



SQUARE D Instruction Bulletin

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Class 9421 Type L Door Mounted Operating Mechanisms for use with Square D Type KAL, KCL and KHL Circuit Breakers

SELECTING KITS

This instruction bulletin contains instructions for assembling and installing Class 9421 Type L door mounted operating mechanisms. Class 9421 Type LP1, LP3 and LP4 kits contain all components necessary for a complete operating mechanism assembly (see Figure 1). The circuit breaker must be purchased separately.

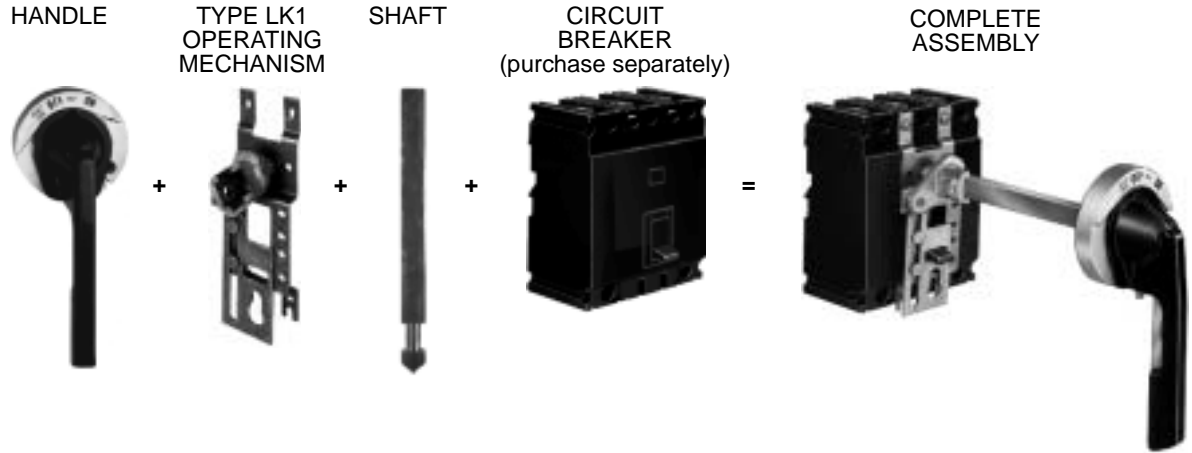


Figure 1 Complete Operating Mechanism Assembly

Operating mechanism kits are comprised of a handle, operating mechanism and shaft kit (see Table 1). Individual component kits are available for meeting special application requirements (see Table 2 and Table 3).

Table 1 Items Included in Type LP1, LP3 and LP4 Kits

Kit Part No.	Items in Kit		
	Class 9421 Type	Handle Assembly	Operating Mechanism
LP1 ^[1]	LH6	LK1	LS8 ^[1]
LP3	LH3	LK1	LS12
LP4	LH6	LK1	LS12

^[1] These kits do not include or require a shaft support bracket assembly.

Table 2 Handle Kits

Kit Part No.		NEMA Rating	Trip Indication
6" Handle ^[1]	3-1/2" Handle ^[2]		
LH6	LH3	1, 3, 3R, 12	Yes
LH46	LH43	4 (painted)	No
LC46	LC43	4 (chrome plated)	No

^[1] See Figure 3 on page 4. ^[2] See Figure 4 on page 5.

Table 3 Shaft Kits

Shaft	Kit Part No.	Mounting Depth	
		Min.	Max.
Standard	LS8	6-1/4"	11-3/16"
Long	LS12 Series C	6-1/4"	21-3/4"

Class 9421 Type LK1 operating mechanisms operate the Square D circuit breakers listed in Table 4. Circuit breakers must be purchased separately.

Table 4 Circuit Breakers Available

Circuit Breaker	Type	No. of Poles
Thermal-Magnetic	KAL, KCL, KHL	2-3
MAG-GARD® Motor Circuit Protector	KAL	2-3
Molded Case Switches	KAL, KHL	2-3

Table 5 Replacement Parts List

Item	Description	Part No.	Quantity
1	Operating Mechanism	Class 9421 Type LK1	1
2	Base Plate	50002-005-50	1
3	Handle Assembly	See Table 2 on page 1	1
4	Shaft	See Table 3 on page 1	1
5	Shaft Support Bracket Assembly (supplied only w/ Type LS12 shaft kit)	—	—
7	Handle Gasket	50002-021-01	1
8	On-Off Mask	30009-359 -02	1
9	Insulator	30002-032-06	1
15	Screw #10-24 x 3-7/8	21590-16792	4
16	Washer #8	23601-11610	4
17	Screw #10-32 x 3/8	21911-17120	2
18	Screw 1/4-20 x 1	21401-20320	1
19	Lock washer 1/4	23704-12000	4
20	Washer 1/4	23601-12010	4
21	Nut 1/4-20	23001-00200	1
22	Screw 1/4-20 x 1/2 (self-tapping type)	21422-20160	3
23	Nut	23001-01400	4
24	Washer	23601-11410	4
25	Lock washer #8	23703-00140	4
26	Screw 1/4-20 x 3/4 (self-tapping type)	21422-20241	3

INSTALLATION

1. Before beginning installation, read this entire installation section. To identify items, refer to Figure 3 on page 4.
2. Open disconnect means ahead of circuit.

DANGER

HAZARDOUS VOLTAGE.
 Disconnect all power before working on equipment.
 Electrical shock will cause severe injury or death.

3. Remove parts from kit(s). Verify all components listed in Table 5 are included.
4. Determine location of circuit breaker on panel (see Figure 2). Mark location and drill four 11/64" diameter holes for the four #10-24 x 3-7/8" thread forming mounting screws (item 15).

5. Place black adhesive ON-OFF mask (item 8) over the ON-OFF markings of the circuit breaker. This eliminates false circuit breaker status readings when the external operating mechanism is mounted.

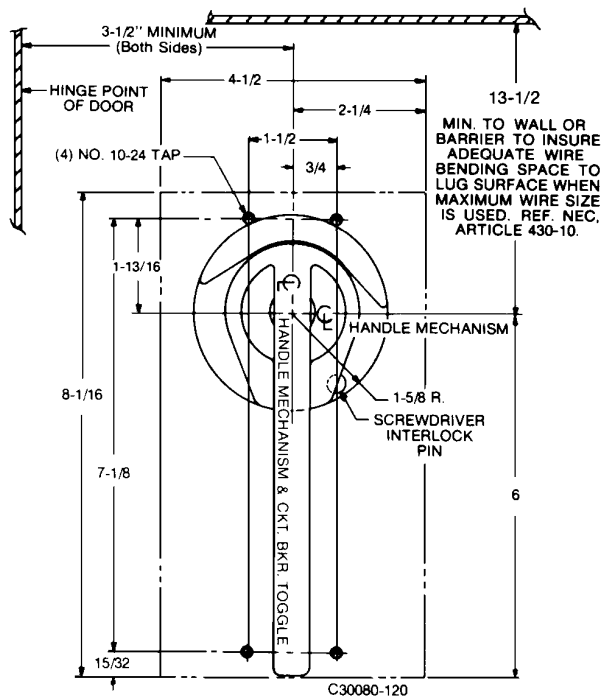


Figure 2 Panel Drilling

6. Position insulator (item 9) under circuit breaker. Using screws and washers (items 15 and 16), mount circuit breaker along with operating mechanism (item 1).

- Determine enclosure mounting depth (dimension H in Figure 3). Calculate the required shaft length (L) using the formula $L = H - 3-5/8"$. Cut shaft to length L.

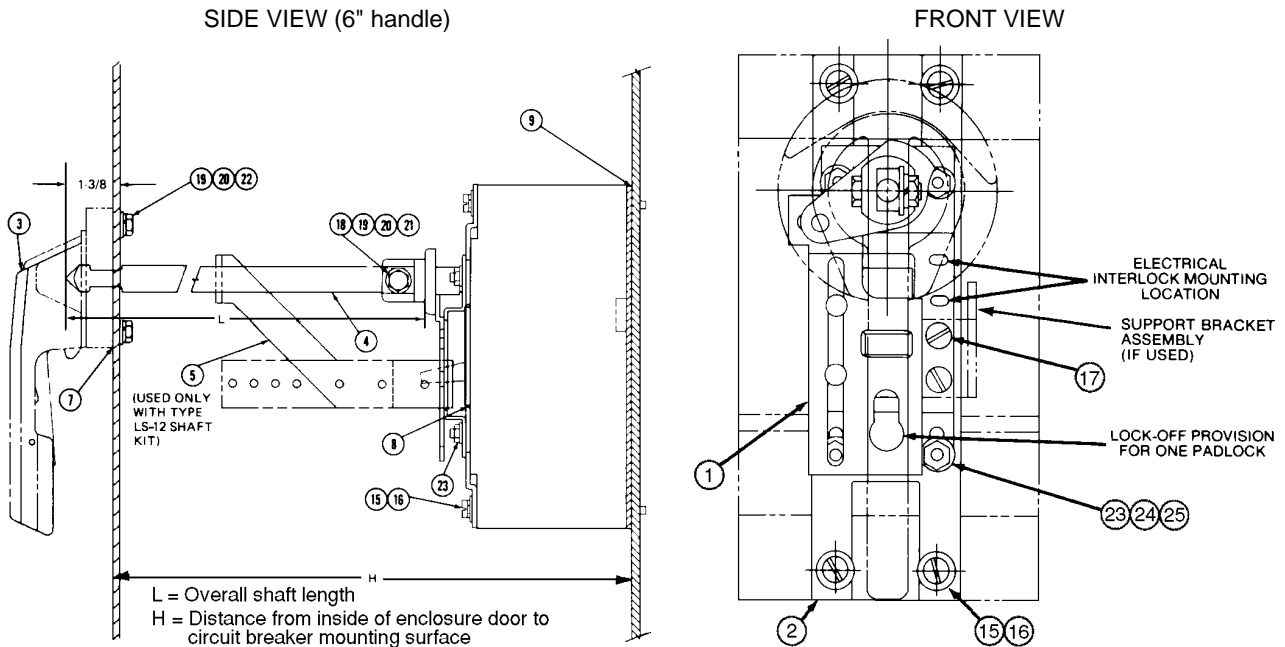


Figure 3 Mounting the Handle Assembly

- Insert shaft until it is completely seated in operating mechanism (see Figure 3). While holding shaft in place, mark the shaft through the shaft mounting hole. Remove shaft and drill a 9/32" hole through the mark on the shaft.
- Reinsert shaft into operating mechanism and secure it with screw, lock washer, washer and nut (items 18, 19, 20 and 21).
- DOOR DRILLING – READ CAREFULLY.**
 - When centerline of operating shaft is 12" or greater from door hinge point:
 - Dab some grease on shaft tip and gently close door until contact is made between the door and shaft tip. The grease marks the center for the 1-3/8" diameter handle mounting hole (see Figure 5 on the back page).
 - Center punch the grease spot and drill 1/8" diameter pilot hole.
 - Cut out drilling template (Figure 5).
 - Center template 1-3/8" diameter hole on pilot hole. Mark and drill holes per template.
 - When centerline of operating shaft is less than 12" from door hinge point, locate hole as directed in step 10.A.1. above and move marked hole an additional 1/8" towards door hinge.
 - If the cut shaft length is 12" or longer, move the hole DOWN 1/8". This compensates for slight shaft droop due to the weight of the shaft.
- Mount handle assembly and gasket (items 2 and 7) using self tapping screws, lockwashers and washers (items 22, 19 and 20). The 6" handle assembly is shown in Figure 3 on page 4. The 3-1/2" handle assembly is shown in Figure 4.

NOTE: If enclosure door thickness is greater than 14 gauge (.075") use the longer 1/4-20 x 3/4 self-tapping screws (item 26).

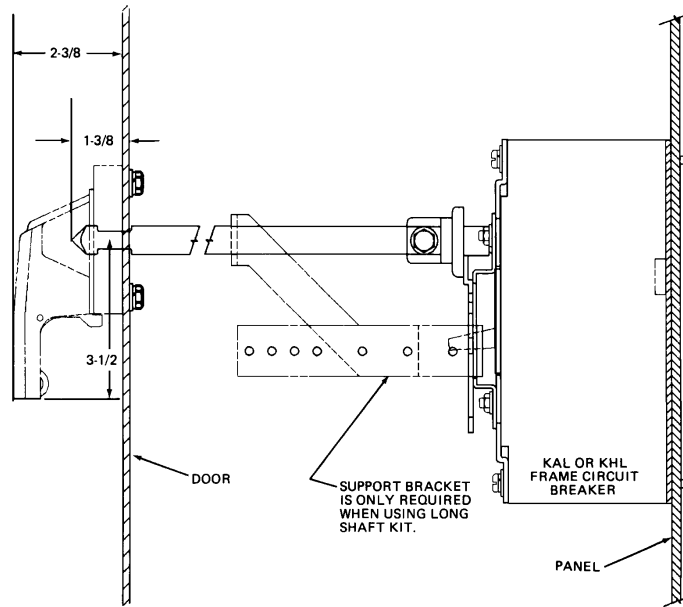


Figure 4 3-1/2" Handle Assembly

12. If the shaft length is greater than 10", the Type LS12 Series C shaft kit, which includes an adjustable shaft support bracket assembly, must be used. The support bracket is factory assembled and may require additional adjustment. Make the support bracket as long as possible while still permitting the door to close and seal completely.
13. Using the two #10-32 x 3/8" screws supplied (item 17), mount the support bracket assembly to the operating mechanism. Do not tighten the screws until proper shaft alignment is attained. Make sure the shaft is free to rotate after the support bracket assembly is mounted. This movement must be checked by turning the shaft to the circuit breaker ON-OFF positions with a suitable wrench. Realign support bracket assembly if binding is discovered.
14. Turn circuit breaker and handle assembly to OFF position and close door. Handle assembly should easily engage shaft. Check ON-OFF operations. If mechanism binds, check alignment of handle assembly and shaft.
NOTE: Handle will positively captivate the shaft with a force. This is normal.
15. Close door and turn handle to ON position. Verify enclosure door cannot be opened with handle and circuit breaker in the ON position.



WARNING

HAZARDOUS VOLTAGE.

Install operating mechanism so enclosure door cannot be opened with handle and circuit breaker in ON position.

Failure to observe this precaution can result in severe personal injury or death.

If an authorized person requires access when the handle and circuit breaker are in the "ON" position, the screwdriver interlock pin can be defeated (see Figure 2 on page 3).

16. TEST RESET OPERATION:

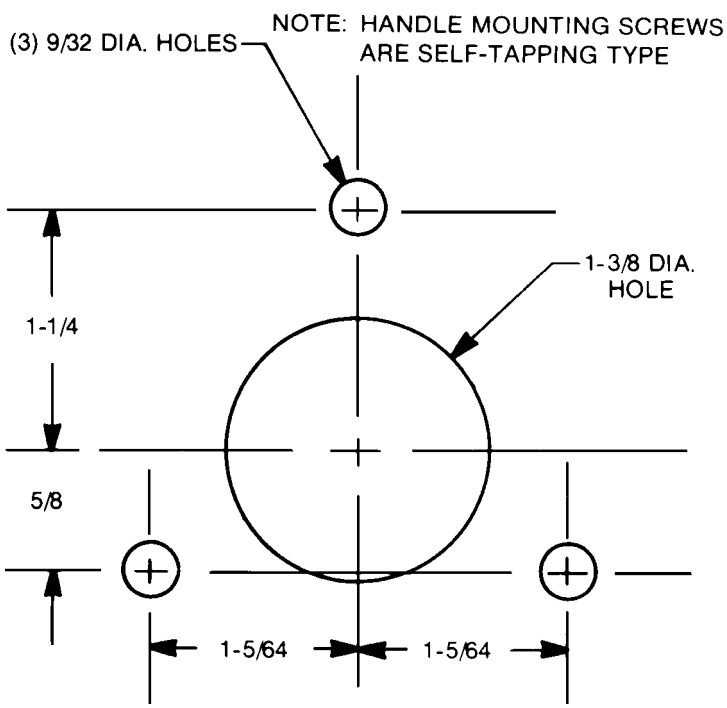
- A. Push trip button on circuit breaker. Circuit breaker should trip.
- B. Move handle assembly to the TRIPPED position or midway between the OFF and ON positions if the handle is non-trip indicating.
- C. Close door onto shaft and at the same time rotate the screwdriver interlock pin. The handle assembly should engage shaft, allowing the door to close.
- D. Move handle assembly to RESET position and test for proper ON-OFF functions.

17. If an electrical interlock is used, mount the interlock assembly to the operating mechanism. Refer to bulletin 30072-313-51.

PLEASE NOTE:

Electrical equipment should be serviced only by qualified electrical maintenance personnel, and this document should not be viewed as sufficient instruction for those who are not otherwise qualified to operate, service or maintain the equipment discussed. Although reasonable care has been taken to provide accurate and authoritative information in this document, no responsibility is assumed by Square D for any consequences arising out of the use of this material.

Figure 5 Door Drilling Template (full scale)





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