

Chapter 8

MAGNETIC SWITCHES (ROTAX D8600 SERIES)

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Introduction

1. The D8600 series of magnetic switches have been designed to meet the requirement for 200 amp. contactors for use in aircraft having 112-volt d.c. electrical systems. A particular application is their use, in conjunction with differential relays, as main generator contactors. The main contacts are continuously rated at 200 amp., and the auxiliary contacts continuously rated at 5 amp.

DESCRIPTION

2. Although basically similar in design, the types in the D8600 series differ in auxiliary contact arrangement and operating coil voltage. For details of specific types, reference should be made to A.P.4343C, Vol. 1, Book 2, Sect. 4. A contactor, typical of the series, is shown in fig. 1 and 2, with a typical circuit diagram in fig. 3.

3. The contactor comprises a moulded base on the front of which are mounted the main and auxiliary contacts, the actuating toggle mechanism and the solenoid.

4. The main contacts are closed by the action of a solenoid with starting and economy windings, via a toggle linkage which also opens or closes the auxiliary contacts. The linkage mechanism also opens the coil economy switch contacts towards the end of the plunger stroke.

5. Protection for the mechanism and contacts is provided by a metal cover within which a moulded "arc-chute" encloses each main contact. Each main moving contact carries with it an arcing-finger which leads the main contacts and diverts the full arcing effect from the main contact surfaces. Later versions have fitted, in addition, what is referred to as a de-ion grid blow-out to assist arc extinction.

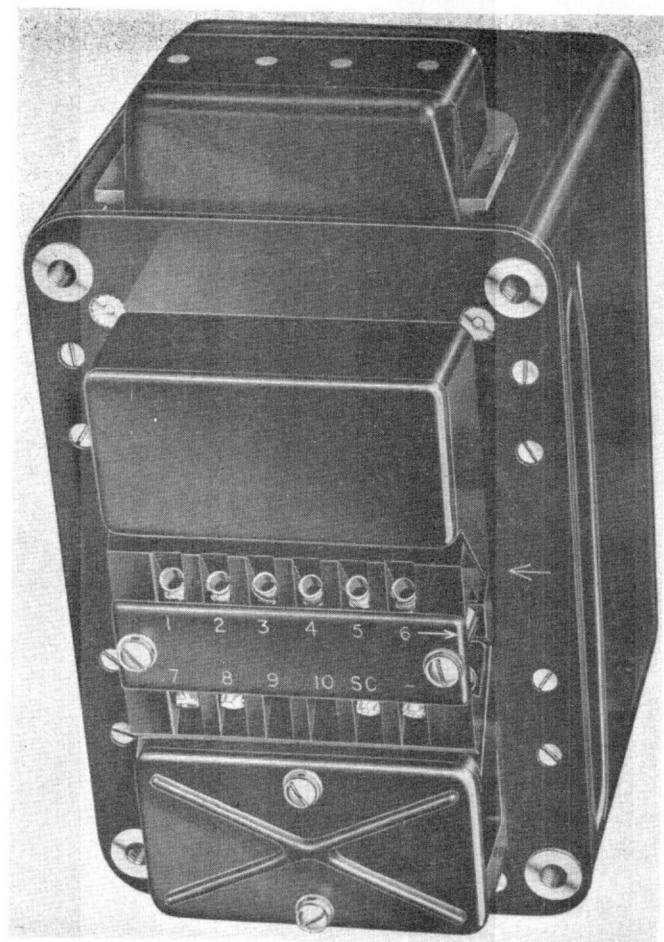


Fig. 1. A typical unit in the D8600 series

Operating coils

6. Information on coil winding resistances and the minimum operating voltage for a specific type within the series will be found in the publication mentioned in para. 2.

Contacts

7. These consist of two pairs of silver nickel contacts in series. The auxiliary and economy contacts are rated at 5 amp. on 28 volts d.c.

Electrical connections

8. Main connections are made at two $\frac{1}{4}$ in. dia. terminal studs to cater for strap connections or cable lugs. The 10 auxiliary terminals are rated at 7 amp. (S.B.A.C. type).

Operation

9. When the operating coil is energized by applying the appropriate voltage, the plunger is drawn into the solenoid. The travel of the plunger actuates a carrier plate which is

pivoted at each end and upon which the main contacts are mounted. The change of motion between the travel of the plunger and the closing of the contacts is achieved via a toggle linkage assembly.

10. Immediately prior to the main contacts closing, the economy switch is opened, inserting the holding winding in series with the closing windings. This reduces the coil current to a continuously rated value which maintains magnetic hold-in.

11. With the operation of the main contacts, a pin protruding beyond the edges of the carrier (and moving with it), operates the auxiliary contacts located on each side of the main frame.

12. The unit will return to its normal position with main contacts open when the voltage across the hold-in coil falls to the drop-out figure.

INSTALLATION

13. The contactors may be mounted in any attitude except with the main contacts pointing downwards. Positioning should allow, also, for the satisfactory removal of the cover for inspection.

14. Provision for securing the unit in position is made by four, brass-bushed, fixing holes, tapped $\frac{1}{4}$ in. B.S.F., let into the moulded base, the fixing centres being 6.156 in. by 4.187 in. Dimensions of the mounting base are 8.329 in., and the height of the unit, from mounting surface to the top of the cover, is 4.890 in. A distance of 1.187 in. protrudes behind panel from mounting surfaces.

SERVICING

15. Assuming that the units have been correctly installed and operated, they will normally require little attention in service. Providing the unit operates satisfactorily it should not be interfered with, but assumed to be serviceable for continued use.

Inspection

16. Remove the cover and examine the contacts for signs of burning or pitting.

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Inspect the mechanism, and if signs of malfunctioning are evident, remove the unit and replace it with a new one. If the unit is satisfactory, replace the cover and secure with cover screws.

17. In certain instances a measure of servicing may be necessary as determined by the requirements of the installation in which this unit is fitted. In such instances, the relevant Aircraft Handbook will give the necessary details.

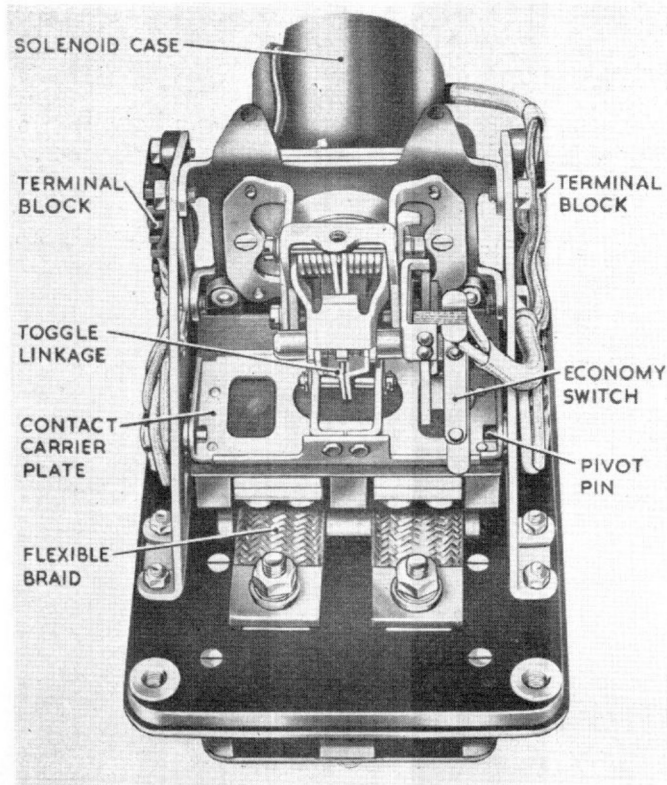


Fig. 2. View with cover removed

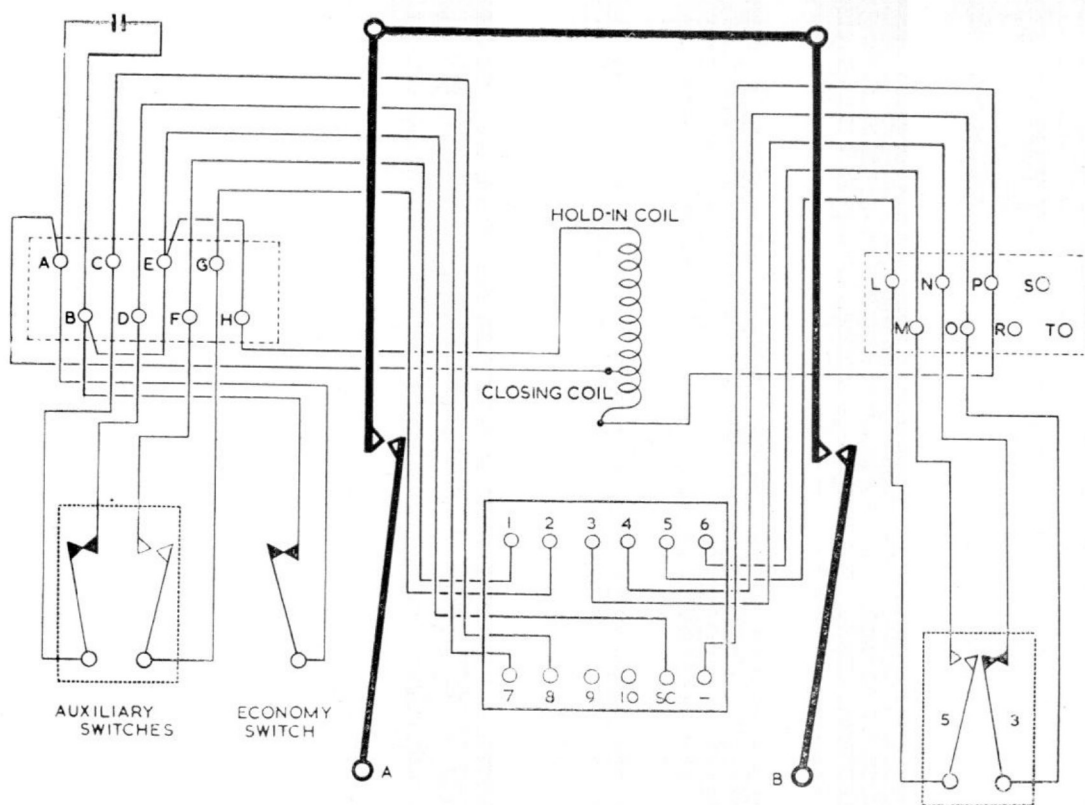


Fig. 3. Typical circuit diagram

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