ELECTRO-MOTIVE DIVISION • GENERAL MOTORS CORPORATION
SERVICE DEPARTMENT

MAINTENANCE INSTRUCTION

ELECTRO-MAGNETIC POWER CONTACTOR-CUTLER HAMMER

DESCRIPTION

The electro-magnetic power contactor, Fig. 1, has silver alloy main contacts and is designed for heavy duty service. Energizing the magnet coil closes the main contacts and mechanically actuates an interlock assembly mounted on the power contactor. The main contacts are held in a closed position by magnetic force and will open with the help of a recall spring when the magnet coil is de-energized.

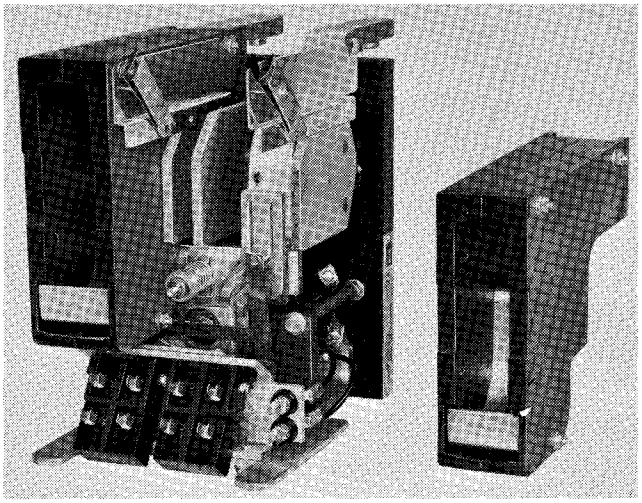

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Fig. 1 — Power Contactor With Arc Shield Removed

Interlock contacts are enclosed in a dust-proof housing. Circuit connections for the interlocks are provided by external terminal tabs. Terminal identification letters are molded into the interlock housing.

The contactor is constructed to protect the main contacts from arcing that may occur when the power circuit is opened. The arc blowout coil or permanent magnet blowout forces the arc away from the main contact tips to the arc shield. The arc shield assembly can be removed for inspecting and servicing the contactor, but it should always be installed prior to operating equipment.

For additional information regarding the operation of the power contactor, refer to the applicable schematic diagram.

MAINTENANCE

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

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

The silver alloy 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 override in the plunger to compensate for allowable wear.

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

INTERLOCK REPLACEMENT

The electrical interlocks are renewed by installing a new interlock block assembly. With normal service, the interlocks should be renewed at the same time that the main contacts are renewed.

It should not be necessary to adjust the interlocks when the blocks are renewed. However, should the adjustment be disturbed for some other reason it can be restored by adjusting the operating screw so that it extends .240" $\pm$ .005" beyond the surface of the interlock mounting bracket with the contactor de-energized. Secure the adjustment with the locknut.

MAIN CONTACT REPLACEMENT

The contacts should be renewed before the gap between the arcing and current carrying contact bridges decreases to .050", or the gap between the current carrying contact bridge and the bakelite contact board decreases to .010" with the contactor in the sealed position, or the thickness of the arcing contact material is reduced to .030" by material transfer. Any of the preceding conditions necessitates replacement of all contacts.

To replace the movable contact tips unlatch and remove the two blowout arc shields. Remove the leads from the coil and the interlock support bracket which is held by two cap screws to the base of the contactor. Remove the two slotted screws holding the operating lever. Remove the lead from the contact plate by removing the round head screw and lockwasher. Remove spring screw assembly by pushing in and applying a 1/4 turn to the nut using a 7/16" wrench, see Fig. 2. The movable arcing and non-arcing contact plate can now be removed. Install new movable contact plate after replacing stationary contacts. Make certain when replacing the spring assembly that it is pushed in far enough to hold the contact plate securely.

To replace the upper stationary arcing contact remove the cap screw, washer, lockwasher, and arc guard using a 7/16" open end wrench, see Fig. 3. Next remove the lower stationary non-arcing contact by removing the two socket screws and external tooth lockwashers with a 1/8" Allen wrench, see Fig. 4.

Install the new stationary and movable contacts by following a reverse procedure to that outlined for removal. No adjustments are required.

MAIN CONTACT SPRING PRESSURE

Refer to Fig. 5 when checking main contact spring pressure. Assemble inner spring

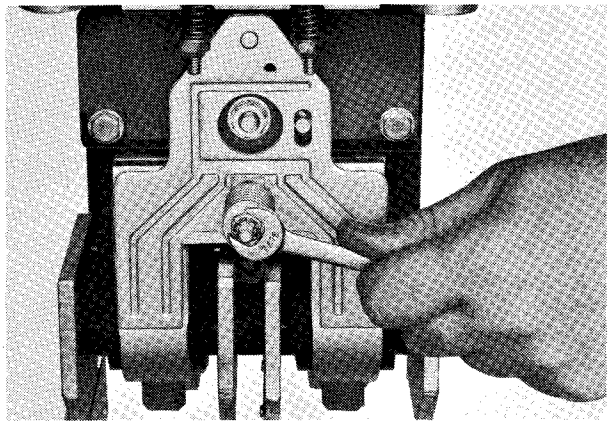

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Fig. 2 — Removing Movable Arcing And Movable Non-Arcing Contact Plate

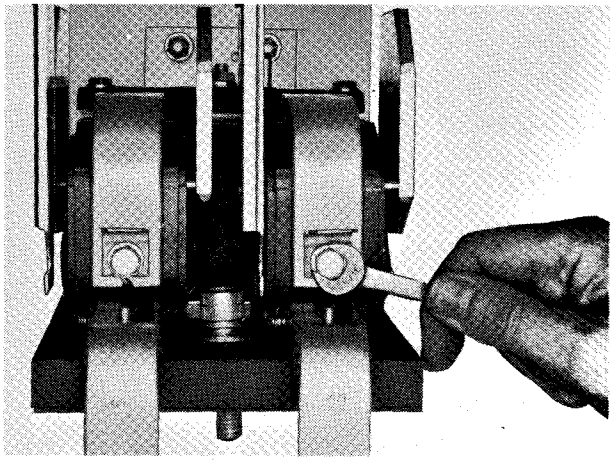

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Fig. 3 — Removing Upper Stationary Arcing Contact And Arc Guard

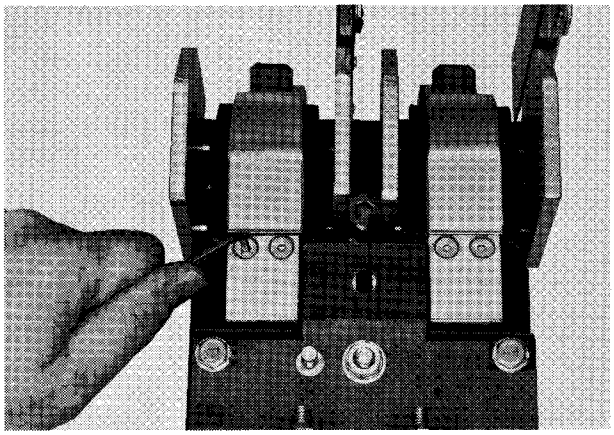

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Fig. 4 — Removing Lower Stationary Non-Arcing Contact

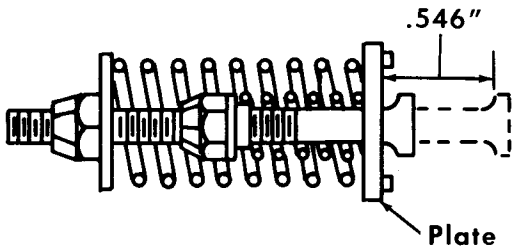

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Fig. 5 — Main Contact Spring Pressure

and nut to screw. Clamp plate in a vise and adjust nut so that a force of 27 pounds at the end of screw will cause the screw head to extend beyond the plate .546".

Assemble the outer spring and nut to screw. Adjust the outer nut so that a combined force of 34 pounds at the end of the screw is required to cause the screw head to extend beyond the plate .546".

MAIN CONTACT WEAR ALLOWANCE

The wear allowance adjustment for the main contacts is made at the factory and should require no further adjustment for the life of the contactor unless the permanent magnet blowout or blowout coil assembly is renewed.

The wear allowance is made with shims. These shim washers are mounted between the bus bar and the panel. All contacts must be new, with the non-arcing contacts just touching (as shown with a light).

Contactors using the blowout coil assembly should have a magnet gap of .023"-.031" as measured at the center of the coil. When the movable non-arcing contacts are manually moved toward the stationary non-arcing contacts and one movable contact has just touched its respective stationary contact (as shown by a light) the other movable contact should be within .010" of its respective stationary contact.

Contactors using permanent magnet blowout should be .031"-.042" measured between the current contact bridge and the bakelite contact board when the contactor is sealed.

MAGNET COIL REPLACEMENT

To replace the magnet coil unlatch and remove the two blowout arc shields. Remove the leads from the coil and the interlock support bracket which is held by two cap screws to the base of the contactor. Remove the two slotted screws holding the operating lever. Remove the lead from the contact plate by removing the round head screw and lockwasher. Remove spring screw assembly by pushing in and applying a 1/4 turn to the nut using a 7/16" wrench. The movable arcing and non-arcing contact plate can now be removed. Remove the non-arcing stationary contacts. Remove the screw and coil retaining washer in the center of the coil. The coil will now slide off and can be replaced with a new coil. Reassemble the contactor in reverse order to the disassembly procedure.

The magnet gap of coil should be .174"-.184" at centerline of core. This can be obtained by sealing armature and adjusting screw through insulating tube to obtain gap of .170"-.180" between contact board at

flat surface and rear of screw head, see Fig. 6.

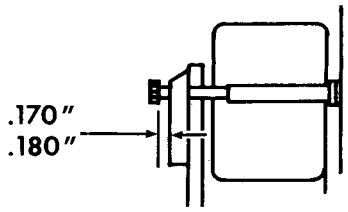

Fig. 6 — Coil Magnet Gap Setting

ARMATURE LEVER RETURN SPRINGS

The armature lever return springs and screws need no adjustment unless they are replaced. This adjustment is made by adjusting the spring pressure uniformly on the two screws until the force required to move the armature is 8 pounds measured at the contact pressure spring screw.

POLARITY IDENTIFICATION

Contactors using the permanent magnet blowout must observe proper polarity on electrical connections and permanent magnets for blowout to be effective. This can be accomplished by using marked permanent magnets or a directional compass (like poles repel, unlike poles attract), see Fig. 7.

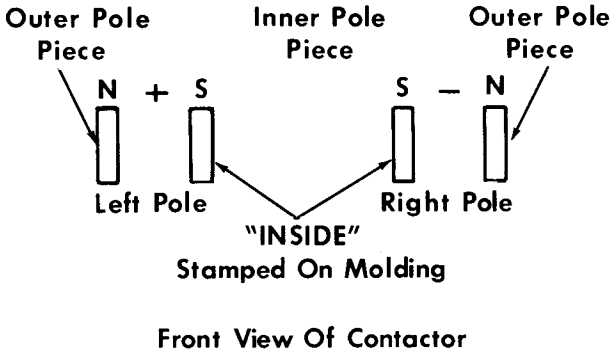

Fig. 7 — Polarity Identification

Litho in U.S.A.

MAINTENANCE DATA

	8326893	8332466	8332994	8334912	8338098	8340347	8366736	8367504
Main Contacts (Double Break - 1000 Volts)	1 N.O. 450 Amps.	1 N.O. 1000 Amps.	1 N.O. 1000 Amps.	1 N.O. 1100 Amps.	1 N.O. 450 Amps.	1 N.O. 1000 Amps.	1 N.O. 1300 Amps.	1 N.O. 1000 Amps.
Interlock Contacts	A-B, C-D & E-F - N.C. 2 Amps. G-H - N.O. 5 Amps.	A-B, C-D - N.C. 5 Amps. E-F, G-H - N.O. 5 Amps.	A-B, C-D & G-H - N.C. 5 Amps. E-F - N.O. 5 Amps.	A-B, C-D - N.C. 5 Amps. E-F, G-H - N.O. 5 Amps.	A-B - N.C. 2 Amps. C-D, E-F & G-H - N.O. 5 Amps.	C-D - N.C. 5 Amps. A-B, E-F & G-H - N.O. 5 Amps.	A-B, C-D - N.C. 5 Amps. E-F, G-H - N.O. 5 Amps.	A-B, C-D & G-H - N.C. 5 Amps. E-F - N.O. 5 Amps.

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

Operation @ 20° C.	
Working	74 VDC
Maximum Pickup	48 VDC
Maximum Dropout	5-28 VDC
Magnet Coil	152.5 Ohms $\pm$ 10% @ 20° C.
Hi-Pot Data	
Coil To Ground	600 V, RMS, 60 Cycle
Coil To Main Contacts	2400 V, RMS, 60 Cycle
Main Contacts To Ground	2400 V, RMS, 60 Cycle
Interlock Contacts To Ground	2400 V, RMS, 60 Cycle
Interlock To Interlock	2400 V, RMS, 60 Cycle