



## TYPE HDO - 3, SERIES A, NEMA SIZE 2, 50 AMPERE, DC CONTACTOR SINGLE POLE, NORMALLY CLOSED

### INSTALLATION AND ADJUSTMENT

Mount the contactor vertically on a rigid support. Provide at least .6" clearance above the top of the contactor base and 1.7" in front of the arc chute for arcing clearance and arc chute removal.

With the contactor power OFF, lift straight up on the arc chute (1) and remove it from the contactor. Operate the contactor by hand to see that the contact tips meet squarely. If they do not, adjust by the procedure described below in step 9 of "Contact Tip Replacement". When released, the contactor should close quickly and completely. If it does not, check for clearance around the core cap (33), the armature (38), and the closing spring (35). Check all electrical connections to see that they are tight and replace the arc chute. No further adjustments are necessary.

**CAUTION:** Do not operate the contactor under load without the arc chute installed in its proper position.

### TROUBLESHOOTING

**PROBLEM:** Contactor will not open when energized.

**SOLUTION:** Check the voltage at the operating coil terminals. An absence of voltage indicates a fault elsewhere in the circuitry. If the coil voltage is normal, disconnect the coil leads and check the coil for continuity. An open or shorted coil must be replaced.

### REPAIR and MAINTENANCE

#### CONTACT TIP REPLACEMENT

To determine when the contact tips should be replaced, the contact follow up must be measured. The contact follow up is the distance "F" measured at the upper edge of the contact arm with the contactor fully closed, as shown on the right. When this distance is reduced to 1/32" or less, the contact tips must be replaced to assure that proper contact pressure is maintained.

Should it be necessary to replace the tips, a screwdriver is the only tool needed and the following procedure should be followed:

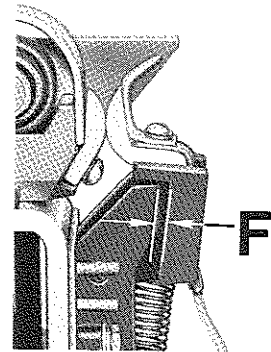
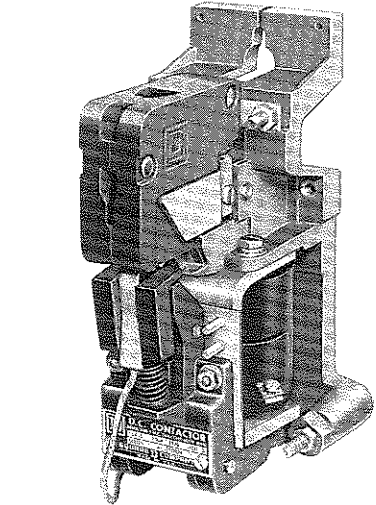
1. Lift straight up on the arc chute (1) and remove it from the contactor.
2. Unscrew the arc horn assembly (47), and remove the flexible connector and movable contact tip.
3. Unscrew the two hex head bolts (9) holding the contact arm, coil, and magnet frame in place.
4. Lower this assembly to a position that will allow the screw (44) holding the stationary contact tip to be removed.
5. Unscrew the screw (44) holding the stationary contact tip (45) in place.
6. Install the new stationary contact tip (45), lock washer (43)\*, and screw (44)\*.

7. Replace the coil, magnet frame, contact arm, and the two bolts (9) holding the parts in place.
8. Install the new movable contact tip (46), assembled connector (41), and new assembled arc horn (47).
9. Operate the contactor by hand to see that the tips meet squarely. Contact tip alignment can be adjusted by loosening the tip retaining screws and shifting the tips. After the contacts are properly aligned, retighten the screws securely.
10. Replace the arc chute.

#### COIL REPLACEMENT

To replace the operating coil a screwdriver and 7/16" open end wrench are required and the following procedure should be followed:

1. Remove the arc chute (1) and operating coil leads.
2. Remove the two hairpin clips (27) and push the contact arm pin (23) out.
3. Remove the assembled contact arm and operating spring (35) from the contactor.
4. Unscrew the two bolts (9) holding the magnet frame to the contactor base.
5. Remove the magnet frame and coil from the contactor, and



6. unscrew the 4 screws (34) holding the core cap to the coil core.
7. Remove the core cap and operating coil.
8. Install the new operating coil, and replace the core cap (33) and the 4 screws (34) holding it.
9. Remount the magnet frame and coil to the contactor base.
10. Replace the contact arm assembly, contact arm pin (23) and the two hairpin clips (27).
11. Reconnect the coil leads and replace the arc chute.

#### LUBRICATION

The type "H" contactor requires no lubrication. The pivot pins bear in a self-lubricating material.

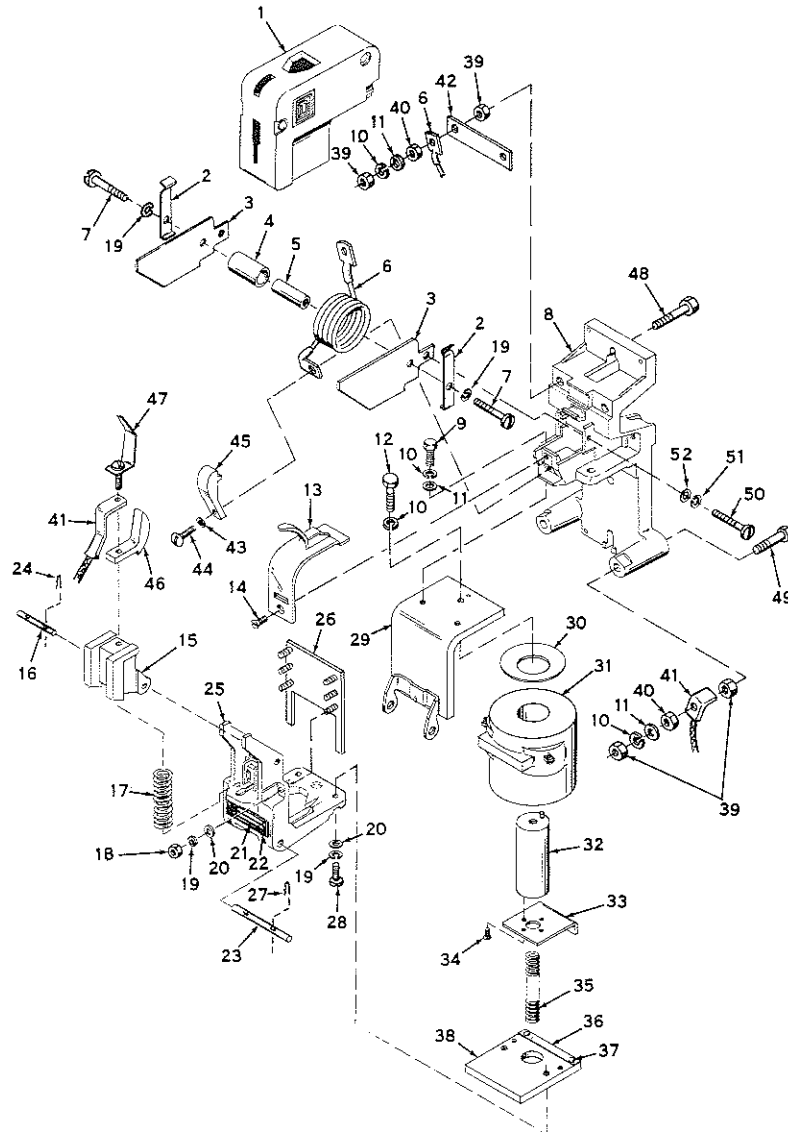
**NOTE:** \*The special non-magnetic bolts and lockwashers supplied with the contact parts kit must be used.

\*Minor revision since previous issue.



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Item No.	Part No.	Description
*1	<del>451015-033-50</del>	Assembled Arc Chute
2	<del>451015-034-01</del>	Arc Chute Spring
3	451015-032-01	Blowout Ear
4	850512-052-29	Blowout Core Insulator
*5	<del>850502-776-08</del>	Blowout Core
6	451015-054-50	Assembled Blowout Coil
*7	21507-16160	#10-24x $\frac{1}{2}$ Lg. Pan Hd. Stl. Screw, 2 Req'd.
8	<del>C51015-028-50</del>	Assembled Contactor Base
9	21408-20200	$\frac{1}{4}$ -20x $\frac{5}{8}$ " Lg. Hex. Hd. Stl. Screw, 2 Req'd.
10	23701-00200	$\frac{1}{4}$ Pl. Lk. Washer, 5 Req'd.
11	23601-00200	$\frac{1}{4}$ Std. Pl. Washer, 4 Req'd.
12	21401-20280	$\frac{1}{4}$ -20x $\frac{7}{8}$ Lg. Hex. Hd. Stl. Screw
13	451015-033-01	Blowout Guard
14	21201-12080	#6-32x $\frac{1}{4}$ " Lg. Fl. Hd. Stl. Screw
15	<del>451015-045-50</del>	Auxiliary Arm
*16	451015-059-01	Auxiliary Arm Pin
17	<del>850502-602-09</del>	Auxiliary Arm Spring
*18	23001-00160	#10-24 Hex. Stl. Nut, 2 Req'd.
*19	23701-00160	#10 Pl. Lk. Washer, 6 Req'd.
20	23601-00141	#10 Std. Pl. Washer, 4 Req'd.
21	<del>451139-093-04</del>	Nameplate
22	21509-12080	#6-32x $\frac{1}{4}$ " Pan Hd. Type F Tapping Screw, 2 Req'd.
*23	<del>451015-061-01</del>	Contact Arm Pin
*24	<del>450502-701-03</del>	Hairpin Clip (Aux. Arm Pin), 2 Req'd.
25	<del>451015-044-01</del>	Contact Arm
26	<del>451015-074-50</del>	Assembled Stop Plate
*27	<del>450502-701-01</del>	Hairpin Clip (Contact Arm Pin), 2 Req'd.
28	21507-16200	#10-24x $\frac{5}{8}$ " Lg. Pan. Hd. Stl. Screw, 2 Req'd.
29	<del>451015-037-50</del>	Assembled Magnet Frame
30	451017-041-01	Spring Washer
*31	451015-067-51	Assembled Operating Coil (240 V)
	451015-067-54	Assembled Operating Coil (120 V)
32	<del>451015-070-50</del>	Assembled Coil Core
33	<del>451015-072-01</del>	Core Cap
34	21201-14100	#8-32x $\frac{5}{16}$ " Lg. Fl. Hd. Stl. Screw, 4 Req'd.
35	<del>850502-602-08</del>	Closing Spring
36	<del>451015-071-01</del>	Armature Spacer
*37	21507-14080	#8-32x $\frac{1}{4}$ " Pan Hd. Stl. Screw, 2 Req'd.
38	<del>451015-043-01</del>	Armature
*39	23003-00200	$\frac{1}{4}$ -20 Hex. Stl. Jam Nut, 6 Req'd.
40	23005-00202	$\frac{1}{4}$ -20 Hex. Brass Nut (Silver Dip), 3 Req'd.
41	451016-050-50	Assembled Connector
42	<del>451015-119-01</del>	Terminal Tie Bar
*43		#10 Pl. Lk. Washer (Sil. Bronze)
*44		#10-24x $\frac{1}{2}$ " Lg. Rd. Hd. Sil. Bronze Screw
*45	Class 9998 Type HD-1 Kit	Stationary Contact Tip (Copper)
*46		Movable Contact Tip (Copper)
*47		Assembled Arc Horn
48	21401-20320	$\frac{1}{2}$ -20x1" Lg. Hex. Hd. Stl. Screw, 2 Req'd.



Item No.	Part No.	Description
49	21401-20560	$\frac{1}{4}$ -20x1- $\frac{3}{4}$ " Lg. Hex. Hd. Stl. Screw, 2 Req'd.
*50	21590-14120	#8-32x $\frac{3}{8}$ " Lg. Pan Hd. Thr'd. Frm. Tri-Lobe
*51	23701-00140	#8 Lk. Washer
*52	23601-00121	#8 Plain Washer

NOTE: Electrical and Mechanical Interlocks, Pneumatic Timers, and Tie Bars are listed under Class 9999 User Modification Kits. See Service Bulletin 9999-1

\*Essential Parts for General Maintenance.  
 •Minor revision since previous issue.