Chapter 68

MANUALLY-OPERATED SWITCHES, ROTAX, D0400 SERIES

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Introduction

1. Manually-operated switches in the D0400 series are four-way rotary selector switches designed to connect a 28V d.c. supply to any one of four circuits. A typical application is selection of one of four starter motors in the starting system of a four-engined aircraft. The switch is fitted with an interlocking plate and is intended for use in conjunction with an interlocking contactor to ensure that the position of the switch cannot be altered while current is flowing.

DESCRIPTION

2. The switch (*fig.* 2) consists of a moulded barrel, having a segmented brass contact ring moulded into it, borne by friction bearings in a switch frame and a base plate. The barrel is rotated by means of a knob.

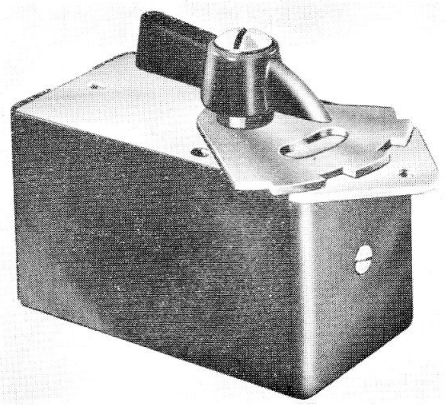

Fig. 1. Typical manually-operated switch

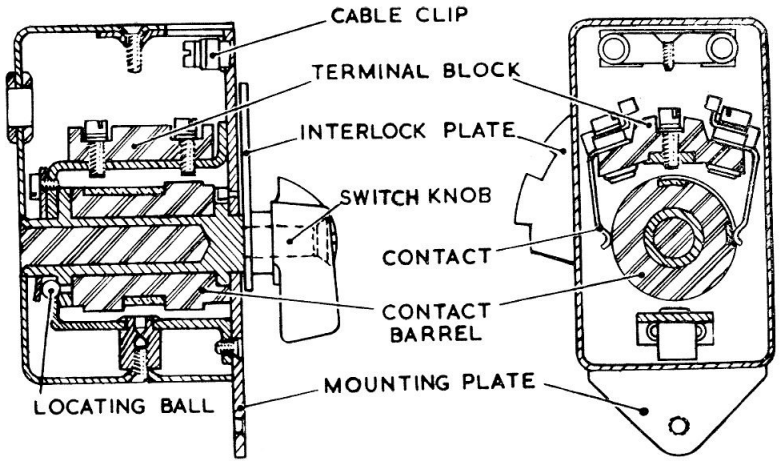

Fig. 2. Switch details

Bolted to the switch frame is a terminal block having six terminals arranged in two tiers of three. Five terminals only are used and each of these has a spring contact which bears on the surface of the barrel. External connections to the switch are brought into the terminal block through a grommet in the cover and are secured by a cable clip on the inside of the mounting plate.

3. The barrel has four positions and is located in any position to which it is set, by a spring-loaded ball engaging a socket in the end of the barrel. An interlocking plate is fitted to the barrel spindle between the switch knob and the base plate; the latter has four recesses to receive the locking catch of the contactor in each of the four switch positions.

Operation

4. At each position of the switch, a common terminal (S) is connected to one of the other four via the segmented brass contact ring of

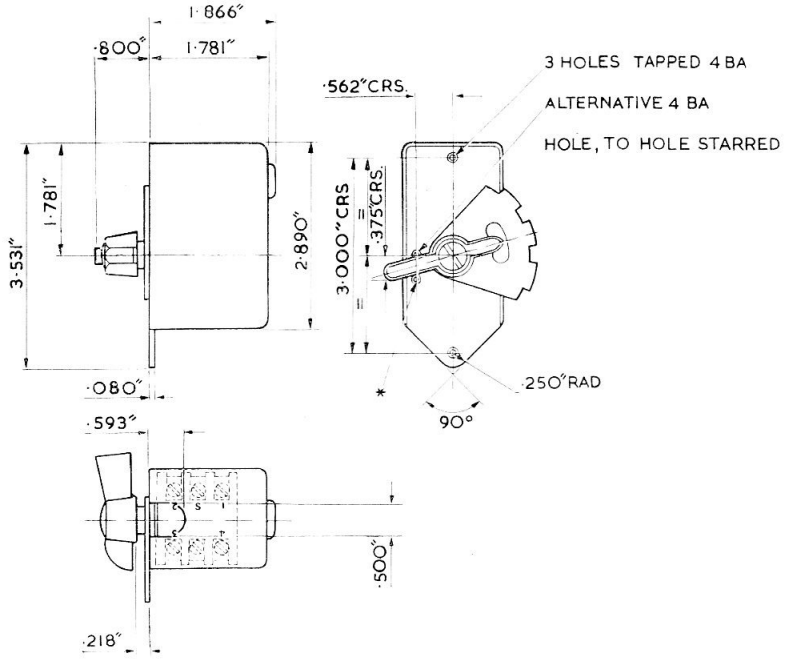

Fig. 3. Installation diagram

the barrel. The position in order anti-clockwise are:—

(1) S to 1
(2) S to 2
(3) S to 3
(4) S to 4

INSTALLATION

5. Three holes, tapped 4 B.A., are provided in the switch base plate for mounting. Two holes are on the main axis of the switches and are spaced 3·000 in. at centres, whilst the third hole (shown starred in fig. 3) is centred at a vertical distance of 0·562 in. from the main axis and offset 0·375 in. from the horizontal centre line. This applies to most units in the series; however, some units have an alternative hole as shown in fig. 3.

When this hole is used. it is important to ensure that the length of fixing screw is such that no fouling of the contact barrel will occur.

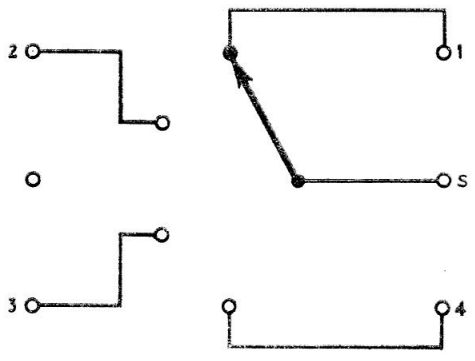

Fig. 4. Diagram of internal connections

6. The terminals are 5 B.A. cheese-head screws. In order to connect the external leads, remove the switch cover and pass them through the grommet. Connect the leads to their correct terminals and secure them to the inside of the switch base plate with the cable clip provided, allowing a little slack between the terminals and the clip. Finally replace the cover.

SERVICING

7. Examine the switch to ensure that it is in good condition and that the external leads have not chafed. Move the knob to each position in turn, and note the action of the switch; it should locate positively in each position with a snap action, and movement between positions should be smooth.

Millivolt drop tests

8. With the switch in each of its four positions in turn, test the potential drop across the connected pairs of terminals (*para.* 4) with 10 amperes flowing. A reading of not more than 100 millivolts should be obtained in each test.

Insulation resistance tests

9. Using a 250-volt insulation resistance tester, measure the insulation resistance between the following points. The reading should not be less than 0·5 megohm (for R.N.) or 5 megohms (for R.A.F.).

Terminal 1 to frame
Terminal 2 to frame
Terminal 3 to frame
Terminal 4 to frame

Appendix 1

MANUALLY-OPERATED SWITCH, ROTAX, TYPE D0419/2

LEADING PARTICULARS

Manually-operated switch, Type D0419/2	*Ref. No.* 5*CW*/5876
Voltage	28*V d.c.*
Current rating	5 *amp.*
Radius of inter-locking plate	1·312 *in.*
Overall dimensions—	
Length...	3·531 *in.*
Width	1·578 *in.*
Height...	2·666 *in.*
Weight	... 11 *oz.*

1. The D0419/2 manually-operated switch is identical to that described and illustrated in the main chapter except that there is no alternative 4 B.A. fixing hole on the mounting plate.

Appendix 2

MANUALLY-OPERATED SWITCH, ROTAX, TYPE D0422

LEADING PARTICULARS

Manually-operated switch, Type D0422	*Ref. No.* 5*CW*/8057
Voltage	28*V d.c.*
Current rating	5 *amp.*
Radius of inter-lock plate	1·312 *in.*
Overall dimensions—	
Length	3·531 *in.*
Width	1·578 *in.*
Height...	2·666 *in.*
Weight	... 11 *oz.*

1. The D0422 manually-operated switch is similar to that described and illustrated in the main chapter except that the alternative 4 B.A. tapped fixing hole has been added to the mounting face. If it is required to use this alternative fixing hole, reference should be made to para. 5 and fig. 3 of the main chapter.

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