INSTRUCTIONS

GEH-3071B
Supersedes GEH-3071A and GEH-3072

GROUND-FAULT AND DIFFERENTIAL RELAYS

IC2820A102

Before any adjustments, servicing, parts replacement or any other act is performed requiring physical contact with the electrical working components or wiring of this equipment, the POWER SUPPLY MUST BE DISCONNECTED.

GENERAL

The IC2820A102 ground fault Relay is designed to be used as a fast-acting, manually reset relay to interrupt control power of a line contactor upon sensing a ground current in the lines to an ac motor load or other ac equipment. If a ground fault can be removed within a few cycles of its initiation, damage to a motor or other ac equipment can be minimized. For example, on a large induction or synchronous motor when an insulation failure occurs to ground, the fault current will be removed before damage is done to the laminations; thus making it possible to repair the motor at a minimum of expense and down-time.

The IC2820A102 differential relay detects any difference in current going in and out of each phase of a wye-connected motor. This current difference will trip the differential relay and shut down the motor by opening the motor line contactor. Separate relays and current transformers are connected in each phase to the motor.

DESCRIPTION

As shown in the elementary diagram (see Fig. 1 and 2) the ground-fault and differential relays are designed for use with a window-type current transformer. The IC2820A102 ground-fault relay and the IC2820A102 differential relay are identical in construction and differ only in application.

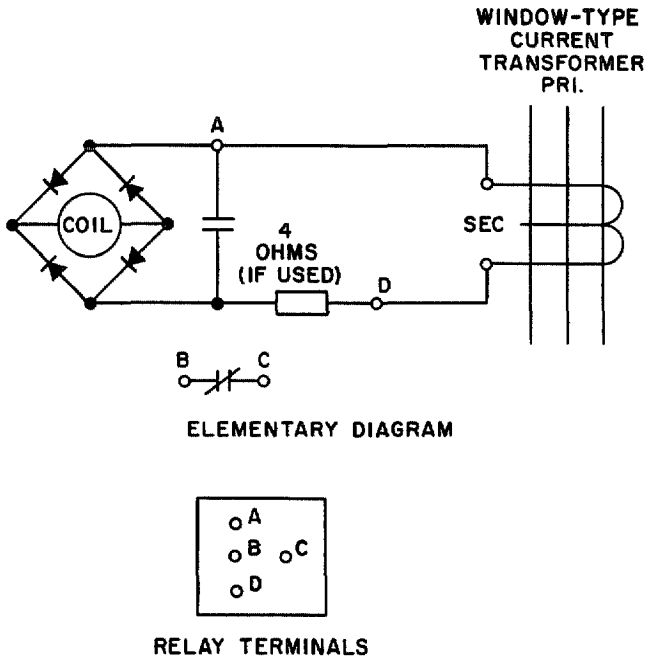

Fig. 1. Elementary diagram of ground-fault relay circuit, IC2820A102

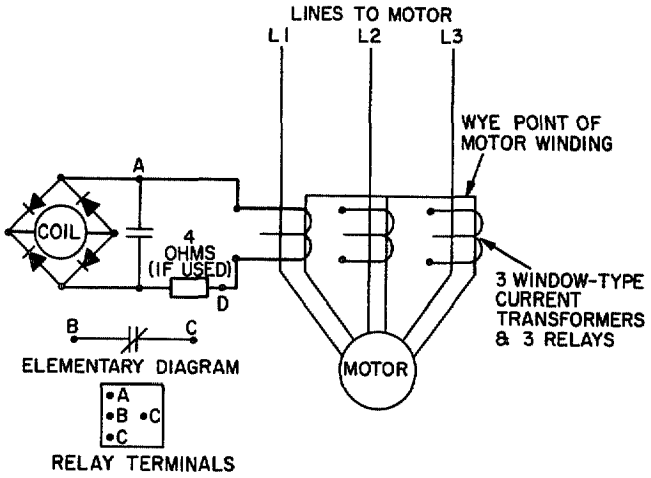

Fig. 2. Elementary diagram of differential-relay circuit, IC2820A102. One relay and current transformer are connected in each motor phase.

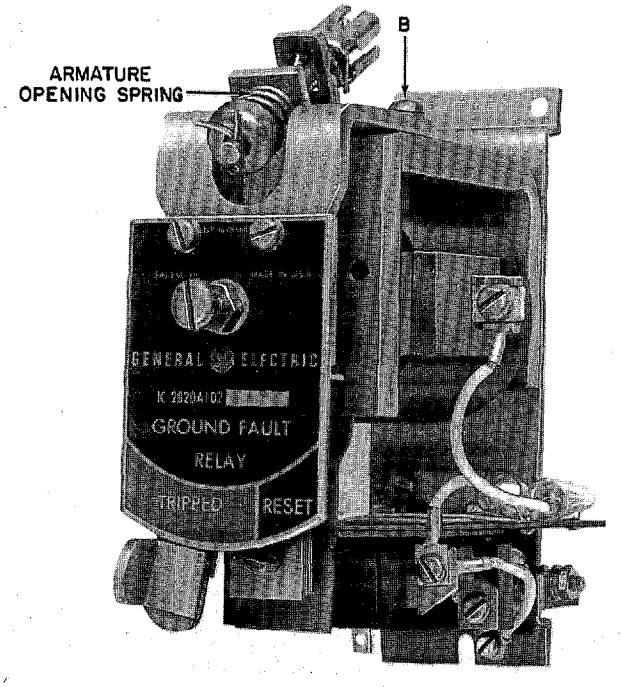

Fig. 3. Reset lever in TRIPPED position

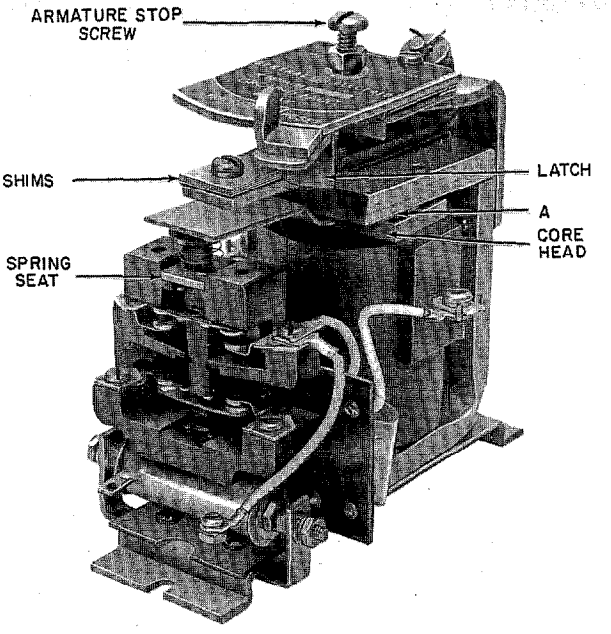

Fig. 4. Reset lever in RESET position

When a ground fault occurs, the vector sum of the currents in the cables through the window will not equal zero and this sum will cause a current in the secondary of the current transformer that will energize the relay coil. This current will actuate the relay to TRIPPED. This tripping time is approximately 13 milliseconds. When the relay trips, the normally-open contacts short out the rectifier and coil.

Also actuated at this time are a second set of contacts that may be either normally open or normally closed. The trip lever holds the relay in the TRIPPED position until the lever is moved in a counterclockwise direction to the RESET position. Figure 3 shows the reset lever in the TRIPPED position and Fig. 4 shows it in the RESET position.

CONNECTIONS

The secondary of the current transformer should be connected to terminals A and D on the relay. Those connections for use of the normally open or normally closed contacts to be used in the control circuit are made at terminals B and C on the contact block.

MOUNTING

The relay should be mounted on a vertical surface with the armature fulcrum at the top and the contacts at the bottom.

When mounting the relay, the proper NEMA standard for electrical clearance and creepage to conducting parts and to ground must be maintained.

ADJUSTMENTS

The following adjustments are made at the factory and should not need to be changed. It will be necessary, however, to readjust or at least to recheck the adjustments after replacing parts.

1. ARMATURE GAP – Adjust the armature stop screw, see Fig. 4, so that the armature gap, measured between the armature shim and edge of core head, Point A, Fig. 4, adjacent to the contact block, is 0.072 to 0.078.

2. RELAY LATCH – The lever should turn freely to the fully latched position when the relay is slowly closed manually and must not bind in any position of the lever arm. While holding the relay closed and armature assembly against the core head, there should be approximately 1/64 in. clearance between the shim and latch. The latch must be easily returned to the RESET position. See Fig. 4.

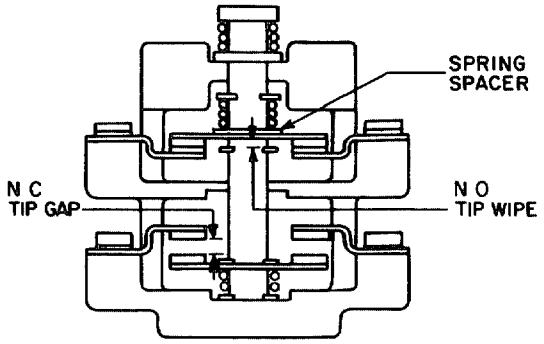

Fig. 5. Universal electrical interlock with one set of normally open contacts, and one set of normally closed contacts in the operated position

3. CONTACT GAPS AND WIPES – With the armature closed and resting against the latch, the contacts should have a gap of 1/16 in. minimum or a wipe of 1/32 in. minimum. See Fig. 5.

4. ARMATURE OPENING SPRING – The armature opening spring (see Fig. 3) is adjusted so that the relay will pick up cleanly with 10 amperes in the primary of current transformer JCH-0 (ratio 300:5) or 11 amperes in the primary of current transformer JCS-0 (ratio 100:5).

MAINTENANCE

COILS

To replace coils, first remove the armature assembly and latching mechanism as a unit by removing the two screws "B" as shown in Fig. 3. This eliminates the possibility of disturbing any adjustments. Then, remove the two flat-head screws that secure the core head to the core. After replacing the coil, replace the core head making certain that the flat-head screws are tightened so that the heads of the screws are below the surface of the core head. Replace the armature and latching mechanism. Perform the necessary checks as described under ADJUSTMENTS.

CONTACTS

To replace contacts, lift the spring seat, (Fig. 4) with the thumb and forefinger and remove the entire movable contact assembly. Snap off the "U"-shaped keys and the movable contacts can be removed. Care should be taken that the operating spring and spring spacer, if removed, are not lost during this operation.

To remove the stationary contact tip assembly, remove the terminal screw and lift the contact tip off the housing. To replace the tip assembly, press it onto the brass insert molded into the block and tighten the terminal screw. Care should be taken to avoid changing the shape of this contact assembly in handling.

CONTACT RATINGS (in Amperes)

Carry	Make	Interrupt						
		*Dc Inductive			†Ac			
		125V	250V	600V	110V	220V	440V	600V
10	60	1.8	0.5	0.2	6	3	1.5	1.2

*Noninductive dc interrupting rating is 1.5 times inductive.
† Capable of interrupting inrush currents of 60 amperes at 110 volts, 30 amperes at 220 volts, 15 amperes at 440 volts and 12 amperes at 600 volts a limited number of times.

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