

Chapter 9

PERSONAL EQUIPMENT CONNECTOR (NORMALAIR)

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Introduction

1. The Normalair type of P.E.C. is used in conjunction with the Mk. 4GT/1 and Mk. 4GT/2 ejection seats installed in the Gnat T Mk. 1 aircraft. It is designed to couple and uncouple the main oxygen and Mic/Tel systems from the appropriate aircraft supplies by a single action. On ejection, all services (except the emergency oxygen) are disconnected automatically. It is to be noted that a separate hose is used for the anti-g suit air supply and this also is disconnected on ejection.

General description

2. The complete system comprises three interconnected assemblies: a personal component in the form of a mask tube assembly, a combined seat hose assembly and a floor socket assembly. The personal component consists of a Type G flying helmet, a helmet connector and an Oxy/Mic/Tel Type P mask. This assembly connects to a socket of the combined seat hose assembly, which in turn plugs into the floor socket assembly. The latter assembly is secured permanently to the aircraft floor and connected to the aircraft oxygen supply and Mic/Tel services. The emergency oxygen supply tube is connected to the seat hose assembly which is secured to the combined harness.

3. Between flights, the combined seat hose assembly is connected to a stowage fitted on the starboard side of the cockpit coaming. The stowage is used to prevent damage and the ingress

of foreign matter into the system. It is to be noted, however, that if the aircraft is flown solo, the seat hose assembly not in use is to be connected to the "in-flight" stowage assembly.

Mask tube assembly (fig. 2)

4. Electrical leads are taken from the four annular contact rings of the mask tube plug to leads moulded to the outer wall of the mask tube. The telephone leads are connected to a socket which mates with the helmet connector plug, and the microphone leads are connected to the mask microphone.

5. Two external bayonet pins are fitted to the mask tube plug. These pins must be inserted fully into the socket slots of the seat hose assembly before the electrical circuit can be established between the plug annular rings and the socket contact blades.

Seat hose assembly (fig. 3)

6. This assembly consists of a combined services connector coupled by means of $\frac{3}{4}$ in. bore anti-kink hose and 5-core electrical cable to a disconnect plug. The combined services connector incorporates a locking socket in which four spring-loaded contact blades are located. The contact blades are coupled by means of the 5-core cable to the annular rings of the disconnect plug. The outer sleeve of the socket is spring-loaded and has two bayonet slots

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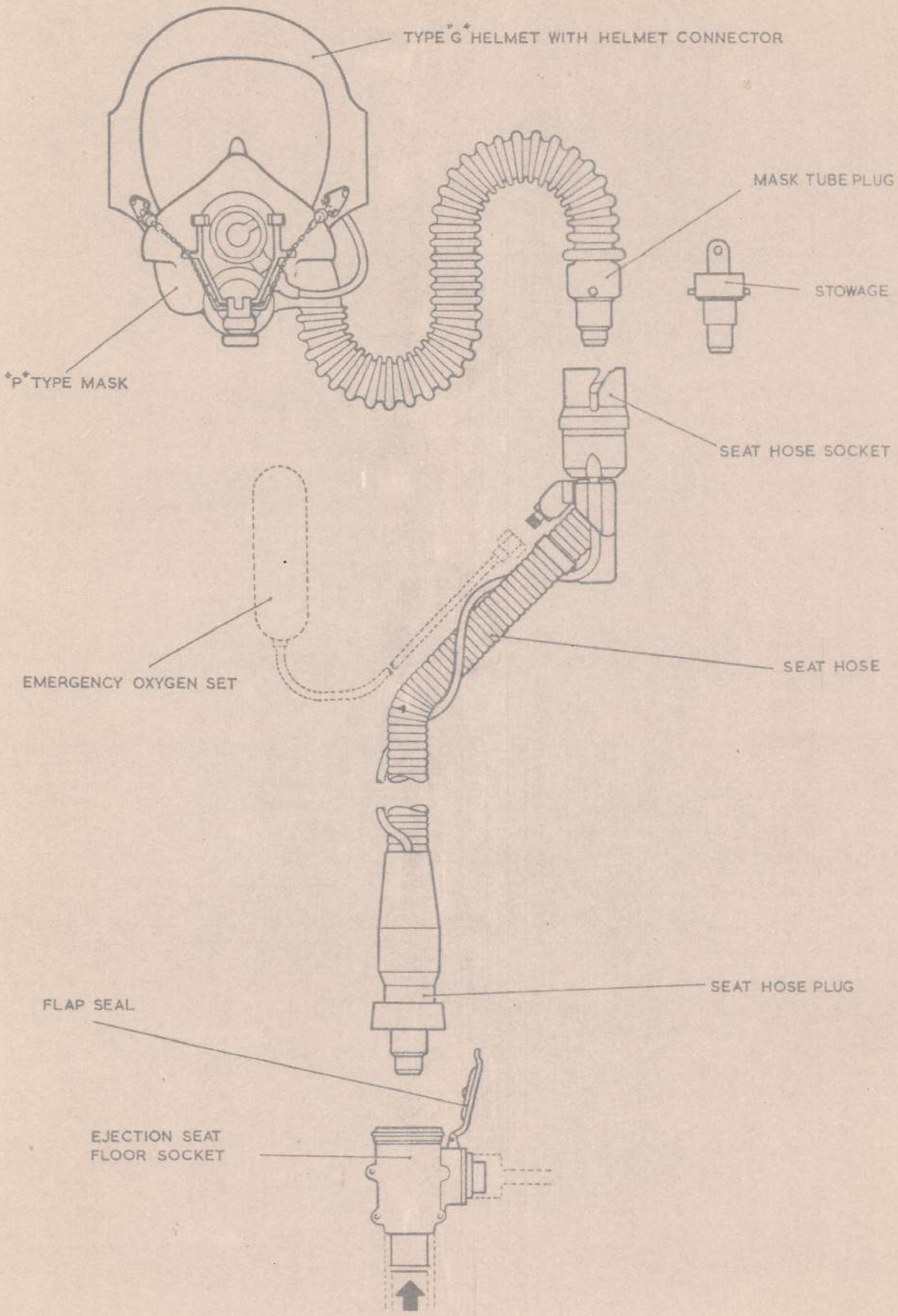


Fig. 1. General arrangement of Oxy/Mic/Tel system

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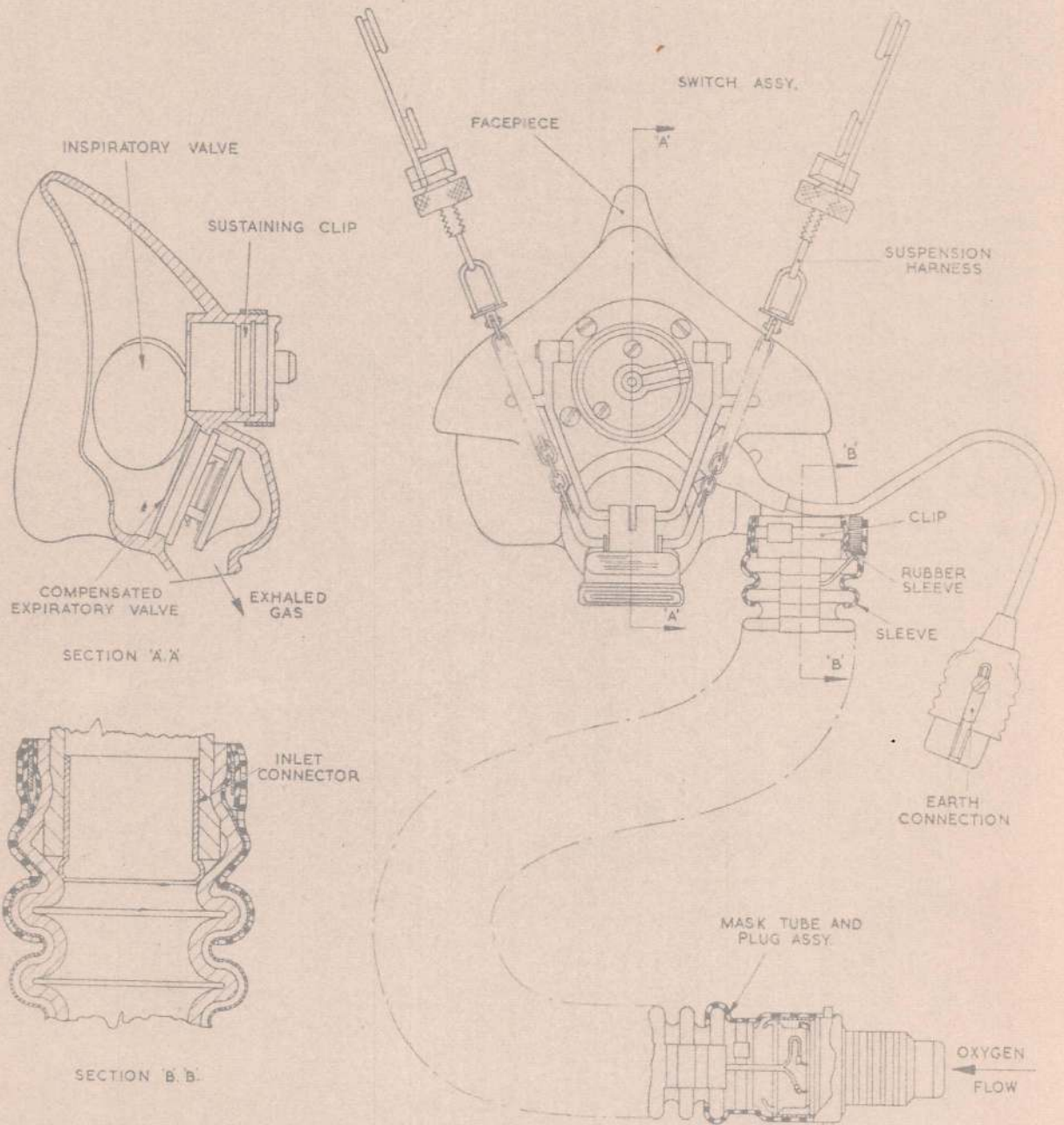


Fig 2. Details of mask tube assembly

which, when the outer sleeve is fully depressed, are aligned with identical slots on the inner sleeve. When the mask tube plug is inserted fully into the socket, the outer sleeve returns to its normal position, so locking the plug bayonet pins. The external surface of the socket is knurled to facilitate manual movement.

7. A relief valve is incorporated to prevent excessive pressures occurring in the supply line when using the emergency oxygen, and a

mushroom-type non-return valve is fitted to prevent loss of oxygen delivered from the normal aircraft supply.

8. The disconnect plug is similar to that fitted to the mask tube, except that a metal sleeve is fitted instead of the bayonet pins. The sleeve is provided with an annular groove to receive the split ring of the floor socket. This ensures that a definite load is required to separate the plug from the socket. A kettle-type non-return valve fitted to the plug prevents the loss of oxygen after separation.

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Floor socket assembly (fig. 4)

9. The assembly consists of a socket housed in a light alloy body and connected internally to a Breeze-type electrical socket. A split ring located in an external groove in the body retains the seat hose plug when the components are mated and locked; a pull-off load of between 30 lb. and 60 lb. is required to separate the plug from the socket.

USING THE EQUIPMENT

Before flight

10. With the Type P mask fitted in the rest position and the user in the ejection seat, the procedure is as follows:—

- (1) Assemble the combined harness.
- (2) Fit the mask to the face.
- (3) Insert the mask tube plug into the seat hose socket with a twisting action; the plug may be rotated in the socket if necessary to remove kinks or twists from the mask tube.
- (4) Switch on the power supply and operate the Mic/Tel services. If communication is established, the mask is correctly connected to the oxygen system and the user may proceed with pre-flight checks.

- (5) Conduct a transmission and receiving test and at the same time stretch and manipulate the mask tube and apply tensile side loads to the plug/socket joint; there must be no interference or interruption of the transmission.

Normal flight

11. It should be noted that the system is so designed that the Mic/Tel circuit is broken before oxygen leakage can occur due to partial disconnection of the mask tube plug. In the event of communication failure, the joint must be checked immediately.

Failure of the oxygen regulator

12. If the regulator fails during flight, the emergency oxygen set is to be operated manually. The mask should not be disconnected from the normal oxygen supply, otherwise communication will be broken. It is essential, however, that the regulator air inlet control is set at NORMAL if the flight is to continue at a safe altitude.

Disconnecting the mask tube assembly

13. To separate the mask tube plug from the connector socket, slide the outer sleeve of the socket downwards with one hand and withdraw the plug with the other. Release the combined harness and fit the combined seat hose socket to the stowage on the starboard side of the cockpit coaming.

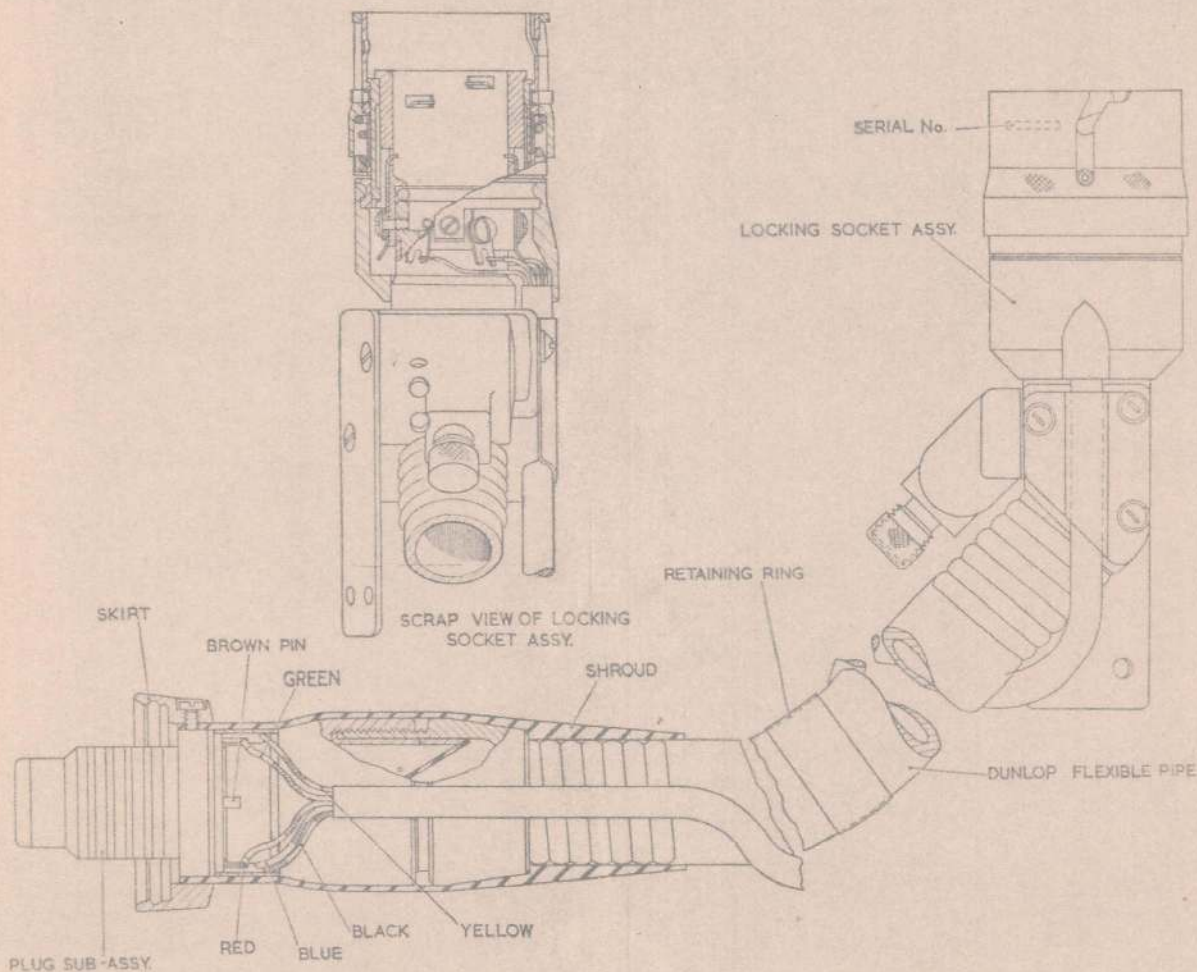


Fig. 3. Details of seat hose assembly

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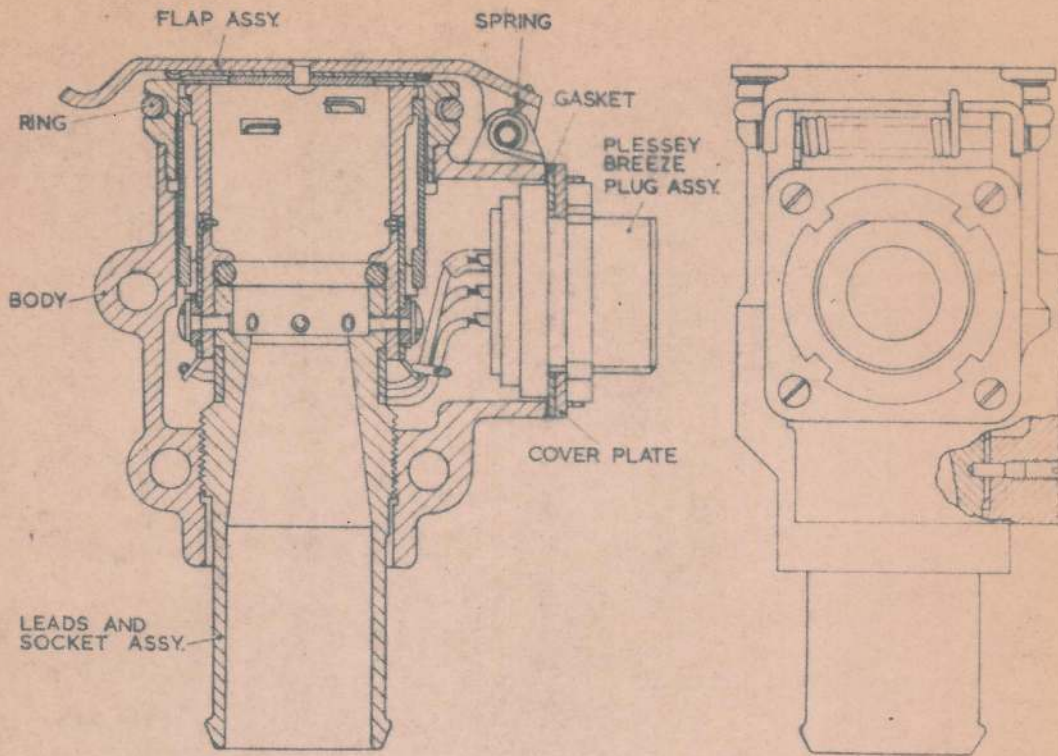


Fig. 4. Details of floor socket assembly

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