



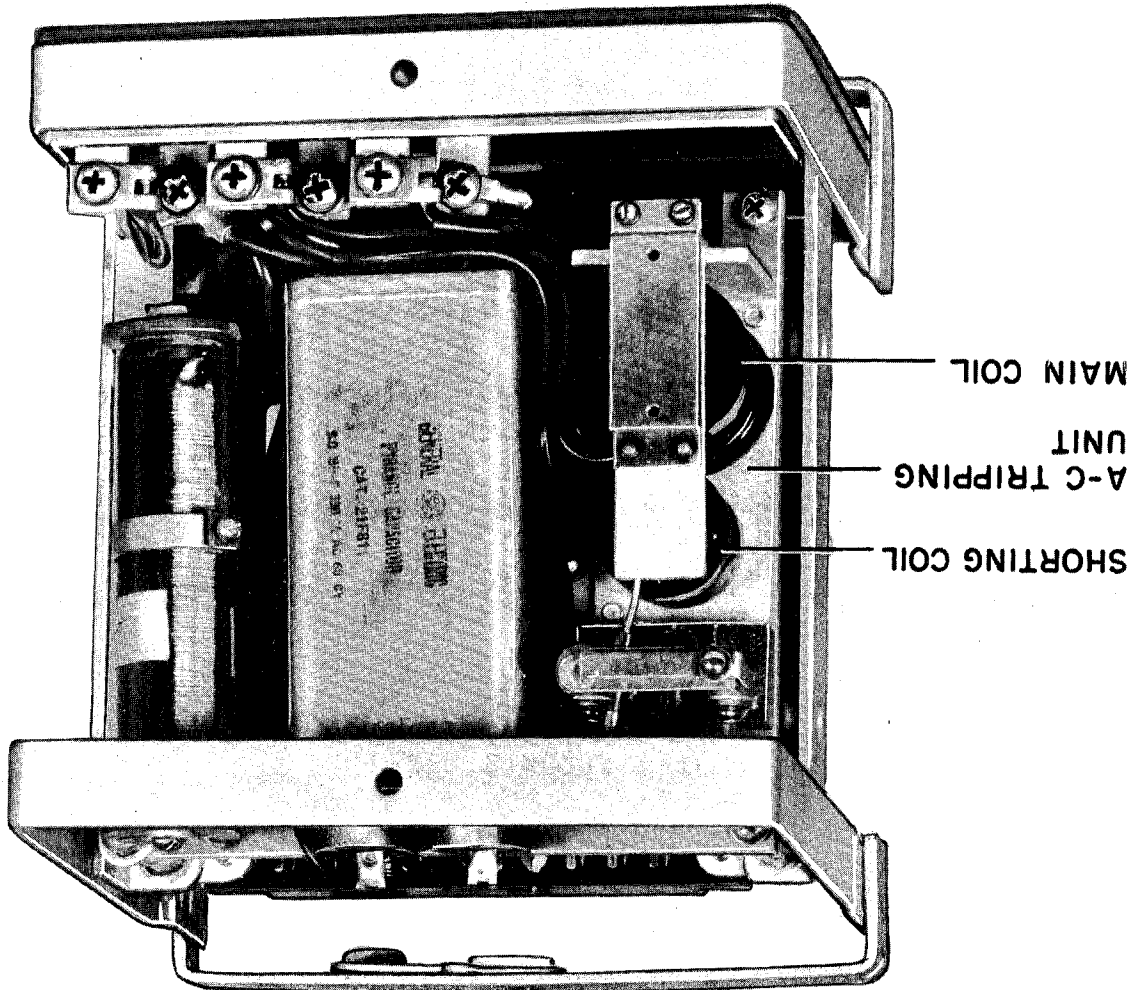
INSTRUCTIONS

GEK-65599
Insert Booklet GEH-2059

TYPE 12IAC99AS(-)A
TIME OVERCURRENT RELAY

GENERAL  ELECTRIC

Fig. 1 (8009963) Rear View of Type IAC Relay
Showing the AC Tripping Unit



TIME OVERCURRENT RELAY

TYPE IAC99AS(-)A

INTRODUCTION

These instructions supplement instruction book GEH-2059 which is included in this book. The combination of the two forms complete instructions for the Type IAC99AS(-)A relay.

The Type IAC99AS(-)A relay is similar to the Type IAC77B relay except that it has an AC seal-in unit and an AC trip unit.

SEAL-IN UNIT

This seal-in unit is mounted in the same manner as the seal-in unit of the Type IAC77A and Type IAC77B relays. This unit has its coil in series with the breaker trip coil and its contacts in parallel with the induction-unit contacts such that when the induction-unit contacts close, the seal-in unit picks up and seals in. When the seal-in picks up, it raises a target into view which remains exposed until released by pressing the reset button beneath the lower-left corner of the cover.

RATINGS

Contacts

The contacts are rated at 30 amperes for voltages not exceeding 250 volts.

Seal-in Coil

The coil of the seal-in unit is rated at 3.5 amperes.

AC TRIPPING UNIT

INTRODUCTION

The AC tripping is a Type REA relay unit designed to energize a circuit-breaker trip coil from its associated current transformer upon the operation of the main unit of the Type IAC relay.

The tripping unit is mounted on the rear of the frame opposite the variable resistor of the induction unit (see Fig. 1). The operation of the unit is illustrated in Fig. 2. The secondary current circulates through the induction-unit current coil and the main coil of the Type REA auxiliary tripping unit, returning through the Type

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.

To the extent required the products described herein meet applicable ANSI, IEEE and NEMA standards; but no such assurance is given with respect to local codes and ordinances because they vary greatly.

REA contacts to the current transformer. Normally, most of the flux generated by the main Type REA coil passes through the upper limb of the magnetic structure and holds the armature firmly against this limb. When the contacts of the induction unit close, the shorting coil of the Type REA is short-circuited and current flows in this coil by transformer action, causing a redistribution of flux which actuates the armature and the Type REA contacts. The opening of the Type REA contacts cause the secondary current to flow through the trip coil which trips the breaker.

APPLICATION

The AC tripping unit is used in Type IAC relays where a reliable direct-current tripping source is not available and it is necessary to trip the breaker from the current-transformer secondary.

RATINGS

The AC tripping unit has a continuous rating of five amperes, but will operate on a minimum current of 3.5 amperes. The unit should be used with three-ampere trip coils. The contacts of these units will transfer current transformer secondary current up to 100 amperes. For applications where the secondary current exceeds 100 amperes, the Type REALIB relay, which has contacts rated 200 amperes, can be used in conjunction with the Type IAC overcurrent relays. The Type REALIB relay is not mounted inside the Type IAC relay case.

BURDENS

Burdens of the Type REA unit are given in the following table.

FREQUENCY	AMPS	IMPEDANCE OHMS	P.F.	VOLT- AMPERS
25	5	0.23	0.62	5.8
50	5	0.33	0.85	8.4
60	5	0.49	0.80	12.2

INSTALLATION

MOUNTING

The outline and panel drilling dimensions are shown in Fig. 5 of this supplement.

CONNECTIONS

The internal connection diagram for the Type IAC99AS(-)A is shown in Fig. 3 of this supplement.

ADJUSTMENTS

The adjustments for the Type IAC99AS(-)A relay are the same as those in the included book except the Type IAC99AS(-)A relay uses Fig. 4 of this supplement. The adjustments for the AC trip unit are described in the following paragraphs.

The AC tripping unit should not require any attention other than occasional cleaning of the contacts. However, if the adjustment should be lost, it may be restored as follows:

CONTACT ADJUSTMENT

With the unit de-energized the movable contact should lie against the stationary contact with enough tension to always insure a good closed circuit. The movable contact brush should be free of any kinks. Also this contact brush should not touch the compound bushing supported from the top of the armature. The brass backing strip should be adjusted to allow a 1/16-inch contact gap with the contacts open. The compound bushing support should be adjusted to allow the back of the movable contact to just touch the brass backing strip when the armature operates to open the contacts. The outer edge of the compound bushing should be approximately 1/32-inch from the inner edge of the stationary contact supporting post.

ARMATURE ADJUSTMENT

Loosen the two screws which hold the armature assembly bracket to the bottom of the frame. Slide the bracket in or out, whichever is necessary, until the armature just touches the pole face of the upper core. In this position, the armature should be about 1/32-inch from the pole face of the lower core. Next, slide the bracket in until the armature leaf spring assumes a vertical position and is spaced clear of both armature and the vertical tip of the bracket. With this setting the armature should be flush against the pole face of both cores, and should put enough pressure on the armature to always return it flush against the pole face of the lower core after each operation of the unit. This alignment is important as a slight gap between armature and pole face of the lower core after the unit operates may cause contacts to open momentarily, dropping the relay target when the circuit breaker is reclosed. Under these conditions, the momentary opening of the contacts is due to the shock of the armature being pulled in against the pole face when the lower coil is energized. Excessive pressure on the armature, caused by the bracket being pushed in too far, will result in too high a pickup or chattering of the movable contact during operation of the unit. Tighten the bracket screws securely after the proper adjustment has been obtained.

ELECTRICAL TESTS

Connect the relay per the test circuit diagram, Fig. 4 of this booklet.

The TOC and IOC units can be tested per GEH-2059 and Fig. 4 of this booklet by closing switch Number Two and switch Number One.

(5) Set the time dial on I0 and hold open the contacts (IAC and instantaneous). Pass 100 amperes (40 amperes for units rated 1.5-6 amperes) through the circuit for 0.2 of a second. The REA armature should not operate, seal-in unit should not operate, there should be no sparking at the contact and the target should not be up. Repeat this test five times. Recheck relay on pickup test (Test Two), without touching REA unit to make sure that minimum current will open any small weld that might have occurred.

(4) Block open the instantaneous unit contacts and with the time dial on Number Two, pass 50 amperes (20 amperes for units rated 1.5-6 amperes) through the circuit. Induction contacts should close (then the REA contacts open, the seal-in contacts close and target indicates). Open the circuit, reset the target (this is to test the operation of the REA contacts). Operate the device on the 50 ampere circuit (20 amperes for units rated 1.5-6 amperes) several times and check that the REA contact current arc is blown away from the compound sleeve. Now operate the device on the 100 ampere circuit (40 amperes for units rated 1.5-6 amperes), once. Visually, check the condition of the REA contacts and reset the target.

HIGH CURRENT TESTS - Use Switches One and Three

Repeat Tests One and Two several times.

(3) Dropout: After the tripping attachment has operated in Test Two, remove the current and allow induction unit contacts to return to Number One time dial setting. The tripping attachment should reset to close its contacts and the seal-in unit should drop out leaving the target in the latched position.

(2) Pickup: Close switches One and Two and with the time dial at Number One setting, pass 3.5 amperes (1.3 amperes for units rated 1.5-6 amperes) through the relay. Close the induction unit contacts by hand; the tripping attachment should open its contacts at least 1/16-inch and the seal-in unit contacts should close.

(1) Noise: With the induction unit, seal-in unit and instantaneous unit contacts open, the tripping attachment should be quiet for all values of current up to 1.5-6.0 amperes. five amperes for units rated 4-16 amperes and two amperes for units rated 1.5-6.0 amperes.

NOISE, PICKUP AND DROPOUT

Check that the REA contact has a 7-9 gram contact pressure measured with a gram gage at the contact tip.

The REA unit can also be tested by closing switch Number One and Number Two for tests Number One, Two and Three below, and switches Number One and Number Three for tests Four and Five. Timing can be accomplished by closing switch Number Two and using switch Number One to apply the timing current to the relay and start the timer. The timer can be stopped by connecting the timer stop channel to the IOC or IOC normally open contact.

(6) Contact Pressure

Insert the tip of a 10 gram scale between the tripping attachment moving contact tip and the stationary contact and check that the contact pressure under these conditions is not less than seven grams.

RECEIVING, HANDLING AND STORAGE

These relays, when not included as 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 sustained 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.

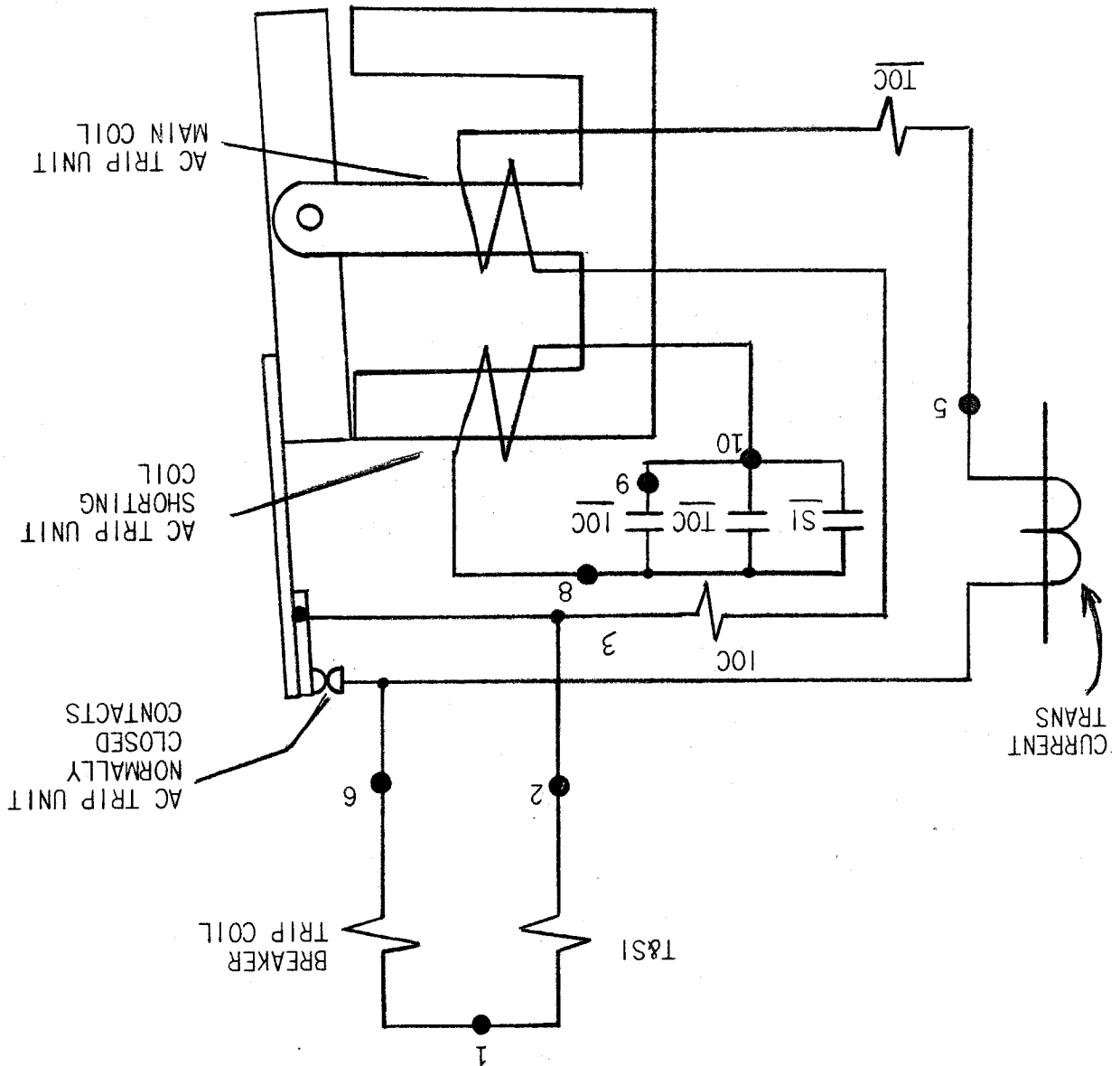
PERIODIC CHECKS AND ROUTINE MAINTENANCE

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 points listed under **INSTALLATION** be checked at an interval of from 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 thoroughly 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.

Fig. 2 (0165A7600-0) Diagram Illustrating the Operation of the AC Tripping Unit in the Type IAC Relay



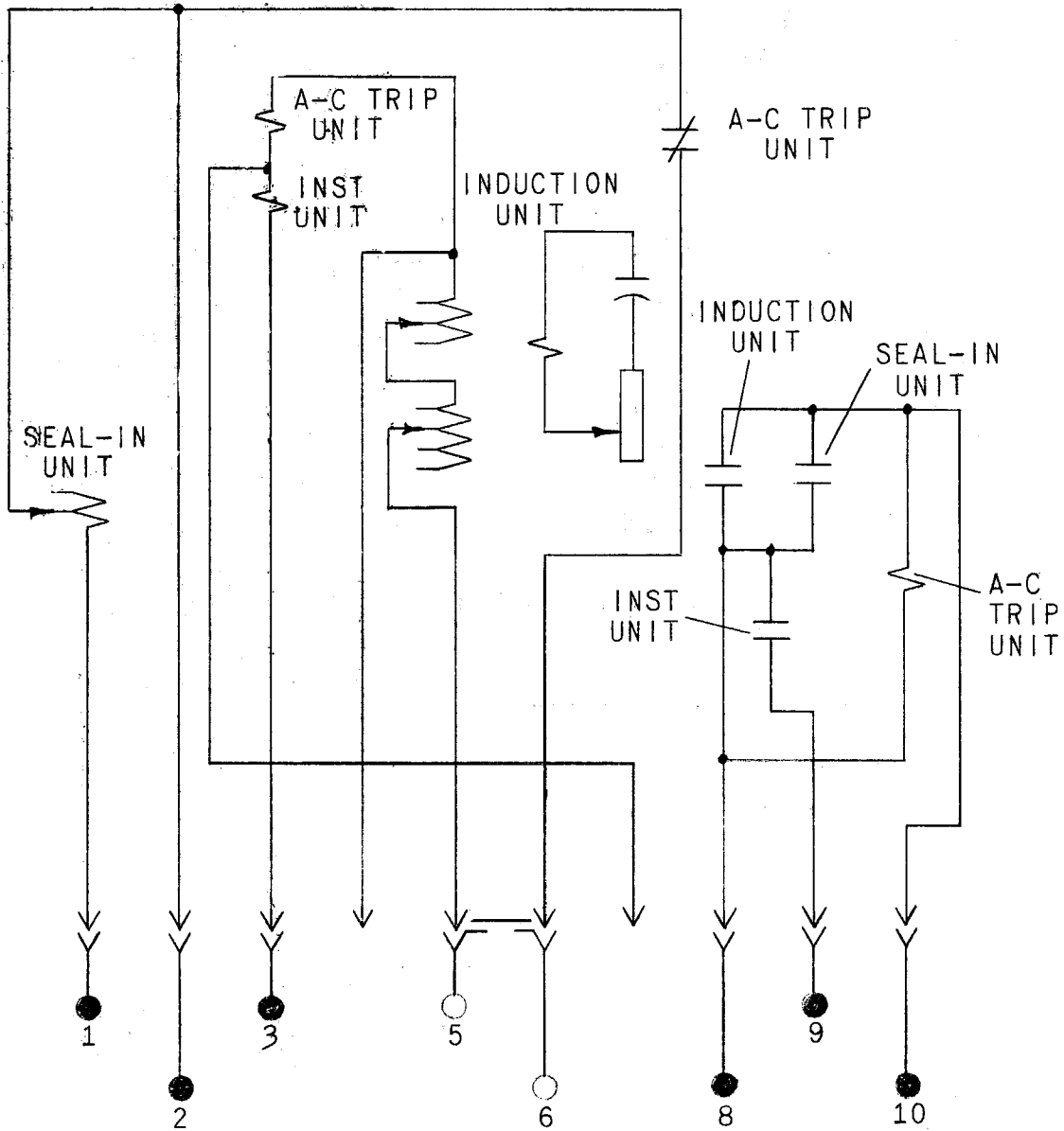
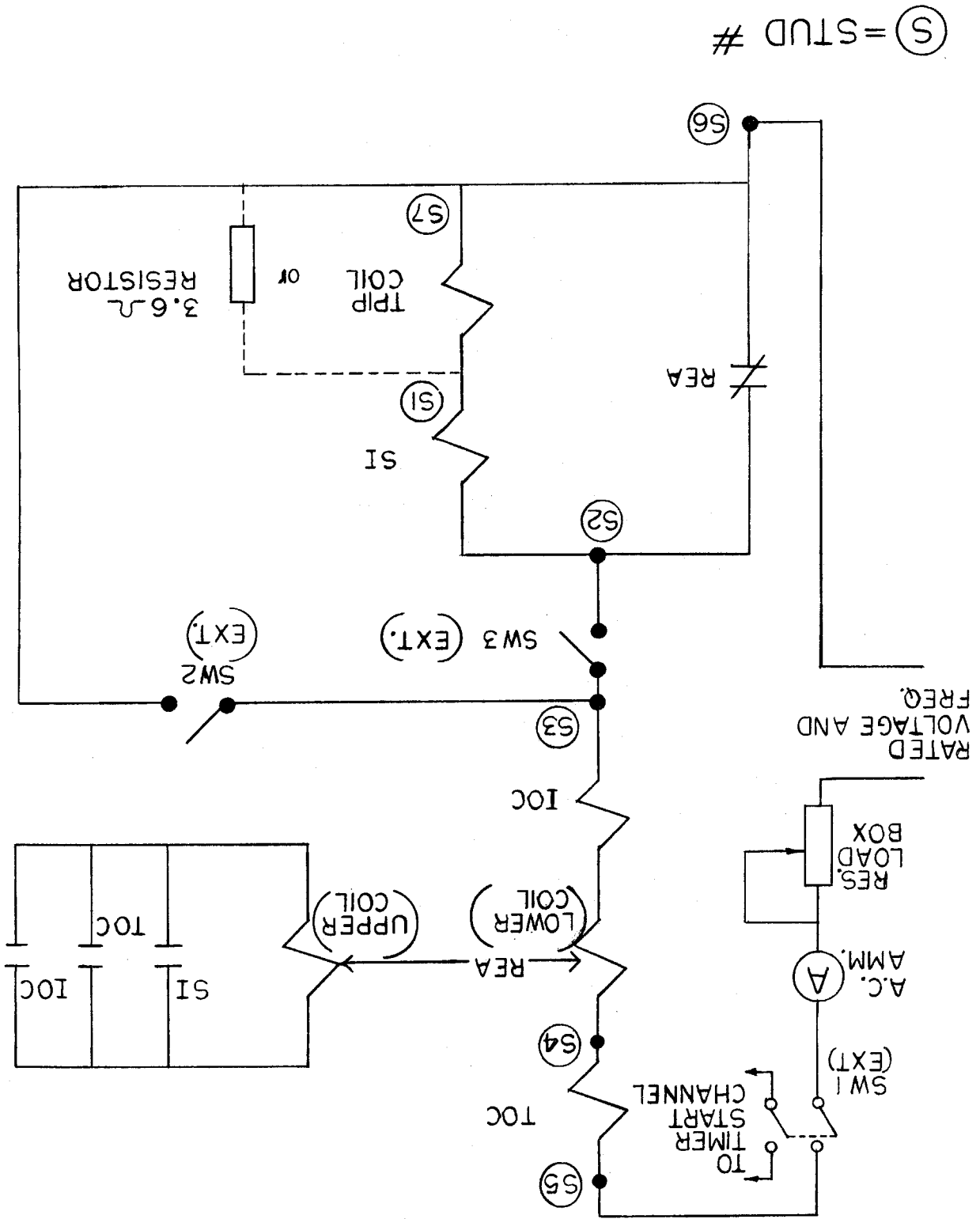


Fig. 3 (0376A0932-0) Internal Connections of the Type IAC99AS(-)A Relay (Front View)

Fig. 4 (0285A5117-0) Test Connections for the Type IAC99AS(-)A Relay



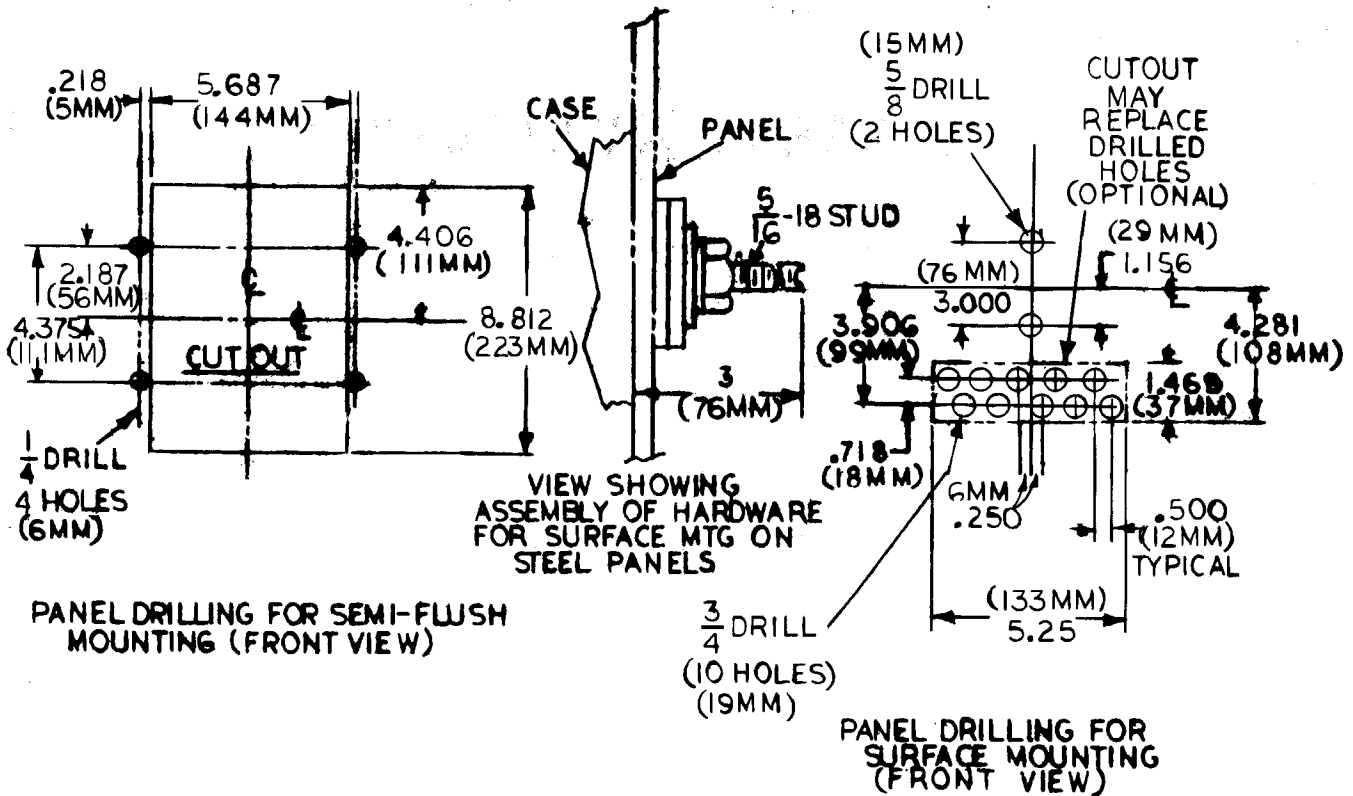
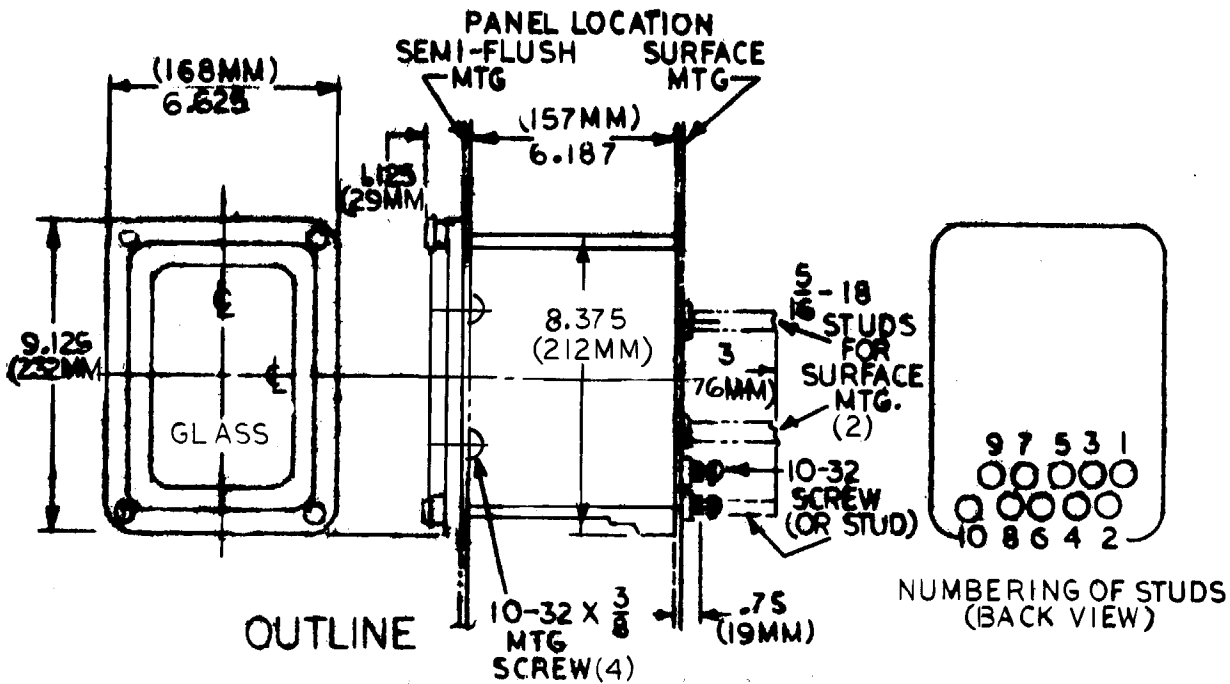


Fig. 5 (006209271-6) Outline and Panel Drilling Dimensions for the Type IAC99AS(-)A Relay

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