Chapter 34

MANUALLY OPERATED SWITCHES, TYPE 8B, No. 1 and 8B, No. 3

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LEADING PARTICULARS

Switch, manually operated, Type 8B, No. 1	*Stores Ref. 5CW/4612*
Switch, manually operated, Type 8B, No. 3	*Stores Ref. 5CW/4768*
Rating	*20 amp. continuous at 28 volt*
Temperature range	*−65 deg. C to +70 deg. C*
Electrical connections	*4 B.A. combined screw and washer terminals*
Mounting	*Four holes tapped 4 B.A. by 0·187 in.*
Dimensions:	
Height (including toggle)	*2·468 ins.*
Length	*1·964 in.*
Width	*1·330 in.*
Weight:	
8B, No. 1	*3·750 oz.*
8B, No. 3	*4·000 oz.*

Introduction

1. These units are 3-way single pole toggle switches intended for use on 28 volt aircraft systems. The switches will hold-on in any one of three positions (the Type 8B, No. 3 incorporating a safety lock in the mid-position) and are continuously rated at 20 amperes.

DESCRIPTION

General

2. In construction and general appearance the switches are similar and only differ in their action. Each switch comprises a moulded casing which houses a cam mechanism, moving contacts and a moulded base assembly containing fixed contacts and terminal inserts.

3. The moving contact arrangement comprises two contact arms arranged side by side. Both arms are pivoted in the middle and have a contact at each end. Corresponding to these four moving contacts are four fixed contacts recessed in the base moulding. Each contact arm is actuated by a lever and cam movement and the switch dollies are strapped by a moulding (*fig.* 1 *and* 2) so that both contact arm mechanisms move together.

Type 8B, No. 1

4. The Type 8B, No. 1 (*fig.* 1) is described in para. 2 and 3. The illustration shows a switch without rubber grommets for the connecting leads. These grommets, which are normally fitted, may be removed when necessary.

Type 8B, No. 3

5. The switch, Type 8B, No. 3 (*fig.* 2) is constructed as described in para. 2 and 3 but has, in addition, a locking device which locks the dollies in the central position (*fig.* 2). Locking is achieved by a clip on the dolly strap, which carries a locating pin at its lower end. The pin and clip are loaded by a spring housed within the clip, and the latter is able to slide up and down within recesses formed in the moulded dolly strap. When the dollies are in the central position, the locating pin enters a hole (position 2) drilled into the raised section of the body moulding and it is necessary to break this alignment, by lifting the clip, to obtain either position 1 or 3 (*fig.* 3).

Electrical connections

6. Electrical connections are made at the rear of the switches via 4 B.A. combined screw and washer terminals which are capable of accommodating cables of up to 19 ampere rating. A rubber grommet is provided at each cable entry position and a moulded cover, which protects the terminals, clamps the grommets in position.

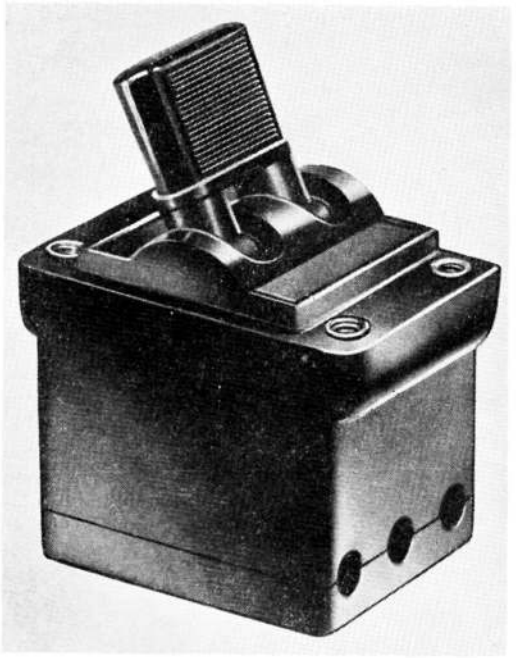

Fig. 1. Type 8B, No. 1 switch

Operation

7. The internal bore of each dolly contains two spring-loaded balls, the lower one of which rests in the centre of the pivoted cam which

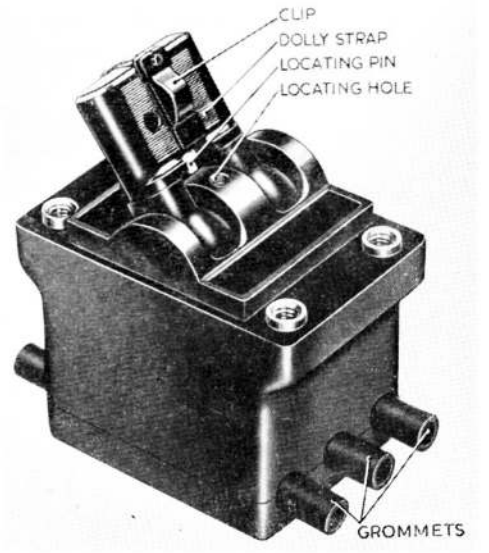

Fig. 2. Type 8B, No. 3 switch

is in turn attached to a contact arm. Movement of the dolly forces the lower spring-loaded ball over the centre of the cam face causing the moving contacts to make or break their respective fixed contact. When the dollies are in the central position, one contact on each arm is closed to a fixed contact, connecting terminal 4 to terminal 2. Movement of the dollies to positions 1 and 3 connects terminal 4 to terminals 1 and 3 respectively; terminal 4 being a common feed.

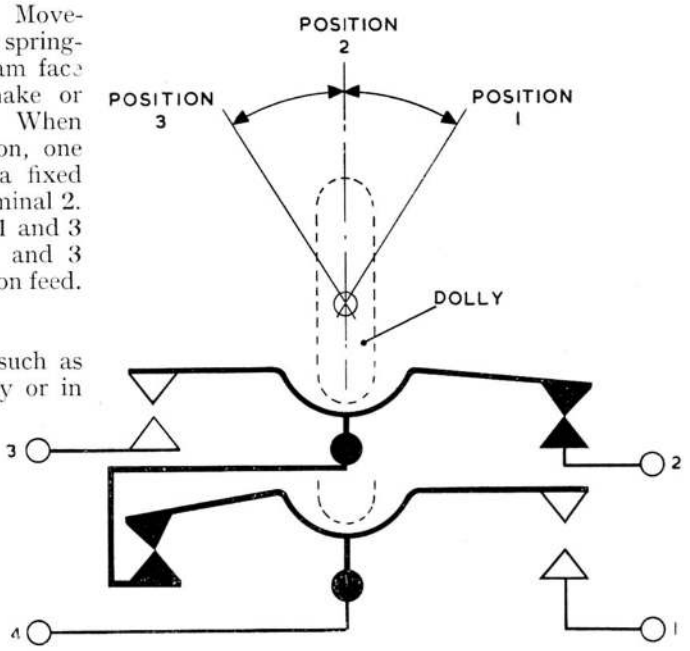

Fig. 3. Operation circuit diagram

INSTALLATION

8. The design of these switches is such as to enable them to be mounted singly or in banks. Provision for mounting is facilitated by four 4 B.A. tapped holes, 0·187 in. deep, whose fixing centres form a rectangle 1·580 in. by 0·860 in.

When mounted, the protrusion behind the mounting surface is 1·437 in.

Note . . .

When mounted in banks, a minimum clearance of 0·032 in. must be allowed between switches.

SERVICING

Inspection

9. It is not recommended that these switches be dismantled, as they have been sealed after manufacture and test. They should, however, be subjected to the following visual examination and test, after which, the switch can be considered as acceptable for continued service.

10. Remove the terminal cover and check that connections are secure and leads and grommets are in good condition.

11. Check the moulded body and terminal cover to ensure that they are not chipped, cracked or otherwise damaged.

12. Operate the switch dollies in each direction to ensure that they are free from binding and that the switch controls its associated circuits in the desired manner.

Testing

13. With 20 amperes flowing through the contacts, the millivolt drop across the terminals must not exceed the following:—

	Terminals 1 and 4	2 and 4	3 and 4
Type 8B, No. 1	40 mV	80 mV	80 mV
Type 8B, No. 3	80 mV	80 mV	80 mV

TABLE 1

Switch test positions

Dolly position	Resistance between terminals		
	1 and 4	2 and 4	3 and 4
Towards terminals 1 and 2 (position 1—fig. 3)	not less than 2 megohm	not less than 2 megohm	Zero
Central (position 2—fig. 3)	not less than 2 megohm	Zero	not less than 2 megohm
Towards terminal 3 (position 3—fig. 3)	Zero	not less than 2 megohm	not less than 2 megohm

14. With the switch in situ, and the external connections released, (using a 250-volt insulation resistance tester) the insulation resistance between all terminals should be as shown in Table 1.

15. It is recommended that any switch which fails to satisfy the preceding inspection and test should be replaced by a new one.

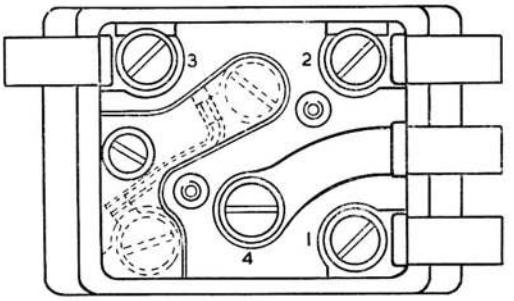

Fig. 4. Terminal arrangement