Chapter 10

OXYGEN SYSTEM

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DESCRIPTION

Introduction

1. Subsequent paragraphs contain a description of the oxygen system installed in the aircraft and give details of functional checks. Servicing of the system components is given in A.P.1275A, Vol.1, Sect.8; the method of charging is contained in Chapter 2 of that section. Details of the pressure-demand regulators are contained in A.P.1275G, Vol.1. Note that all the detailed information required to service the system and its components is at present being transferred to A.P. 1275G, Vol.1.

WARNING...

Oxygen and oil or grease will unite explosively. When handling equipment used in high-pressure oxygen systems, ALL OIL AND GREASE MUST BE KEPT OUT OF CONTACT WITH THE EQUIPMENT. Failure to do this may result in the loss of equipment or life.

General

2. Oxygen is carried in eight wire wound cylinders mounted four on each side of the bomb bay. Each cylinder is fitted with a five-way connection incorporating two non-return valves. A master valve Mk.8 in an oil tight cover labelled OXY in the nose-wheel bay is connected through a filter to the cylinders, enabling them to be charged simultaneously in situ; the correct charge pressure is 1,800 p.s.i.

HIGH-PRESSURE SYSTEM

3. From each bank of cylinders, separate high-pressure supply lines pass through the bomb bay rib, along the air intake ducting to the front spar and thence

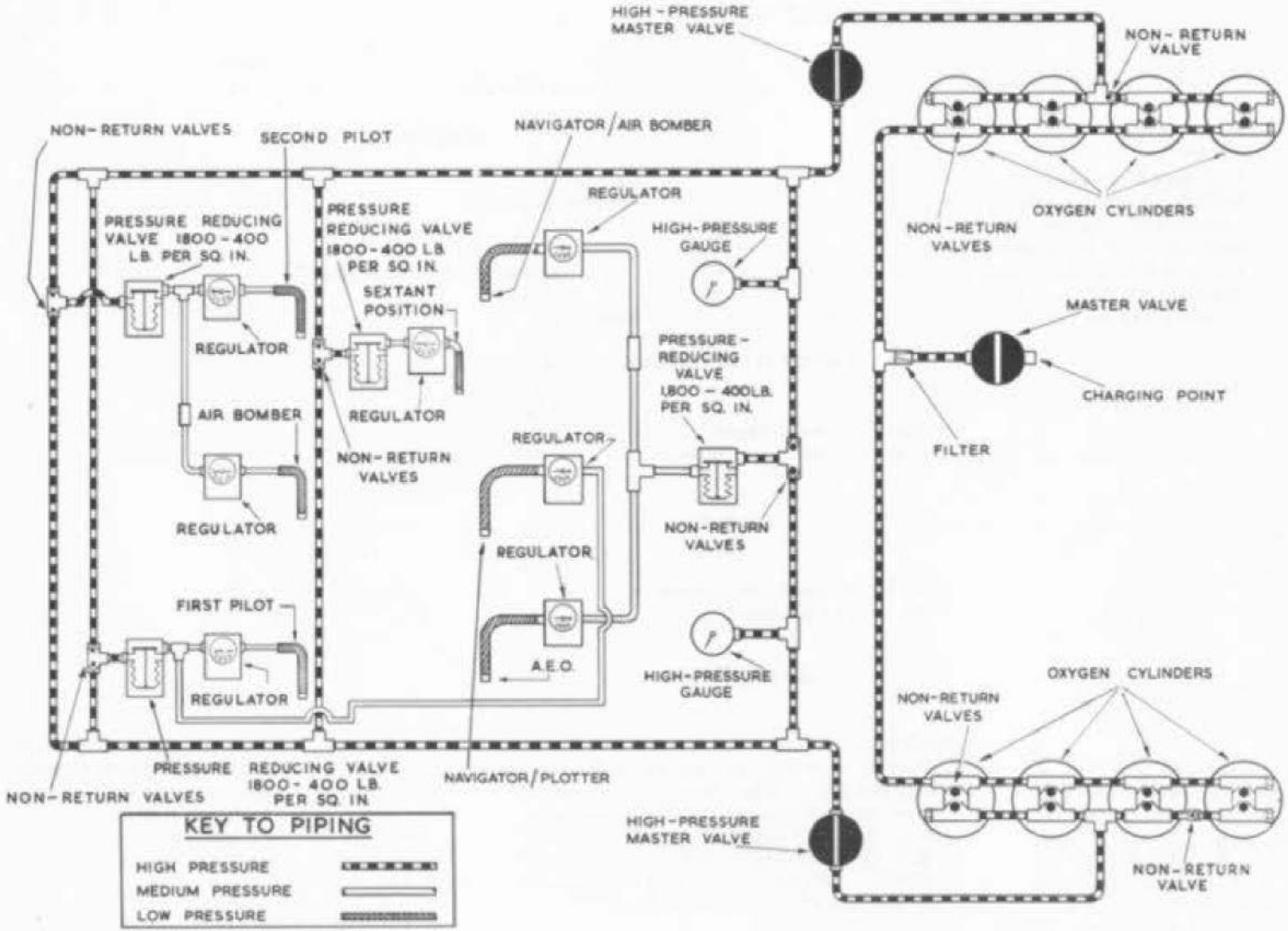

Fig. 1. Oxygen system diagram.

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through the rear pressure bulkhead to two master control valves mounted on the support struts of the crew's floor. The piping then continues along each side of the crew's compartment. Note that the master control valves are wire locked in the OPEN position and must only be closed when a regulator is removed or during servicing operations. The supply lines are joined at four positions by interconnecting lines, the junctions of which are effected by 3-way unions, the third branch of each union being joined by a short length of pipe, through a pressure reducing valve to the medium-pressure system (para.5). All 3-way unions contain two non-return valves so that should one supply line be punctured, then the non-return valve on the branch affected will close, owing to reverse pressure, and seal off the leaking pipe. Thus, only the oxygen in one group of cylinders will be lost.

4. Contents gauges, one to each group of cylinders and mounted on the crew's panel, receive their supply from tee-pieces interposed in the lines between the master control valves and the pressure-reducing valves.

MEDIUM-PRESSURE SYSTEM

5. Oxygen at a static pressure of 200/400 p.s.i. is supplied from four pressure-reducing valves to the crew's regulators and the sextant reading position regulator. Three of these valves are beneath the pilot's floor; one provides a separate low-pressure supply for the regulator at the sextant reading position, the second a common supply for the regulators of the First Pilot and the Navigator/Plotter and the third, a common supply for the regulators of the Second Pilot and the Air Bomber. The fourth, behind the crew's control and instrument panels supplies the regulators of the A.E.O. and the Navigator/Air Bomber.

LOW-PRESSURE SYSTEM

6. From each regulator, a short length of metal piping leads to low pressure tubing which conveys the oxygen to the face masks, Type 13A, of the crew members. The tubing for the First and Second Pilots is different, however, in that it passes below the floor to a pull-off connection adjacent to each seat. From this connection the supply passes through a flexible tube, clipped to the ejector seat, and terminates at a socket on the pilot's face mask; also connected to this tube is the emergency oxygen supply contained within the emergency seat emergency pack. The pull-off connection is so constructed that it will disengage when the seat is ejected and the socket will disconnect when the pilot leaves the seat.

TABLE 1

List of Principal Components in the Oxygen System

Component	Mk.	Ref. No.	Quantity
Adapter, regulator inlet	-	6D/1647	7
Cylinders, oxygen	10A	6D/9429900	8
Gauge, pressure	4	6D/2237	2
H.P. master valve	8*	6D/223	3
Oxygen regulator	17 or 17D	6D/1700	7
Pipe-line filter	1	6D/574	1
Socket, quick-release	10A	6D/1817A	5
Socket, quick;release	9	6D/1652	2
Tubing, 4 ft. to mask tube assembly	-	6D/1579	2
Tubing, 6 ft. to mask tube assembly	-	6D/1580	5
Union, blanking	1	6D/1497	6
Union, blanking, H.P. valve	-	6D/425	1
Valve, reducing	1	6D/1616	4
Valves, non-return	1	6D/427	26
Extension tube	-	6D/2223	1
Dual feed coupling	-	6D/2222	1

DESCRIPTION OF COMPONENTS

Equipment (high-pressure)

7. The high-pressure equipment used in the system, available from stores as designated in Table 1, is fully described in A.P.1275G, Vol.1.

Regulators

8. The pressure demand oxygen regulator, Mk.17, is described in A.P.1275G, Vol.1, Sect.2, Chap.5.

Portable oxygen

9. An extension oxygen feed tube, fitted with a dual feed coupling, is provided for use by the crew members when moving about the crew's cabin. The extension tube is used in conjunction with the normal oxygen feed points and, when not in use, is stowed in a polythene bag

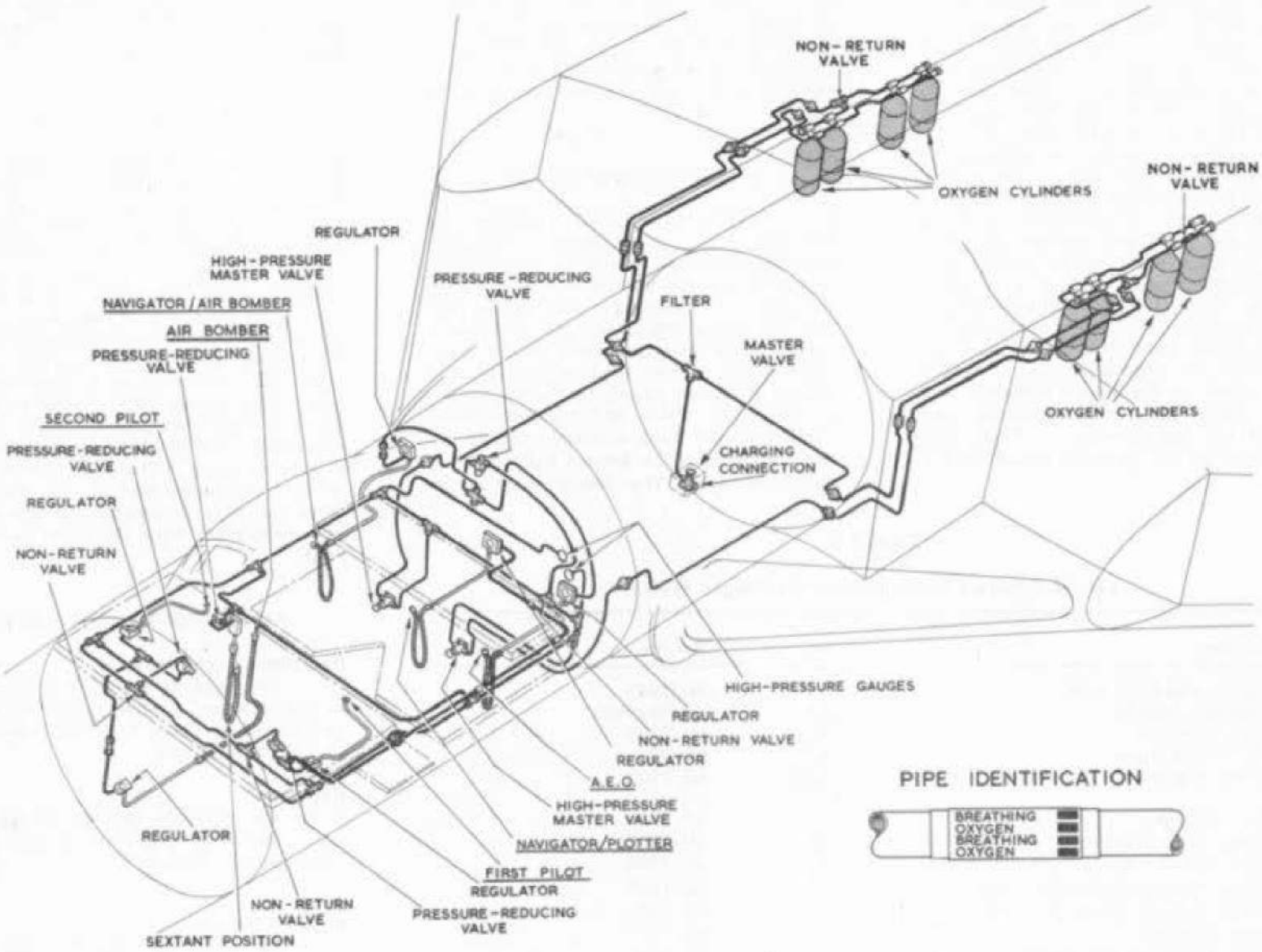

Fig. 2. Oxygen system installation.

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attached to the rear of the Navigator/ Air Bomber's seat. A mic./tel. lead, for use with the extension tube, is attached along the length of the extension tube.

Emergency oxygen

10. One emergency oxygen set, installed in each ejection seat, is operated automatically when the seat is ejected; the supply is, however, available in an emergency when the seat is not ejected. Manually operated knobs, painted yellow, are on the pilot's floor between the two ejection seats. When pulled, the knob releases the oxygen in the emergency set into the supply line to the relevant face mask.

SERVICING

General

11. Servicing of the high pressure components is detailed in A.P.1275G, Vol.1.

FUNCTIONAL CHECKS

12. A functional check of the system, in situ, can be conducted as follows:-

(1) Unlock and turn the master valves to OFF. Turn one regulator ON to exhaust any oxygen remaining in the system forward of the master valves.

(2) With the system fully charged, turn ON one of the master valves.

(3) Check the non-return valves and the master valve that is OFF for correct functioning by observing that one of the pressure gauges remains at zero

(4) Check the regulators in accordance with instructions in A.P.1275G, Vol.1, Sect.2, Chap.5.

(5) Turn OFF all regulators, and check the system for leakage by observing that the system pressure gauge reading remains constant for a period of 20 minutes.

NOTE...
If leakage is suspected it will be necessary to test the joints and all connections in the system using a soap solution; there should be no leak. It is found that leakage is generally caused by dirt on the nipple or branch mating face; this is remedied by cleaning and degreasing the faulty fitting. If the leak still persists, a renewal will be necessary. Always remove the remains of the soap solution on completion of the checks.

(6) Repeat items (2), (3) and (5) on the other half of the system and check that each regulator receives a pressure of 200/400 p.s.i.

(7) On completion of tests, wire lock the master valves in the open position and wire-lock all regulator ON - OFF valves in the ON position (ref. A.P.1275G, Vol.2, Part 1, leaflet No. C.1).

REMOVAL AND ASSEMBLY

General

13. No specific instructions for removal and assembly are necessary. Precautions to be observed when uncoupling oxygen system pipes or dismantling generally are contained in A.P.1275A, Vol.1, Sect.8.