Chapter 2

SOLENOID UNIT, ROTAX, D10901/1

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LEADING PARTICULARS

Solenoid unit, Type D10901/1	*Ref. No.* 5CW/5821
Pull-in current for 140 *lb. load*—	
Main winding	140 *amp.*
Emergency winding	18 *amp.*
Drop-out current for 140 *lb. load*—	
Main winding	6 *to* 13 *amp.*
Emergency winding	0·5 *to* 1·2 *amp.*
Plunger stroke	0·305 *to* 0·318 *in.*
Resistance of windings at 20 *deg. C*—	
Main winding	0·015 *ohm* ±5 *per cent*
Emergency winding	1·25 *ohm* ±5 *per cent*
Overall dimensions—	
Length (over plunger)	6·225 *in.*
Maximum dimension through axis	6·363 *in.*
Weight	23 *lb.*

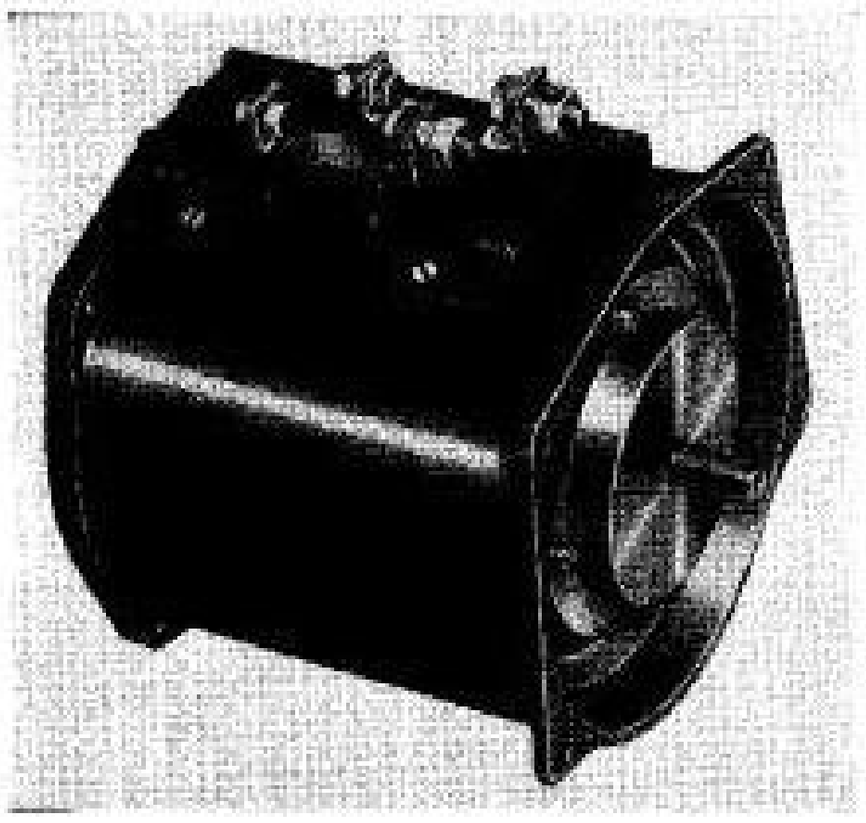

Fig. 1. Type D10901/1 solenoid unit

Introduction

1. The Type D10901/1 solenoid unit is designed for current operation. It is able to raise the rated load of 140 lb. a distance of 0·312 in. when 140 amp. are flowing in the main winding or 18 amp. are flowing in the emergency winding.

2. The D10901/1 unit differs slightly from the previous D10901 (Ref. No. 5CW/5017) in that the securing screws for the end plate and anvil assembly have been changed from 4 B.A. csk/hd. screws caulked in position for locking to 2 B A. ch/hd. screws with associated locking washers incorporated. Similar locking has also been introduced to the solenoid housing assembly and end plate, where 4 B.A. ch/hd. screws have been replaced by 4 B.A. hex/hd. screws and associated locking tab washers. The embodiment of this modification raises the code to D10901/1.

DESCRIPTION

3. A general view of the unit is given in fig. 1. A laminated plunger, having a connecting shaft threaded $\frac{1}{8}$ in. B.S.P., slides in a bobbin tube, whilst a "tell-tale" spindle (fig. 2), which is fitted to the plunger, slides in an axial hole in a soft iron anvil. The anvil is fitted to an end plate and has the emergency coil wound around it. The main coil is wound around the bobbin tube. The solenoid is enclosed by a metal housing and a small cover receives the end of the "tell-tale" spindle.

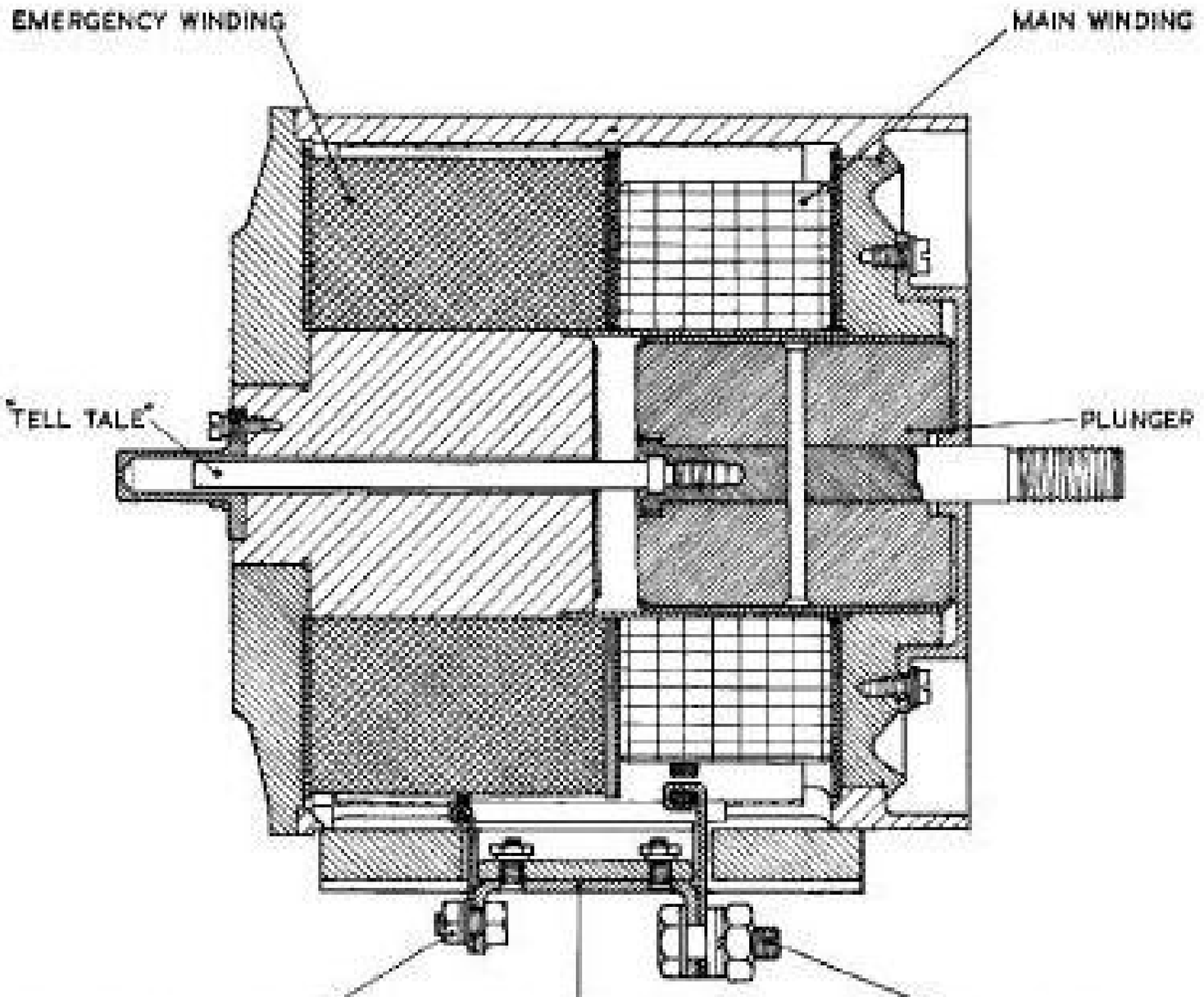

Fig. 2. Sectional view of unit

Electrical connections

4. Two terminal brackets and a double bracket, forming a link, are mounted on a moulded terminal block. The main terminals (5 and 6) have ¼ in. B.S.F. hex/hd. screws for securing external cables, while the emergency terminals (7 and 8) have 2 B.A. hex/hd. screws. The common bracket connects terminals 6 and 8 (fig. 3).

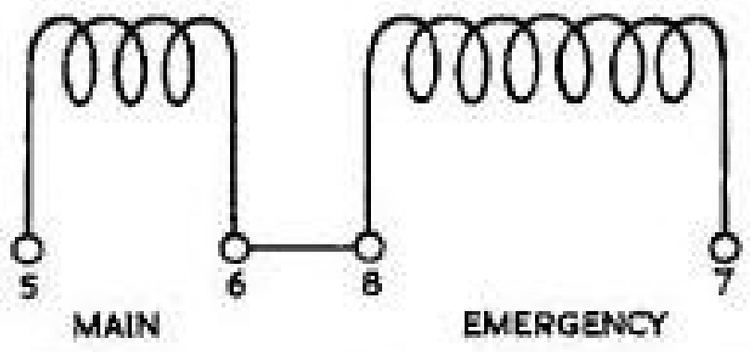

Fig. 3. Diagram of internal connections

Operation

5. When either winding is energized, the plunger is drawn up and when that winding is again de-energized, the plunger returns to its original position under the action of an external return spring or under the action of gravity. No return spring is fitted to the solenoid.

INSTALLATION

6. The solenoid may be mounted in any position convenient to the equipment it is intended to operate. If, however, no return spring is fitted to this equipment, the solenoid must be mounted in a vertical position with the threaded end of the plunger connecting shaft downwards.

7. Four 0·203 in. dia. mounting holes are provided in four lugs at the plunger end. Their fixing centres lie on a 5·900 in. P.C.D.

SERVICING

8. The unit should be inspected for any signs of visible damage. If its serviceability is suspect, it may be tested as detailed in Appendix A.

Appendix A

STANDARD SERVICABILITY TEST FOR SOLENOID UNIT, ROTAX, TYPE D10901/1

Introduction

1. The following tests may be applied to the unit before it is put into service, or at any time when its serviceability is suspect.

Test equipment

2. The following test equipment is required:

(1) Bridge megger tester. Type B (Ref. No. 5G/1708).

(2) Multimeter, Type 12889 (Ref. No. 5QP/7447) or equivalent.

(3) Insulation resistance tester, Type A (Ref. No. 5G/1621).

Testing

Resistance of windings

3. The resistance of the windings, when measured between the terminals and corrected to 20 deg. C, should be:

(1) Main winding—between 0·0135 and 0·0165 ohm.

(2) Emergency winding—between 1·12 and 1·38 ohm.

Stroke

4. The length of stroke should be between 0·305 and 0·318 in.

Pull-in current

5. The minimum current necessary to lift 140 lb. through the whole of the stroke should be measured using each winding in turn, and should not exceed:

(1) Main winding 140 amp.

(2) Emergency winding 18 amp.

Drop-out current

6. With the same load as in para. 5, the drop-out current should be:

(1) Main winding—between 6 and 13 amp.

(2) Emergency winding—between 0·5 and 1·2 amp.

Insulation resistance test

7. The insulation resistance, when measured between the following points with a 500-volt insulation resistance tester, should be not less than 0·5 megohm (for R.N.), or 5 megohms (for R.A.F.).

(1) Between the main winding and the frame.

(2) Between the emergency winding and the frame.

(3) Between the main winding and the emergency winding.

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