CONTROL PAGE - INITIAL ISSUE

A. File the attached Temporary Revision/Alerts in the Manual Supplement in ATA Chapter/Section/Subject/Page sequence

B. File this Control Page in front of the Chapter TRs/Alerts.

C. The following list shows active TRs/Alerts together with TRs/Alerts added by this control page.

Chapter Section Subject	Page	TR/Alert No.
36-11-00	501	* 36-507
36-11-00	501	* 36-508
36-11-00	501	* 36-509
36-11-00	501	* 36-510

D. Remove and Destroy the following TRs/Alerts:

* Indicates TRs/Alerts issued with this control page

ATP TEMPORARY REVISION

AIRPLANE

NB322

28 May, 1997

757 MAINTENANCE MANUAL

TEMPORARY REVISION No. 36-507

Manual Reference 36-11-00 Page 501

REASON FOR REVISION

To include pneumatic bleed system checks.

ACTION

BAB
BAB TASK 36-11-00-705-137
BAB 6. <u>Operational Test of the Reverse Flow Check Controller (RFCC)</u> (Fig. 508)
BAB A. General
BAB (1) Neither test set PM82510 nor electrical power is required for this
BAB test, although the latter may be retained on the aircraft together
BAB with the relay jumper installed in the functional test procedures
BAB for the PRSOV/450F temperature sensor test or for the high stage
BAB pilot/HPSOV test, if convenient.
BAB B. References
BAB (1) AMM 06-43-00/201, Engine and Nacelle Strut Access Doors and Panels
BAB C. Equipment
BAB (1) Analog or Digital Voltmeter (AVO/DVM)
BAB D. Access
BAB (1) Location Zones
BAB 433/443 Nacelle Strut - mid-structure
BAB (2) Access Panel
BAB 433HR/443HL High Pressure Duct Access Panel
BAB E. Procedure
BAB
BAB S 015-141
BAB (1) Open the applicable access panel (View A, Fig. 508)
BAB (AMM 06-43-00/201).
BAB
BAB S 035-142
BAB (2) Disconnect the sense lines and RFCC connector (View B, C, Fig. 508).

Originator: J.OSBORNE
Reference: 0331
Workbook: 36-84

S 435-231

(3) Connect AVO or DVM across Pins 1 and 2 of RFCC electrical connector (View B, C, Fig. 508).

NOTE: As access to the right engine RFCC connector is difficult difficult, the RFCC operation may be checked by tripping CB P11Q19, and connecting an AVO or DVM between base pin X2 of P37 relay K10206 and ground.

S 765-143

(4) If no continuity indicated in Operation 3, use lung power to blow down a plastic or rubber hose of suitable size connected to RFCC upstream connection (or upstream sense line, if left engine).
(a) Continuity should now be indicated.

S 765-144

(5) If continuity indicated in Operation 3 or 4, use lung power to blow down a hose connected to RFCC downstream connection.
(a) Continuity should now be lost.

S 765-145

(6) If continuity lost after completing Operation 5, repeat Operation 4 and check that continuity is re-established.

S 765-146

(7) If continuity not correctly established at any stage, Replace reverse flow check controller (RFCC)(AMM 36-11-18/401).

F. Put the Airplane Back to Its Usual Condition

S 025-144

(1) Remove the plastic or rubber hoses installed for this test.

S 435-145

(2) Connect the sense lines that were disconnected for this test.

NOTE: The use of anti-seize compound EASE OFF 990 or similar will prevent pipe fittings from picking up or galling.

S 425-146

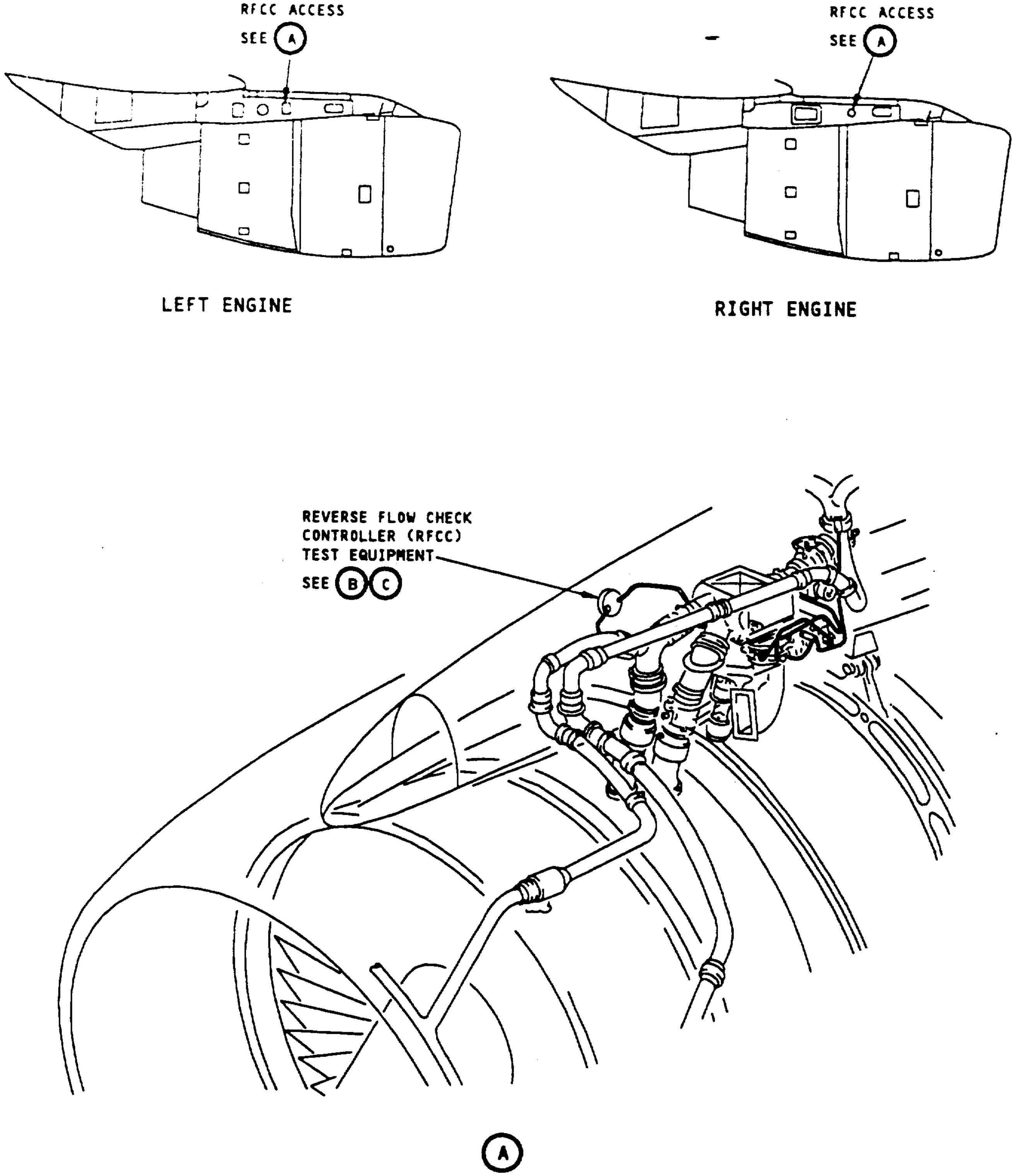
(3) Install RFCC connector(s).

S 425-147

(4) Install relay K10206 (P37 panel) removed in Operation 2.

S 865-148

(5) Close circuit breaker P11Q19 tripped at Operation 2.



Reverse Flow Check Controller Test
Figure 508 (Sheet 1)

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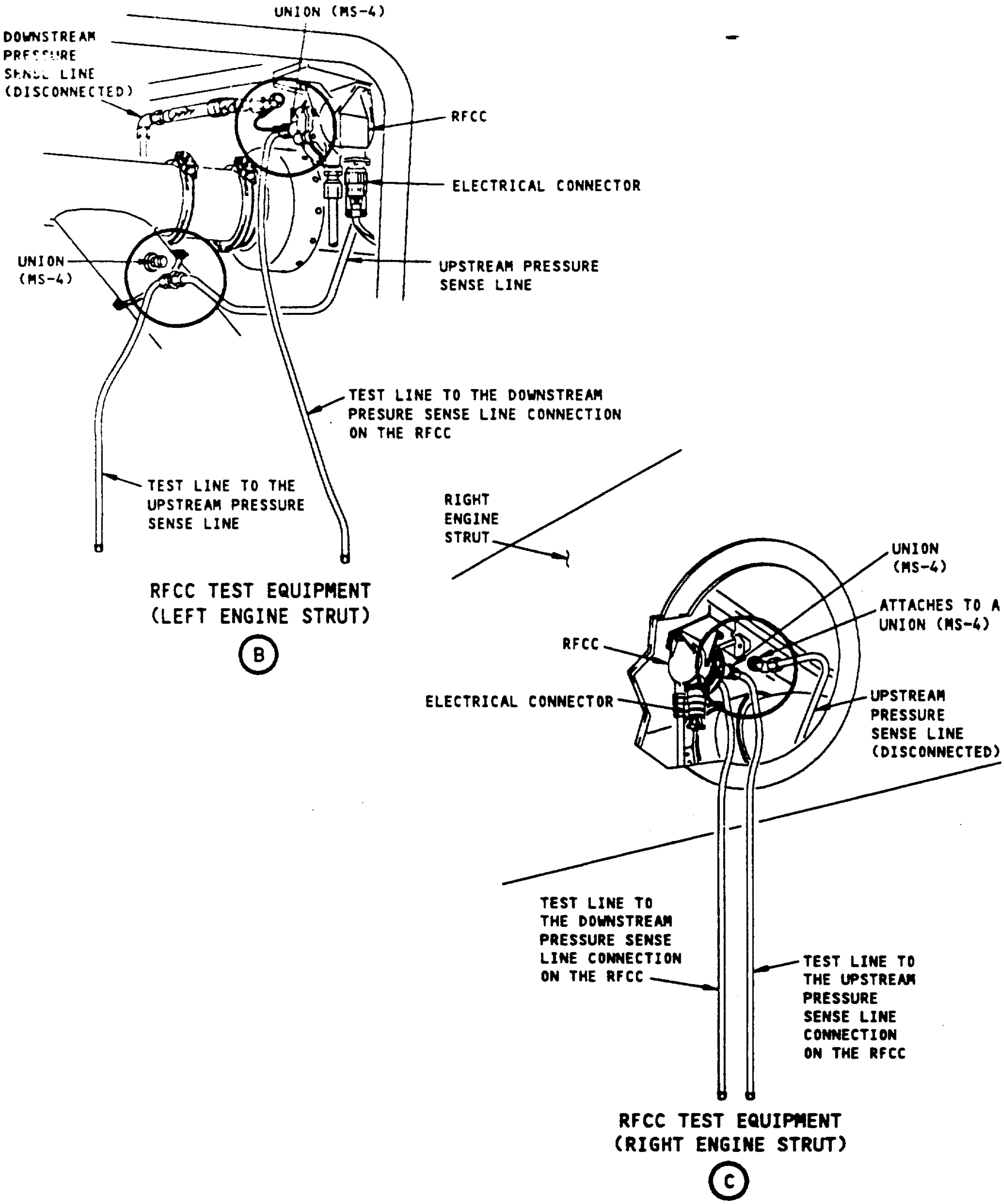

Reverse Flow Check Controller Test
Figure 508 (Sheet 2)

ATP TEMPORARY REVISION

AIRPLANE

NB322

757 MAINTENANCE MANUAL

TEMPORARY REVISION No. 36-508

THIS TEMPORARY REVISION IS ISSUED BY BRITISH AIRWAYS QUALITY AND TECHNICAL SERVICES AND COMPLIES WITH BCAR'S CHAPTER A5-3, B5-3 AND/OR TSS No. 0-2 AS REQUIRED. CAA DESIGN APPROVAL No. DAI/8566/78.

G Litchfield For CHIEF ENGINEER QUALITY AND TECHNICAL SERVICES.

Manual Reference 36-11-00 Page 501

REASON FOR REVISION

To include pneumatic bleed system checks.

ACTION

BAB TASK 36-11-00-705-138
BAB 7. <u>Functional Test of Fan Air Modulating Valve and Fan Air Temperature Sensor</u>
(Fig. 509)
BAB A. General
BAB (1) For this test, you will need a nitrogen supply (tyre trolley low
BAB pressure supply), the C ducts open and test set PM82510.
BAB (2) Aircraft electrical power is not required, but need not be removed
BAB from the aircraft, and if convenient the relay jumper lead installed
BAB in the functional test procedures for the PRSOV/450F temperature
BAB sensor test or for the high stage pilot/HPSOV test may be left in
BAB place.
BAB B. Equipment
BAB (1) PM82510, Test set
BAB (2) Nitrogen source (tyre trolley, low pressure hose)
BAB C. References
BAB (1) AMM 36-11-16/401, Fan Air Modulating Valve
BAB (2) AMM 36-11-17/401, Fan Air Temperature Sensor
BAB D. Access
BAB (1) Location Zones
BAB 411/421 Engine
BAB (2) Access Panel
BAB 413/414/423/424 Fan Cowl Panel
BAB 415/416/425/426 Fan Reverser
BAB E. Procedure
BAB
BAB S 015-149
BAB (1) Open C ducts.
BAB
BAB S 215-150
BAB (2) Check that the FAMV is open but not locked open (View B, Fig. 509).
BAB
BAB S 725-151
BAB (3) Fit TEST GAUGE ASSEMBLY "A" directly to the nitrogen supply, and to
BAB fan air modulating valve (FAMV) inlet pressure sense line connection
BAB with the use of a No. 4 union (View A, Fig. 509).
BAB (a) Set needle valve open.
BAB
BAB S 725-152
BAB (4) Turn on nitrogen supply and adjust to 60-70 psig.
BAB (a) Check that FAMV is closed.
BAB (b) Turn off nitrogen supply.

Originator: J.OSBORNE
Reference: 0331
Workbook: 36-84

S 725-154

(5) If FAMV found closed in the previous step, fit TEST GAUGE ASSEMBLY "B" to the FAMV temperature sensor connection with the use of a No. 6 union (View A, Fig. 509).
   (a) Make sure the associated needle valve is closed.

S 725-232

(6) If FAMV does not close, go to Step 12.

S 725-155

(7) Turn on nitrogen supply and adjust to 16 psig shown on TEST GAUGE "A".
   (a) Check that the FAMV is closed and the pressure on TEST GAUGE "B" not greater than 11 psig.

S 725-252

(8) Increase the nitrogen supply pressure to 60-70 psig.
   (a) Check that the FAMV is still closed and TEST GAUGE "B" pressure is between 9-13 psig.

S 215-156

(9) Check sense lines for leakage, noting there is normally a fixed bleed from the FAMV regulator orifice.

S 725-157

(10) Slowly open the needle valve on TEST GAUGE ASSEMBLY "B" to simulate temperature sensor operation.
   (a) Check that the FAMV is in its full open position with TEST GAUGE "B" pressure not less than 3.5 psig.

S 725-158

(11) Turn off nitrogen supply and go to the end of this procedure, put the airplane back to its usual condition.

S 725-160

(12) If FAMV does not close in Operation (4), disconnect TEST GAUGE ASSEMBLY "A" from nitrogen supply (View C, Fig. 509).

S 725-161

(13) Connect TEST GAUGE ASSEMBLY "C" to open end of disconnected temperature sensor line at the FAMV position with the use of a No. 6 union.

S 725-233

(14) Connect other end of TEST GAUGE ASSEMBLY "C" directly to nitrogen supply and adjust to 15-20 psig shown of TEST GAUGE "C".

S 215-162

(15) Check temperature sensor sense line for leakage.

(a) If there is no apparent leakage, replace fan air temperature sensor (AMM 36-11-17/401).

<u>NOTE</u>: This may be the probable cause for FAMV not closing in step (4).

S 725-163

(16) Shut off nitrogen supply and remove TEST GAUGE ASSEMBLY "C".

S 725-164

(17) Fit TEST GAUGE ASSEMBLY "B" to FAMV temperature sensor connection as in Operation (6) and reconnect TEST GAUGE ASSEMBLY "A" to nitrogen supply.

S 725-165

(18) Turn on the nitrogen supply and adjust to 16 psig shown on TEST GAUGE "A".

(a) Check that the FAMV remains closed and the pressure on TEST GAUGE "B" is not greater than 11 psig.

S 725-166

(19) Increase the nitrogen supply pressure to 60-70 psig.

(a) Check that the FAMV is still closed and TEST GAUGE "B" pressure is between 9-13 psig.

S 215-167

(20) Check sense lines for leakage, noting there is normally a fixed bleed from the FAMV regulator orifice.

S 725-168

(21) Slowly open the needle valve on TEST GAUGE ASSEMBLY "B" to simulate temperature sensor operation.

(a) Check that the FAMV is fully open with TEST GAUGE "B" pressure not less than 3.5 psig.

S 725-169

(22) Turn off nitrogen supply.

F. Put the Airplane Back to Its Usual Condition

S 035-171

(1) Disconnect TEST GAUGE ASSEMBLIES "A" and "B".

S 435-172

(2) Connect the sense lines that were disconnected for the test.

<u>NOTE</u>: The use of anti-seize compound EASE OFF 990 or similar will prevent pipe fittings from picking up or galling.

S 865-173

(3) Return the aircraft to normal.

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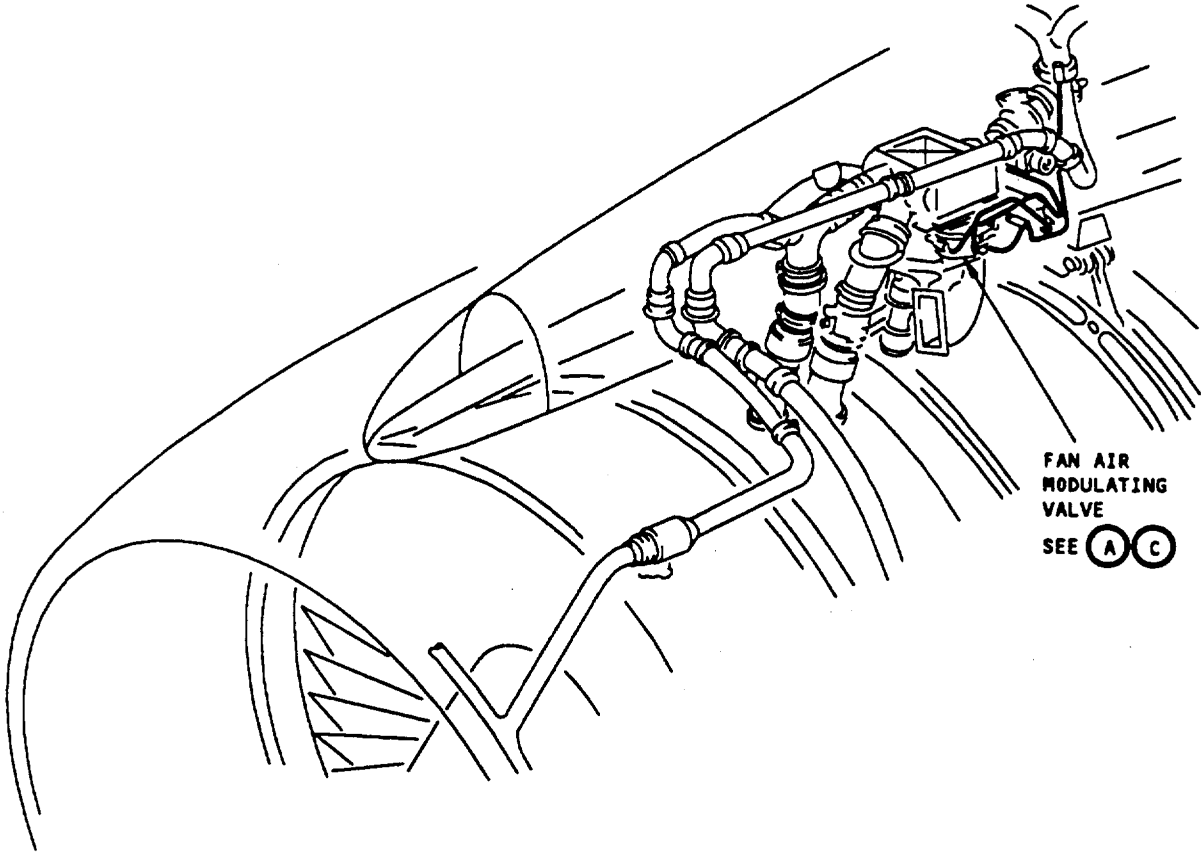
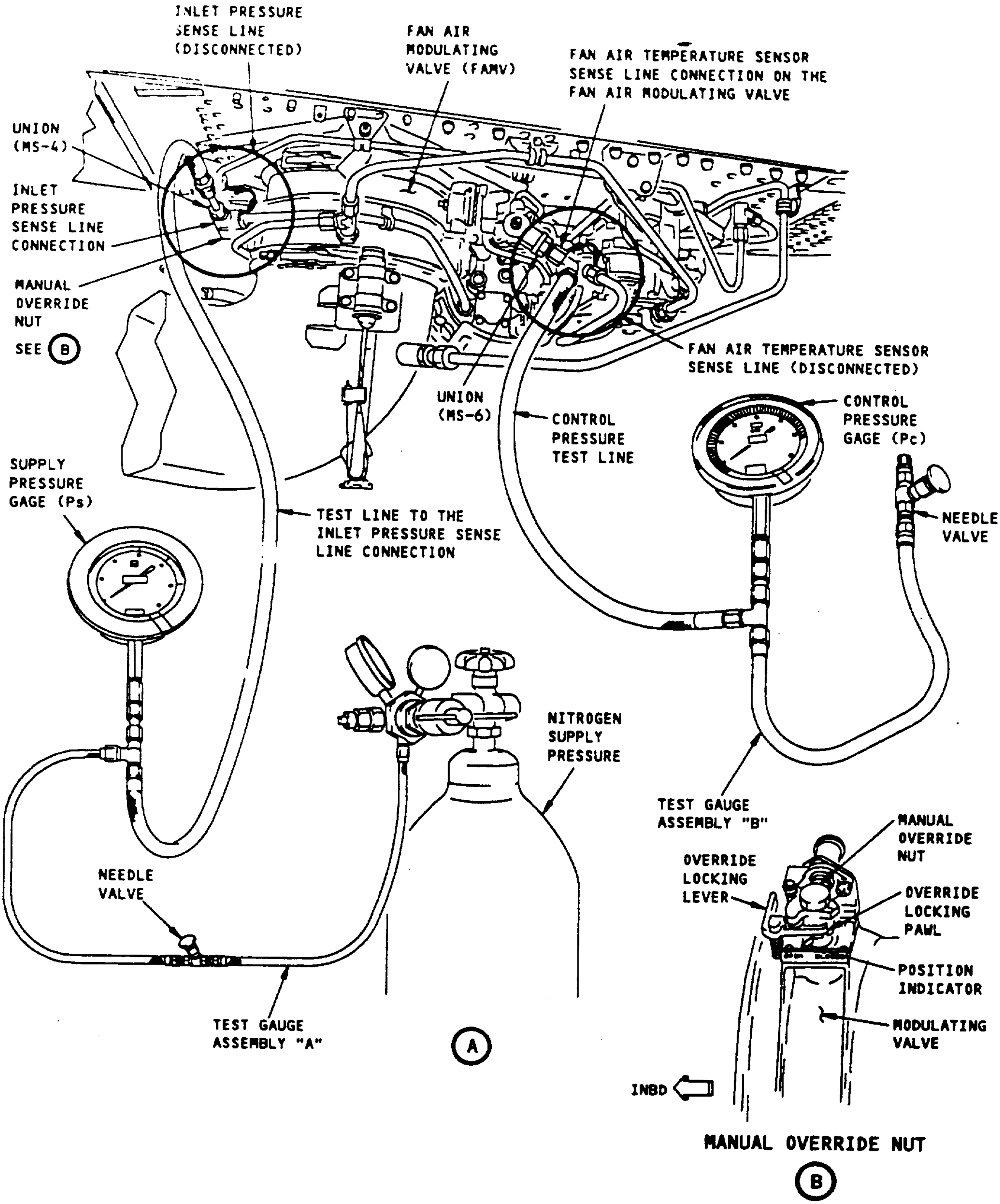


Fan Air Modulating Valve Test
Figure 509 (Sheet 1)



Fan Air Modulating Valve Test
Figure 509 (Sheet 2)

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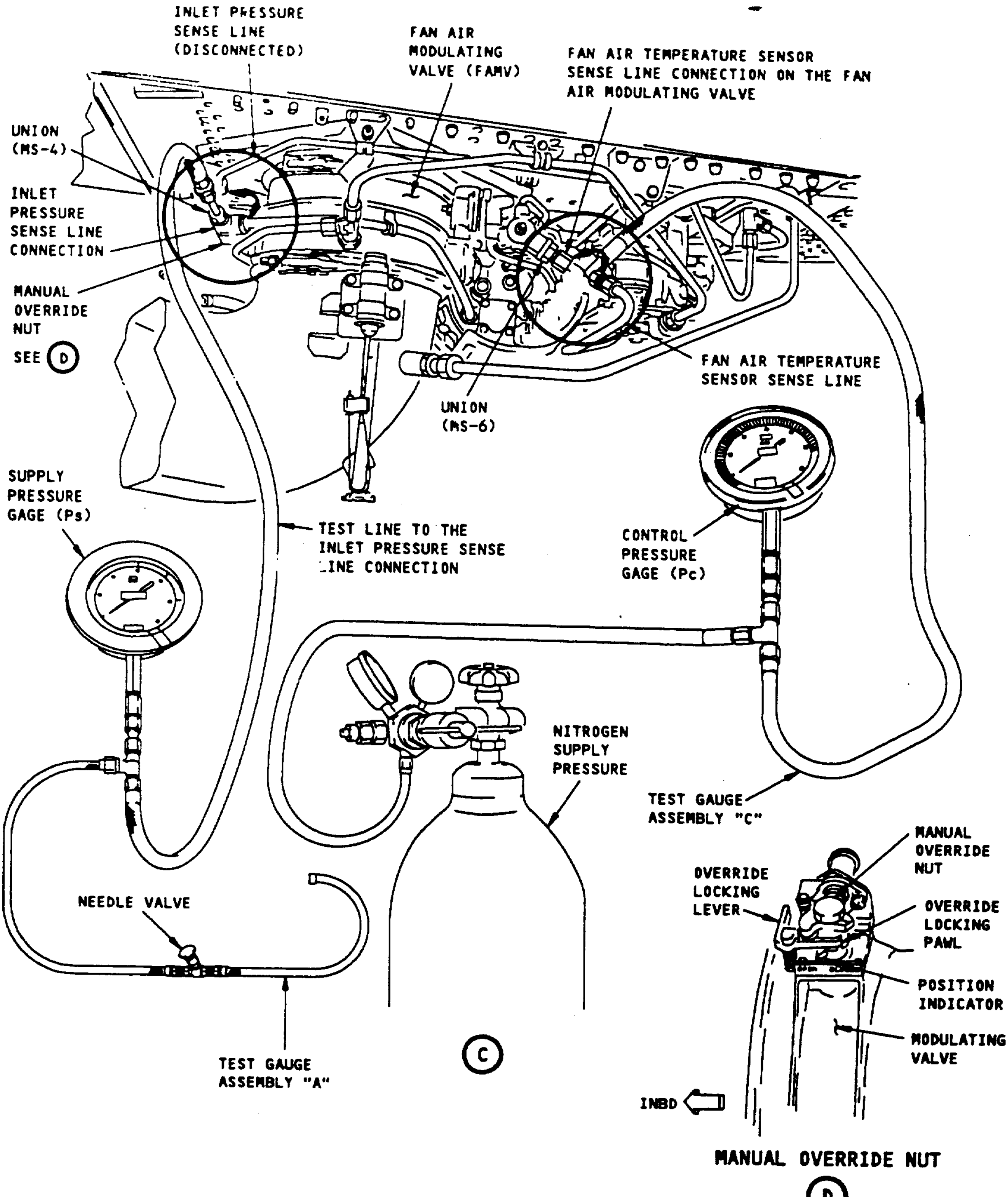


Fan Air Modulating Valve Test
Figure 509 (Sheet 3)

757 MAINTENANCE MANUAL

TEMPORARY REVISION No. 36-509

THIS TEMPORARY REVISION IS ISSUED BY BRITISH AIRWAYS QUALITY AND TECHNICAL SERVICES AND COMPLIES WITH BCAR'S CHAPTER A5-3, B5-3 AND/OR TSS No. 0-2 AS REQUIRED. CAA DESIGN APPROVAL No. DAI/8566/78.

G Litchfield

For CHIEF ENGINEER QUALITY AND TECHNICAL SERVICES.

Manual Reference 36-11-00 Page 501

REASON FOR REVISION

To include pneumatic bleed system checks.

ACTION

BAB TASK 36-11-00-705-139
BAB 8. <u>Functional Test of the Pressure Regulating and Shutoff Valve (PRSOV) and</u>
BAB <u>450°F Temperature Sensor</u> (Fig. 510)
BAB A. General
BAB (1) For this test, you will need a nitrogen supply (tyre trolley, low
BAB pressure supply), test set PM82510, aircraft electrical power and
BAB either APU or ground air source.
BAB B. Equipment
BAB (1) Nitrogen supply (tyre trolley low pressure hose)
BAB (2) PM82510 Test set
BAB (3) Ground air cart or APU
BAB (4) MS21902J4 (No. 4 union)
BAB C. References
BAB (1) AMM 06-43-00/201, Engine and Nacelle Strut Access Panel
BAB (2) AMM 24-22-00/201, Electrical Power Control
BAB (3) AMM 54-53-01/401, Strut Pressure Relief and Access Door
BAB D. Access
BAB (1) Location Zones
BAB 119/120 Main Equipment Center
BAB 433/443 Nacelle Strut Mid-structure
BAB (2) Access Panels
BAB 119BL Main Equipment Center Access Panel
BAB 433LR/443LL Pressure Regulating and Shutoff Valve Access
BAB E. Procedure
BAB
BAB S 865-174
BAB (1) Supply electrical power (AMM 24-22-00/201).
BAB
BAB S 015-175
BAB (2) Open the pylon access door for the L(R) PRSOV, (Strut relief door),
BAB and if required the bulkhead coverplate (AMM 54-53-01/401).
BAB
BAB S 425-176
BAB (3) Connect TEST GAUGE ASSEMBLY "A" to the PRSOV (450°F) temperature
BAB sensor connection or temperature sensor line (right engine), use a
BAB No. 4 union (For left engine; View B, Fig. 510) (For right engine;
BAB View E, Fig. 510).
BAB (a) Connect the other end of the TEST GAUGE ASSY "A" to nitrogen
BAB supply.

Originator: J.OSBORNE
Reference: 0331
Workbook: 36-84

(b) Set needle valve to open.

S 865-179

(4) If the APU is used to supply air, open circuit breaker 11Q23 APU BLEED CONT on the P11 panel.
(a) Remove relay K10280 on P37 panel.
1) Install a jumper between pins 6 and 8 of relay base.
(b) Close circuit breaker, 11Q23 APU BLEED CONT.

<u>NOTE</u>: This allows APU ISOLATION VALVE and the PRSOV to be opened together.

S 215-180

(5) Check that the PRSOV is not locked closed and increase the nitrogen supply pressure to 10 psig (indicated on TEST GAUGE ASSY "A").
(a) Check that the PRSOV is open.

S 215-242

(6) If no PRSOV movement is observed in the previous step, the RFCC contacts are probably in the reverse flow position (open).
(a) Open the applicable circuit breaker on the P11 panel:
1) 11Q10 ENG BLEED CONT L
2) 11Q19 ENG BLEED CONT R
(b) Remove L(R) relay, K10199 on P36 panel (K10206 on P37 panel).
(c) Install jumper between pins A1 and A2 on relay base.

<u>NOTE</u>: This supplies 28VDC to the PRSOV solenoid.

(d) Close the applicable circuit breakers on the P11 panel:
1) 11Q10 ENG BLEED CONT L
2) 11Q19 R ENG BLEED CONT
(e) Check that the PRSOV is not locked closed and increase the nitrogen supply pressure to 10 psig (indicated on TEST GAUGE ASSY "A").
1) Check that the PRSOV is open.

S 215-181

(7) Check that both pack selector switches are OFF.

S 865-182

(8) Pressurize the pneumatic system using APU or ground air source (AMM 36-00-00/201).

<u>NOTE</u>: If right PRSOV is to be tested, and APU air is used, it will be necessary to open the manifold isolation valve. Check that the duct pressure on EICAS or P5 panel is at a minimum of 30 psig.

S 725-183

(9) Slowly increase the nitrogen pressure until the PRSOV is fully open.

S 725-184

(10) Close needle valve and turn off nitrogen supply.

S 725-185

(11) Check that pressure on TEST GAUGE "A" is 21-27 psig.

S 215-186

(12) Check these items for significant leakage:

(a) Pneumatic ducting

(b) Precooler

(c) Sense lines

NOTE: Sense line leakage could bring about a low pressure indication.

(d) PRSOV

NOTE: Ignore fixed bleeds from the PRSOV regulator block which are normal. And on RB211-535C engined aircraft, it should noted that air will normally come out from the intake P1 probe.

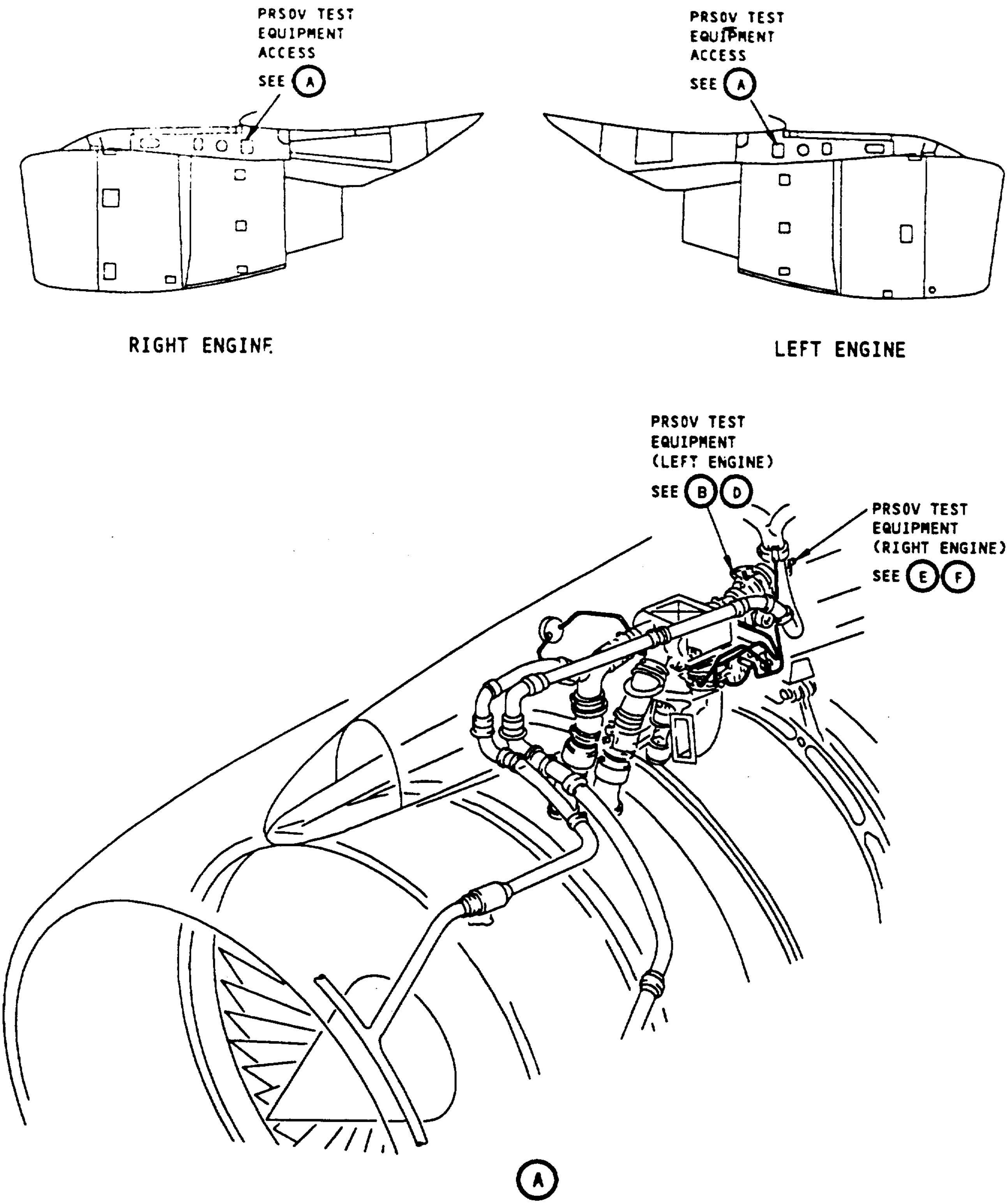
S 725-187

(13) Slowly open the TEST GAUGE "A" needle valve to simulate operation of the 450°F temperature sensor.

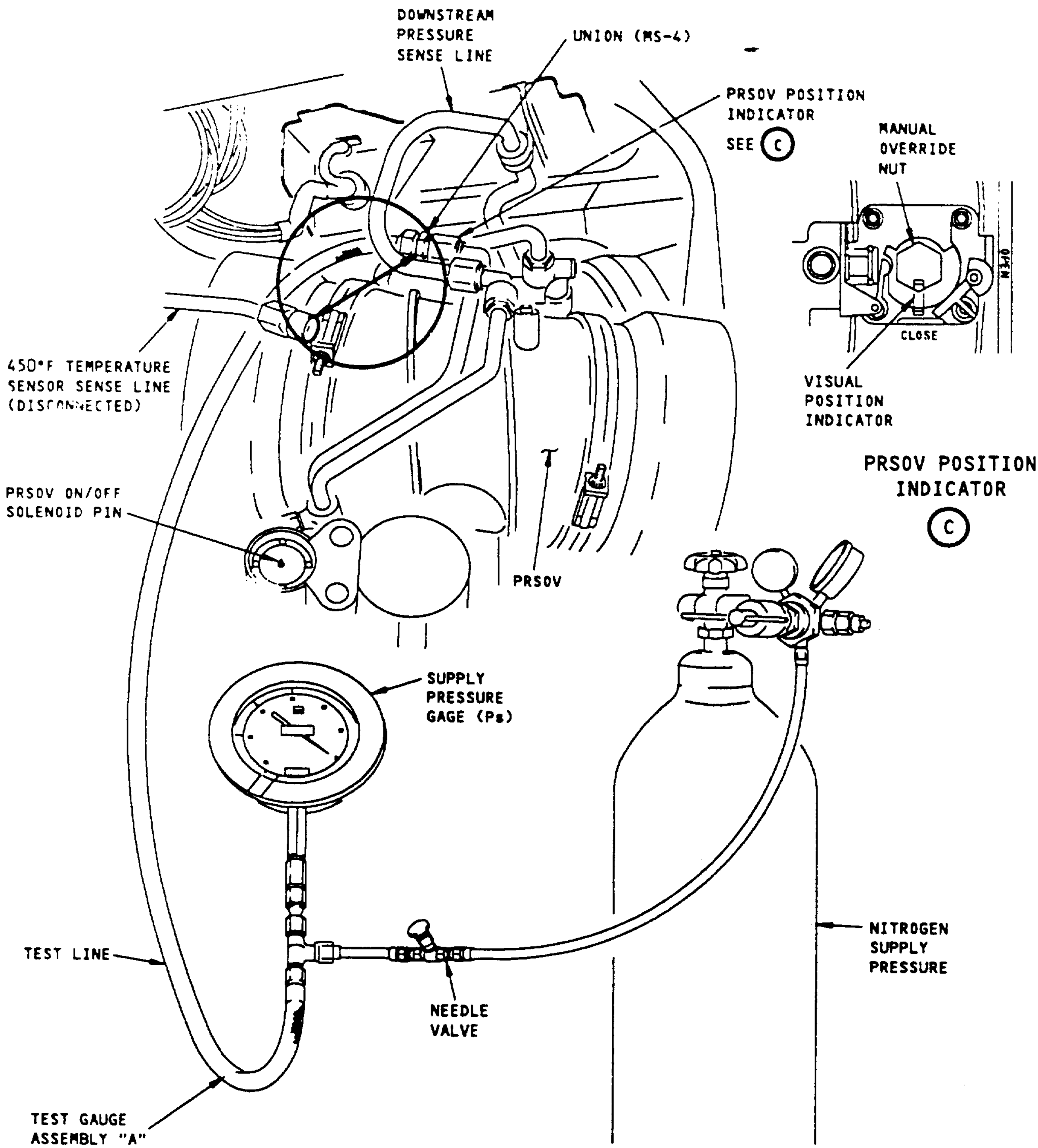
(a) Check that the PRSOV is fully closed within the GAUGE "A" limits shown below:

DUCT PRESSURE (PSI)	GAUGE "A" PRESSURE (PSI)
30	12 - 18
35	14 - 20
40	16 - 22

BAB
BAB S 865-188
BAB (14) Remove the pressure from the pneumatic system (AMM 36-00-00/201).
BAB
BAB S 725-236
BAB (15) Do the steps that follow to check the 450°F temperature sensor:
BAB
BAB S 725-189
BAB (a) For left engine, transfer TEST GAUGE ASSEMBLY "A" to the 450°F
BAB temperature sensor line at the PRSOV location, use a No. 4
BAB union (View D, Fig. 510).
BAB (b) For right engine, transfer TEST GAUGE ASSY "A" to the 450°F
BAB temperature sensor (View F, Fig. 510), use a No. 4 size union.
BAB
BAB S 725-190
BAB (16) Increase nitrogen supply to 35 psig and check the 450°F temperature
BAB sensor sense line for leakage.
BAB
BAB S 865-191
BAB (17) Close the needle valve.
BAB
BAB S 215-192
BAB (18) Check that the decay time on TEST GAUGE "A" pressure drop from
BAB 30 to 10 psig is not less than 25 seconds for the left engine, and
BAB not less than 20 seconds for the right engine.
BAB (a) If decay time is less, replace 450°F Temperature Sensor (AMM
BAB 36-11-13/401).
BAB F. Put the Airplane Back to Its Usual Condition
BAB
BAB S 865-193
BAB (1) Turn off nitrogen supply.
BAB
BAB S 035-225
BAB (2) Remove TEST GAUGE ASSEMBLY "A".
BAB
BAB S 435-226
BAB (3) Connect sense lines that were disconnected for this test.
BAB
BAB NOTE: The use of anti-seize compound EASE OFF 990 or similar
BAB will prevent pipe fittings from picking up or galling.
BAB
BAB
BAB S 025-194
BAB (4) Remove jumpers that were fitted for test unless needed for other
BAB test.



PRSOV Test Equipment
Figure 510 (Sheet 1)

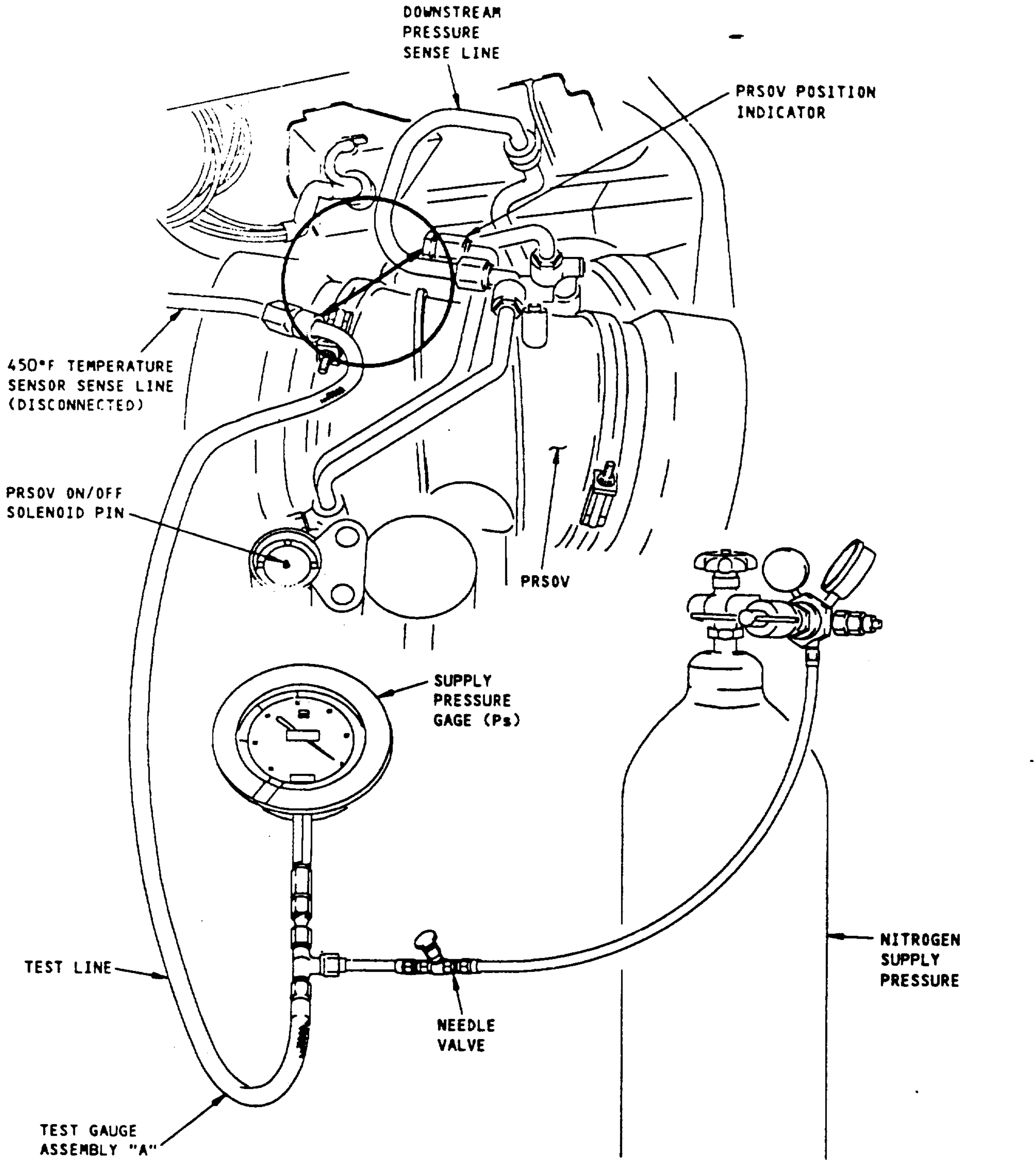


PRSOV POSITION INDICATOR
C

PRSOV TEST EQUIPMENT
(LEFT ENGINE)
B

PRSOV Test Equipment
Figure 510 (Sheet 2)

BAB



PRSOV TEST EQUIPMENT
(LEFT ENGINE)
D

PRSOV Test Equipment
Figure 510 (Sheet 3)

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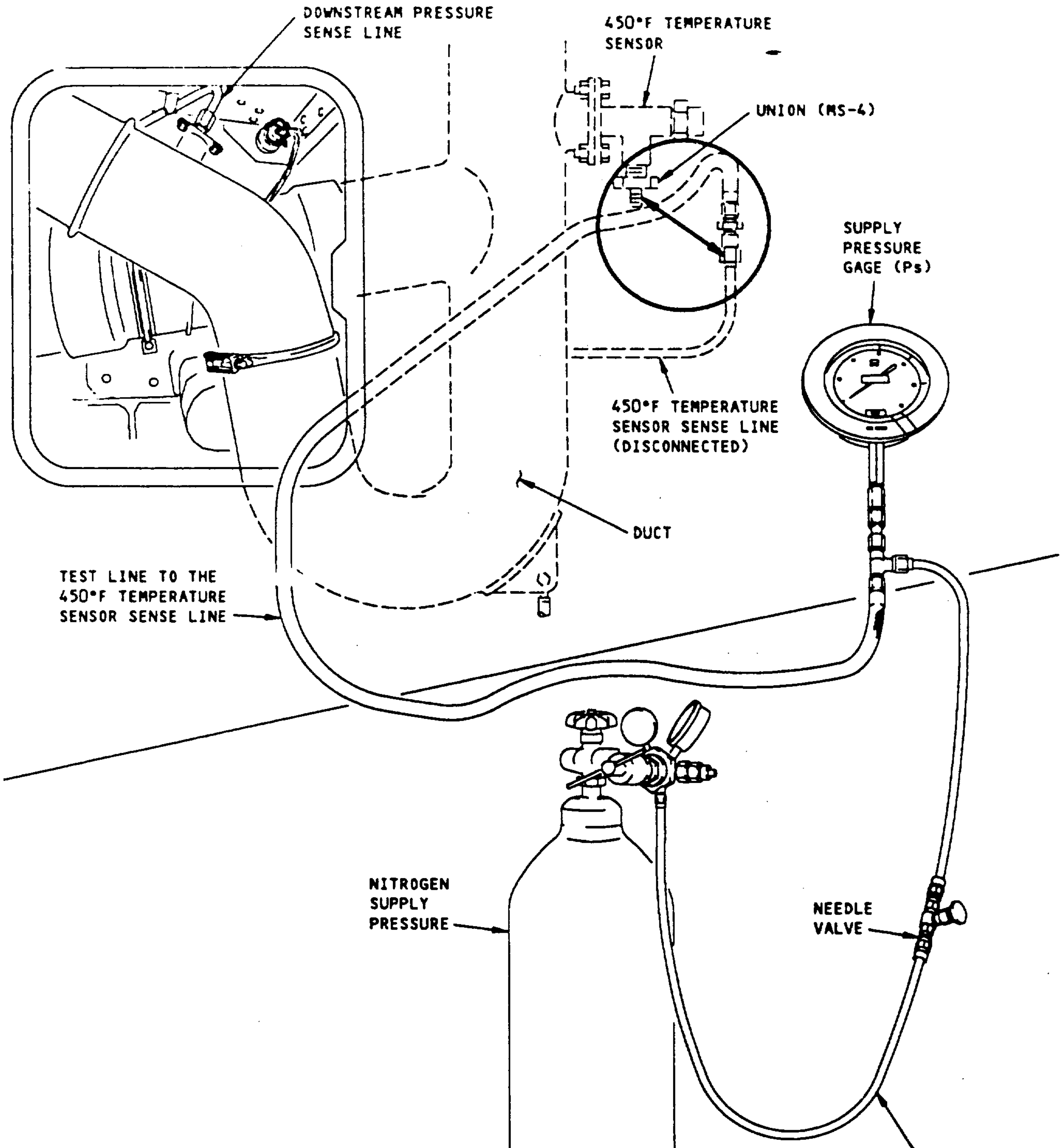

PRSOV TEST EQUIPMENT
(RIGHT ENGINE)

E

PRSOV Test Equipment
Figure 510 (Sheet 4)

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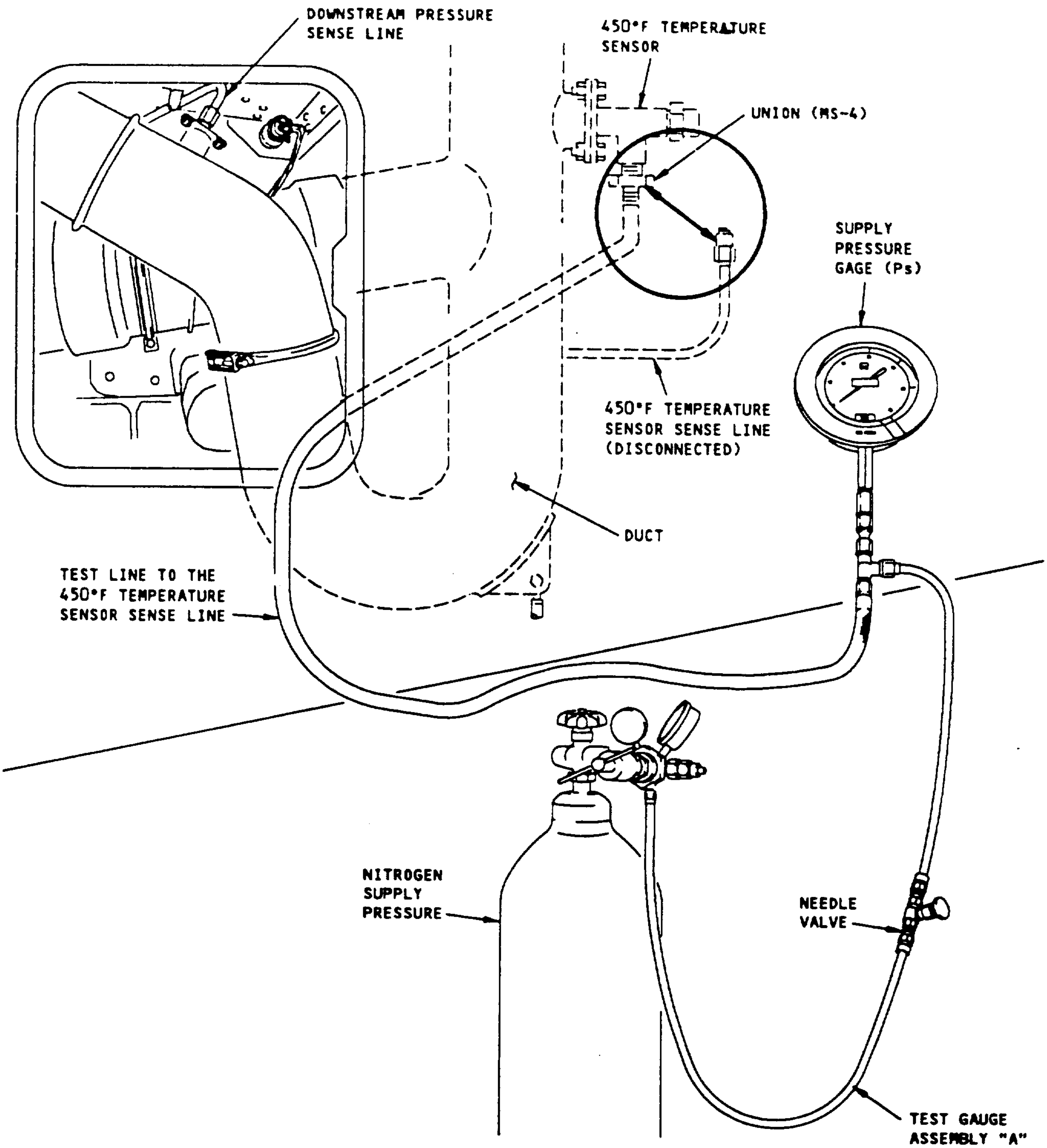

PRSOV TEST EQUIPMENT
(RIGHT ENGINE)
F

PRSOV Test Equipment
Figure 510 (Sheet 5)

757 MAINTENANCE MANUAL

TEMPORARY REVISION No. 36-510

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G Litchfield For CHIEF ENGINEER QUALITY AND TECHNICAL SERVICES.

Manual Reference 36-11-00 Page 501

REASON FOR REVISION

To include pneumatic bleed system checks.

ACTION

BAB TASK 36-11-00-705-140

BAB 9. <u>Functional Test of the High Stage Pilot and High Pressure Shutoff Valve</u> (Fig. 511)

BAB A. General

BAB (1) For this test you will need a nitrogen supply (tyre trolley low pressure supply), Test Set PM82510, the engine C ducts open and aircraft electrical power.

BAB B. Equipment

BAB (1) Nitrogen Supply (tyre trolley low pressure hose)
BAB (2) Test Set PM82510
BAB (3) MS21902J5 (No. 5 union)
BAB (4) MS21902J6 (No. 6 union)

BAB C. References

BAB (1) AMM 36-11-07/401, High Pressure Shutoff Valve
BAB (2) AMM 36-11-08/401, High Stage Pilot

BAB D. Access

BAB (1) Location Zones

119/120	Main Equipment Center
411/421	Engine

BAB (2) Access Panels

119BL	Main Equipment Center Access Panel
413/414/423/424	Fan Cowl Panel
415/416/425/426	Fan Reverser

BAB E. Procedure

BAB S 725-195

BAB (1) Connect the TEST GAUGE ASSEMBLY "C" to the nitrogen supply and to the engine high pressure inlet line on the right hand side of the engine, use a No. 6 union (View A, Fig. 511).

BAB S 725-196

BAB (2) Disconnect the HS PILOT control pressure line at the HPSOV and insert TEST GAUGE ASSEMBLY "D", use a No. 5 union (View C, Fig. 511).

BAB <u>NOTE</u>: This will facilitate montoring of the the control pressure output from the HS PILOT to the HPSOV.

BAB S 215-200

BAB (3) Check that the HPSOV is not locked closed.

BAB S 725-201

BAB (4) Turn the nitrogen supply on, and do the steps that follow:

BAB (a) Watch the HPSOV visual indicator with the use of a mirror and torch, the visual indicator pin is beneath the manual lock out.

Originator: J.OSBORNE
Reference: 0331
Workbook: 36-84

(b) The visual indicator should move before TEST GAUGE ASSEMBLY "C" indicates 5 psig and be in the full open position before 7 psig.

<u>NOTE</u>: Try this a few times and make sure that the valve moves without "sticking" or "jamming".

S 215-237

(5) If no HPSOV movement was observed in the previous step, the RFCC contacts are probably in the reverse flow position (open), do the steps that follow:
  (a) Open the applicable circuit breakers on the P11 panel:
    1) 11Q10 ENG BLEED CONT L
    2) 11Q19 R ENG BLEED CONT
  (b) Remove L(R) relay, K10199 on P36 panel (K10206 on P37 panel).
  (c) Install a jumper between pins A1 and A2.

  <u>NOTE</u>: This supplies a 28 VDC supply to HS pilot solenoid.

  (d) Close the applicable circuit breaker on the P11 panel:
    1) 11Q10 ENG BLEED CONT L
    2) 11Q19 R ENG BLEED CONT
  (e) Repeat the procedure in step 4 again after you have reset the circuit breakers.

S 725-202

(6) Increase the nitrogen supply to 60-70 psig on TEST GAUGE ASSEMBLY "C".

S 215-203

(7) Check the control pressure reading on TEST GAUGE ASSEMBLY "D" is 31-41 psig, which indicates that HS PILOT and HPSOV are serviceable.
  (a) Check the sense lines for leaks.

  <u>NOTE</u>: You will hear/feel air coming from the control orifices on the HS PILOT and HPSOV, this is normal feature.

  (b) If the control pressure is low, the fault could either be the HPSOV or the HS PILOT.

S 725-206

(8) To establish which is defective, install a blank, MS21913-5 or equivalent on the TEST GAUGE ASSEMBLY "D" and repeat step 6-7 (View D, Fig. 511).

(a) If the control pressure is now satisfactory, replace the HPSOV for leakage (AMM 36-11-07/401).

(b) If the control pressure is still low, replace the HS PILOT (AMM 36-11-08/401).

(c) Remove the blank, MS21913-5.

S 725-207

(9) To check the HS PILOT low altitude crossover pressure, increase the nitrogen supply pressure to TEST GAUGE ASSEMBLY "C" until GAUGE "D" pressure drops below 4 psig. GAUGE "C" reading should be as shown in TABLE 501.

S 725-241

(10) Slowly reduce the nitrogen supply pressure and note the pressure on GAUGE "C" at which the GAUGE "D" returns to 31-41 psig.

S 725-209

(11) Record the difference between the two recorded GAUGE "C" pressures, and check that it complies with TABLE 501.

RB211-535 ENGINE TYPE	GAUGE "D" PRESSURE CHANGES TO	GAUGE "C" CHANGE OVER PRESSURE	MINIMUM DIFFERENCE GAUGE "C" READINGS
C	Below 4 psi 31-41 psig	89-99 psig 80 psig min.	3 psi
E4	Below 4 psig 31-41 psig	102-112 Psig 95 psig min.	3 psi

TABLE 501: LOW ALTITUDE CROSSOVER PRESSURE LIMITS

S 725-210

(12) Reduce supply pressure to zero.

S 725-211

(13) To check the HS PILOT high altitude crossover pressure, open the applicable circuit breaker on the P11 panel:

(a) 11Q18 HI STAGE SW OVER L

(b) 11Q27 HI STAGE SW OVER R

S 025-212

(14) Remove connector from the 31,000 ft altitude switch, S10228 (left side) or S10229 (right side) in the right air conditioning bay (View B, Fig. 511).
  (a) Install jumper between pins 2 and 3 of the connector.
  (b) Close the applicable circuit breaker, 11Q18 or 11Q27.

S 725-224

(15) Increase the nitrogen supply pressure to TEST GAUGE ASSEMBLY "C" until GAUGE "D" pressure drops below 4 psig. GAUGE "C" reading should be as shown in TABLE 502.

S 725-214

(16) Slowly reduce the nitrogen supply pressure and note the pressure on GAUGE "C" at which the GAUGE "D" returns to 31-41 psig.

S 725-215

(17) Record the difference between the two recorded GAUGE "C" pressures, and check that it complies with TABLE 502.

RB211-535 ENGINE TYPE	GAUGE "D" PRESSURE CHANGES TO	GAUGE "C" CHANGE OVER PRESSURE	MINIMUM DIFFERENCE GAUGE "C" READINGS
C	Below 4 psig 31-41 psig	77-81 psig 70 psig min.	6 psi
E4	Below 4 psig 31-41 psig	96 psig max. 85-89 psig	6 psi

TABLE 502: HIGH ALTITUDE CROSSOVER PRESSURE LIMITS

S 725-216

(18) Reduce supply pressure to zero.

S 435-217

(19) After the checks are completed, remove jumper and reconnect the altitude switch connector(s).

S 725-218

(20) To test the HS PILOT overpressure setting, move TEST GAUGE ASSEMBLY "C" to the downstream pressure sense connection on the HS PILOT after you first remove the downstream sense line, use a No. 6 union, (View E, Fig. 511).

<u>NOTE</u>: It may be necessary to disconnect the opposite end of the sense line to allow the pipe to be swung out of the way.

S 725-219

(21) Increase the nitrogen supply pressure and note the GAUGE "C" pressure when the HS PILOT red overpressure reset button pops out. This should be between 120-140 psig. Check that the HI STAGE light (P5 panel) is on.

(a) If the button has not extended within these limits, replace the HS PILOT (AMM 36-11-08/401).

(b) If the light fails to come on or illuminates intermittently without the button being extended, examine the affected electrical circuit.

<u>NOTE</u>: In the past, bent pins in the HS PILOT electrical connector have been the cause of spurious warnings.

S 865-222

(22) Reduce the nitrogen pressure source to zero.

F. Put the Airplane Back to Its Usual Condition

S 435-227

(1) Connect sense lines that were disconnected for this test.

<u>NOTE</u>: The use of anti-seize compound EASE OFF 990 or similar will prevent pipe fittings from picking up or galling.

S 035-223

(2) Remove the jumper installed previously unless required for other tests.

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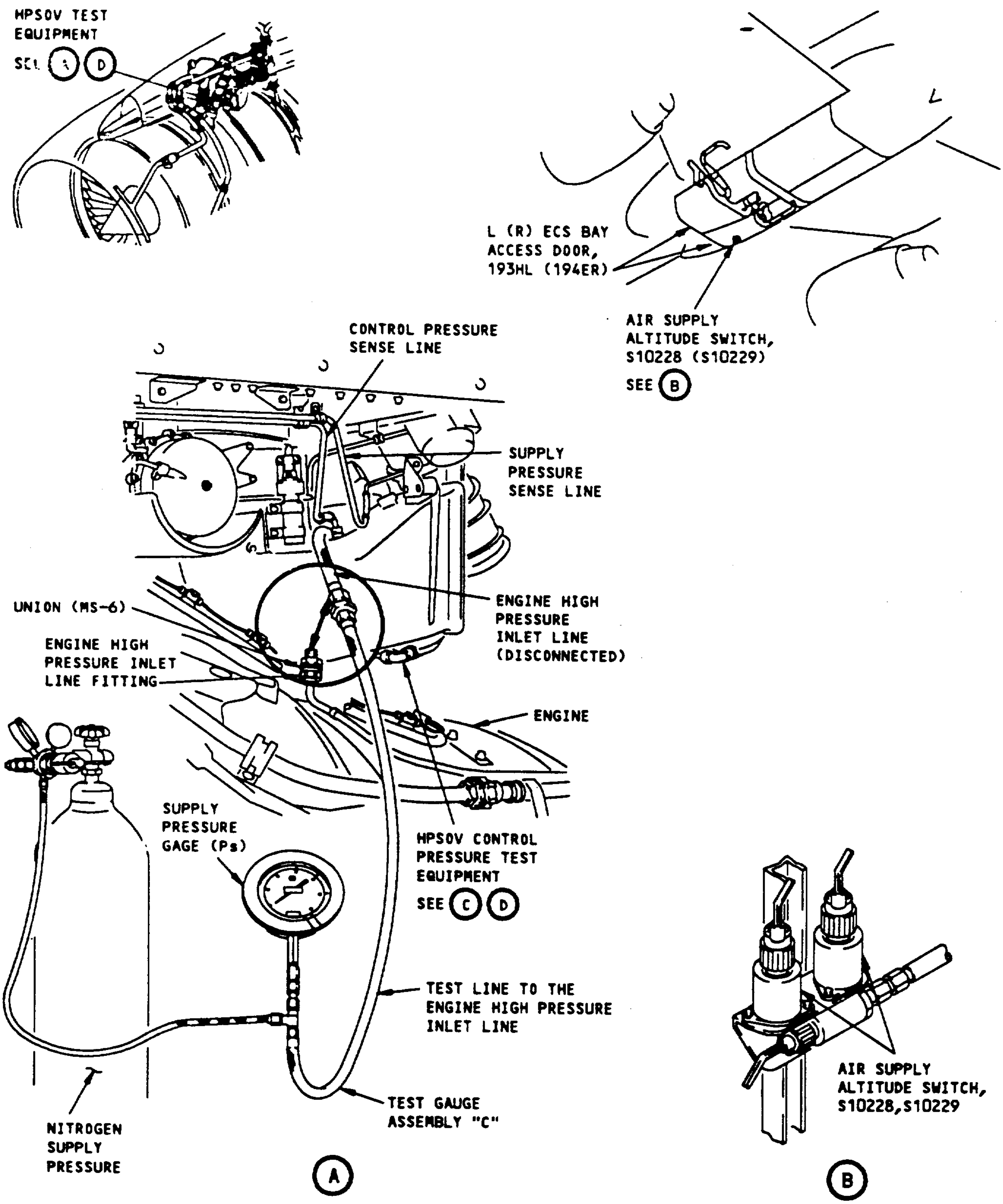

HPSOV Test Equipment
Figure 511 (Sheet 1)

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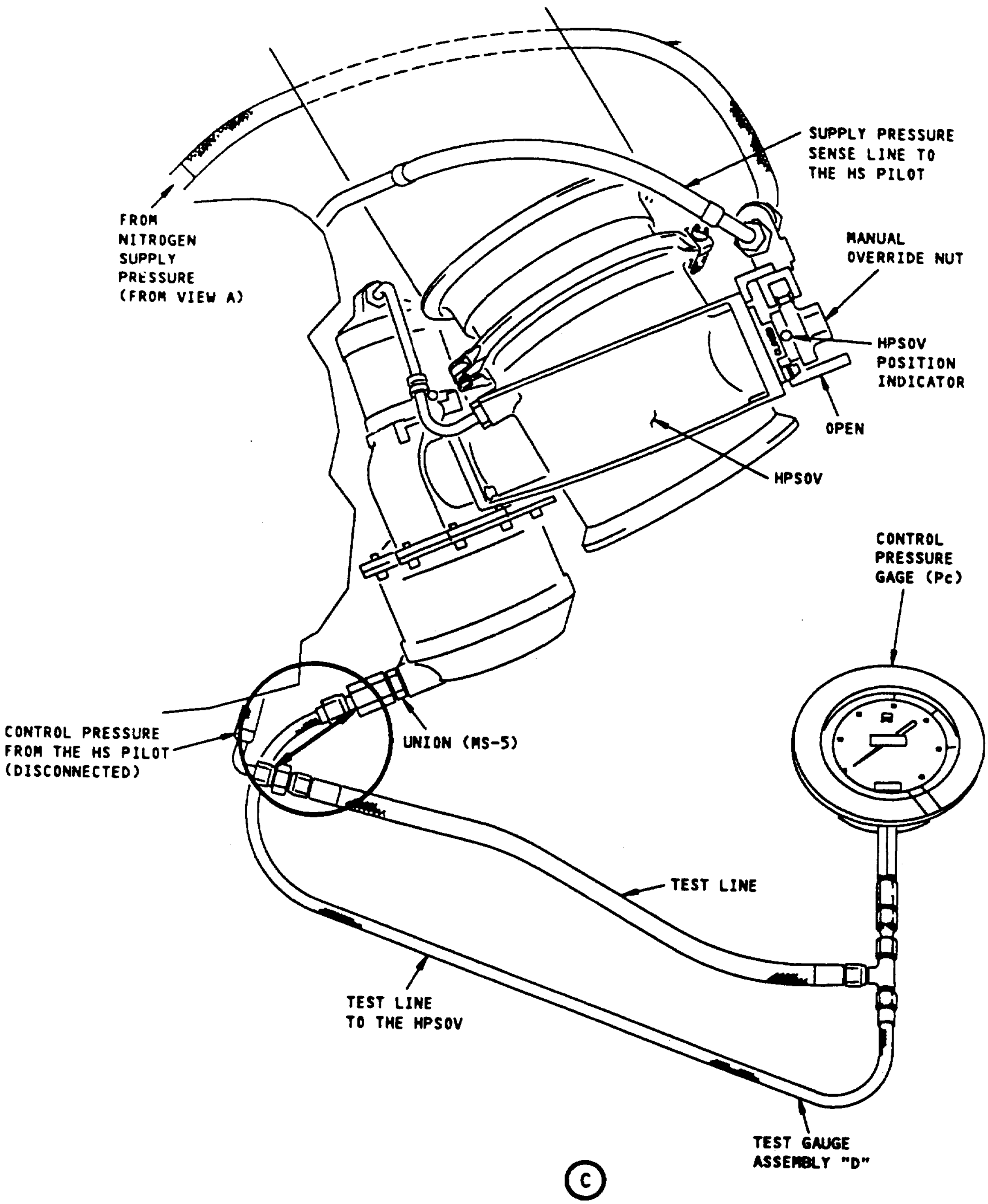

HPSOV Test Equipment
Figure 511 (Sheet 2)

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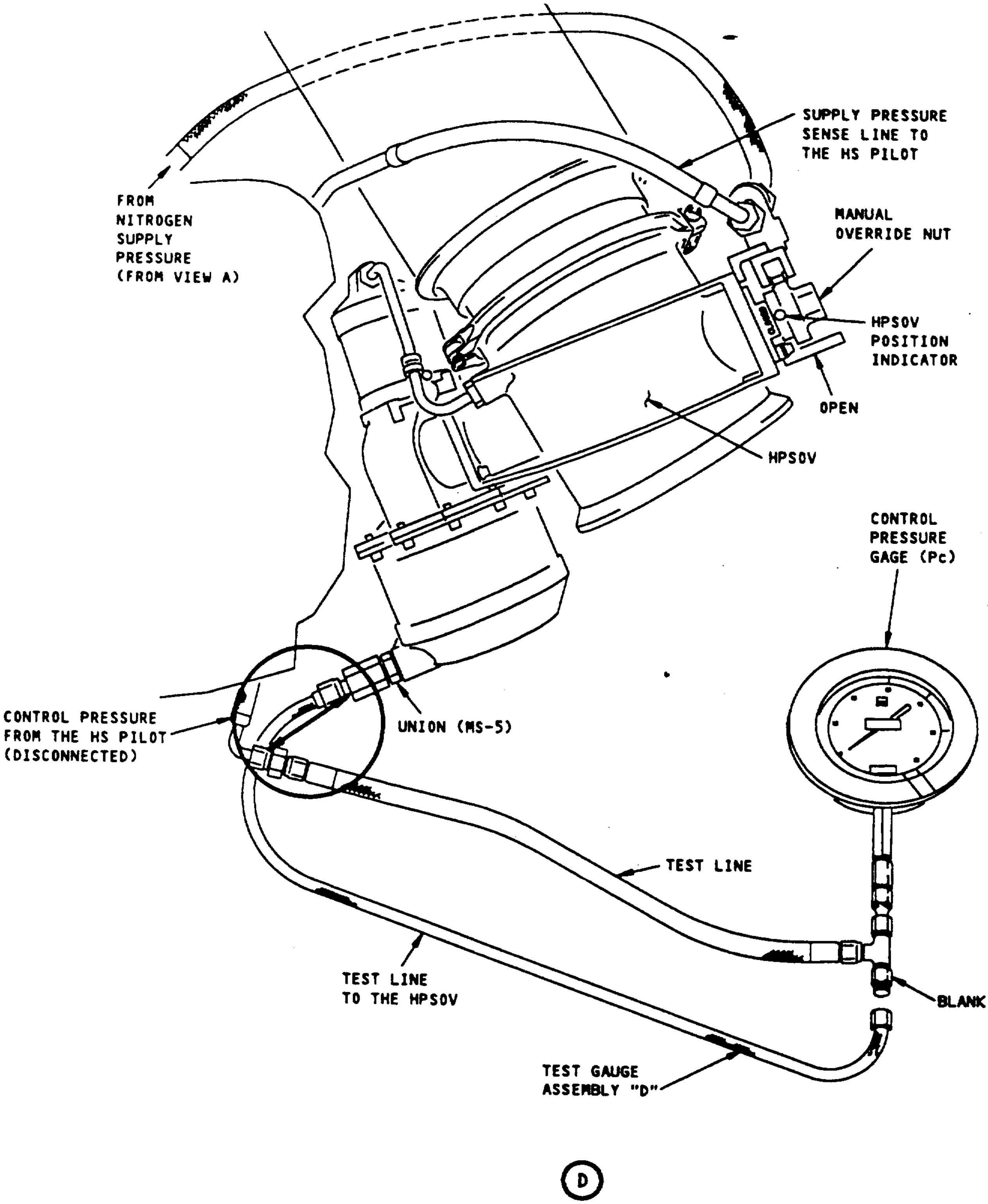

HPSOV Test Equipment
Figure 511 (Sheet 3)

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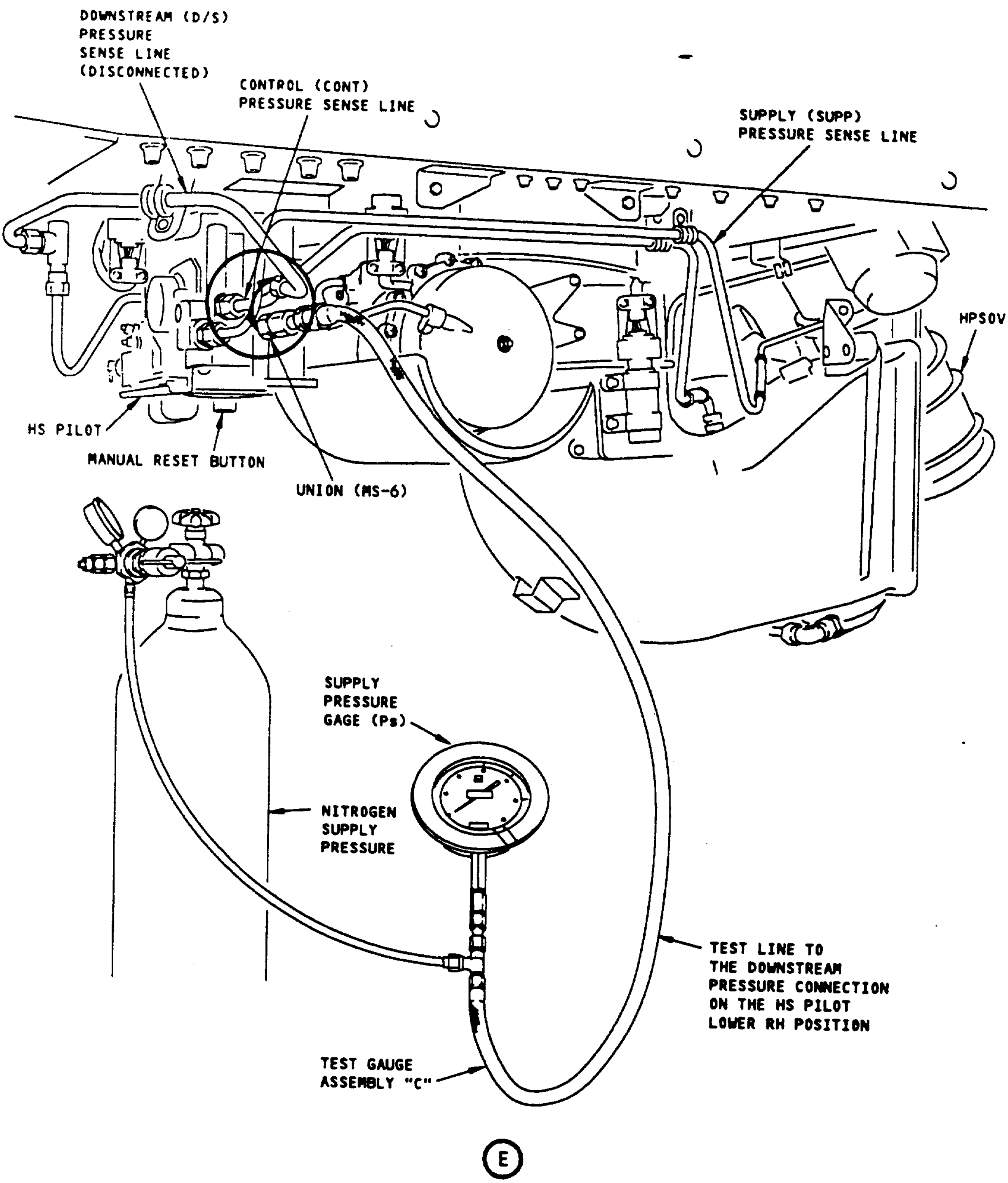

HPSOV Test Equipment
Figure 511 (Sheet 4)

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402	MAR 20/93	10						
403	DEC 20/93	01						
404	SEP 20/90	03						
405	JUN 20/97	01						
406	BLANK							
36-21-02								
401	SEP 20/90	03						
402	SEP 20/90	01						
403	SEP 20/96	03						
404	DEC 20/93	01						
36-22-00								
501	MAY 28/00	01						
502	MAR 20/93	03						
503	DEC 20/93	01						
504	BLANK							
36-22-01								
401	SEP 20/95	01						
402	MAR 20/94	05						
403	SEP 28/02	01						
404	MAR 20/96	01						
36-22-02								
401	MAY 28/01	01						
402	MAR 15/83	01						
403	DEC 20/93	01						
404	DEC 20/93	01						

CHAPTER 36 - PNEUMATIC

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[*] RR RB211-535 ENGINES

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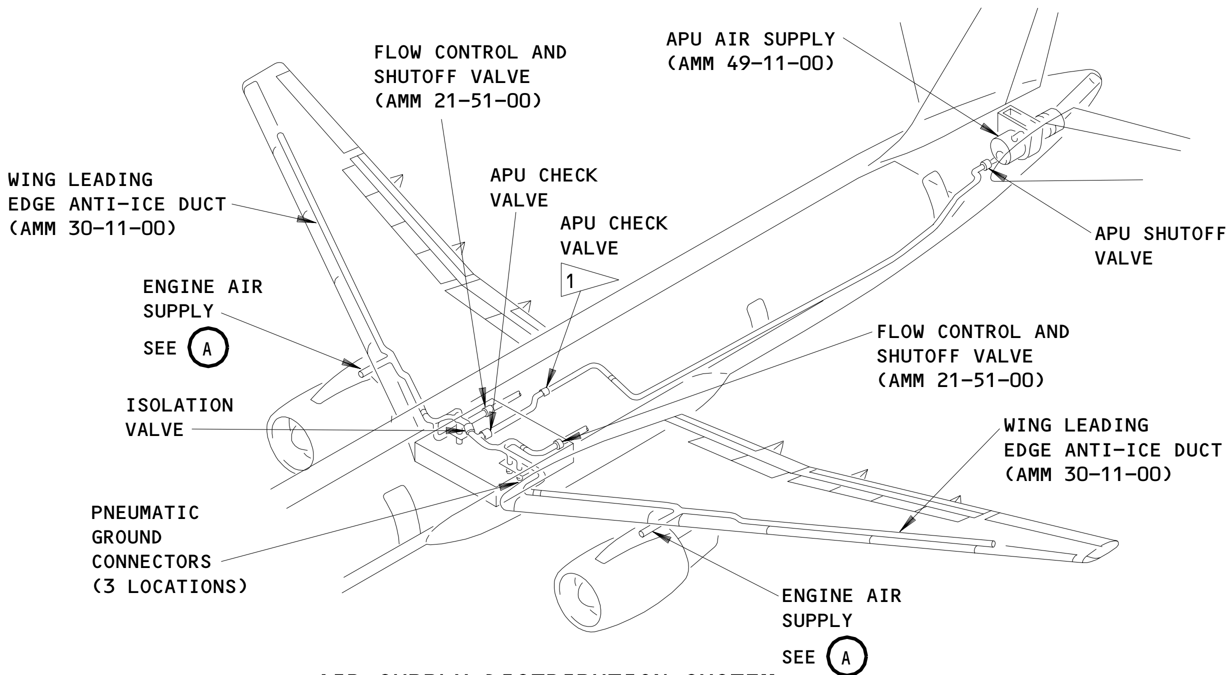
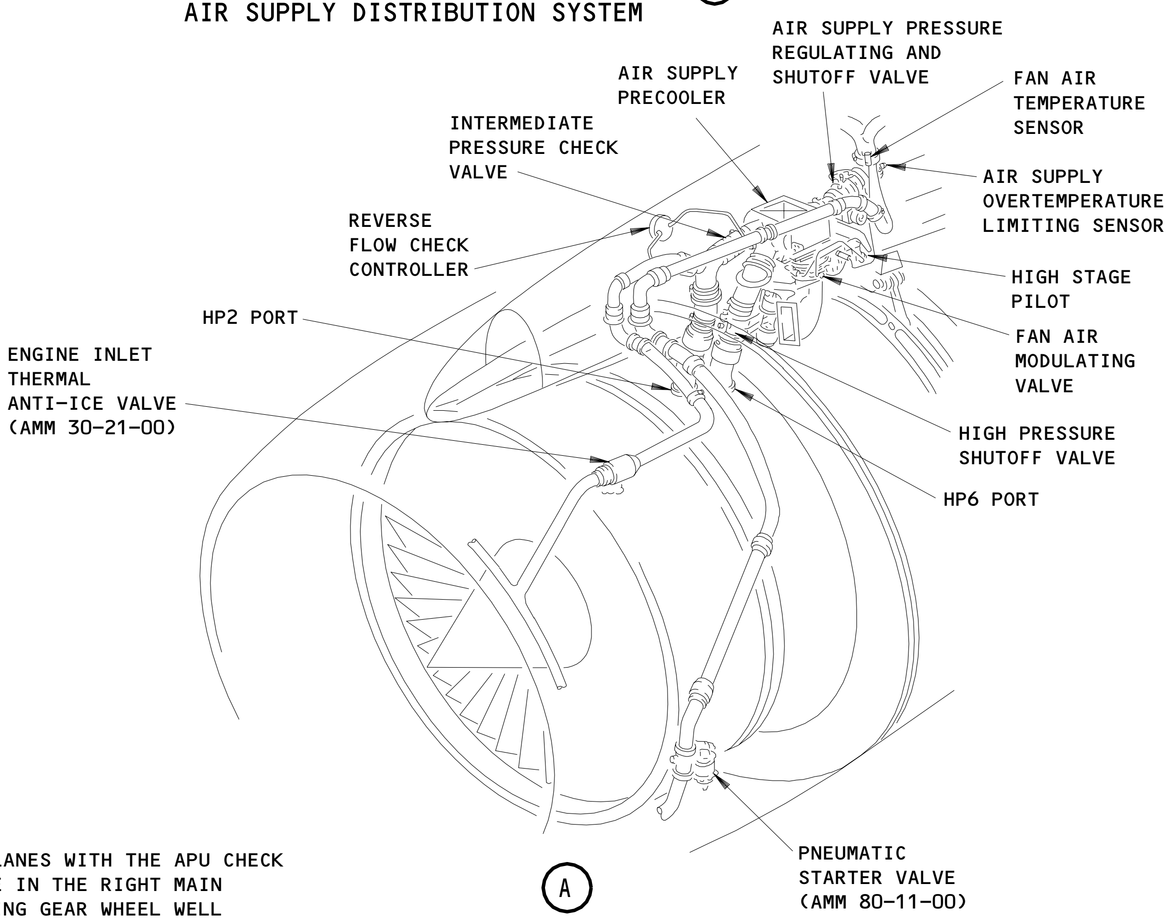
PNEUMATIC-GENERAL - DESCRIPTION/OPERATION

1. General (Fig. 1)
   A. The pneumatic or air supply system supplies pressure and temperature regulated air to various systems. The supplied air is used as a working fluid, system power source or for system pressurization.
   B. The pneumatic system supplies air for these systems: aircraft pressurization, air conditioning , wing leading edge and engine cowl thermal anti-icing, engine starting, hydraulic reservoir pressurization, total air temperature (TAT) probe ambient air induction, rain repellent system pressurization and potable water tank pressurization.
   C. The pnuematic system consists of the Air Supply Distribution System (AMM 36-10-00/001) and the Air Supply Indication System (AMM 36-20-00/001).
   D. Air Supply Distribution System
      (1) Distribution Ducting
         (a) The pneumatic or air supply system is primarily an air distribution system, channeling air through ducts from one of several air sources to user systems. Pneumatic air is channeled through ducts to the hydraulic reservoir and potable water system, the total air temperature (TAT) probe, the air conditioning packs, wing thermal anti-ice ducts, and engine starter.
      (2) Engine Air Supply
         (a) The airplane engines provide the main source of pneumatic air. This air source is normally used whenever the engines are running. Air is supplied from two ports located at the engine compressor section. Through these ports a small amount of high pressure air is bled from the engines. The pneumatic system regulates the pressure and temperature of the air and channels it to the user systems.
      (3) APU Air Supply
         (a) The auxiliary power unit (APU) can be used to provide system air when the airplane is on the ground. The APU also provides inflight bleed air backup in case of engine failure or an engine pneumatic air system malfunction.
      (4) Ground Air Supply
         (a) As an alternate to the APU, a pneumatic ground cart can supply air to the airplane whenever it is parked. Connection between the ground cart and the pneumatic system is through three ground air connectors.
   E. Air Supply Indicating System
      (1) Air Supply Pressure Indication
         (a) Pneumatic system duct pressure is read by duct pressure transducers located on the body crossover duct. The pressure is displayed by the Engine Indicating and Crew Alerting System (EICAS) (Ref 31-41-00) and on a dual duct pressure indicator (Ref 36-20-00).



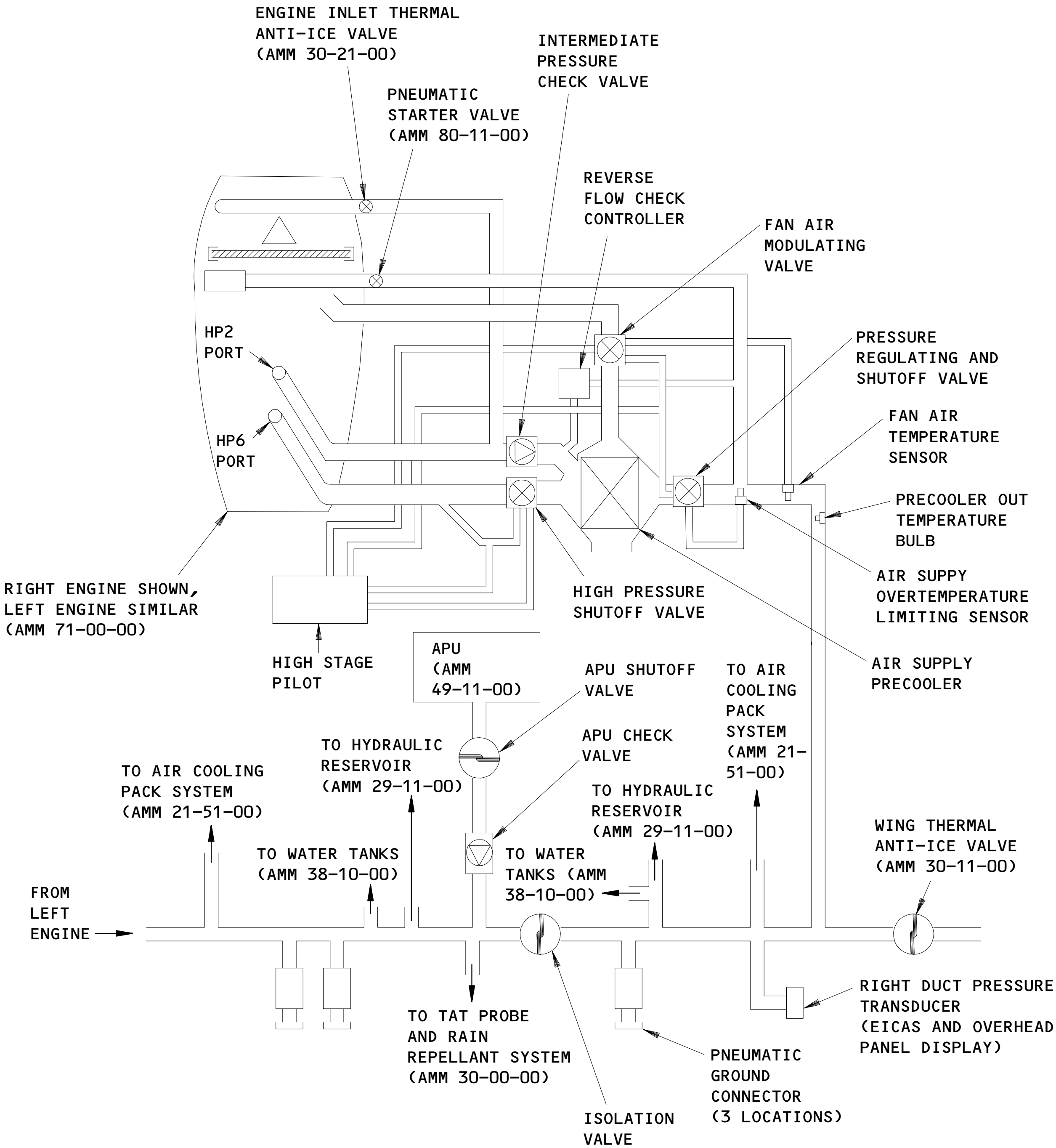
AIR SUPPLY DISTRIBUTION SYSTEM



1 AIRPLANES WITH THE APU CHECK VALVE IN THE RIGHT MAIN LANDING GEAR WHEEL WELL

A

Air Supply System (Pneumatic) - General
Figure 1



Air Supply Distribution Schematic
Figure 2

(2) Air Supply Temperature Indication
    (a) Bleed air temperature is sensed by the precooler out temperature bulb (Ref 36-20-00) and displayed by the Engine Indicating and Crew Alerting System (EICAS) (Ref 31-41-00).

PNEUMATIC-GENERAL - MAINTENANCE PRACTICES (PROVIDE/REMOVE PNEUMATIC POWER)

1. General
   A. This section covers the standard procedure for removing and providing pneumatic power using a ground air source, operating the auxiliary power unit (APU), or operating an engine.
   B. Pressurization of the pneumatic system is required to operate any air-driven system.

TASK 36-00-00-862-001

2. Provide Pneumatic Power Using Ground Air Source (Fig. 201)
   A. Equipment
      (1) Pneumatic sources capable of delivering clean air at the required pressure and flow values, with a connection to mate with a 3-inch diameter check valve on the airplane ground pneumatic service connector.
   B. References
      (1) AMM 06-41-00/201, Section 44 Access Doors and Panels
      (2) AMM 24-22-00/201, Electrical Power Control
   C. Provide pneumatic power.

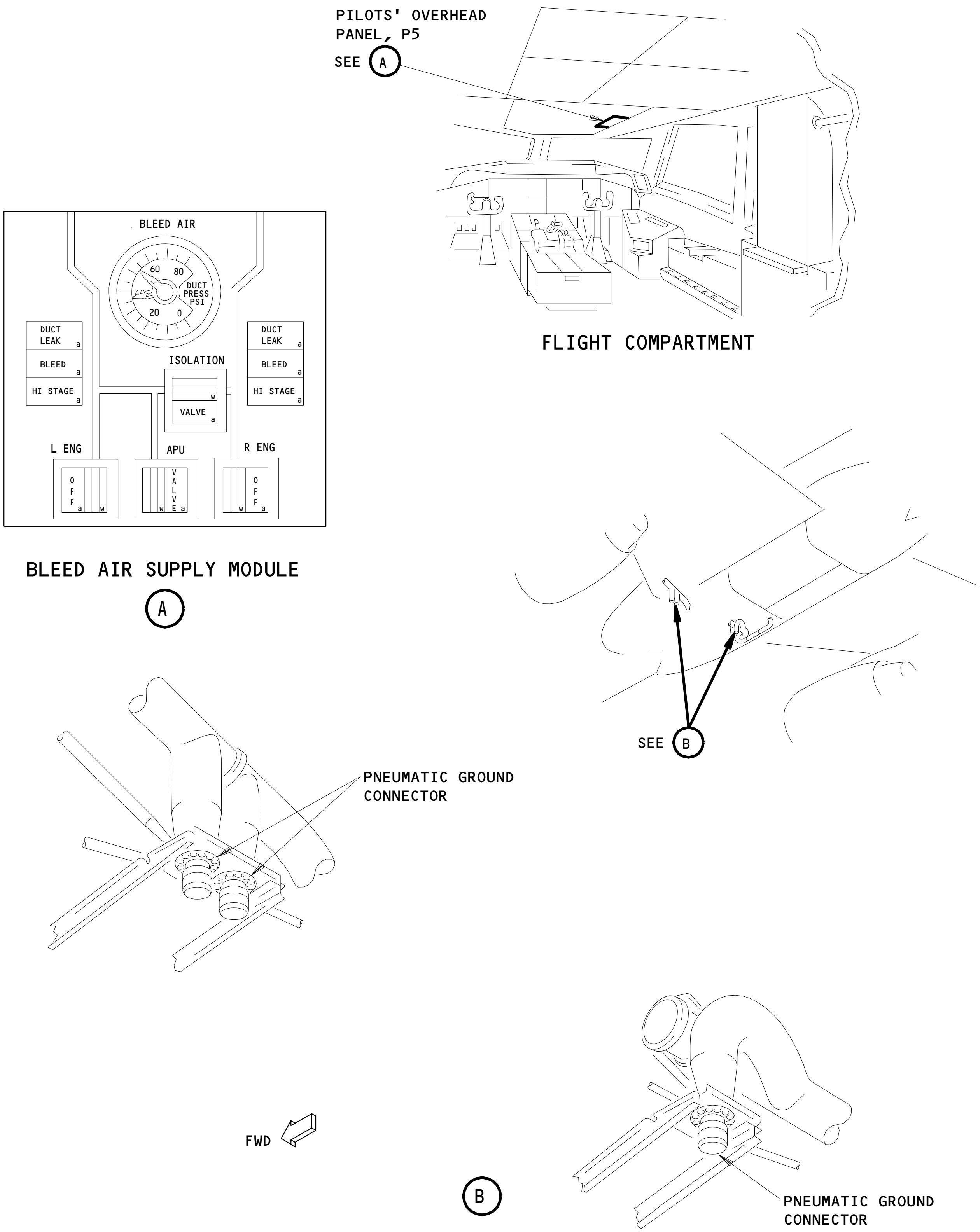
      S 862-002
      (1) Statically ground airplane (Ref 20-41-00).

      S 012-015

      WARNING: PROVIDING PNEUMATIC POWER WILL SUPPLY PNEUMATIC PRESSURE TO OPERATE THE AIR CONDITIONING SYSTEM AND ENGINE START SYSTEM; TO PRESSURIZE THE POTABLE WATER TANKS AND HYDRAULIC RESERVOIR; AND PROVIDE BLEED AIR TO TAT PROBE, AND NACELLE AND WING ANTI-ICE DUCTS. CARE SHOULD BE TAKEN TO ISOLATE THOSE SYSTEMS AND CONTROLS NOT INTENDED FOR OPERATION TO PREVENT LOSS OF PRESSURE, TO PREVENT INADVERTENT ACTUATION OF EQUIPMENT, DAMAGE TO AIRPLANE, AND INJURY TO PERSONNEL.

      CAUTION: ALWAYS APPLY ELECTRICAL POWER BEFORE APPLYING PNEUMATIC POWER AND REMOVE PNEUMATIC POWER BEFORE REMOVING ELECTRICAL POWER TO PREVENT POSSIBLE DAMAGE TO EQUIPMENT.

      (2) Open pneumatic ground service access door 193JL and 194FR, found on ECS access doors in the body to wing fairing section (AMM 06-41-00/201). There are two pneumatic connectors found behind the left access door and there is one pneumatic connector found behind the right access door. The number of connections made depends on system demands, two ground carts may be necessary for engine starting.



Pneumatic Ground Control
Figure 201

S 862-007
(3) Position ground pneumatic source equipment away from work area and connect pneumatic line(s) to ground pneumatic service connector(s).

S 862-008
(4) Provide electrical power (Ref 24-22-00).

S 782-037

WARNING: DO NOT SUPPLY MORE THAN 45 PSIG OF PRESSURE TO THE PNEUMATIC SYSTEM. IF YOU SUPPLY TOO MUCH PRESSURE, DAMAGE TO EQUIPMENT AND INJURY TO PERSONNEL CAN OCCUR.

(5) Start ground pneumatic source and do not supply more than 45 psig.

NOTE: Engine starting requires high airflow and may require at least two ground service carts.

S 862-010
(6) If pneumatic power is required for all system users and ground connection is made on left or right connector only, depress bleed air control ISOLATION VALVE switch/light on the pilots' overhead P5 panel. Verify that white bar light comes on. Verify that VALVE light comes on and then goes out.

S 862-011
(7) Observe BLEED AIR dual DUCT PRESS indicator on P5 panel and verify L and/or R pointer(s) indicate positive pressure. Pressure indication observed will depend upon the ground source used and system load.

TASK 36-00-00-862-012
3. Provide Pneumatic Power Using Auxiliary Power Unit (Fig. 201)
A. References
(1) AMM 24-22-00/201, Electrical Power Control
(2) AMM 49-11-00/201, Auxiliary Power Unit (APU)
B. Provide Pneumatic Power

S 862-016
(1) Provide electrical power (Ref 24-22-00).

S 862-017

WARNING: PROVIDING PNEUMATIC POWER WILL SUPPLY PNEUMATIC PRESSURE TO OPERATE THE AIR CONDITIONING SYSTEM AND ENGINE START SYSTEM; TO PRESSURIZE THE POTABLE WATER TANKS AND HYDRAULIC RESERVOIR; AND PROVIDE BLEED AIR TO TAT PROBE, AND NACELLE AND WING ANTI-ICE DUCTS. CARE SHOULD BE TAKEN TO ISOLATE THOSE SYSTEMS AND CONTROLS NOT INTENDED FOR OPERATION TO PREVENT LOSS OF PRESSURE, TO PREVENT INADVERTENT ACTUATION OF EQUIPMENT, DAMAGE TO AIRPLANE, AND INJURY TO PERSONNEL.

CAUTION: ALWAYS APPLY ELECTRICAL POWER BEFORE APPLYING PNEUMATIC POWER AND REMOVE PNEUMATIC POWER BEFORE REMOVING ELECTRICAL POWER TO PREVENT POSSIBLE DAMAGE TO PNEUMATIC AIR SYSTEM USERS.

(2) Start APU (AMM 49-11-00/201).

S 212-019

(3) Verify that APU RUN light is lit on the pilots' overhead P5 panel.

S 862-020

(4) Press BLEED AIR control APU VALVE switch/light on P5 panel to the open position. Verify that white bar comes on. Verify that VALVE light comes on and then goes out.

S 862-021

(5) If right air-conditioning pack or right side pneumatic ducting requires pneumatic power, press BLEED AIR control ISOLATION VALVE switch/light on the P5 panel to open position. Verify that white flowbar light comes on. Verify that VALVE light comes on and then goes out.

S 862-022

(6) Observe BLEED AIR dual DUCT PRESS indicator on P5 panel and verify that both L and/or R pointer(s) indicate positive pressure.

TASK 36-00-00-862-013

4. Provide Pneumatic Power Using One or Both Operating Engines (Fig. 201)

A. References

(1) AMM 71-00-00/201, Power Plant

B. Provide Pneumatic Power

S 862-023

(1) Provide electrical power (Ref 24-22-00).

S 212-024

(2) Press BLEED AIR ISOLATION VALVE switch/light to closed position. Check that white flowbar light is not on.

S 862-028

WARNING: PROVIDING PNEUMATIC POWER WILL SUPPLY PNEUMATIC PRESSURE TO OPERATE THE AIR CONDITIONING SYSTEM AND ENGINE START SYSTEM; TO PRESSURIZE THE POTABLE WATER TANKS AND HYDRAULIC RESERVOIR; AND PROVIDE BLEED AIR TO TAT PROBE, AND NACELLE AND WING ANTI-ICE DUCTS. CARE SHOULD BE TAKEN TO ISOLATE THOSE SYSTEMS AND CONTROLS NOT INTENDED FOR OPERATION TO PREVENT LOSS OF PRESSURE, TO PREVENT INADVERTENT ACTUATION OF EQUIPMENT, DAMAGE TO AIRPLANE, AND INJURY TO PERSONNEL.

CAUTION: ALWAYS APPLY ELECTRICAL POWER BEFORE APPLYING PNEUMATIC POWER AND REMOVE PNEUMATIC POWER BEFORE REMOVING ELECTRICAL POWER TO PREVENT POSSIBLE DAMAGE TO PNEUMATIC AIR SYSTEM USERS.

(3) Start and operate engine(s) (Ref 71-00-00).

S 212-026

(4) Press applicable BLEED AIR L and/or R ENG switch/light on pilots' overhead P5 panel. Verify that OFF light goes out.

S 212-025

(5) Observe BLEED AIR dual duct pressure indicator on P5 panel and verify L and/or R pointers indicate positive pressure.

S 212-038

(6) If cross bleeding is required, check BLEED AIR control L or R ENG OFF light is illuminated (opposite source engine). Press BLEED AIR control ISOLATION VALVE switch/light on the P5 panel to on position. Verify that white flowbar light comes on. Verify that VALVE light comes on and then goes out.

TASK 36-00-00-862-014

5. Remove Pneumatic Power (Fig. 201)

A. References

(1) AMM 24-22-00/201, Electrical Power Control

(2) AMM 71-00-00/201, Power Plant

B. Remove Pneumatic Power

S 862-029

WARNING: THE PNEUMATIC SOURCE MUST BE SHUT DOWN TO ENSURE COMPLETE VENTING OF PNEUMATIC SYSTEM. RESIDUAL PRESSURE IN THE PNEUMATIC SYSTEM MAY CAUSE PERSONNEL INJURY AND/OR EQUIPMENT DAMAGE DURING MAINTENANCE.

(1) Shut down ground pneumatic source, APU (Ref 49-11-00), or engine(s) (Ref 71-00-00) as applicable.

S 212-030

(2) Make sure the L and/or R ENG Bleed OFF light is on.

S 862-031

WARNING: ENSURE THAT PERSONNEL ARE CLEAR OF WING ANTI-ICE AREA, BLEED AIR CAN CAUSE INJURY TO PERSONNEL.

(3) Place and hold anti-ice test switch on right side P61 panel in WING ANTI-ICE.

S 212-032

(4) Observe bleed air dual duct pressure indicator on P5 panel. Check that both L and R pointers show zero. Release anti-ice test switch.

S 212-033

(5) If applicable depress bleed air ISOLATION VALVE switch/light on P5 panel to closed position. Verify that white bar light goes out. Verify that VALVE light comes on and then goes out.

S 212-034

(6) If applicable depress BLEED AIR APU VALVE switch/light on the P5 panel to closed position. Verify white bar light goes out. Verify that VALVE light comes on and goes out.

S 012-035

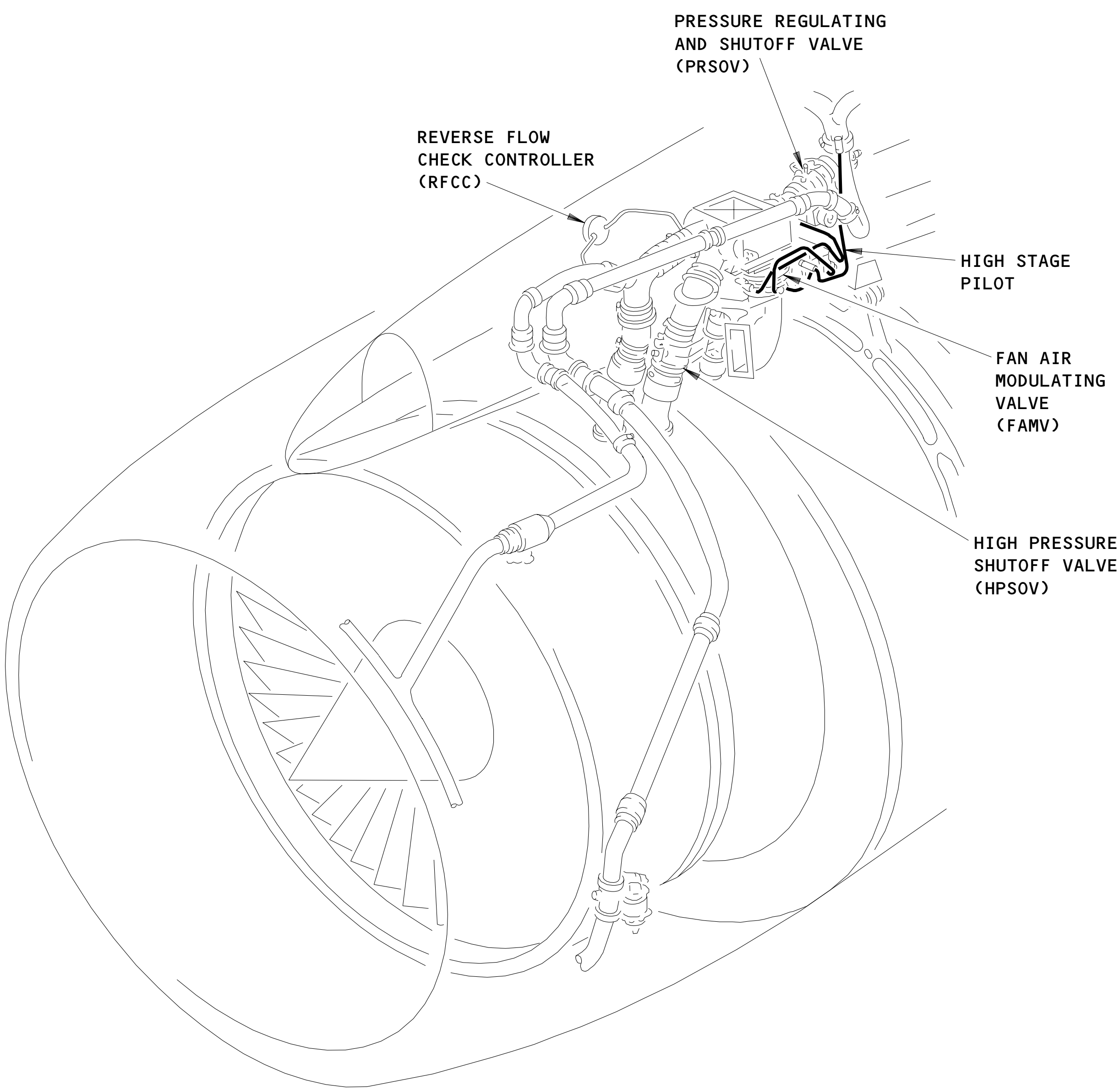
(7) If applicable, disconnect ground pneumatic line(s). Unlock door hinges by lifting locking lever, close pneumatic ground service access door(s) (193JL and/or 194FR).

S 862-036

(8) Remove electrical power if no longer required (AMM 24-22-00/201).

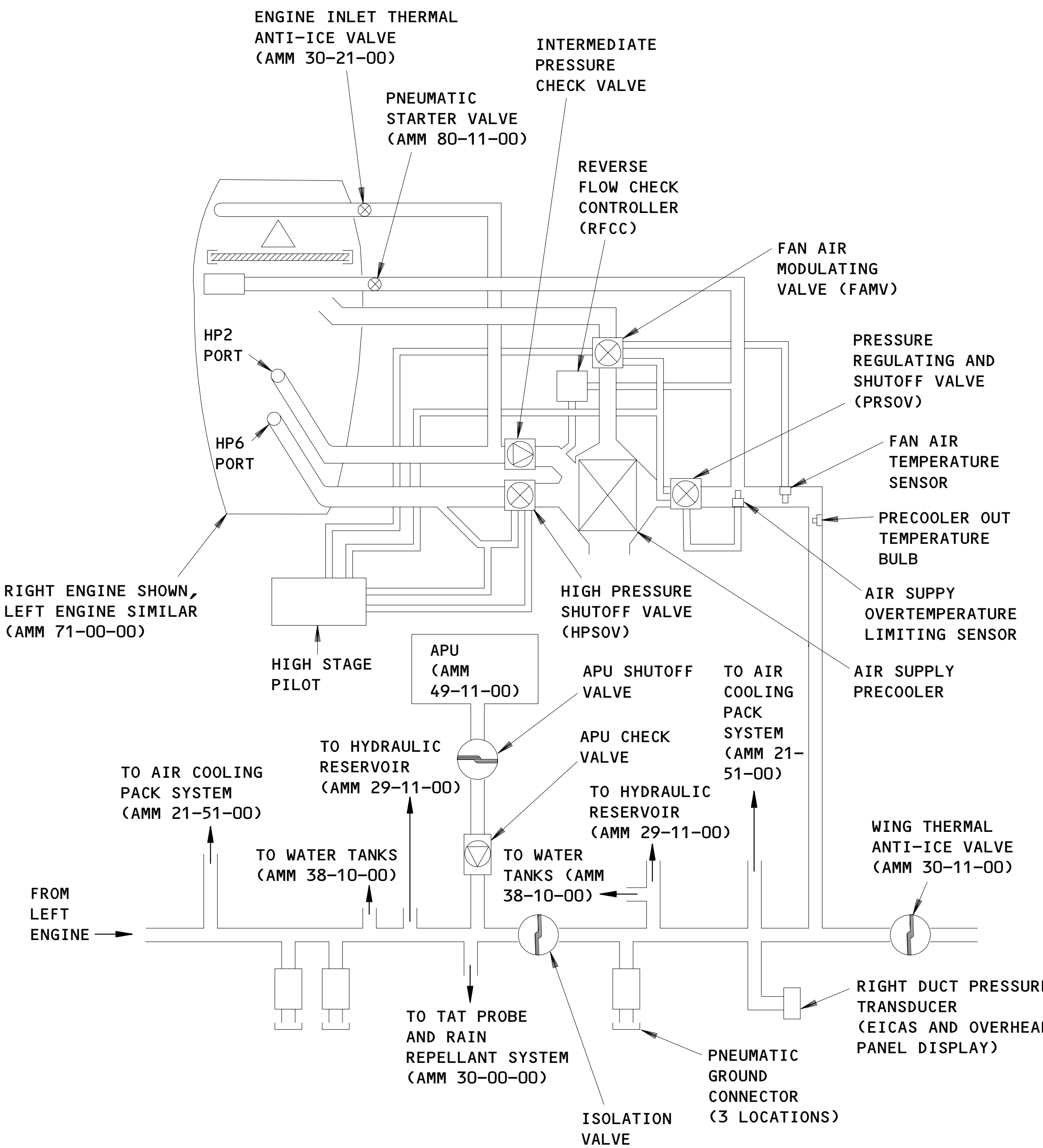
PNEUMATIC SYSTEM HEALTH CHECK - ADJUSTMENT/TEST

1. General
   A. This procedure has these tasks to perform an on-wing health check of the pneumatic system components:
      (1) High Pressure Shutoff Valve (HPSOV) and High Stage Pilot (HS Pilot)
      (2) Pressure Regulating and Shutoff Valve (PRSOV) Test
      (3) Fan Air Modulating Valve (FAMV) Test
      (4) Reverse Flow Check Controller (RFCC) Test
   B. This procedure has instructions to do an on-wing health check test of the Pneumatic System components that are mounted on the engine or strut. The health check tests are similar to the component CMM bench (shop) tests. The health check tests do not require the removal of the Pneumatic System components from the airplane, nor require running the engines, APU, or a high pressure ground cart (pneumatic manifold is not pressurized). Only electrical power is required during the test.
   C. Commercially available test equipment are used during the health check tests and consist of a pressurized air source (such as from nitrogen/air bottles), pressure gages, hoses and end-fittings that are connected to the pneumatic system components to supply and monitor air pressures during the health check tests to confirm component operation.
   D. The following Figures (illustrations) are provided in this procedure:
      (1) Figure 501, Pneumatic System Component Location
      (2) Figure 502, Air Supply System Schematic
      (3) Figure 503, HPSOV Test Equipment
      (4) Figure 504, HS PILOT Test Equipment
      (5) Figure 505, PRSOV Test Equipment
      (6) Figure 506, FAMV Test Equipment
      (7) Figure 507, RFCC Test Equipment

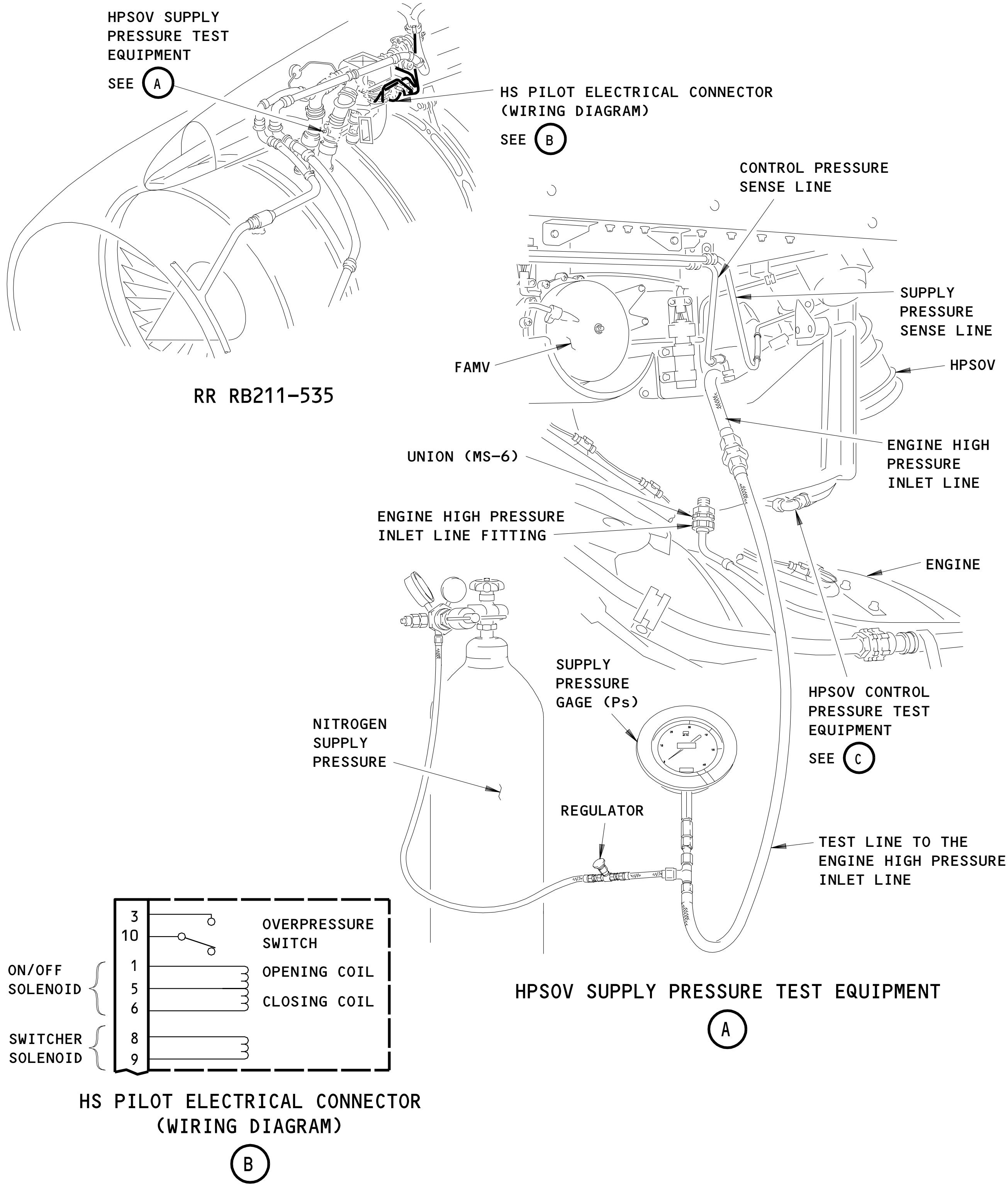


ROLLS ROYCE RB211-535

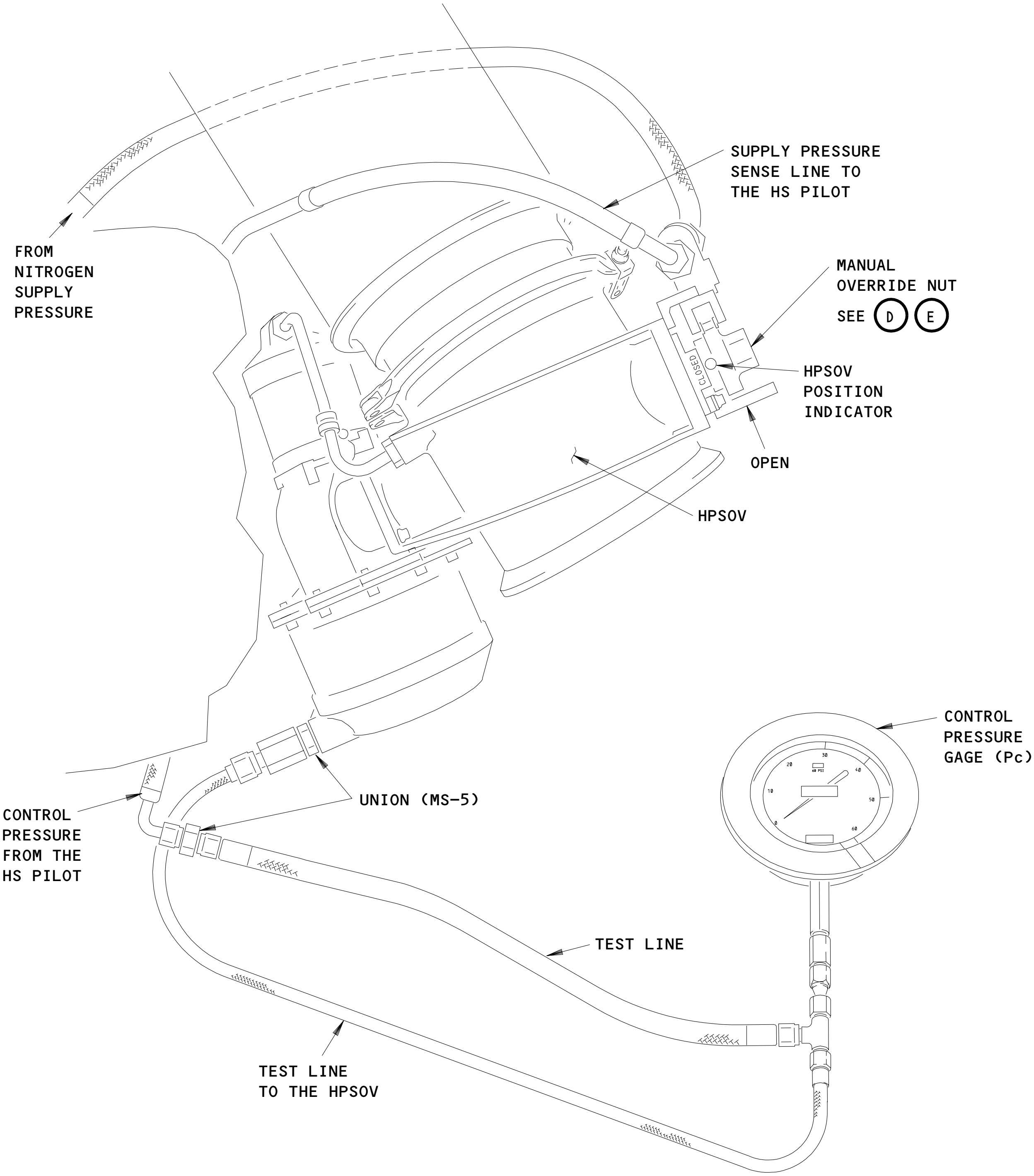
Pneumatic System Components
Figure 501



Air Supply Distribution Schematic
Figure 502



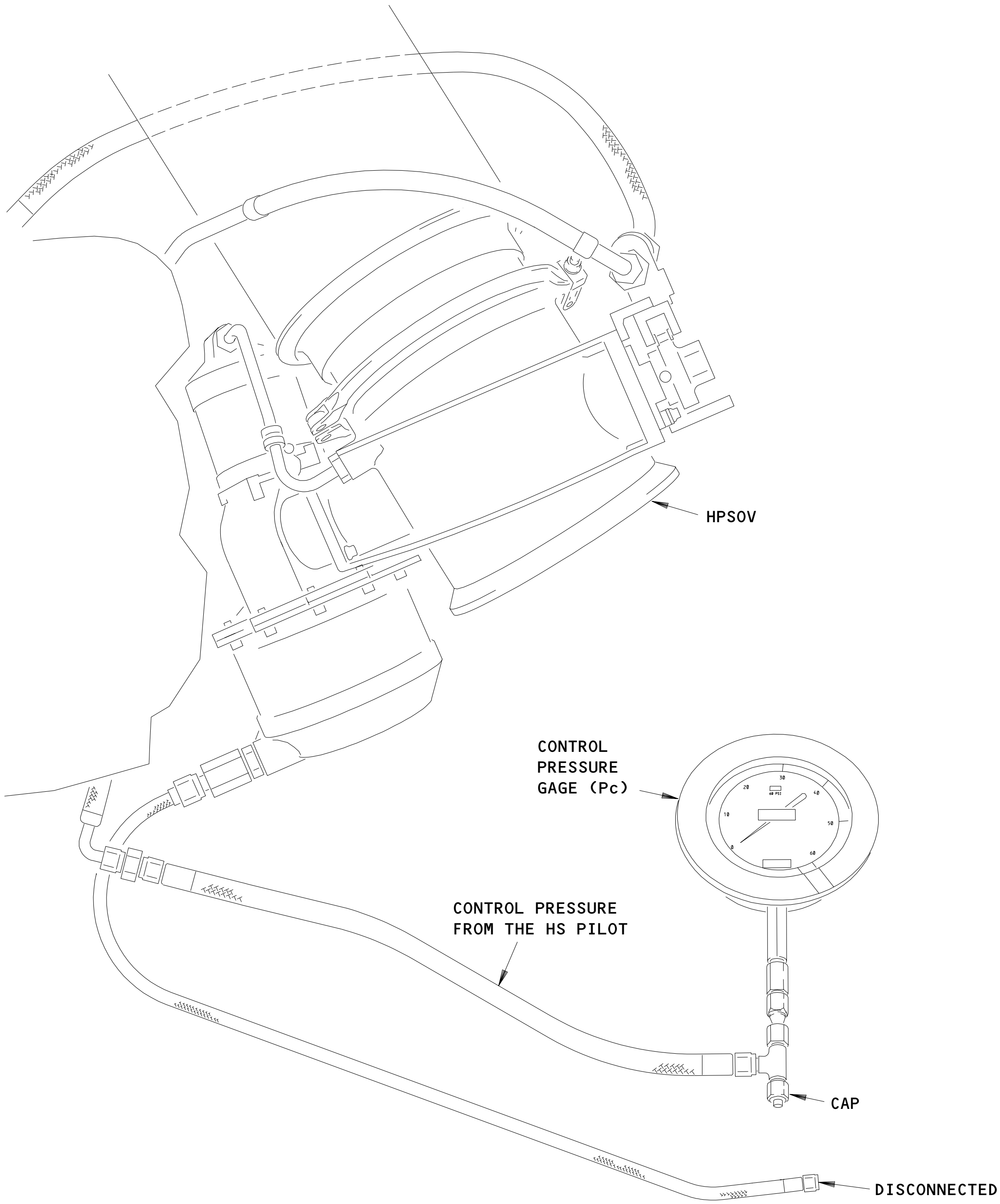
HPSOV Test Equipment
Figure 503 (Sheet 1)



HPSOV CONTROL PRESSURE TEST EQUIPMENT

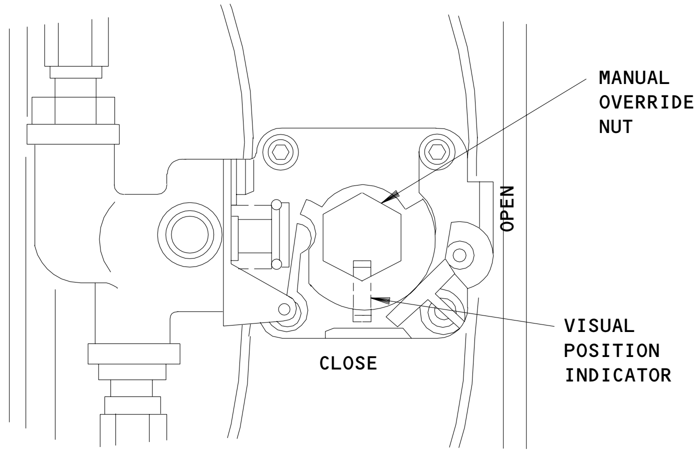
C

HPSOV Test Equipment
Figure 503 (Sheet 2)

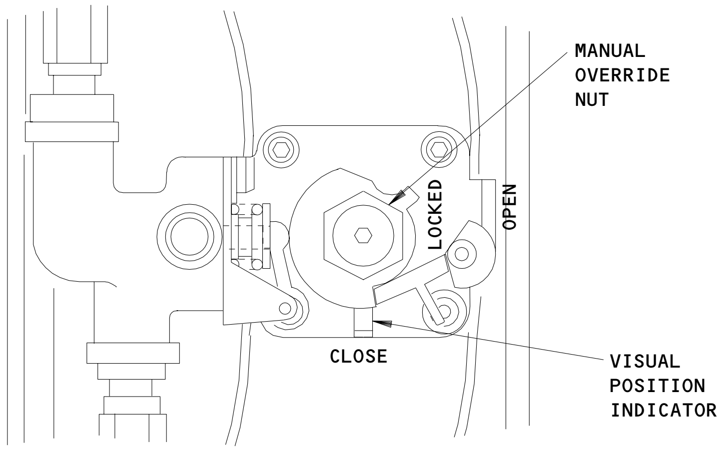


HPSOV CONTROL PRESSURE TEST EQUIPMENT
(TEST LINE DISCONNECTED)
C

HPSOV Test Equipment
Figure 503 (Sheet 3)

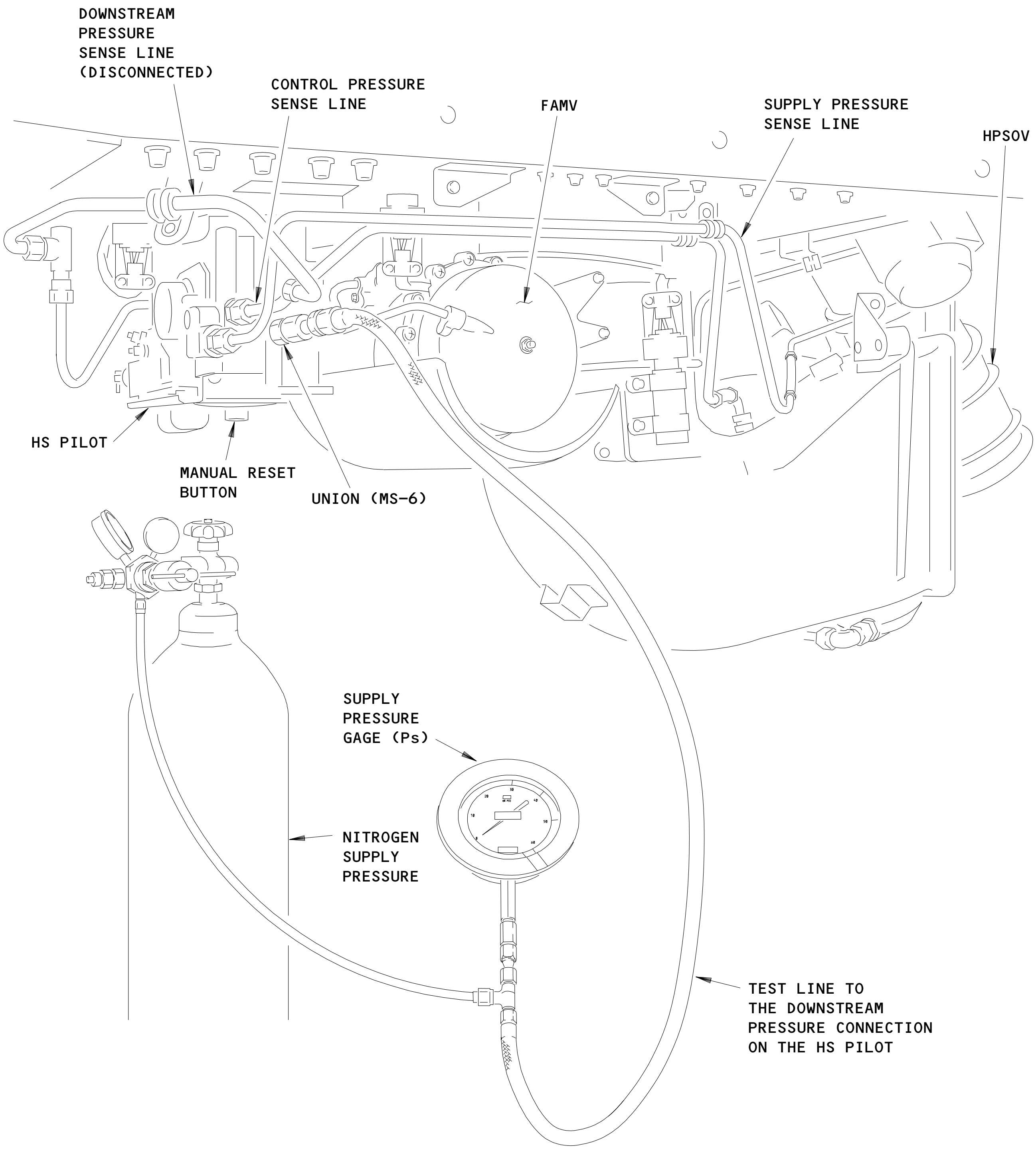


MANUAL OVERRIDE NUT
(HPSOV IS NOT LOCKED CLOSED)
D



MANUAL OVERRIDE NUT
(HPSOV IS LOCKED CLOSED)
E

HPSOV Test Equipment
Figure 503 (Sheet 4)



HS PILOT OVERPRESSURE TEST EQUIPMENT

HS Pilot Test Equipment
Figure 504

TASK 36-00-23-705-151

2. High Pressure Shutoff Valve (HPSOV) and High Stage Pilot (HS PILOT) Test

A. General

(1) This task will perform a test of the HPSOV and the HS PILOT while the HPSOV and HS PILOT are on-wing. This task will also do a test of the overpressure sensor and the crossover switcher system in the HS PILOT.

B. Equipment

(1) Nitrogen or air Source - 0-250 PSIG
(2) C36001 Supply pressure gage - 0-250 PSIG
(3) C36001 Control pressure gage - 0-60 PSIG
(4) Pressure hose - 0-200 PSIG
(5) Union fittings - MS-5 (2 Required)
(6) Union fittings - MS-6 (1 Required)
(7) Cap
(8) 28 Volts DC power supply (Optional)

C. Consumable Materials

(1) D00006 Compound-Antiseize, Bostik Never-Seez Pure Nickel Special
BOSTIK INCORPORATED
BOSTON STREET
MIDDLETON, MA 01949
VENDOR CODE 90983
TELEPHONE 1-800-726-7845

D. References

(1) AMM 06-41-00/201, Fuselage (Major Zones 100 and 200) Access Doors and Panels
(2) AMM 06-43-00/201, Engine and Nacelle Strut (Major Zone 400) Access Doors and Panels
(3) AMM 24-22-00/201, Electrical Power - General
(4) AMM 36-00-00/201, Pneumatic Power - General
(5) AMM 36-11-07/401, High Pressure Shutoff Valve
(6) AMM 36-11-08/401, High Stage Pilot
(7) AMM 78-31-00/201, Thrust Reverser System

E. Access

(1) Location Zones

119	Main Equipment Center
411/421	Engine

(2) Access Panels

119BL	Main Equipment Center Access Panel
413/414/423/424	Fan Cowl Panel
415/416/425/426	Fan Reverser

F. Prepare for the Test

S 865-001

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) Remove pneumatic power (AMM 36-00-00/201).

S 865-002

(2) Supply electrical power (AMM 24-22-00/201).

S 865-003

(3) Open the applicable circuit breaker, on the P11 panel, and attach a DO-NOT-CLOSE tag:
  (a) 11Q10, ENG BLD L
  (b) 11Q19, R ENG BLEED
  (c) 11B31 ENGINE SPEED CARD LEFT
  (d) 11B32 ENGINE SPEED CARD RIGHT

S 045-004

WARNING: DO THE DEACTIVATION PROCEDURE FOR THE THRUST REVERSERS TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(4) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

S 015-005

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

(5) Open the applicable thrust reversers (AMM 78-31-00/201).

S 865-006

(6) 757-300;
To enable testing of the L (R) HPSOV, disconnect the position switch electrical connector, D1936 (D1930), from the R (L) flow control and shutoff valve, V17 (V16), in the ECS bay.

S 865-007

(7) There are two methods that you can use to electrically enable the HS PILOT. Method 1 will jumper the reverse flow check controller (RFCC) a relay and use the airplanes electrical power. Method 2 uses a separate 28 VDC power supply. Method 2 should be used if the applicable engine fire handle is actuated or the engine start switch is selected to "GND".

S 865-008

(8) Do these steps for method 1:
   (a) AIRPLANES WITH HIGH STAGE PILOT VALVE P/N 107460-14 AND HIGHER; Pull the solenoid pin on the HS Pilot valve to enable the HS PILOT.
   (b) AIRPLANES WITH THE HIGH STAGE PILOT VALVE P/N 107460-13 AND LOWER;
   Do these steps:
      1) Get access to the L(R) RFCC (Fig. 507).
      2) Remove the electrical connector.
      3) Install a jumper between pins 1 and 2 of the connector.
   (c) Remove the DO-NOT-CLOSE tag and close the applicable circuit breaker on the P11 panel:
      1) 11Q10, ENG BLEED L
      2) 11Q19, R ENG BLEED CONT
   (d) Put the L(R) ENG Bleed switch-light to the ON position.

S 865-009

(9) Do these steps for method 2:
   (a) Remove the electrical connector from the HS PILOT.
   (b) Apply 28 VDC to pins 5 (ground) and 1 of the HS PILOT for approximately 5 seconds. You should hear the ON/OFF solenoid click at the HS PILOT.
   (c) Remove the 28 VDC power supply.
   (d) Install the electrical connector on the HS PILOT.

S 865-010

(10) The table below shows the pressures you will see during the test of the HPSOV and HS PILOT.

	Ps	Pc
HPSOV Minimum Opening Pressure	1-15 Psi	<5 Psi
HPSOV Fully Open Pressure	15 Psi	<10 Psi
HPSOV Control Pressure	60-70 Psi	33-39 Psi
HS PILOT Crossover	102-112 Psi	<4 Psi
HS PILOT Overpressure	120-135 Psi	NA

G. HPSOV and HS PILOT Test

NOTE: During the test you will be asked some questions. Each question will have a yes or no answer. Each yes or no gives a recommended action, for example: NO, replace the HPSOV (AMM 36-11-07/401). You can continue with the test without doing the action if you want to see other characteristics of the test. However, you should do the recommended action after you complete the test.

S 035-011

(1) Disconnect the engine high pressure inlet line at the fitting (Fig. 503).

S 495-012

(2) Install a cap on the open sense line to keep out unwanted material.

S 485-013

(3) Connect a supply pressure gage (Ps) and a nitrogen (air) supply pressure source to the engine high pressure inlet line (Fig. 503).

S 795-014

CAUTION: WHEN YOU BEGIN TO INCREASE THE SUPPLY PRESSURE, DO NOT EXCEED THE PRESSURE LIMITS THAT ARE GIVEN. DAMAGE TO THE COMPONENTS CAN OCCUR.

(4) Slowly increase Ps to 60-70 PSIG.

S 795-015

(5) Do a check of the control pressure sense line, supply pressure sense line and the newly installed sense lines for nitrogen leakage.

NOTE: Nitrogen may be heard leaking from ambient vent orifices inside the HS PILOT. This is normal and requires no corrective action.

S 795-016
(6) Repair all abnormal leakage.

S 215-017
(7) Make sure the HPSOV is in the fully open position.

S 795-018
(8) Decrease Ps to 0 PSIG.

S 035-019
(9) Remove the control pressure sense line at the HPSOV (Fig. 503).

S 485-020
(10) Install a control pressure gage (Pc) to the control pressure sense line. This will let you monitor Pc during the test (Fig. 503).

S 725-021
(11) Slowly increase Ps to 15 PSIG and monitor when the HPSOV begins to go to the open position and when the HPSOV is at the full open position. The position indicator is on the manual override nut.

NOTE: Pc should be less than 5 PSIG when the HPSOV begins to go to the open position. Pc should be less than 10 psig when the HPSOV is at the fully open position.

S 725-022
(12) Did the HPSOV begin to go to the open position before Pc=5 PSIG?
(a) NO, do the steps that follow:
1) Decrease Ps to 0 PSIG.
2) Replace the HPSOV (AMM 36-11-07/401).
(b) YES, continue.

S 215-023
(13) Is the HPSOV at the full open position before Pc=10 psig?
(a) NO, do the steps that follow:
1) Decrease Ps to 0 PSIG.

2) Replace the HPSOV (AMM 36-11-07/401).
(b) YES, continue.

S 725-024
(14) Increase Ps to 60-70 PSIG.

S 725-025
(15) Is Pc=33-39 PSIG?
(a) YES, the HPSOV and the HS PILOT are satisfactory. Decrease Ps to 0 PSIG. Do not do the "NO" step that follows but do the HS PILOT crossover test.
(b) NO, decrease Ps to 0 PSIG.

NOTE: If Pc is greater than the given pressure replace the HS PILOT (AMM 36-11-08/401). If Pc is less than the given pressure range the HS PILOT could be faulty by not giving the correct Pc or the HPSOV could be leaking internally causing Pc to be low. Do a check of Pc from the HS PILOT.

1) To do a check of Pc from the HS PILOT, remove the control pressure test line to the HPSOV and install a cap on the tee (Fig. 503). This will allow you to monitor the control pressure from the HS PILOT.
2) Increase Ps to 60-70 PSIG.
3) Is Pc=33-39 PSIG?
a) NO, decrease Ps to zero and replace the HS PILOT (AMM 36-11-08/401).
b) YES, replace the HPSOV (AMM 36-11-07/401).

S 715-026
(16) Do these steps to do a test of the HS PILOT crossover:
(a) Slowly increase Ps to 102-112 PSIG.

NOTE: Pc should go to less than 4 PSIG before Ps is greater than 112 PSIG.

(b) Did Pc go to less than 4 PSIG?
  1) NO, do the steps that follow:
    a) Decrease Ps to 0 PSIG.
    b) Replace the HS PILOT (AMM 36-11-08/401).
  2) YES, continue. The HS PILOT is satisfactory.
(c) Slowly decrease Ps to 95 PSIG.
(d) Make sure Pc increases to 33-39 PSIG?

NOTE: Pc should increase to 33-39 PSIG at a lower Ps value than when Pc decreased to less than 4 PSIG. The difference between the two values of Ps should be at least 2 PSI.

(e) Decrease Ps to 0 PSIG.

S 715-027

(17) Do these steps to do a test of the crossover while you simulate altitude greater than 31,000 feet.
(a) Remove the electrical connector to the L(R) 31,000 ft altitude switch found in the fwd bulkhead of the right A/C Pack Bay.
(b) Install a jumper between pins 2 and 3 of the 31,000 ft altitude switch electrical connector (WDM 36-11-12, WDM 36-11-22).
(c) 757-300 AIRPLANES WITH RR RB211-535 ENGINES;
Open the ECS pack bay door to get access to the right (left) pack flow control valve, then do either of these steps to simulate actuation of the flow control valve limit switch to the "open" position with the L/R PACK switches selected OFF.

NOTE: This will keep the high stage switchover inhibit relay K10780 (K10781) de-energized and permit subsequent HS PILOT voltage check (WDM 36-11-12, WDM 36-11-22).

  1) Disconnect the D1936 (D1930) electrical connector from the right (left) pack flow control valve when you test the HS PILOT for the left (right) engine (WDM 21-51-21, WDM 21-51-11).

2) Manually wrench open the right (left) pack flow control valve when you test the HS PILOT for the left (right) engine.

NOTE: There is no lockout feature to keep the pack flow control valve in open position, so you need to manually hold the valve open until the subsequent HS PILOT test is complete.

(d) Slowly increase Ps to 86-96 psig.

NOTE: Pc should go to less than 4 psig before Ps was greater than 96 psig.

(e) Did Pc go to less than 4 psig?
1) NO, do these steps:
a) Remove the HS PILOT electrical connector.
b) Do a check for 26-30v dc on pins 8 and 9 of HS PILOT connector D2780 (D2690) (WDM 36-11-12, WDM 36-11-22). Is there 26-30v dc?
1. NO, repair the electrical circuit between the HS Pilot and the 31,000 ft altitude switch (WDM 36-11-12, WDM 36-11-22).
2. YES, decrease Ps to zero and replace HS PILOT (AMM 36-11-08/401).
2) YES, continue. The HS PILOT is satisfactory.
(f) Slowly decrease Ps to 80 psig.
(g) Make sure Pc increases to 33-39 psig.
(h) Decrease Ps to 0 psig.
(i) Remove jumper from Pins 2 and 3 of the D2782 (D2692) electrical connector for the altitude switch (WDM 36-11-12, WDM 36-11-22).
(j) Install electrical connector D2782 (D2692) to the L(R) 31,000 feet altitude switch.
(k) Re-connect the electrical connnector to the HS PILOT.
(l) 757-300 AIRPLANES WITH RR RB211-535 ENGINES;
Do the applicable step below to restore the right (left) pack flow control valve to its normal condition after you tested the HS PILOT for the left (right) engine, then close the ECS pack bay door:
1) Re-connect the D1936 (D1930) electrical connector to the right (left) pack flow control valve (WDM 21-51-21, WDM 21-51-11).
2) Manually release the pack flow control valve and confirm that the valve position indicator moves to CLOSED.

S 085-028
(18) Remove the nitrogen (air) source, supply pressure gage, hoses and fittings from the engine high pressure inlet line connection.

S 035-029
(19) Remove any covers that were installed on open sense lines or fittings.

S 435-030
(20) Apply antiseize compound and connect the high pressure inlet line to the high pressure inlet line fitting.

S 085-031
(21) Remove the control pressure gage, hoses and fittings from the control pressure sense line.

S 435-032
(22) Apply antiseize compound and connect the control pressure sense line to the HPSOV.

H. HS PILOT Overpressure Sensor Test

S 035-033
(1) Remove the downstream pressure sense line at the HS PILOT (Fig. 504).
   (a) Install a cover on the open sense lines or fittings to keep out unwanted material.

S 485-034
(2) Install the supply pressure gage (Ps) and the nitrogen (air) source to the downstream pressure connection on the HS PILOT as shown in Fig. 504.

S 725-035
(3) Increase Ps to 125-165 PSIG and monitor Ps when the manual reset button extends.

S 725-036
(4) Did the manual reset button extend when Ps = 125-165 PSIG?
   (a) NO, do the steps that follow:
      1) Decrease Ps to 0 PSIG.
      2) Replace the HS PILOT (AMM 36-11-08/401).
   (b) YES, continue. The downstream overpressure sensor is satisfactory.

S 725-037

(5) Decrease Ps to 0 PSIG.

S 215-038

(6) Did the "HI STAGE" light come on at the P5 panel when the manual reset button extends?
- (a) YES, continue. The wiring and overpressure switch are satisfactory.
- (b) NO, there is a problem with the overpressure switch in the HS PILOT or a wiring fault between the overpressure switch and the "HI STAGE" light.
  - 1) Remove the electrical connector from the HS PILOT and do a check for continuity between pins 3 and 10 on the HS PILOT.
  - 2) Is there continuity?
    - a) NO, replace the HS PILOT (AMM 36-11-08/401).
    - b) YES, do a check and repair the wiring between the HS PILOT and the "HI STAGE" light.
  - 3) Install the electrical connector.

S 865-039

(7) Push the manual reset button in.

<u>NOTE</u>: The "HI STAGE" light will go off.

S 085-040

(8) Remove the nitrogen (air) source and supply pressure gage from the downstream pressure connection on the HS PILOT.

S 095-041

(9) Remove any covers that were installed on open sense lines or fittings.

S 435-042

(10) Apply antiseize compound to the fitting for the downstream pressure sense line and connect the downstream pressure sense line to the HS PILOT.

I. Put the Airplane Back to Its Usual Condition

S 865-043

(1) If method 1 was used to electrically enable the HS PILOT do these steps:
- (a) Put the L(R) ENG Bleed switch-light to the OFF position.

(b) Open the applicable circuit breaker, on the P11 panel, and attach a DO-NOT-CLOSE tag:
1) 11Q10, ENG BLEED L
2) 11Q19, R ENG BLEED CONT
(c) AIRPLANES WITH THE HIGH STAGE PILOT VALVE P/N 107460-13 AND LOWER;
Do the steps that follow:
1) Remove the jumper.
2) Install the connector.

S 865-044
(2) If Method 2 was used to electrically enable the HS PILOT, go on to the next step.

S 865-045
(3) Remove the DO-NOT-CLOSE tag and close the applicable circuit breaker on the P11 panel:
(a) 11Q10, ENG BLEED L
(b) 11Q19, R ENG BLEED CONT
(c) 11B31 L ENGINE SPEED CARD
(d) 11B32 R ENGINE SPEED CARD

S 865-046
(4) 757-300 AIRPLANES;
In the ECS bay, replace the position switch connector from the L (R) flow control and shutoff valve.

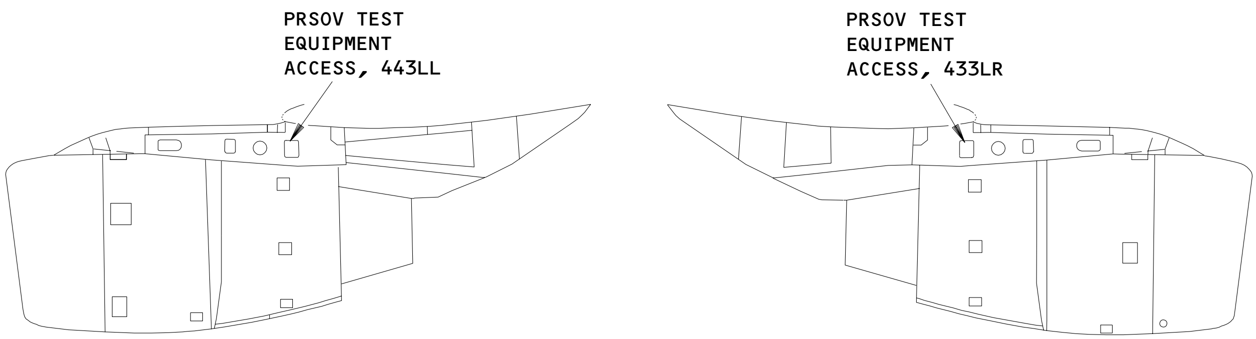
S 415-047

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) Close the applicable thrust reversers (AMM 78-31-00/201).

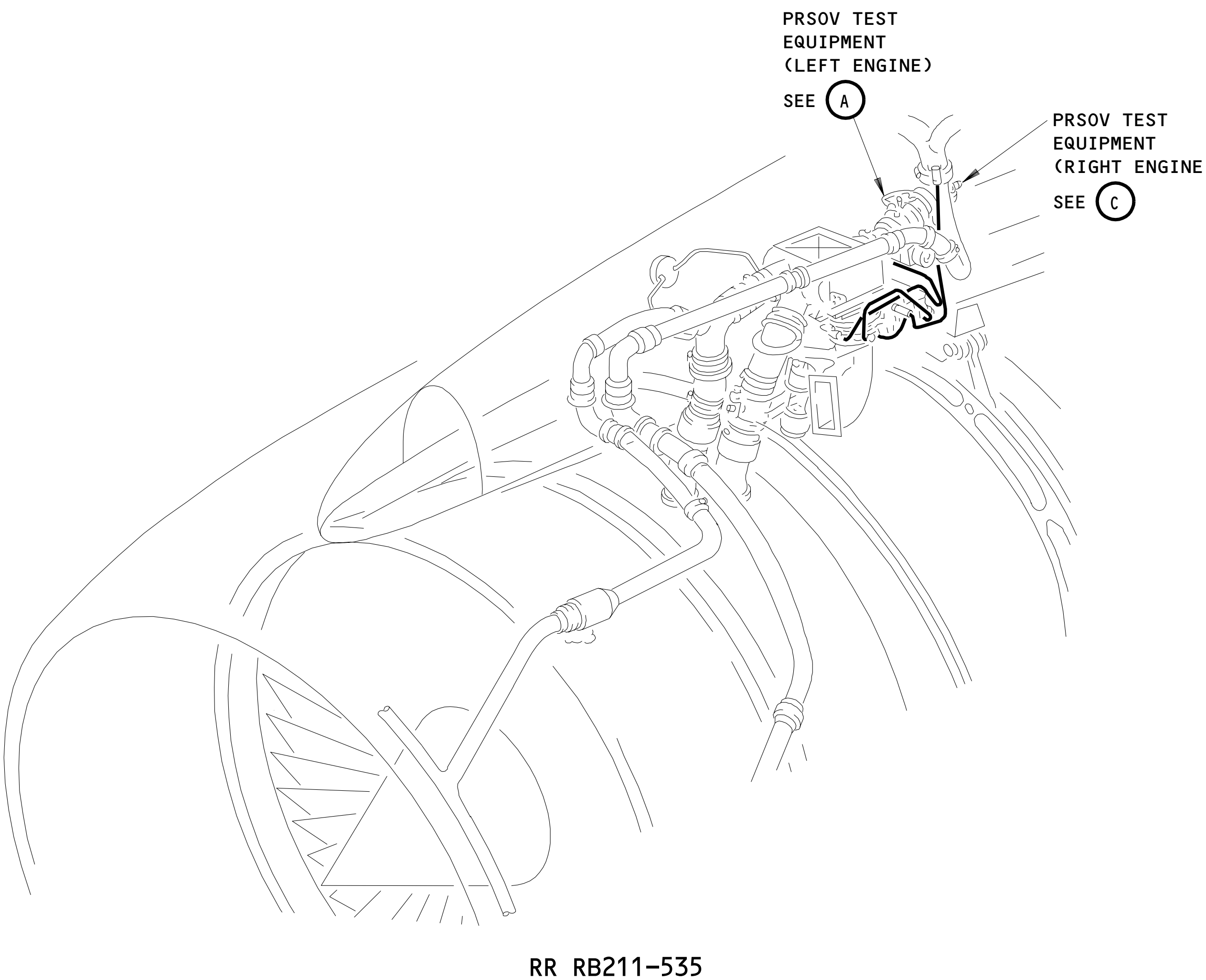
S 445-048
(6) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 865-049
(7) Remove electrical power if it is not necessary (AMM 24-22-00/201).



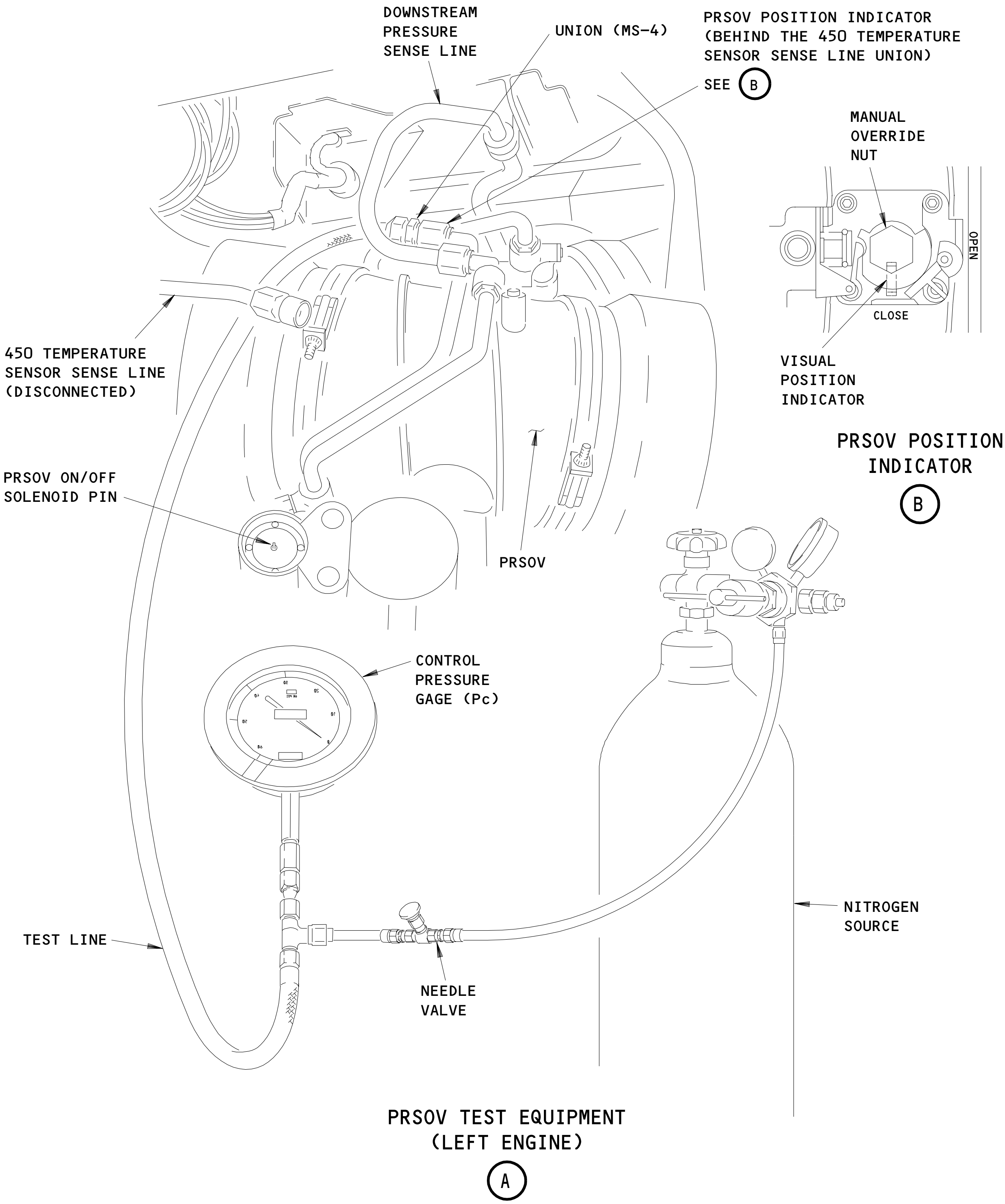
RR RB211-535 RIGHT ENGINE
(INBOARD SIDE)

RR RB211-535 LEFT ENGINE
(INBOARD SIDE)

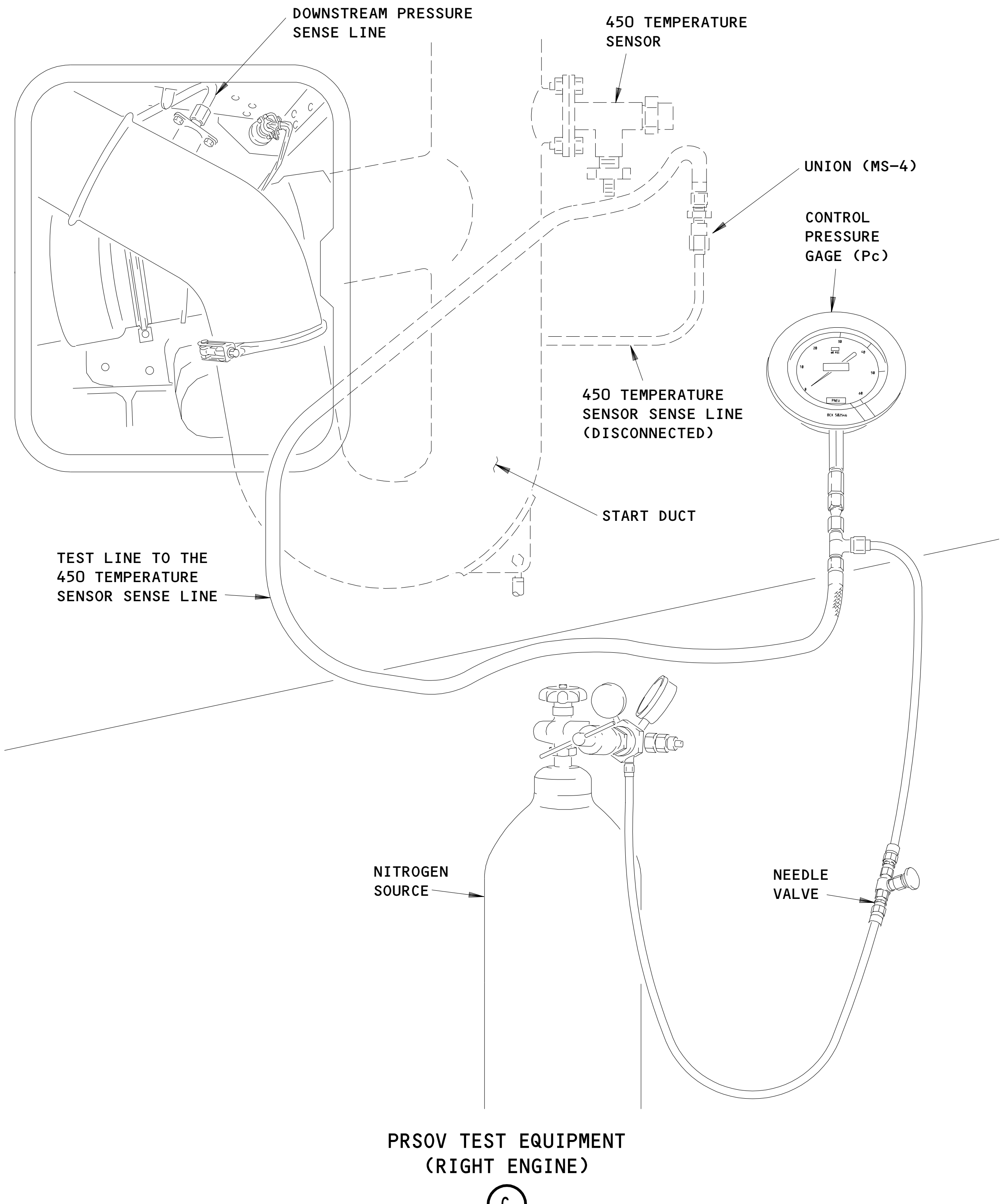


RR RB211-535

PRSOV Test Equipment
Figure 505 (Sheet 1)



PRSOV Test Equipment
Figure 505 (Sheet 2)



PRSOV Test Equipment
Figure 505 (Sheet 3)

TASK 36-00-23-705-152

3. Pressure Regulating and Shutoff Valve (PRSOV) Test

A. General
   (1) This task will perform an operational test of the PRSOV while the PRSOV is installed on the engine.

B. Equipment
   (1) Nitrogen or air source (0-100 PSIG)
   (2) Ground air source or APU (30 PSIG Minimum)
   (3) C36001 Two Pressure gage, 0-60 PSIG Minimum
   (4) Pressure hose - 0-60 PSIG
   (5) Union fittings - MS-4 (2 required)
   (6) Cap
   (7) 28 Volts DC power supply (Optional)

C. Consumable Materials
   (1) D00006 Antiseize Compound, Bostik Never-Seez

D. References
   (1) AMM 06-41-00/201, Fuselage (Major Zones 100 and 200) Access Doors and Panels
   (2) AMM 06-43-00/201, Engine and Nacelle Strut (Major Zone 400) Access Doors and Panels
   (3) AMM 24-22-00/201, Electrical Power - General
   (4) AMM 36-00-00/201, Pneumatic Power - General
   (5) AMM 36-11-09/201, Pressure Regulating and Shutoff Valve

E. Access
   (1) Location Zones

119	Main Equipment Center
433/443	Nacelle Strut Mid-structure

   (2) Access Panels

119BL	Main Equipment Center Access Pane
433LR/443LL	Pressure Regulating and Shutoff Valve Access Panel

F. Prepare for the Test (Fig 505)

S 865-051

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) Remove pneumatic power (AMM 36-00-00/201).

S 865-052

   (2) Supply electrical power (AMM 24-22-00/201).

S 015-053
(3) Open the access door for the PRSOV on the nacelle strut (AMM 06-41-00/201).

NOTE: The reverser halves may need to be closed to access the PRSOV.

S 865-054
(4) There are two methods that you can use to electrically enable the PRSOV. Method 1 will jumper the RFCC and use the airplanes electrical power. Method 2 uses the manual ON/OFF solenoid on the PRSOV.

S 865-055
(5) Do these steps for method 1:
   (a) Open the applicable circut breaker, on the P11 panel:
      1) 11B31 L ENG SPEED CARD
      2) 11B32 R ENG SPEED CARD
      3) 11Q10 L ENG BLEED
      4) 11Q19 R ENG BLEED
   (b) Remove the electrical connector from the RFCC (Fig. 507).
   (c) Install a jumper between pins 1 and 2 on the ships wiring.
   (d) Push the L(R) ENG Bleed OFF switch-light on the P5 panel to the ON position.
   (e) Close the applicable circuit breakers:
      1) 11Q10 L ENG BLEED

S 865-056
(6) Do these steps for method 2:
   (a) Pull the ON/OFF solenoid pin on the PRSOV to the extended position.

   NOTE: A step to reverse this step at the end of the procedure is not necessary.

   (b) Open the applicable circuit breaker on the overhead circuit breaker panel P11 and attach a DO-NOT-CLOSE tag:
      1) 11Q10 L ENG BLEED
      2) 11Q19 R ENG BLEED

S 035-057
(7) For the PRSOV on the right engine, remove the 450 temperature sensor sense line at the 450 temperature sensor (Fig. 505).

S 035-058
(8) For the PRSOV on the left engine, remove the 450 temperature sensor sense line at the PRSOV (Fig. 505).

S 495-059
(9) Install a cover on all open sense lines or fittings to keep out unwanted materials.

S 485-060
(10) For the PRSOV on the right engine, install the nitrogen (air) source, needle valve and control pressure gage Pc (0-60 PSIG) to the sense line for the 450 temperature sensor.

S 485-061
(11) For the PRSOV on the left engine, install the nitrogen (air) source, needle valve and control pressure gage Pc (0-60 PSIG) to the PRSOV.

S 715-062
(12) The table below shows the pressures you will see during the test of the PRSOV.

	Ps	Pc
PRSOV Minimum Opening Pressure	NA	<5 Psi
PRSOV Fully Open Pressure	NA	<8 Psi
PRSOV Control Pressure	30 Psi MIN	22-27 Psi

S 865-063
(13) Remove the DO-NOT-CLOSE tag and close these circuit breakers on the P11 panel:
(a) 11Q10 L ENG BLEED
(b) 11Q19 R ENG BLEED

G. Functional Test of the PRSOV

NOTE: During the test you will be asked some questions. Each question will have a yes or no answer. Each yes or no answer gives a recommended action, for example: NO, replace the PRSOV (AMM 36-11-09/201). You can continue with the test without doing the action if you want to see other characteristics of the test. However, you should do the recommended action after you complete the test.

S 725-064

CAUTION: WHEN YOU BEGIN TO INCREASE THE SUPPLY PRESSURE, DO NOT EXCEED THE PRESSURE LIMITS THAT ARE GIVEN. DAMAGE TO THE COMPONENTS CAN OCCUR.

(1) Slowly increase Pc to 15 PSIG. Monitor when the PRSOV begins to open and when the PRSOV is fully open.

NOTE: You will need a mirror and flashlight to see the position indicator on the manual override nut on the top of the left PRSOV.

Pc should be less than 5 PSIG when the PRSOV begins to open and Pc should be less than 8 when the PRSOV is fully open.

Nitrogen may be heard leaking from ambient vent orifices inside the PRSOV regulator. This is normal and requires no corrective action.

S 725-065

(2) Did the PRSOV begin to open before Pc=5 PSIG?
- (a) NO, replace the PRSOV (AMM 36-11-09/201).
- (b) YES, continue.

S 725-066

(3) Was the PRSOV fully open before Pc=8 PSIG?
- (a) NO, replace the PRSOV (AMM 36-11-09/201)
- (b) YES, Continue.

S 725-067

(4) Decrease Pc to 0 PSIG.

S 865-068

(5) Make sure the ISOLATION VALVE is in the open position.

S 725-069
(6) Pressurize the pneumatic duct to a minimum of 30 PSIG with a ground source or APU (AMM 36-00-00/201).
(a) If the APU is used, make sure the APU switch is in the ON position and open circuit breaker 11Q22 APU BLEED PWR after the pneumatic system is pressurized.

NOTE: This will keep the APU valve open when the PRSOV opens.

S 725-070
(7) Increase Pc to 10-15 PSIG until the PRSOV is open.

S 865-071
(8) Close the needle valve.

S 865-072
(9) Fully back off the regulator on the nitrogen (air) source to decrease the pressure to 0 PSIG.

NOTE: The control pressure gage (Pc) for the nitrogen (air) will not show 0 PSIG.

S 215-073
(10) Make sure the APU or ground source pressure is at least 30 PSIG.

S 865-074
(11) Make sure the PRSOV is in the full open position.

S 215-075
(12) Does the control pressure gage show Pc=22-27 PSIG?
(a) NO, replace the PRSOV (AMM 36-11-09/201)
(b) YES, continue.

S 795-076
(13) Do a check of the downstream pressure sense line from the PRSOV to the start duct for nitrogen (air) leaks.

S 795-077
(14) Repair all leakage.

S 215-078
(15) Make sure the "OFF" light, on the P5 panel, is not on.

S 865-079
(16) Remove pneumatic power (AMM 36-00-00/201).
(a) If the APU was used, close circuit breaker 11Q22 APU BLEED PWR, then put the APU switch to the OFF position.

S 215-080
(17) Make sure the PRSOV is in the closed position and the L ENG (R ENG) OFF light, on the engine bleed air control panel, is on.

H. Put the Airplane Back to Its Usual Condition

S 085-081
(1) For the PRSOV on the right engine, remove the nitrogen (air) source, supply pressure gage, hoses and fittings at the sense line for the 450 temperature sensor.

S 085-082
(2) For the PRSOV on the left engine, remove the nitrogen (air) source, supply pressure gage, hoses and fittings at the PRSOV.

S 095-083
(3) Remove any covers that were installed on the open sense line or fitting.

S 645-084
(4) Apply antiseize compound to the threads of the sense line fitting.

S 435-085
(5) Install the sense line for the 450 temperature sensor.

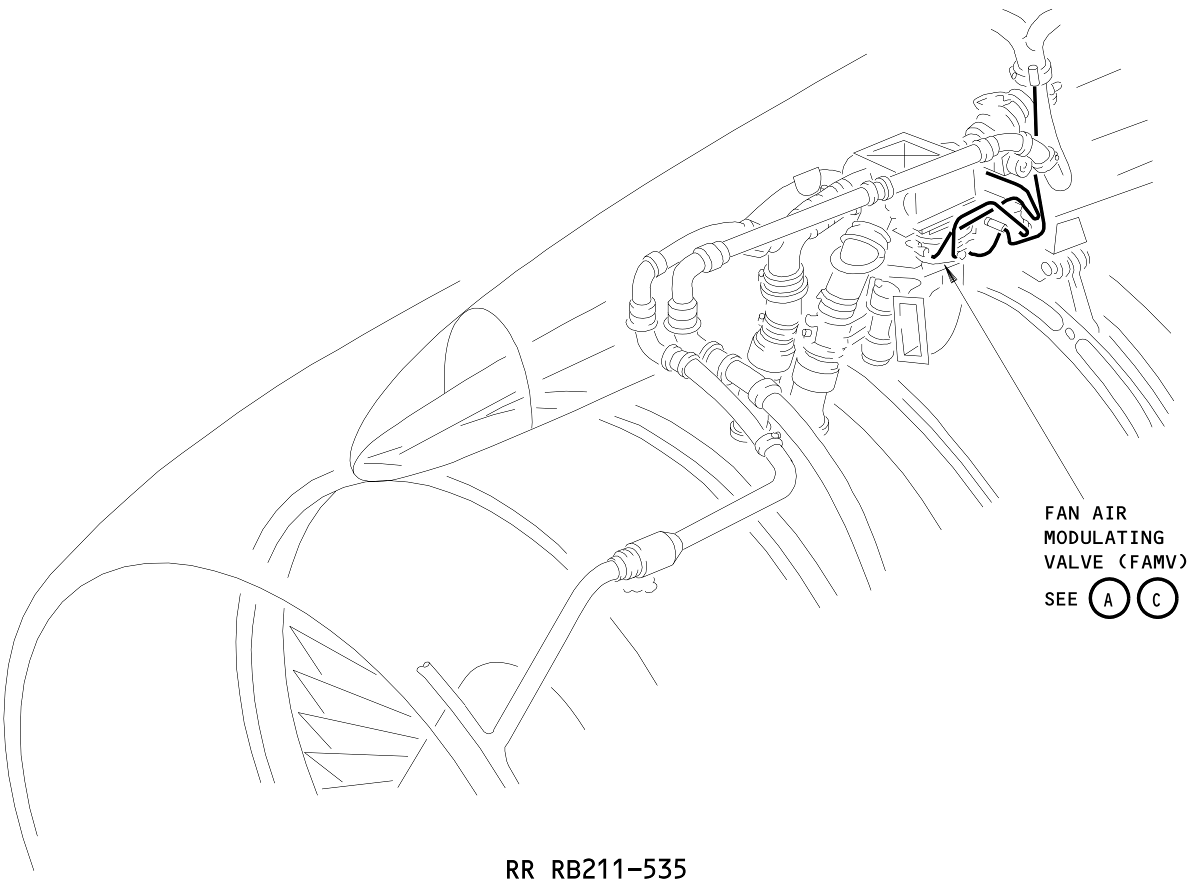
S 415-086
(6) Close the access door for the PRSOV on the nacelle strut (AMM 06-43-00/201).

S 865-087
(7) If method 1 was used to electrically enable the PRSOV, do these steps:
(a) Push the L(R) ENG OFF switch-light on the P5 panel to the OFF position.
(b) Open these circuit breakers on the P5 panel:
1) 11Q10 L ENG BLEED
2) 11Q19 R ENG BLEED
(c) Remove the jumper.
(d) Install the electrical connector.

(e) Remove the DO-NOT-CLOSE tag and close the applicable circuit breaker, on the P11 panel:
1) 11B31 L ENG SPEED CARD
2) 11B32 R ENG SPEED CARD
3) 11Q10 L ENG BLEED
4) 11Q19 R ENG BLEED

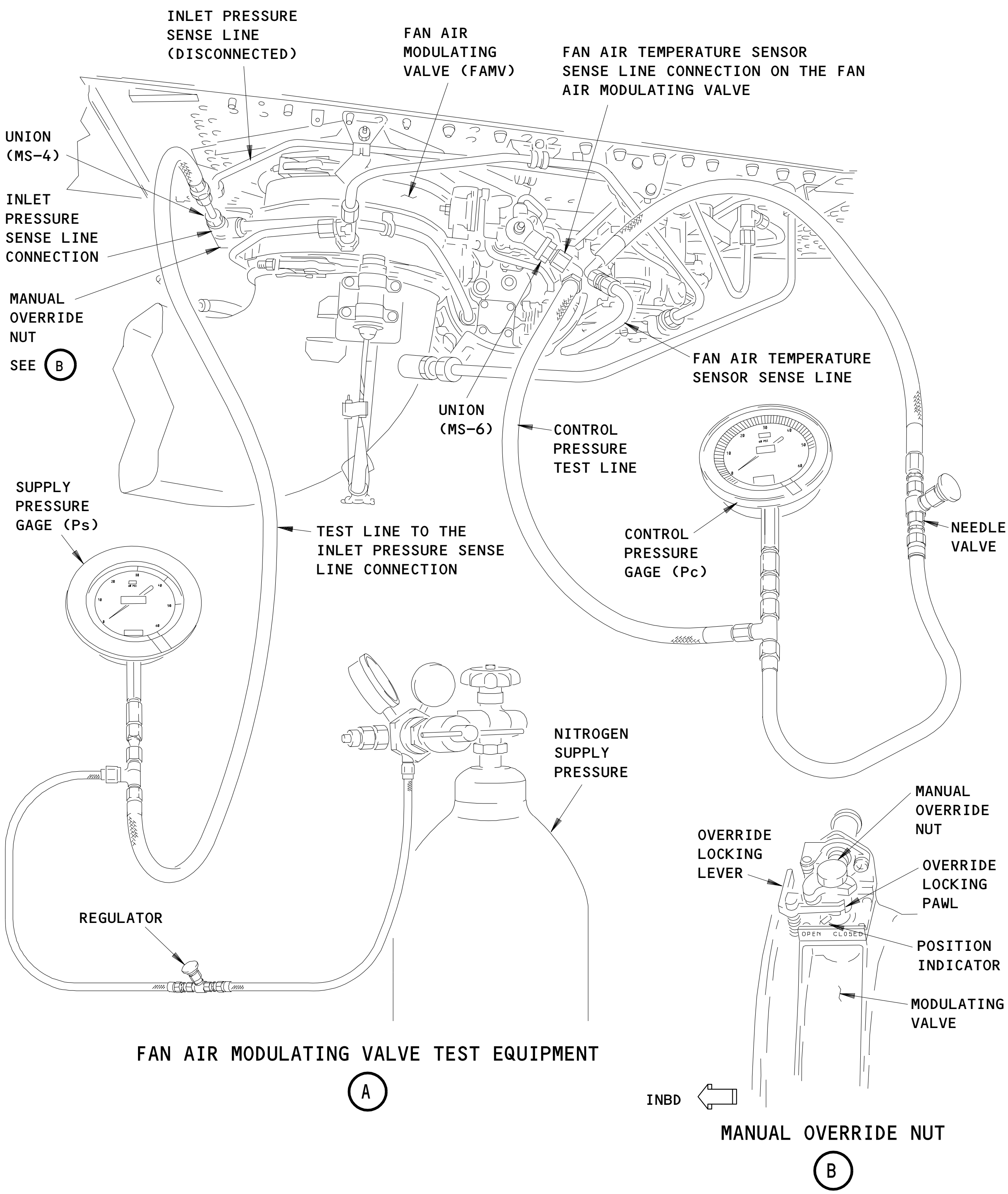
S 865-088

(8) Remove electrical power if it is necessary (AMM 24-22-00/201).

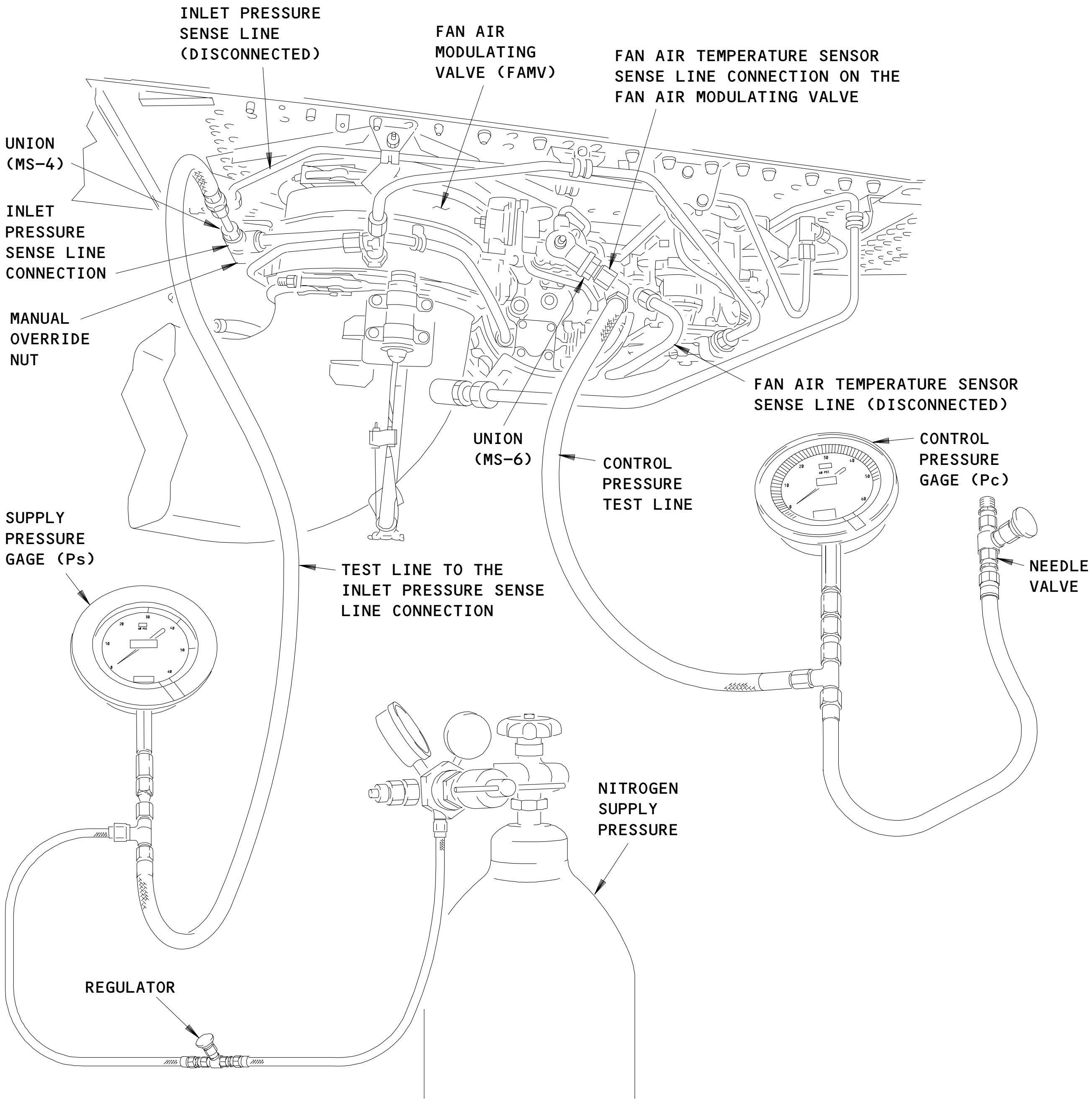


RR RB211-535

Fan Air Modulating Valve Test Equipment
Figure 506 (Sheet 1)



Fan Air Modulating Valve Test Equipment
Figure 506 (Sheet 2)



FAN AIR MODULATING VALVE TEST EQUIPMENT

C

Fan Air Modulating Valve Test Equipment
Figure 506 (Sheet 3)

TASK 36-00-23-705-153

4. Fan Air Modulating Valve (FAMV) Test

A. General

(1) This procedure performs a test of the Fan Air Modulating Valve (FAMV) while the FAMV is installed on the airplane. The procedure also simulates variation in temperature signals sent to the FAMV by the fan air temperature sensor to do a check the FAMV.

(2) Electrical power is not necessary for this task.

B. Equipment

(1) Nitrogen or air source (0-100 PSIG)
(2) C36001 Control pressure gage - 0-30 PSIG
(3) C36001 Supply pressure gage - 0-70 PSIG
(4) Pressure hose - 0-70 PSIG
(5) Needle valve
(6) Union fittings - MS-4 (1 required)
(7) Union fittings - MS-6 (2 required)

C. Consumable Materials

(1) D00006 Antiseize Compound, Bostic Never-Seez

D. References

(1) AMM 06-43-00/201, Engine and Nacelle Strut (Major Zone 400) Access Doors and Panels
(2) AMM 24-22-00/201, Electrical Power - General
(3) AMM 36-00-00/201, Pneumatic Power - General
(4) AMM 36-11-16/401, Fan Air Modulating Valve
(5) AMM 71-11-04/201, Fan Cowl Panel
(6) AMM 71-11-06/201, Core Cowl Panel
(7) AMM 78-31-00/201, Thrust Reverser System

E. Access

(1) Location Zones

411/421 Engine

(2) Access Panels

413/414/423/424 Fan Cowl Panel
415/416/425/426 Fan Reverser

F. Prepare for the Test

S 865-090

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) Remove pneumatic power (AMM 36-00-00/201).

S 045-091

WARNING: DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

S 015-092

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

(3) Open the applicable thrust reverser (AMM 78-31-00/201).

S 715-093

(4) The table below shows the pressures you will see during the test of the FAMV.

	Ps	Pc
FAMV Minimum Closing Pressure	30 Psi	<10 Psi
FAMV Fully Closed Pressure	30 Psi	<12 Psi
FAMV Control Pressure	60-70 Psi	9-12 Psi
FAMV Minimum Opening Pressure	60-70 Psi	>8 Psi
FAMV Fully Open Pressure	60-70 Psi	>3.5 Psi

G. Functional Test of the FAMV (Fig. 506)

NOTE: During the test you will be asked some questions. Each question will have a yes or no answer. Each yes or no answer gives a recommended action, for example: NO, replace the FAMV (AMM 36-11-16/401). You can continue with the test without doing the action if you want to see other characteristics of the test. However, you should do the recommended action after you complete the test.

S 215-094

(1) Look at the position indicator on the manual override nut on the FAMV (Fig. 506). Is the FAMV in the fully open position?
   (a) NO, replace the FAMV (AMM 36-11-16/401) if the FAMV is not locked closed for a specific reason.

(b) Yes, continue.

S 725-095

(2) Manually close the FAMV and do a check for smooth (not sticky) operation of the FAMV and linkage from the full open position to the full closed position.

NOTE: Make sure you move the override locking lever to allow you to turn the manual override nut.

When you manually close the FAMV you should feel some resistance. However, the operation to manually open the FAMV should be smooth.

S 865-096

(3) Release the manual override nut and let the FAMV go to the full open position.
(a) Make sure the valve goes to the full open position.

S 725-097

(4) Was the operation of the FAMV smooth?
(a) NO, replace the FAMV (AMM 36-11-16/401).
(b) YES, continue.

S 435-098

(5) Remove the inlet pressure sense line at the manual override nut on the FAMV.
(a) Install a cover on all open sense lines and fittings to keep out unwanted material.

S 485-099

(6) Install the nitrogen (air) supply pressure (Ps) source and supply pressure gage to the inlet pressure sense line connection on the manual override nut.

S 795-100

CAUTION: WHEN YOU BEGIN TO INCREASE THE SUPPLY PRESSURE, DO NOT EXCEED THE PRESSURE LIMITS THAT ARE GIVEN. DAMAGE TO THE COMPONENTS CAN OCCUR.

(7) Slowly increase Ps to 60-70 PSIG.

S 795-101

(8) Do a check of the sense lines to and from the FAMV and the fan air temperature sensor for leakage.

S 795-102
(9) Repair all abnormal leakage.

NOTE: Nitrogen may be heard leaking from ambient vent orifices inside the FAMV. This is normal and requires no corrective action.

S 215-103
(10) Do a check of the position indicator on the FAMV. Is the FAMV in the fully closed position.
(a) YES, Decrease Ps to 0 PSIG. Go to step 4.G.(11).
(b) NO, do the steps that follow:
1) Decrease Ps to zero.
2) Replace the FAMV (AMM 36-11-16/401).

S 035-104
(11) Disconnect the fan air temperature sensor sense line at the connection on the FAMV (Fig. 506).

S 485-105
(12) Install the fitting on the fan air temperature sensor union on the FAMV.

S 485-106
(13) Install a needle valve and control pressure (Pc) gage to the fitting for the fan air temperature sensor on the FAMV.
(a) Make sure the needle valve is open.

S 485-107
(14) Install a test line from the needle valve to the disconnected fan air temperature sensor sense line (Fig. 506).

S 725-108
(15) Slowly increase Ps to 30 PSIG and monitor Pc when the FAMV starts to close.

NOTE: The FAMV should begin to go to the closed position before Pc = 10 PSIG. The FAMV should be in the fully closed position when Pc = 10-12 PSIG.

S 725-109
(16) Did the FAMV start to close with Pc less than 10 PSIG?
  (a) NO, do the steps that follow:
    1) Decrease Ps to zero.
    2) Replace the FAMV (AMM 36-11-16/401).
  (b) YES, continue.

S 725-110
(17) Was the FAMV in the fully closed position with Pc less than 12 PSIG?
  (a) NO, do the steps that follow:
    1) Decrease Ps to zero.
    2) Replace the FAMV (AMM 36-11-16/401).
  (b) YES, continue.

S 725-111
(18) Continue to slowly increase Ps to 60-70 PSIG.

S 725-112
(19) Is the FAMV in the fully closed position?
  (a) NO, do the steps that follow:
    1) Decrease Ps to zero.
    2) Replace the FAMV (AMM 36-11-16/401).
  (b) YES, continue.

S 725-113
(20) Is Pc greater than 12 PSIG?
  (a) YES, do the steps that follow:
    1) Decrease Ps to zero.
    2) Replace the FAMV (AMM 36-11-16/401).
  (b) NO, continue.

S 215-114
(21) Is Pc less than 9 PSIG?
  (a) YES, close the needle valve.
    1) Is Pc still less than 9 PSIG?
      a) YES, decrease Ps to zero and the replace FAMV (AMM 36-11-16/401).

b) NO, decrease Ps to zero and replace the fan air temperature sensor (AMM 36-11-17/401).

(b) NO, Continue.

S 025-115

(22) Close the needle valve and disconnect test line from needle valve (Fig. 506).

S 725-116

(23) Slowly open the needle valve and reduce Pc until the FAMV begins to open.

NOTE: The FAMV should begin to open before Pc is 8 PSIG.

S 725-117

(24) Did the FAMV begin to open before Pc = 8 PSIG?

(a) NO, do the steps that follow:

1) Decrease Ps to zero.

2) Replace the FAMV (AMM 36-11-16/401).

(b) YES, continue.

S 725-118

(25) Continue to slowly open the needle valve and monitor when the FAMV is in the full open position.

NOTE: The FAMV should be fully open before Pc is 3.5 PSIG.

S 725-119

(26) Is the FAMV in the fully open position before Pc = 3.5 PSIG?

(a) NO, do the steps that follow:

1) Decrease Ps to zero.

2) Replace the FAMV (AMM 36-11-16/401).

(b) YES, continue. The FAMV is satisfactory.

S 725-120

(27) Decrease Ps to 0 PSIG.

H. Put the Airplane to Its Usual Condition

S 085-121

(1) Remove the nitrogen (air) source, supply pressure gage, hoses and fittings from the manual override nut connection.

S 095-122

(2) Remove any covers that were installed on the open sense lines and fittings.

S 085-123

(3) Remove the control pressure gage, hoses, fittings and needle valve from the sense line connection for the fan air temperature sensor.

S 645-124

(4) Apply antiseize compound to the fittings of the supply pressure sense line and sense line for the fan air temperature sensor.

S 435-125

(5) Connect the supply pressure sense line at the manual override nut.

S 435-126

(6) Connect the sense line for the fan air temperature sensor to the FAMV.

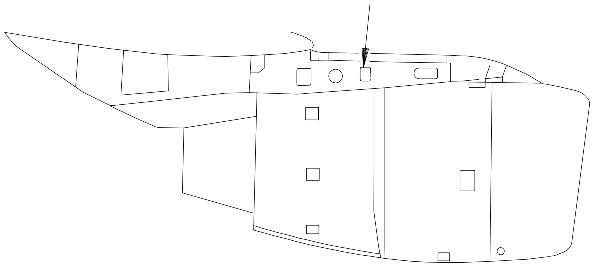
S 415-127

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.

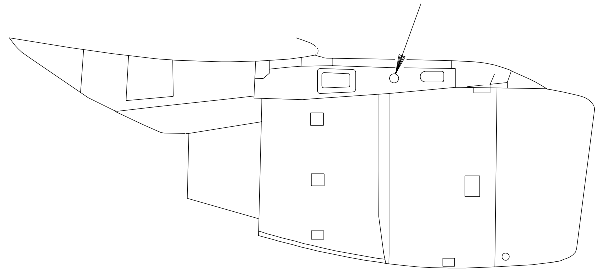
(7) Close the applicable thrust reversers (AMM 78-31-00/201).

S 445-128

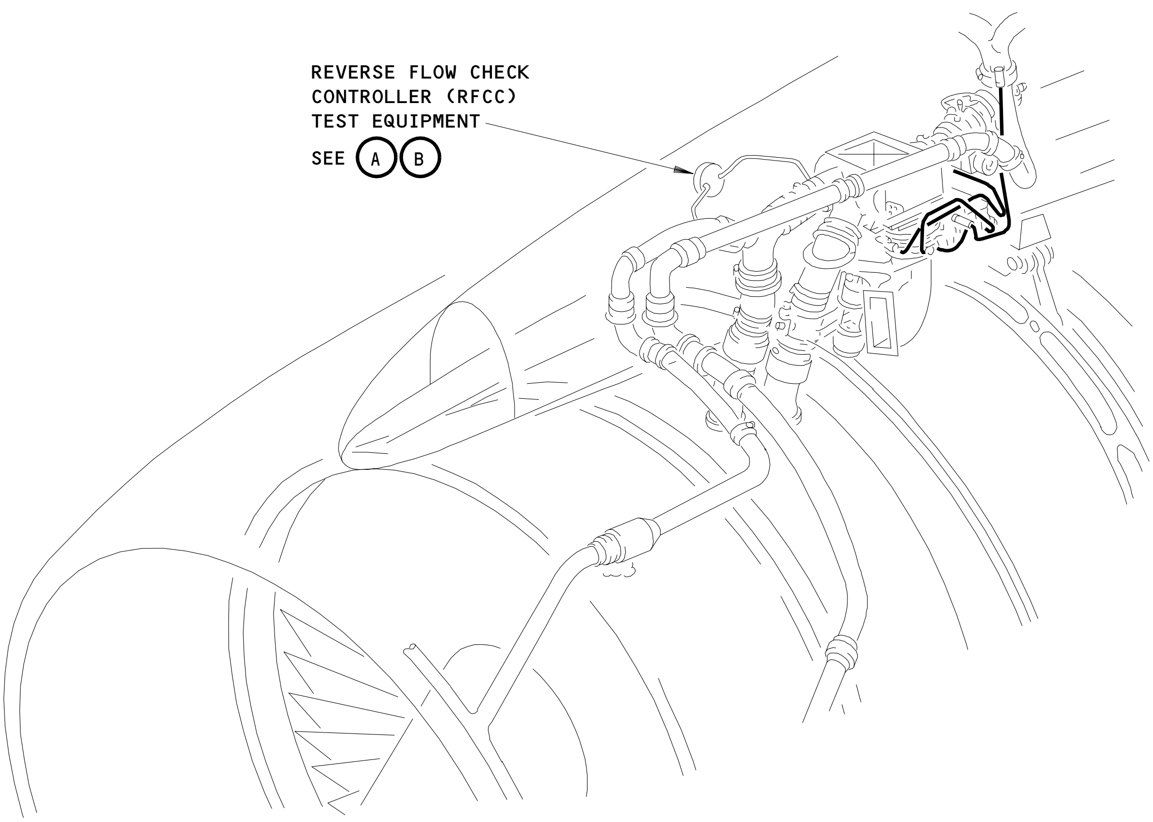
(8) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).



RR RB211-535 LEFT ENGINE
(INBOARD SIDE)

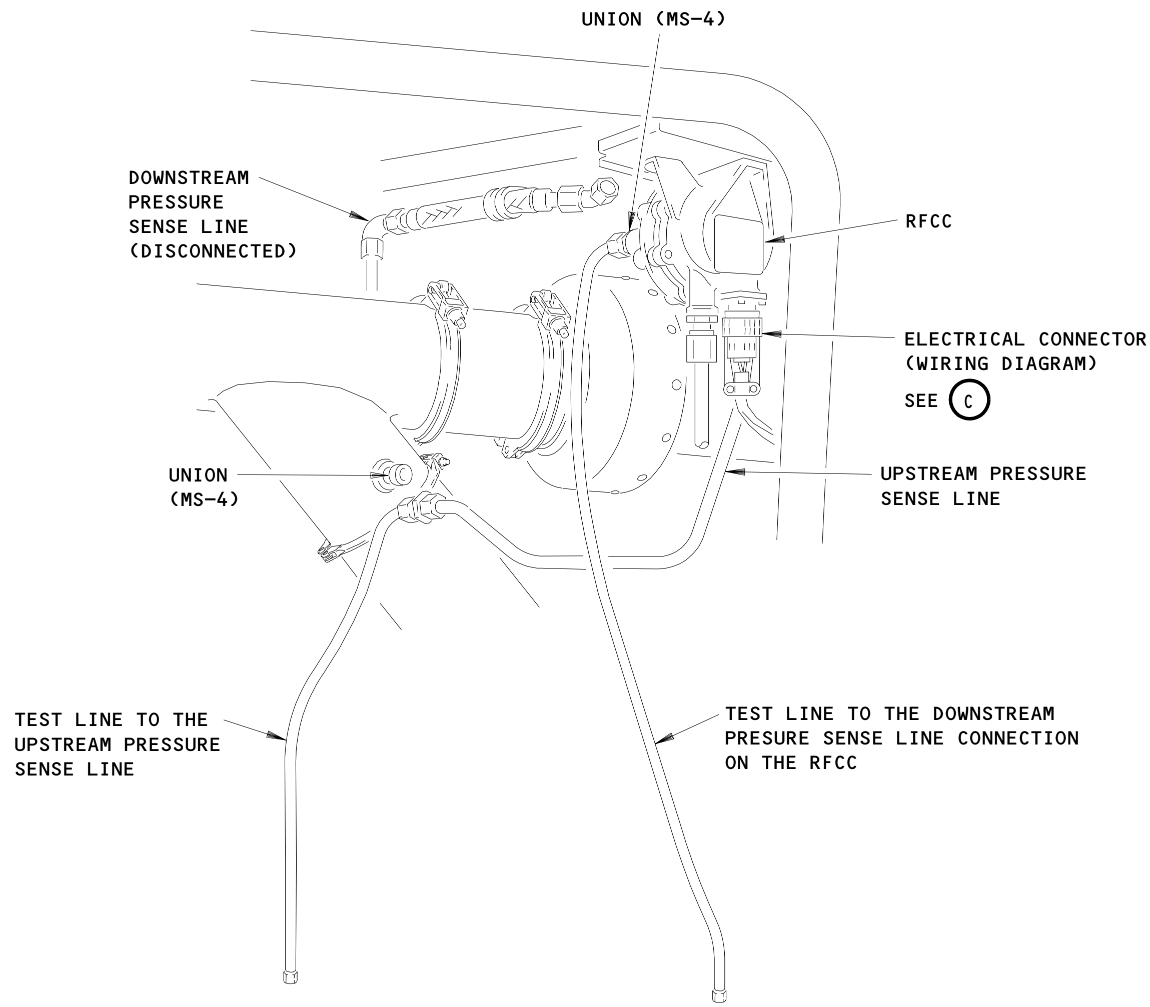


RR RB211-535 RIGHT ENGINE
(OUTBOARD SIDE)



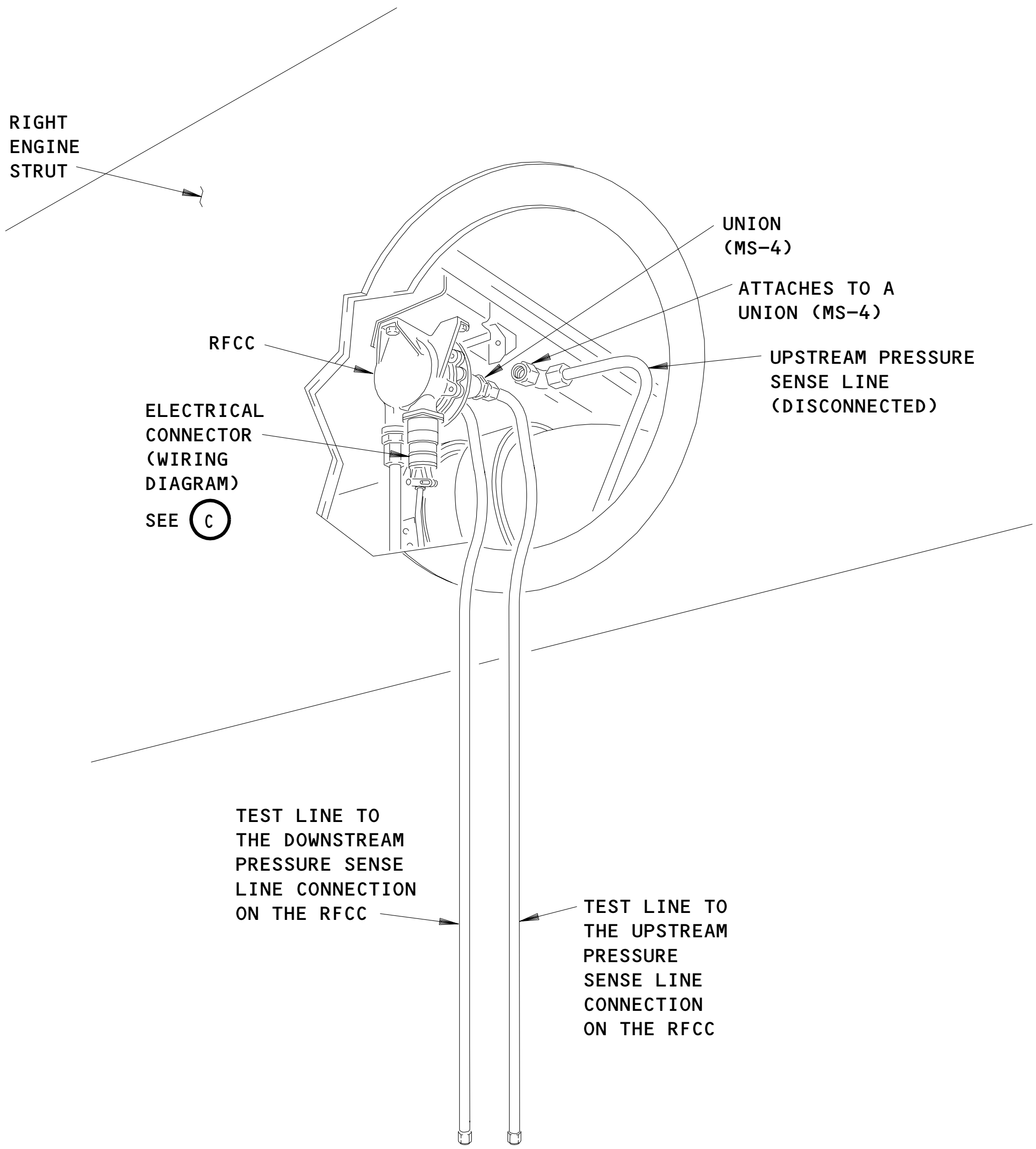
RR RB211-535

Reverse Flow Check Controller Test Equipment
Figure 507 (Sheet 1)

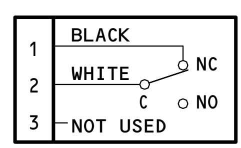


RFCC TEST EQUIPMENT
(LEFT ENGINE STRUT)
A

Reverse Flow Check Controller Test Equipment
Figure 507 (Sheet 2)



RFCC TEST EQUIPMENT
(RIGHT ENGINE STRUT)
B



ELECTRICAL CONNECTOR
WIRING DIAGRAM
C

Reverse Flow Check Controller Test Equipment
Figure 507 (Sheet 3)

TASK 36-00-23-705-154

5. Reverse Flow Check Controller (RFCC) Test

A. General
   (1) This task will perform a test of the RFCC while the RFCC is on-wing.
   (2) References to lung power in the functional test section implies that at least 0.33 psig of pressure is applied in the functional test.

B. Equipment
   (1) Pressure hose - 0-50 PSIG
   (2) UNION Fittings - MS-4 (2 required)
   (3) Volt/Ohmmeter

C. Consumable Materials
   (1) D00006 - Antiseize Compound, Bostik Never-Seez

D. References
   (1) AMM 06-41-00/201, Fuselage (Major Zones 100 and 200) Access Doors and Panels
   (2) AMM 06-43-00/201, Engine and Nacelle Strut (Major Zone 400) Access Doors and Panels
   (3) AMM 24-22-00/201, Electrical Power - General
   (4) AMM 36-00-00/201, Pneumatic Power - General
   (5) AMM 36-11-09/201, Air Supply Pressure Regulating and Shutoff Valve
   (6) AMM 36-11-18/401, Reverse Flow Check Controller

E. Access
   (1) Location Zones

119/120	Main Equipment Center
433/443	Nacelle Strut and Mid-Structure

   (2) Access Panels

119BL	Access Panel for the Main Equipment Center
433HR/443BR	Access Panel for the RFCC

F. Prepare for the Test (Fig. 507)

NOTE: During the test you will be asked some questions. Each question will have a yes or no answer. Each yes or no answer gives a recommended action, for example: NO, replace the RFCC (AMM 36-11-18/401). You can continue with the test without doing the action if you want to see other characteristics of the test. However, you should do the recommended action after you complete the test.

S 865-129

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) Remove Pneumatic Power (AMM 36-00-00/201).

S 865-130
(2) Supply electrical power (AMM 24-22-00/201).

S 865-131
(3) Make sure these circuit breakers, on the P11 panel, are closed:
(a) 11Q10, ENG BLD L
(b) 11Q19, R ENG BLEED

S 865-132
(4) Open the applicable circuit breaker, on the P11 panel, and attach a DO-NOT-CLOSE tag:
(a) 11B31 L ENGINE SPEED CARD
(b) 11B32 R ENGINE SPEED CARD

S 865-133
(5) Put the L(R) ENG OFF Bleed switch-light to the ON position.

S 865-134
(6) Make sure the L(R) fire handle is not pulled.

S 015-135
(7) Open the access panel for the RFCC on the nacelle strut (AMM 06-43-00/201).

S 035-136
(8) On the left strut, remove the upstream sense line at the duct (Fig. 507).

S 035-137
(9) On the right strut, remove the upstream sense line at the RFCC (Fig. 507).

S 035-138
(10) Remove the downstream sense line at the RFCC.

S 425-139

(11) Install the test lines to the upstream and downstream connections to the RFCC.

NOTE: The upstream and downstream sense lines get pnuematic pressure input from upstream and downstream of the PRSOV.

G. Functional Test of the RFCC

S 015-140

(1) Get access to the PRSOV in the strut.

S 725-141

(2) Use lung power to blow into the upstream test line for 10 seconds.

S 725-155

(3) Use lung power to blow into the downstream test line.
Is the L(R) PRSOV solenoid retracted?

NOTE: When the solenoid retracts you will hear a click.

(a) NO, Check for continuity across the RFCC as follows:

WARNING: THE RFCC ELECTRICAL CONNECTOR WILL HAVE ELECTRICAL POWER APPLIED DURING THE TEST. TAKE STEPS TO AVOID SHOCK.

1) Remove the RFCC electrical connector.

NOTE: This check is accomplished as you blow into the downstream test line.

2) Measure for continuity across pins 1 and 2 of the RFCC.
a) If there is continuity replace the RFCC (AMM 36-11-18/401).

b) If there is no continuity then check for wiring or relay failures.

(b) YES, Continue.

S 725-142

(4) Use lung power to blow into the upstream test line.
Is the L(R) PRSOV solenoid extended?

NOTE: When the solenoid extends you will hear a click.

(a) NO, Check for continuity across the RFCC as follows:

WARNING: THE RFCC ELECTRICAL CONNECTOR WILL HAVE ELECTRICAL POWER APPLIED DURING THE TEST. TAKE STEPS TO AVOID SHOCK.

1) Remove the RFCC electrical connector.
2) Measure for continuity across pins 1 and 2 of the RFCC.
a) If there is no continuity replace the RFCC (AMM 36-11-18/401).
b) If there is continuity then check for wiring or relay failures.

(b) Yes, the RFCC is satisfactory.

H. Put the Airplane to Its Usual Condition

S 435-143

(1) If necessary, reconnect the RFCC electrical connector.

S 085-144

(2) Remove the test lines from the upstream and downstream ports.

S 645-145

(3) Apply antiseize compound to the upstream and downstream sense line fittings.

S 435-146

(4) On the right strut, install the upstream sense line at the RFCC.

S 435-147

(5) On the left strut, install the upstream sense line at the duct.

S 435-148

(6) Connect the downstream sense line to the RFCC.

S 415-149

(7) Close the access panel on the nacelle strut (AMM 06-43-00/201).

S 865-150

(8) Remove the DO-NOT-CLOSE tag and close the applicable circuit breaker on the P11 panel:
   (a) 11B31 L ENGINE SPEED CARD
   (b) 11B32 R ENGINE SPEED CARD

DISTRIBUTION - DESCRIPTION AND OPERATION

1. General
   A. The air supply distribution system regulates the temperature and pressure of supply air extracted from the engines. It also transports supply air from the pneumatic sources (engines, auxiliary power unit (APU), and ground air connectors) to the user systems within the airplane.
   B. Pneumatic Air Sources
      (1) The primary source of air for the pneumatic system is engine bleed air. Bleed air is extracted from the left and right engines at intermediate and high pressure ports.
      (2) Two secondary sources are the auxiliary power unit (APU) and three ground air carts. The APU is used with the airplane on the ground and as a backup system in flight. The ground air supply carts connect with three ground air connectors to supply compressed air to the airplane. The ground connectors are located on the wing to body fairing (two on the left side, one on the right side).
   C. Pneumatic Air Requirements
      (1) The pneumatic system supplies air for aircraft pressurization, air conditioning, wing leading edge and engine cowl thermal anti-icing, engine starting, hydraulic reservoir pressurization, total air temperature (TAT) probe ambient air induction, rain repellent system pressurization, and potable water tank pressurization.
   D. Air Supply Control
      (1) The Bleed Air Control Panel (control panel) on the pilot's overhead P5 panel provides air supply system control and indication. The control panel contains indication lights, duct pressure indicator, and four switch/lights which control valve position.
      (2) The HI STAGE light illuminates when a system overpressure occurs upstream of the PRSOV.
      (3) The BLEED light illuminates when a system overheat occurs.
      (4) The DUCT LEAK illuminates when one of the system duct leak sensors detect hot air indicating a duct leak.
   E. Engine Air Supply System (Fig. 2)
      (1) Each engine air supply system consists of the following components: pneumatic ducting, intermediate pressure check valve, high pressure shutoff valve, high stage (HS) pilot, air supply precooler, reverse flow check controller, fan air modulating valve, fan air temperature sensor, air supply pressure regulating and shutoff valve and bleed air overtemperature sensor.

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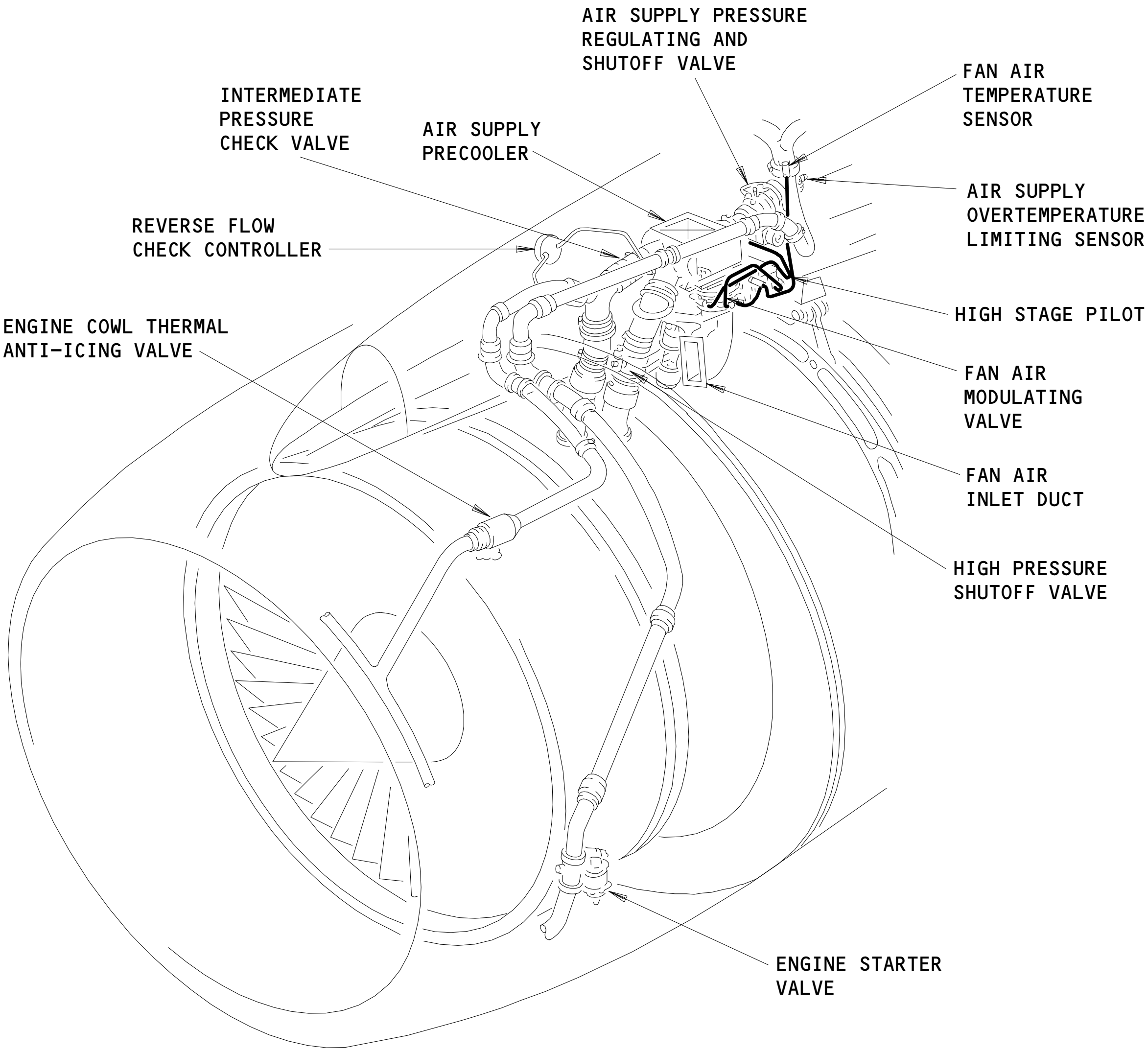
Figure 1



Engine Air Supply System
Figure 2

(2) The engine air supply system controls the pressure, temperature and airflow of engine bleed air. Air is bled off the engine at the intermediate (HP2) pressure bleed port and high (HP6) pressure bleed port. At high engine power settings, HP2 bleed air flows through the intermediate check valve, the precooler, the pressure regulating and shutoff valve, and to system users. The high pressure shutoff valve remains closed during most high power settings. If the HP6 bleed air does not exceed the HP6 pressure limit schedule (101-113 psig up to 31,000 ft and 88-98 psig above 31,000 ft), the high pressure valve opens. The intermediate pressure check valve closes whenever downstream pressure exceeds upstream pressure preventing backflow into the intermediate (HP2) engine compressor section.

(3) It is normal for the observed duct pressure (on the P5 panel) to decrease when the pneumatic pressure supply goes from the high stage port (HP6) to the low stage port (HP2). This could occur at different times for either the left or right sides. During this condition you can observe a split in duct pressure from the left to right side. This means that one side will have a higher duct pressure than the other side. You can see a graph of duct pressure versus EPR (engine power) in the "Low Duct Pressure" fault isolation procedure of the FIM 36-10-00/101. This graph gives the expected pressures for different engine power settings.

(4) Engine bleed air is ducted through the air supply precooler. The precooler is a crossflow, air to air, heat exchanger which uses engine fan air as its cooling medium. Fan air is routed to the precooler through the fan air modulating valve which is attached to the bottom of the precooler. The fan air modulating valve regulates the air flow to the precooler based on control air pressure from the fan air temperature sensor.

(5) Bleed air leaving the precooler is regulated by the pressure regulating and shutoff valve. The valve regulates bleed air between 40-53 psig. At engine settings when the bleed air pressure is below 40-53 psig, the valve is full open.

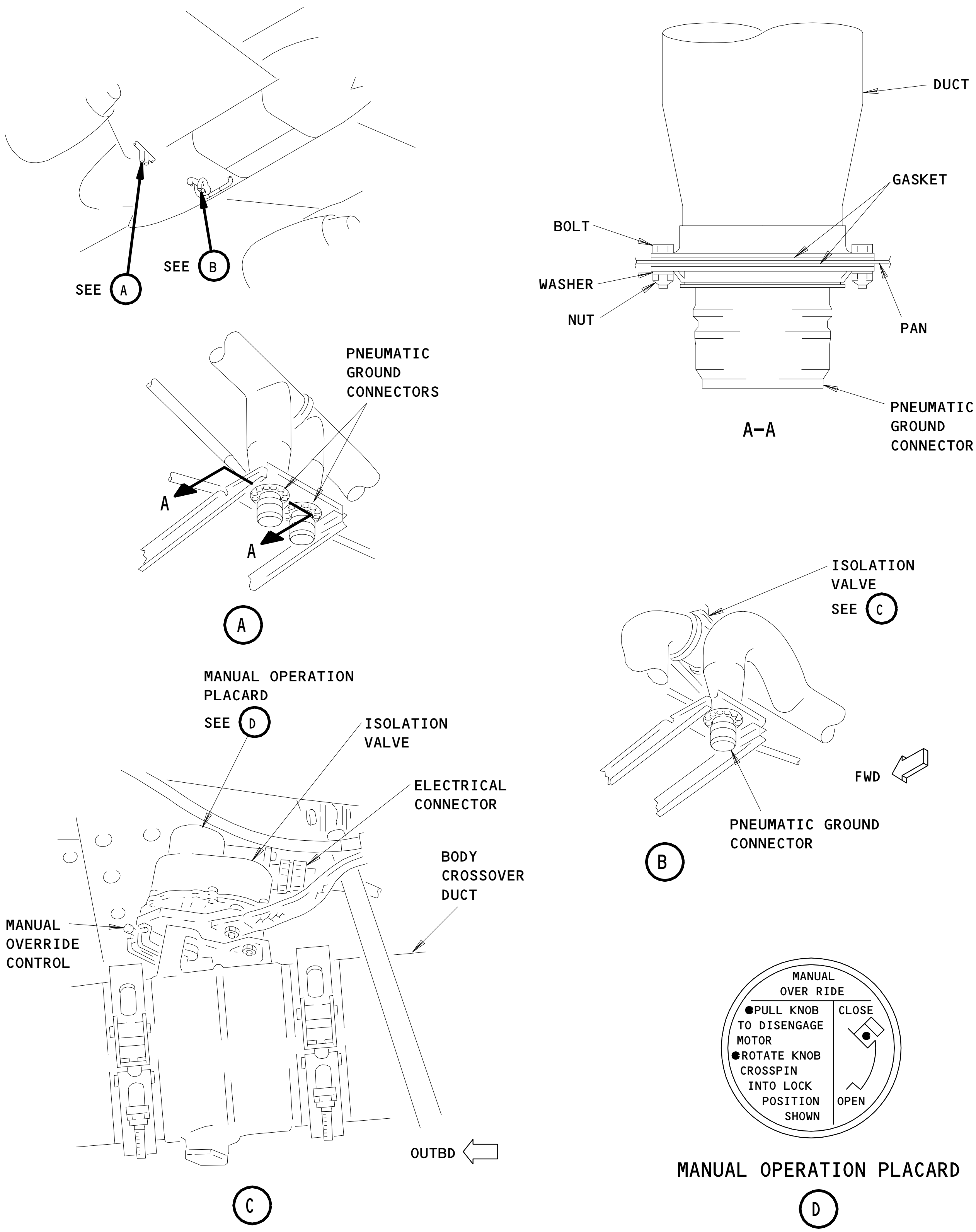
(6) A reverse flow check controller prevents pneumatic air from flowing back into the engine. When a backflow condition is sensed, the controller electrically actuates the closing solenoid of the pressure regulating and shutoff valve and the HS pilot.

2. Component Details

A. Pneumatic Ground Connector (Fig. 3)

(1) The pneumatic ground connector is a 3 inch diameter nipple check valve. The nipple mates with a standard ground cart connector. Three ground connectors are located in the wing to body fairing area. Two connectors on the left side and one connector on the right side of the fuselage are located aft of the ram air inlet doors.

(2) The ground connector is a spring loaded closed nipple check valve. The valve allows air flow in only one direction to the air supply ducting.

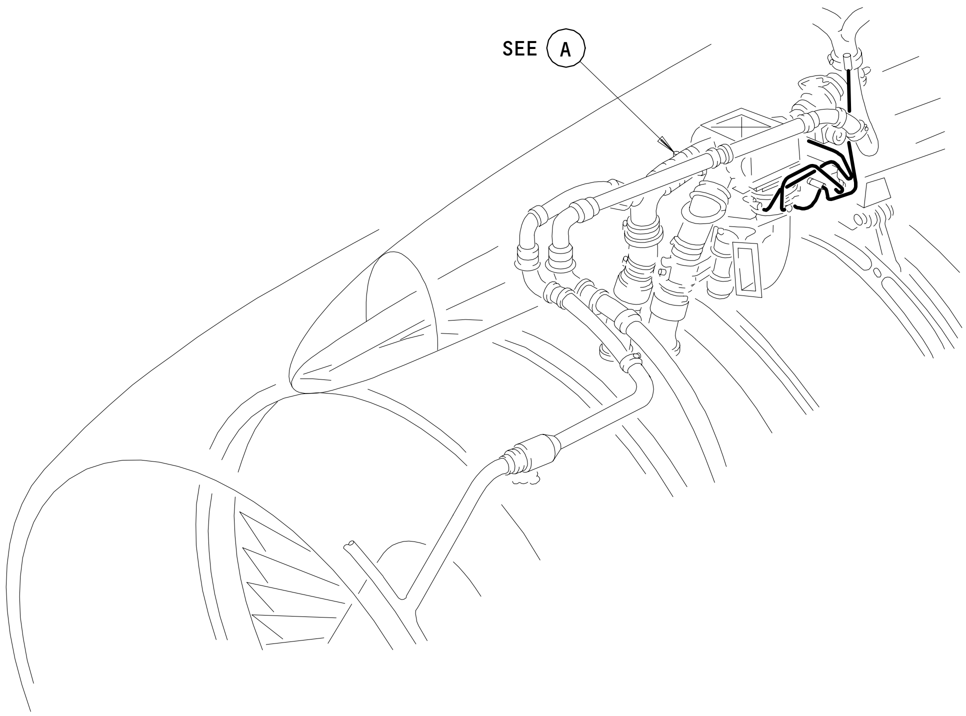


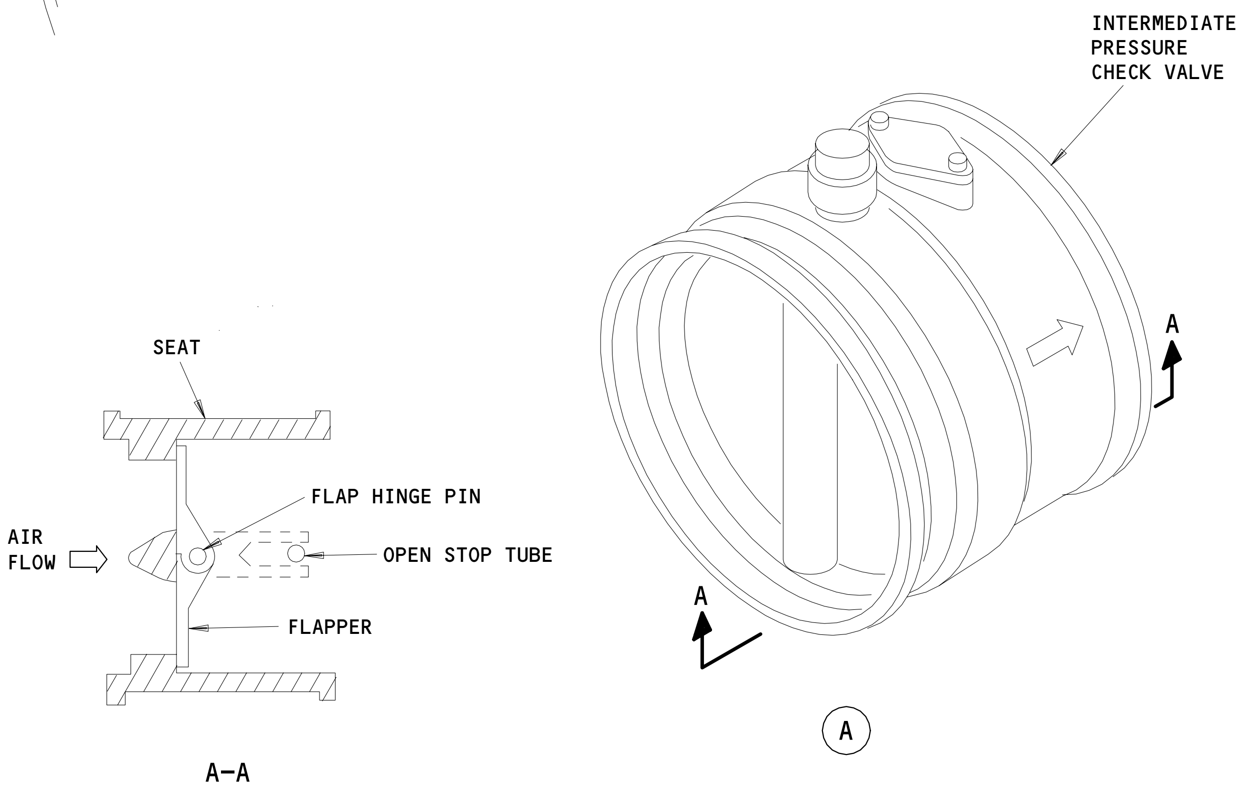
Pneumatic Ground Connector and Isolation Valve
Figure 3

B. Isolation Valve
  (1) One isolation valve located on the air supply body crossover duct allows cross bleeding of pneumatic air. The valve is 5 inches in diameter.
  (2) The valve consists of the following main components:
    (a) A 115v ac electrically driven, two position, actuator assembly. The actuator includes a manual override lever connected to the butterfly linkage inside the actuator assembly.
    (b) A cast aluminum valve body containing the valve butterfly and pivot assembly.
      1) The valve butterfly pivots around a shaft that connects with the actuator linkage when the body and actuator are assembled.

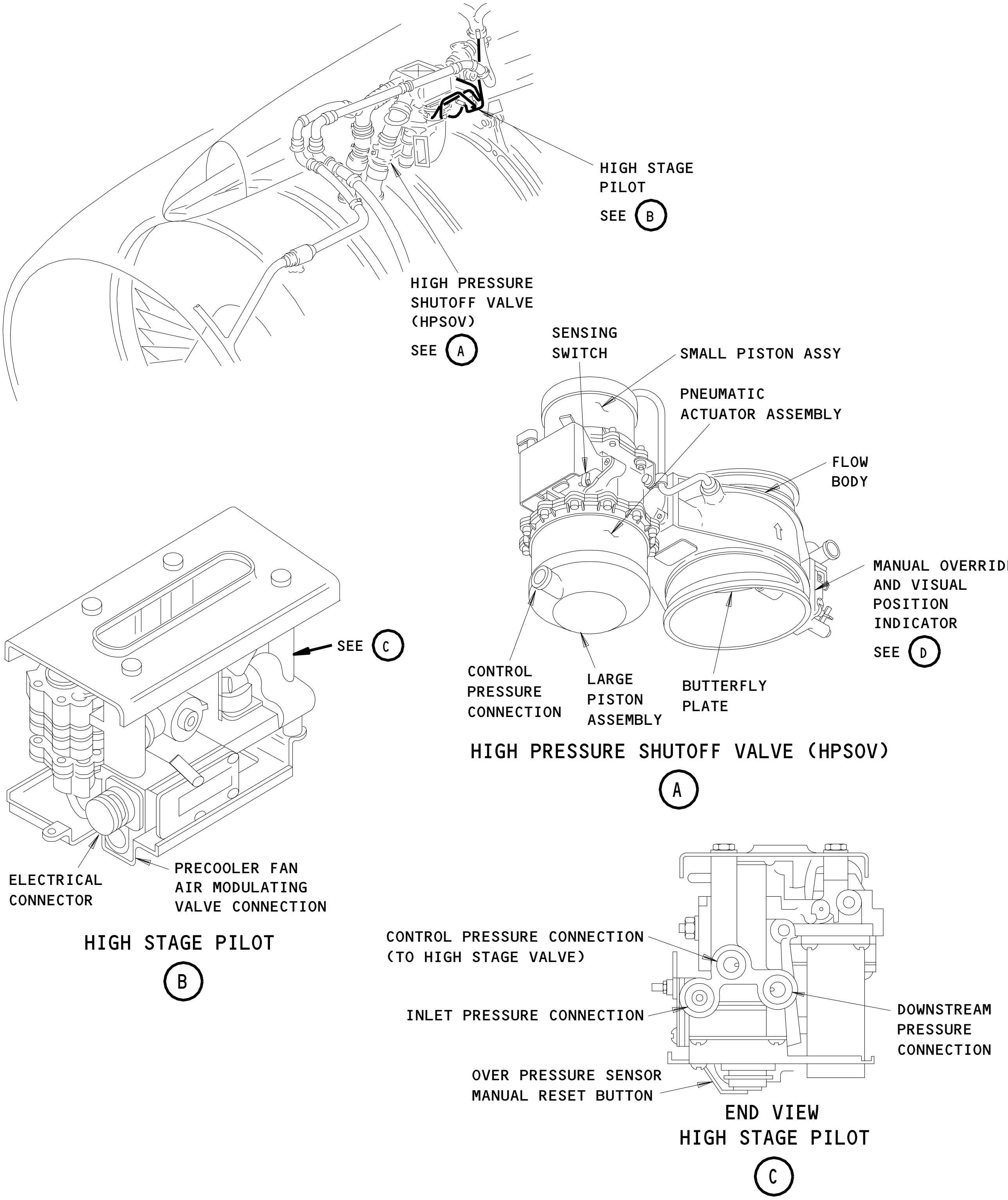
C. Intermediate Pressure Check Valve (Fig. 4)
  (1) The intermediate pressure check valve is a six inch flapper type check valve that serves two purposes:
    (a) The first is to allow unrestricted airflow from the intermediate pressure (HP2) engine bleed port.
    (b) The second function is to prevent higher pressure air from the high pressure shutoff valve from flowing back into the engine.
  (2) The intermediate pressure check valve has a valve body, a stop tube, and two semi-circular flappers. The flappers are hinged about a hinge pin that goes through the center of the valve body.
  (3) The valve flappers open when flow pressure in the direction of the valve body flow arrow is larger than the flow pressure in the opposite direction. The stop tube prevents the flappers from over-travel. Airflow on the flappers in the opposite direction pushes the flappers closed. When closed, the valve prevents airflow in the opposite direction.

D. High Pressure Shutoff Valve (Fig. 5)
  (1) The high pressure shutoff valve (HPSOV) is a pneumatically operated butterfly type valve. The valve is in the open area between the engine and the strut. Get access to the valve through the thrust reverser cowling.
  (2) The HPSOV is used to shutoff high pressure (HP6) air when intermediate pressure (HP2) air can meet air supply system requirements. The HPSOV is commanded open by the HS pilot when the following condition is met.
    (a) Sensed duct pressure upstream of the HPSOV is below the preset HP2/HP6 switchover limit. The switchover limit is set based on the required engine output to support air supply system demands using intermediate pressure (HP2) bleed pressure. If engine output is below the switchover limit, high pressure (HP6) air is used.

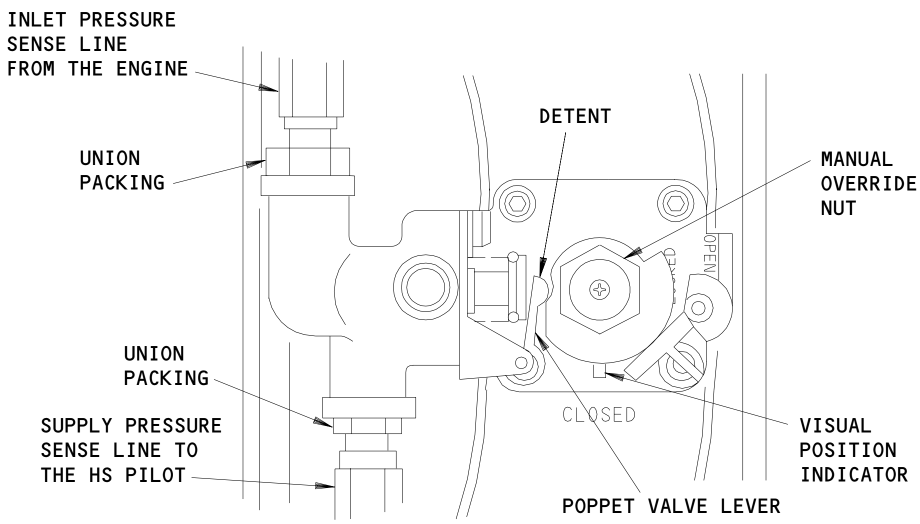




Intermediate Pressure Check Valve
Figure 4

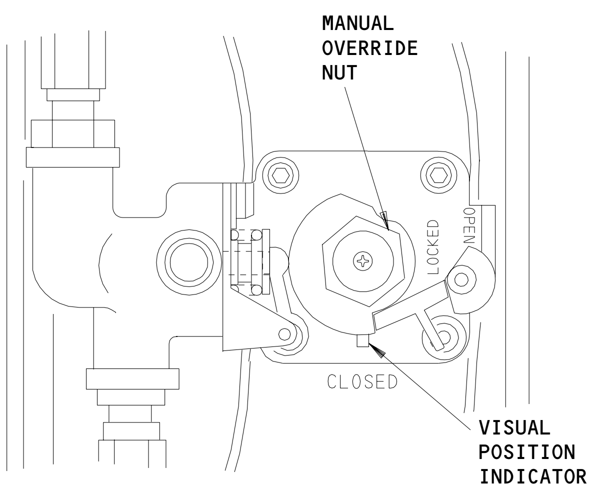


High Pressure Shutoff Valve and High Stage Pilot
Figure 5 (Sheet 1)



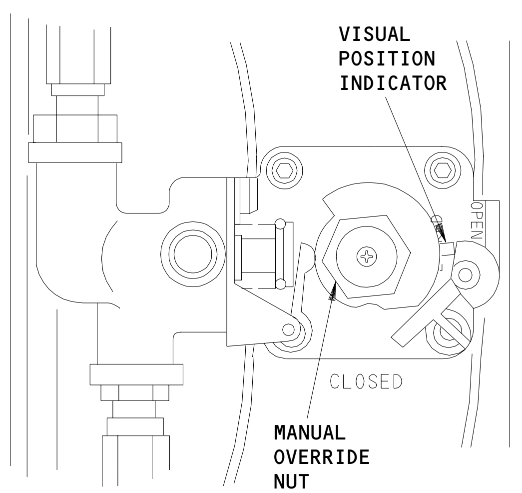
MANUAL OVERRIDE AND VISUAL POSITION INDICATOR
(THE HPSOV IS NOT LOCKED CLOSED)

D



MANUAL OVERRIDE AND
VISUAL POSITION INDICATOR
(THE HPSOV IS LOCKED CLOSED)

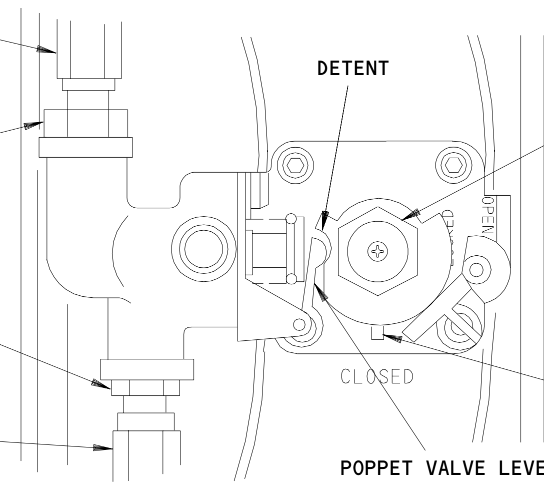
D



MANUAL OVERRIDE AND
VISUAL POSITION INDICATOR
(THE HPSOV IS MANUALLY OPEN)

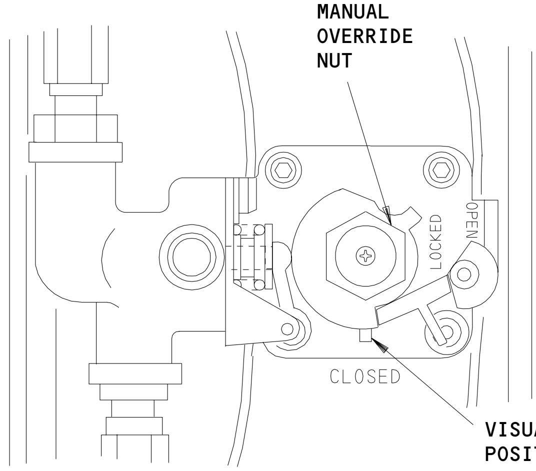
D

High Pressure Shutoff Valve and High Stage Pilot
Figure 5 (Sheet 2)



MANUAL OVERRIDE AND VISUAL POSITION INDICATOR
(THE HPSOV IS NOT LOCKED CLOSED)

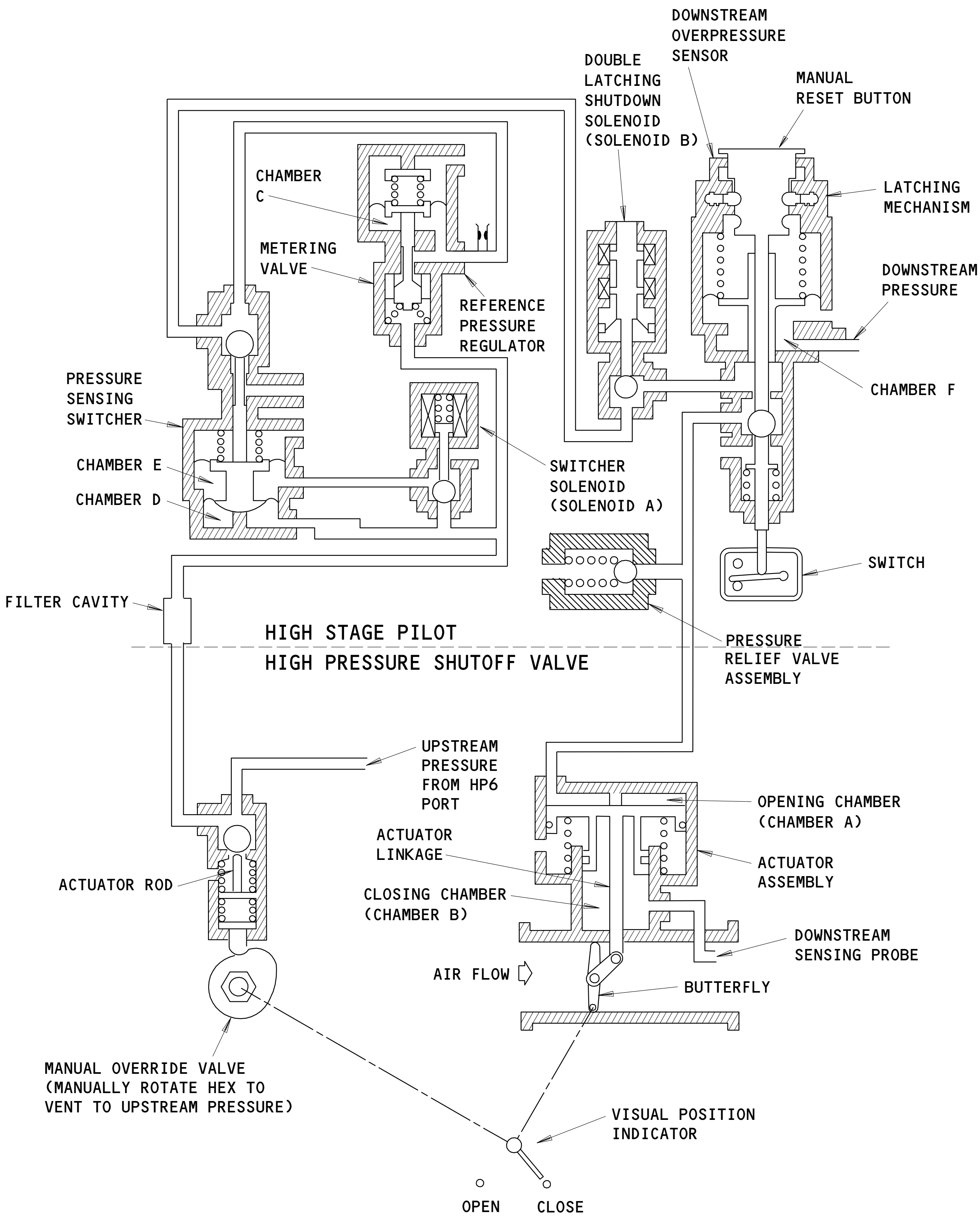
D



MANUAL OVERRIDE AND VISUAL POSITION INDICATOR
(THE HPSOV IS LOCKED CLOSED)

D

High Pressure Shutoff Valve and High Stage Pilot
Figure 5 (Sheet 3)



High Pressure Shutoff Valve and High Stage Pilot Schematic
Figure 5A

(3) Air from the HP6 port enters through the upstream pressure connection and is routed through the manual override valve to the high stage pilot. When the manual override hex is turned clockwise, the cam actuates a pushrod mechanism which moves the ball valve from its normal position to the opposite seat. Upstream pressure is shut off and the high stage pilot supply air is vented to ambient. The HPSOV butterfly is mechanically locked closed when the manual override hex is turned clockwise such that the lever is engaged in the closed lock detent. To unlock the butterfly requires that the lever be pulled out of the detent and that the hex is turned counterclockwise until it returns to its normal position.

(a) AIRPLANES WITHOUT S212N101-52 AND SUBSEQUENT HPSOV DASH NUMBERS;
The manual override hex cannot move the HPSOV butterfly to the open position.

(b) AIRPLANES WITH S212N101-52 AND SUBSEQUENT HPSOV DASH NUMBERS;
The manual overrride hex can be turned counterclockwise to open the HPSOV. The HPSOV cannot be locked open.

(4) When control pressure from the HS pilot becomes sufficient in the opening chamber, the butterfly plate starts to open. Air pressure is sensed downstream of the butterfly and is ported to the closing chamber through the downstream sense probe. The butterfly continues to open until the downstream pressure force in closing chamber plus the spring closing force are balanced by the pressure force in the opening chamber. The HPSOV butterfly will modulate in response to changes in upstream pressure to maintain a 55 psig downstream duct pressure. Regulation of the pressure in opening chamber is through the HS pilot.

(5) A pin connected to the butterfly shaft serves as a visual position indicator.

E. <u>High Stage (HS) Pilot</u> (Fig. 5)

(1) The HS pilot acts in conjunction with the high pressure shutoff valve to control the flow of high pressure (HP6) bleed air. The HS pilot is attached to the bottom of the strut above the engine. The HS pilot is cooled by air routed from precooler cooling air intake duct. Access is obtained by opening thrust reverser cowling.

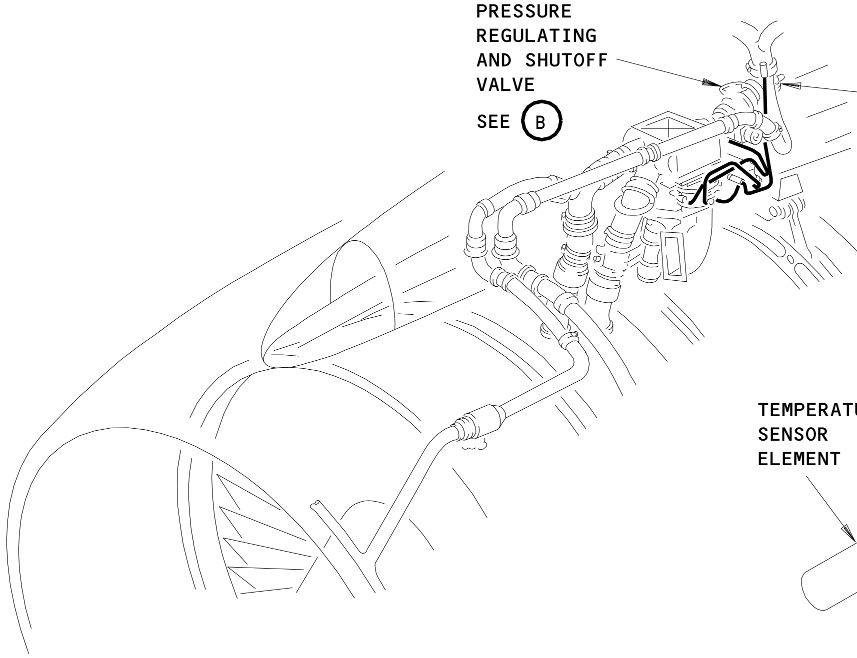
(2) The HS pilot controls pressure to the opening chamber of the high pressure shutoff valve.

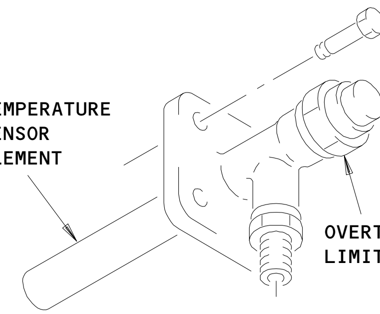
(3) The HS pilot contains three shutdown modes, which act by reducing control pressure to near zero, allowing the high pressure shutoff valve to close.

(4) Control pressure is established by the reference pressure regulator. Upstream pressure from the HP6 engine bleed port enters and flows through the metering valve portion of the reference pressure regulator into chamber C. Chamber C air pressure pushes against the diaphragm assembly. As the diaphragm moves up and overcomes the spring force the metering valve moves towards the closed position to maintain constant reference pressure regulator output pressure.

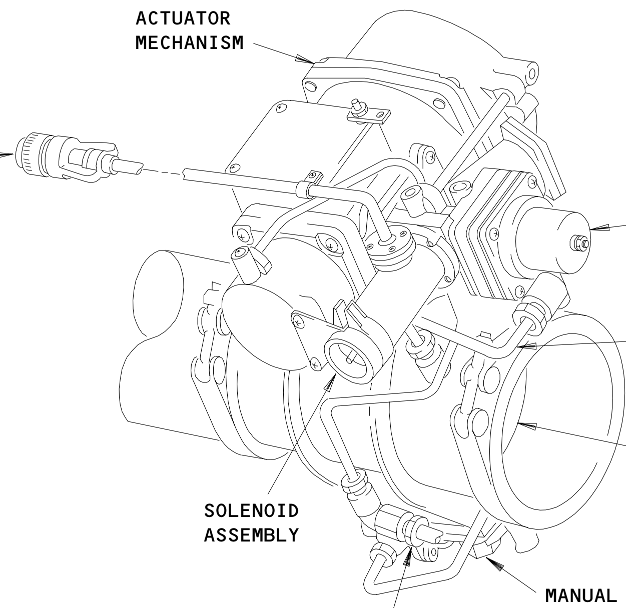
(5) Reference pressure is routed through three shutdown modes.
   (a) In mode 1, the pressure sensing switcher vents reference pressure to ambient when upstream pressure acting against a diaphragm in chamber D exceeds the spring force in the switcher. When the airplane exceeds 31,000 feet, the air supply altitude switch powers the switcher solenoid. The energized switcher solenoid moves the ball valve to the opposite seat shown. This permits upstream pressure to act on the diaphragms in chambers D and E venting the reference pressure to ambient.
   (b) In mode 2, the downstream overpressure sensor vents reference pressure to ambient when a downstream overpressure condition exists (125-135 psig downstream of the HPSOV). Downstream pressure acts on a diaphragm in chamber F of the downstream overpressure sensor. When an overpressure condition exists, the diaphragm pushes the latching mechanism to the upper position. The latching mechanism locks in the overpressure position allowing venting of reference pressure by moving the ball valve off its seat. Once locked the downstream overpressure sensor must be manually reset by depressing the manual reset button on the pilot. An overpressure condition will light the HI STAGE light on P5 panel.
   (c) In mode 3, the double latching shutdown solenoid vents reference pressure to ambient when the closing coil is energized. When the bleed air L or R ENG OFF switchlight on the pilot's overhead P5 panel is positioned to OFF, the respective L or R closing coil is energized.

F. <u>Air Supply Pressure Regulating and Shutoff Valve</u> (Fig. 6)
   (1) The air supply pressure regulating and shutoff valve maintains bleed air pressure to 40-53 psig. It shuts off bleed airflow in response to excessive downstream temperature or if commanded from the BLEED AIR L or R ENG switchlight on P5 panel. The valve is located in the strut compartment downstream of the precooler. Access is through the pressure regulating and shutoff valve access panel.
   (2) Under conditions of zero upstream pressure, the butterfly is held closed by the torsion spring. As upstream pressure begins to increase, the higher pressure is picked up by the upstream pressure probe and routed through the manual override to the reset reference regulator. This pressure passes around the spring-loaded open poppet valve to chamber A. When pressure in chamber A exceeds a predetermined level, pressure force against the diaphragm balances spring force holding the poppet valve open and the poppet valve moves toward the closed position, maintaining reset reference regulator output pressure within a predetermined range.
   (3) This reference pressure is routed through the solenoid to the actuator opening chamber. When pressure against the opening chamber piston exceeds torsion spring closing force, the piston moves and the butterfly begins to open.



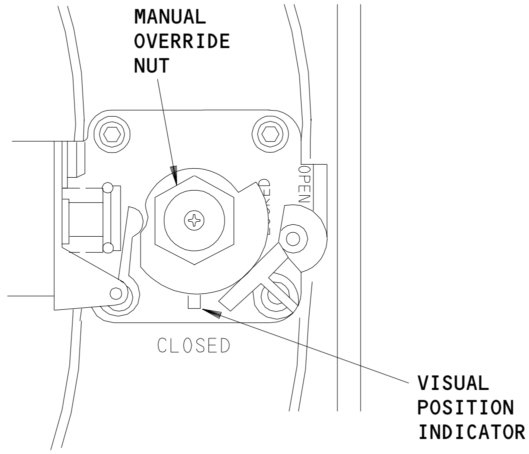


OVERTEMPERATURE
LIMITING SENSOR
A



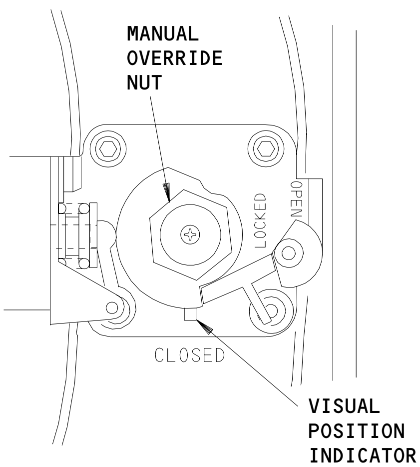
PRESSURE REGULATING AND SHUTOFF VALVE
B

Air Supply Pressure Regulating and Shutoff Valve and
Air Supply Overtemperature Limiting Sensor
Figure 6 (Sheet 1)



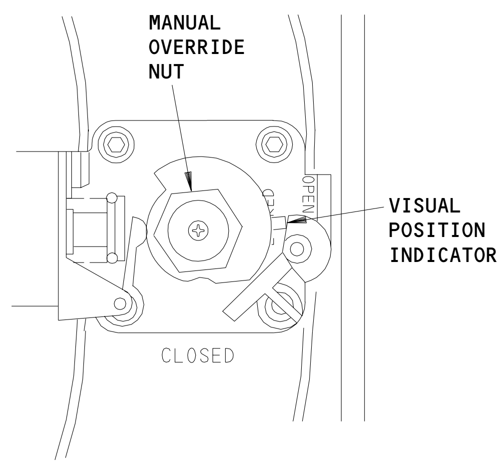
MANUAL OVERRIDE AND
VISUAL POSITION INDICATOR
(THE PRSOV IS NOT LOCKED CLOSED)

C



MANUAL OVERRIDE AND
VISUAL POSITION INDICATOR
(THE PRSOV IS LOCKED CLOSED)

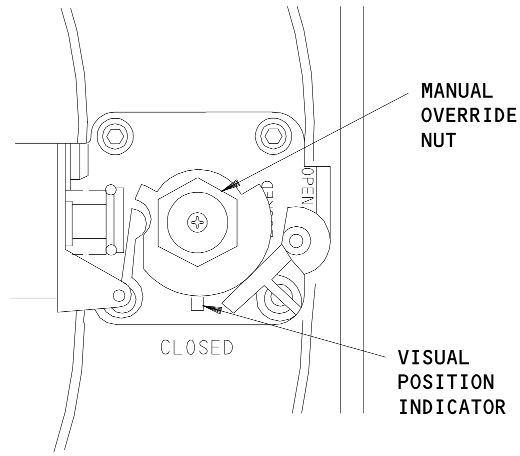
C



MANUAL OVERRIDE AND
VISUAL POSITION INDICATOR
(THE PRSOV IS MANUALLY OPEN)

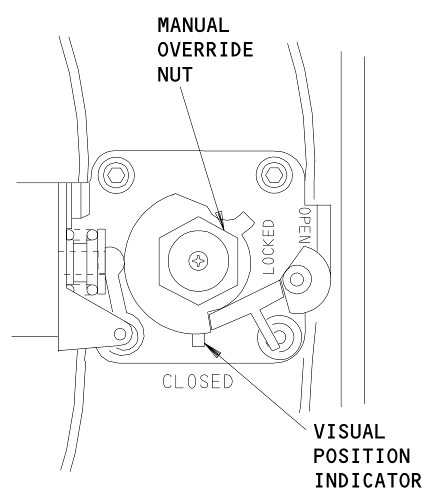
C

Air Supply Pressure Regulating and Shutoff Valve and
Air Supply Overtemperature Limiting Sensor
Figure 6 (Sheet 2)



MANUAL OVERRIDE AND VISUAL POSITION INDICATOR
(THE PRSOV IS NOT LOCKED CLOSED)

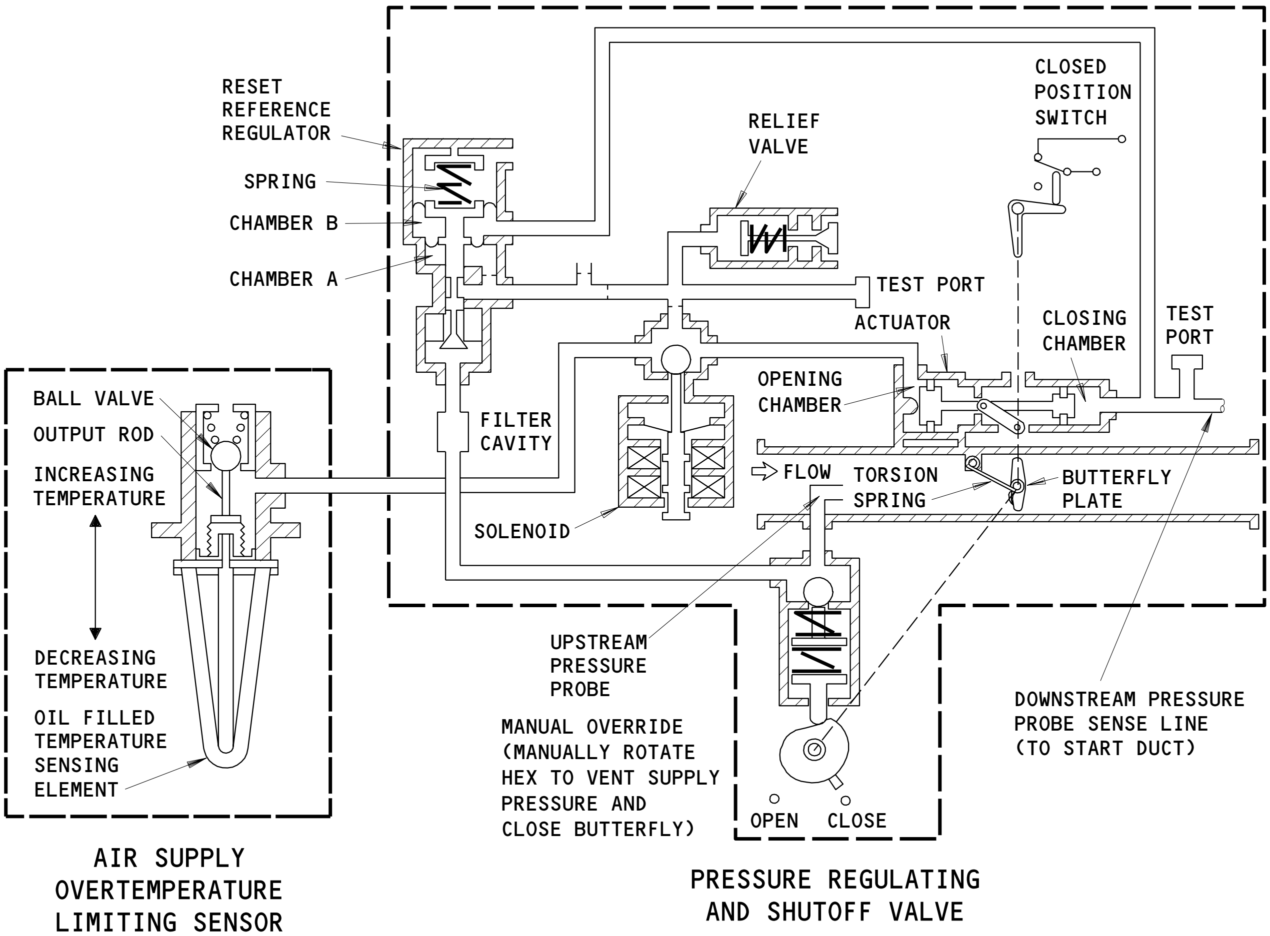
C



MANUAL OVERRIDE AND VISUAL POSITION INDICATOR
(THE PRSOV IS LOCKED CLOSED)

C

Air Supply Pressure Regulating and Shutoff Valve and
Air Supply Overtemperature Limiting Sensor
Figure 6 (Sheet 3)



Air Supply Pressure Regulating and Shutoff Valve and
Air Supply Overtemperature Limiting Sensor Schematic
Figure 6A

(4) As the butterfly opens, downstream pressure increases. This pressure is picked up by the downstream pressure probe and routed to the actuator closing chamber, where the pressure exerts a force against the small piston. When downstream pressure reaches a pre-determined level, pressure against the closing chamber piston plus spring closing force balance opening chamber piston force, holding the butterfly stationary until conditions change.

(5) If downstream pressure begins to decrease because of increased pneumatic system demands, pressure force against the closing chamber piston will be reduced, allowing opening chamber piston pressure to push the butterfly further open until downstream pressure increases to 43-45 psig or the valve is full open.

(6) If downstream pressure begins to increase because of reduced pneumatic system demands, the higher pressure will apply a greater force against the closing chamber piston. The increased closing piston force moves the butterfly toward the closed position, reducing downstream pressure to 43-45 psig.

(7) The reference pressure regulator is provided with a reset feature to adjust opening chamber pressure in response to changes in downstream pressure. Downstream pressure picked up by the downstream pressure probe is routed directly to chamber B of the reset reference regulator. The difference in surface area between the large and small diaphragms of chamber B results in chamber B pressure acting in accord with chamber A pressure, tending to close the regulator poppet valve against spring pressure.

(8) If downstream pressure begins to decrease, pressure in chamber B will be reduced. This reduction in chamber B pressure reduces the combined force exerted by chambers A and B, allowing spring force to open the regulator poppet valve wider. As the poppet valve opens, pressure in chamber A increases until the combined pressure force of chambers A and B again balances spring force holding the poppet valve open, stabilizing regulator output pressure at a new, higher level. The increased regulator output pressure in the actuator opening chamber acts on the piston, moving the butterfly toward the open position, which results in an increase in downstream pressure.

(9) If downstream pressure begins to increase, pressure will increase in chamber B, increasing the combined force exerted by chambers A and B against poppet valve opening spring force, moving the poppet valve toward the closed position. This reduces pressure in chamber A until the combined pressure force of chambers A and B again balances poppet valve opening spring pressure, this time with regulator output pressure at a lower level. The reduced regulator output pressure in the actuator opening chamber allows increased downstream pressure in the closing chamber and torsion spring force to move the butterfly toward the closed position, reducing downstream pressure.

(10) During system operation, when the butterfly is closed, the reference regulator will attempt to offset the decrease in downstream pressure by increasing reference regulator output pressure. As reference pressure increases above a pre-determined level, the relief valve will open and bleed off excess pressure to ambient, limiting reference pressure to that required for proper valve function.

(11) When the closing coil of the double latching solenoid is energized, the solenoid actuating rod moves the ball valve from the position shown to the opposite seat. This blocks off the flow of reference pressure to the actuator opening chamber and vents the opening chamber to ambient, allowing torsion spring force and remaining downstream pressure in the closing chamber to close the valve. When downstream pressure drops below reference pressure, the shuttle valve ball switches from the position shown to the opposite seat, routing reference pressure to the actuator closing chamber. This pressure assists the torsion spring in holding the butterfly closed. The solenoid contains a washer which holds the ball valve in the last position selected when electrical power is removed.

(12) Air supply overtemperature limiting sensor modulates the valve to maintain bleed air temperature at 450°F.

(13) When the manual override hex is turned clockwise, the cam actuates a pushrod mechanism which moves the ball valve from its normal position to the opposite seat. Upstream pressure is shut off and the reference regulator supply pressure is vented to ambient. This drops the pressure in the actuator opening chamber to ambient, allowing the butterfly to close. The butterfly is mechanically locked closed when the manual override hex is turned clockwise such that the lever is engaged in the closed lock detent. To unlock the butterfly requires that the lever be pulled out of the detent and that the hex is turned counterclockwise until it returns to its normal position.

(a) AIRPLANES WITHOUT S212N101-53 AND SUBSEQUENT PRSOV DASH NUMBERS;
The manual override hex cannot move the PRSOV butterfly to the open position.

(b) AIRPLANES WITH S212N101-53 AND SUBSEQUENT PRSOV DASH NUMBERS;
The manual overrride hex can be turned counterclockwise to open the PRSOV. The PRSOV cannot be locked open.

(14) The closed position switch provides remote indication of butterfly position. The closed position switch is connected to the OFF indicator light on the BLEED AIR L and/or R ENG switchlight.

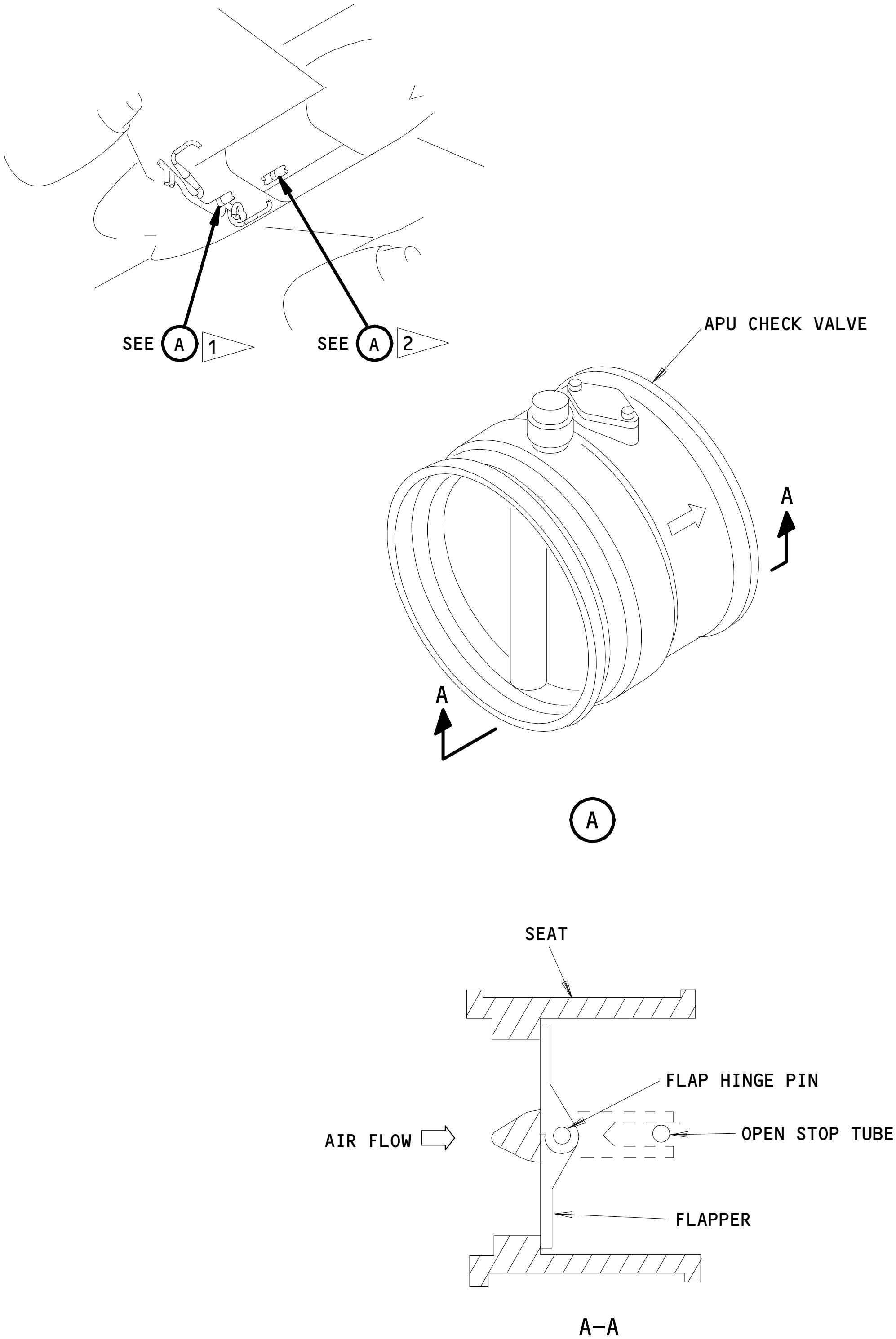
G. <u>Air Supply Overtemperature Limiting Sensor</u>

(1) The air supply overtemperature limiting sensor limits the temperature of the bleed air downstream of the PRSOV. The sensor vents reference pressure from the PRSOV to modulate the PRSOV toward closed. The sensor is located in the strut compartment aft of the PRSOV.

(2) Hermetically sealed fluid expands or contracts in response to changes in bleed air temperature. The fluid acts upon the bellows assembly to move the output rod connected to ball valve. When sensed temperature is above 450°F the ball valve moves off the valve seat allowing venting of reference pressure. At 495°F the ball valve is full open.

H. <u>APU Shutoff Valve</u> (Fig. 7)

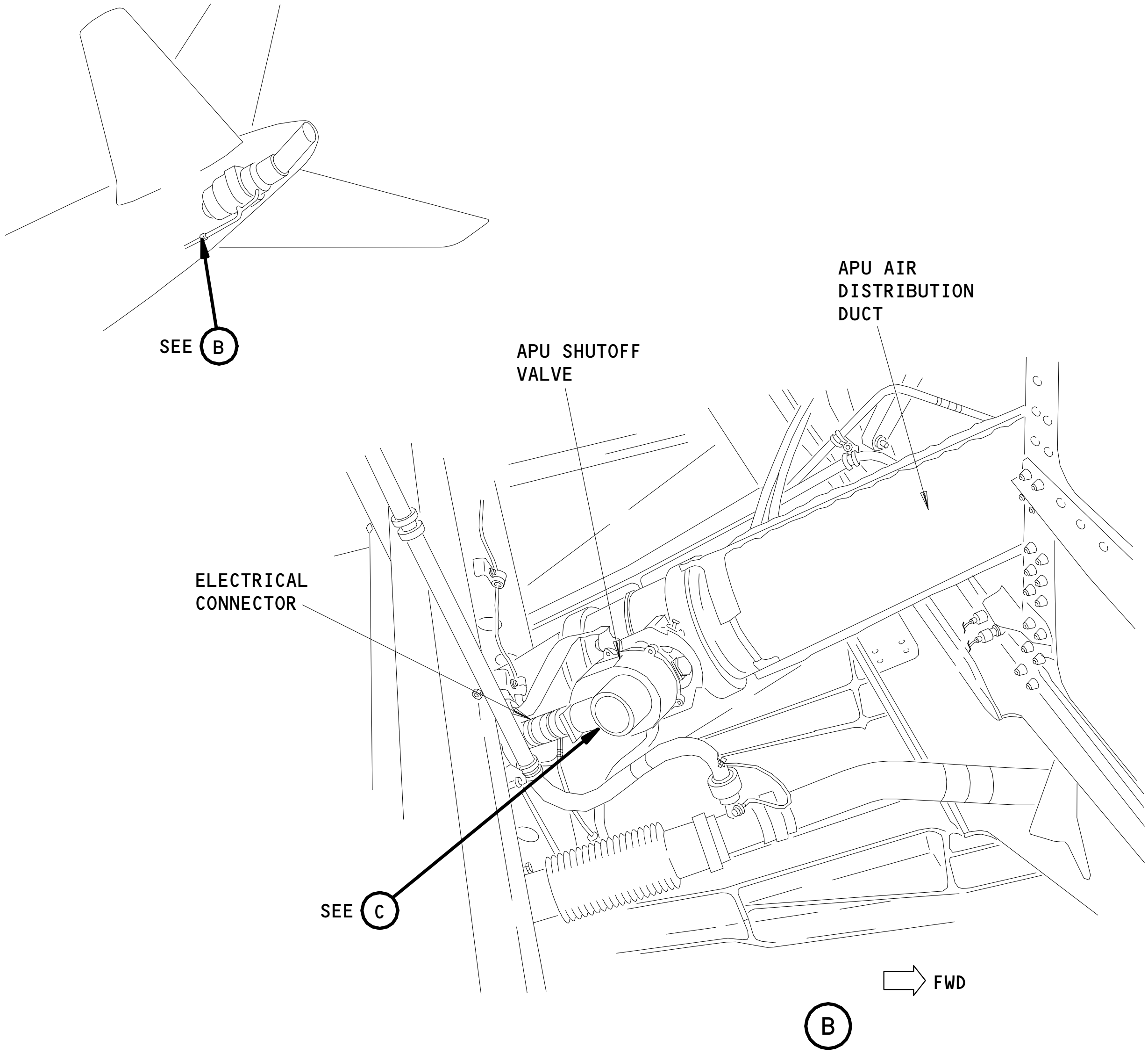
(1) The APU shutoff valve controls bleed air supplied from the APU. The valve is located between the pressure bulkhead and APU fire wall. The valve is 5 inches in diameter.

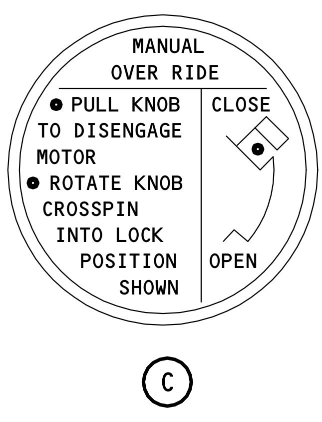


1 AIRPLANES WITHOUT THE OZONE CONVERTER

2 AIRPLANES WITH THE OZONE CONVERTER

APU Check Valve and APU Shutoff Valve
Figure 7 (Sheet 1)





APU Check Valve and APU Shutoff Valve
Figure 7 (Sheet 2)

(2) Valve operation is similar to the isolation valve.

I. APU Check Valve

(1) The APU check valve permits bleed air flow from the APU to body crossover ducting only.

(2) Check valve operation is similar to the intermediate pressure check valve.

J. Air Supply Precooler (Fig. 8)

(1) The air supply precooler cools bleed air to a temperature of 380 ± 20°F. The precooler is located in the strut compartment.

(2) The precooler is a crossflow, single-pass, air to air heat exchanger. The bleed air inlet is divided into high (HP6) and intermediate (HP2) inlet ports. Bleed air leaves the precooler and is directed to the PRSOV. Cooling air flow is controlled by the fan air modulating valve upstream of the cooling air inlet. Cooling air outlet is vented into the strut compartment and exhausted.

(3) The precooler weighs approximately 50 lb.

K. Fan Air Modulating Valve (Fig. 9)

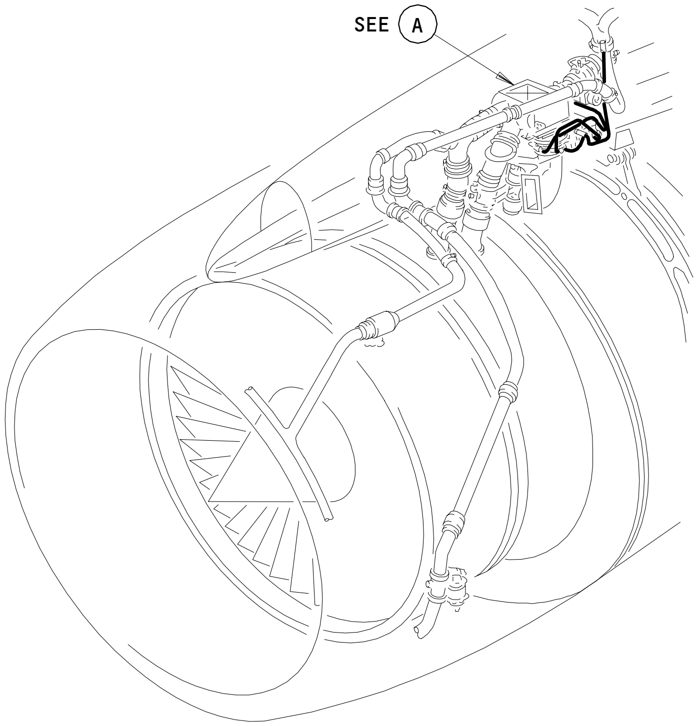
(1) The fan air modulating valve controls the amount of fan air supplied to the precooler. This regulates the temperature of the engine bleed air to 360-400 degrees F.

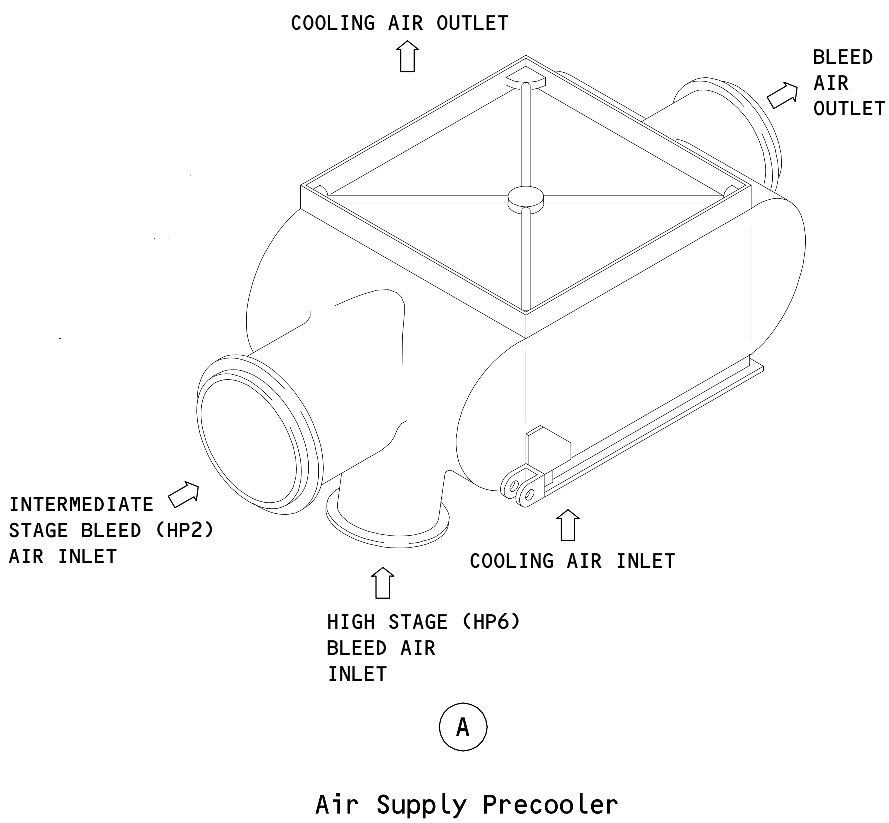
(2) The valve is located between the strut floor and the engine case. It is attached to the air supply precooler. Access to the valve is gained by opening the the thrust reverser cowling.

(3) The fan air modulating valve is a pneumatically activated, temperature controlled, spring loaded open butterfly modulating valve. The fan air temperature sensor operates almost the same way as the air supply overtemperature limiting sensor by controlling the reference pressure to the valve causing the butterfly to move. proportional to sensed temperature. A small amount of fan air is bled from the fan air modulating valve to cool the reverse flow check controller and high stage pilot.

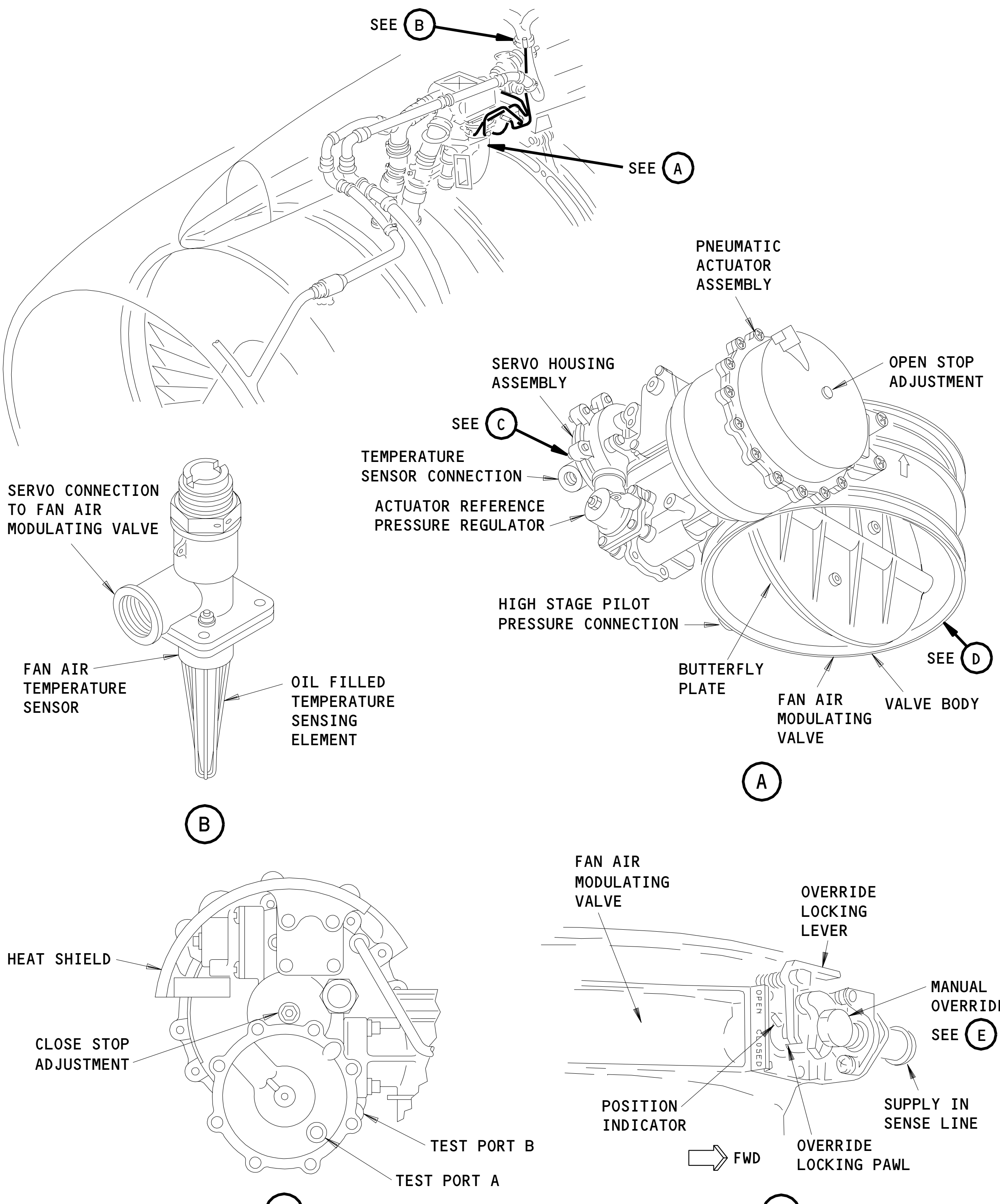
(4) The fan air modulating valve consists of an actuator housing assembly, valve body assembly, servo housing assembly and a manual override lock.

(a) The actuator housing assembly consists of a spring-loaded combination diaphragm and guide assembly, an actuator linkage assembly and a valve cover assembly. The combination diaphragm and guide assembly divides the actuator housing assembly into an open and a close chamber and is spring-loaded towards the open direction. Also the open chamber is vented to ambient. The actuator linkage assembly connects a valve shaft assembly to the diaphragm and guide assembly through a connecting link assembly. The valve cover assembly contains an open stop adjustment screw to limit diaphragm and guide assembly travel. The actuator housing assembly also contains a close stop adjustment screw to limit diaphragm and guide assembly travel and a removable screw providing test port B.

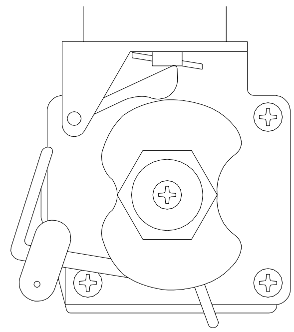




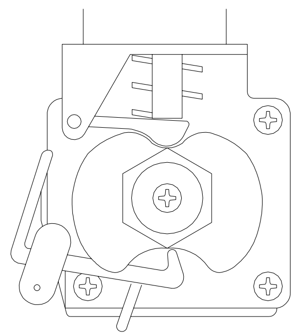
Air Supply Precooler
Figure 8



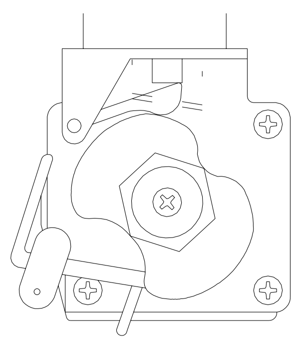
Fan Air Modulating Valve and Fan Air Temperature Sensor
Figure 9 (Sheet 1)



(THE FAN AIR MODULATING
VALVE IS LOCKED CLOSED)



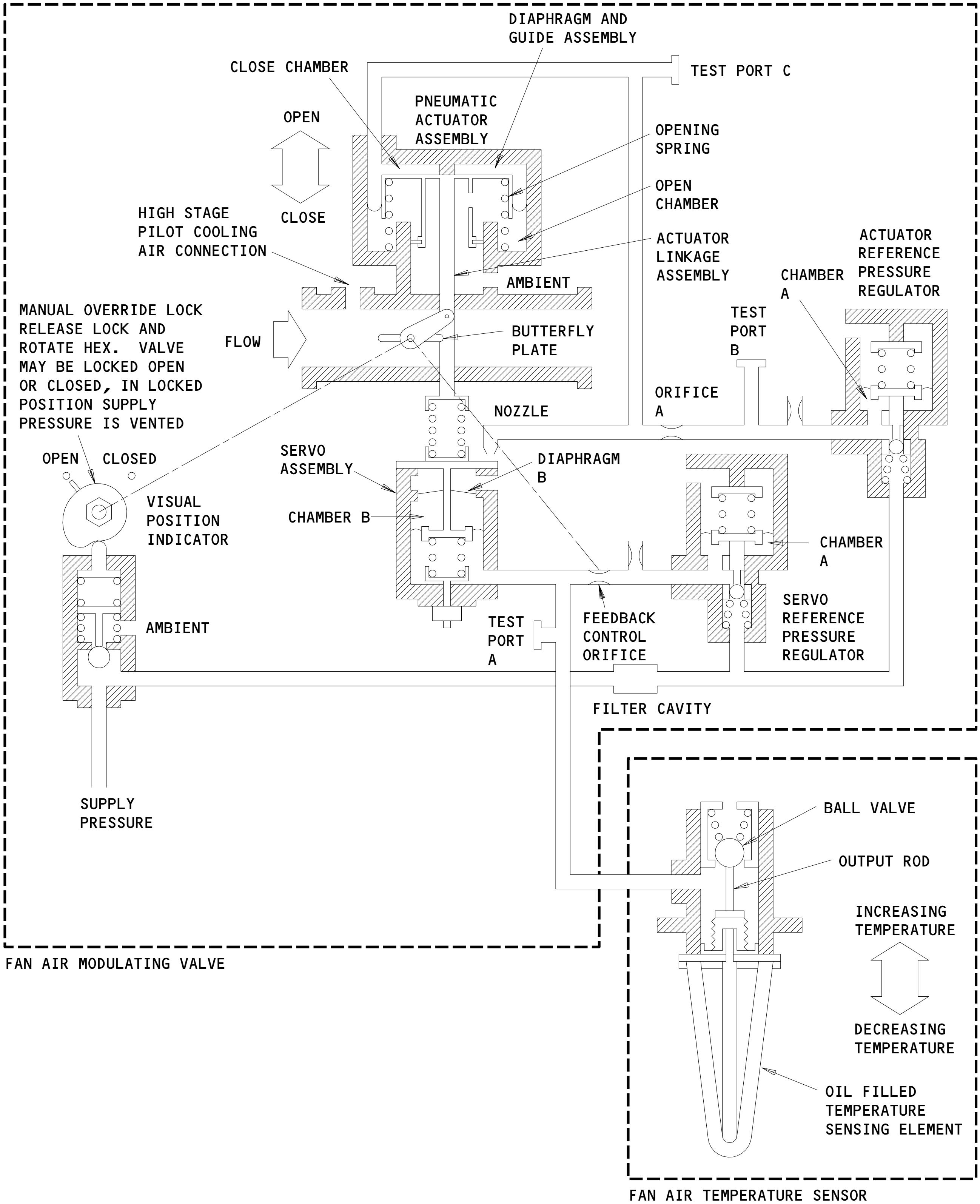
(THE FAN AIR MODULATING
VALVE IS OPEN)



(THE FAN AIR MODULATING
VALVE IS LOCKED OPEN)

MANUAL OVERRIDE
E

Fan Air Modulating Valve and Fan Air Temperature Sensor
Figure 9 (Sheet 2)



Fan Air Modulating Valve and Fan Air Temperature Sensor Schematic
Figure 9A

(b) The valve body assembly consists of a flow body and a modulating type butterfly plate assembly. The flow body is provided with a port to allow cooling air to be routed to the reverse flow check controller and has mounting flanges to mate with airplane ducting and the precooler. The butterfly plate assembly is bolted to the valve shaft assembly so that any movement of the butterfly results in a corresponding movement of the valve shaft assembly. Also the butterfly plate assembly is internally ported to flow a small amount of cooling air from the flow body into the underside of the actuator housing assembly and out to ambient.

(c) The servo housing assembly consists of servo reference pressure regulator, feedback orifice and a servo assembly. The servo reference pressure regulator is provided with a spring-loaded down air diaphragm mounted between a diaphragm cover and a spring loaded open poppet valve. In addition, the diaphragm cover contains a servo reference pressure regulator adjustment screw. The feedback control orifice is provided with an adjustable orifice and is ported to the servo assembly and servo reference pressure regulator. The servo assembly is provided with a spring-loaded air diaphragm mounted between the servo housing assembly and a spring-loaded flexure beam. In addition, the servo assembly contains a servo adjustment screw and a thermostat connection.

(d) The manual override lock consists of a manual wrenching hex, a ball and an actuating rod which is spring loaded against the ball when the manual wrenching hex is wrenched to the closed position. Otherwise the actuating rod does not contact the ball. The manual wrenching hex is provided with a spring-loaded manual lock lever and a visual position indicator pin connected to the valve shaft assembly. The manual override lock is ported to the actuator reference pressure, servo reference regulator, and ambient.

(5) Supply pressure is routed past a normally open manual override lock, through a filter cavity to the base of two reference pressure regulators. Supply air flows through the actuator, reference pressure regulator, and servo reference pressure regulator metering valves, through orifices into chambers A. When the sensed pressures reach the desired level, spring force is overcome and the metering valves move toward the seat to maintain the outlet pressures at a constant level.

(6) The regulated outlet pressure from the actuator reference pressure regulator is routed through orifice A to a control nozzle. The regulated outlet pressure from the servo reference pressure regulator is routed through a valve driven feedback control orifice to the servo assembly and the temperature sensor connection.

(7) The temperature sensor functions as a variable orifice producing a control pressure in servo assembly chamber B that is inversely proportional to sensed temperature, thereby driving chamber B pressure up with decreasing temperature and down with increasing temperature.

(8) When the temperature sensor is closed (sensed temperature is at a minimum) servo assembly chamber B pressure is at its maximum, the control nozzle is closed by the force on diaphragm B and the actuator housing assembly close chamber pressure is at its maximum which is sufficient to drive the butterfly plate assembly closed.

(9) A decrease in servo assembly Chamber B pressure (an increase in sensed temperature) permits the load of the feedback spring to push the flexure beam away from the control nozzle which decreases the actuator housing assembly close chamber pressure. As the pressure decreases, the opening spring force strokes the diaphragm and guide assembly to the open direction until a force balance exists between the close chamber and the opening spring.

(10) As the butterfly plate strokes to the open position the feedback spring produces a decreasing compression load on the flexure beam. This force unbalance causes the flexure beam to move toward the nozzle until a force balance exists between the servo force and feedback spring.

(11) A manual override lock is provided to mechanically lock the butterfly plate assembly into the full lock or full open position.

L. <u>Fan Air Temperature Sensor</u>

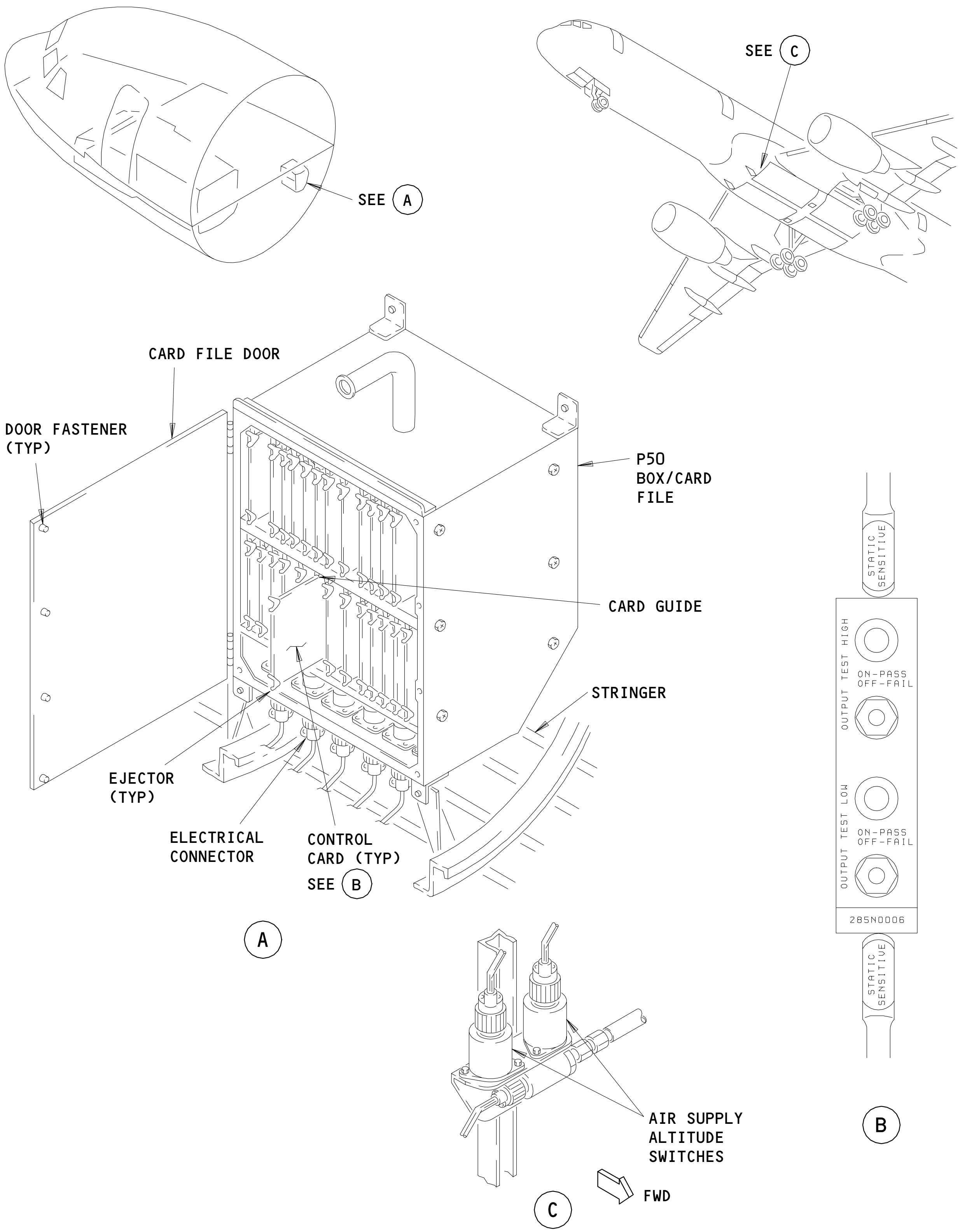
(1) The fan air temperature sensor is a pneumatic bleed-off type temperature unit, and functions in conjunction with the fan air modulating valve to maintain bleed air temperature downstream of the precooler within a specified range. The sensor is located above the strut compartment.

(2) As sensed temperature increases, the hermetically sealed oil within the sensing tube expands and acts upon the bellows assembly. The resulting force against the bellows causes the output rod to move the ball valve off its seat and thereby produce flow through the control orifice and out the ball valve to ambient. The airflow from the supply pressure source develops a pressure drop across the control orifice. As the temperature increases, the ball valve opens up, allowing more airflow through the control orifice with an associated larger pressure drop. The result is a decrease in output signal in response to an increase in sensed temperature. Similarly, when sensed temperature decreases, fluid contraction causes the output rod and ball valve to move in the closing direction. This reduces pressure drop across the control orifice as sensed temperature decreases, therefore the ball valve is modulated to provide a discrete output signal pressure for each sensed temperature.

M. <u>Air Supply Altitude Switch</u> (Fig. 10)

(1) The air supply altitude switch is a barometric switch which closes when an altitude of 31,000 feet is reached. The switch is located in the right ECS bay forward of the a/c pack system.

(2) When the airplane reaches 31,000 feet the switch closes. The closed switch changes the switchover schedule in the HS pilot.



Air Supply Altitude Switch and ECS Bleed Air Card Assembly
Figure 10

N. ECS Bleed Configuration Card (Fig. 16)

(1) The ECS bleed configuration card receives input signals from the pressure regulating and shutoff valve position switches, wing and engine anti-ice switches and the pack flow cards. These input signals are provided as analog output signals, by the card, to the flight management computers, thrust management computer, and electronic engine controllers. The computers and controllers use these signal inputs to match required engine output to current airplane thrust and pneumatic demands.

(2) The ECS bleed configuration card contains two BITE test circuits, OUTPUT TEST HIGH and OUTPUT TEST LOW. The card BITE checks the cards' internal circuits for damage.

O. Pneumatic Duct Insulation (Fig. 11)

(1) Pneumatic duct insulation is installed on the pneumatic ducts in the aft cargo compartment only. The insulation comes in blankets and are installed with fiberglass tape wrapped around and tied in square knots.

(2) The insulation keeps the cargo compartment from heating up when the bleed air APU valve is open.

P. Reverse Flow Check Controller (Fig. 12)

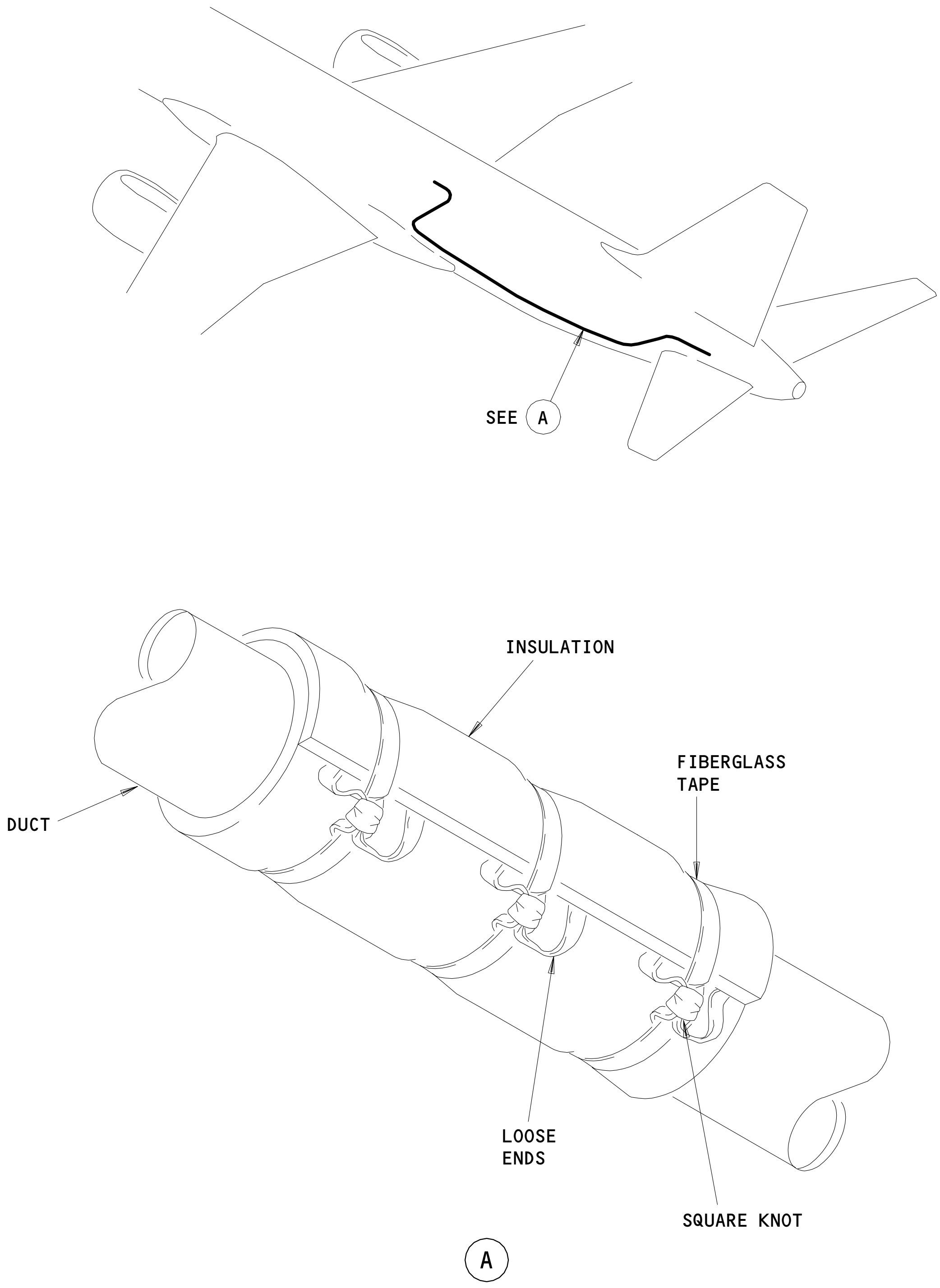
(1) The controller is located in the strut forward of the precooler. The reverse flow check controller is a pneumatically actuated controller. The controller compares upstream and downstream duct pressure to actuate a normally closed sensitive switch. The controller is cooled by air routed from the fan air modulating valve.

(2) The controller consists of a diaphragm assembly and a switch assembly.

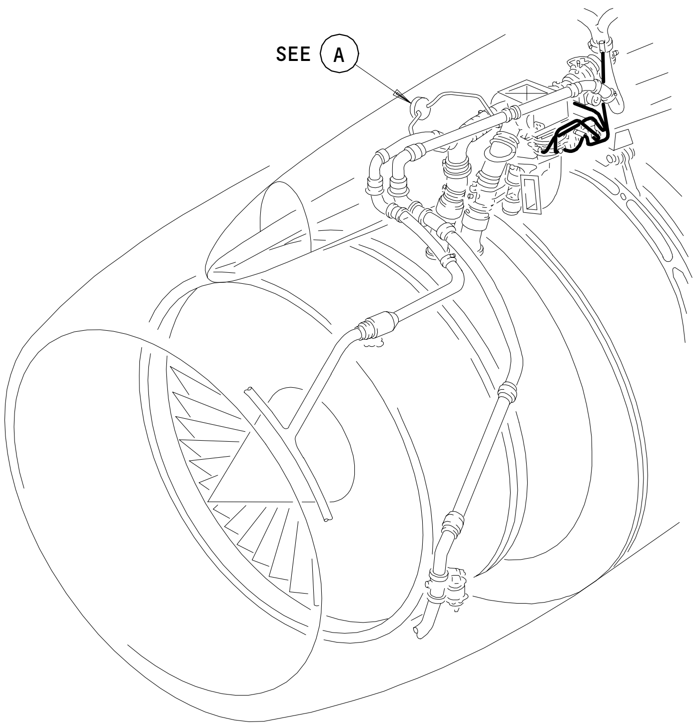
(a) The diaphragm assemby contains two spring loaded dual air diaphragms, a differential pressure adjustment screw, cooling air outlet, and upstream and downstream sense connections.

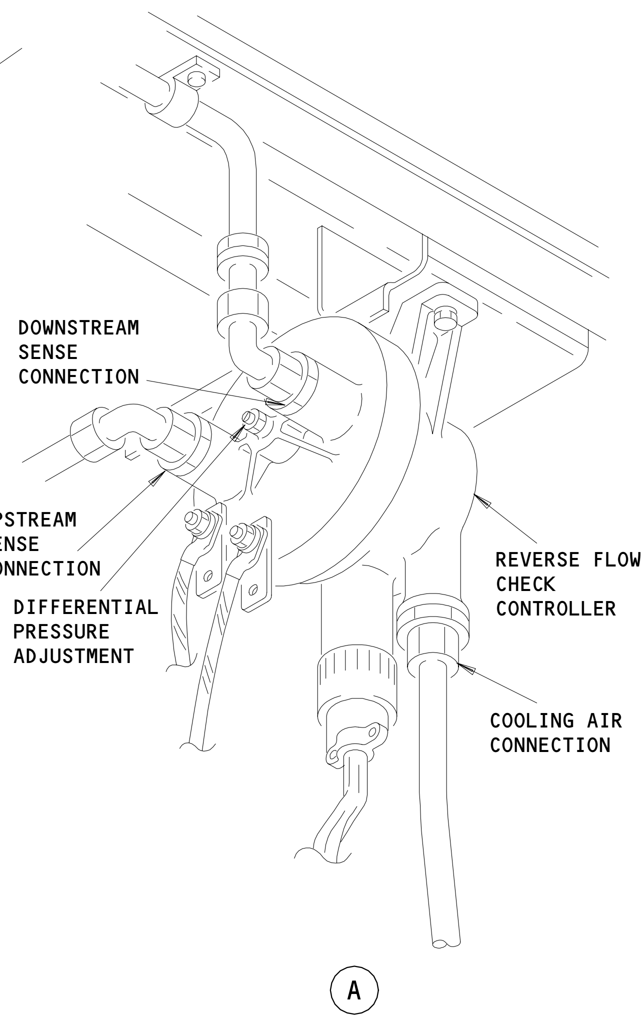
(b) The switch assembly contains a spring loaded L-shaped lever assembly mounted in a valve housing and the sensitive switch wired to an electrical connector.

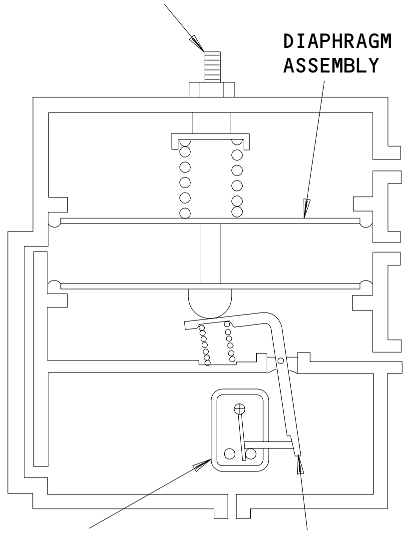
(3) The lever is held in contact with the sensitive switch and the dual air diaphragms by a spring. Movement of the diaphragms caused by changes in sensed pressure controls actuation of the sensitive switch assembly. The sensitive switch assembly consists of a micro switch and a switch actuator.



Pneumatic Duct Insulation
Figure 11







REVERSE FLOW CHECK CONTROLLER

Reverse Flow Check Controller
Figure 12

3. Operation

A. Functional Description

(1) Engine Pneumatic Control

(a) Pressing the L ENG Bleed switch/light on the pilot's overhead P5 panel powers the left PRSOV/HP6 valve control relay if these conditions occur: 1) left engine fire switch is not armed 2) left engine start relay is not to start and 3) left reverse flow check controller signals forward flow. By powering the left PRSOV/HP6 valve control relay, power is removed from the left PRSOV/HP6 off relay and supplied to the left PRSOV/HP6 auto relay.

(b) When power is supplied to the left PRSOV/HP6 auto relay, a five second time delay is initiated. During this 5 second period, power is supplied to the opening coil of the HS pilot double-latching shutdown solenoid and to the auto coil of the pressure regulating and shutoff valve solenoid. This enables the HS pilot and the Pressure Regulating Shutoff Valve to the AUTO position. After the 5 second time delay, the PRSOV/HP6 auto relay opens to remove power from the opening coil of the HS pilot double-latching shutdown solenoid and from the auto coil of the pressure regulating and shutoff valve solenoid.

(c) If an overheat condition should exist at the air supply overheat switch, the left PRSOV/HP6 override relay is powered. The override relay removes power from the auto relay and powers the off relay. The high stage valve through the HS pilot closes and the PRSOV closes.

(d) If the PRSOV is closed, the BLEED AIR OFF light comes on.

(e) If the airplane reaches 31,000 ft altitude, the air supply altitude switch closes, and powers the HS pilot switchover solenoid.

(f) If an overpressure condition exists (greater than 125-135 psig) the HS pilot downstream overpressure sensor latches the high stage valve to close and provides a ground. The BLEED AIR HI STAGE light comes on and an EICAS advisory message L ENG HI STAGE appears.

(g) When the PRSOV is closed, the closed position switch supplies a ground for the OFF light and for the EICAS advisory message L ENG BLEED OFF to be displayed.

(h) With greater air pressure in the upstream sense line of the reverse flow check controller, the diaphragm spring force in the controller keeps the lever assembly away from the switch. This allows the HS Pilot and PRSOV solenoids to stay in the auto position for normal operation.

(i) The fan air temperature sensor controls the operation of the fan air modulating valve. Should the valve become inoperative or malfunction, one of the following may occur:

1) Continuous periods of low pneumatic duct pressure,

2) Low flight deck temperature,

3) Air supply bleed air OFF light and BLEED light illuminated during flight.

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Figure 13

(j) In the event downstream pressure exceeds upstream pressure (reverse flow condition) the differential pressure acting across the dual area diaphragms overcomes the opposing spring force to actuate the switch.
1) The actuation of the switch de-energizes the PRSOV/HP6 control relay. This sends a signal to the off solenoids of the pressure regulating and shutoff valve (PRSOV) and the HS pilot powering both closed.
2) Once upstream pressure exceeds downstream pressure the switch closes. Power is restored to the PRSOV/HP6 control relay, sending a signal to the auto solenoid of the PRSOV, restoring PRSOV operation to normal, and to the open solenoid of the high stage pilot.

(k) Right engine control is similar to left engine control.

(2) Isolation Valve Control
(a) Pressing the BLEED AIR ISOLATION VALVE switch/light to open will light the white bar light and command the isolation valve open by powering the air supply isolation valve.
(b) The BLEED AIR VALVE light will come on during valve travel to indicate valve disagreement.
(c) If after 6 seconds the isolation valve is not in its selected position, an EICAS advisory message BLEED ISLN VALVE appears and the BLEED AIR VALVE light stays on until the isolation valve reaches the selected position.

(3) APU Valve Control
(a) For the APU supply valve to open these conditions must occur:
1) The APU must be operating at 95% maximum speed as indicated by the APU RUN light on the P5 panel coming on (Ref 49-11-00).
2) The L ENG FIRE and APU FIRE switch on P8 panel must be in the unarmed position.
3) The L PRSOV must be closed and either the R PRSOV must be closed or the isolation valve must be closed.
4) The above condition can be disregarded if the engines are being started.

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Figure 14

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Figure 15

(b) Pressing the BLEED AIR APU VALVE switch/light on P5 panel to ON and meeting the above condition will power the control relay to open the valve.

(c) Open and close limit switches provide a ground to the open and closed position relays when the valve reached its selected position.

(d) The bleed air APU VALVE light on the P5 panel will light to indicate valve disagreement.

(e) An EICAS advisory message, APU BLEED VAL will be displayed if the valve is not in its selected position after 6 seconds.

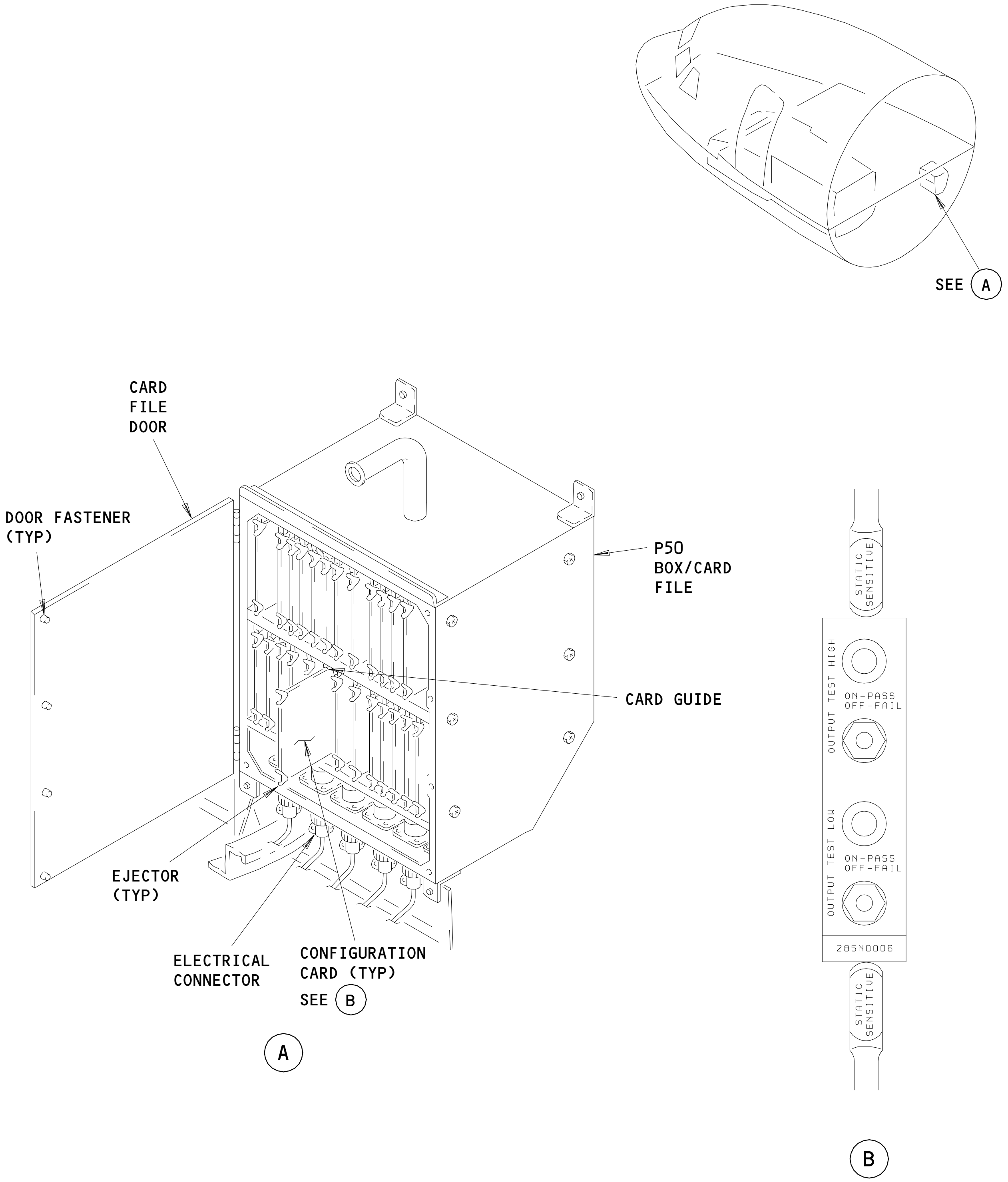
B. ECS Bleed Configuration Card BITE (Fig. 16)

(1) The ECS bleed configuration card contains two BITE test circuits, OUTPUT TEST HIGH and OUTPUT TEST LOW. Pressing the OUTPUT TEST LOW push button momentarily forces all outputs low. If the outputs are all low the TEST LOW LED will be illuminated, if an output fails to go low the TEST LOW LED light will remain extinguished. Pressing the OUTPUT TEST HIGH push button momentarily forces all outputs high. If the the outputs are all high the TEST HIGH LED will be illuminated, if an output fails to go high the TEST HIGH LED will remain extinguished. Failure of either LED to illuminate indicates an internal card fault which will require card replacement (Ref 36-11-12).

C. Control (Fig. 18)

(1) Check that the following circuit breakers on overhead circuit breaker P11 panel are closed:

L and R ENG BLEED
L and R HI STAGE SW OVER
L and R DUCT PRESS IND
L and R PRESS XMTR
ISOL VLV CONT
ISOL VLV PWR
APU BLEED CONT
APU BLEED PWR
EICAS CMPTR R
EICAS LOWER DSPL
EICAS DSPL SW
EICAS DSPL SELECT
EICAS CMPTR L
EICAS UPPER DSPL



ECS Bleed Configuration Card BITE
Figure 16

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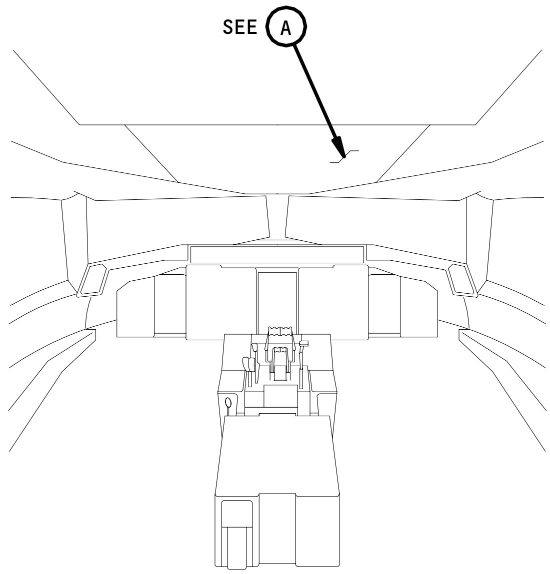
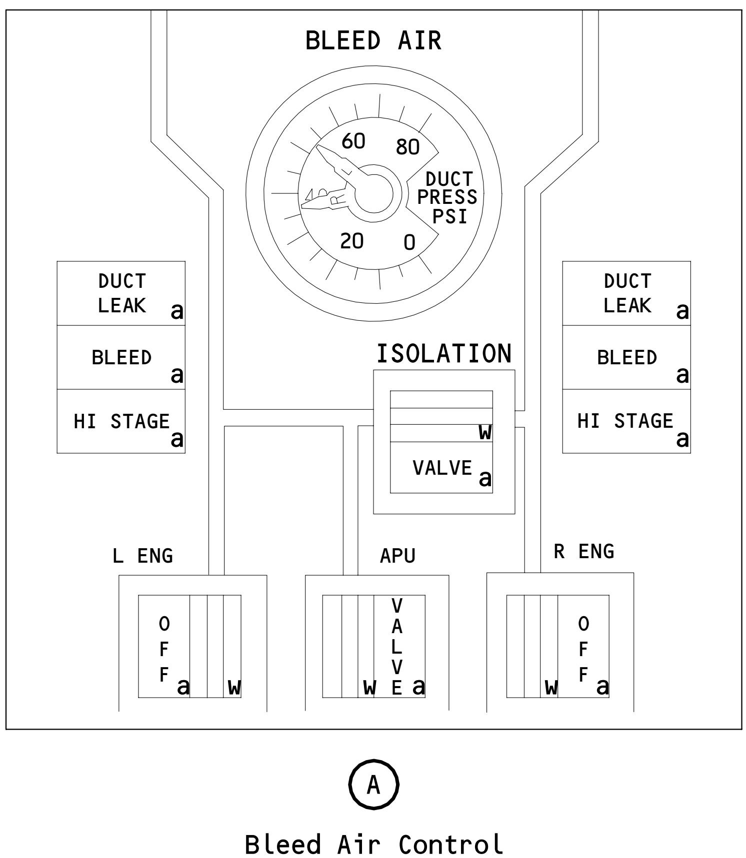
Figure 17





Bleed Air Control
Figure 18

(2) Provide electrical power (Ref 24-22-00).

(3) Provide air by starting the APU (AMM 49-11-00/201), starting an engine (AMM 71-00-00/201), or by providing air through the pneumatic ground connection (Ref 36-00-00). The duct pressure indicator on the pilots' overhead panel P5 will display the pressure in the supply ducts. Alternate action switch/lights on the pilots' overhead panel P5 will provide indication of the air system selected.

D. For more details on the Pneumatic System, refer to these wiring diagrams and functional schematics:

WDM 36-11-12: Bleed Air High Stage Pilot - Left
WDM 36-11-31: Air Supply Isolation Valve Control
WDM 36-11-41: Air Supply APU Valve Control
SSM 36-00-00: Pneumatic System - Simplified

DISTRIBUTION

COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
CARDS - (21-51-00/101)				
L PACK FLOW CONTROL, M863				
R PACK FLOW CONTROL, M864				
CARD - L ECS BLEED CONFIGURATION, M10313	6	1	119BL, MAIN EQUIP CTR, P50	36-11-12
CARD - R ECS BLEED CONFIGURATION, M10312	6	1	119BL, MAIN EQUIP CTR, P50	36-11-12
CIRCUIT BREAKERS -			FLT COMPT, P11	
CONT - R ENG BLEED, C1340		1	11Q19	*
CONT - APU BLEED, C1333		1	11Q23	*
CONT - ISOL VLV, C1338		1	11B2	*
DUCT PRESS IND PWR, C4221		1	11Q15	*
DUCT PRESS XMTR L, C1332		1	11Q16	*
DUCT PRESS XMTR R, C1342		1	11Q24	*
ENG BLEED L, C1339		1	11Q10	*
HI STAGE SW OVER L, C4196		1	11Q18	*
HI STG SW OVER R, C4197		1	11Q27	*
PWR - APU BLEED, C1336		1	11Q22	*
PWR - ISOL VLV, C1337		1	11B3	*
COMPUTERS - (31-41-00/101)				
EICAS L, M10181				
EICAS R, M10182				
CONNECTOR - PNEUMATIC GROUND	2	3	193JL,194FR, GROUND CONNECTOR ACCESS DOOR	36-11-03
CONTROLLER, REVERSE FLOW CHECK, M10550,M10551	5	2	433HR,443HL, STRUT ACCESS DOOR	36-11-18
LIGHT - BLEED, LEFT, YNNL003	2	1	FLT COMP, P5, BLEED AIR SUPPLY MODULE, M10259	*
LIGHT - BLEED, RIGHT, YNNL004	2	1	FLT COMPT, P5, BLEED AIR SUPPLY MODULE, M10259	*
LIGHT - DUCT LEAK, LEFT, YNNL001	2	1	FLT COMPT, P5, BLEED AIR SUPPLY MODULE, M10259	*
LIGHT - DUCT LEAK, RIGHT, YNNL002	2	1	FLT COMPT, P5, BLEED AIR SUPPLY MODULE, M10259	*
LIGHT - HI STAGE, LEFT, YNNL005	2	1	FLT COMPT, P5, BLEED AIR SUPPLY MODULE, M10259	*
LIGHT - HI STAGE, RIGHT, YNNL006	2	1	FLT COMPT, P5, BLEED AIR SUPPLY MODULE, M10259	*
MODULE - BLEED AIR SUPPLY, M01259	2	1	FLT COMPT, P5	*
PILOT - HIGH-STAGE, M10292,M10293	5	2	415AL,425AL,416AR,426AR, THRUST REVERSER COWL	36-11-08
PRECOOLER - AIR SUPPLY	4	2	433CL,443CR,433JR,443JL, PRECOOLER ACCESS PANELS 433HR,443HL, INTERMEDIATE PRES-SURE CHECK VALVE ACCESS PANEL	36-11-15
RELAYS - (31-01-36/101)				
AUTO - L PRSOV/HP6, K10198				
CLOSED - L PRSOV, K10453				
CONT - L PRSOV/HP6, K10199				
OFF - L PRSOV/HP6, K10197				
OUT - L ENG, K10556				
OVRD - L ENG START/PRSOV, K10554				
OVRD - L PRSOV/HP6, K10435				
START - L AIR SUPPLY ENG, K10282				
START - L ENG, K10248				
RELAYS - (31-01-37/101)				
AIR/GND SYS 2, K10201				
AUTO - R PRSOV/HP6, K10205				
CLOSED - R PRSOV, K10454				
CONT - APU AIR SUPPLY,K23				
CONT - R PRSOV/HP6, K10206				

* SEE THE WDM EQUIPMENT LIST

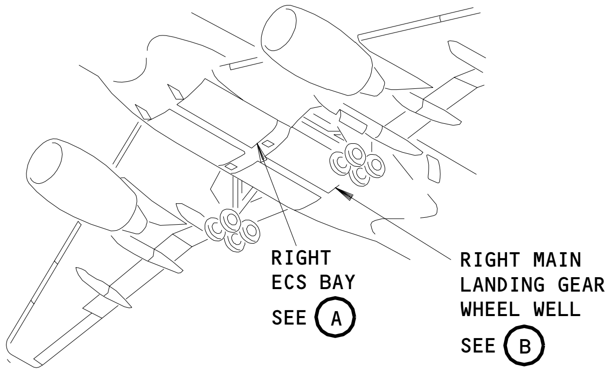
Distribution - Component Index
Figure 101 (Sheet 1)

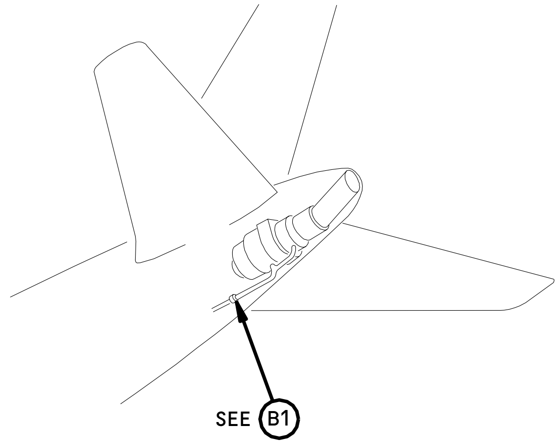
COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	AMM REFERENCE
RELAY - (FIM 31-01-37/101)				
IND - AIR SUPPLY ISOLATION VALVE CLOSED, K21				
IND - AIR SUPPLY ISOLATION VALVE OPEN, K22				
OFF - R PRSOV/HP6, K10204				
OUT - R ENG, K10444				
OVERRIDE - APU AIR SUPPLY, K10280				
OVRD - R PRSOV/HP6, K10436				
OVRD - R ENG START/PRSOV, K10555				
POS - APU AIR SUPPLY VLV CLOSED, K24				
POS - R AIR SUPPLY VLV OPEN, K25				
START - R AIR SUPPLY ENG, K10281				
START - R ENG, K10251				
SENSOR - AIR SUPPLY OVERTEMPERATURE LIMITING	4	2	434AL,444AL, PRESSURE RELIEF STRUT DOOR	36-11-13
SENSOR - FAN AIR TEMPERATURE	4	2	433KR,433KL, HYDRAULIC FUEL, AND ELECTRONIC ACCESS STRUT PANEL	36-11-17
SWITCH - (FIM 26-21-00/101)				
L ENGINE FIRE, S37				
R ENGINE FIRE, S38				
SWITCH - (FIM 26-22-00/101)				
APU FIRE, S39				
SWITCH - AIR SUPPLY ALTITUDE, S10228,S10229	2	2	193HL,194ER, ECS BAY ACCESS DOOR	36-11-14
SWITCH/LIGHT - APU VALVE, YNNS002	2	1	FLT COMPT, P5, BLEED AIR SUPPLY MODULE, M10259	33-13-00
SWITCH/LIGHT - ISOLATION VALVE, YNNS003	2	1	FLT COMPT, P5, BLEED AIR SUPPLY MODULE, M10259	33-13-00
SWITCH/LIGHT - LEFT ENG OFF, YNNS001	2	1	FLT COMPT, P5, BLEED AIR SUPPLY MODULE, M10259	33-13-00
SWITCH/LIGHT - RIGHT ENG OFF, YNNS004	2	1	FLT COMPT, P5, BLEED AIR SUPPLY MODULE, M10259	33-13-00
VALVE - APU CHECK	1	1	194ER, ECS BAY ACCESS DOOR [1] 144, RIGHT LANDING GEAR WHEEL WELL [2]	36-11-11
VALVE - APU SHUTOFF, V47	1	1	313AL ELEVATOR ACCESS DOOR	36-11-10
VALVE - FAN AIR MODULATING	5	2	415AL,425AL,416AR,426AR, THRUST REVERSER COWL	36-11-16
VALVE - HIGH PRESSURE SHUTOFF	5	2	415AL,425AL,416AR,426AR, THRUST REVERSER COWL	36-11-07
VALVE - INTERMEDIATE PRESSURE CHECK	4	2	443HL,433HR, INTERMEDIATE PRESSURE CHECK VALVE ACCESS PANEL	36-11-06
VALVE - ISOLATION, V46	2	1	194ER, ECS BAY ACCESS DOOR	36-11-04
VALVE - PRESSURE REGULATING AND SHUTOFF, V42,V43	3	2	433LR,443LL, PRESSURE RELIEF STRUT DOOR	36-11-09

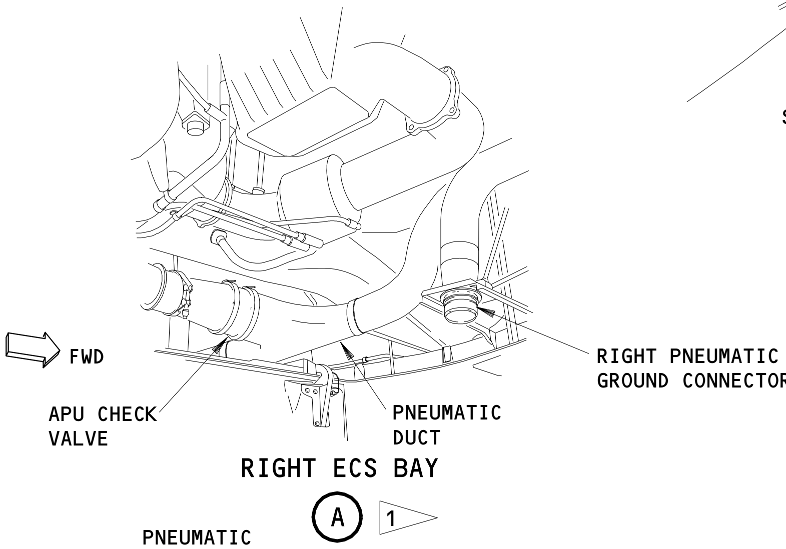
[1] AIRPLANES WITH THE APU CHECK VALVE IN THE RIGHT ECS BAY.

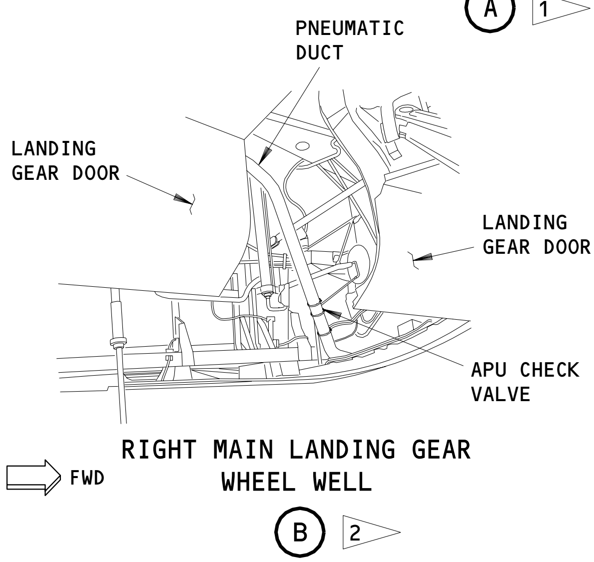
[2] AIRPLANES WITH THE APU CHECK VALVE IN THE RIGHT MAIN LANDING GEAR WHEEL WELL.

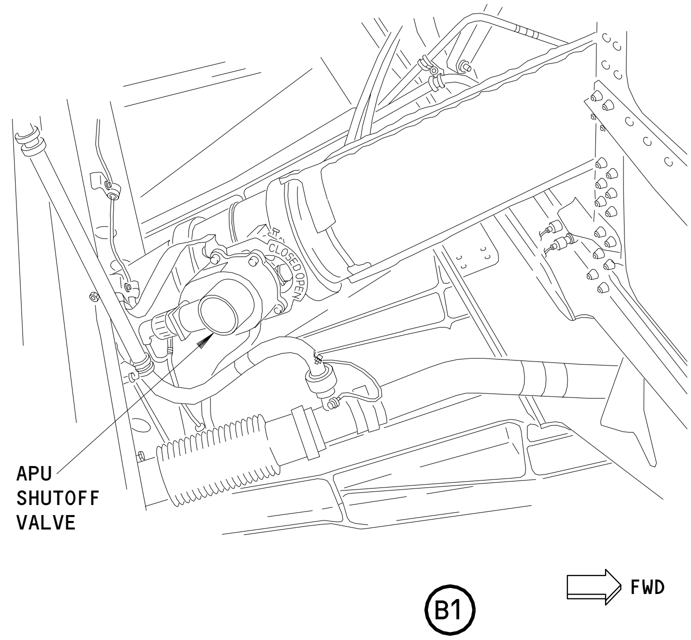
Distribution - Component Index
Figure 101 (Sheet 2)







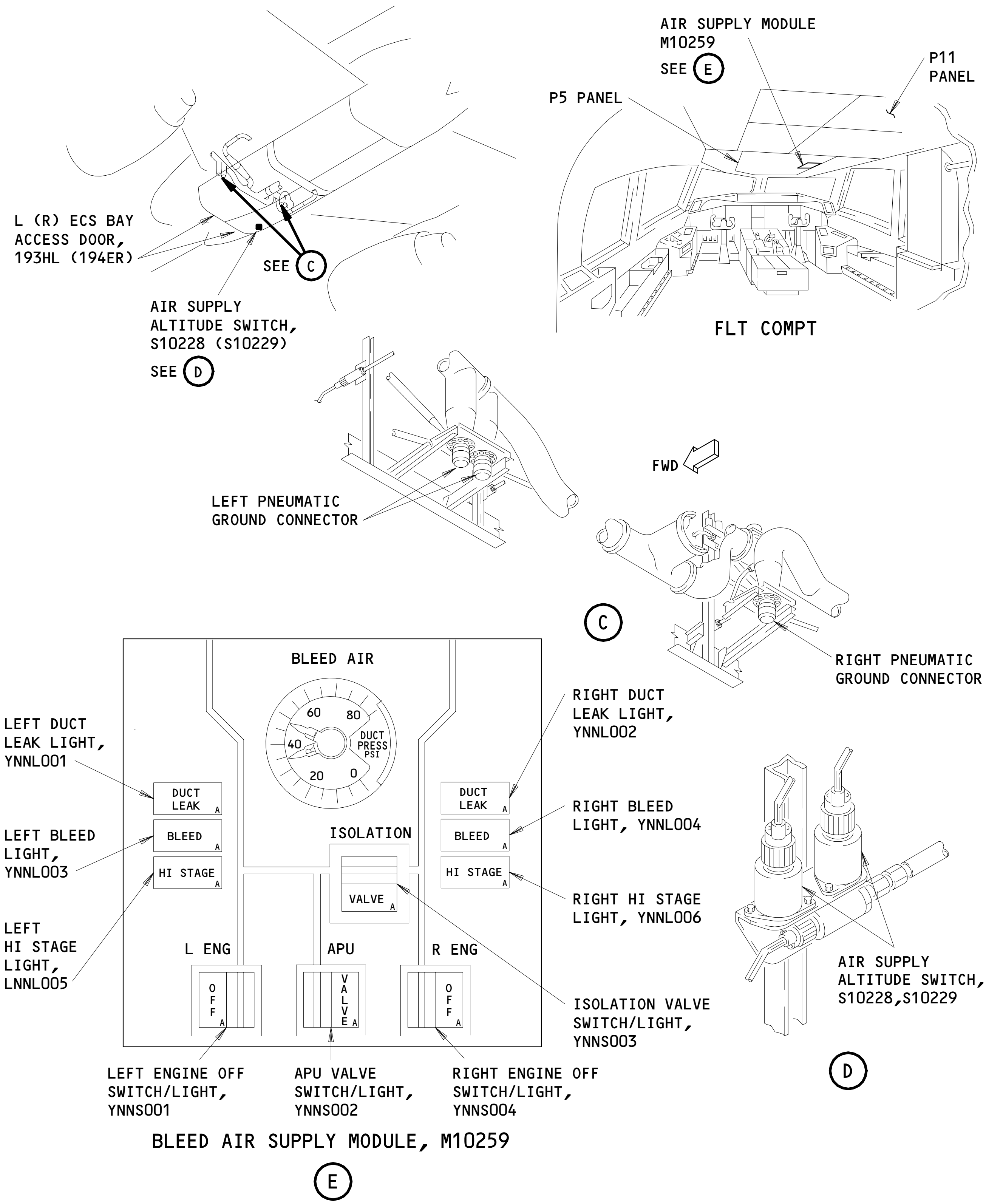




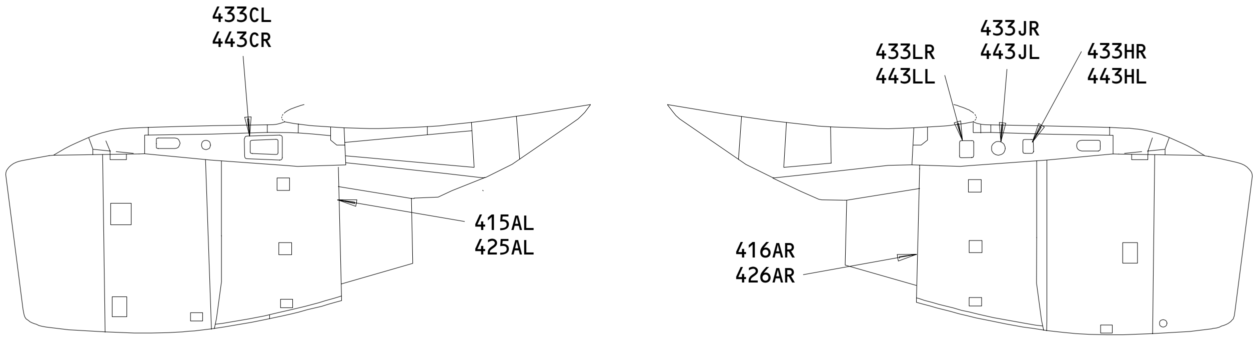
1 AIRPLANES WITH APU CHECK VALVE IN THE RIGHT ECS BAY

2 AIRPLANES WITH APU CHECK VALVE IN THE RIGHT MAIN LANDING GEAR WHEEL WELL

Distribution - Component Location
Figure 102 (Sheet 1)



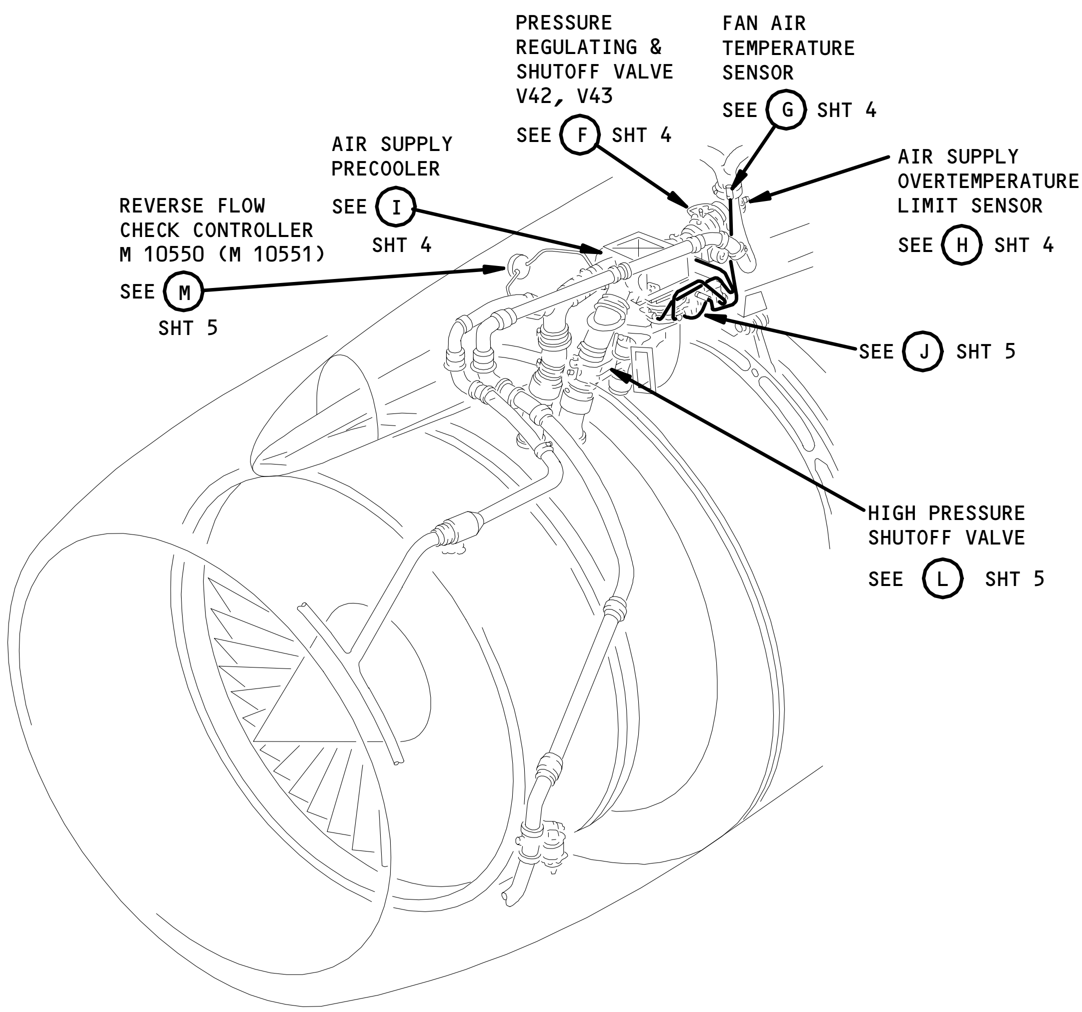
Component Location
Figure 102 (Sheet 2)



LEFT SIDE

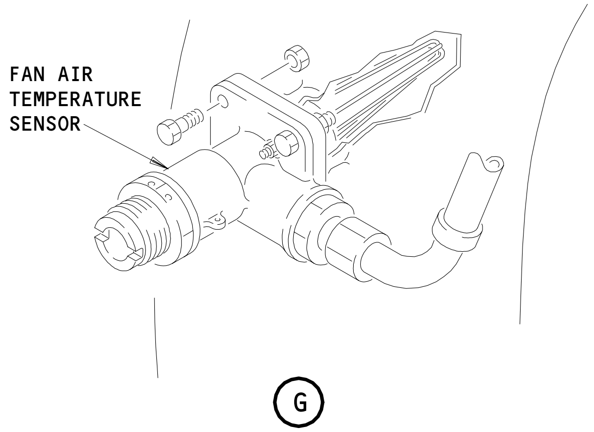
RIGHT SIDE

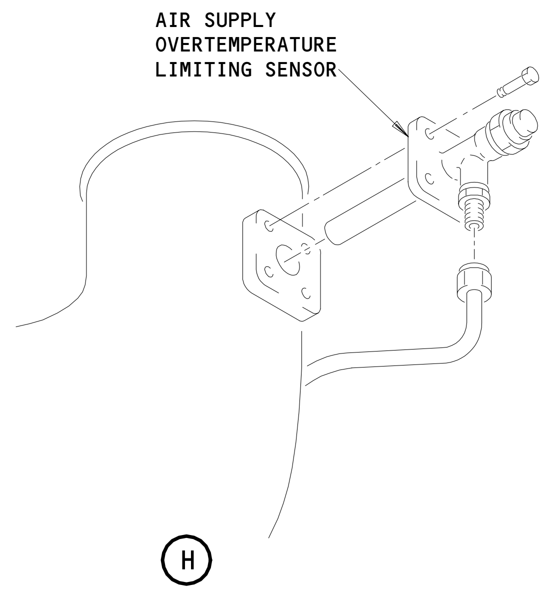
NO. 1 ENGINE SHOWN, NO. 2 ENGINE SIMILAR BUT OPPOSITE.

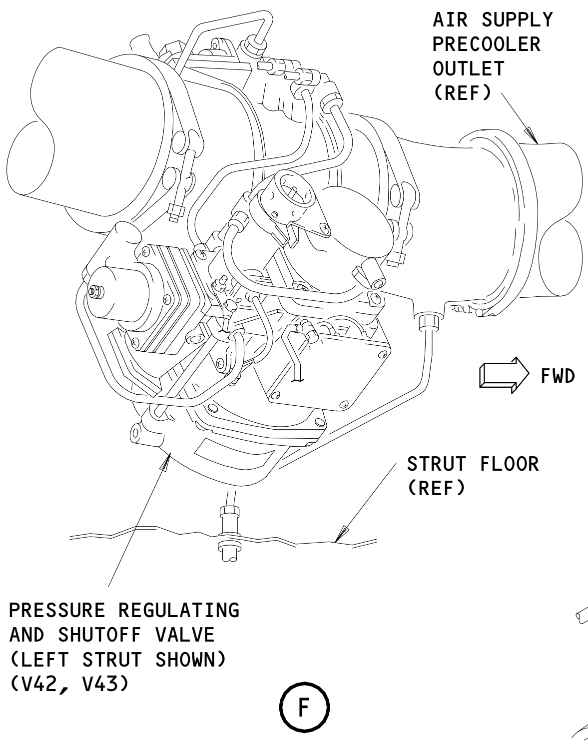


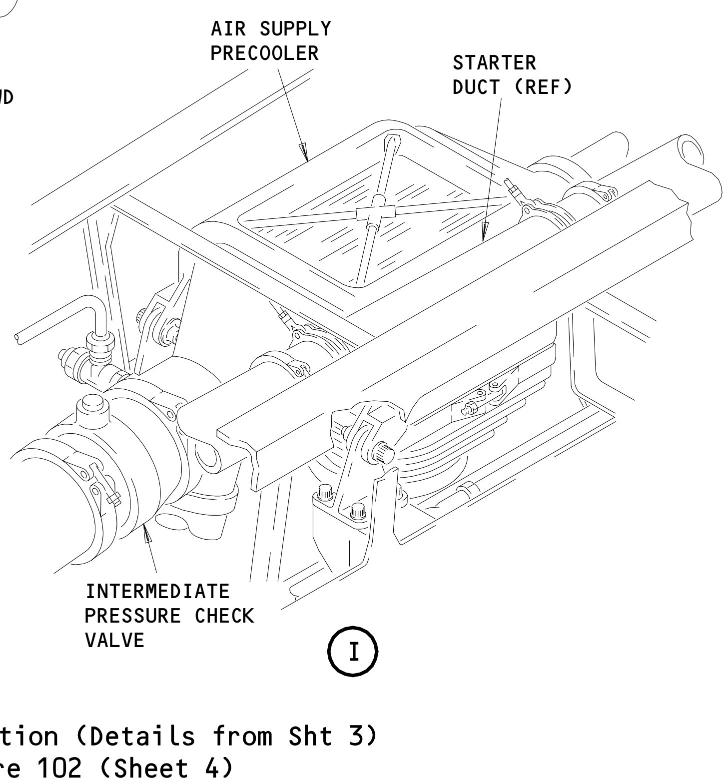
ROLLS ROYCE RB211-535 (REF)

Component Location
Figure 102 (Sheet 3)

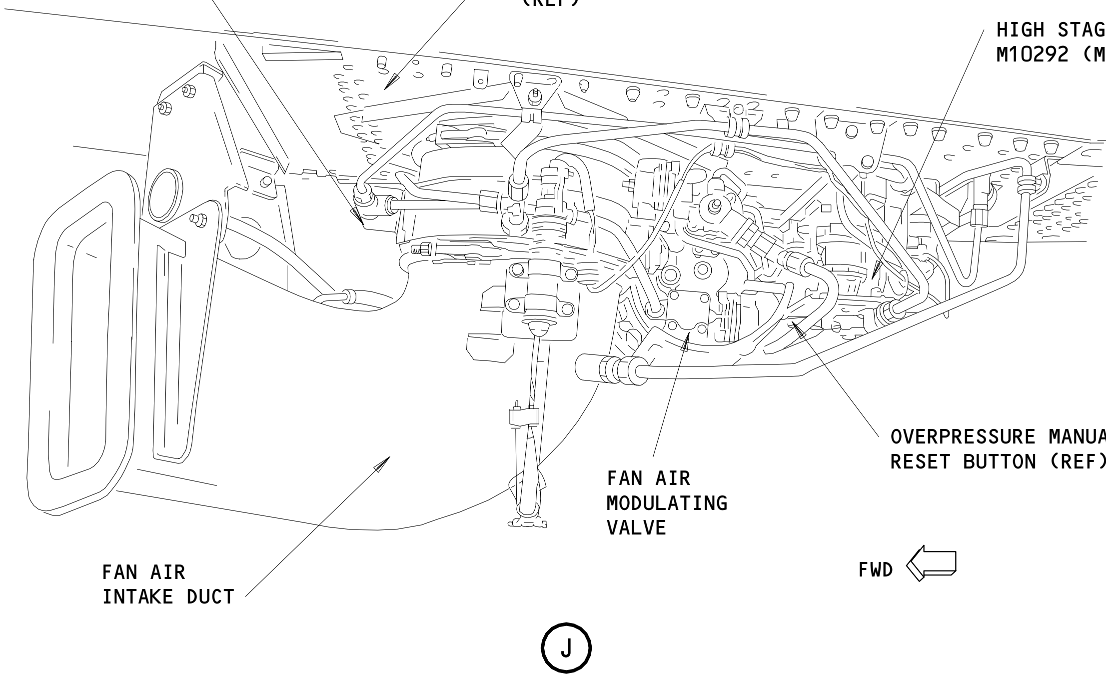


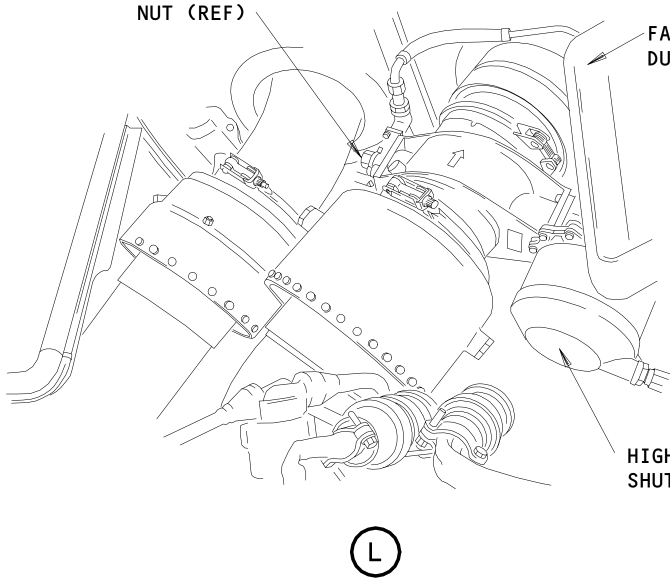


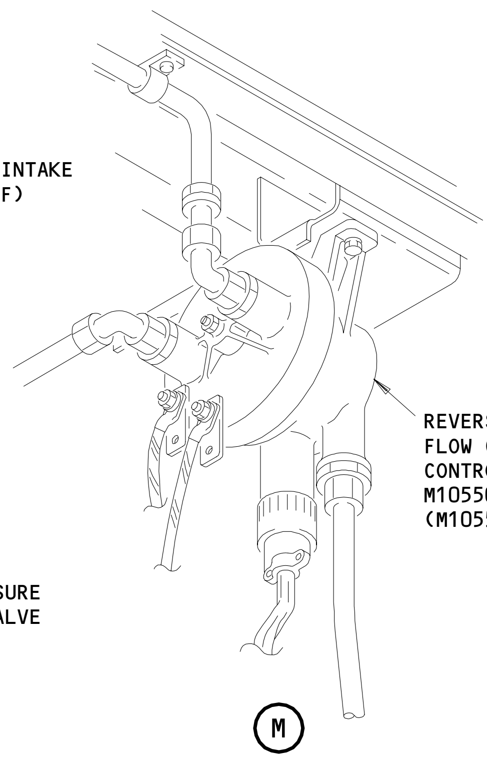




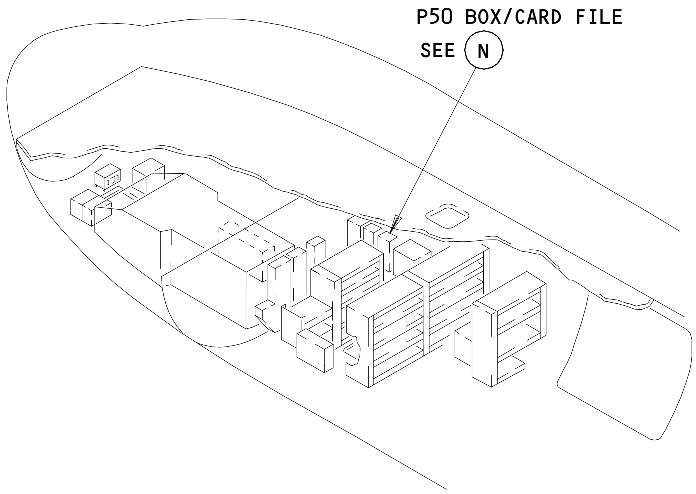
Component Location (Details from Sht 3)
Figure 102 (Sheet 4)

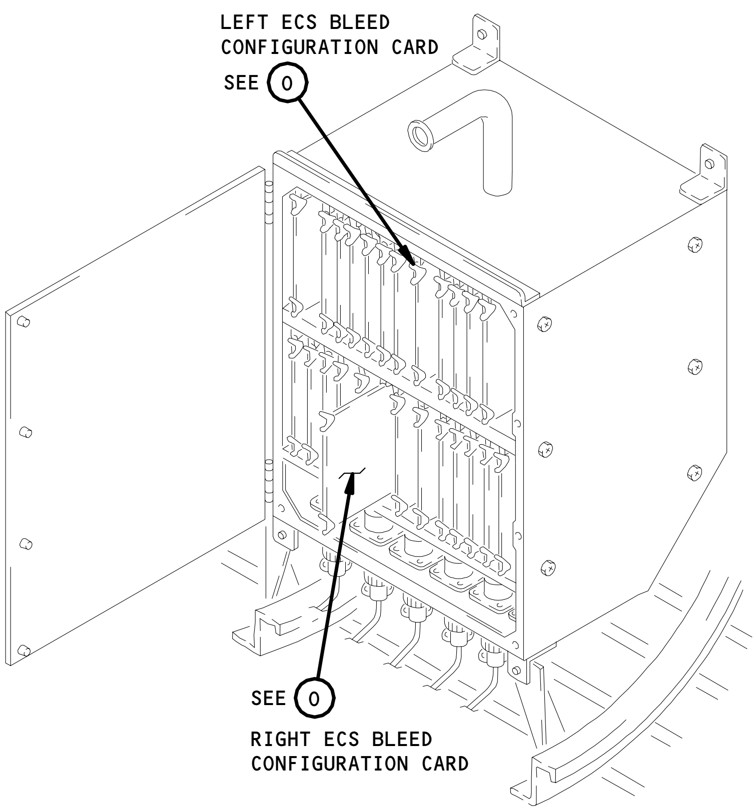






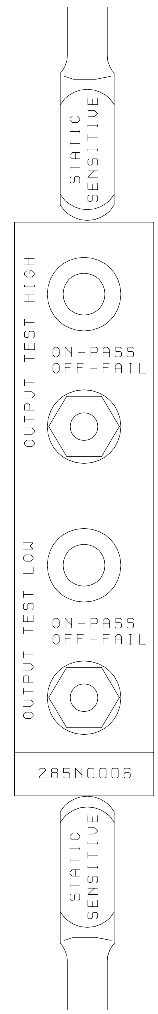
Component Location (Details from Sht 3)
Figure 102 (Sheet 5)





P50 BOX/CARD FILE

N



ECS BLEED CONFIGURATION CARD ASSEMBLY
M10313 (M10312)

O

Component Location
Figure 102 (Sheet 6)

TEMP. AMBIENT_________F   PRESS. AMBIENT________IN HG

ENGINE GROUND RUN

☐ IDLE   ☐ TAKE-OFF
☐ INTERMEDIATE   ☐ REVERSE

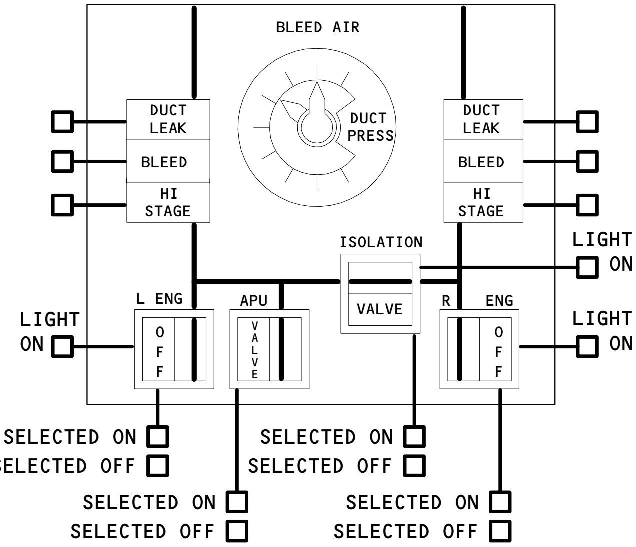
TEMP__________WIND_________/_________BARO__________

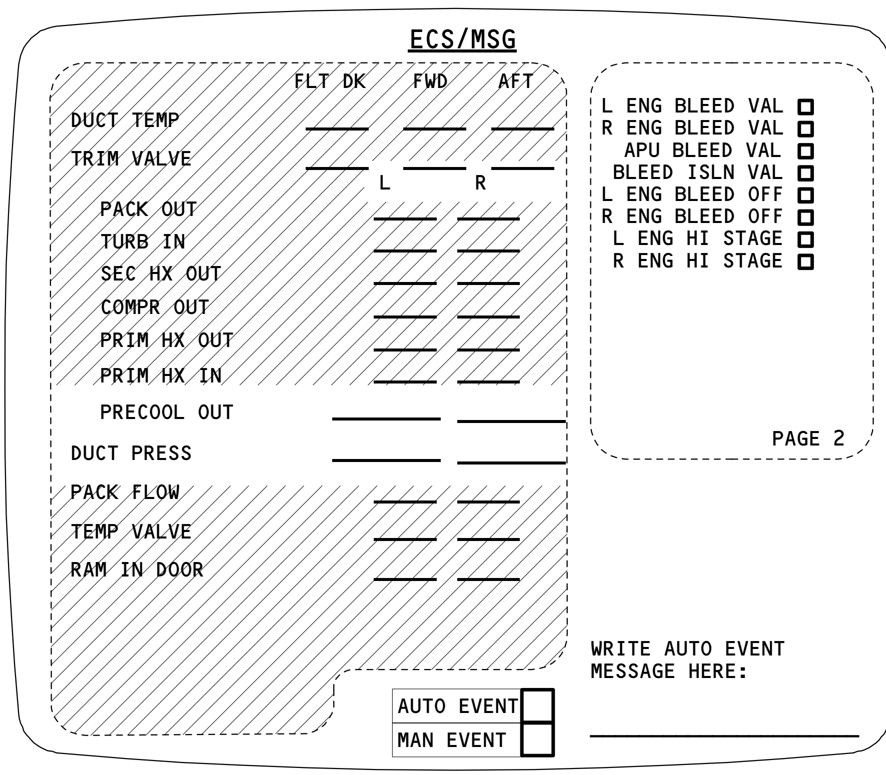
FLIGHT OPERATIONS   FLIGHT NO.___________A/P________

☐ TAKE-OFF   ☐ REVERSE
☐ CLIMB   ☐ IDLE
☐ CRUISE   ☐ DESCENT

EPR__________________

BLEED AIR SUPPLY CONTROL MODULE





RECORDED BY:

NAME____________________________DATE/TIME______________________

OTHER INFO____

____

NOTE: KEEP A RECORD OF THE ABOVE INFORMATION FOR EACH ENGINE. THE INFORMATION WILL BE USED FOR COMPARISON PURPOSES.

757 - EICAS Maintenance and Engine Ground Run Form
Figure 102A

AIR SUPPLY DISTRIBUTION SYSTEM - ADJUSTMENT/TEST

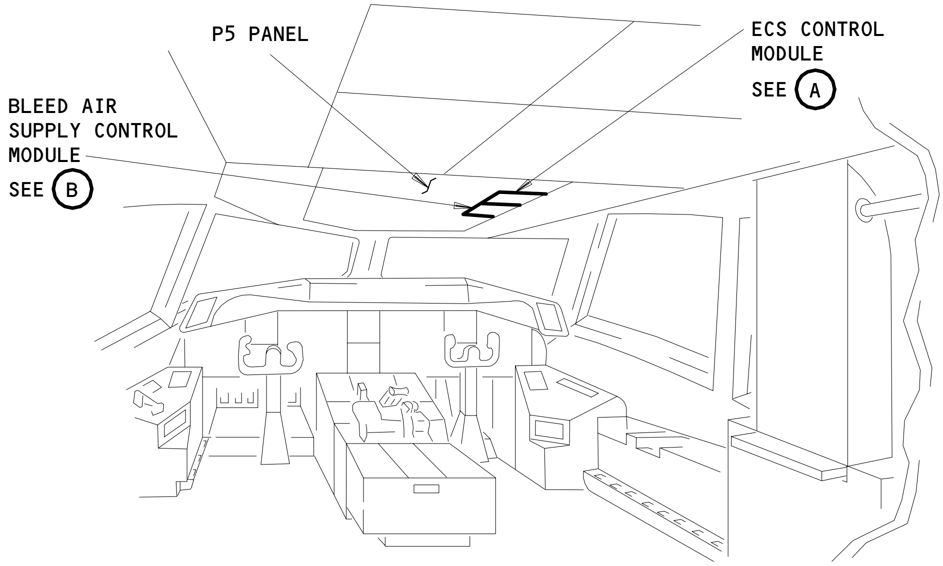
1. General
   A. This procedure has four tasks:
      (1) An Operational Test of the Air Supply Distribution System.
      (2) An Operational Test of the Reverse Flow Check Controller.
      (3) A System Leakage Test.
      (4) An EICAS Maintenance and Engine Ground Run Form.

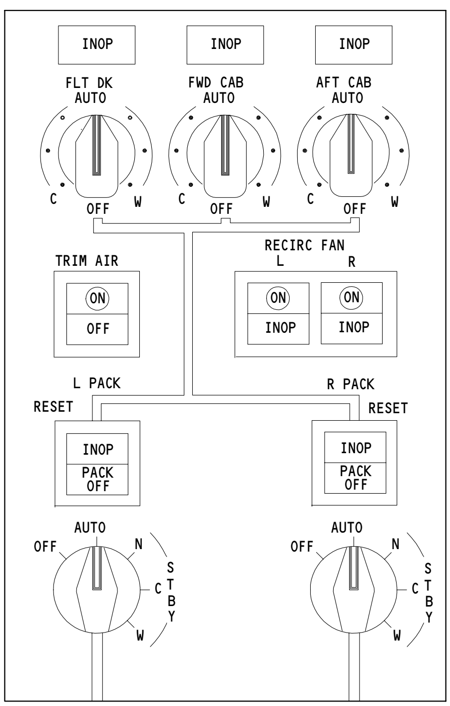
   TASK 36-11-00-715-001
2. Operational Test - Air Supply Distribution System (Fig. 501,502)

   A. General
      (1) The test supplies a BITE test of the ECS bleed configuration card and a system operational test.
   B. Equipment
      (1) Ohm meter - commercially available
      (2) Ground pneumatic cart - commercially available
   C. References
      (1) AMM 06-41-00/201, Fuselage Access Doors and Panels
      (2) AMM 06-42-00/201, Empennage Access Doors and Panels
      (3) AMM 06-43-00/201, Engine and Nacelle Strut Access Doors
      (4) AMM 24-22-00/201, Electrical Power Control
      (5) AMM 36-00-00/201, Pneumatic Power
      (6) AMM 36-11-11/401, APU Check Valve
      (7) AMM 36-11-12/401, ECS Bleed Configuration Card
      (8) AMM 49-61-05/201, APU Control Unit
      (9) AMM 71-00-00/201, Power Plant
      (10) AMM 78-31-00/201, Thrust Reverser System
   D. Access
      (1) Location Zones
          119 Main equipment center (Left)
          313 Stabilizer center section compartment (Left)
          433/443 Nacelle strut - mid-structure
      (2) Access Panels
          119BL Main Equipment Center Access Door
          313BL APU Intake Port Access Door
          433HR/443HL High Pressure Duct Access Door
   E. Prepare for The ECS Bleed Air Control Card BITE Test

      S 865-003
      (1) Supply electrical power (AMM 24-22-00/201).

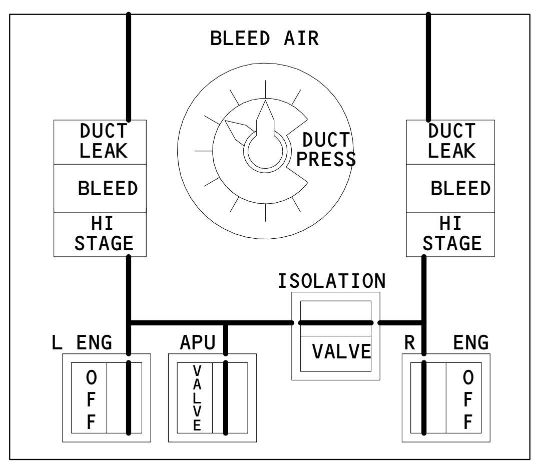
      S 865-004
      (2) Make sure these circuit breakers on the overhead circuit breaker panel, P11, are closed:
          (a) 11Q10, ENG (BLEED, BLD) L





ECS CONTROL MODULE

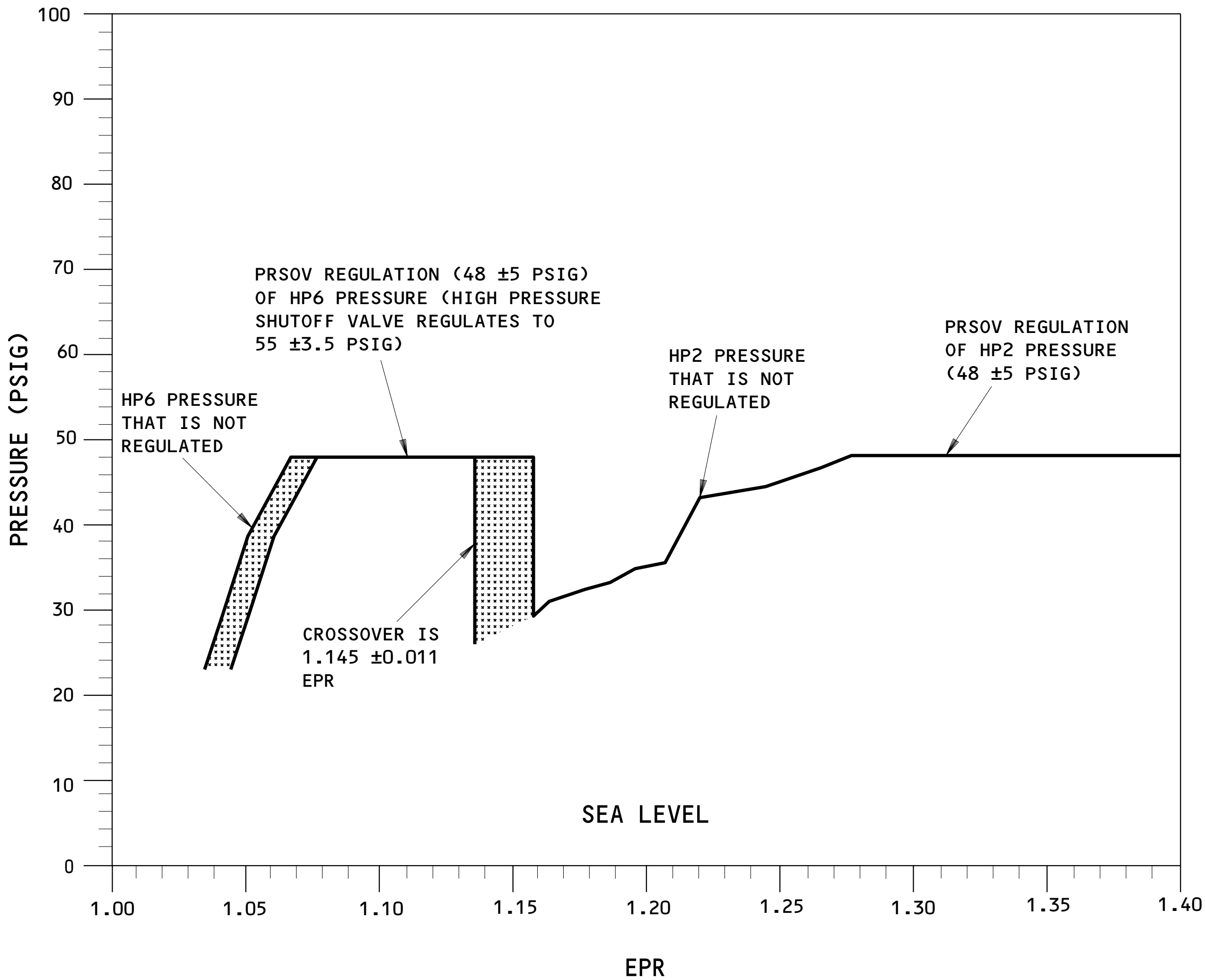
A



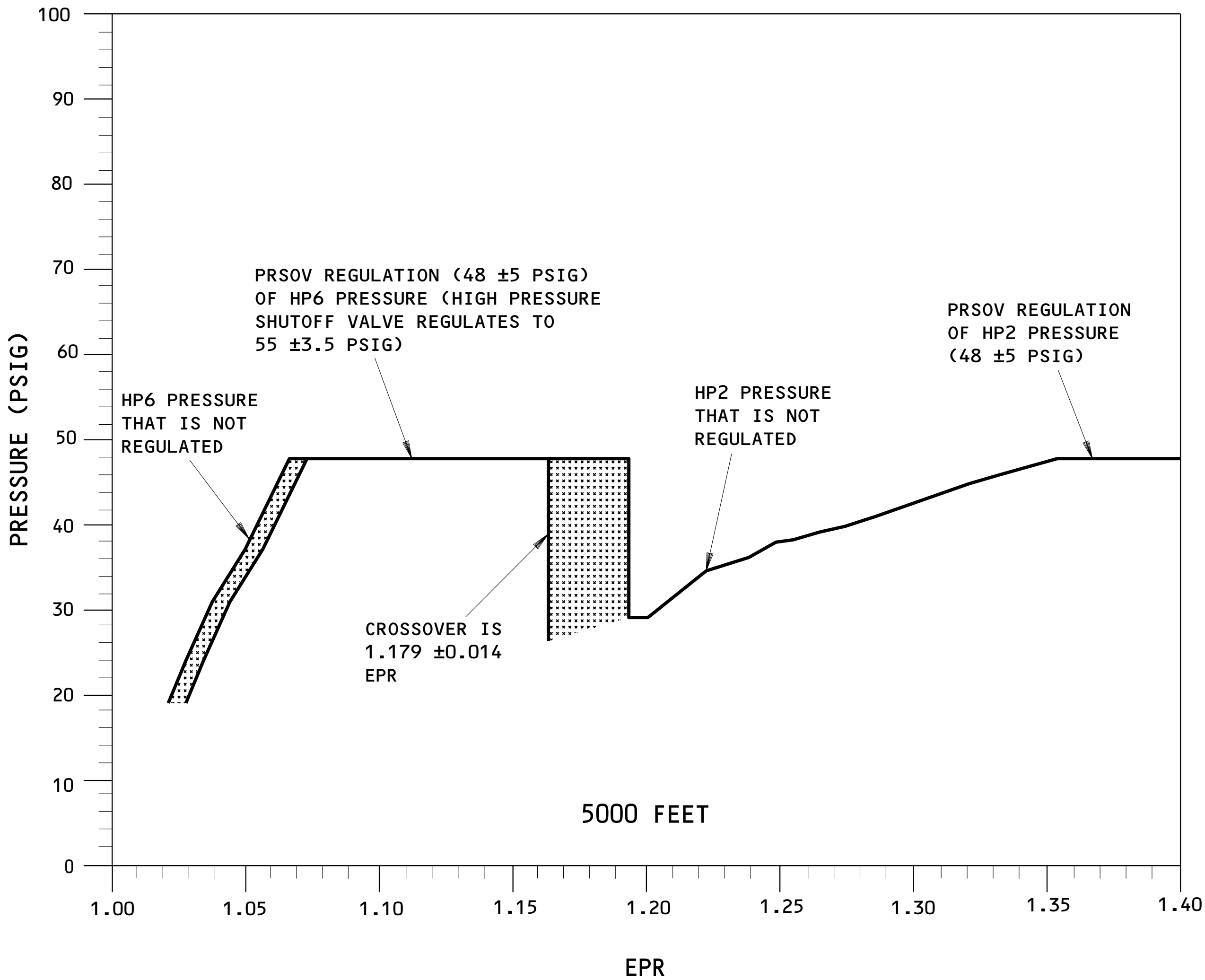
BLEED AIR SUPPLY CONTROL MODULE

B

Pneumatic Control Modules
Figure 501



Pressure vs EPR
Figure 502 (Sheet 1)



Pressure vs EPR
Figure 502 (Sheet 2)

(b) 11Q19, R ENG BLEED (CONT)

S 015-005
(3) Open the access door for the main equipment center 119BL (AMM 06-41-00/201).

S 015-006
(4) Open the access door for the P50 panel.
(a) Find the ECS bleed configuration cards.

S 865-008
(5) On the ECS bleed configuration card, push the OUTPUT TEST LOW switch-light.
(a) Make sure the light comes on.
(b) If the light does not come on, replace the ECS bleed configuration card (AMM 36-11-12/401).

S 865-009
(6) On the ECS bleed configuration card, push the OUTPUT TEST HIGH switch-light.
(a) Make sure the light comes on.
(b) If the light does not come on, replace the ECS bleed configuration card (AMM 36-11-12/401).

S 415-007
(7) Close the P50 access door.

S 415-010
(8) Close the access door for the main equipment center 119BL.

S 865-127
(9) Remove electrical power if it is not necessary (AMM 24-22-00/201).

F. Do the System Test

S 865-011
(1) Supply electrical power (AMM 24-22-00/201).

S 865-128
(2) Push the L and R RECIRC FAN switch-lights, on the P5 panel, to the ON position.
(a) Make sure the INOP light does not come on.

S 865-012
(3) Make sure the BLEED AIR L and R ENG switch-lights, on the pilot's overhead panel, P5, are in the OFF position.
(a) Make sure the OFF lights are on.

S 865-013
(4) Make sure the BLEED AIR ISOLATION VALVE and APU VALVE switch-lights, on the P5 panel, are in the closed position.
(a) Make sure the VALVE lights are off.

S 865-014
(5) Make sure the L and R PACK control selector switches, on the P5 panel, are in the OFF position.
(a) Make sure the PACK OFF light is on.

S 865-123
(6) Push the BLEED AIR L and R ENG switch-lights, on the P5 panel, to the on position.
(a) Make sure the OFF light stays on.

S 865-015
(7) Prepare the left and right engines for usual operation (AMM 71-00-00/201).

S 865-016
(8) Start the left and right engines (AMM 71-00-00/201).

S 865-230
(9) Make sure the bleed air OFF lights are off after five seconds.

S 865-018
(10) Put the L and R PACK control selector switches on the P5 panel to the AUTO position.
(a) Make sure the PACK OFF lights go off.

S 215-020
(11) Make sure the L and R DUCT PRESS on the P5 panel shows between 20 and 30 psi.
(a) If the L and R DUCT PRESS is less than 20 psi, do a check of the engine minimum low idle parameters (AMM 71-00-00/501, Test No. 10 - Low Idle and High Idle Check).

S 865-261

CAUTION: MONITOR THE EGT AND N3. TAKE THE APPLICABLE ACTION TO MAKE SURE YOU DO NOT EXCEED THE LIMITS OF THESE PARAMETERS.

(12) Move the left forward thrust lever slowly forward until the L BLEED AIR DUCT PRESS on the P5 panel increases and becomes stable at 40-53 psi.

S 215-023
(13) Make sure the EICAS EPR, on the top display of the pilot's center instrument P2, shows less than 1.15.

S 865-025

(14) Slowly move the left forward thrust lever in the forward direction.
- (a) Make sure the L BLEED AIR DUCT PRESS, on the P5 panel, decreases to approximately 35 psi.
- (b) Make sure the left engine EPR, on the P2 panel, is larger than 1.13.

  NOTE: This will make sure the high stage valve has closed.

S 215-027

(15) Slowly move the left forward thrust lever in the forward direction.
- (a) Make sure the L BLEED AIR DUCT PRESS, on the P5 panel, stabilizes at 40-53 psi.

  NOTE: This will make sure the pressure regulating and shutoff valve (PRSOV) can control pressure in tolerance.

S 215-026

(16) Slowly move the left forward thrust lever back to the initial condition.
- (a) Make sure the L BLEED AIR DUCT PRESS decreases, then increases.

  NOTE: This will show that the high stage valve has opened.

S 215-028

(17) Slowly move the left forward thrust lever to the idle position.
- (a) Make sure the L BLEED AIR DUCT PRESS, on the P5 panel, decreases to 20-30 psi.
  - 1) If the L DUCT PRESS is less than 20 psi, do a check of the engine minimum low idle parameters (AMM 71-00-00/501, Test No. 10 - Low Idle and High Idle Check).

S 865-262

CAUTION: MONITOR THE EGT AND N3. TAKE THE APPLICABLE ACTION TO MAKE SURE YOU DO NOT EXCEED THE LIMITS OF THESE PARAMETERS.

(18) Move the right forward thrust lever slowly forward until the R BLEED AIR DUCT PRESS on the P5 panel increases and becomes stable at 40-53 psi.

S 215-177

(19) Make sure the EICAS EPR, on the top display of the pilot's center instrument P2, shows less than 1.15.

S 215-129

(20) Slowly move the right forward thrust lever in the forward direction.
- (a) Make sure the R BLEED AIR DUCT PRESS, on the P5 panel, decreases to approximately 35 psi.
- (b) Make sure the right engine EPR, on the P2 panel, is larger than 1.13.

  NOTE: This will make sure the high stage valve has closed.

S 215-130

(21) Slowly move the right forward thrust lever in the forward direction.
- (a) Make sure the R BLEED AIR DUCT PRESS, on the P5 panel, stabilizes at 40-53 psi.

  NOTE: This will make sure the pressure regulating and shutoff valve (PRSOV) can control pressure in tolerance.

S 215-228

(22) Slowly move the right forward thrust lever back to the initial condition.
- (a) Make sure the R BLEED AIR DUCT PRESS decreases, then increases.

  NOTE: This will show that the high stage valve has opened.

S 215-131

(23) Slowly move the right forward thrust lever to the idle position.
- (a) Make sure the R BLEED AIR DUCT PRESS, on the P5 panel, decreases to 20-30 psi.
  - 1) If the R DUCT PRESS is less than 20 psi, do a check of the engine minimum low idle parameters (AMM 71-00-00/501, Test No. 10 - Low Idle and High Idle Check).

S 865-031

(24) Push the ECS MSG switch on the EICAS MAINT panel on the right side panel, P61.

S 215-033

(25) Slowly move the left and right forward thrust levers forward until the left and right engine EPR, on top EICAS display, shows 1.14.

NOTE: If the pressure is lower than 40 psig on the dual duct pressure indicator, the system has started the crossover to HP2 regulated air. The engine thrust levers must be moved back so that the system is still on HP6 regulated air.

S 215-035

(26) Make sure the duct pressure, on the indicator for the dual duct pressure on the P5 panel, shows between 40 and 53 psig.

S 865-146

(27) Turn the control selector switch for the R PACK, on the P5 panel, to the OFF position.
  (a) Make sure the R PACK OFF light comes on.
  (b) Make sure the L PACK flow increases on the EICAS display.

S 215-038

(28) Make sure the L PRECOOL OUT temperature, on the bottom EICAS display, is between 177°C and 204°C (350°F and 400°F).

S 865-142

(29) Turn the control selector switch for the R PACK, on the P5 panel, to the AUTO position.
  (a) Make sure the R PACK OFF light goes off.

S 865-143

(30) Turn the control selector switch for the L PACK, on the P5 panel, to the OFF position.
  (a) Make sure the L PACK OFF light comes on.
  (b) Make sure the R PACK flow increases on the EICAS display.

S 215-144

(31) Make sure the R PRECOOL OUT temperature, on the bottom EICAS display, is between 177°C and 204°C (350°F and 400°F).

S 865-147

(32) Turn the control selector switch for the L PACK, on the P5 panel, to the AUTO position.
  (a) Make sure the L PACK OFF light goes off.

S 865-040

(33) Slowly move the left and right forward thrust levers to the idle position.

S 865-041

(34) Push the ECS/MSG button on the P61 panel to get the status page.

S 865-042

(35) Shut down the left and right engines (AMM 71-00-00/201).

G. Do a check of the APU control system with the APU.

S 215-066

(1) Push the BLEED AIR L and R ENG switch-lights, on the P5 panel, to the closed position.
  (a) Make sure the OFF light comes on and the flow bar goes off.

S 215-067
(2) Make sure the APU valve switch-light is in the off position (flow bar goes off).

S 215-259
(3) Make sure the isolation valve switch-light is in the open position.

S 865-073
(4) Make sure these circuit breakers on the P11 panel are closed:
(a) 11B2, ISOL (VLV, VALVE) CONT
(b) 11B3, ISOL (VLV, VALVE) PWR
(c) 11B34, APU ALTN CONT
(d) 11D19, ENGINE START CONT LEFT
(e) 11D20, ENGINE START CONT RIGHT
(f) 11Q22, APU BLEED PWR
(g) 11Q23, APU BLEED CONT

S 865-074
(5) Supply pneumatic power with the APU (AMM 36-00-00/201).

S 215-255
(6) Make sure the left and right duct pressure is approximately 30 Psig.

S 215-075
(7) Push the BLEED AIR ISOLATION VALVE switch-light to the off (or closed) position.
(a) Make sure the VALVE light comes on and then goes out (flow bar goes off).
(b) Make sure the right duct pressure is approximately 0 Psig.

S 865-076
(8) Open this circuit breaker on the overhead circuit breaker panel, P11, and attach a DO-NOT-CLOSE tag:
(a) 11B3, ISOL (VLV, VALVE) PWR

S 215-077
(9) Push the BLEED AIR ISOLATION VALVE switch-light to the on position (flow bar comes on).
(a) Make sure the VALVE light stays on.

S 215-078
(10) Make sure after 6 seconds, this EICAS message, BLEED ISLN VAL, shows on the top display.

S 215-258
(11) Make sure the left duct pressure is approximately 30 Psig and the right duct pressure is approximately 0 Psig.

S 865-079
(12) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11B3, ISOL (VLV, VALVE) PWR

S 215-080
(13) Make sure the isolation VALVE light goes off after 5 seconds.

S 215-081
(14) Make sure this EICAS message, BLEED ISLN VAL, does not show on the top display.

S 215-257
(15) Make sure the left and right duct pressure is approximately 30 Psig.

S 865-085
(16) Open this circuit breaker on the overhead circuit breaker panel, P11, and attach a DO-NOT-CLOSE tag:
(a) 11Q22, APU BLEED PWR

S 865-086
(17) Push the APU VALVE switch-light to the closed position (flow bar extinguishes).

S 215-087
(18) Make sure the APU VALVE light comes on.

S 215-088
(19) Make sure, after 6 seconds, the EICAS message, APU BLEED VAL, shows on the top display.

S 215-090
(20) Make sure the left and right duct pressure is approximately 30 Psig.

S 865-091
(21) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11Q22, APU BLEED PWR

S 215-092
(22) Make sure the APU VALVE light goes off in 5 seconds or less.

S 215-093
(23) Make sure this EICAS message, APU BLEED VAL, does not show on the top display.

S 215-260
(24) Make sure the left and right duct pressure is 0 Psig.

S 865-096
(25) Remove the APU pneumatic power (AMM 36-00-00/201).

S 865-098
(26) Remove electrical power if it is not necessary (AMM 24-22-00/201).

H. Do a check of the APU control system without the APU.

S 215-222
(1) Push the BLEED AIR L and R ENG switch-lights, on the P5 panel, to the closed position.
(a) Make sure the OFF light comes on and the flow bar goes off.

S 215-223
(2) Make sure the APU valve switch-light is in the off position (flow bar goes off).

S 865-224
(3) Open this circuit breaker on the overhead circuit breaker panel, P11, and attach a DO-NOT-CLOSE tag:
(a) 11Q23, APU BLEED CONT

S 865-225
(4) Open this circuit breaker on the E6 panel and attach a DO-NOT-CLOSE tag:
(a) APU CONT

S 035-226
(5) Remove the APU Control Unit (M206) from the E6 rack (AMM 49-61-05/201).

S 435-266
(6) Connect the pin G5 of the electrical connector D1796B, on the APU control unit, to a ground.

S 865-228
(7) Make sure these circuit breakers on the E6 panel are closed:
(a) APU START
(b) APU CONT

S 865-229
(8) Make sure these circuit breakers on the P11 panel are closed:
(a) 11B2, ISOL (VLV, VALVE) CONT
(b) 11B3, ISOL (VLV, VALVE) PWR
(c) 11B34, APU ALTN CONT
(d) 11D19, ENGINE START CONT LEFT
(e) 11D20, ENGINE START CONT RIGHT
(f) 11Q22, APU BLEED PWR
(g) 11Q23, APU BLEED CONT

S 215-229
(9) Make sure the main battery switch on the P5 panel is in the on position.

S 215-280
(10) Turn the APU start switch on the P5 panel to the START position and then to the ON position.

S 215-231
(11) Push the BLEED AIR ISOLATION VALVE switch-light to the off position.
(a) Make sure the VALVE light comes on and then goes out (flow bar goes off).

S 865-254
(12) Open this circuit breaker on the overhead circuit breaker panel, P11, and attach a DO-NOT-CLOSE tag:
(a) 11B3, ISOL (VLV, VALVE) PWR

S 215-233
(13) Push the BLEED AIR ISOLATION VALVE switch-light to the on position (flow bar comes on).
(a) Make sure the VALVE light stays on.

S 215-234
(14) Make sure after 6 seconds, this EICAS message, BLEED ISLN VAL, shows on the top display.

S 865-235
(15) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
(a) 11B3, ISOL (VLV, VALVE) PWR

S 215-236
(16) Make sure the isolation VALVE light goes off after 5 seconds.

S 215-267
(17) Make sure this EICAS message, BLEED ISLN VAL, does not show on the top display.

S 015-238
(18) Open the access door for the elevator controls 313AL (AMM 06-42-00/201).
(a) Find the APU shutoff valve.

S 865-239

WARNING: USE CAUTION WHEN YOU DO WORK AROUND HOT DUCTS. DO NOT USE THE DUCT FOR A HAND HOLD. THE HOT DUCTS CAN CAUSE INJURY TO PERSONS.

(19) Make sure the visual position indicator for the APU shutoff valve is in the closed position.

S 865-241

(20) Open this circuit breaker on the overhead circuit breaker panel, P11, and attach a DO-NOT-CLOSE tag:
   (a) 11Q22, APU BLEED PWR

S 865-242

(21) Push the APU VALVE switch-light to the open position (flow bar extinguishes).

S 215-243

(22) Make sure the APU VALVE light comes on.

S 215-268

(23) Make sure, after 6 seconds, the EICAS message, APU BLEED VAL, shows on the top display.

S 215-245

WARNING: USE CAUTION WHEN YOU DO WORK AROUND HOT DUCTS. DO NOT USE THE DUCT FOR A HAND HOLD. THE HOT DUCTS CAN CAUSE INJURY TO PERSONS.

(24) Make sure the visual position indicator for the APU shutoff valve stays in the closed position.

S 865-247

(25) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
   (a) 11Q22, APU BLEED PWR

S 215-269

(26) Make sure the APU VALVE light goes off in 5 seconds or less.

S 215-249

(27) Make sure this EICAS message, APU BLEED VAL, does not show on the top display.

S 215-250

WARNING: USE CAUTION WHEN YOU DO WORK AROUND HOT DUCTS. DO NOT USE THE DUCT FOR A HAND HOLD. THE HOT DUCTS CAN CAUSE INJURY TO PERSONS.

(28) Make sure the visual position indictor for the APU shutoff valve is in the OPEN position.

S 865-125

(29) Push the APU VALVE switch-light to the closed position.

S 215-126

(30) Make sure the visual position indictor for the APU shutoff valve is in the CLOSED position.

S 865-252

(31) Remove pneumatic power (AMM 36-00-00/201).

S 415-253

(32) Close the access door for the elevator controls 313AL.

S 865-255

(33) Remove electrical power if it is not necessary (AMM 24-22-00/201).

TASK 36-11-00-715-181

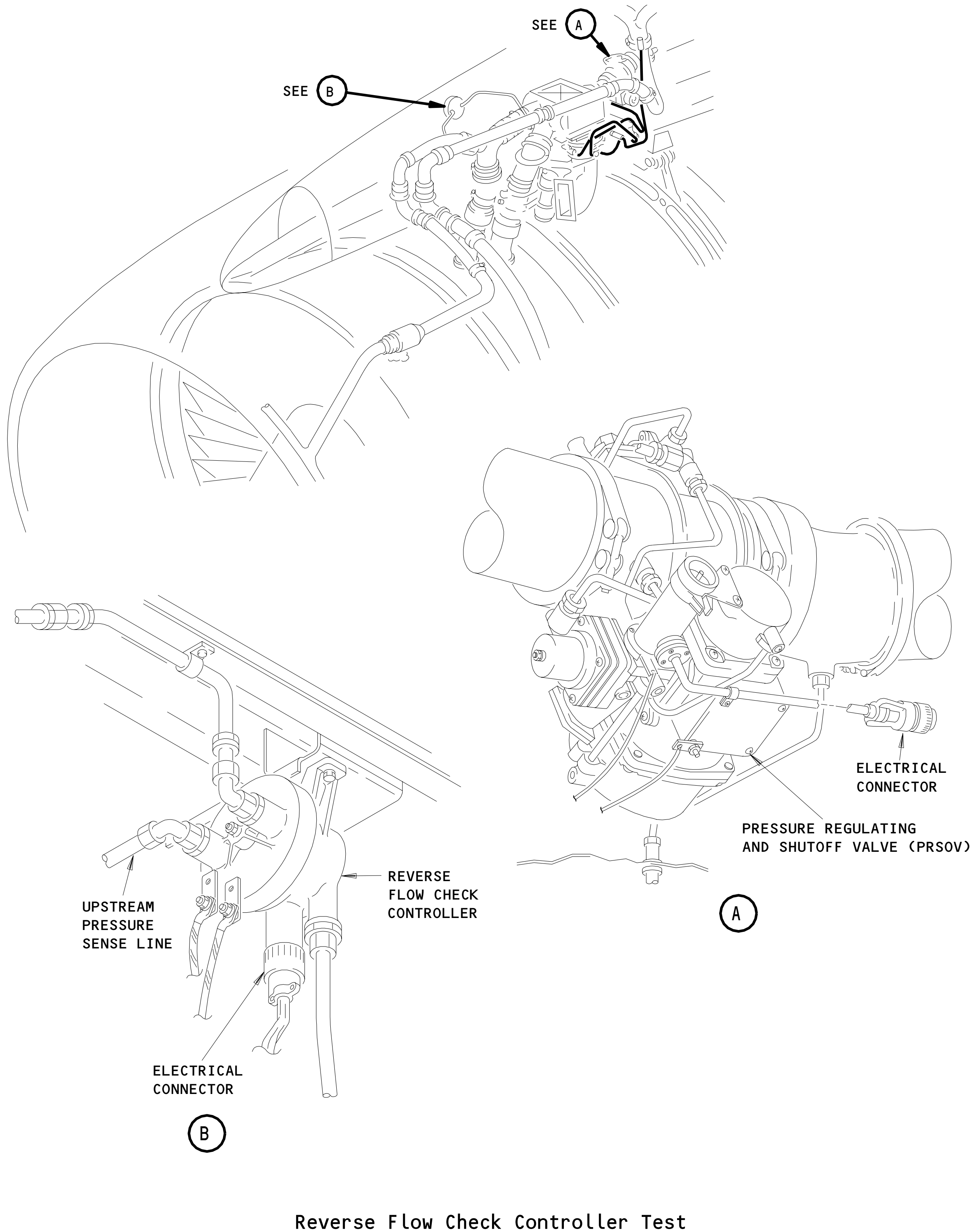
3. Operational Test - Reverse Flow Check Controller (Fig 503).

A. Equipment
  (1) Ohmmeter - commercially available
  (2) Ground pneumatic cart - commercially available

B. References
  (1) 06-43-00/201, Engine and Nacelle Strut Access Doors
  (2) AMM 36-00-00/201, Pneumatic Power
  (3) AMM 78-31-00/201, Thrust Reverser System

C. Access
  (1) Location Zones
    119 Main equipment center (Left)
    313 Stabilizer center section compartment (Left)
    433/443 Nacelle strut - mid-structure
  (2) Access Panels
    119BL Main Equipment Center Access Door
    313BL APU Intake Port Access Door
    433HR/443HL High Pressure Duct Access Door

D. Do a check of the operation of the reverse flow check controller (Fig. 503).



Reverse Flow Check Controller Test
Figure 503

S 045-184

WARNING: DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(1) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

S 015-187

(2) Open the access door for the applicable strut 433HR or 443HL (Ref 06-43-00/201).

S 865-265

(3) Supply pneumatic power with a ground air source or the APU (AMM 36-00-00/201).

S 865-192

(4) Push the ISOLATION VALVE switch on the BLEED AIR module to the open position (the white bar will come on).

S 035-193

(5) Disconnect the connector from the reverse flow check controller.

S 495-194

(6) Connect an ohm meter between pins 1 and 2 of the reverse flow check controller.

S 215-195

(7) Make sure that the ohmmeter shows that the circuit is open.

S 095-196

(8) Disconnect the ohmmeter from the connector.

S 435-197

(9) Connect the connector to the reverse flow check controller.

S 865-205

(10) Do the check of the operation of the reverse flow check controller for the other engine.

S 415-206

(11) Close the access door for the applicable strut 433HR or 443HL (Ref 06-43-00/201).

S 865-208

(12) Remove the pneumatic power (AMM 36-00-00/201).

S 445-213

(13) Do the procedure for the activation of the thrust reverser (AMM 78-31-00/201).

TASK 36-11-00-795-251

4. <u>Air Supply Distribution System Leakage Test</u> (Fig. 504, 505, 506)

A. Equipment
   (1) Ground pneumatic cart - commercially available

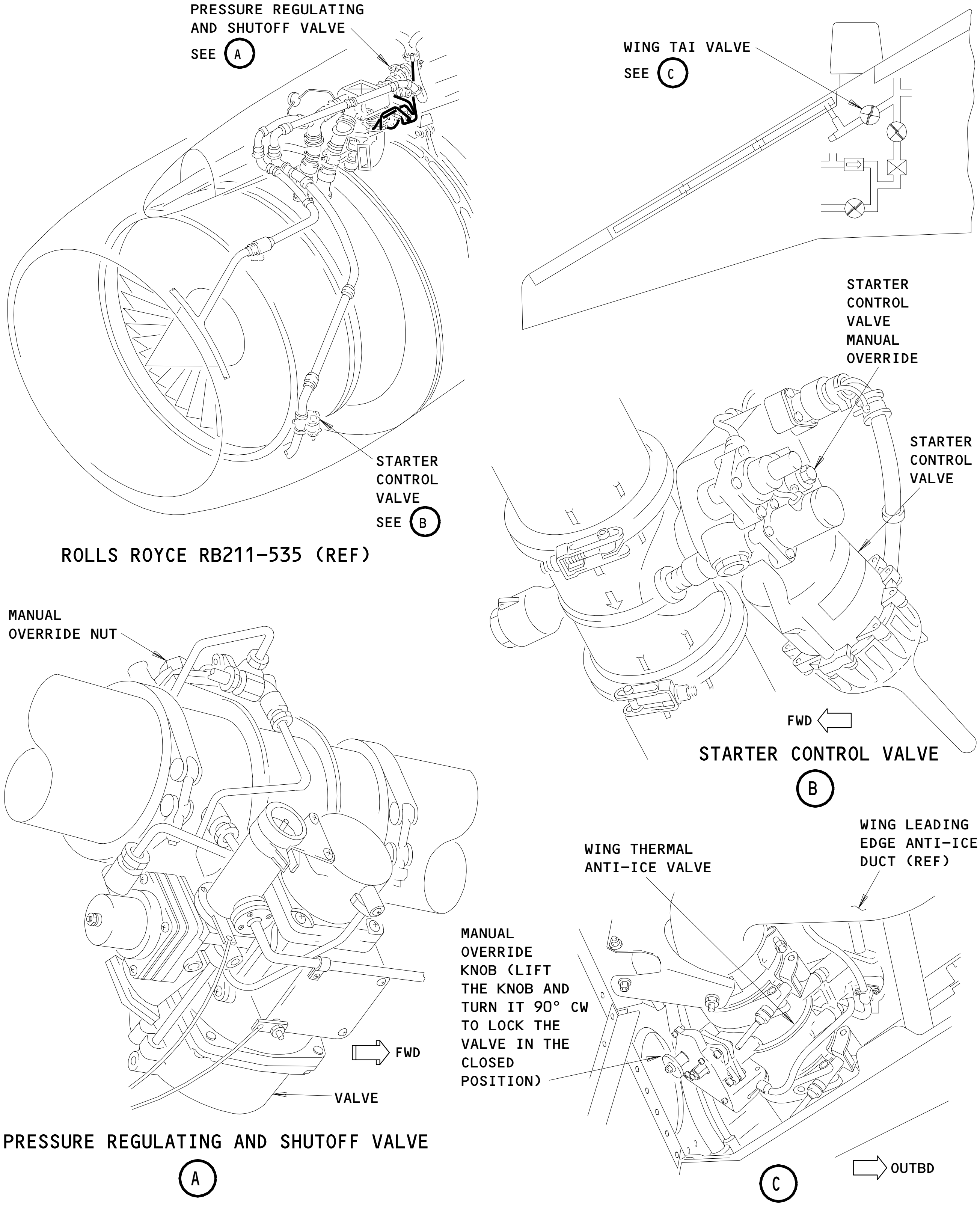
B. References
   (1) AMM 06-41-00/201, Fuselage Access Doors and Panels
   (2) AMM 06-44-00/201, Wings Access Doors and Panels
   (3) AMM 06-46-00/201, Entry, Service and Cargo Access Doors and Panels
   (4) AMM 24-22-00/201, Electrical Power Control
   (5) AMM 36-00-00/201, Pneumatics - Provide/Remove Power
   (6) AMM 36-11-11/401, APU Check Valve
   (7) AMM 71-11-04/201, Fan Cowl Panels

C. Access
   (1) Location Zones
       135/136 Environmental control systems bay
       413/423/414/424 Fan cowl panel
       511/611 Leading edge to front spar
       822 No. 2 cargo door
   (2) Access Panels
       193HL/194ER Environmental Control Systems Components
       413AL/414AR/423AL/424AR Fan Cowl and Fancase
       511KT/611KT Environmental Control System Duct

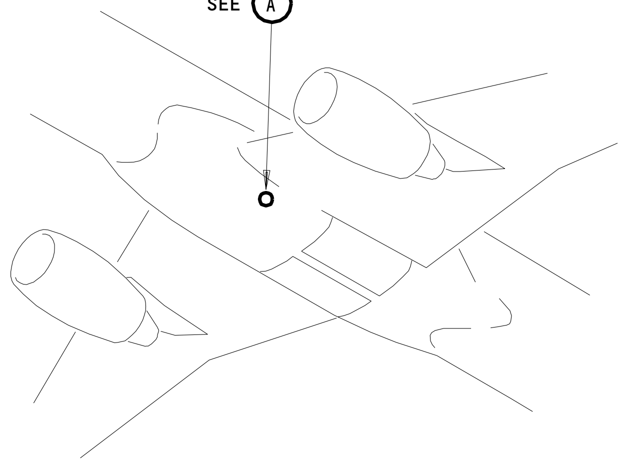
D. Prepare for the Test

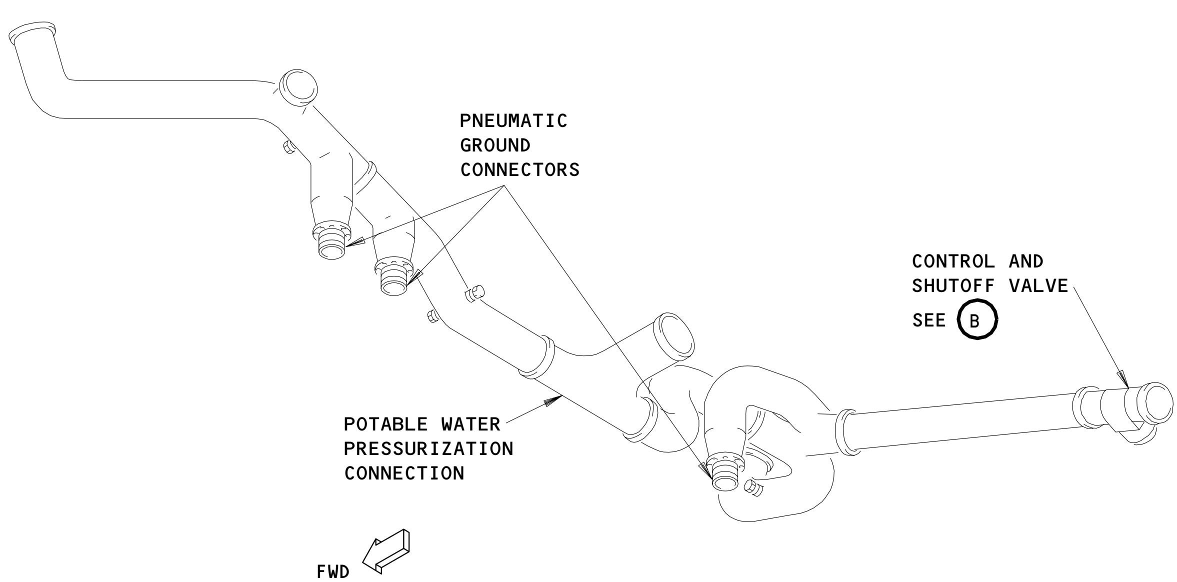
S 865-099

(1) Make sure these circuit breakers on the overhead circuit breaker panel, P11, are closed:
   (a) 11A14, AIR COND PACK LEFT FLOW CONT
   (b) 11A29, AIR COND PACK RIGHT FLOW CONT



Duct Leakage Test - Engine Components - PRSOV, Starter Control and Wing TAI Valves
Figure 504





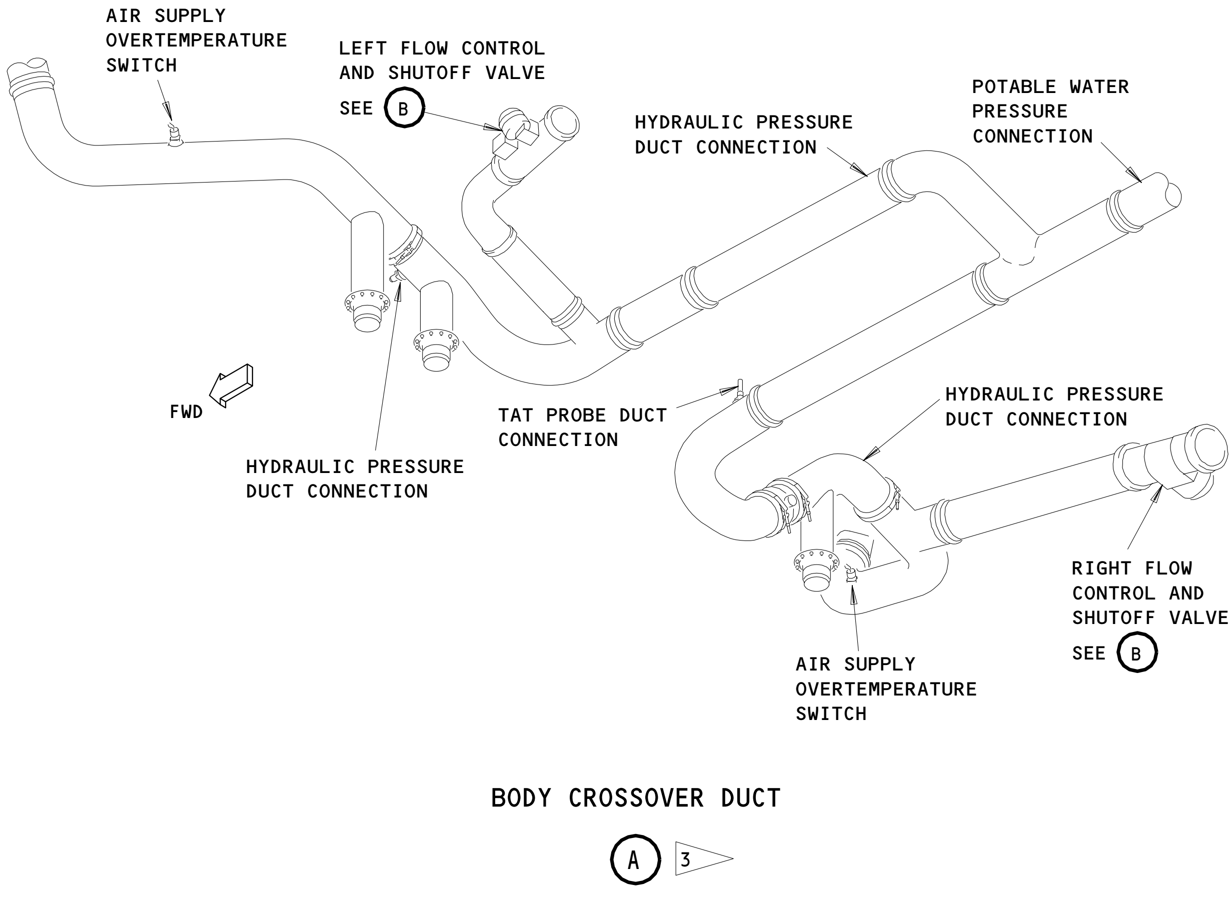
BODY CROSSOVER DUCT

A 1

1 AIRPLANES WITHOUT THE OZONE CONVERTER

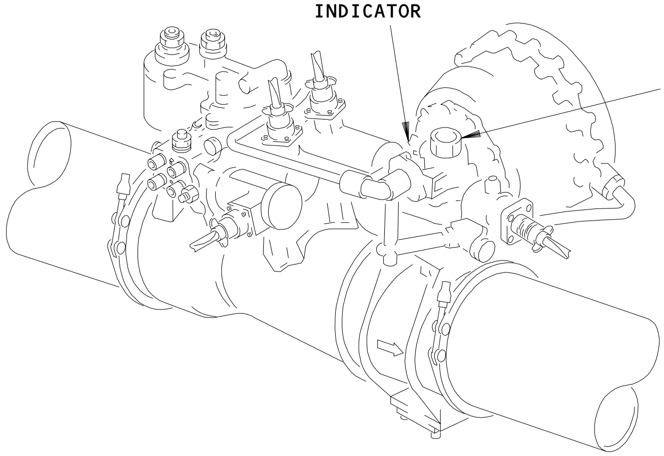
2 NOT USED

Air Supply Leakage Test Components
Figure 505 (Sheet 1)



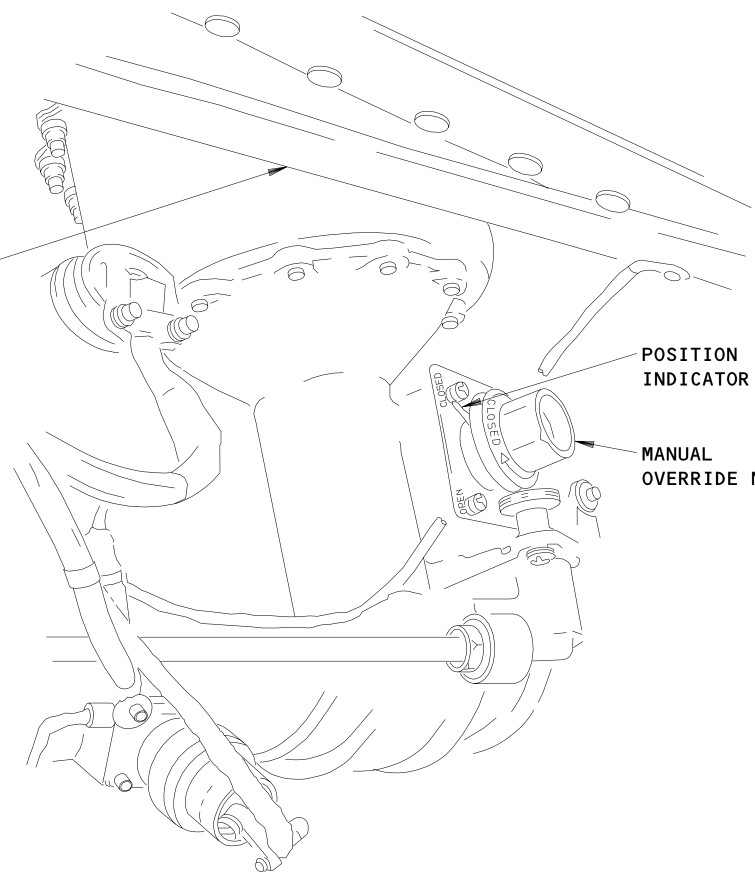
3 AIRPLANES WITH THE OZONE CONVERTER

Body Crossover Pneumatic Duct
Figure 505 (Sheet 2)



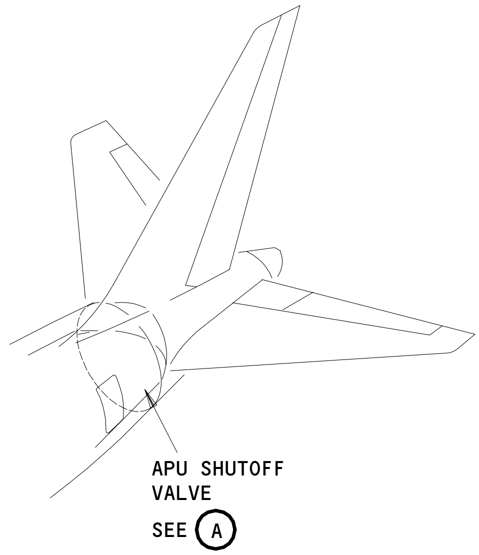
FLOW CONTROL AND SHUTOFF VALVE
(LEFT SIDE IS SHOWN, - RIGHT SIDE IS ALMOST THE SAME)

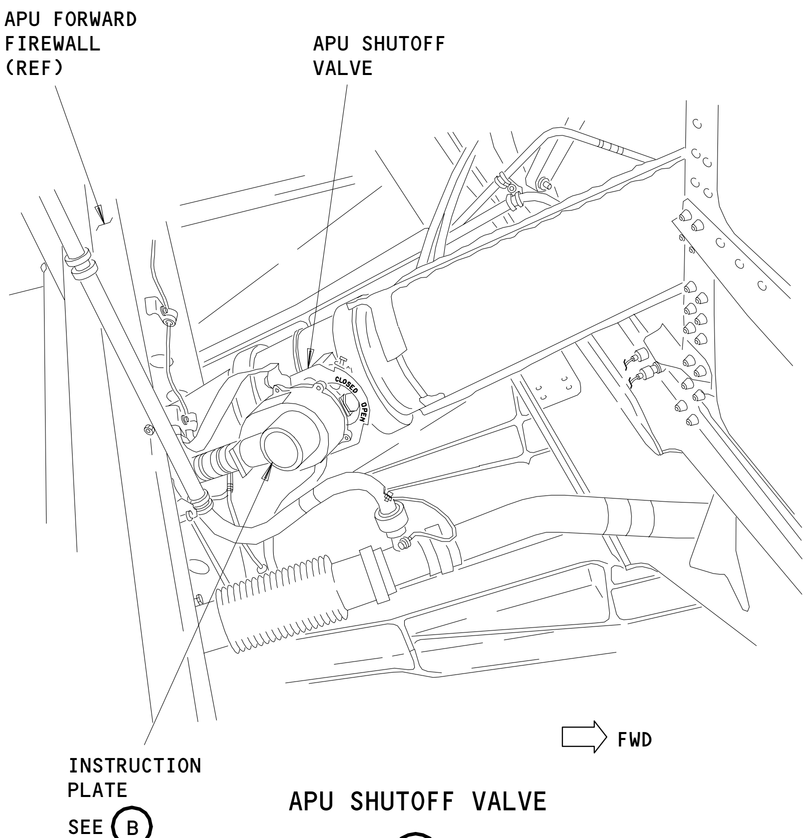
B



C

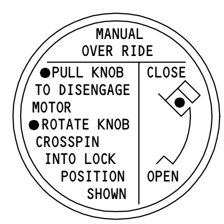
Air Supply Leakage Test Components
Figure 505 (Sheet 3)





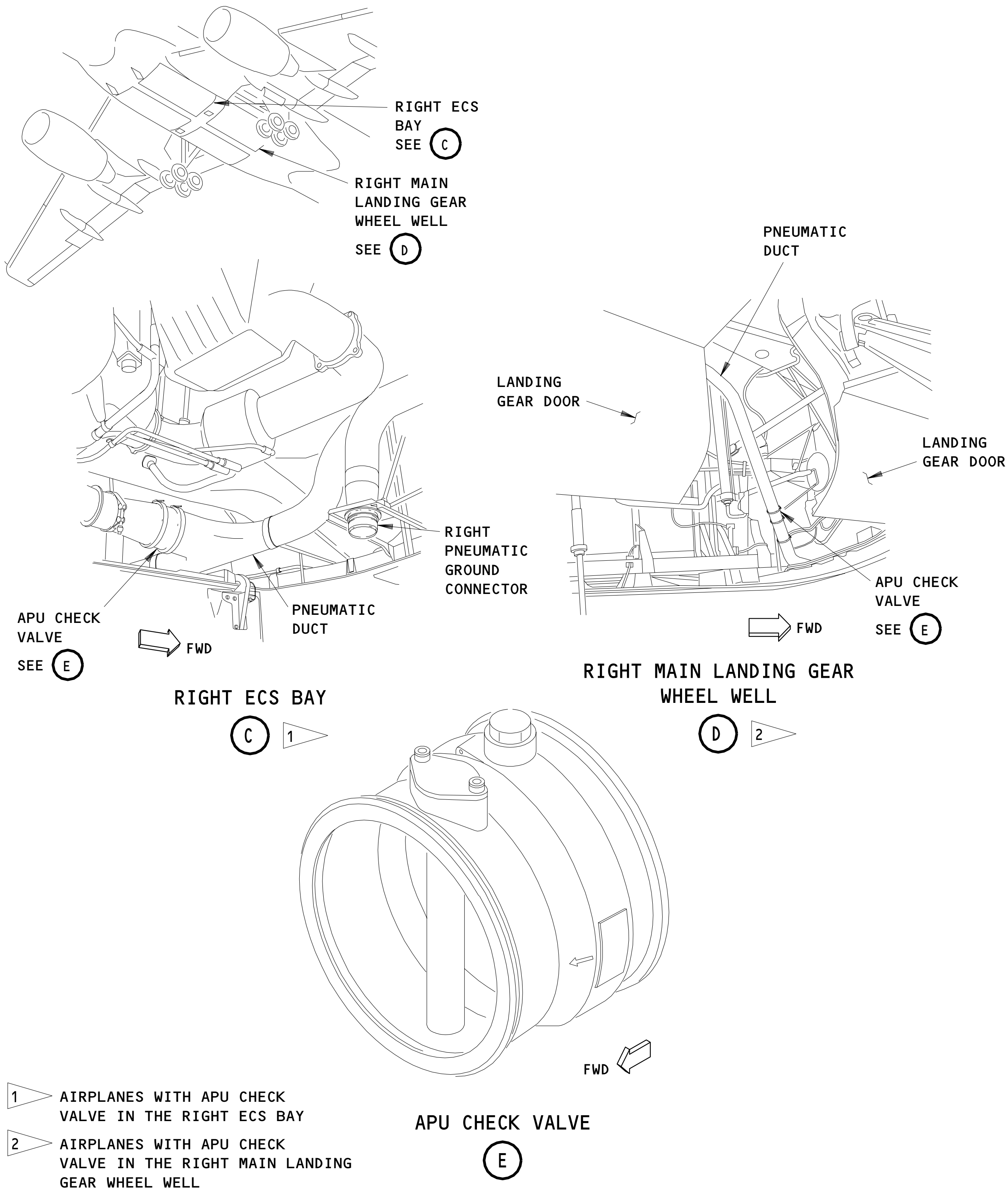
APU SHUTOFF VALVE

A



B

APU Duct Leakage Test Components
Figure 506 (Sheet 1)



APU Duct Leakage Test Components
Figure 506 (Sheet 2)

(c) 11B2, ISOL (VLV, VALVE) CONT
(d) 11B3, ISOL (VLV, VALVE) PWR
(e) 11C27, ANTI-ICE ENG LEFT
(f) 11C28, ANTI-ICE ENG RIGHT
(g) 11C29, ANTI-ICE WING
(h) 11D19, ENGINE START CONT LEFT
(i) 11D20, ENGINE START CONT RIGHT
(j) 11Q10, ENG (BLEED, BLD) L
(k) 11Q18, HI STAGE SW OVER (L, LEFT)
(l) 11Q19, R ENG BLEED (CONT)
(m) 11Q22, APU BLEED PWR
(n) 11Q23, APU BLEED CONT
(o) 11Q27, HI STG SW OVER R or R HI STG SW OVER

E. Do The Air Supply Distribution System Test

S 865-220

WARNING: RELEASE THE PRESSURE IN THE PNEUMATIC DUCT INSTALLATION BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. THE HOT, HIGH-PRESSURE AIR CAN CAUSE INJURY TO PERSONS.

(1) Remove pneumatic power (AMM 36-00-00/201).

NOTE: Pressure is relieved when the system is not in operation.

S 015-136
(2) Open the access doors for the left and right ECS Bay 193HL and 194ER (AMM 06-41-00/201).

S 035-103
(3) Disconnect the potable water pressurization line at the duct.

S 495-102
(4) Install covers on the duct and the potable water pressurization line.

S 035-105
(5) Disconnect the pneumatic supply lines to the pressurization module for the hydraulic reservoir at the duct.

S 495-106
(6) Put a plug on each boss on the duct.

S 495-107
(7) Put a cover on the pneumatic lines.

S 015-108
(8) Open the fan cowl panels on the two engines 413AL, 423AL, 414AR, 424AR (AMM 71-11-04/201).

S 215-109

(9) Make sure the starter control valves for the two engines are in the full closed position (Fig. 504).

(a) If the valves are not closed, turn the manual override for the starter control valve to the closed position (Fig. 504).

S 015-111

(10) Open the panels, 511KT and 611KT, on the leading edge of the wing (AMM 06-44-00/201).

S 215-112

(11) Make sure the two wing TAI valves are in the full closed position (Fig. 504).

(a) If the valves are not fully closed, turn the manual override for the wing TAI valve to the full closed position (Fig. 504).

S 865-113

(12) Supply electrical power (AMM 24-22-00/201).

S 215-114

(13) Make sure the L and R pack selector switches on the pilot's overhead panel, P5, are in the OFF position (Fig. 501, 505).

(a) Attach a DO-NOT-OPERATE tag on the two selector switches.

(b) Make sure the visual position indicators show that the flow control and shutoff valves are in the closed position (Fig. 501, 505).

S 215-115

(14) Make sure the L and R ENG BLEED AIR switch-lights, on the P5 panel, are in the OFF position.

(a) Make sure the OFF light is on.

(b) Attach DO-NOT-OPERATE tags to the two switch-lights.

(c) Make sure the visual position indicator shows the valves are in the closed position.

S 215-117

(15) Make sure the isolation valve is in the full open position (Fig. 505).

(a) Make sure the white flowbar is on.

(b) Make sure the position indicator shows the valve is in the open position (Fig. 505).

S 785-291

(16) Pressurize the pneumatic system with Method 1 or Method 2 below:

NOTE: Method 1 pressurizes the pneumatic system with the Auxilliary Power Unit (APU). Method 2 pressurizes the pneumatic system with a ground air source.

(a) Pressurize the Pneumatic System (Method 1):
  1) Provide pneumatic power using the Auxilliary Power Unit (APU) (AMM 36-00-00/201).

(b) Pressurize the Pneumatic System (Method 2):
  1) Make sure the APU BLEED AIR switch-light, on the P5 panel, is in the off position.
    a) Make sure the flowbar and the VALVE light are off.
    b) Attach a DO-NOT-OPERATE tag to the switch-light.
    c) Make sure the visual position indicator shows the valve is in the closed position.
  2) Remove the APU check valve (AMM 36-11-11/401).
  3) Install the APU check valve so the flow arrow points in the aft direction (AMM 36-11-11/401).

  4) Pressurize the system to 45 ±1 psig using a ground air source (AMM 36-00-00/201).
    a) As an option, the system can be pressurized to 29 ±1 psig.

NOTE: A 45 psig pneumatic pressure is recommended more than 29 psig because the system normally operates near 45 psig. Duct leaks that are detectable at 45 psig may not be detectable at 29 psig.

S 795-121

WARNING: DO NOT PUT YOUR HAND IN FAST AIR LEAKAGE FROM THE DUCT. THE PNEUMATIC AIR IS AT HIGH PRESSURE AND CAN CAUSE INJURY.

(17) Do a check for air leakage at all the duct joints.
  (a) Feel for the air leakage at 12 inches or more from the duct joint if you supplied 45 psig.

(b) Feel for air leakage at 9 inches from the duct joint if you supplied 29 psig (as an alternative to 45 psig).

(c) Small air leakage is satisfactory.

(d) Repair large air leakage by joint or coupling adjustment or duct replacement.

NOTE: Large air leakage is concentrated airflow felt with your hand near a point on the duct joint.

Riveted flange flexible ducts typically exhibit more leakage when pressurized with low (room) temperature air. If there is excessive leakage noted from a rivited flange coupling when you do the leakage test with room temperature air, do the test again after an engine run. The air leakage may decrease as a result of the higher temperature of the duct.

S 795-124

(18) If you cannot get access to all the joints, listen for air at the nearest access.

WARNING: DO NOT PUT YOUR HAND IN THE AIR LEAKAGE FROM THE DUCT. THE PNEUMATIC AIR IS AT HIGH PRESSURE AND CAN CAUSE INJURY.

(a) If you think there is duct leakage, open the applicable access panel.

1) Feel for air leakage at 12 inches or more from the duct if you supplied 45 psig.

2) Feel for air leakage at 9 inches from the duct joint if you supplied 29 psig (as an alternative to 45 psig).

3) Small air leakage is satisfactory.

4) Repair large air leakage by joint or coupling adjustment or duct replacement.

NOTE: Large air leakage is concentrated airflow felt with your hand near a point on the duct joint.

S 215-278

(19) Make sure the L and R DUCT PRESS, on the P5 panel, shows:

(a) 45 ±1 psig.

(b) 29 ±1 psig, if applicable.

S 865-126

(20) Remove pneumatic power (AMM 36-00-00/201).

S 865-293
(21) If you pressurized the pneumatic system with a ground air source, do these steps:
 (a) Remove the electrical connector for the APU shutoff valve.
 (b) Manually open the APU shutoff valve to remove the pressure between the APU check valve and the APU shutoff valve.
 (c) When the pressure is gone, close the APU shutoff valve.
 (d) Install the electrical connector for the APU shutoff valve.

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.

 (e) Remove pneumatic power (AMM 36-00-00/201).

 NOTE: Pressure is relieved when the system is not in operation.

 (f) Remove the APU CHECK VALVE (AMM 36-11-11/401).
 (g) Install the APU CHECK VALVE to make sure the flow arrow points in the forward direction (AMM 36-11-11/401).

S 025-281
(22) Remove the covers on the potable water pressurization line at the duct.

S 425-282
(23) Install the potable water pressurization line at the duct.

S 095-130
(24) Remove the covers from the tube and the duct.

S 435-129
(25) Connect the tube to the duct.

S 095-135
(26) Remove the covers from the pneumatic supply lines to the hydraulic reservoir.

S 095-134
(27) Remove the plugs from the bosses on the duct.

S 435-133
(28) Connect the pneumatic sense lines to the duct.

S 865-136
(29) Put the manual overrides on the engine starter control valves, cowl anti-ice valves, and wing TAI valves to the position for usual operation.

S 415-137

(30) Close the panels, 511KT and 611KT, on the leading edge of the wing (AMM 06-44-00/201).

S 415-138

(31) Close the fan cowl panels on the two engines 413AL, 423AL, 414AR, 424AR (AMM 71-11-04/201).

S 415-139

(32) Close the access doors for the left and right ECS bay 193HL and 194ER.

S 865-140

(33) Remove the DO-NOT-OPERATE tags from the BLEED AIR SUPPLY and the ECS CONTROL modules on the P5 panel.

S 865-141

(34) Remove electrical power if it is not necessary (AMM 24-22-00/201).

TASK 36-11-00-865-122

5. EICAS Maintenance and Engine Ground Run Form (Fig. 507)

A. General

(1) This form includes three primary sections:

(a) The engine ground run and flight operations.

(b) A picture of the bleed air supply control module on the P5 panel.

(c) The ECS/MSG EICAS maintenance page.

(2) The engine ground run and flight operations section contains boxes that you can mark to show the engine or airplane in a given condition. This section also has areas to input other data (temperatures, pressures, EPR etc.) you can use to help in troubleshooting a problem.

(3) The picture of the bleed air supply control module contains boxes that you can mark to show various conditions of the lights and/or switches.

(4) The ECS/MSG EICAS maintenance page has space to write the precooler out temperature, the duct pressure and an AUTO EVENT message that could have occurred. This page also lists all of the EICAS messages applicable to the pneumatics system. Each EICAS message has a box that you can mark to identify the applicable messages for a given fault.

TEMP. AMBIENT_________F   PRESS. AMBIENT________IN HG

ENGINE GROUND RUN

- ☐ IDLE
- ☐ INTERMEDIATE
- ☐ TAKE-OFF
- ☐ REVERSE

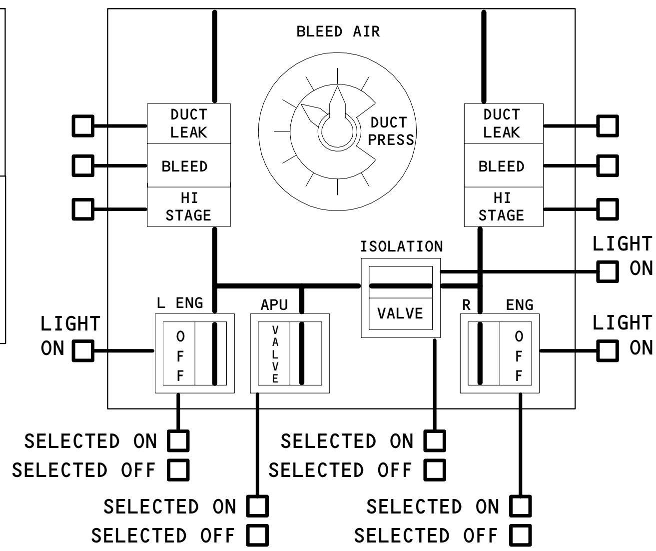
TEMP__________WIND_________/_________BARO__________

FLIGHT OPERATIONS FLIGHT NO.___________A/P________

- ☐ TAKE-OFF
- ☐ CLIMB
- ☐ CRUISE
- ☐ REVERSE
- ☐ IDLE
- ☐ DESCENT

EPR_________________

BLEED AIR SUPPLY CONTROL MODULE



ECS/MSG

	FLT DK	FWD	AFT
DUCT TEMP	____	____	____
TRIM VALVE	____	____	____

	L	R
PACK OUT	____	____
TURB IN	____	____
SEC HX OUT	____	____
COMPR OUT	____	____
PRIM HX OUT	____	____
PRIM HX IN	____	____
PRECOOL OUT	____	____
DUCT PRESS	____	____
PACK FLOW	____	____
TEMP VALVE	____	____
RAM IN DOOR	____	____

- L ENG BLEED VAL ☐
- R ENG BLEED VAL ☐
- APU BLEED VAL ☐
- BLEED ISLN VAL ☐
- L ENG BLEED OFF ☐
- R ENG BLEED OFF ☐
- L ENG HI STAGE ☐
- R ENG HI STAGE ☐

PAGE 2

- AUTO EVENT ☐
- MAN EVENT ☐

WRITE AUTO EVENT
MESSAGE HERE:

____

RECORDED BY:

NAME___________________________DATE/TIME______________________

OTHER INFO____

____

NOTE: KEEP A RECORD OF THE ABOVE INFORMATION FOR EACH ENGINE. THE INFORMATION WILL BE USED FOR COMPARISON PURPOSES.

757 - EICAS Maintenance and Engine Ground Run Form
Figure 507

PNEUMATIC DUCT - REMOVAL/INSTALLATION

1. General
   A. This procedure includes the tasks to remove and install the duct sections in the air supply system. The duct sections from the three air supply sources (engine, APU, and pneumatic ground connectors) to each system are in this procedure.
   B. The Removal and Installation tasks are as follows:
      (1) Engine Air Supply Ducts
      (2) Strut Pneumatic Ducts
      (3) Upper Y-duct
      (4) Wing Leading Edge Ducts
      (5) Body Crossover Ducts
      (6) APU Ducts

TASK 36-11-01-004-017

2. Remove the Engine Duct (Fig. 401)
   A. References
      (1) AMM 24-22-00/201, Electrical Power Control
      (2) AMM 36-00-00/201, Pneumatic - General
      (3) AMM 36-11-20/401, Fan Air Intake Duct
      (4) AMM 71-11-04/201, Fan Cowl Panels
      (5) AMM 78-31-00/201, Thrust Reverser System
   B. Access
      (1) Location Zones

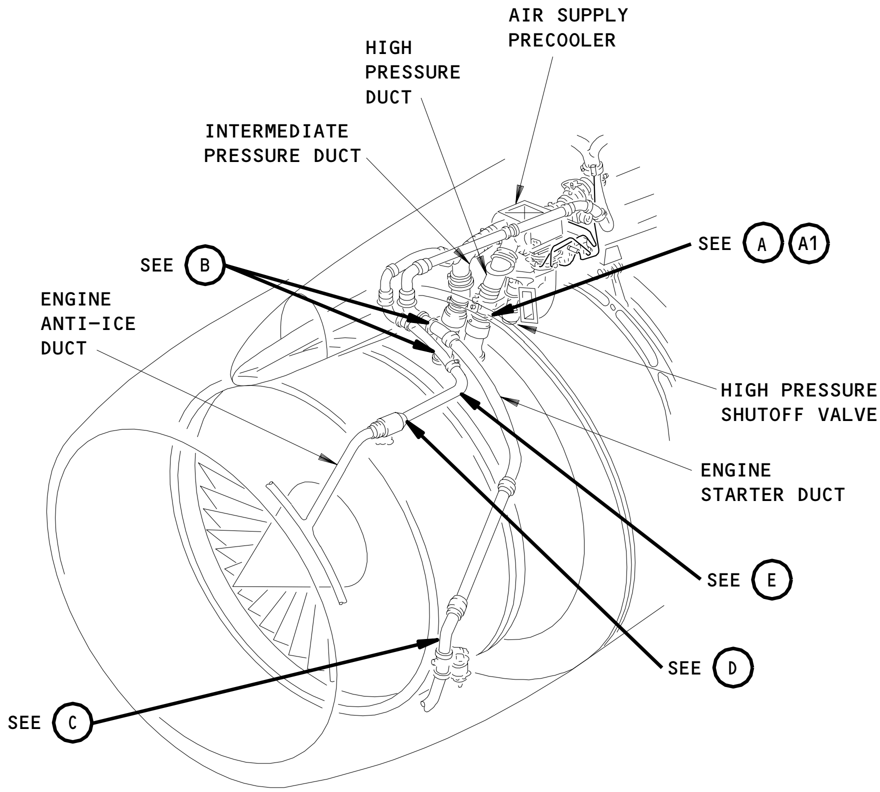
413/423	Fan Cowl Panel (Left)
415/416/425/426	Fan Reverser

   C. Prepare for the Removal

S 044-001

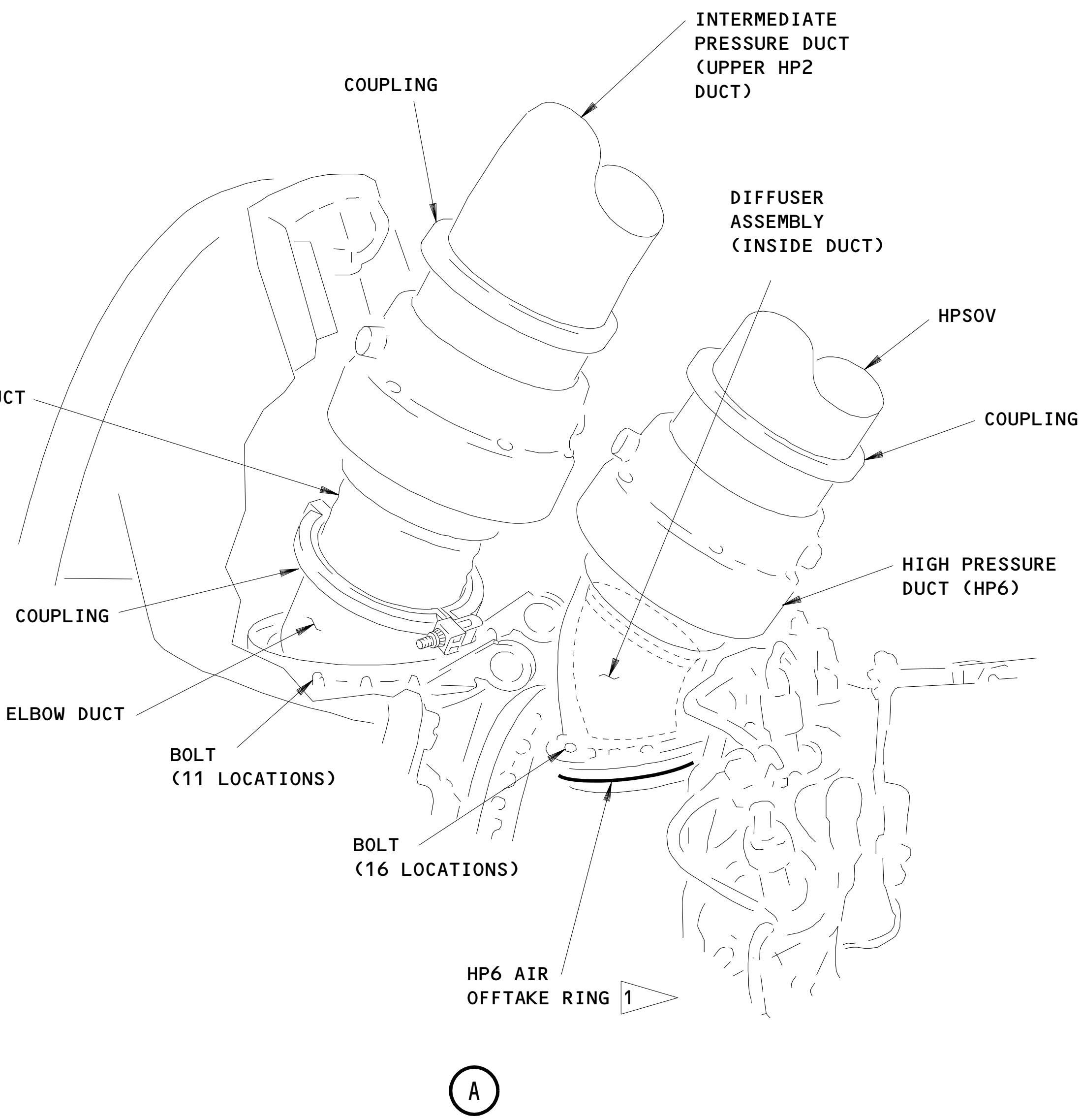
WARNING: DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

      (1) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).



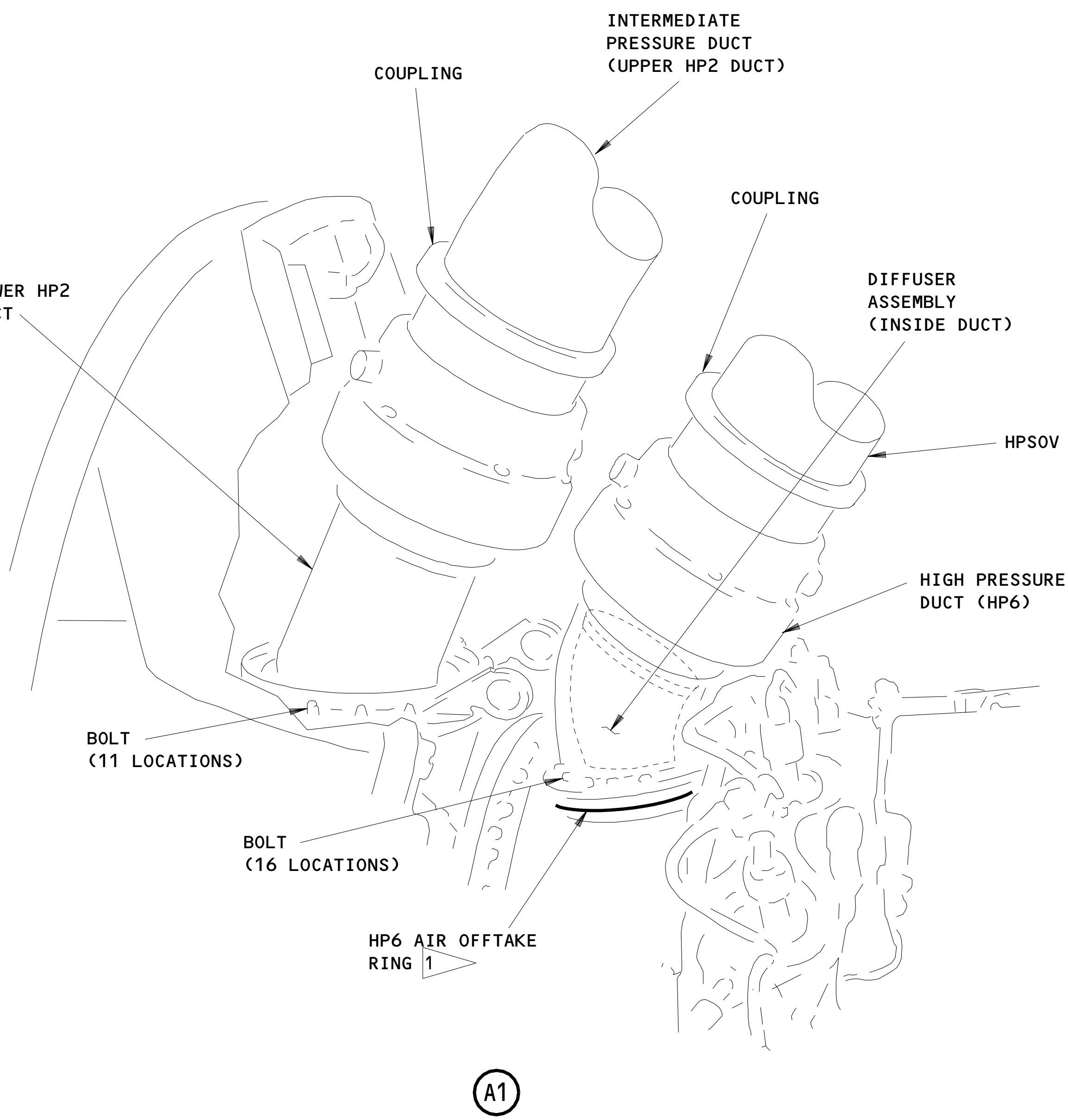
RR RB211-535 ENGINES

Engine Pneumatic Duct
Figure 401 (Sheet 1)



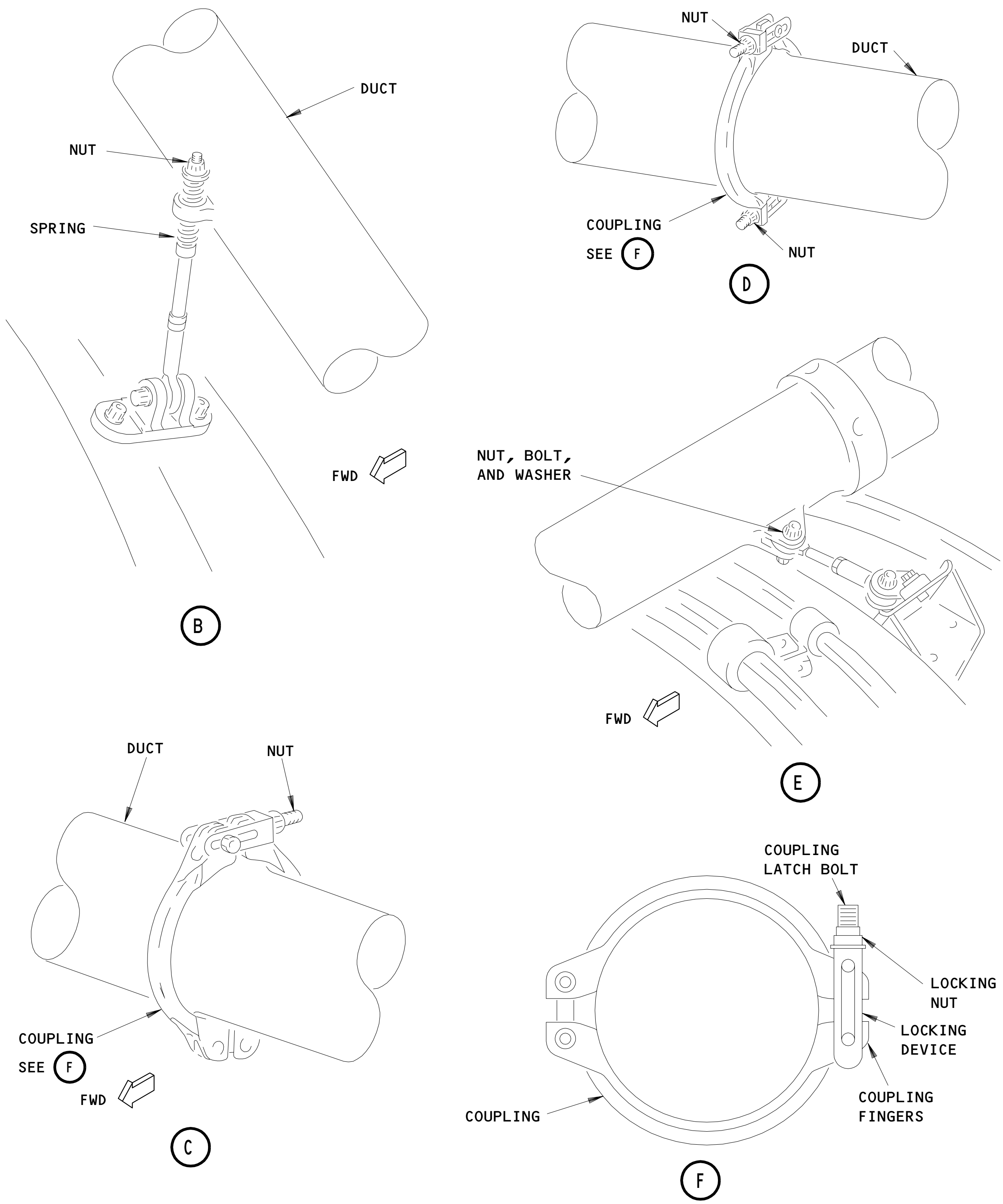
1 THE HP6 AIR OFFTAKE RING CAN BE USED FOR ENGINE SHIPPING PURPOSES TO ATTACH THE DIFFUSER ASSEMBLY TO THE ENGINE WHEN THE HIGH PRESSURE DUCT (HP6) IS REMOVED. THE HP6 AIR OFFTAKE RING IS INSTALLED OVER THE DIFFUSER ASSEMBLY AND ATTACHES THE DIFFUSER ASSEMBLY TO THE ENGINE WITH EIGHT (8) BOLTS.

Engine Pneumatic Duct
Figure 401 (Sheet 2)

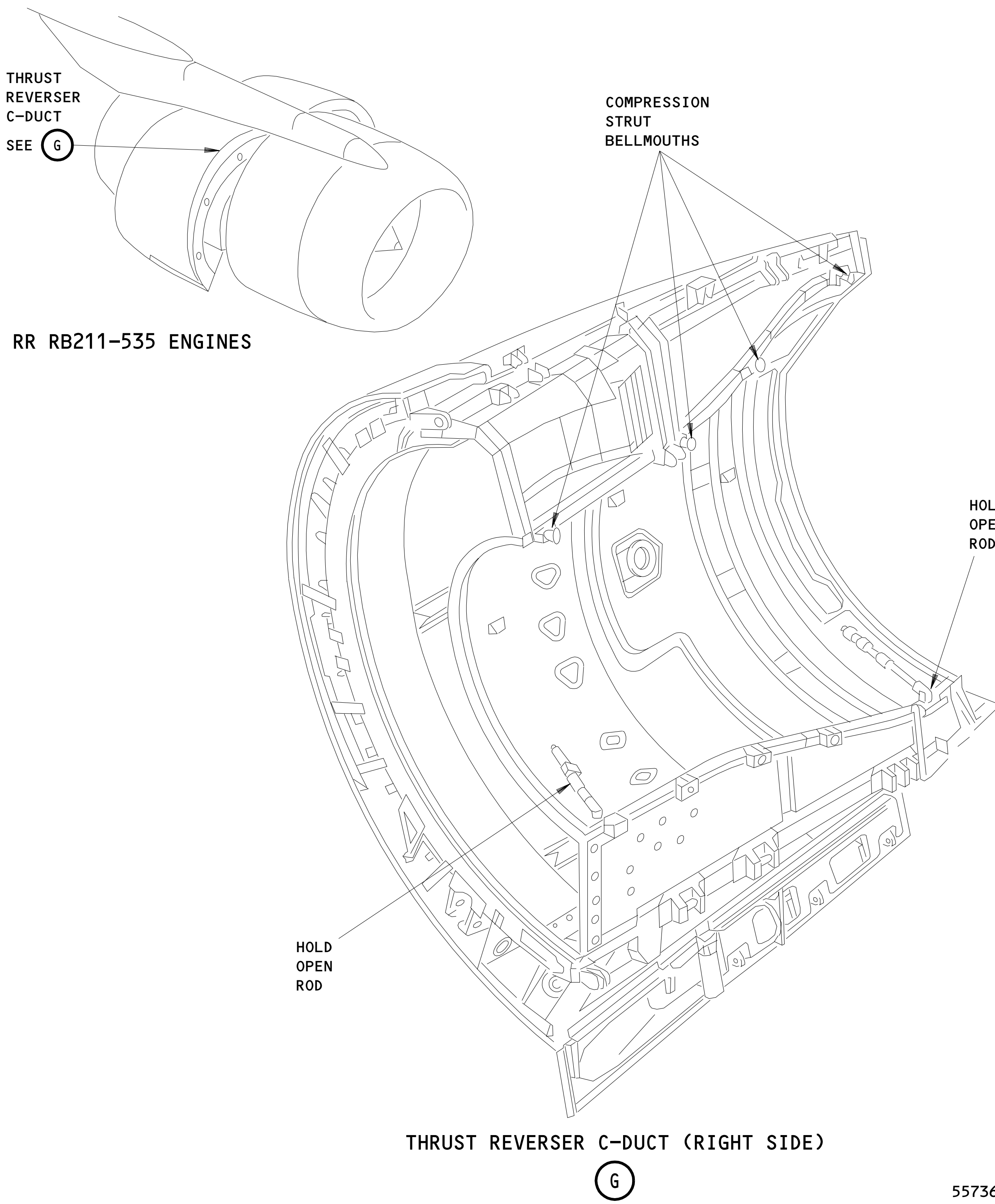


1 THE HP6 AIR OFFTAKE RING CAN BE USED FOR ENGINE SHIPPING PURPOSES TO ATTACH THE DIFFUSER ASSEMBLY TO THE ENGINE WHEN THE HIGH PRESSURE DUCT (HP6) IS REMOVED. THE HP6 AIR OFFTAKE RING IS INSTALLED OVER THE DIFFUSER ASSEMBLY AND ATTACHES THE DIFFUSER ASSEMBLY TO THE ENGINE WITH EIGHT (8) BOLTS.

Engine Pneumatic Duct
Figure 401 (Sheet 3)



Engine Pneumatic Duct
Figure 401 (Sheet 4)



Engine Pneumatic Duct
Figure 401 (Sheet 5)

S 014-018

(2) Open the applicable left fan cowl panel on the left or right engine if you remove the starter or anti-ice duct (413 or 423) (AMM 71-11-04/201).

S 014-005

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

(3) Open the applicable left or right engine thrust reverser cowl if you remove the pneumatic supply duct (high and intermediate pressure ducts) (AMM 78-31-00/201).

S 864-020

(4) Supply electrical power (AMM 24-22-00/201).

S 864-230

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.

(5) Remove pneumatic power (AMM 36-00-00/201).

NOTE: Pressure is released when the system is not in operation.

S 034-024

(6) Remove the coupling from the duct section ends.

S 034-026

(7) Do these steps to get access to remove the intermediate pressure duct attached to the engine:
   (a) Remove the coupling between the high pressure duct and the HPSOV.

(b) Remove the bolts that attach the high pressure duct (HP6) and diffuser assembly to the engine.

(c) Remove the high pressure duct and diffuser assembly.

1) Remove the diffuser assembly out and the HP6 air offtake ring from the end of the high pressure duct (HP6).

(d) Remove the compression rod cone on the right thrust reverser to permit removal of the intermediate pressure duct.

NOTE: If it is necessary to lift the thrust reverser to permit removal of the intermediate pressure duct, use the procedure to hold open the Fan C-duct in AMM 36-11-20/401.

S 034-022

(8) Remove the bolts from the duct section, if it is applicable.

S 024-027

(9) Remove the duct section.

S 034-028

(10) Remove the E-Seals from the flanges.

S 494-029

(11) Put a cover on the duct openings to keep out unwanted material.

TASK 36-11-01-404-030

3. Install the Engine duct (Fig. 401)

A. References

(1) AMM 24-22-00/201, Electrical Power Control
(2) AMM 36-11-20/401, Fan Air Intake Duct
(3) AMM 71-11-04/201, Fan Cowl Panels
(4) AMM 78-31-00/201, Thrust Reverser System

B. Access

(1) Location Zones

413/423	Fan Cowl Panel (Left)
415/416/425/426	Fan Reverser

C. Procedure

S 094-032

(1) Remove the duct covers.

S 214-033
(2) Examine the flange surfaces that seal for worn areas.

S 214-035
(3) Examine all the E-Seals for worn areas, cracks, dents, unwanted material or other damage. Replace all the damaged E-Seals.

S 424-036
(4) Install the E-Seal and the duct.

S 424-037
(5) Align the flanges but do not use force.
(a) Align the flanges to a maximum clearance of 0.03 inch at all points. Realign the duct if it is necessary.

S 434-236

CAUTION: MAKE SURE YOU INSTALL THE LOCKING DEVICE OF THE COUPLING CORRECTLY AS SHOWN IN FIG. 401. IF YOU DO NOT INSTALL THE COUPLING FINGERS INSIDE THE LOCKING DEVICE THE COUPLING CAN LOOSEN AND CAUSE DAMAGE TO EQUIPMENT.

(6) Install the couplings to the duct ends and do not tighten.

S 434-039
(7) Install the bolts, washers, and nuts that attach the duct to the support if it is applicable.

S 434-041
(8) Install the bolts to the duct on the engine port, if it is applicable.

S 434-042
(9) Tighten the coupling nuts on the anti-ice ducts (3-inch couplings) to 85-100 pound-inches.

S 434-287

(10) Tighten the coupling nuts on starter ducts and HP2 ducts to 110-120 inch-pounds.

S 434-043

(11) Install the spring and nut that attach the duct to the support, if it is applicable.

S 424-268

(12) Do these steps if the high pressure duct (HP6) and diffuser assembly were removed.

<u>WARNING</u>: MAKE SURE THE DIFFUSER ASSEMBLY IS INSTALLED INSIDE THE HIGH PRESSURE DUCT(HP6) BEFORE YOU INSTALL THE DUCT TO THE ENGINE. HIGH EGT AND DAMAGE TO THE ENGINE COULD OCCUR IF THE DIFFUSER ASSEMBLY IS NOT INSTALLED IN THE HIGH PRESSURE DUCT (HP6).

(a) Install the diffuser assembly and HP6 air offtake ring to the end of the high pressure duct (HP6), then align the mounting bolt holes through each item.

<u>NOTE</u>: The diffuser assembly fits inside the high pressure duct. The HP6 air offtake ring is installed between the flanges of the diffuser assembly and the high pressure duct (HP6).

(b) Apply antiseize compound and install the bolts that attach the high pressure duct and diffuser assembly to the engine port.
(c) Tighten the 1/4 inch bolts to 90-110 inch-pounds.
(d) Examine the E-Seal for worn areas, cracks, dents, unwanted material and other damage. Replace if the E-Seal is damaged.
(e) Install the E-Seal and coupling between the high pressure duct and the HPSOV.
(f) Tighten the HP6 duct coupling nut to 110-120 inch-pounds.

S 414-269

(13) If you used the hold open procedure for the Fan C-duct, put the Fan C-duct and the thrust reverser back to its usual condition (AMM 36-11-20/401).

S 424-294

CAUTION: MAKE SURE THERE IS A MINIMUM CLEARANCE OF 0.75 INCH BETWEEN THE ENGINE ANTI-ICE DUCT AND THE THRUST REVERSER VALVE INPUT CAM. INTERFERENCE CAN CAUSE DAMAGE TO EQUIPMENT.

(14) If the clearance between the engine anti-ice duct and the thrust reverser input valve cam is not a minimum of 0.75-inch, adjust the HP2 Y-duct and cowl anti-ice duct as follows (Fig. 402):
   (a) Loosen the three clamps that attach the HP2 Y-duct.
   (b) Loosen the clamp at the forward end of the engine cowl anti-ice duct.
   (c) Rotate the HP2 Y-duct assembly so the end that connects to the engine cowl anti-ice duct is aligned in the axis of the anti-ice duct.
   (d) If necessary, rotate the HP2 Y-duct so the flange that mates with the engine anti-ice duct is a few degrees closer to the starter duct.
   (e) Make sure there is a minimum of 0.75-inch clearance between the engine anti-ice duct and the thrust reverser valve input cam.
   (f) Retighten the three clamps on the HP2 Y-duct to 110-120 pound-inches.
   (g) Retighten the clamp at the forward end of the engine anti-ice duct to 85-100 pound-inches.

S 424-291

(15) Install the compression rod cone.

S 424-292

(16) Install a lockwire on the compression rod cone.

D. Put the Airplane Back to Its Usual Condition

S 014-006

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.

(1) Close the applicable thrust reverser cowl (AMM 78-31-00/201).

S 414-044

(2) Close the applicable fan cowl panel, 413 or 423.

S 444-045

(3) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 864-046

(4) Remove electrical power if it is not necessary (AMM 24-22-00/201).

TASK 36-11-01-004-047

4. Remove the Strut Pneumatic Duct (Fig. 402)

A. References

(1) AMM 06-43-00/201, Engine Nacelle Access Doors and Panels

(2) AMM 06-44-00/201, Wing Access Doors and Panels

(3) AMM 24-22-00/201, Electrical Power Control

(4) AMM 36-00-00/201, Pneumatic - General

(5) AMM 78-31-00/201, Thrust Reverser System

B. Access

(1) Location Zones

430/440	No. 1/No 2 Nacelle Strut
511/611	Leading Edge to Front Spar

C. Remove the strut duct section.

S 014-048

(1) To remove a left strut duct section on the left engine, open the applicable engine nacelle access panels and doors (431AC, 433AL, 433BL, 433CL, 433GR, 433HR, 433JR, 433LR, or 434AL) (AMM 06-43-00/201).

S 044-002

WARNING: DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

S 014-050

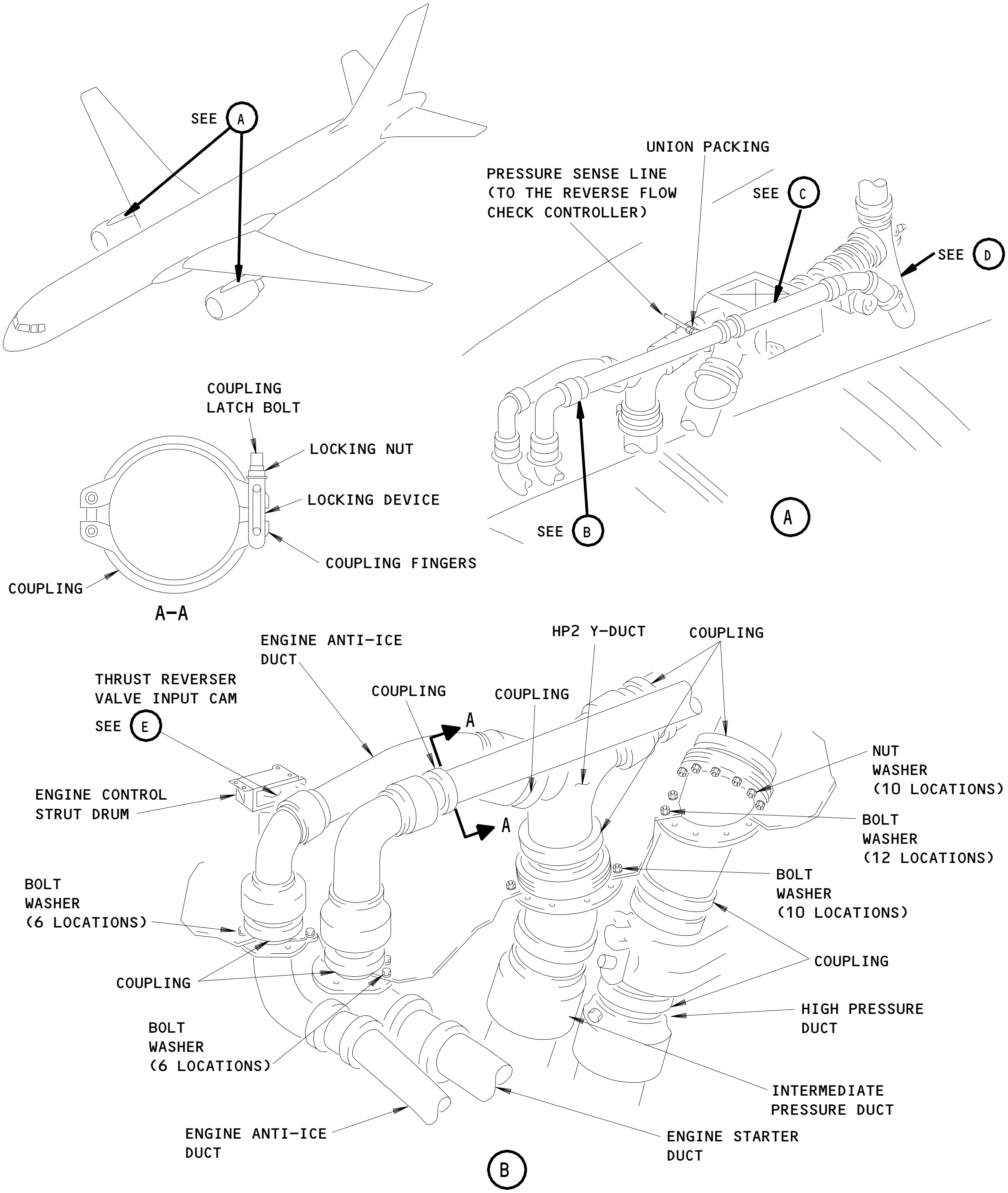
(3) To remove a right strut duct section on the right engine, open the applicable engine nacelle access panels and doors (441AR, 443AR, 443BR, 443CR, 443GL, 443HL, 443JL, 443LL, or 444AL) (AMM 06-43-00/201).

S 014-052

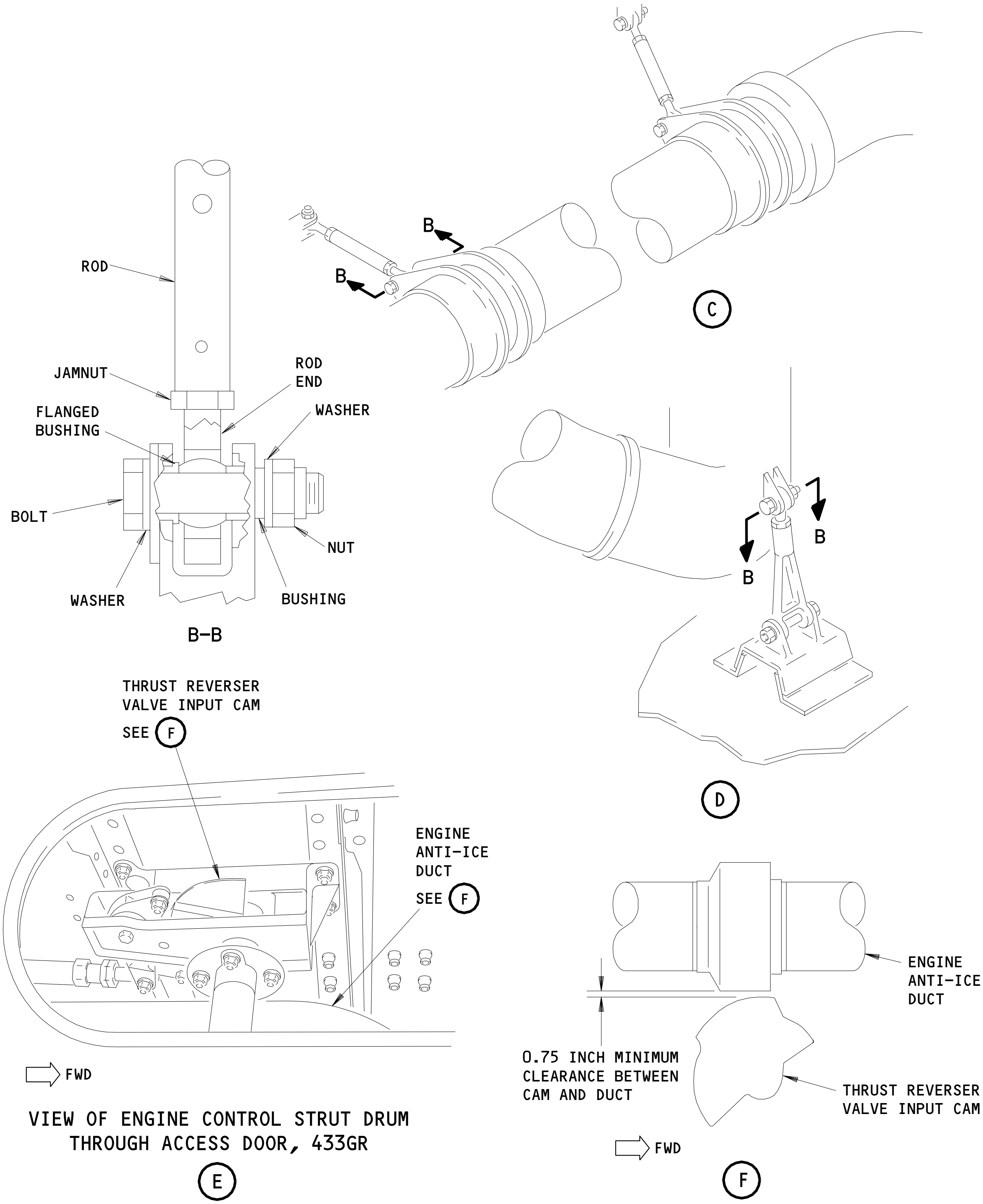
(4) To remove the lower Y-duct in the nacelle strut, remove the applicable environment control systems duct, electrical, and mechanical panel (511KT or 611KT) (AMM 06-44-00/201).

S 864-053

(5) Supply electrical power (AMM 24-22-00/201).



Strut Pneumatic Duct
Figure 402 (Sheet 1)



Strut Pneumatic Duct
Figure 402 (Sheet 2)

S 864-231

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.

(6) Remove pneumatic power (AMM 36-00-00/201).

NOTE: Pressure is released when the system is not in operation.

S 034-055
(7) Disconnect the pressure sense line from the starter duct.

S 034-056
(8) Remove the packing and union from the starter duct.

S 034-057
(9) If the duct section has a rod support, remove the bolt.

S 034-058
(10) Remove the bolts, if it is applicable.

S 034-059
(11) Remove the coupling from the duct section ends.

S 024-060
(12) Remove the duct section.

S 034-061
(13) Remove the E-Seals.

S 494-062
(14) Put a cover on the duct openings to keep out unwanted material.

TASK 36-11-01-404-063
5. Install the Strut Pneumatic duct section (Fig. 402)
A. Consumable Materials
(1) D00006 Antiseize Compound, Bostik Never-Seez

B. References
(1) AMM 06-43-00/201, Engine Nacelle Access Doors and Panels
(2) AMM 06-44-00/201, Wing Access Doors and Panels
(3) AMM 24-22-00/201, Electrical Power Control
(4) AMM 36-00-00/201, Pneumatic - General
(5) AMM 78-31-00/201, Thrust Reverser System

C. Access
(1) Location Zones

430/440	No. 1/No 2 Nacelle Strut
511/611	Leading Edge to Front Spar

(2) Access Panel

433AL/433GR/443AR/443GL	Nose Cowl Anti-Ice Duct, Starter Duct and Pressure Relief, Thrust Reverser Hydraulics, Engine Controls
433LR/443LL	Pressure Regulating Valve and Pressure Relief

D. Procedure

S 094-064
(1) Remove the duct covers.

S 214-065
(2) Examine the flange surface that seals for worn areas.

S 214-066
(3) Examine all the E-Seals for worn areas, cracks, dents, unwanted material or other damage. Replace all the damaged E-Seals.

S 424-067
(4) Install the E-Seals and the duct.

S 424-068
(5) Align the flanges but do not use force.
(a) Align the flanges to a maximum clearance of 0.03 inch at all points. Adjust the duct if it is necessary.

S 434-237

CAUTION: MAKE SURE YOU INSTALL THE LOCKING DEVICE OF THE COUPLING CORRECTLY AS SHOWN IN FIG. 401. IF YOU DO NOT INSTALL THE COUPLING FINGERS INSIDE THE LOCKING DEVICE THE COUPLING CAN LOOSEN AND CAUSE DAMAGE TO EQUIPMENT.

(6) Install the coupling to the duct flange but do not tighten.

NOTE: Install the coupling latch to give the maximum clearance between the components that are near the latch.

S 434-070

(7) Connect the rod support with the bolt, washer, flanged bushing, bushing, washer and nut, if it is applicable.

S 824-255

CAUTION: MAKE SURE THAT THERE IS A MINIMUM CLEARANCE OF 0.75 INCH BETWEEN THE ENGINE ANTI-ICE DUCT AND THE THRUST REVERSER VALVE INPUT CAM. INTERFERENCE CAN CAUSE DAMAGE TO EQUIPMENT.

(8) Make sure that there is a 0.75 inch minimum clearance between the engine anti-ice duct and the thrust reverser valve input cam. (Fig. 402).

S 424-296

CAUTION: DO NOT MOVE THE THRUST LEVERS FORWARD QUICKLY. FAST MOVEMENT OF THE THRUST LEVERS CAN CAUSE DAMAGE TO EQUIPMENT.

(9) If the clearance is not a minimum of 0.75-inch, adjust the HP2 Y-duct and cowl anti-ice duct as follows:
- (a) Loosen the three clamps that attach the HP2-Y-duct.
- (b) Loosen the clamp at the forward end of the engine cowl anti-ice duct.
- (c) Rotate the HP2 Y-duct assembly so the end that connects to the engine cowl anti-ice duct is aligned in the axis of the anti-ice duct.
- (d) If necessary, rotate the HP2 Y-duct so the flange that mates with the engine anti-ice duct is a few degrees closer to the starter duct.
- (e) Make sure there is a minimum of 0.75-inch clearance between the engine anti-ice duct and the thrust reverser valve input cam.
- (f) Retighten the three clamps on the HP2 Y-duct to 110-120 pound-inches.
- (g) Retighten the clamp at the forward end of the engine anti-ice duct to 85-100 pound-inches.

S 644-071
(10) Apply the antisieze compound to the threads of the union and the pressure sense line.

S 434-072
(11) Install the union and the new packing to the starter duct.

S 434-073
(12) Tighten the union.

S 434-074
(13) Connect the pressure sense line to the starter duct.

S 434-075
(14) Tighten the pressure sense line.

S 434-009
(15) Tighten the coupling nut on the 3 inch couplings to 85-100 pound-inches.

S 434-010
(16) Tighten the coupling nut on all the other couplings to 110-120 pound-inches.

S 434-076
(17) Tighten the duct flange.

S 794-077
(18) Do a Test of the duct for air leakage.
(a) Supply pneumatic power (AMM 36-00-00/201).
(b) Small air leakage is satisfactory.
(c) You must repair large air leakage with joint or clamp adjustment.

NOTE: Large air leakage is when you feel the airflow with your hand at a distance of 12 inches or greater from a point on the duct joint.

(d) Remove pneumatic power if it is not necessary (AMM 36-00-00/201).

E. Put the Airplane Back to Its Usual Condition

S 414-078
(1) Install the environment control systems duct, electrical, and mechanical panel if it is applicable (511KT or 611KT).

S 414-079

(2) Close and install the applicable engine nacelle access panels and doors (431AL, 433AL, 433BL, 433CL, 433GR, 433HR, 433JR, 433LR, 434AL, 441AR, 443AR, 443BR, 443CR, 443GL, 443HL, 443JL, 443LL, 444AL).

S 864-081

(3) Remove electrical power if it is not necessary (AMM 24-22-00/201).

S 444-082

(4) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

TASK 36-11-01-004-083

6. Remove the Upper Strut Pneumatic Y-Duct (Fig. 403)

A. References

(1) AMM 06-44-00/201, Wing Access Doors and Panels
(2) AMM 24-22-00/201, Electrical Power Control
(3) AMM 36-00-00/201, Pneumatic - General
(4) AMM 36-11-17/401, Fan Air Temperature Sensor
(5) AMM 36-22-02/401, Precooler Discharge Temperature Bulb.
(6) AMM 78-31-00/201, Thrust Reverser System

B. Access

(1) Location Zones

511/611 Leading Edge to Front Spar

(2) Access Panel

511KT/611KT Environmental Control Systems Duct, Electrical and Mechanical Systems

C. Remove the upper strut pneumatic Y-duct.

S 864-084

(1) Supply electrical power (AMM 24-22-00/201).

S 864-232

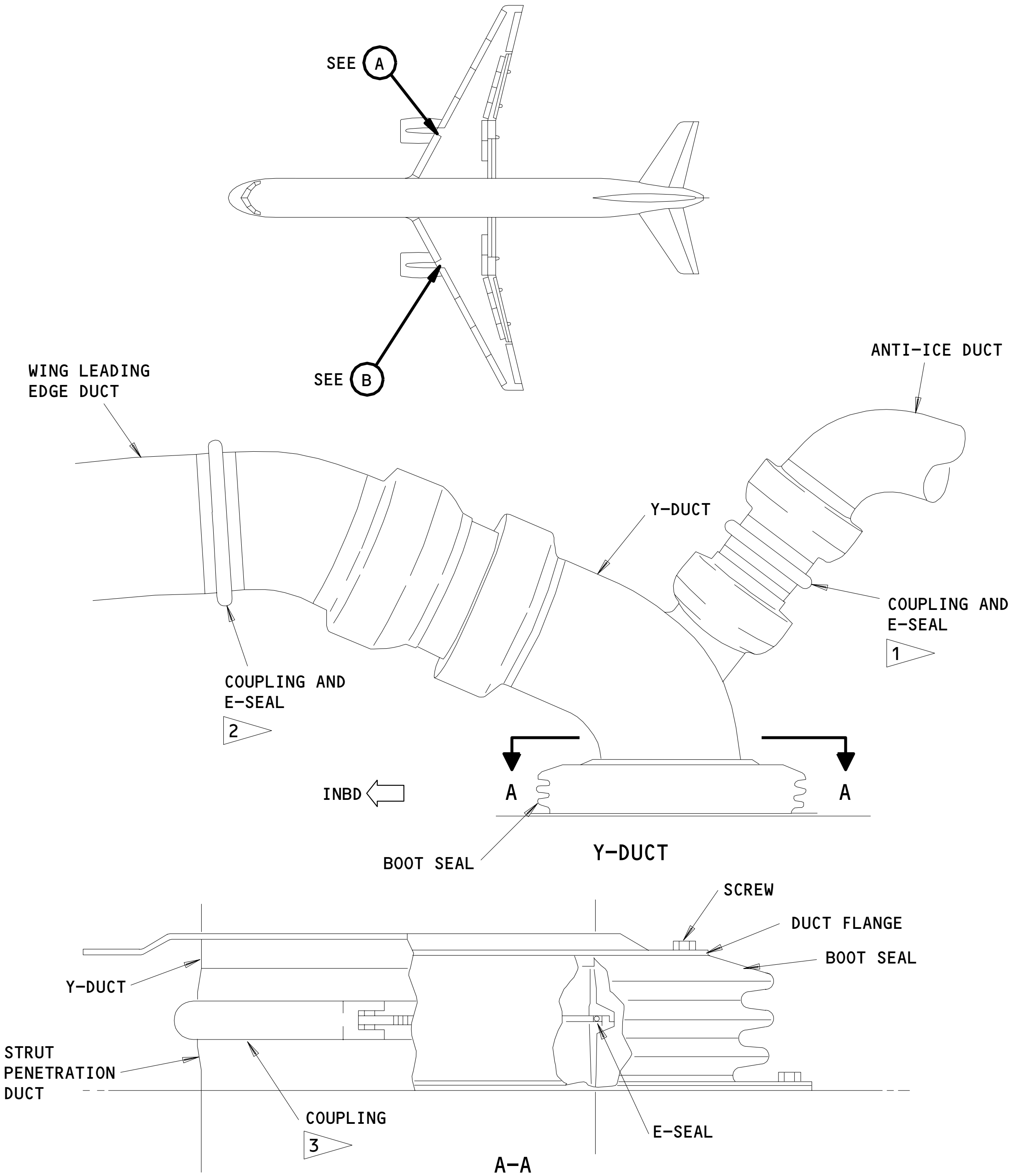
WARNING: RELEASE THE PRESSURE IN THE PNEUMATIC DUCT BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. THE HOT, HIGH-PRESSURE AIR CAN CAUSE INJURY TO PERSONS.

(2) Remove pneumatic power (AMM 36-00-00/201).

NOTE: Pressure is released when the system is not in operation.

S 014-086

(3) Remove the applicable environment control systems duct, electrical, and mechanical panel (511KT or 611KT) (AMM 06-44-00/201).

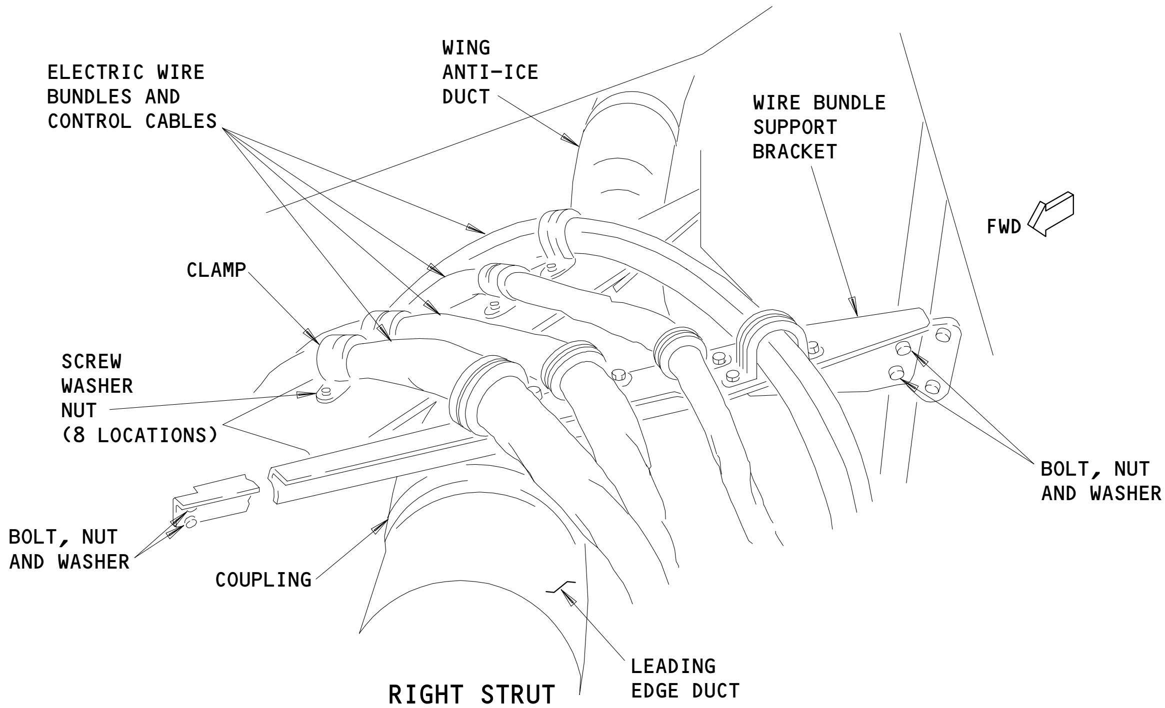


1 AIRPLANES WITH S312N509-4 OR -6 COUPLING;
TIGHTEN TO 45-55 POUND-INCHES
AIRPLANES WITH S312N509-7 COUPLING;
TIGHTEN TO 30-40 POUND-INCHES

2 TIGHTEN TO 50-60 POUND-INCHES

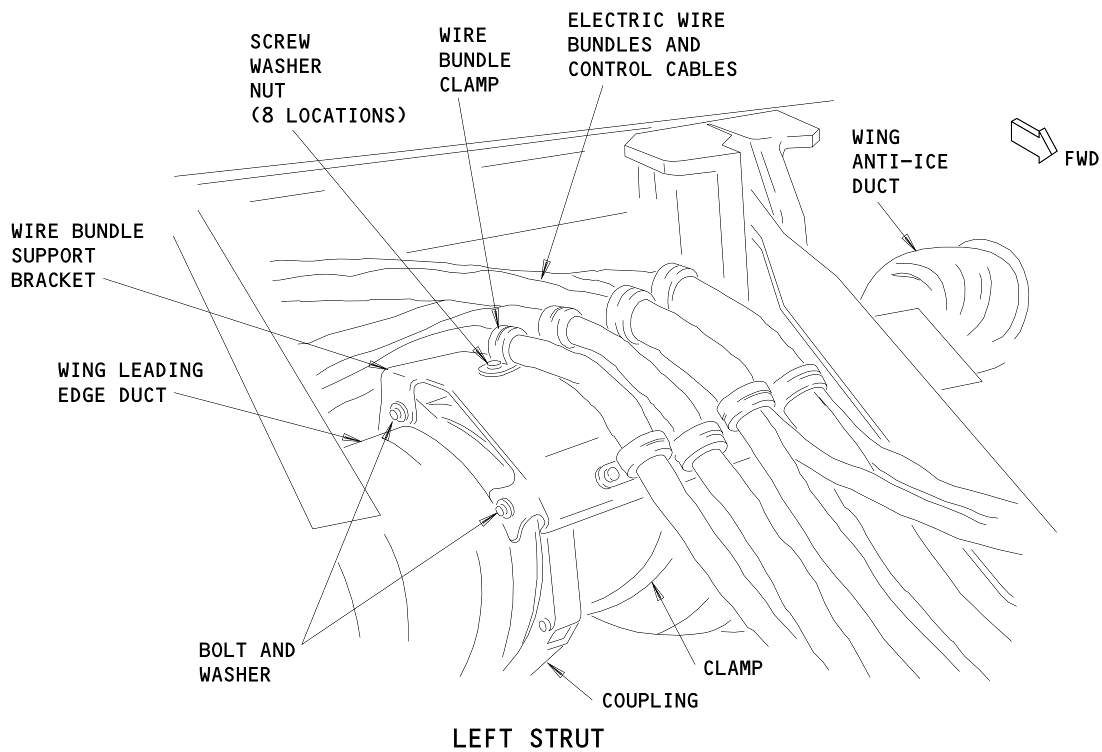
3 TIGHTEN TO 110-120 POUND-INCHES

Upper Strut Pneumatic Y-Duct
Figure 403 (Sheet 1)



RIGHT STRUT

A



LEFT STRUT

B

Upper Strut Pneumatic Y-Duct
Figure 403 (Sheet 2)

S 044-003

WARNING: DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(4) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

S 034-087

(5) On the left engine:
 (a) Remove the eight wire bundle clamps from the wire bundle support bracket.
 (b) Move the wire bundles away from the Y-duct.
 (c) Remove the bolts that hold the wire bundle support bracket to the wing leading edge duct.
 (d) Remove the wire bundle support bracket.

S 034-088

(6) On the right engine:
 (a) Remove the eight wire bundle clamps from the wire bundle support brackets.

 NOTE: There are four clamps on each support bracket.

 (b) Remove the bolts that hold the wire bundle support brackets.
 (c) Remove the support brackets from below the wire bundles.

S 034-089

(7) Remove the fan air temperature sensor (AMM 36-11-17/401).

S 034-090

(8) Remove the precooler discharge temperature bulb (AMM 36-22-02/401).

S 034-091

(9) Remove the screws that hold the boot seal to the duct flange. Move the boot seal to below the coupling.

S 034-092

(10) Remove the coupling from the Y-duct lower joint.

S 034-093

(11) Remove the coupling on the anti-icing duct.

S 034-094

(12) Remove the coupling on the wing leading edge duct.

S 024-095
(13) Remove the Y-duct.
(a) Turn the anti-ice side of the Y-duct to the aft direction of the airplane.
(b) Carefully remove the Y-duct out of the compartment. Remove the wing duct side of the Y-duct first.

S 034-096
(14) Remove the E-Seals from the duct flanges.

S 494-108
(15) Put a cover on the duct openings to keep out unwanted material.

TASK 36-11-01-404-109
7. Install the Upper Strut Pneumatic Y-Duct (Fig. 403)
A. Consumable Materials
(1) Sealant - Dow Corning 93-006-1 (quick curing) or 93-006-6 (longer curing) (AMM 20-30-01/201)
(2) Sealant - BAC 5010, Type 68 (93-076, DC3-6999-1/2 or RTV 430) (AMM 20-30-01/201) - Optional
(3) Parting Agent - Refer to SOPM 20-50-19, General Sealing (BAC5000), for a list of suitable parting agents and their suppliers
B. References
(1) AMM 06-44-00/201, Wing Access Doors and Panels
(2) AMM 24-22-00/201, Electrical Power Control
(3) AMM 36-00-00/201, Pneumatic - General
(4) AMM 36-11-17/401, Fan Air Temperature Sensor
(5) AMM 36-22-01/401, Air Supply Thermal Overtemperature Switch.
(6) AMM 36-22-02/401, Precooler Discharge Temperature Bulb.
(7) AMM 78-31-00/201, Thrust ReverserSystem
C. Access
(1) Location Zones
511/611 Leading Edge to Front Spar

(2) Access Panel
511KT/611KT Environmental Control Systems Duct, Electrical and Mechanical Systems

D. Procedure

S 094-110
(1) Remove the duct covers.

S 214-111
(2) Examine the flange surfaces that seal for too many worn areas.

S 424-112
(3) Carefully move the Y-duct into the opening from the inboard side, the anti-ice duct first.

S 424-113
(4) Align the Y-duct and the new gaskets with the anti-ice duct, wing leading edge duct, and lower Y-duct.

S 424-114
(5) Align the flanges but do not use force.
    (a) Align the flanges to a maximum clearance of 0.03 inch at all points. Adjust the duct if it is necessary.

S 434-238

CAUTION: MAKE SURE YOU INSTALL THE LOCKING DEVICE OF THE COUPLING CORRECTLY AS SHOWN IN FIG. 401. IF YOU DO NOT INSTALL THE COUPLING FINGERS INSIDE THE LOCKING DEVICE THE COUPLING CAN LOOSEN AND CAUSE DAMAGE TO EQUIPMENT.

(6) Install the couplings at all the joints but do not tighten.

S 424-258
(7) AIRPLANES WITH S312N509-4 OR -6 COUPLING;
Tighten the coupling between the anti-ice duct and the Y-duct to 45-55 pound-inches.

S 424-259
(8) AIRPLANES WITH S312N509-7 COUPLING;
Tighten the coupling between the anti-ice duct and the Y-duct to 30-40 pound-inches.

S 434-015
(9) Tighten the coupling between the wing leading edge duct and the Y-duct to 50-60 pound-inches.

S 434-016
(10) Tighten the coupling between the strut penetration duct and the Y-duct to 110-120 pound-inches.

S 434-115
(11) Install the fan air temperature sensor (AMM 36-11-17/401).

S 434-116
(12) Install the precooler discharge temperature bulb (AMM 36-22-02/401).

S 864-117
(13) Supply pneumatic power (AMM 36-00-00/201).

S 794-118
(14) Do a test of the upper Y-duct for air leakage.
(a) Small air leakage is satisfactory.
(b) You must repair large air leakage with joint or coupling adjustment.

S 864-119
(15) Remove pneumatic power if it is not necessary (AMM 36-00-00/201).

S 434-120
(16) Install the boot seal on the upper Y-duct coupling.
(a) Apply parting agent to the bottom surface of the duct flange that mates with the boot seal.
(b) Apply Dow Corning primer DC-1200 to the top side of the boot seal flange.
(c) Apply Dow Corning sealant 93-006 silicone rubber over the primer on the top side of the boot seal.
(d) Attach the boot seal to the duct flange with the screws.

S 434-121
(17) On the left strut:
(a) With the washers and bolts, install the wire bundle support bracket on the leading edge duct flanges.
(b) With the screws, washers, and nuts, install the wire bundle clamp on the wire bundle support bracket.

S 434-122
(18) On the right strut:
(a) Install the wire bundle support brackets to the strut compartment structure with the nuts, washers, and bolts.
(b) Install the wire bundle clamp on the wire bundle support brackets with the screws, washers, and nuts.

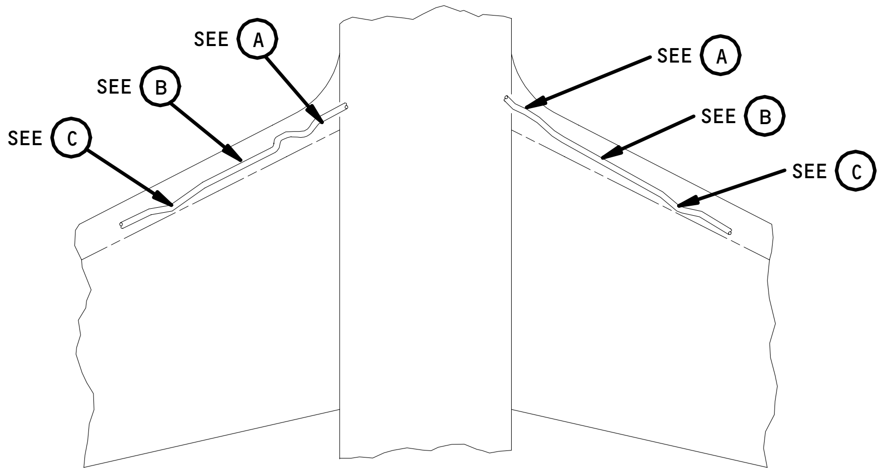
E. Put the Airplane Back to Its Usual Condition

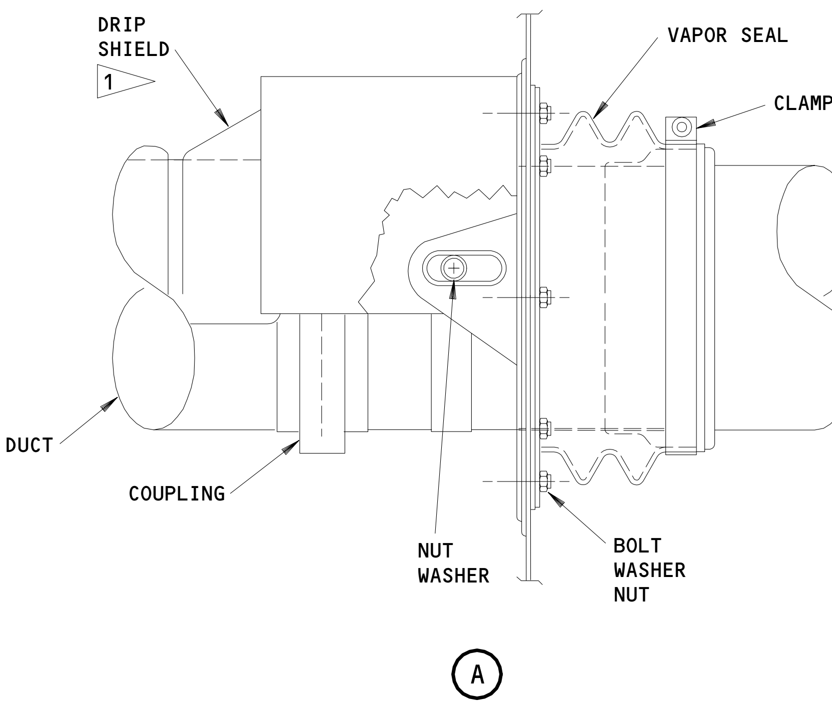
S 414-136
(1) Install the environmental control system duct, electrical, and mechanical panel (AMM 06-44-00/201).

S 444-225
(2) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 864-137
(3) Remove electrical power if it is not necessary (AMM 24-22-00/201).

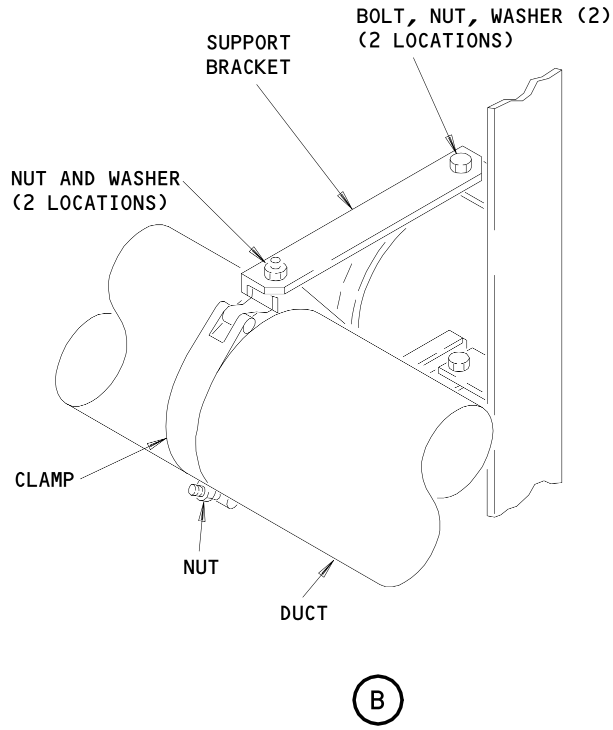
TASK 36-11-01-004-138
8. <u>Remove the Wing Leading Edge Duct</u> (Fig. 404)
A. References
(1) AMM 06-44-00/201, Wing Access Doors and Panels
(2) AMM 24-22-00/201, Electrical Power Control

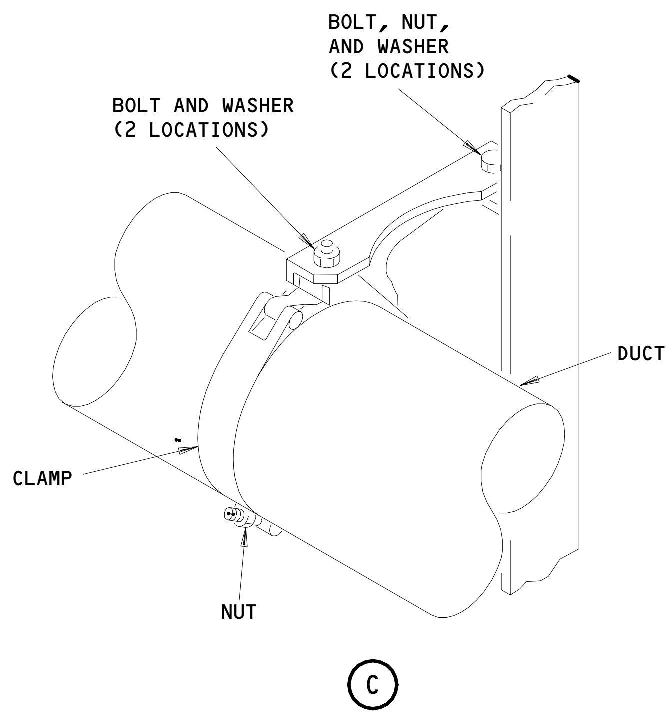




1 LEFT SIDE INSTALLATION

Wing Leading Edge Pneumatic Duct
Figure 404 (Sheet 1)





Wing Leading Edge Pneumatic Duct
Figure 404 (Sheet 2)

(3) AMM 27-81-00/201, Leading Edge Slat System
(4) AMM 36-00-00/201, Pneumatic - General
(5) AMM 78-31-00/201, Thrust Reverser

B. Access
(1) Location Zones
511/611 Leading Edge to Front Spar

C. Remove the wing leading edge duct.

S 864-139
(1) Supply electrical power (AMM 24-22-00/201).

S 864-233

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.

(2) Remove pneumatic power (AMM 36-00-00/201).

NOTE: Pressure is released when the system is not in operation.

S 044-004

WARNING: DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

S 044-141
(4) Fully deploy and then deactivate the leading edge slat (AMM 27-81-00/201).

S 014-142
(5) To remove the left wing leading edge duct, remove the applicable leading edge skin panels (511AB, 511BB, 511CB, 511DB, 511EB, 511FB, 511GB, 511HB, 511JB, 511KT) (AMM 06-44-00/201).

S 014-143
(6) To remove the right wing leading edge duct, remove the applicable leading edge skin panels (611AB, 611BB, 611CB, 611DB, 611EB, 611FB, 611GB, 611HB, 611JB, 611KT) (AMM 06-44-00/201).

S 034-144
(7) Remove these items if it is necessary for the removal of the applicable duct section.
(a) The hanger clamps.
(b) The vapor seal clamp.

S 034-145
(8) Remove the couplings from the duct section ends.

S 024-146
(9) Remove the duct.

S 494-147
(10) Put a cover on the duct openings to keep out unwanted material.

S 024-250
(11) To remove the drip shield (if it is installed) from the applicable duct sections of the left wing leading edge, remove the duct clamps. Keep the drip shield for installation.

TASK 36-11-01-404-150

9. Install the Wing Leading Edge Duct (Fig. 404)

A. Consumable Materials
   (1) Sealant - Dow Corning 93-006-1 (quick curing) or 93-006-6 (longer curing) (AMM 20-30-01/201)
   (2) Sealant - BAC 5010, Type 68 (93-076, DC3-6999-1/2 or RTV 430) (AMM 20-30-01/201) - Optional

B. References
   (1) AMM 06-44-00/201, Wing Access Doors and Panels
   (2) AMM 24-22-00/201, Electrical Power Control
   (3) AMM 27-81-00/201, Leading Edge Slat System
   (4) AMM 36-00-00/201, Pneumatic - General
   (5) AMM 78-31-00/201, Thrust Reverser System

C. Access
   (1) Location Zones
       511/611 Leading Edge to Front Spar

D. Procedure

S 434-151
(1) Install the drip shield (if it was removed) on the applicable duct section of the left wing leading edge.

S 434-152
(2) Install the clamps.

S 394-153
(3) Seal the slots in the drip shield with a sealant.

S 094-154
(4) Remove the duct covers.

S 424-155
(5) Install the duct.

S 434-240

CAUTION: MAKE SURE YOU INSTALL THE LOCKING DEVICE OF THE COUPLING CORRECTLY AS SHOWN IN FIG. 401. IF YOU DO NOT INSTALL THE COUPLING FINGERS INSIDE THE LOCKING DEVICE THE COUPLING CAN LOOSEN AND CAUSE DAMAGE TO EQUIPMENT.

(6) Attach the coupling to the duct flanges but do not tighten the coupling.

S 434-157
(7) Attach and tighten these items if you removed them during the removal task.
(a) The hanger clamps. Tighten the hanger clamp nuts to 10-20 pound-inches.

S 434-158
(8) Tighten the coupling nut to 50-60 pound-inches.

S 214-159
(9) If you install the duct section near hydraulic lines, make sure the duct does not touch the hydraulic lines.

S 794-160
(10) Do a Test of the duct connection for air leakage.
(a) Supply pneumatic power (AMM 36-00-00/201).
(b) Small air leakage is satisfactory.
(c) You must repair large air leakage with duct and coupling adjustment.

NOTE: Large air leakage is when you feel the airflow with your hand at a distance of 12 inches or greater from a point on the duct joint.

S 864-161
(11) Remove pneumatic power if it is not necessary (AMM 36-00-00/201).

E. Put the Airplane Back to Its Usual Condition

S 414-162
(1) Install the applicable leading edge skin panels (511BB, 511CB, 511DB, 511EB, 511FB, 511GB, 511HB, 511JB, 511KT, 611AB, 611BB, 611CB, 611DB, 611EB, 611FB, 611GB, 611HB, 611JB, 611KT)

S 444-163
(2) Stow the leading edge slats (AMM 27-81-00/201).

S 864-229
(3) Remove electrical power if it is not necessary (AMM 24-22-00/201).

TASK 36-11-01-004-165
10. Remove the Body Crossover Duct (Fig. 405)
A. References
(1) AMM 06-41-00/201, Fuselage Access Doors and Panels
(2) AMM 21-52-03/401, Pack Flow Sensor
(3) AMM 24-22-00/201, Electrical Power Control
(4) AMM 36-00-00/201, Pneumatic - General
(5) AMM 36-11-04/401, Isolation Valve
(6) AMM 36-22-01/401, Air Supply Thermal Overtemperature Switch.
B. Access
(1) Location Zones
135/136 Environmental Control Systems Bay

(2) Access Panel
193HL/194ER ECS Components

C. Remove the body crossover duct.

S 014-167
(1) Open the applicable access doors to the environment control systems bay (193HL, 194ER) (AMM 06-41-00/201).

S 864-168
(2) Supply electrical power (AMM 24-22-00/201).

S 864-234

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.

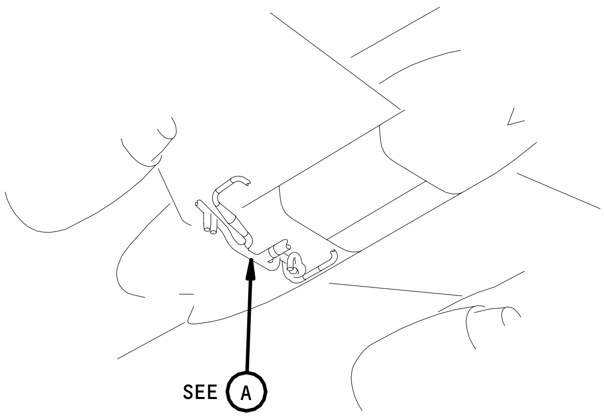
(3) Remove pneumatic power (AMM 36-00-00/201).

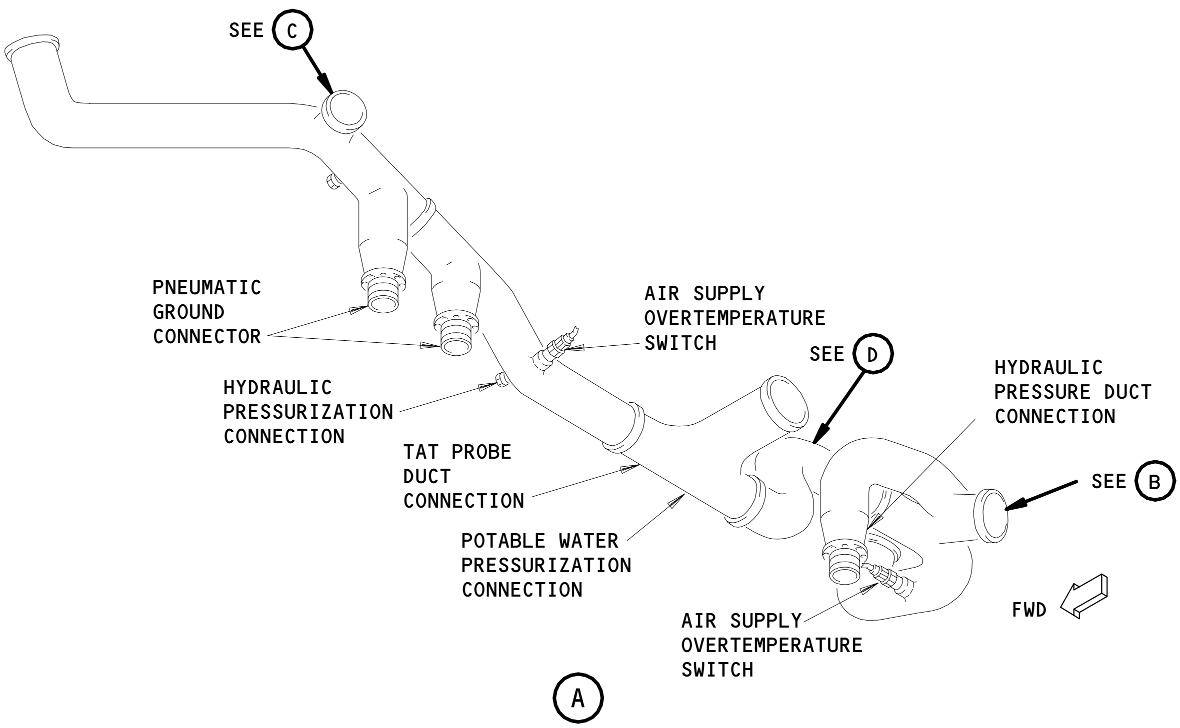
NOTE: Pressure is released when the system is not in operation.

S 034-170
(4) Disconnect the TAT probe duct, if it is applicable.

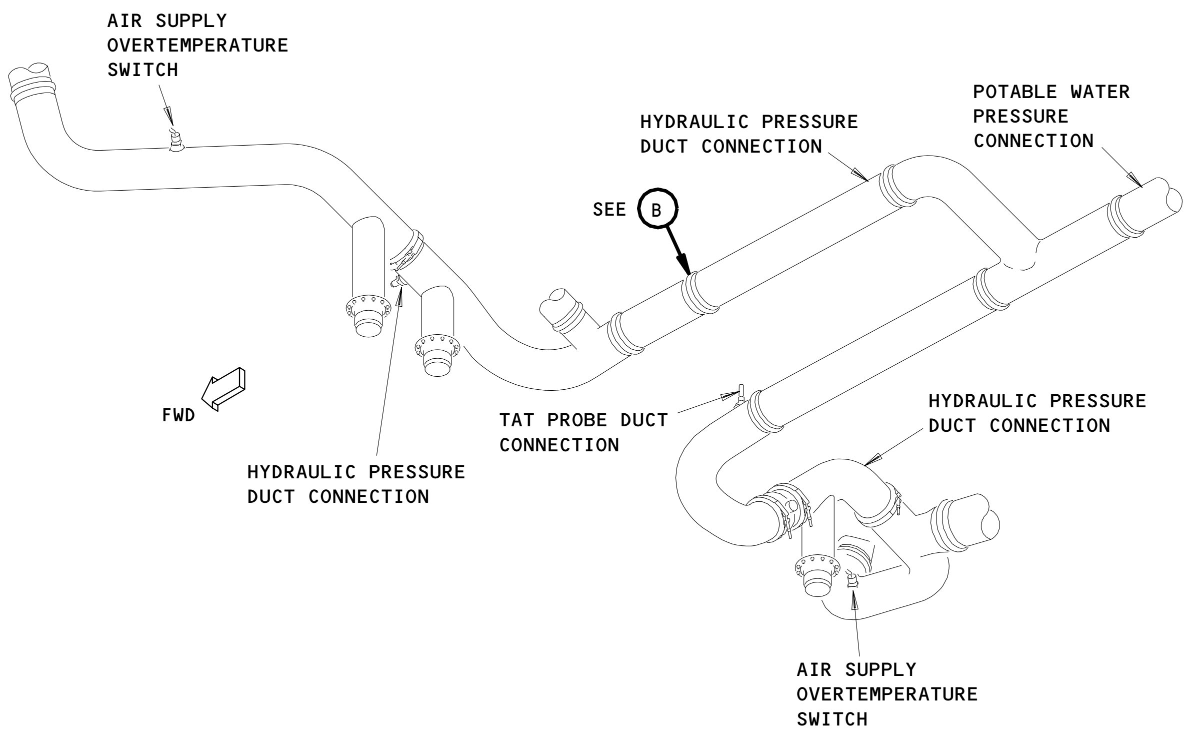
S 034-171
(5) Disconnect the potable water duct, if it is applicable.

S 034-172
(6) Disconnect the hydraulic pressure duct, if it is applicable.

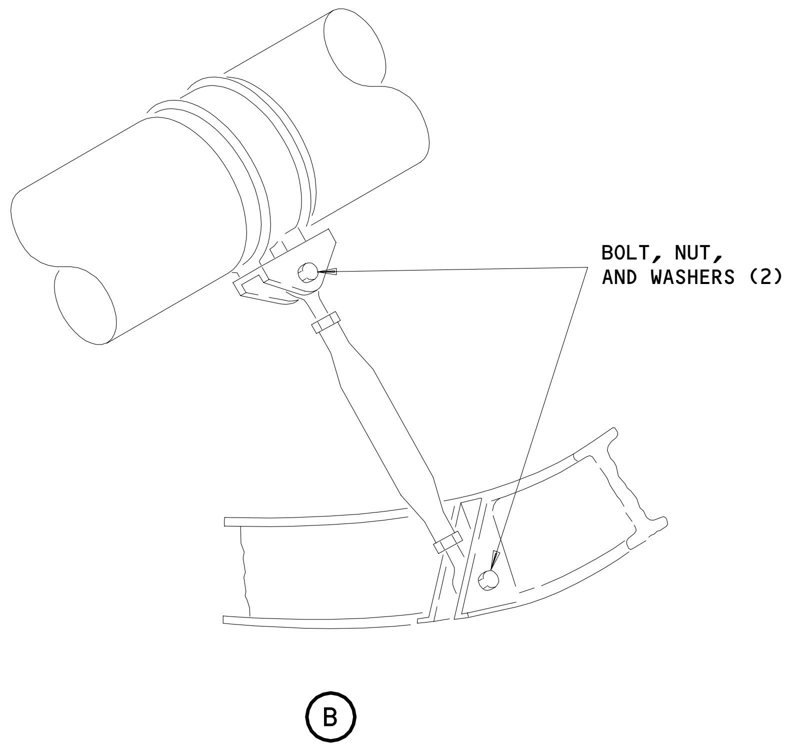


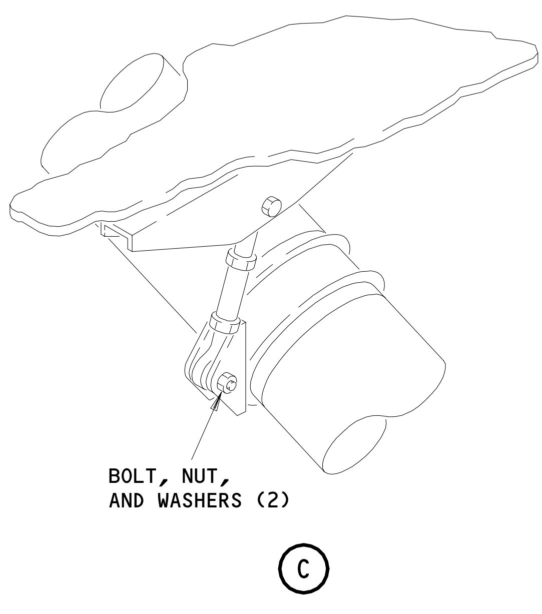


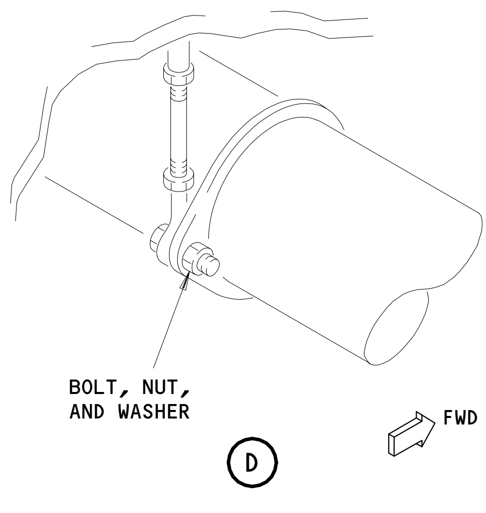
Body Crossover Pneumatic Duct
Figure 405 (Sheet 1)



Body Crossover Pneumatic Duct
Figure 405 (Sheet 2)







Body Crossover Pneumatic Duct
Figure 405 (Sheet 3)

S 034-173
(7) Remove the overtemperature switch (AMM 36-22-01/401).

S 034-174
(8) Remove the bolt from the rod supports, if it is applicable.

S 034-175
(9) Remove the bracket supports, if it is applicable.

S 034-176
(10) Remove the pressure transducer sense line, if it is applicable.

S 034-177
(11) Remove the isolation valve, if it is applicable (AMM 36-11-04/401).

S 034-178
(12) Remove the pack flow sensor, if it is applicable (AMM 21-52-03/401).

S 034-179
(13) Remove the couplings from duct flanges.

S 024-180
(14) Remove the duct.

S 494-181
(15) Put a cover on the duct openings to keep out unwanted material.

TASK 36-11-01-404-226
11. Install the Body Crossover Duct (Fig. 405)

A. References
(1) AMM 06-41-00/201, Fuselage Access Doors and Panels
(2) AMM 20-10-23/401, Standard Practices - Lockwire
(3) AMM 21-52-03/401, Pack Flow Sensor

(4) AMM 24-22-00/201, Electrical Power Control
(5) AMM 36-00-00/201, Pneumatic - General
(6) AMM 36-11-04/401, Isolation Valve
(7) AMM 36-22-01/401, Air Supply Thermal Overtemperature Switch.

B. Access

(1) Location Zones

135/136 Environmental Control Systems Bay

(2) Access Panel

193HL/194ER ECS Components

C. Procedure

S 094-183

(1) Remove the duct cover.

S 424-184

(2) Align the duct in its position.

S 434-241

CAUTION: MAKE SURE YOU INSTALL THE LOCKING DEVICE OF THE COUPLING CORRECTLY AS SHOWN IN FIG. 401. IF YOU DO NOT INSTALL THE COUPLING FINGERS INSIDE THE LOCKING DEVICE THE COUPLING CAN LOOSEN AND CAUSE DAMAGE TO EQUIPMENT.

(3) Install the couplings at each end of the duct, but do not tighten the couplings.

S 434-186

(4) Install the support rods that attach at the duct, if it is applicable.

S 434-187

(5) Install and tighten the bolts, washers and nuts to attach the support rods to the duct, if it is applicable.

S 434-188

(6) Install a lockwire on the support rod, if it is applicable (AMM 20-10-23/401).

S 434-189
(7) Install the pack flow sensor, if it is applicable (AMM 21-52-03/401).

S 434-190
(8) Install the isolation valve, if it is applicable (AMM 36-11-04/401).

S 434-191
(9) Connect the TAT probe duct to the pneumatic duct, if it is applicable.

S 434-192
(10) Connect the potable water duct to the pneumatic duct, if it is applicable.

S 434-193
(11) Connect the hydraulic water duct to the pneumatic duct, if it is applicable.

S 434-194
(12) Install the overtemperature switch (AMM 36-22-01/401).

S 434-195
(13) Install the pressure sense line, if it is applicable.

S 434-011
(14) Tighten the coupling nuts to 50-60 pound-inches.

S 794-196
(15) Do a Test of the duct for air leakage.
   (a) Supply pneumatic power (AMM 36-00-00/201).
   (b) Small air leakage is satisfactory.
   (c) You must repair large air leakage with duct or coupling adjustment.

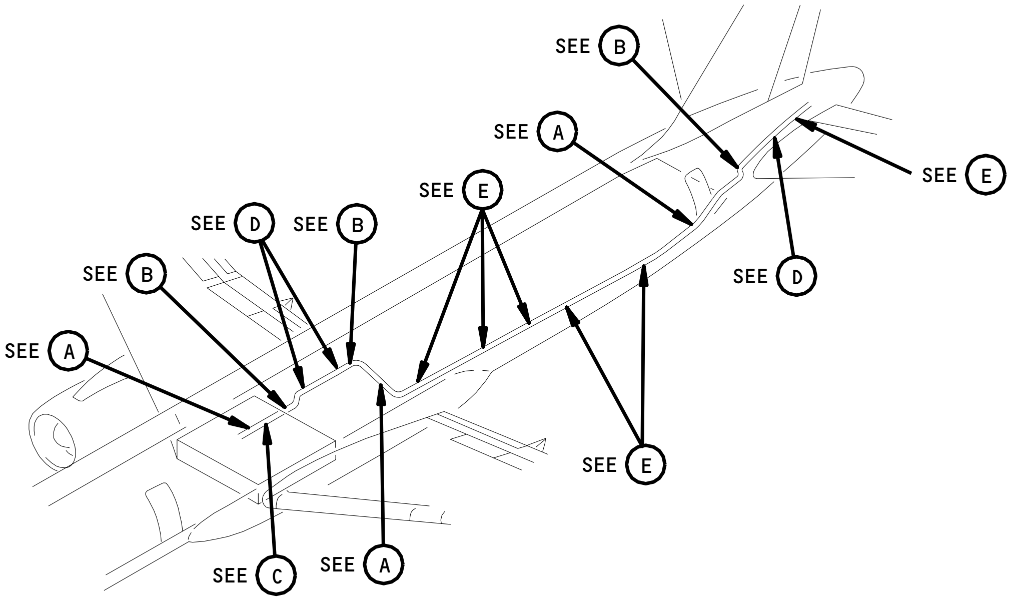
      NOTE: Large air leakage is when you feel the airflow with your hand at a distance of 12 inches or greater from a point on the duct joint.

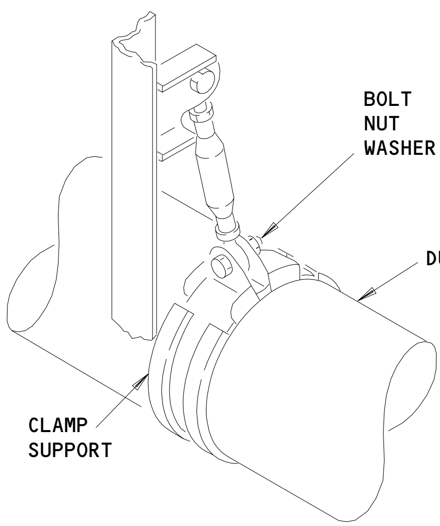
D. Put the Airplane Back to Its Usual Condition

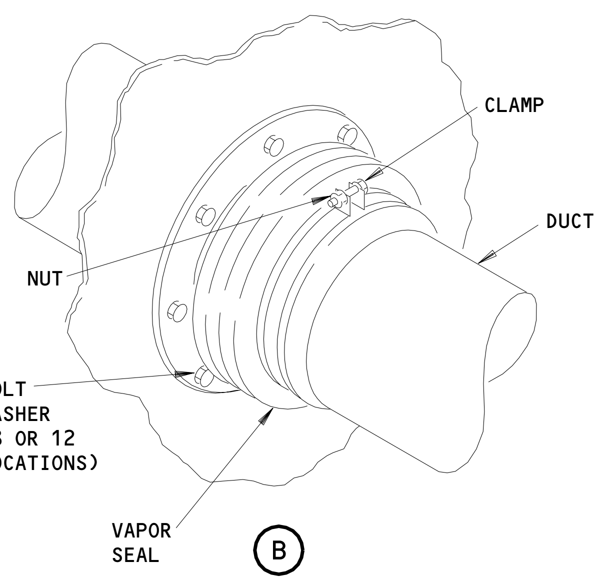
S 864-197
(1) Remove pneumatic power if it is not necessary (AMM 36-00-00/201).

S 414-198
(2) Close the ECS access doors (193HL, 194ER).

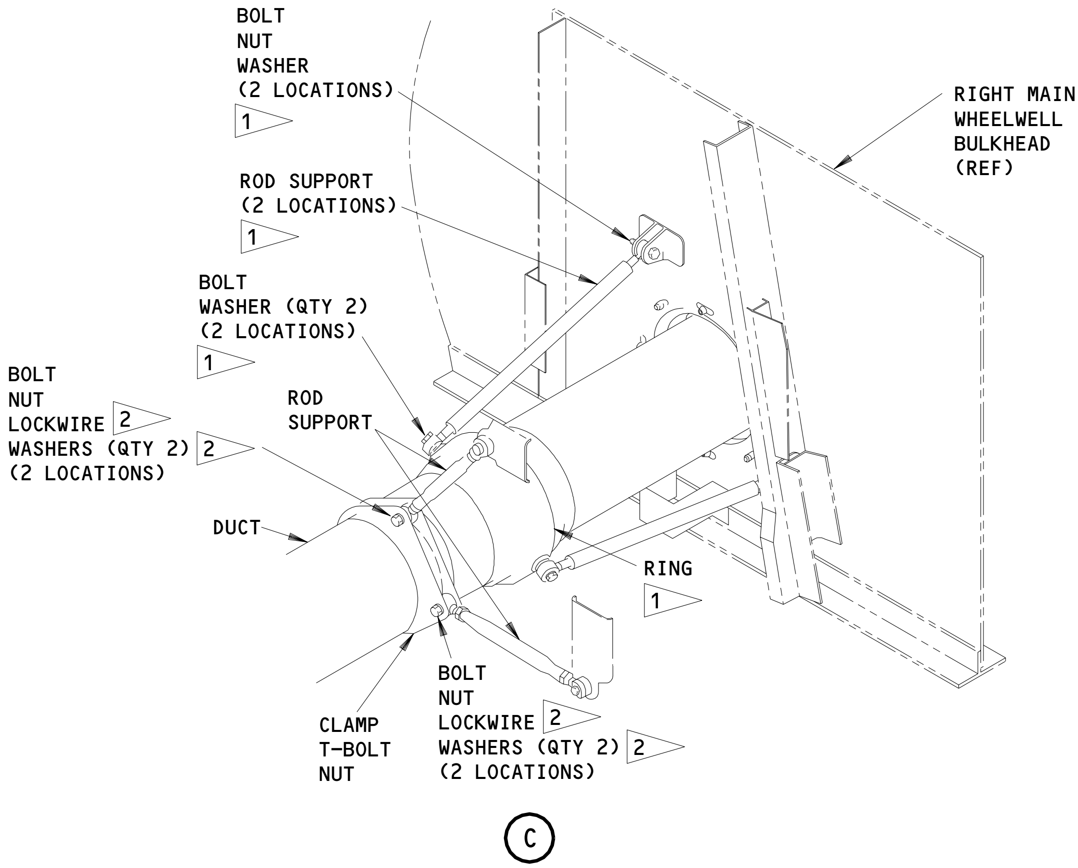
S 864-199
(3) Remove electrical power if it is not necessary (AMM 24-22-00/201).

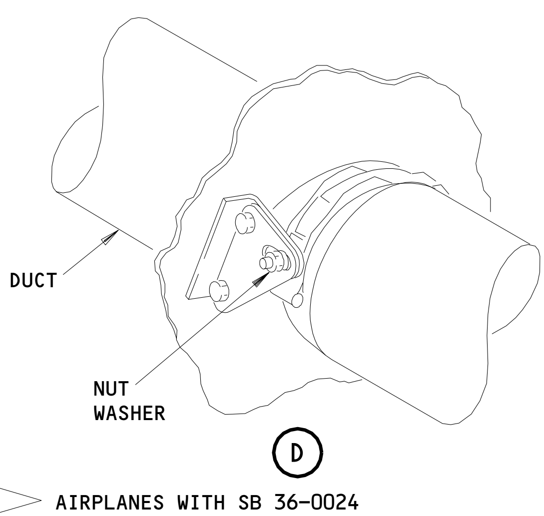


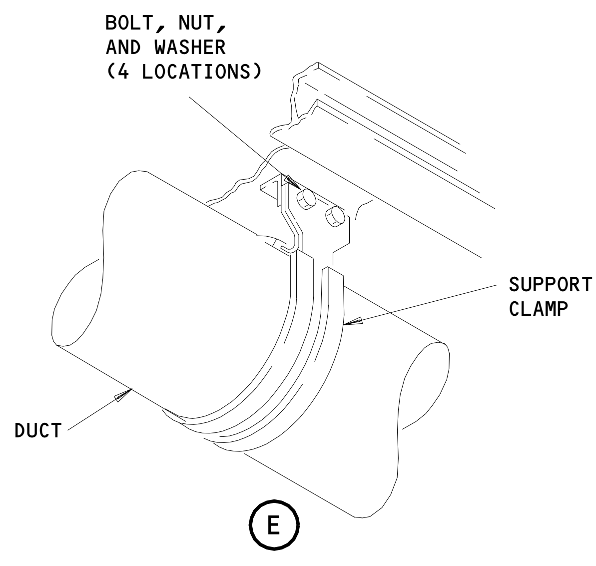




APU Pneumatic Duct
Figure 406 (Sheet 1)







1 AIRPLANES WITH SB 36-0024

2 IF INSTALLED

APU Pneumatic Duct
Figure 406 (Sheet 2)

TASK 36-11-01-004-200

12. Remove the APU Duct (Fig. 406)

A. References

(1) AMM 06-41-00/201, Fuselage Access Doors and Panels
(2) AMM 06-42-00/201, Empennage Access Doors and Panels
(3) AMM 24-22-00/201, Electrical Power Control
(4) AMM 32-00-15/201, Landing Gear Door Locks
(5) AMM 32-00-20/201, Landing Gear Down Locks
(6) AMM 36-00-00/201, Pneumatic - General
(7) AMM 36-11-02/401, Pneumatic Duct Insulation
(8) AMM 36-11-10/401, APU Shutoff Valve
(9) AMM 36-11-11/401, APU Check Valve
(10) AMM 52-34-00/201, No. 1 and 2 Cargo Doors

B. Access

(1) Location Zones

135	Environment Control System Bay (Right)
311	Area AFt of Pressure Bulkhead to BS 1787.45 (Left)
313	Stabilizer Center Section Compartment (Left)
154	Aft Cargo Compartment (Left)

(2) Access Panels

193HL	ECS Components
311AL	APU Fuel Feed System
313AL	APU Intake Port and Door Installation

C. Remove the APU duct section.

S 864-202
(1) Supply electrical power (AMM 24-22-00/201).

S 864-203
(2) Remove pneumatic power (AMM 36-00-00/201).

NOTE: Pressure is released when the system is not in operation.

S 014-204
(3) Open the applicable access doors:
(a) The environmental control systems door (193HL) (AMM 06-41-00/201).
(b) The elevator controls (311AL, 313AL) (AMM 06-42-00/201).
(c) The aft cargo door, 822 (AMM 52-34-00/201).

NOTE: To get access to the APU air supply duct in the cargo bay, it is necessary to remove the sidewall panel in the cargo bay.

S 014-205

(4) If it is necessary to open the doors for the main landing gear, do the steps that follow:

(a) Make sure you install the landing gear downlocks (AMM 32-00-20/201).

WARNING: USE THE PROCEDURE IN AMM 32-00-15/201 TO INSTALL THE DOOR LOCKS. THE DOORS CAN OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY IF THE DOOR LOCKS ARE NOT INSTALLED CORRECTLY.

(b) Open the doors for the nose and main landing gear and install the door locks (AMM 32-00-15/201).

S 034-206

(5) Remove these items, if it is applicable:

(a) The support clamp.
(b) The vapor seal clamp.
(c) The hanger rod bolt(s).
(d) The insulation blanket (AMM 36-11-02/401).
(e) The APU shutoff valve (AMM 36-11-10/401).
(f) The APU check valve (AMM 36-11-11/401).

S 034-207

(6) Remove the couplings on each end of the duct.

S 024-208

(7) Remove the duct.

S 494-209

(8) Put a cover on the duct openings to keep out unwanted material.

TASK 36-11-01-404-211

13. Install the APU Duct (Fig. 406)

A. References

(1) AMM 06-41-00/201, Fuselage Access Doors and Panels
(2) AMM 06-42-00/201, Empennage Access Doors and Panels
(3) AMM 20-10-23/401, Standard Practices - Lockwire
(4) AMM 32-00-15/201, Landing Gear Door Locks
(5) AMM 36-00-00/201, Pneumatic - General
(6) AMM 36-11-02/401, Pneumatic Duct Insulation
(7) AMM 36-11-10/401, APU Shutoff Valve

(8) AMM 36-11-11/401, APU Check Valve
(9) AMM 52-34-00/201, No. 1 and 2 Cargo Doors

B. Access

(1) Location Zones

135	Environment Control System Bay (Right)
311	Area AFt of Pressure Bulkhead to BS 1787.45 (Left)
313	Stabilizer Center Section Compartment (Left)
154	Aft Cargo Compartment (Left)

(2) Access Panels

193HL	ECS Components
311AL	APU Fuel Feed System
313AL	APU Intake Port and Door Installation

C. Procedure

S 094-012

(1) Remove the duct covers.

S 424-212

(2) Align the duct in its position.

S 434-242

CAUTION: MAKE SURE YOU INSTALL THE LOCKING DEVICE OF THE COUPLING CORRECTLY AS SHOWN IN FIG. 401. IF YOU DO NOT INSTALL THE COUPLING FINGERS INSIDE THE LOCKING DEVICE THE COUPLING CAN LOOSEN AND CAUSE DAMAGE TO EQUIPMENT.

(3) Install the couplings at each end of the duct, but do not tighten the couplings.

S 434-214

(4) Install the bolts, washer and nuts that attach the support brackets, hanger clamps, and support rods to the duct, if it is applicable.

S 434-215

(5) Install the vapor clamp, if it is applicable.

S 434-216

(6) Put a lockwire on the hanger rod, if it is applicable (AMM 20-10-23/401).

S 434-217

(7) Install the APU shutoff valve (AMM 36-11-10/401), it is applicable.

S 434-218

(8) Install the APU check valve (AMM 36-11-11/401), if it is applicable.

S 434-219

(9) Install the insulation blanket (AMM 36-11-02/401), it is applicable.

S 434-220

(10) Tighten all the coupling nuts to 50-60 pound-inches.

S 434-013

(11) Tighten all the nuts and bolts that hold the duct in its position to 15-20 pound-inches.

S 794-221

(12) Do a Test of the duct connection for air leakage.

(a) Supply pneumatic power with the APU (AMM 36-00-00/201).

(b) Small air leakage is satisfactory.

(c) You must repair large air leakage with duct and coupling adjustment.

NOTE: Large air leakage is when you feel the airflow with your hand at a distance of 12 inches or greater from a point on the duct joint.

(d) Remove APU pneumatic power if it is not necessary (AMM 36-00-00/201).

D. Put the Airplane Back to Its Usual Condition

S 414-222

(1) Close the applicable access doors:

(a) The environmental control systems door (193HL) (AMM 06-41-00/201).

(b) The elevator controls (311AL, 313AL) (AMM 06-42-00/201).

(c) The aft cargo door, 822 (AMM 52-34-00/201).

S 414-223

(2) If the doors for the main landing gear are open, do the steps that follow:

WARNING: USE THE PROCEDURE IN AMM 32-00-15/201 TO INSTALL THE DOOR LOCKS. THE DOORS CAN OPEN AND CLOSE QUICKLY AND CAN CAUSE INJURY IF THE DOOR LOCKS ARE NOT INSTALLED CORRECTLY.

(a) Open the doors for the nose and main landing gear and install the door locks (AMM 32-00-15/201).

PNEUMATIC DUCT - INSPECTION/CHECK

1. General
   A. This procedure gives the inspection/check of the pneumatic duct from the air sources (engine, APU, and ground connector) to the applicable system (air cooling packs, anti-ice, and engine starter valve).

TASK 36-11-01-206-005

2. Examine the Pneumatic Duct
   A. References
      (1) AMM 06-41-00/201, Fuselage Access Doors and Panels
      (2) AMM 06-42-00/201, Empennage Access Doors and Panels.
      (3) AMM 06-46-00/201, Entry, Service and Cargo Doors Access Doors and Panels
      (4) AMM 06-44-00/201, Wing Access Doors and Panels.
      (5) AMM 06-45-00/201, Engine Nacelle Access Doors and Panels.
      (6) AMM 27-81-00/201, Leading Edge Slat System.
      (7) AMM 32-00-15/201, Landing Gear Door Locks.
      (8) AMM 32-00-20/201, Landing Gear Downlocks
      (9) AMM 36-11-01/401, Pneumatic Duct.
      (10) AMM 36-11-01/701, Pneumatic Duct.
      (11) AMM 36-11-01/801, Pneumatic Duct
      (12) AMM 78-31-00/201, Fan Thrust Reverser System.
   B. Access
      (1) Location Zones

100	Lower Half of Fuselage
300	Empennage and Body Section 48
400	Power Plants and Nacelle Struts
500	Left Wing
600	Right Wing

   C. Prepare For the Inspection/Check

      S 016-004
      (1) Remove or open the applicable access doors and panels:
         (a) The ECS doors (193DL, 194DR, 193HL, 194ER) (AMM 06-41-00/201).
         (b) Make sure the landing gear downlocks are installed (AMM 32-00-20/201).

      WARNING: REFER TO AMM 32-00-15/201 FOR THE LOCK INSTALLATION PROCEDURE. FAST MOVEMENT OF THE DOORS CAN CAUSE INJURY OR DAMAGE IF YOU DO NOT INSTALL THE LOCKS CORRECTLY.

         (c) The main gear doors and install the door locks (AMM 32-00-15/201).
         (d) The aft cargo door (822) (AMM 06-46-00/201).

            NOTE: To get access to the duct in the cargo bay, it is necessary to remove the sidewall panels in the cargo bay.

(e) The elevator controls access doors (311AL, 313AL) (AMM 06-42-00/201).

<u>WARNING</u>: DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(f) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

(g) To examine the wing leading edge duct:
  1) Fully extend and then deactivate the leading edge slat (AMM 27-81-00/201).
  2) Remove the applicable left or right leading edge skin panels (511AB, 511BB, 511CB, 511DB, 511EB, 511FB, 511GB, 511HB, 511JB, 511KT, 611AB, 611BB, 611CB, 611DB, 611EB, 611FB, 611GB, 611JB, 611KT) (AMM 06-44-00/201).

(h) The engine nacelle access panels and doors (431AL, 433AL, 433BL, 433CL 433GR, 433HR, 433JR, 433LR, 434AL, 441AR, 443AR, 443BR, 443CR, 443GL, 443HL, 443JL, 443LL, and 444AL) (AMM 06-45-00/201).

<u>WARNING</u>: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO OPEN THE THRUST REVERSER. IF YOU DO NOT OBEY THE INSTRUCTINOS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(i) Open the fan duct cowl and thrust reverser (AMM 78-31-00/201).

D. Procedure

S 116-006

(1) Clean the pneumatic duct if it is dirty or has contamination with hydraulic fluids (AMM 36-11-01/701).

S 216-007

(2) Examine the duct for metal deterioration, cracks, and dents.

S 426-008

(3) Replace the duct or make an approved temporary repair until the damaged duct can be replaced (AMM 36-11-01/401, AMM 36-11-01/801).

<u>NOTE</u>: Do not repair ducts that have cracks around the circumference. Replace these ducts (AMM 36-11-01/401).

S 216-009

(4) Examine the cooling air line from the fan air modulating valve to the high stage pilot. Look for metal deterioration, cracks, dents, and blockage.

E. Put the Airplane Back to Its Usual Condition

S 416-010

(1) Install or close the applicable access doors and panels.

<u>WARNING</u>: OBEY THE INSTRUCTIONS IN THE PROCEDURE TO CLOSE THE THRUST REVERSER. IF YOU DO NOT OBEY THE INSTRUCTIONS, INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

(a) Close the fan duct cowl and thrust reverser (AMM 78-31-00/201).
(b) The engine nacelle access panels and doors (431AL, 433AL, 433BL, 433CL, 433GR, 433HR, 433JR, 433LR, 434AL, 441AR, 443AR, 433BR, 443CR, 443GL, 443HL, 443JL, 443LL, and 444AL).
(c) The left and right leading edge skin panels (511AB, 511BB, 511CB, 511DB, 511EB, 511FB, 511GB, 511HB, 511JB, 511KT, 611AB, 611BB, 611CB, 611DB, 611EB, 611FB, 611GB, 611JB, 611KT).
(d) Stow the leading edge slats.
(e) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).
(f) The elevator controls access doors (311AL, 313AL).
(g) The cargo bay sidewall panels.
(h) The aft cargo door (822).

<u>WARNING</u>: REFER TO AMM 32-00-15/201 FOR THE LOCK INSTALLATION PROCEDURE. FAST MOVEMENT OF THE DOORS CAN CAUSE INJURY OR DAMAGE IF YOU DO NOT INSTALL THE LOCKS CORRECTLY.

(i) Remove the door locks and close the main gear doors (AMM 32-00-15/201).
(j) The ECS door (193HL, 193DL, 194ER, and 194DR).

PNEUMATIC DUCT - CLEANING/PAINTING

1. General
   A. The two types of duct on the airplane are bare titanium ducts and gold coated titanium ducts. Each type uses different procedures to clean the duct. The Gold coated titanium ducts are in the wing leading edge, wheel well and section 48.
   B. The titanium ducts can corrode and become brittle if touched with fire-resistant hydraulic fluid at temperatures more than 270°F. On ducts that are painted or not painted, you can see these changes:
      (1) A bright glossy brown layer.
      (2) A matt black residue.
      (3) A bare surface on painted ducts.
   C. Both types of ducts should be cleaned if you found the ducts to have been touched with fire-resistant hydraulic fluid. You must be careful that the solution used to clean the ducts does not touch other components.

TASK 36-11-01-107-006

2. Clean the Titanium Ducts
   A. Consumable Materials
      (1) B00130 Solvent - Isopropyl Alcohol, Spec TT-I-735 (Ref 20-30-02)
      (2) B00148 Solvent - Methyl Ethyl Ketone (MEK), TT-M-261
      (3) E00015 Cloth - Lint Free Clean
   B. References
      (1) AMM 05-51-22/201, Fire Resistant Hydraulic Fluid Reaction with Titanium
      (2) AMM 20-30-02/201, Cleaners and Polishes
      (3) AMM 20-30-05/201, Strippers
      (4) SOPM 20-30-03, Standard Overhaul Practices Manual, General Cleaning Procedures
      (5) SOPM 20-41-01, Standard Overhaul Practices Manual, Decoding Table for Boeing Finish Codes
      (6) SOPM 20-44-01, Standard Overhaul Practices Manual, Application of Special Purpose Coating and Finishes
      (7) OHM 36-10-03, Repair of Pneumatic Ducts
   C. Procedure to clean the Bare Titanium Duct

      S 117-002

      (1) You can usually clean the duct with a detergent solution.

S 117-012

WARNING: DO NOT GET SOLVENTS IN YOUR MOUTH OR EYES, OR ON YOUR SKIN. DO NOT BREATHE THE FUMES FROM SOLVENTS. SOLVENTS ARE HAZARDOUS MATERIALS. REFER TO PRODUCT MATERIAL SAFETY DATA SHEETS (MSDS) AND LOCAL REQUIREMENTS FOR PROPER HANDLING PROCEDURES.

(2) Use the solvent, Series 80 (AMM 20-30-80, SOPM 20-30-80), to clean the grease from the ducts.

S 117-008

(3) For titanium ducts without contamination from high-temperature hydraulic fluid, clean the duct with the procedure in OHM 36-10-03.

S 217-004

(4) If the fire-resistant hydraulic fluid touches a duct, you must examine the duct (AMM 05-51-22/201). You must make an analysis to clean the duct (SOPM 20-30-03) or replace the duct (AMM 36-11-01/401).

S 117-009

(5) Titanium ducts that require the removal of hydraulic fluid contamination while installed on the airplane may be cleaned as follows:
   (a) Clean the duct with solvents such as cold alkaline, solvent emulsion, and foam cleaners (SOPM 20-30-03, Section 8, Manual Cleaning).
   (b) To remove thicker layers of hydraulic fluid residue, allow an alkaline solvent to be absorbed for 20 to 40 minutes, then scrape it off duct with a soft piece of wood (tongue depressor).

      NOTE: Do not remove hydraulic fluid residues on titanium ducts with power wire brush or abrasive air blast materials. Aluminized steel wool or scotch brite pads may be used. A duct may remain slightly stained after it has been cleaned, provided that all the hydraulic fluid residue has been removed and the surface of the duct is smooth.

S 377-010

(6) After you clean the ducts, you can paint them with BMS 10-82 low emissitivity gold coating (SOPM 20-44-01) or B-2000 high temperature coating (SOPM 20-41-01, SRF-14.87) 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 ducting.

D. Clean the Gold Coated Titanium Ducts

S 117-005

(1) Clean the gold coated duct with a lint free clean cloth and isopropyl alcohol (AMM 20-30-02/201 and AMM 20-30-05/201).

PNEUMATIC DUCT - APPROVED REPAIRS

1. General
   A. Thin wall ducts can be repaired as an alternative to replacement as specified below. For duct repairs that require welding or with other procedures, see the Overhaul Manual. This procedure includes the repair of titanium wing/body ducts.

TASK 36-11-01-208-002

2. Damage that does Not Require Repair
   A. Procedure

S 218-003

(1) Dents with these conditions:
   (a) The depth of the dent, measured from a straight edge placed longitudinally along the duct, shall be less than 0.05 inches below the adjacent surface.
   (b) All dents shall be gradual and uniform with no sharp intersections.

   NOTE: Make sure the bottom of the dent on the inside of the duct does not have cracks.

S 218-004

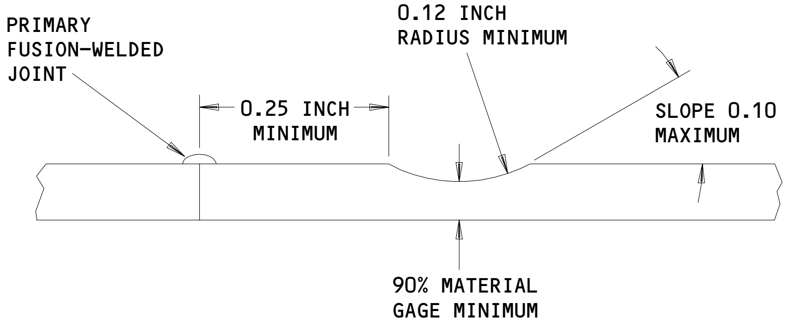
(2) Scratches and gouges that are not deep:
   (a) Make sure they are not larger than 10% of the duct wall thickness.
   (b) Make sure they are smooth and rounded from the base metal.
   (c) Make sure they have a smooth and rounded bottom.

TASK 36-11-01-208-005

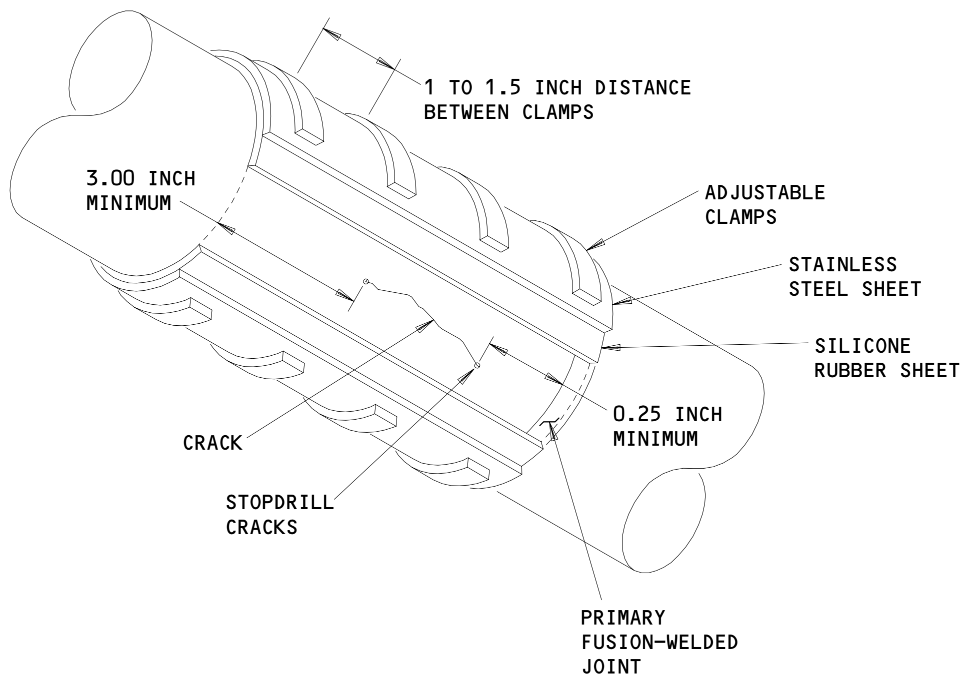
3. The Repair of Dents
   A. Procedure

S 218-014

(1) Pull out the smooth dents with a ball mandrel or with a device that you put in the duct to push the dent out. You can remove some dents if you hydrostatically pressurize the duct (with the approved pressure limits for the applicable system) and use a nonmetallic hammer to hit around the edges of the dent. Do not use procedures which will workharden the metal.



DUCT REWORK (EXAMPLE)



DUCT REPAIR (EXAMPLE)

Pnumatic Duct Approved Repairs
Figure 801

TASK 36-11-01-208-006

4. The Repair of Scratches and Gouges

A. Procedure

S 218-007

(1) Sharp scratches and gouges can be repaired by the removal of the adjacent metal if you apply these limits:

(a) Make sure the minimum wall thickness, at the bottom of a scratch or gouge, after the repair is not less than 90% of the minimum material gage.

(b) Make sure the surface roughness of the repaired area is not more than 40 RHR.

(c) Make sure the slope of the repaired area does not have increase more than 1 to 10.

(d) Make sure the internal and external radii of the repaired area is not less than 0.12 inch.

(e) Replace the duct when the defects on the duct are less than 0.25 inch from a primary fusion-welded joint.

(f) Replace the duct when these defects are more than the given limits.

TASK 36-11-01-308-008

5. The Temporary Repair of Ducts that have Cracks (Fig. 801)

A. General

(1) This procedure supplies the temporary repair of a cracked duct to permit operation until you can replace the duct. Specific information for duct repair limits is contained in the component maintenanace manual.

NOTE: This procedure is used only to repair longitudinal cracks. The temporary repair of circumferential cracks is not permitted.

B. Consumable Materials

(1) A00340 Silicone rubber sheet - 0.10 to 0.15 inch thick

(2) G02318 Stainless steel sheet (AMM 20-30-07)

C. Equipment
(1) Adjustable stainless steel clamps - 3 to 7 inch diameter

D. Procedure to Repair the Ducts that have Cracks

S 868-009
(1) Stopdrill the cracks.

S 358-010
(2) Wrap the silicone rubber sheet around the area of the cracks.

S 218-001
(3) Make sure the silicone rubber sheet extends 3 inches around the cracks in all the directions.

S 358-011
(4) Put a cover of a stainless steel sheet (0.010 inch thick) on the silicone rubber sheet.

S 438-012
(5) Install the clamps along the repair 1 to 1.5 inch apart.

S 438-013
(6) Tighten the clamps.

TASK 36-11-01-368-015
6. Duct Flange Repair
A. Equipment
(1) 6FT001-101 - Flange Reforming Tool
Innovative Support Equipment Engineering, Inc.
745 Potsgrove Place
Tracy, CA 95377-9023
B. References
(1) AMM 36-11-01/401 - Ducts
C. Access
(1) Location Zones

130	BS785.9 to BS955.1
190	Fairings
310	Fuselage - Body Section 48
430/440	No. 1/No. 2 Nacelle Strut
510/610	Wing Leading Edge - Forward of Front San and Inboard of Nacelle Strut

D. Procedure

S 018-017
(1) Get access to the duct flange that you will repair.

S 328-018
(2) Use the flange reforming tool and repair the duct flange.

S 328-016

(3) If you cannot repair the duct flange while the duct flange is installed, remove the duct to get access to the damaged flange (AMM 36-11-01/401).

(a) Repair the duct flange with the flange reforming tool.

(b) Install the Duct (AMM 36-11-01/401).

PNEUMATIC DUCT INSULATION - REMOVAL/INSTALLATION

1. General
   A. The insulation blankets for the pneumatic duct are on the pneumatic ducts in the aft cargo bay. Remove the sidewall panels in the cargo bay to get access to the insulation.

TASK 36-11-02-004-001

2. Remove the Pneumatic Duct Insulation (Fig. 401)
   A. References
      (1) AMM 06-46-00/201, Entry, Service, and Cargo Doors Access Doors and Panels
      (2) AMM 24-22-00/201, Electrical Power Control
      (3) AMM 25-50-02/401, Side Lining Panels
      (4) AMM 36-00-00/201, Pneumatic - General
   B. Access
      (1) Location Zone
          154 Aft Cargo Compartment (Right)

   C. Prepare for the Removal

      S 864-002
      (1) Supply electrical power (AMM 24-22-00/201).

      S 864-003
      (2) Remove pneumatic power (AMM 36-00-00/201).

      S 014-004
      (3) Open the No. 2 cargo door 822 (AMM 06-46-00/201).

      S 014-005
      (4) Remove the applicable sidewall panel in the cargo bay (AMM 25-50-02/401).
   D. Remove the Pneumatic Duct Insulation

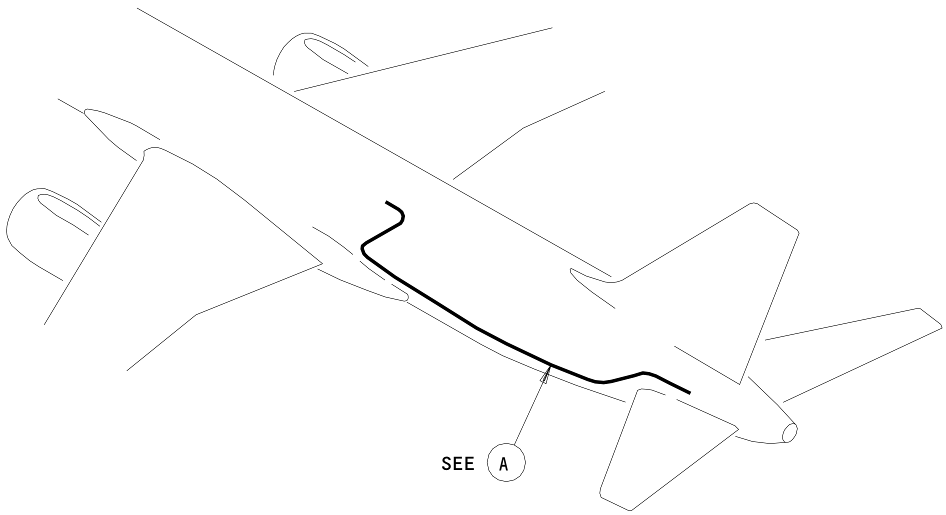
      S 034-006
      (1) Turn the duct insulation until you can see the square knots.

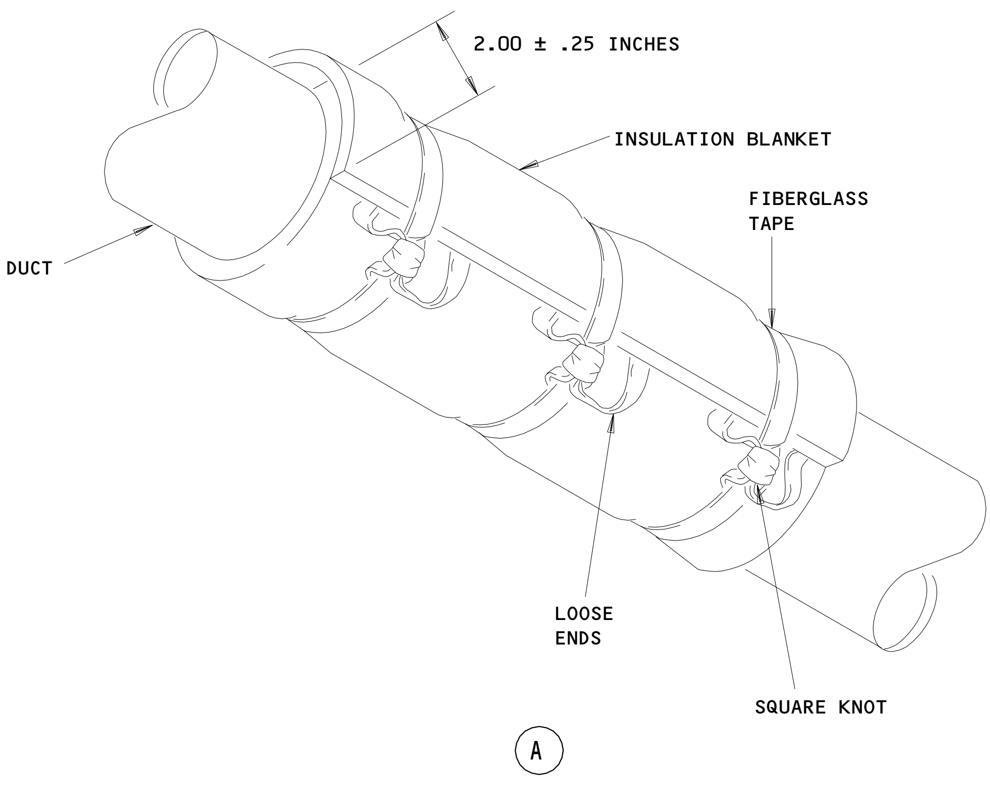
      S 034-007
      (2) Untie the square knots. If you cannot untie the square knots, use a knife to cut the tape.

      S 024-008
      (3) Remove the insulation blanket for the pneumatic duct.

TASK 36-11-02-404-014

3. Install the Pneumatic Duct Insulation (Fig. 401)
   A. References
      (1) AMM 06-46-00/201, Entry, Service, and Cargo Doors Access Doors and Panels
      (2) AMM 24-22-00/201, Electrical Power Control





Pneumatic Duct Insulation - Installation
Figure 401

(3) AMM 25-50-02/401, Side Lining Panels
(4) AMM 36-00-00/201, Pneumatic - General

B. Access
(1) Location Zone
154 Aft Cargo Compartment (Right)

C. Procedure

S 424-009
(1) Install the insulation blanket on the applicable duct. Make an overlap of the insulation blanket 2.00 ±.25 inches along the length of the blanket.

S 424-010
(2) Tie the fiberglass tape in a square knot.

S 434-011
(3) Put the loose ends of the tape under the insulation overlap.

D. Put the Airplane Back to Its Usual Condition

S 414-012
(1) Close the No. 2 cargo door 822.

S 864-013
(2) Remove electrical power if it is not necessary (AMM 24-22-00/201).

PNEUMATIC DUCT INSULATION - APPROVED REPAIRS

1. General
   A. This procedure supplies the repair of the pneumatic duct insulation.

TASK 36-11-02-308-012

2. Repair The Pneumatic Duct Insulation
   A. Consumable Materials
      (1) G00431, Fiberglass Tape
          Owens Corning - ECCB
          Gude Brod Bros - 26X (AMM 20-30-07/201)
   B. References
      (1) AMM 06-46-00/201, Entry, Service and Cargo Doors Access Doors and Panels
      (2) AMM 24-22-00/201, Electrical Power Control
      (3) AMM 25-50-02/401, Sidewall Lining Panels
      (4) AMM 36-00-00/201, Pneumatic - General
      (5) AMM 36-11-02/401, Pneumatic Duct Insulation
   C. Access
      (1) Location Zone
          154 Aft Cargo Compartment (Right)
   D. Procedure

      S 868-002
      (1) Supply electrical power (AMM 24-22-00/201).

      S 868-003
      (2) AMM Remove pneumatic power (AMM 36-00-00/201).

      S 018-004
      (3) Open the No. 2 Cargo Door (822) (AMM 06-46-00/201).

      S 018-005
      (4) Remove the applicable sidewall panels in the aft cargo bay (AMM 25-50-02/401).

      S 968-006
      (5) Replace the insulation blanket if there is less than 75 percent of the fiberglass batt remaining in the insulation blanket (AMM 36-11-02/401).

      S 218-007
      (6) Make sure the area you will repair is clean and dry.

      S 358-008
      (7) Put the tape on the torn part of the insulation blanket.
          (a) Make sure the tape will extend around the torn part of the insulation blanket a minimum of one inch in all the directions.

E. Put the Airplane Back to Its Usual Condition

S 418-009

(1) Install the sidewall panels in the aft cargo bay.

S 418-010

(2) Close the Cargo Door No. 2.

S 868-011

(3) Remove electrical power if it is not necessary (AMM 24-22-00/201).

PNEUMATIC GROUND CONNECTOR REMOVAL/INSTALLATION

1. General
   A. Three pneumatic ground connectors permit the input of air from a ground cart into the air supply system. The connectors are in the wing body fairing. Two connectors are forward and outboard of the left air conditioning pack. The other connector is forward and outboard of the right pack. The removal and installation for all the connectors is the same.

TASK 36-11-03-004-001

2. Remove the Pneumatic Ground Connector (Fig. 401).
   A. References
      (1) AMM 06-41-00/201, Fuselage Access Doors and Panels
      (2) AMM 20-10-23/401, Standard Practices - Lockwire
      (3) AMM 24-22-00/201, Electric Power Control
      (4) AMM 36-00-00/201, Pneumatic - General
   B. Access
      (1) Location Zones
          135/136 Environmental Control System Bay

      (2) Access Panels
          193HL/194ER ECS Components

   C. Procedure

      S 864-002
      (1) Supply electrical power (AMM 24-22-00/201).

      S 024-028
      (2) Remove pneumatic power (AMM 36-00-00/201).

      NOTE: Pressure is released when the system is not in operation.

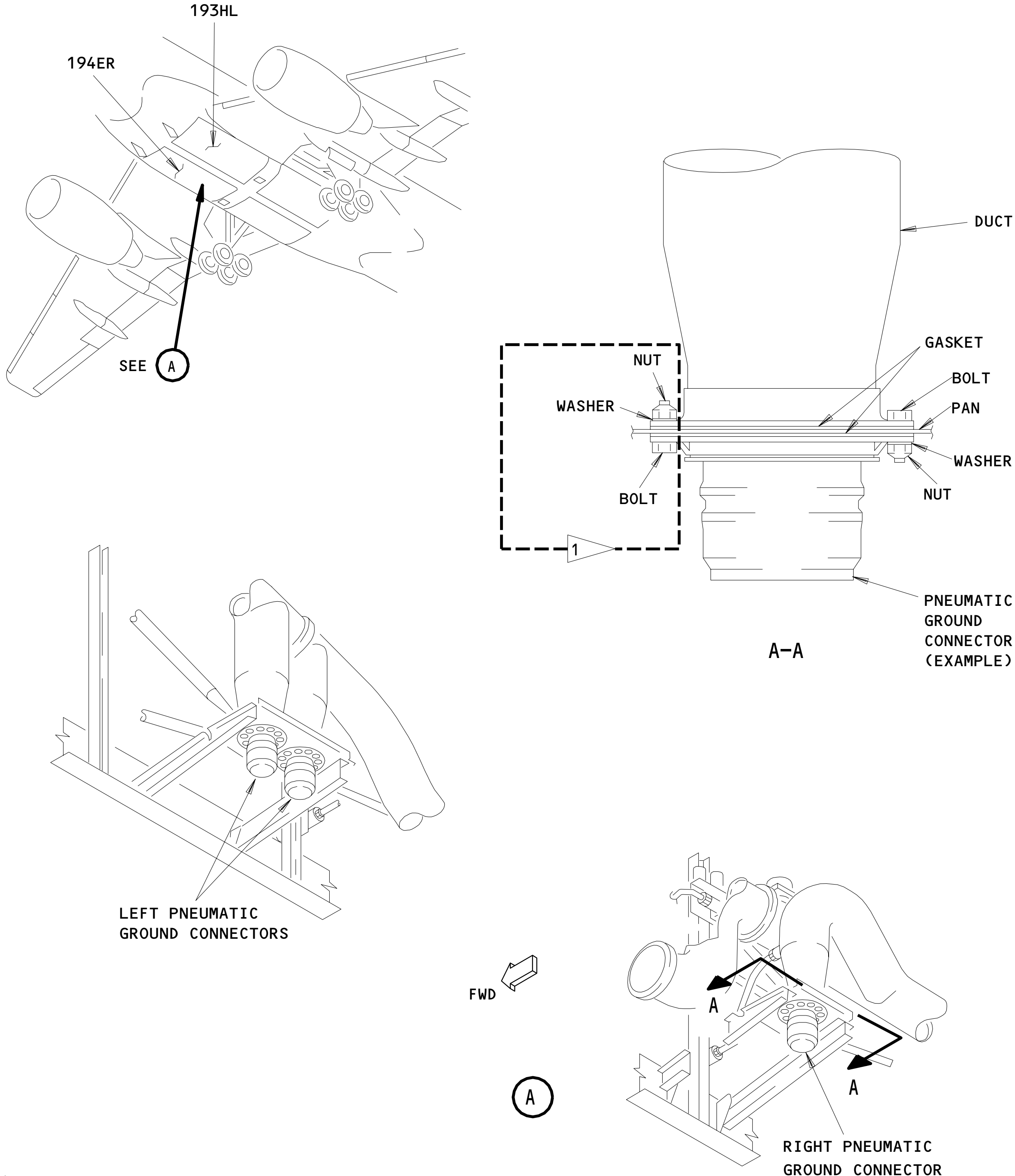
      S 864-024

      WARNING: DO NOT REMOVE THE GROUND CONNECTOR WHILE THE PNEUMATIC DUCT IS PRESSURIZED. THE RELEASE OF PRESSURIZED AIR CAN CAUSE INJURY TO PERSONS.

      (3) To remove the right pneumatic ground connector, open the right ECS access door (194ER) (AMM 06-41-00/201).

      S 014-005
      (4) To remove the left pneumatic ground connectors, open the left ECS access door (193HL) (AMM 06-41-00/201).

      S 034-007
      (5) Remove the bolts (12) from the pneumatic ground connector.



1 INSTALL THE BOLTS (2 LOCATIONS) THAT ARE LOCKWIRED IN THE OPPOSITE DIRECTION. INSTALL THE BOLTS IN THE LOCATION THAT IS NEAREST TO THE CHECK VALVE LOCKWIRE HOLES

Pneumatic Ground Connector
Figure 401

S 024-008
(6) Remove the pneumatic ground connector.

S 034-009
(7) Remove the gasket.

S 494-010
(8) Put a cover on the opening in the duct to keep out unwanted material.

TASK 36-11-03-404-011
3. Install the Pneumatic Ground Connector (Fig. 401)
A. References
(1) AMM 06-41-00/201, Fuselage Access Doors and Panels
(2) AMM 20-10-23/401, Standard Practices - Lockwire
(3) AMM 24-22-00/201, Electric Power Control
(4) AMM 36-00-00/201, Pneumatic - General
B. Access
(1) Location Zones
135/136 Environmental Control System Bay

(2) Access Panels
193HL/194ER ECS Components

C. Procedure

S 094-012
(1) Remove the duct covers.

S 424-013
(2) With a new gasket, align the gasket and the bolt holes for the pneumatic ground connector with the holes in the assembly pan

S 434-014
(3) Install the bolts, washers, nuts shown on Fig. 401.

S 434-015
(4) Tighten the bolts and nuts.

S 434-016
(5) Install the lockwire (AMM 20-10-23/401).
D. Do a test of the pneumatic ground connector for air leakage.

S 864-017
(1) Supply pneumatic power (AMM 36-00-00/201)

S 794-018
(2) Do a check for air leakage around the connector.
(a) Small air leakage is satisfactory.

(b) You must repair large air leakage with connector and gasket adjustment.

NOTE: Large air leakage is when you feel the airflow with your hand at a distance of 12 inches or greater from a point on the duct joint.

E. Put the Airplane Back to Its Usual Condition

S 864-019
(1) Remove pneumatic power if it is not necessary (AMM 36-00-00/201).

S 414-020
(2) Close the access doors (193HL or 194ER).

S 864-021
(3) AMM Remove electrical power if it is not necessary (AMM 24-22-00/201).

ISOLATION VALVE - REMOVAL/INSTALLATION

1. General
   A. This procedure includes the removal and installation of the pneumatic isolation valve. The valve is in the air supply crossover duct immediately forward of the right air conditioning pack.

TASK 36-11-04-004-001

2. Remove The Isolation Valve (Fig. 401)
   A. References
      (1) AMM 06-41-00/201, Fuselage Access Door and Panels
      (2) AMM 20-10-23/401, Standard Practices - Lockwire.
      (3) AMM 24-22-00/201, Electric Power Control.
      (4) AMM 36-00-00/201, Pneumatic - General.
   B. Access
      (1) Location Zone
          136 Environmental Control Systems Bay

      (2) Access Panel
          193HL ECS Components

   C. Prepare for the Removal

      S 864-002
      (1) Supply electrical power (AMM 24-22-00/201).

      S 864-003

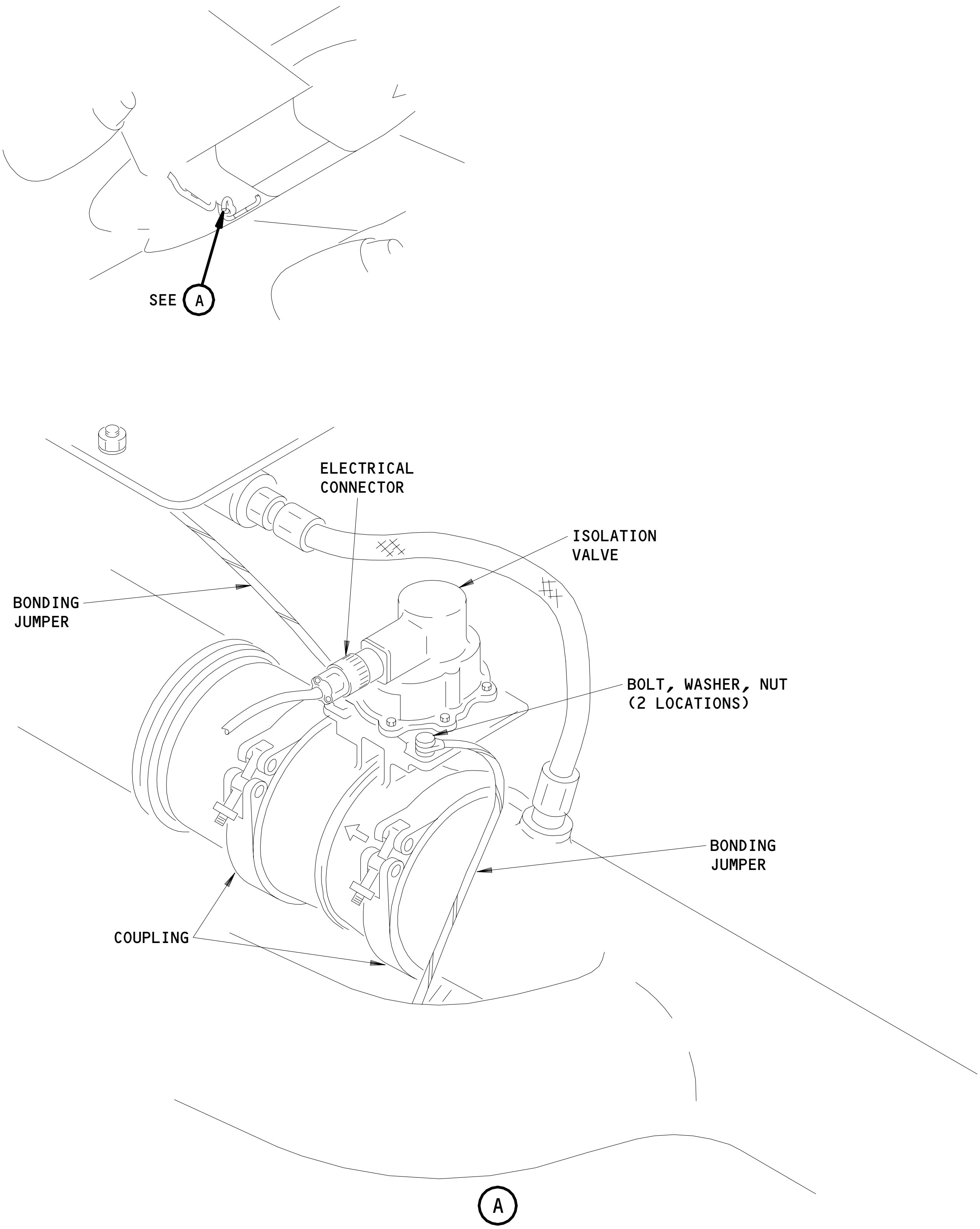
      WARNING: RELEASE THE PRESSURE IN THE PNEUMATIC DUCT BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. THE HOT, HIGH PRESSURE AIR CAN CAUSE INJURY TO PERSONS.

      (2) Remove pneumatic power (AMM 36-00-00/201).

          NOTE: Pressure is released when the system is not in operation.

      S 864-005
      (3) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach DO-NOT-CLOSE tags:
          (a) 11B2, ISOL VALVE CONT
          (b) 11B3, ISOL VALVE PWR

      S 014-006
      (4) Open the right ECS access door (193HL) (AMM 06-41-00/201).



Isolation Valve
Figure 401

D. Remove the Isolation Valve

S 034-007
(1) Disconnect the electrical connector from the valve.

S 034-008
(2) Disconnect the bonding jumpers from the valve.

S 034-009
(3) Loosen and move the coupling along the ducts at each end of the valve.

S 024-010
(4) Remove the valve.

S 494-011
(5) Install a cover on the duct openings to keep out unwanted material.

TASK 36-11-04-404-012
3. Install the Isolation Valve (Fig. 401)
A. References
(1) AMM 06-41-00/201, Fuselage Access Door and Panels
(2) AMM 20-10-23/401, Standard Practices - Lockwire.
(3) AMM 24-22-00/201, Electric Power Control.
(4) AMM 36-00-00/201, Pneumatic - General.
B. Access
(1) Location Zone
136 Environmental Control Systems Bay

(2) Access Panel
193HL ECS Components

C. Procedure

S 094-013
(1) Remove the duct covers.

S 424-014
(2) Install the valve in the duct. Make sure the arrow points inboard.

S 434-015
(3) Install the coupling on each side of the valve.

NOTE: If access and clearance permit, stagger the valve couplings and tighten the coupling nuts to the prescribed torque value.

S 434-016
(4) Tighten the coupling nuts to 50-60 Pound-Inches.

S 434-017
(5) Install the bolt, washer, and nut, for the bonding jumpers to the valve.

S 434-018
(6) Connect the electrical connector to the valve.

S 864-019
(7) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
(a) 11B2, ISOL VALVE CONT
(b) 11B3, ISOL VALVE PWR

D. Do a test of the isolation valve.

S 864-020
(1) Supply pneumatic power (AMM 36-00-00/201).

S 214-021
(2) Push the isolation valve switch-light on the pilots overhead panel, P5, to the open position.
(a) Make sure VALVE light comes on and then goes off.
(b) Make sure white bar light comes on.

S 794-022
(3) Do a check for air leakage at the isolation valve couplings.
(a) Small air leakage is satisfactory.

(b) You must repair large air leakage with joint or clamp adjustment.

NOTE: Large air leakage is when you feel the airflow with your hand at a distance of 12 inches or greater from a point on the duct joint.

S 214-023

(4) Push the isolation valve switch-light, on the P5 panel, to the closed position.
   (a) Make sure the VALVE light comes on and then goes off.
   (b) Make sure the white bar light goes off.

E. Put the Airplane Back to Its Usual Condition

S 864-024

(1) Remove the pneumatic power, if it is not necessary (AMM 36-00-00/201).

S 414-025

(2) Close the access door for the environment control system bay (193HL).

S 864-026

(3) Remove the electrical power, if it is not necessary (AMM 24-22-00/201).

INTERMEDIATE PRESSURE CHECK VALVE - REMOVAL/INSTALLATION

1. General
   A. This procedure includes the removal and installation of the intermediate pressure (IP) check valve.

TASK 36-11-06-004-001

2. Remove The Intermediate Pressure Check Valve (Fig. 401)
   A. References
      (1) AMM 06-43-00/201, Engine Nacelle Access Doors and Panels
      (2) AMM 24-22-00/201, Electric Power Control
      (3) AMM 36-00-00/201, Pneumatic - General
      (4) AMM 36-11-01/401, Pneumatic Duct
      (5) AMM 36-11-09/201, Pressure Regulating and Shutoff Valve
      (6) AMM 78-31-00/201, Thrust Reverser
   B. Access
      (1) Location Zones
          433/443   Nacelle strut - mid-structure
      (2) Access Panels
          433HR/443HL   High Pressure Duct, IP Check Valve Access Door
   C. Prepare for the Removal

      S 864-002
      (1) Supply electrical power (AMM 24-22-00/201).

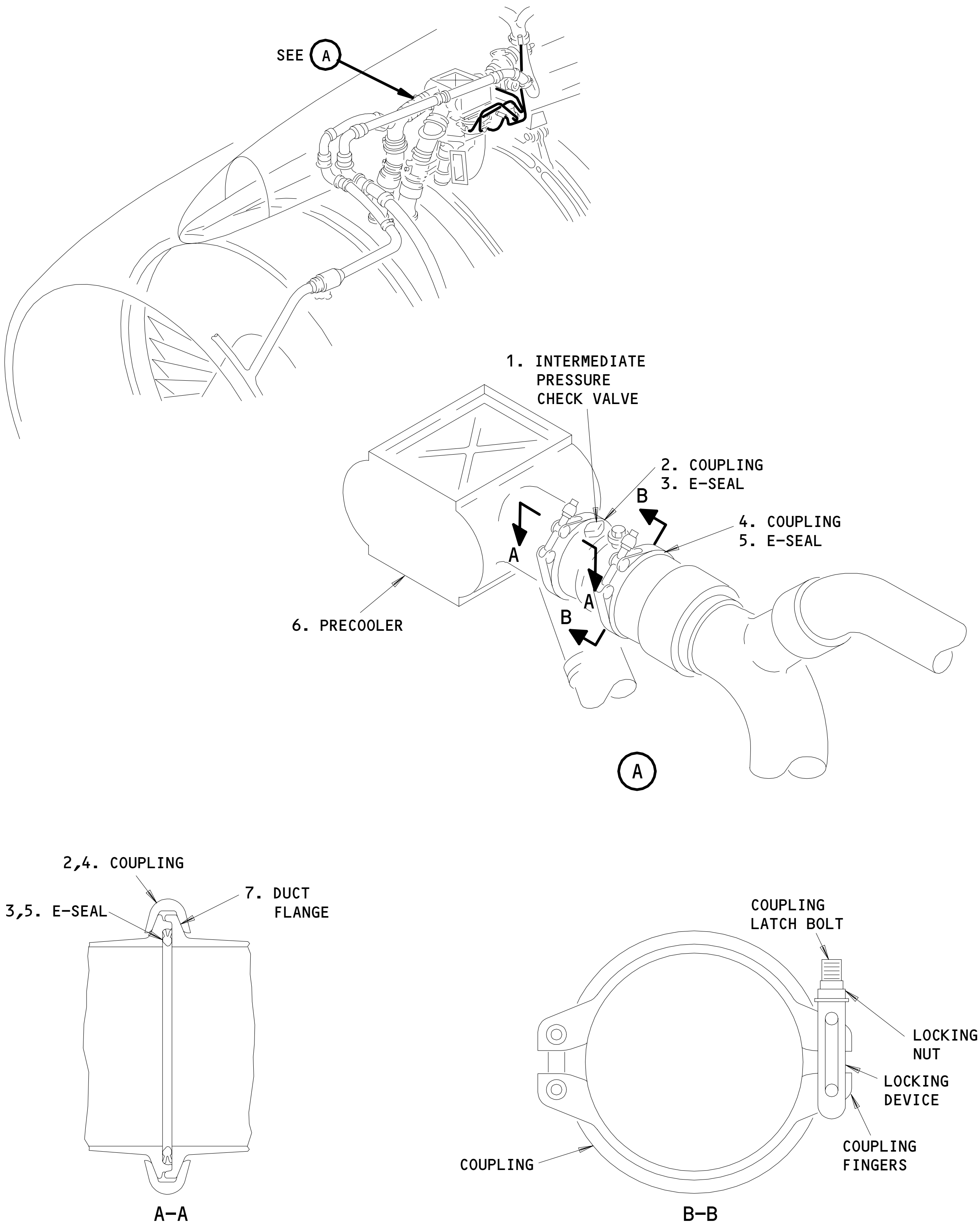
      S 864-046

      WARNING: RELEASE ALL OF THE AIR PRESSURE IN THE DUCT BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. THE HOT, HIGH PRESSURE AIR CAN CAUSE INJURY TO PERSONS.

      (2) Remove pneumatic power (AMM 36-00-00/201).

         NOTE: Pressure is released when the system is not in operation.

      S 034-051
      (3) Do these steps to get access:



Intermediate Pressure Check Valve - Installation
Figure 401

WARNING: DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(a) Do the deactivation procedure for the thrust reverser for Ground Maintenance (AMM 78-31-00/201).
(b) To remove the left IP check valve, do the following:
1) Open the access door for the upper fairing strut, 433HR (AMM 06-43-00/201).
(c) To remove the right IP check valve, do the following:
1) Open the access door for the upper fairing strut, 443HL (AMM 06-43-00/201).
2) Remove the strut duct which is adjacent to the IP check valve (AMM 36-11-01/401).

D. Remove the IP Check Valve

S 434-010
(1) Loosen the couplings (2, 4) at each end of the IP check valve (1).

S 434-009
(2) Move the couplings (2, 4) along the duct.

S 024-013
(3) Remove the IP check valve (1).

S 034-015
(4) Remove the E-seals (3, 5) from the duct flanges.

S 494-018
(5) Install a cover on the duct holes to keep out unwanted objects.

TASK 36-11-06-404-019
3. Install The Intermediate Presssure Check Valve (Fig. 401)
A. Consumable Materials
(1) D00006 Antiseize Compound, Bostik Never-Seez

B. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	1	Intermediate Pressure Check Valve	36-11-01	01	155
	2	Coupling			120
	3	E-seal			140
	4	Coupling			115
	5	E-seal			135

C. References
(1) AMM 06-43-00/201, Engine Nacelle Access Doors and Panels
(2) AMM 24-22-00/201, Electric Power Control
(3) AMM 36-00-00/201, Pneumatic - General
(4) AMM 36-11-01/401, Pneumatic Duct
(5) AMM 36-11-09/201, Pressure Regulating and Shutoff Valve
(6) AMM 78-31-00/201, Thrust Reverser

D. Access
(1) Location Zones
433/443 Nacelle strut - mid-structure
(2) Access Panels
433HR/443HL High Pressure Duct, IP Check Valve Access Door

E. Procedure

S 094-020
(1) Remove the duct covers.

S 214-021
(2) Examine the flange surfaces that seal for cracks, dents, unwanted material or other damage.

S 644-048
(3) Apply antiseize compound to the threads of all the fittings throughout the procedure.

S 214-023
(4) Look at all the E-seals for cracks, dents, unwanted objects or other damage.
(a) Replace all the damaged E-seals.

S 424-024

(5) Install the IP check valve (1) and the E-seals (3, 5) in the duct.
  (a) Make sure the arrow on the check valve body points to the air supply precooler (6).

S 824-026

(6) Align the flanges, but do not use force.
  (a) Align the opposite flanges to a maximum distance of 0.03 inches at a point.
  (b) Align the duct if it is necessary.

S 824-027

(7) Align the flow arrow line on the IP check valve (1) with the alignment mark on the precooler (6).

S 434-044

CAUTION: MAKE SURE YOU INSTALL THE LOCKING DEVICE OF THE COUPLING CORRECTLY AS SHOWN IN FIG. 401. IF YOU DO NOT INSTALL THE COUPLING FINGERS INSIDE THE LOCKING DEVICE, THE COUPLING CAN LOOSEN AND CAUSE DAMAGE TO EQUIPMENT.

(8) Install the coupling (2, 4) on each side of the IP check valve (1).

NOTE: Put the coupling latch in a position to give the maximum clearance between the equipment and the coupling. Stagger the valve couplings if access and clearance permit.

S 434-030

(9) Tighten the coupling nuts to 110-120 pound-inches.

F. Do a Test of the IP check valve

S 864-035

(1) Supply pneumatic power upstream of the air supply pressure regulating and shutoff valve (PRSOV) (AMM 36-11-09/201).

S 794-036

(2) Do a test of the flange on the IP check valve for air leakage.
  (a) Small air leakage is satisfactory.
  (b) You must repair large air leakage with joint or clamp adjustment.

NOTE: Large air leakage is when you feel the airflow with your hand at a distance of 12 inches or greater from a point on the duct joint.

G. Put the Airplane Back to Its Usual Condition

S 414-069
(1) Install the strut duct that you removed to access the right intermediate check valve check valve (AMM 36-11-01/401).

S 864-038
(2) Remove the pneumatic power (AMM 36-00-00/201).

S 864-037
(3) Put the air supply PRSOV back to its usual condition (AMM 36-11-09/201).

S 414-039
(4) Close the upper fairing strut access door (433HR or 443HL).

S 444-049
(5) Do the activation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

S 864-042
(6) Remove electrical power if it is not necessary (AMM 24-22-00/201).

INTERMEDIATE PRESSURE CHECK VALVE INSPECTION/CHECK

1. General
   A. This procedure contains one task. The task does a general visual inspection of the condition of the intermediate pressure check valve for continued in-service use.

TASK 36-11-06-206-006

2. Examine the Intermediate Pressure Check Valve
   A. References
      (1) AMM 36-11-06/401, Intermediate Pressure Check Valve.
   B. Access
      (1) Location Zones
          433/443 Nacelle Strut-Mid-Structure

      (2) Access Panels
          433HR/443HL High Pressure Duct, IP Check Valve

   C. Procedure

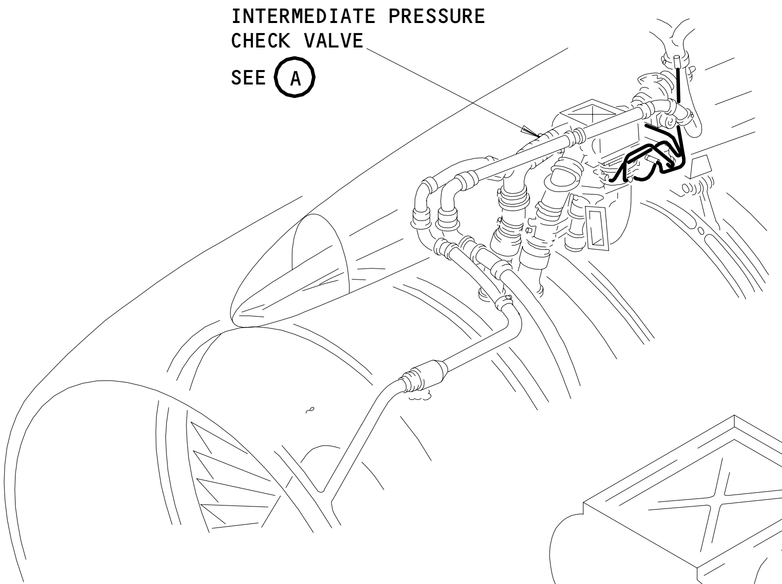
      S 026-001
      (1) Remove the intermediate pressure (IP) check valve (AMM 36-11-06/401).

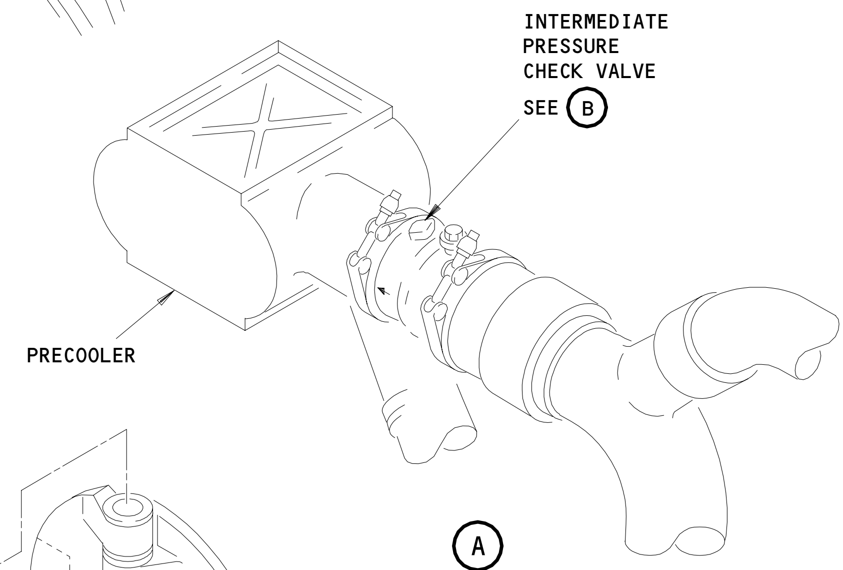
      S 216-002
      (2) Examine the IP check valve for the items that follow:
          (a) Missing parts.
          (b) Cracks or corrosion in the valve housing.
          (c) Make sure the worn areas, on the surfaces of the flappers and the valve body that seal, are equal at all points.
          (d) Carbon streaks or dirt particles on the surfaces of the flappers and the valve body that seal (this shows valve leakage in closed position).
          (e) Make sure the thickness of the flappers in the area that touches the stop pin is not less than 0.095 inch.

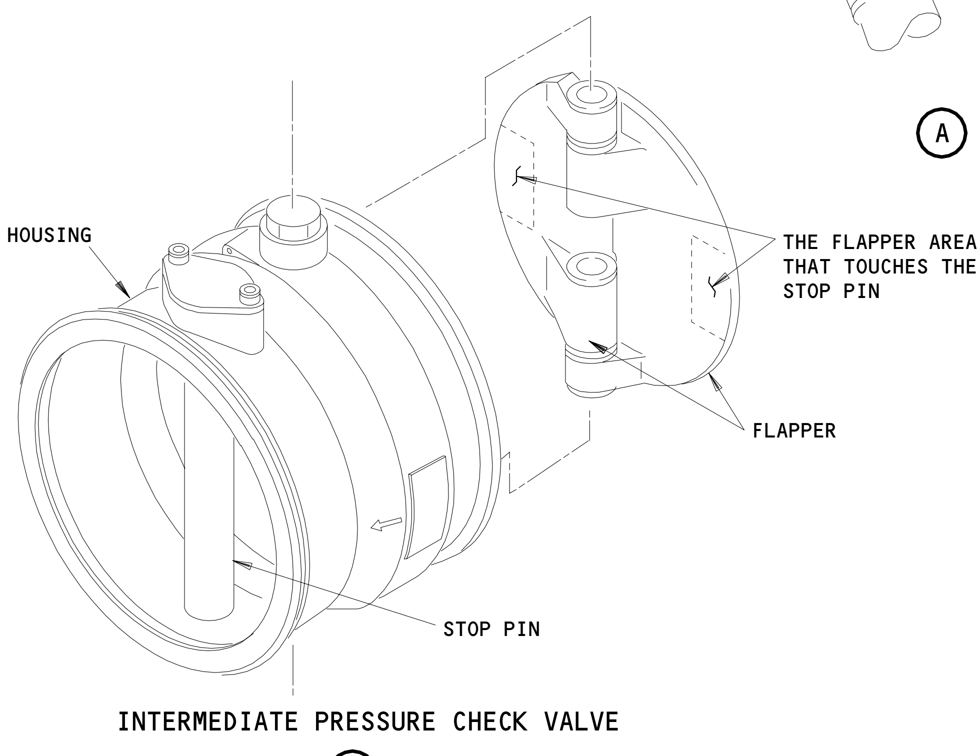
      S 426-003
      (3) If you find one of the above conditions, replace the IP check valve.

      S 436-004
      (4) Tighten all the loose screws.

      S 426-005
      (5) Install the IP check valve (AMM 36-11-06/401).







Intermediate Pressure Check Valve
Figure 601

HIGH PRESSURE SHUTOFF VALVE - REMOVAL/INSTALLATION

1. General
   A. This procedure includes these tasks:
      (1) The removal of the HPSOV.
      (2) The installation of the HPSOV.

TASK 36-11-07-004-001

2. Remove The High Pressure Shutoff Valve (Fig. 401)
   A. References
      (1) AMM 36-00-00/201, Pneumatic - General
      (2) AMM 36-11-09/201, Air Supply Pressure Regulating and Shutoff Valve
      (3) AMM 78-31-00/201, Thrust Reverser System
   B. Access
      (1) Location Zones
          410/420 Engine
      (2) Access Panels
          415AL/425AL Thrust Reverser
   C. Prepare for the Removal

S 864-071

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.

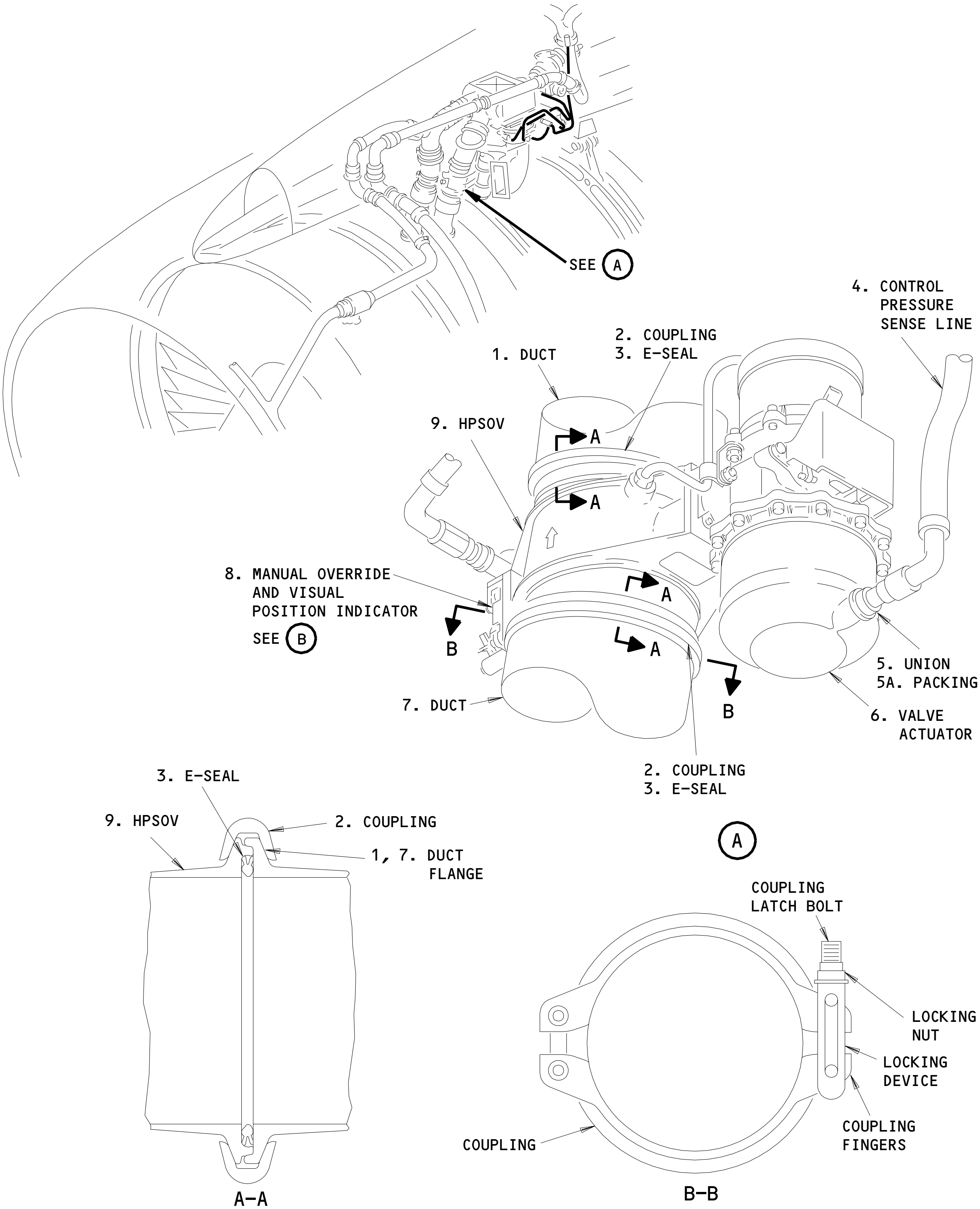
(1) Remove pneumatic power (AMM 36-00-00/201).

NOTE: Pressure is released when the system is not in operation.

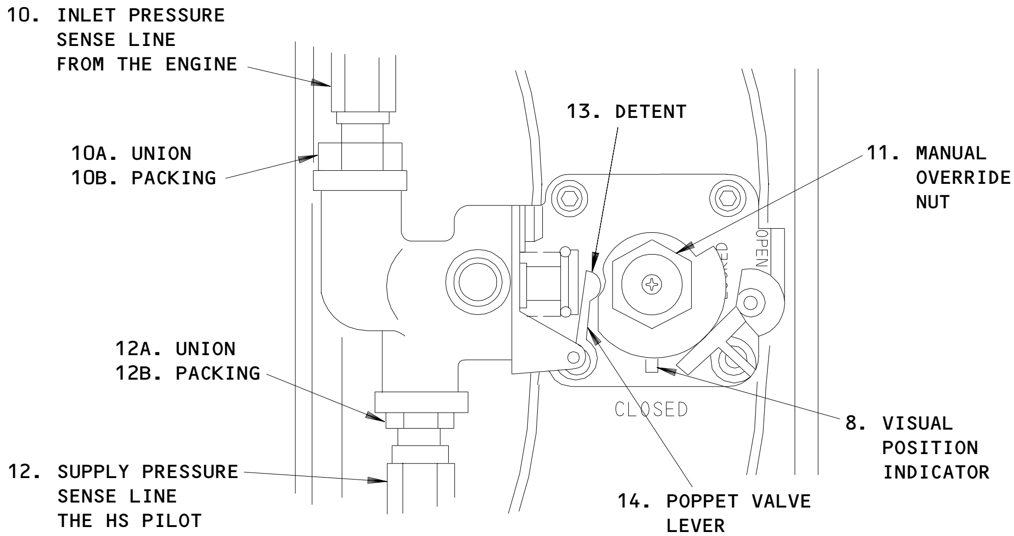
S 044-004

WARNING: DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

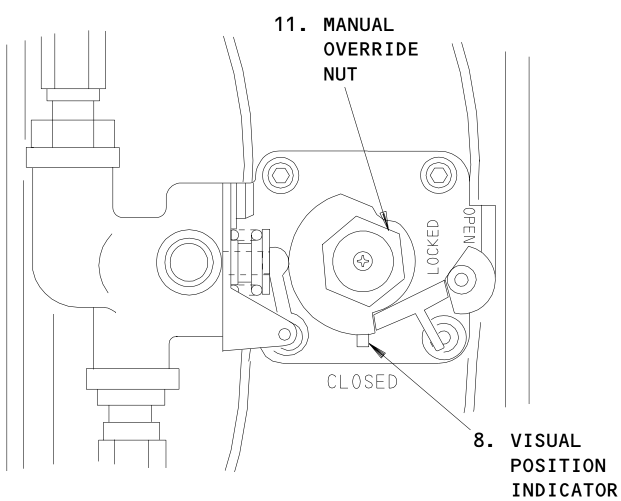


High Pressure Shutoff Valve - Installation
Figure 401 (Sheet 1)



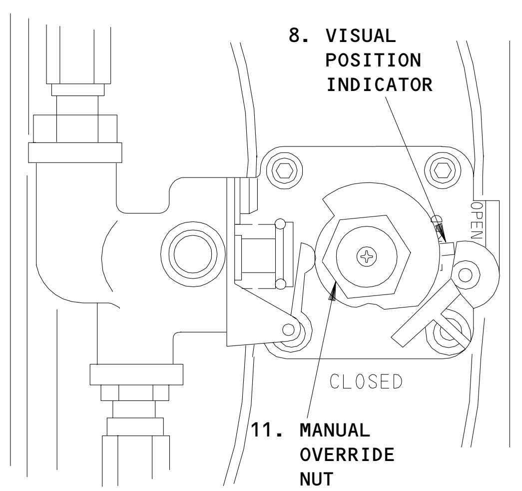
MANUAL OVERRIDE AND VISUAL POSITION INDICATOR
(THE HPSOV IS NOT LOCKED CLOSED)

B



MANUAL OVERRIDE AND
VISUAL POSITION INDICATOR
(THE HPSOV IS LOCKED CLOSED)

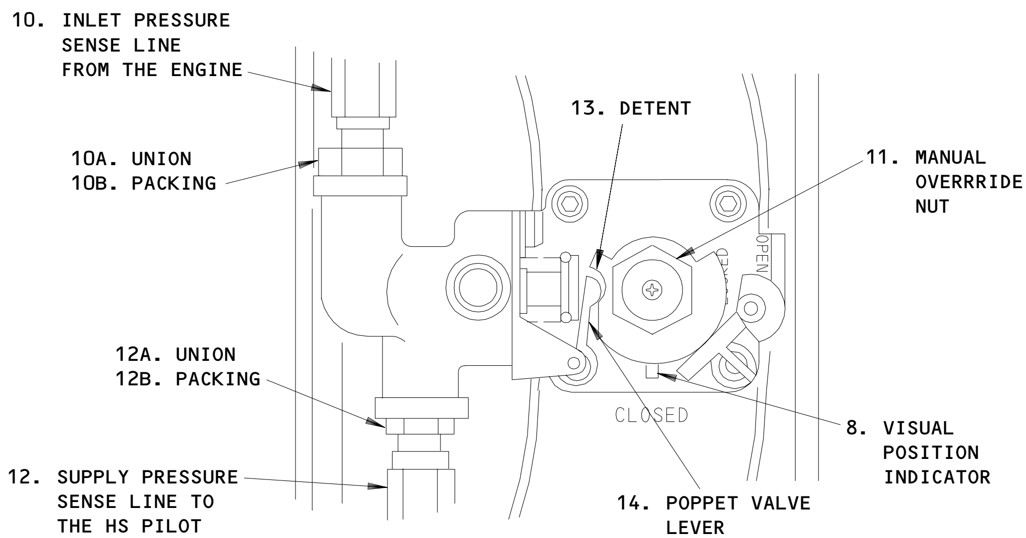
B



MANUAL OVERRIDE AND
VISUAL POSITION INDICATOR
(THE HPSOV IS MANUALLY OPEN)

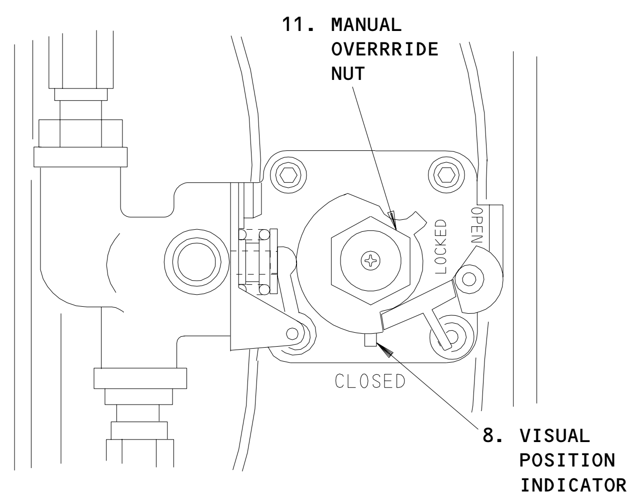
B

High Pressure Shutoff Valve - Installation
Figure 401 (Sheet 2)



MANUAL OVERRIDE AND VISUAL POSITION INDICATOR
(THE HPSOV IS NOT LOCKED CLOSED)

B



MANUAL OVERRIDE AND VISUAL POSITION INDICATOR
(THE HPSOV IS LOCKED CLOSED)

B

High Pressure Shutoff Valve - Installation
Figure 401 (Sheet 3)

S 014-073

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

(3) Open the left thrust reverser (AMM 78-31-00/201).

D. HPSOV Removal

S 034-016

CAUTION: WHEN YOU LOOSEN THE SENSE LINE NUTS FOR THE FLEXIBLE SENSE LINE, MAKE SURE YOU CORRECTLY SUPPORT THE END FITTINGS. IF YOU TWIST OR CAUSE KINKS IN THE FLEXIBLE SENSE LINE, DAMAGE TO THE FLEXIBLE SENSE LINE CAN OCCUR.

(1) Disconnect the control pressure sense line (4).

S 034-011

(2) Disconnect the inlet pressure sense line (10).

S 034-013

(3) Disconnect the supply pressure sense line (12).

S 034-019

(4) Remove the couplings (2).

S 024-017

(5) Remove the HPSOV (9).

S 034-023

(6) Remove the E-seals (3).

S 494-025

(7) Install a cover on the sense lines and duct holes to keep out unwanted objects.

S 034-088

(8) Remove the unions (5,10A,12A) and packing (5A,10B,12B).
   (a) Discard the packing.

TASK 36-11-07-404-027

3. Install The High Pressure Shutoff Valve (Fig. 401)

A. Consumable Materials
   (1) D00006 Antiseize Compound - BOSTIK NEVER-SEEZ

B. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	2	Coupling	36-11-01	01	110
	3	Gasket (E-seal)			130
	9	Valve Assy (HPSOV)			160
	5	Union	36-11-01	06	30
	5A	Packing			35
	10A	Union			20
	10B	Packing			25
	12A	Union			5
	12B	Packing			15

C. References
(1) AMM 24-22-00/201, Electric Power-Control
(2) AMM 36-00-00/201, Pneumatic - General
(3) AMM 36-11-09/201, Air Supply Pressure Regulating and Shutoff Valve
(4) AMM 78-31-00/201, Thrust Reverser System

D. Access
(1) Location Zones
410/420 Engine
(2) Access Panels
415AL/425AL Thrust Reverser

E. Procedure

S 214-028
(1) Make sure the poppet valve lever (14) is in the detent (13) position on the manual override nut. This makes sure the HPSOV is not in the locked closed position.

S 094-029
(2) Remove the duct covers.

S 214-030
(3) Look at the flange surfaces that seal for cracks, dents, unwanted material or other damage.

S 304-070
(4) Replace the HPSOV or repair the flange surface if it is necessary.

S 644-078
(5) Apply the antiseize compound to the threads of the unions (5,10A,12A).

S 424-079
(6) Install the unions (5,10A,12A) and new packing (5A,10B,12B).

S 214-033

(7) Look at all the E-seals for cracks, dents, unwanted objects or other damage.
   (a) Replace all the damaged E-seals.

S 434-056

(8) Install an E-seal (3) in each end of the HPSOV (9).

S 424-057

(9) Install the HPSOV (9).

   NOTE: Put the HPSOV in a position to give the best clearance with adjacent equipment. Make sure there is clearance for the inlet duct for the cooling air.

   (a) Make sure the flow arrow points up.

S 824-034

(10) Align the HPSOV in the duct to make sure the opposite flanges have a maximum distance of 0.03 inches at one point. Do not use force.

S 824-035

(11) Align the ducts if it is necessary.

S 434-085

CAUTION: MAKE SURE YOU INSTALL THE LOCKING DEVICE OF THE COUPLING CORRECTLY AS SHOWN IN FIG. 401. IF YOU DO NOT INSTALL THE COUPLING FINGERS INSIDE THE LOCKING DEVICE THE COUPLING CAN LOOSEN AND CAUSE DAMAGE TO EQUIPMENT.

(12) Install the couplings (2) on the duct and the HPSOV flanges. Do not tighten.

   NOTE: Install the locking device in a position to give the maximum clearance with the adjacent equipment. Stagger the valve couplings if access and clearance permit.

S 094-038

(13) Remove the covers from the sense line connections.

S 434-069

CAUTION: WHEN YOU TIGHTEN THE SENSE LINE NUTS FOR THE FLEXIBLE SENSE LINE, MAKE SURE YOU CORRECTLY SUPPORT THE END FITTINGS. IF YOU TWIST OR CAUSE KINKS IN THE FLEXIBLE SENSE LINE, DAMAGE TO THE FLEXIBLE SENSE LINE CAN OCCUR.

(14) Install the inlet pressure sense line (10).

S 434-044

(15) Install the control pressure sense line (4).

S 434-048

(16) Install the supply pressure sense line (12).

S 434-053

(17) Tighten the couplings to 110-120 pound-inches.

F. Do a leak test of the HPSOV.

S 864-060

(1) Supply pneumatic power upstream of the pressure regulating and shutoff valve (PRSOV) (AMM 36-11-09/201).

<u>NOTE</u>: Method 1 or 3 of AMM 36-11-09/201 (Supply Pneumatic Power Upstream of the PRSOV) gives a leak check of the downstream side of the HPSOV. Method 2 gives a low pressure leak check of the upstream and downstream side of the HPSOV.

S 794-061

(2) Do a test of the HPSOV flanges for leakage.

(a) Small leakage is satisfactory.

(b) You must repair large air leakage with joint or clamp adjustment.

<u>NOTE</u>: Large air leakage is when you feel the airflow with your hand at a distance of 12 inches or greater from a point on the duct joint.

S 864-063

(3) Remove the pneumatic power (AMM 36-00-00/201).

S 864-062

(4) Put the air supply pressure regulating and shutoff valve back to its usual condition (AMM 36-11-09/201).

G. Put the Airplane Back to Its Usual Condition

S 414-074

<u>WARNING</u>: 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 (AMM 78-31-00/201).

S 444-066
(2) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 864-067
(3) Remove electrical power, if it is not necessary (AMM 24-22-00/201).

HIGH PRESSURE SHUTOFF VALVE - ADJUSTMENT/TEST

1. General
   A. This task will perform a test of the HPSOV and the HS PILOT while the HPSOV and HS PILOT are on-wing. This task will also do a test of the overpressure sensor and the crossover switcher system in the HS PILOT.

TASK 36-11-07-715-001

2. Functional Test Of The High Pressure Shutoff Valve (HPSOV) And High Stage Pilot (HS PILOT)

   A. Equipment
      (1) Nitrogen or air Source - 0-250 PSIG
      (2) C36001 Supply pressure gage - 0-250 PSIG
      (3) C36001 Control pressure gage - 0-60 PSIG
      (4) 28 Volts DC power supply (Optional)
      (5) Union fittings - MS-5 (2 Required)
          - MS-6 (1 Required)
   B. Consumable Materials
      (1) D00006 Compound-Antiseize, Bostik Never-Seez Pure Nickel Special
          BOSTIK INCORPORATED
          BOSTON STREET
          MIDDLETON, MA 01949
          VENDOR CODE 90983
          TELEPHONE 1-800-726-7845
   C. Parts
      (1) Cap
      (2) Pressure hose - 0-200 PSIG
   D. References
      (1) AMM 06-41-00/201, Fuselage (Major Zones 100 and 200) Access Doors and Panels
      (2) AMM 06-43-00/201, Engine and Nacelle Strut (Major Zone 400) Access Doors and Panels
      (3) AMM 24-22-00/201, Electrical Power - General
      (4) AMM 36-00-00/201, Pneumatic Power - General
      (5) AMM 36-11-07/401, High Pressure Shutoff Valve
      (6) AMM 36-11-08/401, High Stage Pilot

(7) AMM 78-31-00/201, Thrust Reverser System

E. Access

(1) Location Zones

119	Main Equipment Center
411/421	Engine

(2) Access Panels

119BL	Main Equipment Center Access Panel
413/414/423/424	Fan Cowl Panel
415/416/425/426	Fan Reverser

F. Prepare for the Test

S 865-066

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) Remove pneumatic power (AMM 36-00-00/201).

S 865-003

(2) Supply electrical power (AMM 24-22-00/201).

S 865-004

(3) Open the applicable circuit breaker, on the P11 panel, and attach a DO-NOT-CLOSE tag:

(a) 11Q10, ENG BLEED L

(b) 11Q19, R ENG BLEED CONT

(c) 11B31 L ENGINE SPEED CARD

(d) 11B32 R ENGINE SPEED CARD

S 045-063

WARNING: DO THE DEACTIVATION PROCEDURE FOR THE THRUST REVERSERS TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(4) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

S 015-064

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

(5) Open the applicable thrust reversers (AMM 78-31-00/201).

S 865-054
(6) There are three methods that can be used to enable the High Stage Pilot. Method 1 manually enables the HS Pilot. Method 2 uses the airplane's electrical power and Method 3 uses a separate 28 VDC power supply. Method 3 should be used if the applicable engine fire handle is actuated or the engine start switch is selected to "GND".

S 865-115
(7) Method 1. Use this procedure to manually enable the HS Pilot. The HS Pilot valve must be equipped with a solenoid pin.

(a) Pull the solenoid pin on the HS Pilot valve to enable the HS Pilot.

S 865-117
(8) Method 2. This procedure is used for HS Pilot valves without solenoid pins. Use the airplane's electrical power to enable the HS Pilot.
(a) Get access to the L(R) RFCC (Fig. 504).
(b) Remove the electrical connector.
(c) Install a jumper between pins 1 and 2 of the connector.
(d) Remove the DO-NOT-CLOSE tag and close the applicable circuit breaker on the P11 panel:
1) 11Q10, ENG BLEED L
2) 11Q19, R ENG BLEED CONT
(e) Put the L(R) ENG Bleed switch-light to the ON position.

S 865-118
(9) Method 3. Follow this procedure to enable the HS Pilot using a separate 28 VDC power supply.
(a) Remove the electrical connector from the HS PILOT.
(b) Apply 28 VDC to pins 5 (ground) and 1 of the HS PILOT for approximately 5 seconds. You should hear the ON/OFF solenoid click at the HS PILOT.
(c) Remove the 28 VDC power supply.
(d) Install the electrical connector on the HS PILOT.

S 865-065
(10) The table below shows the pressures you will see during the test of the HPSOV and HS PILOT.

	Ps	Pc
HPSOV Minimum Opening Pressure	1-15 Psi	<5 Psi
HPSOV Fully Open Pressure	15 Psi	<10 Psi
HPSOV Control Pressure	60-70 Psi	33-39 Psi
HS PILOT Crossover	102-112 Psi	<4 Psi
HS PILOT Overpressure	125-140 Psi	NA

G. HPSOV and HS PILOT Test

NOTE: During the test you will be asked some questions. Each question will have a yes or no answer. Each yes or no gives a recommended action, for example: NO, replace the HPSOV (Ref 36-11-07/401). You can continue with the test without doing the action if you want to see other characteristics of the test. However, you should do the recommended action after you complete the test.

S 035-012

(1) Disconnect the engine high pressure inlet line at the fitting (View A, Fig. 501).

S 495-089

(2) Install a cap on the open sense line to keep out unwanted material.

S 485-092

(3) Connect a supply pressure gage (Ps) and a nitrogen (air) supply pressure source to the engine high pressure inlet line (View A, Fig. 501).

S 795-067

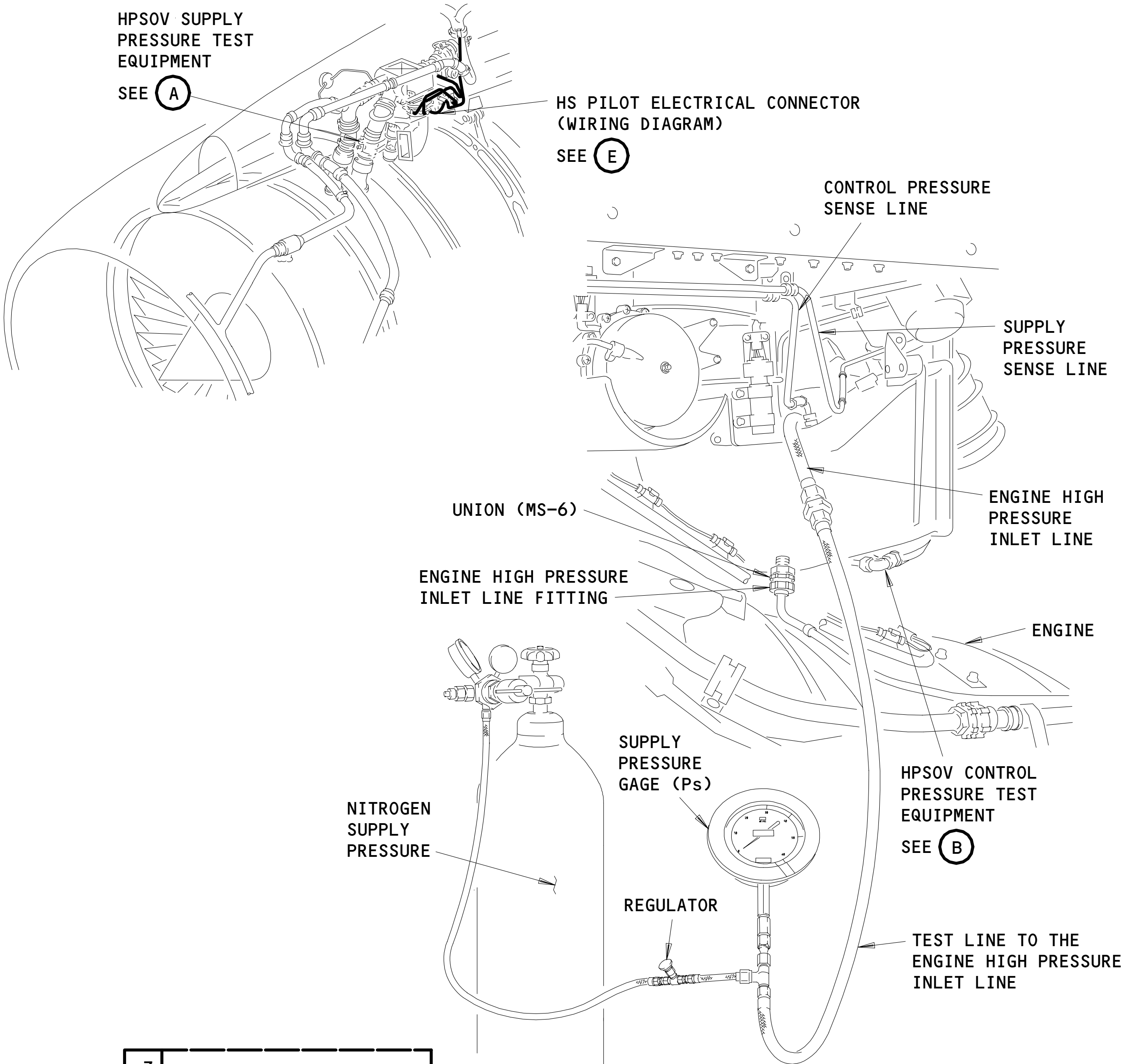
CAUTION: WHEN YOU BEGIN TO INCREASE THE SUPPLY PRESSURE, DO NOT EXCEED THE PRESSURE LIMITS THAT ARE GIVEN. DAMAGE TO THE COMPONENTS CAN OCCUR.

(4) Slowly increase Ps to 60-70 PSIG.

S 795-018

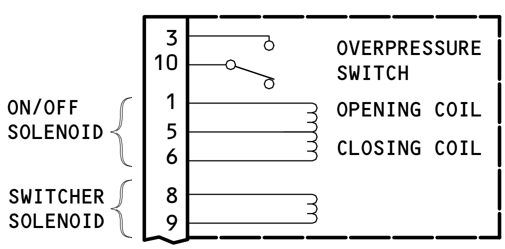
(5) Do a check of the control pressure sense line, supply pressure sense line and the newly installed sense lines for nitrogen (air) leakage.

NOTE: You may hear nitrogen (air) from the HS PILOT. This is from an honest orifice and is not abnormal.



HPSOV SUPPLY PRESSURE TEST EQUIPMENT

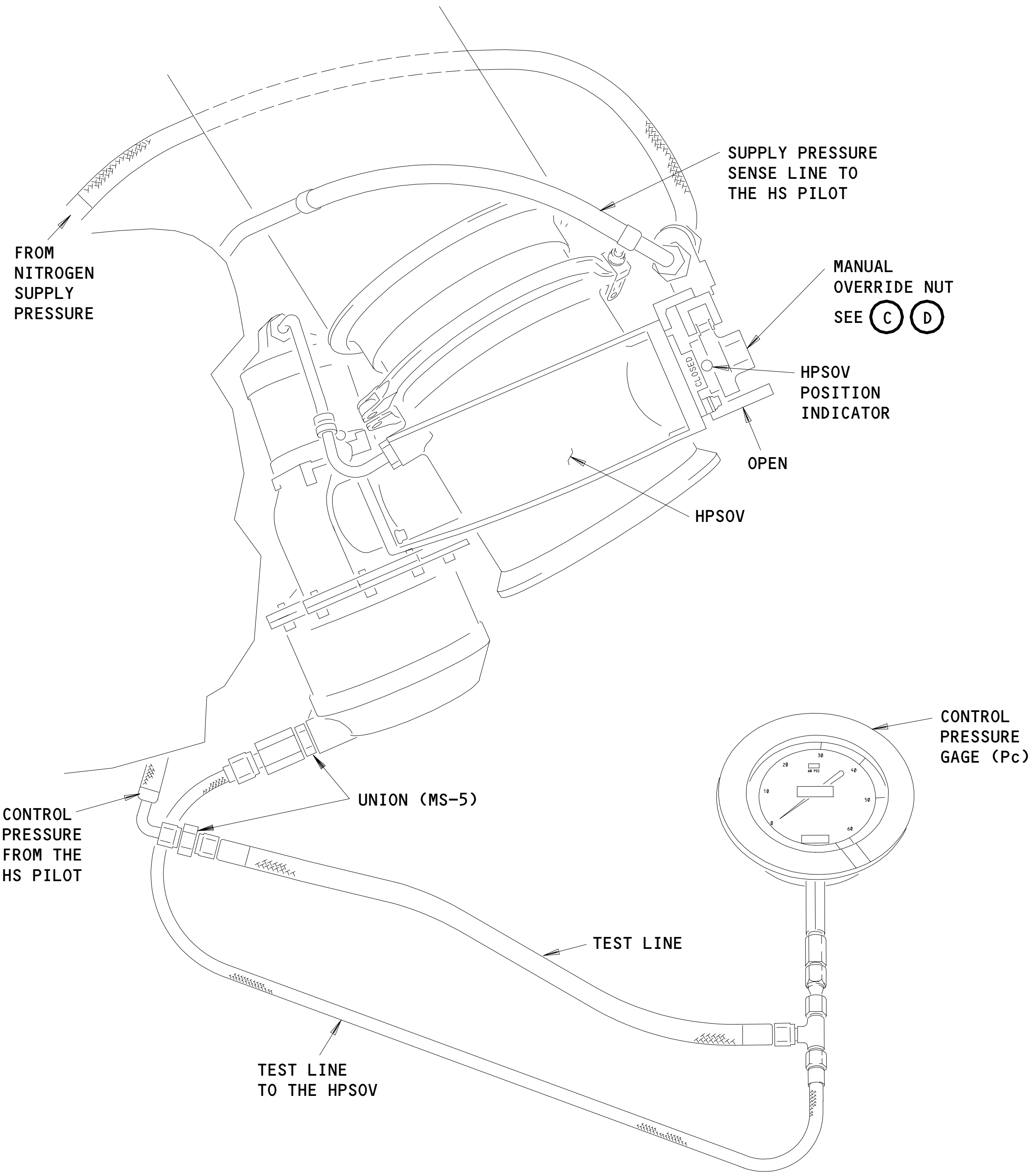
A



HS PILOT ELECTRICAL CONNECTOR
(WIRING DIAGRAM)

E

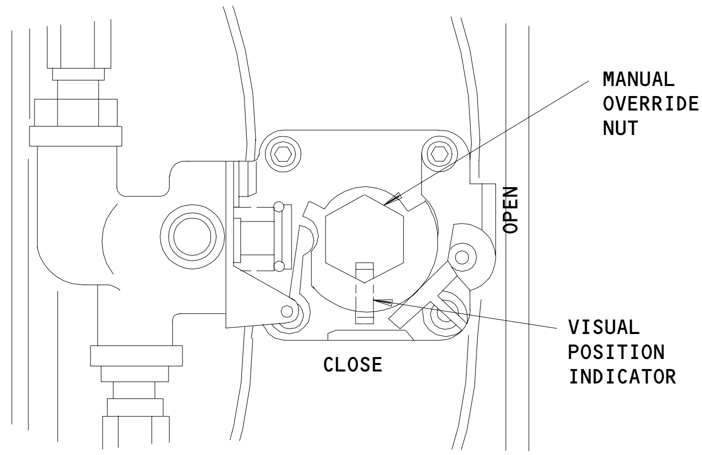
HPSOV Test Equipment
Figure 501 (Sheet 1)



HPSOV CONTROL PRESSURE TEST EQUIPMENT

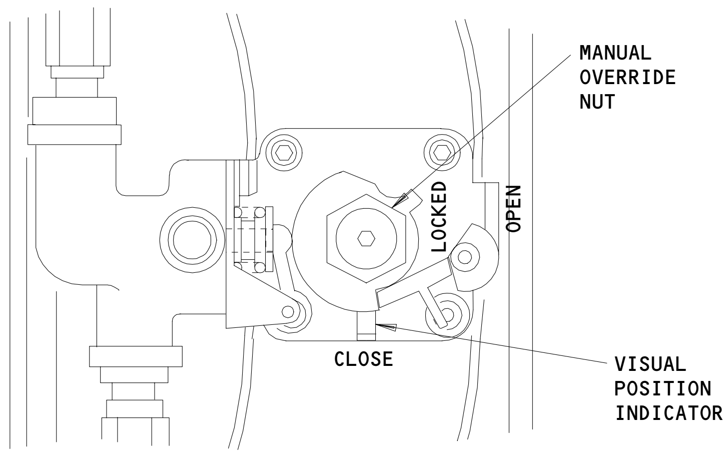
B

HPSOV Test Equipment
Figure 501 (Sheet 2)



THE HPSOV IS NOT LOCKED CLOSED

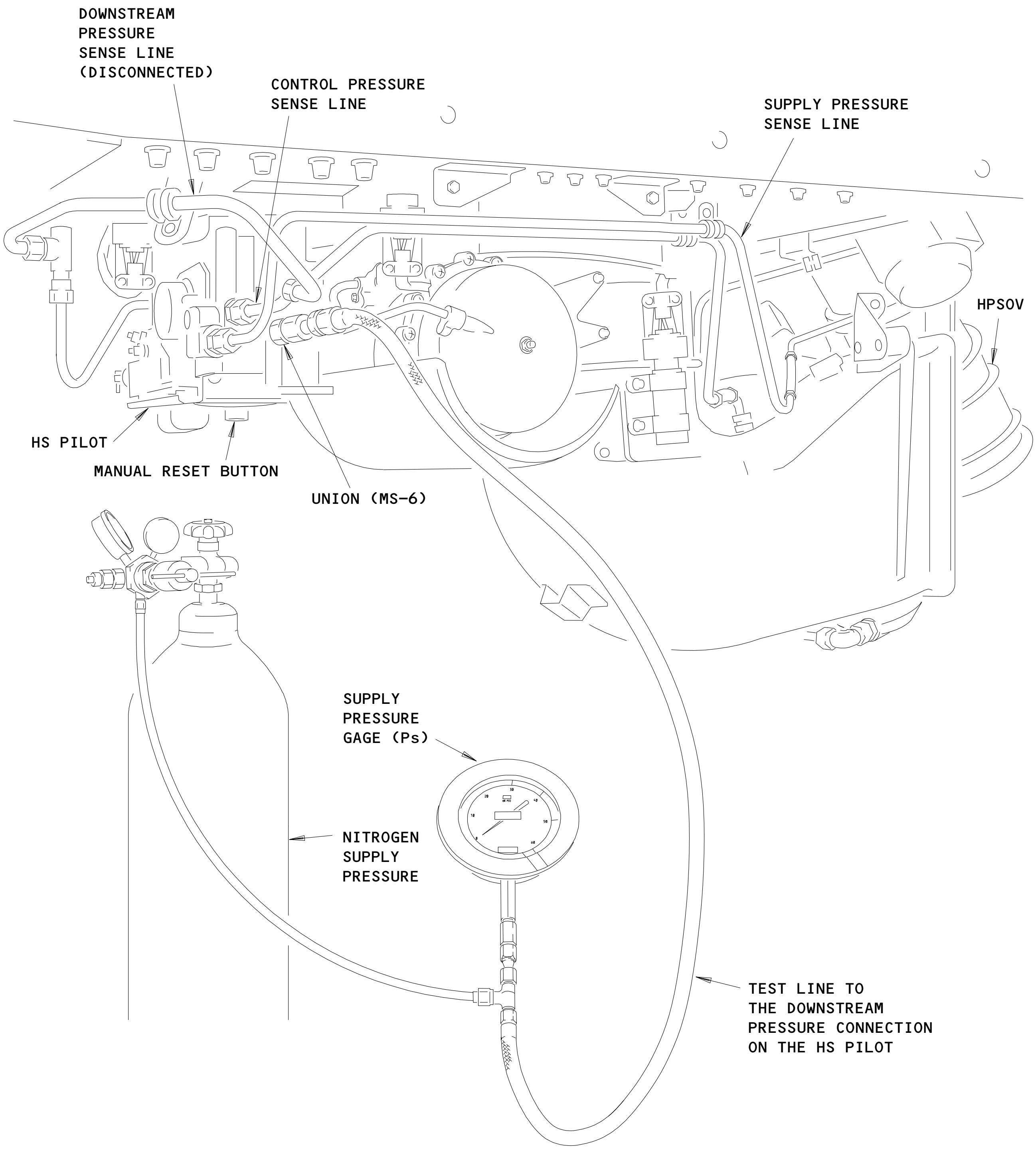
C



THE HPSOV IS LOCKED CLOSED

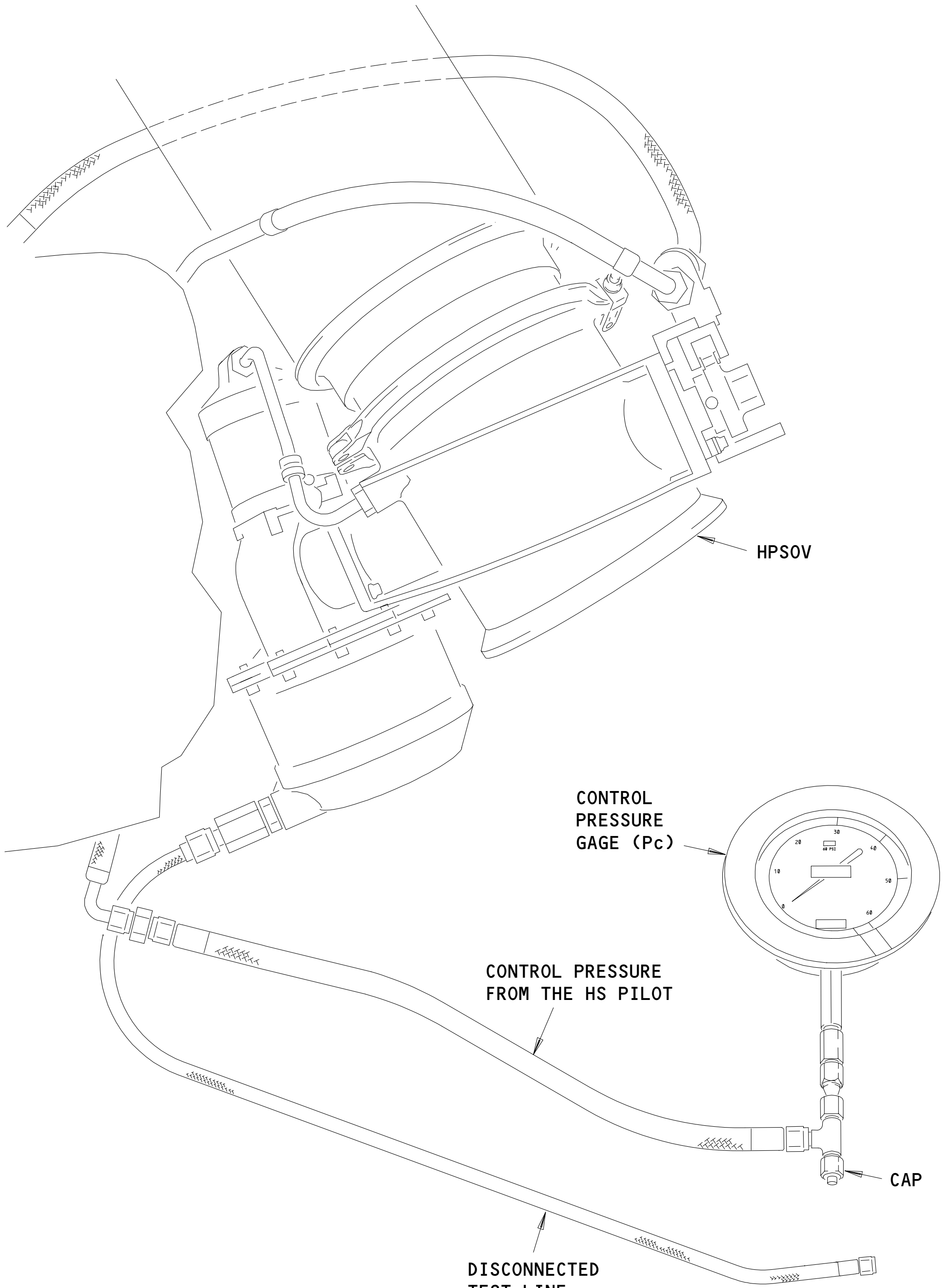
D

HS Pilot/HPSOV Test Equipment
Figure 501 (Sheet 3)

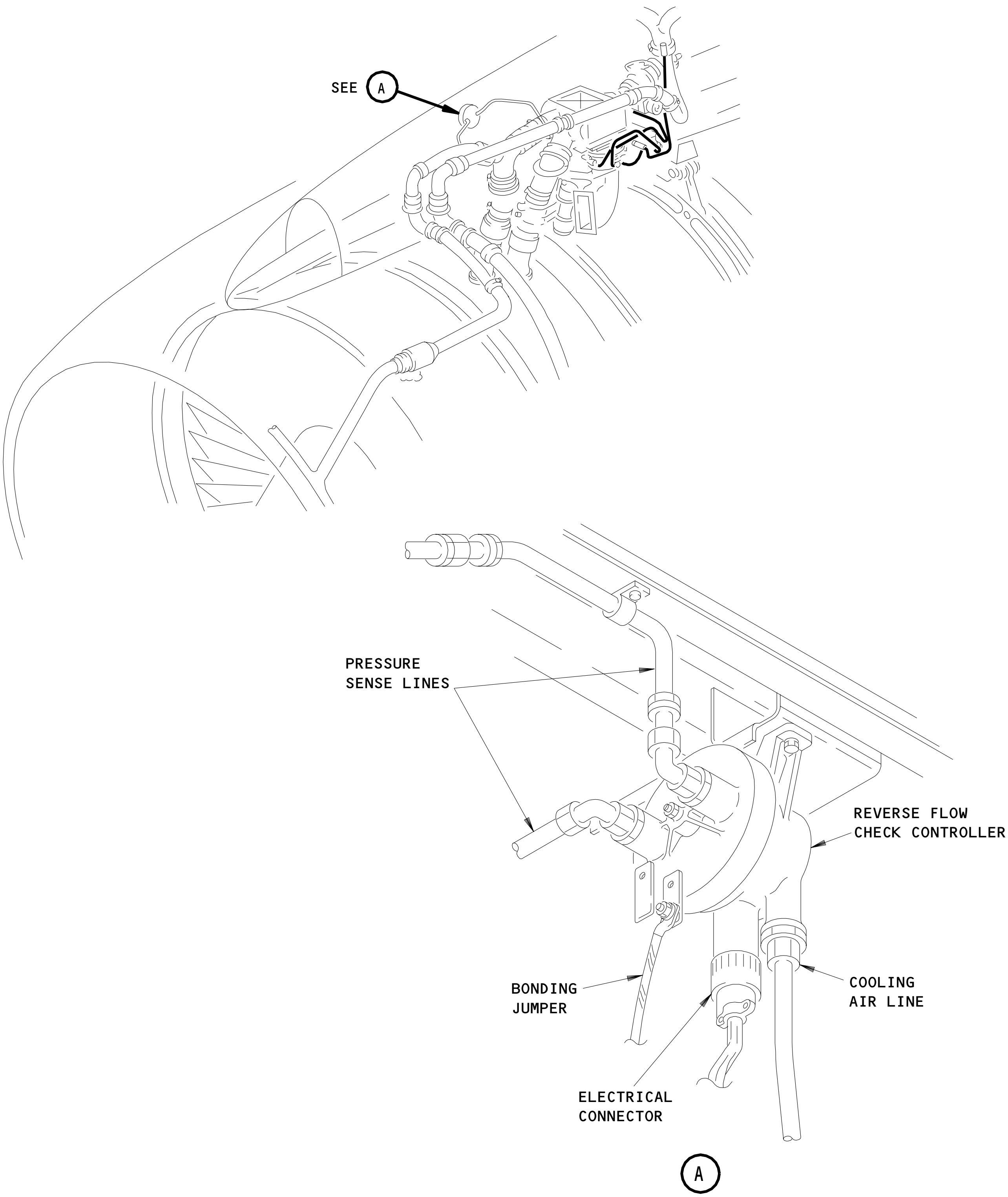


HS PILOT OVERPRESSURE TEST EQUIPMENT

HS Pilot Test Equipment
Figure 502



Control Pressure from the HS Pilot
Figure 503



Reverse Flow Check Controller
Figure 504

S 795-019
(6) Repair all abnormal leakage.

S 215-020
(7) Make sure the HPSOV is in the fully open position.

S 795-021
(8) Decrease Ps to 0 PSIG.

S 035-022
(9) Remove the control pressure sense line at the HPSOV (Fig. 501).

S 485-023
(10) Install a control pressure gage (Pc) to the control pressure sense line. This will let you monitor Pc during the test (View B, Fig. 501).

S 725-024
(11) Slowly increase Ps to 15 PSIG and monitor when the HPSOV begins to go to the open position and when the HPSOV is at the full open position. The position indicator is on the manual override nut.

NOTE: Pc should be less than 5 PSIG when the HPSOV begins to go to the open position. Pc should be less than 10 psig when the HPSOV is at the fully open position.

S 725-025
(12) Did the HPSOV begin to go to the open position before Pc=5 PSIG?
(a) NO, replace the HPSOV (AMM 36-11-07/401).
(b) YES, continue.

S 215-085
(13) Is the HPSOV at the full open position before Pc=10 psig?
(a) NO, replace the HPSOV (AMM 36-11-07/401).
(b) YES, continue.

S 725-026
(14) Increase Ps to 60-70 PSIG.

S 725-027
(15) Is Pc=33-39 PSIG?
(a) YES, the HPSOV and the HS PILOT are satisfactory. Decrease Ps to 0 PSIG. Do not do the "NO" step that follows but do the HS PILOT crossover test.

(b) NO, decrease Ps to 0 PSIG.

NOTE: If Pc is greater than the given pressure replace the HS PILOT (AMM 36-11-08/401). If Pc is less than the given pressure range the HS PILOT could be faulty by not giving the correct Pc or the HPSOV could be leaking internally causing Pc to be low. Do a check of Pc from the HS PILOT.

1) To do a check of Pc from the HS PILOT, remove the control pressure test line to the HPSOV and install a cap on the tee (Fig. 503). This will allow you to monitor the control pressure from the HS PILOT.
2) Increase Ps to 60-70 PSIG.
3) Is Pc=33-39 PSIG?
   a) NO, replace the HS PILOT (AMM 36-11-08/401).
   b) YES, replace the HPSOV (AMM 36-11-07/401).
4) Decrease Ps to 0 PSIG.

S 715-031

(16) Do these steps to do a test of the HS PILOT crossover:
(a) Slowly increase Ps to 102-112 PSIG.

NOTE: Pc should go to less than 4 PSIG before Ps is greater than 112 PSIG.

(b) Did Pc go to less than 4 PSIG?
1) NO, replace the HS PILOT (Ref 36-11-08/401).
2) YES, continue. The HS PILOT is satisfactory.
(c) Slowly decrease Ps to 95 PSIG.
(d) Make sure Pc increases to 33-39 PSIG?

NOTE: Pc should increase to 33-39 PSIG at a lower Ps value than when Pc decreased to less than 4 PSIG. The difference between the two values of Ps should be at least 2 PSI.

(e) Decrease Ps to 0 PSIG.

S 715-071

(17) Do these steps to do a test of the crossover while you simulate altitude greater than 31,000 feet.
(a) Remove the electrical connector to the L(R) 31,000 ft altitude switch found in the fwd bulkhead of the right A/C Pack Bay.
(b) Install a jumper between pins 2 and 3 of the 31,000 ft altitude switch electrical connector (WDM 36-11-12, WDM 36-11-22).
(c) Slowly increase Ps to 86-96 psig.

NOTE: Pc should go to less than 4 psig before Ps was greater than 96 psig.

(d) Did Pc go to less than 4 psig?
  1) NO, do these steps:
    a) Remove the HS Pilot electrical connector.
    b) Do a check for 26-30v dc on pins 8 and 9 of HS PILOT connector D2780 (D2690) (WDM 36-11-12, WDM 36-11-22). Is there 26-30v dc?
      1. NO, repair the electrical circuit between the HS Pilot and the 31,000 ft altitude switch (WDM 36-11-12, WDM 36-11-22).
      2. YES, replace HS Pilot (AMM 36-11-08/401).
  2) YES, continue. The HS Pilot is satisfactory.
(e) Slowly decrease Ps to 80 psig.
(f) Make sure Pc increases to 33-39 psig.
(g) Decrease Ps to 0 psig.
(h) Remove jumper from Pins 2 and 3 of the D2782 (D2692) electrical connector for the altitude switch (WDM 36-11-12, WDM 36-11-22).
(i) Install electrical connector D2782 (D2692) to the L(R) 31,000 feet altitude switch.
(j) Re-connect the electrical connnector to the HS Pilot.

S 085-090
(18) Remove the nitrogen (air) source, supply pressure gage, hoses and fittings from the engine high pressure inlet line connection.

S 035-087
(19) Remove any covers that were installed on open sense lines or fittings.

S 435-033
(20) Apply antiseize compound and connect the high pressure inlet line to the high pressure inlet line fitting.

S 085-037
(21) Remove the control pressure gage, hoses and fittings from the control pressure sense line.

S 435-038
(22) Apply antiseize compound and connect the control pressure sense line to the HPSOV.

H. HS PILOT Overpressure Sensor Test

S 035-039
(1) Remove the downstream pressure sense line at the HS PILOT (Fig. 502).
  (a) Install a cover on the open sense lines or fittings to keep out unwanted material.

S 485-041
(2) Install the supply pressure gage (Ps) and the nitrogen (air) source to the downstream pressure connection on the HS PILOT as shown in Fig. 502.

S 725-043
(3) Increase Ps to 125-140 PSIG and monitor Ps when the manual reset button extends.

S 725-045
(4) Did the manual reset button extend when Ps = 125-140 PSIG?
   (a) NO, replace the HS PILOT (AMM 36-11-08/401).
   (b) YES, continue. The downstream overpressure sensor is satisfactory.

S 725-055
(5) Decrease Ps to 0 PSIG.

S 215-056
(6) Did the "HI STAGE" light come on at the P5 panel when the manual reset button extends?
   (a) YES, continue. The wiring and overpressure switch are satisfactory.
   (b) NO, there is a problem with the overpressure switch in the HS PILOT or a wiring fault between the overpressure switch and the "HI STAGE" light.
      1) Remove the electrical connector from the HS PILOT and do a check for continuity between pins 3 and 10 on the HS PILOT.
      2) Is there continuity?
         a) NO, replace the HS PILOT (AMM 36-11-08/401).
         b) YES, do a check and repair the wiring between the HS PILOT and the "HI STAGE" light.
      3) Install the electrical connector.

S 865-057
(7) Push the manual reset button in.

<u>NOTE</u>: The "HI STAGE" light will go off.

S 085-058
(8) Remove the nitrogen (air) source and supply pressure gage from the downstream pressure connection on the HS PILOT.

S 095-053
(9) Remove any covers that were installed on open sense lines or fittings.

S 435-060
(10) Apply antiseize compound to the fitting for the downstream pressure sense line and connect the downstream pressure sense line to the HS PILOT.

I. Put the Airplane Back to Its Usual Condition

S 865-060

(1) If method 2 was used to electrically enable the HS PILOT do these steps:
  (a) Put the L(R) ENG Bleed switch-light to the OFF position.
  (b) Open the applicable circuit breaker, on the P11 panel, and attach a DO-NOT-CLOSE tag:
    1) 11Q10, ENG BLEED L
    2) 11Q19, R ENG BLEED CONT
  (c) AIRPLANES WITH THE HIGH STAGE PILOT VALVE P/N 107460-13 AND LOWER;
    Do the steps that follow:
    1) Remove the jumper.
    2) Install the connector.

S 865-097

(2) If Method 3 was used to electrically enable the HS pilot, go on to the next step.

S 865-071

(3) Remove the DO-NOT-CLOSE tag and close the applicable circuit breaker on the P11 panel:
  (a) 11Q10, ENG BLEED L
  (b) 11Q19, R ENG BLEED CONT
  (c) 11B31 L ENGINE SPEED CARD
  (d) 11B32 R ENGINE SPEED CARD

S 415-062

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.

(4) Close the applicable thrust reversers (AMM 78-31-00/201).

S 445-061

(5) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 865-074

(6) Remove electrical power if it is not necessary (AMM 24-22-00/201).

HIGH STAGE PILOT - REMOVAL/INSTALLATION

1. General
    A. This procedure has these tasks:
        (1) Removal of the High Stage Pilot (HS Pilot).
        (2) Installation of the HS Pilot.
        (3) Post Installation Test of the HS Pilot.
    B. A complete functional test of the HS Pilot is in AMM 36-11-07/501.

TASK 36-11-08-004-008

2. Remove the High Stage Pilot (Fig. 401)
    A. References
        (1) AMM 36-00-00/201, Pneumatic - General
        (2) AMM 78-31-00/201, Thrust Reverser System
    B. Access
        (1) Location Zone
            410/420 Engine

        (2) Access Panel
            415AL/425AL Thrust Reverser Left
            416AR/426AR Thrust Reverser Right

    C. Prepare for the Removal

        S 864-004

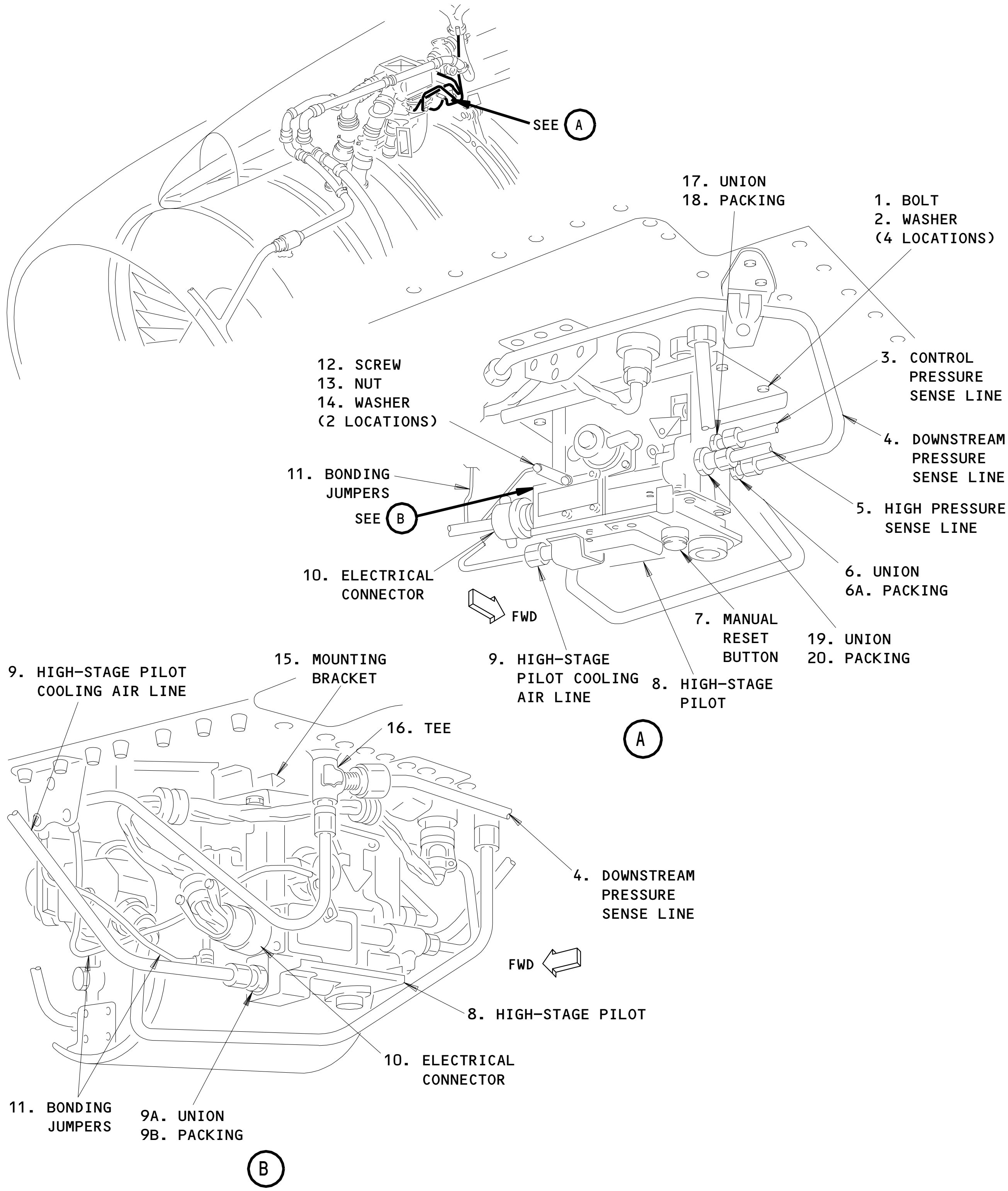
        WARNING: RELEASE THE PRESSURE IN THE PNEUMATIC DUCT BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. THE HOT, HIGH-PRESSURE AIR CAN CAUSE INJURY TO PERSONS.

        (1) Remove pneumatic power (AMM 36-00-00/201).

            NOTE: Pressure is released when the system is not in operation.

        S 864-013

        (2) Do these steps for the high stage pilot on the left engine:
            (a) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach the DO-NOT-CLOSE tags:
                1) 11Q10, ENG (BLEED, BLD) L



High-Stage Pilot
Figure 401

2) 11Q18, HI STAGE SW OVER (L, LEFT)

S 714-017

(3) Do these steps for the high stage pilot on the right engine:
(a) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach the DO-NOT-CLOSE tags:
1) 11Q19, R ENG BLEED (CONT)
2) 11Q27, HI STG SW OVER R or R HI STG SW OVER

S 014-014

(4) Do these steps to get access to the HS Pilot:

WARNING: DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(a) Do the deactivation procedure for thrust reverser for ground maintenance (AMM 78-31-00/201).

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

(b) Open the left and right thrust reverser (AMM 78-31-00/201).

D. High Stage Pilot Removal

S 014-063

(1) Get access to the high stage pilot (8) from the right side of the engine.

S 034-011

(2) Disconnect these pneumatic lines from the HS pilot (8) pneumatic line unions :
(a) The downstream pressure sense line (4) from the union (6).
(b) The high pressure sense line (5) from the union (19).
(c) The control pressure sense line (3) from the union (17).

S 024-064

(3) Remove two bolts (1) and washers (2) from the high stage pilot (8).

NOTE: Make sure that the high stage pilot is secure before you move to the left side of the engine.

S 014-065
(4) Get access to the high stage pilot (8) from the left side of the engine.

S 024-072
(5) Disconnect the electrical connector (10) from the high stage pilot (8).

S 024-073
(6) Remove the screws (12), washers (14), and nuts (13) to disconnect the two bonding jumpers from the high stage pilot (8).

S 024-066
(7) Disconnect the cooling air line (9) from the high stage pilot pneumatic line union (9A).

S 024-067
(8) Remove the last two bolts (1) and washers (2) from the high stage pilot (8).

NOTE: Make sure that the high stage pilot does not fall.

S 024-024
(9) Remove the high stage pilot (8).

S 434-012
(10) Install a cover on the sense line openings to keep out unwanted objects.

S 024-068
(11) Remove the four pneumatic line unions (6, 9A, 17, 19) and packings (6A, 9B, 18, 20) from the high stage pilot (8), if necessary.
(a) Discard the packings.

TASK 36-11-08-404-026
3. Install High Stage Pilot (Fig. 401)

A. Consumable Materials
   (1) D00006 Antisieze Compound - BOSTIK NEVER-SEEZ

B. Parts

MM		NOMENCLATURE	IPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	1	Bolt	36-11-08	05	10
	2	Washer			15
	8	High Stage Pilot			5
	12	Screw	36-11-01	01	71
	13	Nut			75
	14	Washer			73
	6	Union	36-11-01	06	20
	6A	Packing			25
	17	Union			5
	18	Packing			15
	19	Union			30
	20	Packing			35
	9A	Union			30
	9B	Packing			35

C. References
   (1) AMM 24-22-00/201, Electric Power Control
   (2) AMM 36-00-00/201, Pneumatic - General
   (3) AMM 71-00-00/201, Power Plant
   (4) AMM 78-31-00/201, Thrust Reverser System

D. Access
   (1) Location Zone
      410/420 Engine

   (2) Access Panel
      415AL/425AL Thrust Reverser Left
      416AR/426AR Thrust Reverser Right

E. Procedure

   S 644-070
   (1) Apply anti-seize compound to the threads of the unions, if necessary.

   NOTE: This step is not necessary if the four pneumatic lines are still attached to the high stage pilot.

S 424-075

(2) Install the four pneumatic line unions (6, 9A, 17, 19) and packings (6A, 9B, 18, 20) on the high stage pilot (8), if necessary.

NOTE: This step is not necessary if the four pneumatic lines are still attached to the high stage pilot.

S 414-071

(3) Get access for the high stage pilot (8) from the left side of the engine.

S 084-015

(4) Remove the covers from the sense lines.

S 424-027

(5) Install the high stage pilot (8) on the mounting bracket (15).

S 434-041

(6) Install the two bolts (1) and washers (2) to the high stage pilot (8).

NOTE: Make sure that the high stage pilot is secure before you continue.

S 424-076

(7) Connect the cooling air line (9) to the high stage pilot (8) cooling air line union (9A).

S 424-077

(8) Attach the screws (12), washers (14), and nuts (13) to connect the two bonding jumpers (11) to the high stage pilot (8).

S 424-078

(9) Connect the electrical connector (10) to the high stage pilot (8).

S 414-079

(10) Get access to the high stage pilot (8) from the right side of the engine.

S 424-080

(11) Install the last two bolts (1) and washers (2) to the high stage pilot (8).

S 424-081

(12) Connect these pneumatic lines to the high stage pilot (8) pneumatic line unions:

NOTE: The downstream pressure sense line (4) will be connected in the post-installation test.

(a) The control pressure sense line (3) to the union (17).
(b) The high pressure sense line (5) to the union (19).

F. Post Installation Test

S 864-085

(1) If the right high stage pilot was installed, remove the DO-NOT-CLOSE tag and close the circuit breaker on the P11 panel:
(a) 11Q19, R ENG BLEED
(b) 11Q27, HI STG SW OVER R

S 864-086

(2) If the left high stage pilot was installed, remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
(a) 11Q10, ENG BLEED L
(b) 11Q18, HI STAGE SW OVER L

S 214-087

(3) Make sure the manual reset button (7) does not extend.

S 024-088

(4) If necessary, remove the downstream pressure sense line (4).

S 864-089

(5) Connect the nitrogen or air source to the HS pilot (8).

S 784-090

(6) Slowly apply 125-135 psi.

S 214-091
(7) Make sure the manual reset button (7) extends.

S 864-092
(8) Decrease the nitrogen or air source to 0 psig.

S 864-093
(9) Remove the nitrogen or air source.

S 644-094
(10) Apply the antiseize compound to the threads of the union.

S 434-095
(11) Connect the downstream pressure sense line (4).

S 214-096
(12) Make sure the L or R HI STAGE amber light, on the pilot's overhead panel, P5, is on.

S 864-097
(13) Push the manual reset button (7).

S 214-098
(14) Make sure the L or R HI STAGE amber light, on the P5 panel, is not on.

S 414-007

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.

(15) Close the left and right thrust reverser (AMM 78-31-00/201).

S 444-060
(16) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 864-113

(17) Push the L and R RECIRC FAN switch-lights, on the P5 panel, to the ON position.
   (a) Make sure the INOP light does not come on.

S 864-114

(18) Make sure the BLEED AIR L and R ENG switch-lights, on the pilot's overhead panel, P5, are in the OFF position.
   (a) Make sure the OFF lights are on.

S 864-115

(19) Make sure the BLEED AIR ISOLATION VALVE and APU VALVE switch-lights, on the P5 panel, are in the closed position.
   (a) Make sure the VALVE lights are off.

S 864-116

(20) Make sure the L and R PACK control selector switches, on the P5 panel, are in the OFF position.
   (a) Make sure the PACK OFF light is on.

S 864-117

(21) Push the BLEED AIR L and R ENG switch-lights, on the P5 panel, to the on position.
   (a) Make sure the OFF light stays on.

S 864-118

(22) Prepare the left and right engines for usual operation (AMM 71-00-00/201).

S 864-119

(23) Start the left and right engines (AMM 71-00-00/201).

S 864-120

(24) Make sure the bleed air OFF lights are off after five seconds.

S 864-123

(25) Put the L and R PACK control selector switches on the P5 panel to the AUTO position.
   (a) Make sure the PACK OFF lights go off.

S 214-124
(26) Make sure the L and R DUCT PRESS on the P5 panel shows between 20 and 30 psi.
   (a) If the L and R DUCT PRESS is less than 20 psi, do a check of the engine minimum low idle parameters (AMM 71-00-00/501, Test No. 10 - Low Idle and High Idle Check).

S 864-100

CAUTION: MONITOR EGT AND N3. KEEP THE ENGINE IN THE LIMITS. IF YOU OPERATE THE ENGINE OUT OF THE CORRECT RANGE, DAMAGE TO THE ENGINE CAN OCCUR.

(27) Move the left forward thrust lever slowly forward until the L BLEED AIR DUCT PRESS on the P5 panel increases and becomes stable at 40-53 psi.

S 214-128
(28) Make sure the EICAS EPR, on the top display of the pilot's center instrument P2, shows less than 1.15.

S 864-111
(29) Slowly move the left forward thrust lever in the forward direction.
   (a) Make sure the L BLEED AIR DUCT PRESS, on the P5 panel, decreases to approximately 35 psi.
   (b) Make sure the left engine EPR, on the P2 panel, is larger than 1.13.

NOTE: This will make sure the high stage valve has closed.

S 214-132
(30) Slowly move the left forward thrust lever in the forward direction.
   (a) Make sure the L BLEED AIR DUCT PRESS, on the P5 panel, stabilizes at 40-53 psi.

NOTE: This will make sure the pressure regulating and shutoff valve (PRSOV) can control pressure in tolerance.

S 214-133
(31) Slowly move the left forward thrust lever back to the initial condition.
   (a) Make sure the L BLEED AIR DUCT PRESS decreases, then increases.

NOTE: This will show that the high stage valve has opened.

S 214-134
(32) Slowly move the left forward thrust lever to the idle position.

S 864-112

(33) Shut down the left and right engines (AMM 71-00-00/201).

G. Put the Airplane Back to Its Usual Condition

S 864-061

(1) Remove the electrical power, if it is not necessary (AMM 24-22-00/201).

HIGH STAGE PILOT - ADJUSTMENT/TEST

1. General
   A. This procedure performs a functional test of the high pressure shut off valve and the high stage pilot while installed on the wing.
   B. This task will also check the overpressure sensor in the high stage pilot.

TASK 36-11-08-715-085

2. High Stage Pilot - Functional Test
   A. Procedure

      S 725-083

      (1) Do the functional test of the high pressure shutoff valve and high stage pilot (AMM 36-11-07/501).

      NOTE: This test also does an operational test of the overpressure sensor and the crossover switcher system in the high stage pilot.

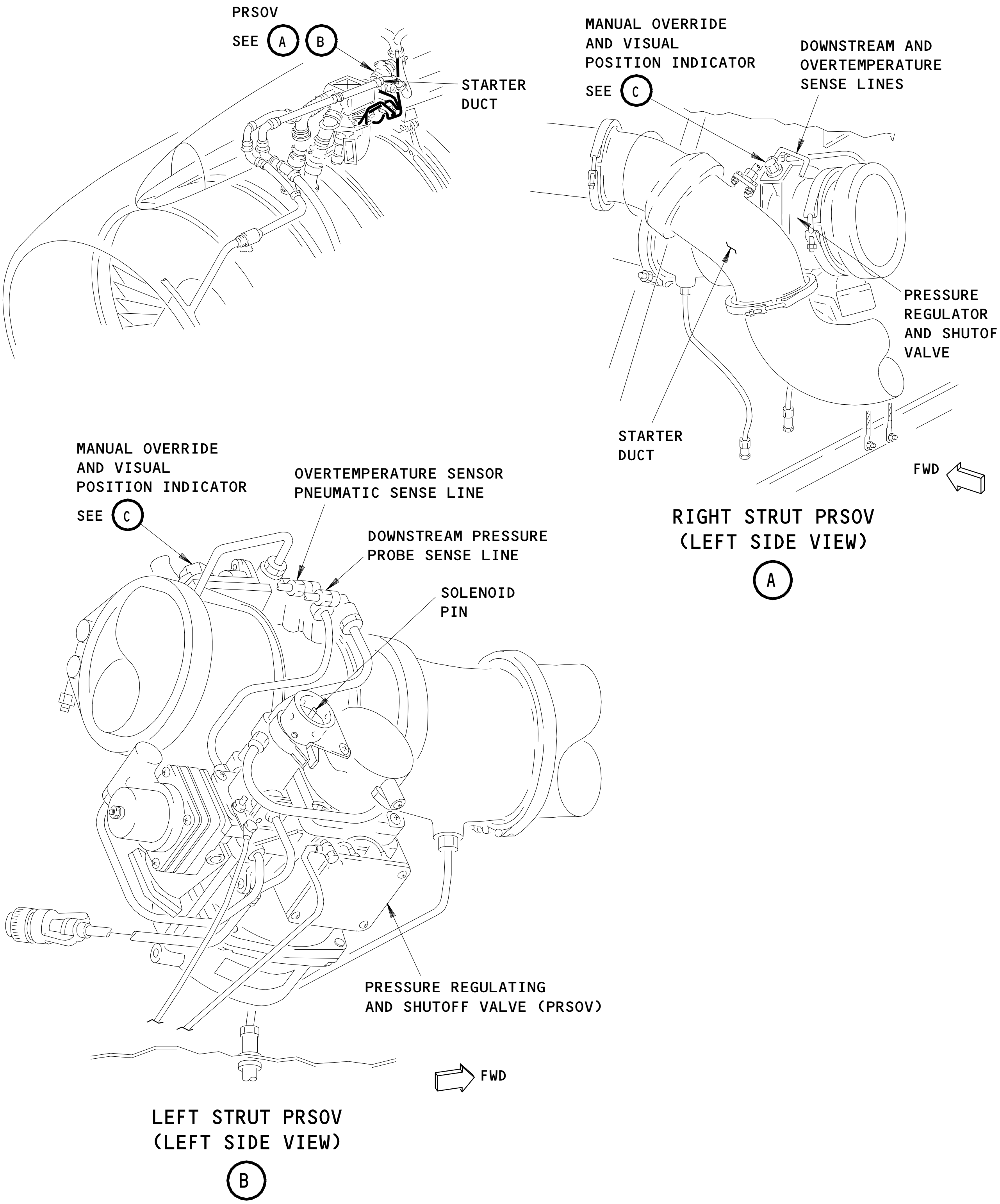
AIR SUPPLY PRESSURE REGULATING AND SHUTOFF VALVE - MAINTENANCE PRACTICES

1. General
   A. This procedure supplies the requirements to pressurize the pneumatic duct upstream of the pressure regulating and shutoff valve (PRSOV). This procedure also removes and installs the PRSOV. Upstream pressurization is necessary to test the PRSOV, intermediate pressure (IP) check valve, precooler, HPSOV and applicable ducts for air leakage.
      (1) Three methods are supplied to pressurize the ducts upstream of the PRSOV.

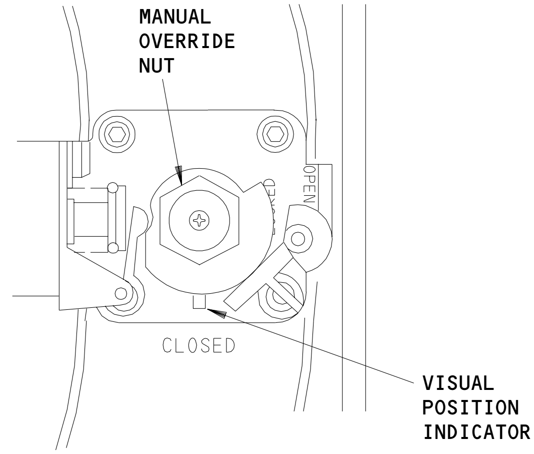
         (a) Pressurization Method 1 opens the PRSOV with a turn of the manual override nut on the PRSOV. A ground air source or the APU will supply pneumatic power from the downstream side of the valve. This method can only be done on PRSOV with Boeing P/N 212N102-53 and above (Allied Signal P/N 3214306-8 and above).
         (b) Pressurization Method 2 dry motors the engine with the PRSOV closed.
         (c) Pressurization Method 3 opens the PRSOV with an external air source connected to a sense line on the PRSOV. A ground air source or the APU will supply pneumatic power from the downstream side of the valve.
      (2) After the installation of the PRSOV, do the leak test at the connections to the PRSOV.

TASK 36-11-09-782-032

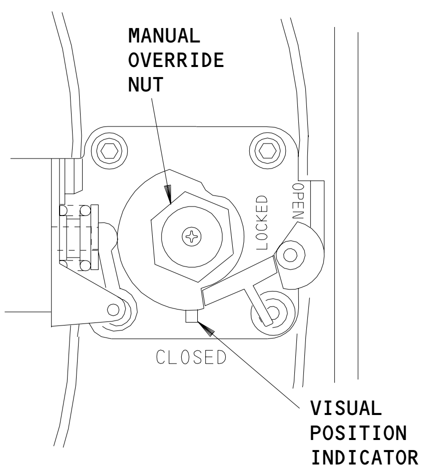
2. Pressurization Upstream of the Pressure Regulating and Shutoff Valve
   A. Equipment
      (1) Nitrogen or Air Source 0-25 psi (connects with No. 4 male connector) - Commercially Available
   B. Consumable Materials
      (1) D00006 Antiseize Compound, Bostik Never=Seez
   C. References
      (1) AMM 06-43-00/201, Engine Nacelle Access Doors and Panels
      (2) AMM 36-00-00/201, Pneumatic General
      (3) AMM 71-00-00/201, Engine Operation
      (4) AMM 78-31-00/201, Thrust Reverser System
   D. Access
      (1) Location Zones
          433/443 Nacelle strut - mid-structure
      (2) Access Panels
          433LR Pressure Regulating Valve, Left Engine
          443LL Pressure Regulating Valve & Pressure Relief, Right Engine



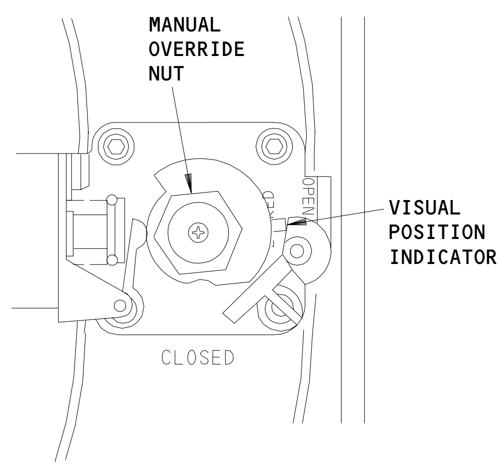
Pressurization Upstream of the Air Supply Pressure Regulating and Shutoff Valve
Figure 201 (Sheet 1)



MANUAL OVERRIDE AND
VISUAL POSITION INDICATOR
(THE PRSOV IS NOT LOCKED CLOSED)
C

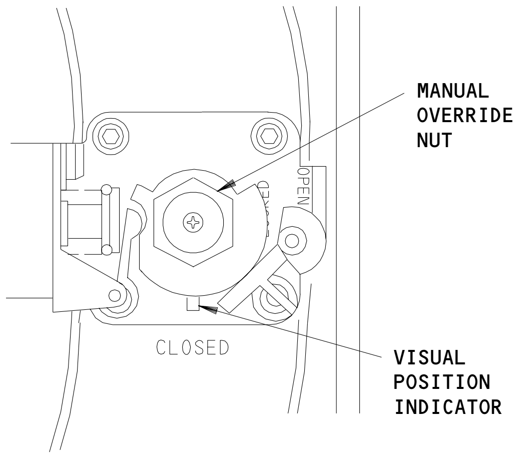


MANUAL OVERRIDE AND
VISUAL POSITION INDICATOR
(THE PRSOV IS LOCKED CLOSED)
C

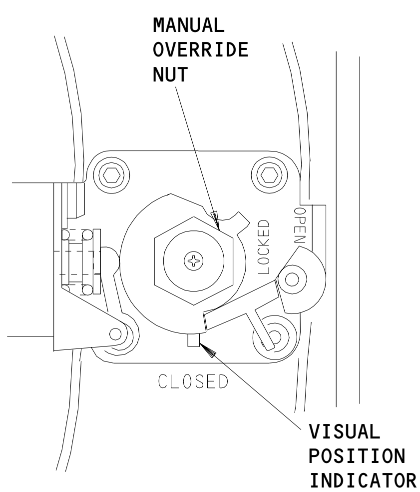


MANUAL OVERRIDE AND
VISUAL POSITION INDICATOR
(THE PRSOV IS MANUALLY OPEN)
C

Pressurization Upstream of the Air Supply Pressure Regulating and Shutoff Valve
Figure 201 (Sheet 2)

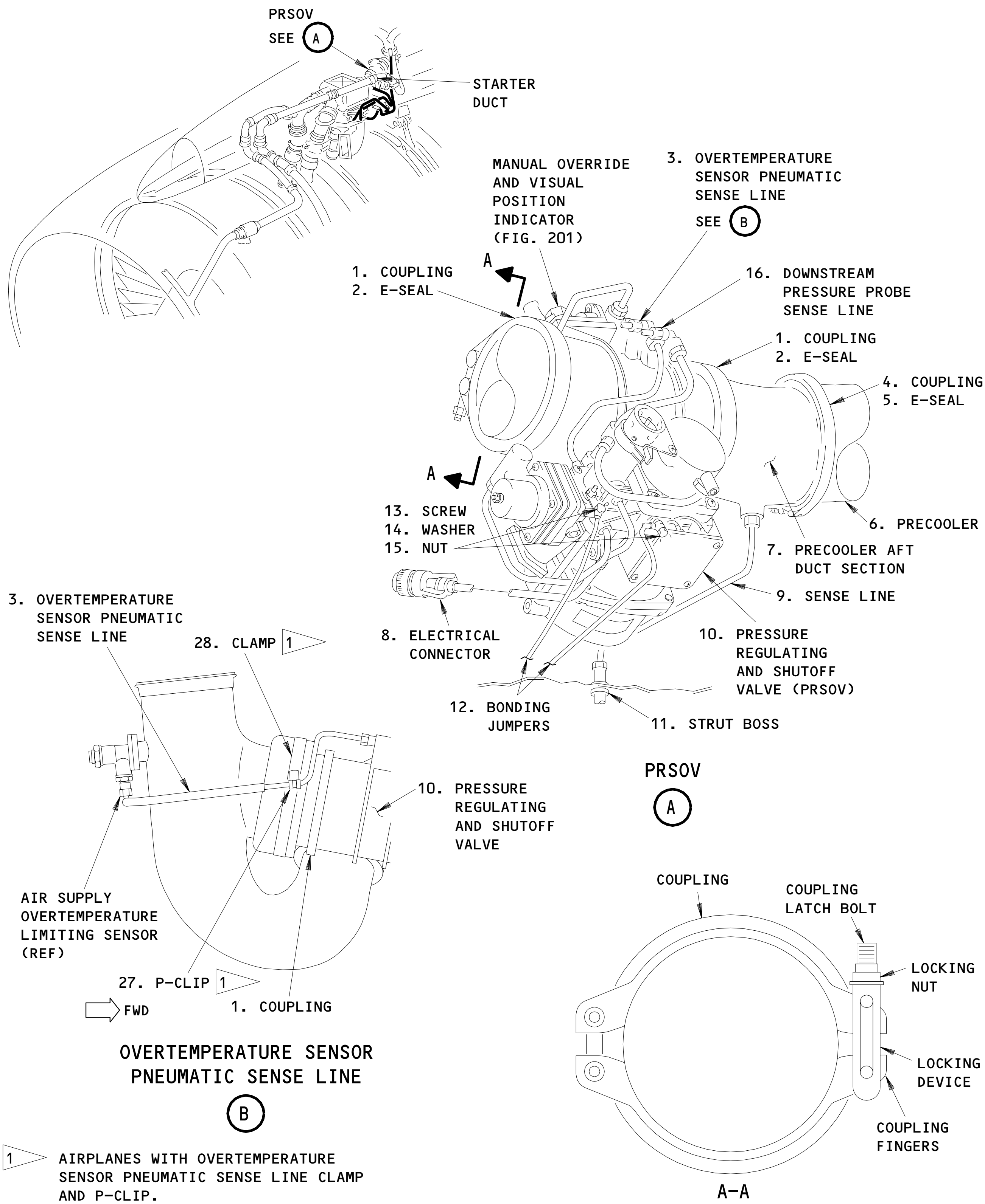


MANUAL OVERRIDE AND VISUAL POSITION INDICATOR
(THE PRSOV IS NOT LOCKED CLOSED)
C

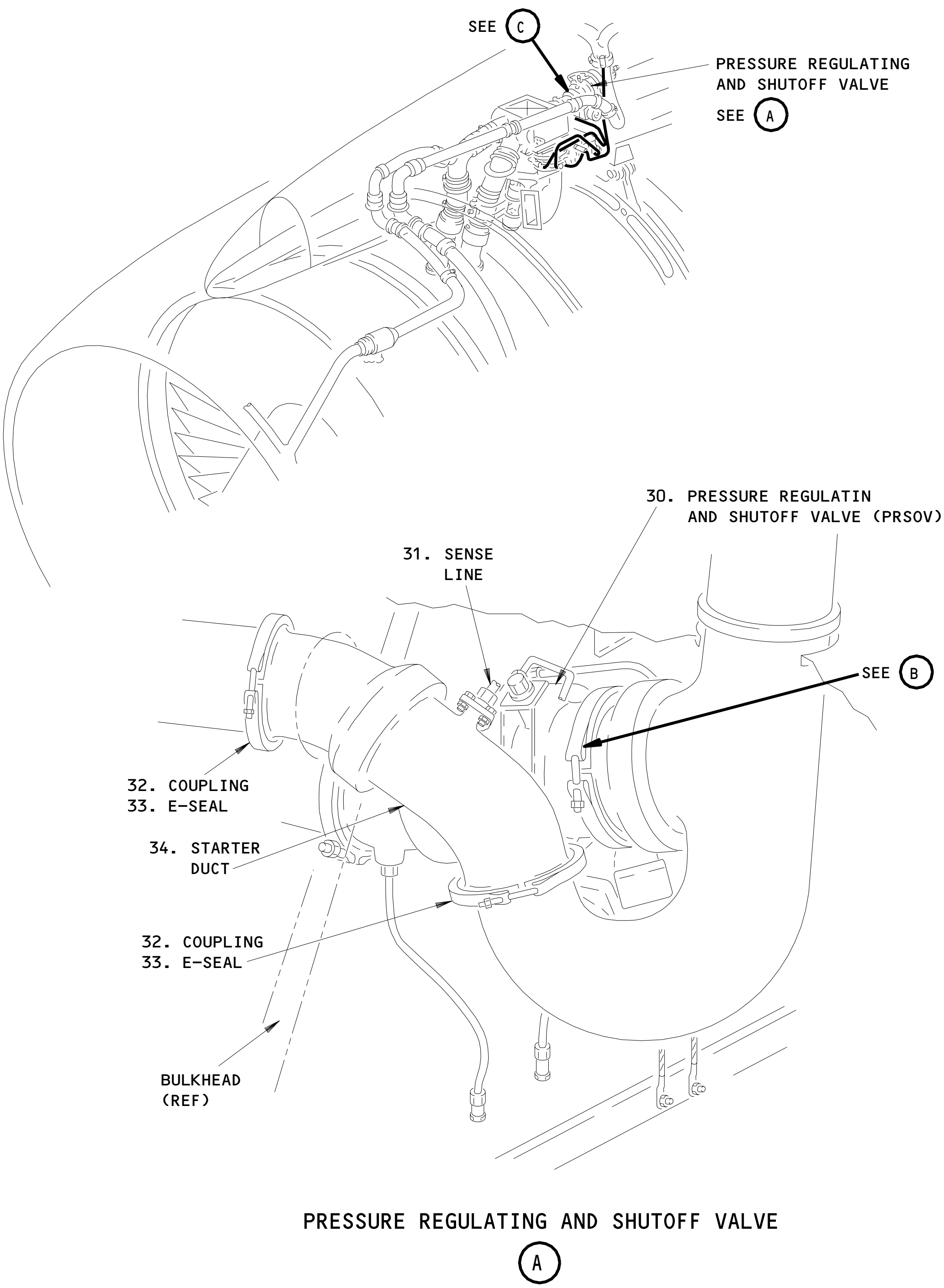


MANUAL OVERRIDE AND VISUAL POSITION INDICATOR
(THE PRSOV IS LOCKED CLOSED)
C

Pressurization Upstream of the Air Supply Pressure Regulating and Shutoff Valve
Figure 201 (Sheet 3)



Air Supply Pressure Regulating and Shutoff Valve Installation (Left Strut)
Figure 202



Air Supply Pressure Regulating and Shutoff Valve Installation (Right Strut)
Figure 203 (Sheet 1)

E. Prepare to Pressurize Upstream of the PRSOV

S 212-037

(1) Make sure the BLEED AIR DUCT PRESS indicator on the P5 pilot's overhead panel shows zero psi.
   (a) If the indicator does not show zero, remove pneumatic power (AMM 36-00-00/201).

S 862-038

<u>WARNING</u>: DO THE DEACTIVATION PROCEDURE FOR THE THRUST REVERSER TO PREVENT THE OPERATION OF THE THRUST REVERSER. ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS OR DAMAGE TO EQUIPMENT.

(2) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

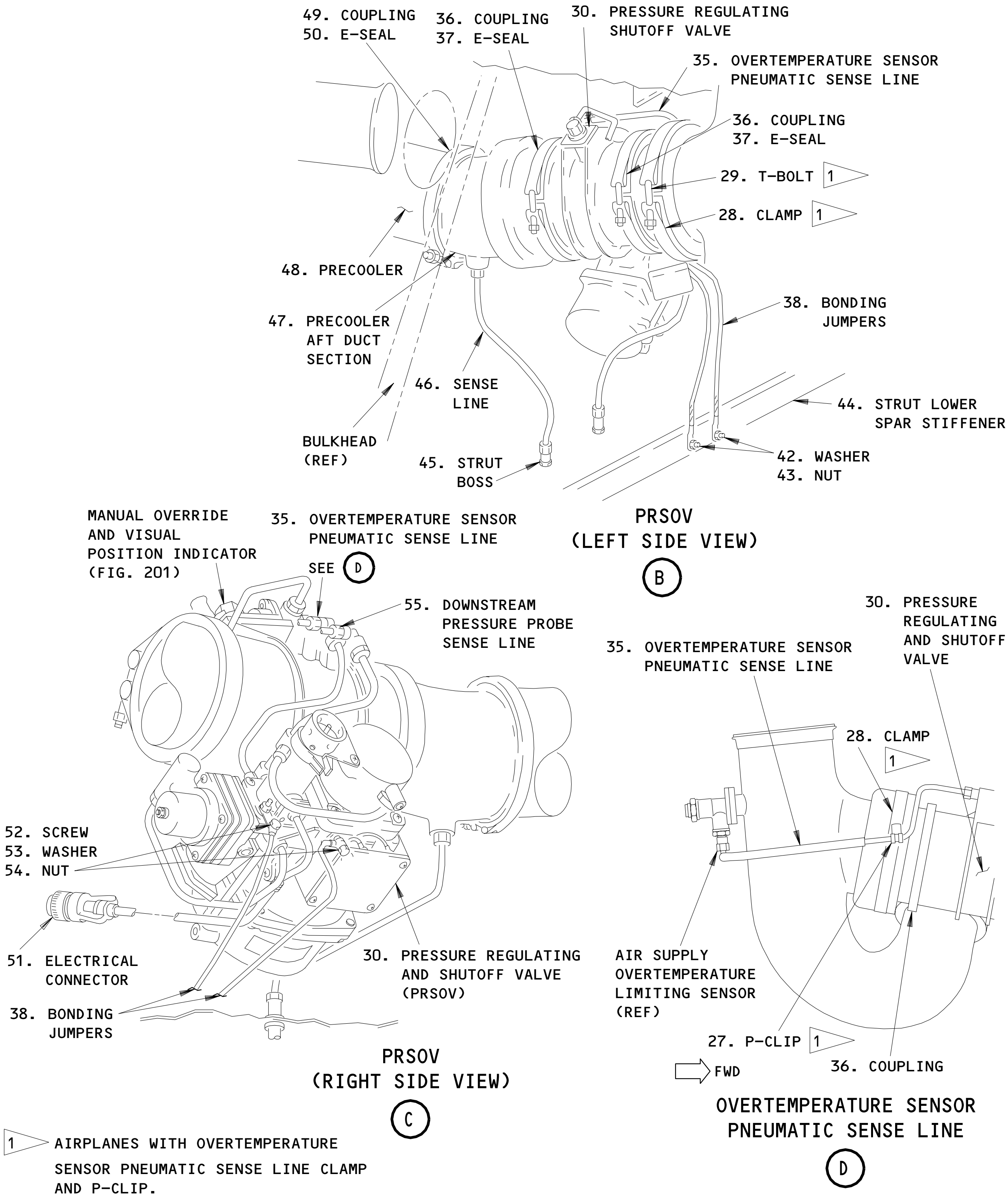
S 012-039

(3) Open the applicable pressure regulating valve and pressure relief door to test the engine for air leakage (Left engine, 433LR or right engine, 443LL) (AMM 06-43-00/201).

F. Pressurize Upstream of the PRSOV

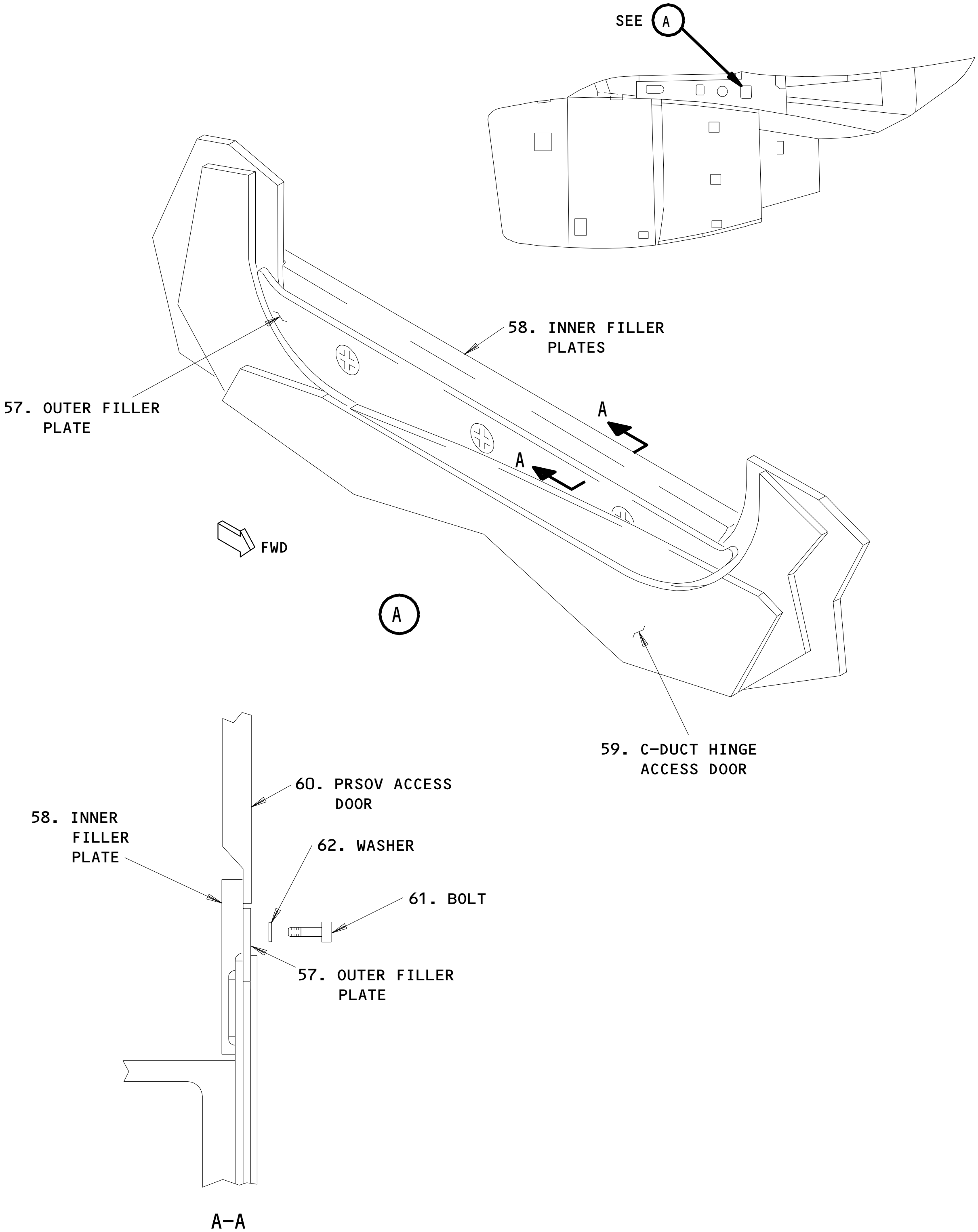
S 782-040

(1) To pressurize the pneumatic ducts with Pressurization Method 1 do these steps:
   (a) Open these circuit breakers on the P11 panel:
       APU BLEED CONT
       APU BLEED PWR
   (b) Supply pneumatic power with the APU or ground source (AMM 36-00-00/201)
   (c) Disconnect the APU shutoff valve, connector D1616, and install a jumper between pin 4 and pin 5 of the ship's wiring.
   (d) Manually open the APU bleed valve.

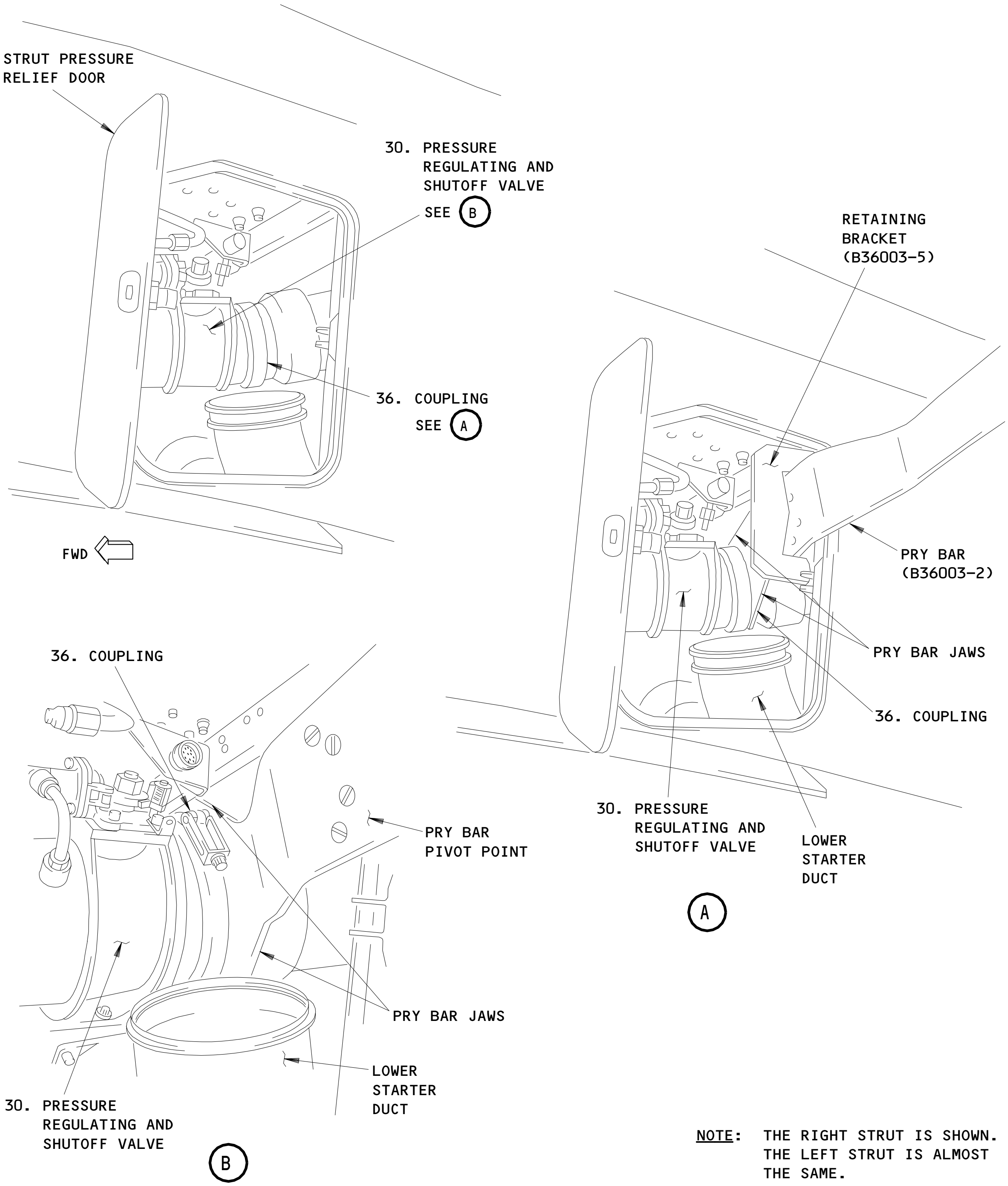


1 AIRPLANES WITH OVERTEMPERATURE SENSOR PNEUMATIC SENSE LINE CLAMP AND P-CLIP.

Air Supply Pressure Regulating and Shutoff Valve (Right Strut)
Figure 203 (Sheet 2)



Air Supply Pressure Regulating and Shutoff
Valve Access Door Filler Plate
Figure 204



NOTE: THE RIGHT STRUT IS SHOWN. THE LEFT STRUT IS ALMOST THE SAME.

Air Supply Pressure Regulating and Shutoff Valve Removal Tool Operation
Figure 205

(e) Close these circuit breakers on the P11 panel:
APU BLEED CONT
APU BLEED PWR
(f) Push the applicable L or R ENG BLEED switch-light on the P5 pilot's overhead panel to the on position (OFF light is on, flow bar is visible).
(g) Manually turn the manual override nut to OPEN with a wrench.

NOTE: This step can only be done on PRSOV with Boeing P/N 212N101-53 and above (Allied Signal P/N 3214306-8 and above).

(h) Make sure that the applicable L or R ENG BLEED "OFF" light goes out.
(i) Perform the required leak checks.

S 782-003
(2) To pressurize the pneumatic ducts with Pressurization Method 2 do these steps:
(a) Turn the manual override nut on the PRSOV to the LOCKED position.
(b) Push the applicable L or R ENG BLEED switch-light, on the P5 panel, to the OFF position.
(c) Motor the engine (AMM 71-00-00/201).

S 782-041
(3) To pressurize the pneumatic ducts with Pressurization Method 3 do these steps (Fig. 201):
(a) For the PRSOV on the right engine, remove the 450 temperature sensor sense line at the 450 temperature sensor.
(b) For the PRSOV on the left engine, remove the 450 temperature sensor sense line at the PRSOV.
(c) Put a cover on the pneumatic sense line or fittings.
(d) For the PRSOV on the right engine, install the nitrogen or air source, needle valve and supply pressure gage to the 450 temperature sensor sense line.
(e) For the PRSOV on the left engine, install the nitrogen or air source, needle valve and supply pressure gage to the PRSOV.
(f) Supply 22-26 psi to the PRSOV with the nitrogen or air source.
(g) Supply pneumatic power with a pneumatic ground cart or the APU. (AMM 36-00-00/201).

NOTE: If you use the APU remove the APU connector, install a jumper between pins 4 and 5. Manually lock the APUSOV open.

S 432-004
(4) When completed with Pressurization Method 3, do these steps:
(a) Remove pneumatic power (AMM 36-00-00/201).

NOTE: If you used the APU, manually unlock the APUSOV. Remove the jumper and install the electrical connector.

(b) Remove the nitrogen or air source, needle valves and gages.
(c) Apply the anti-seize compound to the threads of the fitting.
(d) Connect the pneumatic sense line for the 450 temperature sensor to the PRSOV.

S 862-005
(5) When completed with Pressurization Method 2, do these steps:
(a) Shutdown engine (AMM 71-00-00/201).
(b) Turn the manual override nut on the PRSOV to the NOT LOCKED position.

S 412-006
(6) Close the pressure regulating valve and pressure relief door (433LR or 443LL).

S 442-007
(7) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

TASK 36-11-09-002-008
3. Remove The Air Supply Pressure Regulating and Shutoff Valve
A. Equipment
(1) Pressure Regulating and Shutoff Valve Removal/Installation tool set- B36003-1.
B. General
(1) The air supply PRSOV is in the strut area, immediately aft and above the air supply precooler. The PRSOV controls the bleed air pressure.
C. References
(1) AMM 06-43-00/201, Engine Nacelle Access Doors and Panels
(2) AMM 24-22-00/201, Electrical Power Control
(3) AMM 36-00-00/201, Pneumatic - General.
(4) AMM 78-31-00/201, Thrust Reverser System
D. Access
(1) Location Zones
433 Nacelle strut - mid-structure

(2) Access Panels

416BR	Thrust Reverser Hinge & Hydraulic Disconnects, C-Duct Hinge, Left Engine
433LR	Pressure Regulating Valve, Left Engine
425BL	Thrust Reverser Hydraulic Disconnect, T/R Feedback Actuators, C-Duct Hinge, Right Engine
443JL	Pre-Cooler, Thermal Switch, Right Engine
443LL	Pressure Regulating Valve & Pressure Relief, Right Engine

E. Procedure

S 862-009

(1) Supply electric power (AMM 24-22-00/201).

S 862-034

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.

(2) Remove pneumatic power (AMM 36-00-00/201).

S 012-035

WARNING: DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

S 022-011

(4) To prepare for the removal of the left PRSOV, do the steps that follow (Fig. 202):
   (a) Open this circuit breaker on the overhead circuit breaker P11 panel and attach a DO-NOT-CLOSE tag:
      1) 11Q10 ENG BLD L
   (b) Open the access door for the PRSOV and strut pressure relief (433LR) (AMM 06-43-00/201).
   (c) If it is necessary, remove the filler plates (57,58) (Fig. 204).
      1) Remove the C-duct hinge access panel (59) (416BR).
      2) Remove the screws (61), nuts (63), and washers (62) that connect the two filler plates (57, 58) in the strut pressure relief door.
      3) Remove the two plates (57, 58) (Fig. 203).

S 022-026

(5) To remove the Left PRSOV, do the steps that follow:
   (a) Disconnect the clamp that holds the downstream pressure probe sense line (16) to the strut ceiling.
   (b) Disconnect the pneumatic sense line (3) for the overtemperature sensor from the PRSOV (10).
   (c) Disconnect the downstream pressure probe sense line (16) from the PRSOV (10).
   (d) Disconnect the PRSOV electrical connector (8) from the strut ceiling.
   (e) Remove the sense line (9) from between the aft duct section of the precooler (7) and the strut boss (11).
   (f) Remove the fore and aft couplings (1, 4) from aft duct section of the precooler (7).
   (g) Remove the aft duct section of the precooler (7) from between the PRSOV (10) and the precooler (6).
   (h) If the aft duct section (7) is not easily removed from between the precooler and the PRSOV, do these steps:
      1) Carefully put the B36003-2 pry bar into the strut (Fig. 205).
         a) Carefully put the jaws over the aft duct section between the coupling flange and the flex joint.
         b) Make sure the nylon pivot point is on the aft door frame structure.
      2) Put the B36003-5 retaining bracket over the pry bar.
         a) Make sure the teeth are on the aft side of the frame structure for the aft door.

      <u>CAUTION</u>: DO NOT MOVE THE DUCT FARTHER THAN IS NECESSARY TO REMOVE THE AFT DUCT SECTION FOR THE PRECOOLER. DAMAGE TO THE OTHER AIR SUPPLY DUCTS CAN OCCUR IF YOU MOVE THE DUCT TOO FAR.

      3) Carefully pull the end of the pry bar forward to move the precooler aft duct section (7) in the aft direction (Fig. 202).
      4) Carefully remove the pry bar and the retaining bracket from airplane.
   (i) Loosen the aft PRSOV coupling (1) and turn the top of the PRSOV (10) away from the access hole.

      <u>NOTE</u>: This will improve the access to the bonding jumpers (12) which are on the bottom side of the valve actuator.

   (j) Disconnect the bonding jumpers (12) from the valve.
   (k) Remove the aft PRSOV coupling (1).
   (l) Remove the PRSOV (10) from the duct.
   (m) Remove the aft duct section of the precooler (7).
   (n) Remove the PRSOV (10) from the airplane.
   (o) Remove the E-seals (2, 5) from the duct flanges.

(p) Put a cover over the duct, precooler (6) and sense lines (3, 16) to keep out unwanted objects.

S 022-012

(6) To prepare for the removal of the right PRSOV, do the steps that follow (Fig. 203):
 (a) Open this circuit breaker on the overhead circuit breaker panel P11 and attach a DO-NOT-CLOSE tag:
  1) 11Q19 R ENG BLEED
 (b) Open access door for the precooler thermal switch 443JL (AMM 06-43-00/201).
 (c) Open the access door for the pressure regulating valve and pressure relief strut 443LL (AMM 06-43-00/201).
 (d) Remove the filler plates (57, 58) if more access is necessary.
  1) Open the access panel for the C-duct hinge (59) (425BL).
  2) Remove the screws (61), nuts (63), and washers (62) that connect the two filler plates (57, 58) in the pressure relief strut door (Fig. 203).
  3) Remove the two plates (57, 58) (Fig. 203).

S 022-027

(7) To remove the Right PRSOV, do the steps that follow:
 (a) Disconnect the pressure sense line (31) from the starter duct (34).
 (b) Remove the aft coupling (32) from the starter duct section (34) through the open access door for the pressure regulating valve.
 (c) Remove the forward coupling (32) from the starter duct section (34) through the open access door to the precooler.
 (d) Remove the starter duct section (34).
 (e) Disconnect the PRSOV electrical connector (51) from the strut ceiling.
 (f) Disconnect the clamp that holds the downstream pressure sense line (55) to the strut ceiling.
 (g) Disconnect the pneumatic sense lines for the overtemperature and downstream pressure sensors (35, 55) from the PRSOV (30).
 (h) Disconnect the sense line (46) from the aft duct section of the precooler (47).
 (i) Remove the couplings (36, 49) on the aft duct section of the precooler (47).
 (j) Get access to the coupling through the access door for the precooler thermal switch and the pressure regulating valve.
 (k) Remove the duct section (47) from between PRSOV and precooler.
 (l) If the aft duct section of the precooler (7) is not easily removed, do these steps:
  1) Carefully put the B36003-2 pry bar into the strut (Fig. 205).
   a) Carefully put the jaws over the aft duct section between the coupling flange and the flex joint.
   b) Make sure the nylon pivot point is on the aft door frame structure.

2) Put the B36003-5 retaining bracket over the pry bar.
   a) Make sure the teeth rest on the aft side of the frame structure for the aft door.

CAUTION: DO NOT MOVE THE DUCT FARTHER THAN IS NECESSARY TO REMOVE THE AFT DUCT SECTION FOR THE PRECOOLER. YOU WILL MOVE OR CAUSE DAMAGE TO THE OTHER AIR SUPPLY DUCTS IF YOU MOVE THE DUCT TOO FAR.

3) Carefully pull the end of the pry bar forward to move the precooler aft duct section in the aft direction.
4) Carefully remove the pry bar and the retaining bracket from the airplane.

(m) Remove the E-seals (50,37) from the duct flanges.
(n) Remove the aft coupling (36) from the PRSOV duct.
(o) Disconnect the PRSOV (30) from the duct.
(p) Push the PRSOV (30) to the outboard side of the strut nacelle.
(q) Remove the bonding jumpers (38) from the structure.
(r) Remove the aft duct section of the precooler from the airplane.
(s) Remove the PRSOV (30).
(t) Remove the E-seal (37) from the duct flanges.
(u) Put a cover on the duct, precooler (48) and pneumatic sense lines (35, 55) to keep out unwanted objects.
(v) Disconnect the bonding jumpers (38) from the PRSOV (30).

TASK 36-11-09-002-013

4. Install The Pressure Regulating and Shutoff Valve

A. Equipment
   (1) Pressure Regulating and Shutoff Valve Removal/Installation tool set- B36003-1.
B. Consumable Materials
   (1) D00006 Antiseize Compound, Bostik Never-Seez
C. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
202	1	Coupling	36-11-01	01	125
	2	E-seal			130
	4	Coupling			110
	5	E-seal			130
	7	Duct Assy - Flex			180
	9	Tube Assy	36-11-01	06	140
	10	Pressure Regulating and Shutoff Valve	36-11-09	04	5
	13	Screw	36-11-01	01	82
	14	Washer			85
	15	Nut			90
203	30	Pressure Regulating and Shutoff Valve	36-11-09	04	5
	32	Coupling	80-11-51	01	35
	33	E-seal			40
	34	Duct Assy			110
	36	Coupling	36-11-01	01	125
	37	E-seal			130
	38	Bonding Jumpers			80
	42	Washer			85
	43	Nut			90
	46	Tube Assy	36-11-01	06	140
	47	Duct Assy - Flex	36-11-01	01	180
	49	Coupling			110
	50	E-seal			130
	52	Screw			82
	53	Washer			85
	54	Nut			90
204	57	Outer Filler Plate	54-53-01	05	405
	58	Inner Filler Plate			400
	61	Bolt			390
	62	Washer			395

D. References
(1) AMM 06-43-00/201, Engine Nacelle Access Doors and Panels
(2) AMM 24-22-00/201, Electrical Power Control
(3) AMM 36-00-00/201, Pneumatic - General
(4) AMM 78-31-00/201, Thrust Reverser System

E. Access
   (1) Location Zones
       433   Nacelle strut - mid-structure
   (2) Access Panels
       416BR   Thrust Reverser Hinge & Hydraulic Disconnects, C-Duct Hinge, Left Engine
       433LR   Pressure Regulating Valve, Left Engine

       425BL   Thrust Reverser Hydraulic Disconnect, T/R Feedback Actuators, C-Duct Hinge, Right Engine
       443JL   Pre-Cooler, Thermal Switch, Right Engine
       443LL   Pressure Regulating Valve & Pressure Relief, Right Engine

F. Procedure

S 422-020
(1) To install the left PRSOV, do the steps that follow (Fig. 202):
   (a) Remove the duct covers.
   (b) Examine the flange seal surface for cracks, dents, unwanted objects or other damage.
      1) Replace or repair the PRSOV if it is necessary.
      2) Replace or repair the duct if it is necessary.
   (c) Examine all the E-seals for cracks, dents, unwanted objects or other damage.
      1) Replace all the damaged E-seals.
   (d) Install the E-seal (2) on the aft flange of the PRSOV (10).
   (e) Put the PRSOV (10) in the duct.
      1) Make sure the flow arrow points in the aft direction.
   (f) Install the PRSOV (10) to aft duct section with the coupling (1).
      1) Do not tighten the coupling (1).
   (g) Install the aft duct section of the precooler (7) with the E-seals (2, 5) between the PRSOV (10) and precooler (6).

<u>CAUTION</u>: MAKE SURE YOU INSTALL THE LOCKING DEVICE OF THE COUPLING CORRECTLY AS SHOWN IN FIG. 201. IF YOU DO NOT INSTALL THE COUPLING FINGERS INSIDE THE LOCKING DEVICE THE COUPLING CAN LOOSEN AND CAUSE DAMAGE TO EQUIPMENT.

   (h) Install the couplings (1, 4) on the duct section (7).
      1) Do not tighten the couplings (1, 4).
   (i) If the ducts are too close together, do these steps:
      1) Carefully put the B36003-2 pry bar into the strut (Fig. 205).
         a) Carefully put the jaws over the aft duct section between the coupling flange and the flex joint.
         b) Make sure the nylon pivot point is on the aft door frame structure.

2) Put the B36003-5 retaining bracket over the pry bar.
   a) Make sure the teeth are on the aft side of the frame structure for the aft door.
   b) Carefully apply pressure to the pry bar to move the valve to the aft end of the airplane.
   c) Examine all the E-seals for cracks, dents, unwanted objects or other damage.
   d) Replace all the damaged E-seals.
   e) Put an E-seal (2) on each end of the aft duct section of the precooler (7).
   f) Install the aft duct section of the precooler (7).
   g) Install the coupling (4) between precooler (6) and the aft duct section of the precooler (7).
   h) Do not tighten the coupling.
   i) Slowly remove the pressure from the pry bar to allow the PRSOV (10) to touch the duct section (7).
   j) Carefully remove the pry bar and the retaining bracket from the strut.

(j) Install the coupling (1) at the flange between the duct (7) and the PRSOV (10).
(k) Do not tighten the coupling.
(l) If the coupling (1) cannot be installed because the ducts are too far apart, do these steps:

1) Carefully insert the B36003-2 pry bar into the strut (Fig. 205).
   a) Put the pry bar jaws over the aft duct section, immediately aft of the coupling (1).
   b) Make sure the nylon pivot point is on the aft door frame structure.
2) Carefully pull the pry bar to the aft end of the airplane to close the clearance.
3) Examine all the E-seals for cracks, dents, unwanted objects or other damage.
4) Replace all damaged E-seals.
5) Install an E-seal between the PRSOV (10) and the duct section (7).

6) Install the coupling (1) but do not tighten.
7) Carefully remove the pry bar from the airplane.

(m) Align the aft duct section of the precooler (7) to install the sense line (9).

(n) Do the steps that follow to connect the bonding jumpers (12) to the PRSOV (10):
1) Turn the top of the PRSOV (10) away from the access hole until you can install the bonding jumpers (12).
2) Use the screws (13), washers (14) and nuts (15) to connect the bonding jumpers (12) to the PRSOV (10).

(o) Apply antiseize compound to the threads of the connections before you install the sense lines that follow:

CAUTION: YOU CANNOT SEE THE SENSE LINE CONNECTION WHILE YOU ARE INSTALLING IT. TURN THE FITTING TWO FULL TURNS BY HAND BEFORE TIGHTENING IT WITH A WRENCH TO PREVENT DAMAGE TO THE THREADS ON THE CONNECTOR OR SENSE LINE.

1) Install the sense line (9) between the aft duct section of the precooler (7) and the strut boss (11).
   a) Tighten the connections.
2) Connect the overtemperature sensor pneumatic sense line (3) to the PRSOV (10).
   a) Tighten the nuts.
3) Connect the probe sense line for the downstream pressure (16) to the PRSOV (10).
   a) Tighten the nuts.

CAUTION: DO NOT TIGHTEN THE COUPLINGS MORE THAN THE SPECIFIED LIMIT. IF YOU APPLY TOO MUCH TORQUE, THE VALVE FLOW BODY CAN WARP (BECOME OVAL) AND CAUSE THE VALVE TO NOT OPEN OR CLOSE COMPLETELY DURING OPERATION.

(p) Tighten all the duct couplings (1, 4) to 110-120 pound-inches.

(q) Attach the probe sense line for the downstream pressure (16) to the strut ceiling with the screw and washer.

(r) Connect the electrical connector (8) to the PRSOV (10).

(s) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:
1) 11Q10 ENG BLD L

S 422-019

(2) To install the right PRSOV, do the steps that follow (Fig. 203):

(a) Connect the bonding jumpers (38) to the PRSOV (10).

(b) Remove the duct covers.

(c) Examine the surface of the flange that seals for cracks, dents, unwanted objects or other damage.

(d) Install the PRSOV (30) on the outboard side of the PRSOV duct.
(e) Make sure the flow arrow points to the right.
(f) Connect the bonding jumpers (38) to the structure (44) with the washers (42) and nuts (43).
(g) Examine all the E-seals for cracks, dents, unwanted objects or other damage.
(h) Replace all the damaged E-seals.
(i) Put an E-seal (37) on the aft valve flange.
(j) Install the PRSOV (30) in the duct.
  1) Make sure the flow arrow points in the aft direction.

CAUTION: MAKE SURE YOU INSTALL THE LOCKING DEVICE OF THE COUPLING CORRECTLY AS SHOWN IN FIG. 201. IF YOU DO NOT INSTALL THE COUPLING FINGERS INSIDE THE LOCKING DEVICE THE COUPLING CAN LOOSEN AND CAUSE DAMAGE TO EQUIPMENT.

(k) Install the coupling (36).
  1) Do not tighten coupling (36).
(l) Install the aft duct section of the precooler (47) (with E-seals (37, 50)) between the precooler outlet (48) and the PRSOV (30).
(m) If the ducts are too close together, do these steps:
  1) Carefully insert the B36003-2 pry bar into the strut (Fig. 205).
    a) Put the pry bar jaws over the aft duct section, just aft of the coupling (1).
    b) Make sure the nylon pivot point is on the aft door frame structure.
  2) Put the B36003-5 retaining bracket over the bar teeth that are on the aft side of the aft door frame structure.
  3) Carefully apply pressure to the pry bar to move the valve (30) to the aft end of the airplane.
  4) Examine all the E-seals for cracks, dents, unwanted objects or other damage.
    a) Replace all the damaged E-seals.
  5) Put an E-seal (50) on the two ends of the aft duct section of the precooler.
  6) Install the aft duct section of the precooler (47).
  7) Install the coupling (49) but do not tighten.
  8) Slowly remove the pressure from pry bar to allow the PRSOV (30) to touch the duct section (47).
  9) Carefully remove the pry bar and the retaining bracket from the strut.

(n) Install the coupling (49) between the aft duct section of the precooler (47) and the precooler (48).
    1) Make sure the bolt on is on the bottom of duct and the nut is on the inboard side of the strut.
    2) Do not tighten the nut.

(o) Install the coupling (36) between the aft duct section of the precooler (47) and the PRSOV (30).
    1) Do not tighten the coupling.

(p) If the coupling (36) between the valve (30) and the aft duct section of the precooler (47) cannot be installed:
    1) Carefully install the B36003-2 pry bar in the strut (Fig. 205).
    2) Put the jaws over the aft duct section, immediately aft of the coupling (36).
    3) Make sure the nylon pivot is on the aft door frame structure (Fig. 205).
        a) Carefully pull the end of the pry bar to the aft end of the airplane, to close the clearance.
        b) Examine all the E-seals for cracks, dents, unwanted objects or other damage.
        c) Replace all the damaged E-seals.
        d) Install the E-seal (37) between the valve (30) and the duct (47).
        e) Install the coupling (36) at the joint between the PRSOV (30) and the duct (47).
        f) Carefully remove the pry bar from the airplane.

(q) Align the aft duct section of the precooler (47) to install the sense line (46).

(r) Apply the antiseize lubricant on the threads of the connections before you install the sense lines that follow:
    1) Install the sense line (46) between the aft duct section of the precooler (47) and the strut boss (45).
        a) Tighten the fittings.
    2) AIRPLANES WITHOUT OVERTEMPERATURE SENSOR PNEUMATIC SENSE LINE CLAMP AND P-CLIP;
       Connect the overtemperature sensor pneumatic sense line (35) to the PRSOV (30).
        a) Tighten the nut.

3) AIRPLANES WITH OVERTEMPERATURE SENSOR PNEUMATIC SENSE LINE CLAMP AND P-CLIP;
Do the steps that follow:
a) Loosen the T-bolt (29) on the clamp (28) and the p-clip (27).
b) Connect the overtemperature sensor pneumatic sense line (35) to the PRSOV (30) and tighten the nut.
c) Tighten the T-bolt (29) on the clamp (28) to 10 to 20 inch-pounds.

NOTE: A minimum of two threads on the T-bolt (29) must be above the nut.

NOTE: There should be a minimum clearance of .25 inch between the T-bolt (29) and structure and other components.

d) Tighten the p-clip (27).

NOTE: There should be a minimum clearance of .50 inch between the sense line (35) and structure and other components. There can be a minimum clearance of 0.25 inch between the tube part of the sense line (35) and structure and other components.

4) Connect the probe sense line for the downstream pressure (55) to the PRSOV (30).
a) Tighten the nuts.

CAUTION: DO NOT TIGHTEN THE COUPLINGS MORE THAN THE SPECIFIED LIMIT. IF YOU APPLY TOO MUCH TORQUE, THE VALVE FLOW BODY CAN WARP (BECOME OVAL) AND CAUSE THE VALVE TO NOT OPEN OR CLOSE COMPLETELY DURING OPERATION.

(s) Tighten all the duct couplings (36,49) to 110-120 pound-inches.
(t) Attach the clamp for the downstream pressure sense line to the strut ceiling with the screws and washers.
(u) Connect the electrical connector (51) to the PRSOV (30).
(v) Examine all the E-seals for cracks, dents, unwanted objects or other damage.
1) Replace all the damaged E-seals.
(w) Install the E-seals (33) in the starter duct section (34).
(x) Install the starter duct section (34) with the couplings (32).
1) Do not tighten the couplings (32).
(y) Apply antiseize lubricant to the threads of the connections before you install the sense line (31).
(z) Connect the sense line (31) to the starter duct (34).
1) Tighten the connections.
(aa) Tighten the couplings (32) on the starter duct section (34).

(ab) Manually turn the manual override nut to the NORMAL FULL OPEN position.

(ac) Remove the DO-NOT-CLOSE tag and close this circuit breaker on the P11 panel:

1) 11Q19 R ENG BLEED

G. PRSOV Post-Installation Leakage Test

S 792-016

(1) Do a test for leaks at the connections to the PRSOV:

(a) Do the task "Pressurization Upstream of the PRSOV" to check for leaks at the upstream and downstream PRSOV flange connections (AMM 36-11-09/201).

NOTE: You can use either Method 1 or Method 3 to pressurize the pneumatic system both upstream and downstream of the PRSOV. Method 2 pressurizes the pneumatic system only upstream of the PRSOV.

(b) Do a test of the valve flanges for air leakage:

1) If you do a test of the right side PRSOV, do a test of the starter duct flanges for air leakage.
2) Small air leakage is satisfactory.
3) Repair large air leakage by joint or clamp adjustment.

(c) Remove the pneumatic power (AMM 36-00-00/201).

(d) Decrease the nitrogen or air pressure to 0 psig.

H. Put the Airplane Back to Its Usual Condition

S 412-022

(1) If applicable, install the filler plates for the pressure relief strut door (57, 58) with the screws (61), washers (62), and nuts (63) (Fig. 204).

S 412-044

(2) Install/close the access panel, 416BR/425BL, for the thrust reverser C-duct hinge.

S 412-021

(3) Close the applicable left or right pressure regulating valve and pressure relief door (433LR or 443LL).

S 412-025

(4) Close the access door for the precooler thermal switch 443JL.

S 442-023

(5) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 862-024

(6) Remove electrical power if it is not necessary (AMM 24-22-00/201).

AIR SUPPLY PRESSURE REGULATING AND SHUTOFF VALVE - ADJUSTMENT/TEST

1. General
   A. This task will perform an operational test of the PRSOV while the PRSOV is installed on the engine.

TASK 36-11-09-715-049

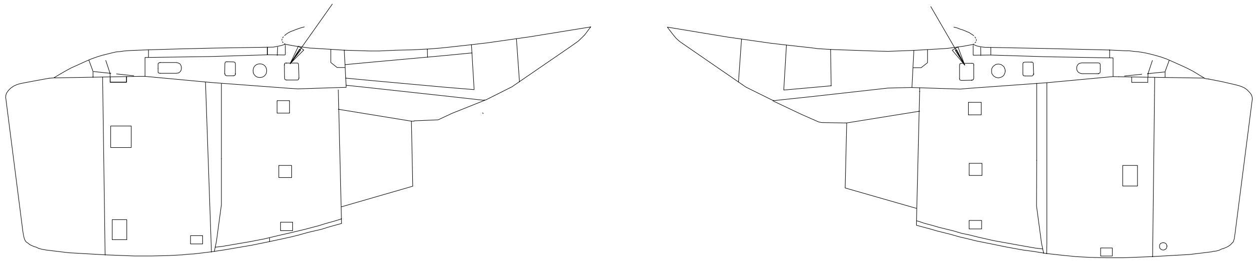
2. Functional Test of the Pressure Regulating and Shutoff Valve (Fig. 501)
   A. Equipment
      (1) Nitrogen or air source (0-100 PSIG)
      (2) Ground air source or APU (30 PSIG Minimum)
      (3) C36001 Two Pressure gage, 0-60 PSIG Minimum
      (4) 28 Volts DC power supply (Optional)
      (5) Union fittings - MS-4 (2 required)
   B. Consumable Materials
      (1) D00006 Antiseize Compound, Bostik Never-Seez
   C. Parts
      (1) Cap
      (2) Pressure hose - 0-60 PSIG
   D. References
      (1) AMM 06-41-00/201, Fuselage (Major Zones 100 and 200) Access Doors and Panels
      (2) AMM 06-43-00/201, Engine and Nacelle Strut (Major Zone 400) Access Doors and Panels
      (3) AMM 24-22-00/201, Electrical Power - General
      (4) AMM 36-00-00/201, Pneumatic Power - General
      (5) AMM 36-11-09/201, Pressure Regulating and Shutoff Valve
   E. Access
      (1) Location Zones

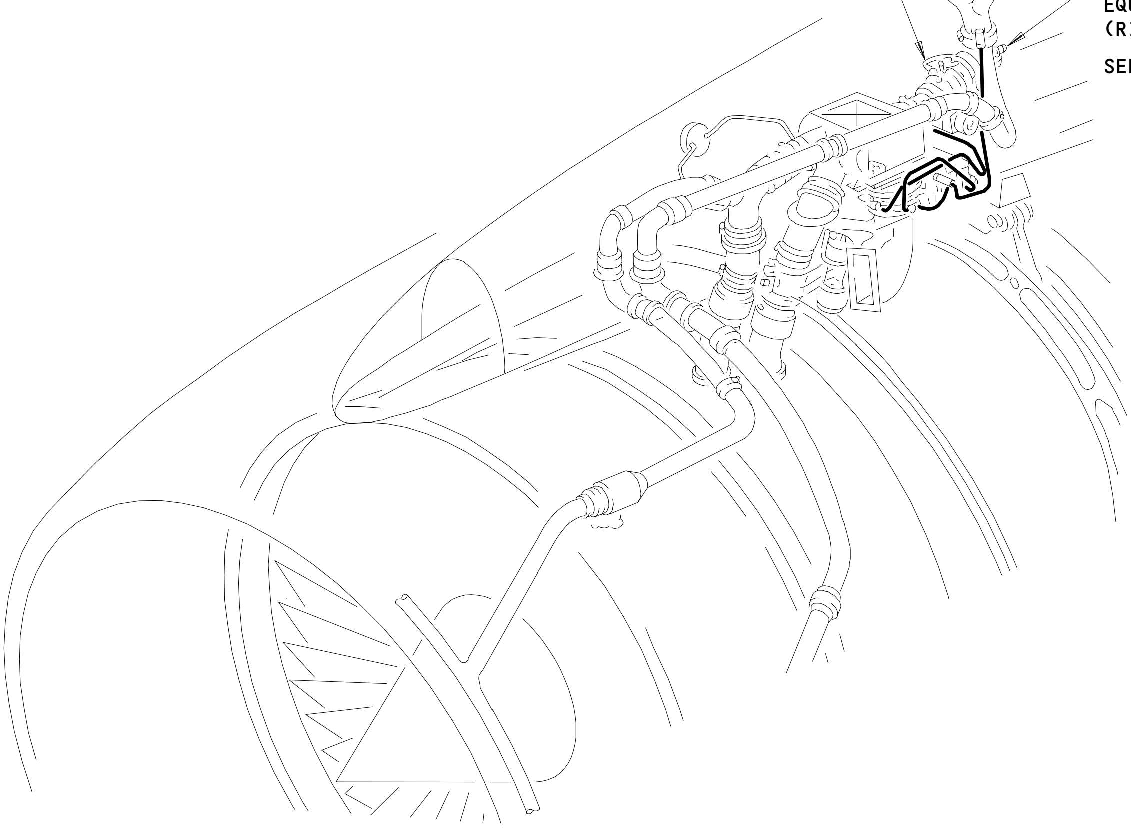
119	Main Equipment Center
433/443	Nacelle Strut Mid-structure

      (2) Access Panels

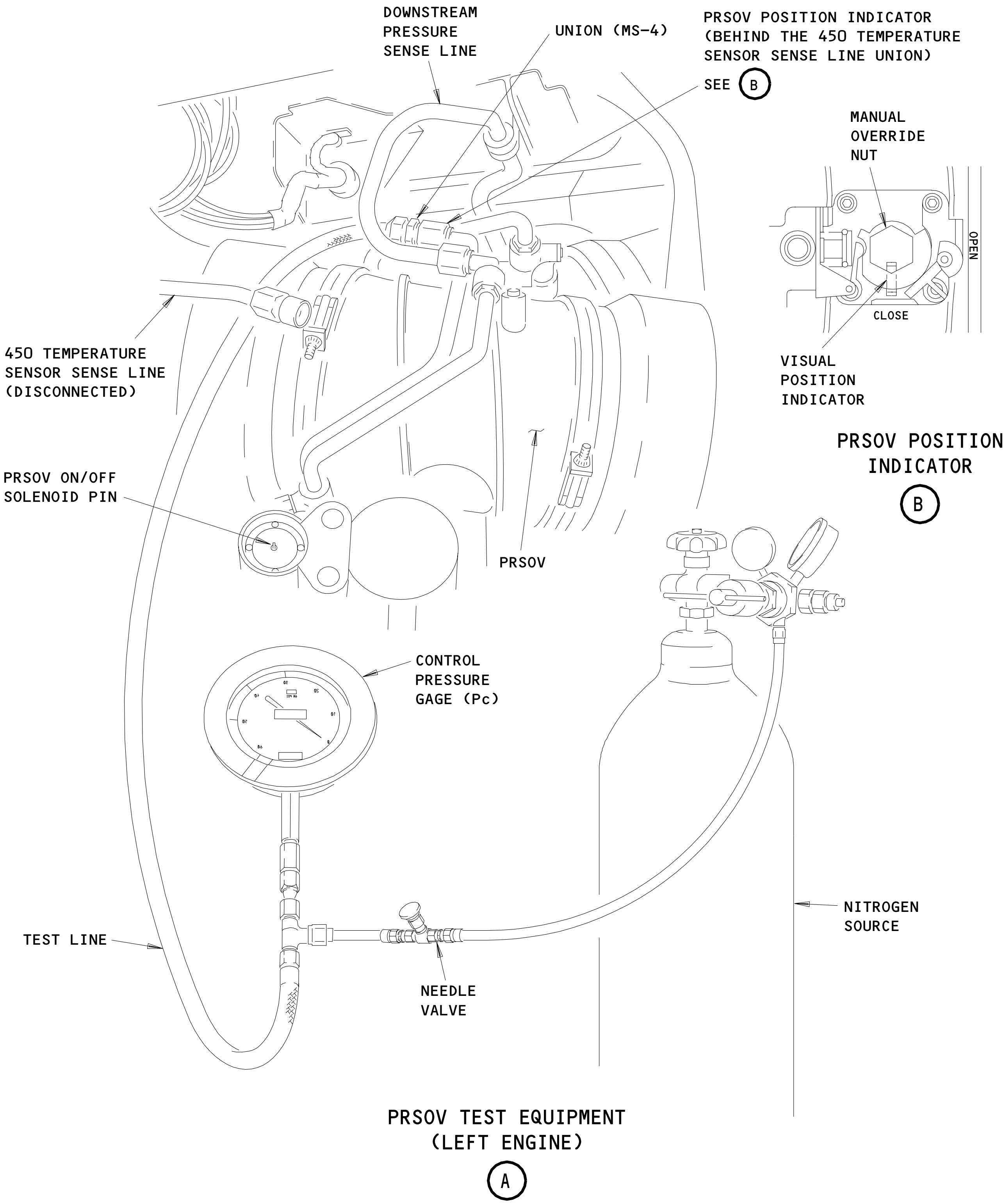
119BL	Main Equipment Center Access Pane
433LR/443LL	Pressure Regulating and Shutoff Valve Access Panel

   F. Prepare for the Test (Fig 501)

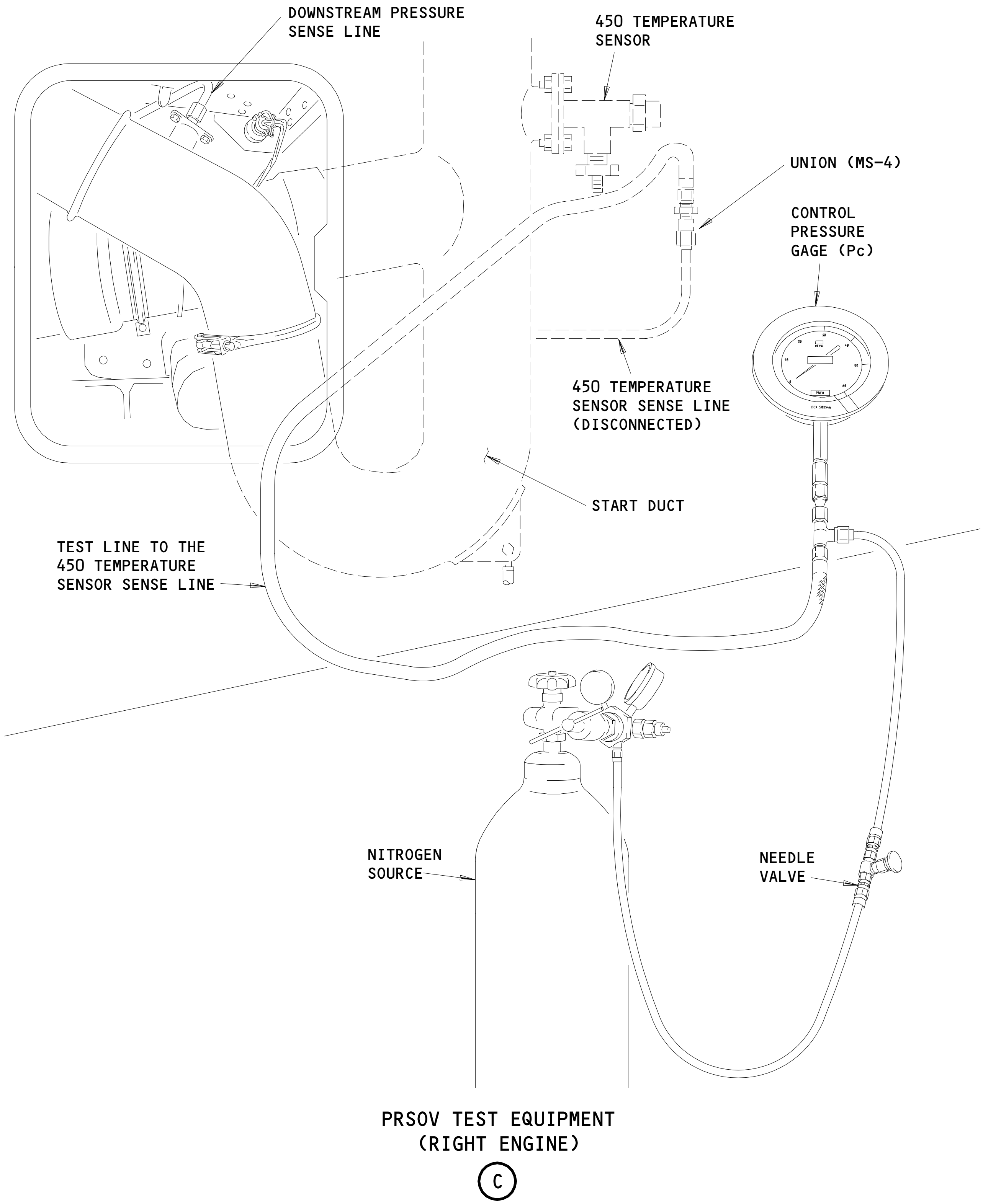




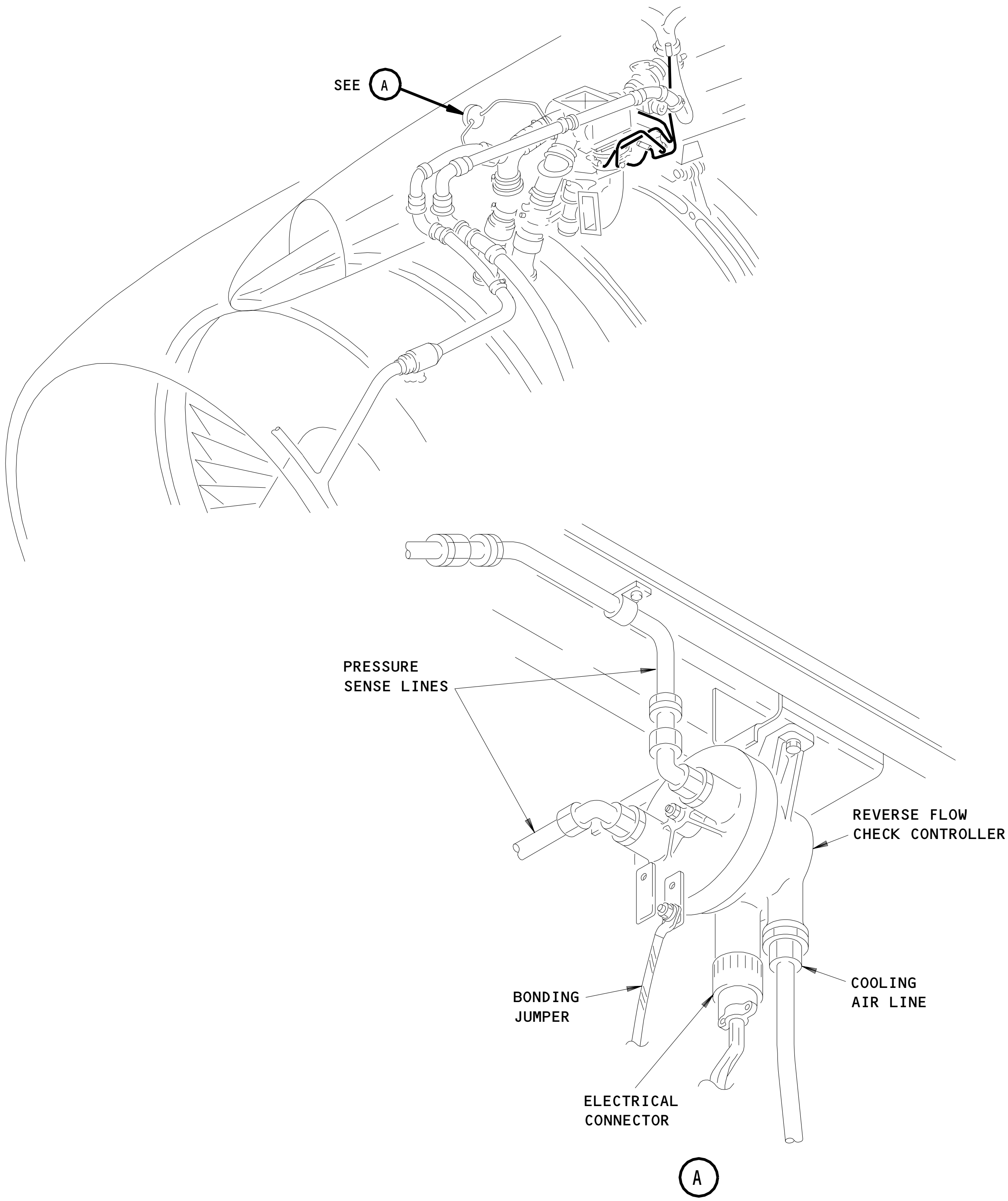
PRSOV Test Equipment
Figure 501 (Sheet 1)



PRSOV Test Equipment
Figure 501 (Sheet 2)



PRSOV Test Equipment
Figure 501 (Sheet 3)



Reverse Flow Check Controller
Figure 502

S 865-057

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) Remove pneumatic power (AMM 36-00-00/201).

S 865-003

(2) Supply electrical power (AMM 24-22-00/201).

S 015-055

(3) Open the access door for the PRSOV on the nacelle strut (AMM 06-41-00/201).

NOTE: The reverser halves may need to be closed to access the PRSOV.

S 865-052

(4) There are two methods that you can use to electrically enable the PRSOV. Method 1 will jumper the RFCC and use the airplanes electrical power. Method 2 uses the manual ON/OFF solenoid on the PRSOV.

S 865-053

(5) Do these steps for method 1:
  (a) Open the applicable circuit breaker, on the P11 panel:
    1) 11B31 L ENG SPEED CARD
    2) 11B32 R ENG SPEED CARD
    3) 11Q10 L ENG BLEED
    4) 11Q19 R ENG BLEED
  (b) Remove the electrical connector from the RFCC (Fig. 502).
  (c) Install a jumper between pins 1 and 2 on the ships wiring.
  (d) Push the L(R) ENG Bleed OFF switch-light on the P5 panel to the ON position.
  (e) Close the applicable circuit breakers:
    1) 11Q10 L ENG BLEED

2) 11Q19 R ENG BLEED

S 865-054

(6) Do these steps for method 2:

(a) Pull the ON/OFF solenoid pin on the PRSOV to the extended position.

NOTE: A step to reverse this step at the end of the procedure is not necessary.

(b) Open the applicable circuit breaker on the overhead circuit breaker panel P11 and attach a DO-NOT-CLOSE tag:

1) 11Q10 L ENG BLEED
2) 11Q19 R ENG BLEED

S 035-012

(7) For the PRSOV on the right engine, remove the 450 temperature sensor sense line at the 450 temperature sensor (View C, Fig. 501).

S 035-013

(8) For the PRSOV on the left engine, remove the 450 temperature sensor sense line at the PRSOV (View A, Fig. 501).

S 495-051

(9) Install a cover on all open sense lines or fittings to keep out unwanted materials.

S 485-014

(10) For the PRSOV on the right engine, install the nitrogen (air) source, needle valve and control pressure gage Pc (0-60 PSIG) to the sense line for the 450 temperature sensor.

S 485-015

(11) For the PRSOV on the left engine, install the nitrogen (air) source, needle valve and control pressure gage Pc (0-60 PSIG) to the PRSOV.

S 715-058

(12) The table below shows the pressures you will see during the test of the PRSOV.

	Ps	Pc
PRSOV Minimum Opening Pressure	NA	<5 Psi
PRSOV Fully Open Pressure	NA	<8 Psi
PRSOV Control Pressure	30 Psi MIN	22-27 Psi

S 865-065

(13) Remove the DO-NOT-CLOSE tag and close these circuit breakers on the P11 panel:
   (a) 11Q10 L ENG BLEED
   (b) 11Q19 R ENG BLEED

G. Functional Test of the PRSOV

NOTE: During the test you will be asked some questions. Each question will have a yes or no answer. Each yes or no answer gives a recommended action, for example: NO, replace the PRSOV (Ref 36-11-09/201). You can continue with the test without doing the action if you want to see other characteristics of the test. However, you should do the recommended action after you complete the test.

S 725-016

CAUTION: WHEN YOU BEGIN TO INCREASE THE SUPPLY PRESSURE, DO NOT EXCEED THE PRESSURE LIMITS THAT ARE GIVEN. DAMAGE TO THE COMPONENTS CAN OCCUR.

(1) Slowly increase Pc (up to 25 PSIG). Monitor when the PRSOV begins to open and when the PRSOV is fully open.

NOTE: You will need a mirror and flashlight to see the position indicator on the manual override nut on the top of the left PRSOV.

Pc should be less than 5 PSIG when the PRSOV begins to open and Pc should be less than 8 when the PRSOV is fully open.

You may hear nitrogen (air) leakage from the PRSOV. A small amount of air leakage is normal. Leakage should not be detectable with your hand at a distance greater than 12 inches from the PRSOV.

S 725-017

(2) Did the PRSOV begin to open before Pc=5 PSIG?
   (a) NO, replace the PRSOV (AMM 36-11-09/201).
   (b) YES, continue.

S 725-018

(3) Was the PRSOV fully open before Pc=8 PSIG?
   (a) NO, replace the PRSOV (AMM 36-11-09/201)
   (b) YES, Continue.

S 725-019

(4) Decrease Pc to 0 PSIG.

S 865-062
(5) Make sure the ISOLATION VALVE is in the open position.

S 725-022
(6) Pressurize the pneumatic duct to a minimum of 30 PSIG with a ground source or APU (AMM 36-00-00/201).
   (a) If the APU is used, make sure the APU switch is in the ON position and open circuit breaker 11Q22 APU BLEED PWR after the pneumatic system is pressurized.

      NOTE: This will keep the APU valve open when the PRSOV opens.

S 725-023
(7) Increase Pc (up to 25 PSIG) until the PRSOV is open.

S 865-024
(8) Close the needle valve.

S 865-025
(9) Fully back off the regulator on the nitrogen (air) source to decrease the pressure to 0 PSIG.

   NOTE: The control pressure gage (Pc) for the nitrogen (air) will not show 0 PSIG.

S 215-026
(10) Make sure the APU or ground source pressure is at least 30 PSIG.

S 865-059
(11) Make sure the PRSOV is in the full open position.

S 215-027
(12) Does the control pressure gage show Pc=22-27 PSIG?
   (a) NO, replace the PRSOV (AMM 36-11-09/201)
   (b) YES, continue.

S 795-028
(13) Do a check of the downstream pressure sense line from the PRSOV to the start duct for nitrogen (air) leaks.

S 795-029
(14) Repair all leakage.

S 215-030
(15) Make sure the "OFF" light, on the P5 panel, is not on.

S 865-031
(16) Remove pneumatic power (AMM 36-00-00/201).
(a) If the APU was used, close circuit breaker 11Q22 APU BLEED PWR, then put the APU switch to the OFF position.

S 215-032
(17) Make sure the PRSOV is in the closed position and the L ENG (R ENG) OFF light, on the engine bleed air control panel, is on.

H. Put the Airplane Back to Its Usual Condition

S 085-033
(1) For the PRSOV on the right engine, remove the nitrogen (air) source, supply pressure gage, hoses and fittings at the sense line for the 450 temperature sensor.

S 085-034
(2) For the PRSOV on the left engine, remove the nitrogen (air) source, supply pressure gage, hoses and fittings at the PRSOV.

S 095-050
(3) Remove any covers that were installed on the open sense line or fitting.

S 645-036
(4) Apply antiseize compound to the threads of the sense line fitting.

S 435-037
(5) Install the sense line for the 450 temperature sensor.

S 415-039
(6) Close the access door for the PRSOV on the nacelle strut (AMM 06-43-00/201).

S 865-056
(7) If method 1 was used to electrically enable the PRSOV, do these steps:
(a) Push the L(R) ENG OFF switch-light on the P5 panel to the OFF position.
(b) Open these circuit breakers on the P5 panel:
1) 11Q10 L ENG BLEED

2) 11Q19 R ENG BLEED

(c) Remove the jumper.

(d) Install the electrical connector.

(e) Remove the DO-NOT-CLOSE tag and close the applicable circuit breaker, on the P11 panel:

1) 11B31 L ENG SPEED CARD

2) 11B32 R ENG SPEED CARD

3) 11Q10 L ENG BLEED

4) 11Q19 R ENG BLEED

S 865-048

(8) Remove electrical power if it is necessary (AMM 24-22-00/201).

APU SHUTOFF VALVE - REMOVAL/INSTALLATION

1. General
   A. This procedure includes the removal and installation of the APU shutoff valve. The valve is immediately forward of the APU firewall bulkhead on the APU air supply duct. The valve controls the bleed air supply from the APU.

TASK 36-11-10-004-001

2. Remove the APU Shutoff Valve (Fig. 401)
   A. References
      (1) AMM 06-42-00/201, Access and Panels
      (2) AMM 24-22-00/201, Electric Power Control
      (3) AMM 36-00-00/201, Pneumatic - General
   B. Access
      (1) Location Zone
          313 Stabilizer Center Section Compartment (Left)

      (2) Access Panel
          313AL APU Intake Port and Door Installation

   C. Prepare for the Removal

      S 864-002
      (1) Supply electrical power (AMM 24-22-00/201).

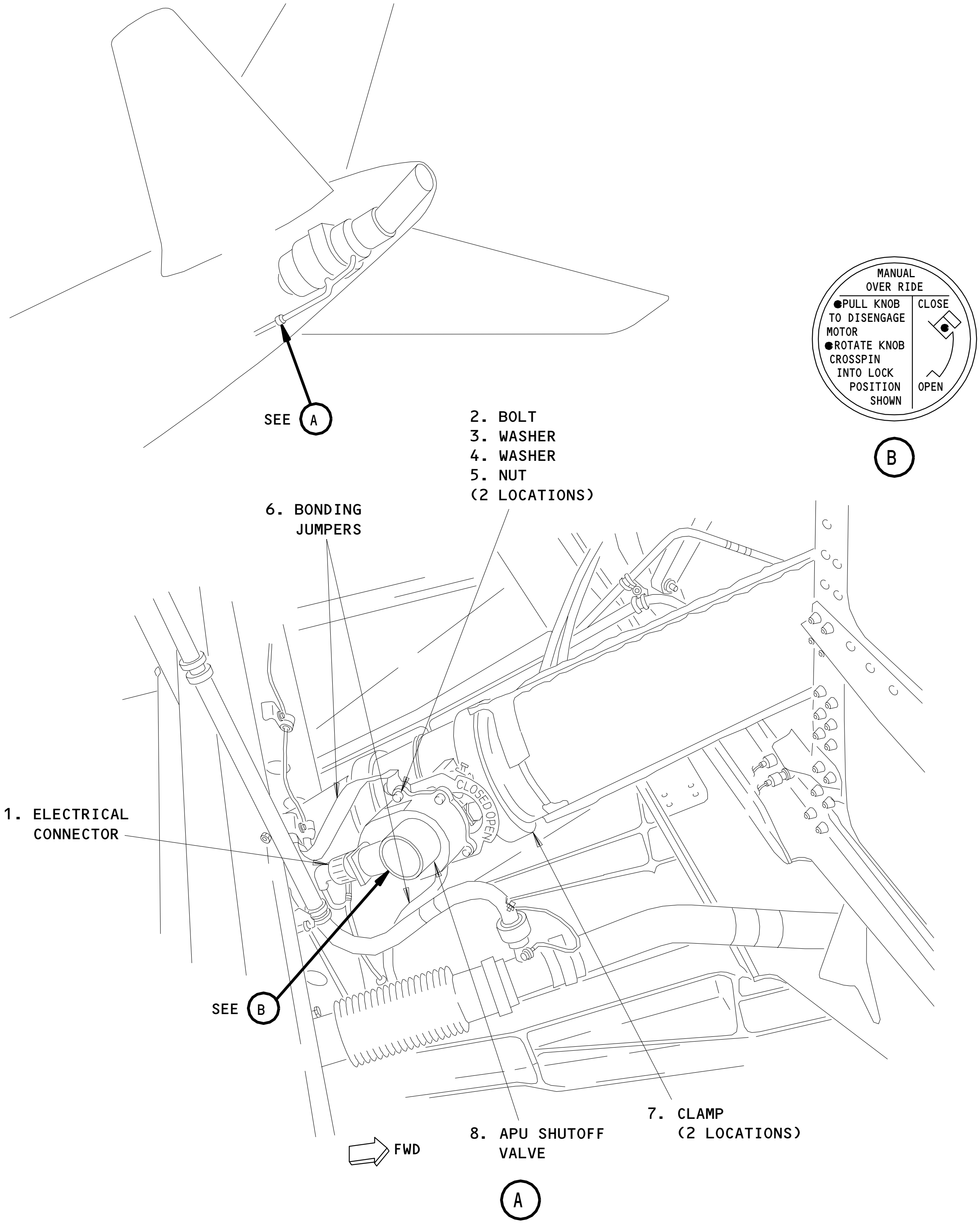
      S 864-003
      (2) Turn the APU selector switch on the pilots overhead Panel, P5, to the OFF position and attach a DO-NOT-OPERATE tag to the switch.

      S 864-004
      (3) Open this circuit breaker on the overhead circuit breaker panel, P11, and attach a DO-NOT-CLOSE tag:
          (a) 11Q23, APU BLEED CONT
          (b) 11Q22, APU BLEED PWR

      S 864-005

   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.

      (4) Remove pneumatic power (AMM 36-00-00/201).



APU Shutoff Valve
Figure 401

S 014-006

WARNING: STAY OFF THE SERVICE ACCESS DOOR, 311AL, AND THE ACCESS DOOR FOR THE CONTROLS BAY, 313AL. YOUR WEIGHT CAN CAUSE THE SPRING-LOADED LATCHES TO RELEASE. IF YOU FALL THROUGH THE DOOR, INJURY CAN OCCUR.

(5) Open the access door for the elevator controls, 313AL (AMM 06-42-00/201)

D. Remove the APU shutoff valve

S 034-007

(1) Disconnect the electrical connector (1) from the valve (8).

S 034-008

(2) Disconnect the bonding jumpers (6) from the valve (8).

S 034-009

(3) Loosen the clamps (7) at each end of the valve (8).

S 034-010

(4) Hold the valve (8) and move the clamps (7) along the duct.

S 024-011

(5) Remove the valve (8).

S 494-012

(6) Install a cover on the duct openings to keep out unwanted material.

TASK 36-11-10-404-013

3. Install the APU Shutoff Valve (Fig. 401)

A. Parts

MM		NOMENCLATURE	IPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	2	Bolt	36-11-10	01	115
	3	Washer			120
	4	Washer			125
	5	Nut			130
	7	Clamp			65
	8	APU Shutoff Valve			160

B. References
   (1) AMM 06-42-00/201, Access and Panels
   (2) AMM 24-22-00/201, Electric Power Control
   (3) AMM 36-00-00/201, Pneumatic - General

C. Access
   (1) Location Zone
       313 Stabilizer Center Section Compartment (Left)

   (2) Access Panel
       313AL APU Intake Port and Door Installation

D. Procedure

S 094-014
(1) Remove the duct covers.

S 424-015
(2) Install the valve (8) in the duct. Make sure the arrow on the valve body points forward.

S 434-016
(3) Install a clamp (7) on each side of the valve.

S 434-017
(4) Tighten the nuts on the clamp to 50-60 pound-inches.

S 434-018
(5) Install the bolts (2), washers (3, 4), and nuts (5) that attach the bonding jumpers (6) to the valve (8).

S 434-019
(6) Attach the electrical connector (1) to the valve (8).

S 864-020
(7) Remove the DO-NOT-CLOSE tag and close these circuit breakers on the P11 panel:
   (a) 11Q23, APU BLEED CONT
   (b) 11Q22, APU BLEED PWR

S 864-021
(8) Remove the DO-NOT-OPERATE tag from the APU selector switch on the P5 panel.

E. Do a Test of the APU shutoff valve.

S 864-022
(1) Supply pneumatic power with the APU (AMM 36-00-00/201).

S 214-023
(2) Push the APU valve switch-light, on the P5 panel, to the open position.
(a) Make sure the VALVE light comes on then goes off.
(b) Make sure the white bar light comes on.

S 794-024
(3) Do a check of the valve for air leakage.
(a) Small air leakage is satisfactory.
(b) You must repair large air leakage with joint or clamp adjustment.

S 214-025
(4) Push the APU VALVE switch-light, on the P5 panel, to the closed position.
(a) Make sure the VALVE comes on then goes off.
(b) Make sure the white bar light goes off.

F. Put the Airplane Back to Its Usual Condition

S 864-026
(1) Remove pneumatic power, if it is not necessary (AMM 36-00-00/201).

S 864-027
(2) Remove electrical power, if it is not necessary (AMM 24-22-00/201).

S 414-028
(3) Close the access door for the elevator controls, 313AL.

APU CHECK VALVE - REMOVAL/INSTALLATION

1. General
   A. This procedure includes the removal and installation of the APU check valve. The APU check valve causes air to flow in only one direction (forward, away from the APU) through the APU duct.
   B. AIRPLANES WITH APU CHECK VALVE IN THE RIGHT ECS PACK BAY;
      The APU check valve is found in the pneumatic ducting that is installed in the right Environmental Control System (ECS) pack bay.
   C. AIRPLANES WITH APU CHECK VALVE IN THE RIGHT MAIN LANDING GEAR WHEEL WELL;
      The APU check valve is found in the pneumatic ducting that is installed in the right main landing gear wheel well area.

TASK 36-11-11-004-019

2. Remove the APU Check Valve (Fig. 401)
   A. References
      (1) AMM 06-41-00/201, Fuselage Access Doors and Panel
      (2) AMM 24-22-00/201, Electric Power Control
      (3) AMM 36-00-00/201, Pneumatic - General
   B. Access
      (1) Location Zone
          136 Environmental Control System Bay (Right)
          144 Main Landing Gear Wheel Well (Right)

      (2) Access Panel
          194ER ECS Components
   C. Prepare for the Removal

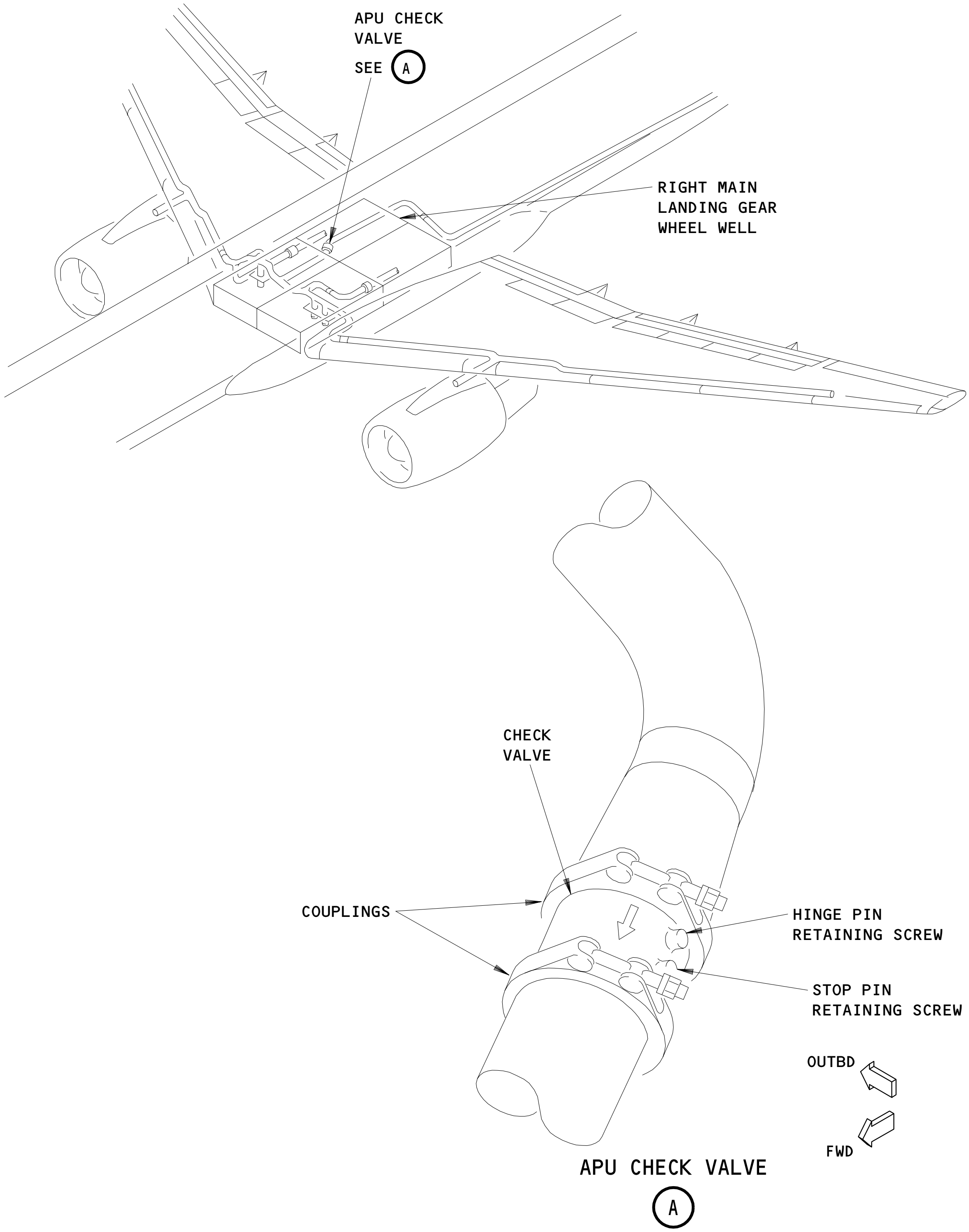
      S 864-002
      (1) Supply electrical power (AMM 24-22-00/201).

      S 864-001

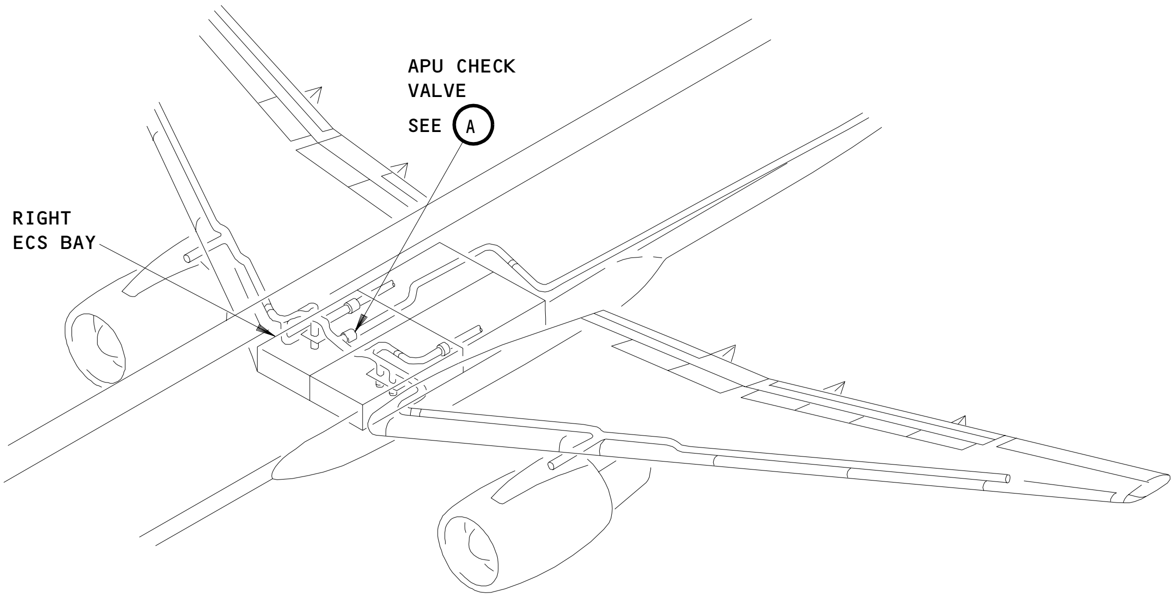
      WARNING: RELEASE THE PRESSURE IN THE PNEUMATIC DUCT BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. THE HOT, HIGH PRESSURE AIR CAN CAUSE INJURY TO PERSONS.

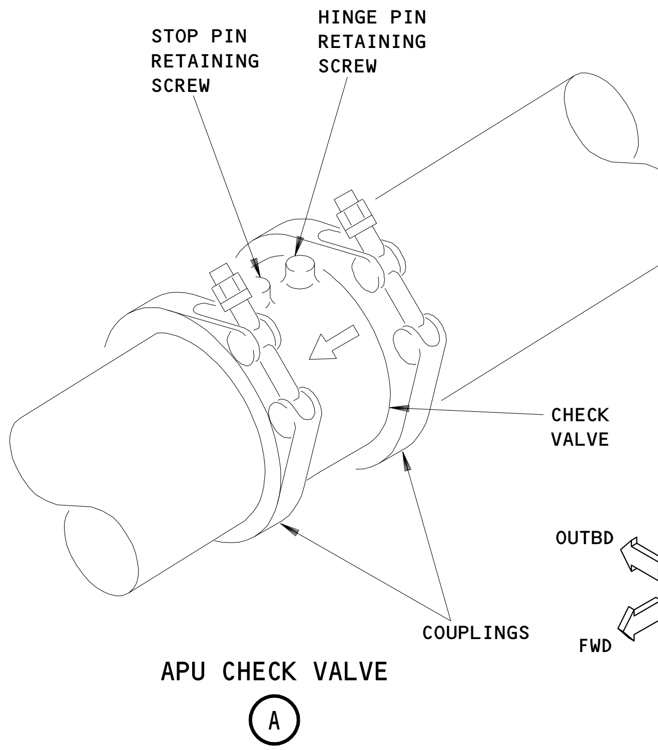
      (2) Remove pneumatic power (AMM 36-00-00/201).

          NOTE: Pressure is released when the system is not in operation.



APU Check Valve Installation
Figure 401





APU Check Valve Installation
Figure 401A

S 014-027
(3) AIRPLANES WITH APU CHECK VALVE IN THE RIGHT ECS BAY;
Open the right access door for the environmental control systems bay 194ER (AMM 06-41-00/201).

D. Remove the APU Check Valve

S 034-003
(1) Loosen the couplings at each side of the valve.

S 034-004
(2) Hold the valve and move the couplings along the duct.

S 024-005
(3) Remove the valve.

S 494-006
(4) Install a cover on the duct opening to keep out unwanted material.

TASK 36-11-11-404-007

3. Install the APU Check Valve (Fig. 401)

A. References
(1) AMM 06-41-00/201, Fuselage Access Doors and Panel
(2) AMM 24-22-00/201, Electric Power Control
(3) AMM 36-00-00/201, Pneumatic - General

B. Access
(1) Location Zone
136 Environmental Control System Bay (Right)
144 Main Landing Gear Wheel Well (Right)

(2) Access Panel
194ER ECS Components

C. Procedure

S 094-008
(1) Remove the duct covers.

S 424-009
(2) Install the valve in the duct. Make sure the flow arrow points in the forward direction and the hinge pin retaining screw is up.

S 434-010
(3) Install a coupling on each side of the valve.

NOTE: If access and clearance permit, stagger the valve couplings and tighten to the stated torque value.

S 434-011
(4) Tighten the coupling nut to 50-60 pound-inches.

D. Do a test of the APU check valve.

S 864-012

(1) Supply pneumatic pressure with the APU (AMM 36-00-00/201).

S 864-020

(2) Push the APU control switch-light on the pilots overhead panel, P5, to the open position.
   (a) Make sure the VALVE light comes on and then goes off.

S 214-014

(3) Make sure the left BLEED AIR dual DUCT PRESS indication shows a positive pressure.

S 794-013

(4) Do a test of the valve flanges for air leakage.
   (a) Small air leakage is satisfactory.
   (b) You must repair large air leakage with joint or clamp adjustment.

   NOTE: Large air leakage is when you feel the airflow with your hand at a distance of 12 inches or greater from a point on the duct joint.

S 864-021

(5) Push the APU control switch-light, on the P5 panel, to the closed position.

S 214-024

(6) Make sure VALVE light comes on and then goes off.

E. Put the Airplane Back to Its Usual Condition

S 864-017

(1) Remove pneumatic power if it is not necessary (AMM 36-00-00/201).

S 414-029

(2) AIRPLANES WITH APU CHECK VALVE IN THE RIGHT ECS BAY;
Close the right access door for the environmental control systems bay 194ER (AMM 06-41-00/201).

S 864-016

(3) Remove electrical power, if it is not necessary (AMM 24-22-00/201).

APU CHECK VALVE - INSPECTION/CHECK

TASK 36-11-11-206-001

1. Examine the APU Check Valve

A. References
   (1) AMM 36-11-11/401, APU Check Valve

B. Access
   (1) Location Zone
       136 Environmental Control System Bay (Right)
       144 Main Landing Gear Wheel Well (Right)

   (2) Access Panel
       194ER ECS Components

C. Procedure

   S 026-002
   (1) Remove the APU check valve (AMM 36-11-11/401).

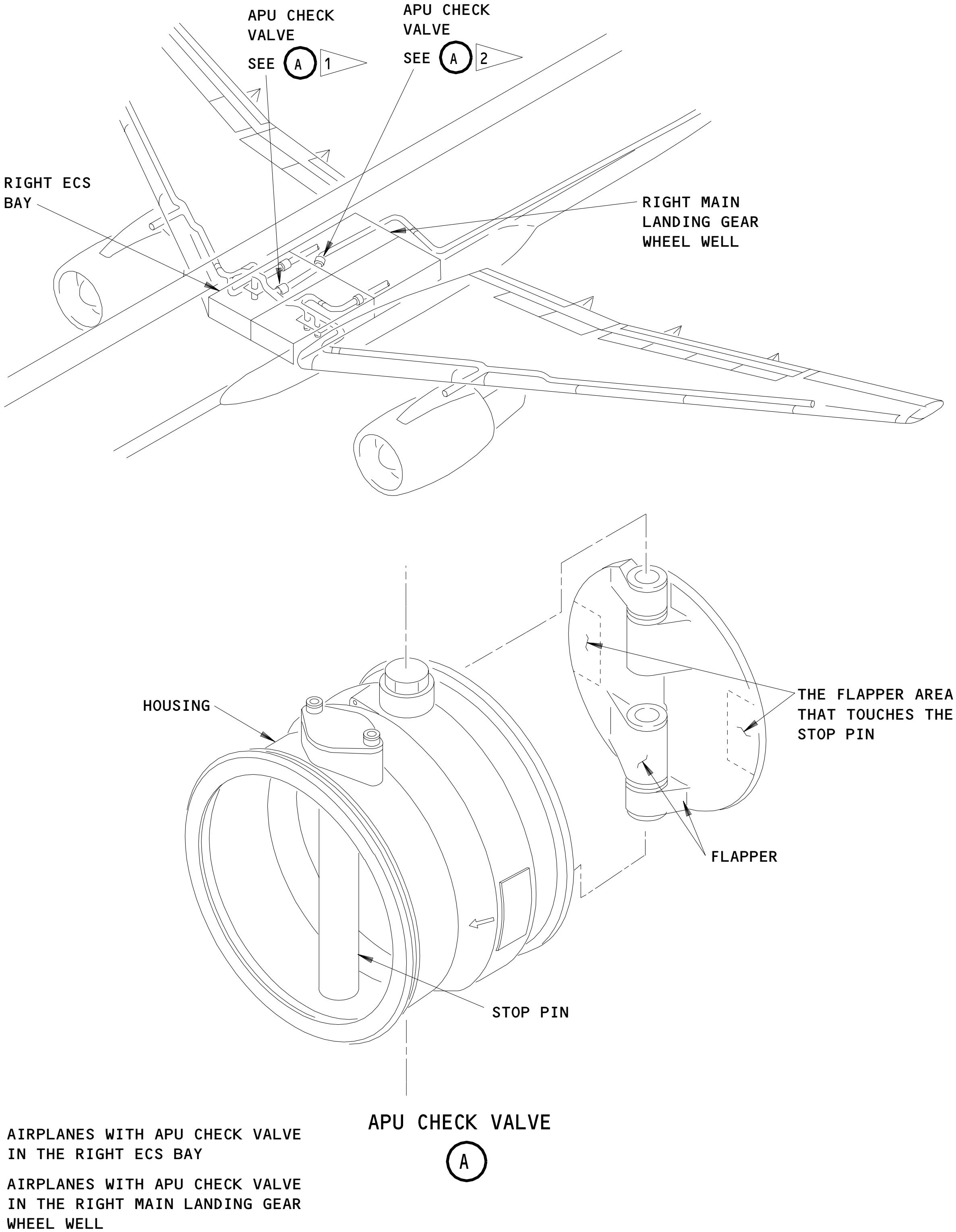
   S 216-003
   (2) Examine the APU check valve for these items:
       (a) Screws that are not there but must be there.
       (b) Cracks or corrosion in the valve housing.
       (c) The flappers, springs, stop tube and hinge pin that have cracks or are damaged.
       (d) Clearance between the surfaces of the flappers and the valve body that seal.
       (e) Carbon streaks or dirt particles (this shows valve leakage in the closed position).
       (f) Make sure the thickness of the flappers in the area that touches the stop pin is not less than 0.095 inch.

   S 966-004
   (3) If you find one of the above conditions, replace the check valve (AMM 36-11-11/401).

   S 436-005
   (4) Tighten all the loose screws.

   S 966-006
   (5) Replace all the lockwire that is damaged. Install the lockwire that is not there but must be there.

   S 426-007
   (6) Install the APU check valve (AMM 36-11-11/401).



1 AIRPLANES WITH APU CHECK VALVE IN THE RIGHT ECS BAY

2 AIRPLANES WITH APU CHECK VALVE IN THE RIGHT MAIN LANDING GEAR WHEEL WELL

APU Check Valve Inspection
Figure 601

ECS BLEED CONFIGURATION CARD REMOVAL/INSTALLATION

1. General
   A. There are two (left and right) ECS bleed configuration cards in the P50 card file panel.

TASK 36-11-12-004-001

2. Remove the ECS Bleed Configuration Card (Fig. 401)
   A. References
      (1) AMM 6-41-00/201, Fuselage Access Doors and Panels.
      (2) AMM 20-10-01, E/E Mounted Components
      (3) AMM 20-41-01/201, Electrostatic Sensitive Devices
      (4) AMM 24-22-00/201, Electrical Power Control
   B. Access
      (1) Location Zone
          119 Main Equipment Center (Left)

      (2) Access Panel
          119BL Main Equipment Center

   C. Prepare for the Removal

      S 864-003
      (1) Supply electrical power (AMM 24-22-00/201).

      S 864-002
      (2) Open the applicable circuit breaker on the overhead circuit breaker panel, P11, and attach a DO-NOT-CLOSE tag:
          (a) 11Q10, ENG BLEED L
          (b) 11Q19, R ENG BLEED

      S 014-004
      (3) Open the access door for the main equipment center, 119BL (AMM 06-41-00/201).

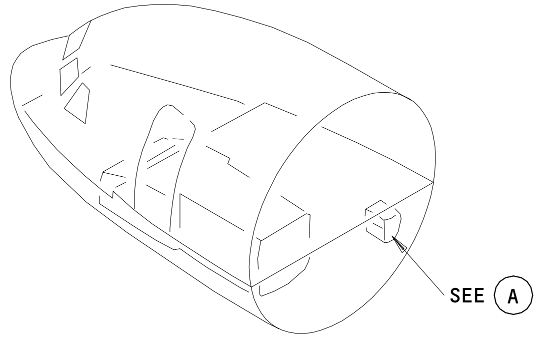
      S 014-005
      (4) Open the P50 panel door and find the card.
   D. Remove the ECS Bleed Configuration Card

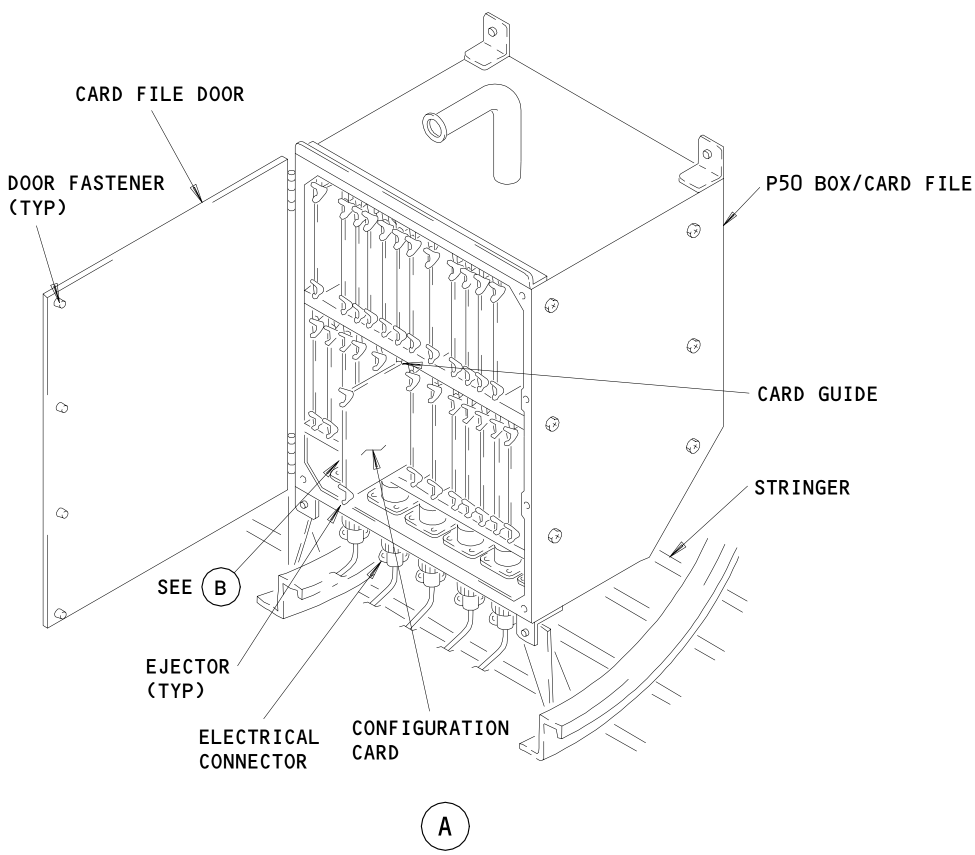
      S 024-007

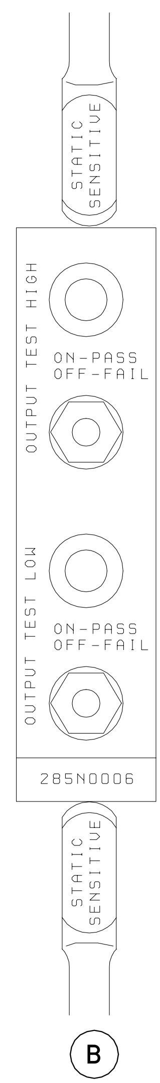
      CAUTION: DO NOT TOUCH THE ECS BLEED CONFIGURATION CARD BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE ECS BLEED CONFIGURATION CARD.

      (1) Do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-41-01/201).

      S 024-019
      (2) Remove the card (AMM 20-10-01).







ECS Bleed Configuration Card
Figure 401

TASK 36-11-12-404-008

3. Install the ECS Bleed Configuration Card (Fig. 401)

A. References
   (1) AMM 6-41-00/201, Fuselage Access Doors and Panels.
   (2) AMM 20-10-01, E/E Mounted Components
   (3) AMM 20-41-01/201, Electrostatic Sensitive Devices
   (4) AMM 24-22-00/201, Electrical Power Control

B. Access
   (1) Location Zone
       119   Main Equipment Center (Left)

   (2) Access Panel
       119BL   Main Equipment Center

C. Procedure

   S 424-009

   CAUTION: DO NOT TOUCH THE ECS BLEED CONFIGURATION CARD BEFORE YOU DO THE PROCEDURE FOR DEVICES THAT ARE SENSITIVE TO ELECTROSTATIC DISCHARGE. ELECTROSTATIC DISCHARGE CAN CAUSE DAMAGE TO THE ECS BLEED CONFIGURATION CARD.

   (1) Do the procedure for devices that are sensitive to electrostatic discharge (AMM 20-41-01/201).

   S 424-010
   (2) Install the card (AMM 20-10-01).

   S 864-011
   (3) Remove the DO-NOT-CLOSE tag and close the applicable circuit breaker on the P11 panel:
       (a) 11Q10, ENG BLEED L
       (b) 11Q19, R ENG BLEED

D. Do a test of the card.

   S 214-012
   (1) Push the OUTPUT TEST LOW pushbutton.
       (a) Make sure the light comes on.

   S 964-013
   (2) Replace the card if the light does not come on.

   S 214-014
   (3) Push the OUTPUT TEST HIGH pushbutton.
       (a) Make sure the light comes on.

S 964-015
(4) Replace the card if the light does not come on.

E. Put the Airplane Back to Its Usual Condition

S 414-016
(1) Close the P50 panel door.

S 864-017
(2) Remove the electrical power if it is not necessary (AMM 24-22-00/201).

S 414-018
(3) Close the access door for the main equipment center, 119BL.

AIR SUPPLY OVERTEMPERATURE LIMITING SENSOR (450°F) - REMOVAL/INSTALLATION

1. General
   A. This procedure has these tasks:
      (1) Overtemperature Limiting Sensor (Sensor) Removal.
      (2) Sensor Installation.

TASK 36-11-13-004-002

2. Sensor Removal (Fig. 401)
   A. References
      (1) AMM 36-00-00/201, Pneumatic - General
      (2) AMM 54-53-01/401, Strut Pressure Relief and Access Doors
      (3) AMM 78-31-00/201, Thrust Reverser System
   B. Access
      (1) Location Zones

434/444	Nacelle Strut - Aft Fairing

      (2) Access Panels

434AL/444AL	Hydraulic Installation Access Panel

   C. Prepare for the Removal

S 864-039

WARNING: RELEASE THE PRESSURE IN THE PNEUMATIC DUCT BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. THE HOT, HIGH-PRESSURE AIR CAN CAUSE INJURY.

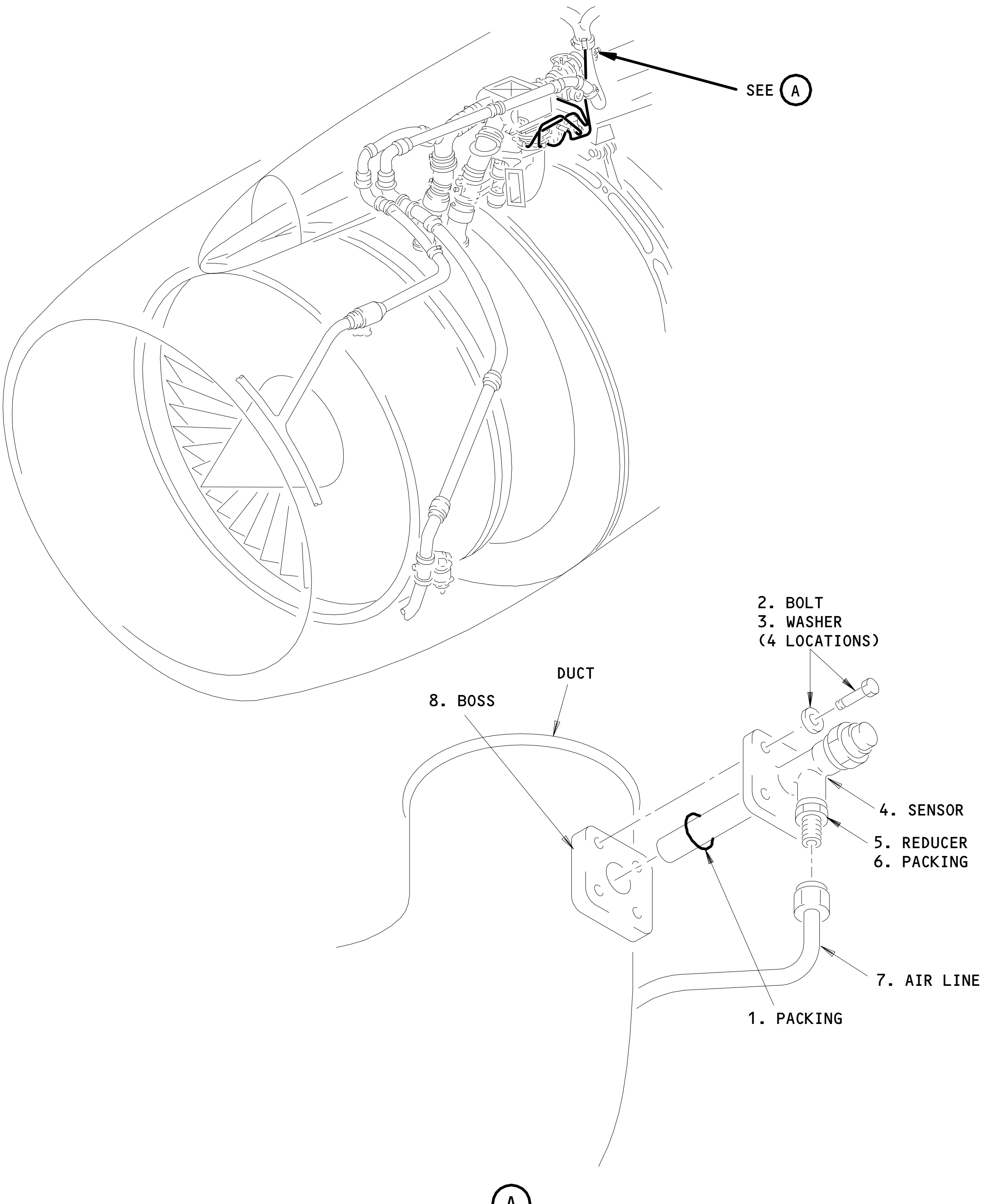
      (1) Remove pneumatic power (AMM 36-00-00/201).

NOTE: Pressure is released when the system is not in operation.

S 864-052

WARNING: DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

      (2) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).



Air Supply Overtemperature Limiting Sensor - Installation
Figure 401

S 014-048
(3) Open the applicable left or right access door on the aft strut, 434AL or 444AL.

S 014-006
(4) Keep the door open with a rod (AMM 06-43-00/201).

S 014-008
(5) Remove the applicable left or right bulkhead coverplate assembly (AMM 54-53-01/401).

D. Sensor Removal

S 984-050

CAUTION: SENSOR CAN BE DAMAGED IF DROPPED OR MISHANDLED. IF SENSOR IS DROPPED, RETURN IT TO THE SHOP OR SUPPLIER FOR CALIBRATION.

(1) Disconnect the air line (7).

S 034-016
(2) Remove the bolts (2) and washers (3).

S 024-017
(3) Carefully tilt the sensor (4) body down.

S 024-018
(4) Move the air line (7) away from the structure.

S 024-019
(5) Remove the sensor (4) and packing (1).
(a) Discard the packing (1).

S 024-049
(6) Remove the reducer (5) and packing (6).
(a) Discard the packing (6).

S 494-020
(7) Put a cover on the duct hole to keep out unwanted objects.

TASK 36-11-13-404-021

3. Sensor Installation (Fig. 401)

A. Consumable Materials

(1) D00006 Antiseize Compound - BOSTIK NEVER-SEEZ

B. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	1	Packing	36-11-13	01	20
	2	Bolt			5
	3	Washer			10
	4	Sensor			15
	5	Reducer			25
	6	Packing			30

C. References
(1) AMM 54-53-01/401, Strut Pressure Relief and Access Doors
(2) AMM 78-31-00/201, Thrust Reverser System

D. Access
(1) Location Zones
434/444 Nacelle Strut - Aft Fairing

(2) Access Panels
434AL/444AL Hydraulic Installation Access Panel

E. Procedure

S 094-022
(1) Remove the duct cover.

S 984-051

CAUTION: SENSOR CAN BE DAMAGED IF DROPPED OR MISHANDLED. IF SENSOR IS DROPPED, RETURN IT TO THE SHOP OR SUPPLIER FOR CALIBRATION.

(2) Do these steps to install the sensor (4):
(a) Apply antisieze compound and install the reducer (5) with new packing (6).
(b) Install new packing (1) on the sensor (4).
(c) Install the sensor (4) with the washers (3) and bolts (2).

S 644-043
(3) Apply the antiseize compound to the air line connection on the sensor (4).

S 434-031
(4) Connect the air line (7).

F. Put the Airplane Back to Its Usual Condition

S 414-034

(1) Install the applicable bulkhead coverplate assembly (AMM 54-53-01/401).

S 414-035

(2) Close the applicable access door on the aft strut 434AL or 444AL.

S 444-037

(3) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

AIR SUPPLY ALTITUDE SWITCH REMOVAL/INSTALLATION

1. General
   A. This procedure has a task to remove the air supply altitude switches and a task to install the air supply altitude switches. The procedures for the two altitude switches are the same.
   B. The switches are installed forward of the air-conditioning packs and approximately at Sta 901, WL 160, and RBL 38.
   C. The altitude switch is operated at 31,000 feet altitude, which causes a lower high pressure bleed air schedule.

TASK 36-11-14-004-009

2. Remove the Air Supply Altitude Switch (Fig. 401)
   A. References
      (1) AMM 06-41-00/201, Fuselage Access Doors and Panels
   B. Access
      (1) Location Zone
          136 Environmental Control System bay (Right)

      (2) Access Panel
          194ER Environmental Control System Access door

   C. Procedure

      S 864-003
      (1) Open the applicable circuit breaker on the overhead circuit breaker panel, P11, and attach a DO-NOT-CLOSE tag:
          (a) 11Q27, R HI STG SW OVER
          (b) 11Q18, L HI STG SW OVER

      S 014-004
      (2) Open the right access door for the environmental control system components (194ER) (Ref 06-41-00).

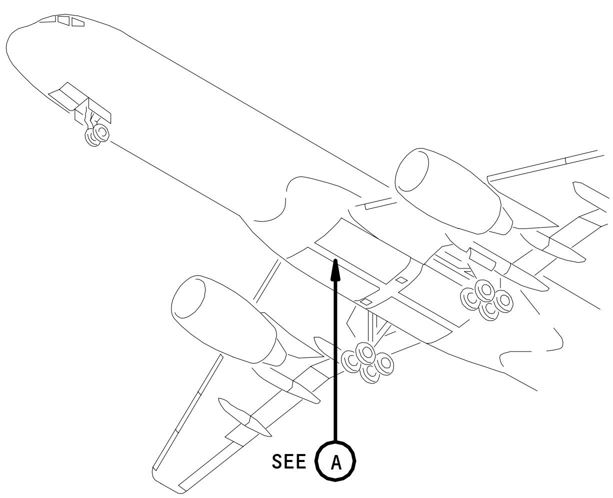
      S 034-005
      (3) Disconnect the electrical connector from the altitude switch.

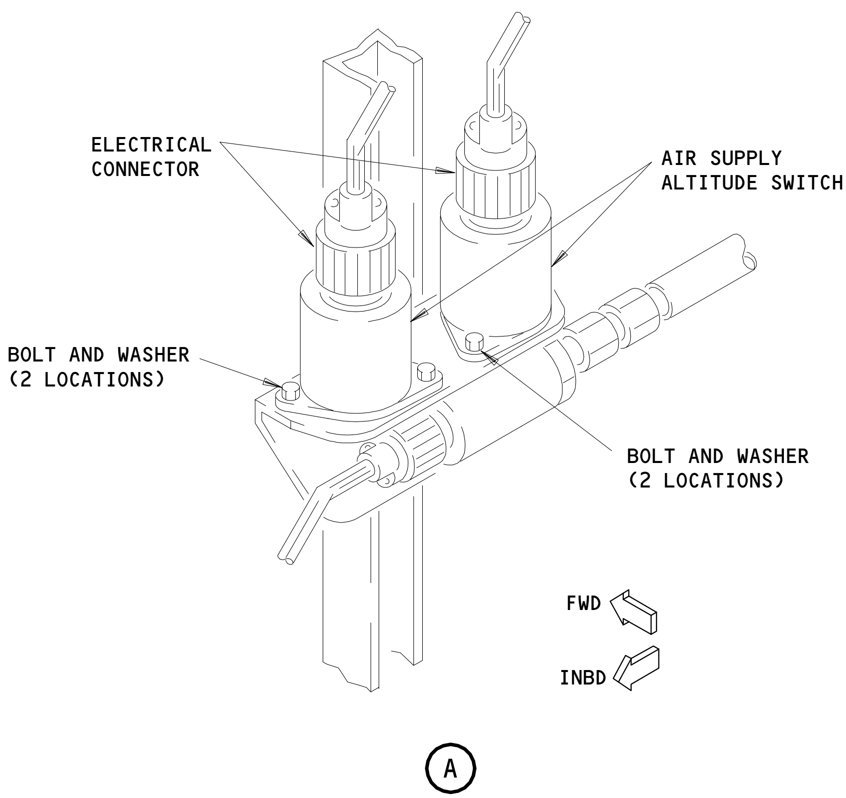
      S 034-006
      (4) Remove the bolts that hold the altitude switch to the bracket support.

      S 024-007
      (5) Remove the altitude switch.

TASK 36-11-14-404-008

3. Install the Air Supply Altitude Switch (Fig. 401)
   A. Access
      (1) Location Zone
          136 Environmental Control System bay (Right)





Air Supply Altitude Switch - Installation
Figure 401

(2) Access Panel
194ER Environmental Control System Access door

B. Procedure

S 424-010
(1) Install the altitude switch on the bracket support.

S 434-011
(2) Install the bolts and washers.

S 434-001
(3) Tighten the bolts.

S 434-012
(4) Install the electrical connector.

S 864-014
(5) Remove the DO-NOT-CLOSE tag and close the applicable circuit breaker on the P11 panel:
(a) 11Q27, R HI STG SW OVER
(b) 11Q18, L HI STG SW OVER

S 414-015
(6) Close the access door for the environmental control system components (194ER).

AIR SUPPLY PRECOOLER REMOVAL/INSTALLATION

1. General
   A. This procedure includes the removal and installation of the air supply precooler. The precooler is in the strut above the engines.

TASK 36-11-15-004-001

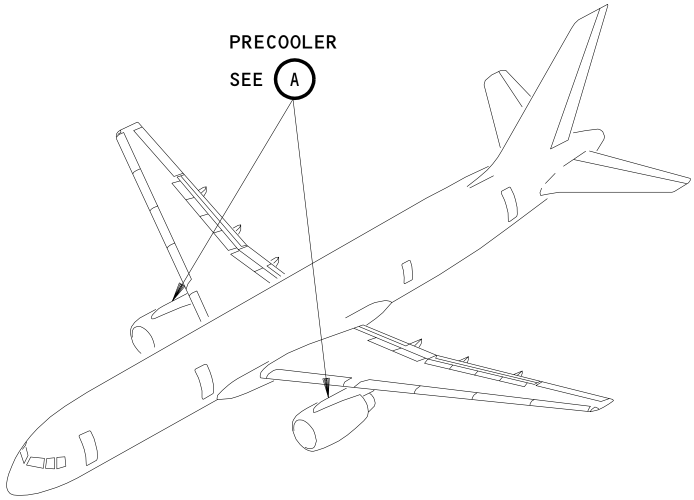
2. Remove The Air Supply Precooler (Fig. 401).
   A. Equipment
      (1) Precooler Removal/Installation Platform (B36001-1).
   B. References
      (1) AMM 06-43-00/201, Engine Nacelle Access Doors and Panels.
      (2) AMM 20-10-23/401, Standard Practices - Lockwire
      (3) AMM 24-22-00/201, Electric Power Control.
      (4) AMM 36-00-00/201, Pneumatic - General.
      (5) AMM 36-11-06/401, Intermediate Pressure Check Valve
      (6) AMM 36-11-09/201, Air Supply Pressure Regulating and Shutoff Valve
      (7) AMM 78-31-00/201, Thrust Reversers
   C. Access
      (1) Location Zones
         415/426 Fan reverser
      (2) Access Panels
         415BL/426BR C-Duct Hinge Access Panel
         433CL/433JR/443CR/443JL Precooler Access Panel
         433HR/443HL Intermediate Pressure Check Valve Access Panel
   D. Prepare for the Removal

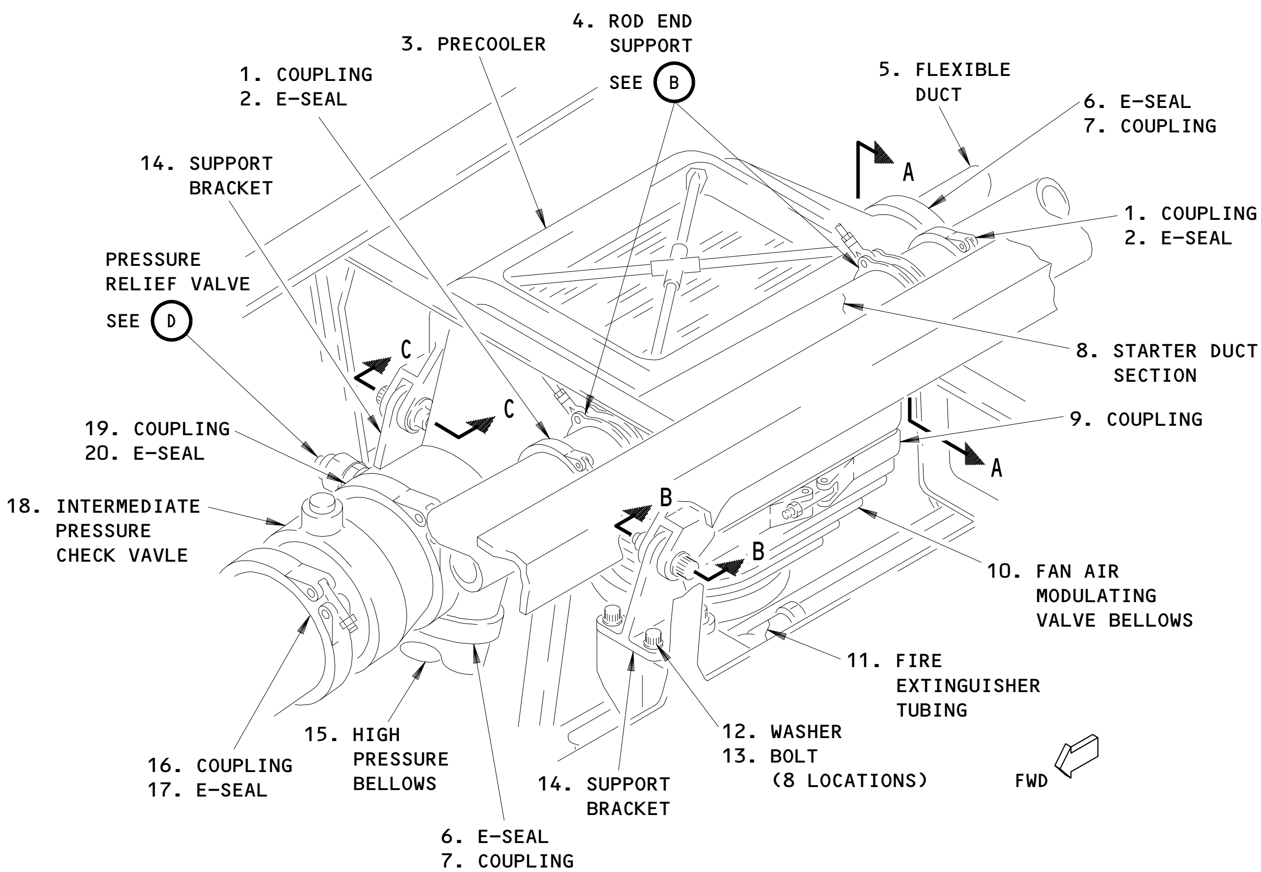
      S 864-002
      (1) Supply electrical power (AMM 24-22-00/201).

      S 864-090

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.

      (2) Remove pneumatic power (AMM 36-00-00/201).

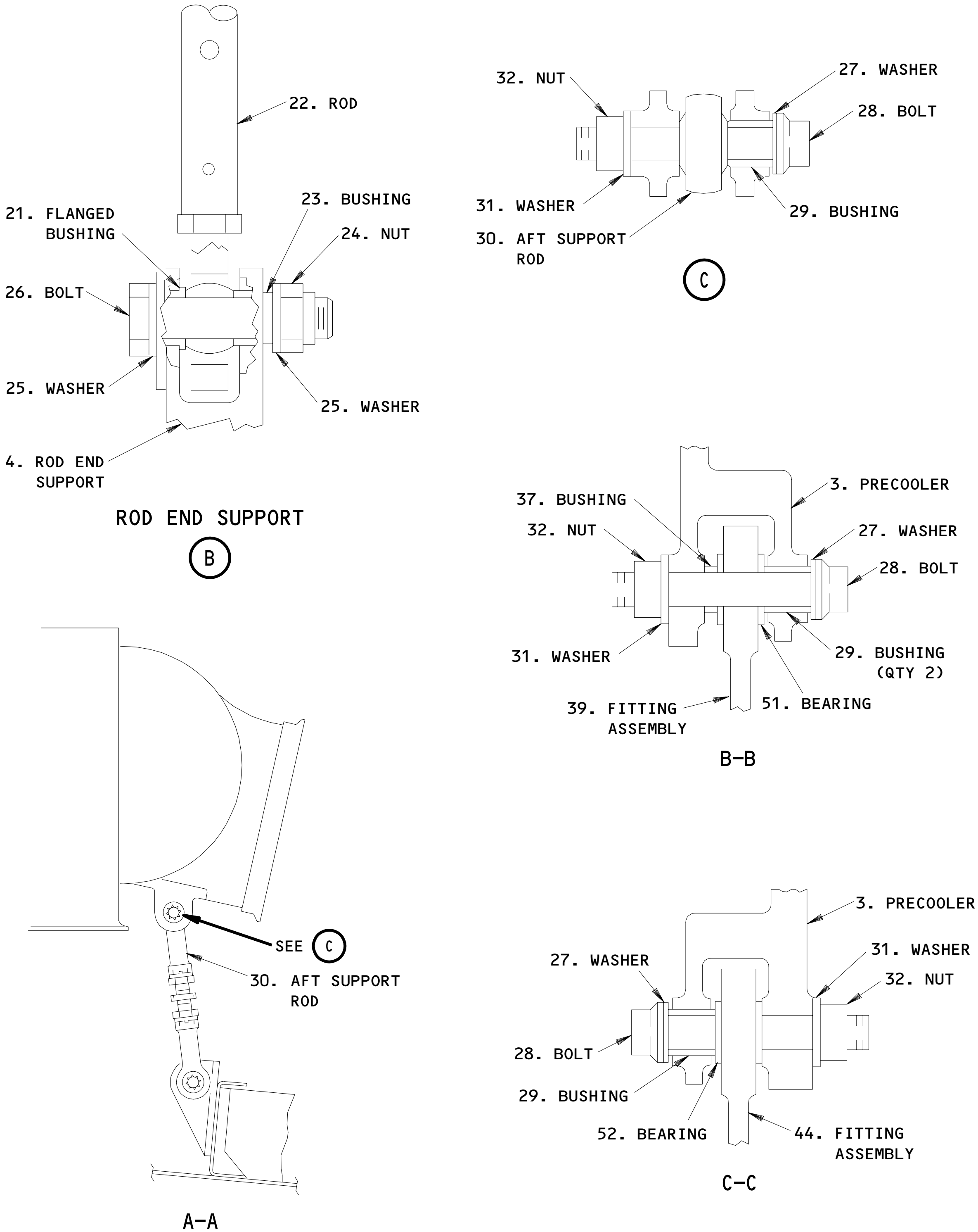




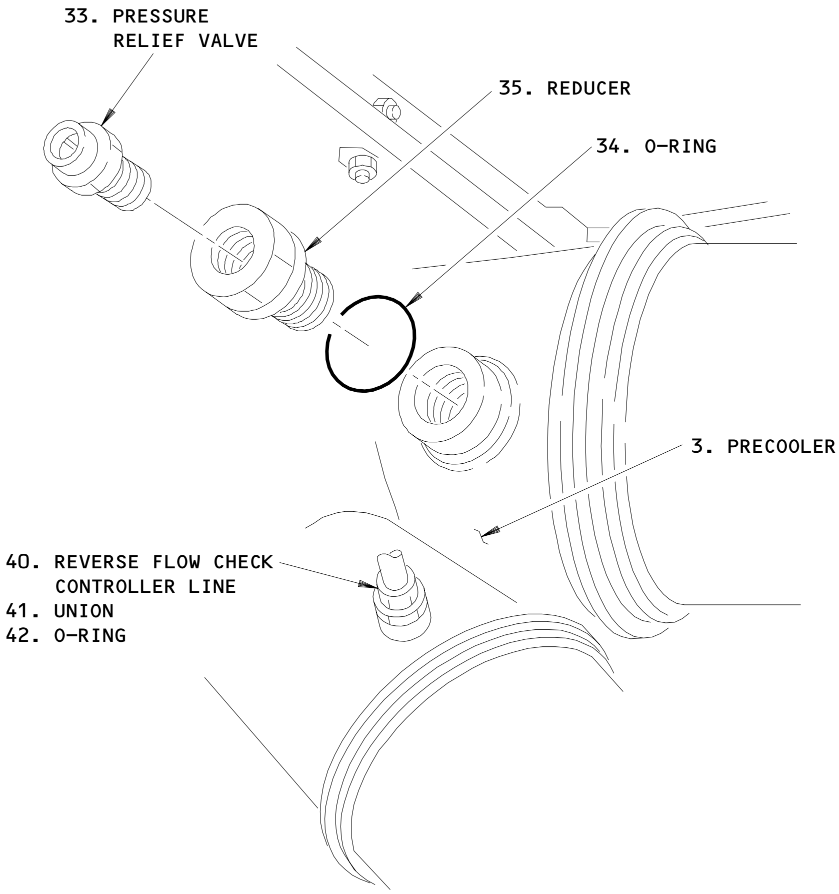
PRECOOLER
A

Air Supply Precooler Installation
Figure 401 (Sheet 1)

139302



Air Supply Precooler Installation
Figure 401 (Sheet 2)



PRESSURE RELIEF VALVE
D

Air Supply Precooler Installation
Figure 401 (Sheet 3)

S 864-081

WARNING: DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(3) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

S 014-004

(4) Remove the access panels that follow to get access to the left precooler.
   (a) The C-duct hinge access fairing (415BL) (AMM 06-43-00/201).
   (b) The precooler access and removal panel (433CL) (AMM 06-43-00/201).
   (c) The precooler removal panel (433JR) (AMM 06-43-00/201).
   (d) The access panel for the intermediate pressure (IP) check valve (433HR) (AMM 06-43-00/201).

S 014-005

(5) Remove the access panels that follow to get access to the right precooler.
   (a) The C-duct hinge access fairing (426BR) (AMM 06-43-00/201).
   (b) The precooler access and removal panel (443CR) (AMM 06-43-00/201).
   (c) The precooler removal panel (443JL) (AMM 06-43-00/201).
   (d) The access panel for the IP check valve (443HL) (AMM 06-43-00/201).

E. Remove the Precooler

S 434-006

(1) Remove the coupling (9) between the precooler (3) and the modulating valve bellows (10).

S 864-007

(2) Push in the modulating valve bellows (10).

S 494-008

CAUTION: MAKE SURE THE PRECOOLER REMOVAL/INSTALLATION PLATFORM DOES NOT CONTACT THE FIRE EXTINGUISHER TUBE. THE INCORRECT INSTALLATION OF THE PLATFORM CAN CAUSE DAMAGE TO EQUIPMENT.

(3) Install the precooler removal/installation platform.

S 434-009

(4) Install the screws (kept in the platform) to hold the platform to the panel frame.

S 434-010

(5) To remove the left precooler:
   (a) Remove the rod end supports (22) from the starter duct section (8).
   (b) Remove the couplings (1) from the ends of the starter duct section (8).
   (c) Remove the starter duct section (8).
   (d) Remove the E-seals (2) from the starter duct flanges.

S 034-011

(6) Remove the coupling (7) between the precooler (3) and the aft flexible duct (5).

S 034-012

(7) Remove the couplings (16, 19) from each side of the IP check valve (18).

S 014-013

(8) Remove the IP check valve (18).

S 034-017

(9) Remove the pressure relief valve (33), reducer (35) and O-ring (34) from the precooler inlet.
   (a) Discard the O-ring (34).
   (b) Keep the pressure relief valve (33) and reducer (35) for installation.

S 034-018

(10) Disconnect the line for the reverse flow check controller (40) from the precooler (3).

S 034-019

(11) Remove the union (41) and O-ring (42) from the precooler (3).
   (a) Discard the O-ring.

S 034-020

(12) Remove the coupling (7) between the precooler (3) and the high pressure bellows (15).

S 034-021

(13) Remove the bolt (28) from the aft support rod of the precooler (30).

S 034-022

(14) Remove the bolts (28) from the left and right precooler support brackets (14).

S 034-023

(15) Remove the bolts (13) that hold the precooler support brackets (14) in position.

S 034-024
(16) Remove the precooler support brackets (14).

S 024-025
(17) Move the precooler (3) forward approximately 4 inches.

S 024-043
(18) Turn the aft end of the precooler (3) 60 degrees.

S 024-026
(19) Pull the aft end of the precooler (3) through the precooler access.

S 024-028
(20) Start to pull the precooler out through the access panel.

S 024-029
(21) Remove the precooler (3) at a 15 degree angle in the downward direction so the HP2 duct can clear the opening.

S 034-030
(22) Remove the E-seals (6, 17, 20) from all the flanges.

S 494-031
(23) Install covers on all the duct openings in the strut to keep out unwanted objects.

TASK 36-11-15-404-034

3. Install The Air Supply Precooler (Fig. 401)

A. Consumable Materials
   (1) D00006 Antiseize Compound, Bostik Never-Seez

B. Equipment
   (1) Precooler Removal/Installation Platform (B36001-1)

C. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	2	E-seal	80-11-51	01	40
401	3	Precooler	36-11-01	01	170
401	6	E-seal	36-11-01	01	130
401	17	E-seal	36-11-01	01	135
401	20	E-seal	36-11-01	01	140
401	34	O-ring	36-11-01	01	144
401	42	O-ring	36-11-18	03	145
401	42	O-ring	36-11-18	04	140

D. References
   (1) AMM 06-43-00/201, Engine Nacelle Access Doors and Panels.
   (2) AMM 20-10-23/401, Standard Practices - Lockwire
   (3) AMM 24-22-00/201, Electric Power Control.
   (4) AMM 36-00-00/201, Pneumatic - General.
   (5) AMM 36-11-06/401, Intermediate Pressure Check Valve
   (6) AMM 36-11-09/201, Air Supply Pressure Regulating and Shutoff Valve
   (7) AMM 78-31-00/201, Thrust Reverser System

E. Access
   (1) Location Zones
       415/426 Fan reverser
   (2) Access Panels
       415BL/426BR C-Duct Hinge Access Panel
       433CL/433JR/443CR/443JL Precooler Access Panel
       433HR/443HL Intermediate Pressure Check Valve Access Panel

F. Procedure

   S 094-035
   (1) Remove the duct covers.

   S 644-085
   (2) Apply the antiseize compound on the pressure relief valve (33).

   S 434-037
   (3) Install the used reducer (35) on the pressure relief valve (33).

   S 434-108
   (4) Install a new O-ring on the reducer (35).

   S 644-086
   (5) Apply the antiseize compound on the reducer (35).

   S 434-038
   (6) Install the pressure relief valve (33), reducer (35) and O-ring (34) into the precooler (3).

S 214-039
(7) Examine the flange surfaces that seal for cracks, dents, unwanted material or other damage.

S 424-075
(8) Put the precooler (3) in front of the precooler access.
(a) Make sure the dual duct opening on the precooler is inboard.

S 424-040
(9) Move the aft end of the precooler downward at approximately a 15 degree angle.

S 424-041
(10) Install the precooler through precooler access panel.

S 424-042
(11) Turn the aft end of the precooler 60 degrees to the rear.

S 434-044
(12) Install the bolts (13) and washers (12) to the precooler support brackets (14).
(a) Do not tighten the bolts.

S 434-045
(13) Install the bolt (28), washers (27, 31), bushings (two) (29, 37) and nut (32) to attach the precooler to the forward left support bracket (39).

S 434-046
(14) Tighten the nut (32) to 110-140 pound inches.

S 434-047
(15) Install the bolt (28), washers (27, 31), bushing (29) and nut (32) to attach the forward right support bracket (44).

S 434-048
(16) Tighten the nut (32) to 110-140 pound inches.

S 434-049
(17) Put the aft support rod (30) into position on the precooler (3).

S 434-050
(18) Install the bolt (28), washer (27, 31), bushing (29) and nut (32) to the aft support rod (30) and the precooler (3).

S 434-051
(19) Tighten the nut (32) to 110-140 pound-inches.

S 434-052
(20) Tighten the bolts (13) on the precooler support brackets (14) to 70-85 pound-inches.

S 824-074
(21) Align the opposite flanges to a maximum distance of 0.03 inches at each point.
(a) Align the duct if it is necessary.
(b) Align the flanges without the use of force.

S 434-053
(22) Install an E-seal (6) in the precooler (3).

S 434-054
(23) Install the high pressure bellows (15) against the precooler flange.

S 434-080
(24) Install a coupling (7) between the precooler (3) and the high pressure bellows (15).

S 434-055
(25) Tighten the coupling (7) nut on the joint between the precooler and the high pressure bellows (15) to 110-120 pound-inches.

S 434-056
(26) Install the IP check valve (18) (AMM 36-11-06/401).

S 644-087
(27) Apply the antiseize compound to the threads of the union (41).

S 434-057
(28) Install the union (41) and new O-ring (42) on the precooler (3).

S 644-082
(29) Apply the antiseize compound to the threads of the line for the reverse flow check controller (40).

S 434-058
(30) Connect the line for the reverse flow check controller (40) to the union (41).
  (a) Tighten the line.

S 434-065
(31) If applicable, install a lockwire from the pressure relief valve (33) to the reducer (35) (AMM 20-10-23/401).

S 434-066
(32) If applicable, install a lockwire from the reducer (35) to the precooler (3) (AMM 20-10-23/401).

S 434-079
(33) Install an E-seal (6) between the precooler (3) and the flexible duct (5).
  (a) Install the coupling (7).
  (b) Tighten the coupling nut.

S 434-077
(34) To install the left precooler:
  (a) Install the E-seals (2) in the starter duct section (8).
  (b) Install the couplings (1) at the starter duct section (8).
  (c) Tighten the coupling nuts (1) to 110-120 pound-inches.
  (d) Install the support rods (two) (22) to the starter duct section (8).
  (e) Install the bolt (26), washer (two) (25), bushing (23), flanged bushing (21) and nut (24) on the two support rods (22) on the starter duct section (8).
    1) Tighten the nut (24) and bolt (26) to 50-70 pound-inches.

S 864-067
(35) Push in the modulating valve bellows (10).

S 094-068
(36) Remove the precooler removal/installation platform (B36001-1).

S 434-069
(37) Install the coupling (9) between the precooler (3) and the modulating valve bellows (10).
  (a) Tighten the coupling nut (9) to 35-45 pound-inches.

S 794-070
(38) Do a test of the precooler for air leakage:
  (a) Pressurize the pneumatic system upstream of the air supply pressure regulating and shutoff valve (PRSOV) (AMM 36-11-09/201).
  (b) Do a check for air leakage at the precooler.
    1) Small air leakage is satisfactory.
    2) Repair large leakage by joint or clamp adjustment.

(c) Remove the pneumatic ground source.
(d) Put the air supply PRSOV back to its usual condition (AMM 36-11-09/201).

G. Put the Airplane Back to Its Usual Condition

S 414-071
(1) Install the applicable access panels (415BL, 426BR, 433CL, 433JR, 433HR, 443CR, 443JL, 443HL).

S 444-072
(2) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 864-073
(3) Remove electrical power if it is not necessary (AMM 24-22-00/201).

AIR SUPPLY PRECOOLER - INSPECTION/CHECK

1. General
   A. This procedure will show how tightly the air supply precooler is installed. The procedure will also show if the precooler has manifold damage.

TASK 36-11-15-206-001

2. Do a Check of the Air Supply Precooler
   A. References
      (1) AMM 36-11-06/401, Intermediate Pressure Check Valve
      (2) AMM 36-11-15/401, Air Supply Precooler
      (3) AMM 36-11-16/401, Fan Air Modulating Valve
      (4) AMM 78-31-00/201, Thrust Reverser System
   B. Access
      (1) Location Zones
          433/443 Nacelle Strut-Mid-Structure

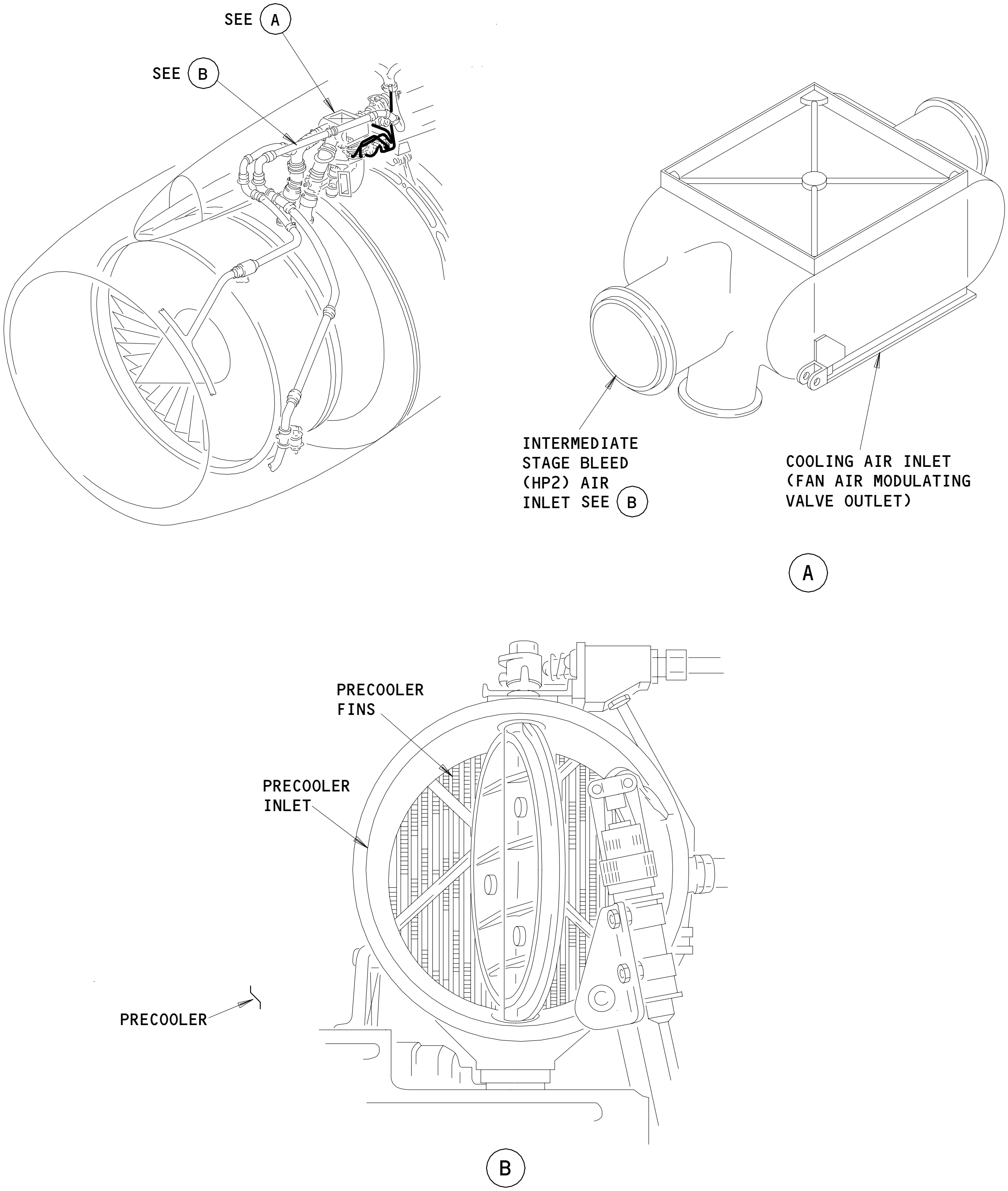
      (2) Access Panel
          433CL/433JR Precooler Access (left)
          443CR/443JL Precooler Access (right)

   C. Procedure

      S 016-025
      (1) Do these steps to get access:

      WARNING: DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

         (a) Do the deactivation procedure for the thrust reverser for Ground Maintenance (AMM 78-31-00/201).
         (b) Remove the access panels that follow to get access to the right engine precooler.
             1) The precooler access and removal panel (443CR).
             2) The precooler removal panel (443JL).



Air Supply Precooler Inlets
Figure 601

(c) Remove the access panels that follow to get access to the left engine precooler.
   1) The precooler access and removal panel (433CL).
   2) The precooler removal panel (433JR).

S 216-005
(2) Do a check of the precooler supports for damage.

S 016-006
(3) Remove the check valve for the Intermediate Pressure (IP) (Ref 36-11-06).

S 016-008
(4) Remove the fan air modulating valve (AMM 36-11-16/401).

S 216-009
(5) Do a check of the precooler fins for unwanted material, dirt, and bent or clogged fins (Fig. 601).

S 216-010
(6) Do a check of the precooler for carbon particles because of air leakage and cracks.

S 866-011
(7) Replace the precooler if the fins are clogged or damaged sufficient to decrease correct airflow (AMM 36-11-15/401).

S 866-019
(8) Replace the precooler if the structural supports are damaged.

S 416-012
(9) Install the IP check valve (AMM 36-11-06/401).

S 416-014
(10) Install the modulating valve (AMM 36-11-16/401).

D. Put the Airplane Back to Its Usual Condition

S 416-015
(1) Install the precooler access and removal panels 433CL, 443CR, 443JL, 433JR.

S 446-030

(2) Do the activation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

FAN AIR MODULATING VALVE - REMOVAL/INSTALLATION

1. General
   A. This procedure has these tasks:
      (1) Fan Air Modulating Valve Removal.
      (2) Fan Air Modulating Valve Installation.

TASK 36-11-16-004-002

2. Remove the Fan Air Modulating Valve (Fig. 401)
   A. References
      (1) AMM 26-11-02/401, Engine Fire and Overheat Detector Element
      (2) AMM 36-00-00/201, Pneumatic - General.
      (3) AMM 78-31-00/201, Thrust Reverser System
   B. Access
      (1) Location Zones
         410/420 Engine

      (2) Access Panels
         415AL/425AL Thrust Reverser

   C. Prepare for the Removal

      S 864-072

      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.

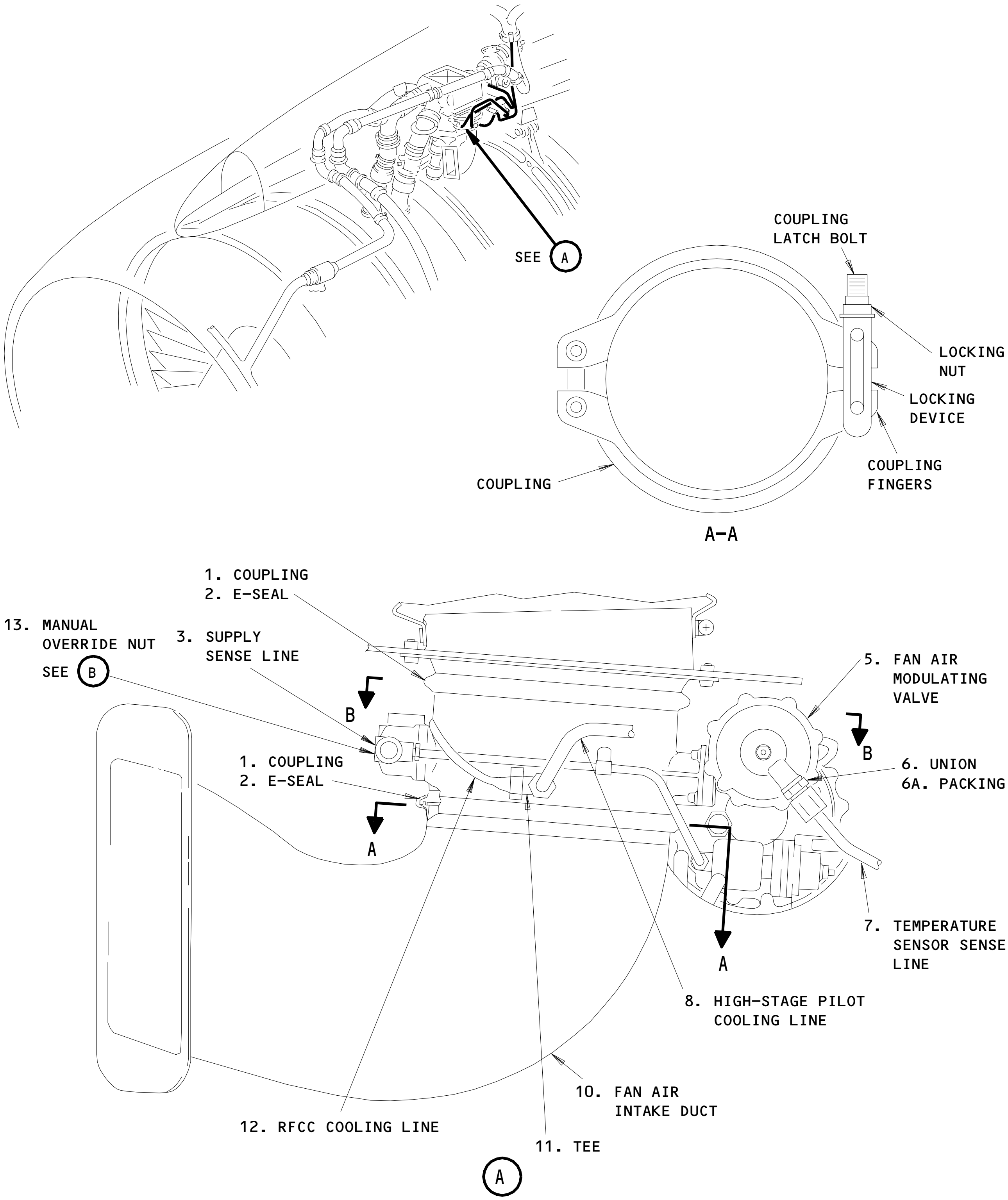
      (1) Remove pneumatic power (AMM 36-00-00/201).

         NOTE: Pressure is released when the system is not in operation.

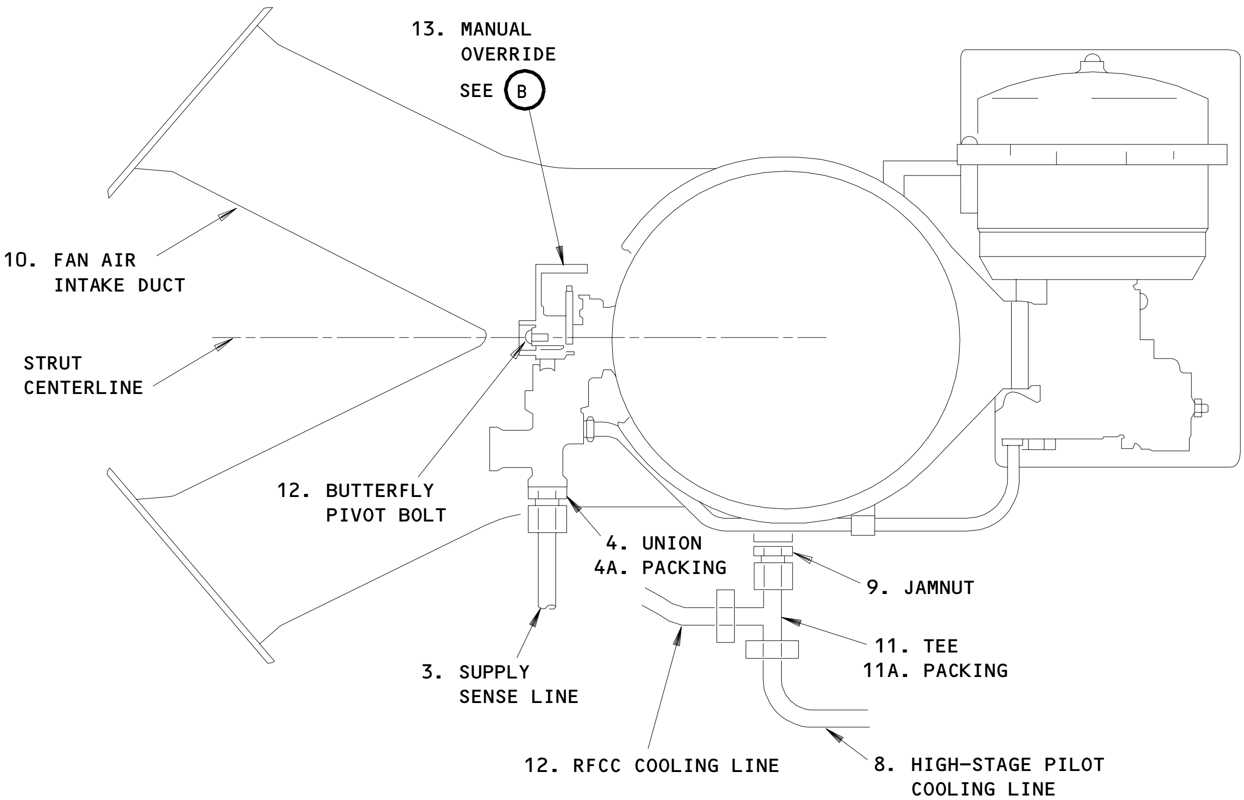
      S 044-075

      WARNING: DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

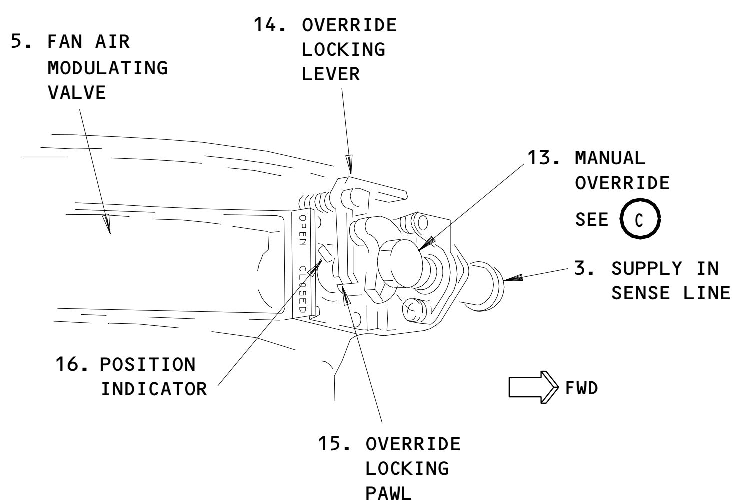
      (2) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).



Fan Air Modulating Valve Installation
Figure 401 (Sheet 1)

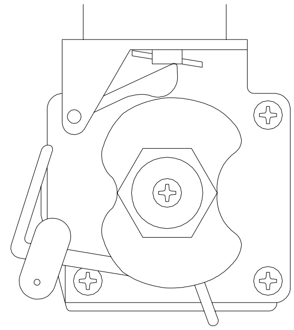


B-B

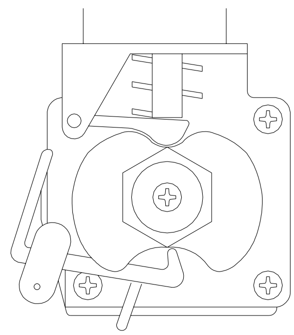


MANUAL OVERRIDE
B

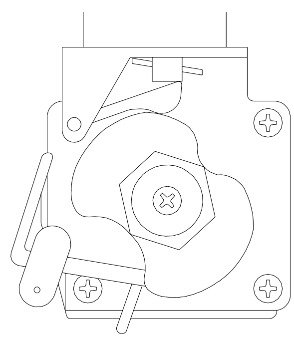
Fan Air Modulating Valve Installation
Figure 401 (Sheet 2)



(THE FAN AIR MODULATING
VALVE IS LOCKED CLOSED)



(THE FAN AIR MODULATING
VALVE IS OPEN)



(THE FAN AIR MODULATING
VALVE IS LOCKED OPEN)

MANUAL OVERRIDE
C

Fan Air Modulating Valve Installation
Figure 401 (Sheet 3)

S 014-005

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

(3) Open the left thrust reverser (AMM 78-31-00/201).

D. Fan Air Modulating Valve Removal

S 014-006

(1) Remove the engine fire and overheat detector element (AMM 26-11-02/401).

S 864-008

(2) Push the override locking lever (14) that is spring-loaded to release the override locking pawl (15) from the detent.

S 864-009

(3) Turn the manual override nut (13) 90 degrees counterclockwise from the center detent to the closed detent.

S 034-012

(4) Disconnect the supply sense line (3).

S 034-014

(5) Disconnect the high-stage pilot cooling line (8).

S 034-015

(6) Disconnect the RFCC cooling line (12).

S 034-017

(7) Disconnect the temperature sensor sense line (7).

S 034-019

(8) Remove the couplings (1).

S 024-021

(9) Remove the fan air modulating valve (5).

S 034-023

(10) Remove the E-seals (2).

S 024-079

(11) Remove the unions (4,6), tee (11) and packing (4A,6A,11A).
(a) Discard the packing.

TASK 36-11-16-404-024

3. Install the Fan Air Modulating Valve (Fig. 401)

A. Consumable Materials
(1) D00006 Antiseize Compound - BOSTIK NEVER-SEEZ

B. Parts

AMM		NOMENCLATURE	AIPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	1	Coupling	36-11-20	05	25
	2	E-seal			30
	5	Fan Air Modulating Valve	36-11-16	05	120
	4	Union	36-11-01	06	5
	4A	Packing			15
	6	Union			10
	6A	Packing			15
	11	Tee	36-11-01	01D	156
	11A	Packing			162

C. References
(1) AMM 26-11-02/401, Engine Fire and Overheat Detector Element
(2) AMM 78-31-00/201, Thrust Reverser System

D. Access
(1) Location Zones
410/420 Engine

(2) Access Panels
415AL/425AL Thrust Reverser

E. Procedure

S 214-025
(1) Look at the flange seal surfaces for cracks, dents, unwanted material or other damage.

S 324-026
(2) Repair or replace the flange surface if it is necessary.

S 424-080
(3) Apply antiseize and install the unions (4,6) and tee (11) with new packing (4A,6A,11A).

S 864-027
(4) Push the override locking lever (14) that is spring-loaded to release the override locking pawl (15).

S 864-028
(5) Turn the manual override nut (13) 90 degrees counterclockwise to the closed detent.

S 214-029
(6) Look at all the E-seals for cracks, dents, unwanted objects or other damage.

S 964-030
(7) Replace all the damaged E-seals.

S 434-031
(8) Install the E-seals (2) on the fan air modulating valve flanges.

S 414-032
(9) Install the fan air modulating valve (5).

S 214-064
(10) Make sure the arrow on the fan air modulating valve body points up.

S 824-037
(11) Align the fan air modulating valve (5) flange with the fan air intake duct (10) flange.

NOTE: Do not use force.

(a) Make sure a maximum distance of 0.03 inches occurs at all points.
(b) Align the duct if it is necessary.

S 824-039
(12) Align the fan air modulating valve (5) to make sure the butterfly pivot axis is on the strut centerline or parallel to (± 2 deg) the strut centerline.

S 434-074

CAUTION: MAKE SURE YOU INSTALL THE LOCKING DEVICE OF THE COUPLING CORRECTLY AS SHOWN IN FIG. 401. IF YOU DO NOT INSTALL THE COUPLING FINGERS INSIDE THE LOCKING DEVICE THE COUPLING CAN LOOSEN AND CAUSE DAMAGE TO EQUIPMENT.

(13) Install the couplings (1).

NOTE: Put the locking device in a position that gives the maximum clearance with the equipment that surrounds the latch. Stagger the valve couplings if access and clearance permit.

S 434-042
(14) Tighten the couplings (1) to 110-125 pound-inches.

S 644-066
(15) Apply the antiseize compound to the threads of the unions (4,6) and tee (11).

S 434-044
(16) Install the temperature sensor sense line (7).

S 434-048
(17) Install the high-stage pilot cooling line (8).

S 434-078
(18) Install the RFCC cooling line (12).

S 434-052
(19) Install the supply sense line (3).

S 864-056
(20) Push the override locking lever (14) to release the override locking pawl (15) from the closed detent.

S 864-057
(21) Turn the manual override nut (13) 90 degrees clockwise to the normal (center) position.

S 414-059
(22) Install the engine fire and overheat detector element (AMM 26-11-02/401).

F. FAMV Post-Installation Test (Method 1)

S 864-092
(1) Pressurize the pneumatic system upstream of the PRSOV to above 30 psig (AMM 36-11-09/201).
   (a) Use Method 1 or Method 2 to pressurize the pneumatic system upstream of the PRSOV to above 30 psig (AMM 36-11-09/201).

S 714-088
(2) Make sure the FAMV goes to the closed position.

S 214-091

(3) Make sure there is no leakage at the sense line connections for the FAMV.
  (a) Apply leak check fluid to all pneumatic sense line connections.
  (b) Repair any leakage.

S 844-093

(4) Release the pneumatic pressure upstream of the PRSOV (AMM 36-11-09/201).

S 724-094

(5) Make sure the FAMV goes back to the open position.

G. FAMV Post-Installation Test (Method 2)

S 724-095

(1) Do the Functional Test of the Fan Air Modulating Valve (FAMV) (AMM 36-11-16/501).

H. Put the Airplane Back to Its Usual Condition

S 414-081

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

(1) Close the left thrust reverser (AMM 78-31-00/201).

S 444-062

(2) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

FAN AIR MODULATING VALVE - ADJUSTMENT/TEST

1. General
   A. This procedure performs a test of the Fan Air Modulating Valve (FAMV) while the FAMV is installed on the airplane. The procedure also simulates variation in temperature signals sent to the FAMV by the fan air temperature sensor to do a check the FAMV.
   B. Electrical power is not necessary for this task.

TASK 36-11-16-715-001

2. Functional Test of the Fan Air Modulating Valve (FAMV)
   A. Equipment
      (1) Nitrogen or air source (0-100 PSIG)
      (2) C36001 Control pressure gage - 0-30 PSIG
      (3) C36001 Supply pressure gage - 0-70 PSIG
      (4) Needle valve
      (5) Union fittings - MS-6 (2 required)
          - MS-4 (1 required)
   B. Consumable Materials
      (1) D00006 Antiseize Compound, Bostic Never-Seez
   C. Parts
      (1) Pressure hose - 0-70 PSIG
   D. References
      (1) AMM 06-43-00/201, Engine and Nacelle Strut (Major Zone 400) Access Doors and Panels
      (2) AMM 24-22-00/201, Electrical Power - General
      (3) AMM 36-00-00/201, Pneumatic Power - General
      (4) AMM 36-11-16/401, Fan Air Modulating Valve
      (5) AMM 78-31-00/201, Thrust Reverser System
   E. Access
      (1) Location Zones
          411/421 Engine

      (2) Access Panels
          413/414/423/424 Fan Cowl Panel
          415/416/425/426 Fan Reverser

   F. Prepare for the Test

      S 865-037

      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) Remove pneumatic power (AMM 36-00-00/201).

S 045-035

WARNING: DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

(2) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

S 015-034

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

(3) Open the applicable thrust reverser (AMM 78-31-00/201).

S 715-040

(4) The table below shows the pressures you will see during the test of the FAMV.

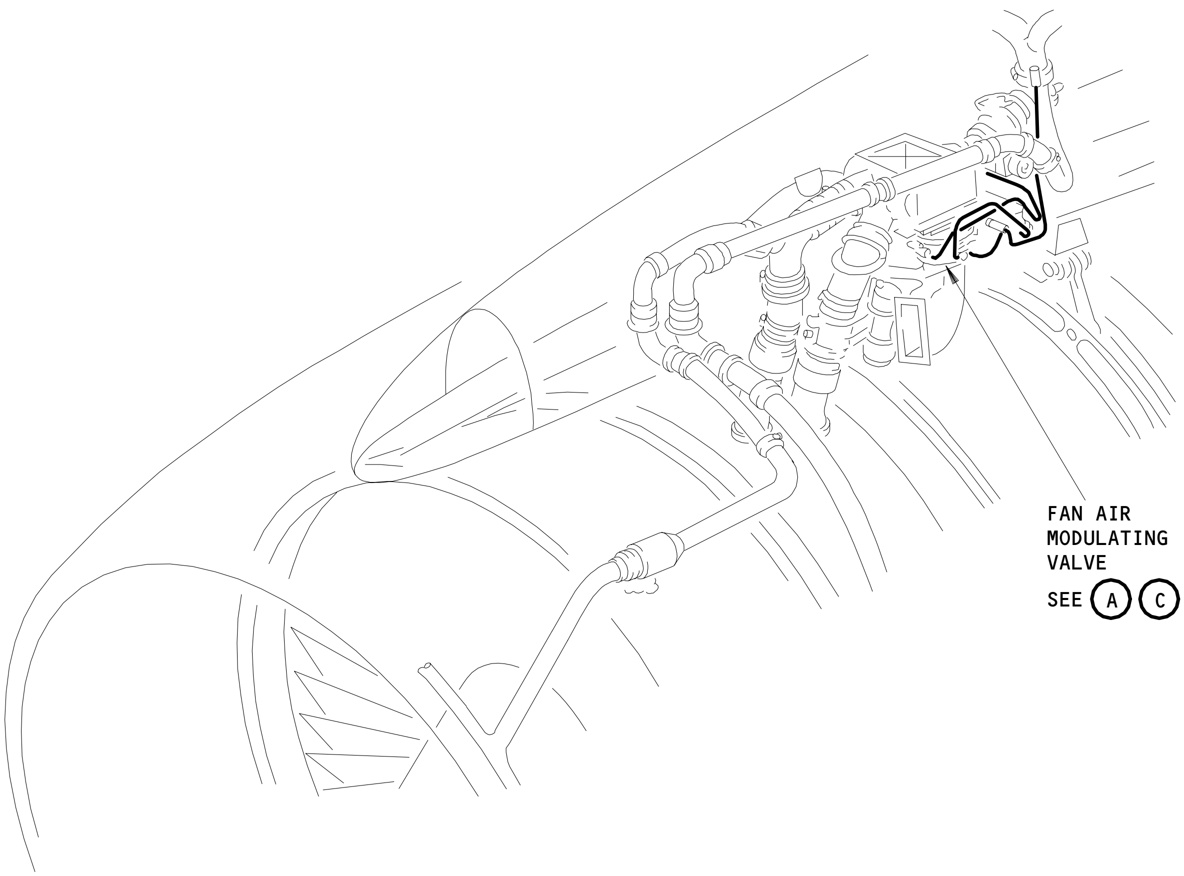
	Ps	Pc
FAMV Minimum Closing Pressure	30 Psi	<10 Psi
FAMV Fully Closed Pressure	30 Psi	<12 Psi
FAMV Control Pressure	60-70 Psi	9-12 Psi
FAMV Minimum Opening Pressure	60-70 Psi	>8 Psi
FAMV Fully Open Pressure	60-70 Psi	>3.5 Psi

G. Functional Test of the FAMV (Fig. 501)

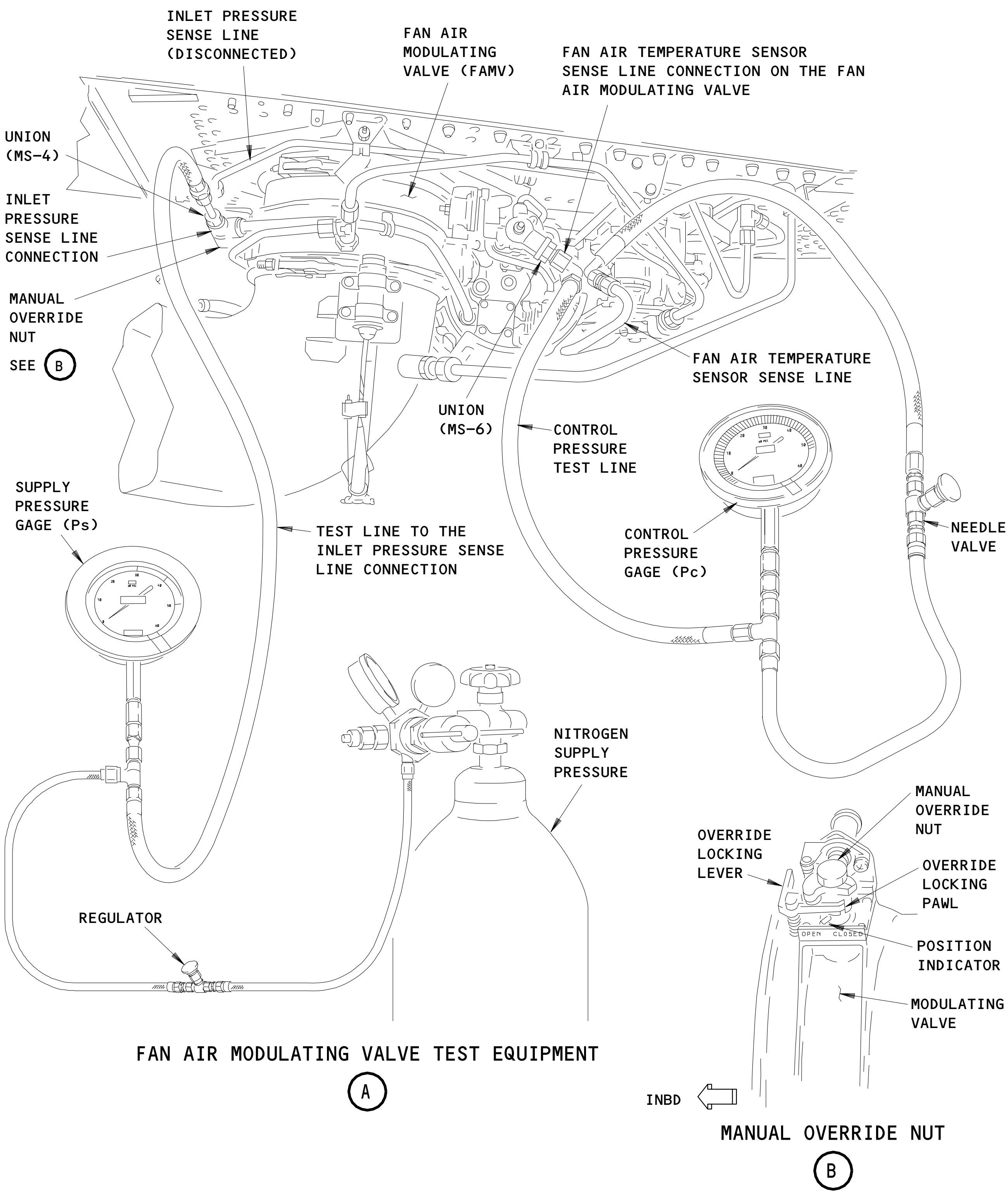
NOTE: During the test you will be asked some questions. Each question will have a yes or no answer. Each yes or no answer gives a recommended action, for example: NO, replace the FAMV (AMM 36-11-16/401). You can continue with the test without doing the action if you want to see other characteristics of the test. However, you should do the recommended action after you complete the test.

S 215-005

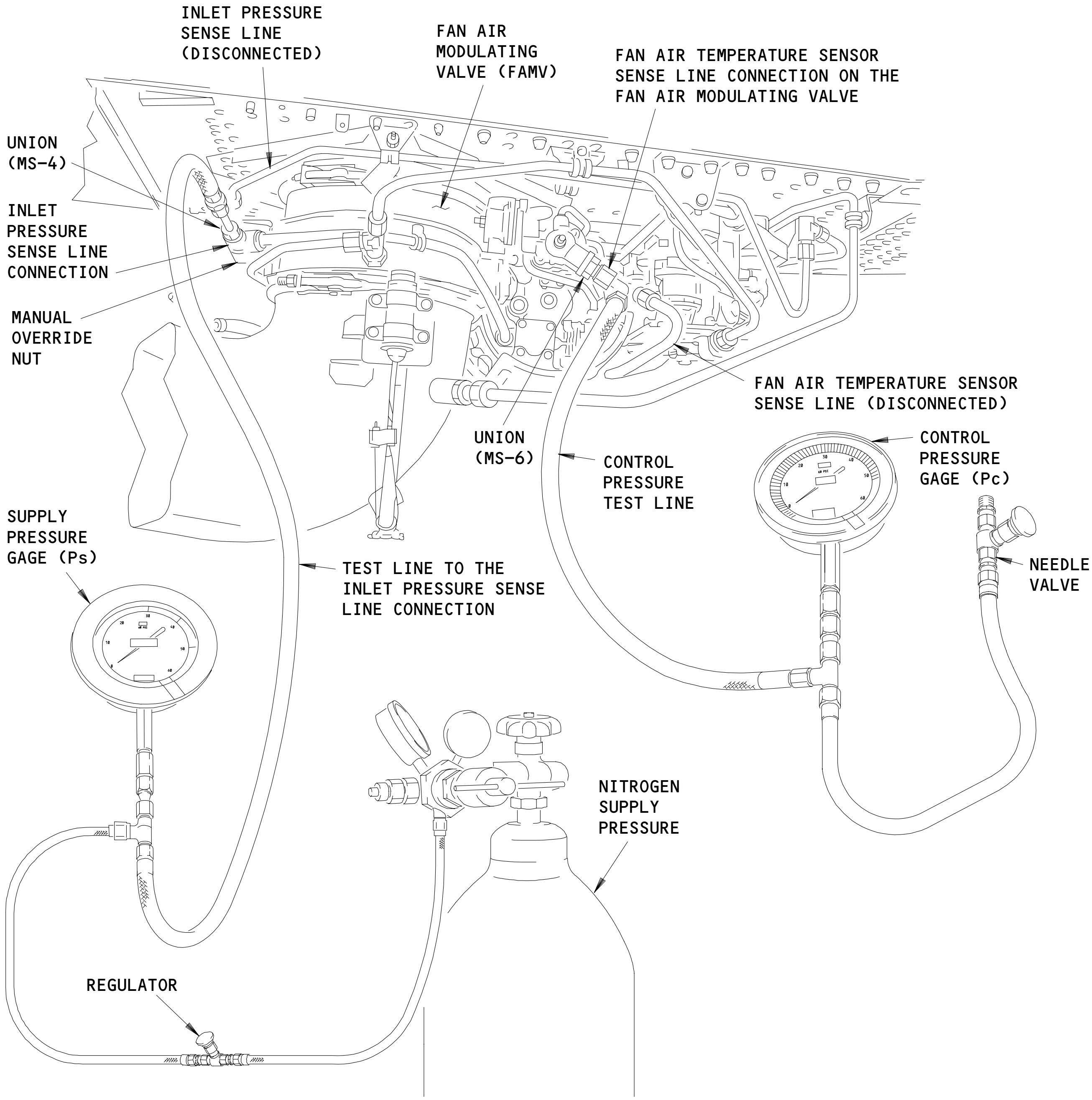
(1) Look at the position indicator on the manual override nut on the FAMV (View B, Fig. 501). Is the FAMV in the fully open position?
   (a) NO, replace the FAMV (AMM 36-11-16/401) if the FAMV is not locked closed for a specific reason.
   (b) Yes, continue.



Fan Air Modulating Valve Test Equipment
Figure 501 (Sheet 1)



Fan Air Modulating Valve Test Equipment
Figure 501 (Sheet 2)



FAN AIR MODULATING VALVE TEST EQUIPMENT
C

Fan Air Modulating Valve Test Equipment
Figure 501 (Sheet 3)

S 725-006
(2) Manually close the FAMV and do a check for smooth (not sticky) operation of the FAMV and linkage from the full open position to the full closed position.

NOTE: Make sure you move the override locking lever to allow you to turn the manual override nut.

When you manually close the FAMV you should feel some resistance. However, the operation to manually open the FAMV should be smooth.

S 865-031
(3) Release the manual override nut and let the FAMV go to the full open position.
(a) Make sure the valve goes to the full open position.

S 725-007
(4) Was the operation of the FAMV smooth?
(a) NO, replace the FAMV (AMM 36-11-16/401).
(b) YES, continue.

S 435-032
(5) Remove the inlet pressure sense line at the manual override nut on the FAMV.
(a) Install a cover on all open sense lines and fittings to keep out unwanted material.

S 485-008
(6) Install the nitrogen (air) supply pressure (Ps) source and supply pressure gage to the inlet pressure sense line connection on the manual override nut.

S 795-038

CAUTION: WHEN YOU BEGIN TO INCREASE THE SUPPLY PRESSURE, DO NOT EXCEED THE PRESSURE LIMITS THAT ARE GIVEN. DAMAGE TO THE COMPONENTS CAN OCCUR.

(7) Slowly increase Ps to 60-70 PSIG.

S 795-010
(8) Do a check of the sense lines to and from the FAMV and the fan air temperature sensor for leakage.

S 795-011

(9) Repair all abnormal leakage.

NOTE: Nitrogen may be heard leaking from ambient vent orifices inside the FAMV. This is normal and requires no corrective action.

S 215-041

(10) Do a check of the position indicator on the FAMV. Is the FAMV in the fully closed position.
  - (a) YES, Decrease Ps to 0 PSIG. Go to step 2.G.(11).
  - (b) NO, do the steps that follow:
    - 1) Decrease Ps to zero.
    - 2) Replace the FAMV (AMM 36-11-16/401).

S 035-048

(11) Disconnect the fan air temperature sensor sense line at the connection on the FAMV (Fig. 501).

S 485-014

(12) Install the fitting on the fan air temperature sensor union on the FAMV.

S 485-013

(13) Install a needle valve and control pressure (Pc) gage to the fitting for the fan air temperature sensor on the FAMV.
  - (a) Make sure the needle valve is open.

S 485-043

(14) Install a test line from the needle valve to the disconnected fan air temperature sensor sense line (View A, Fig. 501).

S 725-015

(15) Slowly increase Ps to 30 PSIG and monitor Pc when the FAMV starts to close.

NOTE: The FAMV should begin to go to the closed position before Pc = 10 PSIG. The FAMV should be in the fully closed position when Pc = 10-12 PSIG.

S 725-016
(16) Did the FAMV start to close with Pc less than 10 PSIG?
(a) NO, do the steps that follow:
1) Decrease Ps to zero.
2) Replace the FAMV (AMM 36-11-16/401).
(b) YES, continue.

S 725-017
(17) Was the FAMV in the fully closed position with Pc less than 12 PSIG?
(a) NO, do the steps that follow:
1) Decrease Ps to zero.
2) Replace the FAMV (AMM 36-11-16/401).
(b) YES, continue.

S 725-018
(18) Continue to slowly increase Ps to 60-70 PSIG.

S 725-019
(19) Is the FAMV in the fully closed position?
(a) NO, do the steps that follow:
1) Decrease Ps to zero.
2) Replace the FAMV (AMM 36-11-16/401).
(b) YES, continue.

S 725-020
(20) Is Pc greater than 12 PSIG?
(a) YES, do the steps that follow:
1) Decrease Ps to zero.
2) Replace the FAMV (AMM 36-11-16/401).
(b) NO, continue.

S 215-044
(21) Is Pc less than 9 PSIG?
(a) YES, close the needle valve.
1) Is Pc still less than 9 PSIG?
a) YES, decrease Ps to zero and the replace FAMV (AMM 36-11-16/401).
b) NO, decrease Ps to zero and replace the fan air temperature sensor (AMM 36-11-17/401).
(b) NO, Continue.

S 025-045
(22) Close the needle valve and disconnect test line from needle valve (View C, Fig. 501).

S 725-042
(23) Slowly open the needle valve and reduce Pc until the FAMV begins to open.

NOTE: The FAMV should begin to open before Pc is 8 PSIG.

S 725-021
(24) Did the FAMV begin to open before Pc = 8 PSIG?
(a) NO, do the steps that follow:
1) Decrease Ps to zero.
2) Replace the FAMV (AMM 36-11-16/401).
(b) YES, continue.

S 725-022
(25) Continue to slowly open the needle valve and monitor when the FAMV is in the full open position.

NOTE: The FAMV should be fully open before Pc is 3.5 PSIG.

S 725-023
(26) Is the FAMV in the fully open position before Pc = 3.5 PSIG?
(a) NO, do the steps that follow:
1) Decrease Ps to zero.
2) Replace the FAMV (AMM 36-11-16/401).
(b) YES, continue. The FAMV is satisfactory.

S 725-024
(27) Decrease Ps to 0 PSIG.

H. Put the Airplane to Its Usual Condition

S 085-025
(1) Remove the nitrogen (air) source, supply pressure gage, hoses and fittings from the manual override nut connection.

S 095-033
(2) Remove any covers that were installed on the open sense lines and fittings.

S 085-026
(3) Remove the control pressure gage, hoses, fittings and needle valve from the sense line connection for the fan air temperature sensor.

S 645-027
(4) Apply antiseize compound to the fittings of the supply pressure sense line and sense line for the fan air temperature sensor.

S 435-028
(5) Connect the supply pressure sense line at the manual override nut.

S 435-029

(6) Connect the sense line for the fan air temperature sensor to the FAMV.

S 415-036

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.

(7) Close the applicable thrust reversers (AMM 78-31-00/201).

S 445-039

(8) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

FAN AIR TEMPERATURE SENSOR - REMOVAL/INSTALLATION

1. General
   A. This procedure has these tasks:
      (1) The Fan Air Temperature Sensor Removal.
      (2) The Fan Air Temperature Sensor Installation.

TASK 36-11-17-004-001

2. Fan Air Temperature Sensor Removal (Fig. 401)
   A. References
      (1) AMM 36-00-00/201, Pneumatic - General
      (2) AMM 78-31-00/201, Thrust Reversers
   B. Access
      (1) Location Zones
          434/444 Nacelle Strut - Aft Fairing

      (2) Access Panel
          511KT/611KT Environmental Control Systems Duct

   C. Prepare for the Removal

      S 864-047

      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) Remove pneumatic power (AMM 36-00-00/201).

          NOTE: Pressure is released when the system is not in operation.

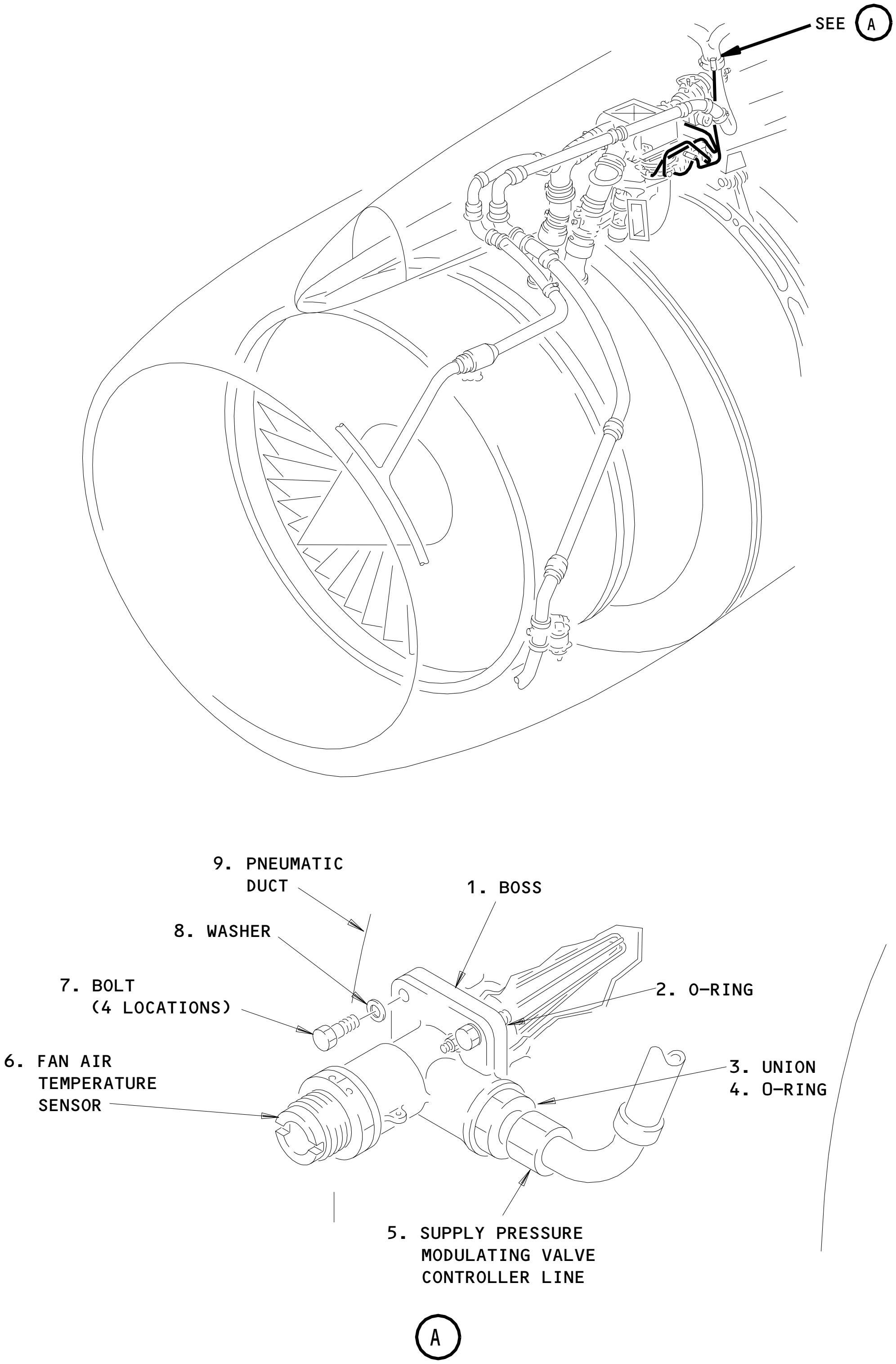
      S 044-040

      WARNING: DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

      (2) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

      S 014-045

      (3) Remove the applicable access panel for the left or right top wing (511KT or 611KT).



Fan Air Temperature Sensor - Installation
Figure 401

D. Fan Air Temperature Sensor Removal

S 034-002
(1) Disconnect the supply pressure modulating valve controller line (5).

S 034-004
(2) Remove the union (3) and packing (4).
(a) Discard the packing.

S 034-008
(3) Remove the bolts (7) and washers (8).

S 024-051

CAUTION: SENSORS MAY BE DAMAGED IF DROPPED OR MISHANDLED. IF SENSOR IS DROPPED, RETURN IT TO THE SHOP OR SUPPLIER FOR CALIBRATION.

(4) Remove the fan air temperature sensor (6) and packing (2).
(a) Discard the packing.

S 494-014
(5) Put a cover on the duct hole to keep out unwanted objects.

TASK 36-11-17-404-015
3. Fan Air Temperature Sensor Installation (Fig. 401)
A. Consumable Materials
(1) D00006 Anti-seize Compound - BOSTIK NEVER-SEEZ
B. Parts

MM			IPC		
FIG	ITEM	NOMENCLATURE	SUBJECT	FIG	ITEM
401	2	Packing	36-11-17	01	165
	3	Union			170
	4	Packing			175
	6	Fan Air Temperature Sensor			180
	7	Bolt			158
	8	Washer			160

C. References
(1) AMM 78-31-00/201, Thrust Reversers
D. Access
(1) Location Zones

434/444 Nacelle Strut - Aft Fairing

(2) Access Panel
511KT/611KT Environmental Control Systems Duct

E. Procedure

S 094-016
(1) Remove the duct cover.

S 424-052

CAUTION: SENSORS MAY BE DAMAGED IF DROPPED OR MISHANDLED. IF SENSOR IS DROPPED, RETURN IT TO THE SHOP OR SUPPLIER FOR CALIBRATION.

(2) Install the fan air temperature sensor (6) with a new packing (2).

S 434-020
(3) Install the bolts (7) and washers (8).

S 644-026
(4) Apply the antiseize compound to the threads of the union (3).

S 434-027
(5) Install the union (3) and the new packing (4).

S 434-031
(6) Install the supply pressure modulating valve controller line (5).

F. Put the Airplane Back to Its Usual Condition

S 414-035
(1) Install the applicable access panel for the left or right top wing (511KT or 611KT).

S 444-037
(2) Do the activation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

REVERSE FLOW CHECK CONTROLLER - REMOVAL/INSTALLATION

1. General
   A. This procedure has these tasks:
      (1) Reverse Flow Check Controller (Controller) Removal
      (2) Controller Installation

TASK 36-11-18-004-001

2. Controller Removal
   A. References
      (1) AMM 36-00-00/201, Pneumatic Power
      (2) AMM 78-31-00/201, Thrust Reverser System
   B. Access
      (1) Location Zones
          433/443   Nacelle strut - mid-structure
      (2) Access Panels
          433HR/443HL   High Pressure Duct Access Panel
   C. Prepare for the Removal

      S 864-057

   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) Remove pneumatic power (AMM 36-00-00/201).

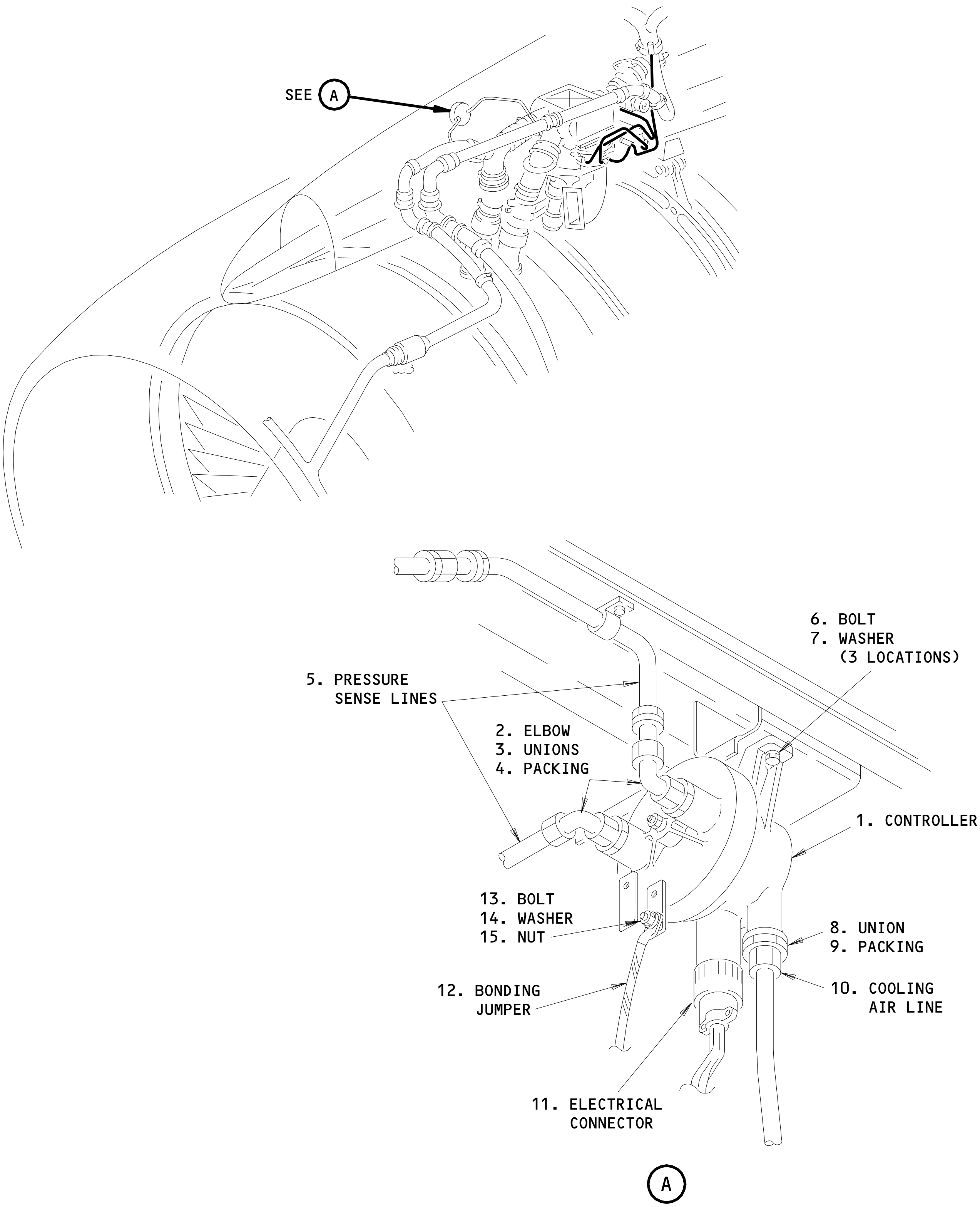
      NOTE: Pressure is released when the system is not in operation.

      S 864-007
      (2) Open these circuit breakers on the overhead circuit breaker panel P11 and attach a DO-NOT-CLOSE tag:
         (a) 11Q10 ENG BLD L
         (b) 11Q19 R ENG BLEED

      S 014-071
      (3) Do these steps to get access to the controller:

      WARNING: DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

         (a) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).



Reverse Flow Check Controller
Figure 401

(b) Open the access door for the applicable strut 433HR, 443HL.

D. Controller Removal

S 034-010
(1) Disconnect the electrical connector (11).

S 034-011
(2) Disconnect the the bolt (13), washers (14) and nut (15) and remove the bonding jumper (12).

S 034-012
(3) Disconnect the pressure sense lines (5).

S 034-013
(4) Disconnect the cooling air line (10).

S 034-014
(5) Remove the bolts (6) and washers (7).

S 024-015
(6) Remove the controller (1).

S 034-016
(7) Remove the unions (3,8), elbows (2) and packing (4,9).
(a) Discard the packing (4,9).

TASK 36-11-18-414-017

3. Controller Installation

A. Consumable Materials
(1) D00006 Anti-seize Compound - BOSTIK NEVER-SEEZ

B. Parts

MM		NOMENCLATURE	IPC		
FIG	ITEM		SUBJECT	FIG	ITEM
401	1	Controller	36-11-18	03	170
	2	Elbow			125,130
	3	Union			110,115
	4	Packing			145,150
	6	Bolt			175
	7	Washer			180
	8	Union			115
	9	Packing			150
	13	Bolt			15
	14	Washer			20,25
	15	Nut			30

C. References
   (1) AMM 20-10-19/401, O-rings
   (2) AMM 24-22-00/201, Electrical Power - Control
   (3) AMM 71-00-00/201, Power Plant
   (4) AMM 78-31-00/201, Thrust Reverser System

D. Access
   (1) Location Zones
       433/443   Nacelle strut - mid-structure
   (2) Access Panels
       433HR/443HL   High Pressure Duct Access Panel

E. Procedure

S 644-063
(1) Apply the antiseize compound to the threads of the unions (3,8) and the elbows (2).

S 424-064
(2) Install the unions (3,8) and the elbows (2), with new packing (4,9) (AMM 20-10-19/401).

S 424-019
(3) Install the controller (1) against the bracket.

S 434-020
(4) Install the bolts (6) and washers (7).

S 864-022
(5) Apply the antiseize compound to the threads of the unions (3,8) and elbows (2).

S 434-023
(6) Install the pressure sense lines (5).

S 434-025
(7) Install the cooling air line (10).

S 434-027
(8) Install the bonding jumper (12) with the bolt (13), washers (14) and nut (15).

S 434-028
(9) Install the electrical connector (11).

S 414-068
(10) Do these steps to close the access:
(a) Close the strut access door 433HR or 443HL.
(b) Do the activation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

S 864-035
(11) Remove the DO-NOT-CLOSE tags and close these circuit breakers on the P11 panel:
(a) 11Q10 ENG BLD L
(b) 11Q19 R ENG BLEED

F. RFCC Post-Installation Test

S 864-083
(1) Supply electrical power (AMM 24-22-00/201).

S 214-088

CAUTION: MONITOR THE ENGINE PARAMETERS TO KEEP THE ENGINES WITHIN THEIR OPERATIONAL LIMITS (AMM 71-00-00/201). IF YOU DO NOT MONITOR THE ENGINE PARAMETERS, DAMAGE TO THE ENGINE CAN OCCUR.

(2) Prepare the left and right engines for usual operation (AMM 71-00-00/201).
(a) Start the left and right engines (AMM 71-00-00/201).
(b) Set the left and right thrust levers to the idle position.

S 214-086
(3) Find the BLEED AIR supply module on the P5 panel.
(a) Push the ISOLATION valve switch-light to the closed position.
1) Make sure that the white flowbar goes off.
(b) Push the APU valve switch-light to the closed position.
1) Make sure that the white flowbar light goes off.
(c) Push the L ENG and R ENG bleed switch-lights to ON position.
1) Make sure that the white flowbar lights come on.

S 864-113

(4) Make sure that the L/R DUCT PRESS indications, on the BLEED AIR supply module, show 20-30 psi.

S 724-114

(5) Do these steps to test the left RFCC operation:
   (a) Push the L ENG bleed switch-light to the OFF position.
      1) Make sure that the L ENG bleed air OFF light is on.

         NOTE: The left PRSOV should be closed.

   (b) Move the right thrust lever until the R DUCT PRESS indication is 5-8 psi higher than at idle.
   (c) Push the ISOLATION valve switch-light to the open position.
      1) Make sure that the white flowbar light comes on.
   (d) Push the L ENG bleed air switch-light to the ON position.
      1) Make sure that the L ENG bleed air OFF light stays on.

         NOTE: This step ensures that the left RFCC keeps the left PRSOV closed due to the higher duct pressure created by the right engine.

   (e) Slowly move the right thrust lever back to the idle position.
   (f) Make sure the L/R DUCT PRESS indications have decreased and stabilized to the original pressure indications with thrust levers at the idle positions.
   (g) Make sure that the L ENG bleed air OFF light goes off.

      NOTE: The left PRSOV should now open due to the left RFCC sensing a decrease in the duct pressure.

S 724-115

(6) Do these steps to test the right RFCC operation:
   (a) Push the R ENG bleed switch-light to the OFF position.
      1) Make sure that the R ENG bleed air OFF light is on.

         NOTE: The right PRSOV should be closed.

(b) Push the ISOLATION valve switch-light to the closed position.
    1) Make sure that the white flowbar goes off.
(c) Make sure the L ENG bleed switch-light is in the ON position.
    1) Make sure that the L ENG bleed air white flowbar light shows.
(d) Move the left thrust lever until the L DUCT PRESS indication is 5-8 psi higher than at idle.
(e) Push the ISOLATION valve switch-light to the open position.
    1) Make sure that the white flowbar light comes on.
(f) Push the R ENG bleed air switch-light to the ON position.
    1) Make sure that the R ENG bleed air OFF light stays on.

       NOTE: This step ensures that the right RFCC keeps the right PRSOV closed due to the higher duct pressure created by the left engine.

(g) Slowly move the left thrust lever back to the idle position.
(h) Make sure the L/R DUCT PRESS indications have decreased and stabilized to the original pressure indications with thrust levers at the idle positions.
(i) Make sure that the R ENG bleed air OFF light goes off.

    NOTE: The right PRSOV should now open due to the right RFCC sensing a decrease in the duct pressure.

G. Put the Airplane Back to Its Usual Condition

S 864-049
(1) Shut down the left and right engines (AMM 71-00-00/201).

S 864-050
(2) Remove electrical power if it is not necessary (AMM 24-22-00/201).

REVERSE FLOW CHECK CONTROLLER - ADJUSTMENT/TEST

1. General
   A. This task will perform a test of the RFCC while the RFCC is on-wing.
   B. References to lung power in the functional test section implies that at least 0.33 psig of pressure is applied in the functional test.

TASK 36-11-18-715-001

2. Functional Test of the Reverse Flow Check Controller (RFCC)
   A. Consumable Materials
      (1) D00006 - Antiseize Compound, Bostik Never-Seez
   B. Parts
      (1) Pressure hose - 0-50 PSIG
      (2) UNION Fittings - MS-4 (2 required)
      (3) Volt/Ohmmeter
   C. References
      (1) AMM 06-41-00/201, Fuselage (Major Zones 100 and 200) Access Doors and Panels
      (2) AMM 06-43-00/201, Engine and Nacelle Strut (Major Zone 400) Access Doors and Panels
      (3) AMM 24-22-00/201, Electrical Power - General
      (4) AMM 36-00-00/201, Pneumatic Power - General
      (5) AMM 36-11-09/201, Air Supply Pressure Regulating and Shutoff Valve
      (6) AMM 36-11-18/401, Reverse Flow Check Controller
   D. Access
      (1) Location Zones

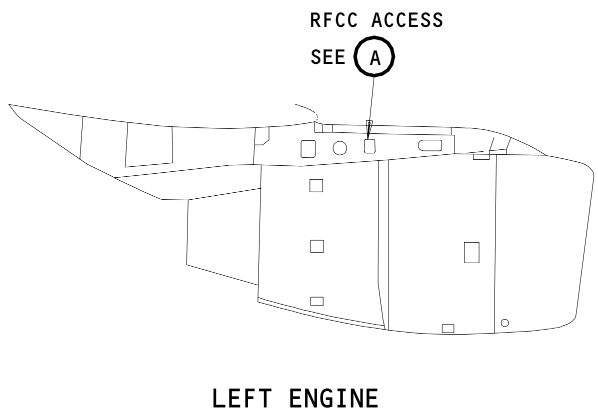
119/120	Main Equipment Center
433/443	Nacelle Strut and Mid-Structure

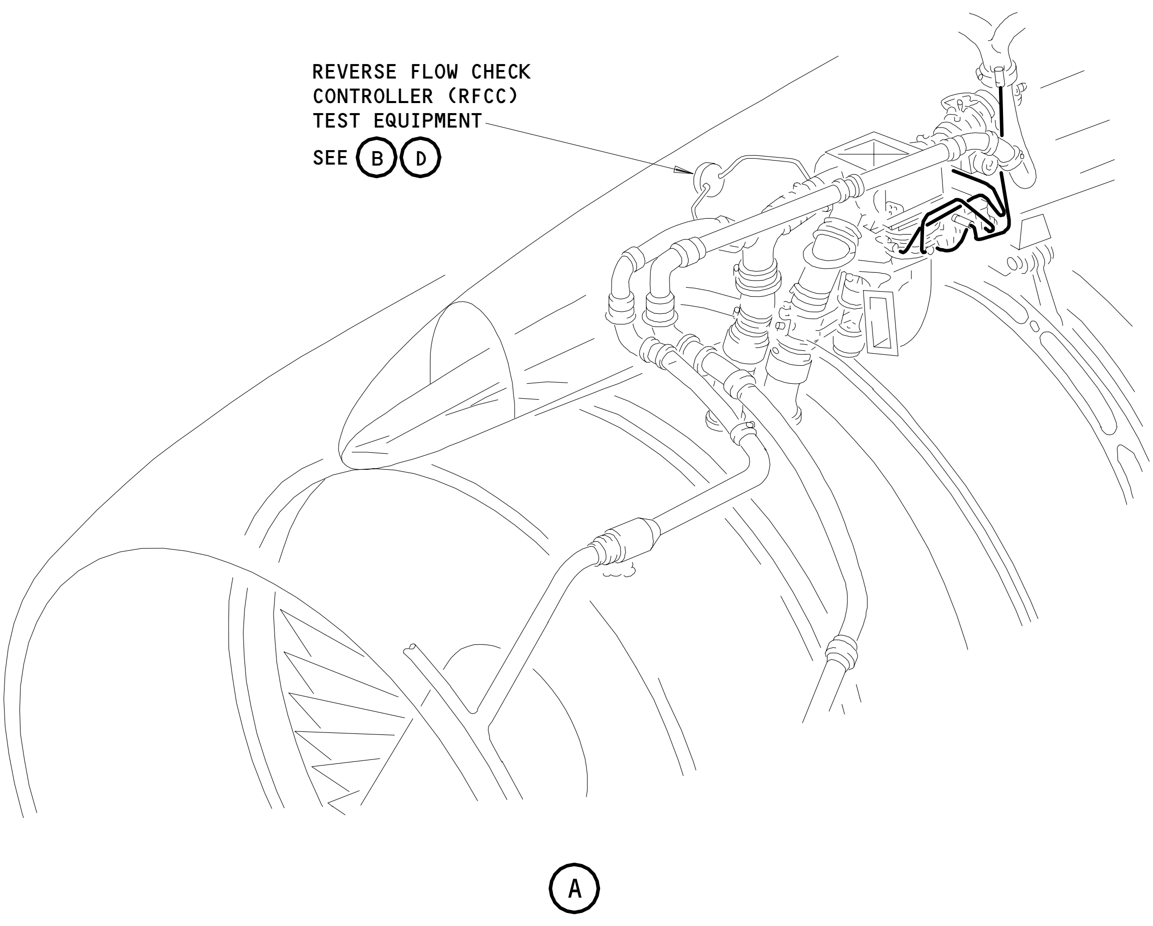
      (2) Access Panels

119BL	Access Panel for the Main Equipment Center
433HR/443BR	Access Panel for the RFCC

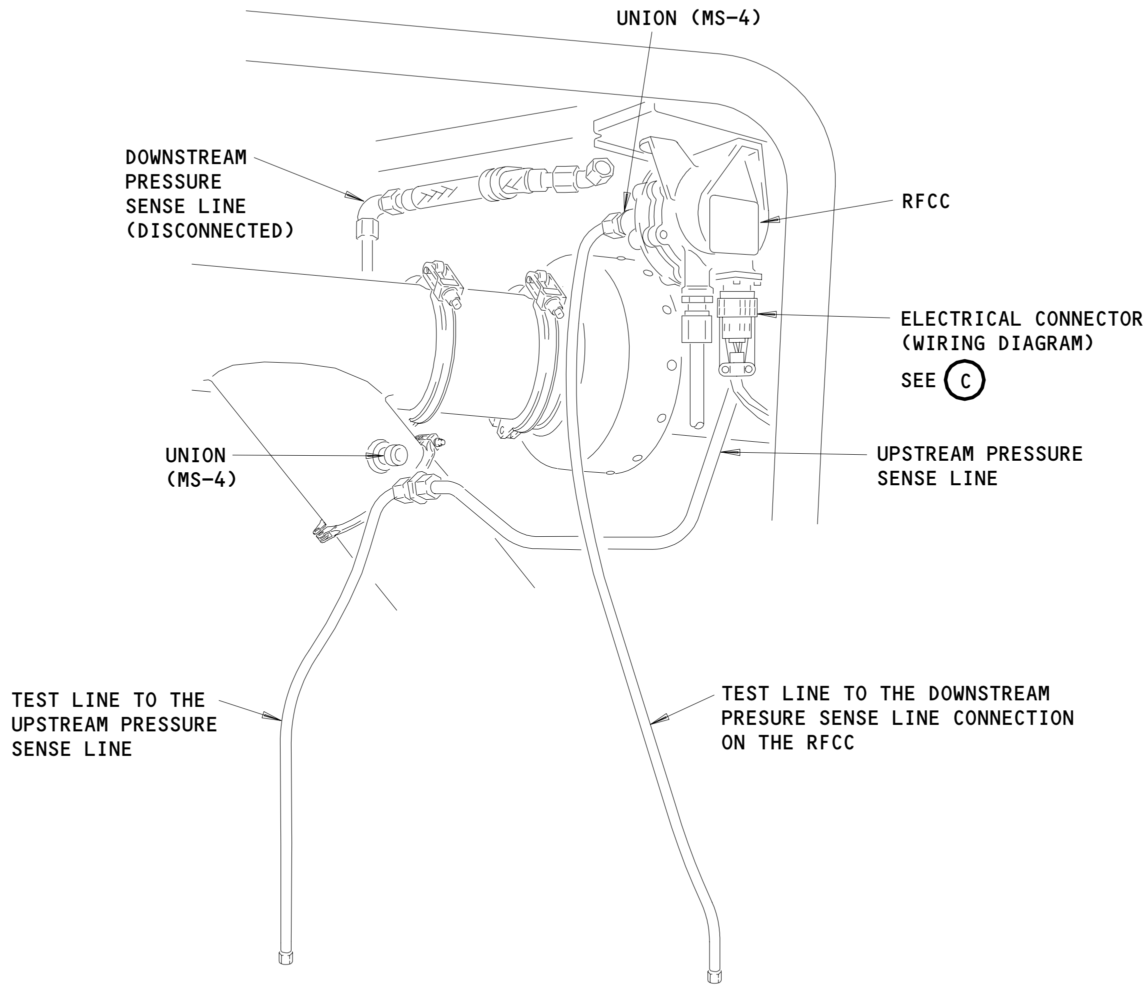
   E. Prepare for the Test (Fig. 501)

      NOTE: During the test you will be asked some questions. Each question will have a yes or no answer. Each yes or no answer gives a recommended action, for example: NO, replace the RFCC (AMM 36-11-18/401). You can continue with the test without doing the action if you want to see other characteristics of the test. However, you should do the recommended action after you complete the test.

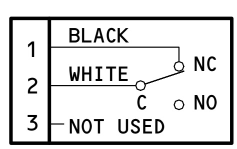




Reverse Flow Check Controller Test Equipment
Figure 501 (Sheet 1)

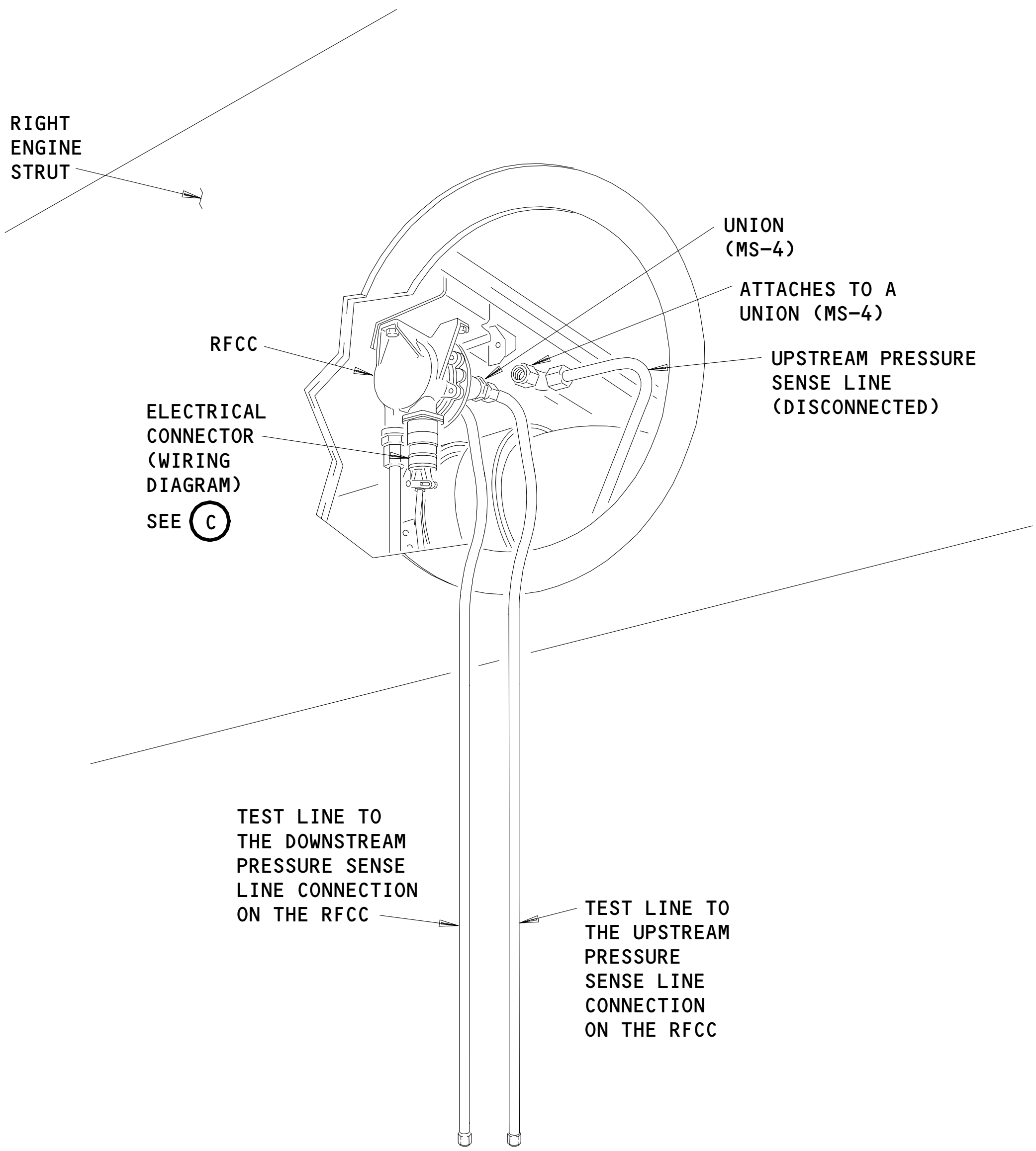


RFCC TEST EQUIPMENT
(LEFT ENGINE STRUT)
B



ELECTRICAL CONNECTOR
WIRING DIAGRAM
C

Reverse Flow Check Controller Test Equipment
Figure 501 (Sheet 2)



RFCC TEST EQUIPMENT
(RIGHT ENGINE STRUT)
D

Reverse Flow Check Controller Test Equipment
Figure 501 (Sheet 3)

S 865-047

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) Remove Pneumatic Power (AMM 36-00-00/201).

S 865-048
(2) Supply electrical power (AMM 24-22-00/201).

S 865-004
(3) Make sure these circuit breakers, on the P11 panel, are closed:
(a) 11Q10, ENG (BLEED, BLD) L
(b) 11Q19, R ENG BLEED (CONT)

S 865-024
(4) Open the applicable circuit breaker, on the P11 panel, and attach a DO-NOT-CLOSE tag:
(a) 11B31 L ENGINE SPEED CARD
(b) 11B32 R ENGINE SPEED CARD

S 865-057
(5) Put the L(R) ENG OFF Bleed switch-light to the ON position.

S 865-058
(6) Make sure the L(R) fire handle is not pulled.

S 015-008
(7) Open the access panel for the RFCC on the nacelle strut (AMM 06-43-00/201).

S 035-009
(8) On the left strut, remove the upstream sense line at the duct (Fig. 501).

S 035-010
(9) On the right strut, remove the upstream sense line at the RFCC (Fig. 501).

S 035-014
(10) Remove the downstream sense line at the RFCC.

S 425-055

(11) Install the test lines to the upstream and downstream connections to the RFCC.

NOTE: The upstream and downstream sense lines get pnuematic pressure input from upstream and downstream of the PRSOV.

F. Functional Test of the RFCC

S 015-053

(1) Get access to the PRSOV in the strut.

S 725-060

(2) Use lung power to blow into the upstream test line for 10 seconds.

S 725-026

(3) Use lung power to blow into the downstream test line.
Is the L(R) PRSOV solenoid retracted?

NOTE: When the solenoid retracts you will hear a click.

(a) NO, Check for continuity across the RFCC as follows:

WARNING: THE RFCC ELECTRICAL CONNECTOR WILL HAVE ELECTRICAL # POWER APPLIED DURING THE TEST. TAKE STEPS TO AVOID SHOCK.

1) Remove the RFCC electrical connector.

NOTE: This check is accomplished as you blow into the downstream test line.

2) Measure for continuity across pins 1 and 2 of the RFCC.
a) If there is continuity replace the RFCC (AMM 36-11-18/401).

b) If there is no continuity then check for wiring or relay failures.

(b) YES, Continue.

S 725-066

(4) Use lung power to blow into the upstream test line.
Is the L(R) PRSOV solenoid extended?

NOTE: When the solenoid extends you will hear a click.

(a) NO, Check for continuity across the RFCC as follows:

WARNING: THE RFCC ELECTRICAL CONNECTOR WILL HAVE ELECTRICAL # POWER APPLIED DURING THE TEST. TAKE STEPS TO AVOID SHOCK.

1) Remove the RFCC electrical connector.
2) Measure for continuity across pins 1 and 2 of the RFCC.
a) If there is no continuity replace the RFCC (AMM 36-11-18/401).
b) If there is continuity then check for wiring or relay failures.

(b) Yes, the RFCC is satisfactory.

G. Put the Airplane to Its Usual Condition

S 435-062

(1) If necessary, reconnect the RFCC electrical connector.

S 085-029

(2) Remove the test lines from the upstream and downstream ports.

S 645-030

(3) Apply antiseize compound to the upstream and downstream sense line fittings.

S 435-031

(4) On the right strut, install the upstream sense line at the RFCC.

S 435-032

(5) On the left strut, install the upstream sense line at the duct.

S 435-033

(6) Connect the downstream sense line to the RFCC.

S 415-049

(7) Close the access panel on the nacelle strut (AMM 06-43-00/201).

S 865-041

(8) Remove the DO-NOT-CLOSE tag and close the applicable circuit breaker on the P11 panel:
(a) 11B31 L ENGINE SPEED CARD

(b) 11B32 R ENGINE SPEED CARD

FAN AIR INTAKE DUCT - REMOVAL/INSTALLATION

1. General
   A. This procedure includes the removal and installation of the fan air intake duct which is aft of the HP-6 bleed duct and below the strut floor.

TASK 36-11-20-004-001

2. Remove the Fan Air Intake Duct (Fig. 401)
   A. Equipment
      (1) Fan C - Duct Hold Open Device B71006-79.
      (2) Fishpole Hoist - P.F. Industries, 9320 15th Avenue So
          Seattle, WA 98108
   B. References
      (1) AMM 26-11-01/401, Overheat Detector
      (2) AMM 36-11-07/401, High Pressure Shutoff Valve
      (3) AMM 70-51-00/201, Torque Tightening Technique
      (4) AMM 78-31-00/201, Thrust Reverser System
      (5) AMM 78-31-10/401, Hinge Access Door
   C. Access
      (1) Location Zones

413/414/423/424	Fan Cowl Panel
415/416/425/426	Fan Reverser

   D. Prepare for the Removal

      S 214-002
      (1) Make sure the forward thrust lever, on the center control stand, is in the idle position.

      S 214-003
      (2) Make sure the reverse thrust lever, on the center control stand, is fully forward.

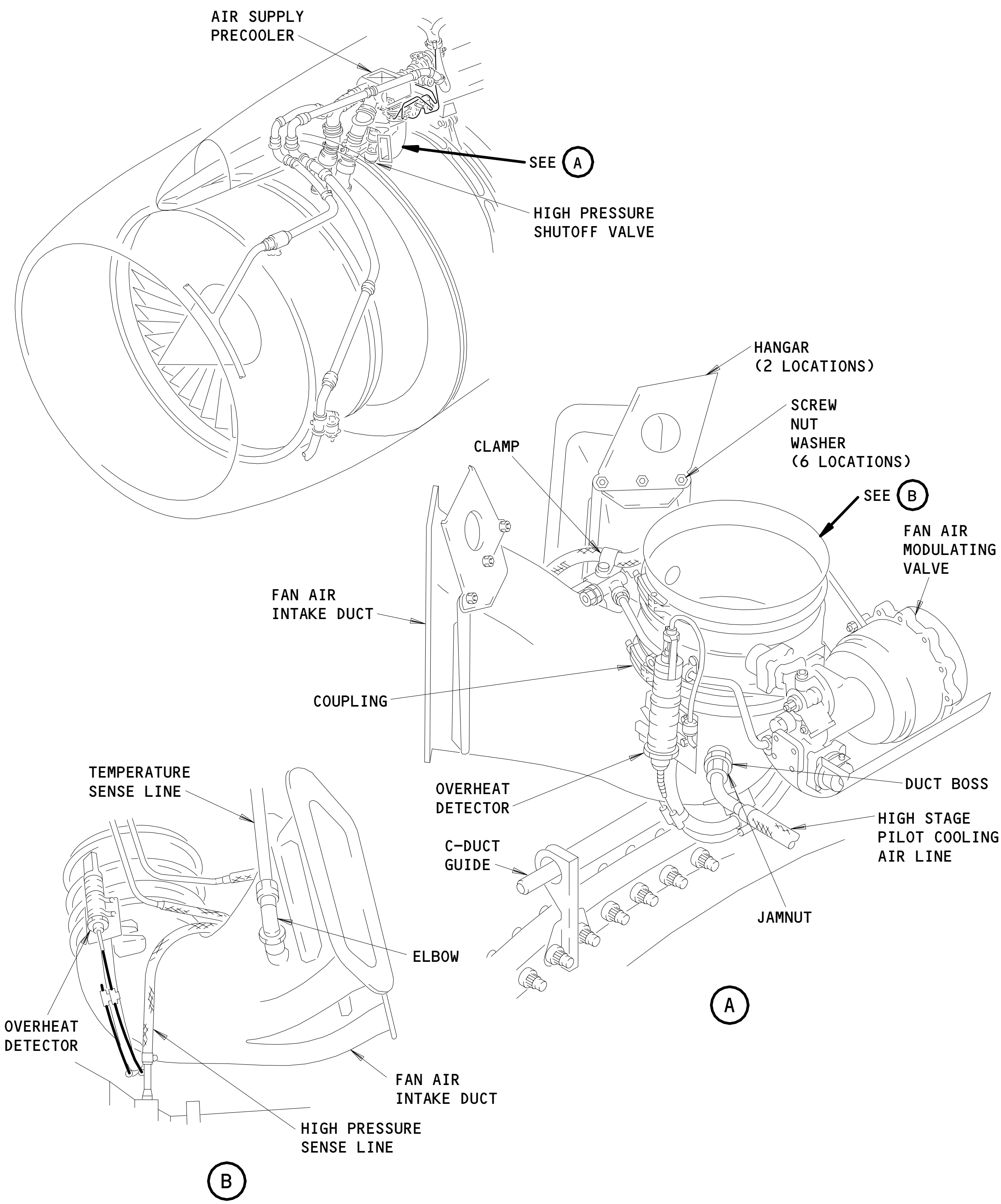
      S 864-004
      (3) Attach DO-NOT-OPERATE tags to the levers.

      S 044-005

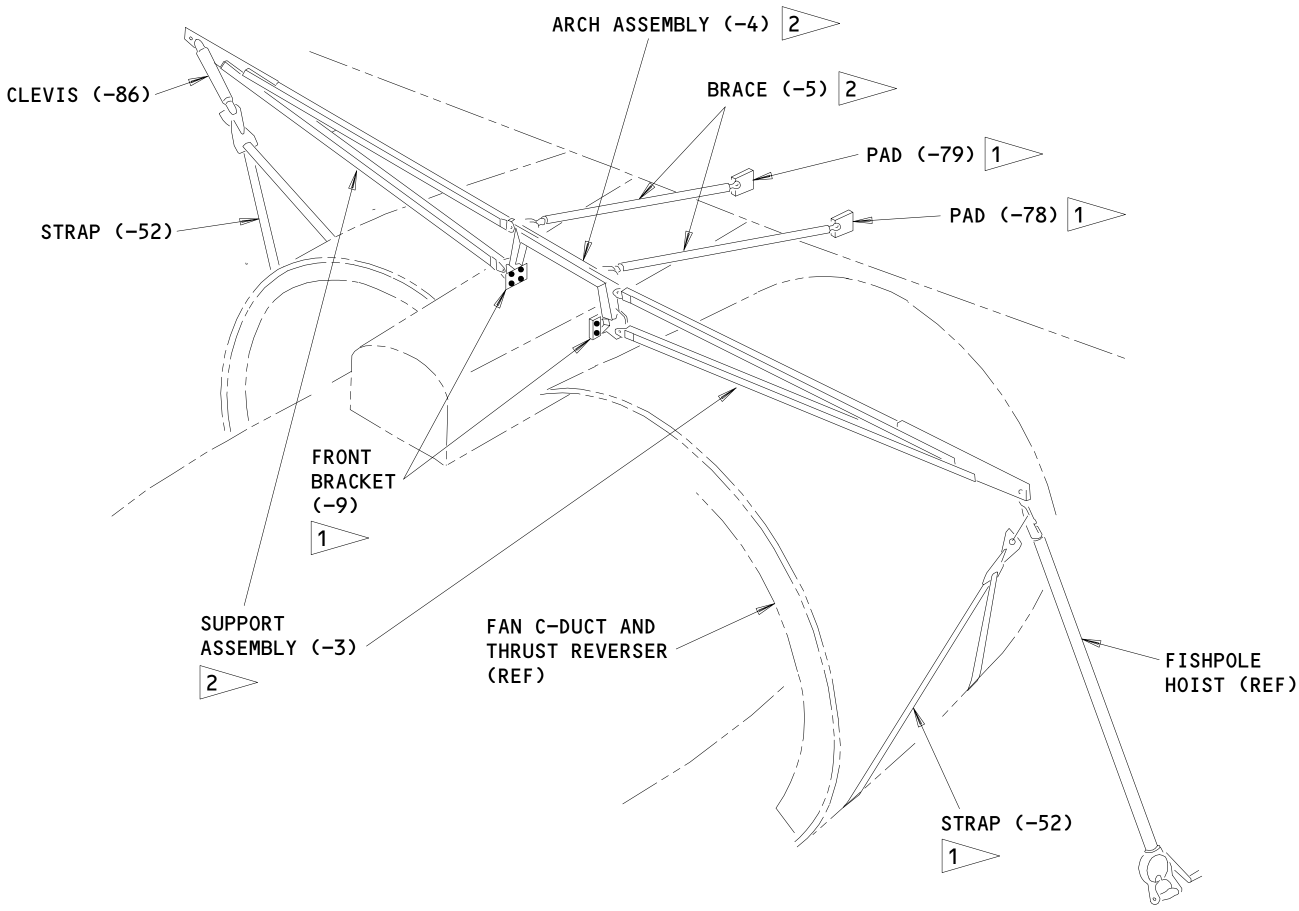
WARNING: DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

      (4) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

      S 014-006
      (5) Remove the hinge access door (AMM 78-31-10/401).

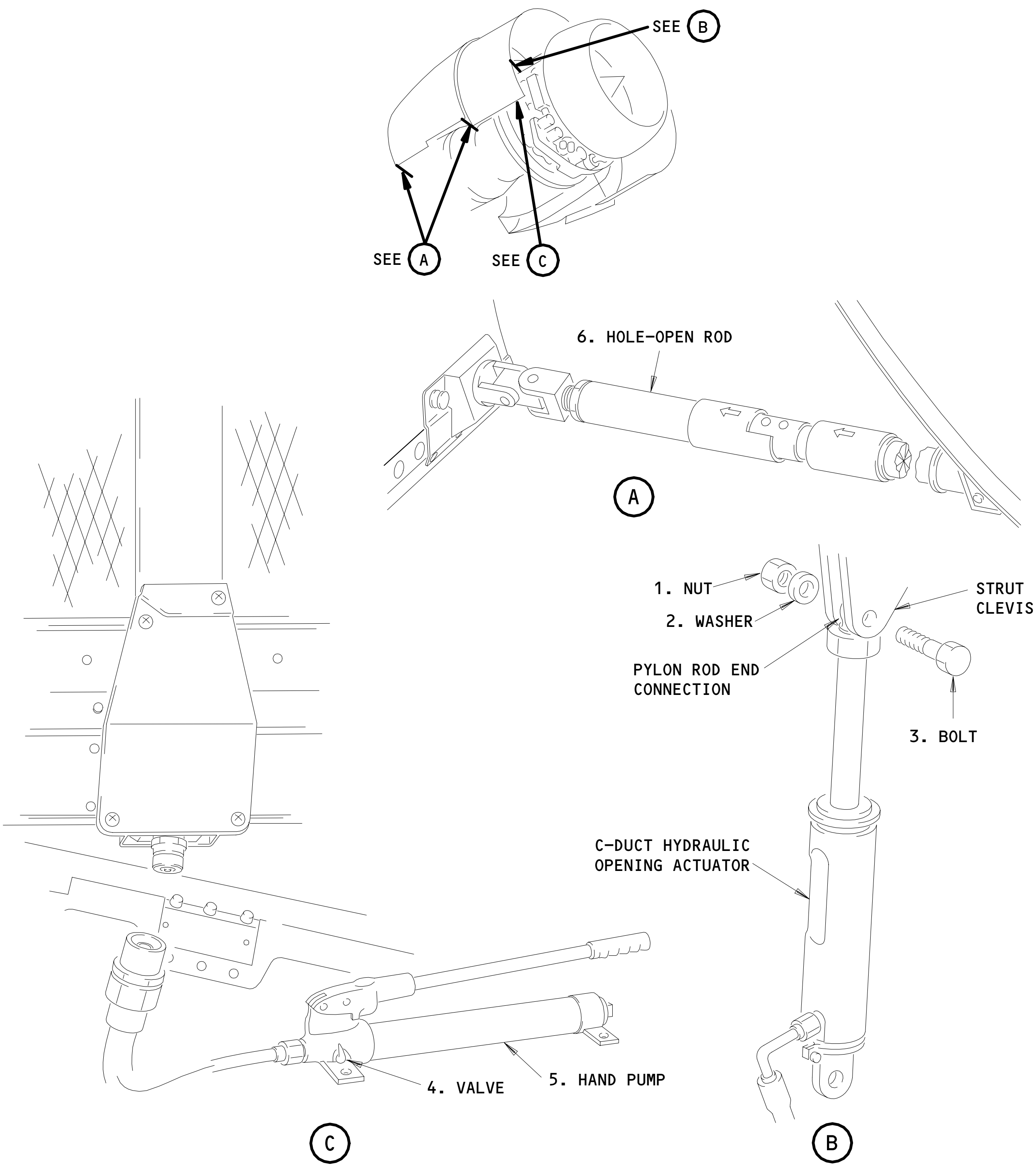


Fan Air Intake Duct
Figure 401



1 ATTACH THE BOLTS THAT ARE KEPT ON THE ASSEMBLY
2 THE BALL LOCK PINS ARE KEPT WITH THE ASSEMBLY

Fan C-Duct Hold-Open Device
Figure 402



NOTE: THE RIGHT SIDE INSTALLATION IS SHOWN,
THE LEFT SIDE INSTALLATION IS OPPOSITE.

56303

Fan C-Duct Hydraulic Opening Actuator Disconnect Points
Figure 403

S 494-007

(6) Install the Fan C-duct Hold Open Device (Fig. 402).

(a) Attach the front bracket (-9) to the mid bootstrap support on each side of the strut. Attach the bolts that are kept on the assembly.

(b) Attach the pad (-79, -78) to the rear bootstrap support on the right and left sides of the strut as shown in Fig. 402. Attach the bolt and washers that are kept on the assembly.

(c) Attach the arch (-4) to the front brackets with the lower ball lock pins that are kept with the arch.

(d) Attach the brace (-5) to the arch assembly and the pad on each side of the strut with the ball lock pins that are kept on the brace and the arch.

(e) Attach the support (-3) to the arch on the left side of the strut. Use the ball lock pins that are kept with the support.

S 014-008

WARNING: MAKE SURE YOU OPEN THE FAN AND CORE COWL PANELS CORRECTLY BY AMM 78-31-00/201 BEFORE YOU OPEN THE FAN DUCT COWL AND THRUST REVERSER. FAILURE TO FOLLOW AMM 78-31-00/201 CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

(7) Open the fan C-ducts and thrust reversers (AMM 78-31-00/201).

E. Remove the Fan Air Intake Duct

S 494-009

(1) Attach the fishpole hoist to the support assembly (Fig. 402).

S 494-010

(2) Attach the strap (-52) to the fishpole hoist and on the bottom of the left fan C-duct and the thrust reverser at two places (Fig. 402). Use the four bolts that are kept with the strap attach fittings.

S 014-011

(3) Hold the fan C-duct and thrust reverser with the fishpole hoist and keep the hold open rods for the installation.

S 034-012

(4) Remove the bolt and disconnect the C-duct hydraulic opening actuator from the strut clevis (Fig. 403).

S 034-013

(5) Move the actuator arm to the closed position and keep the actuator for the installation.

S 034-014

(6) Remove the high pressure shutoff valve (HPSOV) (AMM 36-11-07/401).

S 034-015

CAUTION: MAKE SURE YOU CORRECTLY SUPPORT THE END FITTINGS OF THE FLEXIBLE HOSE ASSEMBLY WHEN YOU LOOSEN OR TIGHTEN THE COUPLING NUTS. INCORRECT SUPPORT OF THE END FITTINGS CAN CAUSE DAMAGE TO THE FLEXIBLE SECTION.

(7) Disconnect the high pressure sense line from the engine case (Fig. 401).

S 034-016
(8) Remove the nacelle overheat detector (AMM 26-11-01/401).

S 034-017
(9) Disconnect the temperature sense line from the duct and remove the elbow.

S 034-019
(10) Loosen the jamnut and disconnect the cooling air line for the high stage pilot from the fan air intake duct boss.

S 034-020
(11) Remove the screws that hold the duct to the hangers.

S 034-021
(12) Remove the coupling that holds the duct to the fan air modulating valve.

S 034-022
(13) Turn the outlet part of the duct approximately 45 degrees to the left side of the engine.

S 024-023
(14) Remove the fan air intake duct from the left side of the engine.

S 494-024
(15) Put a cover on all the duct openings and a cap on all the sense lines to keep out unwanted material.

TASK 36-11-20-404-025
3. Install the Fan Air Intake Duct (Fig. 401)
A. Equipment
(1) Fan C - Duct Hold Open Device B71006-79.

(2) Fishpole Hoist - P.F. Industries, 9320 15th Avenue So
Seattle, WA 98108

B. Consumable Materials

(1) D00006 Antiseize Compound, Bostik Never-Seez

C. References

(1) AMM 26-11-01/401, Overheat Detector
(2) AMM 36-11-07/401, High Pressure Shutoff Valve
(3) AMM 70-51-00/201, Torque Tightening Technique
(4) AMM 78-31-00/201, Thrust Reverser System
(5) AMM 78-31-10/401, Hinge Access Door

D. Access

(1) Location Zones

413/414/423/424	Fan Cowl Panel
415/416/425/426	Fan Reverser

E. Procedure

S 094-026

(1) Remove all the duct covers and the sense line caps.

S 424-027

(2) Install the Y-Part of the fan air intake duct first and then turn the outlet to connect with the fan air modulating valve.

S 434-028

(3) Install the coupling between the fan air modulating valve and the fan air intake valve.
(a) Tighten the coupling nuts to 110-125 pound-inches.

S 434-029

(4) Attach the Y-part of the duct to the hangers that hang from the strut floor. Install the screws, washers and nuts.

S 434-030

(5) To connect the cooling air line for the high stage pilot to the duct, do the steps that follow:
(a) Apply the antiseize compound to the threads.

(b) Install a new O-ring.
(c) Connect the line to the duct and tighten the jamnut.

S 644-032
(6) Apply the antiseize compound to the threads of the elbow.

S 434-033
(7) With a new O-ring, attach the sense line elbow to the duct.

S 434-034
(8) Attach the sense line to the elbow.

S 434-035
(9) Install the nacelle overheat detector (AMM 26-11-01/401).

S 644-036

CAUTION: MAKE SURE YOU CORRECTLY SUPPORT THE END FITTINGS OF THE FLEXIBLE HOSE ASSEMBLY WHEN YOU LOOSEN OR TIGHTEN THE COUPLING NUTS. INCORRECT SUPPORT OF THE END FITTINGS CAN CAUSE DAMAGE TO THE FLEXIBLE SECTION.

(10) Apply the antiseize compound to the threads of the high pressure sense line.

S 434-037
(11) Connect the high pressure sense line to the engine case.

S 434-038
(12) Install the HPSOV (AMM 36-11-07/401).

S 414-039
(13) Close the C-duct to approximately 45 degrees with the fishpole hoist and install the hold open rods (Fig. 403).

S 414-040

WARNING: MAKE SURE THE THRUST REVERSER IS SUPPORTED CORRECTLY BY THE HOLD OPEN RODS. THE THRUST REVERSER CAN CLOSE SUDDENLY WHEN YOU REMOVE THE HOIST WHICH CAN CAUSE INJURY TO PERSONS.

(14) Decrease the load on the fishpole hoist to let the hold open rods get some of the C-duct weight.

S 434-041
(15) Connect the hand pump (5) to the C-duct.

S 434-042
(16) With the hand pump, slowly extend the actuator rod end to the strut clevis fitting.

S 434-043
(17) Install the bolt, washers, and nut that hold the actuator rod end to the strut clevis.

S 434-044
(18) Tighten the nut (AMM 70-51-00/201).

S 424-055
(19) With the hand pump, raise the C-duct and remove the hold open rod.

S 414-045
(20) Open the valve on the hand pump and lower the C-duct to approximately 20 degrees.

S 434-046
(21) Remove the sling from the bottom of the C-duct and from the fishpole hoist.

S 434-047
(22) Remove the fishpole hoist.

S 414-048
(23) Slowly lower the C-duct.

F. Put the Airplane Back to Its Usual Condition

S 414-050

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 fan C-duct and thrust reverser (AMM 78-31-00/201).

S 094-051
(2) Remove the support assembly, braces, arch, pads, and front brackets.

S 414-052
(3) Install the hinge access door (AMM 78-31-10/401).

S 444-053
(4) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 864-054
(5) Remove electrical power if it is not necessary (AMM 24-22-00/201).

PRESSURE RELIEF VALVE - REMOVAL/INSTALLATION

1. General
   A. This procedure gives instructions to remove the pressure relief valve and to install the pressure relief valve.
   B. A pressure relief valve is in the inlet of the high pressure duct of each precooler. The pressure relief valve will release a small quantity of bleed air into the strut compartment. This will occur when the duct pressures are more than a given value.

TASK 36-11-21-004-031

2. Remove the Pressure Relief Valve (Fig. 401)
   A. References
      (1) AMM 06-43-00/201, Engine Nacelle Access Doors and Panels
      (2) AMM 24-22-00/201, Electric Power Control
      (3) AMM 36-00-00/201, Pneumatic - General
      (4) AMM 78-31-00/201, Thrust Reverser System
   B. Access
      (1) Location Zones
          433/443 Nacelle strut - mid-structure
      (2) Access Panels
          433HR High Pressure Duct Access Door
          443CR Precooler Access Door

   C. Prepare for the Removal

      S 864-001
      (1) Supply electrical power (AMM 24-22-00/201).

      S 864-030

      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.

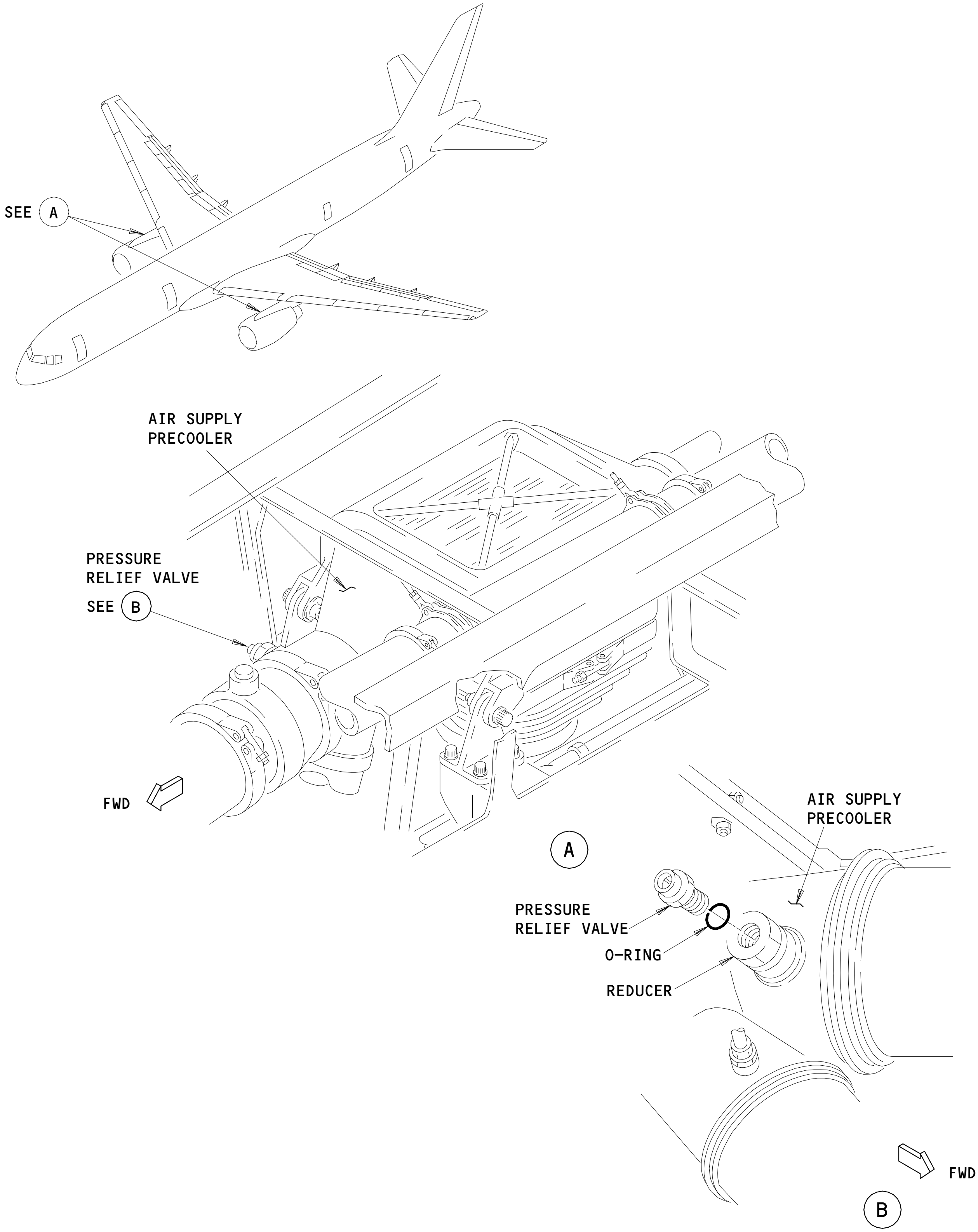
      (2) Remove pneumatic power (AMM 36-00-00/201).

      S 044-003

      WARNING: DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

      (3) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).

      S 014-004
      (4) To get access to the left relief valve, remove the access panel to the high pressure duct 433HR (AMM 06-43-00/201).



Pressure Relief Valve - Installation
Figure 401

S 014-005
(5) To get access to the right relief valve, remove the precooler access panel 443CR (AMM 06-43-00/201).

D. Remove the Pressure Relief Valve

S 034-006
(1) Turn the relief valve counterclockwise to remove the relief valve from the reducer.

S 024-007
(2) Remove the relief valve from the reducer.

S 094-008
(3) Remove the O-ring from the relief valve.

S 034-029
(4) Discard the O-ring.

S 494-009
(5) Put a cover on the hole in the reducer to keep out unwanted objects.

TASK 36-11-21-414-010

3. Install The Pressure Relief Valve (Fig. 401)

A. References

(1) AMM 24-22-00/201, Electric Power Control
(2) AMM 36-11-09/201, Air Supply Pressure Regulating and Shutoff Valve
(3) AMM 78-31-00/201, Thrust Reverser System

B. Access

(1) Location Zones
433/443 Nacelle strut - mid-structure
(2) Access Panels
433HR High Pressure Duct Access Door
443CR Precooler Access Door

C. Procedure

S 094-011
(1) Remove the cover on the reducer hole.

S 494-012
(2) Install a new O-ring on the relief valve.

S 424-013
(3) Install the relief valve in the reducer.

S 434-014
(4) Tighten the relief valve.

S 784-023
(5) Pressurize the pneumatic system upstream of the pressure regulating and shutoff valve (AMM 36-11-09/201).
   (a) Do a check for air leakage around the threads of the reducer and the relief valve.
   (b) Air leakage is unsatisfactory.

D. Put the Airplane Back to Its Usual Condition

S 864-024
(1) Remove the pneumatic ground source.

S 864-025
(2) Put the pressure regulating and shutoff valve back to its usual condition (AMM 36-11-09/201).

S 414-026
(3) Install the applicable access panel (433HR or 443CR).

S 444-027
(4) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 864-028
(5) Remove electrical power if it is not necessary (AMM 24-22-00/201).

BLEED AIR CONTROL PANEL (M10259) - REMOVAL/INSTALLATION

1. General
   A. The Bleed Air Control Panel (M10259) is located on the forward right corner of the P5 forward overhead panel.
   B. This procedure contains these tasks:
      (1) Bleed Air Control Panel - Removal
      (2) Bleed Air Control Panel - Installation

TASK 36-11-22-044-001

2. Bleed Air Control Panel Removal (Fig. 401)
   A. Access
      (1) Location Zones
         (a) 211 Flight Compartment - Left
         (b) 212 Flight Compartment - Right
   B. Removal Procedure

      S 864-003

      (1) Open these circuit breakers and attach DO-NOT-CLOSE tags:
         (a) P11, Overhead Circuit Breaker Panel
            1) 11B02, ISOL VALVE CONT
            2) 11B03, ISOL VALVE PWR
            3) 11Q10, AIR SUPPLY BLEED CONT, LEFT ENG
            4) 11Q19, AIR SUPPLY BLEED CONT, RIGHT ENG
            5) 11Q22, AIR SUPPLY APU BLEED PWR
            6) 11Q23, AIR SUPPLY APU BLEED CONT
            7) 11Q16, AIR SUPPLY DUCT PRESS IND, LEFT
            8) 11Q24, AIR SUPPLY DUCT PRESS IND, RIGHT
            9) 11Q15, AIR SUPPLY DUCT PRESS IND PWR

      S 014-004

      (2) Lower the P5 panel to get access to the bleed air control panel.

      S 024-035

      (3) Disconnect electrical connectors D3538, D3540, D3542 and D3586 from the back of the Bleed Air Control Panel and the Duct Pressure Indicator.

      S 024-036

      (4) Loosen the 1/4-turn fasteners on the bleed air control panel.

      S 014-037

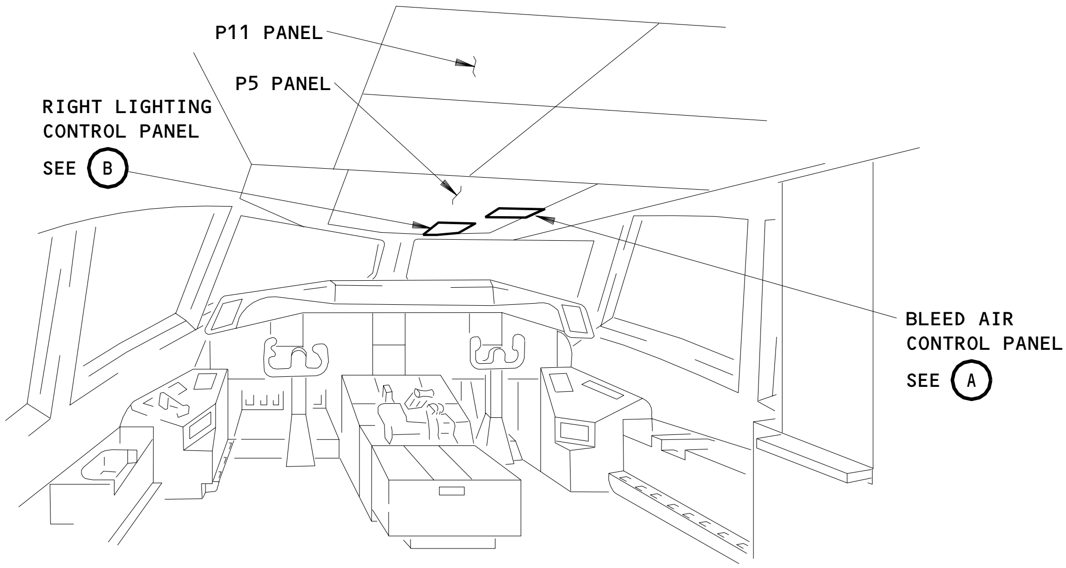
      (5) Remove the bleed air control panel.

      S 024-006

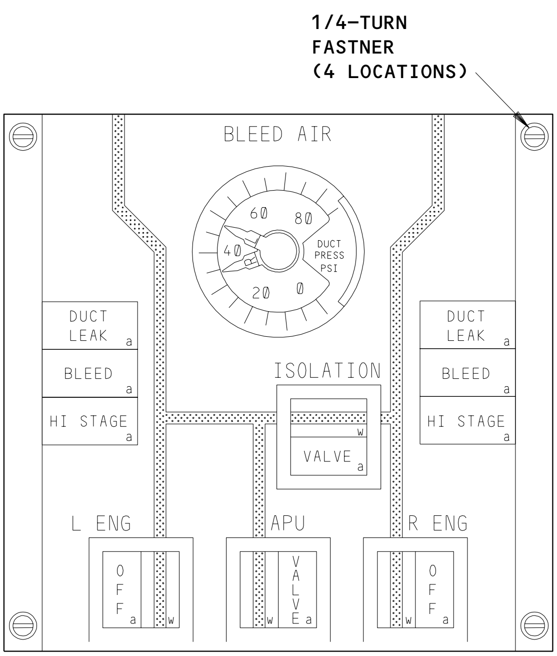
      (6) Loosen the screw on the Duct Pressure Indicator (N1) clamp.

      S 014-007

      (7) Remove the Duct Pressure Indicator.

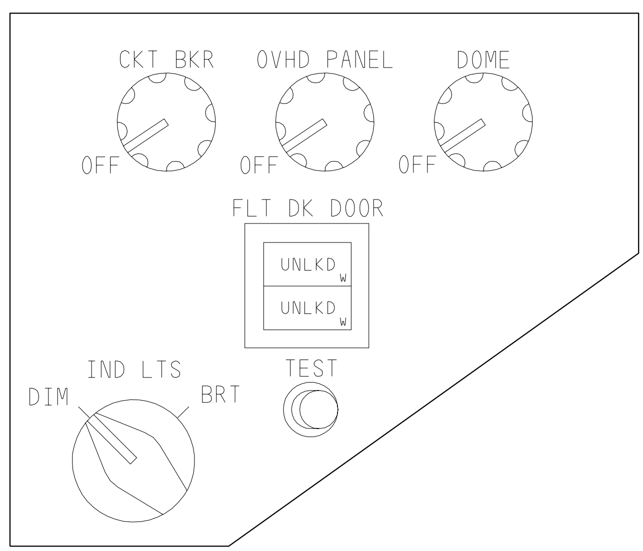


FLIGHT COMPARTMENT



BLEED AIR CONTROL PANEL

A



RIGHT LIGHTING CONTROL PANEL

B

Bleed Air Control Panel Installation
Figure 401

TASK 36-11-22-424-008

3. Bleed Air Control Panel Installation

A. References

(1) AMM 24-22-00/201, Supply and Remove External Power

(2) AMM 36-11-00/501, Air Supply Distribution System - Adjustment/Test

(3) AMM 36-00-00/201, Pneumatic General - Maintenance Practices (Provide/Remove Pneumatic Power)

B. Access

(1) Location Zones

(a) 211 Flight Compartment - Left

(b) 212 Flight Compartment - Right

C. Installation Procedure

S 424-010

(1) Put the duct pressure indicator in the bleed air control panel.

S 424-031

(2) Tighten the clamp screw to 5 - 8 inch-pounds.

S 424-012

(3) Put the bleed air control panel into the P5 forward overhead panel.

S 424-038

(4) Tighten the fasteners on the bleed air control panel.

S 424-039

(5) Connect the D3538, D3540, D3542 and D3586 electrical connectors.

S 424-013

(6) Lift (close) the P5 forward overhead panel and tighten the 1/4-turn fasteners.

S 864-014

(7) Remove the DO-NOT-CLOSE tags and close these circuit breakers.

(a) P11, Overhead Circuit Breaker Panel

1) 11B02, ISOL VALVE CONT

2) 11B03, ISOL VALVE PWR
3) 11Q10, AIR SUPPLY BLEED CONT, LEFT ENG
4) 11Q19, AIR SUPPLY BLEED CONT, RIGHT ENG
5) 11Q22, AIR SUPPLY APU BLEED PWR
6) 11Q23, AIR SUPPLY APU BLEED CONT
7) 11Q16, AIR SUPPLY DUCT PRESS IND, LEFT
8) 11Q24, AIR SUPPLY DUCT PRESS IND, RIGHT
9) 11Q15, AIR SUPPLY DUCT PRESS IND PWR

D. Installation Test Procedure

S 864-016

(1) Supply electrical power (AMM 24-22-00/201).

S 864-017

(2) Supply pneumatic power with the left and right engines (AMM 36-00-00/201).

S 714-018

(3) Push the L ENG switch-light on the bleed air control panel to the ON position.
   (a) Make sure the L ENG OFF light goes out.
   (b) Make sure the flow bar light comes on.
   (c) Make sure the L BLEED AIR DUCT PRESS gauge indicates bleed air pressure.

S 714-019

(4) Push the L ENG switch-light on the bleed air panel to the OFF position.
   (a) Make sure the L ENG OFF light comes on.
   (b) Make sure the flow bar light goes off.

S 714-020

(5) Push the R ENG switch-light on the bleed air panel to the ON position.
   (a) Make sure the R ENG OFF light goes out.
   (b) Make sure the flow bar light comes on.
   (c) Make sure the R BLEED AIR DUCT PRESS gauge indicates bleed air pressure.

S 714-021

(6) Push the R ENG switch-light on the bleed air panel to the OFF position.
   (a) Make sure the R ENG OFF light comes on.
   (b) Make sure the flow bar light goes off.

S 864-033

(7) Remove engine pneumatic power (AMM 36-00-00/201).

S 864-034

(8) Supply pneumatic power with the APU.

S 714-024

(9) Push the APU switch-light on the bleed air panel to the open position.
   (a) Make sure the VALVE light comes on then goes off.
   (b) Make sure the flow bar light comes on.
   (c) Make sure the L BLEED AIR DUCT PRESS gauge indicates bleed air pressure.

S 714-032

(10) Push the ISOLATION switch-light on the bleed air panel to the open position.
   (a) Make sure the VALVE light comes on and then goes off.
   (b) Make sure flow bar light comes on.
   (c) Make sure the R BLEED AIR DUCT PRESS gauge indicates bleed air pressure.

S 714-023

(11) Push the ISOLATION switch-light on the bleed air panel to the closed position.
   (a) Make sure the VALVE light comes on and then goes off.
   (b) Make sure the flow bar light goes off.

S 714-025

(12) Push the APU switch-light on the bleed air panel to the closed position.
   (a) Make sure the VALVE light comes on then goes off.
   (b) Make sure the flow bar light goes off.

S 714-026

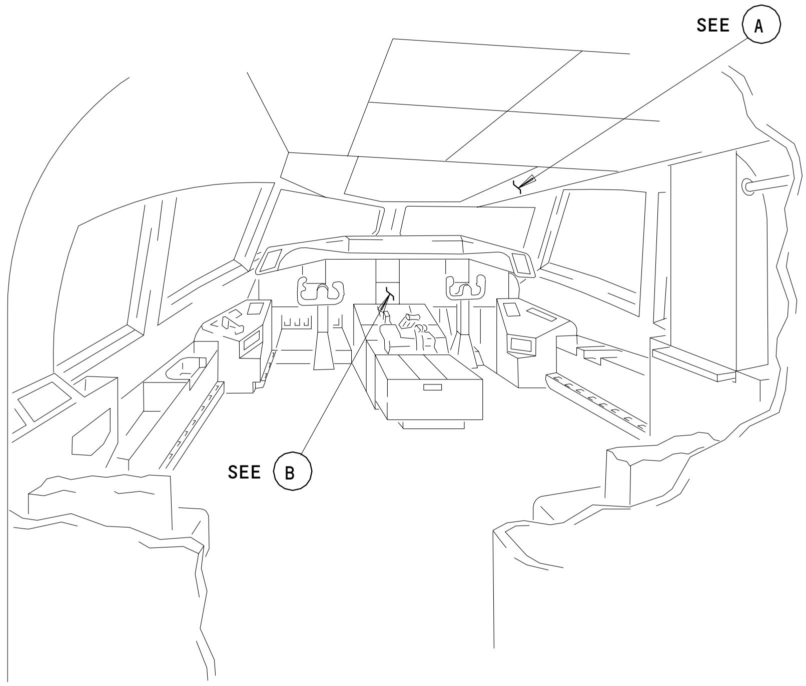
(13) Push the TEST button on the right lighting control panel located in the forward right corner of the P5 Overhead Panel. (Fig. 401)
   (a) Make sure these indicator lights on the Bleed Air Control Panel come on:
      1) Left (right) DUCK LEAK indicator
      2) Left (right) BLEED indicator
      3) Left (right) HI STAGE indicator

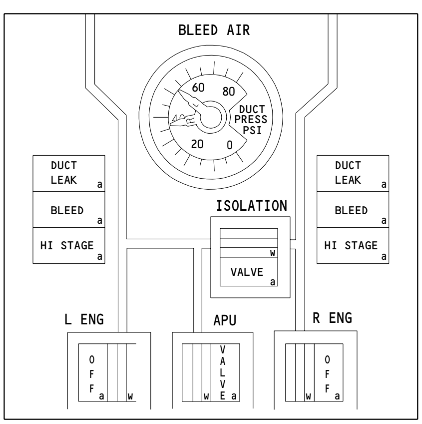
S 844-027

(14) Put the Airplane Back to its Usual Condition.

INDICATING - DESCRIPTION AND OPERATION

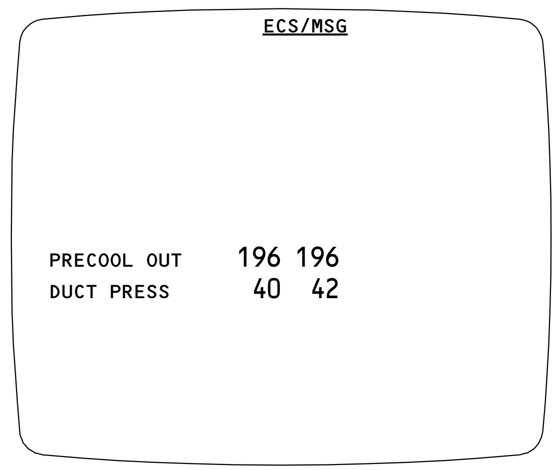
1. General (Fig. 1)
   A. The air supply indicating system provides pressure indication and temperature indication for the air supply distribution system (Ref 36-10-00).
   B. Air Supply Pressure Indicating System (Fig. 2)
      (1) Two pressure transducers provide signals to the dual duct pressure indicator (P5 panel) and to EICAS. The transducers sense available system pressure on either side of the air supply isolation valve. Both transducers are located just forward of the air supply body cross over ducting.
   C. Air Supply Temperature Indicating System
      (1) Air Supply system overheat protection is provided by two 490°F (254°C) overheat switches. The overheat switches sense an overtemperature condition on each side of the isolation valve. The L or R BLEED light on the P5 panel, the EICAS caution Message L or R ENG BLEED VAL, and an aural warning (owl) provide indication of the sensed overheat condition. The PRSOV and high stage valve are commanded closed in an overheat condition.
      (2) The precooler discharge temperature sensor provides EICAS with temperature indication on the ground only. The sensor is located downstream of the PRSOV on a duct section in the wing leading edge above the strut.
2. Operation
   A. Air Supply Pressure Indicating System Operation (Fig. 3)
      (1) Two duct pressure transducers provide a direct reading of the available air pressure supplied by the air supply system. 28 volts dc power operates each pressure transducer.
      (2) The BLEED AIR DUCT PRESS indicator on P5 panel receives signals from transducers on the left and right side of the isolation valve. The output of the indicator displays individual pressure for the right and left side from 0-80 psig.
      (3) EICAS receives signals from a transducer on the left and right side of the isolation valve. Pressing the EICAS MAINT ECS MSG pushbutton on the right side P61 panel will display L and R DUCT PRESS on the EICAS lower display screen.
   B. Air Supply Temperature Indicating System (Fig. 4 and 5)





PILOT'S OVERHEAD PANEL (P5)

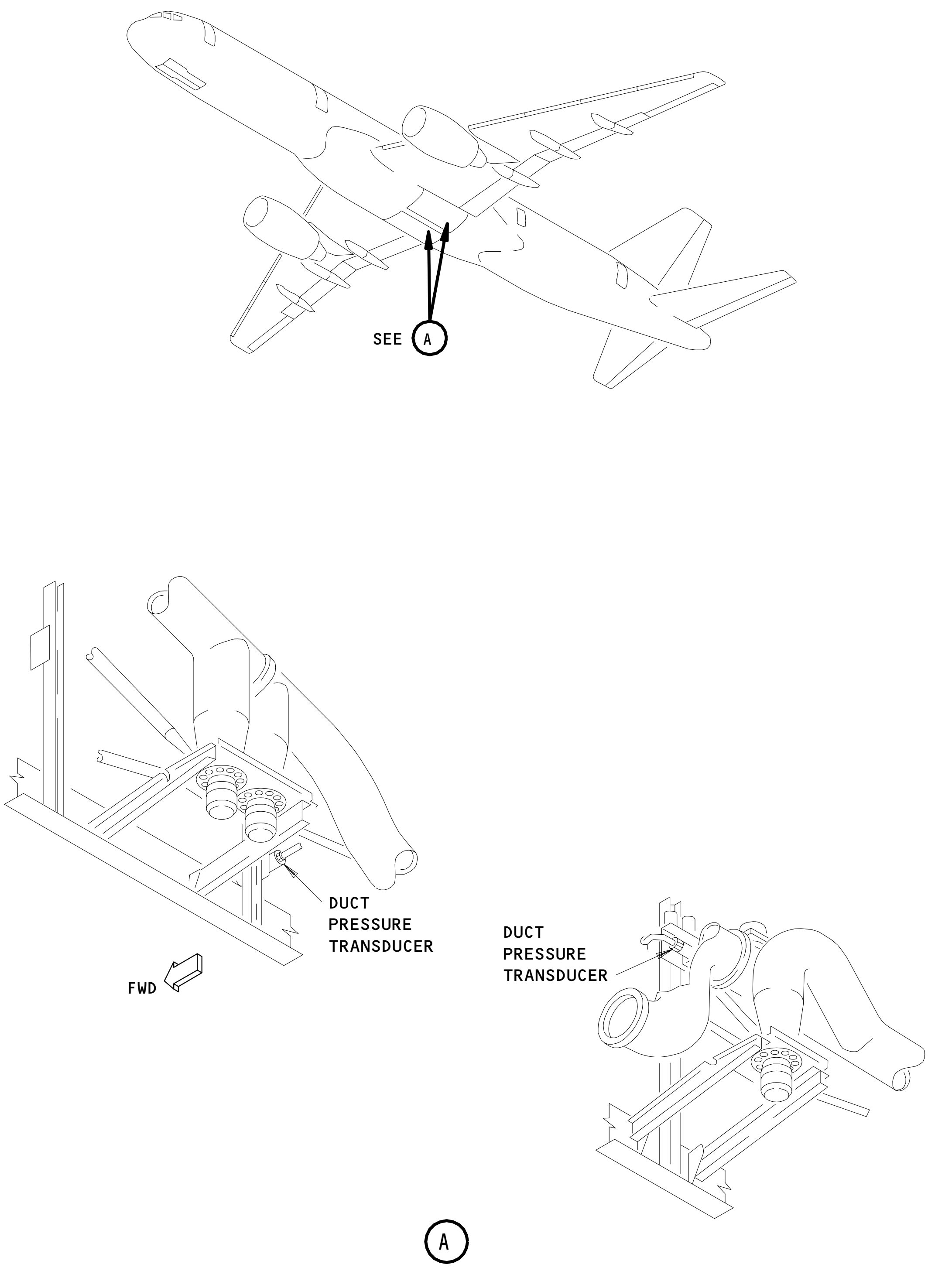
A



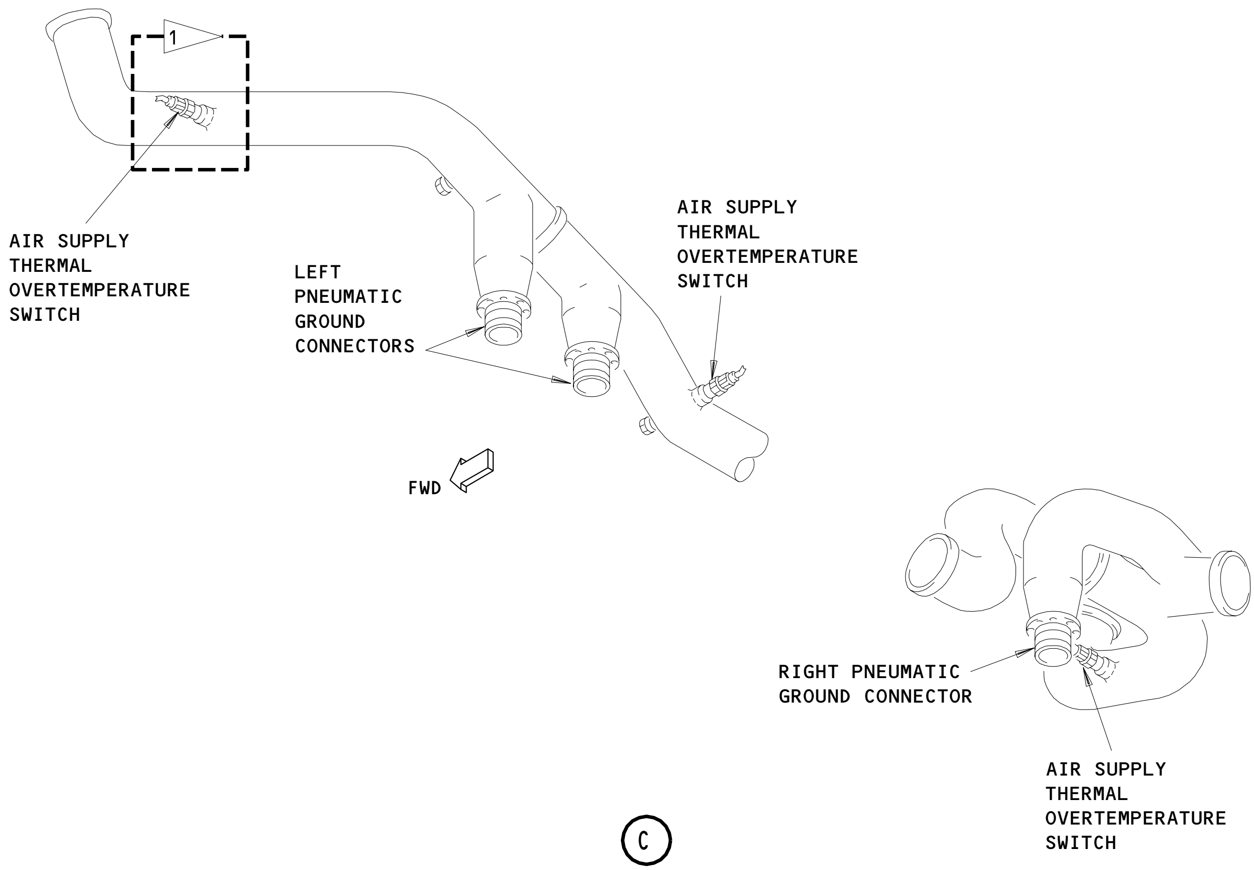
PILOT'S CENTER INSTRUMENT PANEL (P2)

B

Air Supply Indication
Figure 1

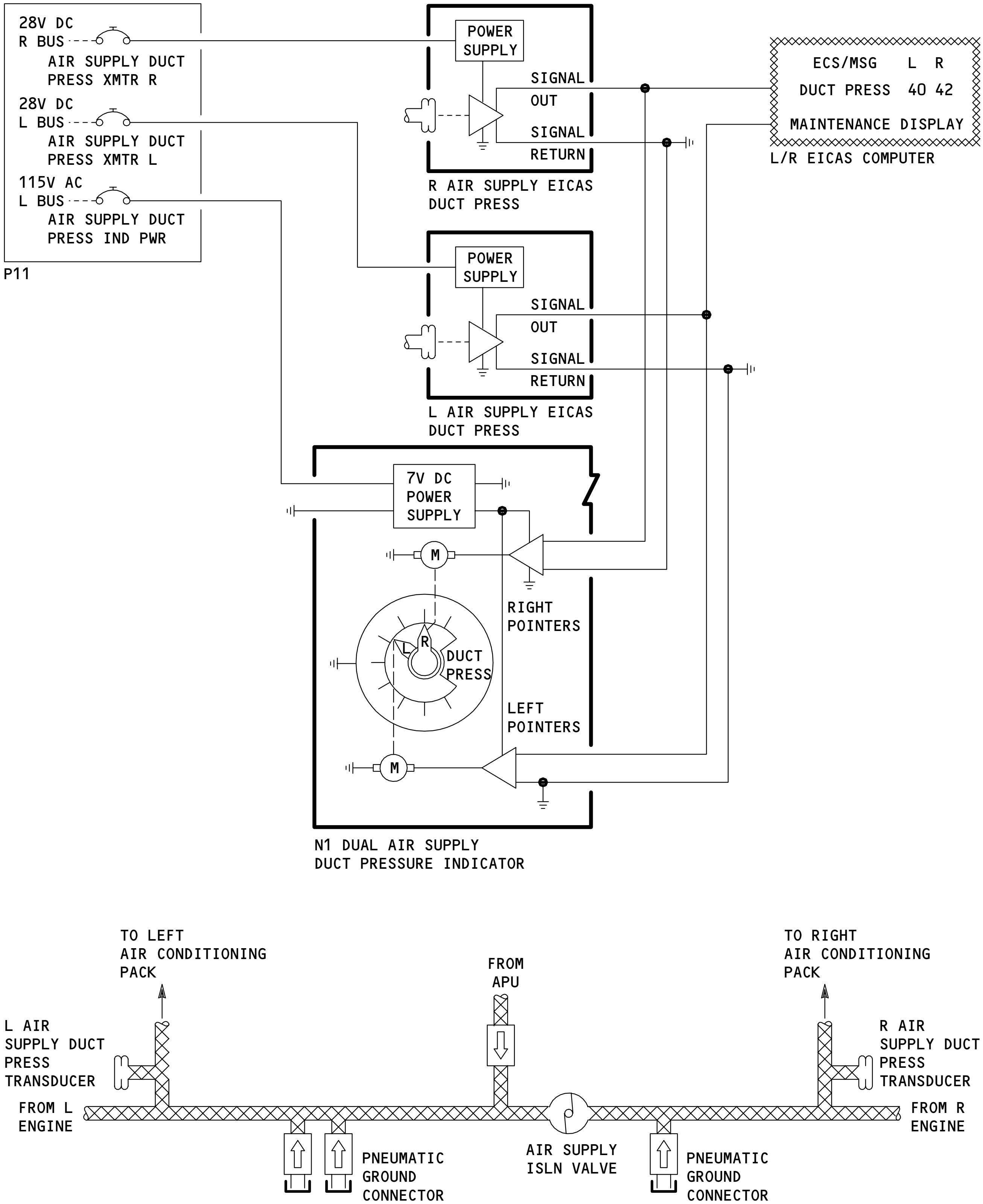


Air Supply Indication Components
Figure 2 (Sheet 1)

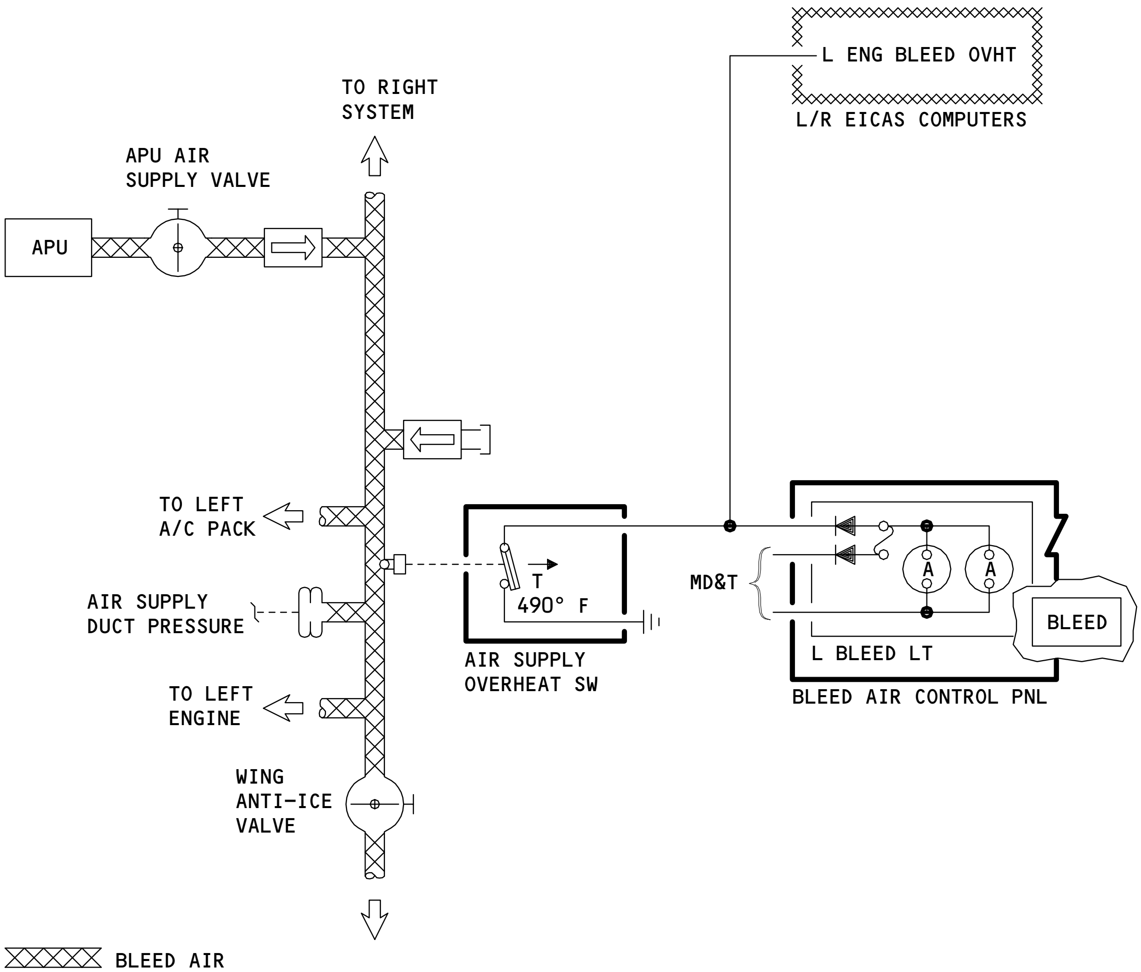


1 ALTERNATE LOCATION

Air Supply Indication Components
Figure 2 (Sheet 2)

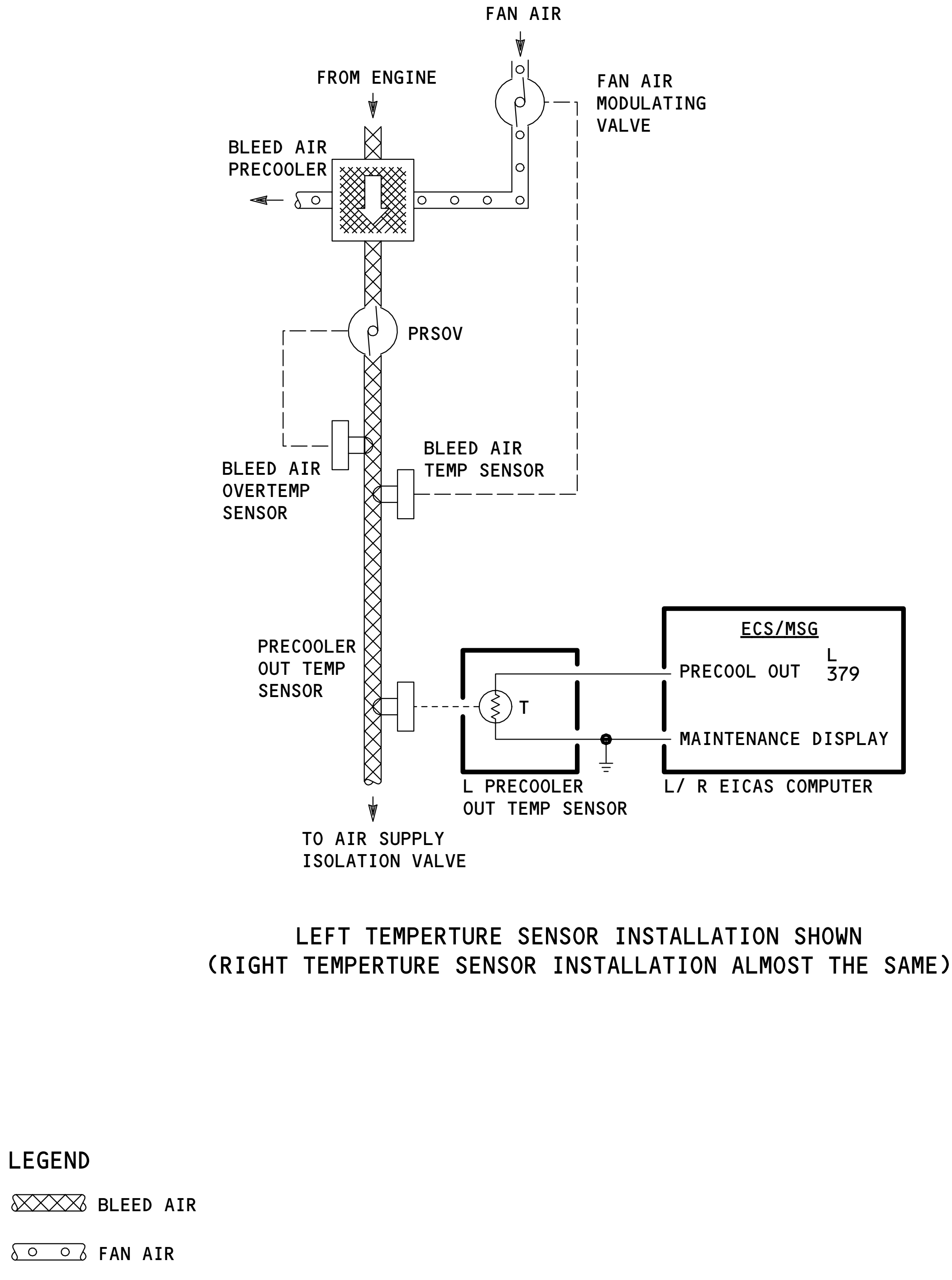


Air Supply Pressure Indicating Operation Schematic
Figure 3



LEFT SYSTEM SHOWN, RIGHT SIMILAR

Air Supply Overheat Indication Schematic
Figure 4



Air Supply Precooler Discharge Temperature Indication System Schematic
Figure 5

(1) The air supply thermal overtemperature switch located on the right and left side of the isolation valve detects an overheat condition at 490°F (254°C). The switch closes at 490°F (254°C) and supplies a ground. The grounded switch energizes the left or right PRSOV/HP6 Ovrd relay, lights the Bleed Air BLEED light on the P5 panel, and supplies an EICAS caution message L or R ENG BLEED VAL.

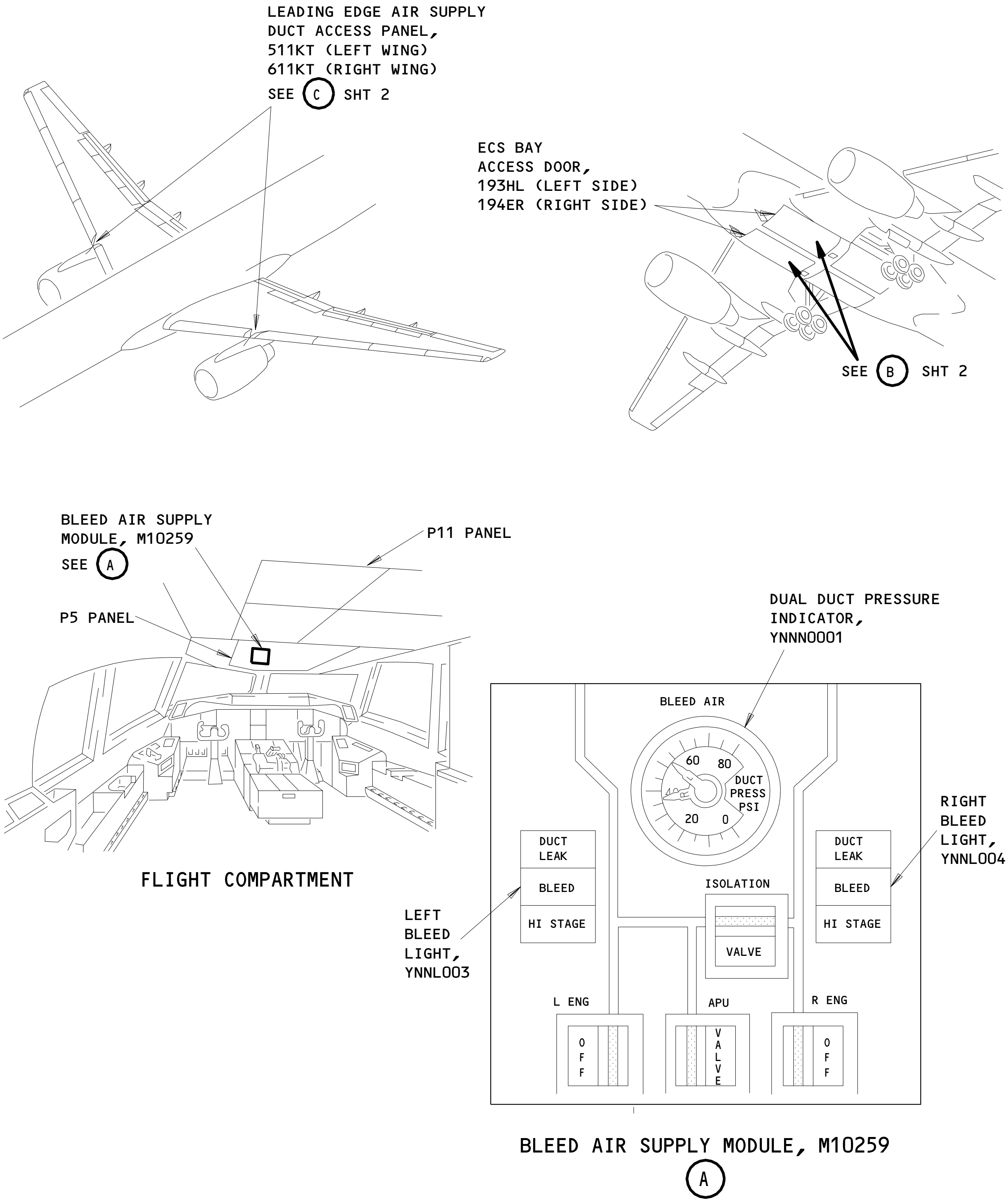
(2) The air supply precooler discharge temperature bulb senses temperature downstream of the PRSOV for temperature indication. A signal is sent to EICAS for display in the flight compartment on the ground. Pressing the EICAS MAINT ECS/MSG switch on the P61 panel will display PRECOOL OUT temperature.

PNEUMATIC INDICATING

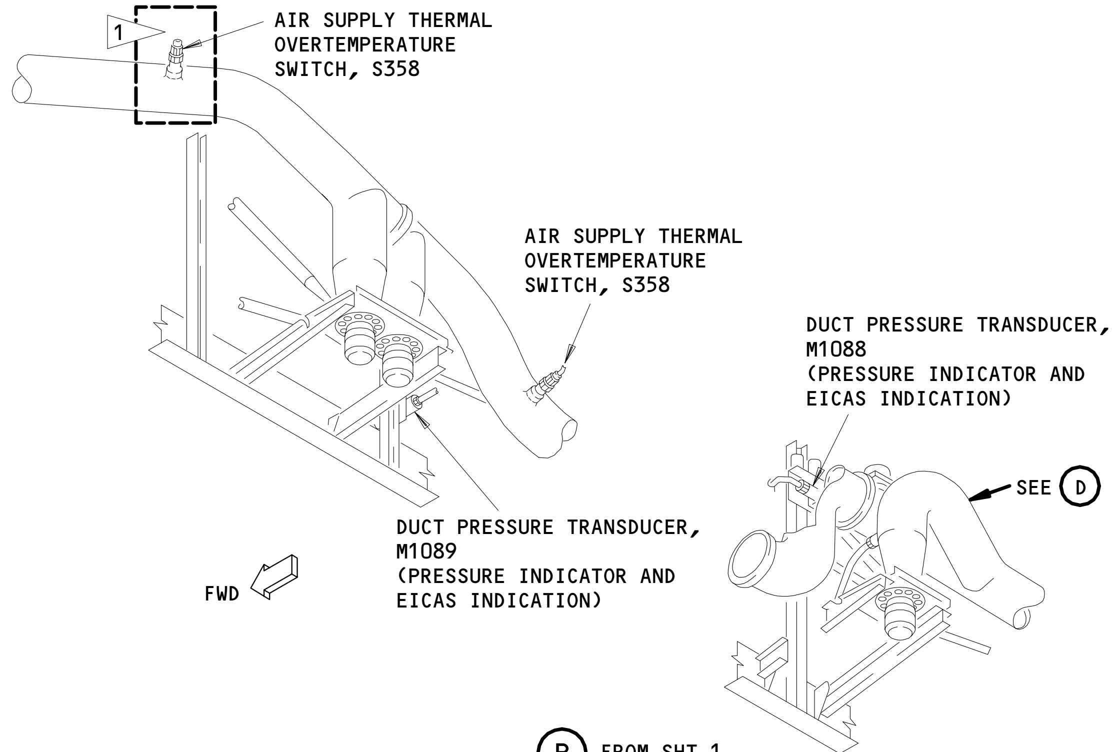
COMPONENT	FIG. 102 SHT	QTY	ACCESS/AREA	REFERENCE
CIRCUIT BREAKERS	1		FLT COMPT, P11	
DUCT PRESS IND - POWER, C4221		1	11Q15	*
DUCT PRESS IND - LEFT, C1332		1	11Q16	*
DUCT PRESS IND - RIGHT, C1342		1	11Q24	*
COMPUTER - (REF 31-41-00, FIG. 101)				
EICAS LEFT, M10181				
EICAS RIGHT, M10182				
INDICATOR - DUAL AIR SUPPLY DUCT PRESSURE, YNNN0001	1	1	FLT COMPT, P5, BLEED AIR SUPPLY MODULE, M10259	36-21-02
LIGHT - BLEED, LEFT, YNNL003	1	1	FLT COMPT, P5, BLEED AIR SUPPLY MODULE, M10259	*
LIGHT - BLEED, RIGHT, YNNL004	1	1	FLT COMPT, P5, BLEED AIR SUPPLY MODULE, M10259	*
MODULE - (REF 36-10-00, FIG. 101)				
BLEED AIR SUPPLY, M10259				
SENSOR - LEFT AIR SUPPLY PRECOOLER DISCHARGE TEMPERATURE, TS350	2	1	433KL, HYDRAULIC, FUEL AND ELEC-TRONIC ACCESS STRUT PANEL	36-22-02
SENSOR - RIGHT AIR SUPPLY PRECOOLER DISCHARGE TEMPERATURE, TS351	2	1	433KR, HYDRAULIC, FUEL AND ELEC-TRONIC ACCESS STRUT PANEL	36-22-02
SWITCH - LEFT AIR SUPPLY THERMAL OVERTEMPERA-TURE, S358	2	1	193HL, ECS BAY ACCESS DOOR	36-22-01
SWITCH - RIGHT AIR SUPPLY THERMAL OVERTEMPERA-TURE, S359	2	1	194ER, ECS BAY ACCESS DOOR	36-22-01
TRANSDUCER - LEFT DUCT PRESSURE, M1089	2	1	193HL, ECS BAY ACCESS DOOR	36-21-01
TRANSDUCER - RIGHT DUCT PRESSURE, M1088	2	1	194ER, ECS BAY ACCESS DOOR	36-21-01

* SEE THE WDM EQUIPMENT LIST

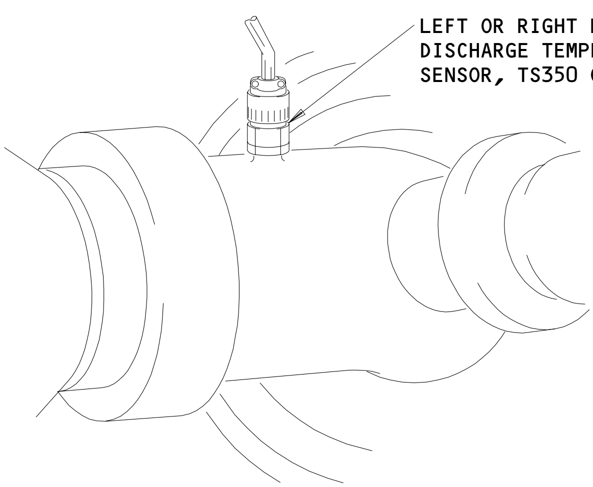
Pneumatic Indicating - Component Index
Figure 101



Pneumatic Indicating - Component Location
Figure 102 (Sheet 1)

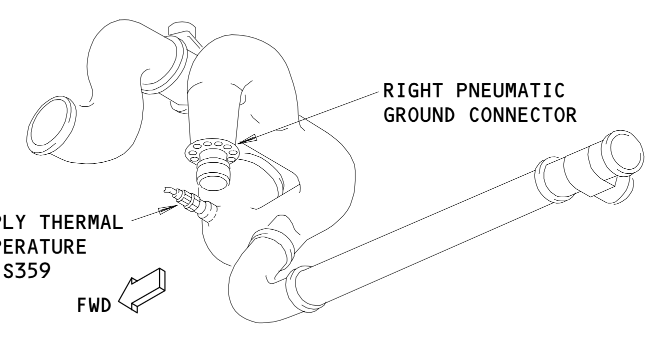


B FROM SHT 1



THE RIGHT SIDE IS SHOWN,
THE LEFT SIDE IS OPPOSITE

C FROM SHT 1



D

1 ALTERNATE LOCATION

Pneumatic Indicating - Component Location
Figure 102 (Sheet 2)

AIR SUPPLY PRESSURE INDICATING SYSTEM - ADJUSTMENT/TEST

1. General
    A. The procedure makes sure that the flight deck and EICAS pressure indication systems operate correctly.

TASK 36-21-00-715-001

2. Air Supply Pressure Indicating System Operational Test
    A. References
        (1) AMM 24-22-00/201, Electrical Power Control
        (2) AMM 36-00-00/201, Pneumatic - General
    B. Access
        (1) Location Zones
            211/212   Control Cabin

    C. Prepare for the Air Supply Pressure Indicating System Operational Test

        S 865-002
        (1) Supply electrical power (AMM 24-22-00/201).

        S 865-003
        (2) Supply pneumatic power (AMM 36-00-00/201).
    D. Air Supply Pressure Indicating System Operational Test

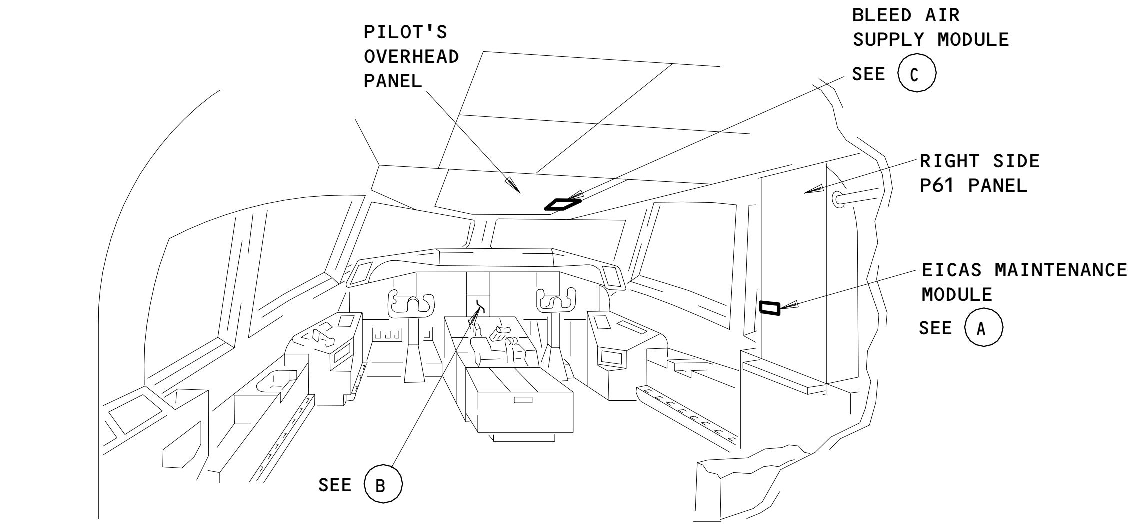
        S 865-004
        (1) Push the BLEED AIR ISOLATION VALVE switch/light on the pilots' overhead P5 panel to the open position.

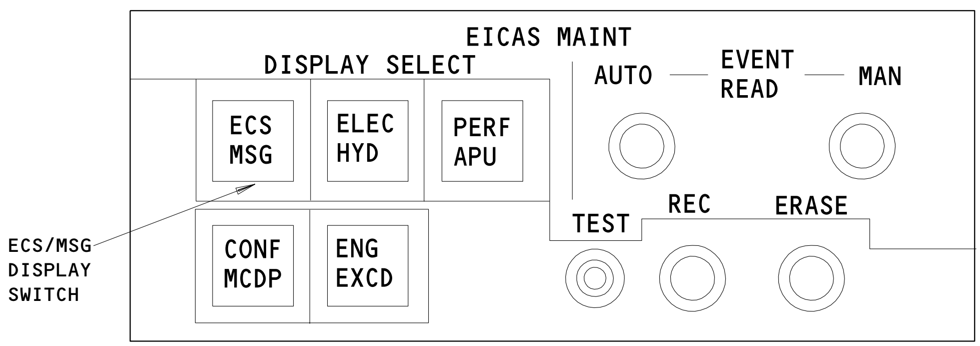
        S 215-005
        (2) Make sure the VALVE light comes on and then goes out.

        S 865-006
        (3) Make sure the five EICAS circuit breakers on the P11 panel are closed.

        S 865-007
        (4) Push the ECS MSG switch on the EICAS MAINT panel on the right side panel P61.

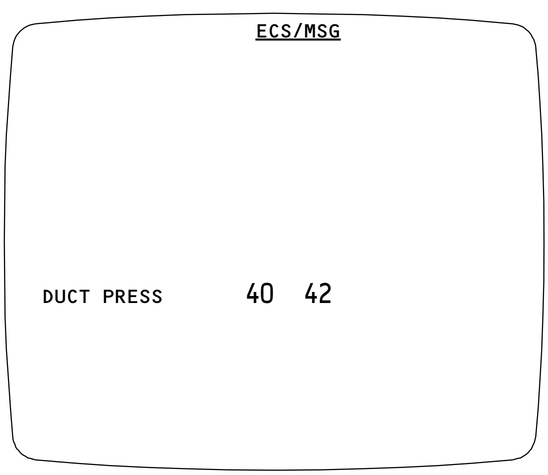
        S 215-008
        (5) Make sure the BLEED AIR L and the R DUCT PRESS indicators on the P5 panel and L and R DUCT PRESS on the lower EICAS display show the same pressure.





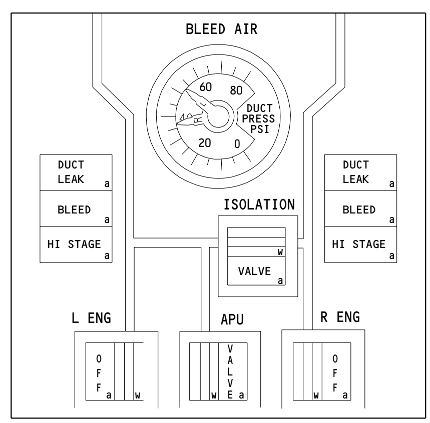
EICAS MAINTENANCE MODULE

A



PILOT'S CENTER INSTRUMENT PANEL (P2)

B



BLEED AIR SUPPLY MODULE

C

Air Supply Indication
Figure 501

E. Put the Airplane Back to Its Usual Condition

S 865-009

(1) Remove pneumatic power if it is not necessary (AMM 36-00-00/201).

S 865-010

(2) Remove electrical power if it is not necessary (AMM 24-22-00/201).

DUCT PRESSURE TRANSDUCER REMOVAL/INSTALLATION

1. General
   A. This procedure has the removal and installation of the duct pressure transducer.
   B. Two transducers are in the wing body fairing. One transducer supplies signals for the indication in the flight compartment. The other transducer supplies signals to the EICAS for the display on the ground.

TASK 36-21-01-004-001

2. Remove the Duct Pressure Transducer
   A. References
      (1) AMM 06-41-00/201, Fuselage Access Door and Panels
      (2) AMM 24-22-00/201, Electric Power Control
      (3) AMM 36-00-00/201, Pneumatic - General
   B. Access
      (1) Location Zones
          135/136 Environmental Control System Bay

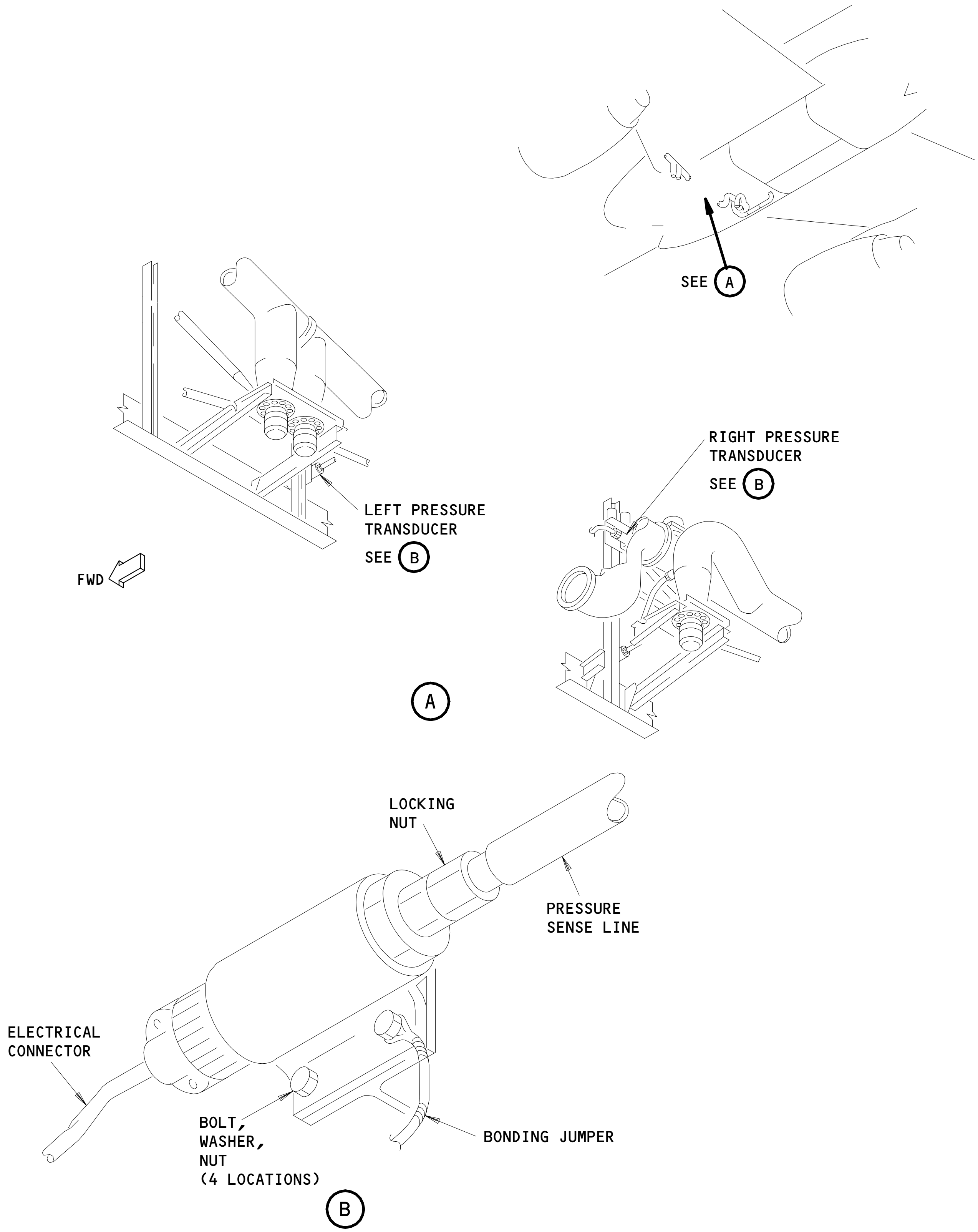
      (2) Access Panels
          193HL/194ER ECS Access Door

   C. Prepare for the Removal of the Duct Pressure Transducer (Fig. 401)

      S 864-002
      (1) Supply the electrical power (AMM 24-22-00/201).

      S 864-005
      (2) To remove the left duct pressure transducer, do the steps that follow:
          (a) Open these circuit breakers on the overhead circuit breaker Panel, P11, and attach DO-NOT-CLOSE tags:
              1) 11Q15, DUCT PRESS IND PWR
              2) 11Q16, DUCT PRESS IND LEFT
          (b) Open the access door, 193HL for the ECS bay (AMM 06-41-00/201).

      S 864-008
      (3) To remove the right duct pressure transducer, do the steps that follow:
          (a) Open these circuit breakers on the P11, panel and attach DO-NOT-CLOSE tags:
              1) 11Q15, DUCT PRESS IND PWR
              2) 11Q24, DUCT PRESS IND RIGHT
          (b) Open the access door, 193ER for the ECS bay (AMM 06-41-00/201).



Duct Pressure Transducer - Installation
Figure 401

D. Remove the Duct Pressure Transducer (Fig. 401)

S 864-036

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) Remove pneumatic power (AMM 36-00-00/201).

NOTE: Pressure is released when the system is not in operation.

S 034-010
(2) Disconnect the pressure sense line from the transducer.

S 434-011
(3) Install the cover on the sense line opening to prevent entry of unwanted objects.

S 034-012
(4) Disconnect the electrical connector from the transducer.

S 034-013
(5) Remove the bolts from the transducer.

S 024-014
(6) Remove the transducer.

TASK 36-21-01-404-015
3. Install the Duct Pressure Transducer (Fig. 401)
A. References
(1) AMM 36-00-00/201, Pneumatic-General
B. Access
(1) Location Zones
135/136 Environmental Control System Bay

(2) Access Panels
193HL/194ER ECS Access Door

C. Procedure

S 424-016
(1) Put the transducer on the spar.

S 434-017
(2) Install the bolts, washers and nuts to the two top bolt holes.

S 434-018
(3) Connect the bonding jumpers to the transducer with the bolts, washers, and nuts in the two lower bolt holes.

S 434-019
(4) Connect the electrical connector to the transducer.

S 034-020
(5) Remove the cover from the pressure sense line.

S 434-021
(6) Connect the pressure sense line to the transducer.

S 864-022
(7) Close these circuit breakers on the P11 panel, and remove the DO-NOT-CLOSE tag:
   (a) 11Q15, DUCT PRESS IND PWR
   (b) 11Q16, DUCT PRESS IND LEFT or
       11Q24, DUCT PRESS IND RIGHT

S 864-023
(8) Make sure that the five EICAS circuit breakers on the P11 panel are closed.

S 864-024
(9) Supply the pneumatic pressure (AMM 36-00-00/201).

S 864-025
(10) Push the ECS/MSG switch on the EICAS maintenance panel on the right side panel, P61.

S 864-026
(11) Push the ISOLATION VALVE on the P5 panel to the open position.

S 214-027
(12) Make sure that white flowbar light comes on.

S 214-028
(13) Make sure that the VALVE light comes on and goes out.

S 214-029
(14) Make sure the DUCT PRESS indicators on the P5 panel shows the same values as the EICAS display.

S 864-030
(15) Push the ISOLATION VALVE on the P5 panel to the closed position.

S 214-031
(16) Make sure the white flowbar light goes off.

S 214-032
(17) Make sure the VALVE light comes on and goes out.

D. Put the Airplane Back to Its Usual Condition

S 864-033
(1) Remove pneumatic pressure, if it is not necessary (AMM 36-00-00/201).

S 414-034
(2) Close the access door, (193HL/194ER) for the ECS bay (AMM 06-41-00/201).

S 864-035
(3) Remove electrical power, if it is not necessary.

DUAL DUCT PRESSURE INDICATOR - REMOVAL/INSTALLATION

TASK 36-21-02-004-001

1. Remove the Duct Pressure Indicator
   A. Access
      (1) Location Zones
          211/212 Control Cabin - Section 41

   B. Prepare for the Removal of the Duct Pressure Indicator

      S 864-002
      (1) Open these circuit breakers on the overhead circuit breaker panel, P11, and attach the DO-NOT-CLOSE tags:
          (a) 11Q15, DUCT PRESS IND PWR
          (b) 11Q16, DUCT PRESS IND LEFT
          (c) 11Q24, DUCT PRESS IND RIGHT
   C. Remove the Duct Pressure Indicator

      S 034-003
      (1) Disengage the 1/4 turn fasteners from the air conditioning module on the PLT overhead panel, P5.

      S 034-004
      (2) Carefully pull the air conditioning module away from the P5 panel sufficiently to get access to the electrical connector.

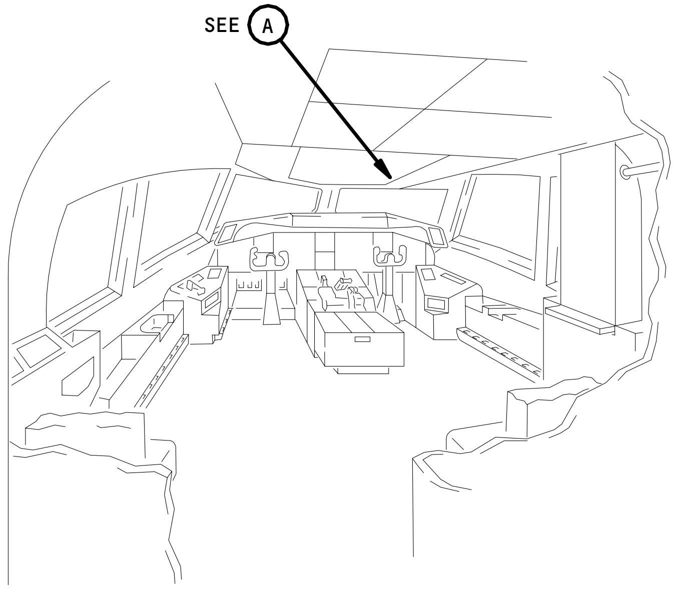
      S 034-005
      (3) Disconnect the electrical connector from the duct pressure indicator.

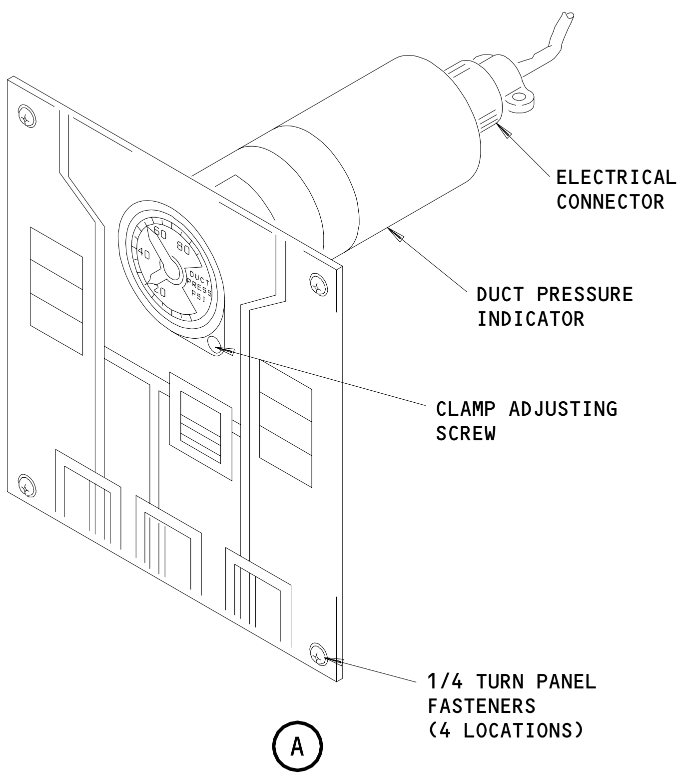
      S 034-006
      (4) Loosen the screw on the clamp.

      S 024-007
      (5) Remove the duct pressure indicator.

TASK 36-21-02-404-008

2. Install the Duct Pressure Indicator (Fig. 401)
   A. References
      (1) AMM 24-22-00/201, Electric Power Control





Dual Duct Pressure Indicator
Figure 401

(2) AMM 36-00-00/201, Pneumatic - General

B. Access

(1) Location Zones

211/212 Control Cabin

C. Procedure

S 424-009

(1) Put the duct pressure indicator in the air conditioning module.

S 434-024

(2) Tighten the clamp to 5-8 pound-inches.

S 434-010

(3) Install the electrical connector to the duct pressure indicator.

S 434-011

(4) Move the air conditioning module back into P5 panel.

(a) Engage the 1/4 turn fasteners.

S 864-012

(5) Close these circuit breakers on the P11 panel, and remove the DO-NOT-CLOSE tag:

(a) 11Q15, DUCT PRESS IND PWR

(b) 11Q16, DUCT PRESS IND LEFT

(c) 11Q24, DUCT PRESS IND RIGHT

S 864-013

(6) Supply electrical power (AMM 24-22-00/201).

S 864-014

(7) Supply pneumatic power (AMM 36-00-00/201).

S 864-015

(8) Push the BLEED AIR ISOLATION switch/light to the open position.

S 214-016

(9) Make sure the VALVE light comes on and goes out.

S 214-017

(10) Make sure the white flowbar light comes on.

S 214-018
(11) Make sure the needles on the two duct pressure indicators show approximately the same pressure.

S 864-019
(12) Push the BLEED AIR ISOLATION switch/light to the closed position.

S 214-020
(13) Make sure the VALVE light comes on and goes out.

S 214-021
(14) Make sure the white flowbar light goes off.

D. Put the Airplane Back to Its Usual Condition

S 864-022
(1) Remove pneumatic power, if it is not necessary (AMM 36-00-00/201).

S 864-023
(2) Remove electrical power, if it is not necessary (AMM 24-22-00/201).

AIR SUPPLY TEMPERATURE INDICATING SYSTEM - ADJUSTMENT/TEST

1. General
   A. This procedure contains a system test of the air supply thermal overtemperature switch. The air supply thermal overtemperature switch is referred to as the overtemperature switch in this procedure.

TASK 36-22-00-735-005

2. Air Supply Temperature Indicating System Test
   A. References
      (1) AMM 06-41-00/201, Fuselage Access Doors and Panels
      (2) AMM 24-22-00/201, Electrical Power Control
   B. Access
      (1) Location Zones
          135/136 Environmental Control System Bay

      (2) Access Panels
          193HL/194ER ECS Access Door

   C. Prepare for the System Test

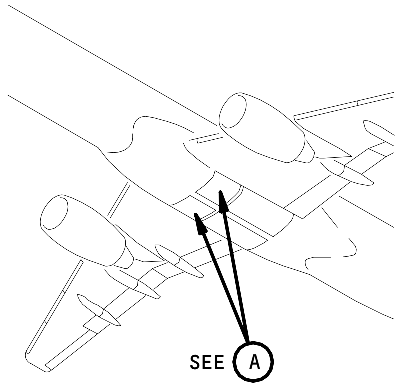
      S 015-006
      (1) Open the left or right ECS access door 193HL or 194ER, find the L (R) overtemperature switch (AMM 06-41-00/201).

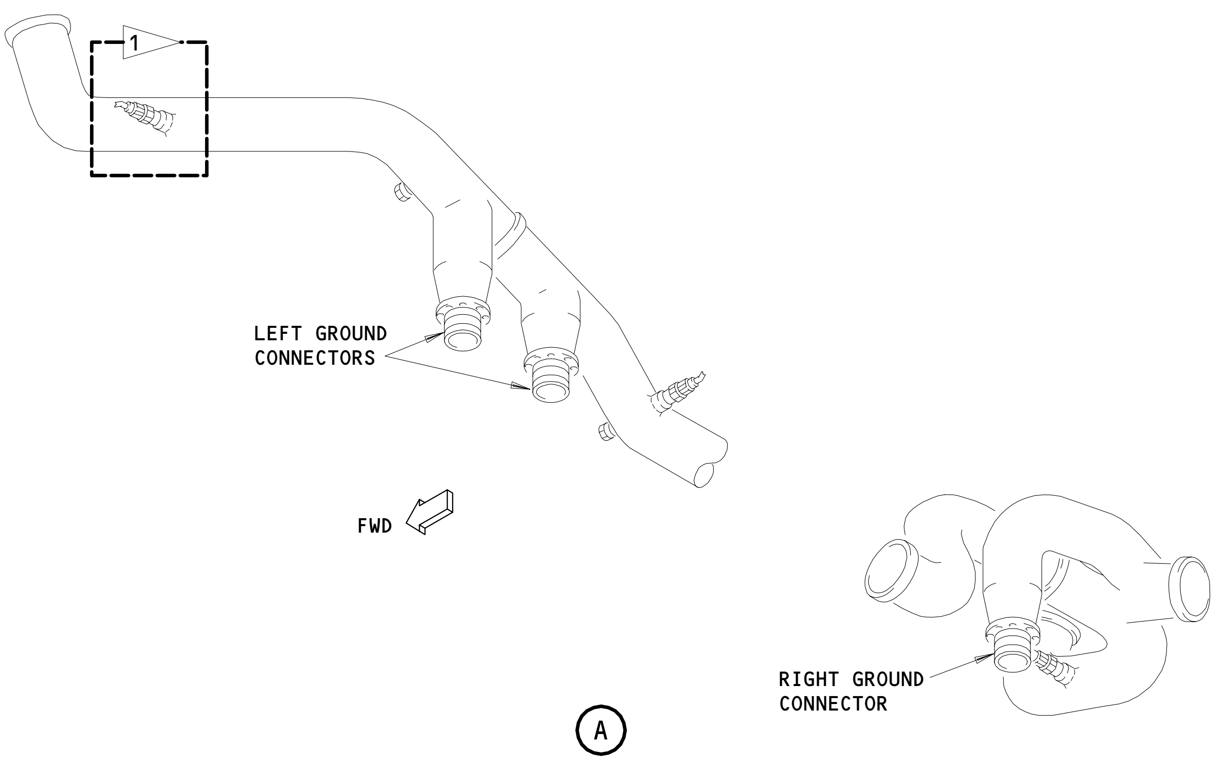
      S 035-008
      (2) Disconnect the electrical connector from the overtemperature switch.

      S 865-009
      (3) Supply the electrical power (AMM 24-22-00/201).
   D. System Test - Air Supply Temperature Indicating System (Fig. 501)

      S 485-010
      (1) Connect a jumper between pins 1 and 2 of the electrical connector.

      S 215-011
      (2) Make sure that the applicable L (R) BLEED light is on and the OFF light on the P5 panel comes on.





1 ALTERNATE LOCATION

Air Supply Thermal Overtemperature Switch - Installation
Figure 501

S 215-032
(3) Make sure the EICAS message, L(R) ENG BLEED VAL, shows on the EICAS display.

S 085-012
(4) Remove the jumper from the electrical connector.

S 435-013
(5) Connect the electrical connector to the overtemperature switch.

S 435-027
(6) Install a lockwire on the electrical connector.

S 215-017
(7) Make sure that L (R) BLEED light on P5 panel goes off.

E. Put the Airplane Back to Its Usual Condition

S 415-018
(1) Close the ECS bay access doors (193HL/194ER).

S 865-021
(2) Remove electrical power if it is not necessary (AMM 24-22-00/201).

AIR SUPPLY THERMAL OVERTEMPERATURE SWITCH (490°F) - REMOVAL/INSTALLATION

1. General
   A. This procedure has instructions for the removal and installation of the air supply thermal overtemperature switches.
   B. The air supply thermal overtemperature switches are referred to as overtemperature switches in this procedure.
   C. There are two overtemperature switches the ECS bay. The two overtemperature switches are the same.

TASK 36-22-01-004-004

2. Remove the Air Supply Thermal Overtemperature Switch
   A. References
      (1) AMM 36-00-00/201, Pneumatic - General
   B. Access
      (1) Location Zones
          135/136 Environmental Control System Bay

      (2) Access Panels
          193HL/194ER ECS Access Door
   C. Prepare for the Removal

      S 864-033

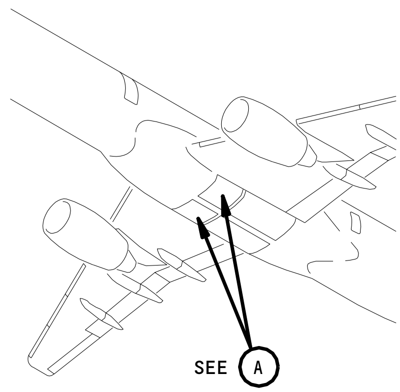
   WARNING: RELEASE THE PRESSURE IN THE PNEUMATIC DUCT BEFORE YOU REMOVE A PNEUMATIC SYSTEM COMPONENT. THE HOT, HIGH-PRESSURE AIR CAN CAUSE INJURY TO PERSONS.

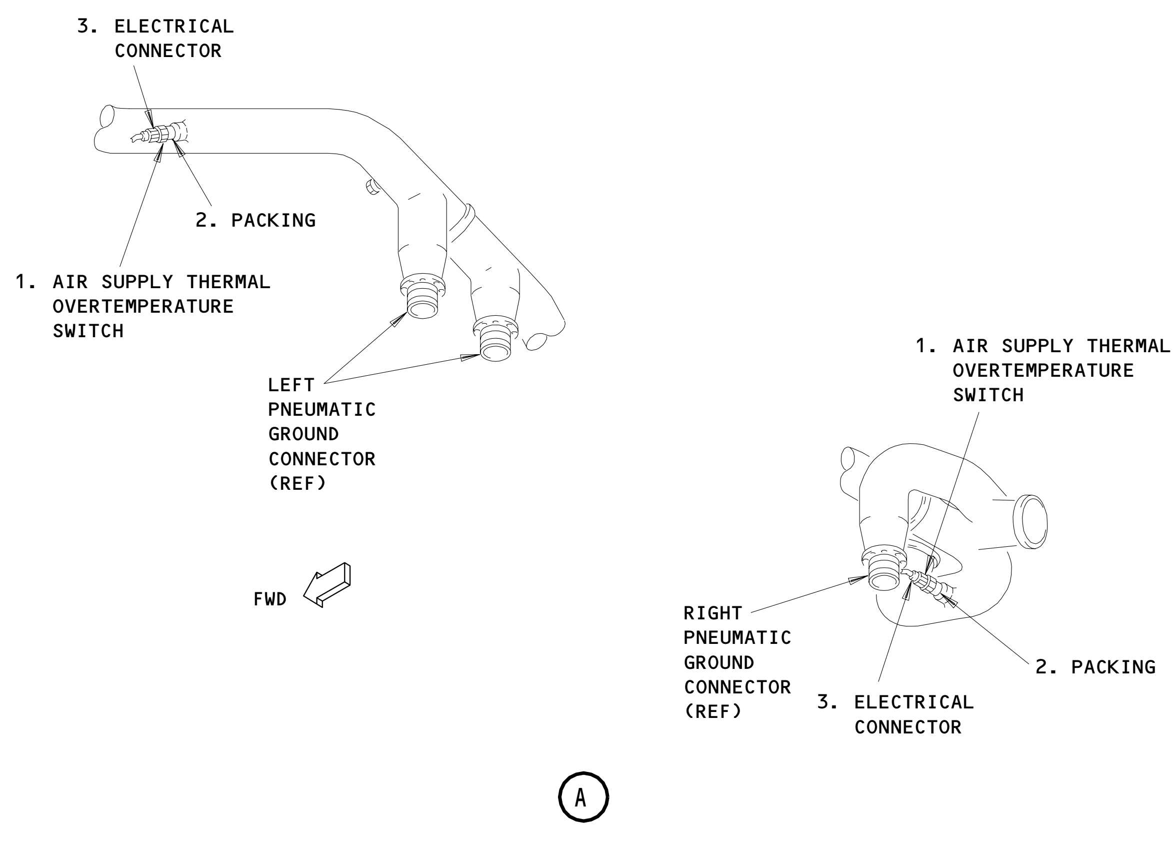
      (1) Remove pneumatic power (AMM 36-00-00/201).

      NOTE: Pressure is released when the system is not in operation.

      S 014-007

      (2) Open the applicable left or right ECS access doors (193HL/194ER) (AMM 06-41-00/201).





Air Supply Thermal Overtemperature Switch - Installation
Figure 401

D. Air Supply Thermal Overtemperature Switch Removal

S 034-009
(1) Disconnect the electrical connector (3).

S 034-010
(2) Remove the overtemperature switch (1) from the pneumatic duct boss.

S 034-011
(3) Remove and discard the packing (2).

S 434-012
(4) Put the cover on the duct opening to prevent entry of unwanted objects.

TASK 36-22-01-404-013
3. Install the Air Supply Thermal Overtemperature Switch (Fig. 401)
A. Parts

MM			IPC		
FIG	ITEM	NOMENCLATURE	SUBJECT	FIG	ITEM
401	1 2	Overtemperature Sensor Packing	36-22-01	02	15 20

B. References
(1) AMM 24-22-00/201, Electrical Power - Control
C. Access
(1) Location Zones
135/136 Environmental Control System Bay

(2) Access Panels
193HL/194ER ECS Access Door
(3) Access Panels
511KT/611KT ECS Duct Access Panel

D. Procedure

S 014-014
(1) Remove the duct cover.

S 424-015
(2) Install the overtemperature switch (1) with the new packing (2) into the duct boss.

S 434-016
(3) Install the electrical connector (3).

E. Put the Airplane Back to Its Usual Condition

S 414-039

(1) Close the ECS access doors (193HL/194ER).

S 864-021

(2) Remove electrical power if it is not necessary (AMM 24-22-00/201).

PRECOOLER DISCHARGE TEMPERATURE SENSOR REMOVAL/INSTALLATION

1. General
   A. This procedure has the removal and installation of the Precooler Discharge Temperature Sensor.
   B. The precooler discharge temperature sensor is referred to as the sensor in this procedure. The sensor is in the wing leading edge above the engine strut.
   C. The sensor supplies a signal to the EICAS for the temperature indication.

TASK 36-22-02-004-004

2. Remove the Precooler Discharge Temperature Sensor
   A. References
      (1) AMM 06-44-00/201, Wing Access Door and Panels
      (2) AMM 24-22-00/201, Electric Power Control
      (3) AMM 36-00-00/201, Pneumatic - General
      (4) AMM 78-31-00/201, Thrust Reverser System
   B. Access
      (1) Location Zones
          511/611 Leading Edge to Front Spar

      (2) Access Panels
          511KT/611KT ECS Duct Access Panel

   C. Prepare for the Removal of the Precooler Discharge Temperature Sensor (Fig. 401)

      S 864-005
      (1) Supply the electrical power (AMM 24-22-00/201).

      S 864-024

      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.

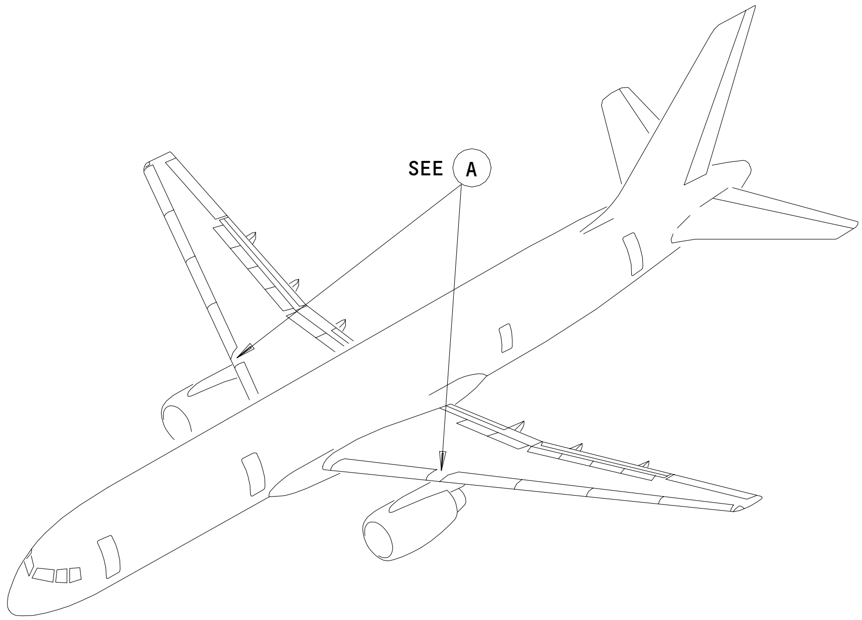
      (2) Remove pneumatic power (AMM 36-00-00/201).

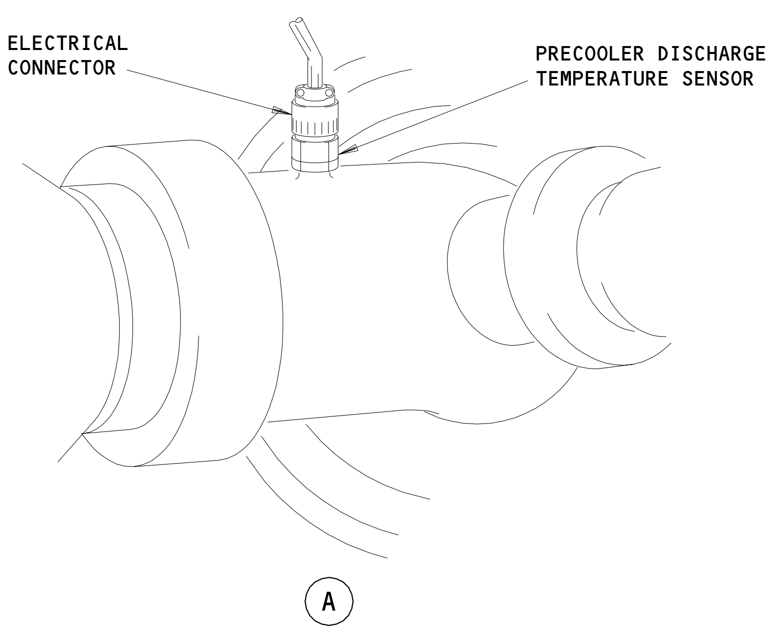
          NOTE: Pressure is released when the system is not in operation.

      S 044-001

      WARNING: DO THE DEACTIVATION PROCEDURE TO PREVENT THE OPERATION OF THE THRUST REVERSER. THE ACCIDENTAL OPERATION OF THE THRUST REVERSER CAN CAUSE INJURIES TO PERSONS AND DAMAGE TO EQUIPMENT.

      (3) Do the deactivation procedure for the thrust reverser for ground maintenance (AMM 78-31-00/201).





Precooler Discharge Temperature Sensor Installation
Figure 401

S 014-007
(4) Remove the applicable ECS duct access panel, 511KT or 611KT (AMM 06-44-00/201).

D. Remove the Precooler Discharge Temperature Sensor

S 034-008
(1) Disconnect the electrical connector from the sensor.

S 024-009
(2) Remove the temperature sensor from the boss duct.

S 434-010
(3) Put a cover on the duct opening to prevent entry of unwanted objects.

TASK 36-22-02-004-011

3. <u>Install the Precooler Discharge Temperature Sensor</u> (Fig. 401).

A. References
   (1) AMM 06-44-00/201, Wing Access Door and Panels
   (2) AMM 78-31-00/201, Thrust Reverser System

B. Access
   (1) Location Zones
       511/611   Leading Edge to Front Spar

   (2) Access Panels
       511KT/611KT   ECS Duct Access Panel

C. Procedure

S 034-012
(1) Remove the duct cover.

S 424-013
(2) Install the sensor into the boss duct.

S 434-014
(3) Connect the electrical connector to the sensor.

S 414-016
(4) Install the ECS duct access panel, 511KT or 611KT (AMM 06-44-00/201).

S 724-017
(5) Do a test on the sensor as follows:
   (a) Make sure that the six EICAS circuit breakers on the P11 panel, are closed.
   (b) Push the ECS/MSG switch on the EICAS Maintenance panel on the P61 panel.
   (c) Make sure that the L or R PRECOOL OUT shows an ambient temperature in the area around the sensor.

D. Put the Airplane Back to Its Usual Condition

S 044-027

(1) Do the activation procedure for the thrust reverser (AMM 78-31-00/201).

S 864-019

(2) Remove electrical power if it is not necessary (AMM 24-22-00/201).