



**Type LAL and MAL — 400 and 1000 Ampere Frame Circuit Breakers
Used in Classes 8539 and 8739 Type SH, Size 6 and Class 8539 Type SJ, Size 7
— 3 Pole AC Combination Starters**

WARNING: Hazard of electrical shock or burn. Be sure to turn off power supplying this equipment before working on it.

Type LAL Circuit Breakers — 400 Ampere Frame

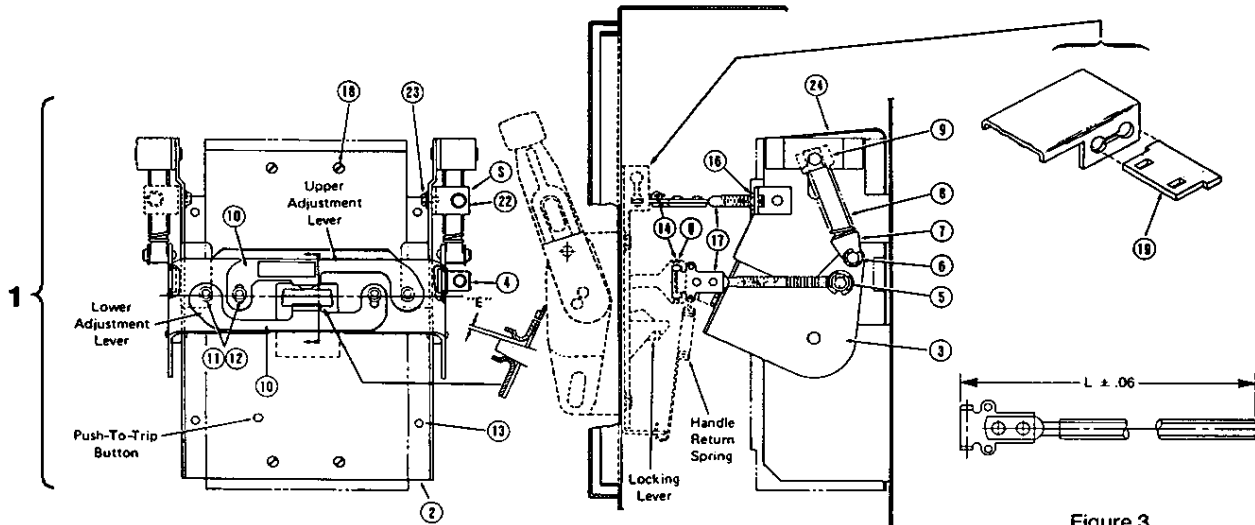


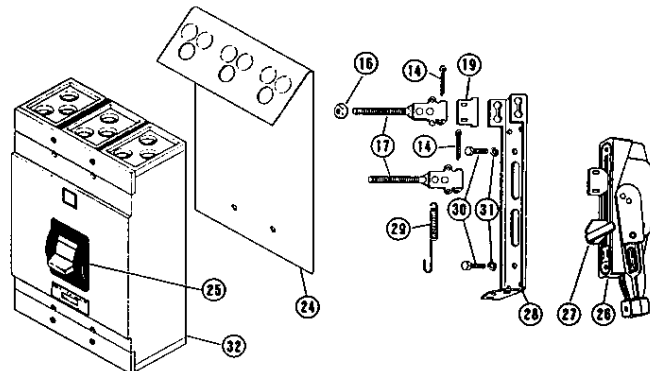
Figure 1

Figure 2

Figure 3
Operating Rod and
Stiffener Rod

REPLACEMENT PARTS LIST

Item	Description	Part Number	Qty
1	Operating Mechanism Complete (includes items 2 thru 25)	Class 9422 Type RR-1	1
2	Mounting Frame Assembly	31004-291-50	1
3	Bail Arm Assembly	31004-294-50	1
4	Drive Pin	31004-296-01	1
5	"E" Ring 5/8"	29907-04010	1
6	"E" Ring 3/4"	29907-02410	4
7	Spring Guide	31004-237-01	2
8	Operating Spring	163480	2
9	Spring Seat	31004-241-01	2
10	Adjustment Lever	31004-354-01	2
11	Screw 1/4-20 x 1/2 (Allen Head)	21601-20160	4
12	Washer 1/4"	23601-00200	4
13	Screw 1/4-20 x 1/2	21916-20160	4
14	Cotter Pin 1/8 x 1 1/4	24201-08400	2
16	Nut 3/8-16	23002-00240	1
17	Rod Assembly	31055-162-50	2
18	Screw Assembly # 12-24 x 3 1/4	21922-18741	4
19	Stiffener Coupler	31055-168-01	1
22	Mechanism Stiffener Bracket	31004-298-01	1
23	Screw Assembly 1/4-20 x 3/8	21926-20120	1
24	Line Terminal Cover	30002-032-03	1
25	ON-OFF MASK	30009-359-03	1
26	Operating Handle Complete for Nema 1, 3R, 4 (Painted), 12 Enclosures (includes items 27 thru 31)	Class 9422 Type A-1	1
26	Operating Handle Complete for Nema 4 Stainless Steel Enclosures (includes items 27 thru 31)	Class 9422 Type A-2	1
27	Locking Lever	31008-467-01	1
28	Handle Stiffener Bracket	31008-470-01	1
29	Handle Return Spring	30017-143-01	1
30	Hex Head Cap Screw 1/4-20 x 3/8	21401-20200	2
31	Lock Washer 1/4"	23701-00200	2
32	Circuit Breaker	See Tables 2 & 3	1



ORDERING INSTRUCTIONS — See Page 3

Supersedes 317AS dated September, 1980

SQUARE D COMPANY



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Type MAL — 1000 Ampere Frame Circuit Breakers

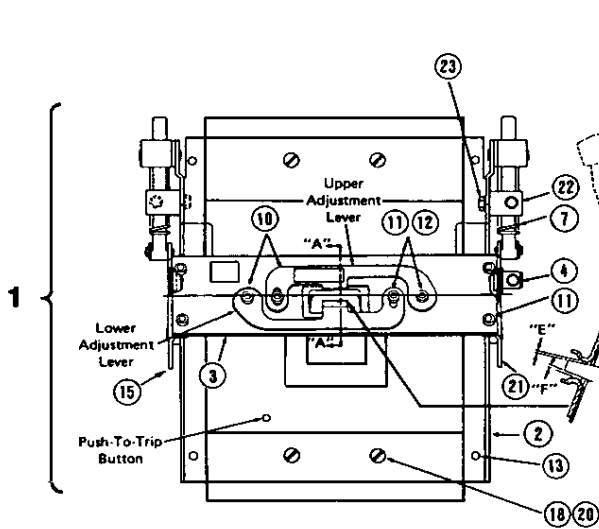


Figure 1

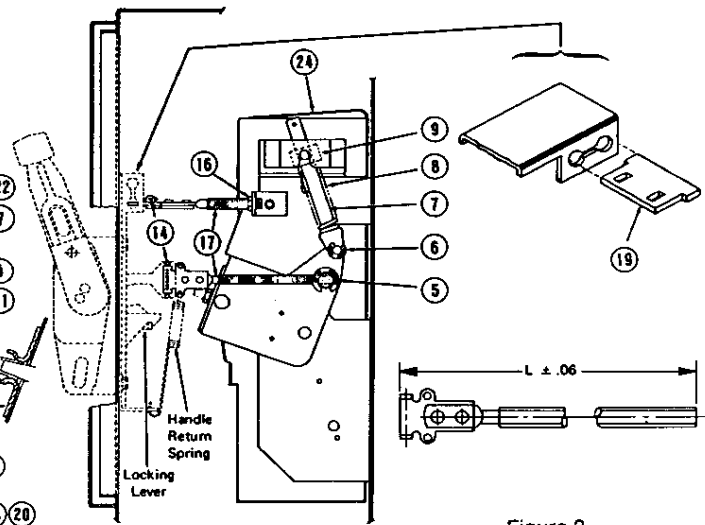
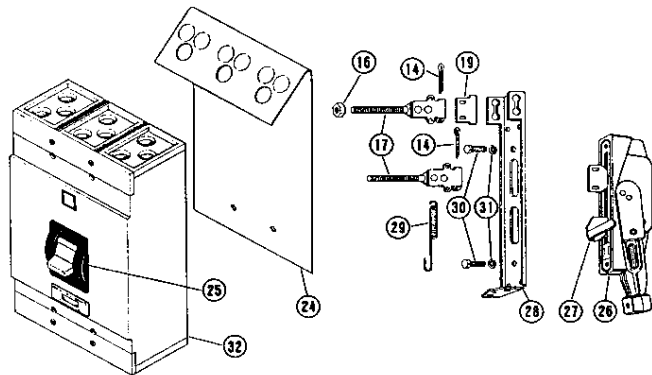


Figure 2

Figure 3
Operating Rod and
Stiffener Rod

REPLACEMENT PARTS LIST

Item	Description	Part Number	Qty
1	Operating Mechanism Sub-Assembly ... (includes items 2 thru 25)	31004-363-50	1
2	Mounting Frame Assembly	31004-308-50	1
3	Bail Arm Bar	31004-353-01	1
4	Drive Pin	31004-296-01	1
5	"E" Ring 5/8"	29907-04010	1
6	"E" Ring 3/8"	29907-02410	4
7	Spring Guide	31004-237-02	2
8	Operating Spring	50502-601-47	2
9	Spring Seat	31004-241-01	2
10	Adjustment Lever	31004-354-01	2
11	Screw 1/4-20 x 1/2 (Allen Head)	21601-20160	8
12	Washer 1/4"	23601-00200	4
13	Screw 1/4-20 x 1/2	21916-20160	2
14	Cotter Pin 1/8 x 1 1/4	24201-08400	4
15	L. Side Bail Arm Plate	31004-355-51	1
16	Nut 3/8-16	23002-00240	1
17	Rod Assembly	31055-162-50	2
18	Screw Assembly 3/16-18 x 4 1/2	21001-22831	4
19	Stiffener Coupler	31055-168-01	1
20	Washer 3/8"	23701-00220	4
21	R. Side Bail Arm Plate	31004-355-50	1
22	Mechanism Stiffener Bracket	31004-298-01	1
23	Screw Assembly 1/4-20 x 3/8	21926-20120	1
24	Line Terminal Cover	30002-032-04	1
25	ON-OFF MASK	30009-359-04	1
26	Operating Handle Complete for Nema 1, 3R, 4 (Painted), 12 Enclosures (includes items 27 thru 31)	Class 9422 Type A-1	1
26	Operating Handle Complete for Nema 4 Stainless Steel Enclosures (includes items 27 thru 31)	Class 9422 Type A-2	1
27	Locking Lever	31008-467-01	1
28	Handle Stiffener Bracket	31008-470-01	1
29	Handle Return Spring	30017-143-01	1
30	Hex Head Cap Screw 1/4-20 x 3/8	21401-20200	2
31	Lock Washer 1/4"	23701-00200	2
32	Circuit Breaker	See Tables 2 & 3	1



ORDERING INSTRUCTIONS — See Page 3

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ADJUSTMENT AND REPAIR INFORMATION

WARNING: Hazard of electrical shock or burn. Be sure to turn off power supplying this equipment before working on it.

If the circuit breaker, Item 32, Page 1 or 2, the operating mechanism, Item 1, or certain parts of the operating mechanism are replaced, it may be necessary to readjust the operating mechanism to insure proper operation. Test for proper operation as follows:

1. Place the operating handle in ON position and push the insulated recessed Push-To-Trip button on the front of the circuit breaker with a pencil or other small tool. This will cause the circuit breaker to trip.
2. Attempt to reset the circuit breaker by moving the operating handle to OFF position. When reset, circuit breaker will turn ON and OFF with an audible snap.
3. If the circuit breaker does not reset, place handle in ON position, decrease gap "E" by loosening screw assemblies in upper adjustment lever, reducing gap "E" (figure 1) and tightening screw assemblies to 70 inch pounds. Repeat as necessary until circuit breaker can be turned ON and OFF, and reset with the operating handle.
4. It may be necessary to turn threaded operating rod out one or two turns and reconnect handle linkage with cotter pin at point Q (figure 2). This adjustment must be made with the operating handle and the circuit breaker mechanism in ON position.

If a new operating rod or stiffener rod (Item 17, Page 1 or Page 2, Figures 2 & 3) is necessary, it should be cut to proper length:

Rod Type	MAL Circuit Breaker	LAL Circuit Breaker
Operating	$L = D - 2\frac{7}{8}"$	$L = D - 2\frac{3}{4}"$
Stiffener	$L = D - T - 4\frac{5}{8}"$	$L = D - T - 4\frac{1}{4}"$

D = distance from handle mounting surface to circuit breaker mounting surface.

T = Flange thickness of handle mounting surface.

TABLE 1
MAG-GARD™ — MOTOR CIRCUIT PROTECTORS
ADJUSTABLE TRIP

Breaker Type	Ampere Rating	Trip Range Amperes	600 VAC Max. 3 Pole Breaker Cat. No.	
LAL	400	1250-2500	LAL-36400-32M	
		1500-3000	LAL-36400-33M	
		1750-3500	LAL-36400-35M	
		2000-4000	LAL-36400-36M	
MAL	600	2500-5000	MAL-36600-40M	
		3000-6000	MAL-36600-42M	
		3500-7000	MAL-36600-44M	
	800	4000-8000	MAL-36800-45M	
		1000	5000-9000	MAL-361000-47M

ORDERING INFORMATION REQUIRED

1. Specify quantity, part number, and description of part.
2. Order circuit breaker, Item 32, Page 1 or 2, from Distribution Equipment Division.

CIRCUIT BREAKERS

Square D Type LAL and MAL circuit breakers are supplied on Class 8539 and 8739 Type S combination starters, Size 6. All standard Size 6 combination starters are supplied with a 600 VAC MAG-GARD® motor circuit protector. Type S combination starters can accept thermal magnetic permanent trip circuit breakers, also. It is possible to substitute one circuit breaker for another within the same frame size. When ordering a replacement circuit breaker, include all the identifying information found on the breaker nameplate. **Replacement circuit breaker should be ordered from the Square D Distribution Equipment Division.** A listing of circuit breaker type numbers is provided in Tables 1 and 2.

ELECTRICAL INTERLOCK

A one or two pole electrical interlock mechanism may be added or replaced on these circuit breaker operating mechanisms. The snap switch only may also be replaced on existing interlock installations. Catalog numbers are shown in Table 3.

TABLE 2
THERMAL — MAGNETIC TRIP CIRCUIT BREAKERS
FIXED TRIP

Breaker Type	Continuous Amperes	600 VAC 3 Pole Breaker Cat. No.
LAL	250	LAL-36250
	300	LAL-36300
	350	LAL-36350
	400	LAL-36400
MAL	450	MAL-36450
	500	MAL-36500
	600	MAL-36600
	700	MAL-36700
	800	MAL-36800
	1000	MAL-361000

TABLE 3

Electrical Interlock Type	Electrical Interlock Mechanism Complete		Replacement Snap Switch Only	
	Class	Type	Class	Type
Single Pole	9999	R-26	9007	A0-2
Double Pole	9999	R-27	9007	C0-3

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