# Chapter 97

# SWITCH MAGNETIC, ROTAX, TYPE D.7001/2

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## LIST OF ILLUSTRATIONS



## LEADING PARTICULARS

| | |
|---|---|
| Voltage ... ... ... ... ... ... ... ... | 24-V. d.c. |
| Current rating ... ... ... ... ... ... | 150 amperes |
| Rating ... ... ... ... ... ... ... | Continuous |
| Coil resistance at 20 deg. C. | |
| Pull-in ... ... ... ... ... ... | 7 ohm. ±10 per cent |
| Hold-in ... ... ... ... ... ... | 97 ohm. ±10 per cent |
| Pull-in voltage ... ... ... ... ... ... ... | 16-V. d.c. |
| Hold-in voltage ... ... ... ... ... ... ... | 12-V. d.c. |
| Length ... ... ... ... ... ... ... ... | 5·687 in. |
| Width ... ... ... ... ... ... ... ... | 3·250 in. |
| Height ... ... ... ... ... ... ... ... | 3·063 in. |
| Weight ... ... ... ... ... ... ... ... | 3 lb. |

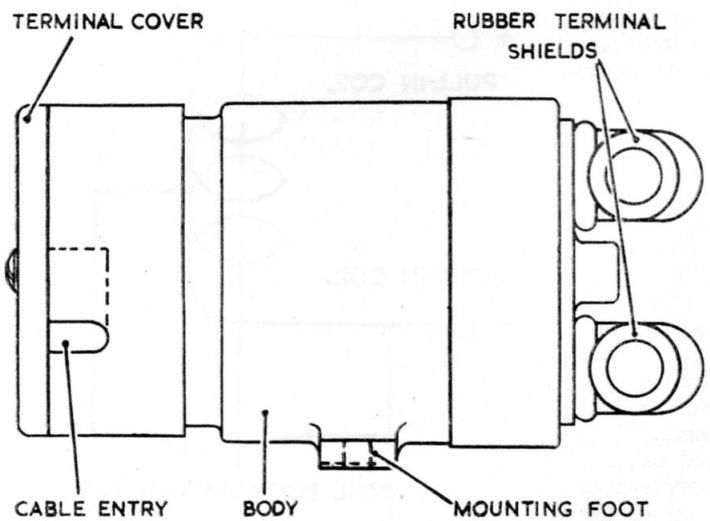


**Fig. 1. Type D.7001/2 switch**

### Introduction

**1.** The D.7001/2 magnetic switch is designed to close a single 24-V d.c. circuit by the remote control of an operating solenoid. The main contacts have a rating of 150 amperes and the solenoid coil is continuously rated, there being an economy switch which opens when the switch plunger pulls in and brings a hold-on winding of greater resistance into circuit. The current flow required to ensure that the plunger is held in is thereby reduced to a minimum.

### DESCRIPTION

**2.** The solenoid plunger and "anvil" (i.e. solenoid core) are

housed in a cylindrical body having one end closed. The plunger slides in a tube within the solenoid and is mounted on a spindle which slides in a bearing in the end wall of the body. The end wall forms the "out" stop of the plunger whilst the "in" stop is formed by the "anvil". The plunger spindle projects through a bore in the "anvil" to carry a moulded circular contact carrier having a contact ring set into it. The contact carrier is free to slide axially on the spindle. A helical spring, about the spindle, in compression between the carrier and the plunger permits follow-through when the contacts make and maintains the required contact pressure. Forward movement of the contact carrier relative to the spindle is limited by a conical stop on the spindle.

**3.** Two fixed contacts are set in a cylindrical cap which is secured to the open end of the body by a ring nut. The contacts are integral with terminal studs which project through to the exterior of the cap and are protected by rubber terminal shields. The forward end of the plunger spindle slides in a bearing in the cap. A helical return spring about the spindle is in compression between the conical stop and the cap.

**4.** The two coil terminals and the coil economy switch are housed in a cylindrical moulding bolted to the end of the body remote from the main terminals. The plunger spindle extends through its bearing in the end wall of the body and into the economy switch housing to operate the economy switch. The switch opens as the plunger reaches the end of its pull-in stroke. The terminals and economy switch are enclosed by a moulded, screw retained cover.

#### Operation

**5.** The plunger is normally held against its "out" stop by the return spring, with the main contacts open and the economy switch closed. When pull-in voltage (16-V.) is applied to the coil terminals the pull-in winding is energized, so that the plunger is pulled in, the contact ring makes with the two fixed contacts commoning the main terminals, and the economy switch opens. The whole winding now comes into circuit and 12-V. is sufficient to hold in the plunger. When the supply to the coil is switched off, the plunger, contact ring and economy switch return to normal under the action of the return spring.

### INSTALLATION

**6.** There are two mounting feet integral with the main body, and each has one 0·234 in. diameter clearance hole. The holes are spaced 2·374 in. at centres.

**7.** The main terminals are $\frac{3}{8}$ in. B.S.F. copper studs and the coil terminals are 4 B.A. screw and washer terminations.

### SERVICING

**8.** Ensure by visual inspection that the switch has not suffered damage, that it is secure on its mounting and that all the external connections are secure. The rubber terminal shields should be in place and should not be in a perished condition.

#### Coil resistance tests

**9.** Measure the resistance of the solenoid winding between the coil terminals, with the coil economy switch both closed and open. When the readings have been corrected to 20 deg. C. ambient termperature, the value of the pull-in winding (economy switch closed) should be between 6·3 and 7·7 ohm and the value of the hold-in winding (economy switch open) should be between 87·3 and 106·7 ohms.

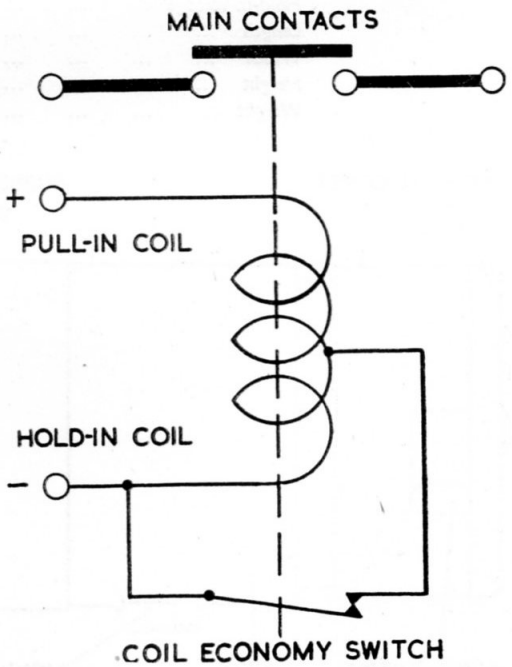


**Fig. 2. Diagram of internal connections**

**Millivolt drop tests**

**10.** Allow a current of 500 amperes to flow through the main contacts (coil energized) and measure the potential drop across the main terminals. A reading of not more than 100 millivolt should be obtained.

**11.** With 5 amperes flowing through the coil economy switch contacts (coil de-energized), the potential drop across the contacts should not exceed 40 millivolt.

**Insulation resistance tests**

**12.** Measure the insulation resistance between the following points, using a 250-V. insulation resistance tester. A reading of at least 50,000 ohm should be obtained in each test.

(1) Main terminals and switch body (coil energized)

(2) The two main terminals (coil de-energized)

(3) Coil terminals and switch body (coil de-energized).

**Note . . .**

*The value of insulation resistance, given in para. 12 applies to switches being tested under normal workshop conditions. Due allowance should be made for climatic conditions of the locality and those of the aircraft servicing area or dispersal point where the tests are being applied. In particularly damp climates, the readings may be low enough to give apparently sufficient reason for rejection and, in these instances, discretion should be exercised.*