

Chapter 9

OIL DILUTION VALVE, TYPE FGH

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LEADING PARTICULARS

Type	Voltage	Stores Ref.
FGH/A/130	24V. d.c. (continuously rated)	27V/2853
FGH/A/150	24V. d.c. (continuously rated)	

Introduction

1. This valve (fig. 1) is an electromagnetic component and there are no unusual design features. Variations occur in the positioning of the electrical connections (fig. 2) and in the valve settings; there are no structural differences. A valve may be conveniently described in two parts, the coil case and coil assembly, and the valve body. The metering jet, which is usually fitted to the outlet port, is an item supplied separately according to the particular installation.

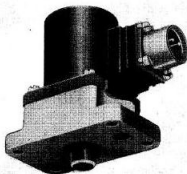


Fig. 1. Oil dilution valve, Type FGH

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DESCRIPTION

Valve body

2. The rectangular valve body (fig. 3) is a light alloy casting which forms the valve chamber. A central boss beneath the body is drilled to provide the inlet and this drilling is counter-bored, from inside the valve chamber, and threaded to receive the valve seat. A duct machined in the wall of the valve chamber communicates with the outlet drilling which is internally threaded to receive a pipe connection. Tapped holes, one in each corner of the top face, receive the coil case retaining screws, and the rectangular mounting flange is drilled at each corner.

Coil case and coil assembly

3. The coil case is a light alloy casting which has a boss at the side on which the breeze plug assembly is mounted and is flanged at the open end. Four holes in this flange accommodate the screws which secure the case to the valve body. A data plate is secured to the top of the coil case.

4. The coil is wound on to a coil former which consists of a tube and two end pieces, and the complete assembly is contained in a magnet frame located in the coil case. A shim washer fitted between the end of the magnet frame and the coil case permits adjustment to ensure that the end faces of the case and lower end piece, which form a common surface to mate with the valve body, are in alignment.

5. The former tube and lower end piece also form a guide in which the armature moves. The top end of the armature is drilled to locate an anti-remnance plug and at the other end a larger drilling accommodates the valve disc holder, which is secured in the armature by a pin. A tapped hole in the armature, at right angles to the valve disc holder, accommodates a grub-screw which facilitates the setting and adjustment of the valve.

6. The valve disc is located by a retainer which is spun over a shoulder on the disc holder. The valve spring, which tends to hold the valve closed, is positioned between the retainer and the lower former end-piece; shims between the spring and the end piece facilitate valve adjustments.

7. Shims and a sealing washer assembled on the lower former end piece prevent external leakage between the valve body and the coil assembly.

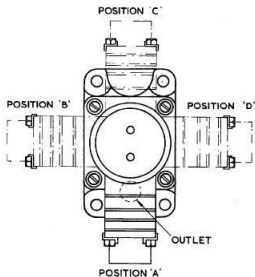
Operation

8. The valve is normally in the closed position. When the coil is energized the armature is attracted to the top former end piece and draws the valve disc off its seat, against the action of the spring. The anti-remnance plug is fitted to prevent actual contact between the armature and the end piece and ensures that the valve returns to the closed position immediately the coil is de-energised.

SERVICING

Dismantling

9. The dismantling of the valve is a straightforward operation. When the coil case is separated



VALVE	POSITION OF BREEZE PLUG
FGH/A/130	A
FGH/A/150	C

Fig. 2. Type variations

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from the valve body, by removing the four attachment screws, the sub-assemblies are accessible. The coil assembly and armature assembly remain with the coil case when the case and body are separated. One point however, must be observed; the coil must be energised while the four attachment screws are removed and the two parts separated. Do not remove the valve seat unnecessarily.

Assembling and setting

10. Assembling the valve is a simple operation as the coil case assembly will be supplied complete from the electrical section. Ensure that the end faces of the coil case and the lower former end piece are correctly aligned. If not, the coil case assembly must be dismantled (the breeze plug assembly must be removed first) and the shim washer between the magnet frame and the coil case adjusted.

11. Ensure that the valve seat is screwed firmly into the valve body.

Valve setting

12. (1) Ensure that the anti-remance plug is fitted to the armature and partly insert the valve disc assembly (which comprises the valve disc holder, valve disc and valve disc retainer). It is recommended that a new valve disc be fitted when re-assembling, unless the used one is unmarked, because, as it is unlikely that a valve disc can be replaced in its original seating position, leakage will result.
- (2) Fit an 8 B.A. grub-screw into the tapped hole in the armature to restrain the movement of the disc holder.
- (3) Place a distance piece (fig. 4) in the valve seat.

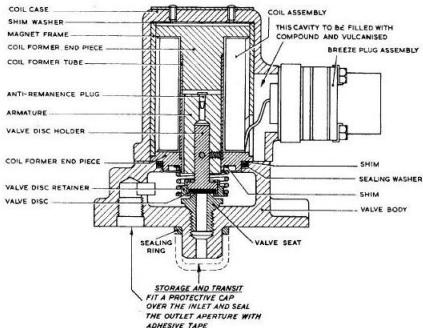


Fig. 3. Valve, Type FGH/A/150

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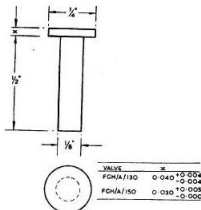


Fig. 4. Valve setting distance piece

- (4) Position the armature, complete with valve disc assembly in the coil assembly and offer up the coil case assembly to the valve body. Tighten down the four retaining screws evenly. As the coil case is drawn to the valve body the armature slides into the former tube until the anti-remnance plug makes contact with the top former end piece. The valve disc holder will continue to slide up inside the armature until the coil case and lower former end piece are tight against the valve body. The valve is now set to its maximum travel.
- (5) Remove the coil case. Withdraw the armature and valve disc assembly taking care not to disturb the setting. Ensure that the grub-screw is tight, then drill through the armature and valve holder with a No. 52 drill (0.0635 in. dia.). Drive in a pin (Part No. FGH.119).
- (6) Remove the grub-screw from the armature and the distance piece from the valve seat.
13. Ensure that the shims and sealing ring are fitted to the lower former end piece, assemble the spring and shim washer on to the armature and valve disc assembly and position it in the coil assembly. Fit the coil case assembly to the valve body, energize the coil to hold the valve disc assembly off the seat until the case retaining screws are tight and so protect the valve disc from damage.

Mechanical testing

14. Use clean dry air or carbon dioxide for the tests, which are to be made in normal room temperature (approximately 68 deg. F.). All instruments used must be calibrated before the tests. Unless otherwise stated, the tests are suitable for all valves.

Armature lift, Type FGH/A/130

15. Mount the valve in a vertical position, with a dial test indicator suitably mounted so that its spindle is inserted through the inlet connection and in contact with the valve disc face. Energize the coil and note that the valve lift is between 0.036 and 0.044 in. (Setting valve—para. 12).

Armature lift, Type FGH/A/150

16. Mount the valve in a vertical position with a dial test indicator suitably mounted so that its spindle is inserted through the inlet connection and in contact with the valve disc face. Energize the coil and note that the valve lift is between 0.030 and 0.035 in. (Setting valve—para. 12).

Pressure test, Type FGH/A/130

17. De-energize the coil and apply an air pressure of 60 lb. per sq. in. at the outlet connection. The valve must be leakproof. To test the joint between the coil case and valve body, the valve may be partially immersed in kerosene or white spirit, coil case uppermost, until the joint is covered.

Pressure test, Type FGH/A/150

18. De-energize the coil and apply an air pressure of 100 lb. per sq. in. at the outlet connection. The valve must be leakproof. To test the joint between the coil case and valve body, the valve may be partially immersed in kerosene or white spirit, coil case uppermost, until the joint is covered.

Functional test, Type FGH/A/130

19. (1) Apply an air pressure of 30 lb. per sq. in. to the inlet connection. The valve must open when the coil is energized to a potential of not more than 16 volts.
- (2) With the coil de-energized, the valve must withstand a test pressure of 60 lb. per sq. in. applied to the inlet connection of the valve, without valve seat leakage or "blow off" occurring.

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Functional test, Type FGH(A)/150

20. (1) Apply an air pressure of 50 lb. per sq. in. to the inlet connection. The valve must open when the coil is energized to a potential of not more than 19 volts.
- (2) With the coil de-energized the valve must withstand a test pressure of 150 lb. per sq. in. applied to the inlet connection of the valve, without valve seat leakage or "blow off" occurring.

Flow test

21. With the coil energized (i.e. valve open) the flow through the valve from inlet to outlet must not be less than 60 gall. per hour with a 30 lb. in. pressure drop across

the valve. The fluid used may be either clean kerosine or white spirit. The valve will meet this requirement if it will pass 25 cubic feet of free air per hour for a pressure drop across the valve of not more than 4.7 in. water gauge which can be checked on the constant-flow test apparatus.

Electrical tests

22. Ensure that all electrical connections are secure, and test for continuity of the windings.

23. Check the insulation resistance between the coil terminals and the valve housing: the reading should not be less than 30 megohms.

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