34 Navigation & Pitot/Static

CHAPTER 34

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CHAPTER 34 - NAVIGATION

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GENERAL - DESCRIPTION AND OPERATION

INSTRUMENT ACCESS

Engine instruments may be removed with the instrument panel in place. Pull the post-light shield straight off to provide clearance for the instruments. Loosen the retaining screw located below and to the left of the instrument, loosening the instrument retaining clamp. Sufficient wiring has been installed to enable you to pull the instrument out.

To gain access to the other instruments remove the four screws attaching the LH or RH panel door and pull it out far enough to disconnect plumbing and wiring, freeing the panel for removal.

NOTE

To avoid marring the finish, wrap padding around the control columns just below the instrument panel.

The glare-shield may be loosened and tilted back by releasing the four clips located on the underneath side.

INSTRUMENT OPERATION

The gyro instruments operate on filtered air provided by the pneumatic pressure system. Adjustment of the pneumatic pressure system is performed by adjusting the various regulators in a specified sequence. A PRESSURIZATION SYSTEM ADJUSTMENT CHART corresponding to applicable illustrations and a general adjustment procedure for each individual regulator is provided in Chapter 36-00-00. The air speed indicator, altimeter, and rate-of-climb indicator operate on air provided by the pitot and static pressure system. (Refer to Chapter 34-10-00.)

An Overhaul and Replacement Schedule for instruments utilized by the Duke series aircraft is found in Chapter 5-00-00.

"END"

FLIGHT ENVIRONMENT DATA - DESCRIPTION AND OPERATION

The pitot and static pressure system provides a source of ram and static air for instrument operation. Ram air enters the pitot tube, located on the LH lower side (P-4 through P-152) or the RH lower side (P-153 and after) of the nose section forward of the nose landing gear doors, and is routed to the pilot's airspeed indicator. A heating element is installed in the pitot mast to prevent the mast from becoming obstructed by ice. Static air is taken from a static air port, located on each side of the aft fuselage. The static air is routed along the right side of the fuselage to the cabin differential pressure gage, rate-of-climb indicator, altimeter and airspeed indicator. Should the normal static system become inoperative, an emergency static air source control, located on the upholstery panel forward of the copilot's seat, may be opened to provide a source of static air. The emergency air port is located on the aft pressure bulkhead. The drain valves are located on the RH lower upholstery panel.

NOTE

When dual instruments are installed an optional dual pitot and static system is utilized. The optional pitot mast is plumbed to the copilot's airspeed indicator. The optional static air ports are located, one on each side of the aft fuselage and are plumbed to the copilot's rate-of-climb indicator, altimeter and airspeed indicator.

"END"

TROUBLESHOOTING
PITOT AND STATIC PRESSURE SYSTEM

	TROUBLE		*PROBABLE CAUSE*		*REMARKS*
1.	Heating element inoperative.	a.	Defective switch.	a.	Replace.
		b.	Grounded or open circuit.	b.	Check for continuity.
		c.	Defective heating element in pitot head.		
2.	Circuit breaker keeps tripping.	a.	Grounded wire.		
3.	Instruments inoperative or erratic in operation.	a.	Lines clogged.	a.	Drain lines at emergency static drain. Disconnect lines at instruments and blow out with low pressure air.
		b.	Line leaks.	b.	Check lines for looseness at all connection points.

"END"

FLIGHT ENVIRONMENT DATA - MAINTENANCE PRACTICES

(Figure 201)

PITOT SYSTEM LEAK TEST

A functional test of the pitot system can be made by using an observer in the cabin to watch the airspeed indicator while air pressure is built up by using a section of soft rubber tubing as follows:

a. Clamp the rubber tubing over the pitot mast inlet, making certain that the connection is air tight.

b. Crimp the end of the tubing and slowly roll it up until the airspeed indicator registers approximately 90% of its maximum reading.

CAUTION

To avoid rupturing the diaphragm of the airspeed indicator, roll up the rubber tubing slowly and do not build up excessive pressure in the line.

c. Secure the rolled up tubing so that it will hold the airspeed indicator reading.

d. If there is no decline in the reading after several minutes, there is no leak in the pitot system.

e. If a decline in the reading of the airspeed indicator is observed, check the pitot system plumbing for leaky hoses and loose connections.

CAUTION

Release the air pressure slowly by unrolling the rubber tubing; a sudden release of the air pressure may damage the airspeed indicator.

PITOT SYSTEM HOSE INSPECTION

After the pitot system is checked for leaks, inspect the hose sections for signs of deterioration. Check all polyethylene tubing for hardness or brittleness. Rubber hoses on which outer surfaces have checked or cracked, particularly at the bends or connecting points, or which have become hard, should be replaced. Replace the defective hose with MIL-H-5593 rubber hose (27, Chart 207, 91-00-00). When new hose is installed, recheck the system for leaks using the PITOT SYSTEM LEAK TEST procedure.

STATIC SYSTEM CLEANING

Blow low air pressure through the lines from the disconnected line at the airspeed indicator to the static ports. Cover each static port separately when blowing to insure that each line is clear. Instrument error or possible damage may result if even one port is clogged with dirt or foreign matter.

CAUTION

Never blow air through the line toward the instrument panel; to do so will seriously damage the instruments. When blowing back through the line from the instrument panel, make sure that no air is blown into the instruments.

NOTE

Wax or polish applied to the static air buttons can cause wrong instrument readings. The static air buttons should be cleaned periodically with a cleaning solvent to insure that no film exists on them.

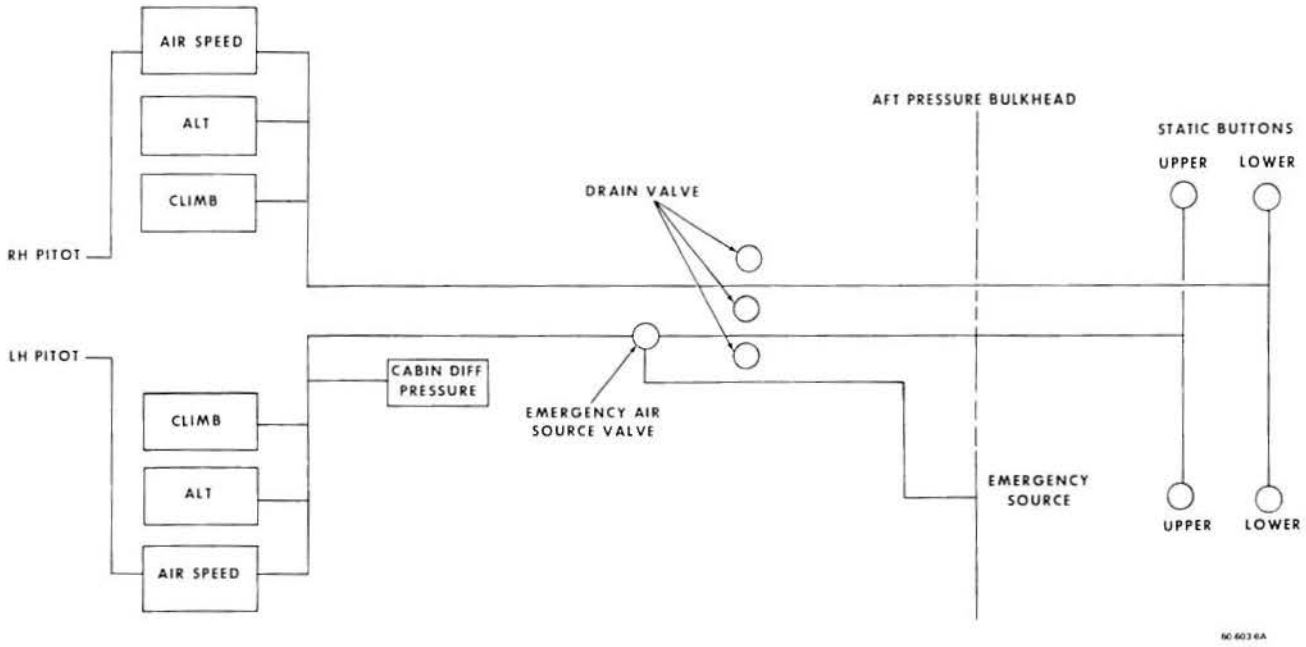
Drain the static air system by opening the static drain valves located on the upholstery panel forward of the copilot's seat.

STATIC SYSTEM LEAK TEST

The static system should be checked for leaks in accordance with the instructions in Federal Aviation Regulation 91.170.

CAUTION

To avoid damaging the airspeed indicators, the indicators should be removed from the system and the lines capped or an equal pressure should be applied to the pitot side of the indicators while leak testing the system.



Pitot and Static System Schematic
Figure 201

"END"