



## Installation Instructions for Alarm (Signal)/Lockout Switch and Auxiliary Switch Combination for LDB, LD, HLD, LW, HLW, LWC Circuit Breakers, Series C Molded 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 judgment, 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 instruction.

### 1.0 INTRODUCTION

#### *General Information*

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

- One or two ASL switches
- One auxiliary switch and one ASL switch
- Two Auxiliary switches 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 switch has a make (alarm) and a break (lockout) contact; it is



*Figure 1-1 Alarm (Signal)/ Lockout Switch Installed in L-Frame Circuit Breaker*

mounted so that the switch actuator arm is controlled by the circuit breaker operating mechanism cradle.

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(es) 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 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. When the crossbar is in the contact-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.

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, 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 29-120L.

**NOTICE**

**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).

*Table 1.1 Alarm (Signal)/Lockout and Auxiliary Switch Electrical Rating Data ①②③*

Maximum Voltage (V)	Freq	Maximum Current (A)	Dielectric Withstand Voltage (V)
600	50/60 Hz	6	2500
125	DC	0.5④	
250	DC	0.25④	

- ① Endurance - 400 electrical operations plus 5600 mechanical operations
- ② Pigtail wire size - No. 18 AWG (0.82 mm)
- ③ Terminal block is listed for use with one or two No. 18 to No. 14 AWG solid or stranded copper wires.
- ④ Non-inductive load

**2.0 INSTALLATION**

**NOTICE**

**The ASL switch(es) accessory combination can be field-installed in LD, HLD, LDC, circuit breakers under UL File E64983.**

**The ASL switch(es) and accessory combination can be field-installed in LW, HLW, and LWC circuit breakers.**

**The ASL switch(es) and accessory combination are 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 ASL switch and 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 sealed circuit breakers. In this case, UL listing becomes invalid and the label should be removed.**

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

The ASL switch (shown in kit form in Figure 2-1) and accessory combination, 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:

**NOTICE**

**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**

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.

**NOTICE**

Steps 2-1 through 2-8 and 2-11 through 2-17 are for general installation and apply to the ASL switch and the accessory combination. Step 2-9 covers installation of the accessory combination.

For new circuit breaker installation, the trip unit must be installed in circuit breaker before attempting to install an ASL switch or accessory combination. Refer to I.L. 29C607, I.L. 29C608, I.L. 29C609 or I.L. 29C610 for instructions on how to install trip unit.

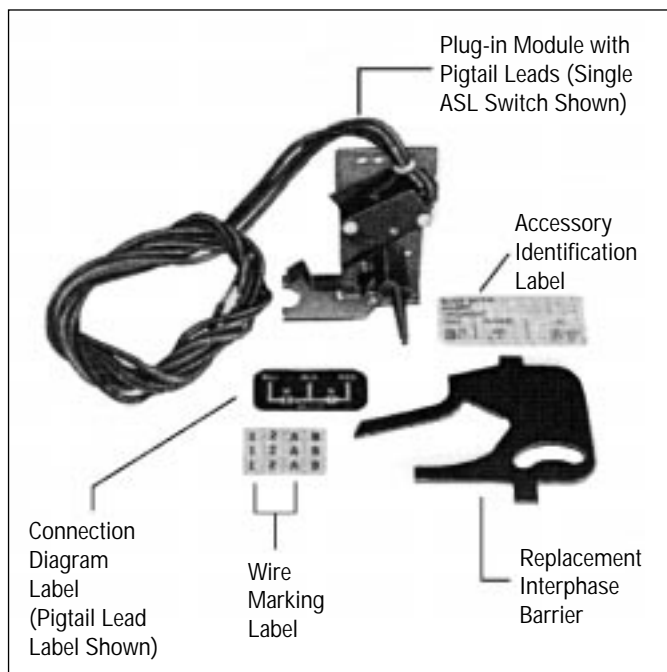


Figure 2-1 Alarm (Signal)/Lockout Switch Kit

- 2-1. Switch circuit breaker to OFF position.

**NOTICE**

**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. 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.

**NOTICE**

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

- 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 (Figure 2-4). Push a fine point implement in one hole to trip the molded case switch.
- 2-6. Remove interphase barrier between center pole and pole in which accessory is to be mounted (Figure 2-2).
- 2-7. Install replacement interphase barrier (supplied with kit) in base (Figure 2-2).

**NOTICE**

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

- 2-8. Route wiring to meet installation requirements (see Figure 2-3).

**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.**

**NOTICE**

**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 or triple combination, leads from the outer accessory switch must go to center trough.**

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

- 2-9. Insert the ASL switch as described in the following steps:
- a. Remove barrier from trip unit accessory mounting slots in pole being used for accessory (Figure 2-4).
  - b. Put tip of actuator arm through slot in interphase barrier and under cradle extension (see Figure 2-5).
  - c. Turn ASL switch mounting bracket to line up with slots in trip unit.
  - d. Slide ASL switch mounting bracket into slots until retaining clip snaps into trip unit. For terminal block assemblies, slide terminal block into mounting slot on side of base as plug-in module is being positioned.
  - e. If required, complete routing of leads to opposite side through rear wiring trough.
  - f. 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.)
  - g. For ASL/auxiliary switch accessory combinations with pigtail leads, attach wire marking labels to bundle of three leads for each switch. (Markers designated A, B and C are provided if required.)

**Accessory Combination Installation**

- 2-10. Install accessory combination switch as described in the following steps:
- a. Remove barrier from trip unit accessory mounting slots in pole being used for accessory (Figure 2-4).
  - b. Put tip of ASL switch actuator arm through slot in interphase barrier and under cradle extension.
  - c. Turn accessory combination mounting bracket to line up with slots in trip unit.
  - d. Slide accessory combination mounting bracket into slots until retaining clip snaps into trip unit. For terminal block assemblies, slide terminal block into mounting slot on side of base as accessory combination is being positioned.
  - e. If required, complete routing of leads to opposite side through rear wiring trough.
  - f. For double auxiliary switch pigtail leads, attach wire marking labels to bundle of three leads for each switch. (Markers designated 1 and 2 are provided if required.)

**General Installation****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.**
- 2-11. With circuit breaker handle in TRIPPED position and accessory pigtail leads (if used) routed as required, install circuit breaker covers. Secure with pan-head cover screws. Torque to 20-22 lb-in. (2.26-2.46 N.m.).
- 2-12. Remove and discard UL listing label on LDB circuit breakers only.

- 2-13. Place accessory labels (supplied with kit) on circuit breaker (Figure 2-7).

## NOTICE

**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 accessory terminal marking label is attached correctly to leads and agrees with related leads at accessory.**

- 2-14. Test ASL switch(es) by connecting continuity tester or ohmmeter across pigtail leads or terminal block connections. Check continuity as follows:
- Circuit breaker handle OFF -  
Check that make contact(s) are open and break contact(s) are closed.
  - Circuit breaker handle ON -  
Check that make contact(s) are open and breaker contact(s) are closed.

## NOTICE

**For molded case switch circuit breakers, omit step c.**

- Press PUSH-TO-TRIP button -  
Check that make contact(s) are closed and break contact(s) are open.
  - If ASL switch(es) fails test, make sure that module is properly seated in trip unit slots. If problem persists, contact Cutler-Hammer.
- 2-15. Test auxiliary switch(es) (when supplied). Connect continuity tester or ohmmeter across pigtail leads or terminal block connections. Check continuity as follows:
- Circuit breaker handle OFF -  
"a" contact(s) - open  
"b" contact(s) - closed.
  - Circuit breaker handle ON -  
"a" contact(s) - closed  
"b" contact(s) - open

## NOTICE

**For molded case switches, omit step c.**

- Press PUSH-TO-TRIP button -  
"a" contact(s) - open  
"b" contact(s) - closed no continuity.
  - If auxiliary switch(es) fails test, make sure that auxiliary switch(es) module is properly seated in trip unit slots. If auxiliary switch(es) appears to be correctly installed and the problem persists, contact Cutler-Hammer.
- 2-16. Install circuit breaker.
- 2-17. Connect accessory leads as required (see Figure 2-7).

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

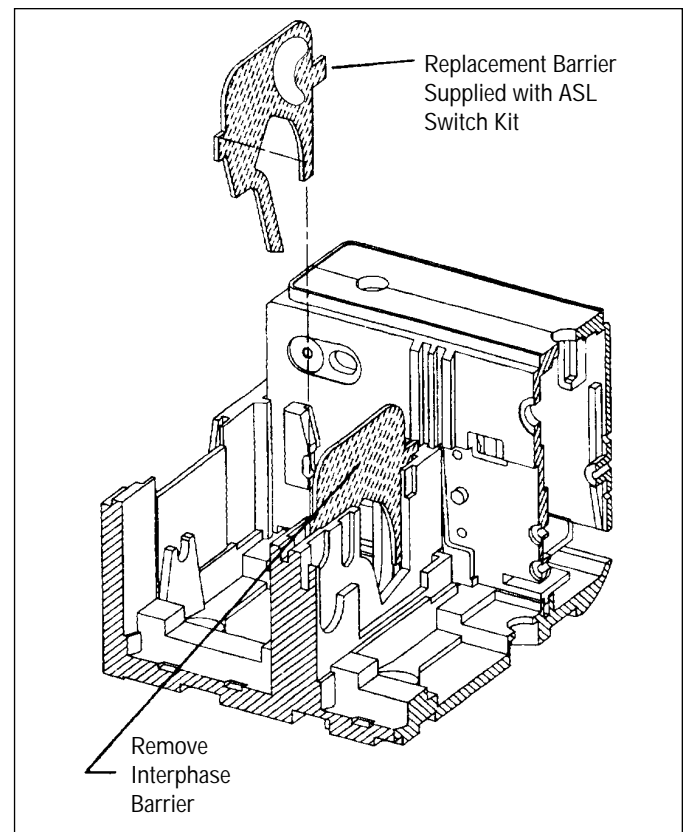


Figure 2-2 Interphase Barrier Replacement

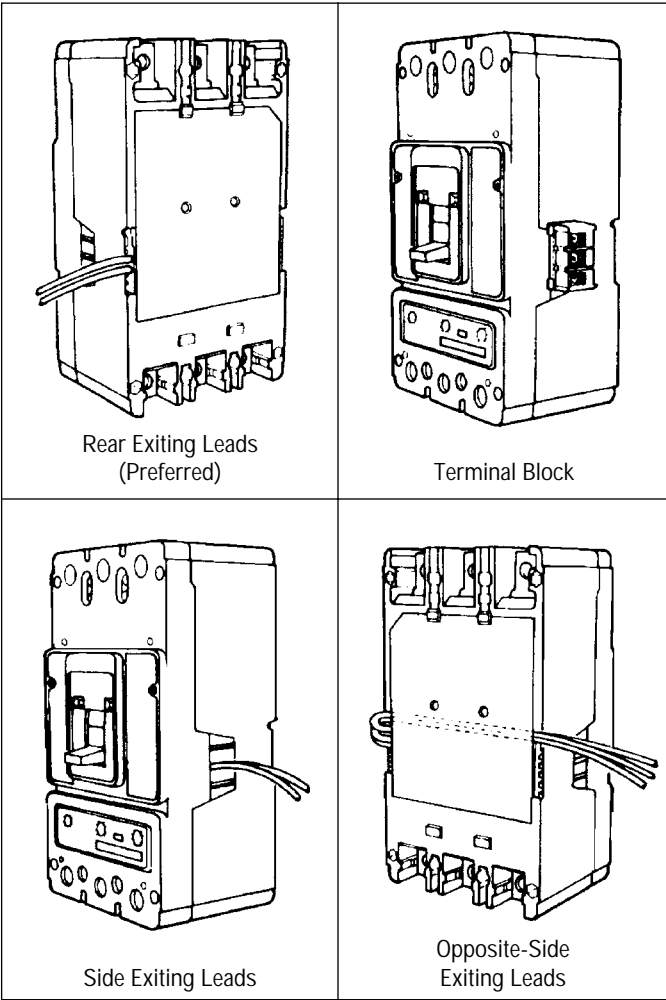


Figure 2-3 Accessory Wiring Options

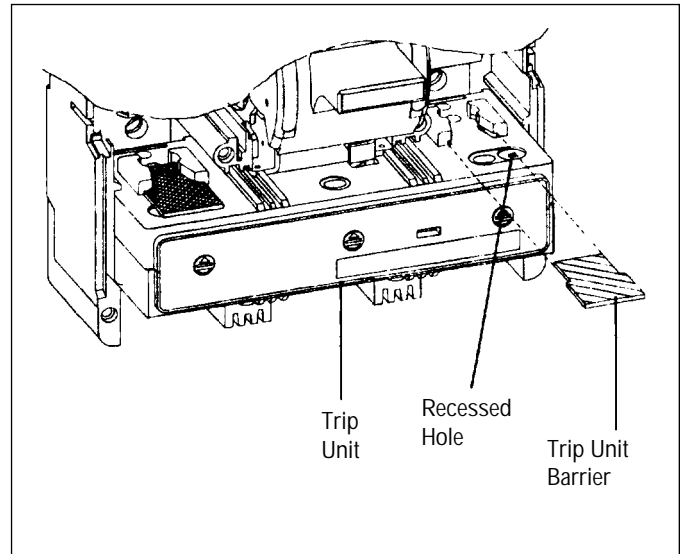


Figure 2-4 Trip Unit Barrier Removal

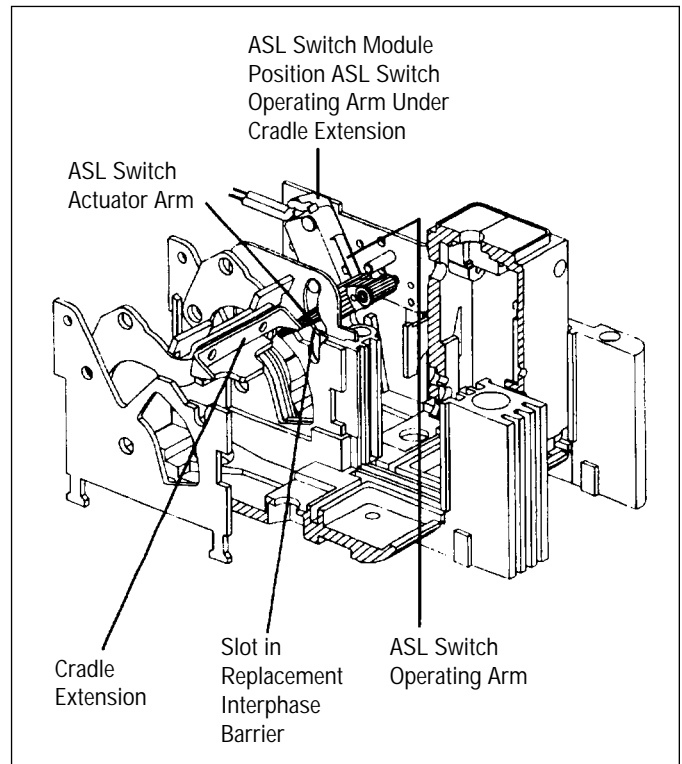


Figure 2-5 Alarm (Signal)/ Lockout Switch Installation

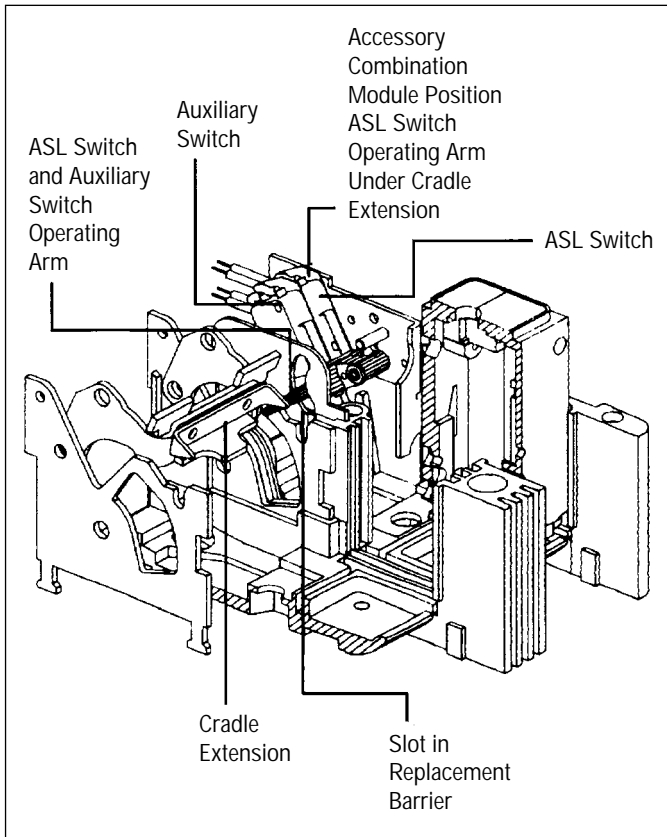


Figure 2-6 Accessory Combination Installation

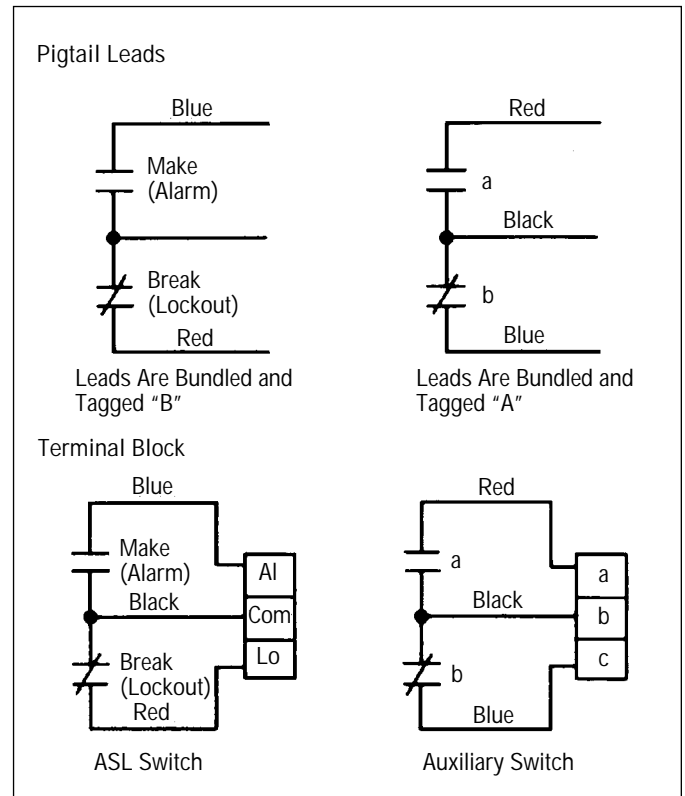


Figure 2-8 Alarm (Signal)/Lockout Switch - Auxiliary Switch Connection Diagram

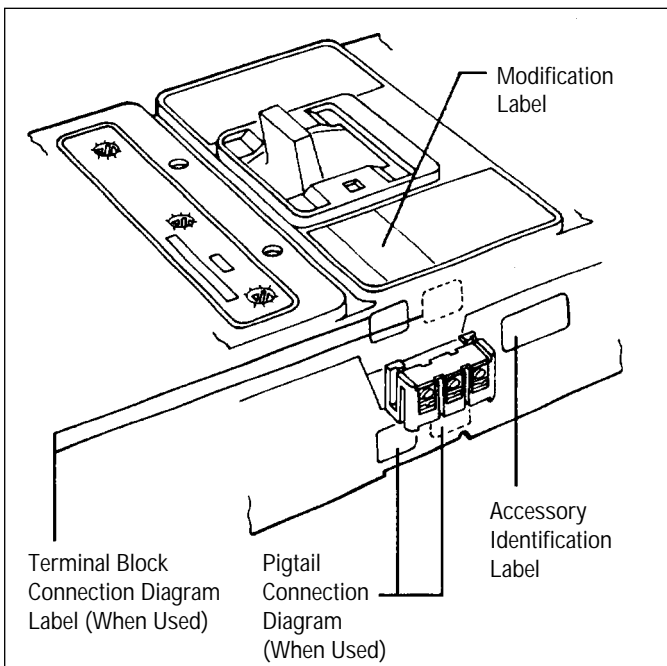


Figure 2-7 Preferred Mounting Locations for Accessory Nameplate Labels

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