



AC FAN CONTACTOR (TWO-SPEED FAN)

DESCRIPTION

The AC contactor, Fig. 1, is a magnetically operated device used to make or break a power circuit. The AC fan contactors are provided with two or three poles for two-speed, single-winding motor applications.



26636

Fig. 1 - AC Fan Contactor

The fan contactor is of a horizontal stroke magnet design with the operating coil assembly in the front and the contacts behind. It consists of three basic units: the molded base assembly, power pack unit, and the electrical interlock assemblies, Fig. 2. All parts are accessible from the front.

The electrical interlock assemblies are mounted to both sides of the molded base. The interlock assemblies consist of two sets of normally closed contacts and one set of normally open contacts on each side.

MAGNET ASSEMBLY

The magnet assembly is completely enclosed within the magnet housing. It is a double pole CI type. The "C" member ("C" shaped) is a stationary magnet frame and the "I" member ("I" shaped) is a movable armature, Fig. 3. The armature operates with horizontal stroke action with throw-out accomplished by springs.

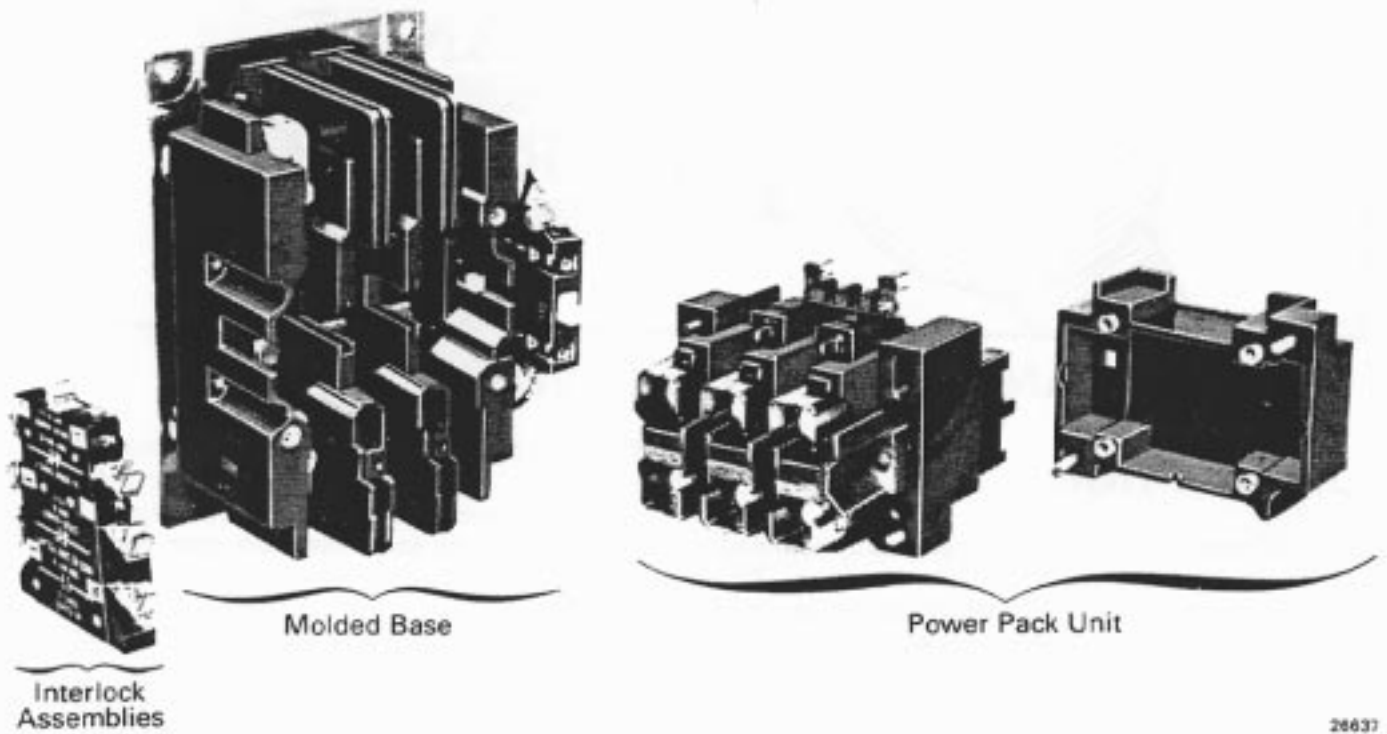
Operation is visually indicated by two square indicators which appear in windows in the front cover. When the contactor is de-energized, the indicators are flush with the cover, Fig. 4. When the contactor is energized, the indicators recede into the housing about 6 mm (1/4").

OPERATING COIL

The 74 VDC operating coil is of double-coil construction, bobbin-wound, and molded in epoxy. The coil terminations extend out the top of the power pack unit for external connection. Prongs molded into the epoxy mate with indentations in the molded base to properly position the coil within the power pack unit and also to provide additional stability.

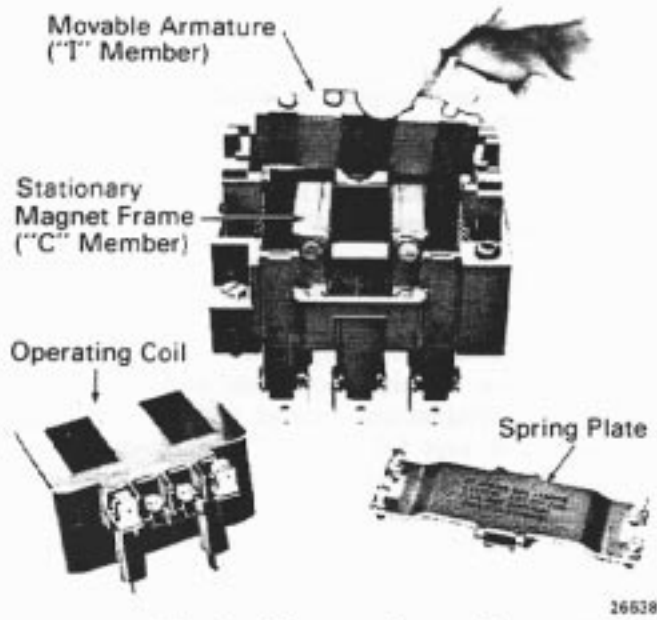
OPERATION

The AC fan contactor is used with locomotive two-speed engine cooling fans. One fan contactor is required to operate a cooling fan at low speed. Two fan contactors are required to operate a cooling fan at high speed.



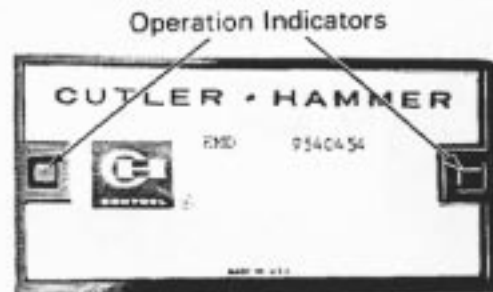
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Fig. 2 - AC Fan Contactor Basic Units



26638

Fig. 3 - Magnet Assembly



NOTE
Indicators in de-energized position (flush with cover).

26639

Fig. 4 - Contactor Operation Indicators

NOTE

On most installations, a three-pole AC fan contactor is used for low speed fan operation while one three-pole and one two-pole AC fan contactor are used for high speed fan operation. Refer to Service Data for contactor part numbers.

The cooling fan is controlled by two temperature switches which close at different ranges of increasing coolant temperature and energize the fan contactor(s) to operate the cooling fan at either low or high speed.

In a three-fan operation, as engine temperature rises, one set of contacts of a temperature switch close, energizing a fan contactor which operates one cooling fan at low speed. As temperature increases, other contacts of the temperature switch close and the second and third fans will start, in progression. These fans will also operate in low speed.

A further increase in coolant temperature will cause contacts in the other temperature switch to close, energizing the fan contactors which operate the first cooling fan at high speed. The second and third cooling fans will follow if further cooling is necessary to maintain coolant temperature at an acceptable level. Maximum cooling is available with all three fans running at high speed.

MAINTENANCE

Only skilled personnel familiar with electrical equipment and the hazards involved should be permitted to service a contactor. All safety precautions must be observed.

Minimum maintenance is required to keep the contactor in serviceable condition. Moving mechanical parts should be free from excess friction. Parts should also be checked for excessive wear. The bearing surfaces of the contactor are designed to operate without lubrication. Do *not* oil or grease at any time.

Contacts are normally oxidized and smoked from regular service. Other contactor parts should not show visible effects of high temperature operation.

The contactor must be kept clean, connections must be tight, and should be inspected and serviced at intervals as specified in the applicable Scheduled Maintenance Program.

CONTACT INSPECTION**WARNING**

Stop the diesel engine and open appropriate circuit breaker prior to any inspection or maintenance procedure to ensure power is not available to the contactor.

The contacts should be free of foreign objects, but need not be smooth. Contact tips should not be cleaned, dressed, or filed.

Contacts are subjected to both mechanical and electrical wear. Normal mechanical wear is insignificant. Electrical wear is caused by arcing which erodes the contacts. During arcing a small portion of each contact is vaporized and blown away.

Accurate determination of when to replace worn contacts with new contacts should combine judgement regarding the appearance of the contacts and actual measurement of wear.

If it is determined that one contact of the contactor is defective, it is advisable to replace all contacts of the contactor.

IRREGULARITY OF CONTOUR

Irregularity of contour usually involves a slantwise type of contact wear. As an example, one edge of a contact may wear more quickly than the other edges. Contacts should be replaced when it is noted that one contact is nearing the condition in which it will be making direct contact with the plate. The plate is the material on which the contact tip is fastened. If the plate is exposed, welding of the contact may occur.

PITTING

A pitted surface has high spots and low spots. Pitting of a contact that is wearing well will show a uniform texture. When it appears that chunks are being torn away from the arcing surface, it is advisable to replace contacts with new contacts.

CONTACT RENEWAL

To renew stationary or movable contacts, perform the following procedure.

DISASSEMBLY

1. Remove the four wires from the operating coil terminals, Fig. 5.

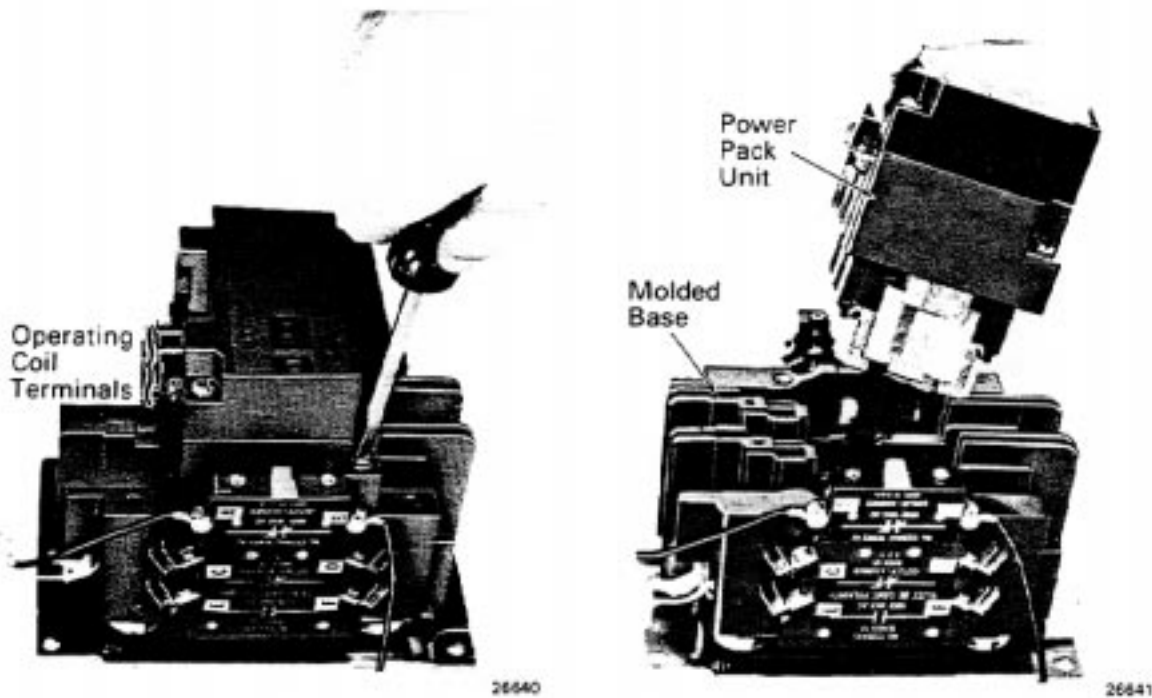


Fig.5 - Power Pack Unit Removal

2. Completely loosen the two captive screws securing the power pack unit to the molded base and remove the power pack unit, Fig. 5.

STATIONARY CONTACT RENEWAL

The stationary contacts are located at the bottom of the molded base. Renew the stationary contacts as follows.

1. Remove screw securing the stationary contact to the molded base and remove stationary contact, Fig. 6.
2. Install new stationary contact.

MOVABLE CONTACT RENEWAL

The movable contacts are located at the bottom of the power pack unit. Renew the movable contacts as follows.

1. Remove the two screws securing the movable contact assembly to the bottom of the magnet housing and remove movable contact assembly, Fig. 7.
2. Compress contact spring, Fig. 8, with a small screwdriver and remove contact spring very carefully from assembly. Use free hand as a shield in case the spring snaps out of assembly.
3. Remove spring retainer and movable contact from assembly.

4. Position movable contact assembly so that the contacts will be facing bottom. Insert new movable contact and spring retainer into assembly. Compress contact spring with thumb and index finger and very carefully insert contact spring into assembly. Use free hand as a shield in case the spring retainer or spring snaps out of assembly. Ensure spring is positioned over raised portion of the molded spring retainer and that the spring retainer is locked in position over the two nibs on the movable contacts.

5. Reassemble the movable contact assembly to the bottom of the magnet housing using two screws.

REASSEMBLY

1. Reassemble power pack unit to molded base assembly using the two captive screws.
2. Reconnect the wires to the operating coil terminals.

OPERATING COIL AND INTERLOCK ASSEMBLY

If the operating coil or interlock assembly fails, it is recommended that the complete contactor be replaced with a new contactor.

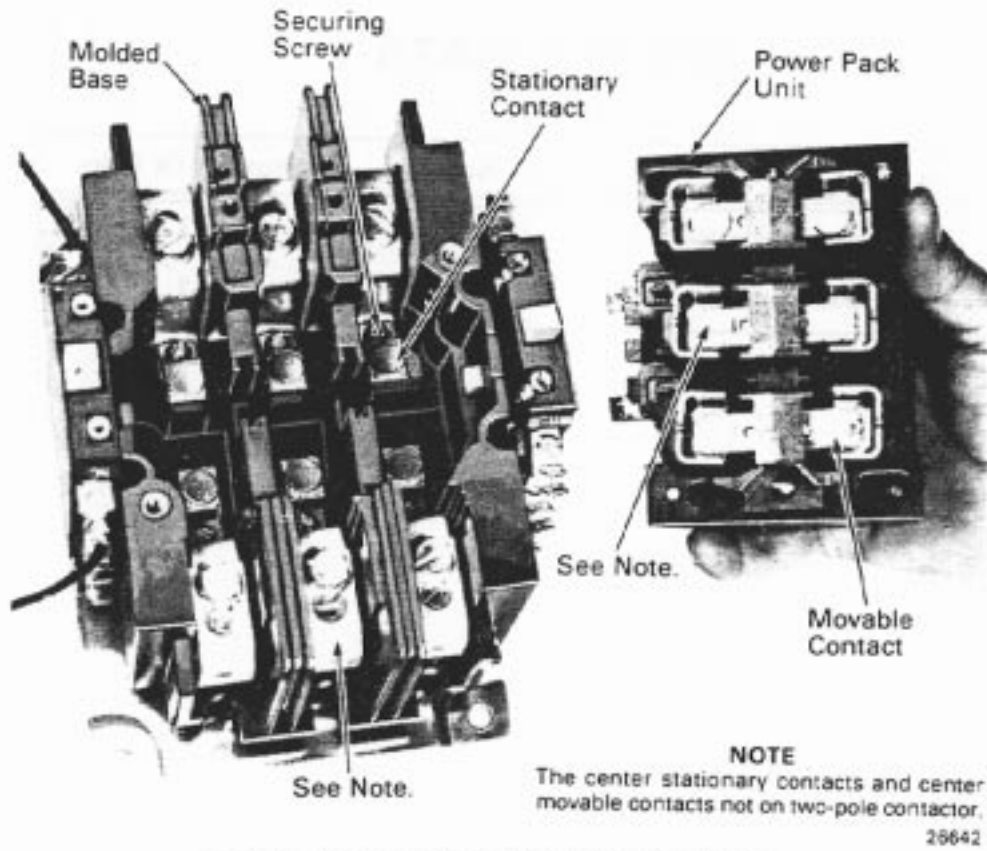


Fig. 6 - Stationary And Movable Contacts

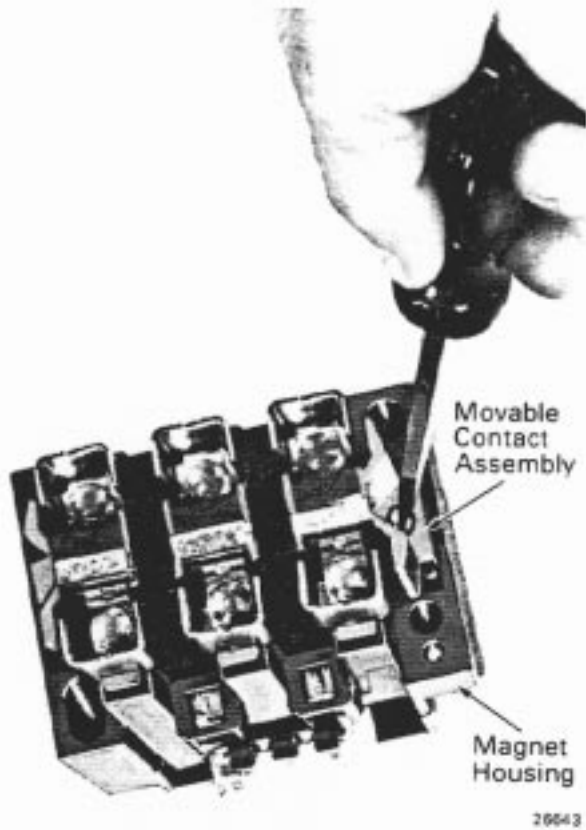


Fig. 7 - Movable Contact Assembly Removal

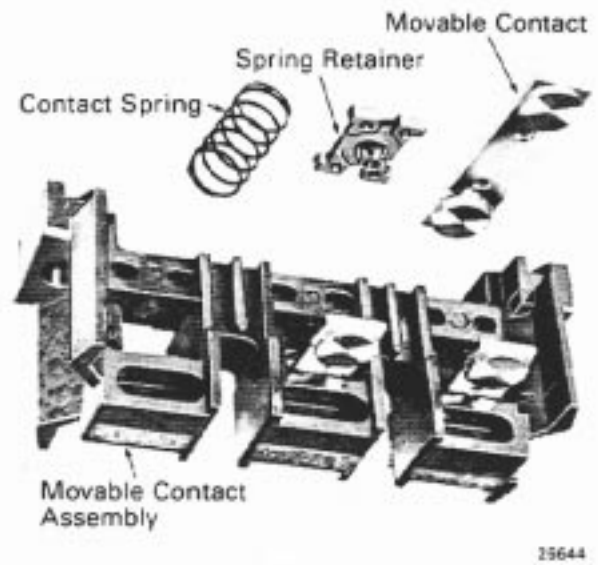


Fig. 8 - Movable Contact Assembly

SERVICE DATA

AC Fan Contactor Application	Part Number	Number Of Poles
High Speed Operation	9540454	3
Low Speed Operation	9543902	2

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Electro-Motive Division Of General Motors La Grange, Illinois 60525