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Chapter 10. OXYGEN SYSTEM

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Introduction

1. This chapter contains a description of the oxygen system, together with details of the servicing necessary to maintain the installation in an airworthy condition. An illustration of the system is also included. For a detailed description of the components employed in the system, reference should be made to the relative equipment publication. ▶

DESCRIPTION AND OPERATION

General

2. The oxygen system of this aircraft consists of a pressure demand type of installation and an emergency supply which is independent of the main system. The demand supply is obtained from two high-pressure oxygen cy-

linders and is fed to the pilot's oxygen mask through a line filter, pressure reducing valve and a demand regulator. The cylinders may be recharged in situ or, alternatively, may be replaced by fully charged cylinders. A gauge in the cabin is provided to indicate the contents of the cylinders. The emergency supply is obtained from a small emergency cylinder which is mounted on the pilot's seat.

NOTE: PROTECTIVE COVERS, OVER VALVES A, B & C ARE OMITTED FOR CLARITY

AIR DIAGRAM
7600K/MIN.
HUNTER GA MK.11
PREPARED BY MINISTRY OF AVIATION
FOR PROMULGATION BY
ADMIRALTY

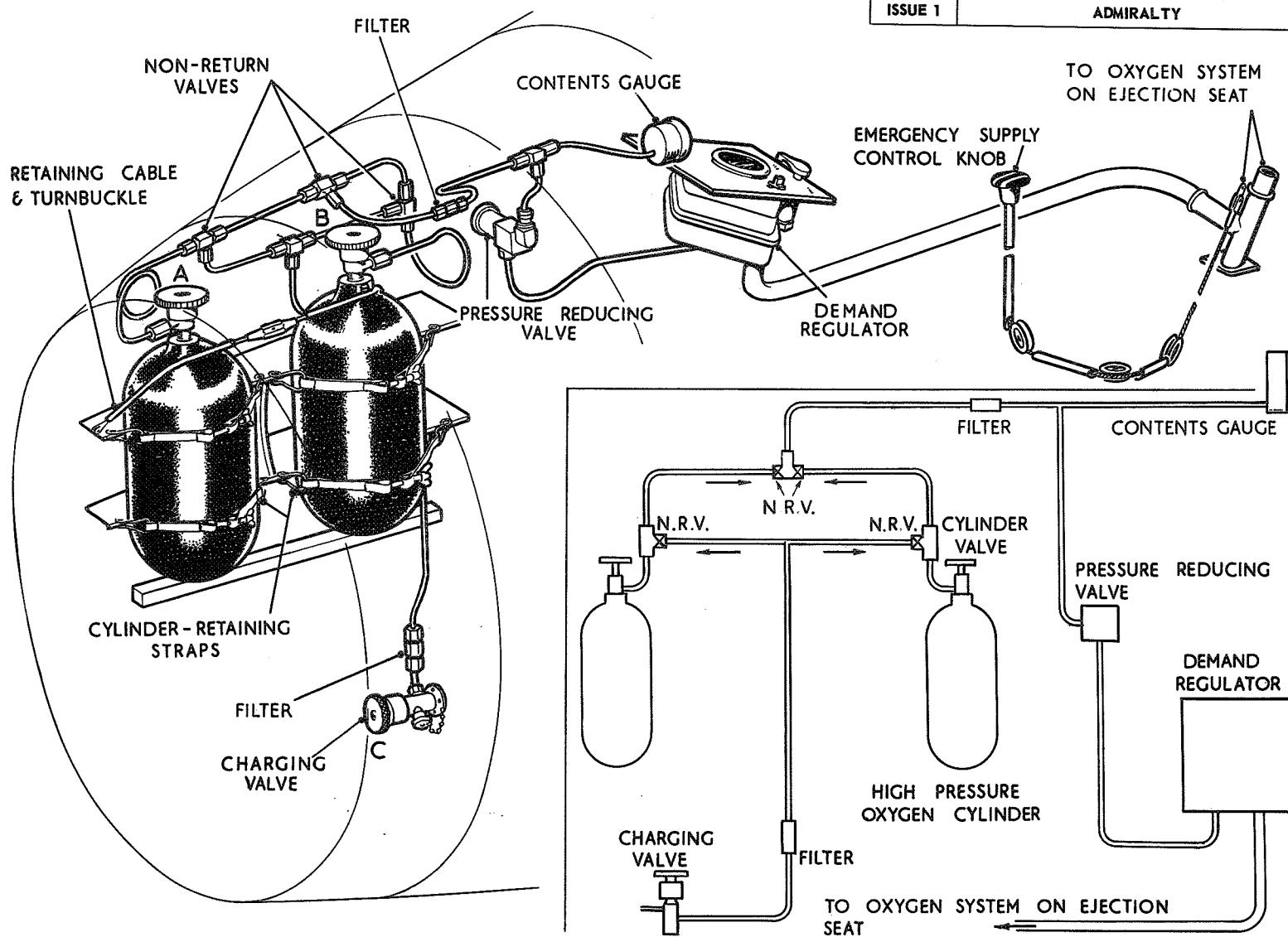


Fig.1. Oxygen installation and diagram

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Oxygen cylinders

3. The 750 litres, oxygen cylinders are installed side by side in the nose wheel bay where they are secured by wing nut tensioned straps to support structure on the starboard side of the bay between frames 4 and 6. The cylinders are mounted with their valves uppermost and rest on a support tube on the bottom of the mounting. A retaining cable, passing over the top of the cylinders, is tensioned by a turn-buckle to prevent the cylinders from moving from the support tube. The valve at the top of each cylinder is provided with a protective cover to ensure that the valves are kept free from oil and grease.

Pressure reducing valve

4. The pressure reducing valve, which reduces the pressure of the oxygen to the required value, is mounted in a clip bolted to the rear face of frame 7 on the starboard side of the aircraft.

Demand regulator

5. The demand regulator is located at the forward end of the cabin starboard shelf and is used to control the installation. The controls consist of an ON-OFF valve, an air cut-off lever and an emergency toggle switch, together with a pressure gauge and flow indicator. When once turned on, the regulator is fully automatic and supplies oxygen in accordance with the pilot's demand in direct relationship to his breathing rate and strength at all times from sea level to a cabin altitude of 50 000 feet.

◀ The regulator is described in detail in the relative equipment publication. ►

Charging valve

6. The charging valve is mounted on the forward face of frame 6, just below the oxygen cylinders. The valve is provided with a protective cover to keep it free from oil and grease. Access to the valve may be gained via the nose wheel aperture and the method of using the valve is described in the relative equipment publication. ►

Pressure gauge (contents)

7. An oxygen pressure gauge, the dial of which is marked to indicate capacity instead of pressure, is provided to indicate the contents of the oxygen cylinders. It is mounted on the bottom of the starboard instrument panel, just above the oxygen regulator.

Filters

8. Filters, are incorporated in the pipe-line from the charging valve to the cylinders and in the pipe-line from the cylinders to the pressure gauge and reducing valve.

Non-return valves

9. Non-return valves are incorporated in the branch pipes from the charging line to the cylinders and in the pipe lines leading from the cylinders to the three-way connector from which the delivery pipe connects with the pressure gauge and reducing valve.

Operation

10. Oxygen leaves the cylinders at high pressure and flows through the non-return valves and a pipe-line filter to the pressure gauge and reducing valve. Leaving the reducing valve at the required pressure, the oxygen flows to the demand regulator where the correct amount of air, depending on the aircraft's altitude, is added, and this air and oxygen mixture is delivered through a pipe which terminates in a quick-release connection which is secured to the cabin floor on the starboard side of the pilot's ejection seat. From this connection, a flexible pipe, clipped to the side of the seat and the pilot's safety harness, is plugged into the pilot's pressure breathing mask via a further quick-release connection. The lower of the quick-release connections is automatically disconnected when the seat is ejected, and the upper one when the pilot leaves the seat after ejection. A plug, attached to the lower connection by balloon cord, is used to seal the connection when the pilot's flexible demand pipe is, under normal conditions, disconnected.

Emergency supply

11. The emergency oxygen supply for use in the event of failure of the main system, or during ejection, consists of a small oxygen cylinder which is mounted on the pilot's seat. ► The cylinder is brought into service by means of a static line when ejection action is taken, or by pulling a control knob on the side of the cabin starboard shelf when the main system fails in flight.

SERVICING

WARNING

No oil or grease must be permitted to come into contact with the oxygen cylinders or any part of the system. It is particularly important, therefore, to ensure that the protective covers for the cylinder valves and charging valve are replaced immediately after servicing.

General

12. The servicing of the oxygen system consists of ensuring that the installation is maintained in a scrupulously clean condition, checking that the oxygen cylinders are fully charged, that the cylinder valves are in the fully open position and periodical cleaning of the filters (para.13). The procedure for charging the cylinders is described in the relative equipment publication. The valves are only accessible after removing the protective covers. The system should be examined to ensure that no damage has occurred and that all components are securely mounted. If the cylinders are removed, and are not to be immediately replaced, the open ends of the pipes must be protected by blanking connections (Ref.No. 6D/237), and on the tee-pieces, etc., blanking unions (Ref.No.6D/1497) should be used. It is important to ensure that, after the reassembly of any components or pipe lines, any arrows existing on such components or pipes point in

the direction of flow, as otherwise the system will be rendered inoperative. Examine the quick-release connections and the emergency oxygen static line to ensure that they are correctly assembled and check the emergency control on the side of the cabin starboard shelf for freedom of movement. The maximum pull-off load of this control, with the system completely assembled, must not exceed 30 lb. When the pilot's ejection seat is removed, or the pilot's demand tube is disconnected from the quick-release connection, the plug, fastened by balloon cord, must be inserted into the quick-release connection to prevent the ingress of foreign matter. The only other servicing necessary is the standard serviceability and operational tests of the components, details of which will be found in the relative equipment publication. ▶

Filters

13. At those periods laid down in the servicing schedule, the filters incorporated in the pipe lines (para.8), accessible only after disconnection of the pipe connections, should be examined for cleanliness and renewed, if necessary. These filters, being essentially small, may easily be mislaid, lost altogether or forgotten. It is essential, therefore, to ensure that they are refitted when pipe lines are being reassembled. It is essential also to ensure that they are fitted the right way round, i.e., so that the direction of flow through the filter is from the closed end to the open end of the filter. ▶

REMOVAL AND ASSEMBLY

General

14. The procedure for removing the reducing valve, pressure gauge and oxygen regulator is obvious, but care must be taken to ensure that the valves on the oxygen cylinders are closed before any pipe lines or components are disconnected. The procedure for changing the oxygen cylinders is described below.

Oxygen cylinders

15. Access to the oxygen cylinders is obtained through the nose wheel aperture in the fuselage. The procedure for changing the cylinders is as follows:—

- (1) Remove the protective cover from each cylinder valve.
- (2) Turn the valve on each cylinder to the closed position. ▶
- (3) Unscrew the pipe coupling at the neck of each cylinder and carefully ease the pipes away until they are clear of the cylinders.
- (4) Cut the locking wire securing the wing nuts on the straps around each cylinder, slacken off the wing nuts and disengage the straps. Cut the locking wire securing the turnbuckle and slacken the retaining cable at the

top of the cylinders sufficiently to free the cylinders.

(5) Remove the cylinders.

(6) Place the fully charged cylinders in position and reverse the operations for removal above. After refitting the pipe couplings to the cylinders, turn the valves on the cylinders to the fully ON position and replace the protective covers. Finally, wire-lock the wing nuts securing the restraining straps and the turnbuckle tensioning the retaining cable holding the cylinders with 22 s.w.g. stainless steel wire D.T.D.161 or 189.

Replacement of emergency oxygen control cable

16. If it is necessary to replace the emergency oxygen control cable on Pre-Mod.282 or Post-Mod.967 aircraft, a new link from the control cable to the connection on the emergency oxygen bottle may be required and should be fitted as follows. Fit the new link Pt.No. F.248510 to the hook on the oxygen bottle assembly, offer up the control cable to the link leaving just enough slack to allow the link to be removed from the hook and mark off the fixing position on the link. The excess length of link should be trimmed off as shown in the Vol.2 leaflet.

Lubrication

17. The following lubricants should be used on the installation:-

XG-273 for emergency control cables.

ZX-22 for locking and sealing the inlet adaptor, 6D/1647, in the demand regulator.



◀ Distilled water may be used as a lubricant when assembling flexible hoses to fittings. ▶

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