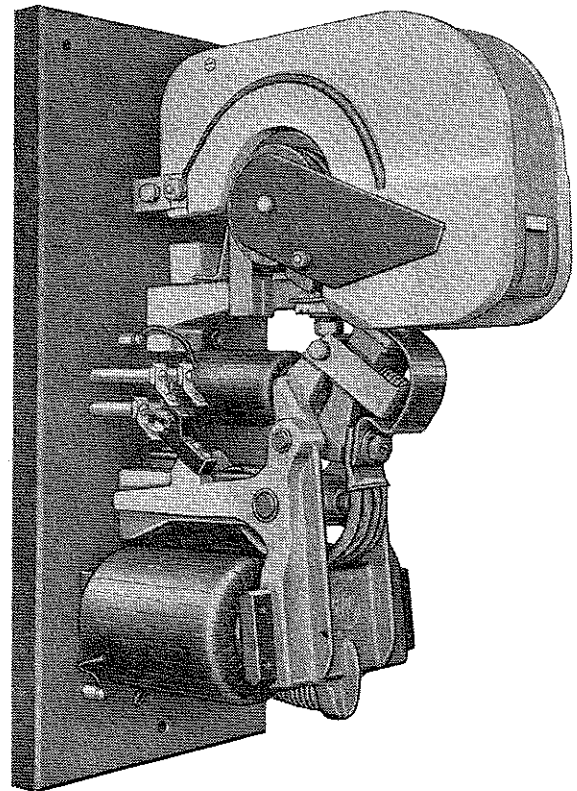
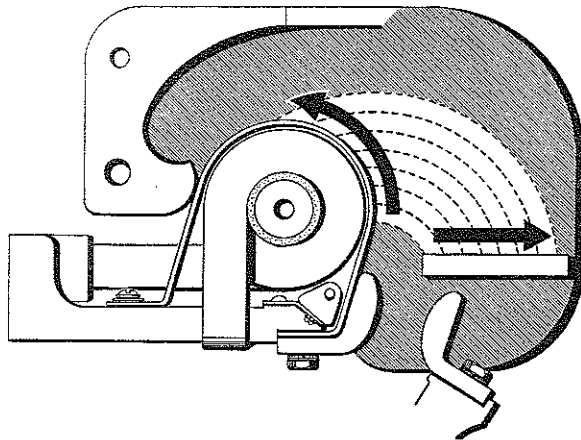
**No. 4 & 4A SINGLE POLE SPRING CLOSED L LINE-ARC CONTACTOR****FOLIO 3
FOR DC OPERATION****INSTRUCTIONS**

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

Contactor Size		Continuous Rating Amperes	Crane and Mill Rating Amperes	Rupturing Capacity Amperes
NEMA	EC&M			
No. 6	No. 4	600	800	6000
	No. 4A	800	1065	8000

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.

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 Oilite bearings. These bearings are self-lubricating and require no lubrication in the field.

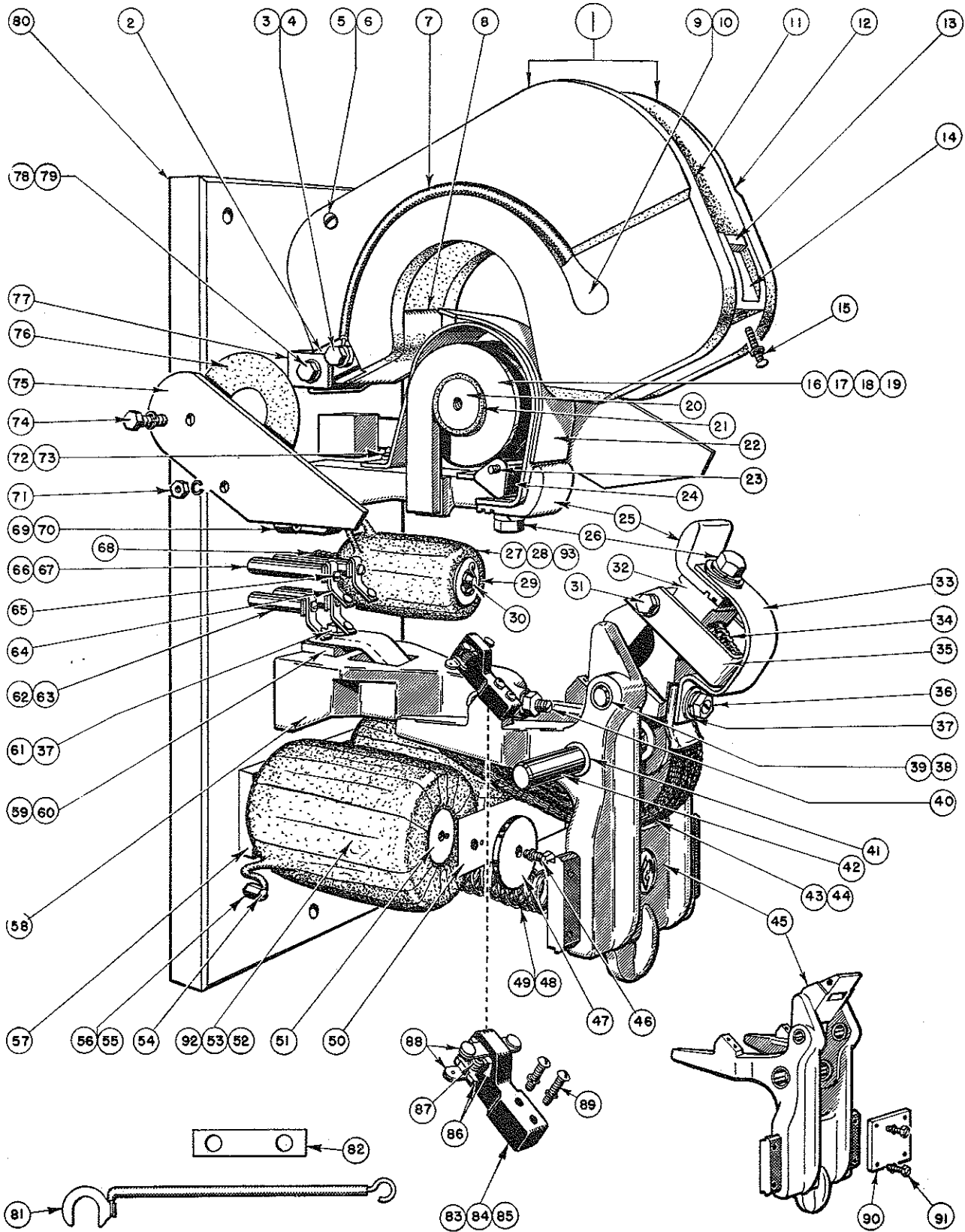
OPERATING COILS: These contactors will operate satisfactorily on 80% of normal control voltage when the coils are hot and will hold in on 20% of normal voltage. The coils will stand 110% of normal voltage continuously.

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)

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No. 4 & 4A 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-4708-A	Arc Shield, Complete	†44	⊙ L-4121-A	Connector, for No. 4A
2	LT-4734	Hinge	45	⊙ L-4102-A	Magnet Arm, Complete with Bearings, Item 39 & 41
3		5/16"x3 1/2" H.I. Cap Screw, Nut & Washers	46		1/4"-20x3/4" Bronze Hex. Mch. Bolt & Lk. Washer, 2 req'd.
4		#1118 Shakeproof Lk. Washer	47	LT-4067	Core Cap, 2 req'd.
⊙ 5	22990-14400	Binding Screw	†48	⊙ L-4105	Operating Spring
⊙ 6	29418-14680	Binding Nut	49	⊙ L-4106	Operating Spring Holder
7	LT-4778	Arc Plate Connector, 2 req'd.	50	LT-4824	Non-magnetic Spacer
8	LT-4745	Arc Shield Spacer	⊙ 51	⊙ L-4132-A	Core, 2 req'd.
9		1/4"-20x1 1/2" F.I. Screw, (not shown) 2 req'd.	†52	LT-4804-AE	Coil, 230 Volt, Single Pole only, 2 req'd., (115 V Coils in series)
10	ZO-1150	Cup Washer, (not shown) 2 req'd.	†53	LT-4805-AE	Coil, 115 Volt, Single Pole only, 2 req'd., (57.5 V Coils in series)
11	LT-4741	Arc Shield, left hand	54		10-24x3/8" R.I. Mch. Screw, 6 req'd.
12	LT-4742	Arc Shield, right hand	55	LTZ-1811	Coil Terminal Stud, for 1 1/4"-1 1/2" Base
13	LT-4720-A	Arc Plate	56	⊙ L-4128	Coil Terminal Stud, for 2" Base
14	LT-4744	Arc Block	57	LT-4814-A	Magnet Frame
15		1/4"-20x1 1/2" R.B. Mch. Screw & #1214 Lk. Washer	58	⊙ L-4104-A	Magnet Arm Bracket
16	LT-4709-A	Blowout Coil & Contact Bracket (No. 4) for 1 1/4"-1 1/2" Base	59	LT-4677-A	Main Terminal Stud, for 1 1/4"-1 1/2" Base
17	LT-4710-A	Blowout Coil & Contact Bracket (No. 4) for 2" Base	60	LT-4628-A	Main Terminal Stud, for 2" Base
18	LT-4711-A	Blowout Coil & Contact Bracket (No. 4-A) for 1 1/4"-1 1/2" Base	61		3/8"-16x1 1/4" H.I. Cap Screw & Lk. Washer Stud, for 1 1/4" Base
19	LT-4712-A	Blowout Coil & Contact Bracket (No. 4-A) for 2" Base	62	⊙ EL-27	Stud, for 1 1/2"-2" Base
20	LT-4757	Blowout Core	63	⊙ EL-28	Stud, for 1 1/2"-2" Base
21	LT-4749	Insulator	†64	⊙ EL-6-A	Contact, 2 req'd. for Open or Closed Control Circuit, 4 req'd. for Open and Closed Control Circuit
22	LT-4732-A	Blowout Guard	65		10-24x1/2" R.I. Mch. Screw & Lk. Washer
23	LT-4748	Stud, for Blowout Ear Spacer	66	⊙ EL-33	Stud, for 1 1/4" Base
24	LT-4743	Blowout Ear Spacer	67	⊙ EL-34	Stud, for 1 1/2"-2" Base
†25	A59905-917-01	Contact Tip	68	⊙ L-3120	Spring, for Retarding Coil
26		1/2"-13x1" H.I. Cap Screw, Washer & Lk. Washer, 2 req'd. NOTE: Std Washer under moving Contact Tip Screw superseded by L-4010 Sq. Washer.	69	LTZ-1810	Retarding Coil Stud for 1 1/4" Base
†27	⊙ L-4113-AE	Retarding Coil, for 230 Volt, Single Pole only	70	LTZ-1811	Retarding Coil Stud, for 1 1/2"-2" Base
†28	⊙ L-4114-AE	Retarding Coil, for 115 Volt, Single Pole only	71		1/4"-20 H.I. Jam Nut & Lk. Washer, for Blowout Ear Spacer Stud, 2 req'd.
⊙ 29	⊙ L-3119	Washer, for Retarding Coil, (one at rear not shown) 2 req'd.	72		3/8"-16x1" R.I. Mch. Screw & Lk. Washer
30	⊙ L-4108	Stop Bar	73	LT-1068	Washer
31		5/16"-18x3/4" H.I. Cap Screw & Lk. Washer, 2 req'd.	74		1/4"-20x1 1/2" H.I. Cap Screw & Lk. Washer, 2 req'd.
32	LT-4716-A	Auxiliary Arm, complete	75	LT-4738	Blowout Ear, 2 req'd.
33	LT-4727	Auxiliary Arm Guard	76	LT-4750	Insulator, 2 req'd.
†34	LT-4755	Contact Spring	77	LT-4733	Arc Shield Clip
35	LT-4737	Spring Bracket	78		5/16"-18x3 1/2" H.I. Cap Screw with 2 Nuts
36	LT-3092	Set Screw, Jam Nut & Lk. Washer	79	B50502-004-02	Spring Washer, 2 req'd.
37	L-4011	Square Washer replaces 3/8" Std. Washer	80	⊙	Base, specify thickness and number of Poles
38	LT-4777	Auxiliary Arm Pin	81	⊙ L-4109-A	Blowout Connector
39	FP-24B14	Oilite Bearing, 2 req'd., pressed into Magnet Arm	82	LT-4754	Connector
40	LT-3093	Set Screw, Jam Nut & Lk. Washer	83	⊙ EL-1-A	Control Circuit Arm, Complete, for Open or Closed Control Circuit
41	FP-24B16	Oilite Bearing, 2 req'd., pressed into Magnet Arm	84	⊙ EL-2-A	Control Circuit Arm, Complete, for Open and Closed Control Circuit
42	LT-4037	Magnet Arm Pin	85	⊙ EL-3	Control Circuit Arm, only
†43	⊙ L-4111-A	Connector, for No. 4	†86	⊙ EL-87	Spring Retainer, 2 req'd.
			†87	⊙ EL-49	Spring
			88	⊙ EL-84-A	Contact Bridge, 1 req'd. for Item 83 2 for Item 84
			89		10-24x1" R.I. Mch. Screw & Lk. Washer, 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
80	⊙	Base, specify thickness and number of Poles
90	⊙ L-4148	Tie Bar
91	⊙	1/4"-20x3/4" H.I. Mch. Screw Slotted, Blk. Burr & Lk. Washer, 4 req'd.
†92	⊙	Coil, specify Voltage and number of Poles
†93	⊙	Retarding coil, specify 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.

⊙ Not used with encapsulated coils, which can be identified by AE suffix on List No.

● Minor revision since previous issue.

No. 4 & 4A 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 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 contacts and negative to the moving contacts. Wiring diagrams are so arranged by the H. I. Division.

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 advanced or replaced. Contacts are grooved for advancing movable contact to compensate for wear.

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 spring should be replaced or contact tips advanced or 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)	11.5-13.5
Sealed, Contacts fully closed (when new).....	18-20

