Chapter 62

MANUALLY-OPERATED SWITCH, TYPE SW.5000/2

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LIST OF ILLUSTRATIONS

LEADING PARTICULARS

*Switch, bus-bar change-over, Type SW.*5000/2 ...	*Ref. No.* 5*CW*/8041
Nominal voltage	28*V d.c.*
Nominal current	... 100 *amp.*
Overall dimensions	$5\frac{3}{4}$ *in. square*
Weight of unit	$7\frac{3}{4}$ *lb.*

Introduction

1. The static condenser, type SW.5000/2 switch is specifically designed for use as a bus-bar, change-over switch. It is a three-position, rotary action switch, comprising seven copper knife contact assemblies mounted on a common drive shaft.

DESCRIPTION

2. Four copper forked contact assemblies are spaced at 90-degree intervals around each centre contact assembly, and cable connections to these stationary contacts are made on $\frac{5}{16}$ in. B.S.F. terminal studs, fitted with Nyloc nuts. The contacts are housed in circular moulded sections which fit together and, with the addition of endplates, form the body of the switch. Four O.B.A. bolts pass through the length of the body and are fitted with nuts and tab washers to secure and lock the sections together.

3. The squared drive shaft is located in the centre of the assembly and is housed in bronze bushes moulded into the endplates. The shaft protrudes through the square endplate at the top of the switch to permit engagement with the operating mechanism; this endplate is drilled at each corner to accommodate the mounting bolts.

4. An aluminium index plate is attached to the round endplate at the base of the switch and indicates the position of the moving contacts: No. 1 SUPPLY-NORMAL—No. 2 SUPPLY. A schematic view of the switch is shown in fig. 1.

5. Each switch section carries an alphabetical reference letter and the four terminal banks are numbered. Interconnection is necessary to obtain the conditions required in the bus-bar change-over circuit, and for this purpose eight copper links and six link assemblies are fitted to the terminal banks.

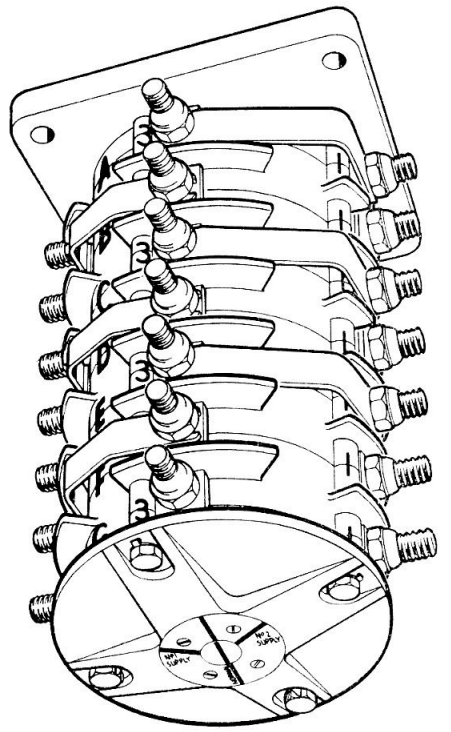

Fig. 1. Schematic view of switch

Operation

6. The three switch positions are equally displaced at 60 degrees to each other and are obtained by rotation of the squared drive shaft in the required direction. The centre contact assemblies rotate with the shaft and engage in the appropriate forked stud and contact assemblies. A stop plate is silver-soldered on the shaft and prevents override.

7. The bottom end of the shaft is grooved and, in conjunction with the index plate at the base of the switch, indicates the position of the contacts and permits correct engagement of the drive shaft, in relation to the control lever position.

8. To prevent current surges being produced by the sudden placing of heavy loads on the bus-bars, switch section 'G' is used to control a bus-bar, auto-trip circuit; it is so arranged that, during change-over, contacts in this section "make", before the contacts in other sections are broken, and "break" when the change-over is completed. A contact arrangement of the switch is shown in fig. 2.

9. Control of the switch is affected by means of a cable and pulley assembly fitted to the drive shaft, and an operating lever located in the flight compartment.

INSTALLATION

10. The switch is held together by two endplate assemblies (fig. 1); the square endplate being utilized for mounting purposes on installation and is provided with four 0·257 in. holes on 5·5 in. P.C.D.

SERVICING

11. Little servicing is possible "in situ", except for ensuring correct switch operation and an inspection for signs of corrosion, pitting of contacts and cracks; the latter defect may most likely occur at the corners of the mounting endplate. If defective a new endplate assembly should be fitted; this can be effected without renewing the complete switch.

TESTING

Continuity and non-contact test

12. With the links removed, and using a 250V insulation resistance tester, effect the following tests, by operating the switch from 'NORMAL' to No. 2 and checking that:—

(1) On sections A, C and E, contacts 3-4 and 1-4 break, before contacts 2–4 make.

(2) On section G, contacts 1-4 make, before contacts 3-4 and 1-4 on sections A, C and E break.

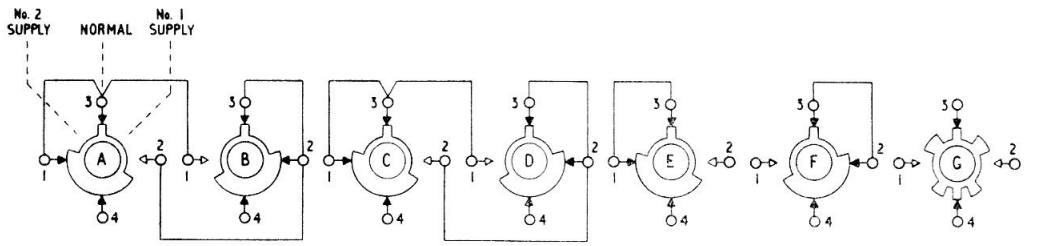

Fig. 1. Contact arrangement

(3) On section G, contacts 3-4 break, before contacts 1-4 make.

(4) On section G, contacts 1-4 break, before contacts 3-4 re-make.

13. Operate the switch from 'NORMAL' to No. 1 and check that:—

(1) On sections B, D and F, contacts 2-4 and 3-4 break, before contacts 1-4 make.

(2) On section G, contacts 2-4 make, before contacts 2-4 and 3-4 on sections B, D and F break.

(3) On section G, contacts 3-4 break, before contacts 2-4 make.

(4) On section G, contacts 2-4 break, before contacts 3-4 re-make.

(5) On section G, that contacts 3-4 are made with the switch set at all three positions: No. 1—NORMAL—No. 2.

Millivolt drop test

14. Using a suitable Avometer, set the switch from No. 1 to 'NORMAL' and check that:—

(1) The volt-drop measured between contacts 1-4 on sections A, C and E does not exceed 10 millivolts at 100 amp. d.c.

(2) The volt-drop measured between contacts 3-4 on sections A, B, C, D, E, and F, does not exceed 10 millivolts at 100 amp. d.c.

(3) The volt-drop measured between contacts 2-4 on sections B, D and F, does not exceed 10 millivolts at 100 amp. d.c.

(4) The volt-drop measured between contacts 3-4 on section G, does not exceed 5 millivolts at 10 amp. d.c.

15. Operate switch to No. 2 from 'NORMAL' until contacts 1-4 on section G are made and check that:—

(1) The volt-drop between these contacts does not exceed 5 millivolts at 10 amp. d.c.

(2) The volt-drop measured between contacts 2-4 on sections A, C and E does not exceed 10 millivolts at 100 amp.

16. Operate switch from No. 2 to No. 1, until contacts 2-4 on section G are made and check that:—

(1) The volt-drop measured between contacts 2-4, does not exceed 5 millivolts at 10 amp. d.c.

(2) The volt-drop measured between contacts 1-4 on sections B, D and F does not exceed 10 millivolts at 100 amp. d.c.

Insulation resistance test

17. Using a 250 insulation resistance tester, check between the following points:—

(1) Each connector on terminal bank No. 1.

(2) Each connector on terminal bank No. 2.

(3) Each connector on terminal bank No. 3.

(4) Each connector on terminal bank No. 4.

(5) Each connector and the drive shaft.

18. With the switch at NORMAL check between:—

(1) Contacts 1-2 on sections A, B, C, D, E and F.

(2) Contacts 1-3 and 2-3 on section G.

19. With the switch at No. 2, check between contacts 2-1 and 2-3 on section A, C and E.

20. With the switch at No. 1, check between contacts 1-2 and 1-3 on sections B, D and E.

21. All individual readings should not be less than 5 megohm (R.A.F.) and 0·5 megohm (R.N.).