Chapter 23

SWITCH, MAGNETIC, TYPE 15A, No. 3 (ROTAX D9411)

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LIST OF ILLUSTRATIONS

LEADING PARTICULARS

Switch, magnetic, Type 15A, No. 3 ...	Stores Ref. No. 5CW/5047
Voltage:	
Main contacts	112-V, d.c.
Auxiliary contacts	28-V, d.c.
Operating coil	28-V, d.c.
Tripping coil	28-V, d.c.
Current rating:	
Main contacts	80 amperes
Auxiliary contacts	5 amperes
Resistance of operating coil at 20 deg. C. ...	3·7 ohm ± 5 per cent
Resistance of tripping coil at 20 deg. C. ...	36 ohm ± 5 per cent
Operational temperature range ...	+ 50 deg. C. to − 65 deg. C.
Operational ceiling	50,000 ft.
Length	5·750 in.
Width	5·437 in.
Height	5·062 in.
Weight	5 lb. 8 oz.

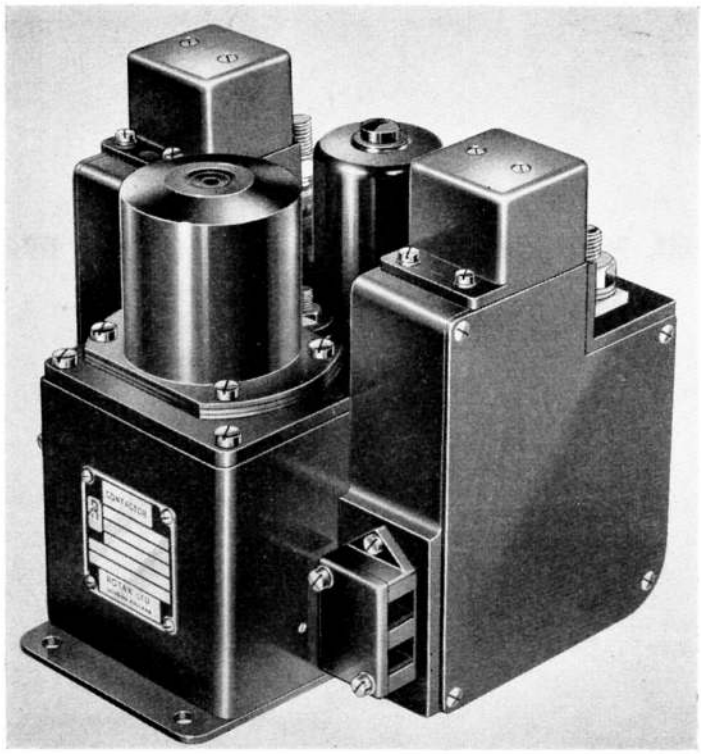

Fig. 1. Type 15A, No. 3 switch

Introduction

1. This unit (*fig.* 1 *and* 2) is included in the series of magnetically operated single pole contactors described in A.P.4343, Vol. 1, Sect. 11, Chap. 17, and is designed for the remote switching of 112 volt circuits whose current ratings do not exceed 80 amperes. The switch is mechanically latched in, and is therefore suitable for applications where continuous rating is required.

DESCRIPTION

2. The unit is generally similar to others in the D 9400 series (*A.P.4343, Vol. 1, Sect. 11, Chap. 17*) with the exception that the bi-metal element is not fitted and that economy resistors (*Fig.* 2 *and* 3) are connected in parallel with the coil safety switch, so that the operating plunger is held in after the switch has latched as long as 28 volts are supplied to the coil terminals. A bus-bar replaces the bi-metal element and electrically connects the two moving contacts. In the absence of a bi-metal element, the switch may only be tripped magnetically or manually. The economy resistors are mounted above the four-way terminal blocks and are enclosed by a metal cover. A tripping coil switch is also incorporated to close the tripping coil circuit only when the main contacts are closed.

Operation

3. If the switch is tripped while the operating coil is energized, the toggle collapses and the main contacts open but, since the solenoid plunger is held "in", the toggle does not return to its normal position and the tripping crank does not engage the latch plate. The switch cannot be operated again until it has been reset. Resetting is achieved by open circuiting the supply to the operating coil thus allowing the plunger to drop out and reset the toggle mechanism.

4. For further details of operation and installation, reference should be made to the chapter mentioned in para. 2.

SERVICING

5. In addition to the servicing detailed in A.P.4343, Vol. 1, Sect. 11, Chap. 17, the following tests should be applied.

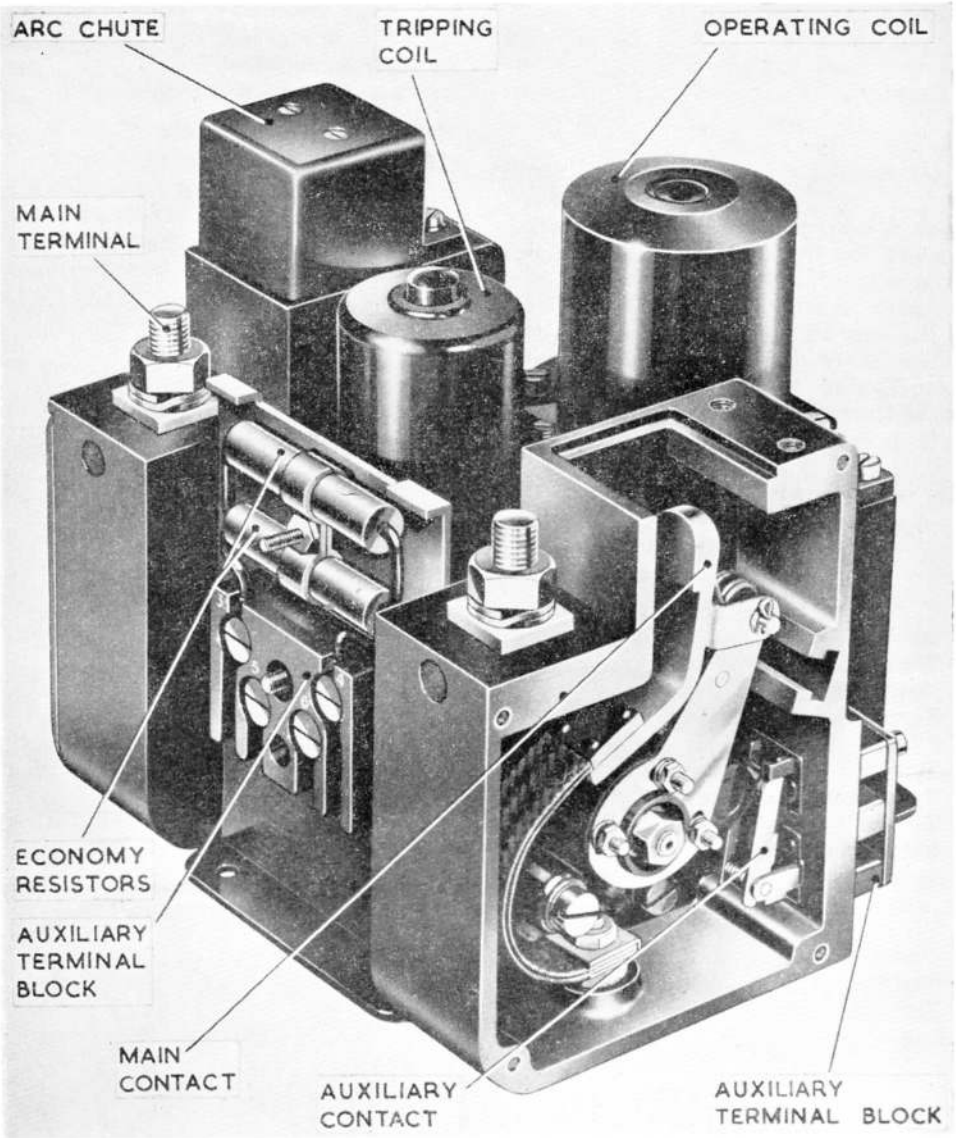

Fig. 2. View of switch, with covers removed

Coil resistance tests

6. Measure the resistance of the operating coil between the appropriate terminals on the four way terminal block (*fig.* 3) with the main contacts open. When corrected to a temperature of 20 deg. C, the coil resistance should be 3·7 ohm ± 5 per cent. With the switch latched in the "closed" position, measure the resistance of the tripping coil, and of the operating coil in circuit with its economy resistors, between the appropriate terminals. When corrected to 20 deg. C, the resistance of the tripping coil should be 36 ohm ± 5 per cent and the resistance of the operating coil circuit should be between 51 ohm and 56·4 ohm.

Millivolt drop tests

7. Allow the rated current of 80 amperes to flow through the 112 volt circuit and test the

following potential drops; they should not exceed the values given below.

(1) across each pair of main contacts	20 millivolt
(2) across each flexible braid	25 millivolt
(3) across each joint	5 millivolt
(4) across the main terminals	110 millivolt

8. With 5 amperes flowing, the potential drop beteen the terminals of each auxiliary switch should not exceed 20 millivolt. With 7·5 amperes flowing, the potential drop across the tags of the operating coil safety switch should not exceed 80 millivolt. With 1 ampere flowing, the potential drop across the tags of the tripping coil switch should not exceed 20 millivolt.

Insulation resistance tests

9. Measure the insulation resistance between the following points, using a 250 volt insulation resistance tester.

(1) Terminal 1 and terminal 2 (contacts open)
(2) Terminal 1 and terminals 5, 7, 9, 10 and frame (contacts open)
(3) Terminal 5 and terminals 6, 7, 8 and 9 (contacts open)
(4) Terminal 6 and terminals 7, 8, 9 and frame (contacts open)
(5) Terminal 7 and terminals 8, 9 and frame (contacts open)
(6) Terminal 8 and terminal 9 and frame (contacts open)
(7) Terminal 9 and terminal 10 (contacts closed)
(8) Terminal 9 and frame (contacts open)
(9) Terminal 5 and frame (contacts open)

A reading of at least 2 megohm should be obtained in each test.

Note . . .

The values given in these insulation tests apply to units being tested under normal workshop conditions. Due allowance must be made for climatic conditions of the locality and those of the aircraft servicing area or dispersal point where the tests are being conducted. In particularly damp climates, the readings may be low enough to give apparently sufficient reason for rejection and in these instances discretion should be exercised.

Resetting interlock mechanism

10. In the event of the main contacts welding, as the result of excessive arcing, the interlock mechanism of the unit will operate to prevent further operation of the unit. Remedial action should be taken, in accordance with A.P.4343, Vol. 1, Sect. 11, Chap. 17.

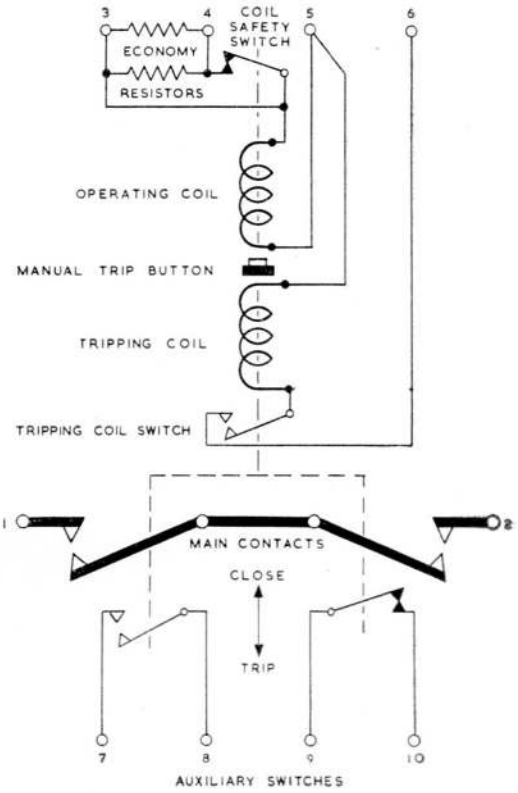

Fig. 3. Diagram of internal connections