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# Mounting Shunt Trip and Undervoltage Release Accessories

*Approved by  
J. H. ...*

J 600 LINE BREAKERS — TYPES TJJ, TJK AND THJK

Printed by \_\_\_\_\_  
Qty \_\_\_\_\_ Date \_\_\_\_\_

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

## 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 plunger 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 flow.

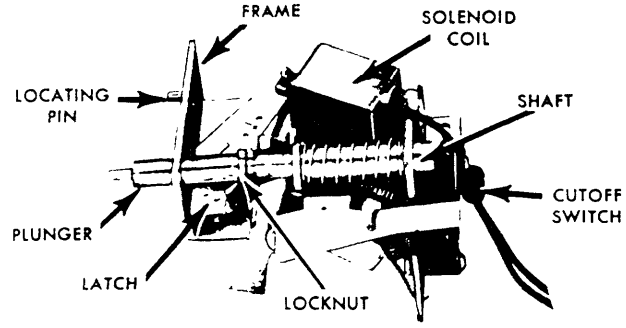


Fig. 1. Shunt Trip (Unit shown for right pole installation)

### 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 magnet with a moving armature affixed to a spring-loaded latch. The latch restrains a spring-biased shaft and plunger 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. If the voltage has not been restored to the solenoid coil, the breaker will trip if an attempt is made to close it.

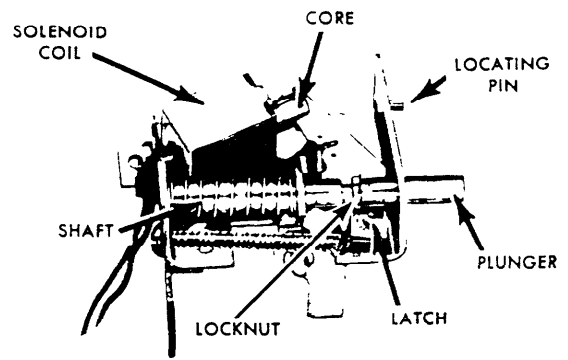


Fig. 2. Undervoltage Release (Unit shown for left pole installation)

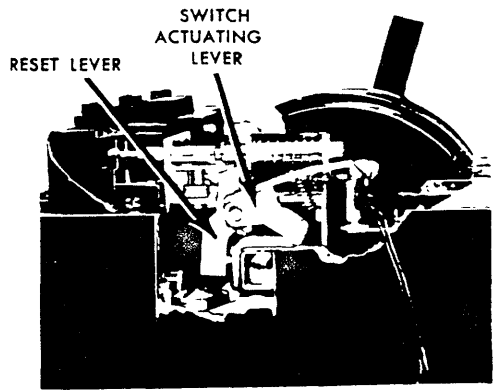


Fig. 3. Shunt Trip Schematic Diagram (Cutaway) (Right Pole Installation)

The shunt trip and undervoltage release must be ordered for either right pole or left pole installation. Both accessories fasten to the breaker base and occupy the space adjacent to the operating mechanism of the breaker. The spring-loaded plunger extends through a knockout in the trip unit case to operate the trip bar. Neither accessory interferes with the normal tripping action of the trip unit.

After installation, two leads (24 inches long min.) are brought out 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. (Add Suffix L or R for Right or Left Pole Mounting)
<b>60 Cycles A.C.</b>		
120	515	TJKSTA110
240	216	TJKSTA211
480	12	TJKSTA4
<b>D.C.</b>		
12	3.3	TJKSTA7
24	1.65	TJKSTA8
48	.8	TJKSTA9
125	.38	TJKSTA110
250	.18	TJKSTA211

### ELECTRICAL DATA FOR UNDERVOLTAGE RELEASE

Coil Voltage	Sealed-in Current at Rated Voltage (RMS Amperes)	Kit Cat. No. (Add Suffix L or R for Right or Left Pole Mounting)
<b>60 Cycles A.C.</b>		
120	.047	TJKUVA1
240	.026	TJKUVA2
480*	.026	TJKUVA4*
600*	.026	TJKUVA6*
<b>D.C.</b>		
12	.20	TJKUVA7
24	.10	TJKUVA8
48	.05	TJKUVA9
125	.018	TJKUVA10
250*	.018	TJKUVA11*

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

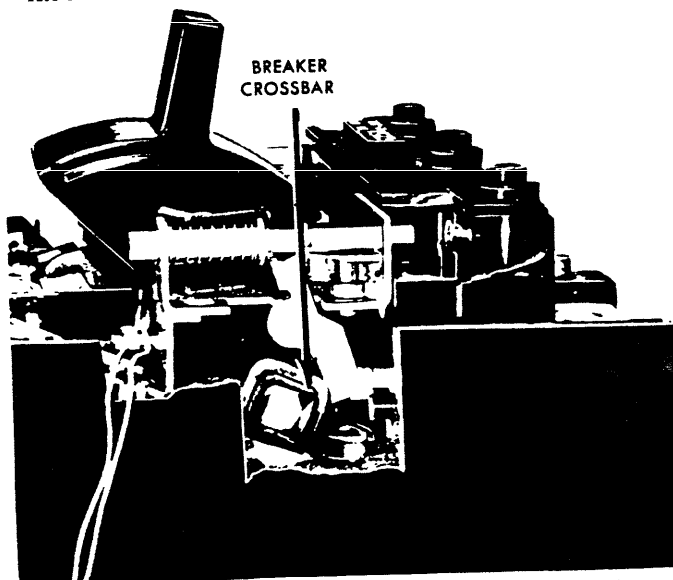


Fig. 4. Undervoltage Release Schematic Diagram (Cutaway) (Left Pole Installation)

## 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. Do not remove trip unit.

**STEP 2** Be sure circuit breaker is de-energized or removed from circuit. Using .125 diameter drill, drill through hole on pole where accessory is to be installed. See Fig. 5. This hole should be drilled from the back of the breaker using the spotting hole closest to the trip unit for locating.

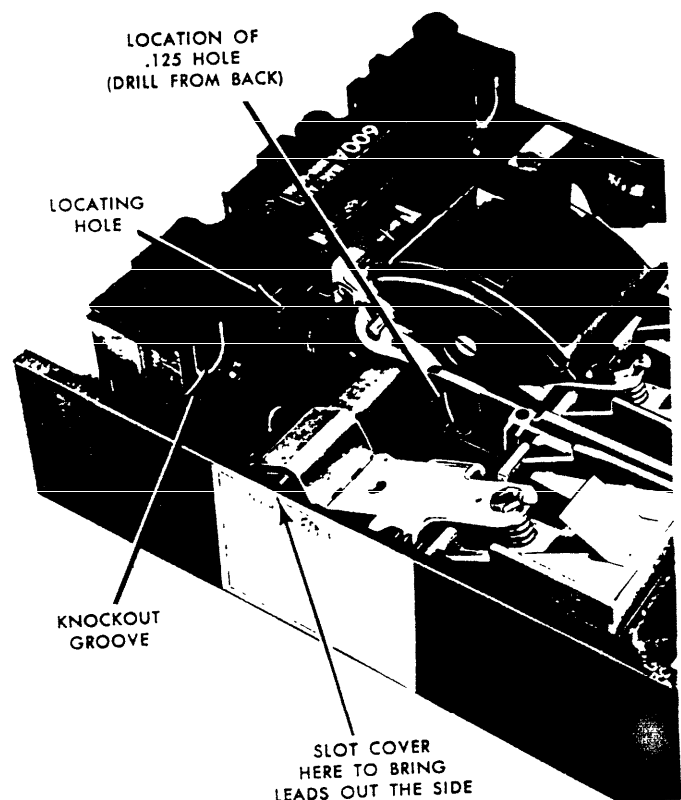


Fig. 5.

**STEP 3** Being careful not to eject chips into trip unit case, drive small screw driver through knockout groove in several places. See Fig. 5. Gently pry outward to remove knockout. Clean all chips from breaker case. Turn breaker to ON position. **Note:** Some trip units may have rectangular knock-outs which are removed by inserting a screwdriver in the slot and prying up.

**STEP 4** Make sure that threaded portion of the shaft is screwed all the way into the plunger. Grasp accessory as shown in Fig. 6 (for shunt trip) or Fig. 7 (for undervoltage release) pulling plunger back beyond latching point.

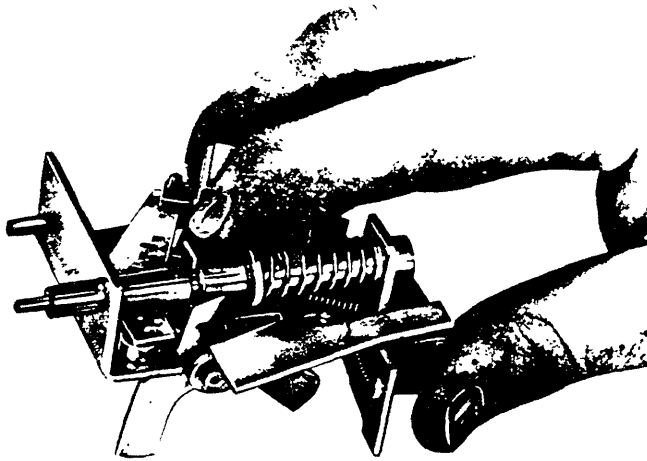


Fig. 6. Holding Shunt Trip for Assembly  
(Unit shown for right pole installation)

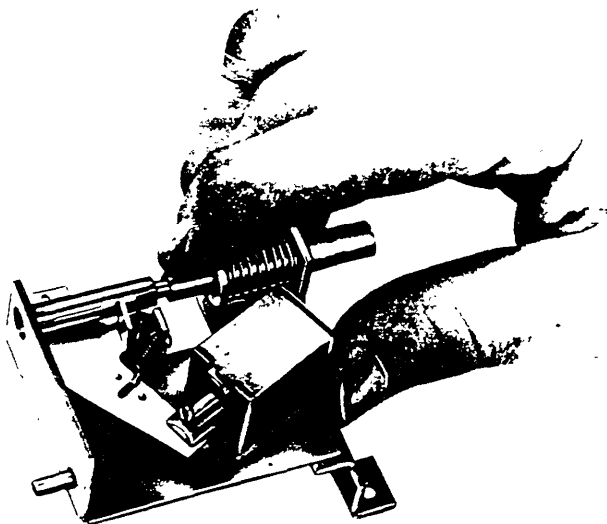


Fig. 7. Holding Undervoltage Release for Assembly  
(Unit shown for left pole installation)

**STEP 5** Holding accessory as shown in Fig. 6 and 7, insert plunger through knockout removed in Step 3, and locating pin into locating hole (see Fig. 1, 2, and 5). Set unit in place so that accessory mounting hole sets on top of hole drilled in Step 2. Actuating lever of shunt trip and reset lever of shunt trip and undervoltage device must be positioned in respect to circuit breaker crossbar as shown in Fig. 3 and Fig. 4.

**STEP 6** Fasten accessory firmly in place using 1" self tapping screw and lockwasher supplied. See Fig. 8.

**STEP 7** To bring the accessory leads out the side of the breaker, file necessary openings in the breaker cover at any point  $3\frac{1}{8}$ " to  $5\frac{3}{4}$ " from the trip end of the breaker. See Fig. 5.

**NOTE:** Accessories with leads brought out the rear of the breaker are available factory installed.

## STEP 8 ADJUSTMENTS FOR UNDERVOLTAGE RELEASE AND SHUNT TRIP

**CAUTION:** The circuit breaker and accessories must be completely de-energized and disconnected from electric circuits when adjustments are made. To ensure optimum performance, it is necessary to adjust both the shunt trip and under voltage 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.

1. With circuit breaker in ON position and accessories de-energized, unlatch shunt trip by manually pushing core through solenoid, the undervoltage release will be unlatched. Turn slotted end of plunger while grasping other end with wrench as shown in Fig. 8. Turn screw driver counter-clockwise until breaker trips, then continue two (2) additional turns.

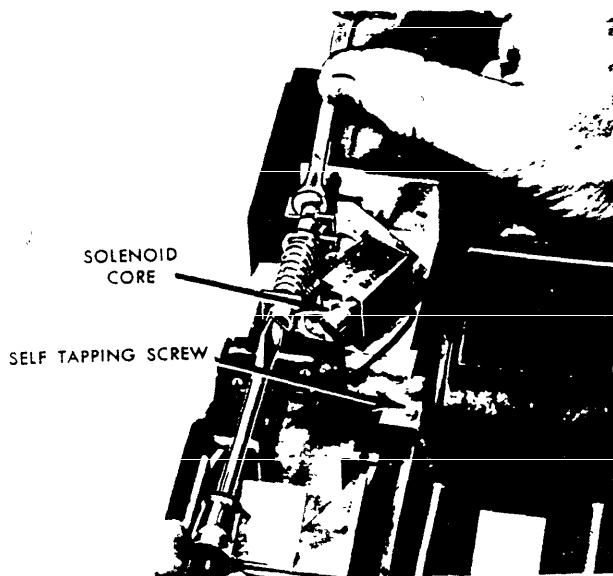


Fig. 8. (Right pole installation shown)

**NOTE:** To prevent loss of adjustment due to vibration, tighten lock-nut against plunger (6 in.-lbs. torque). See Fig. 1 and 2.

#### MECHANICAL CHECK OUT — SHUNT TRIP

1. Relatch and turn breaker on.
2. Check cut-off switch actuator to insure it does not touch switch button. (Actuator should depress switch button completely with breaker in the OFF position.)
3. Being careful to keep hands and fingers clear of breaker contact arms, 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 coil plunger in solenoid (Fig. 6) turn breaker ON.
3. Being careful to keep hands and fingers clear of breaker contact arm, slowly release coil plunger from solenoid, breaker should trip, if not, retrace Step 8 of Adjustment.

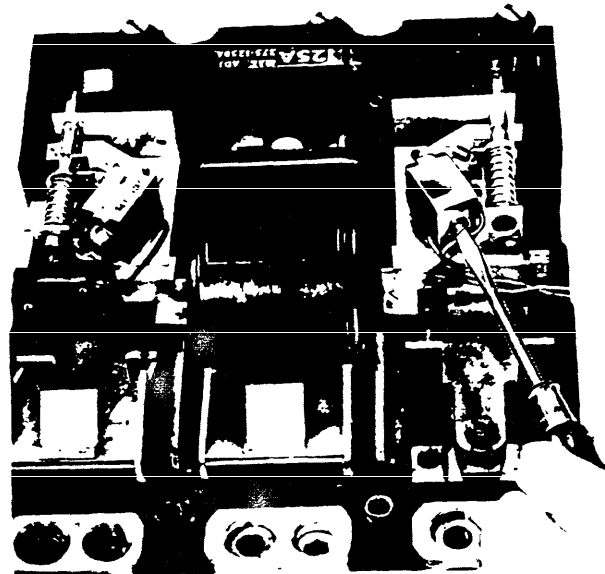


Fig. 9.

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

1. Energize coil with rated voltage, holding the breaker as it will be mounted in service. If the coil buzzes when the breaker is ON adjust buzz control by slowly rotating either clockwise or counter-clockwise as shown in Fig. 9 until buzz is eliminated.

**STEP 9** Replace the breaker cover — the breaker with the accessory installed is now ready for mounting.

**GENERAL**  **ELECTRIC**

CIRCUIT PROTECTIVE DEVICES DEPARTMENT, PLAINVILLE, CONN.

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