

GROUP 3.A

AIR PRESSURE OPERATED INSTRUMENTS

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Equipment employed

1. The air pressure operated flying instruments described in this Group are listed below, together with the appropriate Air Publications to which reference should be made for detailed descriptive and servicing information.

| | | |
|---|---|------------------------------------|
| Pressure head, Mk. 9A | } | <i>A.P.1275A, Vol. 1, Sect. 21</i> |
| Air speed indicator, Mk. 12A | | |
| Machmeter, Mk. 3A | | |
| Altimeter, Mk. 19A | } | <i>A.P.1275A, Vol. 1, Sect. 22</i> |
| Cabin altimeter, Mk. 18 | | |
| Rate-of-climb indicator, Mk. 3A(P) | | |

Introduction

2. This Group contains a description of the air pressure operated flying instruments installed in this aircraft, the majority of which are operated by the pressure head installation. A general description of the instrument installation as a whole, is given in Group 1.A and the location and access to all the instruments and their associated equipment in Group 1.C. Detailed information on the standard components used will be found in the appropriate Air Publications (*listed in para. 1*).

DESCRIPTION

Pressure head installation

3. This installation operates the air speed indicator, machmeter, altimeter and rate of climb indicator. The installation (*illustrated in fig. 1*), consists of an electrically heated pressure head, projecting forward from the port wing tip. The pressure head contains the pressure and static pipes, together with an electric heater element. The pressure and static pipes in the head are connected to the

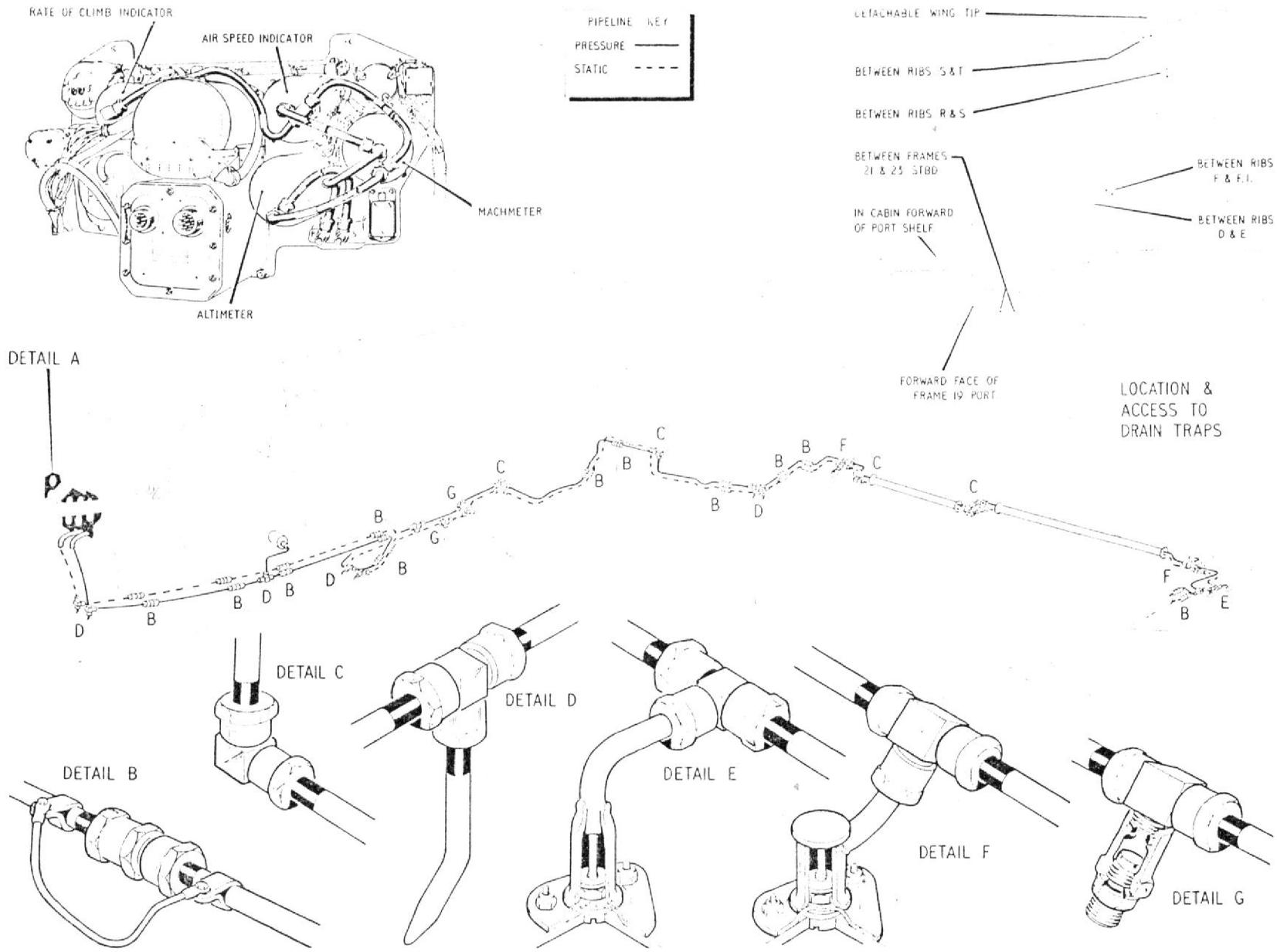


Fig. 1. Pressure head installation

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instruments via the pressure and static connectors (*mounted on port-forward face of centre instrument panel*), by a system of pipe-lines. For the purpose of draining moisture from the pipe-lines, a number of drain traps are provided (*details in fig. 1*).

Pressure head heater

4. The electric heater element in the pressure head is controlled by an ON/OFF switch (*leg panel, adjacent to camera master switch*). A routing and theoretical diagram of the electrical circuit is given in Chap. 1, Group F2.

Note . . .

The pressure head heater must not be switched on before removal of the pressure head cover, or damage to the cover will result. It is also important to ensure that the heater is not left switched on for more than two minutes when the aircraft is on the ground as the heater constitutes a danger to personnel should it be touched by accident. The heat will also eventually crack the insulators on the element.

Air speed indicator

5. The air speed indicator is mounted on the port side of the centre instrument panel. It is a capsule type instrument operated by air pressure drawn from the pressure head installation (*described in para. 3*).

Machmeter

6. The machmeter is installed on the port side of the centre instrument panel adjacent to the air speed indicator. It is provided to give a continuous indication of the ratio of true air speed to the speed of sound. The instrument is operated by the differential air pressure between the pressure and static pipe-lines of the pressure head installation (*described in para. 3*).

Altimeter

7. The altimeter is located just below the air speed indicator on the centre instrument panel. It is an atmospheric pressure

operated instrument provided to give a continuous indication of the aircraft height. The instrument is connected to the static pressure pipe-line of the pressure head installation (*described in para. 3*).

Cabin altimeter

8. This is an aneroid instrument and is located on the starboard instrument panel just above the oxygen gauge. It is not connected to the pressure head installation or to any other instrument, but is open to the air in the cabin, as it indicates the equivalent pressure cabin altitude and not the aircraft height.

Rate of climb indicator

9. The rate of climb indicator is installed on the starboard side of the centre instrument panel adjacent to the artificial horizon. It is a sensitive differential pressure gauge giving the rate of change of the atmospheric pressure in terms of rate of climb or descent, whenever the aircraft departs from level flight. The instrument is connected to the static pressure pipe-line of the pressure head installation (*described in para. 3*).

SERVICING

General

10. Full particulars of the standard testing and servicing procedures for the instruments described in this group are given in the appropriate Air Publications (*listed in para. 1*).

Pressure head drain traps

11. Drain traps are provided in the pressure head installation to collect any moisture which may enter this installation. The drain traps, which are of three different types, are connected into the installation by tee-pieces and are located in pairs (*illustrated in fig. 1*). Each type of drain trap is illustrated in the details given on the illustration and the means of access to the traps is also indicated. All the moisture, etc., in the drains, should be removed periodically as follows:—

- (1) The drain traps illustrated in detail F (*fig. 1*) should be disconnected from the system and any moisture removed. When refitting the drains new rubber sealing rings should be inserted in the union nuts and after the nuts are tightened, an examination should be made to ensure that the unpainted ends of the drain traps do not show below the heads of the union nuts.
- (2) The drain traps illustrated in detail D and E (*fig. 1*) should be opened by unscrewing the slotted plugs in the wing skin until any moisture in the traps drains away.
- (3) The drain traps illustrated in detail G (*fig. 1*) should be opened by inserting a suitable length and diameter of hose into each drain in turn after removing the small access doors, Insertion of the hose pushes open the valve and allows any moisture to escape down the hose.

Pressure head leak tests

12. The pressure and static systems are as leak-tight as possible; every care must be taken to maintain them in this condition since even a moderate leak may develop sufficiently to cause instrument failure. To ensure that the leakage rate is within the required tolerances, the system must be tested in accordance with the instructions given in A.P.1275B, Vol. 2, Part 1, Leaflet A.8 whenever the system is suspect or its pipe-line joints and connections to instruments are disturbed.

REMOVAL AND ASSEMBLY

General

13. The removal of the instrument panels carrying the flying instruments is fully described in Group 1.B. The removal of the pressure head is covered in Sect. 3, Chap. 2. Once access has been obtained, the removal of the remaining items of equipment should present no difficulties.





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