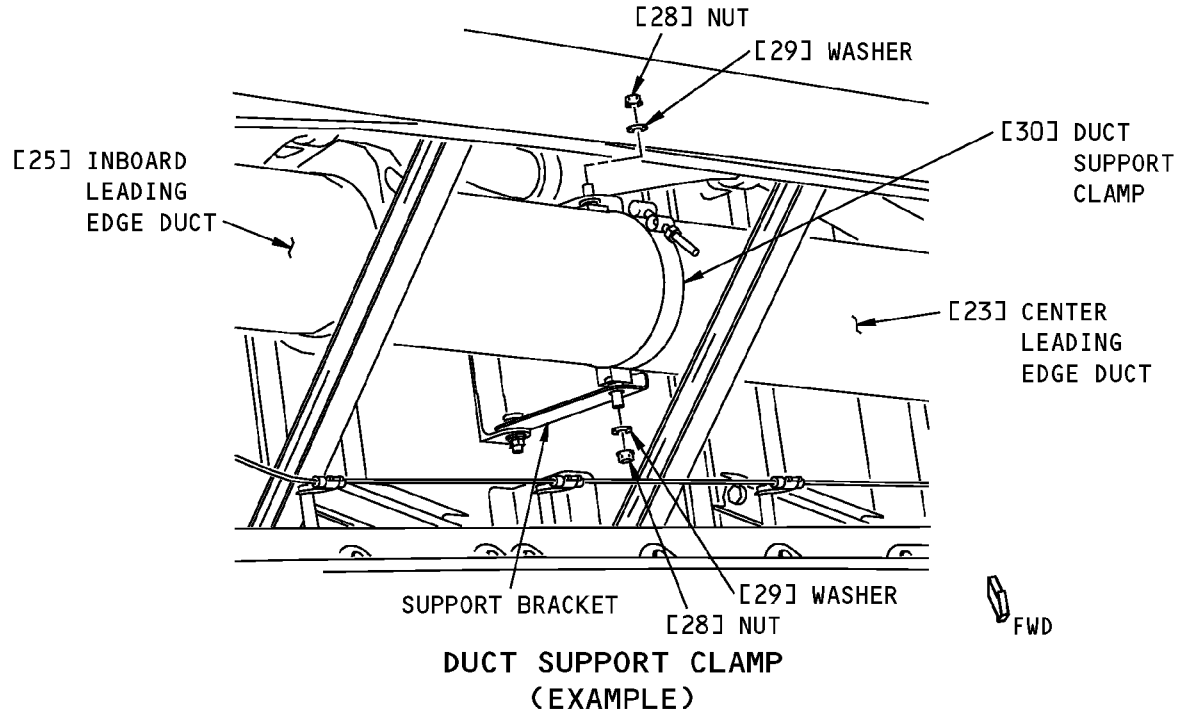
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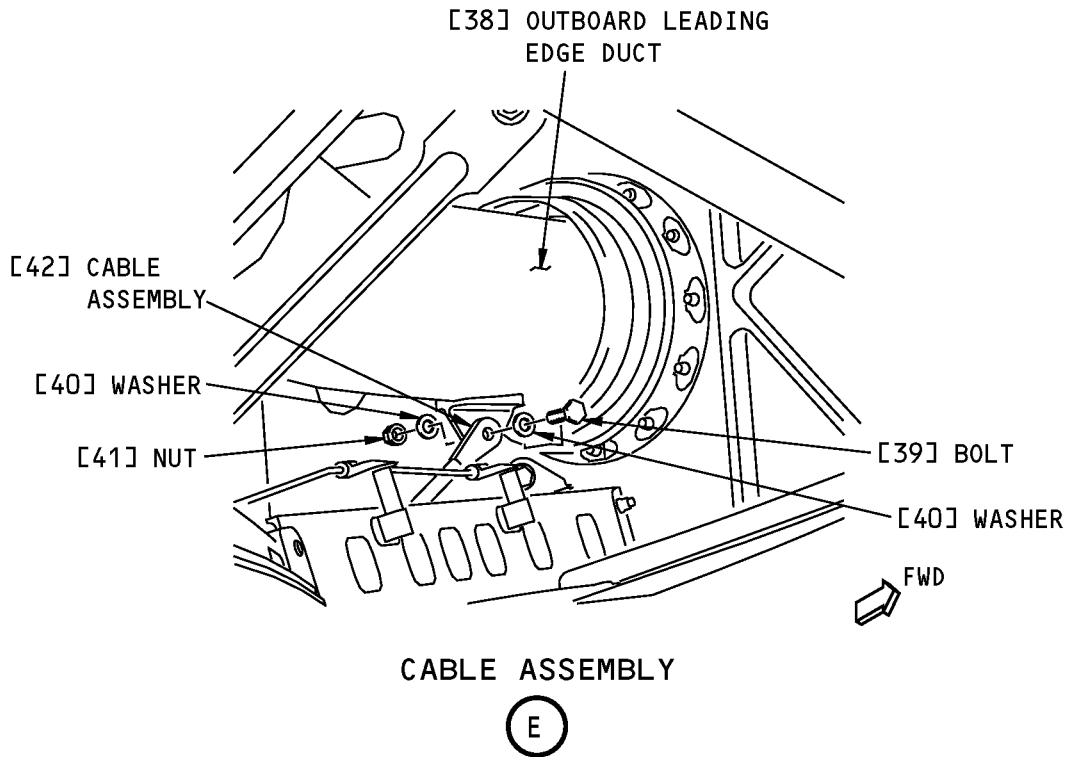
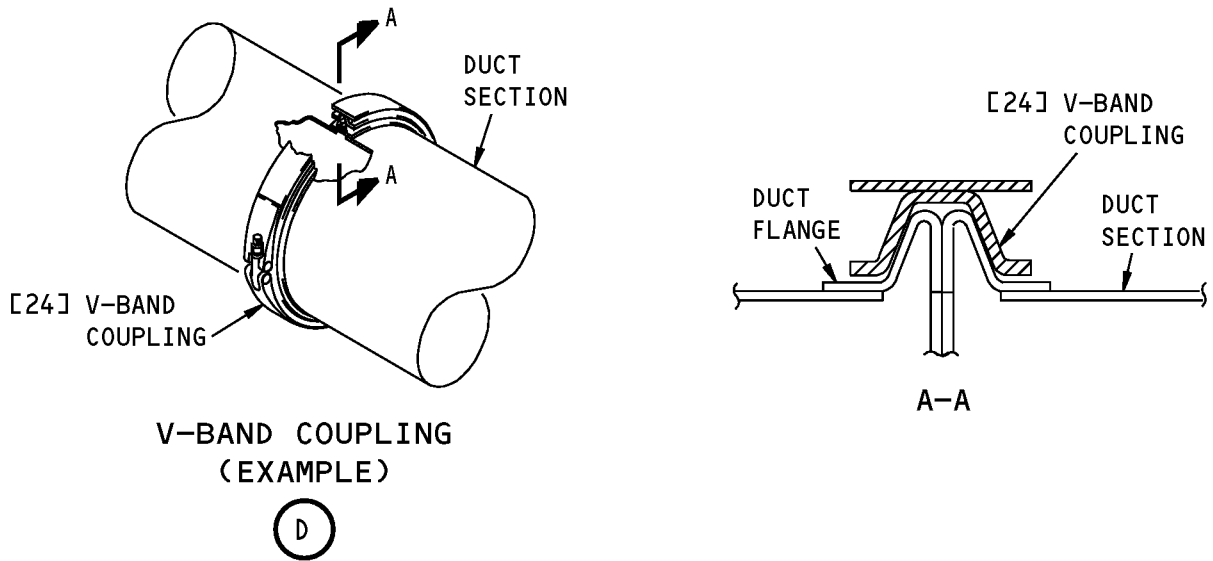


(C)

Wing Leading Edge Pneumatic Duct Installation
Figure 402 (Sheet 2 of 4)/36-13-01-990-803

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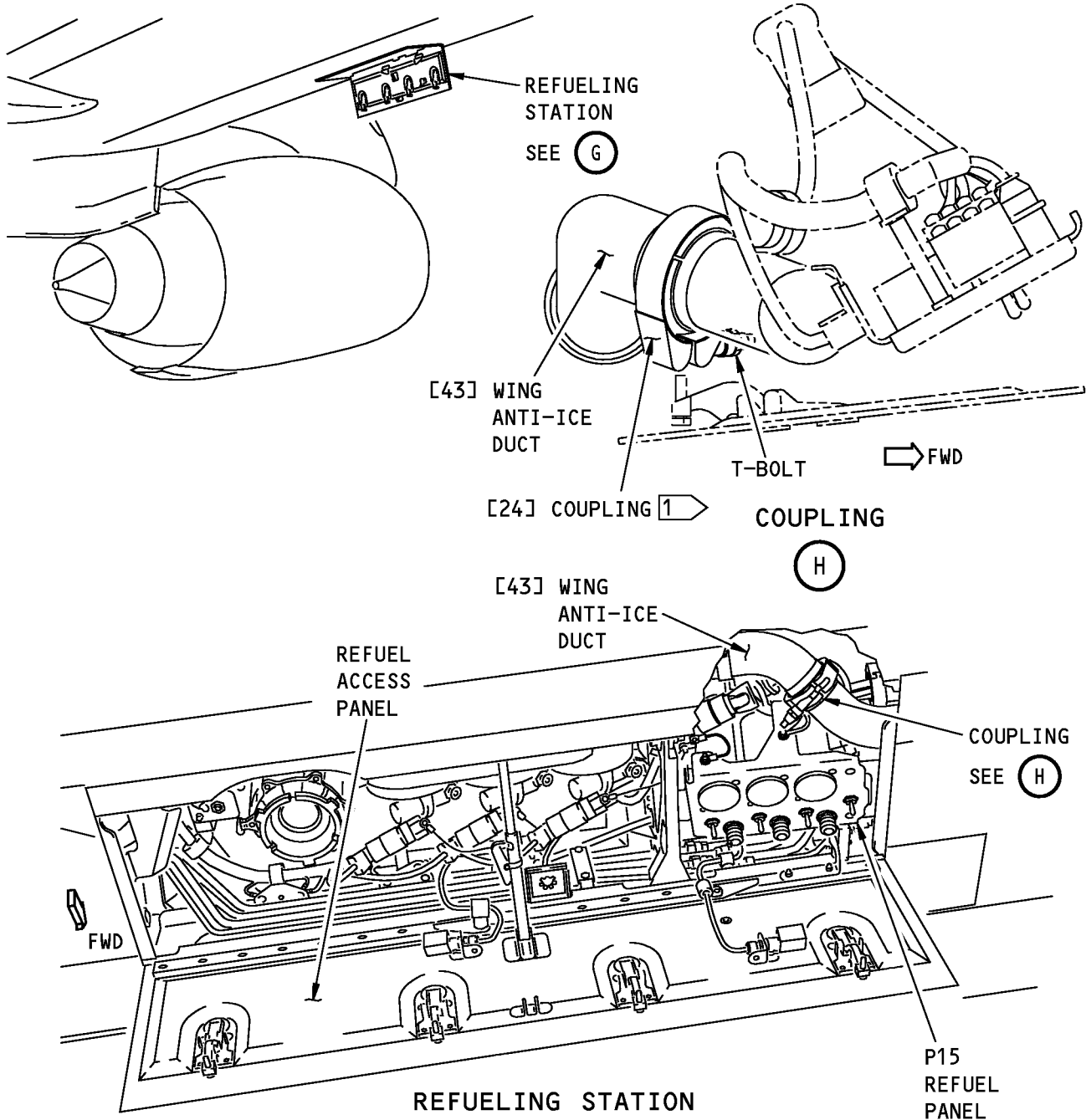


Wing Leading Edge Pneumatic Duct Installation
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1 POSITION THE CLAMP SO THERE IS A MINIMUM CLEARANCE OF 0.50 INCH (12.7 mm) BETWEEN THE COUPLING AND THE ACCESS PANEL AND WIRES.

G

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**Wing Leading Edge Pneumatic Duct Installation
Figure 402 (Sheet 4 of 4)/36-13-01-990-803**

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TASK 36-13-01-400-801

7. Wing Leading Edge Duct Installation

(Figure 402)

A. General

- (1) This procedure is written to provide general information to assist with the installation of the wing leading edge pneumatic duct sections. Do only the steps that are necessary to install the required section of duct.

B. References

Reference	Title
27-81-00-080-801	Leading Edge Flap and Slat Locks Removal (P/B 201)
27-81-00-860-804	Leading Edge Flaps and Slats Retraction (P/B 201)
36-00-00-860-801	Supply Pressure to the Pneumatic System (Selection) (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

C. Tools/Equipment

Reference	Description
STD-3906	Mallet - Rubber

D. Consumable Materials

Reference	Description	Specification
A00160	Sealant - Firewall - Hydraulic Fluid Resistant	BMS5-63
D00010	Compound - Thread Antiseize, High Temperature	MIL-PRF-907F

E. Location Zones

Zone	Area
510	Subzone - Left Wing: Leading Edge, Fwd of Front Spar, Inbd of Strut and Nacelle Gap Cover Area
610	Subzone - Right Wing: Leading Edge, Forward of Front Spar, Inboard of Nacelle Strut, Including Gap Cover Area

F. Access Panels

Number	Name/Location
431CL	Forward Strut Fairing, Left Overwing Fairing, Strut 1
441CR	Forward Strut Fairing, Right Overwing Fairing, Strut 2
621GB	Refuel Access Panel - Slat Station 143.27

G. Install the Duct Section

SUBTASK 36-13-01-080-001

- (1) Remove the covers from the duct openings.

SUBTASK 36-13-01-420-010

- (2) Do these steps only if it is necessary to install a duct section through a penetration hole in the bulkhead or structural barrier.
 - (a) Put the duct section through the boot seal [21].
 - (b) If the boot seal [21] is not installed over the penetration hole, do the steps that follow to install the boot seal [21] before you continue on to the next step:
 - 1) Apply a faying surface seal with sealant, A00160 between the mating surfaces of the boot seal [21] and the bulkhead or structural barrier.

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- 2) Put the seal ring [20] over the boot seal [21].
 - 3) Put the duct section through the penetration hole with the boot seal [21] against the bulkhead or structural barrier.
 - 4) Apply antiseize compound, D00010 to the threads on all of the bolts [26].
 - 5) Install the bolts [26] and washers [27].
 - 6) Tighten the bolts [26] to 20-25 pound-inches (2.22-2.78 Newton-meters).
- (c) Install the clamp [22] on the boot seal [21].

NOTE: Do not tighten the clamp [22]. All of the duct sections must be aligned before the clamp [22] can be tightened.

SUBTASK 36-13-01-410-004

- (3) If there is a cable assembly attachment provision for the duct section, connect the cable assembly [42] to the duct section.

NOTE: Make sure the clearance between the cable assembly and the electrical wire bundle is at least 0.50 in. (12.7 mm).

- (a) Install the bolt [39], washers [40] and nut [41].

SUBTASK 36-13-01-420-011

CAUTION: DO NOT TIGHTEN THE COUPLINGS UNTIL ALL OF THE DUCTS ARE INSTALLED AND ALIGNED. IF THE DUCTS ARE NOT ALIGNED CORRECTLY LEAKS CAN OCCUR AND CAUSE DAMAGE TO EQUIPMENT.

- (4) Install the V-band coupling [24] between the duct sections.

SUBTASK 36-13-01-420-045

- (5) For the [43] anti-ice duct behind the P15 refuel panel, do the following:

- (a) Install the [24] V-band coupling so that the T-bolt is positioned near the front of the P15 panel and with the end of the T-bolt pointing towards the panel.
- (b) Make sure the [24] V-band coupling is positioned so there is a minimum clearance of 0.50 inch (12.7 mm) between the coupling and the P15 panel and wiring.

SUBTASK 36-13-01-420-012

- (6) Align the duct sections.

NOTE: Make sure that there are sufficient clearances between the duct couplings and wiring or structures.

SUBTASK 36-13-01-420-013

- (7) Use a rubber mallet, STD-3906 to lightly tap outer surface the V-band couplings [24].

NOTE: This will make sure you engage the coupling and flanges correctly.

SUBTASK 36-13-01-420-014

- (8) Tighten all the V-band couplings [24] to 45-55 pound-inches (5.00-6.11 Newton-meters).

SUBTASK 36-13-01-420-015

- (9) Tighten all the duct support clamps [30] to 10-15 pound-inches (1.11-1.67 Newton-meters).

SUBTASK 36-13-01-420-016

- (10) Tighten the clamp [22] for the boot seal [21] to 13-18 pound-inches (1.45-2.00 Newton-meters), where applicable.

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H. Wing Leading Edge Duct Installation Test

SUBTASK 36-13-01-720-001

(1) Do a leak test of the duct installation:

(a) Do this task: Supply Pressure to the Pneumatic System (Selection), TASK 36-00-00-860-801.

(b) Do a check for air leakage:

1) Small air leakage is satisfactory.

2) Repair large air leakage.

NOTE: Large air leakage is when you feel the airflow with your hand at a distance of 12 inches (31 cm) or greater from a point on the duct joint.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 36-13-01-860-007

(1) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 36-13-01-860-008

WARNING: MAKE SURE PERSONS AND EQUIPMENT ARE CLEAR OF THE LEADING EDGE AND TRAILING EDGE CONTROL SURFACES. THE LEADING EDGE AND TRAILING EDGE CONTROL SURFACES CAN EXTEND AND RETRACT QUICKLY. THIS CAN CAUSE INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

CAUTION: MAKE SURE THE INBOARD FAN DUCT COWL AND THE THRUST REVERSERS ARE CLOSED OR REMOVED BEFORE YOU RETRACT THE LEADING EDGE FLAPS. THERE IS NOT SUFFICIENT CLEARANCE FOR THE FLAPS TO RETRACT IF THE INBOARD FAN DUCT COWL AND THE THRUST REVERSERS ARE IN THE OPEN POSITION. THIS CAN CAUSE DAMAGE TO EQUIPMENT.

(2) To retract the wing leading edge flaps and remove the lock:

(a) Do this task: Leading Edge Flap and Slat Locks Removal, TASK 27-81-00-080-801.

(b) Do this task: Leading Edge Flaps and Slats Retraction, TASK 27-81-00-860-804.

SUBTASK 36-13-01-410-005

(3) Close the applicable access panels.

<u>Number</u>	<u>Name/Location</u>
431CL	Forward Strut Fairing, Left Overwing Fairing, Strut 1
441CR	Forward Strut Fairing, Right Overwing Fairing, Strut 2
621GB	Refuel Access Panel - Slat Station 143.27

————— END OF TASK —————

TASK 36-13-01-000-804

8. Crossover Duct Removal

(Figure 403)

A. General

(1) This procedure is written to provide general information to assist with the removal of the crossover pneumatic duct sections. Do only the steps that are necessary to remove the required section of duct.

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B. References

Reference	Title
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)
36-13-03-000-801	Ground Pneumatic Connector Check Valve Removal (P/B 401)

C. Location Zones

Zone	Area
192	Lower Wing-To-Body Fairing - Under Wing Box
193	Lower Wing-To-Body Fairing - Wheel Well

D. Access Panels

Number	Name/Location
191CL	Forward Wing To Body Fairing Panel - Middle
191CR	Forward Wing To Body Fairing Panel - Middle
192CL	Air Conditioning Access Door
192CR	Air Conditioning Access Door
192E	ECS Under Keel Panel - Forward

E. Prepare to Remove the Duct Section

SUBTASK 36-13-01-860-009

WARNING: YOU MUST REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. IF YOU DO NOT REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS, HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(1) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 36-13-01-010-011

(2) To get access to the duct section, do this task:

(a) Open these access panels:

Number	Name/Location
191CL	Forward Wing To Body Fairing Panel - Middle
191CR	Forward Wing To Body Fairing Panel - Middle
192CL	Air Conditioning Access Door
192CR	Air Conditioning Access Door
192E	ECS Under Keel Panel - Forward

SUBTASK 36-13-01-020-015

(3) To remove the ground pneumatic connector duct [69], it is necessary to first remove the ground pneumatic connector check valve, do this task: Ground Pneumatic Connector Check Valve Removal, TASK 36-13-03-000-801.

SUBTASK 36-13-01-020-016

(4) Remove or move the other adjacent system installations if it is necessary to get more room to ease the removal of the duct section.

F. Remove the Duct Section

SUBTASK 36-13-01-020-017

(1) Remove the V-band clamp [68] from the end of the duct section.

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SUBTASK 36-13-01-020-018

- (2) Disconnect the pressure line at the duct section, if the duct section has pressure line connected to the duct pressure transducer and/or hydraulic reservoir pressurization system.
 - (a) Put a cover on the open duct boss and disconnected pressure line to keep out unwanted material.

SUBTASK 36-13-01-020-019

- (3) Remove the bolt [61], washers [62] and nut [65] to disconnect the duct support link [66] from the duct support clamp [63].

SUBTASK 36-13-01-020-020

- (4) Remove the applicable duct section.
 - (a) Wing-to-crossover duct [64]
 - (b) Crossover manifold duct [67]
 - (c) Ground pneumatic connector duct [69].

SUBTASK 36-13-01-020-021

- (5) Remove the duct support clamp [63] from the wing-to-crossover duct [64], if the duct section was removed.

NOTE: Keep the duct support clamp [63] for installation on replacement duct.

SUBTASK 36-13-01-020-022

- (6) Install covers on the openings in the duct to keep unwanted material out.

————— **END OF TASK** —————

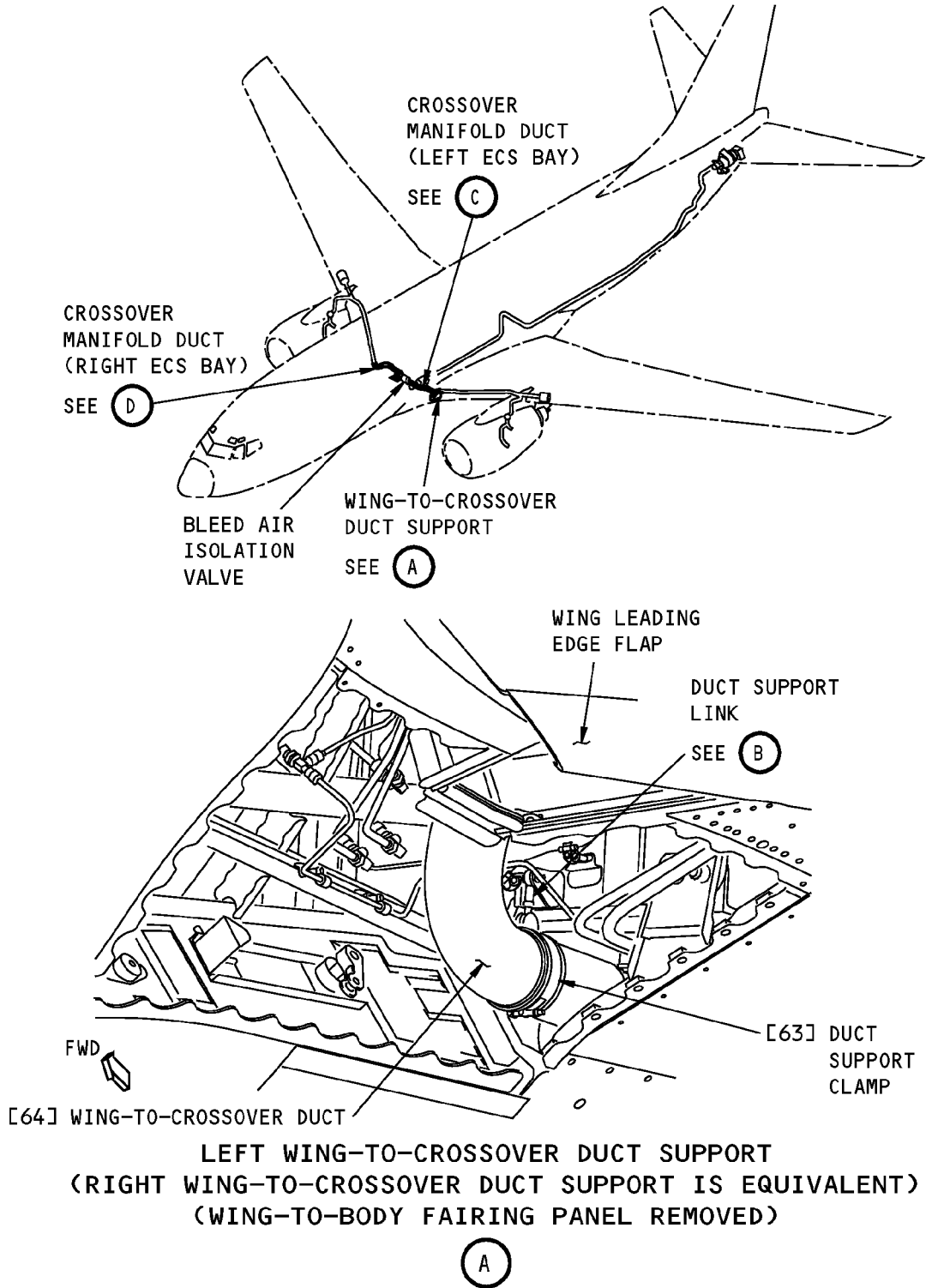
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**Crossover Pneumatic Duct Installation
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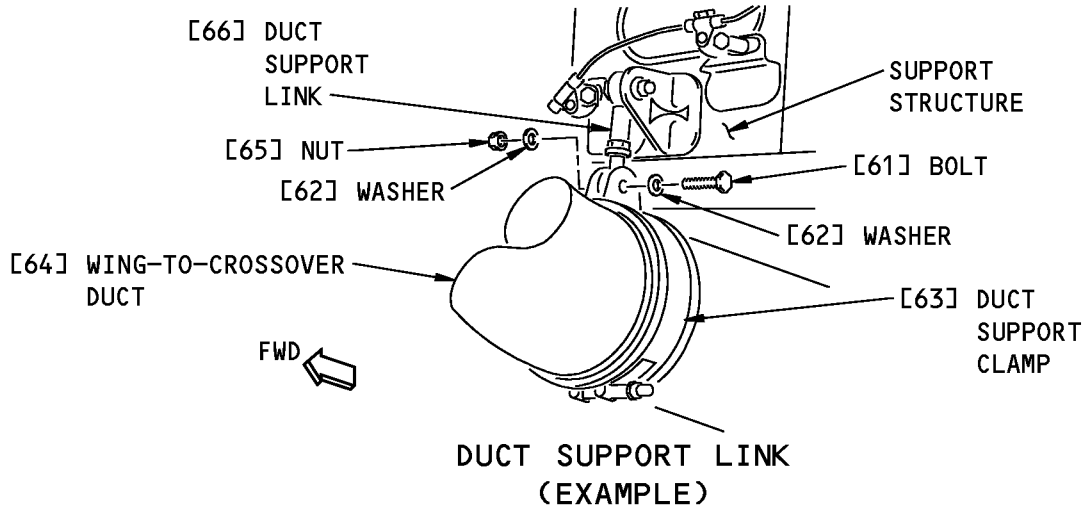
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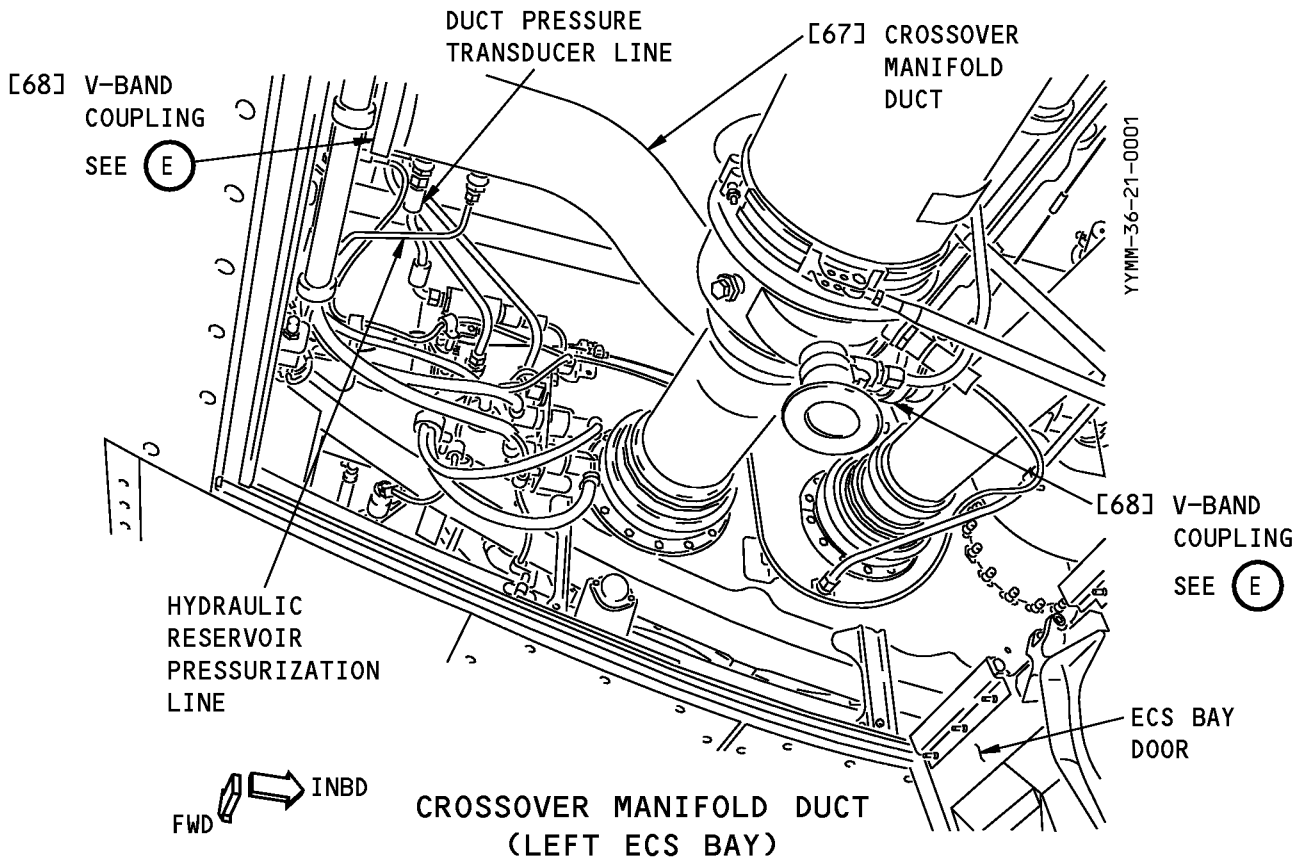
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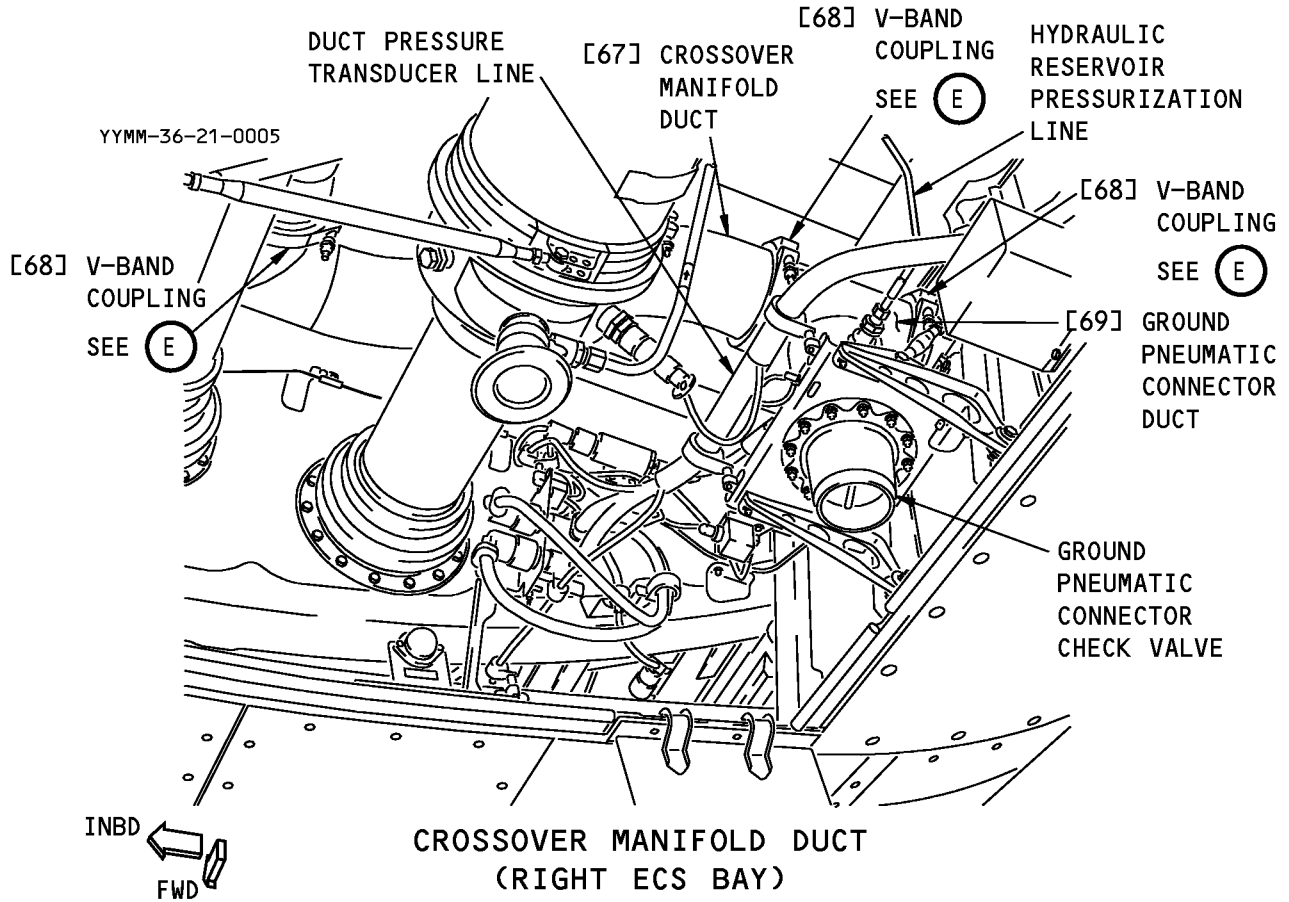
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Crossover Pneumatic Duct Installation
Figure 403 (Sheet 2 of 3)/36-13-01-990-804

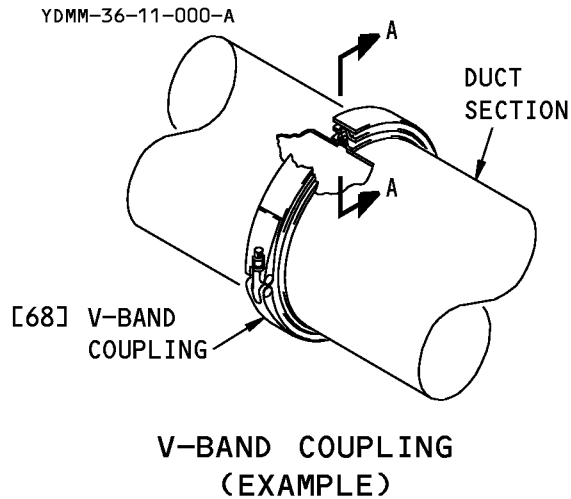
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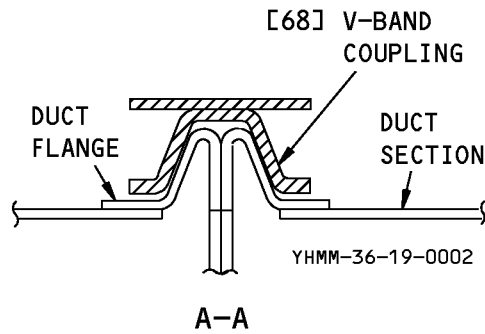
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(D)



(E)



Crossover Pneumatic Duct Installation
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TASK 36-13-01-000-805

9. Crossover Duct Installation

(Figure 403)

A. General

- (1) This procedure is written to provide general information to assist with the installation of the crossover pneumatic duct sections. Do only the steps that are necessary to install the required section of duct.

B. References

Reference	Title
20-50-11-910-801	Standard Torque Values (P/B 201)
36-00-00-860-801	Supply Pressure to the Pneumatic System (Selection) (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)
36-13-03-400-801	Ground Pneumatic Connector Check Valve Installation (P/B 401)

C. Tools/Equipment

Reference	Description
STD-3906	Mallet - Rubber

D. Consumable Materials

Reference	Description	Specification
D00010	Compound - Thread Antiseize, High Temperature	MIL-PRF-907F
G00091	Compound - Oxygen System Leak Detection - Snoop Leak Detector	MIL-PRF-25567

E. Location Zones

Zone	Area
192	Lower Wing-To-Body Fairing - Under Wing Box
193	Lower Wing-To-Body Fairing - Wheel Well

F. Access Panels

Number	Name/Location
191CL	Forward Wing To Body Fairing Panel - Middle
191CR	Forward Wing To Body Fairing Panel - Middle
192CL	Air Conditioning Access Door
192CR	Air Conditioning Access Door
192E	ECS Under Keel Panel - Forward

G. Prepare to Install the Duct Section

SUBTASK 36-13-01-420-017

- (1) Loosely install the duct support clamp [63] on the wing-to-crossover duct [64] before you do the installation.

SUBTASK 36-13-01-860-010

- (2) Remove the covers from the ducts before you do the installation.

H. Install the Duct Section

SUBTASK 36-13-01-420-018

- (1) Put the applicable duct section in the correct position and orientation for installation.

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- (a) Wing-to-crossover duct [64]
- (b) Crossover manifold duct [67]
- (c) Ground pneumatic connector duct [69].

SUBTASK 36-13-01-420-019

CAUTION: DO NOT TIGHTEN THE COUPLINGS UNTIL ALL OF THE DUCTS ARE INSTALLED AND ALIGNED. IF THE DUCTS ARE NOT ALIGNED CORRECTLY LEAKS CAN OCCUR AND CAUSE DAMAGE TO EQUIPMENT.

- (2) Install the V-band coupling [68] between the duct sections.

SUBTASK 36-13-01-020-023

- (3) Do the steps that follow to install the wing-to-crossover duct [64]:
 - (a) If there is a duct support clamp [63] on the duct section, connect the duct support link [66] to duct support clamp [63].
 - 1) Install the bolt [61], washers [62] and nut [65].
 - 2) Tighten the duct support clamp [63].
 - 3) Tighten the bolt [61] and nut [65].

SUBTASK 36-13-01-420-020

- (4) Install the pressure line at the duct section, if the duct section has pressure line connected to the duct pressure transducer and/or hydraulic reservoir pressurization system.
 - (a) Apply antiseize compound, D00010 to the threads on the connection fittings.
 - (b) Torque the fitting on pressure line connection, do this task: Standard Torque Values, TASK 20-50-11-910-801.

SUBTASK 36-13-01-410-006

- (5) Install the ground pneumatic connector check valve, if it was removed, do this task: Ground Pneumatic Connector Check Valve Installation, TASK 36-13-03-400-801.

SUBTASK 36-13-01-420-021

- (6) Align the duct sections.

NOTE: Make sure that there are sufficient clearances between the duct couplings and wiring or structures.

SUBTASK 36-13-01-420-022

- (7) Use a rubber mallet, STD-3906 to lightly tap outer surface the V-band couplings [68].

NOTE: This will make sure you engage the coupling and flanges correctly.

SUBTASK 36-13-01-420-023

- (8) Tighten the V-band couplings [68].

I. Crossover Duct Installation Test

SUBTASK 36-13-01-720-002

- (1) Do a leak test of the duct:
 - (a) Do this task: Supply Pressure to the Pneumatic System (Selection), TASK 36-00-00-860-801.
 - (b) Apply a leak detector Snoop Leak Detector compound, G00091 to the sense line connections.
 - (c) Do a check for air leakage:
 - 1) Small air leakage is satisfactory at the coupling joint.

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- 2) No leakage is permitted at the sense line connection.
- 3) Repair large air leakage.

NOTE: Large air leakage is when you feel the airflow with your hand at a distance of 12 inches (31 cm) or greater from a point on the duct joint.

J. Put the Airplane Back to Its Usual Condition

SUBTASK 36-13-01-860-011

- (1) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 36-13-01-420-024

- (2) Install the other adjacent system installations that was removed or relocated to get more room to ease the installation of the duct section.

SUBTASK 36-13-01-410-007

- (3) Close these access panels:

Number	Name/Location
191CL	Forward Wing To Body Fairing Panel - Middle
191CR	Forward Wing To Body Fairing Panel - Middle
192CL	Air Conditioning Access Door
192CR	Air Conditioning Access Door
192E	ECS Under Keel Panel - Forward

END OF TASK

TASK 36-13-01-000-806

10. APU Pneumatic Duct Removal

(Figure 404)

A. General

- (1) This procedure is written to provide general information to assist with the removal of the APU pneumatic duct sections. Do only the steps that are necessary to remove the required section of duct.

B. References

Reference	Title
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

C. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
139	Keel Beam, (Part) Body Station 540.00 to Body Station 727.00
141	Aft Cargo Compartment - Left
145	Aft Cargo Compartment Equipment Bay - Left
149	Keel Beam (Part) Body Station 727.00 to Body Station 743.95
310	Fuselage - Body Station 1016.00 to Body Station 1217.00

D. Access Panels

Number	Name/Location
192CL	Air Conditioning Access Door
192CR	Air Conditioning Access Door

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Number	Name/Location
192E	ECS Under Keel Panel - Forward
192F	ECS Under Keel Panel - Middle
192K	Air Conditioning Under Keel Panel - Aft
311BL	Stabilizer Trim Access Door
822	Aft Cargo Door

E. Prepare to Remove the Duct Section

SUBTASK 36-13-01-860-012

- (1) Make sure the APU master switch and APU bleed switch on the P5 forward overhead panel are in the OFF position and install DO-NOT-OPERATE tags.

SUBTASK 36-13-01-860-014

WARNING: YOU MUST REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. IF YOU DO NOT REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS, HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (2) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 36-13-01-010-012

- (3) To get access to the duct section, do this step:

- (a) Open these access panels:

Number	Name/Location
192CL	Air Conditioning Access Door
192CR	Air Conditioning Access Door
192E	ECS Under Keel Panel - Forward
192F	ECS Under Keel Panel - Middle
192K	Air Conditioning Under Keel Panel - Aft
311BL	Stabilizer Trim Access Door
822	Aft Cargo Door

SUBTASK 36-13-01-020-024

- (4) In order to get access to the duct sections in the keel beam through the keel beam access holes, remove the air conditioning duct section [99] in the left and right ECS bays (Figure 404) (View A).

SUBTASK 36-13-01-020-025

- (5) If the potable water pressurization line is connected to the duct section, disconnect the potable water pressurization line at the union [71] on the duct section (Figure 404) (View B).

- (a) Put a cover on the union [71] and the disconnected potable water pressurization line to keep unwanted material out.
- (b) Do the steps that follow after the duct section is removed, if it is necessary:
 - 1) Remove the union [71] and packing [72].
 - 2) Discard the packing [72].
 - 3) Put a cover on the open duct boss to keep unwanted material out.

SUBTASK 36-13-01-020-026

- (6) If there is a duct support clamp [76] that is used to support the duct section at an intermediate location, do the steps that follow (Figure 404) (View F):

- (a) Loosen the duct support clamp [76].

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- (b) If it is necessary to remove the duct support clamp [76] to ease removal of the duct section, remove the nuts [77] and washers [78] to disconnect it from the support bracket.

NOTE: Make sure you keep track of the fastener build-up for installation.

SUBTASK 36-13-01-020-027

- (7) If there is a U-clamp [79] that is used to support the duct section at an intermediate location, do the steps that follow (Figure 404) (View G):
- (a) Remove the bolts [80] and washers [81].

NOTE: Make sure you keep track of the fastener build-up for installation.

- (b) Remove the U-clamp [79].

SUBTASK 36-13-01-020-028

- (8) For removal of the pressure seal [93] behind the aft pressure bulkhead and below the horizontal stabilizer and the pressure seal [97] just forward of the aft bulkhead in the MLG wheel well, follow this procedure:

APU Pneumatic Duct Pressure Seal Removal, TASK 36-13-01-020-801

SUBTASK 36-13-01-020-036

- (9) For removal of the insulated duct section found inside the keel beam between the APU check valve and the MLG wheel well, remove the twelve bolts [94] and washers [95], and the two seal ring halves to disconnect the vapor seal from the keel beam.

NOTE: The vapor seal can be removed after the insulated duct section is removed, if it is necessary.

SUBTASK 36-13-01-020-039

- (10) For removal of the APU pneumatic duct between stations 1064 and station 1088, do the steps that follow.
- (a) Get access to the duct through the stabilizer trim access door (Figure 404)(View K).
- (b) Remove the nuts, washers, bolts, and bushings to disconnect the rod assemblies [105], [106], and [107] from the duct (Figure 404)(View L).
- NOTE:** Make sure you keep track of the fastener build-up for installation.
- (c) Remove the bolts and washers attaching the duct supports [116] and [117] to the bulkhead (Figure 404)(View M).

F. Remove the Duct Section

SUBTASK 36-13-01-020-030

- (1) Support the applicable duct section to be removed.

SUBTASK 36-13-01-020-031

- (2) Remove the V-band couplings [70] at each end of the duct section (Figure 404) (View D).

SUBTASK 36-13-01-020-032

- (3) Remove the duct section.

- (a) For insulated duct sections, do these steps as necessary:

- 1) Remove the clamps to remove the insulation blanket(s) from the duct section.
- 2) Remove the clamp to remove the vapor seal from the duct section.

SUBTASK 36-13-01-020-040

- (4) For the duct section between station 1064 and station 1088, remove the two duct supports [116] and [117] from the end of the duct (Figure 404)(View M).

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SUBTASK 36-13-01-480-002

(5) Install covers on the adjacent duct openings to keep unwanted material out.

————— **END OF TASK** —————

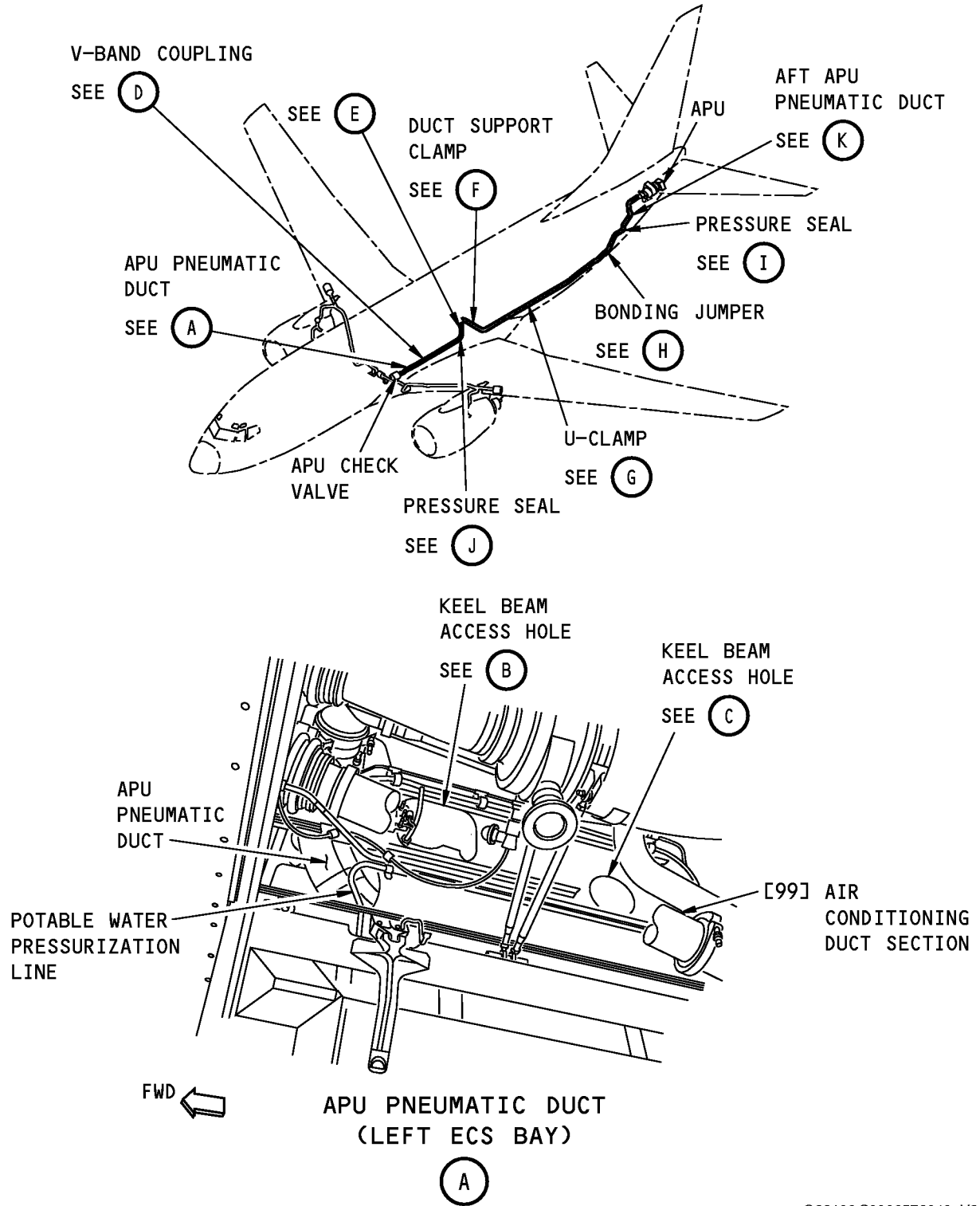
EFFECTIVITY
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APU Pneumatic Duct Installation
Figure 404 (Sheet 1 of 9)/36-13-01-990-805

G23109 S0006578049_V3

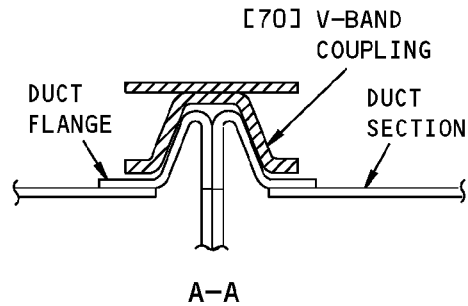
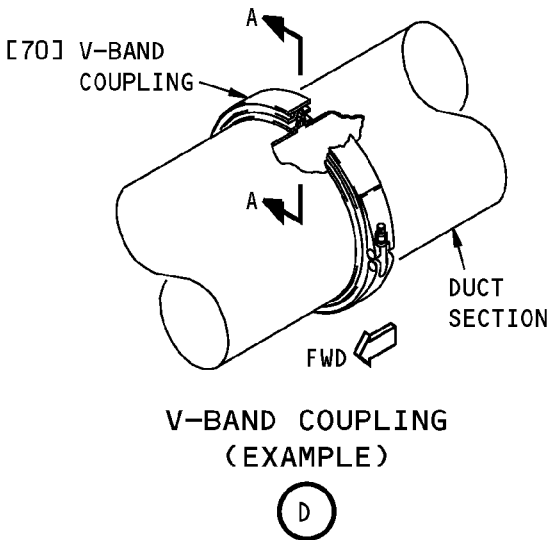
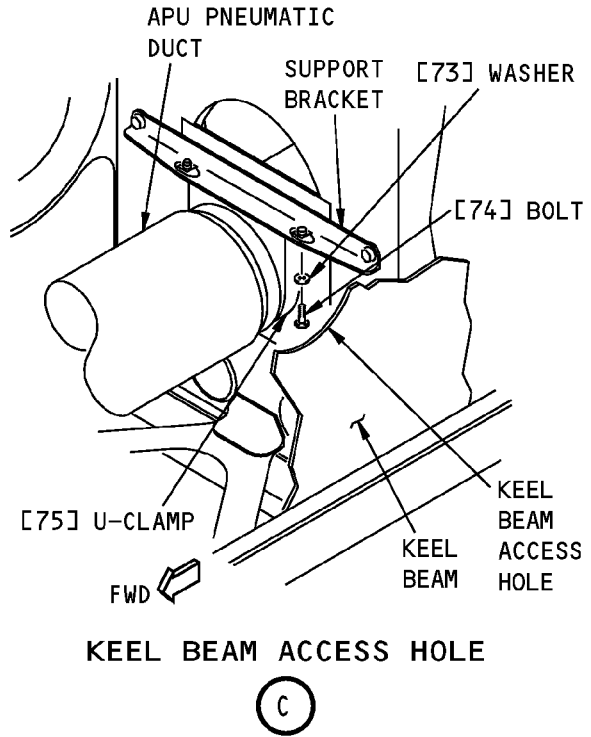
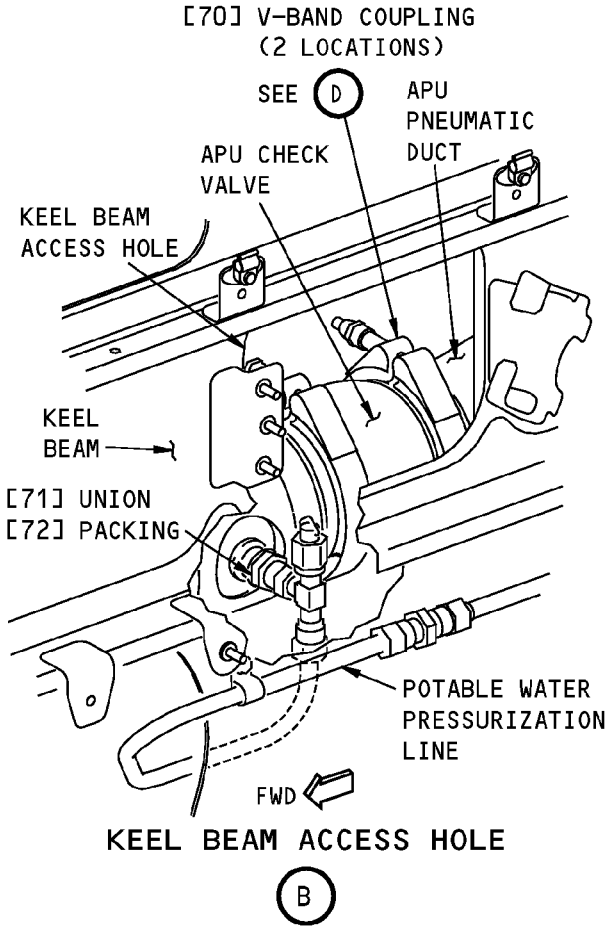
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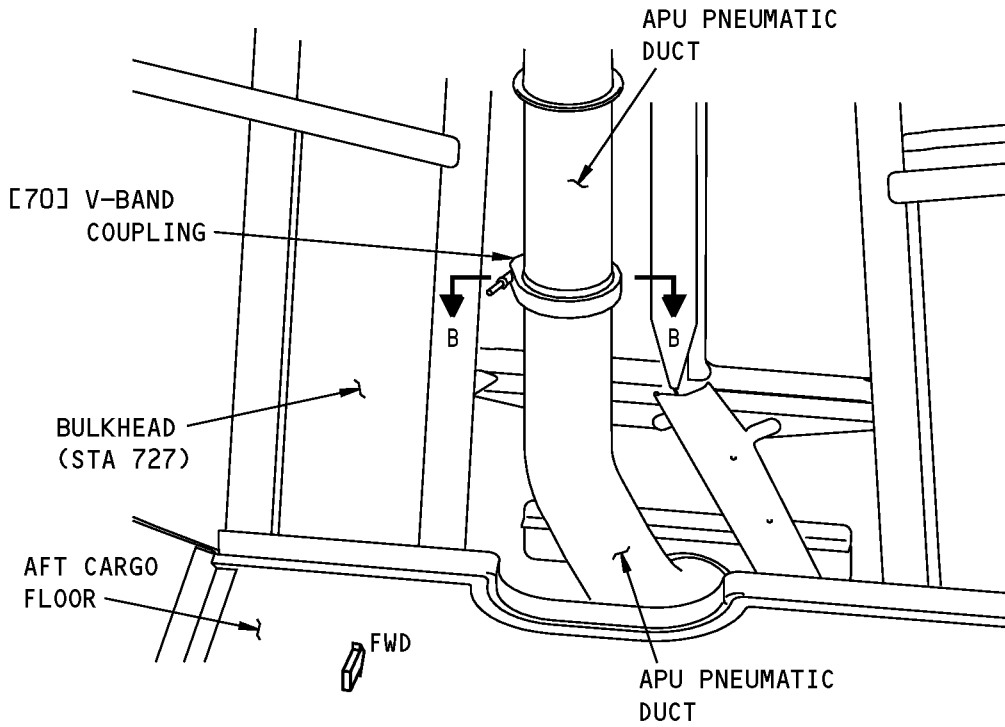
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APU Pneumatic Duct Installation
Figure 404 (Sheet 2 of 9)/36-13-01-990-805

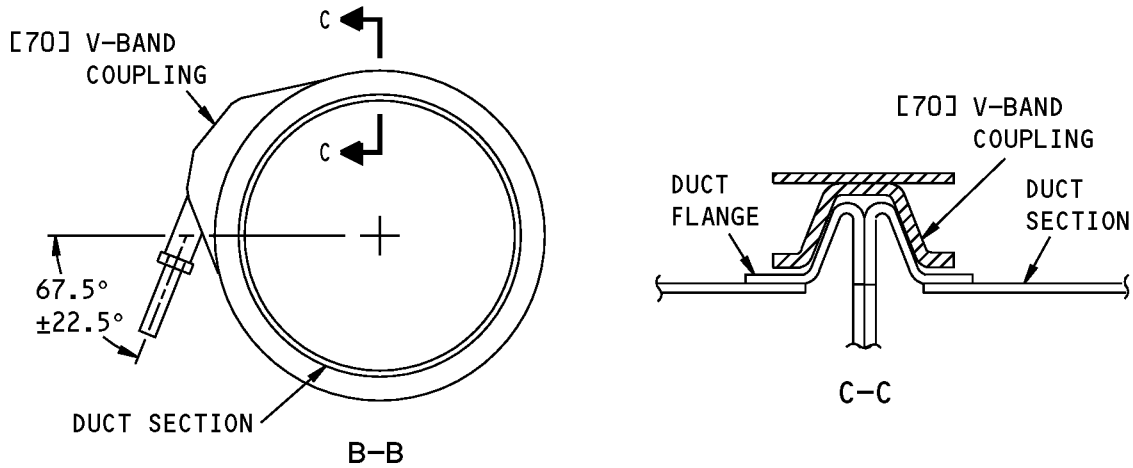
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(AFT CARGO BAY WITH CARGO LINERS REMOVED)

(E)

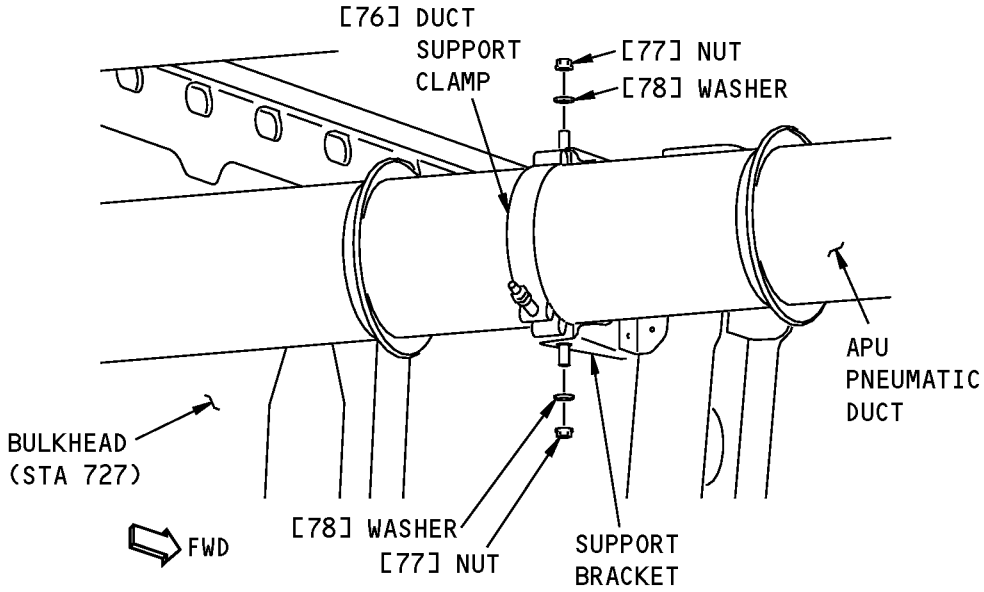


APU Pneumatic Duct Installation
Figure 404 (Sheet 3 of 9)/36-13-01-990-805

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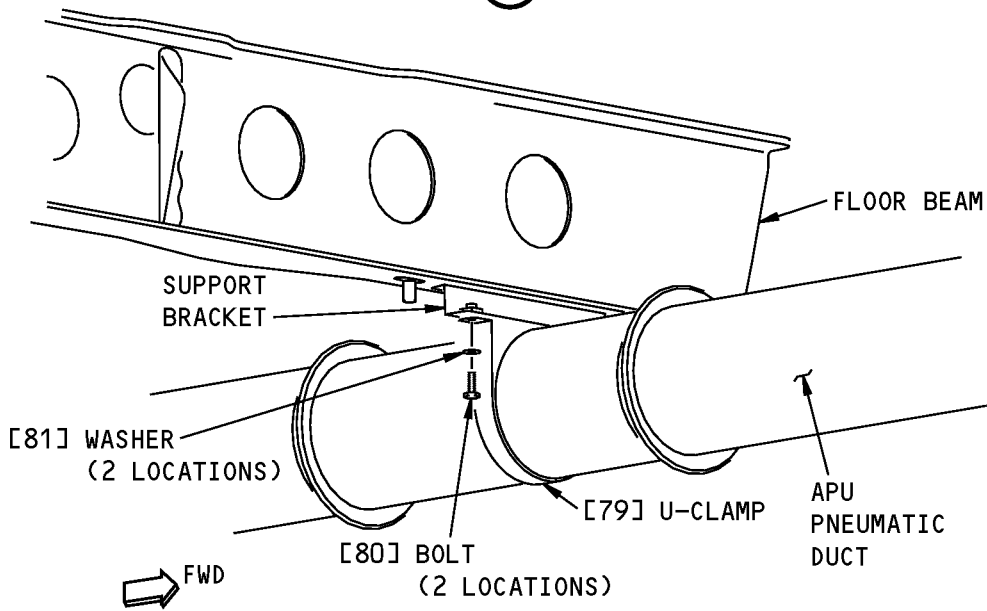
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**DUCT SUPPORT CLAMP
(EXAMPLE)**

F



**U-CLAMP
(EXAMPLE)**

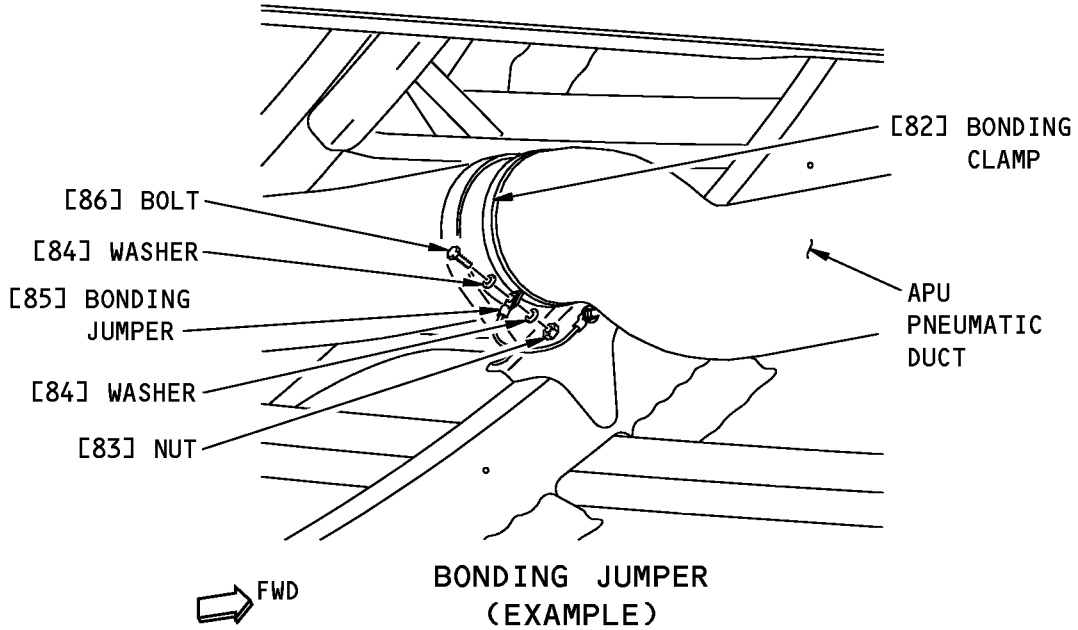
G

**APU Pneumatic Duct Installation
Figure 404 (Sheet 4 of 9)/36-13-01-990-805**

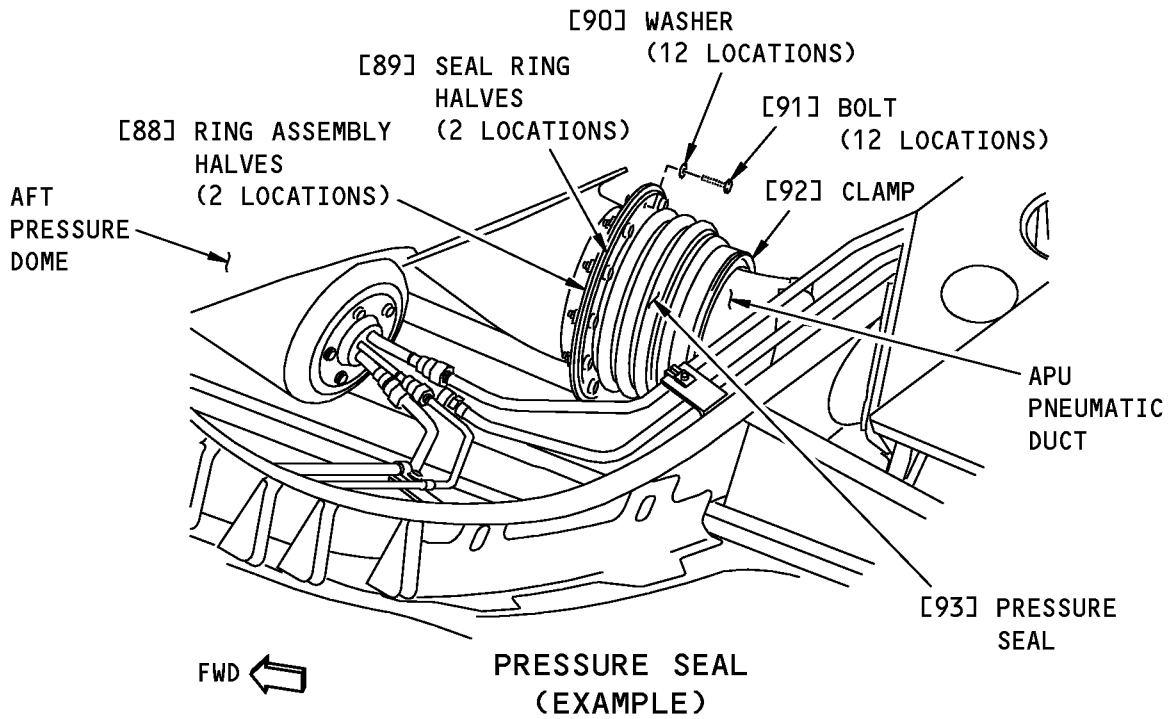
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(H)



(I)

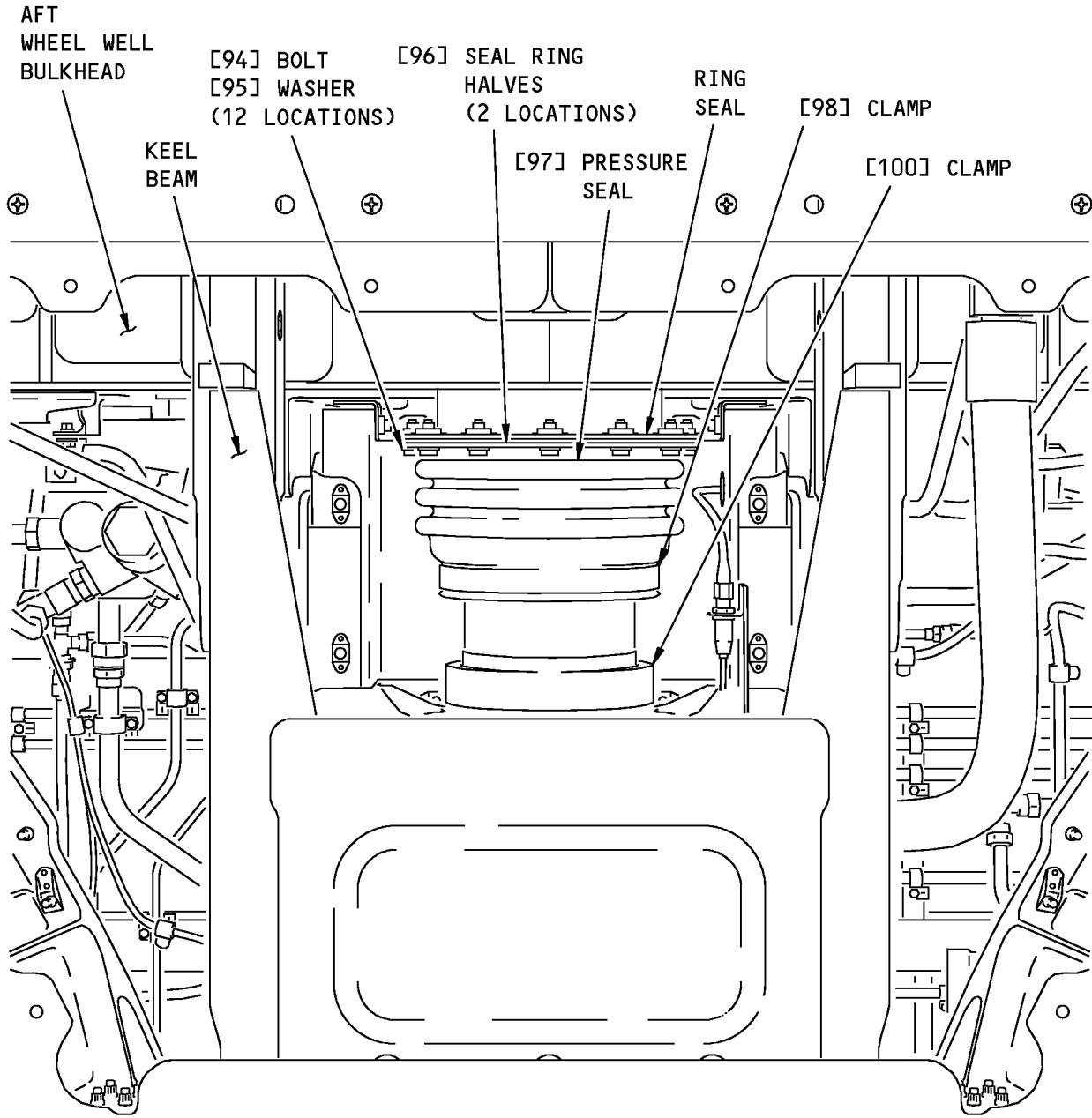
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**APU Pneumatic Duct Installation
Figure 404 (Sheet 5 of 9)/36-13-01-990-805**

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↓
FWD

**PRESSURE SEAL
(VIEW IN THE UP DIRECTION, UNDER KEEL BEAM)**

J

1530457 S0000277512_V1

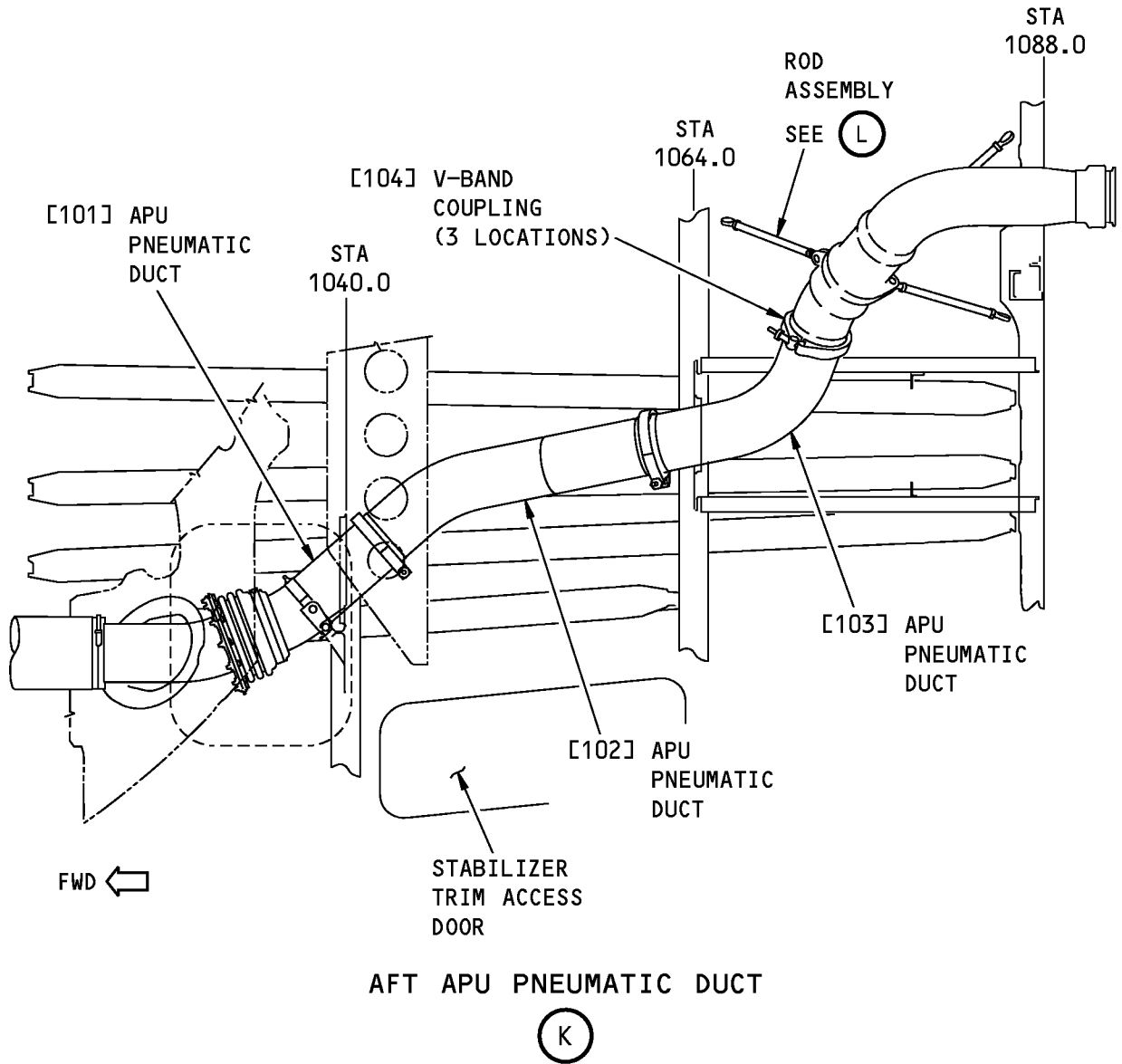
**APU Pneumatic Duct Installation
Figure 404 (Sheet 6 of 9)/36-13-01-990-805**

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1530938 S0000277507_V1

**APU Pneumatic Duct Installation
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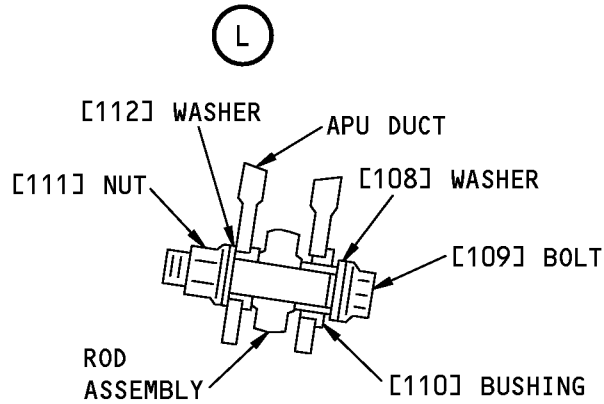
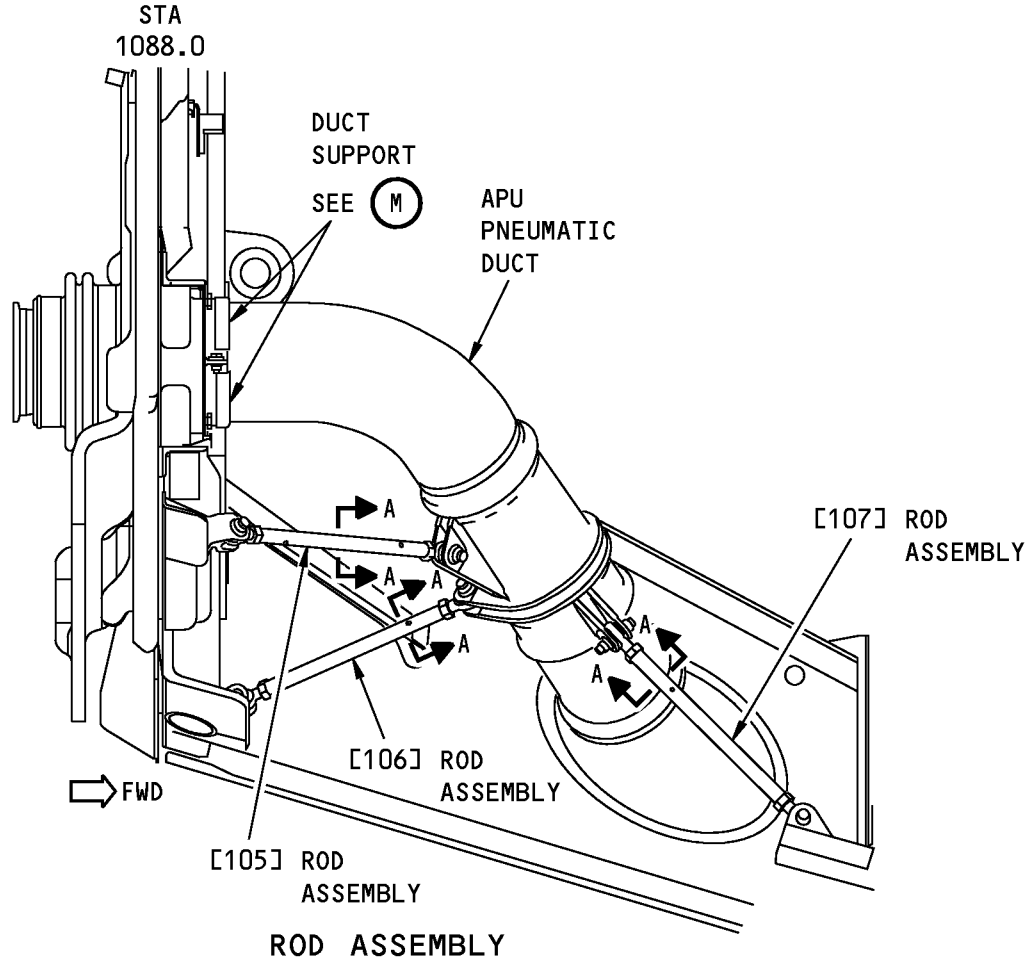
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**ROD ASSEMBLY
(EXAMPLE)
A-A**

1530883 S0000277509_V1

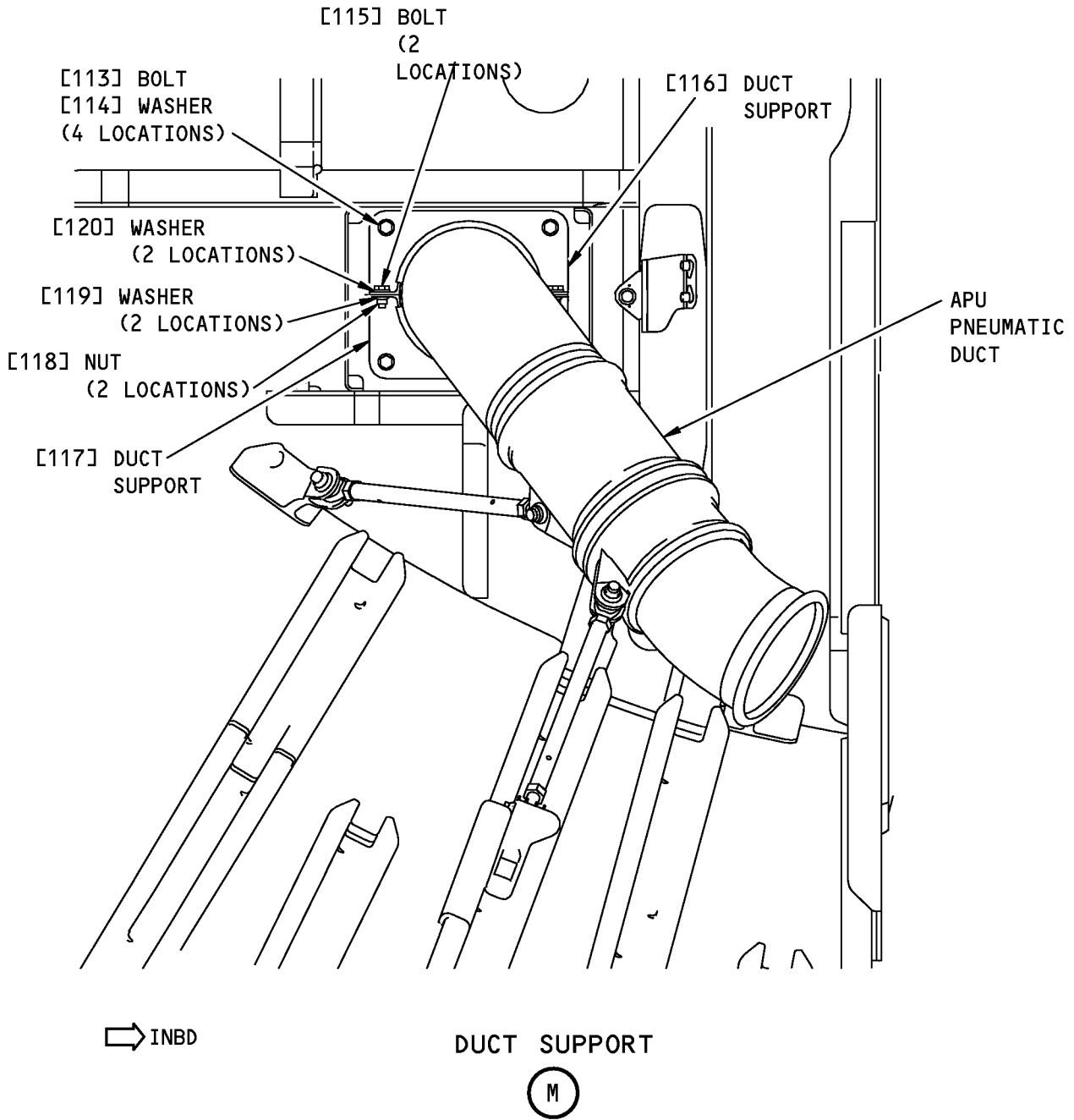
**APU Pneumatic Duct Installation
Figure 404 (Sheet 8 of 9)/36-13-01-990-805**

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1532301 S0000277508_V1

**APU Pneumatic Duct Installation
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TASK 36-13-01-000-807

11. APU Pneumatic Duct Installation

(Figure 404)

A. General

- (1) This procedure is written to provide general information to assist with the installation of the APU pneumatic duct sections. Do only the steps that are necessary to install the required section of duct.

B. References

Reference	Title
20-40-11-760-801	Electrical Bonding (P/B 201)
20-50-11-910-801	Standard Torque Values (P/B 201)
36-00-00-860-803	Supply Pressure to the Pneumatic System with the APU (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

C. Tools/Equipment

Reference	Description
STD-3906	Mallet - Rubber

D. Consumable Materials

Reference	Description	Specification
D00010	Compound - Thread Antiseize, High Temperature	MIL-PRF-907F
G00091	Compound - Oxygen System Leak Detection - Snoop Leak Detector	MIL-PRF-25567

E. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
139	Keel Beam, (Part) Body Station 540.00 to Body Station 727.00
141	Aft Cargo Compartment - Left
145	Aft Cargo Compartment Equipment Bay - Left
149	Keel Beam (Part) Body Station 727.00 to Body Station 743.95
310	Fuselage - Body Station 1016.00 to Body Station 1217.00

F. Access Panels

Number	Name/Location
192CL	Air Conditioning Access Door
192CR	Air Conditioning Access Door
192E	ECS Under Keel Panel - Forward
192F	ECS Under Keel Panel - Middle
192K	Air Conditioning Under Keel Panel - Aft
311BL	Stabilizer Trim Access Door
822	Aft Cargo Door

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G. Prepare to Install the Duct Section

SUBTASK 36-13-01-420-039

- (1) For installation of the insulated duct sections found inside the keel beam between the APU check valve and the MLG wheel well, do these steps:
 - (a) If insulation blanket(s) were removed, install the insulation blanket(s) around the duct section and tighten the clamps 13-17 inch-pounds (1.5-1.9 newton-meters).
 - (b) If the vapor seal was removed, install the vapor seal to the insulated duct with the clamp and tighten the clamp 13-17 inch-pounds (1.5-1.9 newton-meters).

SUBTASK 36-13-01-420-025

- (2) If the duct section has a duct boss provision for the potable water pressurization line, do the steps that follow before the duct section is installed (Figure 404) (View B):
 - (a) Remove the cover from the duct boss.
 - (b) Apply antiseize compound, D00010 to the threads on the union [71].
 - (c) Install a new packing [72] on the union [71].
 - (d) Install the union [71] on the duct boss.

NOTE: For the applicable torque requirement, refer to Standard Torque Values, TASK 20-50-11-910-801.

- (e) Put a cover over the installed union [71] to keep unwanted material out.

SUBTASK 36-13-01-420-026

- (3) If the duct section has a duct support clamp attachment, loosely install the duct support clamp [76] on the duct section before the duct section is installed (Figure 404) (View F).

SUBTASK 36-13-01-420-027

- (4) If the duct section has a bonding jumper attachment, install the bonding clamp [82] on the duct section before the duct section is installed (Figure 404) (View H).

H. APU Pneumatic Duct Installation

SUBTASK 36-13-01-860-015

- (1) Remove the cover from the ducts.

SUBTASK 36-13-01-420-028

- (2) Put the applicable duct section into position for installation.

SUBTASK 36-13-01-420-029

- (3) Loosely install the V-band couplings [70] to support the duct section (Figure 404) (View D).

SUBTASK 36-13-01-420-040

- (4) For installation of the insulated duct section which has the vapor seal found inside the keel beam between the APU check valve and the MLG wheel well, attach the vapor seal to the keel beam with the twelve bolts [94] and washers [95], and the two seal ring halves.
 - (a) Tighten the bolts 30-35 inch-pounds (3.39-3.95 newton-meters).

SUBTASK 36-13-01-420-030

- (5) If there is a potable water pressurization line to be connected to the duct section, do the steps that follow:
 - (a) Remove the covers from the union [71] installed on the duct section and the disconnected potable water pressurization line (Figure 404) (View B).
 - (b) Connect the potable water pressurization line to the union [71] on the duct section.

NOTE: Make sure that the pressurization line installation is not preloaded.

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- (c) Tighten the the potable water pressurization line installation to 60-70 inch-pounds (6.67-7.78 Newton-meters).

SUBTASK 36-13-01-420-031

- (6) If there is a duct support clamp [76] that is used to support the duct section at an intermediate location, do the steps that follow (Figure 404) (View F):
 - (a) Put the duct support clamp [76] into position on the support bracket for installation.
 - (b) Install the washers [78] and nuts [77].
 - (c) Tighten the nuts [77] to 25-35 inch-pounds (2.82-3.95 Newton-meters).
 - (d) Tighten the duct support clamp [76].

SUBTASK 36-13-01-420-032

- (7) If there is a U-clamp [79] that is used to support the duct section at an intermediate location, do the steps that follow (Figure 404) (View G):
 - (a) Put the U-clamp [79] over the duct section.
 - (b) Install the bolts [80] and washers [81].
 - (c) Tighten the bolts [80] to 25-35 inch-pounds (2.82-3.95 Newton-meters).

SUBTASK 36-13-01-420-033

- (8) If there is a bonding jumper [85] to be connected to the duct section, do the steps that follow (Figure 404) (View H):
 - (a) Make sure that the bonding surfaces are clean.
 - (b) Attach the bonding jumper [85] to the bonding clamp [82].

NOTE: Make sure the blue terminal is attached to bonding clamp [82] on the duct section and the red terminal is attached to reference structure.
 - (c) Install the bolt [86], washers [84] and nut [83].
 - (d) Tighten the bolts [86] and nut [83] to 25-35 inch-pounds (2.82-3.95 Newton-meters).
 - (e) Make sure the resistance between the bonding jumper [85] and the bonding clamp [82] is not more than 0.010 ohms. do this task: Electrical Bonding, TASK 20-40-11-760-801.

SUBTASK 36-13-01-020-033

- (9) For installation of the pressure seal [93] behind the aft pressure bulkhead and below the horizontal stabilizer and the pressure seal [97] just forward of the aft bulkhead in the MLG wheel well, follow this procedure:

APU Pneumatic Duct Pressure Seal Installation, TASK 36-13-01-420-801

SUBTASK 36-13-01-420-034

- (10) Use a rubber mallet, STD-3906 to lightly tap outer surface the V-band couplings [70]. Figure 404 (View B)

NOTE: This will make sure you engage the coupling and flanges correctly.

SUBTASK 36-13-01-420-035

- (11) Tighten the V-band couplings [70] to 70 inch-pounds (6.7 Newton-meters).

NOTE: Do not tighten the couplings [70] until all of the duct sections are aligned.

SUBTASK 36-13-01-420-043

- (12) For installation of the APU pneumatic duct between station 1064 and station 1088, do the steps that follow.
 - (a) Attach the duct supports [116] and [117] to the duct with the hardware shown in Figure 404 (View M). Leave the hardware loose.

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- (b) Attach the duct supports to the bulkhead with the bolts and washers shown in Figure 404 (View M). Tighten the bolts to 82 to 88 inch-pounds (9.3 to 9.9 Newton-meters).
- (c) Attach the rod assemblies [105], [106], and [107] to the duct with the bolts, washers, nuts, and bushings as shown in Figure 404 (View L). Tighten the nuts to 82 to 88 inch-pounds (9.3 to 9.9 Newton-meters).
- (d) Loosely install the V-band coupling [104]. (Figure 404) (View K).
- (e) Use a rubber mallet, STD-3906 to lightly tap the outer surface of the V-band coupling [104].
NOTE: This will make sure you engage the coupling and flanges correctly.
- (f) Tighten the V-band coupling [104] to 70 inch-pounds (6.7 Newton-meters).
NOTE: Do not tighten the coupling [104] until the duct sections are aligned.
- (g) Tighten the hardware from step (a) to 35 inch-pounds (4.0 Newton-meters) to secure the duct in the duct support.
- (h) Adjust the rod assemblies [105], [106], and [107] to maintain a minimum 0.20 inch clearance around the duct as it passes through the structure.

I. APU Pneumatic Duct Post-Installation Test

SUBTASK 36-13-01-720-003

- (1) Do a leak test of the APU pneumatic duct installation:
 - (a) Do this task: Supply Pressure to the Pneumatic System with the APU, TASK 36-00-00-860-803.
 - (b) Apply a leak detector Snoop Leak Detector compound, G00091 to the V-band coupling [70] installations and the potable water pressurization line connection.
 - (c) Do a check for air leakage:
 - 1) Small air leakage is satisfactory at the V-band coupling [70] duct joint.
 - 2) No leakage is permitted at the potable water pressurization line connection.
 - 3) Repair large air leakage.
- NOTE: Large air leakage is concentrated airflow you can feel with your hand at a distance of 12 inches (31 cm) or greater from a point on the V-band coupling [70] duct joint.

J. Put the Airplane to Its Usual Condition

SUBTASK 36-13-01-860-016

- (1) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 36-13-01-860-018

- (2) Remove the DO-NOT-OPERATE tags from the APU master switch and APU bleed switch on the P5 forward overhead panel.

SUBTASK 36-13-01-410-008

- (3) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
192CL	Air Conditioning Access Door
192CR	Air Conditioning Access Door
192E	ECS Under Keel Panel - Forward
192F	ECS Under Keel Panel - Middle
192K	Air Conditioning Under Keel Panel - Aft
311BL	Stabilizer Trim Access Door

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(Continued)

Number	Name/Location
822	Aft Cargo Door

END OF TASK

TASK 36-13-01-020-801

12. APU Pneumatic Duct Pressure Seal Removal

(Figure 405)

A. General

- (1) This procedure is a scheduled maintenance task.
- (2) This procedure describes how to remove the APU pneumatic duct pressure seals.

B. References

Reference	Title
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

C. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
93	Pressure Seal	36-13-01-04-075	HAP 001-013, 015-026, 028-030
97	Pressure Seal	36-13-01-04A-075 36-13-01-03-095	HAP 031-054, 101-999 HAP 001-013, 015-026, 028-030
102	Pressure Seal	36-13-01-03A-095 36-13-02-01-070 36-13-02-01A-070	HAP 031-054, 101-999 HAP 001-013, 015-026, 028-030 HAP 031-054, 101-999

D. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
141	Aft Cargo Compartment - Left
143	Area Below Aft Cargo Compartment - Left
145	Aft Cargo Compartment Equipment Bay - Left
192	Lower Wing-To-Body Fairing - Under Wing Box
310	Fuselage - Body Station 1016.00 to Body Station 1217.00

E. Access Panels

Number	Name/Location
192K	Air Conditioning Under Keel Panel - Aft
193D	Wheel Well Panel - Aft Inboard
311BL	Stabilizer Trim Access Door

F. Prepare to Remove the APU Pneumatic Duct Pressure Seal

SUBTASK 36-13-01-860-019

- (1) Make sure the APU master switch and APU bleed switch on the P5 forward overhead panel are in the OFF position and install DO-NOT-OPERATE tags.

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SUBTASK 36-13-01-860-020

WARNING: REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONNEL OR DAMAGE TO EQUIPMENT.

(2) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806

SUBTASK 36-13-01-010-013

(3) To get access to the pressure seals, do this step:

(a) Open these access panels:

<u>Number</u>	<u>Name/Location</u>
192K	Air Conditioning Under Keel Panel - Aft
193D	Wheel Well Panel - Aft Inboard
311BL	Stabilizer Trim Access Door

SUBTASK 36-13-01-020-037

(4) For removal of the Pressure Seal [93] behind the aft pressure bulkhead and below the horizontal stabilizer, do the following:

- (a) Loosen the clamp [92] from the Pressure Seal [93].
- (b) Remove the bolts [91] and washers [90] to remove the seal ring halves [89] and ring assembly halves [88] from the duct section.

NOTE: Make sure you keep track of the fastener build-up for installation.

(c) To remove the duct section do the applicable steps in this procedure:

APU Pneumatic Duct Removal, TASK 36-13-01-000-806

(d) Remove the Pressure Seal [93] from the duct.

SUBTASK 36-13-01-020-038

(5) For the Pressure Seal [97] removal just forward of the aft bulkhead in the MLG wheel well, do the following:

- (a) Loosen the clamp [98] from the Pressure Seal [97].
- (b) Remove the bolts [94] and washers [95] to remove the seal ring halves [96].

(c) Remove the duct section by following this procedure:

APU Pneumatic Duct Removal, TASK 36-13-01-000-806

(d) Remove the Pressure Seal [97] from the duct.

SUBTASK 36-13-01-020-041

(6) For the Pressure Seal [102] removal forward of the MLG wheel well bulkhead at Sta. 661.34, do the following:

- (a) Loosen the clamp [101] from the Pressure Seal [102].
- (b) Remove the bolts [104] and washers [105] to remove the seal ring halves [103].

(c) Remove the duct section by following this procedure:

APU Pneumatic Duct Removal, TASK 36-13-01-000-806

(d) Remove the Pressure Seal [102] from the duct.

————— **END OF TASK** —————

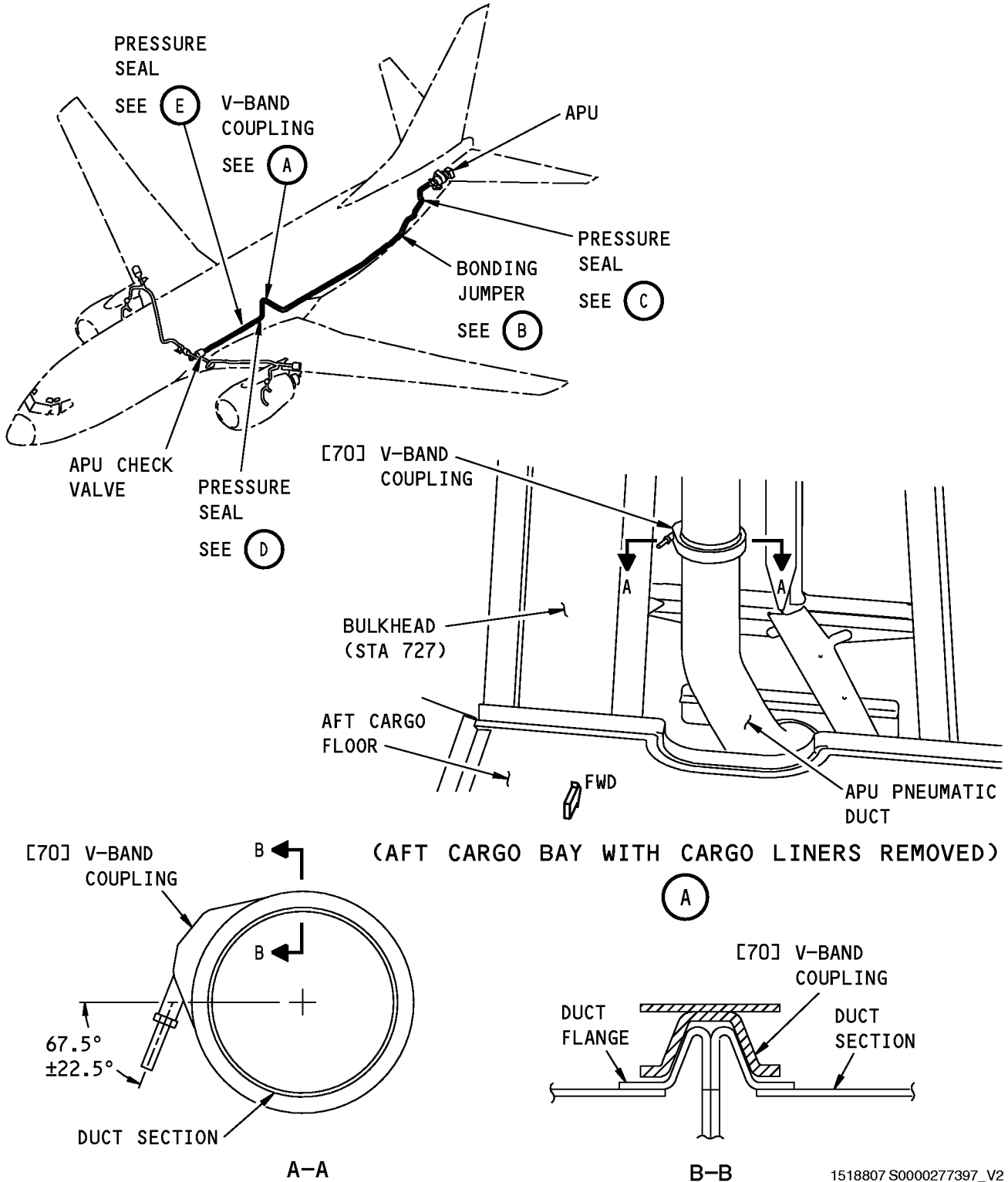
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1518807 S0000277397_V2

**APU Pneumatic Duct Pressure Seal Installation
Figure 405 (Sheet 1 of 4)/36-13-01-990-807**

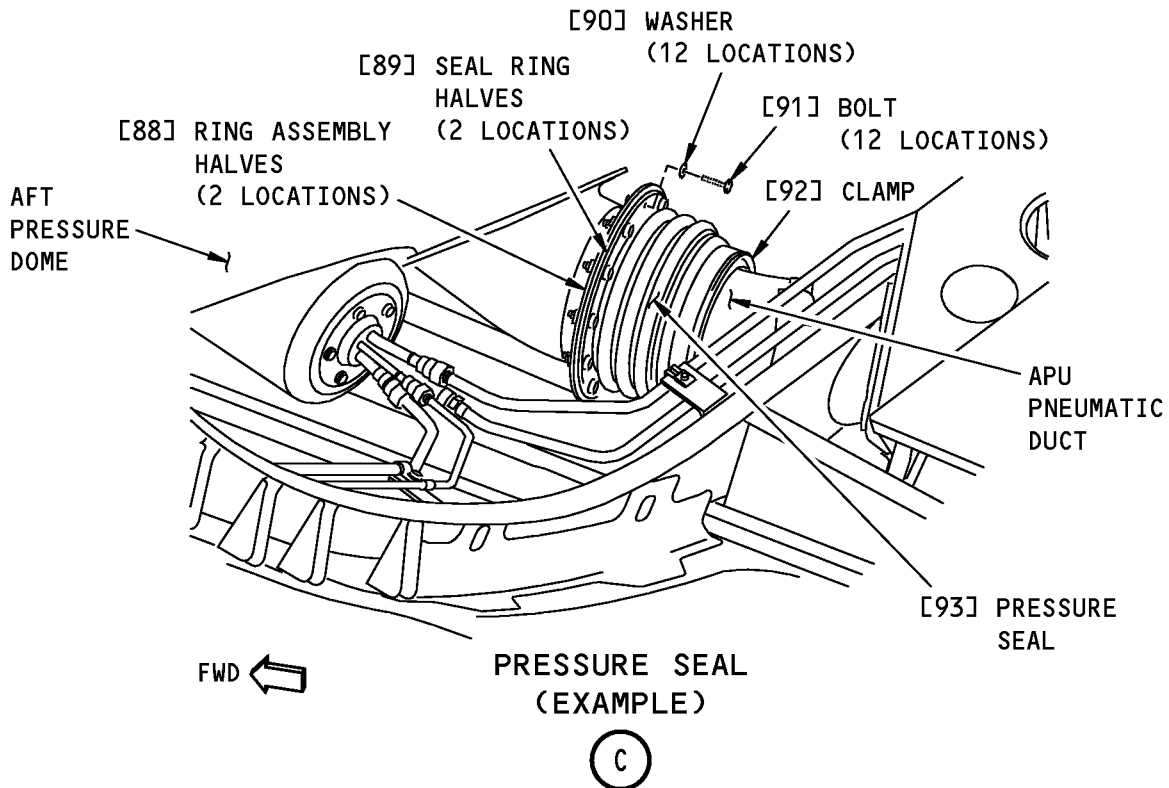
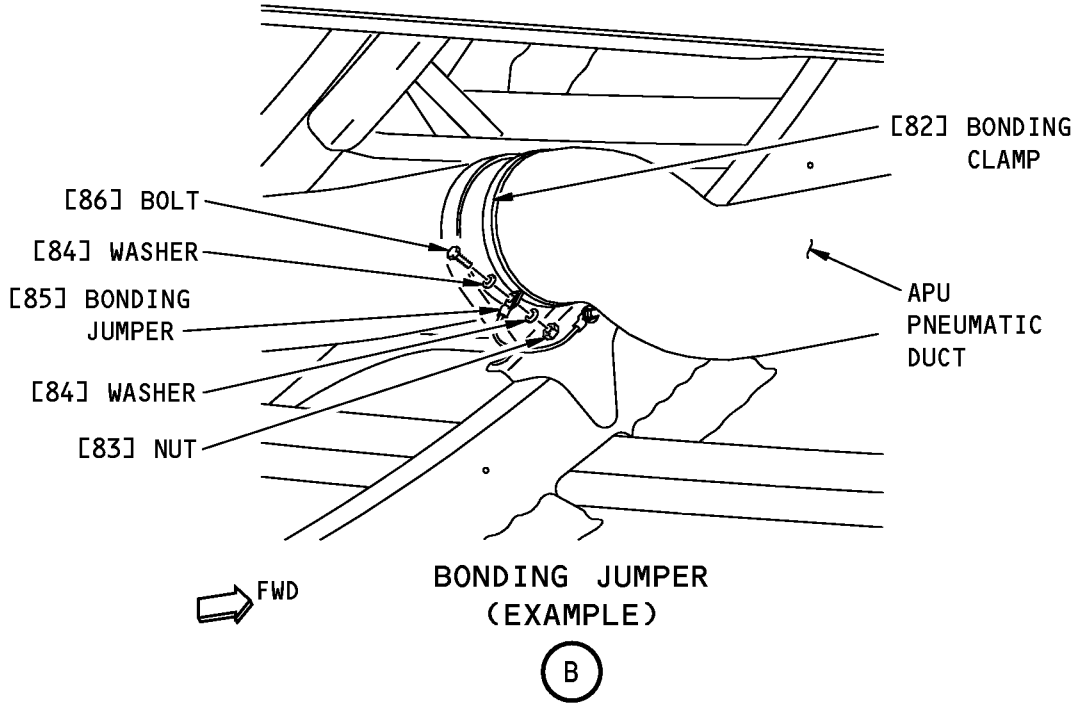
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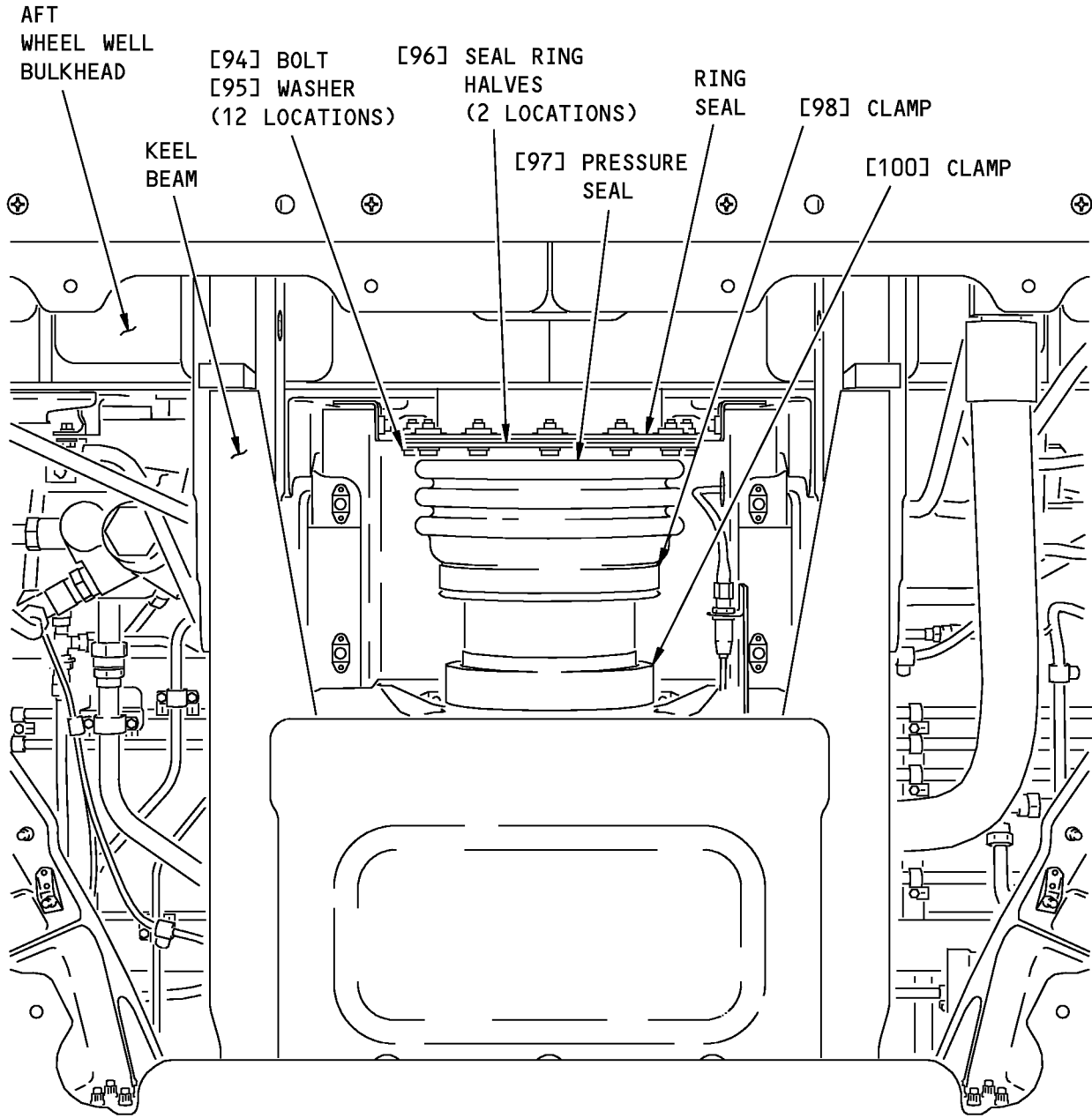
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**APU Pneumatic Duct Pressure Seal Installation
Figure 405 (Sheet 2 of 4)/36-13-01-990-807**

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FWD

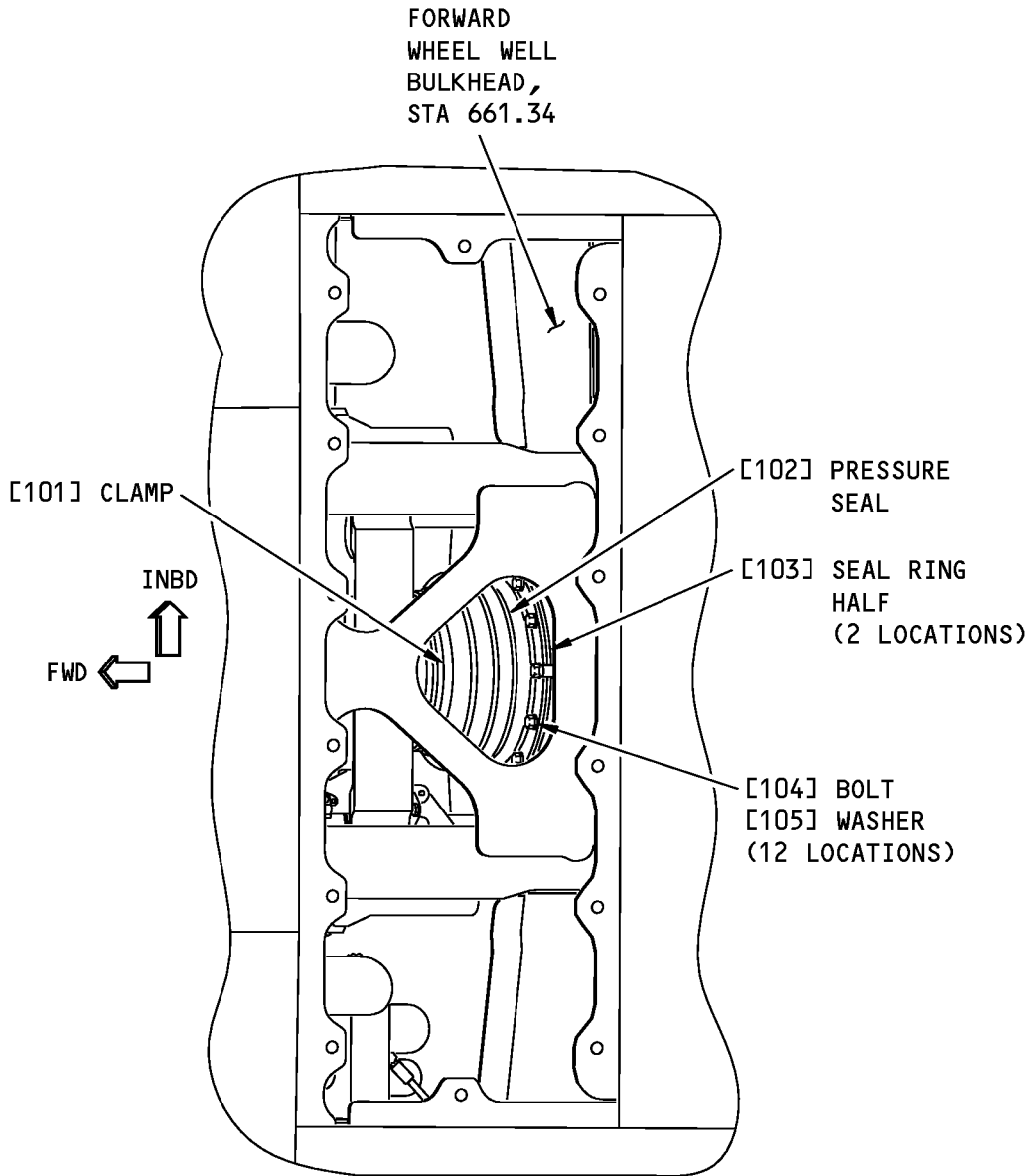
PRESSURE SEAL
(VIEW IN THE UP DIRECTION, UNDER KEEL BEAM)

D

APU Pneumatic Duct Pressure Seal Installation
Figure 405 (Sheet 3 of 4)/36-13-01-990-807

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**PRESSURE SEAL
(ACCESS PANEL, 192K REMOVED)**

E

1696262 S0000306976_V1

**APU Pneumatic Duct Pressure Seal Installation
Figure 405 (Sheet 4 of 4)/36-13-01-990-807**

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TASK 36-13-01-420-801

13. APU Pneumatic Duct Pressure Seal Installation

(Figure 405)

A. General

- (1) This procedure is a scheduled maintenance task.
- (2) This procedure describes how to install the APU pneumatic duct pressure seals.

B. References

Reference	Title
36-00-00-860-803	Supply Pressure to the Pneumatic System with the APU (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

C. Consumable Materials

Reference	Description	Specification
D00010	Compound - Thread Antiseize, High Temperature	MIL-PRF-907F
G00091	Compound - Oxygen System Leak Detection - Snoop Leak Detector	MIL-PRF-25567

D. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
93	Pressure Seal	36-13-01-04-075	HAP 001-013, 015-026, 028-030
97	Pressure Seal	36-13-01-04A-075	HAP 031-054, 101-999
		36-13-01-03-095	HAP 001-013, 015-026, 028-030
102	Pressure Seal	36-13-01-03A-095	HAP 031-054, 101-999
		36-13-02-01-070	HAP 001-013, 015-026, 028-030
		36-13-02-01A-070	HAP 031-054, 101-999

E. Location Zones

Zone	Area
133	Main Landing Gear Wheel Well, Body Station 663.75 to Body Station 727.00 - Left
141	Aft Cargo Compartment - Left
143	Area Below Aft Cargo Compartment - Left
145	Aft Cargo Compartment Equipment Bay - Left
192	Lower Wing-To-Body Fairing - Under Wing Box
310	Fuselage - Body Station 1016.00 to Body Station 1217.00

F. Access Panels

Number	Name/Location
192K	Air Conditioning Under Keel Panel - Aft
193D	Wheel Well Panel - Aft Inboard
311BL	Stabilizer Trim Access Door

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G. Prepare to Install the APU Pneumatic Duct Pressure Seal

SUBTASK 36-13-01-420-041

- (1) For the installation of the Pressure Seal [93] behind the aft pressure bulkhead and below the horizontal stabilizer, do the steps that follow (Figure 405, View C):
 - (a) Remove pressure from the pneumatic ducts by following this procedure: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.
 - (b) Slide the Pressure Seal [93] onto the duct.
 - (c) Push the Pressure Seal [93] to the mating surface of the structural barrier.
 - (d) Install the seal ring halves [89] on the Pressure Seal [93].
 - (e) Install the ring assembly halves [88] on the other side of the structural barrier.
 - (f) Apply antiseize compound, D00010 to the threads of the bolts [91].
 - (g) Install the bolts [91] and washers [90].
 - (h) Tighten the bolts [91] to 30-35 inch-pounds (3.39-3.95 Newton-meters).
 - (i) Clean the surfaces of the Pressure Seal [93], the duct, and the inner surface of the clamp [92] with alcohol and clean wipes to remove any film or grease.
 - (j) Install the clamp [92] loosely on the Pressure Seal [93].
 - (k) Reinstall the duct section by following this procedure:
APU Pneumatic Duct Installation, TASK 36-13-01-000-807
 - (l) Tighten the clamp [92] 20-30 inch-pounds (2.26-3.39 Newton-meters).

SUBTASK 36-13-01-420-042

- (2) For the installation of the Pressure Seal [97] just forward of the aft pressure bulkhead in the MLG wheel well, do the steps that follow (Figure 405, View D):
 - (a) Slide the Pressure Seal [97] onto the duct.
 - (b) Push the Pressure Seal [97] to the mating surface of the ring seal.
 - (c) Install the seal ring halves [96] on the Pressure Seal [97].
 - (d) Apply antiseize compound, D00010 to the threads on all of the bolts [94].
 - (e) Install the bolts [94] and washers [95].
NOTE: The countersunk side of the washer [95] is installed towards the bolt head.
 - (f) Tighten the bolts [94] to 30-35 inch-pounds (3.39-3.95 Newton-meters).
 - (g) Clean the surfaces of the Pressure Seal [97], the duct, and the inner surface of the clamp [98] with alcohol and clean wipes to remove any film or grease.
 - (h) Install the clamp [98] loosely on the Pressure Seal [97].
 - (i) Reinstall the duct section by doing the applicable steps in this procedure:
APU Pneumatic Duct Installation, TASK 36-13-01-000-807
 - (j) Tighten the clamp [98] 20-30 inch-pounds (2.26–3.39 Newton-meters).

SUBTASK 36-13-01-420-044

- (3) For the installation of the Pressure Seal [102] just forward of the MLG wheel well bulkhead at Sta. 661.34, do the steps that follow (Figure 405, View E):
 - (a) Slide the Pressure Seal [102] onto the duct.
 - (b) Push the Pressure Seal [102] to the mating surface of the ring seal.
 - (c) Install the seal ring halves [103] on the Pressure Seal [102].

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- (d) Apply antiseize compound, D00010 to the threads on all of the bolts [104].
- (e) Install the bolts [104] and washers [105].
 - NOTE: The countersunk side of the washer [105] is installed towards the bolt head.
- (f) Tighten the bolts [104] to 30-35 inch-pounds (3.39-3.95 Newton-meters).
- (g) Clean the surfaces of the Pressure Seal [102], the duct, and the inner surface of the clamp [101] with alcohol and clean wipes to remove any film or grease.
- (h) Install the clamp [101] loosely on the Pressure Seal [102].
- (i) Reinstall the duct section by doing the applicable steps in this procedure:
APU Pneumatic Duct Installation, TASK 36-13-01-000-807
- (j) Tighten the clamp [101] 20-30 inch-pounds (2.26-3.39 Newton-meters).

SUBTASK 36-13-01-211-001

- (4) Do a leak test of the APU pneumatic duct installation
 - (a) Do this task: Supply Pressure to the Pneumatic System with the APU, TASK 36-00-00-860-803.
 - (b) Apply leak detector Snoop Leak Detector compound, G00091 to the clamps around the pressure seals and the V-band coupling [70] installations.
 - (c) Do a check for air leakage.
 - 1) Small air leakage is satisfactory at the pressure seal clamps and V-band coupling [70] duct joints.
 - 2) Repair large air leakage.
 - NOTE: Large air leakage is concentrated airflow you can feel with your hand at a distance of 12 inches (31 cm) or greater from a point on the V-band coupling [70] duct joint.
 - (d) Remove pressure from the pneumatic ducts by following this procedure: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

H. Put the Airplane to Its Usual Condition

SUBTASK 36-13-01-860-021

- (1) Remove the DO-NOT-OPERATE tags from the APU master switch and APU bleed switch on the P5 forward overhead panel.

SUBTASK 36-13-01-410-009

- (2) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
192K	Air Conditioning Under Keel Panel - Aft
193D	Wheel Well Panel - Aft Inboard
311BL	Stabilizer Trim Access Door

————— END OF TASK —————

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PNEUMATIC MANIFOLD DUCT - INSPECTION/CHECK

1. General

- A. This procedure has one task. It has instructions to do an inspection of the titanium pneumatic ducts for corrosion caused by contact with fire-resistant hydraulic fluid.
- B. At temperatures above 270°F (132°C), fire-resistant hydraulic fluids, such as skydrol BMS 3-11 becomes acidic. Titanium duct that comes in contact with hydraulic fluid can become brittle and corrode.
- C. A glossy dark brown film or a pitted corroded surface on the duct are signs that the titanium duct has come in contact with hydraulic fluid.
- D. When you find that a titanium duct has come in contact with the hydraulic fluid, you must examine the duct for damage and determine whether the duct should be cleaned, repaired or replaced.

TASK 36-13-01-200-801

2. Pneumatic Manifold Duct Inspection

A. References

Reference	Title
36-13-01-000-808	Pneumatic Manifold Duct Removal (Selection) (P/B 401)
36-13-01-100-801	Pneumatic Duct Cleaning (P/B 701)
36-13-01-300-801	Pneumatic Duct Repairs (P/B 801)
36-13-01-400-802	Pneumatic Manifold Duct Installation (Selection) (P/B 401)

B. Location Zones

Zone	Area
141	Aft Cargo Compartment - Left
191	Lower Wing-To-Body Fairing - Forward of Wing Box
192	Lower Wing-To-Body Fairing - Under Wing Box
311	Area Aft of Pressure Bulkhead - Left
313	Stabilizer Torsion Box Compartment - Left
410	Subzone - Engine 1
420	Subzone - Engine 2
430	Subzone - Engine 1, Nacelle Strut
433	Engine 1 - Strut Torque Box
440	Subzone - Engine 2, Nacelle Strut
443	Engine 2 - Strut Torque Box
511	Left Wing - Leading Edge To Front Spar
521	Left Wing - Leading Edge to Front Spar
522	Left Wing - Slat No. 4
523	Left Wing - Slat No. 3
524	Left Wing - Slat No. 2
611	Right Wing - Leading Edge to Front Spar
621	Right Wing - Leading Edge to Front Spar
622	Right Wing - Slat No. 5
623	Right Wing - Slat No. 6
624	Right Wing - Slat No. 7

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C. Prepare to Inspect the Duct

SUBTASK 36-13-01-010-002

- (1) Open the applicable access panels to get access to the pneumatic duct section for inspection.

D. Pneumatic Manifold Duct Inspection

SUBTASK 36-13-01-010-003

- (1) Examine the titanium duct section for hydraulic fluid contamination, corrosion, or damage.
 - (a) If you find hydraulic fluid contamination, then do this task to clean the titanium duct section:
Pneumatic Duct Cleaning, TASK 36-13-01-100-801.
 - 1) It is acceptable to have stains on the the titanium duct section after it has been cleaned, if all of the hydraulic fluid residue is removed and the surface of the duct is smooth.
 - (b) If there are signs of corrosion or damage on the titanium duct section after it has been cleaned, then repair or replace the duct section.
 - 1) To repair the duct section, do this task:
Pneumatic Duct Repairs, TASK 36-13-01-300-801.
 - 2) To replace the duct section, do these tasks:
Pneumatic Manifold Duct Removal (Selection), TASK 36-13-01-000-808,
Pneumatic Manifold Duct Installation (Selection), TASK 36-13-01-400-802.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 36-13-01-410-002

- (1) Close the applicable access panels.

————— **END OF TASK** —————

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PNEUMATIC MANIFOLD DUCT - CLEANING/PAINTING

1. General

- A. This procedure has one task. The task has instructions to clean the pneumatic ducts.
- B. If you clean pneumatic ducts that are still installed on the airplane, make sure that the chemical solutions used does not spill onto other components.
- C. Titanium ducts that has come in contact with fire-resistant hydraulic fluid at temperatures above 270°F (132°C) should be cleaned. These ducts if not cleaned, can corrode and become brittle. A glossy dark brown film or a pitted, corroded surface on the duct are signs that the titanium duct has come in contact with fire-resistant hydraulic fluid.

TASK 36-13-01-100-801

2. Pneumatic Duct Cleaning

A. References

Reference	Title
20-10-34-120-801	Hand Clean Metal Surfaces with Abrasives (P/B 701)
20-30-31	CLEANERS AND POLISHES
36-13-01-000-801	Strut Pneumatic Duct Removal (P/B 401)
36-13-01-000-802	Strut Pneumatic Duct Installation (P/B 401)

B. Tools/Equipment

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

Reference	Description
COM-2481	Tool - Sealant Removal, BAC5000, PSD 6-184 Approved (Part #: 1-6390-A, Supplier: 63318, A/P Effectivity: 737-ALL) (Part #: 10810, Supplier: \$0855, A/P Effectivity: 737-ALL) (Part #: 234350, Supplier: \$0857, A/P Effectivity: 737-ALL) (Part #: 311, Supplier: KA861, A/P Effectivity: 737-ALL) (Part #: 411B60, Supplier: 3DN12, A/P Effectivity: 737-ALL) (Part #: 411B90, Supplier: 3DN12, A/P Effectivity: 737-ALL) (Part #: DAD5013, Supplier: \$0856, A/P Effectivity: 737-ALL) (Part #: DFD5019, Supplier: \$0856, A/P Effectivity: 737-ALL) (Part #: J5-0275-2010, Supplier: 435R8, A/P Effectivity: 737-ALL) (Part #: SCD5019, Supplier: \$0856, A/P Effectivity: 737-ALL) (Part #: ST982LF, Supplier: 3Z323, A/P Effectivity: 737-ALL) (Part #: TS1275-4, Supplier: 1DWR5, A/P Effectivity: 737-ALL)

C. Consumable Materials

Reference	Description	Specification
B00003	Cleaner - Emulsion Alkaline - GMC 528B	
B00062	Solvent - Acetone (99.5% Grade)	ASTM D 329 (Supersedes O-A-51)
B00130	Alcohol - Isopropyl	TT-I-735
B00153	Solvent - Toluene, Nitration	JAN-T-171, Grade A
B00342	Alcohol - N-Butyl (Butanol)	ASTM D304
B00402	Cleaner - Aerospace Equipment	MIL-PRF-87937
G00034	Cotton Wiper - Process Cleaning Absorbent Wiper (Cheesecloth, Gauze)	BMS15-5

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Reference	Description	Specification
G00251	Abrasive - Mat, Non-Woven, Non-Metallic	A-A-58054

D. Location Zones

Zone	Area
141	Aft Cargo Compartment - Left
191	Lower Wing-To-Body Fairing - Forward of Wing Box
192	Lower Wing-To-Body Fairing - Under Wing Box
311	Area Aft of Pressure Bulkhead - Left
313	Stabilizer Torsion Box Compartment - Left
410	Subzone - Engine 1
420	Subzone - Engine 2
430	Subzone - Engine 1, Nacelle Strut
433	Engine 1 - Strut Torque Box
440	Subzone - Engine 2, Nacelle Strut
443	Engine 2 - Strut Torque Box
511	Left Wing - Leading Edge To Front Spar
521	Left Wing - Leading Edge to Front Spar
522	Left Wing - Slat No. 4
523	Left Wing - Slat No. 3
524	Left Wing - Slat No. 2
525	Left Wing - Slat No. 1
611	Right Wing - Leading Edge to Front Spar
621	Right Wing - Leading Edge to Front Spar
622	Right Wing - Slat No. 5
623	Right Wing - Slat No. 6
624	Right Wing - Slat No. 7
625	Right Wing - Slat No. 8

E. Prepare to Clean the Pneumatic Duct

SUBTASK 36-13-01-010-001

- (1) Open the applicable access panels to get access to the pneumatic ducts you want to clean.

SUBTASK 36-13-01-210-004

- (2) Examine the pneumatic duct for damage. If the duct is damaged, then replace the duct. These are the tasks:

- Strut Pneumatic Duct Removal, TASK 36-13-01-000-801,
- Strut Pneumatic Duct Installation, TASK 36-13-01-000-802.

F. Pneumatic Duct Cleaning

CAUTION: KEEP TRICHLOROETHYLENE, TRICHLOROETHANE, AND PERCHLOROETHYLENE AWAY FROM TITANIUM PARTS. CHLORINATED AND HALOGEN MATERIALS CAUSE DAMAGE TO TITANIUM PARTS.

SUBTASK 36-13-01-280-001

- (1) Do these steps to clean bare titanium ducts that are not contaminated with hydraulic fluid:
 - (a) Clean the duct with one of these cleaners:
 - 1) Manual solvent cleaners:

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- a) solvent, B00153
 - b) alcohol, B00342
 - c) solvent, B00062
- 2) Emulsion cleaners:
- a) GMC 528B cleaner, B00003
- 3) Alkaline cleaners (CLEANERS AND POLISHES, SUBJECT 20-30-31).
- (b) Soak a clean wiper with solvent and wring out excess solvent.
 - (c) Rub the surface with the wet wiper to remove the unwanted material.
 - (d) Wipe the duct dry with a clean wiper.

SUBTASK 36-13-01-960-001

- (2) Do these steps to clean bare titanium ducts with hydraulic fluid contamination:

NOTE: You can have a stain from hydraulic fluid after cleaning if all of the hydraulic fluid residue is removed and the duct surface is smooth.

- (a) Remove oil or other unwanted material with the solvent cleaning procedure shown above.
- (b) Remove the hydraulic fluid and hydraulic fluid residue (this will show as a light, glossy dark brown film) with the alkaline cleaner cleaner, B00402.
- (c) To remove thick layers of hydraulic fluid residue, let the alkaline cleaner absorb into the hydraulic fluid residue for 20-40 minutes.
- (d) Scrape the hydraulic fluid residue with a small sealant removal tool, COM-2481 made of wood, aluminumized steel wool or abrasive mat, G00251 fabric.

NOTE: Do not use a power wire brush or abrasive blast to remove the hydraulic fluid residue.

SUBTASK 36-13-01-110-001

- (3) Clean the gold coated titanium ducts with lint-free clean cotton wiper, G00034 and isopropyl alcohol, B00130.
- (a) When the duct is clean, you can apply BMS 10-82 low emissivity gold coating, or a phosphate-flouride treatment and B-2000 high temperature coating to provide a protective coating for the duct.

NOTE: B-2000 high temperature coating may be applied over worn or scarred BMS 10-82 gold coating or to bare titanium duct.

SUBTASK 36-13-01-110-002

- (4) Clean the nickel alloy ducts with one of these applicable alkaline cleaners or manual solvent cleaners:
- (a) Alkaline cleaners (CLEANERS AND POLISHES, SUBJECT 20-30-31).
 - (b) Manual solvent cleaners:
 - 1) solvent, B00153
 - 2) alcohol, B00342
 - 3) solvent, B00062

SUBTASK 36-13-01-110-003

- (5) Do this task to remove oxide from the titanium ducts:
Hand Clean Metal Surfaces with Abrasives, TASK 20-10-34-120-801.

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SUBTASK 36-13-01-110-004

(6) Remove all oxide from the nickel alloy ducts with abrasive mat, G00251 fabric.

G. Put the Airplane Back to Its Usual Condition

SUBTASK 36-13-01-410-001

(1) Close the applicable access panels.

————— **END OF TASK** —————

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PNEUMATIC MANIFOLD DUCT - REPAIRS

1. General

- A. This procedure has a task to repair the pneumatic duct. The pneumatic duct repair task has these subtasks:
 - (1) Temporarily repair the duct with a crack
 - (2) Repair the duct flange
 - (3) Repair the duct with dents, scratches or gouges.
- B. Off aircraft repairs are not included in this procedure.
- C. If a duct is badly damaged, it may be necessary to replace the ducts as an alternative to the duct repair.

TASK 36-13-01-300-801

2. Pneumatic Duct Repairs

(Figure 801)

A. References

Reference	Title
36-13-01-000-808	Pneumatic Manifold Duct Removal (Selection) (P/B 401)
36-13-01-400-802	Pneumatic Manifold Duct Installation (Selection) (P/B 401)

B. Tools/Equipment

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

Reference	Description
COM-1938	Reforming Tool Kit - Flange (Part #: 6FT001-101, Supplier: OTDH1, A/P Effectivity: 737-ALL)
STD-1175	Clamps - Stainless Steel, 3-7 Inch Adjustable

C. Consumable Materials

Reference	Description	Specification
G00596	Compound - Inspection Material, Liquid Penetrant	SAE AMS 2644
G02306	Material - Synthetic Rubber Sheet, High Temperature	BMS1-54
G02307	Material - Corrosion & Heat Resistant Steel Sheet (21Cr-6Ni-9Mn)	BMS7-191

D. Location Zones

Zone	Area
141	Aft Cargo Compartment - Left
191	Lower Wing-To-Body Fairing - Forward of Wing Box
192	Lower Wing-To-Body Fairing - Under Wing Box
311	Area Aft of Pressure Bulkhead - Left
313	Stabilizer Torsion Box Compartment - Left
410	Subzone - Engine 1
420	Subzone - Engine 2
430	Subzone - Engine 1, Nacelle Strut
433	Engine 1 - Strut Torque Box

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Zone	Area
440	Subzone - Engine 2, Nacelle Strut
443	Engine 2 - Strut Torque Box
511	Left Wing - Leading Edge To Front Spar
521	Left Wing - Leading Edge to Front Spar
522	Left Wing - Slat No. 4
523	Left Wing - Slat No. 3
524	Left Wing - Slat No. 2
611	Right Wing - Leading Edge to Front Spar
621	Right Wing - Leading Edge to Front Spar
622	Right Wing - Slat No. 5
623	Right Wing - Slat No. 6
624	Right Wing - Slat No. 7

E. Prepare to Repair the Pneumatic Duct

SUBTASK 36-13-01-010-004

- (1) Open the applicable access panels to get access to the pneumatic duct section that you want to repair.
 - (a) If it is necessary to remove the duct section to do the repair, do this task: Pneumatic Manifold Duct Removal (Selection), TASK 36-13-01-000-808.

F. Temporarily Repair the Pneumatic Duct with a Crack

(Figure 801)

NOTE: This procedure is only for use for pneumatic ducts that have a longitudinal crack (a crack that is parallel to the length of the duct). Pneumatic ducts that have a circumferential crack (a crack around the duct) must be replaced. This repair procedure is temporary. You must replace the pneumatic duct as soon as you can get a new replacement duct.

SUBTASK 36-13-01-320-001

- (1) Make sure the length of the crack is less than the duct diameter.

SUBTASK 36-13-01-320-002

- (2) Drill a hole at each end of the crack.

SUBTASK 36-13-01-350-001

- (3) Put a sheet of rubber material, G02306 over the crack.
 - (a) Make sure the rubber sheet will go 3 in. (76.2 mm) beyond the crack.

SUBTASK 36-13-01-350-002

- (4) Put a sheet of stainless steel material, G02307 on the rubber sheet.

SUBTASK 36-13-01-350-003

- (5) Install a clamp, STD-1175 on the stainless steel sheet every 1 in. (25.4 mm) to 1½ in. (38.1 mm).

G. Repair the Duct Flange

SUBTASK 36-13-01-010-005

- (1) Get access to the duct flange that needs repair.

NOTE: The flange reforming tool will only repair Janitrol (wide) and Marman (narrow) style flanges.

SUBTASK 36-13-01-320-003

- (2) Use the flange duct reforming tool, COM-1938 and repair the air supply duct flange.

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SUBTASK 36-13-01-230-001

- (3) Inspect the duct flange for cracks after the repair.
 - (a) For metallic and nonmetallic ducts, use the fluorescent penetrant inspection, using water washable inspection compound, G00596 (refer to the applicable vendor's instructions).
 - 1) If the flange has any cracks, replace the duct or repair off of aircraft.

SUBTASK 36-13-01-320-004

- (4) If the duct flange cannot be repaired while the duct is installed, do these steps:
 - (a) Do this task: Pneumatic Manifold Duct Removal (Selection), TASK 36-13-01-000-808.
 - (b) Repair the duct flange with the flange reforming tool.
 - (c) Do this task: Pneumatic Manifold Duct Installation (Selection), TASK 36-13-01-400-802.

H. Repair the Duct with Dents, Scratches or Gouges

(Figure 801)

NOTE: This repair procedure is only applicable to pneumatic ducts with dents that are less than 5 percent of the nominal diameter of the duct and/or pneumatic ducts with sharp scratch or gouge depths of less than 10 percent of the duct's wall thickness.

SUBTASK 36-13-01-350-004

- (1) Do one of the steps that follow to repair the duct with dents:

NOTE: It is not necessary to repair the duct, if the dent does not limit air flow through the duct.

NOTE: Do not use a method that will produce local work-hardening of the duct.

 - (a) You can pull a ball mandrel through the area of the duct that has the dent.
 - (b) You can use an expansion device that is hydraulically or mechanically operated to remove the dent.

SUBTASK 36-13-01-220-001

- (2) Do the steps that follow to repair the duct with a sharp scratch or gouge:

NOTE: It is not necessary to repair the duct, if the scratch or gouge is smooth or rounded and is less than 10 percent of the wall thickness.

 - (a) You can remove some of the adjacent metal surface to make the scratch or gouge smooth with these conditions:
 - 1) The minimum wall thickness at the bottom of the scratch after it is repaired must not be less than 90 percent of the minimum pneumatic duct wall thickness.
 - 2) The surface roughness of the repaired area must not be more than 40 microinches (arithmetical average).
 - 3) The slope of the repaired area must not be more than 10 percent (0.10).
 - 4) The inner and the outer radius of the repaired area must not be more than 0.12 inch (3.05 mm).
 - 5) The distance between a scratch/gouge and a primary welded joint must be more than 0.25 in. (6.35 mm).
 - (b) If the damage to the duct cannot be repaired to meet the above conditions, do one of these tasks:
 - 1) Weld repair the pneumatic duct off aircraft.
 - 2) Replace the damaged duct. To replace the damaged duct, these are the tasks:

Pneumatic Manifold Duct Removal (Selection), TASK 36-13-01-000-808,

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Pneumatic Manifold Duct Installation (Selection), TASK 36-13-01-400-802.

I. Put the Airplane Back to Its Usual Condition

SUBTASK 36-13-01-410-003

- (1) Install the duct section that was removed for repair. To install the duct section, do this task:
Pneumatic Manifold Duct Installation (Selection), TASK 36-13-01-400-802.

SUBTASK 36-13-01-420-001

- (2) Close the access panels.

————— **END OF TASK** —————

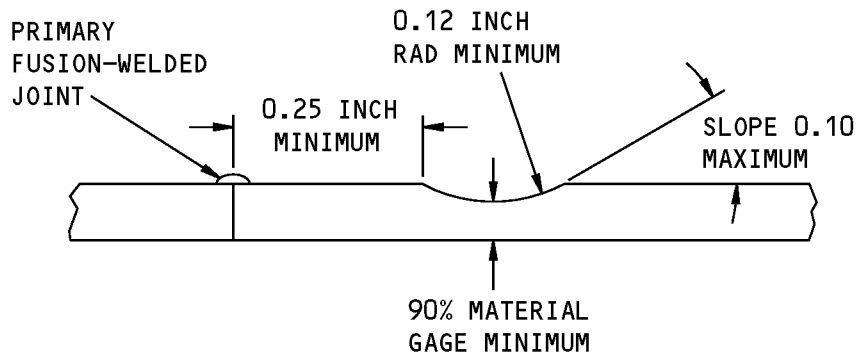
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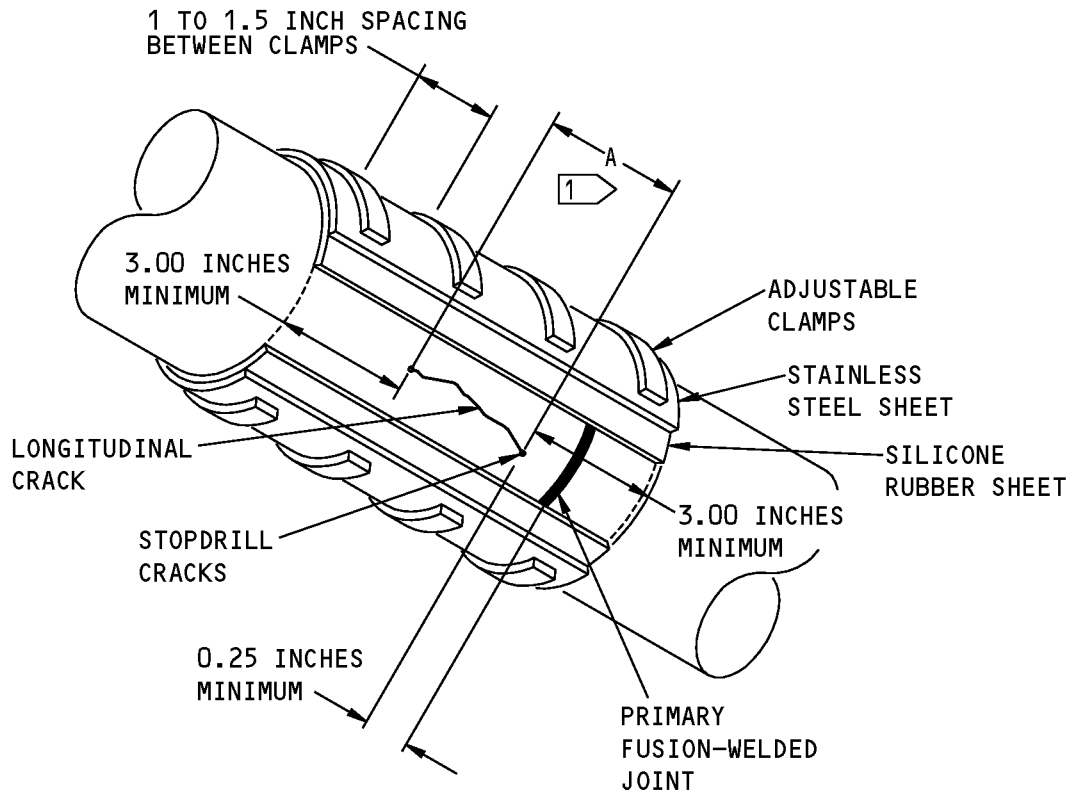
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**DUCT REWORK
(EXAMPLE)**



**DUCT REPAIR
(EXAMPLE)**

1 MAXIMUM CRACK LENGTH MUST NOT BE MORE THAN THE DUCT DIAMETER.

**Pneumatic Duct Repair
Figure 801/36-13-01-990-806**

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PNEUMATIC DUCT INSULATION - REMOVAL/INSTALLATION

1. General

A. This procedure has two tasks:

- (1) Pneumatic duct insulation removal
- (2) Pneumatic duct insulation installation.

B. There are two types of pneumatic insulations that are used to insulate the pneumatic ducts on the airplane:

- (1) Soft insulation - This is a soft, precut, fiberglass pad insulation that is wrapped with a cover and stitched on with tie straps. It is found behind the sidewall liners in the aft cargo compartment.
- (2) Hard shell insulation - This is a hard, preformed, fiberglass lay-up air gap insulation that is pre-shaped to fit snugly around the contour of a specific duct section. The hard shell insulation unit come in two halves and are attached to its respective duct section with band clamp or wire lace. It is found on pneumatic ducts in the keel beam section of the airplane.

TASK 36-13-02-000-801

2. Pneumatic Duct Insulation Removal

(Figure 401)

A. References

Reference	Title
25-52-06-000-801	Remove the Sidewall Lining for the Cargo Compartment (P/B 401)
36-13-01-000-806	APU Pneumatic Duct Removal (P/B 401)

B. Location Zones

Zone	Area
139	Keel Beam, (Part) Body Station 540.00 to Body Station 727.00
141	Aft Cargo Compartment - Left

C. Prepare to Remove the Pneumatic Duct Insulation

SUBTASK 36-13-02-010-002

- (1) Open the applicable access panels to get access to the pneumatic duct insulation.

SUBTASK 36-13-02-860-002

- (2) To remove the sidewall liners in the aft cargo compartment, do this task: Remove the Sidewall Lining for the Cargo Compartment, TASK 25-52-06-000-801.

D. Remove the Pneumatic Duct Insulation

SUBTASK 36-13-02-020-002

WARNING: THE PNEUMATIC DUCTS CAN BE HOT. IF YOU DO NOT REMOVE THE INSULATION CORRECTLY, INJURY TO PERSONS CAN OCCUR.

- (1) To remove the soft insulation, do the steps that follow (Figure 401):
 - (a) Turn the insulation [1] until you get access to the square knots [3] for the fiberglass tape [2].
 - (b) Loosen and remove the square knots [3].
 - (c) Remove the insulation [1].

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SUBTASK 36-13-02-020-003

WARNING: THE PNEUMATIC DUCTS CAN BE HOT. IF YOU DO NOT REMOVE THE INSULATION CORRECTLY, INJURY TO PERSONS CAN OCCUR.

(2) To remove the hard shell insulation, do the steps that follow:

- (a) Remove the APU pneumatic duct section from the keel beam, do this task: APU Pneumatic Duct Removal, TASK 36-13-01-000-806.
- (b) Remove the clamps.
- (c) Remove the hard shell insulation halves.

————— **END OF TASK** —————

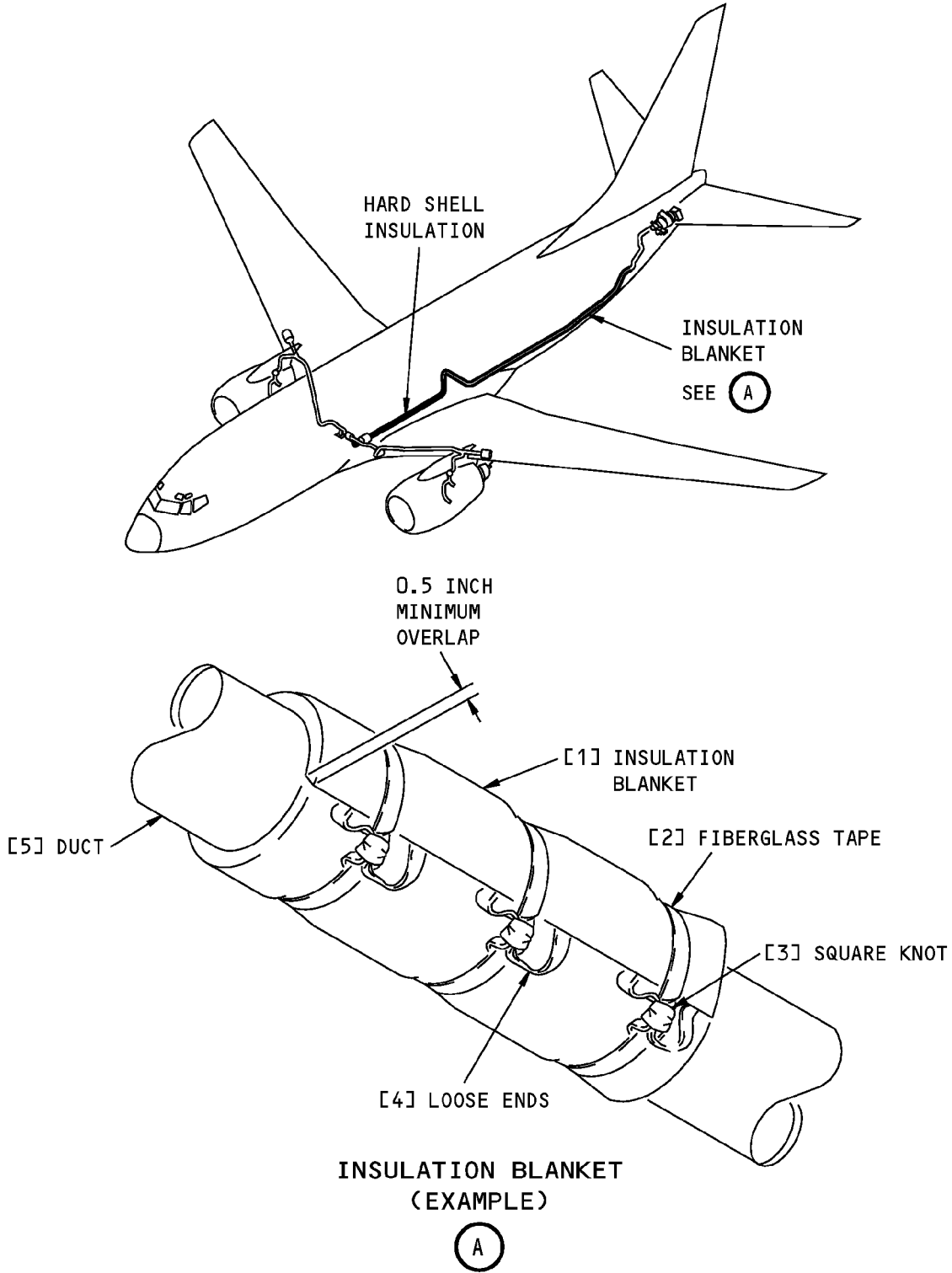
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**Pneumatic Manifold Duct Insulation Blanket Installation
Figure 401/36-13-02-990-803**

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TASK 36-13-02-400-801

3. Pneumatic Duct Insulation Installation

(Figure 401)

A. References

Reference	Title
25-52-06-400-801	Install the Sidewall Lining for the Cargo Compartment (P/B 401)
36-13-01-000-807	APU Pneumatic Duct Installation (P/B 401)

B. Consumable Materials

Reference	Description	Specification
G00431	Tape - Fiberglass - ECC-A	MIL-Y-1140

C. Location Zones

Zone	Area
139	Keel Beam, (Part) Body Station 540.00 to Body Station 727.00
141	Aft Cargo Compartment - Left

D. Install the pneumatic duct insulation

SUBTASK 36-13-02-420-002

(1) To install the soft insulation, do the steps that follow (Figure 401):

(a) Install the insulation [1] around the duct [5].

NOTE: Make sure the insulation [1] overlaps a minimum overlap of 0.5 inches and along the outer surface of the duct bend.

(b) Make a square knot [3] with the fiberglass ECC-A tape, G00431 [2].

NOTE: Approved repair procedure at intermediate tie strap locations: If the tie strap breaks loose from the insulation, a new fiberglass ECC-A tape, G00431 [2] may be used to hold the insulation in its position without being stitched to insulation. This procedure is not approved at end tie strap locations.

(c) Put the loose ends [4] of the fiberglass ECC-A tape, G00431 [2] between the overlap and the insulation [1].

SUBTASK 36-13-02-420-003

(2) To install the hard shell insulation, do the steps that follow:

(a) Install the hard shell insulation on the pneumatic duct.

(b) Install the clamps, tighten to 13-17 pound-inches.

(c) To install the APU pneumatic duct section, do this task: APU Pneumatic Duct Installation, TASK 36-13-01-000-807.

E. Put the Airplane Back to Its Usual Condition

SUBTASK 36-13-02-410-003

(1) To install the sidewall liners in the cargo compartment, do this task: Install the Sidewall Lining for the Cargo Compartment, TASK 25-52-06-400-801.

SUBTASK 36-13-02-410-004

(2) Close the applicable access panels.

————— **END OF TASK** —————

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PNEUMATIC DUCT INSULATION - REPAIRS

1. General

- A. This procedure has instructions to repair the soft insulation blankets that are wrapped around the APU pneumatic duct sections behind the sidewall linings in the aft cargo compartment.
- B. Hard shell insulations which are used to insulate APU pneumatic duct sections in the keel beam cannot be repaired, they must be replaced.
- C. Soft insulation blankets which has more than 25 percent of its fiberglass material missing or torn away must be replaced.

TASK 36-13-02-300-801

2. Pneumatic Duct Insulation Repair

(Figure 801)

A. References

Reference	Title
25-52-06-000-801	Remove the Sidewall Lining for the Cargo Compartment (P/B 401)
25-52-06-400-801	Install the Sidewall Lining for the Cargo Compartment (P/B 401)

B. Consumable Materials

Reference	Description	Specification
G00431	Tape - Fiberglass - ECC-A	MIL-Y-1140
G02305	Tape - Insulation Blanket	BMS5-149

C. Location Zones

Zone	Area
141	Aft Cargo Compartment - Left

D. Access Panels

Number	Name/Location
822	Aft Cargo Door

E. Prepare To Repair the Soft Insulation Blanket

SUBTASK 36-13-02-010-001

- (1) To get access to the soft insulation blankets on the APU pneumatic ducts, do this step:
 - (a) Open this access panel:

Number	Name/Location
822	Aft Cargo Door

SUBTASK 36-13-02-860-001

- (2) Remove the sidewall liners in the aft cargo compartment. To remove the sidewall liners, do this task: Remove the Sidewall Lining for the Cargo Compartment, TASK 25-52-06-000-801.

F. Soft Insulation Blanket Repair

SUBTASK 36-13-02-020-001

- (1) Loosen or remove the fiberglass ECC-A tape, G00431 if it is necessary.

SUBTASK 36-13-02-340-001

- (2) Put the repair tape, G02305 over the tear so the repair tape extends around the tear a minimum of one inch in all directions.

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SUBTASK 36-13-02-420-001

- (3) Tighten or install the fiberglass ECC-A tape, G00431 if it was loose or removed.

NOTE: If a tie strap breaks loose from the soft insulation blanket at an intermediate location, a new fiberglass ECC-A tape, G00431 may be used to hold the soft insulation blanket in place. The replacement tie strap does not have to be stitched on to the soft insulation blanket. This procedure is not approved for end tie strap locations.

G. Put the Airplane to Its Usual Condition

SUBTASK 36-13-02-410-001

- (1) Install the sidewall liners in the cargo compartment. To install the sidewall liners, do this task:
Install the Sidewall Lining for the Cargo Compartment, TASK 25-52-06-400-801.

SUBTASK 36-13-02-410-002

- (2) Close this access panel:

<u>Number</u>	<u>Name/Location</u>
822	Aft Cargo Door

————— **END OF TASK** —————

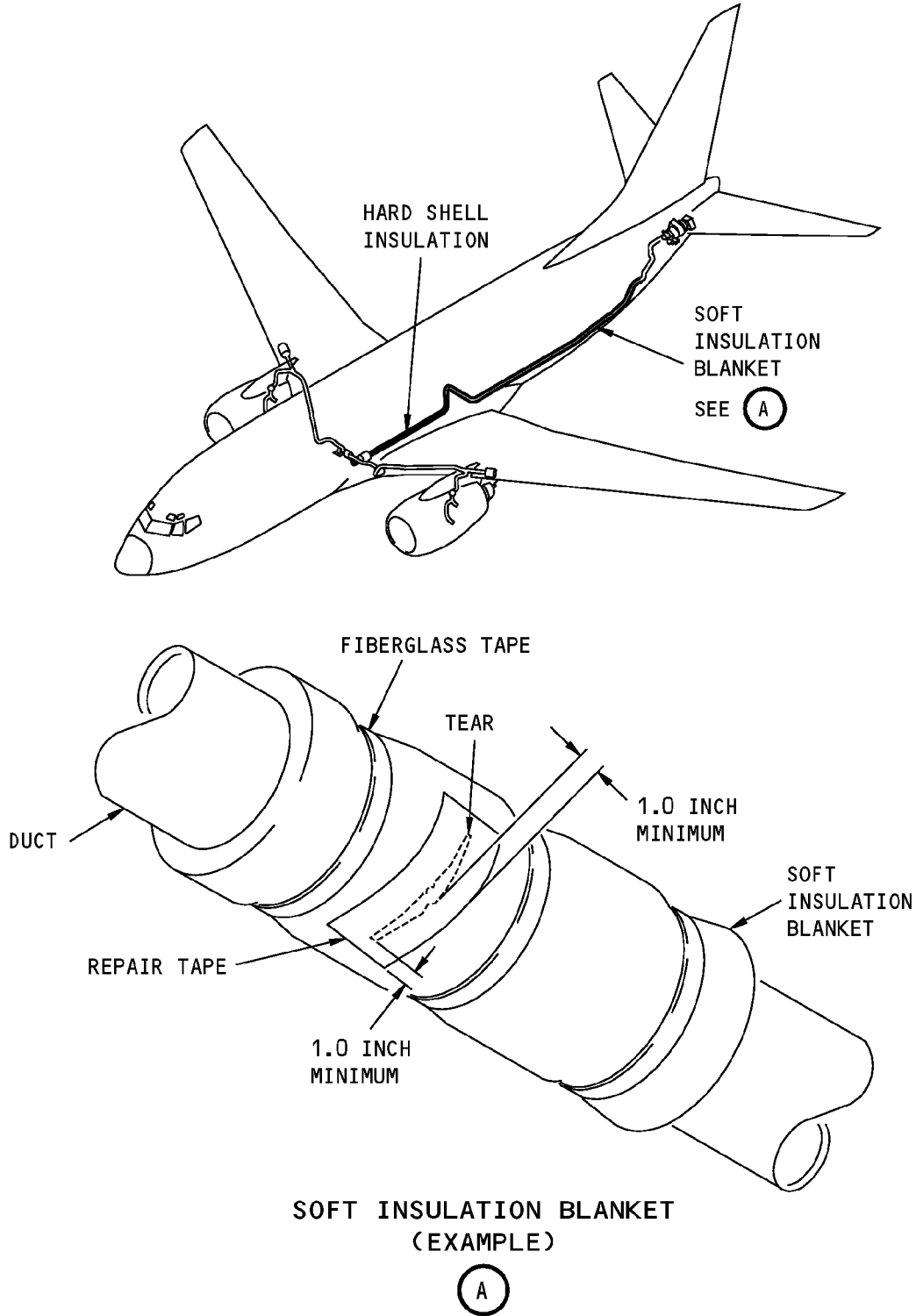
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**Pneumatic Manifold Duct Insulation Blanket Repairs
Figure 801/36-13-02-990-804**

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GROUND PNEUMATIC CONNECTOR CHECK VALVE - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks:
 - (1) Ground pneumatic connector check valve removal
 - (2) Ground pneumatic connector check valve installation.
- B. The ground pneumatic connector check valve is connected to a pneumatic manifold duct installed in the right air conditioning bay.
- C. For this procedure, the ground pneumatic connector check valve will be referred to as the check valve.

TASK 36-13-03-000-801

2. Ground Pneumatic Connector Check Valve Removal

(Figure 401)

A. References

Reference	Title
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

B. Location Zones

Zone	Area
192	Lower Wing-To-Body Fairing - Under Wing Box

C. Access Panels

Number	Name/Location
192CR	Air Conditioning Access Door
192DR	ECS High Pressure Access Door

D. Prepare to Remove the Check Valve

SUBTASK 36-13-03-860-001

- (1) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

NOTE: Make sure that the APU, engines and ground air source are off.

SUBTASK 36-13-03-860-002

- (2) Put these switches on the P5-10 panel to the OFF position and attach DO-NOT-OPERATE tags.
 - (a) BLEED 1
 - (b) BLEED 2
 - (c) APU BLEED.

SUBTASK 36-13-03-010-001

- (3) To get access to the check valve [5], do this step:
 - (a) Open this access panel:

Number	Name/Location
192DR	ECS High Pressure Access Door

SUBTASK 36-13-03-020-001

- (4) To get access to the right air conditioning bay, do this step: .

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- (a) Open this access panel:

<u>Number</u>	<u>Name/Location</u>
192CR	Air Conditioning Access Door

E. Remove the Check Valve

SUBTASK 36-13-03-020-002

- (1) Remove the nuts [6] and washers [7], at 12 locations.

NOTE: To prevent movement or damage to the upper gasket [3], keep the bolts [2] and upper washers [1] in position.

SUBTASK 36-13-03-020-003

- (2) Remove the lower gasket [4].

SUBTASK 36-13-03-020-004

- (3) Remove the check valve [5].

SUBTASK 36-13-03-210-001

- (4) Examine the lower gasket [4] for damage.

- (a) Keep the lower gasket [4] for installation, if it is not damaged.

————— **END OF TASK** —————

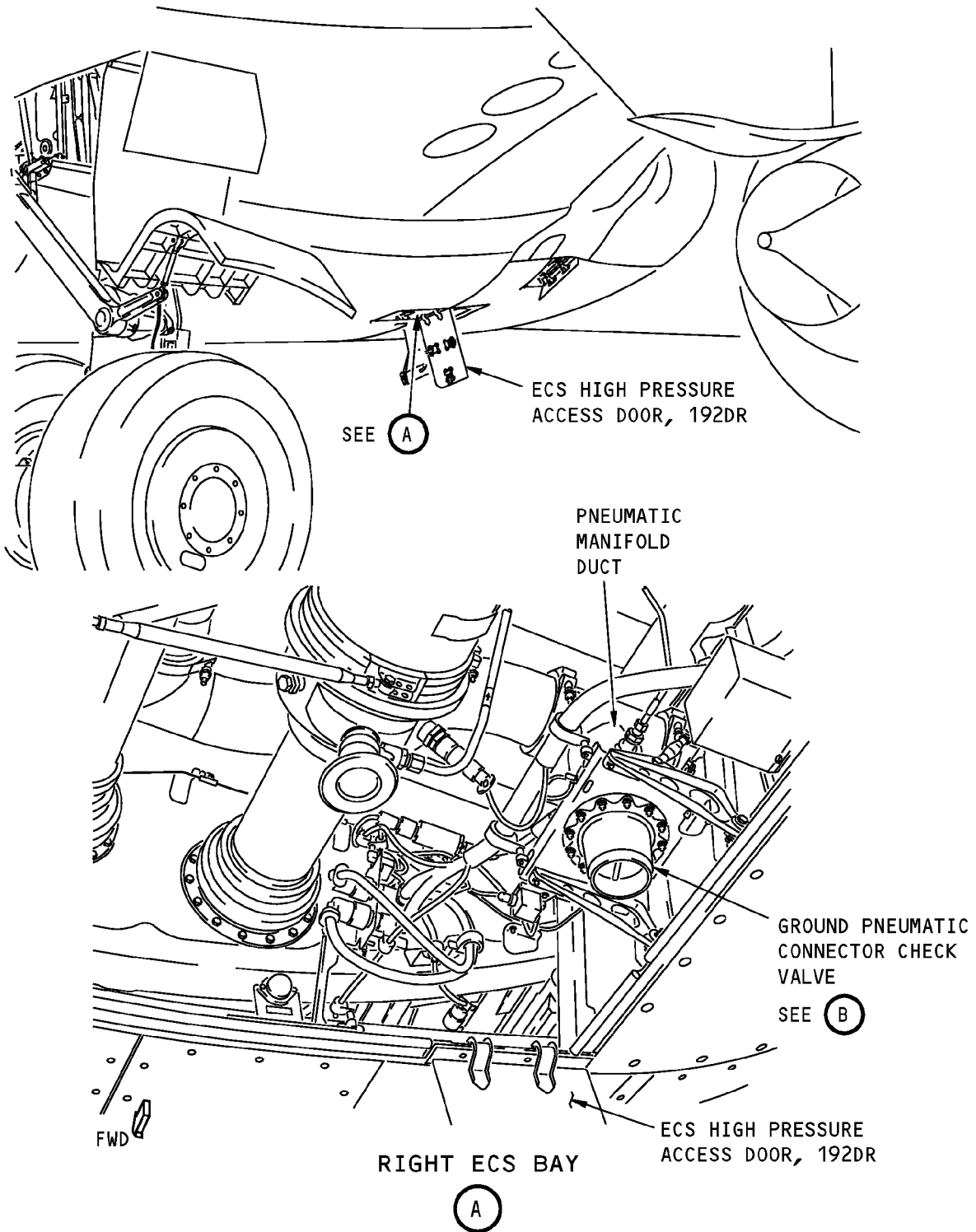
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**Ground Pneumatic Connector Check Valve Installation
Figure 401 (Sheet 1 of 2)/36-13-03-990-802**

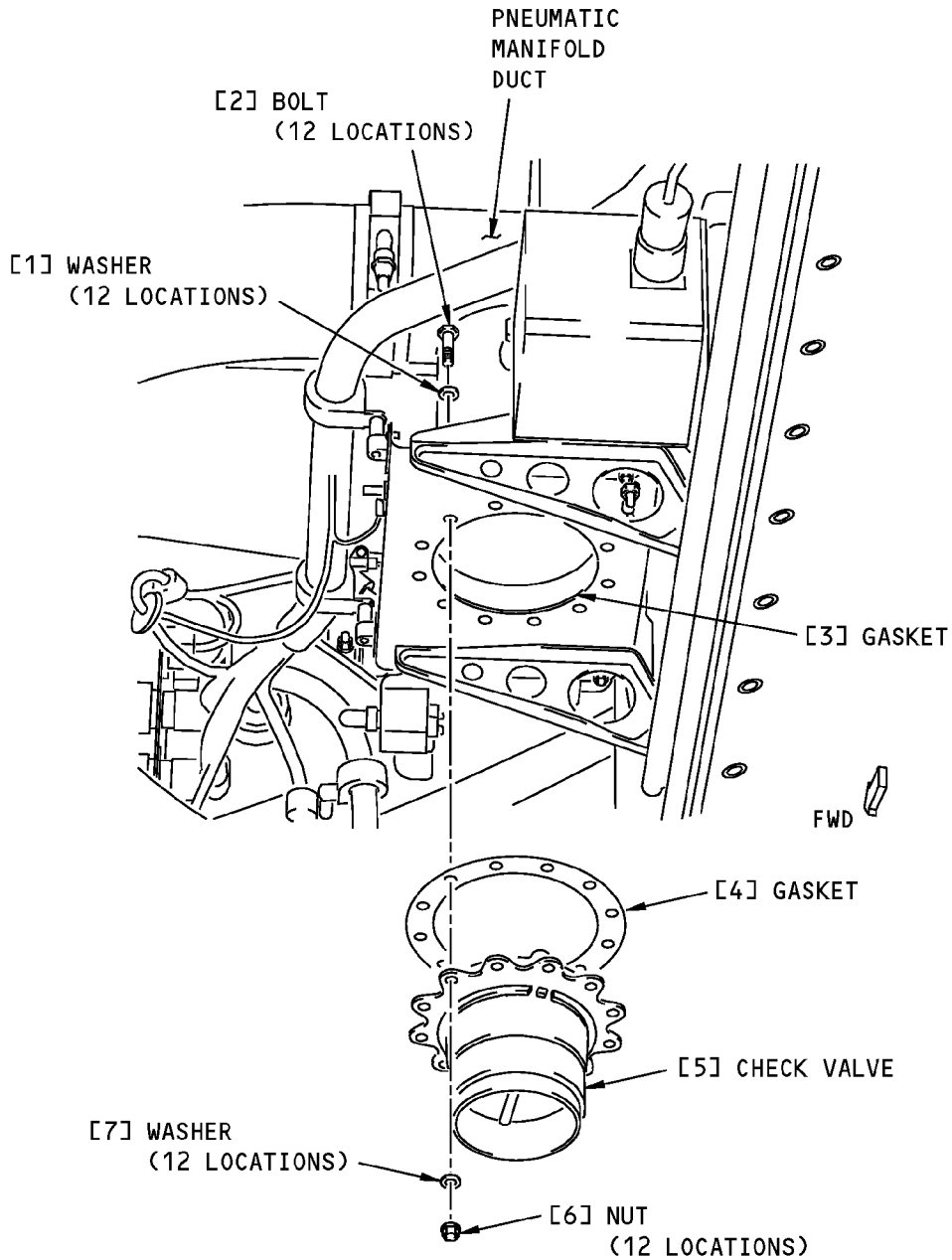
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**GROUND PNEUMATIC CONNECTOR
CHECK VALVE**

(B)

**Ground Pneumatic Connector Check Valve Installation
Figure 401 (Sheet 2 of 2)/36-13-03-990-802**

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TASK 36-13-03-400-801

3. Ground Pneumatic Connector Check Valve Installation

(Figure 401)

A. References

Reference	Title
36-00-00-860-803	Supply Pressure to the Pneumatic System with the APU (P/B 201)
36-00-00-860-804	Supply Pressure to the Pneumatic System with One or Both Engines (P/B 201)

B. Location Zones

Zone	Area
192	Lower Wing-To-Body Fairing - Under Wing Box

C. Access Panels

Number	Name/Location
192CR	Air Conditioning Access Door
192DR	ECS High Pressure Access Door

D. Install the Check Valve

SUBTASK 36-13-03-420-001

(1) Put the check valve [5] and lower gasket [4] in the correct position.

SUBTASK 36-13-03-420-002

(2) Install the nuts [6] and washers [7], at 12 locations.

(a) Tighten the nuts [6] to 26-30 pound-inches (2.89-3.34 Newton-meters).

E. Check Valve Installation Test

SUBTASK 36-13-03-790-001

(1) Do a check for leakage of the check valve [5].

(a) To use the APU to supply pressure to the pneumatic manifold, do this task: Supply Pressure to the Pneumatic System with the APU, TASK 36-00-00-860-803.

(b) To use the engine to supply pressure to the pneumatic manifold, do this task: Supply Pressure to the Pneumatic System with One or Both Engines, TASK 36-00-00-860-804.

(c) Examine the check valve [5] for leakage.

NOTE: Diffused leakage is permitted, concentrated leakage must be repaired.

F. Put the Airplane Back To Its Usual Condition

SUBTASK 36-13-03-410-001

(1) Close these access panels:

Number	Name/Location
192CR	Air Conditioning Access Door
192DR	ECS High Pressure Access Door

SUBTASK 36-13-03-860-003

(2) Remove the DO-NOT-OPERATE tags from these switches on the P5-10 panel:

(a) BLEED 1

(b) BLEED 2

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(c) APU BLEED

————— **END OF TASK** —————

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BLEED AIR ISOLATION VALVE - REMOVAL/INSTALLATION

1. General

- A. This procedure has two tasks.
 - (1) Bleed air isolation valve removal
 - (2) Bleed air isolation valve installation.
- B. The bleed air isolation valve is installed in the keel beam. Access to the bleed air isolation valve is through a keel beam access hole from the left side of the air conditioning bay.
- C. For this procedure, the bleed air isolation valve will be referred to as the valve.

TASK 36-13-04-000-801

2. Engine Bleed Air Isolation Valve Removal

(Figure 401)

A. References

Reference	Title
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

B. Location Zones

Zone	Area
193	Lower Wing-To-Body Fairing - Wheel Well

C. Access Panels

Number	Name/Location
192CL	Air Conditioning Access Door
192CR	Air Conditioning Access Door

D. Prepare to Remove the Valve

SUBTASK 36-13-04-860-001

WARNING: YOU MUST REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. IF YOU DO NOT REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS, HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

NOTE: Make sure that the APU, engines and ground air source are off.

SUBTASK 36-13-04-860-002

- (2) Put the ISOLATION VALVE switch on the P5-10 panel to the CLOSED position.

SUBTASK 36-13-04-860-003

- (3) 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>
A	5	C00259	AIR CONDITIONING BLEED AIR VALVE ISLN

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SUBTASK 36-13-04-010-001

(4) Open these access panels:

<u>Number</u>	<u>Name/Location</u>
192CL	Air Conditioning Access Door
192CR	Air Conditioning Access Door

and .

SUBTASK 36-13-04-020-001

(5) Remove the air conditioning duct section [1] from the left air conditioning bay.

E. Remove the Valve

SUBTASK 36-13-04-020-002

(1) Remove the electrical connector [2].

SUBTASK 36-13-04-020-006

(2) Remove the screw [7], washers [8] and nut [9].

SUBTASK 36-13-04-020-003

(3) Remove the bonding wire [4].

SUBTASK 36-13-04-020-004

(4) Remove the couplings [5] (2 locations).

SUBTASK 36-13-04-020-005

(5) Remove the valve [6] with the actuator attached.

NOTE: Turn the valve [6] until the flanges are horizontal.

————— **END OF TASK** —————

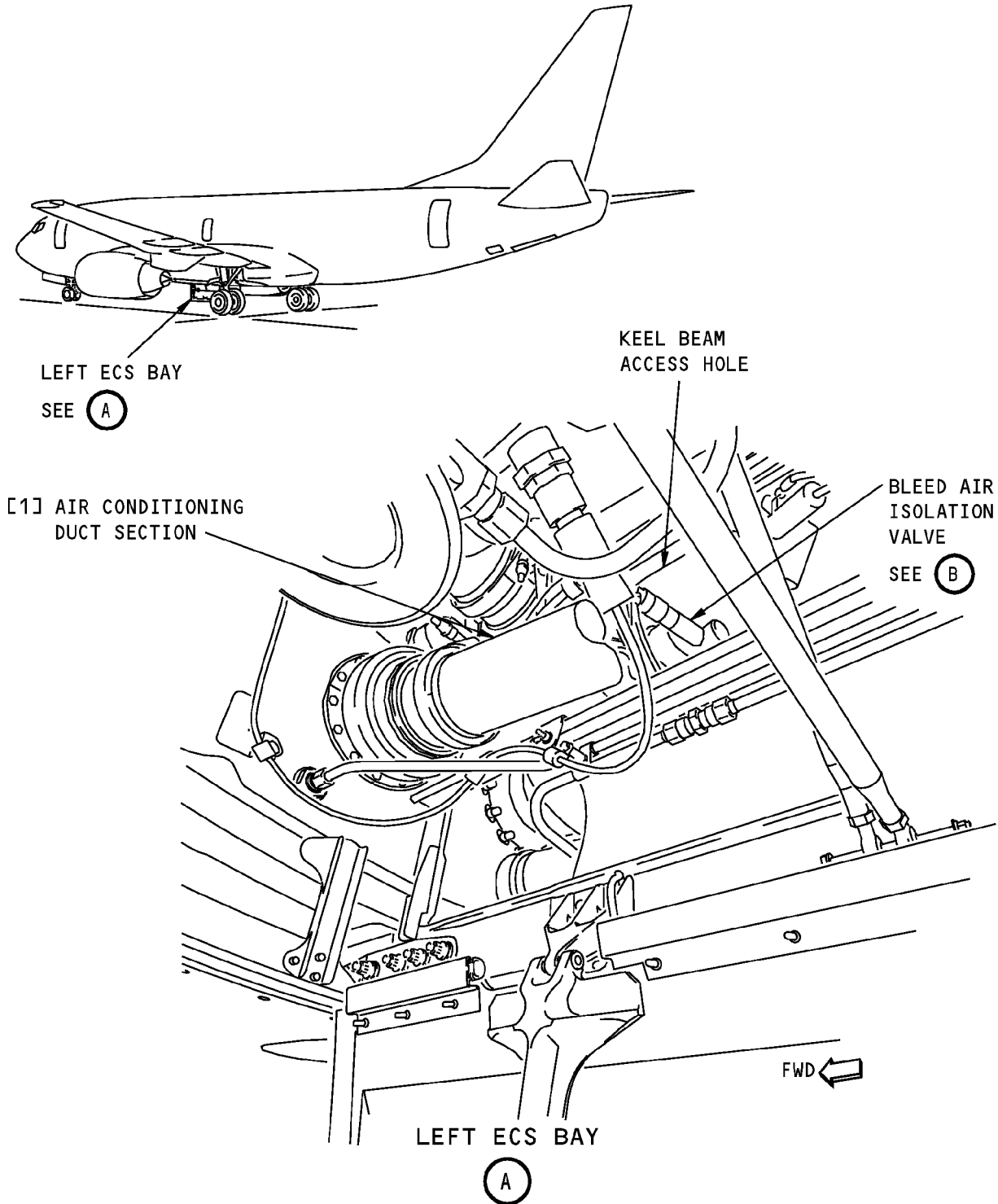
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**Bleed Air Isolation Valve Installation
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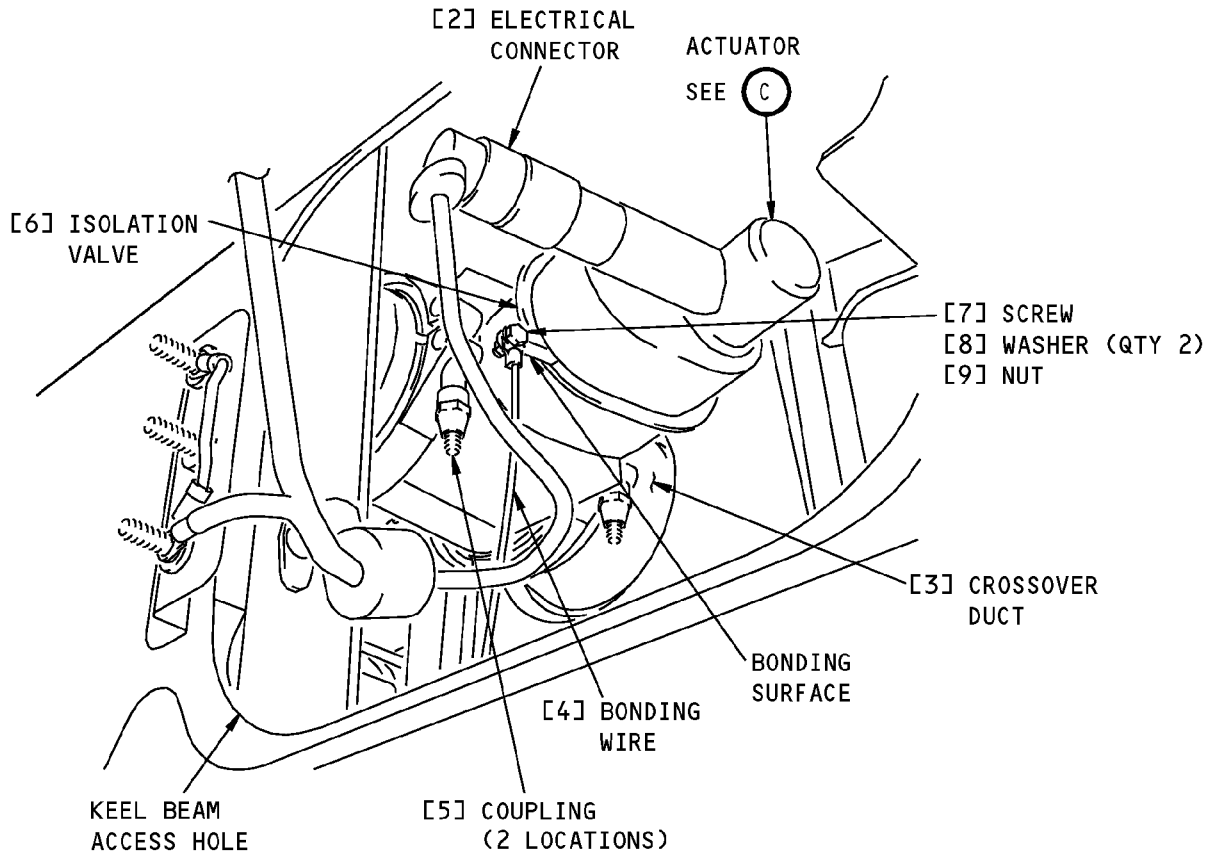
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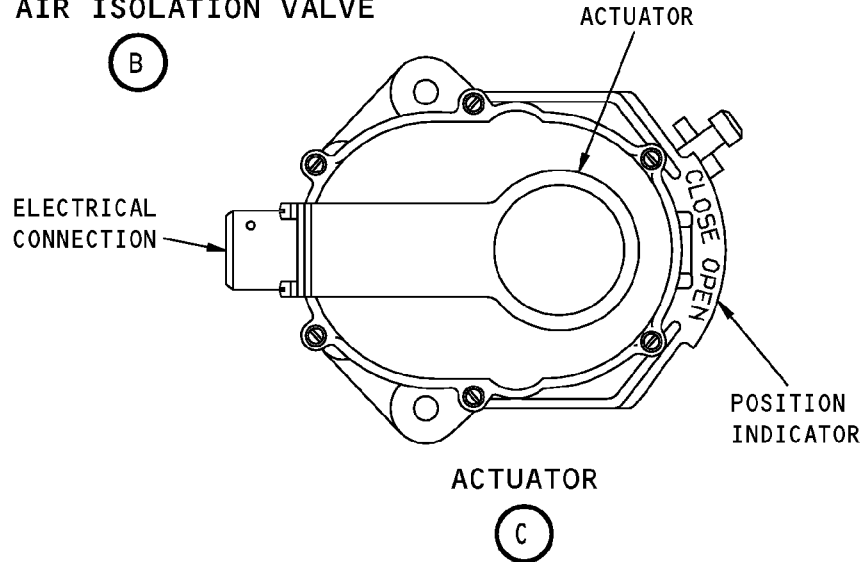
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BLEED AIR ISOLATION VALVE



**Bleed Air Isolation Valve Installation
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TASK 36-13-04-400-801

3. Bleed Air Isolation Valve Installation

(Figure 401)

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
24-22-00-860-812	Remove Electrical Power (P/B 201)
36-00-00-860-801	Supply Pressure to the Pneumatic System (Selection) (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

B. Location Zones

Zone	Area
193	Lower Wing-To-Body Fairing - Wheel Well

C. Access Panels

Number	Name/Location
192CL	Air Conditioning Access Door
192CR	Air Conditioning Access Door

D. Install the Valve

SUBTASK 36-13-04-160-001

(1) Make sure the bonding surface of the valve [6] is clean.

SUBTASK 36-13-04-420-001

(2) Put the valve [6] through the keel beam access hole from the left side of the keel beam.

SUBTASK 36-13-04-420-002

(3) Install the valve [6] in the correct orientation between the crossover ducts [3].

SUBTASK 36-13-04-410-001

(4) Install the couplings [5] (2 locations).

NOTE: Make sure you install the couplings [5] to give the maximum clearance for removal.

(a) Tighten the couplings [5] to 45-50 pound-inches (5.00-5.56 Newton-meters).

SUBTASK 36-13-04-420-003

(5) Install the bonding wire [4].

SUBTASK 36-13-04-420-006

(6) Install the screw [7], washers [8] and nut [9].

SUBTASK 36-13-04-420-004

(7) Install the electrical connector [2].

SUBTASK 36-13-04-420-005

(8) Install the air conditioning duct section [1] on the left air conditioning bay.

SUBTASK 36-13-04-860-004

(9) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
A	5	C00259	AIR CONDITIONING BLEED AIR VALVE ISLN

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E. Test the Valve

SUBTASK 36-13-04-860-005

(1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 36-13-04-860-006

(2) Put the ISOLATION VALVE switch to the OPEN position.

(a) Make sure the valve [6] opens.

SUBTASK 36-13-04-860-007

(3) Put the ISOLATION VALVE switch to the CLOSE position.

(a) Make sure the valve [6] closes.

SUBTASK 36-13-04-860-008

(4) Make sure the two PACK switches are in the OFF position.

SUBTASK 36-13-04-860-009

(5) Do this task: Supply Pressure to the Pneumatic System (Selection), TASK 36-00-00-860-801.

SUBTASK 36-13-04-860-010

(6) Put the ISOLATION VALVE switch to the OPEN position.

(a) Do a check for leakage at the couplings [5] (2 locations).

1) Diffused leakage is permitted, jet blast leakage must be repaired.

F. Put the Airplane To Its Usual Condition

SUBTASK 36-13-04-860-011

(1) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 36-13-04-860-012

(2) Do this task: Remove Electrical Power, TASK 24-22-00-860-812.

SUBTASK 36-13-04-410-002

(3) Close these access panels:

<u>Number</u>	<u>Name/Location</u>
192CL	Air Conditioning Access Door
192CR	Air Conditioning Access Door

and .

————— **END OF TASK** —————

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APU BLEED AIR SYSTEM - ADJUSTMENT/TEST

1. General

- A. This procedure has a task to do the dual bleed warning test. The dual bleed warning test operationally checks that the dual bleed warning indication (on the bleed air control panel) operates correctly.
- B. The DUAL BLEED light circuit is completed by a combination of engine no. 1 bleed switch ON and the APU bleed air valve open. A combination of engine no. 2 bleed switch ON, isolation valve switch OPEN and APU bleed air valve open will also complete the circuit.

TASK 36-14-00-710-801

2. Dual Bleed Warning Test

(Figure 501)

A. References

Reference	Title
24-22-00-860-811	Supply Electrical 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)

B. Location Zones

Zone	Area
212	Flight Compartment - Right

C. Prepare to do the Warning Test

SUBTASK 36-14-00-860-001

- (1) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 36-14-00-860-002

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

F/O Electrical System Panel, P6-3

Row	Col	Number	Name
C	14	C01278	MASTER CAUTION ANNUNCIATOR CONT 4
C	15	C01355	LANDING GEAR AIR/GND SYS 2
C	16	C01356	LANDING GEAR AIR/GND SYS 1
D	12	C00310	INDICATOR MASTER DIM BAT
D	13	C00311	INDICATOR MASTER DIM BUS 1
D	14	C00312	INDICATOR MASTER DIM BUS 2
D	15	C01401	LANDING GEAR AIR/GND RELAY
E	11	C00313	INDICATOR MASTER DIM SECT 1
E	12	C00314	INDICATOR MASTER DIM SECT 2
E	13	C00315	INDICATOR MASTER DIM SECT 3
E	14	C00316	INDICATOR MASTER DIM SECT 4
F	11	C00317	INDICATOR MASTER DIM SECT 5
F	12	C00318	INDICATOR MASTER DIM SECT 6

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
HAP 101-999			
A	1	C00344	AIR CONDITIONING TEMP CONTROL 35 DEG F LEFT

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HAP 101-999 (Continued)

Row	Col	Number	Name
A	2	C00268	AIR CONDITIONING TEMP CONTROL AUTO LEFT
A	3	C00267	AIR CONDITIONING TEMP CONTROL MANUAL
HAP ALL			
A	4	C00399	AIR CONDITIONING RAM AIR MOD LEFT
A	7	C00796	AIR CONDITIONING BLEED AIR VALVES LEFT
HAP 101-999			
B	1	C00345	AIR CONDITIONING TEMP CONTROL 35 DEG F RIGHT
B	2	C00258	AIR CONDITIONING TEMP CONTROL AUTO RIGHT
HAP ALL			
B	4	C00400	AIR CONDITIONING RAM AIR MOD RIGHT
B	7	C00797	AIR CONDITIONING BLEED AIR VALVES RIGHT
HAP 101-999			
C	4	C00257	AIR CONDITIONING OVERHEAT
HAP ALL			
C	5	C00263	AIR CONDITIONING PACK CONT VALVES RIGHT
C	6	C00262	AIR CONDITIONING PACK CONT VALVES LEFT
HAP 101-999			
D	7	C00124	AIR CONDITIONING MIX VALVE POS IND
HAP ALL			
D	8	C00076	AIR CONDITIONING TEMP IND
HAP 101-999			
E	1	C01015	AIR CONDITIONING RECIRC FAN CONT
HAP ALL			
E	4	C00884	AIR CONDITIONING RECIRC RIGHT FAN CABIN AIR

SUBTASK 36-14-00-860-004

(3) Make sure that the engine 1 BLEED and engine 2 BLEED switches are in the OFF position.

SUBTASK 36-14-00-860-027

(4) Start the APU. To start the APU, do this task: APU Starting and Operation, TASK 49-11-00-860-801.

SUBTASK 36-14-00-860-005

(5) Put the APU BLEED switch on the P5-10 panel to the ON position.

SUBTASK 36-14-00-860-006

(6) Put the ISOLATION VALVE switch on the P5-10 panel to the OPEN position.

SUBTASK 36-14-00-860-007

(7) Make sure that the DUAL BLEED light is not on.

SUBTASK 36-14-00-860-008

(8) Put the engine 2 BLEED switch to the ON position.

SUBTASK 36-14-00-860-009

(9) Make sure that the DUAL BLEED, MASTER CAUTION and AIR COND lights come on.

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SUBTASK 36-14-00-860-010

- (10) Put the MASTER DIM and TEST switch, S270, on the P2-1 center instrument panel to the DIM position.

SUBTASK 36-14-00-860-011

- (11) Make sure that the DUAL BLEED, MASTER CAUTION and AIR COND lights dim.

SUBTASK 36-14-00-860-012

- (12) Put the MASTER DIM and TEST switch to the BRT position.

SUBTASK 36-14-00-860-013

- (13) Make sure that the DUAL BLEED, MASTER CAUTION and AIR COND lights go to full bright.

SUBTASK 36-14-00-860-014

- (14) Push to reset either MASTER CAUTION light.

SUBTASK 36-14-00-860-015

- (15) Make sure that both MASTER CAUTION lights and the AIR COND light go off.

SUBTASK 36-14-00-860-016

- (16) Make sure that the DUAL BLEED light stays on.

SUBTASK 36-14-00-860-017

- (17) Put the ISOLATION VALVE switch to the CLOSE position.

SUBTASK 36-14-00-860-018

- (18) Make sure that the DUAL BLEED light goes off.

SUBTASK 36-14-00-860-019

- (19) Put the engine 2 BLEED switch to the OFF position and the engine 1 BLEED switch to the ON position.

SUBTASK 36-14-00-860-020

- (20) Make sure that the DUAL BLEED, MASTER CAUTION and AIR COND lights come on.

SUBTASK 36-14-00-860-021

- (21) Put the ISOLATION VALVE switch to the OPEN position.

SUBTASK 36-14-00-860-022

- (22) Put the engine 2 BLEED switch to the ON position.

SUBTASK 36-14-00-860-023

- (23) Put the APU BLEED switch to the OFF position.

SUBTASK 36-14-00-860-024

- (24) Make sure that the DUAL BLEED light goes off.

D. Put the Airplane Back to Its Usual Condition

SUBTASK 36-14-00-860-025

- (1) Put the engine 1 BLEED and engine 2 BLEED switches to OFF.

SUBTASK 36-14-00-860-028

- (2) Stop the operation of the APU. To stop the APU, do this task: APU Usual Shutdown, TASK 49-11-00-860-802.

SUBTASK 36-14-00-860-026

- (3) Put the ISOLATION VALVE switch to AUTO.

————— END OF TASK —————

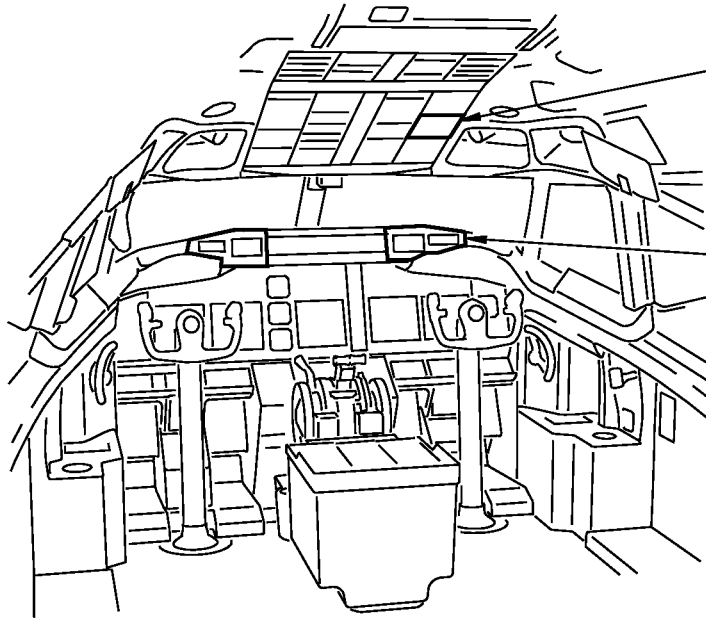
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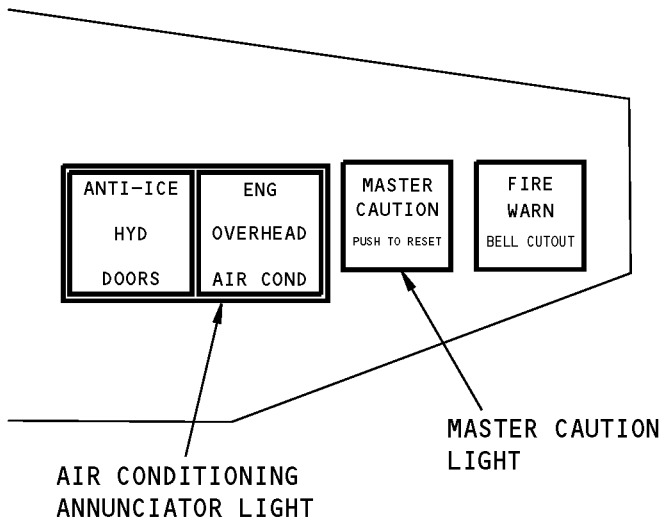
BLEED AIR CONTROL
MODULE, P5 PANEL

SEE (B)

MASTER CAUTION,
P7 PANEL
(2 LOCATIONS)

SEE (A)

FLIGHT COMPARTMENT



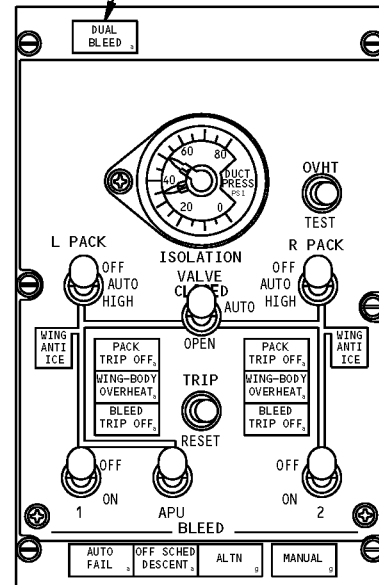
AIR CONDITIONING
ANNUNCIATOR LIGHT

MASTER CAUTION
LIGHT

**MASTER CAUTION, P7 PANEL
(EXAMPLE)**

(A)

DUAL BLEED
WARNING LIGHT



**BLEED AIR CONTROL
MODULE, P5 PANEL**

(B)

**Dual Bleed Warning - Test
Figure 501/36-14-00-990-802**

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APU CHECK VALVE - REMOVAL/INSTALLATION

1. General

- A. This procedure contains two tasks:
(1) APU check valve removal
(2) APU check valve installation.
B. The APU check valve is installed in the keel beam. Access to the APU check valve is through an access hole in the keel beam from the left air conditioning bay.

TASK 36-14-02-000-801

2. APU Check Valve Removal

(Figure 401)

A. References

Table with 2 columns: Reference, Title. Row 1: 36-00-00-860-806, Remove Pressure from the Pneumatic System (P/B 201)

B. Location Zones

Table with 2 columns: Zone, Area. Row 1: 192, Lower Wing-To-Body Fairing - Under Wing Box

C. Access Panels

Table with 2 columns: Number, Name/Location. Row 1: 192CL, Air Conditioning Access Door

D. Prepare to Remove the APU Check Valve

SUBTASK 36-14-02-860-001

WARNING: YOU MUST REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. IF YOU DO NOT REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS, HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

NOTE: Make sure that the APU, engines and ground air source are off.

SUBTASK 36-14-02-860-002

- (2) Put these switches on the P5 panel to the OFF position:

- (a) BLEED 1
(b) BLEED 2
(c) APU BLEED.

SUBTASK 36-14-02-010-001

- (3) Open this access panel:

Table with 2 columns: Number, Name/Location. Row 1: 192CL, Air Conditioning Access Door

SUBTASK 36-14-02-020-001

- (4) Remove the air conditioning duct section [1] to get access to the keel beam access hole.

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SUBTASK 36-14-02-390-001

(5) Put a cover on the open end of the air conditioning ducts to keep unwanted material out.

E. Remove the APU Check Valve

SUBTASK 36-14-02-020-002

(1) Remove the couplings [3].

SUBTASK 36-14-02-020-003

(2) Remove the APU check valve [2] from the APU pneumatic manifold ducts [4].

SUBTASK 36-14-02-390-002

(3) Put a cover on the open end of the APU pneumatic manifold ducts [4] to keep unwanted material out.

————— END OF TASK —————

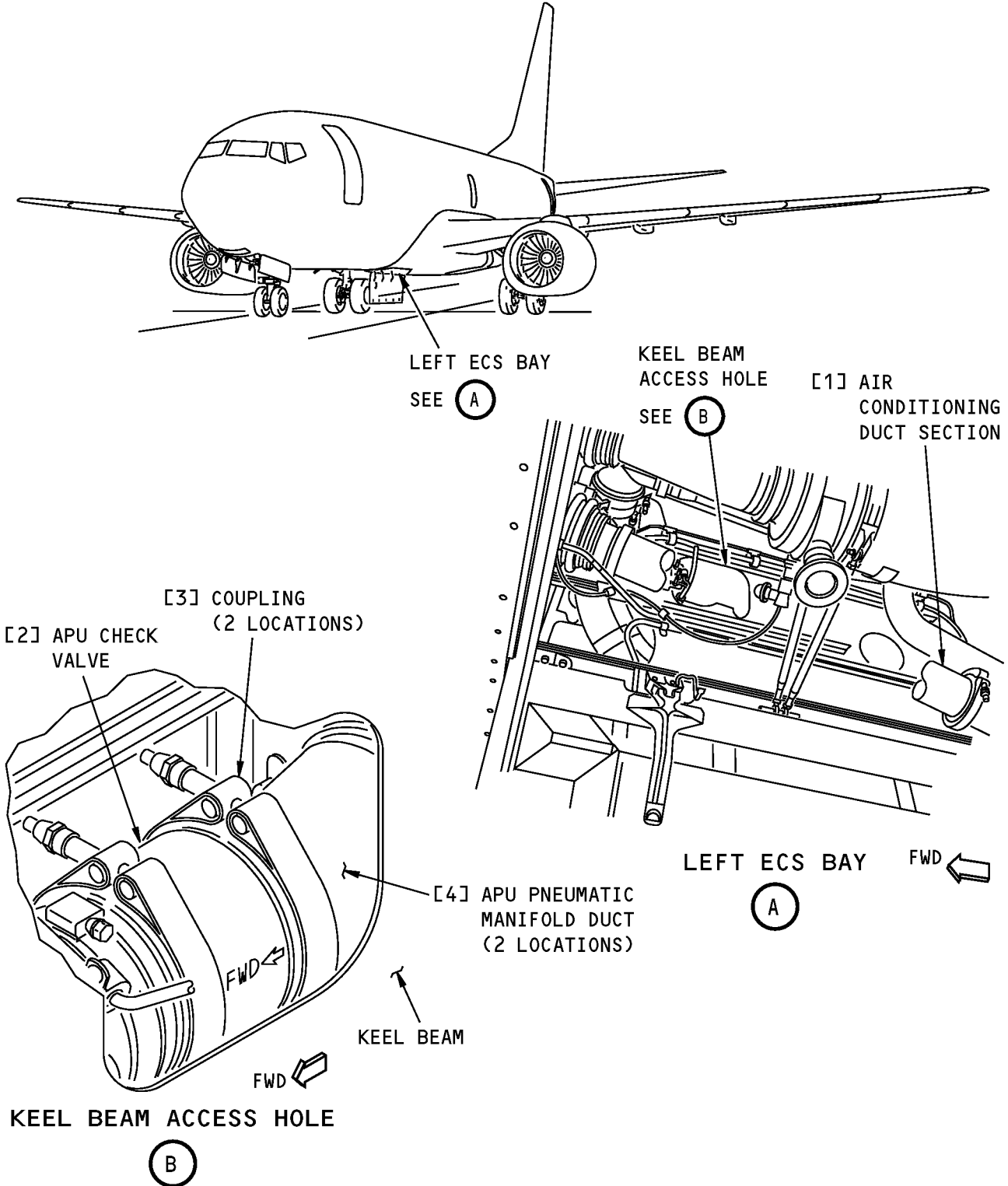
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**APU Check Valve Installation
Figure 401/36-14-02-990-802**

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TASK 36-14-02-400-801

3. APU Check Valve Installation

(Figure 401)

A. References

Reference	Title
36-00-00-860-803	Supply Pressure to the Pneumatic System with the APU (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

B. Access Panels

Number	Name/Location
192CL	Air Conditioning Access Door

C. Install the APU Check Valve

SUBTASK 36-14-02-020-004

- (1) Remove the cover from the APU pneumatic manifold ducts [4].

SUBTASK 36-14-02-420-001

- (2) Install the APU check valve [2] between the APU pneumatic manifold ducts [4] with the flow arrow pointed forward.

SUBTASK 36-14-02-420-002

- (3) Install the couplings [3] on the manifold duct.
 - (a) Tighten the nuts of the couplings [3] to 45-55 pound-inches (5.00-6.12 Newton-meters).

SUBTASK 36-14-02-020-005

- (4) Remove the cover from the air conditioning ducts.

SUBTASK 36-14-02-420-003

- (5) Install the air conditioning duct section [1] in the left air conditioning bay.

SUBTASK 36-14-02-790-001

- (6) Do this leakage test for the APU check valve [2].
 - (a) Do this task: Supply Pressure to the Pneumatic System with the APU, TASK 36-00-00-860-803.
 - (b) Examine the APU check valve [2] for leakage at the coupling [3].
 - 1) Diffused leakage is permitted, jet blast leakage must be repaired.
 - (c) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

D. Put the Airplane Back to Its Usual Condition

SUBTASK 36-14-02-410-001

- (1) Close this access panel:

Number	Name/Location
192CL	Air Conditioning Access Door

————— END OF TASK —————

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DUCT PRESSURE TRANSDUCER - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
 - (1) Duct pressure transducer removal
 - (2) Duct pressure transducer installation.
- B. There are two duct pressure transducers installed on the airplane. One on the forward side of the left air conditioning bay and the other one on the forward side of the right air conditioning equipment bay.
- C. The transducer converts duct pressure data into electrical signals which are sent to the dual duct pressure indicator on the P5 forward overhead panel.
- D. The removal procedure and the installation procedure are the same for each transducer.

TASK 36-21-01-000-801

2. Duct Pressure Transducer Removal

(Figure 401)

A. References

Reference	Title
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

B. Location Zones

Zone	Area
192	Lower Wing-To-Body Fairing - Under Wing Box

C. Access Panels

Number	Name/Location
192CL	Air Conditioning Access Door
192CR	Air Conditioning Access Door

D. Prepare to Remove the Duct Pressure Transducer

SUBTASK 36-21-01-860-001

WARNING: YOU MUST REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. IF YOU DO NOT REMOVE THE PRESSURE FROM THE PNEUMATIC DUCTS, HOT HIGH PRESSURE AIR CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

- (1) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

SUBTASK 36-21-01-860-002

- (2) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
B	5	C00077	AIR CONDITIONING BLEED AIR PRESS IND

SUBTASK 36-21-01-860-003

- (3) Do this task to open the access door, as applicable:

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(a) Open these access panels:

<u>Number</u>	<u>Name/Location</u>
192CL	Air Conditioning Access Door
192CR	Air Conditioning Access Door

E. Duct Pressure Transducer Removal

SUBTASK 36-21-01-020-001

(1) Disconnect the duct pressure sense line [1].

SUBTASK 36-21-01-390-001

(2) Put a cover on the duct pressure sense line [1] to keep out unwanted material.

SUBTASK 36-21-01-020-002

(3) Disconnect the electrical connector [5].

SUBTASK 36-21-01-020-003

(4) Remove the screw [3] and washer [4], at 4 locations.

SUBTASK 36-21-01-020-004

(5) Remove the duct pressure transducer [2].

————— **END OF TASK** —————

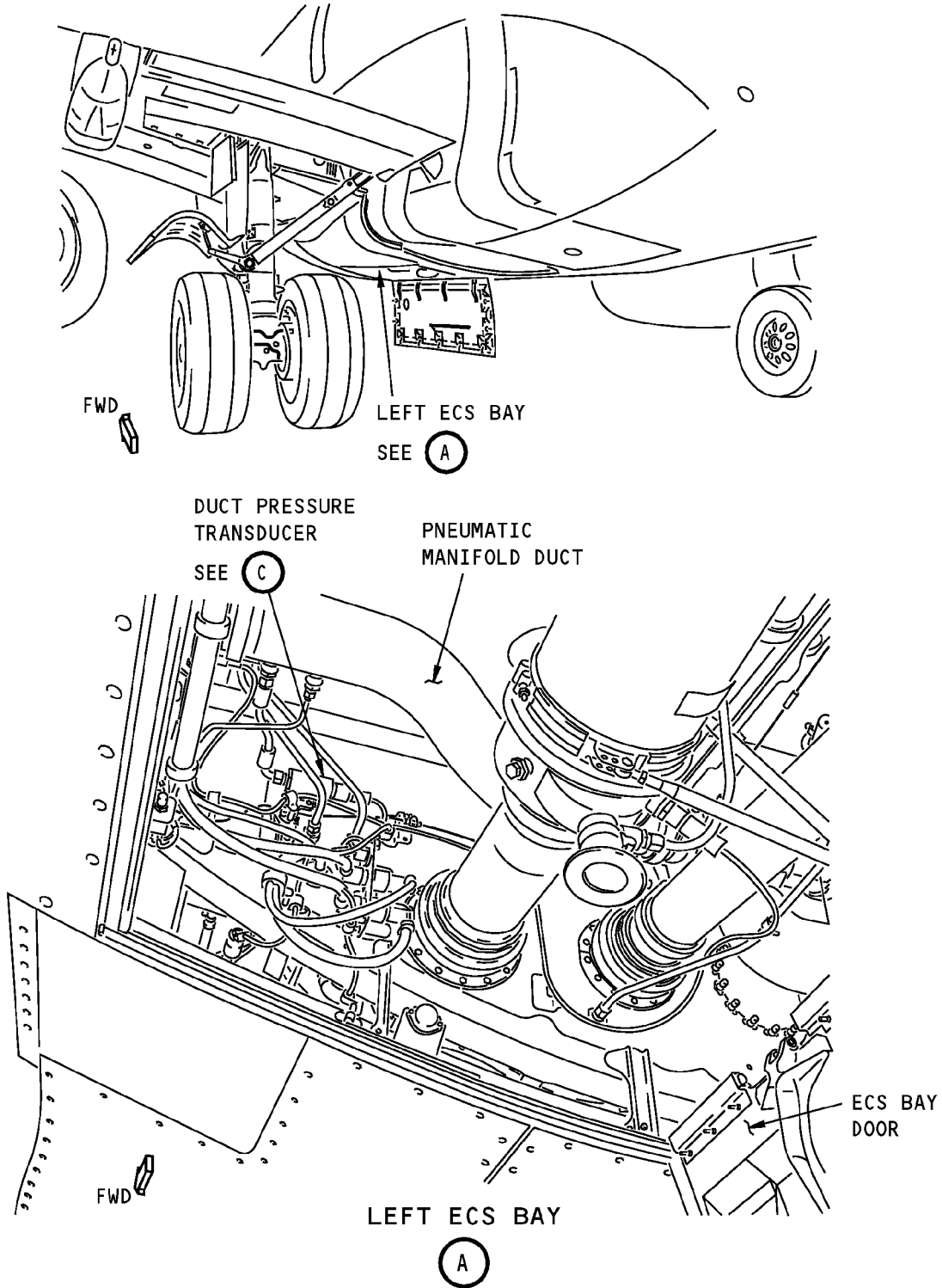
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**Duct Pressure Transducer Installation
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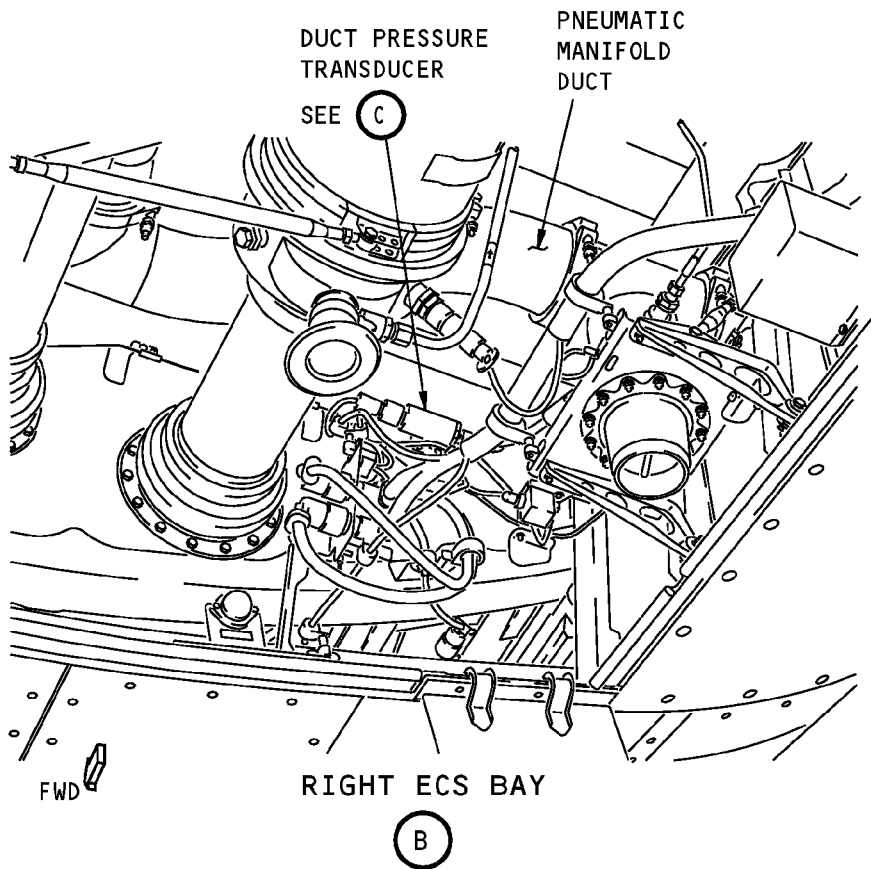
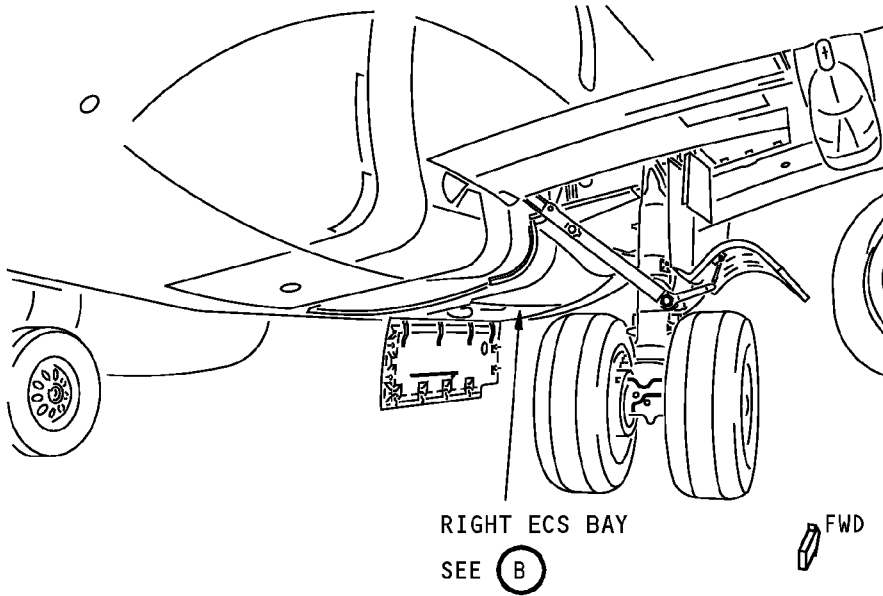
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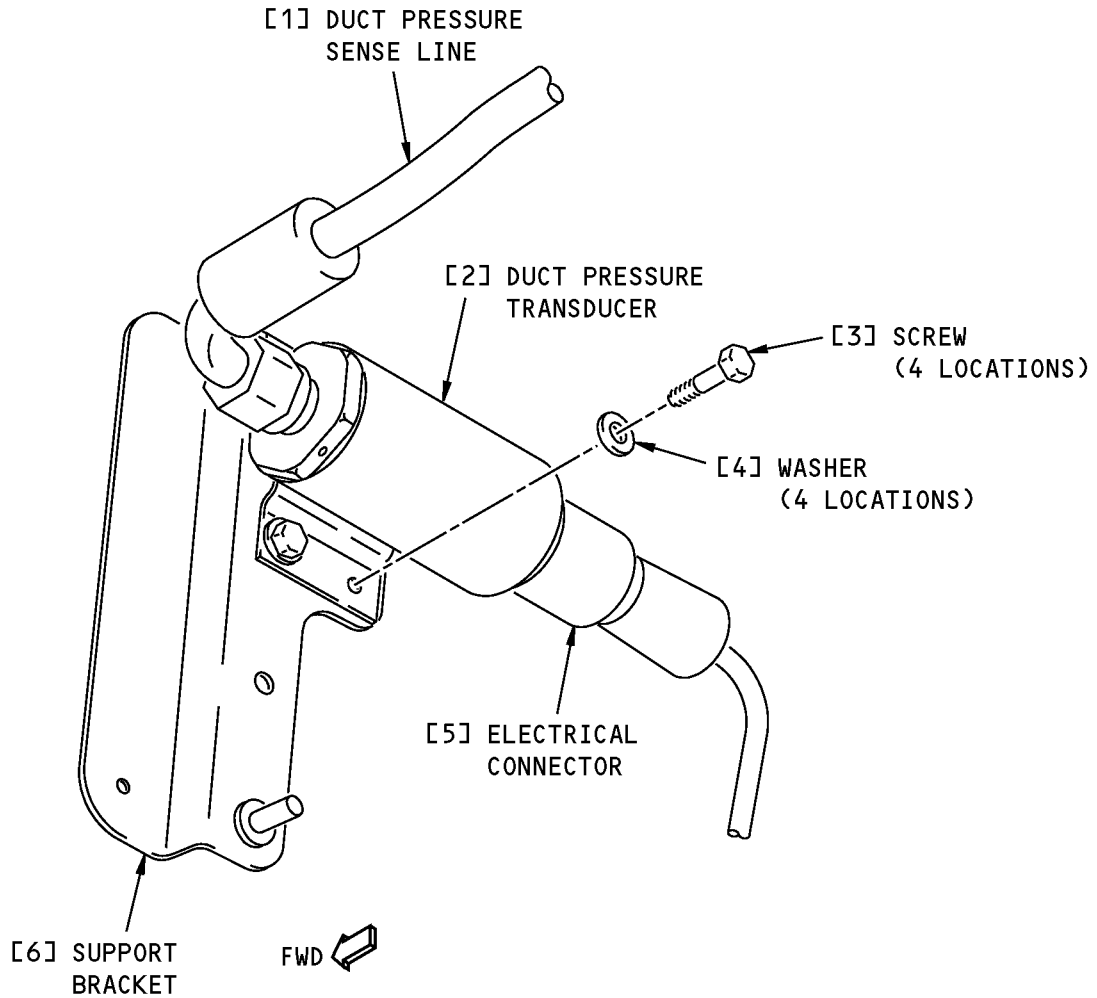
**Duct Pressure Transducer Installation
Figure 401 (Sheet 2 of 3)/36-21-01-990-802**

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**DUCT PRESSURE TRANSDUCER
(EXAMPLE)**



**Duct Pressure Transducer Installation
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TASK 36-21-01-400-801

3. Duct Pressure Transducer Installation

(Figure 401)

A. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Transducer	36-21-01-01-015	HAP 001-013, 015-026, 028-030
		36-21-01-01A-015	HAP 031-054, 101-999

B. Location Zones

Zone	Area
192	Lower Wing-To-Body Fairing - Under Wing Box

C. Access Panels

Number	Name/Location
192CL	Air Conditioning Access Door
192CR	Air Conditioning Access Door

D. Procedure

SUBTASK 36-21-01-860-004

- (1) Put the duct pressure transducer [2] in the correct position on the support bracket [6].

SUBTASK 36-21-01-420-001

- (2) Install the duct pressure transducer [2] on the support bracket [6].

- (a) Install the screw [3] and washer [4], at 4 locations.

SUBTASK 36-21-01-860-005

- (3) Remove the cover from the duct pressure sense line [1].

SUBTASK 36-21-01-420-002

- (4) Connect the duct pressure sense line [1] to the pressure port of the duct pressure transducer [2].

- (a) Tighten the nut to 65-75 pound-inches (7.23-8.34 Newton-meters).

SUBTASK 36-21-01-420-003

- (5) Install the electrical connector [5].

E. Put the Airplane To Its Usual Condition

SUBTASK 36-21-01-860-006

- (1) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
B	5	C00077	AIR CONDITIONING BLEED AIR PRESS IND

SUBTASK 36-21-01-410-001

- (2) Do this task to close the access door, as applicable:

- (a) Close these access panels:

Number	Name/Location
192CL	Air Conditioning Access Door

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(Continued)

<u>Number</u>	<u>Name/Location</u>
192CR	Air Conditioning Access Door

————— **END OF TASK** —————

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DUAL DUCT PRESSURE INDICATOR - REMOVAL/INSTALLATION

1. General

- A. This procedure has these tasks:
(1) Dual duct pressure indicator removal
(2) Dual duct pressure indicator installation.
B. The dual duct pressure indicator is installed on the P5-10 bleed air control panel on the pilot's overhead panel in the flight compartment.
C. The dual duct pressure indicator receives input signals from the left and right duct pressure transducers in the air conditioning bay.
D. For this procedure, the dual duct pressure indicator will be referred to as the pressure indicator.

TASK 36-21-02-600-801

2. Dual Duct Pressure Indicator Removal

(Figure 401)

A. Location Zones

Table with 2 columns: Zone, Area. Row 1: 212, Flight Compartment - Right

B. Prepare to Remove the Dual Duct Pressure Indicator

SUBTASK 36-21-02-010-001

- (1) Open this circuit breaker and install safety tag:

F/O Electrical System Panel, P6-4

Table with 4 columns: Row, Col, Number, Name. Row 1: B, 5, C00077, AIR CONDITIONING BLEED AIR PRESS IND

C. Remove the Dual Duct Pressure Indicator

SUBTASK 36-21-02-020-001

- (1) Disengage the quarter-turn fasteners [5] (6 locations) on the bleed air control module [6].

SUBTASK 36-21-02-020-002

- (2) Carefully pull the bleed air control module [6] out of the P5 panel frame.

SUBTASK 36-21-02-020-003

- (3) Disconnect the electrical connector [1].

SUBTASK 36-21-02-020-004

- (4) Loosen the clamp screw [4] on the front of the bleed air control module [6] to loosen the clamp [3] on the back.

SUBTASK 36-21-02-020-005

- (5) Remove the pressure indicator [2] from the front of the bleed air control module [6].

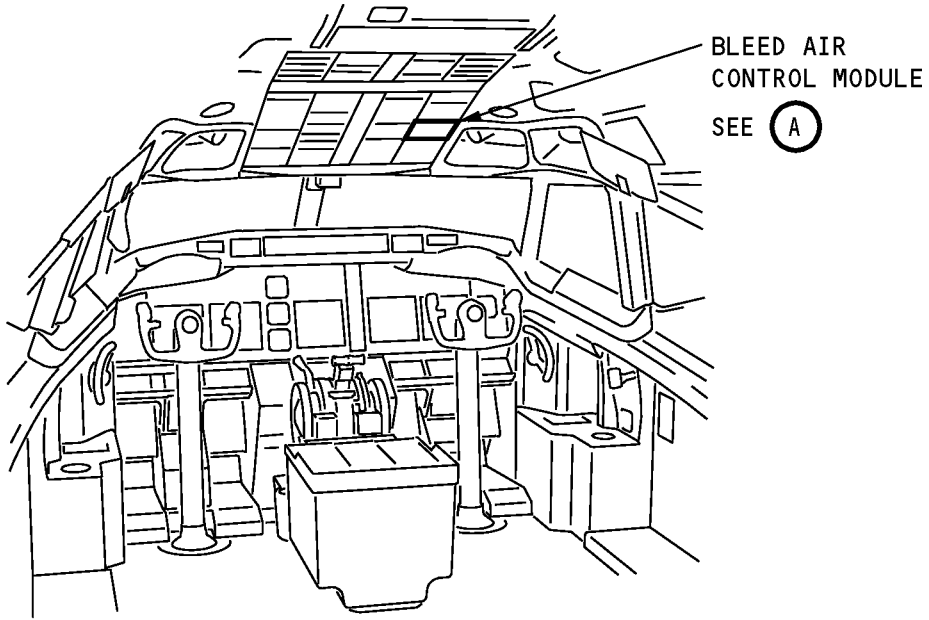
END OF TASK

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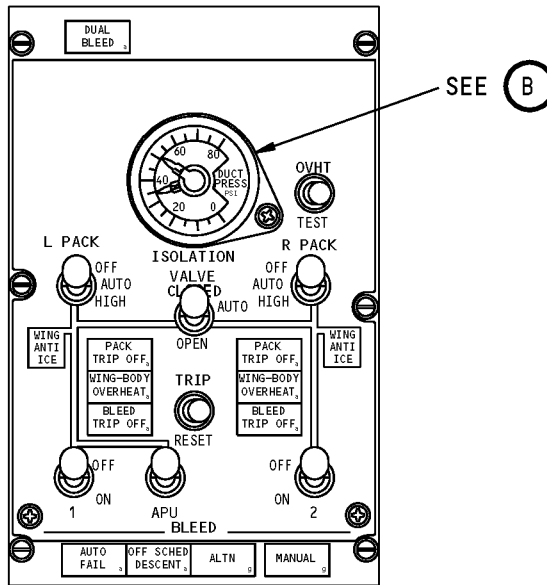
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FLIGHT COMPARTMENT



BLEED AIR CONTROL
MODULE



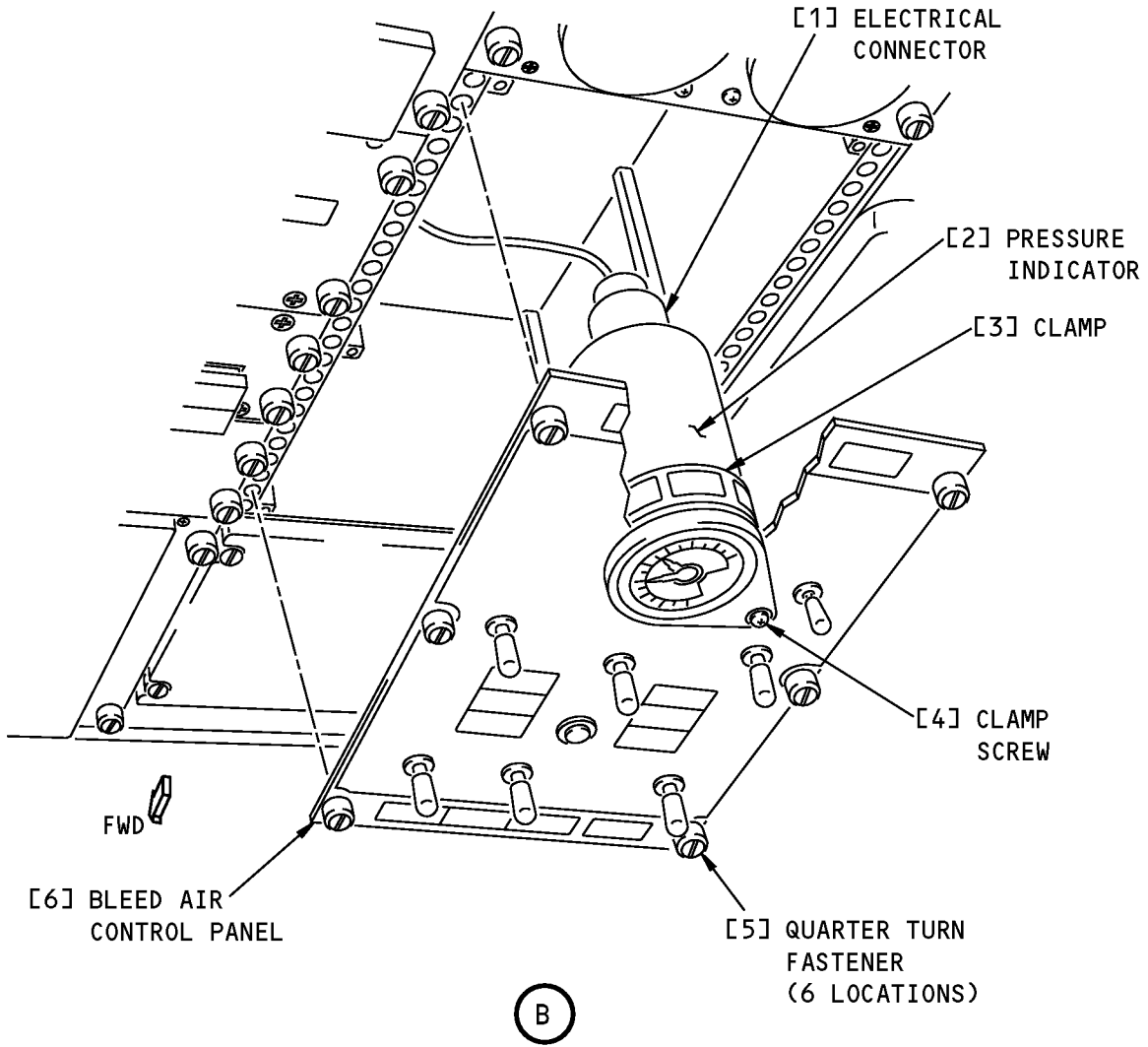
Dual Duct Pressure Indicator Installation
Figure 401 (Sheet 1 of 2)/36-21-02-990-802

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**Dual Duct Pressure Indicator Installation
Figure 401 (Sheet 2 of 2)/36-21-02-990-802**

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TASK 36-21-02-600-802

3. Dual Duct Pressure Indicator Installation

(Figure 401)

A. References

Reference	Title
24-22-00-860-811	Supply Electrical Power (P/B 201)
36-00-00-860-801	Supply Pressure to the Pneumatic System (Selection) (P/B 201)
36-00-00-860-806	Remove Pressure from the Pneumatic System (P/B 201)

B. Expendables/Parts

AMM Item	Description	AIPC Reference	AIPC Effectivity
2	Pressure indicator	36-21-02-02-050	HAP 001-013, 015-026, 028
		36-21-02-03-005	HAP 029-054, 101-999

C. Location Zones

Zone	Area
192	Lower Wing-To-Body Fairing - Under Wing Box

D. Install the Dual Duct Pressure Indicator

SUBTASK 36-21-02-010-002

- (1) Put the pressure indicator [2] backward from the front of the bleed air control module [6] through the clamp [3] on the back.

SUBTASK 36-21-02-420-001

- (2) Tighten the clamp screw [4] to 15-18 pound-inches (1.67-2.00 Newton-meters).

SUBTASK 36-21-02-420-002

- (3) Install the electrical connector [1].

SUBTASK 36-21-02-420-003

- (4) Install the bleed air control module [6] into the P5 panel frame.

- (a) Engage the quarter-turn fasteners [5] (6 locations).

E. Dual Duct Pressure Indicator Test

SUBTASK 36-21-02-420-004

- (1) Remove the safety tag and close this circuit breaker:

F/O Electrical System Panel, P6-4

Row	Col	Number	Name
B	5	C00077	AIR CONDITIONING BLEED AIR PRESS IND

SUBTASK 36-21-02-860-001

- (2) Do this task: Supply Electrical Power, TASK 24-22-00-860-811.

SUBTASK 36-21-02-860-002

- (3) Do this task: Supply Pressure to the Pneumatic System (Selection), TASK 36-00-00-860-801.

SUBTASK 36-21-02-860-003

- (4) Put the isolation valve switch on the bleed air control module [6] to open.

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SUBTASK 36-21-02-860-004

- (5) Make sure that the L and R duct pressure needles on the pressure indicator show approximately the same pressure.

SUBTASK 36-21-02-860-005

- (6) Put the isolation valve switch on the bleed air control module [6] to CLOSED.

SUBTASK 36-21-02-860-006

- (7) Make sure that one of the duct pressure needles shows a decrease in pressure.

F. Put the Airplane To Its Usual Condition

SUBTASK 36-21-02-860-007

- (1) Do this task: Remove Pressure from the Pneumatic System, TASK 36-00-00-860-806.

————— **END OF TASK** —————

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