

## INSTRUCTIONS

# Mounting Shunt Trip and Undervoltage Release Accessories

## K 1200 LINE BREAKERS — TYPES TKM AND THKM

**IMPORTANT NOTE:** *U/L listing is voided when the circuit breaker is modified to add an accessory.*

### DESCRIPTION:

#### SHUNT TRIP

A shunt trip accessory (Fig. 1) is installed in a circuit breaker to provide remote control tripping of the breaker. As indicated in Fig. 1 below, it consists of a solenoid whose core is affixed to a spring-biased latch. When the solenoid coil is energized by closing the control circuit at the remote contacts, the solenoid core releases the latch allowing the shaft and hook to move the breaker trip bar and trip the breaker. The breaker must be reset before being closed again. A cut-off switch opens the solenoid coil electrical circuit when the breaker contacts open. The solenoid coil, therefore, carries only momentary current and is not rated for continuous current.

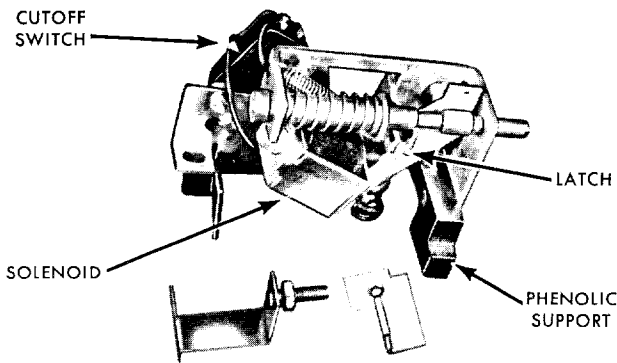


Fig. 1. Shunt Trip

#### UNDERVOLTAGE RELEASE

An undervoltage release accessory (Fig. 2) is installed in a circuit breaker to provide automatic tripping when loss of power occurs or when there is a major voltage dip. As indicated in Fig. 2 below, it consists of a solenoid with a moving armature affixed to a spring-loaded latch. The latch restrains a spring-biased shaft and hook which when released, moves the breaker trip bar to trip the breaker. As long as the voltage connected to the solenoid coil is normal, the solenoid magnetic force overcomes the spring force and the plunger does not act on the trip bar. If the voltage is removed or dips to 30 to 60 percent of rated voltage, the spring force overcomes the solenoid magnetic force, unlatches the shaft

and plunger and trips the breaker. (Drop-out adjustment has been factory pre-set.) If the voltage has not been restored to the solenoid coil, the breaker will trip if an attempt is made to close it.

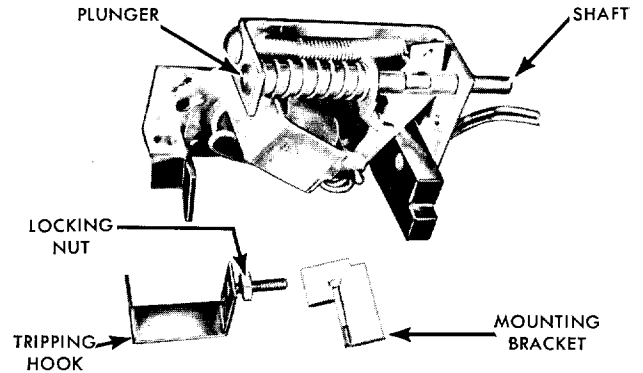


Fig. 2. Undervoltage Release

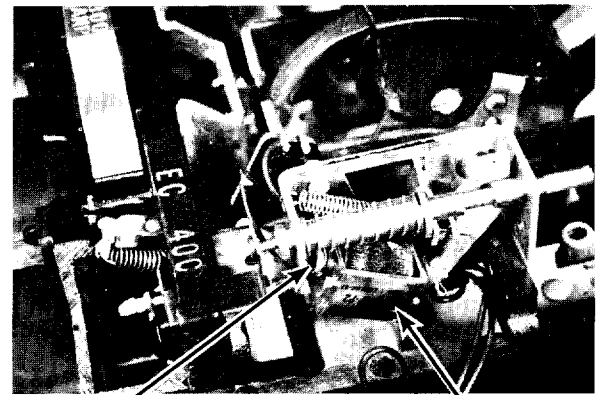


Fig. 3. Shunt Trip

The shunt trip and undervoltage release may be used for either right pole or left pole installation. Both accessories bracket mount to the trip unit base and occupy the space adjacent to the operating mechanism of the breaker. The spring-loaded plunger is attached to a hook which extends through a knockout in the trip unit case to operate the trip bar. Neither accessory interferes with the normal operation of the trip unit.

Two leads (24 inches min.) are provided to be brought through the side of the breaker case. **NOTE:** Accessory leads out the rear of the breaker are available on a factory-installed basis. The external control circuit for both accessories, consisting of normally open switch or relay contacts and connections to a control power source, must be supplied by the user.

#### ELECTRICAL DATA FOR SHUNT TRIP

| Coil Voltage          | Max. Inrush Current to Trip Breaker (Peak Amperes) | Kit Cat. No. |
|-----------------------|--|--------------|
| <b>60 Cycles A.C.</b> |  |              |
| 120                   | .515   | TKMSTA110    |
| 240                   | .216   | TKMSTA211    |
| 480                   | .12  | TKMSTA4      |
| <b>D.C.</b>           |  |              |
| 12                    | 3.3  | TKMSTA7      |
| 24                    | 1.65   | TKMSTA8      |
| 48                    | .8   | TKMSTA9      |
| 125                   | .38  | TKMSTA110    |
| 250                   | .18  | TKMSTA211    |

#### ELECTRICAL DATA FOR UNDERVOLTAGE RELEASE

| Coil Voltage          | Sealed-in Current at Rated Voltage (RMS Amperes) | Kit Cat. No. |
|-----------------------|--|--------------|
| <b>60 Cycles A.C.</b> |  |              |
| 120                   | .047   | TKMUVA1      |
| 240                   | .026   | TKMUVA2      |
| 480*                  | .026   | TKMUVA4*     |
| 600*                  | .026   | TKMUVA6*     |
| <b>D.C.</b>           |  |              |
| 12                    | .20  | TKMUVA7      |
| 24                    | .10  | TKMUVA8      |
| 48                    | .05  | TKMUVA9      |
| 125                   | .018   | TKMUVA10     |
| 250*                  | .018   | TKMUVA11*    |

\* Kit includes resistor to be externally mounted by the installer.

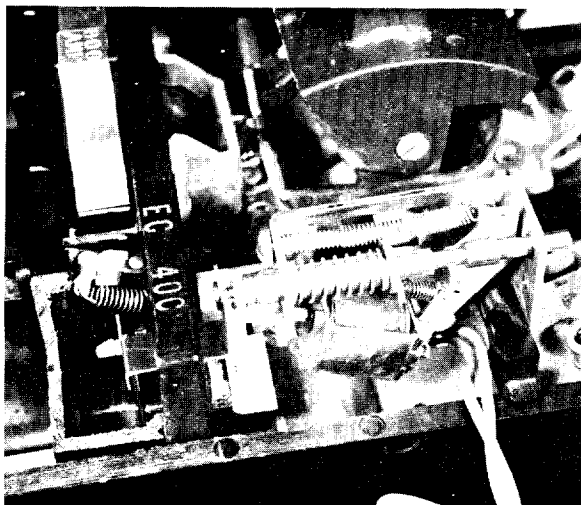


Fig. 4. Undervoltage Release

## INSTALLATION

**CAUTION:** When installing the shunt trip or undervoltage release in a breaker, the breaker must be completely de-energized and disconnected from the electrical circuit. This is mandatory because the breaker must be in the "ON" position to install these accessories.

Circuit breakers and components should be handled, inspected, installed or removed by qualified personnel only and in accordance with these Instructions and accepted safety precautions.

**STEP 1** Remove cover from breaker by unscrewing four cover screws. (Cover screws are those closest to breaker handle.)

**STEP 2** Be sure circuit breaker is de-energized or removed from circuit. Insert a small screwdriver into the slot on the under side of the knockout and pry outward. Fig. 5. *Be careful not to eject chips into the trip unit case. Clean all chips from the breaker case.*

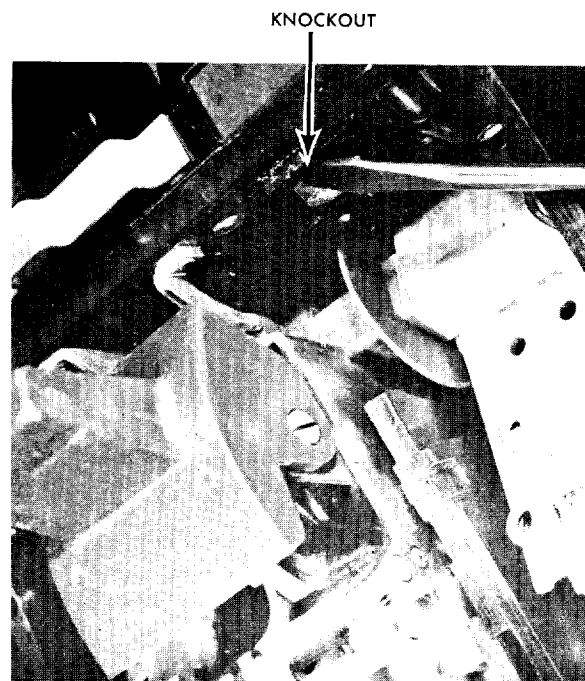


Fig. 5. Removing Knockout

**STEP 3** Place all trip unit adjusting levers in LO position. Use a small sharp tool to pierce the center of the fiber cover on top of the trip unit pole to which the accessory is to be installed.

**CAUTION:** Point the piercing tool away from the external magnetic adjustment lever. Pry outward to remove the cover. Fig. 6.

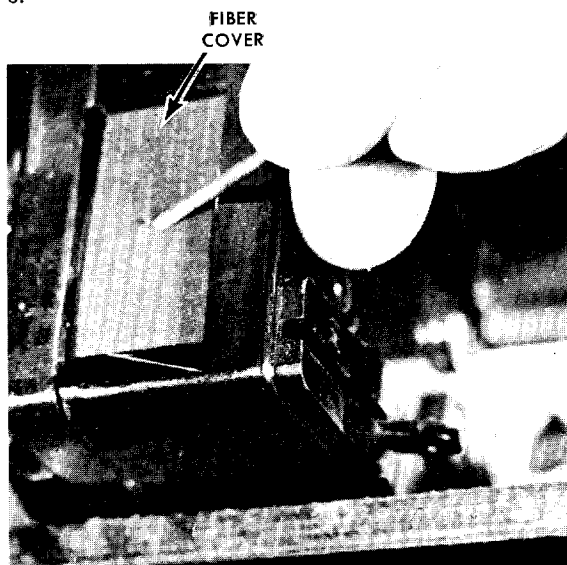


Fig. 6. Removing Fiber Cover

**STEP 4** Position the mounting bracket in the depression on the trip unit case and align the bracket mounting hole with the tapped hole in the boss. Insert a 8-32 x 1/4" screw (provided) through the bracket mounting hole into the tapped hole and fasten firmly. Fig. 7.

**STEP 5** Insert the tripping hook through the knockout (removed in Step 2). Be careful not to damage the hook or trip bar. Fig. 7.

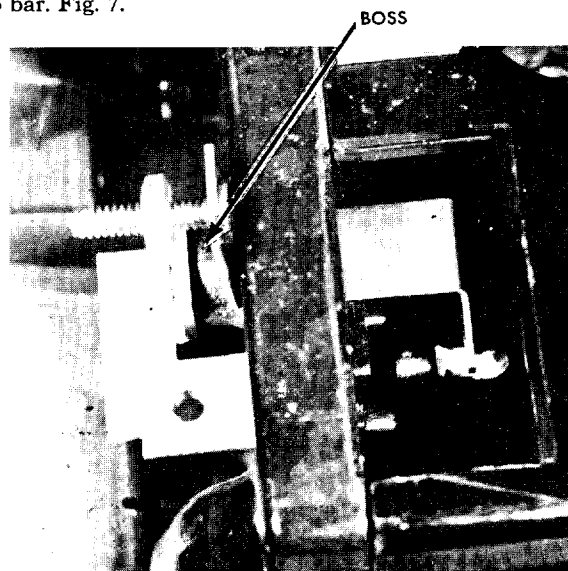


Fig. 7. Assembly of Mounting Bracket and Tripping Hook

**TURN BREAKER TO ON POSITION.**

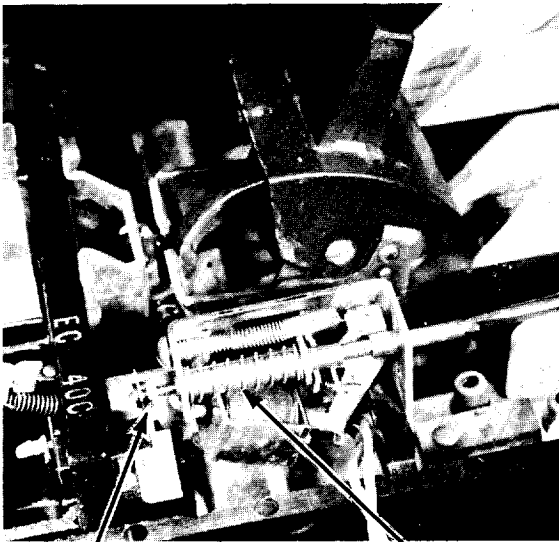
**STEP 6** Unlatch the shunt trip by pushing the core through the solenoid. (The undervoltage release will be unlatched.) With an 8-32 x 1/4" screw in the mounting hole of the accessory frame, set the accessory in place. The phenolic support must set into the groove in the molded base of the breaker. Fasten firmly. Fig. 3-4.

**STEP 7** To bring the accessory leads out the side of the breaker, file necessary openings in the breaker cover (accessory pole side) 5" from the load end of the breaker cover, not including lug cover. See Fig. 5.

## **STEP 8 ADJUSTMENTS FOR UNDERVOLTAGE RELEASE AND SHUNT TRIP**

**CAUTION:** The circuit breaker and accessories must be completely de-energized and disconnected from electrical circuits when adjustments are made. To ensure optimum performance, it is necessary to adjust both the shunt trip and undervoltage release to compensate for manufacturing variations in the breaker. These adjustments have already been made if the shunt trip or undervoltage release was installed at the factory.

Be sure the locking nut is assembled to the screw thread of the tripping hook and turned in to within 1/16" of the screw length. With the breaker in ON position and the accessory de-energized, line up screw threads of tripping hook with internal threads of the plunger. *Be sure hands are clear of breaker mechanism.* Use the slot on the opposite end of the plunger to turn the plunger clockwise until the breaker trips, then continue turning for one (1) additional turn. Fig. 8. Tighten adjustment firmly with locking nut.

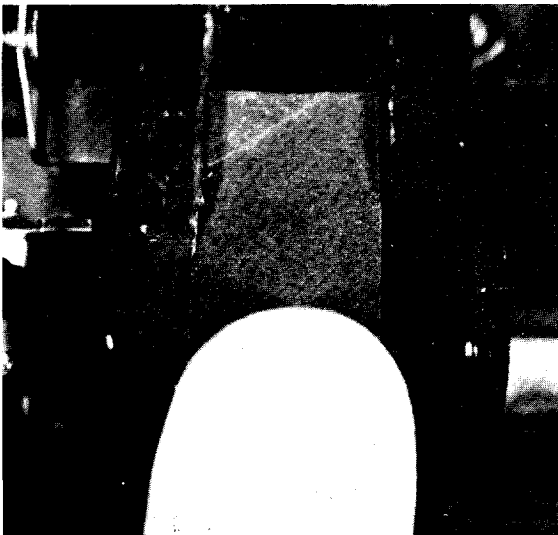


LOCKING  
NUT

PLUNGER

**Fig. 8. Tripping Adjustment**  
(Undervoltage Device)

**STEP 9** Replace the fiber cover for pole unit (removed in Step 3) with cover supplied in kit. Slide the small side of the cover along the shoulders on the long sides of the opening until the cover snaps into place. Fig. 9. Reset the external magnetic adjustment lever to the desired position.



**Fig. 9. Replace the Fiber Cover**

## STEP 10

### MECHANICAL CHECK OUT — SHUNT TRIP

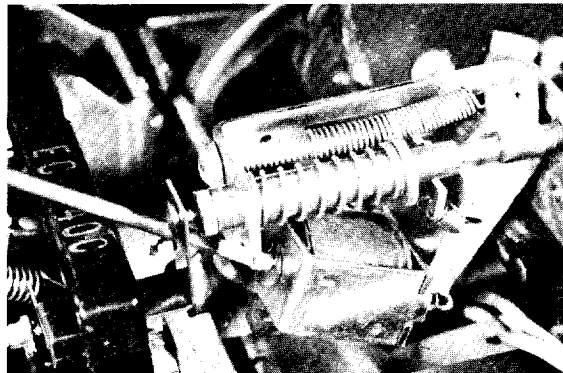
1. Relatch and turn breaker on.
2. Check cut-off switch actuator to insure it depresses switch button. (Actuator should not touch switch button with breaker in the OFF position.)
3. Being careful to keep hands and fingers clear of breaker mechanism, depress solenoid core completely into solenoid (see Fig. 8). Breaker should trip, if not, retrace Step 8.

### MECHANICAL CHECK OUT — UNDERVOLTAGE

1. Relatch breaker.
2. Holding core in solenoid (Fig. 6) turn breaker ON.
3. Being careful to keep hands free of mechanism, slowly release the core. Breaker should trip, if not, retrace Step 8.

### ELECTRICAL CHECK OUT — UNDERVOLTAGE A-C ONLY

1. Energize coil with rated voltage, position the breaker as it will be mounted in service. If the coil buzzes when the breaker is ON, adjust buzz control by slowly rotating as shown in Fig. 10 until buzz is eliminated.



**Fig. 10. Adjusting For Coil Buzz**

**STEP 11** Replace the breaker cover — tighten cover screws. The combined assembly is now ready for mounting.

**GENERAL**  **ELECTRIC**

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