



INSTRUCTIONS

INSTANTANEOUS AUXILIARY RELAY

TYPE HGA

MODEL 12HGA11E(-)A

INTRODUCTION

These instructions plus those included in GEH-1793 form the instructions for this relay.

DESCRIPTION

Relay model HGA11E consists of three HGA type hinged armature relays mounted in a medium size double ended drawout (M2) case. Each of the HGA units used in this relay has two sets of transfer contacts. The contacts of the three units are brought out to separate studs and the operating coils are connected in parallel and brought out to two studs. Figure 1 of this supplement shows the internal connections diagram for this relay. The out-line and panel drilling diagram is shown in Figure 2.

Each of the three HGA units are used in this relay is similar to model HGA11A described in GEH-1793 except the molded cover has been omitted.

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.

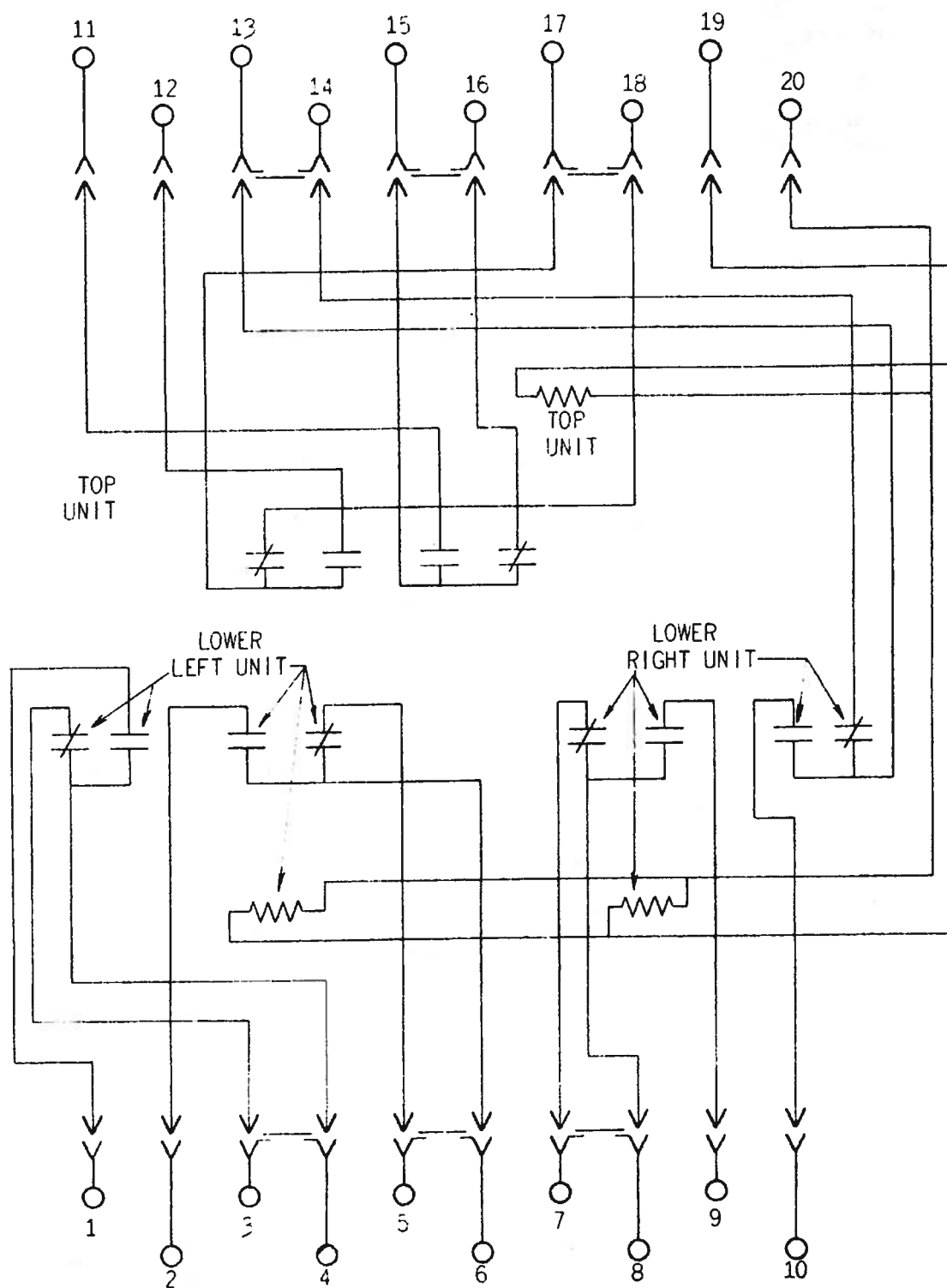


FIG. 1 (0226A6955-0) Internal Connections Diagram For The HGA11E Relay (Front View)

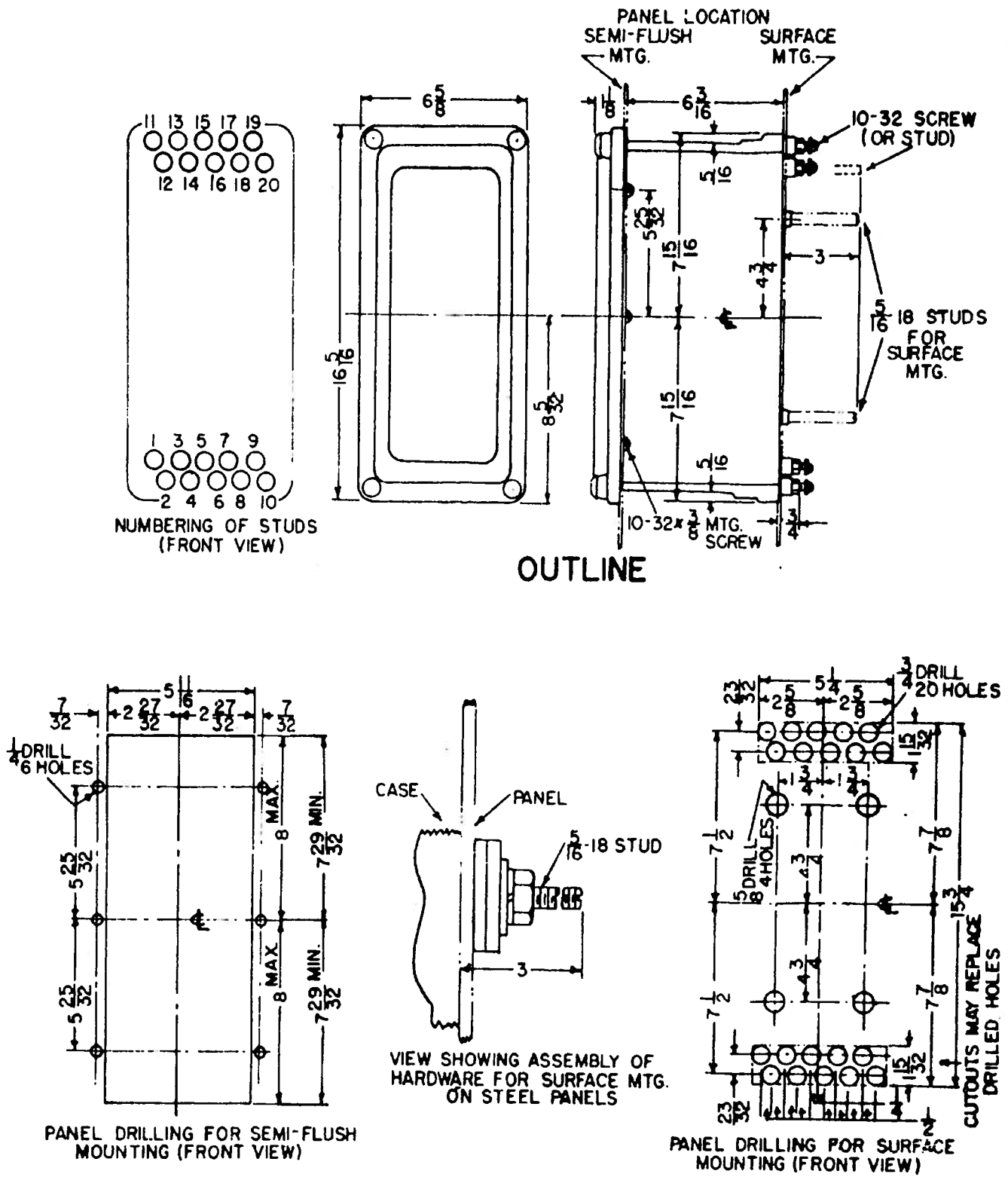


FIG. 2 (K-6209274-2) Outline And Panel Drilling Dimensions For The HGA11E Relay



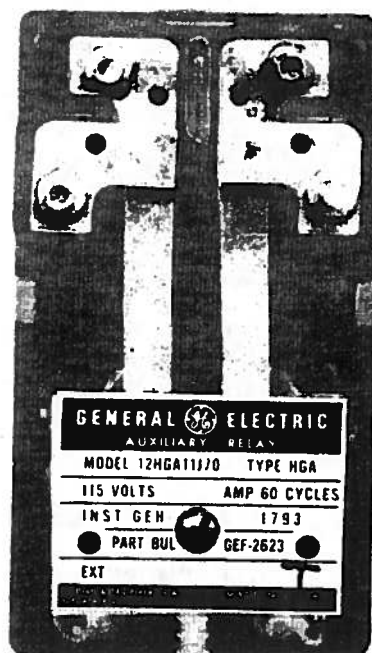
INSTRUCTIONS

GEH-1793J

INSTANTANEOUS AUXILIARY RELAY

TYPES

HGA11A, G, H, J, K, P, S, T, V, W, X



GENERAL  ELECTRIC

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INSTANTANEOUS AUXILIARY RELAY

TYPES

HGA11A, G, H, J, K, P, S, T, V, W, X

DESCRIPTION

These relays are double pole, hinged armature relays, suitable for applications where a high-speed, low energy device is required. For details of the HGA11 type relay, see Table 1.

TABLE 1

RELAY	CASE AND MOUNTING	CONTACT ARRANGEMENT
HGA11A	BACK CONNECTED WITH COVER, SURFACE-MOUNTED RELAY - SEE FIGURE 3	DPDT CONTACT ARRANGEMENT - SEE FIGURE 2
HGA11A(-)F	SIMILAR TO HGA11A, EXCEPT WITH GLASS FRONT COVER AND PROVISION FOR SEMI-FLUSH MOUNTING - SEE FIGURE 4	SIMILAR TO HGA11A
HGA11A(-)G	SIMILAR TO HGA11A, EXCEPT WITH GLASS FRONT COVER - SEE FIGURE 3	SIMILAR TO HGA11A
HGA11A(-)N	SIMILAR TO HGA11A AND INSPECTED BY NAVY - SEE FIGURE 3	SIMILAR TO HGA11A
HGA11G	FRONT CONNECTED WITH COVER FOR FRONT MOUNTING - SEE FIGURE 8	SIMILAR TO HGA11A
HGA11H	FRONT CONNECTED, SURFACE MOUNTED, AND IS AVAILABLE WITHOUT COVER ONLY - SEE FIGURE 7	SIMILAR TO HGA11A
HGA11J	FRONT CONNECTED WITH COVER - SEE FIGURE 5.	SIMILAR TO HGA11A
HGA11K	FRONT CONNECTED WITHOUT COVER, BUT WITH PROVISIONS FOR FRONT MOUNTING - SEE FIGURE 6	SIMILAR TO HGA11A
HGA11P	FRONT CONNECTED WITH COVER, PALLADIUM CONTACTS - SEE FIGURE 5.	SIMILAR TO HGA11A

continued

TABLE 1 (cont'd)

RELAY	CASE AND MOUNTING	CONTACT ARRANGEMENT
HGA11S	FRONT CONNECTED WITH COVER, PROVISIONS FOR FRONT MOUNTING - SEE FIGURE 8	SIMILAR TO HGA11A
HGA11T	FRONT CONNECTED WITH SHOCK RESISTANT COVER - SEE FIGURE 9	SIMILAR TO HGA11A
HGA11V	BACK CONNECTED WITH COVER, SURFACE MOUNTED RELAY, PALLADIUM CONTACTS - SEE FIGURE 3	SIMILAR TO HGA11A
HGA11V(-)F	SIMILAR TO HGA11V EXCEPT WITH GLASS FRONT COVER AND PROVISION FOR SEMI-FLUSH MOUNTING - SEE FIGURE 4	SIMILAR TO HGA11A - SEE FIGURE 2
HGA11W	FRONT CONNECTED WITHOUT COVER, BUT WITH COVER CLIPS - SEE FIGURE 7	SIMILAR TO HGA11A
HGA11X	SIMILAR TO HGA11K, BUT WITH PALLADIUM CONTACTS - SEE FIGURE 6	SIMILAR TO HGA11A

RATINGS

The HGA11 relays are available for coil ratings for standard voltages up to 575 volts for 25, 50 or 60 cycles, and up to 250 volts DC. The DC relays are also available with coil current ratings up to five amperes.

The current closing rating of the contacts is 30 amperes. The current carrying rating is 12 amperes continuously or 30 amperes for one minute. The interrupting ratings (non-inductive circuits) for the various voltages are listed in the Table 2.

TABLE 2

NON-INDUCTIVE CIRCUITS				INDUCTIVE CIRCUITS			
CONTACT CIRCUIT VOLTS		TYPE HGA		CONTACT CIRCUIT VOLTS		TYPE HGA	
AC	DC	SINGLE BREAK	DOUBLE BREAK	AC	DC	SINGLE BREAK	DOUBLE BREAK
	6-32	15	30		6-32	5	10
	48	8	16		48	3	6
	125	2	3		125	1	1.5
	250	0.3	0.4		250	0.25	0.3
115		30	30	115		10	20
230		20	30	230		6	10

BURDENSDC COILS

Burden data for DC coils is shown in Table 3.

TABLE 3
DC COIL BURDENS

VOLTAGE-RATED RELAYS			AMP-RATED RELAYS		
RESISTANCE			RESISTANCE		
VOLTS	+10%	WATTS	AMPS	+10%	WATTS
250	15500	4.03	1	3.42	3.42
125	3650	4.31	2	0.843	3.37
62.5	930	4.20	3	0.360	3.24
48	512	4.5	4	0.195	3.12
32	250	4.10	5	0.124	3.10
24	160	3.60			
12	41	3.51			
6	9.9	3.60			

AC COILS

Certain quantities should be defined before giving burden data for AC coils:

- R_{DC} is resistance of a coil as measured with an ohmmeter, bridge, etc.
- R_{DO} is the AC resistance of a coil when AC power is flowing through the coil, but the relay is not picked up.
- X_{DO} is the inductive impedance when the coil is energized, but the relay is not picked up. The resistive and inductive parts of impedance of coils under picked-up conditions are designated as RPU and XPU.
- Z_{DO} is the impedance of the relay in dropout condition.
- Z_{PU} is the impedance of the relay in picked-up condition.

TABLE 4
AC COIL BURDENS

COIL	RATING	RDC	RDO	XDO	ZDO	RPU	XPU	ZPU
VOLTS	HERTZ	+10%	+10%	+10%	+10%	+10%	+10%	+10%
115	60	90	210	510	550	377	926	1000
230	60	376	860	2060	2230	1260	3750	3960
460	60	1640	3770	9010	9770	4590	16400	17030
575	60	2200	4090	11400	12400	7470	20800	22100

Continued...

TABLE 4 (Cont'd)
AC COIL BURDENS

COIL VOLTS	RATING HERTZ	R _{DC} +10%	R _{DO} +10%	X _{DO} +10%	Z _{DO} +10%	R _{PU} +10%	X _{PU} +10%	Z _{PU} +10%
115	50	90	180	420	460	304	772	830
230	50	512	970	2170	2380	1610	3950	4270
460	50	1640	3230	7510	8180	5430	13700	14700
575	50	2570	5050	11700	12800	8500	21400	23000
115	25	376	410	860	950	447	1564	1620
230	25	1640	1770	3750	4150	1950	6840	7110
460	25	5800	6240	12700	14100	6050	23100	24100
575	25	9150	9830	19500	21800	10800	35600	37200

CHARACTERISTICS

The Type HGA11 is a hinged armature type, high speed auxiliary relay. When the coil is energized, a magnetic flux flows through the armature pole piece and attracts the armature. Two auxiliary contacts are mechanically coupled to the armature. These auxiliary contacts can be normally open or normally closed, and can be used to make or break auxiliary circuits.

ACCEPTANCE TESTS

MECHANICAL ADJUSTMENTS

There should be at least 1/16 inch wipe on normally closed "b" contacts and normally open "a" contacts, as measured at the top of the moving contact carrier. This is determined by operating the armature by hand and checking that there is at least 1/16 inch movement of the top edge of the contact carrier after the contacts have made.

When the armature is operated by hand, "a" contacts should make within 1/32 inch of each other, i.e., with one contact just making, the gap of the other should never be more than 1/32 inch. This also applies to the "b" contacts.

There should be at least 1/32 inch clearance between the armature tailpiece and the bottom inside surface of the cover for all back connected relays with cover. A special cover with cutouts in the sides is available to check this clearance.

PICKUP TEST

Pickup is defined as the minimum voltage or current at which the armature operates and seals firmly against the pole piece. It is adjusted by means of the control spring that is fastened between the anchor pin and the armature tailpiece. The spring should be in the front hole of the anchor pin and the armature groove that gives the highest value of pickup without exceeding 80 percent of its rated AC volts or DC amps or 60 percent of rated DC volts.

The AC voltage or DC current relays are adjusted to pick up at 70-80 percent of rating at rated frequency. The DC voltage relays are adjusted to pick up at 50-60 percent of rating when cold.

*

After AC relays have been continuously energized for a few hours (minimum four hours) at rated voltage, the pickup and dropout voltages increase by 3.5 to 7.5 percent. For DC relays, the pickup and dropout voltages increase by 5 to 10 percent.

The wipe on HGA11 relays exerts a contact pressure of 35 grams $\pm$ 10 percent on "a" contacts and 10 grams $\pm$ 10 percent on "b" contacts.

CONSTRUCTION

*

The HGA11 is a molded case relay. The various parts of the relay can be seen in Figure 10. The control spring is used for adjusting the pickup and dropout voltage. The function of the voltage barrier is to avoid flashover between a pair of electrically separate, but mechanically coupled normally closed contacts, or between a pair of normally open contacts. Cover spring clips maintain spring force against the cover to hold the cover in position.

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 damage sustained in transit. If 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 damaged nor the adjustments disturbed.

If the relays are not to be installed immediately, store them in their original cartons in a place that is free from moisture, dust and metallic chips. Foreign matter that collects on the outside of the case could get inside when the cover is removed, and cause trouble when operating the relay.

PERIODIC CHECKS AND ROUTINE MAINTENANCE

In view of the vital role of relays in the operation of a power system, it is important that a periodic test program be followed. 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, the points listed under **ACCEPTANCE TESTS** should be checked at an interval of from one to two years.

CONTACT CLEANING

A flexible burnishing tool should be used for cleaning relay contacts. This is 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 ensures cleaning the actual points of contact. Knives, files, abrasive paper or cloth of any kind should not be used to clean relay contacts.

RENEWAL PARTS

Sufficient quantities of renewal parts should be carried in stock to promptly replace 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 the complete model number of the relay for which the part is required.

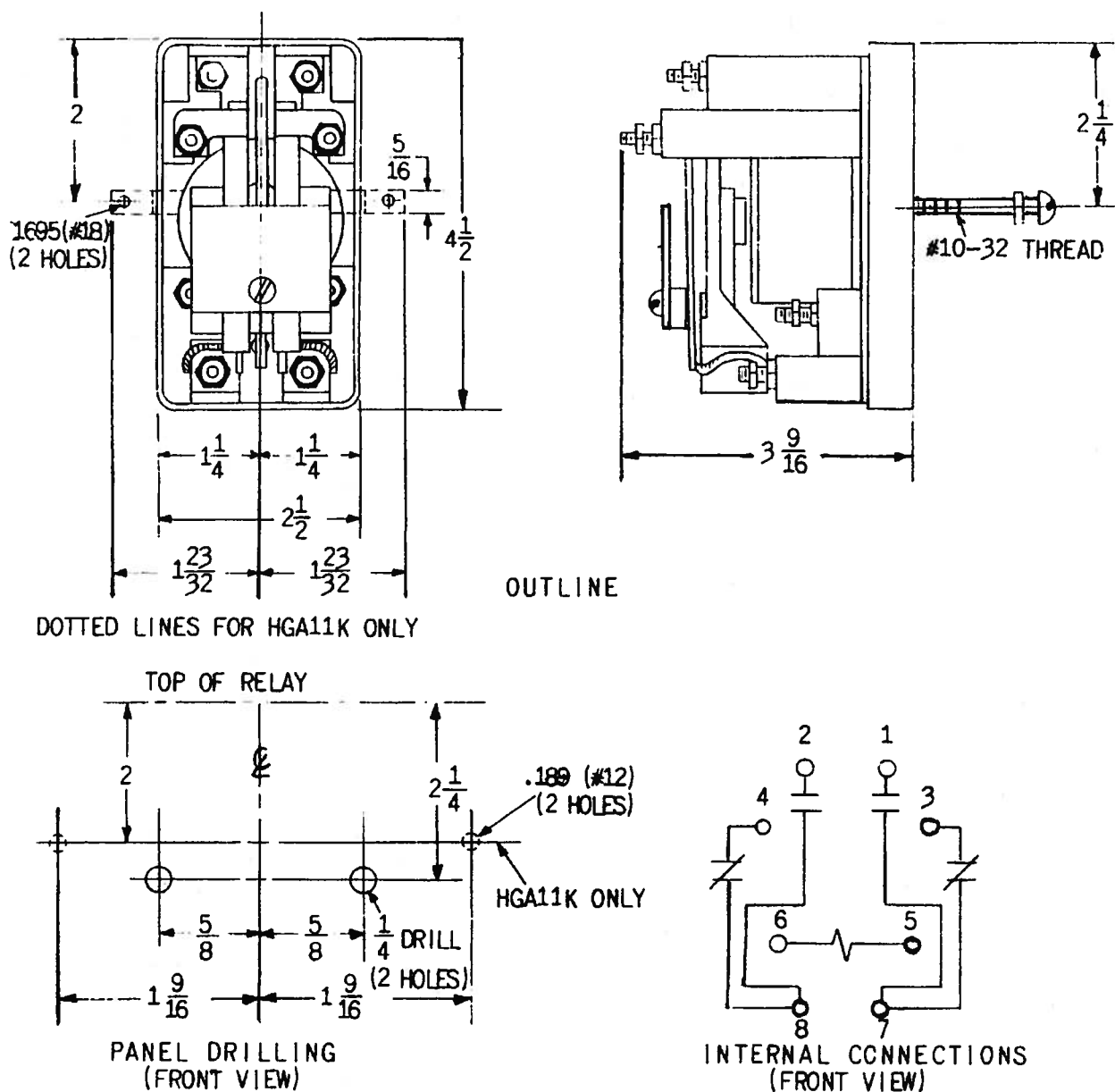
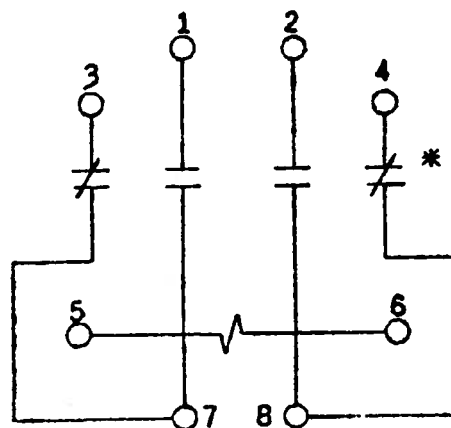
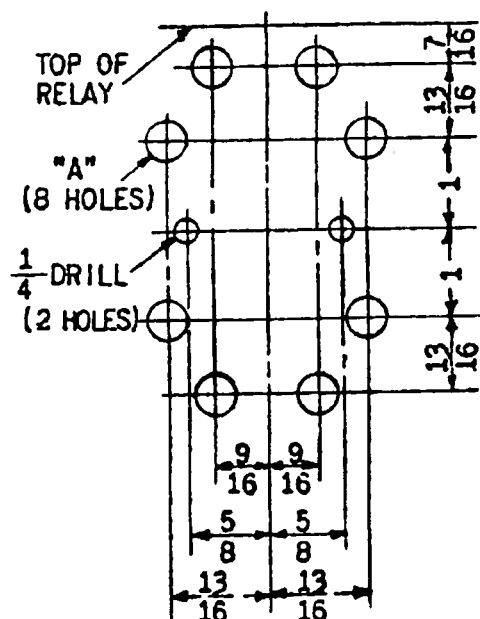
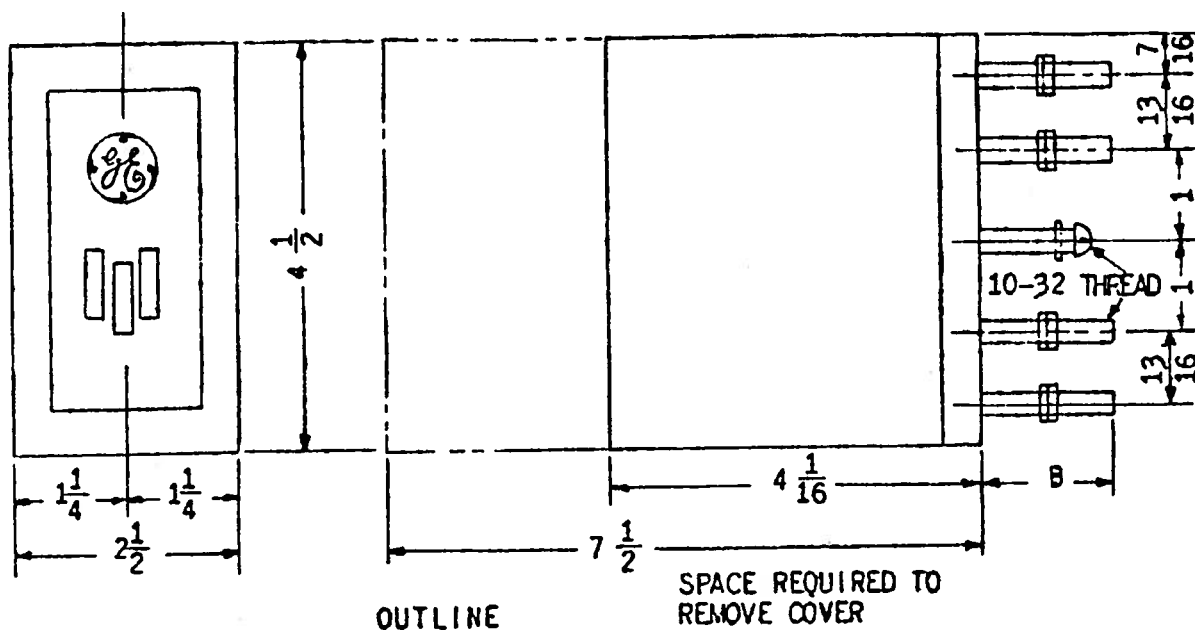


Figure 1

Figure 2

Figures 1 and 2 (0104A8573-0) Internal Connections Diagram for Types HGA11A, G, H, J, K, P, S, T, V, W, and X Relays



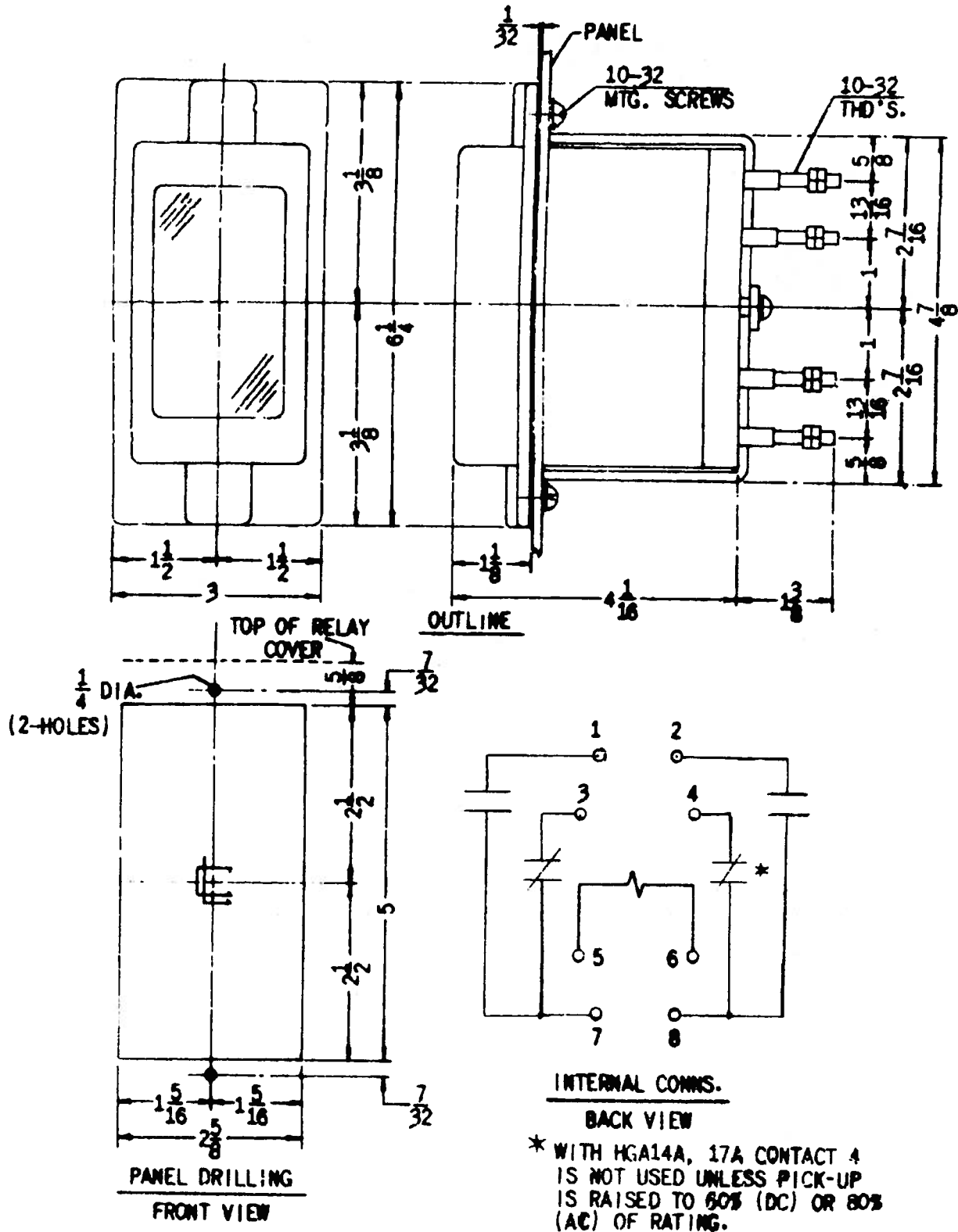
INTERNAL CONNECTIONS
(BACK VIEW)

* = WITH HGA14A, 14J, 14K, 14N, 17A CONTACT 4 IS NOT USED UNLESS PICKUP IS RAISED TO 60% (DC) OR 80% (AC) OF RATING HGC11A DOES NOT USED CONTACT 4.

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

PANEL DRILLING (FRONT VIEW)

* Figure 3 (K-6077058-20) Outline and Panel Drilling Dimensions for the Types HGA11A(-)G, HGA11A(-)N and HGA11V Relays



* Figure 4 (0104A8557-2) Outline and Panel Drilling Dimensions for the Type HGA11A(-)F Relay

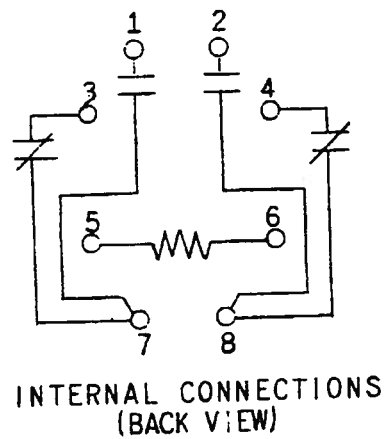
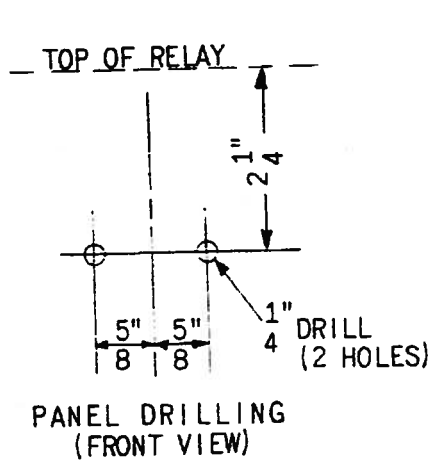
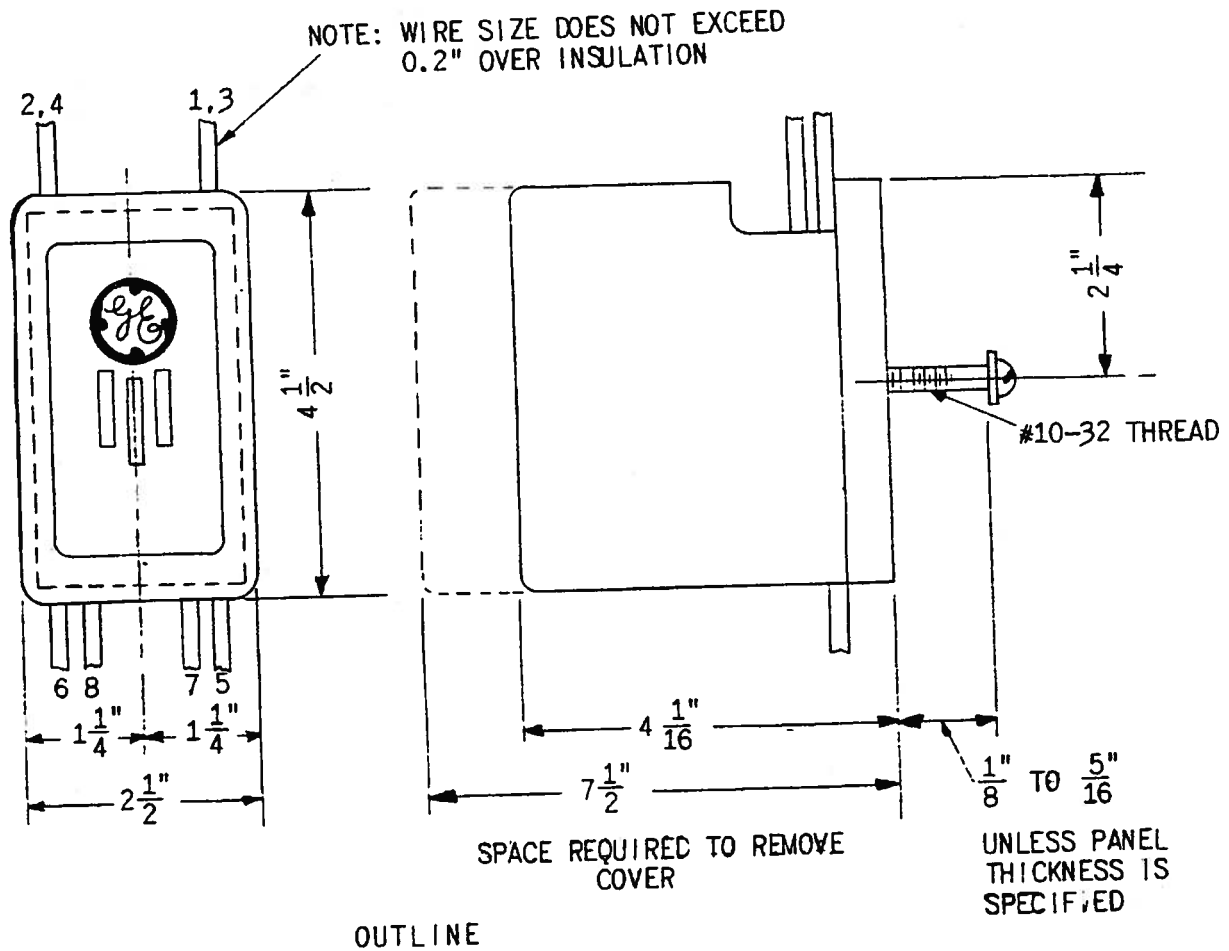


Figure 5 (K-6375626-4) Outline and Panel Drilling Dimensions for Types HGA11J, HGA11P Relays

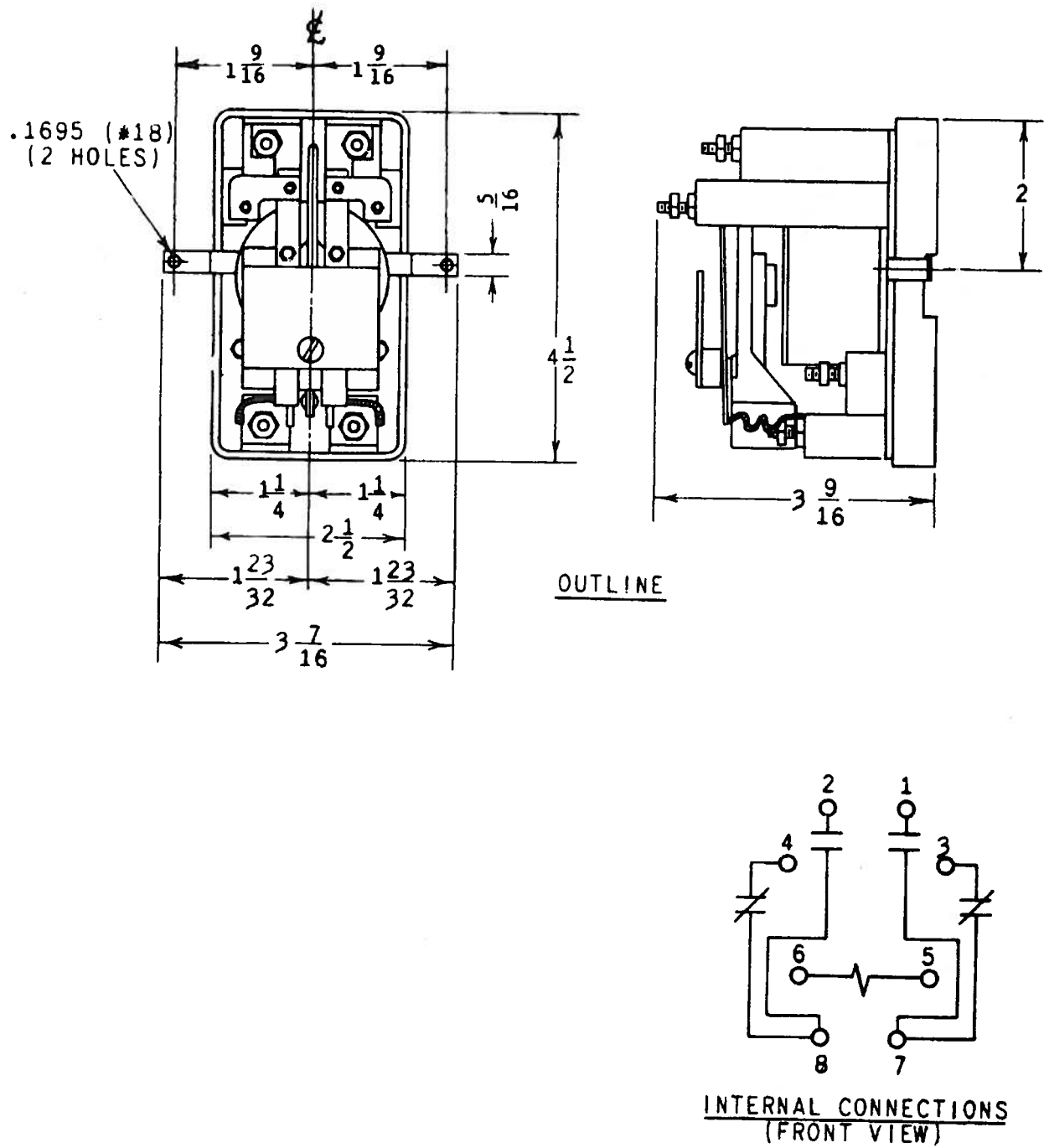
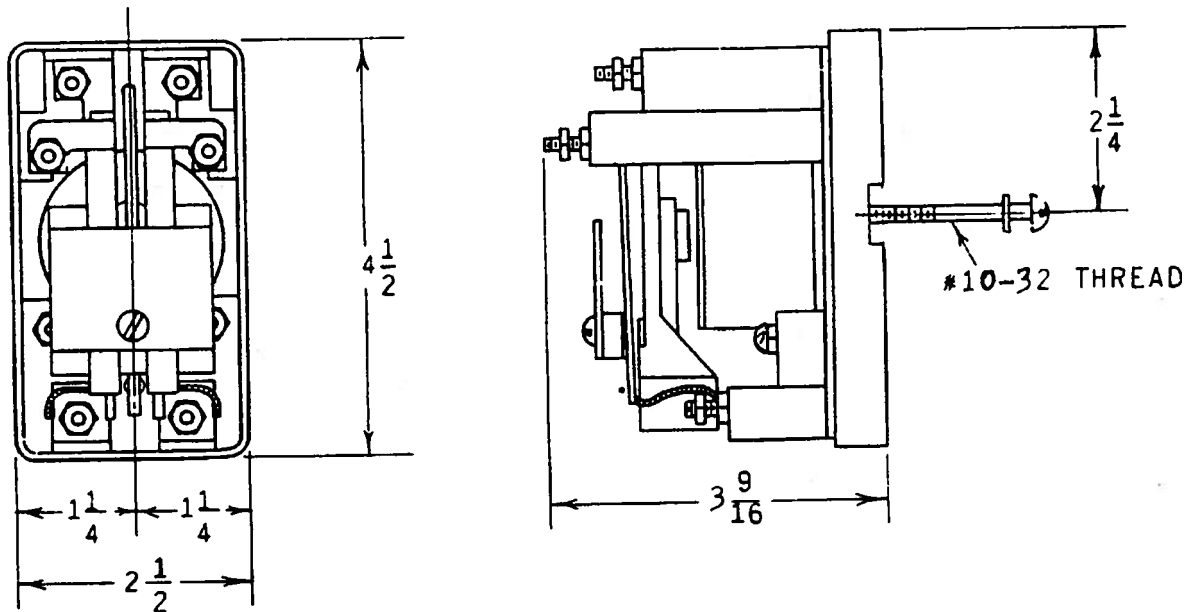
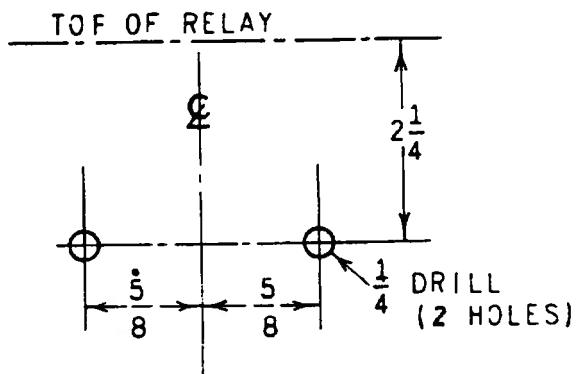


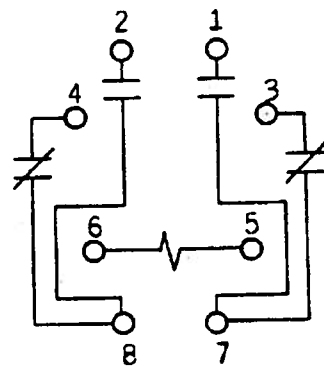
Figure 6 (K-6154317-3) Outline and Panel Drilling Dimensions
for Types HGA11K, HGA11X Relays



OUTLINE



PANEL DRILLING
(FRONT VIEW)



INTERNAL CONNECTIONS
(FRONT VIEW)

Figure 7 (K-6154155-5) Outline and Panel Drilling Dimensions
for Types HGA11H, HGA11W Relays

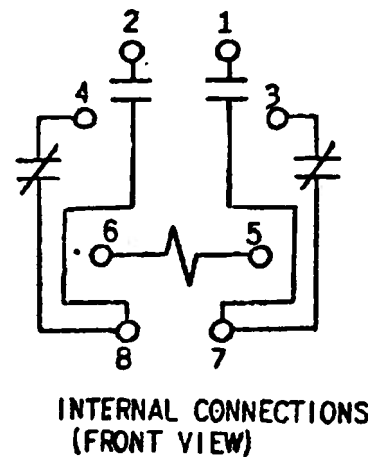
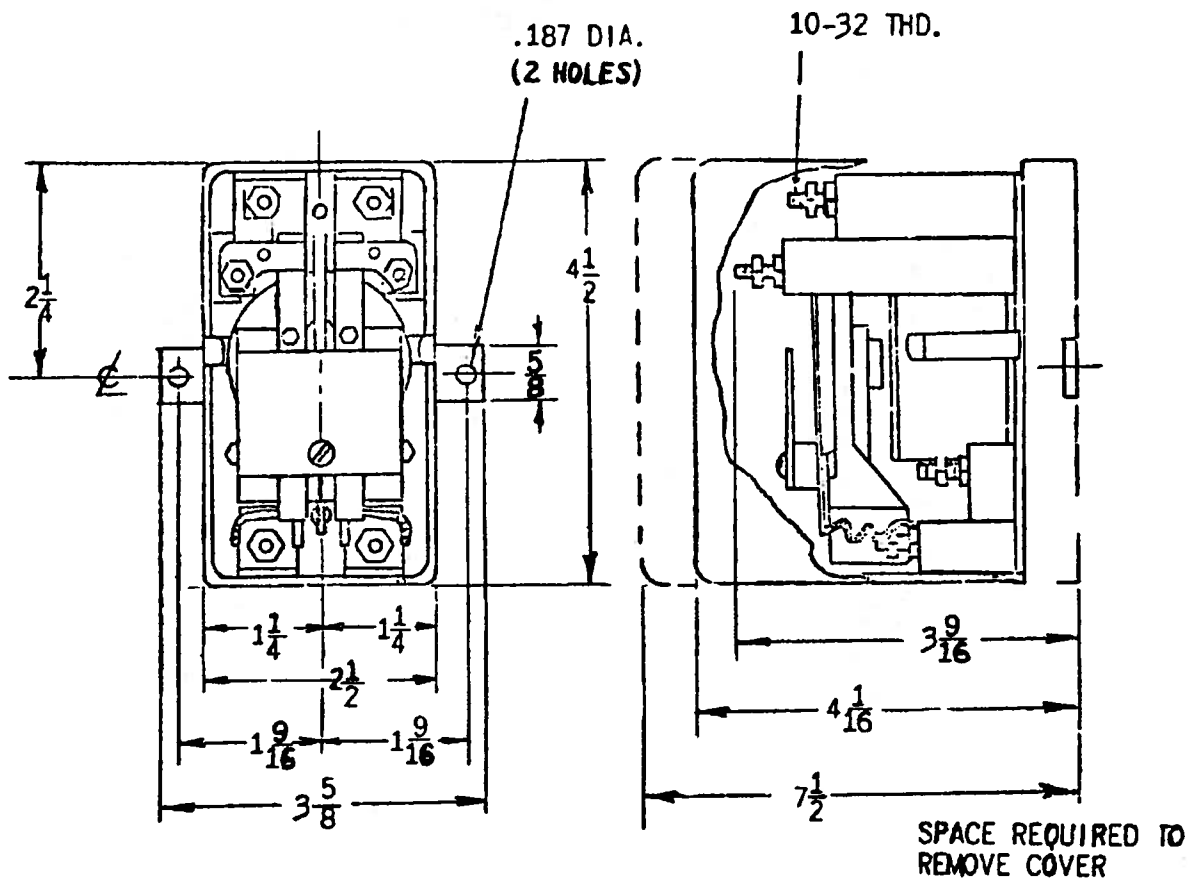


Figure 8 (0165A7757-2) Outline and Panel Drilling Dimensions for Types HGA11G, HGA11S Relays

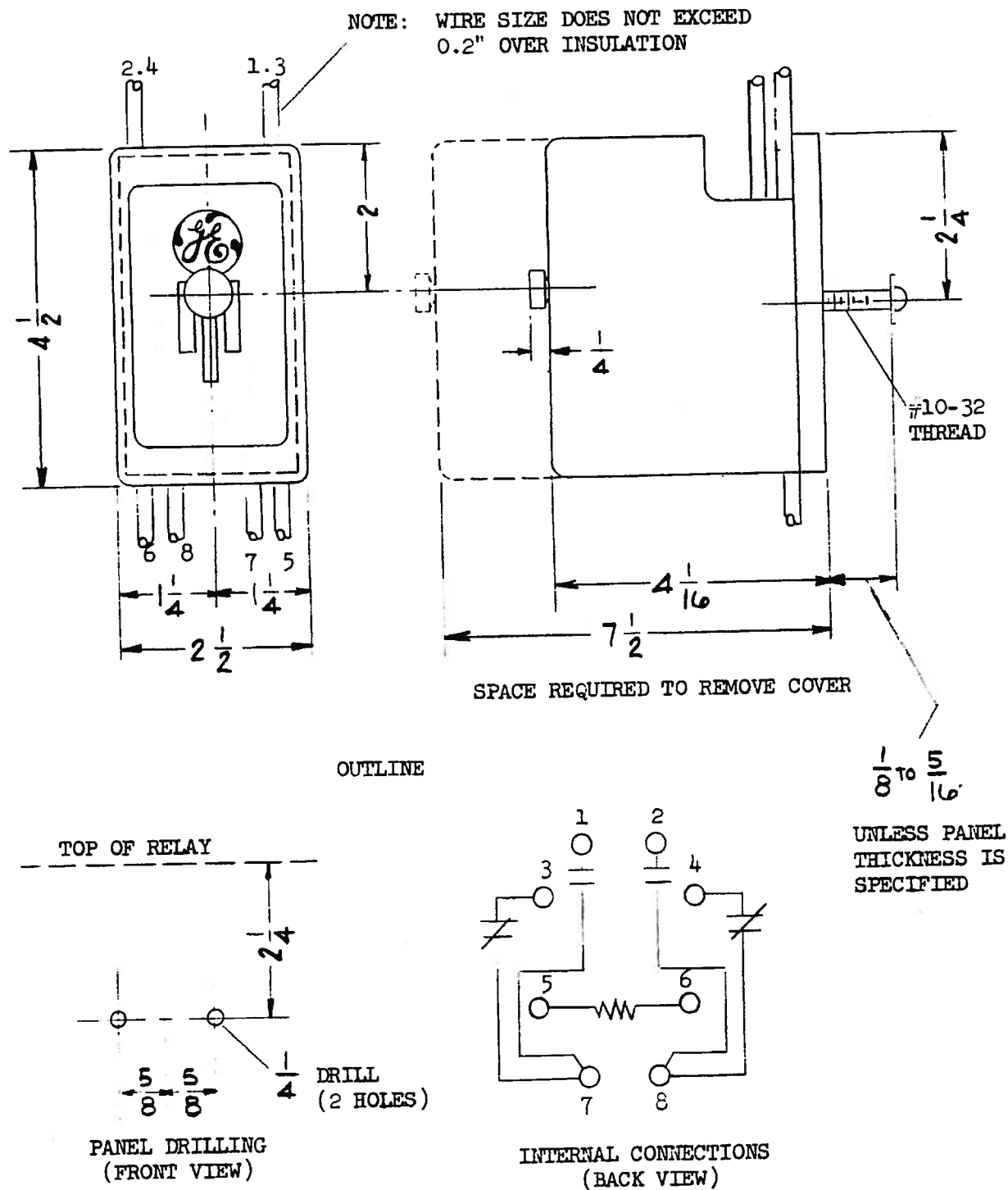


Figure 9 (0127A9568-0) Outline and Panel Drilling Dimensions
for the Type HGA11T(-)A Relay

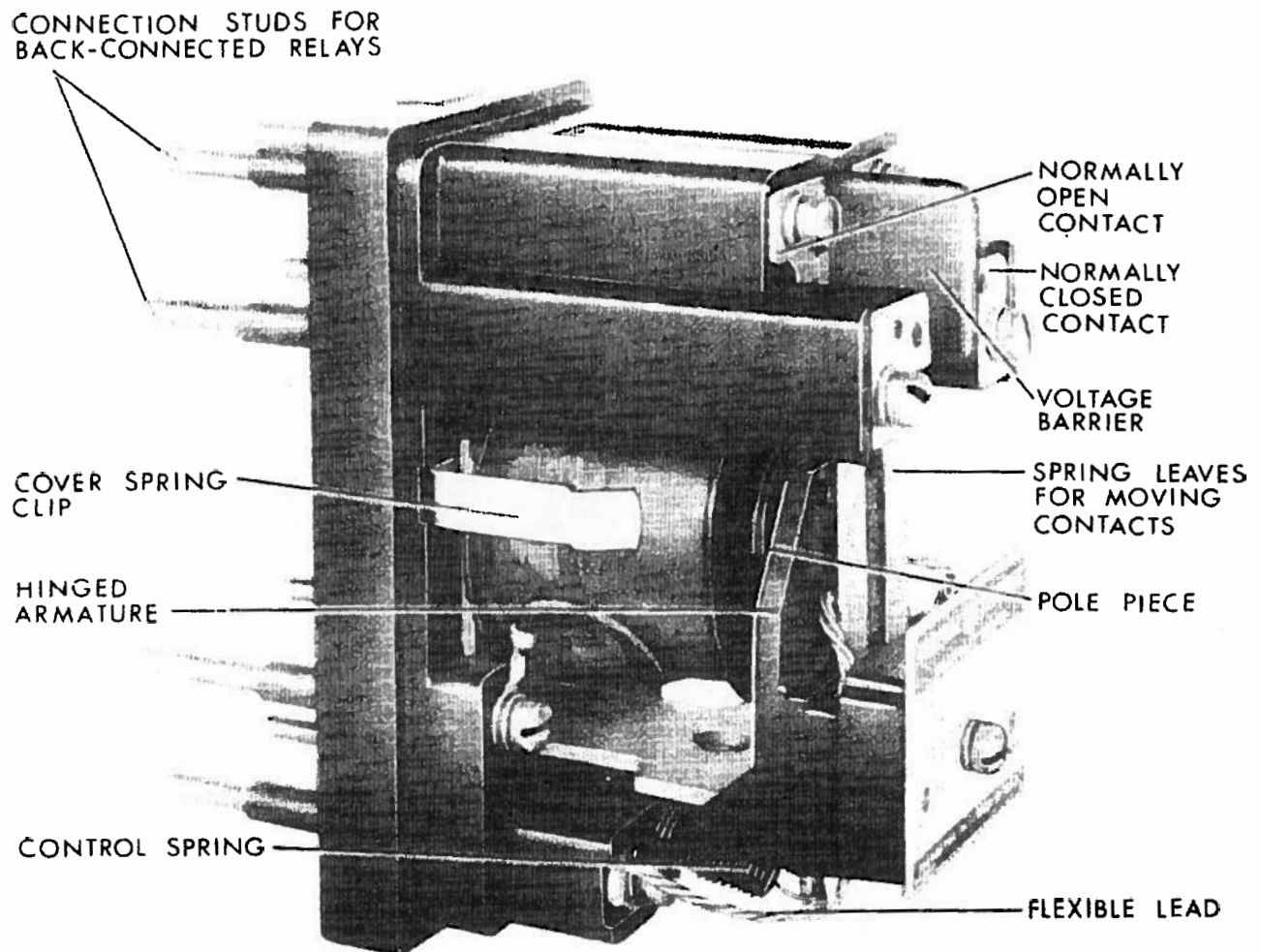


Figure 10 (8042422) Typical HGA Relay Removed from Case



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