

Chapter 13

REVERSING SWITCH, TYPE D5101

LIST OF CONTENTS

	Para.		Para.
Introduction	1	Installation	7
Description	2	Servicing	8
Functioning	6	Testing and adjusting	9

LIST OF ILLUSTRATIONS

	Fig.		Fig.
Reversing switch, Type D5101 (part section) ...	1	Circuit diagram	3
Details of adjusting screw assembly	2		

LEADING PARTICULARS

Type D5101	Stores Ref. 5CW/4448
Normal operating voltage	24-29 volts d.c.
Maximum current	200 amp.

Introduction

1. This is a double-pole change-over relay used to reverse the direction of flow of current in circuits carrying up to 200 amp. It is used primarily in electric motor circuits, where reversing the direction of the current in the armature will reverse the direction of rotation providing that the direction of the current through the field coils remains unchanged.

DESCRIPTION

2. Two separately excited solenoid coils (fig. 1) are secured in yoke brackets to the base of a Bakelite box. The moving contacts assemblies for each solenoid are carried on a common rocker positioned above the coils and protected by a recessed lid secured by four captive screws.

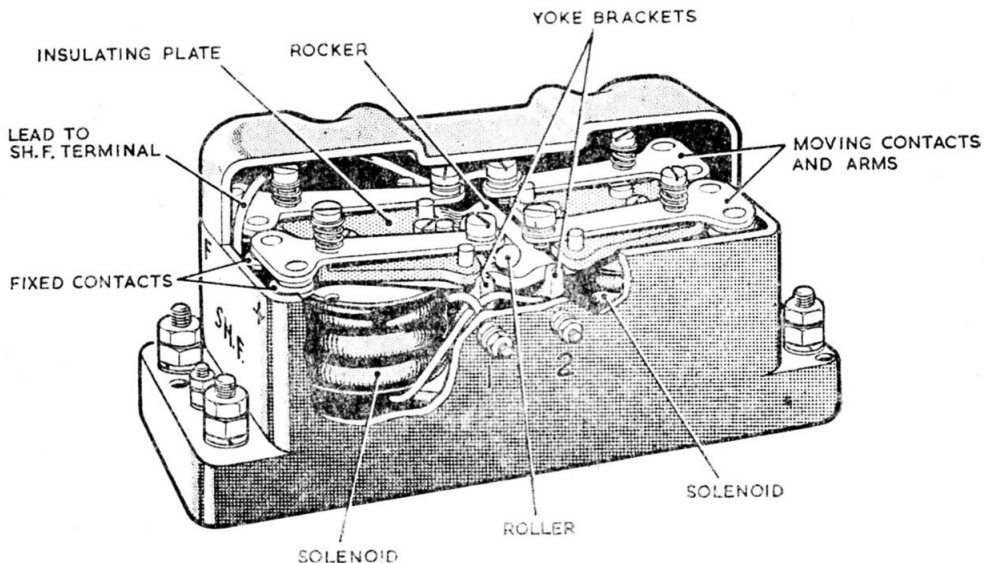


Fig. 1. Reversing switch, Type D5101 (part section)

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(A.L.44, Oct. 55)

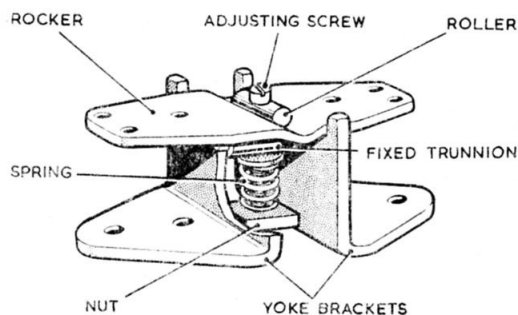


Fig. 2. Details of adjusting screw assembly

3. The core of each solenoid completes its magnetic circuit through its yoke bracket and one half of the rocker. When neither coil is energized, the rocker is supported by both yoke brackets (fig. 2) and the air gaps between the ends of the rocker and the corresponding cores are equal. The rocker is held in this position by a spring, located between a square nut at the end of the adjusting screw and a trunnion fixed between the yoke brackets. Turning the adjusting screw in a clockwise direction will increase the pressure as the spring is further compressed between the nut and the trunnion.

4. The moving contact arms (fig. 1) are secured by a spring loaded screw to an insulating plate, this plate being rigidly attached to the rocker by three screws. An additional screw at the end of each contact arm allows for connections to be made to the arms themselves.

5. Eight fixed contacts, four at each end of the box, are supported on pillars attached to the base. Connections to the terminals are made with metal strips, soldered to the fixed contacts and housed in a recess formed on the underside of the box. Connections to the solenoids are through terminals at the sides of the case. A circuit diagram is shown in fig. 3.

FUNCTIONING

6. Energizing a selected solenoid coil will cause the rocker to be attracted to the core and rock on its support on the yoke bracket of the selected coil. The rocker will come to rest when it meets the top of the core, having raised the centre of the rocker and further compressed the spring on the adjusting screw. The moving contacts on the side of the energized coil will contact the corresponding fixed contacts before the rocker comes to rest, and the moving contact arms will be lifted clear of the insulating plate against the pressure of their retaining springs.

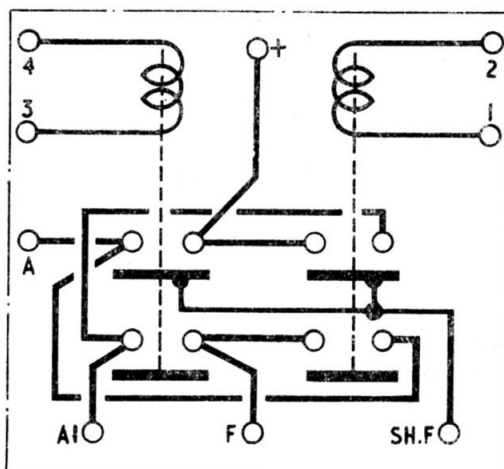


Fig. 3. Circuit diagram

INSTALLATION

7. The switch may be installed in any attitude and is secured by three screws passing through 0.187 in. diameter holes in the base extensions of the box.

SERVICING

8. Servicing will normally be limited to cleaning the contacts with lead free gasoline, checking operation and ensuring the security of all connecting leads, both internal and external.

Testing and adjusting

9. When neither coil is energized, the gaps between the moving contacts and corresponding fixed contacts should not be less than 0.08 in. The operation is checked by energizing each coil in turn on 24 volts, and ensuring that the contact arms of the energized coil are lifted clear of the insulating plate by not less than 0.04 in.

10. ◀ The relay should close at between 10 and 18 volts, applied to either coil, and not open until the voltage falls to 9 volts or less. ▶ Turning the adjusting screw in a clockwise direction will increase the operating voltages and turning the screw in an anti-clockwise direction will decrease them.

11. The insulation resistance between any two terminals not normally connected together when neither coil is energized or between any two terminals not normally connected when the coils are energized in turn, should not be less than 20 megohms when measured with a 250-volt insulation resistance tester.

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