Installation Instructions for Alarm (Signal)/Lockout Switch and Alarm (Signal)/ Lockout Switch and Auxiliary Switch Combination for Cutler-Hammer EHD, FDB, FD, HFD, FDC, FW, HFW, FWC Circuit Breakers and Molded Case Switches

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 can be mounted in a plug-in module for installation in the accessory mounting cavities of a circuit breaker. In an ASL switch-auxiliary switch combination, the ASL switch is always mounted in the plug-in module next to the circuit breaker operating mechanism.

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

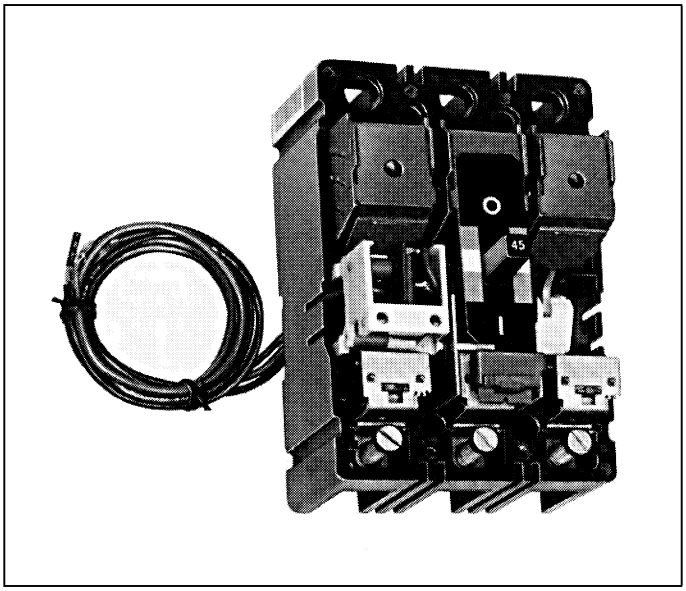

Fig. 1-1. Alarm (Signal)/Lockout Switch Installed in F-Frame Circuit Breaker

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 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 the auxiliary switch.

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	0.5 ④	
250	DC	0.25 ④	

① Endurance - 400 electrical operations plus 4000 mechanical operations

② Pigtail wire size - No. 18 AWG (0.82 mm^2)

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 Selection Data 29-120F.

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: For sealed circuit breakers, 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.

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 right accessory mounting cavity of a 2-pole circuit breaker, in the left or right cavity of a 3-pole circuit breaker, and in the left cavity only of a 4-pole circuit breaker. An ASL switch or accessory combination must be installed in a circuit breaker before the circuit breaker is mounted in an electrical system. Install the ASL switch or accessory combination, as follows:

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 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 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.

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

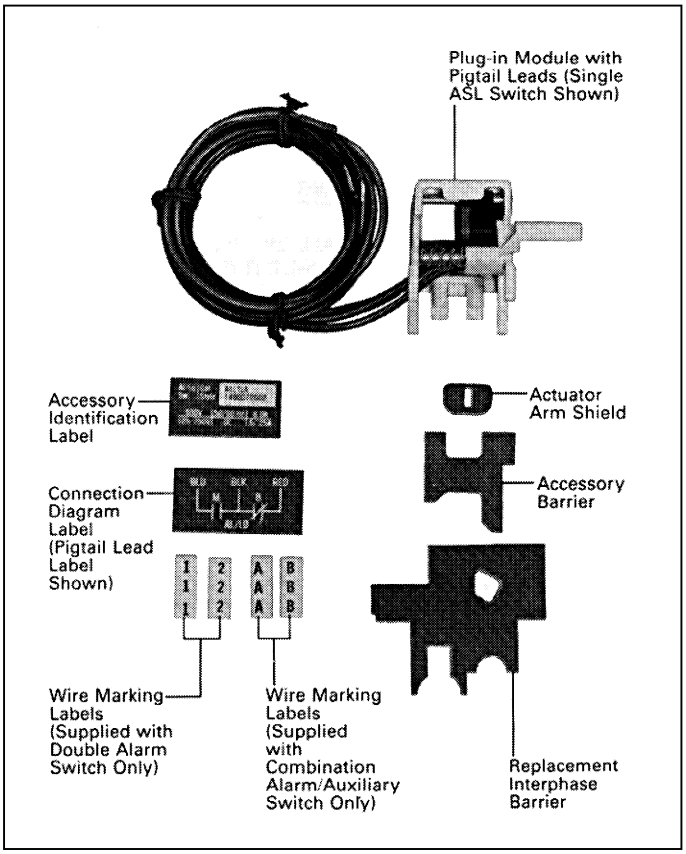

Fig. 2-1. Alarm (Signal)/Lockout Switch Kit

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

2-3. Remove eight cover screws and cover. (The EHD and FDB circuit breakers may have only 4 screws.) The handle must be in the OFF position if the circuit breaker has a cover interlock.

CAUTION

DURING INSTALLATION OF ACCESSORY, DO NOT TOUCH THE CIRCUIT BREAKER CALIBRATED TRIP MECHANISM. CONTACT WITH THE CALIBRATED TRIP MECHANISM 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.

2-4. Press PUSH-TO-TRIP button below escutcheon to trip the operating mechanism.

2-5. Remove interphase barrier between accessory mounting cavity and operating mechanism.

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

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

2-7. Slide accessory barrier into position between molded crossbar and trip bar. Long leg of barrier must go into slot in base (see Fig. 2-3).

Alarm (Signal)/Lockout Switch Installation

2-8. Insert ASL switch as described in the following steps:

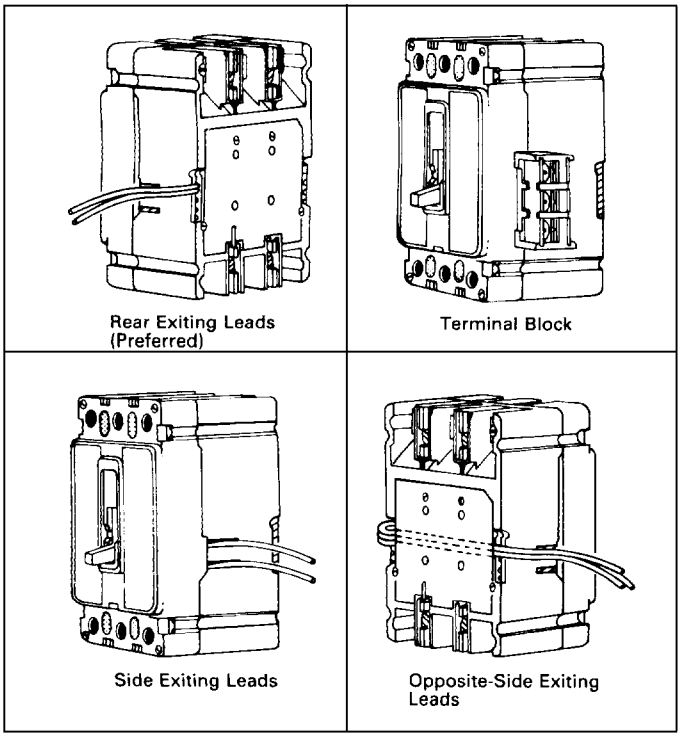

Fig. 2-2. Accessory Wiring Options

a. Put shield on ASL switch actuator arm. (See Fig. 2-4.)

b. Put tip of ASL switch actuator arm through opening in replacement interphase barrier.

c. Slide ASL switch plug-in module and replacement interphase barrier slowly into mounting slots in base. Be sure ASL switch actuator arm is positioned next to the cradle. For terminal block assemblies, slide terminal block into mounting slot in side of base as plug-in module is being positioned.

d. If required, complete routing of opposite-side exiting leads.

e. For double ASL switch with pigtail leads, attach wire marking labels (Fig. 2-1) to the bundle of 3 leads for each switch.

Accessory Combination Installation

Note: When an accessory combination with pigtail leads is installed, the leads from the inner accessory (ASL switch) must go through the trough nearest the line end of the circuit breaker. The leads from the outer accessory (auxiliary switch) must go through the trough nearest the load end of the circuit breaker.

2-9. Install accessory combination switch as described in steps 2-8a and b, and the following steps (see Fig. 2-7):

a. Slide accessory combination plug-in module into mounting slots in base. Replacement interphase barrier must also slide into slots in base. Be sure that ASL switch actuator arm is positioned next to the cradle (see 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 (Fig. 2-1: "A" for auxiliary switch, "B" for ASL switch) to the bundle of 3 leads for each switch.

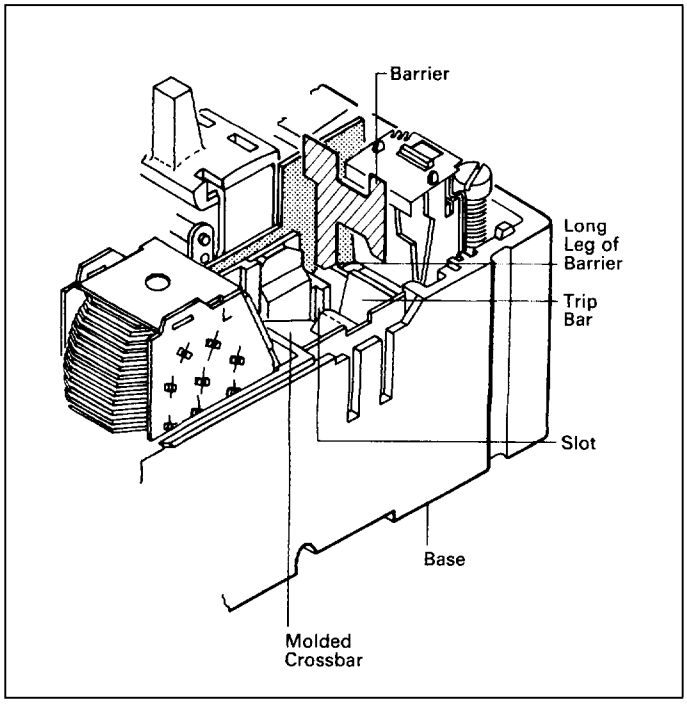

Fig. 2-3. Barrier Installation Position (Left Accessory Mounting Cavity Shown)

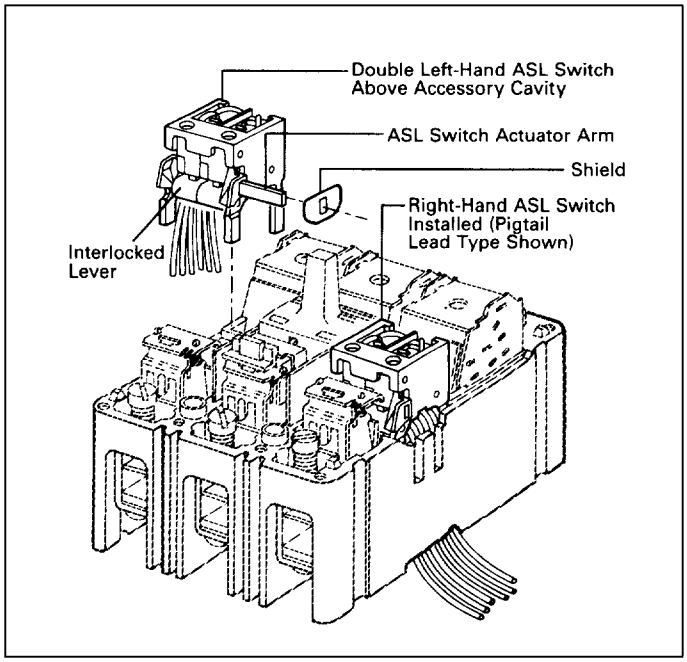

Fig. 2-4. Double Alarm (Signal)/Lockout Switch Installation Positions

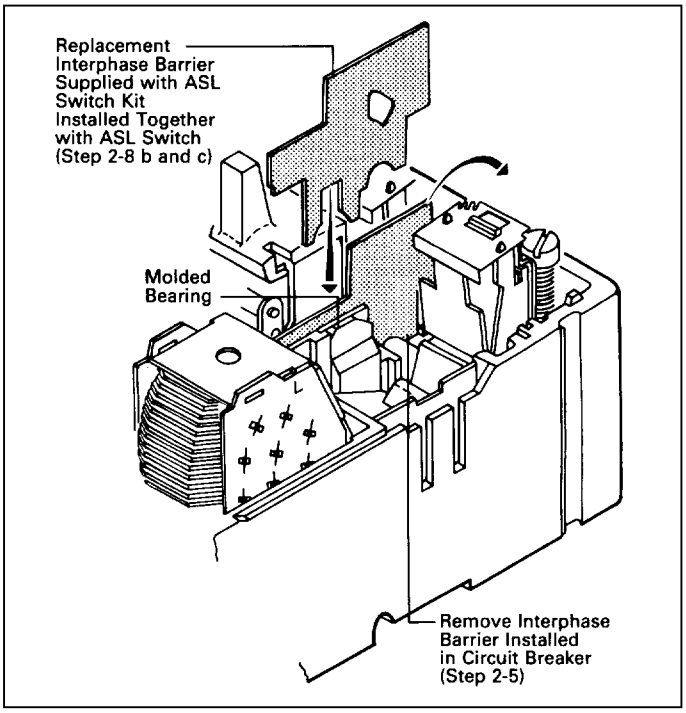

Fig. 2-5. Position of Interphase Barrier and Molded Bearing

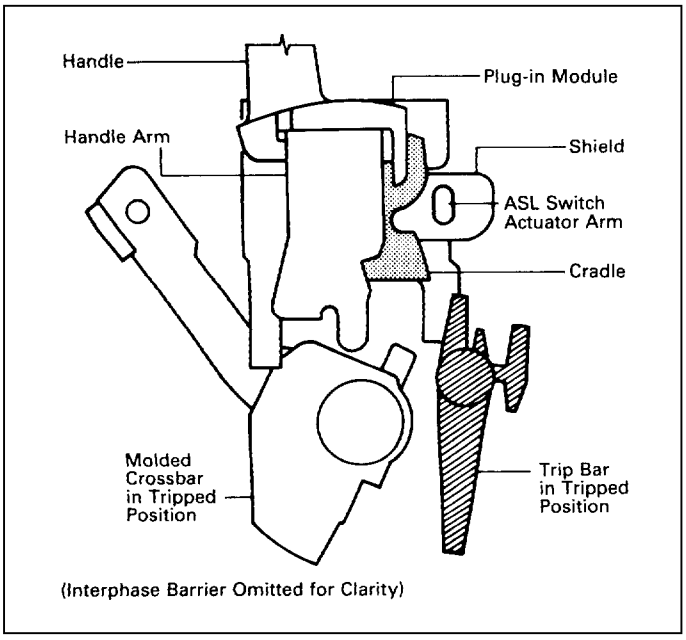

Fig. 2-6. Correct Position for ASL Switch Actuator Arm

General Installation

CAUTION

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

- **ARC EXTINGUISHERS ARE IN EACH ARC EXTINGUISHER CAVITY.**
- **INTERPHASE BARRIER IS FULLY INSERTED IN BASE.**
- **SLIDING HANDLE BARRIER IS CORRECTLY INSTALLED WITH *O* ON BARRIER OVER ARC EXTINGUISHER.**
- **PUSH-TO-TRIP BUTTON SHOULD BE GUIDED THROUGH HOLE IN COVER USING A SMALL SCREWDRIVER.**
- **COVER BAFFLE(S) IN PLACE IN COVER.**
- **PIGTAIL LEADS ARE CLEAR OF THE COVER.**

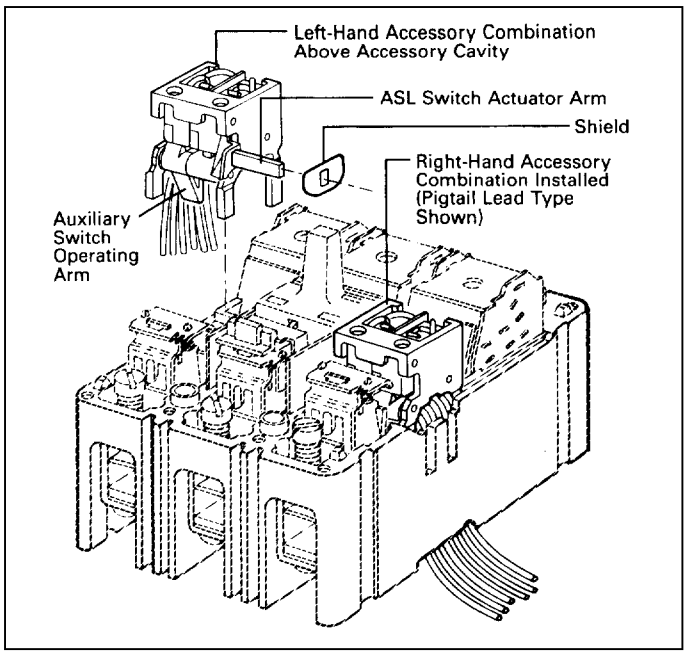

Fig. 2-7. Accessory Combination Installation Positions

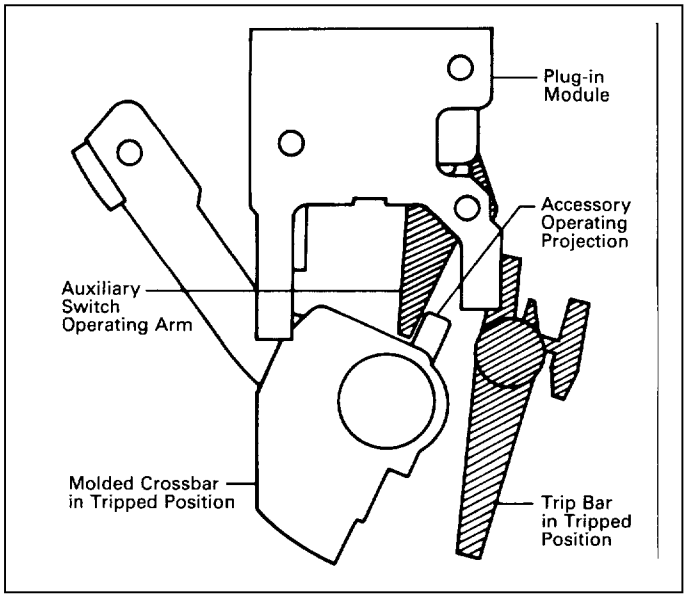

Fig. 2-8. Correct Position for Auxiliary Switch Operating Arm

2-10. With circuit breaker handle in the OFF position and pigtail leads (if used) routed as required, install circuit breaker cover and cover screws. Start reinstallation of the cover screws carefully to avoid cutting new threads in the base. The torque value for the cover screws is 12-15 lb-in.

2-11. When accessory is not factory installed, remove and discard UL listing mark.

Note: When installing shunt trip in 2-pole circuit breakers or circuit breakers with cover mounted accessories, alternate label mounting positions on side of circuit breaker should be selected.

2-12. Place labels supplied with kit on circuit breaker. (See Fig. 2-9.)

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

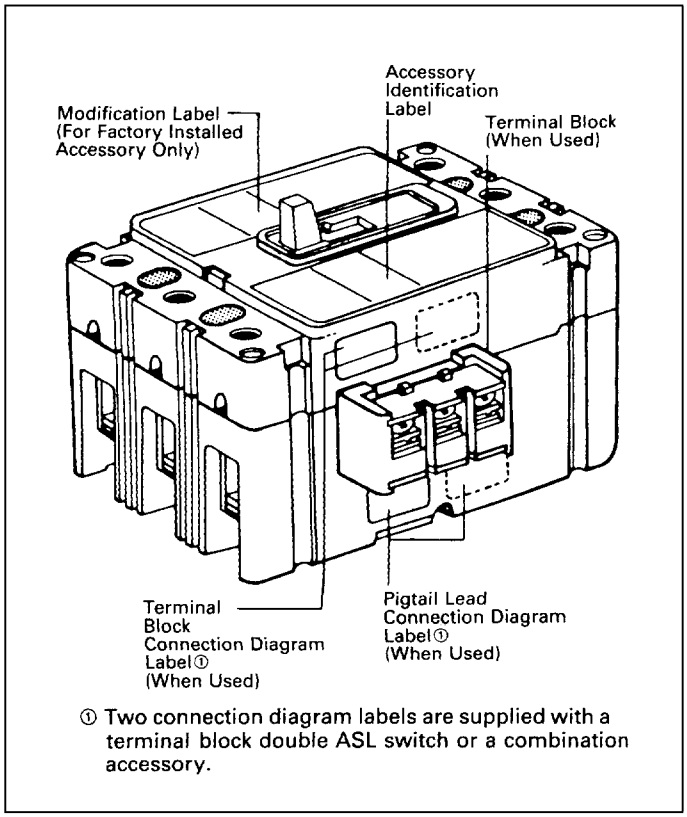

Fig. 2-9. Preferred Mounting Locations for Accessory Labels

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

a. Circuit breaker handle OFF
"Make" contacts - open
"Break" contacts - closed

b. Circuit breaker 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 (if supplied). 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.

c. Press PUSH-TO-TRIP button -
"a" contact(s) - open
"b" contact(s) - closed.

2-15. Install circuit breaker.

2-16. Connect accessory leads as required (see Fig. 2-10).

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

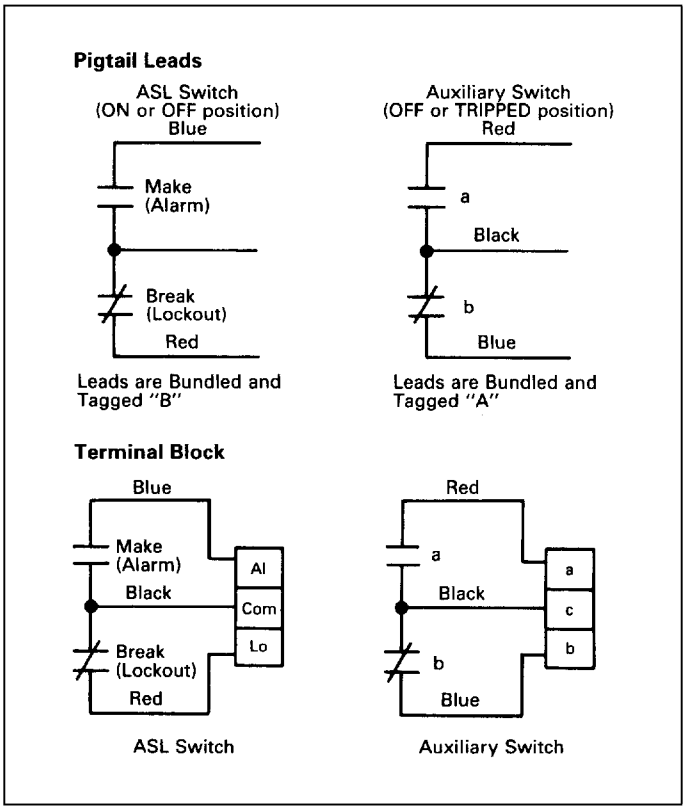

Fig. 2-10. Alarm (Signal)/Lockout Switch and Auxiliary Switch Connection Diagram

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