

CHAPTER

75

AIR

Pratt & Whitney
JT12 OVERHAUL MANUAL (PN 435108)

AIR

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LIST OF EFFECTIVE PAGES

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TO: RECIPIENTS OF JT12 OVERHAUL MANUAL, PART NUMBER 435108

REVISION NO. 74 DATED APRIL 1, 2007

HIGHLIGHTS - AIR

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R 1. **Air Components - General**

R A. **General**

R (1) In this section are procedures for Cleaning, Inspection,
R Repair, and Test of air components for the JT12/JFTD12
R engine.

2. **Anti-Icing Air Valve (PN 693027)**

A. **Disassembly**

See Figure 1101.

(1) Remove the four screws and washers which attach the actuator (1) to the housing (10).

NOTE: Refer to the actuator manufacturer (see Introduction) for overhaul information for the actuator portion of the valve and actuator assembly.

(2) Remove the actuator (1) from the housing (10). This will release the ball (7), pin (5), spacer (21), and pin (2).

(3) Remove the ball seat (4) from the actuator (1) and remove the gasket (6) from its seat in the valve housing (10).

(4) Loosen two screws that attach the bellows to the housing (10) and remove the bellows, guide (20), shim (19), shouldered pin (8), gasket (3), and ball (12).

(5) Remove four screws (16) and washers (15) which attach the valve seat (17) to the valve housing (10). Remove the seat (17) and gasket (18) from the housing (10).

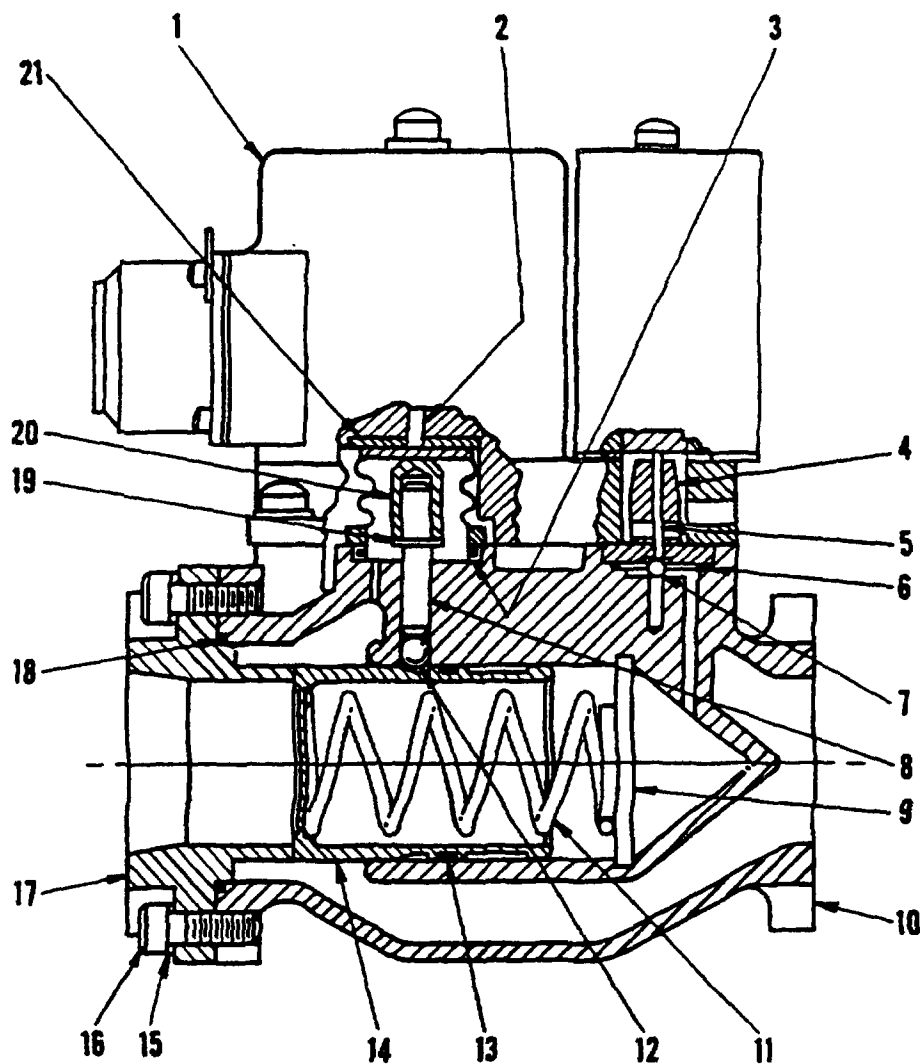
(6) Pull the valve (14), valve spring (11), and spring seat (9) from the housing (10) and remove the metal seal ring (13) from the valve (14).

B. **Cleaning**

R (1) Clean all detail parts (except the solenoid) in Stoddard
R Solvent (PMC 9001). Refer to Section 70-12-00 in the
R Standard Practices Manual. Dry with compressed air.

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Anti-Icing Air Valve
Figure 1101

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1. Actuator
2. Pin
3. Gasket
4. Seat
5. Pin
6. Gasket
7. Ball
8. Shouldered Pin
9. Spring Seat
10. Housing
11. Spring
12. Ball
13. Metal Seal Ring
14. Valve
15. Washer
16. Screw
17. Valve Seat
18. Gasket
19. Shim
20. Guide
21. Spacer

Key To Figure 1101

C. Inspection

- (1) Examine the valve body for cracks, dents, or damage which it will not be possible to repair.
- (2) Examine all threaded parts for thread damage.
- (3) Examine the valve, valve seat, balls, and ball seat for nicks, scratches, or dents that can make the parts not seal correctly.
- (4) The sides of the metal seal ring must be parallel 0.0005 inch and be flat 0.0005 inch per inch of length. The ring gap must be 0.007 - 0.012 inch when installed square in a 1.067 inch basic diameter gage, and the ring must touch the gage wall with gaps no more than 0.0005 inch.
- (5) The OD of the valve must not be less than 1.0617 inch, and the ID of the housing (valve bore) must not be more than 1.0688 inch.

D. Repair

- (1) Solid lubricant replacement

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- (a) Parts on which the solid lubricant coating became worn must get new coating to a thickness of 0.0001 - 0.0005 inch with solid film lubricant (Everlube No. 620 or equivalent). Bake at 135° - 163°C (275° - 325°F). After the lubricant is applied, dry-burnish the sides and outer surface of the ring to get a surface finish of eight micro-inches.

E. Assembly

See Figure 1101.

- (1) Put the valve housing (10) on a bench, air outlet port down.
- (2) Install the spring seat (9), flat side down, into the housing (10) and get it tightly against the shoulder.
- (3) Install the metal seal ring (13) in the groove on the OD of the valve (14) and install the open end of the valve (14) on the spring (11) and into the ID of the housing.
- (4) The sides of the metal seal ring must be parallel 0.0005 inch and be flat 0.0005 inch per inch of length. The ring gap must be 0.007 - 0.012 inch when installed square in a 1.067 inch basic diameter gage, and the ring must touch the gage wall with gaps no more than 0.0005 inch.
- (5) Install the gasket (18) on the shoulder of the valve seat (17) and install the seat in the valve housing (10) with the four washers (15) and screws (16).
- (6) Turn the valve body on its side with the actuator mount flange up.
- (7) Install the gasket (6) and ball (7) in the mount flange of the valve housing (10). Install the seat (4) and pin (5) in the actuator (1).
- (8) Install the ball (12) and the longer stem of the shouldered pin (8) into the recess on the mount flange.

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- (9) Install the applicable shims (19) and guide (20) on the extended end of the pin (8), put gasket (3) in position, and attach the bellows assembly with the two screws.

NOTE: Add shims (19) for the correct gap, adjust the stroke of the straight pin (2), and install the applicable class of spacer (21) as specified in Table of Limits, Reference No. 1056.

- (10) Attach the actuator to the housing with the four screws and washers. Torque the screws to 25 lb-in. and safety them with lockwire.

F. Testing

(1) Equipment necessary

- (a) Air supply with regulator that can supply different air pressures from 0 - 190 psig.
- (b) Airflow measuring device accurate to \pm five percent and an orifice calibrated to supply room-temperature air at a rate of 4.5 pounds per minute with a 1.2 psig pressure drop.
- (c) Direct current source that can supply 5 amperes, 17 - 29 volts.
- (d) Direct current ammeter with full-scale deflection of 5 amperes.
- (e) Cable connections and single-pole, single-throw switch as specified. See Figure 1102.
- (f) Gages to read pressure upstream and downstream of the anti-icing air valve.
- (g) 28-volt lamp

(2) Installation

- (a) During all tests it will be necessary to connect the anti-icing air valve as shown. See Figure 1102.

(3) Leakage check

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- (a) With the valve in the closed position (solenoid energized), adjust the air pressure to five psig. Slowly increase the air pressure to 190 psig. Leakage must not be more than 0.25 lb/min.

(4) Valve operation

- (a) Operate the valve through five cycles at each of these supply conditions, with 10 seconds between each cycle:

Supply Pressure (psig)	Voltage
90	24
90	17
5	29
5	17

1 The time necessary to open and close during a cycle must not be more than a second each, and the light must come on when the valve is open.

2 Operating current drain must not be more than 1.68 amperes.

- (b) With the valve in the open position (solenoid de-energized), slowly increase the inlet pressure until the light comes on. Inlet pressure must not be more than 5.0 psig, and outlet pressure must not be more than 1.2 psig. Increase the inlet pressure to 5.0 psig: outlet pressure must now be 1.2 psig or more.

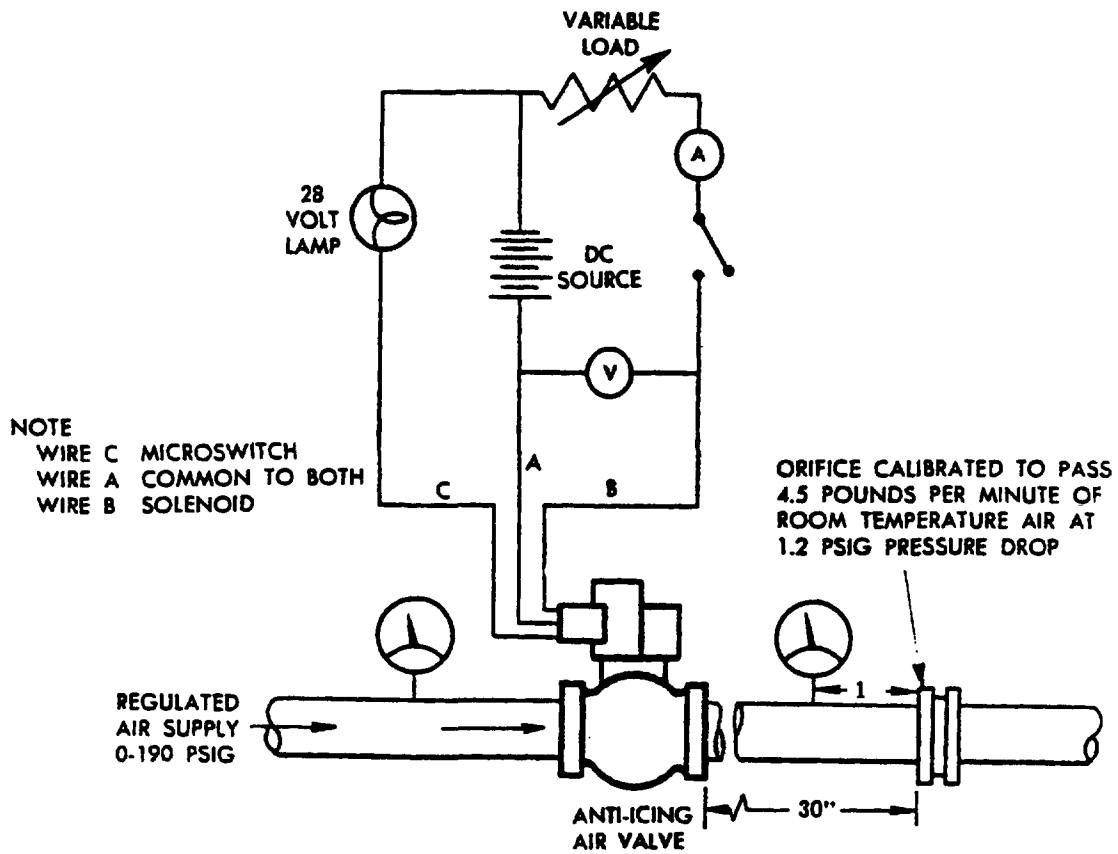
NOTE: It is permitted to do the above check as follows if the orifice was removed: With the valve open (solenoid de-energized), slowly increase the inlet pressure until the light comes on. Inlet pressure must not be more than 5 psig, and airflow must be 4.5 pounds per minute or more.

R G. Table of Limits

- R (1) See Figure 1103 for fits, clearances, and other limits
R applicable to the anti-icing air valve assembly.

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Anti-Icing Air Valve
 Test Schematic
 Figure 1102

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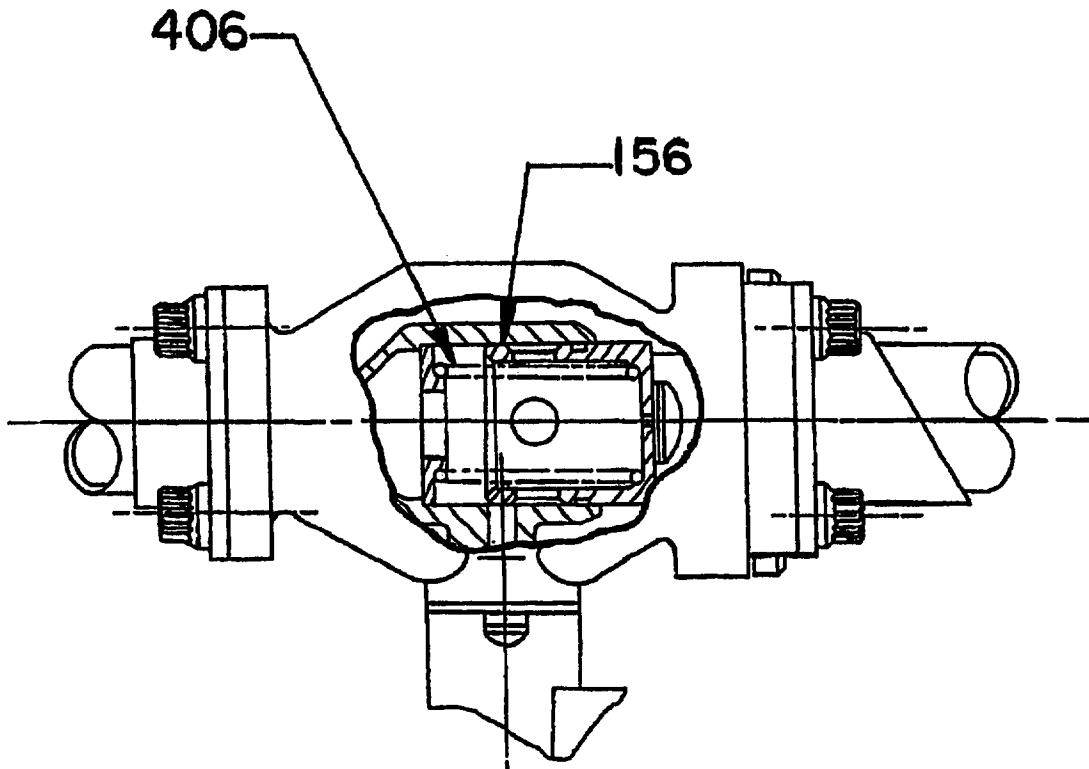
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R (2) Refer to Section 72-00-00, Table of Limits for general
R notes related to reference numbers, units of
R measurement, and symbols used in Tables of Limits.

R	REF.	FIG.	DESCRIPTION	DIMENSIONS	LIMITS	REPLACE
R	NO.	NO.		MIN MAX	MIN MAX	IF OVER
R	(a)		Anti-icing Air Valve Dimensional Limits			
R	156		Anti-Icing Air Valve	1.0625 1.0630		
R			Body	1.0675 1.0680	.0045 .0055	.0055
R	(b)		Anti-icing Air Valve Internal Spring Load Limits			
R	406		Spring-Helical,			
R			Compressor at			
R			1.640 inches		1.875 2.125	1.775

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Anti-icing Air Valve
Clearance Chart
Figure 1103

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