



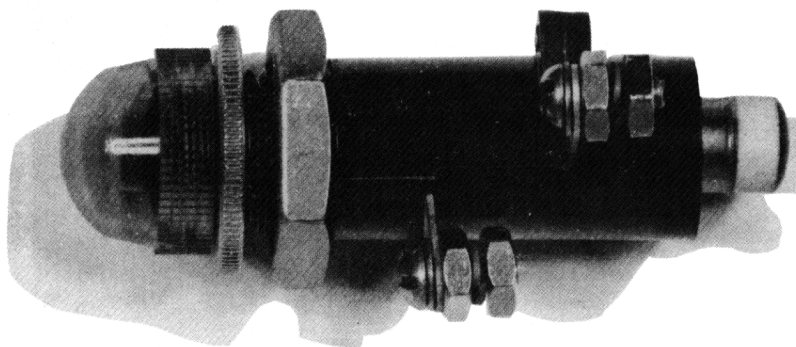
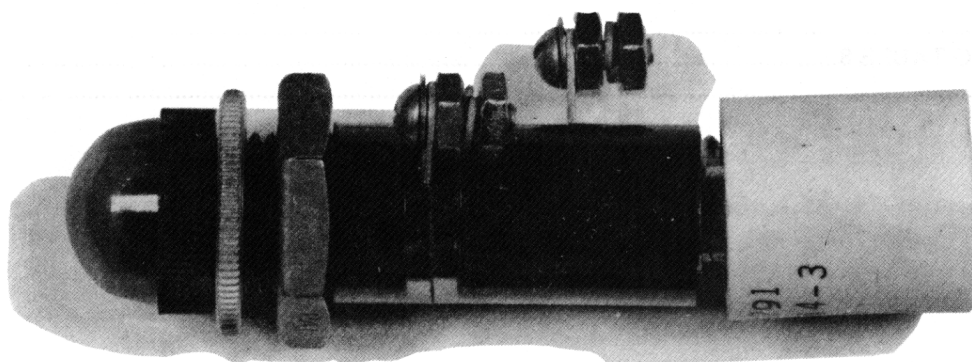
GE VERNOVA

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INSTRUCTIONS

TYPE ET-16 and ET-17 INDICATING LAMPS

Manual Part Number: GEH-3500F Copyright
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Manufactured under an
ISO9002 Registered System

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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 GE VERNOVA.

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

INTRODUCTION

The ET-16 (incandescent and LEDs) and ET-17 (neon) indicating lamps consist of a common receptacle, plug in type resistors and lamps, escutcheon, and color cap. They are available for mounting on switchboard panels up to and including ¼ inch thickness.

APPLICATION

These lamps can be used whenever a panel mounted signal or indicating lamp is desired.

The ET-16 is available for either one brilliance or dim bright operation when incandescent lamps are used. ET-16 lamps are also available with Light Emitting Diodes (LEDs). The incandescent type can be easily upgraded to the LED type. It only requires acquiring the appropriate color LED and lens cap and inserting into the lamp receptacle.

The ET-17 can be used when extra long life is a factor and brilliance is not. It also can be used when low current is desired.

FEATURES

1. The simple "push-twist" type plug has been adopted for both the bulb and the resistor. This was accomplished by incorporating a bayonet base on both components.
2. A common receptacle for both the ET-16 and ET-17 coupled with the plug-in resistor and bulb makes it easy to change on the panel without disassembling.
3. The resistor is in series with the bulb, and the ohmic value for the different circuit voltages is designed at 80% of the rated bulb voltage to give it longer life. Changing voltages is easily accomplished by changing the series resistor (see listed tables for the proper resistor).
4. A short circuit plug is available when a series resistor is not required or if an external resistor is to be used.
5. The ET-16 uses GE Catalog No. 1819 for the 24 DC lamp and GE Catalog Number 1835 for the balance of the ratings. For LED types, long life LEDs (100,000 hours) are specified. Additional features are as follows: reduced heat, resistance to shock and vibration, improved safety, lower current, cost savings, and no cold filament inrush current. The LED lamps come in red, green, and amber colors. White is not an option because a white light LED is not available. ET-17 uses GE Catalog Number B1A.
6. Terminals are readily available. They are designed for either AMP "FASTON" type connectors, solder, or screws.
7. Nine basic color caps designed for maximum visibility are available for ET-16 incandescent types. Five Translucent caps: red, green, yellow, white; and four transparent caps: amber, red, green, blue, and clear. For ET-16 LED types, only the transparent lens caps are recommended. This is because the transparent lens allows more LED light to pass through than the translucent lens cap used on incandescent lamps. The available colors are as follows: red, green, amber, yellow smoke, clear and blue.

ET-17: Because of the special properties of neon, only amber, transparent red, and clear lenses are suitable.

The color caps have a knurled OUTSIDE DIAMETER FOR EASY REMOVAL.

8. The ET-16 is also available for dim bright applications.
9. When special voltage or resistance is required other than those listed, a special lamp may be ordered with the proper design, or designated series resistor.
10. A two-inch insulating washer is supplied with each indicating light. It should be mounted on the inside of the panel as illustrated in Figs. 2, 3, and 4. The function of this washer is to provide additional insulation between the terminal and ground (panel) if a surge were to be induced on one of the potential leads.

If a bulb other than those listed above is required, the lamp will be furnished less the bulb.

Listed tables give some of the specials made available.

RATINGS

Resistors ET-16: 12.5 Watts

ET-17: 1 Watt

BULB	DESIGN VOLTAGE	DESIGN AMPS	CANDLE POWER	AVERAGE LIFE (HOURS)
1819	28	0.04 A	Approx. 0.34	2500
1835	55	0.05 A	Approx. 1.1	5000
B1A	105-125	0.3 mA	-	15,000

CONNECTIONS

See Figure 1A and 1B for typical tell-tale and dim-bright connections.

RECOMMENDED PANEL ASSEMBLY

Thread the pal nut against the shoulder of the receptacle. Install the two-inch insulating washer on the front of the receptacle against the pal nut. Insert the receptacle through the panel and thread the escutcheon nut against panel. Install the color cap and hand tighten (do not force). Turn the escutcheon nut back up against the color cap, then back off $\frac{1}{2}$ to $\frac{3}{4}$ turn ($\frac{3}{4}$ turn recommended) to give at least $\frac{1}{64}$ inch clearance but not more than $\frac{1}{32}$ inch clearance between the color cap and escutcheon nut (for up to $\frac{3}{16}$ inch panel). For the $\frac{1}{4}$ -inch panel, the color cap will be flush with the escutcheon nut. Tighten the pal nut against panel to 10 to 12 inch-pounds of torque.

TABLE 1: ET-16 – INDICATING LAMP

CIRCUIT VOLTAGE			CATALOG NUMBER (includes lamp, color cap, and resistor)	Resistor 0165A7844		Bulb (GE Catalog Number)	receptacle	Color cap †	carton	outline
Rated volts	MIN. volts	MAX. volts		Part No.	Ohmic Value					
24 V DC	22 V	28 V	0116B6708G1	1	10	1819	0116B6709G1	See ordering Table 6	0165A9257P1	0165A7859
48 V DC	44 V	56 V	0116B6708G2	2	200	1835				
125 V DC	110 V	140 V	0116B6708G3	3	2000					
250 V DC	220 V	280 V	0116B6708G4	4	5100					
120 V AC	95 V	130 V	0116B6708G5	5	1900					
240 V AC	195 V	260 V	0116B6708G6	6	4800					

TABLE 2: ET-16 – FOR DIM-BRIGHT APPLICATION

CIRCUIT VOLTAGE			CATALOG NUMBER (includes lamp, color cap, and resistor)	Resistor 0165A9217			Bulb (GE Catalog Number)	receptacle	Color cap †	carton	outline
Rated volts	MIN. volts	MAX. volts		Part No.	Ohmic Value						
					Total	Tap					
48 V DC	44 V	56 V	0116B8108G2	1	450	50	1835	0116B6709G3	See ordering Table 6	0165A9257P2	0165A9216
125 V DC	110 V	140 V	0116B8108G3	2	2550	1700					
250 V DC	220 V	280 V	0116B8108G4	3	6000	4400					
120 V AC	95 V	130 V	0116B8108G5	4	2450	1600					
240 V AC	195 V	260 V	0116B8108G6	5	5700	4200					

TABLE 3: ET-16 – FOR LEDs**Receptacle with Resistor by Voltage**

Rated Voltage	Min.	Max.	Catalog No.
24 DC	22	28	116B6708G41
48 DC	44	56	116B6708G42
125 DC 250 DC	110 220	140 280	116B6708G43 116B6708G44
70 AC 120 AC 130 AC 240 AC	55 95 105 195	76 130 140 260	116B6708G47 116B6708G45 116B6708G48 116B6708G46

LED Lamp by Voltage

Rated Voltage	Lamp Color	Cat. No. Digits
24 DC	Red Green Amber	R92 G92 A92
48 DC	Red Green Amber	R52 G52 A52
125 DC 250 DC	Red Green Amber	R53 G53 A53
70 AC 120 AC 130 AC 240 AC	Red Green Amber	R53 G53 A53

No.3 - Transparent Color Lens Cap

Transp. Cap Color	Cat. No. Digits
Red	R4
Green	G4
Amber	A4
Yellow	Y4
Smoke	S4
Clear	C4
None	N4

Example: Using Table 3 to specify a complete ET-16 LED catalog number for a 24 V DC, Red LED Lamp, red Transparent Color Cap

Catalog Number: 116B6708G41 R92 R4

Receptacle and Resistor by Voltage

LED Lamp Color by Voltage

Lens Cap by Color

TABLE 4: ET-17 – INDICATING LAMP

Voltage Range AC/DC	Cat. No.* (includes Lamp, color gap, and resistor)	Resistor 0165A7956		Bulb (GE Catalog Number)	receptacle	Color Cap †	Carton	Outline
		Part No.	Ohmic Value					
110-139	0116B6734G1	1	200 K	B1A	0116B6709G1	see Ordering Table 7	0165A9257P3	0165A7955
140-219	0116B6734G2	2	560 K					
220-299	0116B6734G3	3	750 K					
300-374	0116B6734G4	4	1 M					
375-449	0116B6734G5	5	1.2 M					
450-600	0116B6734G6	6	1.6 M					

† Specify color cap from Table 6 or 7

**TABLE 5: ET-16 SPECIAL 127B8177
INDICATING LAMP COMPLETE**

Group No*	Volts	1 REQ'D of GR. or PT NO. LISTED BELOW					Color Cap	Carton	Online
		RESISTOR				BULB GE Cat. No.			
		Receptacle	DRG. No.	Part No.	Value				
1	70	0116B6709G-1	0165A7844	7	750 Ω	1835	** See Ordering Table 6	0165A9257P-1	0165A7859
2	17			8	50 Ω	756			
3	140			9	2500 Ω	NONE			
4	220			10	4300 Ω	1835			
5	32			2	200 Ω	1819			
6	125			11	3300 Ω	1835			
7	277			12	5900 Ω	1835			
8	140			9	2500 Ω	1835			
9	130			13	2300 Ω	1835			

** 756 Bulb Furnished by Customer

**TABLE 6: ET-17 SPECIAL 128B1654
INDICATING LAMP COMPLETE**

Group No*	Volts	1 REQ'D of GR. or PART NUMBER LISTED BELOW					Color Cap	Carton	Online
		RESISTOR				BULB GE Cat. No.			
		Receptacle	DRG. No.	Part No.	Value				
1	210 to 250 V AC/DC	0116B6709GR-1	0165A7956	1	56 KΩ	NE51H **	See Ordering Table 7	0165A9257	0165A7955
2	67 to 120 V AC			8	80 KΩ	NE51 or B1A			

** NE51H BULB Furnished by Customer

TABLE 7: COLOR CAP

CAT. NO.	COLOR CAP	
	COLOR	CAT. NO.
0116B6708G	NONE	NONE
0116B6708G*C	CLEAR II	208A3768P1
0116B6708G*R	RED Ø	208A3768P2
0116B6708G*G	GREEN Ø	208A3768P3
0116B6708G*Y	YELLOW Ø	208A3768P4
0116B6708G*W	WHITE Ø	208A3768P5
0116B6708G*B	BLUE II	208A3768P6
0116B6708G*A	AMBER II	208A3768P7
0116B6708G*D	GREEN II	208A3768P8
0116B6708G*E	RED II	208A3768P9

ORDERING TABLE 8: COLOR CAP

CAT. NO.	COLOR CAP	
	COLOR	CAT. NO.
0116B6734G*	NONE	NONE
0116B6734G*C	CLEAR II	208A3768P1
0116B6734G*E	RED II	208A3768P9
0116B6734G*A	AMBER II	208A3768P7

HOW TO ORDER:

Order by the complete Catalog Number and specify color cap. To order renewal parts for ET-16 LEDs or for Incandescent ET16 conversion to LEDs, use the following table:

TABLE 9: ET-16 LEDs RENEWAL PARTS INFORMATION

Receptacle: 116B6709G1			Lamp Color	LED Lamp 286A5442P GE Part No.	Lamp Marking	Lens Cap 286A5443P	Lens Color
Rated Voltage	Resistor 165A7844P Part No.	Ohmic Value					
24 DC	1	10	Red Green Amber	R92 G92 A92	1819L2R 1819L2G 1819L2A	Red	R4
48 DC	2	200	Red Green Amber	R52 G52 A52	1835L2R 1835L2G 1835L2A	Green Amber	G4 A4
125 DC 250 DC	3 4	2000 5100	Red Green Amber	R53 G53 A53	1835L3R 1835L3G 1835L3A	Yellow	Y4
70 AC 120 AC 130 AC 240 AC	7 5 13 6	750 1900 2300 4800	Red Green Amber	R53 G53 A53	1835L3R 1835L3G 1835L3A	Smoke Clear	S4 C4

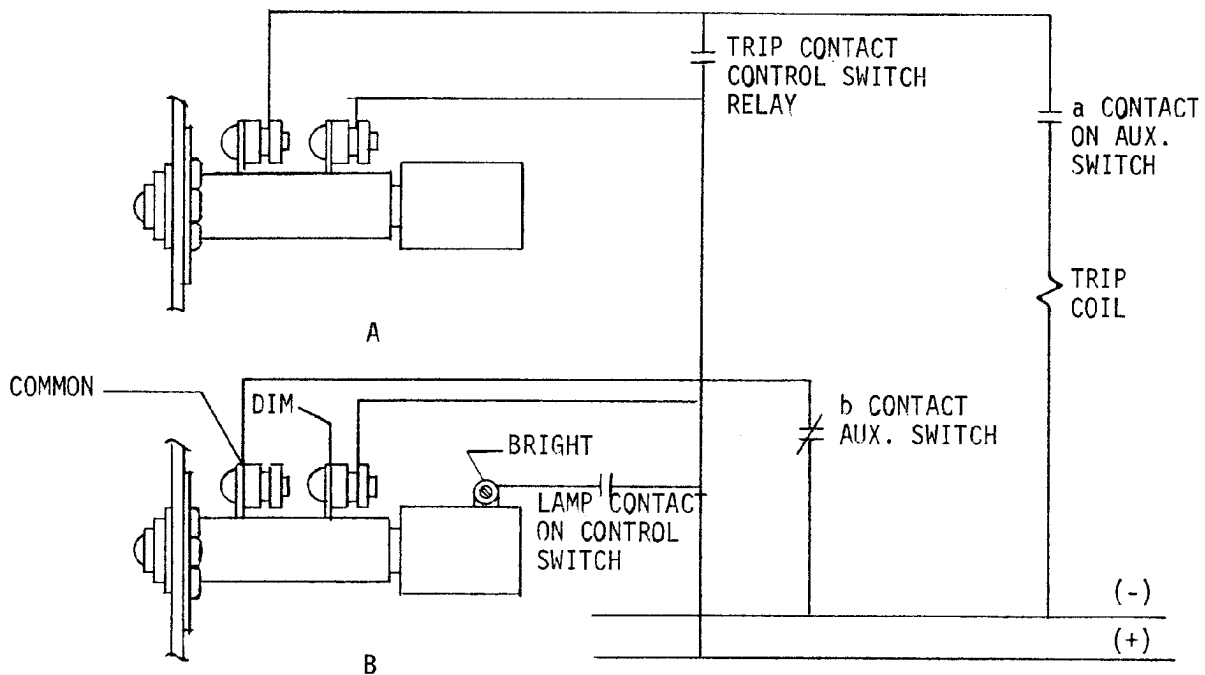


FIG A - SHOWS A TELL-TALE CIRCUIT FOR A CIRCUIT BREAKER CLOSE INDICATION. WHEN THE BREAKER IS CLOSED, THE LIGHTED (RED) LAMP SHOWS NOT ONLY THE BREAKER POSITION, BUT ALSO THAT THE TRIP CIRCUIT IS COMPLETE.

FIG B - FOR CIRCUIT BREAKER OPEN INDICATION, THE DIM-BRIGHT CONNECTION IS OFTEN DESIRABLE, ESPECIALLY WHEN A LARGE NUMBER OF LAMPS ARE LOCATED ON ONE PANEL. A LAMP UNIT WITH TAPPED RESISTOR IS REQUIRED, TOGETHER WITH A CONTROL SWITCH HAVING A LAMP CONTACT WHICH REMAINS CLOSED IN THE NORMAL POSITION, EXCEPT AFTER THE SWITCH HAS BEEN TURNED TO THE TRIP POSITION. A WHITE COLOR CAP ON THE LAMP IS CUSTOMARY. WHEN THE BREAKER IS TRIPPED WITH THE CONTROL SWITCH, THE SWITCH CONTACT IS OPENED, AND THE LAMP GLOWS WITH LOW BRILLIANCY. IF THE BREAKER IS TRIPPED AUTOMATICALLY, THE CONTROL SWITCH CONTACT SHORT-CIRCUITS PART OF THE LAMP RESISTOR SO THE LAMP GLOWS BRIGHTLY, AND THE NON-MANUAL OPERATION CAN BE EASILY LOCATED ON THE PANEL.

Figure 1 (0246A3685[1]): TYPICAL TELL-TALE AND DIM-BRIGHT CONNECTION

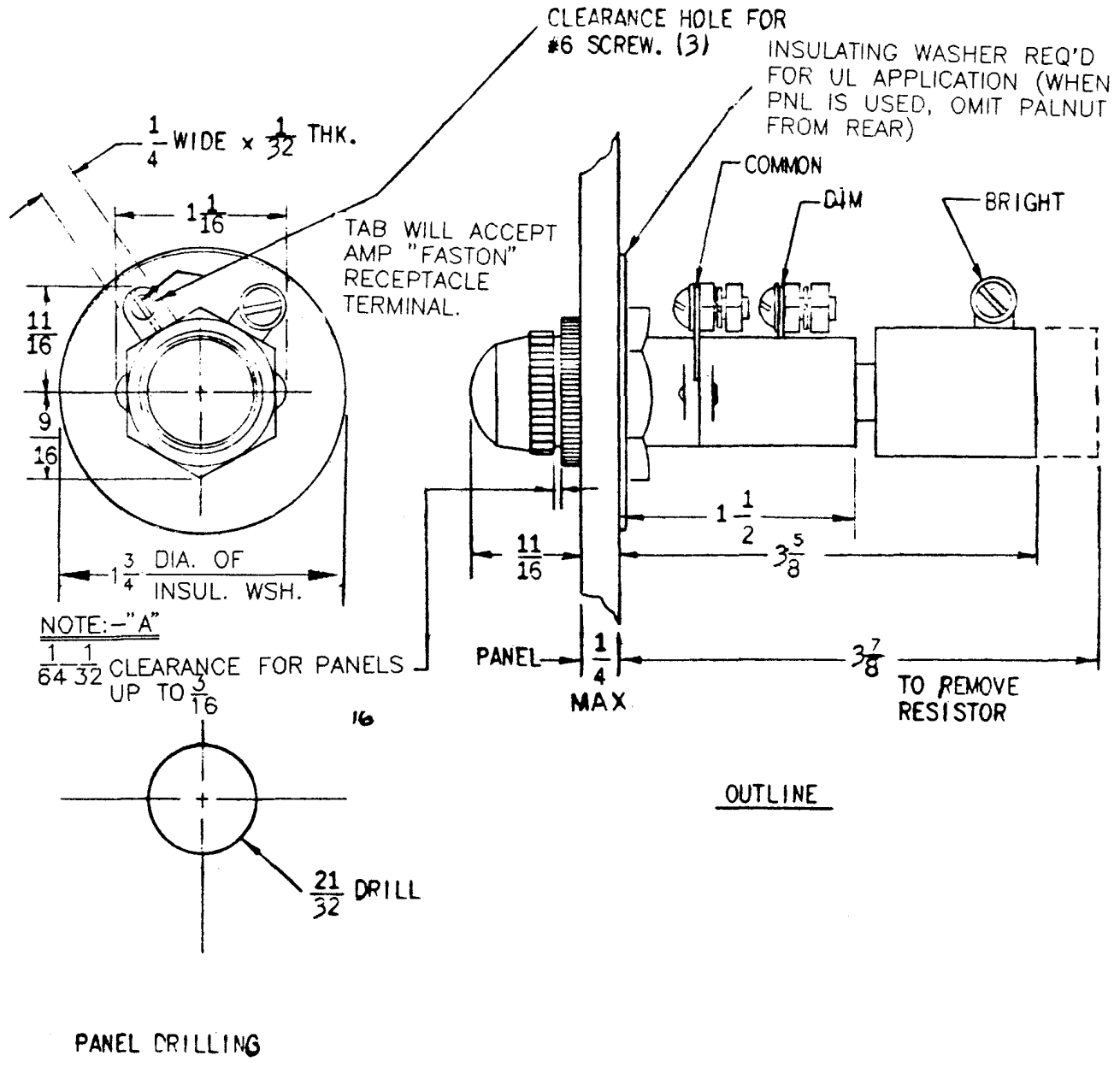
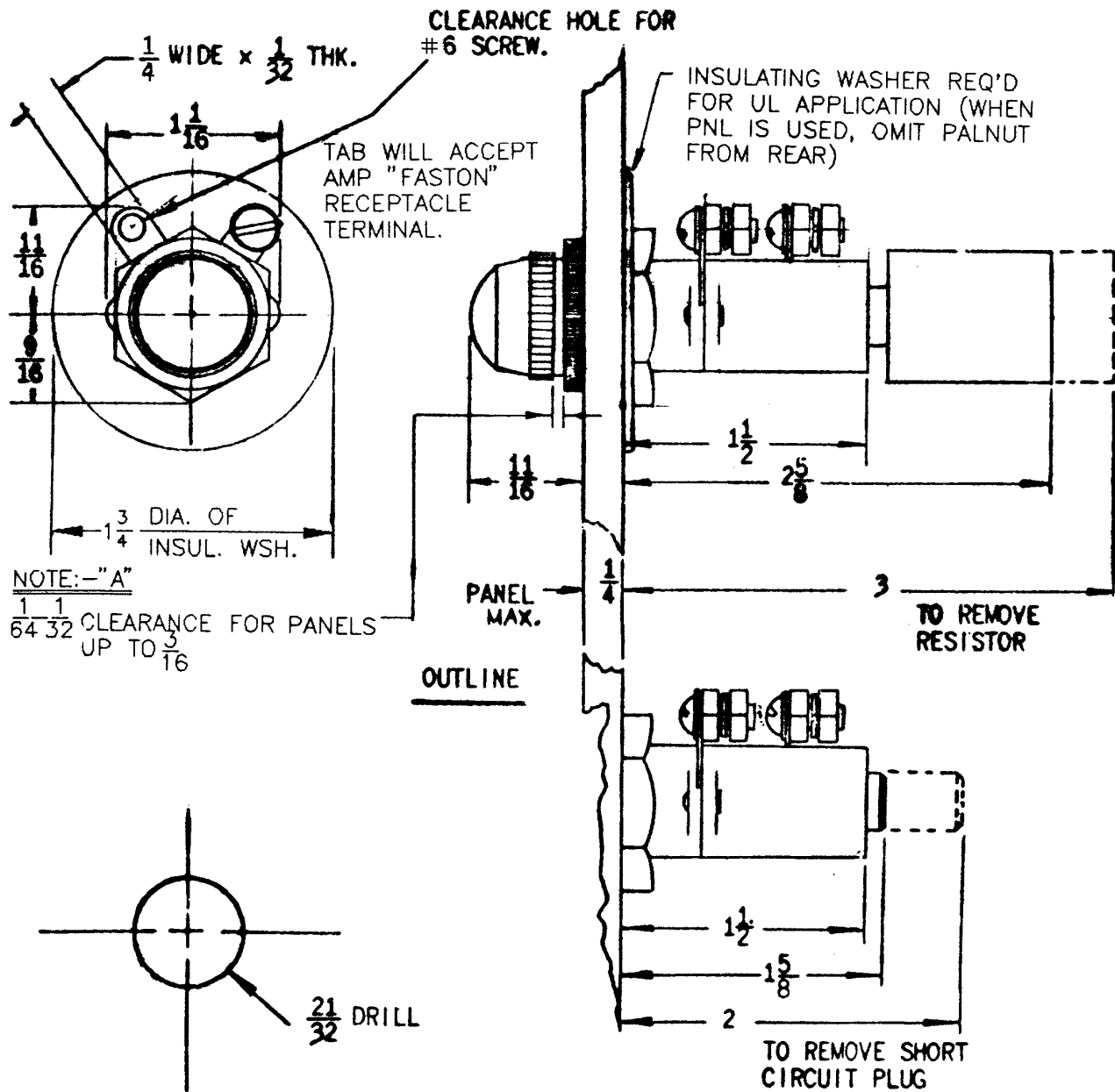


Figure 2 (0165A9216[4]): OUTLINE AND PANE DRILLING FOR TYPE ET-16 INDICATING LAMP WITH TAP RESISTOR FOR DIM BRIGHT OPERATIONS



PANEL DRILLING

Figure 3 (0165A7859[6]): OUTLINE AND PANEL DRILLING FOR TYPE ET-16 INDICATING LAMP

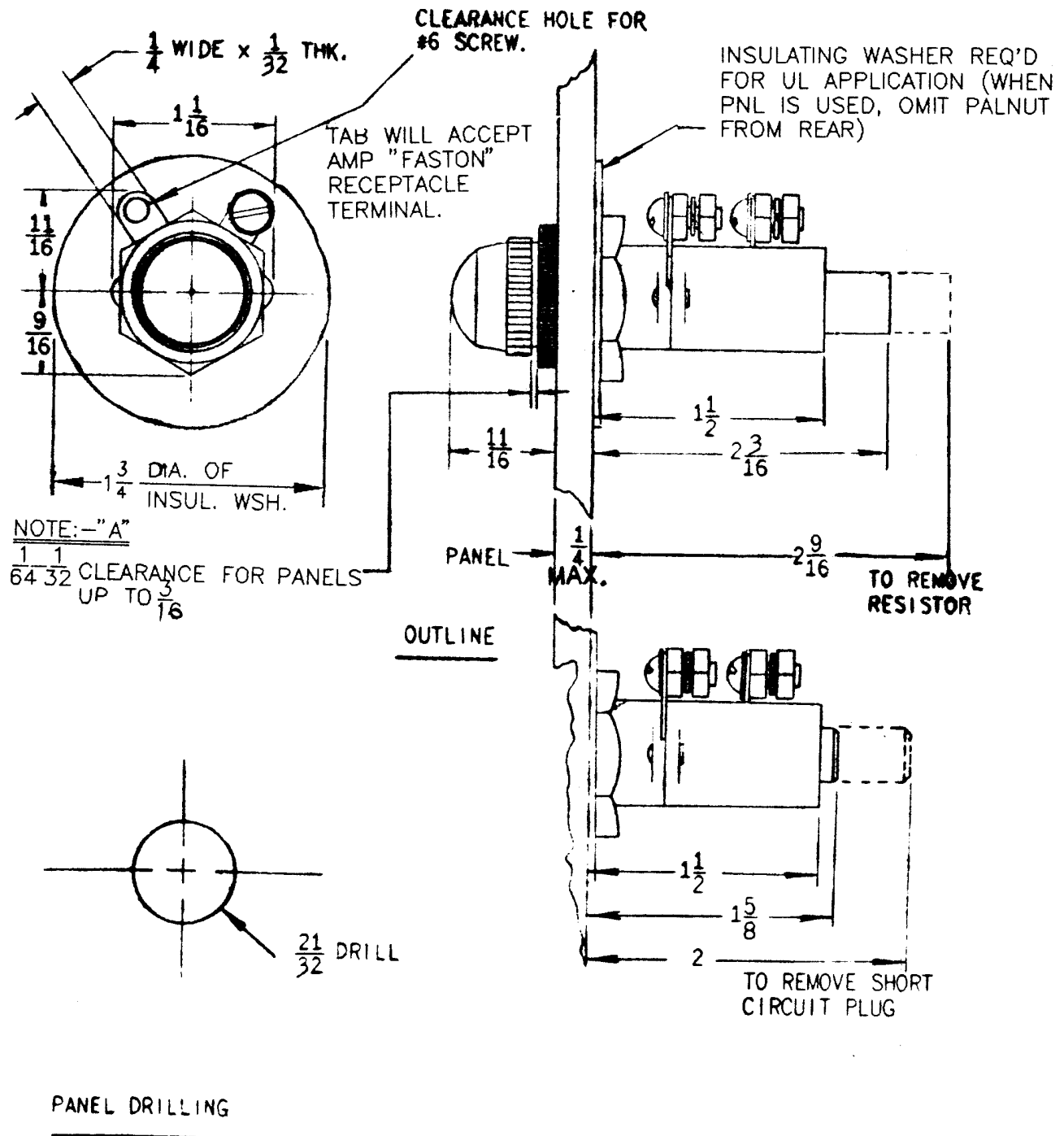


Figure 4 (0165A7955[6]): OUTLINE AND PANEL DRILLING FOR NEON INDICATING LAMP TYPE ET-17



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