

Chapter 5

LIQUID OXYGEN PACKAGE UNIT (803865)

Ref. No. 6D/2878

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Introduction

1. The oxygen package unit, Type CP11/10, Ref. No. 6D/2878 is a 10 litre capacity liquid oxygen system provided with facilities for quick interchangeability within a particular type of aircraft. Basically, this equipment is similar in principle and application to earlier type of liquid oxygen package units, but differs in the method of security of attachment of the complete unit. Also it differs in respect of the type and disposition of certain components.

DESCRIPTION

2. This equipment consists of the following:—

Description	Part No.	Ref. No.	Type
(1) Container	805141		LGC12A
(2) Fill and vent valve	802722	6D/2838	FVB6
(3) Pressure control valve	801427	6D/2699	PVC1
(4) Liquid check valve	801419	6D/2264	NRV.23
(5) Contents gauge control unit	802213	6D/2362	CMB2
(6) Contents indicator	803161	6D/2605	CID8
(7) Cable and plug assembly	804846	6D/2955	TC5
(8) Cradle	804715	6D/2842	

Container (805141)

3. This is a spherical-shaped vacuum insulated container as used in earlier type liquid oxygen package units, but differs in respect of its capacity. It is a 10-litre capacity container surrounded with a panel type heat exchanger unit

position of the aircraft vent pipeline. Details of fill and vent valves are given in Section 1, Chapter 1.

Pressure control valve (801427) Ref. No. 6D/2699

5. The pressure control valve is standard equipment for this type of liquid oxygen system, and

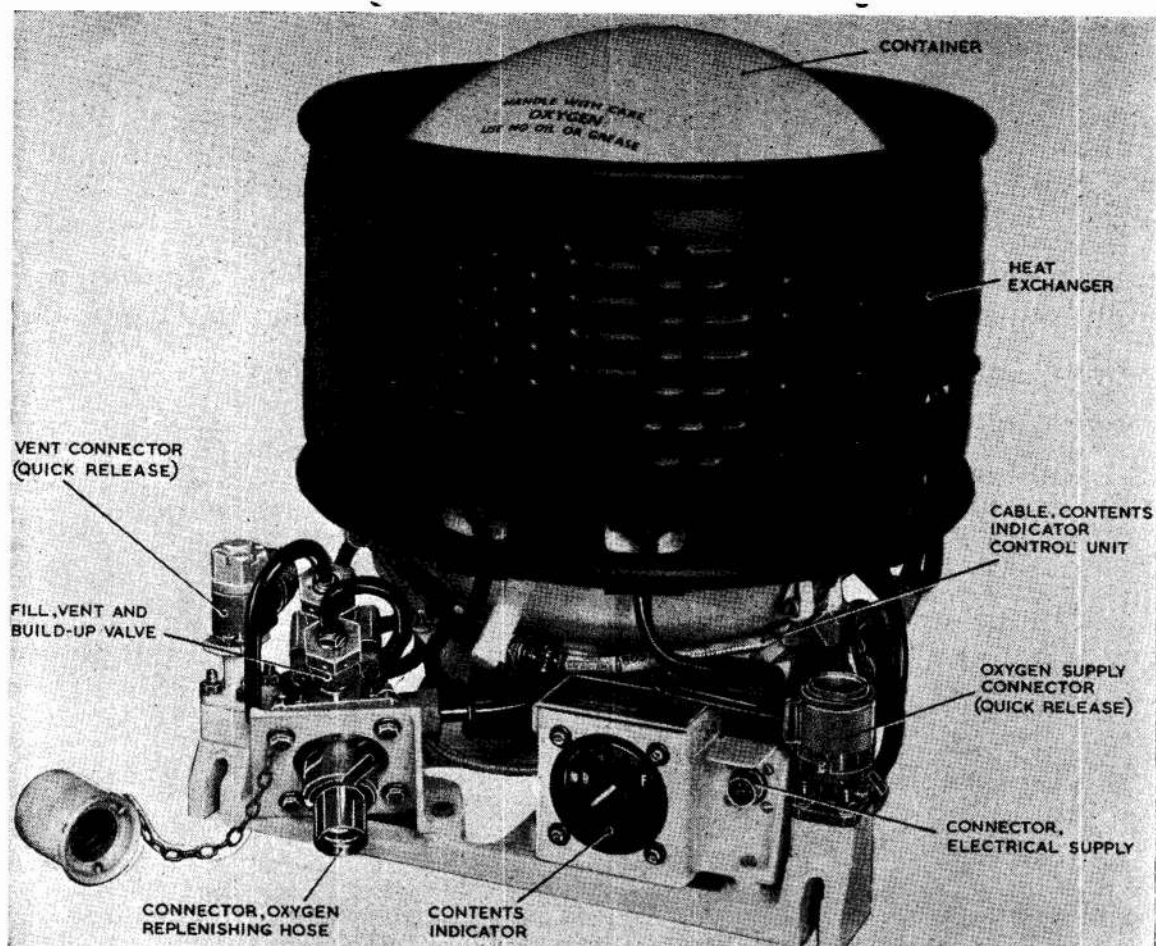


Fig. 1. Liquid oxygen package unit, Ref. No. 6D/2878 front view

differs only in its location in the installation. In this instance it is mounted on the base of the cradle assembly at the rear of the unit. For further details of pressure control valves reference should be made to Section 1, Chapter 2.

Liquid oxygen check valve (801419) Ref. No. 6D/2264

6. The liquid oxygen check valve is a 4-way non-return valve which permits the flow of oxygen in one direction only. It is a simple free moving poppet type valve accommodated in a light-alloy casting. Three of the pipeline connections are of the conical male type, the other connection takes the form of a $\frac{3}{8}$ in. B.S.P. union. Liquid check valves used in liquid oxygen systems are given in Section 1, Chapter 3.

Contents gauge control unit (802213) Ref. No. 6D/2362

7. The contents gauge control unit embodies an oscillator, amplifier and capacitance bridge assembly. It is clamped to the base of the cradle with its electrical connectors and adjusters extending outwards to facilitate the calibration of the liquid oxygen contents gauge. The two calibration adjusters are marked SET EMPTY and SET FULL, a later modification introduced adjusters marked SET LOW and SET HIGH. Details

of the procedure necessary to carry out calibration checks are given in Part 1, Section 3, Chapter 3 of this publication. The contents gauge control unit is described in Section 2, Chapter 1.

Contents indicator (803161) Ref. No. 6D/2605

8. The contents indicator is shown in fig. 1. It is fitted into a light-alloy casting which is secured to the base of the cradle. The current to operate this indicator is supplied from the capacitance bridge (para. 7) which depends for its action on the difference in dielectric constant between gaseous and liquid oxygen, which may be measured as a difference in capacitance according to the level of liquid in the container. The change in capacitance into variations of current is effected by the contents gauge control unit which is described in Section 2, Chapter 1. For further details of the contents indicator, reference should be made to Section 2, Chapter 2.

Cradle

9. Referring to fig. 1 and 2, the cradle is a triangular-shaped light-alloy casting embodying fabric-lined light-alloy shoes which supports the container. Security of attachment of the container in the cradle is by means of metallic straps and strainer bolts located in alignment with the light-alloy shoes. The clevis end of the strainer

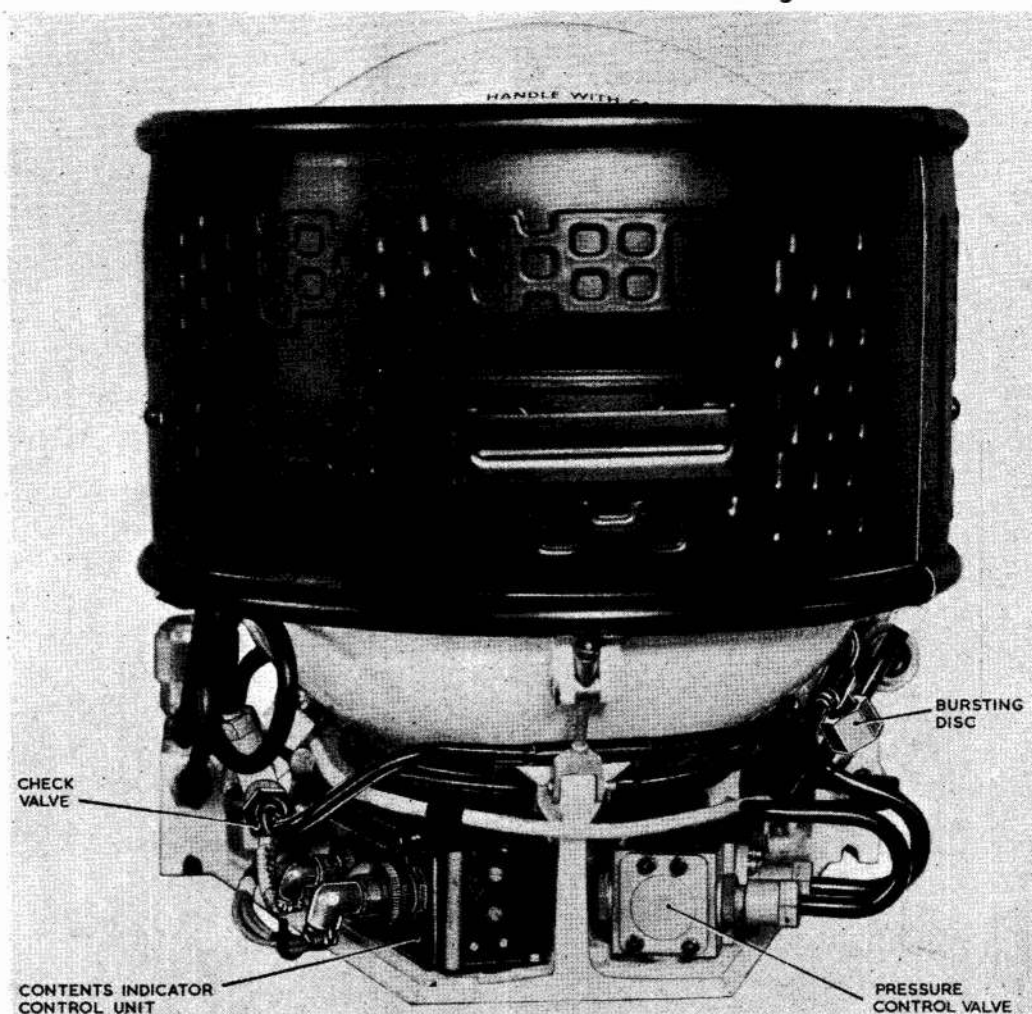


Fig. 2. Rear view

bolts are anchored to the shoes and the container is clamped down on the shoes via the strap assembly

10. Referring to fig. 1 and 2 the contents gauge control unit, pressure control valve and contents indicator are secured to the base of the cradle, whilst the fill and vent valve is mounted on a bracket assembly and inclined downwards.

11. This package unit incorporates two quick release connections, i.e. vent and oxygen supply lines which are mounted on spacer brackets at the front of the unit. Immediately below each bracket the cradle is slotted to accommodate a bolt and nut which secures the package unit in the aircraft. A small casting which retains the contents indicator, also contains the 4-pole socket for the electrical supply cable.

Bursting disc

12. A bursting disc is provided in the system and it is located in a tee-piece shown in fig. 3. It is a fully annealed pure aluminium disc which fails

under excessive pressure resulting from malfunctioning of the pressure control valve. Once the bursting disc has fractured it will be necessary to locate the reason for failure before a new disc is fitted. They are designed to burst at pressures in excess of 225lb./in²g and not more than 300lb./in²g over the ambient range.

Quick release connectors

13. The vent and supply quick release connectors are provided so that, in conjunction with the base fixing bolts, the complete unit is readily removed and replaced. The couplings are connected/disconnected as shown in fig. 1. After removing two bolts from the cradle and disconnecting the electrical supply, the package unit is withdrawn from aircraft. These are socket type connectors (fig. 4) embodying rotatable outer sleeves. When set to the uncoupled position the sleeve is rotated so that a dowel pin is located in a slot. The pipeline is then inserted into the socket and the sleeve rotates to register with a further slot where it will be in the locked position.

RESTRICTED SERVICING

14. With the exception of general inspection for cleanliness and security of attachment of pipe line connections, very little servicing is required. The removal of the complete unit for Bay Servicing will only be necessary when its function is suspect or at periods specified in the appropriate Aircraft Servicing Schedule. For general information in respect of Purging and Fault Finding, reference should be made to Part 1, Section 3, Chapter 3 of this publication.

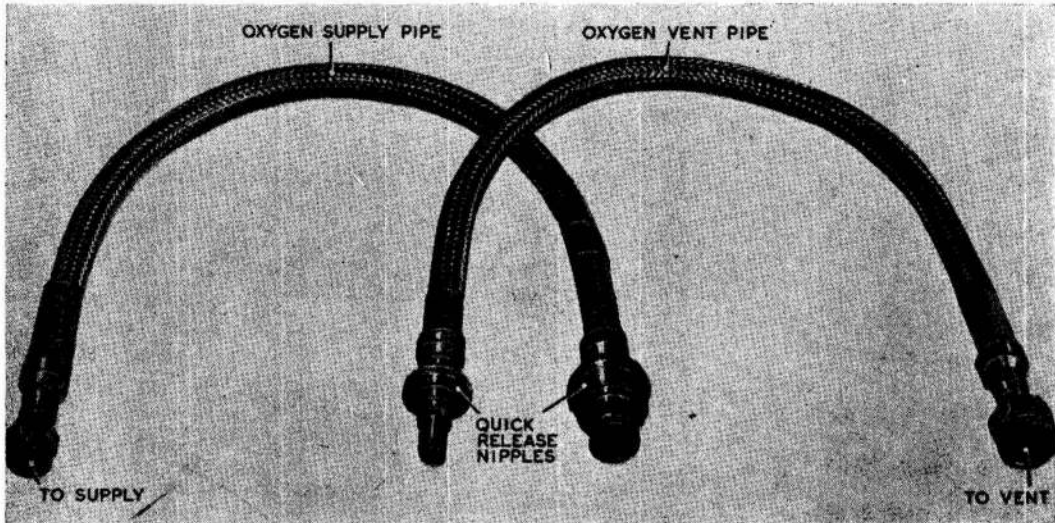


Fig. 3. Flexible pipelines

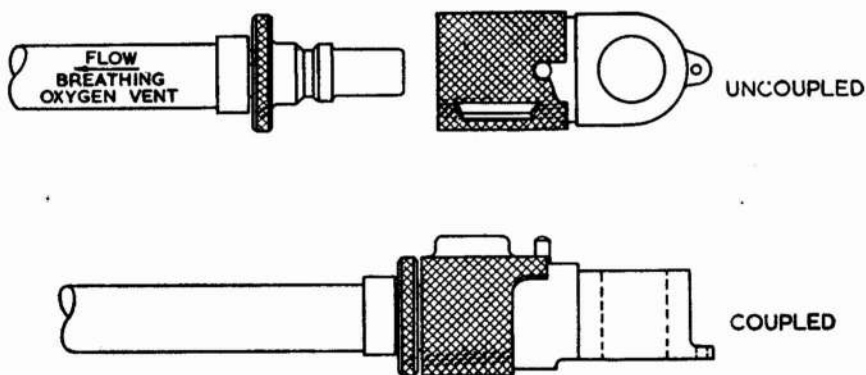


Fig. 4. Quick release connections

◀Renewal of bursting disc

15. Note . . .

The fragile nature of the bursting disc demands great care in handling when removed or refitted. If scratched or bent the bursting pressures may be considerably reduced. The following instructions are to be applied whenever it is necessary to replace a bursting disc.

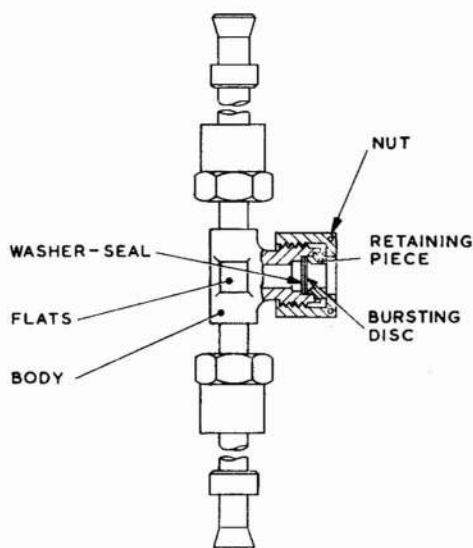


Fig. 5. Bursting disc and vent pipe assembly

Referring to fig. 5, then:—

- (1) Remove the pipe line assembly containing the bursting disc.
- (2) Break the locking wire attached between the body and nut.
- (3) Place the flats of the body between the jaws of a small smooth jawed vice.
- (4) Unscrew the nut from the body.
- (5) Remove the retaining piece. Remove and discard the old bursting disc. Remove and discard the old washer-seal. Extreme care is to be taken to prevent any contamination and ingress of foreign matter at this stage. Ensure that the counter bore housing the washer-seal is clean and flat.
- (6) Fit new washer-seal (Ref. No. 6D/3305). Fit new bursting disc (Ref. No. 6D/3304). Replace retaining piece. Place the flats of the body between the jaws of a smooth jawed vice, screw the nut on to the body, and tighten to a torque loading of 200lb. in. using a correctly calibrated torque wrench. Wire lock the nut to the body using 0.020 inch dia. stainless steel wire.
- (7) Replace the pipe line assembly and purge the package unit as detailed in A.P.1275G, Vol. 1(2nd Edn.), Part 1, Sect. 3, Chap. 3, Para. 5.▶

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