INSTRUCTIONS

AUXILIARY CURRENT RELAYS

HAA15A, HAA15B, HAA15C, HAA15D, HAA15E, HAA15F, HAA15G, HAA15H

GENERAL ELECTRIC

CONTENTS

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DESCRIPTION

The HAA relays, covered by this instruction book, consist of one target unit mounted in a molded plastic case with a glass window. These relays have two normally open contacts, electrically separate from the coil circuits. The two normally open contacts of relay HAA15H are also electrically separate. The available current and voltage ratings are given in Table I. The internal connections are provided in Fig. 3 through 7. The outline and panel drilling dimensions are given in Fig. 7 through 10.

APPLICATION

These HAA relays may be used wherever a single external target function is required. The HAA15A, HAA15C, or HAA15E may be used as an external target and seal-in.

RATINGS

The contacts will make and carry 30 amperes momentarily and will carry six amperes continuously.

The available current and voltage ratings, resistance values, pickup values (see ELECTRICAL TESTS for pickup limits) and the continuous rating of the operating coils are given in Table I.

TABLE I

MODEL	Coil Rating	Tap Rating	DC Resistance	Pickup	Carry 30 Amp For	Carry 10 Amp For	Maximum Continuous
HAA15A HAA15E	0.2/2.0 Amp DC	0.2 Amp	7.0 Ohms	0.2 Amp	--	0.2 Sec	0.30 Amp
	0.2/2.0 Amp DC	2.0 Amp	0.13 Ohm	2.0 Amp	4 Sec.	30 Sec	3.0 Amps
HAA15A	0.6/2.0 Amp DC	0.6 Amp	0.6 Ohm	0.6 Amp	0.5 Sec.	4.5 Sec.	0.90 Amp
	0.6/2.0 Amp DC	2.0 Amp	0.13 Ohm	2.0 Amp	4 Sec.	30 Sec.	3.0 Amp
HAA15C	2.0 Amp AC	--	0.15 Ohm	2.0 Amp	4 Sec.	30 Sec.	3.0 Amp

TABLE I (Continued)

MODEL	Coil Rating	Tap Rating	DC Resistance	Pickup	Carry 30 Amp For	Carry 10 Amp For	Maximum Continuous
HAA15B HAA15F HAA15H	250 Volt DC	--	11200 Ohms**	200 Volt	--	--	250 Volt
	125 Volt DC	--	5600 Ohms	100 Volt	--	--	125 Volt
	48 Volt DC	--	840 Ohms	38.4 Volt	--	--	48 Volt
HAA15B	24 Volt DC	--	200 Ohms	19.2 Volt	--	--	24 Volt
HAA15D HAA15G	230 Volt AC	--	6600 Ohms	185 Volt		--	230 Volt
	120 Volt AC	--	1650 Ohms	96 Volt		--	120 Volt

** Includes series resistor of 5600 ohms

CHARACTERISTICS

The maximum operating values of current or voltage are given in Table I. Operation (pickup) occurs at or below the maximum value.

CONSTRUCTION

The HAA relays covered by this instruction book consist of one target unit mounted in a small molded plastic case with a glass window; see Fig. 1 and 2. The target unit is a small hinged armature type relay with a "U" shaped magnet frame, a fixed pole piece, an armature, which operates the normally open contacts and the target, and an operation coil.

These relays have two normally open contacts, electrically separate from the coil circuit. The contacts of relay HAA15H are also electrically separate. When the coil is energized with rated current or voltage, the contacts will close and the target flag will be latched into position where it is visible from the front of the relay. An external manual reset button is provided on the relay case cover.

Relays with dual rated current coils are connected for the higher ampere rating when shipped as indicated in Fig. 3. Interchange the green and black leads for the lower ampere rating connection.

The HAA15A, HAA15B, HAA15C, HAA15D and HAA15H relays are back connected and can be either projection mounted, Fig. 8, or semi-flush mounted, Fig. 9.

The HAA15E, HAA15F and HAA15G relays are front connected, surface mounted as shown by Fig. 10.

Table II shows the type of operation, current or voltage, AC or DC and references the internal connection diagrams for the HAA relays covered by this instruction book.

TABLE II

Model	Current or Voltage	AC/DC	Internal Connections
HAA15A	I	DC	Figure 3
HAA15B	V	DC	" 4
HAA15C	I**	AC	" 5
HAA15D	V	AC	" 6
HAA15E	I	DC	" 3
HAA15F	V	DC	" 4
HAA15G	V	AC	" 6
HAA15H	V	DC	" 7

** Single rated current coil

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.

Also check the nameplate stamping to ensure that the model number and rating of the relay received agree with the requisition.

Manually check the operation of each unit and that the contact gap is at least 3/32 inch and the wipe is 1/32 inch. Both contacts should close at approximately the same time.

ACCEPTANCE TESTS

PRELIMINARY CHECK

1. Check wiring using the applicable internal connections diagram. Check continuity of contact circuits with armature picked up.

2. Manually check the operation of each unit and that the contact gaps are at least 3/32 inch. Both contacts should close at approximately the same time.

3. With the armature against the pole piece, the upper and lower contact buttons should be reasonably parallel.

4. In the de-energized position, the "T" spring (moving contacts of HAA15H) should rest on the turned-in prongs of the front molded block. The cross member of the "T" spring (moving contacts of HAA15H) should overlap the prongs by at least 1/32 inch so that the armature can never drop down.

5. With the armature against the pole piece, the cross member of the "T" spring (moving contact of HAA15H) should lie in a horizontal plane and there should be at least 0.017 inch wipe on contacts. To check this wipe, raise the armature by hand until the contacts just make. There should be approximately 1/64 inch air gap between the armature and freeze pin of the pole piece; also, hold armature flush against the pole piece by hand and raise the orange target with a sharp tool such as a knife. It should be possible to raise this target at least 1/64 inch.

6. Check reset of the target.

ELECTRICAL TESTS

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 waveforms.

Similarly, relays requiring DC control power should be tested using DC and not full wave rectified power. Unless the rectified power 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 five percent ripple.

Target Units

1. Check pickup using a variable power source. Check pickup of both taps of dual rated current units. The higher tap rating is the green lead and the lower tap is the black lead. The unused taps should be terminated on the dummy terminal. The armature should pick up with a snap action and seal against the pole piece.

   The pickup limits for DC current operated relays are:

RATING	PICKUP AMPS
0.2	0.16 - 0.20
0.6	0.48 - 0.60
2.0	1.6 - 2.0

The pickup limits for AC operated relays are 70 to 80 percent of rated value.

The pickup limits for DC voltage operated relays are 60 percent of rated voltage or less.

2. Check that dropout of DC current operated seal-in units is 25 percent of tap value or higher. This is to ensure the relay will not remain picked up due to low level DC current through a sneak circuit.

3. To check latching-in of targets, energize the seal-in units of DC current operated relays at approximately 95 percent of rating; apply approximately 85 percent of rated value to AC current operated relays and to voltage operated relays.

   Then de-energize the seal-in unit and tap the top of the unit several times to ensure that the target will not drop on vibration.

INSTALLATION

LOCATION

The location should be clean and dry, free from dust and excessive vibration and well lighted to facilitate inspection and testing.

MOUNTING

The outline and panel drilling diagrams are shown in Fig. 8, 9 and 10.

INSPECTION

At the time of installation, the relay should be inspected for tarnished contacts, loose screws, or other imperfections.

CONNECTIONS

The internal connection diagrams for the various relays are shown in Fig. 3 through 7.

DUAL RATED CURRENT UNITS

For the 0.2-2.0 amp and 0.6-2.0 amp dual rated current units, make sure that the tap screw is in the desired tap. The relay is shipped from the factory with the tap screw in the higher ampere position. The tap screw is the screw holding the right-hand stationary contact. To change the tap setting, first remove one screw from the left-hand stationary contact and place it in the desired tap. Next remove the screw from the undesired tap and place it on the left-hand stationary contact where the first screw was removed. See Fig. 1 and 2. This procedure is necessary to prevent the right-hand stationary contact from getting out of adjustment. Screws should never be in both taps at the same time.

SERVICING

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 a superfine file, which removes corroded material quickly without scratching the surface. The flexibility of the tool insures the cleaning of the actual points of contact. Never use knives, files, abrasive paper or cloth of any kind to clean fine silver contacts. A burnishing tool as described above can be obtained from the factory.

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.

When ordering renewal parts, address the nearest Sales Office of the General Electric Company, specify quantity required, name of the part wanted, and give complete nameplate data. If possible, give the General Electric requisition number on which the relay was furnished.

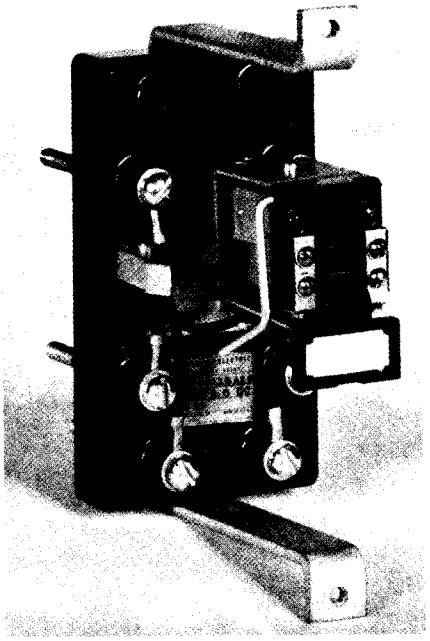


Fig. 1 (8030184) HAA15 Relay Removed from Case

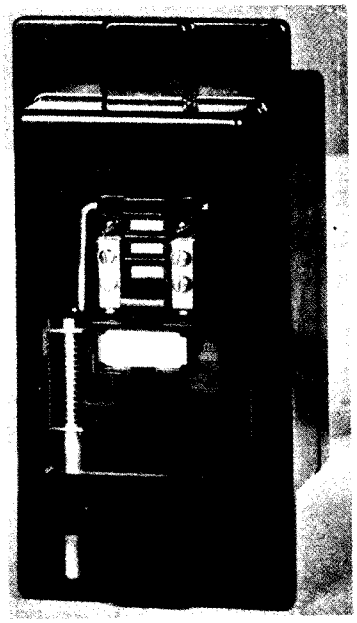


Fig. 2 (8912917) HAA15 Relay in Flush Mounted Case

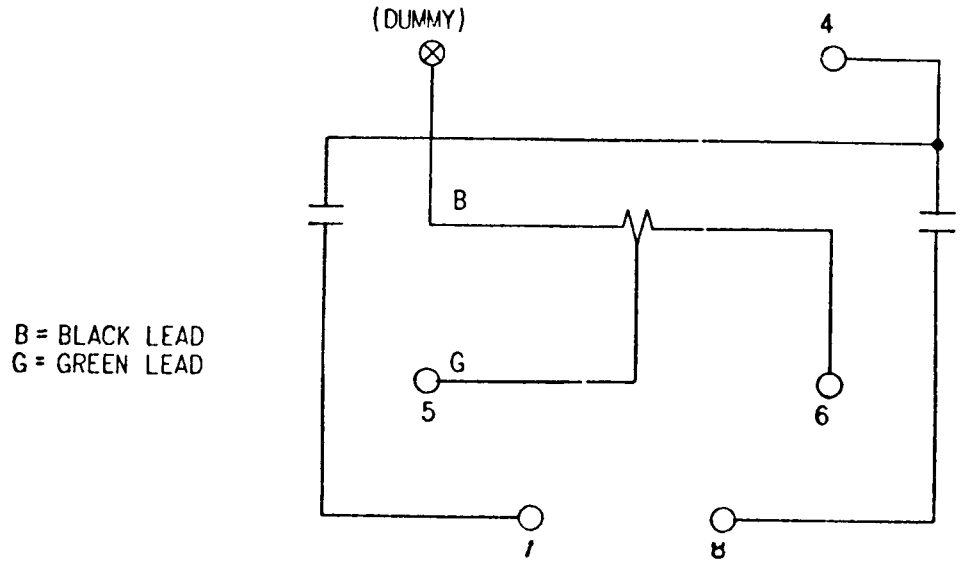
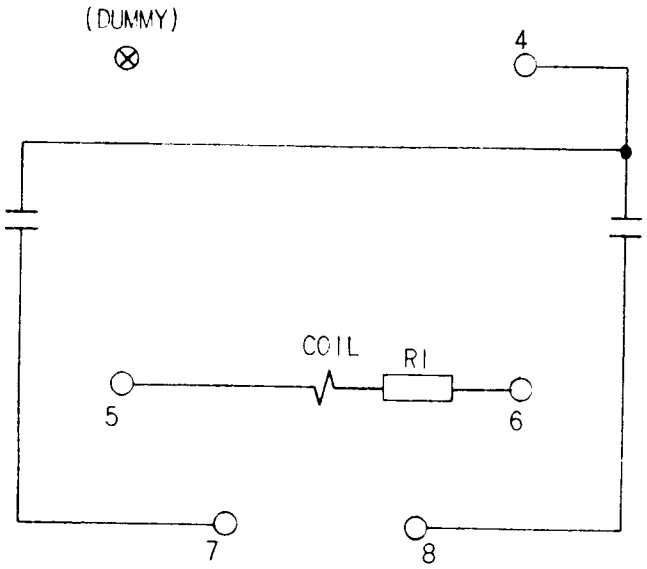


Fig. 3 (0165A6061-0) Internal Connection Diagram of the HAA15A and HAA15E Relays Showing Connections for Higher Amp Rating (Back View)



VOLTS DC	OHMS	
	COIL	RI
250	5600	5600
125	5600	–
48	840	–
24	200	–
110	5600	–

Fig. 4 (0165A6062-2) Internal Connections and Table of Resistance Values of the HAA15B and HAA15F Relays (Back View)

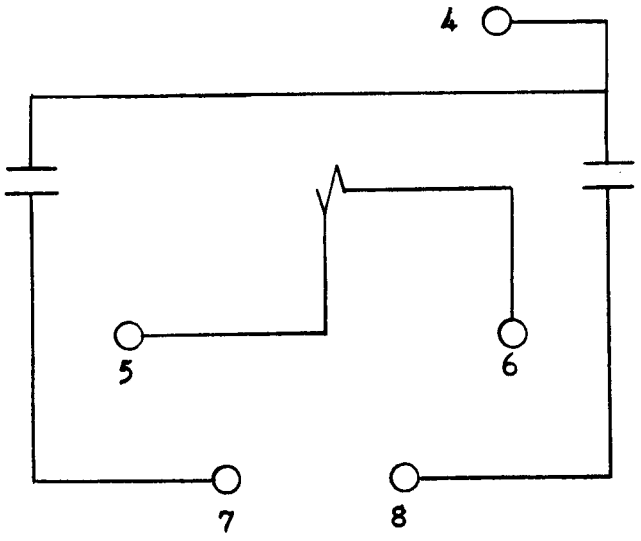


Fig. 5 (0195A9121-0) Internal Connections Diagram of the HAA15C Relay (Back View)

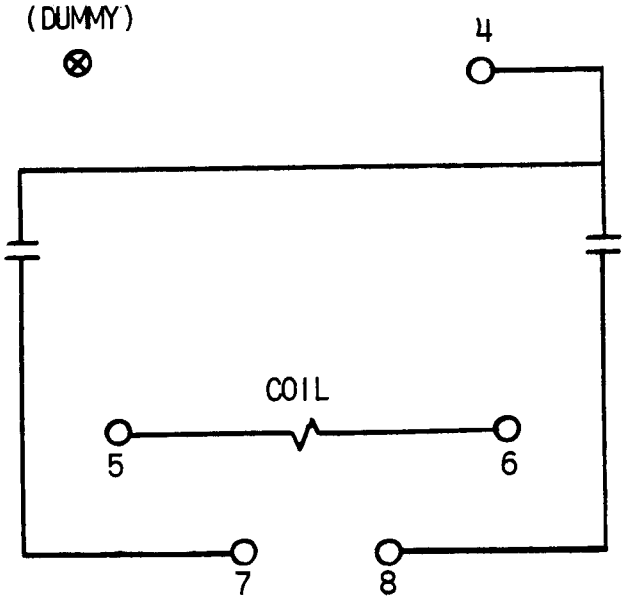
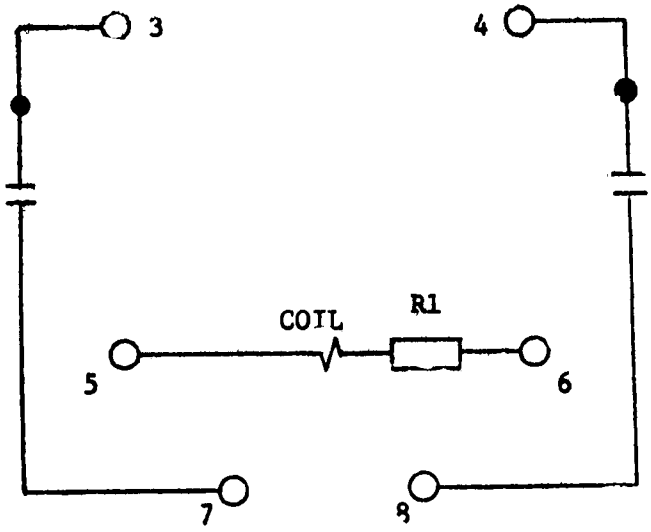


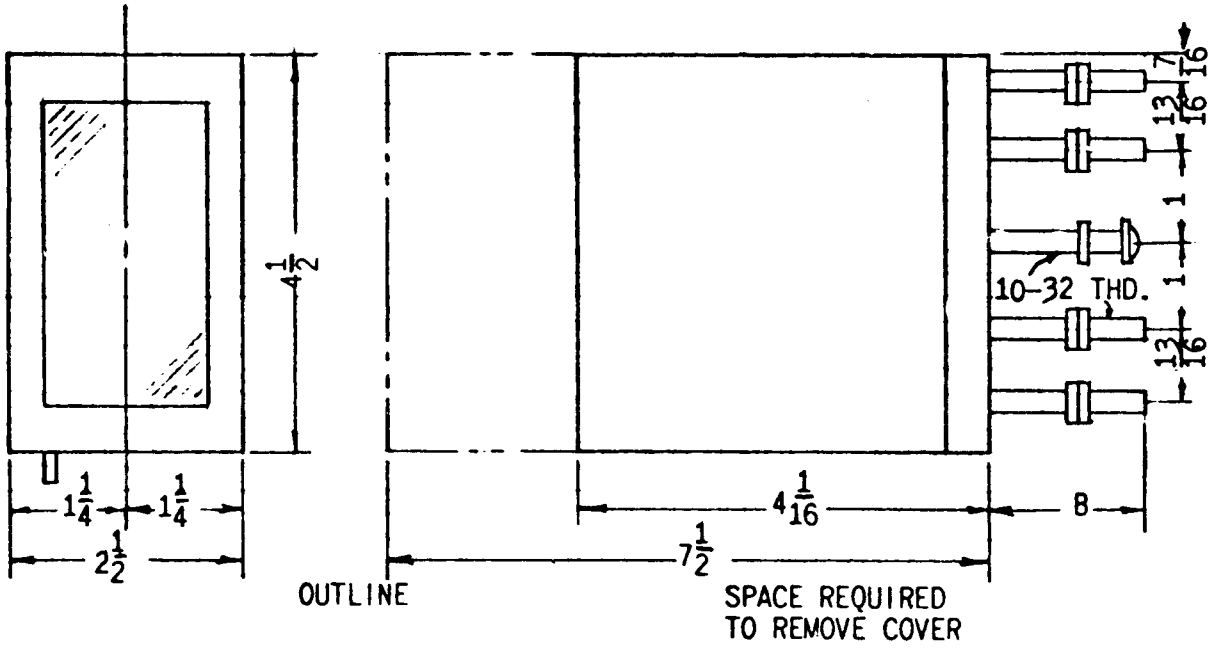
Fig. 6 (0257A5083-0) Internal Connections Diagram of the HAA15D and HAA15G Relays (Back View)

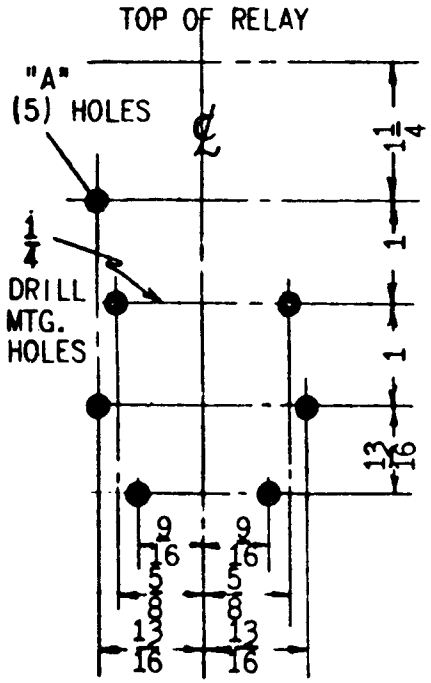


VOLTS DC	OHMS	
	COIL	R1
250	5600	5600
125	5600	-
48	840	-

FIGURE 1 0269A3026

Fig. 7 (0269A3026-0) Internal Connections Diagram and Table of Resistance Values of the HAA15H Relay (Back View)





TYPE OF PANEL	A	B
INSULATING	7/16	2-13/16
STEEL	9/16	1-3/8

PANEL DRILLING (FRONT VIEW)

Fig. 8 (0165A6003-3) Outline and Panel Drilling Dimensions
For the Back Connected Projection Mounted
HAA15A, HAA15B, HAA15C, HAA15D and HAA15H Relays

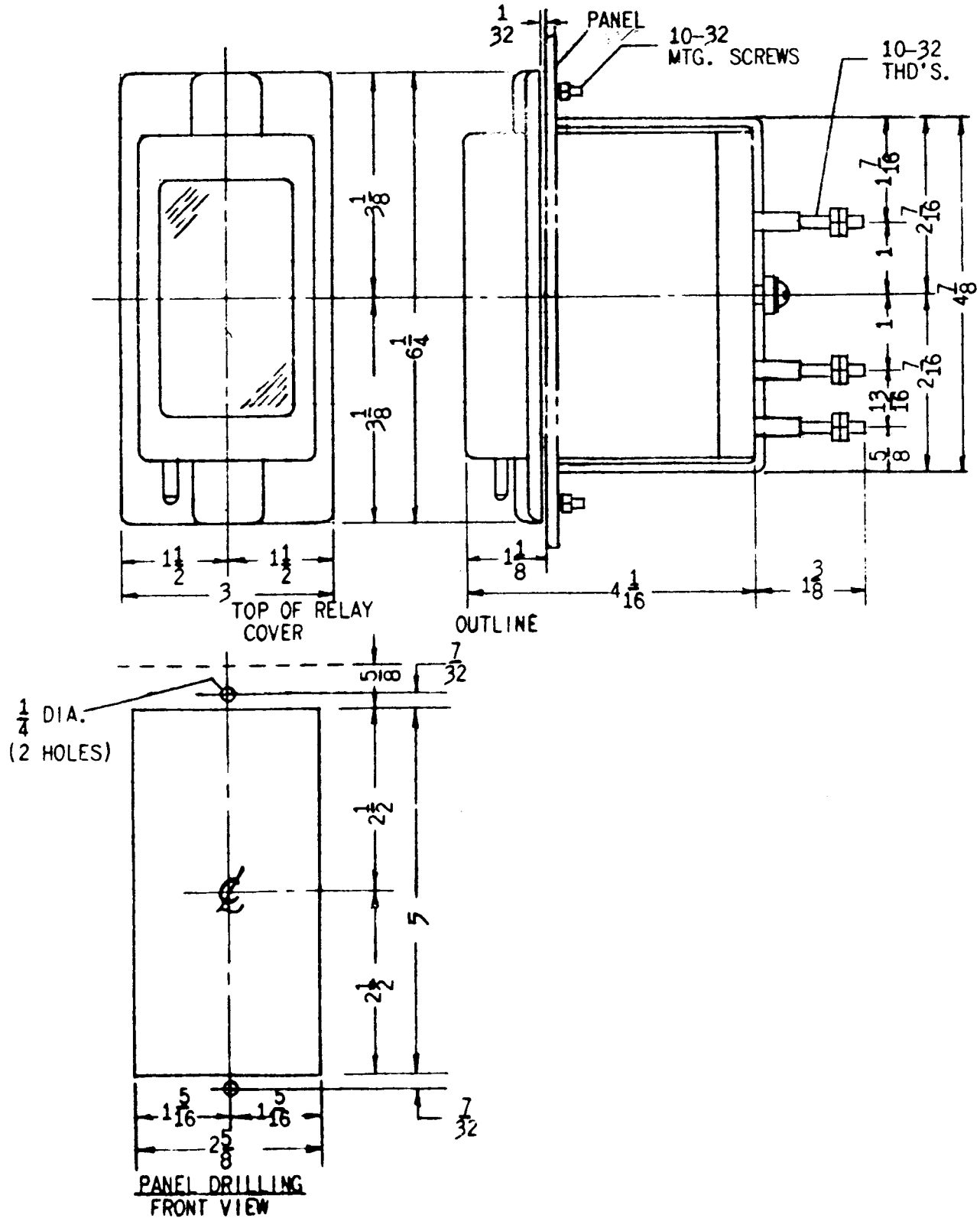


Fig. 9 (0127A9555 [3]) Outline and Panel Drilling Dimensions
For the Back Connected Semi-Flush Mounted
HAA15A, HAA15B, HAA15C, HAA15D and HAA15H Relays

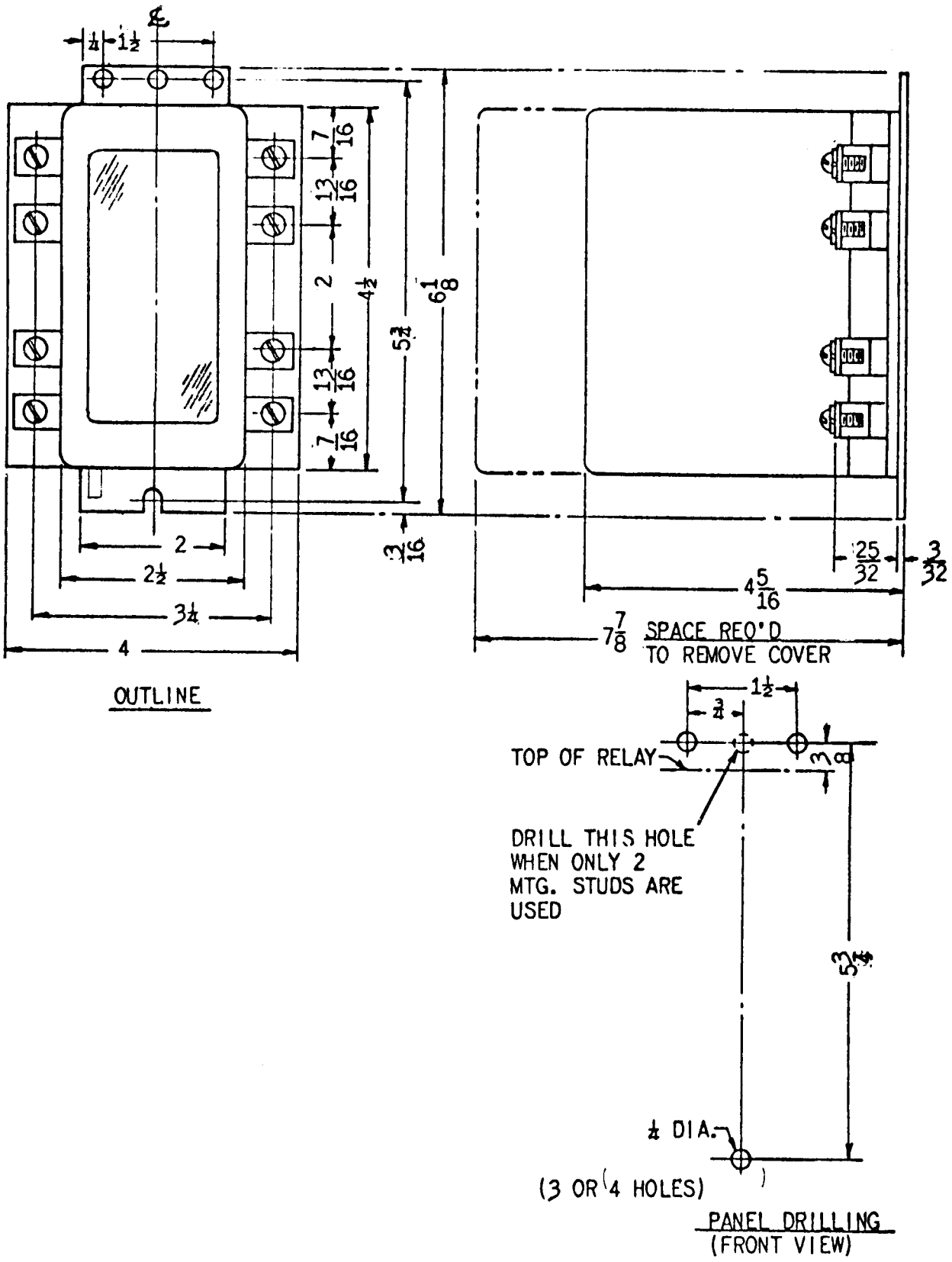


Fig. 10 (0208A3773-0) Outline and Panel Drilling Dimensions for the Front Connected Surface Mounted HAA15E, HAA15F and HAA15G Relays

Since the last edition, Figure 9 has been changed.

Protection and Control

(3/94) (1100)

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