Chapter 65

SWITCH, MAGNETIC, ROTAX, TYPE D10505

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LIST OF ILLUSTRATIONS

LEADING PARTICULARS

Voltage	
Main contacts	28 volts
Auxiliary contacts	28 volts
Operating coil	7·5 volts
Current rating	
Main contacts	150 amperes (cont.)
Auxiliary contacts	5 amperes (cont.)
Overall dimensions	
Length	4·234 in.
Width	2·750 in.
Height	5·375 in.
Operating temperature range	−70 deg. C. to +70 deg. C.
Mounting	Three point fixing tapped 2 B.A.
Weight	2 lb.

Introduction

1. This switch is designed for use in aircraft electrical systems where it is desired to make and break a 28 volt circuit using a 7·5 volt d.c. control circuit. The design of the unit is such that it will operate satisfactorily under severe acceleration forces and, under such conditions, the balanced plungers maintain a substantially stable pull-in voltage, thus preventing the inadvertent operation of the switch. The switch will operate satisfactorily in temperatures ranging from −70 deg. C. to +70 deg. C. and at all altitudes up to 60,000 ft.

DESCRIPTION

2. The Type D10505 magnetic switch (*fig.* 1) comprises a black body moulding, a main and auxiliary contact mechanism, a solenoid which is mounted at one end of the body moulding, two main terminals, two coil terminals and four auxiliary terminals. The auxiliary terminal block (not shown in fig. 1) is mounted on the opposite end of the body moulding to the solenoid.

3. The solenoid core consists of two moving plungers and two pivoted links which fit into the open bore of the coil, which, in turn, is

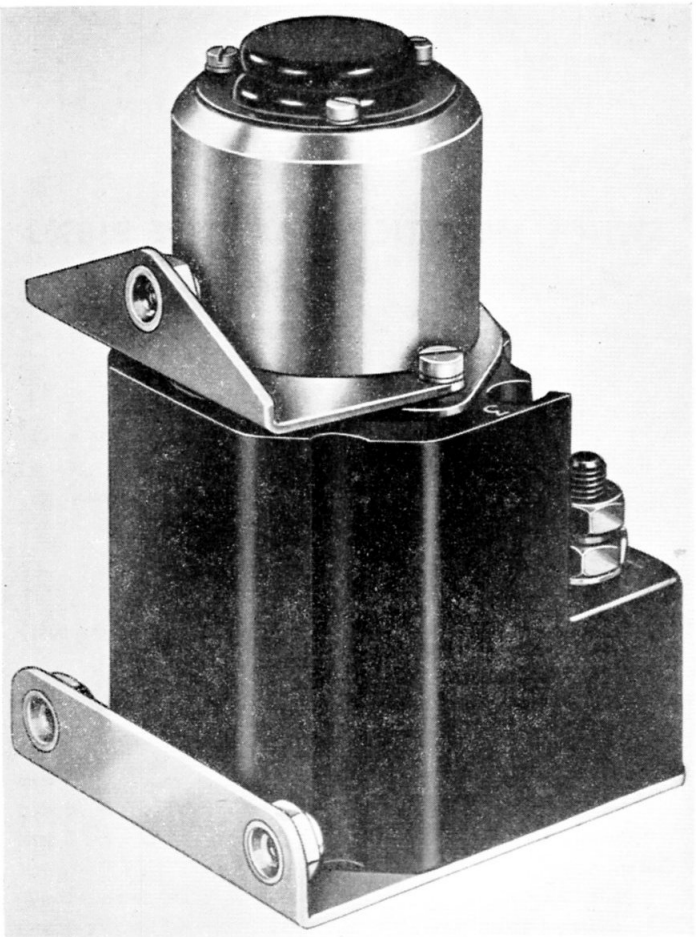

Fig. 1. General view of type D10505 switch

contained in a soft iron cylinder assembled in two halves and secured to the body moulding by two external cheesehead screws. The rear bracket is also secured to the body by these two screws. The moving contact plate is attached, by two spring loaded screws, to an insulated contact moulding. These screws are fastened to and operated by, the solenoid core assembly and the contacts are mounted on a pivoted block as shown in fig. 2. The pivot pin is supported by two duralumin pillars mounted on a flat plate which is held by four screws to the end of the soft iron cylinder enclosing the coil.

4. The auxiliary contacts are mounted on the cover plate of the switch and are operated by a dolly spindle which passes through a hole in the cover plate and screws into the moving contact plate. The contacts are arranged with one pair normally open and one pair normally closed, both pairs of contacts being returned to these positions after operation by light torsion springs.

5. The main fixed contacts form part of the main terminal assemblies and can be adjusted in height by means of shims.

Operation

6. When the coil is energized, the two plungers "E" (*fig.* 2) forming the solenoid core, move towards each other and this movement is imparted to the contacts through the duralumin links, "C" and "D", to the moving contact plate "A" on the pivoted block which pivots on the pin and closes the contacts "A" and "B". The spring on each contact (only one shown in fig. 2) allows the contact block to over travel after the contacts have made and thus exerts pressure on the contacts.

7. The movement of the contact plate is transmitted via the dolly spindle to the auxiliary contacts.

8. The two coiled torsion springs fitted on the pivot pin (not shown in fig. 2) return the contacts to the open position when the solenoid is de-energized.

INSTALLATION

9. The unit may be mounted in any attitude but it is not recommended that it be mounted with the solenoid uppermost. The unit is secured to its fixing by three 2 B.A. bolts which screw into two mounting brackets. The centres of the mounting brackets form a triangle, the base of which is 2·125 in. and the height 2·797 in.

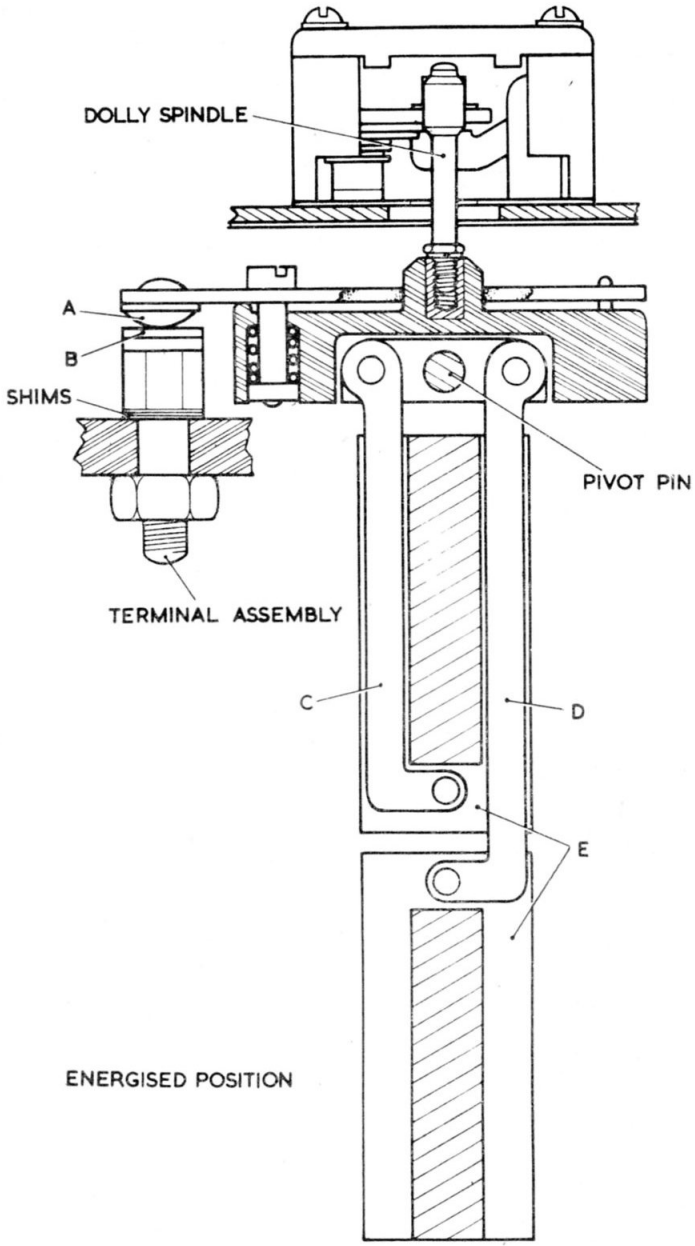

Fig. 2. Diagram of operating mechanism

Electrical connections

10. The main terminal connections are $\frac{1}{4}$ in. B.S.F. studs and the coil terminals which are inset in the body moulding are 4 B.A. screw terminations. The four auxiliary terminals are 4 B.A. screw terminations.

SERVICING

11. When the unit has been correctly installed and operated, it requires little attention in service. If a unit operates satisfactorily, it may be assumed serviceable for continued use.

Inspection

12. A visual inspection should be made from time to time to ensure that the unit is not damaged physically. If there is any sign of damage the unit should be removed and a new one fitted in its place.

Insulation resistance tests

13. Insulation resistance tests should be applied to the unit, provided it is accessible and can be isolated from its circuit.

14. Using a 250 volt insulation resistance tester, the insulation resistance should be at least 50,000 ohms between the following points:—

(1) Terminal 1 and terminal 2 with the main contacts open.

(2) Terminal 1 and terminal 3 with the main contacts closed.

(3) Terminal 1 and each fixing bracket with the main contacts closed.

(4) Terminal 3 and each fixing bracket with the main contacts open and then closed.

(5) Terminal 1 and terminal 5, 6 and 7 with the main contacts closed.

(6) Each fixing bracket and terminals 5, 6 and 7 with the main contacts closed.

(7) Terminal 3 and terminals 5, 6 and 7 with the main contacts closed.

(8) Terminal 5 and terminals 6 and 7 with the main contacts closed.

(9) Terminal 6 and terminal 7 with the main contacts closed.

(10) Terminal 7 and terminal 8 with the main contacts open.

Note . . .

The values of insulation resistances quoted in para. 14 are applicable to units being tested under normal workshop conditions. Due allowance should be made for the climatic conditions of the locality and those of the aircraft servicing area or dispersal point. In damp or humid climates, insulation resistance readings may be low, and discretion should be exercised when considering the unserviceability of the units.

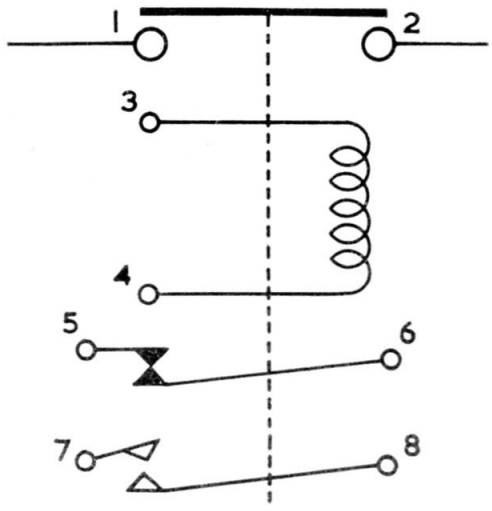

Fig. 3. Diagram of internal connections

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