

## Chapter 9

# STARTING SWITCHES, ROTAX, U2000 SERIES

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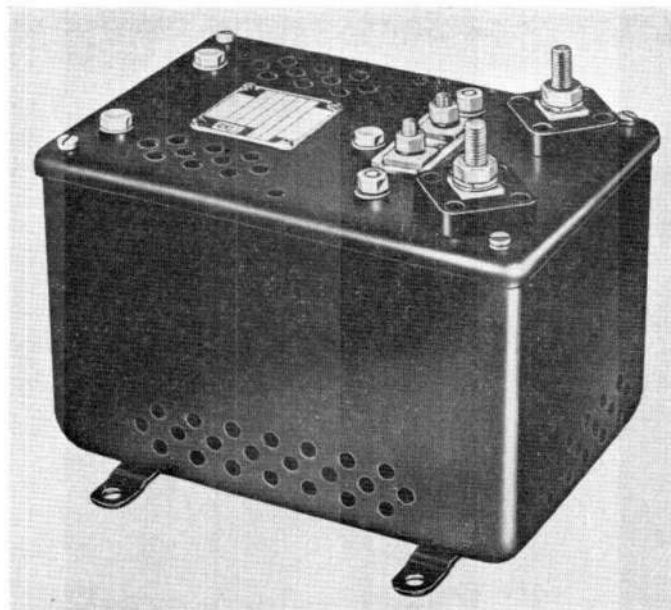


Fig. 1. Typical U2000 series starting switch

### Introduction

1. The U2000 series of starting switches are designed to carry out the starting sequence for various 28 or 112 volt d.c. electric motors. The particular motor for which each switch is designed will be identified, together with other leading particulars, in the chapters covering the individual panels. These will be found in A.P.4343C, Vol. 1, Book 3, Sect. 7 and 8.

### DESCRIPTION

2. The U2000 series of starting switches are all contained in sheet aluminium cases of identical type, though the case for U2006 has larger dimensions and two additional terminals, fitted for the auxiliary contacts which distinguish this model. Apart from the auxiliary contacts in the U2006, the same circuit diagram applies to the complete series, though

values and rating of components vary. The main differences are in the values of both starting and ballast resistors.

3. The case contains a relay, a relay ballast resistor, and a starting resistor, together with two  $\frac{1}{4}$  in. B.S.F. terminals and two 2-B.A. terminals projecting from the base (two additional terminals are fitted on the U2006 only).

4. The relay is operated by a lever system connected to two plungers, one at either end of the solenoid coil, giving a dynamically balanced unit so that the pull-in voltage remains constant under varying accelerations.

### OPERATION

5. A circuit diagram showing a typical installation is given in fig. 2, with the starting resistor connected in series with the motor armature to limit the initial starting current. As the back E.M.F. of the motor builds up, an increasing voltage is applied across the relay coil. When this voltage reaches a pre-determined value, the relay operates, closing the contacts and short-circuiting the starting resistor.

6. The relay pull-in voltage is controlled by a ballast resistor in series with the coil; this resistor is adjusted during manufacture to give the appropriate pull-in voltage for a particular unit. ▶

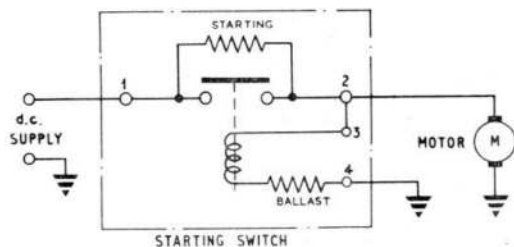


Fig. 2. Typical circuit diagram

### INSTALLATION

7. The U2000 series starter units may be mounted in any attitude by means of four holes drilled in two steel mounting straps riveted to the case. The dimensions and spacing of these holes are given in the relevant chapter for the particular model (para. 1).

### SERVICING

8. These units can be serviced without being removed from the aircraft. First, the leads and terminals should be inspected for cleanliness and wear; the leads to the unit should then be disconnected and the tests described below carried out.

#### Operational test

9. Using a lamp and battery or a low-reading ohmmeter in series with the contacts, ensure that the relay makes contact at the minimum pull-in voltage.

#### Insulation resistance test

10. The insulation resistance between all terminals and earth, and also between the coil and the contacts (terminals 1 and 3), measured with a 500-volt insulation resistance tester, must not be less than 50,000 ohms.

#### Note . . .

The value for resistance quoted in para. 10 above applies to units being tested under normal workshop conditions. Due allowance should be made for local climatic conditions. In particularly humid climates the readings may be low enough to give cause for rejection, and in these instances discretion should be exercised. The relevant servicing schedule will normally give full instructions.

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