

## Chapter 6

### NITROGEN SYSTEM

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### DESCRIPTION

#### Introduction

1. In this system, a supply of nitrogen at high pressure is piped to pressure-reducing valves, from which it is delivered at low pressure to the wing-tip (No.6) tanks to provide pressurization for fuel transfer from the wing-tip tanks to the No.5 and/or No.2 fuel tanks as required. The installation of the system is illustrated in fig.1 and components are listed in Table 1. Control of the system is effected by a switch on the flight engineer's main panel with a magnetic indicator located adjacent to it.

#### STORAGE CYLINDERS

2. Six storage cylinders each of 2,250 litres capacity charged to 1,800 p.s.i. are incorporated in the system (fig.1) and are mounted in groups of three cylinders in the No.1 and No.2 heater compartments forward of former B in the lower half of the front centre section. The cylinder groups are mounted two side by side with the third cylinder on top. The side by side cylinders are mounted in a cradle structure secured by bolts to former C and stringers 25 and 28. Steel

straps, with spreader straps between secure the side-by-side cylinders in the cradle, the spreader straps providing the mounting for the third top cylinder. A tubular upper cradle, accommodating four bolts fits over the top cylinder. The cradle is located by an extension tube at its forward end which is secured by a Pin to a corresponding bracket attached to the aft face of former D. The four bolts in each upper cradle are screwed into threaded trunnions housed in the strap ends to completely secure all three cylinders together.

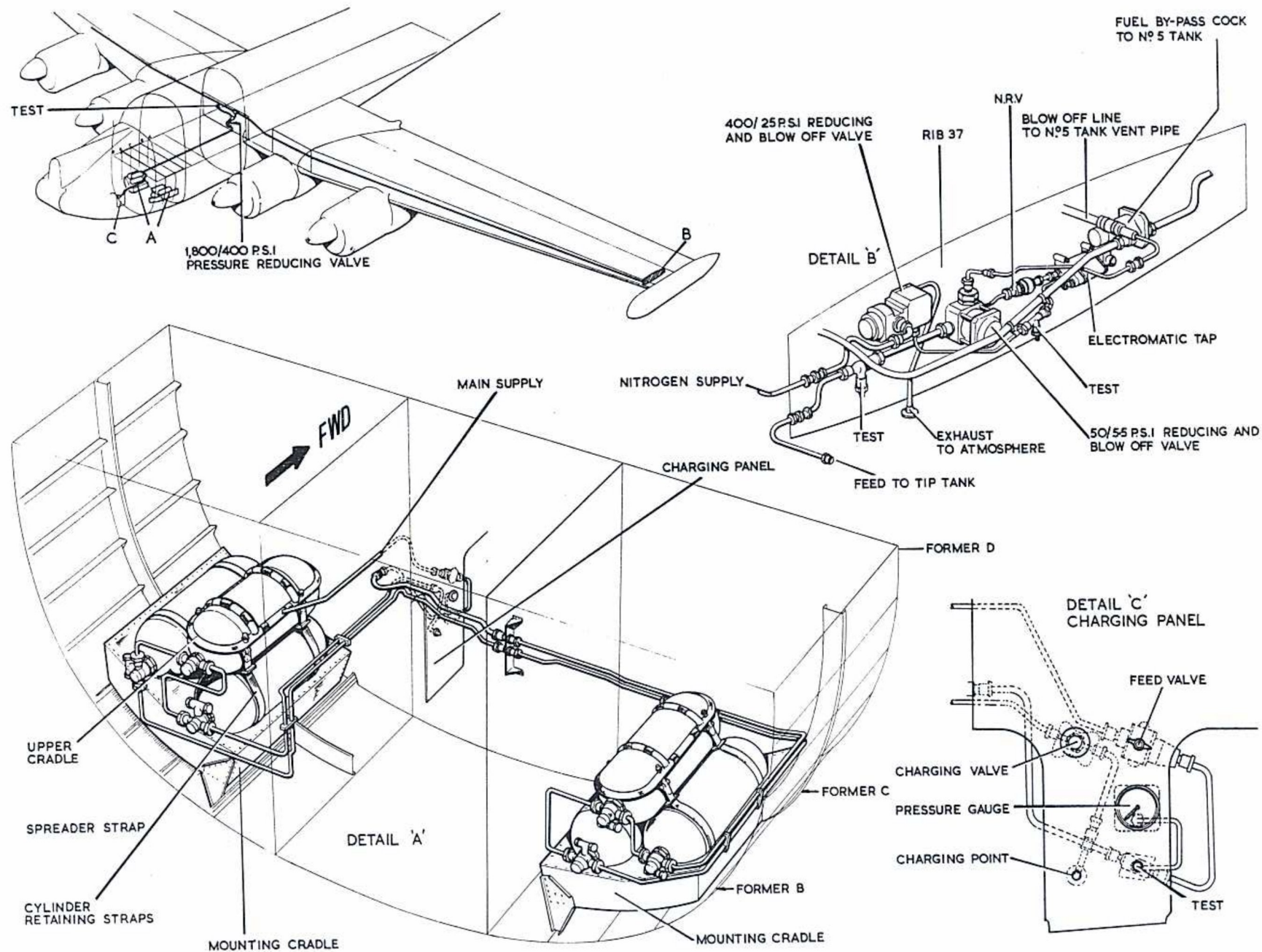


Fig.1. Nitrogen system  
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## CYLINDER INTERCONNECTION PIPING

3. The six storage cylinders in the heater compartments are connected in series between a charging point and a feed valve. From the charging point (Ref.No.26FP/2501) the charging pipe is led to a two-way connector (Ref.No.6D/575) incorporating a filter (Ref.No.6D/574) and a non-return valve (Ref.No.6D/427). From the two way connector the pipe is led to a charging valve (Ref.No.6D/223) and thence to the storage cylinders, connecting them in series as shown in the illustration (fig.1). The feed line from the cylinders, is taken to a drilled block which incorporates a standard  $\frac{1}{4}$  in. B.S.P. test connection (Part No.A58) and a connection to a pressure gauge; from the block the piping is taken to a Saunders feed valve (Part No.903/A.A.O. - I/L). The above items, with the exception of the storage cylinders previously described (para.2), are mounted on a panel at the port side of the nose-wheel compartment forward of former D.

## HIGH PRESSURE DELIVERY PIPING

4. The delivery piping from the feed valve in the nose-wheel compartment is led upwards through the port heater compartment and along and up through the bomb-compartment roof slightly to port of centre, to connect with a 1,800 to 400 p.s.i. pressure-reducing valve mounted on the forward face of the front spar web. From the pressure-reducing valve a short pipe is coupled to a tee-piece from which a cranked branch pipe is led inboard to the spar centre to connect with a test-point, access to which is gained through a panel in the forward face of the front spar cover. The remaining branch from the tee-piece is led up to a further tee-junction from which transverse pipes are led out along the leading edge of the main plane to port and starboard, to supply nitrogen through filters, (Ref.No.6D/808), located between ribs 34 and 38 of each outer main plane, to 400 to 25 p.s.i.

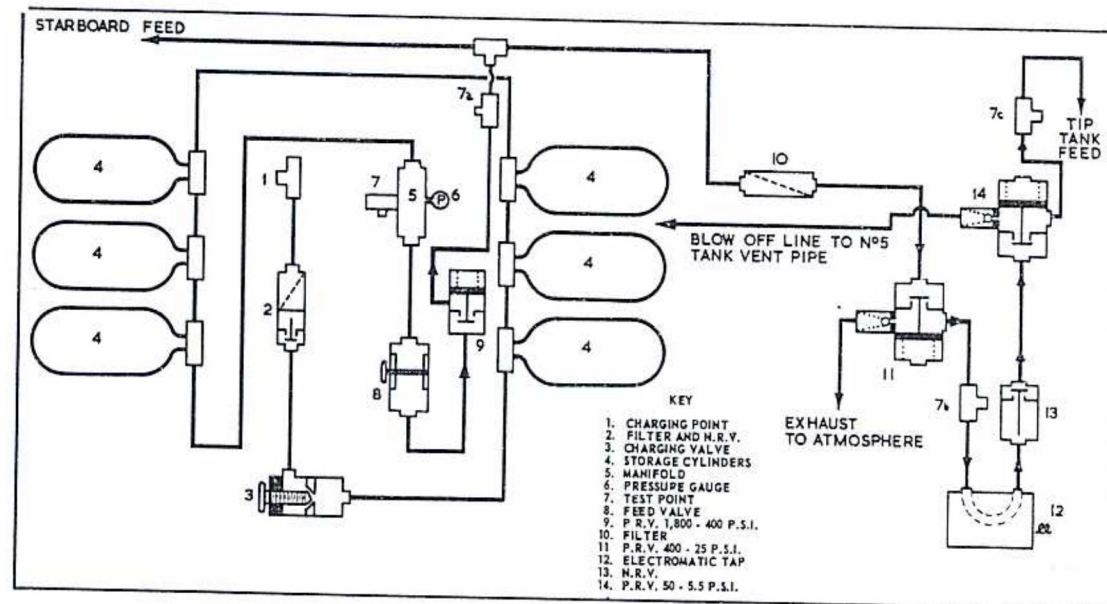


Fig.2. Nitrogen system diagram

pressure-reducing and blow-off valves, (Part No.PAS.26400) located on the out-board face of each rib 37. Two pipes are led from each of these valves, one the relief from the valve, which is vented to atmosphere through the main plane under-surface, the other supplies the nitrogen to pressurize the wing-tip tanks.

## WING-TIP TANK PRESSURIZATION

5. A small bore pipe is led from each 400 to 25 p.s.i. pressure-reducing valve to an electromatic tap, control of which is effected by a switch on the flight engineer's main panel. From the electromatic tap

the pipe connects to a tee-piece incorporating a non-return valve, (Part No.ACM.17836) and a standard A58 test connection. A pipe from the non-return valve is connected to a 50 to 5.5 p.s.i. pressure-reducing and blow-off valve. To prevent a fuel/air mixture being vented into the space at the wing-tip the vent pipe, from the pressure-reducing and blow-off valve, is coupled into the main fuel system vent pipe. From the pressure-reducing and blow-off valve the pipe passes to a tee-piece, incorporating a standard test point, and thence to a standard adapter in the wing-tip tank. The above components are all located on the outboard face of rib 37 and are accessible on removal of the wing-tip fairing panels.

## SERVICING

### STORAGE CYLINDERS

6. Ensure that the storage cylinders are fully discharged before removing any union or component from the system. The pressure must first be released at the test point on the charging panel in the nose wheel compartment.

#### Charging the storage cylinders

7. Instructions for charging the

storage cylinders are contained in Section 2, Chapter 2 (Preparation for flight).

### GENERAL SERVICING

8. Access to the pressure reducing and

blow-off valves of the tip-tank low pressure feed is gained by removing the fairing panels between the outer plane section and the wing tip tanks. Two small panels marked NITROGEN TEST POINT are provided in the main fairing panel. Information regarding all testing and servicing is contained in A.P.1275A, Vol.1, Section 10, Chap.4.

## REMOVAL AND ASSEMBLY

### General

9. Instructions for removing the storage cylinders are given in fig.2. No other specific instructions or special pre-

cautions, other than ensuring the nitrogen high pressure feed valve is in the off position before parting any union or

connection are necessary. Reference should be made to A.P.1275A, Vol.1, for further information.

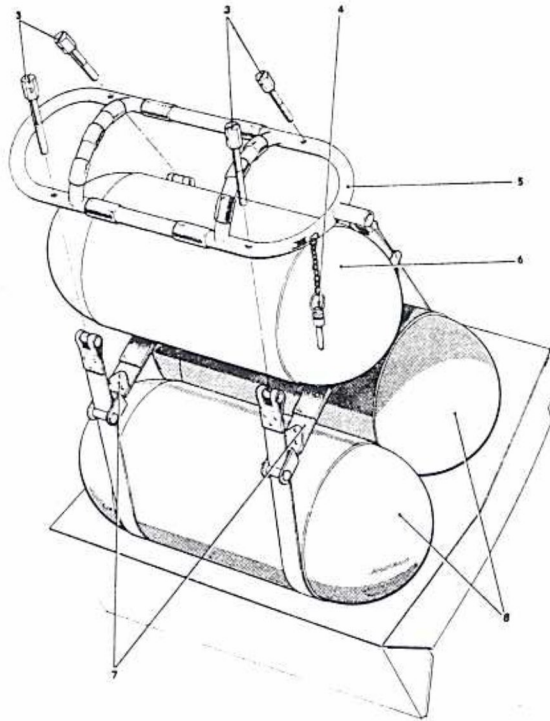


Fig.3. Nitrogen cylinder removal

### KEY

1. Discharge the nitrogen through the test point in the manifold.
2. Disconnect the pipes from the cylinders.
- (3) Remove the four bolts securing the top cradle to the strap trunnions.
- (4) Remove the Pip-pin securing the top cradle to former D.
- (5) Lift the top cradle clear of the cylinder.
- (6) Lift the top cylinder clear of the installation.
- (7) Remove the top cylinder support straps.
- (8) Lift the two bottom cylinders clear of the lower cradle.

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TABLE 1  
NITROGEN SYSTEM COMPONENTS

Item No.	Component	Part No.	Ref.No.	No.off.
1	Charging point	48/Z5346	26FP/2501	1
2	Filter	-	6D/574	1
	Non-return valve	-	6D/427	1
3	Charging valve Mk. VIII		6D/223	1
4	Storage cylinders	2/P3172		6
5	Manifold	57/P3106		1
6	Pressure gauge	-	6A/2689	1
7	Test point	A58	28Y/15464	6
8	Feed valve	903/AA/01/L		1
9	Pressure-reducing valve 1,800 - 400 p.s.i.	ACM.16390	27VA/4816	1
10	Filter	-	6D/808	2
11	Pressure-reducing valve 400 - 25 p.s.i.	PAS/264/001	-	2
12	Electromatic tap	ACM.18008	27VA/4945	2
13	Non-return valve	ACM.17836	27VA/4956	2
14	Pressure-reducing valve 50 - 5.5 p.s.i.	ACM.20156		2