Chapter 45

SWITCH, MAGNETIC RELAY (ROTAX TYPE D 11801)

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LIST OF ILLUSTRATIONS

LEADING PARTICULARS

Switch, magnetic relay	Stores Ref. 5CW/5862
Rated voltage	28 volts
Current consumption at normal load	400 amp.
Operating voltage of coil	
Maximum	29 volts
Minimum	16 volts
Maximum current of coil	0·6 amp.
Minimum current of coil	0·332 amp.
Overall dimensions	
Length	5·375 in.
Width	3·250 in.
Height	5·562 in.
Weight	4 lb.
Coil resistance	48 ohms. ±10% at 20 deg. C.
Rating	Continuous

Introduction

1. The magnetic relay switch is designed for remote control of electrical power supply from the ground to aircraft. The maximum permissible load is 400 amp. at 28 volts.

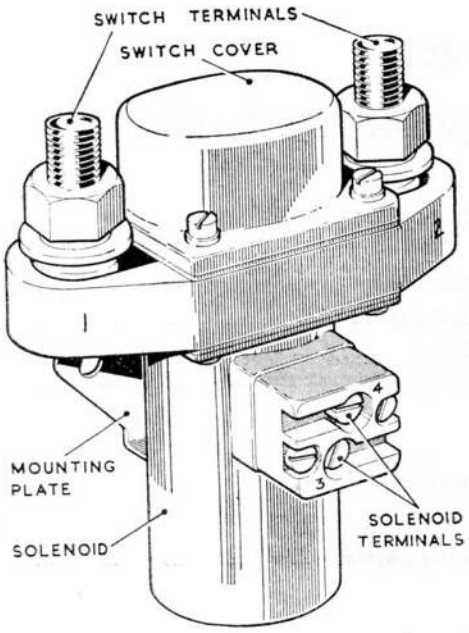

Fig. 1. General view of magnetic relay switch

DESCRIPTION

2. The unit, fig. 1, comprises a solenoid assembly, a moving bridge contact assembly, and supply switch terminals 1 and 2; with two fixed contacts. The fixed contacts are integral with the supply switch terminals, and are secured to an insulated moulding. Secured to the switch body is a moulded cover, which provides access to the supply switch contacts for periodical inspection. A spring-loaded plunger, which is located in the centre of the solenoid, is mechanically linked to the moving bridge contacts. The moving contacts are designed to bridge the fixed contacts when a 28 volt supply is applied to the solenoid. A terminal block, which is secured to the solenoid casing, is provided for solenoid leads and 28 volt supply connections.

Electrical connections

3. The supply switch terminal posts 1 and 2, with associated nuts and washers, are 0·5 in. dia. thread. The two solenoid terminals on the terminal block, are two 4 B.A. terminal screws and washers.

Operation

4. When the solenoid, fig. 2 is energised from a 28 volt supply, applied to terminals 3 and 4, the spring loaded plunger is pulled into the solenoid, and the moving bridge contacts close on to the two fixed contacts, against the compression of the moving bridge contact spring, and the plunger return spring. Electrical continuity between terminals 1 and 2 is now complete, and the supply switch is on closed circuit.

When the coil is de-energized the loaded springs re-assert themselves, and force the plunger, together with the moving contacts, away from the fixed contacts. The supply switch is now on open circuit.

INSTALLATION

5. A mounting plate, drilled with two 0·281 in. clearance holes, is provided for fixing the unit in any position.

SERVICING

6. After installation the unit requires little attention in service. A visual inspection should be made periodically, and, should the unit be found defective, it should be removed from service, and a new one fitted.

Testing

7. (1) Ensure that the minimum current necessary to close the switch completely, does not exceed 0·270 amp. The I.R. drop should not exceed 14 volts. Any movement of the moving contact bridge, to the extent of closing the contacts, must always produce the full amount of follow through.

(2) The switch must hold on until the voltage across the coil is reduced to 5 volts, and must drop out at not less than 1 volt.

(3) With 400 amps. passing through the switch contacts, and the solenoid energized with the minimum pull in current, the millivolt drop across the switch terminals 1 and 2 should not exceed 50 millivolts. The millivolt drop across the mating contacts should not exceed 22 millivolts.

(4) The load required to just move the contacts towards the closed position, against the compression of the return spring, should be between 4 and 4½ lb. With the solenoid de-energized, the total initial contact load, i.e., the load required to just move the moving contact bridge away from the fixed contacts, against the compression of the contact spring, should be between 10 and 10½ lb.

(5) The contact gap should be between 0·062 in., and 0·072 in. The contact follow through should be between 0·020 in. and 0·030 in.

Insulation resistance test

8. (1) With the solenoid energized at 24 volts, the switch should withstand a high potential test of 500 volt, r.m.s. at 50 cycles per second, between the solenoid case, and switch terminals 1 and 2 for one minute.

(2) With the contacts open, the switch should withstand a high potential test of 500 volts, r.m.s. at 50 cycles per second, between switch terminals 1 and 2 for one minute.

(3) The solenoid should withstand a high potential test of 500 volts, r.m.s. at 50 cycles per second, between solenoid terminals 3 and 4, and the solenoid case for one minute.

(4) The insulation resistance between the solenoid and the switch contacts, measured with a 250 volt insulation resistance tester, should not be less than 2 megohms.

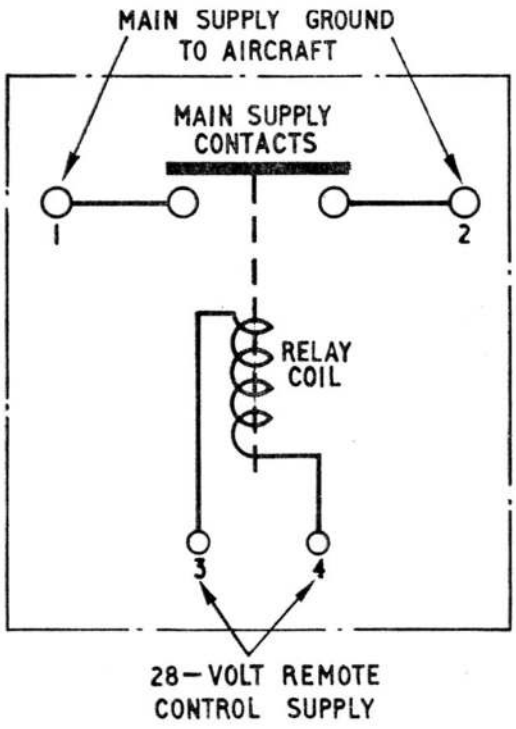

Fig. 2. Wiring diagram

P25636 577186/7908 4/56 2125 C & P Gp. 1