SERVICE BULLETIN 7004-3

MAY, 1967

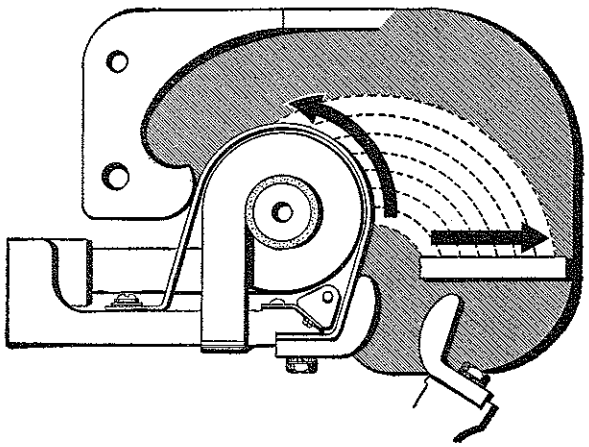
NEMA SIZE 4 SINGLE POLE L LINE-ARC CONTACTOR
FRONT CONNECTED
FOLIO 3A
FOR DC OPERATION

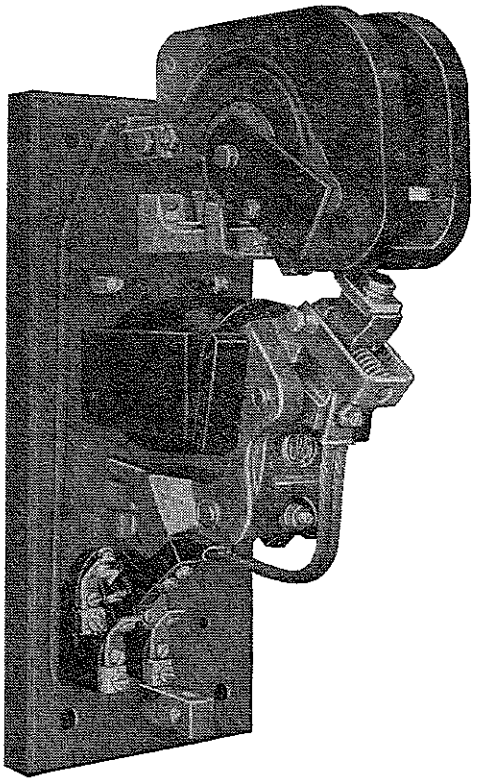
INSTRUCTIONS

TYPE L LINE-ARC CONTACTORS are general purpose, direct current magnetic contactors.

Contactor Size		Continuous Rating Amperes	Crane and Mill Rating Amperes	Rupturing Capacity Amperes
NEMA	EC&M			
No. 4	No. 2	150	200	1500

LINE-ARC: These contactors derive their name from the manner in which they handle the arc. The Line-Arc principle of controlling the arc is simple . . . and automatic. There is nothing to adjust or wear out. At the instant the contacts start to separate, the arc is automatically transferred from the contacts to the arcing plate and circular guard over the blowout coil. The arc, as it travels along the arcing plate and circular guard, is stretched out in a line centered between the arc shields. Hence—cool contacts and the name Line-Arc.





CAUTION—Before operating the contactor under load, be sure that the arc shield is lowered in its proper position.

INSTALLATION: Mount the contactors vertically on rigid supports with at least 3″ clearance above and in front of the arc shields to provide the proper distance for arcing clearance and also for removal of the arc shields. The life of the contactor will be considerably prolonged by installing it in a clean, dry place, preferably in a cabinet and as free as possible from external vibration or shock.

MAGNET AIR GAP: To insure quick release of the magnet arm, an air gap of .034″ minimum and .049″ maximum is provided between the magnet arm and the front ends of the U-shaped frame. See that the magnet faces are free from oil or sticky foreign material.

BEARINGS: Type L contactors are equipped with Nitralloy pins and oil-filled bearings. These bearings are self-lubricating and require no lubrication in the field.

OPERATING COILS: These contactors will operate satisfactorily on 80% of normal control voltage when the coils are hot and will hold in on 20% of normal voltage. The coils will stand 110% of normal voltage continuously.

Contactors for 115 and 230 volt service are supplied with continuous capacity coils. Contactors for 550 volt service are supplied with a 230 volt coil and suitable resistor mounted on the back of the base.

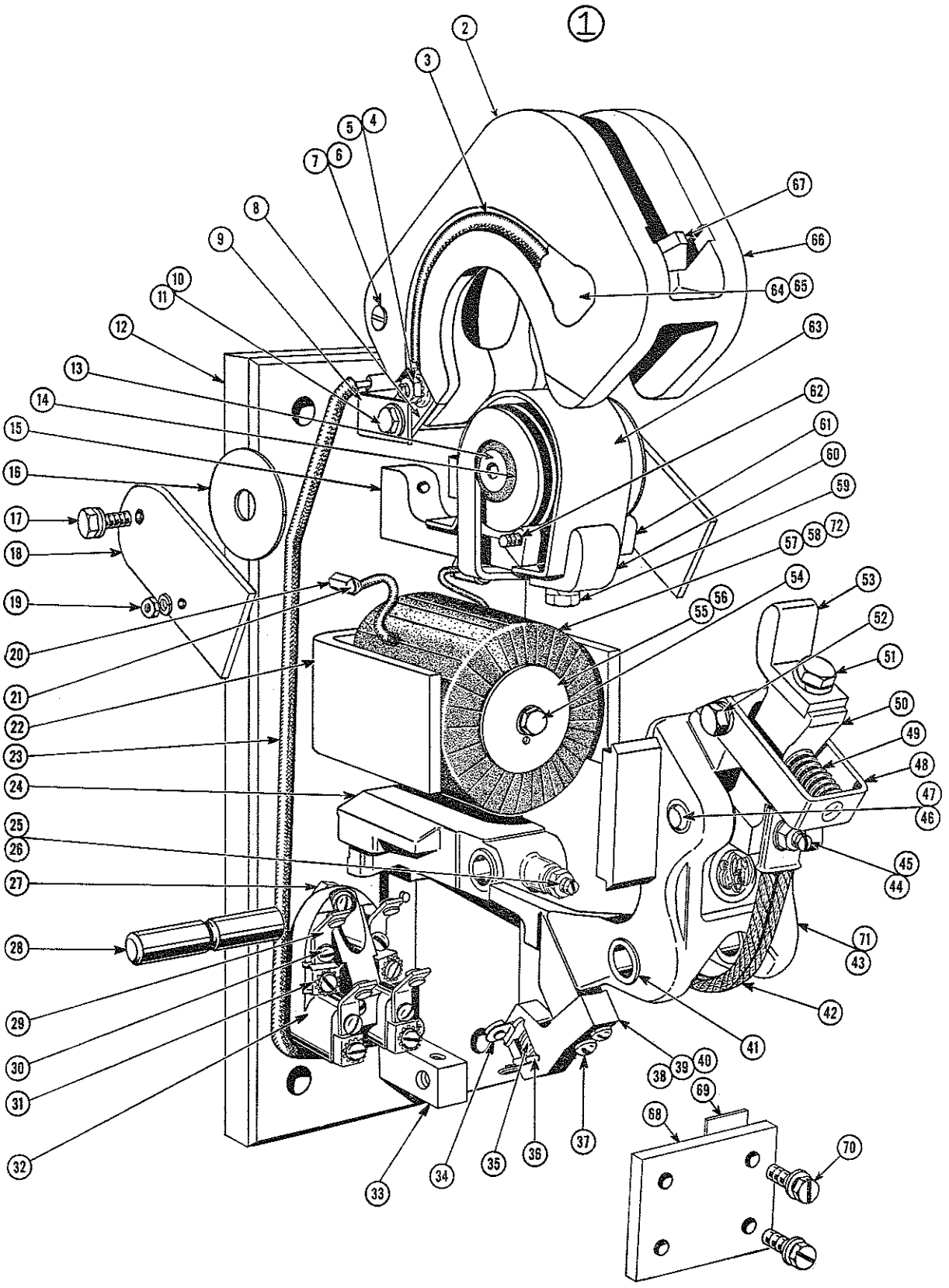
To remove the operating coil, first back out the magnet arm pin set-screw and remove the magnet arm pin. The magnet arm may then be lowered to remove the operating coil.

ELECTRICAL INTERLOCKS: These consist of stationary contacts mounted on the base and a moving contact attached to the bottom of the magnet arm. The moving contact should provide 1/8″ follow-up when the magnet arm reaches its limit of travel, either completely closed or completely opened. The rating of these electrical interlocks is as follows:

	Max. Inrush	Cont. Amps.	Rupturing Capacity Amps. Inductive			
			115 V.	250 V.	440 V.	550 V.
A.C.	30	15	10	10	5	5
D.C.	30	15	2.5	1.0	.4	.4

(Continued on Page 4)

NEMA SIZE 4 SINGLE POLE L LINE-ARC CONTACTOR, FOLIO 3A



NEMA SIZE 4 SINGLE POLE L LINE-ARC CONTACTOR, FOLIO 3A

Item No.	List No.	Description
1	LT-2024-A	Assembled Arc Shield
2	LT-2035	Arc Shield, Left Hand
3	LT-1081	Arc Plate Connector, 2 req'd.
4		¼"-20x2¼" H.I. Cap Screw, Nut and Shake-Proof Lk. Washer
5	ZO-1150	Cup Washer
6	FP-23A13	Binding Nut
7	FP-23A36	Binding Screw
8	LT-1049	Arc Shield Hinge, 2 req'd.
9	LT-2050	Arc Shield Clip
10	B5-0502-004-01	Spring Washer, 2 req'd.
11		¼"-20x2¼" H.I. Cap Screw and H.I. Nut
12		Base, Advise Thickness And Number of Poles
13	LT-2039	Blowout Core
14	LT-2074	Insulator For Blowout Core
15	L-2730-A	Blowout Coil and Contact Bracket
16	LT-1075	Insulator For Blowout Ear, 2 req'd.
17		¼"-20x½" H.I. Cap Screw and Lk. Washer, 2 req'd.
18	LT-1052	Blowout Ear, 2 req'd.
19		10-24 H.I. Nut and Lk. Washer, 2 req'd.
20	L-1721	Coil Terminal Stud, 2 req'd.
21		10-24x⅜" R. Stl. Machine Screw
22	L-2018-A	Frame
●*23	L-1705-A	Blowout Connector
24	LT-2029-A	Magnet Arm Bracket
25	LT-1443	Set Screw
26		¼" 20 H.I. Nut and Lk. Washer
27	EL-110	Stud
28	LT-2037	Magnet Arm Pin
†29	EL-109-A	Assembled Contact
30		10-32x⅜" R. Stl. Machine Screw and Lk. Washer
31	FP-28H1-10	Terminal
32	EL-100-A	Contact Block
33	L-1709	Terminal Bracket
†34	EL-84-A	Contact Bridge, 1 req'd. for Item 38, 2 req'd. for Item 39
†35	EL-49	Spring
36	EL-87	Spring Retainer, 2 req'd.
37		10-24x⅞" R. Stl. Machine Screw and Lk. Washer
38	EL-1-A	Control Circuit Arm, Complete, For Open Or Closed Control Circuit
39	EL-2-A	Control Circuit Arm, Complete, For Open And Closed Control Circuit
40	EL-47	Control Circuit Arm, Only
41	FP-24B13	Bearing, 2 req'd. Pressed Into Magnet Arm
†42	LT-2025 A	Connector
43	L-2013-A	Assembled Magnet Arm, Complete With Bearings, Item 41 and 47
44	LT-1443	Set Screw
45		¼"-20 H.I. Nut, Std. I. Washer and Lk. Washer
46	LT-2038	Auxiliary Arm Pin
47	FP-24B12	Bearing, 2 req'd., Pressed Into Magnet Arm
48	L-1021	Spring Bracket
†49	L-2027	Contact Spring
50	LT-2028-A	Assembled Auxiliary Arm
51		5/16"-18x¾" H.I. Cap Screw and Lk. Washer
52		¼"-20x½" H.I. Cap Screw and Lk. Washer, 2 req'd.
●†53	A50005-008-02	Contact Tip
54		¼"-20x¾" Everdur Hex. Machine Bolt and Lk. Washer
55	L-2015-A	Assembled Core
56	L-1026	Core Cap
●†57	L-2011-AE	Coil, For 115 Volt Single Pole, Only
●†58	L-2010-AE	Coil, For 230 Volt Single Pole, Only
59		5/16"-18x¾" H.I. Cap Screw and Lk. Washer
●†60	A50005-008-02	Contact Tip
61	LT-2064	Blowout Ear Spacer
62	LT-2072	Stud, For Blowout Ear Spacer
63	LT-2265-A	Blowout Guard
64		8-32x¾" F.I. Machine Screw, (not shown) 2 req'd.
65		15/32"x7/32" Cup Washer, (not shown) 2 req'd.
66	LT-2036	Arc Shield, Right Hand
67	LT-2032	Arc Plate

MECHANICALLY-TIED CONTACTORS

Two or more single pole contactors, mounted on a single base, may be mechanically tied to operate as a multiple-pole contactor.

For this type contactor, the following parts are used.

Item No.	List No.	Description
12		Base, Advise Thickness And Number of Poles
68	L-1036	Tie Bar
69	L-1034	Tie Bar Spacer, As Required
70		¼"-20x¾" Hex. Stl. Slotted Hd. Machine Screw, Blk. Burr and Lk. Washer, 4 req'd.
71	L-2083-A	Assembled Magnet Arm
†72		Operating Coil, Advise Voltage And Number of Poles

† Essential Parts for General Maintenance

* Early production of contactors had blowout connector mounted on front of base as illustrated. Current production has blowout connector mounted on rear of base.

● Minor revision since previous issue.

NEMA SIZE 4 SINGLE POLE L LINE-ARC CONTACTOR, FOLIO 3A

MECHANICAL INTERLOCKS: These are horizontal bakelite bars, pivoted at the center. They are carefully ground at the factory to suit the contactors with which they are used. They must prevent the contacts of both contactors touching simultaneously but not interfere with the complete closure and seal of either contactor alone. CAUTION—The interlock should maintain one set of contacts open at least ⅜" when the other contacts just touch.

MAIN CONTACTS: These are made of pure copper by a special forging process to give high Brinell hardness throughout their entire thickness. These contacts close with a slight rolling action, there is no wiping action.

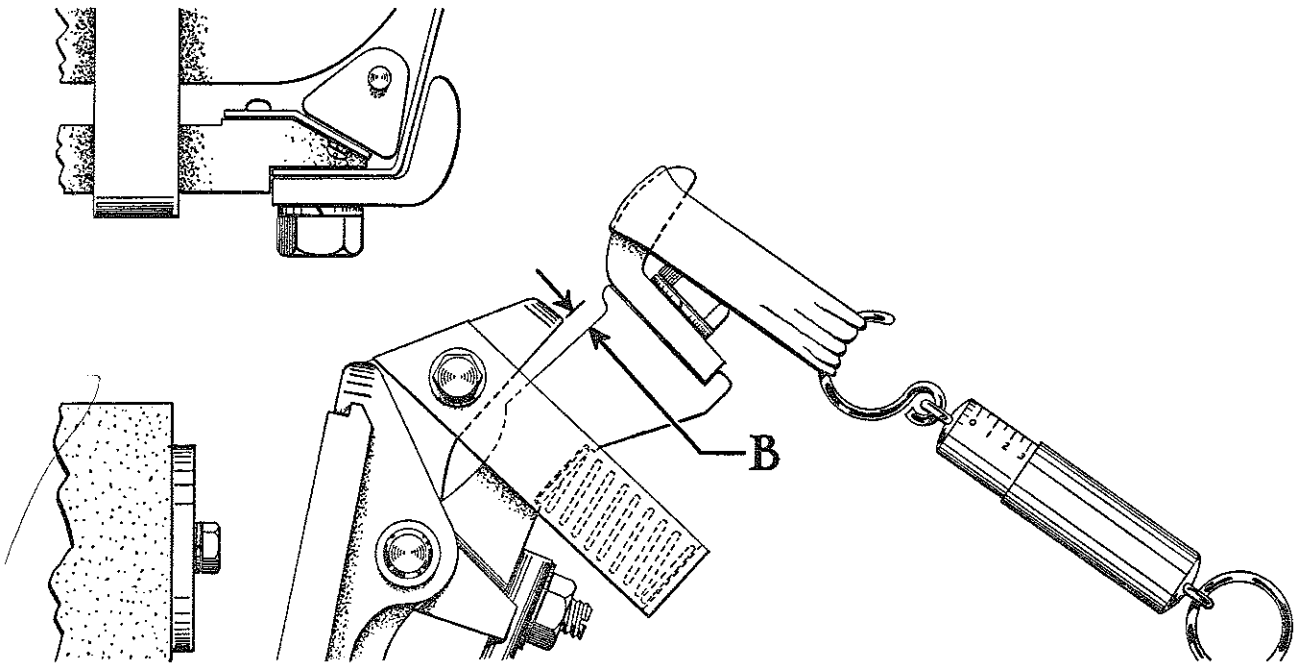
The stationary and moving contacts may wear unequally, depending upon polarity. It may not be necessary to change both contact tips when replacement is necessary. The best operation is obtained with positive connected to the stationary contact and negative to the moving contact. Wiring diagrams are so arranged by the Square D Company.

CONTACT WEAR ALLOWANCE: In the table at right is shown the correct dimension for auxiliary arm opening. Contact follow-up is necessary so that the contact pressure will be maintained as the contacts wear. The follow-up is the amount of opening between the moving contact auxiliary arm and its stop shown at "B" in the sketch below, WITH THE CONTACTOR FULLY CLOSED. Follow-up decreases with contact wear. When dimension "B" is reduced to 1/32", the contact tips must be replaced.

MAIN CONTACT PRESSURE: Type L contactors are designed with contact pressures as given in the table below. A slight arcing or spitting of the contacts when closing may be an indication that the contact tips or spring should be replaced.

To check spring pressures, a spring balance may be used with a tape on the hook passing around the contact tip at its point of contact and pulled at right angles to the auxiliary contact arm, as shown in the sketch below. Contact pressure is correct if the balance scale shows a pull as given in the following table with the arm just leaving its stop at "B".

OPENING WHEN NEW	
Opening at "B" with Contactor fully Closed	.220"
CONTACT PRESSURE IN POUNDS	
Surfaces at "B" just breaking (new or old)	3.0-3.5
Sealed, Contactor fully closed (when new)	5.0-5.5



SERVICE BULLETIN 7004-3

JUNE, 1968

NEMA SIZE 4 SINGLE POLE L LINE-ARC CONTACTOR
FRONT CONNECTED
FOLIO 3A
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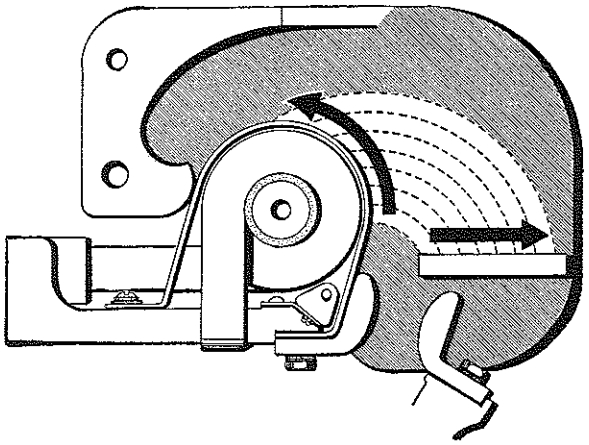
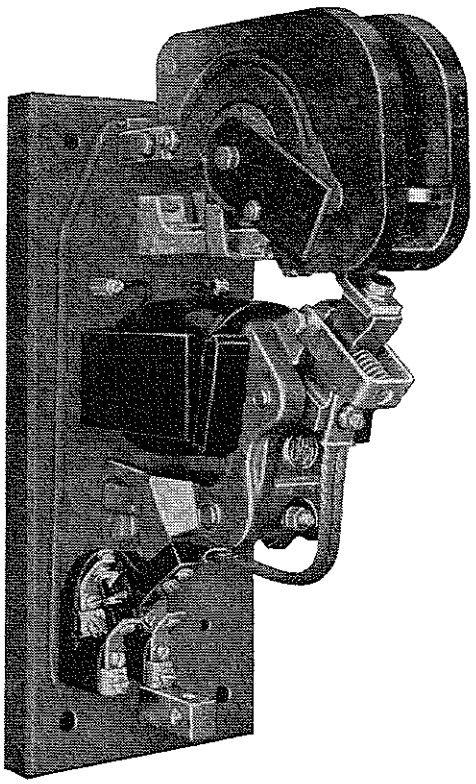
Contactor Size NEMA	Continuous Rating Amperes	Crane and Mill Rating Amperes	Rupturing Capacity Amperes
No. 4	150	200	1500

LINE-ARC: These contactors derive their name from the manner in which they handle the arc. The Line-Arc principle of controlling the arc is simple . . . and automatic. There is nothing to adjust or wear out. At the instant the contacts start to separate, the arc is automatically transferred from the contacts to the arcing plate and circular guard over the blowout coil. The arc, as it travels along the arcing plate and circular guard, is stretched out in a line centered between the arc shields. Hence—cool contacts and the name Line-Arc.





CAUTION—Before operating the contactor under load, be sure that the arc shield is lowered in its proper position.

INSTALLATION: Mount the contactors vertically on rigid supports with at least 3″ clearance above and in front of the arc shields to provide the proper distance for arcing clearance and also for removal of the arc shields. The life of the contactor will be considerably prolonged by installing it in a clean, dry place, preferably in a cabinet and as free as possible from external vibration or shock.

MAGNET AIR GAP: To insure quick release of the magnet arm, an air gap of .034″ minimum and .049″ maximum is provided between the magnet arm and the front ends of the U-shaped frame. See that the magnet faces are free from oil or sticky foreign material.

BEARINGS: Type L contactors are equipped with Nitralloy pins and oil-filled bearings. These bearings are self-lubricating and require no lubrication in the field.

OPERATING COILS: These contactors will operate satisfactorily on 80% of normal control voltage when the coils are hot and will hold in on 20% of normal voltage. The coils will stand 110% of normal voltage continuously.

Contactors for 115 and 230 volt service are supplied with continuous capacity coils. Contactors for 550 volt service are supplied with a 230 volt coil and suitable resistor mounted on the back of the base.

To remove the operating coil, first back out the magnet arm pin set-screw and remove the magnet arm pin. The magnet arm may then be lowered to remove the operating coil.

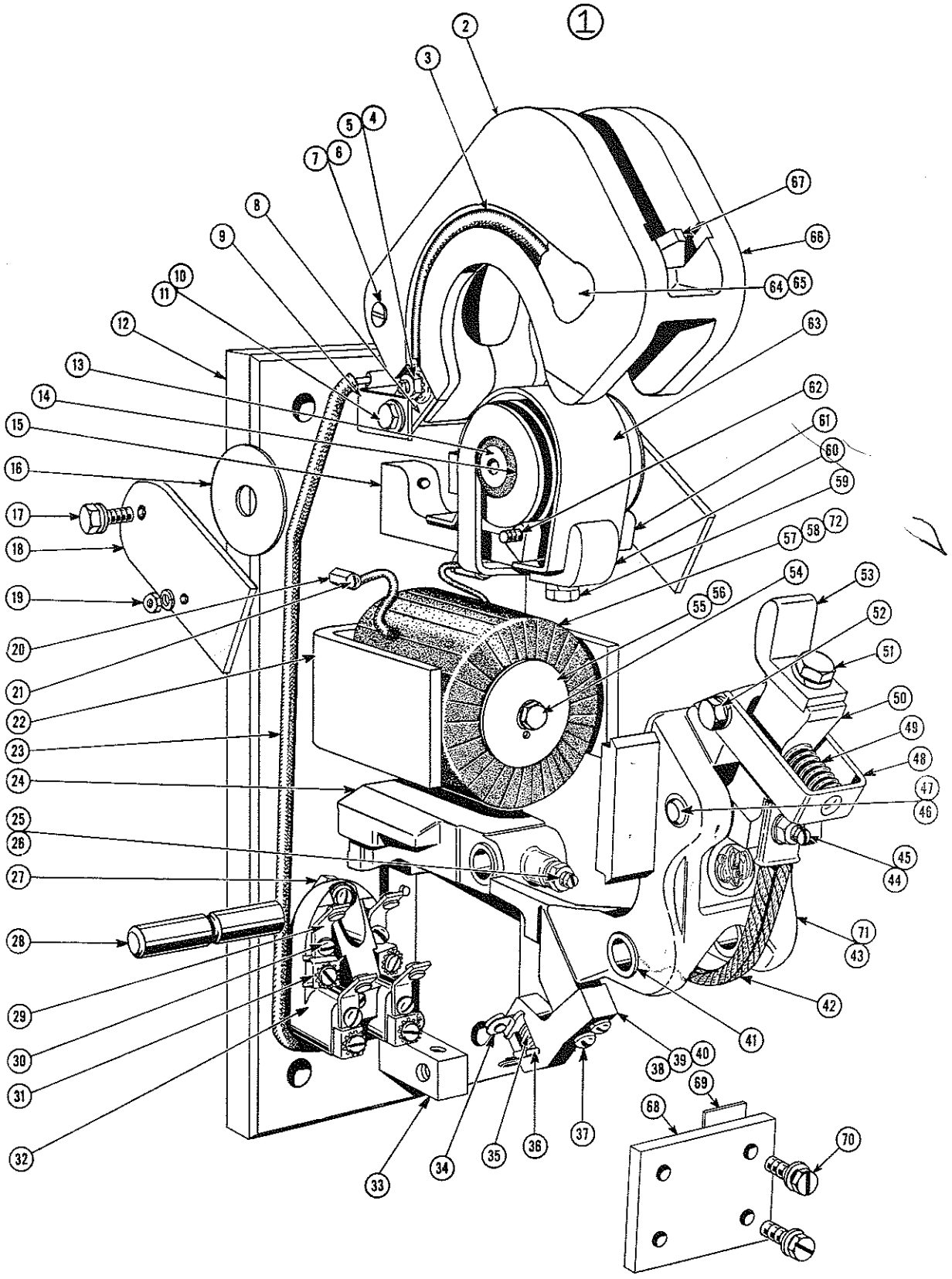
ELECTRICAL INTERLOCKS: These consist of stationary contacts mounted on the base and a moving contact attached to the bottom of the magnet arm. The moving contact should provide 1/8″ follow-up when the magnet arm reaches its limit of travel, either completely closed or completely opened. The rating of these electrical interlocks is as follows:

	Max. Inrush	Cont. Amps.	Rupturing Capacity Amps. Inductive			
			115 V.	250 V.	440 V.	550 V.
A.C.	30	15	10	10	5	5
D.C.	30	15	2.5	1.0	.4	.4

(Continued on Page 4)

Supersedes SB 7004-3 Dated 5-67

NEMA SIZE 4 SINGLE POLE L LINE-ARC CONTACTOR, FOLIO 3A



NEMA SIZE 4 SINGLE POLE L LINE-ARC CONTACTOR, FOLIO 3A

Item No.	List No.	Description
1	LT-2024-A	Assembled Arc Shield
2	~~LT-2035~~	~~Arc Shield, Left Hand~~ Not For Sale
3	~~LT-1081~~	Arc Plate Connector, 2 req'd. Not Sale
4		¼"-20x2¼" H.I. Cap Screw, Nut and Shake-Proof Lk. Washer
5	~~ZO-1150~~	Cup Washer
●6	~~28418-14400~~	Binding Nut. Not For Sale
●7	~~28298-14400~~	Binding Screw. Not For Sale
8	LT-1049	Arc Shield Hinge, 2 req'd.
9	LT-2050	Arc Shield Clip
10	~~B5-0502-804-01~~	Spring Washer, 2 req'd.
11		¼"-20x2¼" H.I. Cap Screw and H.I. Nut
12		Base, Advise Thickness And Number of Poles
13	LT-2039	Blowout Core
14	LT-2074	Insulator For Blowout Core
15	L-2730-A	Blowout Coil and Contact Bracket
16	LT-1075	Insulator For Blowout Ear, 2 req'd.
17		¼"-20x½" H.I. Cap Screw and Lk. Washer, 2 req'd.
18	LT-1052	Blowout Ear, 2 req'd.
19		10-24 H.I. Nut and Lk. Washer, 2 req'd.
20	~~L-1721~~	Coil Terminal Stud, 2 req'd.
21		10-24x⅜" R. Stl. Machine Screw
22	~~L-2018-A~~	Frame
*23	~~L-1705-A~~	Blowout Connector
24	LT-2029-A	Magnet Arm Bracket
25	~~LT-1443~~	Set Screw 21802-20360
26		¼" 20 H.I. Nut and Lk. Washer
27	~~EL-110~~	Stud
28	~~LT-2037~~	Magnet Arm Pin
†29	EL-109-A	Assembled Contact
30	21916-17120	10-32x⅜" R. Stl. Machine Screw and Lk. Washer
31	~~FP-28W1.10~~	Terminal
32	~~EL-100-A~~	Contact Block
33	~~L-1709~~	Terminal Bracket
†34	~~EL-84-A~~	Contact Bridge, ~~1 req'd. for Item 38, 2 req'd. for Item 39~~ 51075-023-50
†35	~~EL-49~~	Spring 50502-602-38
36	~~EL-87~~	Spring Retainer, 2 req'd. 51025-040-01
37		10-24x⅞" R. Stl. Machine Screw and Lk. Washer
38	~~EL-1-A~~	Control Circuit Arm, Complete, For Open Or 51075-022-50 Closed Control Circuit
39	~~EL-2-A~~	Control Circuit Arm, Complete, For Open And Closed Control Circuit
40	~~EL-47~~	Control Circuit Arm, Only
41	~~FP-24B13~~	Bearing, 2 req'd. Pressed 29005-32220
†42	LT-2025 A	Connector
43	L-2013-A	Assembled Magnet Arm, Complete With Bearings, Item 41 and 47
44	~~LT-1443~~	Set Screw 21802-20360
45		¼"-20 H.I. Nut, Std. I. Washer and Lk. Washer
46	~~LT-2038~~	Auxiliary Arm Pin
47	~~FP-24B12~~	Bearing, 2 req'd., Pres 29005-24161
48	L-1021	Spring Bracket
†49	L-2027	Contact Spring
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51		5/16"-18x¾" H.I. Cap Screw and Lk. Washer
52		¼"-20x½" H.I. Cap Screw and Lk. Washer, 2 req'd.
†53	~~A50005-005-02~~	Contact Tip 50005-120-02
54		¼"-20x¾" Everdur Hex. Machine Bolt and Lk. Washer
55	~~L-2015-A~~	Assembled Core
56	L-1026	Core Cap
†57	L-2011-AE	Coil, For 115 Volt Single Pole, Only
†58	L-2010-AE	Coil, For 230 Volt Single Pole, Only
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66	~~LT-2036~~	~~Arc Shield, Right Hand~~ NOT FOR SALE
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71	~~L-2083-A~~	Assembled Magnet Arm
†72		Operating Coil, Advise Voltage And Number of Poles

† Essential Parts for General Maintenance

* Early production of contactors had blowout connector mounted on front of base as illustrated. Current production has blowout connector mounted on rear of base.

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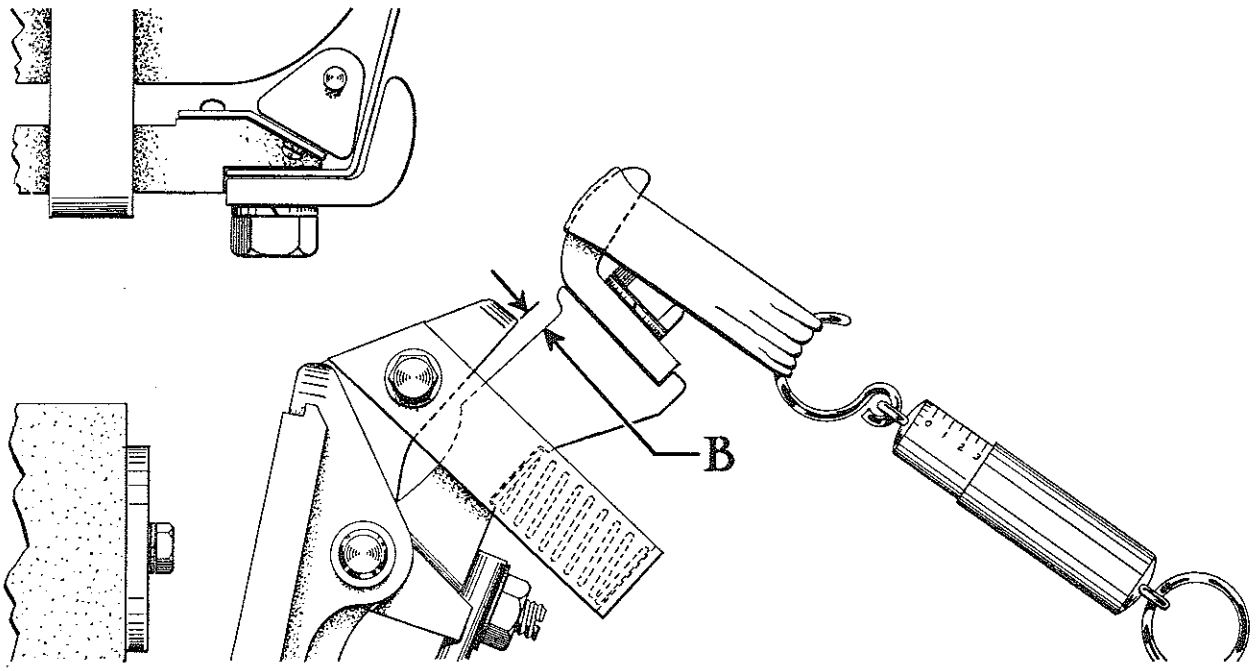
OPENING WHEN NEW	
Opening at "B" with Contactor fully Closed	.220"

CONTACT PRESSURE IN POUNDS	
Surfaces at "B" just breaking (new or old)	3.0-3.5
Sealed, Contactor fully closed (when new)	5.0-5.5



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