Chapter 10 OXYGEN SYSTEM

(Completely Revised)

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DESCRIPTION AND OPERATION

Introduction

1. The pressure demand oxygen system is designed for high altitude flying in conjunction with a pressurized cabin. The oxygen flow to the pilot and observer is controlled by two pressure demand regulators. Economizers are not fitted because the regulators automatically provide varied flows of breathing mixtures according to altitude. Two oxygen cylinders are fitted behind bulkhead No.2. The cylinder pressure is indicated on a gauge mounted on the starboard side of the main instrument panel, and the pressure at each regulator is indicated on the regulator gauge. In addition to the 'blinker' flow indicator on each regulator, a similar magnetic 'blinker' indicator mounted on the instrument panel gives visual indication of the oxygen flow to the observer's mask. On aircraft with Mod.N.894 embodied, magnetic 'blinker' indicators for pilot and observer are mounted on the accelerometer bracket above the main instrument panel. Reference should be made to Sect.2, Chap.4 for identification of the oxygen pipe lines.

2. Fig.1 is a schematic diagram, showing the relative positions of the components and fig.2 shows the installation of the equipment and the pipe runs in the aircraft.

A full description, together with servicing instructions, of the components is given in A.P.1275A, Vol.1, and the regulator is fully described in A.P. 1275G.Vol.1.

WARNING

To avoid the risk of explosion, it is essential that all components and pipe lines of the system are kept free from oil, grease or moisture. Oil must not be allowed to splash on to the regulator as there is a risk that it may seep through the regulator inlet into the supply lines.

Oxygen regulators

3. Each regulator also acts as an economizer by the operation of an aneroid assembly, which increases the oxygen pressure as the air pressure decreases with altitude. A change-over from regulator to full pressure breathing is automatic with increase in altitude. If the diluter lever has been set at 100% OXYGEN position, pure oxygen (i.e. without air) will be delivered at all altitudes.

Regulator controls

4. The operation of the regulator (A.P.1275G, Vol.1) is controlled by the setting of the front panel controls as follows :-

(1) Diluter lever. The diluter lever at the top of the panel, is set to NORMAL OXYGEN for normal flight conditions, but in an emergency, or when a high rate of oxygen is required, it may be switched to 100% OXYGEN. When the lever is at this setting, the air inlet is closed. It is advisable to select 100% OXYGEN if there is any doubt about the purity of the cabin air.

(2) Oxygen control cock. The oxygen control lever, at the bottom of the panel, opens and closes the oxygen inlet valve. It must always be switched to OFF when the system is not in use.

(3) Emergency toggle switch. The emergency toggle switch, located below the pressure gauge, is used under emergency conditions such as lack of oxygen. The diluter lever must be set to 100% OXYGEN and the toggle

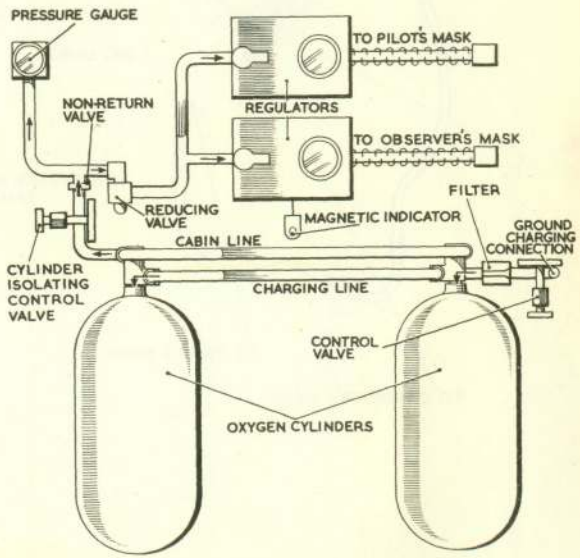

Fig 1 Oxygen system diagram

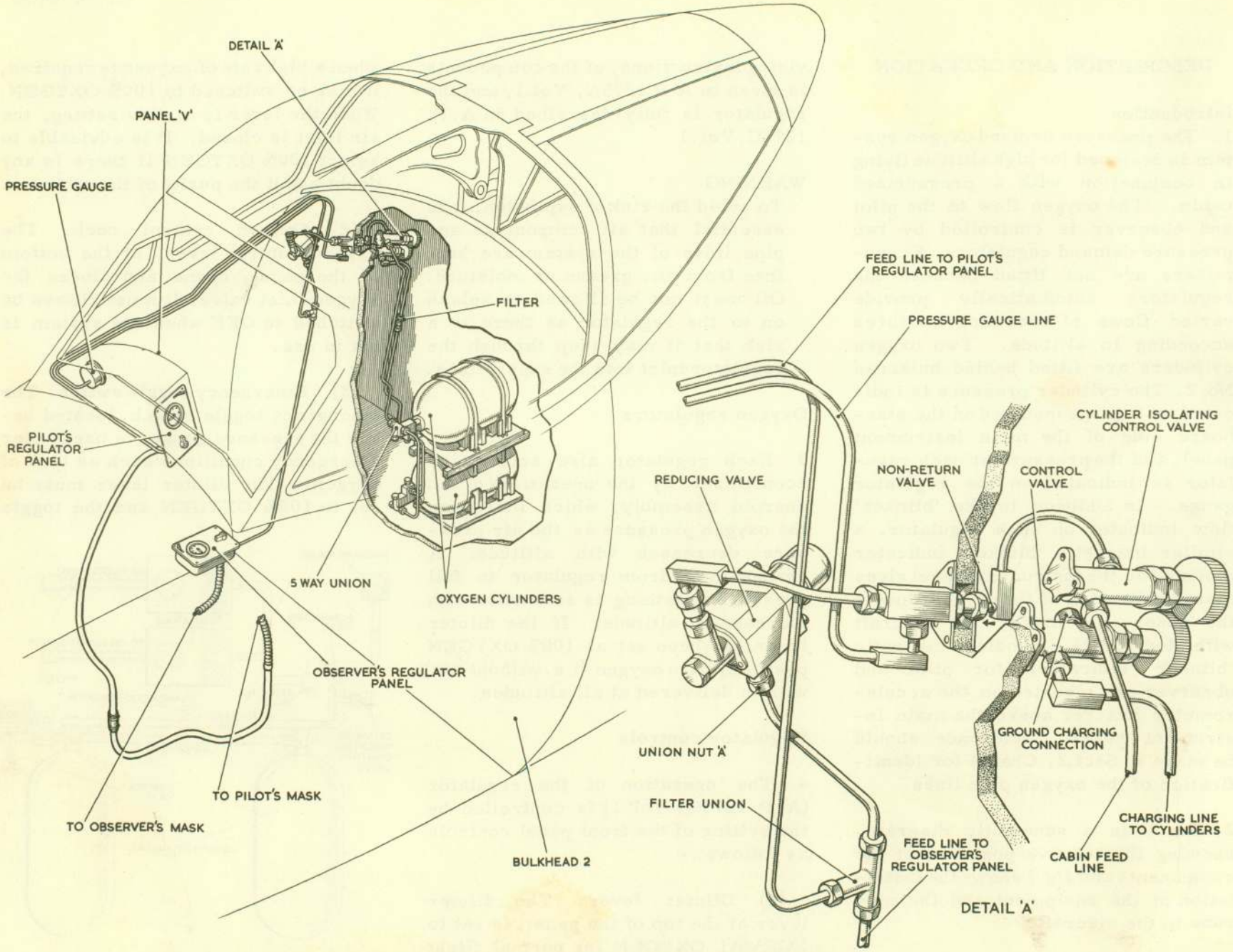

Fig. 2 Installation of oxygen equipment (pre Mod. N.894)

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switch pushed to either side to allow pure oxygen to be delivered at full pressure to the mask at high altitude. The toggle switch may also be used for testing the mask seal by delivering oxygen under pressure.

(4) Pressure gauge and flow indicator. A pressure gauge and flow indicator are combined in the centre of the panel. After the oxygen control lever has been turned ON, the pressure gauge will indicate the line pressure at the regulator, and the rate of movement of the four windows in the flow indicator shows the rate at which the user is breathing and correspondingly the flow of the oxygen. As the regulator panels are not readily visible in flight, the magnetic indicators (para.1) enable the oxygen flow to be easily checked.

SERVICING

General

5. The various components in the system must be inspected at the periods laid down in Vol.4 and details of the permitted servicing for each component are given in Volumes 1 of A.P.1275A and 1275G.

Charging

5. The oxygen cylinders may be charged in situ from an external supply. The charging connection (fig.2), which is integral with a control valve, is mounted on the aft face of bulkhead No.2 and is accessible through the starboard ammunition loading door aperture. Each cylinder should be charged to a pressure of 1,800 p.s.i.

WARNING

Special care must be taken to keep oil, grease or moisture away from the vicinity of the charging connection.

Test dates of oxygen cylinders

7. The dates on which the oxygen cylinders were last removed for testing are stencilled on the upper of the two cylinders. These may be inspected by opening the port ammunition loading door.

REMOVAL AND ASSEMBLY

General

8. All components of the system, with the exception of the cylinders, are mounted in easily accessible positions in the aircraft, and the procedure for their removal will be readily apparent. Before the cylinders are removed, all pressure must be released at the reducing valve as indicated in para.9. The oxygen must be allowed to escape slowly until the main pressure gauge reads zero, and blanking caps must be fitted at all points where connections are broken. If any component forward of bulkhead No.2 is to be removed, the cylinder pressure may be isolated by closing the cylinder isolating control valve.

WARNING

The cylinder isolating control valve must be wire-locked in the fully open position before flight.

Removal of the cylinders

9.(1) Remove the radio installation and mountings.

(2) Unscrew the union nut 'A' (fig. 2) slowly to release the pressure.

(3) Disconnect the pipe lines from the five-way union on the upper cylinder.

(4) Release the securing straps and remove the top cylinder.

(5) Remove the upper cylinder bearers and withdraw the lower cylinder complete with pipes.

Assembling the cylinders

10. The recommended sequence of operations is in the reverse order to that given above. All pipes must be free from grease and blown through with a clean air blast, and parts wire-locked where applicable. The valve assembly on the upper cylinder must be positioned so that the test dates, stencilled on the side of the cylinder, may be readily inspected through the port ammunition door aperture.

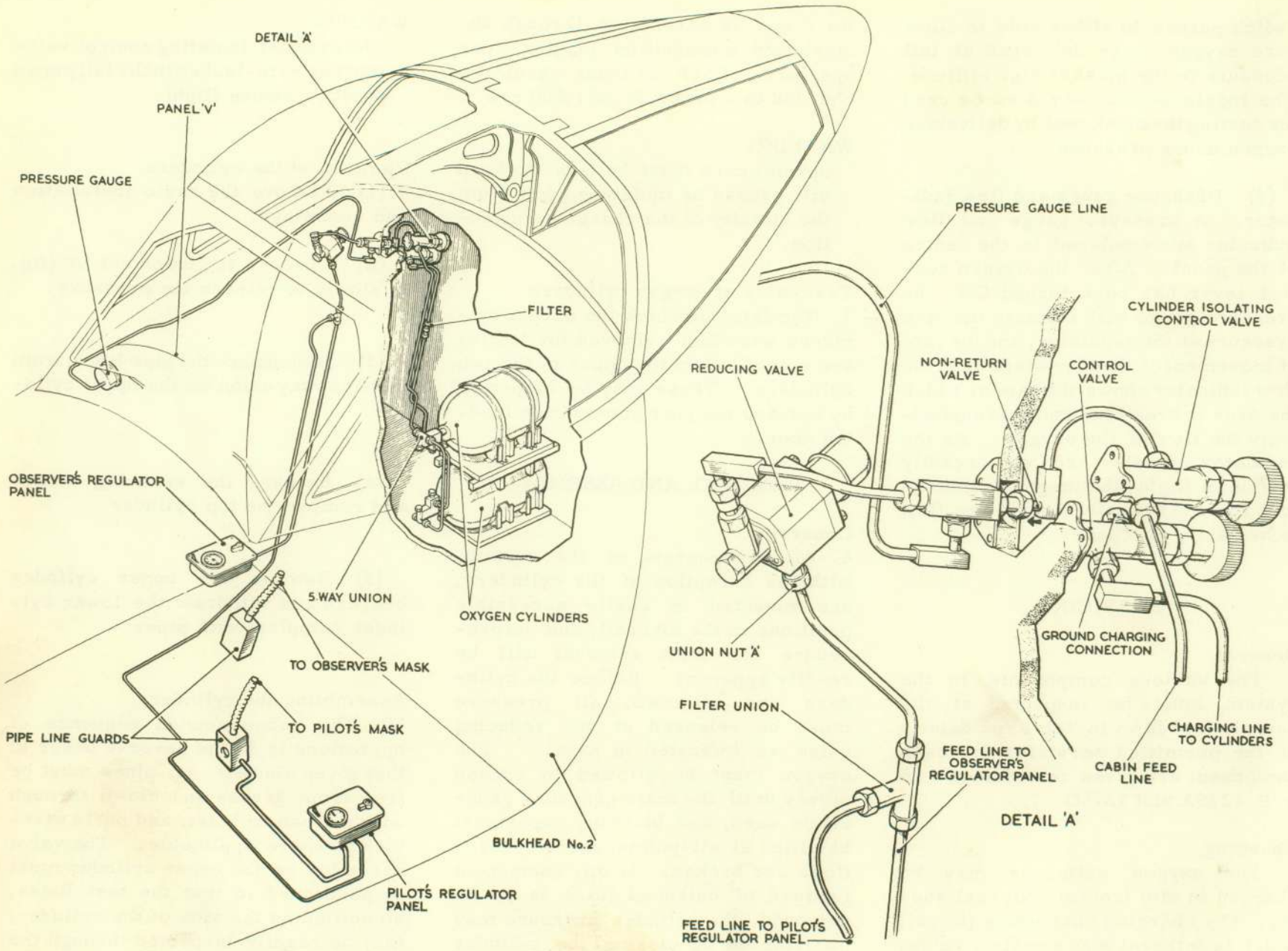

Fig.3 Installation of oxygen equipment (post Mod. N.894)

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