FRED# 15553

Installation Instructions for Undervoltage Release Mechanism (Cradle Reset) for GB/GHB, GC/GHC Circuit Breakers

I.L. 15553
File 29-000

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.

THE WESTINGHOUSE ELECTRIC CORPORATION 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 Westinghouse 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 Westinghouse Electric Corporation for further information or instructions.

1. Introduction

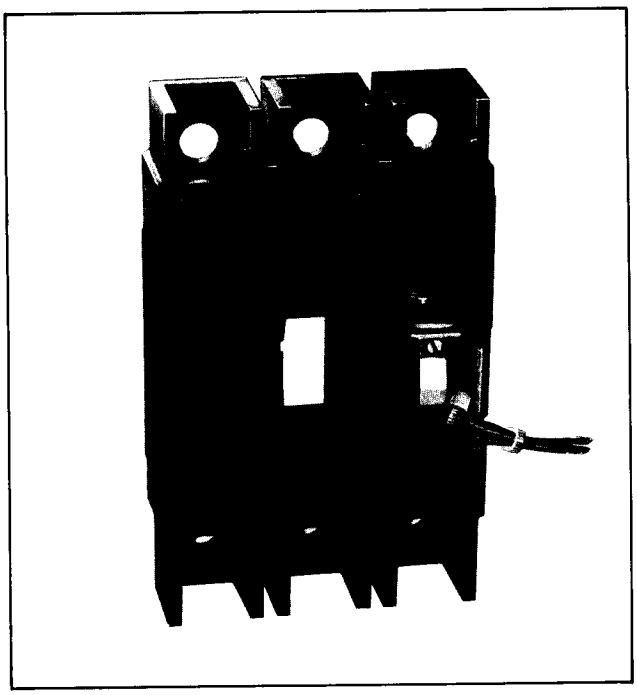

Fig. 1–1. *Undervoltage Release Mechanism (Cradle Reset) Installed in GHC Circuit Breaker*

General Information

The undervoltage release mechanism (UVR) (Fig. 1–1) monitors a voltage (typically a line voltage) and trips the circuit breaker when the voltage falls to between 70 and 35 percent of the solenoid coil rating. The UVR consists of a continuous rated solenoid with a plunger mounted in a plug-in module. The cam on the cradle shaft resets the UVR when normal voltage is restored. With no voltage applied to the UVR, the circuit breaker contacts will not touch when a closing operation is attempted.

The UVR is available with several voltage ratings for most AC requirements. Table 1–1 lists application and electrical operating rating data for the UVR.

This instruction leaflet (IL) gives detailed procedures to install the UVR.

Installation

Note: For sealed circuit breakers, Underwriters Laboratories, Inc. UL489 requires that internal accessories be installed at the factory. The UVR is 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.

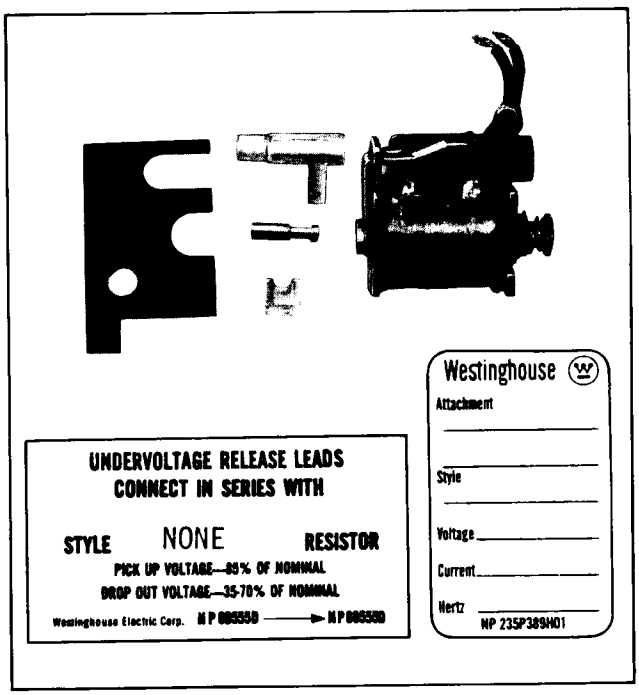

Fig. 2–1. *Undervoltage Release Mechanism (Cradle Reset) Kit*

Before attempting to install the UVR, check that the style number is correct and the rating of the accessory satisfies job requirements.

The UVR, shown in kit form in Fig. 2–1, can be installed in the left-hand accessory mounting cavity in the cover of a 3-pole circuit breaker. A UVR must be installed in the circuit breaker before the circuit breaker is mounted in an electrical system. To install the UVR, perform the following procedures:

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 must be placed on a horizontal surface.

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. The voltages in energized equipment can cause death or severe personal injury.

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

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

2-3. Remove cover screws and cover.

CAUTION

During installation and functional checks of the UVR, do not touch the circuit breaker calibrated trip mechanism. Contact with the calibrated trip mechanism could change trip characteristics.

2-4. Locate knockout (Fig. 2-2) provided in left-side of cover for accessory wiring. Remove knockout and file rough edges smooth.

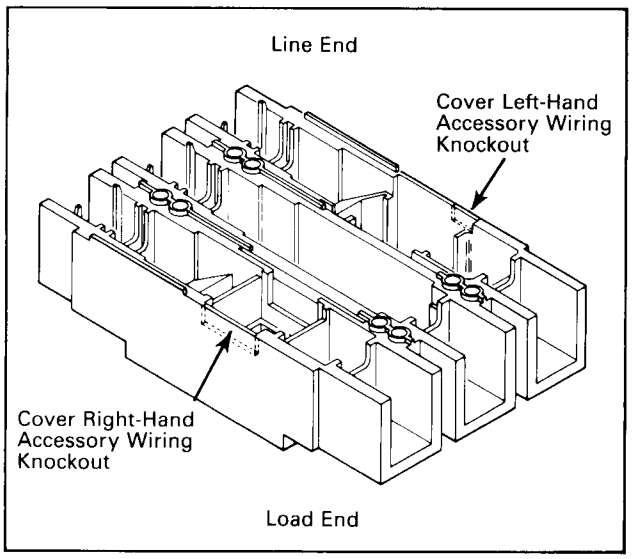

Fig. 2–2. *Location of Accessory Wiring Knockout in Cover*

2-5. With cover in inverted position (Fig. 2-3), position UVR plug-in module as shown and slide into mounting cavity in circuit breaker cover.

Note: Left-hand mouting cavity will be on the right when inside of cover is facing upwards.

Make sure that leads are properly nested and fit into notch provided in cover.

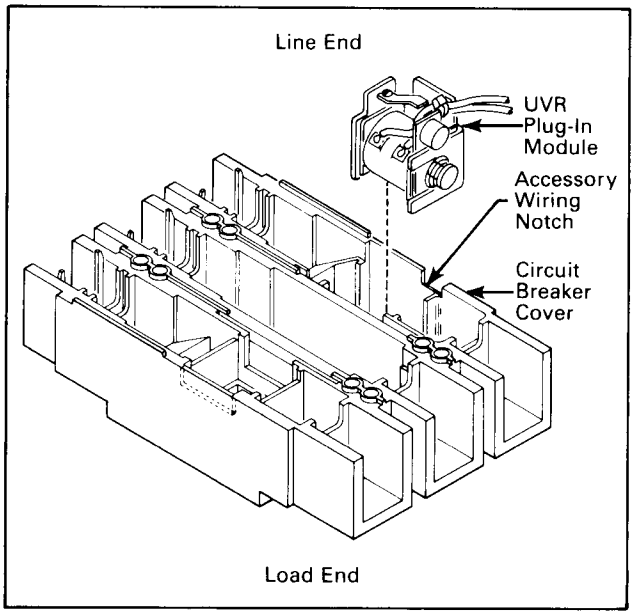

Fig. 2–3. *UVR Installation*

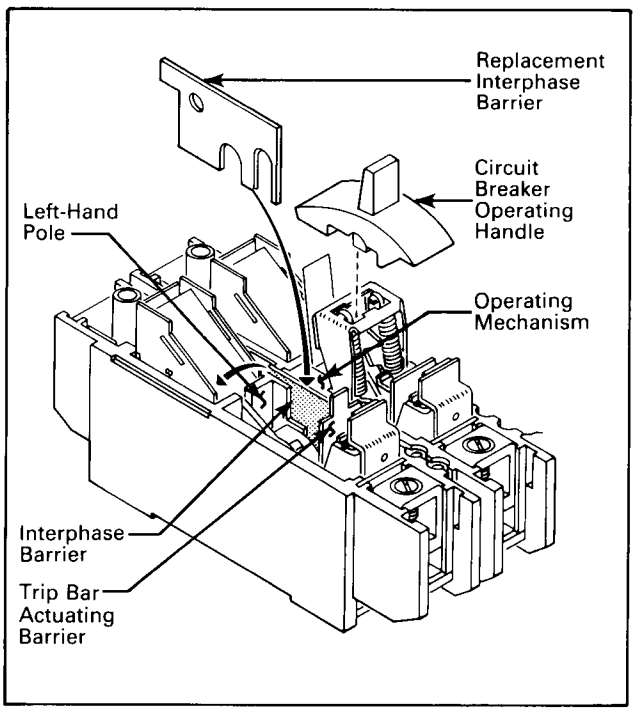

Fig. 2–4. *Circuit Breaker Base Assembly with Cover Removed. Replacement of Left-Hand Barrier*

2-6. Remove circuit breaker operating handle from handle arm (Fig. 2-4).

Note: To install the UVR and cradle cam assembly, the circuit breaker operating mechanism must be in the tripped position.

2-7. Trip the circuit breaker mechanism by lightly depressing the trip bar actuating barrier (Fig. 2-4).

2-8. Prepare circuit breaker base assembly to accept the UVR. Remove interphase barrier between left-hand pole and operating mechanism as shown in Fig. 2-4.

2-9. Insert replacement interphase barrier with cradle cam hole (Fig 2-4).

2-10. Install cradle cam, cradle pin and bearing cap into left-hand pole (Fig. 2-5) using the following steps:

a. Put cradle pin into cradle cam (Fig. 2-5).

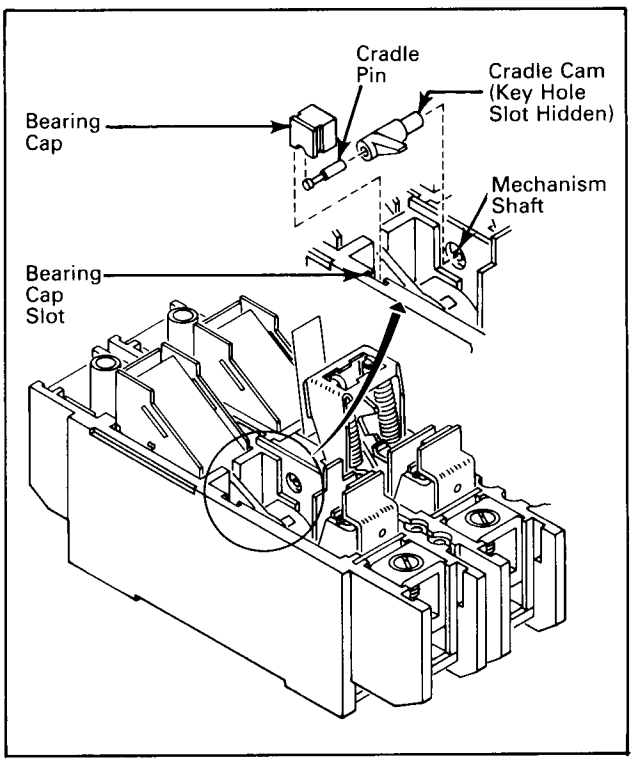

Fig. 2–5. *Cradle Cam Assembly*

CAUTION

Epoxy cement must be fully cured (Step 2-5b) before testing. Failure to allow epoxy cement to cure can result in incorrect retention of UVR cradle cam.

Use only recommended types of epoxy cement. Alternate types, including Super Bond, will adversely affect the cradle cam material

Note: For standard epoxy cement (Hy-Sol Epoxy Kit 11C, Hy-Sol Company, Olean, New York) allow at least 12 hours to cure.

For fast acting epoxy cement (Hy-Sol Epoxy-Kit 390) allow at least one hour to cure.

b. Before assembling cradle cam and cradle pin onto circuit breaker mechanism shaft, apply one drop of epoxy cement to inside of key hole slot in cradle cam (Fig. 2-5). Wipe off excess cement.

Note: Cradle pin cannot be inserted in cradle cam once cradle cam has been cemented in position.

c. Press cradle cam/cradle pin assembly onto mechanism shaft

d. Secure free end of cradle pin in position. Tip circuit breaker gently towards bearing cap slot. Cradle pin will slide from cradle for raised end to be held by bearing cap. Press bearing cap into base slot provided. (See Fig. 2-5)

Note: Testing of UVR should not be carried out until epoxy resin has fully cured and circuit breaker cover has been secured in position.

CAUTION

When installing the circuit breaker cover, make sure that all internal parts are in place:

- Arc extinguishers are in the arc extinguisher cavities.
- Interphase barriers are fully inserted in base.
- Pigtail leads are not pinched by the cover.

Note: Care should be taken in the following step to make sure that the UVR reset lever pushes the UVR plunger into the solenoid as the circuit breaker cover is installed. End of UVR plunger must be against the front of the trip bar actuating barrier and not hooked behind it before the cover can be correctly seated (Fig. 2-6.)

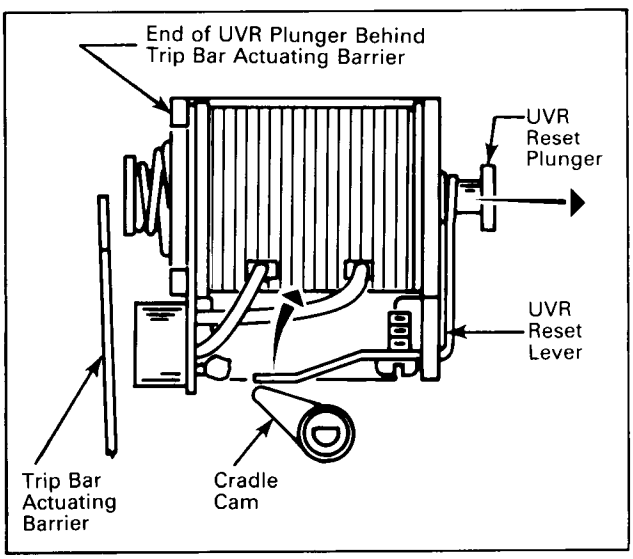

Fig. 2–6. *Sectioned View of Correct Position for UVR Reset Lever and Cradle Cam*

2-11. Install circuit breaker handle on handle arm (Fig. 2-4).

2-12. Carefully position the circuit breaker cover onto the circuit breaker base with the UVR leads nested into the slot provided. When cover is 1/4-inch from base, insert a small flat-blade

screwdriver between the base and cover and press circuit breaker trip bar back against magnet armature. Gently seat cover on base.

2-13. Install cover screws

2-14. Perform a mechanical check of installation. Without energy applied to the UVR, the circuit breaker must trip-free when the handle is moved to the "ON" position.

2-15. Perform an electrical check of installation.

a. Where practical, and after taking all necessary safety precautions, apply UVR rated control voltage to the UVR leads.

b. Reset and close circuit breaker.

c. Remove or reduce the control voltage source to less than 35 per cent of the rated UVR value. The circuit breaker should trip.

2-16. When UVR is installed at a nonUL approved location, remove and discard UL listing label.

2-17. Place labels supplied with kit on circuit breaker. (See Fig. 2-7.)

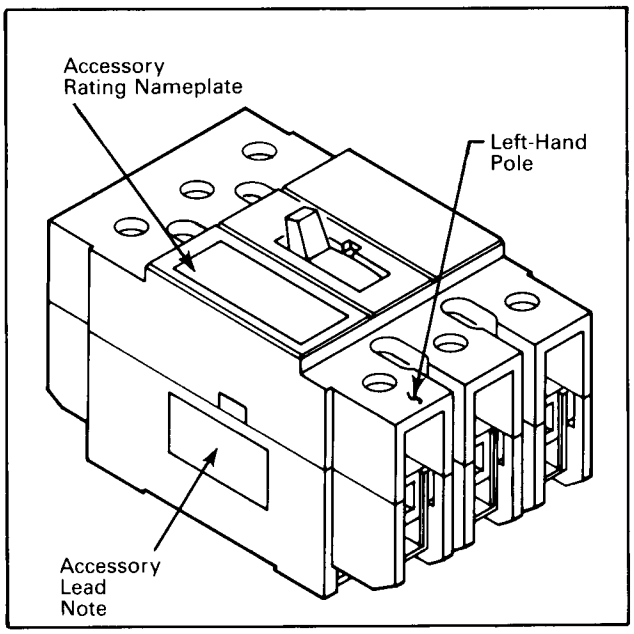

Fig. 2–7. *Preferred Mounting Locations for Accessory Nameplate Labels*

2-18. Install circuit breaker.

Note: No external resistors are required.

2-19. Connect UVR leads (black) to voltage source to be monitored (see Fig. 2-8).

Westinghouse assumes no responsibility for malfunctioning accessories installed by the customer.

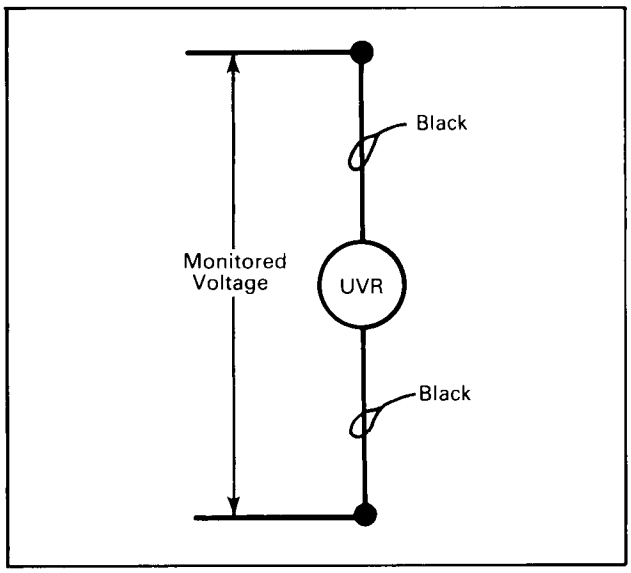

Fig. 2–8. *Undervoltage Release Mechanism (Cradle Reset) Connection Diagram*

Table 1–1. Undervoltage Release Mechanism (Cradle Reset) Ratings①

Style No.	Electrical Operating Ratings (50/60 Hz)						Approximate Operating Time (ms)			
	Voltage (V)	Freq. (Hz)	Dropout Voltage (V) Min.	Dropout Voltage (V) Max.	Pickup Voltage (V) Max.	VA	Min.② UVR Response	Initiation③ Circuit Breaker Contact Separation	Maximum Circuit Breaker Contact Opening	Dielectric④ Withstand Voltage (V)
373D62G03	120	50/60	42	63	76	1.8	5	15	25	1250
373D62G04	24	50/60	8.4	16.8	20.4	5.3	5	15	25	1250
373D62G05	48	50/60	17	33.6	40.8	1.0	5	15	25	1250
373D62G06	60	50/60	21	42	51	1.5	5	15	25	1250
373D62G07	110	50	39	77	94	1.5	5	15	25	1250
373D62G08	208	60	73	146	177	1.2	5	15	25	1416
373D62G09	220	50	77	154	187	1.3	5	15	25	1440
373D62G10	240	50/60	84	168	204	1.4	5	15	25	1480
373D62G11	380	50	133	266	323	3.0	5	15	25	1760
373D62G12	415	50	145	290	352	3.7	5	15	25	1830
373D62G13	440	50	154	308	374	4.0	5	15	25	1880
373D62G14	480	60	168	336	408	4.8	5	15	25	1960

① Endurance – 600 electrical operations of the UVR plus 9400 mechanical operations of the circuit breaker.
② UVR will override a momentary voltage dip up to the response time shown.
③ Unlatching occurs 1 millisecond before circuit breaker contacts begin to separate.
④ For 1 minute.