DRAWOUT HIGH VOLTAGE CONTACTOR, SERIES C 1500/2500/5000 VOLTS 400 AMPERE (OPEN RATING)

GENERAL DESCRIPTION

The Class 8110 drawout type contactor is a 3-pole air break device. The contactor is rated at 5 KV, 400 ampere (open) and has an interrupting rating of 50 MVA RMS symmetrical.

The contactor is supplied in 3 configurations, consisting of the following assemblies, for various applications:

1) Full voltage starter
   a) basic contactor
   b) power fuse assembly
   c) control power transformer assembly
2) "Forward" contactor in a reversing starter
   a) basic contactor with additional stab bus assembly
   b) power fuse assembly
   c) control power transformer assembly
3) "Run" contactor in a reduced voltage starter, or "Reverse" contactor in a reversing starter.
   a) basic contactor with additional stab bus assembly

An additional 750 VA control power transformer may be supplied to obtain 3 phase power. Control power transformers up to 2500 VA are also available. The wiring diagram of the starter should be consulted to determine the control transformer configuration for a particular application.

The Class 8110 contactor is also available as a mechanically latched device for transformer feeder circuits, automatic transfer applications and other applications where it is desirable to have the contactor remain closed should the voltage dip or fail. These contactors are closed electrically and may be opened by mechanical linkage; or optionally by an electrically operated solenoid for remote operation.

MAINTENANCE

GENERAL

Inspection should be done on a regular basis. The contactor should be inspected weekly under intermittent operating conditions where frequent starting is required. When used for longer, continuous-duty cycles, a less frequent inspection interval can be established. If contactor is operating in dirty or contaminated atmosphere, more frequent inspection intervals are desirable.

If trouble is found during inspection, repairs should be made immediately. Make sure all connections are tight and that the arc chutes and barriers are in good condition and properly installed.

Inspect the contact alignment. Contacts should make firmly and squarely over entire surfaces.

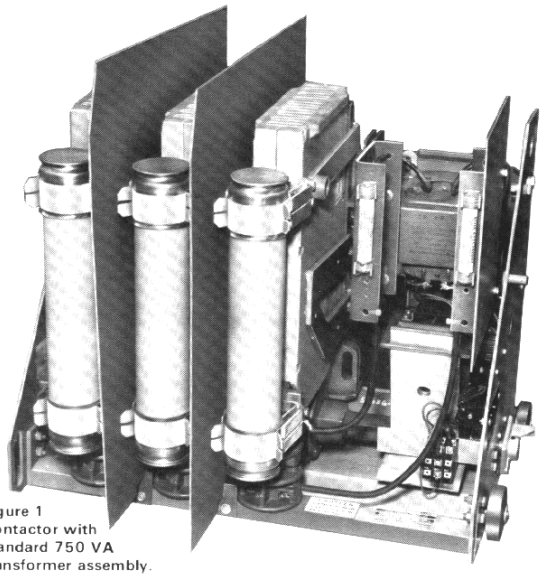


Figure 1
Contactor with standard 750 VA transformer assembly.

CAUTION

MAKE SURE THE CONTACTOR IS DISCONNECTED BEFORE MAINTENANCE PROCEDURES ARE ATTEMPTED.

CLEANING

Brush all dirt or dust from the contactor. Pay particular attention to the stationary and movable contact surfaces. Discoloration of the surfaces and slight pitting is allowable. If the contact surfaces show burned marks, grooves, deep pits, or are structurally weakened, they should be replaced.

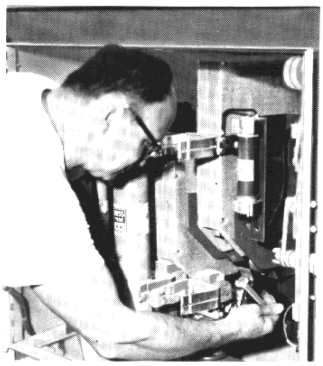
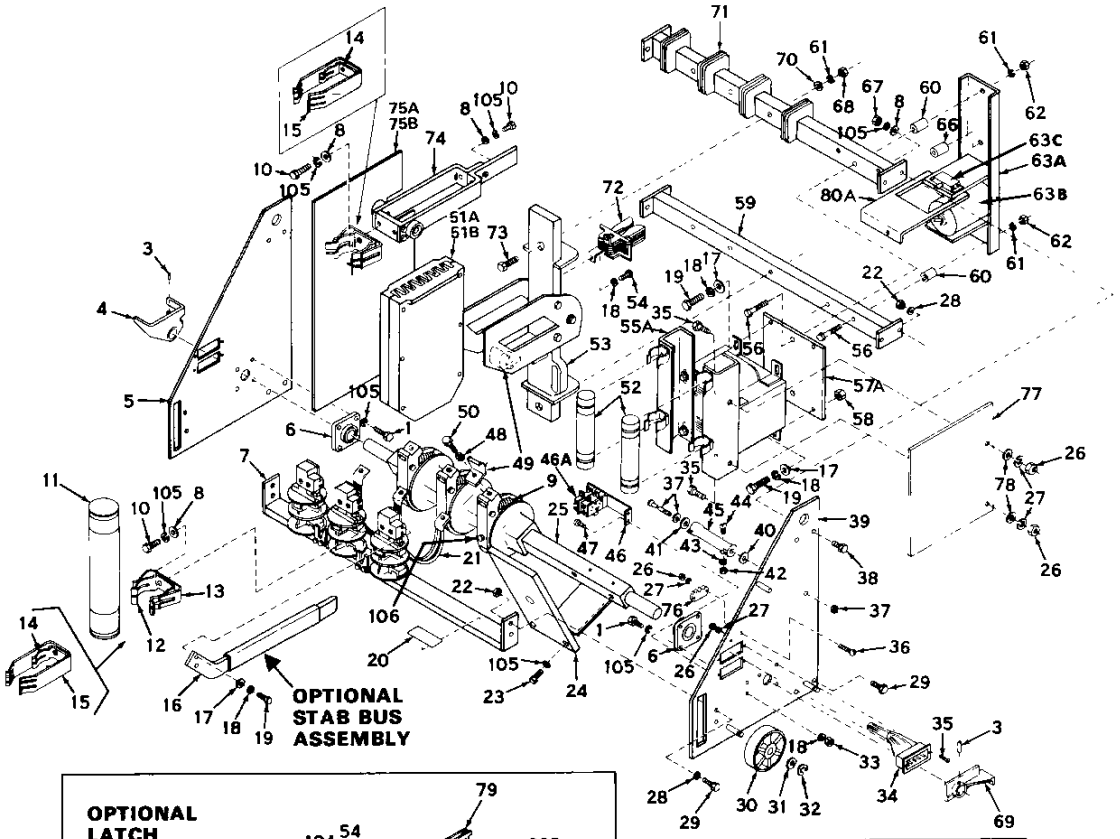


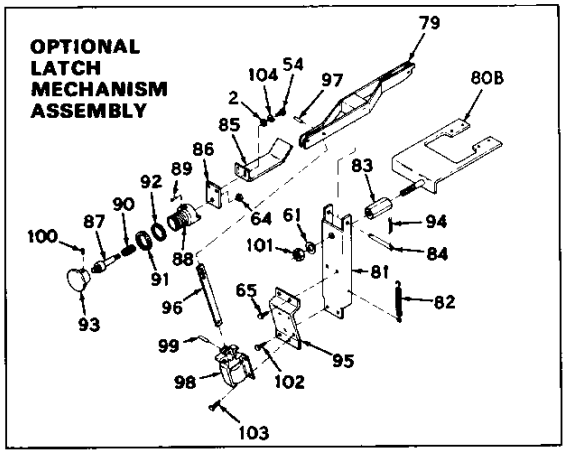
Figure 2 Contact Tip Replacement

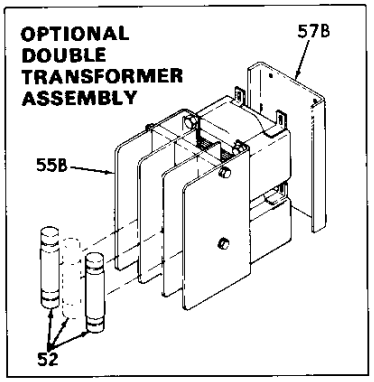
CONTACT TIP REPLACEMENT

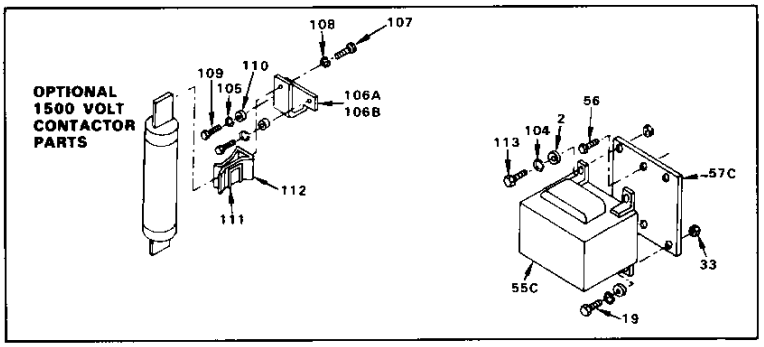
Remove the power fuses, if used, (item 11) and barriers (75). Raise arc chute and prop it in raised position. Use an open end wrench as shown in figure 2 to remove the screw (50) and lock washer (48) securing the lead assembly and moving contact tip (49) to the shaft assembly (25). Remove the screw securing the stationary contact tip. Replace all stationary contact tips first and then replace moving contact tip. An electrical clearance of 7/8" between the stationary and movable contact tips is required when the contactor is de-energized. To adjust the clearance between the tips, turn adjusting screw (114). Remove prop under arc chutes and lower into place; replace barriers and power fuses.

DRAWOUT HIGH VOLTAGE CONTACTOR









DRAWOUT HIGH VOLTAGE CONTACTOR

Item No.	Part No.	Description
1	21402-25160	3/8"-24 x 1/2" H. H. Machine Screw
2	23601-00200	1/4" Plain Washer
3	24209-16480	1/4" x 1 1/2" Roll Pin
4	A51033-077-50	Interlock Arm Assembly
5	C51033-016-50	Frame Sideplate (L.H.)
• 6	29013-03320	Square Flange Shaft Bearing
7	A51033-027-50	Front Channel Assembly, complete with Pedestals, Standoff Insulators, and Barrier Guides
8	23601-00242	3/8" Plain Washer
9	A51033-023-01	Spring (Part of Item 25)
10	21401-24360	3/8" x 16 x 1 1/8" H. H. Cap Screw
*11		Power Fuse, Refer to wiring diagram supplied with specific equipment.
12	B80012-004-01	Fuse Clip, (for Single Fuse)
13	B80012-005-01	Fuse Clip Spring, (for Single Fuse when used)
14	A51202-184-01	Fuse Clip, (Use with Double Fuse)
15	A51202-183-01	Fuse Clip, (Use with Double Fuse)
16	A51033-067-50	Stab Bus Assembly
17	23601-00201	1/4" Plain Washer
18	23712-32000	1/4" Lock Washer
19	21401-20240	1/4" - 20 x 3/4" H. H. Cap Screw
20	A51139-047-03	Name Plate
21	A51033-025-50	Assembly Flex Connector
22	23045-22000	5/16" - 18 Nut
23	21401-24480	3/8" - 16 x 1 1/2" H. H. Cap Screw
24	A51033-058-01	Armature
25	A51033-018-50	Shaft Assembly, complete with Contact Arm Assemblies, Pins, Retaining Rings, Springs, Knocker and Flexible Shunt
26	23001-00160	No. 10-24 Nut
27	23701-00160	No. 10 Lock Washer
28	23701-10221	5/16" Lock Washer
29	21401-22240	5/16" - 18 x 3/4" H. H. Cap Screw
30	29099-10160	Wheel
31	23601-00260	7/16" Plain Washer
•32	29915-02811	7/16" Retaining Ring
33	23001-00200	1/4" - 20 Nut
34	B51033-160-50	Wire Harness
35	21001-16160	No. 10 - 24 x 1/2" RD. H. Machine Screw
36	21507-16280	10 - 24 x 7/8" H. H. Machine Screw
37	A51033-167-50	Resistor Hardware, Includes Items, 40, 41 and 45
38	21401-24320	3/8" - 16 x 1" H. H. Cap Screw
39	C51033-016-51	Frame Sideplate (R.H.)
40	TW-97	Mica Washer
41	X-2184	Mica Washer
42	23001-00120	No. 6 - 32 Nut
43	23701-00120	No. 6 Lock Washer
44	21001-12160	No. 6 - 32 x 1/2" R. H. Machine Screw
45	A52906-013-61	Resistor (Included in Item 37)
46	A51033-059-50	Electrical Interlock Bracket Assembly, complete with Support Electrical Interlock, and Insulator
•46A	2926-B2-G1	Electrical Interlock
47	21401-20200	1/4" - 20 x 5/8" H. H. Cap Screw
48	Class 9998	3/8" Lock Washer
•*49	Type LA-1	Contact Tips (Silver Plated)
50	Parts Kit	3/8" - 16 x 1" H. H. Cap Screw
51	A51033-073-50	Arc Chute Assembly, complete with Sidewalls, Runners, Binding Posts, and Screws
*52		Potential Transformer Fuse, Refer to Wiring Diagram Supplied with Specific Equipment
53	A51033-135-50	Stationary Contact Base Assembly, complete with Base, Bracket, Contact Clip, Contact Tip, Coil, Disconnect Assembly, Blowout Core, Washer, and Blowout Ears
54	21401-20160	1/4" - 20 x 1/2" H. H. Cap Screw
55A, 55B, 55C		Potential Transformer Assembly (Refer to wiring diagram supplied with the specific equipment)
56	21401-28700	1/2" - 13 x 2 3/4" H. H. Cap Screw
57A	A51033-057-01	Mounting Plate
57B	B51033-131-01	Mounting Plate
57C	A51033-223-01	Transformer Mounting Plate
58	23003-00200	1/4" - 20 Nut
59	A51033-030-50	Rear Frame Support Assembly
60	B50502-053-09	Spacer
61	23701-00280	1/2" Lock Washer
62	23045-28000	1/2" - 13 Nut
63A	A51033-052-50	Magnet Base Assembly, including Items 63B and 63C
63B	L-6130A	Coil
63C	A51033-083-50	Electrical Interlock
64	23002-00200	1/4" - 20 Hex Stl. Nut
65	21527-20160	1/4" - 20 x 1/2" Lg. Type "C" Thr'd. Form Screw
66	B50502-053-10	Spacer
67	23045-24000	3/8" - 16 Nut
68	23045-28000	1/2" - 13 Nut
69	A51033-081-50	Interlock Arm Assembly
70	23601-00261	1/2" Plain Washer
71	D51033-031-50	Top Support Assembly
72	A51033-042-50	Primary Disconnect Assembly, complete with Bracket, Disconnect Fingers, Pins, Springs, Spacers and Retaining Rings
73	21401-28480	1/2" - 13 x 1 1/2" H. H. Cap Screw
74	A51033-063-50	Power Fuse Bus Assembly, complete with Bus Bars, Mounting Block, and Barriers
75A	A51033-076-01	Barrier
75B	A51033-219-01	Barrier (1500V only)
76	A51033-084-50	Rectifier
77	A51033-106-01	Barrier
78	23601-00141	No. 10 Plain Washer
79	B51033-139-50	Assem. Mech. Latch Arm.
80A	A51033-055-01	Armature Stop Plate
80B	A51033-141-50	Assem. Armature Stop Plate
81	A51033-142-01	Bracket Mech. Latch
82	A51033-143-01	Spring
83	A51033-144-01	Adjusting Nut
84	B50502-276-38	Pin
85	A51033-147-01	Push Arm
86	A51033-148-01	Push Button Plate
87	A51033-149-01	Push Button Shaft
88	A51033-150-01	Reset Mech. Base
89	2358-X1	Dowel Pin
90	2760-X3	Spring
91	2358-C1-X1	Ring Nut
92	2358-X8	Gasket
93	2358-C6-X3	1 3/8" Dia. Mushroom Button
94	24201-08240	1/8" x 3/4" Lg. Cotter Pin
95	A51033-145-01	Solenoid Bracket
96	A51033-146-01	Solenoid Rod
97	24209-16240	Roll Pin (1/4 x 3/4)
• 98	26002-20190	AC Solenoid 115V 60 Cycle Intermittent Duty
99	24209-08321	1/8 x 1" LG Roll Pin
100	2903-W1408	#8 - 32 - 1/4 Lg. Socket Set Screw
101	23002-00280	1/2 - 13 Hex Stl. Nut
102	21417-22240	5/16 - 18 x 3/4 Lg. Type "C" Thr'd. Form Screw
103	21527-16080	#10 - 24 x 1/4" Lg. Type "C" Thr'd. Form Screw
104	23701-00200	1/4" P.L. L.K. Washer
105	23701-00240	3/8" Lock Washer
106A	A51033-221-01	Fuse Adapter Pad (Top)
106B	A51033-221-02	Fuse Adapter Pad (Bottom)
107	21401-22160	5/16" - 18 x 1/2" Lg. Screw
108	23701-00220	5/16" Lock Washer
•109	21401-24240	3/8" - 16 x 3/4" Hex Head Cap Screw
110	23602-12409	3/8" Plain Washer
111	J-163936	Fuse Clip Spring
•112	J-153507	Fuse Jaw
113	21401-20320	1/4" - 20 x 1" Lg. Screw

*Essential for maintenance
•Minor revision since previous issue

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ELECTRICAL INTERLOCK SWITCH REPLACEMENT

If the starter operates correctly but the electrical interlocks do not operate, remove the two screws (47), lock washers (18), and nuts (33) that secure the interlock switch assembly (46) to the side of the contactor. Replace the interlock switch assembly.

MAGNET COIL REPLACEMENT

Remove the interlock switch assembly (46) (See above paragraph). Remove two screws (23) and lockwashers (9) securing the armature to the operating shaft. Remove core cap screw and core cap washers. Disconnect coil leads from rectifier block. Slide coil off the coil core. Remove and replace coil. Reconnect coil leads. When replacing core cap washers, the thickest of the two (2) washers must be placed next to the coil. Remount the armature and interlock switch assembly.

POWER FUSE REPLACEMENT

Fuse size and rating is determined by motor characteristics (full load current and locked rotor current). Make sure the new fuse is identical with the one being replaced. Fuse information is provided on the schematic diagram supplied with the specific equipment.

Pull the fuse from the top fuse clip and then from the lower clip. If the fuse is frozen in the fuse clips, pry out gently. Take care not to damage the fuse clips.

When installing a new fuse, make sure it is centered between fuse clips and is securely held by the fuse clips at top and bottom. Starters for larger horsepower motors use double fuse clips and double power fuses.

POTENTIAL TRANSFORMER FUSE REPLACEMENT

Potential transformer fuse size and rating is determined by the size of transformer used. Make sure the new fuse is identical with the one being replaced. Fuse information is provided on the schematic diagram supplied with the specific equipment.

Pull the fuse from the top fuse clip and then from the lower clip. If the fuse is frozen in the fuse clips, pry out gently. Take care not to damage the fuse clips.

When installing a new fuse, make sure it seats firmly in the clips. Check that clips are fastened securely to brackets on the potential transformer.

RECTIFIER CHECK

With the test circuit plug inserted in the receptacle at the side of the contactor, check the dc output across terminals 3 and 26 of the rectifier (76). The output voltage should be 95 volts dc if the contactor is open and 20 volts if the contactor is closed. If the output is not correct, then either the rectifier or the magnet coil is defective. Check the output across the rectifier with the coil disconnected to isolate the trouble. The rectifier output should be 95 volts dc. If the rectifier is defective, remove it from the side of the contactor frame and replace it.

TROUBLESHOOTING CHART

Trouble	Probable Cause	Remedy
Contact chatter.	Loose connection in control circuit.	Check connections in control circuit.
	Defective control relay.	Check control relay. Replace if defective.
	Defective magnet.	Check coil or rectifier.
	Low control voltage.	Check line voltage.
Contact life short.	Contacts chatter or bounce	Check contact springs.
	Arc chutes not installed properly.	Seat arc chutes.
	Contacts not properly aligned.	Check alignment. Contacts should make squarely with even pressure across full surface.
	Foreign material in operating or contact mechanisms.	Clean all contact surfaces. Clean all operating mechanism parts.
Contacts overheat.	Loose connection.	Tighten all connections.
	Contact tips not making firmly with stationary contacts.	Check springs on operating shaft assembly for weak or deformed condition. Replace defective springs.
	Dirt or foreign matter on surfaces.	Clean contact surfaces.
	Contact surfaces scored or burned.	Replace contacts.
Contact pressure weak.	Defective contact springs.	Replace springs on operating shaft assembly.
	Contact tips worn beyond limits.	Replace contact tips.
Contacts do not close.	Potential transformer fuses blown.	Inspect potential transformer fuses. Replace if blown.
	Control circuit fuse blown.	Inspect control circuit fuse on relay panel. Replace if blown.
	Magnet coil defective.	Check coil resistance. Cold coil resistance 28 Ohms at 25°C.
	Control relay defective	Check control relay. Replace if defective.
	Potential transformer defective.	Check potential transformer as directed in the Routine Maintenance section of Service Bulletin 8198-1.
	Rectifier defective.	Check as directed in the Maintenance section. Replace if defective.

Supersedes SB 8110-6 Dated 4-70