ELECTRO-MOTIVE DIVISION • GENERAL MOTORS CORPORATION
SERVICE DEPARTMENT

MAINTENANCE INSTRUCTION

ELECTRO-MAGNETIC SWITCHES ALLIS CHALMERS-TYPE 399

DESCRIPTION

The electro-magnetic switch, Fig. 1, is a heavy duty, double pole, double throw switch with two sets of alloy tipped main contacts rated at 1000 amperes. The main contacts are closed when the magnet coil is energized. When the coil is de-energized the main contacts return to the normal position by return springs.

An interlock assembly, enclosed in a dust-proof housing and mounted on the front of the magnet coil frame, is mechanically actuated by the movement of the switch plunger.

When the switch magnet coil is energized, one of the W-X interlock contacts opens which places an economizing resistor in series with the coil circuit to reduce current requirements for keeping the coil energized, Fig. 2.

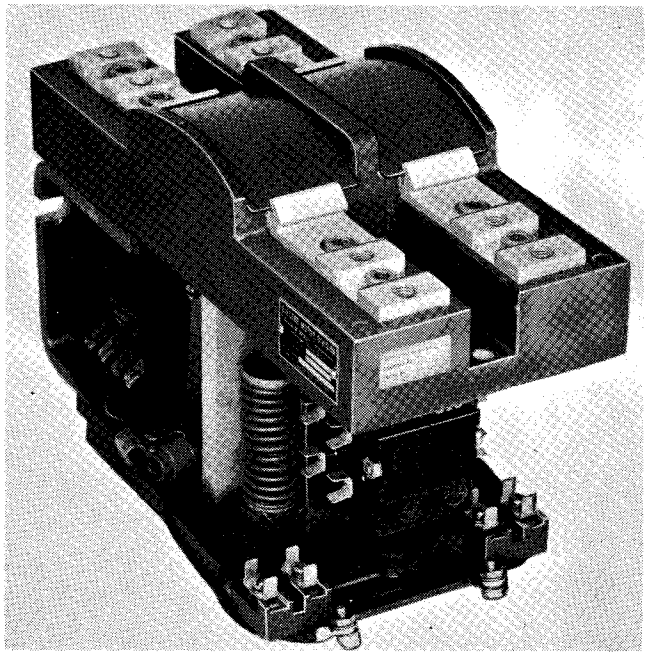

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Fig. 1 — Electro-Magnetic Switch

MAINTENANCE

Minimum maintenance is required to keep the electro-magnetic switch in serviceable condition. In addition to being kept clean and checking that connections are tight, the switch should be inspected at intervals as specified in the applicable Scheduled Maintenance Program.

The alloy tipped main contacts will operate satisfactorily even though blackened, pitted, or eroded. Contact surfaces should not be cleaned, dressed or filed. If any portion of the alloy is worn away, exposing base metal, the contact should be replaced. For the best results, both stationary and movable contacts should be replaced if either alloy tip is worn to base metal. It is not necessary to adjust the contacts because of wear, as there is enough over-ride in the plunger to compensate for allowable wear.

Interlock contacts do not require special attention and are easily replaced when worn 1/16" per mating pair, when compared to new contact dimensions.

CAUTION: No lubrication of any type should be applied to any part of this switch.

NOTE: Information contained herein is applicable to equipment being produced as of the date of publication.

July, 1967

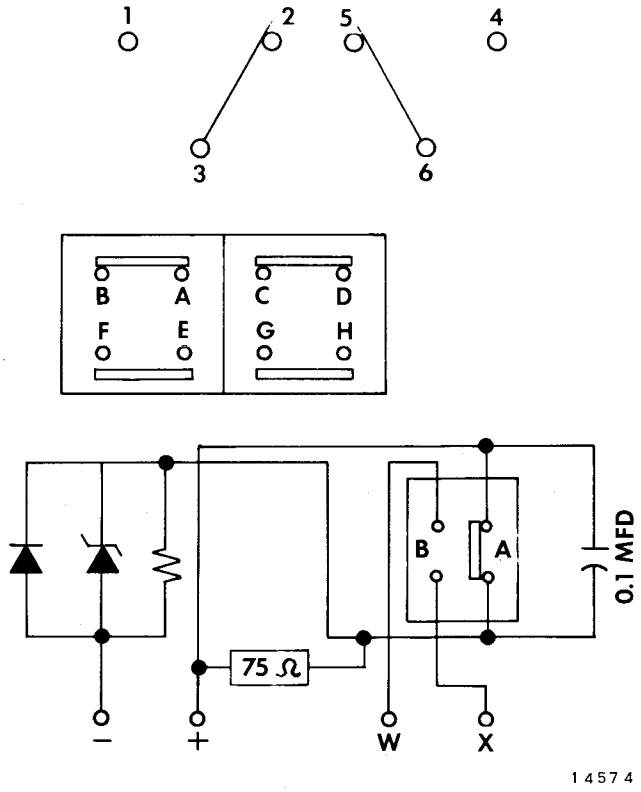

Fig. 2 — Wiring Diagram

REPLACING MOVABLE CONTACT TIPS

After removing top cover exposing contact assembly, remove white silastic material from top of screw. Remove hex socket head screw and lockwasher, Fig. 3, with 3/16" Allen wrench. Lift out movable hold-on iron and movable contact assembly. Replace contact assembly and reassemble with hold-on iron to movable contact bar assembly being careful to line up contacts and tighten screw. Reapply a small amount of silastic material from head of screw to hold-on iron assembly. See Maintenance Data page for part number of silastic material.

REPLACING STATIONARY CONTACT TIPS

To replace stationary contact tips, remove leads connected to stationary contact assembly. Remove two hex socket head screws and lockwashers with a 1/4" Allen wrench, Fig. 4. Lift out stationary contact tip and flexible stationary contact assembly. Place new contact assembly in position being careful that spring assembly and wipe spring are in place and vertical. See Maintenance Data page for contact gap. Replace contact tip and tighten screws. Check movement between stationary contact tip and flexible stationary contact assembly, see Maintenance Data page. Replace top cover and leads to stationary contact assembly.

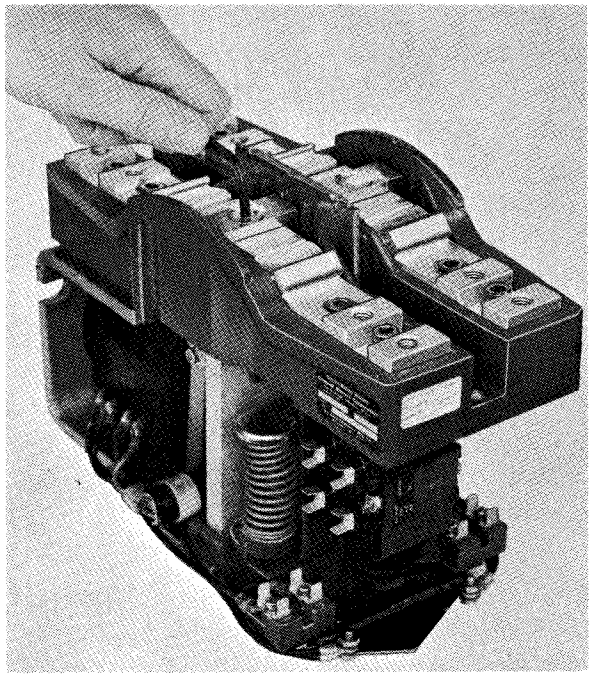

Fig. 3 — Removing Movable Contact Tip

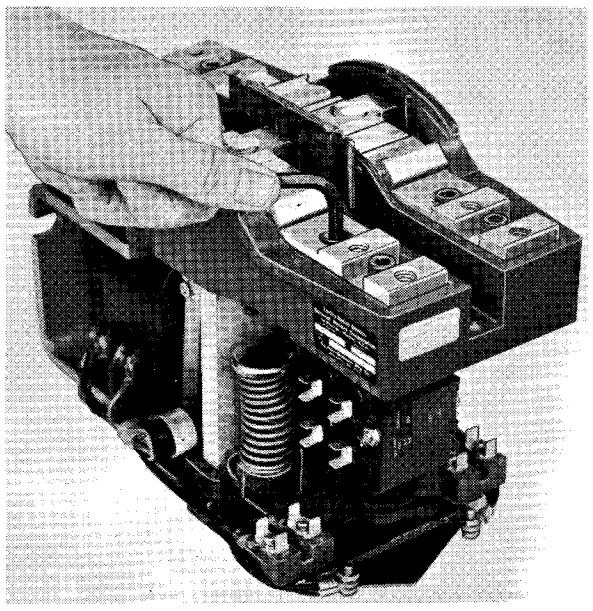

Fig. 4 — Removing Stationary Contact Tip

REPLACING MAGNET COIL

To replace the magnet coil, disconnect all leads to the coil terminals. Remove the hex socket flat head screw that holds the coil core to the coil yoke. Slide coil out sideways to remove from yoke. Observe location and position of pole plate and spring washer when removing the coil. When replacing new coil be certain that the spring washer is centered properly on core so that it is not caught between the core and yoke. Reassemble in reverse order to disassembly.

REPLACING AUXILIARY INTERLOCKS

When interlocks are found defective, they may be replaced as a complete assembly, or the defective parts replaced. Contact tips must always be replaced in the same position so that the normally closed - normally open operation is not changed. See Maintenance Data page for interlock contact positions.

The auxiliary interlock can be replaced by removing two hex socket head screws from the support bracket. Remove the return spring bracket and return springs. Remove the auxiliary interlock and replace with a new or repaired one. Reassemble in reverse order to that of disassembly.

To disassemble the interlock, first remove the two No. 10 through bolts from the contact covers. The covers may then be separated and the movable contact assembly removed without danger of losing small parts.

The movable assembly should be disassembled only in an area where the small parts will not be lost if accidentally dropped. All these parts are retained in assembly by the No. 8 single center screw.

When assembling the movable element into the covers, position the key so it is inside the A-B, E-F (or J-K, L-M) cover. A molded round button inside the opposite cover further assures a correct assembly.

After reassembly, the interlock should be checked for freedom of motion of its movable assembly from stop to stop. Each circuit should be electrically tested for continuity and function.

Absolute internal cleanliness is essential to reliable performance when assembling interlocks.

MAINTENANCE DATA

	*8330201 8328962	8338875	8335901	8341261	8382810
Main Contacts	2 pole Double Throw 1000 Amps. 1000 Volts	2 pole Double Throw 1000 Amps. 1000 Volts	2 pole Double Throw 1000 Amps. 1000 Volts	2 pole Double Throw 1000 Amps. 1000 Volts	2 pole Double Throw 1000 Amps. 1000 Volts
Interlock Contacts	A-B, C-D - N.C. E-F, G-H - N.O. 10 Amps. W-X - N.O. 3 Amps.	A-B - N.C. C-D, E-F, G-H - N.O. 10 Amps. W-X - N.O. 3 Amps.	A-B, C-D - N.C. E-F, G-H - N.O. 10 Amps. J-K - N.O. L-M - N.C. 60 Amps. W-X - N.O. 3 Amps.	A-B, E-F G-H - N.O. C-D - N.C. 10 Amps. W-X - N.O. 3 Amps.	A-B, E-F, G-H - N.O. C-D - N.C. 10 Amps. W-X - N.O. 3 Amps. Lockout Device - 8330045.

60-Ampere Auxiliary Interlock Used On 8335901

Current Rating	60 Amps. DC
Contact Spring Pressure	1.5 lbs. normal
Contact Gap	3/16" normal
Contact Lift	3/32" normal
Contact Wear Allowance	1/32" on each contact face

Lockout Device - 8330045 - Used On 8382810

Switch must have 1/16" clearance between both main movable and stationary contacts on the normally open and normally closed side.

*Includes Rectifier Circuit

The following data is applicable to all of the above switches:

Main Contacts	
Contact Pressure	5 lbs. min. per pole
Wipe Gap	.045" ± .015"
Contact Wear Allowance	3/32" total
Contact Gap	1/4" min. any contact gap (energized or de-energized)
Interlock Contacts	
Contact Spring Pressure	.25 lbs. at 3/32" deflection
Contact Opening	3/16"
Contact Lift	3/32"
Contact Wear Allowance	1/32" each, maximum
Magnet Coil	19.8 Ohms ± 10% @ 20° C.
Economizing Resistor	75 Ohms ± 5% @ 20° C.
Operation	
Working	74 Volts DC
Pickup	48 Volts DC maximum at 20° C.
Dropout	5 to 28 Volts DC at 20° C.
Hi-Pot	
Magnet Coil To Ground	600 Volts RMS 60 Cycle, 1 minute
Interlock Contacts To Mounting	2400 Volts RMS 60 Cycle, 1 minute
Main Contacts To Mounting	2400 Volts RMS 60 Cycle, 1 minute
Coil To Interlock Contacts	2400 Volts RMS 60 Cycle, 1 minute
Interlock Contacts To Interlock Contacts	2400 Volts RMS 60 Cycle, 1 minute
Silastic (2 oz. tube)	8305837