



STANDARD OVERHAUL PRACTICES MANUAL

INSTRUMENT PANEL ELECTRICAL MODULE GENERAL INFORMATION

**PART NUMBER
NONE**

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STANDARD OVERHAUL PRACTICES MANUAL

Revision No. 26
Jul 01/2009

To: All holders of INSTRUMENT PANEL ELECTRICAL MODULE GENERAL INFORMATION 20-11-05.

Attached is the current revision to this STANDARD OVERHAUL PRACTICES MANUAL

The STANDARD OVERHAUL PRACTICES MANUAL is furnished either as a printed manual, on microfilm, or digital products, or any combination of the three. This revision replaces all previous microfilm cartridges or digital products. All microfilm and digital products are reissued with all obsolete data deleted and all updated pages added.

For printed manuals, changes are indicated on the List of Effective Pages (LEP). The pages which are revised will be identified on the LEP by an R (Revised), A (Added), O (Overflow, i.e. changes to the document structure and/or page layout), or D (Deleted). Each page in the LEP is identified by Chapter-Section-Subject number, page number and page date.

Pages replaced or made obsolete by this revision should be removed and destroyed.

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TRANSMITTAL LETTER

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PART NUMBER NONE



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Location of Change

Description of Change

NO HIGHLIGHTS

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HIGHLIGHTS

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Subject/Page	Date	Subject/Page	Date	Subject/Page	Date
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O 1	Jul 01/2009	18	Jul 01/2005		
2	BLANK	19	Mar 01/2007		
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A = Added, R = Revised, D = Deleted, O = Overflow

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All revisions to this manual will be accompanied by transmittal sheet bearing the revision number. Enter the revision number in numerical order, together with the revision date, the date filed and the initials of the person filing.

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STANDARD OVERHAUL PRACTICES MANUAL

INTRODUCTION

1. General

- A. The instructions in this manual tell how to do standard shop procedures during maintenance functions from simple checks and replacement to complete shop-type repair.
- B. This manual is divided into separate sections:
 - (1) Title Page
 - (2) Transmittal Letter
 - (3) Highlights
 - (4) Effective Pages
 - (5) Contents
 - (6) Revision Record
 - (7) Record of Temporary Revisions
 - (8) Introduction
 - (9) Procedures
- C. Refer to SOPM 20-00-00 for a definition of standard industry practices, vendor names and addresses, and an explanation of the True Position Dimensioning symbols used.
- D. The data is general. It is not about all situations or specific installations. Use it as a guide to help you write minimum standards.
- E. If the component overhaul instructions are different from the data in this subject, use the component overhaul instructions.

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INTRODUCTION

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STANDARD OVERHAUL PRACTICES MANUAL

INSTRUMENT PANEL ELECTRICAL MODULE GENERAL INFORMATION

1. INTRODUCTION

- A. The airplane instrument panel contains electrical modules which have a baseplate assembly, indicating lights, control switches, power connectors (light bases), and a wire bundle assembly. Some modules also include printed circuit card assemblies. The baseplate assembly has quick release fasteners which let you remove the module as a unit from the instrument panel. The baseplate and clamps can hold many different types of indicating instruments.
- B. Refer to the Electrical and Electronics Wiring Diagram Manual for the schematic diagrams which show how the modules are connected in a system or part of a system.
- C. The subject includes some procedures for annunciators S231T290-series and S231T300 series. These are Boeing Specification part numbers, and are related to the vendor part numbers in Table 1. For more details, refer to the Boeing Specification Cross Reference Index D6-42448.

Table 1: Annunciator Part Number Systems

BOEING SPECIFICATION PART NUMBER	VENDOR PART NUMBER	VENDOR
S231T290-1XXX	433-673-1001-1XXX	V81590
S231T290-2XXX	851-30768-2XXX	V96182
S231T290-3XXX	851-30768-3XXX	V96182
S231T290-4XXX	433-673-1004-4XXX	V81590
S231T290-5XXX	851-35100-5XXX	V96282
S231T300-1XXX	434-674-1005-1XXX	V81590
S231T300-2XXX	434-674-1031-2XXX	V81590

- D. Some of the units could have overhaul instructions in manuals written by the vendor or manufacturer. Refer to the Boeing Overhaul Manual/Component Maintenance Manual Index D6-47081 for a list of part numbers and available manuals. If the vendor's overhaul instructions are different from the instructions in this subject, use the vendor's overhaul instructions.
- E. This subject also includes procedures for some vendor-made lightplates. These lightplates have different specification part numbers and vendors, but the procedure for all of them is the same. Instructions could be printed on some lightplates to tell you to use this procedure. Refer to Paragraph 7., for details.
- F. Refer to SOPM 20-00-00 for a list of all the vendor names and addresses.

2. MATERIALS

- A. Aliphatic naphtha (Ref SOPM 20-60-01)
- B. Captive screws, lightplate – S0050001-1 (V9U239)
- C. Isopropyl alcohol (Ref SOPM 20-60-01)
- D. Lacing Tape – BMS 13-54 or MIL-T-43435
- E. Light bulbs, lightplate – No. 50001, 6832T1 short, 5-volt, 0.06 amp, unbased (V9U239 or V58774)
- F. Loctite Adhesive – Superbonder Adhesive No. 416 (V05972)
- G. Loctite Compound – Nutlock Compound 83 (Replaces Compound 74) (V05972)

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- H. Loctite primer – Grade T (V05972)
- I. Paint, lightplate – See Table 5
- J. Power connector, lightplate – S0050002 (V9U239) or 800000119 (V05617)
- K. RTV Primer – Dow Corning 1204 (V71984)
- L. Sealant – Dow Corning 3145RTV (V71984)
- M. Sleeving – Varglas non-fray, Type HD or HP (V79074)
- N. Wire ties, colored – Panduit SST1.51-series, SST21-series, SST25-series, or PLT1.0M-series (V06383)

3. **GENERAL**

- A. Disassemble these modules only as necessary to clean, examine or repair the components.
- B. If you disassemble the module, see Figure 1 for details about the installation of module components.
- C. If some screws that attach standoffs are not easy to remove, they possibly were installed with Loctite compounds. When you install these screws, be sure to install them with Loctite compound unless a washer is also included (Figure 2).
- D. Refer to these standard practices, as applicable:
 - (1) SOPM 20-11-02 for electrical connectors
 - (2) SOPM 20-11-03 for terminal lugs and electrical bond areas, and replacement of heat shrinkable tubing.
 - (3) SOPM 20-12-01 for soldering
 - (4) SOPM 20-12-02 for electrostatic-discharge-sensitive devices
 - (5) SOPM 20-50-05 for application of aluminum foil and other markers
 - (6) SOPM 20-50-10 for application of stencils, part numbers and other identification markings
- E. When you replace damaged wires, use the same wire type and color as the original, or as shown by the schematic diagram or applicable overhaul instructions.
- F. When you tie or replace ties on wiring harnesses, use the same type and color as the original, or as shown by the schematic diagram or applicable overhaul instructions. The color of the ties is important because it identifies the wire bundle by separation category, to keep wire bundles of one system apart from those of a different system. Table 2 shows typical Functional Separation Codes which are noted on schematic diagrams, along with the necessary wire tie color. Wires of different codes must have a minimum of 1/4-inch separation. Wires of different subcategory codes must also have a different routing. Thus category L2A wires must have a different routing than category L2B wires, although the two wires have the same red wire ties. Wires with N (neutral) codes can have the same routing as any other coded group unless the subcategories are different. Sleeving can be used to keep the wire bundles at the necessary separation.

Table 2: Functional Separation Categories and Color Codes

Functional Separation Codes	Wire Tie Color
1 or R (Right power system)	Green
2 or C (Center bus power)	Yellow
3 or L	Red
4	Brown

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**STANDARD OVERHAUL PRACTICES MANUAL****Table 2:** Functional Separation Categories and Color Codes (Continued)

Functional Separation Codes	Wire Tie Color
S	Blue
N	White
A	Orange
H	Purple

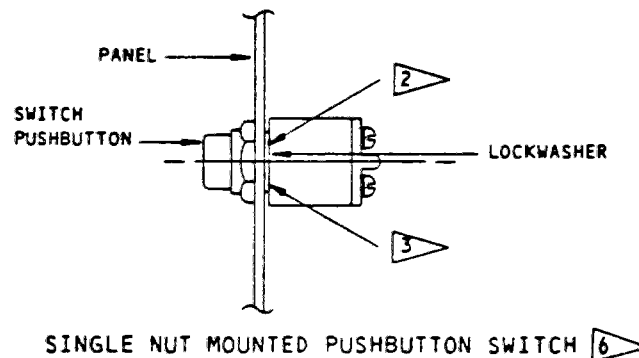
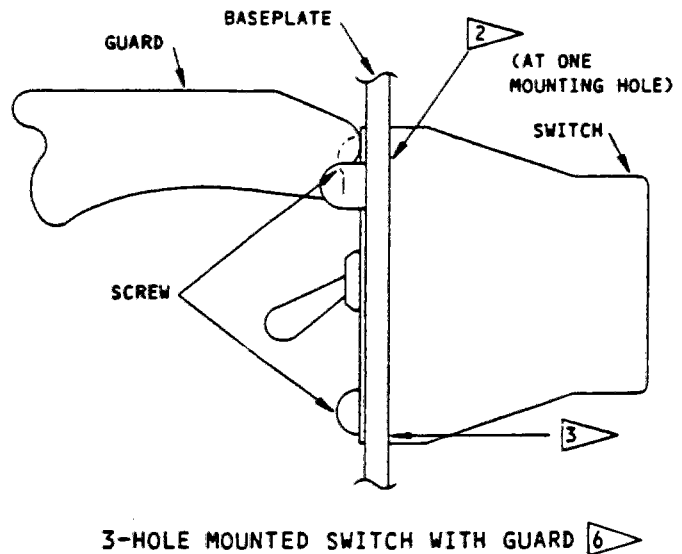
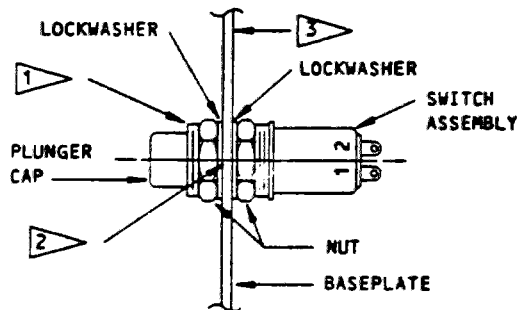
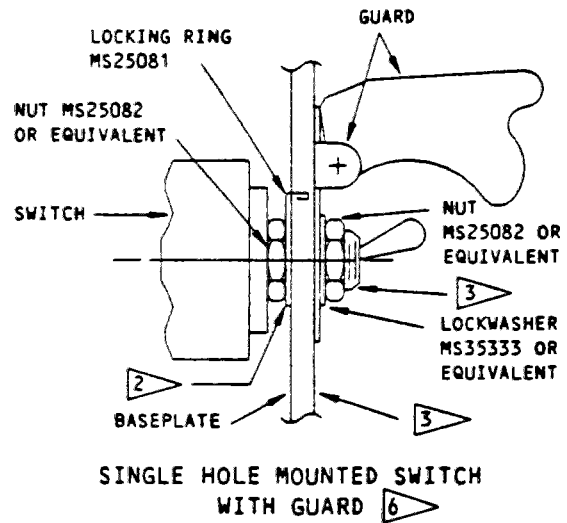
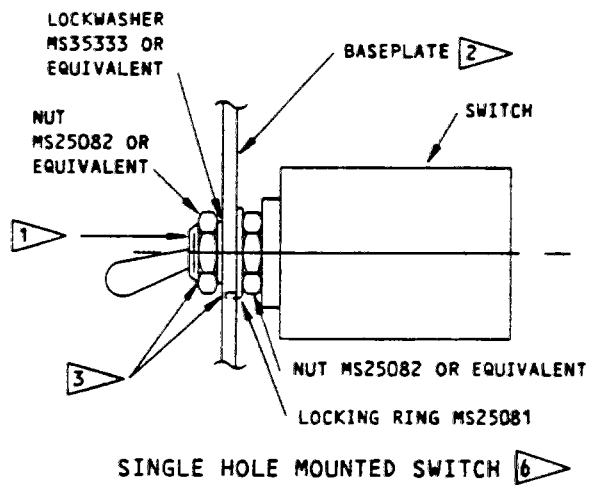
G. Remove dust, dirt, and other unwanted material from the unit with low-pressure air suction.

WARNING: WHEN YOU USE ISOPROPYL ALCOHOL OR ALIPHATIC NAPHTHA, TRY NOT TO BREATHE THE VAPORS TOO MUCH. USE THESE CLEANERS ONLY WITH A GOOD FLOW OF AIR. DO NOT GET THESE CLEANERS IN THE EYES, ON THE SKIN OR CLOTHING. KEEP THESE CLEANERS AWAY FROM HEAT, SPARKS, OR OPEN FLAME.

CAUTION: USE ONLY THESE CLEANERS. OTHER CLEANERS COULD DAMAGE ASSEMBLY SURFACES OR CAUSE CIRCUIT FAILURES. ALSO, ISOPROPYL ALCOHOL DISSOLVES ACRYLIC ENCAPSULANT. REFER TO 20-11-01 FOR DETAILS.

H. Clean interior surfaces and electrical contacts with isopropyl alcohol or aliphatic naphtha. Dry fully with low-pressure air.

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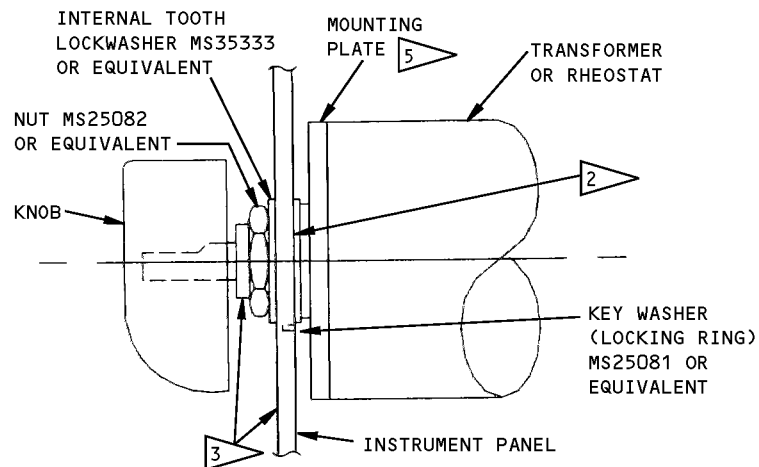
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Module Component Installation Examples
Figure 1 (Sheet 1 of 3)

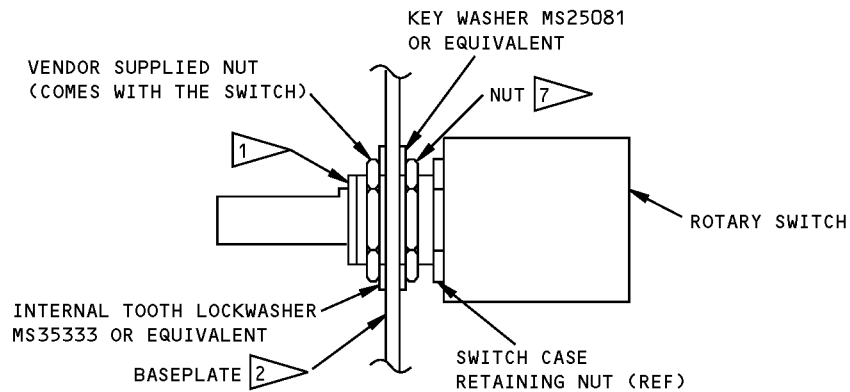
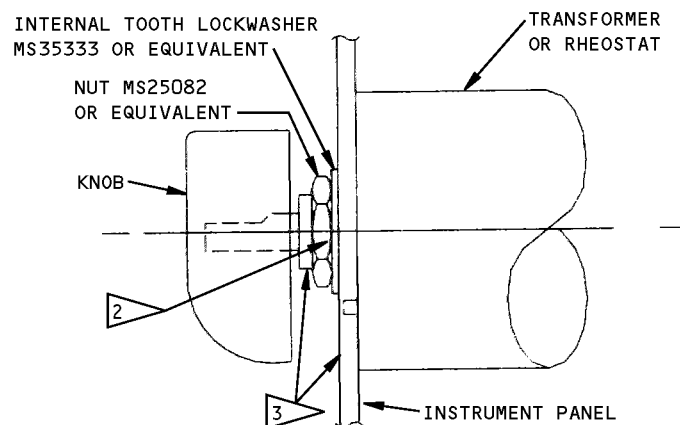
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TRANSFORMER, RHEOSTAT OR ROTARY SWITCH (WITH LOCKING RING) 6

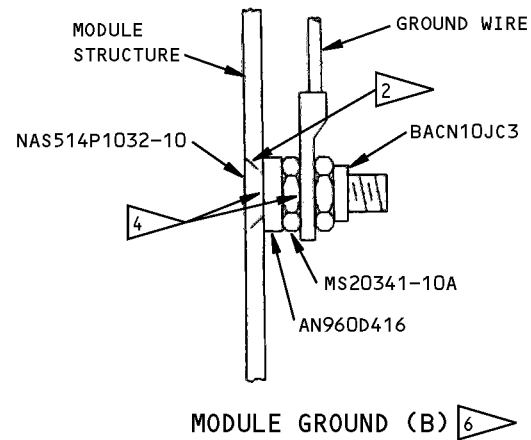
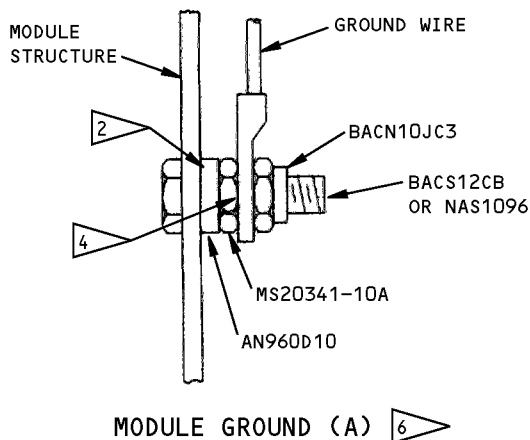
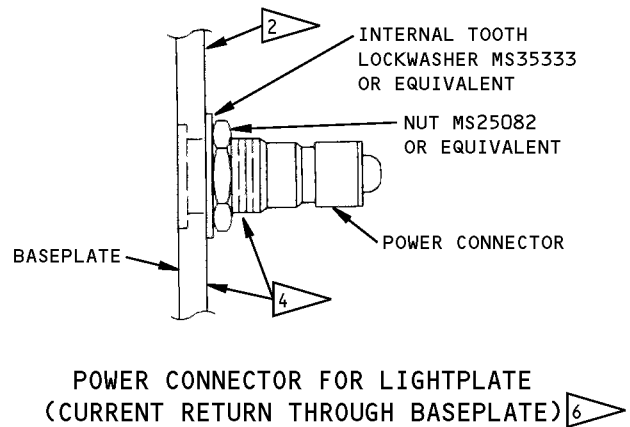
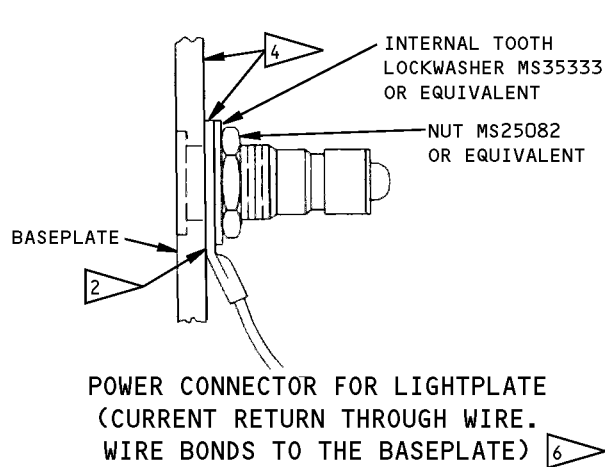
TRANSFORMER, RHEOSTAT OR ROTARY SWITCH (WITH LOCKING RING)
(ALTERNATE CONFIGURATON) 7

TRANSFORMER, RHEOSTAT OR ROTARY SWITCH (WITHOUT LOCKING RING) 6

Module Component Installation Examples
Figure 1 (Sheet 2 of 3)

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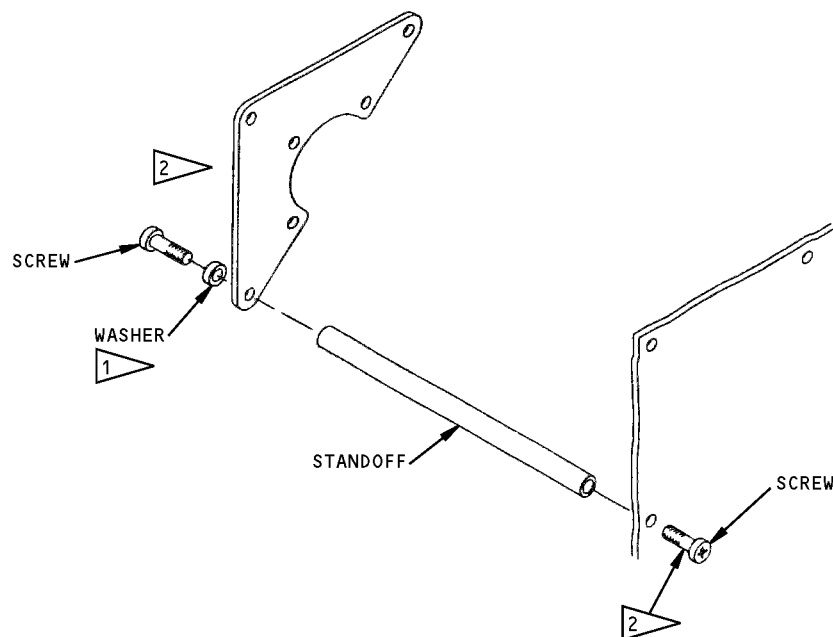
- 1 APPROXIMATELY TWO THREADS TO SHOW
- 2 SPOT CLEAN INDICATED SURFACE PER SOPM 20-11-03
- 3 MAXIMUM RESISTANCE 0.0025 OHM
- 4 MAXIMUM RESISTANCE 0.001 OHM
- 5 IF THE MOUNTING PLATE IS NOT NECESSARY, DISCARD IT
- 6
 - 1. THESE INSTALLATIONS APPLY ONLY TO ALUMINUM PANELS WITH CHEMICAL CONVERSION COATING NOT PAINTED ON THE BACK SIDE.
 - 2. IF THE METAL BODY SHELL IS MADE OF STAINLESS STEEL, MOUNT IT DIRECTLY ON THE CHEMICAL-CONVERSION-COATED PANEL.
 - 3. IF THE METAL BODY SHELL IS MADE OF ANODIZED ALUMINUM, CLEAN THE EDGE OF THE SHELL THAT TOUCHES THE CHEMICAL-CONVERSION-COATED PANEL PER SOPM 20-11-03.
- 7 INSTALL THIS NUT IF INCLUDED IN THE HARDWARE OR IF IT IS ADDED WHEN FOUND NECESSARY.

Module Component Installation Examples
Figure 1 (Sheet 3 of 3)

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- 1 WHEN THE OVERHAUL INSTRUCTIONS SHOW A WASHER AT THIS LOCATION, DO NOT INSTALL THE SCREWS WITH LOCTITE COMPOUND
- 2 WHEN THERE IS NO WASHER 1, INSTALL THE SCREWS WITH LOCTITE PRIMER GRADE T AND LOCTITE NUTLOCK COMPOUND 83 (V05972).

When to Use Loctite
Figure 2

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4. ASSEMBLY OF COMPONENTS THAT USE THE MIL-T-81714 TERMINATION SYSTEM

NOTE: Examples are S213T290 lighted pushbutton switches and S231T300 annunciator light indicators.

- A. Installation of M39029/1-16-20 contacts on one size 20 or 22 AWG wire
 - (1) Remove $3/16 \pm 1/32$ inch of insulation from the end of the wire.
 - (2) Use the applicable crimp tool from Table 3.
 - (3) Put the bare end of the wire into the contact crimp barrel, until you can see the conductor through the inspection hole.
 - (4) Put the contact in the crimp tool locator to the bottom. Close the tool handle until the ratchet releases and the tool handles open.
 - (5) Remove the completed contact-wire assembly from the tool.
- B. Installation of M39029/1-16-20 contacts on two size 24 AWG wires
 - (1) Remove $3/16 \pm 1/32$ inch of insulation from the end of each wire.
 - (2) Use the applicable crimp tool from Table 3.
 - (3) Put the bare end of the wire into the contact crimp barrel, until you can see the conductor through the inspection hole.
 - (4) Put the contact in the crimp tool locator to the bottom. Close the tool handle until the ratchet releases and the tool handles open.
 - (5) Remove the completed contact-wire assembly from the tool.
- C. Installation of contacts
 - (1) Use the applicable insertion tool per Table 4.
 - (2) Put the contact into the insertion tool tip. Put the contact carefully through the grommet hole and push lightly until the contact is fully engaged.
 - (3) Pull lightly on the wire to make sure the contact is correctly engaged. Do not make a nick in the wire insulation with your fingernails.
- D. Removal of contact
 - (1) Use the applicable removal tool from Table 4.
 - (2) Put the wire into the back part of the tool, then put the wire into the front portion of tool.
 - (3) Hold the wire and removal tool together and remove them as a unit from the insert cavity.

Table 3: Crimping Tool Configurations

BASIC TOOL PART NUMBER	SELECTOR/LOCATOR			POSITIONER TURRET LOCATOR	POSITION COLOR
	AWG 24	AWG 22	AWG 20		
M22520/2-01 ^{*[1]}	5	6	7	M22520/2-11	
M22520/1-01	2	3	4	M22520/1-02	RED

^{*[1]} These tool selector settings can be adjusted and the turret assembly and positioners interchanged if you can be sure that the results will be satisfactory and the operator had a minimum of one hour instruction (official and recorded) in tool operation and maintenance.

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Table 4: Insertion/Extraction Tools

CONTACT WIRE BARREL SIZE	TOOL PART NUMBER
22	M83723/31-22
20	M83723/31-20
16	M83723/31-16
12	M83723/31-12

5. S231T290 SWITCH REPAIRS

CAUTION: REMOVE POWER FROM THE MODULE BEFORE YOU REMOVE THE CAP.

NOTE: See Figure 3 for S231T290-1000, -4000 series and Figure 4 for S231T290-2000, -3000, -5000 series switches.

A. Removal of S231T290 switches from the instrument panel.

- (1) Disconnect the wiring before you start to remove the switch from the panel.
- (2) Remove the sleeve from the base (housing) assembly.
 - (a) S231T290-2000, -3000, -5000 series – Remove the two screws on the end of the switch.
 - (b) S231T290-1000, -4000 series – Pull off the cap assembly to get at the mounting screws on the master module. Then turn the mounting screws counterclockwise eight turns.
- (3) Slide the sleeve off the switch. Remove the switch from the panel.

B. Cap assembly

- (1) Remove the cap assembly to replace lamps and to replace the fuse/diode module. Removal of the cap assembly is not necessary to install the switch guard.
- (2) Make sure that the cap assembly is in the up position before you try to remove it. You cannot remove the cap when it is in the depressed position.
- (3) On S231T290-2000 series switches, push the cap assembly down 0.065-0.165 inch. On all switches, pull the cap out with your fingertips (do not use a tool). The cap will come out approximately 1 inch before it is held by two wire retaining clips.
- (4) Repair of S231T290 lens cap assembly
 - (a) Remove the two tabs from the lens assembly. Sand the cut edges smooth.
 - (b) Remove loose dust with an air blast. Clean the inside edges of the lens assembly and the mating area of the lens capsule assembly with isopropyl alcohol.
 - (c) Assemble the lens assembly and the lens capsule assembly. Back off the lens assembly to make a gap approximately 0.050 inch wide, and fill this gap on all four sides with Loctite Superbond Adhesive No. 416.
 - (d) Push the lens and the lens capsule together with finger pressure only. Remove unwanted adhesive. Hold the finger pressure for 15 seconds.
 - (e) Let the unit cure overnight at room temperature.

C. Lamp Replacement

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- (1) Turn the cap 90 degrees in one direction or the other to expose the bases of the lamps. With fingernails, pull out lamps to be replaced. Install the replacement lamps in the empty lamp sockets.
- (2) Turn the cap back to the correct position.

D. Fuse/Diode Module Replacement

- (1) S231T290-1000, -4000 series:

- (a) Pull the lens cap out from the master module. Turn the lens on the bail wires to get at the mounting screws. Turn the mounting screws counterclockwise eight turns.
- (b) To remove the master module, turn the lens cap 90 degrees, put a finger between the bail wires, and pull on the lens cap as you hold the housing assembly in position. If the bail wires come off the master module before the master module comes out, remove the master module with insulated needle nose pliers.
- (c) Turn the assembly to put the fuse/diode card in the up position. Pull the fuse/diode card straight back to disconnect it from the master module.
- (d) Hold the replacement fuse/diode card between your fingers and plug the card into the socket pins of the master module.

- (2) S231T290-2000, -3000, -5000 series:

NOTE: Some switch assemblies may contain two fuse/diode modules (Figure 4).

- (a) The cap assembly must be completely removed from the base assembly. Disengage the wire retaining clips from the holes in the corners of the cap assembly.
- (b) Hold the fuse/diode module with padded needle nose pliers and pull out. The fuse/diode module will slide straight out of the base.
- (c) Hold the replacement module with the pliers and push it into the empty socket, with the notch of the module to the back and the center of the switch. If the notch is not in the correct position, the module will not go in easily, or it will cause the cap assembly to lock in the UP position after assembly.

E. Installation of the Cap Assembly

- (1) On S231T290-2000, -3000, -5000 series only, align the small keying pin on the center shaft of the cap with the keying slot inside the cavity of the base assembly (master module).
- (2) Install the wire retaining clips if you removed them.
 - (a) S231T290-1000, -4000 series – Install the hooked ends of the clips into the correct clip slots of the master module assembly.
 - (b) S231T290-2000, -3000, -5000 series – Install the clip ends into the correct holes in the corners of the cap assembly.

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**STANDARD OVERHAUL PRACTICES MANUAL**

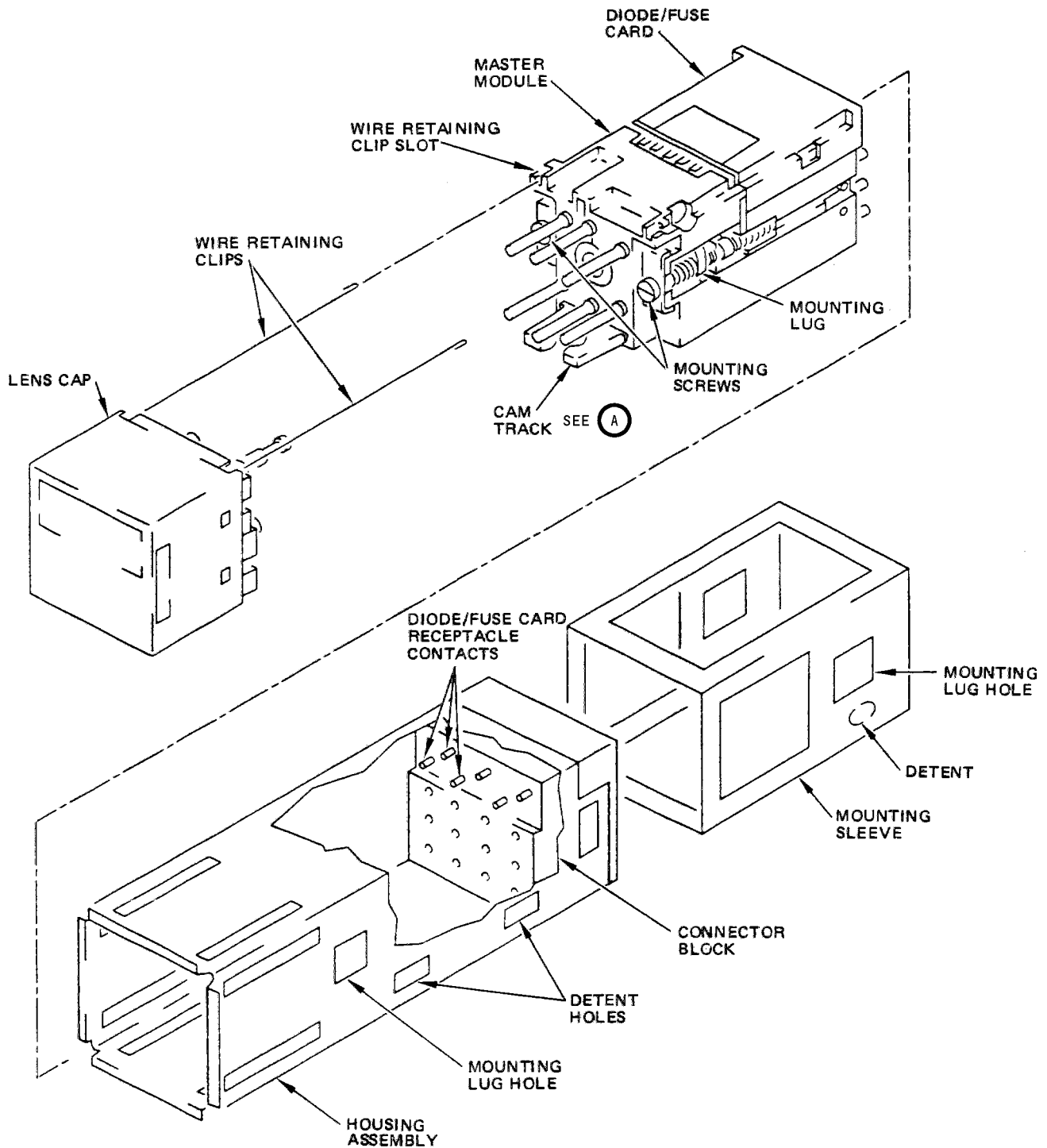
CAUTION: MAKE SURE THAT THE WIRE FOLLOWER STAYS IN THE CAM TRACK WHEN THE CAM PLATE IS MOVED BACK AND FORTH.

- (3) S231T290-1000, -4000 series only – Temporarily turn the cap assembly 90 degrees to let you get at the master module. Push the master module into the housing assembly and make sure that the metal contacts on the rear of the diode/fuse card align with the mating receptacle contacts in the connector block (Figure 3). Put the complete switch assembly back into the instrument panel before you replace the cap assembly. Move the mounting sleeve over the housing assembly, with the mounting lug holes aligned. Tighten the mounting screws until snug. See that the mounting lugs engage the mounting sleeve. With a jeweler's screwdriver, alternately tighten the mounting screws in 1/4-turn increments until both screws are tightened to 15-20 pound-inches. Then turn the lens cap assembly back to be correctly aligned with the master module.
 - (4) Align the center shaft of the cap assembly with the guide hole in the center of the base assembly (master module). Lightly press the cap assembly with your thumb until it latches. Make sure the cap is square with the base (housing) assembly to prevent damage to the guide ring. Push and release the switch a few times to see that it operates correctly.
- F. Installation of S231T290 switches in the instrument panel.
- (1) Put the switch unit in the panel cutout.
 - (2) Install the sleeve.

CAUTION: DO NOT TIGHTEN THE SCREWS MORE WHEN YOU FEEL RESISTANCE. A GAP BETWEEN THE BACK OF THE SWITCH AND THE TABS ON THE SLEEVE IS PERMITTED.

- (a) S231T290-2000, -3000, -5000 series – Install the sleeve and the two screws. Tighten the screws to 18-22 pound-inches.

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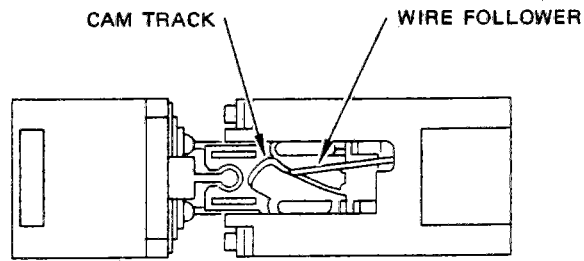
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Indicator Switch S231T290-1000, -4000 Series
Figure 3 (Sheet 1 of 2)

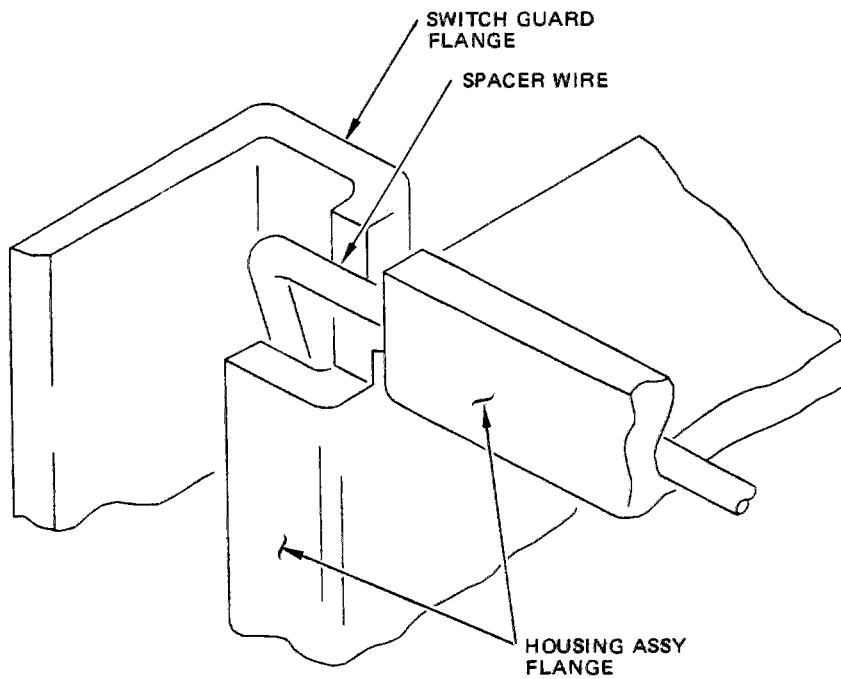
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STANDARD OVERHAUL PRACTICES MANUAL



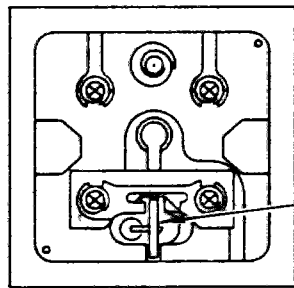
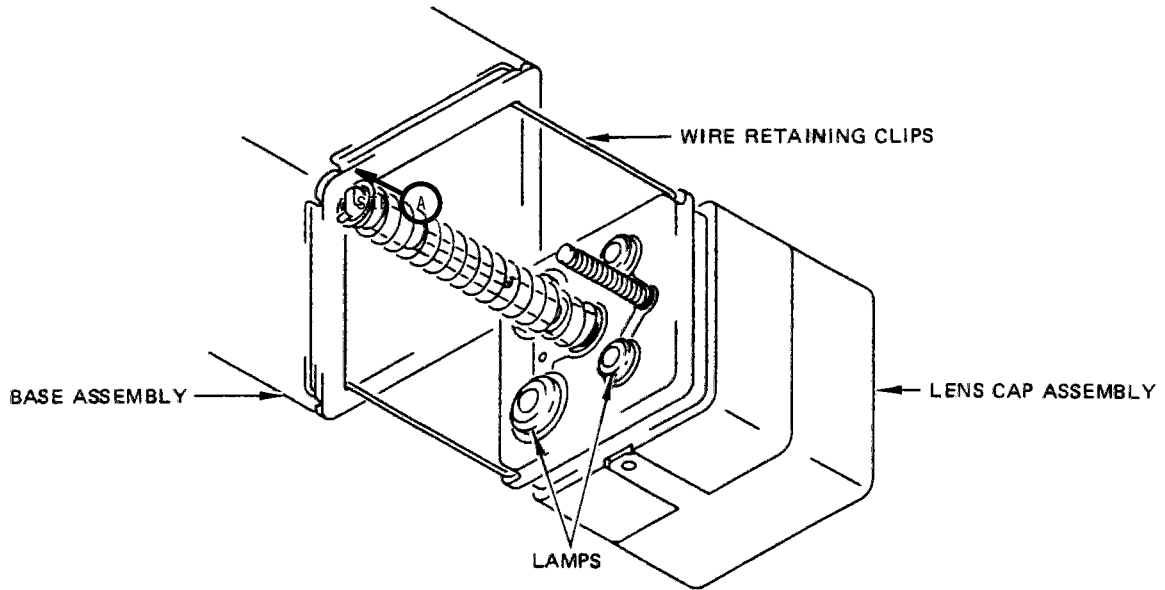
A



Indicator Switch S231T290-1000,-4000 Series
Figure 3 (Sheet 2 of 2)

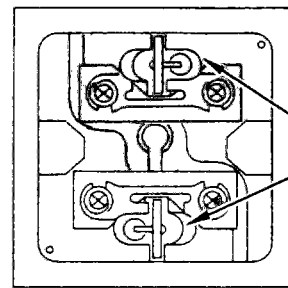
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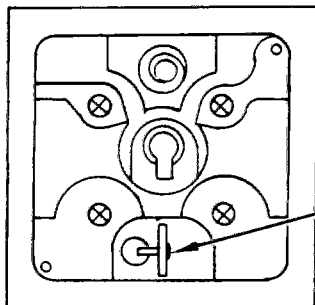
S231T290-2000 SERIES

SINGLE FUSE
DIODE MODULE



DOUBLE FUSE
DIODE MODULE

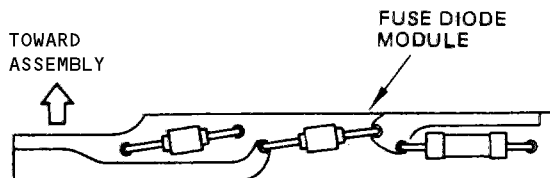
A



S231T290-3000 SERIES

SINGLE FUSE
DIODE MODULE

PUT NOTCH TOWARD
CENTER OF ASSEMBLY



FUSE DIODE
MODULE

Indicator Switch S231T290-2000,-3000,-5000 Series
Figure 4

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6. S231T300 ANNUNCIATOR REPAIRS

A. Removal (Figure 5)

- (1) Disconnect wires with the extraction tool (Table 4).
- (2) Pull out on the lens cap assembly as for lamp replacement.
- (3) Hold the top and the bottom of the diode/fuse card with your thumb and forefinger as shown. Pull the card assembly straight out until the back of the card is clear of the base assembly. Push up on the card and remove it.
- (4) Lightly squeeze the sides of the drawer assembly and remove it from the base assembly.
- (5) Put a small screwdriver into the base assembly as shown and loosen the screws until the mounting lugs turn into the housing and the sleeve comes loose. Remove the sleeve from the indicator assembly. Remove the indicator assembly from the panel cutout.

B. Lamp Replacement

- (1) Hold the sides of the lens cap between your thumb and forefinger. Pull out as you rock it slightly side-to-side, until the lens cap comes loose. It will release suddenly and must not be permitted to hit against the slide mechanism stops at the fully extended position.
- (2) Turn the lens cap assembly downward to get at the lamp bases. Remove and replace lamps as necessary. There are flats on the metal lamp holder sleeves. Turn the sleeve to align the flat side with the raised shoulder on the cap assembly. Push the lamps in until fully down against the sleeve. Push and release the lamp bases against the springs. Replace the cap assembly if it catches.
- (3) Turn the lens cap assembly back up to align it with the drawer assembly, and then move it into the base. Push on the lens cap until you feel a click.

C. Installation

- (1) Make sure the assembly is disassembled as for removal.
- (2) Install the base assembly into the panel cutout. TOP is printed on the base assembly housing.

CAUTION: MAKE SURE THE MOUNTING SLEEVE IS TURNED TO THE CORRECT POSITION, OR IT WILL PREVENT INSTALLATION, AND COULD PUT THE PINS OUT OF ALIGNMENT WHEN THE SCREWS ARE TIGHTENED.

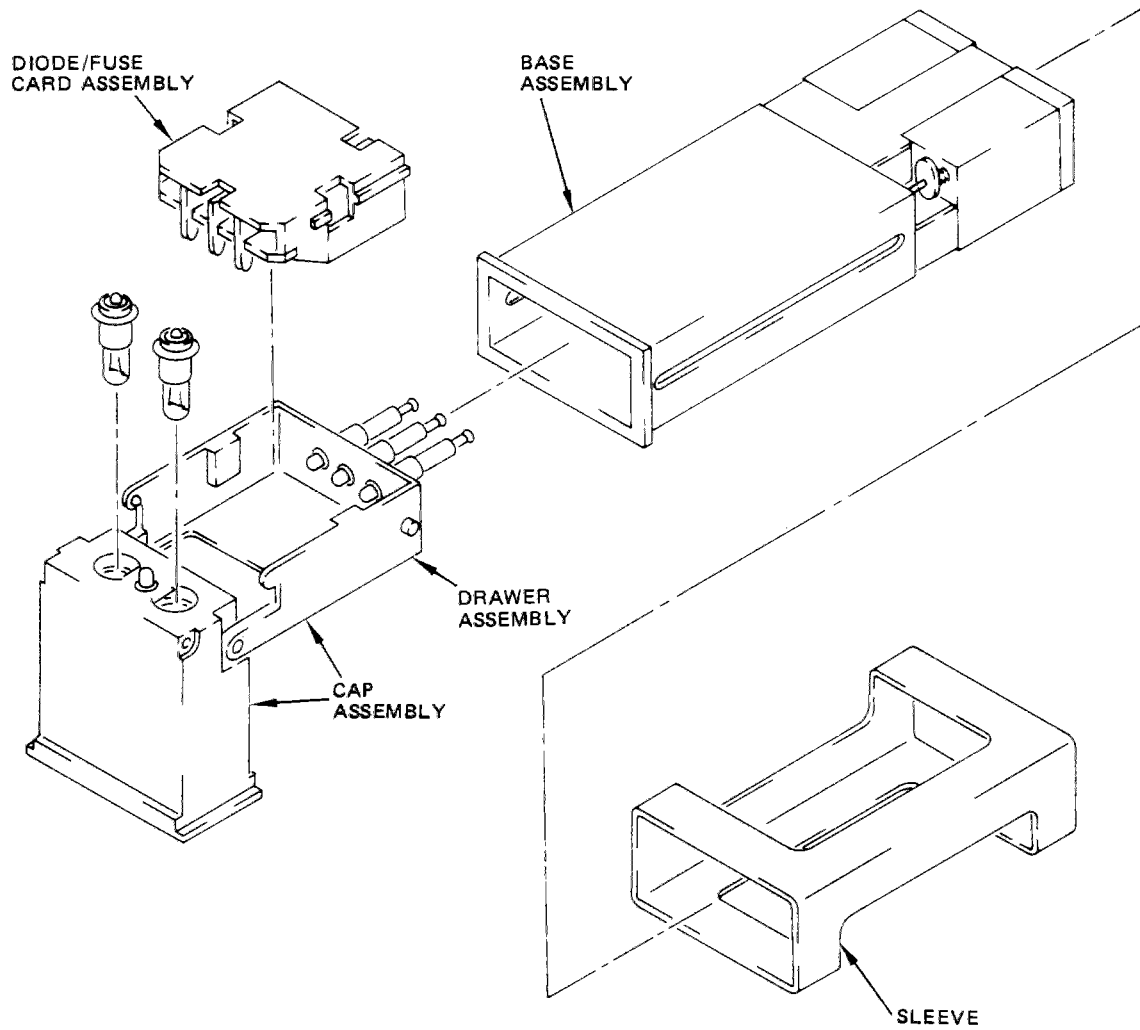
- (3) Slide the mounting sleeve over the rear of the base assembly. The solid bars between the sleeve ends must align with the mounting screws. If an open space is aligned with the mounting screws, turn the sleeve end-for-end.

CAUTION: DO NOT TIGHTEN THE MOUNTING SCREWS TOO MUCH, OR YOU COULD PUT THE CONTACTS OUT OF ALIGNMENT.

- (4) Carefully turn the mounting screws until the mounting lugs turn and fully engage the mounting sleeve. Do not tighten. See that both mounting lugs are engaged, and that the sleeve is centered over the panel cutout. Alternately tighten the screws to 12 ounce-inches maximum.
- (5) Lightly squeeze the sides of the drawer assembly and install it in the housing. Install the diode/fuse card assembly, rear end first, and lightly squeeze the front end down until the card pops into place. Make sure the 3-pronged end of the card is nearest to the lamps. Do not squeeze the sides of the drawer assembly while you push down on the card.
- (6) Turn the lens cap assembly upward to align with the drawer assembly and slide into the base. Push down on the lens cap until you feel a click.
- (7) Install wiring with the applicable insertion tool (Table 4).

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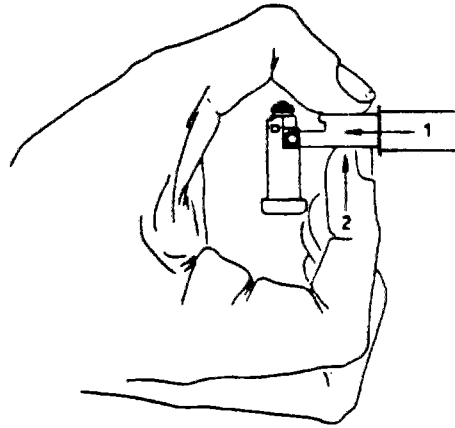


Annunciator S231T300 Details
Figure 5 (Sheet 1 of 2)

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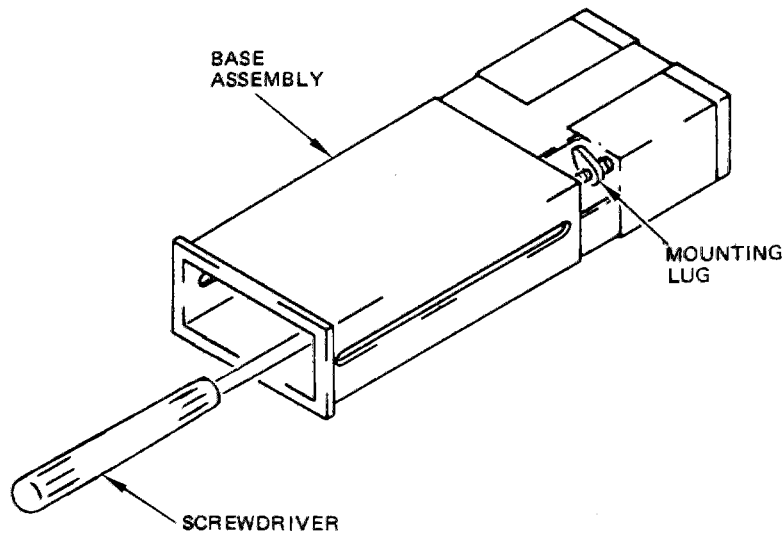


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1. PULL OUT
2. PUSH UP

DIODE/FUSE ASSEMBLY REMOVAL



Annunciator S231T300 Details
Figure 5 (Sheet 2 of 2)

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7. LIGHTPLATES

A. Cleaning

- (1) Brush off dust and dirt with a non-metallic soft bristle brush.

CAUTION: DO NOT WIPE LENS SURFACES WITH ABRASIVE MATERIALS OR CLEANERS. YOU COULD SCRATCH THE COATING ON THE LENS.

- (2) Wipe the surfaces with a soft cloth wet with isopropyl alcohol.
- (3) Dry the cleaned surfaces with a soft, clean cloth.

B. Examine the lightplate for cracks, scratches, worn-off or damaged markings, or other defects.

C. Lens Replacement

- (1) Remove the lens. These are bonded in position with sealant.
- (2) Remove unwanted sealant from the window opening. Clean the area with isopropyl alcohol.
- (3) With a cotton swab, apply a thin layer of RTV primer to the surfaces of the window opening which will touch the lens. Let the primer dry 2 hours.
- (4) Apply a thin bead of RTV sealant around the edge of the window opening.
- (5) Carefully install the replacement lens into the window opening. Push the lens down lightly on all four corners. Do not push the sealant out of the front of the panel.
- (6) Apply more sealant around the edge of the lens. Make the sealant surface smooth with the lens face, and remove sealant that gets on the front of the lightplate.
- (7) Put the lightplate face down on a clean surface. Let the sealant cure for 24 hours.
- (8) After the cure is completed, apply four pounds pressure to each corner of the lens. Examine the lens to make sure it stays sealed from water.

D. Light Bulb Replacement

- (1) Put the lightplate assembly face down on a cloth or plastic sheet.
- (2) Remove the screws from the rear of the lightplate.
- (3) Remove as a unit the backplate and the circuit board subassembly from the lightplate. Then disassemble the backplate from the circuit board to get at the solder connections.
- (4) With a 600°F soldering iron, unsolder the defective light bulb.
- (5) Install a replacement light bulb. Many lightplates have printed data on them which can help identify replacement light bulbs and other parts. Most lightplates use 5-volt, 0.06-amp unbased lamps, such as part number 50001 available from Avio Corp. (V9U239) or Wamco (V58774). Solder the leads and cut off the unwanted lead lengths.
- (6) Put the circuit board on the lightplate. Make sure there is clearance between the replacement light bulb and the lightplate. Unsolder and adjust the location of the replacement light bulb as necessary.
- (7) Remove the circuit board from the lightplate. Repair the encapsulant as necessary per SOPM 20-11-01.
- (8) With the lightplate face down on a cloth or plastic sheet, install the circuit board and the backplate with the screws.
- (9) After the light bulb replacement is complete and the lightplate is back together, we recommend you make a check of the lightplate to see if it is serviceable, with the correct rated voltage applied to the power connector at the rear of the unit.

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E. Power Connector Replacement

- (1) Put the lightplate assembly face down on a cloth or plastic sheet.
- (2) Remove the screws from the rear of the lightplate.
- (3) Remove as a unit the backplate and the circuit board subassembly from the lightplate. Then disassemble the backplate from the circuit board to get at the solder connections.
- (4) With a 600°F soldering iron, unsolder the four tabs and the center section of the defective power connector. Bend the four tabs up to release the connector.
- (5) Install a replacement power connector. Most lightplates use part number S005002 available from Aviocorp (V9U239). Other lightplates use part number 800000119 available from IDD Aerospace Corp. (V05617), which mates with the 800000121-1 power connector on most panels. Bend the four tabs down against the circuit board. Then solder the tabs and the center section.
- (6) Put the circuit board on the lightplate.
- (7) With the lightplate face down on a cloth or plastic sheet, install the circuit board and the backplate with the screws.
- (8) After the power connector replacement is complete and the lightplate is back together, we recommend you make a check of the lightplate to see if it is serviceable, with the correct rated voltage applied to the power connector at the rear of the unit.

F. Painted Markings

- (1) Touch up the painted markings with the applicable paint system shown in Table 5.

Table 5: Lightplate Paint System Data

Color	Paint	Catalyst	Thinner	Vendor
Black	F63LXB5	V66V29	R7KB29	V54636
White	26F20-10 (Replaces 663-3-43)	PC-219 (Replaces X -310A)	TL59	V98502
Light Brown	H99NY11 (Replaces M49NC2)	V66V29	R7KB29	V54636
Dark Brown	H99NY2 or BMS 1083C	V66V29	R7KB29	V54636
Gray	F63LXA333 or H99AY9	V66V29	R7KB29	V54636
Flat Gray	M99AY1	V66V29	R7KB29	V54636

G. Captive Fasteners

- (1) See Figure 6 for applicable fasteners by lightplate color and hole size.

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Color	Hole Size (Inch)	Fastener	Vendor	Drawing Ref.
Dark Gray	0.311 - 0.316	CA1187-1-1	V29372	8 on 10-61800
	0.267 - 0.277	FB7900-6A1	V97928	8 on 10-61800
	0.250 - 0.285	CPS6C5DL10GY	V12324	8 on 10-61800
Light Gray	0.311 - 0.316	CA1187-1-2	V29372	9 on 10-61800
	0.267 - 0.277	FB7900-6A1	V97928	9 on 10-61800
	0.250 - 0.285	CPS6C5DL16GY	V12324	9 on 10-61800
Dull Black	0.311 - 0.316	CA1187-1	V29372	20 on 10-61800
	0.267 - 0.277	FB7900-6A1	V97928	20 on 10-61800
Light Brown	0.250 - 0.285	CPS6C5DL12BN	V12324	2 on S233T100
	0.267 - 0.277	FB7900-6A1	V97928	2 on S233T100
	0.280 - 0.375	CPS6C8DL12BN	V12324	128 on S233T100
	0.272 - 0.406	S0050001-6-3	V9U239	128 on S233T100
	0.280 - 0.375	CPS6C9DL12BN	V12324	129 on S233T100
	0.272 - 0.406	S0050001-3-3	V9U239	129 on S233T100

Lightplate Captive Fasteners Data
Figure 6

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