ELECTRO-MOTIVE DIVISION • GENERAL MOTORS CORPORATION
SERVICE DEPARTMENT

MAINTENANCE INSTRUCTION

STARTING CONTACTOR

DESCRIPTION

The engine starting contactor, Fig. 1, is a heavy duty two-pole bridge type contactor designed for 74 volt DC operation. The main contact assembly consists of four movable and four stationary alloy contacts. Two movable contacts mounted on each of two bridge connectors will close against their two mating stationary contacts. Two movable contacts are thus connected in series to establish a circuit. Two such groups are contained in the assembly and each of the four stationary contacts terminate at terminal studs for external connections.

The interlocks, Fig. 2, consist of a snap-action switch mounted on the bottom of the contactor assembly having one normally open (A) or one normally closed (B) circuit. The external connections are provided directly on the switch case using four quick connect terminals.

OPERATION

The normally closed interlocks in the switch are held closed by the main contact actuating assembly bearing upon a plunger and spring. When the magnet

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Fig. 1 — Starting Contactor

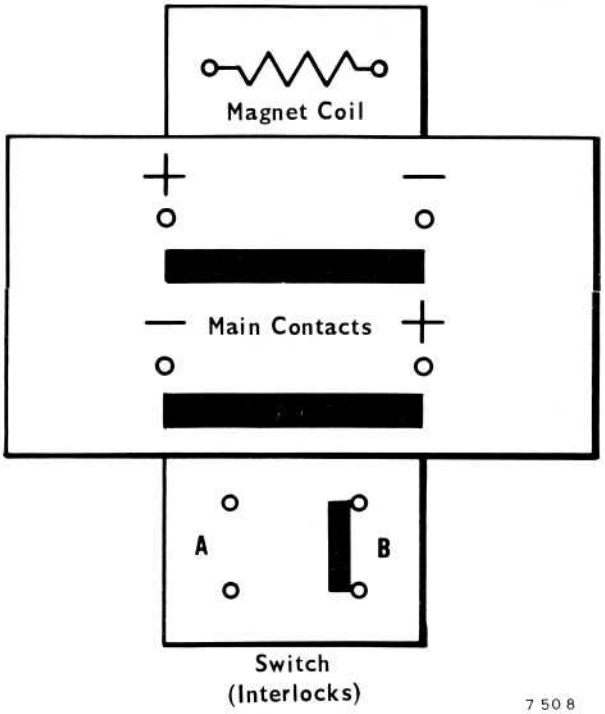

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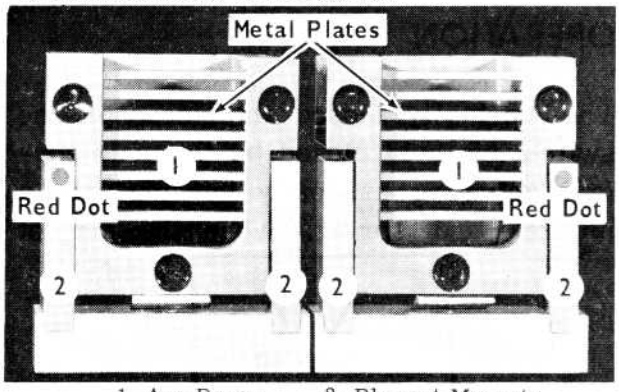
Fig. 2 — Interlock Arrangement

*NOTE: Information contained herein is applicable to the equipment being manufactured or used as of the date of publication.

coil is energized, the main movable contact assembly moves to close the main contacts. This movement relieves the pressure upon the switch actuating plunger and permits the normally closed interlocks to open. When the magnet coil is de-energized, the reverse action takes place and the interlocks are closed.

The arc suppression assembly, Fig. 3, consists of a separate arc box for each of the four main contacts. Each arc box has two permanent magnet pole pieces of opposite polarity located one on each side of the arc box. The north (N) magnetic pole of each magnet is identified with a red dot. It is of utmost importance that these be properly inserted into the assembly otherwise severe arc damage to the contacts will result.



1. Arc Boxes 2. Blowout Magnets

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Fig. 3 — Arc Suppression Assembly

In addition to the above, laminations of metal plates having an air gap between them are used to further quench the arc as it is blown away from the contacts by the force of the permanent magnets. These plates act as the arcing horn on conventional types of contactors.

MAINTENANCE

Under normal operating conditions this contactor should provide satisfactory service and trouble free performance for an extended period of time. The dust free enclosure for contacts and interlocks, together with simplified construction and silver alloy contacts, require but little attention other than periodic inspections. Refer to Scheduled Maintenance Program, for such inspection intervals.

CONTACT INSPECTION AND RENEWAL

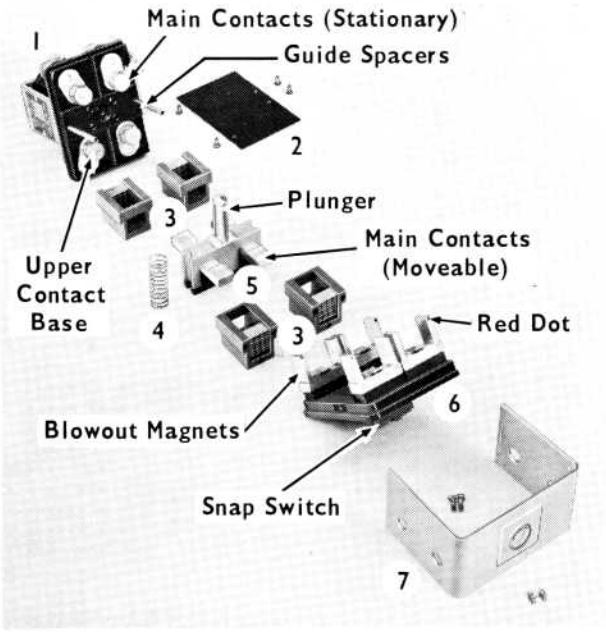
Contacts may become blackened through normal operation. This will not in itself interfere with the electrical operation of the contactors. Abrasives should not be used to clean silver alloy contacts as there is a possibility that abrasive particles will become embedded in the contact surface causing poor electrical contact. If beads are formed on the contact face through misuse or arcing, to the extent that satisfactory contact cannot be made, they may be removed with a small clean mill file.

When the movable contacts are worn down to the point where only 1/32" or less of alloy material remains, the contacts should be replaced.

The following steps should be followed in disassembling this contactor, see Fig. 4:

1. Disconnect all wire leads from terminals of contactor.
2. Remove the contactor from the panel or brackets.
3. Remove the front cover and the four screws holding the back plate to the lower contact base.
4. Remove the two screws from the bottom of the lower contact base which hold this base to the two guide spacers. The upper contact base, containing the magnet coil assembly, can now be separated from the lower contact assembly.
5. The main springs, arc boxes and plunger assembly can now be removed.

If the movable contacts are to be replaced, remove by disassembling the plunger



1. Magnet Coil Assembly
2. Rear Cover Plate
3. Arc Boxes
4. Main Spring
5. Plunger Assembly
6. Lower Contact Base
7. Front Cover

Fig. 4 — Exploded View Of Lower Contact Assembly

assembly and removing the spring retainers, holding the springs and contacts in place.

The stationary contact posts may be removed by unscrewing them from the base of the magnet coil assembly.

COIL RENEWAL

Should it become necessary to replace the magnet coil, proceed as follows, see Fig. 5:

1. Perform Steps 1 through 4 "Contact Inspection and Renewal."
2. Setting aside the lower contact assembly, remove the four screws holding the magnet coil assembly to the anchor plate.
3. Remove the four screws in the bottom of the upper contact base which are holding it to the magnet frame.
4. Remove the stop core locknut and washer, and by turning clockwise, remove the stop core assembly down and out of the frame and coil. The coil may now be slid out of the frame and the new coil inserted.

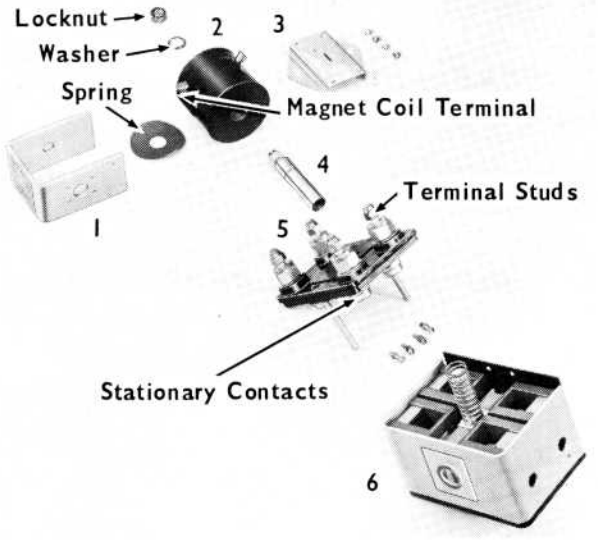
CONTACTOR REASSEMBLY

Clean all parts before reassembly and see that the plunger and contact assembly have free movement within the magnet core.

Contactor should be reassembled in reverse order of disassembly.

CAUTION: The blowout magnets must be reassembled (if removed) with the correct polarity. If the red dot indicating the north pole has been removed for any reason, the magnet can be checked with a compass and should be re-marked.

The assembly is built and tested to operate for an extended period with a minimum of attention.



1. Magnet Coil Frame
2. Magnet Coil
3. Mounting Plate
4. Stop Core
5. Upper Contact Base
6. Lower Contact Assy.

Fig. 5 — Exploded View Of Magnet Coil Assembly

MAINTENANCE DATA

Contacts

Main	2 N.O. - Starting Duty
Aux.	1 N.O. or 1 N.C. - 3 Amps.

Coil

Resistance	23 ohms $\pm$ 10% @ 20° C.

Operation at 20° C.

Working	74 volts DC
Pickup	48 volts DC maximum
Dropout	3 - 28 volts DC

Hi-Pot Test

Coil to Ground	600 volts RMS - 60 cycles
Coil to Contacts	2400 volts RMS - 60 cycles
Contacts to Ground	2400 volts RMS - 60 cycles
Aux. Contacts to Ground	2400 volts RMS - 60 cycles
Interlock to Interlock	2400 volts RMS - 60 cycles