Chapter 33

MANUALLY OPERATED SWITCHES, ROTAX, D7900 SERIES

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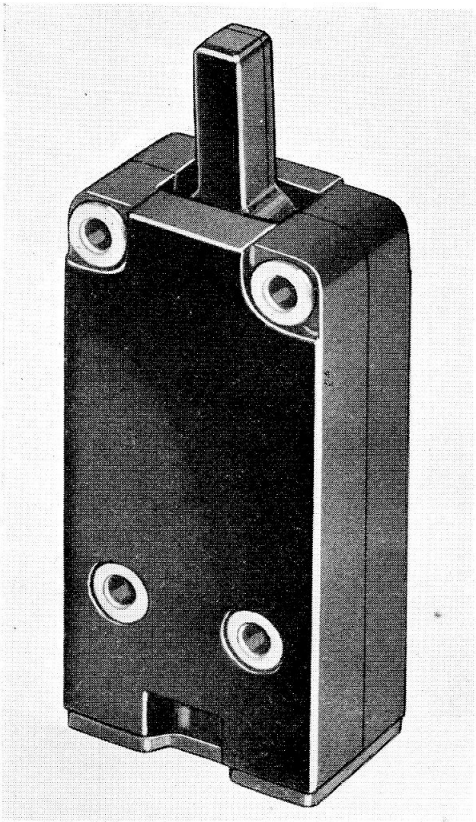

Fig. 1. Typical D7900 series switch

Introduction

1. Switches in the D7900 series have two normally open pairs of contacts, either of which may be closed by operating a dolly to the left or right of its central "off" position. The dolly is self centering and contacts are closed only as long as the dolly is held over by hand. The switch is designed for 28-volt circuits and its current rating is 2·5 amp.

DESCRIPTION

2. A typical switch in the series is illustrated in fig. 1 and 2. All the moving parts of the switch (*fig.* 2) are set between the two side plates of a switch frame assembly. The dolly with its actuator is pivoted at the top while at the bottom, a common terminal post is fitted. The two moving contact linkages are situated on either side of a central spacing post. Each linkage consists of an actuating arm, which engages the actuating dolly through a roller and is kept against the dolly by a torsion spring, and a moving contact arm. These two arms are linked by a toggle spring which ensures snap action "make" and "break" operations.

3. The switch mechanism is housed by two similar mouldings held together by four eyelet rivets which pass through the body of the switch and provide clearance holes for 6 B.A. mounting screws. The fixed contacts are set in the mouldings against the side walls and are connected to their terminals by copper strips. The three terminals are 6 B.A. screws and washer assemblies and are set into the bottom of the switch; they are enclosed by a small moulded cover.

Operation

4. When the dolly is operated to either side, the actuator pushes the appropriate toggle arm, against the action of its torsion spring. During this operation the toggle spring is compressed by the movement of the actuating arm until it "over centres" and the contact arm snaps into the closed position.

5. When the dolly is released, the torsion spring returns the actuating arm to its original position and the dolly to its central "off" position while the moving contact snaps open. Normally the dolly is held in the central position between the two actuating arms.

INSTALLATION

6. The switch may be mounted in any position. The four 6 B.A. eyelets are arranged symmetrically about the main axis of the switch. The distance between the centres of the pair close to the dolly is 0·715 in. while the distance between the centres of the lower pair is 0·540 in. The distance between the centre lines of the two pairs is 1·325 in.

SERVICING

7. It is not possible to dismantle these switches. They should be examined for cracks and signs of visible damage. The terminal cover should be removed, and the leads checked for loose connections and corrosion.

Testing

8. If the serviceability of the switch is suspect, it may be tested as laid down in Appendix A.

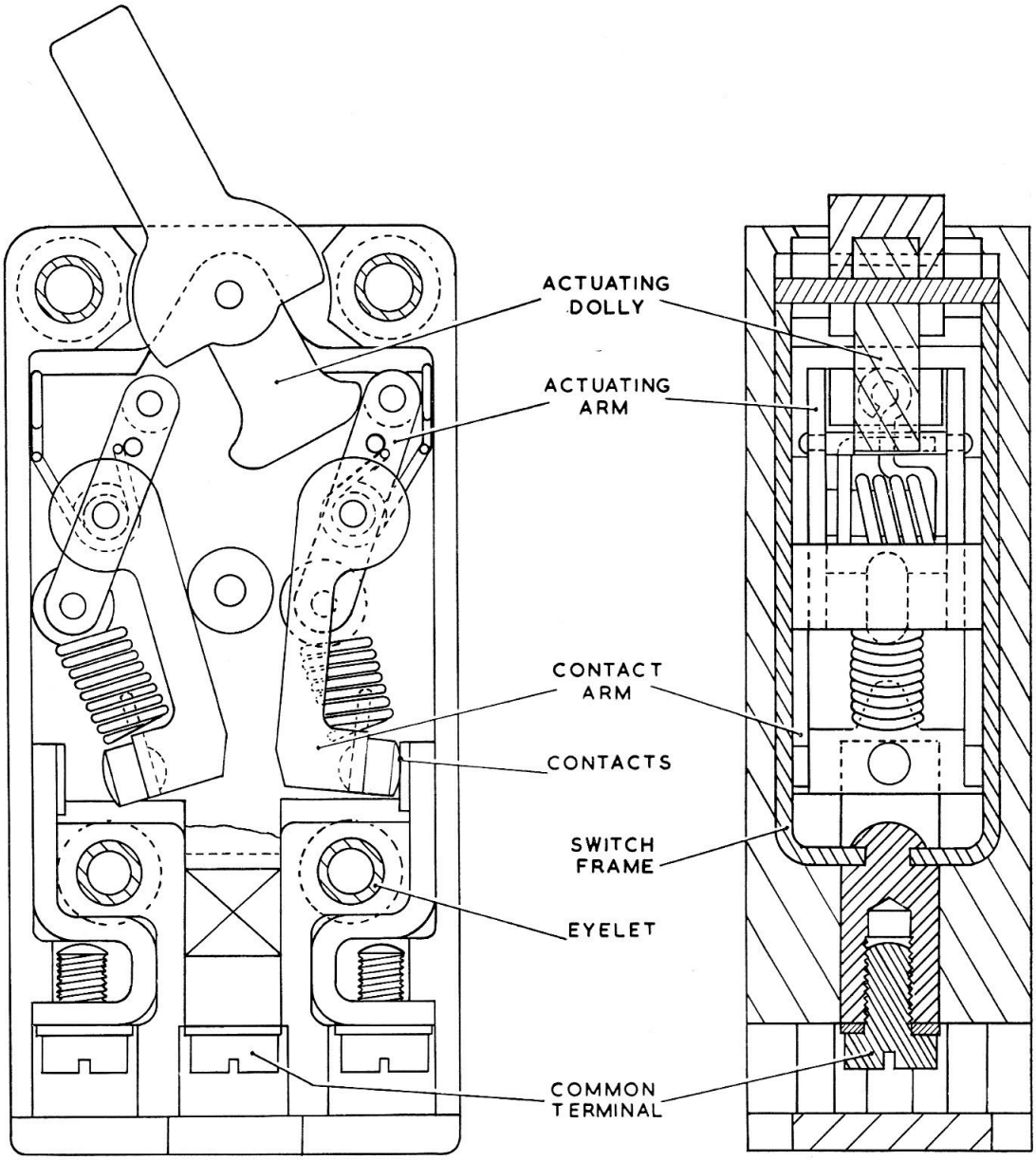

Fig. 2. Switch details

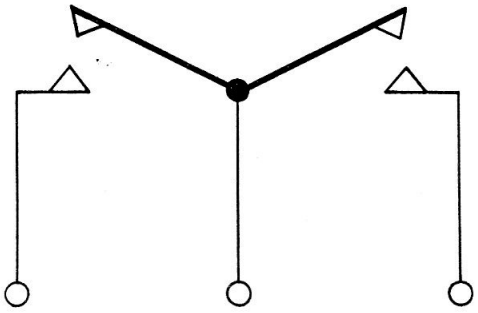

Fig. 3. Diagram of internal connections

Appendix A

STANDARD SERVICEABILITY TEST FOR MANUALLY OPERATED SWITCHES, ROTAX, D7900 SERIES

Introduction

1. The following tests may be applied to the switch before it is put into Service, or at any time when its serviceability is suspect.

Test equipment

2. The following test equipment is required

(1) Suitable 0–5A d.c. ammeter.

(2) Multimeter, Type 12889 (Ref. No. 5QP/17447) or equivalent.

(3) Insulation resistance tester, Type C (Ref. No. 5G/152).

Testing

Millivolt drop test

3. With the rated current of 2·5 amp. at 28 volts passed through each pair of contacts in turn, the potential drop between terminals should not exceed 40 mV in each test.

Insulation resistance test

4. The insulation resistance, when measured between the following points with a 250 volt insulation resistance tester, should not be less than 0·5 megohm (for R.N.) or 5 megohms (for R.A.F.).

(1) Between any pair of the three terminals with the switch in the OFF position.

(2) Between terminals not normally connected, with the switch in each ON position.

Appendix 1

MANUALLY OPERATED SWITCH, TYPE 1B (ROTAX D7901)

LEADING PARTICULARS

Manually operated switch, Type 1B	*Ref. No. 5C W/4402*
Voltage	*28V d.c.*
Current rating	*2·5 amp. (inductive load)*
Operating temperature	*−65 deg. C to +70 deg. C*
Altitude	*60,000 ft. (max.)*
Overall dimensions —	
Length	*2·662 in.*
Width	*0·625 in.*
Height	*1·000 in.*
Weight	*1½ oz. (42·5 gm.)*

1. The manually operated switch, Type 1B (Rotax D7901), is identical to that described and illustrated in the main chapter.

Appendix 2

MANUALLY OPERATED SWITCH, TYPE 1B, No. 5 (ROTAX D7905/1)

LEADING PARTICULARS

Manually operated switch, type 1B, No. 5	*Ref. No. 5C W/7538*
Voltage	*28V d.c.*
Current rating	*2·5 amp. (inductive load)*
Operating temperature	*—65 deg. C to +70 deg. C*
Altitude	*60,000 ft. (max.)*
Overall dimensions —	
Length	*2·662 in.*
Width	*0·625 in.*
Height	*1·000 in.*
Weight	*1½ oz. (42·5 gm)*

1. The manually operated switch, Type 1B, No. 5 (Rotax D7905/1) is basically similar to that described and illustrated in the main chapter, except that the toggle action has been redesigned to improve the switch action.

2. The D7905/1 switch supersedes the manually operated switch, Type 1B, No. 1 (Rotax D7904) (Ref. No. 5CW/6104), by the introduction of positive spring location on the spring retainers; the changes in design were introduced through modifications SW. 6008 and SW.6192.

3. The electrical connections are similar to that described in the main chapter but differ slightly in the identification, i.e., connections are made to three 6 B.A. combined screw and washer terminations in the base of the unit; the central terminal is common, and the other two terminals are identified by red and blue spots.

4. Installation of the unit differs slightly also from the main chapter in that the switch may be mounted in any attitude, but by three tubular rivets; the fourth rivet is solid, and correct installation is thus facilitated.

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