Chapter 35

SWITCH MAGNETIC, ROTAX, TYPE D11401

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LIST OF ILLUSTRATIONS

LEADING PARTICULARS

Voltage of coil	112-V. d.c.
Voltage of contacts	112-V. d.c.
Contact rating	2·5 amperes
Coil resistance	1860 ohm ± 10 per cent
Coil "pull-in" voltage	47–61 volt
Coil "drop-out" voltage	2-8 volt
Length	3·760 in.
Width	3·700 in.
Height	2·370 in.

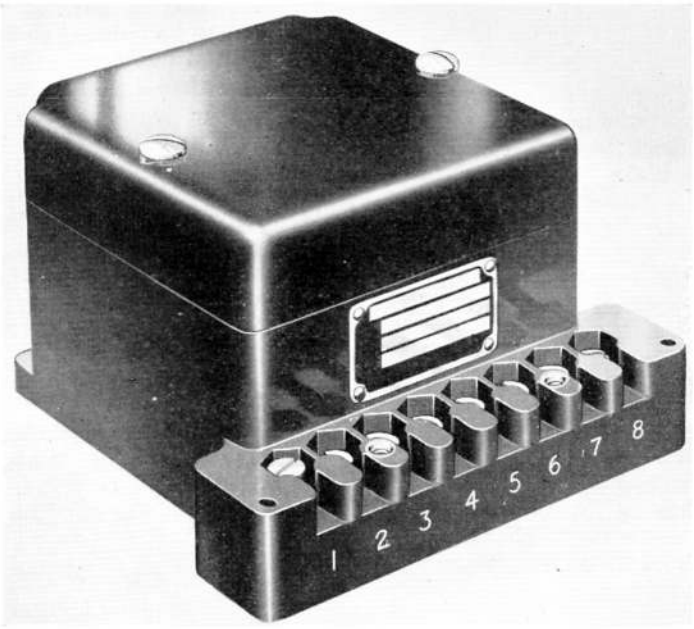

Fig. 1. General view of D 11401 switch

Introduction

1. The Rotax D11401 magnetic switch is a normally open, three-pole contactor for use in 112-V. d.c. circuits. The operating coil is also energized from a 112-V. supply.

DESCRIPTION

2. The switch is housed within a moulded case, of which a terminal block for external connections is an integral part. The solenoid is fixed to a mounting bracket which supports it within the case with its plunger axis horizontal and the plunger at the end remote from the terminal block. The plunger is linked to a toggle arm which is pivoted to the mounting bracket. The toggle arm form is approximately a right angle. The vertical part carries a contact block to which the three moving contacts are fitted (pointing vertically downwards) and the horizontal part carries a balance weight above the solenoid. Each moving contact has a mating fixed contact set in a well below the solenoid and the three pairs of contacts operate in separate compartments formed by moulded barriers. The contacts are normally held in the open position by a torsion return spring fitted over the toggle pivot pin. The switch is enclosed by a moulded cover. The internal connections to the terminals are made by conductors running in slots in the underside of the case which are covered by a bottom cover and liner. The terminals are enclosed by a screw retained cover.

Operation

3. When the coil is energized (terminals 1 and 2), the plunger pulls in and moves the moulded contact block towards the coil so that the contacts make, completing three independent circuits (terminals 3,4; 5, 6 and 7, 8). As the contacts swing closed the counter-balance weight swings upwards. When the coil is de-energized the torsion spring returns the contacts to normal.

INSTALLATION

4. Four 6 B.A. clearance holes are provided for mounting; they are spaced symmetrically about the main axis of the unit. The two holes at the terminal end are spaced 3·450 in. at centres whilst those at the contact end are spaced 2·640 in. at centres. The distance between the two lines of centres, along the main axis, is 3·500 in.

5. The terminals are 4 B.A. screw and washer terminations.

SERVICING

6. Make a general visual inspection of the unit to ensure that no damage has been sustained, that the unit is secure on its mounting and that the electrical connections are clean and secure.

7. In order to gain access to the contacts for inspection, the switch must be taken from its mounting and the bottom cover removed. The contacts should be examined for excessive burning and pitting and should be burnished if necessary.

Coil resistance test

8. The resistance of the coil, measured between terminals 1 and 2, should be 1860 ohms $\pm$ 10 per cent (corrected to 20 deg. C. ambient temperature).

Coil "pull-in" voltage test

9. With a suitable milliammeter in series with the coil, connect a variable supply to terminals 1 and 2. Commence with zero reading on the milliammeter. Slowly increase the supply from zero, noting the rising milliammeter reading. The solenoid should operate the contacts before the current has exceeded 30 milliamperes. The product of the operating current and the actual resistance of the coil (*para.* 8) should be between 48-V. and 61-V.

Coil "drop-out" voltage test

10. The current passing through the coil should now be reduced slowly. The plunger should drop out before the current has become less than 4 milliamps. The product of this current and the resistance of the coil (*para.* 8) should not be less than 8-V.

Millivolt drop test

11. Allow the rated current of 2·5 amperes to flow through each pair of contacts in turn (coil energized) and measure the potential drop across the appropriate pairs of terminals (*fig.* 2). In each test the reading should not exceed 80 millivolts.

Insulation resistance test

12. Measure the insulation resistance between the following points using a 500-V. insulation resistance tester. A reading of at least 50,000 ohms should be obtained in each test.

(1) Contacts open

- (*a*) Terminal 3 and terminal 4
- (*b*) Terminal 5 and terminal 6
- (*c*) Terminal 7 and terminal 8

(2) Contacts closed

(*a*) Terminal 1 and terminals 3, 5 and 7

(*b*) Terminal 3 and terminals 5 and 7

(*c*) Terminal 5 and terminal 7

(*d*) Frame and terminals 1, 3, 5 and 7

Note . . .

The value of insulation resistance given in para. 12 applies to switches 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 where the tests are being applied. In particularly damp climates, the readings obtained may be low enough to give apparently sufficient reason for rejection and, in these instances, discretion should be exercised.

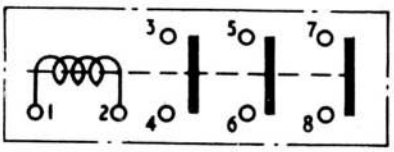

Fig. 2. Diagram of internal connections