



Field Mounting of Shunt Trip and Undervoltage Release Accessories

F 225 LINE BREAKERS — TYPES TFJ, TFK AND THFK

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

APPLICATION

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. 3 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 plunger, which in turn contacts the breaker trip bar to trip the breaker. The breaker must be reset manually 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.

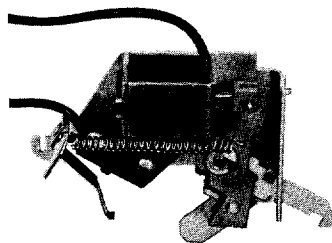


Fig. 1. Shunt trip

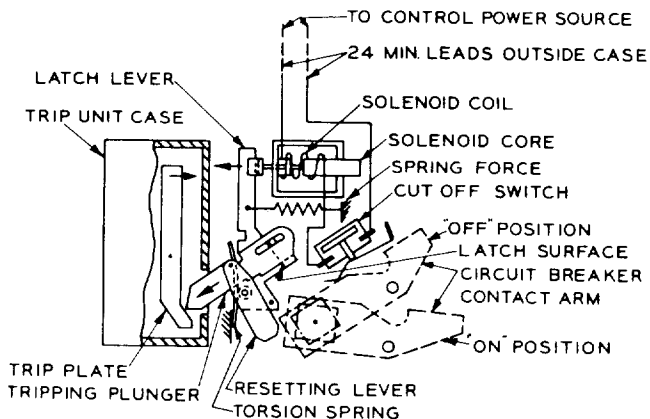


Fig. 3. Shunt trip schematic diagram

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. 4 below, it consists of a solenoid magnet with a moving armature affixed to a spring-loaded latch. The latch restrains a spring-biased plunger which when released, contacts 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 unlatches the plunger, which trips the breaker.

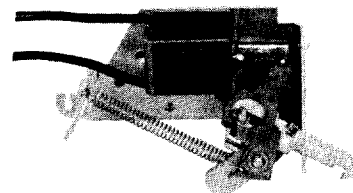


Fig. 2. Undervoltage release

When the circuit breaker contacts are open, a self-adjusting mechanical reset lever actuated by a main contact arm holds the solenoid armature in the sealed-in position and the plunger out of contact with the trip bar. When the voltage is restored, the solenoid magnet energizes and holds the plunger latched in this position, and the breaker can be reset and turned ON. If the voltage has not been restored to the solenoid coil, the breaker will trip if an attempt is made to close it.

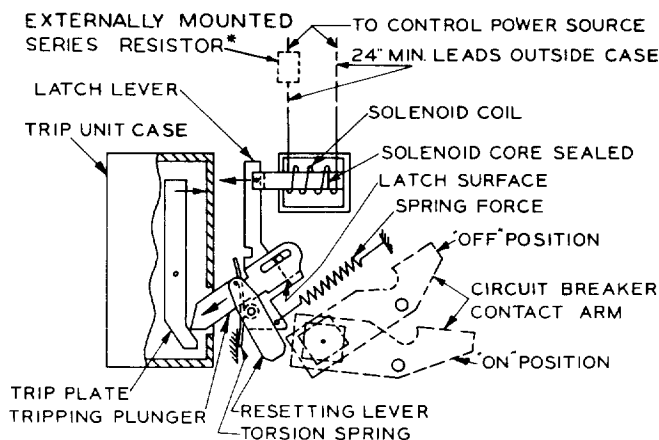


Fig. 4. Undervoltage release schematic diagram

*Furnished with 240, 480, 600 VAC and 250 VDC Unit Only.

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the General Electric Company.

DISTRIBUTION EQUIPMENT DIVISION PLAINVILLE, CONN. 06062



DESCRIPTION

The shunt trip and undervoltage accessories can be mounted in either right or left pole and occupy the space next to the operating mechanism inside the breaker case. They are attached to the trip unit. 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 during overcurrent conditions.

Electrical Data For Shunt Trip

Coil Voltage	Max. Inrush Current to Trip Breaker (Amperes)	Kit Cat. No. (Right or Left Pole)
60 Cycles A.C.		
120	1.0	TFKST12
240	2.0	TFKST12
480	1.5	TFKST13
600	1.9	TFKST13
D.C.		
12	6.8	TFKST7
24	4.2	TFKST8
48	1.0	TFKST9
125	1.0	TFKST12
250	0.4	TFKST11

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 Undervoltage Release

Coil Voltage	Sealed-in Current at rated Voltage (Amperes)	Kit Cat. No. (Right or Left Pole)
60 Cycles A.C.		
120	.018	TFKUV1
240	.018	TFKUV2 *
480	.018	TFKUV4 *
600	.018	TFKUV6 *
D.C.		
12	.200	TFKUV7
24	.100	TFKUV8
48	.050	TFKUV9
125	.018	TFKUV10
250	.018	TFKUV11 *

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

INSTALLATION

PRECAUTION: The circuit breaker must be in the OFF position and the circuit de-energized before installing accessories. Circuit breakers and components should be handled, inspected, installed or removed only by qualified personnel and in accordance with accepted safety precautions.

STEP 1

1

Remove cover from breaker by unscrewing four cover screws.

STEP 2

2

Do not remove trip unit from breaker case. Trip breaker with twist-to-trip button on trip unit. **Caution:** Be sure to hold handle firmly when tripping breaker. Otherwise, mechanism spring action may propel handle from the rocker arm of the breaker.

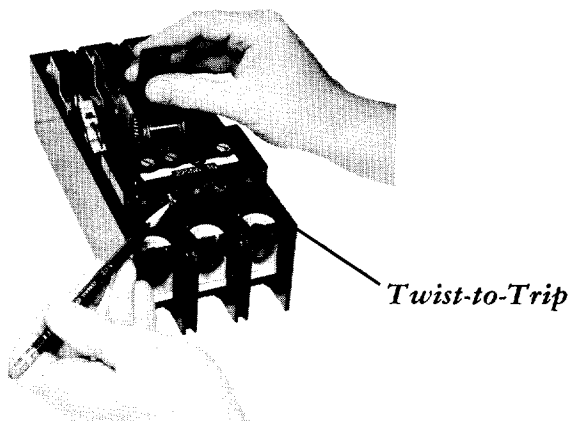


Fig. 5. Tripping the breaker

STEP 3

3

Being careful not to eject chips into trip unit case, insert small screwdriver into slot (A, Fig. 6) and gently pry outward to remove knockout. Clean chips from breaker case.

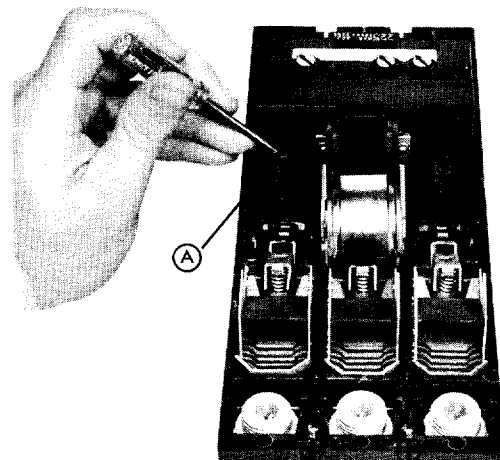


Fig. 6. Removing trip unit knockout

STEP 4

Install insulating barrier as shown. Note bottom of long slot in barrier should slip over small boss (B, Fig. 7) on trip unit case. Always make sure insulation is between accessory and operating mechanism of the breaker.

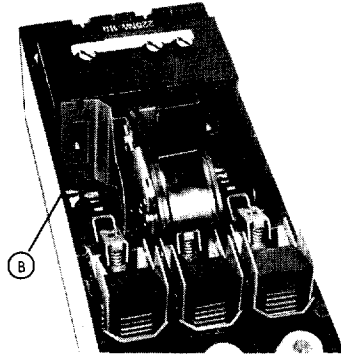


Fig. 7. Installing insulating barrier

STEP 5

Grasp accessory as shown and force plunger back until it latches in notch "C" (Figs. 8 and 9).

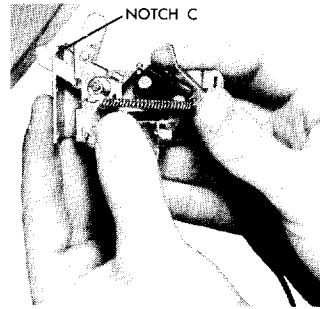


Fig. 8. Latching shunt trip

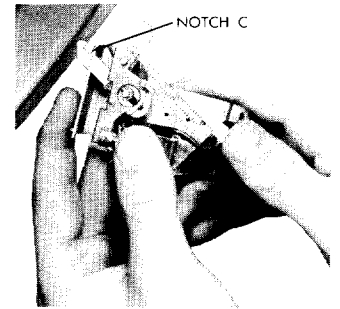


Fig. 9. Latching undervoltage release

STEP 6

Holding accessory as shown, insert the latched plunger into trip unit knockout removed in Step 3. Press the unit into place — this unlatches the plunger, allowing it to contact the breaker trip bar. Note small bent tab (D) should fit into hole (E) in the trip unit case (See Figs. 10 and 11).

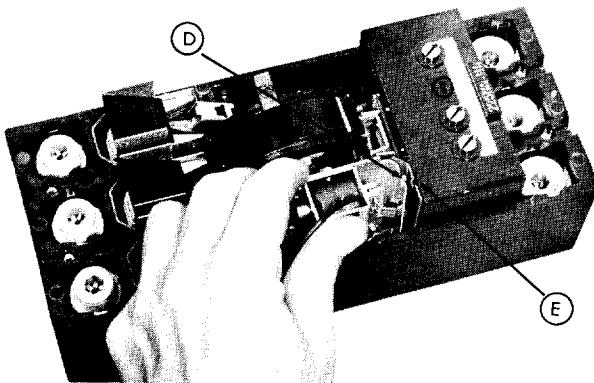


Fig. 10. Installing shunt trip in left pole

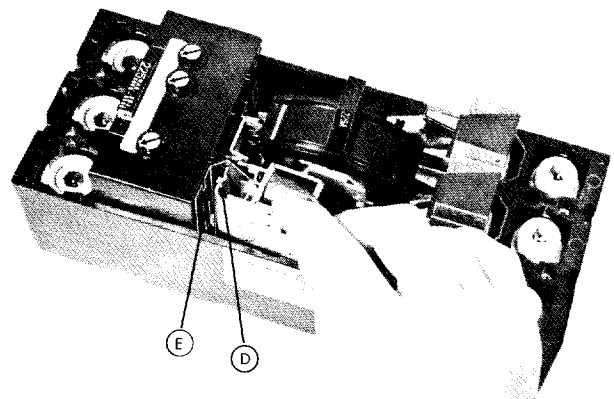
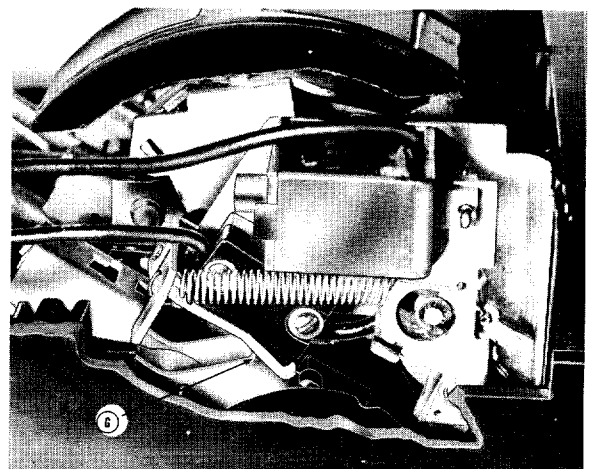


Fig. 11. Installing undervoltage release in right pole

CAUTION — IMPORTANT

When installing shunt trip, be certain actuating spring "G" is located exactly as shown in photo at right, otherwise unit WILL NOT OPERATE PROPERLY. Spring MUST RIDE ATOP contact carrier.



STEP 7

Insert small screwdriver in notch (F) and pry outward as shown to wedge accessory in place (See Figs. 12 and 13).

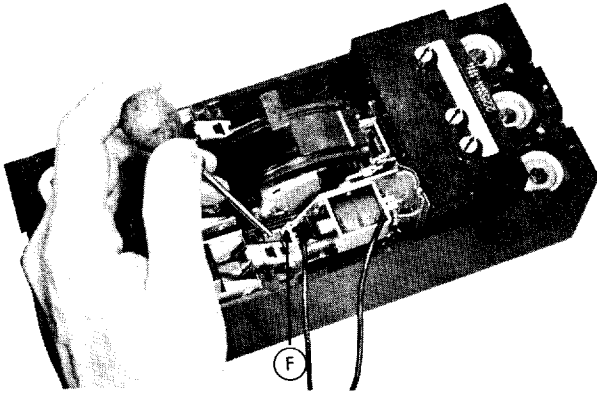


Fig. 12. Wedging shunt trip in place

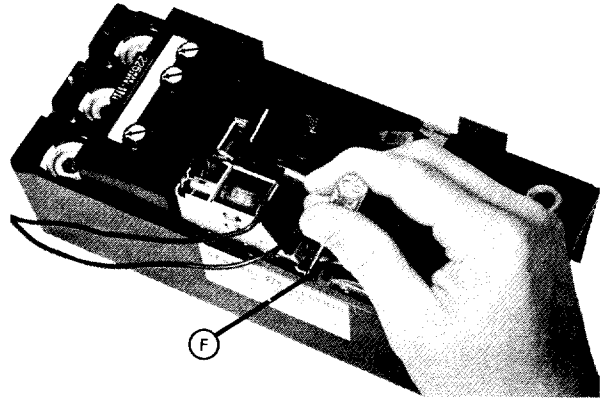


Fig. 13. Wedging undervoltage release in place

STEP 8

To bring the accessory leads out the side of the breaker, file necessary openings in the breaker cover at any point $3\frac{1}{2}$ " to $5\frac{3}{4}$ " from the trip unit end of the breaker. Clean filings from the breaker cover. **Note:** accessories with leads brought out the rear of the breaker are available factory-installed.

STEP 9

Replace the breaker cover. Make the following electrical tests to assure proper operation:

ELECTRICAL CHECK FOR PROPER OPERATION

SHUNT TRIP

1. Reset and move breaker handle to ON.
2. Connect a test circuit to the accessory leads. The circuit breaker should trip when a test voltage between 80 and 100 percent of rated accessory coil voltage is applied.
3. Check to make sure no current is flowing through the shunt trip coil after the breaker has been turned to OFF.

UNDervOLTAGE RELEASE

1. Connect a test circuit to the accessory leads. With the breaker in the TRIPPED position, apply to the test circuit a voltage that is at least 80 percent of rated coil voltage. Reset and move the breaker handle to ON.
2. Reduce the test voltage and observe that the circuit breaker trips within 30 to 60 percent of rated accessory coil voltage.
3. Apply rated voltage. Reset and reclose the breaker. Remove the test voltage entirely — the breaker must trip instantaneously.