

**Installation Instructions for Auxiliary Switch for LDB, LD, HLD, LDC, LW, HLW, LWC Circuit Breakers, Series C Molded Case Switches, and Motor Circuit Protectors (HMCP)**

 **WARNING**

**CONTACT WITH ENERGIZED EQUIPMENT CAN RESULT IN DEATH, SEVERE PERSONAL INJURY, OR SUBSTANTIAL PROPERTY DAMAGE. DO NOT ATTEMPT TO INSTALL OR PERFORM MAINTENANCE ON EQUIPMENT WHILE IT IS ENERGIZED. ALWAYS VERIFY THAT NO VOLTAGE IS PRESENT BEFORE PROCEEDING WITH THE TASK, AND ALWAYS FOLLOW GENERALLY ACCEPTED SAFETY PROCEDURES.**

**CUTLER-HAMMER IS NOT LIABLE FOR THE MISAPPLICATION OR MISINSTALLATION OF ITS PRODUCTS.**

The user is cautioned to observe all recommendations, warnings, and cautions relating to the safety of personnel and equipment as well as all general and local health and safety laws, codes, and procedures.

The recommendations and information contained herein are based on Cutler-Hammer experience and judgement, but should not be considered to be all-inclusive or covering every application or circumstance which may arise. If any questions arise, contact Cutler-Hammer for further information or instructions.

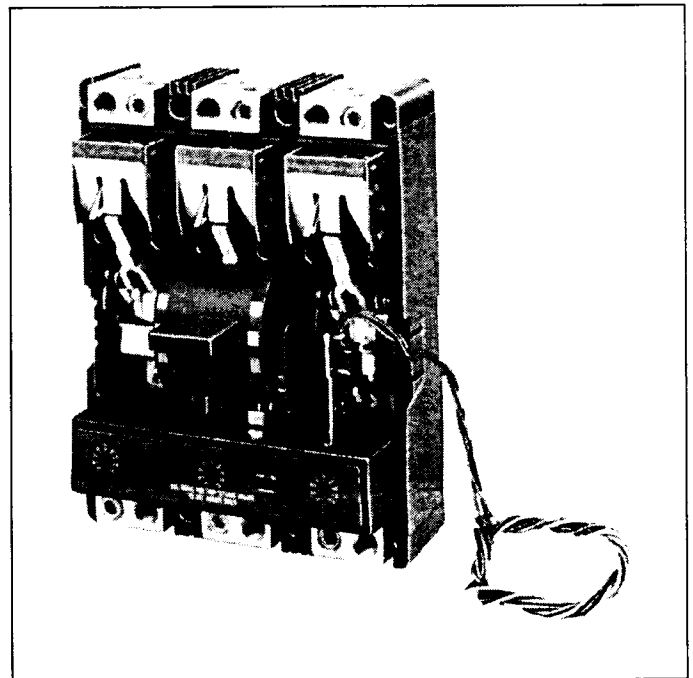
**1. INTRODUCTION**

**General Information**

The auxiliary switch (Fig. 1-1) indicates circuit breaker contacts status, and is used for remote signaling and system interlocking purposes. The switch consists of one, two, or three single-pole, double-throw (SPDT) switches assembled to a plug-in module. The plug-in module is mounted in slots in the top of the trip unit, it occupies the accessory cavity in the circuit breaker frame, and is positioned so that the switch actuator is operated by the crossbar. Each SPDT switch has one "a" and one "b" contact. When the crossbar is in the contacts-closed position, the "a" contact of each SPDT switch is closed and the "b" contact is open. When the crossbar is in the tripped or contacts-open position, the "a" contact is open and the "b" contact is closed.

Table 1-1 lists electrical rating data for the auxiliary switch.

For this publication, the term circuit breaker shall also include molded case switch and motor circuit protector.



*Fig. 1-1. Auxiliary Switch Installed in L-Frame Circuit Breaker*

**Table 1-1. Auxiliary Switch Electrical Rating Data**<sup>①②③</sup>

Maximum Voltage (V)	Freq.	Maximum Current (A)	Dielectric Withstand Voltage (V)
600	50/60 Hz	6	2500
125	DC	0.5 <sup>④</sup>	
250	DC	0.25 <sup>④</sup>	

- ① Endurance - 400 electrical operations plus 5600 mechanical operations
- ② Pigtail wire size - No. 18 AWG (0.82 mm<sup>②</sup>)
- ③ Terminal block is listed for use with one or two No. 18 to No. 14 AWG solid or stranded copper wires. Torque is 7 lb-in (0.8 N.m)
- ④ Non-inductive load

Depending on the model ordered, connections for the auxiliary switch are in one of four forms. The standard wiring configuration is pigtail leads exiting the rear of the base directly behind the auxiliary switch. Optional configurations include a terminal block mounted on the same side of the base as the accessory, leads exiting the side of the base where the accessory is mounted, and leads exiting the rear of the base on the side opposite the accessory. The 18-inch long pigtail leads are color coded for identification; identification labels are provided for pigtail leads and terminal block points. For allowable locations of all accessories, refer to Frame Book 29-104.

**Note:** When the walking beam interlock is used with the circuit breaker, the rear trough cannot be used for accessory pigtail leads.

This instruction leaflet (I.L.) gives detailed procedures for installing the auxiliary switch.

## 2. INSTALLATION

**Note:** The auxiliary switch can be field-installed in LD, HLD, and LDC circuit breakers under UL File E64983.

The auxiliary switch can be field-installed in LW, HLW, and LWC circuit breakers.

The auxiliary switch is listed for factory installation under UL File E7819.

For sealed circuit breakers (LDB), Underwriters Laboratories Inc. UL 489 requires that internal accessories be installed at the factory. The auxiliary switch is listed for factory installation under UL File E7819.

Where local codes and standards permit and UL listing is not required, internal accessories can be field installed in sealed circuit breakers. In this case, UL listing becomes invalid and the label should be removed.

**Before attempting to install the auxiliary switch check that the catalog number is correct as ordered and that the rating of the accessory satisfies the job requirements.**

The auxiliary switch, shown in kit form in Fig. 2-1, is installed in the right or left accessory mounting cavity of a 2-, 3-, or 4-pole circuit breaker with an LT (fixed thermal) LTA (adjustable thermal) trip unit; or LS (electronic) trip unit. An auxiliary switch must be installed in the circuit breaker before the circuit breaker is mounted in an electrical system. To install the auxiliary switch, perform the following procedures:

**Note:** A circuit breaker that is mounted in an electrical system must be removed to install the accessory. To ensure correct accessory installation, the circuit-breaker must be placed on a horizontal surface.

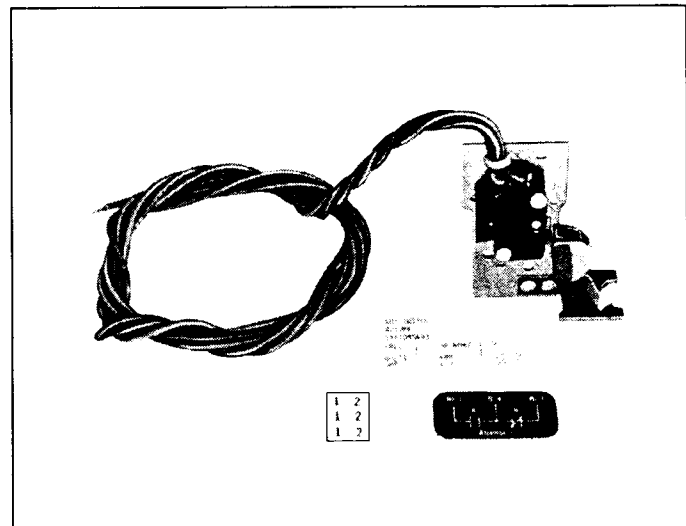


Fig. 2-1. Auxiliary Switch Kit

**WARNING**

**THE VOLTAGES IN ENERGIZED EQUIPMENT CAN CAUSE DEATH OR SEVERE PERSONAL INJURY. BEFORE REMOVING A CIRCUIT BREAKER INSTALLED IN AN ELECTRICAL SYSTEM, MAKE SURE THE CIRCUIT BREAKER IS SWITCHED TO THE OFF POSITION AND THERE IS NO VOLTAGE PRESENT WHERE WORK IS TO BE PERFORMED. SPECIAL ATTENTION SHOULD BE PAID TO REVERSE FEED APPLICATIONS TO ENSURE NO VOLTAGE IS PRESENT.**

**Note: For new circuit breaker installation, the trip unit must be installed in circuit breaker before attempting to install a auxiliary switch. Refer to I.L. 29C607, I.L. 29C608, I.L. 29C609 or I.L. 29C610 for instructions on how to install trip unit.**

2-1. Switch circuit breaker to OFF position.

**Note: Molded case switch trip units are not equipped with a PUSH-TO-TRIP button. For molded case switches, omit step 2-3.**

2-2. Disconnect and remove circuit breaker from installation and terminal connections.

2-3. Switch circuit breaker to ON position then press PUSH-TO-TRIP button to trip operating mechanism and check handle moves to trip position with white colored indicator visible in escutcheon window.

2-4. Remove circuit breaker cover screws and covers.

2-5. For high instantaneous trip-type (catalog suffix K designation) molded case switches, find recessed hole in either of the trip unit outer poles normally intended for intermediate plunger (Fig. 2-3). Push a fine point implement in one hole to trip the molded case switch.

**Note: For a single auxiliary switch having rear or opposite-side exiting pigtail leads, thread leads through center trough in side of base before attempting to insert the mounting bracket. For double or triple accessories, leads from the outer auxiliary switch must go to the center trough. Pigtail leads exiting in this manner should be eased through trough as mounting bracket is inserted into trip unit retaining**

**slots. Use center trough also for leads exiting the side of the circuit breaker.**

2-6. Route wiring to meet installation requirements (see Fig. 2-2).

**CAUTION**

**LEADS SHOULD BE FORMED AND ROUTED TO CLEAR ALL MOVING PARTS WHEN ACCESSORY IS PROPERLY INSTALLED. LEADS COULD BE DAMAGED IF IN CONTACT WITH MOVING PARTS.**

2-7. Insert auxiliary switch as described in the following steps (Fig. 2-3).

- a. Remove barrier from trip unit accessory mounting slots in pole being used for accessory (see Fig. 2-3).
- b. Slide auxiliary switch plug-in module into slots until retaining clip snaps into trip unit. Auxiliary switch actuator must be above the crossbar. For terminal block assemblies, slide terminal block into mounting slot on side of base as plug-in module is being positioned
- c. If required, complete routing of leads to opposite side through rear wiring trough.
- d. For double or triple auxiliary switch pigtail leads, attach wire marking labels to bundle of three leads for each switch. (Markers designated 1, 2, and 3 are provided if required.)

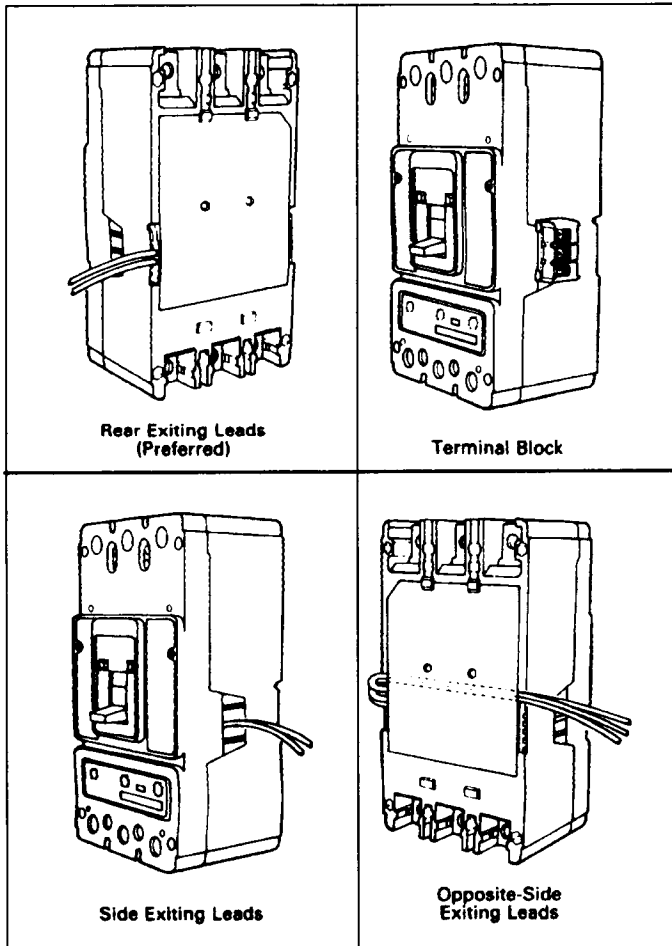


Fig. 2-2. Accessory Wiring Options

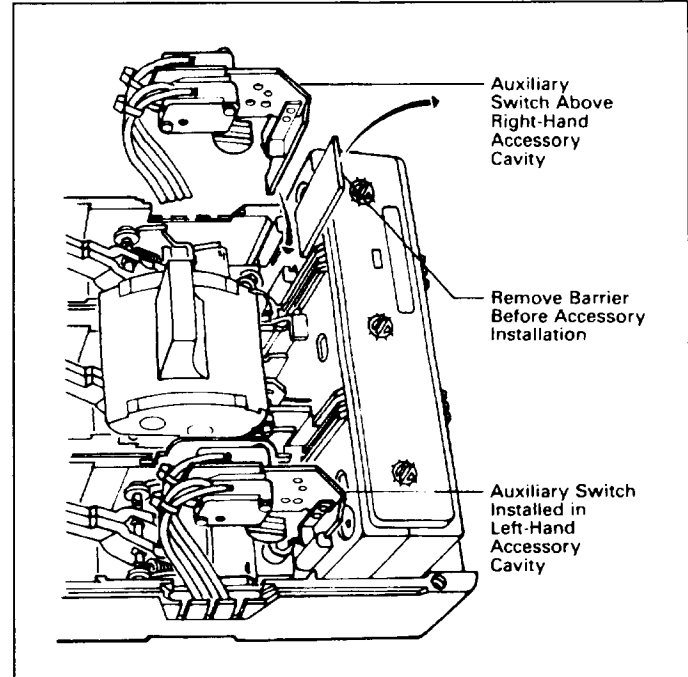


Fig. 2-3. Auxiliary Switch Installation Positions



## CAUTION

**WHEN INSTALLING CIRCUIT BREAKER MAIN COVER, MAKE SURE THAT ALL INTERNAL PARTS ARE IN PLACE:**

- **SLIDING HANDLE BARRIER IS POSITIONED SO THAT THE HANDLE OPENING IS ALIGNED WITH THE HANDLE.**
  - **ALL LEADS ARE CLEAR OF THE COVER.**
- 2-8. With circuit breaker handle in TRIPPED position and accessory pigtail leads (if used) routed as required, install circuit breaker covers. Secure with pan-head screws. Torque to 20-22 lb.-in. (2.26-2.49 N.m).
- 2-9. Remove and discard UL listing label on LDB circuit breakers only.
- 2-10. Place accessory labels (supplied with kit) on circuit breaker (see Fig. 2-4).

**Note: Accessory labels show connection diagram for auxiliary switch. Pigtail leads are color coded red, black, and blue.**

2-11. Test auxiliary switch(es). Connect continuity tester or ohmmeter across pigtail leads or terminal block connections. Check continuity as follows:

- a. Circuit breaker handle OFF –  
 “a” contact(s) - open  
 “b” contact(s) - closed.
- b. Circuit breaker handle ON –  
 “a” contact(s) - closed  
 “b” contact(s) - open

**Note: For molded case switches omit step c.**

- c. Press PUSH-TO-TRIP button –  
 “a” contact(s) - open  
 “b” contact(s) - closed.
- d. If auxiliary switch(es) fails test, make sure that auxiliary switch(es) module is properly seated in trip unit slots. If auxiliary switch appears to be correctly installed and the problem persists, contact Cutler-Hammer.

2-12. Install circuit breaker.

2-13. Connect auxiliary switch(es) as required (see Fig. 2-5).

Cutler-Hammer assumes no responsibility for malfunctioning accessories installed by the customer.

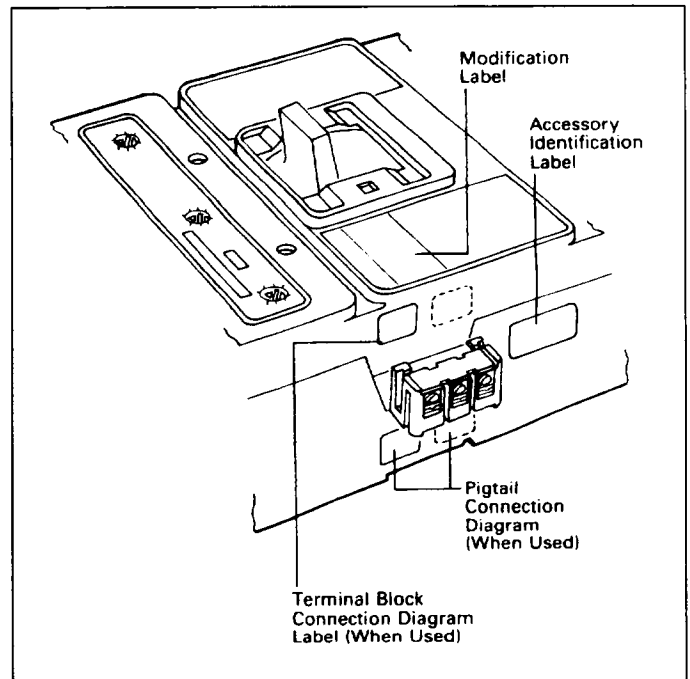


Fig. 2-4 Preferred Mounting Locations for Accessory Nameplate Labels

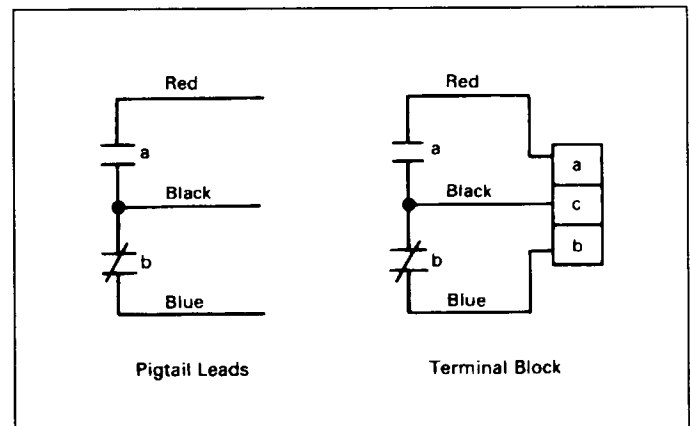


Fig. 2-5. Auxiliary Switch Connection Diagram

**Cutler-Hammer**

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