INSTRUCTIONS

GEI-42540A
Supersedes GEI-42540

TIME DELAY UNDERVOLTAGE SYSTEM USING *IC2820-1754D RELAY

*(Also identified with prefix CR instead of IC)

INTRODUCTION

This instruction covers a circuit and circuit components for use on an a-c system to give adjustable time delay dropout on voltage failure and to give instantaneous pickup and dropout from a START-STOP control switch. This circuit is available for 110-volt and for 208/230-volt control sources.

Time delay on voltage failure is obtained by capacitor timing. Metallic rectifiers are used to supply direct current to the relay.

OPERATION

Figure 1 shows the elementary connection of the circuit.

Closure of START contact will apply pulsations of half-wave rectified power to the relay to pick it up and close its seal circuit and will charge the capacitor. During the blocked-out half-waves of a-c, the capacitor will supply voltage to the relay to prevent its dropping out as indicated in Fig. 2.

On failure of the a-c control voltage, the capacitor will discharge through the relay coil. The time required for this voltage to decay to a value which will allow the relay to dropout is determined by the RC time constants of the circuit.

When the STOP contact is opened, the relay coil will be de-energized and the device will drop out instantaneously. Its normally closed contact will allow the capacitor to discharge through the resistor. The ohmic value of the resistor must be so chosen that the RC time constant of this discharge circuit is low enough to prevent reclosure of the relay upon release of the STOP contact.

MOUNTING

The relay should be mounted with the armature knife edge at the top and the contact tips in the down position, Fig. 3. The knife edge (E) of the armature should be kept free from dust, as any accumulation will affect the timing.

The bimetal sliding shim (A), Fig. 3, should always be assembled to the relay armature with the steel magnetic portion in the up position or nearest the armature knife edge. The notched corner of the shim, Fig. 4, indicates the steel portion.

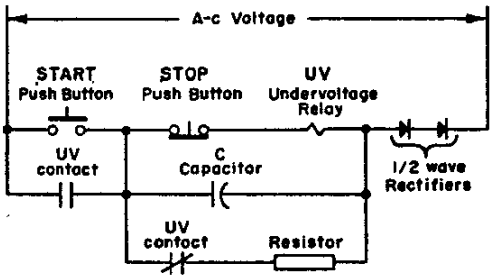

Fig. 1. Elementary wiring diagram for time delay undervoltage using an IC2820-1754D relay

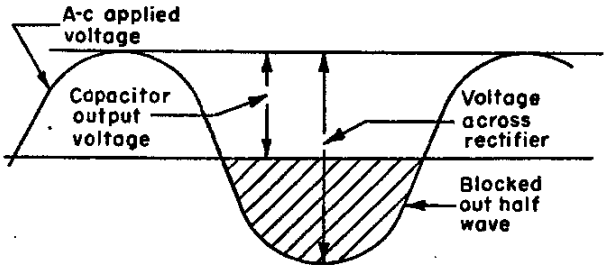

Fig. 2. Distribution of applied voltage

ADJUSTMENT

GENERAL

The adjustment of time delay dropout should be made by means of the sliding bimetal shim (A), Fig. 3. The bimetal shim is composed of a steel magnetic portion and a nonmagnetic portion, Fig. 4. To shift the position of the shim, loosen the two screws (C), Fig. 3, in the armature of the relay and slide the shim either up or down depending upon the change

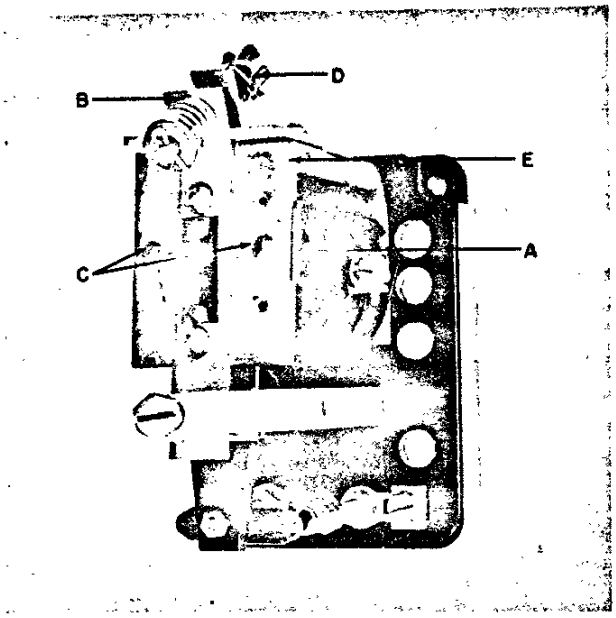

Fig. 3. IC2820-1754D relay

in time required, then tighten the screws. By moving the shim down, more steel is introduced between the armature and the core. This reduces the air gap in the magnetic circuit and permits a higher flux density. Then on voltage failure, the coil current will decay to a smaller value before the relay drops out. Thus, sliding the shim down increases the time required to drop out while sliding the shim up, decreases the time required to drop out.

TIP GAP SETTING

The normally closed tip gap should be 1/8 inch plus or minus 1/64 inch.

The normally open tip gap should be 3/32 inch minimum.

SPRING PRESSURE

Spring pressure should be measured on the screw at the normally open contact end of the compound bar. The spring pressure varies with voltages and times required. The adjustment of the tension spring (B), Fig. 3, is made by adjusting the nut (D), Fig. 3. Discretion must be used in adjusting the spring. The magnitude of the spring tension must be such as to hold the armature positively against the back stop but not of such magnitude as to prevent the armature from closing when the relay coil is energized at its maximum operating temperature.

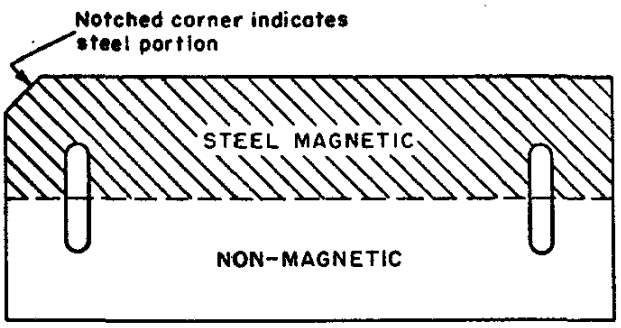

Fig. 4. Bimetal sliding shim used on IC2820-1754D relay

The spring pressures should be as follows:

8-12 ounces when the relay is used in a 220- or 230-volt a-c circuit.

2-10 ounces when the relay is used in a 110-volt a-c circuit.

TESTING

Check tip gap setting and set spring pressure as given under ADJUSTMENT.

Set the time delay dropout, by means of the sliding shim to give 1.5-2.0 seconds after application of power for one minute. Dropout with the push button operation should be instantaneous.

Check the pickup after the above adjustments have been made. Pickup should be between 60-80 percent as measured across the complete control voltage source. If this value is not obtained with the initial adjustment, change the spring pressure and shim setting, and recheck the pickup.

COMPONENTS

The type of relay, rectifier and resistor used in this circuit is the same in each case regardless of the time delay required. For a 110-volt, a-c control circuit, relay coil 22D11G25 and a 200-mf, 300-volt capacitor are used. For a 220-volt to 230-volt, a-c control circuit, relay coil 22D11G168 and a 50-mf, 450-volt capacitor are used.

To obtain longer time delays, additional capacitors may be added in parallel with the existing one. Pickup and adjustment must then be checked in the manner described above.

INDUSTRY CONTROL DEPARTMENT

GENERAL ELECTRIC

SCHENECTADY, N. Y.

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