

Part I—Description and Management of Systems

Chapter 9—Pneumatic Systems

List of Contents

General	Para. 1	Other pneumatic systems	Para.
Entrance door system		Scanner pressurisation	8
Entrance door system supplies	2	T4 Bombsight computer	9
Door opening	3	Engine air pressure	10
Canopy jettison	4	Illustrations	Fig.
Door closing	5	Door, canopy seals, T4 bombsight systems	1
Door and canopy seals	6	H2S system	2
De-icing tank pressurisation	7	T4 Bombsight system	3
		Engine air pressure	4

1 General

There are five separate pneumatic systems in the aircraft, as follows:

- (a) Storage system, for operation of:
 - Main entrance door opening and closing
 - Canopy jettison
 - Door and canopy seal inflation
 - Windscreen de-icing pressurisation
- (b) A storage system for pressurising the H2S scanner installation.
- (c) A storage system for the T4 bombsight computer.
- (d) An engine air system to supply compressed air for the following:
 - Bomb bay seal inflation
 - Hydraulic reservoir and power pack pressurisation

Fuel tanks and recuperators pressurisation
Equipment in rear fuselage

(e) An emergency air system for undercarriage lowering, dealt with in Chapter 8.

Entrance Door System

2 Entrance door system supplies

(a) Two storage cylinders, charged to 2,000 PSI from an external supply, are on the port side of the crew compartment. Their charging points and pressure gauges are on the front bulkhead in the nosewheel bay. The forward cylinder supplies pressure for door opening and canopy jettison, while the rear bottle supplies door closing, door and canopy seal inflation and pressurisation of the windscreen de-icing tank.

(b) A ground servicing cock, on the underside of the crew's floor is normally locked in the open position by a red cover. When turned off, it isolates the services supplied by the rear cylinder.

3 Door opening

(a) Pressure at 1,200 PSI for operating the door jacks is controlled by the EMERGENCY position of the door opening lever, on the forward end of the door frame on the port side. On the ground, with the undercarriage down, the air passes through a restrictor, to control the rate of movement. In the air, with the undercarriage raised, the restrictor is by-passed, to allow the full pressure to open the door against the air stream. The cabin should be depressurised before opening the door.

(b) A switch is provided at the navigator's station, which, when operated, causes air to pass through a unimatic valve to a jack which withdraws the door bolts and allows air to pass to the jacks. At the same time, the door opening lever is moved up to the gate and a lower portion of the lever assembly, below the gate, is moved on to operate the emergency door opening valve. The cabin should be depressurised first. Loads on the door bolts are such that, using the above control alone, the door will not open until the differential pressure has dropped to 1.5 PSI (30 seconds at 43,000 feet, 9.5 seconds at 27,000 feet); if the door opening lever is placed in the gated EMERGENCY position at the same time, however, the door will open at 2.65 PSI (20 seconds at 43,000 feet, 5.5 seconds at 27,000 feet). However, unless escape in the minimum time is essential, the manual control should not be used in conjunction with the switch.

(c) When the door has been opened by the navigator's switch, a subsequent failure of the 28-volt supply results in the lower portion of the door opening lever assembly returning to the entrance to the gate and the door closing under slip-stream pressure. Therefore, the first rear crew member to reach the door must ensure that the door opening lever is placed in the gated EMERGENCY position.

(d) If the door locking pins become scored, the door may fail to open when the navigator's switch is used. In this case, the manual control should be used; closing the cabin air switches may assist by reducing the time required to de-pressurise the cabin.

(e) If the door seal deflation valve plunger is out of alignment and the seal cannot deflate, the door will not open. In this case, disconnect or sever the seal inflation pipe on the starboard side of the seal.

4 Canopy jettison

The canopy jettison pneumatic valve is operated by pulling either seat firing handle. When the valve is operated, air at 1,200 PSI passes to a ram which opens the jaws of the canopy attachment and operates the jettison gun. For mechanical jettison, see Chapter 15.

5 Door closing

(a) The door closing valve is operated either by a toggle handle, or, externally, by a pushbutton near the door handle. The toggle handle is normally stowed under a hinged panel in the floor below the centre crew seat.

(b) When the valve is operated, air at 400 PSI is fed to the up side of the door jacks.

6 Door and canopy seals

The door and canopy seals are supplied with air from the rear cylinder at 25 PSI. The door seal is inflated automatically when the entrance door is closed and the canopy seal when the canopy is locked in position.

7 De-icing tank pressurisation

The de-icing tank is pressurised with air at 14-15 PSI. A pressure-maintaining valve in the line cuts off the supply when the pressure in the main system falls to 150 PSI.

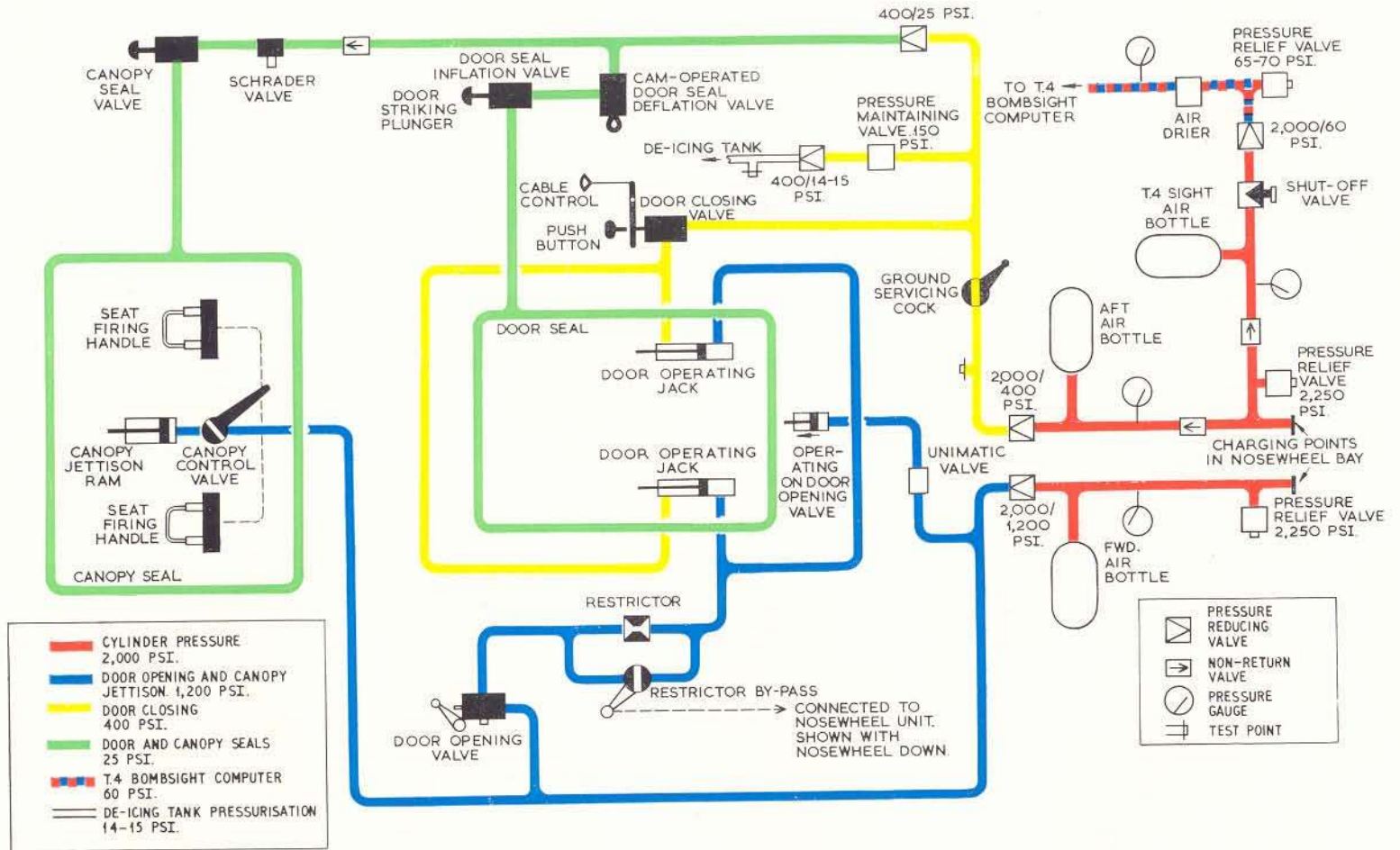


Fig 1 Door, Canopyseals, T4 Bombsight Systems

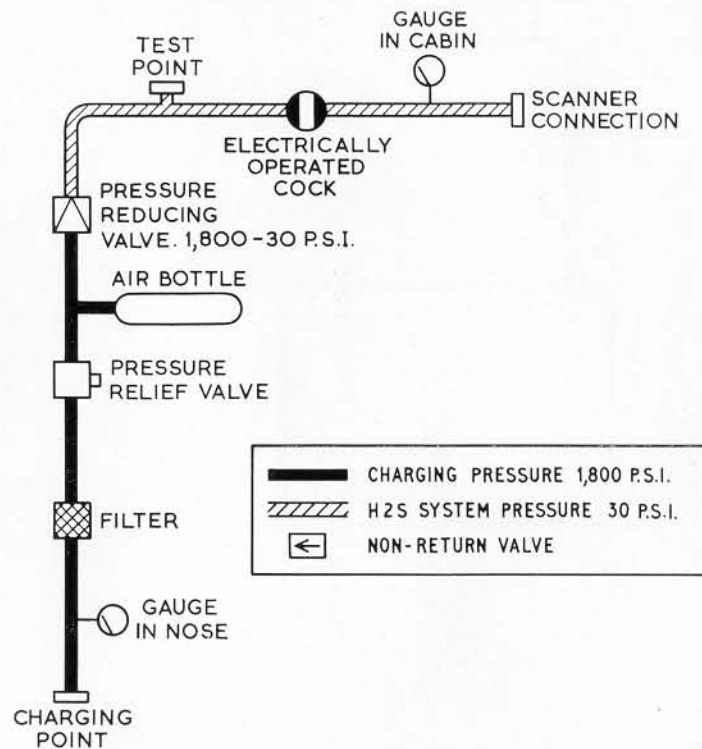


Fig 2 H2S System

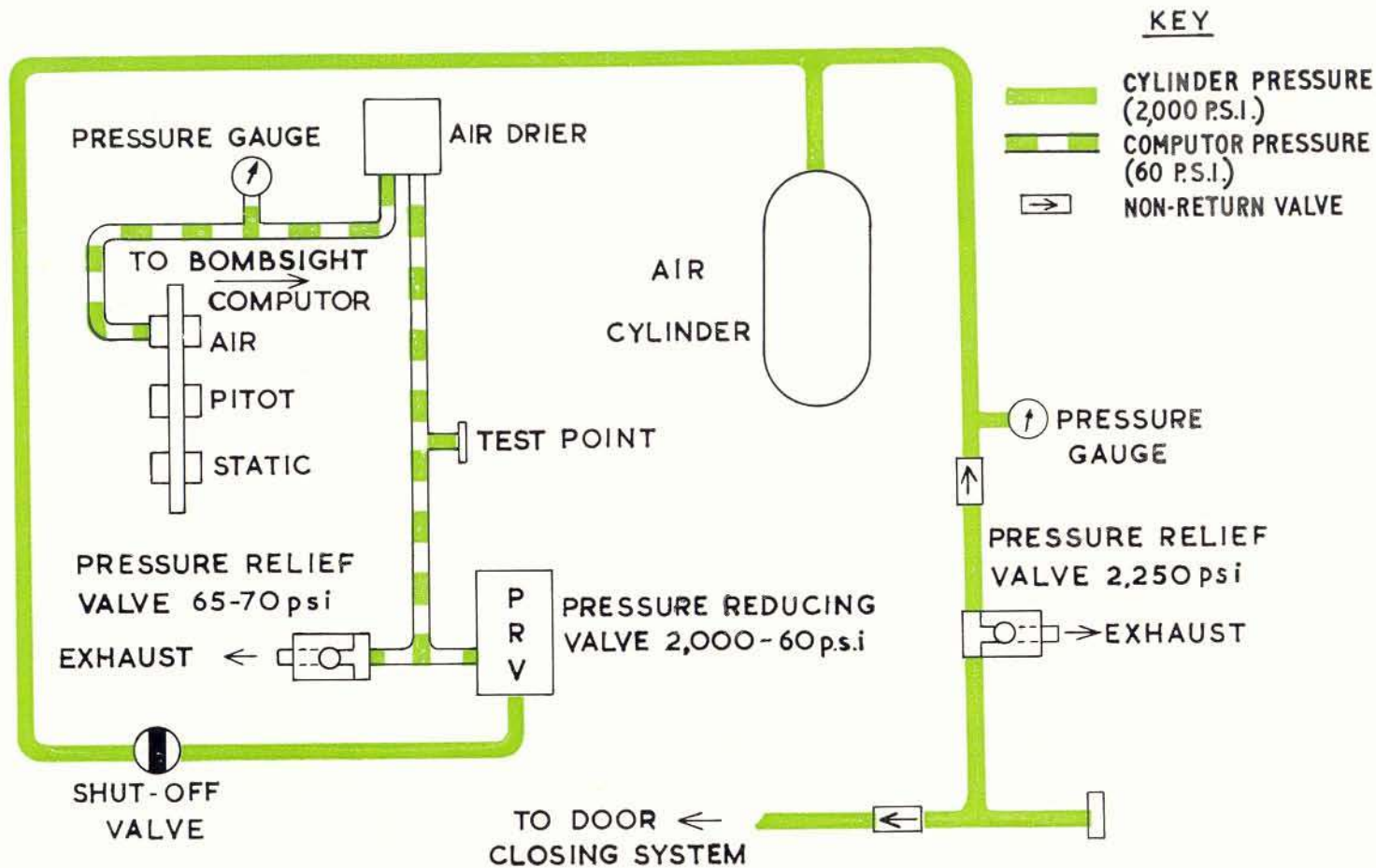


Fig 3 T4 Bombsight System

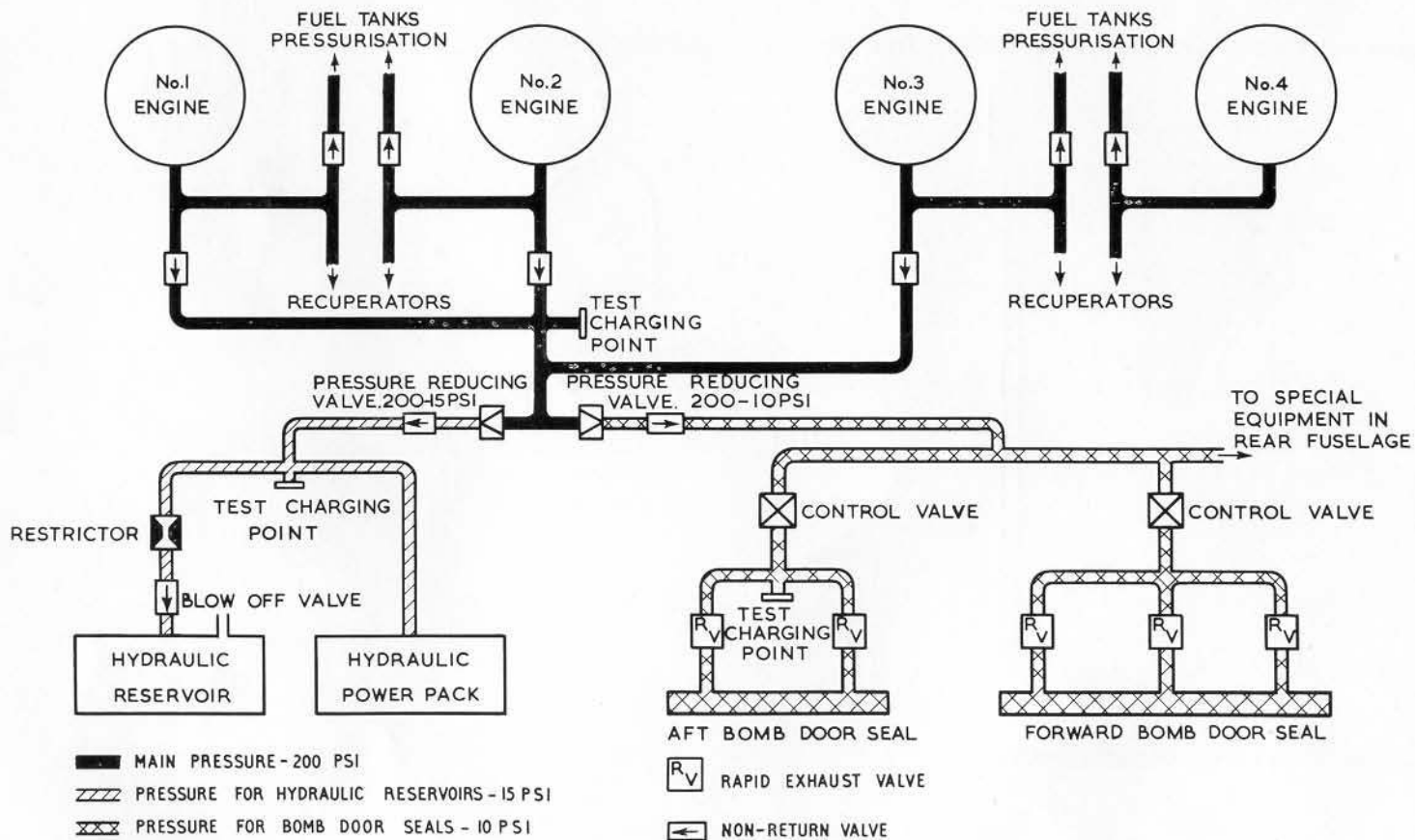


Fig 4 Engine Air Pressure

Other Pneumatic Systems

8 Scanner pressurisation

(a) The storage cylinder, charged to 1,800 PSI, is on the port side of the nose section. The charging point and pressure gauge are behind the access panel for emergency equipment on the port side of the nose.

(b) H₂S system

Air at 30 PSI is passed to a regulator, the supply being controlled by an ON/OFF switch at the navigator/radar's station. Also at this station is an absolute pressure gauge, showing the pressure delivered from the regulator to the scanner (normally 15 PSI).

(c) *Rear warning.* See Chapter 21

9 T4-bombsight computer

(a) Air for the T4 bombsight computer is stored in a cylinder below the pilots' floor. The cylinder is charged to a pressure of 2,000 PSI and is charged through the same charging point as the rear entrance-door bottle. The charging pressure gauge is on a separate panel below the charging panel.

(b) Air is supplied to the computer via a shut-off valve, behind the 1st pilot's seat at floor level, and a pressure-reducing valve, which reduces the pressure to 60 PSI. A relief valve (65-70 PSI)

and an air drier are fitted in the system. A gauge beside the shut-off valve shows the pressure at the computer. The minimum endurance for the computer air is calculated as 1½ hours.

10 Engine air pressure

(a) Compressed air from Nos. 1, 2 and 3 engines is supplied at 15 PSI to pressurise the hydraulic reservoir and the hydraulic power pack, to ensure that a positive head of fluid is maintained to prevent cavitation. A blow-off valve in the reservoir relieves pressure at 22-27 PSI and closes at 16 PSI.

(b) Air from Nos. 1, 2 and 3 engines is supplied at 10 PSI to inflate the bomb door seals. Inflation and deflation of the seals is controlled by a micro-switch at the forward end of the doors on the port side.

(c) Air for fuel tank pressurisation and recuperator pressurisation is supplied from all the engines, each engine serving its own fuel tank group. Tank pressurisation is at approximately 2 PSI and recuperator pressurisation is at 6-10 PSI.

(d) Air cooling for the equipment in the rear fuselage is supplied from Nos. 1, 2 and 3 engines at 10 PSI (see Chapter 21).

This file was downloaded
from the RTFM Library.

Link: www.scottbouch.com/rtfm

Please see site for usage terms,
and more aircraft documents.



LIGHTNING MK. 1
COVER PITOT HEAD
EB2-88-511