



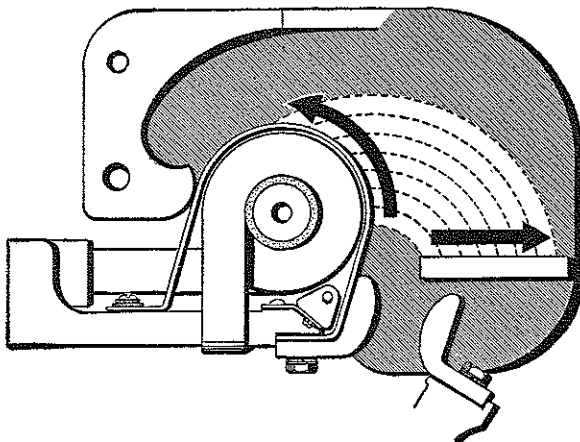
**NEMA SIZE 4 SINGLE POLE SPRING CLOSED L LINE-ARC CONTACTOR
FRONT CONNECTED
FOLIO 3A
FOR DC OPERATION**

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.

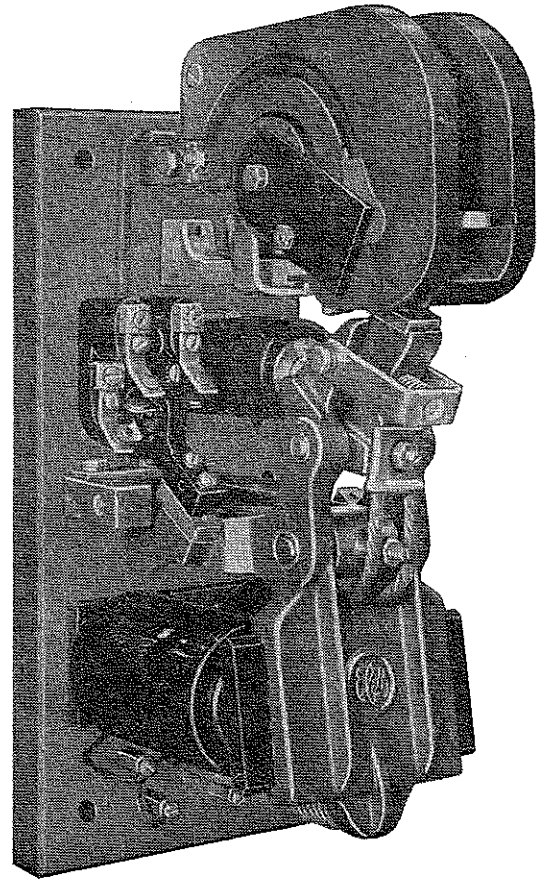


CAUTION—Before operating the contactor under load, be sure that the arc shield is lowered in its proper position.

INSTALLATION: Mount the contactors vertically on rigid supports with at least 3" clearance above and in front of the arc shield 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.

THE MAGNET CIRCUIT: To insure quick release of the magnet arm when the coils are de-energized, a non-magnetic spacer .016" thick is placed between the magnet cores and core caps. See that the magnet faces are free from oil or sticky foreign material. To insure snappy operation when the operating coils are energized, a retarding coil, located on the main arm stop bar, is connected across the control circuit supply. This holds the arm against the stop bar until the magnetic flux in the operating coils builds up sufficiently to pull it away with a quick action, which greatly prolongs the life of the contact tips.

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



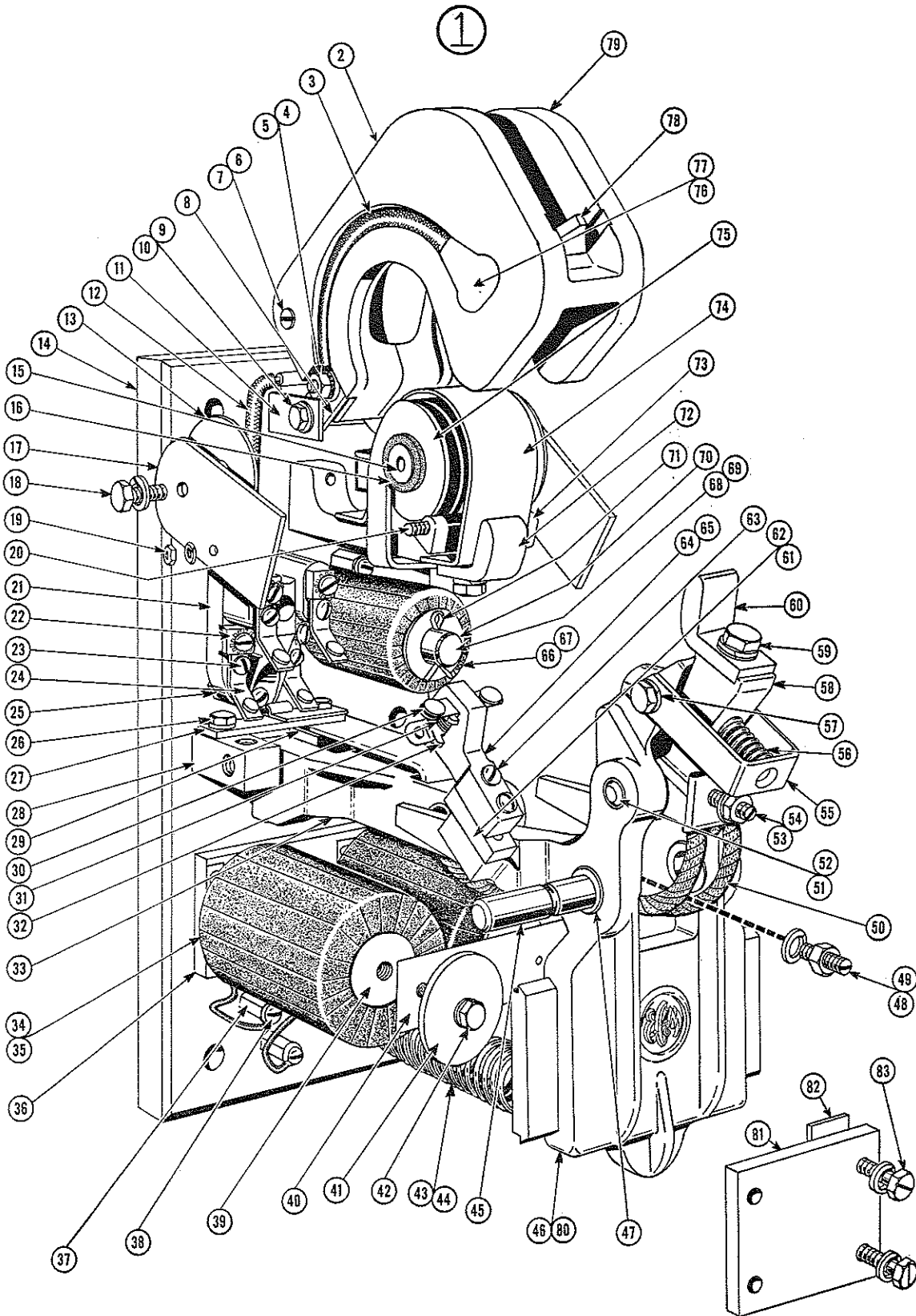
OPERATING COILS: These contactors will operate satisfactorily on 80% of normal control voltage when the coils are hot and will hold in on 20% of normal voltage. The coils will stand 110% of normal voltage continuously.

Each contactor has a horseshoe type magnetic circuit using two duplicate magnet coils. Contactors for 115 volt and 230 volt service are supplied with half-voltage coils connected in series. Contactors for 550 volt service are supplied with 230 volt coils and suitable resistor mounted on the back of the base.

To remove the operating coils, first disengage the operating spring. Next remove the connector from the auxiliary arm by backing off the set-screw nut. Then back out the magnet arm pin set screw and remove the magnet arm pin. The magnet arm may then be removed for access to the coils. When replacing coils, be sure to replace the non-magnetic spacer under the core caps.

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Item No.	List No.	Description	Item No.	List No.	Description
✓ 1	LT-2024-A	Assembled Arc Shield.....	42		¼"-20x¾" Everdur Hex. Machine Bolt and Lk. Washer.....
2	LT-2035	Arc Shield, Left Hand <i>NOT FOR SALE</i>	†43	L-2103	Operating Spring.....
3	LT-1081	Arc Plate Connector, 2 req'd. <i>NO SALE</i>	44	L-1106	Operating Spring Holder, (not shown).....
4		¼"-20x2¼" H.I. Cap Screw, Nut and Shake-proof Lk. Washer.....	45	LT-2037	Magnet Pin.....
5	ZO-1150	Cup Washer.....	46	L-2102-AS	Assembled Magnet Arm, Complete with Bearings Item 47 and 52.....
6	FP-23A-13	Binding Nut. <i>NOT FOR SALE</i>	✓47	FP-24B13	Bearing, 2 req'd. Presc <i>29005-32220</i>
7	FP-23A36	Binding Screw. <i>NOT FOR SALE</i>	✓48	LT-1443	Set Screw. <i>21802-20360</i>
✓8	LT-1049	Arc Shield Hinge, 2 req'd.....	49		¼"-20 H.I. Nut and Lk. Washer.....
⊙9	B5052-004-01	Spring Washer, 2 req'd.....	†50	L-2111-A	Assembled Connector.....
10		¼"-20x2¼" H.I. Cap Screw and H.I. Nut.....	51	LT-2038	Auxiliary Arm Pin.....
✓11	LT-2050	Arc Shield Clip.....	✓52	FP-24B12	Bearing, 2 req'd. Presc <i>29005-24161</i>
⊙12	L-1755-A	Blowout Connector.....	✓53	LT-1443	Set Screw. <i>21802-20360</i>
✓13	LT-1075	Insulator For Blowout Ear, 2 req'd.....	54		¼"-20 H.I. Nut, Std. I. Washer and Lk. Washer
14		Base, Advise Thickness and Number of Poles.....	55	L-1021	Spring Bracket.....
✓15	LT-2039	Blowout Core.....	†56	L-2027	Contact Spring.....
✓16	LT-2074	Insulator For Blowout Core.....	57		¼"-20x½" H.I. Cap Screw and Lk. Washer.....
✓17	LT-1052	Blowout Ear, 2 req'd.....	✓58	LT-2028-A	Auxiliary Arm.....
18		¼"-20x½" H.I. Cap Screw and Lk. Washer, 2 req'd.....	59		⅝"-18x¾" H.I. Cap Screw and Lk. Washer.....
19		10-24 H.I. Nut and Lk. Washer, 2 req'd.....	⊙60	AS0005-007-02	Contact Tip. <i>50005-120-02</i>
20	LT-2072	Stud, For Blowout Ear Spacer.....	61	EL-134	Spacer, Left Hand.....
21	EL-100-A	Contact Block.....	62	EL-133	Spacer, (not shown) Right Hand.....
22	FP-20HT-10	Terminal.....	63		10-24x½" R. Stl. Machine Screw and Lk. Washer.....
23	<i>21916-17120</i>	10-32x¾" R. Stl. Machine Screw and Lk. Washer.....	64	EL-1-A	Control Circuit Arm, Complete, For Open or Closed Control Circuit.....
✓†24	EL-109-A	Assembled Contact.....		<i>51075-022-50</i>	
25	EL-118	Stud.....		EL-2-A	Control Circuit Arm, Complete, For Open and Closed Control Circuit.....
26		¼"-20x¾" Hex. Stl. Cap Screw, Std. Washer and Lk. Washer.....		EL-47	Control Circuit Arm, Only.....
27	L-1752	Bus Bar.....	†66	L-1114-A	Retarding Coil, For 115 Volt.....
28	L-1763-A	Main Terminal Stud, Left Hand.....	✓†67	L-1113-A	Retarding Coil, For 230 Volt.....
29	L-1757-A	Main Terminal Stud, Right Hand.....	68	L-2108	Stop Bar.....
✓†30	EL-84-A	Contact Bridge, 1 req'd. for Item 64, 2 req'd. for Item 65. <i>51075-023-50</i>	69	DEM-67	Spring, For Retarding Coil, (not shown).....
✓†31	EL-49	Spring. <i>50502-602-38</i>	70	L-1119	Washer, 2 req'd., 1 Used Behind Coil (not shown).....
✓32	EL-87	Spring Retainer, 2 req'd. <i>51075-040-01</i>	71		⅛"x1" Cotter Pin.....
33	L-2104-A	Magnet Arm Bracket.....	⊙†72	AS0005-007-02	Contact Tip. <i>50005-120-02</i>
✓⊙†34	L-2117-AE	Coil, 115 Volt, 2 req'd., (57.5V Coils in series)	✓73	LT-2064	Blowout Ear Spacer.....
✓⊙†35	L-2116-AE	Coil, 230 Volt, 2 req'd., (115 V Coils in series)	✓74	LT-2265-A	Blowout Guard.....
36	L-3018-A	Assembled Core Plate.....	✓75	L-2730-A	Assembled Blowout Coil and Contact Bracket..
37	L-1754	Coil Terminal Stud, 6 req'd.....	76		8-32x¾" F.I. Machine Screw, (not shown) 2 req'd.....
38		10-24x¾" R. Stl. Machine Screw.....	77		1½"x½" Cup Washer, (not shown) 2 req'd.....
39	L-3015-A	Assembled Core, 2 req'd.....	78	LT-2032	Arc Plate.....
40	L-3029	Non-Magnetic Spacer.....	79	LT-2036	Arc Shield, Right Hand <i>NOT FOR SALE</i>
✓41	L-1026	Core Cap, 2 req'd.....			

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
14		Base, Advise Thickness and Number of Poles....
†34		Operating Coil, Advise Voltage and Number of Poles.....
†66		Retarding Coil, Advise Voltage and Number of Poles.....
80	L-2190-AS	Assembled Magnet Arm, Complete with Bearings item 47 and 52.....
81	L-4148	Tie Bar.....
82	L-3034	Tie Bar Spacer, As Required.....
83		¼"-20x¾" Hex. Stl. Slotted Cap Screw, Bk. Burr and Lk. Washer, 4 req'd.....

† Essential Parts for General Maintenance

⊙ Minor revision since previous issue.

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

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

ELECTRICAL INTERLOCKS: These consist of stationary contacts mounted on the base and a moving contact attached to the magnet arm. The moving contact should provide $\frac{1}{8}$ " 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

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 $\frac{3}{8}$ " when 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 connection to the stationary contacts and negative to the moving contacts. 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 CONTACTS FULLY CLOSED.** Follow-up decreases with contact wear. When dimension "B" is reduced to $\frac{1}{2}$ ", 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.....	.312"
CONTACT PRESSURE IN POUNDS	
Surfaces at "B" just breaking (new or old).....	2.25-2.75
Sealed, Contactor fully closed (when new).....	5.25-5.75

