



**Installation Instructions for Alarm (Signal)/Lockout Switch and Alarm (Signal)/Lockout Switch and Auxiliary Switch Combination for DK, KDB, KD, HKD, KDC, KW, HKW, KWC Circuit Breakers, Molded Case Switches, and K-Frame Motor Circuit Protectors (HMCP)**

**WARNING**

DO NOT ATTEMPT TO INSTALL OR PERFORM MAINTENANCE ON EQUIPMENT WHILE IT IS ENERGIZED. DEATH, SEVERE PERSONAL INJURY, OR SUBSTANTIAL PROPERTY DAMAGE CAN RESULT FROM CONTACT WITH ENERGIZED EQUIPMENT. 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.

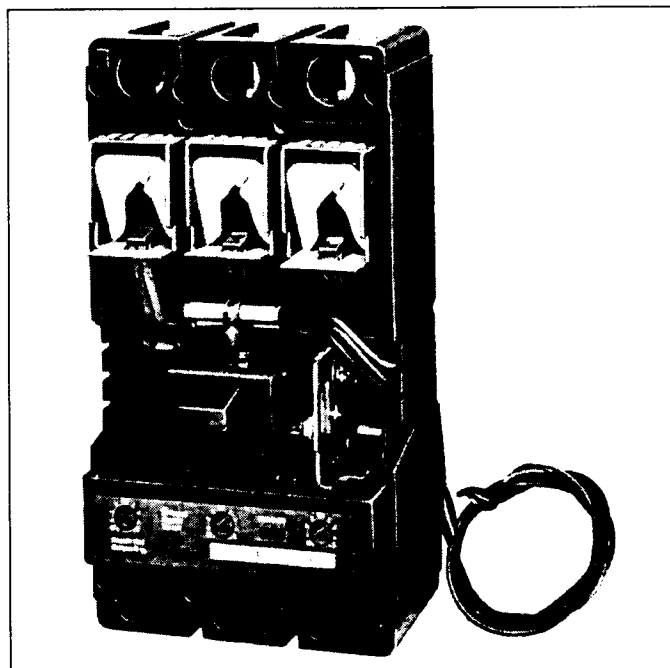
**1. INTRODUCTION****General Information**

The alarm (signal)/lockout switch (ASL switch) is attached to a plug-in module available in the following combinations (see Fig. 1-1):

- One or two ASL switches
- One auxiliary switch and one ASL switch

The plug-in module is mounted in slots in the top of the trip unit and occupies the accessory mounting cavity in the circuit breaker frame.

The ASL switch provides remote signaling and interlocking when the circuit breaker trips; it consists of one or two single-pole, double-throw (SPDT) switches. Each SPDT



*Fig. 1-1. Alarm (Signal)/Lockout Switch Installed in K-Frame Circuit Breaker*

switch has a make (alarm) and a break (lockout) contact; it is mounted so that the switch actuator arm is controlled by the circuit breaker operating mechanism cradle. The actuator arm extends past the operating mechanism cradle; therefore, only one plug-in module containing an ASL switch or switches can be used in a circuit breaker.

When the circuit breaker is in the ON or OFF position, the cradle holds the make contact open and the break contact closed. When the circuit breaker is in the tripped position, the make contact is closed and the break contact is open. Any type of trip operation (for example, automatic trip, shunt trip, or undervoltage release) actuates the ASL switch.

The auxiliary switch in the combination accessory indicates circuit breaker contacts status and is used for remote signaling and system interlocking purposes. Each SPDT switch has one "a" and one "b" contact. The plug-in module mounts in the accessory mounting cavity of the circuit breaker so that the switch actuator arm rests against the molded crossbar. When the molded crossbar is in the contacts-closed position, the "a" contact of each SPDT switch is closed and the "b" contact is open. When

the molded 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 ASL switch and auxiliary switch.

**Table 1-1. Alarm (Signal)/Lockout Switch and 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 - 1000 electrical operations plus 5000 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 wire. Torque is 7 lb-in (0.8 N.m)
- ④ Non-inductive load

Depending on the model ordered, connections for the ASL switch and auxiliary switch contacts are in one of four forms. The standard wiring configuration is pigtail leads exiting the rear of the base directly behind the accessory. 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 29-103.

**Note: No more than three pigtail leads can be routed through the rear trough in the circuit breaker base. When the walking beam interlock is used with the circuit breaker, the rear trough cannot be used for accessory pigtail leads.**

This Instruction Leaflet (IL) gives detailed procedures for installing the ASL switch and ASL switch/auxiliary switch combination (accessory combination.)

## 2. INSTALLATION

**Note: The ASL switch(es) and accessory combination can be field-installed in KD, HKD, and KDC circuit breakers under UL File E64983.**

The ASL switch(es) and accessory combination can be field-installed in KW, HKW, and KWC circuit breakers.

For sealed circuit breakers (DK, KDB), Underwriters Laboratories, Inc. UL489 requires that internal accessories be factory installed. The ASL switch and the auxiliary switch are 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 DK and KDB sealed circuit breakers. In this case, UL listing becomes invalid and the UL label should be removed.

**Before attempting to install the ASL switch or accessory combination, check that the catalog number is correct and the rating of the accessory(s) satisfies the job requirements.**

The ASL switch and accessory combination, as shown in kit form in Fig. 2-1, can be installed in the right or left accessory mounting cavity of a 2-, 3-, or 4-pole circuit breaker. An ASL switch or accessory combination must be installed in the circuit breaker before the circuit breaker is mounted in an electrical system. To install the ASL switch or accessory combination, 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.**

## General Installation

**WARNING**

**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. THE VOLTAGES IN ENERGIZED EQUIPMENT CAN CAUSE DEATH OR SEVERE PERSONAL INJURY.**

**Note:** Steps 2-1 through 2-11 and 2-14 through 2-20 are for general installation and apply to the ASL switch and the accessory combination. Step 2-12 covers installation of the ASL switch. Step 2-13 covers installation of the accessory combination.

For new circuit breaker installation, the trip unit must be installed in the circuit breaker before attempting to install an ASL switch or accessory combination. Refer to I.L. 29C603, I.L. 29C604, or I.L. 29C605 for instructions on how to install trip unit.

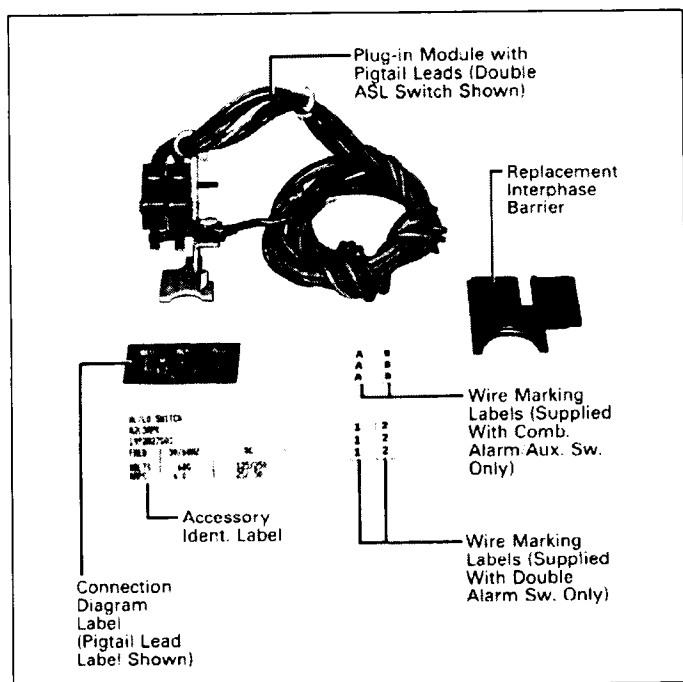


Fig. 2-1. Alarm (Signal)/Lockout Switch Kit

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 2-2.

- 2-2. Press PUSH-TO-TRIP button to trip operating mechanism.
- 2-3. Disconnect and remove circuit breaker from installation and terminal connections.
- 2-4. Remove cover screws and cover.

**Note:** To install accessory, circuit breaker must be in tripped position.

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

**WARNING**

**DO NOT RESET CIRCUIT BREAKER AFTER MOLDED HANDLE IS REMOVED. CRADLE RESET PIN MAY FLY OUT AND CAUSE INJURY IF MECHANISM IS TRIPPED.**

- 2-7. Remove handle-retaining screw and molded handle from handle arm. (See Fig. 2-3.)
- 2-8. Remove interphase barrier between center pole and pole in which accessory is to be mounted. (See Fig. 2-3.)
- 2-9. Install replacement interphase barrier supplied with kit in base. (See Fig. 2-3.)

**Note:** Before the next step, be sure that replacement interphase barrier has been installed in correct accessory cavity side, and that cradle reset pin has not fallen out of retaining-slot in handle arm.

- 2-10. Put molded handle on handle arm, and install retaining screw.

**Note:** For all combinations of accessories, leads from inner accessory switch must go to the wiring trough nearest line end of circuit breaker. For a double combination, leads from the outer accessory switch must go to center trough.

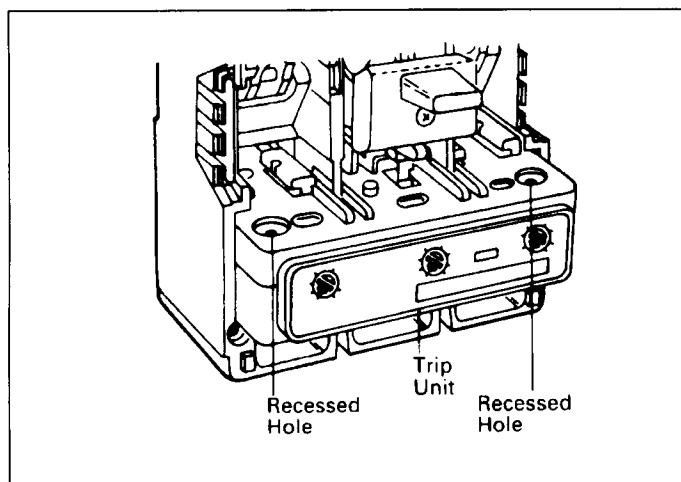


Fig. 2-2. Recessed Hole Location in K-Frame Trip Unit

**Note:** For an accessory having rear or opposite-side exiting pigtail leads, thread leads through trough in side of base before attempting to insert mounting bracket. Pigtail leads exiting in this manner should be eased through trough as mounting bracket is inserted into trip unit retaining slots.

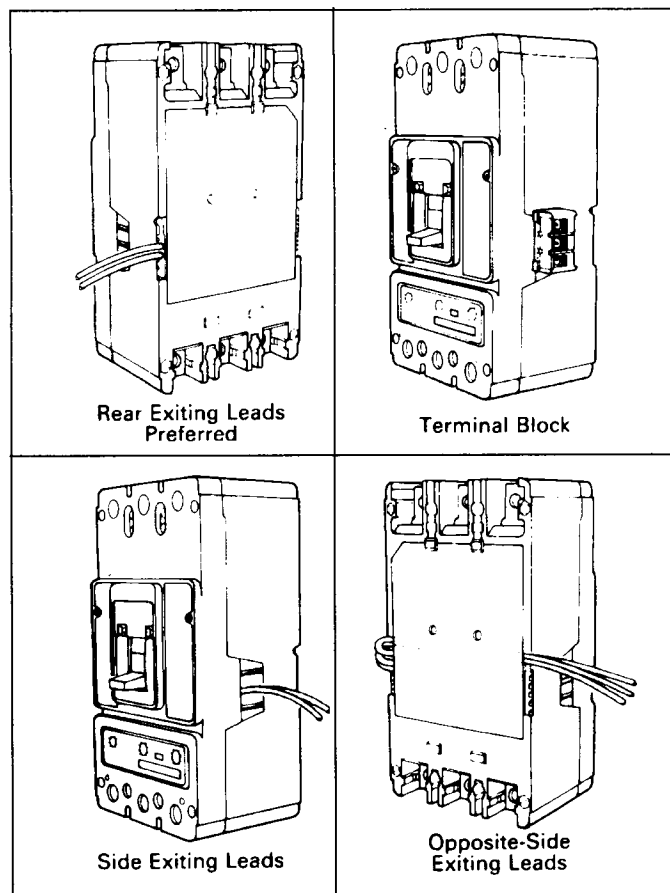


Fig. 2-4. Accessory Wiring Options

2-11. Route wiring to meet installation requirements.  
(See Fig. 2-4.)

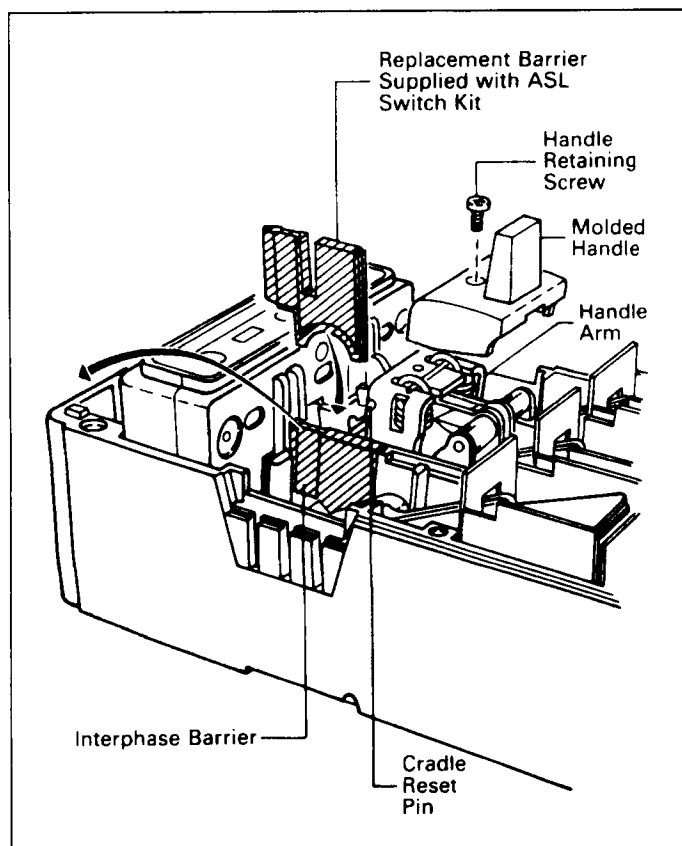


Fig. 2-3. Interphase Barrier Replacement

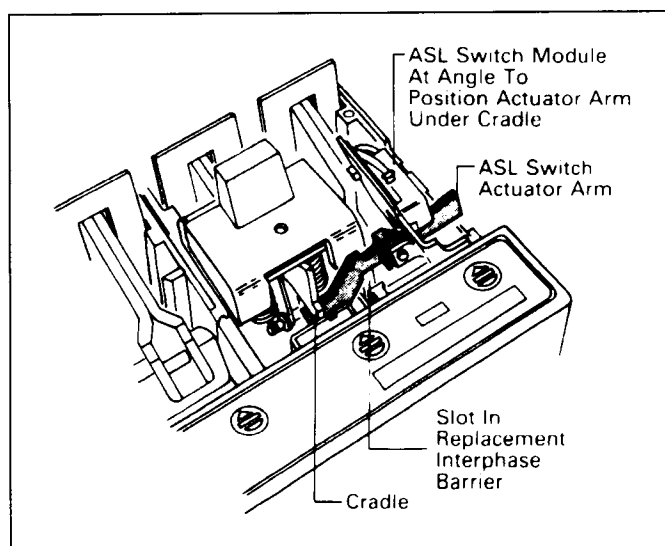


Fig. 2-5. Alarm (Signal)/Lockout Switch Installation

**CAUTION**

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

**Alarm (Signal)/Lockout Switch Installation**

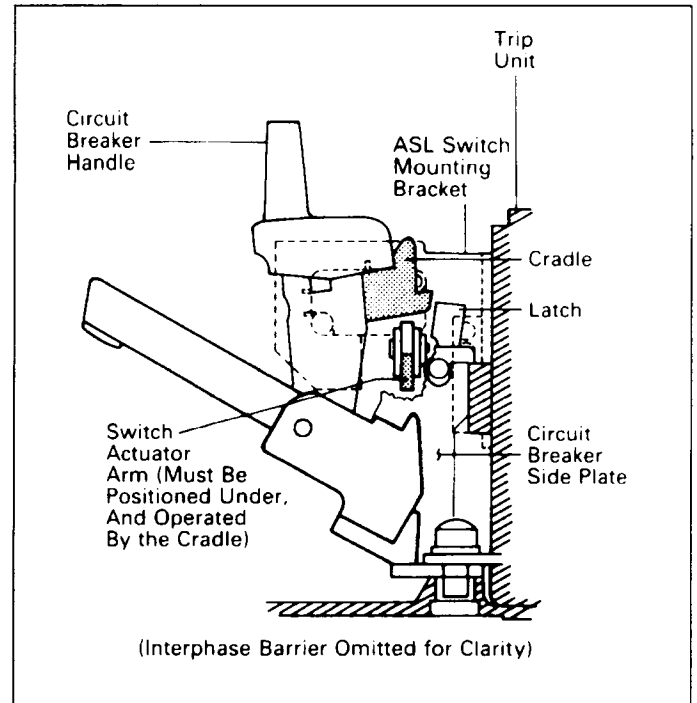
2-12. Insert ASL switch as described in the following steps:

- a. Put tip of actuator arm through slot in replacement interphase barrier and under cradle. (See Fig. 2-5.)
- b. Turn ASL switch mounting bracket to line up with slots in trip unit.
- c. Slide ASL switch mounting bracket into slots until retaining clip snaps into trip unit. Make sure ASL switch actuator arm is positioned as shown in Fig. 2-6. For terminal block assemblies, slide terminal block into mounting slot on side of base as plug-in module is being positioned.
- d. If required, complete routing of leads to opposite-side through rear wiring trough.
- e. For double ASL switch with pigtail leads, attach wire marking labels to bundle of three leads for each switch. (Markers designated 1 and 2 are provided.)

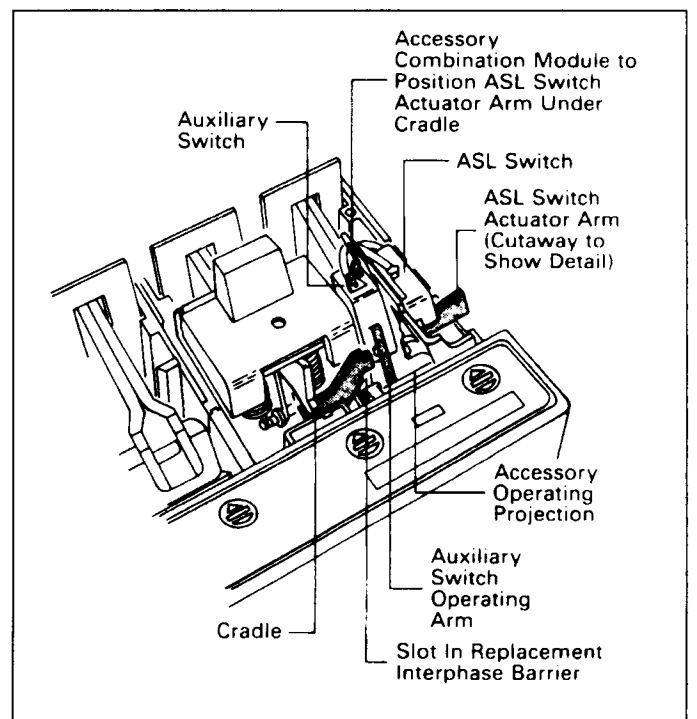
**Accessory Combination Installation**

2-13. Install accessory combination switch as described in the following steps:

- a. Put tip of ASL switch actuator arm through slot in replacement interphase barrier and under cradle (Fig. 2-7). Make sure ASL switch operating arm is positioned as shown in Fig. 2-6.
- b. Turn accessory combination mounting bracket to line up with slots in trip unit.



**Fig. 2-6. Alarm (Signal)/Lockout Switch Actuator Arm Location**



**Fig. 2-7. Accessory Combination Installation**

- c. Slide accessory combination mounting bracket into slots until retaining clip snaps into trip unit. Be sure that auxiliary switch operating arm is between accessory operating projection on the molded crossbar and arc extinguisher (Fig. 2-8). For terminal block assemblies, slide terminal block into mounting slot on side of base as accessory combination is being positioned.

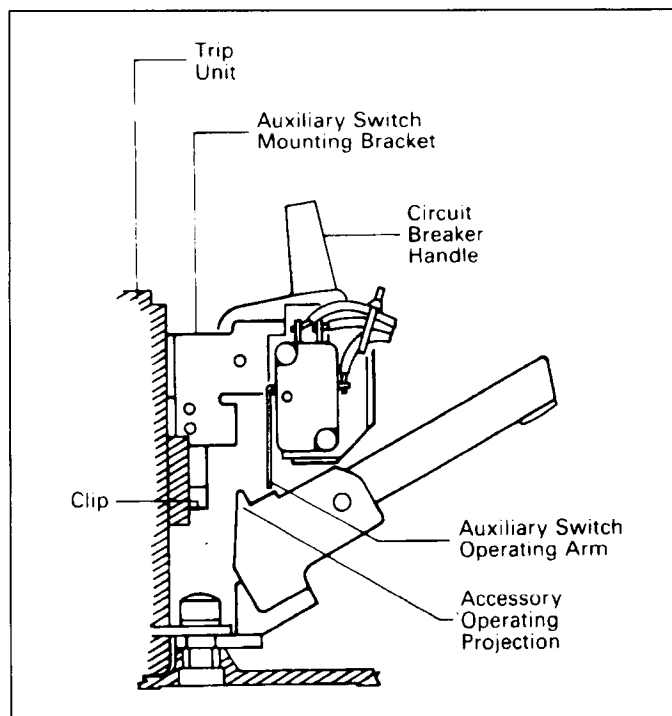


Fig. 2-8. Auxiliary Switch Operating Arm Location

- d. If required, complete routing of leads to opposite-side through rear wiring trough.
- e. For ASL/auxiliary switch accessory combination with pigtail leads, attach wire marking labels to bundle of three leads for each switch. (Markers designated A and B are provided.)

## General Installation



## CAUTION

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

- **SLIDING HANDLE BARRIERS ARE INSTALLED SO THAT THE HANDLE OPENING IS ALIGNED WITH THE HANDLE.**
- **PIGTAIL LEADS ARE CLEAR OF COVER.**

**WHEN REMOVED AND REINSTALLED, THREAD-FORMING SCREWS TRY TO REFORM THE THREADS IN THE CIRCUIT BREAKER BASE. CARE SHOULD BE TAKEN EVERY TIME A THREAD-FORMING SCREW IS USED TO ENSURE THAT THE SCREW STARTS IN THE ORIGINAL THREADS. DAMAGED THREADS CAN RESULT IN IMPROPER CIRCUIT BREAKER COVER RETENTION.**

2-14. With circuit breaker handle in TRIPPED position and accessory pigtail leads (if used) routed as required, install circuit breaker cover. Secure with pan-head screws followed by thread-forming screws, as shown in Fig. 2-10.

2-15. Remove and discard UL listing label on DK and KDB circuit breakers only.

2-16. Place accessory labels (supplied with kit) on circuit breaker. (See Fig. 2-11.)

**Note: Accessory labels show connection diagram for ASL switch and/or auxiliary switch contacts. Pigtail leads are color coded red, black, and blue. Be sure that wire marking label is attached correctly to leads and agrees with related leads at accessory.**

2-17. Test ASL switch by connecting continuity tester or ohmmeter across pigtail leads or terminal block connections. Check continuity as follows:

- a. Circuit breaker handle OFF — Check that make contact(s) are open and break contact(s) are closed.

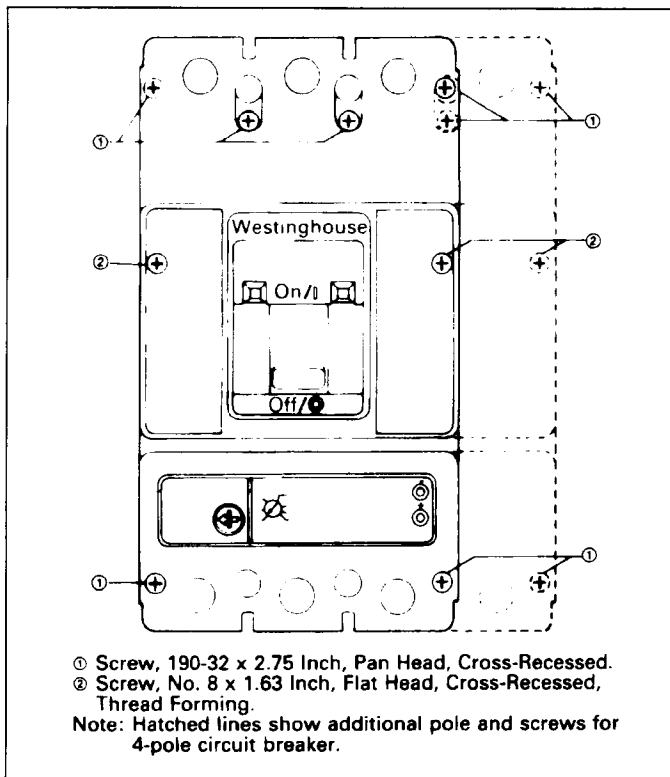


Fig. 2-10. Cover Screw Installation Positions

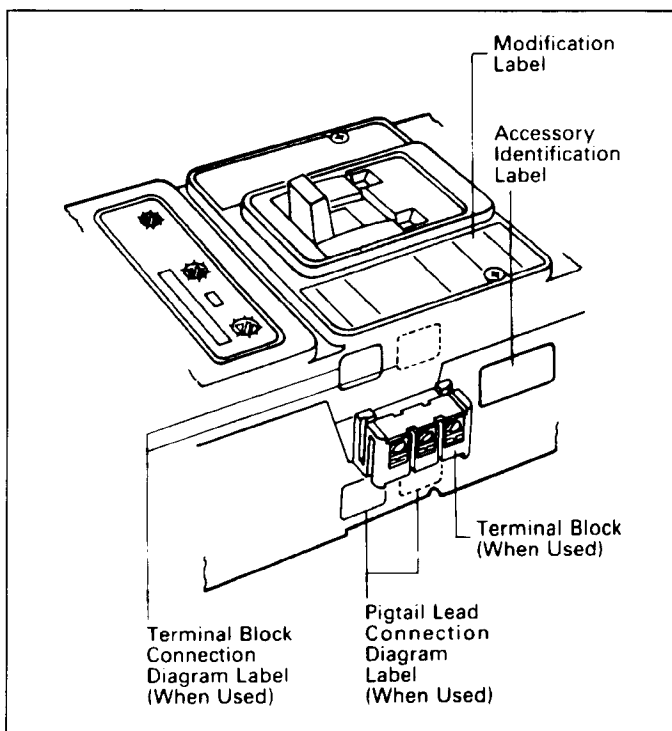


Fig. 2-11. Preferred Mounting Locations for Accessory Nameplate Labels

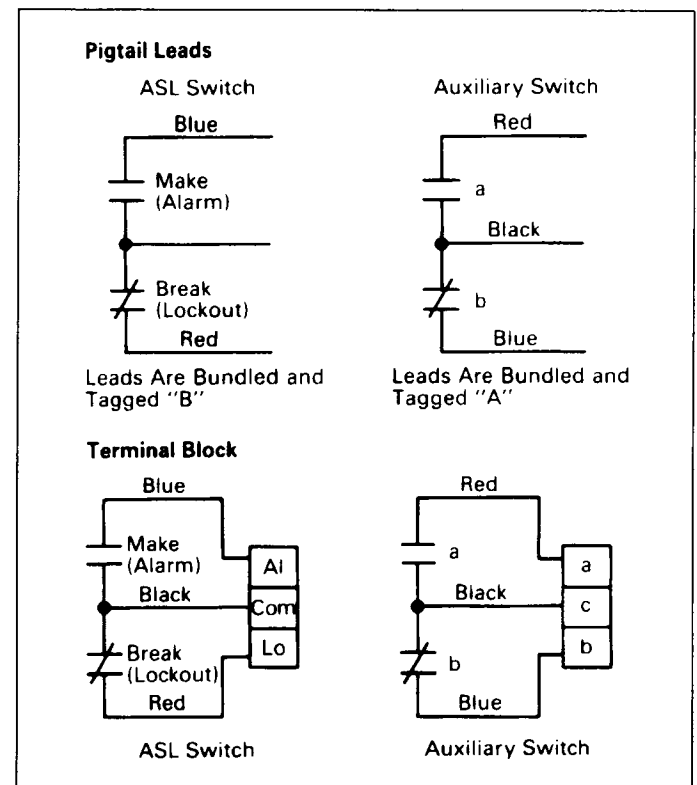


Fig. 2-12. Alarm (Signal) Lockout Switch — Auxiliary Switch Connection Diagram

- b. Circuit breaker handle ON — Check that make contact(s) are open and break contact(s) are closed.
- c. Press PUSH-TO-TRIP button — Check that make contact(s) are closed and break contact(s) are open.
- d. If ASL switch fails test, make sure that module is properly seated in trip unit slots. If problem persists, contact Cutler-Hammer.

2-18. Test auxiliary switch (when supplied). Connect continuity tester or ohmmeter across pigtail leads or terminal block connections. Check continuity as follows:

- a. Circuit breaker handle OFF —  
 "a" contact - open  
 "b" contact - closed.
- b. Circuit breaker handle ON —  
 "a" contact - closed  
 "b" contact - open.

- c. Press PUSH-TO-TRIP button —  
“a” contact - open  
“b” contact - closed.
- d. If auxiliary switch fails test, make sure that module is properly seated in trip unit slots. If problem persists, contact Cutler-Hammer.

2-19. Install circuit breaker.

2-20. Connect accessory leads as required.  
(See Fig. 2-12.)

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

**Cutler-Hammer**

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