

Chapter 13

MAGNETIC SWITCHES (ROTAX, D9300 SERIES)

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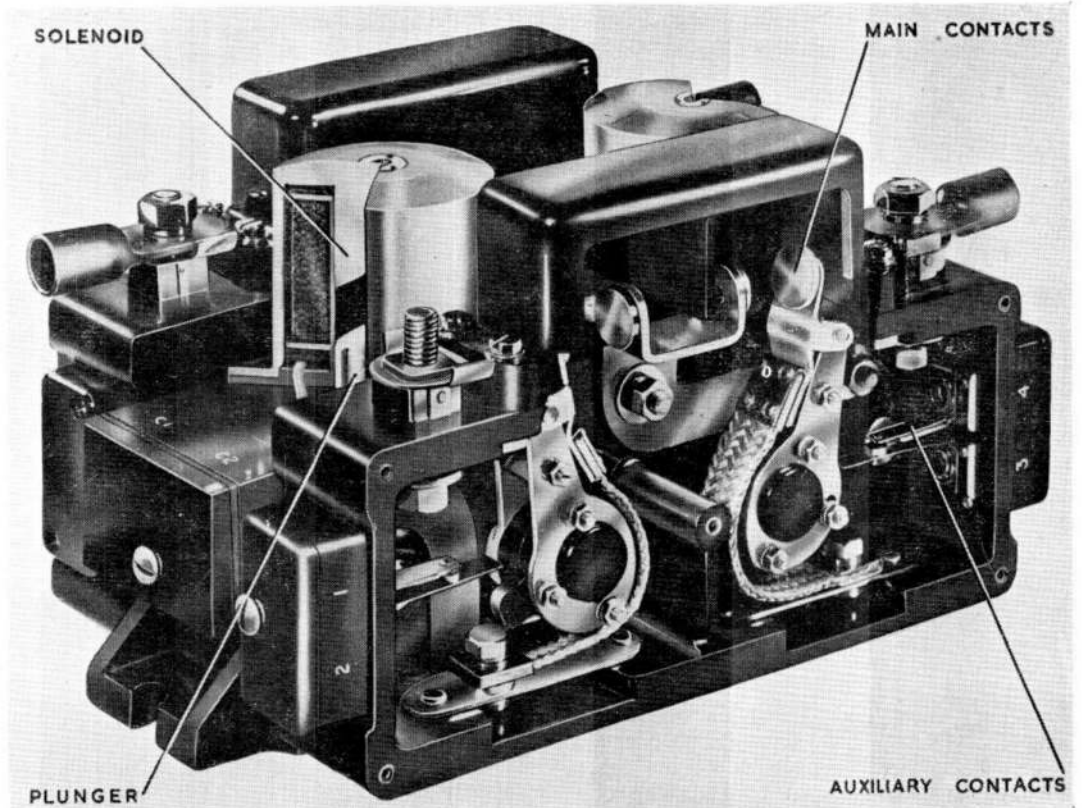


Fig. 1. Part sectional view of a typical switch (D9300 series)

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(A.L.43, Mar., 1954)

Introduction

1. This range of double-pole reversing magnetic switches is designed for short rating use in 112-volt d.c. systems. The main purpose of these units is to provide current flow in either direction as required, e.g., to effect reversal of direction of rotation of an actuator motor.

DESCRIPTION

2. The types of switches in the D9300 series differ only in the rating and arrangement of contacts; for details of specific types refer to A.P.4343B, Vol. 1, Sect. 23. Each unit comprises a light alloy casting which houses the actuating and interlocking mechanism. Two operating solenoids with their associated terminal blocks are mounted on the top and end faces respectively. Two moulded switch housings, containing the main and auxiliary and shunt field contacts, are fitted to the opposite side faces.

3. The main terminal post assemblies and the auxiliary or shunt field terminal blocks (fig. 1) are fitted directly to, and mounted externally on, each of the switch housing.

4. Easily removable covers are fitted over the main contacts and to the switch housings to facilitate access for inspection and servicing purposes.

5. A part sectional view of a typical magnetic switch is given in fig. 1. This illustrates the arrangement of the terminals, solenoids and contacts. The unit is provided with two mounting lugs, one of which may be seen in the illustration.

6. Separate pairs of contacts are employed for each direction of rotation, with an interlocking mechanism provided to prevent the simultaneous operation of both sets of contacts. The main contacts are short rated at 112 volts and the two pairs of auxiliary contacts are mechanically linked to operate at the same time as their associated main contacts.

7. Electrical connections are made via the directly fitted $\frac{1}{4}$ B.S.F. terminal posts and the externally mounted terminal blocks fitted with 4 B.A. combined screw and washer terminals.

FUNCTIONING

8. When either of the solenoids is energized, the magnetic pull created on its plunger will cause it, against the pressure of the return springs, to be drawn in towards the core. This movement is transmitted via the actuating levers and main contact carrier driving

shafts to operate the respective main and associated shunt field and auxiliary contacts.

9. When the energizing current through the solenoid is broken, the plunger, under pressure from the return springs, is returned to the rest position, causing at the same time, through the actuating mechanism, the contacts to return to their normal positions.

10. Operation of the interlocking mechanism is such that, besides preventing the simultaneous closing of both sets of contacts if both coils are inadvertently operated together, it ensures that in the event of one pair of contacts becoming locked in the ON position, the circuit will be interrupted by the other pair of contacts when the operating solenoid is de-energized. These contacts cannot be closed until the interlock mechanism is normally unlatched.

11. The shunt field contacts are so arranged that the polarity of the associated motor shunt winding will remain the same with either solenoid operated, irrespective of the direction of armature current.

INSTALLATION

12. Full installation details may be obtained from the relevant Aircraft Handbook, but mounting in any position, other than with the base plate uppermost, is permissible to facilitate convenient wiring and inspection.

SERVICING

13. Little servicing of these magnetic switches is necessary. If visual inspection reveals no signs of pitting or burning of contacts or other physical damage, and that the terminal connections are clean and tight, the unit may be considered serviceable providing that it controls its associated motor satisfactorily.

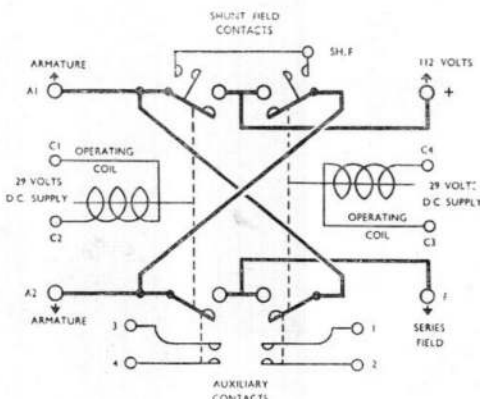


Fig. 2. Wiring diagram

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