ELECTRO-MOTIVE

M.I. 5406
*Rev. B

MAINTENANCE INSTRUCTION

DYNAMIC BRAKE GRID SHORTING CONTACTORS 8416136, 8436326, 8459697, AND 9521384

INTRODUCTION

The data contained in this Maintenance Instruction will apply to contactors 8416136, 8436326, 8459697, and 9521384 unless specifically identified. For ease of reference where procedural differences occur, the information will be presented by subject followed by the applicable part number(s).

DESCRIPTION

The dynamic brake grid shorting contactors, Fig. 1, are normally open, single-pole devices, capable of connecting and interrupting DC current up to 2250 amperes at 700 volts.

Contactors 8416136, 8436326, and 8459697 are electrically polarized devices equipped with a permanent magnet which provides the magnetic field necessary for proper directional arc transfer. Because the magnet is permanently polarized, *reverse polarity will damage these contactors.*

Contactor 9521384, however, is a non-polarized device equipped with an intermittent duty blowout coil in place of a permanent magnet. This arrangement desensitizes this contactor to current direction (polarity), when properly installed.

Interlocks are enclosed in two molded, dustproof housings, two single-pole switches to a unit. Circuit connections for the interlocks are provided by external quick-disconnect type terminals. The interlocks are identified by letters stamped on the brackets immediately next to the terminals, or on the interlocks themselves.

The contactor operates when 74 VDC is applied to the magnet (operating) coil. Energizing the magnet coil generates a magnetic flux which closes the main contacts and mechanically actuates the two pair of single-pole control interlocks. The main contacts are held in a closed position by magnetic force and are opened by a return spring when the magnet coil is de-energized.

All of these contactors use two sets of contacts: the main current carrying contacts and the arcing contacts. The arcing contacts close before and open after the main contacts.

In contactors 8416136, 8436326, and 8459697, the arc first appears at the arcing contacts and then transfers onto runners in the arc chute. A magnet housed in the arc chute generates a magnetic field between the pole pieces of the chute which forces the arc to transfer. *Because the magnet is permanently polarized, current must always flow into the contactor terminal marked (+) for transfer to occur.* If current flows in the reverse direction, the magnetic field forces the arc down into the contactor (possibly destroying it.)

In contactor 9521384, the intermittent duty blowout coil replaces the permanent magnet. Current flows through the coil generating a magnetic field between the pole pieces. *The direction of the current flow determines the polarity of the magnetic field.* Therefore, the arc is forced to transfer to the arc runners whenever the intermittent duty blowout coil is energized.

After the arc expands sufficiently, it can no longer be sustained and the current flow stops. At all other

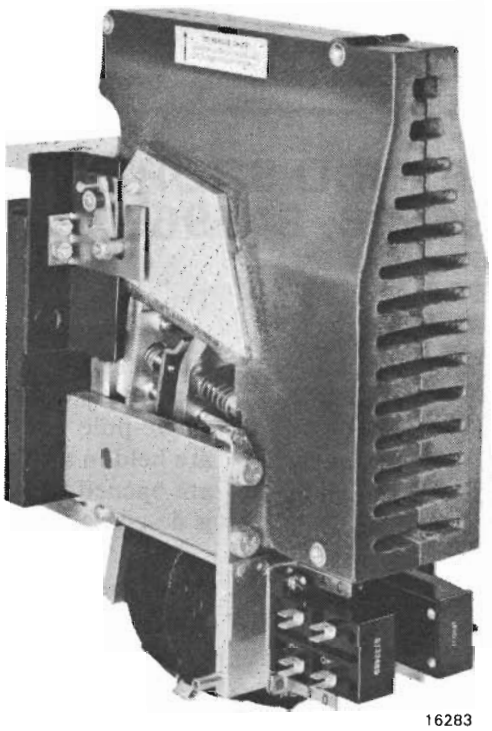
*This bulletin is revised and supersedes previous issues of this number.
Areas of change are indicated by vertical bars.

times of power flow, the current flows through a parallel circuit composed of the main contacts and the arcing contacts.

SAFETY PRECAUTIONS

WARNING

This contactor was designed for specific application to electric power circuits of diesel-electric equipment where the circuits and devices are enclosed in suitable protective cabinets. Care has been taken in the design of the equipment to provide for the safety of operating and service personnel, provided reasonable care is exercised in the performance of operating and service functions.



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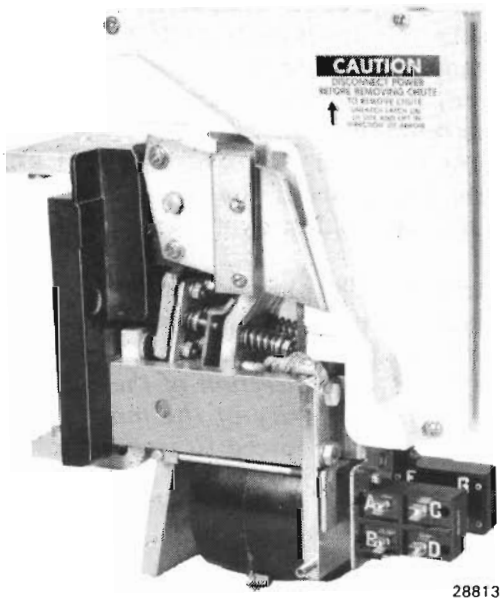
POLARIZED CONTACTOR



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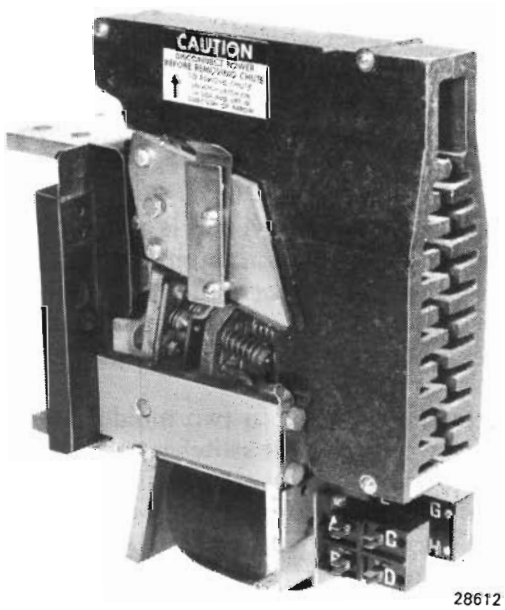

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NON-POLARIZED CONTACTORS

Fig.1 – Dynamic Brake Grid Shorting Contactors

The following safety considerations should always be carefully observed in the application, operation, or servicing of the equipment.

1. ELECTRICAL RATINGS of the equipment are values that should be considered to be EXTREMELY DANGEROUS to personnel.

2. EQUIPMENT SHOULD ALWAYS BE COMPLETELY DE-ENERGIZED BEFORE HANDLING OR PERFORMING ANY SERVICE OPERATIONS. Most metal parts of the contactor are common to either the positive or negative side of the main power terminals. De-energizing the operating coil is not sufficient to render the equipment safe; the power lines must also be disconnected or otherwise de-energized. If power lines are not de-energized, all parts of the device should be considered to be at the maximum system voltage.

3. IF INSPECTION OF ENERGIZED EQUIPMENT IS NECESSARY, DO NOT TOUCH OR HANDLE ANY PARTS. DO NOT STAND DIRECTLY IN FRONT OF THE EQUIPMENT WHEN PERFORMING VISUAL INSPECTIONS. The discharge of hot gases and particles is always likely when the contactor is operated in an energized circuit.

4. NEVER ATTEMPT TO OPERATE THE DYNAMIC BRAKE CONTACTOR WITHOUT HAVING THE ARC CHUTE PROPERLY IN PLACE.

5. NEVER ATTEMPT TO REMOVE THE ARC CHUTE WHILE THE DYNAMIC BRAKE CONTACTOR IS IN AN ENERGIZED OR CLOSED POSITION. Such action would be extremely dangerous and would likely result in extensive damage.

6. Operating temperatures for the dynamic brake contactor(s) are high. SERIOUS BURNS CAN RESULT FROM HANDLING THE EQUIPMENT AFTER IT HAS BEEN IN SERVICE AND BEFORE IT HAS BEEN ALLOWED TO COOL.

MAINTENANCE

Only skilled personnel familiar with electrical equipment and the hazards involved should be permitted to service a dynamic brake grid shorting 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 excess wear. The bearing surfaces, other than the armature lever pivot, are designed to operate without lubrication. Do not oil or grease at any time.

Main contacts and arc chute parts are normally oxidized and smoked from regular service. Other contactor parts should not show visible damage from high temperatures.

Alloy contacts will operate satisfactorily even though blackened, pitted, and eroded. Do not clean, dress, or file contact surfaces. Replace contacts when any portion of the alloy material is worn to the base metal.

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

Refer to Figs. 2 and 3 throughout the following maintenance procedures.

LUBRICATION

8416136, 8436326, AND 8459697

Lubricate two armature lever pivots, Fig. 2, with one drop of light machine oil annually. Oil holes for this purpose are located above the pivots. NO OTHER PARTS SHOULD BE LUBRICATED.

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This contactor is lubricated at the factory, and DOES NOT require periodic lubrication. However, if the lubrication is removed during parts renewal, relubricate the armature lever shaft at the pushrod assembly hole, Fig. 3. Refer to Service Data for recommended lubricant. NO OTHER PARTS SHOULD BE LUBRICATED.

INSPECTION OF ARCING CONTACTS

8416136 AND 8436326

Arcing contact replacement can be determined by the remote indicator screw, Fig. 2. If the head of the screw is flush or above the front surface of the interlock mounting bracket when the arcing

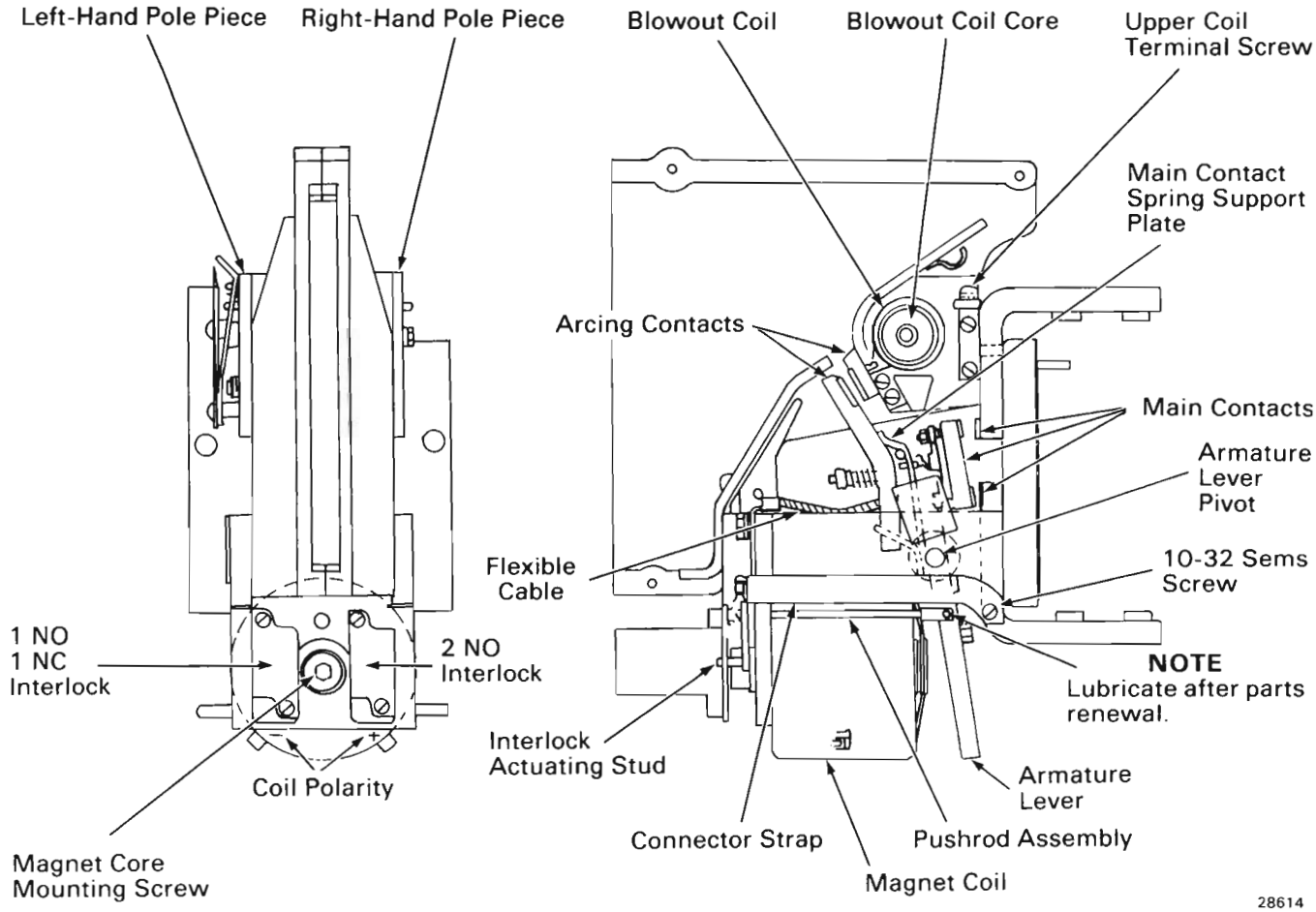

Fig.3 - Cross-Section Of Contactor 9521384

NOTE

Wear allowance is the gap between the rear of the locknut and the front of the spacer, Fig. 6, with the contactor in a closed position.

When measuring worn contacts, do not disturb the original adjustment. The main contact wear allowance can be checked as indicated in steps 1 through 4.

NOTE

Occasionally within a procedure, dual step numbers appear and are identified with an asterisk (*) preceding the step number. It is the user's responsibility to properly identify and follow the step applicable to an individual part number before proceeding to the steps which are common to all part numbers as indicated. In no instance should the numerical sequence of the steps be broken.

8416136 AND 8436326

*1. Remove arc chute by rotating spring-loaded arc chute latch to clear contactor latch post and lift out arc chute vertically, Fig. 4.

8459697 AND 9521384

*1. Press arc chute latch on the left side, upper rear of the arc chute, Fig. 5, out of the way of the arc chute latch post, and lift out arc chute vertically.

8416136, 8436326, 8459597, AND 9521384

2. Energize the magnet operating coil.

3. Check the wear allowance gap between the rear of the movable contact locknut and the front movable contact spacer as shown in Fig. 6.

*A. **8416136 AND 8436326**

Replace main contacts if original 1.3 mm (0.050") gap has been reduced to 0.25 mm (0.010").

*A. **8459697 AND 9521384**

Replace main contacts if original 0.89 mm (0.035") gap has been reduced to 0.25 mm (0.010").

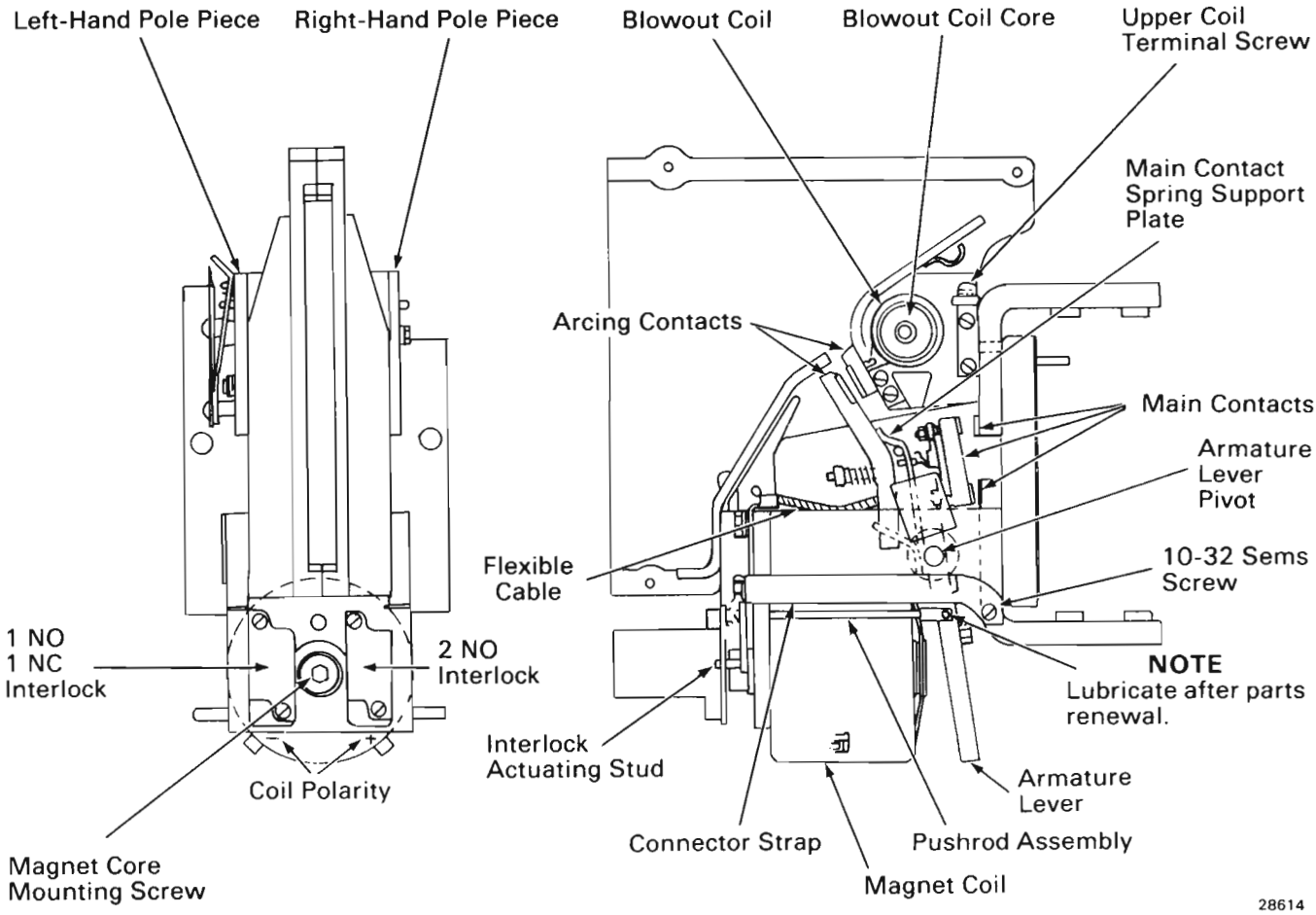

Fig.3 - Cross-Section Of Contactor 9521384

NOTE

Wear allowance is the gap between the rear of the locknut and the front of the spacer, Fig. 6, with the contactor in a closed position.

When measuring worn contacts, do not disturb the original adjustment. The main contact wear allowance can be checked as indicated in steps 1 through 4.

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Occasionally within a procedure, dual step numbers appear and are identified with an asterisk (*) preceding the step number. It is the user's responsibility to properly identify and follow the step applicable to an individual part number before proceeding to the steps which are common to all part numbers as indicated. In no instance should the numerical sequence of the steps be broken.

8416136 AND 8436326

*1. Remove arc chute by rotating spring-loaded arc chute latch to clear contactor latch post and lift out arc chute vertically, Fig. 4.

8459697 AND 9521384

*1. Press arc chute latch on the left side, upper rear of the arc chute, Fig. 5, out of the way of the arc chute latch post, and lift out arc chute vertically.

8416136, 8436326, 8459597, AND 9521384

2. Energize the magnet operating coil.

3. Check the wear allowance gap between the rear of the movable contact locknut and the front movable contact spacer as shown in Fig. 6.

*A. **8416136 AND 8436326**

Replace main contacts if original 1.3 mm (0.050″) gap has been reduced to 0.25 mm (0.010″).

*A. **8459697 AND 9521384**

Replace main contacts if original 0.89 mm (0.035″) gap has been reduced to 0.25 mm (0.010″).

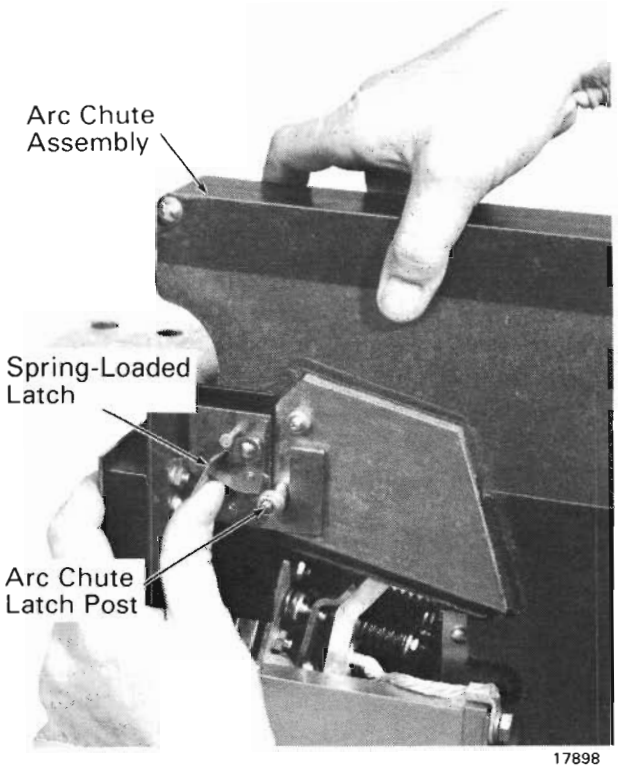


Fig.4 - Removing Arc Chute Equipped With Rotating Latch

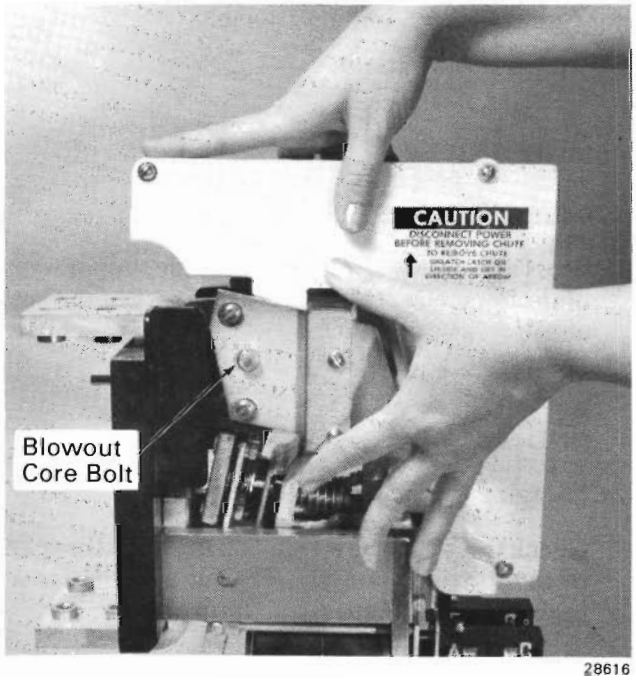


Fig.5 - Removing Arc Chute Equipped With Pressure Relief Latch

8416136, 8436326, 8459697, AND 9521384

4. De-energize the magnet operating coil and remove all connections to the electrical terminals prior to replacing contacts.

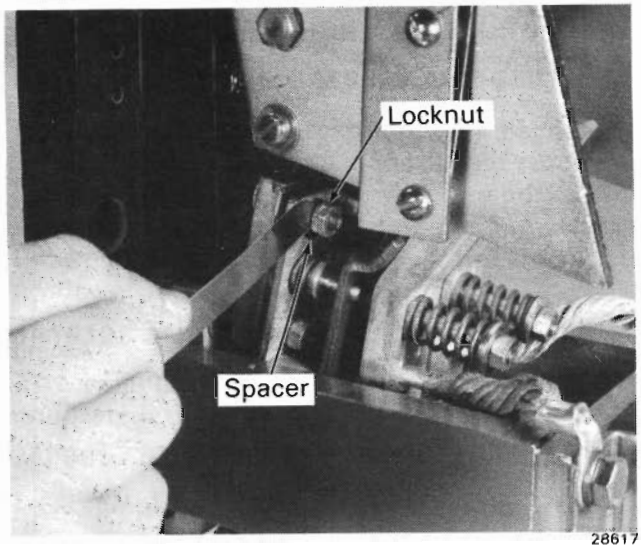


Fig.6 - Checking Main Contacts Wear Allowance

INTERLOCK ASSEMBLY REPLACEMENT

8416136, 8436326, 8459697, AND 9521384

The electrical interlocks are renewed by installing a new interlock block assembly.

Adjustment of the interlock actuating stud is made at the factory and should not need readjustment. However, should the adjustment be disturbed, it can be restored by adjusting the actuating stud so that it extends 6 mm ± 0.1 mm (0.240″ ± 0.005″) beyond the surface of the interlock mounting bracket with the operating coil energized. Apply Grade A-A Loctite to the threads to lock the stud.

NOTE

Prior to applying Loctite retaining compound, Loctite cleaner-activator can be used to ensure a good bond. (Refer to Service Data.)

MAGNET OPERATING COIL REPLACEMENT

8416136, 8436326, 8459697, AND 9521384

1. Remove the arc chute.
2. Remove one interlock (either the right or left).
3. Use a 3/8″ Allen wrench to remove the screw and lockwasher mounting the magnet core to the front magnet frame, Fig. 3.

4. Install new magnet coil and coil clamp on the core.

5. Replace magnet core on the front magnet frame.

6. Install interlock.

NOTE

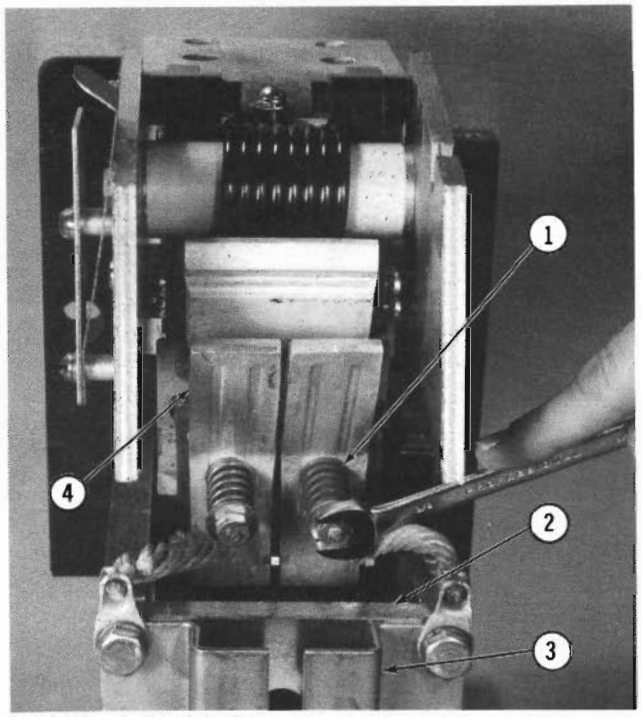
If the enclosure does not provide adequate clearance for removal of the coil as described above, follow the Alternate Method given below.

ALTERNATE METHOD (MAGNET OPERATING COIL REPLACEMENT)

8416136, 8436326, 8459597, AND 9521384

1. Remove the arc chute.

2. Remove interlock mounting bracket, pushrod assembly, and front magnet frame from side magnet frames by removing four bolts, Figs. 7 and 3.



1. Pressure Spring
2. Front Magnet Frame
3. Interlock Mounting Bracket
4. Movable Arcing Contact

28618

Fig.7 – Removing Movable Arcing Contacts

3. Remove magnet coil clamp and magnet coil, Fig. 16.

4. Clean dirt and grease from parts.

5. Install new magnet coil and coil clamp.

6. Replace front magnet frame.

7. Insert pushrod assembly through holes in front magnet frame and into two receiving sleeves on the armature lever.

8416136 AND 8436326

*8. Place the small end of the armature return spring over the boss provided.

8459697 AND 9521384

*8. Place the small end of the armature return spring over the remote indicator pin.

9. Replace interlock bracket, and insert and tighten four bolts.

ARCING CONTACT REPLACEMENT MOVABLE AND STATIONARY

8416136, 8436326, 8459697, AND 9521384

1. Remove the arc chute.

2. Remove the two bolts holding the two flexible cables to the movable contacts, Fig. 8.

3. Remove the two locknuts and spring glands, holding the pressure springs and the movable arcing contacts to the armature, Fig. 7, and remove the movable arcing contacts.

8416136, 8436326, AND 8459697

*4. Remove two (2) flathead hex socket screws mounting the stationary arcing contact, Figs. 2 and 14.

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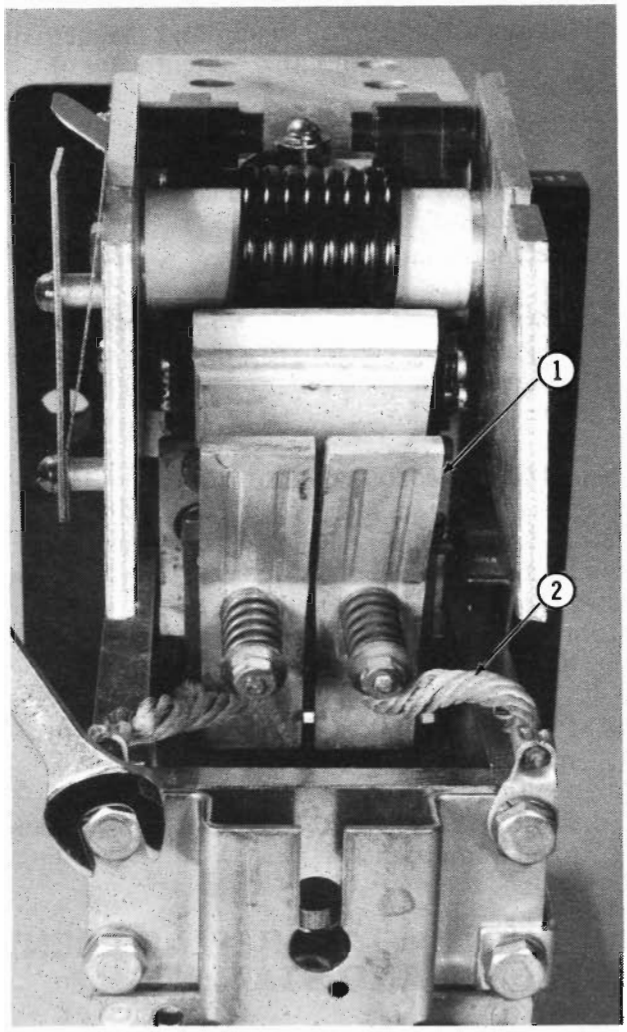
*4. Remove two hex socket cap screws from the stationary arcing contacts, Fig. 9, and remove the stationary arcing contact.



1. Movable Arcing Contact
2. Flexible Cable

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Fig.8 – Removing Flexible Cables To Movable Arcing Contacts

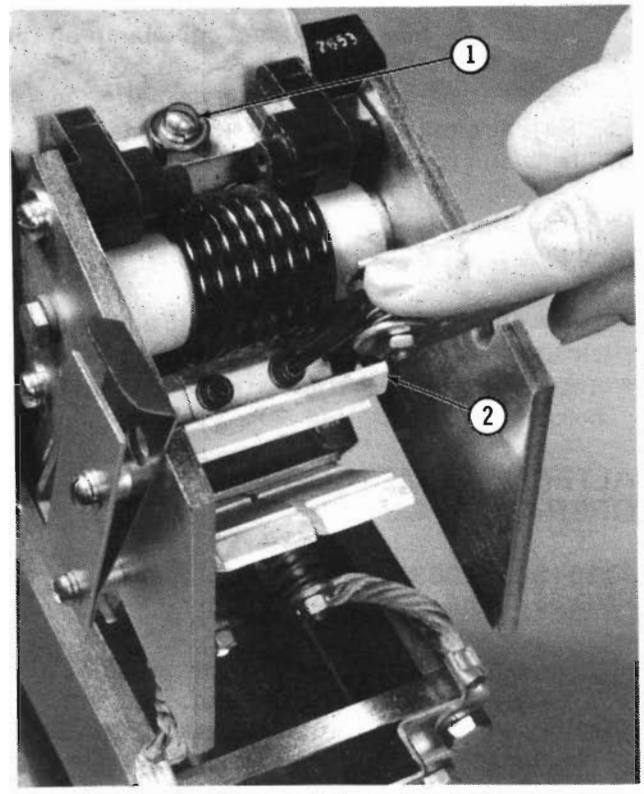
8416136, 8436326, 8459697, AND 9521384

5. Install new stationary arcing contact with new lockwashers and screws.

   Tighten screws to a torque of 4-5 N·m (35-45 in.-lbs).

6. Install two new movable arcing contacts, two pressure springs with spring glands, and two locknuts.

7. Adjust the arcing contact pressures by tightening the two movable arcing contact locknuts so that the nut is advanced until a flat area on the screw threads is fully visible.



1. Upper Coil Terminal Screw
2. Stationary Arcing Contact

28620

Fig.9 – Removing Stationary Arcing Contact

NOTE

To check or adjust movable arcing contact pressure, refer to Finish Reassembly Of Contactor section of this Maintenance Instruction.

8. Replace the two bolts holding the flexible cables, Fig. 8.

BLOWOUT COIL ASSEMBLY REPLACEMENT

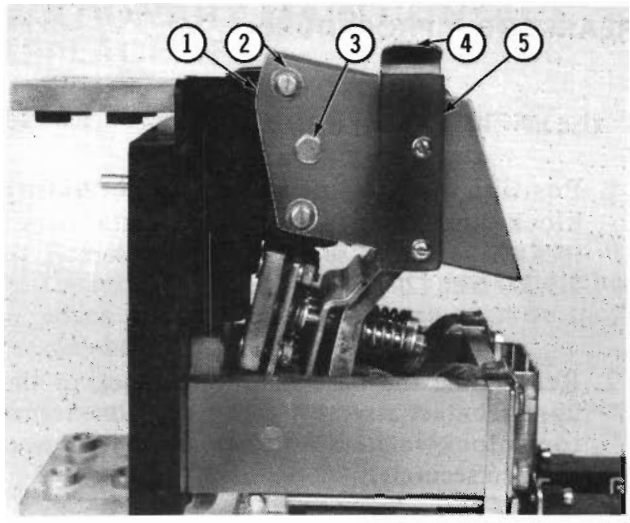
9521384

DISASSEMBLY PROCEDURE

1. Remove the arc chute.

2. Remove the bolt and lockwasher holding the blowout core to the left-hand pole piece, Fig. 10.

3. Slide the core and right-hand pole piece through the coil, and off of the right-hand base, Fig. 11.



1. Left Pole Piece
2. Base Screws And Flat Washers
3. Blowout Core Bolt And Lockwasher
4. Spring Clip
5. Base Plate

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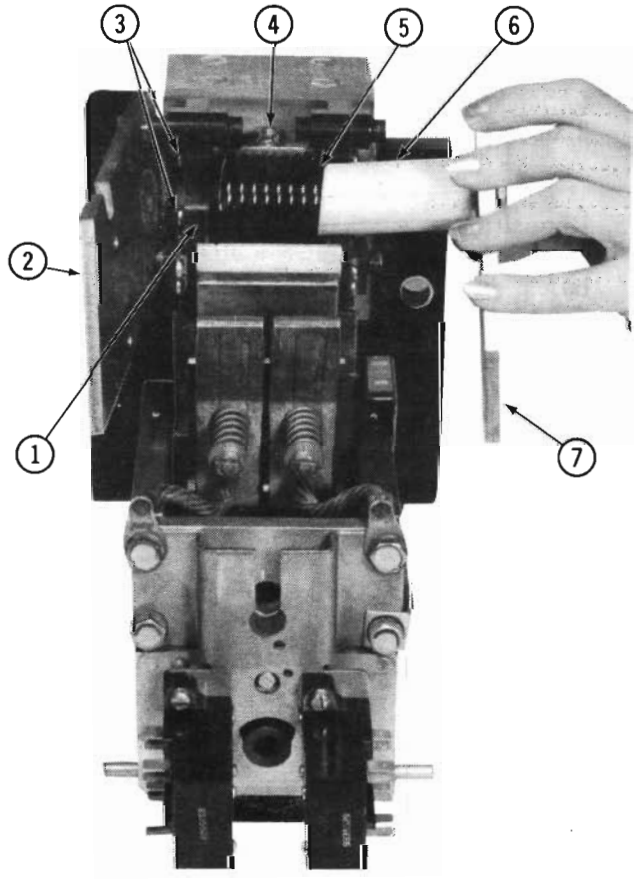
Fig.10 – Side View Of Left Pole Piece



1. Base
2. Left Pole Piece
3. Screws And Flat Washers
4. Upper Coil Terminal Screw
5. Blowout Coil
6. Blowout Coil Core
7. Right Pole Piece

28622

Fig.11 – Removing Blowout Coil Core

4. Unscrew the two screws and flat washers retaining the left-hand pole piece assembly to the base, and remove assembly from base, Fig. 10.

5. Unscrew the two Allen head screws and lockwashers, and remove the stationary arcing contact.

6. Remove the upper coil terminal screw, Fig. 9.

7. Remove the four screws securing the lower brass mounting block of the coil assembly between the left and right bases.

8. Loosen the two back screws holding the right base, and slide the coil and lower brass mounting block assembly forward and out from the bases.

NOTE

If the bases are to be renewed, proceed to Replacing The Bases, Disassembly Procedure, step 9. If not, perform the following Blowout Coil Reassembly Procedure.

REASSEMBLY PROCEDURE

1. Hold the right base, and slide the blowout coil and lower brass mounting block assembly into the bases. Retighten the two back screws *while holding the base flush against the vertical surface of the upper contact assembly.* Tighten screws to 2.3-3.0 N·m (20-26 in.-lbs) torque.

2. Reposition the lower brass mounting block of the coil assembly between the left and right bases. Insert and tighten the four screws to 2.3-3.0 N·m (20-26 in.-lbs) torque.

3. Insert and tighten the upper coil terminal screw.

4. Reinstall the stationary arcing contact using the two lockwashers and Allen head screws.

CAUTION

When performing step 5, tighten the two screws to 1.5-1.8 N·m (13-16 in.-lbs).

5. Reinstall the left-hand pole piece assembly to the left base using two flat washers and screws.

6. Slide the core and right-hand pole piece through the coil, onto the right-hand base.

7. Reassemble the blowout core to the left-hand pole piece, by applying lockwasher and bolt.

NOTE

It may be necessary to loosen the terminal screw to align core with left-hand pole piece bolt hole prior to inserting the bolt. Retighten terminal screw.

8. Reinstall the arc chute blowout assembly.

REPLACING THE BASES

9521384

DISASSEMBLY PROCEDURE

1. Remove the arc chute.
2. Remove the bolt and lockwasher holding the blowout core to the left-hand pole piece, Fig. 10.
3. Slide the core and right-hand pole piece through the coil, and off of the right-hand base, Fig. 11.
4. Unscrew the two screws and flat washers retaining the left-hand pole piece assembly to the base, and remove assembly from base, Fig. 10.
5. Remove the upper coil terminal screw, Fig. 9.
6. Remove the four screws securing the lower brass mounting block of the coil assembly between the left and right bases, and slide the coil and lower brass mounting block assembly forward and out from between the bases.
7. Remove the right base by loosening the two back screws.

NOTE

On some devices, the two back screws of the left base are accessible. If so, remove the screws to remove the left base. Attach new left base by applying 2.3-3.0 N·m (20-26 in.-lbs) torque to tighten the screws. Proceed to step 3 of the Reassembly Procedure.

8. Remove two flathead Hex socket screws and external tooth Hex lockwashers from the upper brass mounting block. Remove the upper brass mounting block with the left-side base attached.
9. Remove the two screws and external tooth lockwashers, and separate the left-side base from the mounting block.

REASSEMBLY PROCEDURE

NOTE

Use *new* bases when reassembling.

1. Position the left-side base to the mounting block, and reapply the two external tooth lockwashers and screws. Tighten screws to 2.3-3.0 N·m (20-26 in.-lbs).
2. Reassemble the base mounting block to the upper contact assembly using the two external tooth lockwashers and hex socket screws. Tighten securely.
3. Reapply the right-side base and insert the two back screws. Turn finger tight.
4. Hold the right base, and slide the coil and lower brass mounting block assembly into the bases. Retighten the two back screws *while holding the base flush against the vertical surface of the upper contact assembly*. Tighten screws to 2.3-3.0 N·m (20-26 in.-lbs).
5. Reposition the lower brass mounting block of the coil assembly between the left and right bases. Insert and tighten the four screws to 2.3-3.0 N·m (20-26 in.-lbs).
6. Insert and tighten the upper coil terminal screw.

CAUTION

When performing step 7, tighten the two screws to 1.5-1.8 N·m (13-16 in.-lbs).

7. Reinstall the left-hand pole piece assembly to the left base using two flat washers and screws.
8. Slide the core and right-hand pole piece through the coil, onto the right-hand base.
9. Reassemble the blowout core to the left-hand pole piece, using lockwasher and bolt.

NOTE

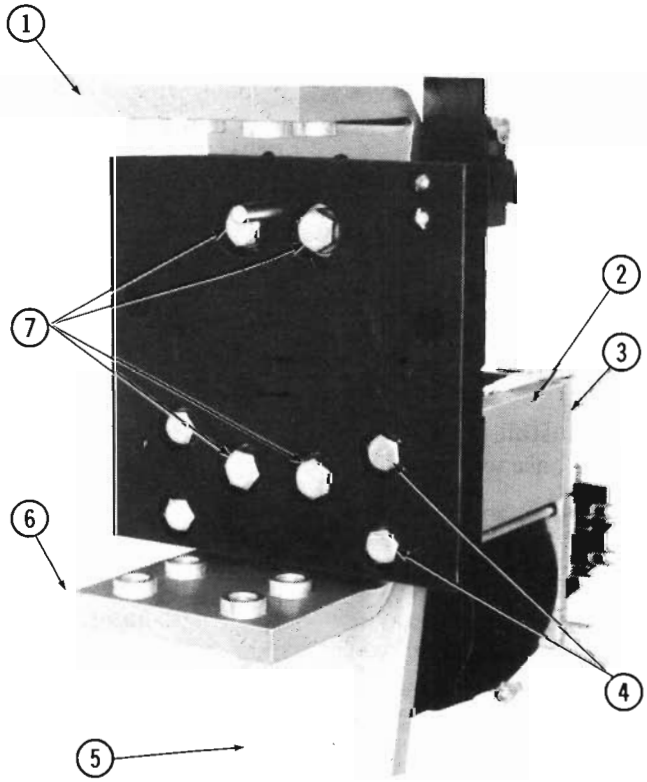
It may be necessary to loosen the terminal screw to align core with left-hand pole piece bolt hole prior to inserting the bolt.

10. Retighten terminal screw if necessary.
11. Reinstall the arc chute blowout assembly.

STATIONARY MAIN CONTACT REPLACEMENT

8416136, 8436326, AND 8459697

1. Remove the arc chute.
2. Remove the thin insulator glued to the back of the mounting panel by carefully peeling the edges. Clean adhesive off both parts so they may be reglued later.
3. Remove stationary arcing contact from upper stationary main contact, Fig. 14.
4. Remove 10-32 Sems screw and washers attaching the connector strap to the lower stationary main contact, Figs. 2 and 12. Note which washer was used as a spacer between the strap and contact for reassembly.
5. Remove upper and lower stationary main contacts, Fig. 12, from mounting panel by removing four (4) bolts.



1. Upper Stationary Main Contact
2. Side Magnet Frame
3. Interlock Mounting Bracket
4. Magnet Frame Bolts
5. Armature Lever
6. Lower Stationary Main Contact
7. Main Contact Bolts

28623

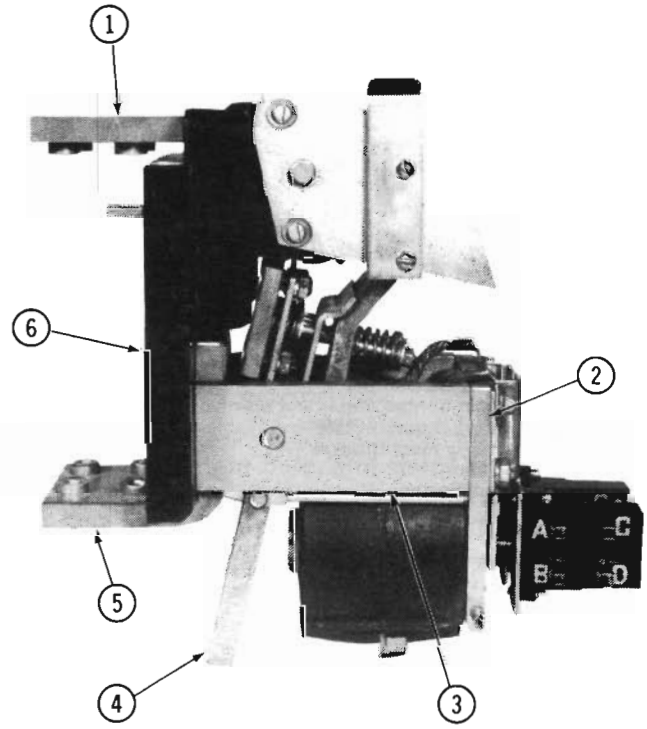
Fig.12 – Contactor, Rear View

6. Install new upper and lower main contacts to mounting panel. The upper contact is stamped + and the lower contact is stamped -.

9521384

DISASSEMBLY PROCEDURE

1. Remove the arc chute, Fig. 5.
2. Remove the thin insulator, Fig. 13, glued to the back of the mounting panel by carefully peeling the edges. Clean adhesive off both parts so they may be reglued later.



1. Upper Stationary Main Contact
2. Interlock Mounting Bracket
3. Side Magnet Frame
4. Armature Lever
5. Lower Stationary Main Contact
6. Thin Insulator

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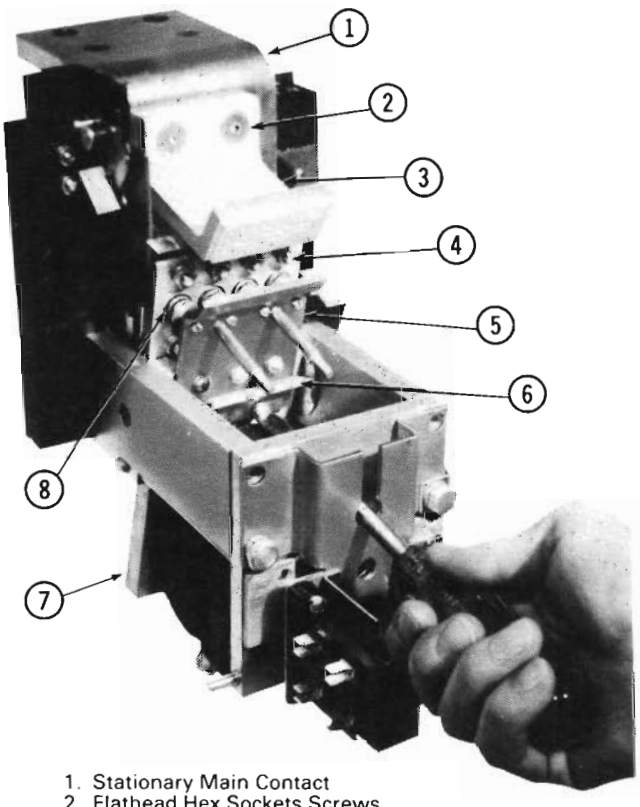
Fig.13 – Contactor, Side View (With Arc Chute Removed)

3. Remove the bolt and lockwasher holding the blowout core to the left-hand pole piece, Fig. 10.
4. Slide the core and right-hand pole piece through the coil and off the right-hand base.
5. Unscrew the two screws and flat washers retaining the left-hand pole piece assembly to the base, and remove assembly from base.



1. Stationary Main Contact
2. Flathead Hex Sockets Screws
3. Stationary Arcing Contact
4. Movable Main Contact Retaining Screws
5. Contact Spring Support Plate
6. Movable Arcing Pivot Bracket
7. Armature Lever
8. Main Contact Springs

Fig.14 – Removing Movable Arcing Pivot Bracket

6. Remove the upper coil terminal screw, Fig. 9.

7. Remove the four screws securing the lower brass mounting block of the coil assembly between the left and right bases.

8. Loosen the two back screws holding the right base, and slide the coil and lower brass mounting block assembly forward and out from the bases.

9. Remove the two back screws previously loosened in step 8 above, and remove the right-side base.

10. Remove two flathead hex socket screws and external tooth washers from the upper brass mounting block, removing this block with left-side base attached.

11. Remove 10-32 Sems screw and washers attaching the connector strap to the lower stationary main contact, Fig. 3. Note which washer is used as a spacer between the strap and contact for reassembly.

12. Remove upper and lower main power contacts from mounting panel by removing four (4) bolts.

13. Install new main power contacts onto the mounting panel.

REASSEMBLY PROCEDURE

1. Remount the upper and lower main power contacts to the mounting panel and reattach connector strap.

2. Reattach the upper mounting block with left-side base attached *as an assembly*, to the upper main contact.

3. Secure the right-side base to the upper mounting block with two screws, and slide the coil and lower brass mounting block assembly back between the bases. Tighten screws to 2.3-3.0 N·m (20-26 in.-lbs) torque.

4. Secure the lower brass mounting block of the coil assembly between the left and right bases using four screws. Tighten screws to 2.3-3.0 N·m (20-26 in.-lbs) torque.

5. Replace the upper coil terminal screw.

CAUTION

When performing step 6, tighten the two screws to 1.5-1.8 N·m (13-16 in.lbs) torque.

6. Reinstall the left-hand pole piece assembly to the base using two flat washers and two screws.

7. Slide the core and right-hand pole piece through the coil and onto the right-hand base.

8. Reinstall the blowout core to the left-hand pole piece using a lockwasher and bolt.

NOTE

It may be necessary to loosen the terminal screw to align core with left-hand pole piece bolt hole prior to inserting the bolt. Retighten terminal screw.

9. Reapply the thin insulator to the back of the mounting panel.

10. Reinstall the arc chute.

MOVABLE MAIN CONTACT REPLACEMENT

8416136, 8436326, AND 8459697

1. Remove the arc chute.
2. Remove the stationary arcing contact from upper stationary main contact, Fig. 14, by removing two flathead hex socket screws.
3. Remove the two bolts holding the two flexible cables of the movable arcing contacts to the front magnet frame, Fig. 8.
4. Remove the two locknuts and spring glands holding the pressure springs and the movable arcing contacts to the armature, Fig. 8, and remove the movable arcing contacts.
5. Remove the two screws holding the movable arcing pivot bracket to the armature lever, Fig. 14.
6. Remove three screws (located directly above the screws removed in step 5) holding the contact spring support plate to the armature lever.
7. Remove eight locknuts from the movable main contact retaining screws.
8. Remove the four movable non-arcing main contacts.
9. Install four *new* movable main contacts on the armature lever, using bearings on the top screws and spacers on the bottom screws. Turn locknuts on a couple of turns.
10. Apply 74 VDC to coil.

CAUTION

Keep hands clear of contactor when applying voltage.

11. With one hand, push the top and bottom main movable contact bridge retaining screws in, so that the movable main contact is firmly held against the stationary main contact as shown in Fig. 15.

NOTE

Step 12 is applicable to contactors 8416136 and 8436326 only. For wear allowance gap information of contactor 8459697, proceed to step 15.

12. By adjusting the eight locknuts, obtain a wear allowance gap of 1.27 mm (0.050″), Fig. 15.
13. Remove supply voltage from coil. Reposition the four springs in place on the contact spring

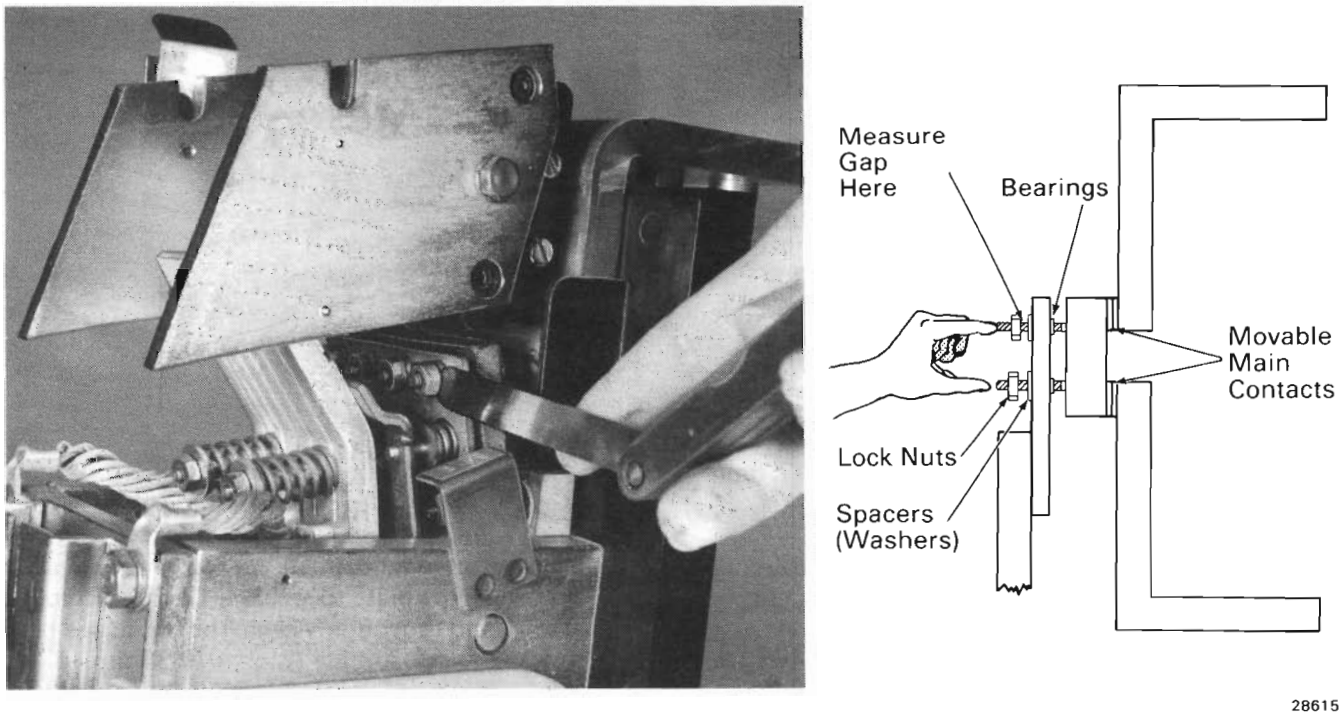


Fig.15 – Adjusting And Measuring Main Contact Wear Allowance

support plate, Fig. 14. Attach the support plate to the armature with three screws.

14. Adjust the eight locknuts to obtain a wear allowance gap of 0.89 mm (0.035″).

9521384

1. Remove the arc chute.
2. Removes the bolt and lockwasher holding the blowout core to the left-hand pole piece.
3. Slide the core and right-hand pole piece through the coil and off of the right-hand base.
4. Unscrew the two screws and flat washers and flat washers retaining the left-hand pole piece assembly to the base, and remove assembly from base.
5. Remove the upper coil terminal screw.
6. Remove the four screws securing the lower brass mounting block of the coil assembly between the left and right bases.
7. Loosen the two back screws holding the right base, and slide the coil and lower brass mounting block assembly forward and out from the bases.
8. Remove the two back screws previously loosened in step 7 above, and remove the right-side base.
9. Remove two flathead hex socket screws and external tooth washers from the upper brass mounting block, removing this block with left-side base attached.
10. Remove the two bolts holding the two flexible cables to the movable arcing contacts, Fig. 8.
11. Remove the two locknuts and spring gland holding the pressure springs and the movable arcing contacts to the armature, Fig. 7, and remove the movable arcing contacts.
12. Remove two screws holding the movable arcing pivot bracket to the armature lever, Fig. 14.
13. Remove three screws (located directly above the screws removed in step 12) holding the contact spring support plate to the armature lever.

NOTE

Remove and save any shims clamped between the spring support plate and the armature.

14. Remove eight locknuts from the movable main contact retaining screws.
15. Remove the four movable non-arcing main contacts.
16. Install four *new* movable main contacts on the armature lever, using bearings on the top screws and spacers on the bottom screws.
17. Apply 74 VDC to coil.

CAUTION

Keep hands clear of contactor when applying voltage.

18. With one hand, push the top and bottom main movable contact bridge retaining screws in so that the movable main contact is firmly held against the stationary main contacts, Fig. 15.
19. Adjust the eight locknuts to obtain a wear allowance gap of 0.89 mm (0.035″).
20. Remove supply voltage from coil.
21. Reposition the four springs in place on the contact spring support plate. Attach the support plate to the armature with three screws. Replace all shims removed in step 13.

PRESSURE MEASUREMENT OF MAIN CONTACTS

8416136, 8436326, 8459697, AND 9521384

1. Measure the pressure of the main contacts at the center of the upper contacts. The measurement should be made perpendicular to the contact surface. A hooked rod may be useful for making this measurement.
2. If adjustment is required, remove support plate from armature by removing three screws.
3. Apply heat to adjustment screws where engaged with support plate to weaken Loctite. Remove screws and thoroughly clean the threads. Retap holes in support plate using a 10-32 tap.
4. Reattach the adjustment screws to the support plate, and the support plate to the armature.

5. Set contact pressure; then apply Grade A-A Loctite.

NOTE

Prior to applying Loctite retaining compound, Loctite cleaner-activator can be used to ensure a good bond. (Refer to Service Data.)

8416136 AND 8436326

The main contact pressure of these contactors should be 2.2 - 2.3 kg (4.75 - 5.00 lbs.).

8459697 AND 9521384

The main contact pressure of these contactors should be 2.8 - 2.9 kg (6.25 - 6.50 lbs).

FINISH REASSEMBLY OF CONTACTOR

8416136, 8436326, AND 8459697

1. Fasten the movable arcing contact pivot bracket to the armature lever with two screws, Fig. 14.

NOTE

To reach these screws, insert a screwdriver through the 13 mm (1/2") diameter hole in the front of the contactor.

2. Replace the two movable arcing contacts, two pressure springs with spring glands, and two locknuts, Fig. 7.

3. Tighten the two movable arcing contact locknuts until a flat area filed on the screw threads is just fully visible, to obtain proper contact pressure.

4. To check movable arcing contact spring pressure, measure the pressure of each contact perpendicular to a point 11 mm (7/16") down from the end of the arcing contact. Movable arcing contact spring pressure should be 0.9 - 1.0 kg (2.0 - 2.25 lbs).

5. To adjust movable arcing contact spring pressure, place contactor in open position and rotate adjusting nut to obtain 0.9 - 1.0 kg (2.0 -2.25 lbs).

6. Replace the two bolts to hold flexible cables as shown in Fig. 8.

7. Replace the stationary arcing contacts, Fig. 14.

8. Attach the insulator to the mounting panel with rubber cement.

9521384

1. Perform steps 1. through 6. above.

2. Reinstall the molded bases by performing steps 3. through 11. below.

NOTE

Use *new* bases when reassembling.

3. Reattach the upper mounting block with the left-side base attached as an assembly to the upper main contact.

4. Secure the right-side base to the upper mounting block with two screws, and slide the coil and lower brass mounting block assembly into the bases. Retighten the two back screws *while holding the base flush against the vertical surface of the upper contact assembly.* Tighten screws to 2.3 - 3.0 N·m (20 - 26 in.-lbs).

5. Reposition the lower brass mounting block of the coil assembly between the left and right bases. Insert and tighten the four screws to 2.3 - 3.0 N·m (20 - 26 in.-lbs).

6. Insert and tighten the upper coil terminal screw.

CAUTION

When performing step 7, tighten the two screws to 1.5 - 1.8 N·m (13 - 16 in.-lbs).

7. Reinstall the left-hand pole piece assembly to the left base using two flat washers and screws.

8. Slide the core and right-hand pole piece through the coil, onto the right-hand base.

9. Reassemble the blowout core to the left-hand pole piece, by applying lockwasher and bolt.

NOTE

It may be necessary to loosen the terminal screw to align core with left-hand pole piece bolt hole prior to inserting the bolt. Retighten terminal screw.

10. Reinstall the arc chute blowout assembly.

ADJUSTMENTS

INTERLOCK ACTIVATING STUDS

8416136, 8436326, 8459697, AND 9521384

It should not be necessary to adjust the interlock activating studs when the interlock blocks are replaced. However, should the adjustment be disturbed, it can be restored by adjusting the interlock activating stud so that it extends 6.10 mm ± 0.13 mm (0.240″ ± 0.005″) beyond the surface of the interlock mounting bracket with the contactor energized, Figs. 1 and 2. Apply Grade A-A Loctite to the threads to lock the studs.

MAGNET GAP

8416136, 8436326, 8459697 AND 9521384

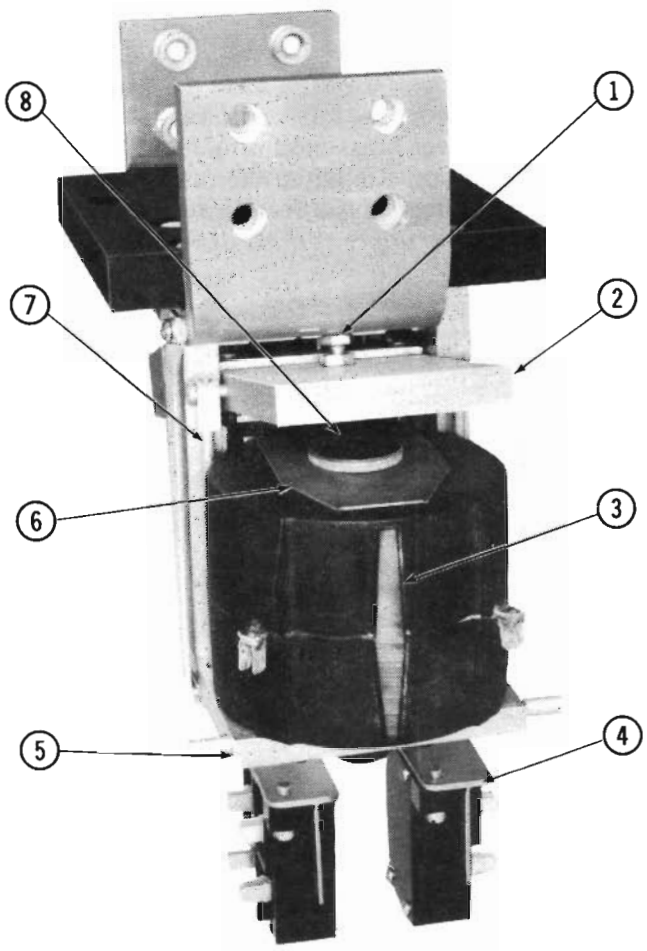
It should not be necessary to adjust the magnet gap. The gap is set at the factory and should require no further adjustment. However, should the adjustment be disturbed, restore the gap between the armature lever and the magnet core centerline to a value of 14.22 mm (0.560″).

8416136 AND 8436326

To accomplish the adjustment, *turn the magnet gap adjusting screw*, Fig. 16.

8459697 AND 9521384

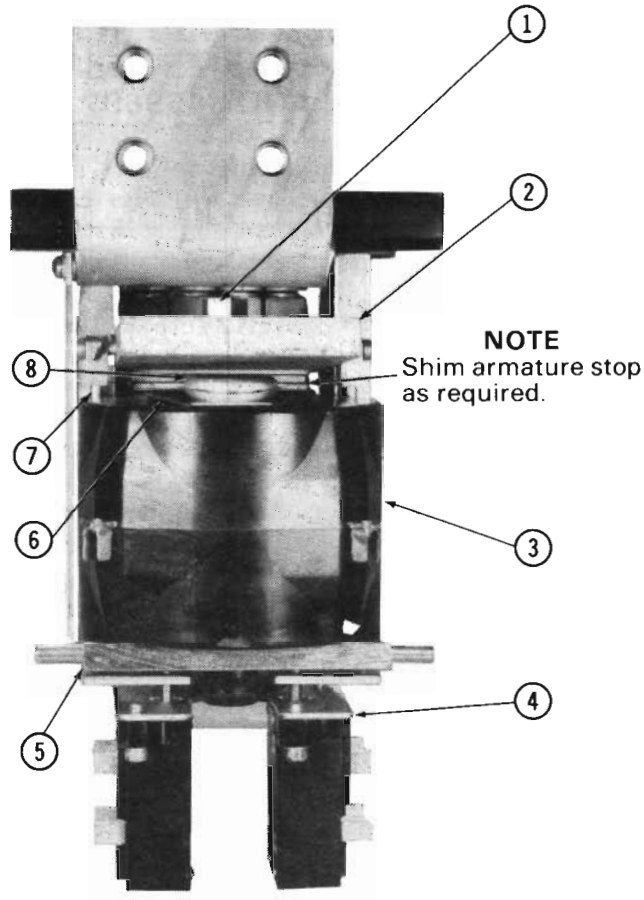
To accomplish the adjustment, *shim the armature stop*, Fig. 17.



1. Magnet Gap Adjusting Screw
2. Armature Lever
3. Magnet Coil
4. Interlock Mounting Bracket
5. Front Magnet Frame
6. Magnet Coil Clamp
7. Pushrod Assembly
8. Magnet Coil Core

28626

Fig.16 – Contactors 8416136 And 8436326, Bottom View



1. Magnet Gap Adjusting Screw
2. Armature Lever
3. Magnet Coil
4. Interlock Mounting Bracket
5. Front Magnet Frame
6. Magnet Coil Clamp
7. Pushrod Assembly
8. Magnet Coil Core

28627

Fig.17 – Contactor 8459697 And 9521384, Bottom View

REMOTE INDICATOR SCREW

8416136 AND 8436326

The remote indicator screw, Fig. 2, is adjusted at the factory and should not need readjustment. However, should adjustment be disturbed, it can be restored by the following procedure.

1. Place a 2.18 mm (0.086″) diameter rod horizontally across the face of the magnet core. Position the rod exactly halfway between the top and bottom of the magnet core. Refer to Fig. 16.

2. Pull the armature lever firmly against the rod while checking indicator screw in steps 3 and 4.

3. Place the end of a metal straight edge or other metal object with flat edges, across the edges of the indicator screw hole.

4. Adjust the indicator screw until the head of the screw is exactly flush with the top surface of the interlock mounting bracket. Apply Grade A-A Loctite to the indicator screw threads.

NOTE

Prior to applying Loctite retaining compound, Loctite cleaner-activator can be used to ensure a good bond. (Refer to Service Data.)

INSTALLATION

8416136, 8436326, 8459697, AND 9521384

Care must be taken in handling and mounting the contactor so that the molded and other parts will not be damaged.

The contactor is adjusted at the factory and no further adjustments are necessary at time of installation.

Two 14 mm (9/16″) holes for 13 mm (1/2″) screws are provided in the mounting panel for the purpose of mounting the contactor. A pin located in the rear of the mounting panel may be used to support the contactor while the screws are being inserted.

TERMINAL CONNECTIONS

8416136, 8436326, 8459697, AND 9521384

Two terminals for the contactor are located behind the mounting panel, Fig. 7. Electrical polarity must be observed. The upper terminal is positive and stamped +. The lower terminal is negative and stamped -.

3/8″-16 screws should be used to attach the cables to the terminals.

All interlock terminals are located at the front of the contactor below the arc chute. The interlocks are identified by letters stamped on brackets or the interlock itself immediately next to the terminals. These terminals as well as the magnet coil terminals are the quick-disconnect type.

Terminals for the magnet coil are located on the coil.

SERVICE DATA

SPECIFICATIONS

MAIN CONTACTS

1 Normally Open	2250 amperes, 700 VDC
Contact Wear Allowance Gap	
Contactors 8416136 and 8436326	1.27 mm (0.050″)
Contactors 8459697 and 9521384	0.89 mm (0.035″)
Contactor Replacement Gap Limit	0.25 mm (0.010″)
Contact Spring Pressure	
Contactors 8416136 and 8436326	2.2 - 2.3 kg (4.75 - 5.0 lbs)
Contactors 8459697 and 9521384	2.8 - 2.9 kg (6.25 - 6.50 lbs)

INTERLOCK CONTACTS

9335528 A-B, Normally Closed C-D, Normally Open	5 Amperes
9335529 E-F, Normally Open G-H, Normally Open	5 Amperes

ARCING CONTACTS

Movable Contact Spring Pressure	0.9 - 1.0 kg (2.0 - 2.25 lbs)

MAGNET OPERATING COIL

Resistance (at 20° C)	121 ohms (± 10%)

OPERATION (From -40° to + 100° C)

Working Voltage (Continuous)	74 VDC
Pickup (at 20° C)	45 VDC
Dropout (at 20° C)	5-28 VDC

HI-POT

Magnet Coil To Mounting	600 V RMS
Magnet Coil To Main Contacts Main Contacts To Mounting Main Contacts To Interlocks Between Open Main Contacts Interlocks To Mounting Interlock To Interlock	3200 V RMS

MATERIAL LIST

Lubricant	
Molykote - G-N Molybdenum Disulfide Paste, 0.473 liter (1 pint) can	9517921
Mastic	Rubber Cement
Retaining Compound: Loctite Grade A-A, 10 cc bottle	8471182
Retaining Compound: Loctite Grade A-A, 250 cc bottle	9330517
Cleaner-Activator: Loctite Cleaner-Activator, 170 g (6 Oz.) aerosol can	8352873