

Chapter 4

QUICK-DISCONNECT COUPLING, SELF-SEALING (Part No. 199000)

LIST OF CONTENTS

<i>Introduction</i>	<i>Para.</i> 1	Operation	<i>Para.</i> 5
Description	2	Installation	7
<i>Receptacle assembly</i>	3	Servicing	8
<i>Plug assembly</i>	4		

LIST OF ILLUSTRATIONS

				Fig.
Quick-disconnect	coupling	(Part	No.	
199000)	...	...	...	1
Sectional view	...	...	...	2

LIST OF APPENDICES

			<i>App.</i>
<i>Standard serviceability tests</i>	...	...	1

LEADING PARTICULARS

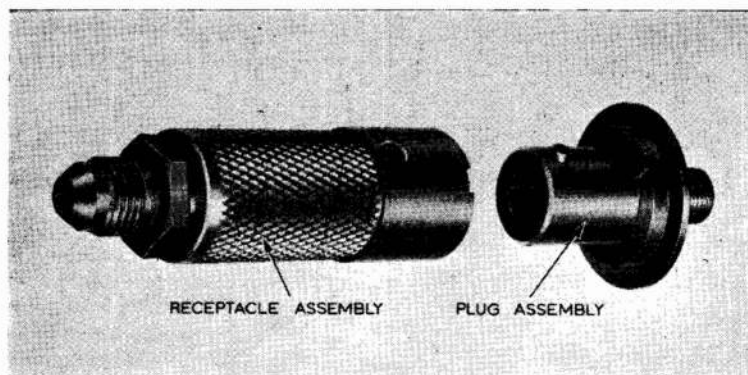
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Fig. 1. Quick-disconnect coupling (Part No. 199000)

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Introduction

1. The quick-disconnect coupling, self sealing (fig. 1) is fitted in the supply line of certain aircraft liquid oxygen installations to provide a self sealing connection that affords positive engagement and permits rapid connection and disconnection.

DESCRIPTION

2. The unit (fig. 2), comprises a receptacle assembly (Part No. 199000-1), and a plug assembly (Part No. ◀199000-28).▶ When the two assemblies are engaged, they form a leak-proof connection, and when disengaged each assembly incorporates a self-sealing device.

Receptacle assembly

3. The spring housing is in the form of a threaded adapter and houses the spring which bears on to a steel ball positioned in the sealing seat. One end of the housing is threaded to accommodate a supply line connection. The other end is also threaded and is screwed on to the

bellows assembly which comprises a poppet, a body, a stem, a bellows and a spring. These components are housed in the cap and sleeve assembly. The friction ring is fitted in this assembly and abuts an external shoulder on the bellows assembly. The retaining ring is fitted in a recess in the cap and sleeve assembly and retains the bellows assembly. An internal spiral groove and two holes in the cap and sleeve assembly provide the guide track and holes for two lock pins fitted in the plug assembly.

Plug assembly

4. The spring housing is similar to that fitted in the receptacle assembly except that there are differences in the thread sizes. An identical spring is positioned in the housing and locates an identical ball on the sealing seat; the latter is secured and located when the spring housing is screwed into the body assembly. Two lock pins fitted diametrically opposite to each other, form a part of the body assembly. A locking device consisting of a locking ring, spring and retainer, positively locks the two lock pins when the plug assembly is connected to the receptacle assembly.

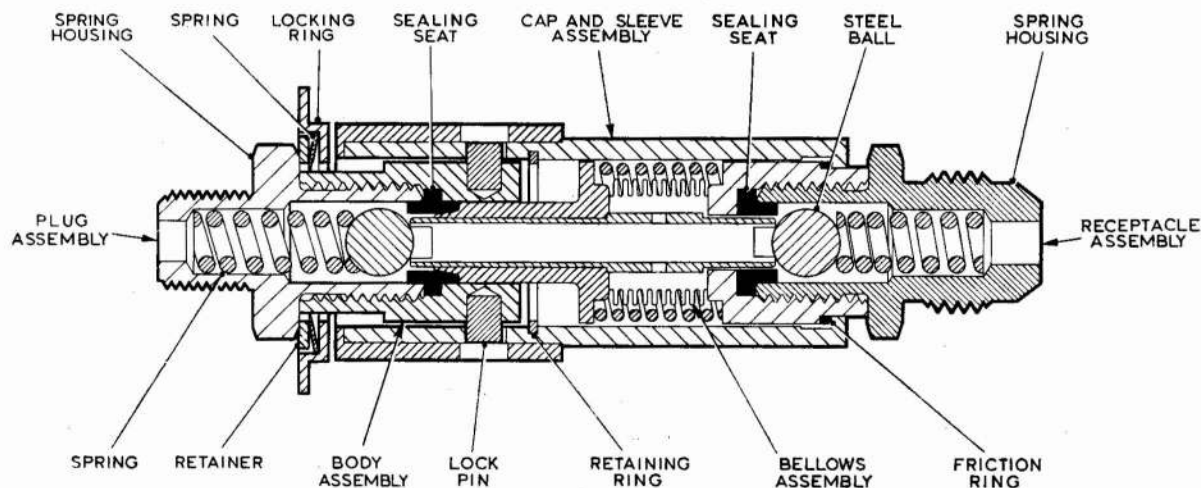


Fig. 2. Sectional view

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OPERATION

5. For engagement, the receptacle assembly half is turned clockwise on to the plug assembly. The springs in both halves of the coupling are compressed and the two balls are forced away from their sealing seats, permitting a free flow of oxygen through the unit. The two assemblies are locked when the two lock pins are visible through the holes in the cap and sleeve assembly, and are held in position by the spring-loading action of the locking device.

6. To disconnect the coupling, depress the locking ring to remove the loading on the lock pins; turn the receptacle assembly counter-clockwise and then detach it from the plug. The springs in both assemblies are extended and the two balls forced up against their sealing seats, closing off the free flow through the assemblies. The coupling is unlocked when the two lock pins are not visible through the holes in the cap and body assembly.

INSTALLATION

7. Before installing a unit in an aircraft liquid oxygen installation, refer to the relevant aircraft air publication for installation details. If it

is required to test the coupling prior to installation, apply the standard serviceability tests (App. 1).

Caution . . .

When mating the coupling assemblies, ensure that both are free from moisture.

SERVICING

WARNING

Many materials, particularly oil and grease, are subject to spontaneous combustion when exposed to undiluted oxygen under pressure. Precautions must be taken, therefore, to exclude oil, grease, dust and metal particles from the coupling.

8. Routine servicing consists of examining the unit for freedom from damage and corrosion. In addition, the coupling should be examined for positive locking and evidence of leakage. If either connection is found to be defective, it should be disposed of in accordance with current Service procedure.

Appendix 1
STANDARD SERVICEABILITY TESTS
for
QUICK-DISCONNECT COUPLING, SELF SEALING
(Part No. 199000)

Introduction

1. The tests detailed in this Appendix should be applied before the unit is fitted in an aircraft liquid oxygen installation, when the serviceability of the unit is in doubt and at the appropriate examination periods at Equipment Depots.

and grease, are subject to spontaneous combustion when exposed to undiluted oxygen under pressure. Precautions must be taken, therefore, to exclude oil, grease, dust and metal particles from the coupling and the test equipment.

TEST EQUIPMENT

2. The equipment required is as follows :—
- (1) Breathing oxygen test supply (170 lb/in²)
 - (2) Blanking caps
 - (3) Pressure gauge (Ref. No. 6C/263)
 - (4) Valve, master, Mk. 10A (Ref. No. 6D/2313)
 - (5) Torque spanner.

PARTICULARS OF TEST

3. The tests are to be applied under normal room temperature (+15°C) and pressure (29.92 in. Hg.) conditions. The gas supply for the test must be breathing oxygen.

4. Soap solution for leak testing must be prepared in accordance with the instructions contained in Part 1, Sect. 2, Chap. 1. Precautions must be taken to prevent the solution entering the coupling, and all traces of soap solution and moisture must be removed when each test is completed.

WARNING

Many materials, particularly oil

TEST PROCEDURE**Operating test**

5. Complete five cycles of engaging and disengaging the coupling assemblies. During this test, check for smoothness of operation and freedom of movement. The coupling assemblies must disengage when a direct axial force, not exceeding 25 lb, is applied in tension along the centre line of the receptacle assembly, and a maximum of 25 lb in. torque is applied in a twisting motion.

External leak test

6. Blank the end of one spring housing, and apply a pressure of 165 lb/in.² to the end of the opposite spring housing for a period of one minute. During this period, there must be no external leakage while the assemblies are engaged, or when they are being engaged and disengaged. Repeat the test, applying the pressure to the opposite end.

Self sealing leak test

7. Disconnect the coupling. Apply a pressure of 110 lb/in.² to each assembly, in turn, for a period of two minutes. During this period there must be no visible or audible leakage from the assembly.



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