

AP 103J-0301-1

(Superseding AP 4303E, Vol. 1
Sect. 2, Chap. 8, App. 6)

X A ~~EA~~ HYD.
ELECTRO-MAGNETIC VALVE
TEDDINGTON TYPE FGB/A/II

GENERAL AND TECHNICAL INFORMATION

BY COMMAND OF THE DEFENCE COUNCIL

T. Dunnett

Ministry of Defence

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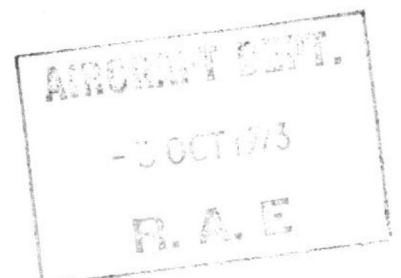
Service users should send their comments through
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AP(N)140 Chap.1 Annex A (RN)

AP 3158 Vol.2 Leaflet No.D6 (ARMY and RAF)

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AMENDMENT RECORD SHEET

To record the incorporation of an Amendment List in this publication,
sign against the appropriate A.L. No. and insert the date of incorporation.

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MODIFICATION STATE

There are no modifications in respect of this unit.

LIST OF MATERIALS

Nomenclature	Ref. No.
Trichloroethane	33D/2201949
Lint-free cloth	32B/1250398
Compound SQ-32M	34B/2202370
Oil OX-38	34B/9100591
Silicone fluid MS200 (viscosity 10cS)	

LIST OF TOOLS AND TEST EQUIPMENT

Nomenclature	Ref. No.	Part No.
Air charging trolley	4G/5803	
Dial test indicator	1B/9100089	
Flowmeter	6C/1106746	
Insulation resistance tester, Type C	5G/152	
Bonding resistance tester, Type B	5G/2126	
Multimeter Type 12889	5QP/17447	
Electrical supply 10 to 29V d.c.		
Electrical connector		CZ.49014

LEADING PARTICULARS

Ref. No.	..	..	..	..	..	..	..	..	..	27V/5365
Voltage	..	..	..	..	..	..	..	..	..	28V d.c.
Electrical connector	..	..	..	..	..	..	..	..	..	2-pin miniature Breeze plug
Inlet and outlet connections	..	..	..	..	..	..	..	..	..	$\frac{1}{4}$ in BSP
Overall dimensions:										
Length	..	..	..	..	..	..	..	..	..	1.64 in
Height	..	..	..	..	..	..	..	..	..	5.13 in
Width	..	..	..	..	..	..	..	..	..	1.50 in
Weight	..	..	..	..	..	..	..	..	..	0.78 lb

Introduction

1. This valve is a solenoid valve controlled by a remote pressure switch.

When energized, it permits a flow of air from an associated butterfly valve to bleed to atmosphere.

DESCRIPTION

2. The valve body is machined to form a valve chamber connected to threaded inlet and outlet ports. A valve seat and seal are fitted in the base of the valve chamber, and a threaded hole in the base of the valve body, opposite the valve seat, is fitted with a special screw and a joint seal. A coil and former assembly is fitted into a coil cover which is screwed into the valve body and secured by a ring nut. An armature has an anti-remanence plug at the upper end, and a spring-loaded valve head at the lower end. Leads from the coil are connected to a Breeze plug fitted to a plug holder which is secured, through an adapter, a locking plate and a locking ring, to the coil cover.

Principle of operation

3. When the solenoid is de-energized, the valve head is held on the valve seat by the spring. When energized,

the armature lifts the valve head off its seat and allows the passage of air through the valve body.

SERVICING

Dismantling

4. (1) Remove four screws and ease off the electrical connector. Dismantle the connector to remove the pins, but do not separate the pins from the leads. Remove and discard the gasket.
- (2) Remove four screws, nuts and eight spring washers securing the plug holder. Remove and discard the gasket.
- (3) Remove two screws and lift off the adapter.
- (4) Unscrew the locking ring, and withdraw the locking cage and locking plate.
- (5) Straighten the staked portion of the ring nut, and slacken the nut.
- (6) Unscrew the coil cover from the valve body. Withdraw the coil cover, and the coil and former assembly. Remove and discard the O-ring fitted to the coil and former assembly.
- (7) Separate the armature and the spring from the coil and former assembly.

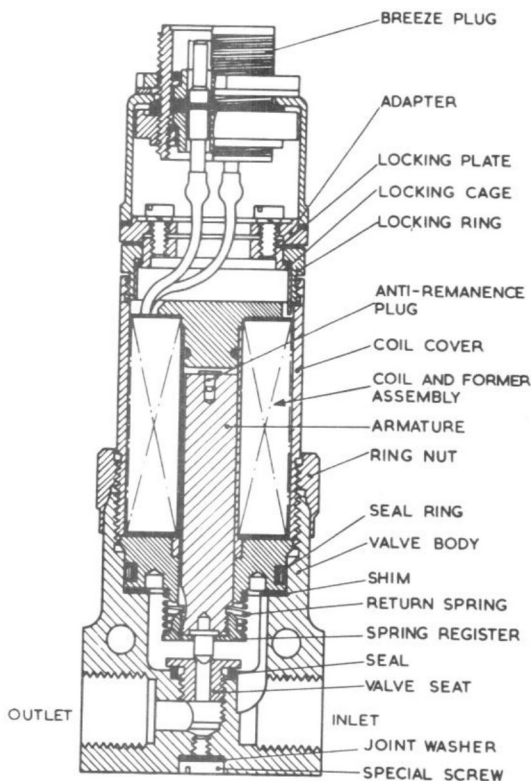


Fig. 1. Sectional view

(8) Extract the shims from the valve body; record the thickness.

(9) Unscrew the valve seat and the special screw; remove and discard the seal and the joint washer.

Cleaning

5. Metal components should be cleaned in trichloroethane and dried with a lint-free cloth.

CAUTION...

The solvent must not come into contact with the coil assembly.

Examination

General

6. Examine all components for corrosion, damage, distortion and wear. Renew defective parts.

Coil and former assembly

7. (1) Examine for deterioration of the coils and the sleeving.

(2) Using the multimeter Type 12889, check that the coil resistance is not less than 30 or more than 35 ohms at 20°C.

Spring

8. Check that the load required to compress the spring to a length of 0.29 in is not less than 9 oz or more than 10 oz.

Assembling

9. Fit new spring washers, gaskets, O-ring, seal and joint washer during assembly.

(1) Position the seal on the valve seat and screw the valve seat into the valve body.

(2) Insert shims, equivalent to those removed during dismantling, into the valve body.

(3) Lightly coat a new O-ring with oil OX-38 and assemble it to the coil assembly. Position the spring over the armature and insert the armature into the coil and former assembly. Assemble the coil cover over the coil and temporarily fit the coil locking ring. Screw the coil cover into the valve body.

(4) Support the assembly with the valve body uppermost and set the dial test indicator with its probe entered into the valve seat to contact the valve head. Connect the electrical supply, and switch on and off. The

armature lift, when the supply is switched on, should be not less than 0.025 or more than 0.030 in. If necessary, adjust the thickness of the shims in the valve body to achieve this requirement. Disconnect the electrical supply.

(5) Unscrew the coil cover and coat the exposed threads with compound SQ-32M. Screw the ring nut on the coil cover, screw the cover tightly into the valve body and tighten the ring nut. Clean off surplus compound.

(6) Remove the coil locking ring from the cover. Assemble the locking cage and the locking plate to the locking ring. Coat the threads of the locking ring with compound SQ-32M, and screw the locking ring into the coil cover. Ensure that the coil leads emerge from the centre of the plate.

(7) Lightly coat the exposed face of the locking ring with compound SQ-32M, position the plug adapter and secure with two screws and spring washers.

(8) Position a new gasket and the plug holder on the plug adapter, and secure with four screws and nuts with spring washers each side of the flanged joint.

(9) Locate a new gasket on the plug holder, assemble the leads to the connector and secure to the plug holder with four screws and spring washers.

(10) Fit the special screw and a new joint washer into the base of the valve body.

(11) Test the unit (para 11 to 16).

(12) After satisfying the tests, lock the ring nut by staking the skirt into the slot in the valve body.

TESTING

General

10. The test values specified are related to normal room temperature conditions.

Minimum operating voltage and seat leakage test

11. (1) Connect the air supply to the inlet and, with the unit vertical and connector plug uppermost, apply a pressure of 200 lbf/in². Energize the solenoid at 10.5V d.c. and check that the valve opens to permit a flow of air.

(2) De-energize the solenoid, connect the flowmeter to the outlet and check that the leakage past the valve seat does not exceed 0.017 ft³/min.

Return spring test

12. Invert the valve and energize the solenoid at 29V d.c. De-energize the solenoid and check that the armature returns, without hesitation, to the

closed position. Apply air pressure of 200 lbf/in² to the inlet and check that the valve leakage does not exceed 0.017 ft³/min.

Leakage test

13. Connect the air supply to the inlet and blank the outlet. Apply pressure of 300 lbf/in² and immerse the unit in a bath of silicone fluid MS200 (viscosity 10cS) to a depth sufficient to cover the knurled ring. There should be no leakage.

Insulation resistance test

14. Using the insulation resistance tester Type C, check that the resistance between the connector plug pins and the shroud is not less than 2 megohms at 250V d.c.

Bonding resistance test

15. Using the bonding tester, Type B, check that the resistance between the connector plug shroud and the valve body does not exceed 0.025 ohm.

Current consumption test

16. Using the multimeter, Type 12889, check that the current consumption at 24V d.c. does not exceed 0.8A.

