



JANUARY, 1968

NEMA SIZE 4 SINGLE POLE SPRING CLOSED L LINE-ARC CONTACTOR

FOLIO 3

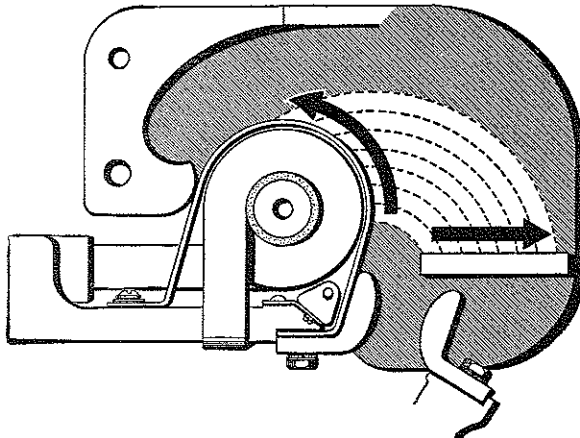
FOR DC OPERATION

INSTRUCTIONS

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

Contactors 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.

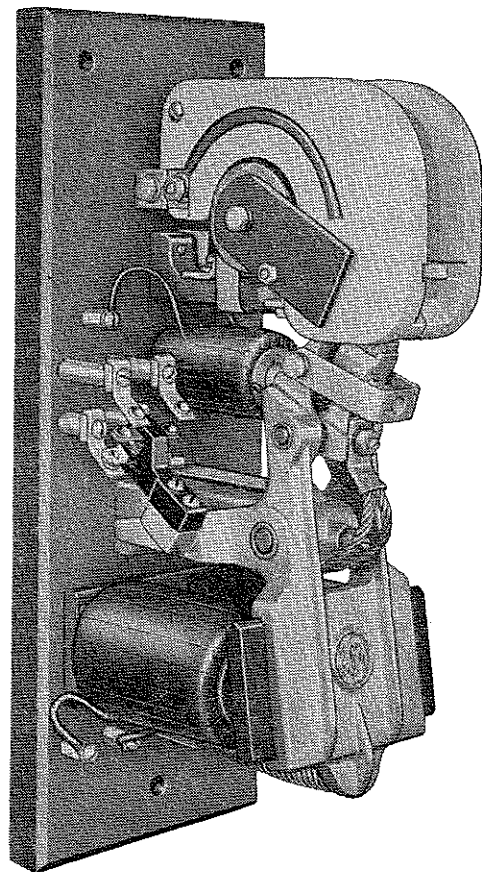


CAUTION — Before operating the contactor under load, be sure that the arc shield is lowered in its proper position.

INSTALLATION: Mount the contactors vertically on rigid supports with at least 3" clearance above and in front of the arc 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 Nitralloy pins and oil-filled bearings. These bearings are self-lubricating and require no lubrication in the field.



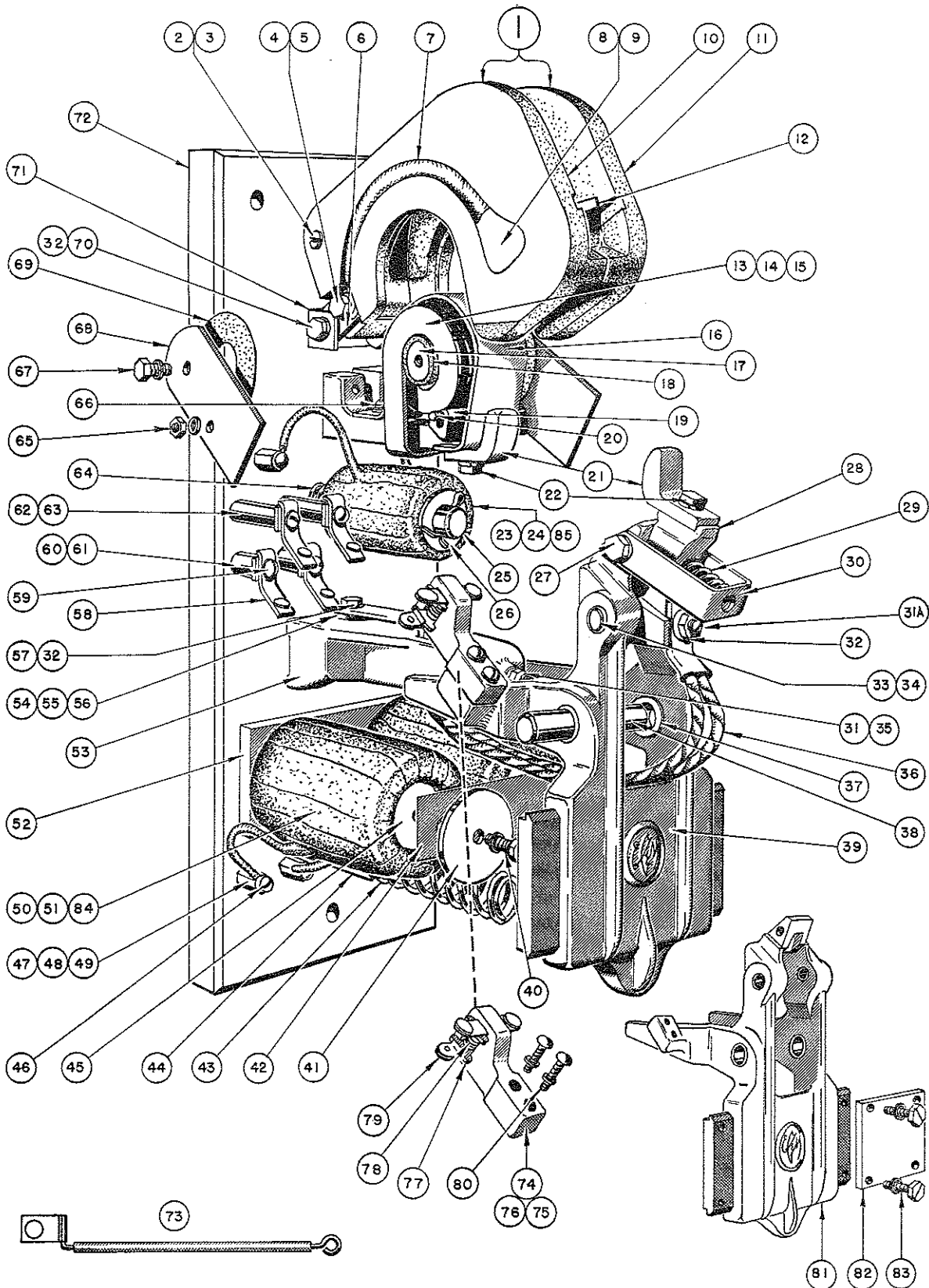
OPERATING COILS: These contactors will operate satisfactorily on 80% of normal control voltage when the coils are hot and will hold in on 20% of normal voltage. The coils will stand 110% of normal voltage continuously.

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.

(Continued on Page 4)

NEMA SIZE 4 SINGLE POLE SPRING CLOSED 1 LINE-ARC CONTACTOR, FOLIO 3



ADVISE NAMEPLATE MARKING WHEN ORDERING PARTS

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

NOTE: Indented items are component parts of item immediately preceding.

Item No.	List No.	Description	Item No.	List No.	Description
1	LT-2024-A	Assembled Arc Shield, Complete	42	L-3029	Non-magnetic Spacer
2	22999-14400	Binding Screw	43	L-2105	Operating Spring
3	29418-14400	Binding Nut	44	L-1106	Operating Spring Holder
4		1/4"-20x2 1/4" H.I. Cap Screw, Nut & Shake-proof Lk. Washer	45	L-3015-A	Core, 2 req'd.
5	ZO-1150	Cup Washer, 2 req'd.	46		10-24x3/8" R.I. Mch. Screw
6	LT-1049	Arc Shield Hinge, 2 req'd.	47	LTZ-1809	Coil Terminal Stud, for 1" Base, 6 req'd.
7	LT-1081	Arc Plate Connector, 2 req'd.	48	LTZ-1810	Coil Terminal Stud, for 1 1/4"-1 1/2" Base, 6 req'd.
8		8-32x3/4" F.I. Mch. Screw, 2 req'd.	49	LTZ-1811	Coil Terminal Stud, for 2" Base, 6 req'd.
9	ZO-1121	Cup Washer, 2 req'd.	50	L-2116-AE	Coil, 230 Volt, Single Pole only, (115 V Coils in series)
10	LT-2035	Arc Shield, left hand	51	L-2117-AE	Coil, 115 Volt, Single Pole only, (57.5 V Coils in series)
11	LT-2036	Arc Shield, right hand	52	L-3018-A	Core Plate
12	LT-2032	Arc Plate	53	L-2104-A	Magnet Arm Bracket
13	LT-2656-AB	Blowout Coil & Contact Bracket, for 1" Base	54	LT-2044-A	Main Terminal Stud, for 1" Base
14	LT-2657-AB	Blowout Coil & Contact Bracket, for 1 1/4"-1 1/2" Base	55	LT-2045-A	Main Terminal Stud, for 1 1/4"-1 1/2" Base
15	LT-2658-AB	Blowout Coil & Contact Bracket, for 2" Base	56	LT-2646-A	Main Terminal Stud, for 2" Base
16	LT-2265-A	Blowout Guard	57		1/4"-20x3/4" H.I. Cap Screw
17	LT-2039	Blowout Core	58	EL-6-A	Contact, 2 req'd. for Open or Closed, 4 req'd. for Open and Closed
18	LT-2074	Insulator, for Blowout Core	59		10-24x1/2" R.I. Mch. Screw & Lk. Washer
19	LT-2064	Blowout Ear Spacer	60	EL-19	Stud, for 1"-1 1/4" Base
20	LT-2072	Stud, for Blowout Ear Spacer	61	EL-20	Stud, for 1 1/2"-2" Base
21	A39995-908-02	Contact Tip, 2 req'd.	62	EL-29	Stud, for 1"-1 1/4" Base
22		5/16"-18x3/4" H.I. Cap Screw & Lk. Washer, 2 req'd.	63	EL-30	Stud, for 1 1/2"-2" Base
23	L-1113-A	Retarding Coil, for 230 Volt, Single Pole only	64	DLM-67	Spring, 2 req'd.
24	L-1114-A	Retarding Coil, for 115 Volt, Single Pole only	65		10-24 H.I. Nut & Lk. Washer, 2 req'd.
25	L-2108	Stop Bar	66		5/16"-18x3/4" R.I. Mch. Screw Lk. Washer with 1 1/2"x3/8" #18 Ga. Sp. St. Washer
26	L-1119	Washer, for Retarding Coil, 2 req'd., (one at rear of coil not shown)	67		1/4"-20x1/2" H.I. Cap Screw & Lk. Washer, 2 req'd.
27		1/4"-20x1/2" H.I. Cap Screw and Lk. Washer, 2 req'd.	68	LT-1052	Blowout Ear, 2 req'd.
28	LT-2028-A	Auxiliary Arm, Complete	69	LT-1075	Insulator, for Blowout Ear, 2 req'd.
29	L-2027	Contact Spring	70		1/4"-20x2 1/4" H.I. Cap Screw with 2 Nuts
30	L-1021	Spring Bracket	71	LT-2050	Arc Shield Clip
31	LT-1443	Set Screw & 1/4"-20 H.I. Nut	72		Base, specify thickness & number of poles
32		1/4" Std. l. Washer	73	L-2109-A	Blowout Connector
33	LT-2038	Auxiliary Arm Pin	74	EL-1-A	Control Circuit Arm, for Open or Closed Control Circuit
34	FP-24B12	Oilite Bearing, 2 req'd., per Magnet Arm	75	EL-2-A	Control Circuit Arm, for Open and Closed Control Circuit
35	LT-1443	Set Screw, 1/4"-20 H.I. Nut & Lk. Washer	76	EL-47	Control Circuit Arm, only
36	L-2111-A	Connector	77	EL-87	Spring Retainer
37	FP-24B13	Oilite Bearing, 2 req'd. per Magnet Arm	78	EL-49	Spring
38	LT-2037	Magnet Arm Pin	79	EL-84-A	Contact Bridge, 1 req'd. for Item 74,, 2 for Item 75
39	L-2102A	Magnet Arm, Complete with Bearings, Item 34 & 37	80		10-24x1" R.I. Mch. Screw & Lk. Washer, 2 req'd.
40		1/4"-20x3/4" Bronze Hex Cap Screw & Lk Washer, 2 req'd.			
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
72		Base, Specify thickness and number of poles...
81	L-2190-A	Magnet Arm
82	L-3036	Tie Bar
83		1/4"-20x3/4" H.I. Slotted Cap Screw, Blk. Burr & Lk. Washer
84		Coil, furnish Voltage and number of Poles
85		Retarding Coil, furnish Voltage and Number of Poles

⊙ These are new parts used on Folio 3 Contactors and are not interchangeable with parts of previous design contactors. All other parts are interchangeable.

† Essential Parts for General Maintenance

⊙ Minor revision since previous issue

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

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 connected to the stationary contacts and negative to the moving contacts. Wiring diagrams are so arranged by the Square D Company.

MAIN CONTACT OPENING: In the table at right is shown the correct dimension for contact 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 $\frac{1}{32}$ ", 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.....	.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

