



## Installation Instructions for Alarm (Signal)/ Lockout Switch and Alarm (Signal)/ Lockout Switch and Auxiliary Switch Combination for F-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

Several combinations of the alarm (signal)/lockout switch (ASL switch) and auxiliary switch are available. One or two ASL switches, or an ASL switch and auxiliary switch combination (see Fig. 1-1), can be mounted in a plug-in module for installation in the accessory mounting cavities of a motor circuit protector (HMCP). In an ASL switch-auxiliary switch combination, the ASL switch is always mounted in the plug-in module next to the HMCP operating mechanism.

The ASL switch (Fig. 1-1) provides remote signaling and interlocking when the HMCP trips, and consists of one or two single-pole double-throw (SPDT) switches. Each SPDT switch has a make (alarm) and a break (lockout)

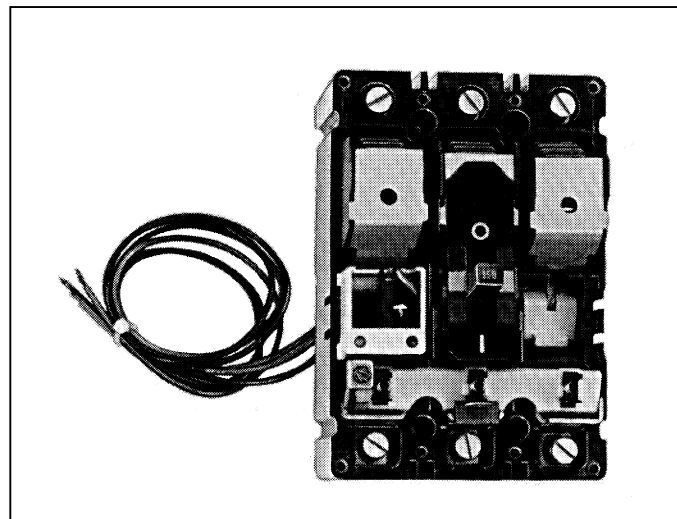


Fig. 1-1. Alarm (Signal)/Lockout Switch Installed in F-Frame Motor Circuit Protector (HMCP)

contact, and is mounted so that the switch actuator arm is controlled by the HMCP 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 HMCP is in the ON or OFF position, the cradle holds the make contact open and the break contact closed. When the HMCP is in the tripped position, the make contact is closed and the break contact is open. Any trip operation actuates the ASL switch.

The auxiliary switch provides circuit breaker contacts status and is used for remote signaling and system interlocking. Each SPDT switch has one "a" and one "b" contact. The plug-in module mounts in the accessory mounting cavity of the HMCP 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 the auxiliary switch.

**Table 1-1. Auxiliary Switch Electrical Rating Data** ①②③

Maximum Voltage (V)	Frequency	Maximum Current (A)	Dielectric Withstand Voltage (V)
600	50/60 Hz	6	
125	DC	0.5 ④	2500
250	DC	0.25 ④	2500

**Notes:**

- ① Endurance — 6000 electrical operations plus 4000 mechanical operations
- ② Pigtail wire size — No. 18 AWG (0.82 mm<sup>2</sup>)
- ③ Terminal block is approved 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 Noninductive 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 Selection Data 29-120F.

**Note: No more than three pigtail leads can be routed through the rear trough in the HMCP base. When the walking beam interlock is used with the HMCP, 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: For sealed HMCP, Underwriters Laboratories, Inc. UL489 requires that internal accessories be factory installed. The ASL switch and the auxiliary switch are listed only for factory installation under UL File E7819.**

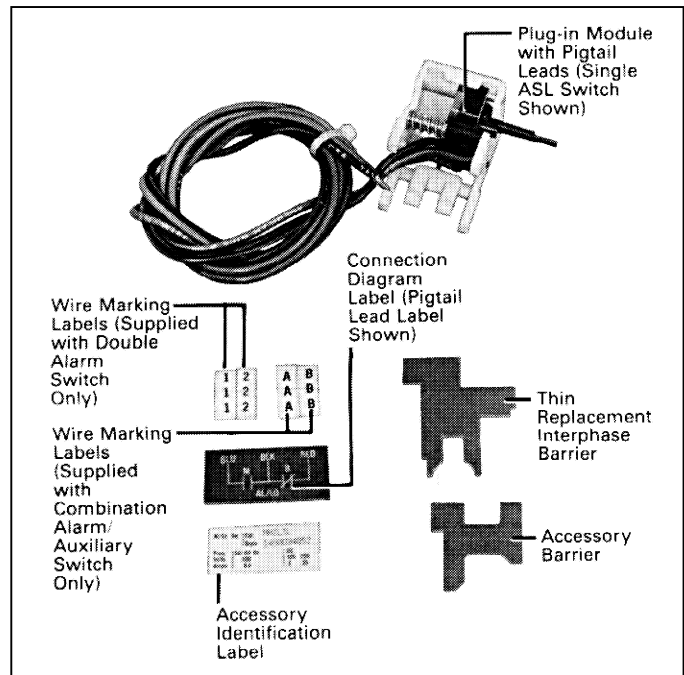


Fig. 2-1. Alarm (Signal)/Lockout Switch Kit

**Where local codes and standards permit and UL listing is not required, internal accessories can be field-installed. In this case, the UL listing mark must 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(ies) satisfies the job requirements.**

The ASL switch and accessory combination, as shown in kit form in Fig. 2-1, can be installed in the left or right accessory mounting cavity of a 3-pole HMCP. An ASL switch or accessory combination must be installed in a HMCP before the HMCP is mounted in an electrical system. Install the ASL switch or accessory combination, as follows:

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

Steps 2-1 through 2-7 and 2-10 through 2-16 are general installation procedures and apply to the ASL switch and the accessory combination. Step 2-8 covers installation of the ASL switch. Step 2-9 covers installation of the accessory combination.

## General Installation



### WARNING

**BEFORE REMOVING A HMCP INSTALLED IN AN ELECTRICAL SYSTEM, MAKE SURE THE HMCP 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.**

- 2-1. Switch HMCP to the OFF position.
- 2-2. Disconnect and remove circuit breaker from installation and terminal connections.
- 2-3. Remove eight cover screws and cover. The handle position must be in the OFF position if the HMCP has a cover interlock.



### CAUTION

**DURING INSTALLATION OF ACCESSORY, DO NOT PUT PRESSURE ON THE HMCP TRIP MECHANISM ADJUSTING BAR. UNDUE PRESSURE ON THE HMCP TRIP MECHANISM ADJUSTING BAR COULD CHANGE THE TRIP CHARACTERISTICS.**

**Note: For an accessory having rear or opposite-side exiting pigtail leads, thread leads through trough in side of base before attempting to install the accessory. Pigtail leads exiting in this manner must be eased through trough as accessory is inserted into mounting cavity.**

**Observe position of thin interphase barrier before it is removed. Replacement interphase barrier must be installed in the same slot after the accessory is installed.**

- 2-4. Press PUSH-TO-TRIP button below escutcheon to trip the operating mechanism.
- 2-5. Remove thin interphase barrier positioned between molded bearing and thick interphase barrier (Fig. 2-2).

**Note: When a double ASL switch is installed, the leads from the inner ASL switch must go to the trough in the base nearest the line end of the HMCP. The leads from the outer ASL switch must go to the trough nearest the load end of the HMCP.**

- 2-6. Route wiring to meet installation requirements (see Fig. 2-3).
- 2-7. Slide fiberglass barrier into position between molded crossbar (white) and trip bar (red). Long leg of barrier must go into angle in base molding (see Fig. 2-4).

### Alarm (Signal)/Lockout Switch Installation

- 2-8. Insert ASL switch as described in the following steps (see Fig. 2-5):
  - a. Slide ASL switch plug-in module slowly into mounting slots in base. Be sure ASL switch actuator arm is positioned next to the cradle (Fig. 2-6). For terminal block assemblies, slide terminal block into mounting slot in side of base as plug-in module is being positioned.
  - b. If required, complete routing of opposite-side exiting leads.
  - c. For double ASL switch with pigtail leads, attach wire marking labels to the bundle of three leads for each switch (Fig. 2-1).

### Accessory Combination Installation

**Note: When an accessory combination is installed, the leads from the inner accessory (ASL switch) must go through the slot nearest the line end of the HMCP. The leads from the outer accessory (auxiliary switch) must go through the slot nearest the load end of the HMCP.**

- 2-9. Install accessory combination switch as described in the following steps (see Fig. 2-7):

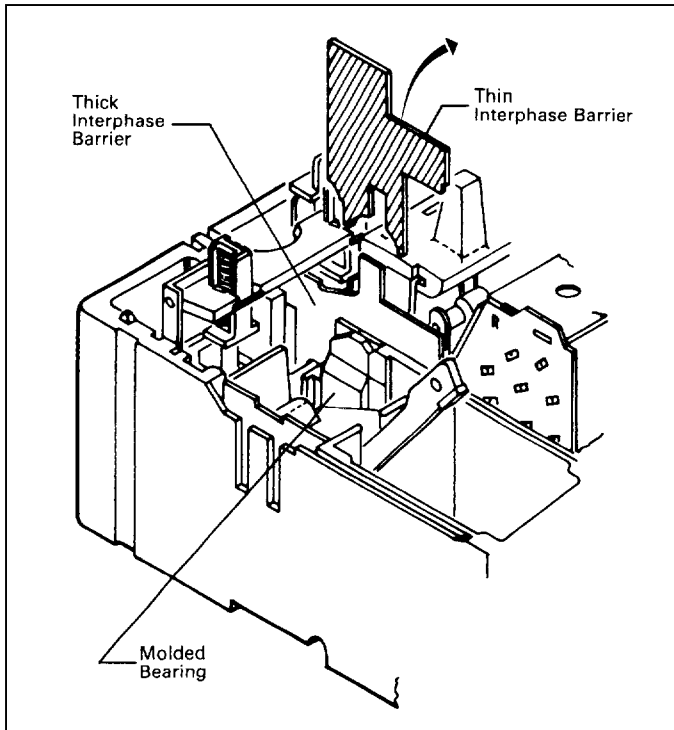


Fig. 2-2. Removal of Thin Interphase Barrier

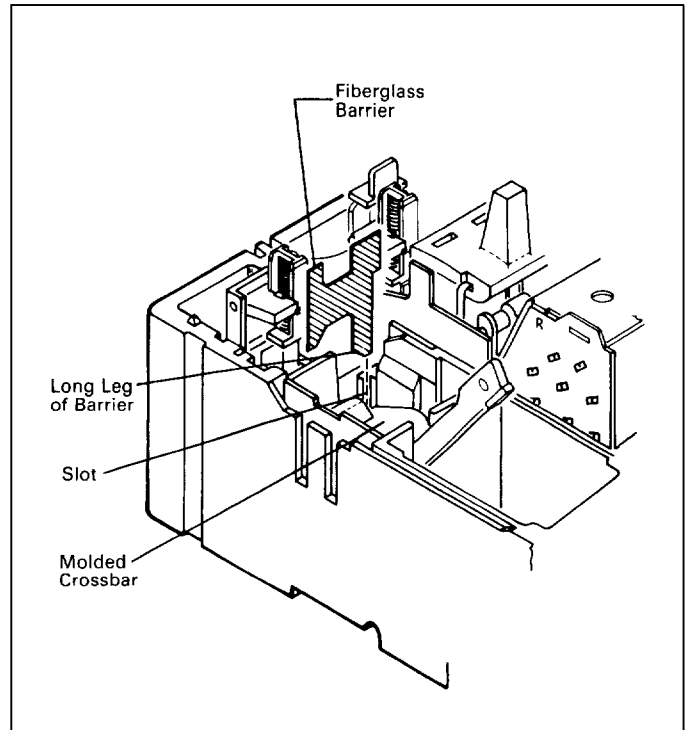


Fig. 2-4. Fiberglass Barrier Installation Position (Right Accessory Mounting Cavity Shown)

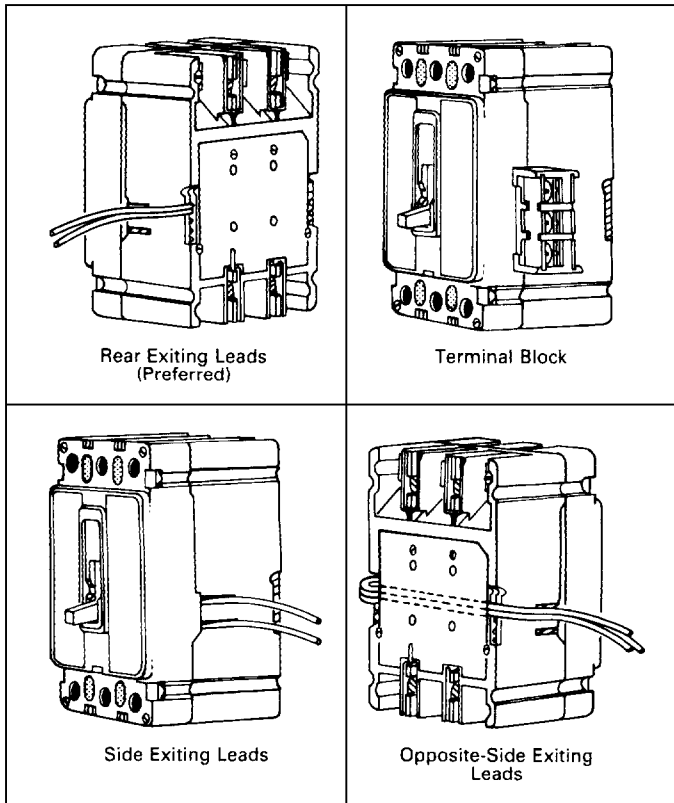


Fig. 2-3. Accessory Wiring Options

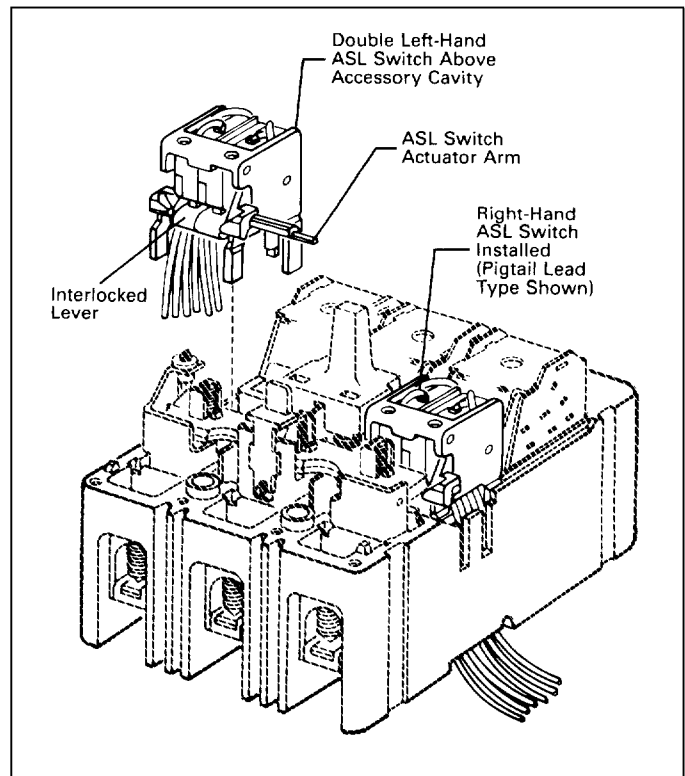


Fig. 2-5. Alarm (Signal)/Lockout Installation Positions

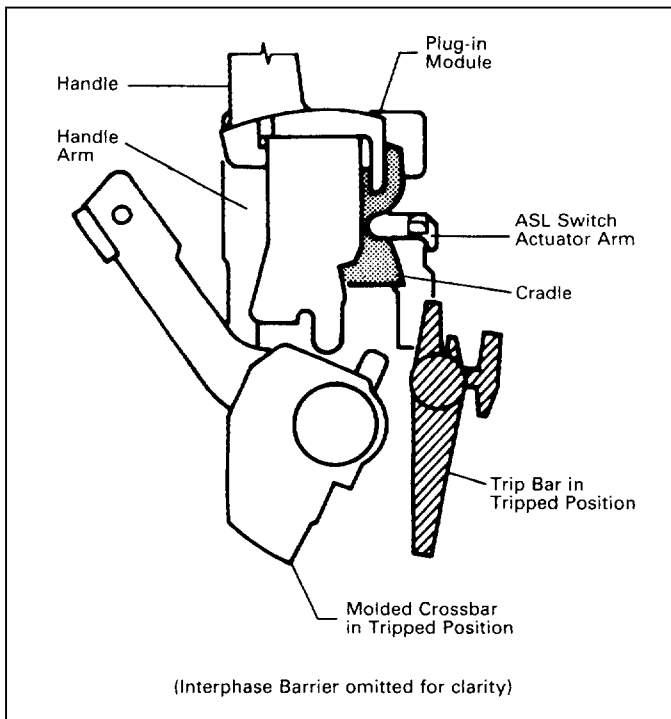


Fig. 2-6. Correct Position for ASL Switch Actuator Arm

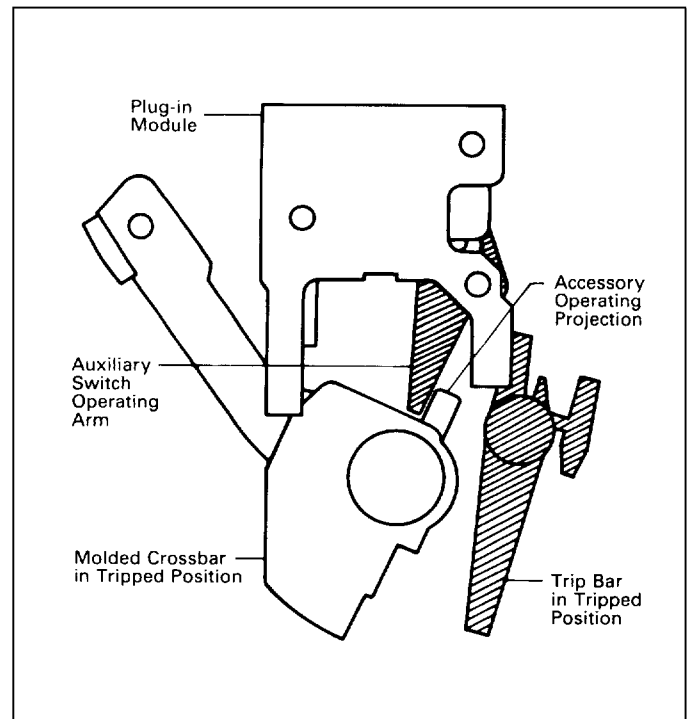


Fig. 2-8. Correct Position for Auxiliary Switch Operating Arm

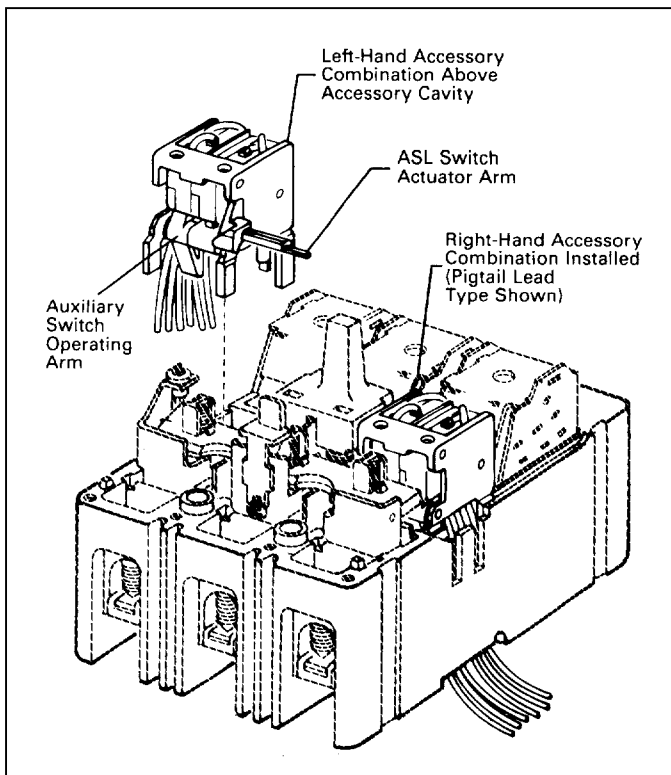


Fig. 2-7. Accessory Combination Installation Positions

- a. Slide accessory combination plug-in module into mounting slots in base. Be sure that ASL switch actuator arm is positioned next to the cradle (Fig. 2-6) and auxiliary switch operating arm is between the accessory operating projection on the molded crossbar and the arc extinguisher (see Fig. 2-8). For terminal block assemblies, slide terminal block into mounting slot on side of base as accessory combination is being positioned.
- b. If required, complete routing of opposite-side exiting leads.
- c. Attach wire marking labels ('A' for auxiliary switch, 'B' for ASL switch) to the bundle of three leads for each switch (Fig. 2-1).

**General Installation**

**Note:** When installing replacement interphase barrier after the accessory(ies) make sure the thick interphase barrier remains in position in the HMCP base mounting slots and rests on the molded crossbar. (See Fig. 2-2.)

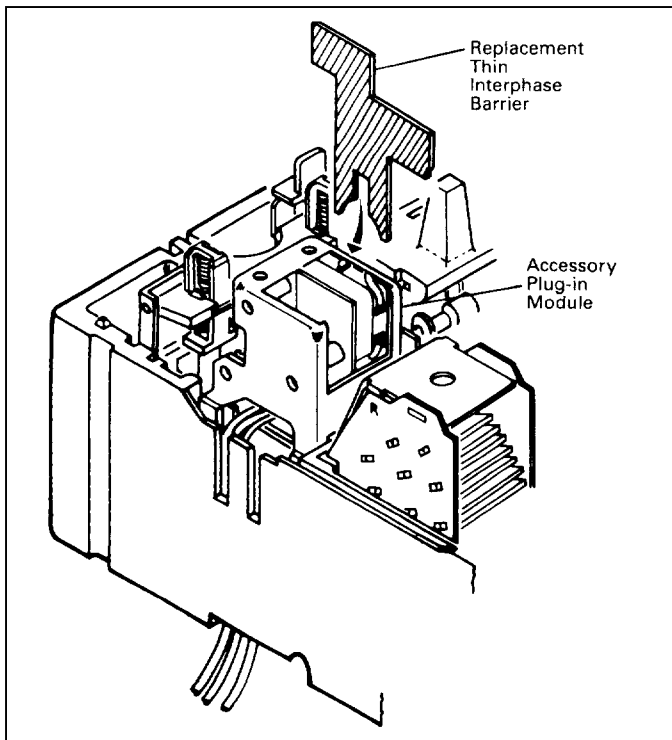


Fig. 2-9. Interphase Barrier Installation

- a. Slide thin replacement interphase barrier into position between thick interphase barrier and molded bearing. (See Fig. 2-9.)



## CAUTION

**WHEN INSTALLING THE HMCP COVER, MAKE SURE THAT ALL INTERNAL PARTS ARE IN PLACE:**

- **TOP SHIELDS OF EACH ARC EXTINGUISHER ARE IN THE ARC EXTINGUISHER CAVITIES:**
- **INTERPHASE BARRIER IS FULLY INSERTED IN BASE:**
- **SLIDING HANDLE BARRIER IS CORRECTLY INSTALLED WITH O ON BARRIER OVER ARC EXTINGUISHER:**
- **PUSH-TO-TRIP BUTTON GOES THROUGH HOLE IN COVER:**
- **COVER BAFFLE(S) IN PLACE IN COVER:**
- **PIGTAIL LEADS ARE IN BASE SLOTS AND CLEAR OF THE COVER:**

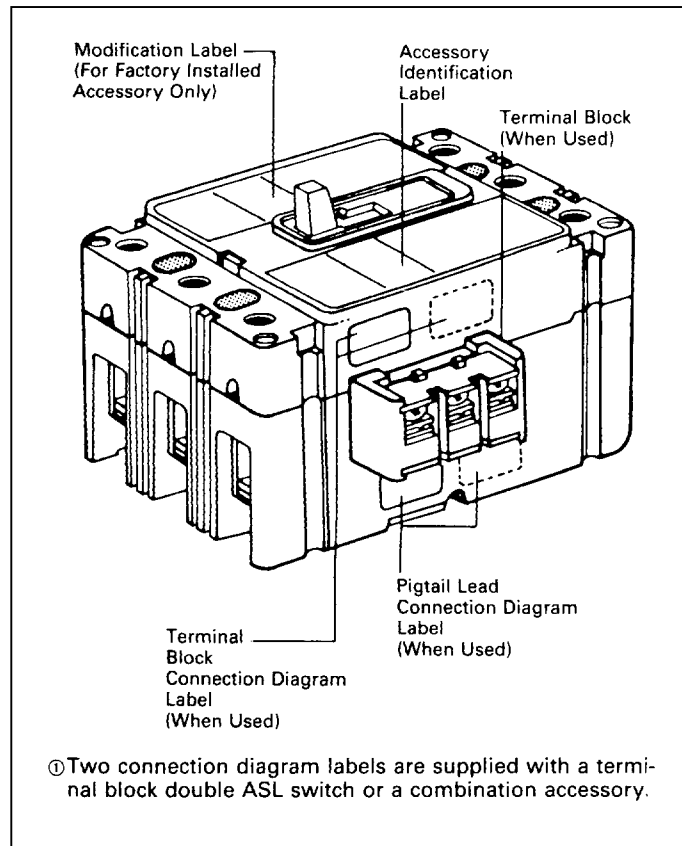


Fig. 2-10. Preferred Mounting Locations for Accessory Labels

- 2-10. With HMCP handle in the OFF position and pigtail leads routed as required, install cover and eight cover screws. Start reinstallation of the cover screws carefully to avoid cutting new threads in the base. The cover screw torque value is 12-15 lb-in.
- 2-11. When accessory is installed at a non-UL approved location, remove and discard UL listing mark.

**Note: When installing accessory(ies) in HMCPs with cover mounted accessories, alternate label mounting positions on side of HMCP should be selected.**

- 2-12. Place labels supplied with kit on HMCP. (See Fig. 2-10.)

**Note: Labels on HMCP show connection diagram for ASL switch contacts and auxiliary switch. Pigtail leads are color coded red, black, and blue.**

2-13. Test ASL switch(es). Connect continuity tester or ohmmeter across pigtail leads or terminal block connections. Check continuity as follows:

- a. HMCP handle OFF  
 "Make" contacts — open  
 "Break" contacts — closed
- b. HMCP handle ON  
 "Make" contacts — open  
 "Break" contacts — closed
- c. Press PUSH-TO-TRIP button  
 "Make" contacts — closed  
 "Break" contacts — open

2-14. Test auxiliary switch (when supplied). Connect continuity tester or ohmmeter across pigtail leads or terminal block connections. Check continuity as follows:

- a. HMCP handle OFF —  
 "a" contact(s) — open  
 "b" contact(s) — closed.
- b. HMCP handle ON —  
 "a" contact(s) — closed  
 "b" contact(s) — open.
- c. Press PUSH-TO-TRIP button —  
 "a" contact(s) — open  
 "b" contact(s) — closed.

2-15. Install HMCP.

2-16. Connect accessory leads as required (see Fig. 2-11).

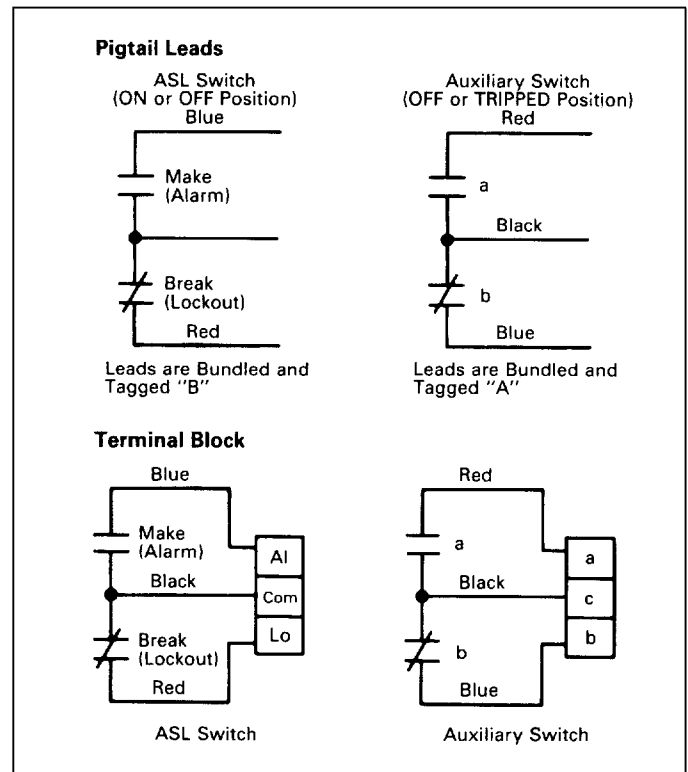


Fig. 2-11. Alarm (Signal)/Lockout Switch and Auxiliary Switch Connection Diagram

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

**Cutler-Hammer**

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