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ANALYZED

ARROW 1

MAINTENANCE INSTRUCTIONS

Classification cancelled / Changed to UNCLASS
By authority of AVRO
Date 30 Sept 58
Signature
Unit / Rank / Appointment AVRO

AIR CONDITIONING SYSTEM

MAINTENANCE REPORT 105-22-4
2 April 1957

71/maint-22/1

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FORM 1749 A

15814054

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1. AIR CONDITIONING GROUND SUPPLY UNIT

To be issued at a later date.

2. AIR CONDITIONING SYSTEM GROUND TESTS

2.1 Aircraft Test Equipment

The following equipment is permanently installed on the aircraft for use during ground testing.

2.1.1 The Air Conditioning Ground Test Panel is located on the left hand side of the nose wheel well. The panel houses electrical and pressure disconnect fittings.

2.1.2 A pressure line runs from the top of the heat exchanger to the air conditioning ground test panel.

2.1.3 A thermocouple is mounted in the cockpit inlet supply duct. Electrical wires run from the thermocouple to the air conditioning ground test panel.

2.1.4 A thermocouple is mounted in the radar nose supply duct. Electrical wires run from the thermocouple to the air conditioning ground test panel.

2.1.5 A thermocouple is mounted in the air duct on the downstream side of the expansion turbine. Electrical wires run from the thermocouple to the air conditioning ground test panel.

2.1.6 A pitot head is mounted in the radar nose supply duct. Pitot and static lines run from the pitot head to the air conditioning ground test panel.

2.2 Ground Test Equipment

2.2.1 Air Conditioning Test Unit - (Ref. Fig. 1)

This unit houses 1 pressure gauge, 2 temperature gauges and one air flow indicator.

The test unit is equipped with a pressure hose, one electrical cable, one pitot hose, and one static hose, each approximately 50 feet in length.

The hoses and cable have fittings to mate with corresponding fittings on the air conditioning ground test panel.

2.2.1 Air Conditioning Test Unit - (Ref. Fig. 1) (Continued)

The test unit is equipped with long cables and hoses in order to allow the ground personnel to stand well clear of the aircraft with the engines running. This is intended to alleviate, as much as possible, the danger of injury due to high engine noise level.

2.3 Test Procedures

Connect the Air Conditioning Test Unit to the aircraft by attaching the hoses and cables to the air conditioning ground test panel. Select the master switch on the test unit to the "ON" position. Carry out the following checks:

2.3.1 L.H. Pressure Reducing Valve

Start the L.H. engine and run at ✱ R.P.M. Read the pressure on the pressure gauge (Ref. Fig. 1). The pressure reading should be ✱ p.s.i.

2.3.2 Air Temperature Downstream of the Cockpit Temperature Control Valve

Start the R.H. engine and run both engines at ✱ R.P.M. With reference to Fig. 1, select the temperature selector switch to position No. 1 and read the temperature on temperature gauge "B". The temperature reading should be ✱ °F.

2.3.3 Air Temperature Downstream of the Radar Temperature Control Valve

With both engines running at ✱ R.P.M. and with reference to Fig. 1, select the temperature selector switch to position No. 2 and read the temperature on temperature gauge "B". The temperature reading should be ✱ °F.

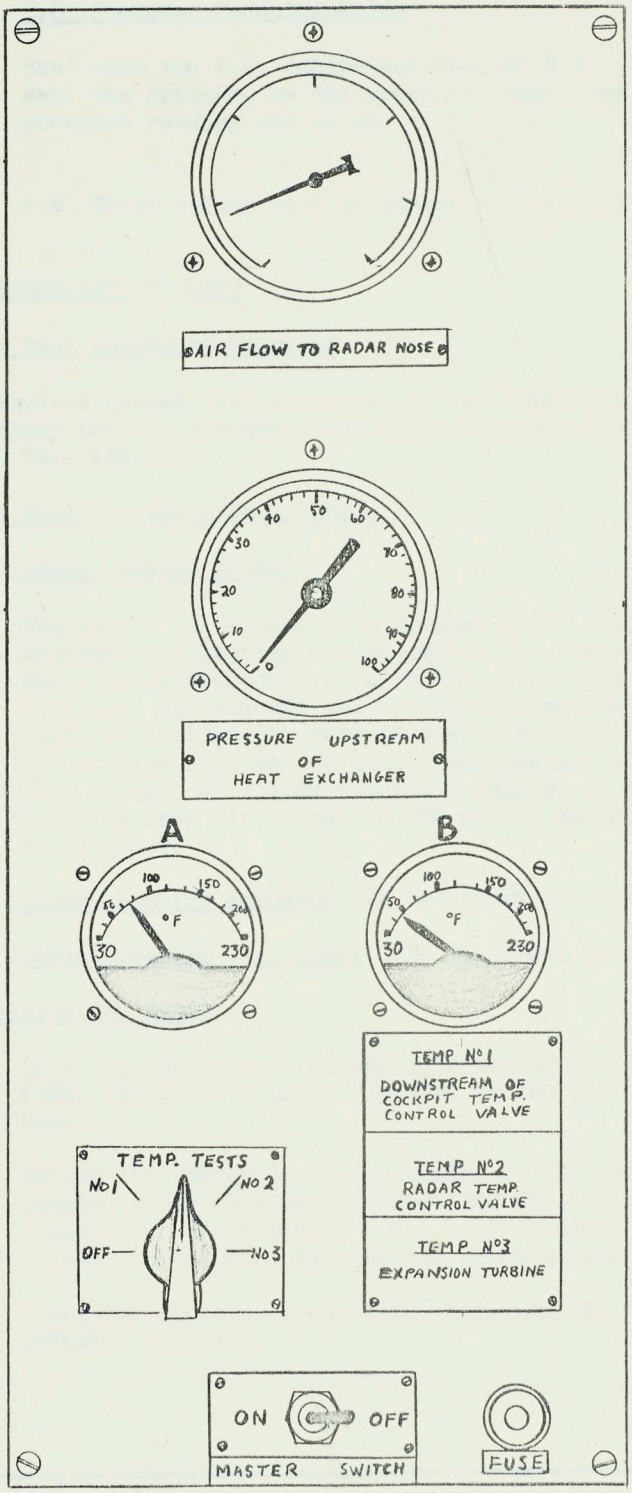
2.3.4 Air Temperature Downstream of the Expansion Turbine

With both engines running at ✱ R.P.M. and with reference to Fig. 1, select the temperature selector switch to position No. 3 and read the temperature on temperature gauge "B". The temperature reading should be ✱ °F.

2.3.5 Air Flow to the Radar Nose

With both engines running at ✱ R.P.M., read the air flow on the air flow indicator (Ref. Fig. 1). The air flow reading should be ✱.

FIGURE 1
UNIT - AIR CONDITIONING TEST



2.3.6 R.H. Pressure Reducing Valve

Shut down the L.H. engine and run the R.H. engine at ✱ R.P.M. Read the pressure on the pressure gauge (Ref. Fig. 1). The pressure reading should be ✱ p.s.i.

(✱ These values will be stated when available.)

3. COCKPIT PRESSURIZATION TESTS

3.1 Ground Test Equipment Required

The required ground test equipment is one Cabin Leakage Tester, one Canopy Locking Actuator, one Cabin Pressure Test Panel, and one Jumper Wire (AN 16).

3.2 Ground Test Equipment Description

3.2.1 Cabin Leakage Tester

The tester to be used is a Sprague Model S-414. This unit is designed for testing and measuring the leakage of pressurized cockpits of fighter type aircraft. The unit contains all the controls, instruments and accessories necessary to supply air under controlled pressure to the cockpit in order to determine its leakage rate and to assist maintenance personnel in locating leaks. Utilizing plant air supply, it is capable of handling free air volume to 200 c.f.m. and pressure required to 10 p.s.i.

3.2.2 Canopy Locking Actuator (To be issued later)

3.2.3 Cabin Pressure Test Panel (To be issued later)

3.3 Preparation for Tests

3.3.1 Lock the navigator's canopy by reaching through the "ACCESS PANEL NAVIGATOR'S LATCH" located on the pilot's seat bulkhead.

3.3.2 Attach the canopy locking actuator to the pilot's canopy locking slide (see Dwg. 7-4200-1100 Sht. 1) and make electrical connections to terminals 5 and 6 of terminal strip E32, located on the R.H. side of the pilot's cockpit.

3.3.3 Place the pilot's canopy latch lever in the "CANOPY SEAL INFLATE" position.

3.3.4 Connect the jumper wire between terminals 1 and 3 of terminal strip E32, thus over-riding the canopy actuation switch.

3.3.5 Connect the hangar air supply to the cabin leakage tester.

3.3.6 Remove the blanking caps from the cockpit pressurization test inlet and outlet fittings located on the pilot's cockpit floor. Connect the pressure line from the cabin leakage tester to the inlet fitting and connect the static line from the cabin leakage tester to the outlet fitting.

3.3.7 Remove the plug from the low pressure air filter and drain valve, located aft of the navigator's seat bulkhead and connect the canopy seal air supply line to the valve.

3.3.8 Make electrical connections from the cabin pressure test panel to terminals 15 and 16 of terminal strip E2, located on the R.H. side of the nose wheel well; from the cabin pressure test panel to circuit breaker E1/73 on E1 panel, located on the L.H. side of the nose wheel well; and from the cabin pressure test panel to the cockpit pressure dump solenoid; located on the aft face of the navigator's seat bulkhead.

3.3.9 Connect the electrical ground power supply to the aircraft.

3.4 Cockpit Pressure Test

3.4.1 Select "ALL OFF" on the cockpit pressure regulator controller and the cockpit safety valve controller.

3.4.2 Select the canopy switch on the cabin pressure test panel to "CANOPY OPEN" position.

3.4.3 Close the pilot's canopy by operating the external canopy actuation switch.

3.4.4 Select the canopy switch on the cabin pressure test panel to "CANOPY LOCK" position.

3.4.5 With reference to Fig. 2, inflate the canopy seals as follows:

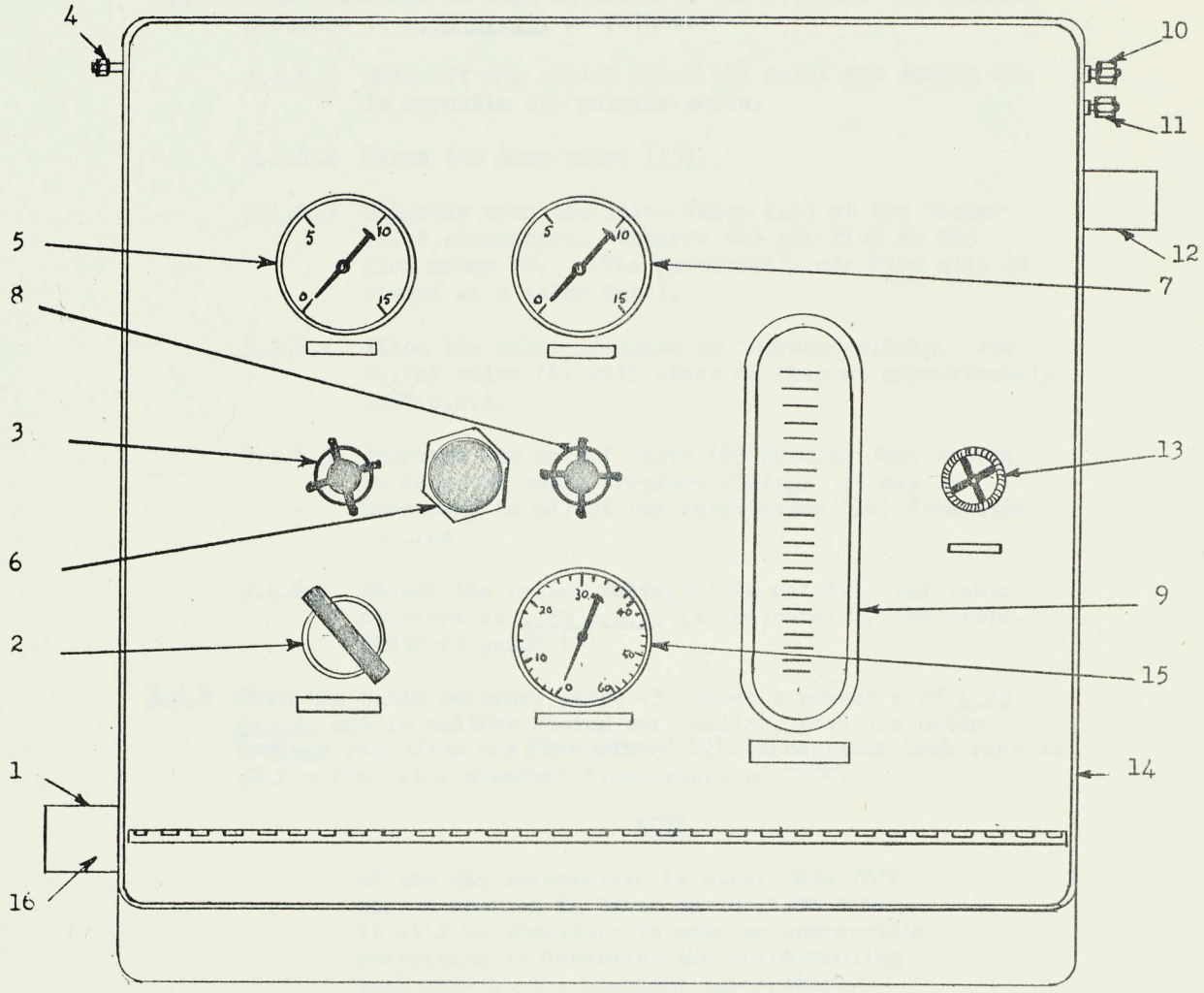
3.4.5.1 Back off the canopy seal regulator valve (2).

3.4.5.2 Open the cylinder shut-off valve (3).

3.4.5.3 Open the regulator shut-off valve (8).

3.4.5.4 Adjust the canopy seal pressure until the canopy seal pressure gauge (15) indicates 20 p.s.i.

FIGURE 2
TESTER - CABIN LEAKAGE - PORTABLE



1. Tester Air Inlet
2. Canopy Seal Press Regulator Valve
3. Cylinder Shut Off Valve
4. Canopy Seal Air Bottle Filler Valve
5. Cabin Press Gauge 0-15 p.s.i.
6. Relief Valve
7. Blower Press Gauge 0-15 p.s.i.
8. Regulator Shut Off Valve
9. Flow meter 0-170 C.F.M.
10. Cabin Press Hose Conn.
11. Canopy Seal Hose Conn.
12. Cabin Air Nose Conn.
13. Cabin Air Dump Valve
14. Cabinet
15. Canopy Seal Press Gauge C-60 p.s.i.
16. Inlet Valve

3.4.6 With reference to Fig. 2, build up and regulate the cockpit pressure to 4.75 p.s.i. as follows:

3.4.6.1 Back off the relief valve (6) until the sleeve end is opposite the pointer screw.

3.4.6.2 Close the dump valve (13).

3.4.6.3 Slightly open the inlet valve (16) at the tester inlet connection. Observe the air flow in the flow meter (9). (The permissible air flow will be stated at a later date).

3.4.6.4 Allow the cabin pressure to increase slowly. The relief valve (6) will start to open at approximately 1.75 p.s.i.

3.4.6.5 Increase the relief valve (6) setting just enough to keep the cabin pressure rising. It may be necessary to adjust the inlet valve (16) from time to time.

3.4.6.6 Adjust the relief valve (6) to maintain the cabin pressure at 4.75 p.s.i. as indicated by the cabin pressure gauge (5).

3.4.7 When the cabin pressure gauge (5) shows a pressure of 4.75 p.s.i. and is neither rising nor falling, read the cabin leakage rate from the flow meter (9). (Acceptable leak rate is 42.5 c.f.m. at a standard temperature of 70°F).

NOTE

If the air temperature is other than 70°F when a reading is taken on the flow meter, it will be necessary to make an appropriate correction to determine the corresponding leak rate at the standard temperature condition. Use the chart installed adjacent to the flow meter.

3.5 Cockpit Pressure Regulator Test

3.5.1 Select "DIFFERENTIAL ON" on the cockpit pressure regulator controller.

3.5.2 Build up the cockpit pressure, as described in Para 3.4.6 until the cockpit pressure regulator operates. This should occur between 4.5 and 5.0 p.s.i. The flow meter (9) will indicate when this occurs.

3.6 Cockpit Pressure Dump Test

3.6.1 Build up the cockpit pressure to 4.5 p.s.i.g.

3.6.2 Select the dump switch on the cabin pressure test panel to "DUMP". This will open the dump valve and allow air to escape.

3.6.3 The time allowed for the pressure to drop to ambient pressure is 7.0 seconds. The pressure will be indicated on the cabin pressure gauge (5).

3.6.4 Select the dump switch on the cabin pressure test panel to the "OFF" position.

3.7 Cockpit Safety Valve Test

3.7.1 Select "ALL OFF" on the cockpit pressure regulator controller.

3.7.2 Select "DIFFERENTIAL ON" on the cockpit safety valve controller.

3.7.3 Raise the cockpit pressure until the safety valve operates. This should occur between 5.25 and 5.75 p.s.i.g.

3.8 Completion of Tests

When the tests are complete, carry out the following:

3.8.1 Make sure that all cabin pressure is released by closing the inlet air valve 16 (Ref. Fig. 2), cracking the dump valve 13 (Ref. Fig. 2), and allowing the cabin pressure to come down gradually.

3.8.2 Release the canopy seal pressure by shutting off the regulator valve 8 (Ref. Fig. 2) and loosening the canopy seal hose connection.

3.8.3 Select the canopy switch on the cabin pressure test panel to "CANOPY OPEN" position.

3.8.4 Open the canopy by operating the external canopy actuation switch.

3.8.5 Disconnect and remove the canopy locking actuator.

3.8.6 Remove the jumper wire from terminals 1 and 3 of terminal strip E32.

3.8.7 Disconnect and remove the air pressure lines, the static lines, and the canopy seal lines, from the aircraft.

3.8.8 Disconnect and remove the electrical leads from the cabin pressure test panel to terminal strip E2, cockpit pressure dump solenoid, and panel E1.

3.8.9 Disconnect the electrical ground power supply.

3.8.10 Select "FLIGHT" on the cockpit pressure regulator controller and the cockpit safety valve controller.