CHAPTER

75

AIR

MD-80
AIRCRAFT MAINTENANCE MANUAL

CHAPTER 75
AIR

Subject/Page	Date	COC
75-EFFECTIVE PAGES		
1 thru 2	AUG 01/2016	
75-CONTENTS		
1	Feb 01/2016	
2	Feb 01/2016	
75-00-00		
1	Feb 01/2015	
2	BLANK	
75-00-00		
201	Feb 01/2015	
202	Feb 01/2015	
203	Feb 01/2015	
204	Feb 01/2015	
75-10-00		
1	Feb 01/2015	
2	Feb 01/2015	
75-10-00		
101	Feb 01/2015	
102	Feb 01/2016	
103	Feb 01/2016	
104	Feb 01/2016	
105	Feb 01/2016	
106	Feb 01/2016	
107	Feb 01/2015	
108	BLANK	
75-10-00		
501	Feb 01/2016	
502	Feb 01/2016	
75-10-01 Config 1		
201	Feb 01/2015	
202	Feb 01/2016	
203	Feb 01/2016	
204	Feb 01/2016	
205	Feb 01/2016	
206	Feb 01/2016	
207	Feb 01/2015	
208	Feb 01/2016	
75-10-01 Config 1 (cont)		
209	Feb 01/2015	
210	BLANK	
75-10-02 Config 1		
201	Feb 01/2016	
202	Feb 01/2016	
203	Feb 01/2016	
204	Feb 01/2016	
205	Feb 01/2016	
206	Feb 01/2015	
207	Feb 01/2015	
208	BLANK	
75-10-02		
601	Feb 01/2015	
602	Feb 01/2015	
75-10-03 Config 1		
201	Feb 01/2015	
202	Feb 01/2016	
203	Feb 01/2016	
204	Feb 01/2016	
205	Feb 01/2016	
206	Feb 01/2016	
207	Feb 01/2015	
208	Feb 01/2016	
209	Feb 01/2015	
210	BLANK	
75-10-04		
201	Feb 01/2015	
202	Feb 01/2016	
203	Feb 01/2016	
204	Feb 01/2016	
205	Feb 01/2016	
206	Feb 01/2015	
207	Feb 01/2015	
208	Feb 01/2016	
209	Feb 01/2016	
210	Feb 01/2015	
75-10-05		
201	Feb 01/2016	
202	Feb 01/2016	
203	Feb 01/2016	
204	Feb 01/2016	
205	Feb 01/2016	
206	Feb 01/2016	
207	Feb 01/2016	
208	Feb 01/2016	
209	Feb 01/2016	
210	Feb 01/2016	
211	Feb 01/2016	
212	Feb 01/2016	
213	Feb 01/2016	
214	Feb 01/2016	
215	Feb 01/2016	
216	Feb 01/2015	
217	Feb 01/2015	
218	Feb 01/2015	
219	Feb 01/2016	
220	Feb 01/2015	
75-20-00		
1	Feb 01/2015	
2	BLANK	
75-20-01		
201	Feb 01/2015	
202	Feb 01/2015	
203	Feb 01/2016	
204	Feb 01/2016	
205	Feb 01/2016	
206	Feb 01/2016	
207	Feb 01/2016	
208	Feb 01/2016	
75-30-00 Config 1		
1	Feb 01/2015	
2	Feb 01/2015	
3	Feb 01/2015	

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

75-EFFECTIVE PAGES

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

75-EFFECTIVE PAGES

MD-80
AIRCRAFT MAINTENANCE MANUAL

CHAPTER 75
AIR

75-CONTENTS

CHAPTER 75
AIR

GENERAL - DESCRIPTION AND OPERATION

1. General

A. The engine air system outlined in this chapter consists of engine anti-icing, nose cowl anti-icing, accessory cooling, and compressor bleed. All systems are identical for each engine.

2. Engine Anti-Icing

A. The engine anti-icing is provided by 8th-stage compressor bleed air to anti-ice the inlet guide vanes and inlet bullet. For a complete description and operation of engine anti-icing, refer to PAGEBLOCK 75-10-00/001.

B. Nose cowl anti-icing is provided by 13th-stage compressor bleed air. refer to (PAGEBLOCK 75-10-00/001)

3. Accessory Cooling

A. Accessory cooling is provided by nacelle compartment ventilation and cooling air extracted from the integral fan annular discharge duct of the engine. For a complete description and operation of accessory cooling, refer to PAGEBLOCK 75-20-00/001.

4. Compressor Control

A. The compressor control system provides operational flexibility by bleeding high-pressure compressor discharge air into the integral fan annular discharge duct during engine starting and operation at low thrust settings. For a complete description and operation of compressor control, refer to COMPRESSOR CONTROL - DESCRIPTION AND OPERATION, PAGEBLOCK 75-30-00/001 Config 1 or COMPRESSOR CONTROL - DESCRIPTION AND OPERATION, PAGEBLOCK 75-30-00/001 Config 2.

5. Indicating

A. The indicating portion of the engine anti-icing system provides means to monitor the position of the engine and nose cowl air shutoff valves. The valves control the supply of engine bleed air to the compressor inlet guide vanes and nose cowl. For a complete description and operation of engine anti-icing indicating, refer to PAGEBLOCK 75-40-00/001.

1. General Maintenance Features

A. Maintenance Interphone System

(1) The maintenance interphone system provides a means of communication between the flight compartment and maintenance personnel working in the other areas of the aircraft. A maintenance interphone switch, located on the overhead switch panel, is utilized to actuate the system.

(2) Two interphone jacks are accessible to personnel working in the engine areas. One jack is installed on the left side and the other on the right side of fuselage adjacent to the engine pylons.

B. Engine Accessibility

WARNING: EXERCISE CARE TO AVOID STRAKES WHEN WORKING IN AREA WITH COWL DOORS OPEN OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: OPEN UPPER COWL DOOR ONLY AS MUCH AS NECESSARY TO ALLOW HOLD-OPEN RODS TO BE CONNECTED TO ENGINE. OPENING DOOR TOO FAR MAY CAUSE DAMAGE TO PYLON HINGE POINTS.

(1) Accessibility is provided to all systems and components within the engine installation. The forward lower cowl door provides access to the accessory gearbox area and the aft lower cowl door provides access to the aft lower portion of the engine. The upper cowl door provides access to the upper portion of the engine. Small access doors are provided in the cowl doors for access to areas requiring frequent servicing.

C. Component Interchangeability

(1) Identical accessories are installed on each engine.

2. Safety and Operating Precautions

CAUTION: EXTRA CAUTION MUST BE OBSERVED TO MAKE CERTAIN ELECTRICAL CIRCUITS TO ALL FIRE EXTINGUISHER CONTAINER CARTRIDGES ARE ISOLATED WHEN TEST PROCEDURES REQUIRE OPERATION OF FIRE EXTINGUISHER OR EMERGENCY SHUTDOWN SYSTEMS.

CAUTION: BEFORE ANY ADJUSTMENT ON THROTTLE CONTROL SYSTEM, MAKE CERTAIN THAT THRUST REVERSER CONTROL VALVE IS IN DUMP POSITION AND SAFETY PIN IS INSTALLED. (PAGEBLOCK 78-00-00/201)

A. Circuit Breakers

(1) All circuit breakers opened during maintenance should be tagged to prevent inadvertent operation of affected system.

B. High-Voltage System and Components

WARNING: BEFORE ACTIVATING ANY FUEL, ELECTRICAL, HYDRAULIC, OR PNEUMATIC SYSTEM FOR MAINTENANCE PURPOSES, MAKE CERTAIN THAT ALL PERSONNEL AND EQUIPMENT ARE CLEAR OF OPERATING PORTIONS OF THE AIRCRAFT. INADVERTENT OPERATION OF AN AIRCRAFT SYSTEM COULD RESULT IN DEATH OR SERIOUS INJURY TO PERSONNEL.

(1) Prior to performing maintenance on high-voltage system or components, make certain that power to system or components has been shut off and that all affected circuit breakers are open and tagged.

C. Application of External Power and Pressurization of Fluid Systems

WARNING: EXERCISE CARE TO AVOID STRAKES WHEN WORKING IN ENGINE AREA WITH COWL DOORS OPEN OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: TO PREVENT STRUCTURAL DAMAGE, USE BOTH HOLD OPEN RODS ON EACH COWL DOOR.

CAUTION: OPEN UPPER COWL DOOR ONLY AS MUCH AS NECESSARY TO ALLOW HOLD-OPEN RODS TO BE CONNECTED TO ENGINE. OPENING DOOR TOO FAR MAY CAUSE DAMAGE TO PYLON HINGE POINTS.

CAUTION: MAKE CERTAIN RIGHT ENGINE UPPER COWL DOOR IS CLOSED BEFORE OPERATING APU, OR APU EXHAUST WILL IMPINGE DIRECTLY ON COWL DOOR CAUSING EXTENSIVE DAMAGE.

D. Cowl Doors

NOTE: Forward lower cowl door overlaps the aft lower cowl door and must be opened first.

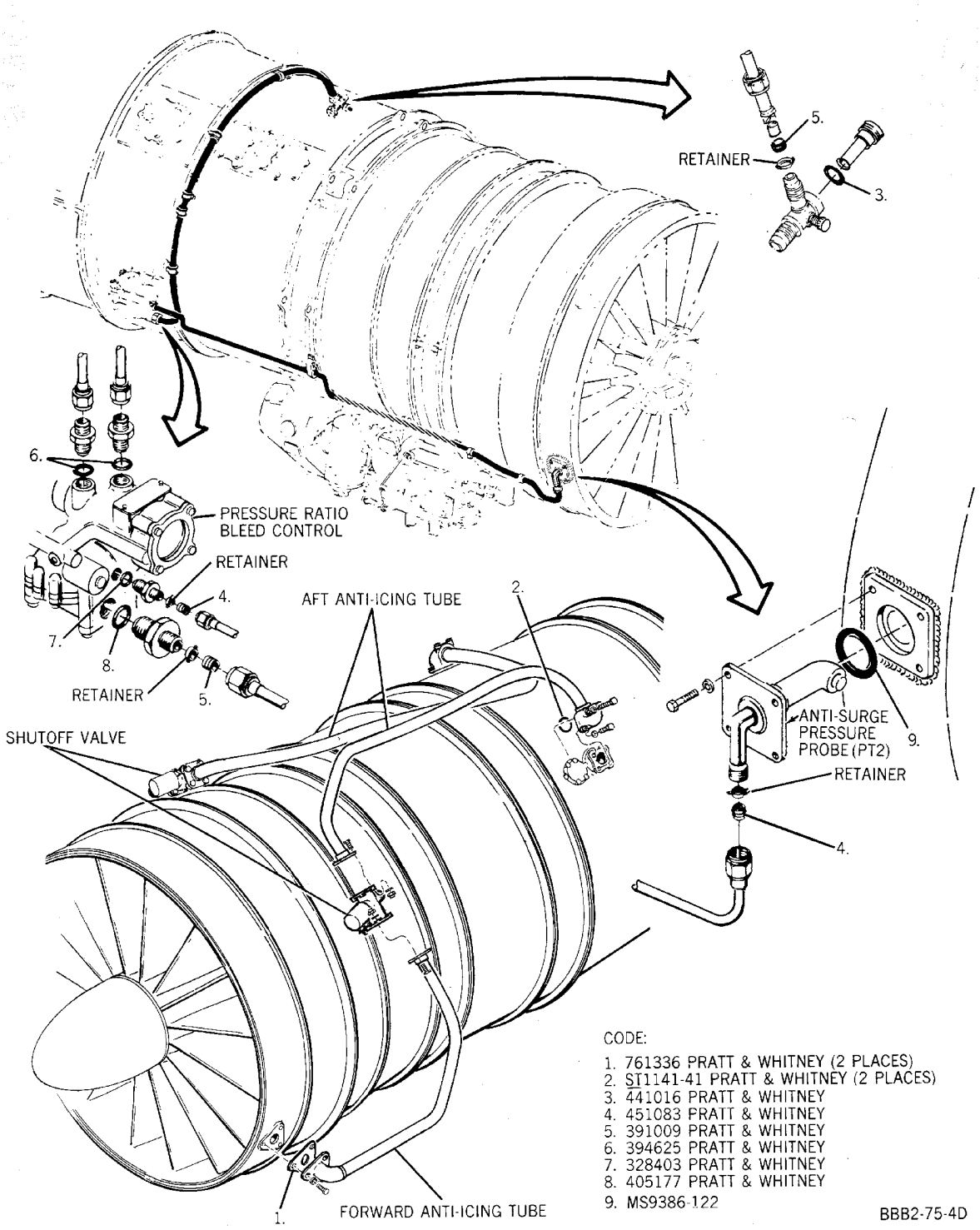
3. General Maintenance Practices

A. Protective Covers - When lines and electrical connectors are disconnected or components are removed, caps, covers, or other suitable means should be provided to prevent damage or foreign material contamination.

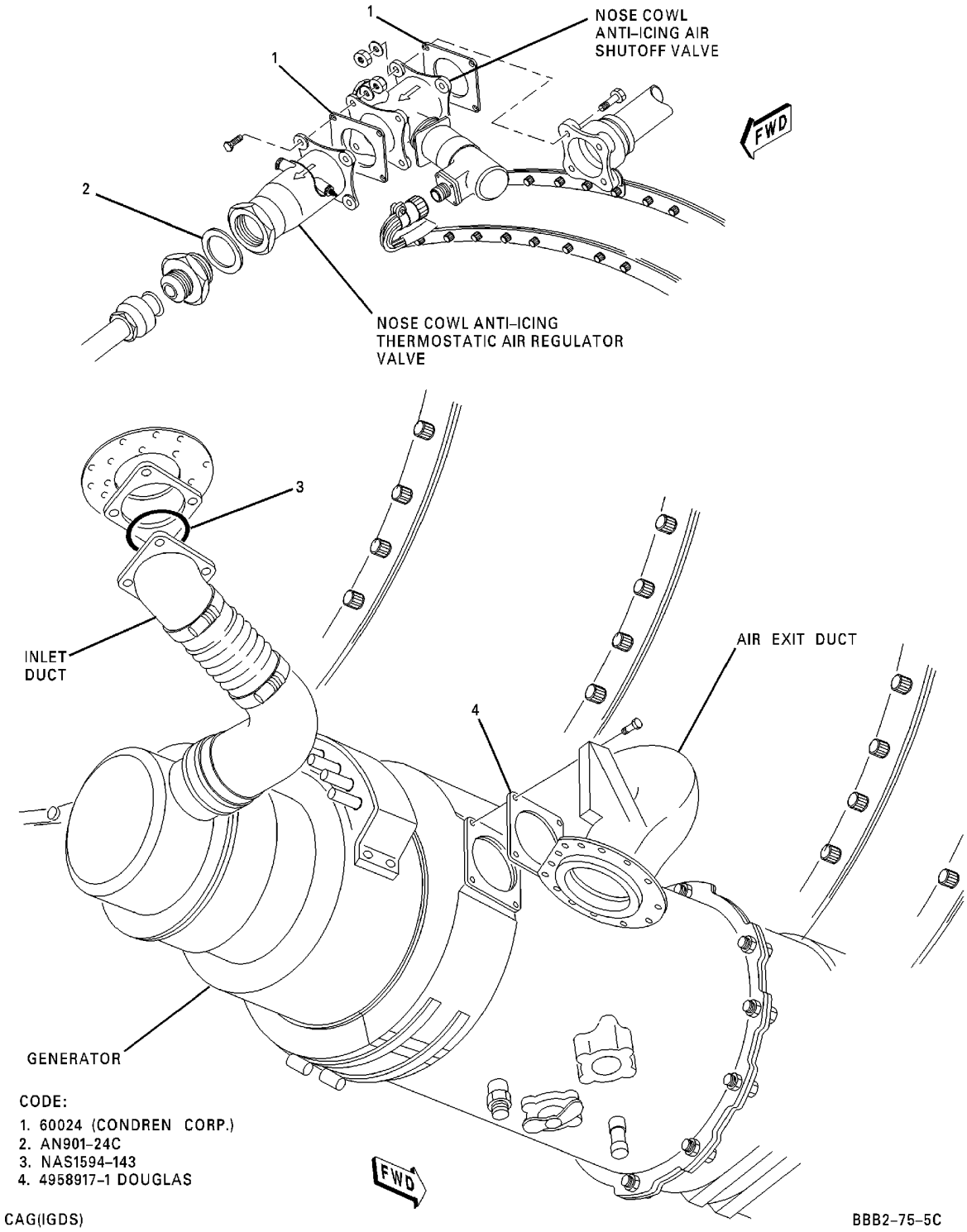
B. External Electrical Power

(1) For procedures to connect external electrical power to aircraft, refer to PAGEBLOCK 24-00-00/001.

C. The packings and or gaskets called out in Figure 201 are provided as an aid in performing maintenance procedures outlined in this chapter.



General - Packing Location
Figure 201/75-00-00-990-801 (Sheet 1 of 2)



General - Packing Location
Figure 201/75-00-00-990-801 (Sheet 2 of 2)

ENGINE ANTI-ICING - DESCRIPTION AND OPERATION

1. General

A. Engine anti-icing prevents ice formation on the compressor inlet guide vanes, inlet bullet, and nose cowl leading edge by forcing engine compressor bleed air to pass over the inner surfaces of these elements.

2. Engine Anti-Icing

A. Description

(1) Engine and inlet bullet anti-icing air is provided by air obtained from the 8th-stage compressor bleed air manifold. Nose cowl anti-icing air is provided by air obtained from the 13th-stage compressor bleed air manifold.

(2) The engine anti-icing system consists of the following components: a control switch, indicating lights, anti-icing air shutoff valves, and anti-icing metering plugs.

(3) The engine anti-icing control switch provides common control for all air shutoff valves. The switch is a toggle switch, located on the ice protection portion of the overhead switch panel in the flight compartment.

(4) The indicating lights, one blue and one amber, provide a visual indication of anti-icing air shutoff valve operation. The lights are located on the annunciator panel in the flight compartment.

(5) The anti-icing air shutoff valves control the flow of bleed air utilized for anti-icing purposes. The valves are electrically operated, butterfly-type shutoff valves, equipped with integral limit and position indicating switches. An external mechanical position indicator provides a visual means of determining the position of the butterfly at the valve. The valves are located on the forward upper portion of the engine; two valves are installed in the engine anti-icing air ducts, and the third is installed in the nose cowl anti-icing air duct.

(6) The anti-icing thermostatic air regulator valve regulates the flow of anti-icing air supplied to the nose cowl leading edge. The valve is a temperature operated disk-type valve. The valve consists of a valve body, stator plate, valve disk, bimetallic spring assembly, and a failure indicator pin. The failure indicator pin provides a means of mechanically checking the operation of the valve. Two bosses on the valve body are used to install adjustable open and close position stops. The adjustable stops consist of a screw, nut, and washer. The valve is installed in the air duct between the anti-icing air shutoff valve and the nose cowl leading edge.

B. Operation

(1) To initiate operation, the anti-icing control switch is placed in the on position and the following sequence of events occurs:

(a) A circuit is completed from an AC bus, through a circuit breaker and the control switch, to the anti-icing air shutoff valves.

(b) At the same time, a circuit is completed from a dc bus, through a circuit breaker and the control switch, to the air shutoff valve limit and position indicating switches.

(c) The amber light comes on until all three valves move to their full open limit switches. When any valve reaches the full open position, the open position limit switch of that valve illuminates the blue light indicating that anti-icing is on. A continuous amber light indicates that one of the valves has not moved as selected.

(d) The flow of nose cowl anti-icing air is limited by a thermostatic air regulator valve.

1) Air passes through the nose cowl anti-icing thermostatic air regulator valve flanged end and enters the stator plate through the bimetallic spring assembly and valve disk. The valve disk elements control the airflow and are in the maximum open position when the bimetallic spring is cold.

2) As the air temperature changes, the bimetallic spring rotates causing the valve disk to turn. As the valve disk turns, the disk elements cover a portion of the stator plate apertures reducing the open area, thereby reducing air flow. The valve disk elements hit against the adjustable stop at a predetermined temperature allowing minimum flow area.

3) As air temperature decreases, the valve disk elements are positioned by the bimetallic spring to expose more area in the stator plate elements and increase the flow of air.

4) The anti-icing thermostatic air regulator valve modulates between open and close supplying anti-icing air to the nose cowl.

(e) To cease operation the anti-icing control switch is moved to the off position, the blue light remains on and the amber light comes on until all three valves move to their full closed limit switches. When the anti-icing control switch is in the off position and the valves are closed, there is no amber or blue light.

ENGINE ANTI-ICING - TROUBLE SHOOTING

1. General

A. The engine and nose cowl anti-icing systems use the same control switch and indicating lights.

B. The position indicator on the valves should be checked to isolate the faulty valve circuit before performing detailed trouble shooting procedures.

C. The anti-icing air shutoff valve control circuits are powered by 115-volt, 400-cycle AC. The indicating light circuits are powered by 28-volt DC.

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following items.

Table 101

Name and Number	Manufacturer
Multimeter Model 2000	Dana

3. Trouble Shooting

Table 102

Step	Possible Causes	Isolation Procedure	Correction
A.	NO ANTI-ICING SYSTEM VALVE OPERATION (NO BLUE INDICATING LIGHT)		
(1)	Indicating light burned out	Depress warn/caution light test switch.	Replace lamp.
(2)	Anti-icing control switch defective	Position switch to on and check for 115-volt AC at switch terminals A3, B3, and C3. If no power, check at switch terminals A2, B2, and C2. If no power, see Step (3).	If power exists at terminals A3, B3, and C3, check system wiring as specified in Step (3). If power exists at terminals A2, B2, and C2, replace switch.
(3)	System wiring defective	Check system wiring for open circuit, wire to wire, or wire to ground short circuits.	Repair wiring.
B.	ONE VALVE DOES NOT RESPOND TO SWITCH POSITIONING (AMBER LIGHT)		
(1)	Anti-icing air shutoff valve defective	Visually check mechanical position indicator on all three valves to isolate defective valve. Disconnect electrical connector from defective valve. Check for 115-volt AC between ground and pin A or B, depending on switch position. If no power, see Condition A, Step (3).	If power exists at check points, replace valve.

4. Test and Troubleshooting

A. Procedure

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

LOWER EPC, ICE PROTECTION LEFT DC BUS

Row	Col	Number	Name
M	23	B1-330	LEFT ICE PROTECT AUGMENT VALVE

LOWER EPC, ICE PROTECTION RIGHT DC BUS

Row	Col	Number	Name
N	23	B1-331	RIGHT ICE PROTECT AUGMENT VALVE

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893			
K	30	B1-43	ANTI-ICING VALVE LEFT ENGINE COWL

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	30	B1-44	ANTI-ICING VALVE RIGHT ENGINE COWL

WJE ALL

(a) Preliminary setup.

(2) Position L Engine Anti-Icing switch OFF. Position R Engine Anti-Icing switch OFF. L & R ENGINE ANTI-ICE INDICATIONS ARE NOT ILLUMINATED. L & R ENGINE VALVE INDICATIONS ARE NOT ILLUMINATED.

(a) Visually verify valves are all closed with on valve indicators. All three valves should be closed. Any valve that is not closed should be replaced at this time.

WARNING: TAG AND USE SAFETY CLIPS TO SAFETY THE CIRCUIT BREAKERS. IF THE CIRCUIT BREAKERS ARE NOT OPENED, TAGGED, AND SAFETIED, INJURY TO PERSONS AND DAMAGE TO EQUIPMENT CAN OCCUR.

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

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893			
K	30	B1-43	ANTI-ICING VALVE LEFT ENGINE COWL

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	30	B1-44	ANTI-ICING VALVE RIGHT ENGINE COWL

WJE ALL

(a) Opening the circuit breakers removes motor power to the valves so they will not open in Paragraph 4.A.(4).

(4) Position L Engine Anti-Icing switch ON. Position R Engine Anti-Icing switch ON. L & R ENGINE ANTI-ICE INDICATIONS ARE BLUE. L & R ENGINE VALVE INDICATIONS ARE AMBER.

(a) This step checks the valve disagree indication with commanded position.

(5) Make sure that these circuit breakers are closed:

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893			
K	30	B1-43	ANTI-ICING VALVE LEFT ENGINE COWL

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	30	B1-44	ANTI-ICING VALVE RIGHT ENGINE COWL

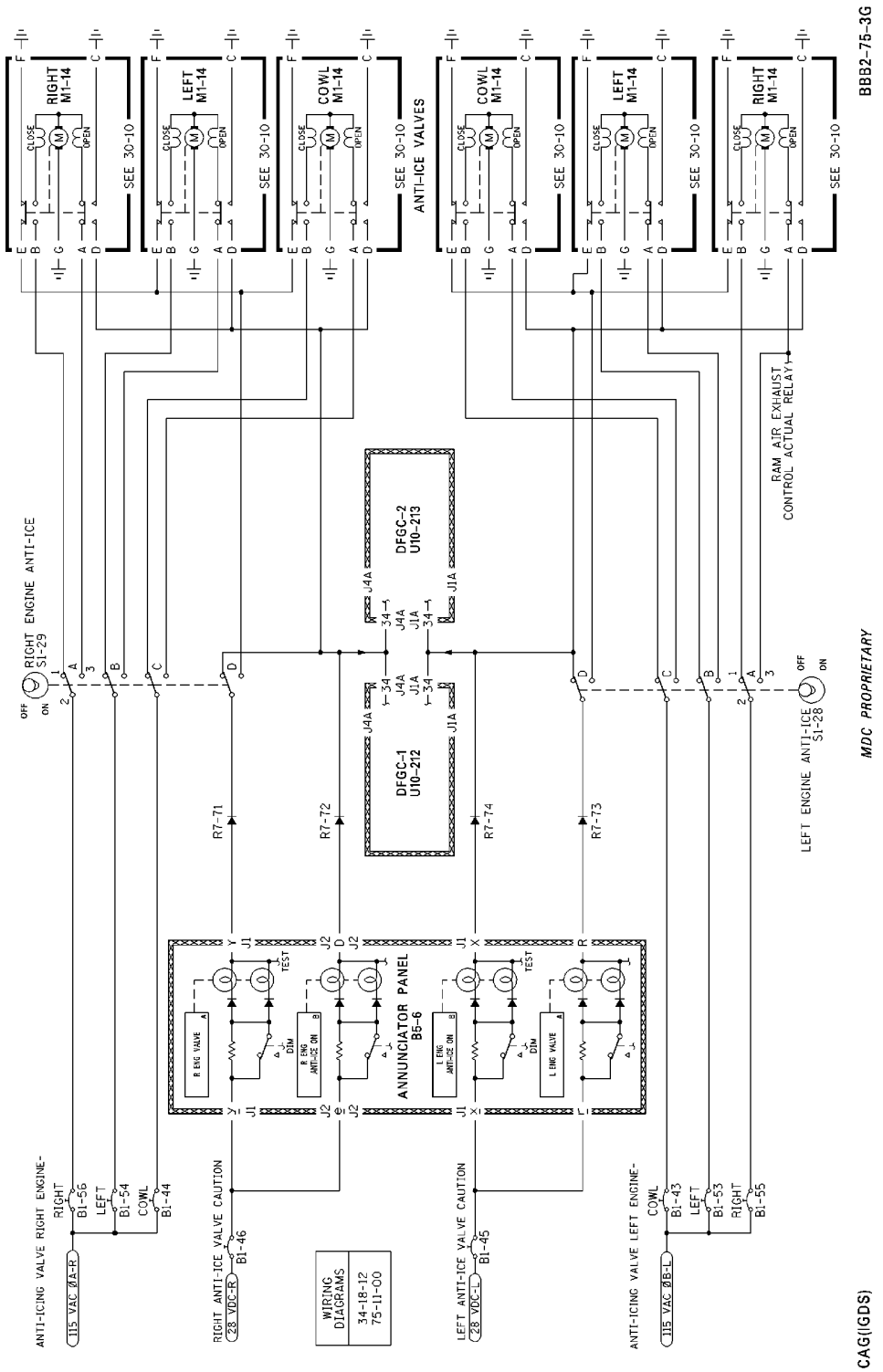
WJE ALL

(a) L & R ENGINE ANTI-ICE INDICATIONS ARE BLUE. L & R ENGINE VALVE INDICATIONS ARE NOT ILLUMINATED.

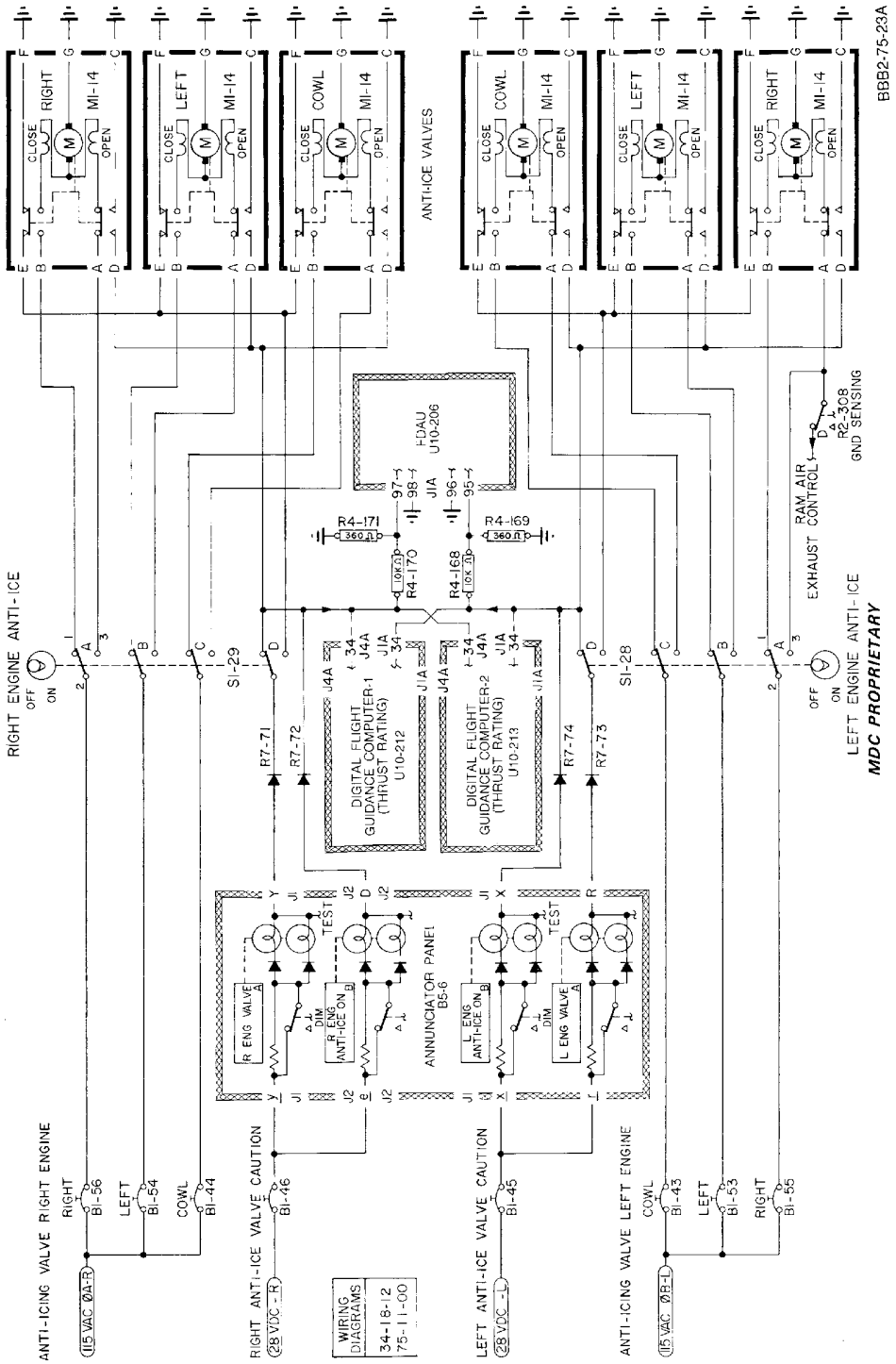
1) The valves should motor open. Visually verify valves are fully open. If an AMBER valve indication is illuminated, replace the defective valve.

(6) If the problem still exists, replace the anti-ice warning box.

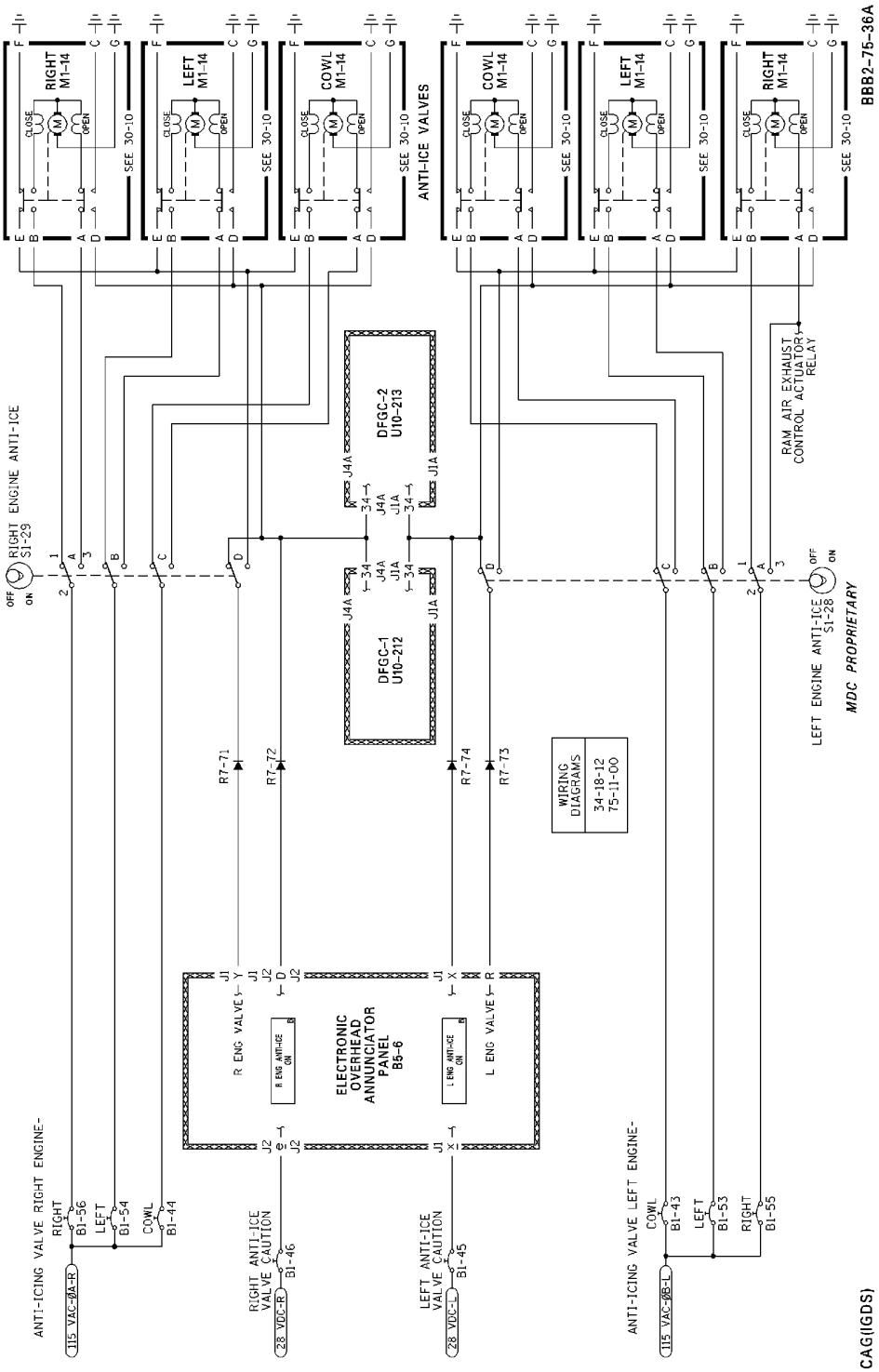
(7) After test is complete, return the airplane to the normal configuration.



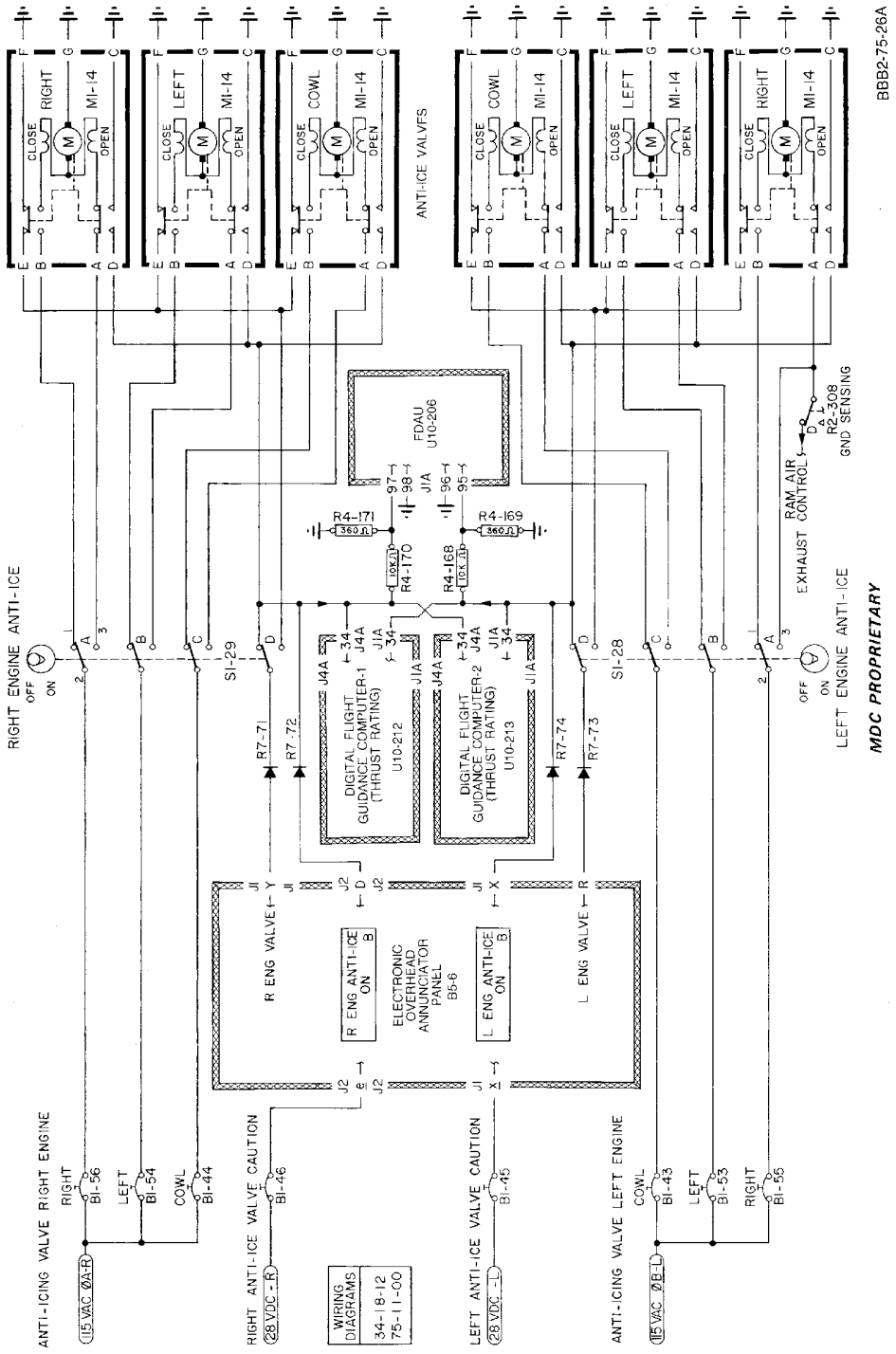
Engine Anti-icing - Trouble Shooting
Figure 101/75-10-00-990-801 (Sheet 1 of 4)



Engine Anti-icing - Trouble Shooting
Figure 101/75-10-00-990-801 (Sheet 2 of 4)



Engine Anti-icing - Trouble Shooting
Figure 101/75-10-00-990-801 (Sheet 3 of 4)



Engine Anti-icing - Trouble Shooting
Figure 101/75-10-00-990-801 (Sheet 4 of 4)

ENGINE ANTI-ICING - ADJUSTMENT/TEST

1. General

A. The following procedure tests the engine anti-icing system.

B. The engine anti-icing air shutoff valves and the nose cowl anti-icing air shutoff valve utilize a common control switch and indicating lights.

WARNING: EXERCISE CARE TO AVOID STRAKES WHEN WORKING IN ENGINE AREA WITH COWL DOORS OPEN OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: TO PREVENT STRUCTURAL DAMAGE, USE BOTH HOLD OPEN RODS ON EACH COWL DOOR.

CAUTION: OPEN UPPER COWL DOOR ONLY AS MUCH AS NECESSARY TO ALLOW HOLD-OPEN RODS TO BE CONNECTED TO ENGINE. OPENING DOOR TOO FAR MAY CAUSE DAMAGE TO PYLON HINGE POINTS.

CAUTION: MAKE CERTAIN RIGHT ENGINE UPPER COWL DOOR IS CLOSED BEFORE OPERATING APU, OR APU EXHAUST WILL IMPINGE DIRECTLY ON COWL DOOR CAUSING EXTENSIVE DAMAGE.

C. All three valves are located on the forward upper portion of the engine. Access is through cowl doors.

NOTE: Forward lower cowl door overlaps the aft lower cowl door and must be opened first.

2. Adjustment/Test Engine Anti-icing System

A. Test Engine Anti-icing System

(1) Energize aircraft electrical system. (PAGEBLOCK 24-00-00/001)

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

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	37	B1-45	LEFT ANTI-ICE VALVE CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	37	B1-46	RIGHT ANTI-ICE VALVE CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893			
K	30	B1-43	ANTI-ICING VALVE LEFT ENGINE COWL
K	31	B1-53	ANTI-ICING VALVE LEFT ENGINE LEFT
K	32	B1-55	ANTI-ICING VALVE LEFT ENGINE RIGHT

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	30	B1-44	ANTI-ICING VALVE RIGHT ENGINE COWL
L	31	B1-54	ANTI-ICING VALVE RIGHT ENGINE LEFT
L	32	B1-56	ANTI-ICING VALVE RIGHT ENGINE RIGHT

WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893 (Continued)

UPPER EPC, L DC BUS

Row	Col	Number	Name
WJE 417, 419, 421, 423, 865, 869, 871, 872			
K	32	B1-999	ANTI-ICING VALVE LEFT ENGINE COWL
K	33	B1-1000	ANTI-ICING VALVE LEFT ENGINE LEFT
K	34	B1-1001	ANTI-ICING VALVE LEFT ENGINE RIGHT

UPPER EPC, R DC BUS

Row	Col	Number	Name
L	32	B1-996	ANTI-ICING VALVE RIGHT ENGINE COWL
L	33	B1-997	ANTI-ICING VALVE RIGHT ENGINE LEFT
L	34	B1-998	ANTI-ICING VALVE RIGHT ENGINE RIGHT

WJE ALL

(3) Place engine anti-icing control switch in ON position.

(4) Check that the amber ENG VALVE light briefly comes on while the valves are in transit.

(5) Check that blue ENG ANTI-ICE ON light comes on in approximately 2 seconds and that amber ENG VALVE light does not remain on.

(6) Check that position indicators on all valves indicate open position.

(7) Check that the amber ENG VALVE light briefly comes on while the valves are in transit.

(8) Place engine anti-icing control switch in OFF position.

(9) Check that blue ENG ANTI-ICE ON and amber ENG VALVE light goes off.

(10) Check that position indicators on all valves indicate closed position.

(11) Deenergize airplane electrical system. (PAGEBLOCK 24-00-00/001)

ENGINE ANTI-ICING AIR SHUTOFF VALVES - MAINTENANCE PRACTICES

1. General

A. This maintenance practices provides removal/installation and adjustment/test instruction for the engine anti-icing air shutoff valves located on left and right side of the engine on the compressor case. Engine anti-icing air shutoff valves are interchangeable.

WARNING: EXERCISE CARE TO AVOID STRAKES WHEN WORKING IN ENGINE AREA WITH COWL DOORS OPEN OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: TO PREVENT STRUCTURAL DAMAGE, USE BOTH HOLD OPEN RODS ON EACH COWL DOOR.

CAUTION: OPEN UPPER COWL DOOR ONLY AS MUCH AS NECESSARY TO ALLOW HOLD-OPEN RODS TO BE CONNECTED TO ENGINE. OPENING DOOR TOO FAR MAY CAUSE DAMAGE TO PYLON HINGE POINTS.

CAUTION: MAKE CERTAIN RIGHT ENGINE UPPER COWL DOOR IS CLOSED BEFORE OPERATING APU, OR APU EXHAUST WILL IMPINGE DIRECTLY ON COWL DOOR CAUSING EXTENSIVE DAMAGE.

B. Removal, installation, and test procedures for all engine anti-icing air shutoff valves are identical. Access is through upper cowl door.

NOTE: Forward lower cowl door overlaps the aft lower cowl door and must be opened first.

C. Before installation of valves, check all openings to make certain no foreign objects are present.

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items:

NOTE: Some materials in the Equipment and Materials list may not be permitted to be used in your location. Persons in each location must make sure they are permitted to use these materials. All persons must obey all applicable federal, state, local, and provincial regulations for their location.

Table 201

Name and Number	Manufacturer
Lockwire, .020 corrosion resistant steel, P05-288	Not Specified
Lockwire, NASM20995N32, DPM 684	Not Specified
Cloth, cotton, lint free, P05 005	Not Specified
Foil, aluminum, P05 169	Not Specified
Developer, non-aqueous, fluorescent penetrant, P05 237	Not Specified

3. Removal/Installation Engine Anti-icing Air Shutoff Valve

A. Remove Engine Anti-icing Air Shutoff Valve

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
U	42	B1-422	ENGINE START VALVE LEFT

WJE ALL

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	37	B1-45	LEFT ANTI-ICE VALVE CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	37	B1-46	RIGHT ANTI-ICE VALVE CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION
WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893			
K	30	B1-43	ANTI-ICING VALVE LEFT ENGINE COWL
K	31	B1-53	ANTI-ICING VALVE LEFT ENGINE LEFT
K	32	B1-55	ANTI-ICING VALVE LEFT ENGINE RIGHT

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
WJE ALL			
L	26	B1-425	RIGHT ENGINE IGNITION
WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893			
L	30	B1-44	ANTI-ICING VALVE RIGHT ENGINE COWL
L	31	B1-54	ANTI-ICING VALVE RIGHT ENGINE LEFT
L	32	B1-56	ANTI-ICING VALVE RIGHT ENGINE RIGHT

UPPER EPC, L DC BUS

Row	Col	Number	Name
WJE 417, 419, 421, 423, 865, 869, 871, 872			
K	32	B1-999	ANTI-ICING VALVE LEFT ENGINE COWL
K	33	B1-1000	ANTI-ICING VALVE LEFT ENGINE LEFT
K	34	B1-1001	ANTI-ICING VALVE LEFT ENGINE RIGHT

WJE 417, 419, 421, 423, 865, 869, 871, 872 (Continued)

UPPER EPC, R DC BUS

Row	Col	Number	Name
L	32	B1-996	ANTI-ICING VALVE RIGHT ENGINE COWL
L	33	B1-997	ANTI-ICING VALVE RIGHT ENGINE LEFT
L	34	B1-998	ANTI-ICING VALVE RIGHT ENGINE RIGHT

WJE ALL

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Open the upper and the lower cowl doors. (COWL DOORS - MAINTENANCE PRACTICES, PAGEBLOCK 71-10-03/201 Config 1)

(4) Disconnect electrical connector from anti-icing air shutoff valve.

(5) Remove bolts connecting forward anti-icing tube to engine inlet case.

(6) Remove bolt clamping forward anti-icing tube to engine flange.

(7) Remove bolt connecting forward anti-icing tube to anti-icing air shutoff valve and remove tube.

(8) Remove bolts connecting aft anti-icing tube to shutoff valve and remove valve.

B. Install Engine Anti-icing Air Shutoff Valve

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged.

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	41	B1-423	ENGINE START VALVE RIGHT
U	42	B1-422	ENGINE START VALVE LEFT

WJE ALL

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	37	B1-45	LEFT ANTI-ICE VALVE CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	37	B1-46	RIGHT ANTI-ICE VALVE CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893

K	30	B1-43	ANTI-ICING VALVE LEFT ENGINE COWL
K	31	B1-53	ANTI-ICING VALVE LEFT ENGINE LEFT
K	32	B1-55	ANTI-ICING VALVE LEFT ENGINE RIGHT

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name

WJE ALL

L	26	B1-425	RIGHT ENGINE IGNITION

WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893

L	30	B1-44	ANTI-ICING VALVE RIGHT ENGINE COWL
L	31	B1-54	ANTI-ICING VALVE RIGHT ENGINE LEFT
L	32	B1-56	ANTI-ICING VALVE RIGHT ENGINE RIGHT

UPPER EPC, L DC BUS

Row	Col	Number	Name

WJE 417, 419, 421, 423, 865, 869, 871, 872

K	32	B1-999	ANTI-ICING VALVE LEFT ENGINE COWL
K	33	B1-1000	ANTI-ICING VALVE LEFT ENGINE LEFT
K	34	B1-1001	ANTI-ICING VALVE LEFT ENGINE RIGHT

UPPER EPC, R DC BUS

Row	Col	Number	Name
L	32	B1-996	ANTI-ICING VALVE RIGHT ENGINE COWL
L	33	B1-997	ANTI-ICING VALVE RIGHT ENGINE LEFT
L	34	B1-998	ANTI-ICING VALVE RIGHT ENGINE RIGHT

WJE ALL

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and safety pin is installed.

(3) If necessary, open the upper and the lower cowl doors. (COWL DOORS - MAINTENANCE PRACTICES, PAGEBLOCK 71-10-03/201 Config 1)

(4) Position anti-icing air shutoff valve on aft anti-icing tube, with flow arrow pointing down, and install attach bolts.

(5) Position forward anti-icing tube on inlet case using new gasket and install attach bolts.

(6) Install bolts attaching forward anti-icing tube to anti-icing air shutoff valve.

(7) Install bolt clamping tube to engine flange.

NOTE: Actuator and valve and mating anti-icing tube for each (left and right) side were formerly secured to engine bracket with two bolts (one bolt through each upper and lower tube eye). Current engine bracket has only one bolt hole, so that only one bolt is used for left or right side; with former two-hole bracket, one bolt may be omitted to avoid affects of thermal expansion. Either upper or lower bolt may be omitted with former bracket, but bolt shown in Figure 201 will not be used with current (one-hole) bracket.

(8) Connect valve electrical connector. Safety connector with .032 inch lockwire.

(9) Remove tools, equipment, loose hardware, spilled fluids, and debris from maintenance area.

(10) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
U	42	B1-422	ENGINE START VALVE LEFT

WJE ALL

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	37	B1-45	LEFT ANTI-ICE VALVE CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	37	B1-46	RIGHT ANTI-ICE VALVE CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION
WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893			
K	30	B1-43	ANTI-ICING VALVE LEFT ENGINE COWL
K	31	B1-53	ANTI-ICING VALVE LEFT ENGINE LEFT
K	32	B1-55	ANTI-ICING VALVE LEFT ENGINE RIGHT

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
WJE ALL			
L	26	B1-425	RIGHT ENGINE IGNITION
WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893			
L	30	B1-44	ANTI-ICING VALVE RIGHT ENGINE COWL
L	31	B1-54	ANTI-ICING VALVE RIGHT ENGINE LEFT
L	32	B1-56	ANTI-ICING VALVE RIGHT ENGINE RIGHT

WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893 (Continued)

UPPER EPC, L DC BUS

Row	Col	Number	Name
WJE 417, 419, 421, 423, 865, 869, 871, 872			
K	32	B1-999	ANTI-ICING VALVE LEFT ENGINE COWL
K	33	B1-1000	ANTI-ICING VALVE LEFT ENGINE LEFT
K	34	B1-1001	ANTI-ICING VALVE LEFT ENGINE RIGHT

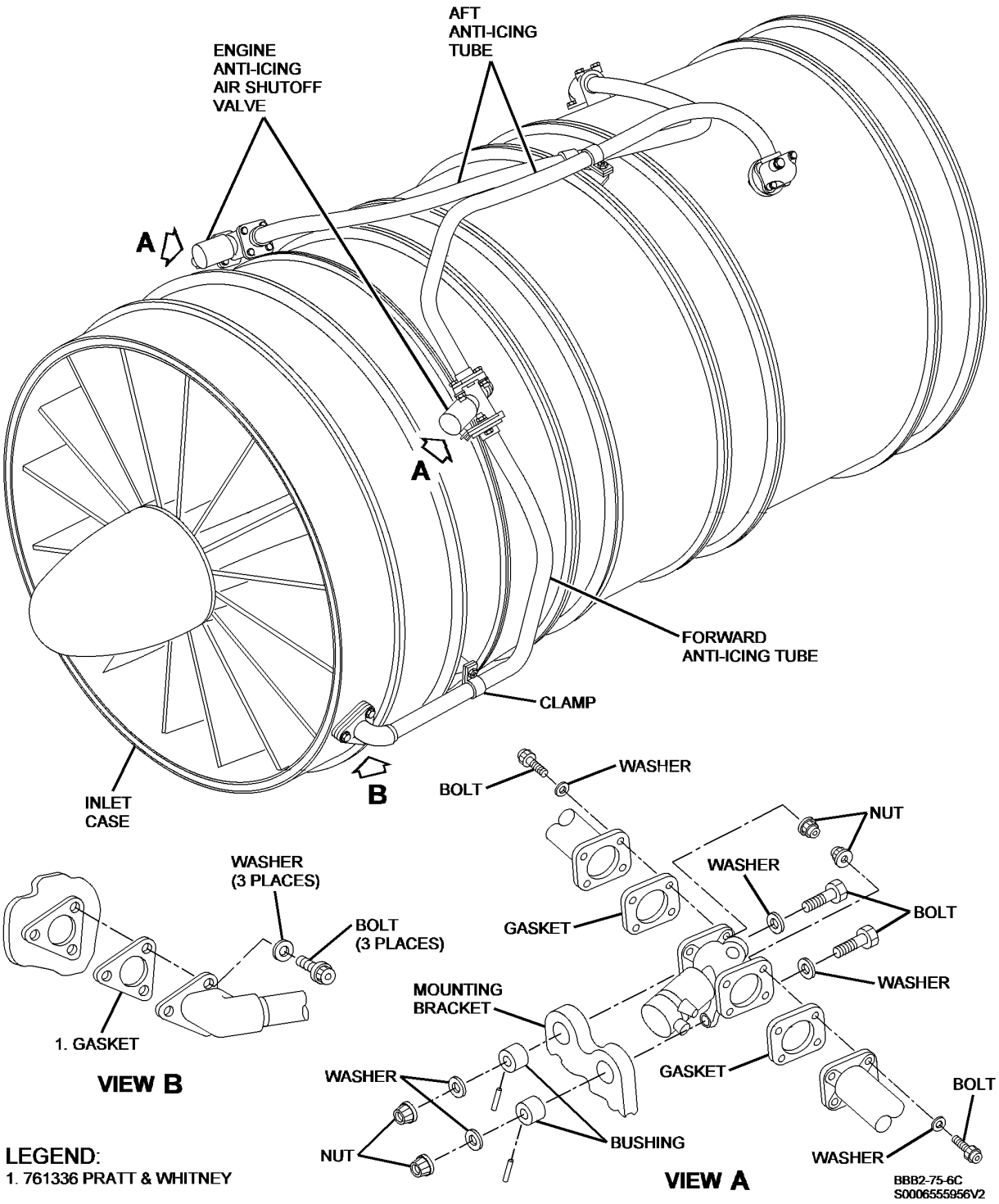
UPPER EPC, R DC BUS

Row	Col	Number	Name
L	32	B1-996	ANTI-ICING VALVE RIGHT ENGINE COWL
L	33	B1-997	ANTI-ICING VALVE RIGHT ENGINE LEFT
L	34	B1-998	ANTI-ICING VALVE RIGHT ENGINE RIGHT

WJE ALL

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(11) Remove safety pin from thrust reverser control valve. Stow safety pin.



Engine Anti-icing Air Shutoff Valves - Removal/Installation
Figure 201/75-10-01-990-802

4. Adjustment/Test Engine Anti-icing Air Shutoff Valve

A. Test Engine Anti-icing Air Shutoff Valve

(1) If necessary, open the upper and the lower cowl doors. (COWL DOORS - MAINTENANCE PRACTICES, PAGEBLOCK 71-10-03/201 Config 1)

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

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	37	B1-45	LEFT ANTI-ICE VALVE CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	37	B1-46	RIGHT ANTI-ICE VALVE CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893			
K	30	B1-43	ANTI-ICING VALVE LEFT ENGINE COWL
K	31	B1-53	ANTI-ICING VALVE LEFT ENGINE LEFT
K	32	B1-55	ANTI-ICING VALVE LEFT ENGINE RIGHT

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	30	B1-44	ANTI-ICING VALVE RIGHT ENGINE COWL
L	31	B1-54	ANTI-ICING VALVE RIGHT ENGINE LEFT
L	32	B1-56	ANTI-ICING VALVE RIGHT ENGINE RIGHT

UPPER EPC, L DC BUS

Row	Col	Number	Name
WJE 417, 419, 421, 423, 865, 869, 871, 872			
K	32	B1-999	ANTI-ICING VALVE LEFT ENGINE COWL
K	33	B1-1000	ANTI-ICING VALVE LEFT ENGINE LEFT
K	34	B1-1001	ANTI-ICING VALVE LEFT ENGINE RIGHT

UPPER EPC, R DC BUS

Row	Col	Number	Name
L	32	B1-996	ANTI-ICING VALVE RIGHT ENGINE COWL
L	33	B1-997	ANTI-ICING VALVE RIGHT ENGINE LEFT
L	34	B1-998	ANTI-ICING VALVE RIGHT ENGINE RIGHT

WJE ALL

(3) Energize aircraft electrical system. (GENERAL - DESCRIPTION AND OPERATION, PAGEBLOCK 24-00-00/001)

(4) Place ENG ICE PROTECT switch in ON position.

(5) Check that the amber ENG VALVE light briefly comes on while the valves are in transit.

(6) Check that blue ENG ANTI-ICE ON light comes on in approximately 2 seconds and that amber ENG VALVE light does not remain on.

(7) Check that position indicators on all valves indicate open position.

(8) Place ENG ICE PROTECT switch in OFF position.

(9) Check that the amber ENG VALVE light briefly comes on while the valves are in transit.

(10) Check that blue ENG ANTI-ICE ON and amber ENG VALVE light goes off.

(11) Check that position indicators on all valves indicate closed position.

(12) Wrap anti-ice shutoff valve and all attach points of ducting with aluminum foil.

(a) Operate engine at idle and check for external leaks. Foil will blow off or become deformed if leaks are present.

(b) If leaks are found, check air shutoff valve and tubing for proper installation and correct any faults.

(13) If necessary, do alternate method as follows:

WARNING: USE THE HAZARDOUS MATERIAL WARNINGS GIVEN BELOW FOR THE STEPS THAT FOLLOW.

THE HAZARDOUS MATERIAL WARNINGS ARE LISTED AFTER THE INTRODUCTION SECTION IN THE FRONT OF THE AMM.

Hazardous Material Warnings

HAZMAT 1711, WET NON-AQUEOUS DEVELOPER (DPM 2449-2)

HAZMAT 1000, REFER TO MSDS

(a) Apply non-aqueous developer to the air shutoff valve tube attach points.

(b) Operate engine at idle and check for external leaks. Check developer for signs of leakage.

(c) If leaks are found, check air shutoff valve and tubing for proper installation and correct any faults.

(14) Repeat applicable step Paragraph 4.A.(12) or Paragraph 4.A.(13).

(15) De-energize airplane electrical system. (GENERAL - DESCRIPTION AND OPERATION, PAGEBLOCK 24-00-00/001)

(16) If used, remove the aluminum foil from the air shutoff valve and tubing.

(17) If used, remove developer from the air shutoff valve and tubing with a lint free cloth.

(18) Close the upper and lower cowl doors. (COWL DOORS - MAINTENANCE PRACTICES, PAGEBLOCK 71-10-03/201 Config 1)

ENGINE ANTI-ICING AIR TUBES - MAINTENANCE PRACTICES

1. General

A. The engine anti-icing air tubes are located on the left and right sides of the engine. The tubes extend from elbows located on the sides of the rear compressor outer duct to ducts located at the sides of the inlet case.

WARNING: EXERCISE CARE TO AVOID STRAKES WHEN WORKING IN ENGINE AREA WITH COWL DOORS OPEN OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: TO PREVENT STRUCTURAL DAMAGE, USE BOTH HOLD OPEN RODS ON EACH COWL DOOR.

CAUTION: OPEN UPPER COWL DOOR ONLY AS MUCH AS NECESSARY TO ALLOW HOLD-OPEN RODS TO BE CONNECTED TO ENGINE. OPENING DOOR TOO FAR MAY CAUSE DAMAGE TO PYLON HINGE POINTS.

CAUTION: MAKE CERTAIN RIGHT ENGINE UPPER COWL DOOR IS CLOSED BEFORE OPERATING APU, OR APU EXHAUST WILL IMPINGE DIRECTLY ON COWL DOOR CAUSING EXTENSIVE DAMAGE.

B. Removal and installation procedures for the engine anti-icing air tubes installed on each engine are identical. Access is through upper cowl doors.

NOTE: Forward lower cowl door overlaps the aft lower cowl door and must be opened first.

C. Before installation of tubes, check all openings to make certain no foreign objects are present.

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items:

NOTE: It is possible that some materials in the Equipment and Materials List cannot be used for some or all of their necessary applications. Before you use the materials, make sure the types, quantities, and applications of the materials necessary are legally permitted in your location. All persons must obey all applicable federal, state, local, and provincial laws and regulations when it is necessary to work with these materials.

Table 201

Name and Number	Manufacturer
Lockwire, .032 corrosion resistant steel, P05-289	

3. Removal/Installation Engine Anti-icing Air Tubes

A. Remove Engine Anti-icing Air Tubes

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891 (Continued)

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

Open and tag the anti-ice valve circuit breakers that follow:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	37	B1-45	LEFT ANTI-ICE VALVE CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	37	B1-46	RIGHT ANTI-ICE VALVE CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893			
K	30	B1-43	ANTI-ICING VALVE LEFT ENGINE COWL
K	31	B1-53	ANTI-ICING VALVE LEFT ENGINE LEFT
K	32	B1-55	ANTI-ICING VALVE LEFT ENGINE RIGHT

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	30	B1-44	ANTI-ICING VALVE RIGHT ENGINE COWL
L	31	B1-54	ANTI-ICING VALVE RIGHT ENGINE LEFT
L	32	B1-56	ANTI-ICING VALVE RIGHT ENGINE RIGHT

WJE ALL

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Disconnect clamp from forward anti-icing tube.

(4) Remove bolts attaching forward anti-icing tube to inlet case.

(5) Remove bolts attaching anti-icing air shutoff valve to forward anti-icing tube.

(6) Remove forward anti-icing tube.

(7) Remove bolts attaching anti-icing air shutoff valve to aft anti-icing tube.

(8) Remove bolts attaching aft anti-icing tube to rear compressor outer duct.

(9) Remove aft anti-icing tube.

B. Install Engine Anti-icing Air Tubes

NOTE: The left aft anti-icing tube should be installed loosely at both ends, then both ends should be tightened evenly to prevent preload of the tube during the installation procedure.

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	41	B1-423	ENGINE START VALVE RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	42	B1-1	ENGINE IGNITION LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name

WJE ALL

K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

Make sure the anti-ice valve circuit breakers that follow are opened and tagged:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	37	B1-45	LEFT ANTI-ICE VALVE CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	37	B1-46	RIGHT ANTI-ICE VALVE CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893			
K	30	B1-43	ANTI-ICING VALVE LEFT ENGINE COWL
K	31	B1-53	ANTI-ICING VALVE LEFT ENGINE LEFT
K	32	B1-55	ANTI-ICING VALVE LEFT ENGINE RIGHT

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	30	B1-44	ANTI-ICING VALVE RIGHT ENGINE COWL
L	31	B1-54	ANTI-ICING VALVE RIGHT ENGINE LEFT
L	32	B1-56	ANTI-ICING VALVE RIGHT ENGINE RIGHT

WJE ALL

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and safety pin is installed.

CAUTION: MAKE SURE THAT THE ANTI-ICE TUBES ARE NOT PRELOADED DURING THE INSTALLATION PROCEDURE. THIS WILL PREVENT DAMAGE TO THE TUBES.

(3) Position aft anti-icing tube and attach as follows:

(a) Install bolts loosely on the aft anti-icing tube to anti-icing air shutoff valve.

(b) Tighten all bolts evenly and safety the anti-icing tube to duct boss bolts with lockwire (P05-289).

(4) Install new gasket on rear compressor outer duct boss.

(5) Connect aft anti-icing tube to duct boss with washers and bolts. Safety bolts with P05-289 lockwire.

(6) Install forward anti-icing tube on engine and into support flange. Use new gasket on inlet case upper pad.

(7) Connect forward anti-icing tube to inlet case using bolts and washers.

(8) Install bolts attaching forward anti-icing tube to anti-icing air shutoff valve.

(9) Connect clamp to forward anti-icing tube.

(10) Remove tools, equipment, loose hardware, spilled fluids, and debris from maintenance area.

(11) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	41	B1-423	ENGINE START VALVE RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	42	B1-1	ENGINE IGNITION LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name

WJE ALL

K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

Close these circuit breakers:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	37	B1-45	LEFT ANTI-ICE VALVE CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	37	B1-46	RIGHT ANTI-ICE VALVE CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name

WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893

K	30	B1-43	ANTI-ICING VALVE LEFT ENGINE COWL
K	31	B1-53	ANTI-ICING VALVE LEFT ENGINE LEFT
K	32	B1-55	ANTI-ICING VALVE LEFT ENGINE RIGHT

UPPER EPC, ENGINE - RIGHT AC BUS

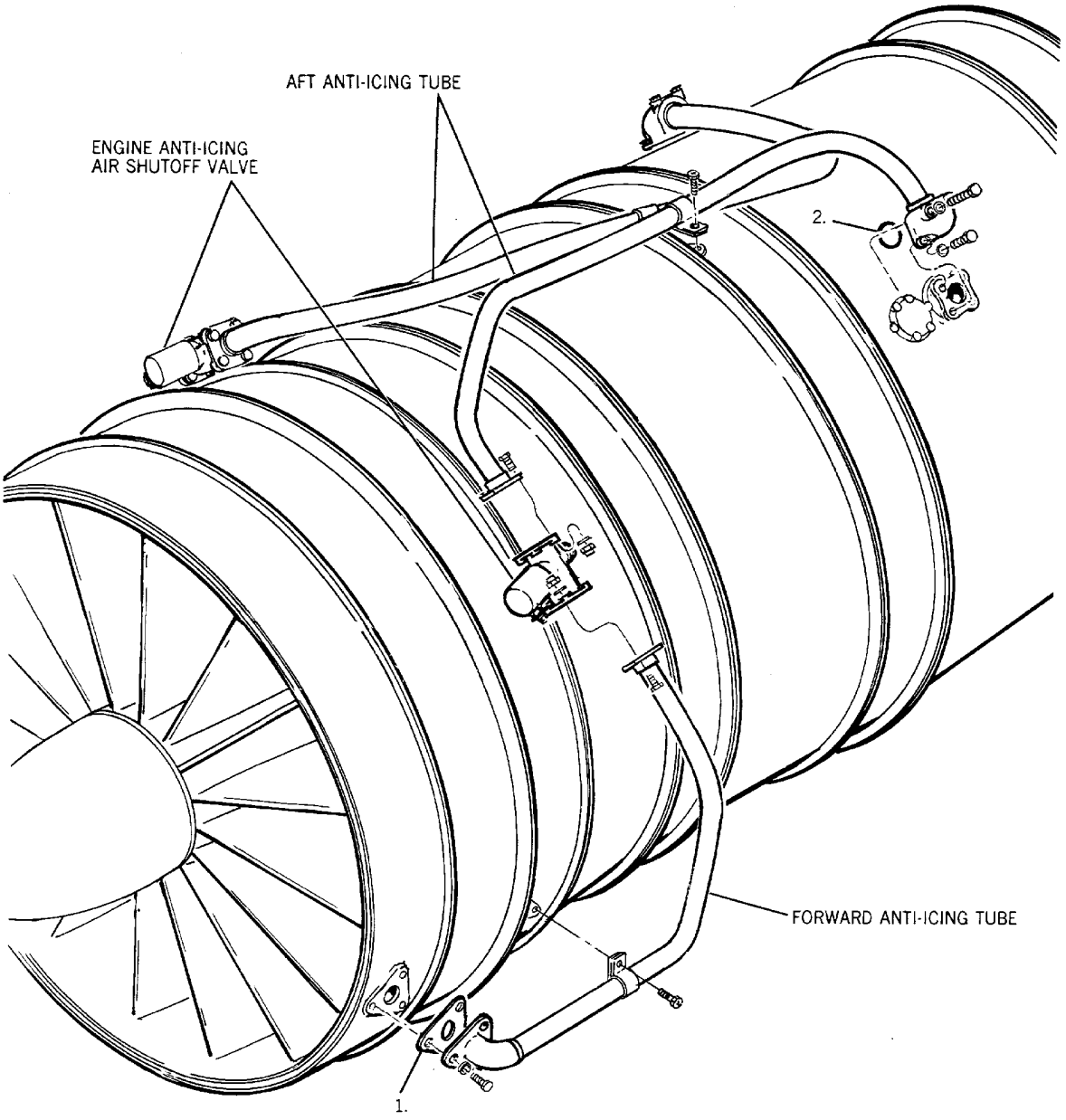
Row	Col	Number	Name
L	30	B1-44	ANTI-ICING VALVE RIGHT ENGINE COWL
L	31	B1-54	ANTI-ICING VALVE RIGHT ENGINE LEFT
L	32	B1-56	ANTI-ICING VALVE RIGHT ENGINE RIGHT

WJE ALL

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(12) Remove safety pin from thrust reverser control valve. Stow safety pin.

(13) Pressure test pneumatic system. (PAGEBLOCK 36-00-00/201)



1. 761336 PRATT & WHITNEY
2. ST1141-41, ST1111-41 OR ST1121-41
   PRATT & WHITNEY

BBB2-75-9C

Engine Anti-icing Air Tubes - Removal/Installation
Figure 201/75-10-02-990-802

ENGINE ANTI ICING AIR TUBES INSPECTION\CHECK

1. General

A. These inspection procedures are a normal function of operating organizations. They consist of required inspections and minor adjustments necessary on the engine anti icing air tubes.

2. Procedure- Engine Anti Icing Air Tubes Inspection

A. Inspect the air tubes for scratches as follows: (Figure 601)

(1) Minor scratches, that have no appreciable depth, are permitted.

(2) Scratches produced by a cutting medium and not greater than 0.003 in. (0.076 mm) depth, are permitted.

(3) Smooth out scratches to 0.005 in. (0.127 mm) maximum depth.

B. Inspect the air tubes for nicks and chafing as follows: (Figure 601)

(1) Nicks and chafing that are made smooth and three-quarters of the wall thickness remains are permitted. The repaired area must not be more than 0.5 in^2 (322.6 mm^2).

C. Inspect the air tubes for dents as follows: (Figure 601)

(1) Dents without sharp edges or corners are permitted, if the tube internal passage will permit free passage of a ball having a diameter of 75 percent of the tube diameter.

(2) Dents within 0.25 in. (6.35 mm) of the ferrules are not permitted.

D. Inspect the air tubes for pitting as follows: (Figure 601)

(1) Minor isolated pitting not more than 0.003 in. (0.076 mm) depth is permitted.

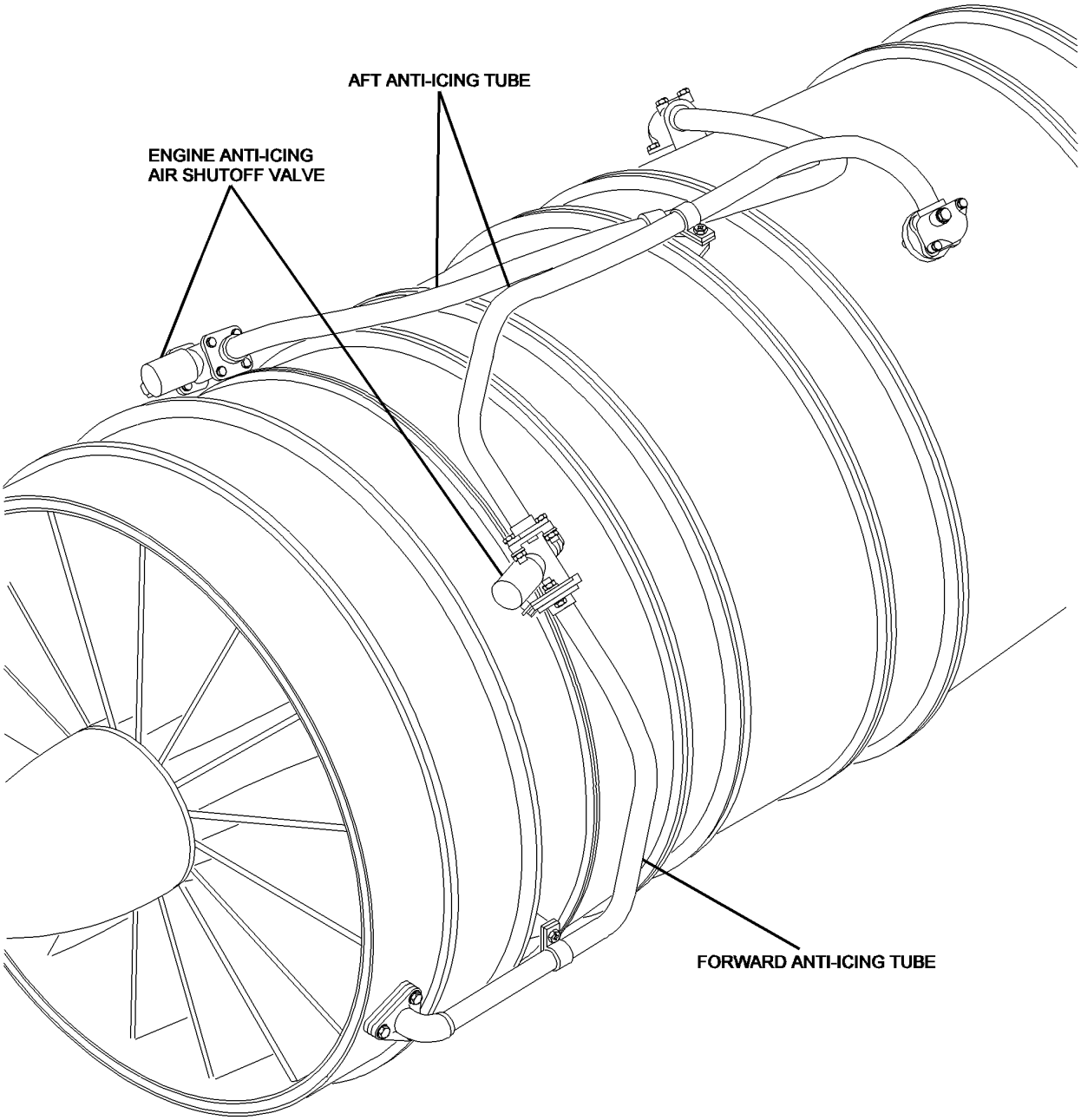
(2) Make clusters of pitting smooth to 0.005 in. (0.127 mm) maximum depth.

E. Inspect the rear air tubes for cracks as follows: (Figure 601)

(1) Replace air tubes with circumferential or axial cracks in the area adjacent to the rear elbow braze. (ENGINE ANTI-ICING AIR TUBES - MAINTENANCE PRACTICES, PAGEBLOCK 75-10-02/201 Config 1)

F. Miscellaneous Inspections

(1) Replace air tubes that are damaged more than the repairable limits. (ENGINE ANTI-ICING AIR TUBES - MAINTENANCE PRACTICES, PAGEBLOCK 75-10-02/201 Config 1)



Engine Anti Icing Air Tube Inspection
Figure 601/75-10-02-990-803

NOSE COWL ANTI-ICING AIR SHUTOFF VALVE - MAINTENANCE PRACTICES

1. General

A. This maintenance practice provides removal/installation and adjustment/test instruction for the nose cowl anti-icing air shutoff valve located on the top side of the engine on the compressor case. The nose cowl anti-icing air shutoff valve installed on the right and left engine are interchangeable.

WARNING: EXERCISE CARE TO AVOID STRAKES WHEN WORKING IN ENGINE AREA WITH COWL DOORS OPEN OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: TO PREVENT STRUCTURAL DAMAGE, USE BOTH HOLD OPEN RODS ON EACH COWL DOOR.

CAUTION: OPEN UPPER COWL DOOR ONLY AS MUCH AS NECESSARY TO ALLOW HOLD-OPEN RODS TO BE CONNECTED TO ENGINE. OPENING DOOR TOO FAR MAY CAUSE DAMAGE TO PYLON HINGE POINTS.

CAUTION: MAKE CERTAIN RIGHT ENGINE UPPER COWL DOOR IS CLOSED BEFORE OPERATING APU, OR APU EXHAUST WILL IMPINGE DIRECTLY ON COWL DOOR CAUSING EXTENSIVE DAMAGE.

CAUTION: MAKE CERTAIN NOSE COWL ANTI-ICING MIXING TUBE AND NOZZLE ARE CORRECTLY ALIGNED AFTER INSTALLATION OF AIR SHUTOFF VALVE.

B. Removal, installation, and test procedures for the nose cowl anti-icing air shutoff valve installed on each engine are identical. Access is through upper cowl door.

NOTE: Forward lower cowl door overlaps the aft lower cowl door and must be opened first.

C. Before installation of valve, check all openings to make certain no foreign objects are present.

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed item:

NOTE: Some materials in the Equipment and Materials list may not be permitted to be used in your location. Persons in each location must make sure they are permitted to use these materials. All persons must obey all applicable federal, state, local, and provincial regulations for their location.

Table 201

Name and Number	Manufacturer
P05-288 Safety Wire (Lockwire)	Not Specified
Torque wrench 0 in-lb (0 N·m) to 200 in-lb (23 N·m)	Not Specified
Developer, non-aqueous, fluorescent penetrant, P05-237	Not Specified
Foil, aluminum, P05-169	Not Specified
Cloth, cotton, lint free, P05-005	Not Specified

3. Removal/Installation Nose Cowl Anti-Icing Air Shutoff Valve

A. Remove Valve

(1) Energize aircraft electrical system. (GENERAL - DESCRIPTION AND OPERATION, PAGEBLOCK 24-00-00/001)

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(2) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

Open and tag the anti-ice valve circuit breakers that follow:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	37	B1-45	LEFT ANTI-ICE VALVE CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	37	B1-46	RIGHT ANTI-ICE VALVE CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893			
K	30	B1-43	ANTI-ICING VALVE LEFT ENGINE COWL
K	31	B1-53	ANTI-ICING VALVE LEFT ENGINE LEFT
K	32	B1-55	ANTI-ICING VALVE LEFT ENGINE RIGHT

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	30	B1-44	ANTI-ICING VALVE RIGHT ENGINE COWL
L	31	B1-54	ANTI-ICING VALVE RIGHT ENGINE LEFT

WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893 (Continued)

(Continued)

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	32	B1-56	ANTI-ICING VALVE RIGHT ENGINE RIGHT

WJE ALL

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(3) Place thrust reverser control valve in dump position and install safety pin.

(4) Open the upper and the lower cowl doors.

(5) Disconnect electrical connector from anti-ice air shutoff valve.

(6) Remove bolts, washers and nuts that attach valve to thermostatic anti-icing air regulator valve.

(7) Remove upper bolts, washers and nuts that attach valve to aft duct attach flange.

(8) Remove lower bolt(s), washer(s), and locknut(s) that attach valve to engine mounting bracket.

(9) Remove valve and gaskets.

WJE 412, 414

(10) Check anti-ice valve connecting flanges for straightness. In case of distorted flanges, valve has to be replaced.

WJE ALL

B. Install Valve

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893 (Continued)

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

Make sure the anti-ice valve circuit breakers that follow are opened and tagged:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	37	B1-45	LEFT ANTI-ICE VALVE CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	37	B1-46	RIGHT ANTI-ICE VALVE CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893			
K	30	B1-43	ANTI-ICING VALVE LEFT ENGINE COWL
K	31	B1-53	ANTI-ICING VALVE LEFT ENGINE LEFT
K	32	B1-55	ANTI-ICING VALVE LEFT ENGINE RIGHT

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	30	B1-44	ANTI-ICING VALVE RIGHT ENGINE COWL
L	31	B1-54	ANTI-ICING VALVE RIGHT ENGINE LEFT
L	32	B1-56	ANTI-ICING VALVE RIGHT ENGINE RIGHT

WJE ALL

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and safety pin is installed.

(3) If necessary, open the upper and the lower cowl doors.

(4) Position anti-ice air shutoff valve between aft duct attach flange and thermostatic anti-icing air regulator valve; install new gasket between valve and aft duct attach flange, and install upper attach bolts, washers and nuts.

NOTE: Valve is installed with flow arrow on valve body pointing forward.

(5) Install lower bolt(s), washer(s), and locknut(s) that attach valve to engine mounting bracket.

(6) Install new gasket between valve and thermostatic anti-icing air regulator valve.

(7) Install bolts, washers and nuts that attach valve to regulator valve.

(8) Tighten all valve attach bolts to a torque of 100 in-lb (11.3 N·m) to 140 in-lb (15.8 N·m).

(9) Connect valve electrical connector. Safety connector with lockwire.

(10) Remove tools, equipment, loose hardware, spilled fluids, and debris from maintenance area.

(11) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

Close these circuit breakers:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	37	B1-45	LEFT ANTI-ICE VALVE CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	37	B1-46	RIGHT ANTI-ICE VALVE CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893			
K	30	B1-43	ANTI-ICING VALVE LEFT ENGINE COWL
K	31	B1-53	ANTI-ICING VALVE LEFT ENGINE LEFT
K	32	B1-55	ANTI-ICING VALVE LEFT ENGINE RIGHT

WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893 (Continued)

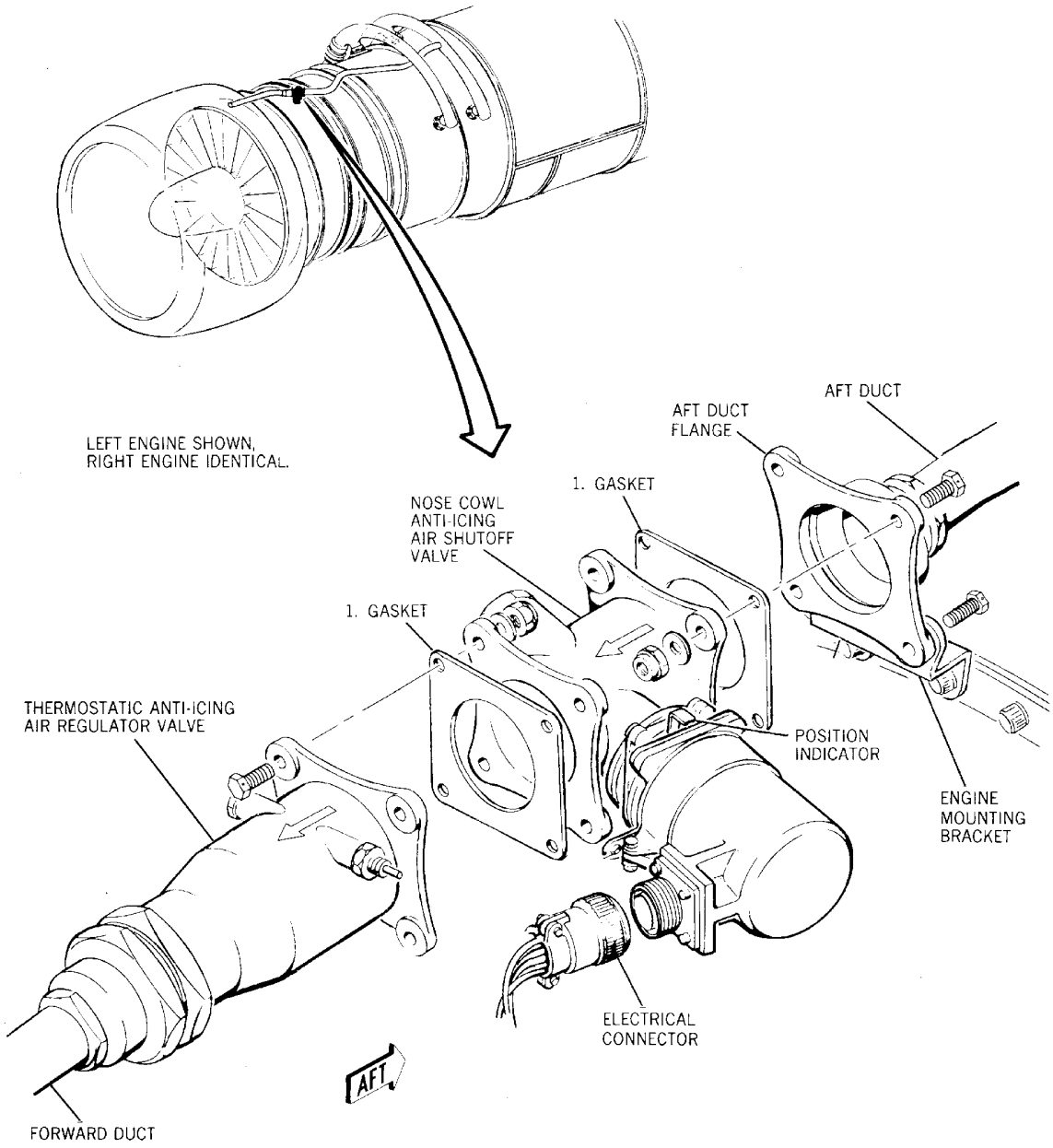
UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	30	B1-44	ANTI-ICING VALVE RIGHT ENGINE COWL
L	31	B1-54	ANTI-ICING VALVE RIGHT ENGINE LEFT
L	32	B1-56	ANTI-ICING VALVE RIGHT ENGINE RIGHT

WJE ALL

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(12) Remove safety pin from thrust reverser control valve. Stow safety pin.



1. 60024 (CONDREN CORP.)

BBB2-75-7C

Nose Cowl Anti-icing Air Shutoff Valve - Removal/Installation
Figure 201/75-10-03-990-802

4. Adjustment/Test Nose Cowl Anti-icing Air Shutoff Valve

A. Test Nose Cowl Anti-icing Air Shutoff Valve

(1) If necessary, open the upper and the lower cowl doors.

(2) Energize aircraft electrical system. (GENERAL - DESCRIPTION AND OPERATION, PAGEBLOCK 24-00-00/001)

(3) Make sure that these circuit breakers are closed:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	37	B1-45	LEFT ANTI-ICE VALVE CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	37	B1-46	RIGHT ANTI-ICE VALVE CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893			
K	30	B1-43	ANTI-ICING VALVE LEFT ENGINE COWL
K	31	B1-53	ANTI-ICING VALVE LEFT ENGINE LEFT
K	32	B1-55	ANTI-ICING VALVE LEFT ENGINE RIGHT

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	30	B1-44	ANTI-ICING VALVE RIGHT ENGINE COWL
L	31	B1-54	ANTI-ICING VALVE RIGHT ENGINE LEFT
L	32	B1-56	ANTI-ICING VALVE RIGHT ENGINE RIGHT

WJE ALL

(4) Place engine anti-icing control switch in ON position.

(5) Check that blue ENG ANTI-ICE light comes on in approximately 2 seconds and that amber ENG VALVE light does not remain on.

(6) Check that position indicator on all valves indicate open position.

(7) Place engine anti-icing control switch in OFF position.

(8) Check that blue ENG ANTI-ICE ON and amber ENG VALVE light goes off.

(9) Check that position indicator on all valves indicate closed position.

(10) Wrap aluminum foil, as applicable, over the air shutoff valve tube and all the ducting attach points.

(a) Operate engine at idle and check for external leaks. Foil will blow off or become deformed if leaks are present.

(b) If leaks found, check valve for proper installation and correct any faults found.

(11) If necessary, do alternate method as follows:

WARNING: USE THE HAZARDOUS MATERIAL WARNINGS GIVEN BELOW FOR THE STEPS THAT FOLLOW.

THE HAZARDOUS MATERIAL WARNINGS ARE LISTED AFTER THE INTRODUCTION SECTION IN THE FRONT OF THE AMM.

Hazardous Material Warnings

HAZMAT 1711, WET NON-AQUEOUS DEVELOPER (DPM 2449-2)

HAZMAT 1000, REFER TO MSDS

(a) Apply non-aqueous developer to the air shutoff valve tube and all the ducting attach points.

(b) Operate engine at idle and check for external leaks. Check developer for signs of leakage.

(c) If leaks are found, check valve for proper installation and correct any faults.

(12) Repeat applicable step Paragraph 4.A.(10) or Paragraph 4.A.(11).

(13) De-energize airplane electrical system. (PAGEBLOCK 24-00-00/001)

(14) If used, remove the aluminum foil from all duct connections

(15) If used, remove developer from all duct connections with a lint free cloth.

(16) Close the upper and lower cowl doors.

NOSE COWL ANTI-ICING THERMOSTATIC AIR REGULATOR VALVE - MAINTENANCE PRACTICES

1. General

A. This maintenance practice provides removal/installation and adjustment/test instructions for the nose cowl anti-icing thermostatic air regulator valve located on the top side of the engine on the compressor case. The nose cowl anti-icing thermostatic air regulator valve installed on the right or left engines are interchangeable.

WARNING: EXERCISE CARE TO AVOID STRAKES WHEN WORKING IN ENGINE AREA WITH COWL DOORS OPEN OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: TO PREVENT STRUCTURAL DAMAGE, USE BOTH HOLD OPEN RODS ON EACH COWL DOOR.

CAUTION: OPEN UPPER COWL DOOR ONLY AS MUCH AS NECESSARY TO ALLOW HOLD-OPEN RODS TO BE CONNECTED TO ENGINE. OPENING DOOR TOO FAR MAY CAUSE DAMAGE TO PYLON HINGE POINTS.

CAUTION: MAKE CERTAIN RIGHT ENGINE UPPER COWL DOOR IS CLOSED BEFORE OPERATING APU, OR APU EXHAUST WILL IMPINGE DIRECTLY ON COWL DOOR CAUSING EXTENSIVE DAMAGE.

CAUTION: MAKE CERTAIN NOSE COWL ANTI-ICING MIXING TUBE AND NOZZLE ARE CORRECTLY ALIGNED AFTER INSTALLATION OF AIR REGULATOR VALVE.

B. Removal, installation, and test procedures for the nose cowl anti-icing thermostatic air regulator valve installed on each engine are identical. Access is through upper cowl door.

NOTE: Lower forward cowl door overlaps the lower aft cowl door and must be opened first.

C. Before installation of valve, check all openings to make certain no foreign objects are present.

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items:

NOTE: Some materials in the Equipment and Materials list may not be permitted to be used in your location. Persons in each location must make sure they are permitted to use these materials. All persons must obey all applicable federal, state, local, and provincial regulations for their location.

Table 201

Name and Number	Manufacturer
Push-pull gage, range 0 to 20 pounds (calibrated in 4 ounce increments), tool number 719-20	John Chatillon & Sons, Inc. Force Measurement Division 7609 Business Park Drive Greensboro, NC 27409
Push-pull gage, range 0 to 80 pounds (calibrated in 1 pound increments), tool number 8D	John Chatillon & Sons, Inc. Force Measurement Division 7609 Business Park Drive Greensboro, NC 27409
Lockwire, .032 corrosion resistant steel, P05-289	
Torque wrench (0 to 300 inch-pounds range)	
Torque wrench (0 to 1800 inch-pounds range).	

3. Removal/Installation Nose Cowl Anti-icing Thermostatic Air Regulator Valve

A. Remove Valve

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

Open and tag the anti-ice valve circuit breakers that follow:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	37	B1-45	LEFT ANTI-ICE VALVE CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	37	B1-46	RIGHT ANTI-ICE VALVE CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893			
K	30	B1-43	ANTI-ICING VALVE LEFT ENGINE COWL
K	31	B1-53	ANTI-ICING VALVE LEFT ENGINE LEFT
K	32	B1-55	ANTI-ICING VALVE LEFT ENGINE RIGHT

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	30	B1-44	ANTI-ICING VALVE RIGHT ENGINE COWL
L	31	B1-54	ANTI-ICING VALVE RIGHT ENGINE LEFT

WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893 (Continued)

(Continued)

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	32	B1-56	ANTI-ICING VALVE RIGHT ENGINE RIGHT

WJE ALL

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Disconnect forward duct coupling nut from anti-icing thermostatic air regulator valve.

(4) Remove bolts, washers and nuts that attach valve to nose cowl anti-icing air shutoff valve.

(5) Remove valve.

(6) Remove gasket.

(7) Remove reducer fitting and gasket from valve.

B. Install Valve

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

Make sure the anti-ice valve circuit breakers that follow are opened and tagged:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	37	B1-45	LEFT ANTI-ICE VALVE CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	37	B1-46	RIGHT ANTI-ICE VALVE CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name

WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893

K	30	B1-43	ANTI-ICING VALVE LEFT ENGINE COWL
K	31	B1-53	ANTI-ICING VALVE LEFT ENGINE LEFT
K	32	B1-55	ANTI-ICING VALVE LEFT ENGINE RIGHT

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	30	B1-44	ANTI-ICING VALVE RIGHT ENGINE COWL
L	31	B1-54	ANTI-ICING VALVE RIGHT ENGINE LEFT
L	32	B1-56	ANTI-ICING VALVE RIGHT ENGINE RIGHT

WJE ALL

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS BEEN DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6555 TO 7245 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and safety pin is installed.

(3) Install new gasket on union and install union in valve.

(4) Tighten union to torque of 950-1050 inch-pounds (107.4-118.7 N·m).

(5) Position valve between forward duct and nose cowl anti-icing air shutoff valve, install new gasket, and install bolts.

(6) Tighten bolts to torque of 100 to 140 inch-pounds (11.3 to 15.8 N·m).

(7) Connect forward duct coupling nut.

(8) Tighten coupling nut to torque of 600 to 900 inch-pounds (67.8 to 101.7 N·m). Safety coupling nut with P05-289 lockwire.

(9) Remove tools, equipment, loose hardware, spilled fluids, and debris from maintenance area.

(10) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

Close these circuit breakers:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	37	B1-45	LEFT ANTI-ICE VALVE CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	37	B1-46	RIGHT ANTI-ICE VALVE CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893			
K	30	B1-43	ANTI-ICING VALVE LEFT ENGINE COWL
K	31	B1-53	ANTI-ICING VALVE LEFT ENGINE LEFT
K	32	B1-55	ANTI-ICING VALVE LEFT ENGINE RIGHT

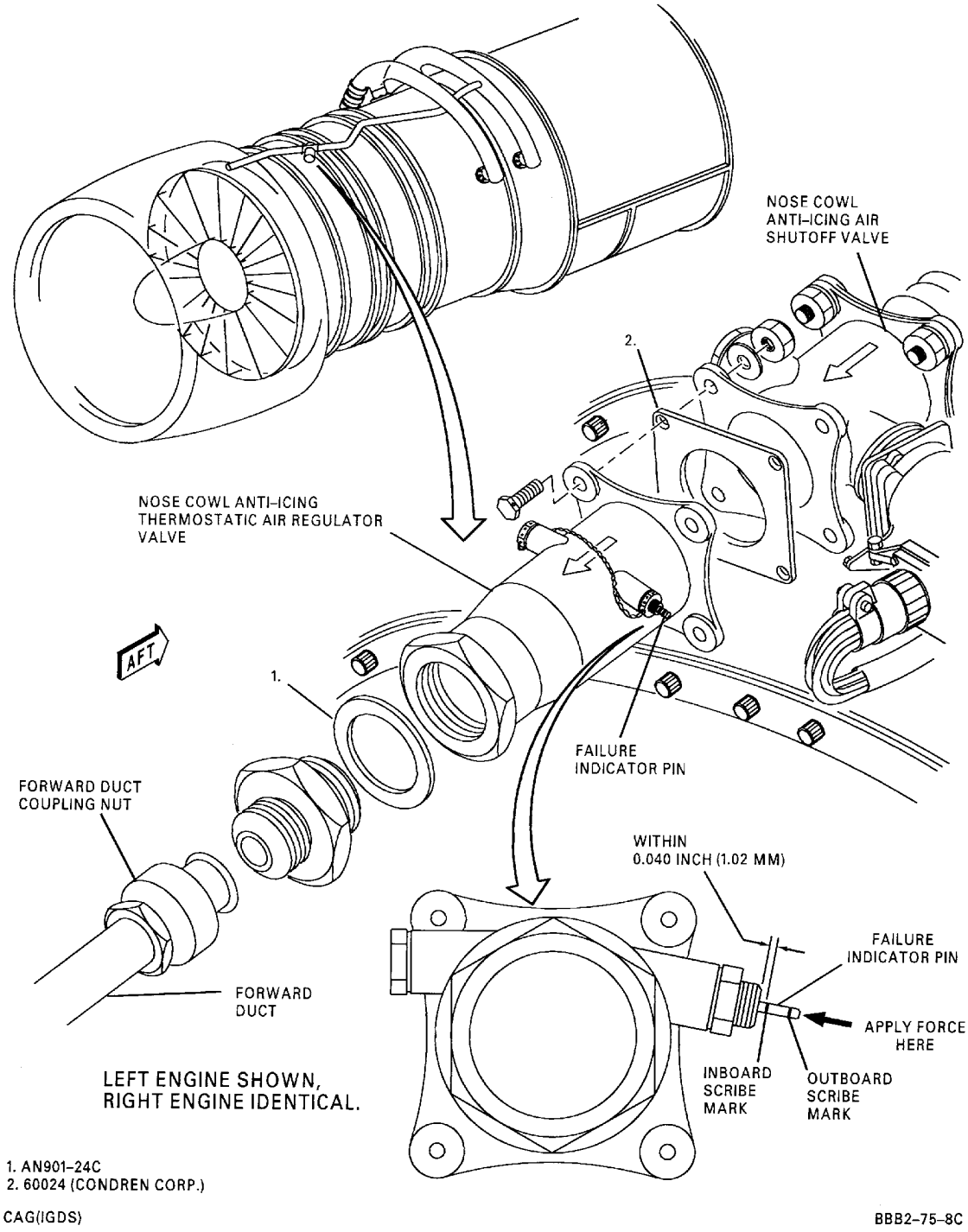
UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	30	B1-44	ANTI-ICING VALVE RIGHT ENGINE COWL
L	31	B1-54	ANTI-ICING VALVE RIGHT ENGINE LEFT
L	32	B1-56	ANTI-ICING VALVE RIGHT ENGINE RIGHT

WJE ALL

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(11) Remove safety pin from thrust reverser control valve. Stow safety pin.



Nose Cowl Anti-icing Thermostatic Air Regulator Valve - Removal/Installation
Figure 201/75-10-04-990-801

WJE 401-411, 415-427, 429, 861-866, 868, 869, 871-881, 883, 884, 886, 887, 891-893

4. Adjustment/Test Nose Cowl Anti-icing Thermostatic Air Regulator Valve

A. Test Valve Failure Indicating Pin

NOTE: Test should be made when valve temperature is approximately 60° to 100°F (15.6° to 37.0°C).

(1) Check to determine if rotor is against open stop.

CAUTION: USE EXTREME CARE TO PREVENT DAMAGE TO VALVE DURING TEST.

(a) With aid of push-pull gage, carefully apply no more than 2.0 lbf (8.9 N) of force to position the inboard scribe mark within 0.040 in. (1.02 mm) flush with the end of the open stop. (Figure 201)

NOTE: Depending on type of push/pull gage used for test, access to nose cowl anti-icing thermostatic air regulator valve failure indicator pin may be inhibited by location of electrical connector on anti-icing air shutoff valve. A locally manufactured adapter ("L" or "foot shaped"), should be attached to push/pull gage rod end to aid in applying proper force to indicator pin.

(b) Observe for following conditions:

1) If force required to move pin is greater than 2.0 pounds (0.908 kg):

a) Indicator pin possibly bent.

b) Possible binding within pin housing.

2) If pin moves beyond scribe mark:

a) Unit is binding.

b) Bi-metal is broken.

c) Valve is not in open position.

(c) Release pin.

(2) Check to determine if bi-metal has proper load/preload.

(a) Carefully apply no more than 55.0 lbf (244.7 N) of force at the end of the failure indicator pin to position the outboard scribe mark within 0.040 in. (1.02 mm) to flush with the end of the stop. Outboard scribe mark shall not move below the top surface of the open stop with less than 10.0 lbf (44.5 N) of force. The pin must move smoothly with no evidence of sticking or binding.

NOTE: Valves equipped with old spring need a force of 12 to 30 pounds (5.44 to 13.6 kg) force only.

(b) Observe for following conditions:

1) If force required is greater than 55 pounds (24.95 kg):

a) Indicator pin possibly bent

b) Binding within pin housing

c) Unit out of calibration - high preload

d) Binding between rotor and stator.

2) If force required is less than 10 pounds (4.54 kg):

a) Bi-metal is broken

b) Unit out of calibration - low preload.

(c) Release pin.

WJE 401-411, 415-427, 429, 861-866, 868, 869, 871-881, 883, 884, 886, 887, 891-893 (Continued)

(3) If any check criteria in items 1 and/or 2 above cannot be met, thermostatic regulator valve should be removed and replaced.

WJE ALL

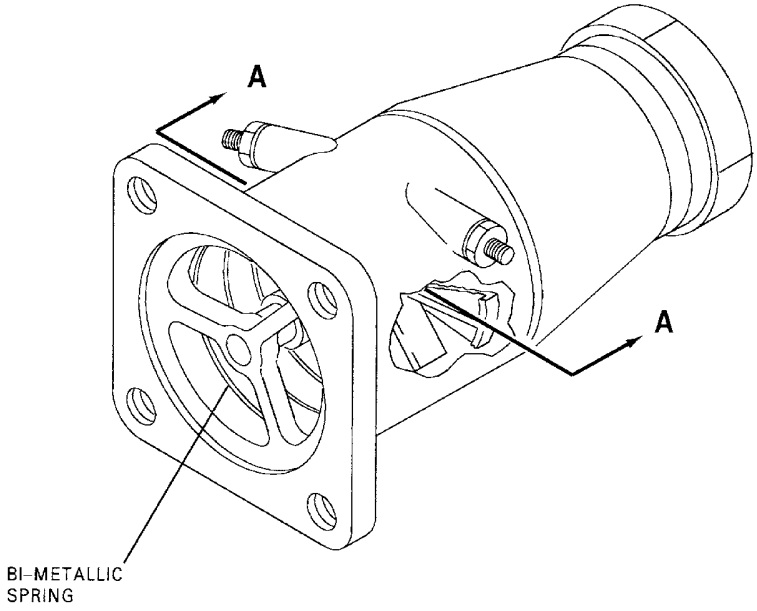
5. Check Nose Cowl Anti-Icing Thermostatic Air Regulator Valve

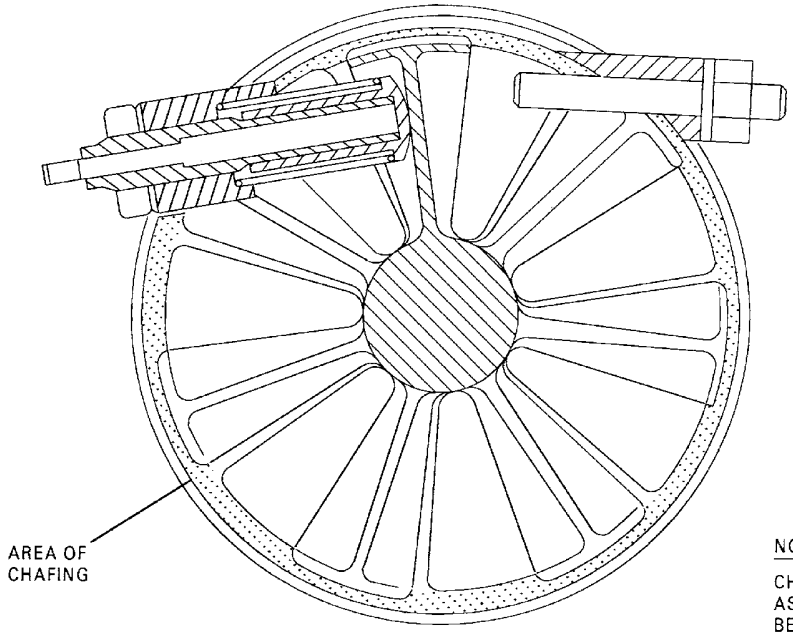
A. Remove Valve. (Paragraph 3.A.)

(1) Visually check upstream side of stator plate and rotor blades for evidence of chafing. If chafing is found, valve must be replaced. (Figure 202)

(2) Visually check bi-metal spring for cracks and/or distortion. If cracks and/or distortion are found, valve must be replaced. (Figure 202)

B. If no defects are found, install valve. (Paragraph 3.B.)





NOTE:

CHAFING IS DESCRIBED AS EVIDENCE OF CONTACT BETWEEN STATOR PLATE AND ROTOR BLADES

SECTION A-A

CAG(IGDS)

BBB2-75-32

Nose Cowl Anti-Icing Thermostatic Air Regulator Valve - Inspection/Check
Figure 202/75-10-04-990-802

NOSE COWL ANTI-ICING AIR DUCTS - MAINTENANCE PRACTICES

1. General

A. Nose cowl anti-icing air ducts.

WARNING: EXERCISE CARE TO AVOID STRAKES WHEN WORKING IN ENGINE AREA WITH COWL DOORS OPEN OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: TO PREVENT STRUCTURAL DAMAGE, USE BOTH HOLD OPEN RODS ON EACH COWL DOOR.

CAUTION: OPEN UPPER COWL DOOR ONLY AS MUCH AS NECESSARY TO ALLOW HOLD-OPEN RODS TO BE CONNECTED TO ENGINE. OPENING DOOR TOO FAR MAY CAUSE DAMAGE TO PYLON HINGE POINTS.

CAUTION: MAKE CERTAIN RIGHT ENGINE UPPER COWL DOOR IS CLOSED BEFORE OPERATING APU OR APU EXHAUST WILL IMPINGE DIRECTLY ON COWL DOOR CAUSING EXTENSIVE DAMAGE.

CAUTION: MAKE CERTAIN NOZZLE AND MIXING TUBE ARE CORRECTLY ALIGNED AFTER INSTALLATION OF ANTI-ICING SYSTEM DUCTING.

B. Removal and installation procedures for the nose cowl anti-icing air ducts installed on each engine are identical. Access is through upper cowl doors and through 7307C and 7309C for left engine; 7404C and 7402C for right engine.

NOTE: Forward lower cowl door overlaps the aft lower cowl door and must be opened first.

C. Before installation of ducts, check all openings to make certain no foreign objects are present.

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items.

Table 201

Name and Number	Manufacturer
Lockwire, .032 corrosion resistant steel, P05-289	
Torque wrench (0 to 300 inch-pounds range)	
Torque wrench (0 to 1800 inch-pounds range).	

3. Removal/Installation Nose Cowl Anti-icing Air Ducts

A. Remove Forward Duct

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891 (Continued)

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

Open and tag the anti-ice valve circuit breakers that follow:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	37	B1-45	LEFT ANTI-ICE VALVE CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	37	B1-46	RIGHT ANTI-ICE VALVE CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893			
K	30	B1-43	ANTI-ICING VALVE LEFT ENGINE COWL
K	31	B1-53	ANTI-ICING VALVE LEFT ENGINE LEFT
K	32	B1-55	ANTI-ICING VALVE LEFT ENGINE RIGHT

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	30	B1-44	ANTI-ICING VALVE RIGHT ENGINE COWL
L	31	B1-54	ANTI-ICING VALVE RIGHT ENGINE LEFT
L	32	B1-56	ANTI-ICING VALVE RIGHT ENGINE RIGHT

WJE ALL

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Remove clamp that connects forward duct to nozzle.

(4) Disconnect forward duct coupling nut.

(5) Remove forward duct.

B. Install Forward Duct

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	41	B1-423	ENGINE START VALVE RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	42	B1-1	ENGINE IGNITION LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name

WJE ALL

K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

Make sure the anti-ice valve circuit breakers that follow are opened and tagged:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	37	B1-45	LEFT ANTI-ICE VALVE CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	37	B1-46	RIGHT ANTI-ICE VALVE CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893			
K	30	B1-43	ANTI-ICING VALVE LEFT ENGINE COWL
K	31	B1-53	ANTI-ICING VALVE LEFT ENGINE LEFT
K	32	B1-55	ANTI-ICING VALVE LEFT ENGINE RIGHT

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	30	B1-44	ANTI-ICING VALVE RIGHT ENGINE COWL
L	31	B1-54	ANTI-ICING VALVE RIGHT ENGINE LEFT
L	32	B1-56	ANTI-ICING VALVE RIGHT ENGINE RIGHT

WJE ALL

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and safety pin is installed.

(3) Connect forward duct coupling nut.

NOTE: The forward duct flange face should be positioned 1.5 (38.1 mm) (±0.03(.76 mm)) inches aft of the engine "A" flange face.

(4) Install clamp that connects forward duct to nozzle and tighten to torque of 35 to 45 inch-pounds (4.0 to 5.1 N·m). To ensure proper fit of forward duct, make certain that nose cowl anti-ice valve is installed on forward side of mounting bracket. Make certain that mounting bracket is installed on forward side of engine flange D.

(NOSE COWL ANTI-ICING AIR SHUTOFF VALVE - MAINTENANCE PRACTICES, PAGEBLOCK 75-10-03/201 Config 1)

NOTE: Nozzle may be moved fore and aft to permit alignment of flanges on forward duct and nozzle.

WJE ALL; AFTER SERVICE BULLETIN 30-61

(5) Tighten forward duct coupling nut to torque of 600 to 900 inch-pounds (67.8 to 101.7 N·m). Safety coupling nut with P05-289 lockwire.

WJE ALL

(6) Tighten forward duct coupling nut to torque of 600 to 900 inch-pounds (67.8 to 101.7 N·m).

(7) Remove access door 7309C (L/H) or 7402C (R/H) and check alignment of mixing tube and nozzle.

WJE 401-405, 409, 412, 414-416, 418, 420, 422, 424-427, 429, 863, 864, 866, 868, 869, 871, 872, 880, 881, 883, 884, 891

(Paragraph 3.F.(9)(c))

WJE 406-408, 410, 411, 421, 423, 865, 886, 887

(Paragraph 3.F.(9)(d))

WJE 412, 414, 873-879, 892, 893

(Paragraph 3.F.(9)(e))

WJE ALL

(8) Install access doors.

(9) Remove tools, equipment, loose hardware, spilled fluids, and debris from maintenance area.

(10) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

Close these circuit breakers:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	37	B1-45	LEFT ANTI-ICE VALVE CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	37	B1-46	RIGHT ANTI-ICE VALVE CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893			
K	30	B1-43	ANTI-ICING VALVE LEFT ENGINE COWL
K	31	B1-53	ANTI-ICING VALVE LEFT ENGINE LEFT
K	32	B1-55	ANTI-ICING VALVE LEFT ENGINE RIGHT

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	30	B1-44	ANTI-ICING VALVE RIGHT ENGINE COWL
L	31	B1-54	ANTI-ICING VALVE RIGHT ENGINE LEFT
L	32	B1-56	ANTI-ICING VALVE RIGHT ENGINE RIGHT

WJE ALL

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(11) Remove safety pin from thrust reverser control valve. Stow safety pin.

C. Remove Aft Duct

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

Open and tag the anti-ice valve circuit breakers that follow:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	37	B1-45	LEFT ANTI-ICE VALVE CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	37	B1-46	RIGHT ANTI-ICE VALVE CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name

WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893

K	30	B1-43	ANTI-ICING VALVE LEFT ENGINE COWL
K	31	B1-53	ANTI-ICING VALVE LEFT ENGINE LEFT
K	32	B1-55	ANTI-ICING VALVE LEFT ENGINE RIGHT

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	30	B1-44	ANTI-ICING VALVE RIGHT ENGINE COWL
L	31	B1-54	ANTI-ICING VALVE RIGHT ENGINE LEFT
L	32	B1-56	ANTI-ICING VALVE RIGHT ENGINE RIGHT

WJE ALL

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Remove pin and clamp that connects aft duct to 13th-stage high-pressure bleed air manifold.

(4) Disconnect aft duct coupling nut.

(5) Disconnect clamp that attaches aft duct to engine bracket.

WJE ALL; AFTER SERVICE BULLETIN 30-61

(a) Remove clamps that attach aft duct to engine brackets.

WJE ALL

(6) Remove aft duct.

D. Install Aft Duct

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

Make sure the anti-ice valve circuit breakers that follow are opened and tagged:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	37	B1-45	LEFT ANTI-ICE VALVE CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	37	B1-46	RIGHT ANTI-ICE VALVE CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893			
K	30	B1-43	ANTI-ICING VALVE LEFT ENGINE COWL
K	31	B1-53	ANTI-ICING VALVE LEFT ENGINE LEFT
K	32	B1-55	ANTI-ICING VALVE LEFT ENGINE RIGHT

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	30	B1-44	ANTI-ICING VALVE RIGHT ENGINE COWL

WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893 (Continued)

(Continued)

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	31	B1-54	ANTI-ICING VALVE RIGHT ENGINE LEFT
L	32	B1-56	ANTI-ICING VALVE RIGHT ENGINE RIGHT

WJE ALL

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and safety pin is installed.

(3) Position aft duct and connect clamp that attaches duct to engine bracket.

WJE ALL; AFTER SERVICE BULLETIN 30-61

(a) Position aft duct and install clamps to engine brackets.

WJE ALL

(4) Connect aft duct coupling nut.

NOTE: To prevent preloading duct, do not apply torque to coupling nut at this time.

(5) Install clamp that connects aft duct to high-pressure bleed air manifold, install safety pin, and tighten to torque of 65 to 75 inch-pounds (7.3 to 8.6 N·m).

WJE ALL; BEFORE SERVICE BULLETIN 30-61

(6) Tighten coupling nut to torque of 600 to 900 inch-pounds (67.8 to 101.7 N·m).

WJE ALL; AFTER SERVICE BULLETIN 30-61

(7) Tighten coupling nut to torque of 600 to 900 inch-pounds (67.8 to 101.7 N·m). Safety with P05-289 lockwire.

WJE ALL

(8) Remove access door 7309C (L/H) or 7402C (R/H) and check alignment of mixing tube and nozzle.

WJE 401-405, 409, 412, 414-416, 418, 420, 422, 424-427, 429, 863, 864, 866, 868, 869, 871, 872, 880, 881, 883, 884, 891

(Paragraph 3.F.(9)(c))

WJE 406-408, 410, 411, 421, 423, 865, 886, 887

(Paragraph 3.F.(9)(d))

WJE 412, 414, 873-879, 892, 893

(Paragraph 3.F.(9)(e))

WJE ALL

(9) Install access doors.

(10) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

Close these circuit breakers:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	37	B1-45	LEFT ANTI-ICE VALVE CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	37	B1-46	RIGHT ANTI-ICE VALVE CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893			
K	30	B1-43	ANTI-ICING VALVE LEFT ENGINE COWL
K	31	B1-53	ANTI-ICING VALVE LEFT ENGINE LEFT
K	32	B1-55	ANTI-ICING VALVE LEFT ENGINE RIGHT

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	30	B1-44	ANTI-ICING VALVE RIGHT ENGINE COWL
L	31	B1-54	ANTI-ICING VALVE RIGHT ENGINE LEFT
L	32	B1-56	ANTI-ICING VALVE RIGHT ENGINE RIGHT

WJE ALL

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(11) Remove safety pin from thrust reverser control valve. Stow safety pin.

(12) Pressure test pneumatic system. (PAGEBLOCK 36-00-00/201)

E. Remove Nose Cowl Nozzle and Mixing Tube

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

Open and tag the anti-ice valve circuit breakers that follow:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	37	B1-45	LEFT ANTI-ICE VALVE CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	37	B1-46	RIGHT ANTI-ICE VALVE CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893			
K	30	B1-43	ANTI-ICING VALVE LEFT ENGINE COWL
K	31	B1-53	ANTI-ICING VALVE LEFT ENGINE LEFT
K	32	B1-55	ANTI-ICING VALVE LEFT ENGINE RIGHT

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	30	B1-44	ANTI-ICING VALVE RIGHT ENGINE COWL
L	31	B1-54	ANTI-ICING VALVE RIGHT ENGINE LEFT
L	32	B1-56	ANTI-ICING VALVE RIGHT ENGINE RIGHT

WJE ALL

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Remove access doors 7307C and 7309C for left engine; 7404C and 7402C for right engine.

(4) Remove clamp connecting nozzle to forward duct.

(5) Loosen nuts on support clamps at forward end of nozzle.

(6) Loosen screws in aft bulkhead flange to allow flange to float on bulkhead.

(7) Remove nozzle.

(8) Remove bolts attaching mixing tube to links.

(9) Remove clamp connecting mixing tube to elbow.

(10) Remove mixing tube.

F. Install Nose Cowl Mixing Tube and Nozzle

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891 (Continued)

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

Open and tag the anti-ice valve circuit breakers that follow:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	37	B1-45	LEFT ANTI-ICE VALVE CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	37	B1-46	RIGHT ANTI-ICE VALVE CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893			
K	30	B1-43	ANTI-ICING VALVE LEFT ENGINE COWL
K	31	B1-53	ANTI-ICING VALVE LEFT ENGINE LEFT
K	32	B1-55	ANTI-ICING VALVE LEFT ENGINE RIGHT

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	30	B1-44	ANTI-ICING VALVE RIGHT ENGINE COWL
L	31	B1-54	ANTI-ICING VALVE RIGHT ENGINE LEFT
L	32	B1-56	ANTI-ICING VALVE RIGHT ENGINE RIGHT

WJE ALL

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Install clamp attaching mixing tube to elbow. Tighten nut to torque of 35 to 45 inch-pounds (3.9 to 5.1 N·m).

(4) Install bolts attaching mixing tube to links. Tighten nut to torque of 5 to 10 inch-pounds (0.6 to 1.1 N·m) running torque.

(5) Carefully slide nozzle through aft bulkhead flange and support clamps. Loosen fasteners, if necessary.

(6) Loosen screws in flange to allow flange to float on bulkhead.

(7) Install clamp to connect nozzle to duct. Tighten nut to torque of 35 to 45 inch-pounds (3.9 to 5.1 N·m).

(8) Differentially tighten support clamp nuts to torque of 15 to 20 inch-pounds (1.7 to 2.2 N·m).

(9) Remove screws from bulkhead flange and check hole alignment. If holes are in alignment, install screws. If holes are not in alignment, proceed as follows:

(a) Loosen bolts in links supporting mixing tube and nozzle.

(b) Install screws attaching flange to structure.

WJE 401-405, 409, 412, 414-416, 418, 420, 422, 424-427, 429, 863, 864, 866, 868, 869, 871, 872, 880, 881, 883, 884, 891

(c) Align nozzle to within .15 inch (4.0 mm) of centerline of mixing tube.

(Figure 203)

WJE 406-408, 410, 411, 421, 423, 865, 886, 887

(d) Align nozzle to within 0.15 inch (4 mm) of centerline of mixing tube. Make certain that index plate on nozzle engages notch in bracket attached to flange. (Figure 204)

NOTE: The nozzle flange face should be positioned 1.5 (38.1 mm) (±0.03(.76 mm)) inches aft of the nose cowl attachment flange face.

WJE 412, 414, 873-879, 892, 893

(e) Align nozzle to within .15 inch (4.0 mm) of centerline of mixing tube.

(Figure 203)

NOTE: The nozzle flange face should be positioned 1.5 (38.1 mm) (±0.03(.76 mm)) inches aft of the nose cowl attachment flange face.

WJE ALL

(f) Tighten link bolts to torque of 5 to 10 inch-pounds (0.6 to 1.1 N·m) running torque.

(10) Install access doors 7307C and 7309C for left engine, 7404C and 7402C for right engine.

(11) Remove tools, equipment, loose hardware, spilled fluids, and debris from maintenance area.

(12) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

Close these circuit breakers:

LOWER EPC, ENGINE - LEFT DC BUS

Row	Col	Number	Name
S	37	B1-45	LEFT ANTI-ICE VALVE CAUTION

LOWER EPC, ENGINE - RIGHT DC BUS

Row	Col	Number	Name
T	37	B1-46	RIGHT ANTI-ICE VALVE CAUTION

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE 401-412, 414-416, 418, 420, 422, 424-427, 429, 861-864, 866, 868, 873-881, 883, 884, 886, 887, 891-893			
K	30	B1-43	ANTI-ICING VALVE LEFT ENGINE COWL
K	31	B1-53	ANTI-ICING VALVE LEFT ENGINE LEFT
K	32	B1-55	ANTI-ICING VALVE LEFT ENGINE RIGHT

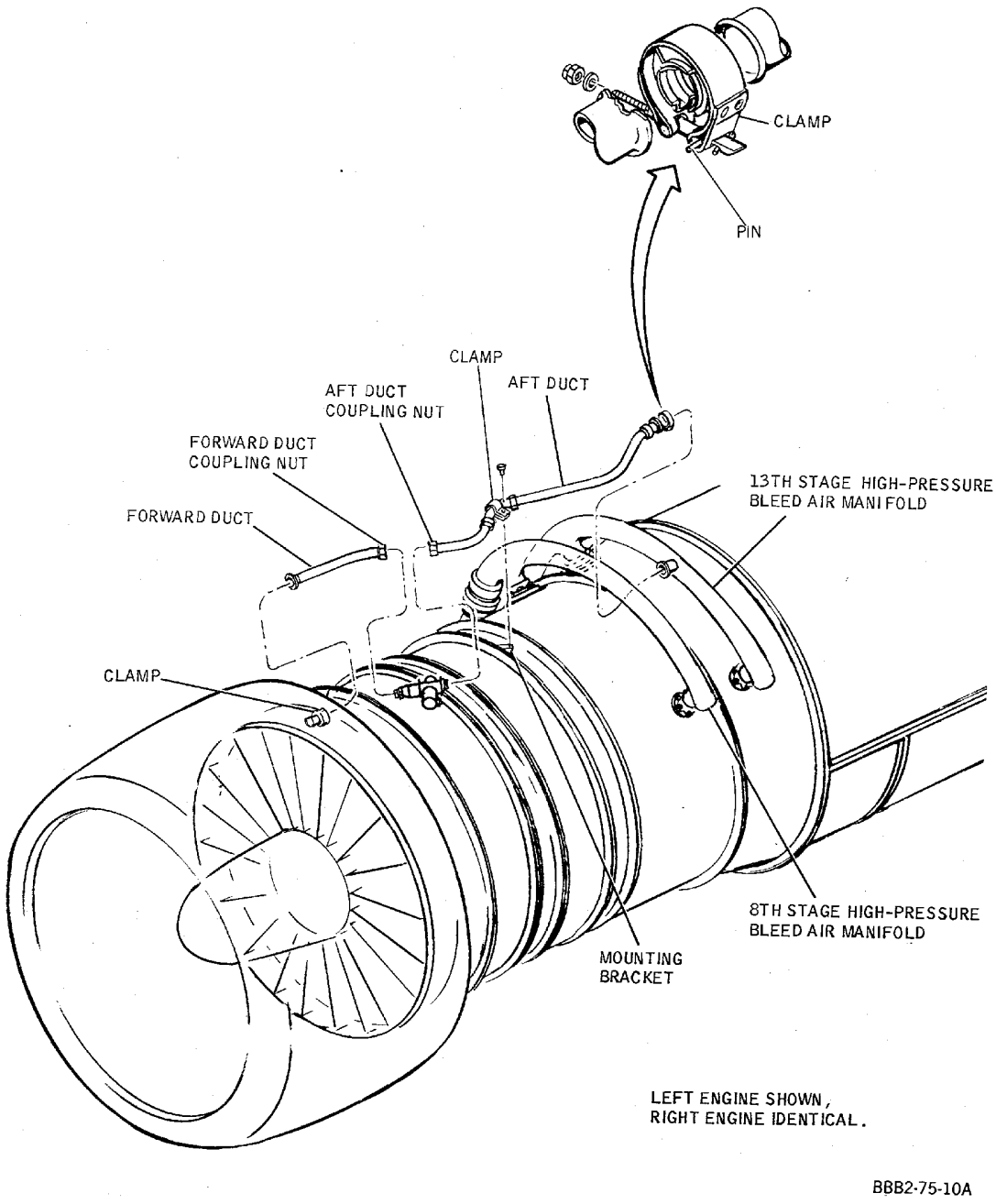
UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	30	B1-44	ANTI-ICING VALVE RIGHT ENGINE COWL
L	31	B1-54	ANTI-ICING VALVE RIGHT ENGINE LEFT
L	32	B1-56	ANTI-ICING VALVE RIGHT ENGINE RIGHT

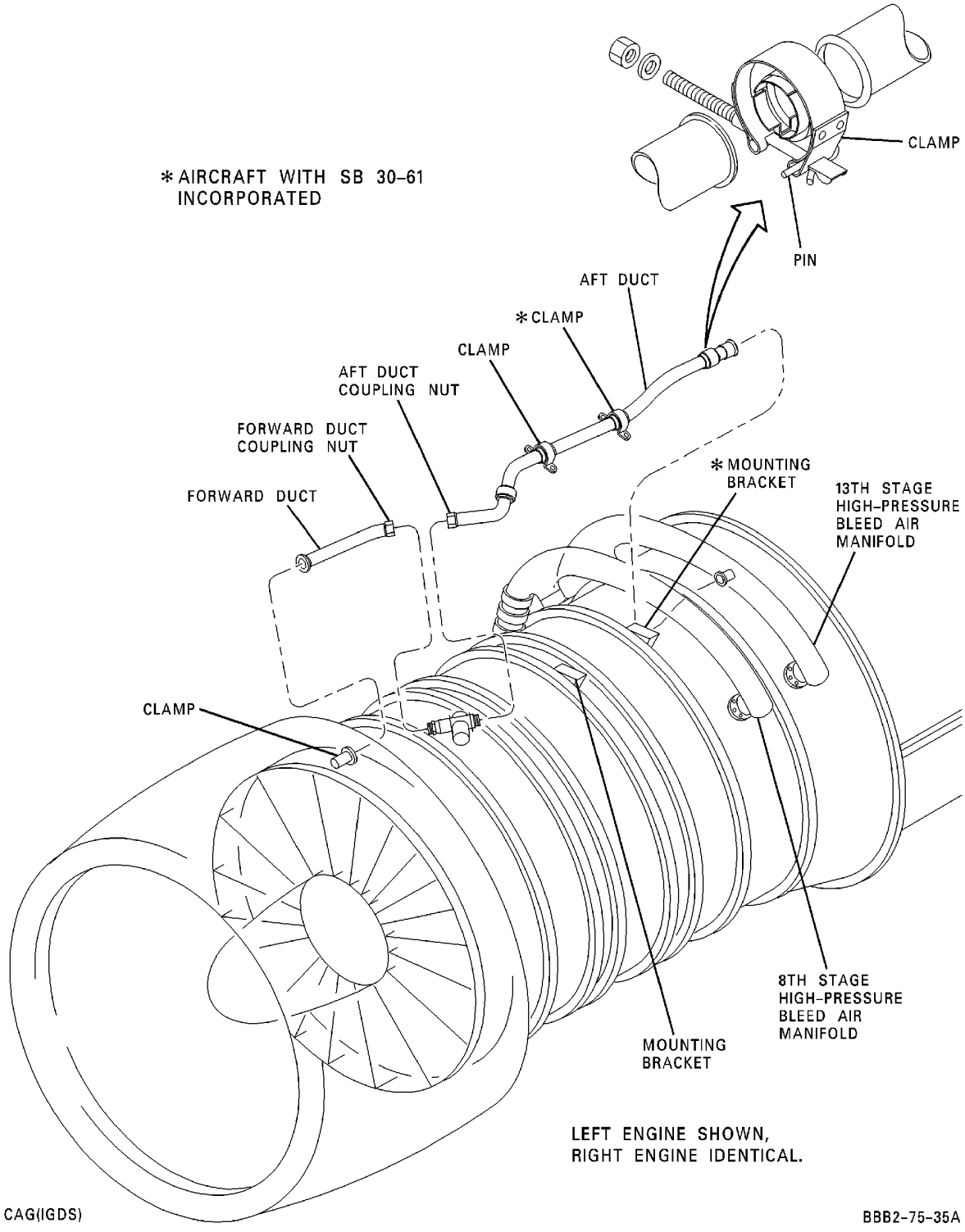
WJE ALL

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

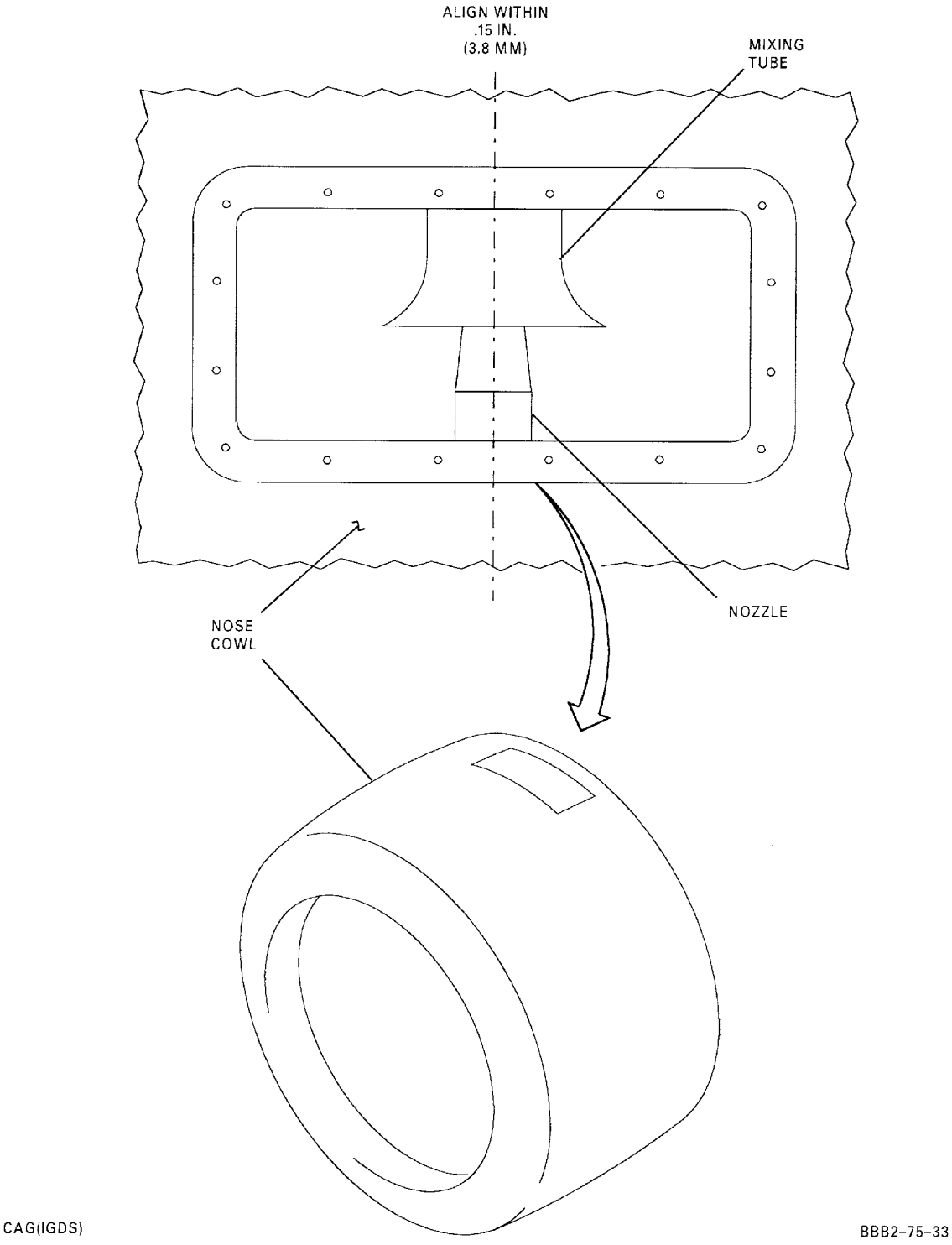
(13) Remove safety pin from thrust reverser control valve. Stow safety pin.



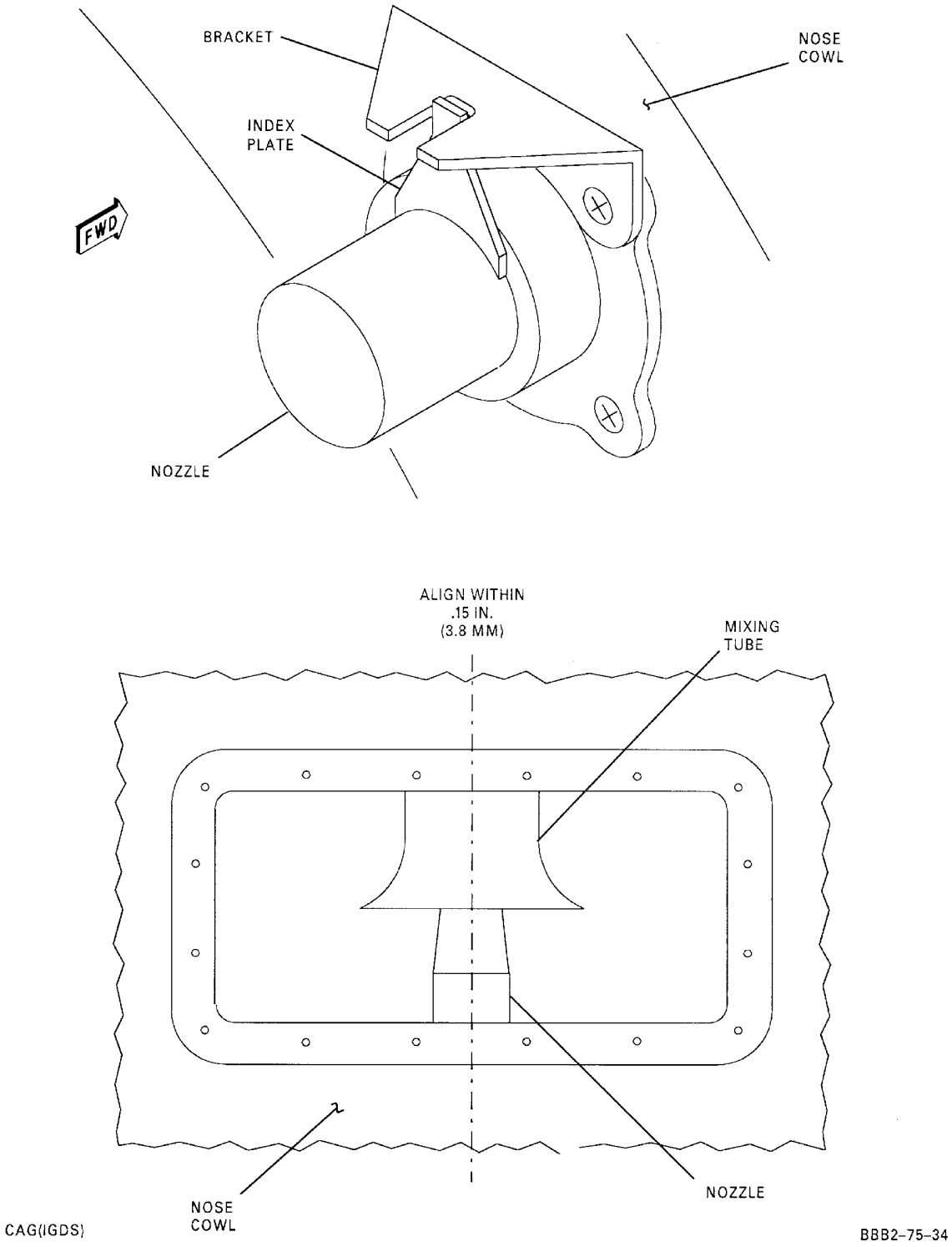
Nose Cowl Anti-icing Air Ducts - Removal/Installation
Figure 201/75-10-05-990-801



Nose Cowl Anti-icing Air Ducts - Removal/Installation (Aircraft with SB 30-61 Incorporated)
Figure 202/75-10-05-990-802



Nose Cowl Nozzle and Mixing Tube - Alignment
Figure 203/75-10-05-990-803



Nose Cowl Nozzle and Mixing Tube - Alignment
Figure 204/75-10-05-990-804

ACCESSORY COOLING - DESCRIPTION AND OPERATION

1. General

A. Accessory cooling incorporates a self-sufficient, nacelle compartment ventilating and accessory cooling system, and a generator cooling system that utilizes engine fan duct bleed air.

2. Nacelle Compartment Cooling

A. Nacelle compartment ventilation and accessory cooling prevents accumulation of combustible air mixtures in the nacelle and provides cooling for the major portion of the engine-mounted accessory components. During ground operation, normal airflow provides sufficient ventilation and cooling. In flight ventilation and cooling are accomplished by ram air that is admitted through a scoop in the lower cowl door. The air is exhausted overboard through an exit duct in the upper cowl door.

3. Generator Cooling

A. Generator cooling air is supplied from the integral fan annular discharge duct of the engine. The cooling air is drawn through the generator and exhausts overboard through an exit duct in the lower cowl door. Generator cooling components consist of an inlet duct with flexible bellows, a generator cooling air cap, cooling air shroud, and exhaust exit duct.

GENERATOR COOLING AIR DUCTS - MAINTENANCE PRACTICES

1. General

A. Generator cooling air ducts are interchangeable.

WARNING: EXERCISE CARE TO AVOID STRAKES WHEN WORKING IN ENGINE AREA WITH COWL DOORS OPEN OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: TO PREVENT STRUCTURAL DAMAGE, USE BOTH HOLD OPEN RODS ON EACH COWL DOOR.

B. Removal and installation procedures for the generator cooling air ducts installed on each engine are identical. Access is through forward lower cowl door.

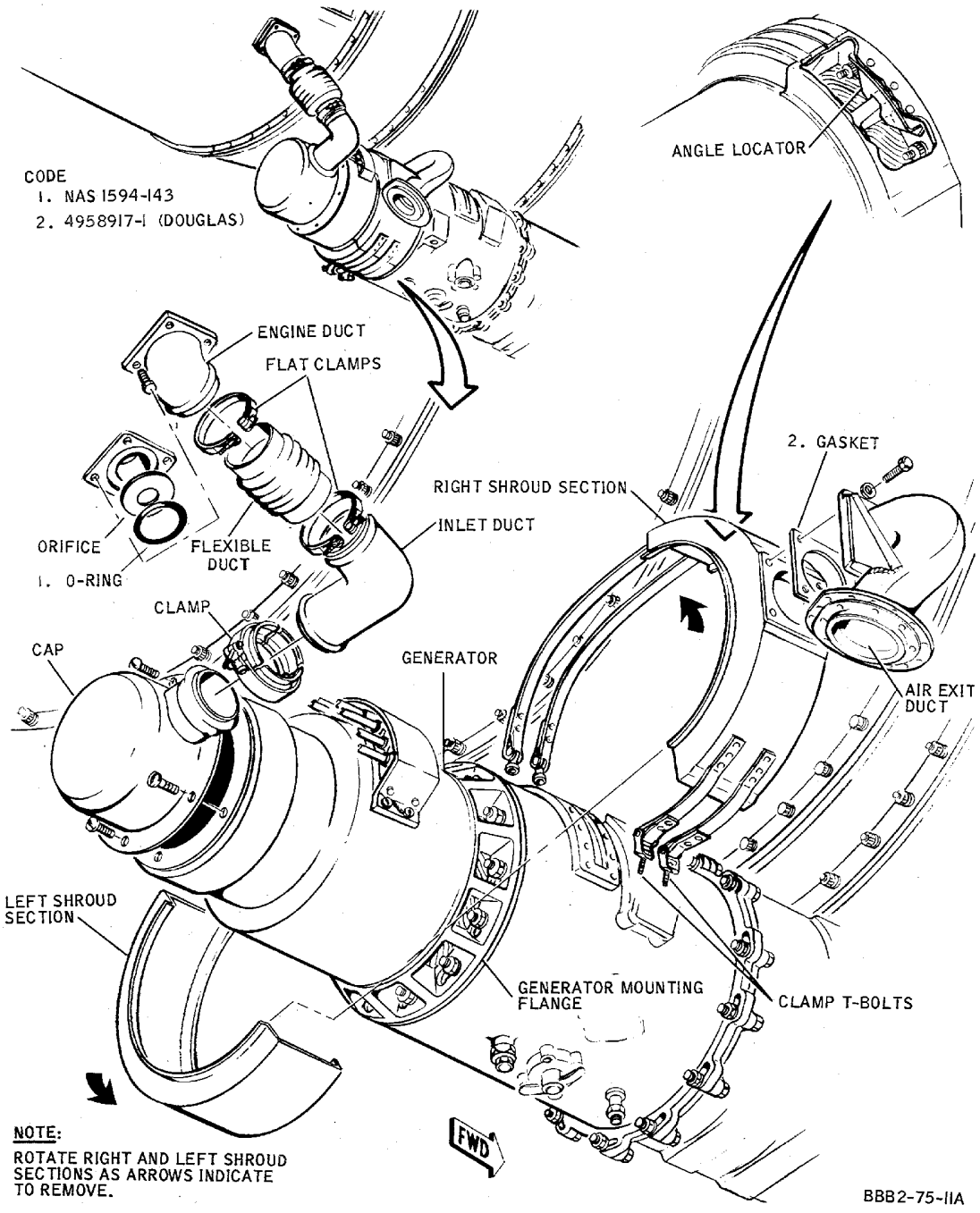
2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following items:

NOTE: It is possible that some materials in the Equipment and Materials List cannot be used for some or all of their necessary applications. Before you use the materials, make sure the types, quantities, and applications of the materials necessary are legally permitted in your location. All persons must obey all applicable federal, state, local, and provincial laws and regulations when it is necessary to work with these materials.

Table 201

Name and Number	Manufacturer
Lockwire, .032 corrosion resistant steel, P05-289	
Lockwire, .020 corrosion resistant steel, P05-288	
Petrolatum, lubricant (VV-P-236) DPM 675	Commercially available
Torque wrench (0 to 100 inch-pounds range)	



Generator Cooling Air Ducts - Removal/Installation
Figure 201/75-20-01-990-801

3. **Removal/Installation Generator Cooling Air Ducts**

A. Remove Generator Cooling Inlet Ducts

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Remove clamps that connect inlet duct to generator cap.

(4) Loosen flat clamps that connect flexible duct to engine duct and inlet duct.

(5) Remove inlet duct and flexible duct.

(6) Remove bolts that attach engine duct to engine and remove duct and orifice.

(7) Remove O-ring from engine duct.

(8) Remove screws that attach cap to generator and remove cap.

B. Install Generator Cooling Inlet Ducts

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and safety pin is installed.

(3) Position cap, install screws, and safety screws with P05-288 0.020 inch lockwire.

NOTE: Generator cap inlet should be positioned on horizontal centerline, right side of generator.

WARNING: WHITE PETROLATUM IS AN AGENT THAT IS AN IRRITANT. MAKE SURE ALL PERSONS OBEY ALL OF THE PRECAUTIONS WHEN WHITE PETROLATUM IS USED.

- DO NOT USE IN AREAS WHERE THERE IS HIGH HEAT, SPARKS, OR FLAMES.
- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT BREATHE THE MIST.

(WARNING PRECEDES)

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIER'S MSDS FOR:

- MORE PRECAUTIONARY DATA
- APPROVED SAFETY EQUIPMENT
- EMERGENCY MEDICAL AID.

TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THIS HAZARDOUS AGENT.

(4) Apply light coating of petrolatum on new O-ring and install on engine duct.

(5) Position orifice between engine and engine duct and install engine duct.

(6) Install bolts attaching engine duct to engine and safety bolts with P05-288 0.020 inch lockwire.

(7) Place flat clamp on flexible duct; insert inlet duct into bellows approximately 1 to 2 inches and tighten clamp enough to retain bellows on duct.

(8) Place flat clamp on flexible duct; slide flexible duct over engine duct and tighten clamp enough to retain.

(9) Align inlet duct with cap and install clamp.

(10) Make certain inlet duct is positioned properly and tighten clamp to torque of 35 to 45 inch-pounds (4.0 to 5.0 N·m). Safety clamp with P05-289 0.032 inch lockwire.

(11) Adjust flexible duct if necessary, tighten clamps to torque specified on clamp, and safety with P05-288 0.020 inch lockwire.

(12) Remove tools, equipment, loose hardware, and debris from maintenance area.

(13) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(14) Remove safety pin from thrust reverser control valve. Stow safety pin.

C. Remove Generator Cooling Air Shroud and Air Exit Duct

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	41	B1-423	ENGINE START VALVE RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	42	B1-1	ENGINE IGNITION LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name

WJE ALL

K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Remove screws that attach air exit duct to shroud and remove air exit duct and gasket.

(4) Loosen and disconnect clamp T-bolts at bottom of shroud.

(5) Remove left shroud section.

(6) Lift right shroud section to clear generator mounting flange and move aft approximately 1 to 2 inches to clear angle locator.

(7) Rotate right shroud section 180 degrees counterclockwise on generator.

(8) Remove right shroud section.

D. Install Generator Cooling Air Shroud and Air Exit Duct

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and safety pin is installed.

(3) Position right shroud section at left side of generator and rotate shroud 180 degrees clockwise.

NOTE: Air exit opening should be positioned on horizontal centerline, right side of generator, at completion of rotation.

(4) Move right shroud section forward approximately 1 to 2 inches (25.4 to 50.8 mm), lift to engage generator mounting flange, and align with angle locator.

(5) Install left shroud section, making certain left and right shroud sections mate properly.

(6) Connect clamp T-bolts at bottom of shroud and tighten to torque of 25 to 30 inch-pounds (2.8 to 3.4 N·m). Safety clamps with P05-289 0.032 inch lockwire.

(7) Position air exit duct and gasket on shroud and install screws and washers.

(8) Remove tools, equipment, loose hardware, and debris from maintenance area.

(9) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(10) Remove safety pin from thrust reverser control valve. Stow safety pin.

COMPRESSOR CONTROL - DESCRIPTION AND OPERATION

1. General

A. The compressor control bleed air system aids in acceleration of the engine rotor during starting. This is accomplished by discharging 8th- and 13th-stage compressor air into the fan discharge duct. The major components consists of a pressure ratio bleed control and compressor bleed valves. The bleed air system also incorporates a bleed override control valve which opens the bleed valves during engine deceleration conditions.

2. Compressor Control

A. Description

(1) The pressure ratio bleed control (PRBC) senses low-pressure compressor inlet total pressure ($P_{t\ 2}$) and discharge pressure ($P_{s\ 3}$). The bleed control is located on the lower right side of the engine on the diffuser case.

NOTE: Dependent on engine configuration, the input signal to the pressure ratio bleed control may be either Ps3 (6th stage) or Ps3.2 (8th stage).

(2) The bleed override control valve is located on the lower right side of the engine just forward of the PRBC.

(3) The compressor bleed valves port 8th- and 13th-stage air into the fan discharge duct. The 8th-stage valves are located on the rear compressor case at the 2 and 6 o'clock positions. The 13th-stage valve is located on the engine diffuser case at the seven o'clock position. The valve consists of an internal valve which acts as a piston, and a valve seat.

B. Operation

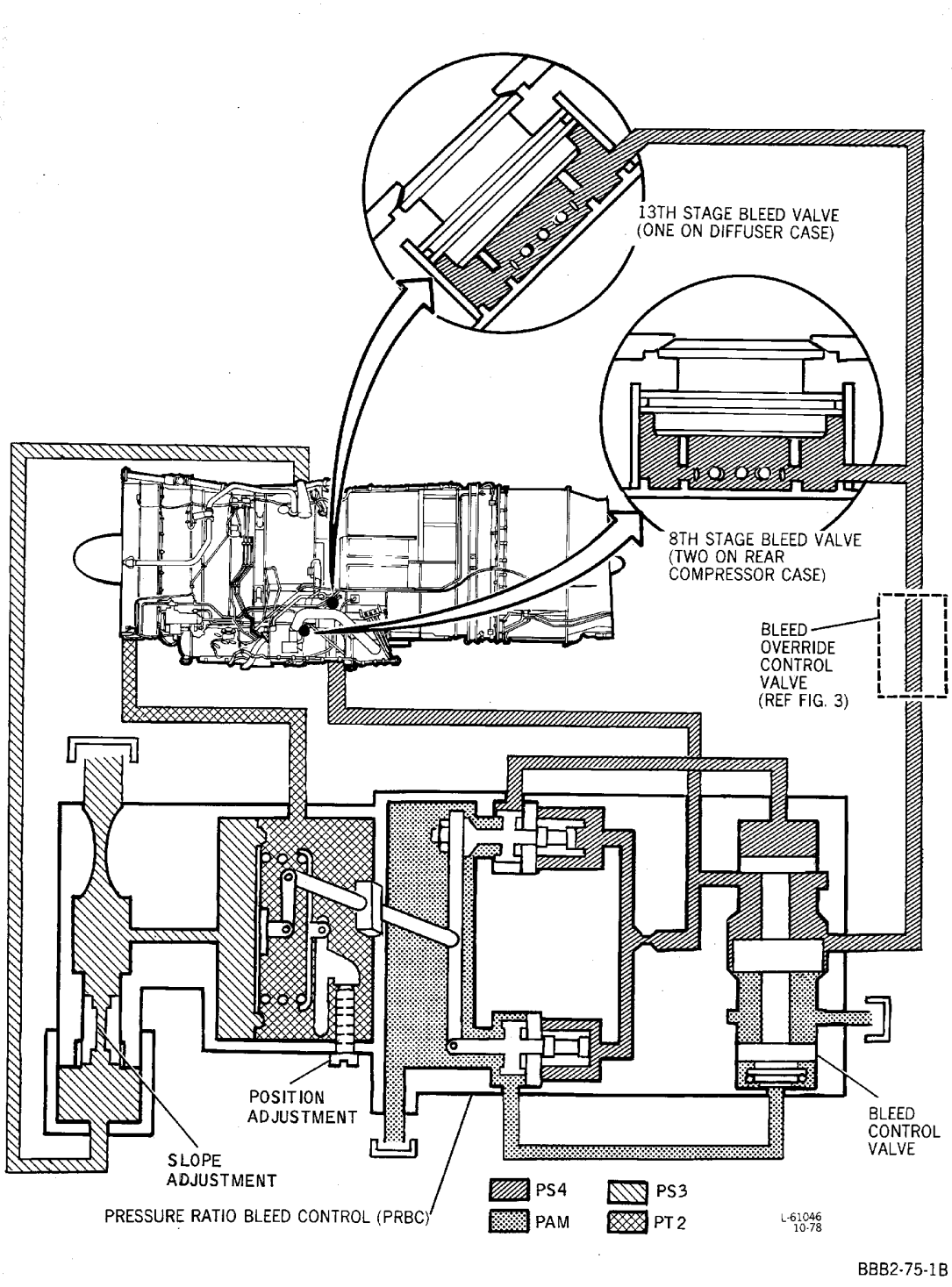
(1) When the engine is static, the bleed valves may be in any of the following positions: open, closed, or intermediate.

(2) When the engine is static, the bleed valves may be in any of the following positions: open, closed, or intermediate.

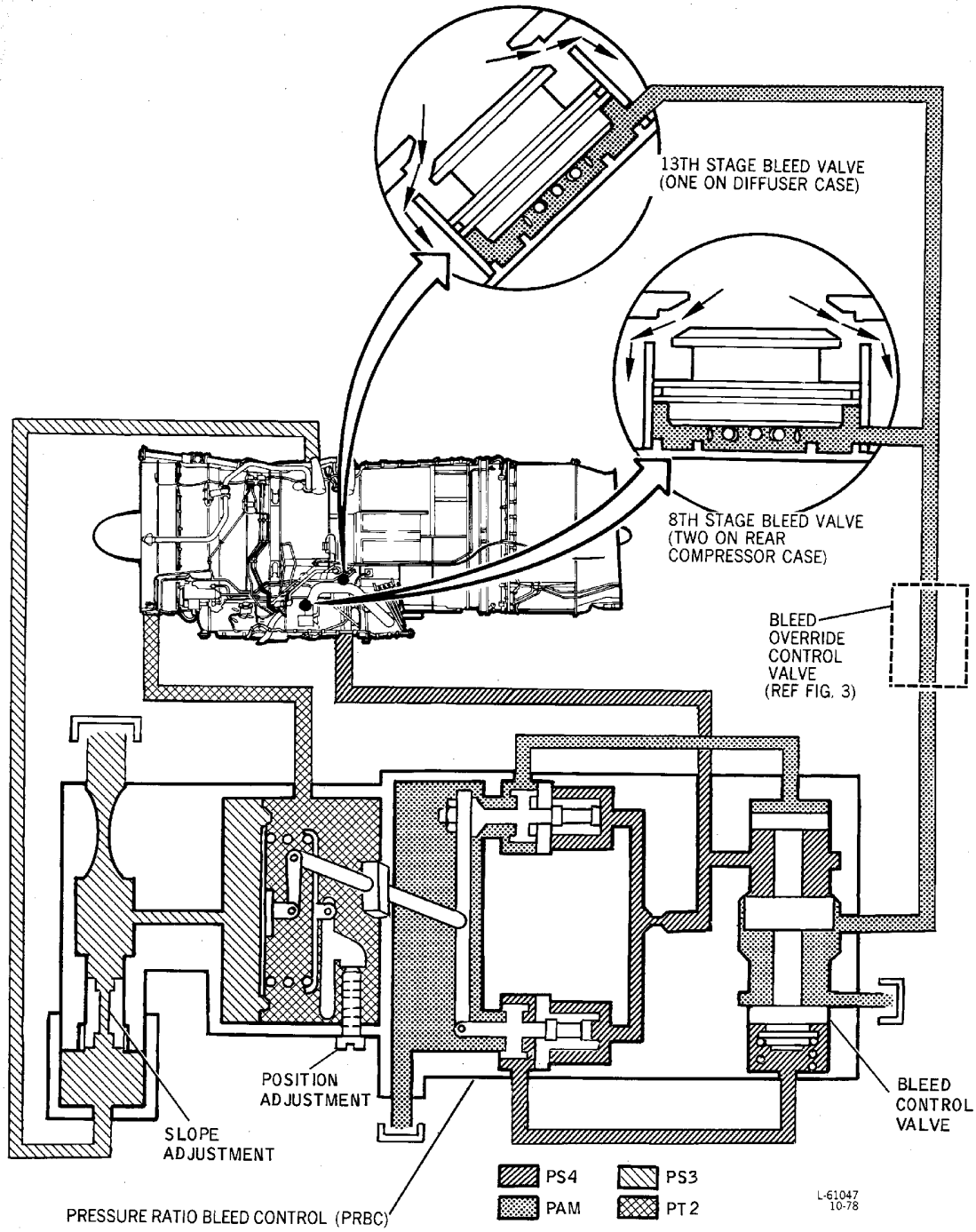
(3) During starting, as the engine accelerates, compressor discharge air pressure acts on the bleed valve faces to force the valves into the open position. This allows a portion of the 8th- and 13th-stage discharge air to flow into the fan discharge duct. As $P_{s\ 3}$ pressure increases it overcomes $P_{t\ 2}$ pressure plus spring pressure moving the diaphragm to reposition the poppet valves, which port $P_{s\ 4}$ air pressure to the back side of the bleed valves, closing the bleed valves.

(4) On engine shut-down, the $P_{t\ 2}/P_{s\ 3}$ ratio decreases and internal compressor discharge air pressure forces the bleed valves open. As engine rotor speed further decreases, compressor discharge air pressure becomes insufficient to hold the bleed valves open, and the valves move to an indeterminate static position.

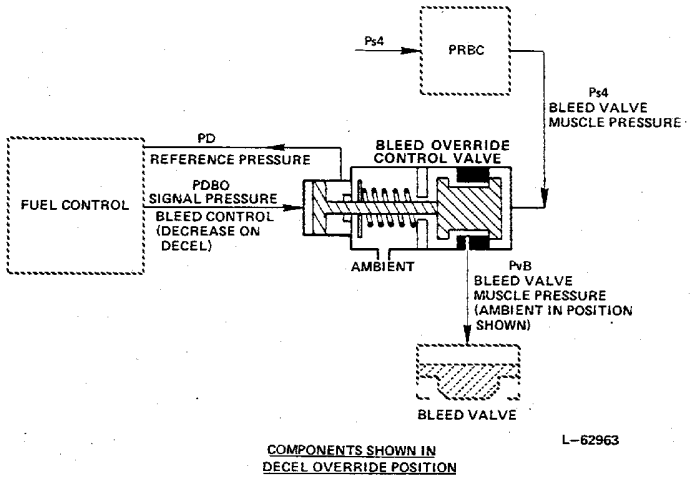
(5) During engine deceleration the bleed override control valve closes off $P_{s\ 4}$ air pressure to the bleed valves allowing them to open. The bleed override control valve is a combined hydraulic-pneumatic valve which is actuated by a fuel pressure signal from the fuel control. High fuel pressure causes the valve body on the pneumatic side to unseat and allows $P_{s\ 4}$ air from the pressure ratio bleed control to flow to the bleed valves and close them. This system is designed to increase operational flexibility by allowing a bleeds-open condition under engine deceleration conditions.



Compressor Control Schematic - Closed
Figure 1/75-30-00-990-807



Compressor Control Schematic - Open
Figure 2/75-30-00-990-808



BBB2-75-12

Bleed Override Control Valve - Schematic
Figure 3/75-30-00-990-809

COMPRESSOR CONTROL - DESCRIPTION AND OPERATION

1. General

A. The compressor control bleed air system aids in acceleration of the engine rotor during starting. This is accomplished by discharging 8th- and 13th-stage compressor air into the fan discharge duct. The major components consists of a pressure ratio bleed control and compressor bleed valves. The bleed air system also incorporates a bleed override control valve which opens the bleed valves during engine deceleration conditions and a start bleed control valve which controls the 13th-stage bleed valve.

B. On JT8D-217C, -219 series engines incorporating Pratt and Whitney Temporary Revision No. 75-1, dated Oct 10/89 (Ref. P&W SB 5871); the 6th stage bleed air system aids in reducing vibration induced stresses to the 7th stage compressor blades during idle operation and reduces blade sensitivity to foreign object damage. The system is comprised of three bleed valves and a separate Pressure Ratio Bleed Control Valve.

2. Compressor Control

A. Description

(1) The pressure ratio bleed control (PRBC) senses low-pressure compressor inlet total pressure ($P_{t\ 2}$) and discharge pressure ($P_{s\ 3}$). The PRBC is located on the lower right side of the engine on the diffuser case.

NOTE: Dependent on engine configuration, the input signal to the pressure ratio bleed control may be either $P_{s\ 3}$ (6th stage) or $P_{s\ 3.2}$ (8th stage).

(2) On JT8D-217C/219 engines incorporating Pratt and Whitney Temporary Revision No. 75-1, dated Oct 10/89 (Ref. P&W SB 5871); the 6th stage bleed pressure ratio bleed control (PRBC) also senses low-pressure compressor inlet total pressure ($P_{t\ 2}$) and discharge pressure ($P_{s\ 3}$). The PRBC is also located on engine lower right side on diffuser case.

NOTE: This 6th stage PRBC is not interchangeable with surge bleed PRBC due to differences in internal scheduling.

(3) The bleed override control valve is located on the lower right side of the engine just forward of the PRBC.

(4) The start bleed valve is located on the lower right side of the engine just above the PRBC.

(5) The compressor bleed valves port 8th- and 13th-stage air into the fan discharge duct. The three 8th-stage valves are located on the rear compressor case. The 13th-stage valve is located on the engine diffuser case at the seven o'clock position. The valve consists of an internal valve which acts as a piston, and a valve seat.

(6) On JT8D-217C/219 engines incorporating Pratt and Whitney Temporary Revision No. 75-1, dated Oct 10/89 (Ref. P&W SB 5871); the three 6th stage bleed valves port into the fan discharge duct. These valves are located on the intermediate case at 120 degree intervals. They are identical in design to the surge bleed valves.

B. Operation

(1) When the engine is static, the bleed valves may be in any of the following positions: open, closed, or intermediate.

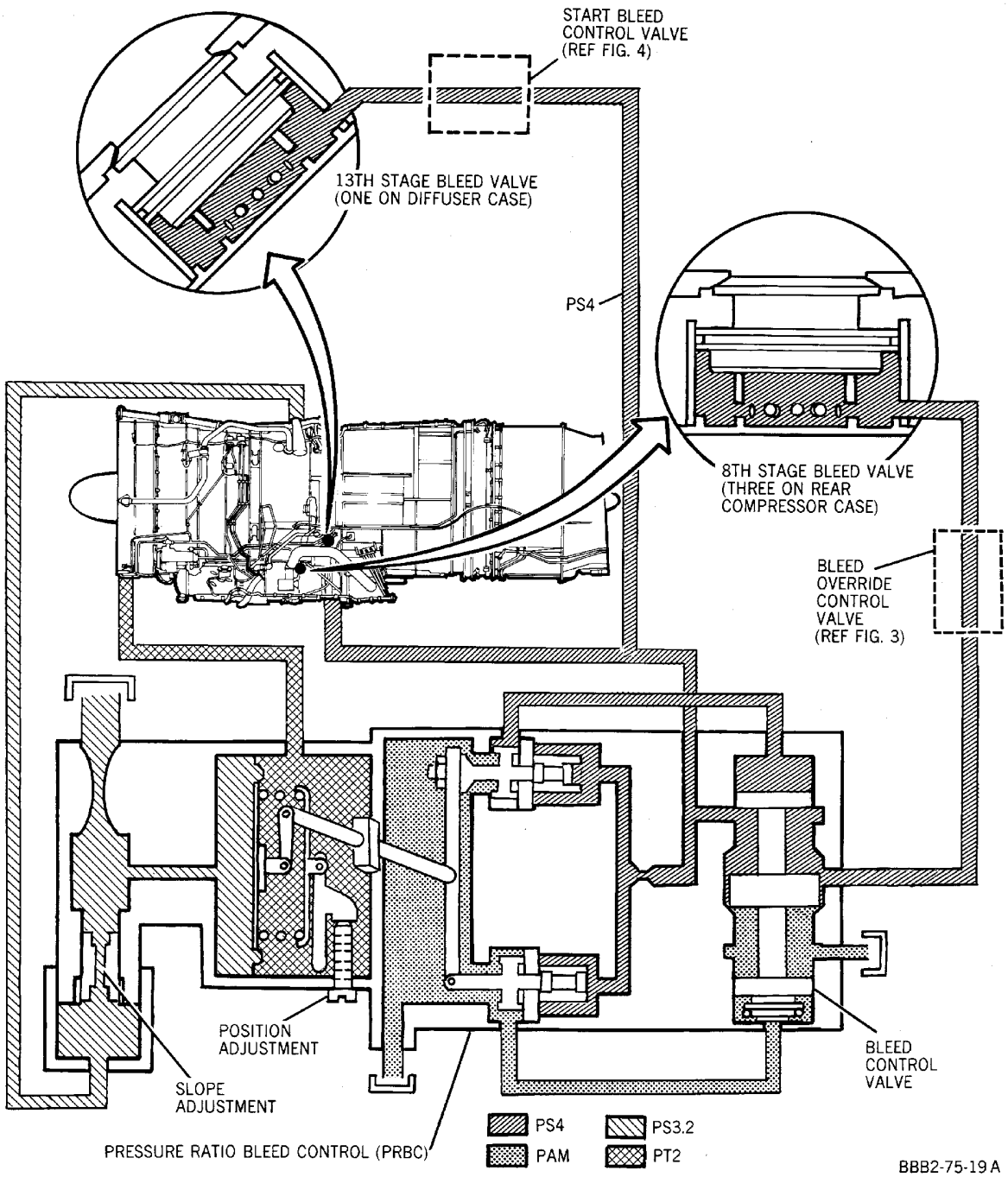
(2) During starting, as the engine accelerates, compressor discharge air pressure $P_{s\ 4}$ acts on the bleed valve faces to force the valves into the open position. This allows a portion of the 8th- and 13th-stage discharge air to flow into the fan discharge duct. The PRBC controls the 8th-stage bleed valves, as $P_{s\ 3\cdot 2}$ pressure increases it overcomes $P_{t\ 2}$ pressure plus spring pressure moving the diaphragm to reposition the poppet valves, which port $P_{s\ 4}$ air pressure to the back side of the 8th-stage bleed valves, closing the bleed valves. The start bleed control valve controls the 13th-stage bleed valve, as $P_{s\ 4}$ pressure increases during starting cycle, valve spring pressure is overcome and $P_{s\ 4}$ pressure closes the 13th-stage bleed valve.

(3) On JT8D-217C/219 engines incorporating Pratt and Whitney Temporary Revision No. 75-1, dated Oct 10/89 (Ref. P&W SB 5871); the 6th stage PRBC valve schedules the three valves to be open during the starting sequence, up to and including idle. The valves close at 68-72 percent N2 at sea level standard day conditions as the engine is accelerated from idle.

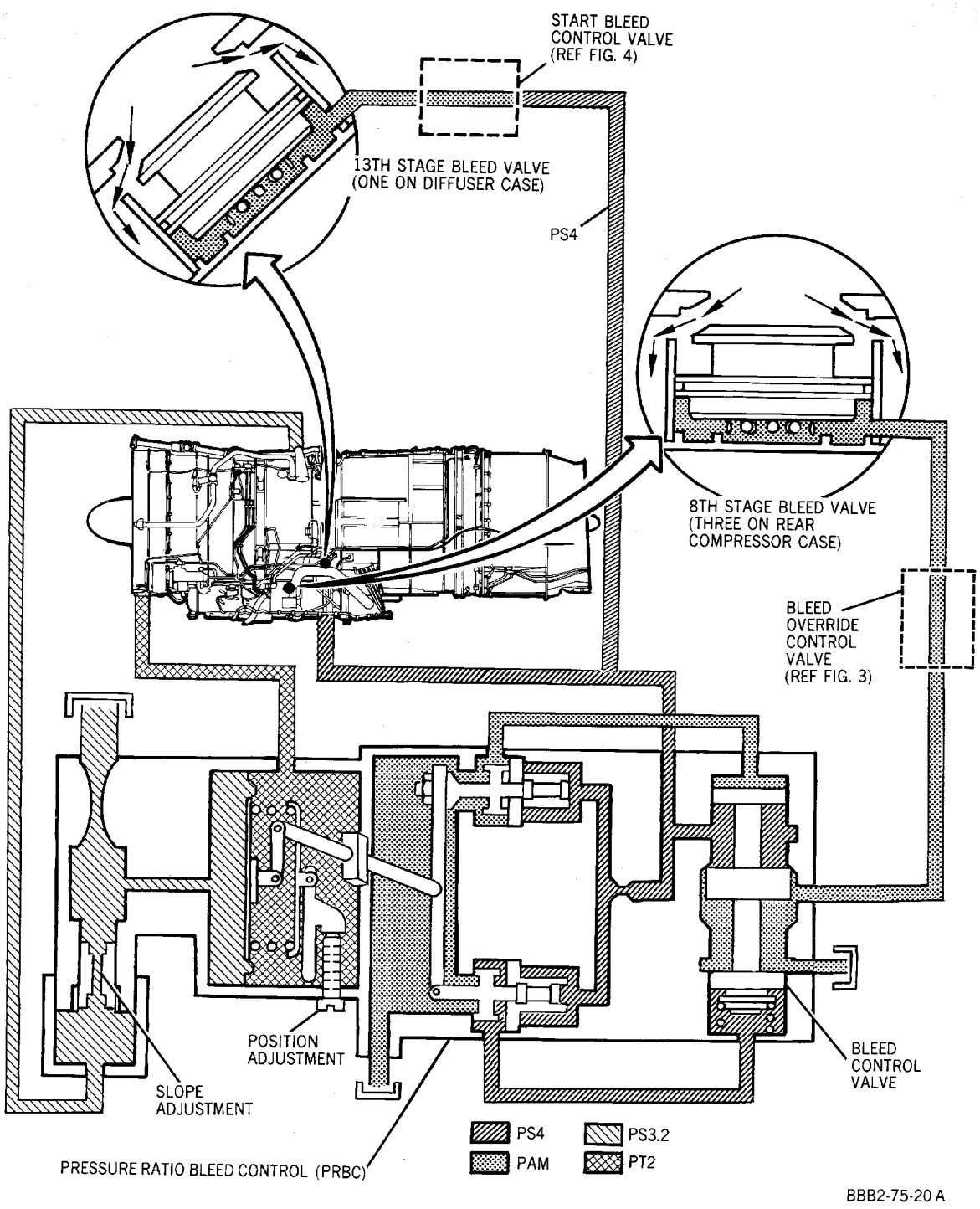
NOTE: Engines incorporating the 6th stage bleed system will be slightly slower in acceleration time than engines without this system. This only affects the initial portion of the acceleration process until the 6th stage bleed valves close just above idle speed.

(4) On engine shut-down, the $P_{t\ 2}/P_{s\ 3\cdot 2}$ ratio decreases and internal compressor discharge air pressure forces the 8th-stage bleed valves open. As engine rotor speed further decreases, compressor discharge air pressure becomes insufficient to hold the bleed valves open, and the valves move to an indeterminate static position.

(5) During engine deceleration the bleed override control valve closes off $P_{s\ 4}$ air pressure to the 8th-stage bleed valves allowing them to open. The bleed override control valve is a combined hydraulic-pneumatic valve which is actuated by a fuel pressure signal from the fuel control. High fuel pressure causes the valve body on the pneumatic side to unseat and allows $P_{s\ 4}$ air from the pressure ratio bleed control to flow to the 8th-stage bleed valves and close them. This system is designed to increase operational flexibility by allowing a bleeds-open condition under engine deceleration conditions.

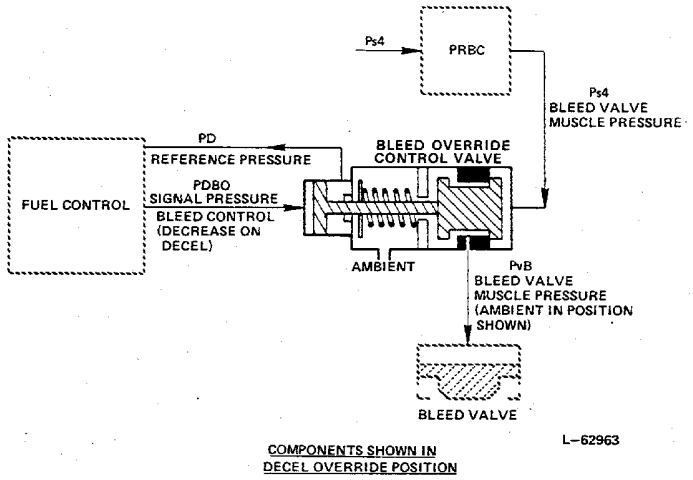


Compressor Control Schematic - Closed
Figure 1/75-30-00-990-801



Compressor Control Schematic - Open
Figure 2/75-30-00-990-802

WJE 401-412, 414-427, 429, 861-866, 868, 869, 871-874, 880, 881, 883, 884, 891-893

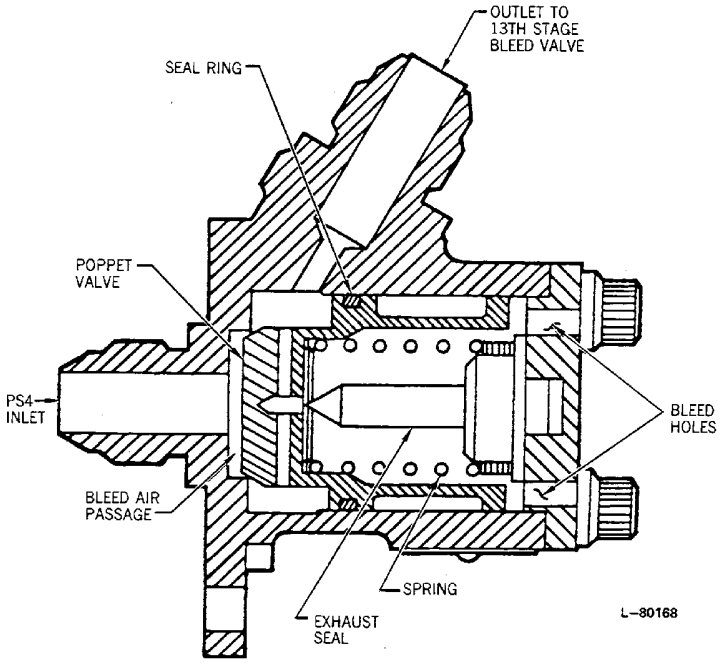


BBB2-75-12

Bleed Override Control Valve - Schematic
Figure 3/75-30-00-990-803

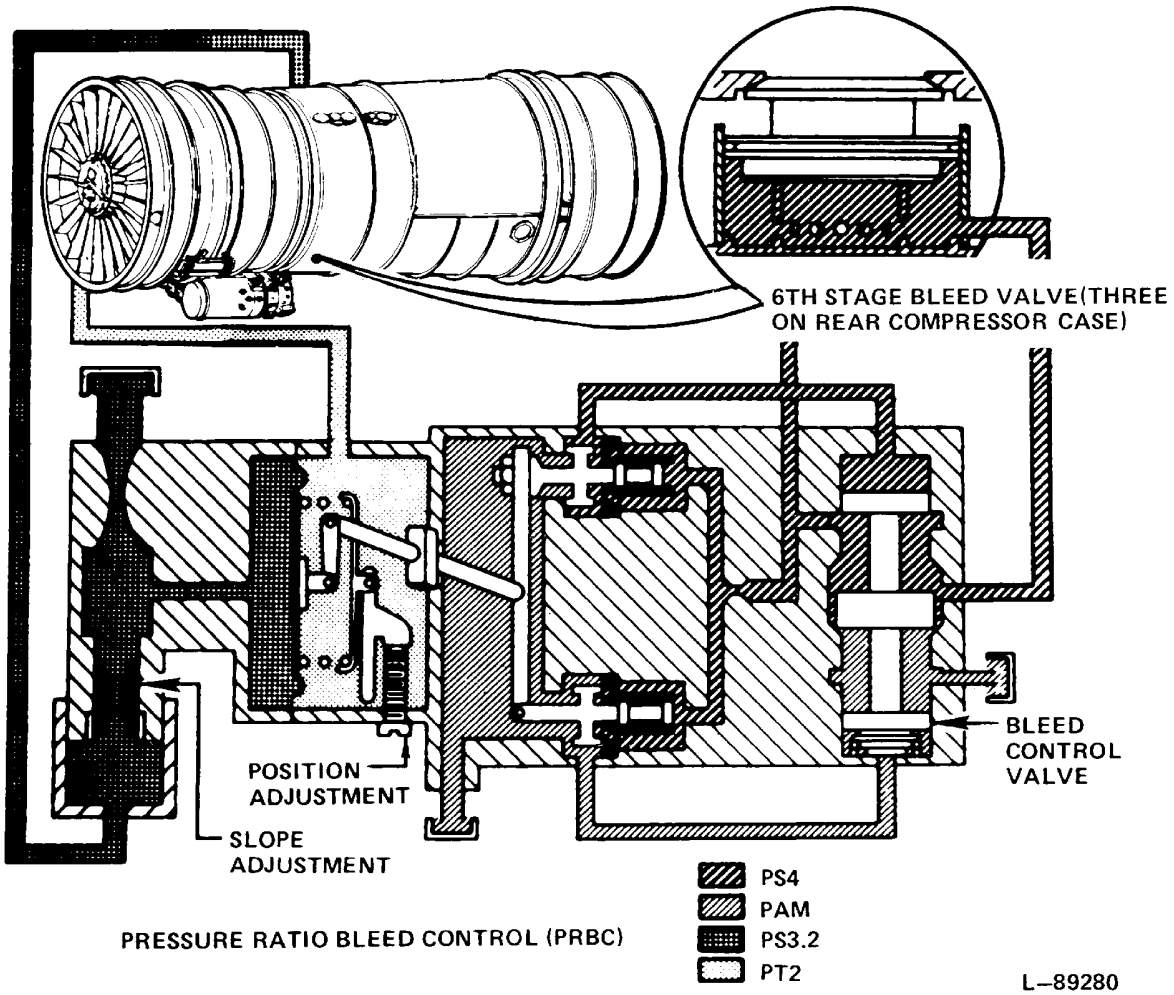
WJE 401-412, 414-427, 429, 861-866, 868, 869, 871-874, 880, 881, 883, 884, 891-893

WJE 401-412, 414-427, 429, 861-866, 868, 869, 871-874, 880, 881, 883, 884, 891-893

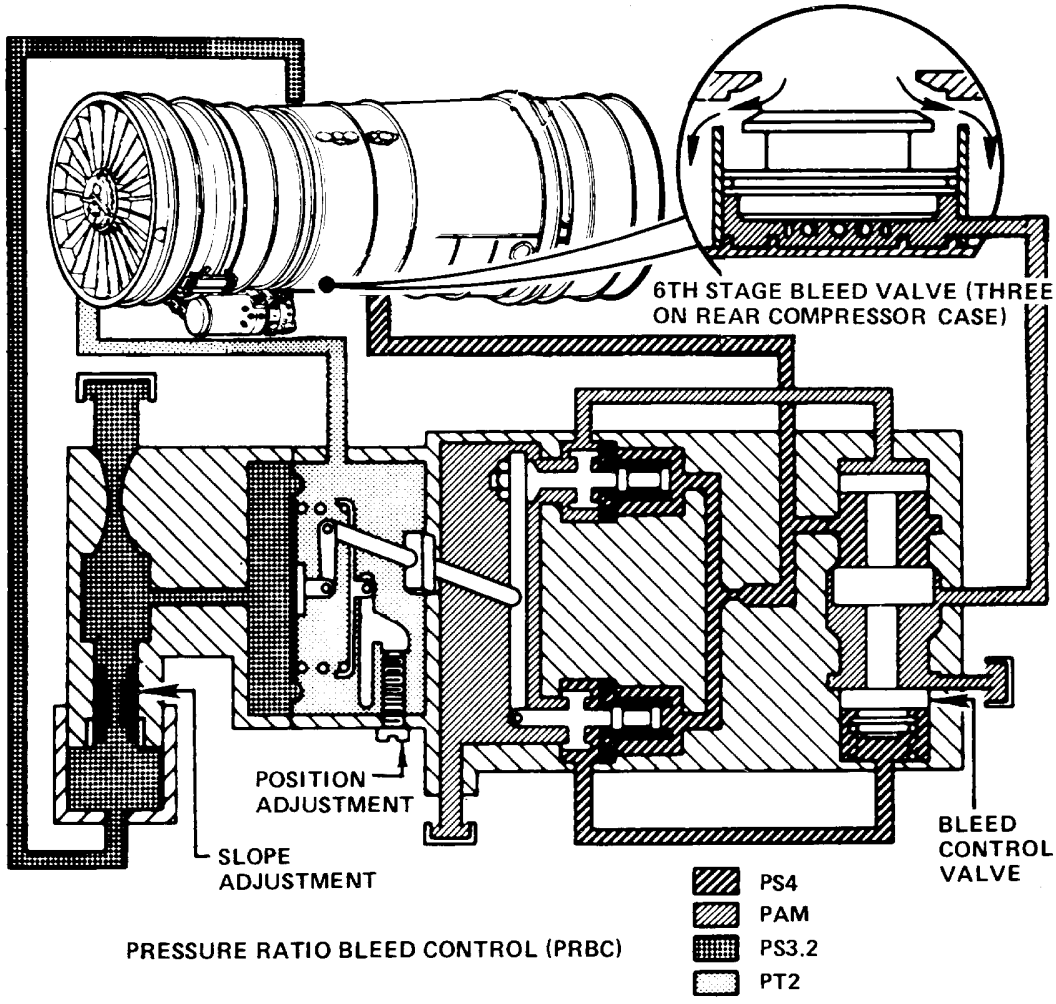


Start Bleed control Valve
Figure 4/75-30-00-990-804

WJE 401-412, 414-427, 429, 861-866, 868, 869, 871-874, 880, 881, 883, 884, 891-893



Engine 6th Stage Bleed System Schematic - Closed
Figure 5/75-30-00-990-805



Engine 6th Stage Bleed System Schematic - Open
Figure 6/75-30-00-990-806

PRESSURE RATIO BLEED CONTROL - MAINTENANCE PRACTICES

1. General

A. This maintenance practice provides removal/installation instructions for the pressure ratio bleed controls.

WARNING: EXERCISE CARE TO AVOID STRAKES WHEN WORKING IN ENGINE AREA WITH COWL DOORS OPEN, OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: TO PREVENT STRUCTURAL DAMAGE, USE BOTH HOLD OPEN RODS ON EACH COWL DOOR.

B. The engine bleed pressure ratio bleed control is located on the lower right side of the engine. Removal and installation procedures for all engine pressure ratio bleed controls are identical. Access is through forward lower cowl doors.

CAUTION: REPLACEMENT PRBC MUST BE THE SAME AS ORIGINAL PART.

C. Before installation of control, check all openings to make certain no foreign objects are present.

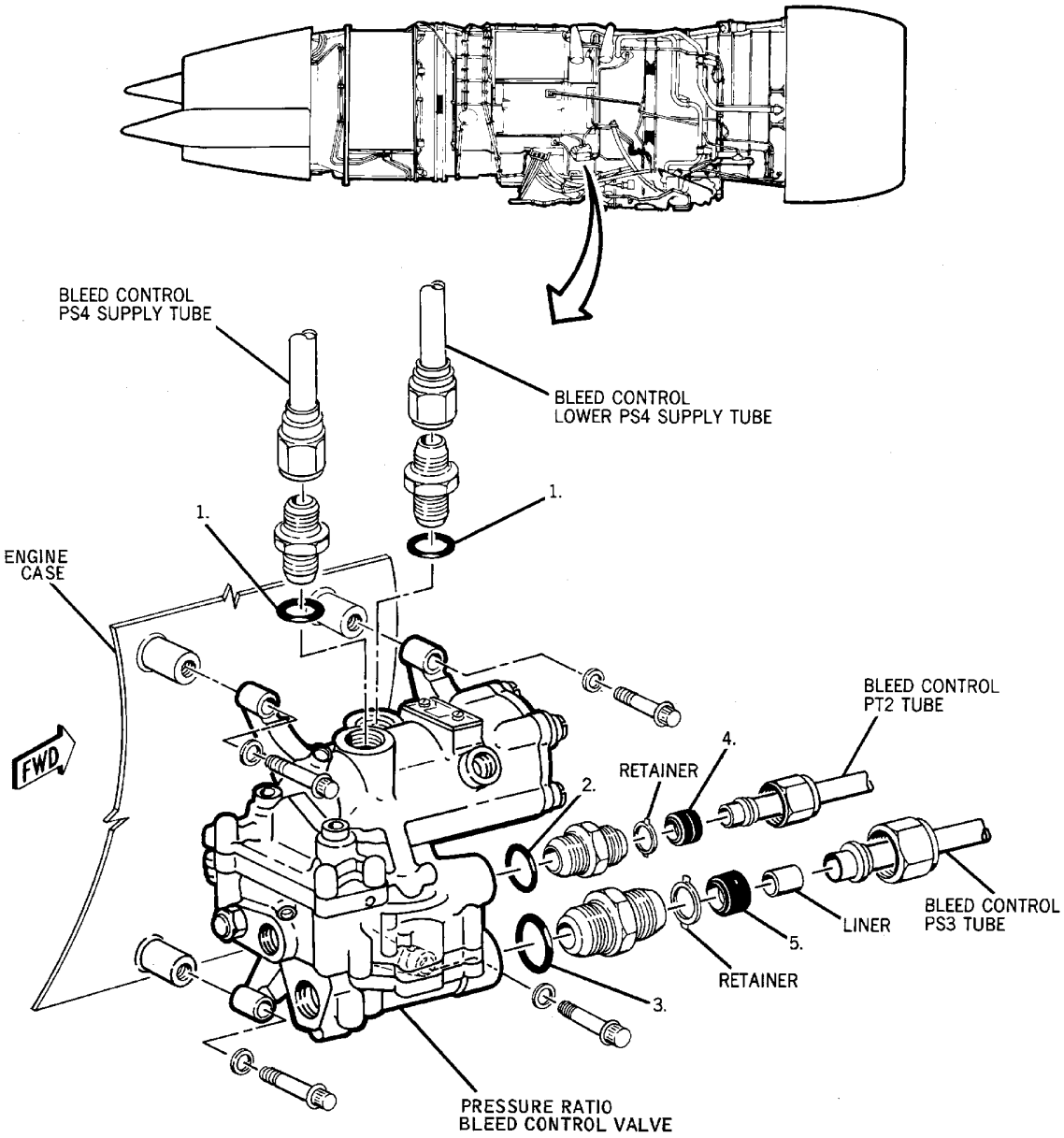
2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items:

NOTE: It is possible that some materials in the Equipment and Materials List cannot be used for some or all of their necessary applications. Before you use the materials, make sure the types, quantities, and applications of the materials necessary are legally permitted in your location. All persons must obey all applicable federal, state, local, and provincial laws and regulations when it is necessary to work with these materials.

Table 201

Name and Number	Manufacturer
Petrolatum, lubricant VV-P-236 DPM 675	Commercially available
Assembly Fluid PWA 36500	Ultrachem Inc. Wilmington, DE 19899 (Ultrachem Assembly Fluid #1)
Lockwire, .032 corrosion resistant steel, P05-289	
Torque wrench (0 to 200 inch- pounds range)	



CODE:

1. 394625 (PRATT & WHITNEY)
2. 328403 (PRATT & WHITNEY)
3. 405177 (PRATT & WHITNEY)
4. 451083 (PRATT & WHITNEY)
5. 391009 (PRATT & WHITNEY)

BBB2-75-16

Pressure Ratio Bleed Control - Removal/Installation
Figure 201/75-31-01-990-803

EFFECTIVITY
WJE 401-403, 405, 406, 409, 410, 412, 414-416, 418, 420-427, 429, 861-866, 868, 869, 871-879, 881, 883, 884, 891, 892

3. **Removal/Installation Pressure Ratio Bleed Control**

A. Remove Bleed Control

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415, 416, 418, 420-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 405, 406, 410, 877, 884, 892

U	41	B1-423	ENGINE START VALVE RIGHT

WJE 415, 416, 418, 420-427, 429, 861-866, 868, 869, 871-874, 891

U	42	B1-1	ENGINE IGNITION LEFT

WJE 405, 406, 410, 877, 884, 892

U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name

WJE 401-403, 405, 406, 409, 410, 412, 414-416, 418, 420-427, 429, 861-866, 868, 869, 871-879, 881, 883, 884, 891, 892

K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Disconnect bleed control Ps4 lower supply tube.

(4) Disconnect bleed control Ps4 supply tube.

(5) Disconnect bleed control Ps3 tube and discard packing.

NOTE: Dependent on engine configuration, the input signal to the pressure ratio bleed control may be either Ps3 (6th stage) or Ps3.2 (8th stage).

(6) Disconnect bleed control Pt2 tube and discard packing.

(7) Remove bolts attaching bleed control to engine.

B. Install Bleed Control

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415, 416, 418, 420-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 405, 406, 410, 877, 884, 892

U	41	B1-423	ENGINE START VALVE RIGHT

WJE 415, 416, 418, 420-427, 429, 861-866, 868, 869, 871-874, 891

U	42	B1-1	ENGINE IGNITION LEFT

WJE 405, 406, 410, 877, 884, 892

U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name

WJE 401-403, 405, 406, 409, 410, 412, 414-416, 418, 420-427, 429, 861-866, 868, 869, 871-879, 881, 883, 884, 891, 892

K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and safety pin is installed.

WARNING: WHITE PETROLATUM IS AN AGENT THAT IS AN IRRITANT. MAKE SURE ALL PERSONS OBEY ALL OF THE PRECAUTIONS WHEN WHITE PETROLATUM IS USED.

- DO NOT USE IN AREAS WHERE THERE IS HIGH HEAT, SPARKS, OR FLAMES.
- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT BREATHE THE MIST.

(WARNING PRECEDES)

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIER'S MSDS FOR:

- MORE PRECAUTIONARY DATA
- APPROVED SAFETY EQUIPMENT
- EMERGENCY MEDICAL AID.

TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THIS HAZARDOUS AGENT.

CAUTION: DO NOT APPLY EXCESSIVE AMOUNT OF PWA 36500 ASSEMBLY FLUID TO AIR TUBE PACKING. PWA 36500 ASSEMBLY FLUID CARRIED INTO COMPONENTS BY HEATED AIR CAN CAUSE MALFUNCTION.

(3) Lightly lubricate new packing with petrolatum, VV-P-236, or Pratt & Whitney Assembly Fluid (PWA 36500) and install on tubes.

(4) Position bleed control on engine and install mounting bolts.

(5) Connect bleed control Pt2 tube.

(6) Connect bleed control Ps3 tube. Tighten tube nut to torque of 110 to 120 inch-pounds (12.4 to 13.6 N·m).

NOTE: Dependent on engine configuration, the input signal to the pressure ratio bleed control may be either Ps3 (6th stage) or Ps3.2 (8th stage).

(7) Connect bleed control Ps4 supply tube.

(8) Connect bleed control Ps4 lower supply tube.

NOTE: Minimum clearance between tubes or tubes and structure should be 0.125 (3.175 mm.) unless otherwise specified.

(9) Safety tube nuts with P05-289 lockwire.

(10) Remove tools, equipment, loose hardware, and debris from maintenance area.

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

(11) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415, 416, 418, 420-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405, 406, 410, 877, 884, 892			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415, 416, 418, 420-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405, 406, 410, 877, 884, 892			
U	42	B1-422	ENGINE START VALVE LEFT

WJE 405, 406, 410, 877, 884, 892 (Continued)

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE 401-403, 405, 406, 409, 410, 412, 414-416, 418, 420-427, 429, 861-866, 868, 869, 871-879, 881, 883, 884, 891, 892			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(12) Remove safety pin from thrust reverser control valve. Stow safety pin.

PRESSURE RATIO BLEED CONTROL - MAINTENANCE PRACTICES

1. General

A. This maintenance practice provides removal/installation instructions for the pressure ratio bleed controls.

WARNING: EXERCISE CARE TO AVOID STRAKES WHEN WORKING IN ENGINE AREA WITH COWL DOORS OPEN OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: TO PREVENT STRUCTURAL DAMAGE, USE HOLD OPEN RODS ON EACH COWL DOOR.

B. The engine compressor surge bleed pressure ratio bleed control is located on the lower right side of the engine. Removal and installation procedures for all engine pressure ratio bleed controls are identical. Access is through forward lower cowl doors.

C. On JT8D-217C/219 engines incorporating Pratt and Whitney Temporary Revision No. 75-1, dated Oct 10/89 (Ref. P&W SB 5871); the 6th stage bleed pressure ratio bleed control (PRBC) is located on lower right side on combustion chamber and turbine fan duct at approximately 5 o'clock position.

CAUTION: REPLACEMENT PRESSURE RATIO BLEED CONTROL (PRBC) MUST BE THE SAME AS ORIGINAL PART.

CAUTION: THE PRESSURE RATIO BLEED CONTROL ON THE COMBUSTION CHAMBER AND TURBINE FAN DUCT (WITH SB 5871) CONTROLS THE 6TH STAGE COMPRESSOR BLEED SYSTEM. THIS CONTROL IS NOT INTERCHANGEABLE WITH THE CONTROL ON THE DIFFUSER OUTER FAN DUCT (WHICH CONTROLS THE 8TH/13TH STAGE COMPRESSOR BLEED SYSTEM). BE SURE THAT THE CONTROL IS THE CORRECT PART NUMBER.

D. Before installation of either control, check all openings to make certain no foreign objects are present.

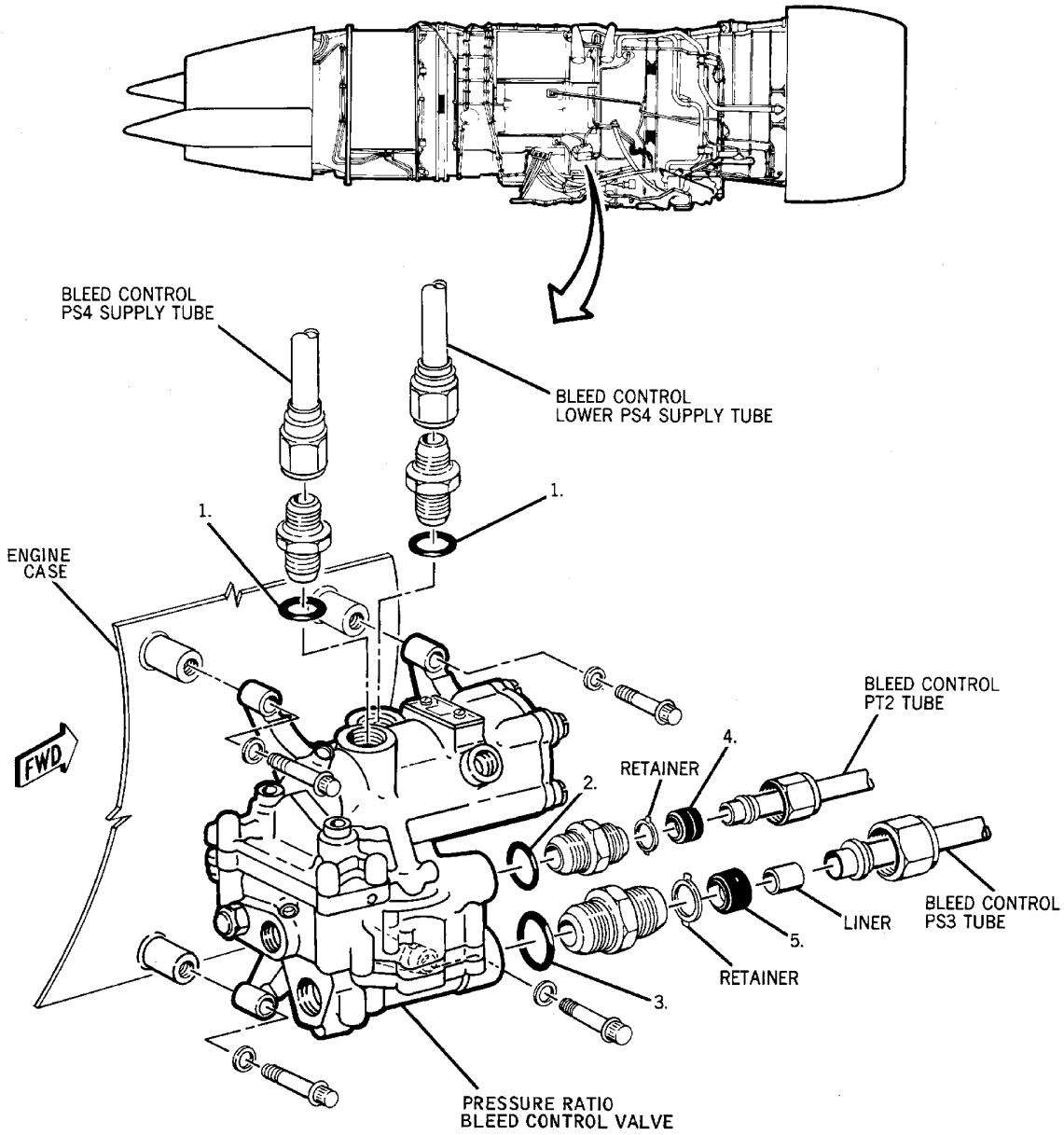
2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items:

NOTE: It is possible that some materials in the Equipment and Materials List cannot be used for some or all of their necessary applications. Before you use the materials, make sure the types, quantities, and applications of the materials necessary are legally permitted in your location. All persons must obey all applicable federal, state, local, and provincial laws and regulations when it is necessary to work with these materials.

Table 201

Name and Number	Manufacturer
Petrolatum, lubricant, VV-P-236 DPM 675	Commercially available
Assembly Fluid PWA 36500	Ultrachem Inc. Wilmington, DE 19899 (Ultrachem Assembly Fluid #1)
Lockwire, .032 corrosion resistant steel, P05-289	
Torque wrench 0 in-lb (0 N·m) to 200 in-lb (23 N·m)	



CODE:

1. 394625 (PRATT & WHITNEY)
2. 328403 (PRATT & WHITNEY)
3. 405177 (PRATT & WHITNEY)
4. 451083 (PRATT & WHITNEY)
5. 391009 (PRATT & WHITNEY)

BBB2-75-16

Pressure Ratio Bleed Control - Removal/Installation
Figure 201/75-31-01-990-801

3. Removal/Installation Surge Bleed and 6th Stage (with SB 5871) Pressure Ratio Bleed Controls

NOTE: This procedure, except where noted in Paragraph 3.A.(6) is applicable to engines without and with Pratt and Whitney SB 5871 (surge bleed control, only) engines with SB 5871 (surge bleed and 6th stage bleed - have two separate controls and they are not interchangeable).

A. Remove Bleed Control

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR REVERSER OPERATION COULD RESULT IN DEATH OR SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
U	41	B1-423	ENGINE START VALVE RIGHT
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Disconnect bleed control Ps4 lower supply tube.

(4) Disconnect bleed control Ps4 supply tube.

(5) Disconnect surge bleed control Ps3 tube and discard packing.

(6) With P&W SB 5871, disconnect 6th stage bleed control Ps3.2 tube and discard packing.

NOTE: Dependent on engine configuration, the input signal to the pressure ratio bleed control may be either Ps3 (6th stage) or Ps3.2 (8th stage).

(7) Disconnect bleed control Pt2 tube and discard packing.

(8) Remove bolts attaching bleed control to engine.

B. Install Surge Bleed Control

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR REVERSER OPERATION COULD RESULT IN DEATH OR SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
U	41	B1-423	ENGINE START VALVE RIGHT
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and safety pin is installed.

WARNING: WHITE PETROLATUM IS AN AGENT THAT IS AN IRRITANT. MAKE SURE ALL PERSONS OBEY ALL OF THE PRECAUTIONS WHEN WHITE PETROLATUM IS USED.

- DO NOT USE IN AREAS WHERE THERE IS HIGH HEAT, SPARKS, OR FLAMES.
- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT BREATHE THE MIST.

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIERS MSDS FOR:

- MORE PRECAUTIONARY DATA.
- APPROVED SAFETY EQUIPMENT.
- EMERGENCY MEDICAL AID.
- TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THIS HAZARDOUS AGENT.

(WARNING PRECEDES)

CAUTION: DO NOT APPLY EXCESSIVE AMOUNT OF PWA 36500 ASSEMBLY FLUID TO AIR TUBE PACKING. PWA 36500 ASSEMBLY FLUID CARRIED INTO COMPONENTS BY HEATED AIR CAN CAUSE MALFUNCTION.

(3) Lightly lubricate new packing with petrolatum, VV-P-236; or Pratt & Whitney Assembly Fluid (PWA 36500) and install on tubes.

(4) Position bleed control on engine and install mounting bolts.

(5) Connect bleed control Pt2 tube.

(6) Connect bleed control Ps3 tube. Tighten tube nut to torque of110 in-lb (12.4 N·m) to 120 in-lb (13.6 N·m).

NOTE: Dependent on engine configuration, the input signal to the pressure ratio bleed control may be either Ps3 (6th stage) or Ps3.2 (8th stage).

(7) Connect bleed control Ps4 supply tube.

(8) Connect bleed control Ps4 lower supply tube.

NOTE: Minimum clearance between tubes or tubes and structure should be 0.125 in. (3.175 mm) unless otherwise specified.

(9) Safety tube nuts with P05-289 lockwire.

(10) Remove tools, equipment, loose hardware, and debris from maintenance area.

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR REVERSER OPERATION COULD RESULT IN DEATH OR SERIOUS INJURY TO PERSONNEL.

(11) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
U	41	B1-423	ENGINE START VALVE RIGHT
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(12) Remove safety pin from thrust reverser control valve. Stow safety pin.

C. Install 6th Stage Bleed Control

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR REVERSER OPERATION COULD RESULT IN DEATH OR SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
U	41	B1-423	ENGINE START VALVE RIGHT
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and safety pin is installed.

WARNING: WHITE PETROLATUM IS AN AGENT THAT IS AN IRRITANT. MAKE SURE ALL PERSONS OBEY ALL OF THE PRECAUTIONS WHEN WHITE PETROLATUM IS USED.

- DO NOT USE IN AREAS WHERE THERE IS HIGH HEAT, SPARKS, OR FLAMES.
- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT BREATHE THE MIST.

(WARNING PRECEDES)

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIERS MSDS FOR:

- MORE PRECAUTIONARY DATA.
- APPROVED SAFETY EQUIPMENT.
- EMERGENCY MEDICAL AID.
- TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THIS HAZARDOUS AGENT.

CAUTION: DO NOT APPLY EXCESSIVE AMOUNT OF PWA 36500 ASSEMBLY FLUID TO AIR TUBE PACKING. PWA 36500 ASSEMBLY FLUID CARRIED INTO COMPONENTS BY HEATED AIR CAN CAUSE MALFUNCTION.

(3) Lightly lubricate new packing with petrolatum, VV-P-236; or Pratt & Whitney Assembly Fluid (PWA 36500) and install on tubes.

CAUTION: THE PRESSURE RATIO BLEED CONTROL ON THE COMBUSTION CHAMBER AND TURBINE FAN DUCT (WITH SB 5871) CONTROLS THE 6TH STAGE COMPRESSOR BLEED SYSTEM. THIS CONTROL IS NOT INTERCHANGEABLE WITH THE CONTROL ON THE DIFFUSER OUTER FAN DUCT (WHICH CONTROLS THE 8TH/13TH STAGE COMPRESSOR BLEED SYSTEM). BE SURE THAT THE CONTROL IS THE CORRECT PART NUMBER.

(4) Position bleed control on engine bracket on combustion chamber and turbine fan duct and install mounting bolts. (Figure 202)

(5) Connect bleed control Pt2 tube.

(6) Connect bleed control Ps3.2 tube. Tighten tube nut to torque of 110 in-lb (12.4 N·m) to 120 in-lb (13.6 N·m).

(7) Connect bleed control Ps4 supply tube.

(8) Connect bleed control Ps4 lower supply tube.

NOTE: Minimum clearance between tubes or tubes and structure should be 0.125 in. (3.175 mm) unless otherwise specified.

(9) Safety tube nuts with .032 inconel lockwire, G60170.

(10) Remove tools, equipment, loose hardware, and debris from maintenance area.

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR REVERSER OPERATION COULD RESULT IN DEATH OR SERIOUS INJURY TO PERSONNEL.

(11) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
U	41	B1-423	ENGINE START VALVE RIGHT
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(12) Remove safety pin from thrust reverser control valve. Stow safety pin.

D. 6th Stage Pressure Ratio Bleed Control Tube - Removal/Installation (With SB 5871)

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR REVERSER OPERATION COULD RESULT IN DEATH OR SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
U	41	B1-423	ENGINE START VALVE RIGHT
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and safety pin is installed.

WARNING: WHITE PETROLATUM IS AN AGENT THAT IS AN IRRITANT. MAKE SURE ALL PERSONS OBEY ALL OF THE PRECAUTIONS WHEN WHITE PETROLATUM IS USED.

- DO NOT USE IN AREAS WHERE THERE IS HIGH HEAT, SPARKS, OR FLAMES.
- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT BREATHE THE MIST.

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIERS MSDS FOR:

- MORE PRECAUTIONARY DATA.
- APPROVED SAFETY EQUIPMENT.
- EMERGENCY MEDICAL AID.
- TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THIS HAZARDOUS AGENT.

CAUTION: DO NOT APPLY EXCESSIVE AMOUNT OF PWA 36500 ASSEMBLY FLUID TO AIR TUBE PACKING. PWA 36500 ASSEMBLY FLUID CARRIED INTO COMPONENTS BY HEATED AIR CAN CAUSE MALFUNCTION.

(3) Lightly lubricate new packing with petrolatum, VV-P-236; or Pratt & Whitney Assembly Fluid (PWA 36500) and install on tubes.

(4) Remove pressure ratio bleed control tubes. (Figure 202).

(a) Disconnect bleed valve control supply tube at pressure ratio bleed control and at upper boss on diffuser outer fan duct. Remove tube.

(b) Disconnect the bleed control Ps4 supply tube at the pressure ratio bleed control and at the bleed control Ps4 manifold. Remove tube.

(c) Disconnect the bleed control Ps3.2 supply tube at the pressure ratio bleed control and at the bleed control Ps3 manifold. Remove tube.

(d) Disconnect the bleed control Pt2 supply tube at the pressure ratio bleed control and at the bleed control Pt2 manifold. Remove tube.

(5) Install pressure ratio bleed control tubes. (Figure 202)

(a) Connect the bleed control Ps3.2 supply tube at the pressure ratio bleed control and at the bleed control Ps3 manifold.

(b) Connect the bleed control Pt2 supply tube at the pressure ratio bleed control and at the bleed control Pt2 manifold.

(c) Connect the bleed control Ps4 supply tube at the pressure ratio bleed control and at the bleed control Ps4 manifold.

(d) Connect the bleed valve control supply tube at the pressure ratio bleed control and at the upper boss on the diffuser outer fan duct.

NOTE: Minimum clearance between tubes or tubes and structure should be 0.125 in. (3.175 mm) unless otherwise specified.

(6) Safety tube nuts with P05-289 lockwire.

(7) Remove tools, equipment, loose hardware, and debris from maintenance area.

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR REVERSER OPERATION COULD RESULT IN DEATH OR SERIOUS INJURY TO PERSONNEL.

(8) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
U	41	B1-423	ENGINE START VALVE RIGHT
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

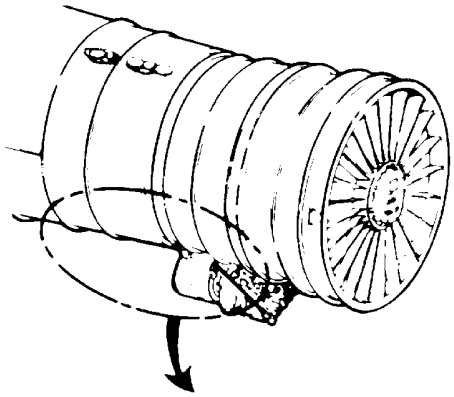
Row	Col	Number	Name
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

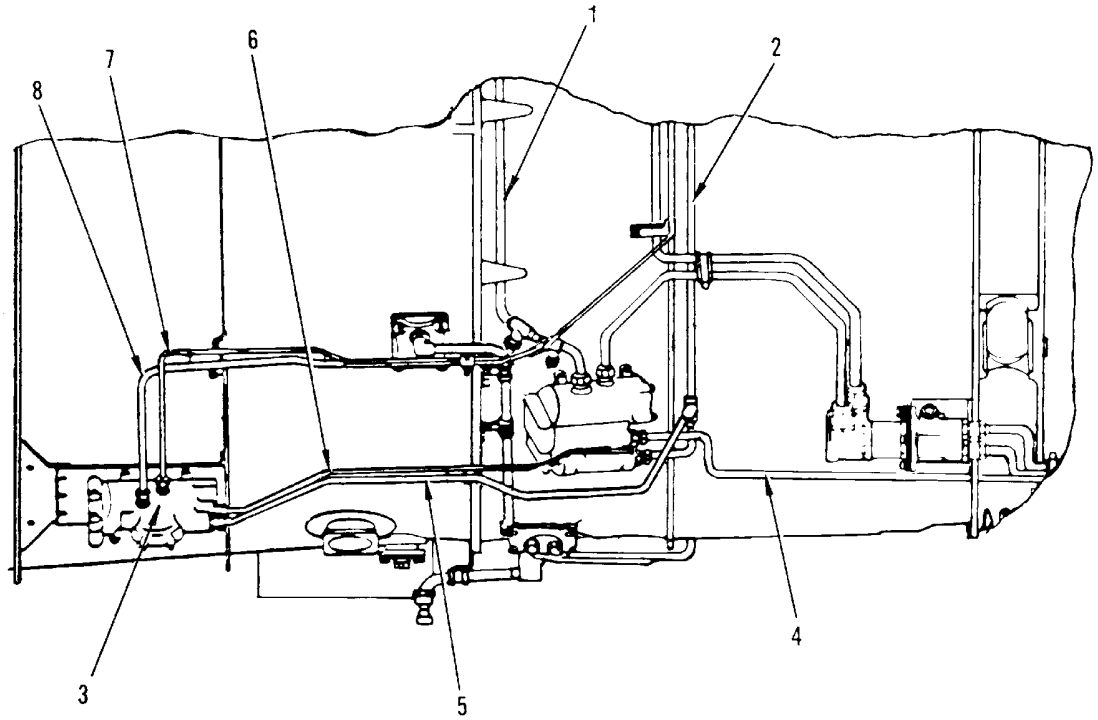
WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(9) Remove safety pin from thrust reverser control valve. Stow safety pin.



1. Bleed Control PS4 Manifold
2. Bleed Control PS3 Manifold
3. Pressure Ratio Bleed Control
4. Bleed Control PT2 Manifold
5. Bleed Control PS3.2 Supply Tube
6. Bleed Control PT2 Supply Tube
7. Bleed Valve Control Supply Tube
8. Bleed Control PS4 Supply Tube

Key To Figure 202



BBB2-75-30 A

6th Stage Pressure Ratio Bleed Control - Removal/Installation
Figure 202/75-31-01-990-802

BLEED OVERRIDE CONTROL VALVE - MAINTENANCE PRACTICES

1. General

A. Bleed override control valves are interchangeable.

WARNING: EXERCISE CARE TO AVOID STRAKES WHEN WORKING IN ENGINE AREA WITH COWL DOORS OPEN, OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: TO PREVENT STRUCTURAL DAMAGE, USE BOTH HOLD OPEN RODS ON EACH COWL DOOR.

B. The bleed override control valve is located on the lower right side of the engine. Removal and installation procedures for all engine bleed override control valves are identical. Access is through forward lower cowl doors.

C. Before installation of valves, check all openings to make certain no foreign objects are present.

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items:

NOTE: It is possible that some materials in the Equipment and Materials List cannot be used for some or all of their necessary applications. Before you use the materials, make sure the types, quantities, and applications of the materials necessary are legally permitted in your location. All persons must obey all applicable federal, state, local, and provincial laws and regulations when it is necessary to work with these materials.

Table 201

Name and Number	Manufacturer
Petrolatum, lubricant VV-P-236 DPM 675	Commercially available
Assembly Fluid PWA 36500	Ultrachem Inc. Wilmington, DE 19899 (Ultrachem Assembly Fluid #1)
Lockwire, .032 corrosion resistant steel, P05-289	

3. Removal/Installation Bleed Override Control Valve

A. Remove Control Valve

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891 (Continued)

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Disconnect control valve lower Ps4 tube.

(4) Disconnect valve upper Ps4 tube.

(5) Disconnect control valve fuel signal tube.

(6) Disconnect control valve fuel pressure tube.

(7) Remove bolts attaching control valve to engine.

(8) Remove fittings from control valve ports. Discard packings and gaskets.

B. Install Control Valve

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891 (Continued)

(Continued)

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and safety pin is installed.

WARNING: WHITE PETROLATUM IS AN AGENT THAT IS AN IRRITANT. MAKE SURE ALL PERSONS OBEY ALL OF THE PRECAUTIONS WHEN WHITE PETROLATUM IS USED.

- DO NOT USE IN AREAS WHERE THERE IS HIGH HEAT, SPARKS, OR FLAMES.
- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT BREATHE THE MIST.

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIER'S MSDS FOR:

- MORE PRECAUTIONARY DATA
- APPROVED SAFETY EQUIPMENT
- EMERGENCY MEDICAL AID.

TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THIS HAZARDOUS AGENT.

CAUTION: DO NOT APPLY EXCESSIVE AMOUNT OF PWA 36500 ASSEMBLY FLUID TO AIR TUBE PACKING. PWA 36500 ASSEMBLY FLUID CARRIED INTO COMPONENTS BY HEATED AIR CAN CAUSE MALFUNCTION.

(3) Lightly lubricate new packing and with petrolatum, VV-P-236 or Pratt & Whitney Assembly Fluid (PWA 36500), and install packing and gaskets on control valve fittings.

(4) Install fittings in respective control valve ports.

(5) Position control valve on engine and install mounting bolts.

(6) Connect control valve fuel pressure tube.

(7) Connect control valve fuel signal tube.

(8) Connect control valve upper Ps4 tube.

(9) Connect control valve lower Ps4 tube.

(10) Safety tube nuts with P05-289 lockwire.

(11) Remove tools, equipment, loose hardware, and debris from maintenance area.

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

(12) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

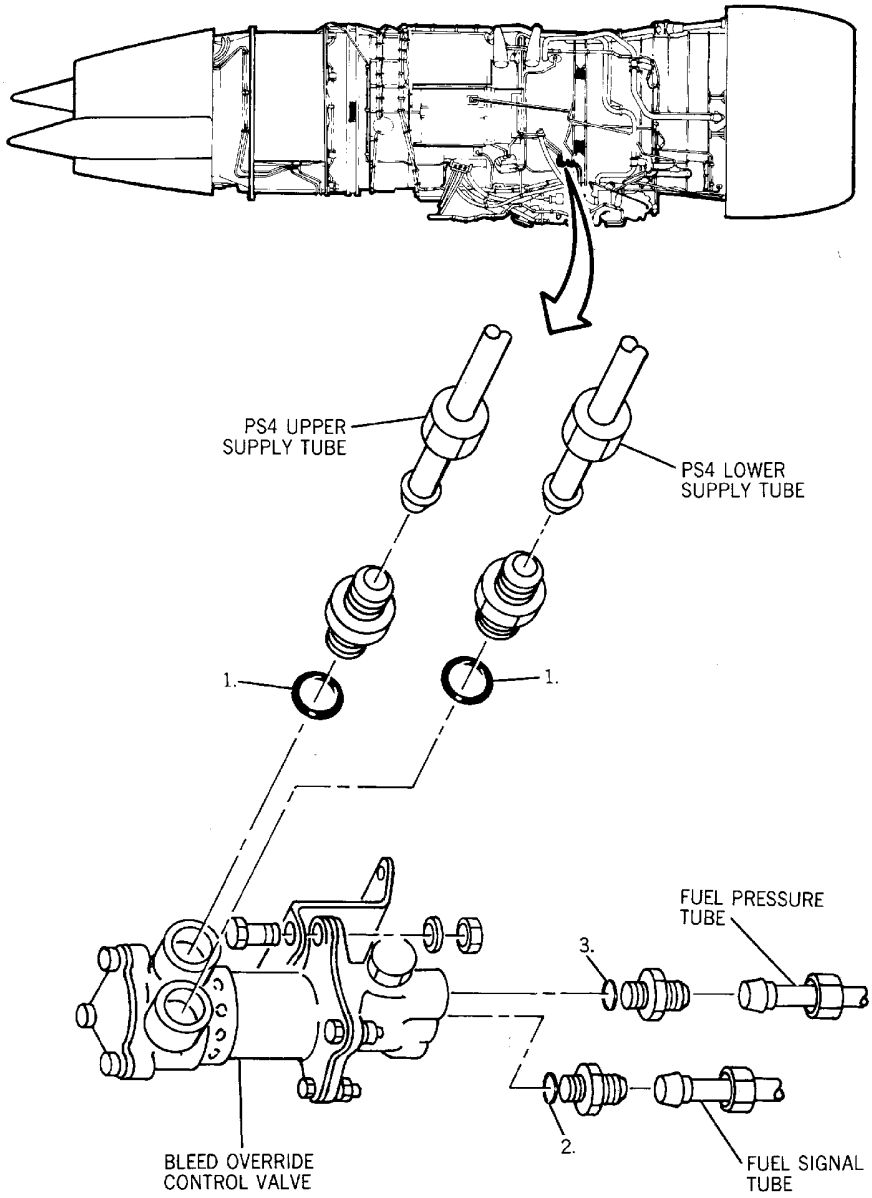
Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(13) Remove safety pin from thrust reverser control valve. Stow safety pin.



CODE:
1. 628248 (PRATT & WHITNEY)
2. 627381 (PRATT & WHITNEY)
3. 571020 (PRATT & WHITNEY)

BBB2-75-17A

Bleed Override Control Valve - Removal/Installation
Figure 201/75-31-02-990-801

ANTI-SURGE PRESSURE PROBE (Pt_2) - MAINTENANCE PRACTICES

1. General

A. The anti-surge pressure probe (Pt_2) is located on the lower right side of the engine intake at approximately the 5 o'clock position.

WARNING: EXERCISE CARE TO AVOID STRAKES WHEN WORKING IN ENGINE AREA WITH COWL DOORS OPEN, OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: TO PREVENT STRUCTURAL DAMAGE, USE BOTH HOLD OPEN RODS ON EACH COWL DOOR.

B. Before installing probe, check all openings to make certain no foreign objects are present.

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items:

NOTE: It is possible that some materials in the Equipment and Materials List cannot be used for some or all of their necessary applications. Before you use the materials, make sure the types, quantities, and applications of the materials necessary are legally permitted in your location. All persons must obey all applicable federal, state, local, and provincial laws and regulations when it is necessary to work with these materials.

Table 201

Name and Number	Manufacturer
Petrolatum, lubricant VV-P-236 DPM 675	Commercially available
Assembly Fluid	Ultraclean Inc. Wilmington, DE 19899 (Ultrachem Assembly Fluid #1)
Lockwire, .032 corrosion resistant steel, P05-289	

3. Removal/Installation Anti-Surge Pressure Probe (Pt_2)

A. Remove Pressure Probe

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	41	B1-423	ENGINE START VALVE RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	42	B1-1	ENGINE IGNITION LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893

U	42	B1-422	ENGINE START VALVE LEFT

WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893 (Continued)

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Disconnect bleed control (Pt_2) tube from pressure probe on inlet case. Discard retainer and packing.

(4) Remove bolts attaching pressure probe to inlet case. Remove probe and discard packing.

B. Install Pressure Probe

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and safety pin is installed.

WARNING: WHITE PETROLATUM IS AN AGENT THAT IS AN IRRITANT. MAKE SURE ALL PERSONS OBEY ALL OF THE PRECAUTIONS WHEN WHITE PETROLATUM IS USED.

- DO NOT USE IN AREAS WHERE THERE IS HIGH HEAT, SPARKS, OR FLAMES.
- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT BREATHE THE MIST.

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIER'S MSDS FOR:

- MORE PRECAUTIONARY DATA
- APPROVED SAFETY EQUIPMENT
- EMERGENCY MEDICAL AID.

TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THIS HAZARDOUS AGENT.

(3) Lightly lubricate new packing with petrolatum (VV-P-236), and install on pressure probe.

(4) Install probe on engine inlet case.

WARNING: WHITE PETROLATUM IS AN AGENT THAT IS AN IRRITANT. MAKE SURE ALL PERSONS OBEY ALL OF THE PRECAUTIONS WHEN WHITE PETROLATUM IS USED.

- DO NOT USE IN AREAS WHERE THERE IS HIGH HEAT, SPARKS, OR FLAMES.
- USE IN AN AREA OPEN TO THE AIR.
- CLOSE THE CONTAINER WHEN NOT USED.
- DO NOT BREATHE THE MIST.

WARNING: REFER TO THE APPLICABLE MANUFACTURER'S OR SUPPLIER'S MSDS FOR:

- MORE PRECAUTIONARY DATA
- APPROVED SAFETY EQUIPMENT
- EMERGENCY MEDICAL AID.

TALK WITH THE LOCAL SAFETY DEPARTMENT OR AUTHORITIES FOR THE PROCEDURES TO DISCARD THIS HAZARDOUS AGENT.

(WARNING PRECEDES)

CAUTION: DO NOT APPLY EXCESSIVE AMOUNT OF PWA 36500 ASSEMBLY FLUID TO AIR TUBE PACKING. PWA 36500 ASSEMBLY FLUID CARRIED INTO COMPONENTS BY HEATED AIR CAN CAUSE MALFUNCTION.

(5) Lightly lubricate new retainer and packing with petrolatum (VV-P-236) or Pratt & Whitney Assembly Fluid (PWA 36500), and install on bleed control (Pt_2) tube.

(6) Install bleed control (Pt_2) tube on pressure probe and safety connector nut with P05-289 lockwire.

(7) Remove tools, equipment, loose hardware, and debris from maintenance area.

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

(8) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 877, 880, 884, 886, 887, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

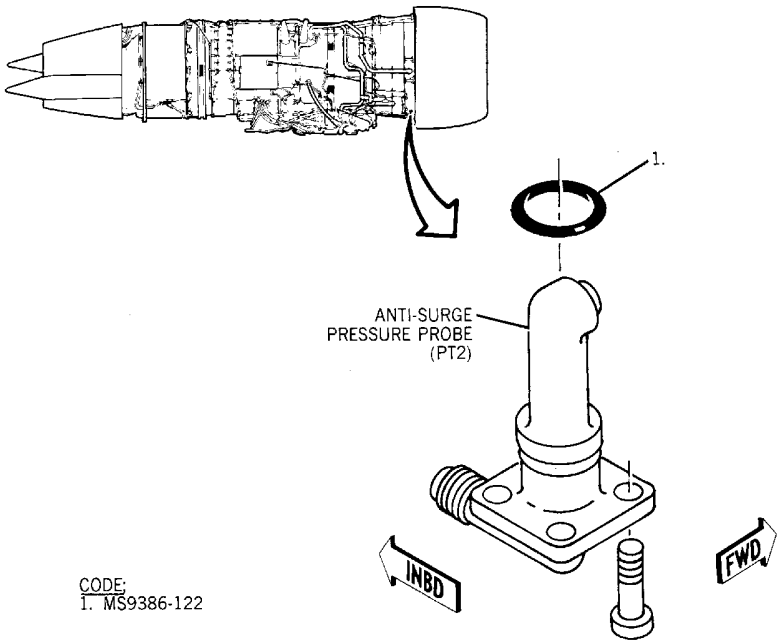
Row	Col	Number	Name
WJE ALL			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(9) Remove safety pin from thrust reverser control valve. Stow safety pin.



Anti-Surge Pressure Probe (Pt2) - Removal/Installation
Figure 201/75-31-03-990-801

START BLEED CONTROL VALVE - MAINTENANCE PRACTICES

1. General

NOTE: This maintenance practice applies only to engines without Pratt & Whitney SB 5863 incorporated.

A. This maintenance practice provides removal/installation instructions for the start bleed control valve.

WARNING: EXERCISE CARE TO AVOID STRAKES WHEN WORKING IN ENGINE AREA WITH COWL DOORS OPEN, OR INJURY TO PERSONNEL COULD RESULT.

CAUTION: TO PREVENT STRUCTURAL DAMAGE, USE BOTH HOLD OPEN RODS ON EACH COWL DOOR.

B. The start bleed control valve is located on the lower right side of the engine. Removal and installation procedures for all engine start bleed control valves are identical. Access is through forward lower cowl doors.

C. Before installation of valves, check, check all openings to make certain no foreign objects are present.

2. Equipment and Materials

NOTE: Equivalent substitutes may be used instead of the following listed items:

Table 201

Name and Number	Manufacturer
Lockwire, .032 corrosion resistant steel, P05-289	

3. Removal/Installation Start Bleed Control Valve

A. Remove Valve

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(1) Tag throttle/thrust reverser lever, and open and tag following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	41	B1-2	ENGINE IGNITION RIGHT

WJE 405-408, 410, 411, 880, 884, 892, 893

U	41	B1-423	ENGINE START VALVE RIGHT

WJE 415-427, 429, 861-866, 868, 869, 871-874, 891

U	42	B1-1	ENGINE IGNITION LEFT

WJE 405-408, 410, 411, 880, 884, 892, 893

U	42	B1-422	ENGINE START VALVE LEFT

WJE 405-408, 410, 411, 880, 884, 892, 893 (Continued)

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE 401-412, 414-427, 429, 861-866, 868, 869, 871-874, 880, 881, 883, 884, 891-893			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Place thrust reverser control valve in dump position and install safety pin.

(3) Disconnect control valve lower Ps4 tube.

(4) Disconnect valve upper Ps4 tube.

(5) Remove bolts attaching control valve to engine and remove valve.

B. Install Valve

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

WARNING: TAG AND SAFETY CIRCUIT BREAKERS.

(1) Make certain throttle/thrust reverser lever is tagged and following circuit breakers are opened and tagged:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 880, 884, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 880, 884, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

Row	Col	Number	Name
WJE 401-412, 414-427, 429, 861-866, 868, 869, 871-874, 880, 881, 883, 884, 891-893			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THAT THRUST REVERSER HYDRAULIC SYSTEM HAS DEPRESSURIZED BY CHECKING THRUST REVERSER ACCUMULATOR PRESSURE GAGE AFTER CONTROL VALVE ARM HAS BEEN LOCKPINNED IN DUMP POSITION. GAGE SHOULD READ 950 TO 1050 PSI (6550 TO 7239 KPA) (PRECHARGE PRESSURE).

(2) Make certain thrust reverser control valve is in dump position and safety pin is installed.

(3) Position control valve on engine and install and tighten mounting bolts.

(4) Connect control valve upper Ps4 tube.

(5) Connect control valve lower Ps4 tube.

(6) Safety tube nuts with P05-289 lockwire.

(7) Remove tools, equipment, loose hardware, and debris from maintenance area.

WARNING: MAKE CERTAIN CIRCUIT BREAKERS ARE OPEN BEFORE ATTEMPTING MAINTENANCE PROCEDURES. INADVERTENT ENGINE START OR THRUST REVERSER OPERATION COULD RESULT IN SERIOUS INJURY TO PERSONNEL.

(8) Remove tag from throttle/thrust reverser lever, and remove tags and close following circuit breakers:

LOWER EPC, DC TRANSFER BUS

Row	Col	Number	Name
U	40	B1-40	ENGINE START PUMP
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	41	B1-2	ENGINE IGNITION RIGHT
WJE 405-408, 410, 411, 880, 884, 892, 893			
U	41	B1-423	ENGINE START VALVE RIGHT
WJE 415-427, 429, 861-866, 868, 869, 871-874, 891			
U	42	B1-1	ENGINE IGNITION LEFT
WJE 405-408, 410, 411, 880, 884, 892, 893			
U	42	B1-422	ENGINE START VALVE LEFT

UPPER EPC, ENGINE - LEFT AC BUS

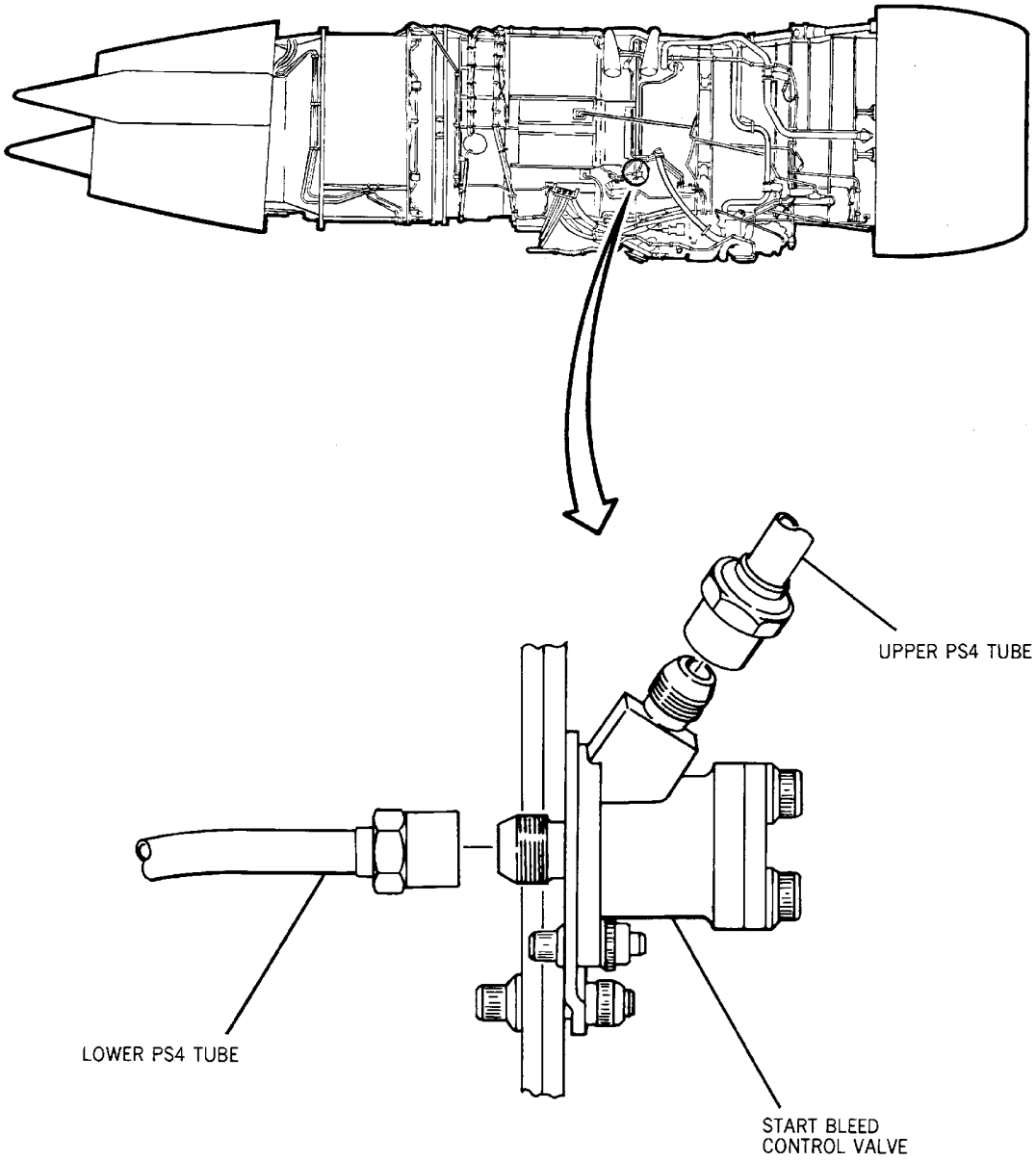
Row	Col	Number	Name
WJE 401-412, 414-427, 429, 861-866, 868, 869, 871-874, 880, 881, 883, 884, 891-893			
K	26	B1-424	LEFT ENGINE IGNITION

UPPER EPC, ENGINE - RIGHT AC BUS

Row	Col	Number	Name
L	26	B1-425	RIGHT ENGINE IGNITION

WARNING: MAKE CERTAIN THROTTLE/THRUST REVERSER LEVER POSITION CORRESPONDS WITH THRUST REVERSER DOOR POSITION AND THAT ALL PERSONNEL AND EQUIPMENT ARE WELL CLEAR OF THRUST REVERSER BEFORE OPERATION. ANY TIME THAT THRUST REVERSER CONTROL VALVE IS NOT IN DUMP POSITION, 3000 PSI (20,700 KPA) IS AVAILABLE AND WILL MOVE REVERSER DOORS IN RESPONSE TO THROTTLE/THRUST REVERSER LEVER MOVEMENT REGARDLESS OF WHETHER ANY ELECTRICAL OR HYDRAULIC POWER IS SUPPLIED TO AIRCRAFT.

(9) Remove safety pin from thrust reverser control valve. Stow safety pin.



Start Bleed Control Valve - Removal/Installation
Figure 201/75-31-04-990-801

EFFECTIVITY
WJE 401-412, 414-427, 429, 861-866, 868, 869, 871-874, 880, 881, 883, 884, 891-893

COMPRESSOR BLEED SYSTEM - INSPECTION/CHECK

1. Periodic Inspection

A. General

(1) These inspection procedures are a normal function of operating organizations. They consist of required inspections and minor adjustments necessary on the JT8D engine. The nature and conditions of engine operation determine the time interval between required inspections. For this reason, the intervals described in the Periodic Inspection Chart in this section are labeled Routine, Minor, and Major.

(2) Engine compartment cleanliness is important because the extensive mass airflow tends to draw foreign objects into the engine. Thoroughly clean the entire engine compartment with a vacuum cleaner after completion of any work. Keep the compartment free of dirt, oil and grease, and remove all unused parts, such as nuts, washers, and pieces of lockwire. Immediately cover all apertures resulting from the disconnection of tubing or parts. Use external caps on all tube openings, not internal plugs.

(3) Carefully inspect the compressor bleed system without dismantling to ensure that all connections are tight and free from leaks and that lines, tubing and controls are secure.

2. Inspect Pressure Ratio Bleed Control

A. Equipment and Materials Required

NOTE: Equivalent substitutes may be used instead of the following items:

NOTE: It is possible that some materials in the Equipment and Materials List cannot be used for some or all of their necessary applications. Before you use the materials, make sure the types, quantities, and applications of the materials necessary are legally permitted in your location. All persons must obey all applicable federal, state, local, and provincial laws and regulations when it is necessary to work with these materials.

Name and Number	Manufacturer
WC-393 Lubricant	S0213 Aviation Fluids Services, Inc. 950 Kingsland Ave. St. Louis, MO 63130 USA Phone: (800) 325-4720 or (314) 721-2910

B. Procedure

Table 601

Nature of Inspection	Inspection Time			Remarks
	Routine	Minor	Major	
a. Security of mounting.		X	X	
b. Security of accessible lines and fittings.		X	X	

3. **Inspect Bleed Valve Sleeve Strainer Element (On High Bleed Pad, Left Upper Side on Diffuser Outer Duct)**

A. Procedure

Table 602

Nature of Inspection	Inspection Time			Remarks
	Routine	Minor	Major	
Foreign matter; strainer damaged.			X	Replace strainer, or if serviceable, clean with a standard solvent then dry with compressed air.

4. **Inspect Pressure Ratio Bleed Control Ps3 Air Supply Screen**

A. Procedure

Table 603

Nature of Inspection	Inspection Time			Remarks
	Routine	Minor	Major	
Foreign matter.			X	Disconnect Ps3 line from pressure bleed control and remove fitting, metering plug, venturi, and screen. Brush clean parts and reassemble.

5. **Inspect Bleed Valve Control**

A. Procedure

Table 604

Nature of Inspection	Inspection Time			Remarks
	Routine	Minor	Major	
a. Security of mounting.		X	X	
b. Security of accessible lines and fittings.		X	X	

6. **Inspect 8th and 13th Stage (and 6th Stage if applicable) Compressor Bleed Valves**

NOTE: Engines post SB 5871 have a 6th stage flutter bleed system.

A. Equipment and Materials Required

NOTE: Equivalent substitutes may be used instead of the following items:

NOTE: It is possible that some materials in the Equipment and Materials List cannot be used for some or all of their necessary applications. Before you use the materials, make sure the types, quantities, and applications of the materials necessary are legally permitted in your location. All persons must obey all applicable federal, state, local, and provincial laws and regulations when it is necessary to work with these materials.

Name and Number	Manufacturer
WC-393 Lubricant	Aviation Fluids Services, Inc. 950 Kingsland Ave. St. Louis, MO 63130 USA Phone: (800) 325-4720 or (314) 721-2910

(Continued)

Name and Number	Manufacturer
Nitrogen or air supply	Not specified

B. Procedure

Table 605

Nature of Inspection	Inspection Time			Remarks
	Routine	Minor	Major	
Make sure the bleed valve moves freely.			X	Bleed valves that do not operate freely can be lubricated by the following procedure:

NOTE: Bleed valve that cannot be freed by lubrication and bleed valves that need frequent lubrication should be removed and replaced.

(1) Disconnect the Ps4 tube (muscle lines) at the connection nearest to the bleed valves they are connected to. (Figure 601)

(a) Post SB 5871 there will be a tube at the upper right bleed manifold toward the rear of the engine that is for three 6th stage bleed valves.

(b) There will be a supply tube that extends up along the rear of Flange H that supplies 8th stage and 13th stage bleed valves of these configurations:

1) JT8D-209, -217, and -217A: Two 8th stage and one 13th stage bleed valve (pre SB 6380).

2) JT8D-217C, -219: Three 8th stage bleed valves (pre SB 5863) or two 8th stage bleed valves and one 13th stage bleed valve (post SB 5863 and pre SB 6380).

(c) There will be a supply tube that extends up along the front of Flange H that supplies a 13th stage stage bleed valve (JT8D-217C, -219 pre SB 5863 and all engines post SB 6380).

WJE 401-411, 415-427, 429, 861-866, 868, 869, 871-881, 883, 884, 886, 887, 891-893

(2) Inject 4 fl-oz (118 ml) to 6 fl-oz (177 ml) of approved lubricant into the engine end of the Ps4 tube connection (muscle line). (Figure 601)

NOTE: The only lubricant approved for this application is WC-393. This is the only product known to P&W which keeps its lubricating properties at engine operating temperatures without gumming or coking (which can result in increased seizing of the valve).

WJE 412, 414

(3) Inject 4 fl-oz (118 ml) to 6 fl-oz (177 ml) of approved lubricant into the engine end of the Ps4 tube connection (muscle line). (Figure 601)

WJE ALL

(4) Apply 100.0 psi (689.5 kPa) of air or nitrogen to make sure that there is flow into the valve. This will make the valve move.

(5) Let the lubricant stay in the valve for 30 minutes.

(6) Operate the valve (open and close) by one of the methods that follows:

(a) Apply alternately pressure and suction to the Ps4 tube (muscle line) to open and close the valve two or three times.

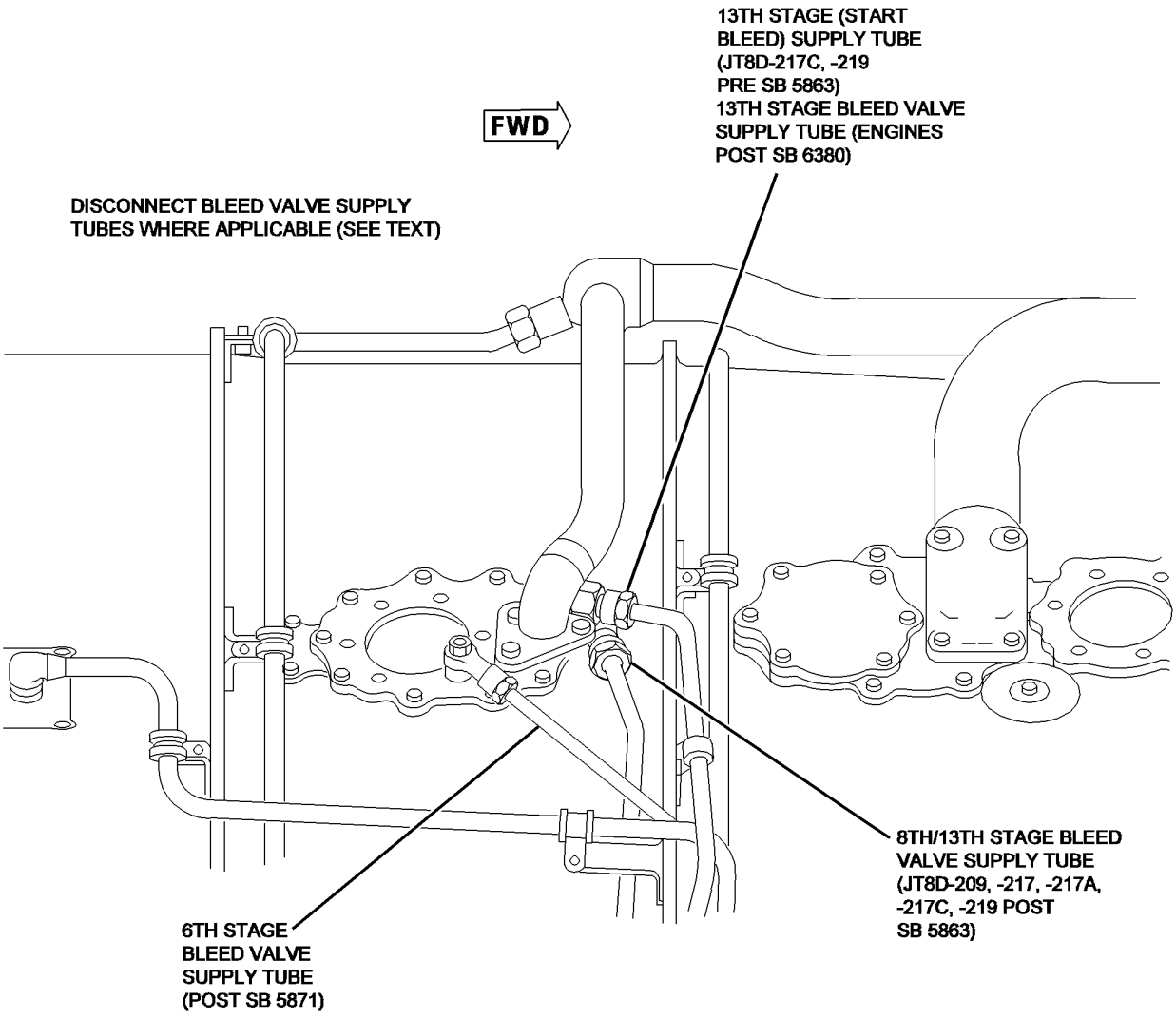
(b) Listen for the sound of the valve as it moves into each position. If the bleed valve does not move, do the step that follows:

(c) Connect the Ps4 tube (muscle line).

WJE 401-411, 415-427, 429, 861-866, 868, 869, 871-881, 883, 884, 886, 887, 891-893

(d) Start the engine and accelerate upto the bleed close point two or three times to make the valve open and close.

WJE ALL



UPPER RIGHT SIDE OF ENGINE

L-H7873 (0609)
PWV

BBB2-75-51A
S0000238911V2

Compressor Bleed System Inspection/Check
Figure 601/75-31-05-990-801

INDICATING - DESCRIPTION AND OPERATION

1. General

A. The engine and nose cowl anti-icing air shutoff valves utilize the same indicating circuits. A blue indicating light located on the annunciator panel in the flight compartment will come on when any of the three valves are fully open. An amber indicating light on the same panel will come on when one or more of the valves are in disagreement with the engine anti-icing control switch. Refer to Figure 75-10-00-990-801 for system schematic.

B. Each engine anti-icing indicating system is protected by a single circuit breaker.