INSTRUCTIONS

GEK-34173A

AUXILIARY RELAY

TYPE NAA15H

GENERAL ELECTRIC

CONTENTS

INTRODUCTION

The Type NAA15H relay is a special purpose auxiliary relay designed specifically for use with ground distance relays and torque-controlled time and instantaneous overcurrent relays. It is the purpose of the NAA to limit torque control, that is limit operation, of these overcurrent relays to single-phase-to-ground faults.

The Type NAA15H relay includes a plunger-type instantaneous overcurrent unit and four telephone type auxiliary units as shown in the internal connection diagram of Figure 1. The relay is mounted in the S2 size drawout case, the outline and mounting dimensions for which are shown in Figure 4.

APPLICATION

The Type NAA15H relay is intended specifically for use with ground distance relays of the CEYG51 type and torque-controlled overcurrent relays such as the Type IAC80 and CFC17A. A typical application of the NAA15H relay, with the associated ground distance and torque-controlled overcurrent relays, is illustrated by the external connection diagram of Figure 2.

The auxiliary units A1, A2, and A3 are operated respectively by contacts of the ground mho units associated with phase 1, phase 2, and phase 3. The contacts of these auxiliary units are interlocked with the torque control windings of the instantaneous and/or time overcurrent relays in such a way that operating torque will be developed only when a single ground mho unit has operated indicating a single-phase-to-ground fault. If more than one mho unit operates, all torque control circuits are blocked.

During a multiphase-to-ground fault there may be operating time differences between the mho units that are involved. Consequently, during a double-phase-to-ground fault a torque control circuit may be completed momentarily as a result of one auxiliary unit operating ahead of the other. The A4 auxiliary unit, which is operated by any of the ground mho unit contacts, introduces a slight time delay in the completion of the torque control circuits thus allowing time for both mho units and their associated auxiliaries to operate.

The operating coil of the instantaneous overcurrent unit (IOC) is connected in the CT residual circuit and its contact supervises the contact circuits of the three ground mho units. This limits operation of the auxiliary units to faults involving ground thus preventing an operation of any unit should one of the ground mho units operate on a phase fault.

RATINGS

INSTANTANEOUS OVERCURRENT UNIT

Coil: Tapped - 5 and 10 amperes
Untapped - 1.5, 3, 6, 12 and 25 amperes, DC or 25 to 60 Hertz

Contact: The carrying rating of the contacts is 5 amperes continuously or 30 amperes for tripping. The interrupting ratings for a resistive load are given in Table A.

TABLE A

	DC				AC		
V	24	48	125	250	115	230	460
A	5	2	1	0.3	5	2	1

The contact pressure at the maximum pick-up or drop-out positions may be adjusted by bending the stationary-contact springs, near the part attached to the base. This adjustment may change the contact gap and contact wipe slightly. Adjustments of contact stops within the normal range does not affect the contact pressure at the maximum pick-up or drop-out positions, as the contact springs are separated from the stops in these positions. The normal contact pressure on relays with one "a" contact and one "b" contact is 15 grams, measured at the contact tip. This is the initial pressure required to just lift the contact away from its contact stop. When 2 "a" or 2 "b" contacts are used, this initial pressure should be 5 grams on each contact.

TELEPHONE RELAYS

Before installation, the telephone relays should be checked mechanically to see that they operate smoothly and that the contacts are correctly adjusted.

With the telephone relays de-energized each normally open contact should have a gap of .010" - .015". Observe wipe on each normally closed contact by deflecting the stationary contact member towards the frame. Wipe should be approximately .005".

The wipe on each normally open contact should be approximately .005". This can be checked by inserting a .005" shim between the residual screw and the pole piece and operating the armature by hand. The normally open contacts should make before the residual screw strikes the shim.

ACCEPTANCE TESTS

See Figure 1 for internal connections.

INSTANTANEOUS OVERCURRENT UNIT

1. Check to see that the pickup current agrees with the calibration marks and that the unit meets the dropout called for in the CHARACTERISTICS section.

TELEPHONE RELAYS

A1, A2, and A3: Check, at rated voltage, that the pickup time is no greater than 8 milliseconds. The dropout time must be between 50 and 80 milliseconds.

A4: Check, at rated voltage, for a pickup time between 40 and 60 milliseconds. The dropout time shall be no more than 16 milliseconds.

ELECTRICAL TESTS

DRAWOUT RELAYS GENERAL

Since all drawout relays in service operate in their case, it is recommended that they be tested in their case or an equivalent steel case. In this way any magnetic effects of the enclosure will be accurately duplicated during testing. A relay may be tested without removing it from the panel by using a 12XLA13A test plug. This plug makes connections only with the relay and does not disturb any shorting bars in the case. Of course, the 12XLA12A test plug may also be used. Although this test plug allows greater testing flexibility, it also requires C.T. shorting jumpers and the exercise of greater care since connections are made to both the relay and the external circuitry.

POWER REQUIREMENTS GENERAL

All alternating current operated devices are affected by frequency. Since non-sinusoidal waveforms can be analyzed as a fundamental frequency plus harmonics of the fundamental frequency, it follows that alternating current devices (relays) will be affected by the applied waveform.

Therefore, in order to properly test alternating current relays it is essential to use a sine wave of current and/or voltage. The purity of the sine wave (i.e. its freedom from harmonics) cannot be expressed as a finite number for any particular relay, however, any relay using tuned circuits, R-L or RC networks, or saturating electromagnets (such as time overcurrent relays) would be essentially affected by non-sinusoidal wave forms.

Similarly, relays requiring dc control power should be tested using dc and not full wave rectified power. Unless the rectified supply is well filtered, many relays will not operate properly due to the dips in the rectified power. Zener diodes, for example, can turn off during these dips. As a general rule the dc source should not contain more than 5% ripple.

INSTALLATION

The relay should be mounted on a vertical surface in a location reasonably free from excessive heat, moisture, dust and vibration. See figure 4 for the outline and panel drilling.

PERIODIC CHECKS AND ROUTINE MAINTENANCE

In view of the vital role of protective relays in the operation of a power system it is important that a periodic test program be followed. It is recognized that the interval between periodic checks will vary depending upon environment, type of relay and the user's experience with periodic testing. Until the user has accumulated enough experience to select the test interval best suited to his individual requirements, it is suggested that the material under the ACCEPTANCE TESTS be complied with every one to two years.

CONTACT CLEANING

For cleaning relay contacts, a flexible burnishing tool should be used. This consists of a flexible strip of metal with an etched-roughened surface resembling in effect a superfine file. The polishing action is so delicate that no scratches are left, yet it will clean off any corrosion throughly and rapidly. Its flexibility insures the cleaning of the actual points of contact. Do not use knives, files, abrasive paper or cloth of any kind to clean relay contacts.

SERVICING

Should servicing the relay become necessary, follow the ADJUSTMENT SECTION and the ACCEPTANCE TESTS SECTION.

RECEIVING, HANDLING AND STORAGE

These relays, when not included as a part of a control panel, will be shipped in cartons designed to protect them against damage. Immediately upon receipt of a relay, examine it for any damage substained in transit. If injury or damage resulting from rough handling is evident, file a damage claim at once with the transportation company and promptly notify the nearest General Electric Apparatus Sales Office.

Reasonable care should be exercised in unpacking the relay in order that none of the parts are injured or the adjustments disturbed.

If the relays are not to be installed immediately, they should be stored in their original cartons in a place that is free from moisture, dust and metallic chips. Foreign matter collected on the outside of the case may find its way inside when the cover is removed and cause trouble in the operation of the relay.

RENEWAL PARTS

It is recommended that sufficient quantities of renewal parts be carried in stock to enable the prompt replacement of any that are worn, broken, or damaged.

Since the last edition, Figure 4 has been revised.

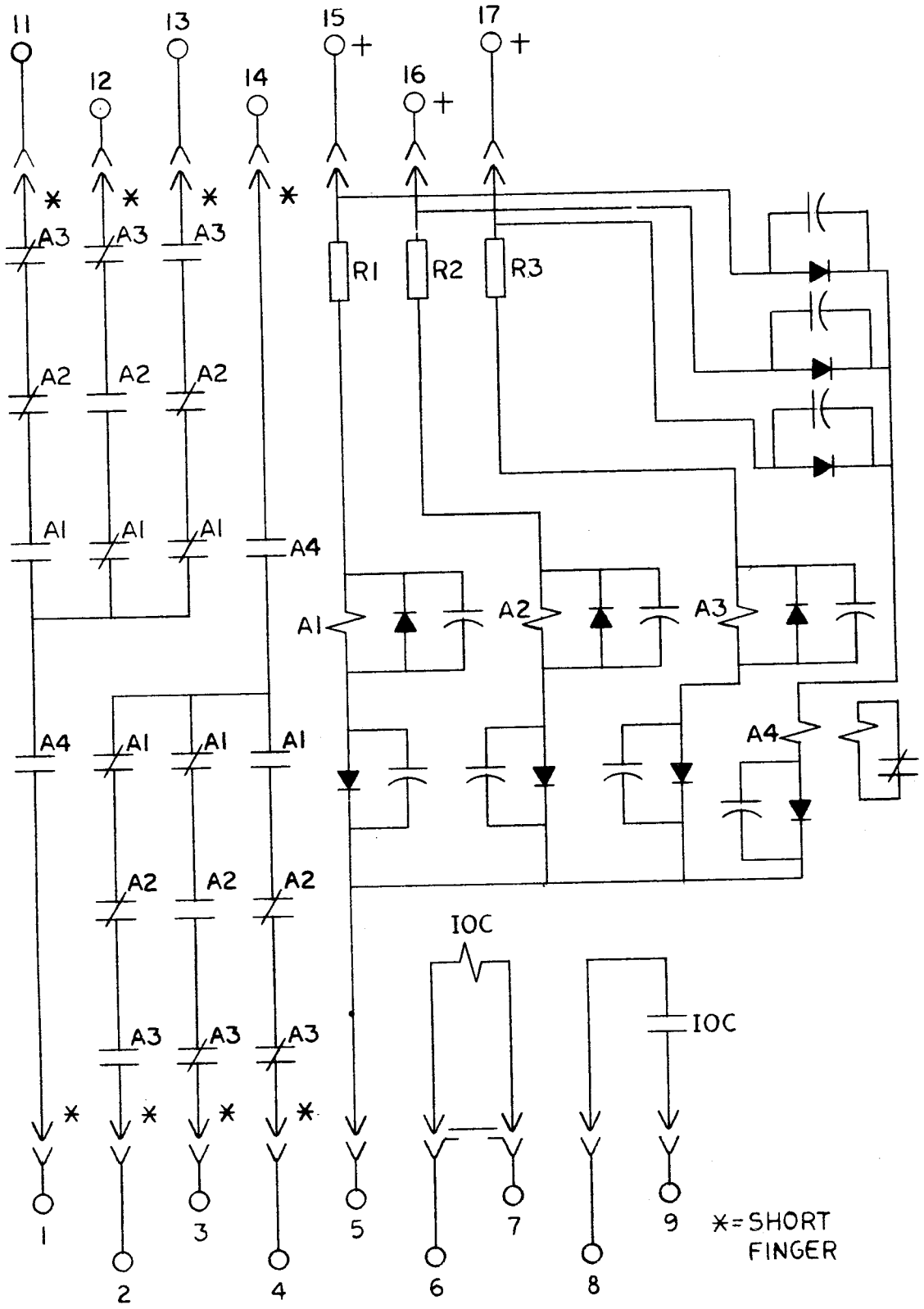

FIG. 1 (0246A3358-1) Internal Connections Diagram For Relay Type NAA15H (Front View)

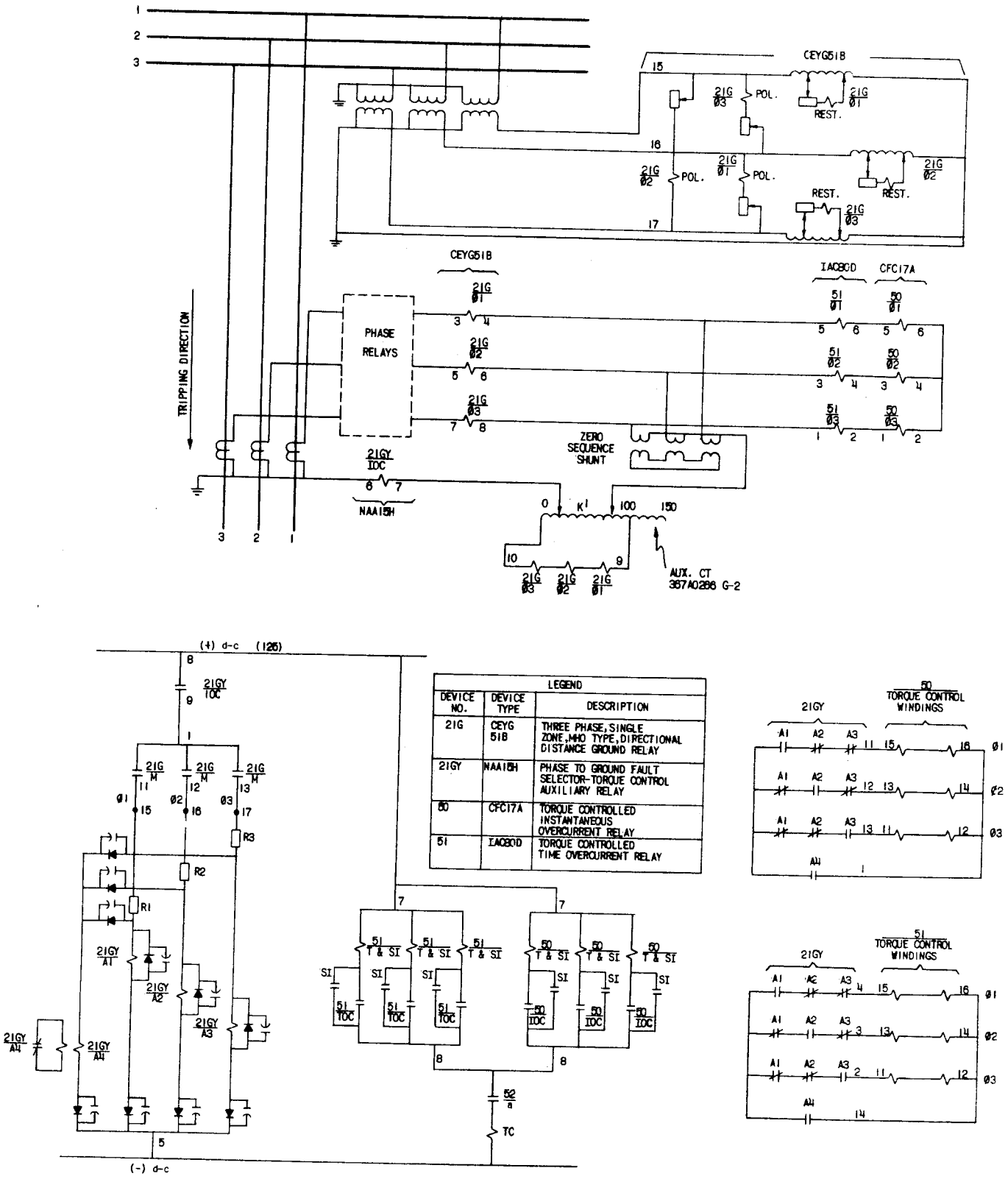

FIG. 2 (0165B2658-0 SH. 1 & 2) Typical External Connections Of Type NAA15H Relay

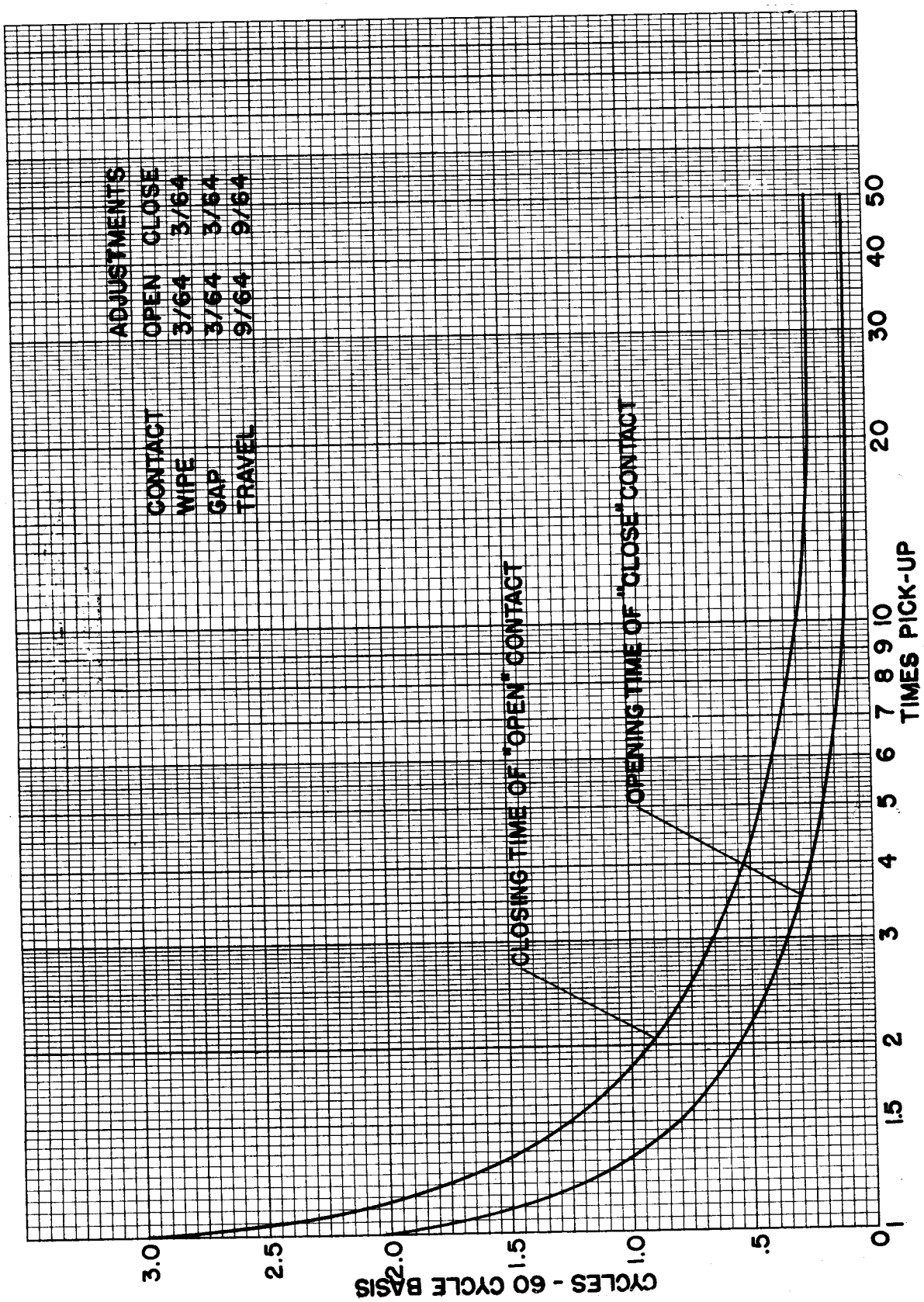

FIG. 3 (0418A711-1) Time Curves For The Instantaneous Overcurrent Unit

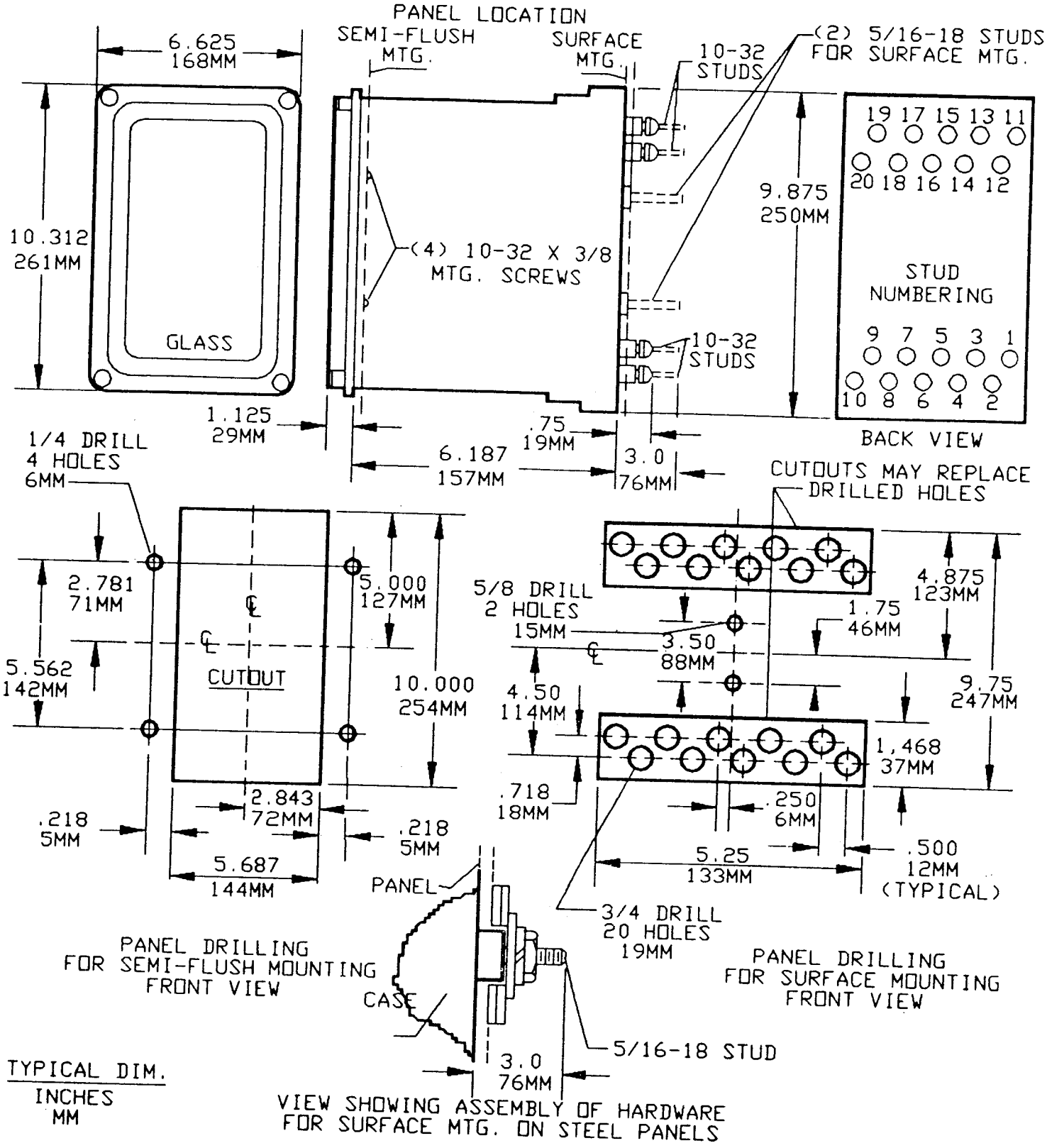

Figure 4 (6209272 [7]) Outline and Panel-Drilling Dimensions for the Type NAA15H Relay

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