

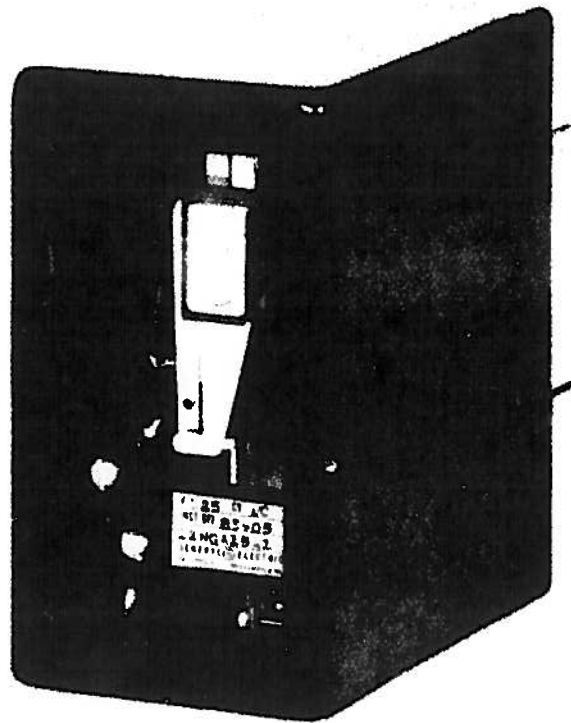


GEI-83905J

## ***INSTRUCTIONS***

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### **AUXILIARY RELAY NGA15A AND NGA15L**



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**GENERAL ELECTRIC**

GEI-83905

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Cover Photo (8030183)

AUXILIARY RELAY  
NGA15A AND NGA15L

DESCRIPTION

The Type NGA15A and 15L are DC auxiliary relays mounted on a small molded base as shown in Figures 1 and 2. They are designed to provide DC auxiliary functions with a variety of operating time characteristics. Both types of relays are continuously rated and both have a diode-resistor combination for coil surge suppression. Each relay has two normally open and two normally closed contacts in a transfer contact configuration.

Additional characteristics are as follows:

NGA15A - back connected with cover, either surface or semi-flush mounting (suffix F), see Figure 3 for internal connections, and Figures 5 and 6 for outlines and panel drilling dimensions.

NGA15L - front connected with cover, surface mounting, optional glass front cover (suffix G), see Figure 7 for internal connections, and Figures 8 and 9 for outlines and panel drilling dimensions.

APPLICATION

The NGA15A and NGA15L are DC auxiliary relays designed for general applications. They are available with a variety of operating time characteristics as is shown in Tables A and B. These are the currently available models as of the printing date of this book. If a specific pickup or dropout time is not given, as indicated by a dash, this time is not checked and is not held within any specific limits in the factory tests. The tables also give the specific values of all the components of the circuit.

Details of other forms of these relays which are now obsolete are given in the tables of Figure 3 for NGA15A and Figure 7 for NGA15L. These tables also specify the suitable relay to be substituted for those relays that have been made obsolete.

*These instructions do not purport to cover all details or variations in equipment nor 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.*

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The internal connection diagrams show that resistor R1 in series with a blocking diode is connected around the operating coil (T). This circuit serves to limit the surge overvoltage that the coil can produce when that circuit is interrupted. The overall circuit is designed to limit the surge voltage to a value approximately equal to the continuous voltage rating of the relay. The value of resistor R1 will also affect the dropout time of the relay. Therefore the selection of the resistance value of R1 must be made on the basis of both characteristics of the relay, surge overvoltage and dropout time.

### RATINGS

The relay contacts will close and carry 30 amperes DC momentarily for tripping duty at control voltages of 250 VDC or less. These contacts will carry three amperes (3 amps) continuously and have interrupting ratings as given in Table C.

TABLE A - NGA15A(-)

FORM (-)	DC VOLTS	PICKUP MS	DROPOUT MS	OHMS			C mfd	EXT RES ohms
				T	R1	R2		
21 (REVA)	125	8 max	100min	2500	-	2000	-	-
28 (REVA)	75	50 max	250 min	2500	1000	-	0.05	-
30 (REVA)	125	80-120	60-90	2500	1000	1000	-	-
32 (REVA)	125	90-110	60 max	2500	3900	1000	-	-
33 (REVA)	125	50-55	-	7800	1000	-	-	-
34 (REVA)	125	28-38	220-300	2500	3900	1500	0.05	-

TABLE B (NGA15L(-)

5	125	50-55	-	7800	10000	-	-	-
6	125	8 max	100 min	2500	-	2000	-	-
7	250	50-55	-	7800	10000	-	-	-

TABLE C

Volts	Current Inductive †	Current Non-Inductive
48	1.0	3.0
100/125 VDC	0.5	1.5
220/250 VDC	0.25	0.75
115V 60 Cyc.	0.75	2.0
230V 60 Cyc.	0.5	1.0

† Induction of Average Trip 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 Sales Office.

Reasonable care should be exercised in unpacking the relay. 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.

When the relay is received, check the nameplate stamping to ensure that the model number and the rating of the relay received agree with the requisition. Check the operation manually and also check that the contact gap and wipe agree with values given under the section on **ADJUSTMENTS AND INSPECTION**.

### ADJUSTMENTS AND INSPECTION

The relay has been adjusted at the factory to pick up at 80% or less of rated voltage and should not require further adjustment. If necessary the pickup can be decreased by decreasing the spacing of the armature from the pole face.

With the relay de-energized each normally open contact should have a gap of 0.010 inch - 0.015 inch. Observe the wipe on each normally closed contact by deflecting the stationary contact member toward the frame. Wipe should be approximately 0.005 inch.

The wipe on a normally open contact can be checked by inserting a 0.005 inch shim between the residual screw and the pole piece and operating the armature by hand. The normally open contact should make before the residual screw strikes the shim.

The dropout time of the relay may be adjusted by means of the residual screw in the armature. The more the residual screw is turned in the shorter the dropout time. Be sure to tighten the locknut after adjusting this screw. The residual screw must not be removed completely. The minimum gap must be 0.002 inch between the armature and the pole face.

The dropout time may also be adjusted a small amount by varying the amount of pressure on the closed contacts.

In order to decrease the pickup time of the relay, reduce the pressure of the normally closed contacts by bending slightly the movable flexible contact arm.

After each adjustment the contact gap and wipe must be rechecked and the contact pressure should never be less than 10 grams measured at the contact tips.

All of the adjustments in this section may be most easily made with the tools supplied in the relay tool kit XRT11A1.

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### **SERVICING**

For cleaning fine silver contact a flexible burnishing tool should be used. This consists of an etch-roughened strip of flexible metal, resembling a superfine file which removes corroded material quickly without scratching the surface. The flexibility of the tool ensures the cleaning of the actual points of contact. Never use knives, files, abrasive paper or cloth 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.

Since the last edition, Figure 7 has been revised.

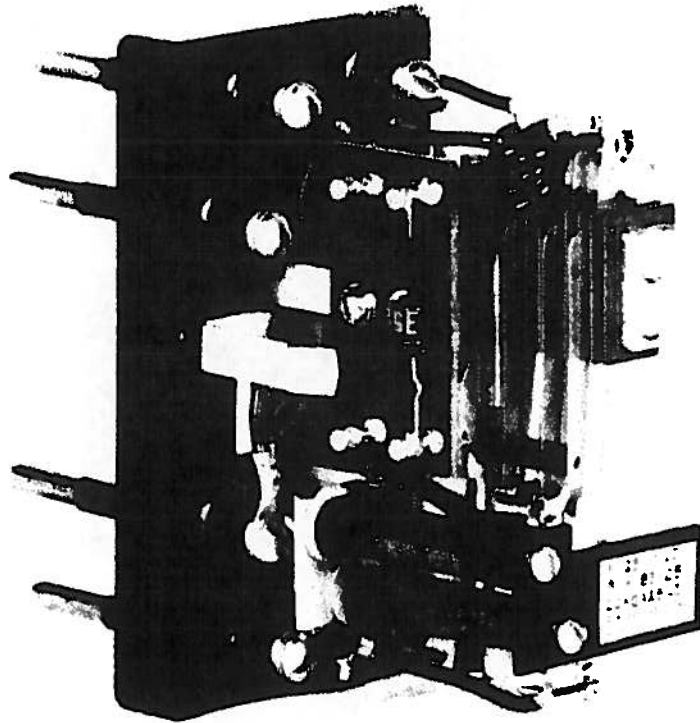


Figure 1 (8030186) NGA15A Relay Removed from Case

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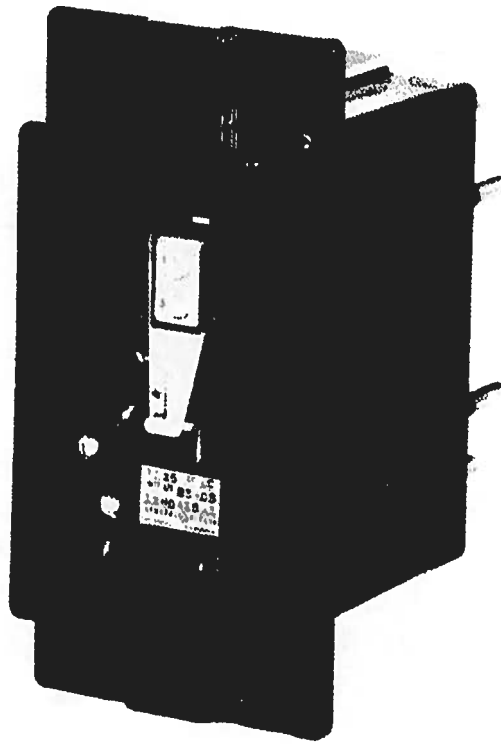
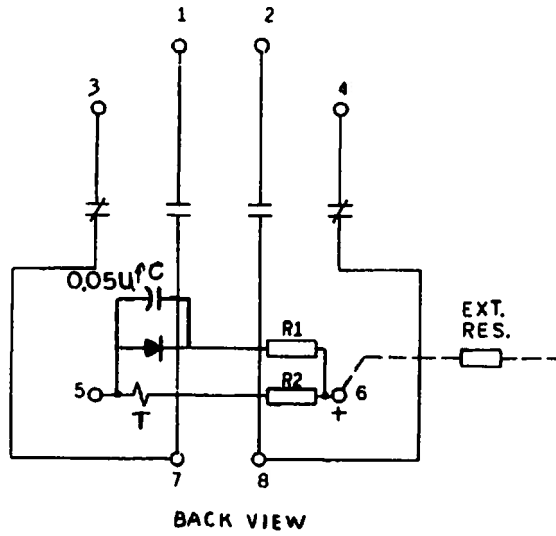


Figure 2 (8030182) NGA15A Relay in Flush Mounted Case



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SEE SHEET 2 FOR COMPONENT VALUES

MODEL	D-C VOLTS CONTINUOUS	P.U. TIME (MILLI SECONDS)		D.O. TIME (MILLI SECONDS)		OHMS			EXT. RES.
		MIN.	MAX.	MIN.	MAX.	T	R1	R2	
12NGA15A (12R)	125	8	32	1200	10000	3000			
2 Δ	50	16	116	167	800	800			
3 (25)	250	8	32	1000	10,000	10,000			
4 (25)	50	8	32	150	700	500			
5 (24)	125	8	32	1200	10000	3000			
6 Z	50	16	116	167	800	800			
7 (25)	250	8	32	8000	10,000	10,000			
8 (25)	50	8	32	150	700	500			
9 (27)	220	8	32	1200	10000	3000			
10 F	125 o.s.	8	32	8	80	3000	1500		
11**	250 o.s.	8	32	8	80	3000	3000		
12 O	125 o.s.	16	116	167	3000	8000			
13 Δ	250 o.s.	16	116	167	12,000	10,000			
14**	125 o.s.	60	110	60	2500	4000	1000		
15**	125 o.s.	80	80	7000	10,000				
16**	125 o.s.	28	38	220	300	2500	1500	1500	
17**	125 o.s.	80	280	380	2500	5000	1000		
18 (28)	125 o.s.	80	300	300	2500	1000			
19 (29)	75	80	300	300	2500	1000			
20**	50 o.s.	8	32	8	80	700	500	2500	
21 (REV. A)	125	8	100	8	2500	2000			
22 (30)	125	80	120	80	80	2500	1000	1000	
23 (31)	125	8	32	8	80	3000		1500	
24 (4)	125	8	32	8	1200	1000			
25 (5)	250	8	32	8000	10000				
26 (6)	50	8	32	150	800				
27 (7)	250	8	32	1200	8000				
28	75	8	32	2500					
29 (1)	250	8	32	8	80	100	1500	1500	
30 (REV. A)	125	80	120	80	80	2500	1000	1000	
31 (2)	125	8	32	8	80			1500	

\* ( ) SUPERCEDED BY 12 (NGA15A\*) OF FORM NUMBER SHOWN IN (-).  
 \* ( ) SUPERCEDED BY 12 (NGA15A\*) OF FORM NUMBER SHOWN IN (-).  
 \*\* INTERMITTENT RATING (10 SECONDS)-DO NOT ORDER-SEE 12 (NGA15A)  
 Δ INTERMITTENT RATING (10 SECONDS)-DO NOT ORDER-SEE 12 (NGA15A)

	C	MFD
22 REV. A	75	50 250
23 REV. A	125	90 140 80 2500 1000 1000
33 REV. A	125	50 55 7600 10000
34 REV. A	125	28 38 220 300 2500 3800 1500 .05
35 REV. A	110	28 38 140 160 2500 3900 1000 .05
36 REV. A	220	28 38 140 160 2500 3900 4000 .05

Figure 3 (0148A4042 SH.1[8] & SH.2[10]) Internal Connection Diagram and Table of Resistance Values of the NGA15A Relay

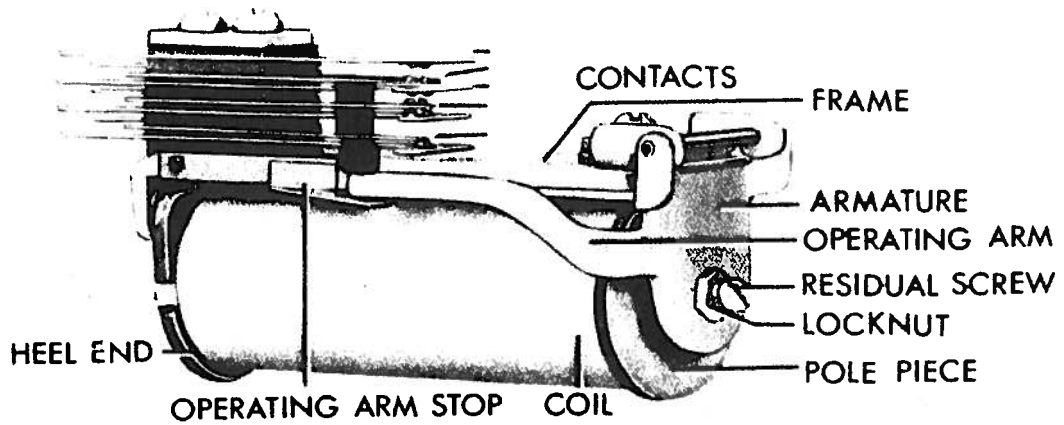
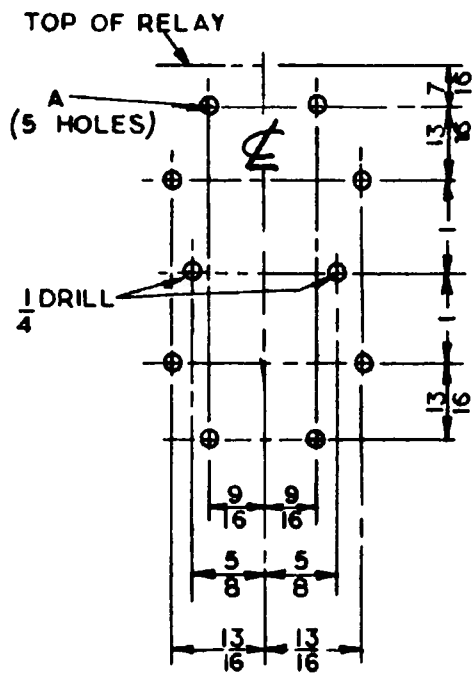
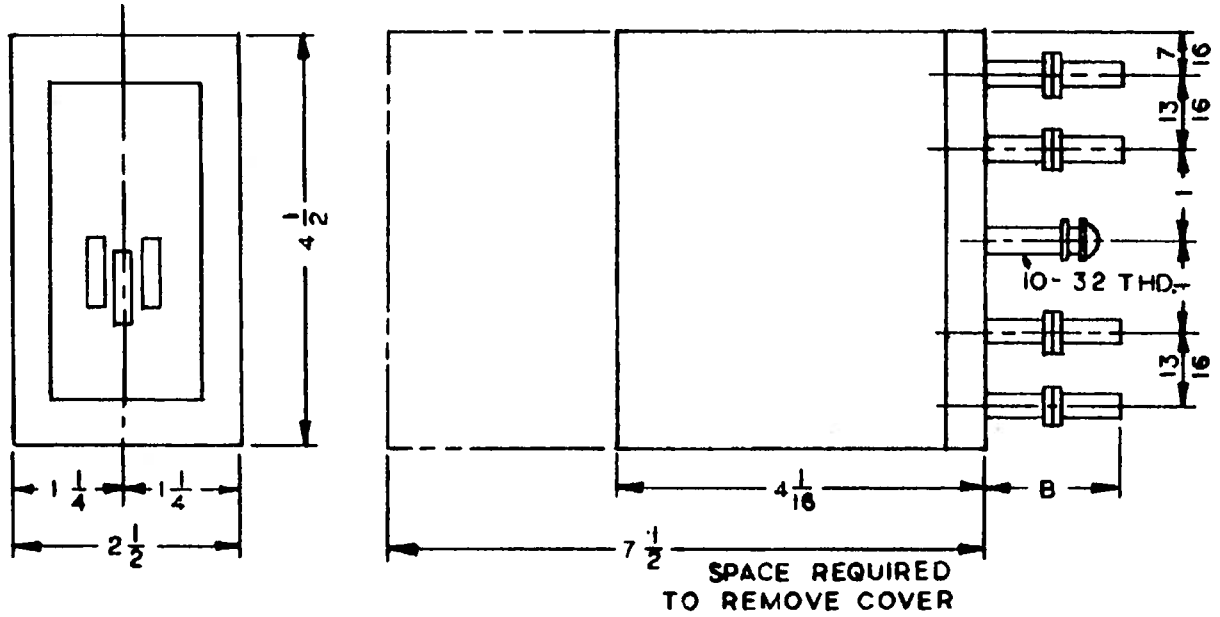


Figure 4 (8012106) Typical Telephone-Relay Unit in the NGA15A Relay



OUTLINE

TYPE OF PANEL	A	B
INSULATING	$\frac{7}{16}$	$2-\frac{13}{16}$
STEEL	$\frac{9}{16}$	$1-\frac{3}{8}$

PANEL DRILL (FRONT VIEW)

Figure 5 (0148A3979-6) Outline and Panel Drilling Dimensions for the Projection Mounted NGA15A Relay

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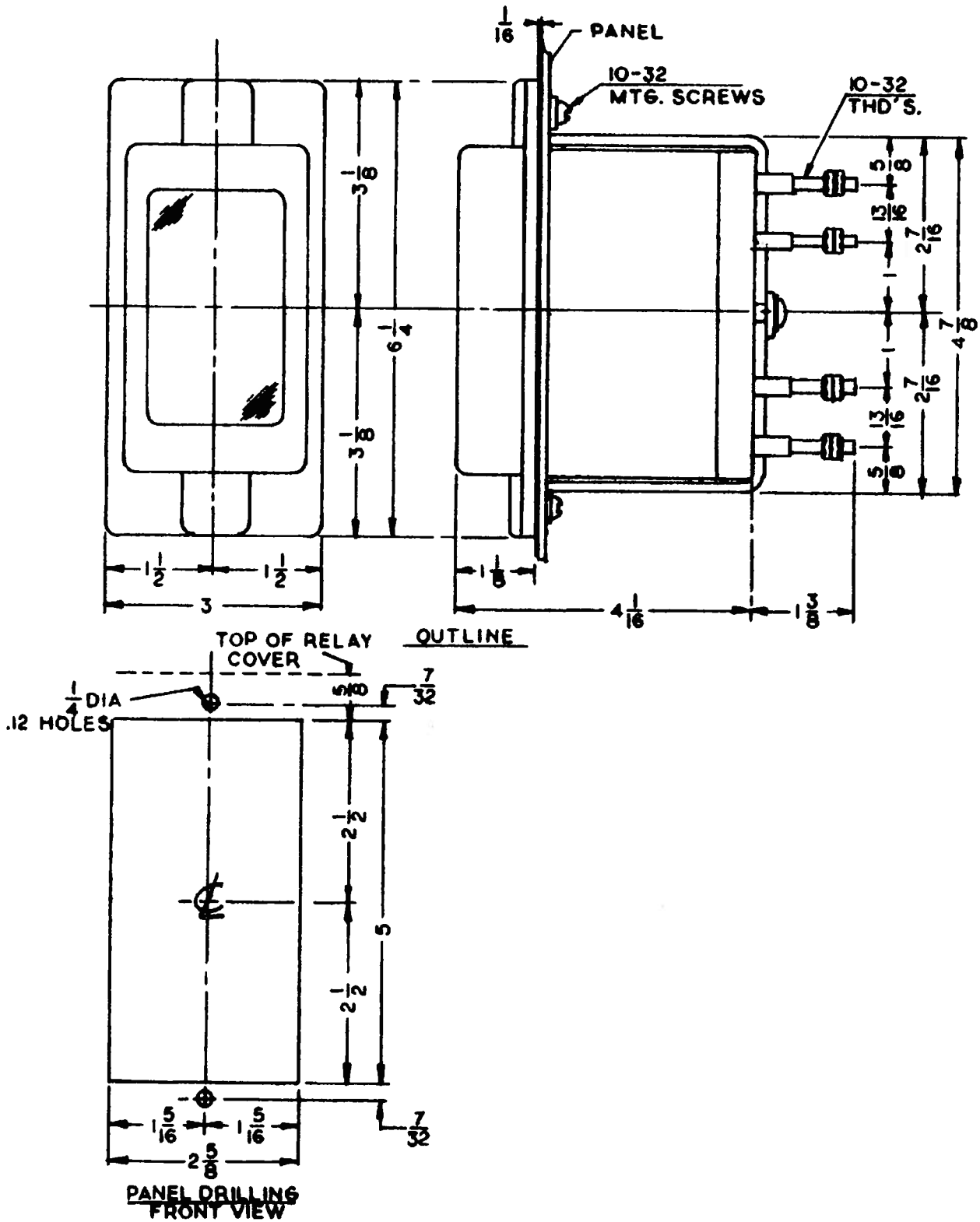
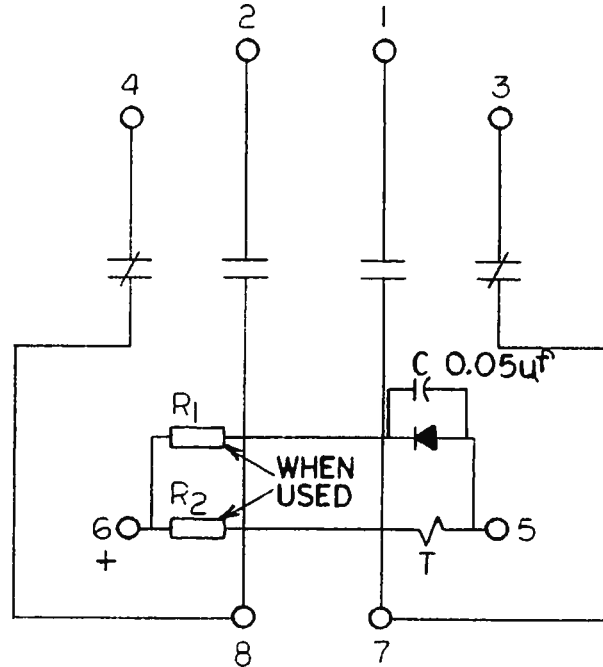


Figure 6 (0148A3978-7) Outline and Panel Drilling Dimensions for the Semi-Flush Mounted NGA15A Relay



MODEL	DC VOLTS CONTINUOUS	P.U. TIME (MILLISECS)		D.O. TIME (MILLISECS)		OHMS		
		MIN.	MAX.	MIN.	MAX.	T	R1	R2
NGA15L1 $\Delta$	125		8	32		1200	4000	4000
NGA15L2 *	48		8	32		150	700	500
NGA15L3 $\Delta$	125		8	32		1200	3900	4000
NGA15L4 *	48		8	32		150	680	500
NGA15L5	125	50	55			7800	10000	
NGA15L6	125		8	100		2500		2000
NGA15L7	250	50	55			24000	10000	

$\Delta$  = SUPERCEDED BY NGA15AG3  
 \* = SUPERCEDED BY NGA15AG4

Figure 7 (0227A2500 [5]) Internal Connection Diagram and Table of Resistance Values of the NGA15L Relay

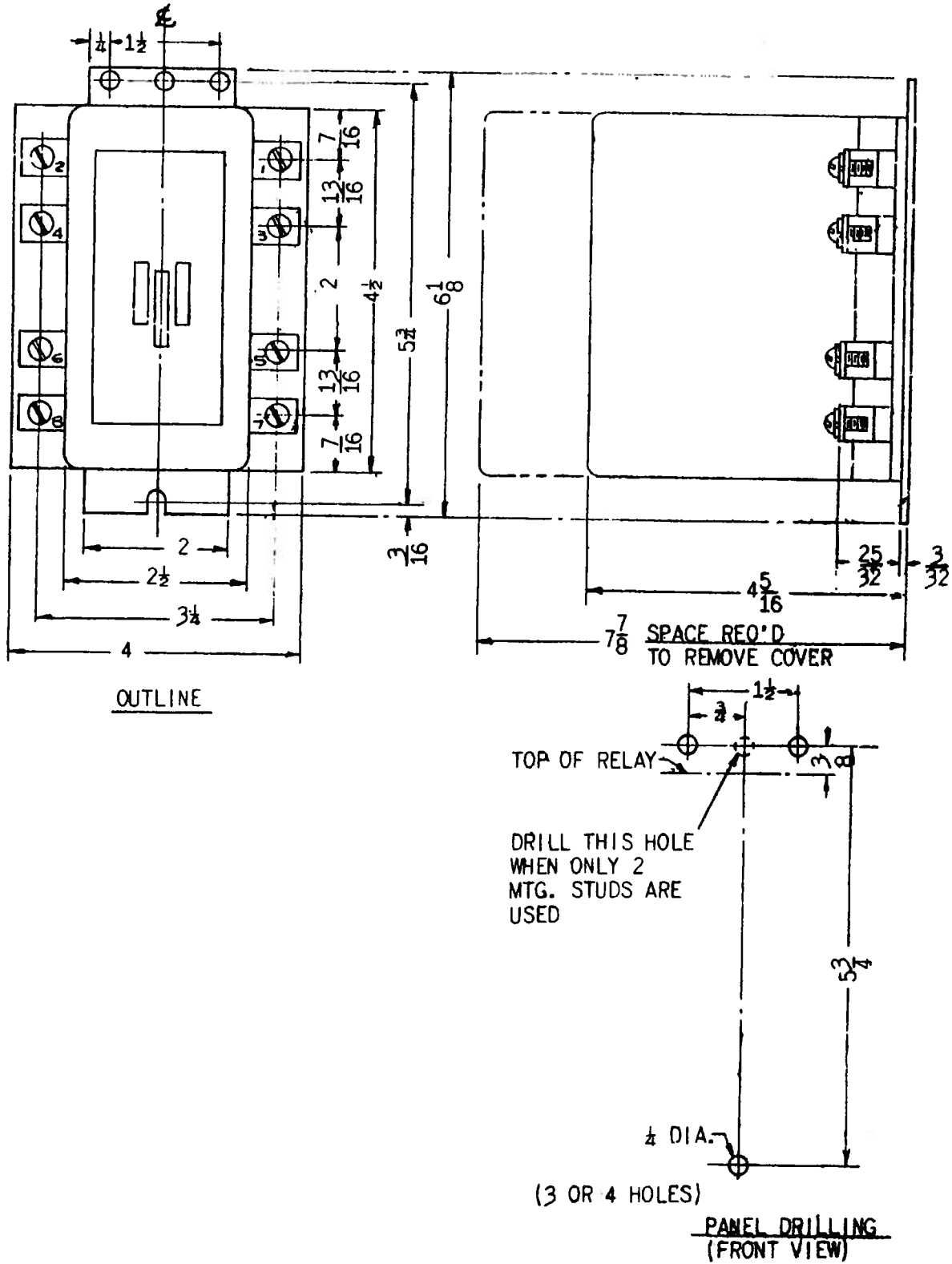


Figure 8 (0208A3642-1) Outline and Panel Dimensions for the Front Connected NGA15L with Solid Front Cover

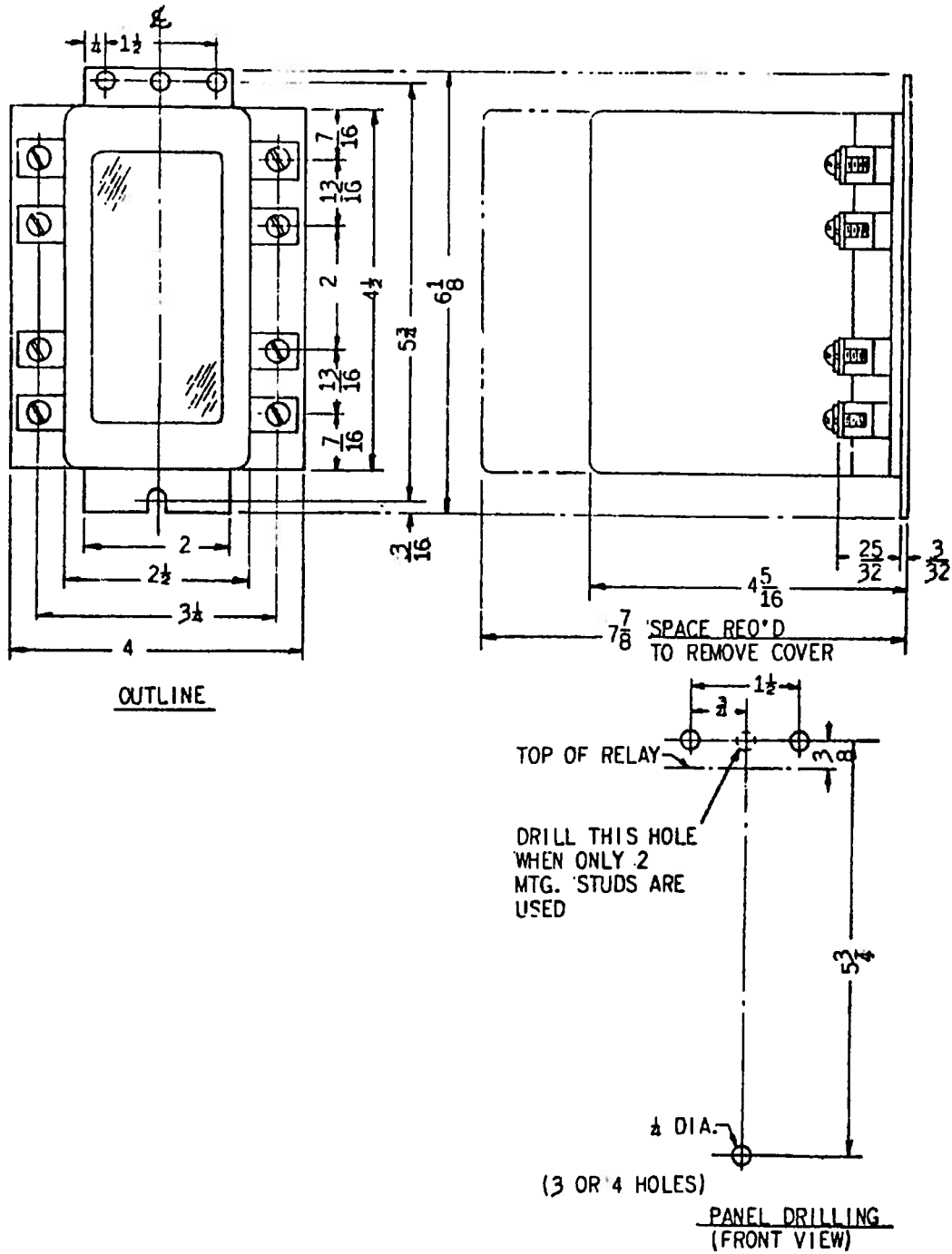


Figure 9 (0208A3643) Outline and Panel Dimensions for the Front Connected NGA15A with Glass Front Cover



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