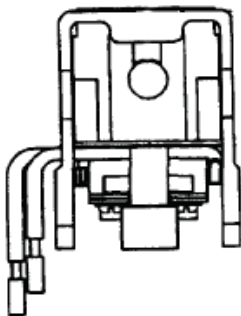


Installation Instructions for Shunt Trip for EHD, FDB, FD, HFD, FDC, FW, HFW, FWC Circuit Breakers, Molded Case Switches and F-Frame Motor Circuit Protectors (HMCP)



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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.

EATON 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 Eaton 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 Eaton for further information or instructions.

1. INTRODUCTION

General Information

The shunt trip (Fig. 1-1) provides remote controlled electrical tripping for the circuit breaker and consists of an intermittent rated solenoid with a tripping plunger and a cutoff switch mounted in a plug-in module. Shunt trip modules are mounted so that when the solenoid plunger retracts into the energized solenoid, the trip lever presses against the trip bar and trips the circuit breaker. As the circuit breaker trips, the accessory operating projection on the molded crossbar presses against the cutoff switch actuator arm to open the cutoff switch, disconnecting power to the solenoid and preventing coil burn out.

Table 1-1 lists application and electrical operating rating data for the shunt trip.

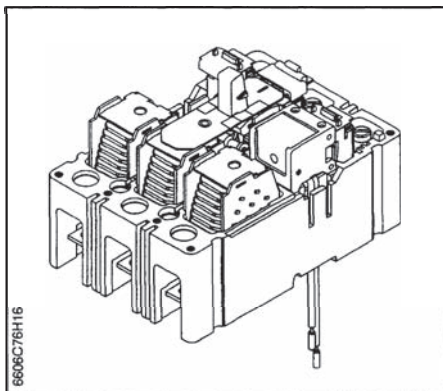


Fig. 1-1. Shunt Trip Installed in F-Frame Circuit Breaker.

Depending on the model ordered, connections for the shunt trip are in one of four forms. The standard wiring configuration is pigtail leads exiting the rear of the base directly behind the shunt trip. 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 shunt trip.

2. INSTALLATION

Note: For sealed circuit breakers, Underwriters Laboratories, Inc. UL489 requires that internal

Fig. 2-1. Shunt Trip Kit.

- 2-4. Reset the circuit breaker if tripped and switch the breaker ON.
- 2-5. Route wiring to meet installation requirements (see Fig. 2-2).
- 2-6. Insert shunt trip as described in the following steps (see Fig. 2-3):

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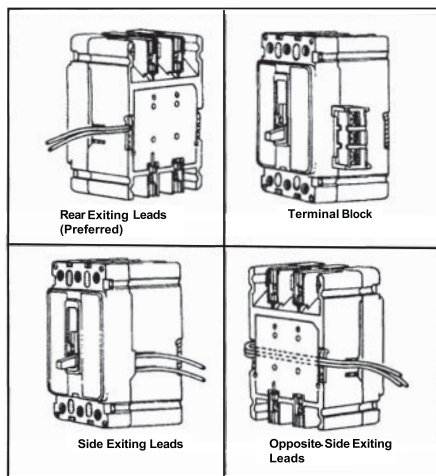


Fig. 2-2. Accessory Wiring Options.

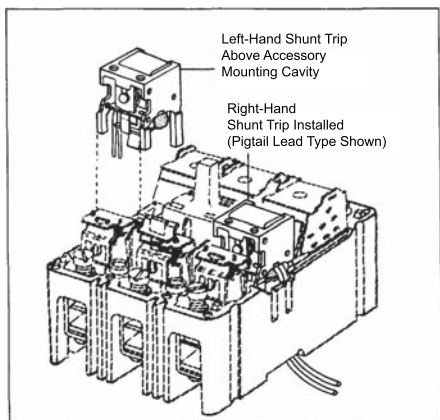


Fig. 2-3. Shunt Trip Installation Positions.

- a. Slide barrier into position between molded crossbar and trip bar. Long leg of barrier must go into slot in base (see Fig. 2-4).
- b. Slide shunt trip plug-in module into mounting slots in circuit breaker base.

Note: The circuit breaker must be in the ON position while inserting the shunt trip.

- c. End of switch actuator arm should be between crossbar and trip bar (see Fig. 2-5). 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.



WARNING

WHEN CHECKING THE ACCESSORY, DO NOT PUT FINGERS NEAR MOVING PARTS INSIDE THE CIRCUIT BREAKER CASE. SPRINGS CAUSE INTERNAL PARTS TO MOVE QUICKLY AND WITH FORCE. CONTACT WITH MOVING PARTS CAN CAUSE INJURY.

- 2-7. Perform a mechanical check of the shunt trip after installation:
 - a. With the circuit breaker still electrically isolated, hold shunt trip plug-in module in position and reset the circuit breaker.
 - b. Hold accessory in position. Using a small flat-blade screwdriver, push in on solenoid plunger (see Fig. 2-6). Circuit breaker should move to the trip position.
 - c. If mechanical check does not trip the circuit breaker, confirm that the shunt trip is correctly installed. If the shunt trip appears to be correctly installed and the problem persists, contact Eaton.

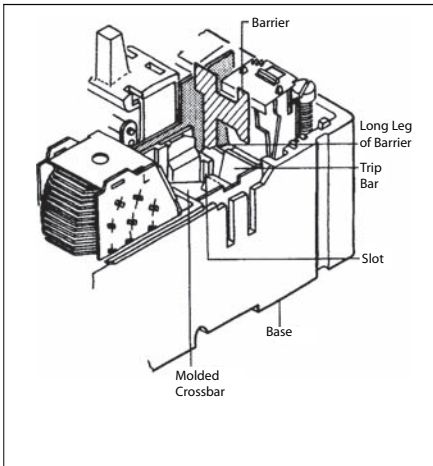


Fig. 2-4. Barrier Installation Position.

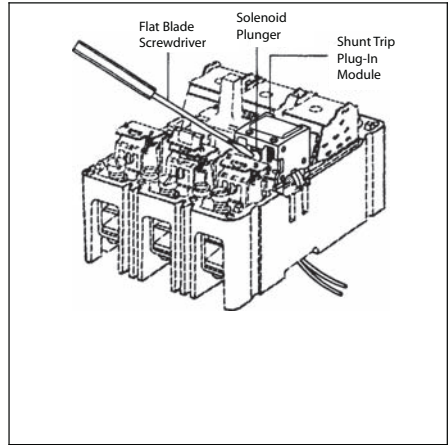


Fig. 2-6. Shunt Trip Mechanical Check.



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) IS IN PLACE IN COVER.
- PIGTAIL LEADS ARE CLEAR OF THE COVER.

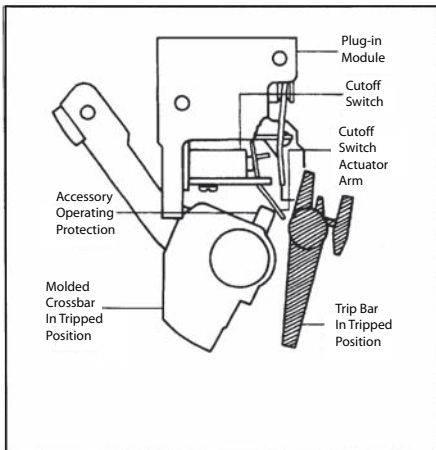


Fig. 2-5. Correct Position for Cutout Switch Actuator Arm and Molded Crossbar.

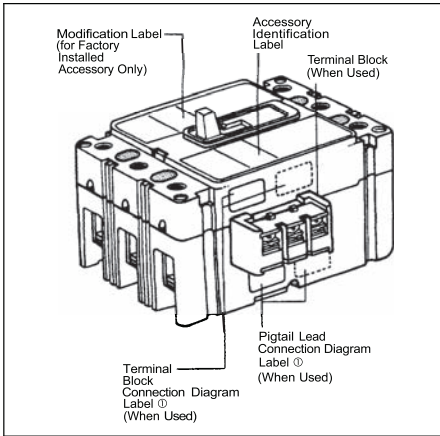


Fig. 2-7. Preferred Mounting Locations for Accessory Nameplate Labels.

- 2-8. With the circuit breaker handle in the OFF position and pigtail leads (if used) routed as required, install circuit breaker cover and eight cover screws.
- 2-9. When shunt trip is installed at a non-UL approved location, remove and discard UL listing label.
- 2-10. Place labels supplied with kit on circuit breaker. (See Fig. 2-8.)

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.

Note: Labels on circuit breaker show connection diagram for shunt trip contacts. Pigtail leads are color coded yellow and white.

- 2-11. Test shunt trip. Connect ohmmeter across pigtail leads or terminal block connections. Check continuity as follows:
 - a. Circuit breaker handle OFF - no continuity.
 - b. Circuit breaker handle ON - less than 9000 ohms.
 - c. Press PUSH-TO-TRIP button - no continuity.

2-12. Install circuit breaker.

2-13. Connect shunt trip as required (see Fig. 2-8).

Eaton assumes no responsibility for malfunctioning accessories installed improperly by the customer.

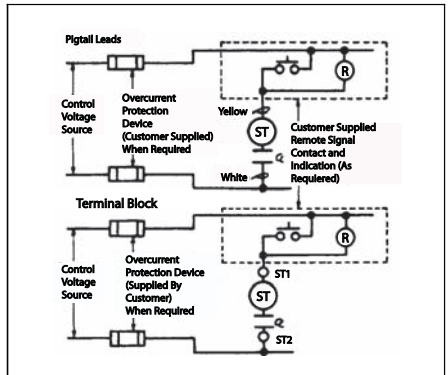


Fig. 2-8. Shunt Trip Connection Diagram.

Table 1-1. Shunt Trip Electrical Rating Data.

- Average unlatching time 6 milliseconds.
- Average circuit breaker contact total opening time 18 milliseconds.
- Endurance - 4000 electrical operations plus 4000 mechanical operations.
- Shunt trip can be operated up to a maximum of six times per minute.
- Maximum operating voltage 110% of maximum voltage range rating.
- Terminal block is approved for use with one or two No. 18 to No. 14 AWG solid or stranded copper wire. Torque is 7 pound-inches (0.8 N.m).

Catalog Suffix	Application Ratings		Electrical Operating Ratings (Nominal Values)						
	Voltage (V)	Frequency (Hz)	Supply Voltage (V)	Minimum Operating Voltage (V)	I _p at 0.017s (A)	I _p at 0.25s (A)	I _{rms} at 0.033s (A)	VA	One Minute Dielectric Withstand Voltage (V)
03	9-24	50/60	9	6.3	6.1		4.3	40	1048
			12		8.5		6	75	
			24		17		12	300	
	12-24	DC	12	8.4		8		100	
			24			16		400	
08 ①	48-127	50/60	48	33.6	2.7		1.9	92	1254
			60		3.4		2.4	140	
			110		6.2		4.4	480	
			120		6.8		4.8	570	
			127		7.2		5.1	640	
	48-60	DC	48	33.6		2.1		100	
			60			2.6		160	
12	208-380	50/60	208	146	1.2		0.88	180	1760
			220		1.3		0.93	200	
			240		1.4		1.00	240	
			380		2.3		1.60	610	
	110-127	DC	110	77		.50		55	
			120			.55		66	
			125			.57		71	
18	415-600	50/60	400	280	1.1		0.77	310	2200
			415		1.1		0.80	330	
			440		1.2		0.85	380	
			480		1.3		0.93	450	
			525		1.4		1.02	530	
			550		1.5		1.06	590	
			600		1.6		1.16	700	
	220-250	DC	220	154		0.48		110	
			250			0.55		140	

① Suitable for use in ground fault protection applications.

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Eaton Corporation
Electrical Group
1000 Cherrington Parkway
Moon Township, PA 15108
United States
877-ETN-CARE (877-386-2273)
Eaton.com

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