



GE VERNOVA

INSTRUCTIONS

GEK-49938B

Insert Booklet GEI-83905

DC AUXILIARY RELAY TYPE NGA15AK

INTRODUCTION

This supplement in addition to GEI-83905 constitutes the instructions for the NGA15AK relay.

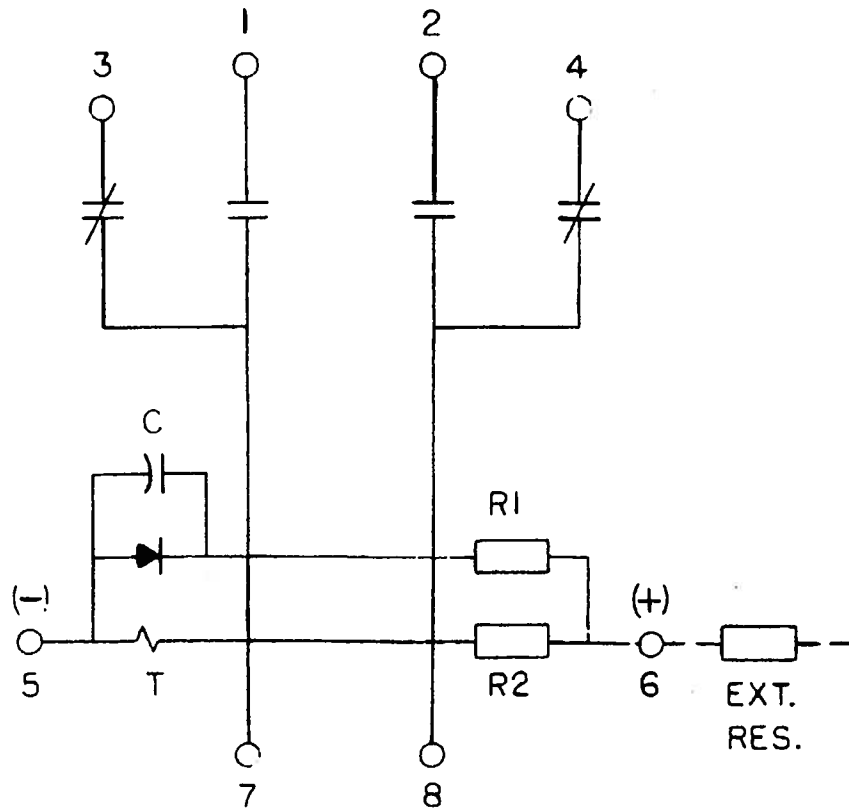
DESCRIPTION

The NGA15AK relay is similar to relay NGA15A except for the internal connections as shown in Fig. 1 of this supplement.

Since the last edition, Figure 1 has been changed

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.



MODEL	DC VOLTS	T OHMS	R1	R2	EXT. RES.	C MFD
12NGA15AK1	250	58	3.6K	—	3K	0.05
2	125	58	3.6K	—	1.5K	0.05
3	48	10	390	—	250	0.05
4	125	1.2K	3.9K	4K	—	0.05
5	250	5K	10K	10K	—	0.05
6	48	150	680	500	—	0.05
7	220	1.2K	8.2K	8.2K	—	0.05
8	110	1.2K	3.9K	3.3K	—	0.05

MODEL	DC VOLTS	T OHMS	R1	R2	EXT. RES.	C MFD
12NGA15AG1	125	58Ω	3.6K	—	1.5K	0.05
2	48	10	390	—	250	0.05
3	125	1200Ω	3.9K	4K	—	0.05
4	48	150Ω	680	500	—	0.05

Fig.1 (0273A9176 Sh.1 [0] & Sh.2 [2]) Internal Connections for Type NGA15AK Relay



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RELAYS

AUXILIARY RELAYS

TYPES

NGA15A AND NGA15L

GEI-83905J

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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.

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.

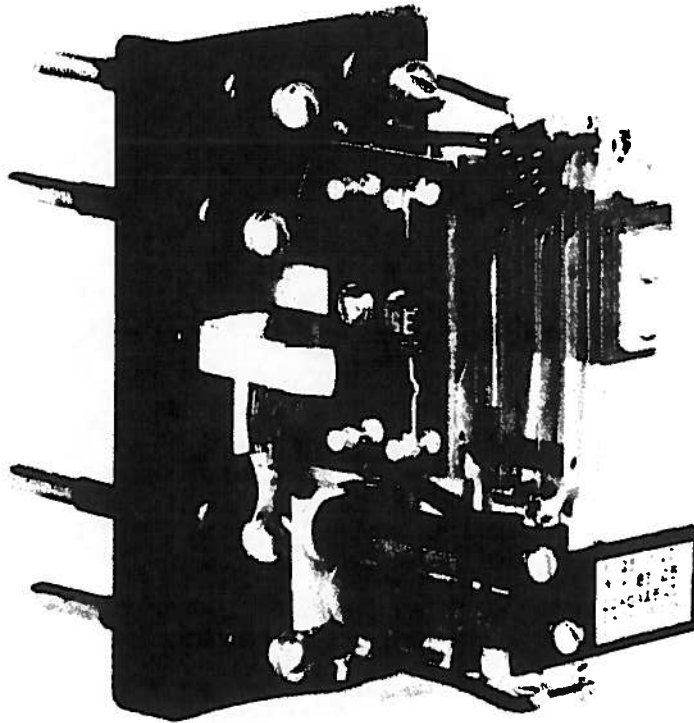


Figure 1 (8030186) NGA15A Relay Removed from Case

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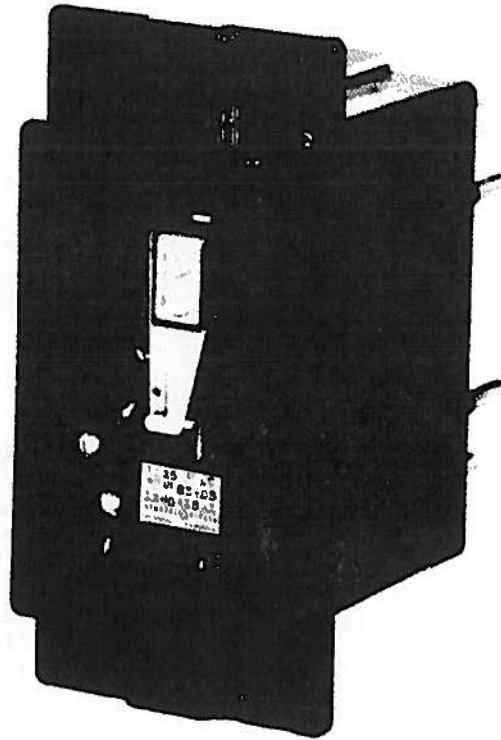
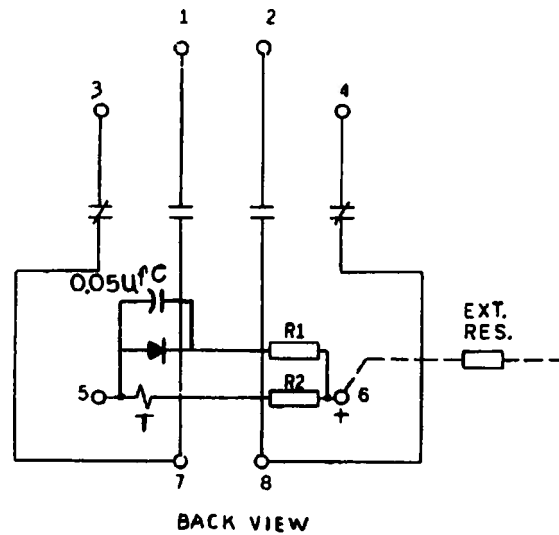


Figure 2 (8030182) NGA15A Relay in Flush Mounted Case

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SEE SHEET 2 FOR COMPONENT VALUES

MODEL	D-C VOLTS CONTINUOUS	P.V. TIME (MULTI SECONDS)		D.O. TIME (MULTI SECONDS)		OHMS			EXT. RES.
		MIN.	MAX.	MIN.	MAX.	T	R1	R2	
12GA15A (1) (4)	125	8	32	1200	1000	1000	1000	1000	
2 (1)	125	8	32	1200	1000	1000	1000	1000	
3 (1)	125	8	32	1200	1000	1000	1000	1000	
4 (1)	125	8	32	1200	1000	1000	1000	1000	
5 (1)	125	8	32	1200	1000	1000	1000	1000	
6 (1)	125	8	32	1200	1000	1000	1000	1000	
7 (1)	125	8	32	1200	1000	1000	1000	1000	
8 (1)	125	8	32	1200	1000	1000	1000	1000	
9 (1)	125	8	32	1200	1000	1000	1000	1000	
10 (1)	125	8	32	1200	1000	1000	1000	1000	
11 (1)	125	8	32	1200	1000	1000	1000	1000	
12 (1)	125	8	32	1200	1000	1000	1000	1000	
13 (1)	125	8	32	1200	1000	1000	1000	1000	
14 (1)	125	8	32	1200	1000	1000	1000	1000	
15 (1)	125	8	32	1200	1000	1000	1000	1000	
16 (1)	125	8	32	1200	1000	1000	1000	1000	
17 (1)	125	8	32	1200	1000	1000	1000	1000	
18 (1)	125	8	32	1200	1000	1000	1000	1000	
19 (1)	125	8	32	1200	1000	1000	1000	1000	
20 (1)	125	8	32	1200	1000	1000	1000	1000	
21 (1)	125	8	32	1200	1000	1000	1000	1000	
22 (1)	125	8	32	1200	1000	1000	1000	1000	
23 (1)	125	8	32	1200	1000	1000	1000	1000	
24 (1)	125	8	32	1200	1000	1000	1000	1000	
25 (1)	125	8	32	1200	1000	1000	1000	1000	
26 (1)	125	8	32	1200	1000	1000	1000	1000	
27 (1)	125	8	32	1200	1000	1000	1000	1000	
28 (1)	125	8	32	1200	1000	1000	1000	1000	
29 (1)	125	8	32	1200	1000	1000	1000	1000	
30 (1)	125	8	32	1200	1000	1000	1000	1000	
31 (1)	125	8	32	1200	1000	1000	1000	1000	
32 (1)	125	8	32	1200	1000	1000	1000	1000	
33 (1)	125	8	32	1200	1000	1000	1000	1000	
34 (1)	125	8	32	1200	1000	1000	1000	1000	
35 (1)	125	8	32	1200	1000	1000	1000	1000	
36 (1)	125	8	32	1200	1000	1000	1000	1000	
37 (1)	125	8	32	1200	1000	1000	1000	1000	
38 (1)	125	8	32	1200	1000	1000	1000	1000	
39 (1)	125	8	32	1200	1000	1000	1000	1000	
40 (1)	125	8	32	1200	1000	1000	1000	1000	
41 (1)	125	8	32	1200	1000	1000	1000	1000	
42 (1)	125	8	32	1200	1000	1000	1000	1000	
43 (1)	125	8	32	1200	1000	1000	1000	1000	
44 (1)	125	8	32	1200	1000	1000	1000	1000	
45 (1)	125	8	32	1200	1000	1000	1000	1000	
46 (1)	125	8	32	1200	1000	1000	1000	1000	
47 (1)	125	8	32	1200	1000	1000	1000	1000	
48 (1)	125	8	32	1200	1000	1000	1000	1000	
49 (1)	125	8	32	1200	1000	1000	1000	1000	
50 (1)	125	8	32	1200	1000	1000	1000	1000	
51 (1)	125	8	32	1200	1000	1000	1000	1000	
52 (1)	125	8	32	1200	1000	1000	1000	1000	
53 (1)	125	8	32	1200	1000	1000	1000	1000	
54 (1)	125	8	32	1200	1000	1000	1000	1000	
55 (1)	125	8	32	1200	1000	1000	1000	1000	
56 (1)	125	8	32	1200	1000	1000	1000	1000	
57 (1)	125	8	32	1200	1000	1000	1000	1000	
58 (1)	125	8	32	1200	1000	1000	1000	1000	
59 (1)	125	8	32	1200	1000	1000	1000	1000	
60 (1)	125	8	32	1200	1000	1000	1000	1000	
61 (1)	125	8	32	1200	1000	1000	1000	1000	
62 (1)	125	8	32	1200	1000	1000	1000	1000	
63 (1)	125	8	32	1200	1000	1000	1000	1000	
64 (1)	125	8	32	1200	1000	1000	1000	1000	
65 (1)	125	8	32	1200	1000	1000	1000	1000	
66 (1)	125	8	32	1200	1000	1000	1000	1000	
67 (1)	125	8	32	1200	1000	1000	1000	1000	
68 (1)	125	8	32	1200	1000	1000	1000	1000	
69 (1)	125	8	32	1200	1000	1000	1000	1000	
70 (1)	125	8	32	1200	1000	1000	1000	1000	
71 (1)	125	8	32	1200	1000	1000	1000	1000	
72 (1)	125	8	32	1200	1000	1000	1000	1000	
73 (1)	125	8	32	1200	1000	1000	1000	1000	
74 (1)	125	8	32	1200	1000	1000	1000	1000	
75 (1)	125	8	32	1200	1000	1000	1000	1000	
76 (1)	125	8	32	1200	1000	1000	1000	1000	
77 (1)	125	8	32	1200	1000	1000	1000	1000	
78 (1)	125	8	32	1200	1000	1000	1000	1000	
79 (1)	125	8	32	1200	1000	1000	1000	1000	
80 (1)	125	8	32	1200	1000	1000	1000	1000	
81 (1)	125	8	32	1200	1000	1000	1000	1000	
82 (1)	125	8	32	1200	1000	1000	1000	1000	
83 (1)	125	8	32	1200	1000	1000	1000	1000	
84 (1)	125	8	32	1200	1000	1000	1000	1000	
85 (1)	125	8	32	1200	1000	1000	1000	1000	
86 (1)	125	8	32	1200	1000	1000	1000	1000	
87 (1)	125	8	32	1200	1000	1000	1000	1000	
88 (1)	125	8	32	1200	1000	1000	1000	1000	
89 (1)	125	8	32	1200	1000	1000	1000	1000	
90 (1)	125	8	32	1200	1000	1000	1000	1000	
91 (1)	125	8	32	1200	1000	1000	1000	1000	
92 (1)	125	8	32	1200	1000	1000	1000	1000	
93 (1)	125	8	32	1200	1000	1000	1000	1000	
94 (1)	125	8	32	1200	1000	1000	1000	1000	
95 (1)	125	8	32	1200	1000	1000	1000	1000	
96 (1)	125	8	32	1200	1000	1000	1000	1000	
97 (1)	125	8	32	1200	1000	1000	1000	1000	
98 (1)	125	8	32	1200	1000	1000	1000	1000	
99 (1)	125	8	32	1200	1000	1000	1000	1000	
100 (1)	125	8	32	1200	1000	1000	1000	1000	

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

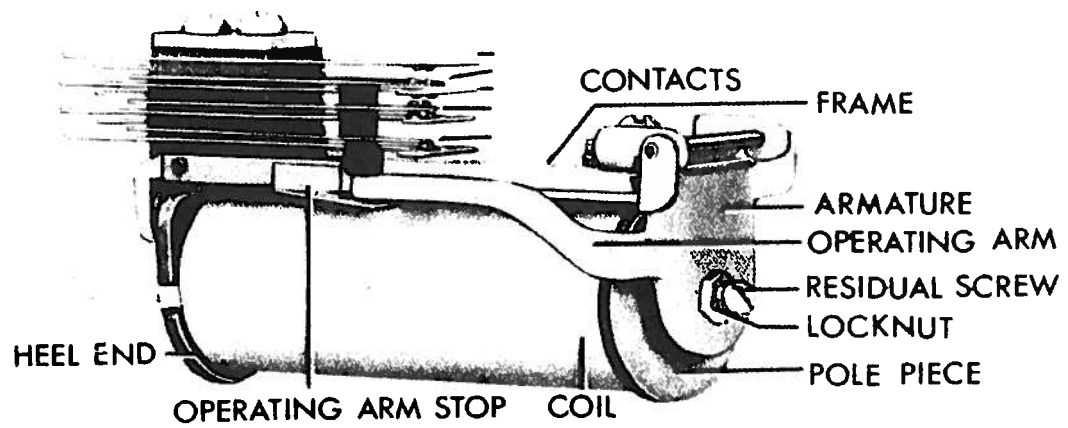


Figure 4 (8012106) Typical Telephone-Relay Unit in the NGA15A Relay

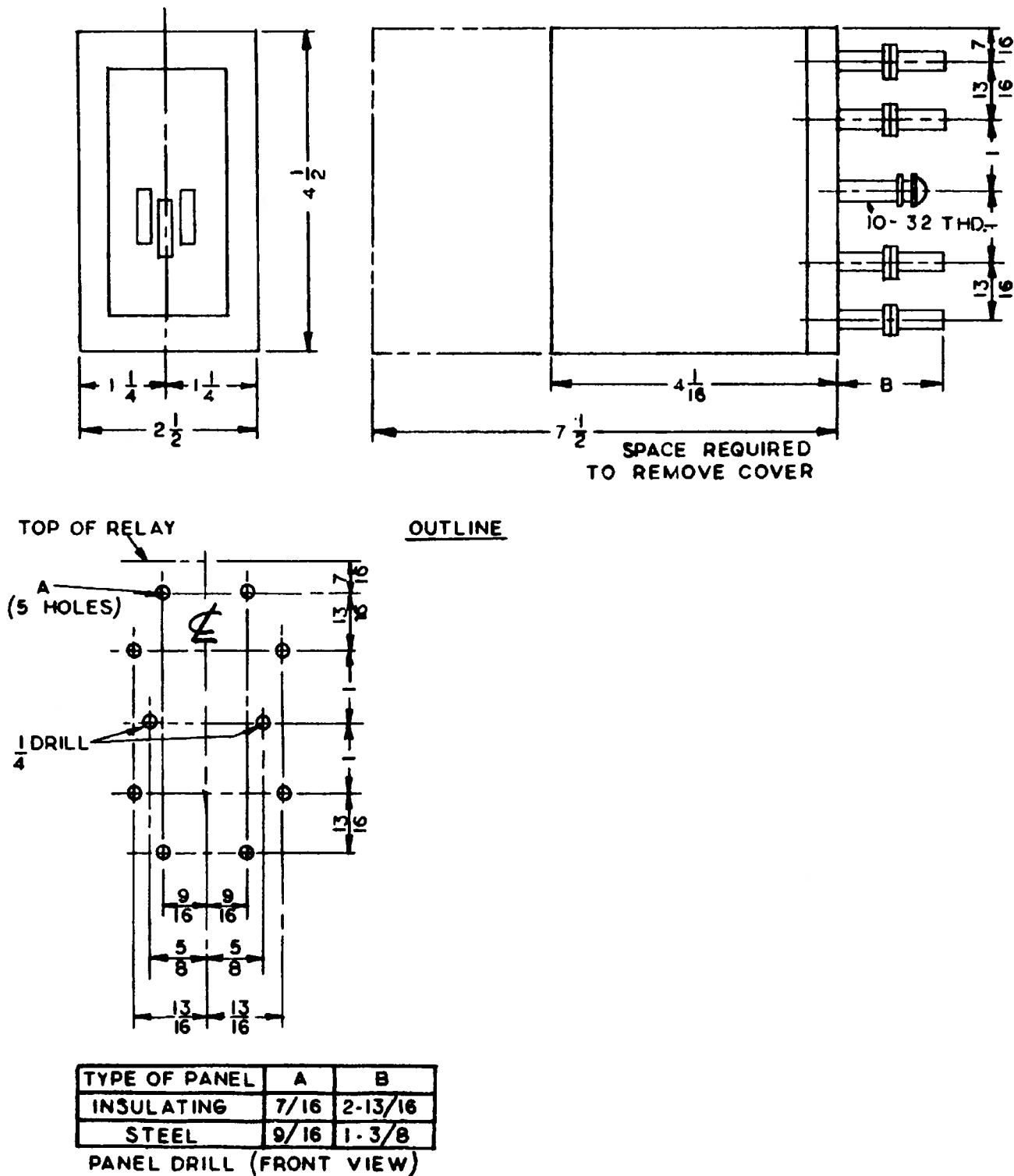


Figure 5 (0148A3979-6) Outline and Panel Drilling Dimensions for the Projection Mounted NGA15A Relay

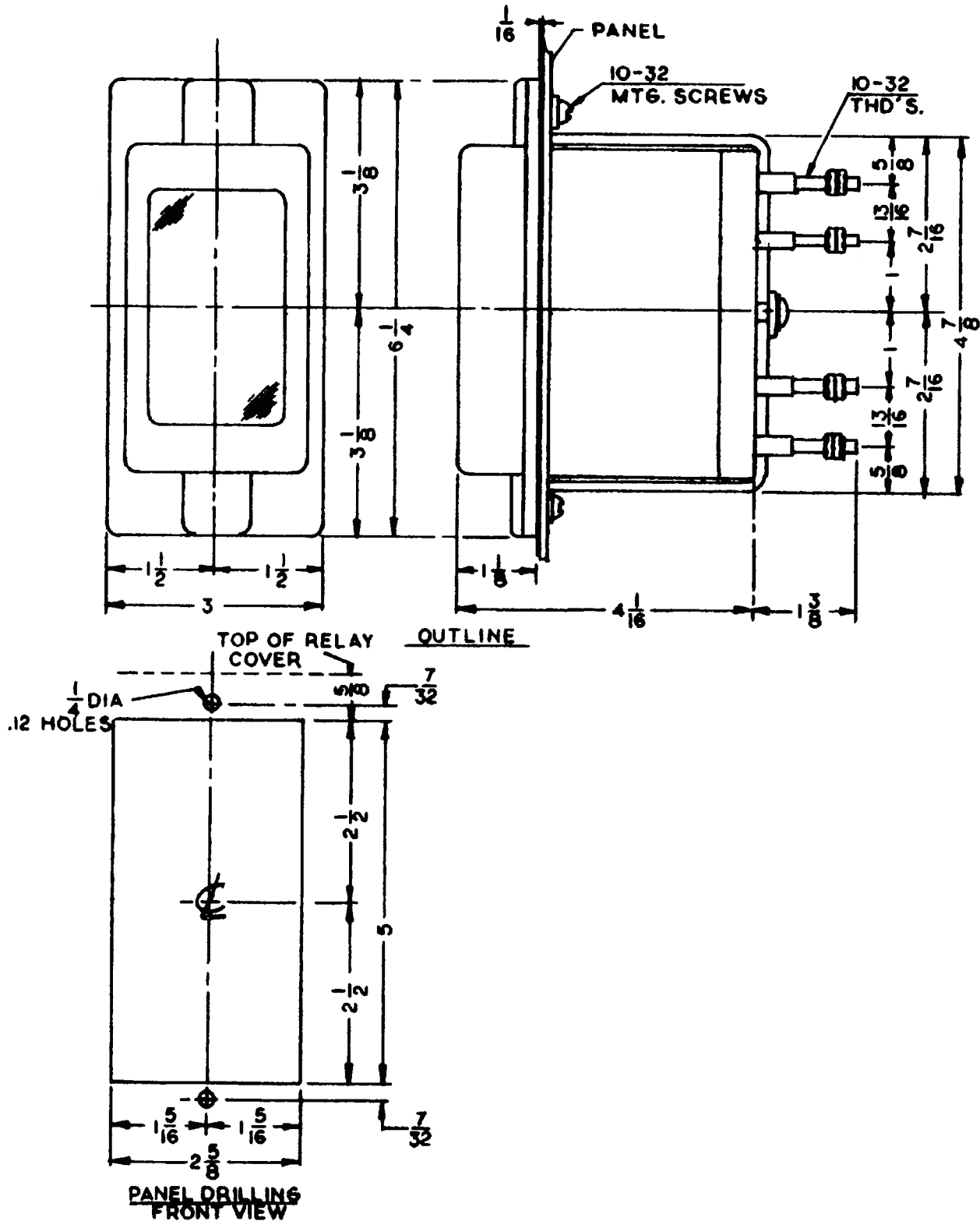
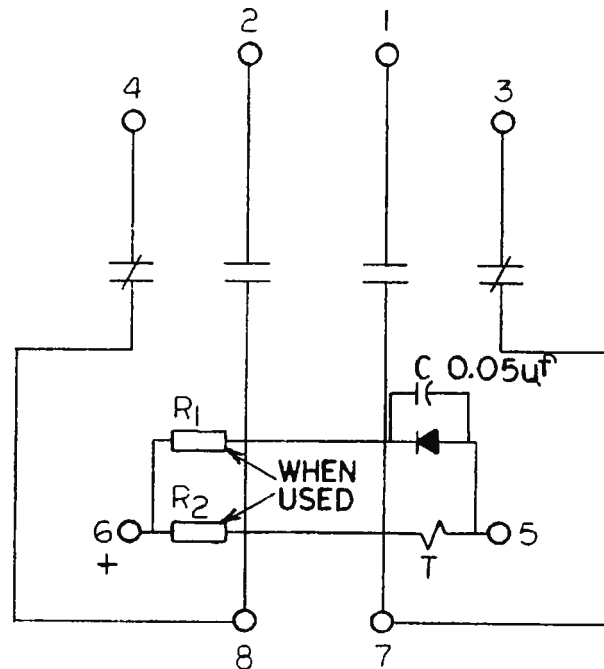


Figure 6 (0148A3978-7) Outline and Panel Drilling Dimensions for the Semi-Flush Mounted NGA15A Relay



MODEL	DC VOLTS CONTINUOUS	P.U. TIME (MILLISECS)		D.O. TIME (MILLISECS)		OHMS		
		MIN.	MAX.	MIN.	MAX.	T	R1	R2
NGA15L1 Δ	125		8	32		1200	4000	4000
NGA15L2 *	48		8	32		150	700	500
NGA15L3 Δ	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	

Δ = SUPERCEDED BY NGA15AG3

* = SUPERCEDED BY NGA15AG4

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

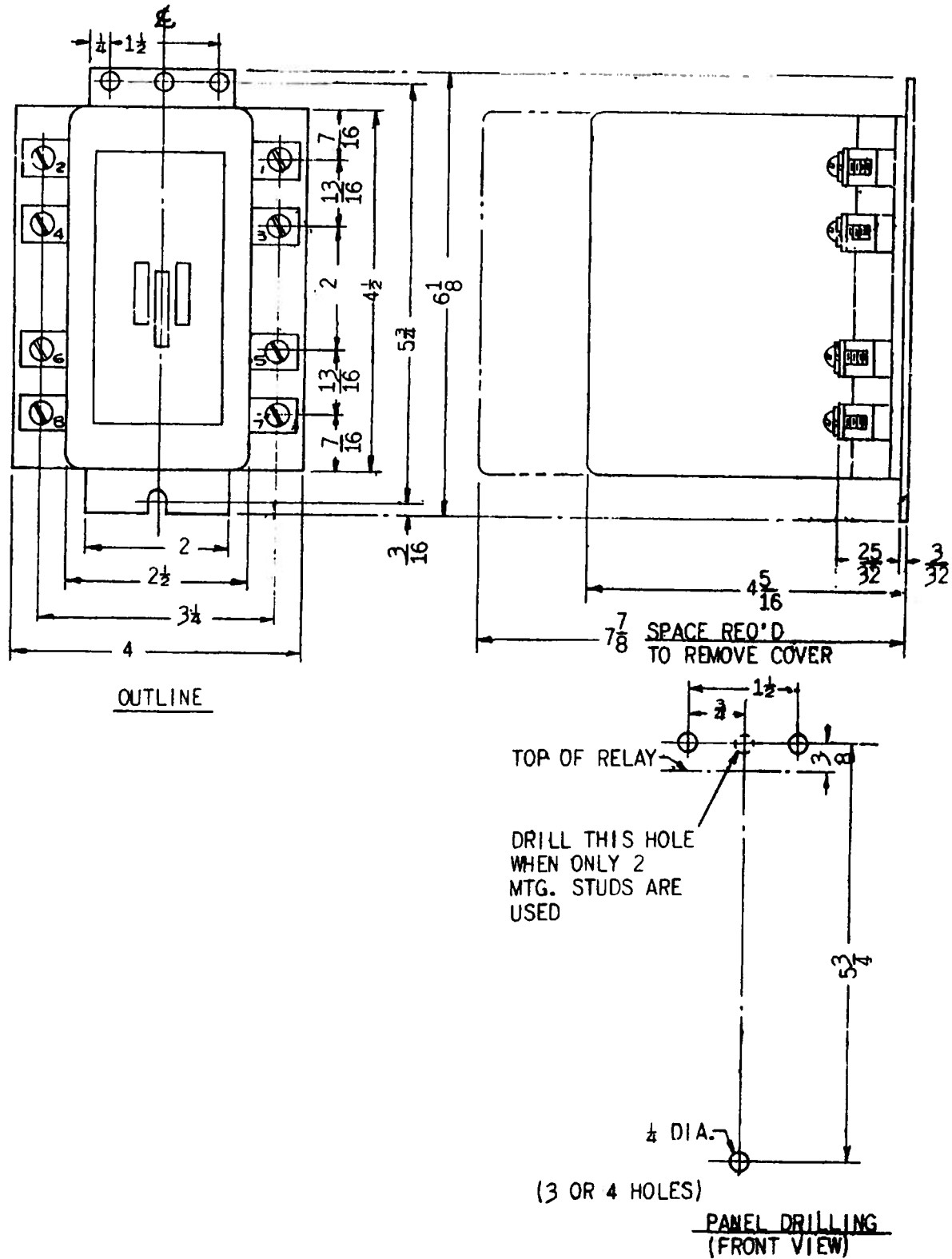


Figure 8 (0208A3642-1) Outline and Panel Dimensions for the Front Connected NGA15L with Solid Front Cover

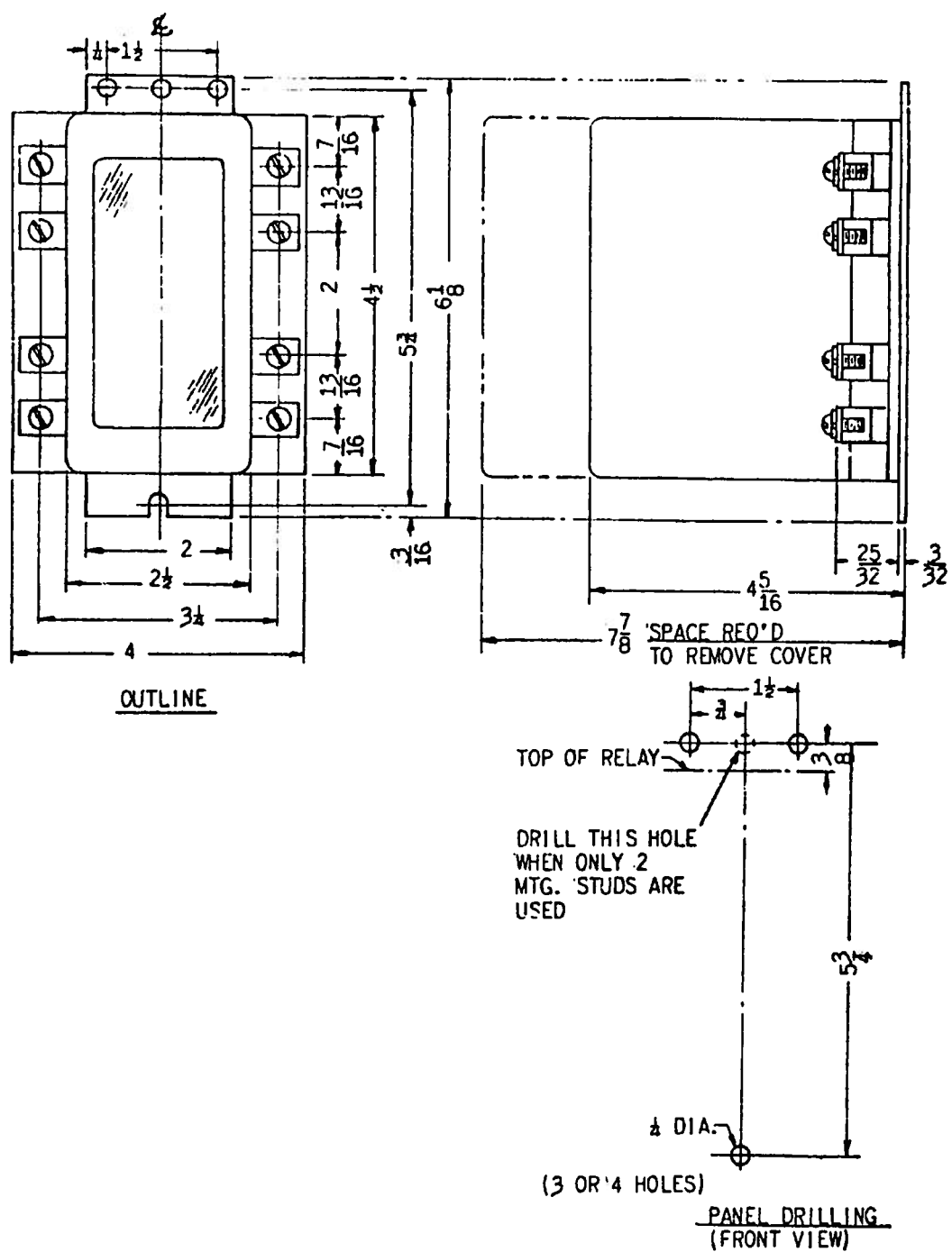


Figure 9 (0208A3643) Outline and Panel Dimensions for the Front Connected NGA15A with Glass Front Cover



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