# TECHNICAL MANUAL

# AVIATION UNIT AND AVIATION INTERMEDIATE MAINTENANCE MANUAL

# CH-47D HELICOPTER

**This manual together with TM 55-1520-240-23-1, TM 55-1520-240-23-2, TM 55-1520-240-23-3, TM 55-1520-240-23-4, TM 55-1520-240-23-5, TM 55-1520-240-23-6, TM 55-1520-240-23-8, TM 55-1520-240-23-9, TM 55-1520-240-23-10, TM 55-1520-240-23-11, supersedes TM 55-1520-240-23-1, TM 55-1520-240-23-2, TM 55-1520-240-23-3, TM 55-1520-240-23-4, TM 55-1520-240-23-5, TM 55-1520-240-23-7, TM 55-1520-240-23-8, TM 55-1520-240-23-9, TM 55-1520-240-23-10, 10 May 1983, and TM 55-1520-240-23-6, 6 May 1983, including all changes.**

19 SEPTEMBER 2002

# WARNING AND FIRST AID DATA

For artificial respiration and other first aid data, refer to FM 21-11.

Personnel performing instructions involving operations, procedures, and practices which are included or implied in this technical manual shall observe the following instructions. Disregard of these warnings and precautionary information can cause serious injury, illness, death, or an aborted mission.

**WARNING**

An operating procedure, practice, etc., which if not correctly followed, could result in personal injury or loss of life.

**CAUTION**

An operation procedure, practice, etc., which if not strictly observed, could result in damage to or destruction of equipment.

**NOTE**

An operating procedure, condition, etc., which is essential to highlight.

**WARNING**

## Cleaning Solvents

Those areas of skin and clothing that come in contact with cleaning solvents should be thoroughly washed immediately.

Saturated clothing should be removed immediately.

Areas in which cleaning solvents are used should be adequately ventilated to keep vapors to a minimum.

If cleaning solvents contact the eyes, nose, or ears, flush them with generous quantities of water, and then seek medical attention immediately.

**WARNING**

## Electrical and Electronic Equipment Maintenance

Do not wear rings, watches, or metal jewelry when working around electrical equipment. Serious burns can result.

Be careful when working on 150 and 300 vdc circuits and on ac generator 115 and 200 vac outputs. Serious burns can result.

WARNING

### Dangerous Static Charges

Ground the helicopter during parking, fueling, or defueling. Sparks can cause fuel vapor to ignite.

WARNING

### Dangerous Voltages at Antenna Terminals

Be careful when working near antenna or antenna terminals. Radio frequency (rf) voltages exist at these points when transmitters are operating. Contact with radiating antennas can cause serious rf burns.

WARNING

### Poisonous Carbon Monoxide Fumes

Toxic carbon monoxide fumes may be present inside the helicopter whenever engines or APU are operating with cargo ramp open. Ventilate the cockpit.

WARNING

### Corrosive Battery Electrolyte (Potassium Hydroxide)

The electrolyte used in nickel-cadmium batteries contains potassium hydroxide which is a caustic substance.

Contact with skin or eyes will cause burns.

Use rubber gloves, rubber apron, and protective eye covering or face shield when handling battery.

If personal contact with electrolyte occurs, flush immediately with large amounts of only clean water. Get medical attention immediately.

WARNING

### Explosive Battery Hazard

Before removing or installing battery, make sure battery switch is OFF and battery has cooled down if overheated.

Connecting or disconnecting battery connector while battery is under load may cause explosion or electrical arcing resulting in injury to personnel.

WARNING

## Electrolyte Contamination

Separate nickel-cadmium batteries and lead-acid type batteries as far as possible from each other.

Do not let anything associated with a lead-acid battery, including air, come in contact with a nickel-cadmium battery or its electrolyte. Sulfuric acid fumes from a lead-acid battery could result in damage to a nickel-cadmium battery leading to battery failure and a hazard to personnel.

Do not use same tools or protective clothing for both types of batteries.

If sulfuric acid has been somehow mixed with electrolyte in the battery, the upper areas of the battery cells will appear green in color indicating battery failure or damage and potential danger to personnel unless replaced.

WARNING

## Acids and Alkalines

Do not add water to acid. A violent action will result. Add acid to water in small quantities.

Rust stripper is an alkaline solution.

Avoid skin contact. Wear protective clothing. Wash thoroughly after using.

WARNING

## Windshield Rain Repellent

Do not let windshield rain repellent contact open flame. Deadly hydrogen fluoride gas could be generated.

Wash hands with soap and water after handling repellent.

WARNING

## Antiseize Compounds

Some antiseize compounds are irritants. Avoid inhaling fumes and contact with skin.

Wear protective clothing. Wash thoroughly after using.

WARNING

## Paints, Varnishes, Dopes, Thinners, and Lubricants

These materials are generally highly flammable and may be irritants. Work in a well-ventilated area away from open flames.

Avoid inhaling fumes and prolonged contact with skin. Wash thoroughly after using.

WARNING

## Epoxy Resin, Cements, and Adhesives

These materials may contain toxic or irritating substances. They may also be flammable. Work in a well-ventilated area away from open flames.

Wear protective clothing. Avoid contact with skin. Wash thoroughly after using.

WARNING

## Radiation Hazard

Some instruments contain radioactive material. Do not try to disassemble these instruments. They present no radiation hazard unless seal is broken.

If you think seal is broken, do not remove instrument from helicopter before consulting Base Radioactive Protection Officer (AR 40-15).

Use a beta-gamma radiac meter AN/PDR-27 or equivalent to determine if instrument contains radioactive material (radium).

WARNING

## Fire Extinguishing Agents

Monobromotrifluoromethane ($CF_3Br$) is highly volatile but is not easily detected by smell. It is not toxic, but reduces oxygen available for proper breathing.

If liquid $CF_3Br$ contacts skin, it can cause frostbite or low temperature burns.

If agent touches eyes or skin, immediately flush affected area with running water. Get medical attention.

WARNING

## Noise

Sound pressure levels in this helicopter during some operating conditions exceed the Surgeon General's hearing conservation criteria (TB MED 251).

Hearing protection devices, such as aviator helmet or ear plugs, shall be worn by all personnel in and around the helicopter during operation.

WARNING

## FOD

Make sure area is clear of foreign objects before closing access doors, panels, and fairings.

If area is not clear, damage to components or systems could result in personal injury or death.

WARNING

## JP-4/JP-5/JP-8 Fuel MIL-T-5264

Fuel is flammable. Do not use near welding areas, open flames, or on very hot surfaces.

Use only with adequate ventilation.

Avoid prolonged or repeated contact with skin. Prolonged contact may cause drying and irritation of skin.

Remove saturated clothing immediately.

Do not smoke when handling fuel.

Do not take internally.

Store in approved, metal safety containers.

WARNING

## Lubricating Oils MIL-L-23699 or MIL-L-7808

If oil is decomposed by heat, toxic gases are released.

Prolonged contact with liquid or mist may cause dermatitis and irritation.

If there is prolonged contact with skin, wash affected area with soap and water. If oil contacts eyes, flush with water immediately. Remove saturated clothing.

If swallowed, do not try to vomit. Seek immediate medical attention.

When handling liquid oil, wear rubber gloves. If prolonged contact with mist is likely, wear approved respirator.

WARNING

## Lifting Components With Hoist

Lifting or hoisting of components shall only be done by designated personnel.

The load capacity rating shall be clearly marked on hoist. Do not exceed load rating.

Inspection and testing for cracks or defects in hoist system shall be performed on a regular basis.

Before lifting, alert personnel in immediate areas.

Before lifting, balance the load.

Do not stand under load while it is being moved from one area to another on a hoist.

Do not stand under load to do maintenance work.

WARNING

## Hydraulic Pressures

High pressures used in testing hydraulic components can cause line rupture or component failure.

Only qualified personnel shall operate, service, and maintain hydraulic test equipment.

Use heavy plastic shielding at least 5/8 inch thick when applying pressures over 250 psi to prevent injury to personnel.

WARNING

## Hydraulic Fluid

Hydraulic fluid is toxic. It can irritate skin and eyes and cause burns. When fluid is decomposed by heating, it releases toxic gases.

Avoid inhaling. Use only with adequate ventilation. If prolonged contact with mist is likely, wear an appropriate respirator.

Avoid contact with skin, eyes, or clothing. Wear rubber gloves if handling liquid.

In case of contact with skin, immediately wash skin with soap and water. In case of contact with eyes, flush them immediately with clear water and get medical attention.

If liquid is swallowed, do not induce vomiting; get immediate medical attention.

WARNING

## Compressed Air

Do not use more than 30 psi compressed air for cleaning purposes. Debris propelled under pressure can cause injury to eyes.

Use eye protection to prevent injury to personnel.

WARNING

## Flare Dispenser

Flares can accidentally fire, sometimes from stray voltage. Injury or death can result.

Remove all electrical power from helicopter before installing loaded payload module on dispenser assembly.

Keep hands and face away from end of payload module during installation.

WARNING

## Maintenance Platforms/Workstands

Use only authorized maintenance platforms/workstands, or other approved locally procured stands and restraint equipment, when working above 10 feet on helicopters in a nontactical environment. Otherwise, personnel injury could result from accidental falls.

WARNING

## Black Light Inspection Eyewear

Do not wear eyeglasses having light sensitive lenses while performing magnetic particle (black light) or fluorescent penetrant inspections.

Such lenses have a 16 to 45 percent light transmission loss.

Wearing them can result in failure to detect flaws and cracks under ultraviolet light.

WARNING

## Cadmium-Plated Tools

Use only chrome-plated or unplated steel tools when working on the helicopter.

Cadmium or zinc-plated tools are not permitted, since these platings are prone to chipping and flaking. The chips and flakes could cause corrosion or fluid contamination.

All tools, regardless of plating type, shall be serviceable and free of chipping.

# URGENT

**CHANGE NO. 2**

**HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 7 MAY 2004**

Aviation Unit and Aviation Intermediate Maintenance Manual

## CH-47D HELICOPTER

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1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

| **Remove pages** | **Insert Pages** |
|---|---|
| A/(B blank) | A/(B blank) |
| 8-287 | 8-288 |

2. Retain this sheet in front of the manual for reference purposes.

**TM 55-1520-240-23-7**
**C2**

By Order of the Secretary of the Army:

**PETER J. SCHOOMAKER**
*General, United States Army*
*Chief of Staff*

Official:

**JOEL B. HUDSON**
*Administrative Assistant to the*
*Secretary of the Army*
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DISTRIBUTION:
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**CHANGE**
**NO. 1**

**HEADQUARTERS**
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Aviation Unit and Aviation Intermediate
Maintenance Manual

# CH-47D HELICOPTER

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| 8-109 and 8-110 | 8-109 and 8-110 |
| 8-129 and 8-130 | 8-129 and 8-130 |
| 8-135 and 8-136 | 8-135 and 8-136 |
| 8-245 and 8-246 | 8-245 and 8-246 |
| 8-261 and 8-262 | 8-261 and 8-262 |
| 8-361 and 8-362 | 8-361 and 8-362 |
| 9-1 and 9-2 | 9-1 and 9-2 |
| 9-15 and 9-16 | 9-15 and 9-16 |
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| 9-309 and 9-310 | 9-309 and 9-310 |
| 9-447 through 9-450 | 9-447 through 9-450 |
| 9-609 and 9-610 | 9-609 and 9-610 |

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By Order of the Secretary of the Army:

Official:

**PETER J. SCHOOMAKER**
*General, United States Army*
*Chief of Staff*

**JOEL B. HUDSON**
*Administrative Assistant to the*
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# LIST OF EFFECTIVE PAGES

Insert latest changed pages; dispose of superseded pages in accordance with regulations.

N0TE: On a changed page, the portion of the text affected by the latest change is indicated by a vertical line, or other change symbol, in the outer margin of the page. Changes to illustrations are indicated by miniature pointing hands. Changes to wiring diagrams are indicated by shaded areas.

Dates of issue for original and changed pages are:

| | |
|---|---|
| Original | 19 September 2002 |
| Change 1 | 30 September 2003 |
| Change 2 | 7 May 2004 |

| Page No. | *Change No. |
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*Zero in this column indicates an original page.

TECHNICAL MANUAL
NO. 55-1520-240-23-7

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 19 SEPTEMBER 2002

# AVIATION UNIT AND AVIATION INTERMEDIATE MAINTENANCE MANUAL

# CH-47D HELICOPTER

**REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS**

You can improve this manual. If you find any mistakes or if you know of a way to improve these procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) located in the back of this manual, directly to: Commander, U.S. Army Aviation and Missile Command, ATTN: AMSAM-MMC-MA-NP, Redstone Arsenal, AL 35898-5000. A reply will be furnished to you. You may also provide DA Form 2028 information to AMCOM via e-mail, fax, or the World Wide Web. Our fax number is: DSN 788-6546 or Commercial 256-842-6546. Our e-mail address is: 2028@redstone.army.mil. Instructions for sending an electronic 2028 may be found at the back of this manual immediately preceding the hard copy 2028. For the World Wide Web use: https://amcom2028.redstone.army.mil.

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*This manual together with TM 55-1520-240-23-1, TM 55-1520-240-23-2, TM 55-1520-240-23-3, TM 55-1520-240-23-4, TM 55-1520-240-23-5, TM 55-1520-240-23-6, TM 55-1520-240-23-8, TM 55-1520-240-23-9, TM 55-1520-240-23-10, TM 55-1520-240-23-11, supersedes TM 55-1520-240-23-1, TM 55-1520-240-23-2, TM 55-1520-240-23-3, TM 55-1520-240-23-4, TM 55-1520-240-23-5, TM 55-1520-240-23-7, TM 55-1520-240-23-8, TM 55-1520-240-23-9, TM 55-1520-240-23-10, 10 May 1983, and TM 55-1520-240-23-6, 6 May 1983, including all changes.

# CHAPTER 8
# INSTRUMENTS

## SECTION I
## ENGINE INSTRUMENTS DESCRIPTION AND OPERATION

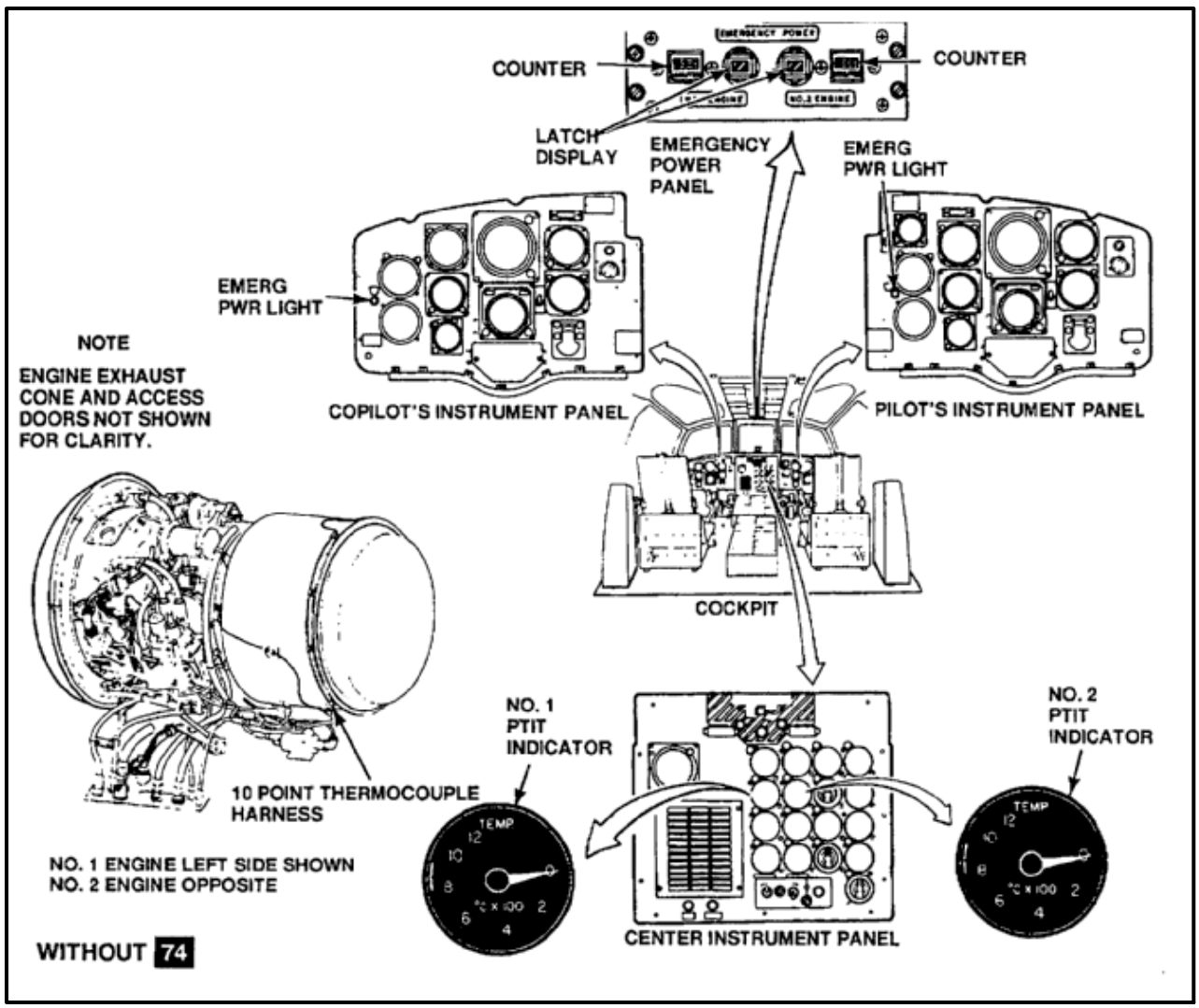
### *POWER TURBINE INLET TEMPERATURE (PTIT) AND EMERGENCY POWER INDICATING SYSTEM WITHOUT* 74

#### Description

Except for component locations, the PTIT and emergency power indicating circuits are identical for each engine. The PTIT system uses a 10-probe thermocouple to measure temperature at the inlet to the engine power turbine section. This temperature is displayed on indicators, one for each engine, on the center instrument panel. The emergency power and indicating system includes a set-point circuit in each indicator, an EMERG PWR light for each engine, and an emergency power panel. The set-point circuit is factory adjusted to provide a signal when PTIT is **890º to 910ºC**. This indicates the engine is providing emergency power. When an engine is operated at emergency power, the EMERG PWR light comes on.

The EMERG PWR lights are located on the pilot's and copilot's instrument panels. When PTIT exceeds **910ºC** for at least **4 seconds**, a timer starts recording overtemperature duration. A striped latch display on the emergency power panel indicates that the engine was operated under emergency power and alerts maintenance personnel to record time and perform any necessary inspections or maintenance. The emergency power panel is located in the cockpit overhead panel, below the engine condition panel.

Thermocouple probes (10) are in tubes around the power turbine nozzle. The probes extend into the gas stream between the vanes of the third turbine nozzle. Heat from the combustion chamber causes the probes to generate a voltage proportional to the heat. This voltage is applied to the No. 1 PTIT indicator and the indicator displays the temperature on a scale calibrated **0 to 1,200ºC**.



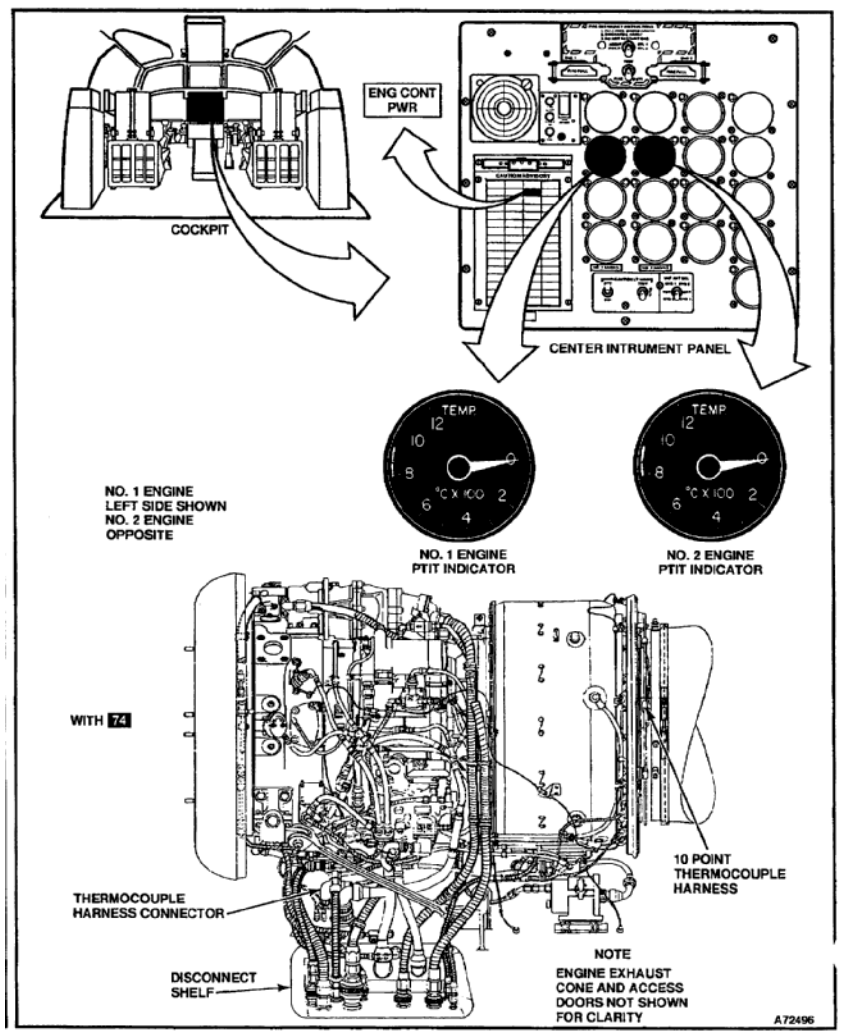
### *POWER TURBINE INLET TEMPERATURE AND CONTINGENCY POWER INDICATING SYSTEM WITH 74*

#### Description

Except for component locations, the power turbine inlet temperature (PTIT) and contingency power indicating circuits are the same for both engines. The PTIT system uses ten T4.5 thermocouples and a harness to measure the temperature at the inlet to each engine power turbine section. The power turbine inlet temperature signal is sent to the digital electronic control unit (DECU). An output signal is sent from the DECU to the PTIT indicators on the center instrument panel. The indicators are hermetically sealed and powered by **28 vdc**. The indicator has a high impedance so that the wiring harness resistance does not have an effect on the indication of the PTIT.

The contingency power indicating system is operated from the PTIT indicators. When the power turbine inlet reaches a temperature of greater than **894ºC** on either engine, a switched ground circuit is completed at the indicator. This causes the amber ENG CONT PWR light on the Master Caution Panel to come on. When the PTIT drops below the contingency level, the ENG CONT PWR light goes out.

Ten T4.5 thermocouple probes are mounted in tubes around the power turbine nozzle. The probes extend into the gas stream between the vanes of the third turbine nozzle. The probes are connected to a harness. Heat at the power turbine inlet causes the probes to generate a voltage proportional to the heat. The voltage is sent to the DECU and then to the PTIT indicator. The indicator displays the temperature on a scale calibrated **0 to 1,200°C**.

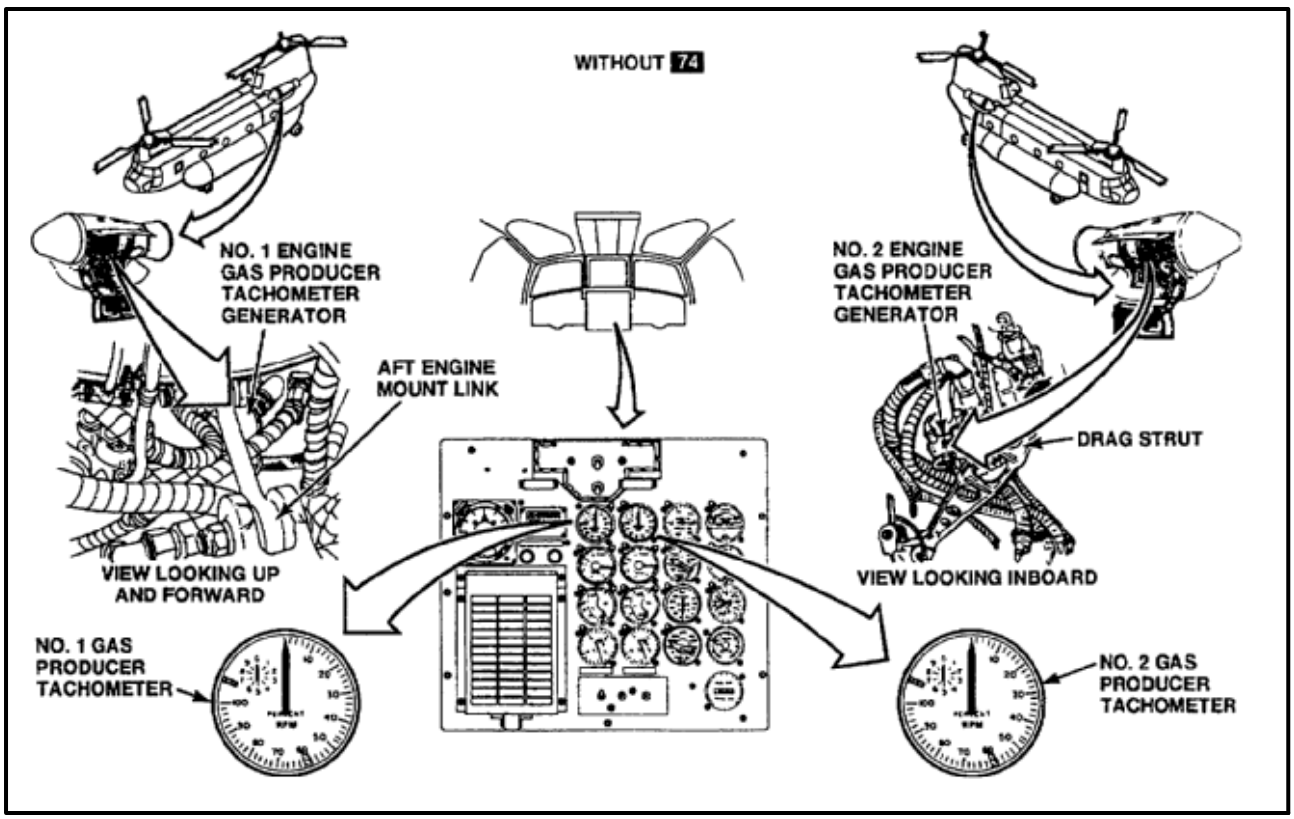


### *GAS PRODUCER TACHOMETER SYSTEM WITHOUT 74*

#### Description

The gas producer tachometer system is a synchronous system that measures engine compressor rpm. There is a separate system for each engine. Each system consists of an indicator and a tachometer generator. The generator is on the engine. The indicator is on the center instrument panel. The gas producer tachometer indicator indicates compressor rpm as a percentage of maximum rated speed.

The indicator is calibrated **0 to 110 percent rpm**. Electrical connections are made through a connector at the rear of the clamp mounted instrument. The gas producer tachometer generator is a three phase ac generator mounted on the engine at the **5 o'clock** position. It supplies voltage to the tachometer indicator at a frequency proportional to the speed of the engine compressor. Electrical connections are made through a connector in the side of the generator.



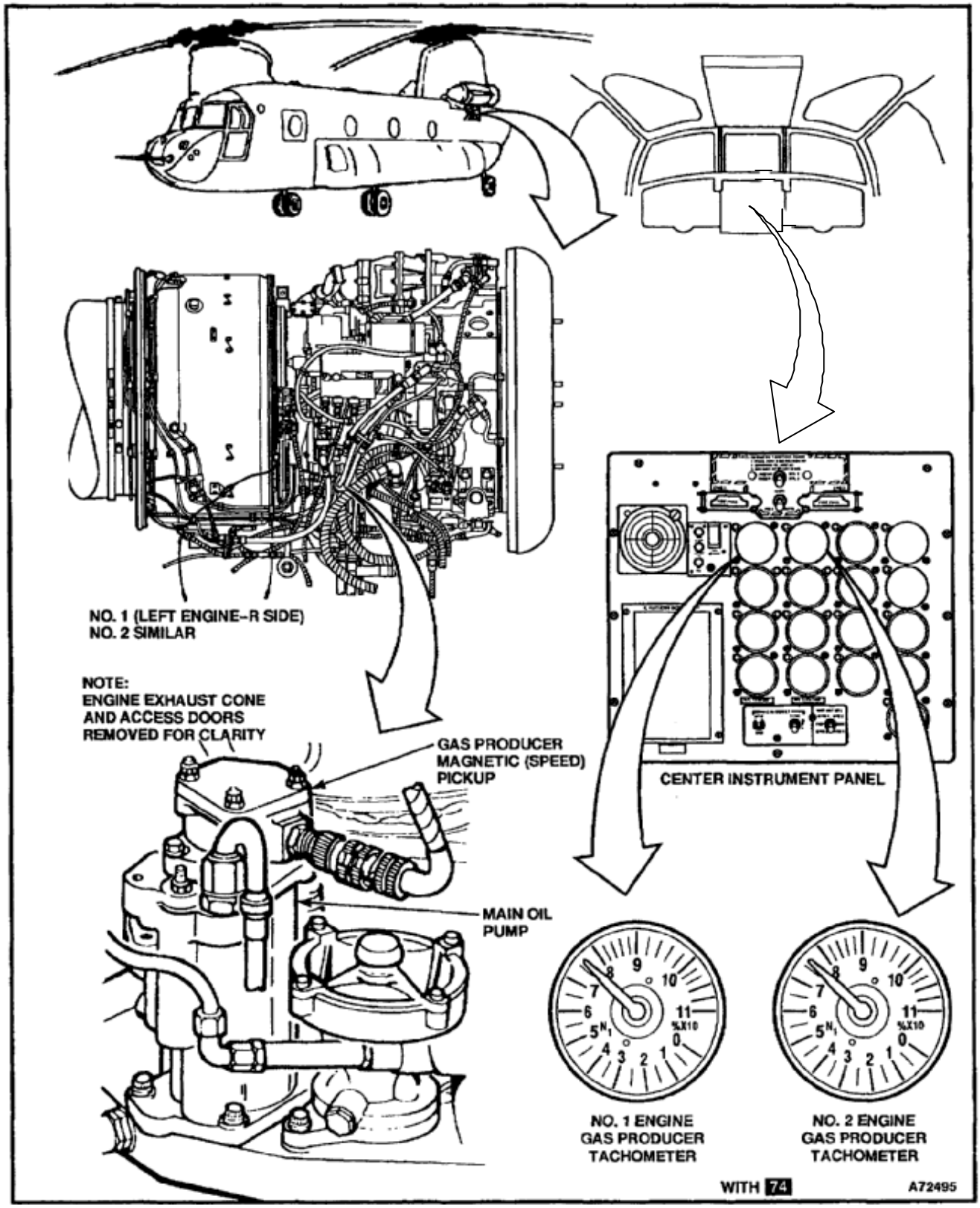
### *GAS PRODUCER TACHOMETER SYSTEM WITH 74*

**Description**

The gas producer tachometer indicating (N1) system measures engine compressor rpm. There is a separate system for each engine. Each system consists of an indicator and a magnetic (speed) pickup. The magnetic pickup is mounted on the engine. The indicator is mounted on the center instrument panel.

The gas producer tachometer (N1) indicator shows compressor rpm as a percentage of maximum rated speed. The indicator is calibrated **0 to 110 percent** rpm. Electrical connections are made through a connector at the rear of the instrument.

The only powerplant-mounted equipment is a magnetic pickup. The magnetic pickup gives a signal frequency that is proportional to gas producer speed. Electrical connections are made through a connector on the side of the magnetic pickup.


NO. 1 (LEFT ENGINE–R SIDE)
NO. 2 SIMILAR
NOTE:
ENGINE EXHAUST CONE
AND ACCESS DOORS
REMOVED FOR CLARITY
GAS PRODUCER
MAGNETIC (SPEED)
PICKUP
MAIN OIL
PUMP
CENTER INSTRUMENT PANEL
NO. 1 ENGINE
GAS PRODUCER
TACHOMETER
NO. 2 ENGINE
GAS PRODUCER
TACHOMETER
WITH 74
A72495

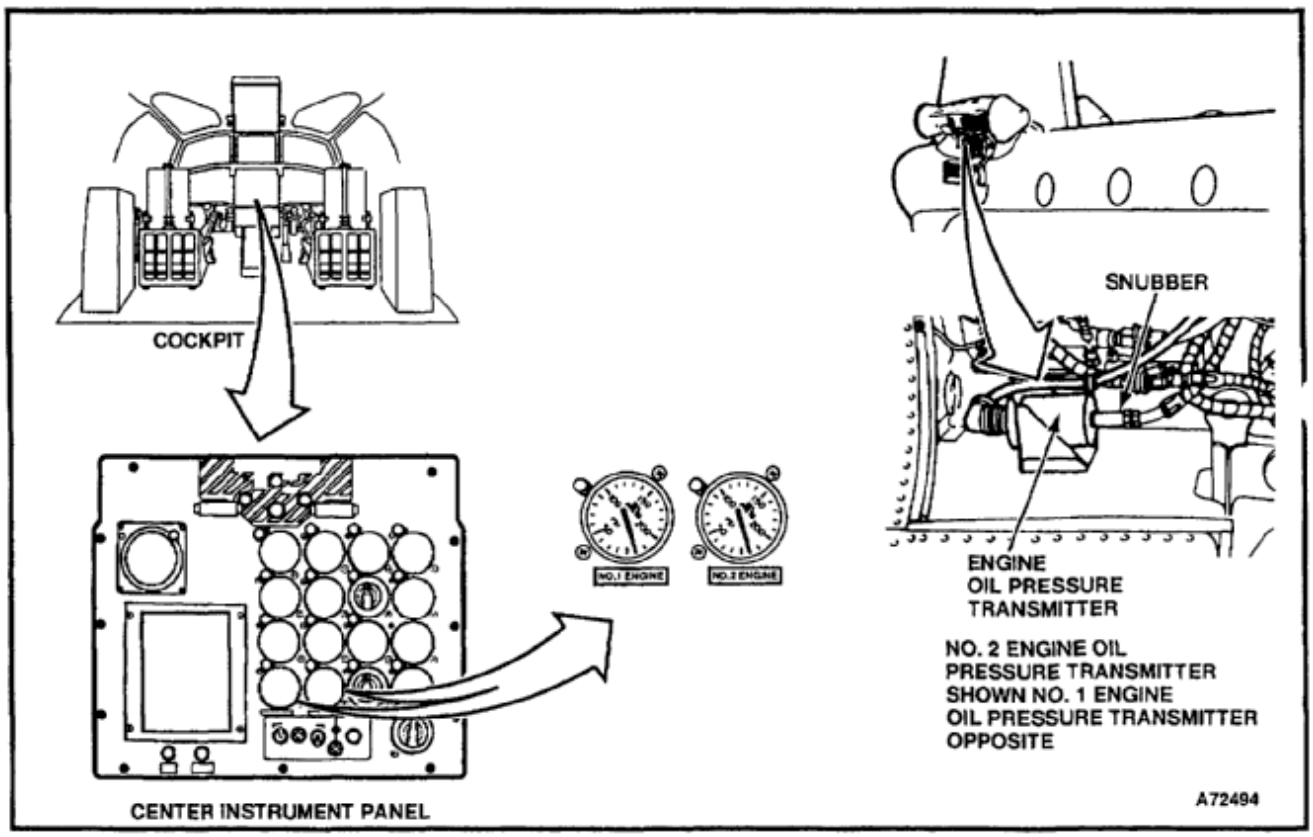
### *ENGINE OIL PRESSURE INDICATING SYSTEM*

**Description**

The engine oil pressure indicating system is a differential pressure synchro system. It measures and indicates the pressure of oil circulating within the engine. There is a separate system for each engine. Each system consists of an indicator and a pressure transmitter synchro. The transmitter is located in the engine nacelle. The indicator is on the center instrument panel.

The engine oil pressure indicator, a synchro receiver, indicates oil pressure as psi. The indicator is calibrated from **0 to 200 psi**. Electrical connections are made through a connector at the rear of the clamp mounted instrument.

The transmitter, a synchro transmitter, is linked to the engine oil system through a flexible hose, coupling and snubber. Pressure is applied to a diaphragm in the transmitter causing the transmitter rotor to turn. This causes a change in the stator voltage in the indicator, that causes the stator rotor to turn, moving the pointer to the correct pressure indication. The snubber reduces the effect of pressure surges on the system. A zero adjustment is included on the transmitter.



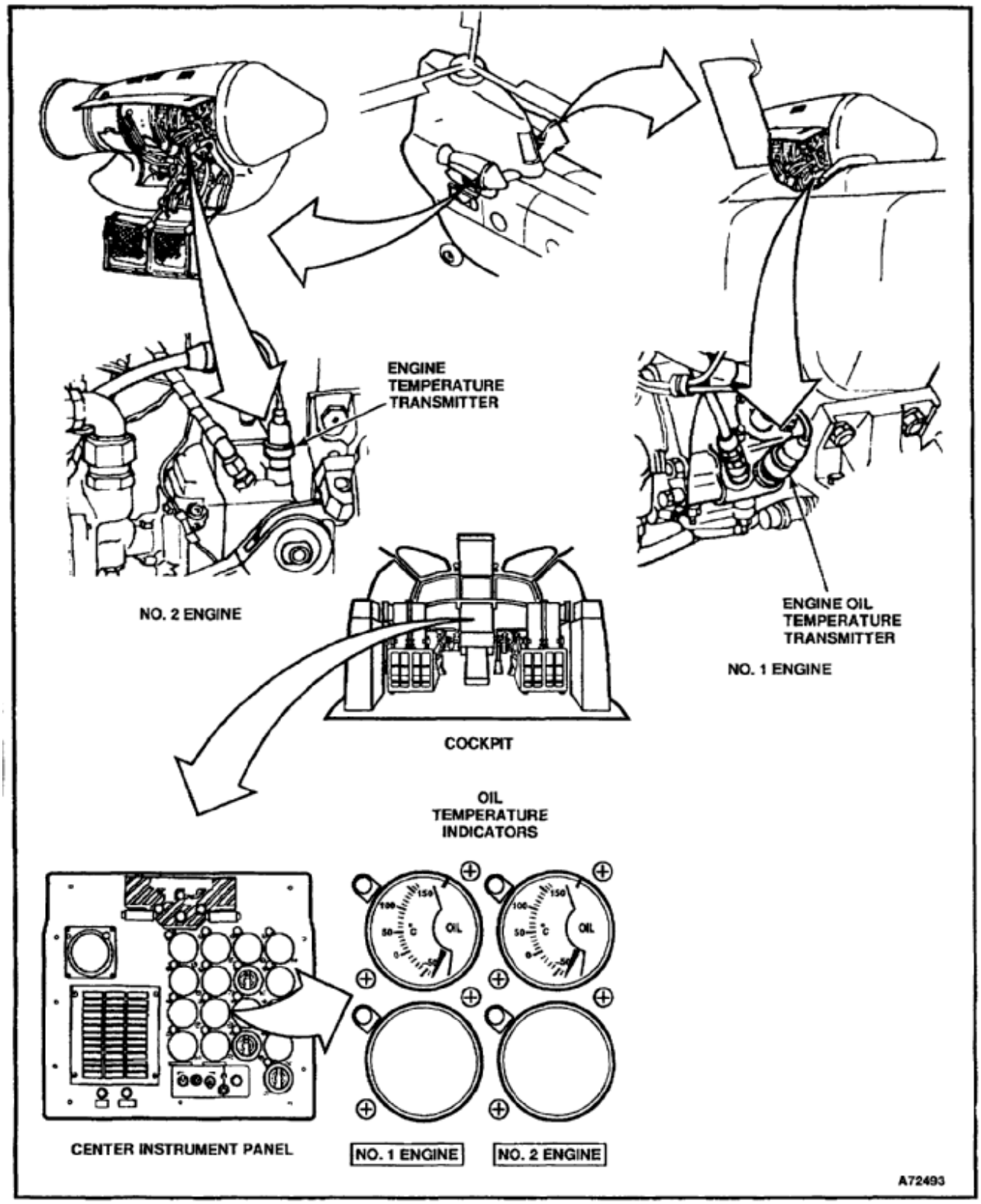
### *ENGINE OIL TEMPERATURE INDICATING SYSTEM*

**Description**

The engine oil temperature indicating system is an electrical resistance thermometer system. It measures and indicates the temperature of the oil circulating in the engine. There is a separate system for each engine. Each system consists of an indicator and a temperature bulb. As oil temperature varies, bulb resistance varies, causing the indicator pointer to move a distance proportional to the temperature change.

The temperature bulb senses and transmits engine oil temperature signals to the indicator. The bulb is calibrated to provide **90.38 ohms** resistance at **0ºC (32ºF)**. It is located at the **4 o'clock** position, screwed into a lube fitting, on the engine.

The indicator is clamp mounted on the center instrument panel with electrical connections provided through an electrical connector at the rear of the indicator. The indicator is calibrated from **–70ºC to +150ºC**.


ENGINE TEMPERATURE TRANSMITTER
NO. 2 ENGINE
ENGINE OIL TEMPERATURE TRANSMITTER
NO. 1 ENGINE
COCKPIT
OIL TEMPERATURE INDICATORS
OIL
CENTER INSTRUMENT PANEL
NO. 1 ENGINE
NO. 2 ENGINE
A72493

### *TORQUE INDICATING SYSTEM WITHOUT 74*

**Description**

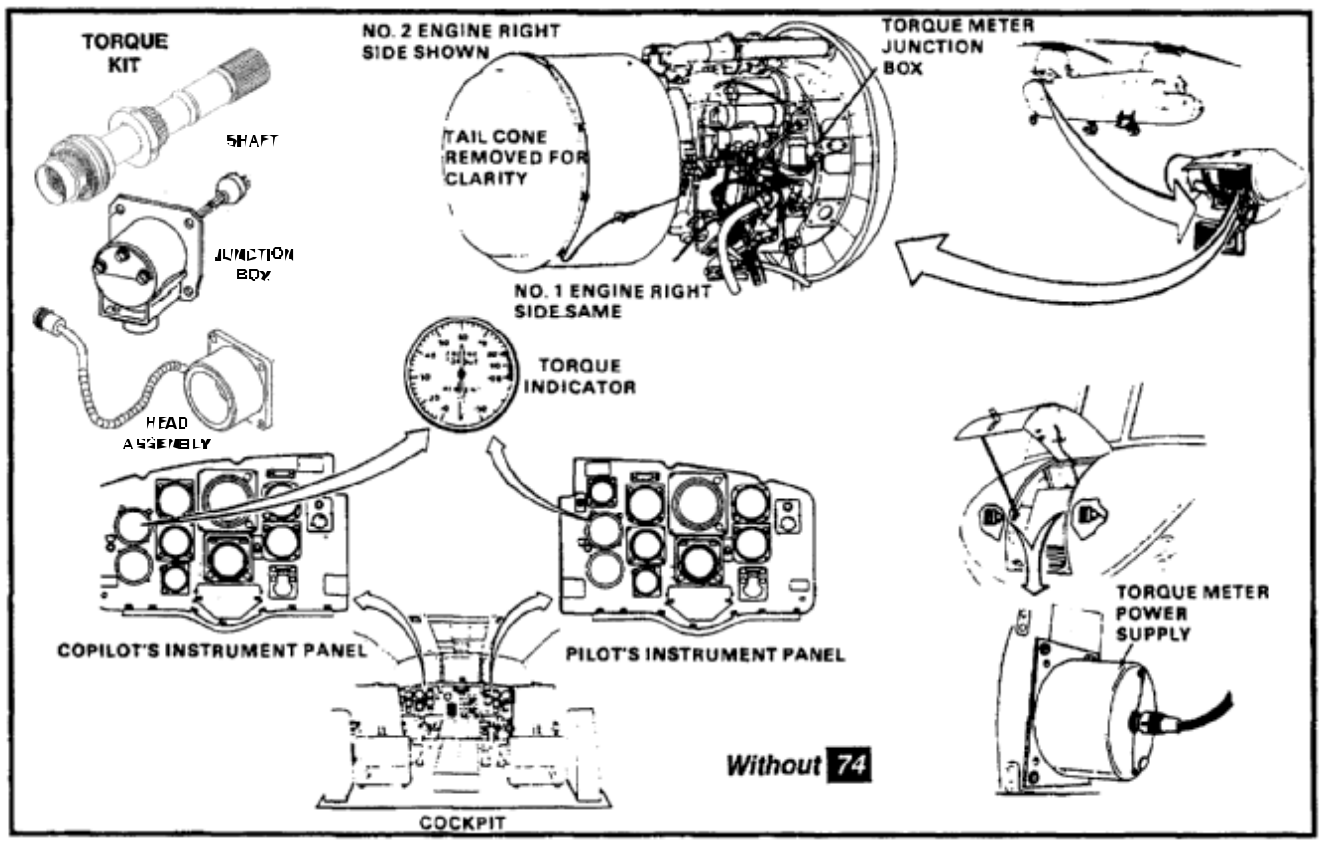
The torque indicating system, which monitors engine power output, is a ratio system. It measures and indicates the amount of engine torque. The system consists of an engine-driven power shaft, a head assembly and a junction box on each engine, a dual torque indicator on each pilot's instrument panel, and two power supplies in the nose compartment.

The head assembly and the power shaft make up a transformer. The head assembly contains the single primary and two secondary windings of the transformer. The power shaft is the core of the transformer. The junction box provides interconnection between system components. The head assembly, power shaft, and junction box make up a calibrated set. If one part is bad, all three must be replaced with a matched set.

A signal from the torquemeter power supply is applied to the primary winding in the head assembly. With no engine torque developed, equal signals are coupled to the secondary windings. When engine torque is developed, the power shaft is distorted, and unequal signals are coupled to the secondaries. The signals from the secondaries are rectified in the indicator and moves the pointer to show percentage of rated torque.

The indicator is calibrated **0 to 150 percent** and has two numbered pointers, one for each engine. Electrical connections are provided through two connectors at the rear of the clamp mounted indicators.

The torquemeter power supply is a solid-state inverter that converts dc voltage to ac voltage for use by the engine torque sensor (head assembly).



### *TORQUE INDICATING SYSTEM WITH* 74

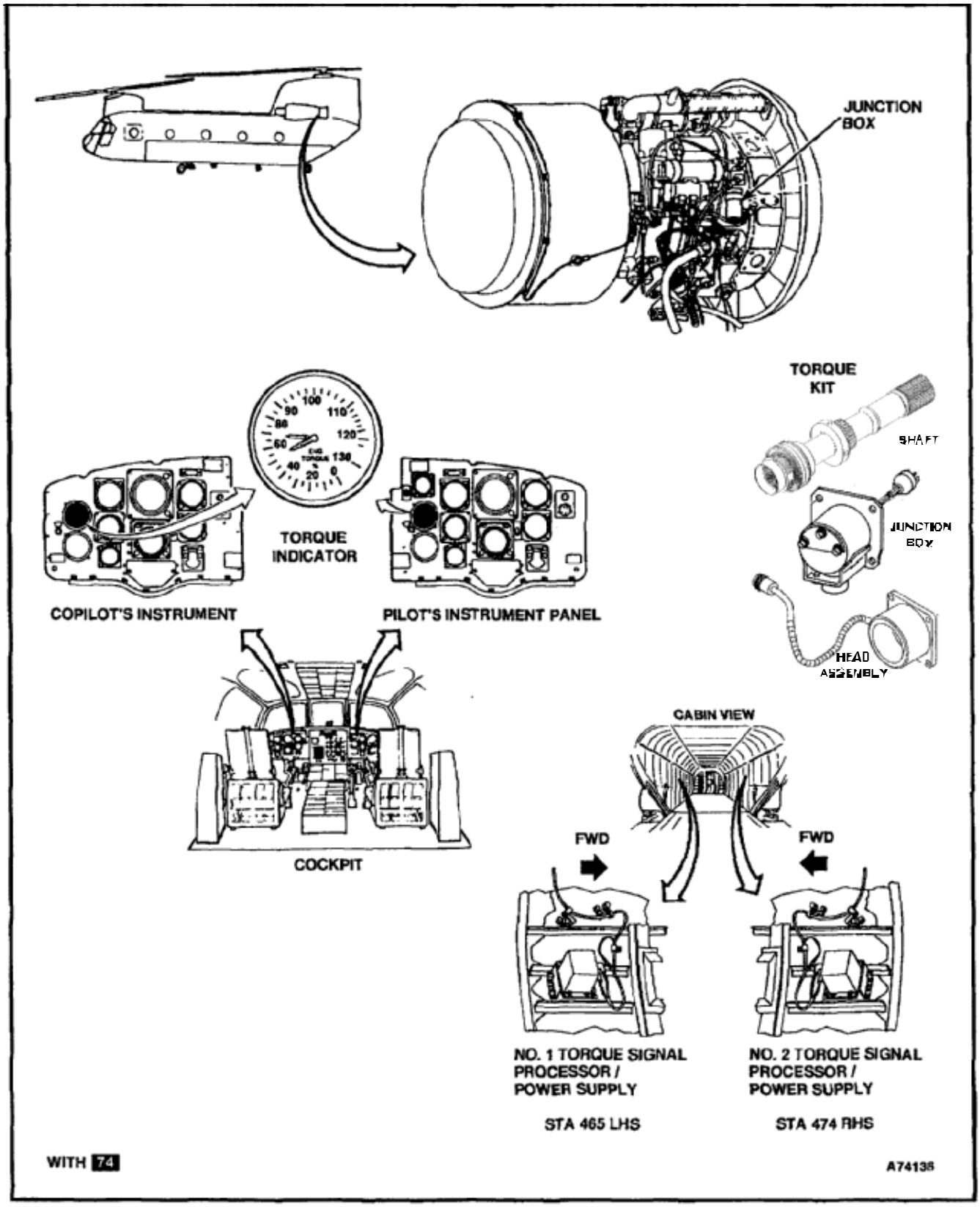
**Description**

The torque indicating system, which monitors the engine power output, is a ratio detector system. It measures and indicates the amount of engine torque. The system consists of two dual torque indicators on each pilot's instrument panel, an engine driven power shaft, a head assembly and a junction box on each engine, and two separate torque signal processor/power supply units. The torque signal processor/power supply units are mounted in the aft cabin ceiling at left hand sta. 465 and right hand sta. 474.

The torquemeter head provides an electric torque signal that is proportional to the twisting motion of the power shaft. That signal is transmitted through a cable to the junction box. The junction box is mounted on the engine inlet housing. It provides operating power for the torquemeter head and receives signals from the head and sends them to the torque signal processor/power supply. The engine driven power shaft, head assembly and junction box make up a matched assembly. If one component is bad, all three must be replaced with a matched set.

The torque signal processor/power supply provides a **6 kHz** constant current signal to the torquemeter head. It processes the signal coming from the junction box and sends this signal to cockpit torque indicator and engine digital electronic control unit (DECU).

The torque indicator is calibrated **0 to 150 percent**. It has two pointers each marked with the number of its respective engine. Electrical connections are provided through connectors at the rear of each indicator. The indicator is hermetically sealed.


JUNCTION BOX
TORQUE KIT
SHAFT
JUNCTION BOX
HEAD ASSEMBLY
TORQUE INDICATOR
COPILOT'S INSTRUMENT
PILOT'S INSTRUMENT PANEL
COCKPIT
CABIN VIEW
FWD
FWD
NO. 1 TORQUE SIGNAL PROCESSOR / POWER SUPPLY
NO. 2 TORQUE SIGNAL PROCESSOR / POWER SUPPLY
STA 465 LHS
STA 474 RHS
WITH 74
A74135

*FUEL FLOW INDICATING SYSTEM*

**Description**

This system consists of a fuel flow indicator, a power supply, and two transmitters, one for each engine.

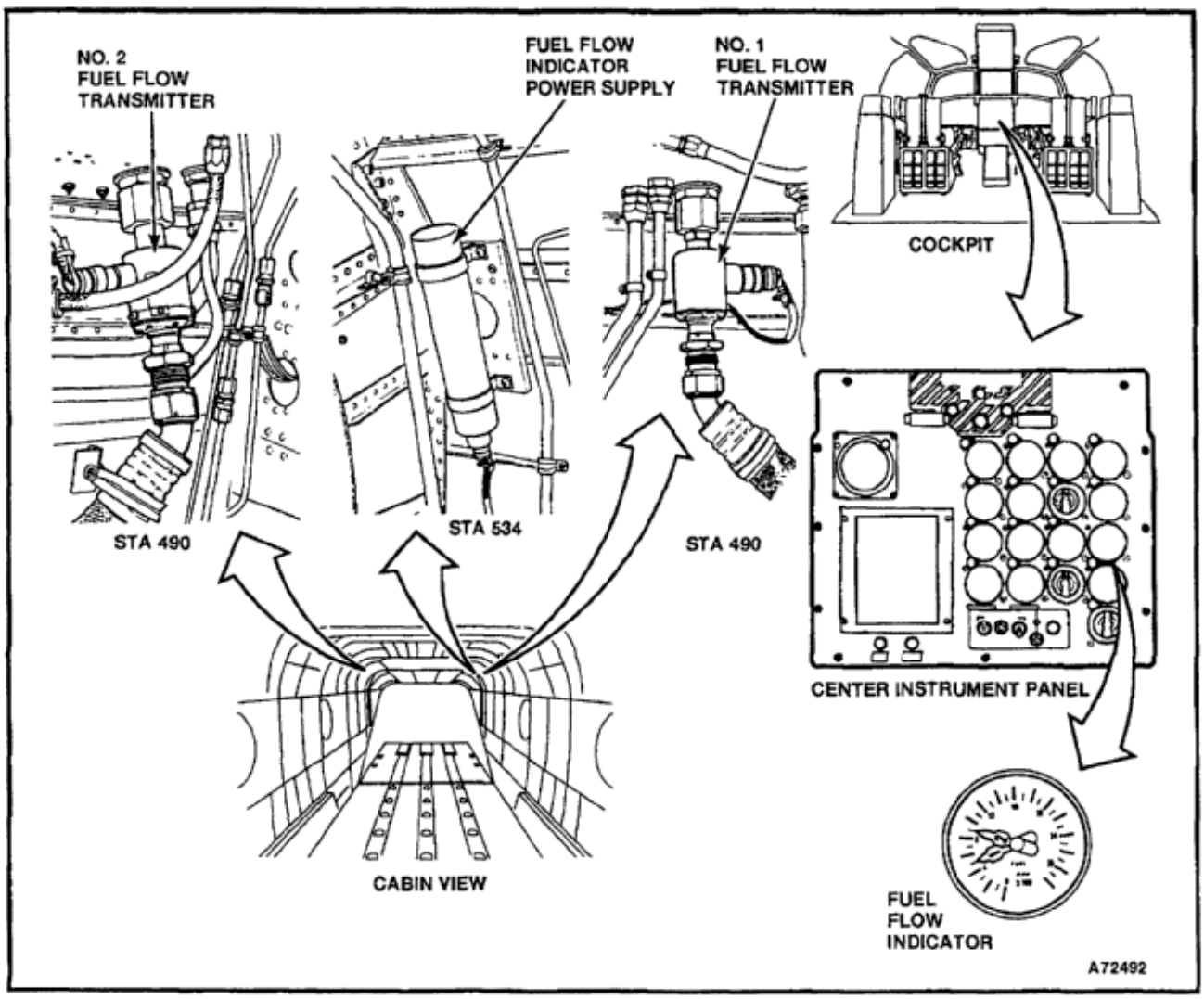
The fuel flow indicator, clamp mounted on the center instrument panel indicates fuel flow in pounds per hour (PPH). The power supply provides power to both transmitters, which are located below the engine disconnect shelves, both sides, aft cabin.

The fuel flow indicator power supply furnishes power to the transmitter motor, the rotor of which is an impeller.

The impeller is driven at a constant angular velocity. As fuel passes through the impeller it picks up the angular velocity of the impeller.

The fuel strikes a spring restrained stator causing the stator to rotate in proportion to the flow rate. The change in angular rotation is measured by a synchro connected to the stator.

The synchro signal is applied to a receiver synchro in the fuel flow indicator and displays the fuel flow rate in pounds per hour (PPH).




END OF TASK

# SECTION II
# ENGINE INSTRUMENTS

## 8-2 TEST POWER TURBINE INLET TEMPERATURE (PTIT) INDICATOR 8-2

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Tester, Exhaust Gas Temperature Model BH112JB-53
Power Supply, 28 VDC
Multimeter
Connector, M83723-75W1407N
Light Indicator, MS25041-4
Lamp, MS25237-327
Wire, No. 20 Insulated

***Materials:***

Solder (E360)

***Personnel Required:***

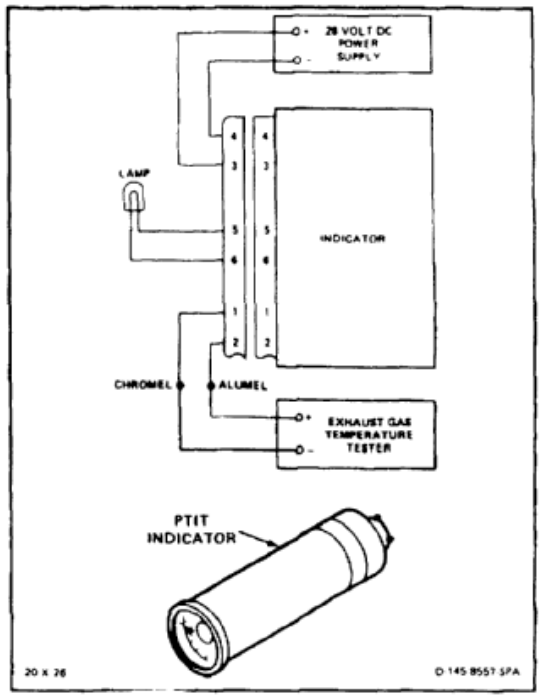
Aircraft Electrician
Inspector

***References:***

TM 55-1500-323-25
TM 55-4920-401-13&P

***Equipment Condition:***

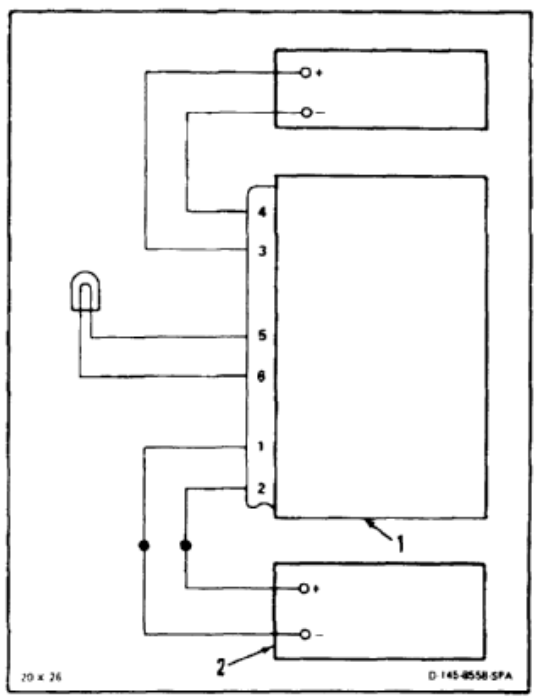
Off Helicopter Task
Test Setup




1. Connect indicator (1) to test setup.
2. Apply **28 vdc** to test setup.

***FRICTION TEST***

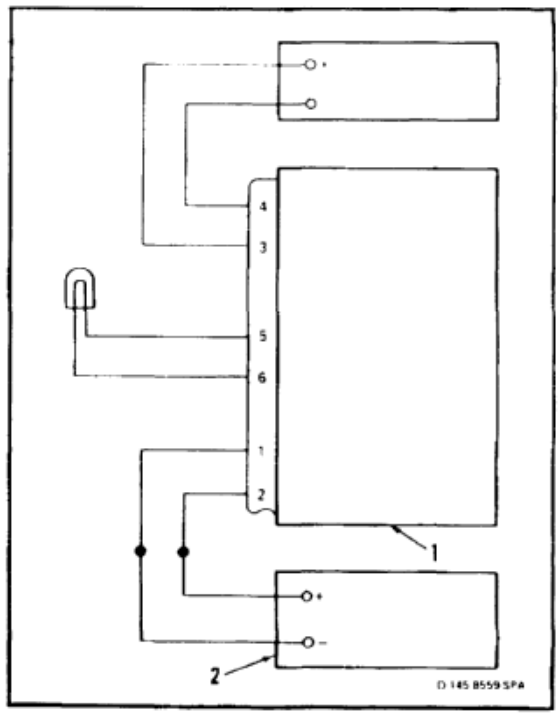
3. Slowly adjust tester (2) to cause indicator (1) to read **200ºC**. Record indicator reading.
4. Tap indicator (1). Record indicator reading.
5. Compare indicator (2) readings from steps 3 and 4. Difference shall be no more than **24ºC**.
6. Repeat steps 3, 4, and 5 at **400ºC, 700ºC, 800ºC, 900ºC, and 1200ºC**. Difference shall be no more than **24ºC** at all noted settings.



***SCALE ERROR TEST***

7. Adjust tester (2) to **ºC**. Test Point settings listed. Indicator (1) readings shall be within tolerance as follows: (Tap indicator before recording readings.)

| TEST POINT ºC | INDICATOR READING RANGE ºC |
|---|---|
| 200 | 160 to 240 |
| 300 | 260 to 340 |
| 400 | 370 to 430 |
| 500 | 470 to 530 |
| 600 | 580 to 620 |
| 700 | 690 to 710 |
| 800 | 795 to 805 |
| 900 | 890 to 910 |
| 1000 | 980 to 1020 |
| 1100 | 1070 to 1130 |
| 1200 | 1160 to 1240 |

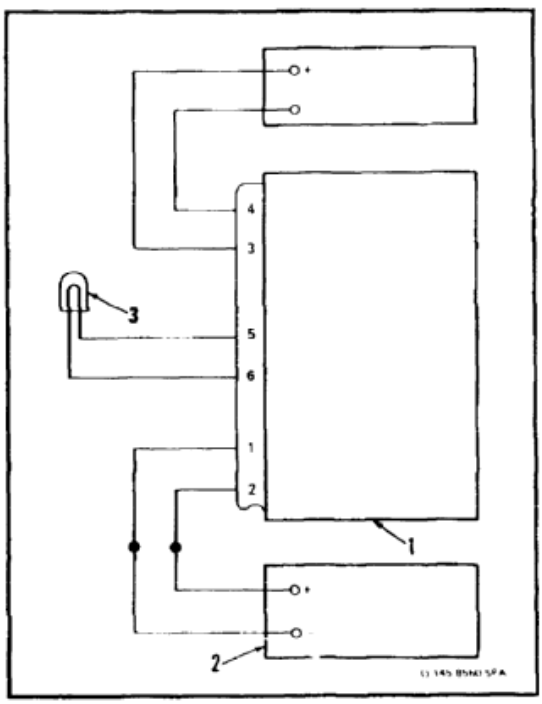



***SWITCH POINT SETTING***

8. Adjust tester (2) to **0ºC** setting.

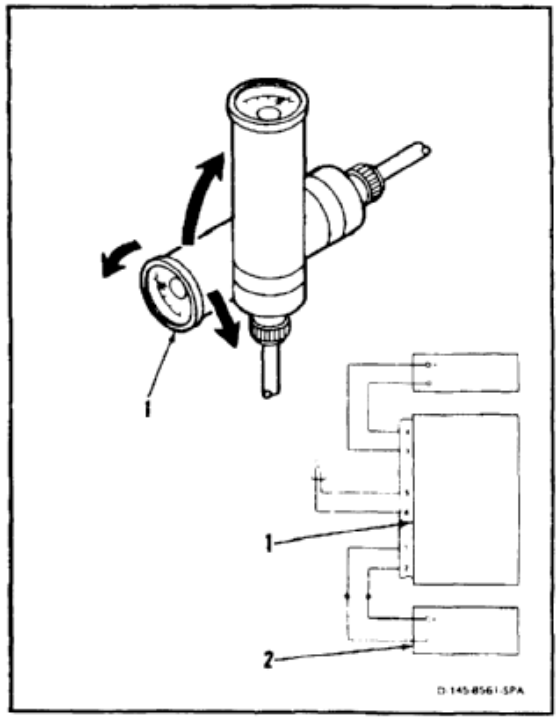
9. Slowly adjust tester (2) up until lamp (3) comes on.

10. Tap indicator (1) and record reading. Reading shall be **890ºC to 910ºC**.



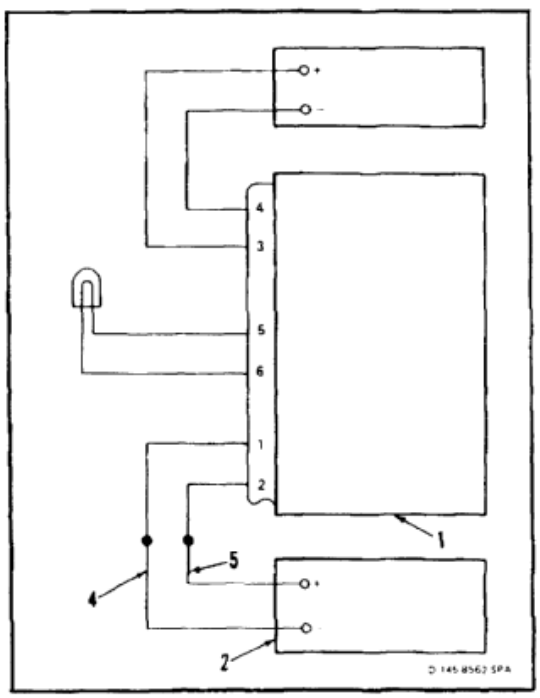
***POSITION ERROR TEST***

11. Adjust tester (2) cause indicator (1) to read **600ºC** with indicator dial in normal (vertical) position.
12. Rotate indicator (1) **90º** counterclockwise. Tap indicator and record reading. Return indicator to original position.
13. Rotate indicator (1) **90º clockwise**. Tap indicator and record reading. Return indicator to original position.
14. Rotate indicator up (dial in horizontal position). Tap indicator and record reading. Return indicator to original position.
15. Compare readings from steps 11, 12, 13, and 14. Difference shall not be more than **24ºC**.



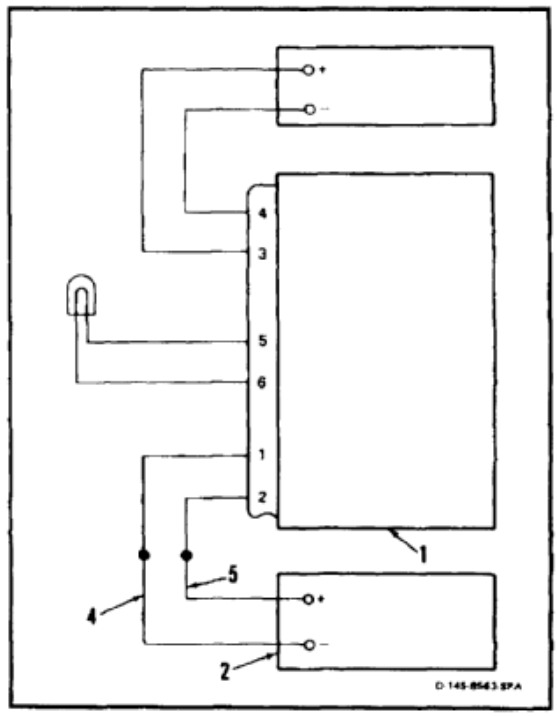

***GROUNDED THERMOCOUPLE TEST***

16. Adjust tester (2) to **800ºC**. Check indicator. Indicator (1) shall read **795ºC to 805ºC**. Record indicator reading.
17. Ground tester (2) chromel lead (4) to indicator (1) case. Check indicator. Indicator shall not read more than **5ºC** from reading in step 16.
18. Remove ground from chromel lead.
19. Repeat steps 17 and 18, grounding tester alumel lead (5) to indicator (1) case. Check indicator. Indicator shall not read more than **±5ºC** from reading in step 16.



***OPEN THERMOCOUPLE TEST***

20. Adjust tester (2) to **900ºC**. Check indicator (1). Indicator shall read **890ºC to 910ºC**. Record indicator reading.
21. Disconnect tester (2) chromel lead (4). Check indicator (1). Pointer of indicator shall fall to full down scale stop.
22. Reconnect tester (2) chromel lead (4). Check indicator (1). Indicator shall indicate reading recorded in step 20.
23. Repeat steps 21 and 22, disconnect tester Alumel lead (5).
24. Turn off power to test setup.
25. Disconnect indicator (1) from test setup.




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-3 REMOVE PILOT'S OR COPILOT'S EMERGENCY POWER LIGHT 8-3

INITIAL SETUP

***Applicable Configurations:***

Without 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

Tape (E385)
Tags (E264)

***Personnel Required:***

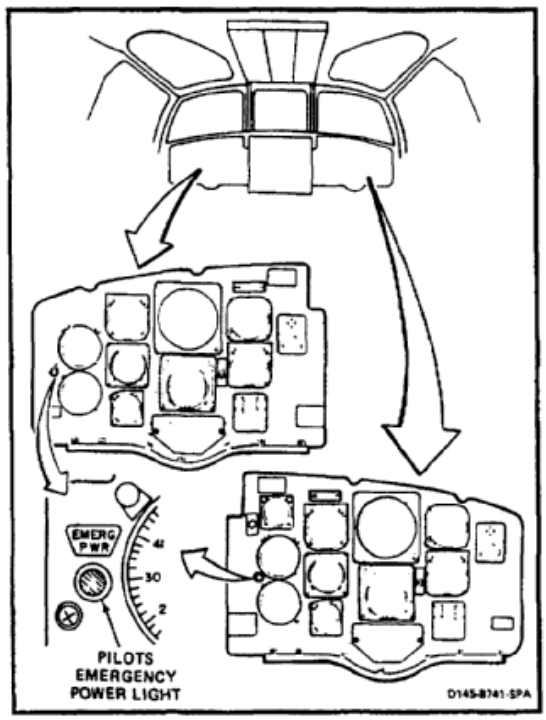
Aircraft Electrician

***References:***

TM 55-1500-323-25

***Equipment Condition:***

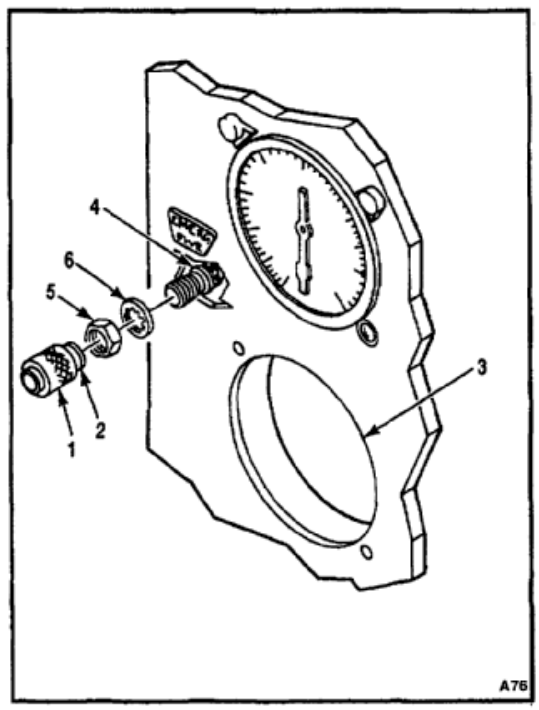
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Rotor Tachometer Indicator Removed (Task 8-88)



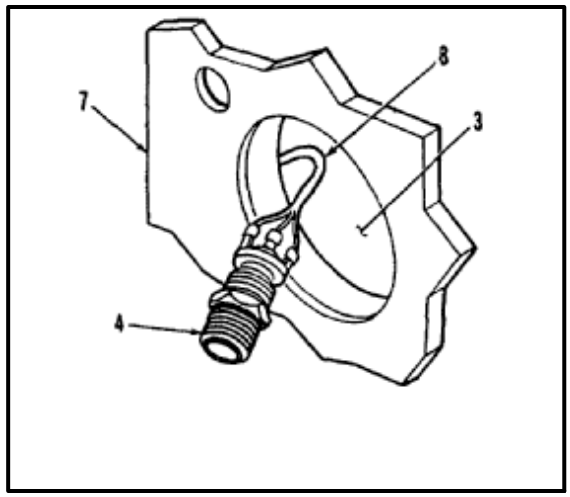

**NOTE**

Procedure is the same to remove pilot's or copilot's light. Pilot's is shown here.

1. Remove lens (1) with lamp (2). Turn lens counterclockwise to remove.
2. Reach through rotor tachometer indicator mount hole (3) and hold light base (4).
3. Remove nut (5) and washer (6).



4. Pull light base (4) through to back of panel (7).
5. Pull light base (4) through rotor tachometer indicator mount hole (3).
6. Tag and unsolder wires (8). Tape ends of wires (TM 55-1500-323-25).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-4 INSTALL PILOT'S OR COPILOT'S EMERGENCY POWER LIGHT 8-4

INITIAL SETUP

***Applicable Configurations:***

Without 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun
Heat Gun

***Materials:***

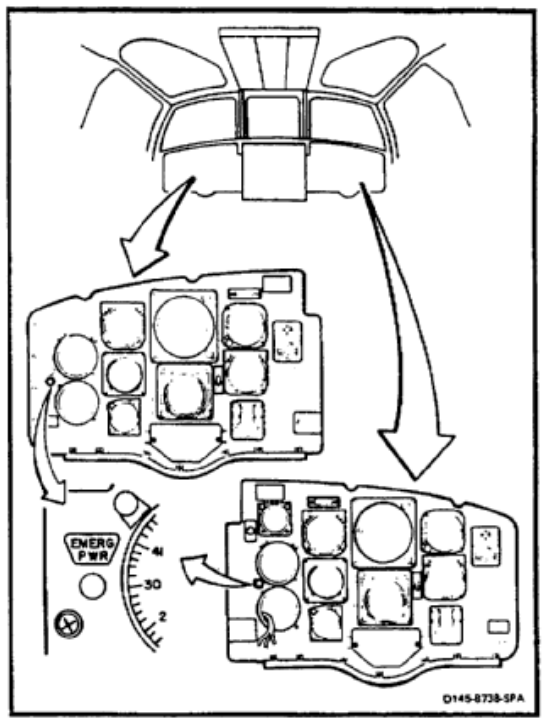
Solder (E360)
Tubing (E431)

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P
TM 55-1500-323-25



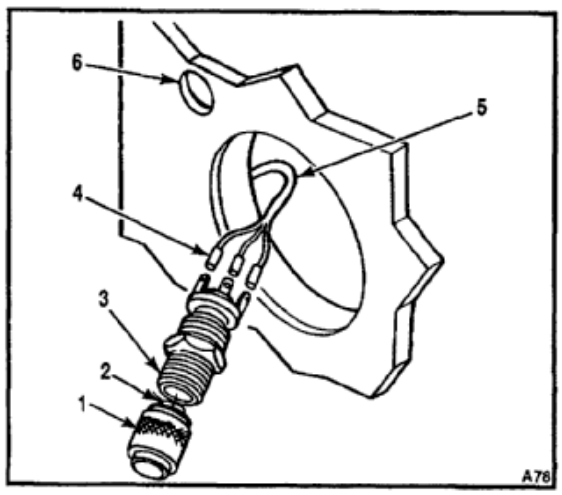

**CAUTION**

Remove lens and lamp prior to soldering. Lamp center contact may melt and solder in place.

**NOTE**

Procedure is the same to install pilot's or copilot's light. Pilot's is shown here.

1. Remove lens (1) and lamp (2) from light base (3).
2. Install tubing (4) and solder wires (5) to light base (3). Slide tubing over solder joint and shrink with heat gun (TM 55-1500-323-25).
3. Install light base (3) in panel mount hole (6).

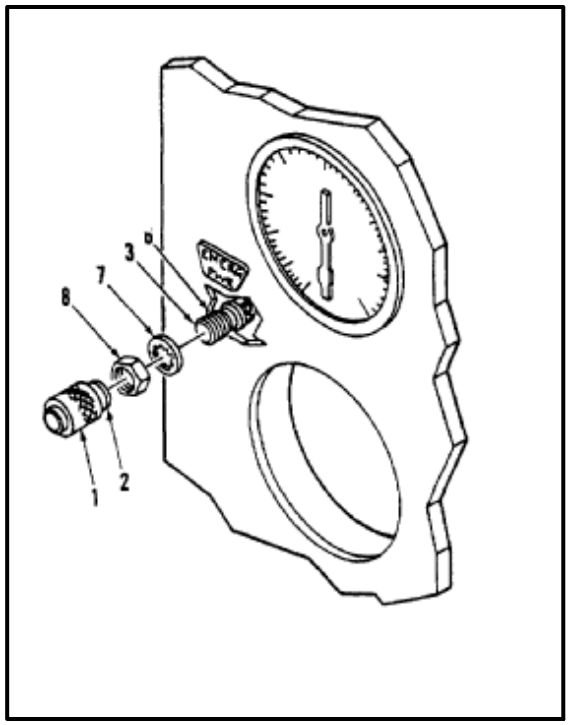


4. Install washer (7) and nut (8) on light base (3).
5. Install lens (1) with lamp (2).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Install rotor tachometer indicator (Task 8-89).
Emergency power light operational check (TM 55-1520-240-T).




END OF TASK

## 8-5 REPLACE PILOT'S OR COPILOT'S EMERGENCY POWER LAMP 8-5

INITIAL SETUP

***Applicable Configurations:***

Without 74

***Tools:***

None

***Materials:***

None

***Parts:***

Lamp

***Personnel Required:***

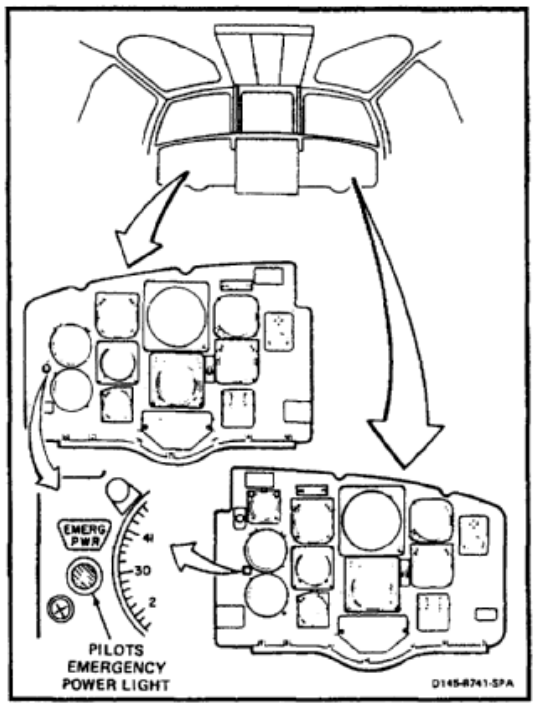
Aircraft Electrician

***References:***

TM 55-1520-240-23P

***Equipment Condition:***

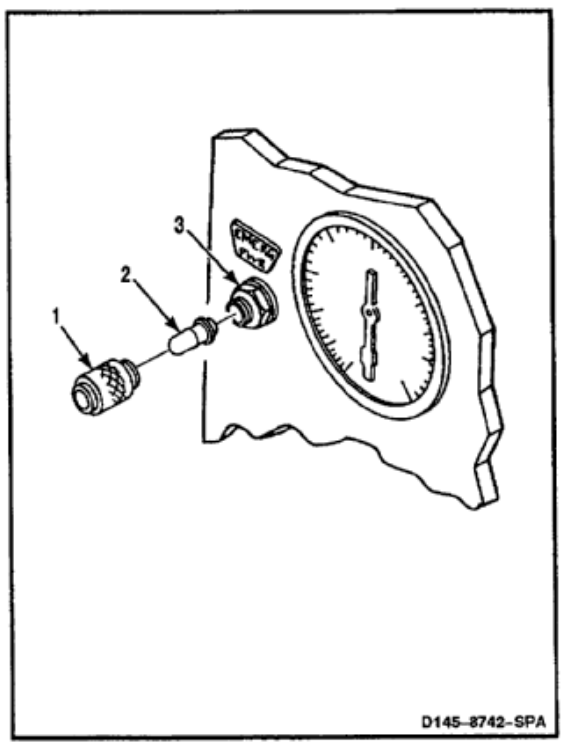
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




**NOTE**

Procedure is the same to replace pilot's or copilot's emergency power lamp. Pilot's lamp shown here.

1. Remove lens (1) with lamp (2). Turn lens counterclockwise to remove.
2. Remove lamp (2) from lens (1).
3. Install lamp (2) in lens (1).
4. Install lens (1) with lamp (2) on light base (3).




***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).

END OF TASK

## 8-6 REMOVE EMERGENCY POWER SWITCHES 8-6

INITIAL SETUP

***Applicable Configurations:***

Without 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Workstand

***Materials:***

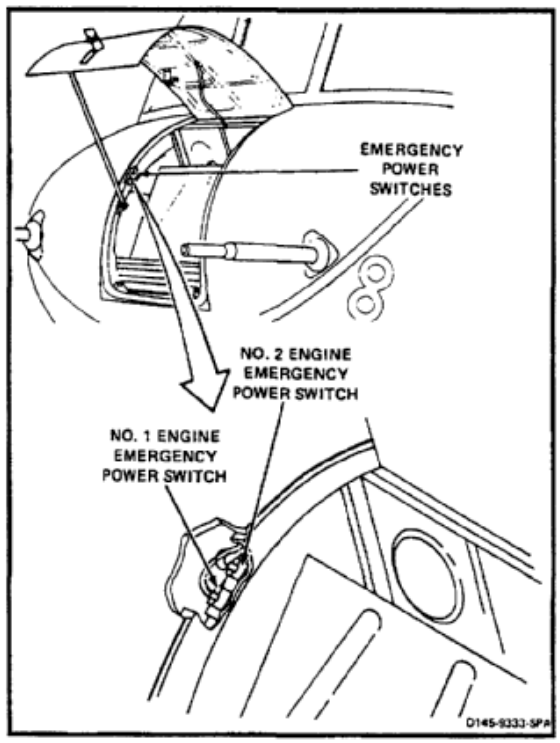
Paper Tags (E264)

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

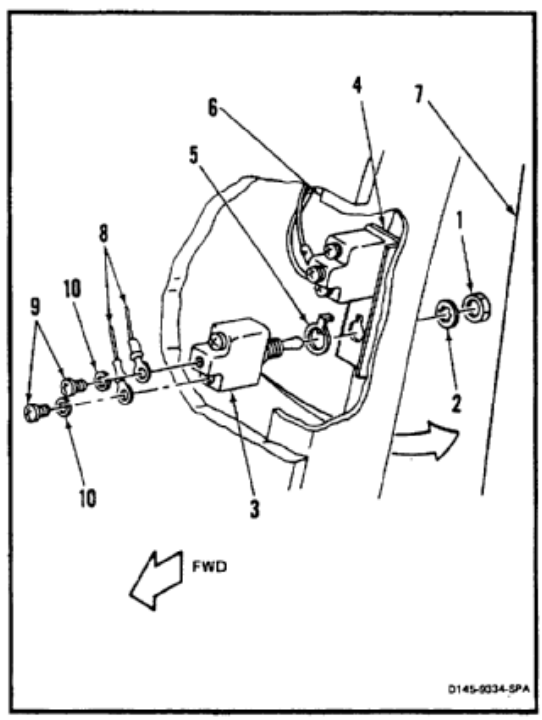
Battery Disconnected (Task 1-39)
Hydraulic Power Off
Electrical Power Off
Nose Enclosure Door Open (Task 2-2)




**NOTE**

Procedure is the same for removing No. 1 or No. 2 engine emergency power switches. No. 1 is shown here.

1. Remove nut (1) and washer (2) from switch (3).
2. Push switch (3) up and out of bracket (4).
3. Remove locking ring (5).
4. Pull switch (3) down into area between frame (6) and absorber (7).
5. Tag two wires (8).
6. Remove two screws (9) and two washers (10).
7. Remove two wires (8).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-7 INSTALL EMERGENCY POWER SWITCHES 8-7

INITIAL SETUP

***Applicable Configurations:***

Without 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Workstand

***Materials:***

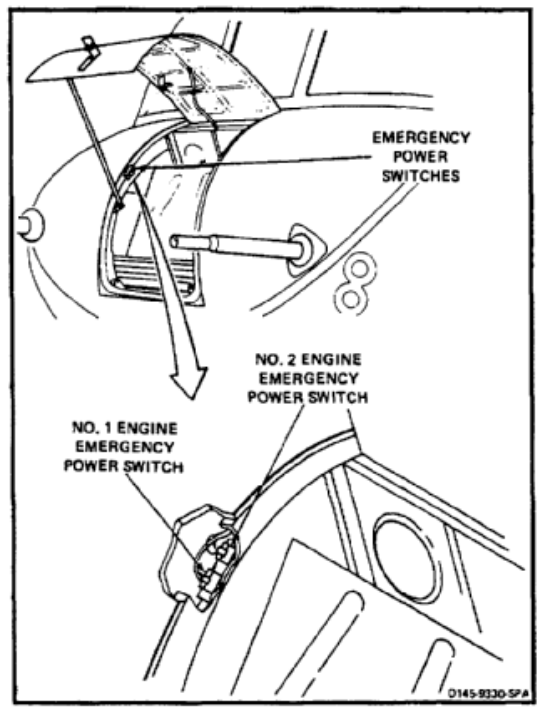
None

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

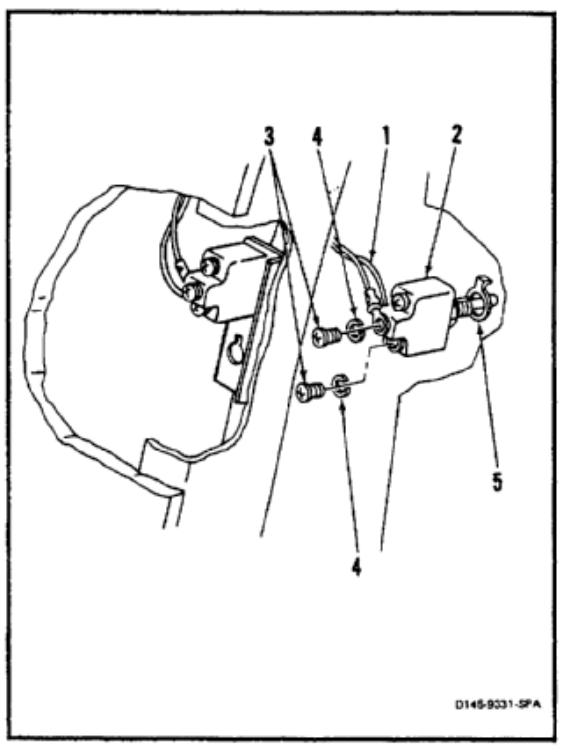
TM 55-1520-240-23P




**NOTE**

Procedure is the same for installing No. 1 or No. 2 engine emergency power switches. No. 1 is shown here.

1. Remove two tags and connect wires (1) to switch (2). Use two screws (3) and washers (4).
2. Install locking ring (5) on switch (2).

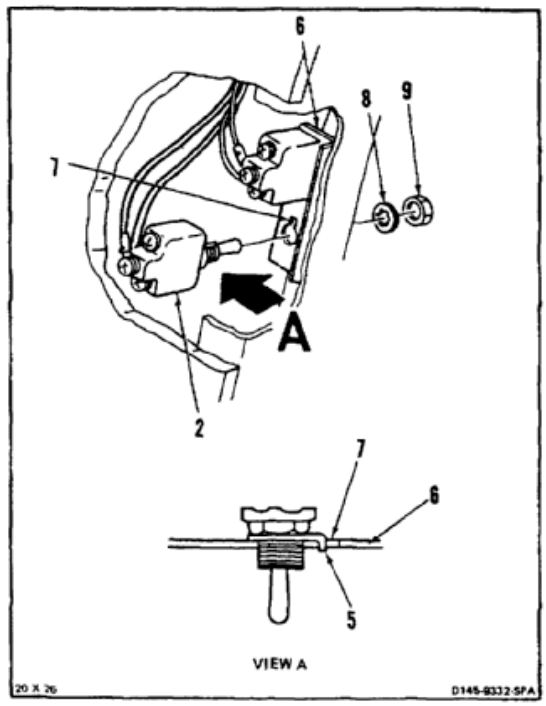


3. Install switch (2) in switch bracket (6). Make sure tab of locking ring (5) engages slot (7) of switch bracket (6).
4. Install lockwasher (8) and nut (9).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Operational check of emergency power warning system (TM 55-1520-240-T).
Close nose enclosure door (Task 2-2).




END OF TASK

## 8-8 TEST GAS PRODUCER TACHOMETER INDICATOR 8-8

INITIAL SETUP

***Applicable Configurations:***

Without 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Tachometer Indicator-Generator Test Set TTU-27/E
AC Power Supply, 115 Volt 400Hz

***Materials:***

None

***Personnel Required:***

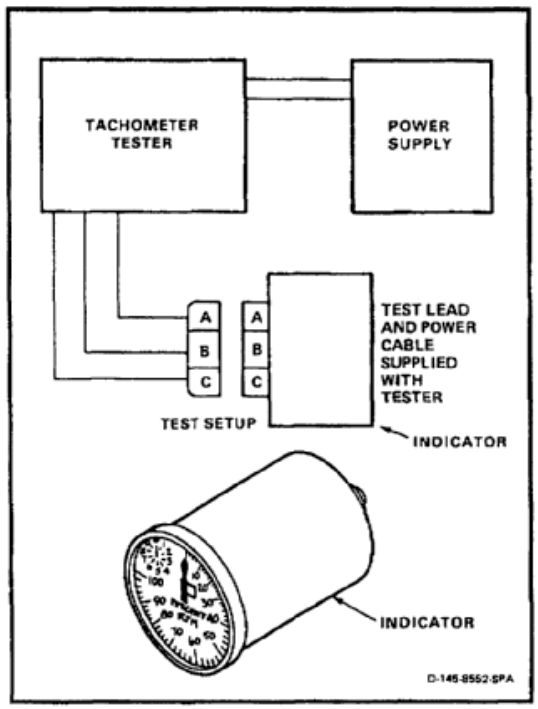
Aircraft Electrician
Inspector

***References:***

TM 1-1500-204-23
TM 11-6625-673-15-1

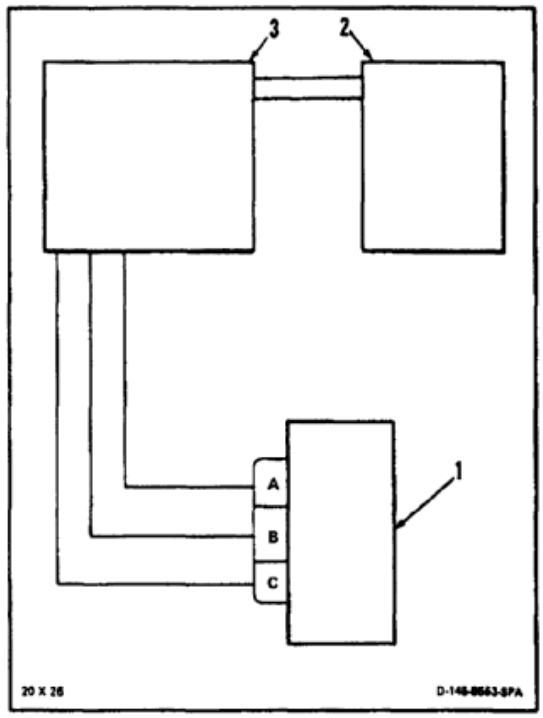
***Equipment Condition:***

Off Helicopter Task
Test Setup



1. Connect indicator (1) to test setup (TM 11-6625-673-15-1).
2. Turn on power supply (2).
3. Adjust tester (3) and check indicator (1) at each of the following settings. Tester shall read as follows: (TM 11-6625-673-15-1).

| INDICATOR READING (PERCENT RPM) | TESTER RPM X1 INDICATOR |
|---|---|
| 0 | 0 |
| 10 | 418 to 422 |
| 25 | 1044 to 1056 |
| 50 | 2083 to 2117 |
| 75 | 3134 to 3166 |
| 100 | 4179 to 4221 |
| 110 | 4597 to 4643 |




4. Repeat step 3 in reverse order.

***INSPECT***

5. Shutdown power supply (2).
6. Disconnect indicator (1) from test setup.

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-9 REMOVE NO. 1 GAS PRODUCER TACHOMETER GENERATOR 8-9

INITIAL SETUP

***Applicable Configurations:***

Without 74

***Tools:***

Powerplant Repairer's Tool Kit, NSN 5180-00-323-4944

***Materials:***

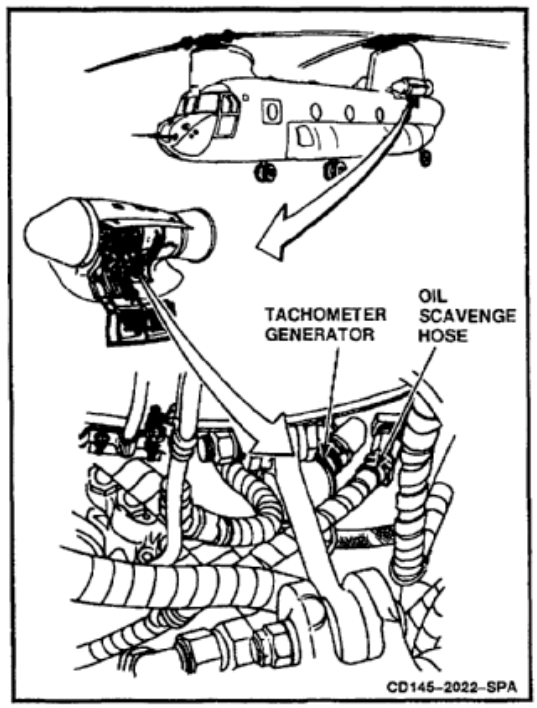
Cloths (E120)

***Personnel Required:***

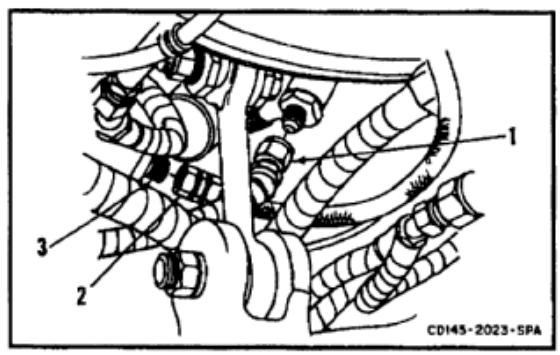
Aircraft Powerplant Repairer

***Equipment Condition:***

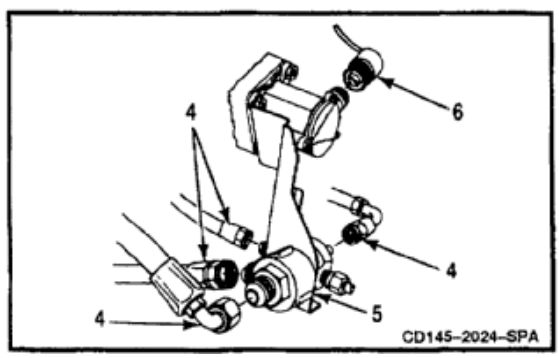
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Engine Access Cover Opened (Task 4-49)
Engine Work Platform Open (Task 2-2)



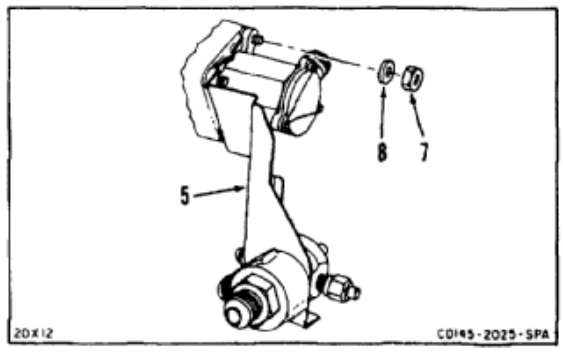

1. Disconnect oil scavenge hose (1). Cap hose immediately.
2. Disconnect fuel hose (2). Cap hose and fuel control fitting (3). Use container and cloths (E120) for spilled fluid.




3. Disconnect four drain hoses (4) from bracket (5).
4. Remove lockwire and disconnect cable connector (6).



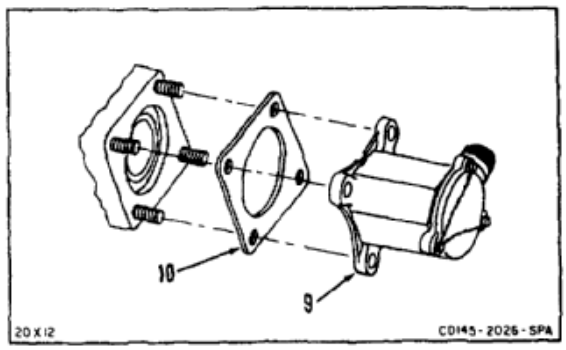
5. Remove four nuts (7) and washers (8).
6. Remove bracket (5).




7. Remove tachometer generator (9) and gasket (10).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 8-10 REMOVE NO. 2 GAS PRODUCER TACHOMETER GENERATOR 8-10

INITIAL SETUP

***Applicable Configurations:***

Without 74

***Tools:***

Powerplant Repairer's Tool Kit, NSN 5180-00-323-4944

***Materials:***

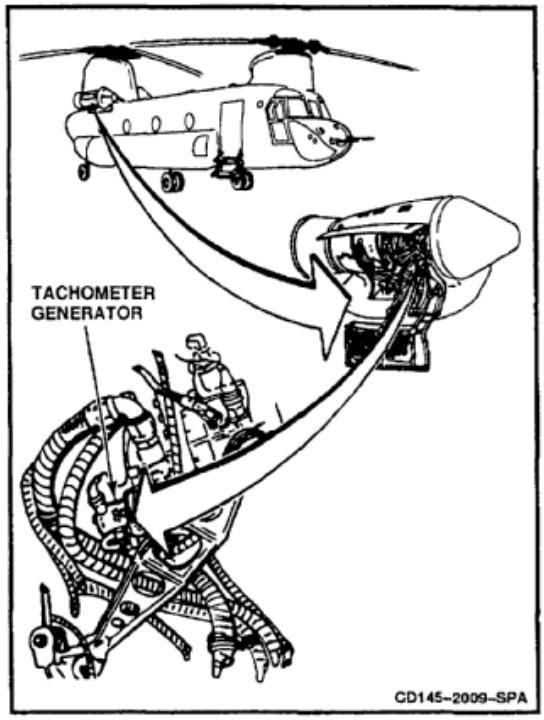
Cloths (E120)

***Personnel Required:***

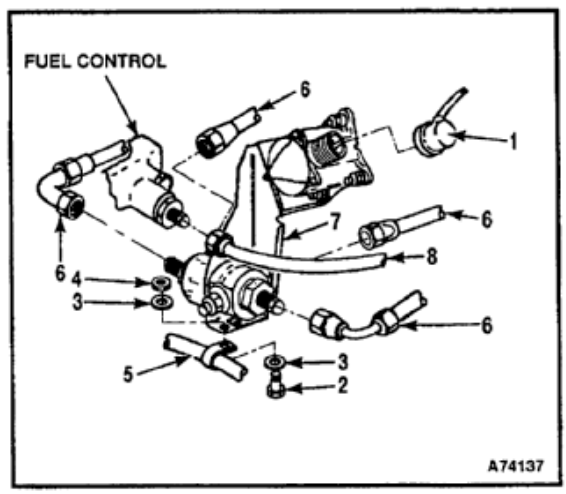
Aircraft Powerplant Repairer

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Engine Access Cover Open (Task 4-49)
Engine Work Platform Open (Task 2-2)



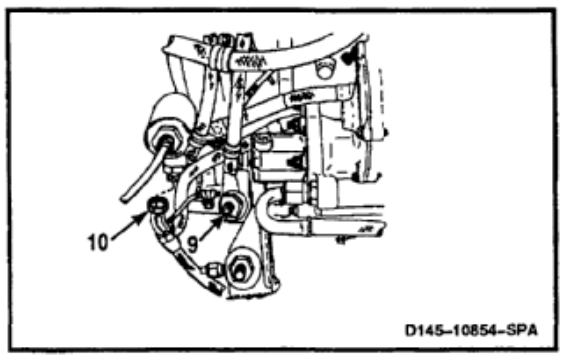

1. Remove lockwire and disconnect cable connector (1).
2. Remove screw (2), two washers (3), and nut (4). Disconnect clamp (5) from bracket (7).
3. Disconnect four drain hoses (6) from bracket (7). Use cloths (E120) for spilled fluid.
4. Disconnect fuel hose (8). Cap hose. Use cloths (E120) for spilled fluid.



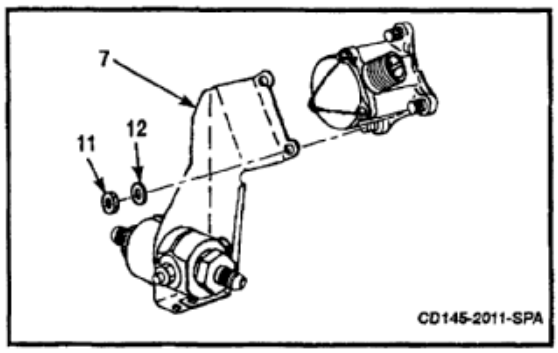
**NOTE**

Do not remove packing from fuel control fitting.

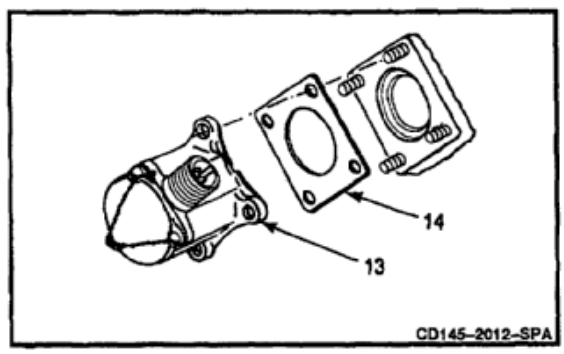
5. Remove fuel control fitting (9).
6. Disconnect oil scavenge hose (10). Cap hose immediately. Use cloths (E120) for spilled fluid.




7. Remove four nuts (11) and washers (12).
8. Remove bracket (7).

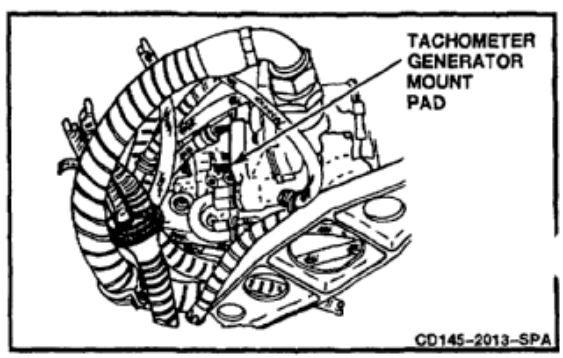



9. Remove tachometer generator (13) and gasket (14).




***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 8-11 TEST GAS PRODUCER TACHOMETER GENERATOR 8-11

INITIAL SETUP

***Applicable Configurations:***

Without 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Tachometer Indicator-Generator Test Set TTU-27/E
AC Power Supply, 115 Volt 400Hz

***Materials:***

None

***Personnel Required:***

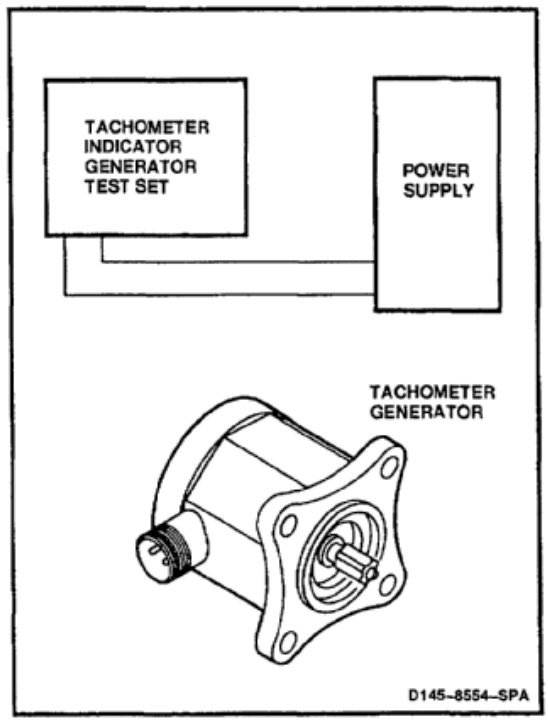
Aircraft Electrician
Inspector

***References:***

TM 1-1500-204-23
TM 11-6625-673-15-1

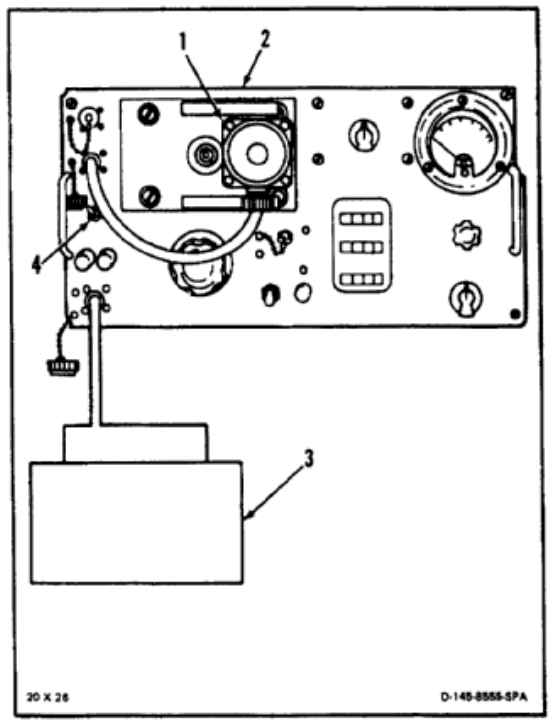
***Equipment Condition:***

Off Helicopter Task
Test Setup



## 8-11 TEST GAS PRODUCER TACHOMETER GENERATOR (Continued) 8-11

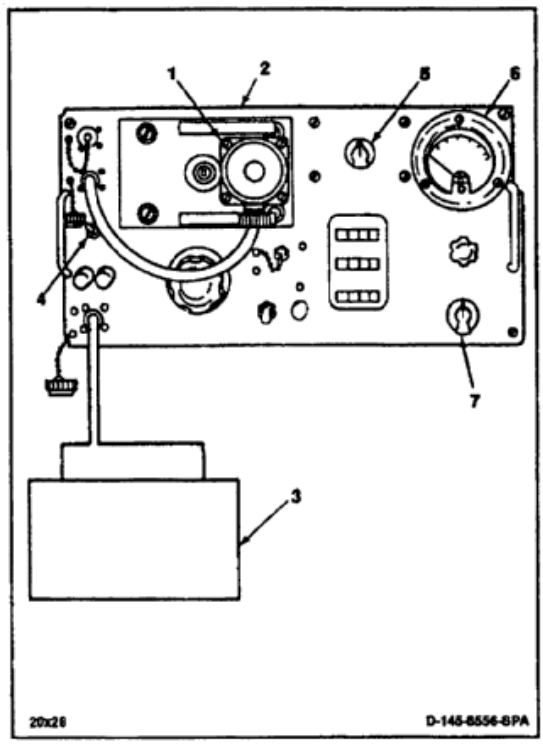
1. Attach generator (1) to test set (2) (TM 11-6625-673-15-1).
2. Turn on power supply (3).
3. Turn on and adjust test set (2). Check generator (1) at the following settings by operating test set switch (4) from TEST GEN to MASTER GEN and comparing indications (TM 11-6625-673-15-1).




| DRIVE SPEED RPM X1 INDICATOR | INDICATION PERCENT TEST SET INDICATOR | INDICATION TOLERANCE |
|---|---|---|
| 0 | 0 | ±0.5 |
| 1050 | 25 | ±0.6 |
| 2100 | 50 | ±0.8 |
| 3150 | 75 | ±0.5 |
| 4200 | 100 | ±0.5 |
| 4600 | 110 | ±0.5 |

4. Repeat step 2 in reverse order.

5. Adjust test set to obtain **2500 RPM** (TM 11-6625-673-15-1).
6. Set test switch (4) to TEST GEN.
7. Set LOAD IN OHMS switch (5) to 40Y. Check GENERATOR OUTPUT VOLTAGE (6) by setting TEST GEN switch (7) to positions A-B, B-C, and A-C. Output voltage shall not exceed **12.5 volts**. Voltage shall be same at all positions (TM 11-6625-673-15-1).
8. Repeat step 7, set LOAD IN OHMS switch (5) to 20Y. Voltage shall not exceed **12.5 volts** (TM 11-6625-673-15-1).
9. Shut down test set (2).
10. Shut down power supply (3).
11. Remove generator (1) from test set (2).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-12 INSTALL NO. 1 GAS PRODUCER TACHOMETER GENERATOR 8-12

INITIAL SETUP

***Applicable Configurations:***

Without 74

***Tools:***

Powerplant Repairer's Tool Kit, NSN 5180-00-323-4944

***Materials:***

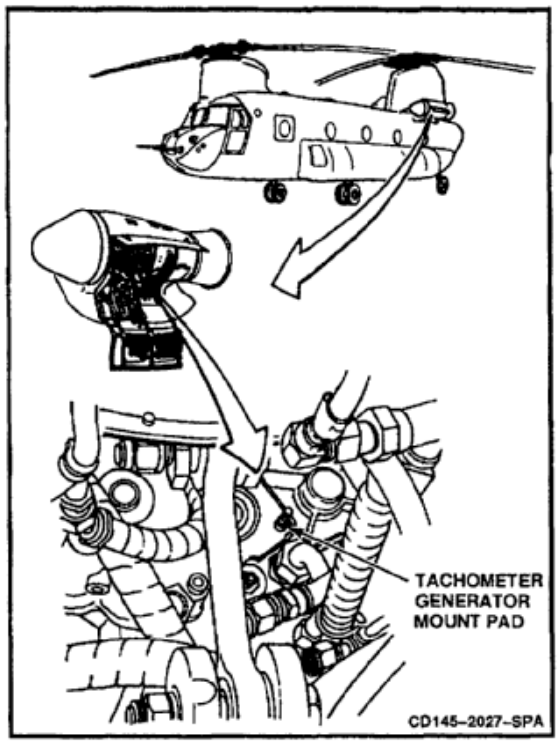
Plastilube (E280)
Lockwire (E231)

***Personnel Required:***

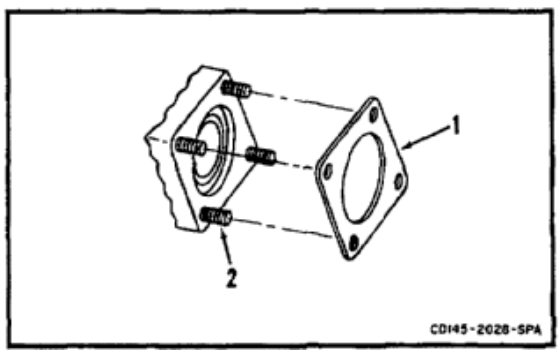
Aircraft Powerplant Repairer
Inspector

***References:***

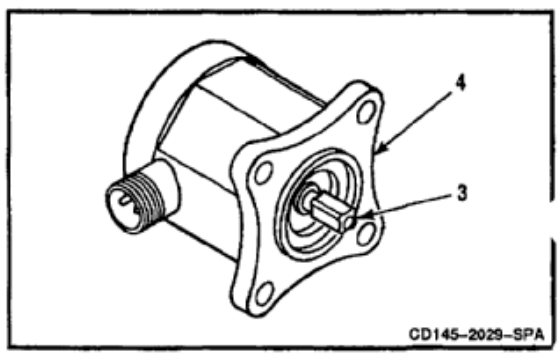
TM 55-1520-240-23P



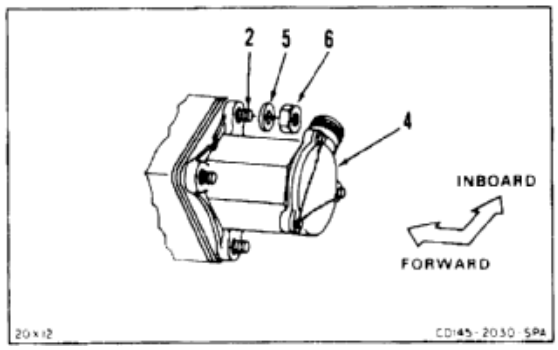

1. Install gasket (1) over mount pad studs (2).



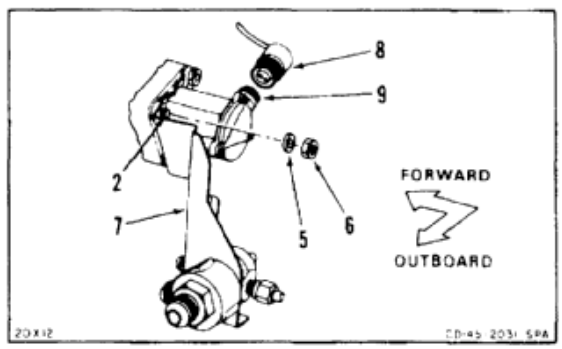

2. Lubricate shaft (3) on tachometer generator (4). Use plastilube (E280).



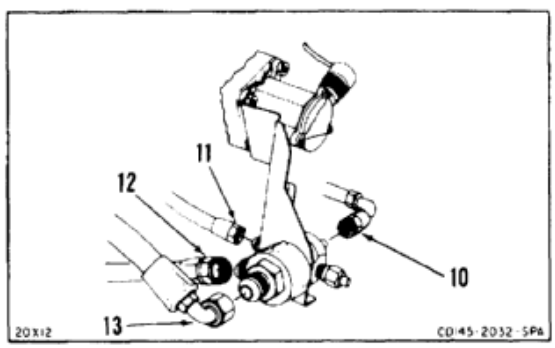
3. Position tachometer generator (4) on mount pad studs (2) with receptacle positioned at **2 o'clock**.
4. Install two washers (5) and nuts (6) on two inboard studs. Do not tighten nuts at this time.




5. Position bracket (7) over two outboard studs (2).
6. Install two washers (5) and nuts (6) on two outboard studs. Tighten four nuts.
7. Connect connector (8). Lockwire connector with lockwire (E231).




8. Connect drain hose (10).
9. Connect drain hose (11).
10. Connect drain hose (12).
11. Connect drain hose (13).

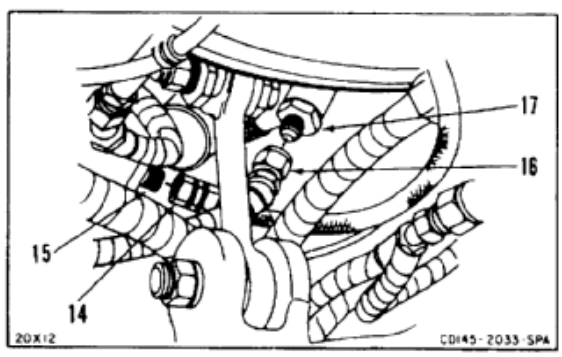



12. Remove cap from fuel control fitting (15) and connect fuel hose (14) to fitting.
13. Remove caps and connect oil scavenge hose (16) to dual chip detector housing fitting (17).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Check engine oil level (Task 1-52).
Operation check of gas producer tachometer generator (TM 55-1520-240-T).
Close engine access cover (Task 4-50).
Close engine work platform (Task 2-2).




END OF TASK

## 8-13 INSTALL NO. 2 GAS PRODUCER TACHOMETER GENERATOR 8-13

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Powerplant Repairer's Tool Kit, NSN 5180-00-323-4944

***Materials:***

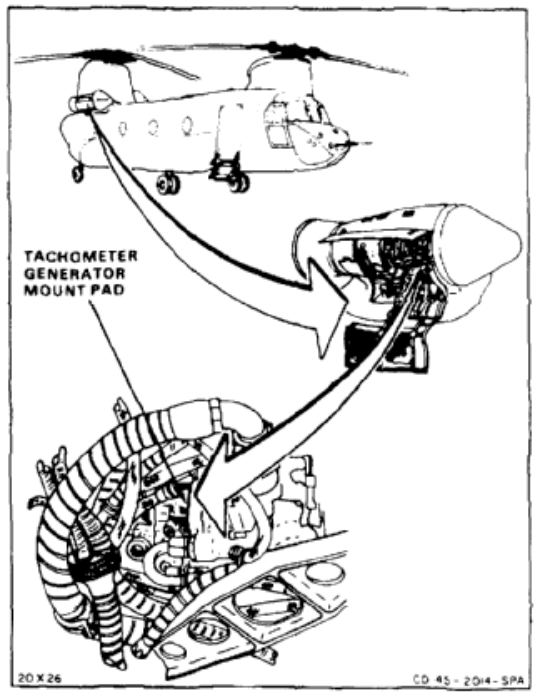
Plastilube (E280)
Lockwire (E231)

***Personnel Required:***

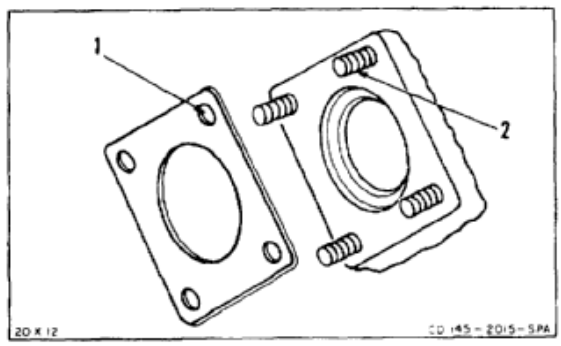
Aircraft Powerplant Repairer
Inspector

***References:***

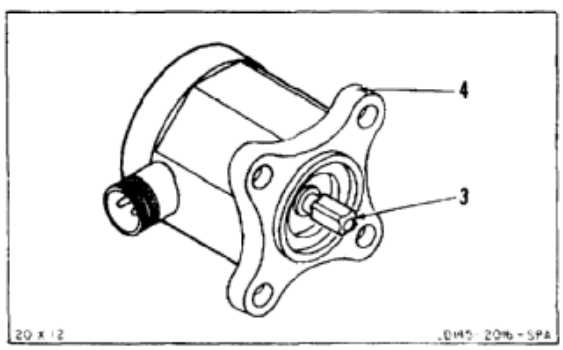
TM 55-1520-240-23P



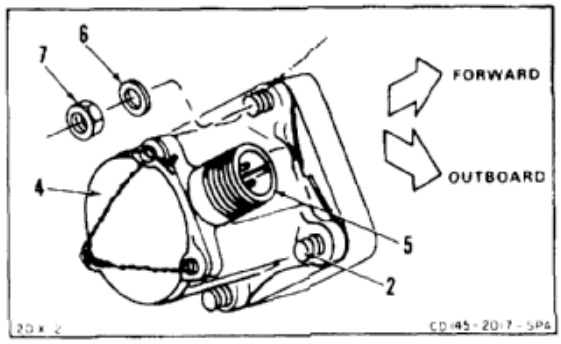

1. Install gasket (1) over mount pad studs (2).



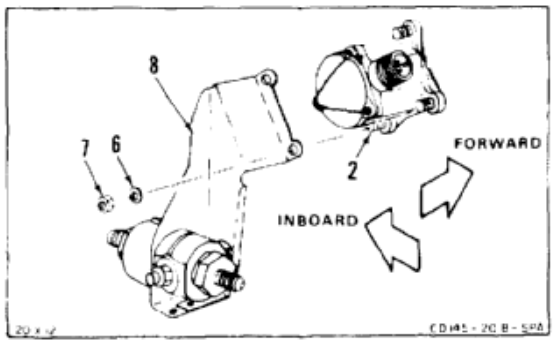

2. Lubricate shaft (3) on tachometer generator (4). Use plastilube (E280).



3. Position tachometer generator (4) on mount pad studs (2) with receptacle (5) positioned at **2 o'clock**.
4. Install two washers (6) and nuts (7) on two outboard studs (2). Do not tighten nuts at this time.



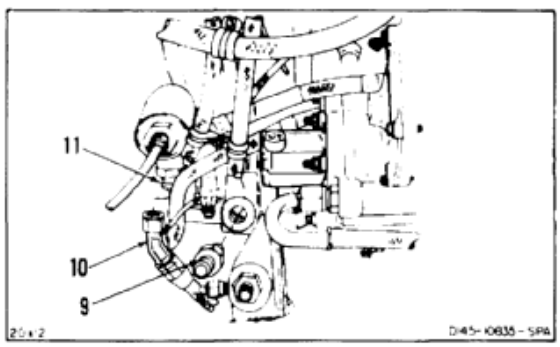

5. Position bracket (8) over two inboard studs (2).
6. Install two washers (6) and nuts (7) on two inboard studs (2). Tighten all four nuts (7).



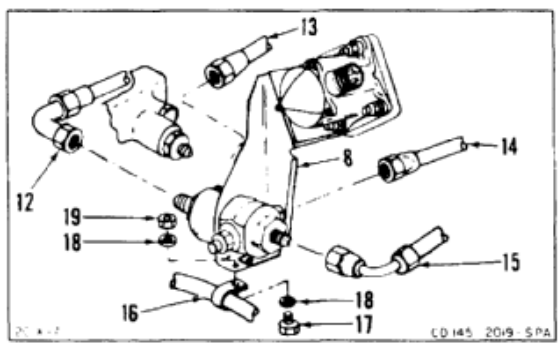

**NOTE**

Check that packing on fitting is servicable.

7. Install fuel control fitting (9).
8. Remove cap and connect oil scavenge hose (10) to dual chip detector housing fitting (11).

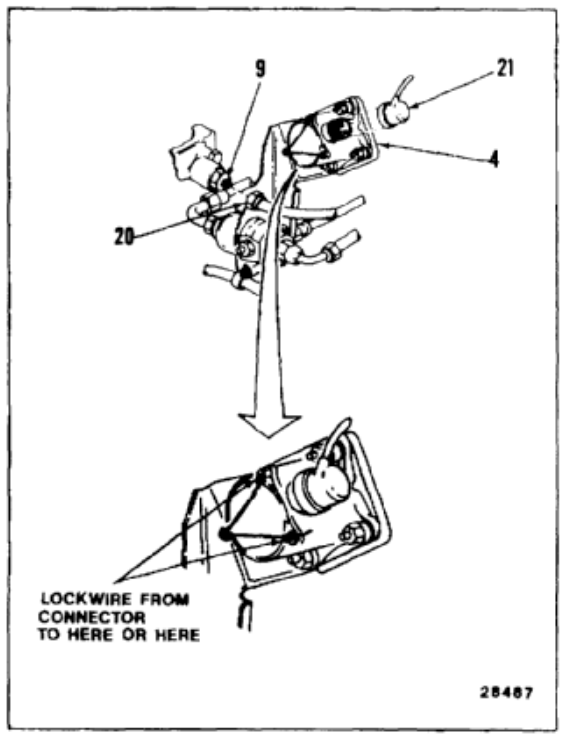



9. Connect drain hose (12).
10. Connect drain hose (13).
11. Connect drain hose (14).
12. Connect drain hose (15).
13. Connect clamp (16) to bracket (8). Install screw (17), two washers (18), and nut (19).



14. Connect fuel hose (20) to fitting (9).

15. Connect cable connector (21) to tachometer generator (4). Lockwire connector with lockwire (E231).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check of gas producer tachometer generator (TM 55-1520-240-T).
Close engine access cover (Task 4-50).
Close engine work platform (Task 2-2).

END OF TASK

## 8-14 TEST ENGINE OIL PRESSURE INDICATOR 8-14

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Test Set, Synchro TTU-23/E
Multimeter
AC Power Supply, 115 Volt 400 Hz

***Materials:***

None

***Personnel Required:***

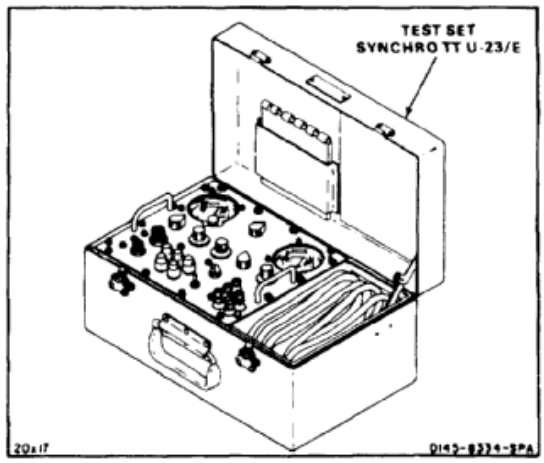
Aircraft Electrician
Inspector

***References:***

TM 1-1500-204-23
TM 11-6625-2843-14

***Equipment Condition:***

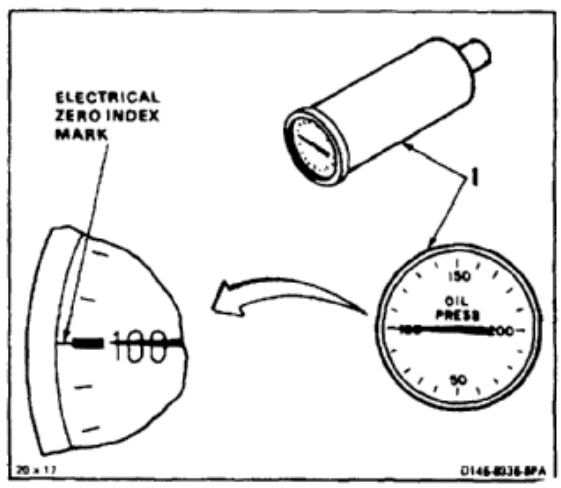
Off Helicopter Task




1. Set up test set (TM 11-6625-2843-14).
2. Connect indicator (1) to test set.
3. Check indicator (1) electrical zero (TM 11-6625-2843-14). Tip of indicator pointer shall be within **0.010 inch** of electrical zero index mark (**0.31 inch** long mark at **100 graduation**).

***INSPECT***

4. Check indicator calibration (TM 11-6625-2843-14) using listed readings.




| TRANSMITTER INDICATOR (PSI) | TEST SET INDICATOR ANGLE (DEGREES) |
|---|---|
| 0 | 0 to 5 |
| 40 | 67 to 77 |
| 80 | 139 to 149 |
| 120 | 209 to 233 |
| 160 | 281 to 295 |
| 200 | 353 to 360 |

***INSPECT***

5. Disconnect indicator (1) from test set.

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-15 REMOVE ENGINE OIL PRESSURE TRANSMITTER 8-15

INITIAL SETUP

***Applicable Configurations:***

Without 74

***Tools:***

Engine and Powerplant Repairer's Tool Kit, NSN 5180-00-323-4944

***Materials:***

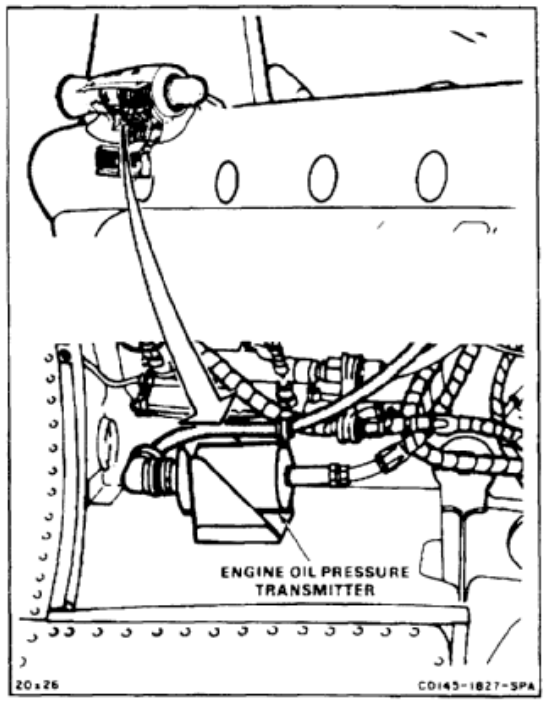
Cloths (E120)

***Personnel Required:***

Medium Helicopter Repairer

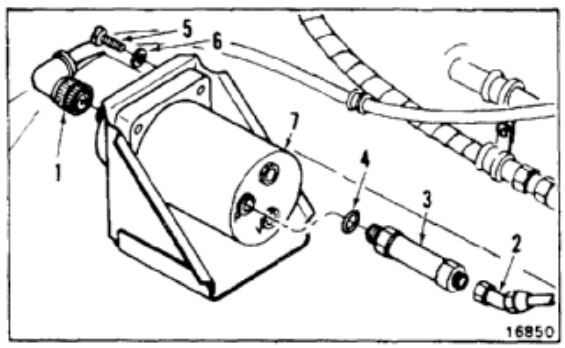
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Access Door Open (Task 4-49)
Engine Work Platform Open (Task 2-2)




**NOTE**

Procedure is same for No. 1 and No. 2 engine oil pressure transmitters. No. 2 transmitter is shown here.




1. Remove lockwire and disconnect cable plug (1).
2. Disconnect oil hose (2).
3. Remove dampener (3) and packing (4).
4. Wipe up oil with cloths (E120).
5. Remove lockwire and remove four screws (5) and washers (6).
6. Remove transmitter (7).

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-15.1 REMOVE ENGINE OIL PRESSURE TRANSMITTER AND VIBRATION ISOLATOR MOUNT 8-15.1

INITIAL SETUP

***Applicable Configurations:***

With 44

***Tools:***

Engine and Powerplant Repairer's Tool Kit, NSN 5180-00-323-4944

***Materials:***

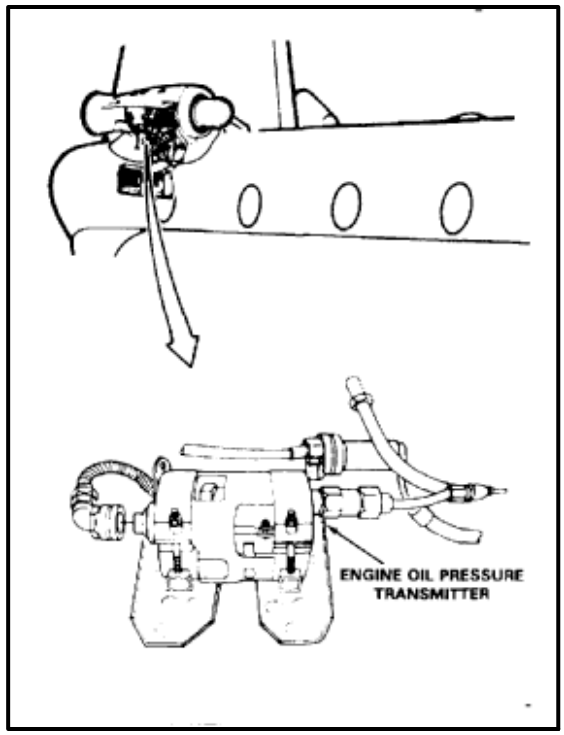
Cloths (E120)

***Personnel Required:***

Medium Helicopter Repairer

***Equipment Condition:***

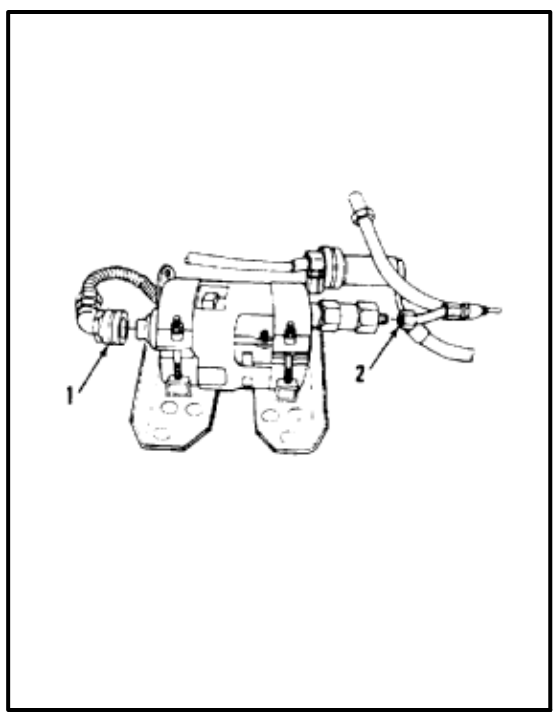
Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Access Door Open (Task 4-49)
Engine Work Platform Open (Task 2-2)



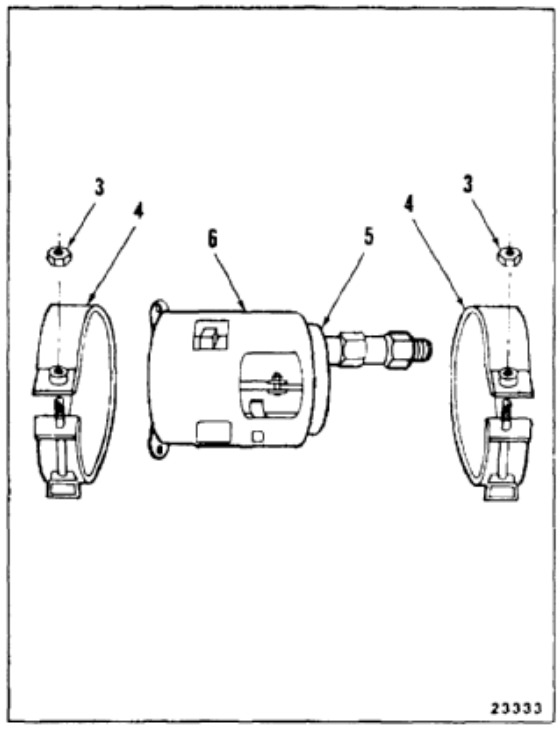

**NOTE**

Procedure is same for No. 1 and No. 2 engine oil pressure transmitters. No. 2 transmitter is shown here.

1. Remove lockwire and disconnect cable plug (1).
2. Disconnect oil hose (2).
3. Wipe up oil with cloths (E120).



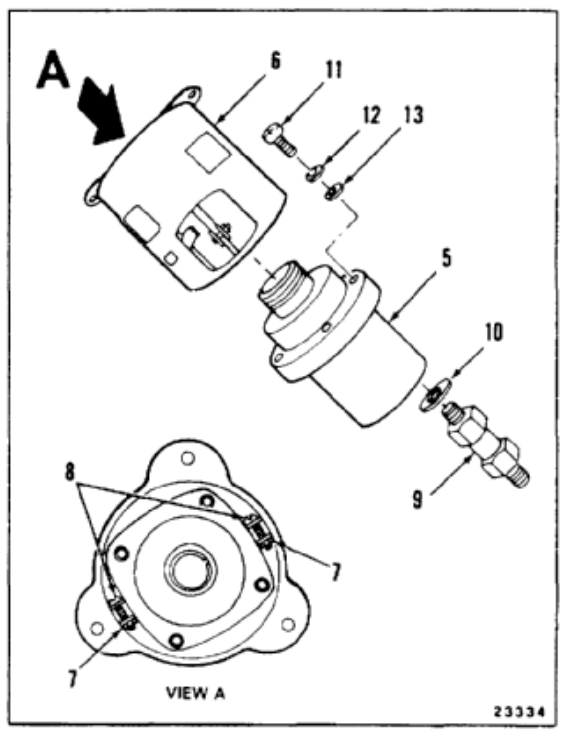
4. Remove two nuts (3) and open two clamps (4).
5. Remove transmitter (5) and mount (6).
6. Loosen two nuts (7) and screws (8).
7. Remove transmitter (5) from mount (6).




8. Remove dampener (9) and packing (10) from transmitter (5).
9. Remove screw (11), lockwasher (12), and washer (13) from transmitter (5).

***FOLLOW-ON MAINTENANCE:***

Replace transmitter isolator mount clamps (if necessary) (Task 8-15.2).




END OF TASK

## 8-15.2 REPLACE ENGINE OIL PRESSURE TRANSMITTER VIBRATION ISOLATOR CLAMPS 8-15.2

INITIAL SETUP

***Applicable Configurations:***

With 44

***Tools:***

Airframe Repairer's Tool Kit, NSN 5180-00-323-4876

***Materials:***

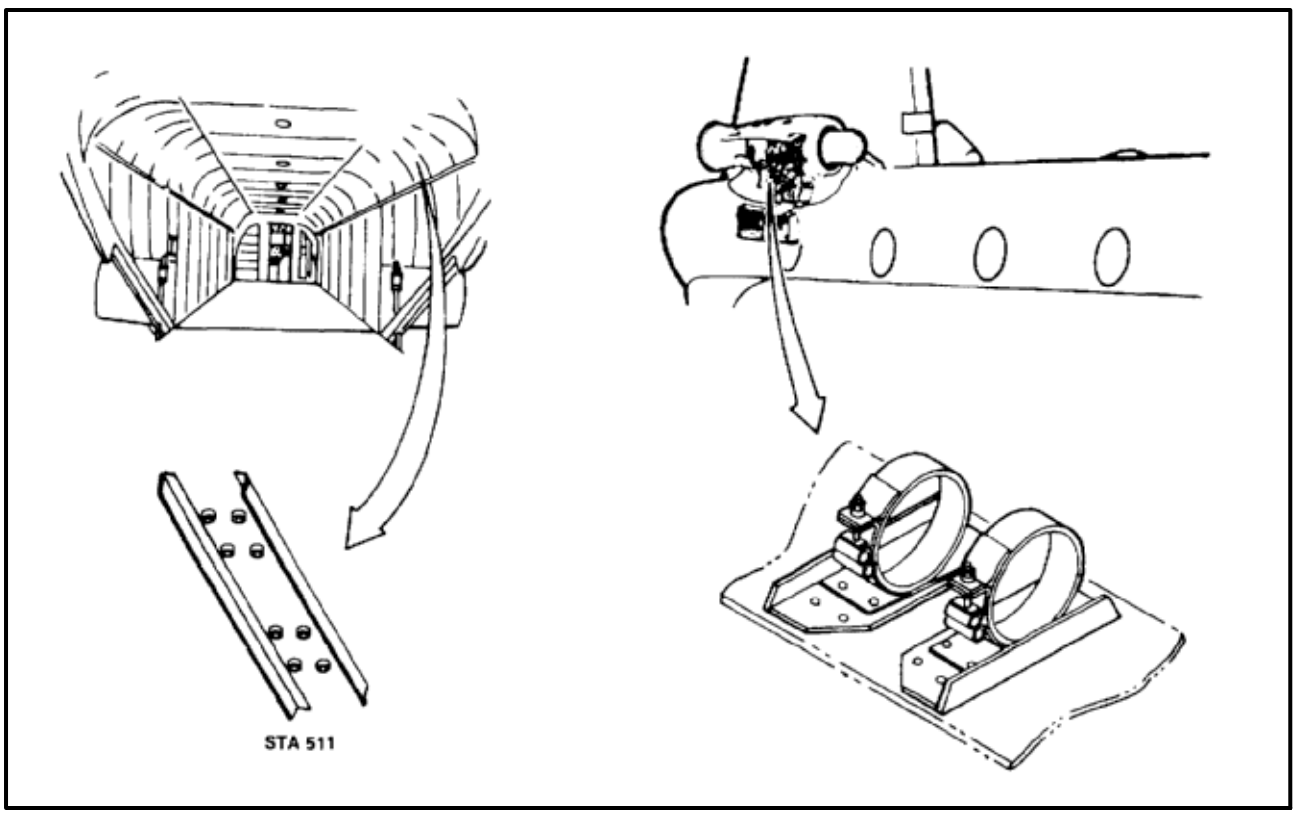
None

***Personnel Required:***

Aircraft Structural Repairer (2)
Inspector

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Access Door Open (Task 4-49)
Engine Work Platform Open (Task 2-2)
Cargo Ramp Open and Level (Task 2-2)
Engine Oil Pressure Transmitter and Vibration Isolator Mount Removed (Task 8-15.1)

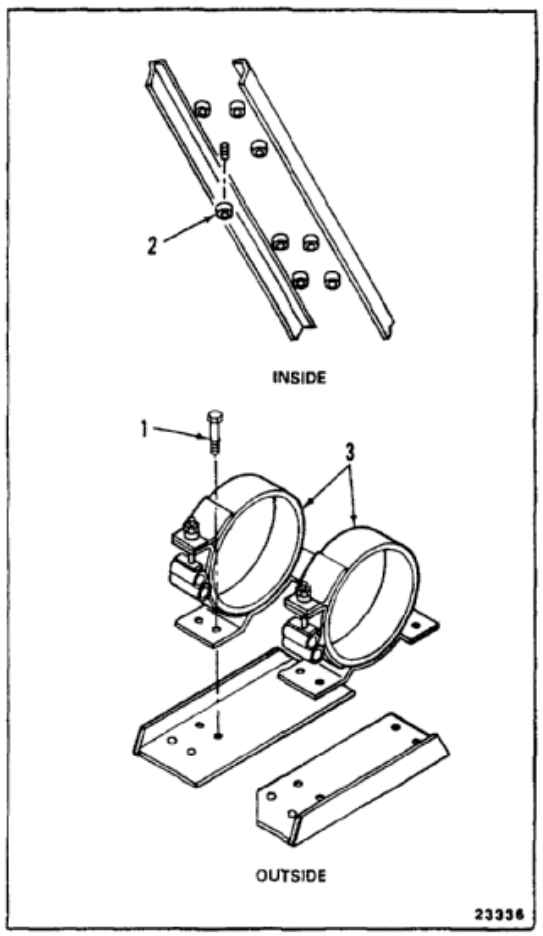


## 8-15.2 REPLACE ENGINE OIL PRESSURE TRANSMITTER VIBRATION ISOLATOR CLAMPS (Continued) 8-15.2

**NOTE**

Procedure is same for No. 1 and No. 2 isolator mount clamps. No. 2 clamps are shown here.

1. Position helper inside aft fuselage.
2. Remove eight bolts (1) from outside and eight collars (2) from inside.
3. Remove two clamps (3).
4. Position serviceable clamp (3) on structure with clamp opening outboard.
5. Install four bolts (1) from outside and four collars (2) from inside.
6. Repeat steps 4 and 5 for other clamp (3).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Install oil pressure transmitter and vibration isolator mount (Task 8-16.1).

END OF TASK

## 8-16 INSTALL ENGINE OIL PRESSURE TRANSMITTER 8-16

INITIAL SETUP

***Applicable Configurations:***

Without 44 and 74

***Tools:***

Engine and Powerplant Repairer's Tool Kit, NSN 5180-00-323-4944

***Materials:***

Lockwire (E231)
Petrolatum (E274)

***Parts:***

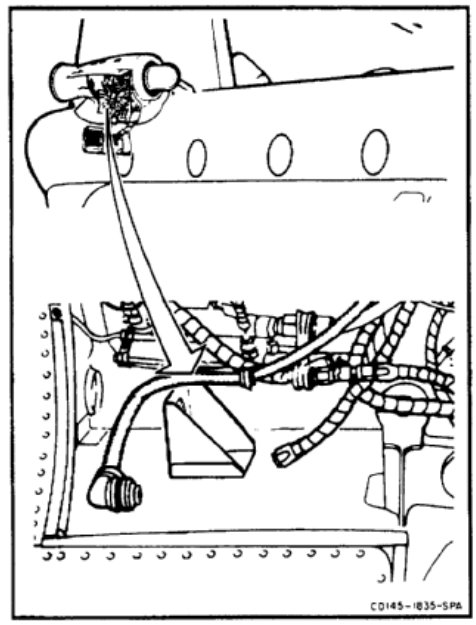
Preformed Packing

***Personnel Required:***

Medium Helicopter Repairer
Inspector

***References:***

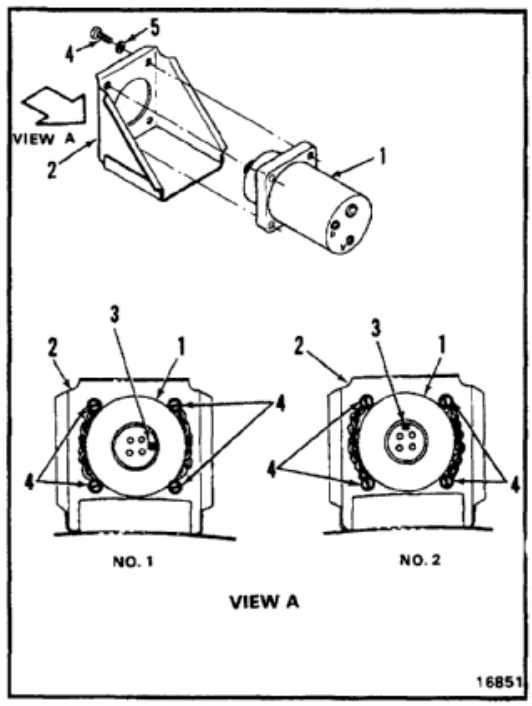
TM 55-1520-240-23P



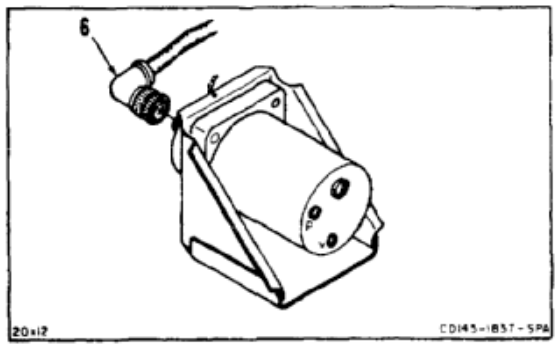

**NOTE**

Procedure is same for No. 1 and No. 2 engine oil pressure transmitters except as noted. No. 2 transmitter is shown here.

1. For No. 1 installation, position transmitter (1) in bracket (2). Make sure connector keyway (3) is inboard.
2. For No. 2 installation, position transmitter (1) in bracket (2). Make sure connector keyway (3) is up.
3. Install four screws (4) and washers (5).
4. Lockwire screws (4) together. Use lockwire (E231).



5. Connect and lockwire cable plug (6). Use lockwire (E231).

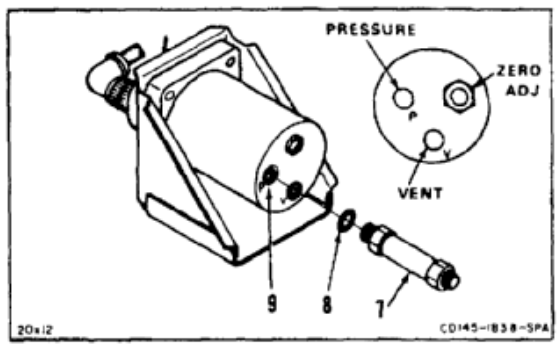



**NOTE**

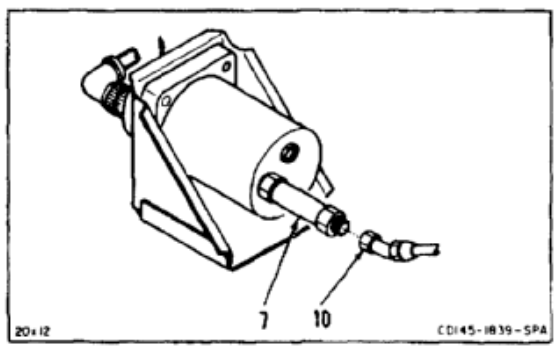
Transmitter has three ports at forward end: P, V, and capped port (zero adjust).

Arrow on dampener shall point toward transmitter.

6. Lubricate dampener (7) and packing (8). Use petrolatum (E274). Install dampener (7) and packing (8) in P port (9).



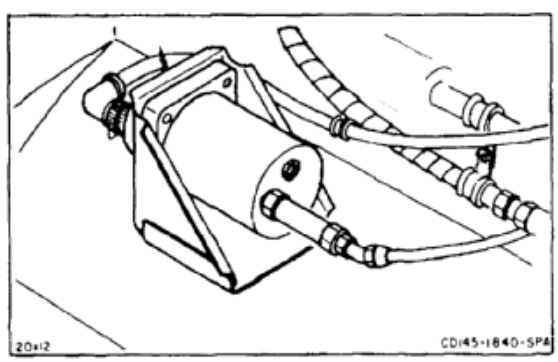

7. Lubricate thread of hose fitting (10). Use petrolatum (E274). Connect hose (10) to dampener (7).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Close engine access door (Task 4-50).
Close engine work platform (Task 2-2).
Perform engine operational check (TM 55-1520-240-T).




END OF TASK

## 8-16.1 INSTALL ENGINE OIL PRESSURE TRANSMITTER AND VIBRATION ISOLATOR MOUNT 8-16.1

INITIAL SETUP

***Applicable Configurations:***

With 44

***Tools:***

Engine and Powerplant Repairer's Tool Kit, NSN 5180-00-323-4944

***Materials:***

Lockwire (E227)
Petrolatum (E274)

***Parts:***

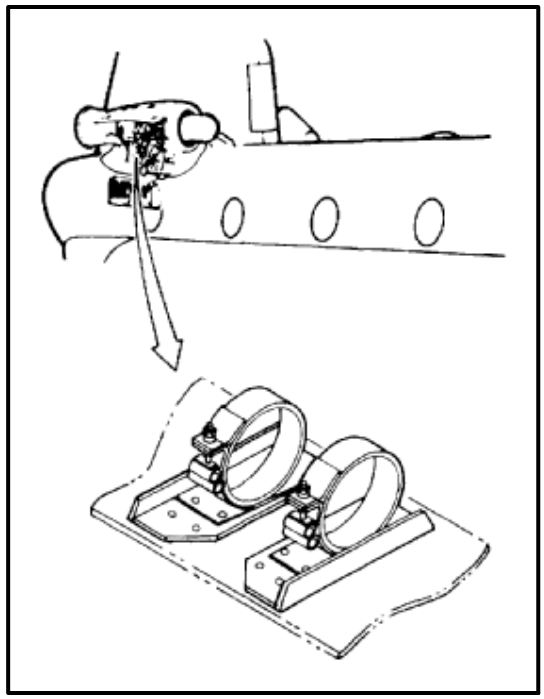
Preformed Packing

***Personnel Required:***

Medium Helicopter Repairer
Inspector

***References:***

TM 55-1520-240-23P



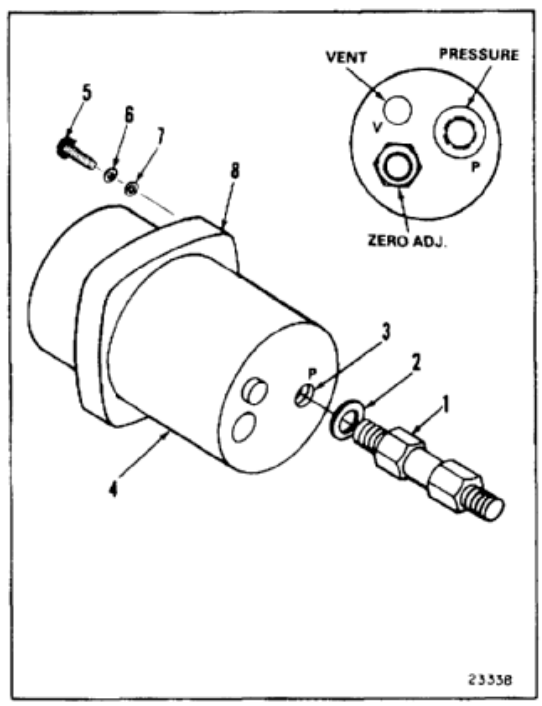
**NOTE**

Procedure is same for No. 1 and No. 2 engine oil pressure transmitters. No. 2 transmitter is shown here.

Transmitter has three ports at forward end: P, V, and capped port (zero adjust).

Arrow on dampener shall point toward transmitter.

1. Lubricate dampener (1) and packing (2). Use petrolatum (E274). Install dampener and packing in P port (3) of transmitter (4).
2. Install screw (5), lockwasher (6), and washer (7) in any hole of mounting flange (8).



## 8-16.1 INSTALL ENGINE OIL PRESSURE TRANSMITTER AND VIBRATION ISOLATOR MOUNT (Continued) 8-16.1

3. Insert transmitter (4) in mount (9). Position as follows:

**NOTE**

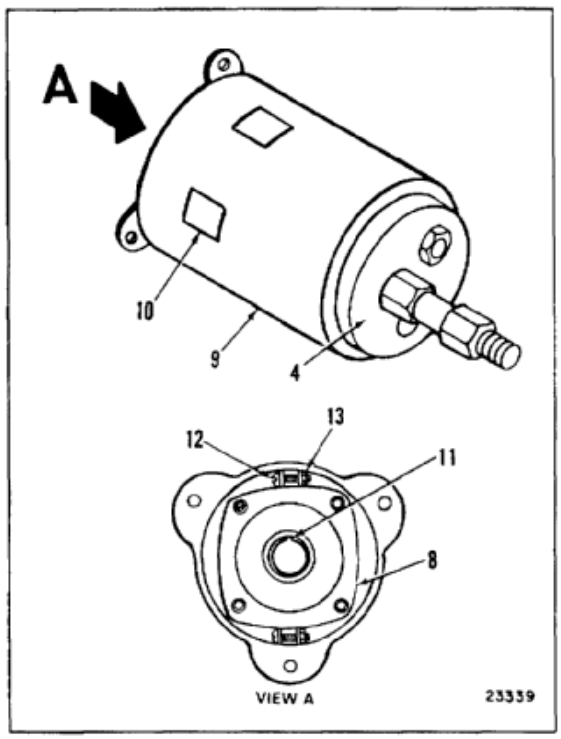
The left hand transmitter keyway must be between the **11 and 1 o'clock** position after installation.

The right hand transmitter keyway must be between the **5 and 7 o'clock** position after installation.

In order to clear installation of clamp it may be necessary to reposition fuel lines.

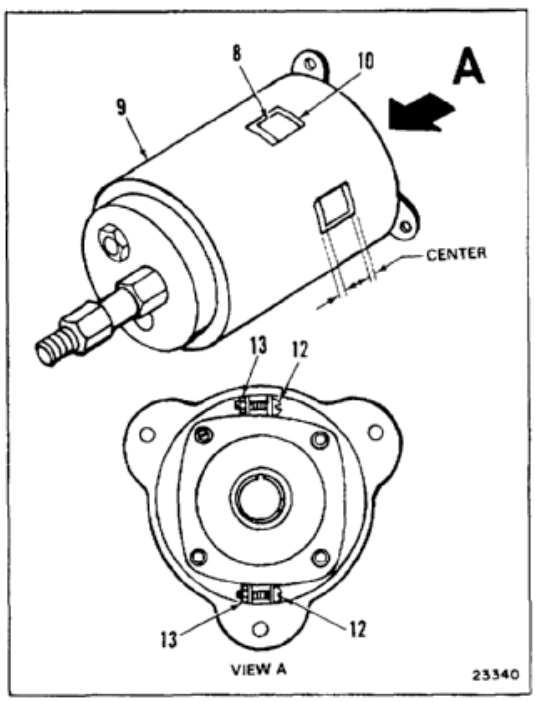
a. Rotate transmitter (4) until four corners of mounting flange (8) are within four square mount holes (10).

b. Rotate transmitter (4) until keyway (11) and two screws (12) and nuts (13) are approximately aligned as shown.



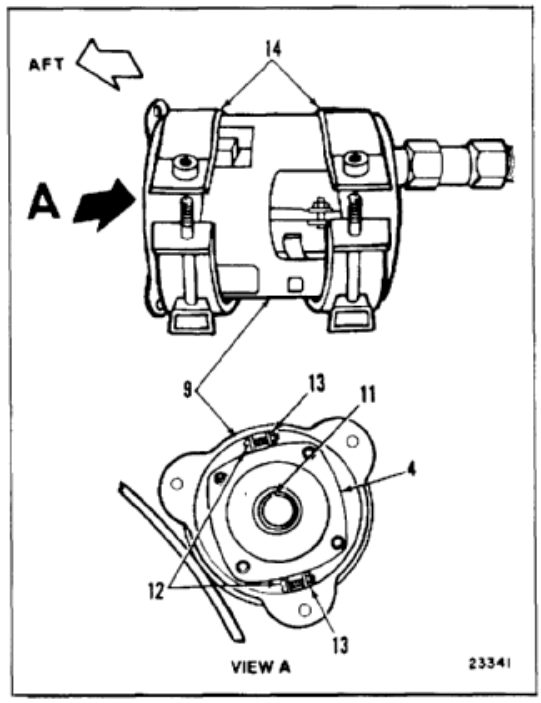

c. Center transmitter mounting flange (8) within square mount holes (10).

4. Tighten two screws (12) and nuts (13) in mount (9).



**8-16.1 INSTALL ENGINE OIL PRESSURE TRANSMITTER AND VIBRATION ISOLATOR MOUNT (Continued)** **8-16.1**

5. Position mount (9) in two clamps (14). Make sure keyway (11) is facing up. Make sure one screw (12) and nut (13) is facing up.
6. If transmitter (4) and mount (9) is not positioned as shown, loosen two screws (12) and nuts (13) and go to step 3.

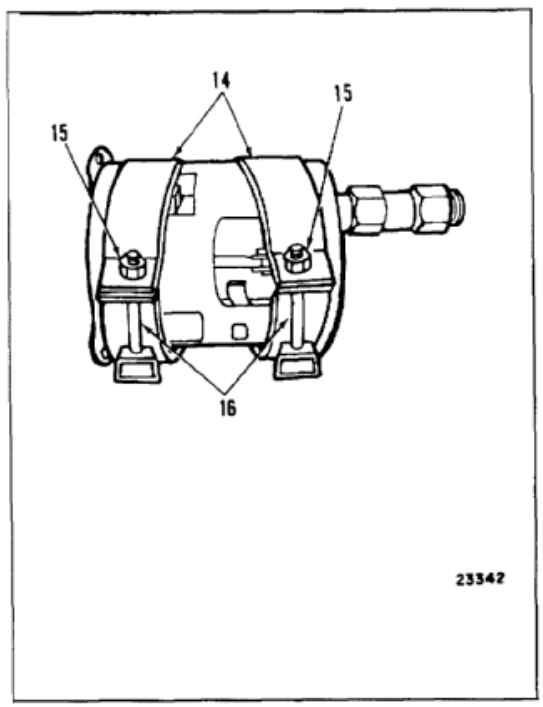



7. Close clamps (14) and install two nuts (15) on t-bolts (16).

**NOTE**

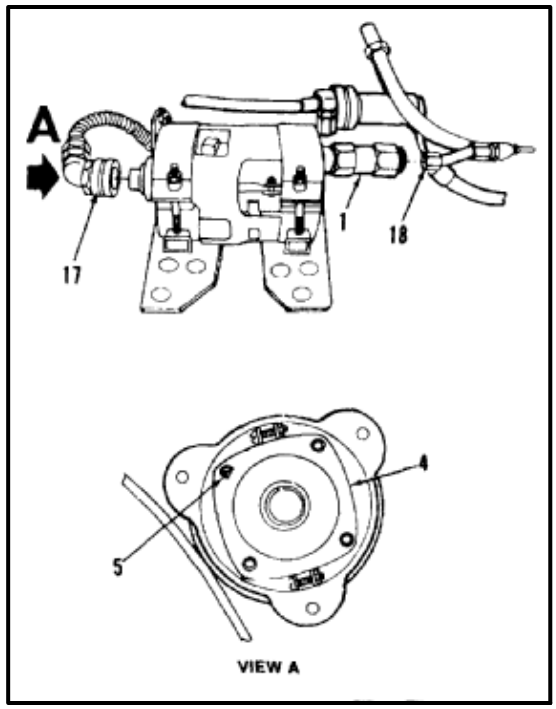
After tightening, minor distortion of mount is acceptable.

8. Tighten nuts (15) until one to three threads of t-bolt (16) show above each nut.



9. Connect cable plug (17) to transmitter (4).
10. Lockwire cable plug (17) to screw (5). Use lockwire (E227).
11. Lubricate thread of hose fitting (18). Use petrolatum (E274). Connect hose to dampener (1).

***INSPECT***




***FOLLOW-ON MAINTENANCE:***

Close engine access door (Task 4-50).
Close engine work platform (Task 2-2).
Perform engine operational check (TM 55-1520-240-T).

END OF TASK

## 8-17 TEST ENGINE OIL TEMPERATURE INDICATOR 8-17

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 6625-00-556-4915
Thermometer Tester, Electrical
DC Power Supply, 0-50 Volt
Multimeter

***Materials:***

None

***Personnel Required:***

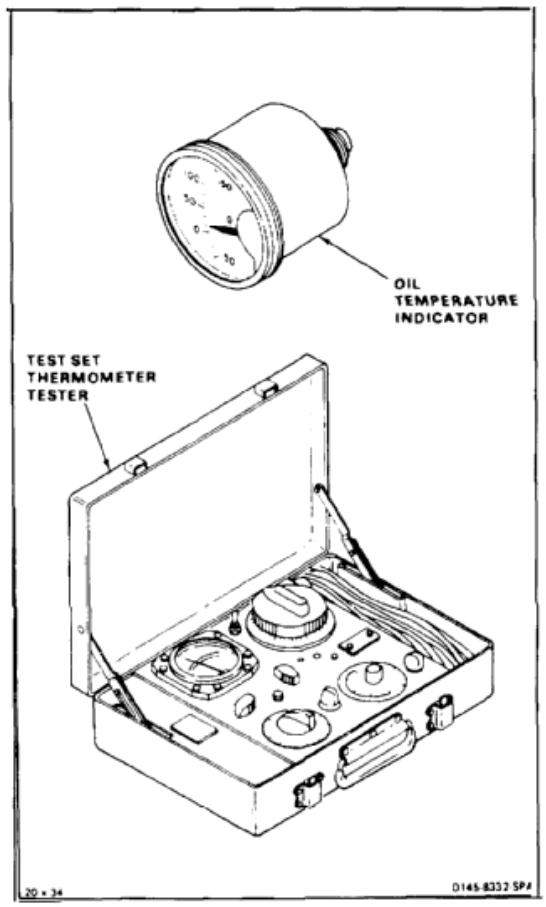
Aircraft Electrician
Inspector

***References:***

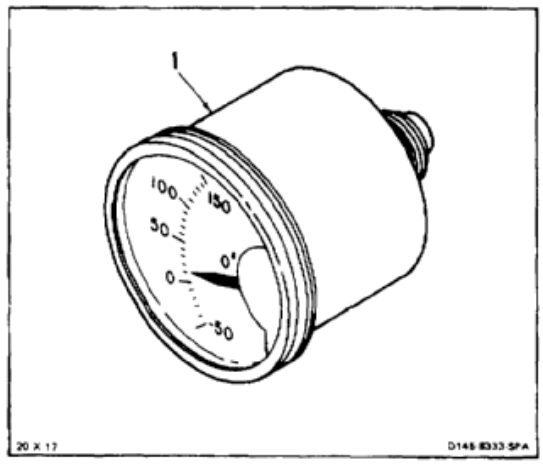
TM 1-1500-204-23
TM 55-6695-200-15

***Equipment Condition:***

Off Helicopter Task



1. Set up test set (1) (TM 55-6695-200-15).
2. Connect indicator (1) to test set.
3. Perform scale error test (TM 55-6695-200-15), at **28.5 vdc**. Indicator readings shall be within tolerance as follows:




| INDICATOR TEST POINT ºC (ºF) | TEST SET AT NORMAL VOLTAGE (28.5) RANGE ºC (ºF) |
|---|---|
| –70 (–94) | –66 to 74º (–86.8 to –101.2º) |
| –30 (–22) | –27 to 33º (16.6 to –27.4º) |
| 0 (32) | –2 to 2º (28.4 to 35.6º) |
| 30 (86) | 28 to 32º (82.4 to 89.6º) |
| 80 (176) | 78 to 82º (172.4 to 179.6º) |
| 120 (248) | 117 to 123º (242.6 to 253.4º) |
| 150 (302) | 146 to 154º (294.8 to 309.2º) |

4. Repeat step 2 at **22.5 vdc**.

| INDICATOR TEST POINT ºC (ºF) | TEST SET AT REDUCED VOLTAGE (22.5) RANGE ºC (ºF) |
|---|---|
| –70 (–94) | –67 to –73º (–88.6 to –99.4º) |
| –30 (–22) | –27 to 33º (–16.6 to –27.4º) |
| 0 (32) | –2 to 2º (28.4 to 35.6º) |
| 30 (86) | 28 to 32º (82.4 to 89.6º) |
| 80 (176) | 78 to 82º (172.4 to 179.6º) |
| 120 (248) | 117 to 123º (242.6 to 253.4º) |
| 150 (302) | 147 to 155º (296.6 to 307.4º) |

***INSPECT***

5. Disconnect indicator (1) from test set.

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-18 REPLACE ENGINE OIL TEMPERATURE TRANSMITTER (BULB) 8-18

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Engine and Powerplant Repairer's Tool Kit, NSN 5180-00-323-4944

***Materials:***

None

***Personnel Required:***

Aircraft Powerplant Repairer

***References:***

TM 55-2840-254-23P
TM 55-2840-254-23

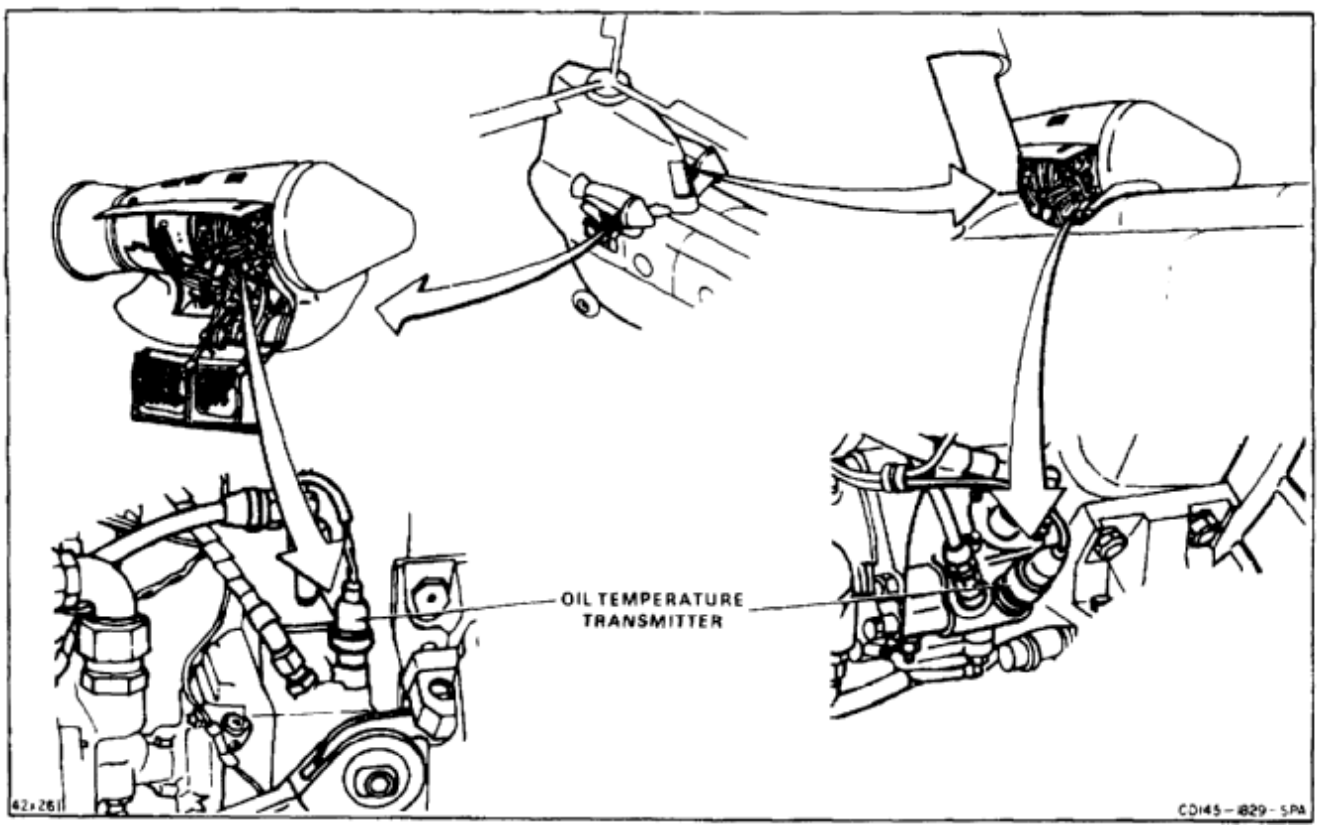
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Engine Access Door Open (Task 4-49)
Engine Work Platform Open (Task 2-2)

**NOTE**

Engine oil temperature transmitter is forward on right of both engines.

1. Replace engine oil temperature transmitter (TM 55-2840-254-23).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-18.1 ZERO ADJUST PILOT'S OR COPILOT'S TORQUEMETER INDICATOR 8-18.1

INITIAL SETUP

***Applicable Configurations:***

Without 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Test Cable (E42)

***Materials:***

None

***Personnel Required:***

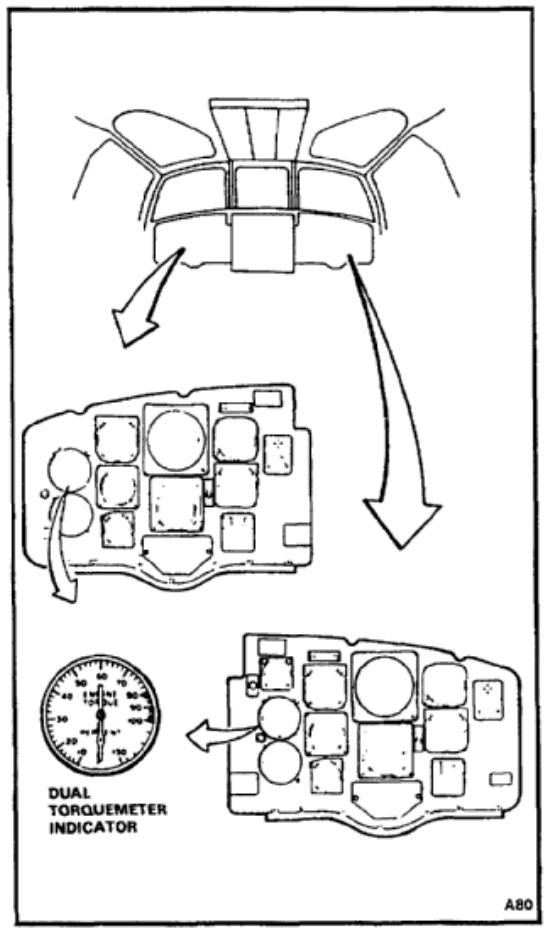
Aircraft Electrician
Inspector

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Engine Access Cover Open (Task 4-49)
Engine Work Platform Open (Task 2-2)

***References:***

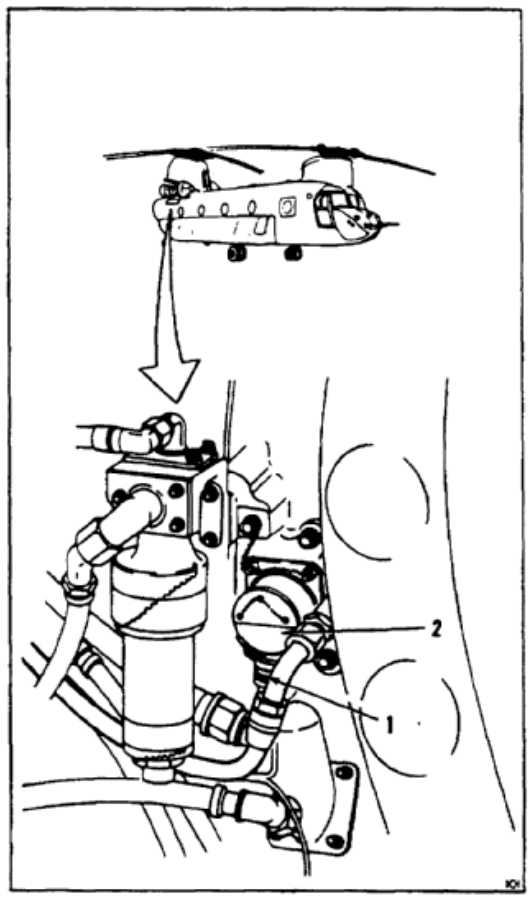
TM 55-6600-200-20
Task 1-36
Task 1-38
Task 1-39



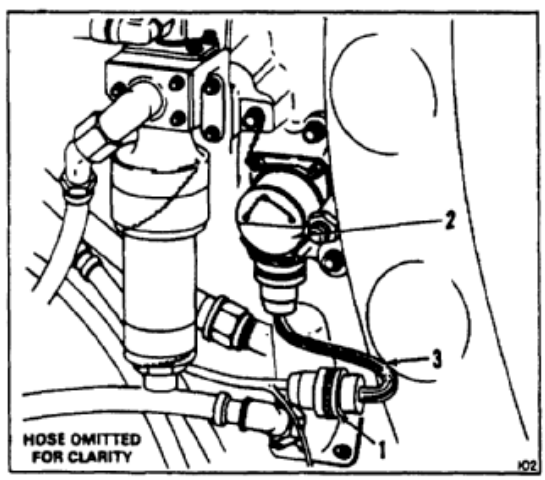

**NOTE**

Procedure is the same to adjust pilot's or copilot's torquemeter indicator, except for pointers affected. Adjusting the copilot's indicator affects both No. 1 pointers. Adjusting the pilot's indicator affects both No. 2 pointers. Adjustment of pilot's indicator is shown here. Intermixing of P/N 114ES270-3 and P/N 114ES270-4 on the same aircraft is not allowed.

1. Disconnect electrical connector (1) from torquemeter junction box (2).




2. Connect test cable (E42) (3) between connector (1) and junction box (2).

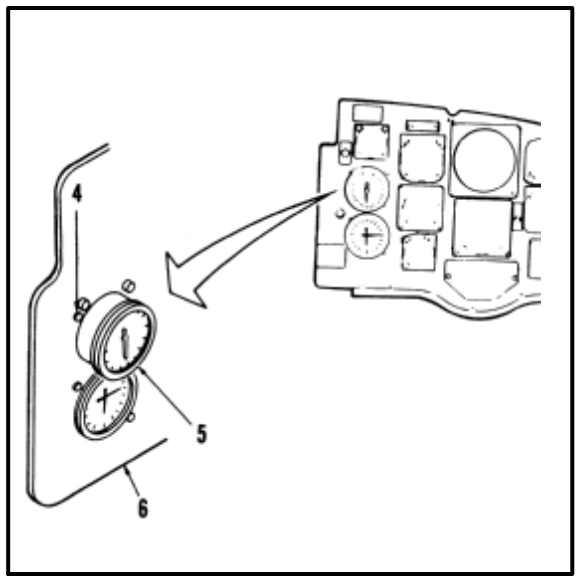


3. Loosen round head clamp screw (4).

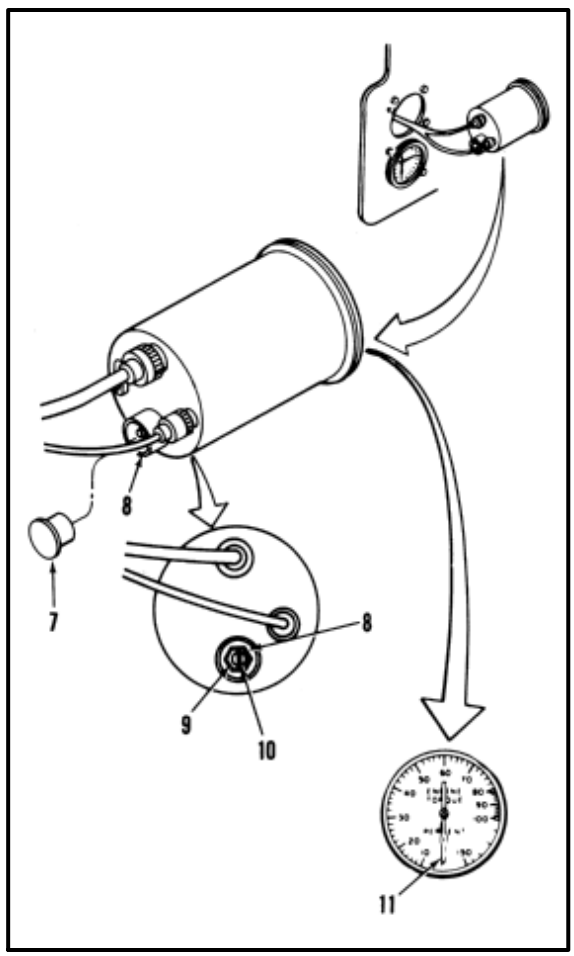
CAUTION

Be careful when handling indicators. Rough handling will damage indicators.

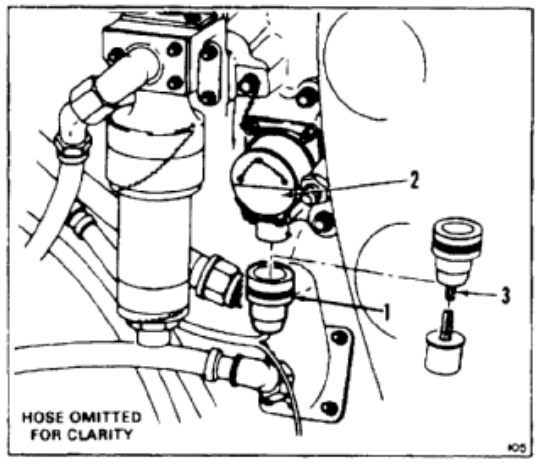
4. Grasp indicator (5) at case rim. Then pull indicator from panel (5).




5. Remove cap (7) from resistor R101 (8).
6. Connect battery (Task 1-39).
7. Start and run APU (Task 1-38).
8. Loosen lock but (9) on resistor R101 (8). Turn screw (10) until pilot's and copilot's No. 2 pointers (11) are as near to **0** as possible.
9. Tighten lock nut (9). Install cap (7) over resistor R101 (8).
10. Install indicator (5) in panel (6).
11. Tighten round head clamp screw (4).
12. Apply index mark from indicator (5) to panel (6) (TM 55-6600-200-20).



13. Shut down APU (Task 1-36).
14. Disconnect battery (Task 1-39).
15. Disconnect and remove test cable (E42) (3).
16. Connect electrical connector (1) to torquemeter junction box (2).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Close engine access cover (Task 4-50).
Close engine work platform (Task 2-3).
Perform operational check of engine torquemeter system (TM 55-1520-240-T).

END OF TASK

## 8-19 TEST DUAL TORQUEMETER INDICATOR (AVIM) 8-19

INITIAL SETUP

***Applicable Configurations:***

Without 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
AC Power Supply, 115 Volt 400 Hz
Meter Test Set, TS-682A/GSM-1
Soldering Gun
Crimping Tool, NSN 5120-00-075-2544
Connector, PT06CE8-4S
Connector, M53476W12-10S
Wire, No. 20, Insulated

***Personnel Required:***

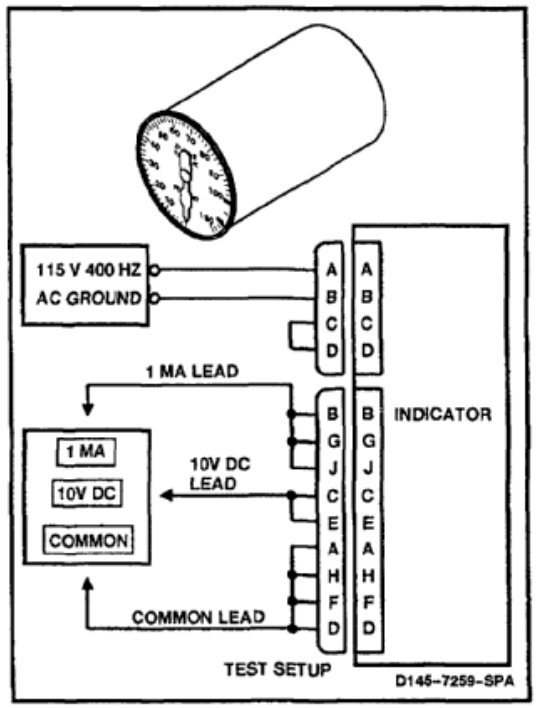
Aircraft Electrician
Inspector

***References:***

TM 11-6625-277-14

***Equipment Condition:***

Off Helicopter Task
Electrical Test Setup

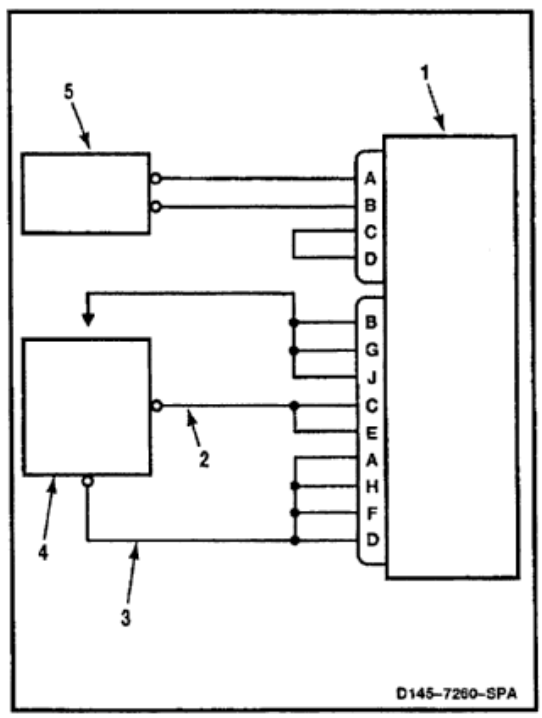



**NOTE**

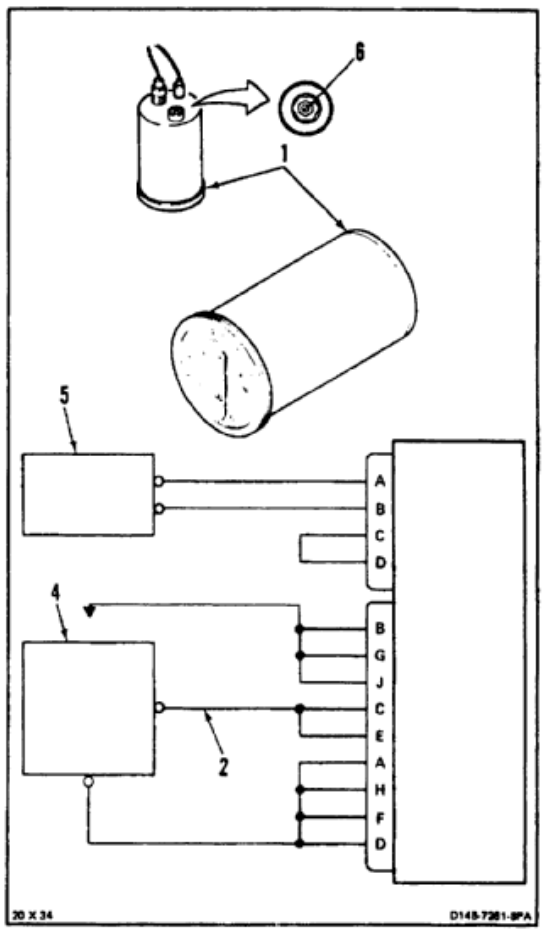
Connect **1 MA or 10 vdc** test leads to indicated jack only when specified in test procedure.

Intermixing of P/N 114ES270-3 and 114ES70-4 on the same aircraft is not allowed.

1. Connect indicator (1) to test setup.
2. Connect **10 vdc** lead (2) and COMMON lead (3) to meter test set (4) jacks.
3. Apply power to power supply (5).



4. Adjust meter test set (4) DIRECT CURRENT COURSE and DIRECT CURRENT FINE controls until DC MICROAMPERE meter reads **7.5 vdc** (TM 11-6625-277-14).
5. Adjust indicator zero adjust screw (6) on back of indicator (1), until No. 1 pointer reads **0**.
6. Adjust meter test set (4) DIRECT CURRENT COURSE and DIRECT CURRENT FINE controls until DC MICROAMPERE meter reads **0** (TM 11-6625-277-14).
7. Shut down power supply (5).
8. Disconnect **10 vdc** lead (2) from meter test set (4).



9. Connect 1 MA lead (7) to meter test set (4).

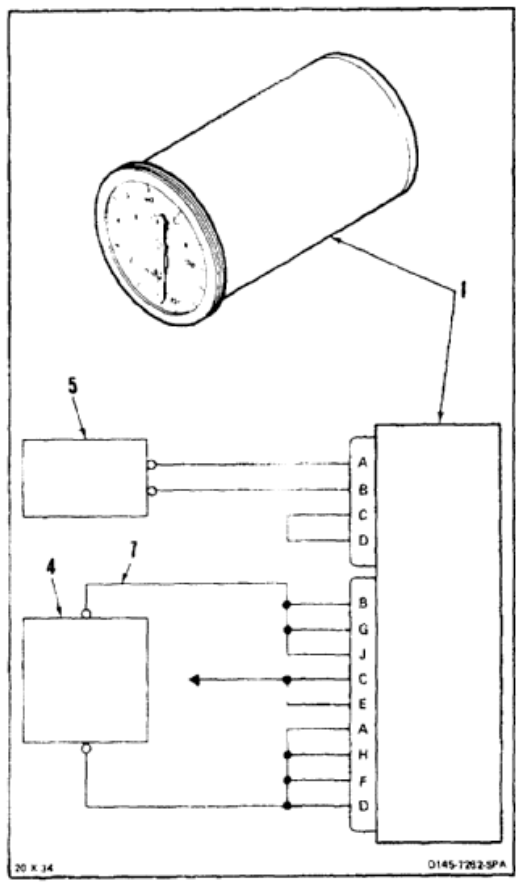
10. Apply power to power supply (5).

**NOTE**

When testing No. 1 pointer of indicator, No. 2 pointer will also move. Ignore No. 2 pointer until test of No. 1 is complete.

11. Adjust meter test set (4) DIRECT CURRENT COURSE and DIRECT CURRENT FINE controls to obtain indicator (1) settings as indicated below. For indicator setting listed test set MICROAMPERE reading shall be within range as listed below:

| TORQUEMETER INDICATOR READING | TS-682A/GSM-1 DC MICROAMPERE RANGE (UA) |
|---|---|
| 10 | 51 to 63 |
| 20 | 117 to 129 |
| 40 | 277 to 289 |
| 60 | 450 to 462 |
| 80 | 599 to 611 |
| 100 | 694 to 706 |
| 150 | 813 to 825 |




12. Repeat step 11 and check indicator (1) pointer No. 2. Meter test set (4) readings shall be within tolerance as listed in step 11.

13. Adjust meter test set (4) DIRECT CURRENT COURSE and DIRECT CURRENT FINE to **0 dc** (TM 11-6625-277-14).

14. Shutdown power supply (5).

15. Disconnect indicator (1) from test setup.

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-20 REMOVE ENGINE TORQUEMETER POWER SUPPLY 8-20

INITIAL SETUP

***Applicable Configurations:***

Without 74

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Workstand

***Materials:***

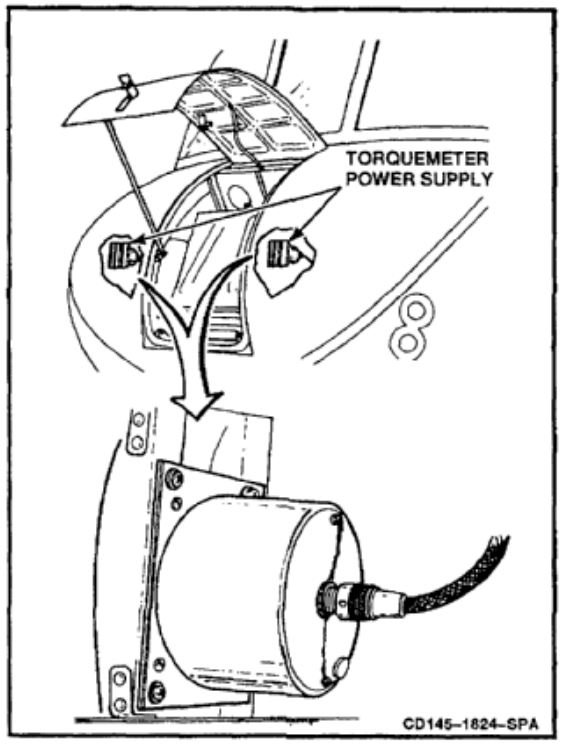
Cloths (E120)

***Personnel Required:***

Medium Helicopter Repairer (2)

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Hydraulic Power Off
Electrical Power Off
Nose Enclosure Door Open (Task 2-2)



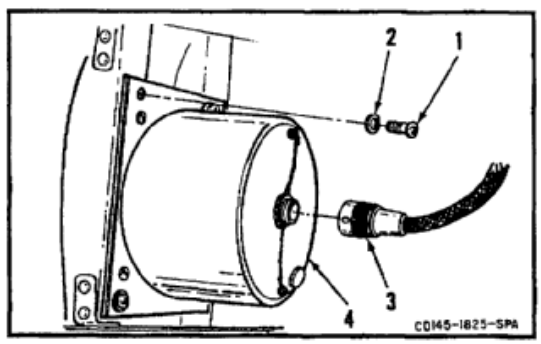

**NOTE**

Procedure is same for left and right power supply. Left power supply is shown here.

1. Place cloths (E120) on lower windshield panel to protect surface.
2. Remove four screws (1) and washers (2).
3. Disconnect cable plug (3).

**NOTE**

Power supply will not pass through nose enclosure. Vibration absorber blocks way.




4. Have helper remove power supply (4) through cockpit.

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-21 TEST TORQUEMETER POWER SUPPLY (AVIM) 8-21

INITIAL SETUP

***Applicable Configurations:***

Without 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
DC Power Supply, 0 to 30 VDC
Electronic Counter AN/USM 26 or Equal
Voltmeter, Differential, AC/DC ±0.2 Percent Accuracy (Fluke 803B or Equal)
Resistor Precision, 1 Ohm ±0.1 Percent, 3 Watt (Dale Type, RS-2 or Equal)
Resistance Decade, 0 to 2500 Ohms ±1 Percent
Inductors, Toroid 2.5 mH (Thordarson Meissner TOR 7231 or Equal) (5)
Switch, MS25125-1 or Equal (2)
Connector, MS3126-8-4S
Crimping Tool, NSN 5120-00-075-2455
Wire, No. 20, Insulated

***Materials:***

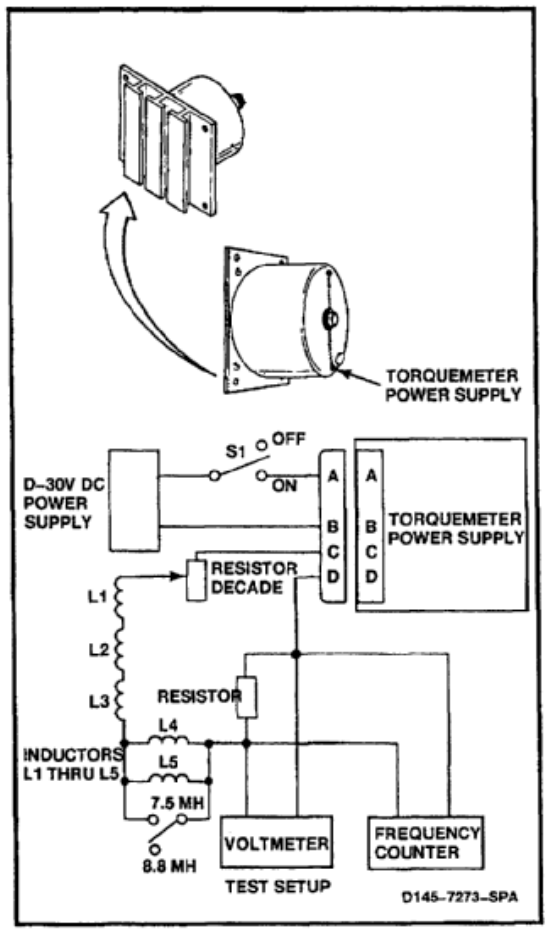
None

***Personnel Required:***

Aircraft Electrician
Inspector

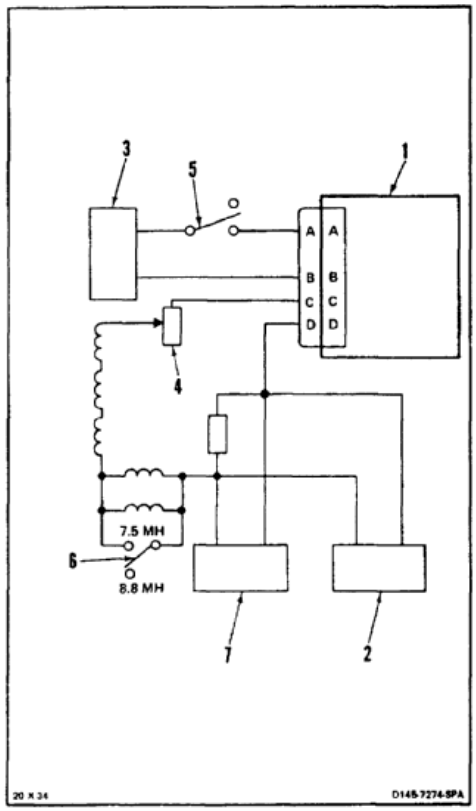
***Equipment Condition:***

Off Helicopter Task
Electrical Test Setup



***TEST TORQUEMETER POWER SUPPLY***

1. Connect torquemeter power supply (1) to test setup.
2. Set electronic counter (2) to minimum time base of **10 seconds**.
3. Turn on power supply (3) and adjust power supply (3) to **30 vdc**.
4. Adjust resistance decade (4) to **20 ohms**.
5. Set switch (5) to ON.
6. Set switch (6) to **7.5 mH** position (closed). Check voltmeter (7). Voltmeter shall read **537 to 543 millivolts**. Check electronic counter (2). Counter shall read **1,995 to 2.005 Hz**.
7. Adjust resistance decade (4) to **30 ohms**. Check voltmeter (7) and counter (2). Readings shall be same as readings in step 6.
8. Set switch (6) to **8.8 mH** position (open). Check voltmeter (7) and counter (2). Readings shall be same as readings in step 6.
9. Adjust resistance decade (4) to **20 ohms**. Check voltmeter (7) and counter (2). Readings shall be same as reading in step 6.
10. Adjust power supply (3) to **24 vdc**. Repeat steps 6 thru 9. Check voltmeter (7) and counter (2). Readings at each step shall be same as readings in step 6.




***SHUTDOWN***

11. Set switch (5) to OFF.
12. Shutdown power supply (3).
13. Disconnect torquemeter power supply (1) from test setup.

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-22 INSTALL ENGINE TORQUEMETER POWER SUPPLY 8-22

INITIAL SETUP

***Applicable Configurations:***

Without 74

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Workstand

***Materials:***

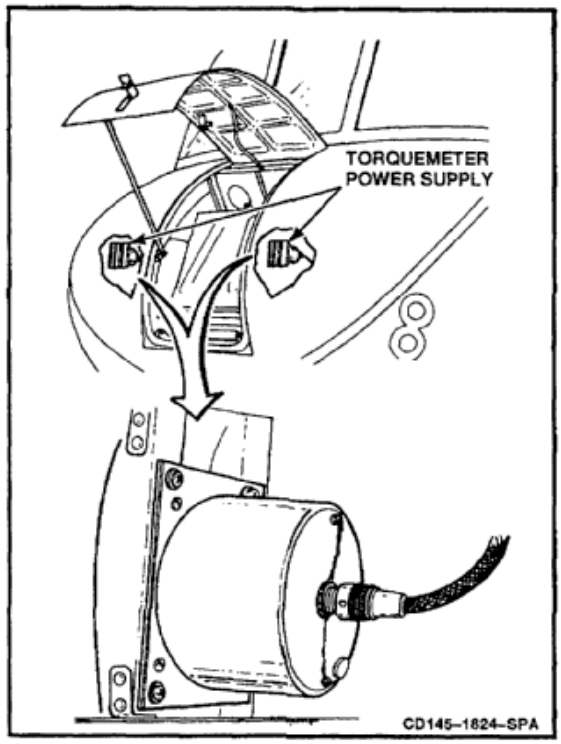
None

***Personnel Required:***

Medium Helicopter Repairer (2)
Inspector

***References:***

TM 55-1520-240-23P

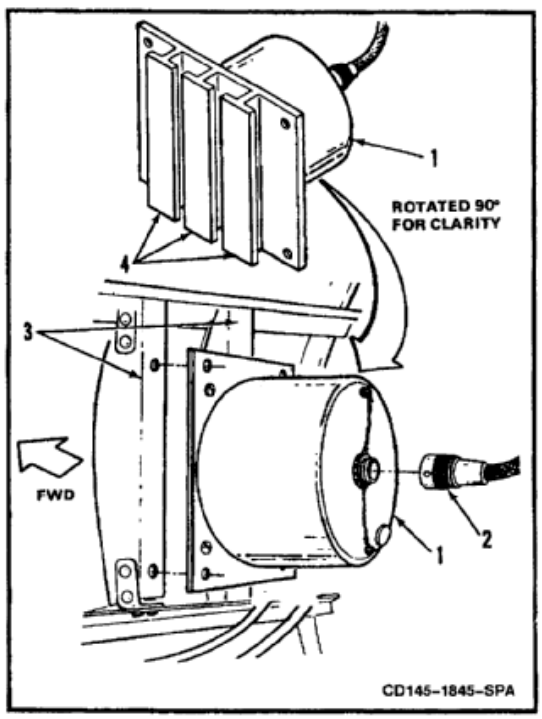



**NOTE**

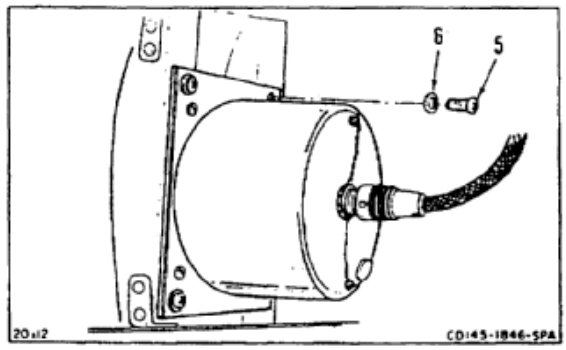
Procedure can be used for left or right power supply. Left power supply is shown here.

Power supply will not pass through nose enclosure. Vibration absorber blocks way.

1. Have helper inside cockpit, guide power supply (1) from cockpit into nose enclosure.
2. Connect cable plug (2) to power supply (1).
3. Position power supply (1) on mounting bracket (3) with cooling fins (4) vertical and forward.



4. Install four screws (5) and washers (6).
5. Remove cloths from lower windshield panel.




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Zero adjust engine torquemeter indicator (Task 8-18.1).
Close nose enclosure door (Task 2-2).
Perform engine operational check (TM 55-1520-240-T).

END OF TASK

## 8-22.1 REMOVE NO. 1 OR NO. 2 TORQUE SIGNAL PROCESSOR/POWER SUPPLY 8-22.1

INITIAL SETUP

***Applicable Configurations:***

With 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

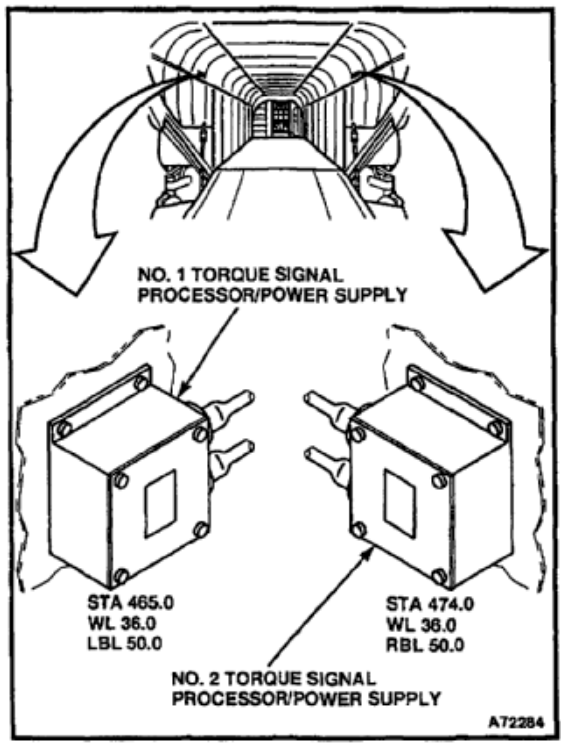
Paper Tags (E264)

***Personnel Required:***

Aircraft Electrician

***Equipment Conditions:***

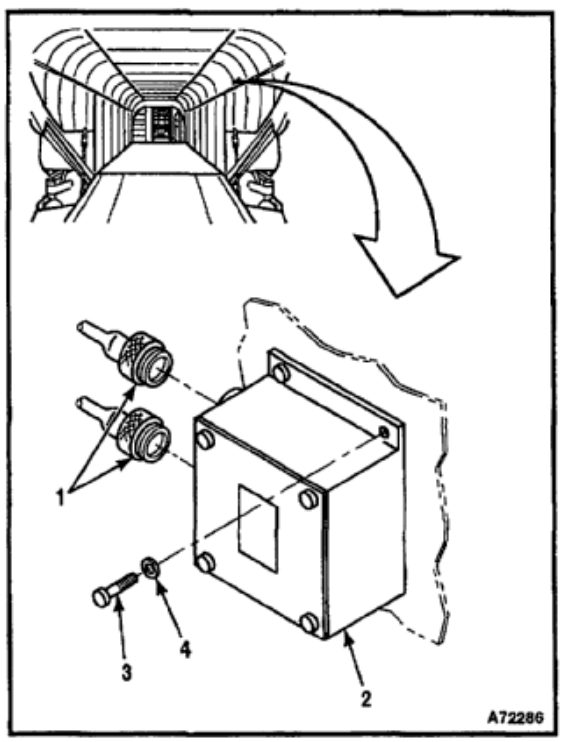
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




**NOTE**

The procedure is the same to remove the No. 1 or No. 2 torque signal processor/power supply. The No. 2 torque signal processor/power supply is shown here.

1. Tag and disconnect two connectors (1) from torque signal processor/power supply (2). Use paper tags (E264).
2. Remove four screws (3) and washers (4).
3. Remove torque signal processor/power supply (2).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-22.2 INSTALL NO. 1 OR NO. 2 TORQUE SIGNAL PROCESSOR/POWER SUPPLY 8-22.2

INITIAL SETUP

***Applicable Configurations:***

With 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

Aliphatic Naphtha, Type II (E245)
Cloths (E120)
Gloves (E184.1)

***Personnel Required:***

Aircraft Electrician
Inspector

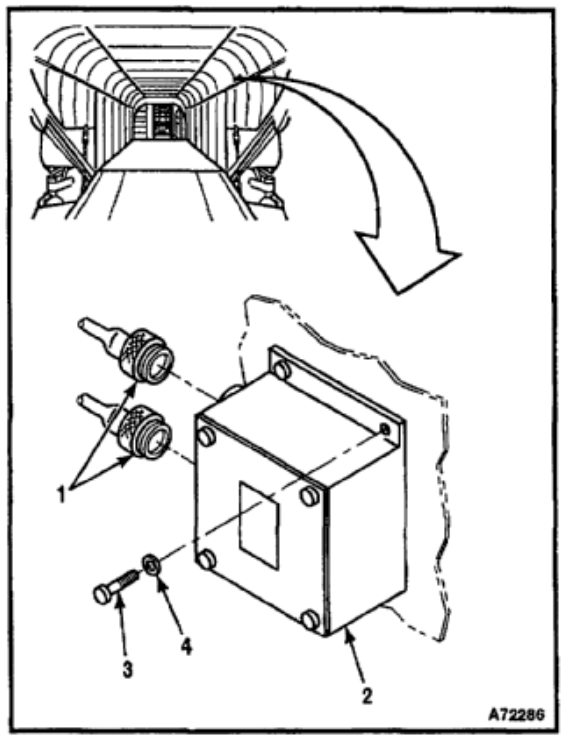
***References:***

TM 55-1520-240-T

***General Safety Instructions:***

**WARNING**

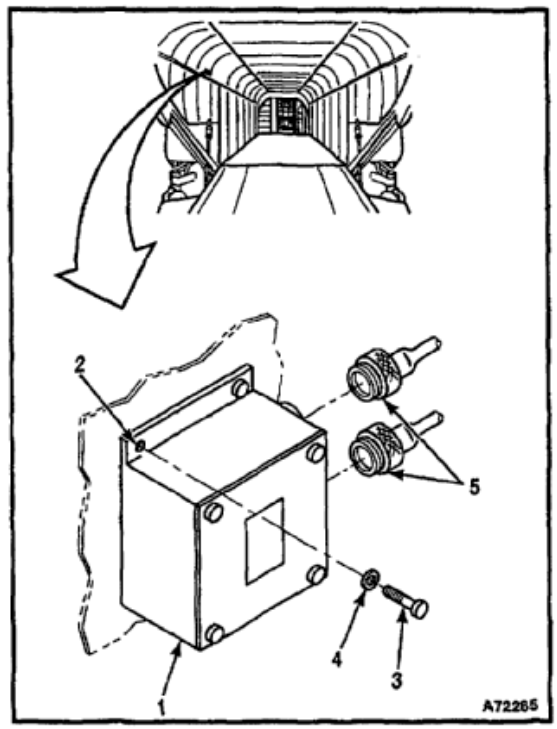
Aliphatic naphtha (E245) is combustible and toxic. It can irritate skin and cause burns. Avoid contact with skin, eyes, or clothing. Use only with adequate ventilation. Keep away from heat, sparks, and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.



**NOTE**

The procedure is the same to install the No. 1 or No. 2 torque signal processor/power supply. The No. 1 torque signal processor/power supply is shown here.

1. Put on gloves (E184.1).
2. Clean bonding surfaces of torque signal processor/power supply (1). Use aliphatic naphtha (E245) and cloths (E120).
3. Put torque signal processor/power supply (1) over mounting holes (2).
4. Install four screws (3) and washers (4).
5. Connect electrical connectors (5). Remove paper tags.




***FOLLOW-ON MAINTENANCE:***

Perform an operational check of engine torque indicating system (TM 55-1520-240-T).

END OF TASK

# SECTION III
# FLIGHT INSTRUMENTS
# DESCRIPTION AND OPERATION

### *PITOT-STATIC SYSTEM*

#### Description

The pitot-static system senses dynamic and static air pressure. It supplies these pressures to the AFCS computers and to the vertical speed indicators, and to the altimeters and the airspeed indicators on the pilot's panels. The system consists of pitot tubes, static pressure ports, and interconnecting tubing. A heater is an integral part of the pitot tubes and uses **115 vac**.

Teflon tubing and flexible hoses are used to connect the components of the pitot-static system. The flexible hoses are installed between the tubing and the flight instruments and the AFCS computers. Compression sleeve fitting assemblies are used to connect tubing together or to pitot-static system components.

The pitot tube senses dynamic air pressure. The left tube supplies pressure to the copilot's airspeed indicator and No. 1 AFCS computer. The right tube supplies pressure to the pilot's airspeed indicator and No. 2 AFCS computer.

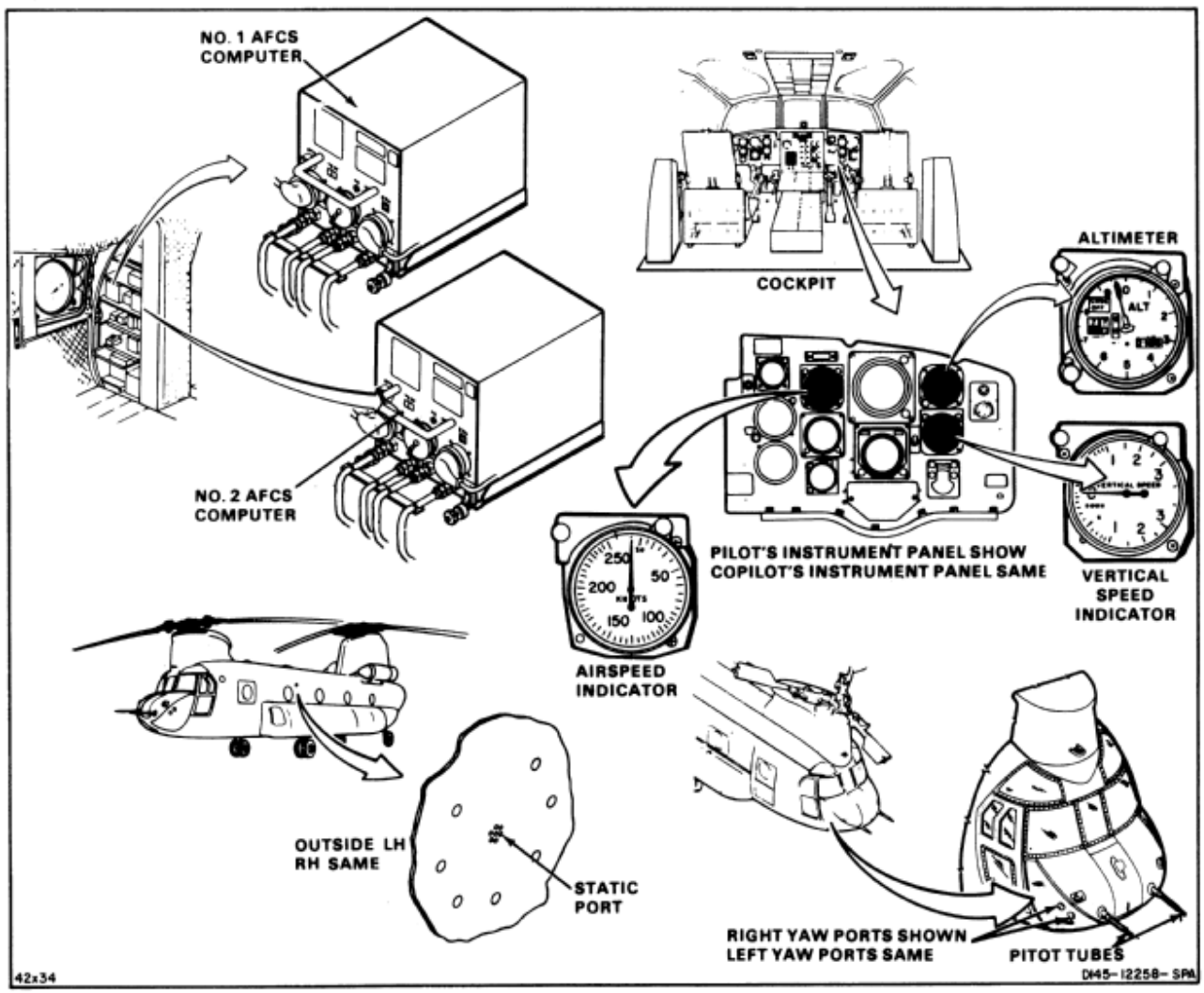
The static ports sense air pressure. This pressure is supplied to the vertical speed altimeter and the airspeed indicators and the AFCS computers.

The airspeed indicator is a sensitive differential pressure gage. It measures and indicates the pressure differential between pitot (dynamic) and static air pressures. Two airspeed indicators are installed, one in each pilot's instrument panel. The indicators are calibrated from **20 to 250 knots**. A restrictor in the pitot port of the indicator dampens pointer fluctuations.

Two altimeters, one in each pilot's panel, are installed. The copilot's altimeter is a barometric instrument. It indicates the height of the helicopter above sea level. The pilot's altimeter is an AIMS instrument. In addition to providing the barometric altitude, it provides data to the IFF system for ground readout of helicopter altitude.

The vertical speed indicator measures and displays rate of ascent or descent in feet-per-minute. An adjustment screw, on the front of the indicator, is used to zero the pointer. Two indicators are installed, one in each pilot's instrument panel.

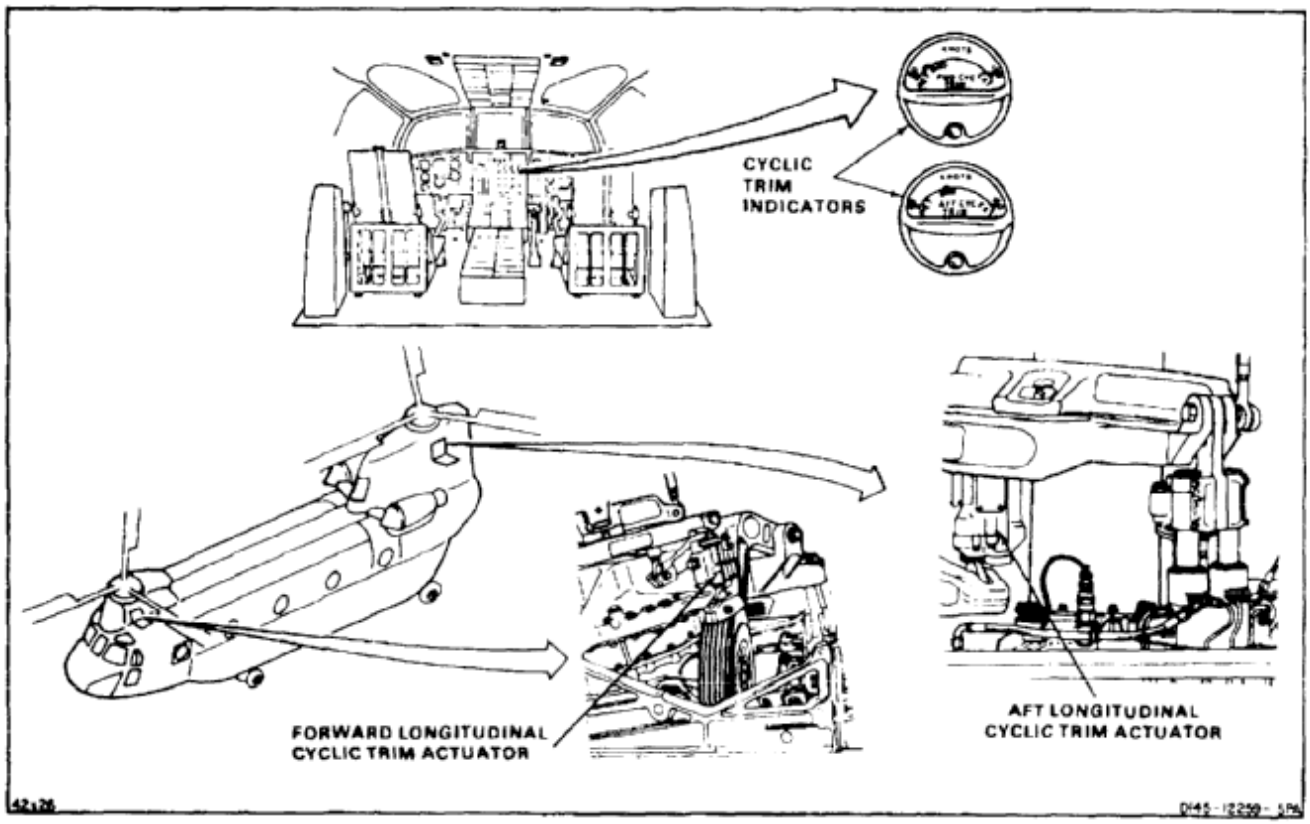
Four yaw sensing ports are in pairs on the sides of the lower nose compartment. Each port is heated by a **25 watt** heater. The sideslip sensing ports provide differential air pressure to both No. 1 and No. 2 AFCS computers.


NO. 1 AFCS COMPUTER
NO. 2 AFCS COMPUTER
COCKPIT
ALTIMETER
PILOT'S INSTRUMENT PANEL SHOW
COPILOT'S INSTRUMENT PANEL SAME
VERTICAL SPEED INDICATOR
AIRSPEED INDICATOR
OUTSIDE LH
RH SAME
STATIC PORT
RIGHT YAW PORTS SHOWN
LEFT YAW PORTS SAME
PITOT TUBES
42x34
DH45-12258-SPA

### *FORWARD AND AFT CYCLIC TRIM INDICATOR*

**Description**

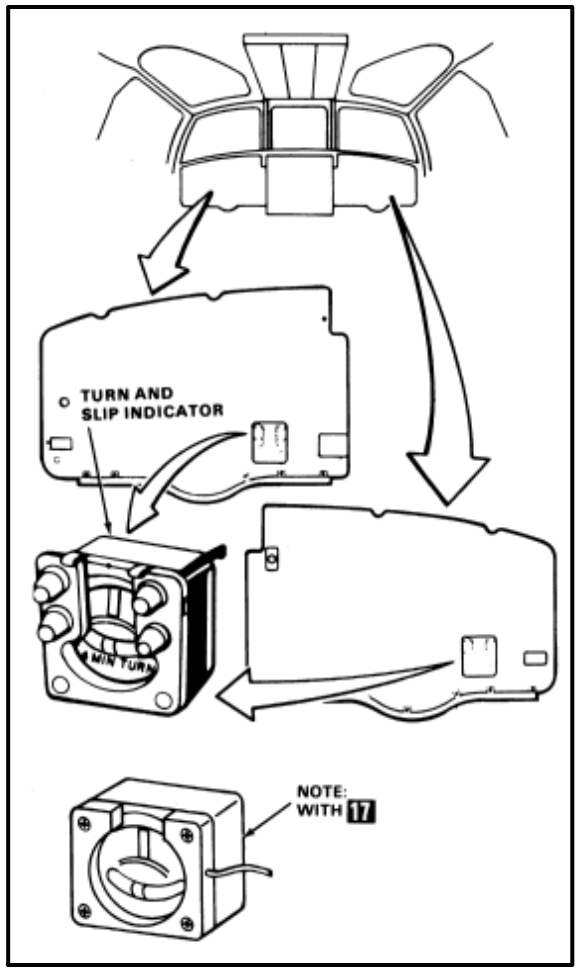
Two cyclic trim indicators show the positions of the forward and aft longitudinal cyclic trim actuators relative to airspeed. The indicators provide an indication to the pilots that the actuators are tilting the swashplates to the correct angle for the indicated airspeed. The indicators are clamp mounted on the center instrument panel. They are calibrated **60 to 160 knots**.



*TURN AND SLIP INDICATOR*

**Description**

The turn and slip indicator consists of an inclinometer and an electrically driven gyro. The inclinometer contains a ball in a curved, sealed glass tube. The tube is filled with damping fluid. Two turn and slip indicators are installed, one in each pilot's instrument panel. The indicators are on sloping plates. The plates maintain the indicators in a flight level attitude. The turn and slip indicators are powered by **28 vdc**.




END OF TASK

# SECTION IV
# FLIGHT INSTRUMENTS

## 8-24 INSPECT PITOT-STATIC AND SIDESLIP SENSING SYSTEMS 8-24

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Workstands

***Materials:***

None

***Personnel Required:***

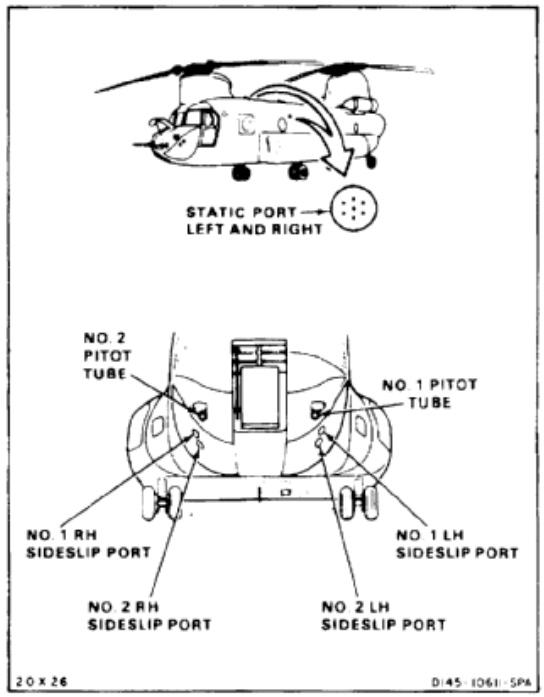
Aircraft Electrician
Inspector

***References:***

TM 1-1500-204-23
TM 11-1520-240-23
TM 55-1520-240-T
Task 8-25
Task 8-38
Task 8-90
Task 8-91

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Nose Enclosure Access Door Open (Task 2-2)




1. Test pitot tube heat (TM 55-1520-240-T).
2. Test sideslip sense port heat (TM 55-1520-240-T).
3. Remove altimeters (Task 8-90).
4. Test altimeters (Task 8-38).
5. Install altimeters (Task 8-91).
6. Drain pitot-static and sideslip sense systems (Task 8-25).
7. Perform leak check of pitot-static system (TM 55-1520-240-T).
8. Perform leak check of sideslip sense system (TM 55-1520-240-T).

***FOLLOW-ON MAINTENANCE:***

Close nose enclosure access door (Task 2-2).

END OF TASK

## 8-25 DRAIN PITOT-STATIC AND SIDESLIP SENSING SYSTEMS 8-25

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Workstand

***Materials:***

None

***Personnel Required:***

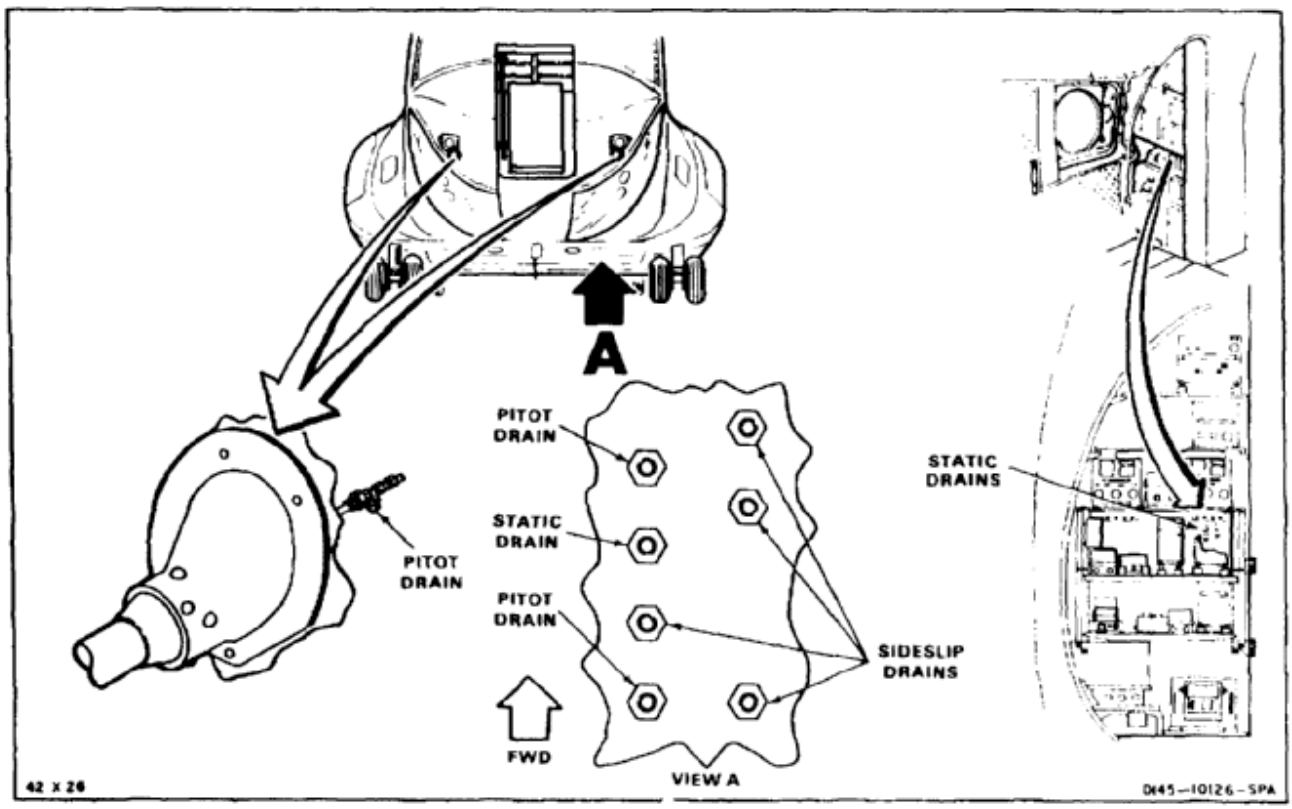
Aircraft Electrician
Inspector

***References:***

TM 1-1500-204-23
TM 11-1520-240-23

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Nose Enclosure Door Open (Task 2-2)
Radio Compartment Acoustical Blanket Removed (Task 2-208)
TSEC/KY28 Removed (TM 11-1520-240-23)



## 8-25 DRAIN PITOT-STATIC AND SIDESLIP SENSING SYSTEMS (Continued) 8-25

**NOTE**

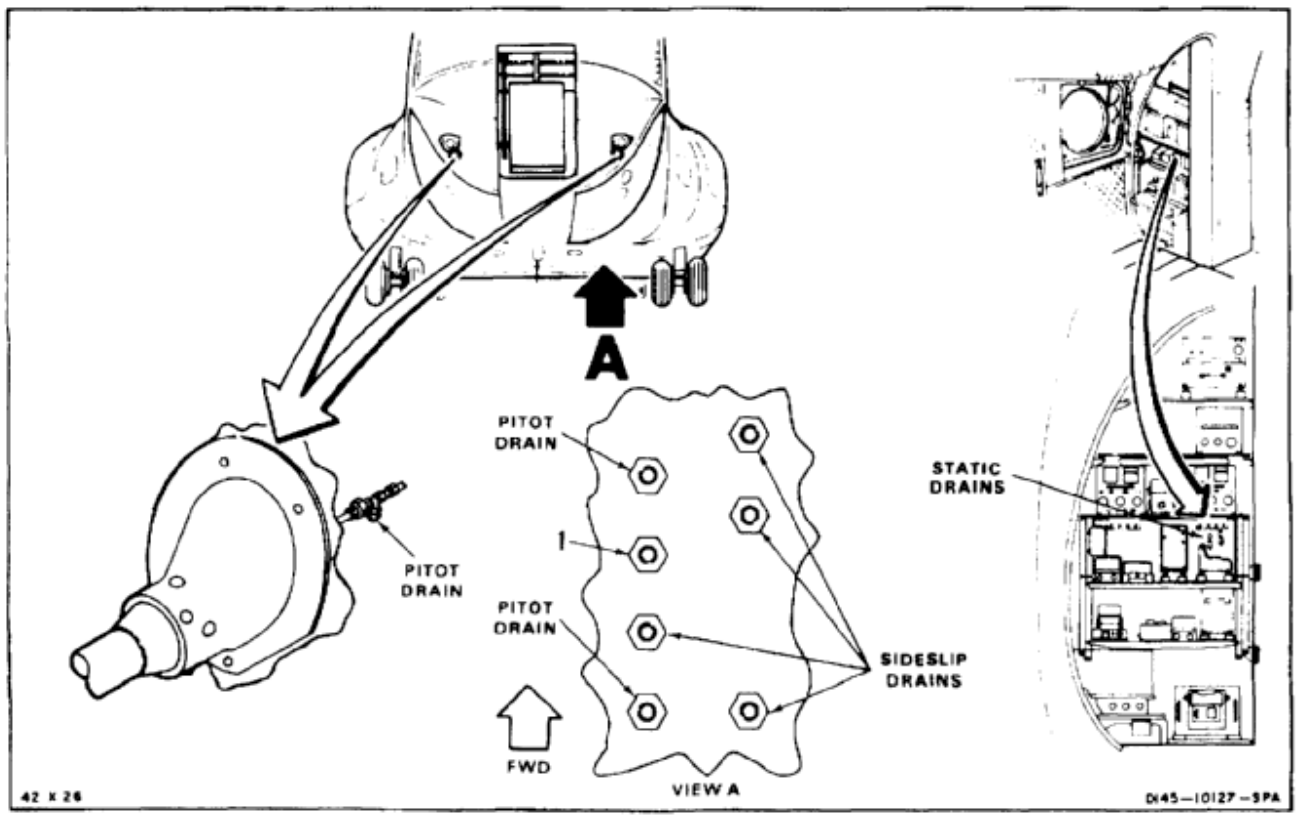
The procedure to drain pitot-static and side slip sensing systems requires removal of 11 drain caps in three areas of aircraft, nose compartment, electronics compartment, and lower fuselage (outside) skin, sta. 118, lbl 6. Removal of lower fuselage static drain is shown here.

1. Remove static drain cap (1).
2. Shake moisture from cap (1).
3. Install drain cap (1). Tighten cap finger-tight plus **1/4 turn**.
4. Repeat steps at remaining drain cap locations.

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Pitot-static system leak check (TM 55-1520-240-T).
Side slip sensing system leak check (TM 55-1520-240-T).
Install TSEC/KY28 (TM 11-1520-240-23).
Install radio compartment acoustical blanket (Task 2-210).
Close nose enclosure door (Task 2-2).




END OF TASK

## 8-26 PURGE PITOT-STATIC AND SIDESLIP SENSE SYSTEMS 8-26

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Workstands
Source of Low Pressure (40-50 Psi) Dry Compressed Air or Nitrogen

***Materials:***

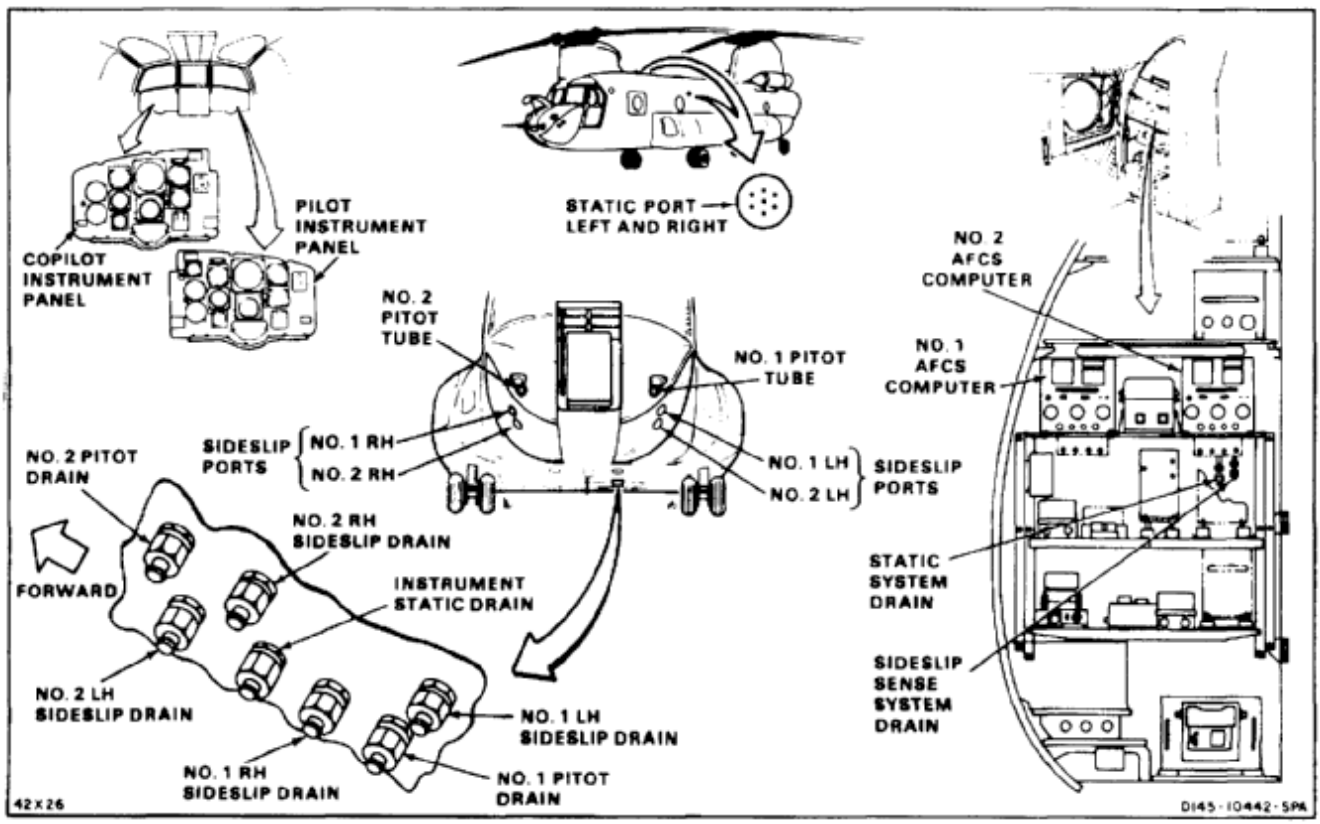
None

***Personnel Required:***

Aircraft Electrician (2)
Inspector

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Nose Enclosure Door Open (Task 2-2)
Radio Compartment Acoustical Blanket Removed (Task 2-208)
TSEC/KY28 Removed (TM 11-1520-240-23)
Pilot's AIMS Altimeter, Copilot's Barometric Altimeter Removed (Task 8-90)
Pilot's and Copilot's Vertical Speed and Airspeed Indicators Removed (Task 8-90)



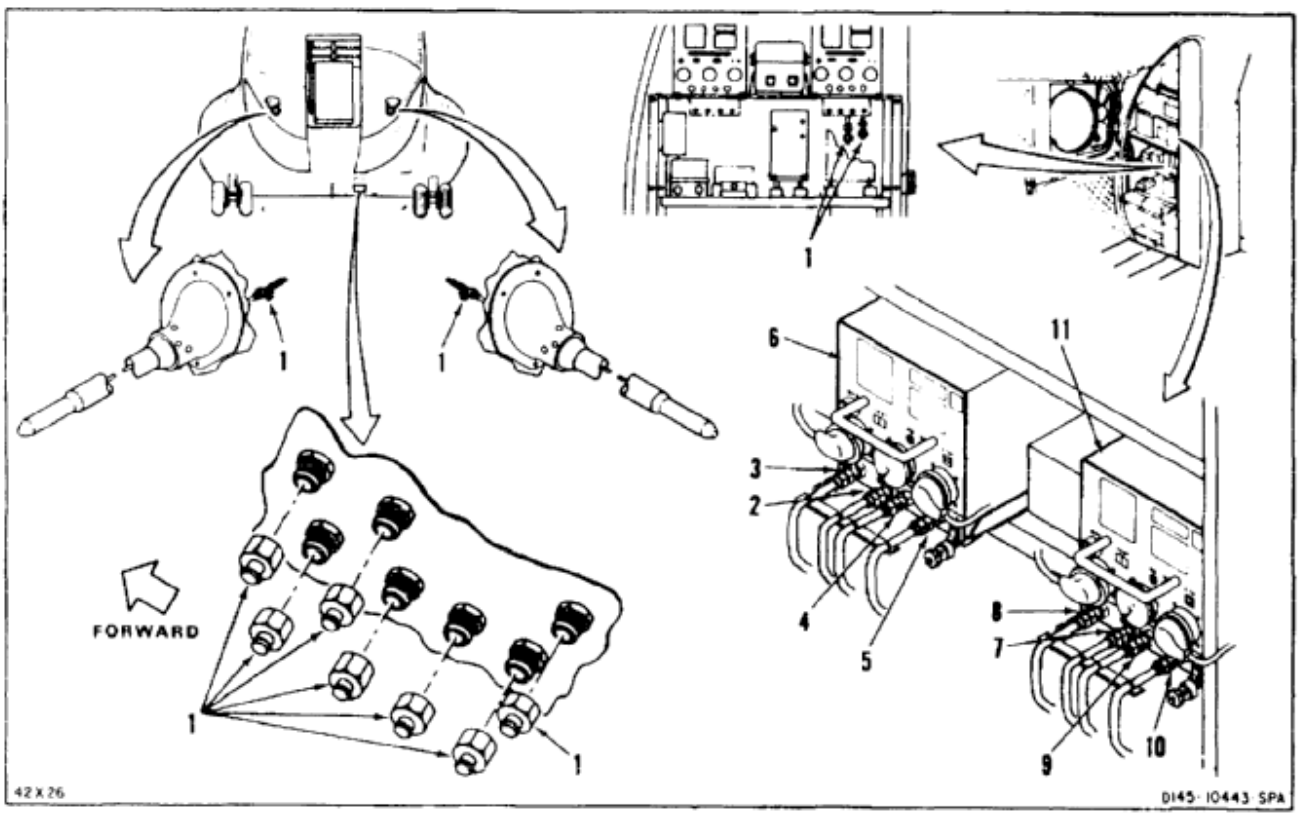
## 8-26 PURGE PITOT-STATIC AND SIDESLIP SENSE SYSTEMS (Continued) 8-26

1. Remove seven bottom fuselage drain caps (1).
2. Remove two nose compartment drain caps (1).
3. Remove two radio compartment drain caps (1).
4. Disconnect pitot (2), static (3), and sideslip lines (4 and 3) from No. 1 AFCS Computer (6).
5. Disconnect pitot (7), static (8), and side-slip lines (9 and 10) from No. 2 AFCS Computer (11).

**CAUTION**

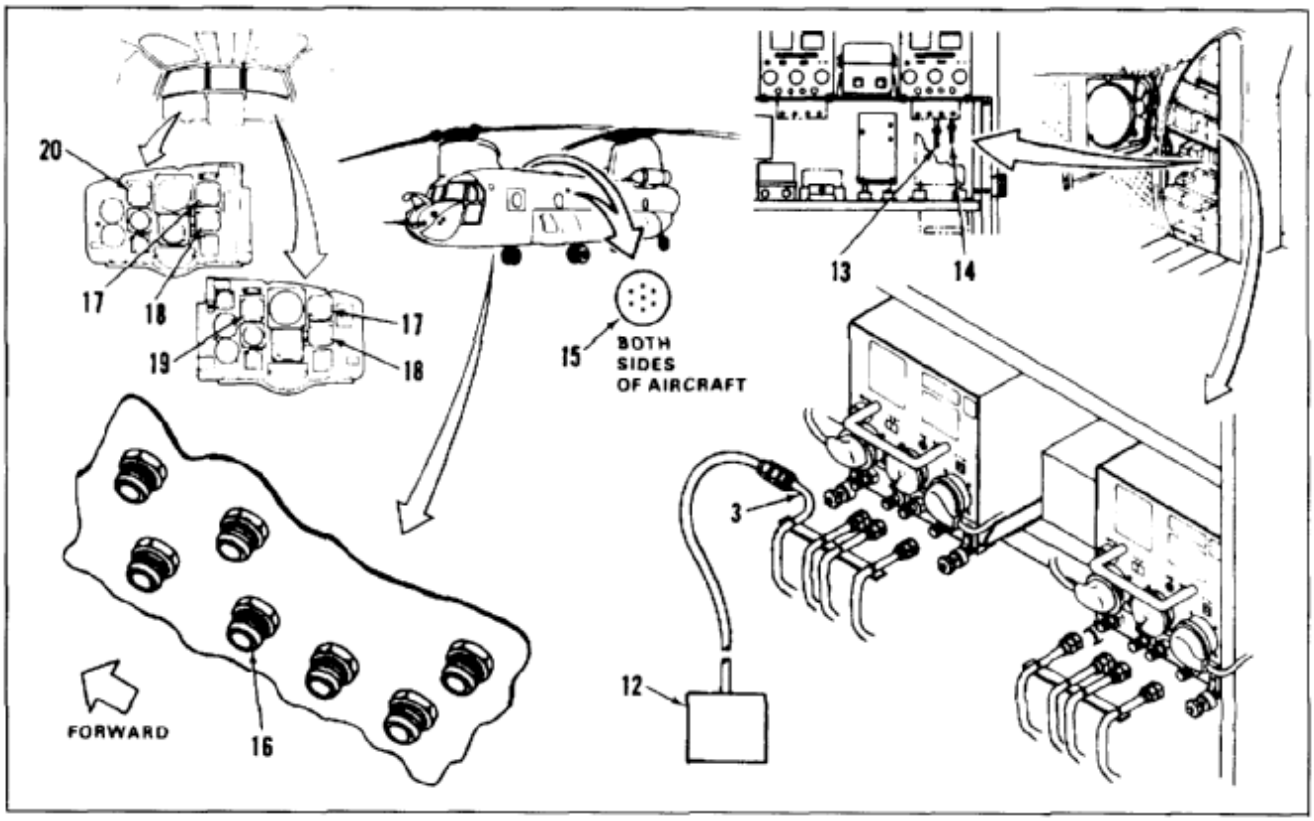
Do not purge pitot or static lines unless they are disconnected from the flight instruments and the AFCS computers. Otherwise, the instruments or computers can be damaged.

6. Connect compressed dry air source (2) to No. 1 AFCS computer static pressure line (3).

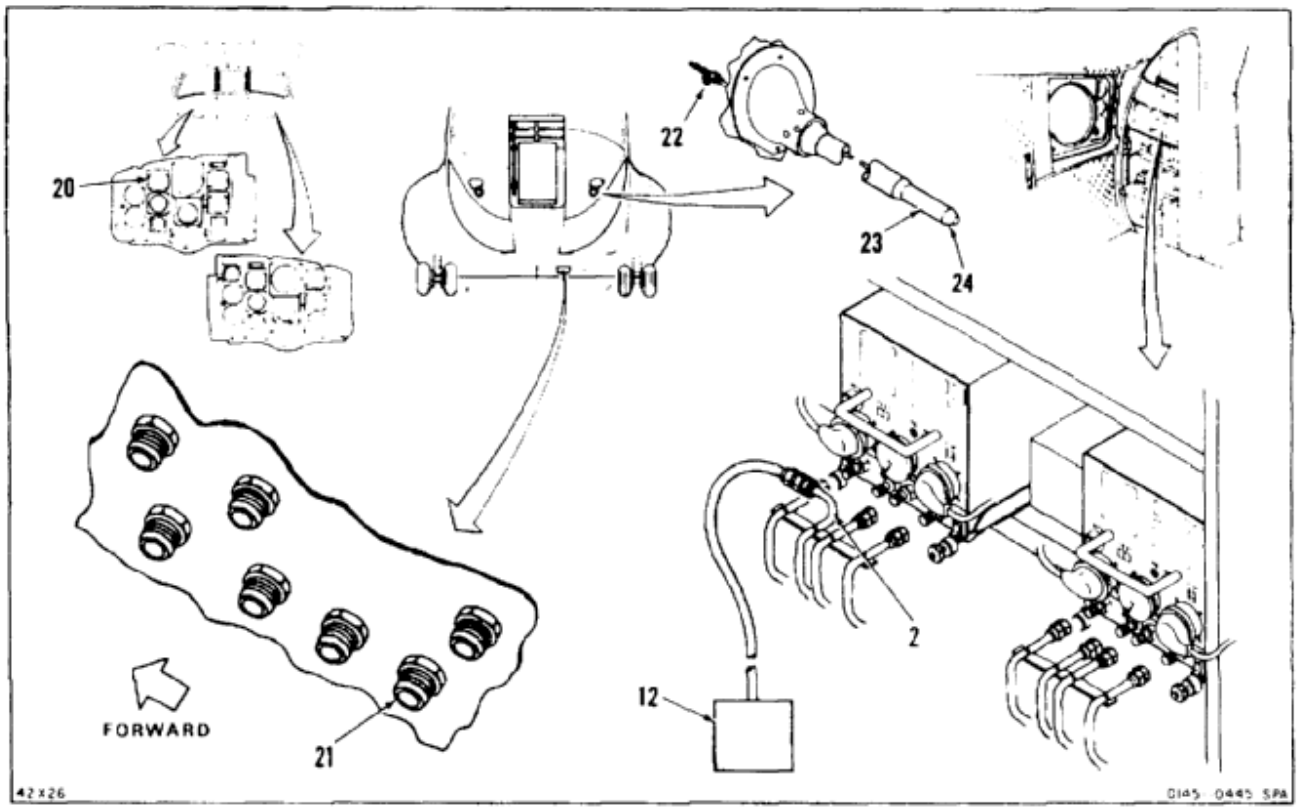


## 8-26 PURGE PITOT-STATIC AND SIDESLIP SENSE SYSTEMS (Continued) 8-26

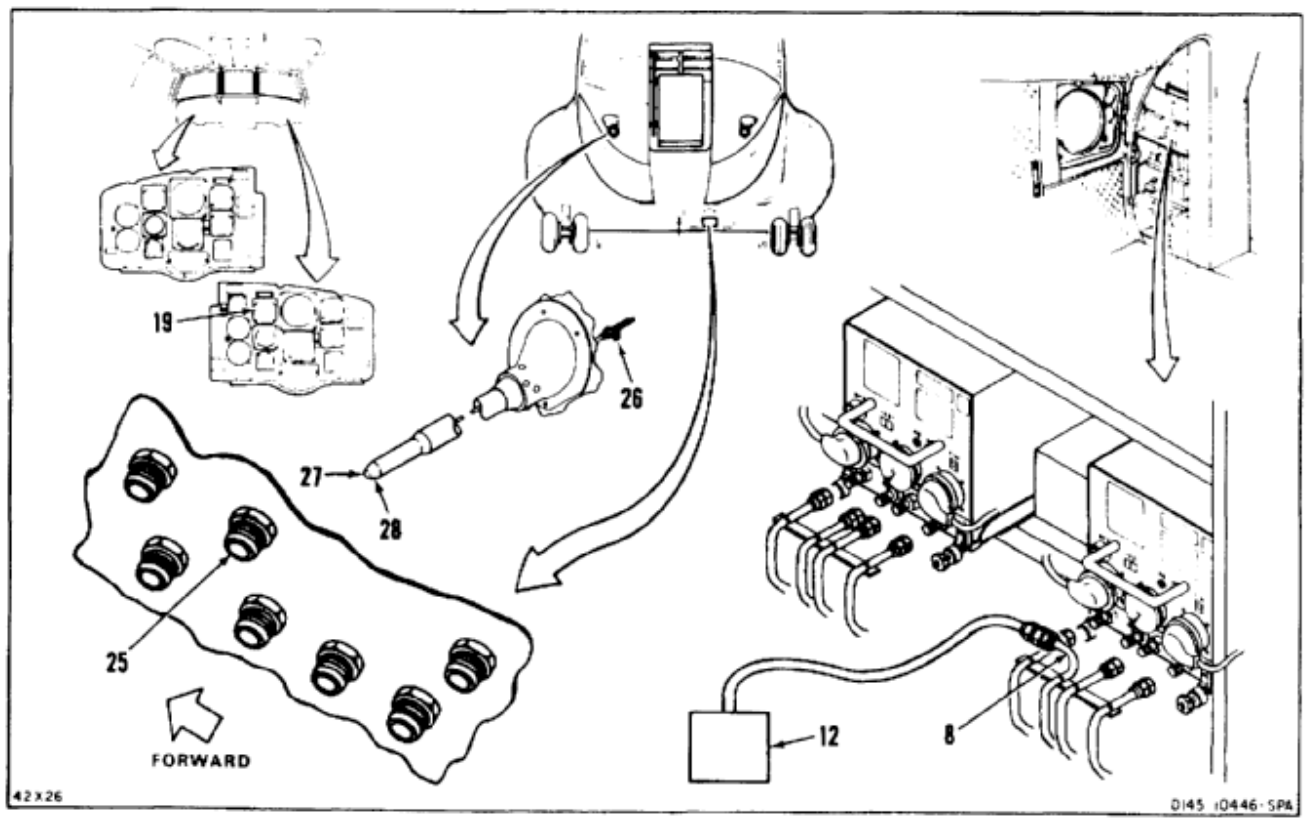
7. Turn on dry air source (12). Adjust air to **45 psi**. Check that air flows from static lines until moisture and other contaminates are removed at the following locations:
   a. No. 2 AFCS static pressure line (8).
   b. Radio compartment static system drains (13 and 14).
   c. No. 1 and No. 2 static ports, No. 1 (15) is shown here.
   d. Lower fuselage at static system drain (16).
   e. Static pressure lines at pilot's and copilot's altimeters (17) vertical speed indicators (18).
   f. Static pressure line at pilot's airspeed indicator (19).
   g. Static pressure line at copilot's airspeed indicator (20).
8. Turn off air source (12).
9. Disconnect air source (12) from No. 1 AFCS computer static pressure line (3).



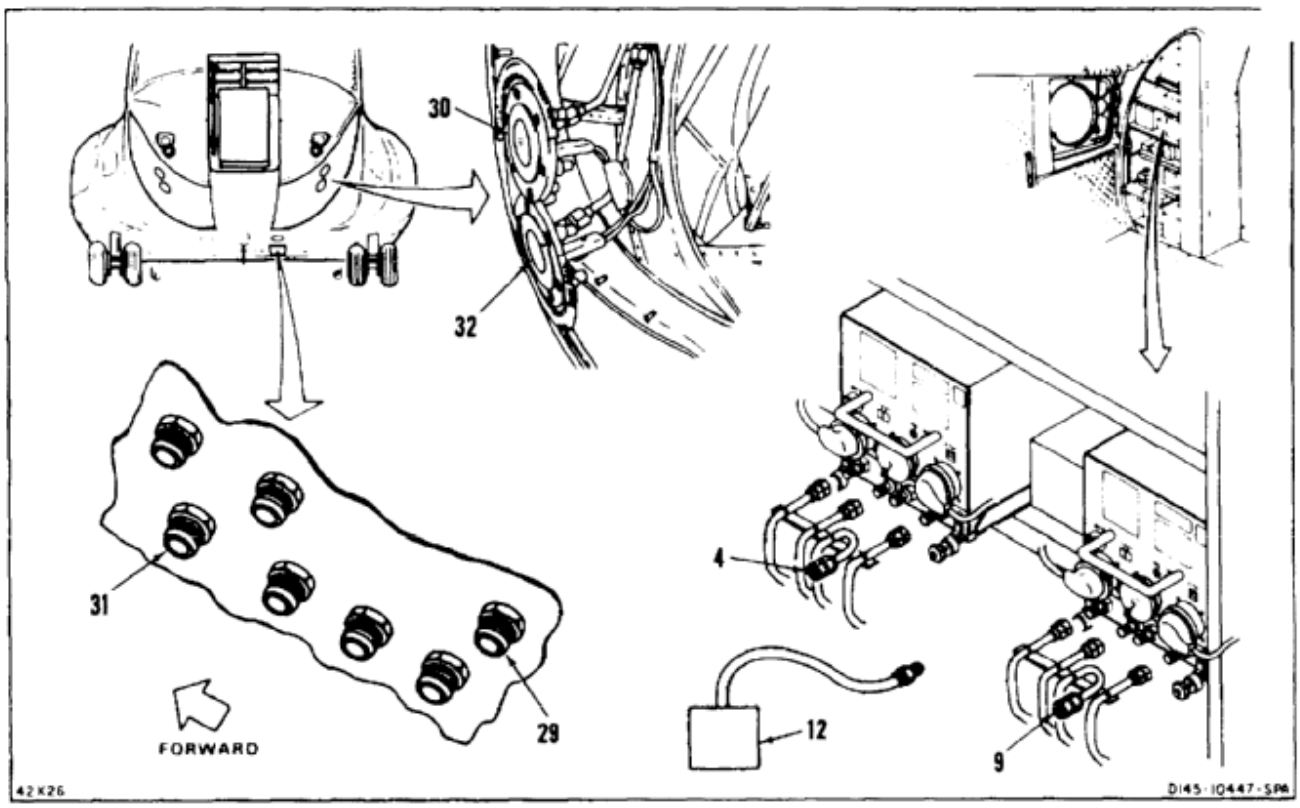
10. Connect compressed air source (12) to No. 1 AFCS computer pitot line (2).
11. Turn on dry air source (12). Adjust to **45 psi**. Check that air flows from pitot lines, until moisture and other contaminates are removed at the following locations:
    a. Lower fuselage No. 1 pitot system drain (21).
    b. No. 1 pitot mast extension drain (22).
    c. No. 1 pitot tube (23) and pitot tube drain hole (24).
    d. Pitot line to copilot's airspeed indicator (20).
12. Turn off air source (12).
13. Disconnect air source (12) from No. 1 AFCS computer plot line (3).



14. Connect compressed air source (12) to No. 2 AFCS computer pitot line (8).
15. Turn on dry air source (12). Adjust to **45 psi**. Check that air flows from pitot lines, until moisture and other contaminates are removed at the following locations:
    a. Lower fuselage No. 2 pitot system drain (25).
    b. No. 2 pitot mast extension drain (26).
    c. No. 2 pitot tube (27) and pitot tube drain hole (28).
    d. Pitot line to copilot's airspeed indicator (19).
16. Turn off air source (12).
17. Disconnect air source (12) from No. 2 AFCS computer pitot line (8).



18. Connect compressed dry air source (12) to No. 1 AFCS, LH No. 1 sideslip line (4).
19. Turn on dry air source (12). Adjust air to **45 psi**. Check that air flows from sideslip line, until moisture and other contaminates are removed at the following locations:
    a. Lower fuselage LH No. 1 sideslip drain (29).
    b. LH No. 1 sideslip port (30).
20. Turn off air source (12).
21. Disconnect air source (12) from No. 1 AFCS, LH No. 1 sideslip line (4).
22. Connect compressed dry air source (12) to No. 2 AFCS LH No. 2 sideslip line (9).
23. Turn on dry air source (12). Adjust air to **45 psi**. Check that air flows from sideslip line, until moisture and other contaminates are removed at the following locations:
    a. Lower fuselage LH No. 2 sideslip drain (31).
    b. LH No. 2 sideslip port (32).
24. Turn off air source (12).
25. Disconnect air source (12) from No. 2 AFCS LH No. 2 sideslip line (9).



26. Connect compressed dry air source (12) to No. 1 AFCS RH No. 1 sideslip line (5).

27. Turn on dry air source (12). Adjust air to **45 psi**. Check that air flows from sideslip line, until moisture and other contaminates are removed, at the following locations:

    a. Lower fuselage RH No. 1 sideslip drain (33).

    b. RH No. 1 sideslip port (34).

28. Turn off air source (12).

29. Disconnect air source (12) from No. 1 AFCS RH No. 1 sideslip line (5).

30. Connect compressed dry air source (12) to No. 2 AFCS RH No. 2 sideslip line (10).

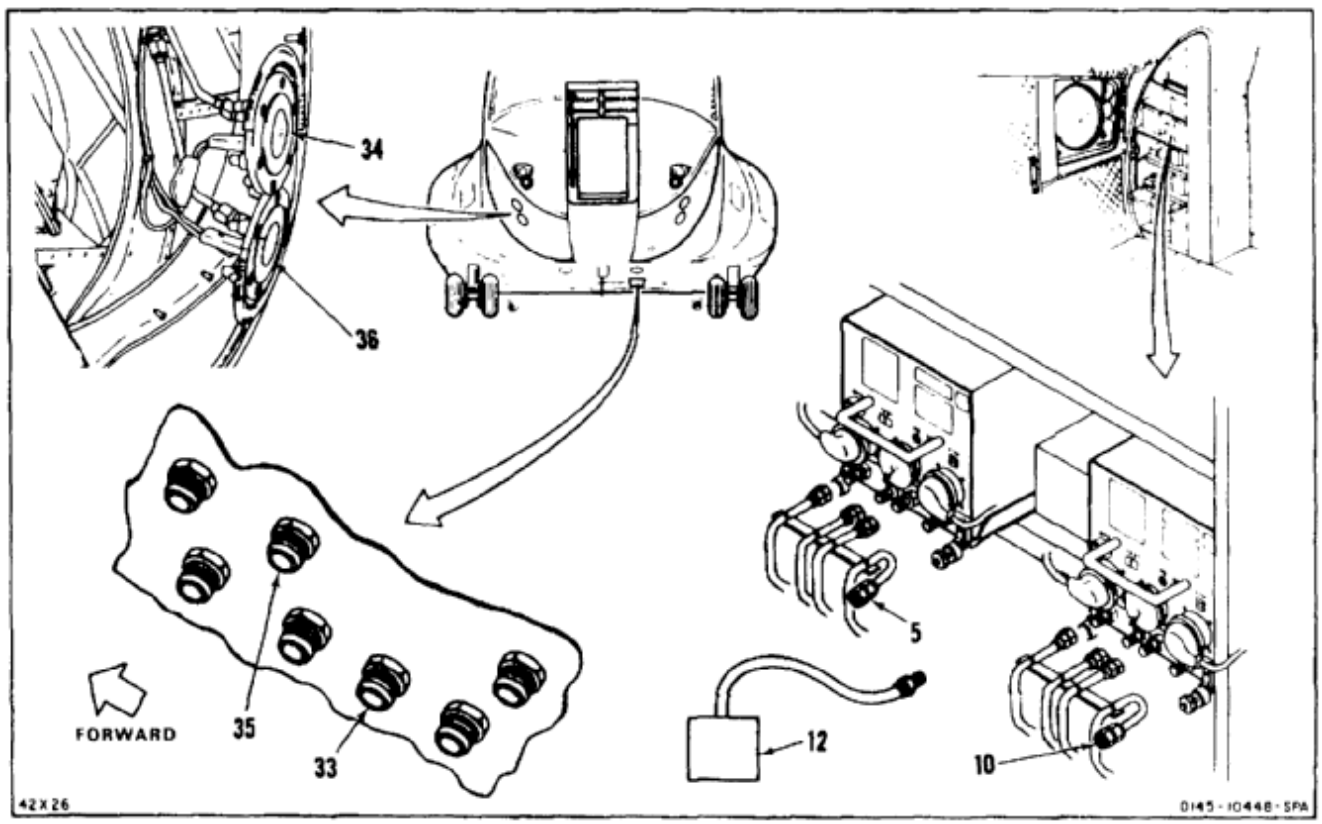
31. Turn on dry air source (12). Adjust air to **45 psi**. Check that air flows from sideslip line until moisture and other contaminates are removed at the following locations:

    a. Lower fuselage RH No. 2 sideslip drain (35).

    b. RH No. 2 sideslip port (36).

32. Turn off air source (12).

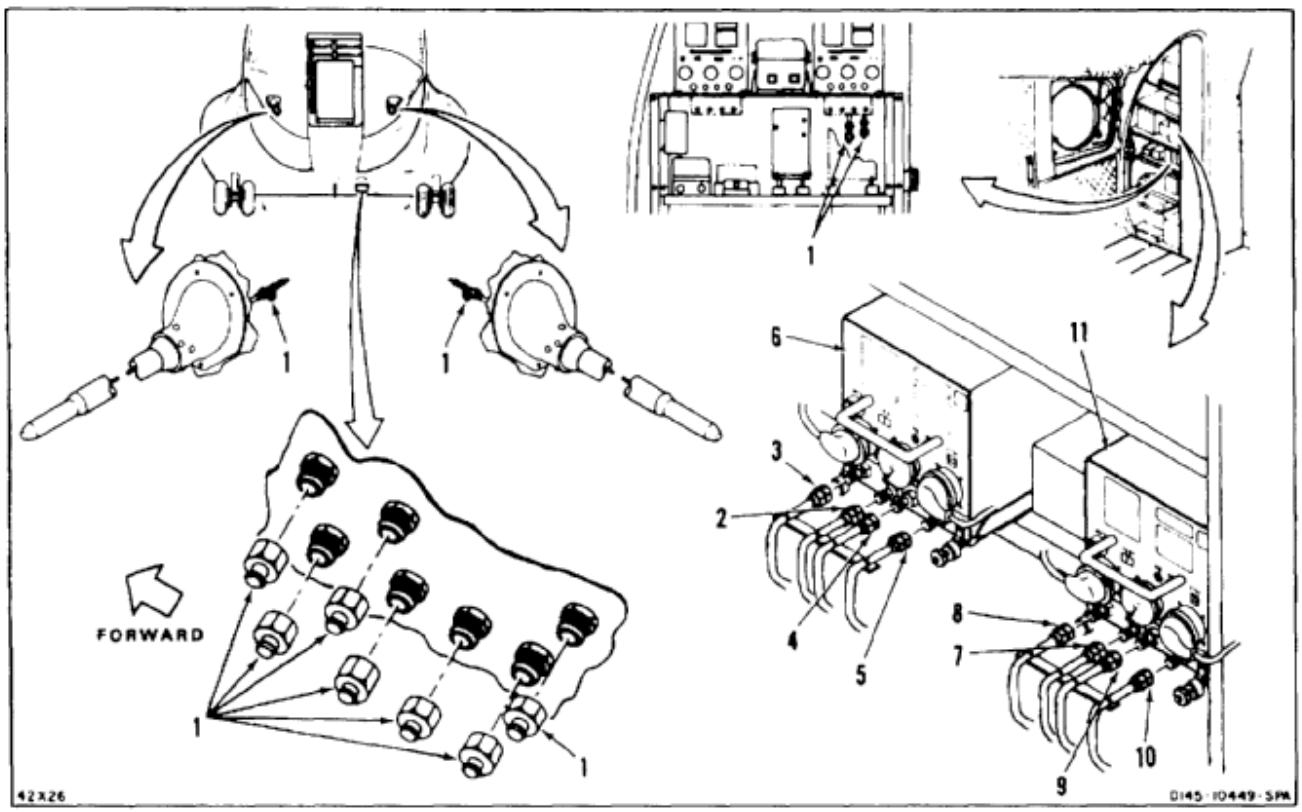
33. Disconnect air source (12) from No. 2 AFCS, RH No. 2 sideslip line (10).



34. Connect pitot (7), static (8), and sideslip lines (9 and 10) to No. 2 AFCS computer (11).
35. Connect pitot (2), static (3), and sideslip lines (4 and 5) to No. 1 AFCS computer (6).
36. Install two radio compartment drain caps (1).
37. Install two nose compartment drain caps (1).
38. Install seven bottom fuselage drain caps (1).

***FOLLOW-ON MAINTENANCE:***

Pitot static system leak check (TM 55-1520-240-T).
Sideslip sensing system leak check (TM 55-1520-240-T).
Install TSEC/KY28 (TM 11-1520-240-23).
Install electronic compartment acoustical blanket (Task 2-210).
Install pilot's AIMS altimeter, copilot's barometric altimeter (Task 8-91).
Install pilot's and copilot's vertical speed and airspeed indicators (Task 8-91).
Close nose enclosure door (Task 2-2).
TSEC/KY28 operational check (TM 11-1520-240-23).




END OF TASK

## 8-26.1 REPLACE PITOT STATIC AND SIDESLIP SWAGELOK FITTINGS AND TUBING 8-26.1

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

Adhesive (E50.1)

***Personnel Required:***

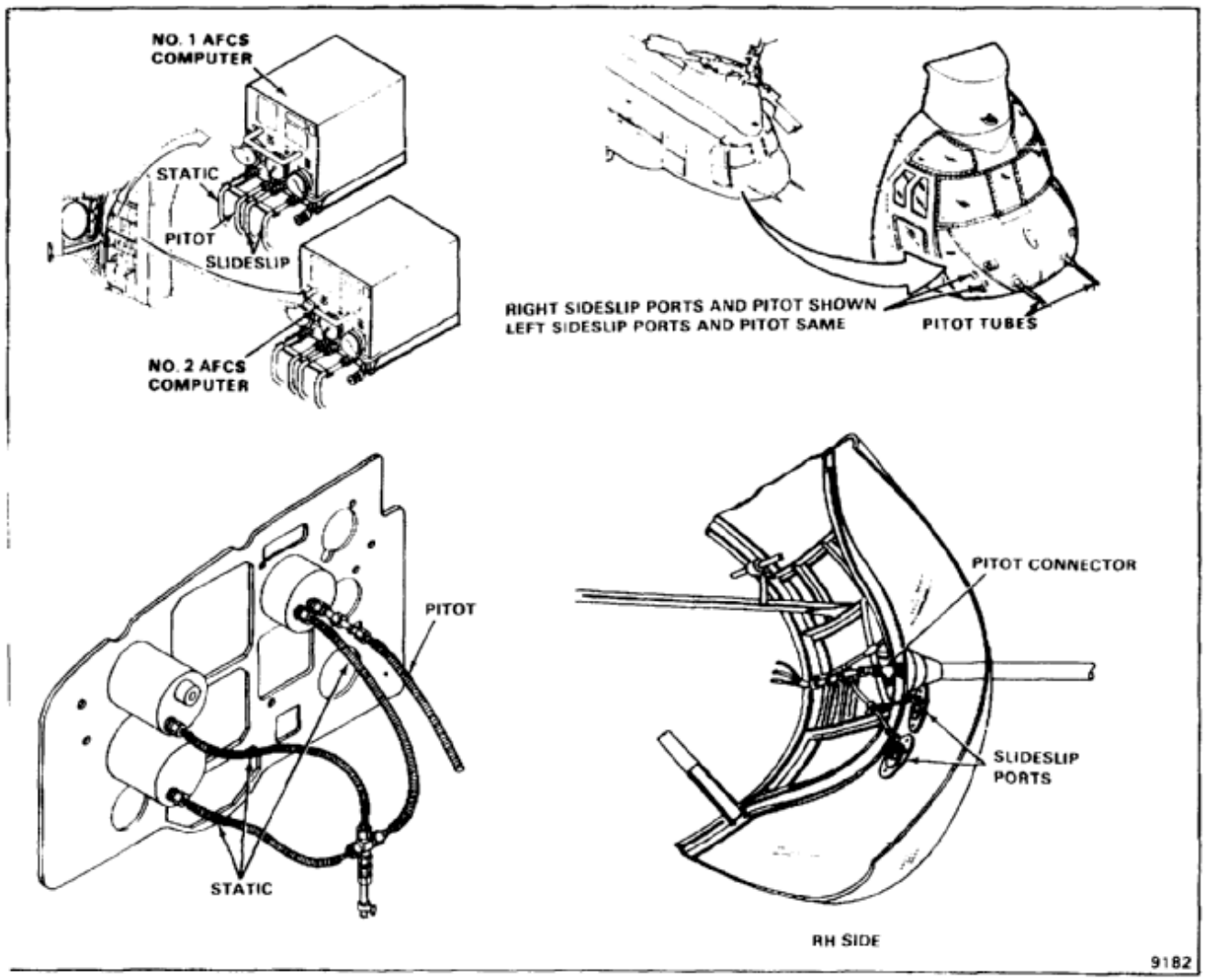
Aircraft Electrician

***Equipment Condition:***

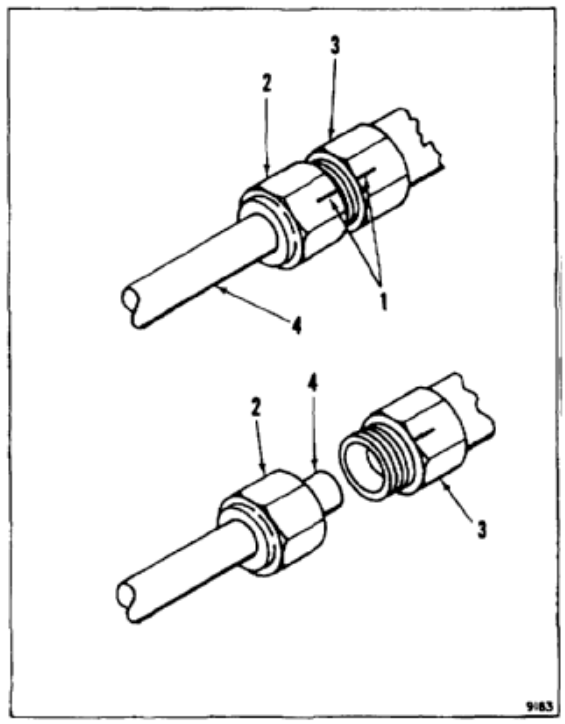
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Radio Compartment Acoustical Blanket Removed (Task 2-208)
Nose Enclosure Open

***References:***

TM 55-1520-240-23P



***DISCONNECT SWAGELOK CONNECTED PARTS***




CAUTION

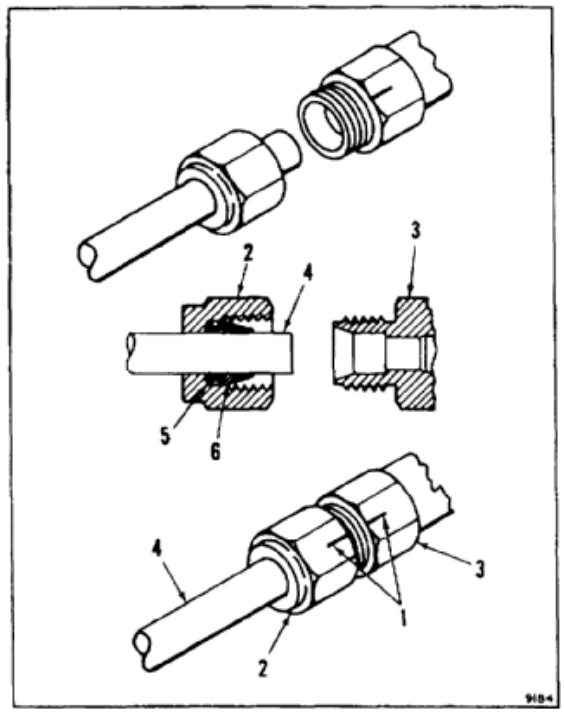
Do not pull connector or tubing from nut. Ensure that ferrules and compression nut stay with either serrated tube connector or non-corrugated tubing as applicable. If ferrules slide from non-corrugated tubing or serrated tube, install new ferrules and thread compression nut loosely into fitting body.

**NOTE**

This procedure is the same for replacing swageloked connections using either serrated tube hose connections or non-corrugated tubing. Non-corrugated tubing connections are shown.

1. Scribe index mark (1) on compression nut (2) and fitting body (3).
2. Hold fitting body (3) with a wrench. Using another wrench, loosen compression nut (2).
3. Remove compression nut (2) and tubing (4) from fitting (3).

***RECONNECT PREVIOUSLY SWAGED SWAGELOK PARTS, PLUGS, AND FIRINGS***

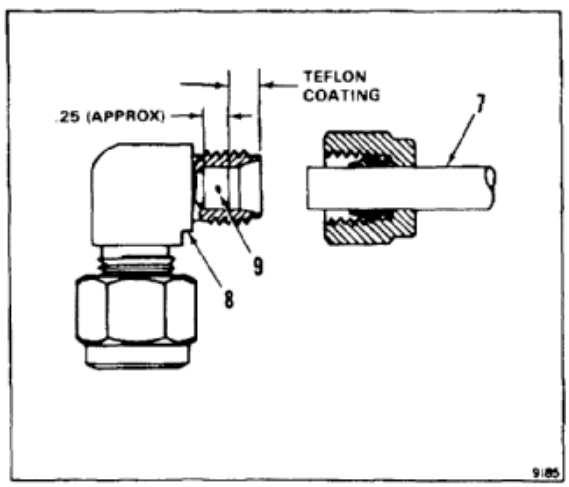



CAUTION

When installing nuts and plugs, machined ferrule end of ports, or reducing port connectors, tighten only until index marks align, otherwise, damage to tubing could occur.

4. Check that ferrules (5 and 6) are in position in compression nut (2).
5. Insert serrated tube connector or non-corrugated tubing (4) as applicable, into fitting (3) until ferrule (6) seats in fitting.
6. Tighten compression nut (2) finger-tight.
7. Hold fitting (3) with wrench. Using another wrench, turn compression nut (2) only until index marks (1) align.

***CONNECT FITTINGS THAT MUST BE SWAGED***




CAUTION

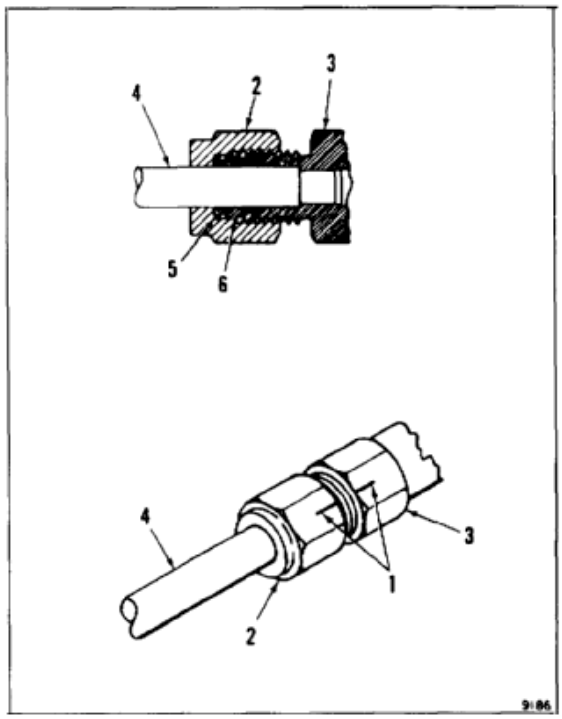
Do not apply adhesive (E50.1) to Teflon coating.

**NOTE**

Perform steps 8 thru 12 when fittings and tubing must be removed for swaging. When fittings and tubing can be swaged in their installed location go to step 14.

8. Remove end of tubing (7) from fitting (8).
9. Check that end of tubing (7) and fitting (8) are free from foreign material.
10. Apply dab of adhesive (9) (E50.1) to inside of fitting (8).
11. Insert tube (7) into fitting (8) and hold in position until adhesive sets. Wait at least **one minute**.
12. Remove tube (7) and fitting (8) from their installed location and swage.

13. Check that ferrules (5 and 6) are in position in fitting (3).
14. Check that compression nut (2) is loosely installed.
15. Insert serrated tube connector or non-corrugated tubing (4) as applicable, through compression nut (2) into fitting body (3) until contact is made with shoulder of fitting body.
16. Tighten compression nut (2) finger-tight.
17. Scribe new index mark (1) on compression nut (2) and fitting body (3).
18. Hold fitting body (3) with wrench. With another wrench, tighten compression nut (2) **1-1/4 turns** past scribe mark (1).
19. If tube and fitting were removed for swaging, reinstall in aircraft.




***INSPECT***

***REPLACE CORRUGATED TUBING ON SERRATED TUBE CONNECTOR***

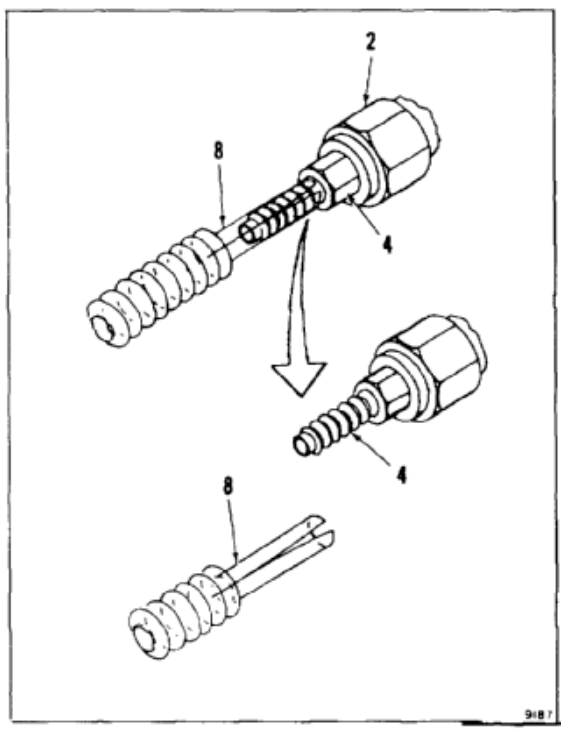
CAUTION

When cutting corrugated tubing, do not nick or cut the serrated tube connector.

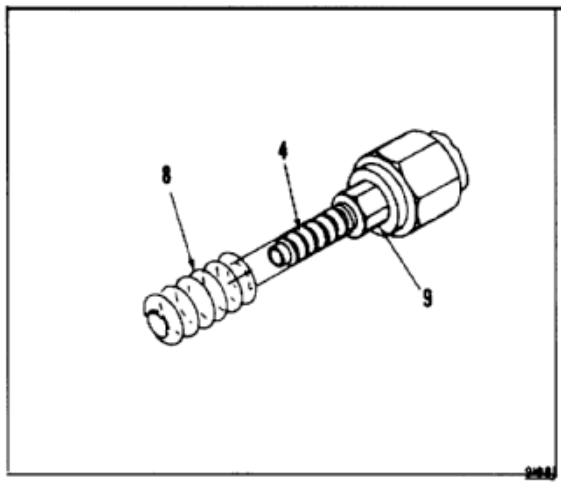
**NOTE**

Use this procedure only to replace corrugated tubing or serrated tube connector.

20. Cut tubing (8) about **1/2 inch** below connector (4). Continue cut toward compression nut (2), until tubing can be peeled from connector.
21. Remove tubing (8).



22. Install corrugated tubing (8) by pushing end of tube onto serrated connector (4) until tubing contacts fitting body shoulder (9).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Test pitot static system (TM 55-1520-240-T).

END OF TASK

## 8-26.2 REPAIR PITOT-STATIC AND SIDESLIP TUBING 8-26.2

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4918
Workstand
Heat Gun, 200º to 500ºF
Knife, Craftsman
Container, Water

***Materials:***

Cloths
Gloves

***Parts:***

Unions NY-400-6
Compression Nuts NY-402-1
Ferrule Front NY-404-1
Ferrule Back NY-403-1
Tubing 11464 TEFZEL

***Personnel Required:***

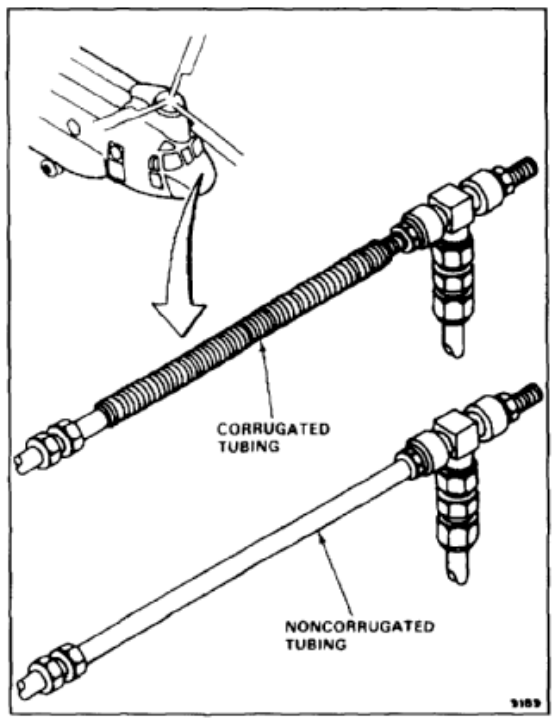
Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-T
Task 8-26.1

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




CAUTION

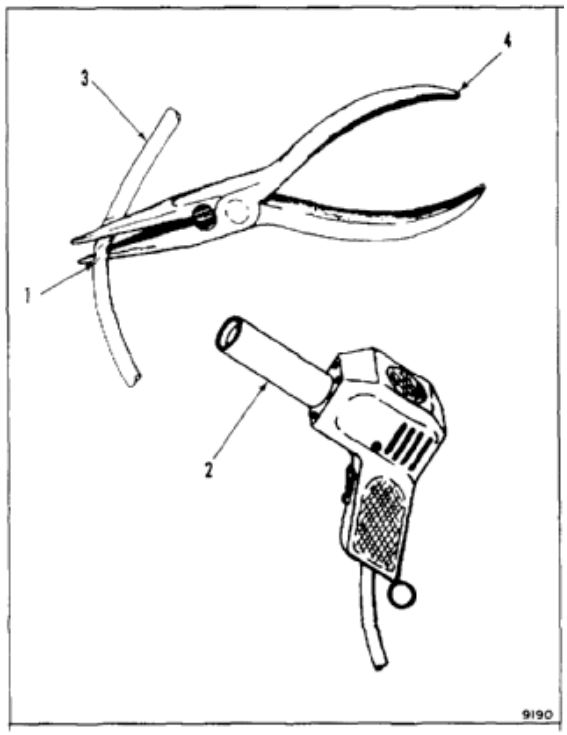
Heat tubing to a workable state only. When overheated, tubing will change to a sticky liquid state.

**NOTE**

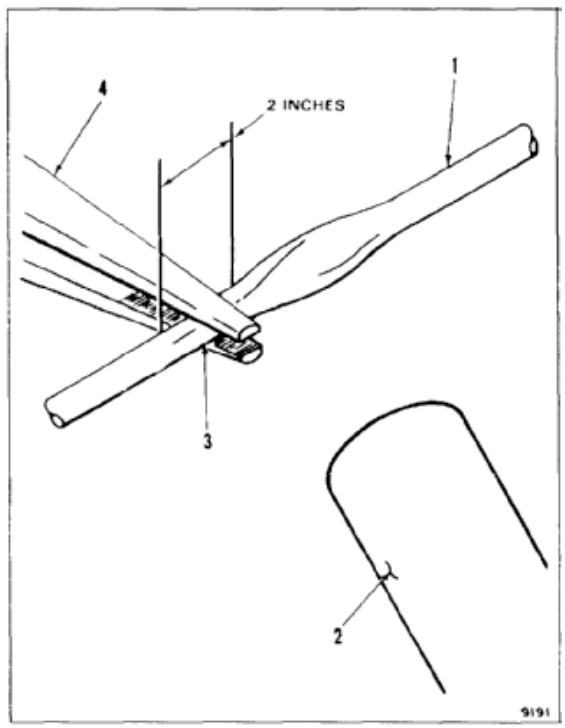
There is no repair for corrugated tubing. Replace entire length (Task 8-26.1).

***REPAIR OF MINOR KINKS***

1. Adjust heat control and heat gun and apply heat (**250º to 300ºF**) to kinked area (1). Hold heat gun (2) **9 to 12 inches** from tubing (3) until tubing becomes soft and workable.
2. Remove heat source. Apply pressure gently on the tube (3) **90º** to the kink (1). Reshape the tube using smooth broad nose pliers (4).

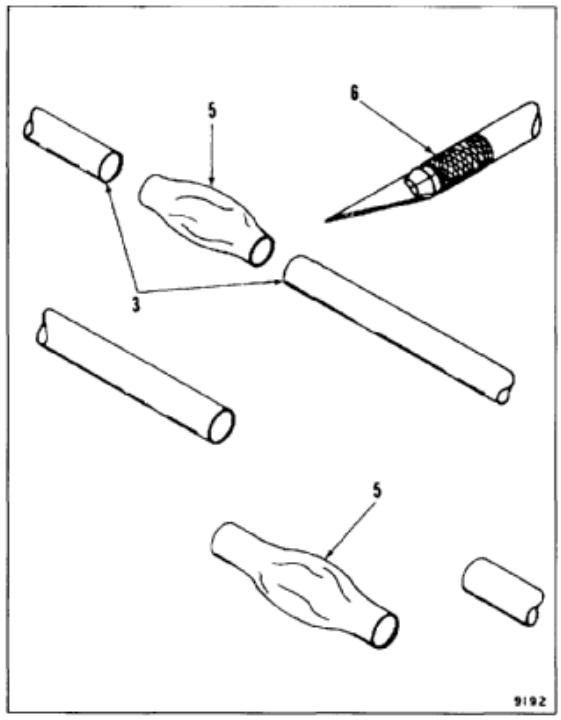



3. Reapply heat to damaged area. Using pliers (4), gently stroke tube (3) starting **2 inches** above kink (1) and continue to **2 inches** below kink to remove bulge. Repeat at several places around outside diameter of tube as it cools.

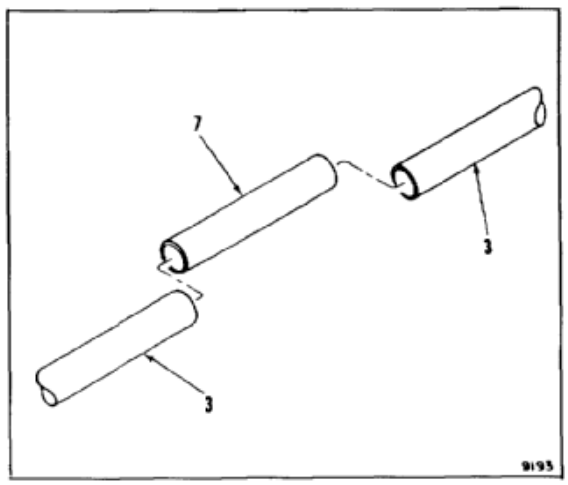


***REPAIR OF SEVERELY KINKED OR CRUSHED TUBING***

4. Cut through tube (3) just beyond bulge on each side of damaged section (5). Make cut **90°** to tube. Use knife (6). Remove damaged section (5).



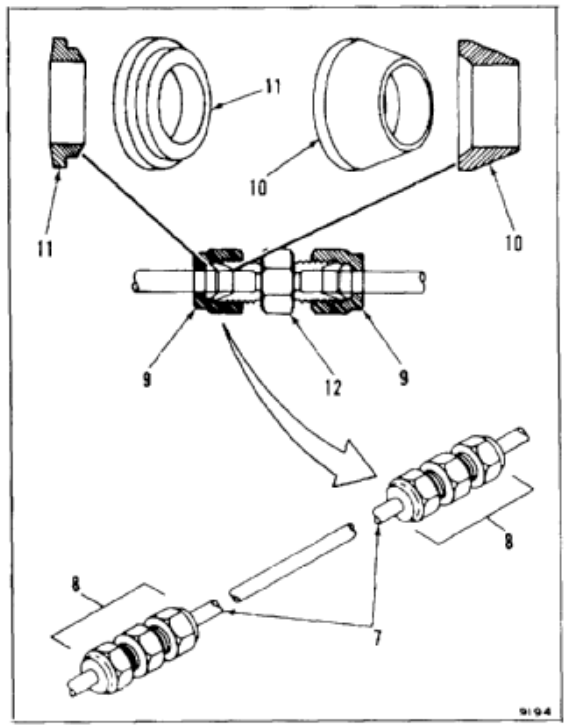

5. Cut piece of new tubing (7) to fit into cut out section of installed tubing (3).



**NOTE**

During assembly of fittings, check that the front and back ferrules are correctly positioned in the compression nuts and that ends of tubing are clean and free of foreign matter.

6. Assemble a fitting (8) on each end of new tubing (7). Use two compression nuts (9), four ferrules (10 and 11), and a union (12).



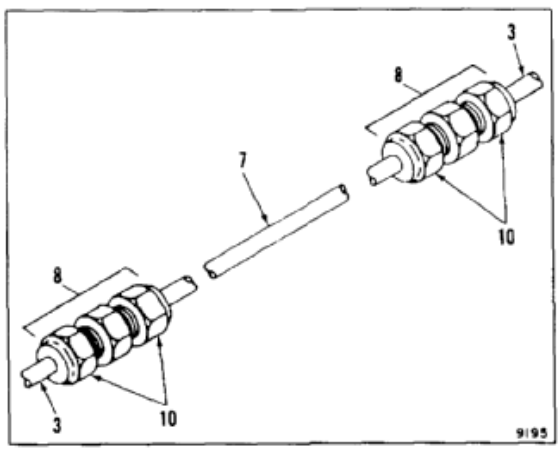

7. Position new tubing (7) and fittings (8) into cutout section of installed tubing (3).

**NOTE**

Make sure that ends of tubing are firmly seated against shoulder of union.

8. Tighten compression nuts (10) (Task 8-26.1).

***INSPECT***




***FOLLOW-ON MAINTENANCE:***

Leak check system (TM 55-1520-240-T).

END OF TASK

## 8-27 REMOVE NO. 1 OR NO. 2 PITOT TUBE 8-27

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Workstand

***Materials:***

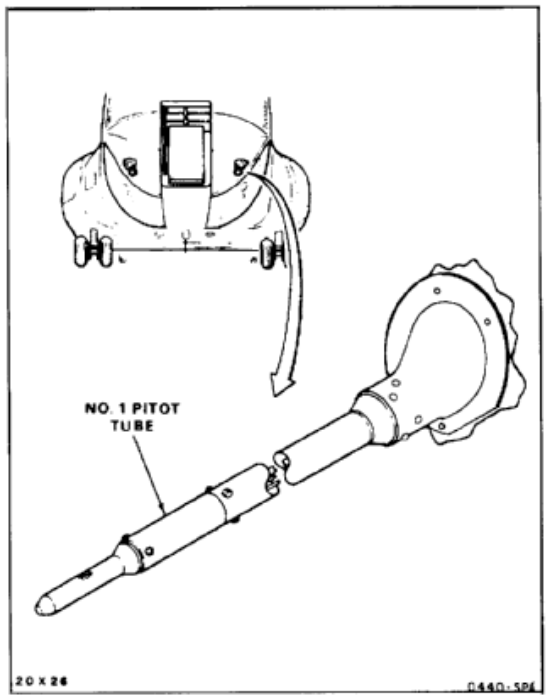
None

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off

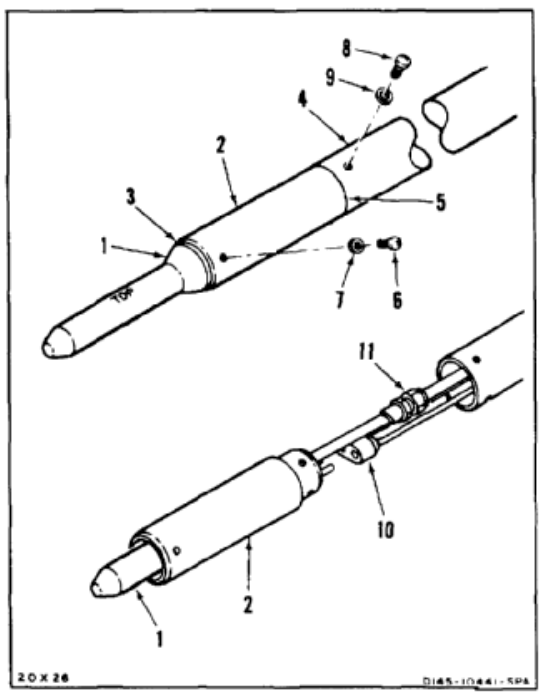



**WARNING**

Be sure electrical power is off when working with pitot tube. Otherwise, personnel could be burned.

**NOTE**

Procedure is same to remove No. 1 or No. 2 pitot tube.




1. Remove sealant from pitot tube (1) and sleeve (2) joint (3).
2. Remove sealant from sleeve (2) and support (4) joint (5).
3. Remove sealant from three screws (6). Remove screws and washers (7).
4. Remove sealant from four screws (8). Remove screws and washers (9).
5. Slide sleeve (2) forward over pitot tube (1).
6. Disconnect electrical connector (10).
7. Disconnect pitot tube at coupling (11).
8. Remove pitot tube (1) and sleeve (2).

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-28 REMOVE NO. 1 OR NO. 2 PITOT TUBE SUPPORT 8-28

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Workstand

***Materials:***

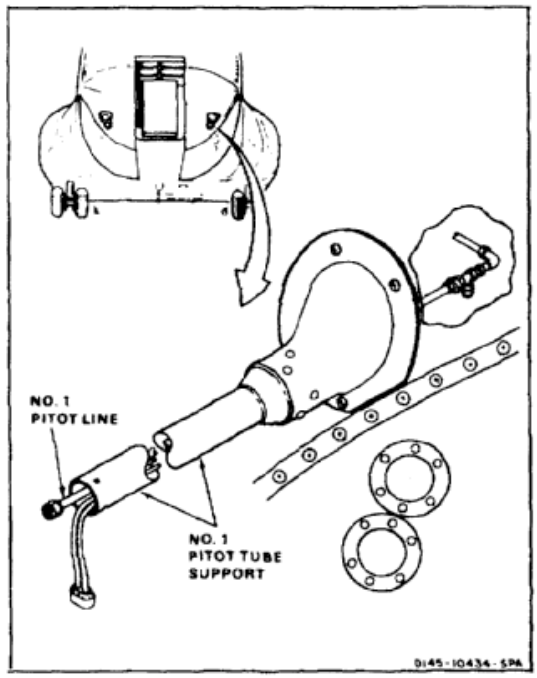
None

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

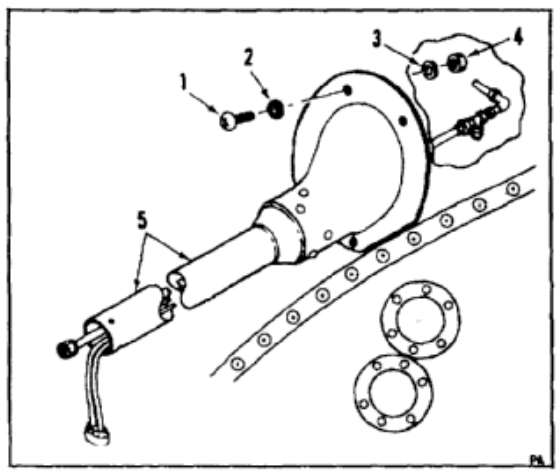
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Nose Enclosure Access Door Open (Task 2-2)
Pitot Tube No. 1 or No. 2 Removed (Task 8-27)



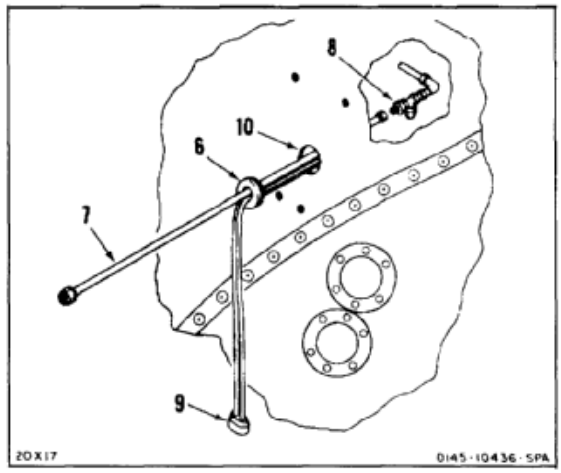

**NOTE**

Procedure is same to remove No. 1 or No. 2 pitot tube support. No. 1 pitot tube support removal is shown here.

1. Remove sealant and four screws (1), seal washers (2), washers (3), and nuts (4).
2. Remove support (5).



3. Remove grommet (6).
4. Disconnect pitot line (7) at fitting (8).
5. Pull wire harness (9) through access hole (10).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-29 INSTALL NO. 1 OR NO. 2 PITOT TUBE SUPPORT 8-29

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Workstand

***Materials:***

Dry Cleaning Solvent (E162)
Cloths (E120)
Gloves (E186)
Twine (E433)
Sealant (E336)

***Parts:***

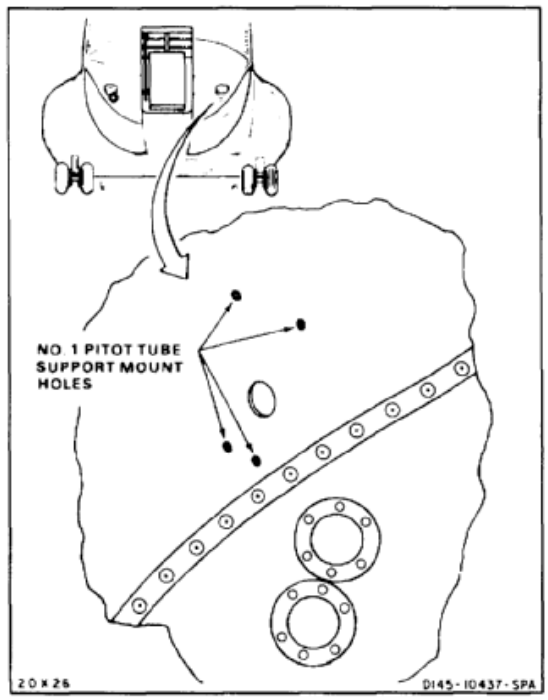
Seal Washers

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P

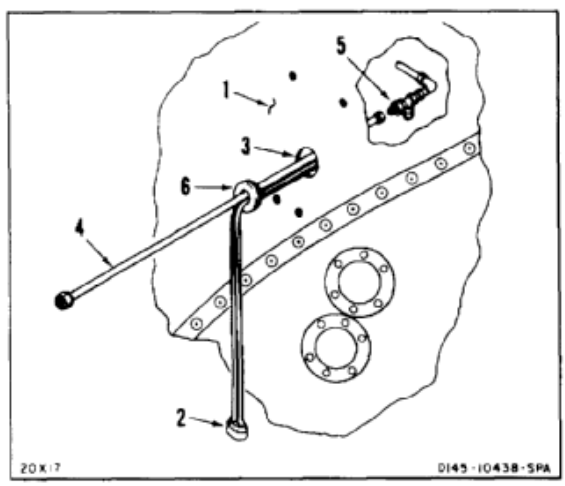



**WARNING**

Dry cleaning solvent (E162) is combustible and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

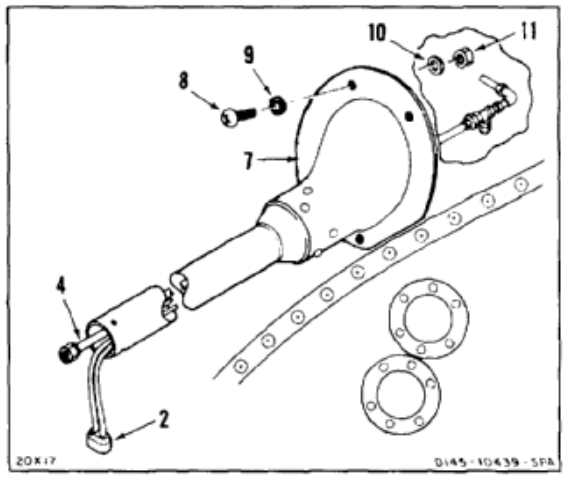
**NOTE**

The procedure to install No. 1 or No. 2 pitot tube support is the same. Installation of No. 1 pitot tube support is shown here.




1. Clean pitot tube mount area (1). Use dry cleaning solvent (E162), cloth (E120), and gloves (E186).
2. Pull wire harness connector (2) through access hole (3).
3. Install pitot line (4) to fitting (3).
4. Install grommet (6).

5. Position pitot tube support (7), over pitot line (4) and wire harness connector (2). Use twine (E433) to tie connector (2) to pitot tube end of line.
6. Install four screws (8). Make sure seal washers (9) are under heads of screws.
7. Install four washers (10) and nuts (11).
8. Remove twine installed in step 5.




**WARNING**

Sealant (E336) can irritate skin and cause burns. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

9. Seal screws (8) and pitot tube support (7) mating surfaces. Use sealant (E336).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Install pitot tube (Task 8-30).
Close nose access door (Task 2-2).

END OF TASK

## 8-30 INSTALL NO. 1 OR NO. 2 PITOT TUBE 8-30

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Workstand

***Materials:***

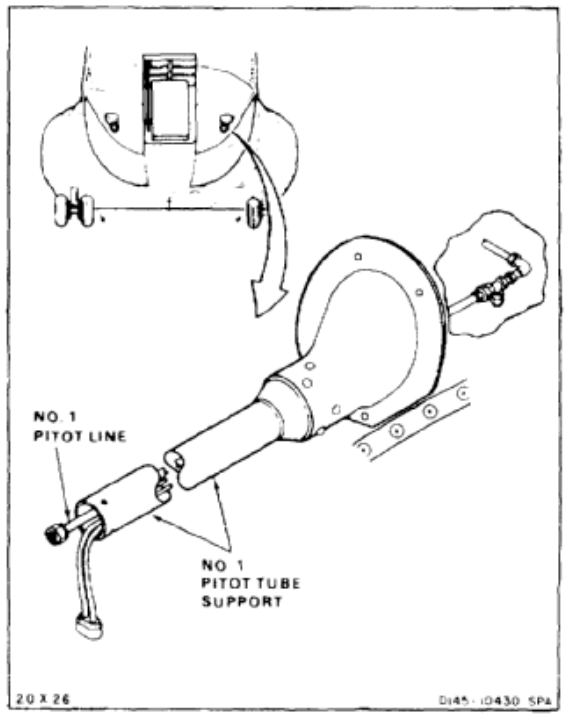
Sealant (E336)

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

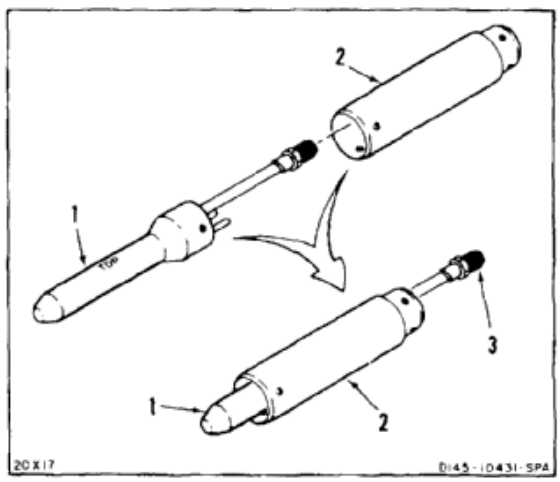
TM 55-1520-240-23P



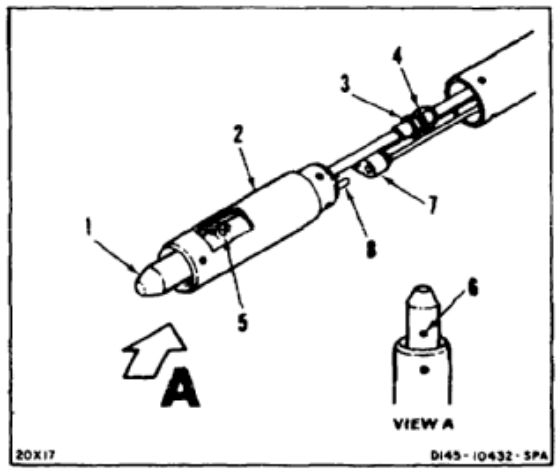

**NOTE**

The procedure to install No. 1 or No. 2 pitot tube is the same. Installation of No. 1 is shown here.

1. Place pitot tube (1) inside sleeve (2), make sure fitting (3) protrudes from stepped down end of sleeve.



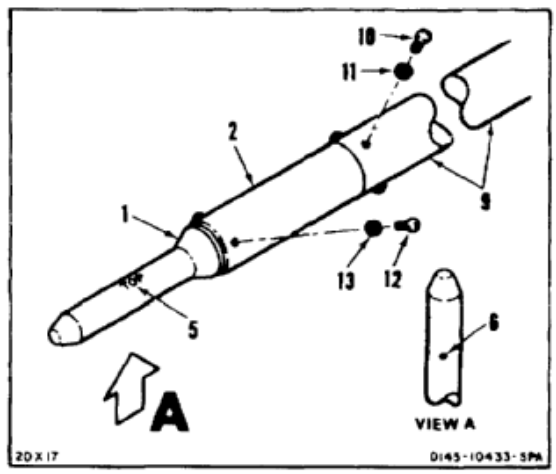
2. Connect pitot line (4) to pitot tube fitting (3). Make sure word "TOP" (5) is at up position and that drain hole (6) is down.
3. Connect electrical connector (7) to pins (8).




4. Slide sleeve (2) over pitot tube (1) and into pitot tube support (9).
5. Install four screws (10) and washers (11).
6. Install three screws (12) and washers (13). Make sure word "TOP" (5) is at up position and that drain hole (6) is down.

**WARNING**

Sealant (E336) can irritate skin and cause burns. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.




7. Seal screws (10) and pitot tube (9) mating surfaces.

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Test pitot-static system (TM 55-1520-240-T).
Close nose enclosure access door (Task 2-2).

END OF TASK

## 8-31 REMOVE SIDESLIP SENSING PORTS 8-31

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Workstand

***Materials:***

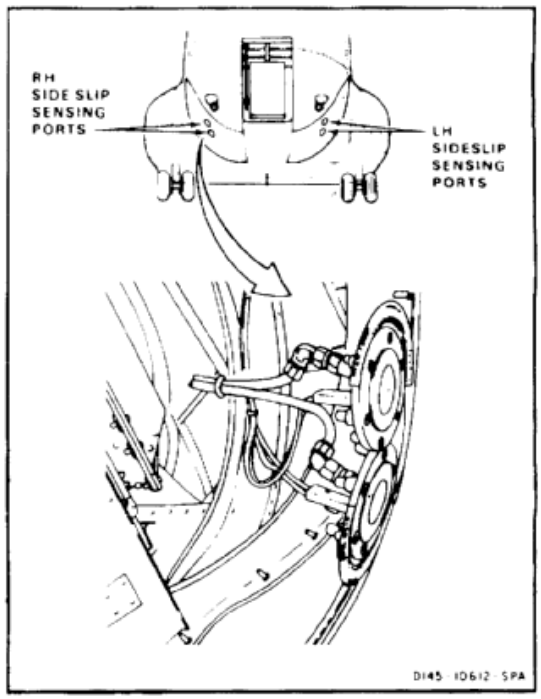
None

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Nose Enclosure Access Door Open (Task 2-2)




**NOTE**

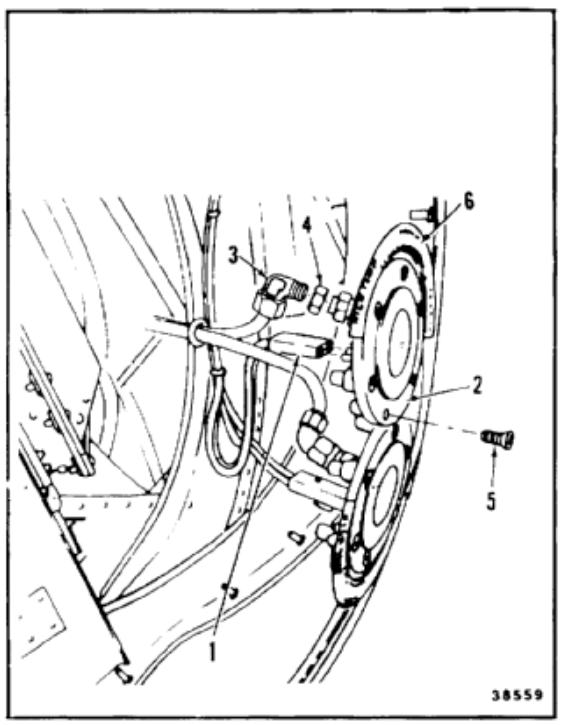
Procedure is the same to remove all four sideslip sensing ports. No. 1 RH is shown here.

1. Disconnect electrical connector (1) from sideslip sensing port (2).

**CAUTION**

Do not disassemble compression fitting in order to retain clips inside of compression fitting.

2. Disconnect sideslip sensing line (3), at compression fitting nut (4).
3. Remove six screws (5).
4. Remove sideslip sensing port (2) from window panel (6).

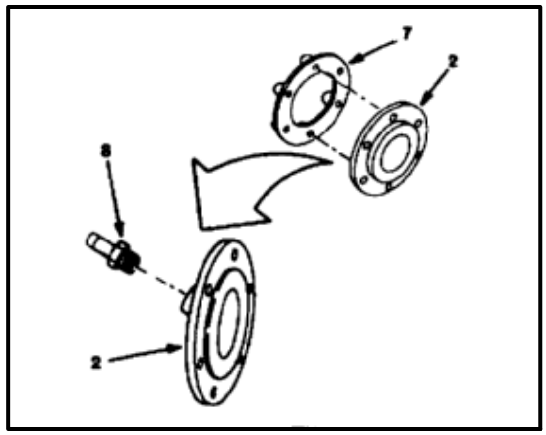


**8-31 REMOVE SIDESLIP SENSING PORTS (Continued) 8-31**

5. Remove retainer (7) from slideslip sensing port (2).
6. Remove tube adapter (8) from slideslip sensing port (2).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Workstand
Torque Screwdriver, 0-50 Inch-Pounds

***Materials:***

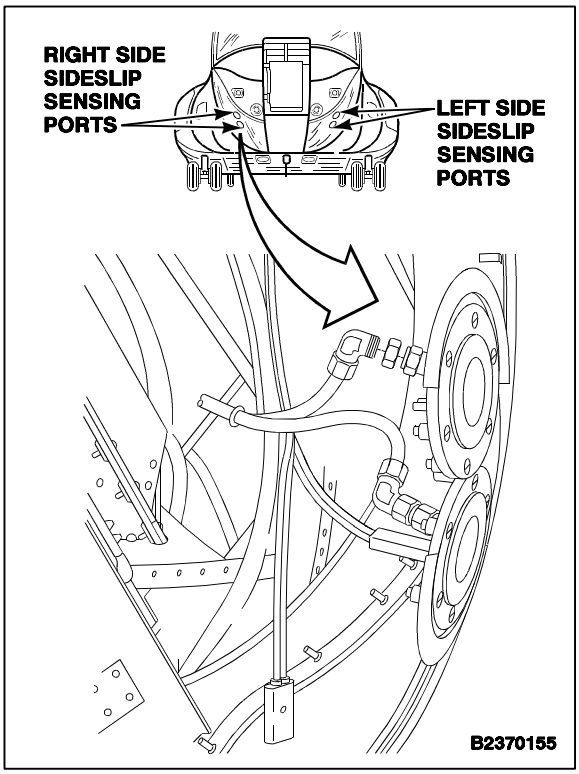
Packing

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

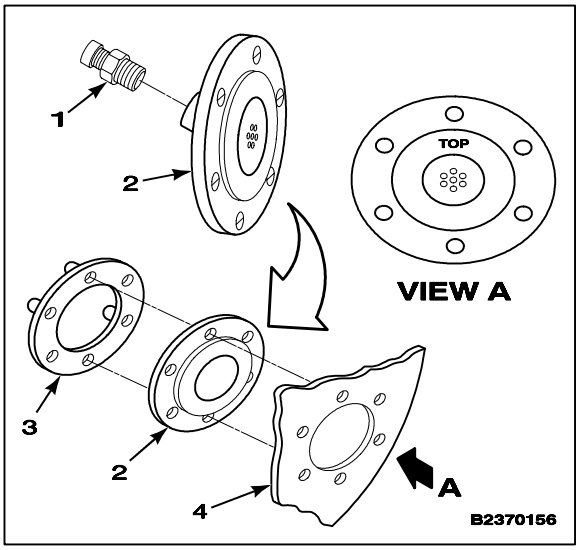
TM 55-1520-240-23P



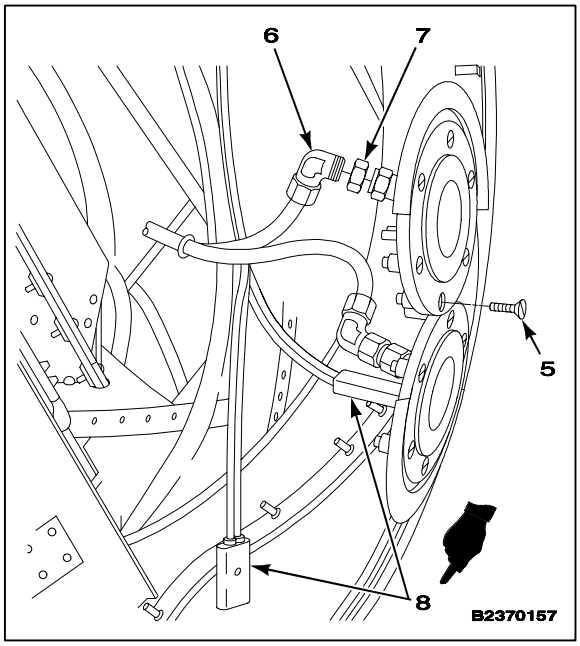

**NOTE**

Procedure is the same to install four sideslip sensing ports. No. 1 RH is shown here.

1. Install adapter (1) in slideslip sensing port (2).
2. Install retainer (3) on slideslip sensing port (2).
3. Position sideslip sensing port (2) and retainer (3) in window panel (4). Position from inside panel and make sure word "TOP" is up.



4. Install six screws (5). Torque screws to **6 inch-pounds**.
5. Connect sideslip sensing line (6), at compression fitting nut (7).
6. Connect electrical connector (8).




***FOLLOW-ON MAINTENANCE:***

Leak check sideslip system (TM 55-1520-240-T).
Close nose enclosure access door (Task 2-2).

END OF TASK

## 8-33 REMOVE STATIC PORT ADAPTER 8-33

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Airframe Repairer's Tool Kit, NSN 5180-00-323-4876
Workstand

***Materials:***

None

***Personnel Required:***

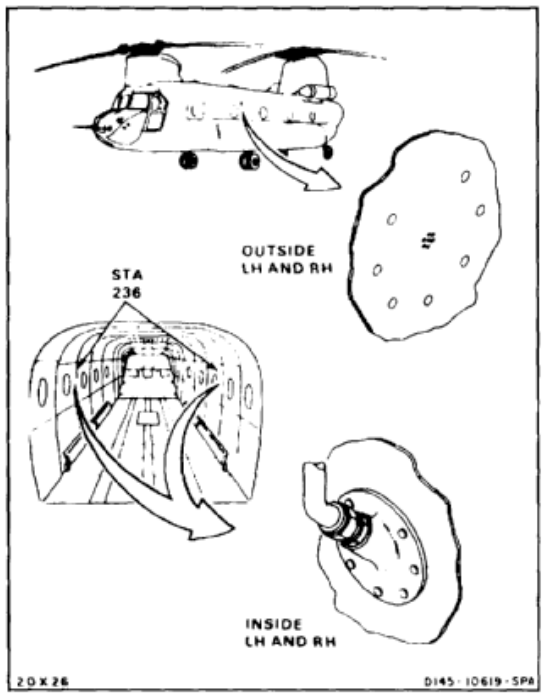
Medium Helicopter Repairer
Aircraft Structural Repairer

***References:***

TM 1-1500-204-23

***Equipment Condition:***

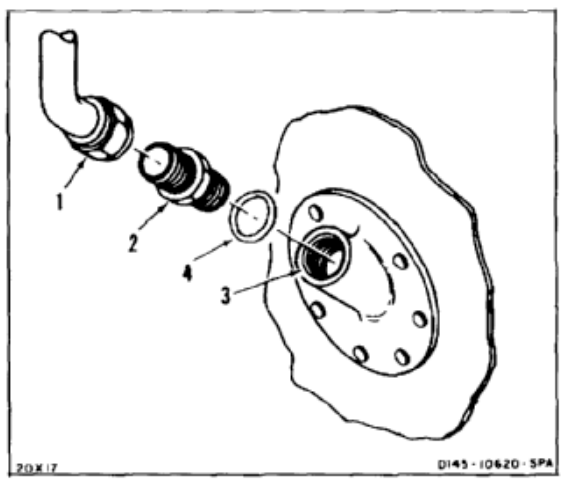
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Side Acoustic Blanket (Sta. 200 to 240) Removed (Task 2-208)




**NOTE**

Procedure is same to remove No. 1 or No. 2 static ports. No. 1 static port is shown here.

1. Disconnect tube (1).
2. Remove straight thread connector (2) and packing (4) from static port adapter (3).

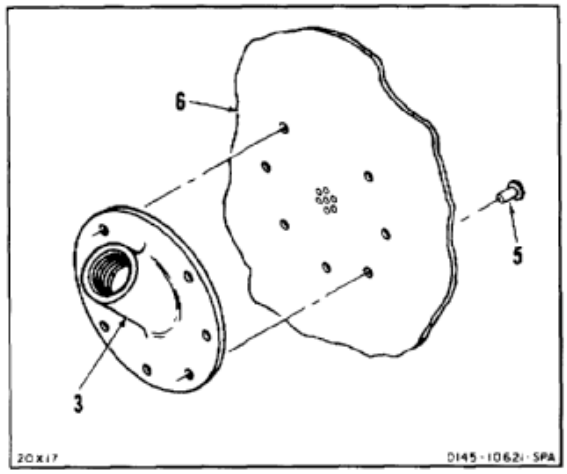


## 8-33 REMOVE STATIC PORT ADAPTER (Continued) 8-33

3. From outside aircraft, remove seven rivets (5).
4. From inside aircraft, remove static port adapter (3) from fuselage skin (6).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 8-34 INSTALL STATIC PORT ADAPTER 8-34

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Airframe Repairer's Tool Kit, NSN 5180-00-323-4876
Workstand

***Materials:***

Dry Cleaning Solvent (E162)
Cloths (E120)
Gloves (E186)
Sealant (E336)

***Parts:***

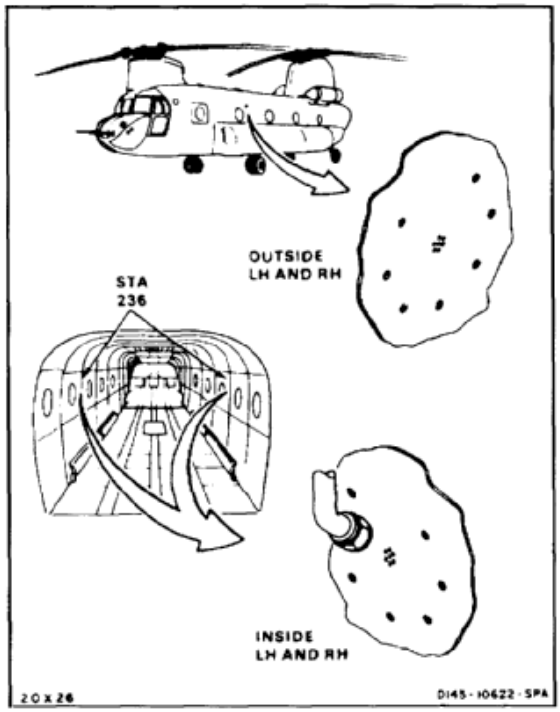
Packing
Rivets

***Personnel Required:***

Medium Helicopter Repairer
Aircraft Structural Repairer
Inspector

***References:***

TM 1-1500-204-23
TM 55-1520-240-23P
TM 55-1520-240-T

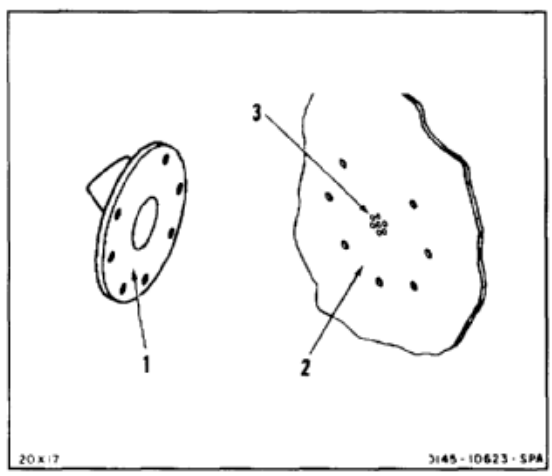



**WARNING**

Dry cleaning solvent (E162) is combustible and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

**NOTE**

Procedure is same to install No. 1 or No. 2 static ports. No. 1 static port is shown here.



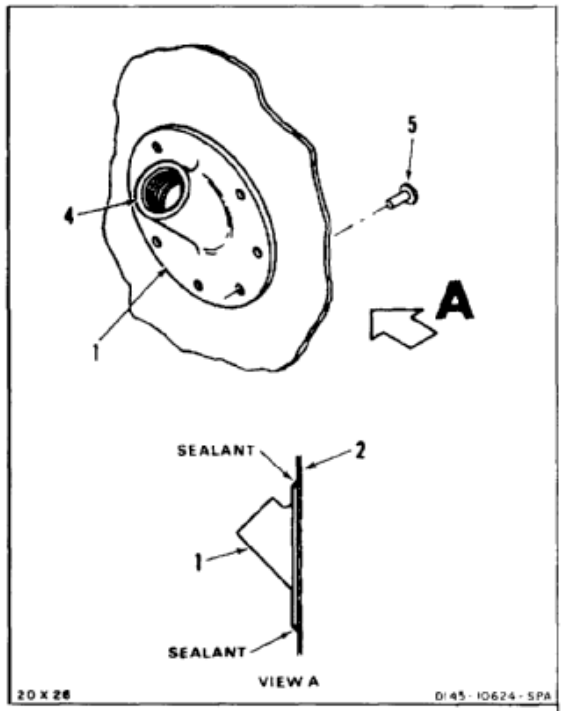

1. Clean mating surfaces of static port adapter (1) and inner fuselage skin (2). Use gloves (E186) and dry cleaning solvent (E162). Make sure no debris is in static port holes (3). Make sure holes are not deformed.

2. Position static port adapter (1). Make sure threaded port (4) is up.
3. From outside aircraft, install seven rivets (5).

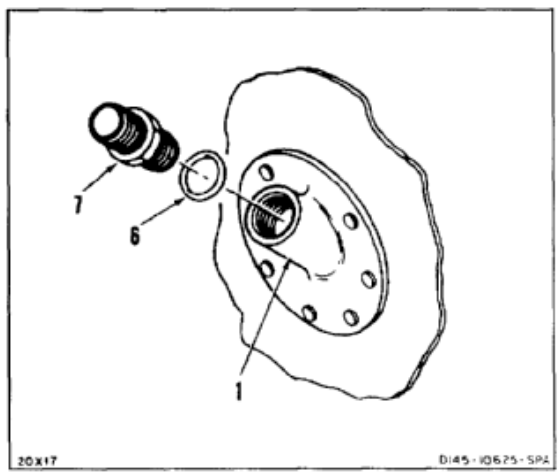
**WARNING**

Sealant (E336) can irritate skin and cause burns. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

4. From inside aircraft, seal static port adapter (1) to inner fuselage skin (2). Use sealant (E336). Wear gloves (E186).

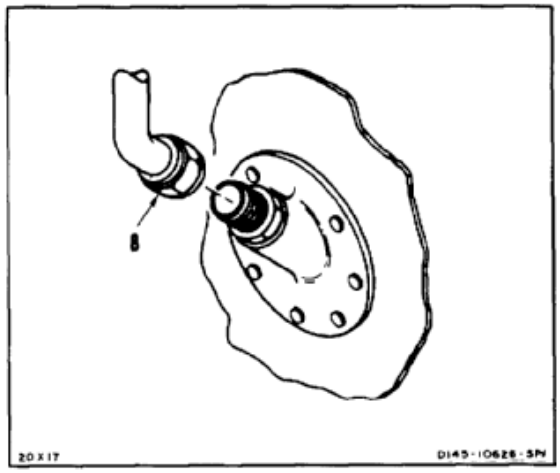



5. Install packing (6) in groove of straight thread connector (7).
6. Install straight thread connector (7) in static port adapter (1).



7. Connect static line tube (8).

***INSPECT***




***FOLLOW-ON MAINTENANCE:***

Leak check pitot static system (TM 55-1520-240-T).
Install side acoustical blanket (Task 2-210).

END OF TASK

## 8-35 TEST AIRSPEED INDICATOR RESTRICTOR 8-35

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Instrument Repairer's Tool Kit, NSN 4920-00-323-4913
Pitot and Static Systems Tester
Stopwatch

***Materials:***

None

***Parts:***

Airspeed Indicator
Flared Tube Tee
Tube Coupling

***Personnel Required:***

Aircraft Electrician

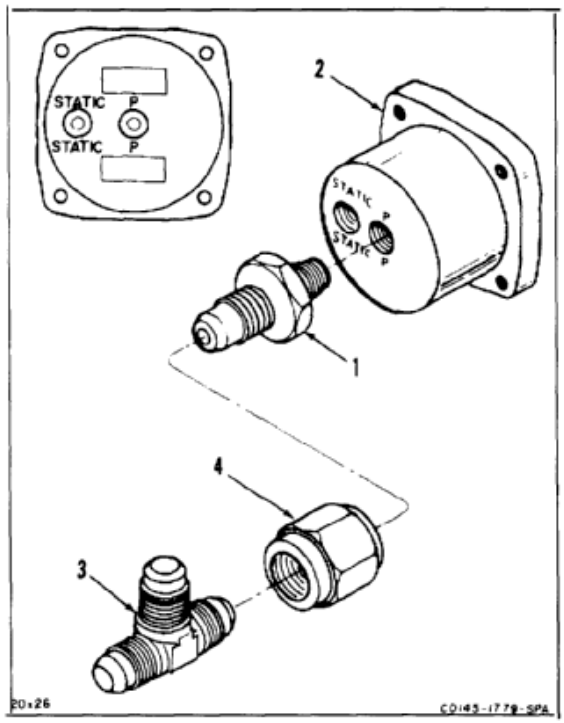
***References:***

TM 55-4920-231-14
Task 8-37

***Equipment Condition:***

Tester Rigged For Airspeed Indicator Test (TM 55-4920-231-14)
Off Helicopter Task

1. Install restrictor (1) in P port of serviceable airspeed indicator (2).
2. Connect tee (3) to restrictor (1) with coupling (4).



3. Connect hose (5) of tester (6) to tee (3).
4. Connect external case leak valve (7) to tee (3). Make sure valve is closed.

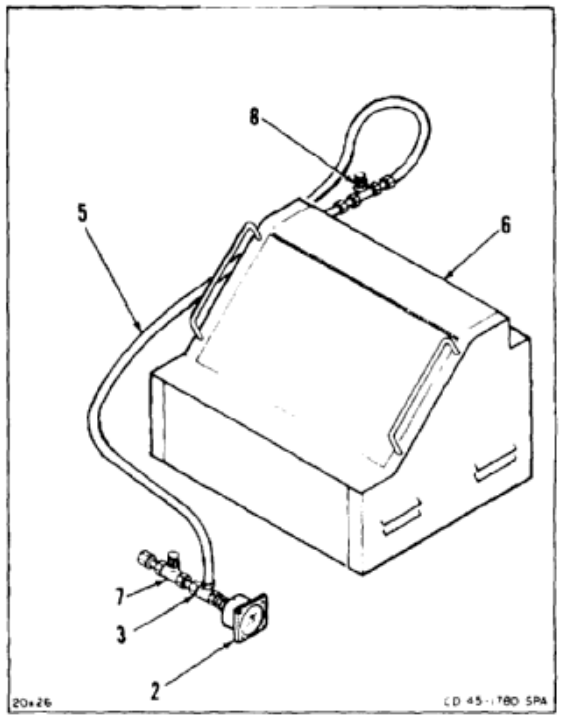
**NOTE**

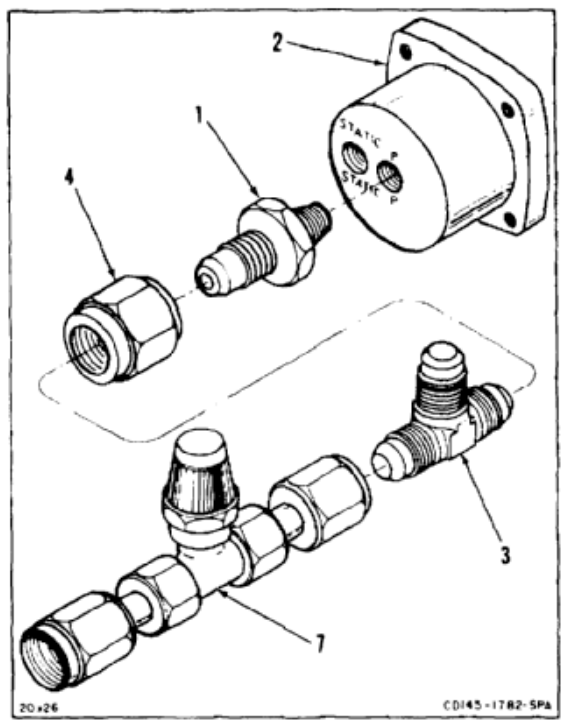
External case leak valve is part of tester.

5. Check that indicator (2) reads **0**.
6. Adjust tester (6) until indicator (2) reads **250 knots** (TM 55-4920-231-14).
7. Close external case leak valve (8). Check that indicator (2) reading does not change.
8. Open valve (7) and record time for indicator (2) reading to drop to **20 knots**. Use stopwatch. Elapsed time shall be **3.5 to 4.0 seconds**.
9. Open valve (8) and close valve (7).
10. Repeat steps 5 thru 8 twice. Adjust restrictor if recorded times are not **3.5 to 4.5 seconds** (Task 8-37).
11. Disconnect hose (5) from tee (3).
12. Shut down tester (6) (TM 55-4920-231-14).
13. Remove valve (7), tee (3), and coupling (4) from restrictor (1).
14. Remove restrictor (1) from airspeed indicator (2).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 8-36 REPLACE AIRSPEED INDICATOR RESTRICTOR 8-36

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

Cloth (E120)
Gloves (E186)
Antiseize Thread Compound (E76)

***Personnel Required:***

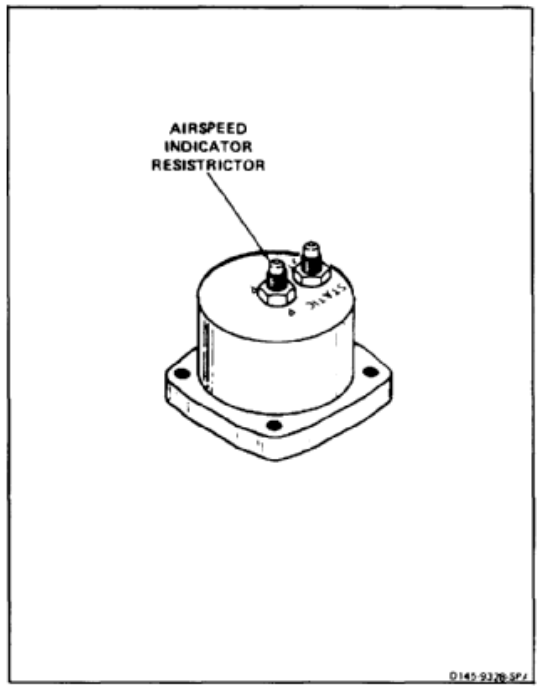
Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P

***Equipment Condition:***

Off Helicopter Task




**NOTE**

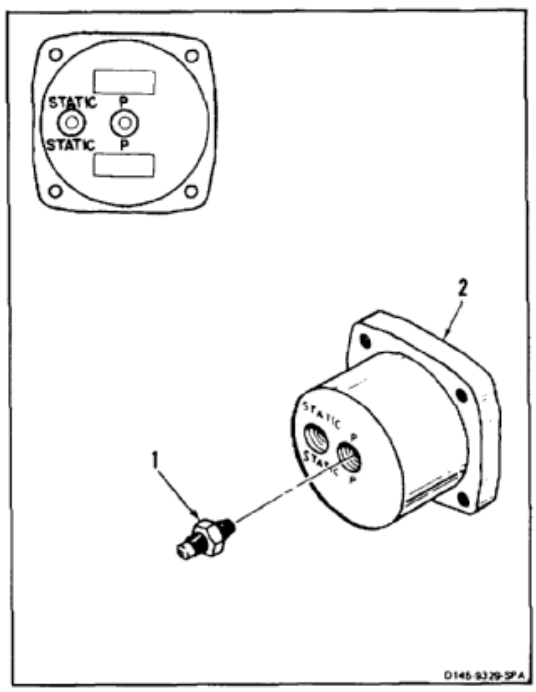
Be careful when handling the airspeed indicator. Rough handling will damage indicator.

1. Remove restrictor (1) from P port of airspeed indicator (2).

**WARNING**

Antiseize compound (E76) is extremely toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

2. Apply antiseize (E76) to pipe thread end of restrictor (1). Use gloves (E186).
3. Install restrictor (1) in P port of airspeed indicator (2).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-37 ADJUST AIRSPEED INDICATOR RESTRICTOR 8-37

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Instrument Repairer's Tool Kit, NSN 4920-00-323-4913
Pitot and Static Systems Tester
Stopwatch
Spline Wrench, 0.050 Inch, NSN 5120-00-288-9085

***Materials:***

Sealant (E340)
Primer (E299)
Gloves (E186)

***Parts:***

Airspeed Indicator
Flared Tube Tee
Tube Coupling

***Personnel Required:***

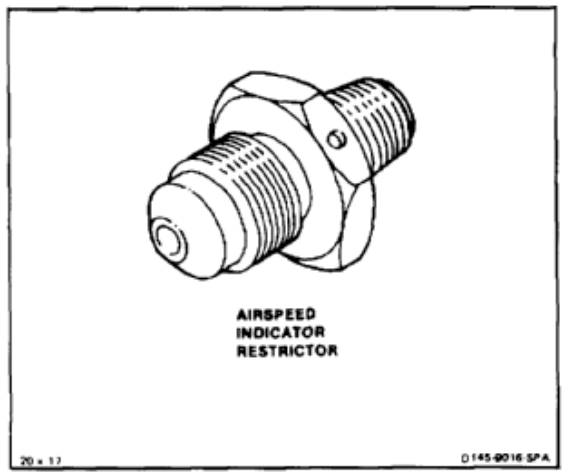
Aircraft Electrician
Inspector

***References:***

Task 8-35
TM 55-4920-231-14

***Equipment Condition:***

Tester Rigged for Airspeed Indicator Test (TM 55-4920-231-14)
Airspeed Indicator Restrictor Tested (Task 8-35)
Off Helicopter Task



**8-37 ADJUST AIRSPEED INDICATOR RESTRICTOR (Continued) 8-37**

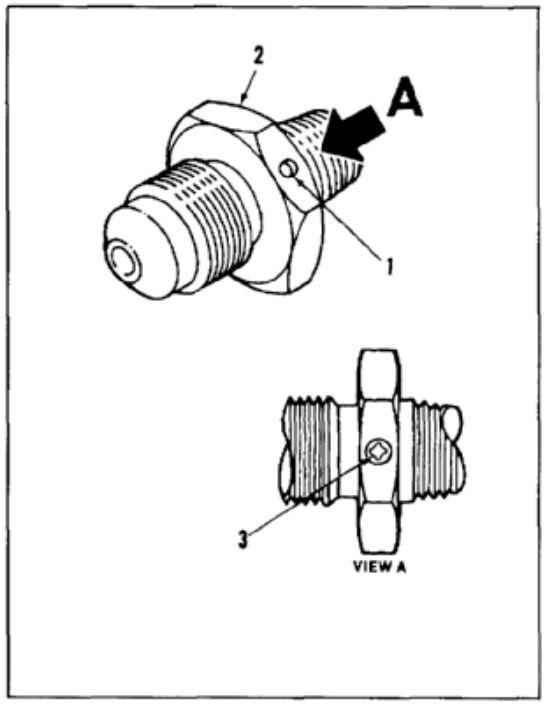
1. Remove sealant from setscrew hole (1) of restrictor (2).

**NOTE**

Setscrew is turned very slightly when adjusting.

2. If the elapsed time in test (Task 8-35) was more than **4.0 seconds**, turn setscrew (3) counterclockwise. If the elapsed time was less than **3.5 seconds**, turn setscrew clockwise.

3. After adjusting setscrew (3), repeat test (Task 8-35). If the elapsed time is not **3.5 to 4 seconds**, repeat step 2. If the elapsed time is **3.5 to 4 seconds**, go to step 4.



**WARNING**

Primer (E299) is flammable and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from heat or open flame. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

4. Apply primer (E299) to thread of setscrew hole (1). Do not get primer in spline socket of setscrew (3). Allow primer to dry at room temperature for **30 minutes**. Wear gloves (E186).

**WARNING**

Sealant (E340) can irritate skin and cause burns. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

5. Apply sealant (E340) to setscrew hole (1). Wear gloves (E186).

6. Test restrictor (2) (Task 8-35). Elapsed time must be **3.5 to 4 seconds**.

***INSPECT***

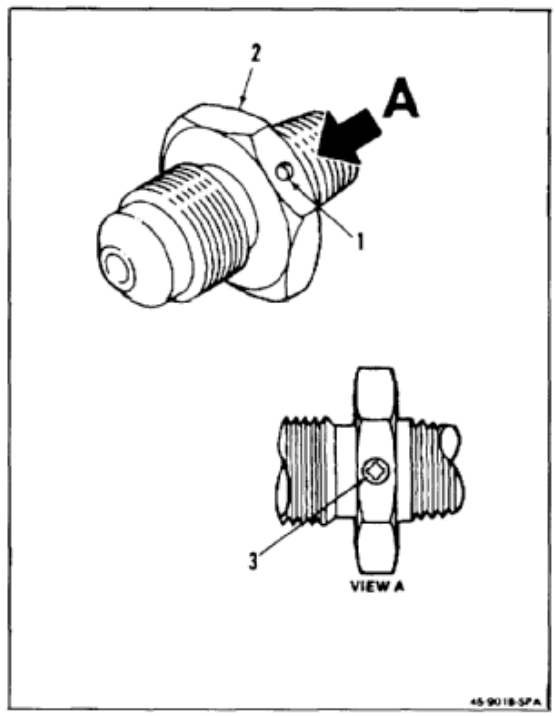
7. Cure sealant (E340) for **24 hours**.

8. Test restrictor (2) (Task 8-35) after **24 hour** cure time. Elapsed time must be **3.5 to 4 seconds**.

***INSPECT***

***FOLLOW ON MAINTENANCE:***

None




END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Pitot and Static Systems Tester
Power Supply, 28 VDC
Stopwatch

***Materials:***

None

***Personnel Required:***

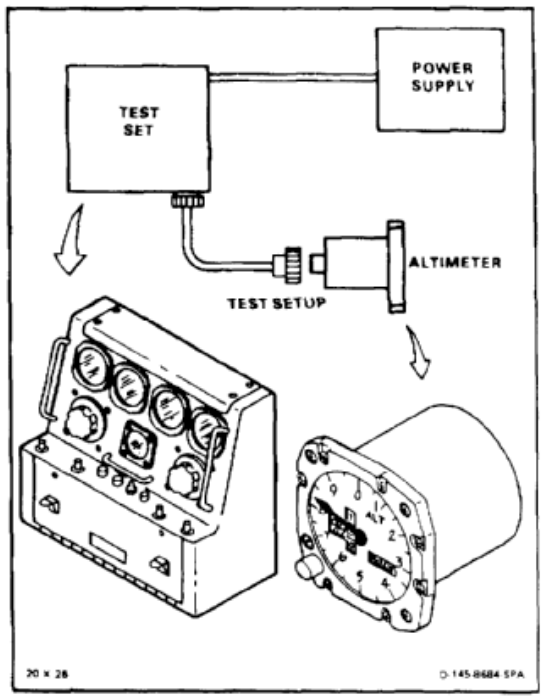
Aircraft Electrician
Inspector

***References:***

TM 1-1500-204-23
TM 55-4920-231-14

***Equipment Condition:***

Off Helicopter Task
Test Setup




CAUTION

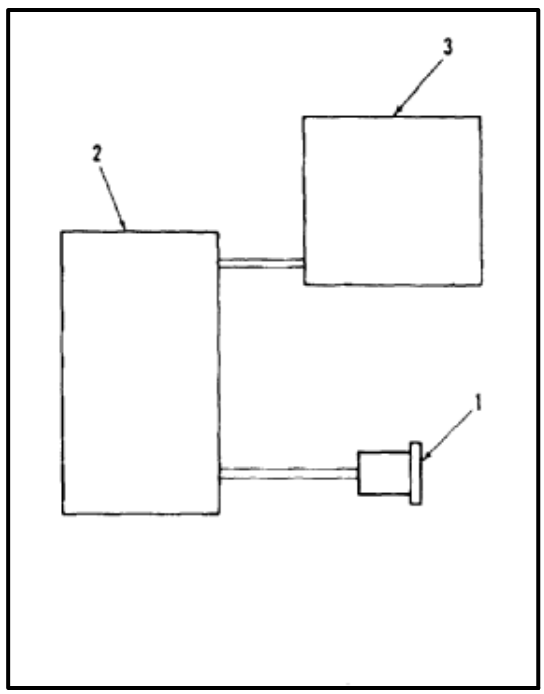
Be careful when handling altimeter. Rough handling will damage altimeter.

1. Supply **28 vdc** to altimeter vibrator during following test.

1.1. Set altimeter (1) to read **0 feet** altitude.

2. Connect altimeter to test set (2) (TM 55-4920-231-14).

3. Turn on power supply (3).




CAUTION

Do not exceed **3,000 feet per minute** rate of increase.

4. Turn on and adjust test set (2) to cause altimeter (1) to read **18,000 feet** (TM 55-4920-231-14).

5. Shut test set valve off. Check altimeter (1). Altimeter shall not lose more than **100 feet in 1 minute** (TM 1-1500-204-23).

***INSPECT***

CAUTION

Do not exceed **3,000 feet per minute** rate of decrease.

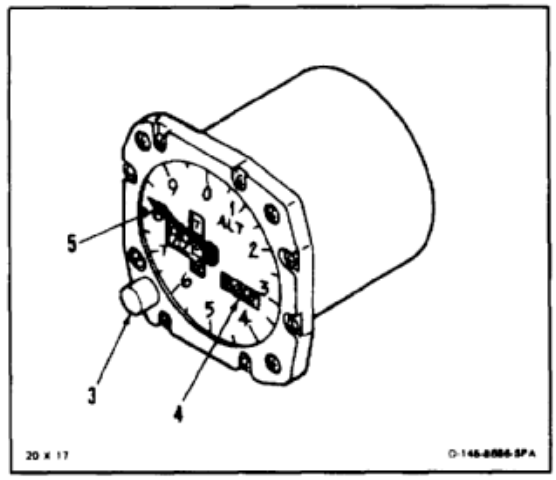
6. Adjust test set (2) to cause altimeter (1) to **0 feet** altitude reading (TM 55-4920-231-14).

7. Rotate adjustment knob (3) to bring barometric scale (4) from **28.10 to 31.00**. Check that no binding occurs and that pointers (5) move smoothly.
8. Rotate adjustment knob (3) to bring barometric scale to **29.92**. Record altitude reading.
9. Rotate adjustment knob (3) to bring barometric scale to **28.50**. Record altitude reading.
10. Compare readings from steps 8 and 9. The difference shall be between **1,315 and 1,365 feet**.

***INSPECT***

11. Rotate adjustment knob (3) to bring barometric scale to **29.92**. Record reading.
12. Rotate adjustment knob (3) to bring barometric scale to **30.90**. Record reading.
13. Compare readings from steps 11 and 12. The difference shall be between **868 and 918 feet**.

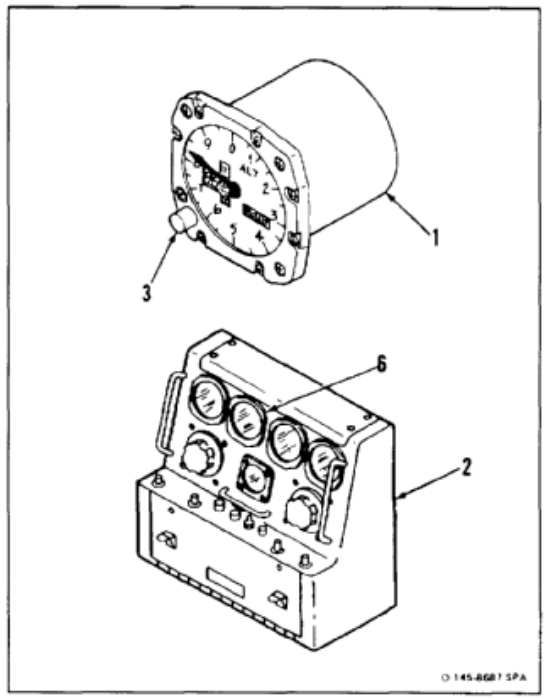
***INSPECT***



14. Rotate adjustment knob (3) of test altimeter (6) and altimeter being tested to bring both barometric scales to **29.92**. Record altitude reading.
15. Adjust test set to altitude test points. Readings shall be within tolerance listed (TM 55-4920-231-14).

***INSPECT***

16. Adjust test set (2) to cause altimeter to return to altitude recorded in step 14.
17. Shut down test set (TM 55-4920-231-14).
18. Shut down power supply.
19. Disconnect altimeter (1) from test setup.




| ALTITUDE TEST POINT (FEET) | ALTIMETER READING (FEET) |
|---|---|
| 0 | –30 to 30 |
| 500 | 465 to 535 |
| 1,000 | 965 to 1,035 |
| 1,500 | 1,460 to 1,540 |
| 2,000 | 1,960 to 2,040 |
| 3,000 | 2,955 to 3,045 |
| 4,000 | 3,950 to 4,050 |
| 6,000 | 5,940 to 6,060 |
| 8,000 | 7,930 to 8,070 |
| 10,000 | 9,920 to 10,080 |
| 12,000 | 11,910 to 12,090 |
| 14,000 | 13,900 to 14,100 |
| 16,000 | 15,890 to 16,110 |
| 18,000 | 17,880 to 18,120 |
| 20,000 | 19,870 to 20,130 |

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-39 REMOVE CRUISE GUIDE SIGNAL CONDITIONER 8-39

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

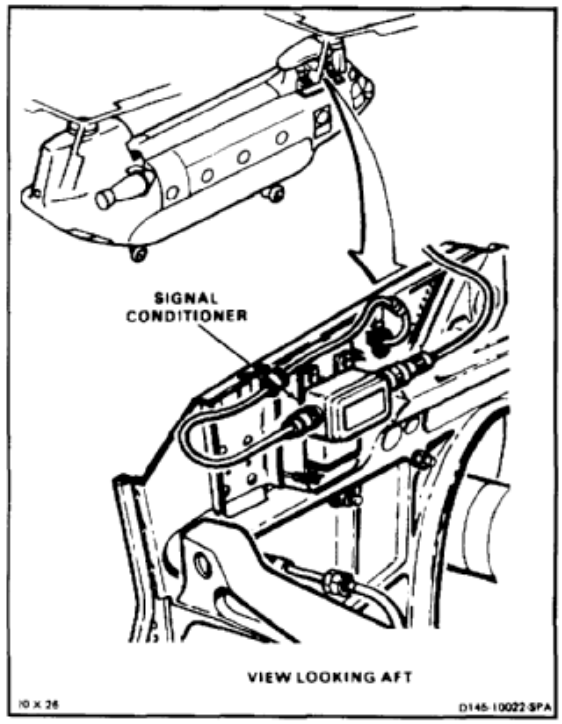
Paper Tags (E264)

***Personnel Required:***

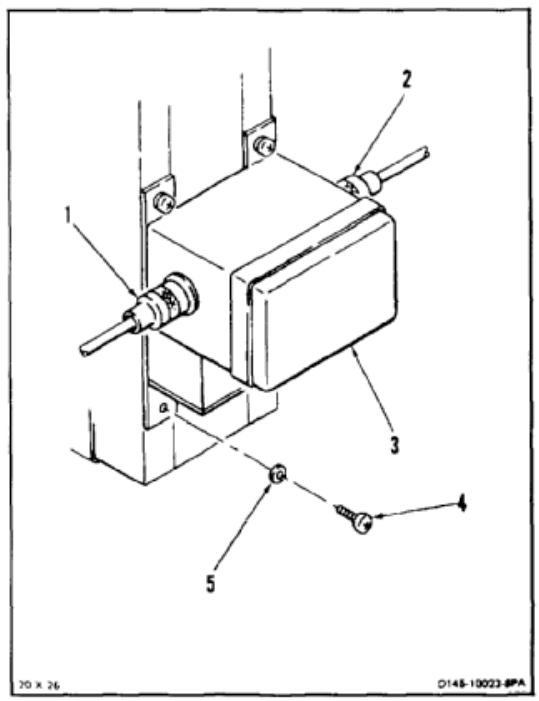
Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Right Forward Work Platform Open (Task 2-2)




1. Tag and disconnect two connectors (1 and 2) from signal conditioner (3).
2. Remove four screws (4) and washers (5).
3. Remove signal conditioner (3).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-40 INSTALL CRUISE GUIDE SIGNAL CONDITIONER 8-40

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

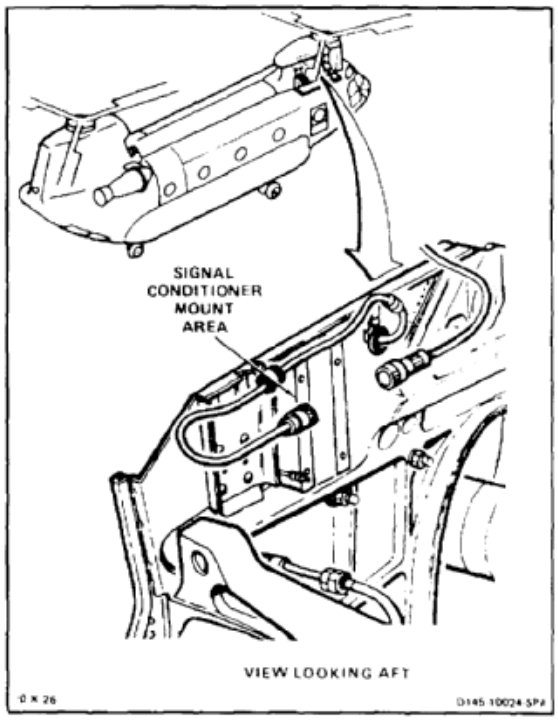
Dry Cleaning Solvent (E162)
Cloths (E120)
Gloves (E186)

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

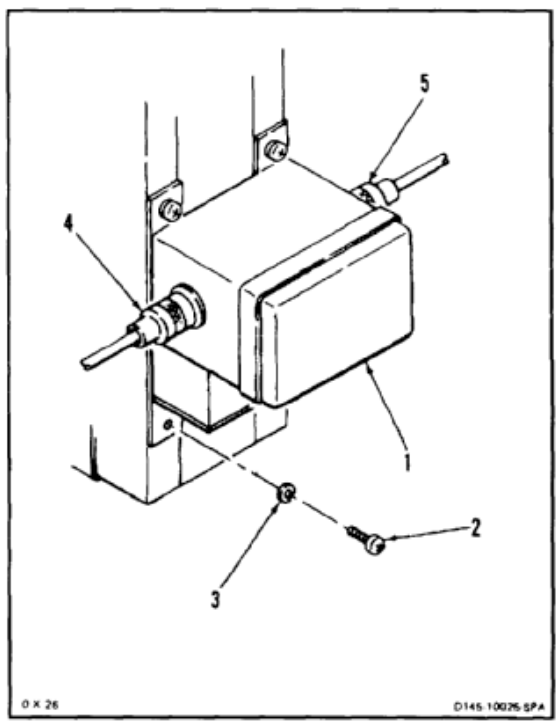
TM 55-1520-240-23P
TM 55-1500-323-25




**WARNING**

Dry cleaning solvent (E162) is combustible and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

1. Clean bonding surfaces of signal conditioner (1). Use dry cleaning solvent (E162), cloth (E120), and gloves (E186).
2. Position signal conditioner (1).
3. Install four screws (2) and washers (3).
4. Connect two electrical connectors (4 and 5). Remove tags.




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Close right forward work platform (Task 2-2).
Perform operational check (TM 55-1520-240-T).

END OF TASK

## 8-41 REMOVE CRUISE GUIDE SIGNAL PROCESSOR 8-41

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

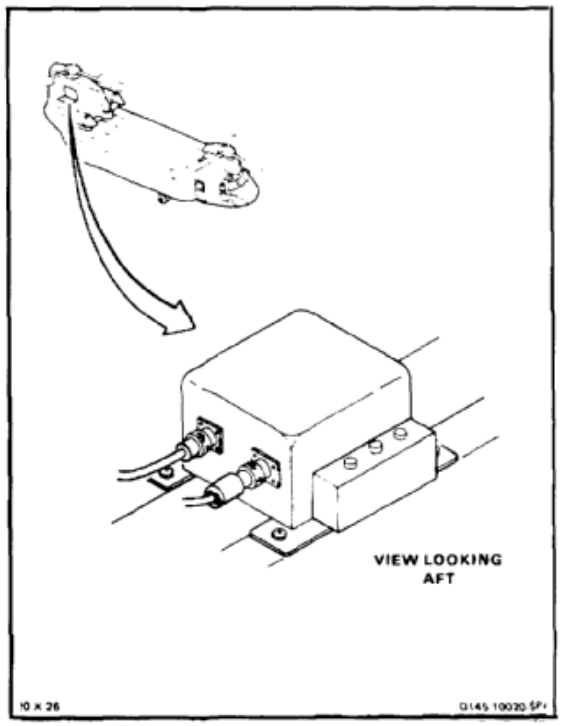
Paper Tags (E264)

***Personnel Required:***

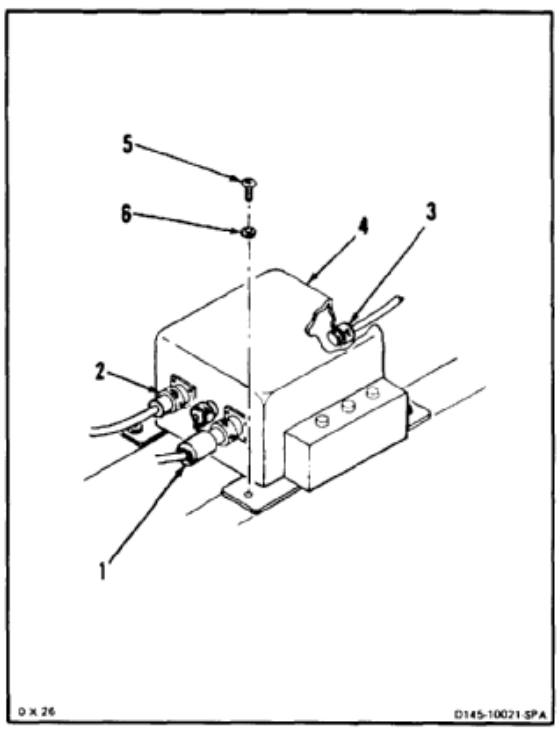
Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Right Pylon Work Platform Open (Task 2-2)




1. Tag and disconnect three connectors (1, 2, and 3) from signal processor (4).
2. Remove four screws (5) and washers (6).
3. Remove signal processor (4).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-42 INSTALL CRUISE GUIDE SIGNAL PROCESSOR 8-42

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

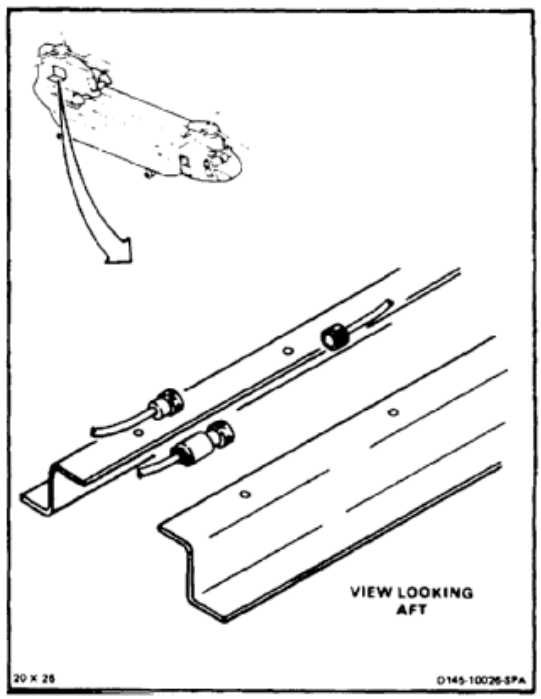
Dry Cleaning Solvent (E162)
Cloths (E120)
Gloves (E186)

***Personnel Required:***

Aircraft Electrician
Inspector

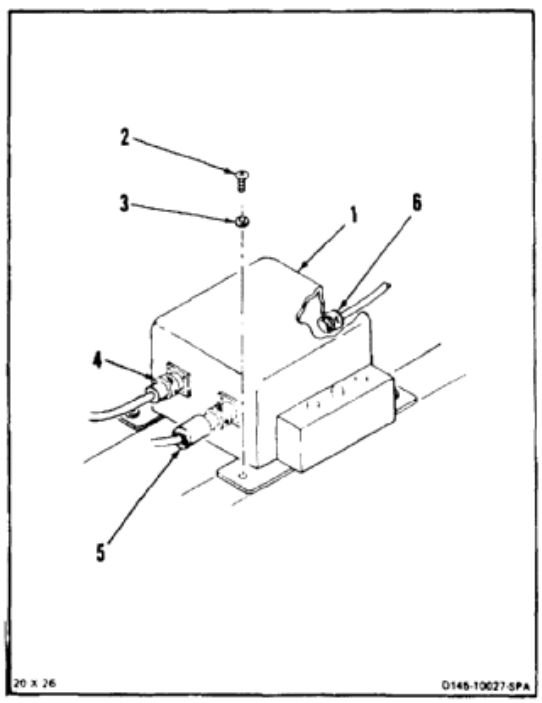
***References:***

TM 55-1520-240-23P
TM 55-1500-323-25




**WARNING**

Dry cleaning solvent (E162) is combustible and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.




1. Clean bonding surfaces of signal processor (1). Use dry cleaning solvent (E162), cloth (E120), and gloves (E186).
2. Position signal processor (1).
3. Install four screws (2) and washers (3).
4. Connect three electrical connectors (4, 5, and 6). Remove tags.

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Close right pylon work platform (Task 2-2).
Perform operational check (TM 55-1520-240-T).

END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
AC Power Supply, 115 Volt 60 Hz
Meter Test Set, TS-682A/GSM-1
Wire, No. 20, Insulated
Connector, MS3476W10-6S

***Materials:***

None

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 11-6625-277-14

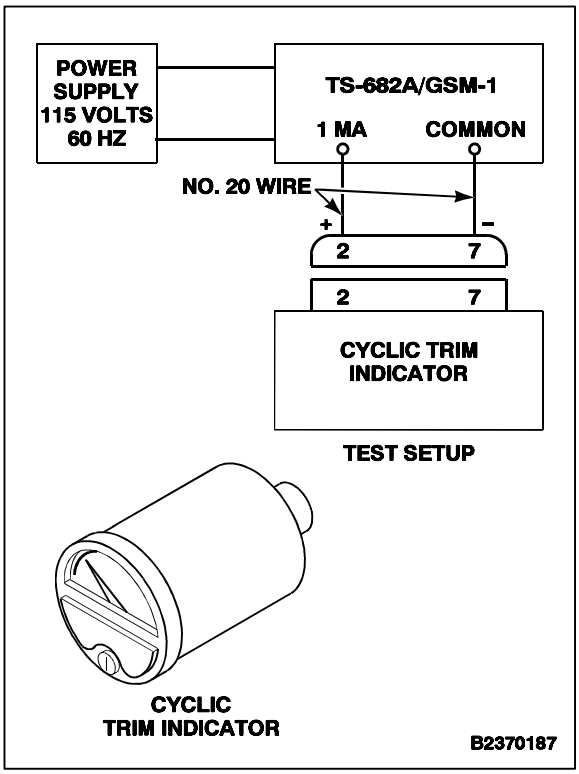
***Equipment Condition:***

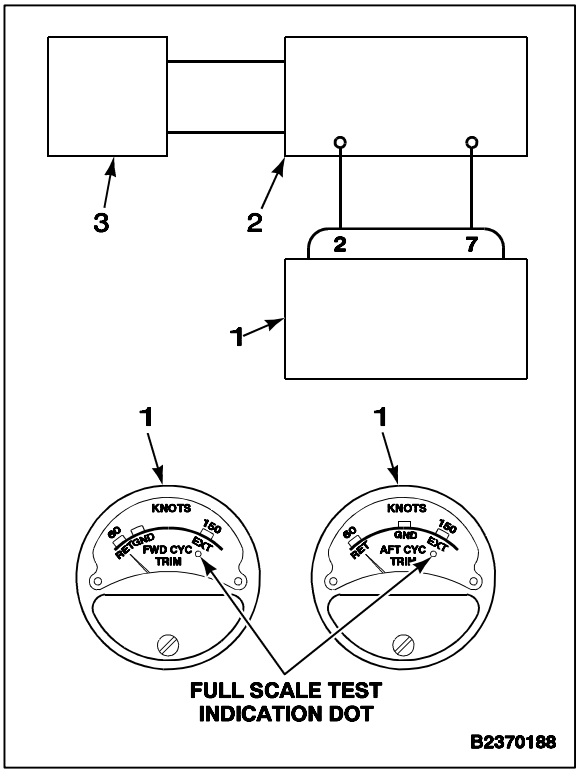
Off Helicopter Task
Electrical Test Setup

1. Connect forward or aft cyclic trim indicator (1) to test setup (TM 11-6625-277-14).
2. Turn on power supply (2).
3. Adjust test set (3) for minimum dc output.
4. Turn on test set (2).
5. Adjust test set dc output. Increase dc output until indicator (1) reads full scale (test indication dot).
6. Check test set (2). Test set shall read **520 to 530 microamperes**.
7. Adjust test set (3) to minimum dc output.
8. Shut down test set (2) (TM 11-6625-277-14).
9. Shut down power supply (3).
10. Remove indicator (1) from test setup.

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

INITIAL SETUP

***Applicable Configurations:***

Without 17

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

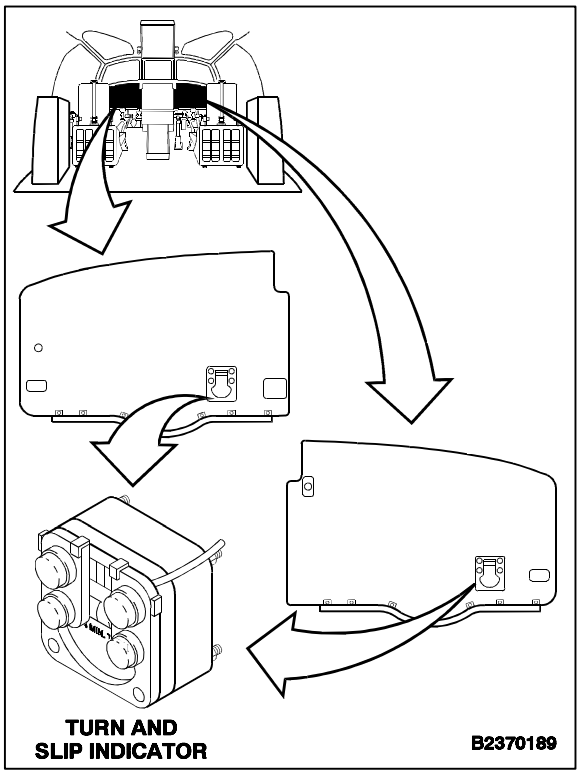
None

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




**NOTE**

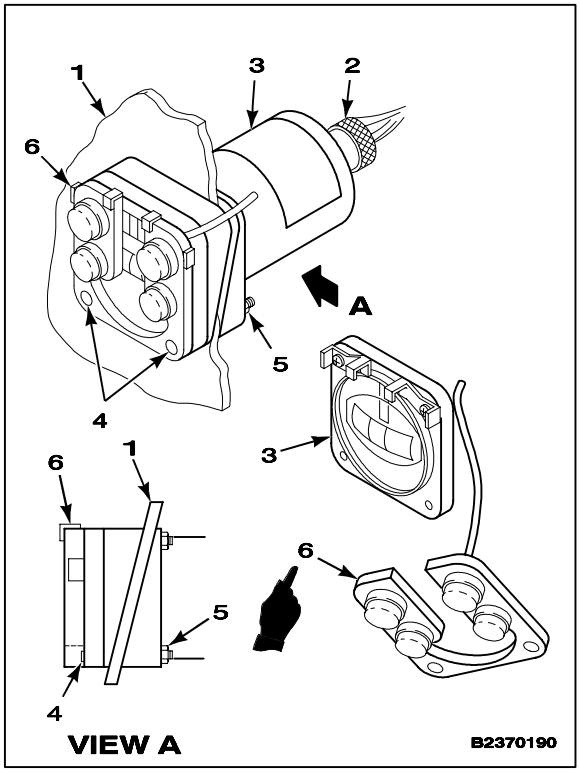
Procedure is same for removing pilot's or copilot's turn and slip indicator.

1. Reach up under instrument panel (1) and disconnect wire harness connector (2) from indicator (3).
2. Remove two long screws (4) and nuts (5).

**NOTE**

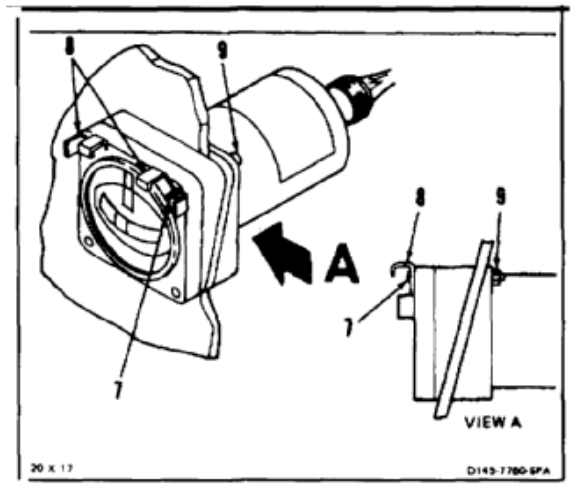
Do not cut or disconnect wire to light fixture.

3. Remove light fixture (6). Pull fixture down and aft, away from indicator (3).



## 8-44 REMOVE TURN AND SLIP INDICATOR — PILOT'S OR COPILOT'S INSTRUMENT PANEL (Continued) 8-44

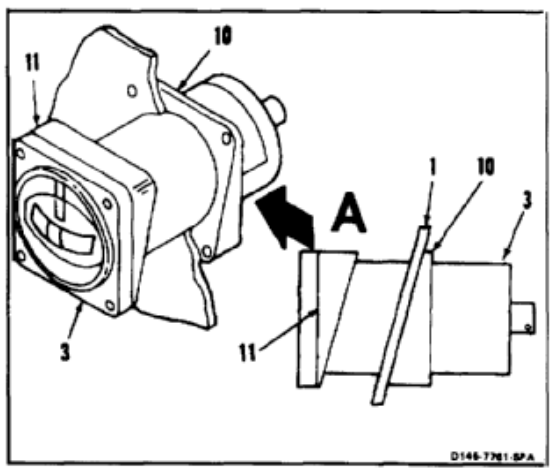
4. Remove two short screws (7), two clips (8), and nuts (9).




CAUTION

Be careful when handling indicator. Rough handling will damage indicator.

5. Reach up under instrument panel (1) and hold mounting plate (10).
6. Slide indicator (3) and second mounting plate (11) out of instrument panel (1).
7. Remove mounting plate (10) from in back of instrument panel (1).




8. Remove mounting plate (11) from indicator (3).

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-44.1 REMOVE TURN AND SLIP INDICATOR — PILOT'S OR COPILOT'S INSTRUMENT PANEL 8-44.1

INITIAL SETUP

***Applicable Configurations:***

With 17 or 69

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

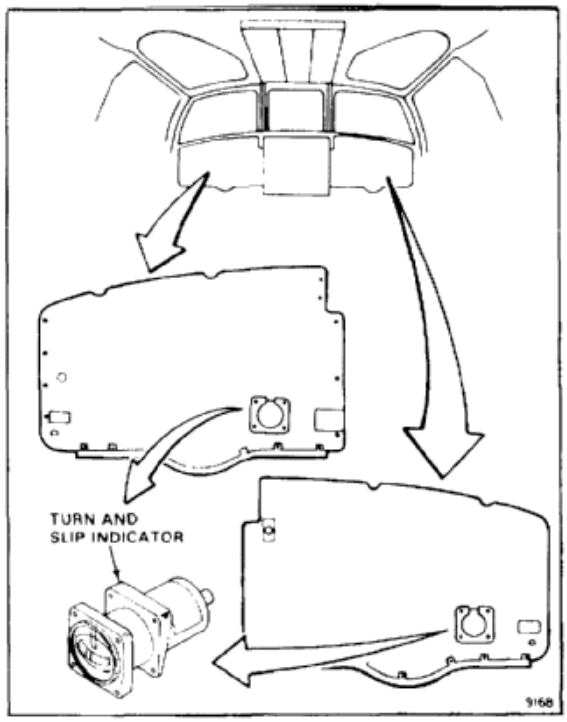
None

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power
Hydraulic Power Off




**NOTE**

Procedure is same for removing pilot's or copilot's turn and slip indicator.

1. Reach up under instrument panel (1) and disconnect wire harness connector (2) from indicator (3).
2. Remove four screws (4) and nuts (5).

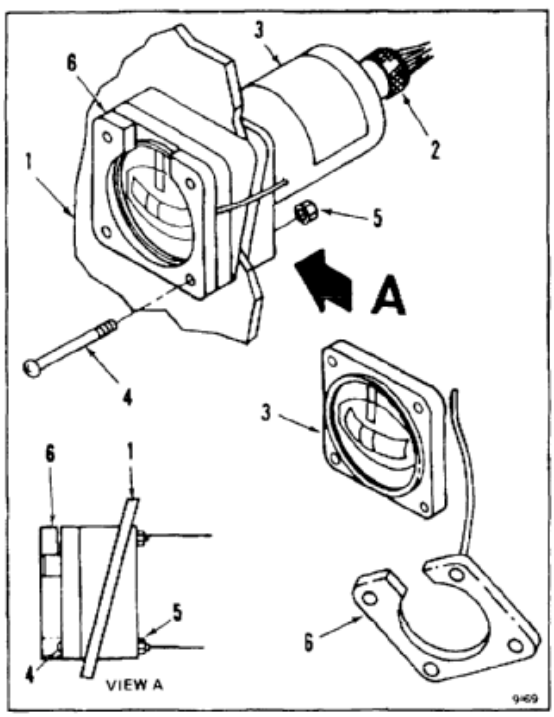
CAUTION

If light fixture is not supported, internal connection to power wire could be damaged.

**NOTE**

Do not cut or disconnect wire to light fixture.

3. Remove light fixture (6) from indicator (3). Support fixture.

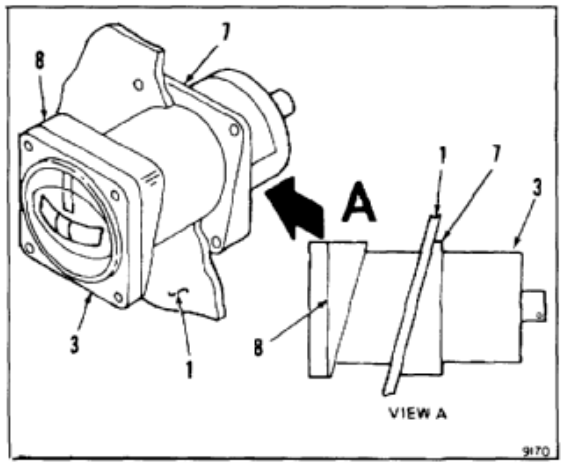


**8-44.1 REMOVE TURN AND SLIP INDICATOR — PILOT'S OR COPILOT'S INSTRUMENT PANEL (Continued)** **8-44.1**

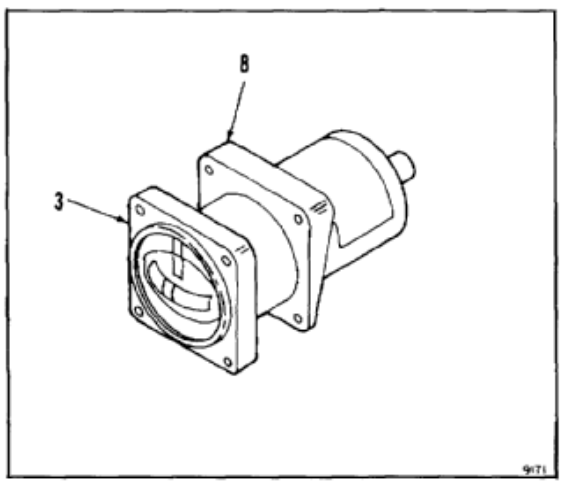
CAUTION

Be careful when handling indicator.
Rough handling will damage indicator.

4. Reach up under instrument panel (1) and hold mounting plate (7).
5. Slide indicator (3) and second mounting plate (8) out of instrument panel (1).
6. Remove mounting plate (7) from in back of instrument panel (1).




7. Remove mounting plate (8) from indicator (3).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-45 INSTALL TURN AND SLIP INDICATOR IN PILOT'S OR COPILOT'S INSTRUMENT PANEL 8-45

INITIAL SETUP

***Applicable Configurations:***

Without 17

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

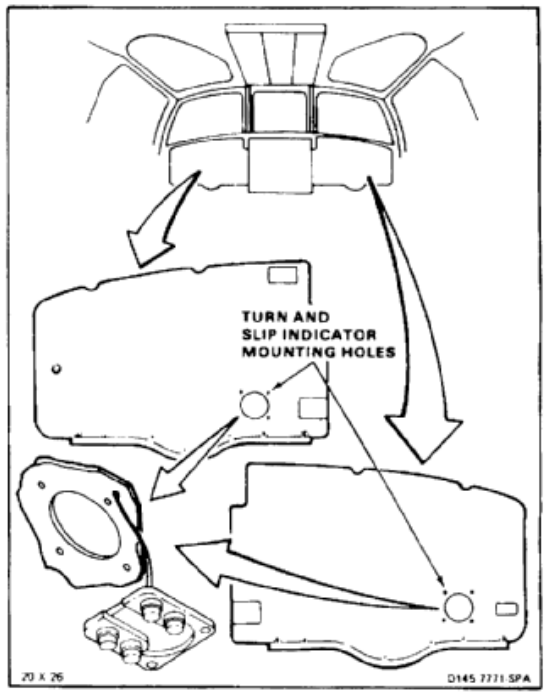
Cloth (E120)

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P
TM 55-6600-200-20
TM 55-1500-323-25



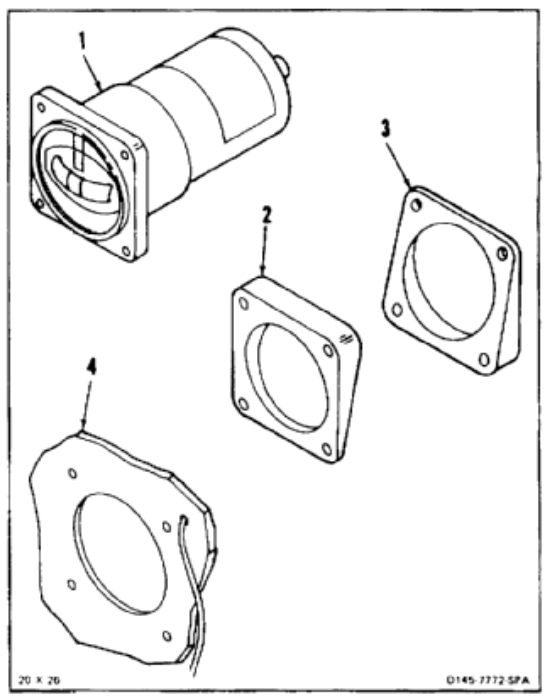

**CAUTION**

Be careful when handling indicators. Rough handling will damage indicators.

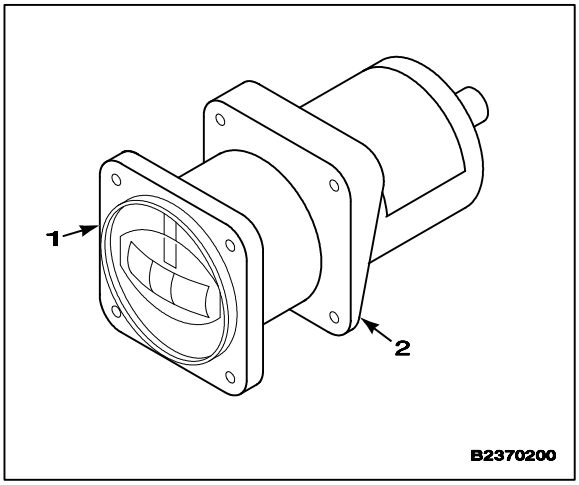
**NOTE**

Procedure is same for installing pilot's or copilot's turn and slip indicator.

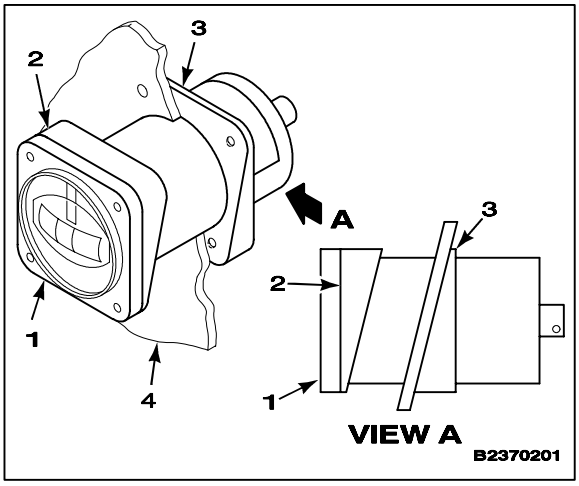
1. Clean bonding surfaces of indicator (1) mounting plates (2 and 3) and instrument panel (4). Use cloth (E120) (TM 55-1500-323-25).



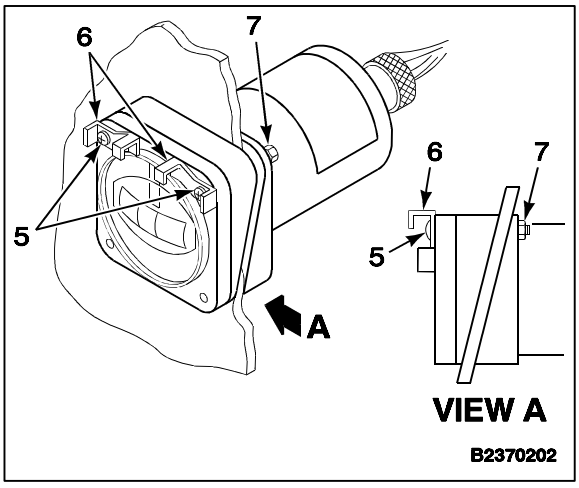
2. Install mounting plate (2) on indicator (1). Make sure screw holes of indicator and mount plate are aligned and that wide section of mount plate is up.



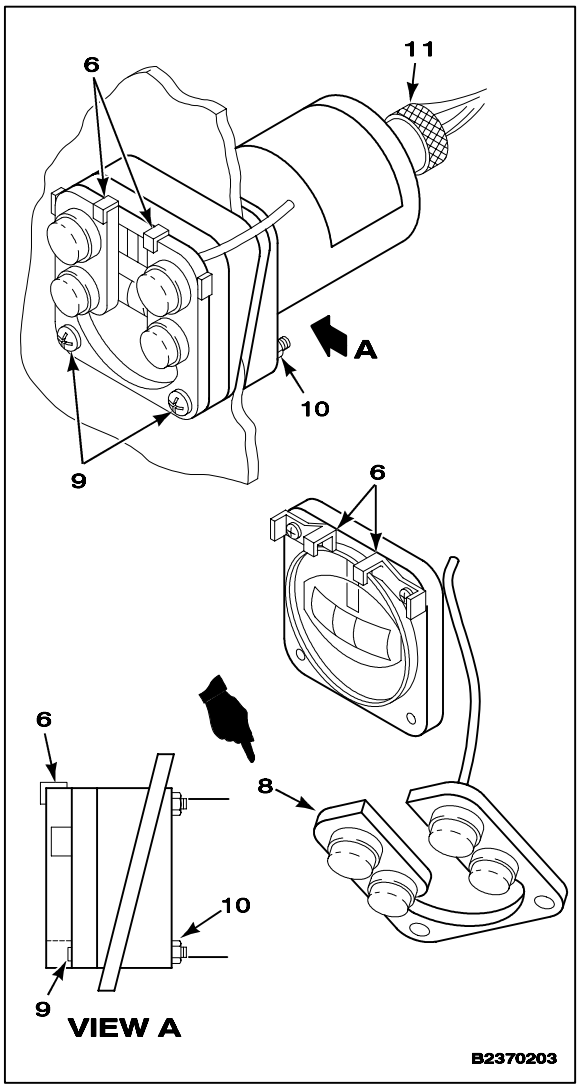

3. Hold second mount plate (3) in place behind instrument panel (4), wide section of mount plate down.
4. Install indicator (1) and first mount plate (2) in instrument panel (4).




5. Install two short screws (5) and clips (6). Make sure turned down end of clip is at top.
6. Install two nuts (7).



7. Install lamp fixture (8), slide fixture up and under the turned down ends of clips (6).
8. Install two long screws (9).
9. Install two nuts (10)
10. Connect connector (11).




***FOLLOW-ON MAINTENANCE:***

Perform operational check of turn and slip indicator (TM 55-1520-240-T).
Perform operational check of instrument lighting (TM 55-1520-240-T).

END OF TASK

## 8-45.1 INSTALL TURN AND SLIP INDICATOR IN PILOT'S OR COPILOT'S INSTRUMENT PANEL 8-45.1

INITIAL SETUP

***Applicable Configurations:***

With 17 or 69

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

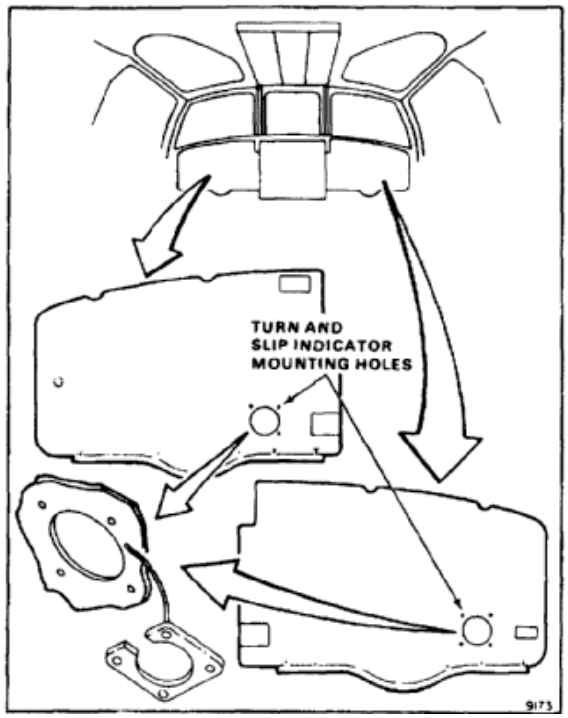
Cloth (E120)

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P
TM 55-6600-200-20
TM 55-1500-323-25



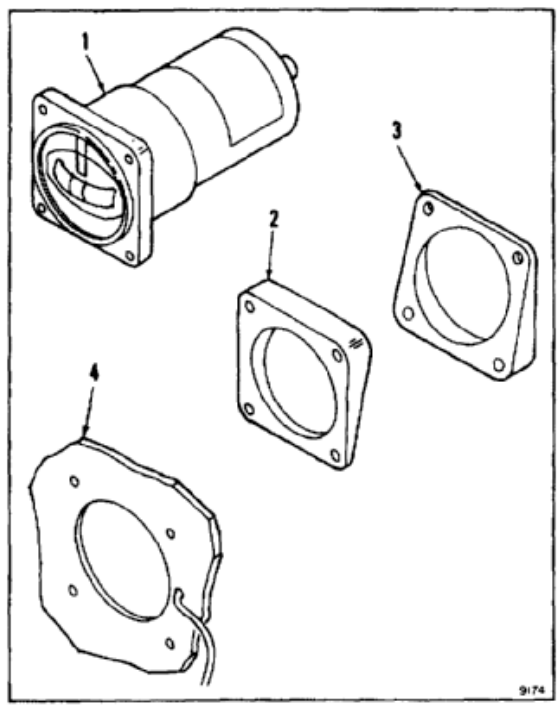

CAUTION

Be careful when handling indicators. Rough handling will damage indicators.

**NOTE**

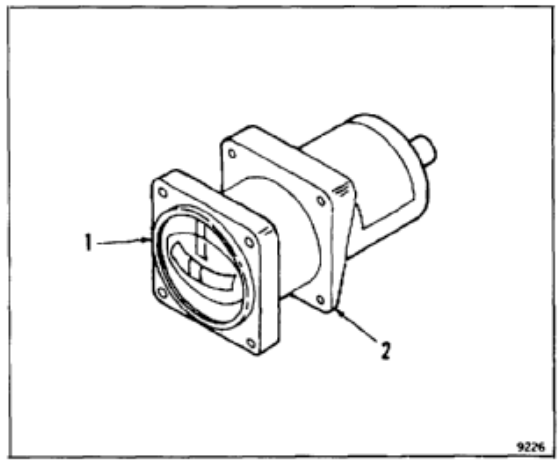
Procedure is same for installing pilot's or copilot's turn and slip indicator.

1. Clean bonding surfaces of indicator (1) mounting plates (2 and 3) and instrument panel (4). Use cloth (E120) (TM 55-1500-323-25).

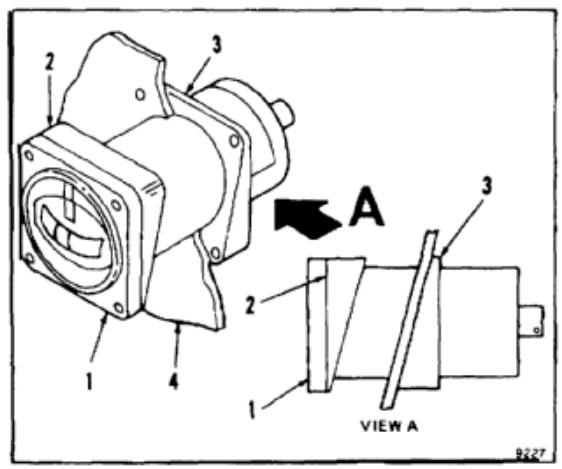


**8-45.1 INSTALL TURN AND SLIP INDICATOR IN PILOT'S OR COPILOT'S INSTRUMENT PANEL (Continued)** **8-45.1**

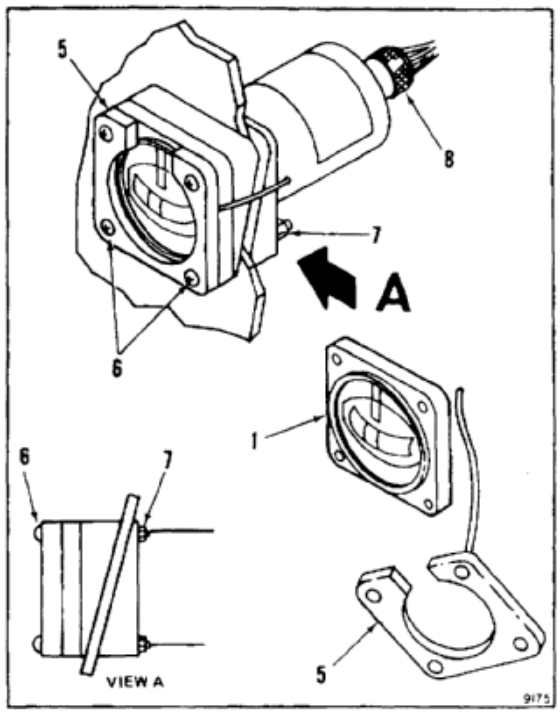
2. Install mounting (2) on indicator (1). Make sure screw holes of indicator and mount plate are aligned and that wide section of mount plate is up.




3. Hold second mount plate (3) in place behind instrument panel (4), wide section of mount plate down.
4. Install indicator (1) and first mount plate (2) in instrument panel (4).



5. Install light fixture (5).
6. Install four screws (6) and nuts (10).
7. Connect connector (8).




***FOLLOW-ON MAINTENANCE:***

Perform operational check of turn and slip indicator (TM 55-1520-240-T).
Perform operational check of instrument lighting (TM 55-1520-240-T).

END OF TASK

## 8-46 REMOVE MAGNETIC COMPASS 8-46

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Instrument Repairer's Tool Kit, NSN 5180-00-323-4913
Non-Magnetic Screwdriver

***Materials:***

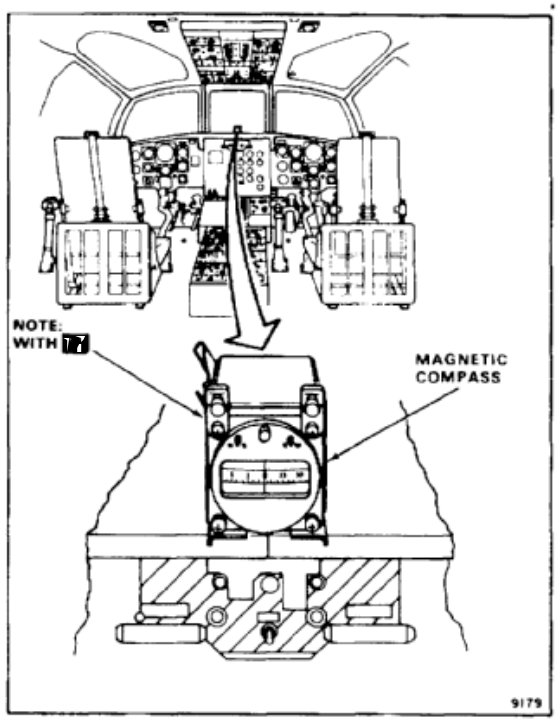
None

***Personnel Required:***

Medium Helicopter Repairer

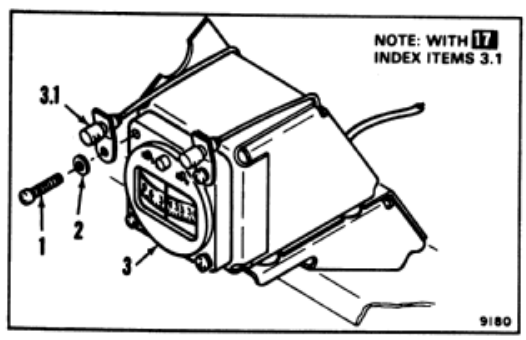
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




1. Remove four screws (1) and washers (2) from compass (3).

1.1. With 17, remove two light assemblies (3.1).

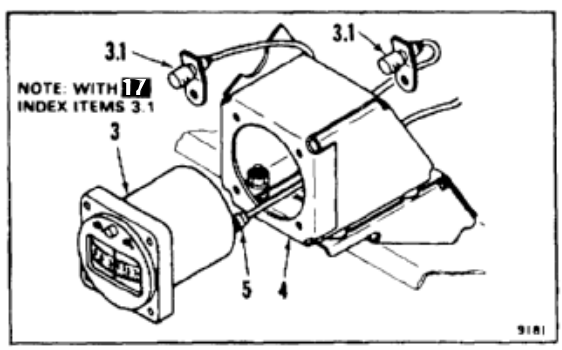



2. Remove compass (3) from bracket (4).

3. Disconnect connector (5) from compass (3).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 8-46.1 REMOVE MAGNETIC COMPASS BRACKET 8-46.1

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Instrument Repairer's Tool Kit, NSN 5180-00-323-4913

***Materials:***

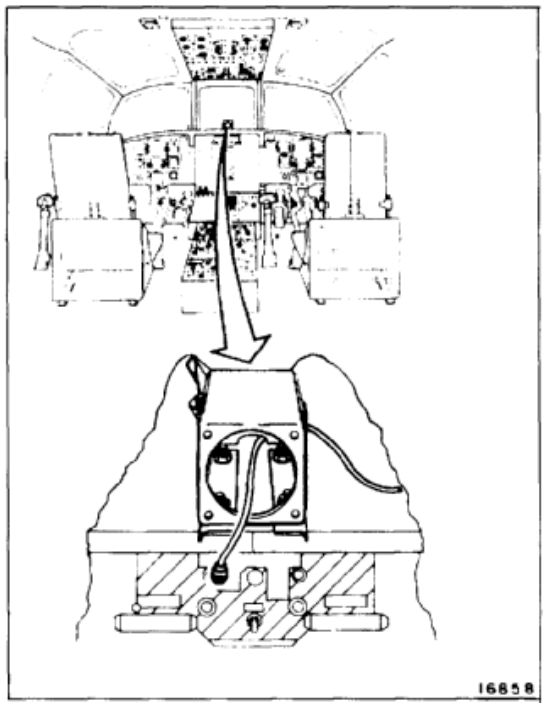
None

***Personnel Required:***

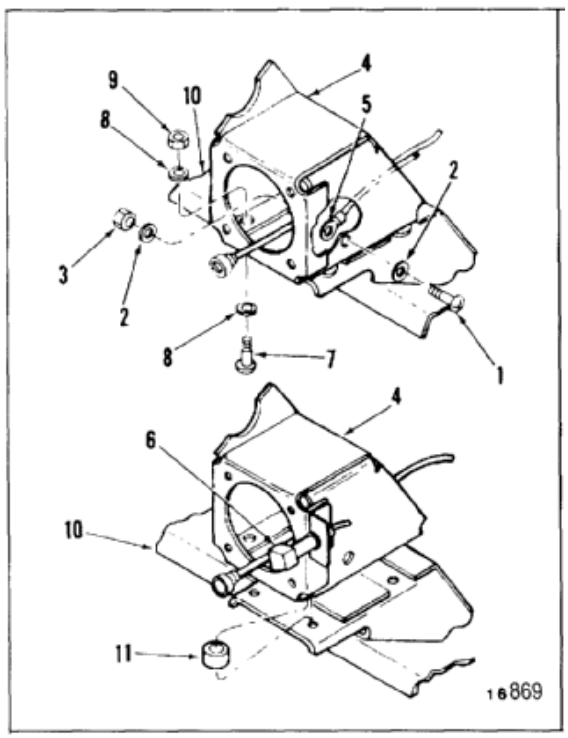
Medium Helicopter Repairer

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Magnetic Compass Removed (Task 8-46)




1. Without **17**, remove screw (1), washers (2), and nut (3) from bracket (4) and ground wire (5).
2. Without **17**, remove postlight (6) from side of bracket (4).
3. Remove four screws (7), eight washers (8), and four nuts (9) from bracket (4) and sill of glare shield (10).
4. Remove bracket (4) and shock mounts (11) from glare shield (10).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-46.2 INSTALL MAGNETIC COMPASS BRACKET 8-46.2

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Instrument Repairer's Tool Kit, NSN 5180-00-323-4913

***Materials:***

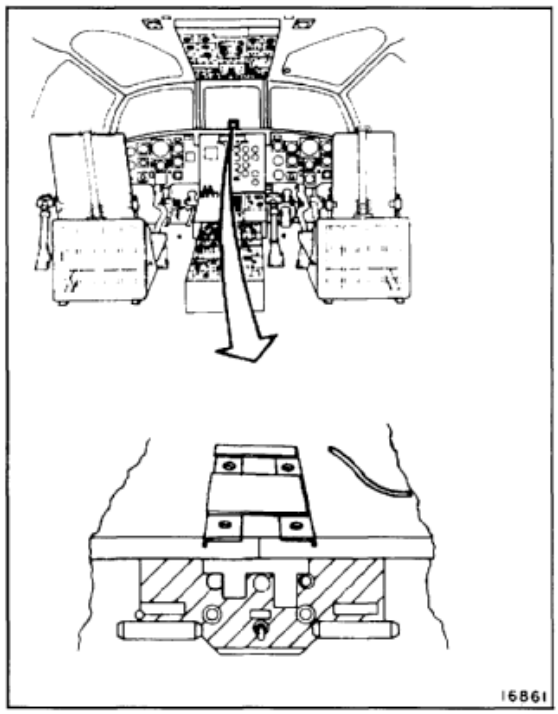
None

***Personnel Required:***

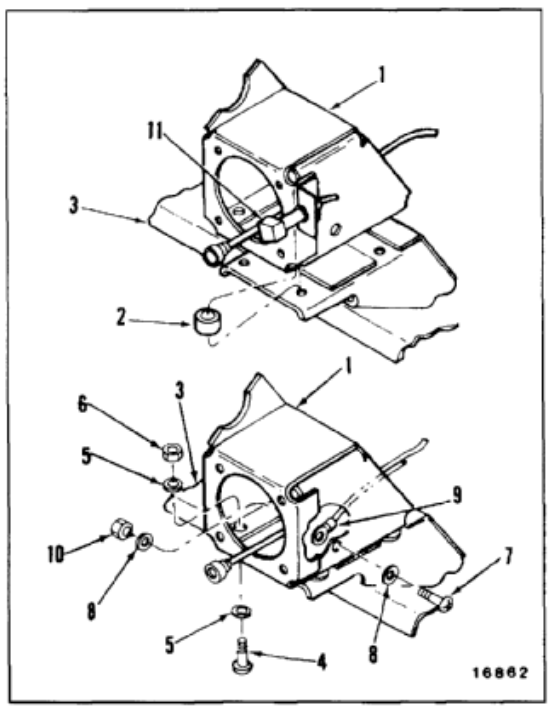
Medium Helicopter Repairer
Inspector

***References:***

TM 55-1520-240-23P




1. Position bracket (1) with four shock mounts (2) on sill of glare shield (3).
2. Install four screws (4), eight washers (5), and four nuts (6) in bracket (1) and glare shield (3).
3. Without **17**, install screw (7), washer (8), ground wire (9), washer (8) and nut (10) in bracket (1).
4. Without **17**, install postlight (11) on side of bracket (1).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Install magnetic compass (Task 8-47).

END OF TASK

## 8-47 INSTALL MAGNETIC COMPASS 8-47

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Instrument Repairer's Tool Kit, NSN 5180-00-323-4913
Non-Magnetic Screwdriver

***Materials:***

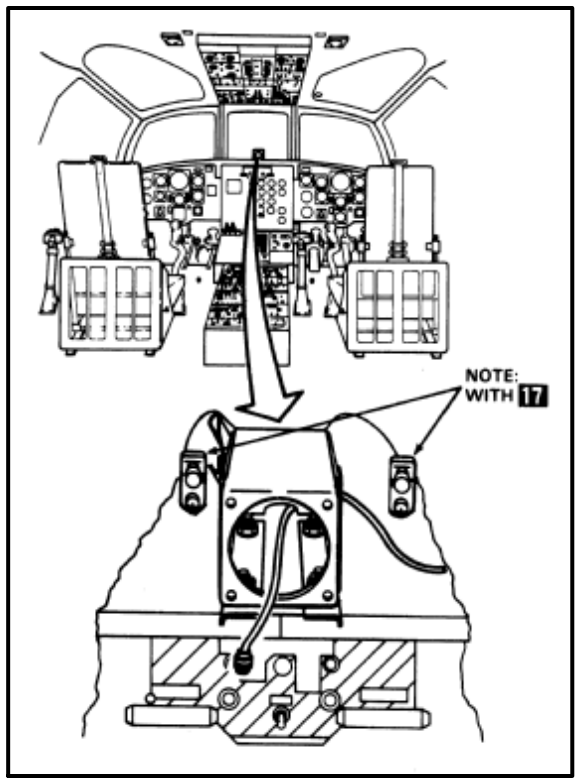
None

***Personnel Required:***

Medium Helicopter Repairer
Inspector

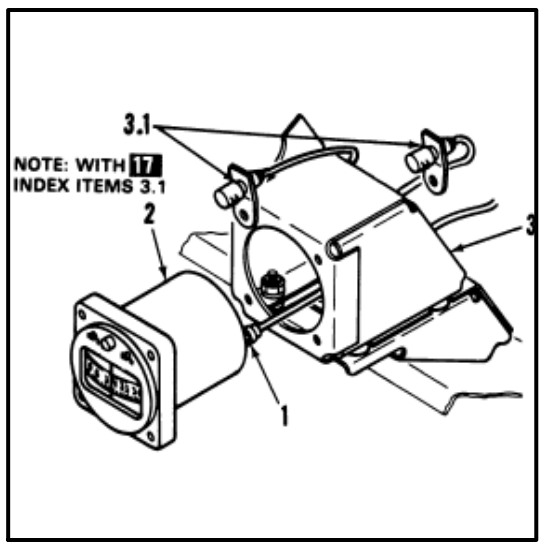
***References:***

TM 55-1520-240-23P
TM 55-1500-204-23




1. Connect electrical connector (1) to compass (2).
2. Position compass (2) in bracket (3) as shown.

2.1. With 17, position two light assemblies (3.1) over upper compass mounting holes.



CAUTION

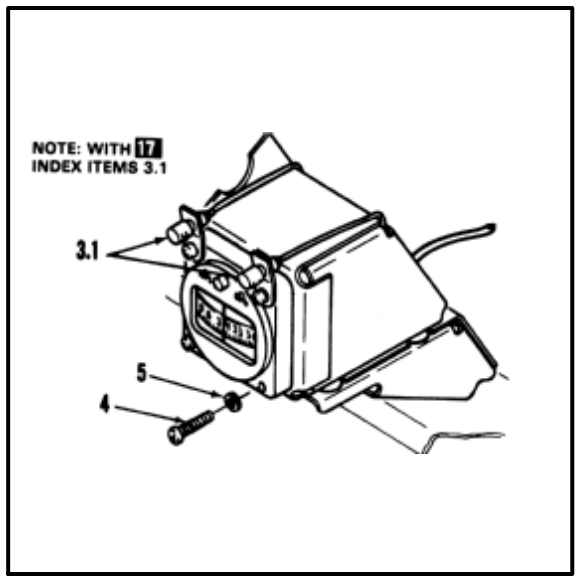
Screws, screwdriver, and washers must be non-magnetic.

3. Install four screws (4) and washers (5).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Compensate compass (TM 1-1500-204-23).




END OF TASK

## 8-48 REPLACE OR REPAIR PILOT'S OR COPILOT'S HORIZONTAL SITUATION INDICATOR (ID2103) 8-48

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electronic Equipment Tool Kit, TK-101/G, NSN 5180-00-064-5178

***Materials:***

None

***Personnel Required:***

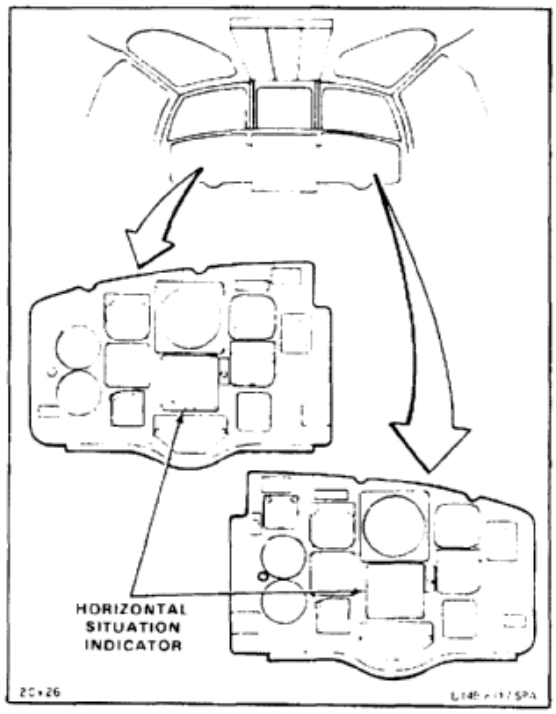
Navigation/Flight Control Equipment Repairer
Avionics Inspector

***References:***

TM 11-1520-240-23
TM 11-1520-240-34

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




See TM 11-1520-240-23 for maintenance instructions.

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-49 REPLACE OR REPAIR HORIZONTAL SITUATION INDICATOR (HSI) MODE SELECT PANEL 8-49

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electronic Equipment Tool Kit, TK-101/G, NSN 5180-00-064-5178

***Materials:***

None

***Personnel Required:***

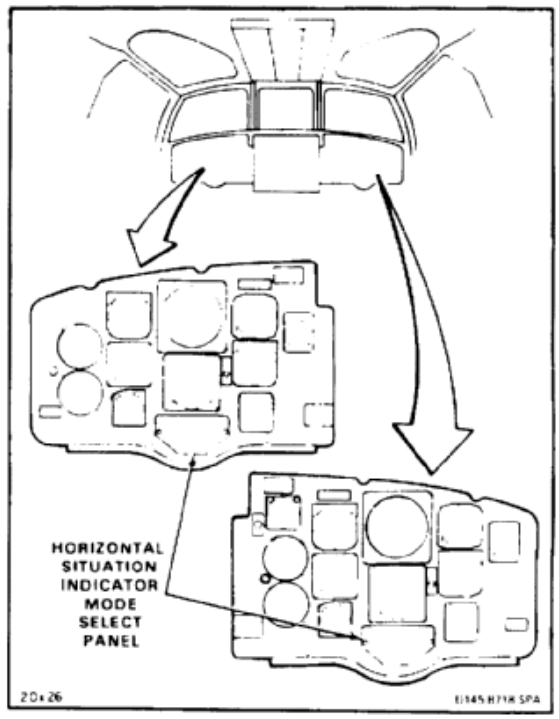
Navigation/Flight Control Equipment Repairer
Avionics Inspector

***References:***

TM 11-1520-240-23
TM 11-1520-240-34

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




See TM 11-1520-240-23 for maintenance instructions.

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-50 TEST HORIZONTAL SITUATION INDICATOR (HSI) MODE SELECT PANEL 8-50

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electronic Equipment Tool Kit, TK-101/G, NSN 5180-00-064-5178

***Materials:***

None

***Personnel Required:***

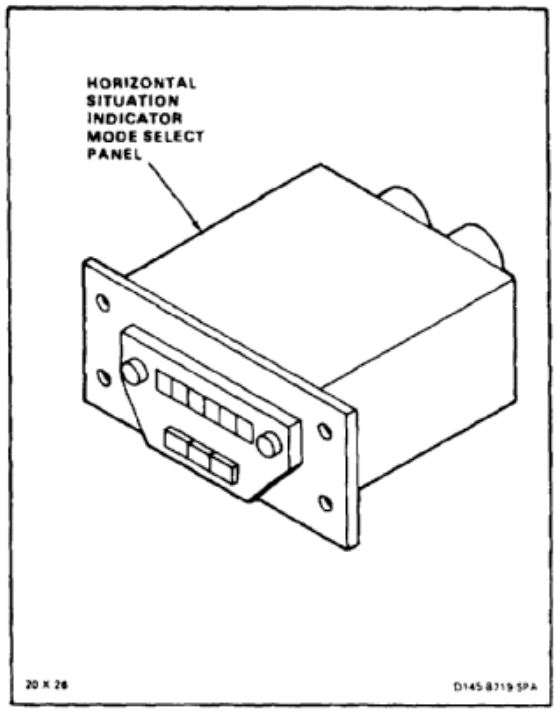
Navigation/Flight Control Equipment Repairer
Avionics Inspector

***References:***

TM 11-1520-240-23
TM 11-1520-240-34

***Equipment Condition:***

Off Helicopter Task




See TM 11-1520-240-23 for test instructions.

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-51 REPLACE OR REPAIR PILOT'S RADAR ALTIMETER INDICATOR/RECEIVER-TRANSMITTER RT-1115A/APN-209, WITHOUT 62 RT-1115F/APN-209, WITH 62 8-51

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electronic Equipment Tool Kit, TK-101/G, NSN 5180-00-064-5178

***Materials:***

None

***Personnel Required:***

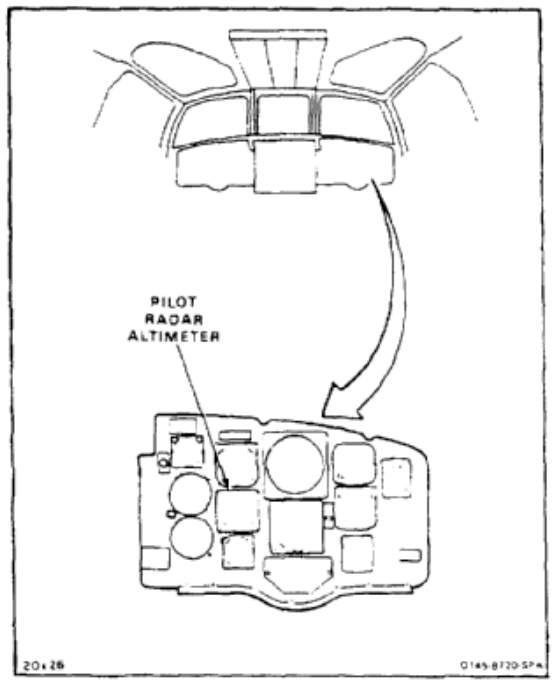
Navigation/Flight Control Equipment Repairer
Avionics Inspector

***References:***

TM 11-1520-240-23

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




See TM 11-1520-240-23 for maintenance instructions.

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-52 TEST PILOT'S RADAR ALTIMETER INDICATOR/RECEIVER-TRANSMITTER RT-1115A/APN-209, WITHOUT 62 RT-1115F/APN-209, WITH 62 8-52

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electronic Equipment Tool Kit, TK-101/G, NSN 5180-00-064-5178
Multimeter

***Materials:***

None

***Personnel Required:***

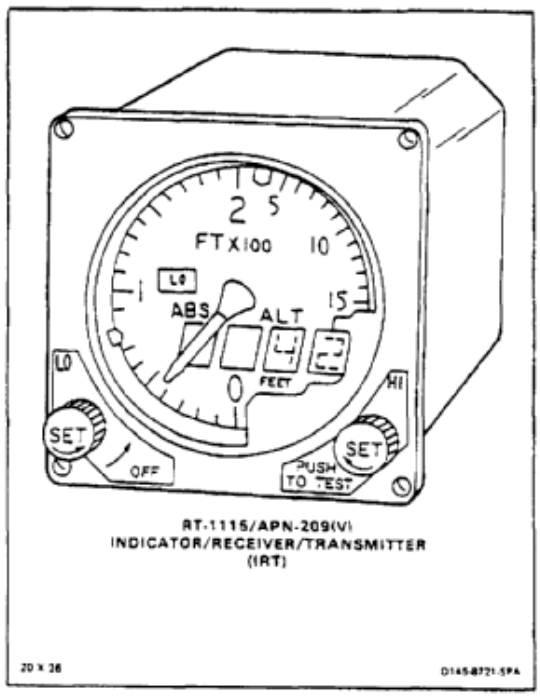
Navigation/Flight Control Equipment Repairer
Avionics Inspector

***References:***

TM 11-1520-240-23

***Equipment Condition:***

Off Helicopter Task



RT-1115/APN-209(V)
INDICATOR/RECEIVER/TRANSMITTER
(IRT)

See TM 11-1520-240-23 for maintenance instructions.

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-53 REPLACE OR REPAIR COPILOT RADAR ALTIMETER REMOTE INDICATOR (ID-1917/APN-209) 8-53

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electronic Equipment Tool Kit, TK-101/G, NSN 5180-00-064-5178

***Materials:***

None

***Personnel Required:***

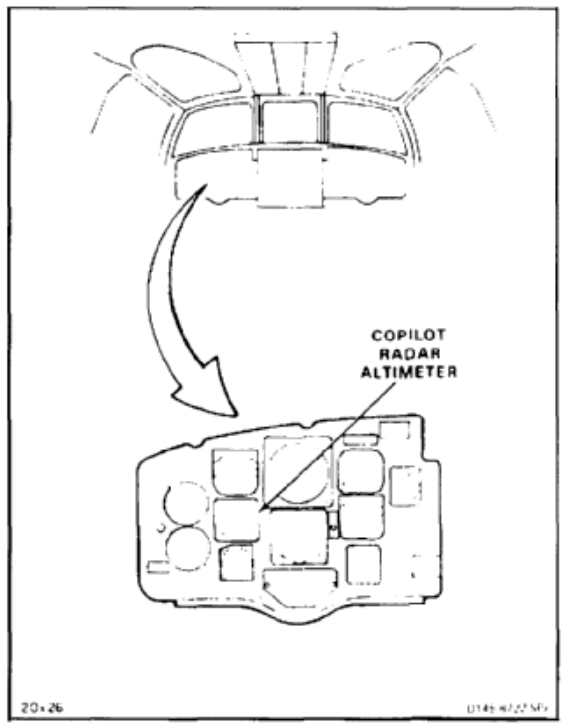
Navigation/Flight Control Equipment Repairer
Avionics Inspector

***References:***

TM 11-1520-240-23
TM 11-1520-240-34

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




See TM 11-1520-240-23 for maintenance instructions.

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-54 TEST COPILOT'S RADAR ALTIMETER REMOTE INDICATOR (ID-1917/APN-209) 8-54

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electronic Equipment Tool Kit, TK-101/G, NSN 5180-00-064-5178
Multimeter

***Materials:***

None

***Personnel Required:***

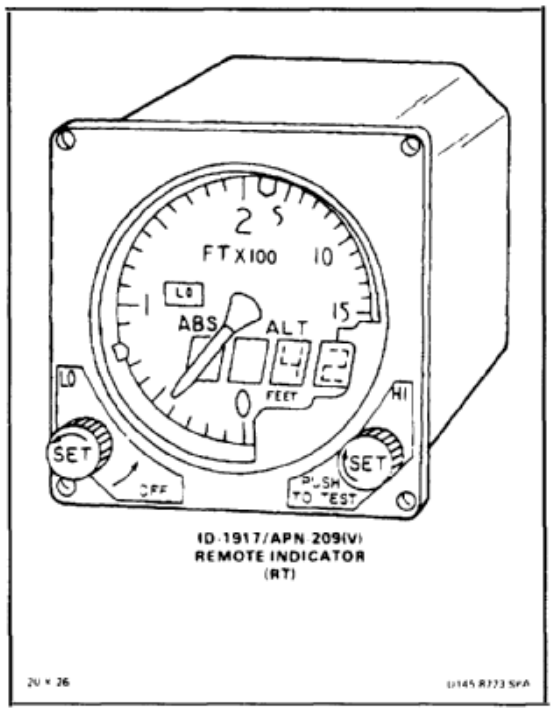
Navigation/Flight Control Equipment Repairer
Avionics Inspector

***References:***

TM 11-1520-240-23
TM 11-1520-240-34

***Equipment Condition:***

Off Helicopter Task



ID-1917/APN 209(V)
REMOTE INDICATOR
(RT)

See TM 11-1520-240-23 for maintenance instructions.

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-55 REPLACE OR REPAIR PILOT'S OR COPILOT'S ATTITUDE INDICATOR (ARU-12/A) 8-55

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electronic Equipment Tool Kit, TK-101/G, NSN 5180-00-064-5178

***Materials:***

None

***Personnel Required:***

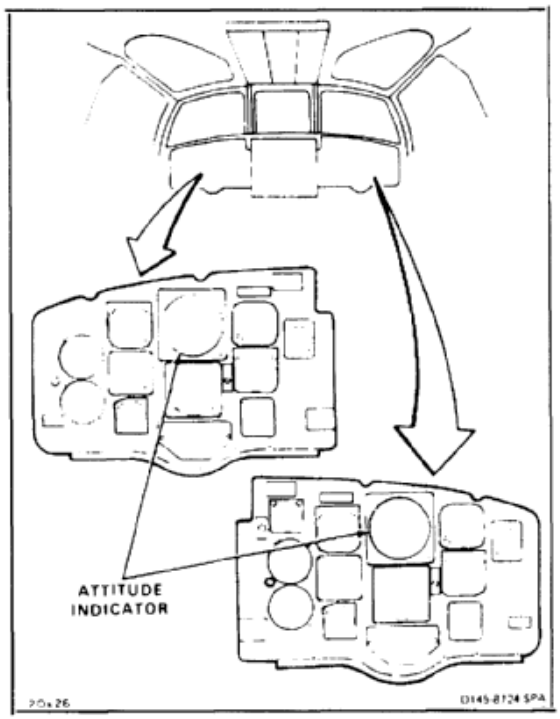
Navigation/Flight Control Equipment Repairer
Avionics Inspector

***References:***

TM 11-1520-240-23
TM 11-1520-240-34

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




See TM 11-1520-240-23 for maintenance instructions.

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-56 TEST ATTITUDE INDICATOR (ARU-12/A) 8-56

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electronic Equipment Tool Kit, TK-101/G, NSN 5180-00-064-5178
Multimeter

***Materials:***

None

***Personnel Required:***

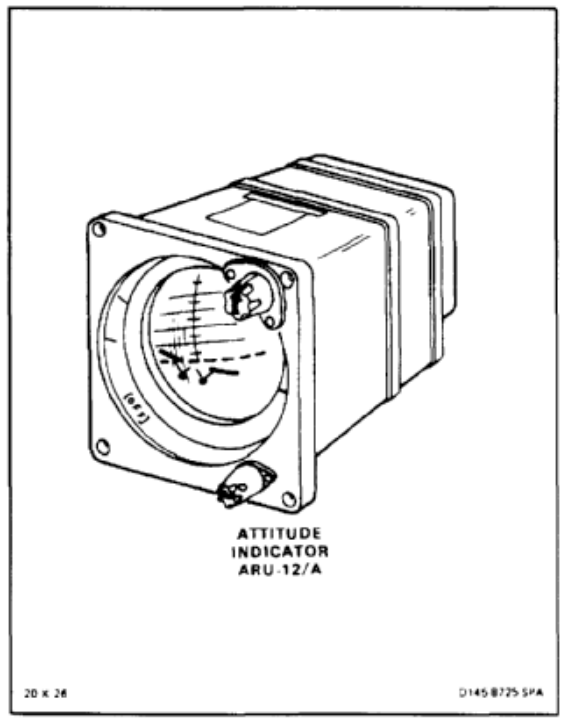
Navigation/Flight Control Equipment Repairer
Avionics Inspector

***References:***

TM 11-1520-240-23
TM 11-1520-240-34

***Equipment Condition:***

Off Helicopter Task




See TM 11-1520-240-23 for maintenance instructions.

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

# SECTION V
# MISCELLANEOUS INSTRUMENTS
# DESCRIPTION AND OPERATION

### *TRANSMISSION OIL PRESSURE INDICATING AND CAUTION SYSTEM*

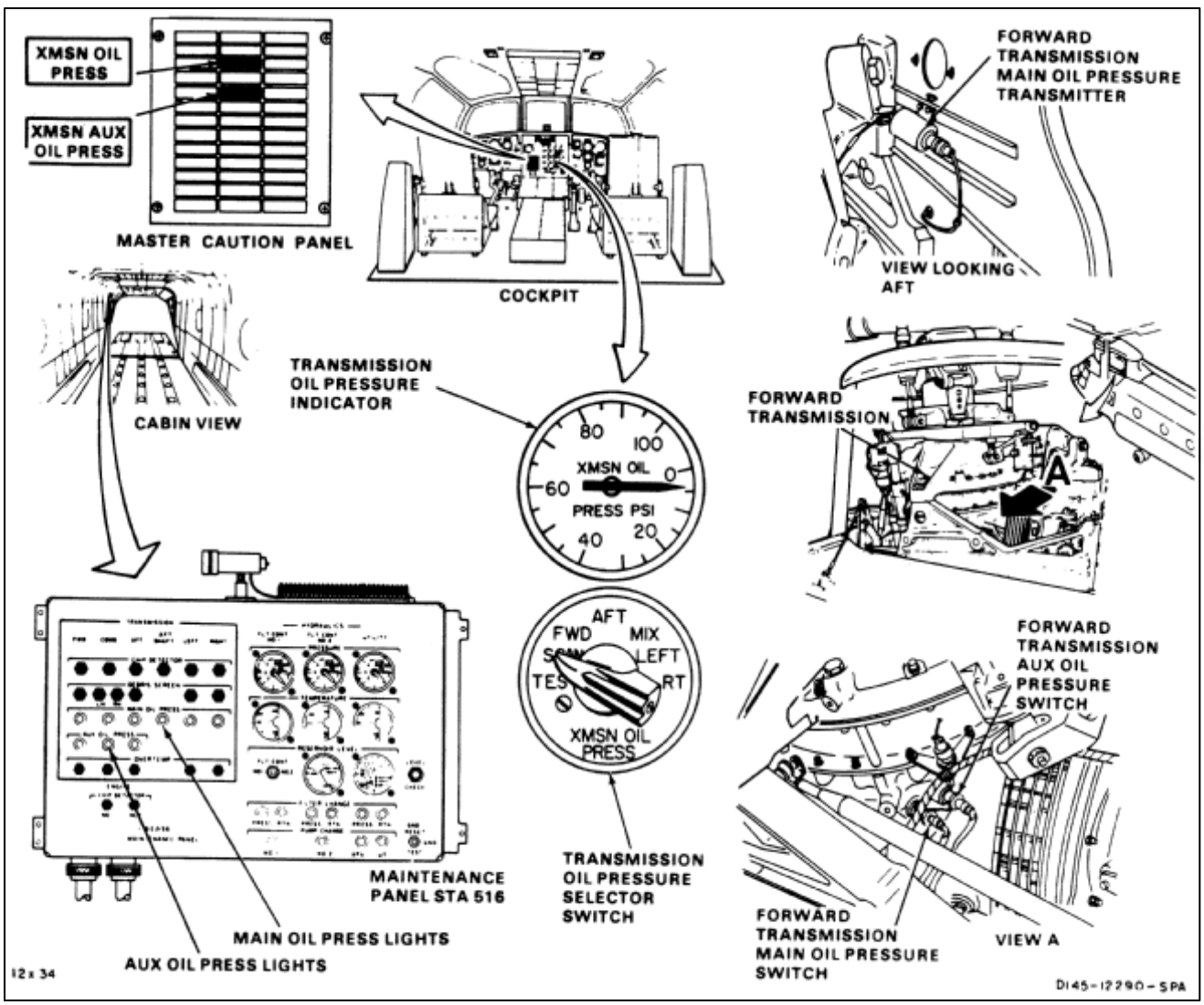
**Description**

This system consists of an oil pressure indicating system and an oil pressure caution system for the transmission main and auxiliary oil lubrication systems. The main lube system has both indicating and caution light monitoring circuits. The auxiliary system has only caution light monitoring circuits.

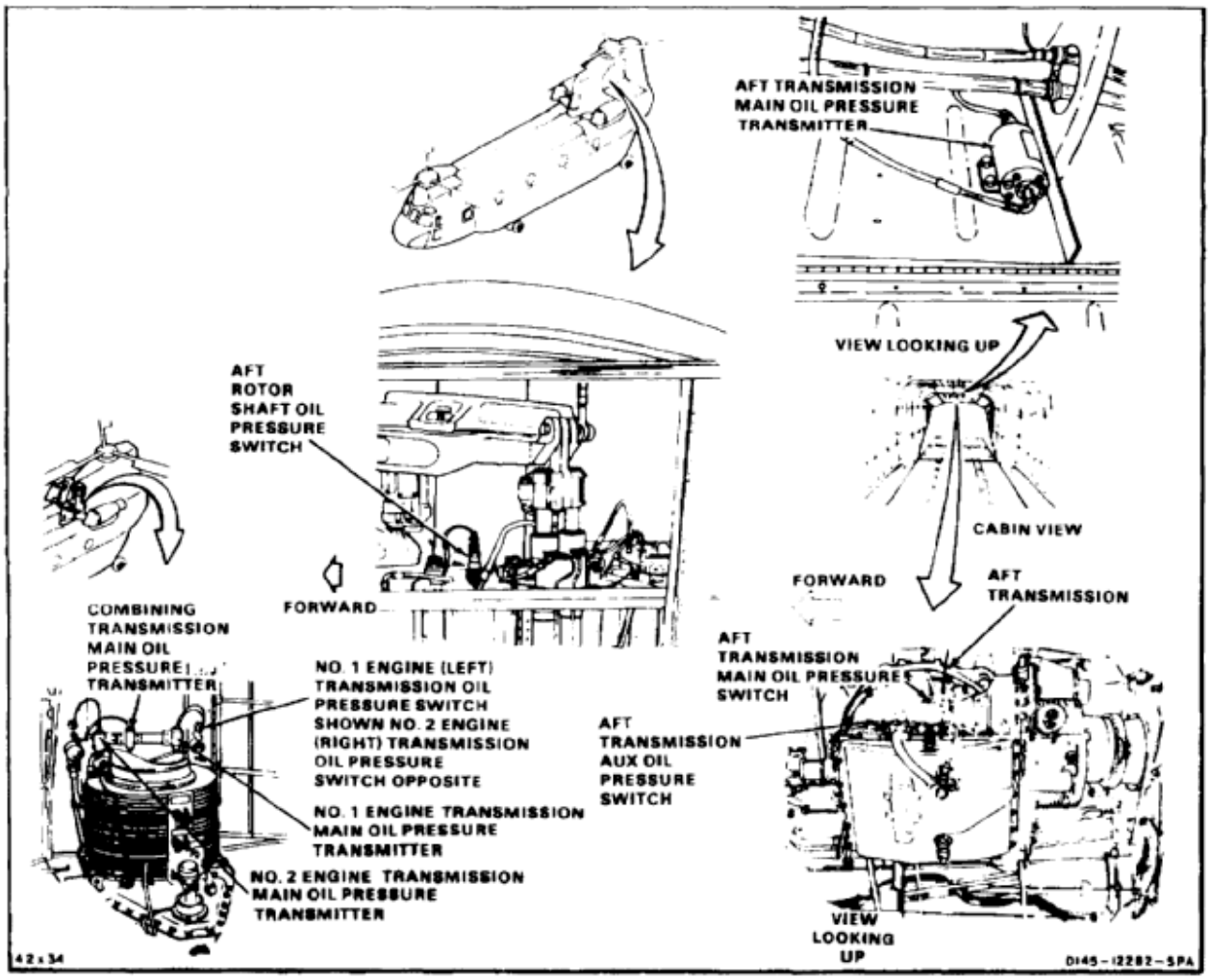
The indicating system includes the transmission oil pressure selector switch and indicator, clamp mounted on center instrument panel, and five transducers, one for each transmission. The indicating system is powered by **115 vac**.

The indicating system senses pressure in the five transmissions and indicates the lowest of the five pressures or the pressure at the selected transmission. The transducers that provide signals to the indicator are linear variable differential transducers with internal electronic circuitry.

The test circuit is limited to checking of the indicator system. Operating the selector switch to TEST causes the indicator pointer to move to the low end of the scale.



The caution system includes six pressure switches in the main oil system, three pressure switches in the auxiliary oil system, nine lights on the maintenance panel and two capsules in the caution panel, all powered by **28 vdc**. The maintenance panel is located in the aft cabin, right side. When pressure in the monitored oil system falls below the normal range, its switch completes a ground circuit causing the corresponding maintenance panel transmission oil pressure light to come on. A diode circuit in the maintenance panel connects this ground circuit to the master caution panel to light either the XMSN OIL PRESS or XMSN AUX OIL PRESS capsule.



### *TRANSMISSION OIL TEMPERATURE INDICATING AND CAUTION SYSTEM*

**Description**

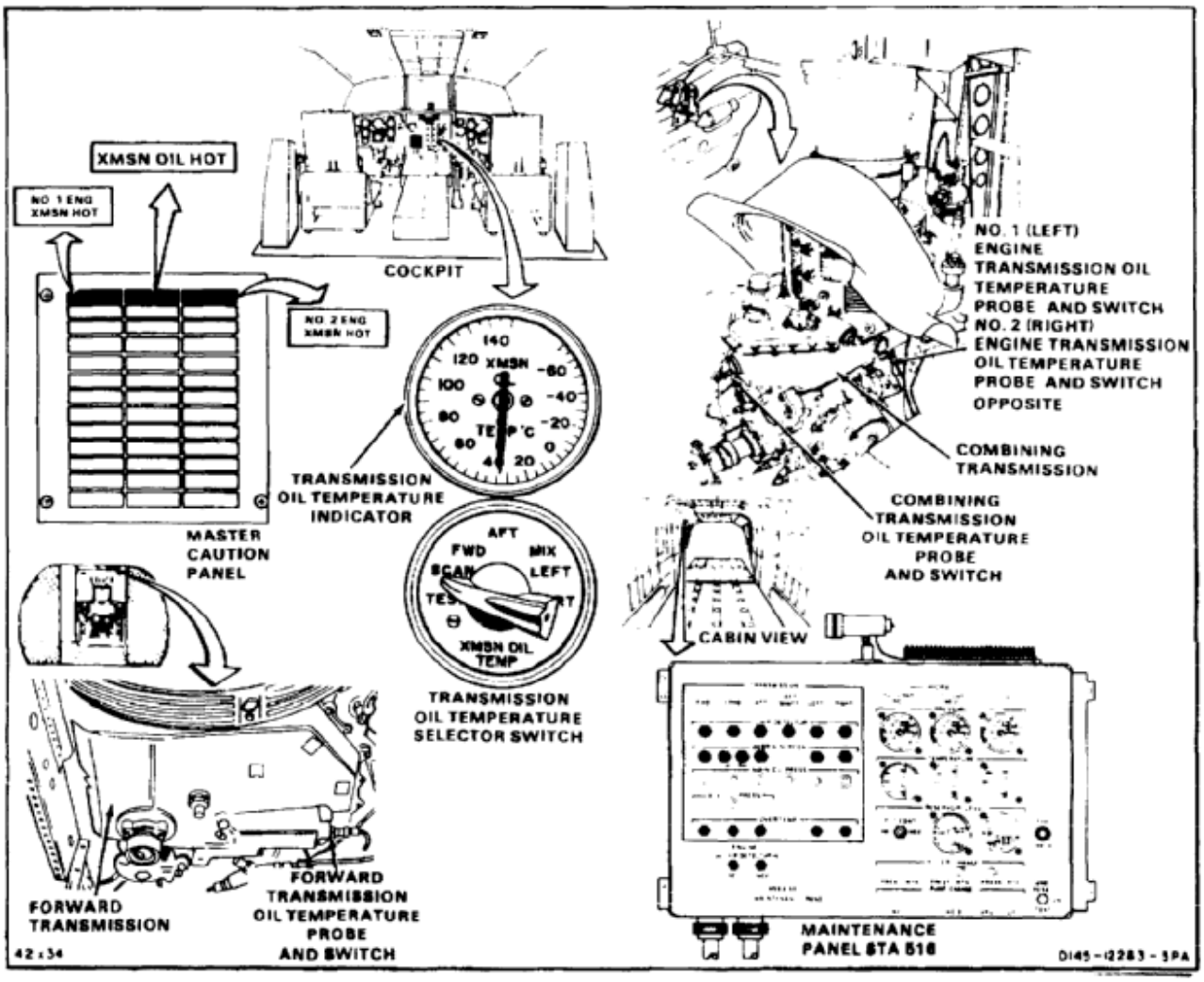
This system includes the transmission oil temperature indicating system and a transmission oil temperature caution system for the main oil lubrication system.

The indicating system includes the transmission oil temperature selector switch and indicator, clamp mounted on center instrument panel and five temperature probes, one in each transmission sump. The indicating system is powered by **115 vac**.

The indicating system senses oil temperature in the five transmissions and indicates the highest of the five temperatures or the oil temperature in a selected transmission.

Temperature probe resistance is proportional to oil temperature and is displayed on the cockpit indicator.

A monitor provides two indications if a temperature probe is open or shorted. When the selector switch is at SCAN the indicator pointer will indicate above full scale. When the selector switch is at the position corresponding to the defective bulb, the pointer will indicate below –**70°C**.

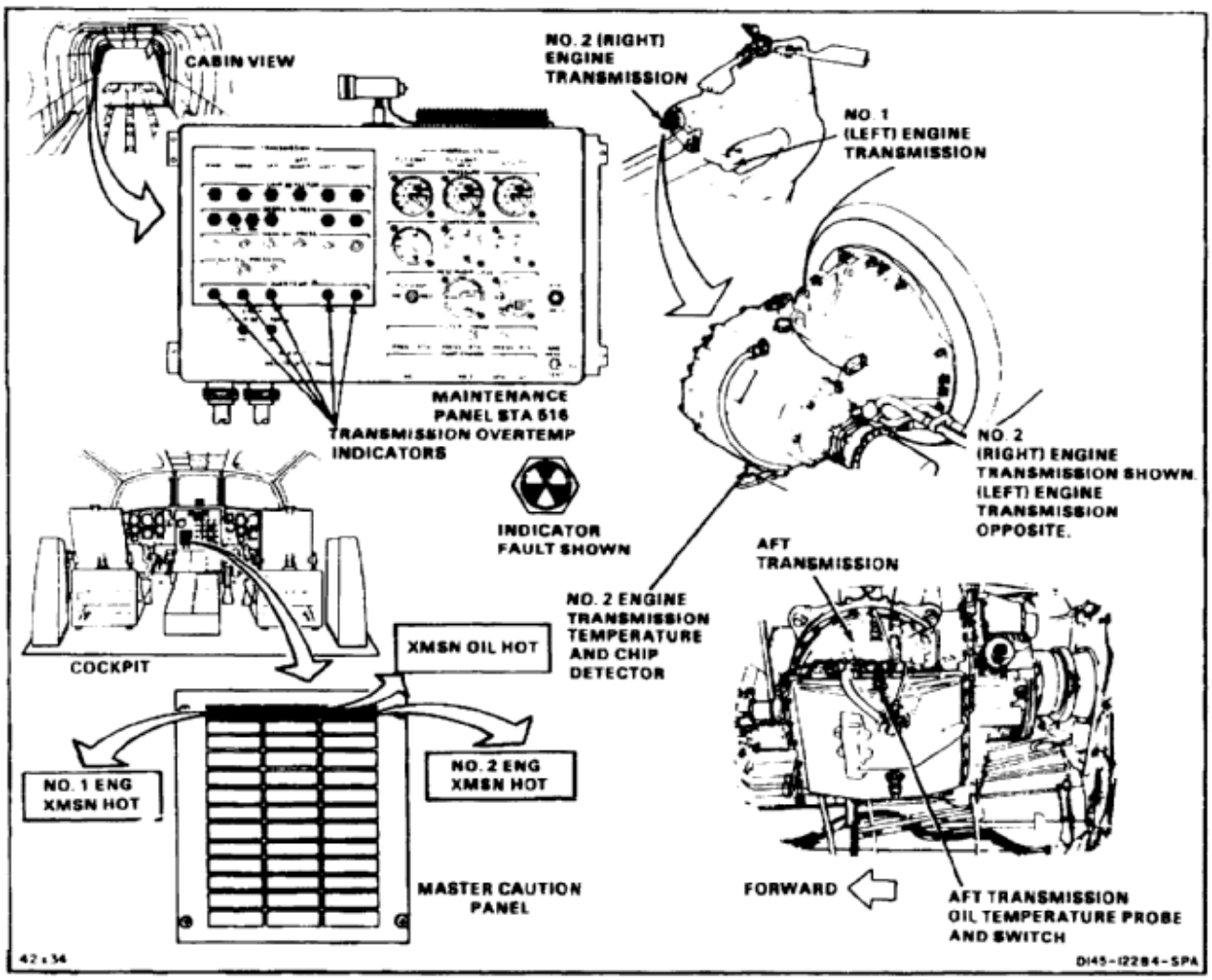


A test circuit performs an overall check of the indicator. When the selector switch is set to TEST, the indicator pointer should go below –**70°C**.

The caution system includes five indicators on the maintenance panel, three capsules on the caution panel and seven thermal switches. Five of the thermal switches are in temperature transmitters as follows; forward transmission sump, combining transmission sump, aft transmission sump, No. 1 engine transmission sump, and No. 2 engine transmission sump. The two remaining thermal switches are in the engine transmission temperature switch and chip detectors, which are mounted in the engine transmission housing.

The caution system has five circuits that operate magnetic latch type indicators on the maintenance panel. When oil temperature in any of the five transmissions exceeds **276° to 292°F (136° to 144°C)** the thermal switch closes and completes a ground circuit to latch the indicator. When latched, the indicator displays a black and white pattern. The ground from any of the five thermal switches is also applied through its associated diode to turn on the XMSN OIL HOT capsule on the caution panel. The diodes form an OR gate that lights the single caution capsule from any one of the five switches while inhibiting the latching of all annunciators on the maintenance panel when one switch closes.

The caution system also has two circuits that turn on No. 1 and No. 2 ENG XMSN OIL HOT capsules on the caution panel. When oil temperature in an engine transmission exceeds **375° to 425°F (191° to 218°C)**, the thermal switch in the transmission temperature switch and chip detector closes and completes a ground circuit. This ground lights the associated capsule in the caution panel.



*FUEL QUANTITY INDICATING SYSTEM*

**Description**

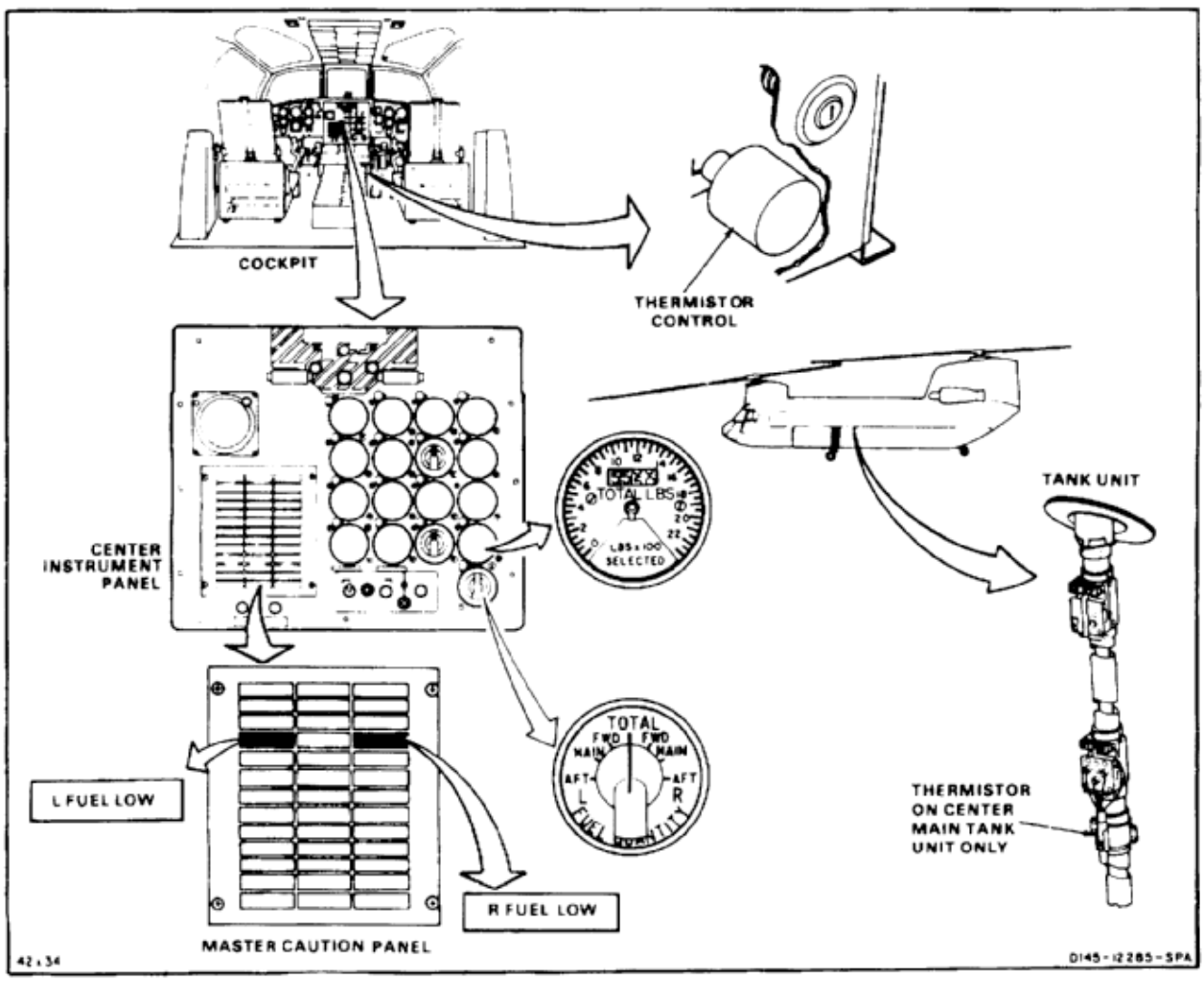
This system includes the fuel quantity indicating system and a low level sensing system.

The indicating system includes the fuel quantity selector switch and indicator clamp mounted on center instrument panel, and ten tank units, one in each forward or aft aux tank and three in each main tank. A change in fuel level causes a change in the capacitance of the tank units. This causes an unbalance in the fuel quantity indicator bridge circuit. The unbalance results in a gage correction signal at the bridge output. This signal is amplified to drive a servo motor. The servo motor moves a variable resistor wiper arm thru reduction gears to reestablish the bridge balance. A printer on the wiper shaft moves across the calibrated scale and indicates the quantity in single-tank quantity indication. The variable resistor wiper arm is mechanically linked to a counter mechanism which displays the total fuel quantity in pounds.

The rear of the indicator contains four adjustments for full and empty calibration, two for the dial and two for the digital readout. The indicator is powered by **115 vac** and electrical connection is through a connector at the rear of the indicator.

The low level sensing system includes a dual thermistor control unit in the console, a low level sensor in each center tank unit at the **20 percent** level, and two capsules, L or R FUEL LOW in the master caution panel.

When the fuel quantity falls below the **20 percent** level, the thermistor in the low fuel sensor is no longer cooled by fuel. Its temperature then rises and its resistance decreases. The thermistor is part of a normally unbalanced bridge circuit in the thermistor control unit. The output signal which results from the imbalance is amplified to operate a relay. When the resistance of the thermistor decreases, the relay releases as the bridge approaches a null condition. The L or R FUEL LOW light capsule is lighted when the relay releases. The low level sensing system is powered by **28 vdc**.



The fuel quantity system also includes a switching box and an inverter. These are used to provide fuel quantity indication at the refueling station.

The inverter provides **115 vac** to the fuel quantity indicating system when fuel quantity is checked at the refueling station. The inverter is located in the cabin overhead at sta. 220.

The switching box removes the fuel quantity probe signals from the cockpit indicator and switch and connects the signals to the refueling station indicator and switch. This occurs when the refueling station is activated. The switching box is located at sta. 220.

***ROTOR TACHOMETER INDICATING SYSTEM***

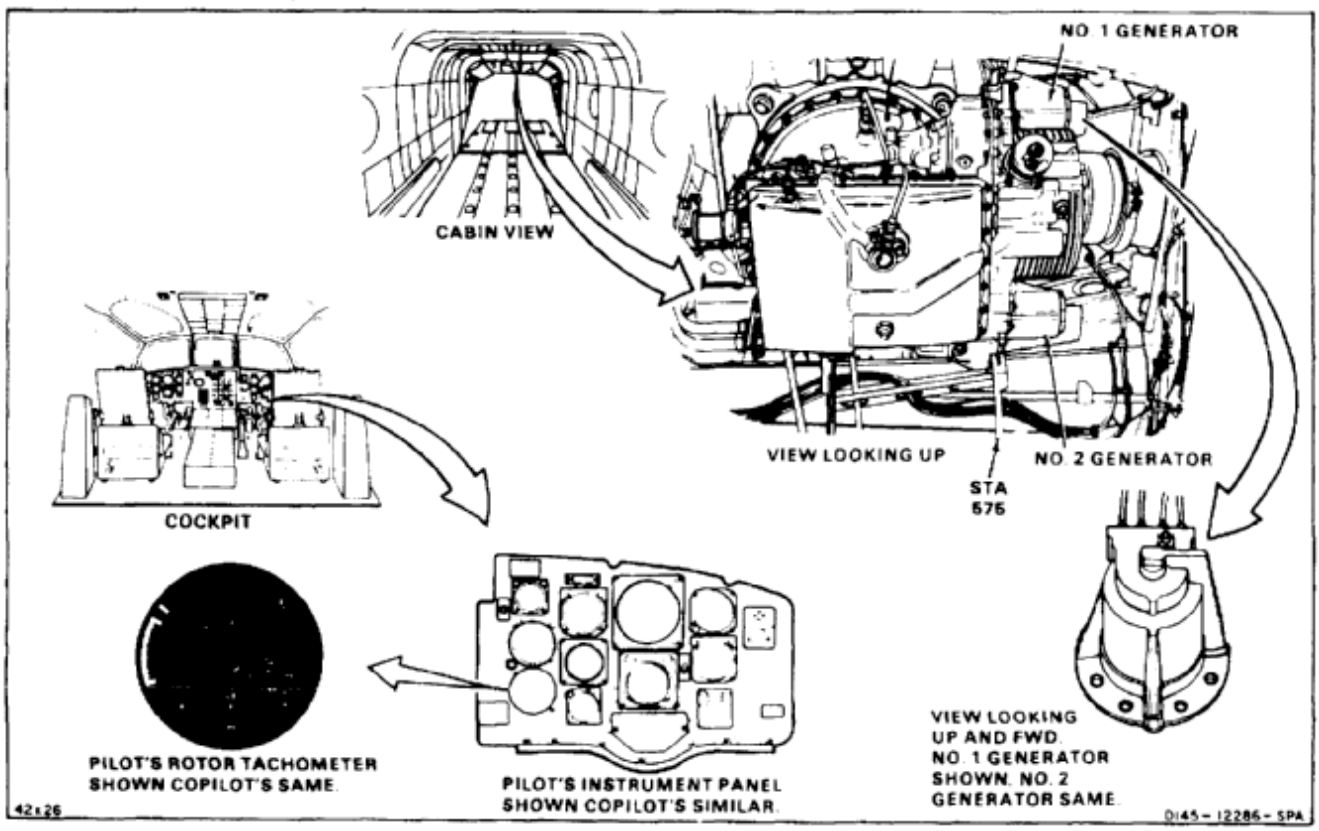
**Description**

The rotor tachometer system includes two identical circuits. Each circuit indirectly measures and indicates rotor rpm in percentage between **0 and 130. One hundred percent** equals **225 rotor rpm**. The system includes a speed sensor in each ac main generator and a rotor tachometer indicator in each pilot's instrument panel.

Each speed sensor is a simple stator coil within the main generator PMG (permanent magnet generator) that provides a signal whose frequency is proportional to ac generator rpm and rotor rpm. The sensor output is available regardless of the generator on/off state. Loss of rpm output can occur only as the result of a failed sensor coil or a sheared generator shaft.

The sensor signal is processed within each indicator by converting the signal frequency to a proportional dc voltage level. The dc lever is then amplified within a conventional servo loop within the indicator. Rotor rpm is shown on the dial face using a dial and sub dial pointer. The short sub dial pointer indicates rotor rpm in percent from **0 to 60 percent**. The long dial pointer then indicates between **60 and 130 percent**.

The rotor tachometers are clamp mounted in pilot's instrument panels and powered by a **28 vdc** circuit breaker.



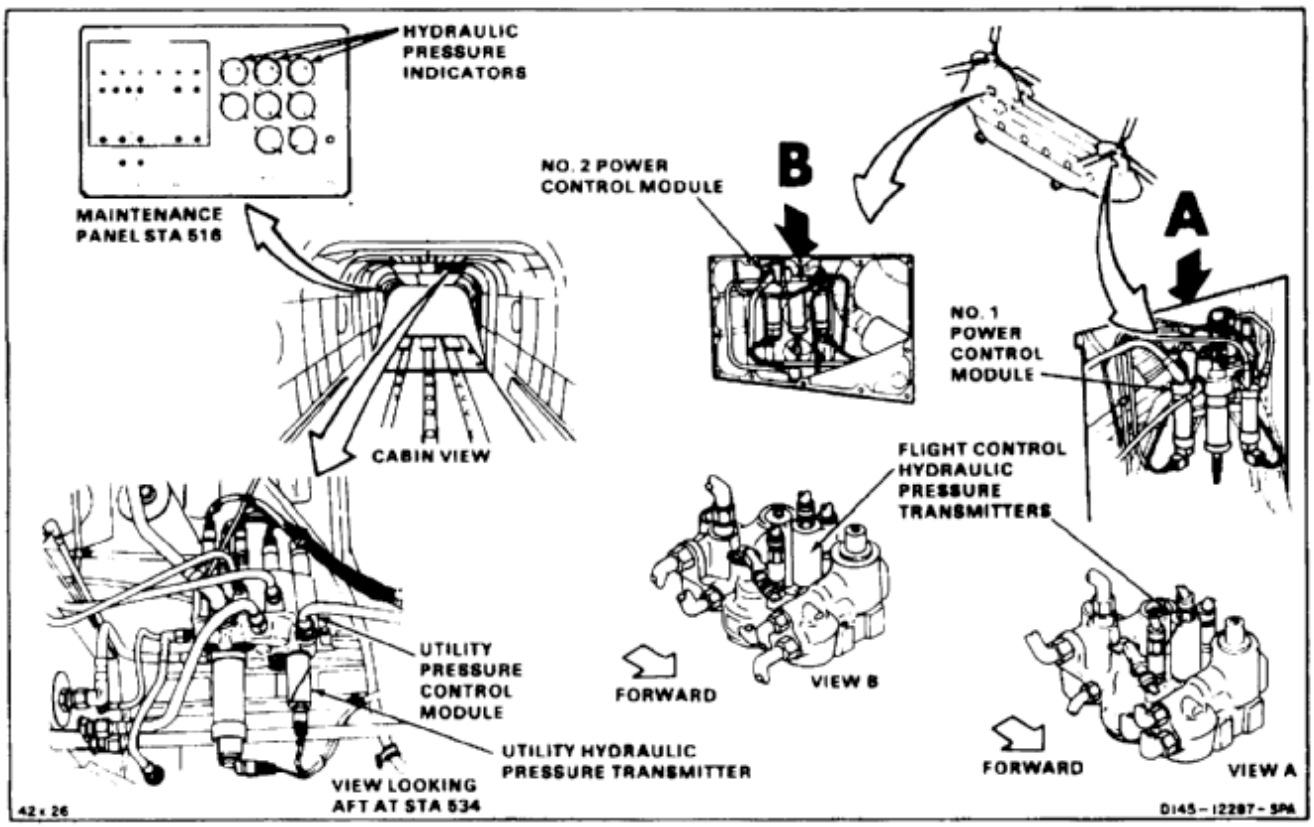
### *HYDRAULIC PRESSURE INDICATING SYSTEMS*

**Description**

The maintenance panel contains indicators for three hydraulic pressure indicating systems. Two of these systems measure pressure in the two flight control hydraulic systems. The other system measures pressure in the utility hydraulic system. Each system consists of an indicator and a pressure transmitter. In operation, hydraulic pressure is applied to the transmitter. The transmitter generates an electrical signal proportional to pressure. The signal is transmitted to the indicator where it is converted to a pressure reading. These systems are powered by **28 vdc**.

The hydraulic pressure indicators are **0 to 5 volt** meter movements with scale indications of **0 to 4000 psi**. Three identical indicators are clamp mounted in the maintenance panel one for each hydraulic system. Electrical connections are made through a receptacle on the rear of each indicator.

The transmitter receives **28 vdc** and provides an output of **0 to 5 vdc**. The transmitter contains a flexible pressure dome which has bonded strain gages. These strain gages, resistive elements, are connected as a wheatstone bridge. When pressure is applied to the dome, the dome distorts and changes the resistance of the bridge. The change in bridge output is amplified to drive a conventional moving coil type indicator to display pressure in psi. There are three pressure transmitters, utility system, located on the utility system control module (sta. 534 LH), No. 1 system, located on the No. 1 system power control module (sta. 123, WL 78), and No. 2 system, located on the No. 2 system power control module (sta. 544, WL 86).



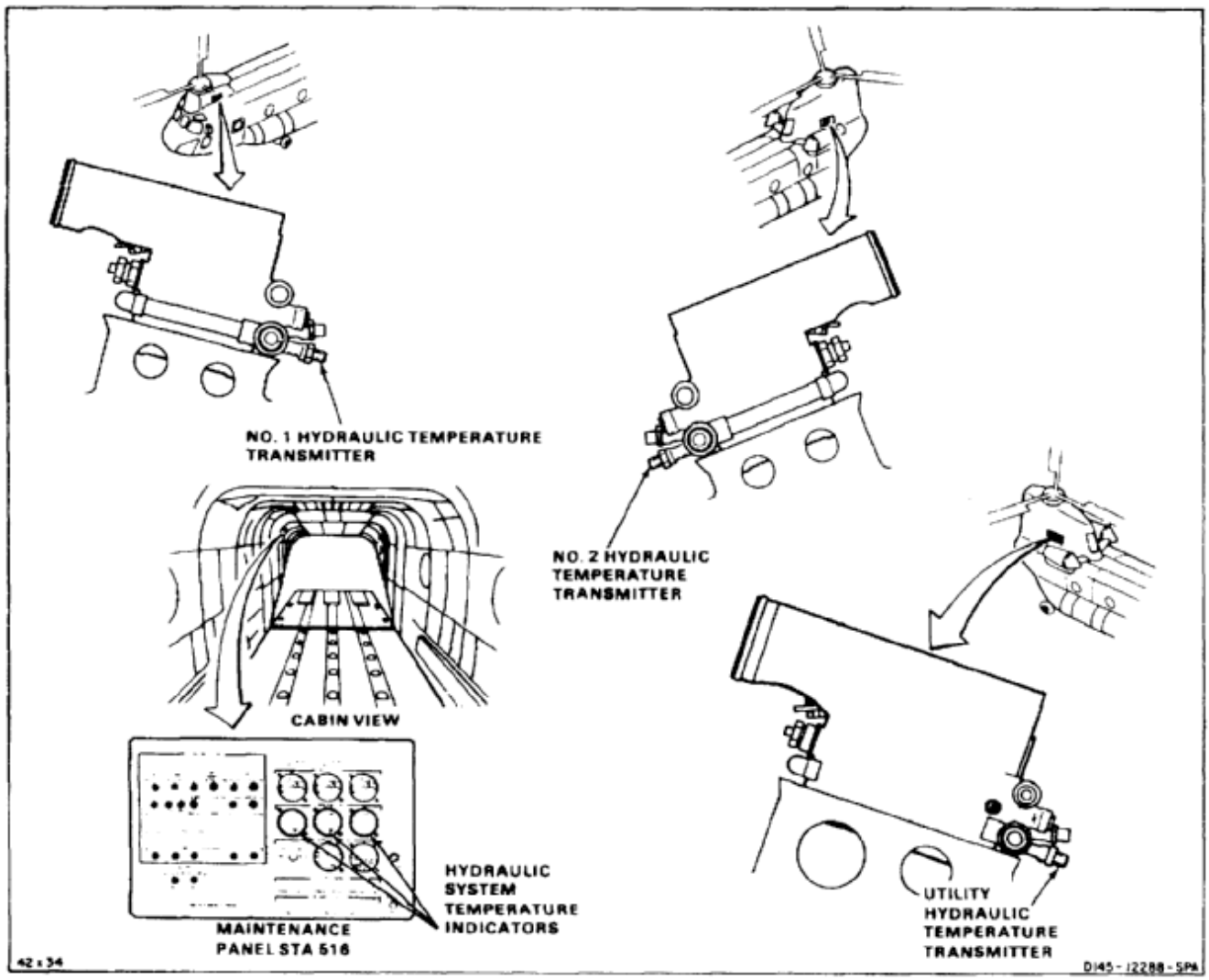
### *HYDRAULIC TEMPERATURE INDICATING SYSTEM*

**Description**

The maintenance panel contains indicators for three hydraulic oil temperature indicating systems. Two systems measure temperature of the hydraulic oil in the flight control (No. 1 and No. 2) hydraulic systems. The other system measures temperature of the hydraulic oil in the utility hydraulic system. Each system contains an indicator and a temperature transmitter. As hydraulic oil temperature varies, transmitter resistance varies. The resistance change causes the indicator pointer to move a distance proportional to the hydraulic oil temperature change.

The hydraulic temperature indicators, calibrated –**50° to +150°C**, are clamp mounted in the maintenance panel. Electrical connection is provided by a receptacle at the rear of each indicator.

The hydraulic temperature transmitter senses and transmits hydraulic oil temperature signals to the indicator. The transmitters are calibrated to provide **90.38 ohms at 0ºC (32°F)**. Each transmitter is threaded into its respective hydraulic system reservoir cooler.

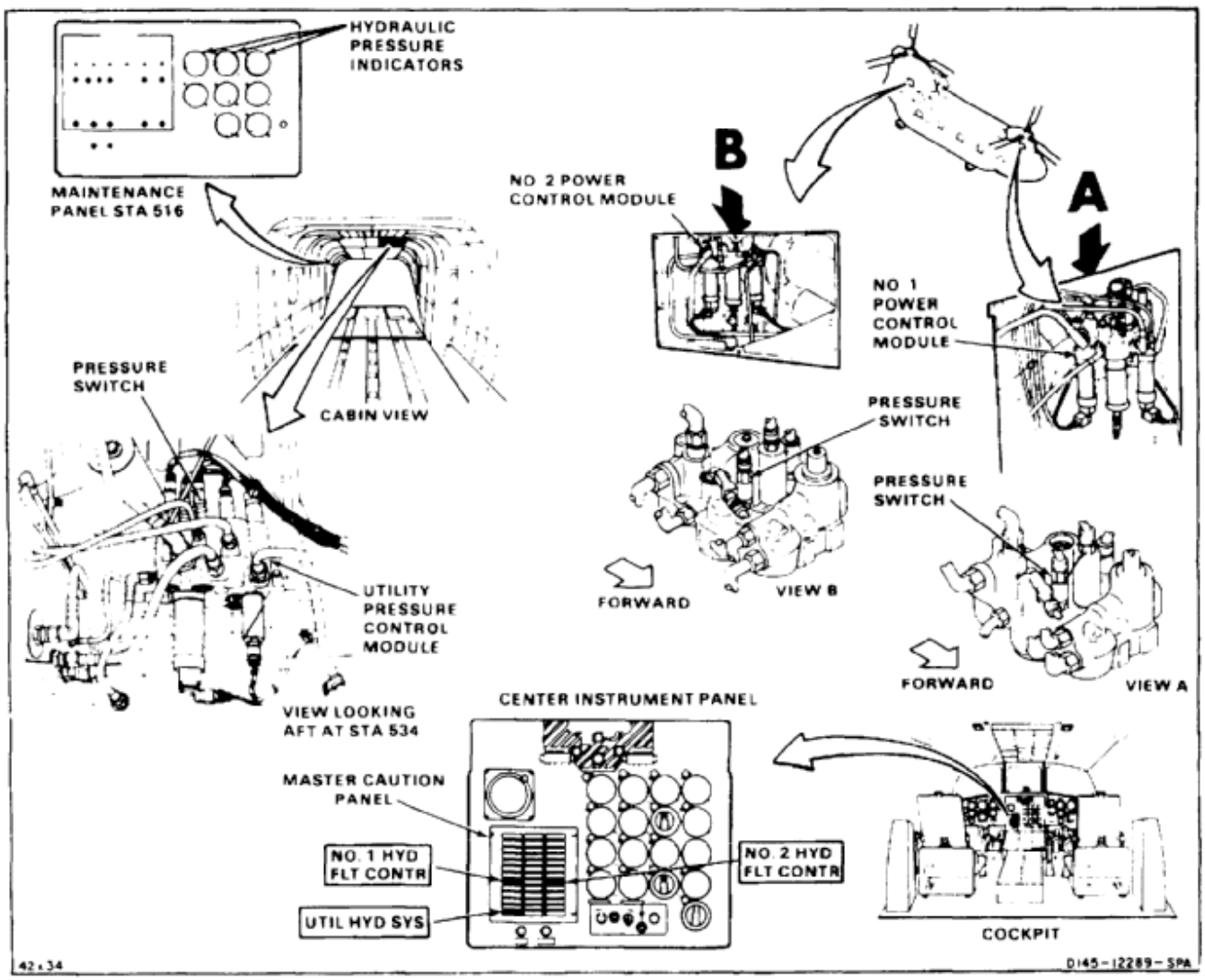


### *HYDRAULIC LOW PRESSURE WARNING SYSTEM*

**Description**

Each of the three hydraulic systems contains a pressure switch that causes a caution light on the master caution panel to come on with decreasing system pressure. Two of the switches have additional functions. The No. 1 and No. 2 boost pressure switches signal their respective AFCS computers when the hydraulic systems are pressurized. The switches are also used as an interlock to prevent turning off a good system when one system has malfunctioned.

The hydraulic low pressure switch opens at increasing pressure below **1,400 psi**. This turns the caution light off. It closes at a decreasing pressure between **2,050 and 1,950 psi**. This turns the caution light on. The utility system pressure switch is on the utility system pressure control module. The No. 1 and No. 2 hydraulic system low pressure switches are on the No. 1 and No. 2 power control modules respectively.




END OF TASK

# SECTION VI
# MISCELLANEOUS INSTRUMENTS

## 8-58 TEST TRANSMISSION OIL PRESSURE SELECTOR SWITCH OR INDICATOR (AVIM) 8-58

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

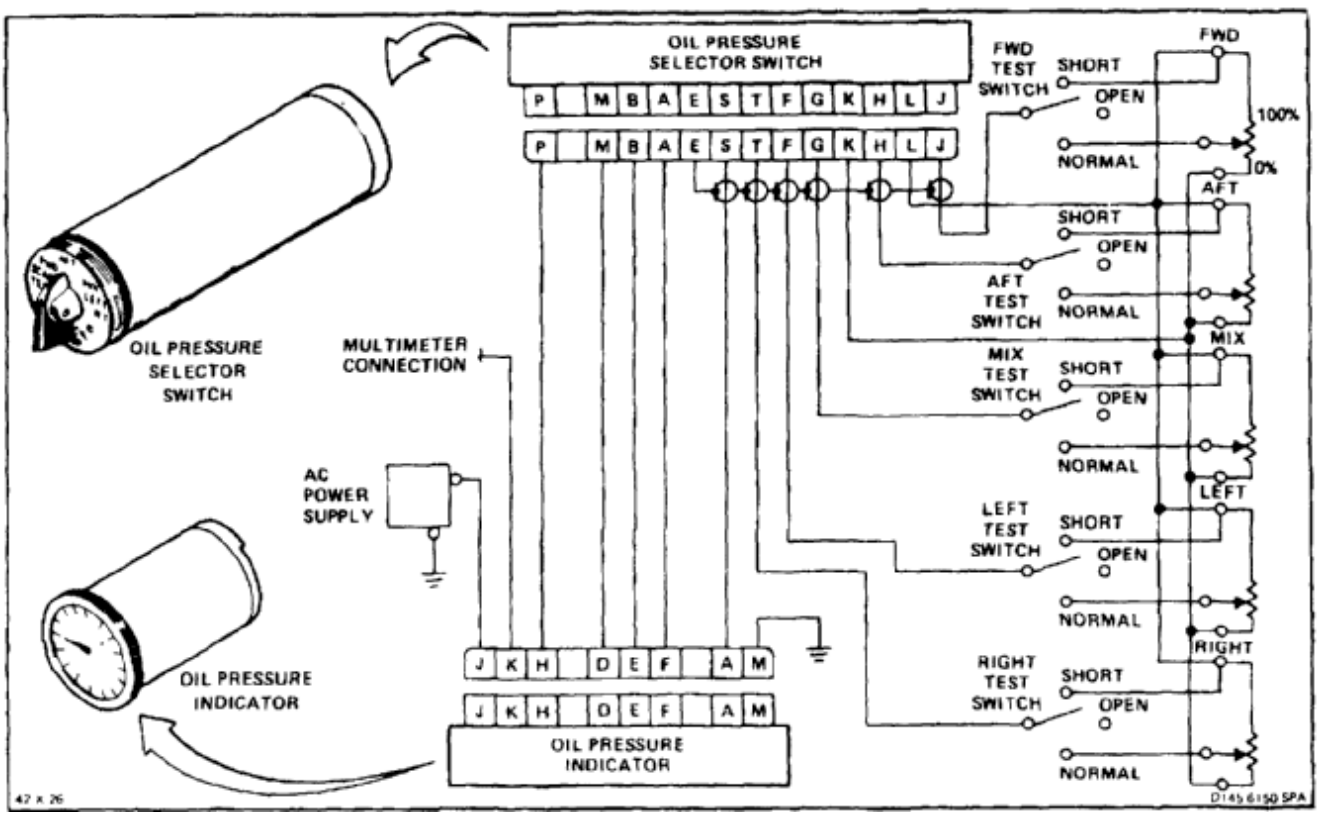
Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
AC Power Supply, 115 Volt 400 Hz
Transmission Oil Pressure Selector Switch, 384332-016
Transmission Oil Pressure Indicator, 331002-06015
Variable Resistors, 5000 Ohm ±3percent, 5 Watt, 10 Turn, Counter, 0-100 Percent, 0.25 Percent Linearity (5)
Stopwatch
Multimeter
Crimping Tool, NSN 5120-00-075-2544
Connector, MS3476W14-19S
Connector, MS3476W14-15S
Switch, MS24523-21 (5)
Wire, No. 20, Insulated
Wire, No. 20, Shielded

***Personnel Required:***

Aircraft Electrician
Inspector

***Equipment Condition:***

Off Helicopter Task
Electrical Test Setup



## 8-58 TEST TRANSMISSION OIL PRESSURE SELECTOR SWITCH OR INDICATOR (AVIM) (Continued) 8-58

**NOTE**

For testing indicator, a known good selector switch is used.

For testing selector switch, a known good indicator is used.

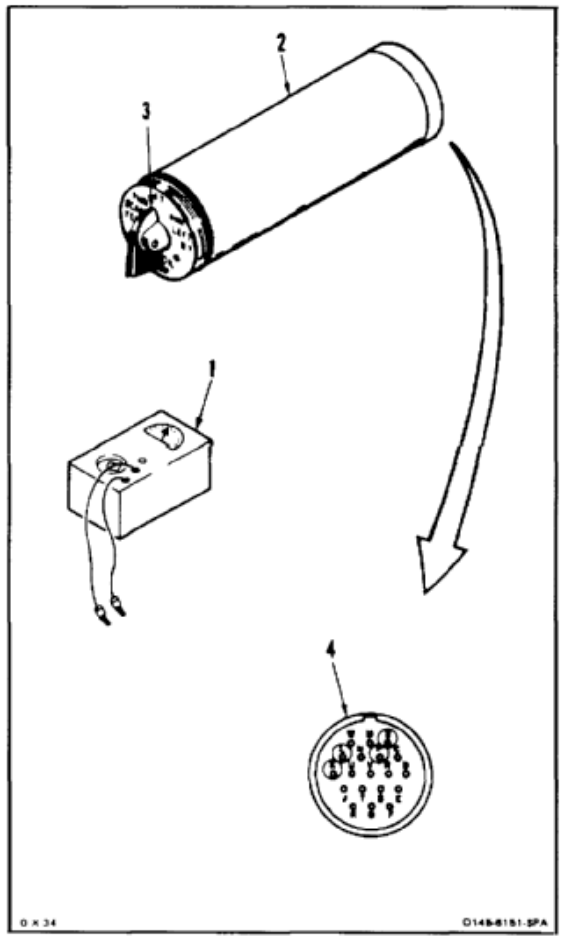
Variable resistors are at maximum resistance with dials at **0**, minimum resistance with dials at **100 percent**.

Clockwise rotation of resistors increases resistance.

Clockwise rotation of resistors lowers pressure reading on indicator.

Perform steps 1 thru 54 if testing selector switch.

Perform steps 9 thru 54 if testing indicator.



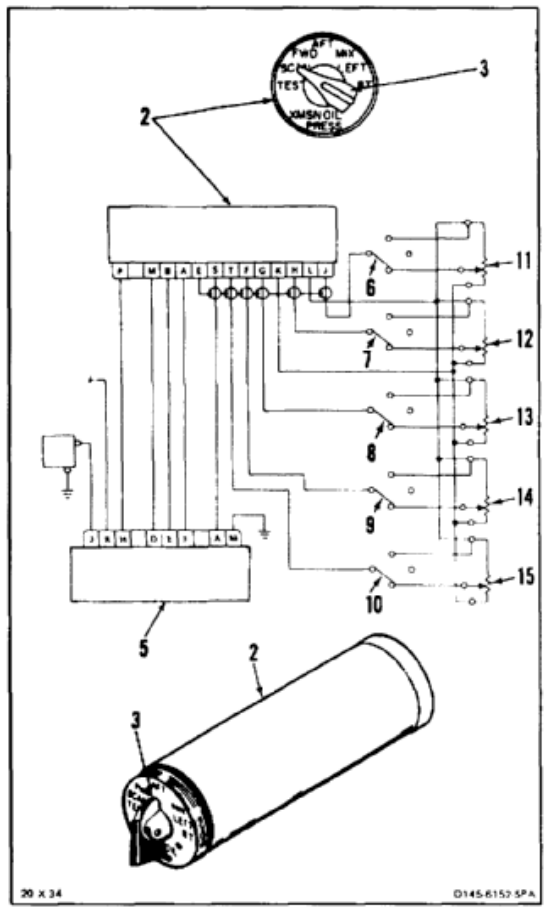

***SELECTOR SWITCH CONTINUITY AND RESISTANCE TEST***

1. Connect multimeter (1) set to RX1 to pins B and L of selector switch (2).
2. Rotate selector switch knob (3) through all dial positions. Check multimeter (1) at each position. Multimeter shall indicate continuity at all switch positions.
3. Remove multimeter test lead from pin L. Connect lead to selector switch case ground (receptacle shell) (4).
4. Rotate selector switch knob (3) through all dial positions. Check multimeter (1) at each position. Multimeter shall indicate open circuit at all switch positions.
5. Disconnect multimeter (1).
6. Connect multimeter (1) set to RX1 to pins P and K of selector switch (2). Check multimeter. Multimeter shall indicate continuity.
7. Remove multimeter lead from pin P. Connect load to selector switch case ground (4). Check multimeter (1). Multimeter shall indicate continuity.
8. Disconnect multimeter (1).

**8-58 TEST TRANSMISSION OIL PRESSURE SELECTOR SWITCH OR INDICATOR (AVIM) (Continued)** **8-58**

***DIAL LAMP TEST WITHOUT 17***

9. Connect selector switch (2) to test setup. Switch knob (3) to SCAN.
10. Connect indicator (5) to test setup.
11. Set test switches (6, 7, 8, 9, and 10) to NORMAL.
12. Adjust variable resistors (11, 12, 13, 14, and 15) to **100 percent** (full counterclockwise).
13. Apply power to test setup. Indicator (5) shall read **100 psi**. Selector switch (2) SCAN position dial lamp shall come on.
14. Set selector switch knob (3) to TEST and hold. Check TEST dial lamp. Lamp shall come on. Release selector switch. Switch knob (3) shall return to SCAN.
15. Set selector switch knob (3) to each dial position, FWD, AFT, MIX, LEFT, and RIGHT. Check dial lamp for each position. Lamp shall come on at each position.



## 8-58 TEST TRANSMISSION OIL PRESSURE SELECTOR SWITCH OR INDICATOR (AVIM) (Continued) 8-58

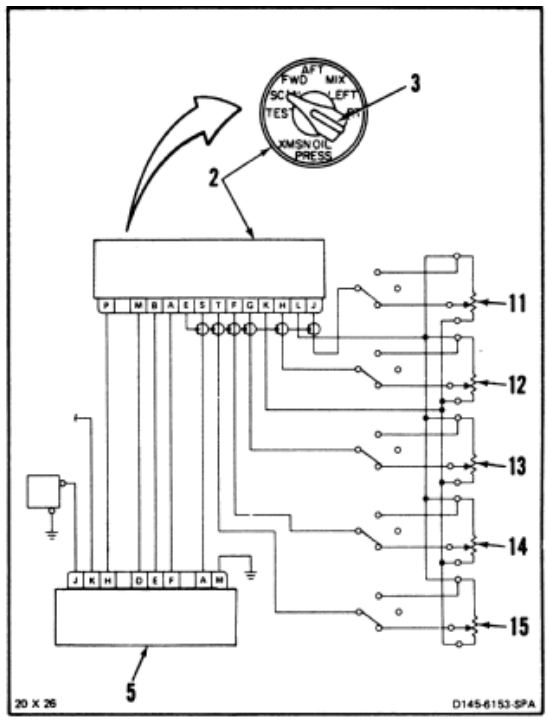
### *TRANSDUCER CIRCUIT TEST*

16. Set selector switch knob (3) to SCAN.

**NOTE**

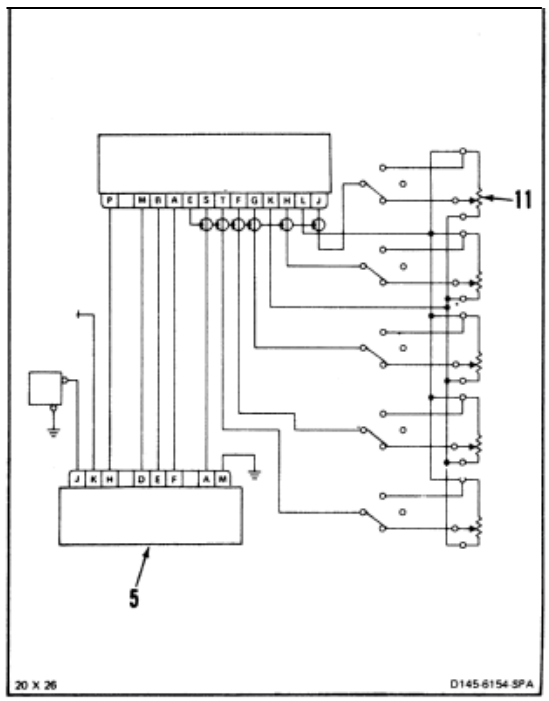
Without **17**, SCAN dial lamp remains on when selector switch is at SCAN.

17. Adjust FWD resistor (11) **three turns** clockwise.
18. Check selector switch (2). Without **17**, FWD dial lamp shall come on as resistor (11) is adjusted.
19. Check indicator (5). Indicator shall read **70 psi**. Adjust FWD resistor (11) to **100 percent** (full counterclockwise).
20. Repeat steps 17, 18, and 19 at AFT resistor (12), MIX resistor (13), LEFT resistor (14), and RIGHT resistor (15).




### *SENSITIVITY TEST*

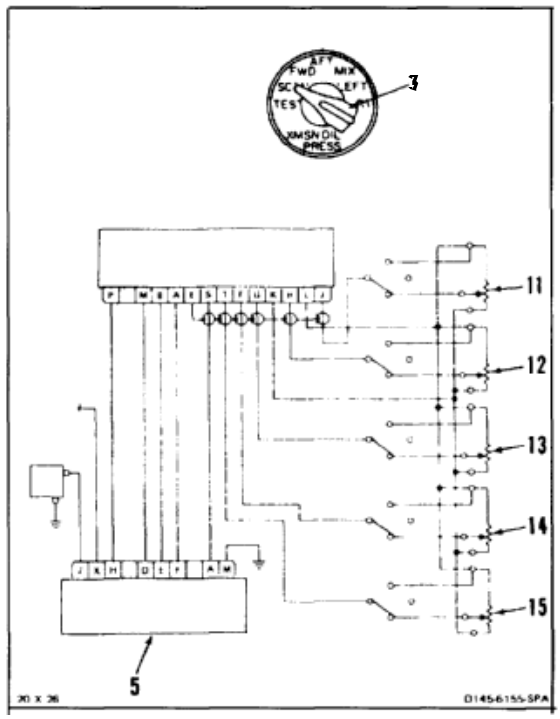
21. Adjust FWD resistor (11) clockwise until indicator (5) reads **20 psi**. Record FWD resistor setting.
22. Adjust FWD resistor (11) counterclockwise until pointer of indicator (5) just begins to move. Record FWD resistor setting.
23. Compare settings for FWD resistor (11) in steps 21 and 22. Difference shall be less than **1 percent**.
24. Repeat steps 21, 22, and 23 four times. Use **40, 50, 70, and 90 psi** as starting points. Then go to step 25.
25. Repeat steps 21, 22, and 23 five times. Use **90, 70, 50, 40, and 20 psi** as starting points and adjust FWD resistor (11) clockwise. Then go to step 26.



## 8-58 TEST TRANSMISSION OIL PRESSURE SELECTOR SWITCH OR INDICATOR (AVIM) (Continued) 8-58

***RESPONSE TEST***

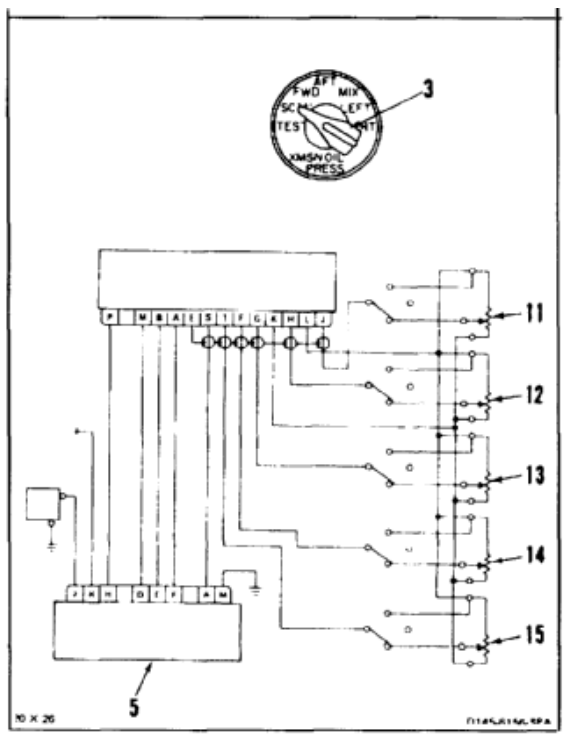
26. Set selector switch knob (3) to SCAN. Adjust FWD resistor (11) until indicator (5) reads **30 psi**.
27. Adjust AFT resistor (12), MIX resistor (13), LEFT resistor (14), and RIGHT resistor (15) clockwise to **3500 ohms (7 turns)**.
28. Adjust AFT resistor (12) clockwise until pointer of indicator (5) moves upscale then downscale. Check upscale movement of pointer. Upscale movement of pointer shall be less than **1 psi**. Adjust AFT resistor to setting recorded in step 27.
29. Repeat steps 27 and 28 at MIX (13), LEFT (14), and RIGHT (15) resistors. Then go to step 30.




***SCALE ERROR TEST***

30. Set selector switch knob (3) to SCAN.
31. Adjust resistors (11, 12, 13, 14, and 15) to **100 percent** (full counterclockwise).
32. Adjust FWD resistor (11) clockwise. For indicator (5) readings listed, resistor settings shall be within tolerance as follows:

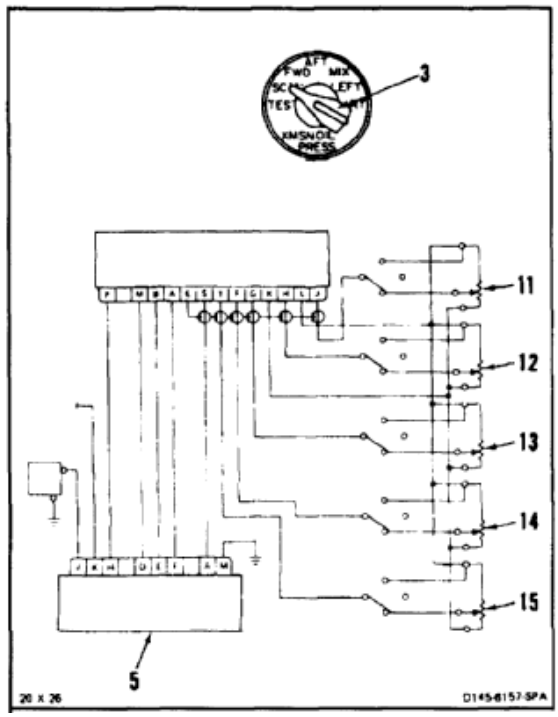
| SET INDICATOR READING TO | VARIABLE RESISTOR SETTING SHALL BE |
|---|---|
| 95 psi | 93.5 to 96.5 percent |
| 80 psi | 78.5 to 81.5 percent |
| 60 psi | 58.5 to 61.5 percent |
| 40 psi | 38.5 to 41.5 percent |
| 20 psi | 18.5 to 21.5 percent |
| 0 psi | 0 to 1.5 percent |



## 8-58 TEST TRANSMISSION OIL PRESSURE SELECTOR SWITCH OR INDICATOR (AVIM) (Continued) 8-58

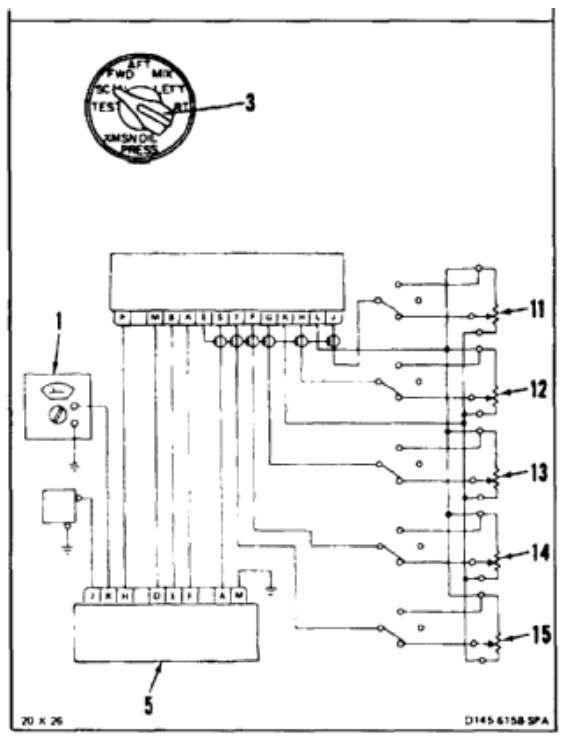
### *TRAVEL TIME TEST*

33. Set selector switch knob (3) to FWD.
34. Adjust resistors (11, 12, 13, 14, and 15) to **100 percent** (full counterclockwise).
35. Adjust FWD resistor (11) clockwise until indicator (5) reads **50 psi**.
36. Set selector switch knob (3) to AFT.
37. Adjust AFT resistor (12) clockwise until indicator (5) reads **15 psi**.
38. Set selector switch knob (3) to FWD. Check indicator (5). Pointer of indicator shall move to **15 psi** in less than **5 seconds**.
39. Set selector switch knob (3) to AFT. Check indicator (5). Pointer of indicator shall move to **50 psi** in less than **5 seconds**.




### *CAUTION LIGHT TEST*

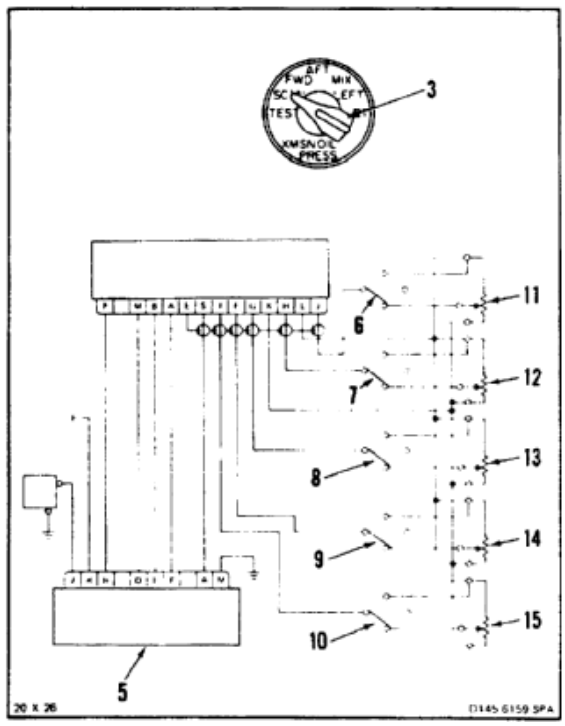
40. Set selector switch knob (3) to SCAN.
41. Adjust resistors (11, 12, 13, 14, and 15) to **100 percent** (full counterclockwise).
42. Connect multimeter (1), set to RX1, between case ground and pin K of indicator (5).
43. Adjust FWD resistor (11) clockwise until indicator (5) reads **95 psi**.
44. Continue to adjust FWD resistor (11) clockwise. Check multimeter (1). Multimeter shall indicate continuity when indicator (5) reads **21.5 to 18.5 psi**. Muitimeter shall continue to indicate continuity to **0 psi** on indicator.
45. Disconnect multimeter (1).



**8-58 TEST TRANSMISSION OIL PRESSURE SELECTOR SWITCH OR INDICATOR (AVIM) (Continued)** **8-58**

***FAIL SAFE CIRCUIT TEST (OPEN)***

46. Set selector switch knob (3) to SCAN.
47. Adjust variable resistors (11, 12, 13, 14, and 15) to **100 percent** (full counterclockwise).
48. Adjust variable resistors (11, 12, 13, 14, and 15) **five turns** clockwise. Check indicator (5). Indicator shall read **50 psi**.
49. Set FWD test switch (6) to OPEN. Check indicator (5). Pointer of indicator shall move to **0 psi**. Set FWD test switch to NORMAL. Pointer of indicator shall return to **50 psi**.
50. Repeat step 49 at AFT test switch (7), MIX test switch (8), LEFT test switch (9), and RIGHT test switch (10).




***FAIL SAFE CIRCUIT TEST (SHORT)***

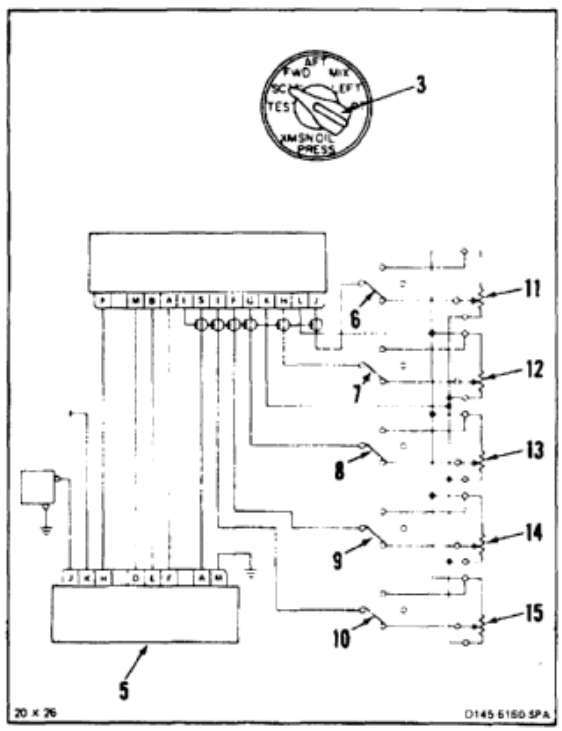
51. Set selector switch knob (3) to FWD. Set FWD test switch (6) to SHORT. Check indicator (5). Pointer of indicator shall move to **100 psi**. Set FWD test switch to NORMAL. Pointer of indicator shall return to **50 psi**.
52. Repeat step 51 with selector switch (2) at AFT, MIX, LEFT, and RIGHT dial position, for AFT test switch (7), MIX test switch (8), LEFT test switch (9), and RIGHT test switch (10), respectively.

***SHUTDOWN***

53. Remove power from test setup.
54. Remove indicator (5) and selector switch (2) from test setup.

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 8-59 REMOVE COMBINING NO. 1, OR NO. 2 ENGINE TRANSMISSION OIL PRESSURE TRANSDUCER 8-59

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Container, 2 Quart

***Materials:***

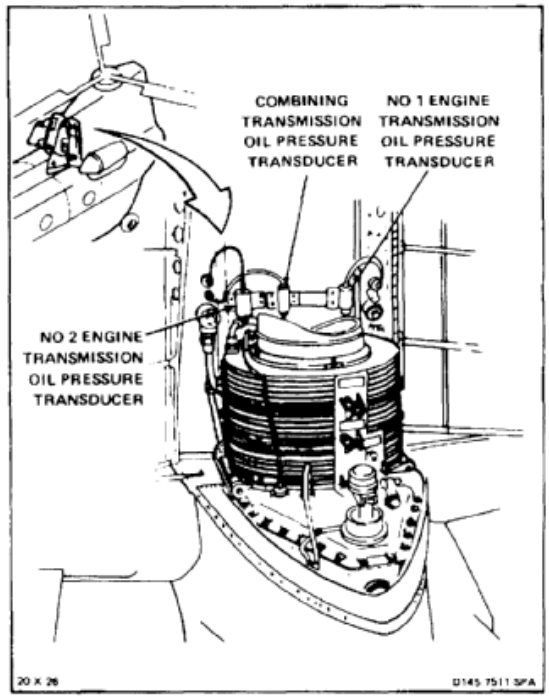
Cloth (E120)

***Personnel Required:***

Medium Helicopter Repairer

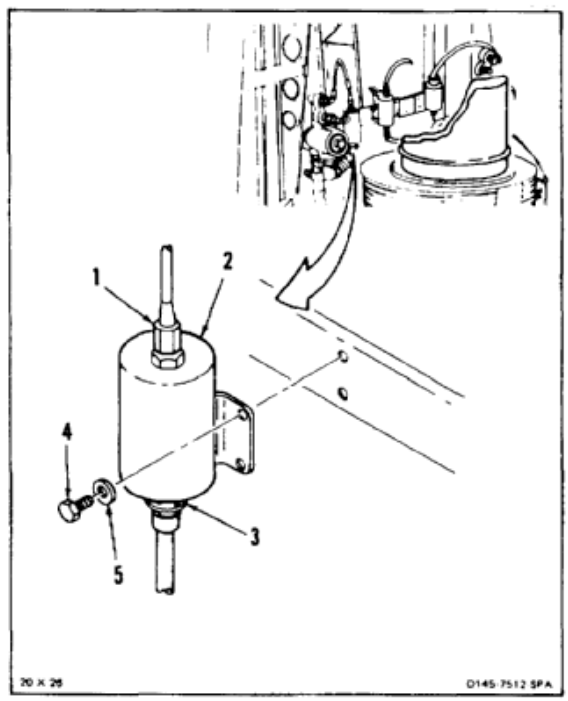
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Aft Pylon Doors Open (Task 2-2)




**NOTE**

Removal of No. 1 and No. 2 engine and combining transmission oil pressure transducers is similar. Electrical disconnect is at bottom of engine transmission transducers and at top of combining transmission transducer. Removal of No. 2 engine transmission oil pressure transducer is shown here.




1. Disconnect hose (1) from transducer (2). Use container and cloths (E120) for spilled oil.
2. Disconnect electrical connector (3) from pressure transducer (2).
3. Remove four bolts (4) and washers (5).
4. Remove pressure transducer (2).

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-60 INSTALL COMBINING NO. 1 OR NO. 2 ENGINE TRANSMISSION OIL PRESSURE TRANSDUCER 8-60

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

***Materials:***

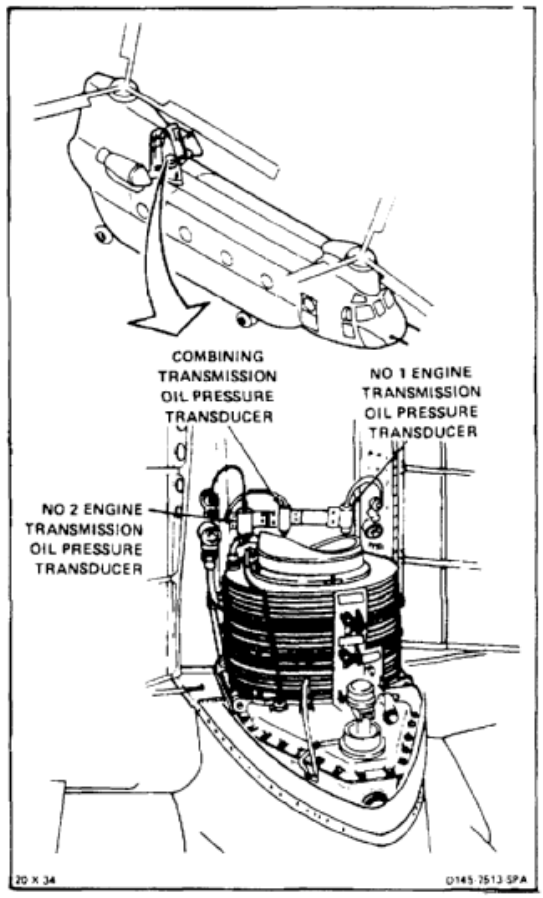
Cloth (E120)

***Personnel Required:***

Medium Helicopter Repairer
Inspector

***References:***

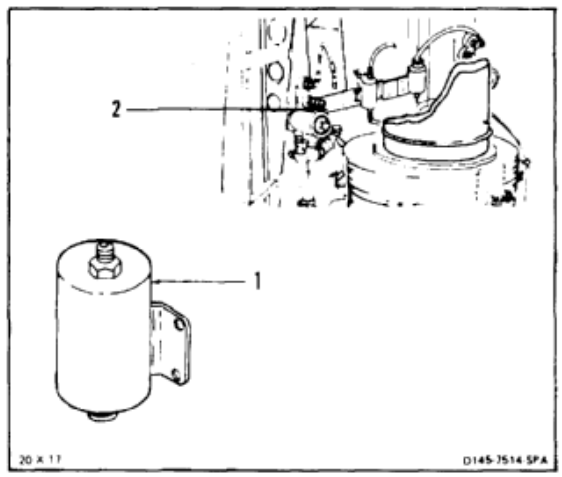
TM 55-1520-240-23P
TM 55-1500-323-25
TM 55-1500-325-25



**NOTE**

Installation of No. 1 and No. 2 engine and combining transmission oil pressure transducers is similar. Electrical disconnect is at bottom of engine transmission transducers and at top of combining transmission transducer. Installation of No. 2 engine transmission oil pressure transducer is shown here.

1. Clean bonding surfaces of transducer (1) and mount surface (2) (TM 55-1500-325-25). Use cloth (E120).

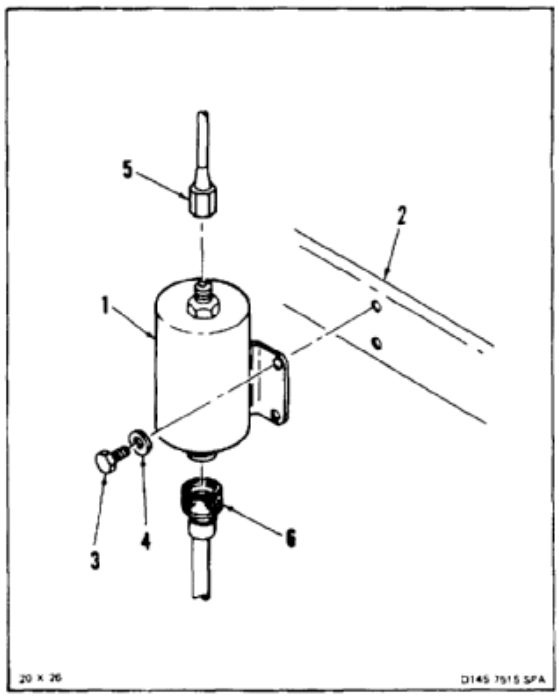



2. Position transducer (1) on mount surface (2). Install four bolts (3) and washers (4).
3. Connect hose (5) to transducer (1).
4. Connect connector (6) to transducer (1).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Close aft pylon doors (Task 2-2).
Perform operational check (TM 55-1520-240-T).




END OF TASK

## 8-61 REMOVE AFT TRANSMISSION OIL PRESSURE TRANSDUCER 8-61

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Container, 2 Quart

***Materials:***

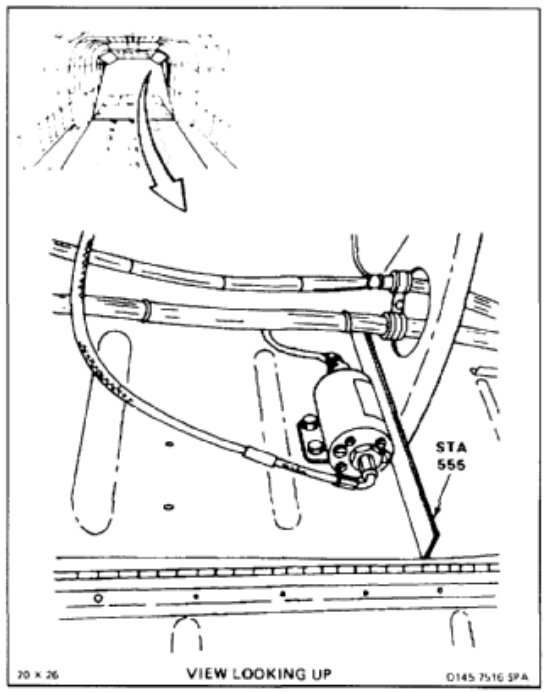
Cloth (E120)

***Personnel Required:***

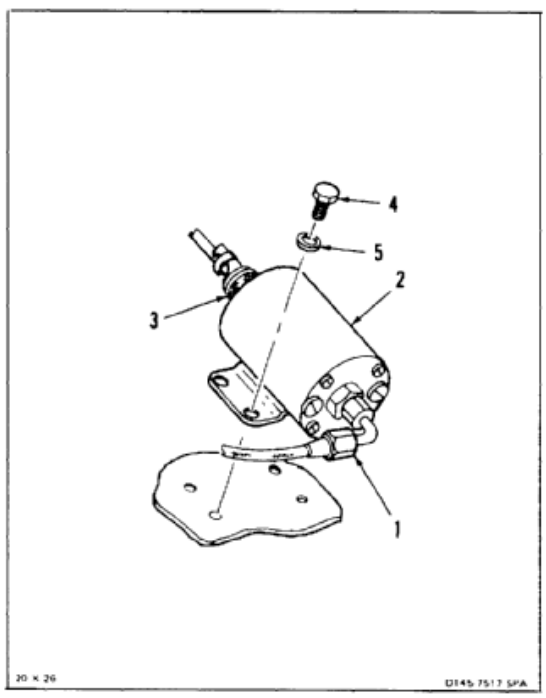
Medium Helicopter Repairer

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Cargo Ramp Open and Level (Task 2-2)
Baffles Under Aft Transmission Open (Task 2-2)




1. Disconnect hose (1) from pressure transducer (2). Use container and cloths (E120) for spilled oil.
2. Disconnect electrical connector (3) from pressure transducer (2).
3. Remove four bolts (4) and washers (5).
4. Remove pressure transducer (2).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-62 INSTALL AFT TRANSMISSION OIL PRESSURE TRANSDUCER 8-62

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

***Materials:***

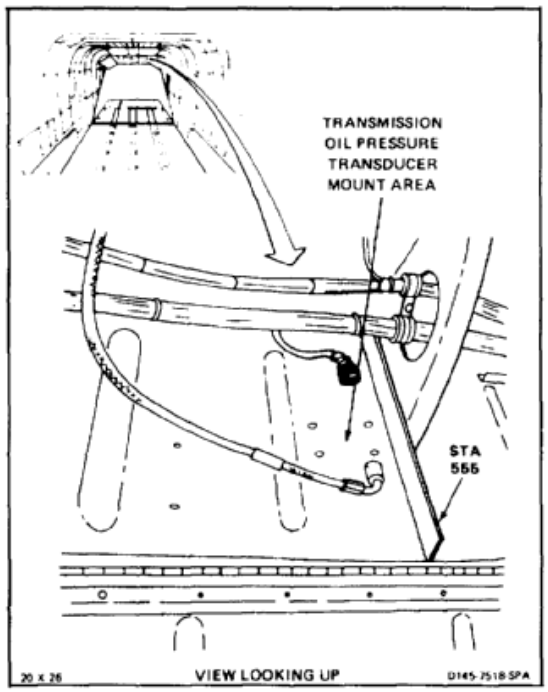
Cloth (E120)

***Personnel Required:***

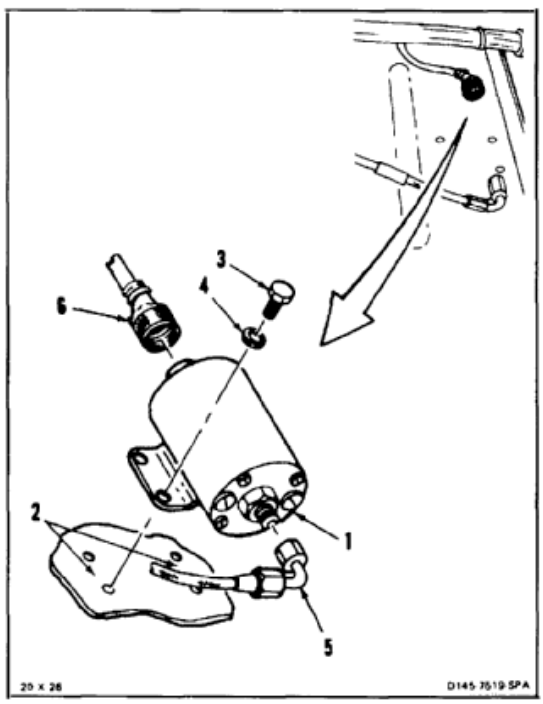
Medium Helicopter Repairer
Inspector

***References:***

TM 55-1520-240-23P
TM 55-1500-323-25




1. Clean mounting surfaces of transducer (1) and structure (2) (TM 55-1500-323-25). Use cloth (E120).
2. Position transducer (1). Install four bolts (3) and washers (4).
3. Connect hose (5) to transducer (1).
4. Connect connector (6) to transducer (1).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Close baffles under aft transmission (Task 2-2).
Perform operational check (TM 55-1520-240-T).
Close cargo ramp (Task 2-2).

END OF TASK

## 8-63 REMOVE FORWARD TRANSMISSION OIL PRESSURE TRANSDUCER 8-63

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Container, 2 Quart

***Materials:***

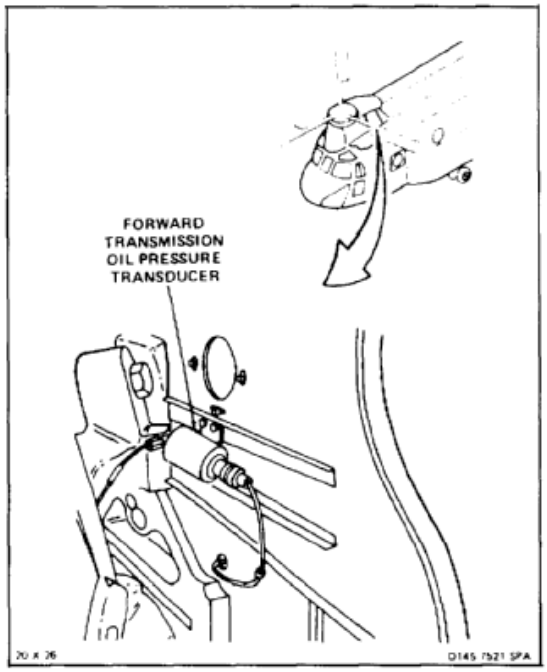
Cloth (E120)

***Personnel Required:***

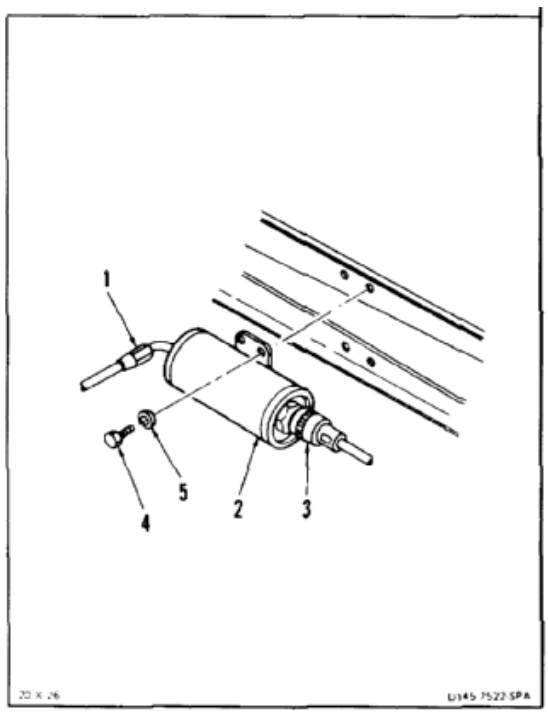
Medium Helicopter Repairer

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Left Forward Work Platform Open (Task 2-2)




1. Disconnect hose (1) from pressure transducer (2). Use container and cloths (E120) for spilled oil.
2. Disconnect electrical connector (3) from pressure transducer (2).
3. Remove four bolts (4) and washers (5).
4. Remove pressure transducer (2).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-64 INSTALL FORWARD TRANSMISSION OIL PRESSURE TRANSDUCER 8-64

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

***Materials:***

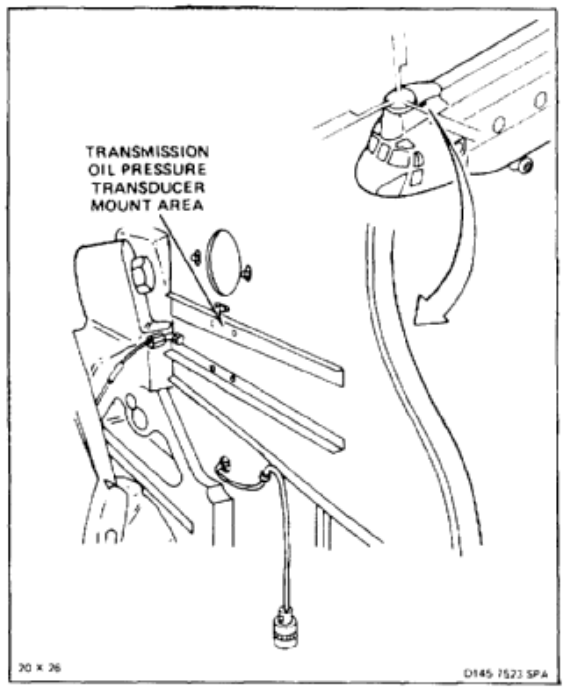
Cloth (E120)
Dry Cleaning Solvent (E162)
Gloves (E186)

***Personnel Required:***

Medium Helicopter Repairer
Inspector

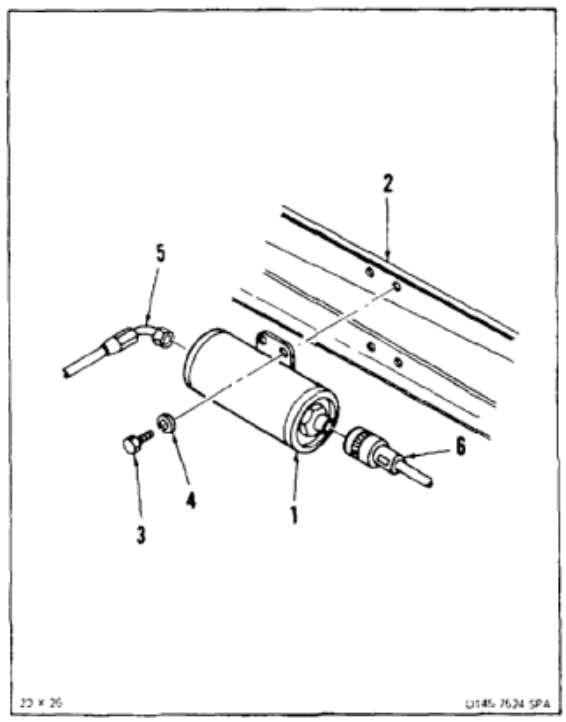
***References:***

TM 55-1520-240-23P
TM 55-1500-323-25




**WARNING**

Dry cleaning solvent (E162) is flammable and toxic. It can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.




1. Clean bonding surfaces of transducer (1) and mounting surface (2) (TM 55-1500-323-25). Use dry cleaning solvent (E162), cloth (E120), and gloves (E186).
2. Position transducer (1). Install four bolts (3) and washers (4).
3. Connect hose (5) to transducer (1).
4. Connect connector (6) to transducer (1).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Close left forward work platform (Task 2-2).
Perform operational check (TM 55-1520-240-T).

END OF TASK

## 8-65 REPLACE FORWARD TRANSMISSION OIL PRESSURE SWITCHES 8-65

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 30 to 150 Inch-Pounds

***Materials:***

Lockwire (E231)
Oil (E254)

***Parts:***

Packing

***Personnel Required:***

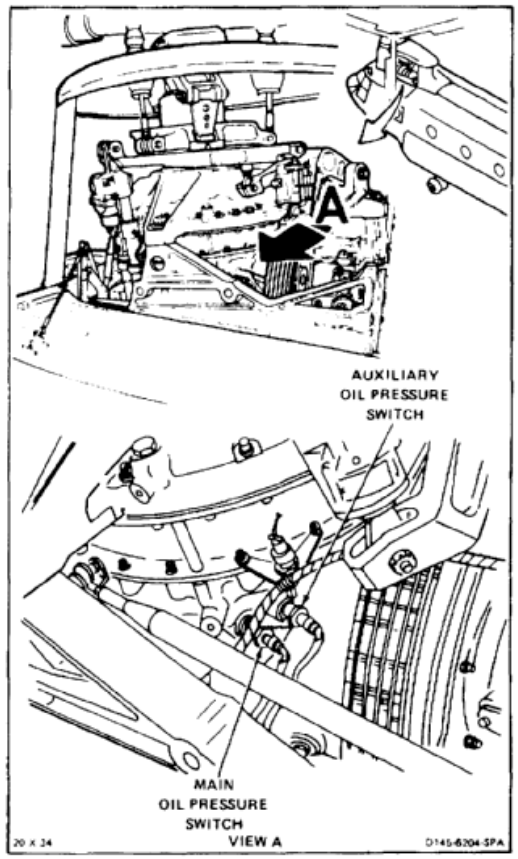
Medium Helicopter Repairer
Inspector

***References:***

TM 55-1520-240-23P

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Left Forward Transmission Fairing Open (Task 2-2)

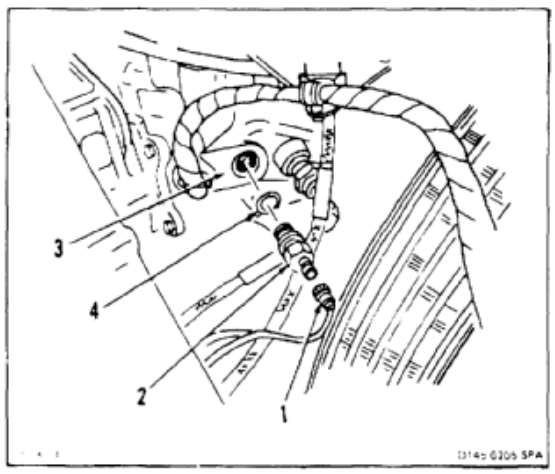



**NOTE**

Procedure is same to replace main or auxiliary switch. Replacement of main switch is shown here.

***REMOVE SWITCH***

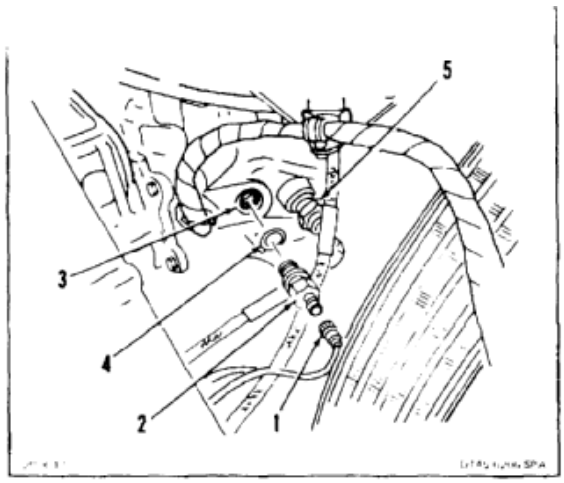
1. Disconnect connector (1) from switch (2).
2. Remove lockwire from switch (2).
3. Remove switch (2) from transmission (3).
4. Remove packing (4) from switch (2).



***INSTALL SWITCH***

**WARNING**

Oil (E254) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for least **15 minutes**. Get medical attention for eyes.




5. Coat packing (4) and threads of switch (2) with oil (E254).
6. Install packing (4) on switch (2).
7. Install switch (2) in transmission (3). Torque switch to **80 inch-pounds**.
8. Lockwire main switch (2) to auxiliary switch (5). Use lockwire (E231).
9. Connect connector (1) to switch (2).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).
Close left forward transmission fairing (Task 2-2).

END OF TASK

## 8-66 REPLACE COMBINING TRANSMISSION MAIN OIL PRESSURE SWITCH 8-66

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 30 to 150 Inch-Pounds

***Materials:***

Oil (E254)
Lockwire (E231)
Cloth (E120)

***Parts:***

Packing

***Personnel Required:***

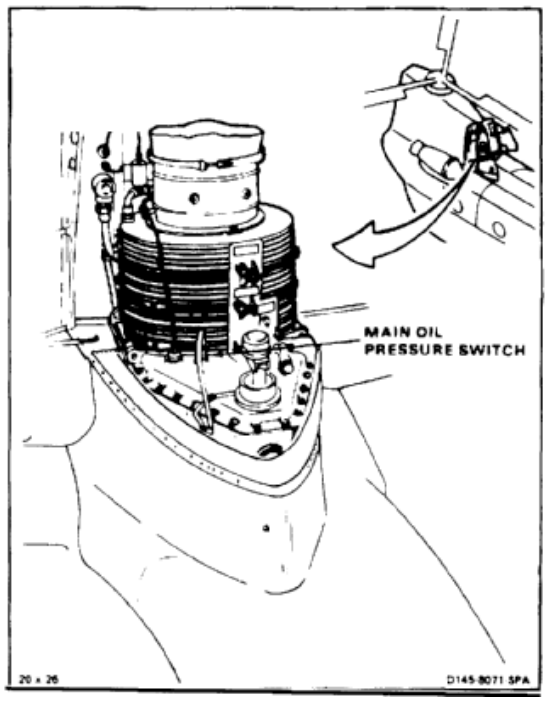
Medium Helicopter Repairer
Inspector

***References:***

TM 55-1520-240-23P

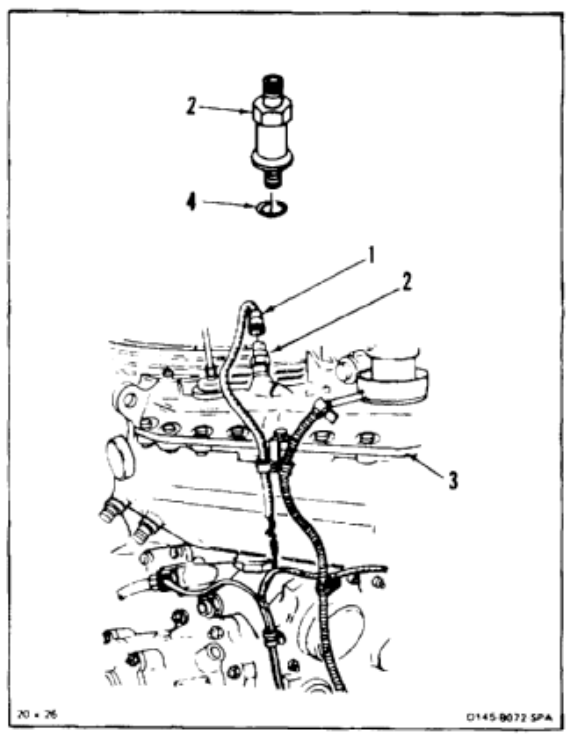
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Aft Pylon Doors Open (Task 2-2)




***REMOVE SWITCH***

1. Disconnect electrical connector (1) from switch (2).
2. Remove lockwire from switch (2).
3. Remove switch (2) from sump cover (3).
4. Wipe up spilled oil. Use cloth (E120).
5. Remove packing (4) from switch (2).

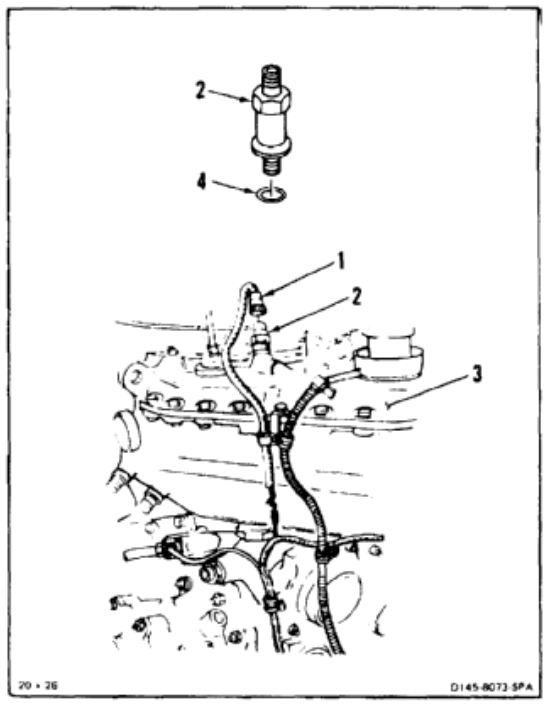


***INSTALL SWITCH***

**WARNING**

Oil (E254) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for least **15 minutes**. Get medical attention for eyes.

6. Coat packing (4) and thread of switch (2) with oil (E254).
7. Install packing (4) on switch (2).
8. Install switch (2) in sump cover (3). Torque switch to **80 inch-pounds**.
9. Lockwire switch (2) to sump cover (3). Use lockwire (E231).
10. Connect electrical connector (1) to switch (2).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Close aft pylon doors (Task 2-2).
Perform operational check (TM 55-1520-240-T).

END OF TASK

## 8-67 REPLACE COMBINING TRANSMISSION AUXILIARY OIL PRESSURE SWITCH 8-67

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 30 to 150 Inch-Pounds

***Materials:***

Oil (E254)
Lockwire (E231)
Cloth (E120)

***Parts:***

Packing

***Personnel Required:***

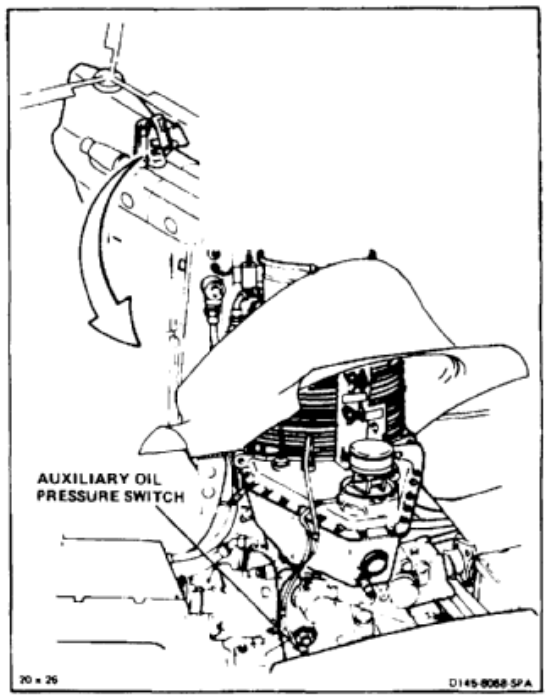
Medium Helicopter Repairer
Inspector

***References:***

TM 55-1520-240-23P

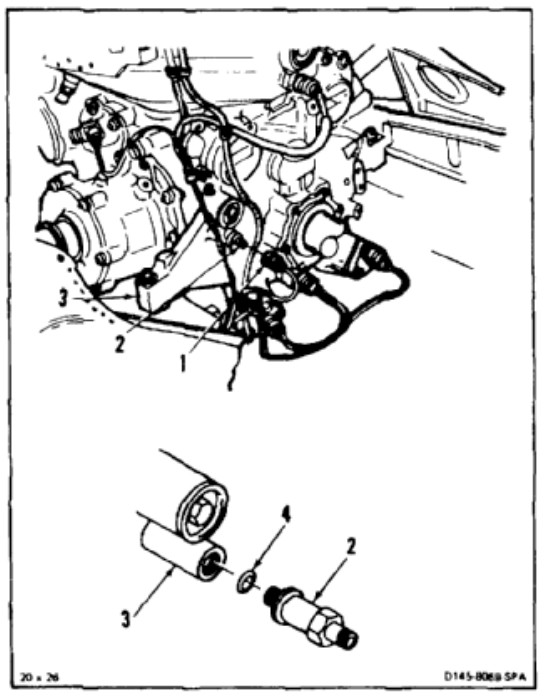
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Pylon Doors Open (Task 2-2)
Pylon Lower Fairing Open (Task 2-2)




***REMOVE SWITCH***

1. Disconnect electrical connector (1) from switch (2).
2. Remove lockwire from switch (2).
3. Remove switch (2) from transmission (3).
4. Wipe up spilled oil. Use cloth (E120).
5. Remove packing (4) from switch (2).

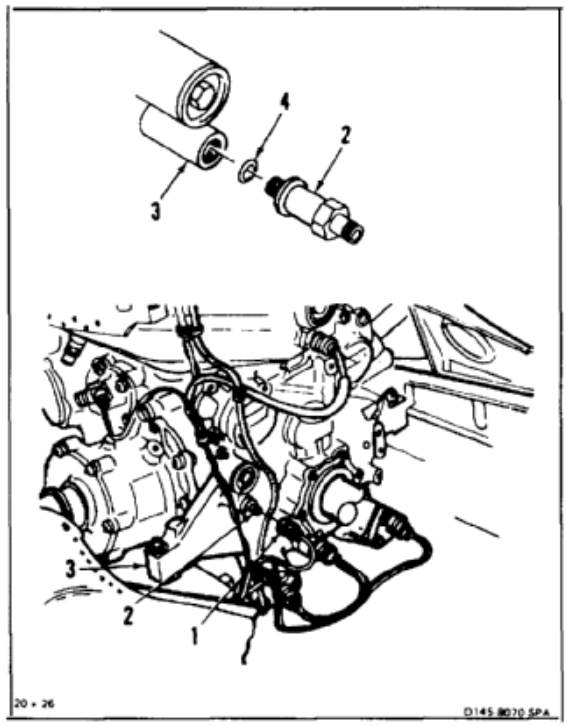


***INSTALL SWITCH***

**WARNING**

Oil (E254) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for least **15 minutes**. Get medical attention for eyes.

6. Coat packing (4) and thread of switch (2) with oil (E254).
7. Install packing (4) on switch (2).
8. Install switch (2) in transmission (3). Torque switch to **80 inch-pounds**.
9. Lockwire switch (2) to transmission (3). Use lockwire (E231).
10. Connect electrical connector (1) to switch (2).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Close pylon lower fairing (Task 2-2).
Close pylon doors (Task 2-2).
Perform operational check (TM 55-1520-240-T).

END OF TASK

## 8-68 REPLACE NO. 1 ENGINE TRANSMISSION MAIN OIL PRESSURE SWITCH 8-68

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 30 to 150 Inch-Pounds

***Materials:***

Oil (E254)
Lockwire (E231)
Cloth (E120)

***Parts:***

Packing

***Personnel Required:***

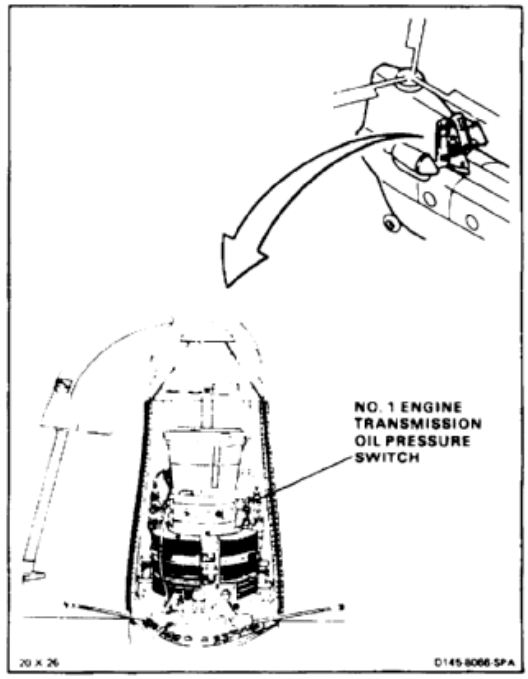
Medium Helicopter Repairer
Inspector

***References:***

TM 55-1520-240-23P

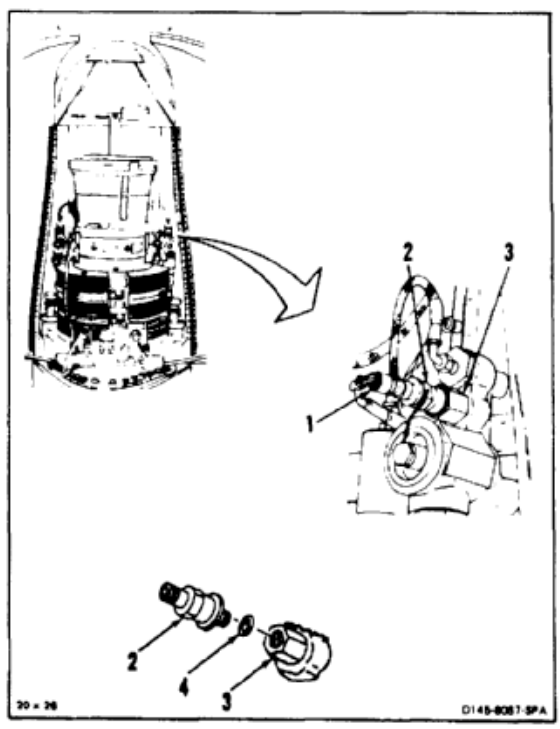
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Pylon Doors Open (Task 2-2)




***REMOVE SWITCH***

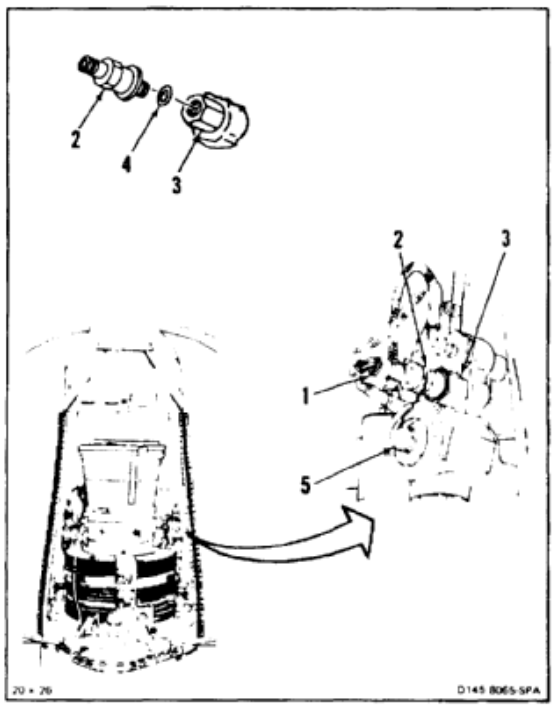
1. Disconnect electrical connector (1) from switch (2).
2. Remove lockwire from switch (2).
3. Remove switch (2) from screen support housing (3).
4. Wipe up spilled oil. Use cloth (E120).
5. Remove packing (4) from switch (2).



***INSTALL SWITCH***

**WARNING**

Oil (E254) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for least **15 minutes**. Get medical attention for eyes.




6. Coat packing (4) and thread of switch (2) with oil (E254).
7. Install packing (4) on switch (2).
8. Install switch (2) in screen support housing (3). Torque switch to **80 inch-pounds**.
9. Lockwire switch (2) to screen cover (5). Use lockwire (E231).
10. Connect electrical connector (1) to switch (2).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Close pylon doors (Task 2-2).
Perform operational check (TM 55-1520-240-T).

END OF TASK

## 8-69 REPLACE NO. 2 ENGINE TRANSMISSION MAIN OIL PRESSURE SWITCH 8-69

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 30 to 150 Inch-Pounds

***Materials:***

Oil (E254)
Lockwire (E231)
Cloth (E120)

***Parts:***

Packing

***Personnel Required:***

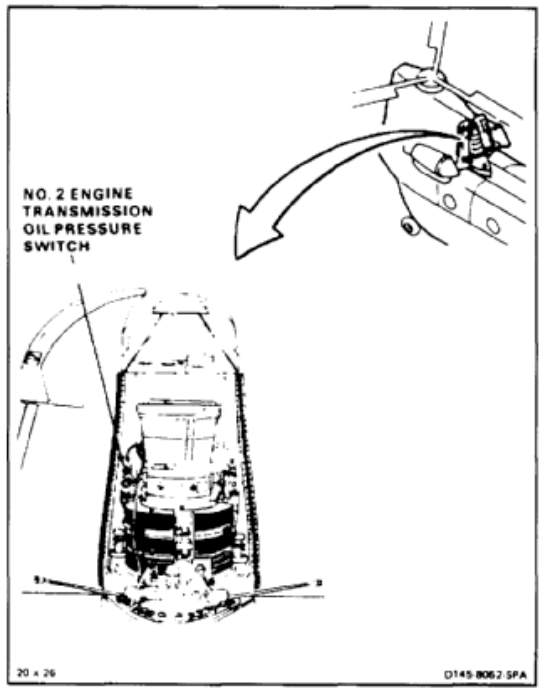
Medium Helicopter Repairer
Inspector

***References:***

TM 55-1520-240-23P

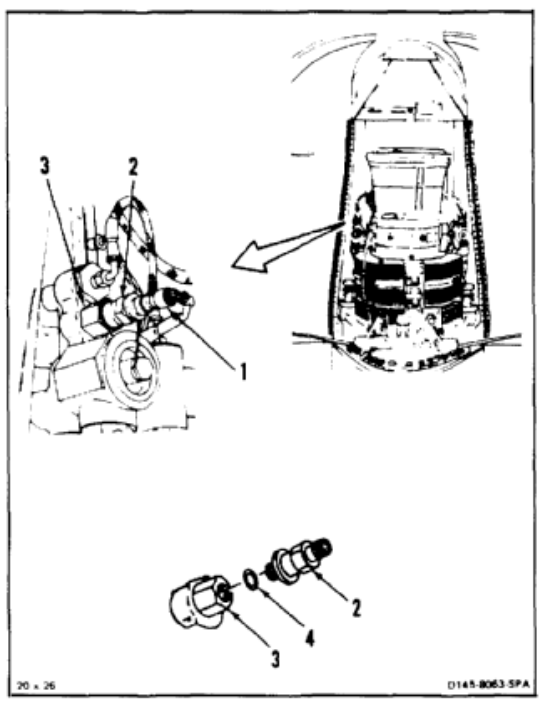
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Pylon Doors Open (Task 2-2)




***REMOVE SWITCH***

1. Disconnect electrical connector (1) from switch (2).
2. Remove lockwire from switch (2).
3. Remove switch (2) from screen support housing (3). Wipe up spilled oil. Use cloth (E120).
4. Remove packing (4) from switch (2).

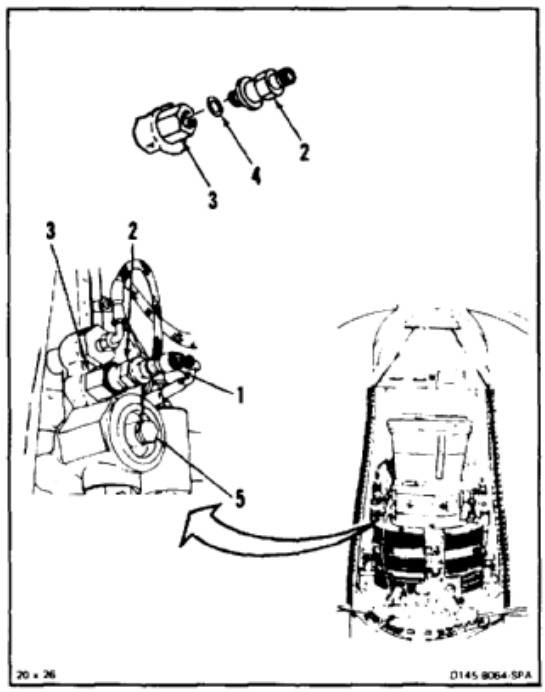


***INSTALL SWITCH***

**WARNING**

Oil (E254) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for least **15 minutes**. Get medical attention for eyes.

5. Coat packing (4) and thread of switch (2) with oil (E254).
6. Install packing (4) on switch (2).
7. Install switch (2) in screen support housing (3). Torque switch to **80 inch-pounds**.
8. Lockwire switch (2) to screen cover (5). Use lockwire (E231).
9. Connect electrical connector (1) to switch (2).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Close pylon doors (Task 2-2).
Perform operational check (TM 55-1520-240-T).

END OF TASK

## 8-70 REPLACE AFT TRANSMISSION MAIN OIL PRESSURE SWITCH 8-70

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 30 to 150 Inch-Pounds

***Materials:***

Oil (E254)
Lockwire (E231)
Cloth (E120)

***Parts:***

Packing

***Personnel Required:***

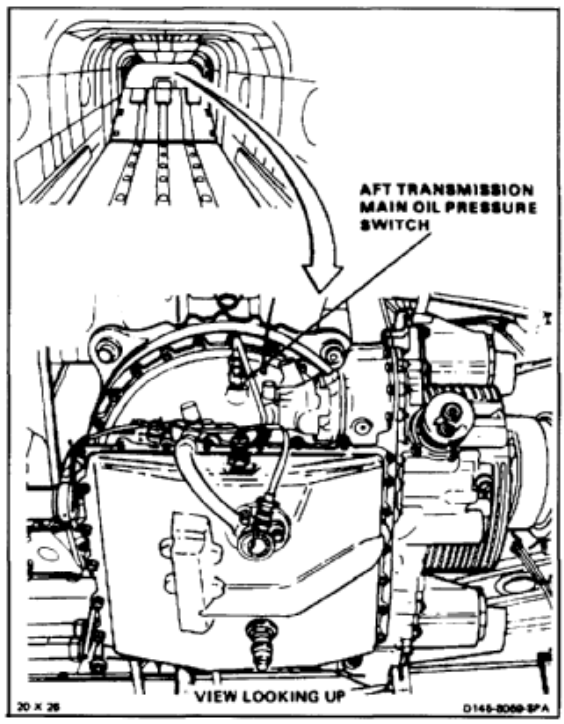
Medium Helicopter Repairer
Inspector

***References:***

TM 55-1520-240-23P

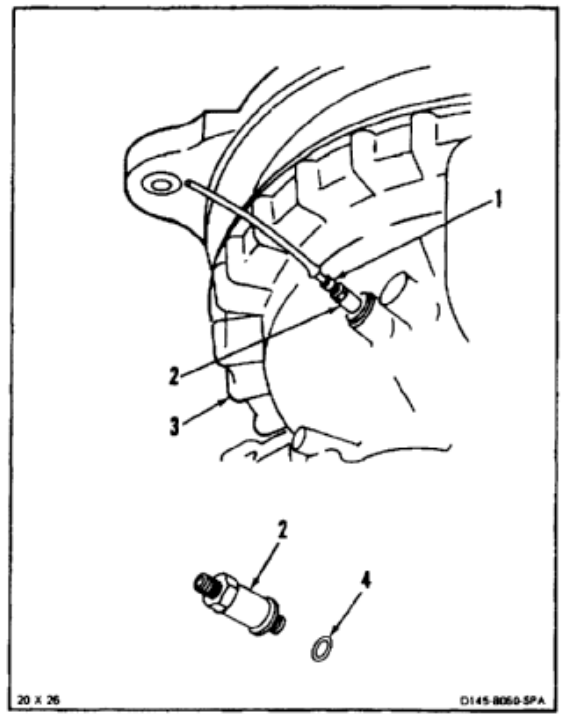
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Cargo Ramp Open and Level (Task 2-2)
Baffles Under Aft Transmission Open (Task 2-2)
Aft Transmission Drip Tray Removed (Task 2-3)



***REMOVE SWITCH***

1. Disconnect electrical connector (1) from switch (2).
2. Remove lockwire from switch (2).
3. Remove switch (2) from transmission (3). Wipe up spilled oil. Use cloth (E120).
4. Remove packing (4) from switch (2).

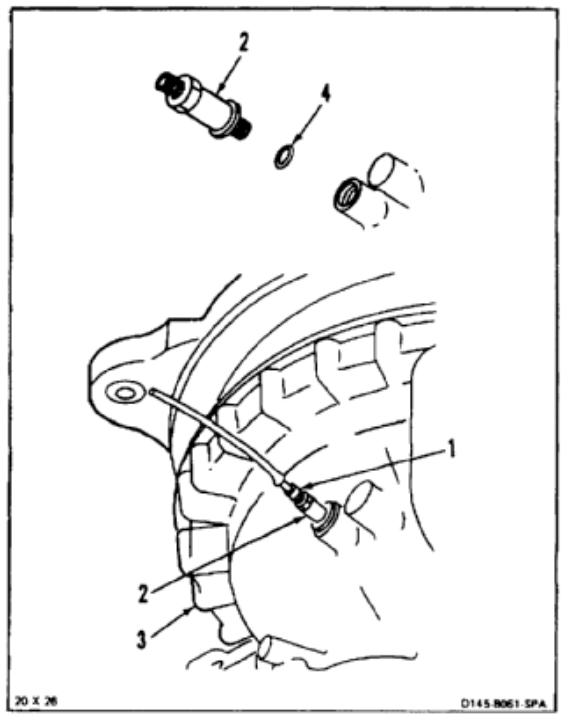



***INSTALL SWITCH***

**WARNING**

Oil (E254) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for least **15 minutes**. Get medical attention for eyes.

5. Coat packing (4) and thread of switch (2) with oil (E254).
6. Install packing (4) on switch (2).
7. Install switch (2) in transmission (3). Torque switch to **80 inch-pounds**.
8. Lockwire switch (2) to transmission (3). Use lockwire (E231).
9. Connect electrical connector (1) to switch (2).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Close baffles under aft transmission (Task 2-2).
Install aft transmission drip tray (Task 2-3).
Close cargo ramp (Task 2-2).
Perform operational check (TM 55-1520-240-T).

END OF TASK

## 8-71 REPLACE AFT TRANSMISSION AUXILIARY OIL PRESSURE SWITCH 8-71

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 30 to 150 Inch-Pounds

***Materials:***

Oil (E254)
Lockwire (E231)
Cloth (E120)

***Parts:***

Packing

***Personnel Required:***

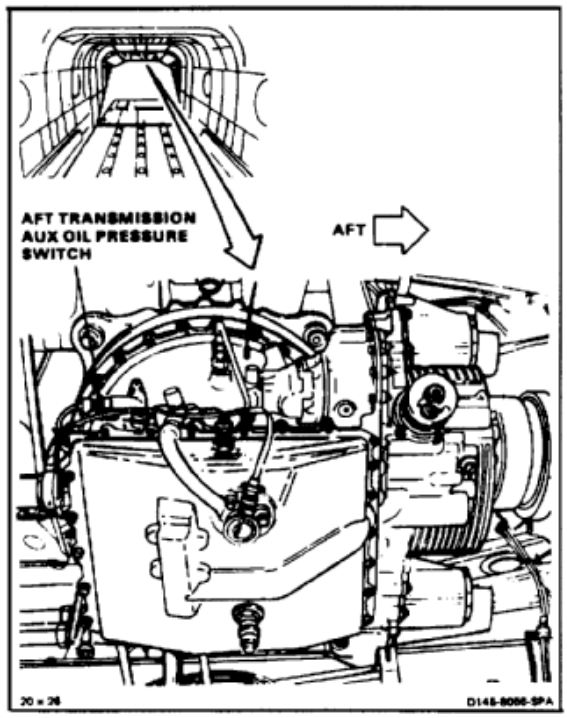
Medium Helicopter Repairer
Inspector

***References:***

TM 55-1520-240-23P

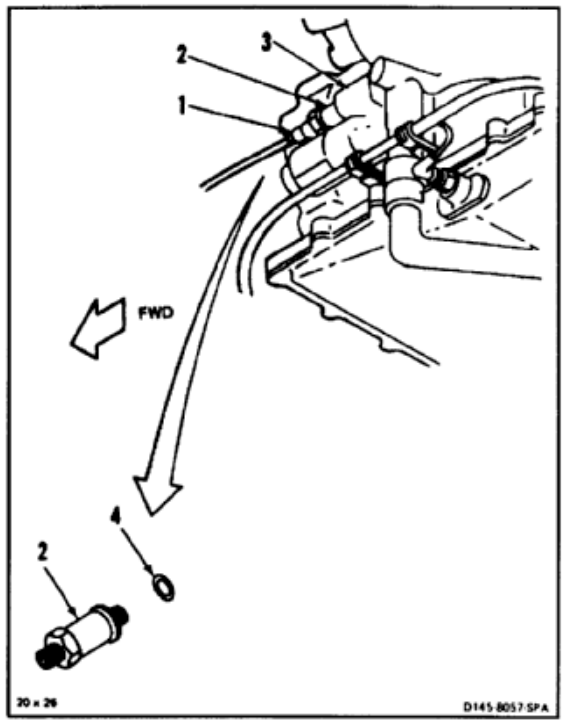
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Cargo Ramp Open and Level (Task 2-2)
Baffles Under Aft Transmission Open (Task 2-2)
Aft Transmission Drip Tray Removed (Task 2-3)



***REMOVE SWITCH***

1. Disconnect electrical connector (1) from switch (2).
2. Remove lockwire from switch (2).
3. Remove switch (2) from transmission (3). Wipe up spilled oil. Use cloth (E120).
4. Remove packing (4) from switch (2).

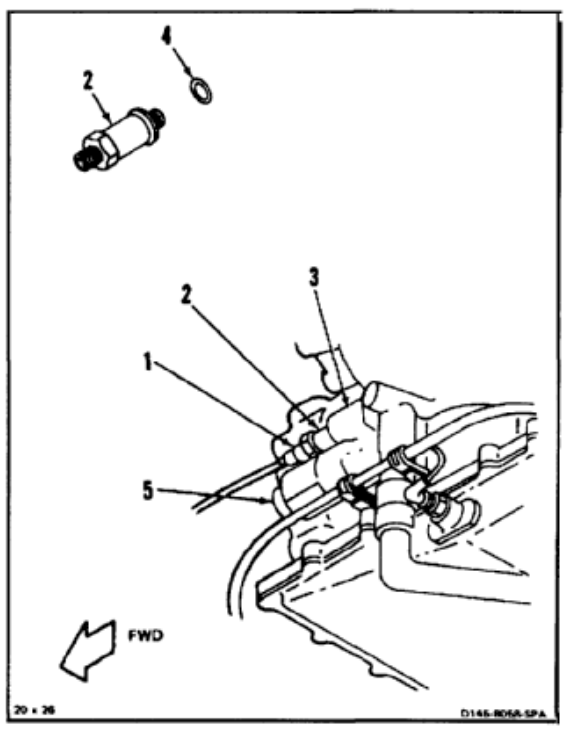



***INSTALL SWITCH***

**WARNING**

Oil (E254) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for least **15 minutes**. Get medical attention for eyes.

5. Coat packing (4) and thread of switch (2) with oil (E254).
6. Install packing (4) on switch (2).
7. Install switch (2) in transmission (3). Torque switch to **80 inch-pounds**.
8. Lockwire switch (2) to screen cover (5). Use lockwire (E231).
9. Connect electrical connector (1) to switch (2).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Close baffles under aft transmission (Task 2-2).
Install aft transmission drip tray (Task 2-3).
Close cargo ramp (Task 2-2).
Perform operational check (TM 55-1520-240-T).

END OF TASK

## 8-72 REPLACE AFT ROTOR SHAFT MAIN OIL PRESSURE SWITCH 8-72

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 30 to 150 Inch-Pounds

***Materials:***

Oil (E254)
Lockwire (E231)
Cloth (E120)

***Parts:***

Packing

***Personnel Required:***

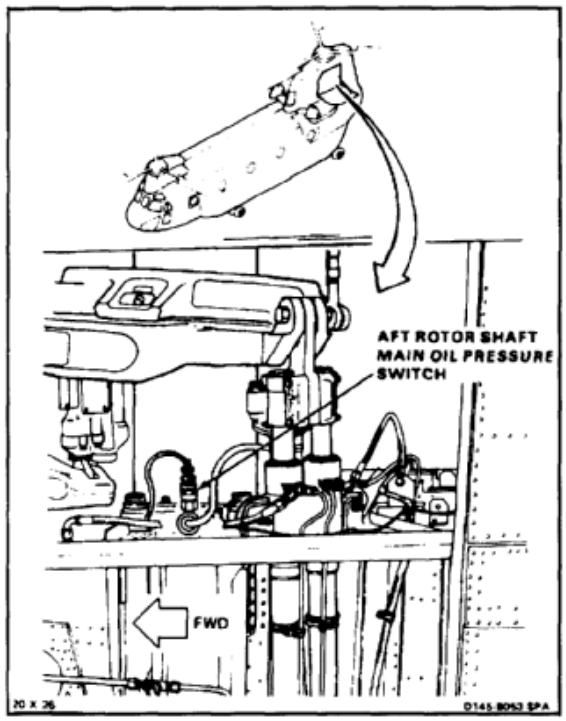
Medium Helicopter Repairer
Inspector

***References:***

TM 55-1520-240-23P

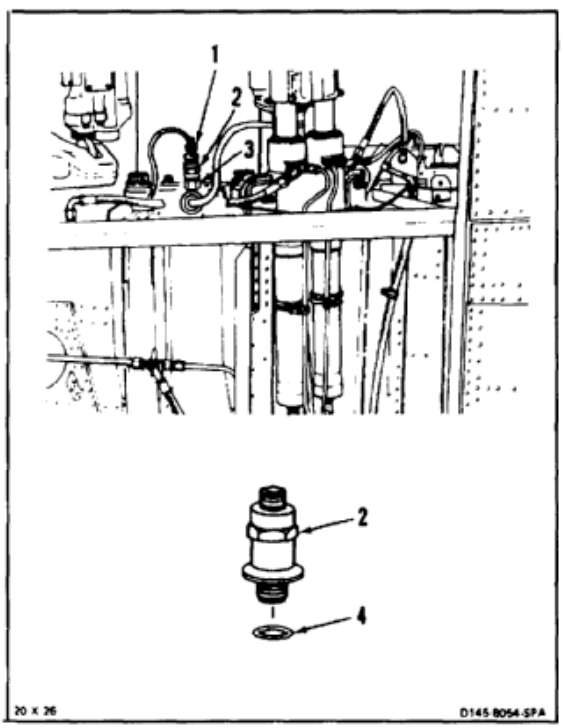
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Aft Left Work Platform Open (Task 2-2)




***REMOVE SWITCH***

1. Disconnect electrical connector (1) from switch (2).
2. Remove lockwire from switch (2).
3. Remove switch (2) from bushing (3). Wipe up spilled oil. Use cloth (E120).
4. Remove packing (4) from switch (2).

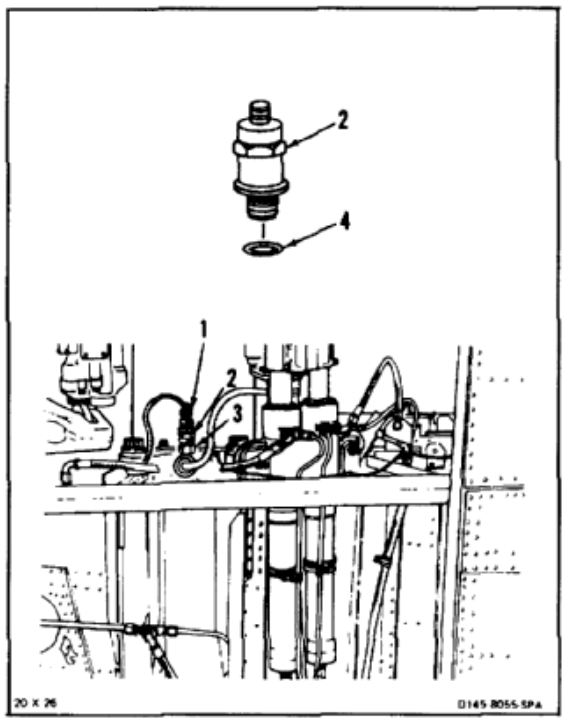


***INSTALL SWITCH***

**WARNING**

Oil (E254) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for least **15 minutes**. Get medical attention for eyes.

5. Coat packing (4) and thread of switch (2) with oil (E254).
6. Install packing (4) on switch (2).
7. Install switch (2) in bushing (3). Torque switch to **80 inch-pounds**.
8. Lockwire switch (2) to bushing (3). Use lockwire (E231).
9. Connect electrical connector (1) to switch (2).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Close aft left work platform (Task 2-2).
Perform operational check (TM 55-1520-240-T).

END OF TASK

## 8-73 TEST TRANSMISSION OIL TEMPERATURE SELECTOR SWITCH OR INDICATOR (AVIM) 8-73

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
AC Power Supply, 115 Volt 400 Hz
Transmission Oil Temperature Selector Switch 384332-015
Transmission Oil Temperature Indicator 321001-03019
Resistance Decade, 0 to 2500 Ohms ±1 Percent (5)
Multimeter
Stopwatch
Crimping Tool, NSN 5120-00-075-2544
Connector, MS3476W14-15SX
Connector, MS3476W14-18S
Wire, No. 20, Insulated
Wire, No. 20, Shielded
Switch, MS24523-21 (5)

***Materials:***

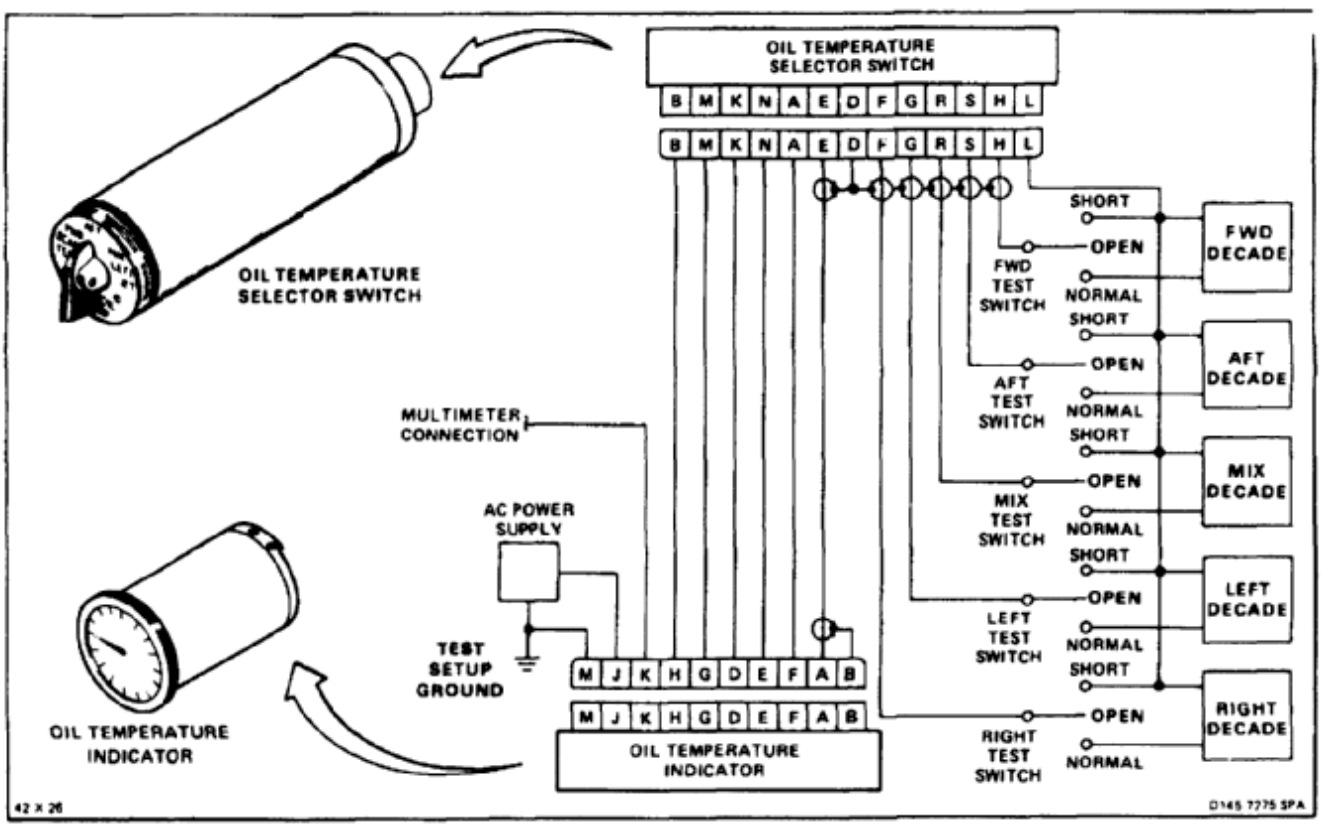
None

***Personnel Required:***

Aircraft Electrician
Inspector

***Equipment Condition:***

Off Helicopter Task
Electrical Test Setup



**NOTE**

For testing indicator, a known good selector switch is used.

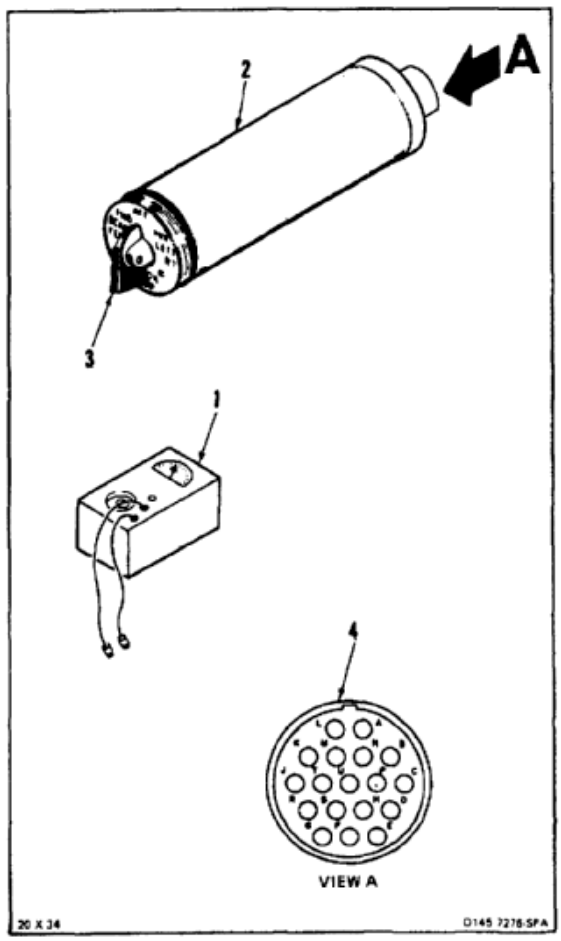
For testing selector switch a known good indicator is used.

Perform steps 1 thru 52 if testing selector switch.

Perform steps 8 thru 52 if testing indicator.

***SELECTOR SWITCH CONTINUITY AND RESISTANCE TEST***

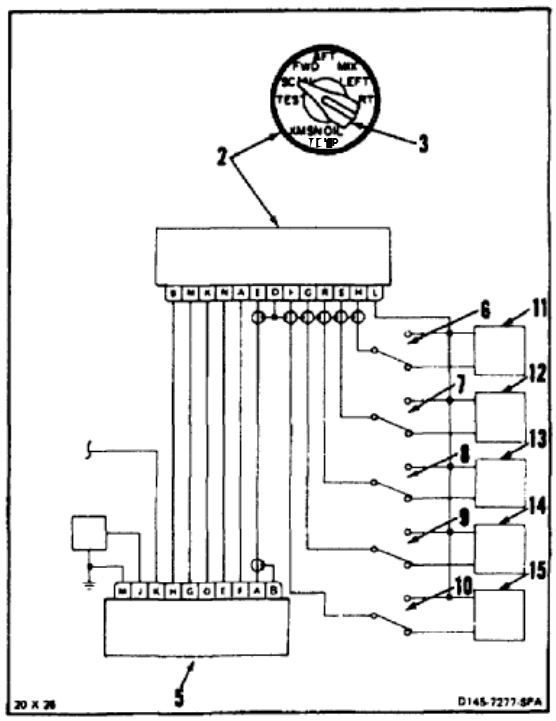
1. Connect multimeter (1), set to RX1, to pins A and L of selector switch (2).
2. Rotate selector switch knob (3) through all dial positions. Check multimeter (1). Multimeter shall indicate continuity at all switch positions. Disconnect multimeter.
3. Connect multimeter (1), set to RX1, to pins A and D of selector switch (2). Repeat step 2. Disconnect multimeter.
4. Connect multimeter (1) set to RX1 to pin A and case ground (4) (receptacle shell). Repeat step 2. Disconnect multimeter.
5. Set selector switch knob (3) to SCAN.
6. Connect multimeter (1), set to RX 10,000 to pins N to S of switch (2). Check multimeter (1). Multimeter shall indicate between **9.975 and 11.025 K ohm**.
7. Repeat step 6 between pins N to R, N to G, N to H, and N to F of switch (2). Then go to step 8.



## 8-73 TEST TRANSMISSION OIL TEMPERATURE SELECTOR SWITCH OR INDICATOR (AVIM) (Continued) 8-73

### *DIAL LAMP TEST*

8. Connect selector switch (2) to SCAN to test setup.
9. Connect indicator (5) to test setup.
10. Set test switches 6, 7, 8, 9, and 10 to NORMAL.
11. Set decades (11, 12, 13, 14, and 15) to **0 ohm**.
12. Apply power to test set up. Selector switch (2) SCAN position dial lamp shall come on.
13. Set and hold selector switch knob (3) to TEST. Check TEST dial lamp. Lamp shall come on. Release selector switch. Switch knob (3) shall return to SCAN.
14. Set selector switch knob (3) to each dial position, FWD, AFT, MIX, LEFT, AND RT. Check dial lamp for each position. Lamp shall come on at each position.



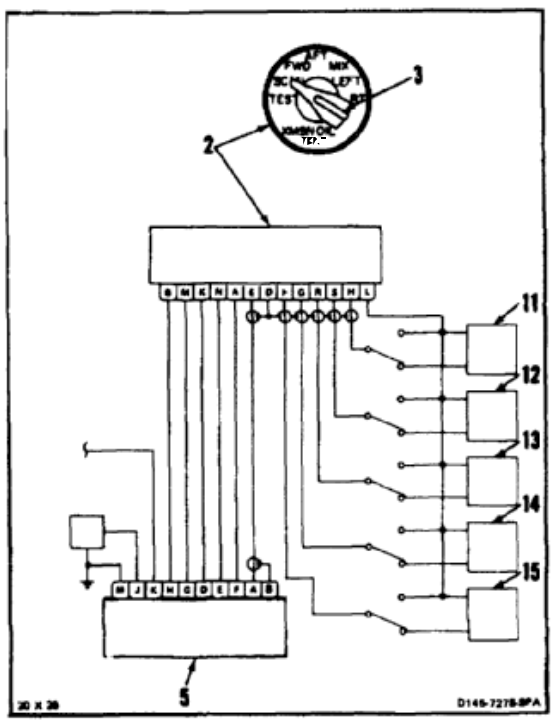

### *TRANSDUCER CIRCUIT TEST*

15. Set selector switch knob (3) to SCAN.

**NOTE**

SCAN dial lamp remains on when selector switch is at SCAN.

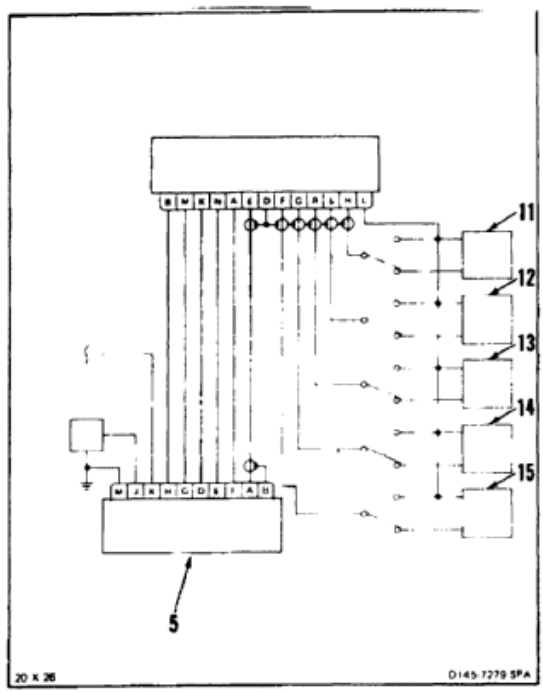
16. Adjust FWD decade (11), AFT decade (12), MIX decade (13), LEFT decade (14), and RIGHT decade (15) to **1500 ohms**.
17. Adjust FWD decade (11) to **500 ohms**.
18. Check selector switch (2). FWD dial lamp shall come on as decade (11) is adjusted.
19. Check indicator (5). Indicator shall read below –**60ºC**.
20. Adjust FWD decade (11) to **1500 ohms**.
21. Repeat steps 17 thru 20 at AFT decade (12), MIX decade (13), LEFT decade (14), and RIGHT decade (15). Then go to step 26.



## 8-73 TEST TRANSMISSION OIL TEMPERATURE SELECTOR SWITCH OR INDICATOR (AVIM) (Continued) 8-73

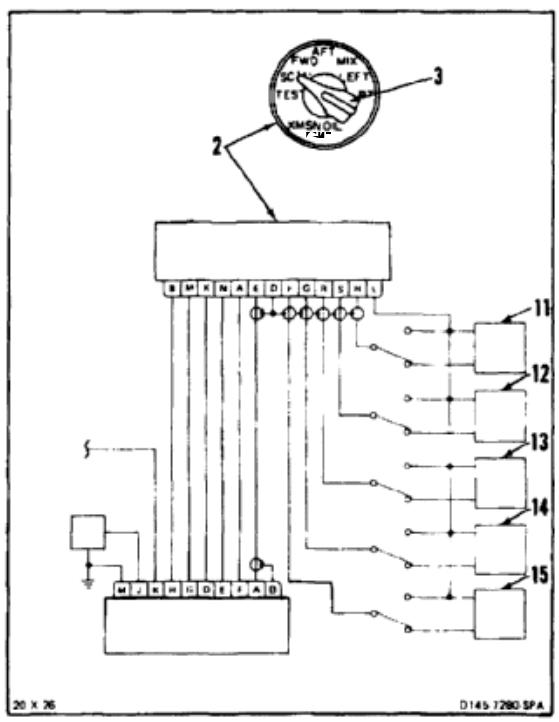
***SENSITIVITY TEST***

22. Adjust AFT decade (12), MIX decade (13), LEFT decade (14), and RIGHT decade (15) to **1000 ohms**.
23. Adjust FWD decade (11) until pointer of indicator (5) reads **10ºC**. Record decade setting.
24. Adjust FWD decade (11) down until pointer of indicator (5) just begins to move. Record decade setting.
25. Compare settings for FWD decade (11) in steps 23 and 24. Difference shall be no more than **9.0 ohms**.
26. Repeat steps 23 thru 25 four times. Use **40ºC, 60ºC, 100ºC, and 120ºC** as starting points. Then go to step 27.
27. Repeat steps 23 thru 25 five times. Use **120ºC, 100ºC, 60ºC, 40ºC, and 10ºC** as starting points and adjust FWD decade (11) up. Then go to step 28.




***RESPONSE TEST***

28. Set selector switch knob (3) to SCAN. Adjust FWD decade (11), AFT decade (12), MIX decade (13), LEFT decade (14), and RIGHT decade (15) to **1500 ohms**.
29. Adjust FWD decade (11) up until pointer of indicator (5) moves to follow adjustment. Pointer shall first decrease then increase to follow adjustment. Check down scale movement of pointer. Down scale movement of pointer shall be less than **2.5ºC**.
30. Adjust FWD decade to **1500 ohms**.
31. Repeat steps 29 and 30 at AFT decade (12), MIX decade (13), LEFT decade (14), and RIGHT decade. Then go to step 32.

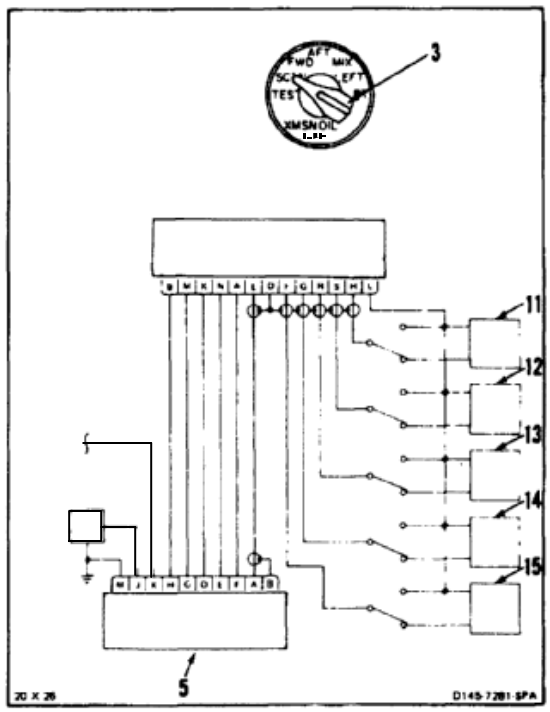


## 8-73 TEST TRANSMISSION OIL TEMPERATURE SELECTOR SWITCH OR INDICATOR (AVIM) (Continued) 8-73

### *SCALE ERROR TEST*

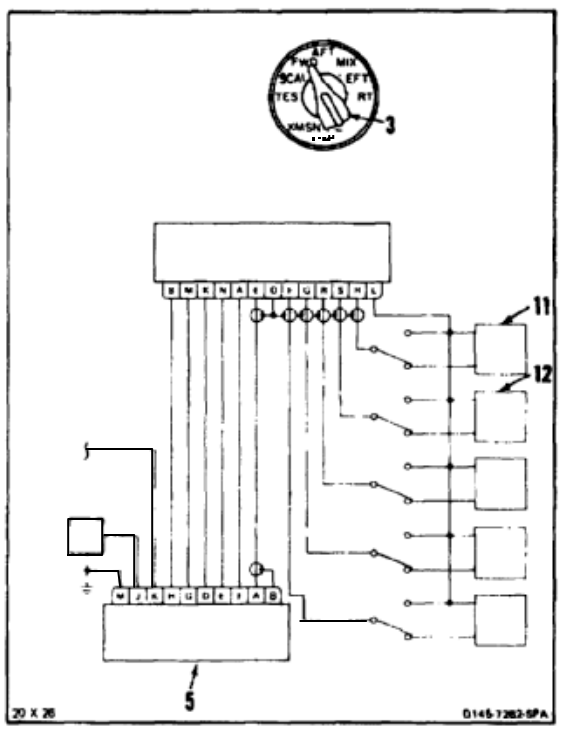
32. Set selector switch knob (3) to SCAN.
33. Adjust AFT decade (12), MIX decade (13), LEFT decade (14), and RIGHT decade (15) to **700 ohms**.
34. Adjust FWD decade (11) to cause indicator (5) readings listed. Decade settings shall be within tolerance as follows:

| SET INDICATOR READING TO | DECADE SETTING SHALL BE (OHMS) |
|---|---|
| –70ºC | 776.4 to 818.4 |
| –50ºC | 885.9 to 927.9 |
| 0ºC | 1,179.0 to 1,221.0 |
| +50ºC | 1,508.8 to 1,550.8 |
| +100ºC | 1,882.7 to 1,924.7 |
| +150ºC | 2,304.6 to 2,346.6 |




### *TRAVEL TIME TEST*

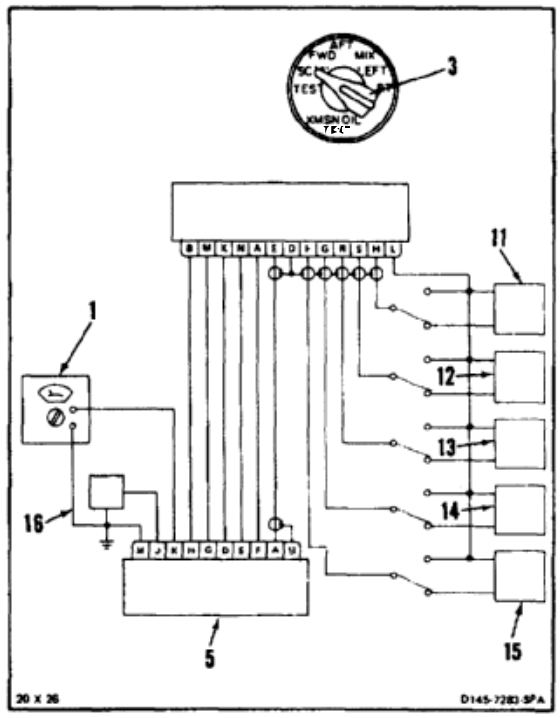
35. Set selector switch knob (3) to FWD.
36. Adjust FWD decade (11) until indicator (5) reads **+50ºC**.
37. Set selector switch knob (3) to AFT.
38. Adjust AFT decade (12) until indicator (5) reads **–30ºC**.
39. Set selector switch knob (3) to FWD. Check indicator (5). Pointer of indicator shall move to **+50ºC** in less than **5 seconds**.
40. Set selector switch knob (3) to AFT. Check indicator (5). Pointer of indicator shall move to **–30ºC** in less than **5 seconds**.



## 8-73 TEST TRANSMISSION OIL TEMPERATURE SELECTOR SWITCH OR INDICATOR (AVIM) (Continued) 8-73

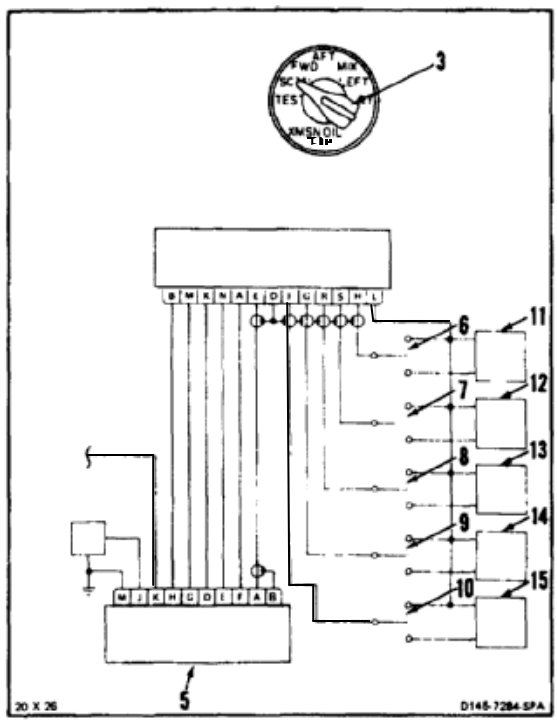
### *CAUTION LIGHT TEST*

41. Set selector switch knob (3) to SCAN.
42. Adjust AFT decade (12), MIX decade (13), LEFT decade (14), and RIGHT decade (15) to **700 ohms**.
43. Connect multimeter (1), set to RX1, between test setup ground (16) and pin K of indicator (5).
44. Adjust FWD decade (11) to **797.4 ohms**.
45. Continue to increase adjustment of FWD decade (11). Check multimeter (1). Multimeter shall indicate continuity when indicator (5) reads **127°C to 133°C**. FWD decade setting shall be greater than **2023.8 ohms**. Multimeter shall continue to indicate continuity to **150°C** on indicator.
46. Disconnect multimeter (1).




### *FAIL-SAFE CIRCUIT TEST (OPEN)*

47. Set selector switch knob (3) to SCAN.
48. Adjust FWD decade (11), AFT decade (12), MIX decade (13), LEFT decade (14), and RIGHT decade (15) to **1200 ohms**. Check indicator (5). Indicator shall read **0°C**.
49. Set FWD test switch (6) to OPEN. Check indicator (5). Pointer of indicator shall move to **150°C**. Set FWD test switch to NORMAL. Pointer of indicator shall return to **0°C**.
50. Repeat step 49 at AFT test switch (7), MIX test switch (8), LEFT test switch (9), and RIGHT test switch (10). Then go to step 51.



**8-73 TEST TRANSMISSION OIL TEMPERATURE SELECTOR SWITCH OR INDICATOR (AVIM) (Continued)** **8-73**

***FAIL-SAFE CIRCUIT TEST (SHORT)***

51. Set selector switch knob (3) to FWD. Set FWD test switch (6) to SHORT. Check indicator (5). Pointer of indicator shall move to **0ºC**. Set FWD test switch to NORMAL. Pointer of indicator shall return to **150ºC**.

52. Repeat step 50 with selector switch knob (2) at AFT, MIX, LEFT, and RIGHT dial positions, for test switch AFT (7), MIX (8), LEFT (9), and RIGHT (10) respectively. Then go to step 53.

***SHUTDOWN***

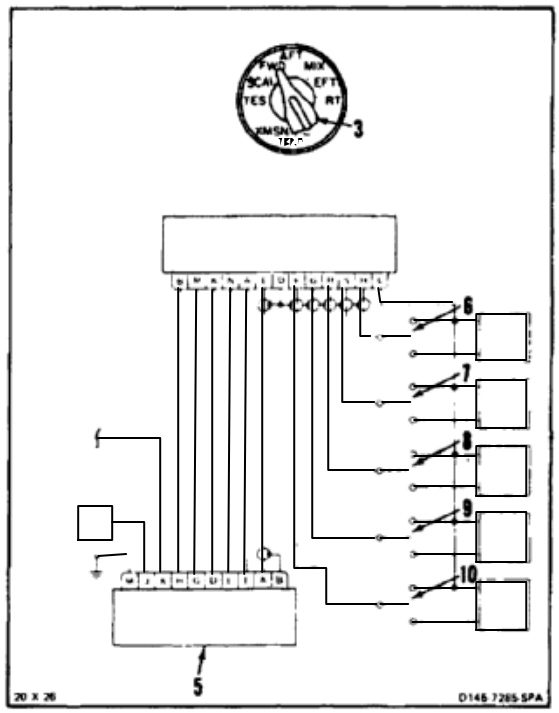
53. Shutdown ac power.

54. Remove indicator (5) and selector switch (2) from test setup.

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 8-74 REPLACE FORWARD TRANSMISSION OIL TEMPERATURE TRANSMITTER 8-74

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 30 to 150 Inch-Pounds

***Materials:***

Oil (E254)
Lockwire (E231)
Cloth (E120)

***Parts:***

Packing

***Personnel Required:***

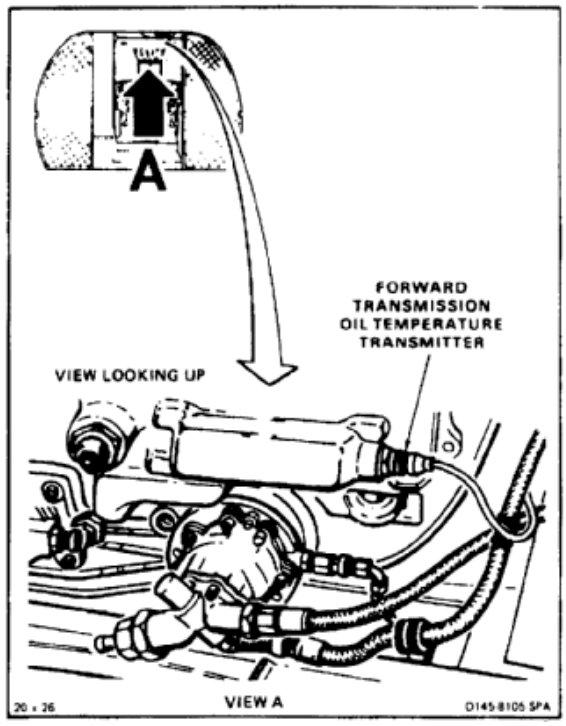
Medium Helicopter Repairer
Inspector

***References:***

TM 55-1520-240-23P

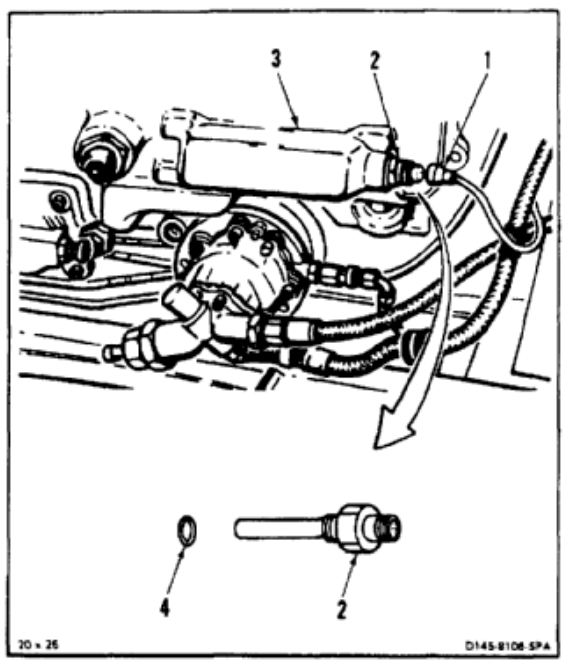
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Passageway Acoustic Blanket Removed (Task 2-107)
Forward Transmission Drip Pan Removed (Task 2-3)
Forward Transmission Oil Drained (Task 6-110)




***REMOVE TRANSMITTER***

1. Disconnect electrical connector (1) from transmitter (2).
2. Remove lockwire from transmitter (2).
3. Remove transmitter (2) from transmission sump (3).
4. Wipe up spilled oil. Use cloth (E120).
5. Remove packing (4) from transmitter (2).

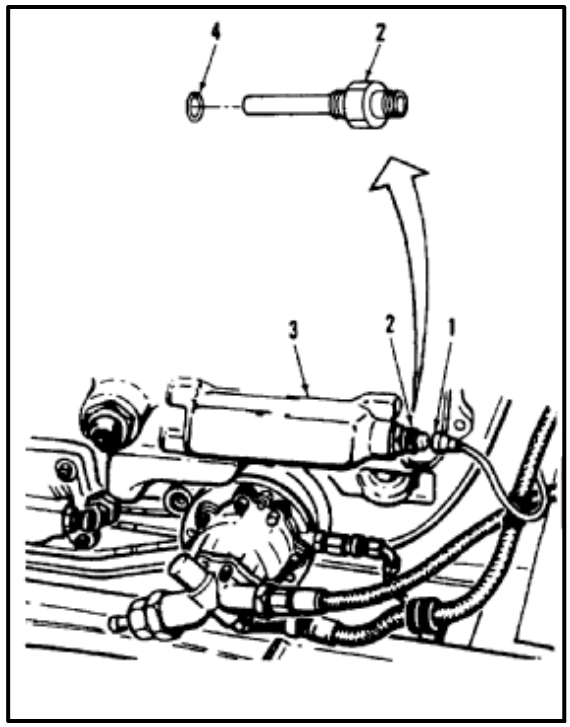


***INSTALL TRANSMITTER***

**WARNING**

Oil (E254) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for least **15 minutes**. Get medical attention for eyes.

6. Coat packing (4) and threads of transmitter (2) with oil (E254).
7. Install packing (4) on transmitter (2).
8. Install transmitter (2) in transmission sump (3). Torque transmitter to **80 inch-pounds**.
9. Lockwire transmitter to transmission sump (3). Use lockwire (E231).
10. Connect electrical connector (1) to transmitter (2).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Service forward transmission (Task 1-54).
Perform operational check (TM 55-1520-240-T).
Install forward transmission drip pan (Task 2-3).
Install passageway acoustic blankets (Task 2-108).

END OF TASK

## 8-75 REPLACE COMBINING TRANSMISSION OIL TEMPERATURE TRANSMITTER 8-75

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 30 to 150 Inch-Pounds

***Materials:***

Oil (E254)
Lockwire (E231)
Cloth (E120)

***Parts:***

Packing

***Personnel Required:***

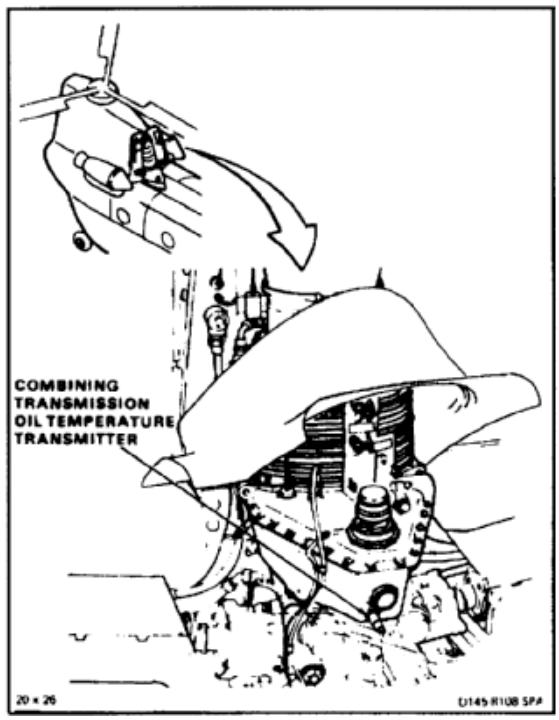
Medium Helicopter Repairer
Inspector

***References:***

TM 55-1520-240-23P

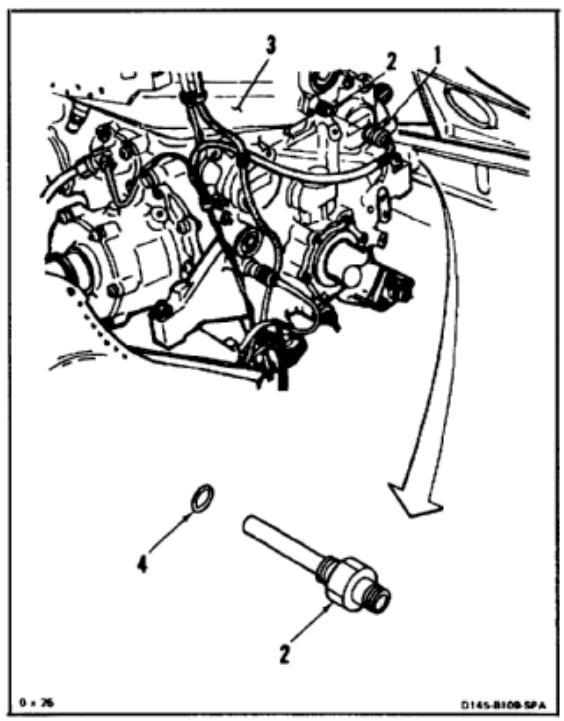
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Pylon Doors Open (Task 2-2)
Pylon Lower Fairing Open (Task 2-2)
Combining Transmission Oil Drained (Task 6-168)




***REMOVE TRANSMITTER***

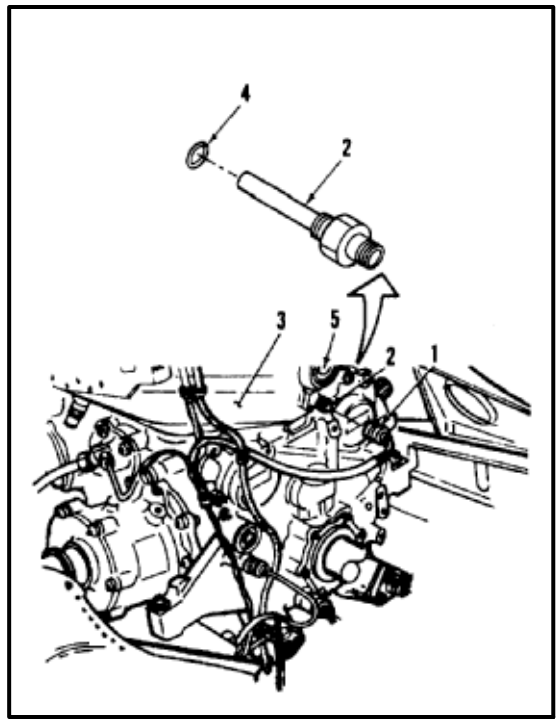
1. Disconnect electrical connector (1) from transmitter (2).
2. Remove lockwire from transmitter (2).
3. Remove transmitter (2) from transmission sump (3).
4. Wipe up spilled oil. Use cloth (E120).
5. Remove packing (4) from transmitter (2).



***INSTALL TRANSMITTER***

**WARNING**

Oil (E254) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for least **15 minutes**. Get medical attention for eyes.




6. Coat packing (4) and threads of transmitter (2) with oil (E254).
7. Install packing (4) on transmitter (2).
8. Install transmitter (2) in transmission sump (3). Torque transmitter to **80 inch-pounds**.
9. Lockwire transmitter (2) to sight gage (5).
10. Connect electrical connector (1) to transmitter (2).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Service combining transmission (Task 1-54).
Close pylon lower fairing (Task 2-2).
Close pylon doors (Task 2-2).
Perform operational check (TM 55-1520-240-T).

END OF TASK

## 8-76 REPLACE NO. 1 ENGINE TRANSMISSION OIL TEMPERATURE TRANSMITTER 8-76

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 30 to 150 Inch-Pounds

***Materials:***

Oil (E254)
Lockwire (E231)
Cloth (E120)

***Parts:***

Packing

***Personnel Required:***

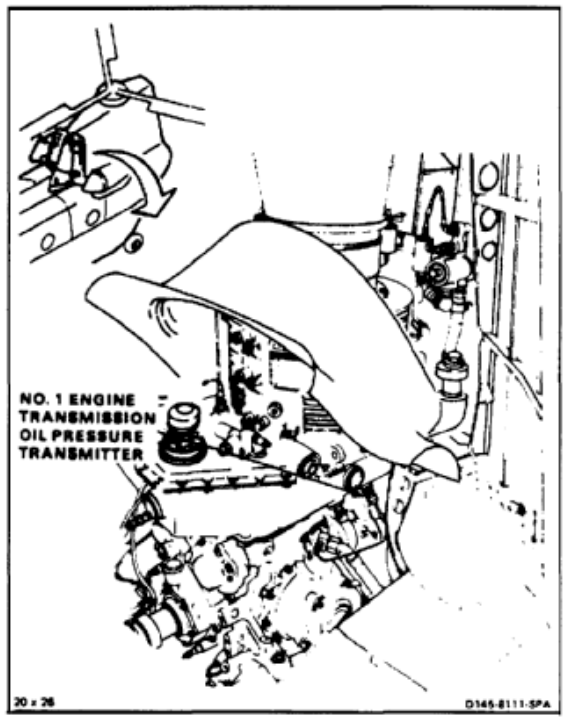
Medium Helicopter Repairer
Inspector

***References:***

TM 55-1520-240-23P

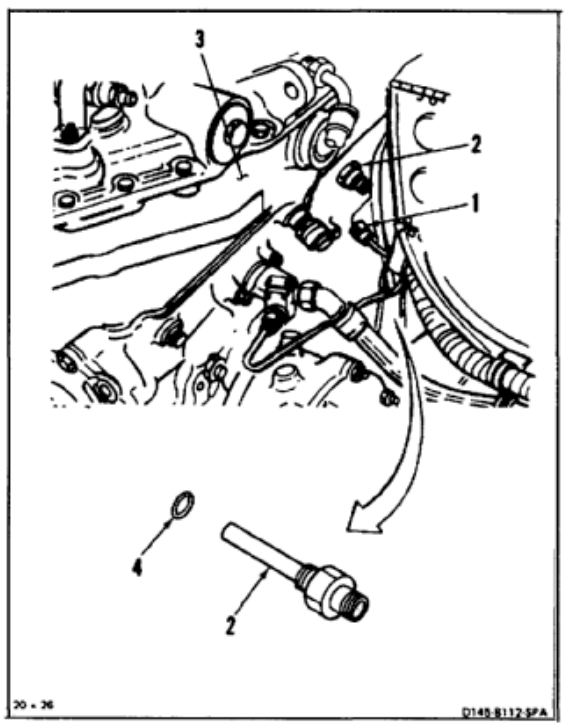
***Equipment Condition:***

Battery Disconnected
Electrical Power Off
Hydraulic Power Off
Pylon Doors Open (Task 2-2)
Aft Pylon Lower Fairing Open (Task 2-2)
No. 1 Engine Transmission Drained (Task 6-196)




***REMOVE TRANSMITTER***

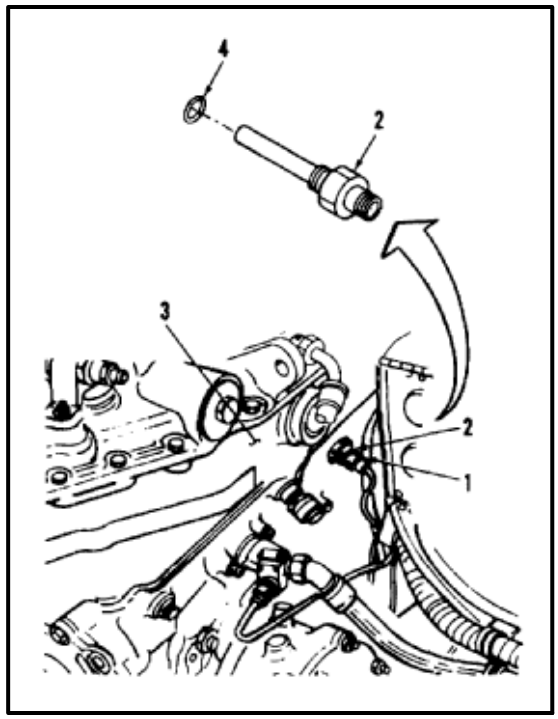
1. Disconnect electrical connector (1) from transmitter (2).
2. Remove lockwire from transmitter (2).
3. Remove transmitter (2) from transmission sump (3).
4. Wipe up spilled oil. Use cloth (E120).
5. Remove packing (4) from transmitter (2).



***INSTALL TRANSMITTER***

**WARNING**

Oil (E254) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for least **15 minutes**. Get medical attention for eyes.




6. Coat packing (4) and threads of transmitter (2) with oil (E254).
7. Install packing (4) on transmitter (2).
8. Install transmitter (2) in transmission sump (3). Torque transmitter to **80 inch-pounds**.
9. Lockwire transmitter (2) to transmission sump (3).
10. Connect electrical connector (1) to transmitter (2).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Service No. 1 engine transmission (Task 1-54).
Close pylon lower fairing (Task 2-2).
Close pylon doors (Task 2-2).
Perform operational check (TM 55-1520-240-T).

END OF TASK

## 8-77 REPLACE NO. 2 ENGINE TRANSMISSION OIL TEMPERATURE TRANSMITTER 8-77

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 30 to 150 Inch-Pounds

***Materials:***

Oil (E254)
Lockwire (E231)
Cloth (E120)

***Parts:***

Packing

***Personnel Required:***

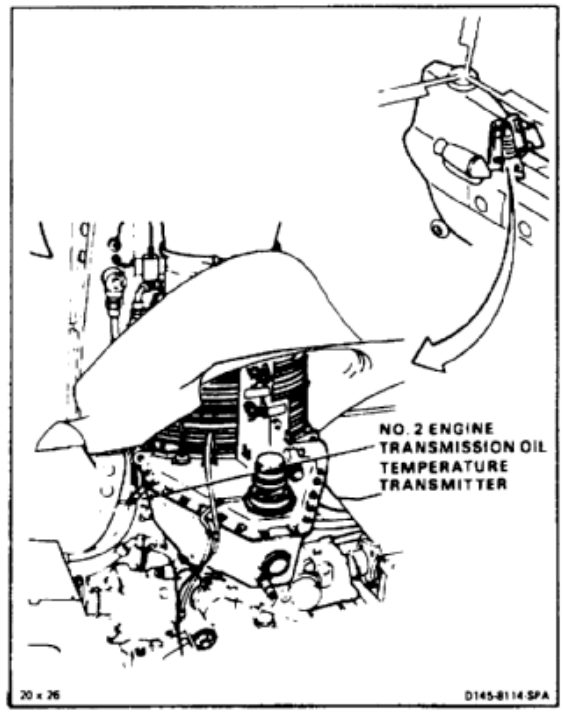
Medium Helicopter Repairer
Inspector

***References:***

TM 55-1520-240-23P

***Equipment Condition:***

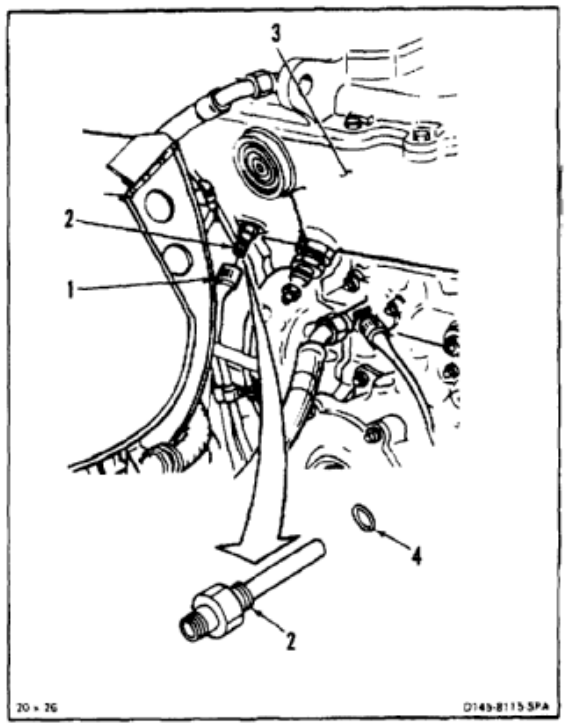
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Pylon Doors Open (Task 2-2)
Pylon Lower Fairing Open (Task 2-2)
No. 2 Engine Transmission Drained (Task 6-196)



## 8-77 REPLACE NO. 2 ENGINE TRANSMISSION OIL TEMPERATURE TRANSMITTER (Continued) 8-77

***REMOVE TRANSMITTER***

1. Disconnect electrical connector (1) from transmitter (2).
2. Remove lockwire from transmitter (2).
3. Remove transmitter (2) from transmission sump (3).
4. Wipe up spilled oil. Use cloth (E120).
5. Remove packing (4) from transmitter (2).

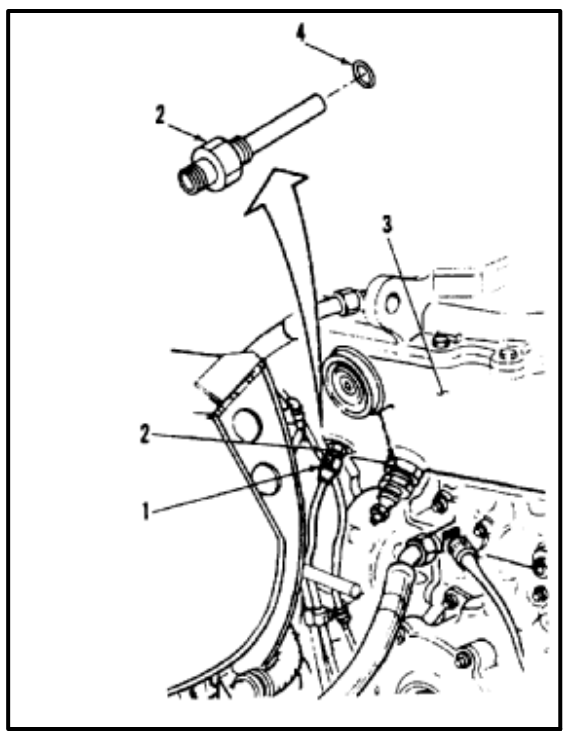



***INSTALL TRANSMITTER***

**WARNING**

Oil (E254) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for least **15 minutes**. Get medical attention for eyes.

6. Coat packing (4) and threads of transmitter (2) with oil (E254).
7. Install packing (4) on transmitter (2).
8. Install transmitter (2) in transmission sump (3). Torque transmitter to **80 inch-pounds**.
9. Lockwire transmitter (2) to transmission sump (3).
10. Connect electrical connector (1) to transmitter (2).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Service No. 2 engine transmission (Task 1-54).
Close aft pylon lower fairing (Task 2-2).
Close aft pylon door (Task 2-2).
Perform operational check (TM 55-1520-240-T).

END OF TASK

## 8-78 REPLACE AFT TRANSMISSION OIL TEMPERATURE TRANSMITTER 8-78

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 30 to 150 Inch-Pounds
Workstand

***Materials:***

Oil (E254)
Lockwire (E231)
Cloth (E120)

***Parts:***

Packing

***Personnel Required:***

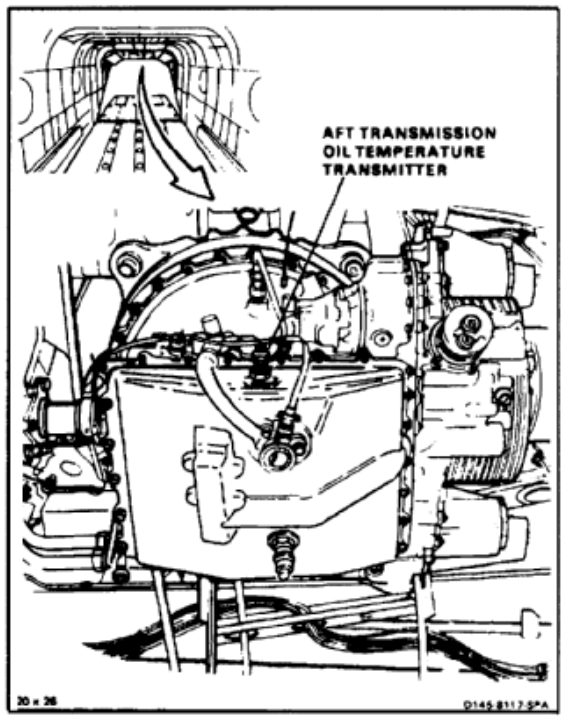
Medium Helicopter Repairer
Inspector

***References:***

TM 55-1520-240-23P

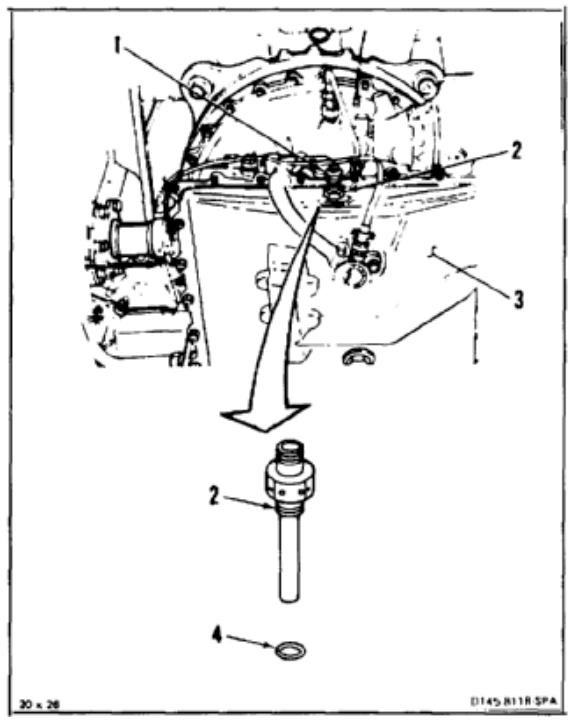
***Equipment Condition:***

Battery Disconnected
Electrical Power Off
Hydraulic Power Off
Cargo Ramp Open and Level (Task 2-2)
Baffles Under Aft Transmission Open (Task 2-2)
Aft Transmission Drip Tray Removed (Task 2-3)
Aft Transmission Oil Drained (Task 6-138)



***REMOVE TRANSMITTER***

1. Disconnect electrical connector (1) from transmitter (2).
2. Remove lockwire from transmitter (2).
3. Remove transmitter (2) from transmission sump (3).
4. Wipe up spilled oil. Use cloth (E120).
5. Remove packing (4) from transmitter (2).

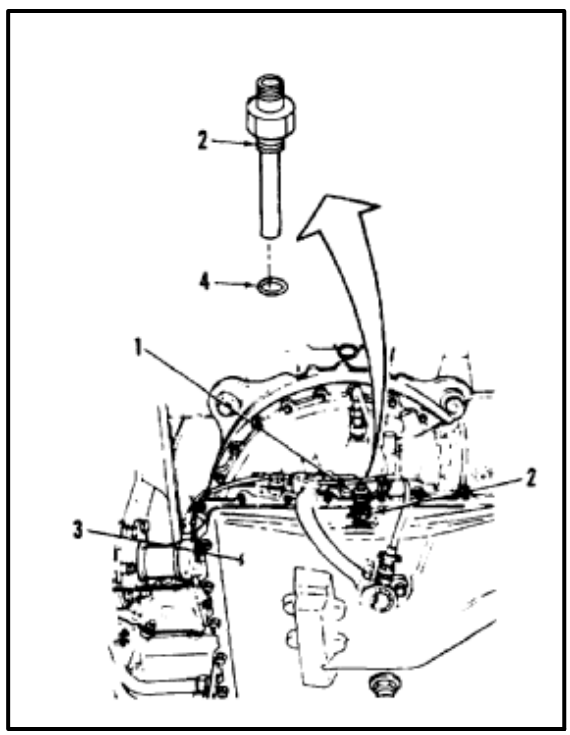



***INSTALL TRANSMITTER***

**WARNING**

Oil (E254) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for least **15 minutes**. Get medical attention for eyes.

6. Coat packing (4) and threads of transmitter (2) with oil (E254).
7. Install packing (4) on transmitter (2).
8. Install transmitter (2) in transmission sump (3). Torque transmitter to **80 inch-pounds**.
9. Lockwire transmitter (2) to transmitter sump (3).
10. Connect electrical connector (1) to transmitter (2).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Service aft transmission (Task 1-54).
Install aft transmission drip tray (Task 2-3).
Close baffles under aft transmission (Task 2-2).
Close cargo ramp (Task 2-2).
Perform operational check (TM 55-1520-240-T).

END OF TASK

## 8-79 REMOVE FUEL QUANTITY INDICATING SYSTEM THERMISTOR CONTROL UNIT 8-79

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

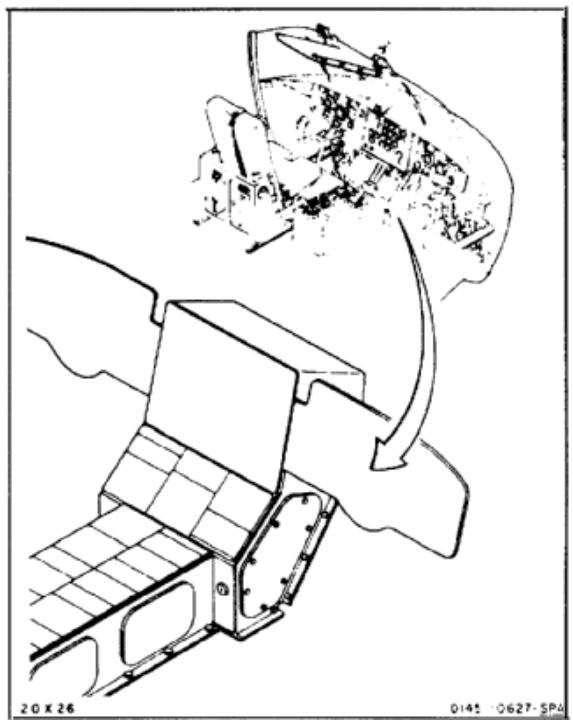
None

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

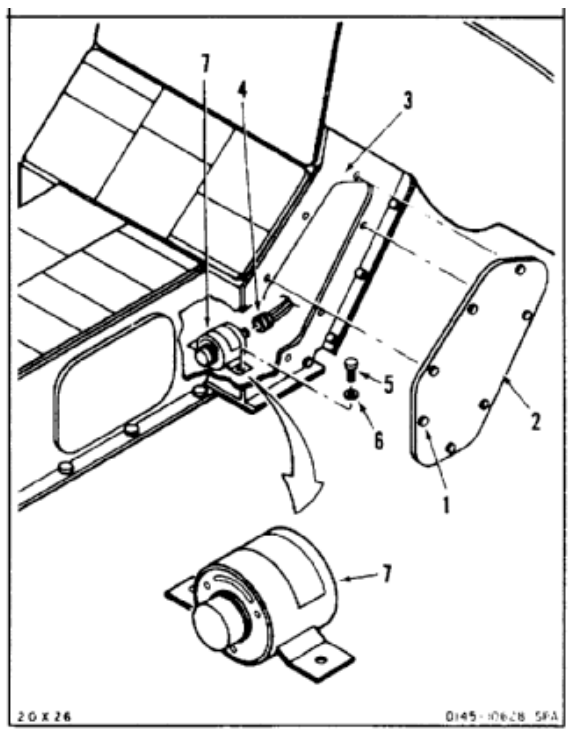
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




1. Loosen seven fasteners (1). Remove panel (2) from side of console (3).
2. Disconnect electrical connector (4).
3. Remove two screws (5) and washers (6). Remove control unit (7).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 8-80 INSTALL FUEL QUANTITY INDICATING SYSTEM THERMISTOR CONTROL UNIT 8-80

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

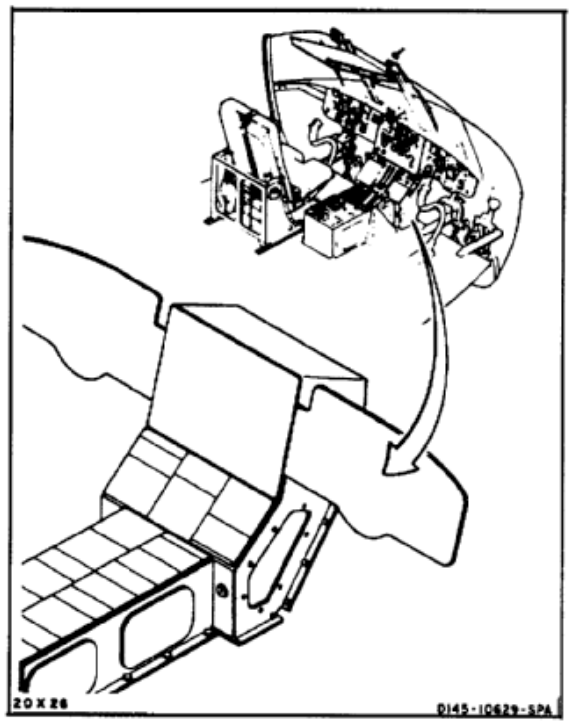
None

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P



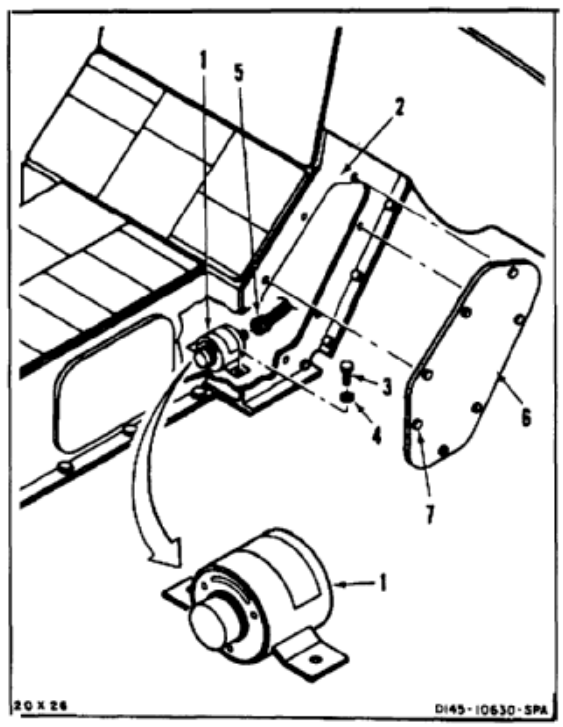

1. Position thermistor control unit (1) in console (2), receptacle facing forward.
2. Install two screws (3) and washers (4).
3. Connect electrical connector (5).

***INSPECT***

4. Position panel (6) on console (2). Tighten seven fasteners (7).

***FOLLOW-ON MAINTENANCE:***

Test and adjust fuel quantity indicator (Task 8-80.5).
Perform operational check of fuel quantity indicating system (TM 55-1520-240-T).




END OF TASK

## 8-80.1 REMOVE FUEL FLOW TRANSMITTER 8-80.1

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

***Materials:***

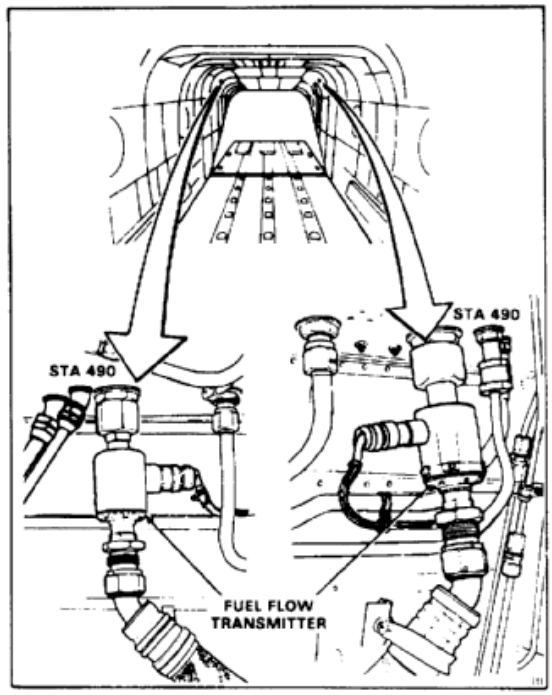
None

***Personnel Required:***

Medium Helicopter Repairer

***Equipment Condition:***

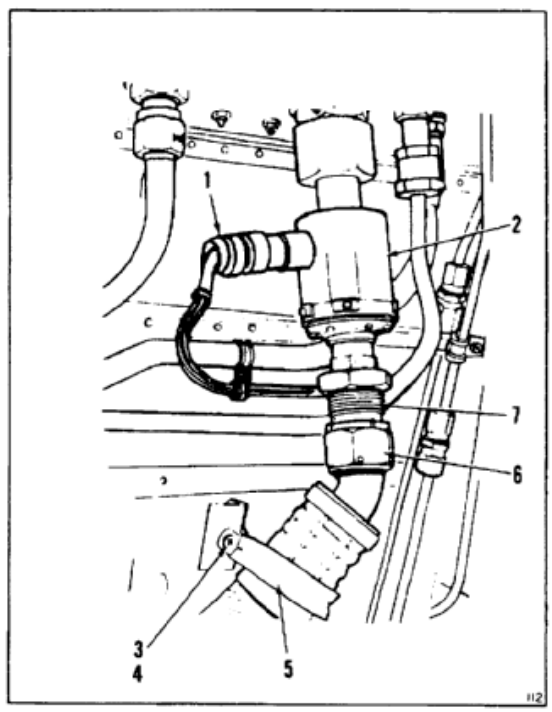
Battery Disconnected
Electrical Power Off
Hydraulic Power Off



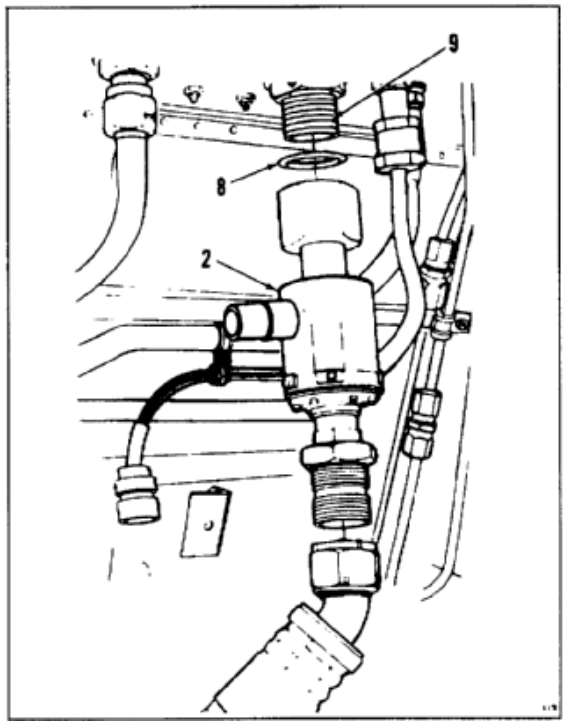

**NOTE**

Procedure is same to remove No. 1 or No. 2 transmitter. Removal of No. 1 transmitter is shown here.

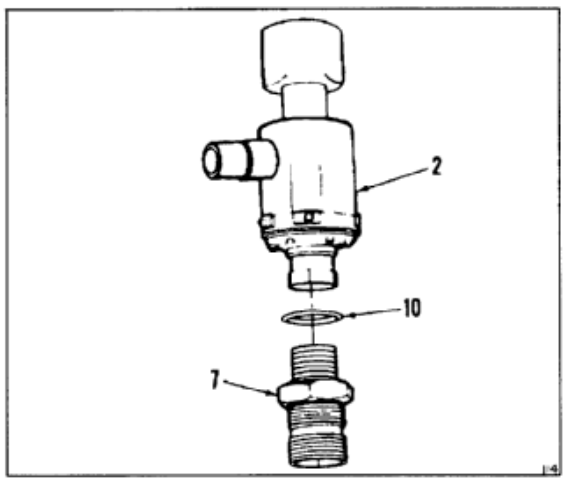
1. Disconnect electrical connector (1) from transmitter (2).
2. Remove screw (3), nut (4), and clamp (5).
3. Disconnect hose (6) from union (7).



4. Remove transmitter (2) and packing (8) from bushing (9).




5. If transmitter (2) will be replaced, remove union (7) and packing (10).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-80.2 INSTALL FUEL FLOW TRANSMITTER 8-80.2

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

***Materials:***

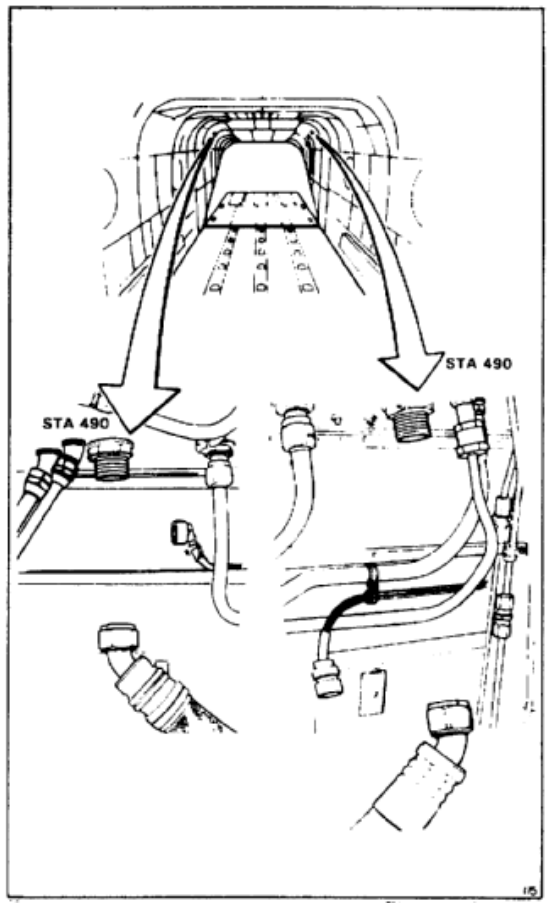
Packings

***Personnel Required:***

Medium Helicopter Repairer
Inspector

***Equipment Condition:***

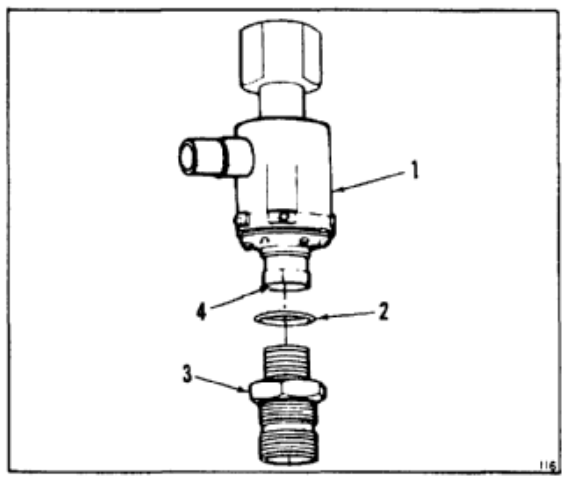
Battery Disconnected
Electrical Power Off
Hydraulic Power Off



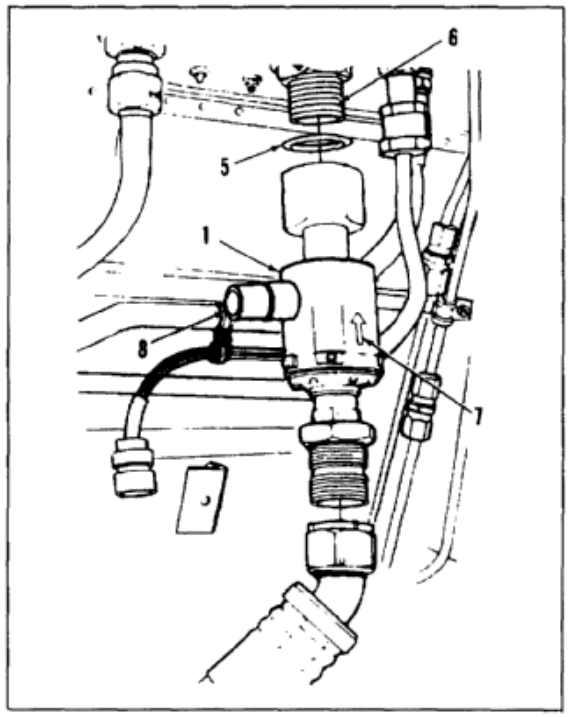

**NOTE**

Installation is the same for No. 1 and No. 2 transmitters. Installation of No. 1 transmitter is shown.

1. If transmitter (1) was replaced, install packing (2) and union (3) in inlet port (4).



2. Install packing (5) and transmitter (1) on bushing (6). Make sure flow arrow (7) points up and receptacle (8) is aft.

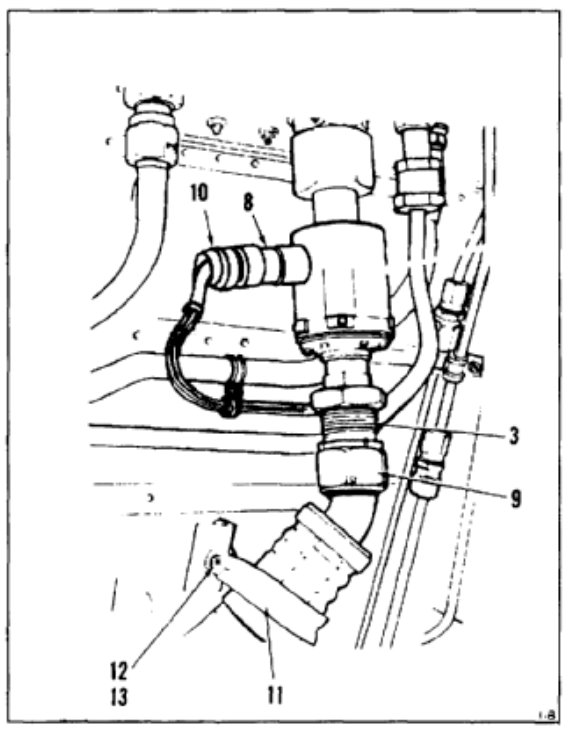



3. Connect hose (9) to union (3).
4. Connect electrical connector (10) to receptacle (8).
5. Install clamp (11), using screw (12) and nut (13).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check of fuel flow system (TM 55-1520-240-T).




END OF TASK

## 8-80.3 REMOVE FUEL FLOW SYSTEM POWER SUPPLY 8-80.3

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

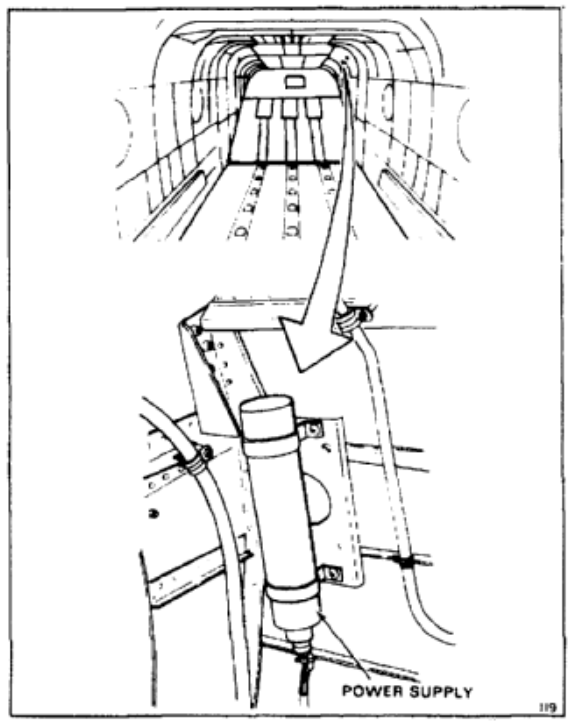
None

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

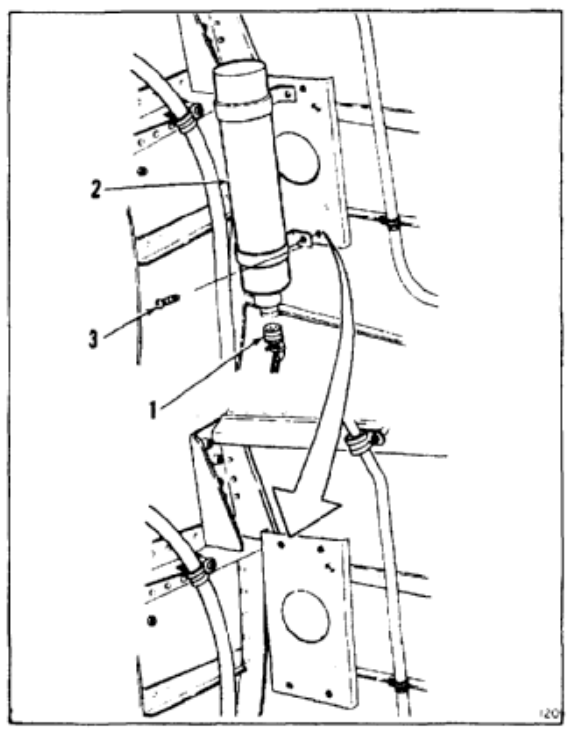
Battery Disconnected
Electrical Power Off
Hydraulic Power Off




1. Disconnect electrical connector (1) from power supply (2).
2. Remove four screws (3) and power supply (2).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 8-80.4 INSTALL FUEL FLOW SYSTEM POWER SUPPLY 8-80.4

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

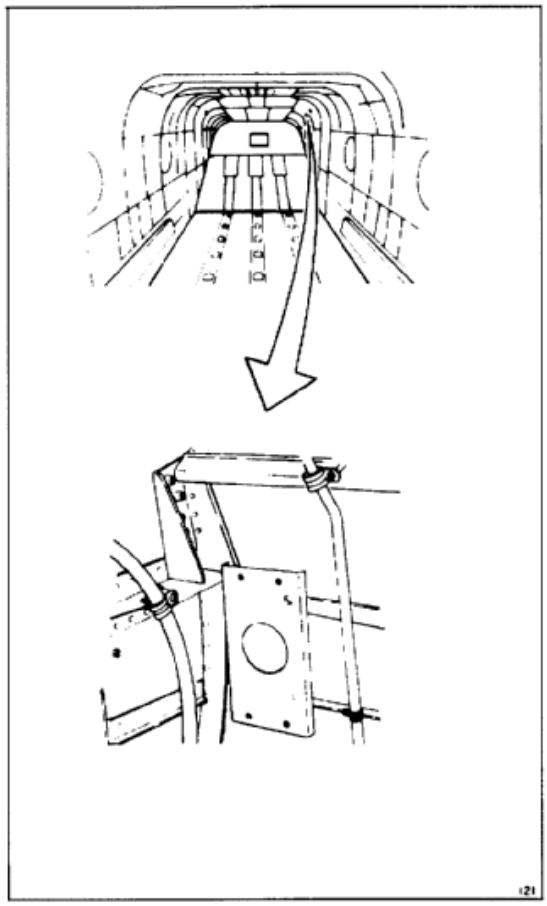
None

***Personnel Required:***

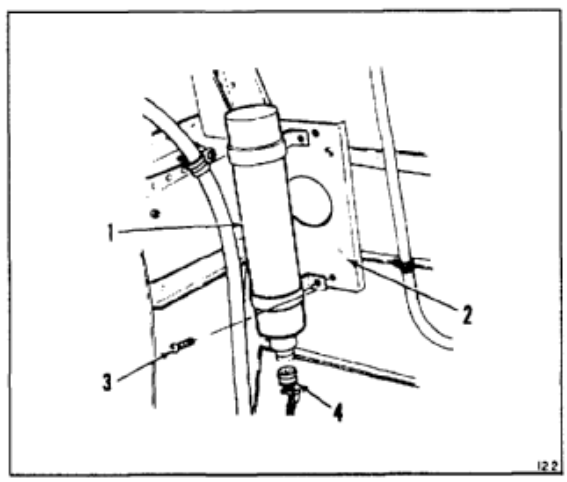
Aircraft Electrician

***Equipment Condition:***

Battery Disconnected
Electrical Power Off
Hydraulic Power Off



1. Position power supply (1) on panel (2). Install four screws (3).
2. Connect electrical connector (4).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check of fuel flow system (TM 55-1520-240-T).

END OF TASK

## 8-80.5 TEST AND ADJUST FUEL QUANTITY INDICATOR 8-80.5

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
AC Power Supply, 115 Volt 400 Hz
Test Set TF-20-1 (2 ea)
Test Cable (E43, APP E)
Extension Cord, 50 Foot, (2 ea)

***Materials:***

None

***Personnel Required:***

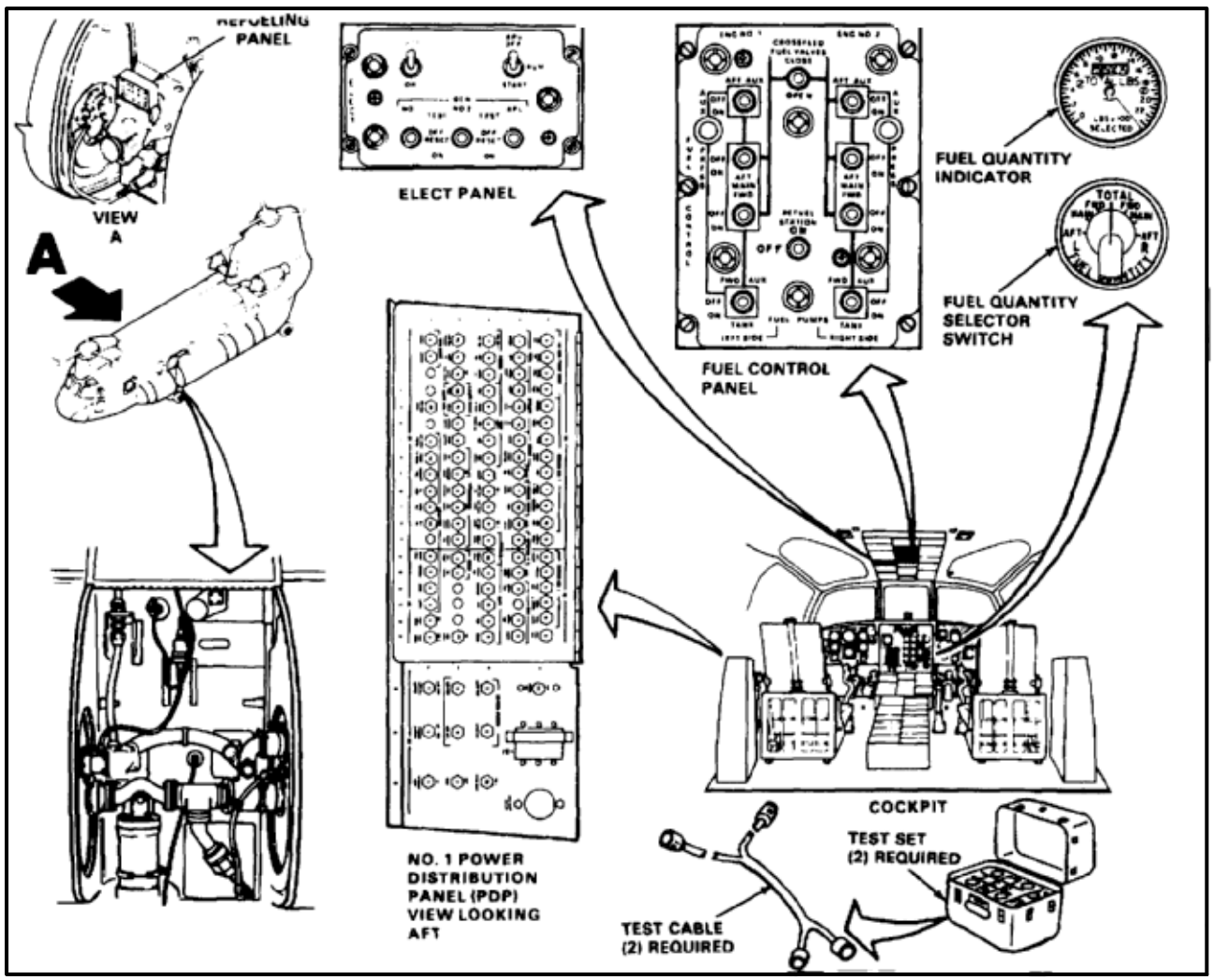
Aircraft Electrician (2)
Inspector

***References:***

Task 1-67
Appendix E

***Equipment Condition:***

Battery Connected (Task 1-100)
AC Electrical Power On (Task 1-67)
Fuel Tank Left and Right Forward Access Panel Open (Task 2-3.1)
Helicopter Defueled (Task 10-34 or 10-35)

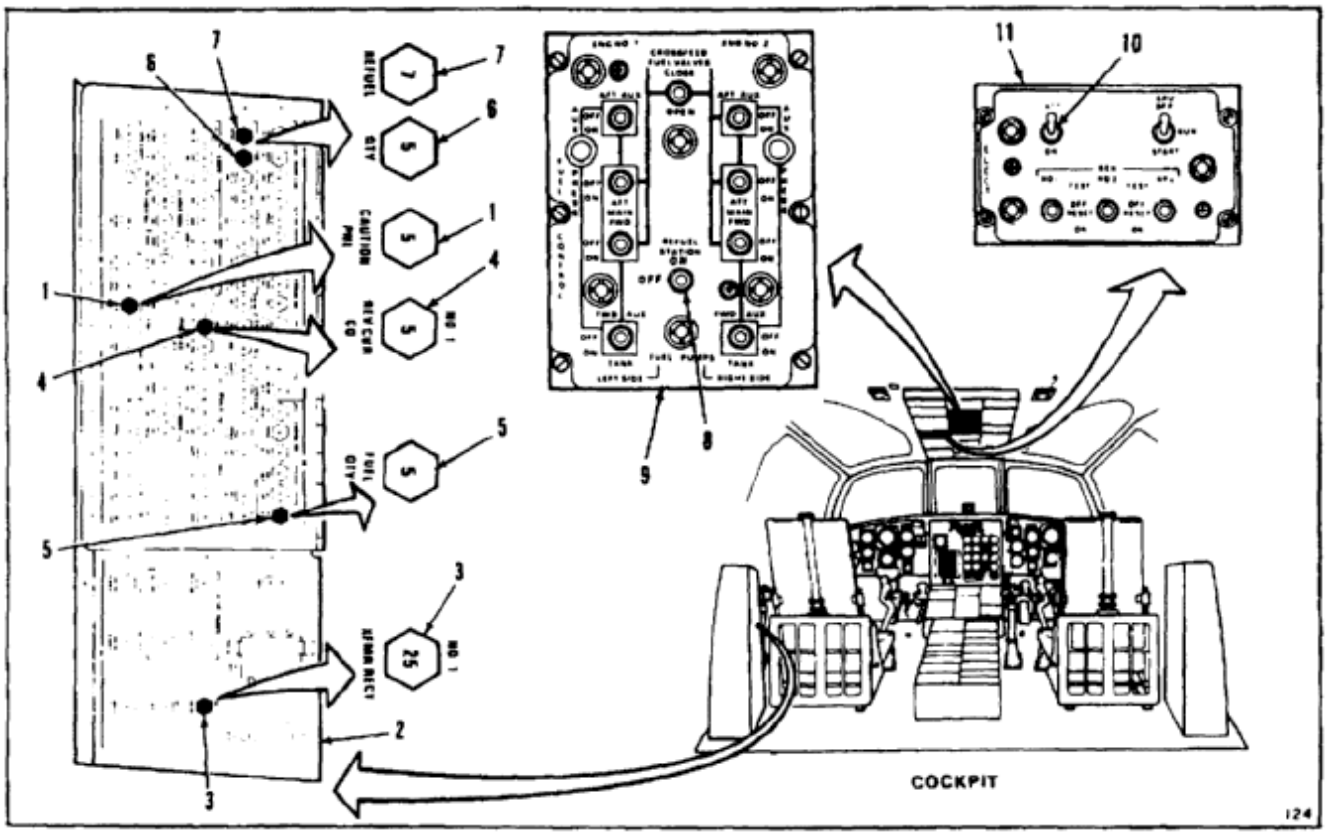


## 8-80.5 TEST AND ADJUST FUEL QUANTITY INDICATOR (Continued) 8-80.5

1. Check CAUTION PNL circuit breaker (1) on left power distribution panel (PDP) (2) is closed.
2. Check NO. 1 XFMR RECT circuit breaker (3) on left PDP (2) is closed.
3. Check NO. 1 REV CUR CO circuit breaker (4) on left PDP (2) is closed.
4. Check FUEL QTY circuit breaker (5) on left PDP (2) is closed.
5. Check FUEL QTY CONTROL circuit breaker (6) on left PDP (2) is closed.
6. Check REFUEL circuit breaker (7) on left PDP (2) is closed.

***TEST TOTAL SYSTEM FUEL INDICATOR***

7. Set REFUEL STATION switch (8) on FUEL CONTROL panel (9) to OFF.
8. Set BATT switch (10) on ELECT panel (n) to ON.



9. Loosen screw (12).

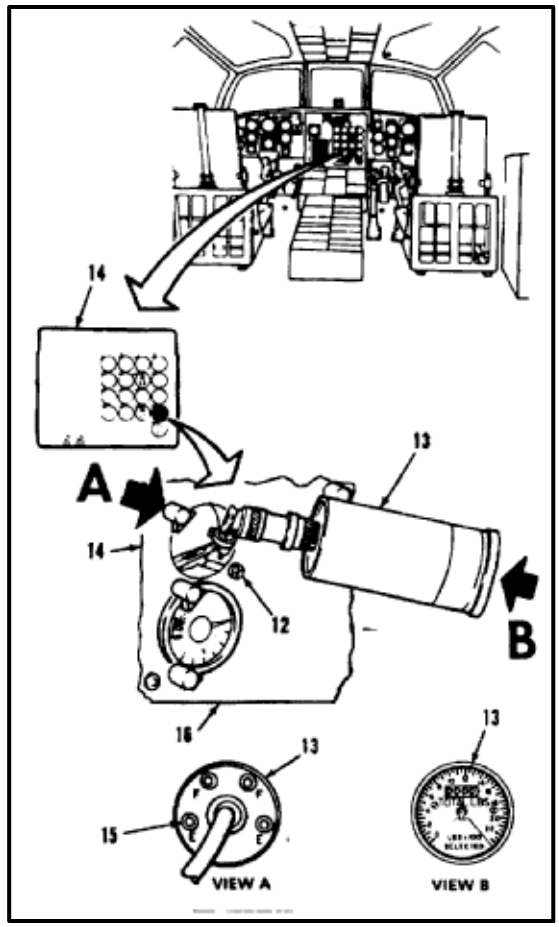
CAUTION

Do not disconnect connector from indicator. Indicator can be damaged.

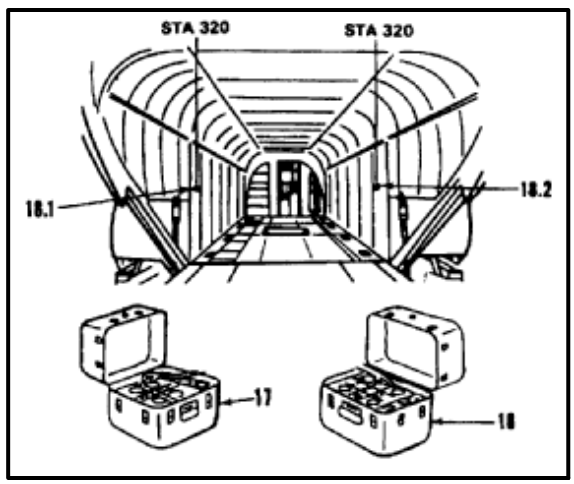
10. Grasp fuel quantity indicator (13) at case rim and slide from panel (14).

11. Turn E adjustment screw (15) at back of indicator (13) until digital display indicates **0000 TOTAL LBS**.

12. Install indicator (13) in panel (14) with display up and parallel to lower edge (16) of panel. Tighten screw (12).




13. Connect power cords from test sets (17 and 18) to receptacles (18.1 and 18.2) on each side of cabin interior at sta. 320. Use extension cords.



14. Calibrate test sets (17 and 18). (Refer to instructions in test sets.) Restrict calibration to zero and high.

14.1. Remove electrical power. Set BATTERY switch (10) on panel (11) to OFF.

CAUTION

Do not ground units or harness to aircraft. Instruments can be damaged.

15. Tag and disconnect connector (19) from receptacle (20) at forward end of access (21) to forward left tank (22).

16. Connect connector (23) of cable (E43) (24) from test set (17) to receptacle (20).

17. Connect connector (25) of cable (E43) (24) to connector (19).

17.1. Connect connector A (25.1) to COAX receptacle of test set (17).

17.2. Connect connector B (25.2) to UNSH receptacle of test set (17).

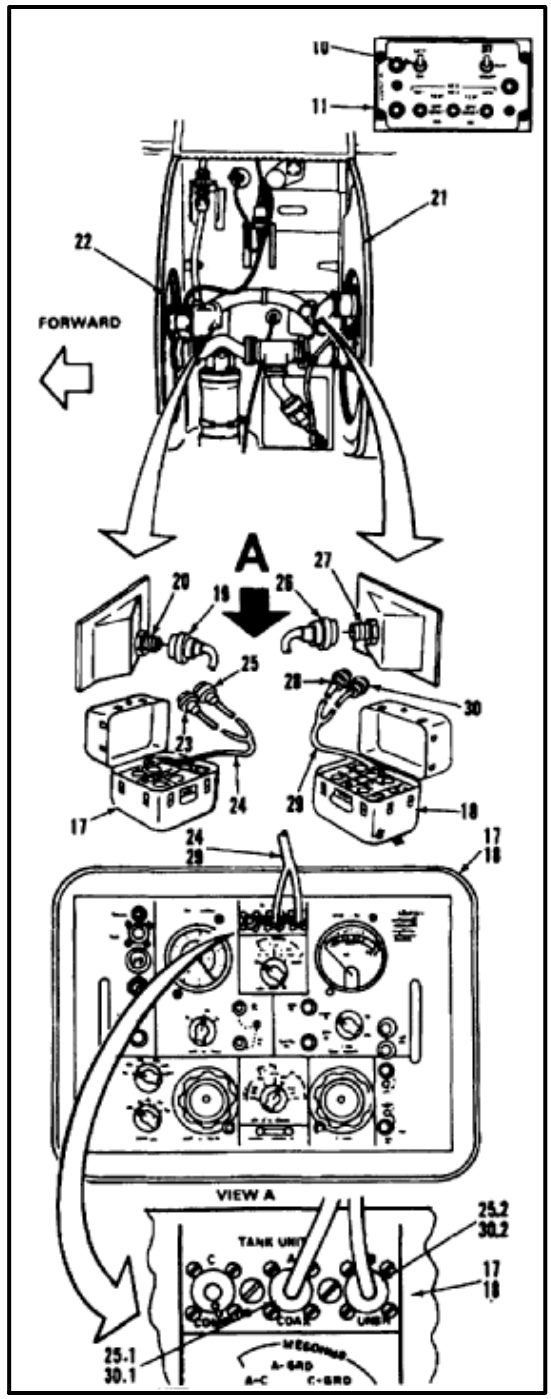
18. Tag and disconnect connector (26) from receptacle (27) at aft end of access (21).

19. Connect connector (28) of cable (E43) (29) from test set (18) to receptacle (27).

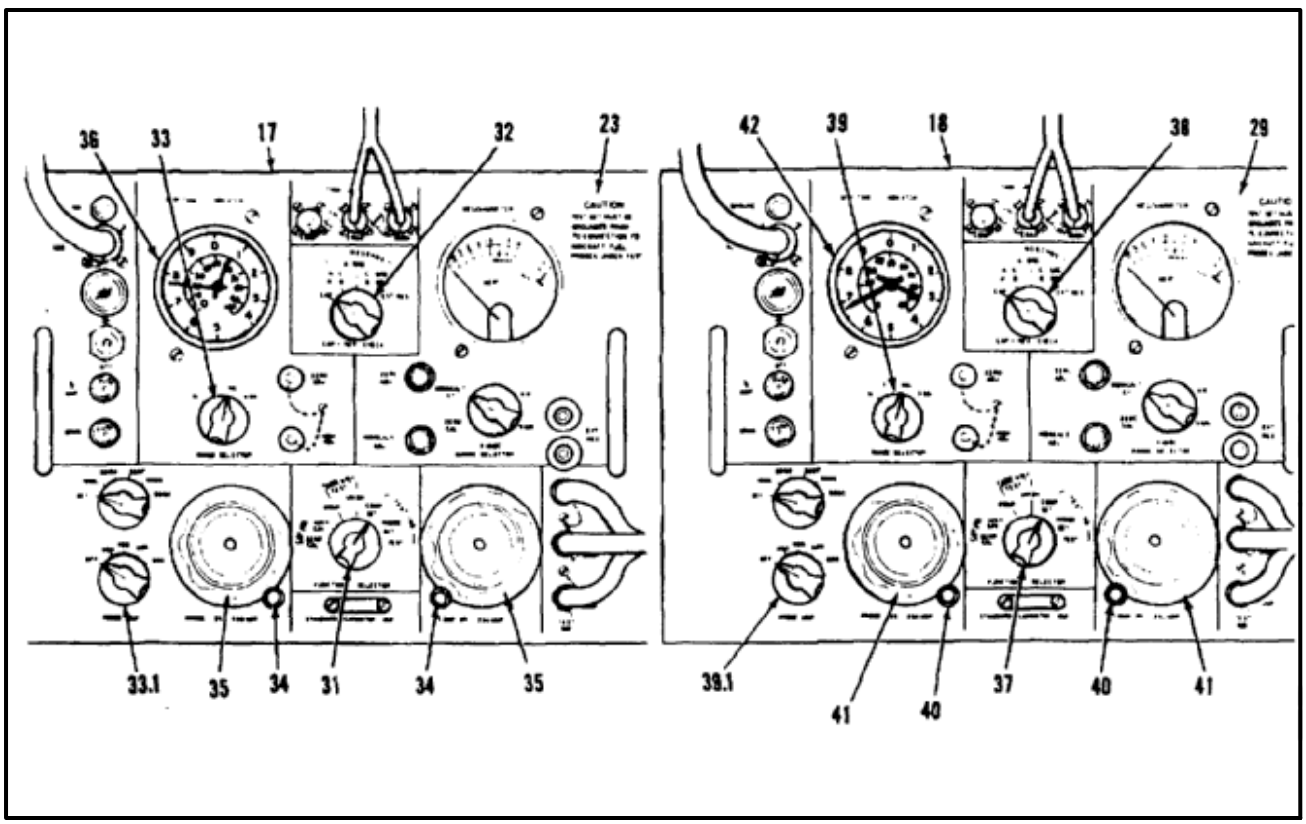
20. Connect connector (30) of cable (E43) (29) to connector (26).

20.1. Connect connector A (30.1) to COAX receptacle of test set (18).

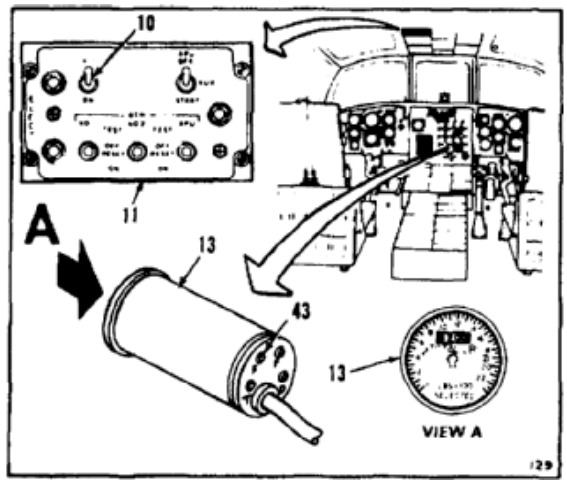
20.2. Connect connector B (30.2) to UNSH receptacle of test set (18).



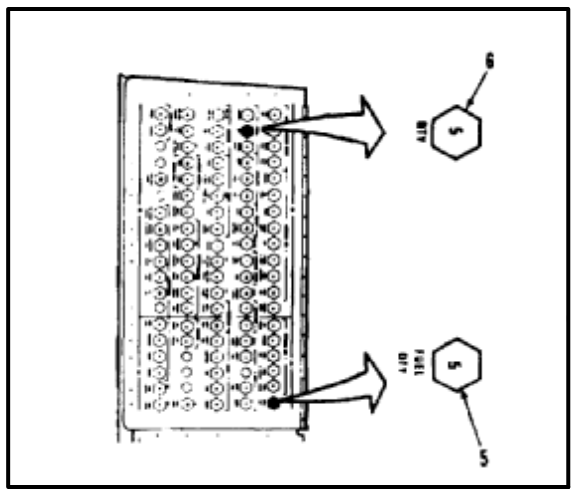
21. Set FUNCTION SELECTOR switch (31) of test set (17) to TEST IND/PROBE SET.
22. Set CAP-RES CHECK switch (32) to CAP.
23. Set capacitance RANGE SELECTOR switch (33) to X10.
23.1. Set PROBE MMF switch (33.1) to **400**.
24. Loosen clamp (34) and turn PROBE knob (35) until CAPACITANCE INDICATOR (36) indicates **579.16 mmf**. Tighten clamp.
25. Set FUNCTION SELECTOR switch (37) of test set (18) to TEST IND/PROBE SET.
26. Set CAP-RES CHECK switch (38) to CAP.
27. Set capacitance RANGE SELECTOR switch (39) to X10.
27.1. Set PROBE MMF switch (39.1) to **800**.
28. Loosen clamp (40) and turn PROBE knob (41) until CAPACITANCE INDICATOR (42) indicates **868.74 mmf**. Tighten clamp.
29. Apply electrical ac power. (Task 1-67).
29.1. Set FUNCTION SELECTOR switches (31 and 37) on test sets (17 and 18) to TEST. Pointers on each CAPACITANCE indicator (36 and 42) will turn counterclockwise, then stabilize.



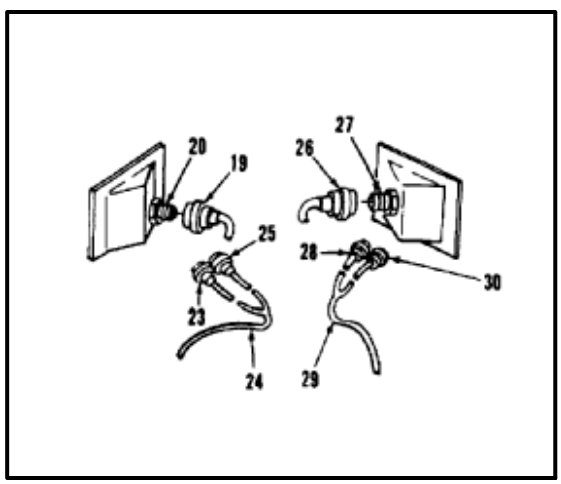
30. Set switch (10) on panel (11) to ON.
31. Remove indicator (13) (steps 9 and 10).
32. Turn F adjustment screw (43) at back of indicator (13) until digital display indicates **8200 TOTAL LBS**.
33. Install indicator (13) (step 12).




34. Open FUEL QTY IND and FUEL QTY CONTROL circuit breakers (5 and 6).

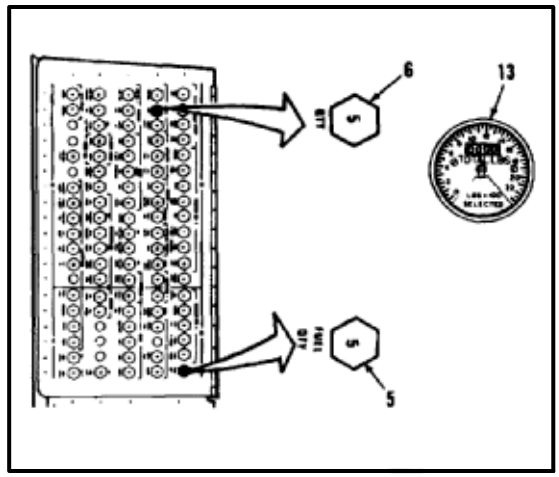



35. Working at forward left tank, disconnect connector (30) from connector (26).
36. Disconnect connector (28) from receptacle (27).
37. Connect connector (26) to receptacle (27).
38. Disconnect connector (25) from connector (19).
39. Disconnect connector (23) from receptacle (20).
40. Connect connector (19) to receptacle (20).



41. Working in cockpit, close FUEL QTY IND and FUEL QTY CONTROL circuit breakers (5 and 6).

42. Check that display on indicator (13) indicates **0000 TOTAL LBS**. If not, repeat steps 9 thru 12.




***TEST TOTAL SYSTEM PRESSURE REFUEL INDICATOR***

43. Set REFUEL STATION switch (8) on panel (9) in cockpit to ON.

43.1. Go to refueling panel (43.1) in right forward wheel well.

43.2. Set PWR ON switch (43.2) on refueling panel (43.1) to ON.

44. Check that digital display on fuel quantity indicator (43.3) is **0000 LBS**. If it is not, perform the following:

a. Loosen screw (43.4).

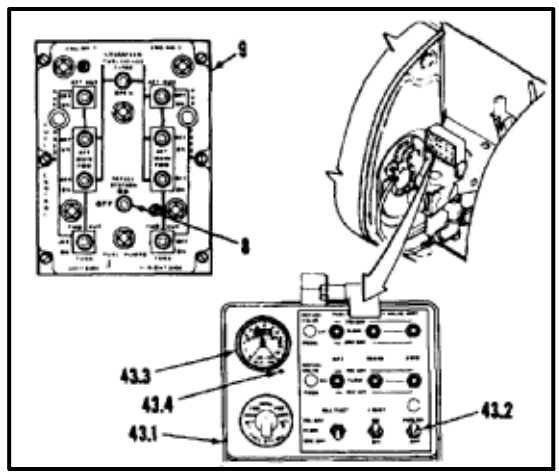
**CAUTION**

Do not disconnect connector from indicator. Indicator can be damaged.

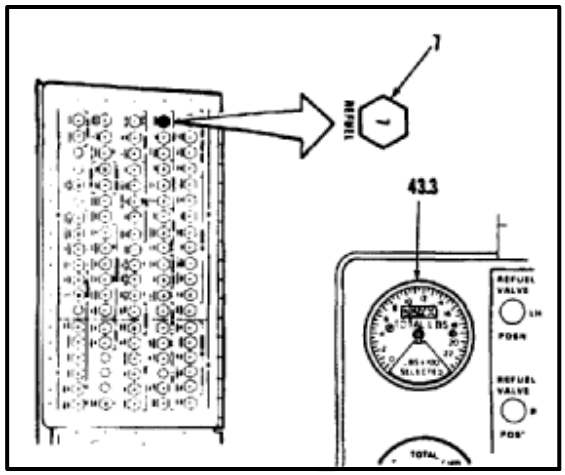
b. Grasp fuel quantity indicator (43.3) at rim and slide it from refueling panel (43.1).

c. Repeat steps 11 and 12 for indicator (43.3).

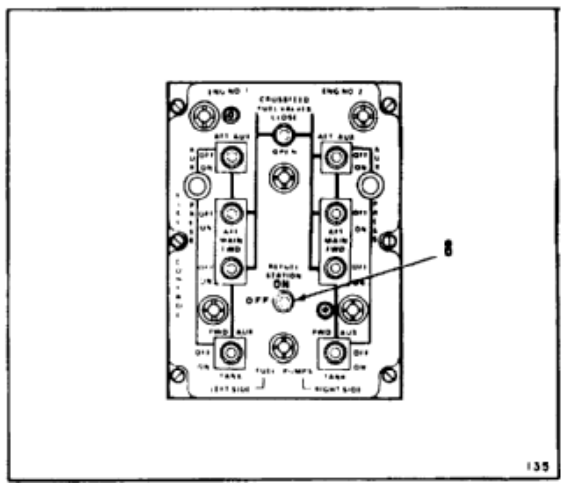
45. Repeat steps 15 thru 30.



46. Open REFUEL circuit breaker (7).
47. Repeat steps 35 thru 40.
48. Close REFUEL circuit breaker (7).
49. Check that display on indicator (43.3) indicates **0000 LBS**. If not, repeat step 44.

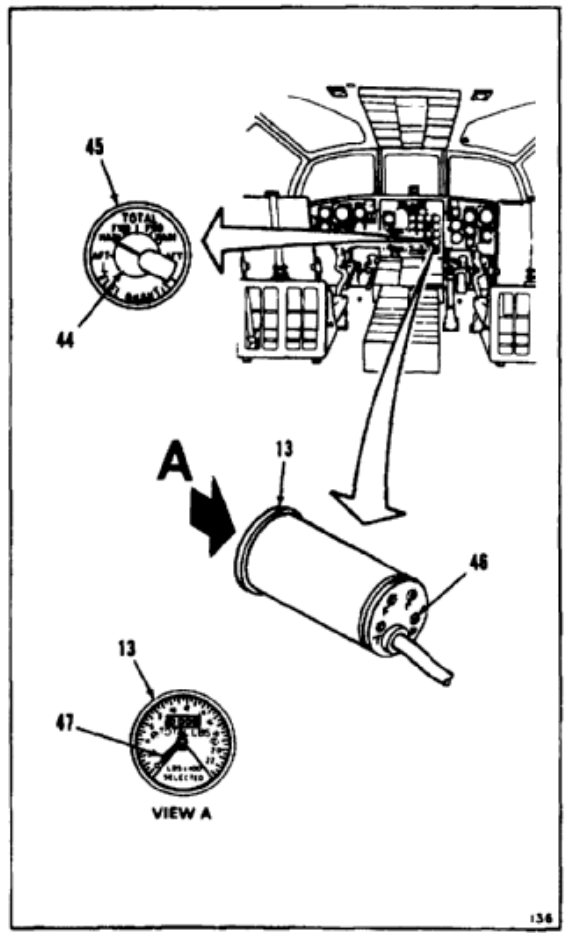



50. Set REFUEL STATION switch (8) to OFF.

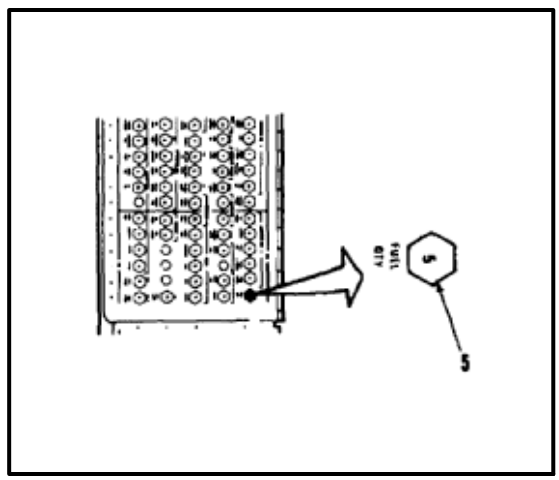


***TEST SELECT SYSTEM FUEL INDICATOR***

51. Remove fuel quantity indicator (13) (steps 9 and 10).
52. Have helper set knob (44) of FUEL QUANTITY selector switch (45) to L MAIN. Hold in position.
53. Turn E adjustment screw (46) on right side at back of indicator (13) until pointer (47) indicates **0 LBS**.
54. Install indicator (13) (step 12).
55. Set and hold knob (44) at L AFT position. Pointer (47) shall indicate **0 LBS**.
56. Repeat step 55 for positions L FWD, R FWD, R MAIN, and R AFT.
57. Set knob (44) to TOTAL. Pointer (47) shall not show.

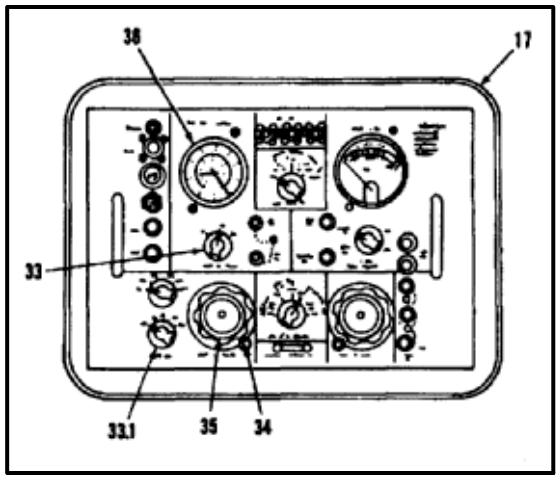



58. Open FUEL QTY circuit breaker (5).
59. Repeat steps 15 thru 22.



59.1. On test set (17), set RANGE SELECTOR switch (33) to X10. Set PROBE MMF switch (33.1) to OFF.

60. Loosen clamp (34) and turn PROBE knob (35) of test set (17) until CAPACITANCE INDICATOR (36) indicates **144.79 mmf**. Tighten clamp.

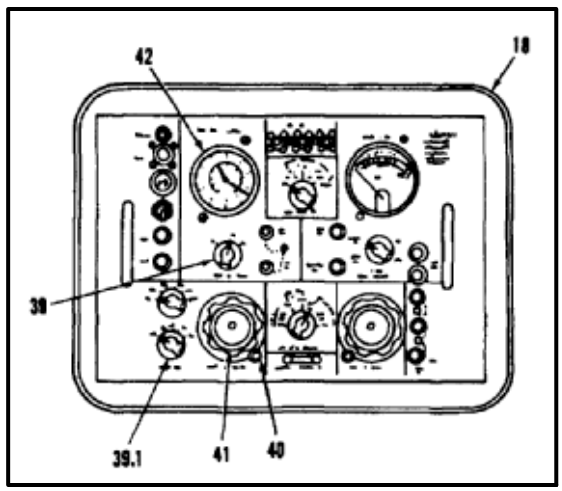



61. Repeat steps 25 and 26 on test set (18) .

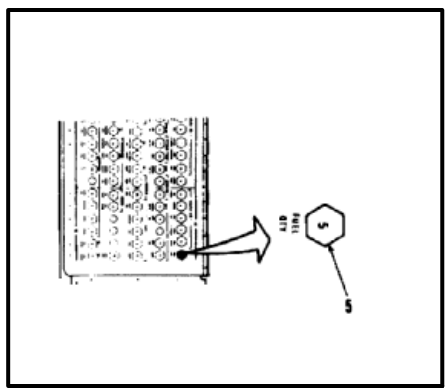
61.1. Set RANGE SELECTOR switch (39) to X10. Set PROBE MMF switch (39.1) to **400**.

62. Loosen clamp (40) and turn PROBE knob (41) of test set (18), until CAPACITANCE INDICATOR (42) indicates **434.37 mmf**. Tighten clamp.

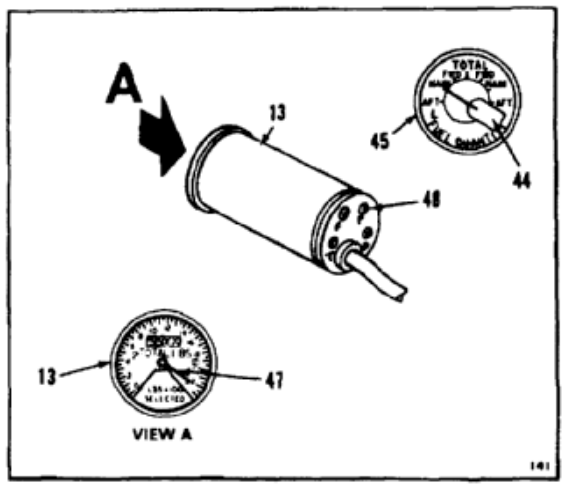
63. Apply ac electrical power (Task 1-67) .



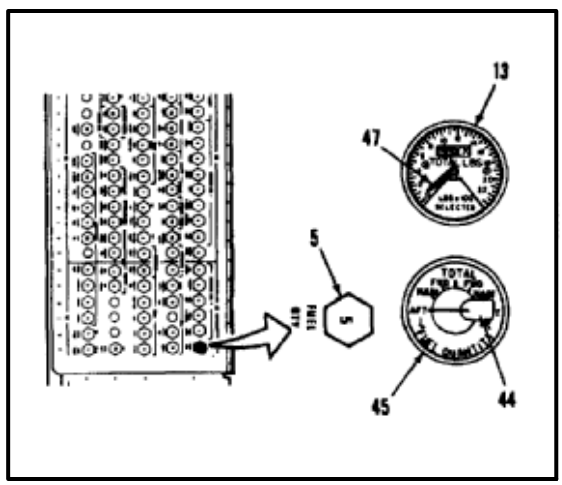

64. Close FUEL QTY circuit breaker (5).



65. Remove indicator (13) (steps 9 and 10).
66. Have helper set knob (44) of switch (45) to L MAIN. Hold in position.
67. Turn F adjustment screw (48) on right side at back of indicator (13) until pointer (47) indicates **2200 LBS**.
68. Install indicator (13) (step 12).
69. Set knob (44) of switch (45) to L FWD. Indicator shall indicate **950 LBS**.

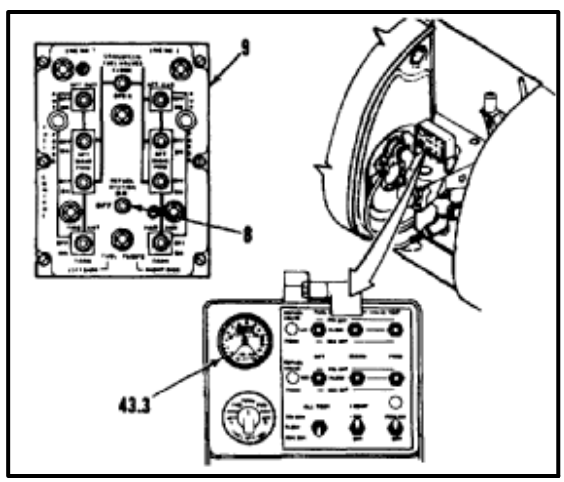



70. Open FUEL QTY circuit breaker (5).
71. Repeat steps 35 thru 40.
72. Set and hold knob (44) at L AFT position, then L MAIN, L FWD, R FWD, R MAIN, and R AFT. Check that pointer (47) indicates **0 LBS**. at each position. If not, repeat steps 51 and 53 thru 56.
73. Close FUEL QTY IND circuit breaker (5) .
74. Set knob (44) to TOTAL. Pointer (47) shall not show.

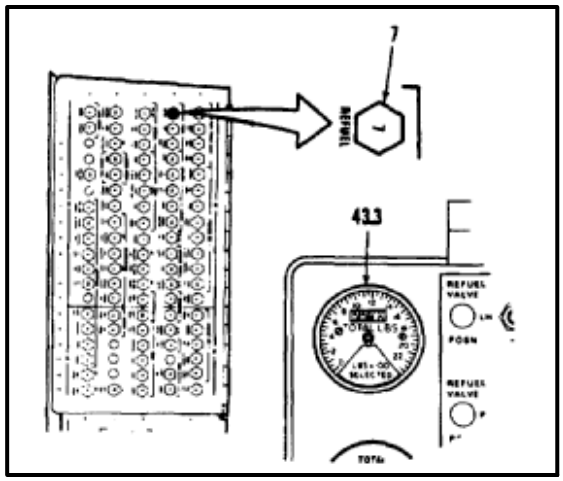



***CALIBRATE SELECT SYSTEM PRESSURE REFUEL INDICATOR***

75. Set REFUEL STATION switch (8) on panel (9) in cockpit to ON.
76. Check that pointer of indicator (43.3) indicates **0 LBS**. If not, repeat steps 43.2 thru 44.



77. Open REFUEL circuit breaker (7).
78. Repeat steps 15 thru 22, then steps 60 thru 62.
79. Close REFUEL circuit breaker (7).
80. Repeat steps 44a and 44b. Repeat steps 66 thru 69 for fuel panel indicator (43.3).
81. Open REFUEL circuit breaker (7).
82. Repeat steps 35 thru 40 and 72.
83. Close REFUEL circuit breaker (7).
84. Set knob (44) of switch (45) to TOTAL. Pointer of indicator (43.3) shall not show.

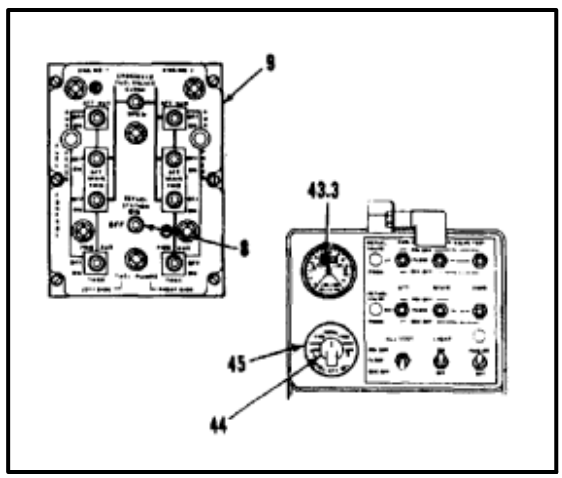



85. Set REFUEL STATION switch (8) on panel (9) to OFF.

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Remove ac electrical power (Task 1-67).
Close forward left and right fuel tank access panels (Task 2-3.1).
Refuel helicopter (Task 1-51).




END OF TASK

## 8-80.5.1 TEST AND ADJUST FUEL QUANTITY INDICATOR USING PSD 60-1AF FUEL QUANTITY TEST SET 8-80.5.1

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Fuel Quantity Test Set PSD60-1AF, NSN 6625-01-297-5305
Fuel Quantity System "Dual T" cable PSDAF-106
Hearing Protectors
Fuel Sump and Drain Equipment
Phillips Screwdriver No. 2
Jeweler's Screwdriver

***Materials:***

None

***Personnel Required:***

Aircraft Electrician
Inspector

***Equipment Condition:***

Battery Connected (Task 1-39)
AC Electrical Power On (Task 1-67)
Fuel Tank Left and Right Forward Access Panel Open (Task 2-3.1)
Fuel Quantity Operations Test I/A/W/ TM 55-1520-240-T-2 (Task 8-11.3)
Helicopter Defueled (Task 10-34 or 10-35)
Ground Aircraft to Earth Ground Per Approved Procedures

***SAFETY PRECAUTIONS REQUIRED WHEN TESTING AND/OR CALIBRATING FUEL QUANTITY SYSTEM***

**WARNING**

DO NOT USE ANY FUEL QUANTITY TESTER OTHER THAN THE PSD60-1AF with this procedure. The PSD60-1AF is battery-powered, and therefore inherently safe. Testers powered by **115 vac** require voltage and ground continuity tests which are not required by the PSD60-1AF.

**WARNING**

ALWAYS GROUND THE TESTER to a good, clean aircraft ground. DO NOT CONNECT ground wire behind circuit breaker panels or near any exposed power termination. Failure to comply could result in a fuel tank explosion or fire, and serious injury to personnel.

**WARNING**

NEVER CONNECT a fuel gauge or signal conditioner unit to an electrically live connector. Such practice may be a hazard to the aircraft and personnel, and may damage the gauge or SCU.

**WARNING**

If a circuit breaker pops during calibration or troubleshooting, a short circuit is indicated. Refer to FAULT ISOLATION PROCEDURES and correct fault before reapplying power.

**WARNING**

USE ONLY AUTHORIZED TEST EQUIPMENT to test, troubleshoot, and calibrate the fuel quantity system. Shop testers, including multimeters and meggers, are NOT CERTIFIED SAFE for use on any wiring to the fuel tank. Failure to comply could result in a fuel tank explosion or fire, and serious injury to personnel.

**WARNING**

Always ground the aircraft under test to earth ground per approved procedures. Failure to comply could result in a fuel tank explosion or fire, and could result in serious injury to personnel.

**CAUTION**

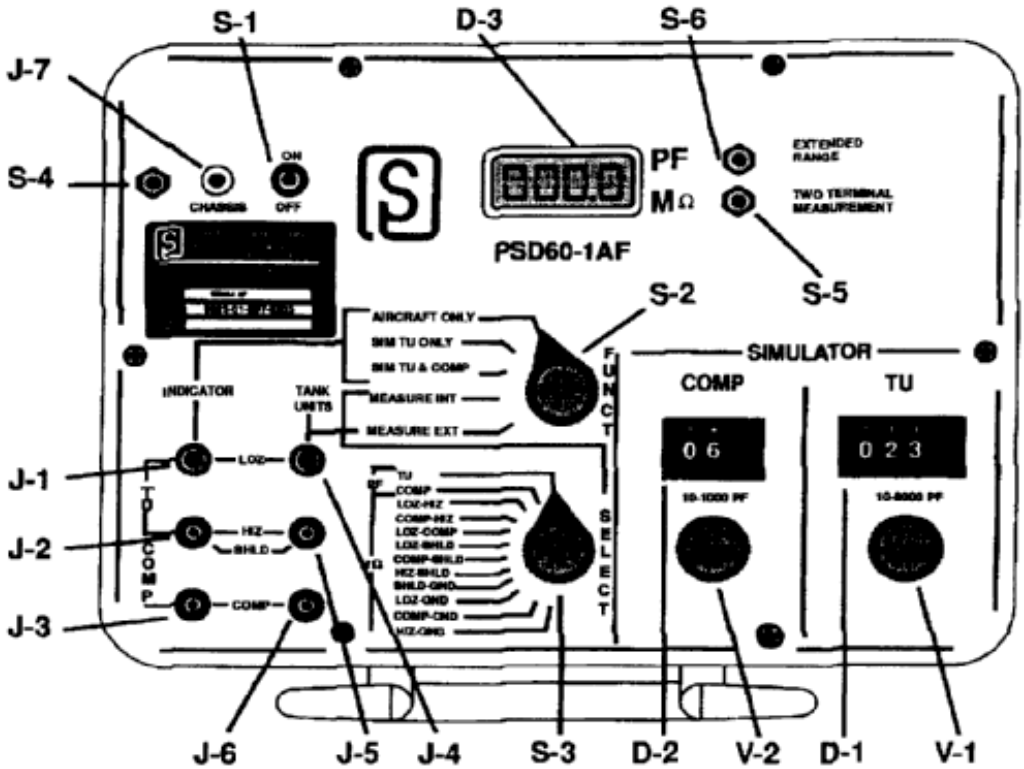
DO NOT attempt to calibrate a fuel quantity system that has a known failure.

APU causes dangerous noise levels. Wear appropriate hearing protection.

***PART I. CALIBRATION OF FUEL GAUGE DIAL INDICATION***

1. Deleted.
2. Deleted.
3. Open right Forward Fuel Tank Access Panel.
4. Verify that the following circuit breakers are closed:

   CAUTION PNL on No. 1 PDP
   XFMR RECT on No. 1 PDP
   REV CUR CO on No. 1 PDP
   FUEL QTY on No. 1 PDP
   FUEL QTY XFEED CONTROL on No. 1 PDP
   REFUEL on No. 1 PDP




J–1 LOZ output to indicator
J–2 HIZ output to indicator
J–3 Comp LOZ output to indicator
J–4 Tank Unit (TU) LOZ input
J–5 Tank Unit (TU) HIZ input
J–6 Compensator LOZ input

J-7 Airframe ground jack
V-1 TU simulator vernire
V-2 COMP simulator vernier
S-1 Power ON-OFF switch
S-2 FUNCTION select switch
S-3 Capacitance-Meg select switch

S-4 Lid-close power OFF switch
S-5 Press for two-terminal megger
S-6 X10 (high) range switch
D-1 Tank Unit simulator decade
D-2 Compensator simulator decade
D-3 Liquid Crystal Display (LCD)

**Figure 1. PSD60-1AF tester**

5. Connect fuel quantity tester CHASSIS jack (J-7) to airfame ground between the Right Main and Right Forward Aux fuel tanks.
6. Lift to unlock tester power toggle switch (S-1) and turn to ON (Figure 1).
7. Allow a **3 minute** warmup. If words "LO BAT" appear in upper-left corner of LCD (Figure 2), replace batteries.
8. Connect PSDAF-106 "T" cable lead (Figure 10) marked "MAIN & AUX HIZ" to TU HIZ terminal (J-5) on tester (Figure 1).
9. Connect PSDAF-106 "T" cable "MAIN LOZ" lead to tester TU LOZ terminal (J-4) on tester (Figure 1).
10. Rotate tester FUNCT switch (S-2) to MEAS EXT (Figure 1).
11. Rotate tester SELECT switch (S-3) to TU.
12. Read cable LOZ-HIZ capacitance displayed on LCD If capacitance exceeds **.5 pf**, repair or replace interface cable. Record capacitance on dial calibration worksheet line 1 (Figure 23.1).
13. Subtract cable capacitance measured in step 12 above from **361.7 pf**. Record result on worksheet line 2.
14. Disconnect interface cable MAIN & AUX HIZ and MAIN LOZ leads from tester TU terminals.
15. Connect cable MAIN & AUX HIZ lead to INDICATOR HIZ terminal (J-2) on left side of tester.
16. Connect cable MAIN LOZ lead to tester INDICATOR LOZ terminal (J-1).
17. Connect cable MAIN CP lead to tester INDICATOR COMP terminal (J-3).
18. Disconnect cable 300W7 (19-pin connector) from 057W2 at right MAIN tank access panel 114PS518.
19. Connect interface cable (J-2) to connector disconnected from tank access panel 114PS518. DO NOT CONNECT (P-2) to 057W2 on tank.
20. Rotate tester FUNCT switch (S-2) to MEASURE INT.
21. Select "034" on TU decade D-1 (Figure 3).

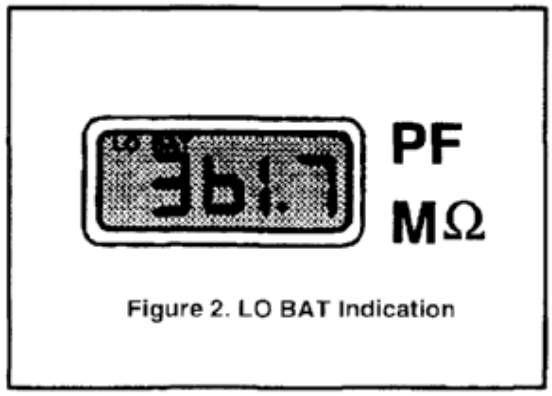



Figure 2. LO BAT Indication

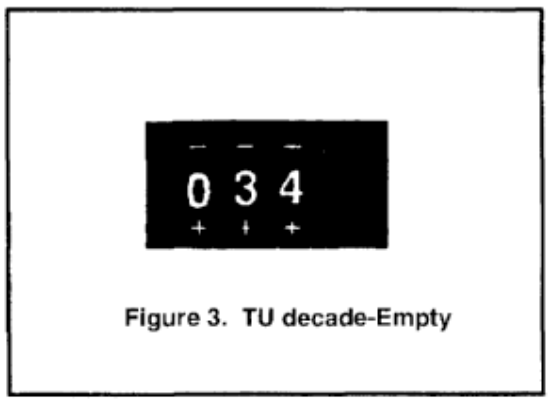



Figure 3. TU decade-Empty

22. Adjust TU vernier (V-1) until tester LCD reads simulated empty MAIN tank capacitance calculated in step 13 above (Worksheet line 2).
23. Rotate SELECT switch (S-3) on tester to COMP.
24. Select "41" on COMP decade (D-2) (Figure 4).
25. Adjust COMP vernier (V-2) until LCD reads **434.4 pf**.
26. Rotate FUNCT switch (S-2) on tester to SIM TU ONLY.
27. Disconnect aircraft wiring plug from fueling panel gauge. Remove gauge from panel and reconnect aircraft plug to gauge.
28. Connect AGPU (TM 55-1730-229-12) or turn ON APU (Task 15-1.5).
29. Turn ON "REFUEL STATION" switch on cockpit Fuel Control Panel (Figure 5).
30. At refueling panel in right forward wheel well, turn PWR ON-OFF switch ON.
31. Select RIGHT MAIN tank on Fuel Quantity Selector switch at refueling panel (Figure 6).

**NOTE**

Refer to Figure 6 for location and identification of trimmers.

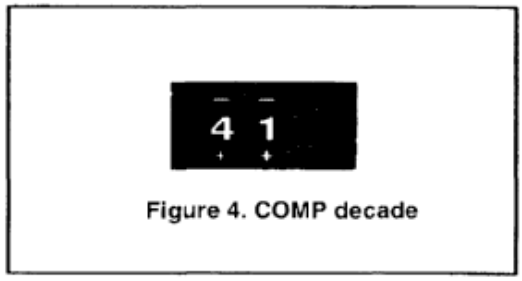


Figure 4. COMP decade

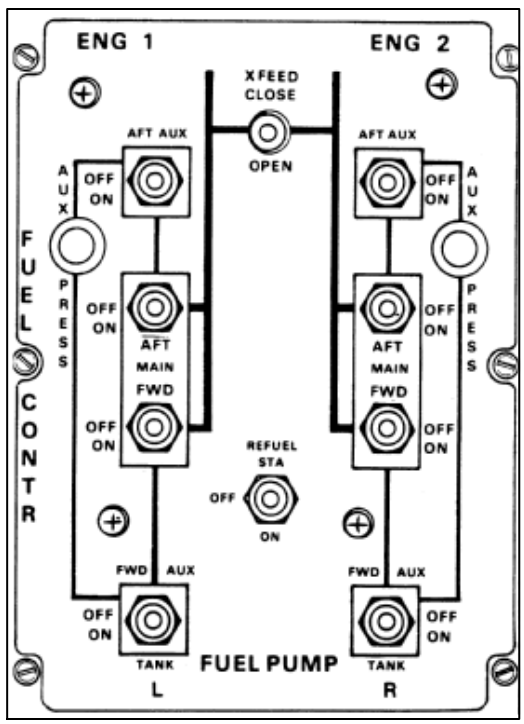
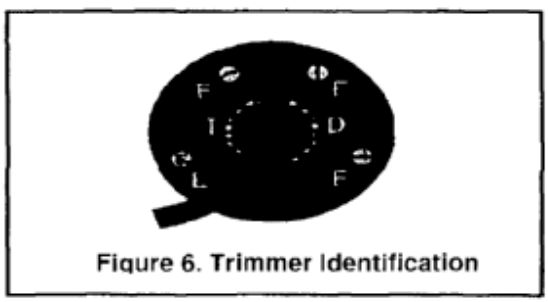


Figure 5. Fuel Control Panel


Figure 6. Trimmer Identification

32. Adjust "E" trimmer, marked "D" for "Dial" indication, until gauge pointer reads **0 lb** (Figure 7).
33. Rotate FUNCT switch (S-2) on tester to SIM TU & COMP.
34. Adjust "F" trimmer, marked "D" for "Dial" indication, until gauge pointer reads **2200 lb** (Figure 8).

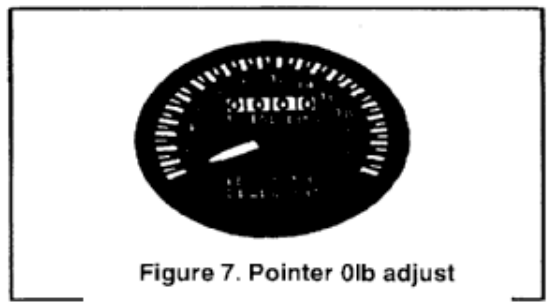


Figure 7. Pointer 0lb adjust

**NOTE**

Digital total fuel indication will display sum of fuel in all tanks, including **2200 lb** simulated in RIGHT MAIN.

35. Rotate FUNCT switch (S-2) on tester back to SIM TU ONLY.
36. Readjust "E" trimmer for Dial indication, if necessary, to read **0 lb** on gauge.
37. Turn PWR switch on Refueling Panel (Figure 5) OFF.
38. In cockpit, select RIGHT MAIN tank on Fuel Quantity Selector Switch (Figure 9).

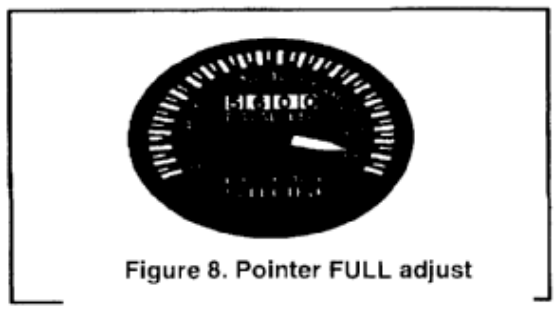


Figure 8. Pointer FULL adjust

39. Remove Fuel Quantity Indicator from instrument panel.
40. Adjust "E" trimmer, marked "D" for Dial indication, until gauge pointer reads **0 lb**.
41. Rotate FUNCT switch (S-2) on tester to SIM TU & COMP.
42. Adjust "F" trimmer, marked "D" for dial until gauge pointer reads **2200 lb**.

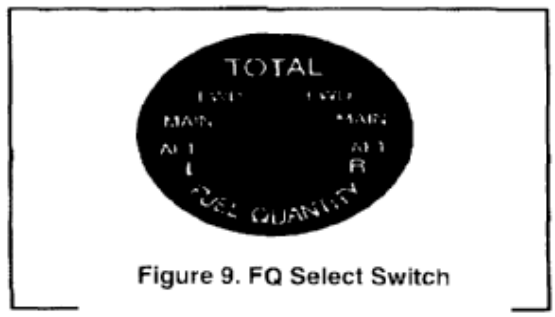



Figure 9. FQ Select Switch

**8-80.5.1 TEST AND ADJUST FUEL QUANTITY INDICATOR USING PSD 60-1AF FUEL QUANTITY TEST SET (Continued)** **8-80.5.1**

43. Rotate FUNCT switch (S-2) on tester back to SIM TU ONLY.
44. Adjust "E" trimmer, if necessary, until gauge pointer reads **0 lb**.
45. If calibrating TOTAL FUEL function of gauge, proceed to PART II of this procedure.
46. In cockpit, pull FUEL QTY IND (No. 1 PDP) and FUEL QTY XFEED CONTROL (No. 1 PDP) circuit breakers.
47. Replace gauge in instrument panel. Refer to Task 8-80.5, step 12.
48. At refueling panel, replace gauge in panel. Refer to Task 8-80.5, step 12.
49. Disconnect PSDAF-106 "T" cable from aircraft wiring, and from tester (Figure 10).
50. Reconnect aircraft wiring harness 300W7 to MAIN tank wall connector 057W2.
51. Turn tester OFF. Disconnect ground lead and place in lid of tester.

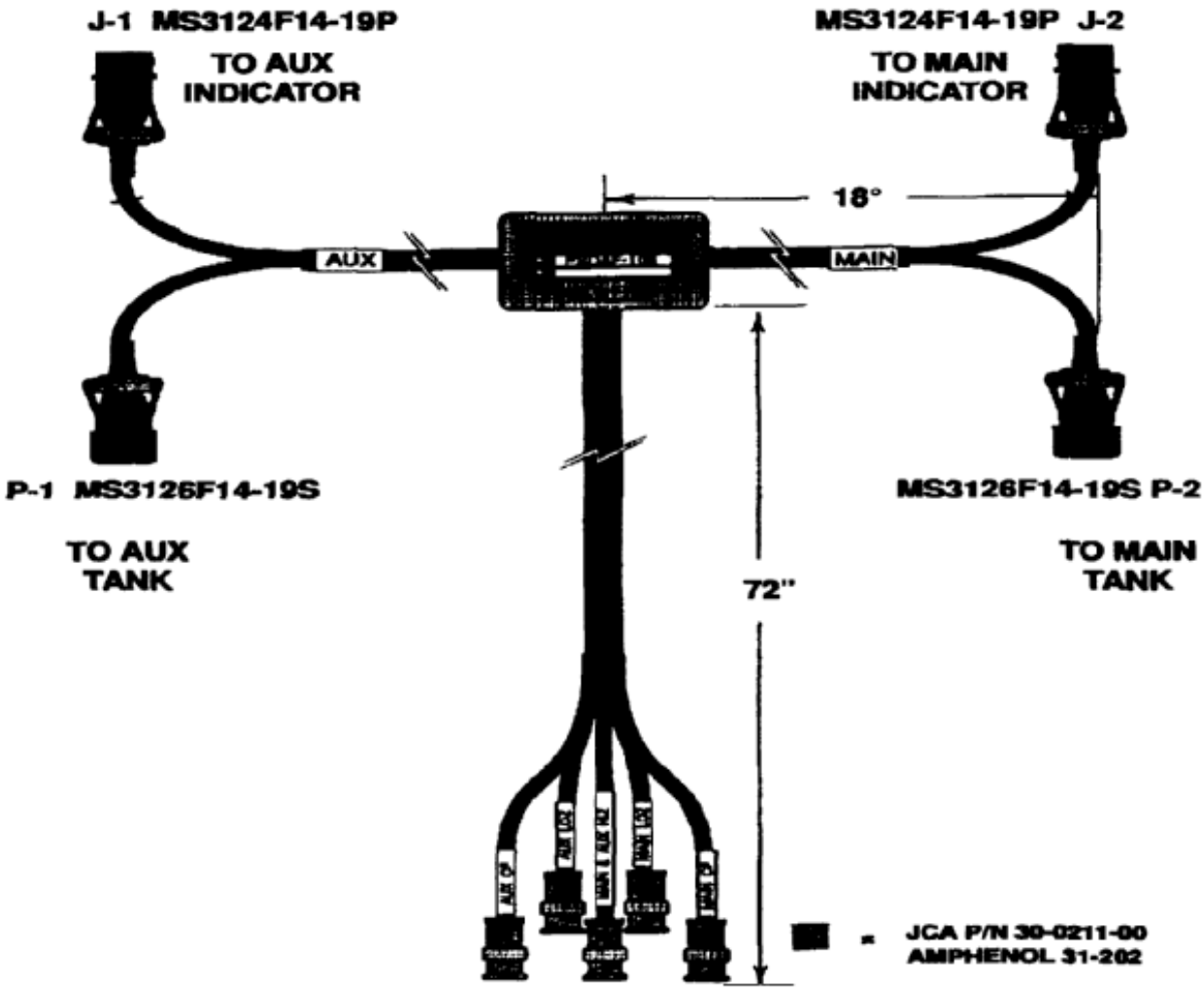



*Figure 10. PSDAF-106"T" cable*

***PART II. CALIBRATION OF DIGITAL TOTAL FUEL QUANTITY INDICATION***

1. Read and observe all safety precautions listed above.
2. Ground aircraft to earth ground per approved procedure.
3. Open Left and Right Forward and Aft Fuel Tank access panels.
4. Disconnect the following connectors from the fuel tank access panels 114PS518.

| TANK | HARNESS# | TANK CONN# |
|---|---|---|
| RIGHT MAIN | 300W7 | 057W2 |
| LEFT MAIN | 300W6 | 057W9 |
| FWD RT AUX | 300W4 | 057W1 |
| FWD LT AUX | 300W2 | 057W10 |
| AFT RT AUX | 300W5 | 057W5 |
| AFT LT AUX | 300W3 | 057W6 |

5. Verify that the following breakers are closed:

| CIRCUIT BREAKER | PDP # |
|---|---|
| CAUTION PANEL | No. 1 |
| XFMR RECT | No. 1 |
| REV CUR CO | No. 1 |
| FUEL QTY | No. 1 |
| FUEL QTY XFEED CONTROL | No. 1 |
| REFUEL | No. 1 |

6. Connect fuel quantity tester CHASSIS jack (J-7) to airframe ground between the Right Main and Right Forward Aux fuel tanks located at STA 210.
7. Lift latches to unlock tester. Turn ON-OFF switch to ON. If words "LO BAT" appear in upper left corner of LCD display (Figure 11), replace batteries.
8. Allow a **3 minute** warm up before using tester to measure cable.

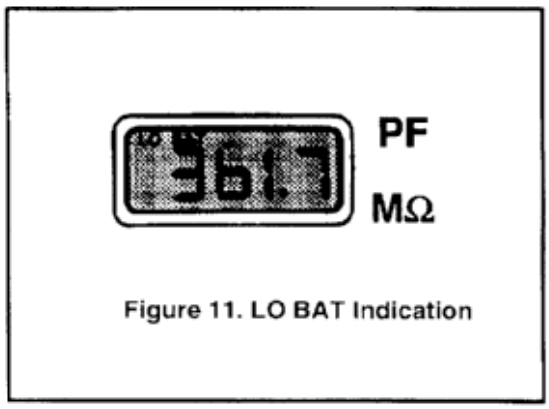



Figure 11. LO BAT Indication

9. Connect PSDAF-106 "T" cable "MAIN & AUX HIZ" lead to TANK UNITS HIZ terminal (J-5) on tester (Figure 1).
10. Connect PSDAF-106 "T" cable "MAIN LOZ" lead (Figure 10) to tester TANK UNITS LOZ terminal (J-4) (Figure 1).
11. Rotate tester FUNCT switch (S-2) to MEASURE EXT.
12. Rotate tester SELECT switch (S-3) to the TU.
13. Read and record cable LOZ-HIZ capacitance displayed on LCD. If capacitance exceeds **.5 pf**, repair or replace interface cable.
14. Disconnect cable MAIN & AUX HIZ and MAIN LOZ leads from tester TANK UNITS terminals.
15. Connect MAIN & AUX HIZ lead to INDICATOR HIZ terminal (J-2) on tester (Figure 1).
16. Connect MAIN LOZ lead to INDICATOR LOZ terminal (J-1) on tester (Figure 1).

17. Connect AUX CP lead to INDICATOR COMP terminal (J-3) on tester (Figure 1).
18. Rotate tester FUNCT switch (S-2) to MEASURE INT.
19. Select "070" on TU decade (D-1) (Figure 12).

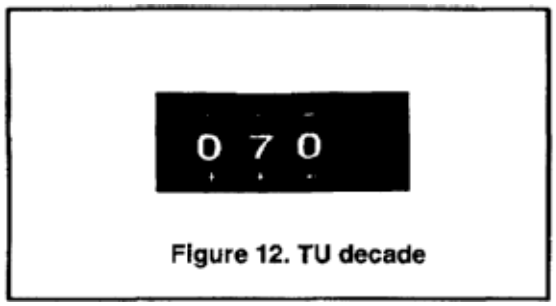



Figure 12. TU decade

20. Adjust TU vernier (V-1) to read **723.4 pf** on tester LCD (Figure 13).
21. Rotate SELECT switch (S-3) on tester to COMP.

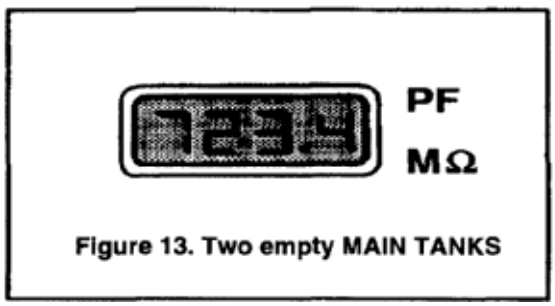



Figure 13. Two empty MAIN TANKS

22. Select "46" on COMP decade (D-2) (Figure 14).

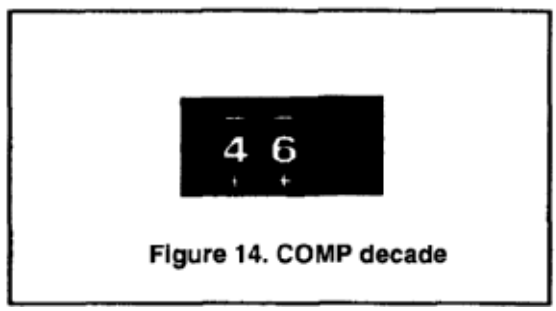



Figure 14. COMP decade

23. Adjust COMP vernier (V-1) until LCD display reads **486.4 pf** (Figure 15).
24. Rotate tester FUNCT switch (S-2) to SIM TU & COMP.
25. Disconnect cable 300W7 from right MAIN tank connector 057W2 at access panel 114PS518.
26. Connect PSDAF-106 "T" cable (Figure 10) (J-2) to 300W7 plug disconnected above. DO NOT connect (P-2) to tank connector.
27. Disconnect 300W4 from RIGHT FWD AUX tank connector 057W1 at access panel 114PS518.
28. Connect PSDAF-106 "T" cable (Figure 10) (J-1) to 300W4 plug disconnected above. DO NOT connect (P-1) to tank connector.
29. Rotate Fuel Quantity Select switch in cockpit to TOTAL (Figure 16).
30. Slide Fuel Quantity Indicator out of instrument panel in cockpit (Task 8-97).
31. To identify trimmer adjustments (Figure 17).
32. Connect and power AGPU (TM 55-1730-229-12), or turn ON aircraft APU (Task 15-1.5).
33. Adjust "E" trimmer marked "T" for Total Fuel until digital total fuel indication reads **"0000"**.
34. Verify that dial indication (pointer) is out of sight.

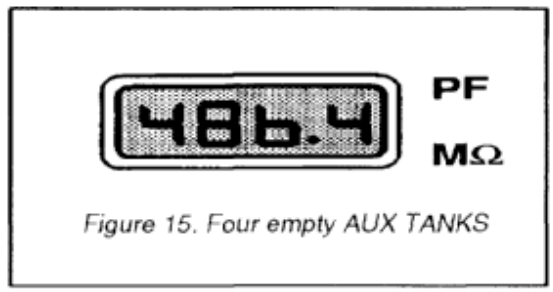


Figure 15. Four empty AUX TANKS

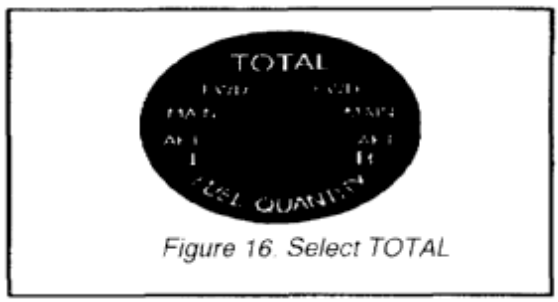
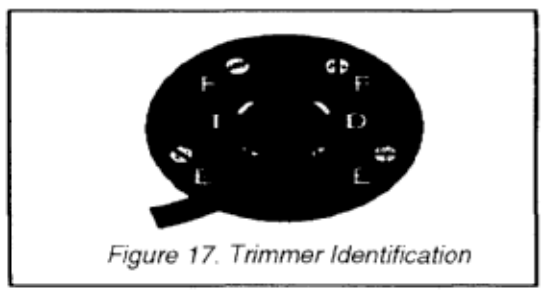


Figure 16. Select TOTAL


Figure 17. Trimmer Identification

## 8-80.5.1 TEST AND ADJUST FUEL QUANTITY INDICATOR USING PSD 60-1AF FUEL QUANTITY TEST SET (Continued) 8-80.5.1

35. On Refuel Panel, disconnect aircraft wiring plug from fuel gauge. Remove gauge from panel and reconnect plug to gauge (Figure 19).
36. Rotate Fuel Quantity Select switch on Refueling Panel to TOTAL (Figure 16).
37. Turn REFUEL STATION ON-OFF switch on Fuel Control panel ON (Figure 18).
38. At Refueling Panel, switch PWR ON-OFF switch ON (Figure 19).
39. Adjust "E" trimmer marked "T" for Total Fuel until digital total fuel gauge reads **"0000"**.
40. Verify that dial pointer is out of sight.

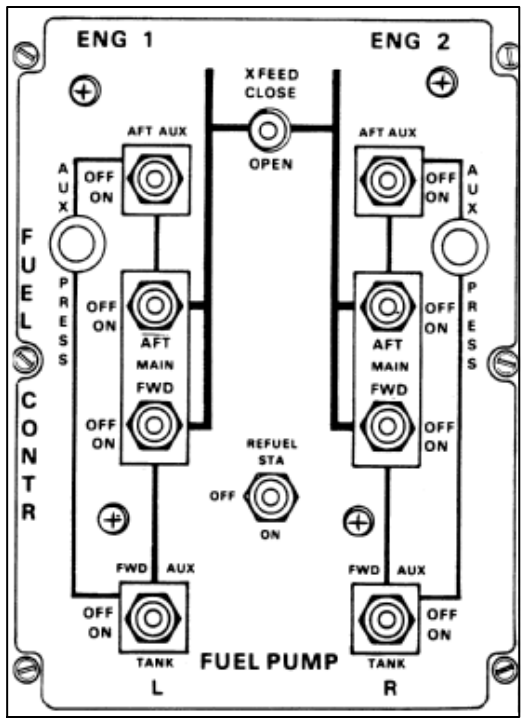



Figure 18. Fuel Control Panel

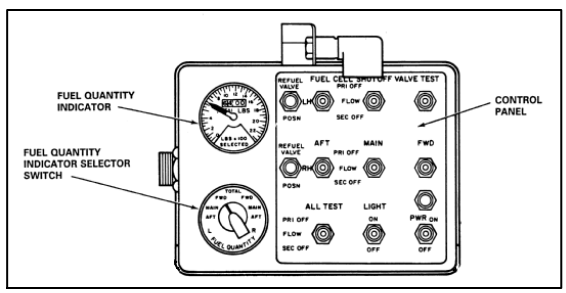



Figure 19. Refueling Panel

41. Rotate FUNCT switch (S-2) on tester to MEASURE INT.

42. Adjust COMP SIM decade (D-2) to read "99" (Figure 20).

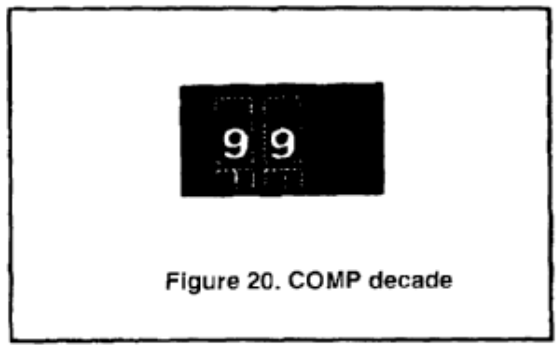



Figure 20. COMP decade

43. Adjust COMP SIM vernier (V-2) to read **1004.6 pf** on tester LCD (Figure 21).

**NOTE**

This capacitance value equals four AUX tanks at **850 lb** each or a total of **3400 lb**.

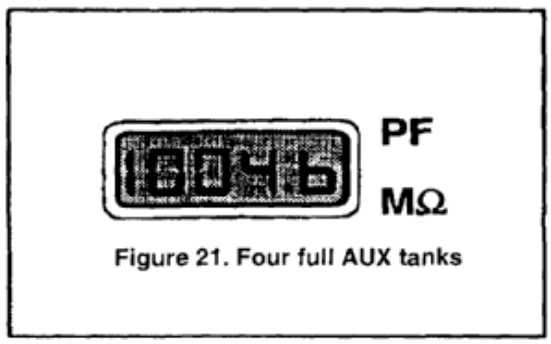



Figure 21. Four full AUX tanks

44. Rotate SELECT switch (S-3) on tester to TU position.

45. Adjust TU decade (D-1) to "157" (Figure 22).

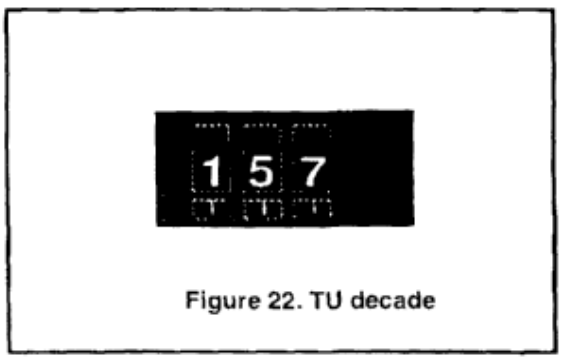



Figure 22. TU decade

46. Adjust TU vernier (V-1) to read **1592.2 pf** on tester LCD display (Figure 23).

**NOTE**

This capacitance value equals two main tanks at **2200 lb** each for total of **4400 lb**.

47. Rotate FUNCT switch (S-2) on tester to SIM TU & COMP.
48. Adjust "F" trimmer marked "T" on back of fueling panel gauge to read **7800 lb** on gauge.
49. In cockpit, turn REFUEL STATION ON-OFF switch on Fuel Control Panel to OFF.
50. Adjust "F" trimmer marked "" on gauge until total reads "**7800**".
51. Repeat steps 18 thru 24.
52. Readjust "E" trimmer marked "" if necessary to read "**0000**" on gauge.
53. Turn Refuel Station ON-OFF switch ON.
54. Readjust "E" trimmer marked "T" on refueling panel gauge, if necessary, to read "**0000**".
55. Remove electrical power.
56. Reinstall gauge in instrument panel. Refer to Task 8-80.5, step 12.
57. At refueling panel, reinstall gauge in panel. Refer to Task 8-80.5, step 12.

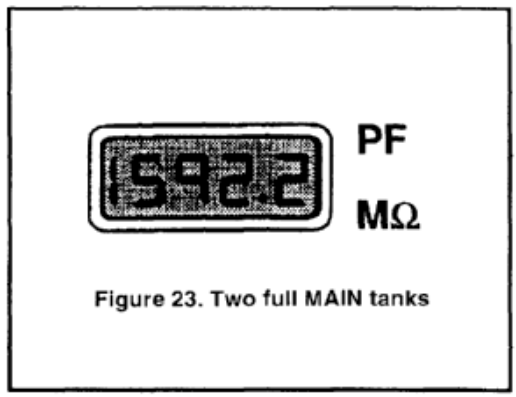



Figure 23. Two full MAIN tanks

58. Disconnect PSDAF-106 "T" cable from 300W7 and 300W4 (Figure 10).

59. Reconnect harnesses 300W2 thru 300W7 as follows:

| TANK | HARNESS# | TANK CONN# |
|---|---|---|
| RIGHT MAIN | 300W7 | 057W2 |
| LEFT MAIN | 300W6 | 057W9 |
| FWD RT AUX | 300W4 | 057W1 |
| FWD LT AUX | 300W2 | 057W10 |
| AFT RT AUX | 300W5 | 057W5 |
| AFT LT AUX | 300W3 | 057W6 |

60. Turn tester OFF and store grounding cable harness in lid.

| | |
|---|---|
| | 361.7 pf |
| 1 Read and record cable LOZ-HIZ capacitance | ____pf |
| 2 Subtract line 1 from 361.7pf. Result is | ____pf |
| 3 Select SIM TU ONLY. Adjust "E" trimmer marked "D" for **0 lb** | ____lb |
| 4 Select SIM TU & COMP. Adjust "F" trimmer marked "D" for **2200 lb** | ____lb |
| 5 Select SIM TU ONLY. Readjust "E" trimmer as necessary for **0 lb** | ____lb |

***FIGURE 23.1. DIAL CALIBRATION — WORKSHEET***

***PART III. TESTING AND TROUBLESHOOTING FUEL QUANTITY SYSTEM***

***SECTION A: MEASURING CAPACITANCE OF EMPTY TANKS***

1. Read and observe all safety precautions listed at the beginning of this procedure.
2. Ground aircraft to earth ground per approved procedures.
3. Completely drain sumps. Failure to do so invalidates measurements.
4. Open fuel tank access panel for tank to be measured.
5. Connect PSD60-1AF Fuel Quantity System tester CHASSIS jack (J-7) to airframe ground between MAIN and AUX fuel tank (Figure 1) (STA 210.00).
6. Lift latches to unlock tester. Turn ON-OFF switch to ON. If words "LO BAT" appear in upper left corner of LCD (Figure 24), replace batteries.
7. Allow tester to warm up for **3 minutes** before taking any measurements.
8. Connect PSDAF-106 "T" cable lead marked "MAIN & AUX HIZ" to TANK UNITS HIZ terminal (J-5) (Figure 10).

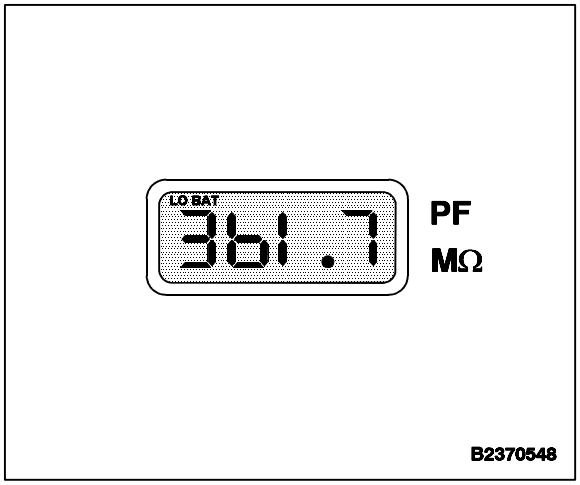



**Figure 24. LO BAT Indication**

9. If measuring a MAIN TANK, connect "T" cable lead marked "MAIN LOZ" to TU terminal (J-4).
10. If measuring an AUX TANK, connect "T" cable lead marked "AUX LOZ" to TU terminal (J-4).
11. Rotate tester FUNCT switch to MEASURE EXT.
12. Rotate tester SELECT switch to TU.
13. Read and record cable LOZ-HIZ capacitance displayed on LCD. If capacitance is over **.5 pf**, repair or replace cable.
14. Disconnect fuel quantity system harness from tank wall connector listed below:

| TANK | HARNESS# | TANK CONN# |
|---|---|---|
| RIGHT MAIN | 300W7 | 057W2 |
| LEFT MAIN | 300W6 | 057W9 |
| FWD RT AUX | 300W4 | 057W1 |
| FWD LT AUX | 300W2 | 057W10 |
| AFT RT AUX | 300W5 | 057W5 |
| AFT LT AUX | 300W3 | 057W6 |

15. If measuring a MAIN TANK, connect "T" cable (P-1) to tank wall connector DO NOT connect (J-1) to aircraft wiring connector.
16. If measuring an AUX TANK, connect "T" cable (P-2) to tank wall connector. DO NOT connect (J-2) to aircraft wiring connector.
17. Read capacitance of "T" cable plus empty tank on tester LCD.
18. Subtract capacitance measured in step 13 from reading in step 17. This is actual empty tank capacitance, compare with Table 1.

***TABLE 1 — FUEL TANK CAPACITANCE VALUES***

| TANK | EMPTY MIN | EMPTY NOMINAL | EMPTY MAX | ADDED NOMINAL | FULL NOMINAL | READING IN LB |
|---|---|---|---|---|---|---|
| MAIN | 360.7 pf | 361.7 pf | 367.9 pf | 434.4 pf | 796.1 pf | 2200 |
| AUX | 120.2 pf | 121.6 pf | 122.7 pf | 144.8 pf | 266.4 pf | 950 |

**8-80.5.1 TEST AND ADJUST FUEL QUANTITY INDICATOR USING PSD 60-1AF FUEL QUANTITY TEST SET (Continued)** **8-80.5.1**

***SECTION B: MEASURING INSULATION RESISTANCE OF INTANK WIRING AND PROBES***

1. Complete Section A, steps 1 thru 11.
2. Rotate SELECT switch (S-3) to LOZ-HIZ.

**NOTE**

The PSD60-1AF tester indicates "over-range" above **10,000 megohms** by flashing three colons and displaying four zeros (Figure 25).

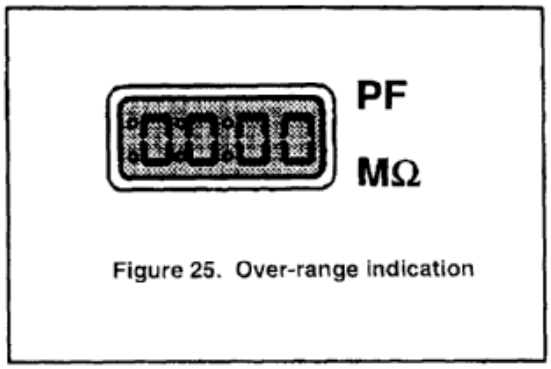



Figure 25. Over-range indication

3. Allow reading to stabilize for **30 seconds**. Verify that insulation resistance reading displayed is over **20 megohms**.
4. Rotate SELECT switch (S-3) to COMP-HIZ.
5. Allow reading to stabilize for **30 seconds**. Verify that insulation resistance reading is over **20 megohms**.
6. Rotate SELECT switch (S-3) counterclockwise, pausing for **30 seconds** at each position. Verify that reading in each remaining position is over **1 megohm**.

***SECTION C: CALIBRATE DIAL INDICATION TO ACTUAL EMPTY TANK***

1. Complete Sections A and B.
2. Rotate FUNCT switch (S-2) to MEASURE INT.
3. Rotate SELECT switch (S-3) to TU.
4. Disconnect "T" cable from TU terminals of tester.
5. Connect "T" cable lead marked "MAIN & AUX HIZ" to INDICATOR HIZ terminal (J-2).
6. If calibrating a MAIN TANK, connect "T" cable MAIN LOZ lead to INDICATOR LOZ terminal (J-1) DO NOT connect MAIN CP lead.
7. If calibrating an AUX TANK, connect "T" cable AUX LOZ lead to INDICATOR LOZ terminal (J-1). DO NOT connect AUX CP lead.

8. Set the TU decade (D-1) on tester to read "041" if calibrating a MAIN TANK, and to "011" if calibrating an AUX TANK (Figures 26 and 27).
9. Subtract cable LOZ-HIZ capacitance measured in Section A, step 13 from "ADDED" capacitance listed in Table 1 for this tank.
10. Adjust TU vernier (V-1) until LCD reads capacitance calculated in step 9.
11. Verify that (P-2) is connected to tank-wall connector if calibrating a MAIN TANK, and that (P-1) is connected if calibrating an AUX TANK.
12. Rotate FUNCT switch (S-2) to AIRCRAFT ONLY.
13. If calibrating Refueling Panel gauge, disconnect plug from gauge, remove gauge from panel, and reconnect plug to gauge.
14. Connect and turn ON AGPU, or turn ON aircraft APU to supply electrical power.
15. Close the following circuit breakers on No. 1 PDP:

    CAUTION PANEL
    XFMR RECT
    REV CUR CO
    FUEL QTY
    FUEL QTY XFEED CONTROL
    REFUEL

16. Deleted.
17. If calibrating a Fueling Panel gauge, switch REFUEL STATION switch on cockpit Fuel Control Panel to ON. Switch PWR ON-OFF switch on Refueling Panel to ON.
18. Select tank to be calibrated on Fuel Quantity Select switch.

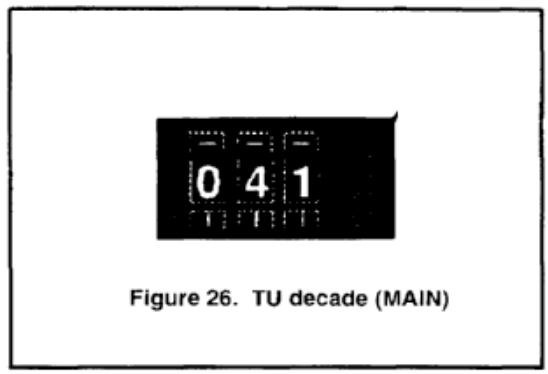



Figure 26. TU decade (MAIN)

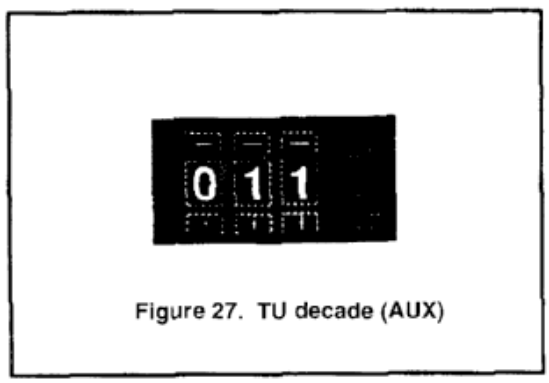



Figure 27. TU decade (AUX)

19. Identify "E" and "F" trimmers marked "D" for DIAL indication (Figure 28).
20. Adjust "E" trimmer marked "D" for DIAL until pointer on gauge reads **0 lb**.
21. Rotate FUNCT switch (S-2) on tester to SIM TU ONLY.
22. Adjust "F" trimmer marked "D" until pointer on indicator reads "READING IN LB" listed in Table 1.
23. Rotate FUNCT switch (S-2) back to AIRCRAFT ONLY.
24. Readjust "E" trimmer if necessary to make pointer return to **0 lb**.
25. Turn tester power OFF.
26. Pull FUEL QTY breaker. Turn OFF aircraft power.
27. Disconnect "T" cable from tester. Disconnect tester ground wire from aircraft and tester. Store in lid of tester.
28. Reinstall gauge per Task 8-80.5, step 12.

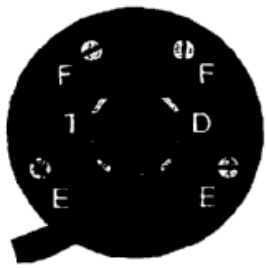
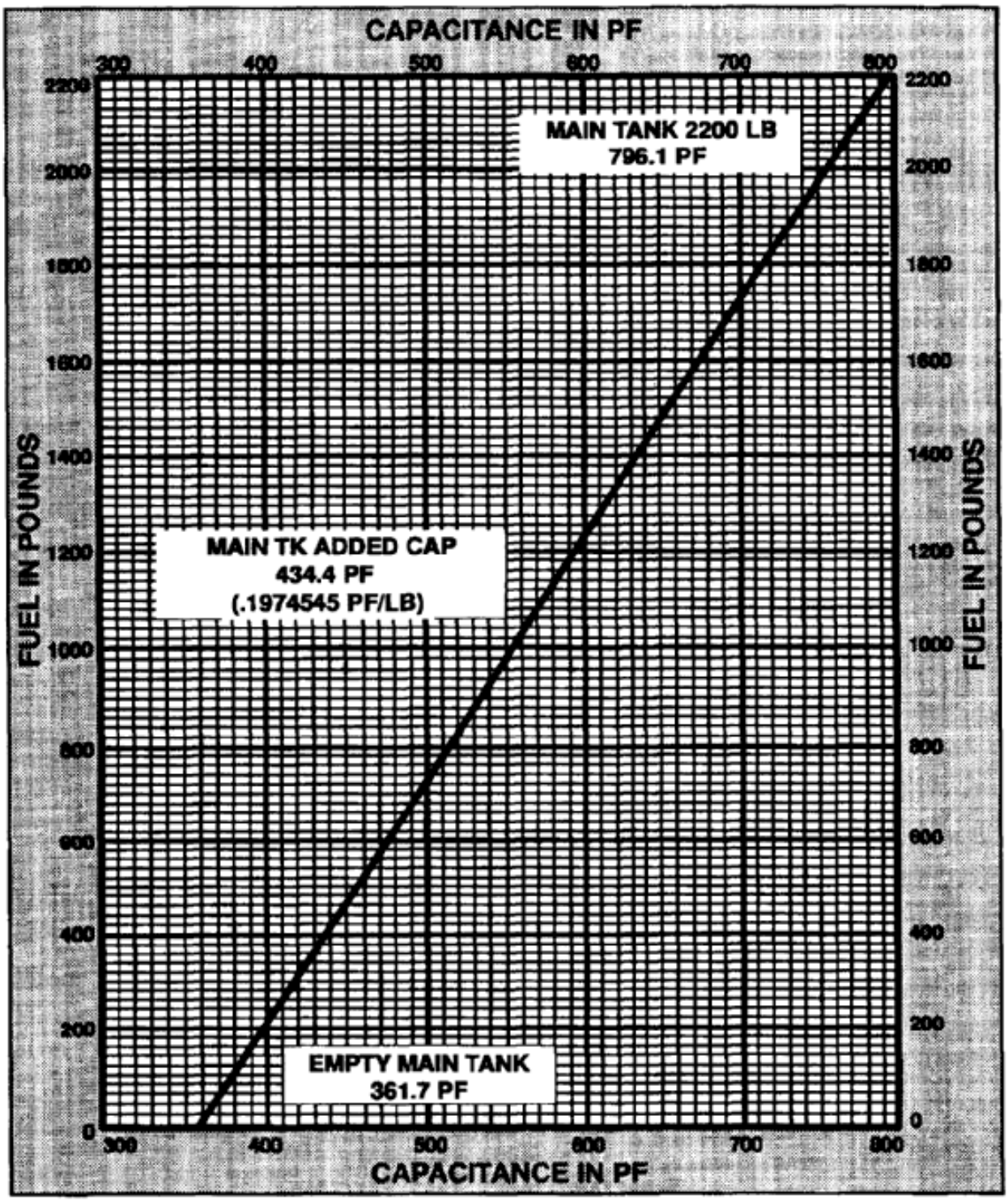


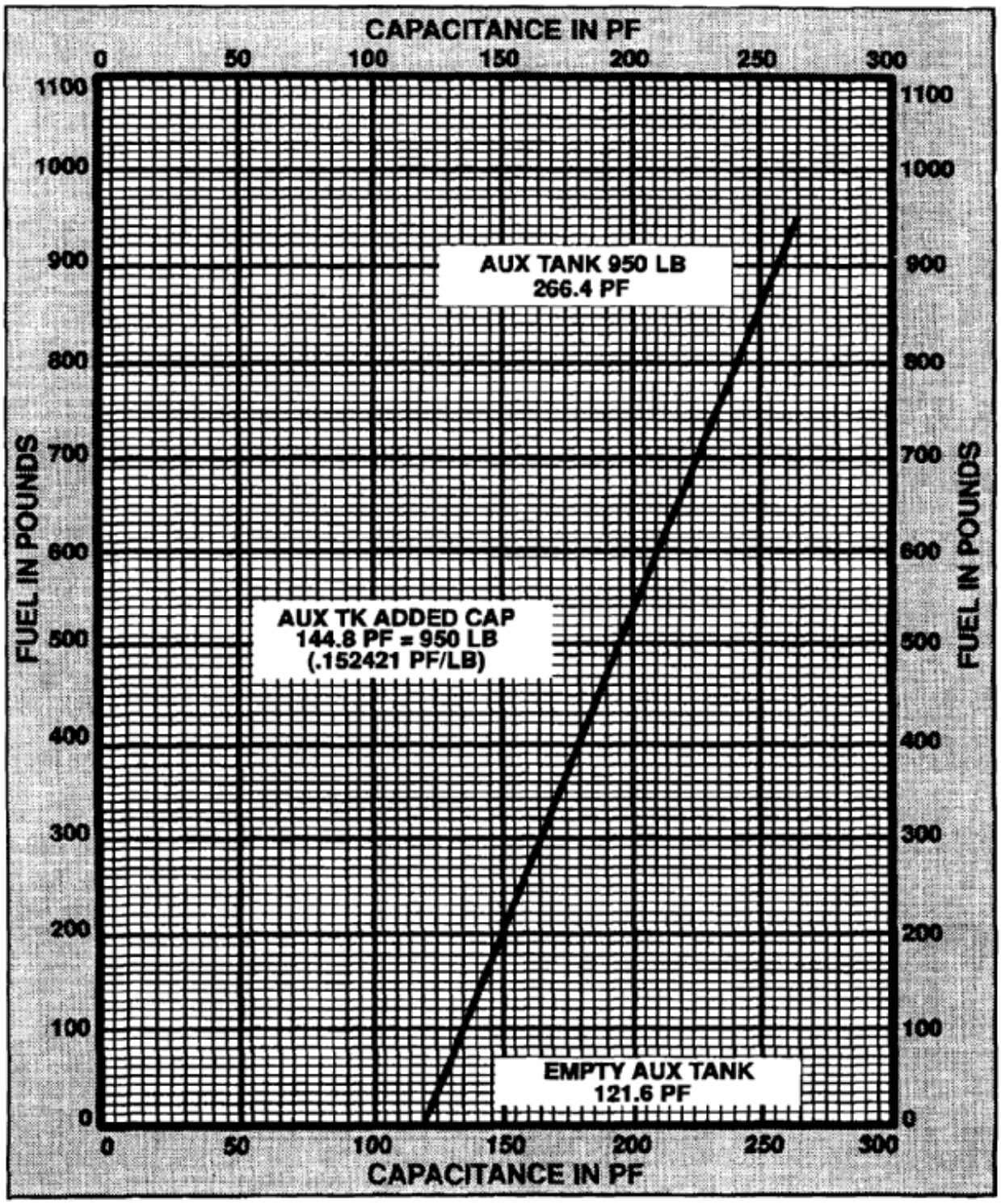
Figure 28. Trimmer identification

***SECTION D: CHECK GAUGE LINEARITY OR ACCURACY AT ANY POINT OTHER THAN EMPTY OR FULL QUANTITIES***

1. Calibrate dial indication.
2. Complete Sections A and C.
3. Disconnect (P-1 or P-2) or "T" cable from tank-wall.
4. Subtract LOZ-HIZ capacitance measured in step 13 from capacitance given in Graph I or II for desired dial reading.
5. Rotate SELECT switch to TU.
6. Set TU decade (D-1) **15-20 pf** below desired capacitance.
7. Adjust TU vernier (V-1) to read capacitance calculated in step 4.
8. Rotate FUNCT switch to SIM TU ONLY.
9. Verify that indicator dial reads FUEL QUANTITY IN LB given in Table 1.
10. Pull breakers. Restore aircraft to normal configuration.
11. Turn tester OFF. Store ground wire in lid.


CAPACITANCE IN PF
300
400
500
600
700
800
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
FUEL IN POUNDS
MAIN TANK 2200 LB
796.1 PF
MAIN TK ADDED CAP
434.4 PF
(.1974545 PF/LB)
EMPTY MAIN TANK
361.7 PF

Graph I




Graph II

END OF TASK

## 8-80.6 REMOVE FUEL QUANTITY SWITCH BOX 8-80.6

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

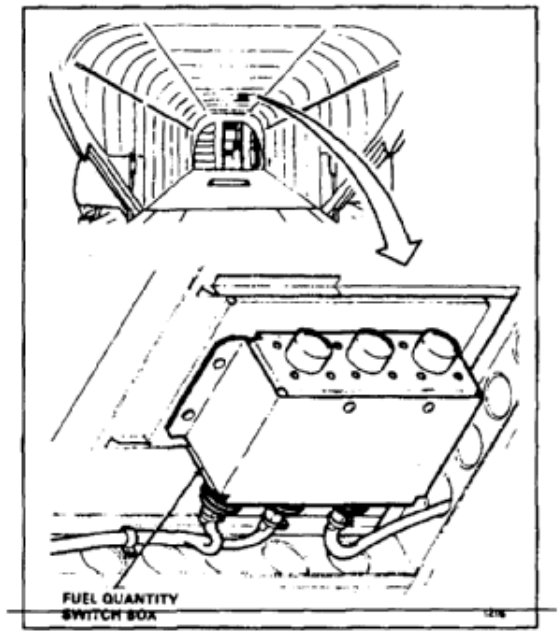
None

***Personnel Required:***

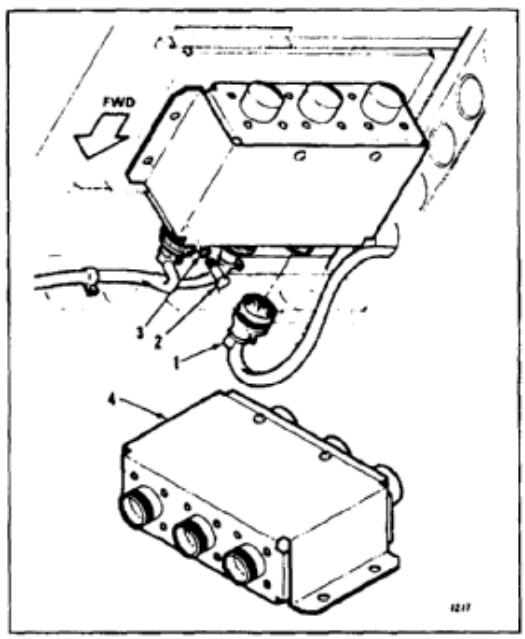
Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Cabin Ceiling Acoustical Panels Removed (Task 2-208)




1. Disconnect three electrical connectors (1).
2. Remove four screws (2) and washers (3). Remove switch box (4).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-80.7 DISASSEMBLE FUEL QUANTITY SWITCH BOX (AVIM) 8-80.7

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun
Contact Removal/Insertion Tool, M81969/14-03

***Materials:***

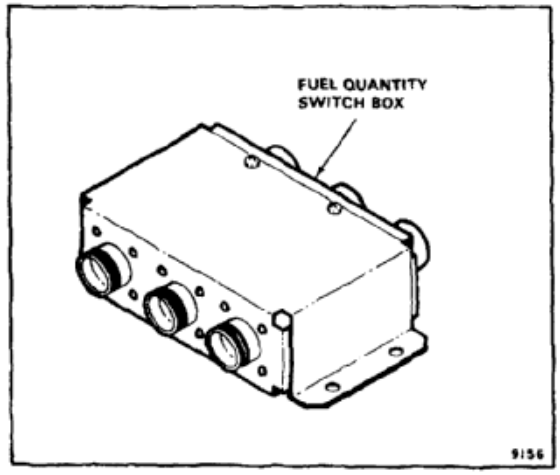
Paper Tags (E264)

***Personnel Required:***

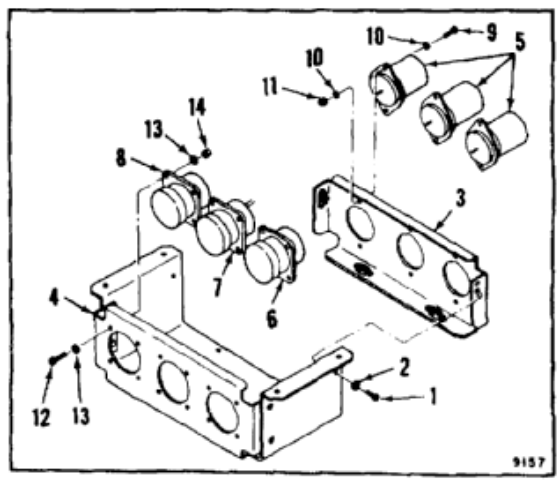
Aircraft Electrician

***Equipment Condition:***

Off Helicopter Task




1. Remove 4 screws (1), washers (2), and separate cover (3) from housing (4).
2. Tag and unsolder wires from three relays (5). Tag and remove wires from three receptacles (6, 7, and 8). Use contact removal/insertion tool.
3. Remove six screws (9), twelve washers (10) and six nuts (11), and separate 3 relays (5) from cover (3).
4. Remove twelve screws (12), twenty-four washers (13), twelve nuts (14) and separate receptacles (6, 7, and 8) from housing (4).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-80.8 ASSEMBLE FUEL QUANTITY SWITCH BOX (AVIM) 8-80.8

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Iron
Gun Type Heater
Contact/Removal Insertion Tool, M81969/14-03

***Materials:***

Flux (E178)
Solder (E360)
Tubing Heat Shrinkable (E431)

***Personnel Required:***

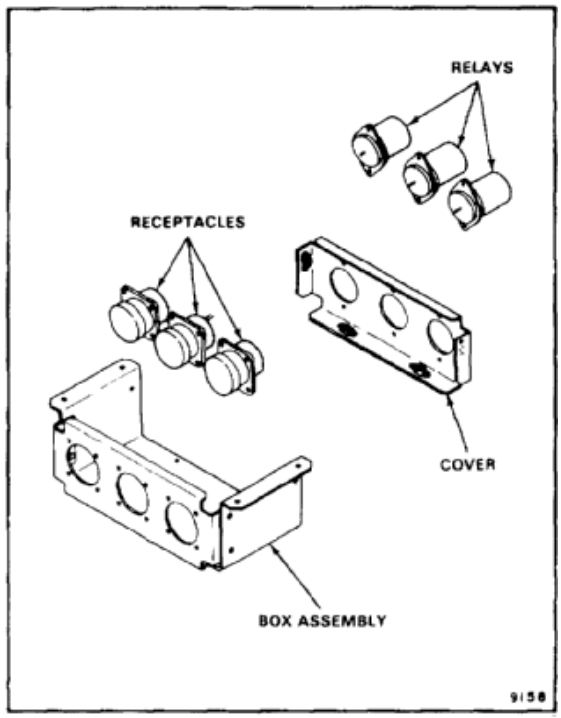
Aircraft Electrician
Inspector

***References:***

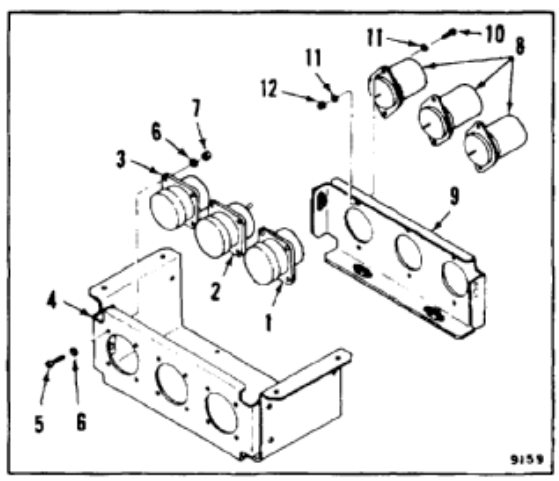
TM 55-1520-240-23P
TM 55-1500-323-24

***Equipment Condition:***

Off Helicopter

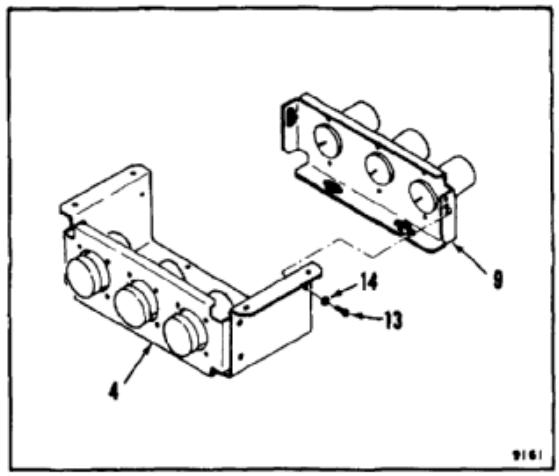



1. Position three receptacles (1, 2, and 3) in box assembly (4). Install twelve screws (5), twenty-four washers (6), and twelve nuts (7).
2. Position three relays (8) in cover (9). Install six screws (10), twelve washers (11), and six nuts (12).
3. Connect wires to three relays (8). Refer to tags. Use solder (E360) and tubing (E431) (TM 55-1500-323-24).
4. Connect wires to three receptacles (1, 2, and 3). Refer to tags. Use contact removal/insertion tool (M81969/14-03) (TM 55-1500-323-24).
5. Remove tags.




***INSPECT***

6. Position cover (9) on box assembly (4). Install four screws (13) and washers (14).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-80.9 INSTALL FUEL QUANTITY SWITCH BOX 8-80.9

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

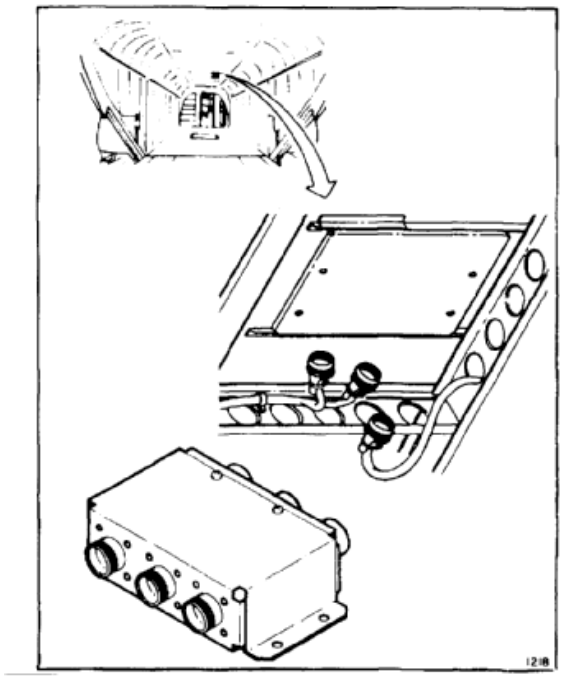
None

***Personnel Required:***

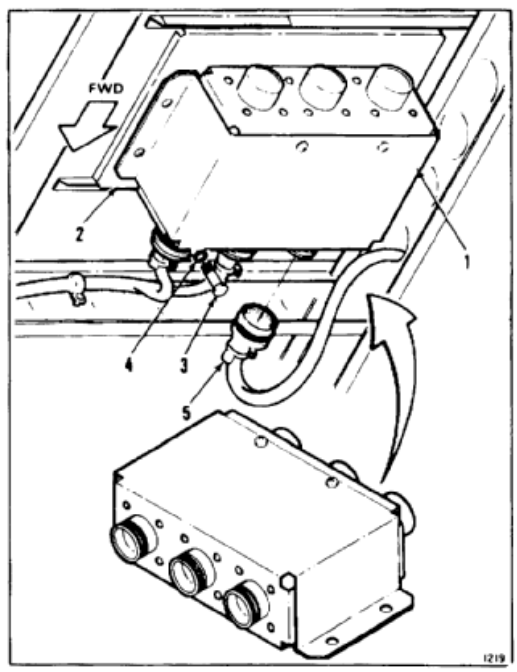
Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P



1. Position fuel quantity switch box (1) on mounting plate (2). Install four screws (3) and washers (4).
2. Connect three electrical connectors (5).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check of fuel quantity indicating system (TM 55-1520-240-T).
Install cabin ceiling acoustical panels (Task 2-210).

END OF TASK

## 8-81 REMOVE FUEL QUANTITY INDICATING SYSTEM TANK UNIT 8-81

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

***Materials:***

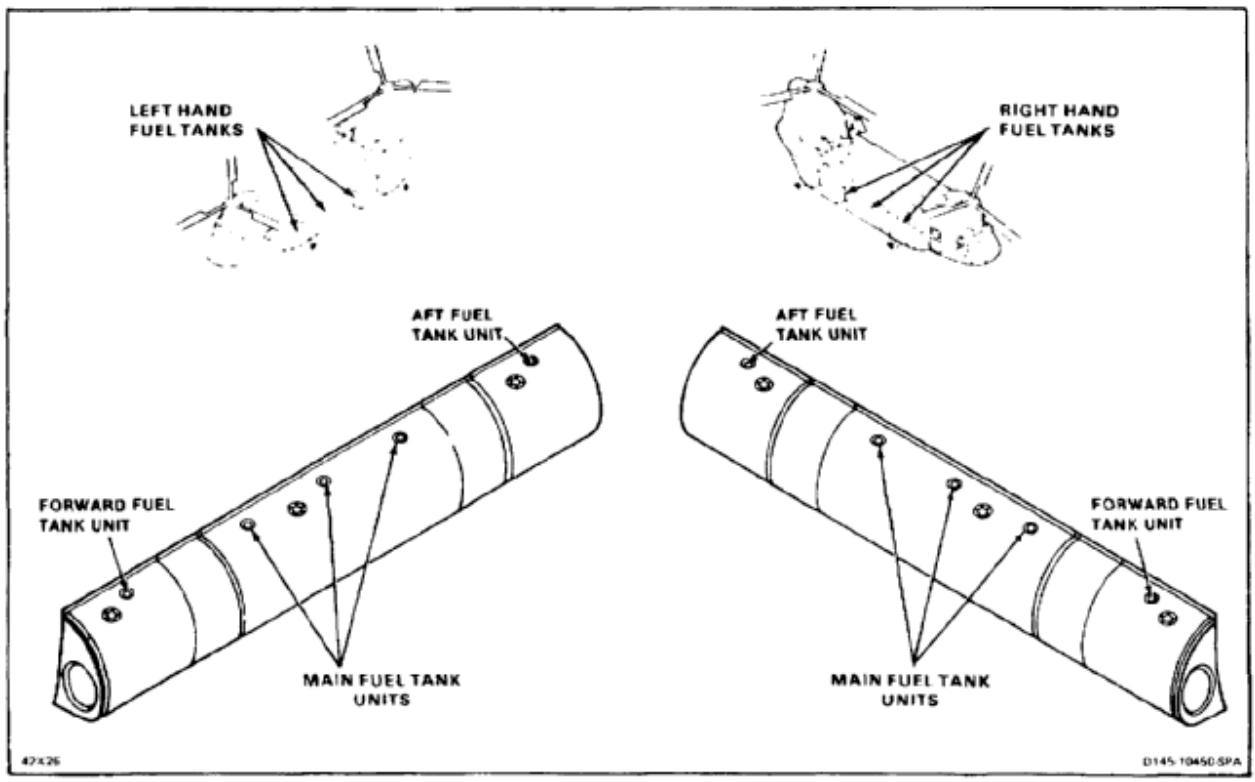
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

Medium Helicopter Repairer

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Helicopter Grounded
Electrical Power Off
Hydraulic Power Off



**NOTE**

Procedure is same to remove any tank unit except where noted in task. Removal of left hand main center tank unit is shown here.

1. Remove four bolts (1) and washers (2).

**NOTE**

Forward and aft tanks have five bolts and washers.

2. Lift unit (3) from tank (4) until four terminals (5) are exposed. Loosen wire clamp (6). Tag and disconnect four wires (7) by loosening four screws (8). Tape wire ends. Secure wires to fuel tank.

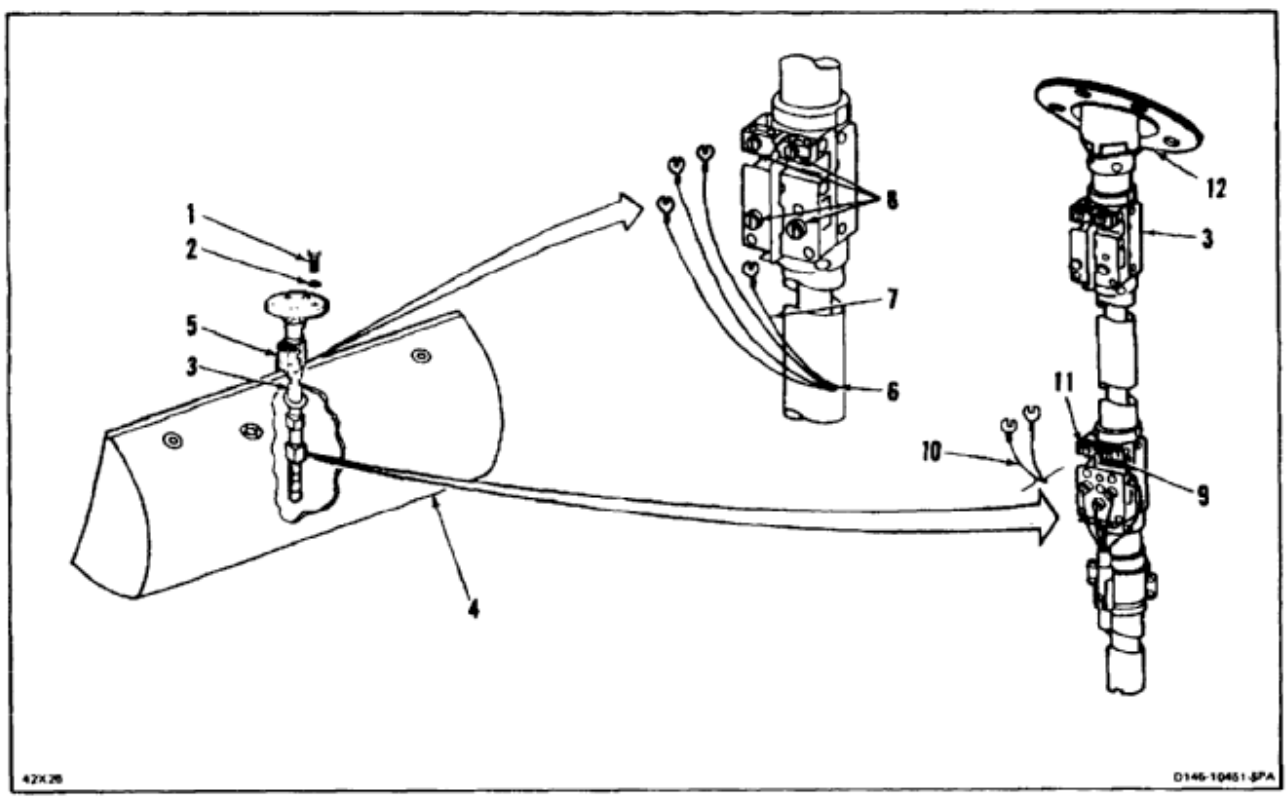
**NOTE**

Left hand main center tank unit and right hand main center tank unit have wires connected to the bottom of the unit.

3. Lift unit (3) out of tank (4) until two terminals (9) are exposed. Tag and disconnect two wires (10) by loosening two screws (11). Tape wire ends. Secure wires to fuel tank.
4. Remove unit (3).
5. Remove gasket (12).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 8-82 INSTALL FUEL QUANTITY INDICATING SYSTEM TANK UNIT 8-82

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 30-150 Inch-Pounds

***Materials:***

None

***Parts:***

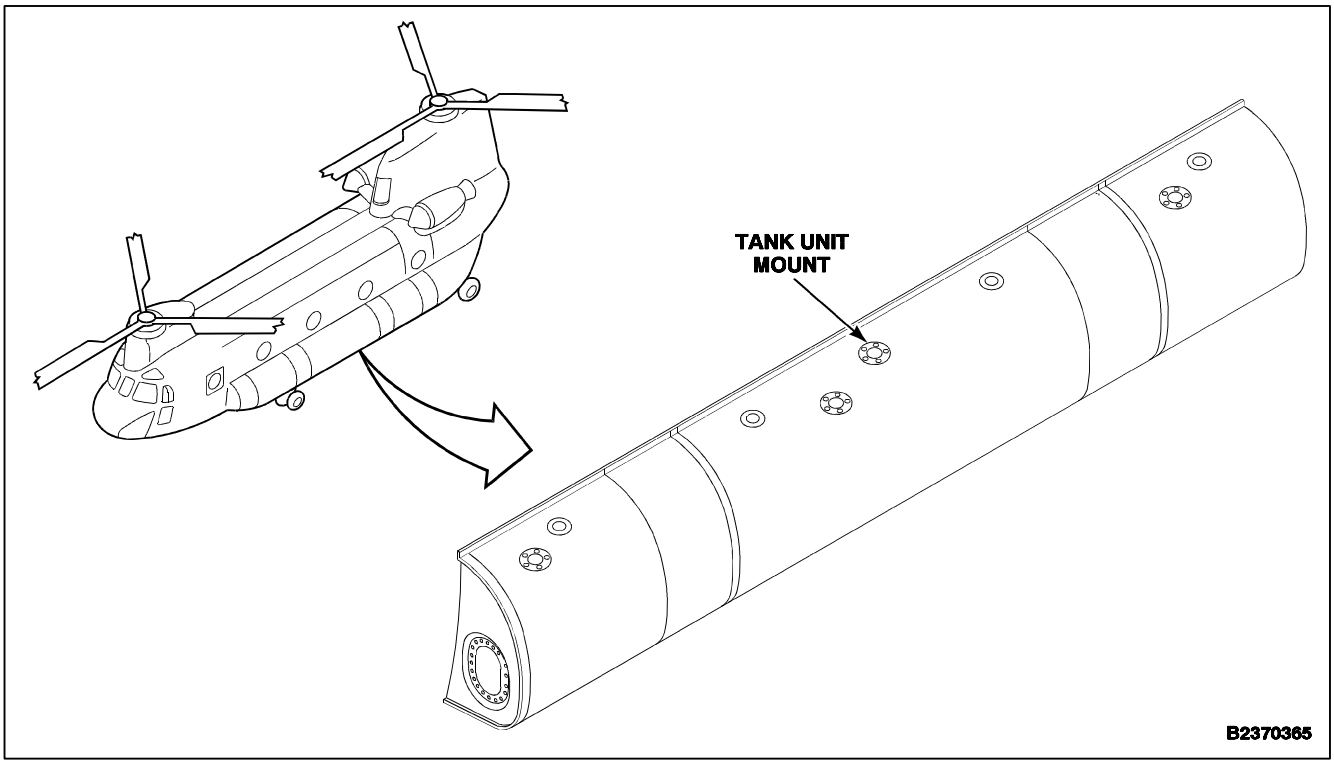
Gasket

***Personnel Required:***

CH-47 Helicopter Repairer
Inspector

***References:***

TM 55-1520-240-23P



**NOTE**

Procedure is same to install any tank unit except where noted in task. Installation of left hand main center tank unit is shown here.

1. Install gasket (1) on unit (2).

**NOTE**

Left hand main center tank unit and right hand main tank unit have wires connected to the bottom of the unit.

2. Insert unit (2) into tank (3) until bracket (4) is at top of tank. Remove tape and install two wires (5) to two terminals (6). Tighten two screws (7). Remove tags.
3. Lower unit (2) into tank (3) until bracket (8) is at top of tank. Remove tape and connect four wires (9) to four terminals (10). Tighten four screws (11). Remove tags.
4. Tighten clamp (12).
5. Lower unit (2) into tank (3). Install four bolts (13) and washers (14).

**NOTE**

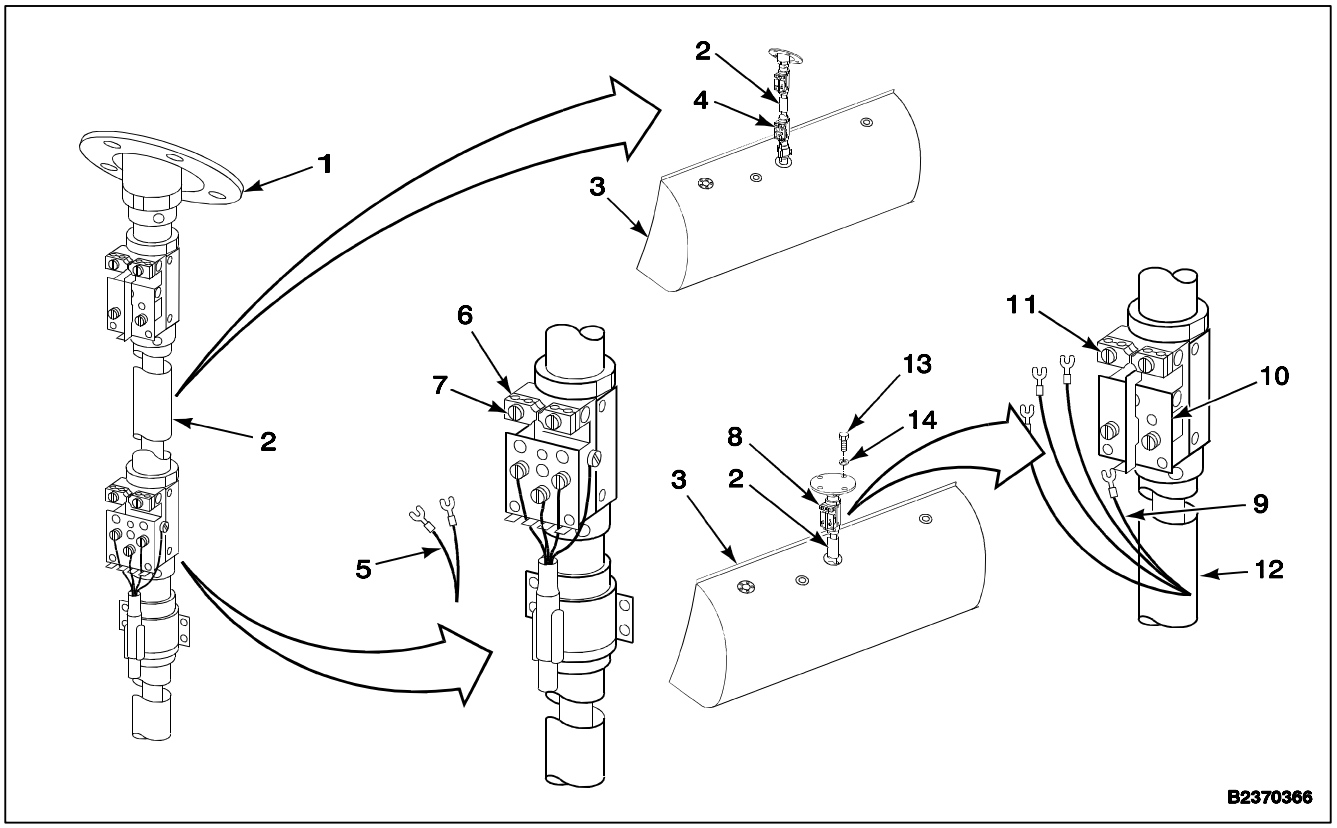
Forward and aft tanks have five bolts and washers.

6. Torque four bolts (13) to **60-80 inch-pounds**.

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).
Perform test and adjust fuel quantity indicator using PSD 60-fuel quantity test set (Task 8-80.5.1, Part III).




END OF TASK

## 8-82.1 REPLACE FUEL QUANTITY SYSTEM COAXIAL CONNECTOR CONTACTS 8-82.1

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Soldering Stand Assembly, P/N 949649
Super Heater, Heating Tool, AA-400
Mini Solder Sleeve Reflector, 979663
Holding Fixture, AD-1319 or AD-1494
Adapter, AT-1319-19
Solder Gun
Crimper, Inner Contact MH800, Locator K269
Crimper, Outer Contact WT440, DIE No. 4400
Insertion/Extraction Tool, MS3447-12/M155-670-12
Air Pressure Supply, 0 to 100 PSI
Knife or Razor Blade

***Materials:***

Tubing, Heat Shrinkable (E431)
Solder (E360)

***Parts:***

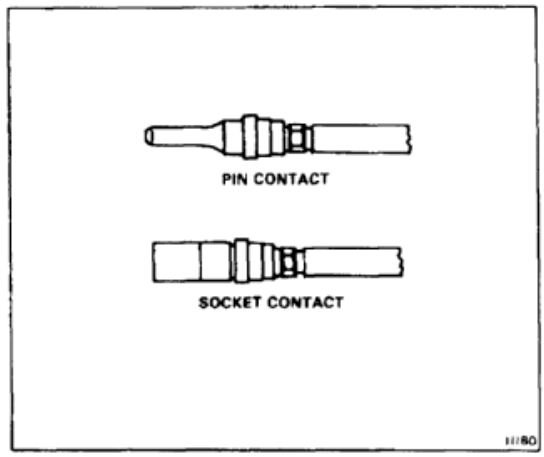
Solder Pins, Soldertact, NSN 5999-01-127-3954
Solder Sockets, Soldertact, NSN 5999-01-068-2588
Crimp Pins 10936
Crimp Sockets 10937

***Personnel Required:***

Aircraft Electrician
Inspector

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




**NOTE**

This procedure describes two methods of contact replacement: the solder method and the crimp method. Soldering procedure is same for pin or socket contacts. Pin contacts are shown.

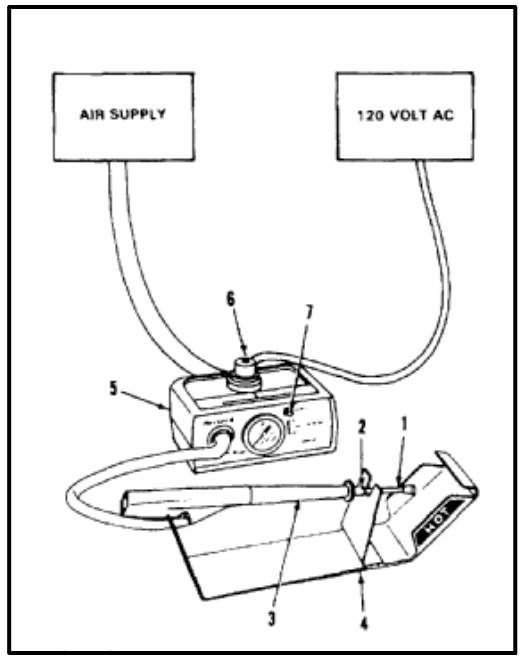
*SOLDER METHOD CONTACT REPLACEMENT*

**Soldering Equipment Setup**

**WARNING**

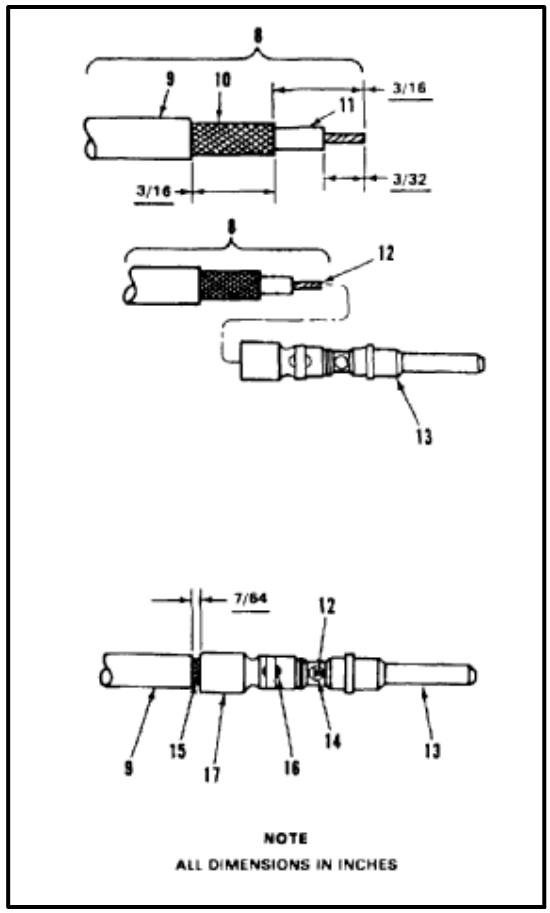
Do not touch soldering gun nozzle or tip. Tip temperature is more than **500ºF**. Serious burns could result if touched.

1. Install reflector (1) over nozzle (2) of gun (3).
2. Place gun (3) in stand (4).
3. Attach heater (5) to air supply. Using knob (6), adjust indicated air pressure to **30 psi**.
4. Attach heater to **120 vac**.
5. Adjust air to **50 psi**. The heat light (7) on the heater (5) will come on.
6. Allow heat to stabilize for **1 minute**. It may be necessary to readjust the air pressure to maintain **50 psi**.



**Cable Preparation**

7. Prepare coaxial cable (8) by removing outer jacket (9), shield (10), and dielectric (11) to dimensions shown.
8. Tin coaxial cable center conductor (12). Use solder (E360).
9. Install contact (13) carefully over end of prepared cable (8). Push contact gently, while twisting it onto cable until it seats.
10. Check that the center conductor (12) is visible through the forward inspection hole (14). Also, check that the shield braid (15) is visible through the rear inspection window (16).
11. Check that the spacing between the end of the contact body (17) and the cable jacket insulation (9) does not exceed **7/64 inch**.

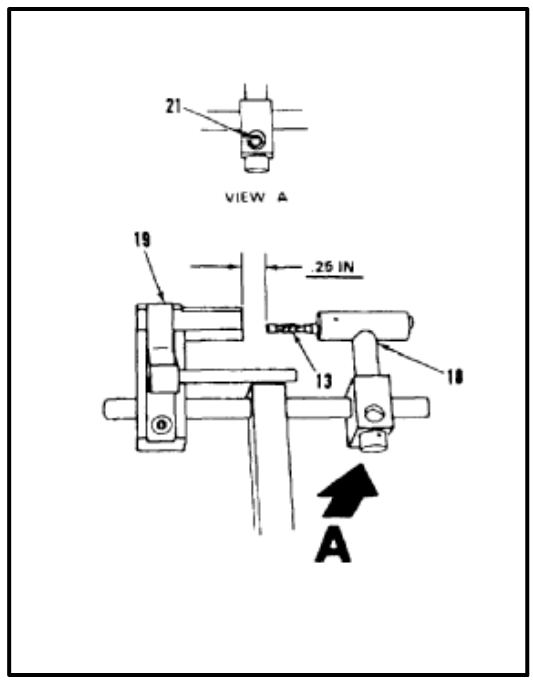


**Holding Fixture Setup**

CAUTION

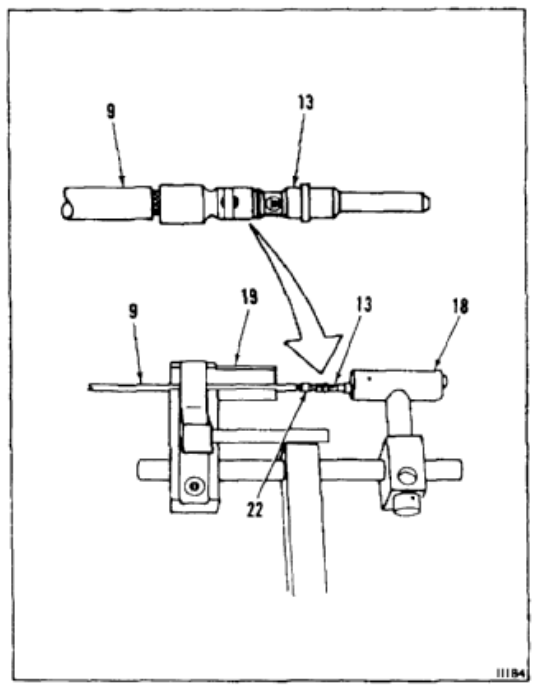
The holding fixture and adapter or the smaller holding tool must be used when soldering to prevent damage to contacts. When using the smaller holding tool, the cable must be secured to prevent cold solder joints.

12. Install a contact (13) into the appropriate end of the adapter (18). Pin contact into P end or socket contact into S end.
13. Adjust adapter (18) to give a setup dimension of about **0.25 inches** from end of contact (13) to end of cable clamp (19).
14. Tighten set screw (21) on back of adapter (18). Remove contact (13).

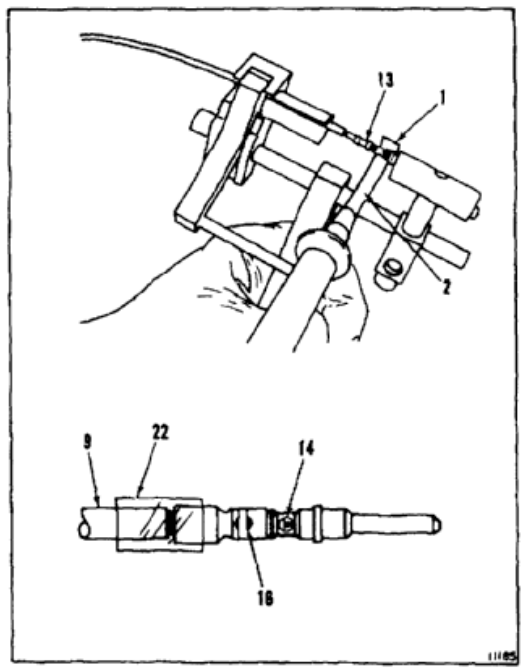



**Soldering Operation**

15. Position contact (13) and cable (9) through cable clamp (19).
16. Install heat shrink sleeving (22) over end of cable (9).
17. Check that the cable (9) is fully inserted into the contact (13).
18. Insert the contact (13) fully into the adapter (18).
19. Check that the cable (9) is straight between the cable clamp (19) and the adapter (18).



20. Position heat gun nozzle (2) and reflector (1) so that the contact (13) is in the hot air stream.
21. Direct heat around the front inspection window (14) and rear inspection window (16) until the solder preforms melt and flow onto the conductors, and the insulating sleeve (22) shrinks around the coaxial cable outer jacket (9).
22. Remove heat.

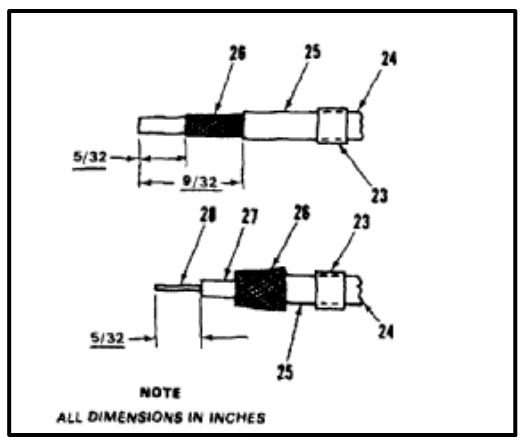



***INSPECT***

***ASSEMBLY PROCEDURE FOR CRIMP TYPE CONTACT***

**Cable Preparation**

23. Install crimp sleeve (23) over end of coaxial cable (24).
24. Prepare coaxial cable (24) by removing outer jacket (25) and shield (26) to dimensions shown.
25. Fold back shield (26) and strip dielectric (27) from inner conductor (28) to dimensions shown.



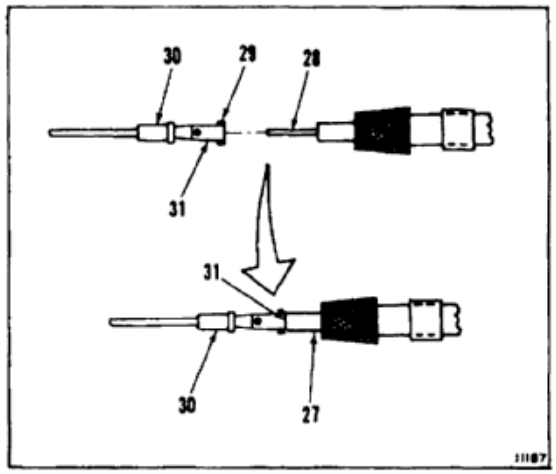
26. Install contact separator (29) on inner contact (30) flush with end of wire barrel (31).

**NOTE**

If required, trim cable inner conductor in order to butt end of contact wire against cable dielectric before crimping.

27. Install inner contact (30) on inner conductor (28) with end of wire barrel (31) against dielectric (27).

28. Crimp inner contact (30). Use crimper MH800 with locator K269.



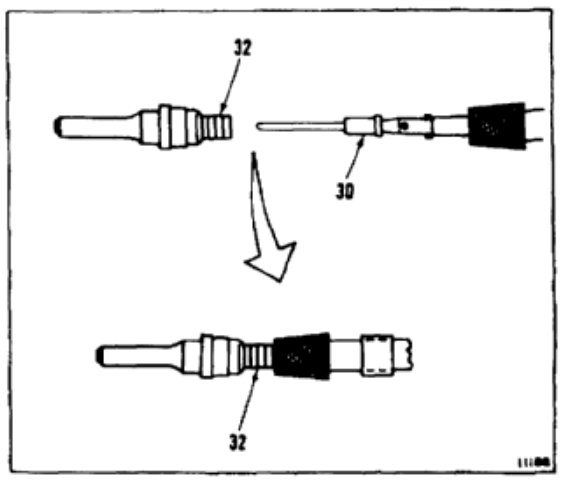

**CAUTION**

Do not exert more than **1 pound** pressure to seat inner contact. Damage to contact could occur.

**NOTE**

After seating inner contact on cable, support contact and cable until crimp sleeve is installed to prevent strain on inner contact crimp joint.

29. Push inner contact (30) onto contact outer body (32) until inner contact seats.



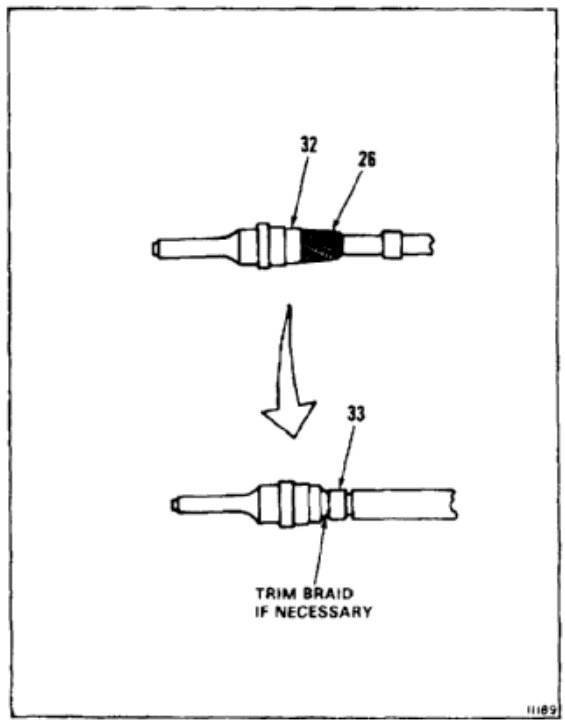
30. Fold cable outer braid (26) over back of contact (32).

**NOTE**

After crimping, trim any braid protruding from between crimp sleeve and contact shoulder as close to the sleeve as possible.

31. Slide crimp sleeve (33) forward over the exposed braid (26). Crimp the sleeve. Use crimper, Thomas and Betts WT440 and DIE4400 or equivalent.

***INSPECT***



***ASSEMBLY PROCEDURE FOR CRIMP TYPE SOCKET***

**Prepare cable as shown in steps 21 thru 25.**

**CAUTION**

Do not exert more than **1 pound** pressure to seat inner contact. Damage to contact could occur if more than **1 pound** pressure is used.

**NOTE**

After seating inner contact, support contact cable assembly until crimp sleeve is installed to prevent strain on inner contact crimp joint.

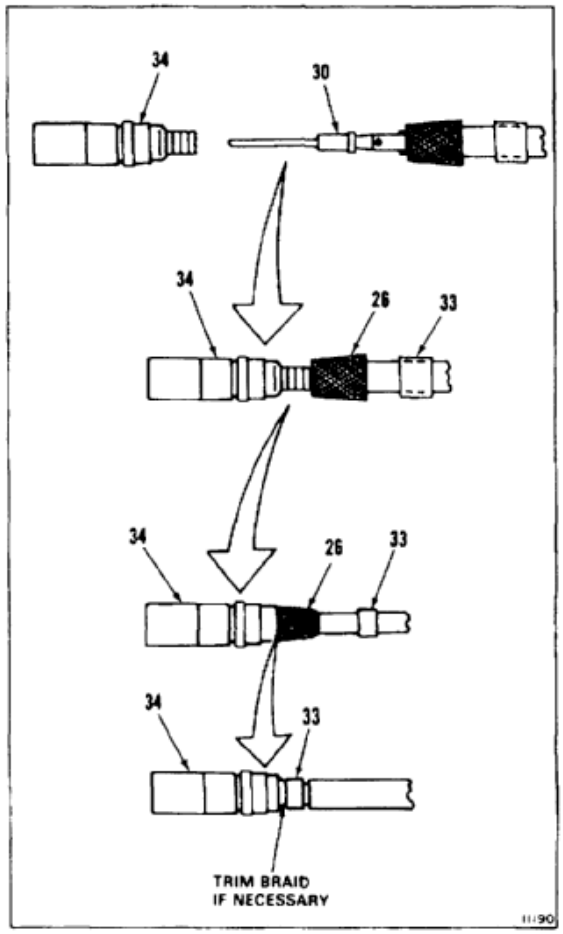
32. Push inner contact (30) onto contact outer body (34) until inner contact seats.

33. Fold cable outer braid (26) over back of contact (34).

**NOTE**

After crimping, trim any braid protruding from between crimp sleeve and contact shoulder as close as possible.

34. Slide crimp sleeve (33) forward over the exposed braid (26). Crimp sleeve. Use crimper MH800.




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-83 TEST HYDRAULIC PRESSURE INDICATOR 8-83

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
DC Power Supply, 0-5 Volt
Connector, MS3476W10-6S
Calibrated Voltmeter

***Materials:***

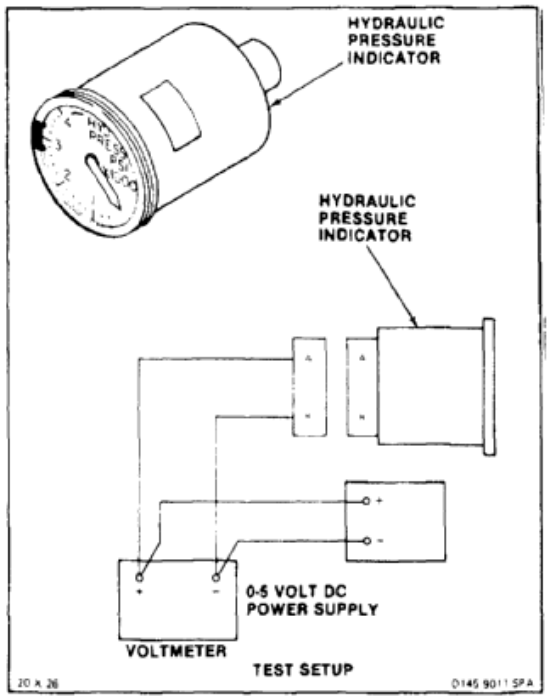
None

***Personnel Required:***

Aircraft Electrician
Inspector

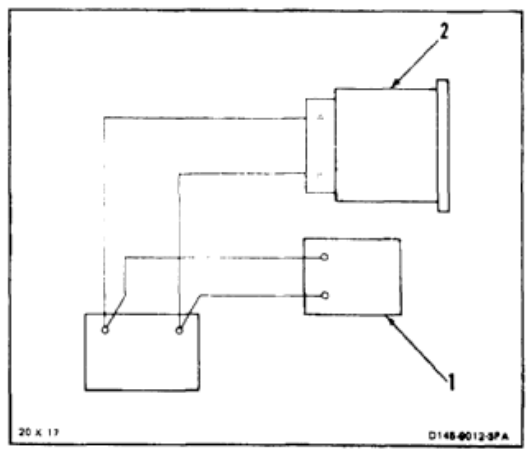
***Equipment Condition:***

Off Helicopter Task
Test Setup




**CAUTION**

Be careful when handling indicator.
Rough handling will damage indicator.




1. Turn on and adjust dc power supply (1) to **0 volts**.
2. Connect indicator (2) to test setup.
3. Adjust power supply to settings listed. Indicator readings shall be as follows:

| DC SOURCE MIN | VOLTAGE MAX | SCALE READING (PSI) |
|---|---|---|
| 1.410 | 1.590 | 1000 |
| 2.410 | 2.590 | 2000 |
| 3.410 | 3.590 | 3000 |
| 4.410 | 4.590 | 4000 |

4. Adjust power supply (1) to **0 volts** and shut down.
5. Disconnect indicator (2) from test setup.

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-84 TEST HYDRAULIC RESERVOIR LEVEL INDICATORS 8-84

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Meter Test Set TS-682A/GSM-1
Connector, MS3476W8-33S
Wire, No. 20, Unshielded

***Materials:***

None

***Personnel Required:***

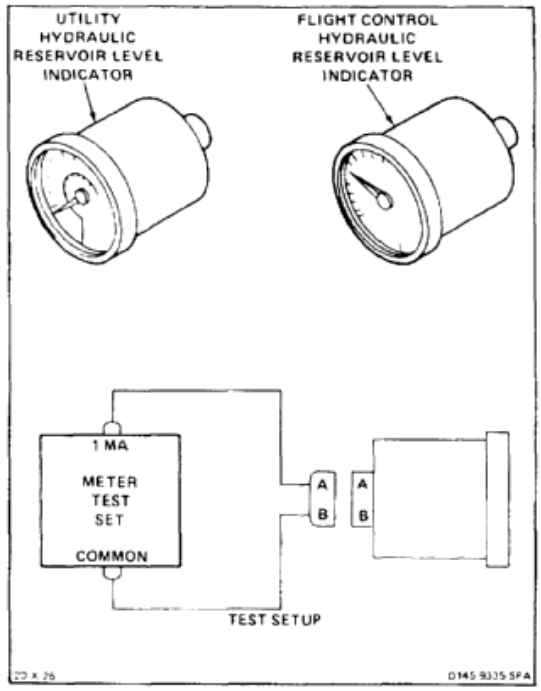
Aircraft Electrician
Inspector

***References:***

TM 11-6625-277-14

***Equipment Condition:***

Off Helicopter Task
Electrical Test Setup

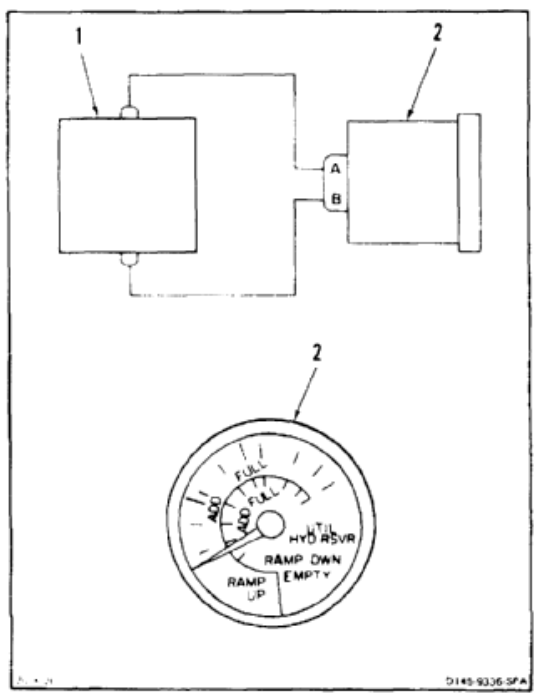



**NOTE**

Test setup is the same for both utility, hydraulic, or flight control reservoir indicators. If testing utility indicator, go to step 1. If testing flight control indicator, go to step 6.

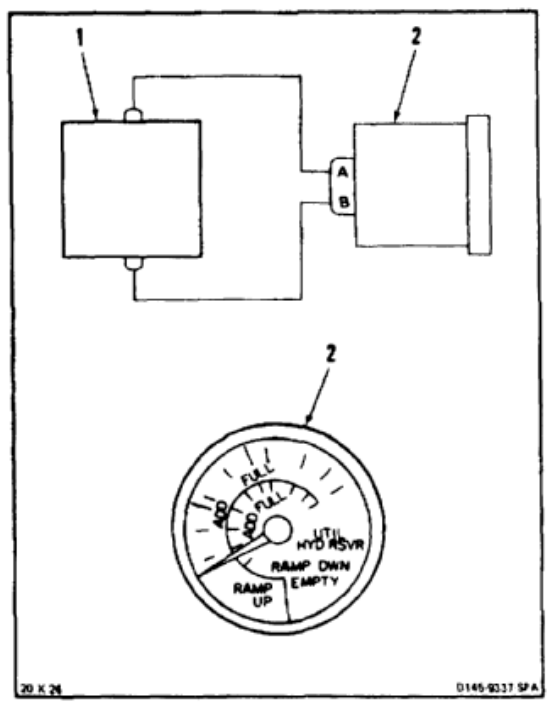
***TEST UTILITY HYDRAULIC RESERVOIR INDICATOR***

1. Adjust meter test set (1) to **0 milliamperes** (TM 11-6625-277-14).
2. Connect utility hydraulic reservoir indicator (2) to test setup.
3. Apply power to test setup and adjust meter test set (1) (TM 11-6625-277-14). For indicator (2) outer scale marks, milliampere readings shall be as follows:



| INDICATOR OUTER SCALE MARK | TEST SET MILLIAMPERE READING |
|---|---|
| 1 (EMPTY) | 0 |
| 2 | .29 |
| 3 | .38 |
| 4 (ADD) | .46 |
| 6 | .48 |
| 6 | .57 |
| 7 (FULL) | .65 |
| 8 | .73 |
| 9 | .82 |
| 10 | .90 |
| 11 | 1.00 |

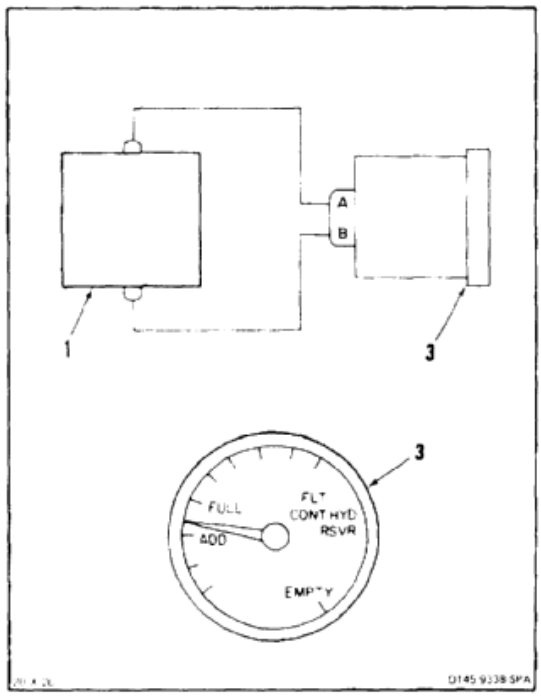
4. Adjust test set (1) to **0 milliamperes** (TM 11-6625-277-14).
5. Disconnect indicator (2) from test setup.



***TEST FLIGHT CONTROL HYDRAULIC RESERVOIR INDICATOR***

6. Adjust meter test set (1) to **0 milliamperes** (TM 11-6625-277-14).
7. Connect flight control hydraulic reservoir indicator (3) to test setup.
8. Apply power to test setup and adjust meter test set (TM 11-6625-277-14). For indicator scale marks, milliampere readings shall be as follows:

| INDICATOR SCALE MARKS | TEST SET MILLIAMPERE READING |
|---|---|
| 1 (EMPTY) | 0 |
| 2 | .33 |
| 3 | .41 |
| 4 (ADD) | .49 |
| 5 (FULL) | .58 |
| 6 | .66 |
| 7 | .74 |
| 8 | .82 |
| 9 | .90 |
| 10 | 1.00 |




9. Adjust test set (1) to **0 milliamperes** (TM 11-6625-277-14).
10. Remove power from test setup.
11. Disconnect indicator (3) from test setup.

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-85 TEST HYDRAULIC TEMPERATURE INDICATOR 8-85

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 6625-00-556-4915
Thermometer Tester, Electrical
Connector, MS3476W10-6S
DC Power Supply, 0-50 Volt
Wire, No. 20, Unshielded
Multimeter

***Materials:***

None

***Personnel Required:***

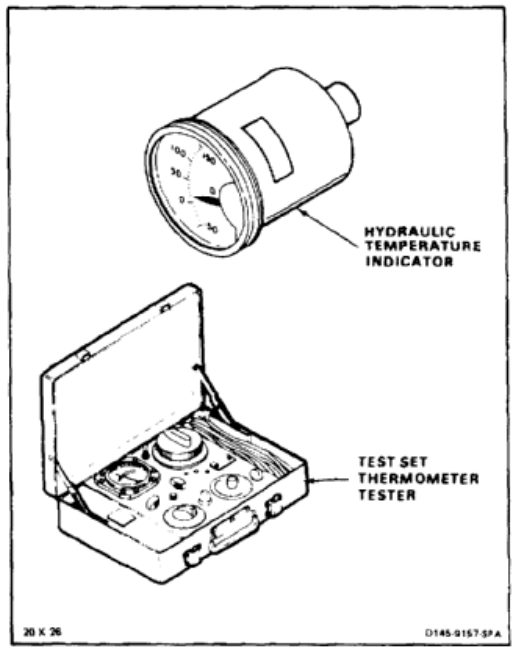
Aircraft Electrician
Inspector

***References:***

TM 1-1500-204-23
TM 55-6695-200-15

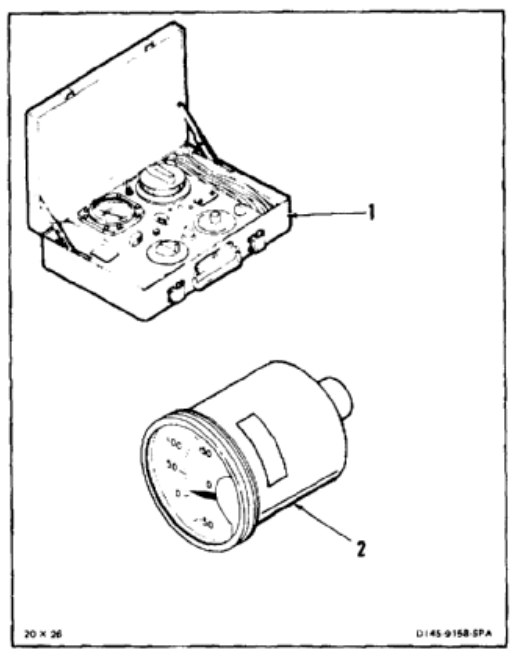
***Equipment Condition:***

Off Helicopter Task




1. Setup test set (1) (TM 55-6695-200-15).
2. Connect indicator (2) to test set.
3. Perform scale error test at **28.5 vdc** (TM 55-6695-200-15). Indicator readings shall be within tolerance as follows:

| INDICATOR TEST POINT °C(°F) | TEST SET AT NORMAL VOLTAGE (28.5) RANGE °C (°F) |
|---|---|
| –70 (–94) | –66 to –74° (–86.8 to –101.2°) |
| –30 (–22) | –27 to 33° (16.6 to –27.4°) |
| 0 (32) | –2 to 2° (28.4 to 35.6°) |
| 30 (86) | 28 to 32° (82.4 to 89.6°) |
| 79 (176) | 78 to 82° (172.4 to 179.6°) |
| 129 (248) | 117 to 123° (242.6 to 253.4°) |
| 150 (302) | 146 to 154° (294.8 to 309.2°) |




***INSPECT***

4. Disconnect indicator (2) from test set (1).

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-86 REMOVE CENTER INSTRUMENT PANEL CLAMP MOUNTED INSTRUMENTS 8-86

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

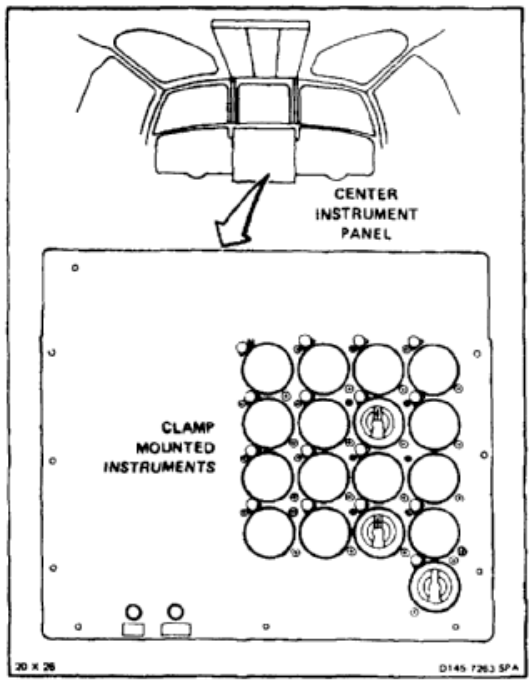
None

***Personnel Required:***

Aircraft Electrician

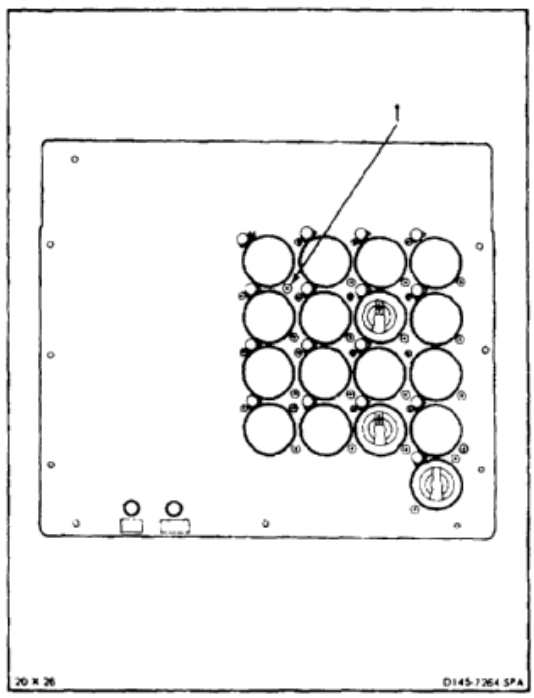
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




**NOTE**

Procedure is similar to remove the following center instrument panel components: No. 1 and No. 2 Gas Producer Tachometer, No. 1 and No. 2 PTIT Indicator, No. 1 and No. 2 Engine Oil Temperature Indicator, No. 1 and No. 2 Engine Oil Pressure Indicator, Transmission Oil Pressure Indicator, Transmission Oil Pressure Selector Switch, Transmission Oil Temperature Indicator, Transmission Oil Temperature Selector Switch, Forward Cyclic Trim Indicator, Aft Cyclic Trim Indicator, Fuel Flow Indicator, Fuel Quantity Indicator, and Fuel Quantity Selector Switch. Removal of No. 1 Gas Producer Tachometer is shown here.

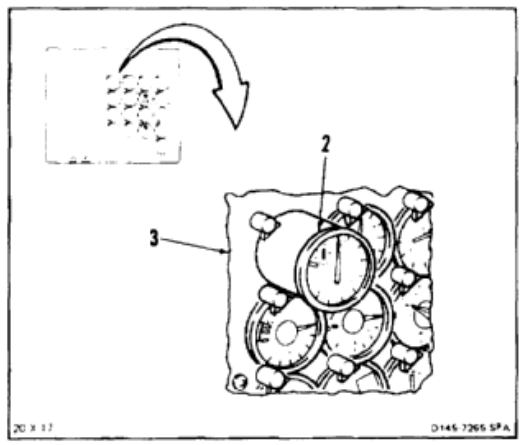



1. Loosen round head clamp screw (1).

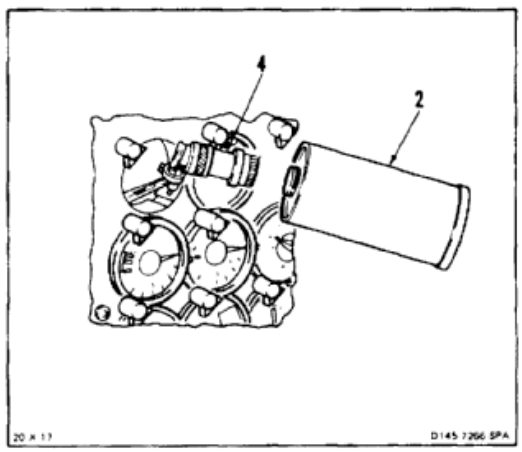
CAUTION

Be careful when handling instruments. Rough handling will damage instruments.

2. Grasp instrument (2), at case rim, then pull out of panel (3).




3. Disconnect wire harness connector (4) from instrument (2).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-87 INSTALL CLAMP MOUNTED INSTRUMENTS IN CENTER INSTRUMENT PANEL 8-87

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Small Brush, Camel Hair

***Materials:***

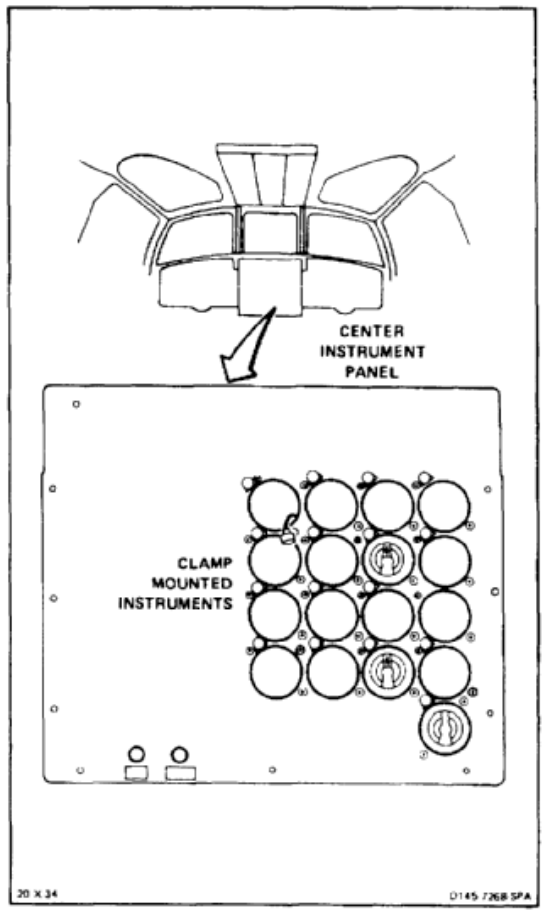
Cloth (E120)

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P
TM 55-1520-240-10
TM 55-6600-200-20
TM 55-1500-323-25




**CAUTION**

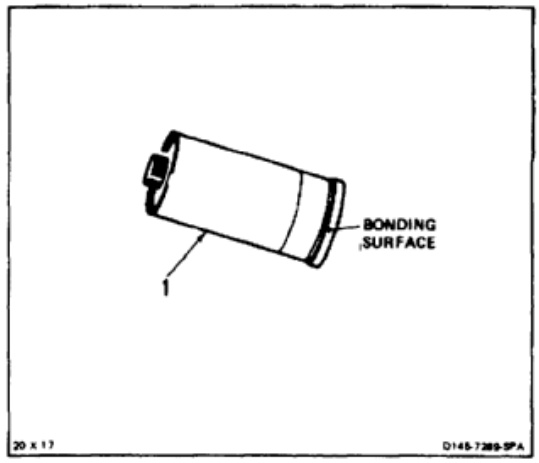
Be careful when handling instruments. Rough handling will damage instruments.

**NOTE**

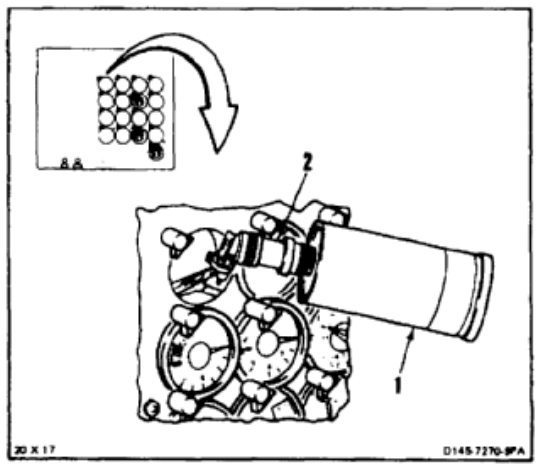
Procedure is similar to install the following center instrument panel components: No. 1 and No. 2 Gas Producer Tachometer, No. 1 and No. 2 PTIT Indicator, No. 1 and No. 2 Engine Oil Temperature Indicator, No 1 and No. 2 Engine Oil Pressure Indicator, Transmission Oil Pressure Indicator, Transmission Oil Pressure Selector Switch, Transmission Oil Temperature Indicator, Transmission Oil Temperature Selector Switch, Forward Cyclic Trim Indicator, Aft Cyclic Trim Indicator, Fuel Flow Indictor, Fuel Quantity Indicator, and Fuel Quantity Selector Switch. Installation of No. 1 Gas Producer Tachometer is shown here.

## 8-87 INSTALL CLAMP MOUNTED INSTRUMENTS IN CENTER INSTRUMENT PANEL (Continued) 8-87

1. Clean bonding surface of instrument (1). Use cloth (E120).
2. Check instrument (1) for range marks. Apply range marks and index mark to instrument, if required (TM 55-1520-240-10 and TM 55-6600-200-20).



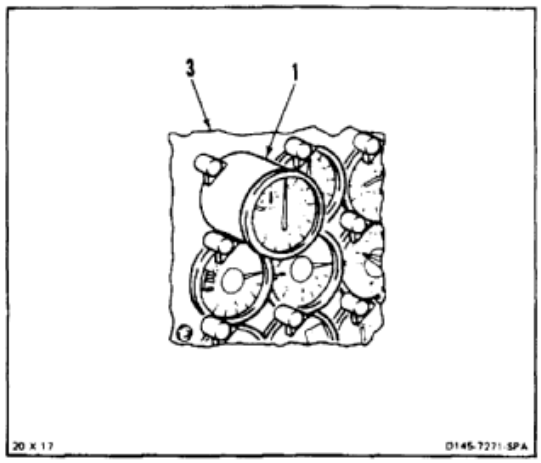

3. Connect wire harness connector (2) to instrument (1).



**8-87 INSTALL CLAMP MOUNTED INSTRUMENTS IN CENTER INSTRUMENT PANEL (Continued)** **8-87**

4. Install instrument (1) in panel (3). If installing PTIT indicator, engine oil temperature indicator, or engine oil pressure indicator, position noted graduation at **9 o'clock** position as follows:

| INDICATOR | GRADUATION LOCATED AT 9 O'CLOCK POSITION |
|---|---|
| PTIT | 763ºC |
| ENGINE OIL TEMPERATURE | 88ºC |
| ENGINE OIL PRESSURE | 70 PSI |

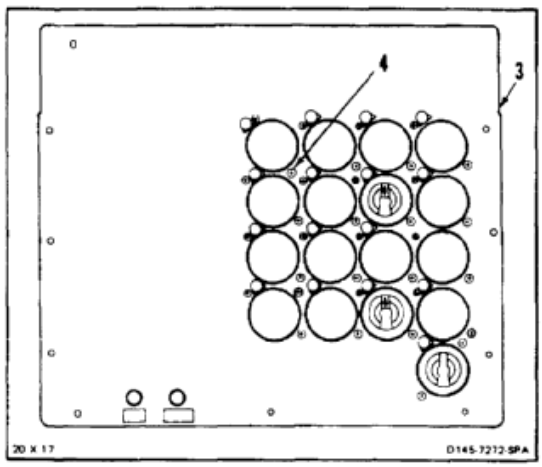



5. Tighten round head clamp screw (4).
6. Apply index mark, if required, from instrument (1) to panel (3) (TM 55-6600-200-20).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

If fuel quantity indicator was replaced, test and adjust (Task 8-80.5).
Perform operational check of affected system (TM 55-1520-240-T).




END OF TASK

## 8-88 REMOVE CLAMP MOUNTED INSTRUMENTS FROM PILOT'S OR COPILOT'S INSTRUMENT PANEL 8-88

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

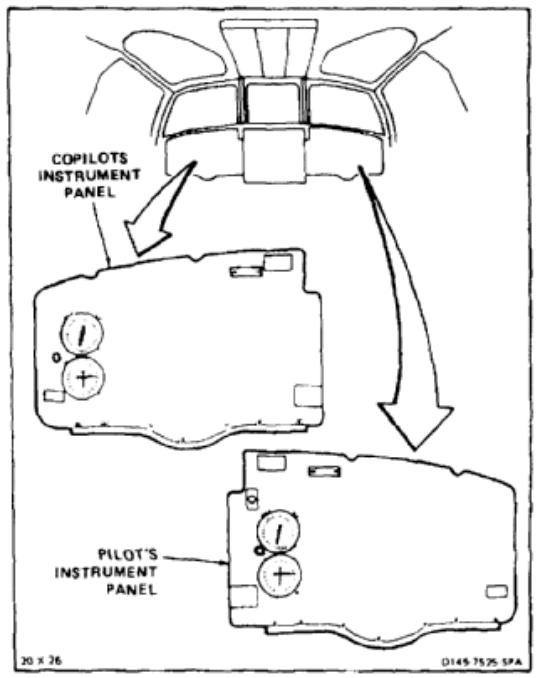
None

***Personnel Required:***

Aircraft Electrician

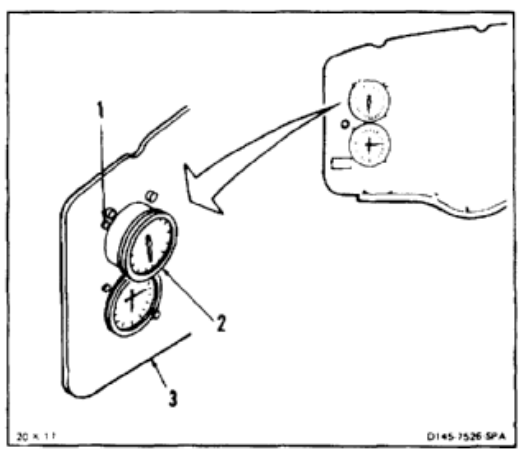
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




**NOTE**

Procedure is similar for removing pilot's and copilot's Dual Torquemeter Indicator or Rotor Tachometer. Removal of copilot's Dual Torquemeter Indicator is shown here. Intermixing of P/N 114ES270-3 and P/N 114ES270-4 on the same aricraft is not allowed.



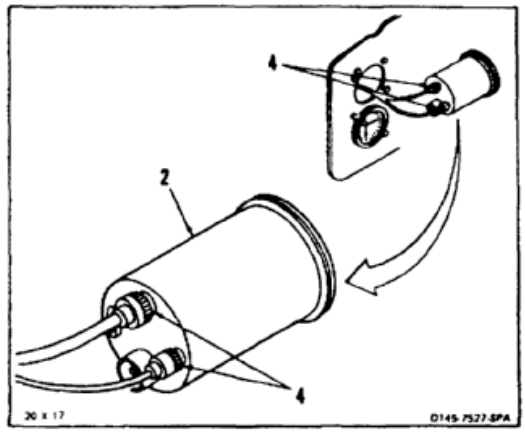

1. Loosen round head clamp screw (1).

CAUTION

Be careful when handling indicators. Rough handling will damage indicators.

2. Grasp indicator (2) at case rim then pull indicator out of panel (3).

3. Disconnect wire harness connector (4) (two connectors on Dual Torquemeter), from indicator (2).




***FOLLOW-ON MAINTENANCE:***

Zero adjust engine torquemeter indicator (Task 8-18.1).

END OF TASK

## 8-89 INSTALL CLAMP MOUNTED INSTRUMENTS IN PILOT'S OR COPILOT'S INSTRUMENT PANEL 8-89

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Small Brush, Camel Hair

***Materials:***

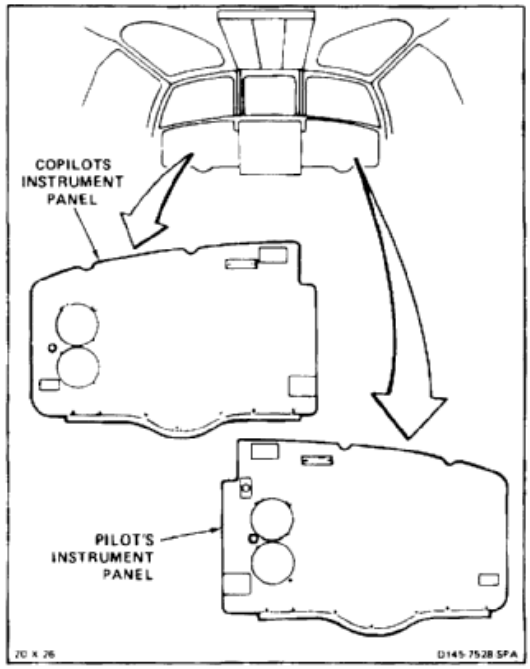
Cloth (E120)

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P
TM 55-1520-240-10
TM 55-6600-200-20
TM 55-1500-323-25



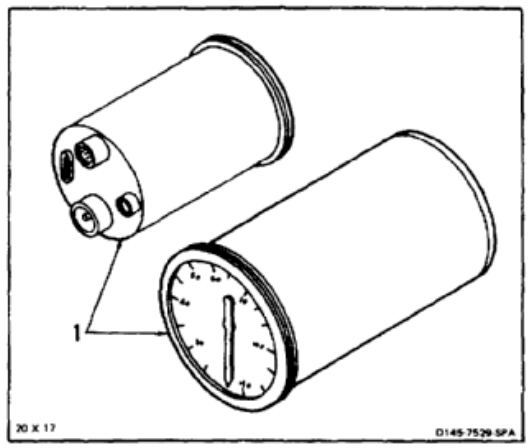
## 8-89 INSTALL CLAMP MOUNTED INSTRUMENTS IN PILOT'S OR COPILOT'S INSTRUMENT PANEL (Continued) 8-89

**CAUTION**

Be careful when handling indicators. Rough handling will damage indicators.

**NOTE**

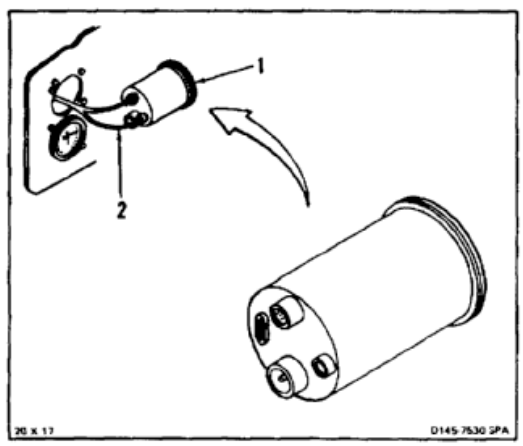
Procedure is similar for installing pilot's and copilot's Dual Torquemeter Indicator or Rotor Tachometer. Installation of copilot's Dual Torquemeter Indicator is shown here. Intermixing of P/N 114ES270-3 and P/N 114ES270-4 on the same aircraft is not allowed.



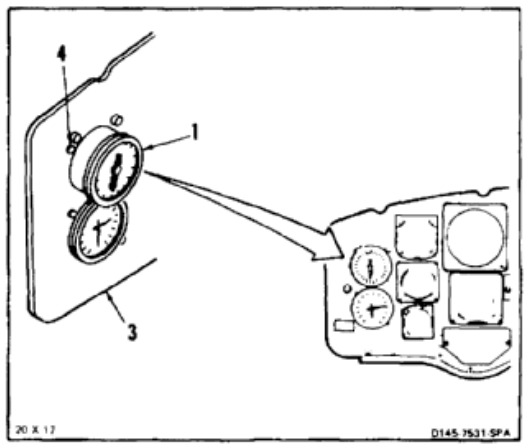

1. Clean bonding surface of indicator (1). Use cloth (E120).

2. Check indicator (1) for range marks. Apply range marks and index mark to indicator if required (TM 55-1520-240-10 and TM 55-6600-200-20).

3. Connect wire harness connector (2) (two connectors on dual torquemeter) to indicator (1).



4. Install indicator (1) in panel (3).
5. Tighten round head clamp screw (4).
6. Apply index mark from indicator (1) to panel (3) (TM 55-6600-200-20).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Adjust zero (torquemeter indicator installation only).
Perform operational check of affected system (TM 55-1520-240-T).

END OF TASK

## 8-90 REMOVE FLANGE MOUNTED INSTRUMENTS PILOT'S OR COPILOT'S INSTRUMENT PANEL 8-90

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

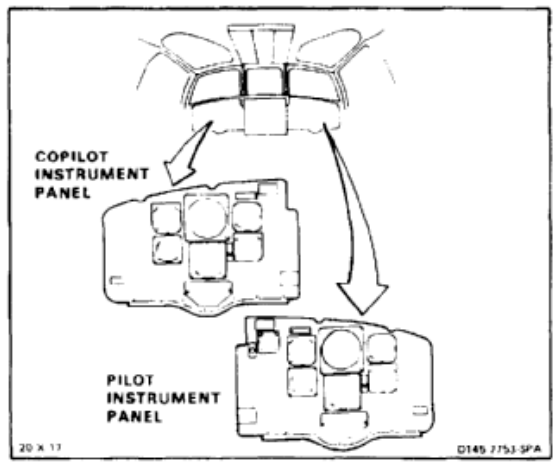
None

***Personnel Required:***

Aircraft Electrician
Medium Helicopter Repairer

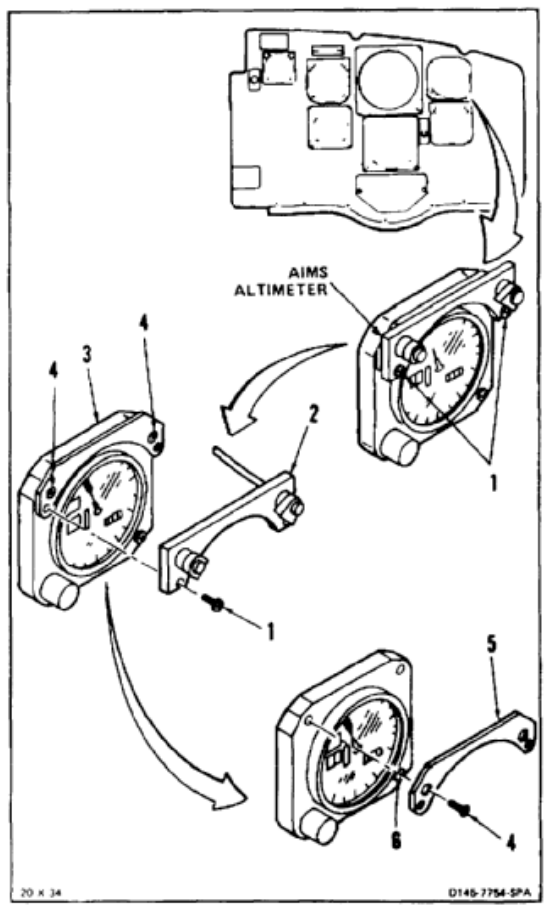
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




**NOTE**

Procedure is similar for removing the cruise guide indicator and AIMS altimeter from the pilot's instrument panel, barometric altimeter from copilot's instrument panel, and the following instruments from both pilot's and copilot's instrument panels; Airspeed Indicator, Attitude Indicator, Vertical Velocity Indicator, Horizonal Situation Indicator, HSI mode select panel and Radar altimeter. When removing airspeed indicator, AIMS altimeter, Barometer altimeter or Vertical velocity indicator panel light must be removed before removing instrument. Removal of AIMS altimeter is shown here.




1. Remove two screws (1).

CAUTION

Do not cut or disconnect wire to lamp bracket.

2. Pull lamp bracket (2) aft and away from instrument (3).
3. Remove two screws (4) and adaptor bracket (5).
4. Remove screw (6) (or screws).

CAUTION

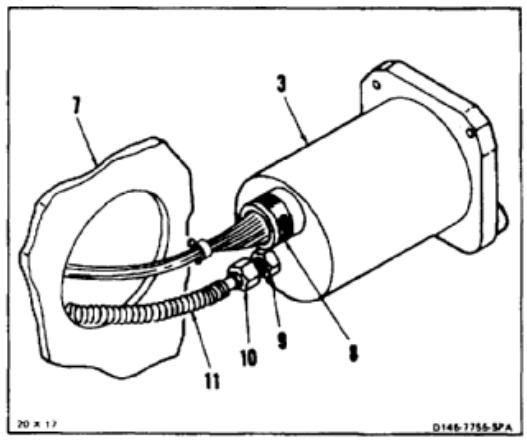
Be careful when handling indicator. Rough handling will damage indicator.

5. Slide indicator (3) aft, out of instrument panel (7).
6. Disconnect electrical connector (8).
7. Scribe a mark on fitting body (9) and fitting nut (10).

**NOTE**

Do not disconnect any serrated tube hose by pulling hose from compression sleeve fittings.

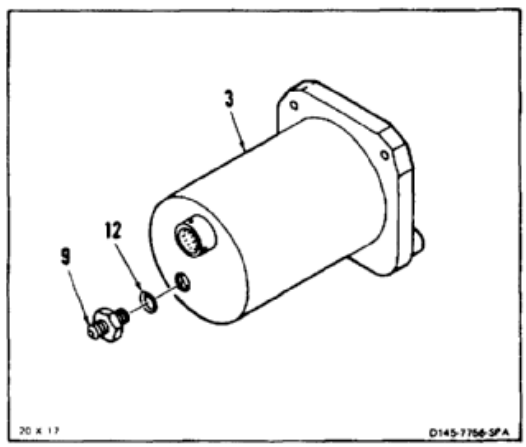
8. Have helper hold indicator. Hold fitting body (9) with wrench and loosen fitting nut (10) with second wrench.
9. Remove fitting nut (10) and serrated tube hose (11) together.




10. Tag and remove fitting body (9) from indicator (3).
11. Remove packing (12) from fitting body (9) (no packing on fittings with tapered pipe thread).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 8-91 INSTALL FLANGE MOUNTED INSTRUMENTS IN PILOT'S OR COPILOT'S INSTRUMENT PANEL 8-91

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Small Brush, Camel Hair

***Materials:***

Cloth, Cleaning (E120)

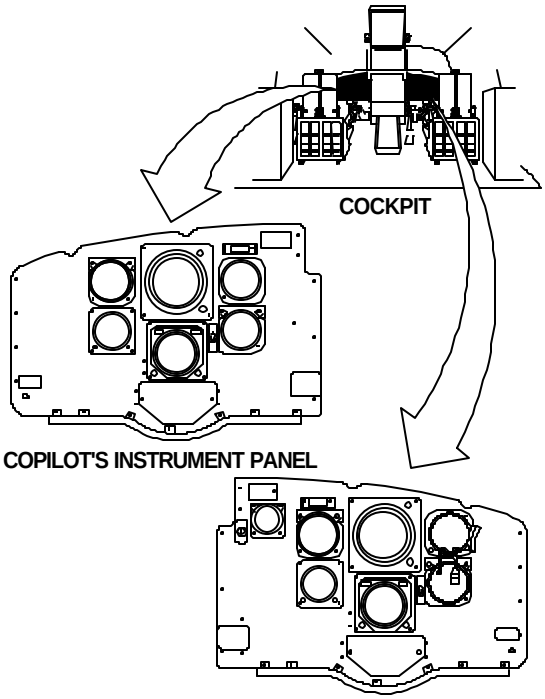
***Personnel Required:***

Aircraft Electrician
CH-47 Helicopter Repairer Inspector

***References:***

TM 1-1520-240-10
TM 55-1500-323-25
TM 55-1520-240-23
TM 55-6600-200-20

***General Safety Instructions:***




CAUTION

Be careful when handling indicators.
Rough handling will damage indicator.

**NOTE**

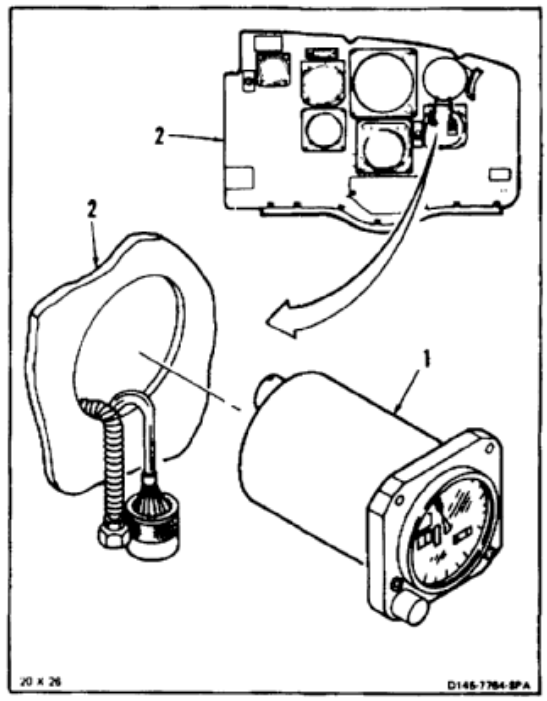
Insure instruments are marked in accordance with TM 1-1520-240-10 limitations.

## 8-91 INSTALL FLANGE MOUNTED INSTRUMENTS IN PILOT'S OR COPILOT'S INSTRUMENT PANEL (Continued) 8-91

**NOTE**

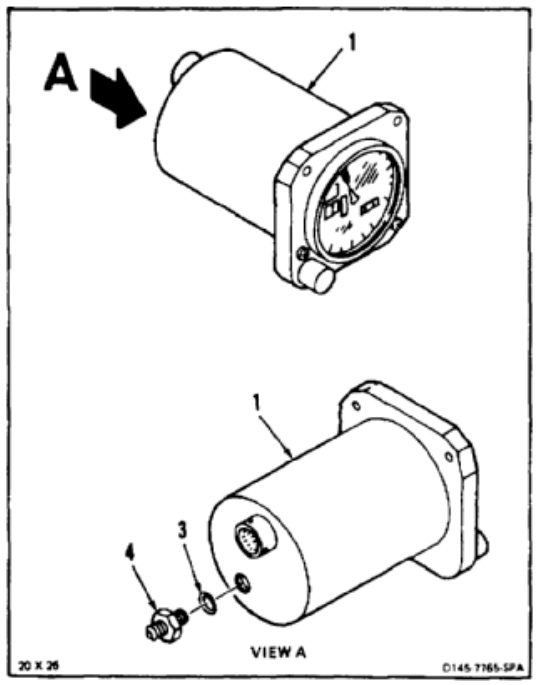
Procedure is similar for installing the cruise guide indicator and AIMS altimeter in the pilot's instrument panel, the barometric altimeter in the copilot's instrument panel, and the following instruments in both pilot's and copilot's instrument panels: airspeed indicator, attitude indicator, vertical velocity indicator, horizontal situation, HSI mode select panel and radar altimeter. When installing airspeed indicator, AIMS altimeter. barometric altimeter, vertical velocity indicator, panel light must be installed. Installation of AIMS altimeter is shown here.

1. Clean bonding surface of indicator (1) and panel (2). Use cloth (E120).

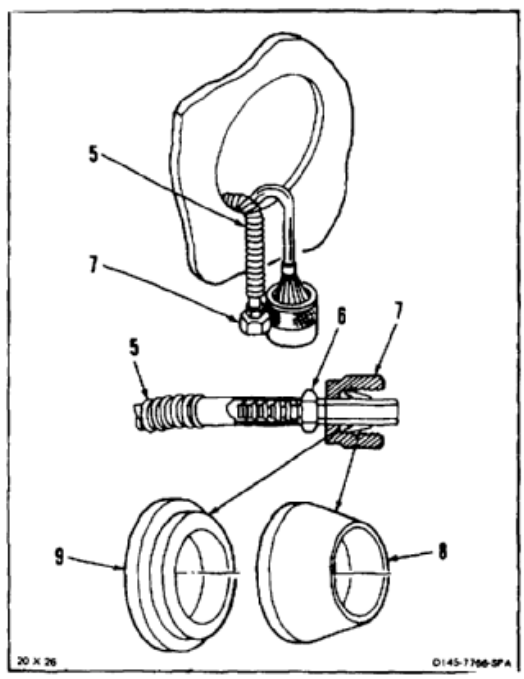


**8-91 INSTALL FLANGE MOUNTED INSTRUMENTS IN PILOT'S OR COPILOT'S INSTRUMENT PANEL (Continued)** **8-91**

2. Check instrument (1). Apply range marks and index mark to indicator, if required (TM 55-1520-240-10 and TM 55-6600-200-20).
3. Install packing (3) on fitting body (4) (no packing on fittings with tapered pipe thread).
4. Install fitting body (4) in indicator (1).




5. Check serrated tubing hose (5). Hose connector (8), nut (7), front ferrule (8), and rear ferrule (9) must be in place before connecting tubing hose.

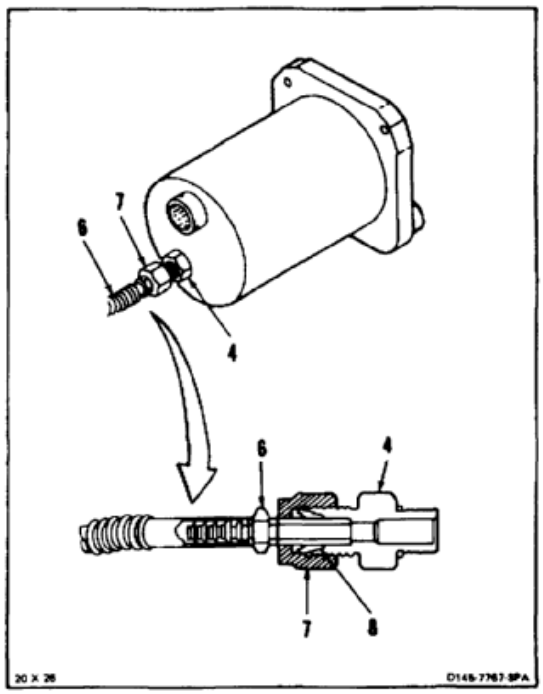


**8-91 INSTALL FLANGE MOUNTED INSTRUMENTS IN PILOT'S OR COPILOT'S INSTRUMENT PANEL (Continued)** **8-91**

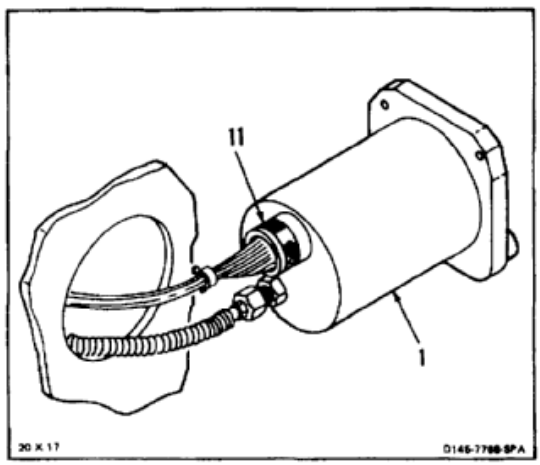
CAUTION

Do not let indicator hang unsupported from serrated tube hose.

6. Insert hose connector (6), nut (7) and ferrules (8 and 9) into fitting body (4). Make sure front ferrule (7) is seated against fitting body (4).
7. Have helper hold indicator (1), push hose connector (6) firmly against fitting body (4) and install fitting nut (7) on fitting body. Tighten finger-tight.
8. Hold fitting body (4) with wrench. Using second wrench, tighten fitting nut (7) to scribe mark. Snug nut tightly.

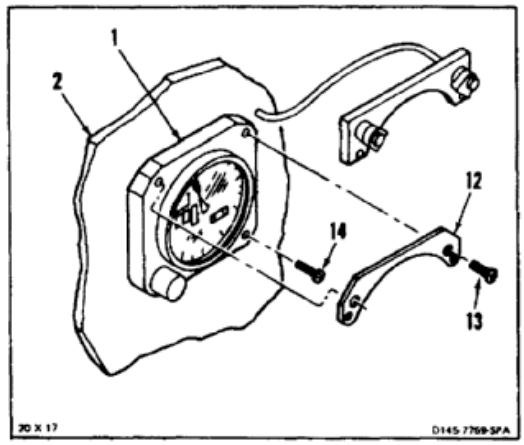



9. Connect wire harness connectors (11) to indicator (1).



**8-91 INSTALL FLANGE MOUNTED INSTRUMENTS IN PILOT'S OR COPILOT'S INSTRUMENT PANEL (Continued)** **8-91**

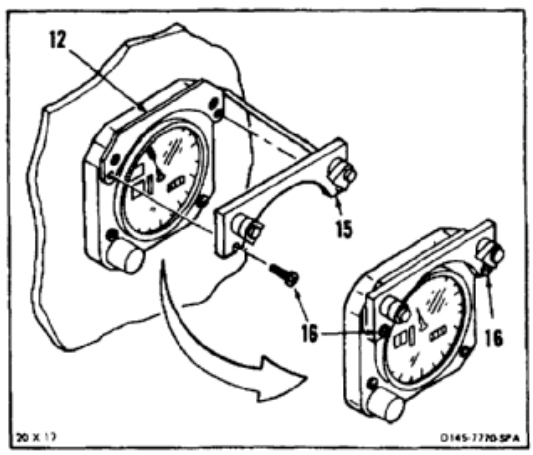
10. Install indicator (1) in instrument panel (2).
11. Position adapter bracket (12) over indicator (1).
12. Install two screws (13).
13. Install remaining screw (14) (or screws).




14. Position panel light (15) over adapter bracket (12).
15. Install two screws (16).

***FOLLOW-ON MAINTENANCE:***

Perform operational check of affected system (TM 55-1520-240-T).
Perform operational check of instrument lights (TM 55-1520-240-T).




END OF TASK

## 8-92 REMOVE CLOCK 8-92

INITIAL SETUP

***Applicable Configurations:***

Without 17

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

***Materials:***

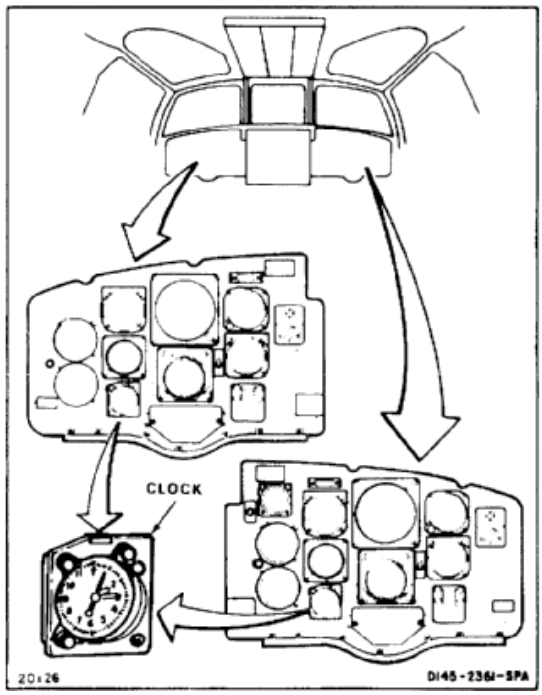
None

***Personnel Required:***

Medium Helicopter Repairer

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off

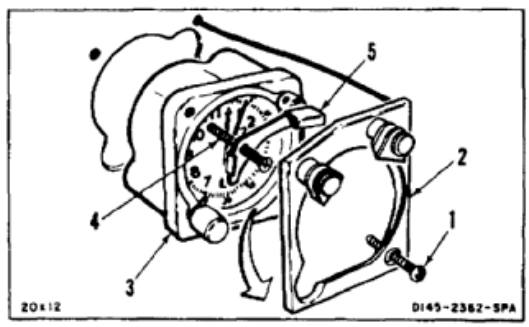



1. Remove screw (1). Rotate light fixture (2) down and aft, away from clock (3).

**NOTE**

Do not cut or disconnect wire to light fixture.

2. Remove screw (4) and bracket (5).
3. Remove clock (3).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-92.1 REMOVE CLOCK 8-92.1

INITIAL SETUP

***Applicable Configurations:***

With 17

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

***Materials:***

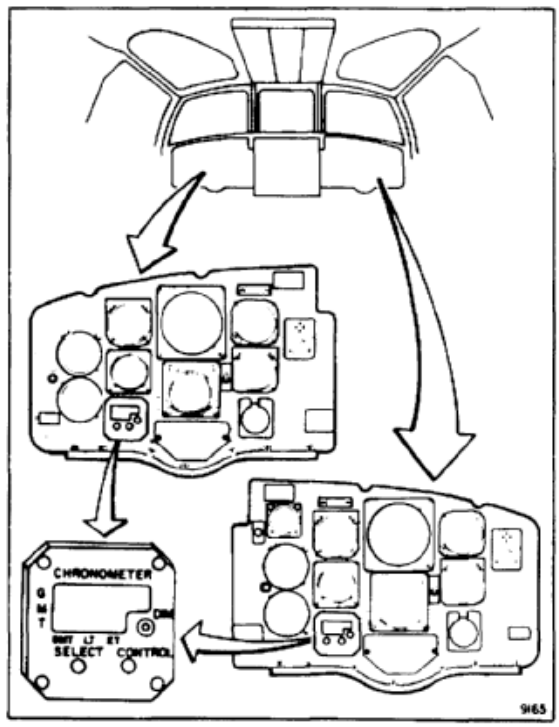
None

***Personnel Required:***

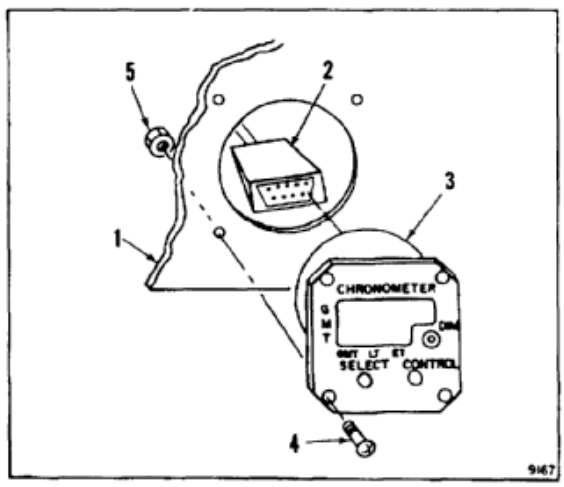
Medium Helicopter Repairer

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




1. Reach up under instrument panel (1) and disconnect connector (2) from clock (3).
2. Remove four screws (4) and nuts (5).
3. Remove clock (3) from panel (1).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-93 INSTALL CLOCK 8-93

INITIAL SETUP

***Applicable Configurations:***

Without 17

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

***Materials:***

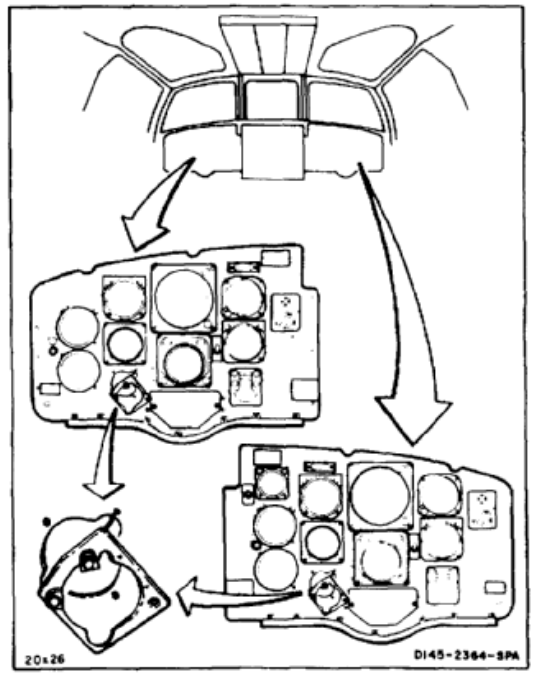
None

***Personnel Required:***

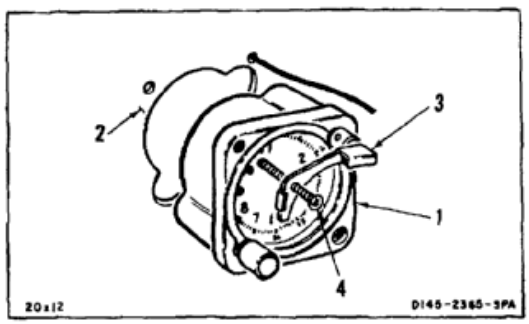
Medium Helicopter Repairer
Inspector

***References:***

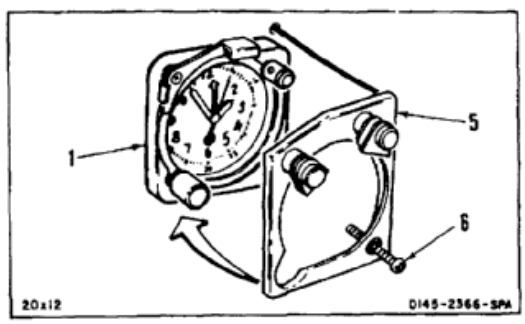
TM 55-1520-240-23P




1. Position clock (1) in panel (2).
2. Install bracket (3) and flat head screw (4). Align lower edge of bracket with raised edge of clock face.

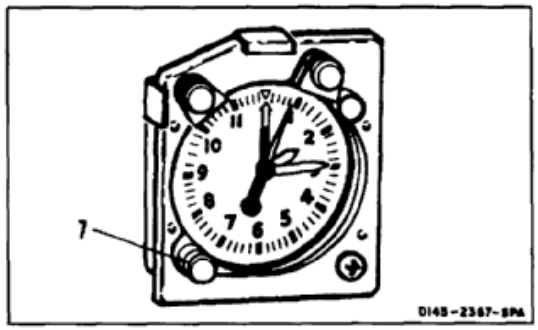



3. Position light fixture (5). Rotate light fixture up and forward onto clock (1). Install screw (6).



4. To wind clock, turn knob (7) clockwise.

5. To set time, pull knob (7) out and turn.




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform cockpit lighting operational check (TM 55-1520-240-T).

END OF TASK

## 8-93.1 INSTALL CLOCK 8-93.1

INITIAL SETUP

***Applicable Configurations:***

With 17

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

***Materials:***

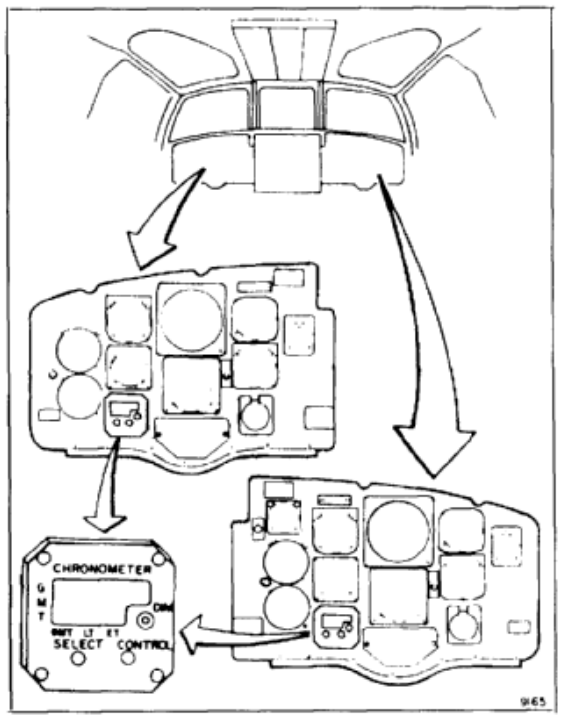
Battery, AA Alkaline, 3 Year Life

***Personnel Required:***

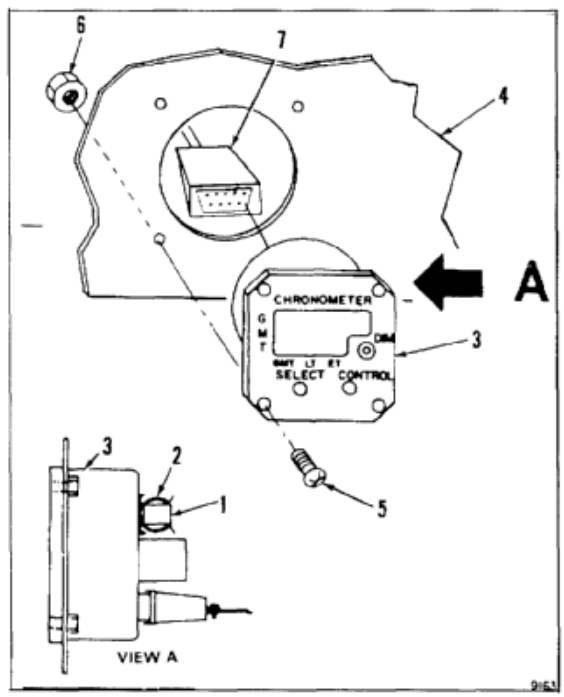
Medium Helicopter Repairer

***References:***

TM 55-1520-240-23P




1. If needed, replace battery (1) in holder (2).
2. Position clock (3) in panel (4).
3. Install four screws (5) and nuts (6).
4. Reach up under panel (4) and connect connector (7).




***FOLLOW-ON MAINTENANCE:***

Perform operational check of clock (TM 55-1520-240-T).

END OF TASK

## 8-93.2 REMOVE ROTOR TACH CAPACITOR (AVIM) 8-93.2

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrician Repairer's Tool Kit, NSN 5180-00-323-495

***Materials:***

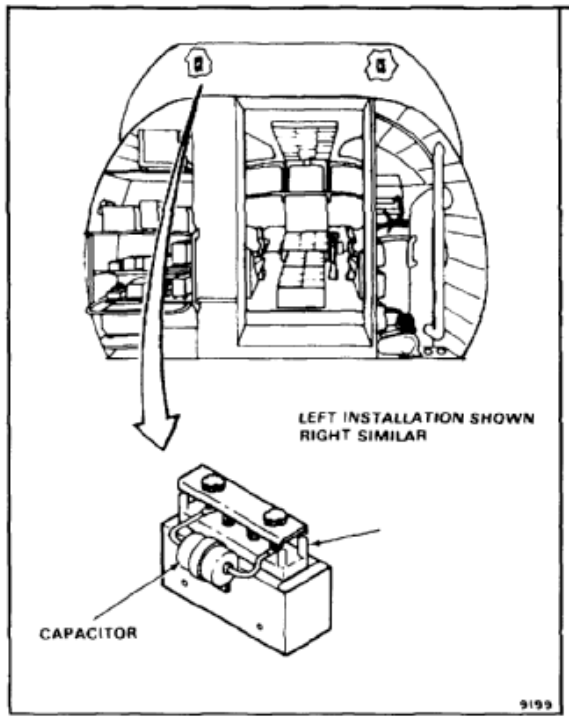
None

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

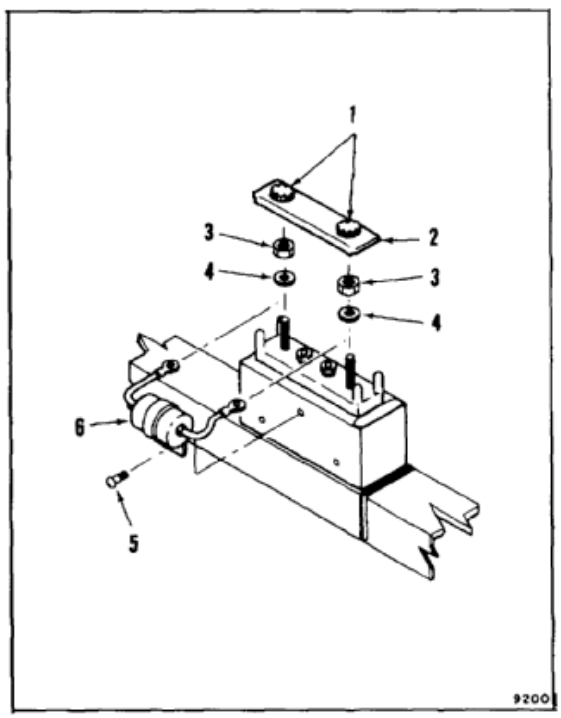
Battery Disconnected (Task 1-39)
Electric Power Off
Acoustic Blanket Removed (Task 2-208)




1. Loosen two knobs (1).
2. Remove terminal board cover (2).
3. Remove two self-locking nuts (3) and washers (4).
4. Remove screw (5) and capacitor (6).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 8-93.3 INSTALL ROTOR TACH CAPACITOR (AVIM) 8-93.3

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrician Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

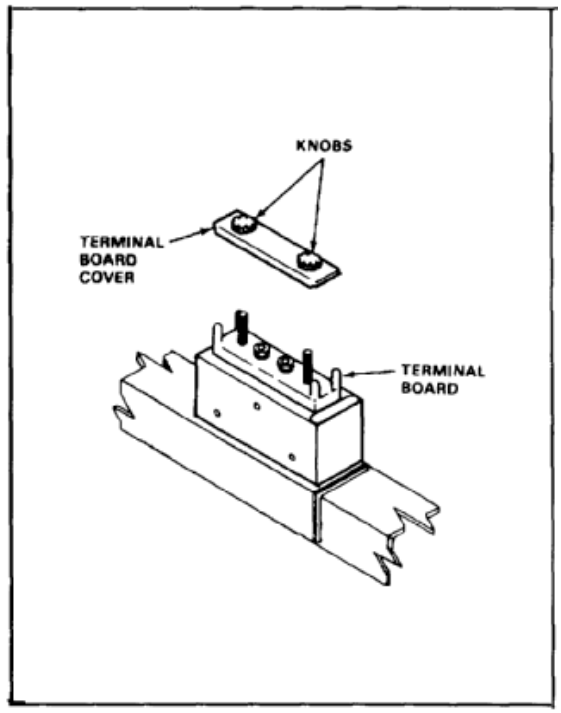
None

***Personnel Required:***

Aircraft Electrician

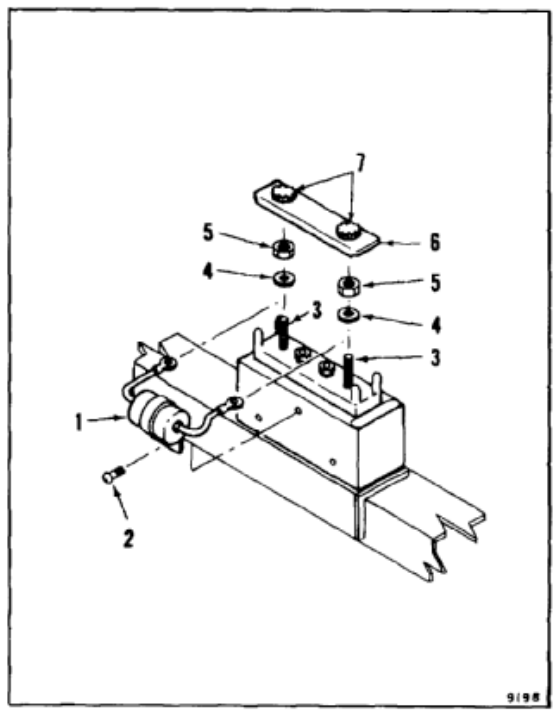
***References:***

TM 55-1520-240-23P



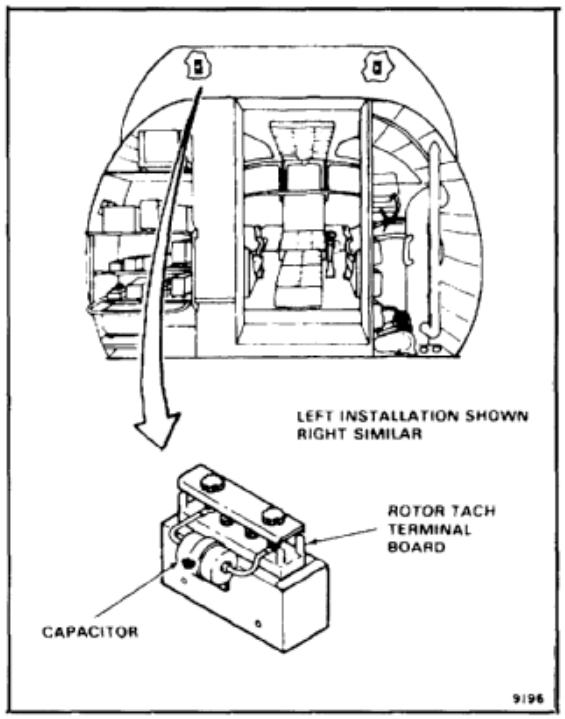

1. Position capacitor (1) and attach with screw (2).
2. Position capacitor terminals on terminal board studs (3). Install with washers (4) and nuts (5).
3. Position terminal board cover (6) on studs (3). Tighten knobs (7).

***INSPECT***



***FOLLOW-ON MAINTENANCE:***

Perform operational check of rotor tach system (TM 55-1520-240-T).




END OF TASK

## 8-94 REMOVE THERMOMETER (FAT GAGE) 8-94

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Workstand

***Materials:***

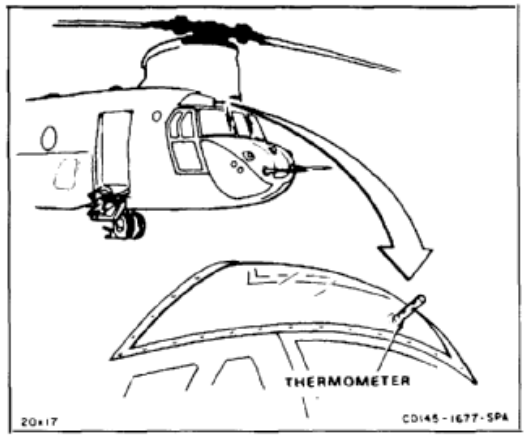
None

***Personnel Required:***

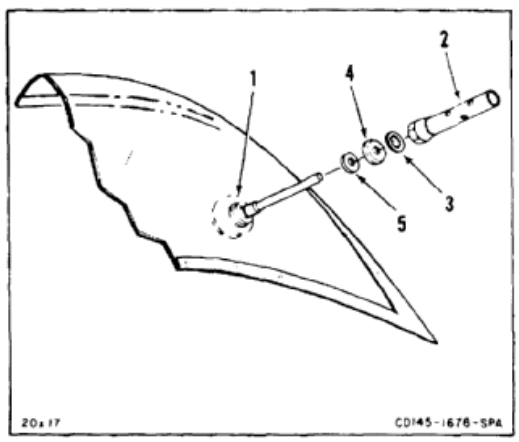
Medium Helicopter Repairer (2)

***Equipment Condition:***

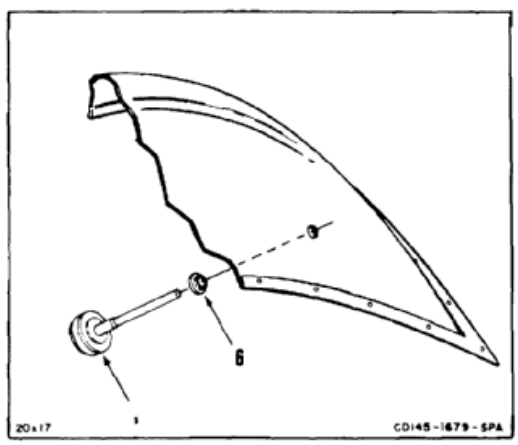
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




1. Have helper in cockpit hold thermometer (FAT gage) (1).
2. Remove sunshield (2), lockwasher (3), dished washer (4), and rubber washer (5).




3. Have helper remove thermometer (1) and rubber washer (6) from inside cockpit.




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-95 TEST FREE AIR TEMPERATURE (FAT) INDICATOR 8-95

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Mercury Centigrade Thermometer
Container, 2 Quart

***Materials:***

None

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 1-1500-204-23

***Equipment Condition:***

Off Helicopter Task


TEST SETUP

See TM 1-1500-204-23 for test instructions.

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-96 INSTALL THERMOMETER FAT GAGE 8-96

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Workstand

***Materials:***

Rubber Washer

***Personnel Required:***

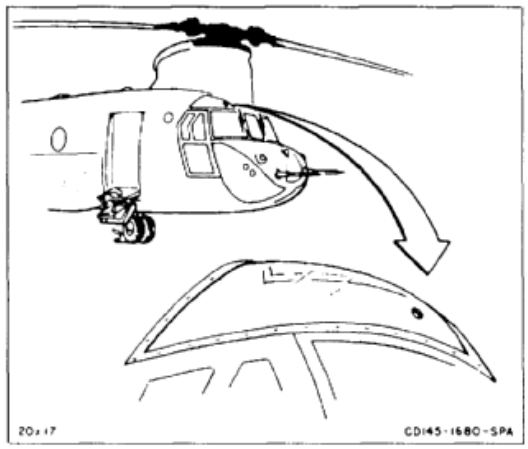
Medium Helicopter Repairer (2)
Inspector

***References:***

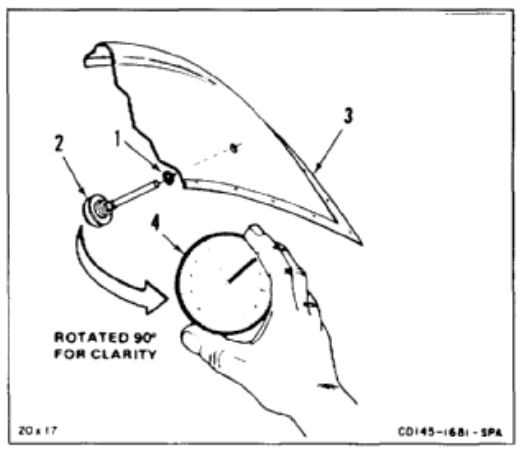
TM 55-1520-240-23P

***Equipment Condition:***

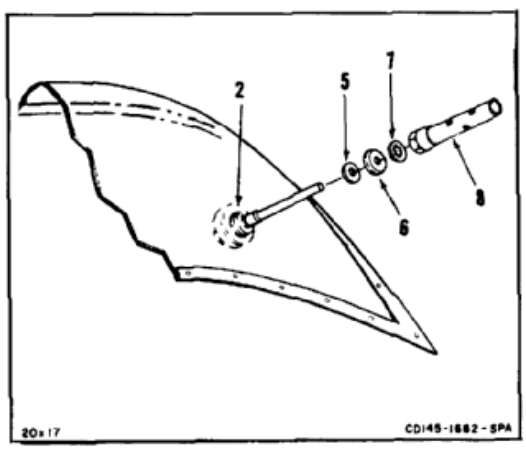
Thermometer Tested, TM 1-1500-204-23




1. Install rubber washer (1) on thermometer (FAT gage) (2).
2. Have helper, in cockpit, install thermometer (2) and washer (1) in hole in panel (3). Hold thermometer so dial (4) is in position shown.




3. Install rubber washer (5), dished washer (6), lockwasher (7), and sunshield (8) on thermometer (2).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-97 REMOVE CLAMP MOUNTED INSTRUMENTS FROM MAINTENANCE PANEL 8-97

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

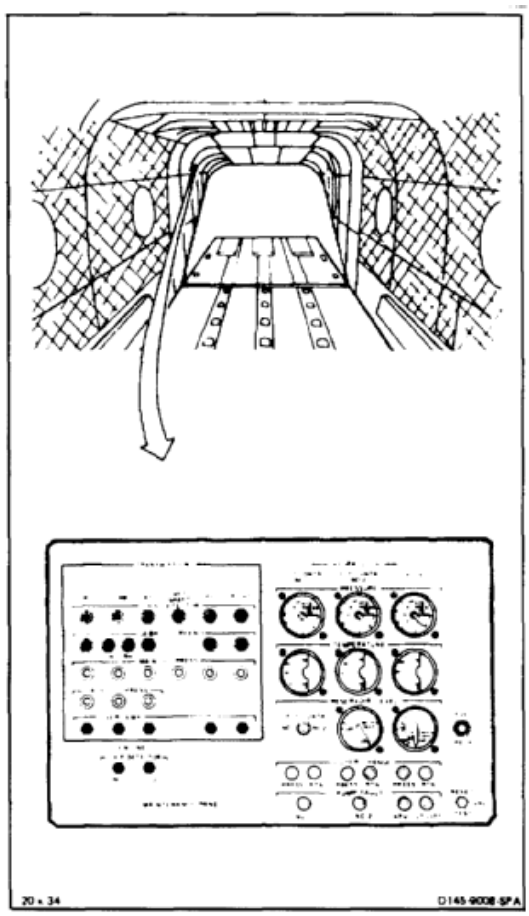
None

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

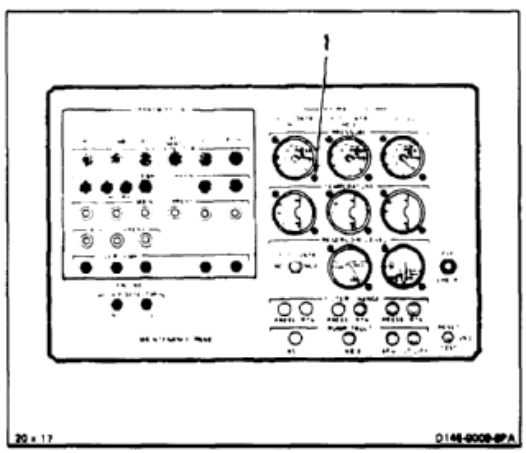
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Cargo Ramp Open and Level (Task 2-2)



**NOTE**

Procedure is the same for removing hydraulic pressure, temperature or reservoir level indicators from maintenance panel. Removal of No. 1 Flight Control Hydraulic Pressure indicator is shown here.

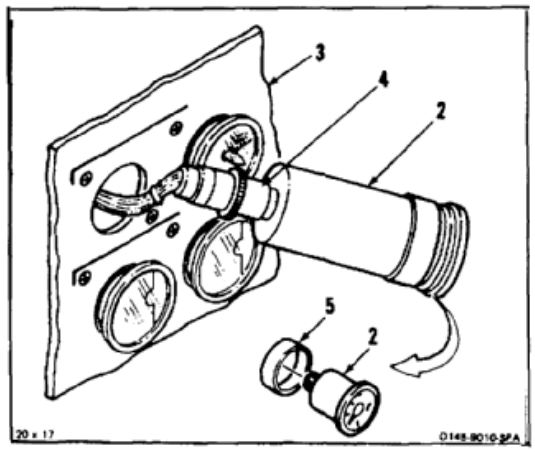
1. Loosen round head clamp screw (1).



CAUTION

Be careful when handling indicator.
Rough handling will damage indicator.

2. Grasp indicator (2) at case rim and slide out of maintenance panel (3).
3. Disconnect wire harness connector (4) from indicator (2).
4. Remove spacer (5) from indicator (2).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-98 INSTALL CLAMP MOUNTED INSTRUMENTS IN MAINTENANCE PANEL 8-98

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Small Brush, Camel Hair

***Materials:***

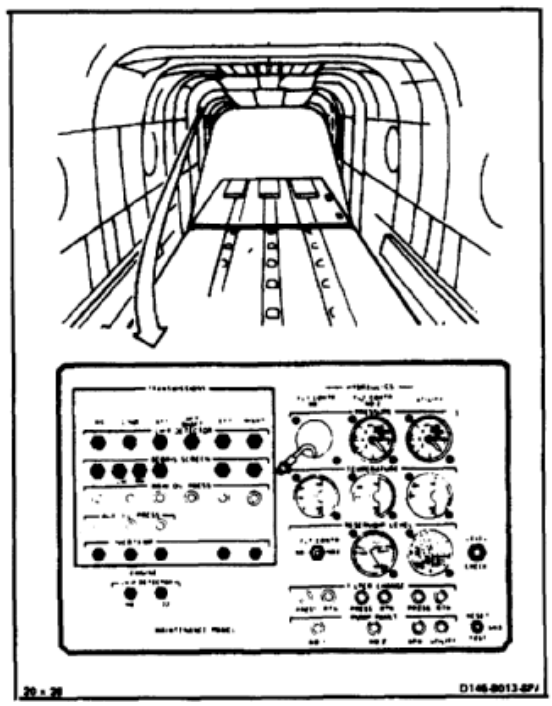
Cloth (E120)

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-10
TM 55-6600-200-20
TM 55-1500-323-25

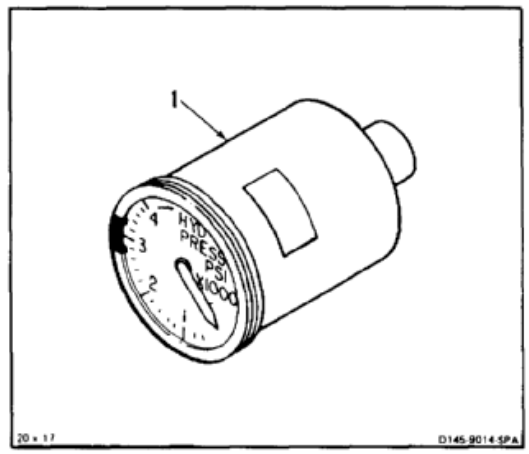


**NOTE**

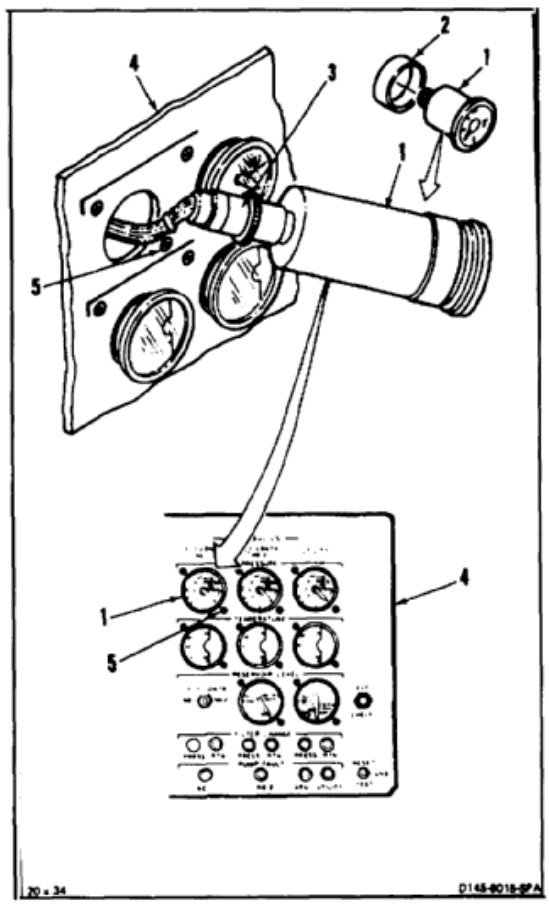
Procedure is the same for installing hydraulic pressure, temperature, or reservoir level indicators in maintenance panel. Installation of No. 1 Flight Control Hydraulic Pressure Indicator is shown here.

**CAUTION**

Be careful when handling indicators. Rough handling will damage indicators.




1. Clean bonding surface of indicator (1). Use cloth (E120).
2. Check indicator (1) for range marks. Apply range marks and index mark to indicator if required (TM 55-1520-240-10 and TM 55-6600-200-20).
3. Install spacer (2) on indicator (1).
4. Connect wire harness connector (3) to indicator (1).
5. Install indicator (1) in maintenance panel (4).
6. Tighten round head clamp screw (5).
7. Apply index mark, if required, from maintenance panel (3) to indicator (1) (TM 55-6600-200-20).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check of affected system (TM 55-1520-240-T).

END OF TASK

## 8-99 REMOVE MAINTENANCE PANEL 8-99

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

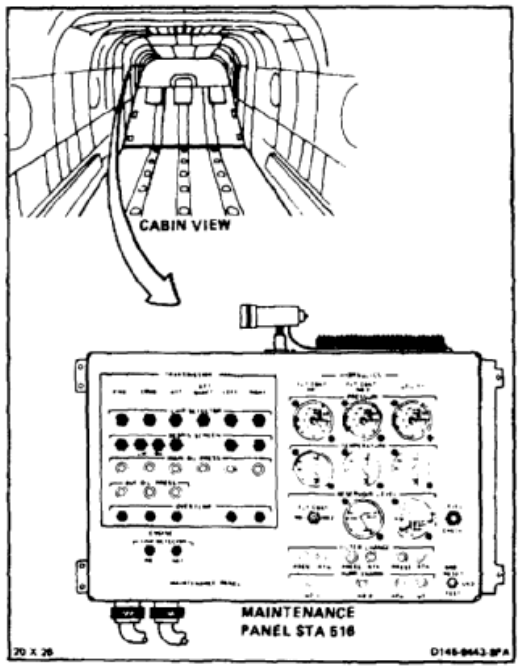
Paper Tags (E264)

***Personnel Required:***

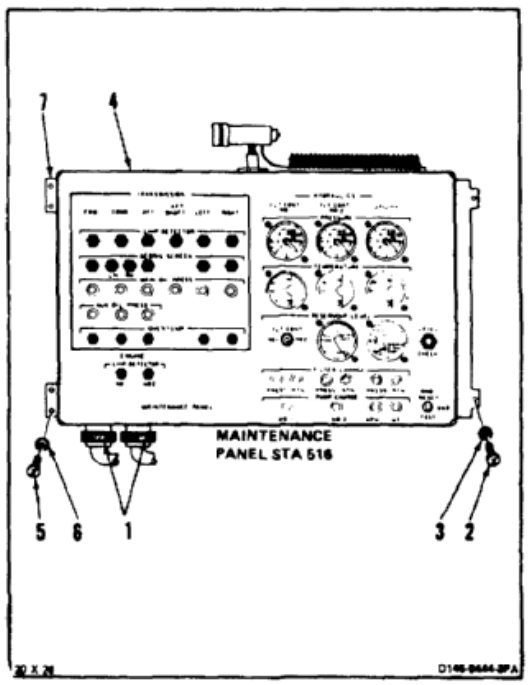
Aircraft Electrician
Medium Helicopter Repairer

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Cargo Ramp Open and Level (Task 2-2)




1. Tag and disconnect two wire harness connectors (1).
2. Remove two screws (2) and washers (3) from right side of maintenance panel (4). Panel will swing out.
3. Have helper support maintenance panel (4).
4. Remove four screws (5) and washers (6) from left side maintenance panel hinges (7).
5. Remove maintenance panel (4).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-100 REMOVE HYDRAULIC MAINTENANCE PANEL COMPONENTS 8-100

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun
Contact Insertion/Removal Tool, M81969/14-02
Module Extraction Tool CTJ-R06
Module Extraction Tool CTJ-R12

***Materials:***

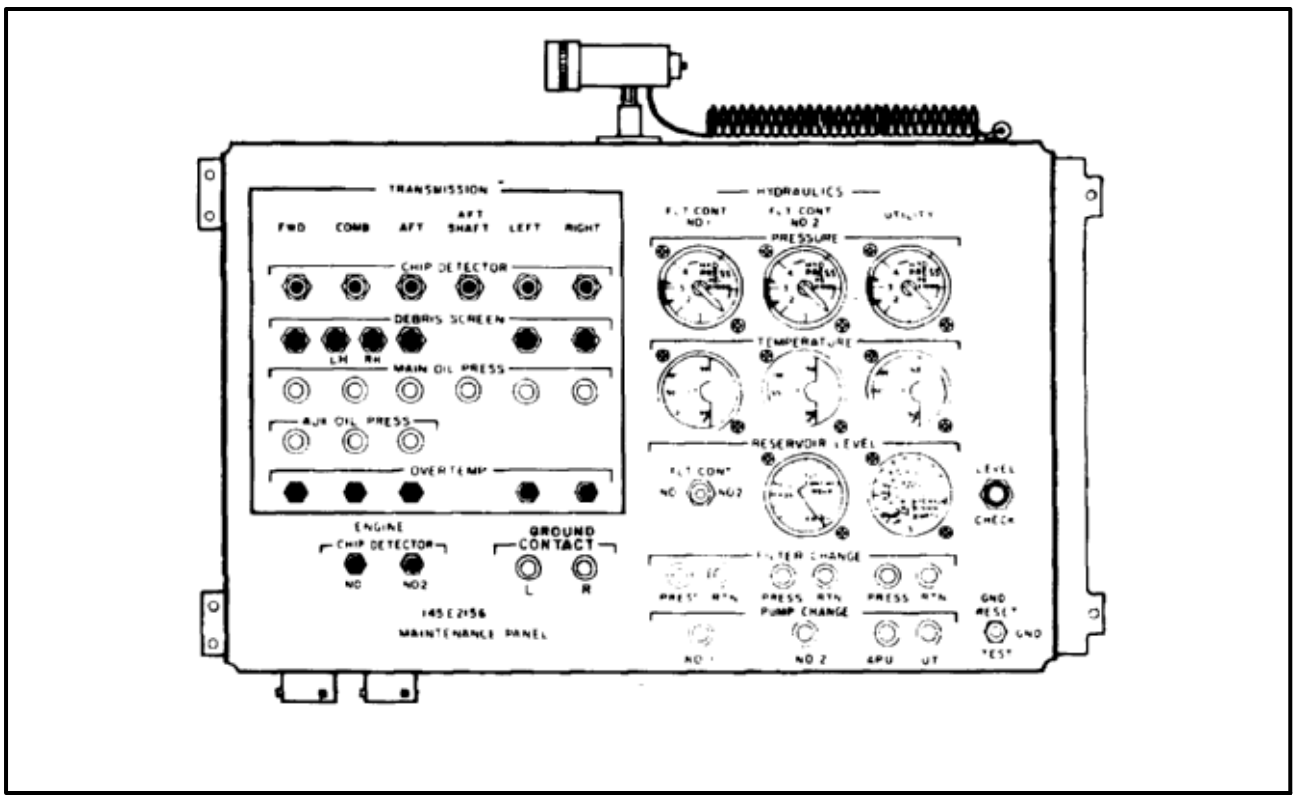
Paper Tags (E264)

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

Off Helicopter Task

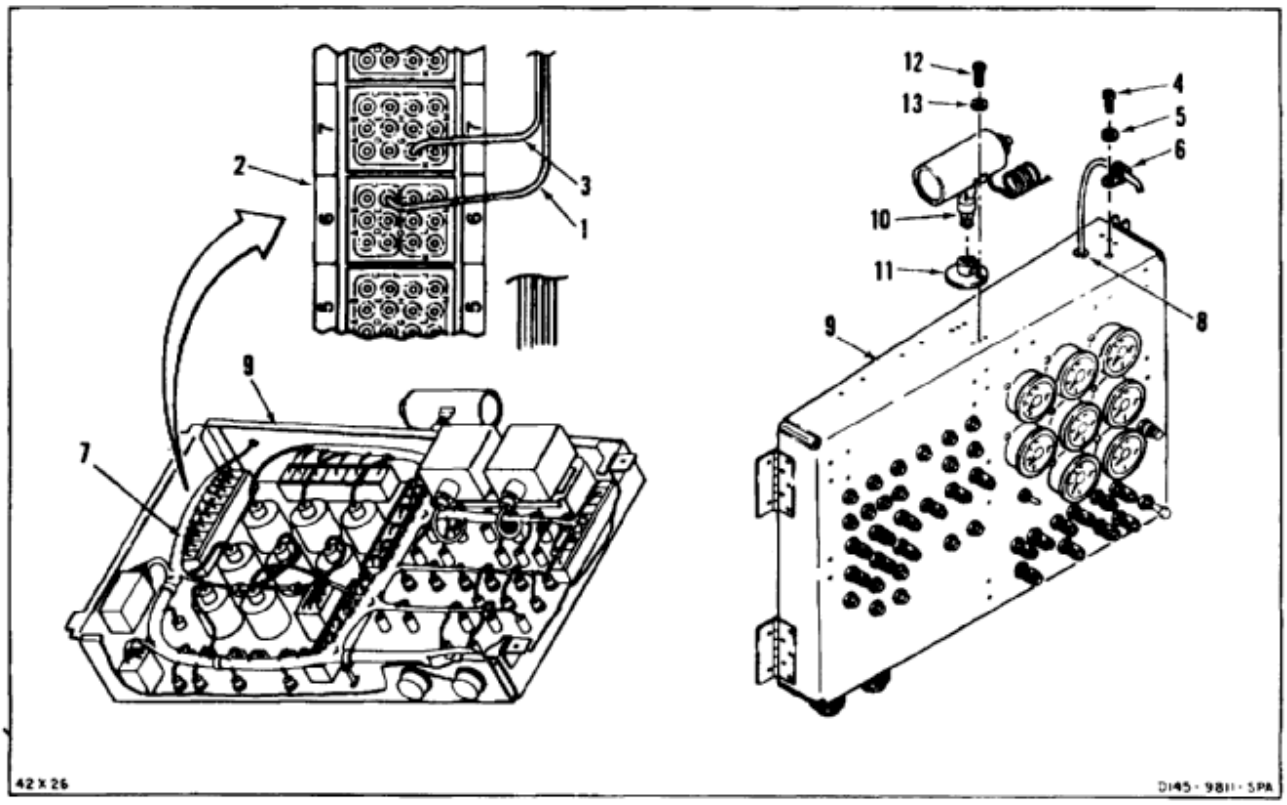


## 8-100 REMOVE HYDRAULIC MAINTENANCE PANEL COMPONENTS (Continued) 8-100

**NOTE**

Procedure is similar to remove like components. Task contains 12 separate removals.

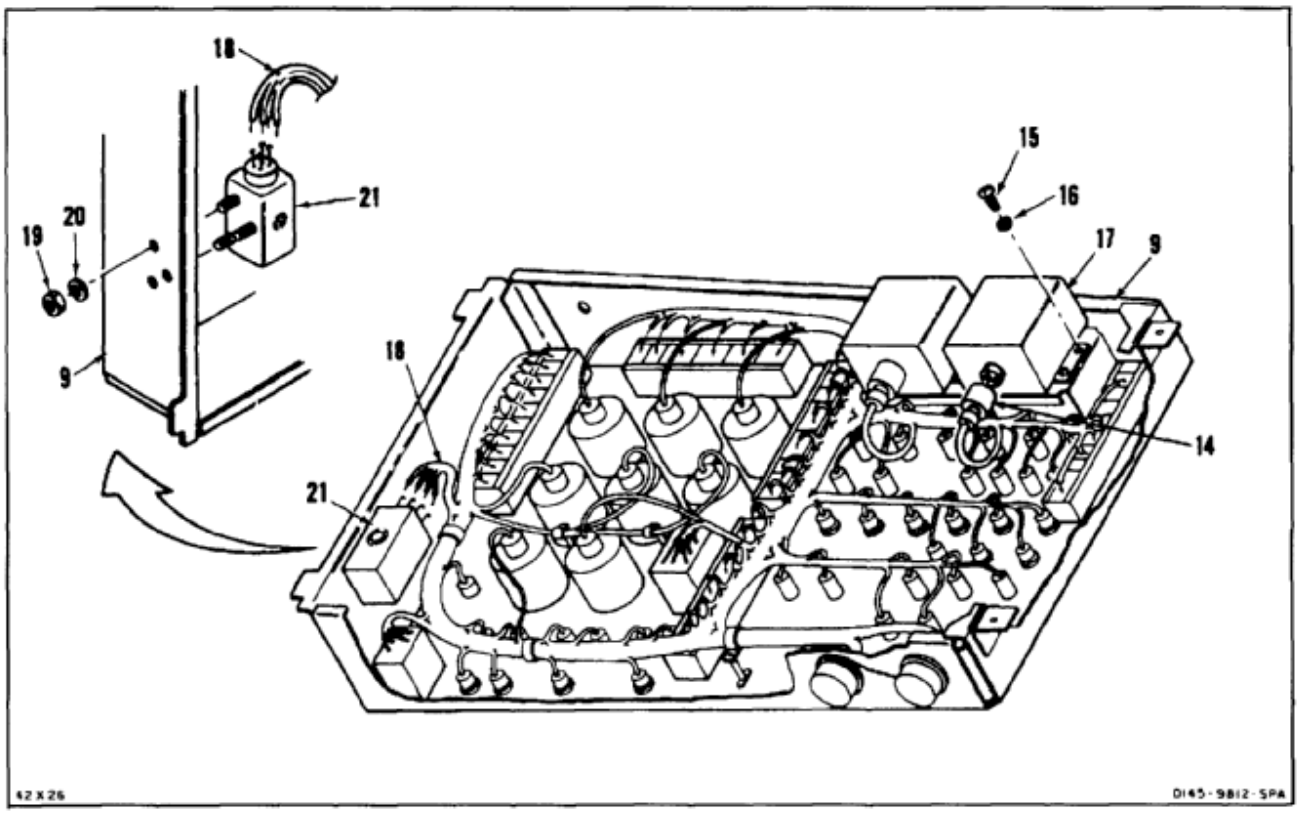
1. Remove WORK LIGHT as follows:
   a. Tag and disconnect white wire (1) from TB4(2)6F. Use contact insertion/removal tool.
   b. Tag and disconnect black wire (3) from TB4(2)7G. Use contact insertion/removal tool.
   c. Remove screw (4), washer (5), and clamp (6).
   d. Remove wires (1 and 3) from wire harness (7). Remove lacing tape as necessary.
   e. Pull wires (1 and 3) through grommet (8).
   f. Remove grommet (8) from panel (9).
   g. Remove work light (10) from base (11).
   h. Remove two screws (12) and washers (13).
   i. Tag and remove base (11) from panel (9).



**NOTE**

Procedure to remove UTILITY or No. 1/No. 2 FLIGHT CONTROL hydraulic system level SIGNAL CONDITIONER is the same. Removal of UTILITY hydraulic system level SIGNAL CONDITIONER is shown here.

2. Remove UTILITY hydraulic system level SIGNAL CONDITIONER as follows:
   a. Tag and disconnect wire harness connector (14).
   b. Remove four screws (15) and washers (16).
   c. Tag and remove signal conditioner (17) from panel (9).
3. Remove aft transmission low oil pressure time delay relay as follows:
   a. Tag and disconnect four wires (18).
   b. Remove three nuts (19) and washers (20).
   c. Tag and remove relay (21) from panel (9).



**NOTE**

Procedure is the same to remove HYDRAULIC PRESSURE, TEMPERATURE, and RESERVOIR LEVEL INDICATORS. Removal of No. 1 FLIGHT CONTROL HYDRAULIC PRESSURE INDICATOR is shown here.

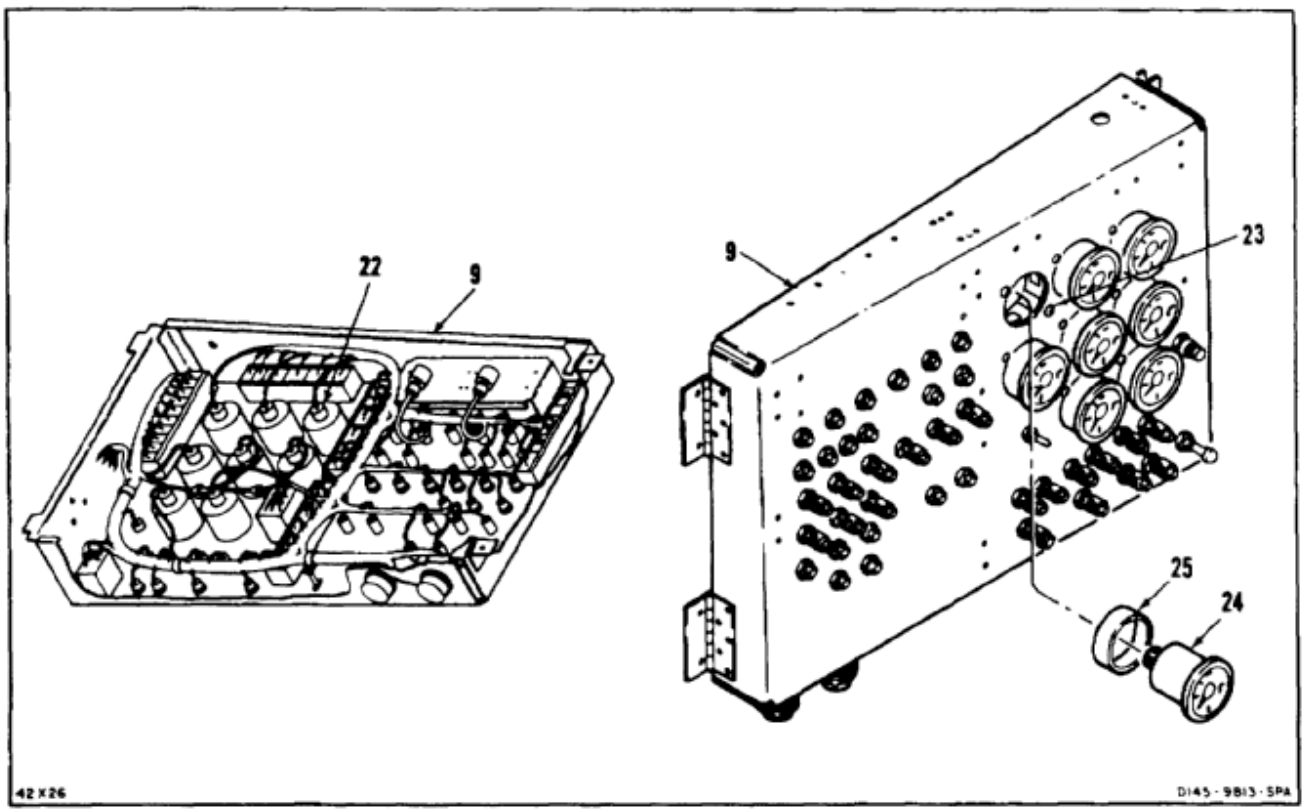
4. Remove No. 1 FLIGHT CONTROL HYDRAULIC PRESSURE INDICATOR as follows:

a. Tag and disconnect wire harness connector (22).

b. Loosen round head clamp screw (23).

c. Tag and remove indicator (24) from panel (9).

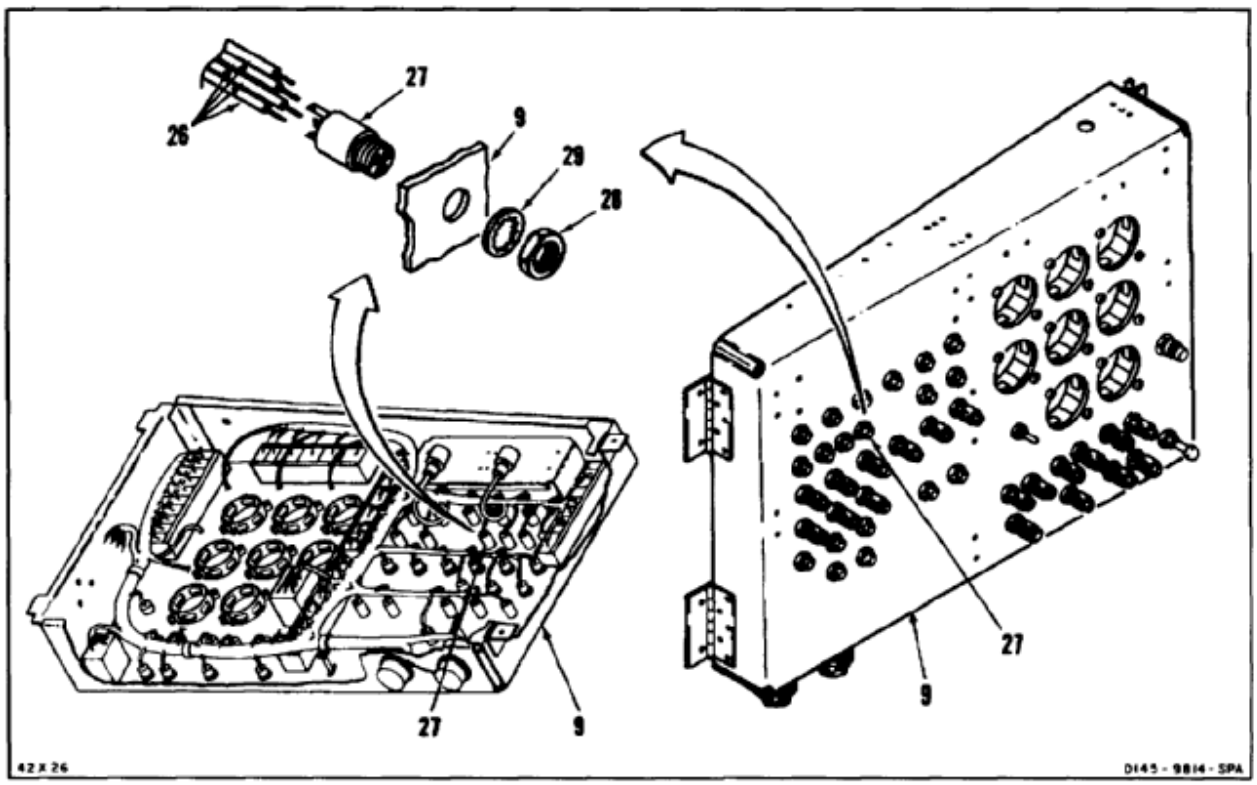
d. Remove spacer (25) from indicator (24).



**NOTE**

Procedure is the same to remove TRANSMISSION CHIP DETECTOR, DEBRIS SCREEN, OVERTEMP, and ENGINE CHIP DETECTOR INDICATORS. Removal of AFT TRANSMISSION CHIP DETECTOR INDICATOR is shown here.

5. Remove AFT TRANSMISSION DEBRIS SCREEN INDICATOR as follows:
   a. Tag and unsolder four wires (26) from indicator (27). Remove lacing tape and shrink tubing as necessary.
   b. Remove nut (28) and lockwasher (29).
   c. Tag and remove indicator (27) from panel (9).



**NOTE**

Procedure is the same to remove GND RESET/TEST and FLIGHT CONTROL HYDRAULIC RESERVOIR LEVEL SELECT SWITCH. Removal of GND RESET/TEST SWITCH is shown here.

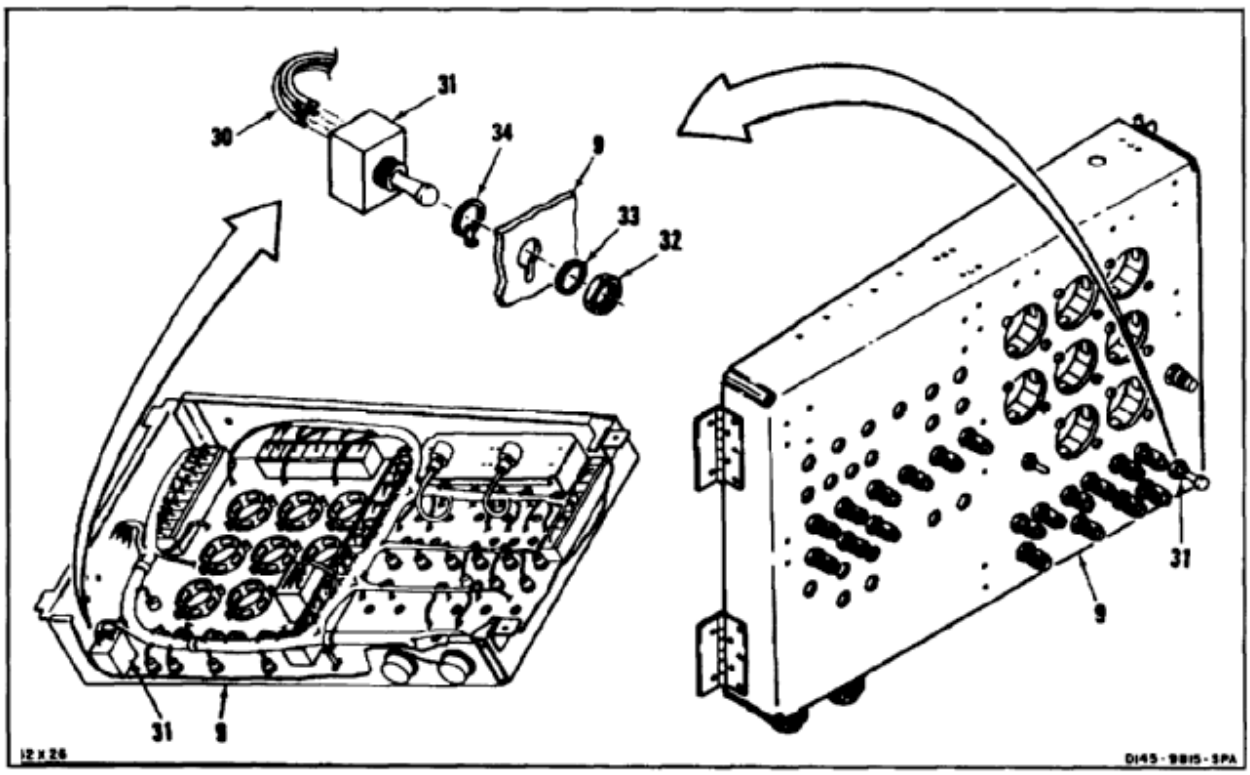
6. Remove GND RESET/TEST SWITCH as follows:

a. Tag and remove five wires (30) from switch (31). Use contact insertion/removal tool. Remove lacing tape as necessary.

b. Remove nut (32) and lockwasher (33) from switch (31).

c. Tag and remove switch (31) from panel (9).

d. Remove locking ring (34) from switch (31).



**NOTE**

Procedure is same to remove the TRANSMISSION MAIN OIL, AUX OIL PRESS, FILTER CHANGE, PUMP FAULT and, on helicopters with 25, GROUND CONTACT indicator lights. Removal of the FWD TRANSMISSION AUX OIL PRESS indicator light is shown here.

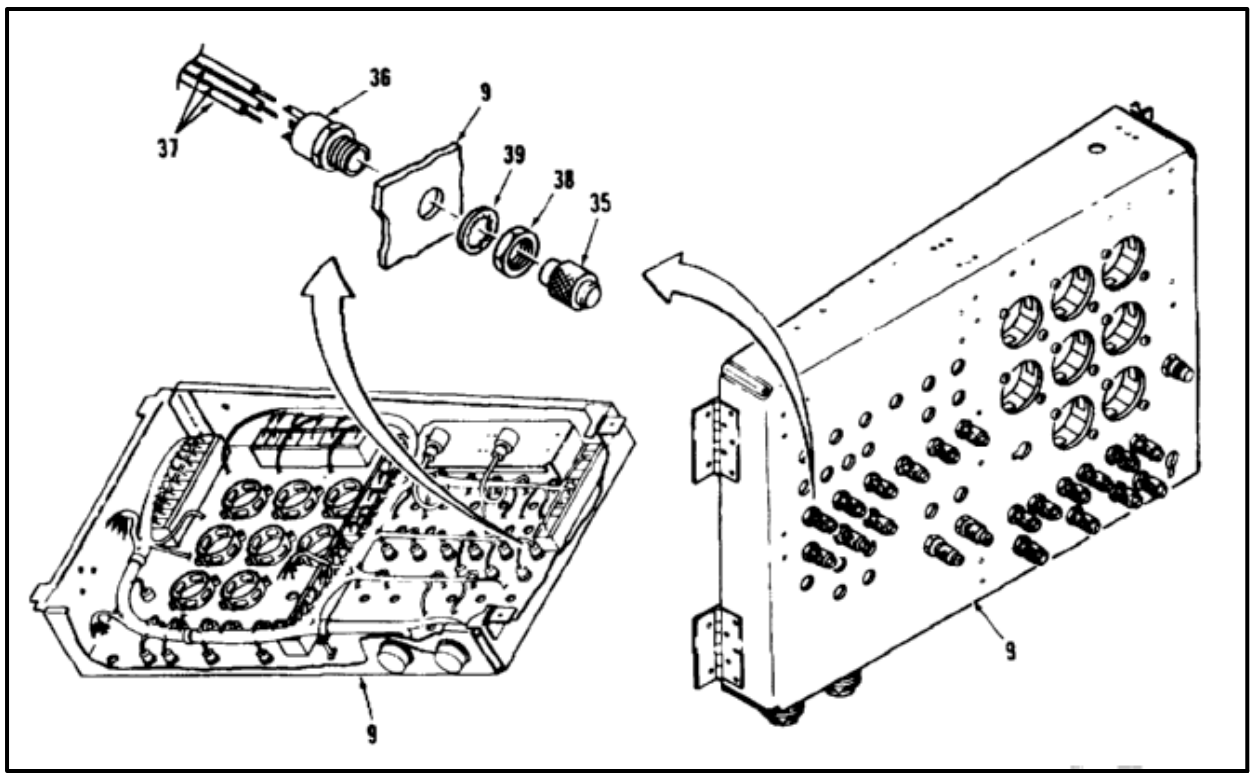
7. Remove indicator light as follows:

a. Remove lens (35) from light (36).

b. Tag and unsolder three wires (37) from light (36). Remove lacing tape and shrink tubing as necessary.

c. Remove nut (38) and lockwasher (39) from light (36).

d. Tag and remove light (36) from panel (9).



8. Remove UTILITY HYDRAULIC RESERVOIR LEVEL check switch as follows:

   a. Tag and unsolder two wires (40) from switch (41). Remove lacing tape and shrink tubing as necessary.

   b. Remove nut (42) and lockwasher (43) from switch (41).

   c. Tag and remove switch (41) from panel (9).

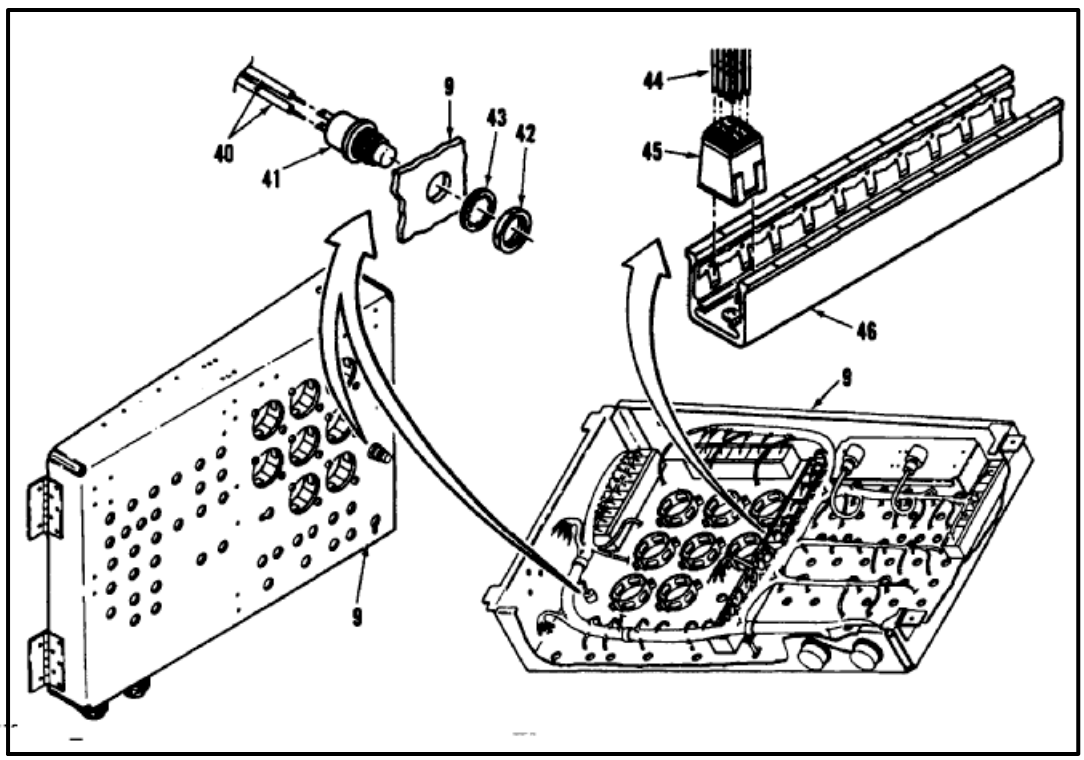
**NOTE**

Procedure is the same to remove 30 terminal modules using the CTJ-R06 module extraction tool. Removal of 10 diode modules requires using the CTJ-R 12 module extraction tools. Removal of TB2-1 is shown here.

9. Remove TB2-1 terminal module as follows:

   a. Tag and disconnect twelve wires (44) from module (45). Use insertion/removal tool.

   b. Tag and remove module (45) from module mounting track (46). Use module extraction tool.

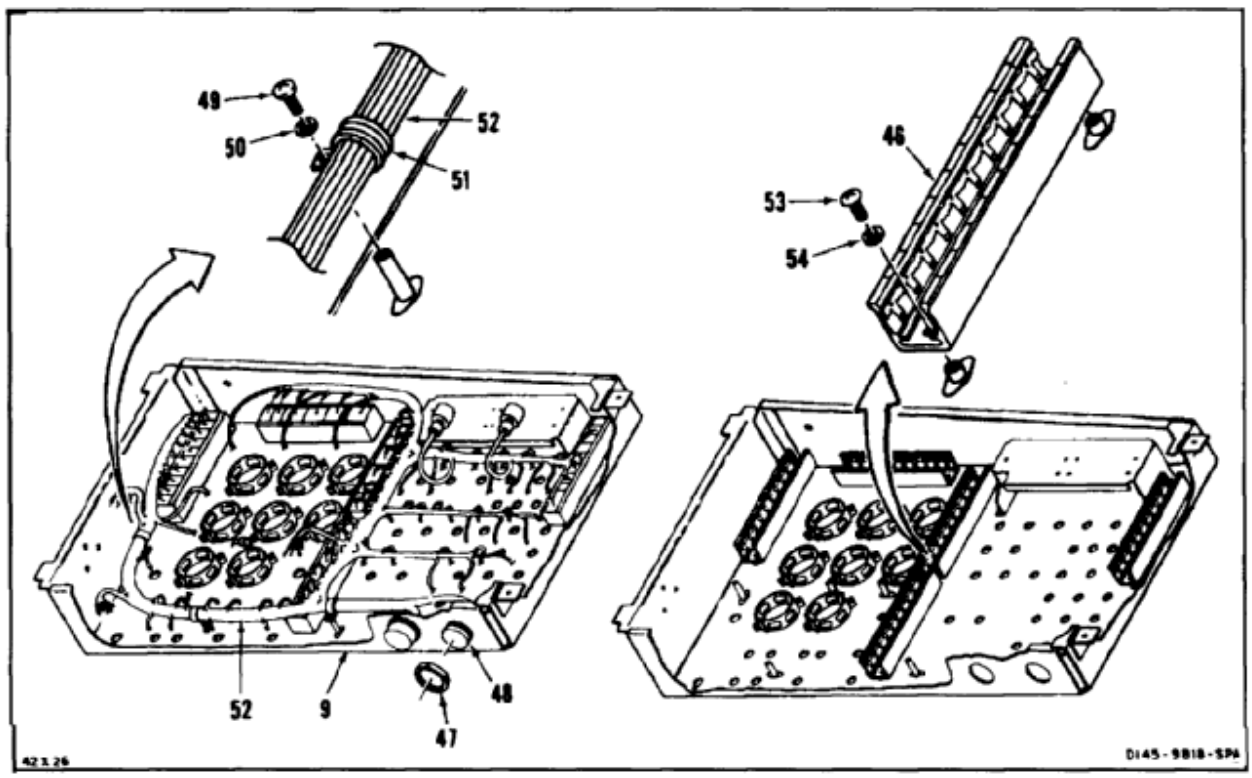


10. Remove wire harness as follows:
    a. Remove lockwire. Remove two nuts (47) from wire harness receptacles (48).
    b. Pull receptacles (48) out of panel (9).
    c. Remove five screws (49) and washers (50) from five clamps (51).
    d. Remove wire harness (52) from panel (9).
    e. Remove five clamps (51) from wire harness (52).

**NOTE**

Procedure is the same to remove five terminal board module mounting tracks. Removal of TB-2 is shown here.

11. Remove mounting track TB-2 is as follows:
    a. Remove two screws (53) and washers (54) from mounting track (46).
    b. Tag and remove mounting track (46).



**NOTE**

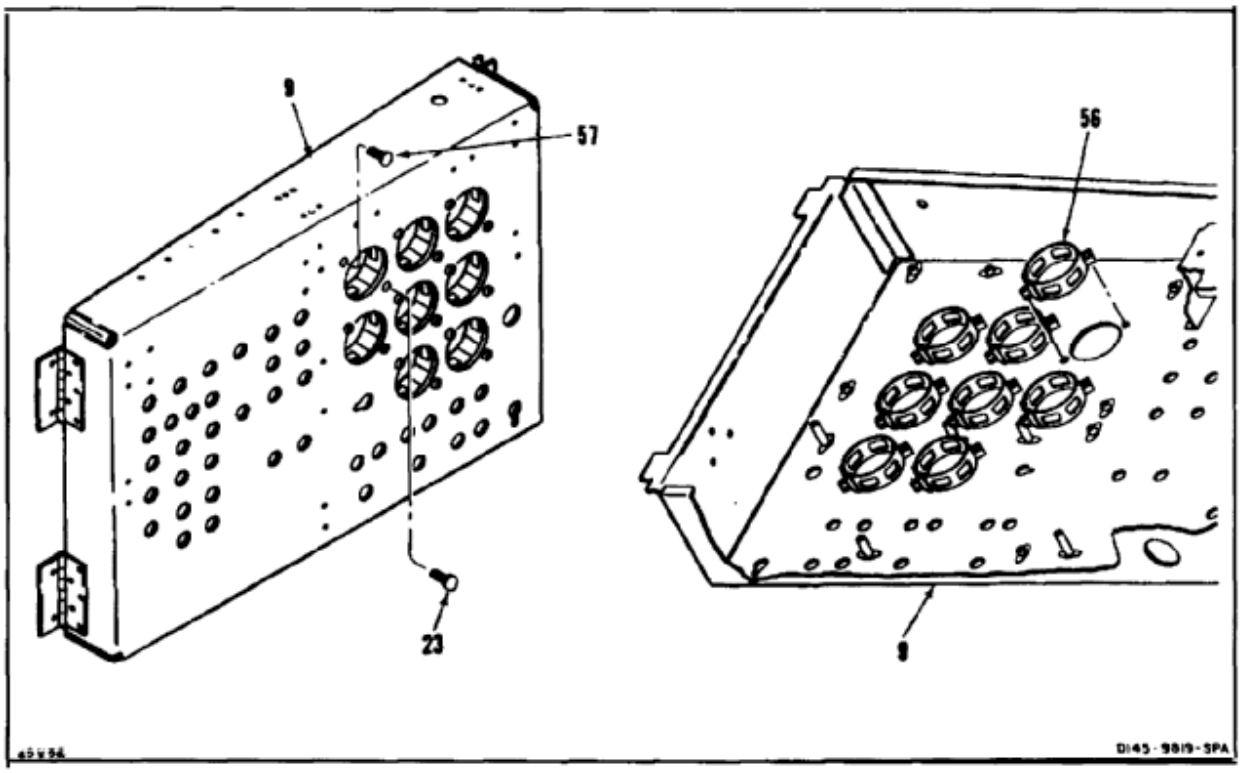
Procedure is the same to remove eight indicator mount clamps. Removal of No. 1 FLIGHT CONTROL HYDRAULIC PRESSURE INDICATOR MOUNT CLAMP is shown here.

a. Remove round head clamp screw (55) from clamp (56).

b. Remove flat head retainer screw (57) from clamp (56).

c. Tag and remove clamp mount (56) from panel (9).

12. Remove indicator mount clamp as follows:




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-101 INSTALL HYDRAULIC MAINTENANCE PANEL COMPONENTS 8-101

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun
Contact Insertion/Removal Tool, M83723-31-20
Heat Gun

***Materials:***

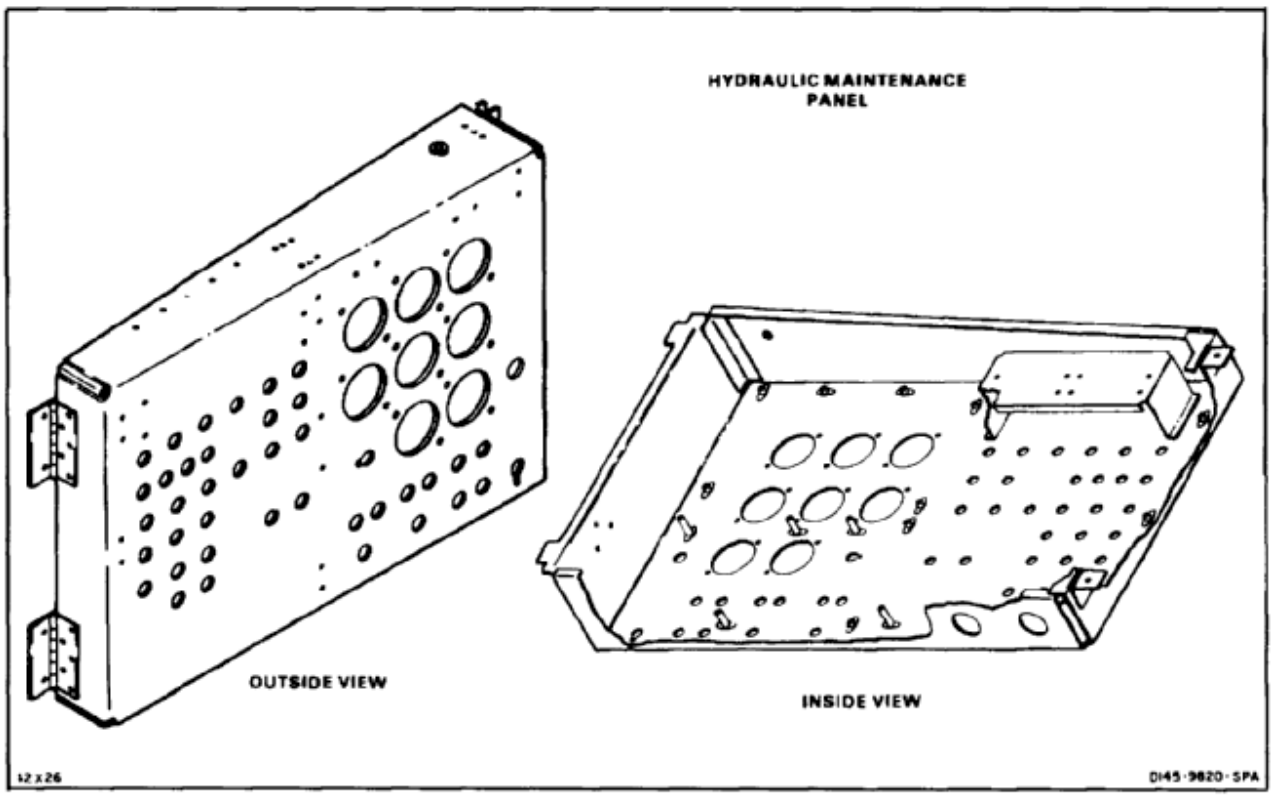
Tape, Lacing (E403)
Tubing (E431)
Solder (E360)
Lockwire (E231)
Cloth (E120)

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P
TM 55-1520-240-10
TM 55-6600-200-20
TM 55-1500-323-25

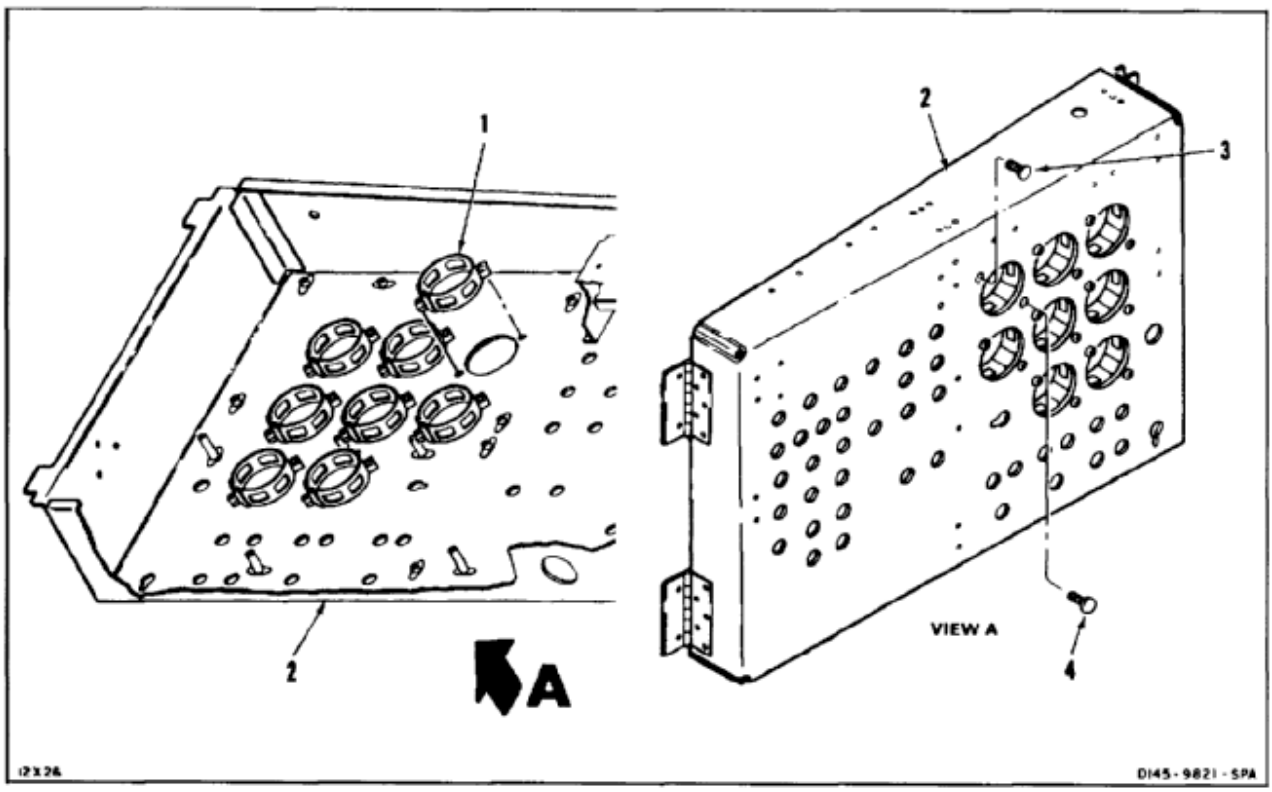


**NOTE**

Procedure is similar to install like components. Task contains 12 separate installations.

Procedure is the same to install eight indicator mount clamps. Installation of No. 1 FLIGHT CONTROL HYDRAULIC PRESSURE INDICATOR mount clamp is shown here.

1. Install indicator mount clamp as follows:
   a. Remove tag and position clamp (1) in panel (2).
   b. Install flathead retainer screw (3).
   c. Install round head clamp screw (4). Do not tighten screw at this time.

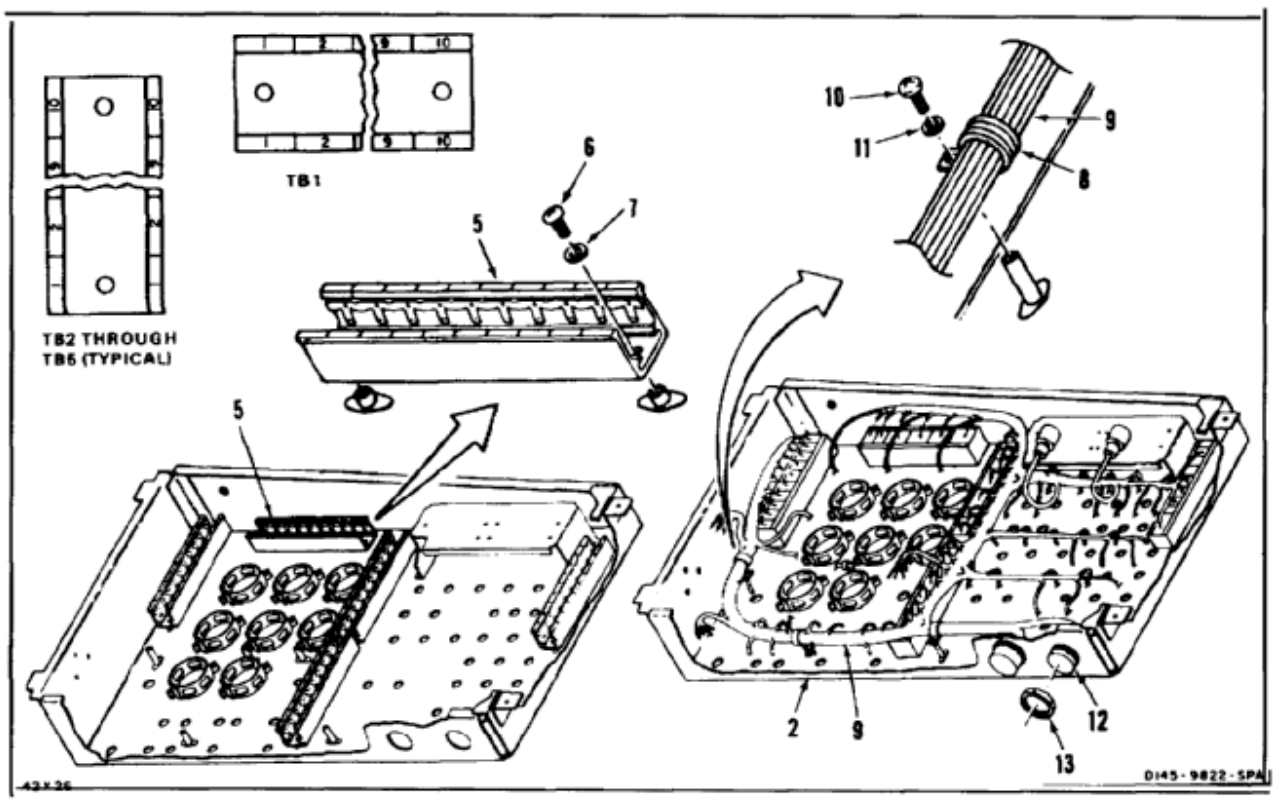


***INSPECT***

**NOTE**

Procedures to install five terminal board mounting tracks are similar. Installation of TB1 is shown here.

2. Installation of TB1 mounting track is as follows:
   a. Remove tag and position mounting track (5). For TB1, numbers 1 through 10 must read left to right. For TB2 through TB5, numbers 1 through 10 must read bottom to top.
   b. Install two screws (6) and washers (7).
3. Install wire harness as follows:
   a. Install all five clamps (8) on wire harness (9).
   b. Position wire harness (9) in panel (2).
   c. Install five screws (10) and washers (11).
   d. Install wire harness receptacles (12) in panel (2).
   e. Install two nuts (13) on receptacles (12). Lockwire nuts together. Use lockwire (E231).

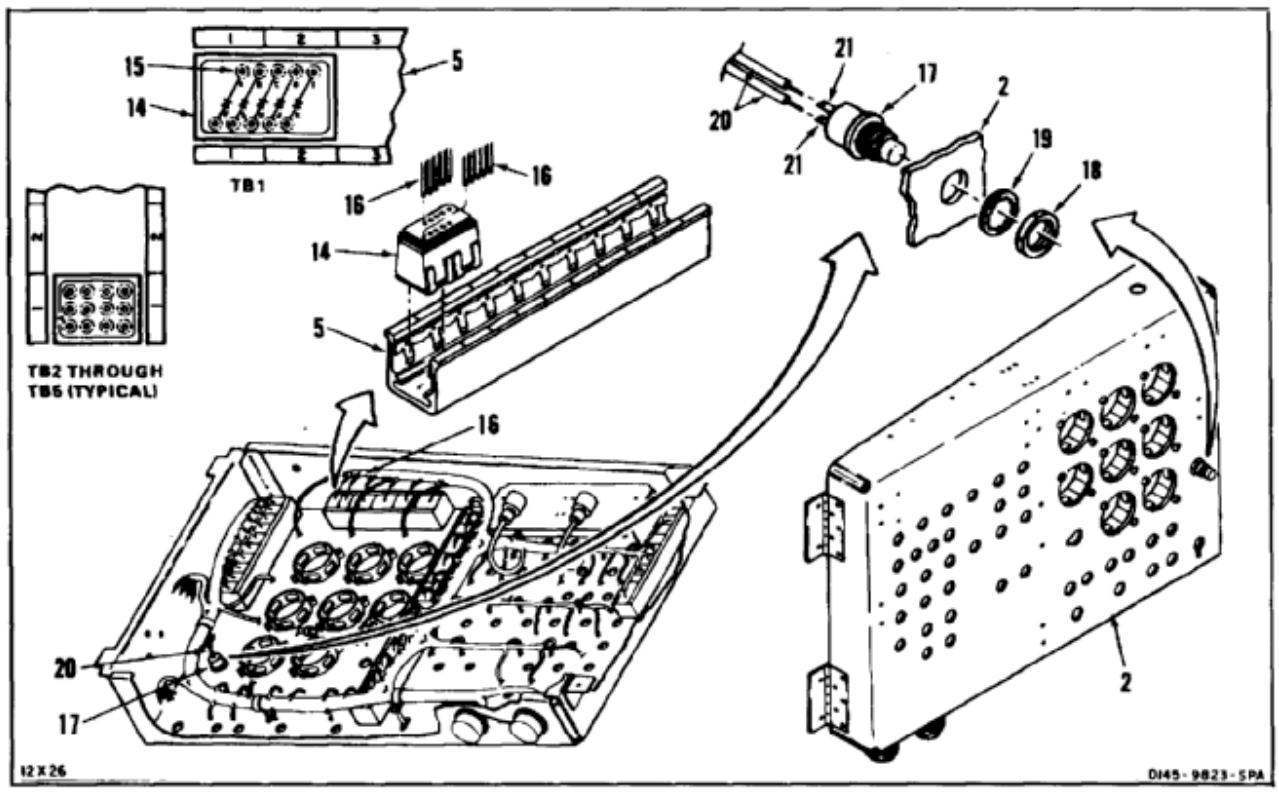


***INSPECT***

**NOTE**

Procedure is the same to install 10 diodes and 30 terminal modules. Installation of TB1-1/2 is shown here.

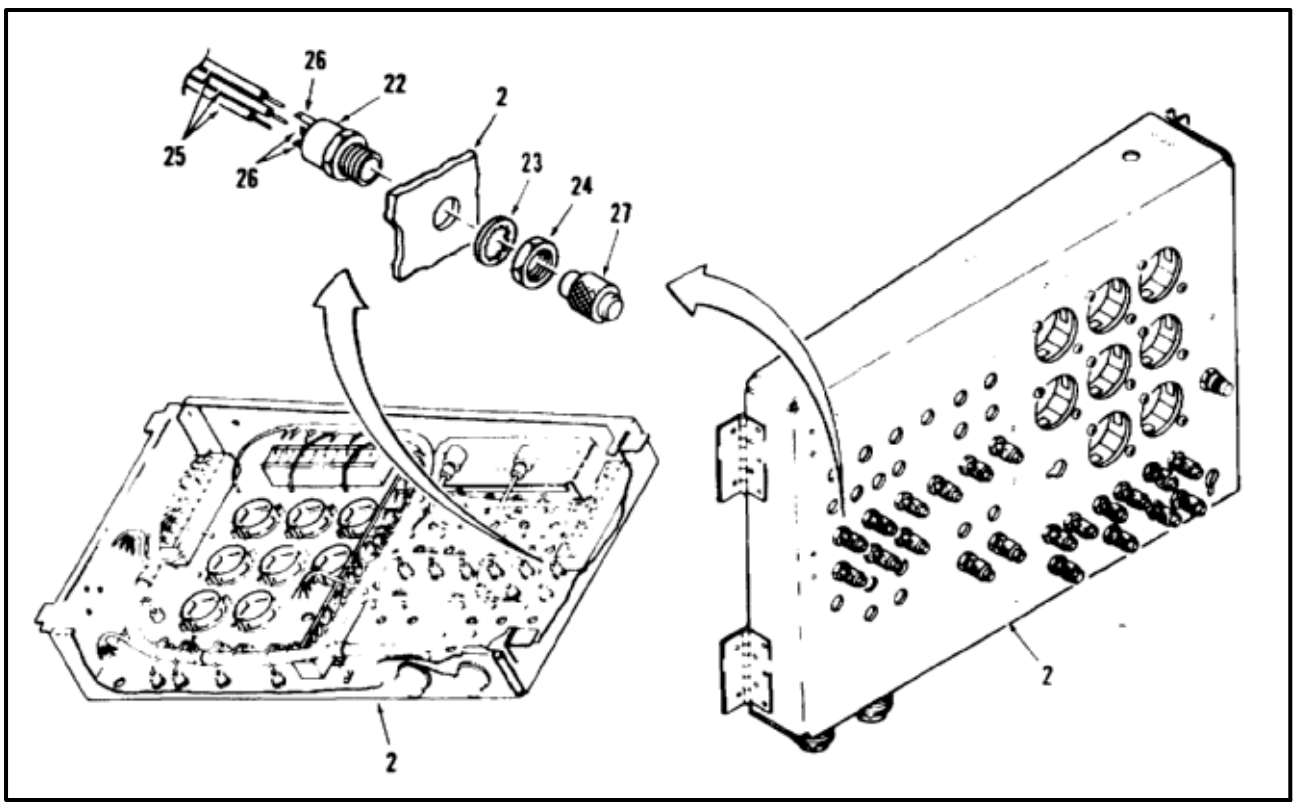
4. Install TB1-1/2 module as follows:
   a. Install module (14) in mounting track (5). Make sure A pin (15) location is at upper left. When installing modules in TB2 through TB5, make sure A pin location is at lower left.
   b. Connect 10 wires (16) to module (14). Use contact insertion/removal tool. Remove tags.
   c. Tie wires (16). Use lacing tape (E403) (TM 55-1500-323-25).
5. Install UTILITY HYDRAULIC RESERVOIR LEVEL check switch as follows:
   a. Remove tag and install switch (17) in panel (2) from inside.
   b. Install nut (18) and washer (19).
   c. Install tubing (E431) over wires (20).
   d. Solder two wires (20) to switch terminals (21). Use solder (E360). Remove tag.
   e. Slide tubing (E431) over switch terminals (21) and shrink with heat gun.
   f. Tie wires (20). Use lacing tape (E403) (TM 55-1500-323-25).



**NOTE**

Procedure is the same to install the TRANSMISSION MAIN OIL and AUX OIL PRESS, FILTER CHANGE, PUMP FAULT, and, on helicopters with 25, GROUND CONTACT indicator lights. Installation of the FWD TRANSMISSION AUX OIL PRESS indicator light is shown here.

6. Install indicator light as follows:
   a. Remove tag and install light base (22) in panel (2) from inside.
   b. Install lockwasher (23) and nut (24).
   c. Install tubing (E431) over three wires (25).
   d. Solder three wires (25) to light terminals (26). Use solder (E360). Remove tags.
   e. Slide tubing (E431) over light terminals (26) and shrink with heat gun.
   f. Tie wires (25). Use lacing tape (E403) (TM 55-1500-323-25).
   g. Install lens (27) on light base (22).

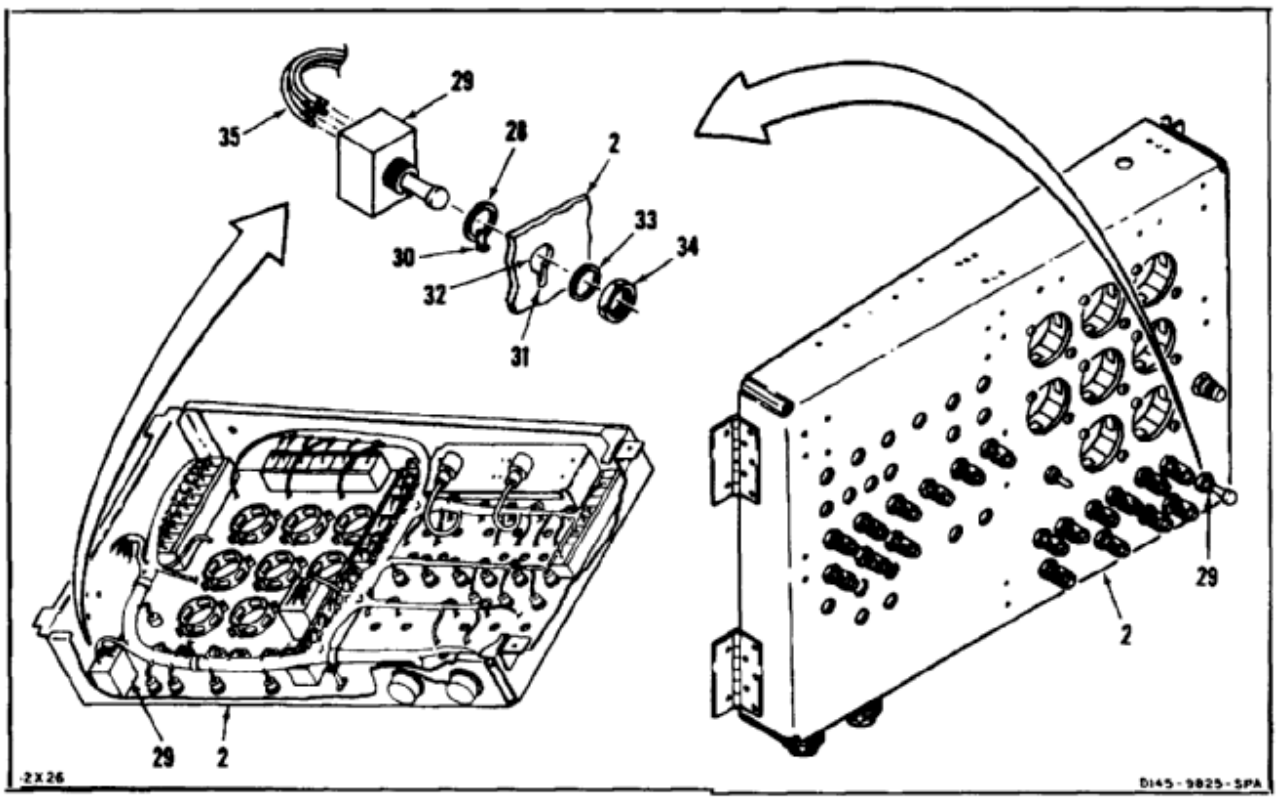


## 8-101 INSTALL HYDRAULIC MAINTENANCE PANEL COMPONENTS (Continued) 8-101

**NOTE**

Procedure is same to install GND RESET/TEST and FLIGHT CONTROL HYDRAULIC RESERVOIR LEVEL SELECT SWITCH. Installation of GND RESET/TEST SWITCH is shown here.

7. Install GND RESET/TEST SWITCH as follows:
   a. Install locking ring (28) on switch (29). Make sure tab (30) of locking ring faces away from switch.
   b. Remove tag and install switch (29) in panel (2) from inside. Make sure that tab (30) of locking ring (28) is in locator notch (31) of switch mount hole (32).
   c. Install lockwasher (33) and nut (34).
   d. Connect five wires (35). Use contact insertion/removal tool. Remove tags.
   e. Tie wires (35). Use lacing tape (E403) (TM 55-1500-323-25).



**NOTE**

Procedure is the same to install TRANSMISSION CHIP DETECTOR, DEBRIS SCREEN, OVERTEMP, and ENGINE CHIP DETECTION INDICATORS. Installation of FORWARD TRANSMISSION CHIP DETECTOR INDICATOR is shown here.

8. Install FORWARD TRANSMISSION CHIP DETECTOR INDICATOR as follows:

a. Install indicator (36) in panel (2) from inside.

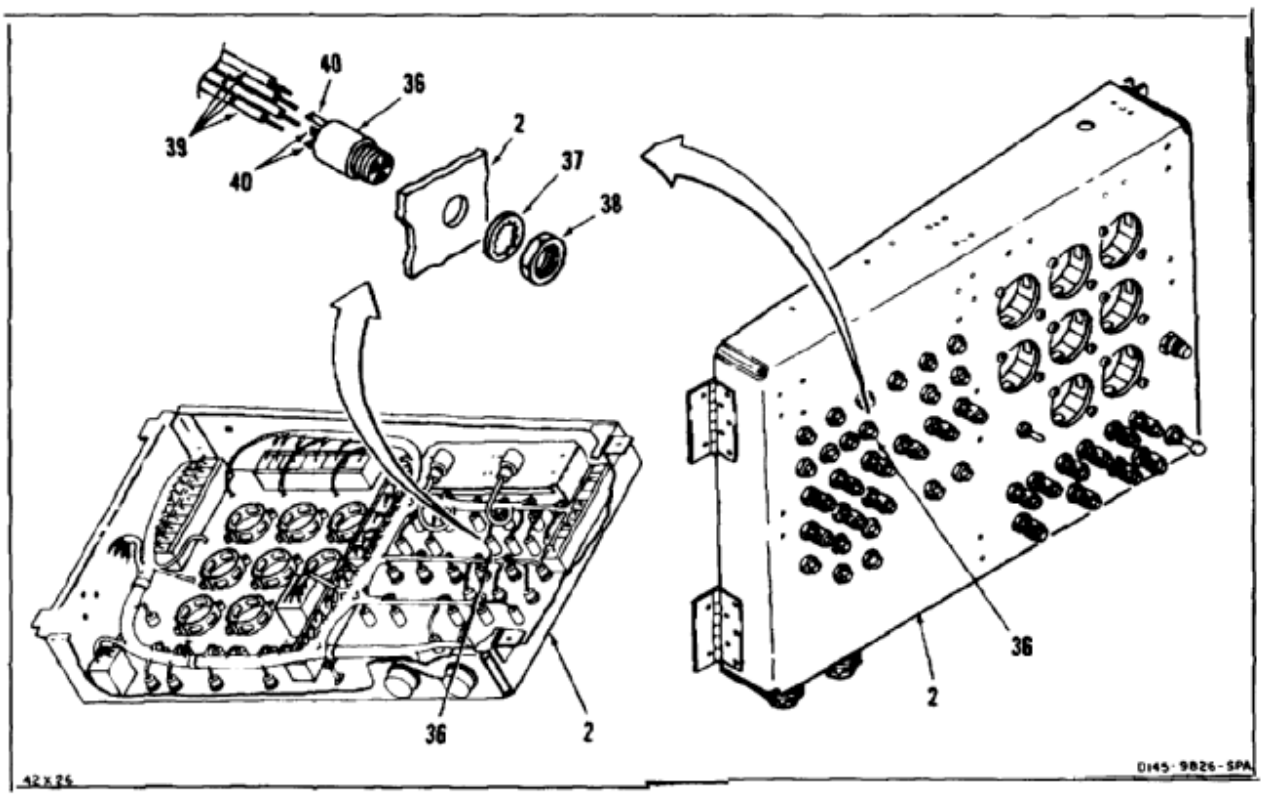
b. Install lockwasher (37) and nut (38).

c. Install tubing (E431) over four wires (39).

d. Solder four wires (39) to indicator terminals (40). Use solder (E360). Remove tags.

e. Slide tubing (E431) over indicator for terminals (40) and shrink with heat gun.

f. Tie wires (39). Use lacing tape (E403) (TM 55-1500-323-25).



**NOTE**

Procedure is the same to install HYDRAULIC PRESSURE TEMPERATURE and RESERVOIR LEVEL INDICATORS. Installation of No. 1 FLIGHT CONTROL HYDRAULIC PRESSURE INDICATOR is shown here.

9. Install No. 1 FLIGHT CONTROL HYDRAULIC PRESSURE INDICATOR as shown:

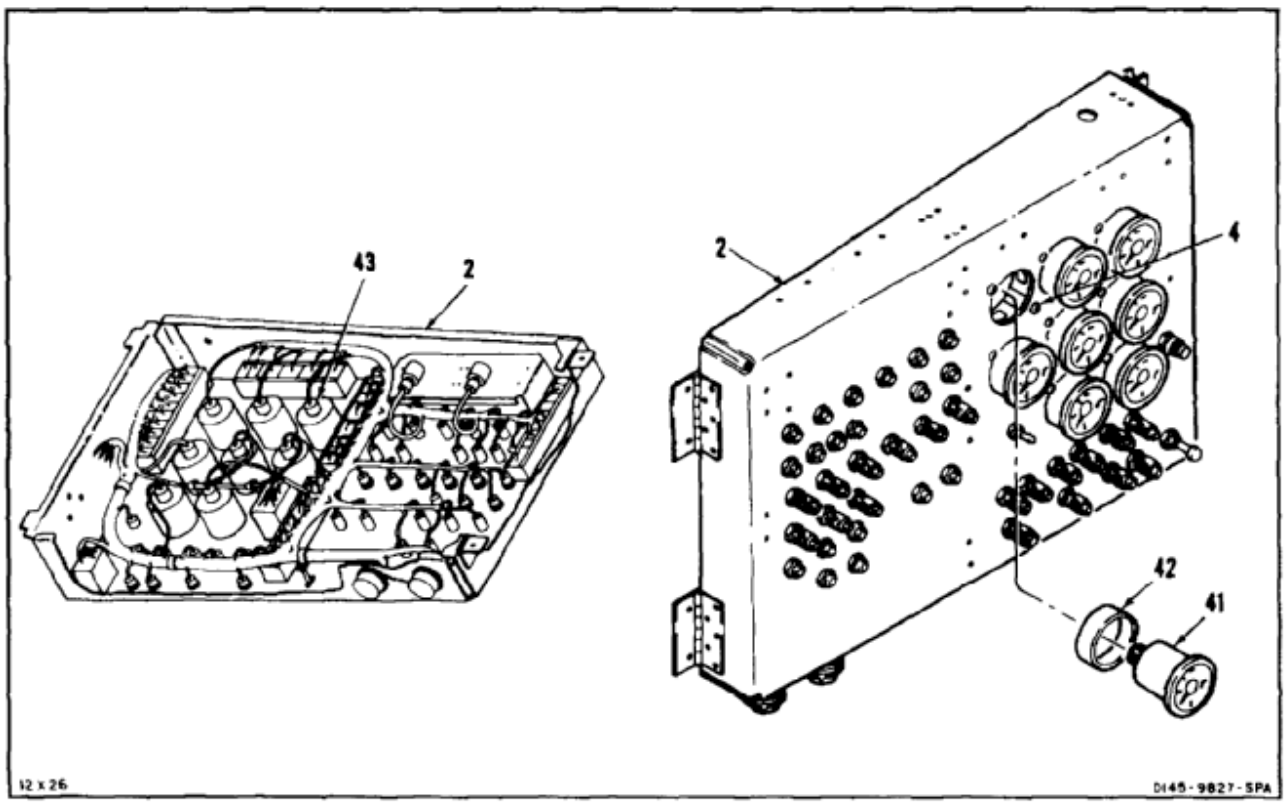
a. Clean bonding surface of indicator (41). Use cloth (E120).

b. Install space (42) on indicator (41).

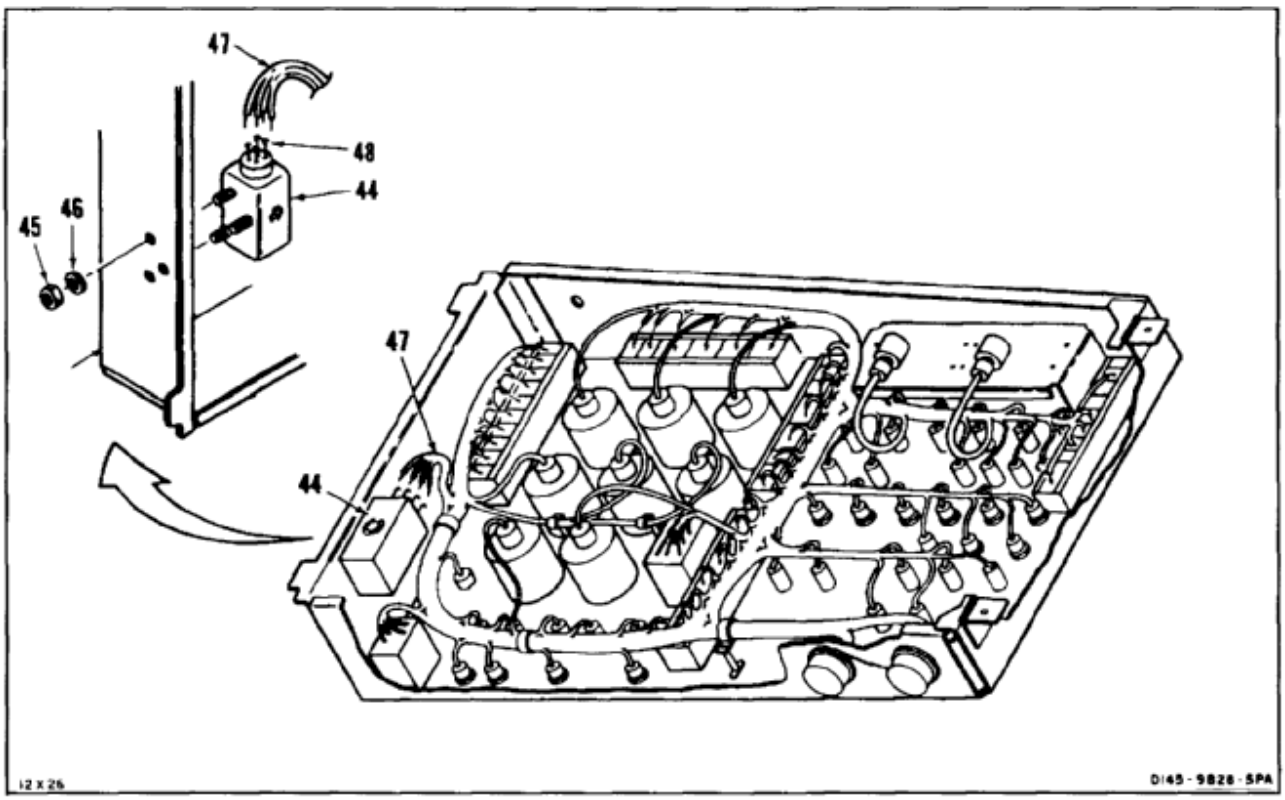
c. Remove tag and install indicator (41) in panel (2) (TM 55-1520-240-10).

d. Tighten round head clamp screw (4).

e. Connect electrical connector (43) to indicator (41). Remove tag.



10. Install aft transmission low oil pressure time delay relay as follows:
    a. Remove tag and install relay (44) in panel (2).
    b. Install three nuts (45) and washers (46).
    c. Install tubing (E431) over four wires (47).
    d. Solder four wires (47) to relay terminals (48). Use solder (E360). Remove tags.
    e. Slide tubing (E368.1) over relay terminals (48) and shrink with heat gun.
    f. Tie wires (47). Use lacing tape (E403) (TM 55-1500-323-25).



**NOTE**

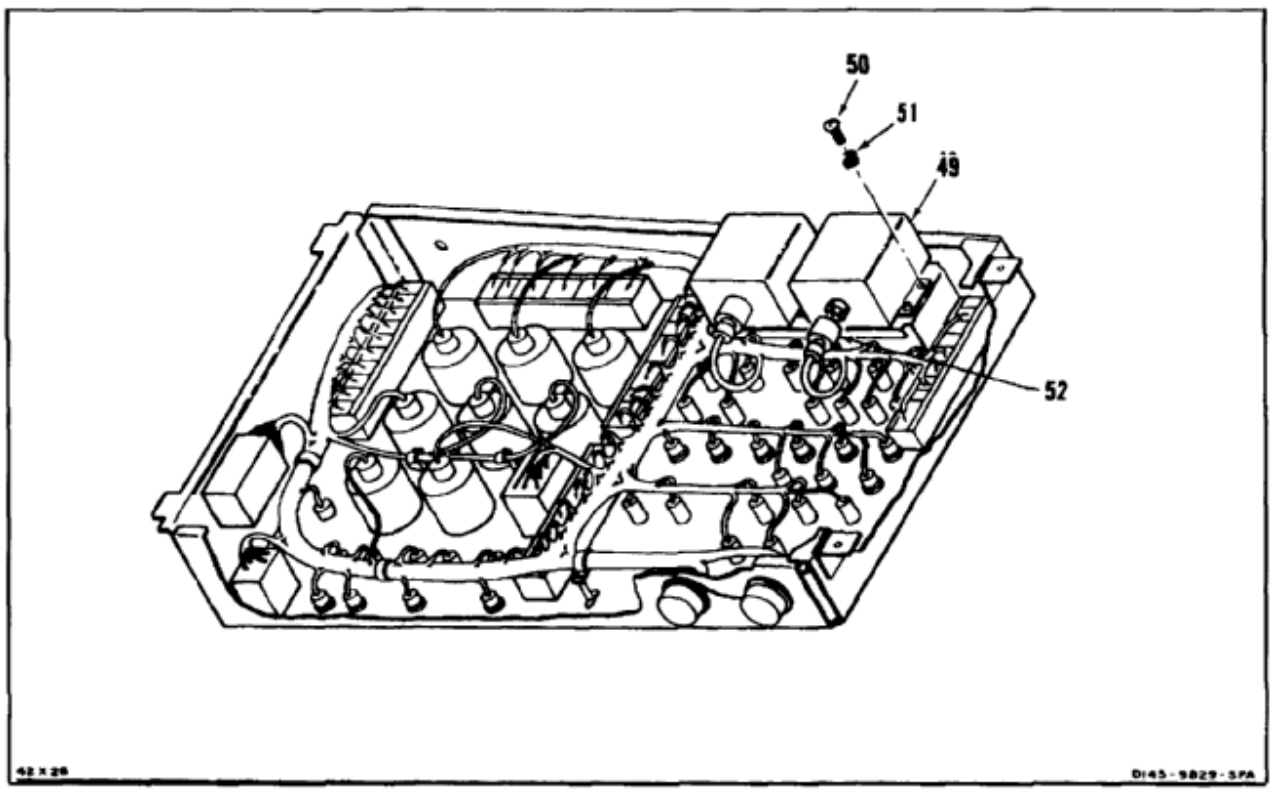
Procedure is the same to install UTILITY or No. 1/No. 2 FLIGHT CONTROL hydraulic system level SIGNAL CONDITIONER. Installation of UTILITY hydraulic system level SIGNAL CONDITIONER is shown here.

11. Install UTILITY hydraulic system level SIGNAL CONDITIONER as follows:

a. Clean bonding surfaces of signal conditioner (49). Use cloth (E120).

b. Position signal conditioner (49) and install four screws (50) and washers (51). Remove tag.

c. Connect electrical connector (52) to signal conditioner (49). Remove tag.



12. Install WORK LIGHT as follows:

a. Remove tag and position base (53) on panel (2).

b. Install two screws (54) and washers (55).

c. Install work light (56) in base (53).

d. Install grommet (57) in panel (2).

e. Route two work light wires (58 and 59) through grommet (57).

f. Route black work light wire (58) to T54 (60) module 7 (61). Insert wire into pin socket (7). Use contact insertion/removal tool.

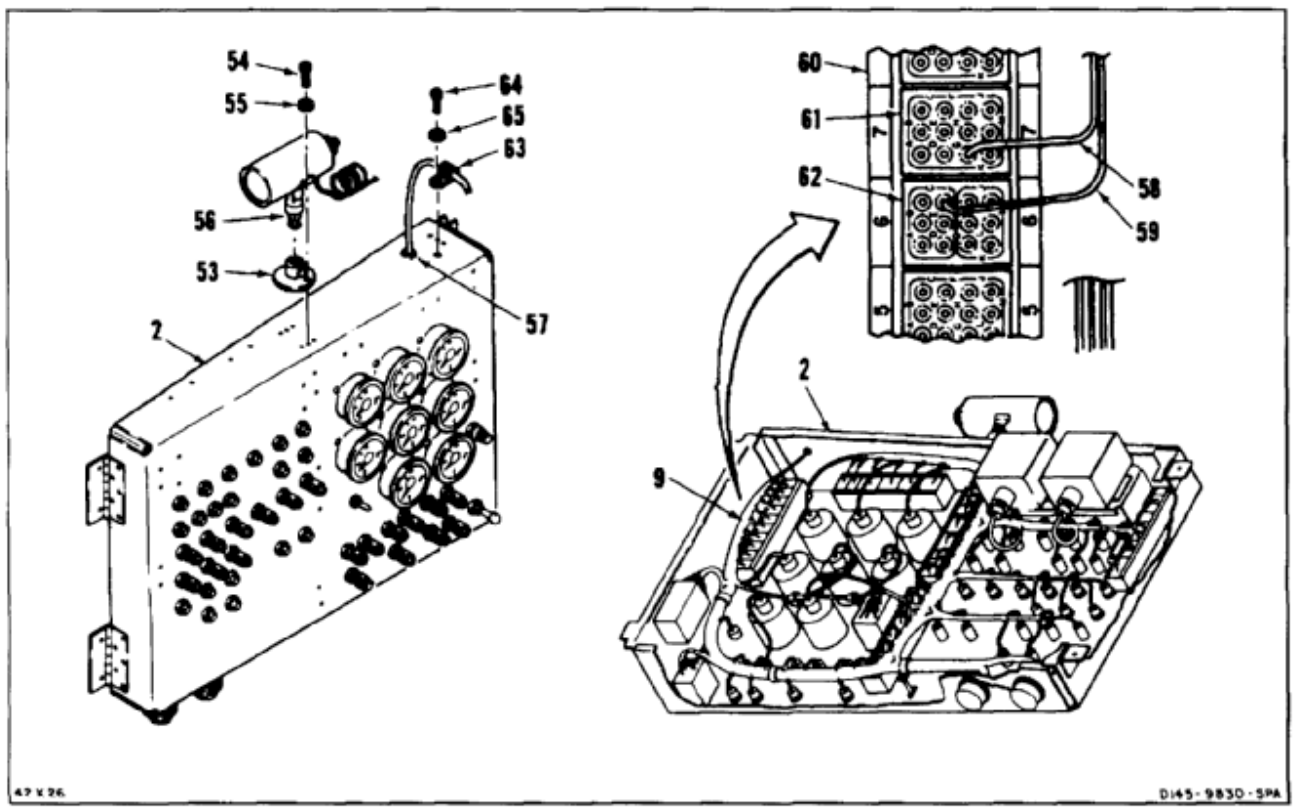
g. Route white work light wire (59) to TB4 (60) module 6 (62). Insert wire into pin socket F. Use contact insertion/removal tool.

h. Position clamp (63) and install screw (64) and washer (65).

i. Tie work light wires (58 and 59) to wire harness (19). Use lacing tape (E403) (TM 55-1500-323-25).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 8-102 INSTALL HYDRAULIC MAINTENANCE PANEL 8-102

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

Cloth (E120)
Dry Cleaning Solvent (E162)
Gloves (E186)

***Personnel Required:***

Aircraft Electrician
Medium Helicopter Repairer
Inspector

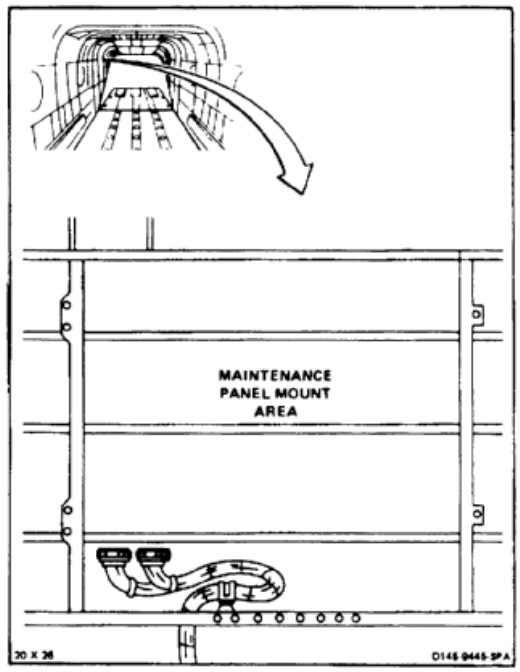
***References:***

TM 55-1520-240-23P
TM 55-1500-323-25

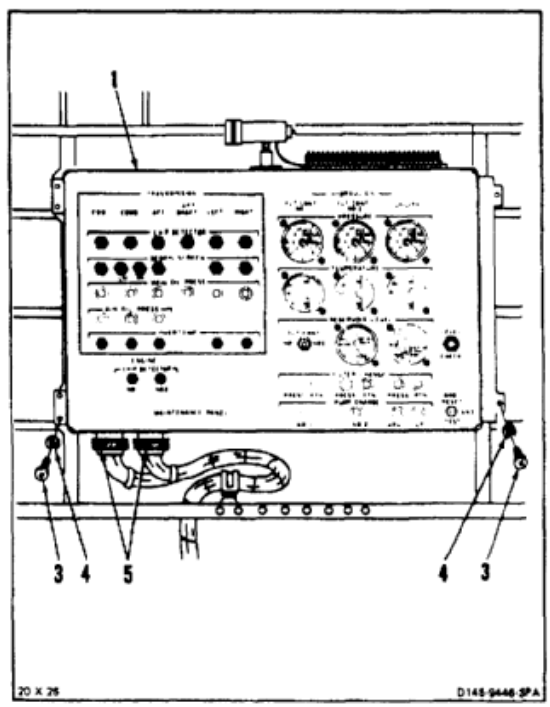
***General Safety Instructions:***

**WARNING**

Dry cleaning solvent (E162) is combustible and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.




1. Clean bonding surfaces of maintenance panel (1). Use gloves (E186) and cloths (E120) (TM 55-1500-323-25).
2. Position maintenance panel (1). Have helper hold panel in position.
3. Install six screws (3) and washers (4).
4. Connect two wire harness connectors (6). Remove tags.




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Operational check of system (TM 55-1520-240-T).



END OF TASK

## 8-103 REMOVE PILOT'S INSTRUMENT PANEL 8-103

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Contact Insertion/Removal Tool, M83723-31-20

***Materials:***

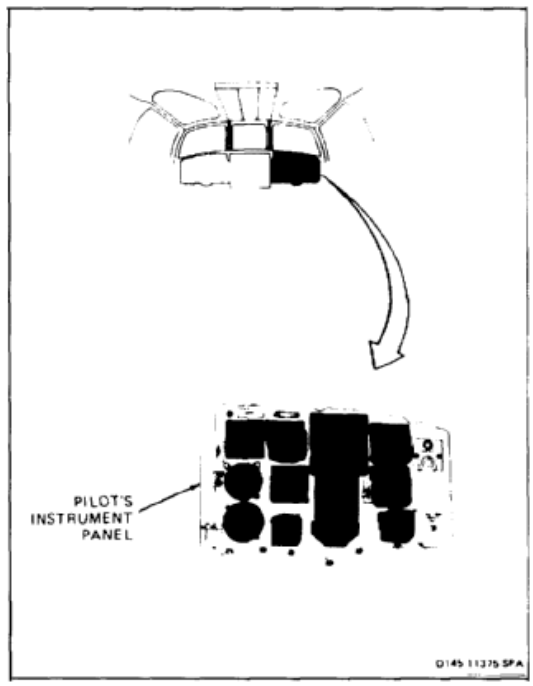
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

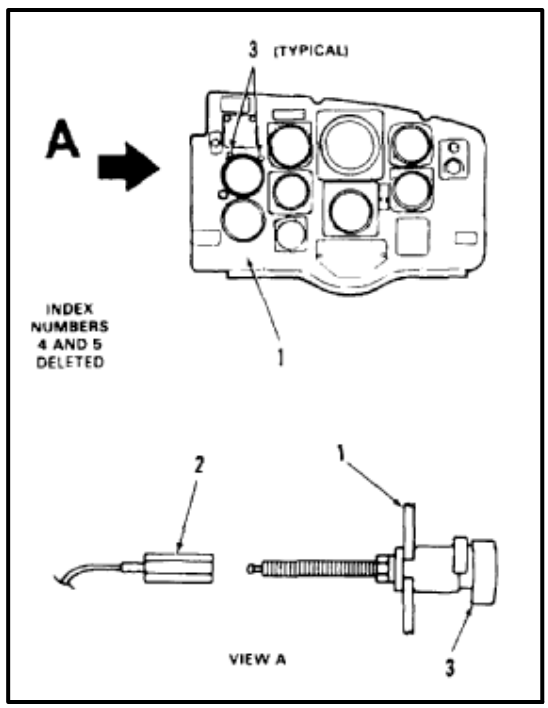
Aircraft Electrician

***Equipment Condition:***

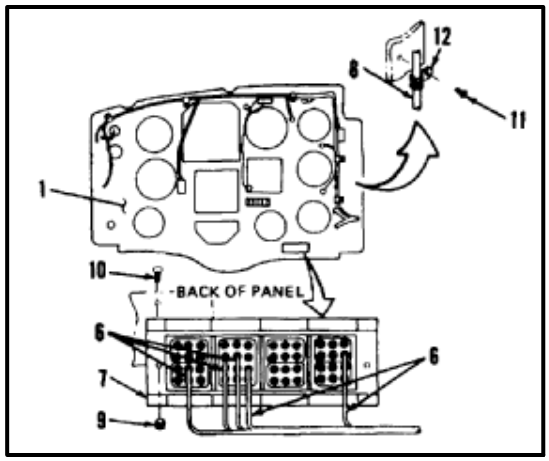
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Remove Emergency Power Light (Task 8-3)
Remove Clock (Task 8-92)
Remove Clamp Mounted Instruments on Pilot's Panel (Task 8-88)
Remove Flange Mounted Instruments on Pilot's Panel (Task 8-90)
Remove Turn and Slip Indicator (Task 8-44)
Remove Radar Altimeter (TM 11-1520-240-23)




1. Without 17, reach behind panel (1), tag and disconnect wire (2) from each postlight (3). Use tags (E264). Tape wire ends. Use tape (E385).
2. With 17, tag and unscrew wire (2) from each postlight (3). Tape screw thread ends. Use tape (E385).



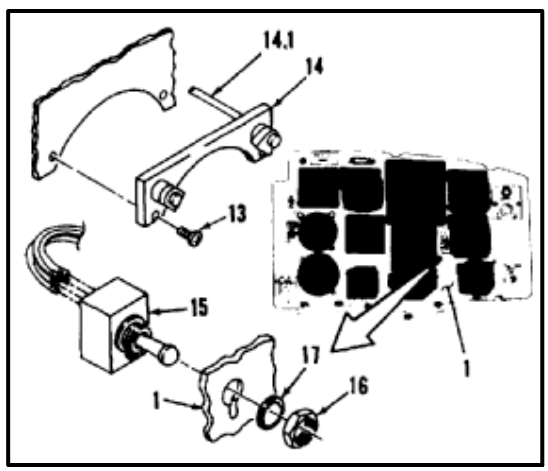
3. Disconnect five wires (6) from TB2 (7). Use contact insertion/removal tool.
4. Remove five wires (6) from wire harness (8).
5. Remove module directly above each nut (9). Use module extraction tool. Remove two screws (10), nuts (9), and TB2 (7).
6. Remove four screws (11) from four clamps (12).
7. Move wire harness (8) away from panel (1).



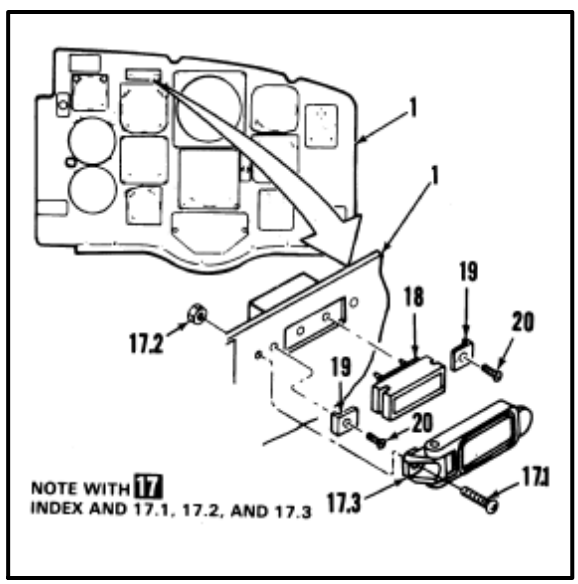

**NOTE**

Helicopters without 17 have three light fixtures. Helicopters with 17 have four light fixtures.

8. Remove two screws (13) from each light fixture (14). Remove fixture by cutting wire (14.1) and pulling end through panel (1). Tag fixture.
9. Remove each of two switches (15) by removing nut (16) and washer (17). Push switch through instrument panel (1).

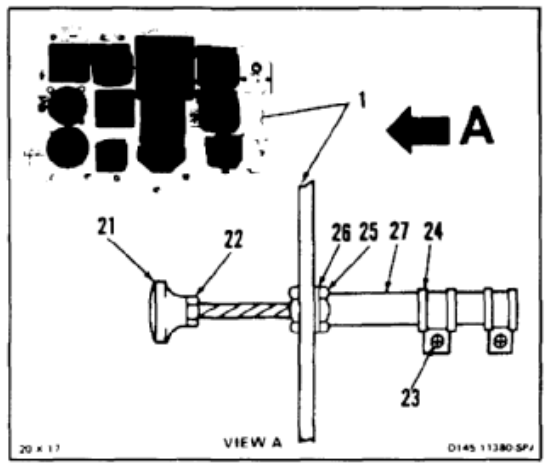



10. With 17, remove screw (17.1), nut (17.2), and filter cap (17.3).
11. Remove light (18) from two clips (19). Remove two screws (20) and two clips from panel (1).

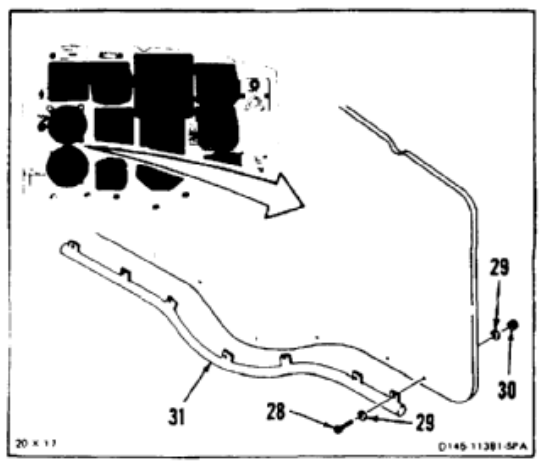


12. Remove knob (21) and nut (22).

13. Loosen screw (23) on clamp (24). Loosen nut (25) and washer (26). Slide tube (27) through panel (1).




14. Remove 7 screws (28), 14 washers (29), 7 nuts (30), and pad (31).



15. Without 17, remove lens (32) and lamp (33).

15.1. Loosen two setscrews (34) and remove knob (35).

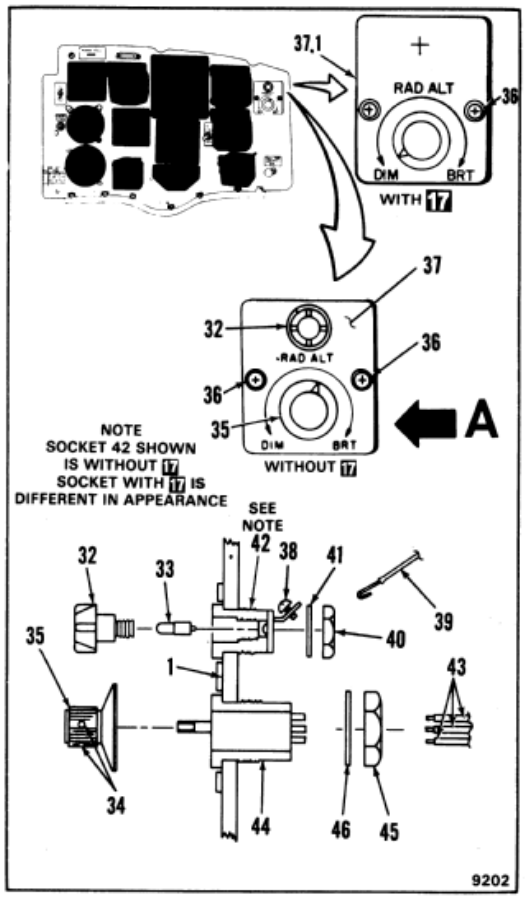
16. Remove two screws (36) and remove panel (37 or 37.1).

17. Loosen screw (38) and remove wire (39). Tape exposed end of wire. Use tape (E385).

18. Remove nut (40), washer (41), and socket (42) from panel (1).

19. Tag and disconnect three wires (43) from rheostat (44). Tape exposed end of wire. Use tape (E385).

20. Remove nut (45), washer (46), and rheostat (44) from panel (1).

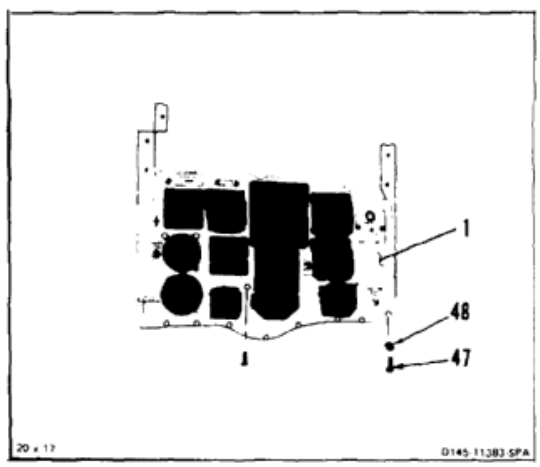



21. Remove nine screws (47) and washers (48).

22. Remove panel (1).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 8-104 INSTALL PILOT'S INSTRUMENT PANEL 8-104

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Contact Insertion/Removal Tool, M83723-31-20

***Materials:***

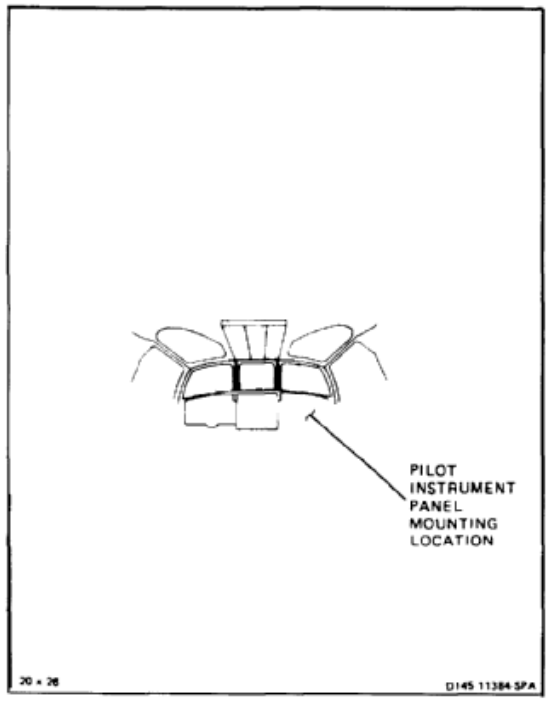
None

***Personnel Required:***

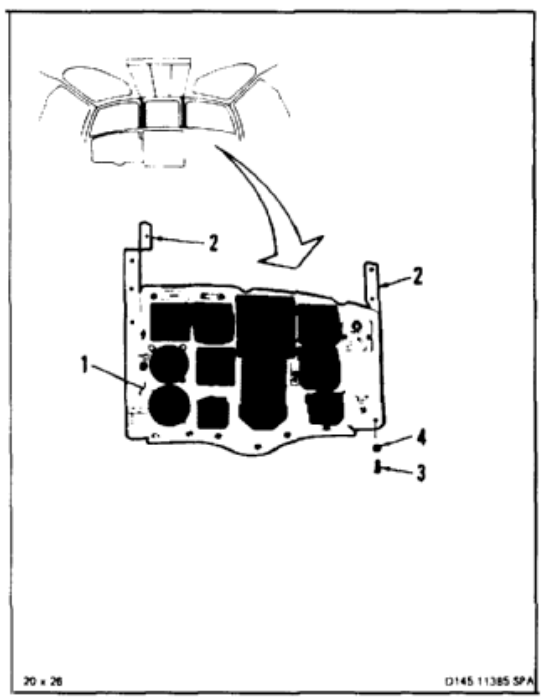
Aircraft Electrician
Inspector

***References:***

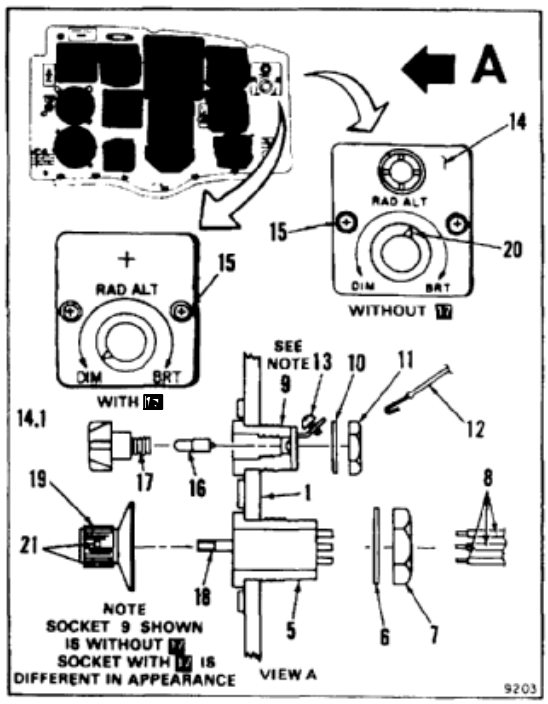
TM 55-1520-240-23P
TM 55-1500-323-25



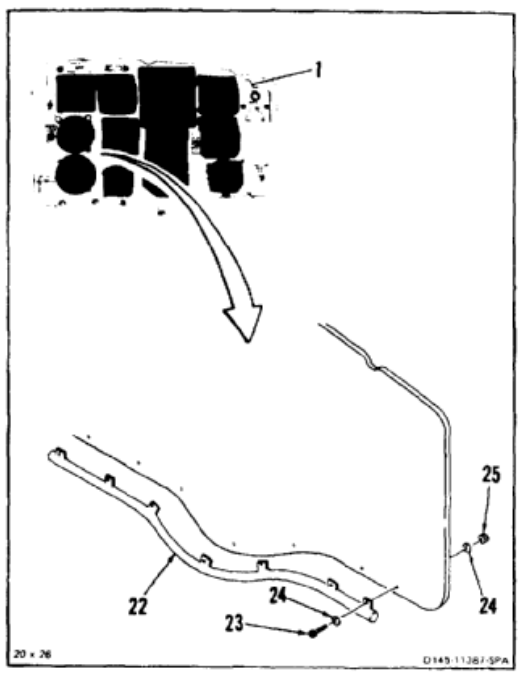

1. Position panel (1) on mounting brackets (2). Install nine screws (3) and washers (4).



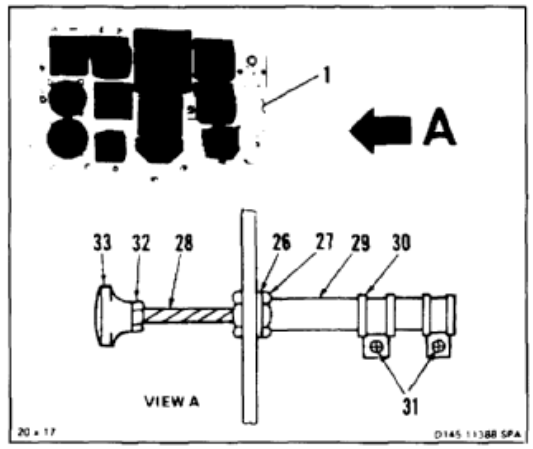
2. Position rheostat (5) in panel (1). Install washer (6) and nut (7) on rheostat. Remove tape and connect three wires (8) to rheostat (5). Remove tags.
3. Position socket (9) in panel (1). Install washer (10) and nut (11) on socket.
4. Remove tape and connect wire (12) to socket (9). Tighten screw (13).
5. Position panel (14 or 14.1). Install two screws (15).
6. Without **17**, install lamp (16) and lens (17) in socket (9).
7. Turn rheostat shaft (18) to left. Position knob (19) on shaft (18) so pointer (20) is on DIM. Tighten two setscrews (21).



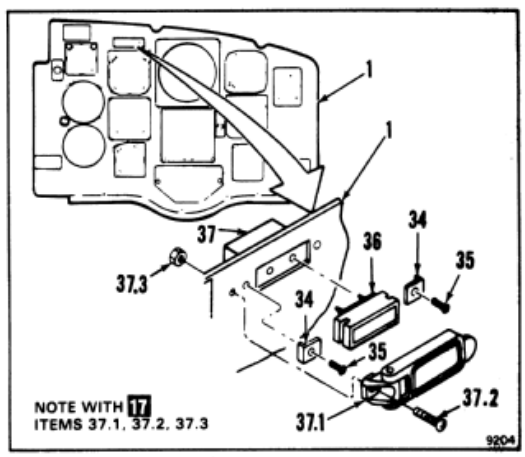

8. Position pad (22) on panel (1). Install 7 screws (23), 14 washers (24), and 7 nuts (25).



9. Position washer (26) and nut (27) on wire (28).
10. Thread wire (28) through tube (29) and slide tube through panel (1) into clamps (30).
11. Install washer (26) and nut (27) on tube (29). Tighten screws (31) on clamps (30).
12. Install nut (32) and knob (33) on wire (28).



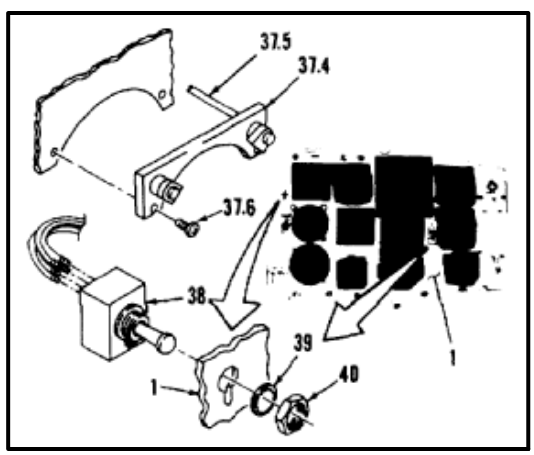

13. Position two clips (34) on panel (1). Install two screws (35). Install light (36) between two clips. Make sure light plugs into socket (37).
13.1. With 17, position filter cap (37.1) on panel (1). Install screw (37.2) and nut (37.3).



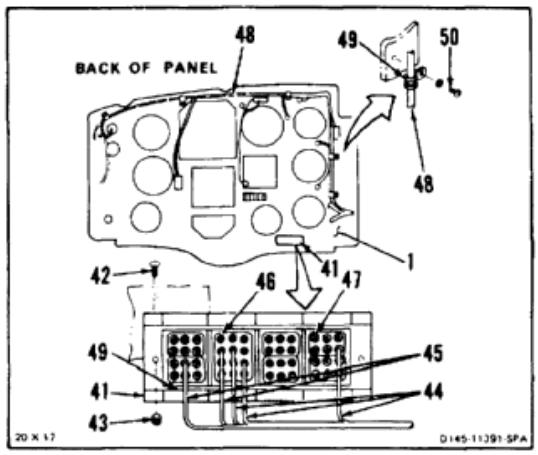

**NOTE**

Helicopters without 17 have three light fixtures on pilot's panel. Helicopters with 17 have four light fixtures.

13.2. Install each light fixture (37.4) by threading wire (37.5) through hole in panel (1). Install two screws (37.6). Splice wire behind panel (TM 55-1500-323-25).
14. Position each of two switches (38) in panel (1). Install washer (39) and nut (40).

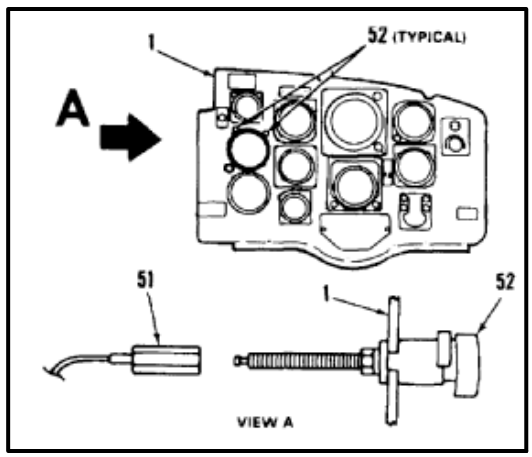


15. Position TB2 (41) on panel (1). Install two screws (42) and nuts (43). Install module directly above each nut.
16. Remove tape and insert three wires (44) and two wires (45) through holes in panel (1).
17. Install three wires (44) in module (46) and two wires (45) in module (47). Use contact insertion/removal tool.
18. Install five wires (44 and 45) in wire harness (48). Position wire harness on panel (1).
19. Install four clamps (49) with four screws (50).




20. Without **17**, reach behind panel (1) and connect wire (51) to each postlight assembly (52).
21. With **17**, reach behind panel (1) and screw wire (51) to each postlight assembly (52).

***INSPECT***




***FOLLOW-ON MAINTENANCE:***

Install radar altimeter (TM 11-1520-240-23).
Install turn and slip indicator (Task 8-45).
Install flange mounted instruments on pilot's panel (Task 8-91).
Install clamp mounted instruments on pilot's panel (Task 8-89).
Install clock (Task 8-93).
Install emergency power light (Task 8-4).
Perform operational check of affected systems (TM 55-1520-240-T).

END OF TASK

## 8-105 REMOVE COPILOT'S INSTRUMENT PANEL 8-105

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Contact Insertion/Removal Tool, M83723-31-20

***Materials:***

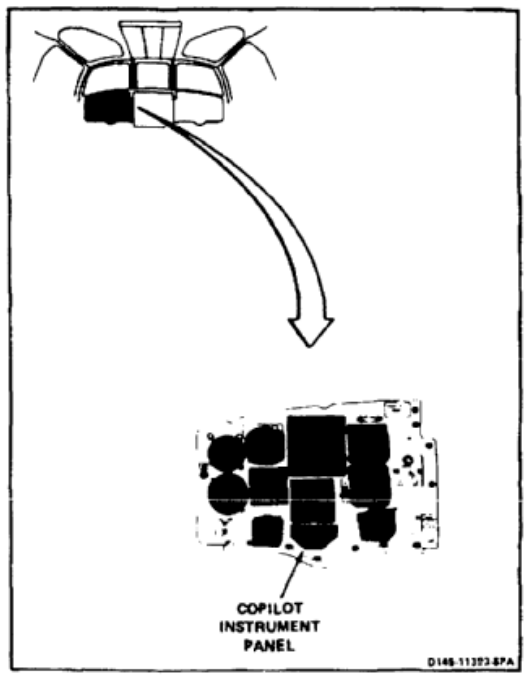
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

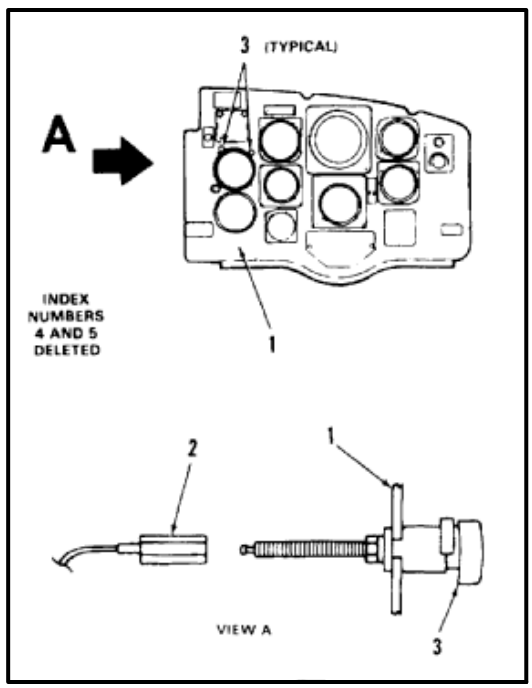
Aircraft Electrician

***Equipment Condition:***

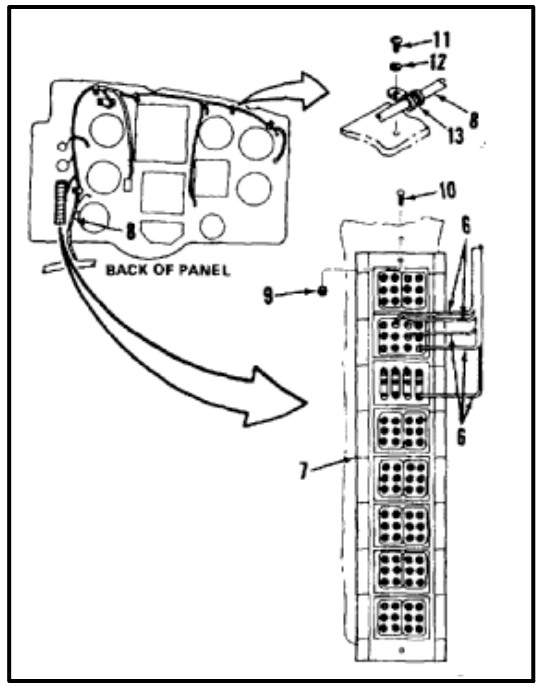
Battery Disconnected (Task 1-39)
Electrical Power Off
Remove Emergency Power Light (Task 8-3)
Remove Clock (Task 8-92)
Remove Clamp Mounted Instruments on Copilot's Panel (Task 8-88)
Remove Flange Mounted Instruments on Copilot's Panel (Task 8-90)
Remove Turn and Slip Indicator (Task 8-44)
Remove Radar Altimeter (TM 11-1520-240-23)




1. Without 17, reach behind panel (1), tag and disconnect wire (2) from each postlight (3). Use tags (E264). Tape wire ends with (E385).
2. With 17, tag and unscrew wire (2) from each postlight (3). Tape screw thread ends.



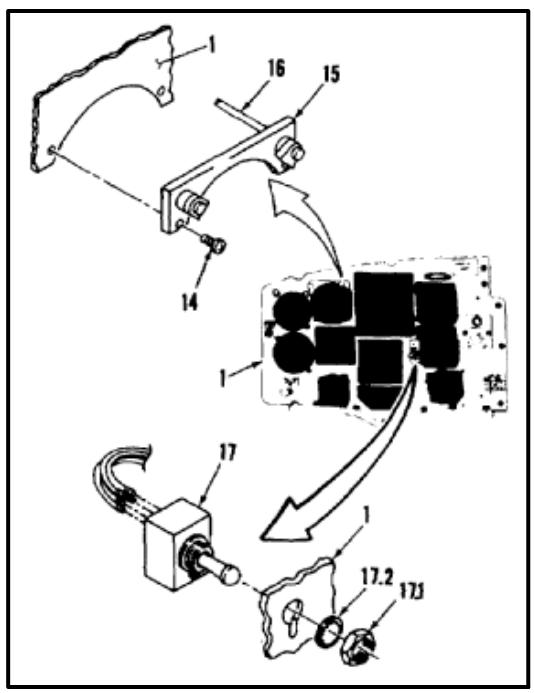
3. Disconnect five wires (6) from TB1 (7). Use contact insertion/removal tool.
4. Remove five wires (6) from wire harness (8).
5. Remove module directly above each nut (9). Remove two screws (10), nuts (9), and TB1 (7).
6. Remove five screws (11), washers (12), and clamps (13).
7. Move wire harness (8) away from panel (1).



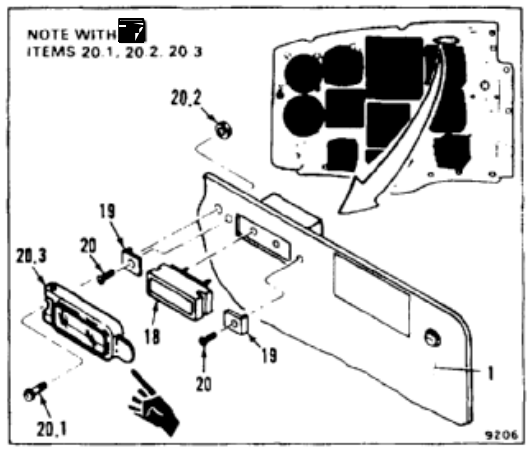

**NOTE**

Helicopters without 17 have three light fixtures. Helicopters with 17 have four light fixtures.

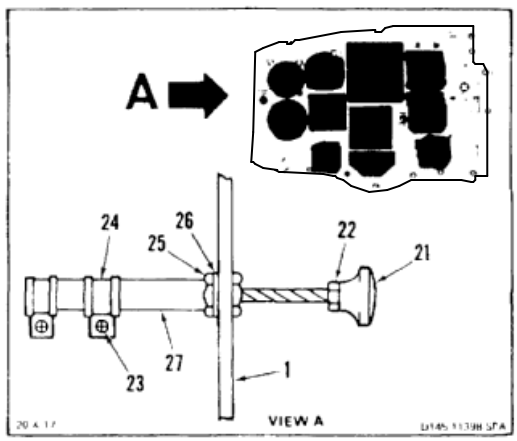
8. Remove two screws (14) from each light fixture (15). Remove fixture by cutting wire (16) and pulling end through panel (1). Tag wire.
9. Remove each of two switches (17) by removing nut (17.1) and washer (17.2). Push switch through instrument panel (1).



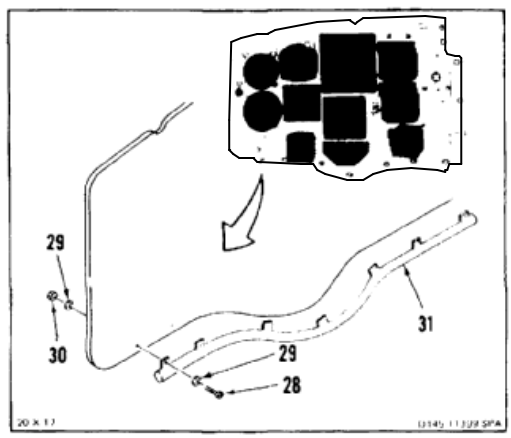
10. Remove light (18) from two clips (19).
11. Remove two screws (20) and two clips, from panel (1).
11.1. With 17, remove screw (20.1), nut (20.2), and filter cap (20.3).




12. Remove knob (21) and nut (22).
13. Loosen screw (23) on clamp (24). Loosen nut (25) and washer (26). Slide tube (27) through panel (1).




14. Remove seven screws (28), 14 washers (29), seven nuts (30), and pad (31).



15. Without 17, remove lens (32) and lamp (33).

15.1. Loosen two setscrews (34) and remove knob (35).

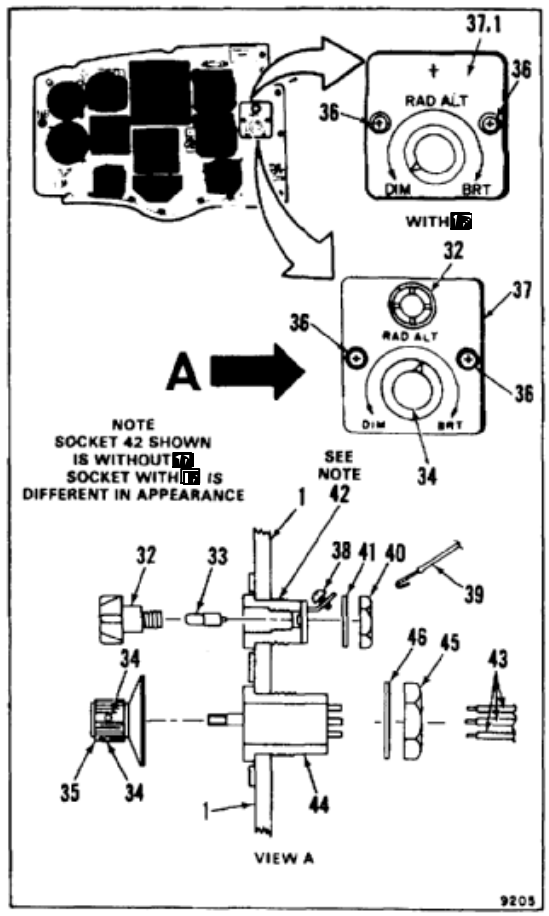
16. Remove two screws (36) and remove panel (37 or 37.1).

17. Loosen screw (38) and remove wire (39). Tape exposed end of wire. Use tape (E385).

18. Remove nut (40), washer (41), and socket (42) from panel (1).

19. Tag and disconnect three wires (43) from rheostat (44). Tape exposed end of wire. Use tape (E385).

20. Remove nut (45), washer (46), and rheostat (44) from panel (1).

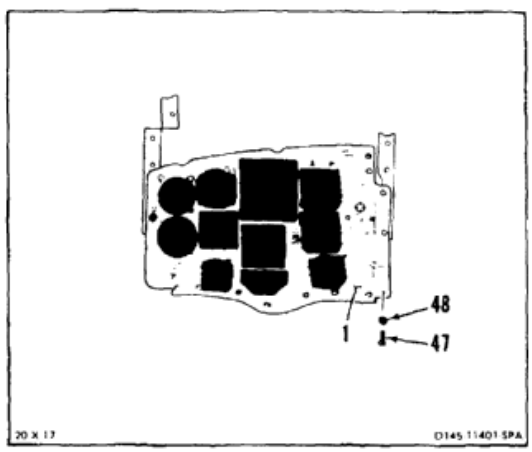



21. Remove nine screws (47) and washers (48).

22. Remove panel (1).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 8-106 INSTALL COPILOT'S INSTRUMENT PANEL 8-106

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Contact Insertion/Removal Tool, M83723-31-20

***Materials:***

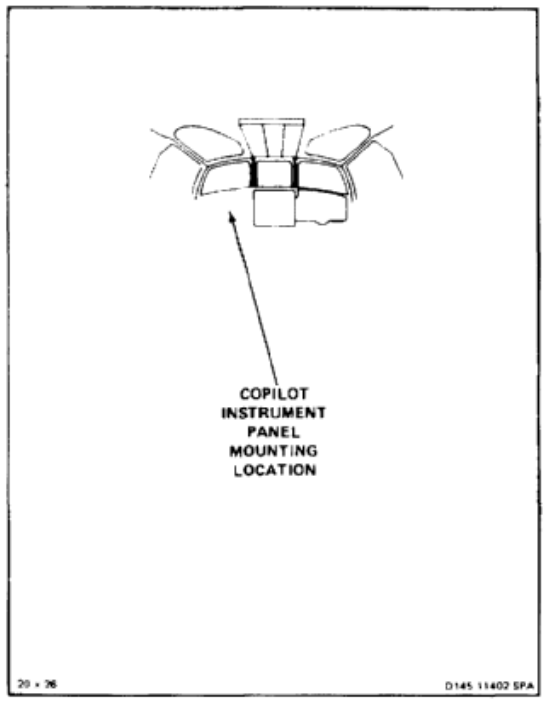
None

***Personnel Required:***

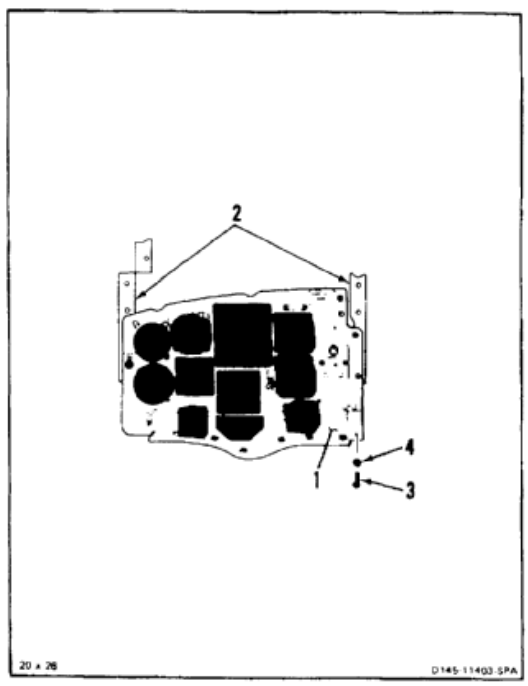
Aircraft Electrician
Inspector

***References:***

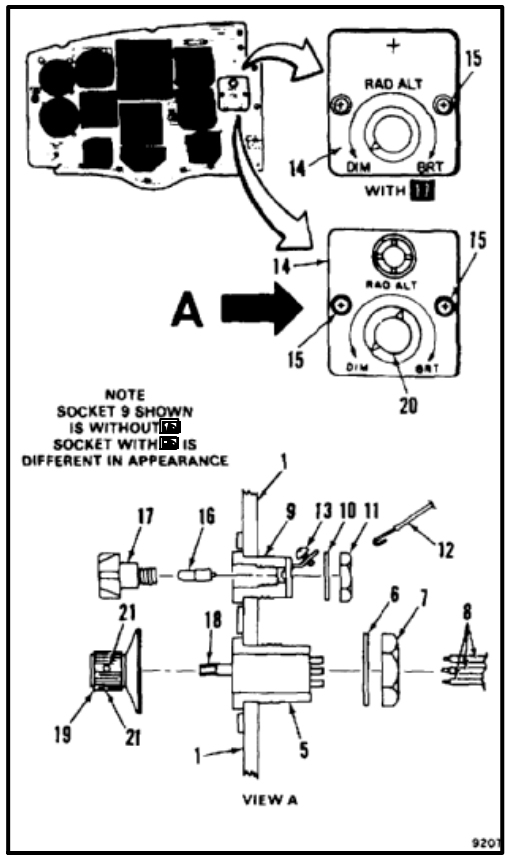
TM 55-1520-240-23P
TM 55-1500-323-25



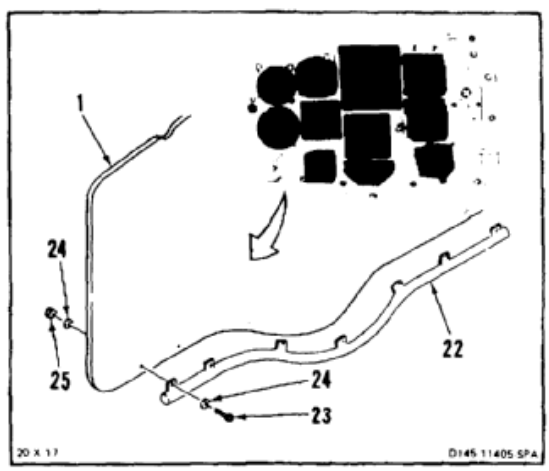

1. Position panel (1) on mounting brackets (2). Install nine screws (3) and washers (4).



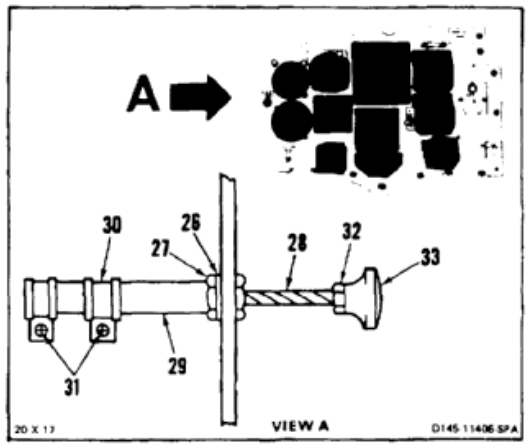
2. Position rheostat (5) in panel (1). Install washer (6) and nut (7) on rheostat.
3. Remove tape and connect three wires (8) to rheostat (5). Remove tags.
4. Position socket (9) in panel (1). Install washer (10) and nut (11) on socket.
5. Remove tape and connect wire (12) to socket (9). Tighten screw (13).
6. Position panel (14 or 14.1). Install two screws (15).
7. Without 17, install lamp (16) and lens (17) in socket (9).
8. Turn rheostat shaft (18) to left. Position knob (19) on shaft so pointer (20) is on DIM. Tighten two setscrews (21).




9. Position pad (22) on panel (1). Install seven screws (23), 14 washers (24), and seven nuts (25).



10. Place washer (26) and nut (27) on wire (28).
11. Thread wire (28) through tube (29) and slide tube through panel (1) into clamps (30).
12. Install washer (26) and nut (27) on tube (29). Tighten screws (31) on clamps (30).
13. Install nut (32) and knob (33) on wire (28).

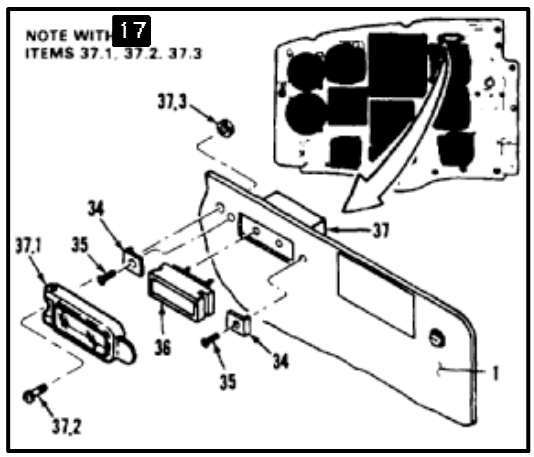



14. Position two clips (34) on panel (1). Install two screws (35). Install light (36) between two clips. Make sure light plugs into socket (37).

14.1. With 17, position filter cap (37.1) on panel (1). Install screw (37.2) and nut (37.3).

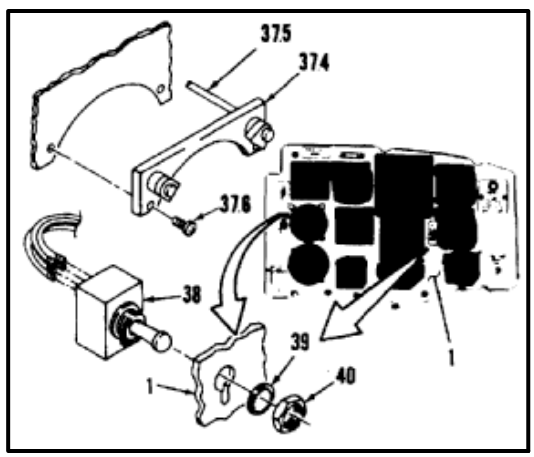
**NOTE**

Helicopters without 17 have two light fixtures on copilot's panel. Helicopters with 17 have four light fixtures.

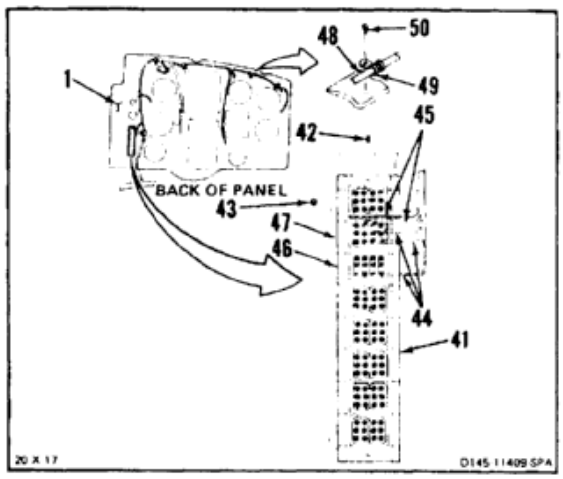



14.2. Install each light fixture (37.4) by threading wire (37.5) through hole in panel (1). Install two screws (37.6). Splice wire behind panel (TM 55-1500-323-25).

15. Position switch (38) in panel (1). Install washer (39) and nut (40).

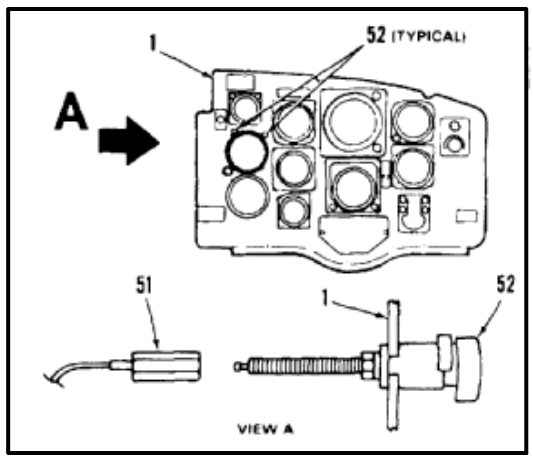


16. Position TB1 (41) on panel (1). Install two screws (42) and nuts (43). Install module directly above each nut.
17. Remove tags and insert three wires (44) and two wires (45) through holes in panel (1).
18. Install three wires (44) in module (46) and two wires (45) in module (47). Use contact insertion/removal tool.
19. Install five wires (44 and 45) in wire harness (48). Position wire harness on panel (1).
20. Install five clamps (49) with five screws (50).




21. Without **17**, reach behind panel (1) and connect wire (51) to each postlight assembly (52).
22. With **17**, reach behind panel (1) and screw wire (51) to each postlight assembly (52).

***INSPECT***




***FOLLOW-ON MAINTENANCE:***

Install radar altimeter (TM 11-1520-240-23).
Install turn and slip indicator (Task 8-45).
Install flange mounted instruments on copilot's panel (Task 8-91).
Install clamp mount instruments on copilot's panel (Task 8-89).
Install clock (Task 8-93).
Install emergency panel light (Task 8-4).
Perform operational check of affected systems (TM 55-1520-240-T).

END OF TASK

## 8-107 REMOVE CENTER INSTRUMENT PANEL 8-107

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Contact Insertion/Removal Tool, M83723-31-20
Soldering Gun

***Materials:***

Paper Tags (E264)
Tape (E385)

***Personnel Required:***

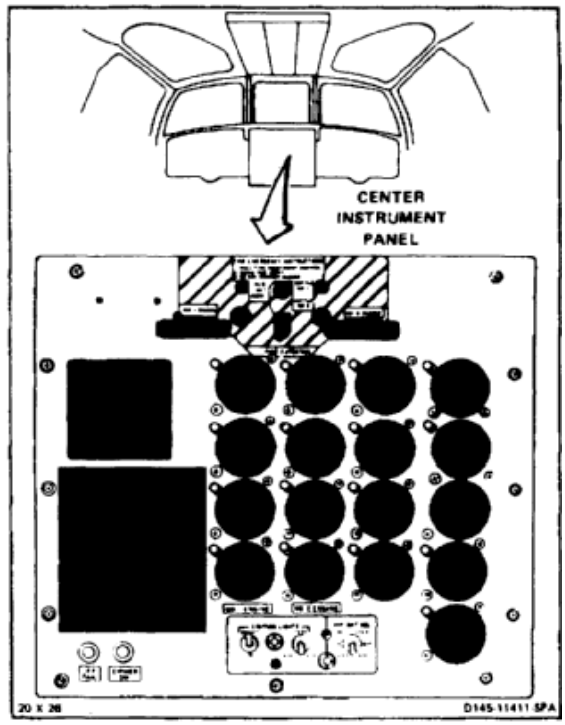
Aircraft Electrician

***References:***

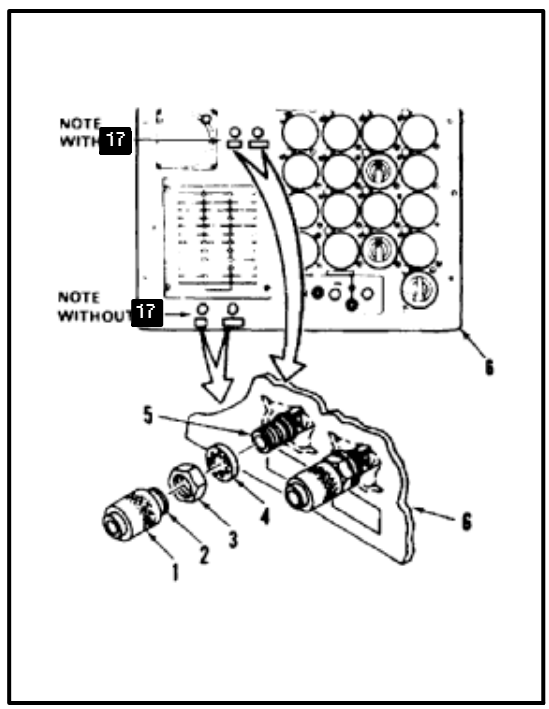
TM 11-1520-240-23
TM 55-1500-323-25

***Equipment Condition:***

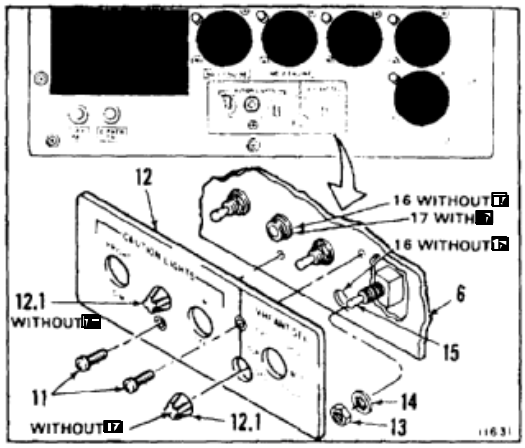
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Clamp Mounted Instruments on Center Panel Removed (Task 8-86)
Master Caution Panel Removed (Task 9-128)
Fire Pull Control Removed (Task 12-15)
Fire Agent Switch Removed (Task 12-19)




1. Remove two lenses (1) and lamps (2).
2. Remove nut (3) and washer (4) from two light bases (5). Tag light bases. Push light bases through panel (6).



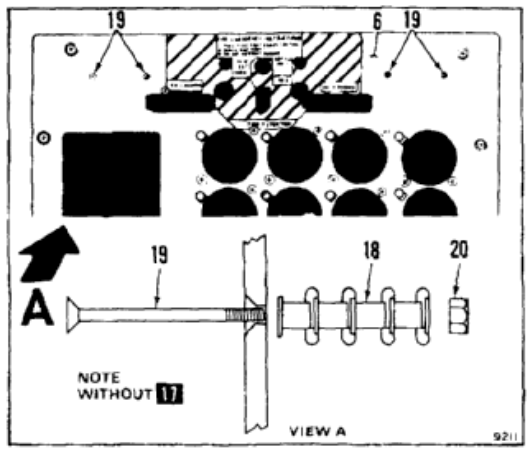
3. Remove two screws (11) from light plate (12). Without 17, remove two lens caps (12.1). Remove plate.
4. Remove three nuts (13) and washers (14). Push three switches (15) through panel (6). Tag switches.
5. Without 17, reach behind panel (6) and unsolder wires from each of two light sockets (16).
5.1. With 17, reach behind panel (6) and disconnect wires from light socket (17).




**NOTE**

Helicopters without 17 have resistor assemblies. Helicopters with 17 do not have resistor assemblies.

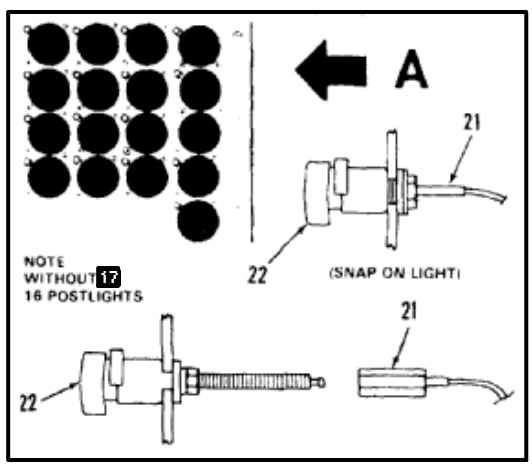
6. Without 17, reach behind panel (6) and hold each of two resistor assemblies (18) in turn. Remove two screws (19) and nut (20) from each assembly. Tag resistor assemblies.



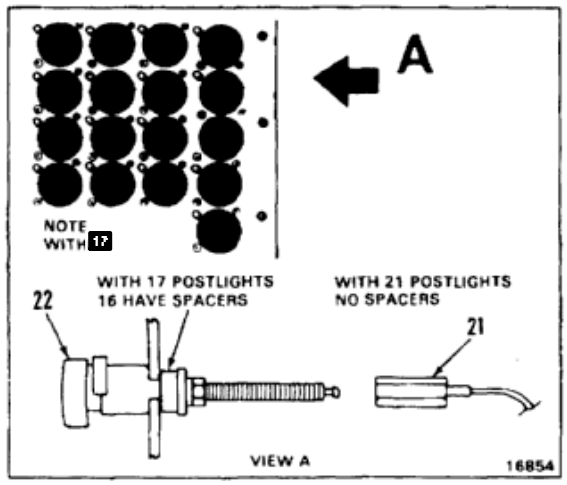

**NOTE**

Helicopters without 17 have 16 postlights. Helicopters with 17 have 17 or 21 postlights.

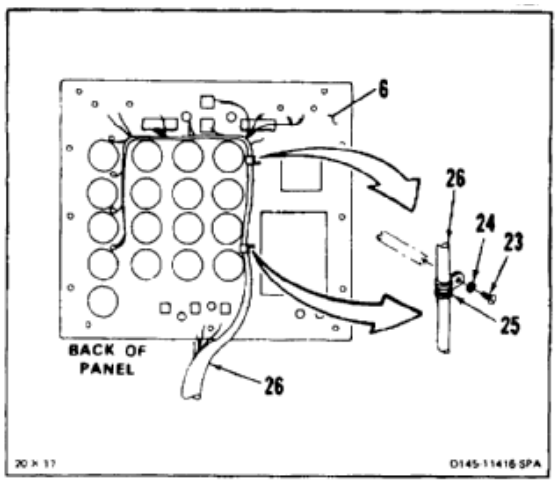
7. Without 17, disconnect wire (21) from each of 16 postlights (22). Tape wire ends.



8. With 17, tag and unscrew wire (21) from each of 17 or 21 postlights (22). Use tags (E264). Tape screw thread ends with tape (E385).




9. Remove two screws (23) and washers (24). Remove two clamps (25) and move wire harness (26) away from panel (6).

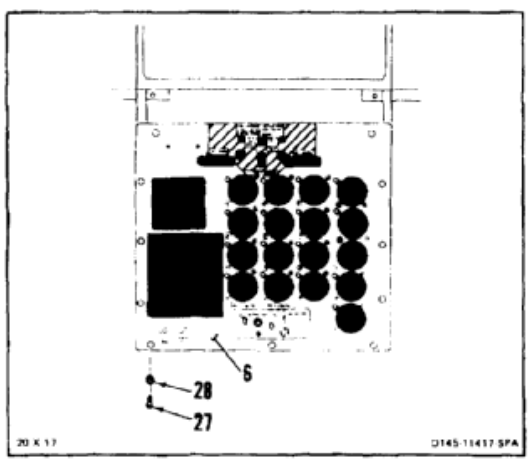



10. Remove 11 screws (27) and washers (28).

11. Remove panel (6).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 8-108 INSTALL CENTER INSTRUMENT PANEL 8-108

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

Solder (E360)

***Parts:***

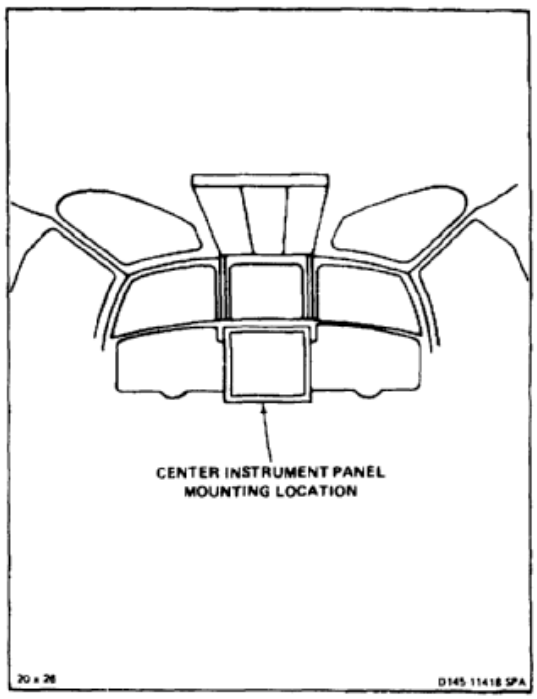
Splices (2)

***Personnel Required:***

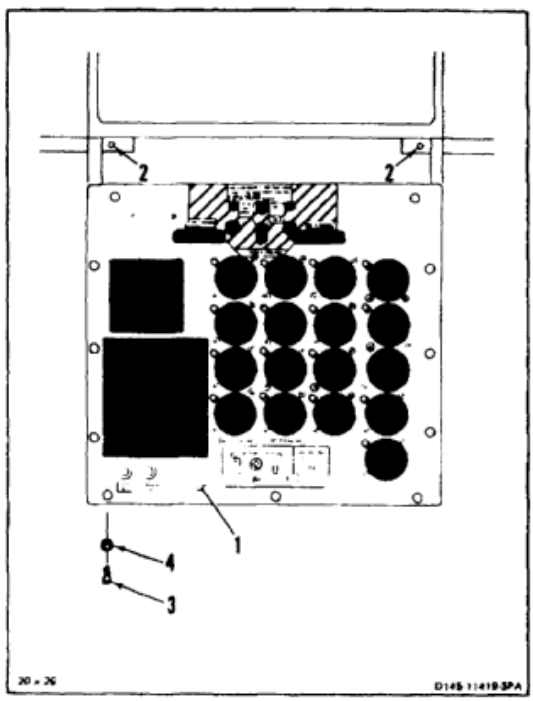
Aircraft Electrician
Inspector

***References:***

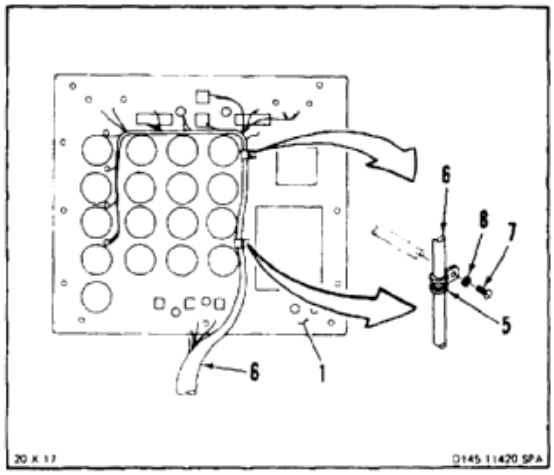
TM 55-1520-240-23P
TM 55-1500-323-25




1. Position panel (1) on brackets (2). Install 11 screws (3) and washers (4).



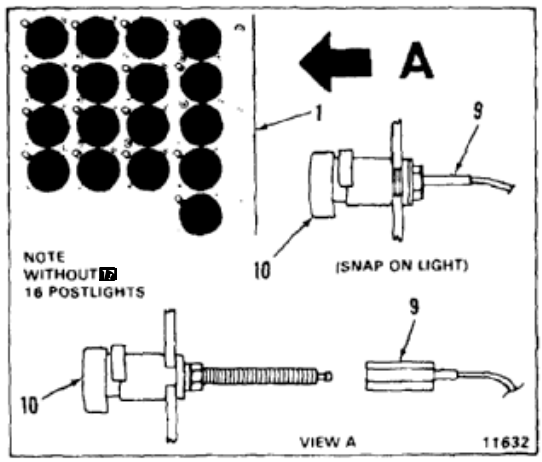
2. Install two clamps (5) on wire harness (6). Position wire harness on back of panel (1) and install two screws (7) and washers (8).



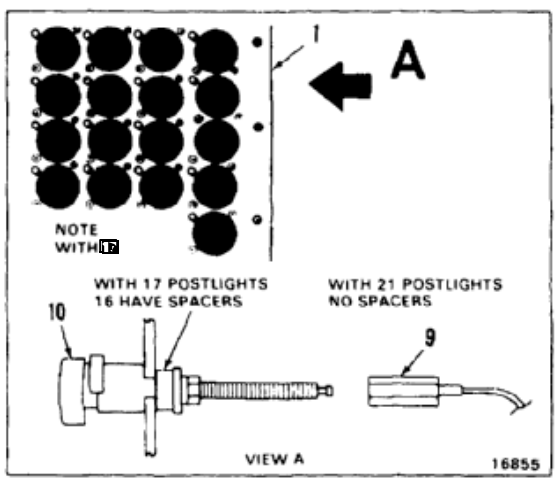

**NOTE**

Helicopters without 17 have 16 postlights. Helicopters with 17 have 17 or 21 postlights.

3. Without 17, reach behind panel (1) and connect wire (9) to 16 postlight assemblies (10).



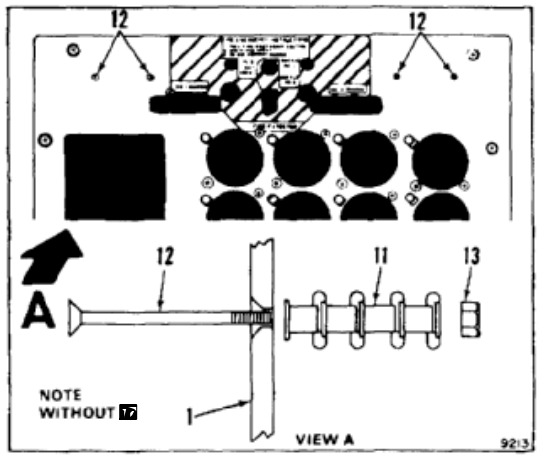

4. With 17, reach behind panel (1) and screw wire (9) to 17 or 21 postlight assemblies (10).



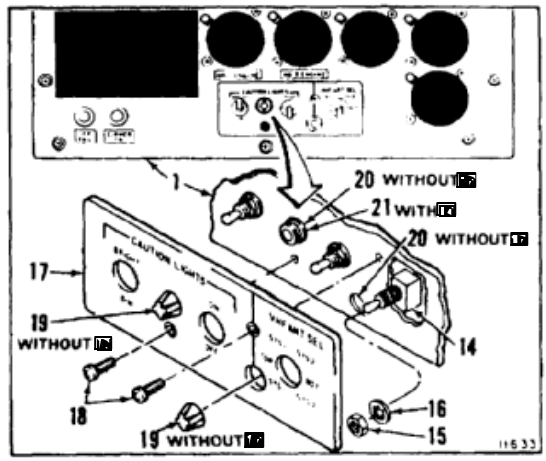
**NOTE**

Helicopters without 17 have resistor assemblies. Helicopters with 17 do not have resistor assemblies.

5. Without 17, remove tags and position two resistor assemblies (11) on back of panel (1). Install four screws (12) and nuts (13).



6. Reach behind panel (1) and position three switches (14) in panel (1). Install three nuts (15) and washers (16).
7. Position light plate (17) on panel (1). Install two screws (18). Without 17, install two lens caps (19).
8. Without 17, reach behind panel (1) and solder wires to each of two light sockets (20).
9. With 17, reach behind panel (1) and screw wires onto light socket (21).

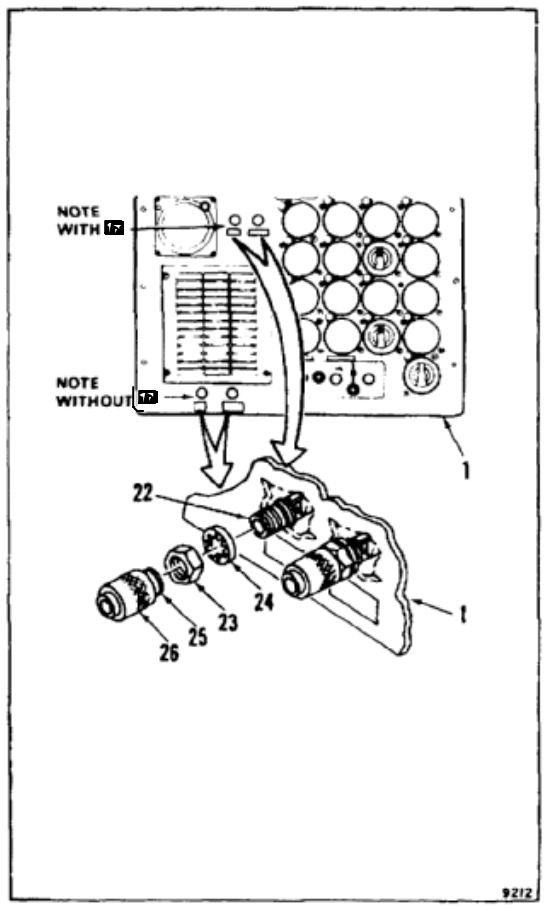



10. Reach behind panel (1) and position two light bases (22) in panel (1). Install two nuts (23) and washers (24) on light bases.
11. Install two lamps (25) in two lenses (26). Install lenses in two light bases (22).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Install clamp mounted instruments in center panel (Task 8-87).
Install master caution panel (Task 9-131).
Install caution lights and VHF switch panel (Task 9-133).
Install fire pull control (Task 12-18).
Install fire agent switch (Task 12-20).
Perform operational check of affected systems (TM 55-1520-240-T).




END OF TASK

## 8-109 REMOVE MISCELLANEOUS LIGHTS FROM PILOT'S OR COPILOT'S INSTRUMENT PANEL 8-109

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Contact Insertion/Removal Tool, M83723-31-20

***Materials:***

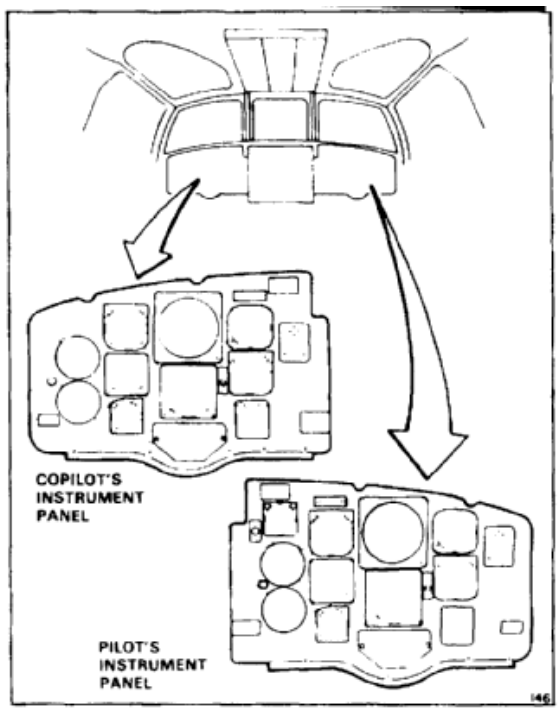
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

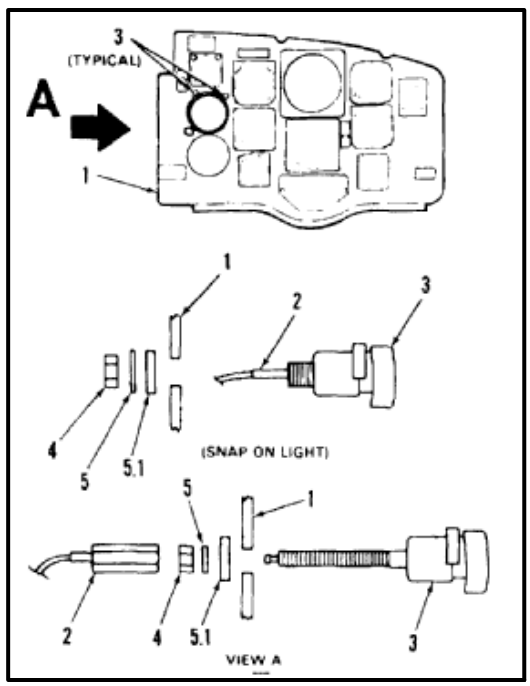
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




**NOTE**

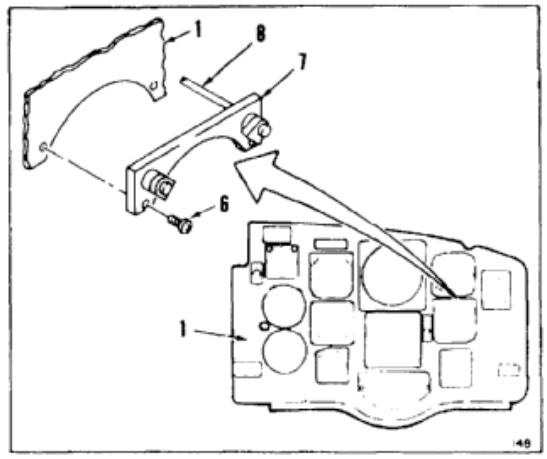
Procedure is similar for removing pilot's and copilot's instrument panel lights. Removal of pilot's lights is shown here.

1. Without 17, reach behind panel (1), tag and disconnect wire (2) from postlight (3).
2. With 17, reach behind panel (1), tag and unscrew wire (2) from postlight (3).
3. Remove nut (4), washer (5), collar (5.1), and postlight (3).

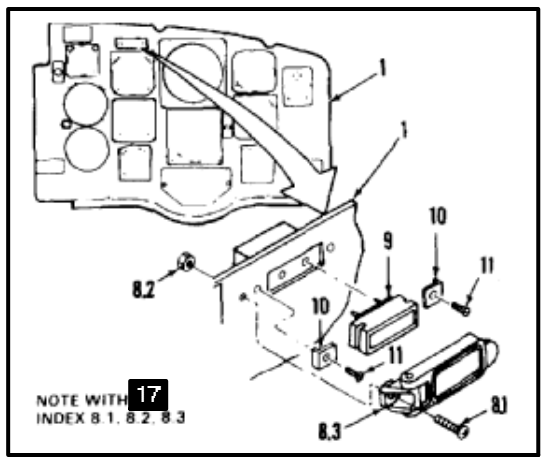


**8-109 REMOVE MISCELLANEOUS LIGHTS FROM PILOT'S OR COPILOT'S INSTRUMENT PANEL (Continued)** **8-109**

4. Remove two screws (6) from each panel light fixture (7).
5. Remove light fixture (7) by removing wire (8) through panel (1). Tag fixtures.




6. With 17, remove screw (8.1), nut (8.2), and filter cap (8.3).
7. Remove master caution light (9) from two clips (10). Remove two screws (11) and two clips from panel (1).

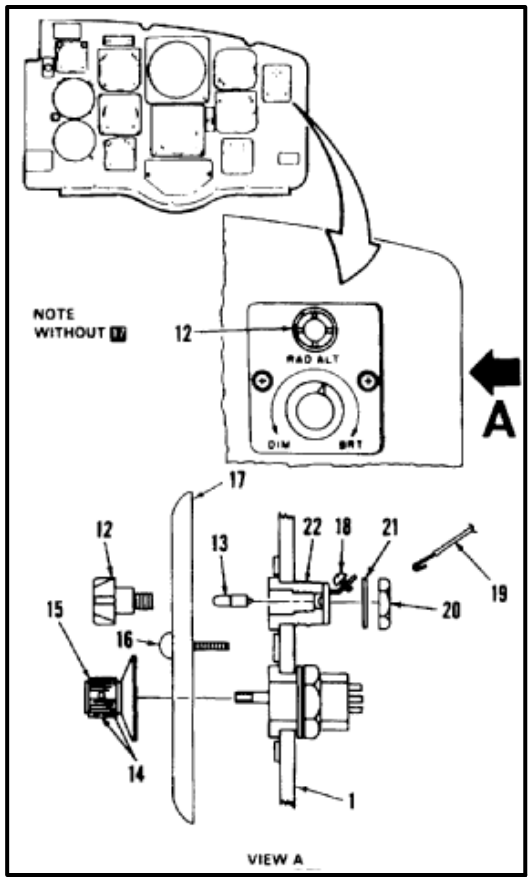


**8-109 REMOVE MISCELLANEOUS LIGHTS FROM PILOT'S OR COPILOT'S INSTRUMENT PANEL (Continued)** **8-109**

**NOTE**

Steps 8 thru 12 apply only to helicopters without 17.

8. Remove lens (12) and lamp (13).
9. Loosen two setscrews (14) and remove knob (15).
10. Loosen two screws (16) and remove panel (17).
11. Loosen screw (18) and remove wire (19). Tape exposed end of wire. Use tape (E385).
12. Remove nut (20), washer (21), and socket (22) from panel (1).

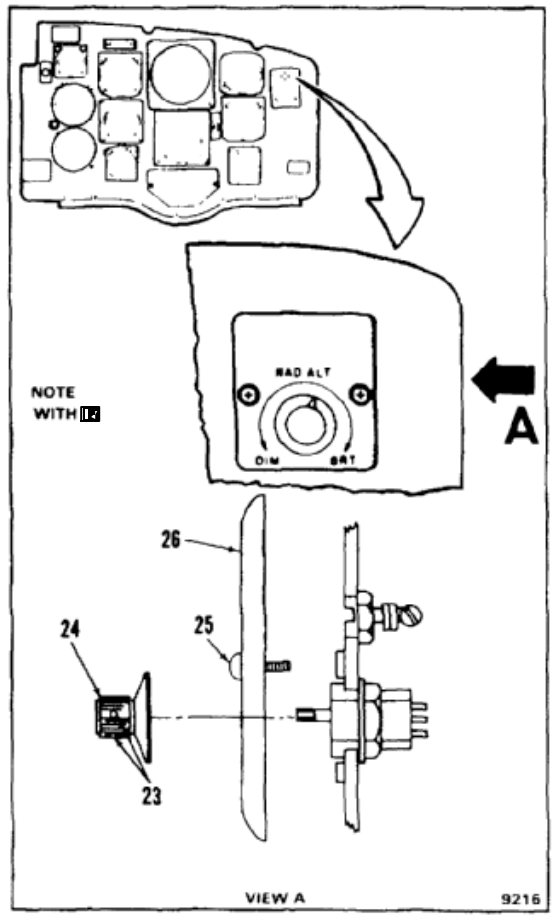


**8-109 REMOVE MISCELLANEOUS LIGHTS FROM PILOT'S OR COPILOT'S INSTRUMENT PANEL (Continued)** **8-109**

**NOTE**

Steps 13 and 14 apply only to helicopters with 17.

13. Loosen two setscrews (23) and remove knob (24).
14. Loosen two screws (25) and remove light plate (26).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-110 INSTALL MISCELLANEOUS LIGHTS ON PILOT'S OR COPILOT'S INSTRUMENT PANEL 8-110

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Contact Removal/Insertion Tool, M83723-31-20

***Materials:***

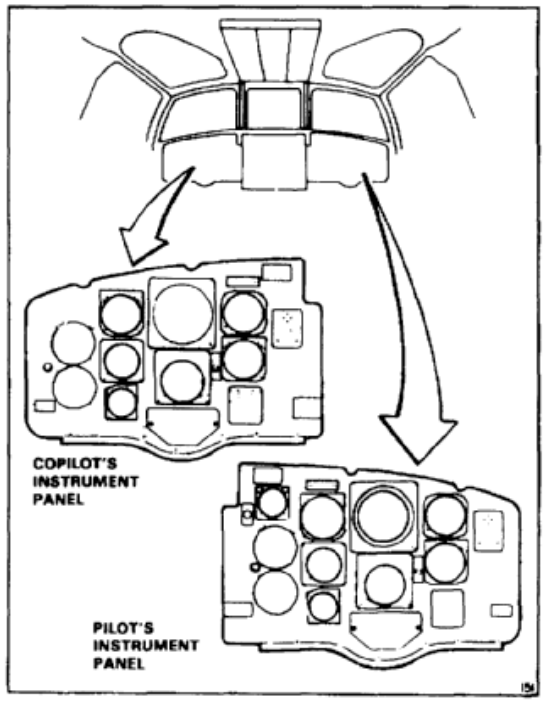
None

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P
TM 55-1500-323-25



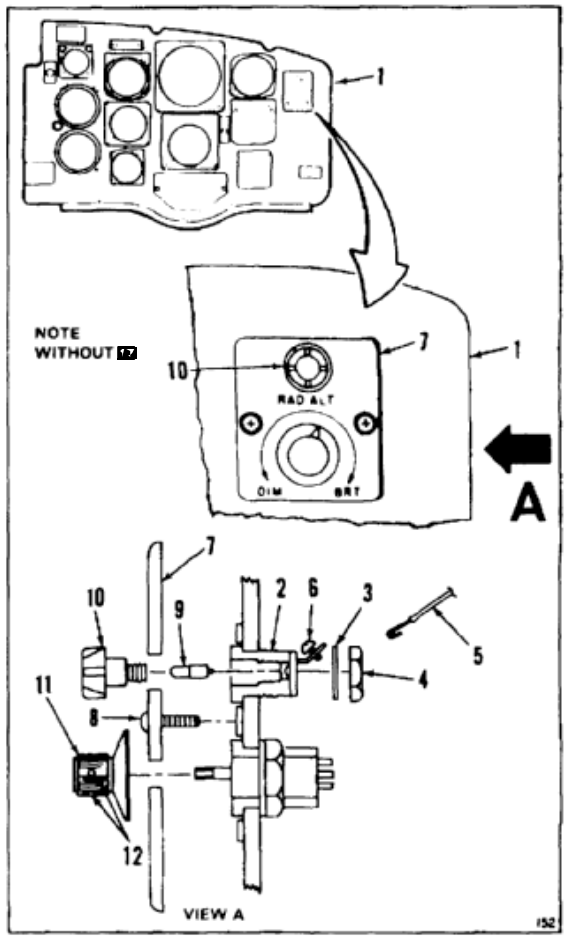
## 8-110 INSTALL MISCELLANEOUS LIGHTS ON PILOT'S OR COPILOT'S INSTRUMENT PANEL (Continued) 8-110

**NOTE**

Procedure is similar for installing pilot's and copilot's instrument panel lights. Installation of pilot's lights is shown here.

Steps 1 thru 5 apply only to helicopters without 17.

1. Position socket (2) in panel (1). Install washer (3) and nut (4) on socket.
2. Remove tape and connect wire (5) to socket (2). Tighten screw (6).
3. Install light plate (7) and tighten two screws (8).
4. Install lamp (9) and lens (10) in socket.
5. Install knob (11) and tighten two setscrews (12).

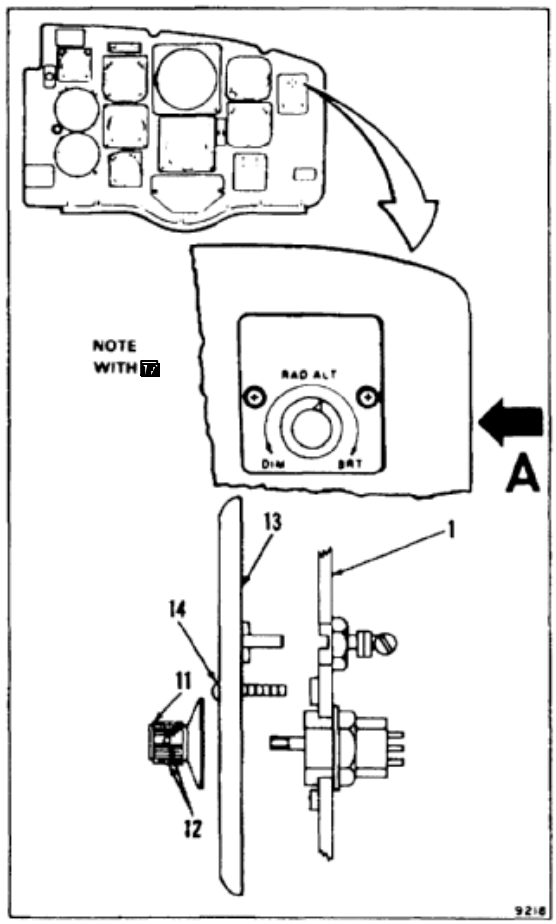


**8-110 INSTALL MISCELLANEOUS LIGHTS ON PILOT'S OR COPILOT'S INSTRUMENT PANEL (Continued)** **8-110**

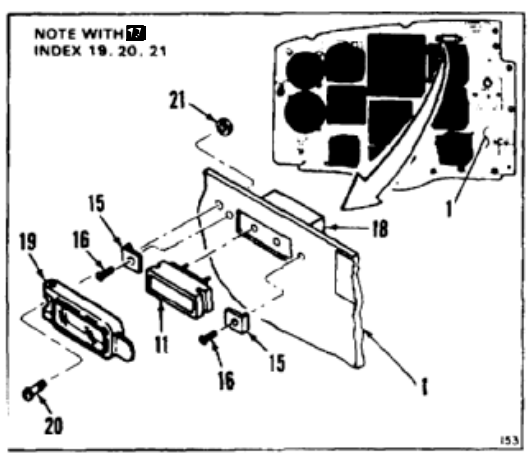
**NOTE**

Steps 6 and 7 apply only to helicopters with 17.

6. Install light plate (13) on panel (1) and tighten two screws (14).
7. Install knob (11) and tighten two setscrews (12).




8. Position two clips (15) on panel (1). Install two screws (16). Install master caution light (17) between two clips. Make sure light plugs into socket (18).
9. With 17, position filter (19) on panel (1). Install screw (20) and nut (21).

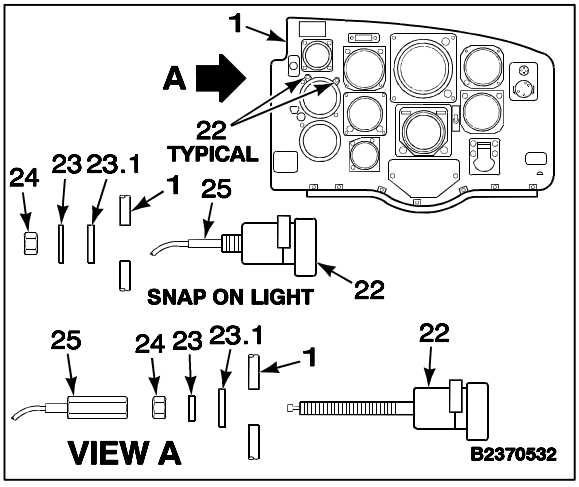


**CAUTION**

Do not over-torque nut (24). Tighten nut until snug only.

**NOTE**

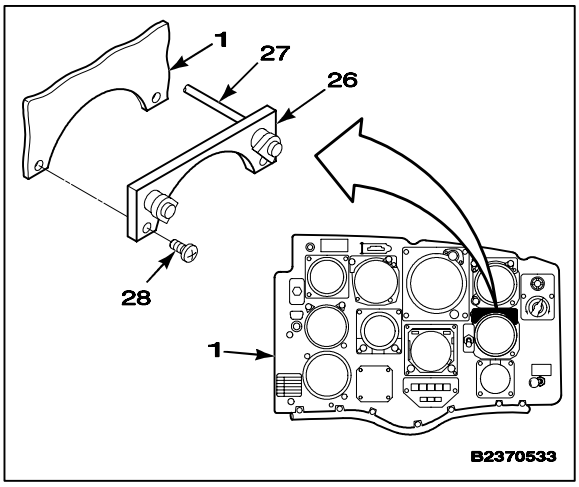
Light must be positioned as shown. Lights at turn and slip indicators require non-magnetic washers. If removed, NAS spacers must be used.




10. Position postlight (22) in panel (1). Install washer (23), collar (23.1), and nut (24).
11. (Without **17**), reach behind panel (1) and connect wire (25) to postlight (22).
12. (With **17**), reach behind panel (1) and screw wire (25) into postlight (22).

***INSPECT***

13. Install light fixture (26) by threading wire (27) through hole in panel (1). Install two screws (28). Splice wire behind panel (TM 55-1500-323-25).




***FOLLOW-ON MAINTENANCE:***

Perform operational check of affected systems (TM 55-1520-240-T).

END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

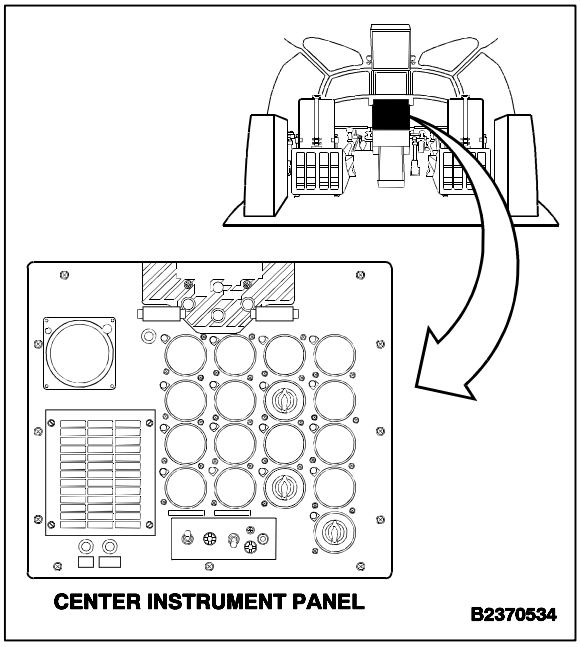
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

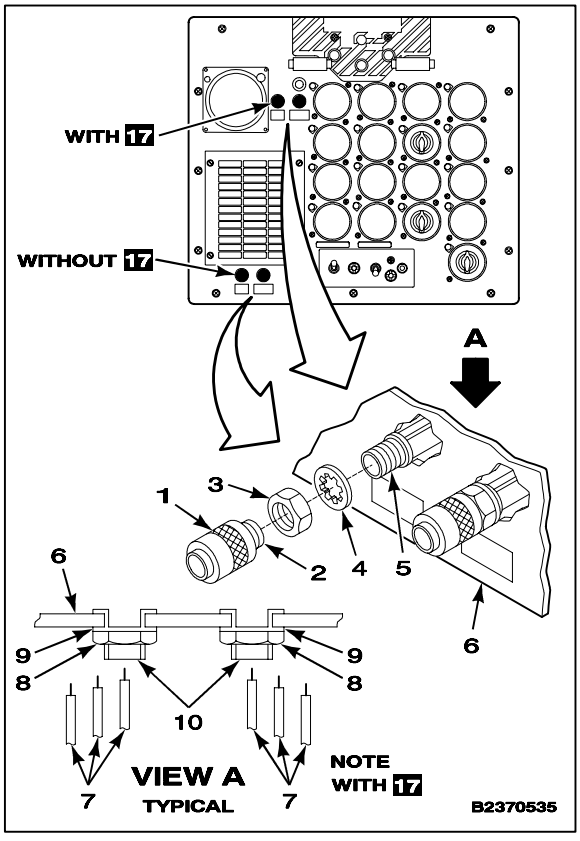
Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off



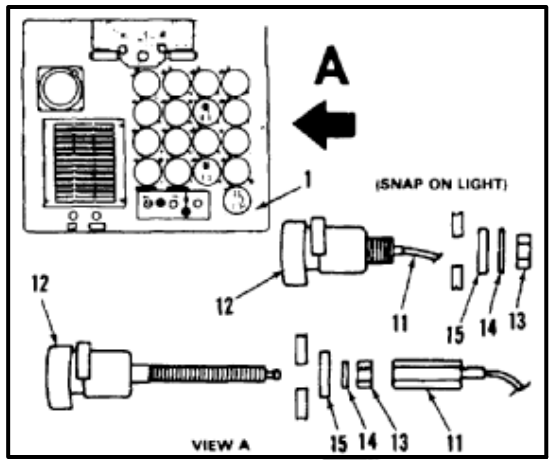

1. Remove lens (1) and lamp (2).
2. Remove nut (3) and washer (4) from light base (5). Tag light base. Push light base through panel (6).
3. Tag and cut wire (7). Cover exposed end of wire. Use tape (E385).
4. Remove two nuts (8) and washers (9). Remove two sockets (10).



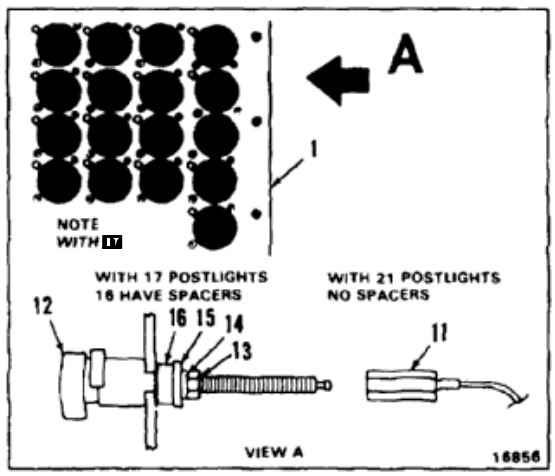
**NOTE**

Helicopters without 17 have 16 postlights. Helicopters with 17 have 17 or 21 postlights.

5. Without 17, reach behind panel (1), tag and disconnect wire (11) from postlight (12). Use tags (E264). Cover exposed ends of wires. Use tape (E385).
6. Without 17, remove nut (13), washer (14), and collar (15). Remove postlight (12).




7. With 17, reach behind panel (1), tag and unscrew wire (11) from postlight (12).
8. With 17, 17 postlights, remove nut (13), washer (14), collar (15) and spacer (16) for sixteen postlight assemblies. Remove nut (13), washer (14), and collar (15) for the remaining assembly. Remove postlight (12).
9. With 17, 21 postlights, remove nut (13), washer (14), and collar (15) for twenty-one postlight assemblies.




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-112 INSTALL MISCELLANEOUS LIGHTS ON CENTER INSTRUMENT PANEL 8-112

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Contact Removal/Insertion Tool, M8723-31-20
Soldering Gun

***Materials:***

Solder (E360)

***Parts:***

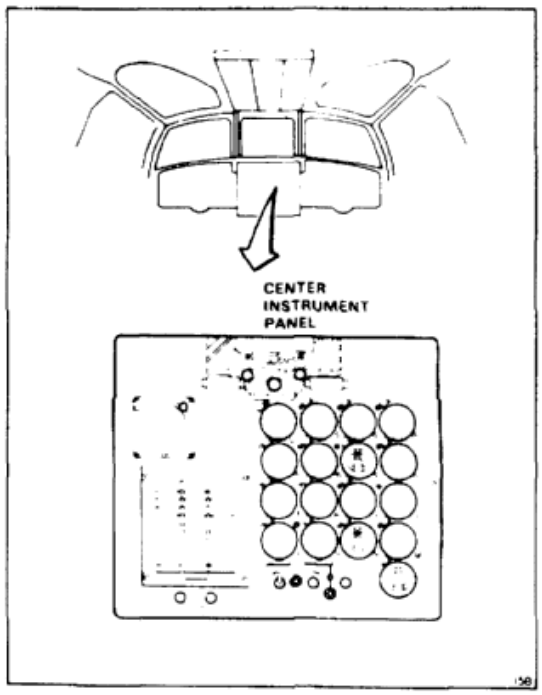
Splices (2)

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-T
TM 55-1500-323-25



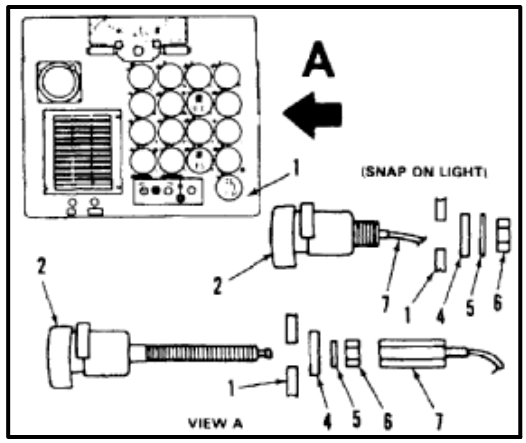

CAUTION

Do not overtorque nut (6). Tighten until snug only.

**NOTE**

Helicopters without 17 have 16 postlights. Helicopters with 17 have 17 or 21 postlights.

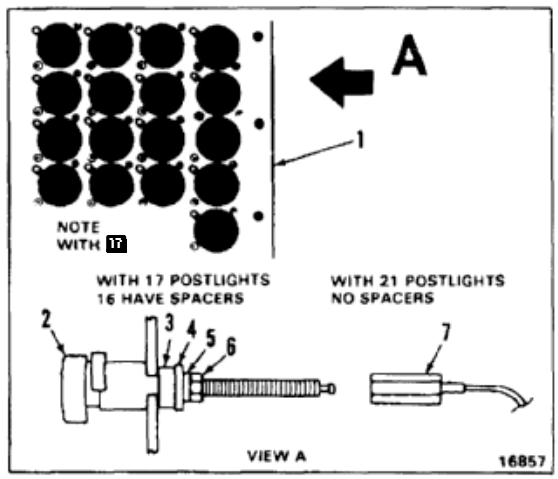
1. Without 17, position postlight (2) in panel (1). Install collar (4), washer (5), and nut (6).
2. Without 17, reach behind panel (1) and connect wire (7) to postlight (2).



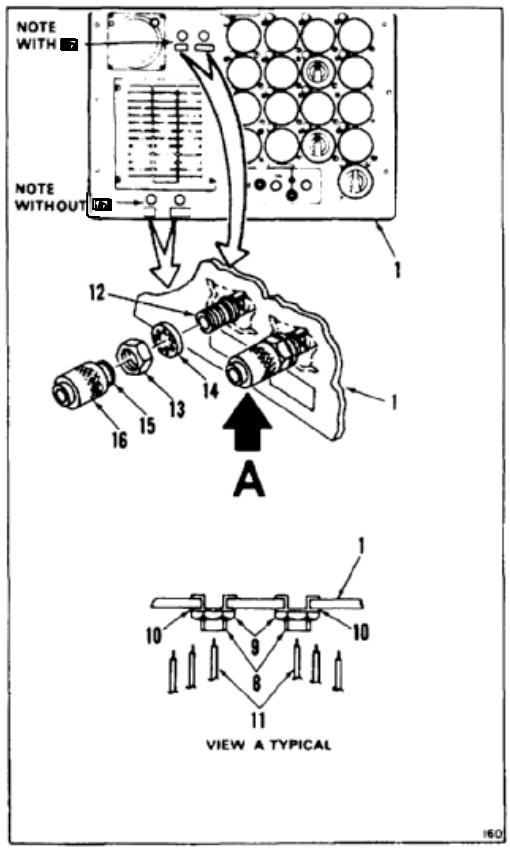

2.1. With 17, 17 postlights, position postlight (2) in panel (1). Install spacer (3), collar (4), washer (5) and nut (6) for sixteen postlight assemblies. Install collar (4), washer (5), and nut (6) for the remaining assembly.

2.2. With 17, 21 postlights, position postlight (2) in panel (1). Install collar (4), washer (5), and nut (6) for 21 postlight assemblies.

3. With 17, reach behind panel (1) and screw wire (7) onto postlight (2).



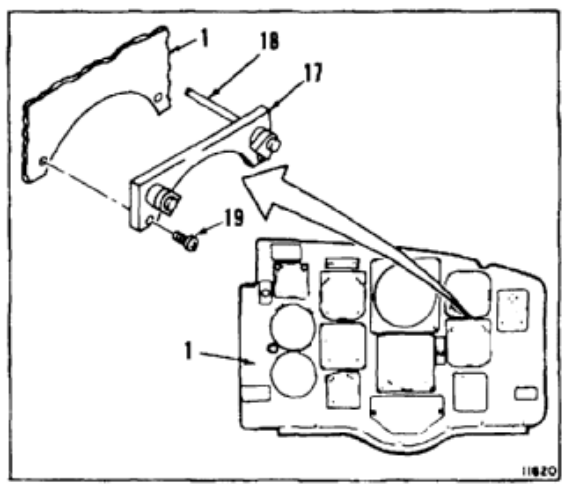
4. Position socket (8) in panel (1). Install nut (9) and washer (10).
5. Splice wires (11) to socket (8) (TM 55-1500-323-25).
6. Remove tag and position light base (12) in panel (1). Install nut (13) and washer (14) on light base.
7. Install lamp (15) in lens (16). Install lens in light base (12).




8. Install each light fixture (17) by threading wire (18) through hole in panel (1). Install two screws (19). Splice wire behind panel (TM 55-1500-323-25).

***FOLLOW-ON MAINTENANCE:***

Perform operational check of affected systems (TM 55-1520-240-T).




END OF TASK

## 8-113 REMOVE FIRE EMERGENCY AND MASTER CAUTION PANEL LIGHT PLATE ASSEMBLIES 8-113

INITIAL SETUP

***Applicable Configurations:***

With 17

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

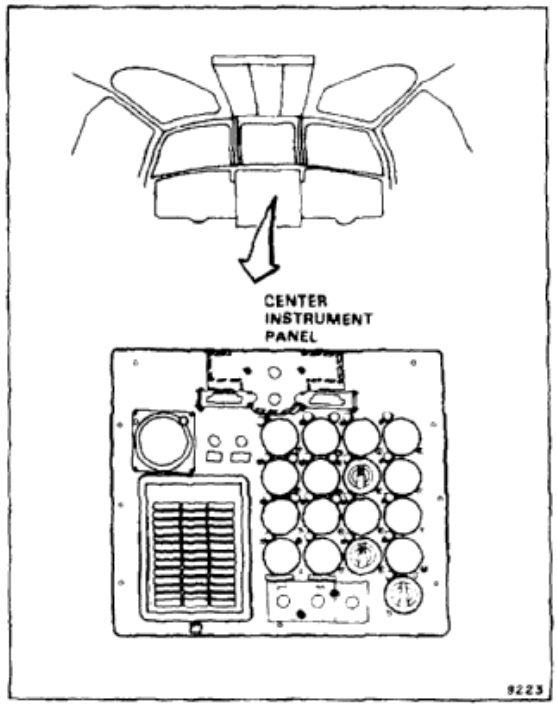
None

***Personnel Required:***

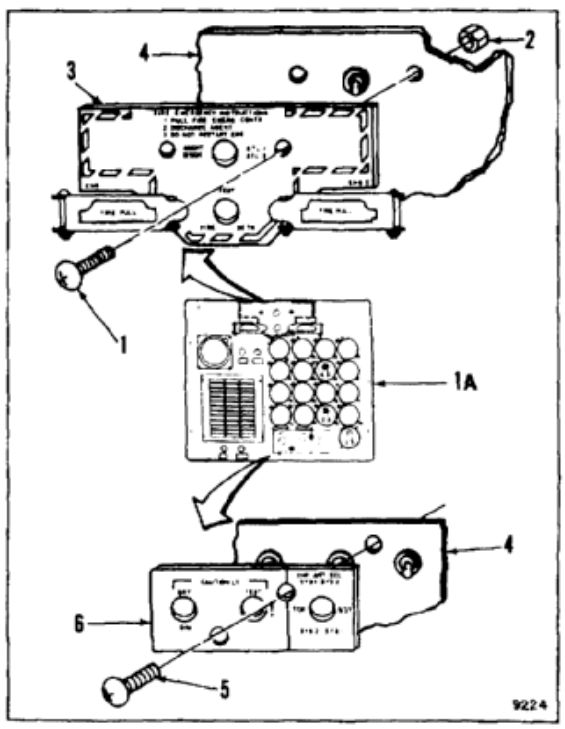
Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




1. Remove two screws (1) and nuts (2). Remove fire emergency plate (3) from instrument panel (4).
2. Remove two screws (5). Remove master caution panel light plate (6) from instrument panel (4).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 8-114 INSTALL FIRE EMERGENCY AND MASTER CAUTION PANEL LIGHT PLATE ASSEMBLIES 8-114

INITIAL SETUP

***Applicable Configurations:***

With 17

***Tools:***

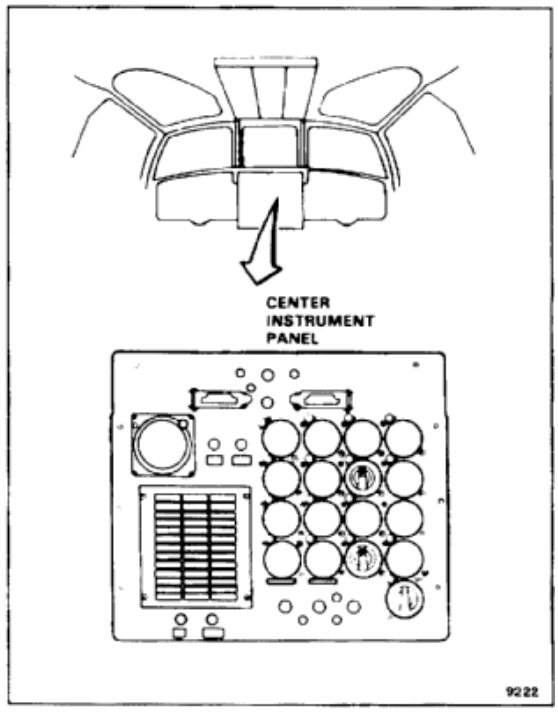
Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Personnel Required:***

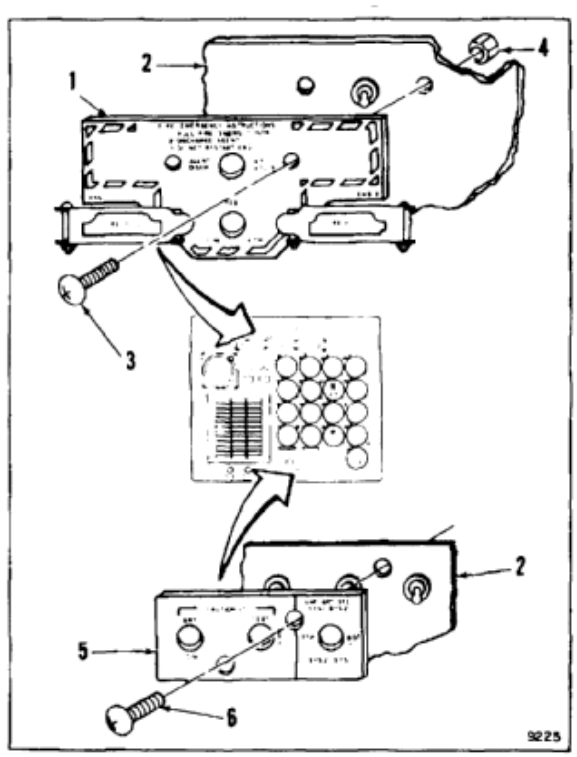
Aircraft Electrician
Inspector

***References:***

TM 55-1500-323-25




1. Install fire emergency plate (1) on center instrument panel (2).
2. Install two screws (3) and nuts (4).
3. Install master caution panel light plate (5) on center instrument panel (2).
4. Install two screws (6).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).

END OF TASK

# CHAPTER 9
# ELECTRICAL SYSTEMS

## SECTION I
## DIRECT CURRENT (DC) POWER DISTRIBUTION SYSTEM DESCRIPTION AND THEORY OF OPERATION

## 9-1 DIRECT CURRENT (DC) POWER DISTRIBUTION SYSTEM 9-1

### *DESCRIPTION*

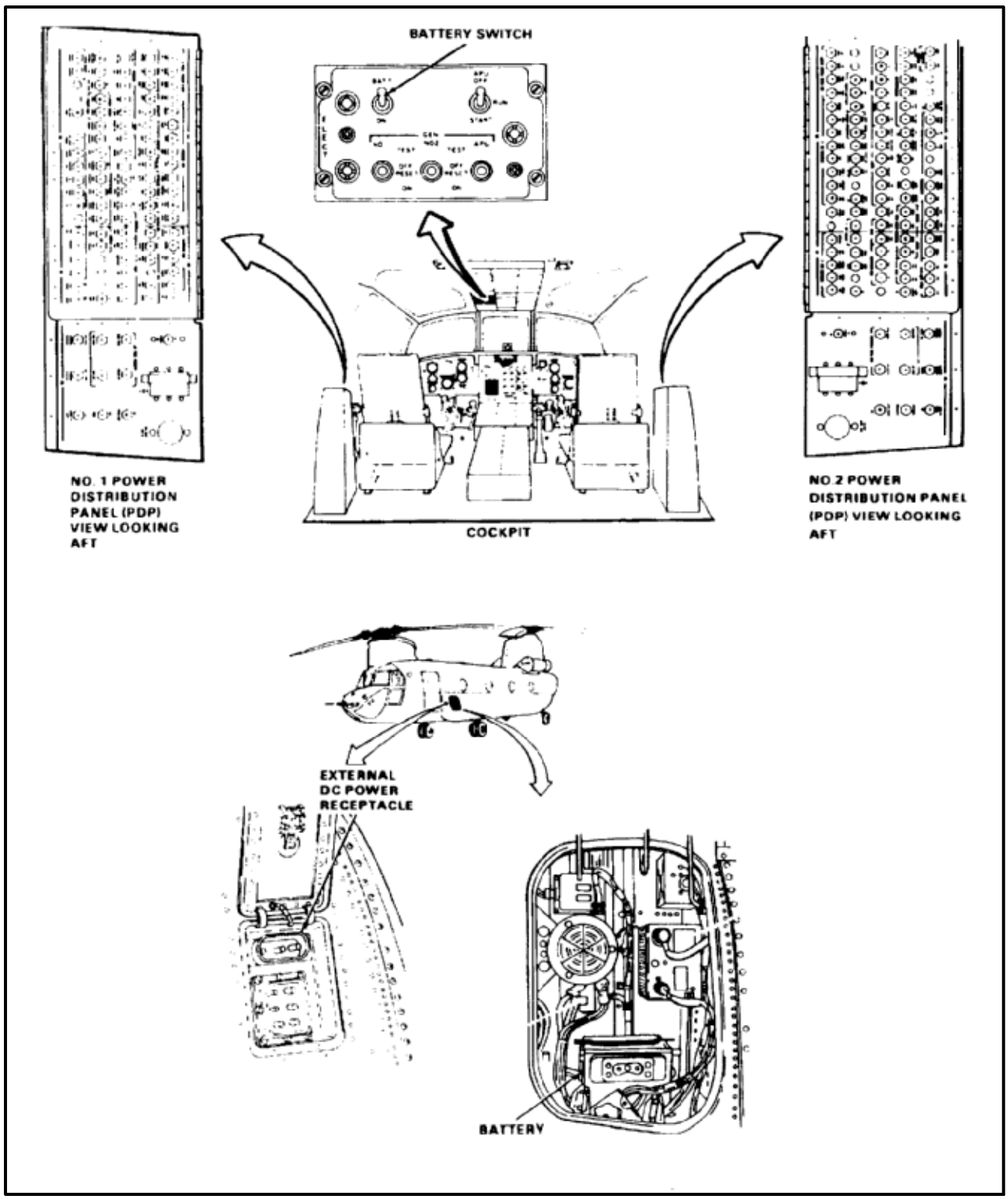
There are four sources of dc power for the helicopter: Two **200 ampere** transformer-rectifiers (for the No. 1 and No. 2 dc systems), an **11-ampere-hour** battery, and external dc power. The transformer-rectifiers and external dc power provides **24 vdc** to one or more of five separate buses, located within the No. 1 and No. 2 power distribution panels (PDP). The buses distribute the power to all dc electrical components on the helicopter.

The No. 1 PDP contains buses for the No. 1 dc system, battery and switched battery, and half of the essential bus. The No. 2 PDP contains the No. 2 dc system bus and the other half of the essential bus.

During normal operation, power is available at all five buses. When only battery power is available, **24 vdc** is available at the battery, switched battery, and essential buses. When external dc power is applied, power is available at the No. 1, No. 2, essential, and switched battery buses. The battery bus is powered only by the battery.

The only control switch for the system is the battery on-off (BATT) switch on the overhead electrical panel in the cockpit. The master caution panel has lights to indicate the status of the system.

Most of the electrical connectors used on the aircraft have a fully-coupled indicator which is utilized to prevent over or under engagement of the connector by the installer, and is also utilized during inspection as a quick visual indication of proper installation. This indicator consists of three axial stripes, usually blue in color, placed on the plug shell which will align with three corresponding stripes on the coupling ring when completely coupled. Do not over-tighten the coupling ring beyond the blue stripes.


BATTERY SWITCH
NO. 1 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT
COCKPIT
NO.2 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT
EXTERNAL DC POWER RECEPTACLE
BATTERY

*DC POWER DISTRIBUTION WITHOUT* **74**

| NO. 1 DC BUS | NO. 2 DC BUS | ESSENTIAL BUS NO. 1 PDP |
|---|---|---|
| AUX AFT LH FUEL PUMP CONT | RH FWD UTILITY RCPT | THRUST BRAKE |
| MAIN AFT LH FUEL PUMP CONT | RH AFT UTILITY RCPT | CAUTION PNL |
| LH MAIN FWD FUEL PUMP CONT | PILOT UTILITY RCPT | UHF AM |
| LH AUX FWD FUEL PUMP CONT | CARGO HOOK NORM RLSE CONT | LH INTPH |
| ENGINE NO. 1 OIL TEMP | CARGO HOOK NORM RLSE PWR | VOR |
| ENG NO. 1 ANTI-ICE | BLADE TRACK | TURN & SLIP |
| COPLT HSI MODE SEL | CYCLIC TRIM AFT ACTR | NORM APU CONT |
| CHAFF | PLT HSI MODE SEL | COPLT CLOCK |
| RAD WARN | AFCS NO. 2 | CONT AC |
| ENGINE NO. 1 TORQUE | HF | NO. 1 EMER ENG TRIM |
| ENGINE NO. 1 TRIM | IFF | CARGO HOOK EMERG REL PWR |
| FUEL QTY | AIMS ALT | CARGO HOOK EMERG REL CONT |
| XFEED CONT | RADAR ALT | ENGINE NO. 1 CONT CONT |
| COPLT UTILITY | ENGINE NO. 2 TRIM | ENGINE NO. 1 IGN |
| LH FWD UTILITY | ENGINE NO. 2 ANTI-ICE | ENGINE NO. 1 START & TEMP |
| LH AFT UTILITY | ENGINE NO. 2 TORQUE | ENGINE NO. 1 FUEL SHUTOFF |
| HOIST CONT | KY28 | ENGINE NO. 1 FIRE EXT |
| HOIST CABLE CUTTER | HF | ROTOR TACH |
| SLT FIL | MSL DET SYS | ESS BUS FEEDER |
| SLT CONT | DOPPLER | |
| NVG FORM LIGHTING | VHF HOM | **NO. 2 PDP** |
| NO. 1 BLOWER CONTROL | ENGINE NO. 2 OIL TEMP | |
| UTIL BLOWER CONTROL | RH FUEL PUMP CONT FWD AUX | PILOT CLOCK |
| UTIL SYS CONT | RH FUEL PUMP CONT FWD MAIN | ROTOR TACH |
| BRAKE STEER | RH FUEL PUMP CONT AFT MAIN | ENGINE NO. 2 FIRE EXT |
| MAINT PNL | RH FUEL PUMP CONT AFT AUX | ENGINE NO. 2 IGN |
| FWD ACTR CYCLIC TRIM | SLT FIL | ENGINE NO. 2 FUEL SHUTOFF |
| MNL CYCLIC TRIM | SLT CONT | ENGINE NO. 2 START & TEMP |
| CLTV DRIVER ACTR | CKPT DIM CONT | ENGINE NO. 2 COND CONT |
| AFCS NO. 1 | INSTR FLOOD | TURN & SLIP |
| ADF | POS LIGHTING | RH INTPH |
| VHF NO. 2 AM/FM COMM | ANTI-COL TOP | INST FLOOD LIGHTING |
| NO. 1 DC BUS CONT | ANTI-COL BOT | NO. 2 EMERG ENG TRIM |
| WSHLD COPLT CONT | NAV CONT VGI | TROOP ALARM BELL |

## 9-1 DIRECT CURRENT (DC) POWER DISTRIBUTION SYSTEM (Continued) 9-1

***DC POWER DISTRIBUTION WITHOUT 74***

| NO. 1 DC BUS | NO. 2 DC BUS | ESSENTIAL BUS NO. 1 PDP |
|---|---|---|
| ESS BUS CONT | AVIONICS COOLING | TROOP ALARM JUMP LT |
| | CRUISE GUIDE | VHF ANT SEL |
| | NO. 2 DC BUS CONT | VHF NO. 1 AM/FM |
| | OMEGA POWER | CKPT DOME LIGHTS |
| | OMEGA TAS | |
| | MAINT PNL LTS | |
| | FLT CONT HYDRAULICS | |
| | HYDRAULICS FLUID TEMP | |
| | HYDRAULICS PRESSURE IND | |
| | PWR XFER | |
| | NO. 2 HYDRAULIC BLOWER | |
| | WSHLD ANTI-ICE CONT CTR | |
| | WSHLD ANTI-ICE CONT PILOT | |
| | WSHLD WIPER | |
| | CABIN HEATER CONT | |
| **BATTERY BUS** | | **SWITCHED BATTERY BUS** |
| HYDRAULICS OIL LEVEL | | CONT CENTER |
| EMERG APU CONT | | CABIN & RAMP LIGHTING |
| | | OIL LEVEL CHECK LIGHTING |
| | | REFUEL |
| | | EMERG EXIT LIGHTS |

*DC POWER DISTRIBUTION WITH 74*

| NO. 1 DC BUS | NO. 2 DC BUS | ESSENTIAL BUS NO. 1 PDP |
|---|---|---|
| AUX AFT LH FUEL PUMP CONT | AUX FWD RH FUEL PUMP CONT | RAMP EMER CONT |
| MAIN AFT LH FUEL PUMP CONT | MAIN FWD RH FUEL PUMP CONT | THRUST BRAKE |
| MAIN FWD LH FUEL PUMP CONT | MAIN AFT RH FUEL PUMP CONT | UHF AM |
| AUX FWD LH FUEL PUMP CONT | AUX AFT RH FUEL PUMP CONT | INTPH LH |
| ENGINE NO. 1 TORQUE | ENGINE NO. 2 TORQUE | CPLT CLOCK |
| ENGINE NO. 1 OIL TEMP | ENGINE NO. 2 OIL TEMP | APU CONT NORM |
| FUEL QTY | OMEGA TAS | LIGHTING CAUTION PNL |
| FUEL XFEED CONT | ARN-148 PWR | VOR |
| COPLT UTILITY | RH FWD UTILITY RCPT | TURN & SLIP |
| LH FWD UTILITY | RH AFT UTILITY RCPT | CONT AC |
| LH AFT UTILITY | PILOT UTILITY RCPT | CARGO HOOK EMER REL PWR |
| HOIST CONT | CARGO HOOK NORM RLSE CONT | CARGO HOOK EMER REL CONT |
| HOIST CABLE CUTTER | CARGO HOOK NORM RLSE PWR | ROTOR TACH |
| MNL CYCLIC TRIM | BLADE TRACK | NO. 1 ENGINE COND CONT |
| FWD ACTR CYCLIC TRIM | CYCLIC TRIM AFT ACTR | NO. 1 ENGINE FUEL SHUTOFF |
| CLTV DRIVER ACTR | NO. 2 DC BUS CONT | NO. 1 ENGINE START IGN |
| AFCS NO. 1 | CRUISE GUIDE | NO. 1 ENGINE TEMP |
| VHF NO. 2 AM/FM COMM | AFCS NO. 2 | NO. 1 ENGINE FIRE EXT |
| COPLT HSI MODE SEL | KY-28 POWER | ESS BUS FEEDER |
| ADF | PWR | |
| RAD WARN | ARC-199 HF | **NO. 2 PDP** |
| CHAFF | IFF | |
| NO. 1 DC BUS CONT | PLT HSI MODE SEL | VHF ANT SEL |
| WSHLD COPLT CONT | VHF HOM | VHF NO. 1 AM/FM |
| NO. 1 BLOWER CONTROL | DOPPLER | INTPH RH |
| UTIL BLOWER CONTROL | AIMS ALT | PILOT CLOCK |
| BRAKE STEER | RAD ALT | INST FLOOD LIGHTING |
| MAINT PNL | MSL CONT | CKPT DOME LIGHTING |
| ESS BUS CONT | NAV CONT VGI | NAV TURN & SUP |
| SLT CONT | NO. 2 HYDRAULIC BLOWER | TROOP ALARM BELL |
| NVG FORM LIGHTING | PWR XFER | TROOP ALARM JUMP LT |
| SLT FIL | HYDRAULICS PRESS IND | NO. 2 EMERG ENG TRIM |
| UTILITY SYS CONTROL | HYDRAULICS FLUID TEMP | ROTOR TACH |

## 9-1 DIRECT CURRENT (DC) POWER DISTRIBUTION SYSTEM (Continued) 9-1

***DC POWER DISTRIBUTION WITH 74***

| NO. 1 DC BUS | NO. 2 DC BUS | ESSENTIAL BUS NO. 1 PDP |
|---|---|---|
| | FLT CONT HYDRAULICS | NO. 2 ENGINE REV CONT |
| | MAINT PNL LTS | NO. 2 ENGINE FUEL SHUTOFF |
| | AVIONICS COOLING | NO. 2 ENGINE TEMP |
| | CABIN HEATER CONT | NO. 2 ENGINE START IGN |
| | WSHLD WIPER | NO. 2 ENGINE PRI CONT |
| | WSHLD ANTI-ICE CONT PILOT | NO. 2 ENGINE FIRE EXT |
| | WSHLD ANTI-ICE CONT CTR | |
| | IFM | |
| | SLT FIL | |
| | SIT CONT | |
| | ARC-201 PWR | |
| | CKPT DIM COND | |
| | POS | |
| | ANTI COL TOP | |
| | ANTI COL BOT | |
| | INSTAR FLOOD | |
| | OMEGA POWER | |
| **BATTERY BUS** | | **SWITCHED BATTERY BUS** |
| HYDRAULICS OIL LEVEL | | CONT CENTER |
| APU CONT EMERG | | CABIN & RAMP LIGHTING |
| | | OIL LEVEL CHECK LIGHTING |
| | | REFUEL |
| | | EMER EXIT LIGHTING |

### *POWER DISTRIBUTION PANELS*

Two power distribution panels (PDP) are the electrical load centers for the dc power distribution system. The panels contain circuit breakers and relays associated with both power systems.

The No. 1 PDP is outboard of the copilot seat on the left side of the cockpit. Its contents are associated with the No. 1 dc system. It services the left side of the helicopter.

The No. 2 PDP is outboard of the pilot seat on the right side of the cockpit. Its contents are associated with the No. 2 dc system. It services the right side of the helicopter.

The following major components are in one or both PDP:

**Circuit Breakers** (No. 1 and No. 2 PDP): All of the helicopter dc circuit breakers are on one or the other PDP. All **5 through 50 ampere** circuit breakers are single-hole mounted. The **70 ampere ac and 100 ampere dc** bus tie circuit breakers are mounted with screws and washers.

**Reverse Current Cutout (RCCO) Relays:** Each RCCO relay prevents its associated TR from connecting to the aircraft dc buses when that TR has low or no output.

**TR Failure Relays:** If either transformer-rectifier fails, the associated TR failure relay opens, lighting a light on the master caution panel and energizing the dc bus tie relay in the No. 2 PDP.

**DC Bus Tie Relay:** When the dc bus tie relay is energized, both the No. 1 and No. 2 dc buses are connected together so that they may be powered from a single TR or dc external power.

**Switched Battery Bus Relay** (No. 1 PDP): The position of this relay determines whether the switched battery bus will be powered by the essential bus or the battery bus.

**Essential DC Bus Relay** (No. 1 PDP): The position of this relay determines whether the essential dc bus will be powered by the No. 1 dc bus or the battery.

**DC External Power Relay** (No. 1 PDP): When this relay is energized, external dc power is connected to the No. 1 dc bus.

**External Power Control Relay** (No. 1 PDP): When external dc power is applied, this relay lights the EXT PWR light on the master caution panel and de-energizes the No. 1 and No. 2 RCCO relays. This arms the dc system for crosstie coupling between the No. 1 and No. 2 buses.

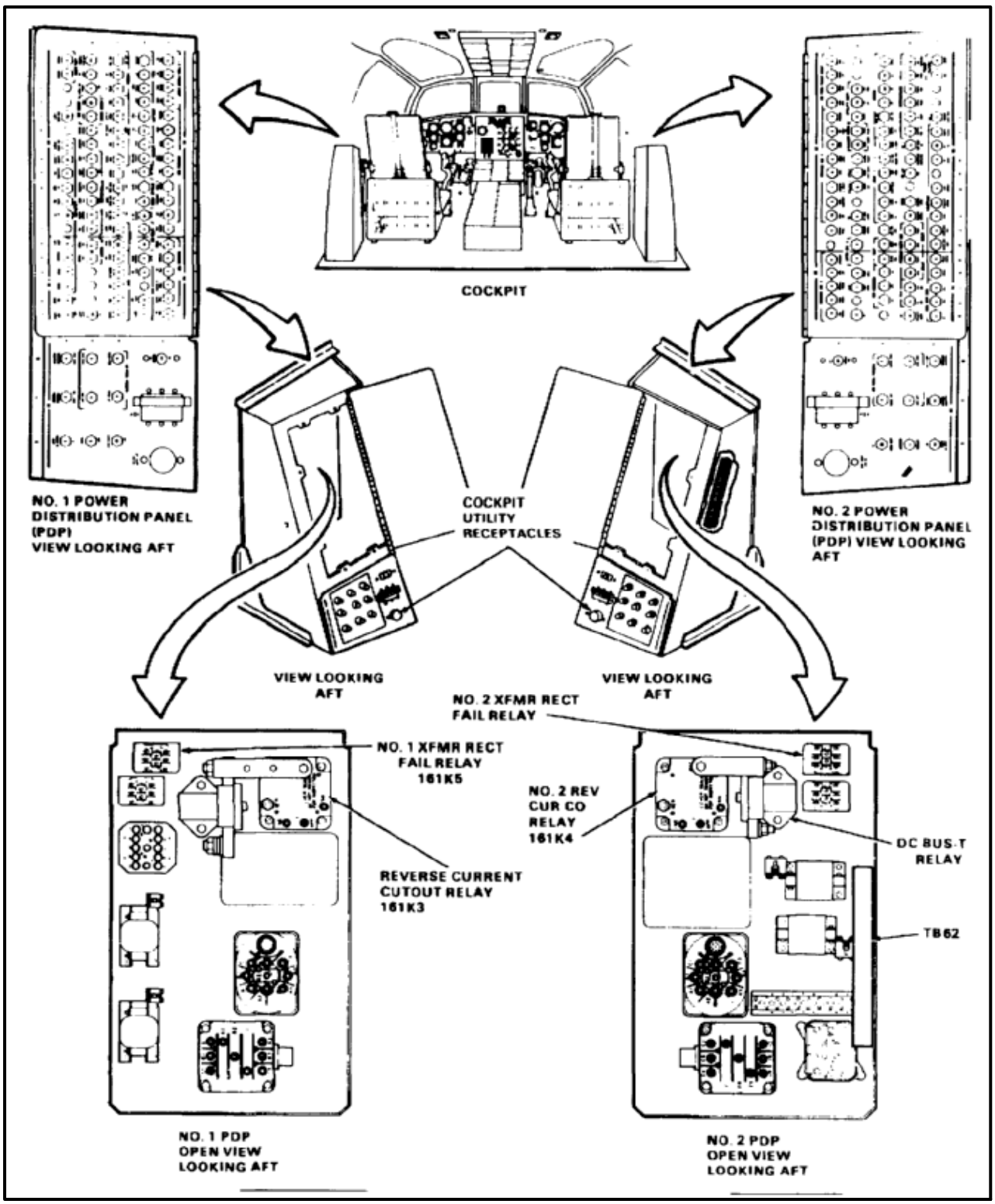
**Reverse DC Polarity Protection (Blocking) Diode** (No. 1 PDP): This diode ensures that the external power and power control relays cannot be operated by external dc voltage of reversed polarity.

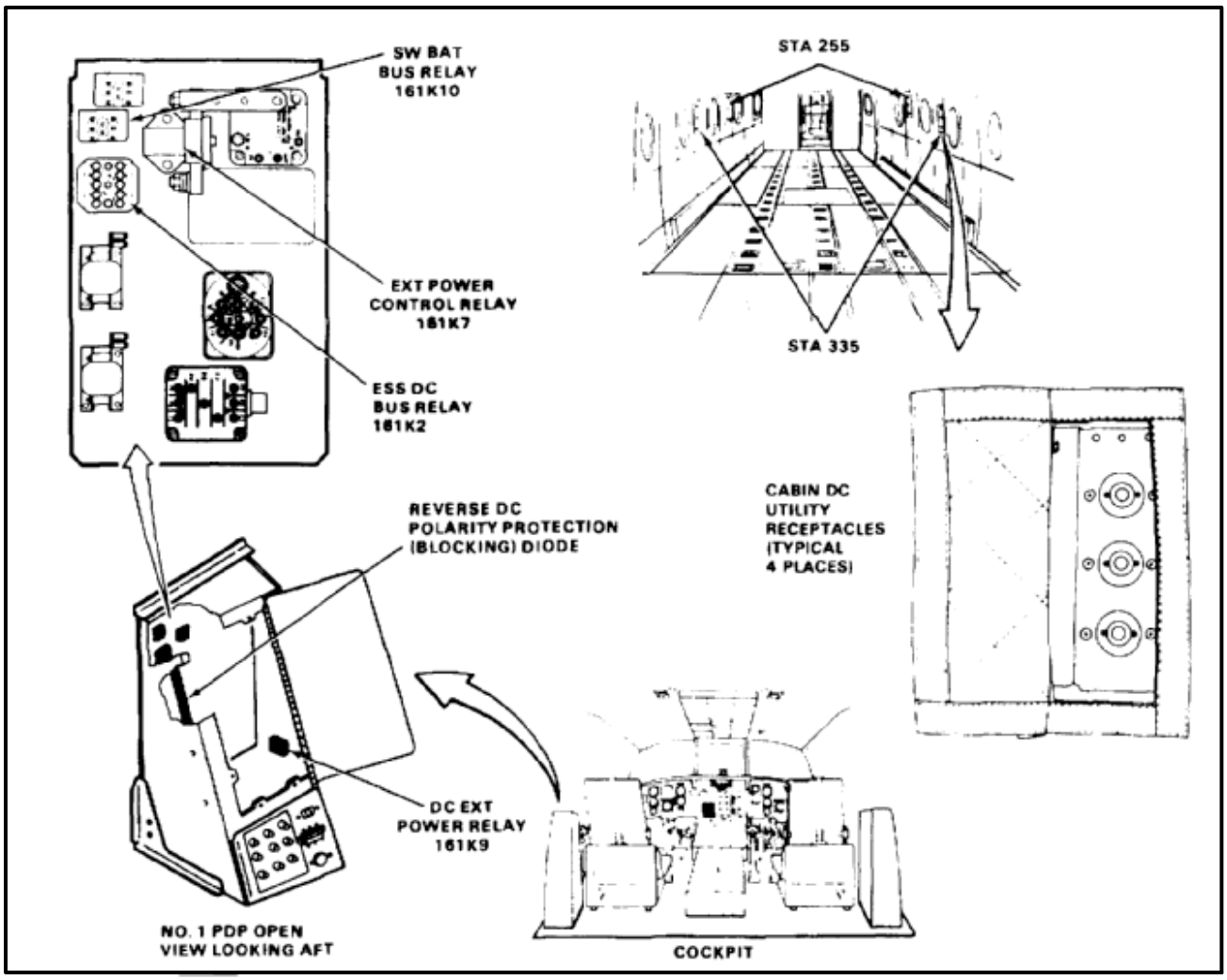
**DC Utility Receptacle** (No. 1 and No. 2 PDP): This **28 volt** receptacle accepts any plug-in dc accessory with a current rating of less than **15 amperes**. Power for the No. 1 (copilot) and No. 2 (pilot) receptacles comes from the associated dc bus.

### *CABIN DC UTILITY RECEPTACLES*

There are 12 dc receptacles in the cabin, a set of three on each side of the cabin at sta. 260 and 360, WL 0. The total current rating of the dc plug-in accessories per each side of the cabin must be less than **15 amperes**.

Power for the left and right receptacles comes from the No. 1 and No. 2 dc buses, respectively. One **15 ampere** circuit breaker serves each parallel-connected set of three receptacles.


COCKPIT
NO. 1 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT
NO. 2 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT
COCKPIT UTILITY RECEPTACLES
VIEW LOOKING AFT
VIEW LOOKING AFT
NO. 2 XFMR RECT FAIL RELAY
NO. 1 XFMR RECT FAIL RELAY 161K5
NO. 2 REV CUR CO RELAY 161K4
DC BUS-T RELAY
REVERSE CURRENT CUTOUT RELAY 161K3
TB62
NO. 1 PDP OPEN VIEW LOOKING AFT
NO. 2 PDP OPEN VIEW LOOKING AFT


SW BAT
BUS RELAY
161K10
EXT POWER
CONTROL RELAY
161K7
ESS DC
BUS RELAY
161K2
STA 255
STA 335
CABIN DC
UTILITY
RECEPTACLES
(TYPICAL
4 PLACES)
REVERSE DC
POLARITY PROTECTION
(BLOCKING) DIODE
DC EXT
POWER RELAY
161K9
NO. 1 PDP OPEN
VIEW LOOKING AFT
COCKPIT

### *TRANSFORMER-RECTIFIERS*

Two transformer-rectifiers (TR) are the primary source of dc power on the helicopter. Each transforms **115/200 volt 400 Hz ac power to 48.5 vac** and rectifies it to **28 vdc**. The No. 1 TR is located in the left electrical equipment pod with the battery and the battery charger. The No. 2 TR is in the right electrical equipment pod.

Each TR assembly consists of an input filter, a step-down transformer, rectifiers, an output filter, a step-down autotransformer and a control relay. An integral cooling fan draws air from inlets in the cabin at sta. 176. Air from the pod is vented to the cabin near floor level.

The dc output of the TR is not regulated. Regulation is accomplished indirectly through regulation of the input voltage. Each TR is protected by its own reverse current cutout (RCCO) relay, located in the No. 1 or No. 2 power distribution panel.

If power from either of these primary dc power sources is interrupted, a light on the master caution panel (NO. 1 RECT OFF or NO. 2 RECT OFF) will come on.

### *BATTERY*

The battery subsystem includes a **24 volt** nickel-cadmium battery rated at **11 ampere hours**, a battery charger, a relay, status lights, and a caution light on the master caution panel. The battery, charger, and relay are located in the left electrical pod.

When there is no other source of dc power, the battery, when plugged in, supplies the battery bus and the switched battery bus. When the cockpit battery switch is on, it also supplies the essential bus.

### *BATTERY CHARGER*

The charger monitors and controls the state of charge of the battery. It is powered by **115/200 volt, 3 phase, 400 Hz ac** from the No. 1 ac bus. A relay connects the battery to the charger and the essential dc bus when the battery switch on the cockpit overhead panel is on.

BATTERY charge status lights are in the left electrical pod. The CHARGING light indicates battery is on normal charge (battery is less than **80 percent** charged). The CHARGE COMPLETE light indicates battery is on low charge (battery is more than **80 percent** charged).

A BATT SYS MAL light on the master caution panel in the cockpit comes on and charging stops when one or more of the following conditions occur:

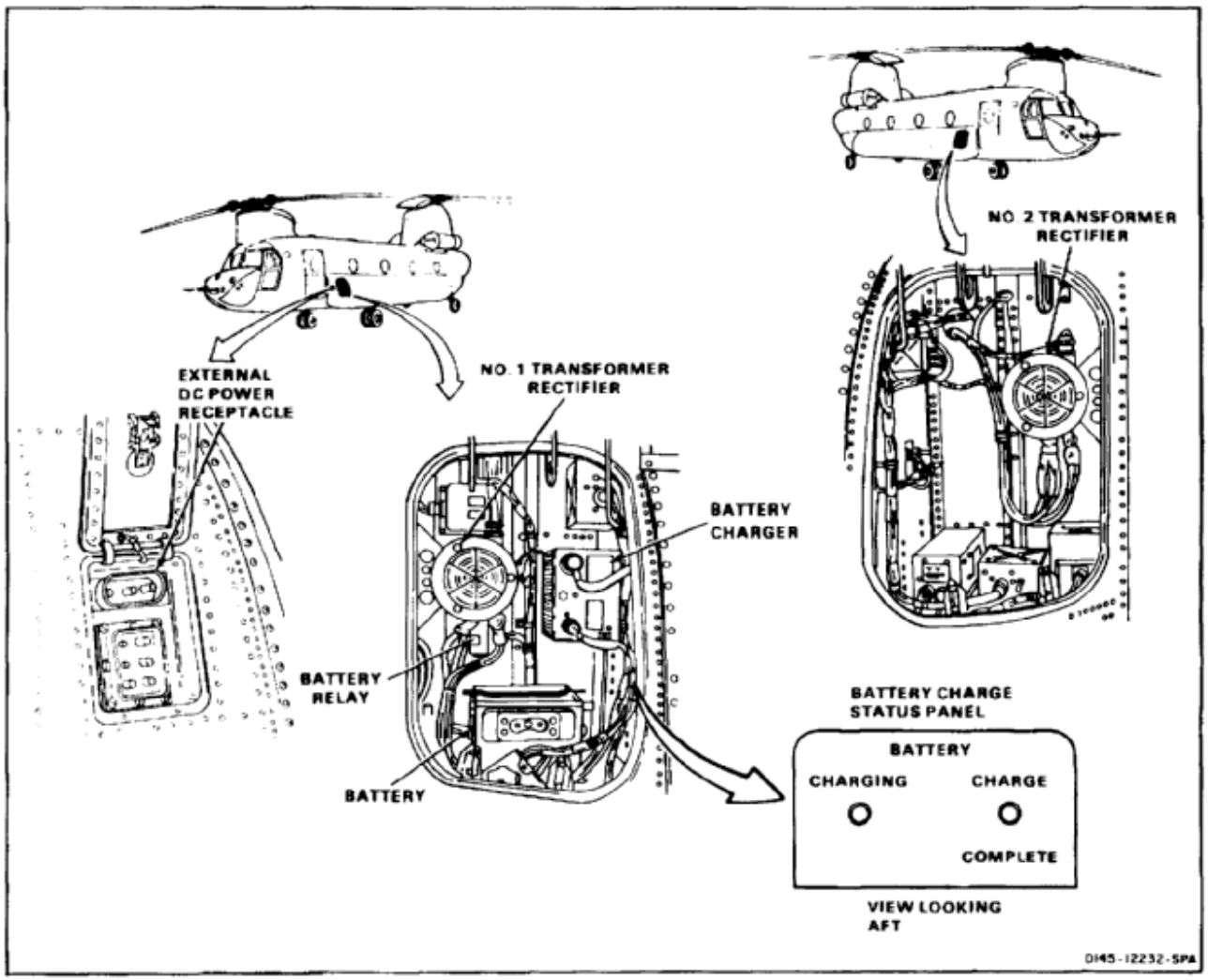
Battery or charger overtemperature.
Battery temperature sensor failure.
Battery cell imbalance.
Fault in charger circuits.

### *EXTERNAL POWER*

A dc external power receptacle accepts the cable from an external dc power supply cart to supply **28 vdc** power to the helicopter. The receptacle is located inside a hinged access door at the forward end of the left pod.

When an external source of dc power is used, the No. 1 and No. 2 transformer-rectifiers are automatically disconnected. Power from the external source is applied to the No. 1 and No. 2 dc buses and to the essential and switched battery buses. An EXT PWR light on the master caution panel comes on to indicate when external power is being used, and is powered through the dc external power relay.

The application of external dc power will not charge the battery.


NO. 2 TRANSFORMER RECTIFIER
EXTERNAL DC POWER RECEPTACLE
NO. 1 TRANSFORMER RECTIFIER
BATTERY CHARGER
BATTERY RELAY
BATTERY
BATTERY CHARGE STATUS PANEL
BATTERY
CHARGING
CHARGE
COMPLETE
VIEW LOOKING AFT
0145-12232-SPA

***THEORY OF OPERATION***

When **115/200 volt 400 Hz ac** power is available to the No. 1 and No. 2 transformer-rectifiers, the No. 1 and No. 2 dc power sources become available. Each source provides **28 vdc** to its respective dc bus and can supply up to **200 amperes**.

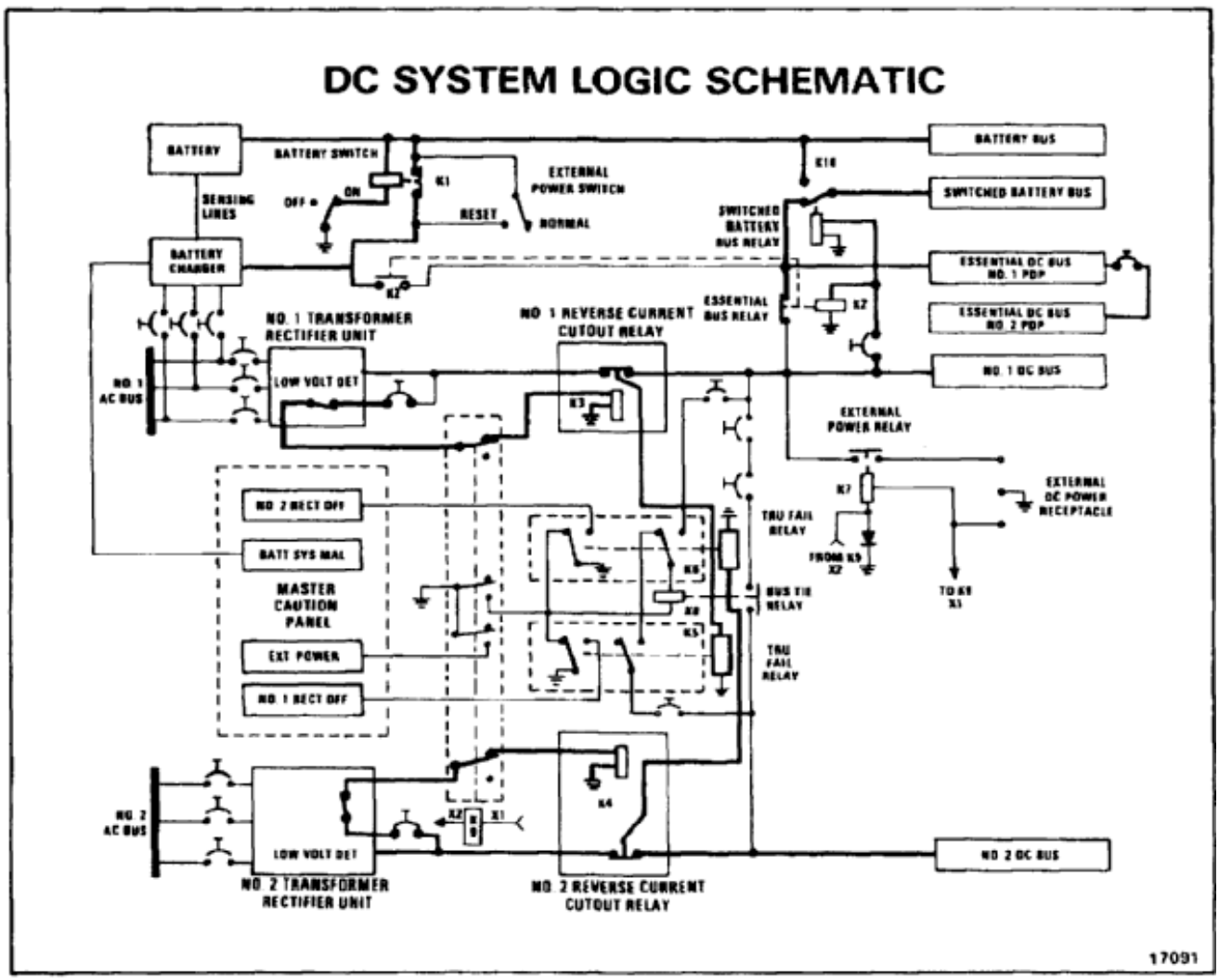
***RCCO RELAY***

Each transformer-rectifier (TR) is protected against a reverse flow of current from the helicopter dc bus by a reverse current cutout (RCCO) relay. Relay 161K3 protects the No. 1 TR and relay 161K4 the No. 2 TR.

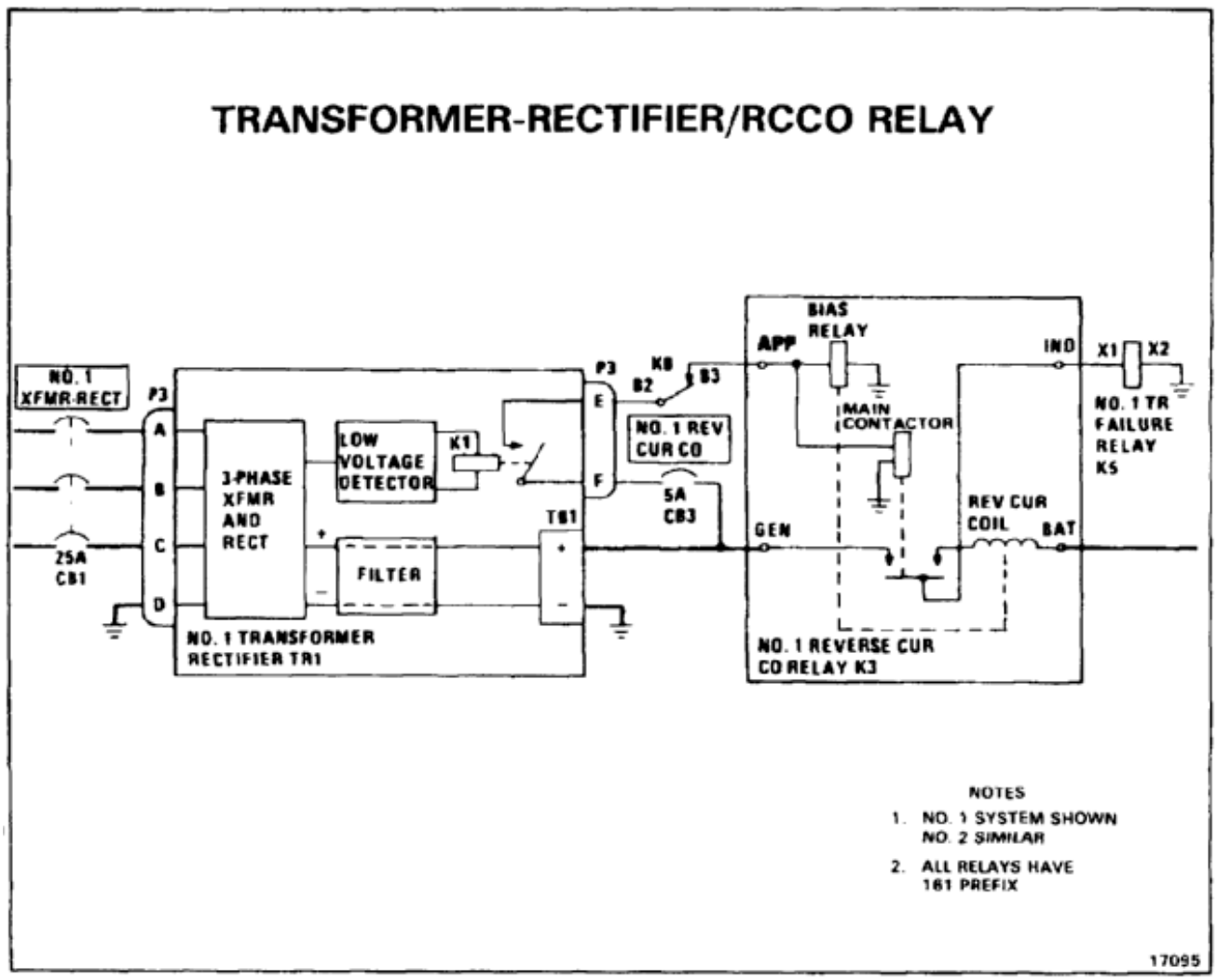
In normal operations, **28 vdc** power from the TR is routed from the GEN to the BATT terminals of the relay through an internal main contactor. The control of this internal main contactor is provided by a low voltage detection circuit within the TR.

If this low voltage detection circuit determines that TR output is acceptable, **28 vdc** is routed thru the TR to the APP terminal of the RCCO, energizing the internal main contactor and connecting the TR to the dc bus.

If this low voltage detector circuit determines that TR output is not acceptable, no TR output is applied to the RCCO APP terminal. As a result the internal main contactor is not energized isolating the TR from the dc bus. When this happens, TR failure relay 161K5 (No. 1) or 161K6 (No. 2) is de-energized, lighting the relevant RECT OFF light on the master caution panel and energizing dc bus tie relay 161K8. Energizing 161K8 connects the No. 1 and No. 2 dc buses, allowing both to be powered by the operating TR.



If the detection circuit determines that TR output is not acceptable, no output from the TR is applied to the APP RCCO, the internal main contactor is not energized, isolating the TR from the aircraft dc bus. When this happens, TR failure relay 161K5 (No. 1) or 161K6 (No. 2) is de-energized, lighting the relevant RECT OFF light on the master caution panel and energizing dc bus tie relay 161K8. Energizer 161K8 connects the No. 1 and No. 2 dc busses, allowing both to be powered by the operating TR.



### *BATTERY*

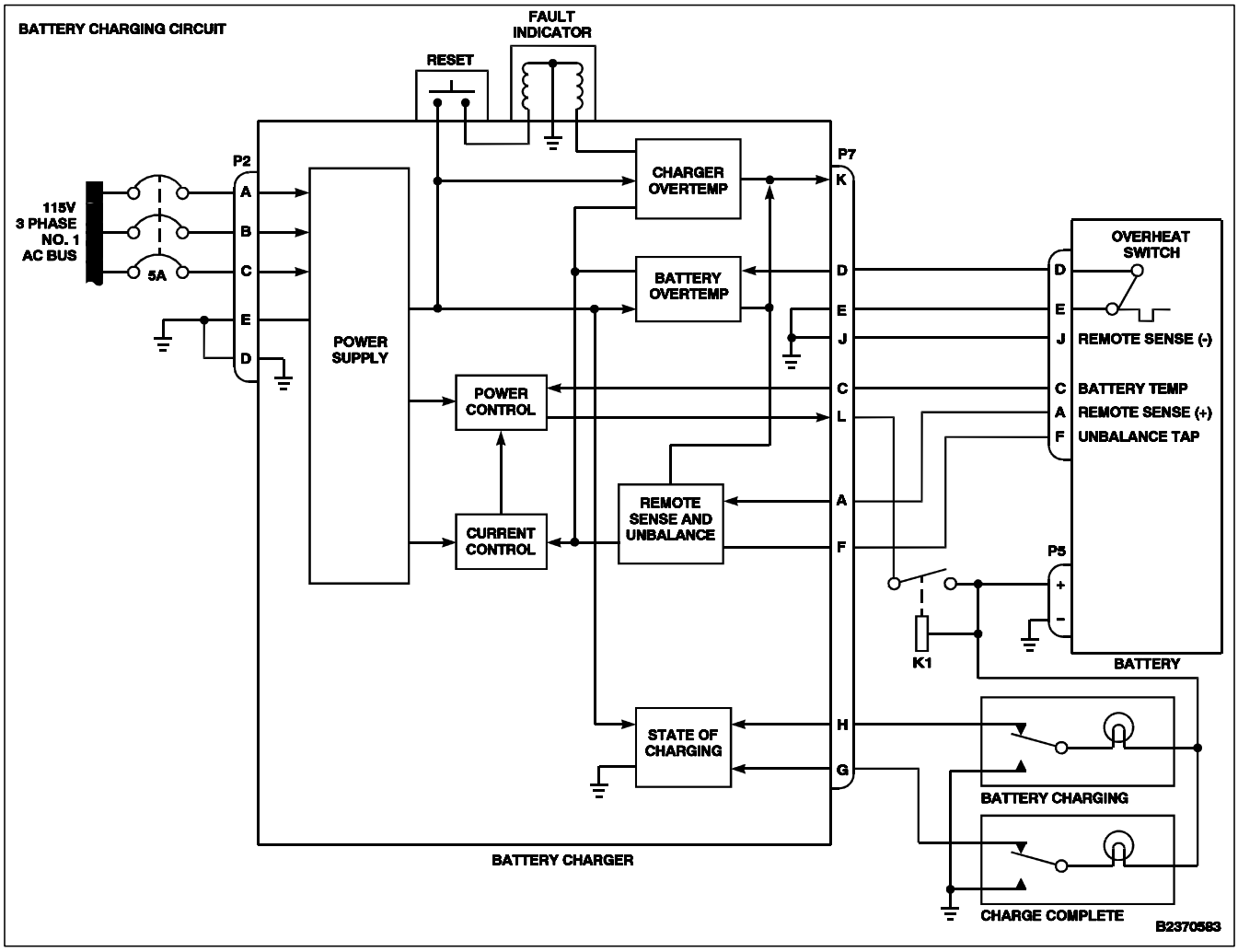
When the battery is connected, **24 vdc** is supplied directly to the battery bus. In addition, if the No. 1 dc bus is not powered, the battery provides **24 vdc** to the switched battery bus through switched battery bus relay 161K10. If the cockpit battery switch is on, **24 vdc** is also provided to the essential dc bus through battery bus relay 161K1 and essential dc bus relay 161K2.

### *BATTERY CHARGER*

When power is applied to the No. 1 ac bus the charger will charge the battery if there are no malfunctions in the system. It is a constant current charge (**10-11 amps**) and will continue until battery is more than **80 percent** charged. At this point, the charger drops to very low current (**0.04 amp**). Normal charge (**10-11 amps**) will not start again until the battery voltage drops below approximately **80 percent** of rated capacity.

The charger also has provision for low current charging (**1.5 amp**) for deeply discharged batteries. A charger failure will not damage or discharge the battery.

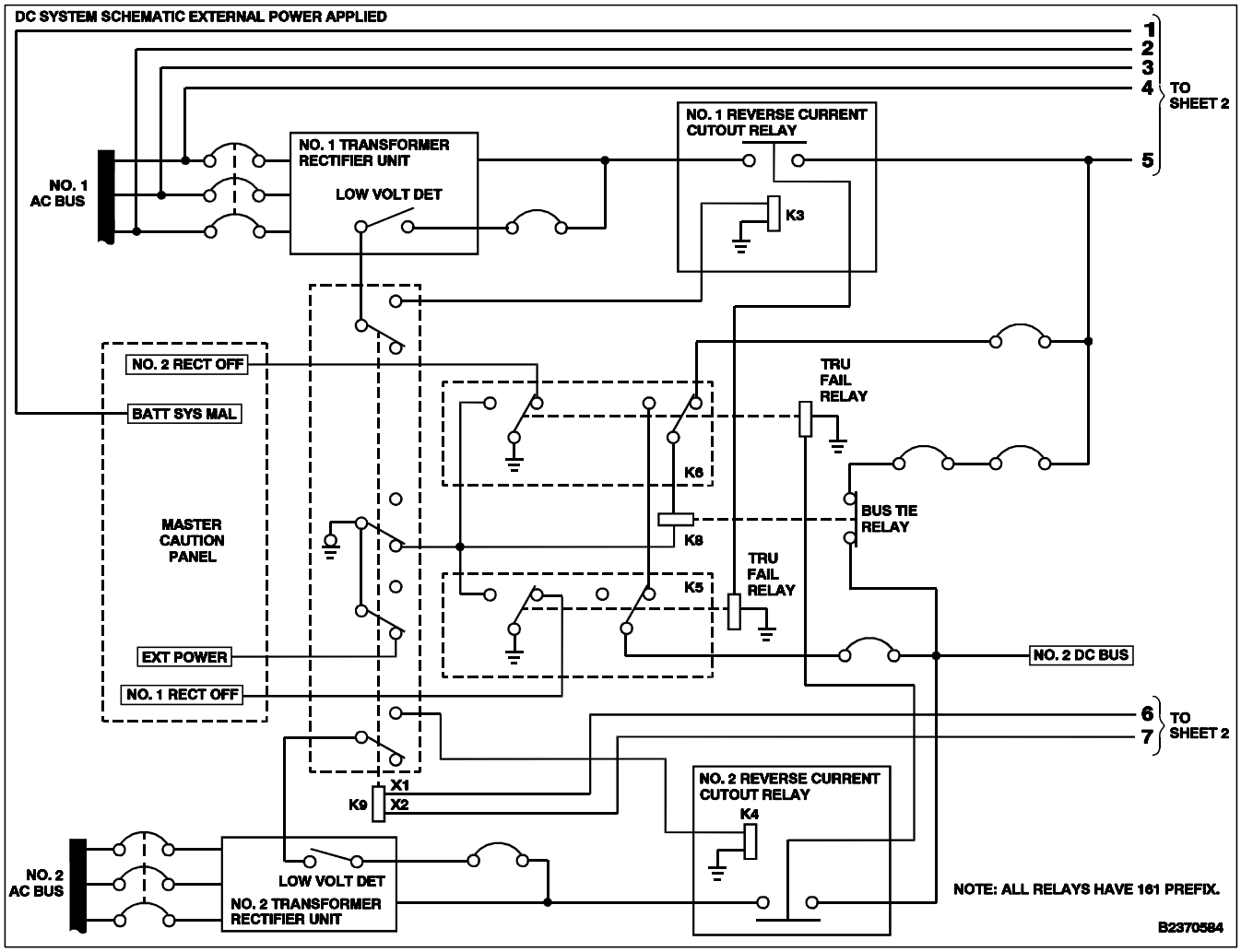
The charger can detect a battery overtemperature condition and will stop charging. Charging will not start again until battery cools and charger is manually reset or power is cycled off and on. The charger will operate at any frequency between **380 and 440 Hz**.

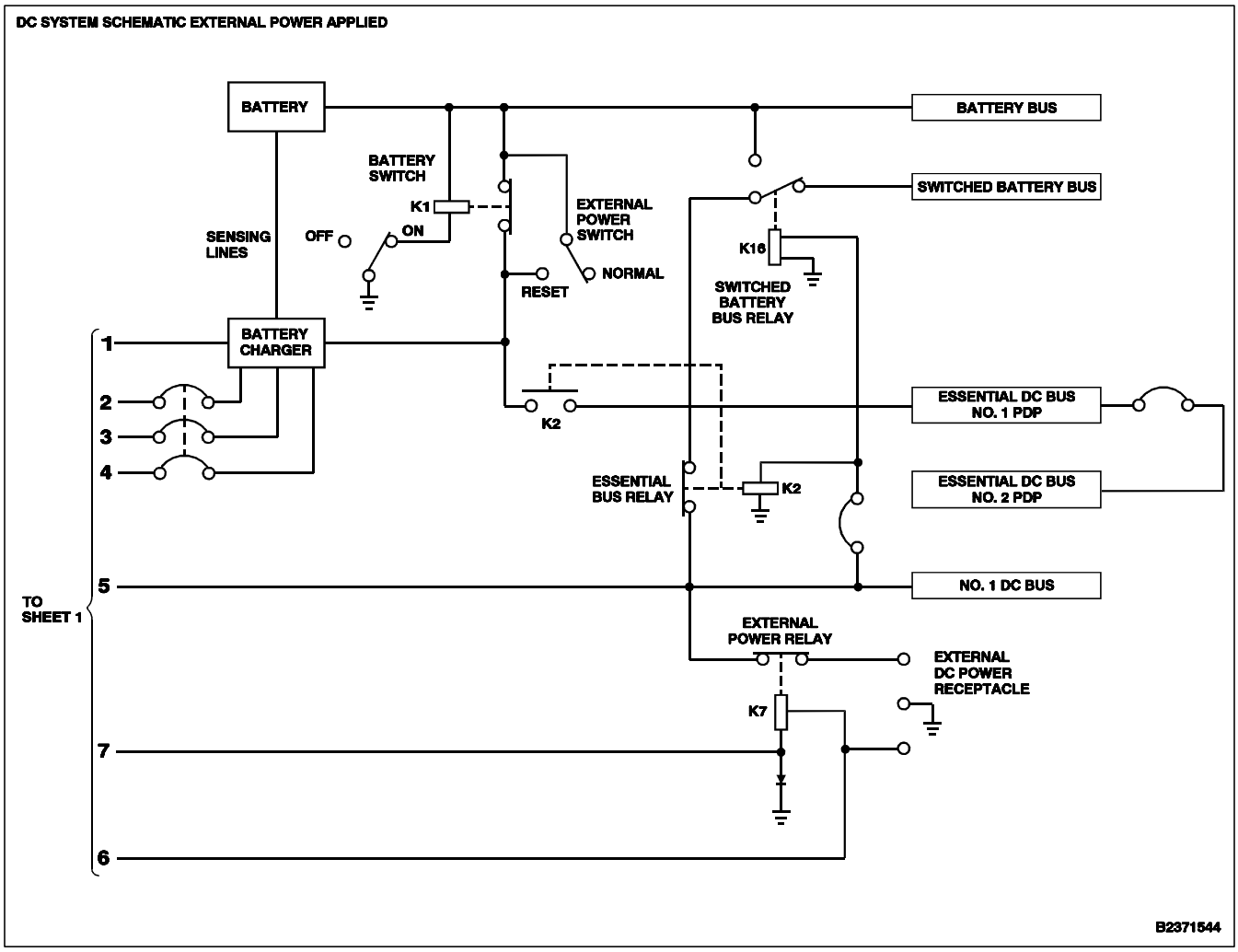


### *EXTERNAL POWER*

When external dc power is applied to the helicopter, dc external power control relay 161K9 is energized. This disconnects the No. 1 and No. 2 transformer-rectifiers from their respective buses by de-energizing their respective RCCO relays. The energized power control relay also lights the EXT PWR light on the master caution panel.

At the same time, dc external power relay 161K7 is energized to connect **24 vdc** from the external source to the No. 1 dc bus. This energizes relay 161K2, applying power to the essential dc bus, bus tie relay 161K8, powering the No. 2 bus, and energizes relay 161K10, applying power to the switched battery bus.




DC SYSTEM SCHEMATIC EXTERNAL POWER APPLIED
BATTERY
BATTERY BUS
BATTERY SWITCH
K1
OFF
ON
SENSING LINES
EXTERNAL POWER SWITCH
NORMAL
RESET
SWITCHED BATTERY BUS
K16
SWITCHED BATTERY BUS RELAY
BATTERY CHARGER
1
2
3
4
K2
ESSENTIAL DC BUS NO. 1 PDP
ESSENTIAL BUS RELAY
K2
ESSENTIAL DC BUS NO. 2 PDP
5
TO SHEET 1
NO. 1 DC BUS
EXTERNAL POWER RELAY
EXTERNAL DC POWER RECEPTACLE
K7
7
6
B2371544

END OF TASK

# SECTION II
# DIRECT CURRENT (DC) POWER DISTRIBUTION SYSTEM

## 9-2 REMOVE TRANSFORMER-RECTIFIER 9-2

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

***Materials:***

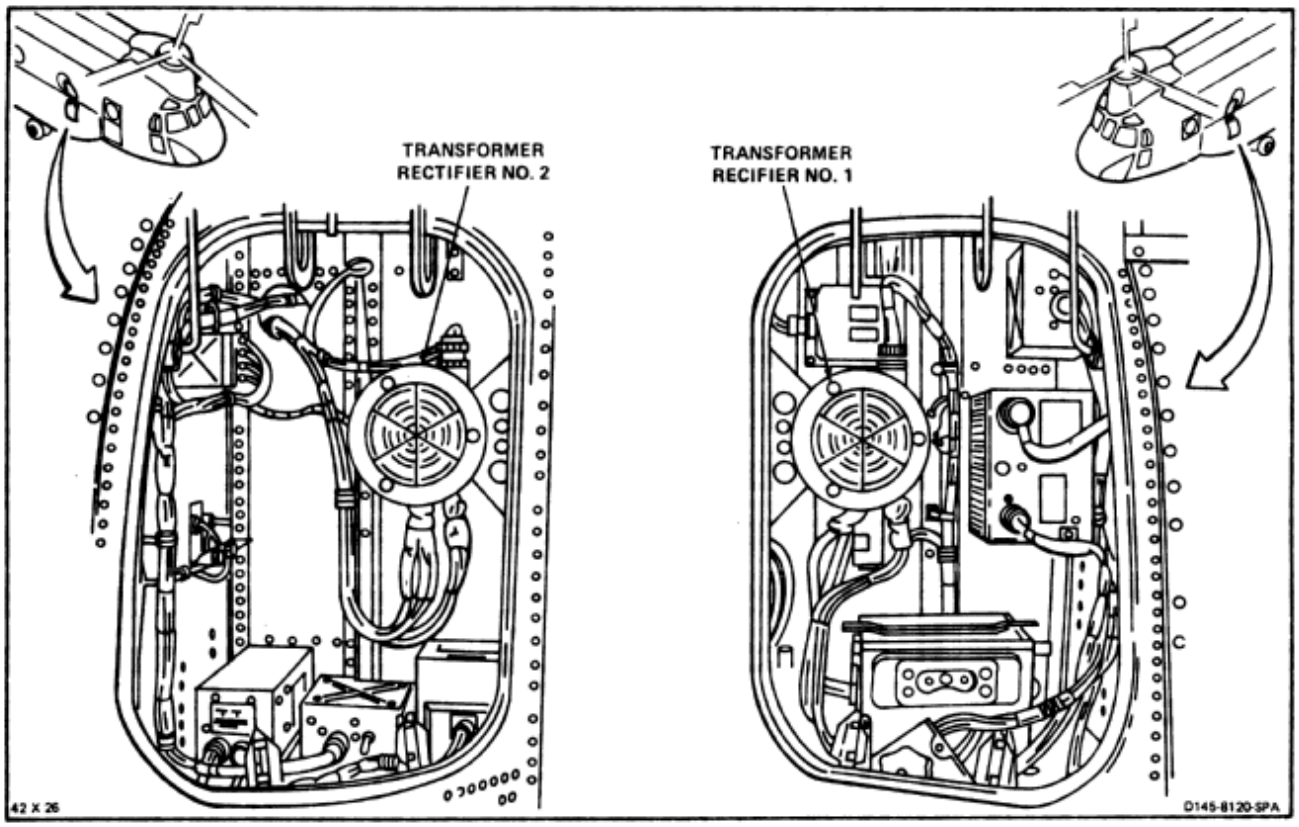
Tags (E264)
Tape (E385)

***Personnel Required:***

Medium Helicopter Repairer

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Right or Left Electrical Compartment Access Door Open (Task 2-2)

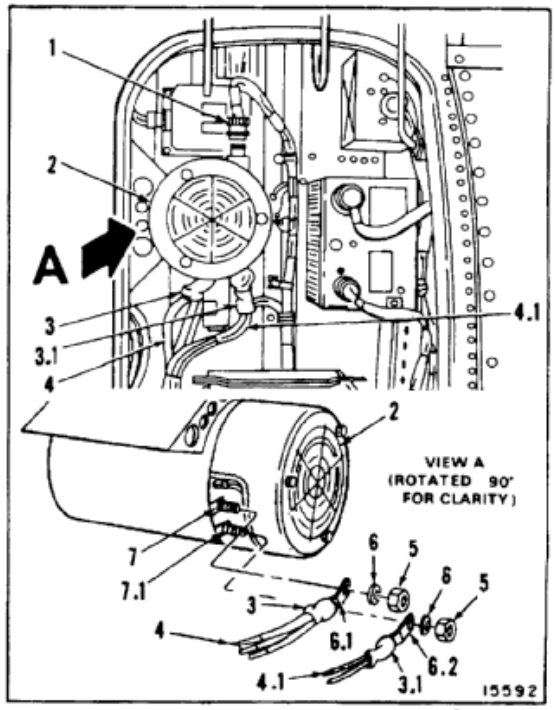


## 9-2 REMOVE TRANSFORMER-RECTIFIER (Continued) 9-2

**NOTE**

Procedure is same to remove transformer-rectifier No. 1 or No. 2. Removal of transformer-rectifier No. 1 is shown here.

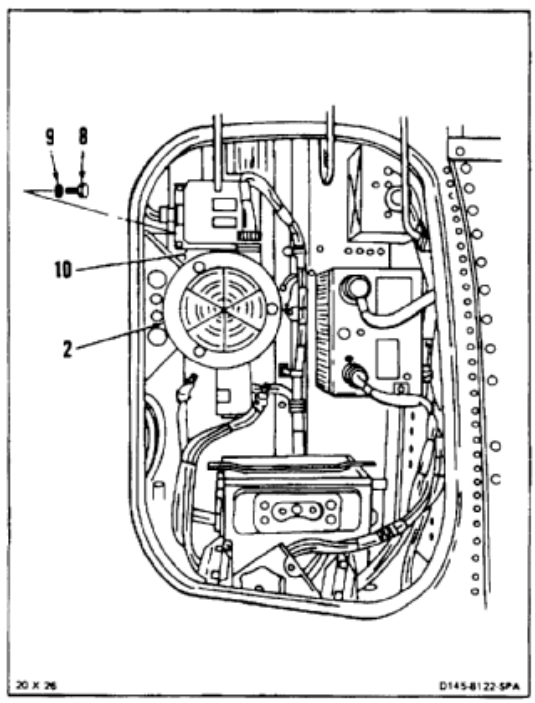
1. Disconnect plug (1) from transformer-rectifier (2).
2. Slide two boots (3 and 3.1) over wire bundles (4 and 4.1).
3. Remove two nuts (5) and washers (6).
4. Tag and remove terminal (6.1) (with wire bundle (4) attached) from stud (7). Use tags (E264).
5. Tag and remove terminal (6.2) (with wire bundle (4.1) attached) from stud (7.1). Use tags (E264).




6. Remove four bolts (8) and washers (9).
7. Remove transformer-rectifier (2) from bracket (10).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-2.1 REPLACE TRANSFORMER-RECTIFIER-TO-FUSELAGE SEAL 9-2.1

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

***Materials:***

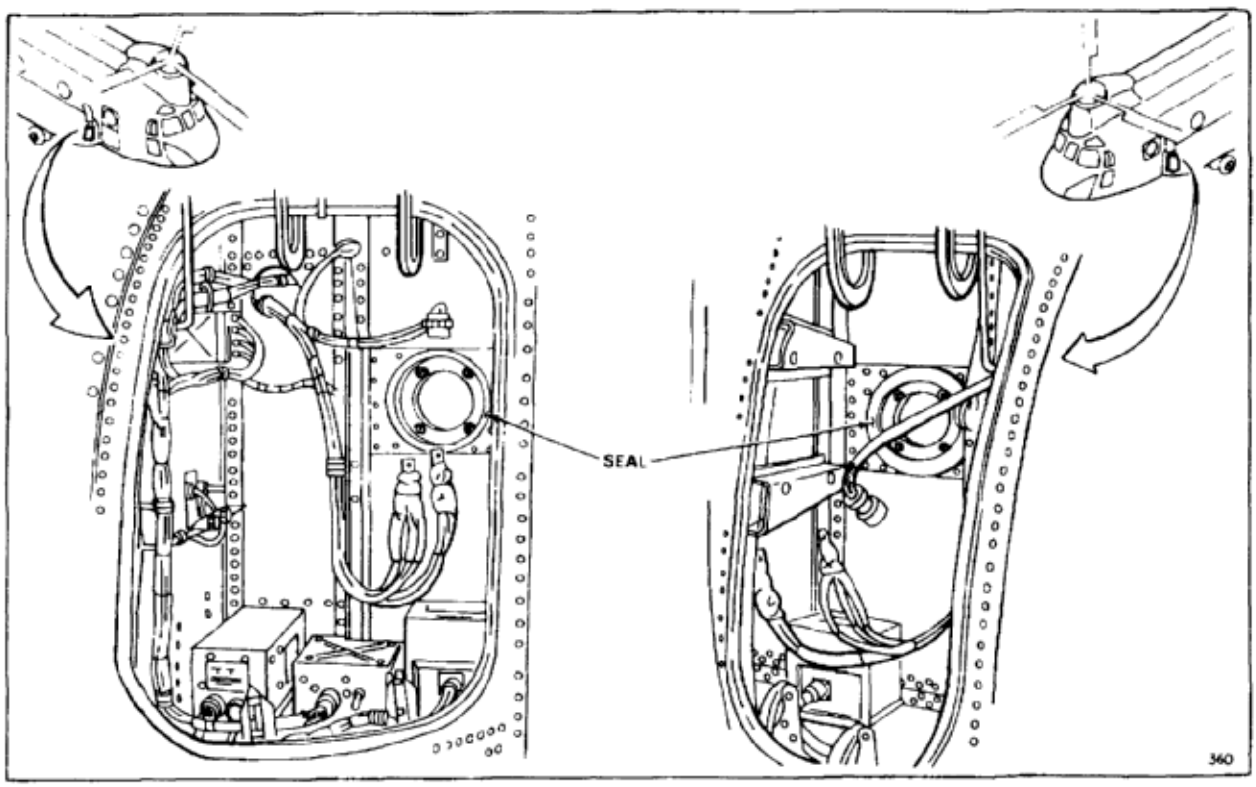
None

***Personnel Required:***

Medium Helicopter Repairer

***Equipment Condition:***

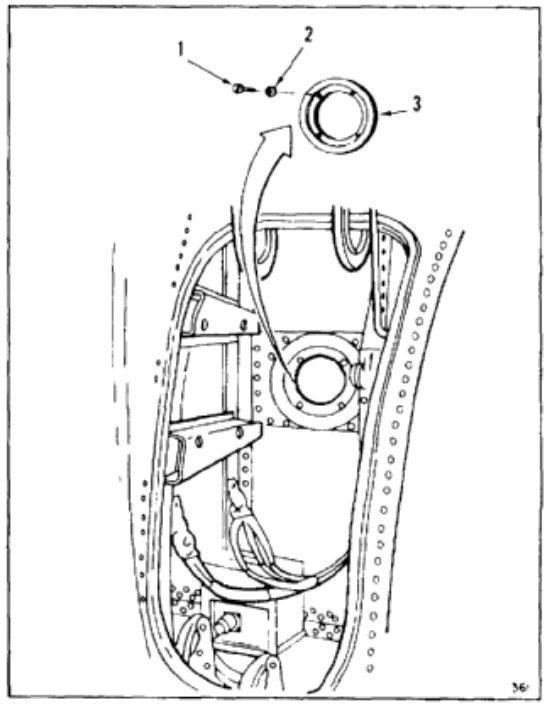
Transformer-Rectifier Removed (Task 9-2)



**NOTE**

Procedure is same to replace No. 1 or No. 2 seal. Replacement of No. 1 seal is shown here.

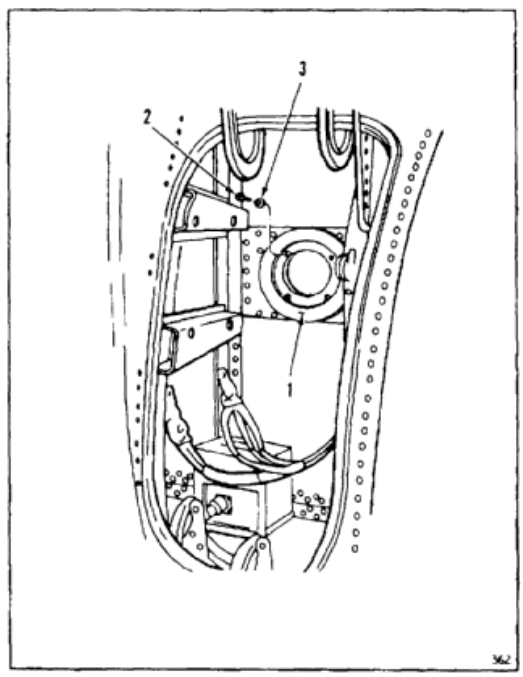
1. Remove four screws (1) and four washers (2) and remove seal (3).




2. Position replacement seal (1) on fuselage, flat side inboard.
3. Install four screws (2) and washers (3).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-3 INSTALL TRANSFORMER-RECTIFIER 9-3

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

***Materials:***

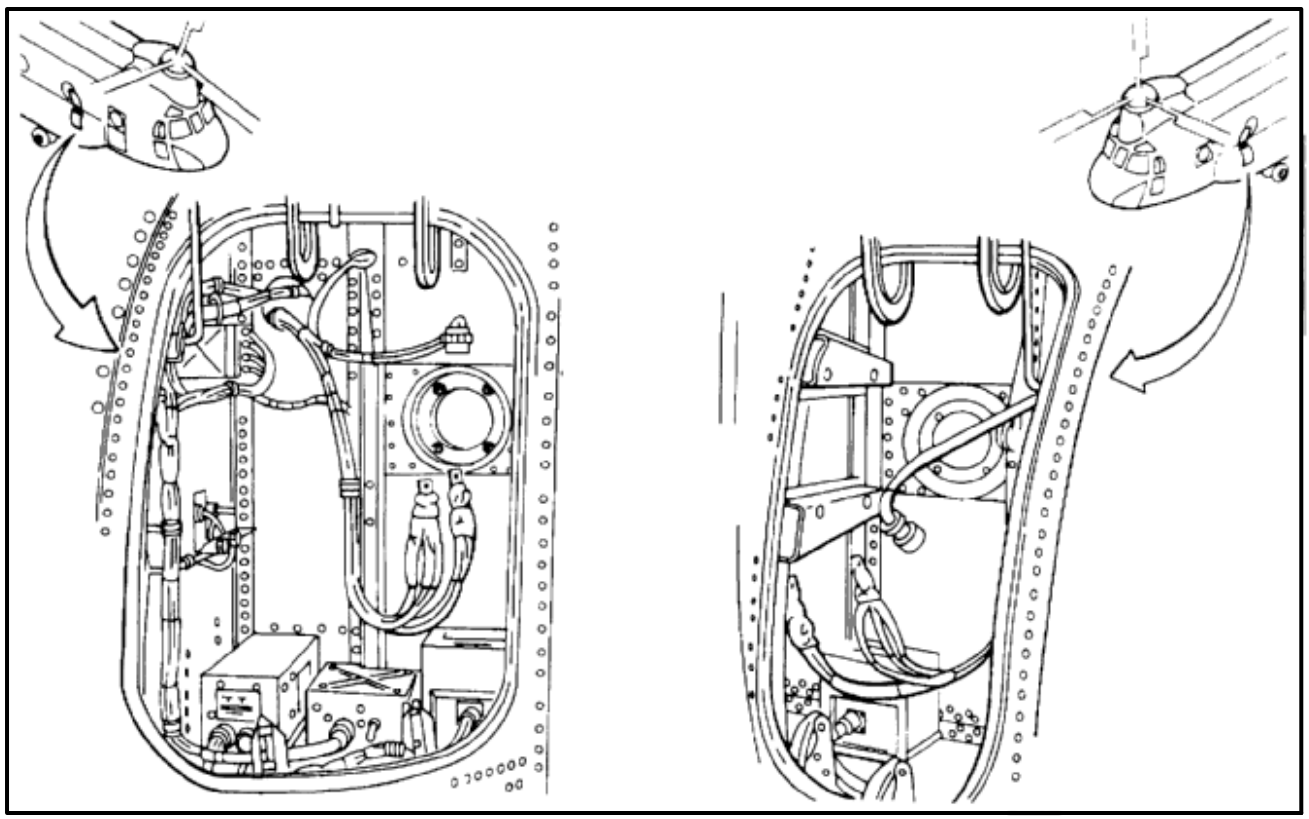
None

***Personnel Required:***

Medium Helicopter Repairer
Inspector

***References:***

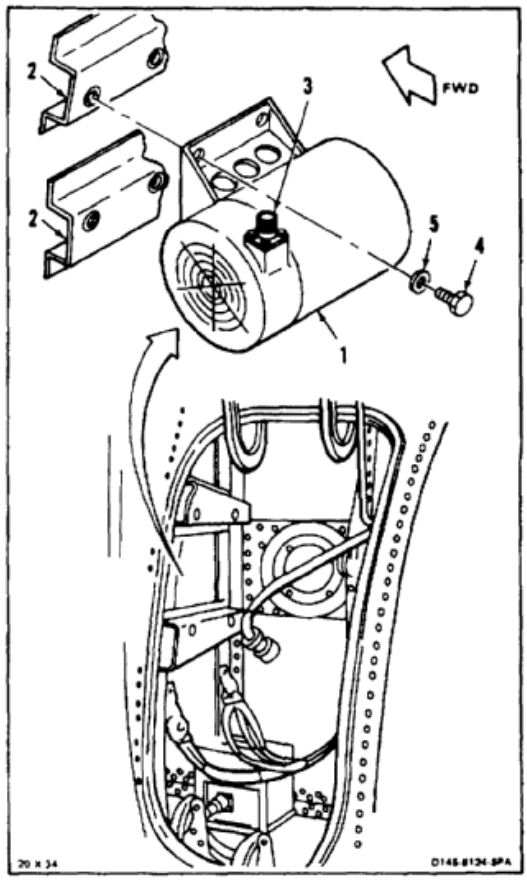
TM 55-1520-240-23P



**NOTE**

Procedure is same to install transformer-rectifier No. 1 or No. 2. Installation of transformer-rectifier No. 1 is shown here.

1. Position transformer-rectifier (1) on bracket (2) with receptacle (3) up.
2. Install four bolts (4) and washers (5) in transformer-rectifier (1).



3. Connect plug (6) to receptacle (3). Lockwire (E231) plug to receptacle.

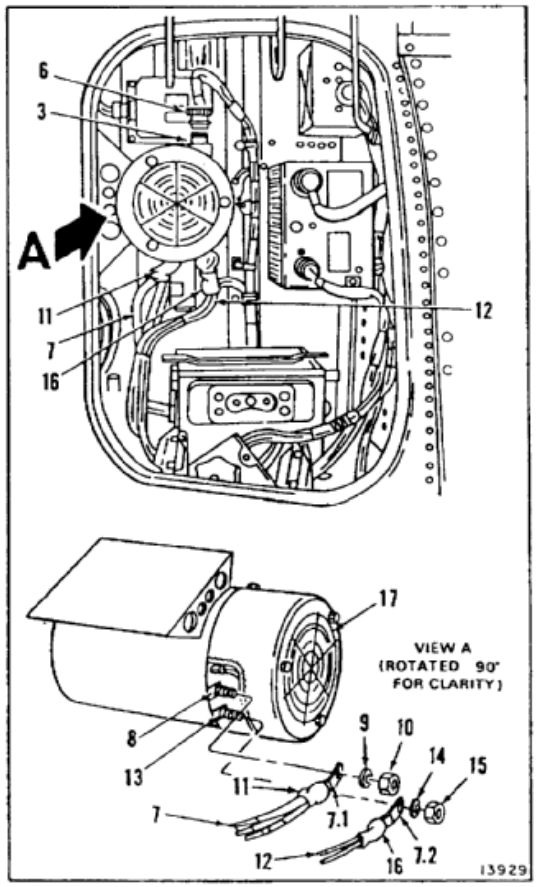
CAUTION

Wire bundles must be on correct studs; otherwise fire and damage to component can result.

**NOTE**

When installing wire bundle (7 and 12), make certain that flange on bus bars (7.1 and 7.2) faces the rear of unit (inboard).

4. Install bus bar (7.1) with wire bundle (7) (attached) on stud (8). Secure with washer (9) and nut (10). Remove tag. Slide boot (11) over stud.
5. Install bus bar (7.2) with wire bundle (12) (attached) on stud (13). Secure with washer (14) and nut (15). Remove tag. Slide boot (16) over stud.
6. Check that there is no debris or obstruction on screen (17).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).
Close left or right hand electrical compartment door (Task 2-2).

END OF TASK

## 9-4 REMOVE DC POWER RECEPTACLE 9-4

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

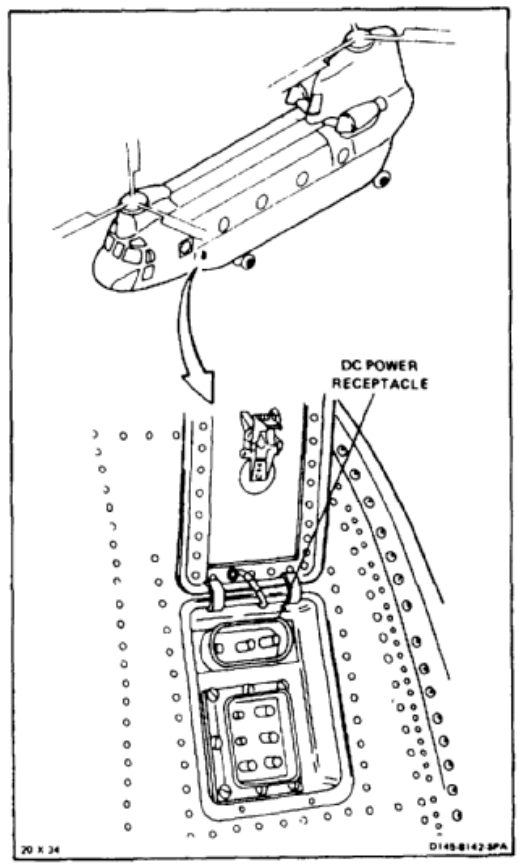
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

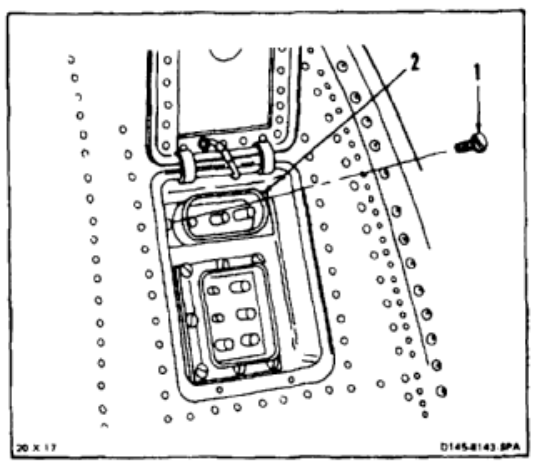
Aircraft Electrician

***Equipment Condition:***

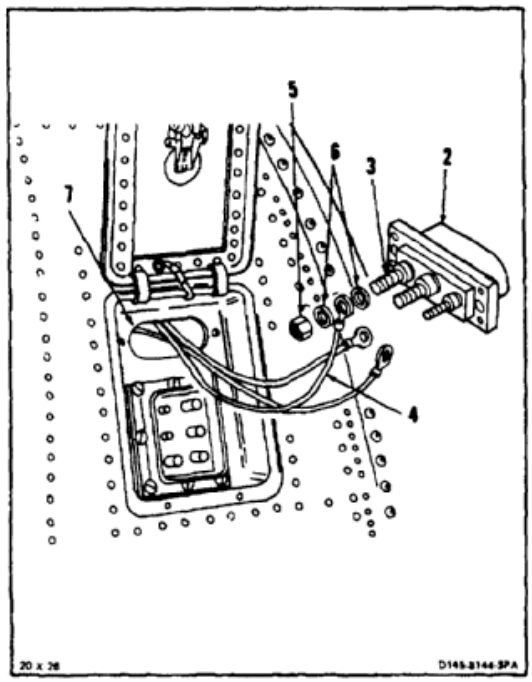
Battery Disconnected (Task 1-39)
Electrical Power Off
EXT PWR DC-AC Access Cover Open (Task 2-2)




1. Cut sealant away from two screws (1) of dc receptacle (2).
2. Remove two screws (1) from receptacle (2).



3. Pull receptacle (2) outboard for access to terminals (3).
4. Tag three wires (4). Remove three nuts (5) and washers (6) from terminals (3). Use tags (E264).
5. Disconnect three wires (4) from terminals (3). Remove receptacle (2).
6. Install washers (6) and nuts (5) loosely on terminals (3).
7. Tape ends of three wires (4). Use tape (E385).
8. Scrape sealant from receptacle (2) and hole (7).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-5 INSTALL DC POWER RECEPTACLE 9-5

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

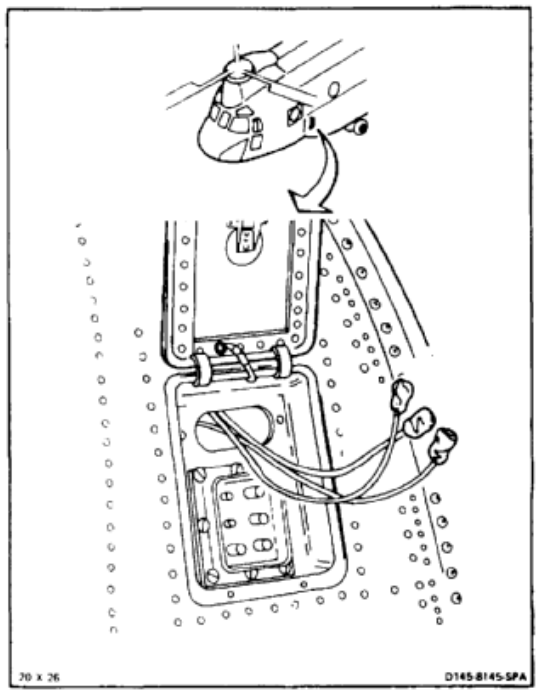
Acetone (E20)
Sealant (E336)
Cloths (E120)
Gloves (E186)

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

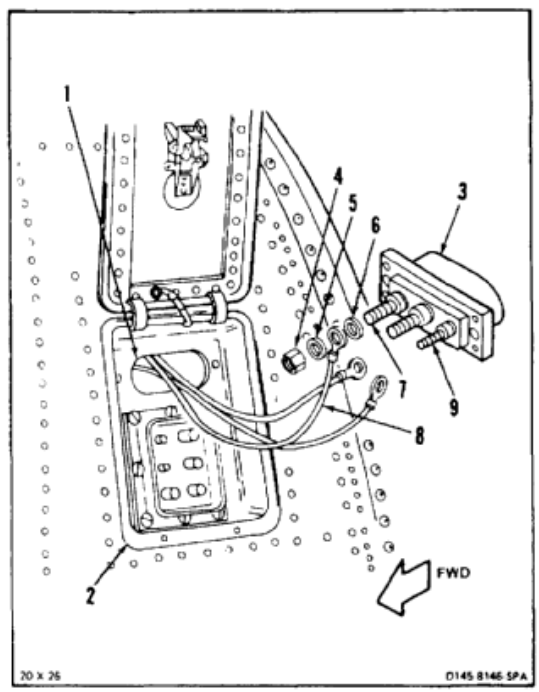
TM 55-1520-240-23P




**WARNING**

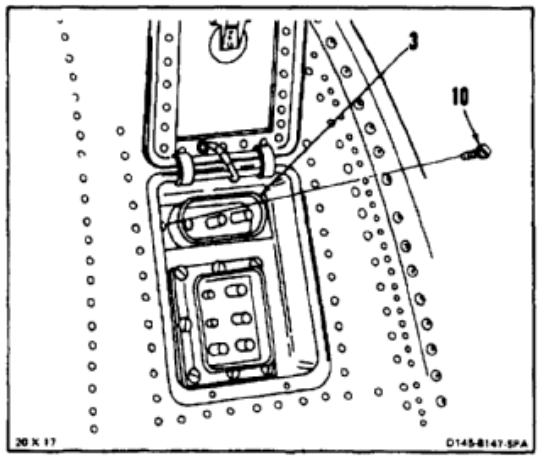
Acetone (E20) can form toxic vapors if exposed to flame. Use in well-ventilated area, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

1. Clean surfaces around hole (1) of box (2) and receptacle (3). Use acetone (E20) and cloths (E120). Wear gloves (E186).
2. Remove three nuts (4), washers (5), and washers (6) from terminals (7).
3. Remove tape from ends of three wires (8). Connect wires to terminals (7) of receptacle (3). Install three washers (6), washers (5), and nuts (4) on terminals. Remove tags from wires.
4. Position receptacle (3), small terminal (9) forward, in hole (1) of box (2).




***INSPECT***

5. Install two screws (10) in receptacle (3).




**WARNING**

Sealant (E336) can irritate skin and cause burns. Avoid contact with skin, eyes, and clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

6. Apply sealant to screws (10) and edge of receptacle (3). Use sealant (E336). Wear gloves (E186).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).
Close EXT PWR DC-AC access cover (Task 2-2).

END OF TASK

## 9-6 REMOVE DC CABIN UTILITY RECEPTACLE 9-6

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

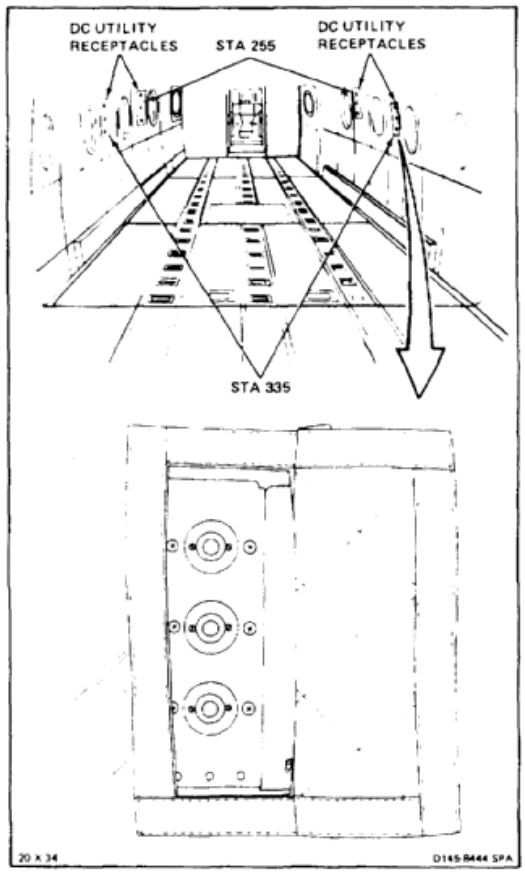
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

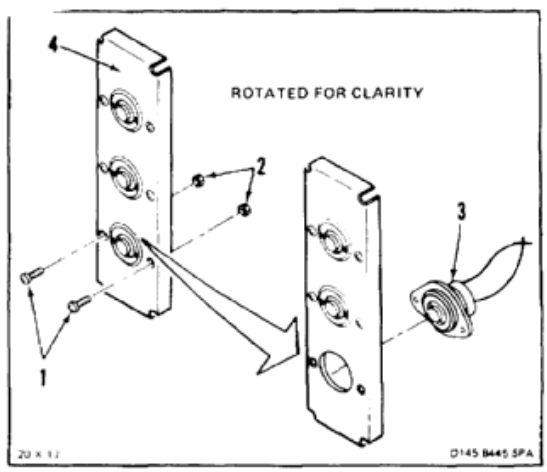
Battery Disconnected (Task 1-39)
Electrical Power Off
Acoustical Blanket Removed (Task 2-208)



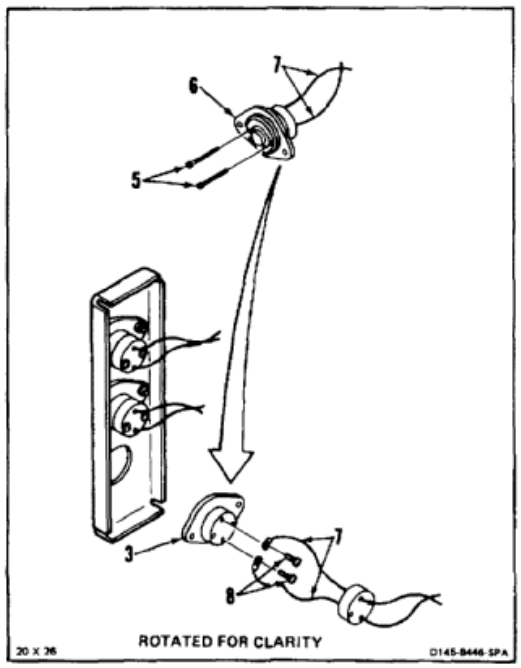

**NOTE**

Procedure is same to remove any dc utility receptacle.

1. Remove two screws (1) and nuts (2) from receptacle (3).
2. Pull receptacle (3) from back of panel (4).



3. Remove two screws (5) from cover (6).
4. Slide cover (6) over two wires (7).
5. Tag and disconnect two wires (7) by removing two screws (8). Tape wire ends.
6. Remove receptacle (3).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-7 INSTALL DC CABIN UTILITY RECEPTACLE 9-7

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

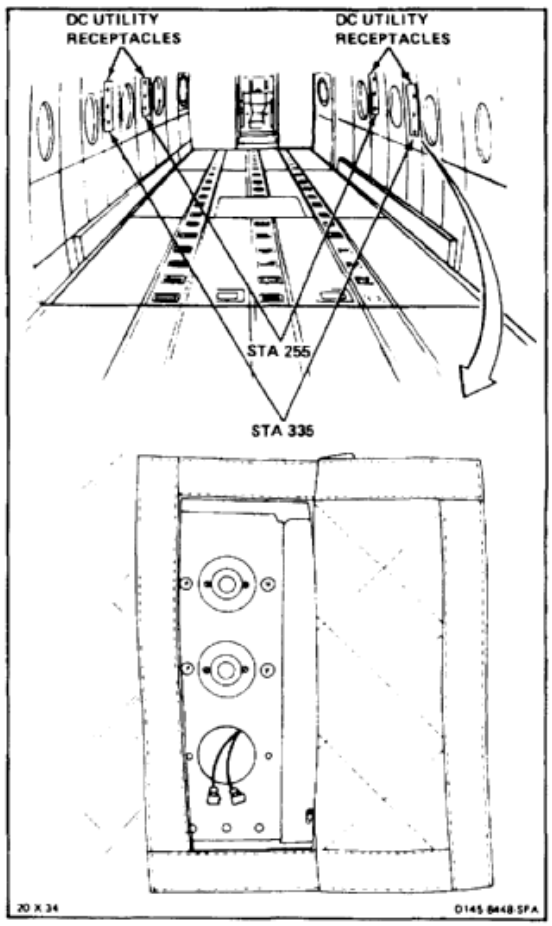
None

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P



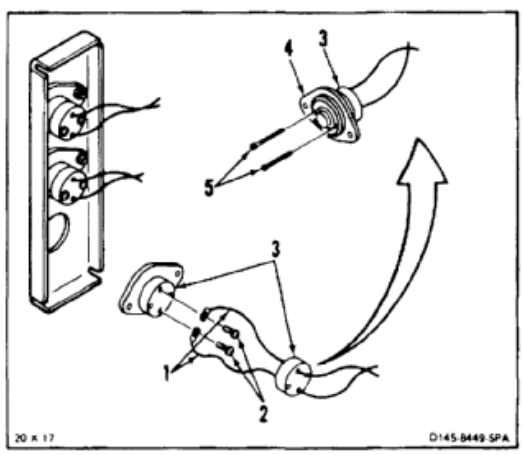

CAUTION

Positive wire must be connected to positive terminal; otherwise, damage to support equipment or fire may result.

**NOTE**

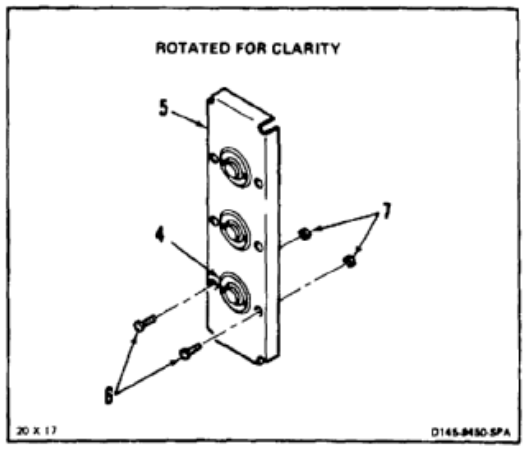
Procedure is same to install any dc utility receptacle.

Small terminal (brass colored) is positive.




1. Remove tape and connect two wires (1) by installing two screws (2). Remove tags.
2. Position cover (3) on receptacle (4). Install two screws (5).

3. Position receptacle (4) on panel (5). Install two screws (6) and nuts (7).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Install acoustical blanket (Task 2-210).
Perform operational check (TM 55-1520-240-T).

END OF TASK

## 9-8 REMOVE POWER DISTRIBUTION PANEL (PDP) 9-8

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Electrical Tool Kit, NSN 5180-00-323-4915

***Materials:***

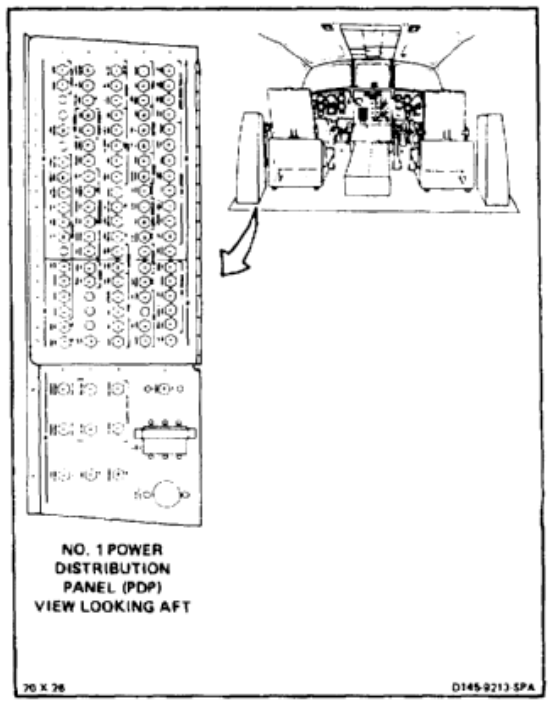
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

Aircraft Electrician (2)

***Equipment Condition:***

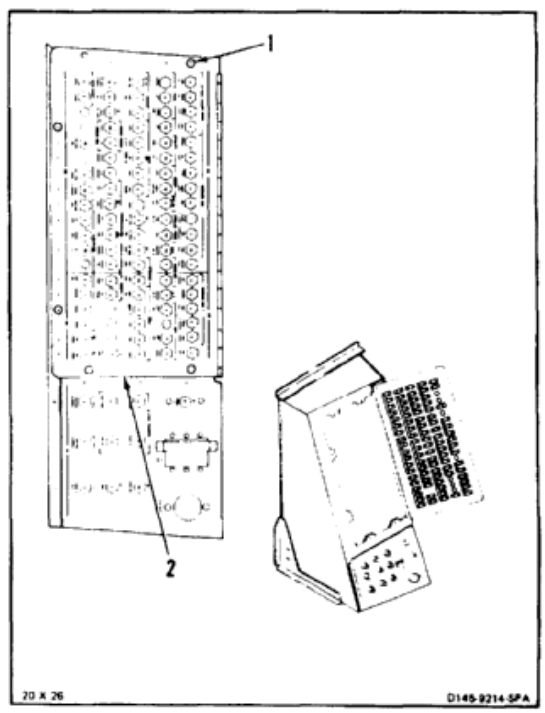
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off



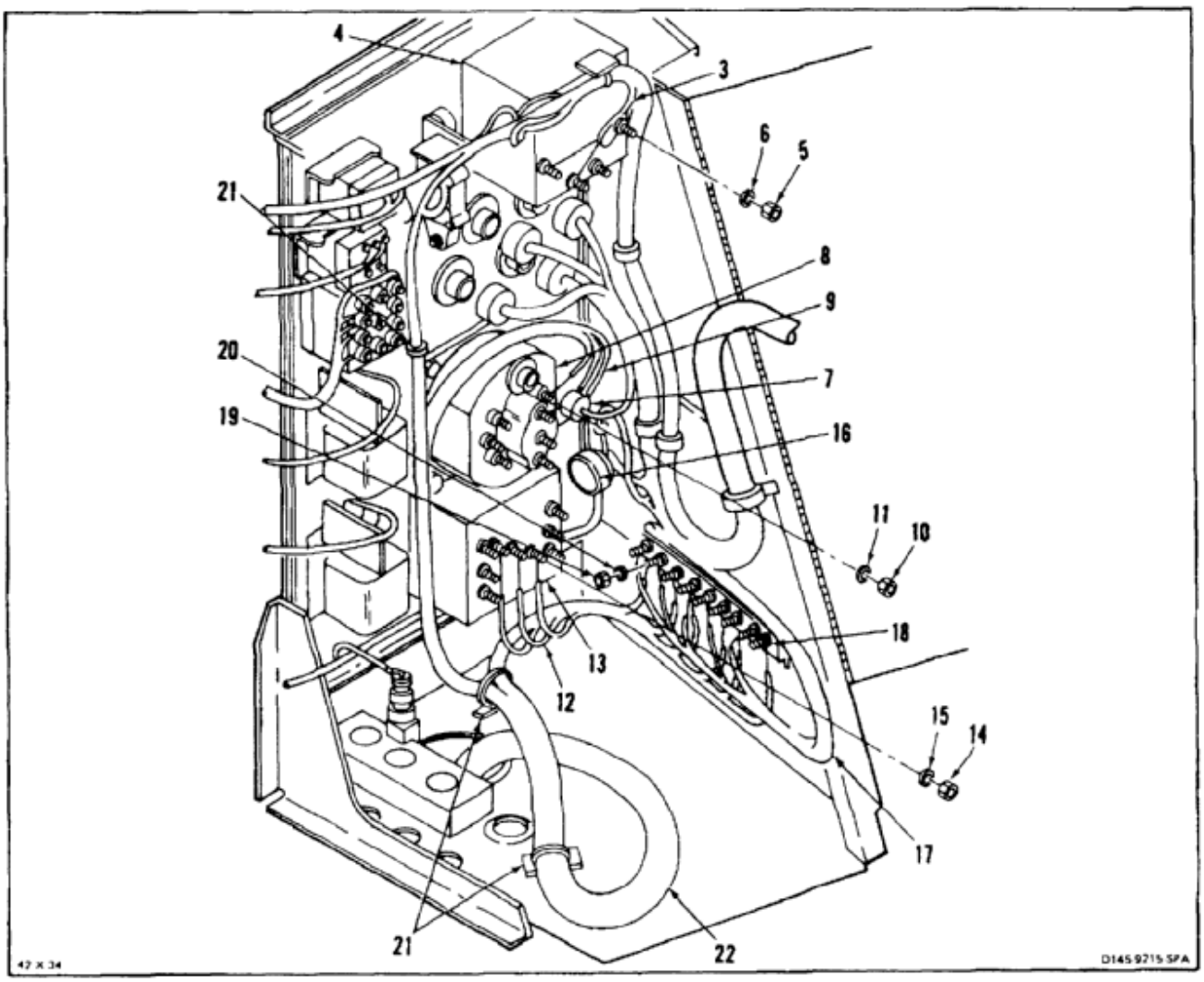

**NOTE**

Procedure is similar to remove No. 1 PDP or No. 2 PDP. Removal of No. 1 PDP is shown here.

1. Loosen six fasteners (1). Open panel (2).



2. Tag and disconnect six wires (3) from relay (4) by removing five nuts (5) and washers (6). Tape wire ends. Use tags (E264) and tape (E385).
3. Tag and disconnect electrical connector (7) from relay (8).
4. Tag and disconnect three wires (9) from relay (8) by removing three nuts (10) and washers (11). Tape wire ends.
5. Tag and disconnect three wires (12) from relay (13) by removing three nuts (14) and washers (15).
6. Tag and disconnect electrical connector (16) from relay (13).
7. Tag and disconnect wires (17) from board TB50 (18) by removing 6 nuts (19) and washers (20). Tape wire ends. Lay harness aside.
8. Cut and remove three straps (21) securing bundle (22).

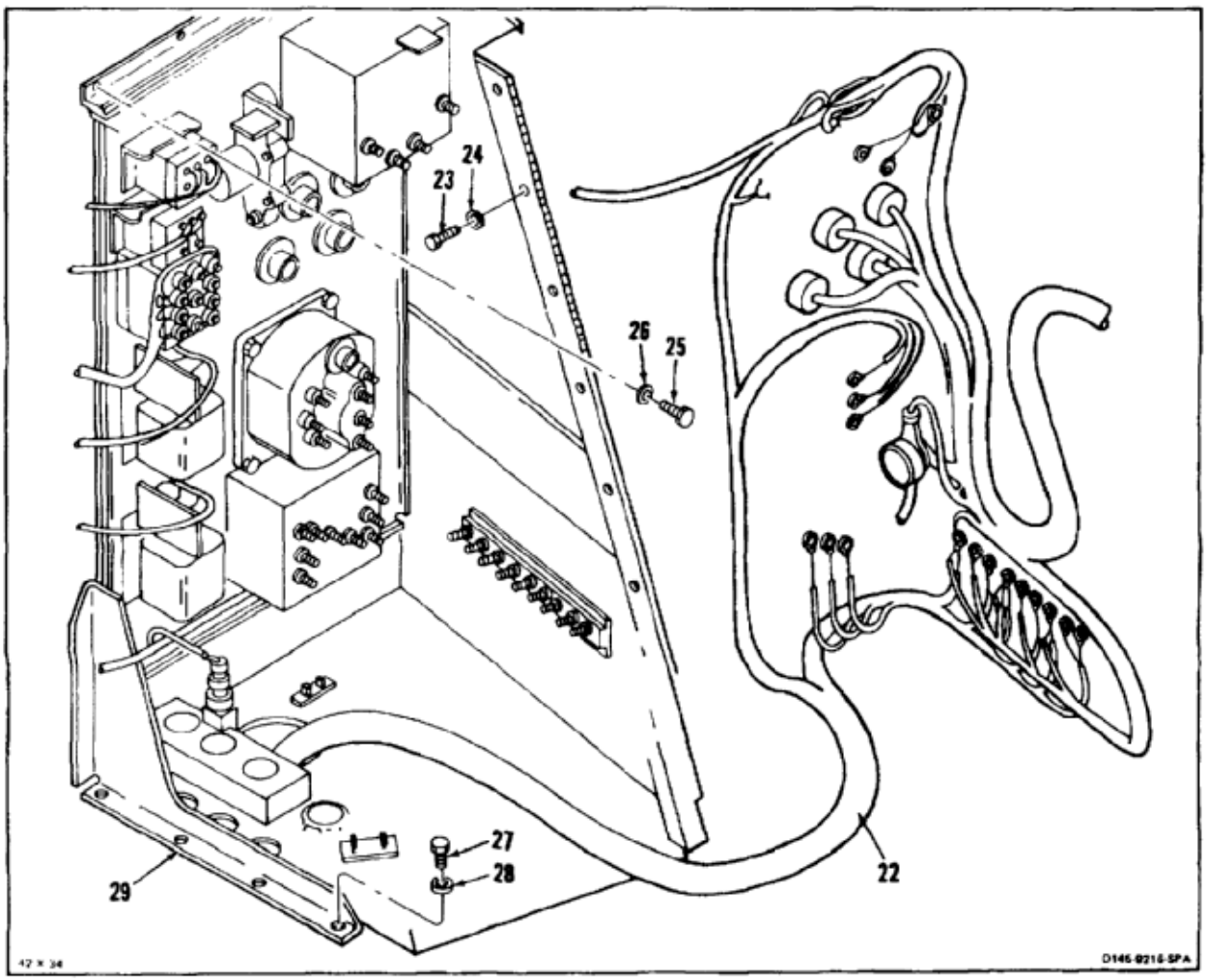


**9-8 REMOVE POWER DISTRIBUTION PANEL (PDP) (Continued) 9-8**

9. Remove six bolts (23) and washers (24).
10. Remove four bolts (25) and washers (26).
11. Remove four bolts (27) and washers (28).
12. Have helper feed cable (22) through base of PDP (29) Remove PDP.

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-9 INSTALL POWER DISTRIBUTION PANEL (PDP) 9-9

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

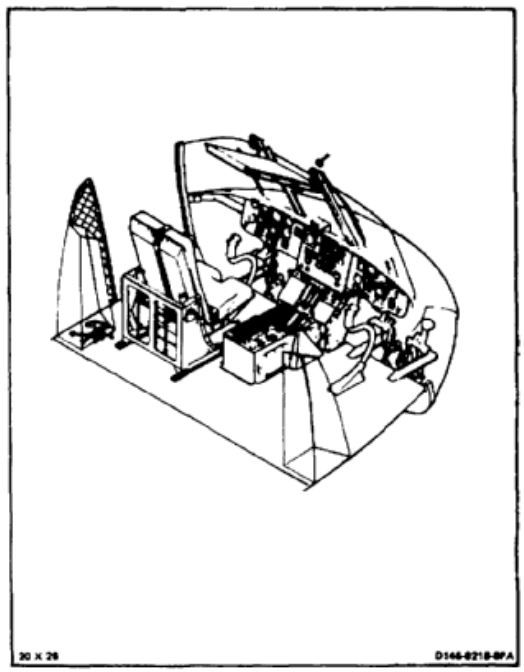
Strap (E374)

***Personnel Required:***

Aircraft Electrician (2)
Inspector

***References:***

TM 55-1520-240-23P

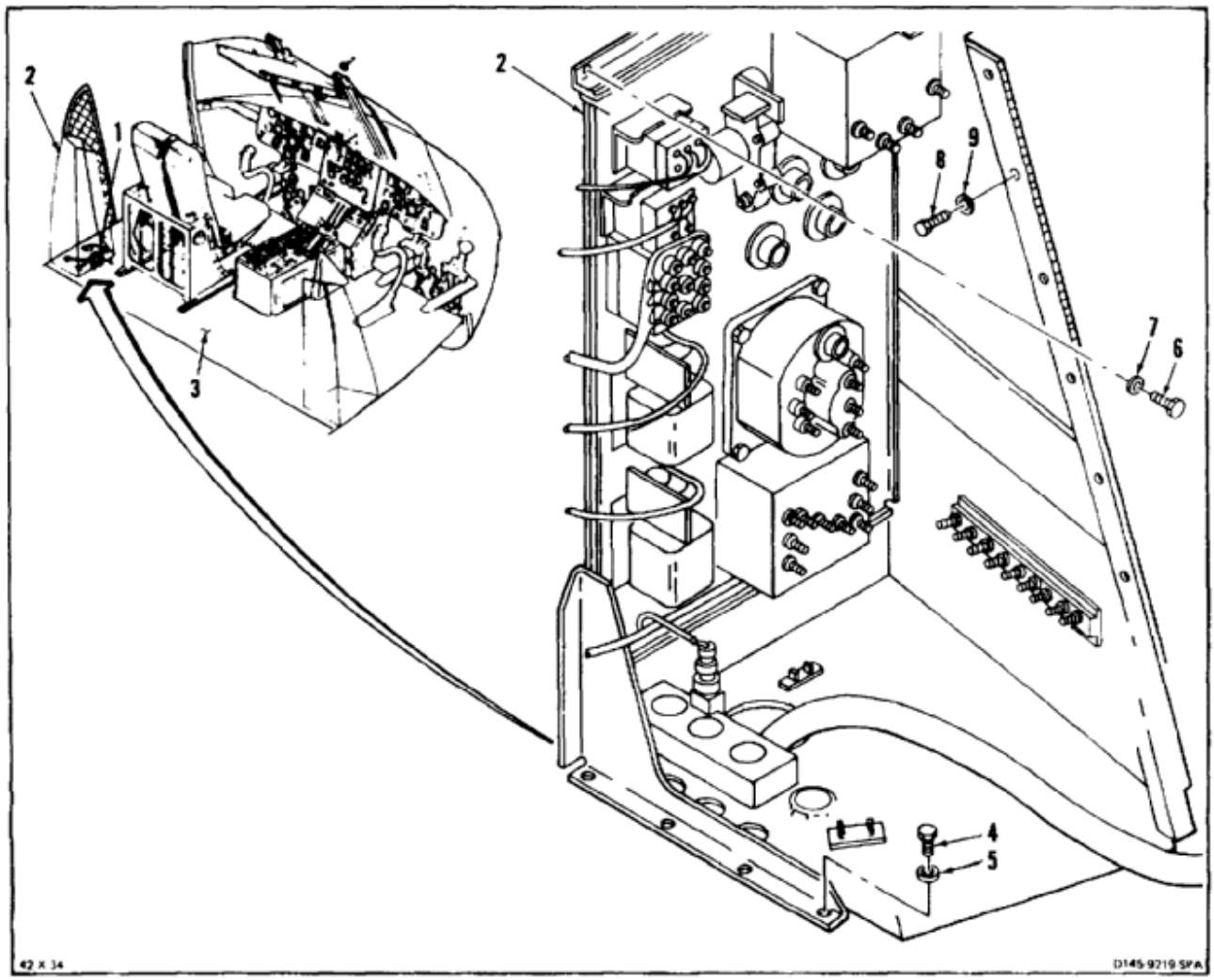


## 9-9 INSTALL POWER DISTRIBUTION PANEL (PDP) (Continued) 9-9

**NOTE**

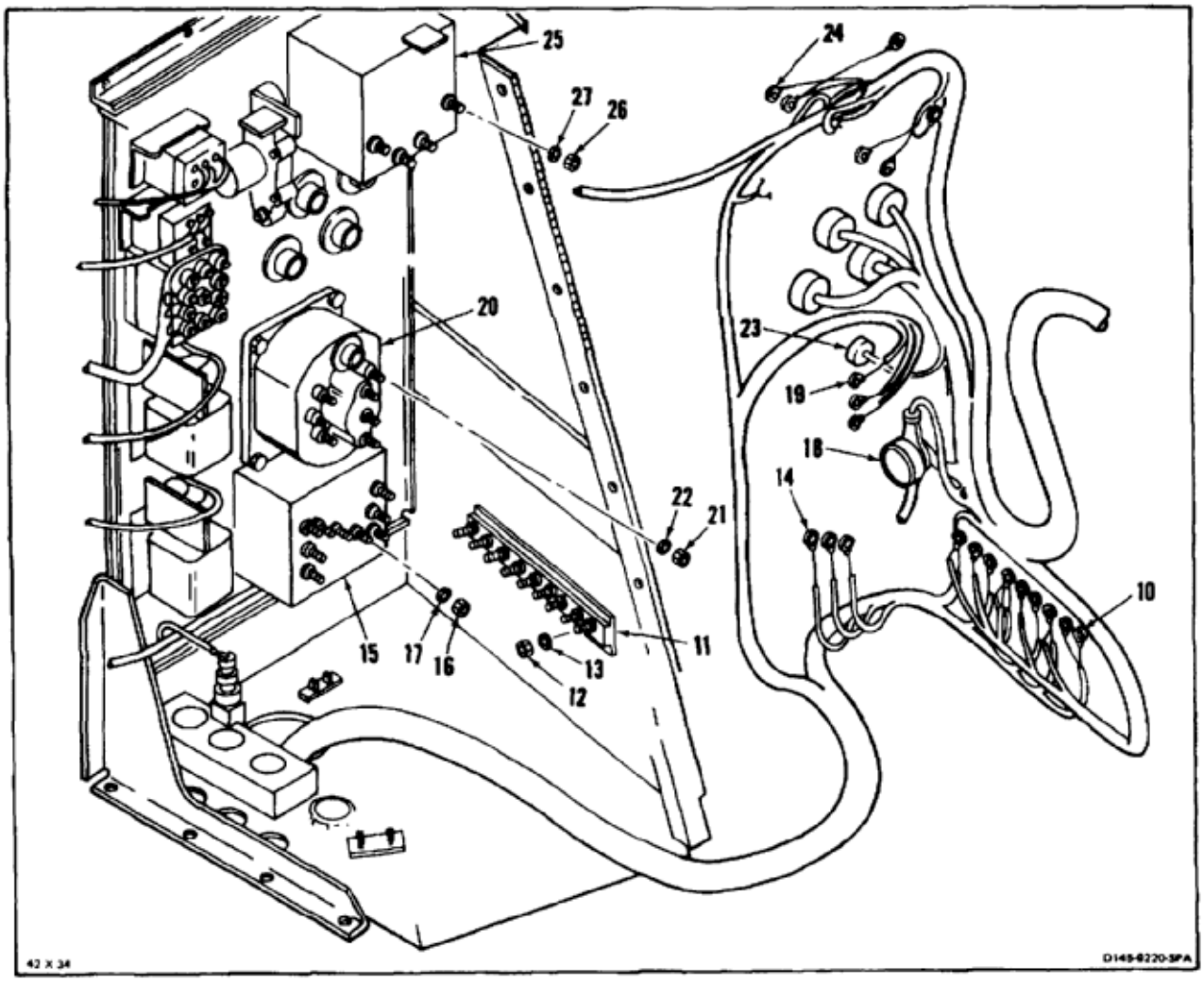
Procedure is similar to install No. 1 PDP or No. 2 PDP. Installation of No. 1 PDP is shown here.

1. Have helper feed cable (1) through base of PDP (2). Position PDP (2) on floor (3).
2. Install four bolts (4) and washers (5).
3. Install four bolts (6) and washers (7).
4. Install six bolts (8) and washers (9).



**9-9 INSTALL POWER DISTRIBUTION PANEL (PDP) (Continued) 9-9**

5. Remove tape. Connect 10 wires (10) to board TB50 (11) by installing 6 nuts (12) and washers (13). Remove tags.
6. Remove tape. Connect three wires (14) to relay 241K1 (15) by installing three nuts (16) and washers (17). Remove tags.
7. Connect electrical connector (18) to relay 241K1 (15).
8. Remove tape. Connect three wires (19) to relay 241K5 (20) by installing three nuts (21) and washers (22). Remove tags.
9. Connect electrical connector (23) to relay 241K5 (20). Remove tag.
10. Remove tape. Connect six wires (24) to relay 161K3 (25) by installing five nuts (26) and washers (27). Remove tags.



## 9-9 INSTALL POWER DISTRIBUTION PANEL (PDP) (Continued) 9-9

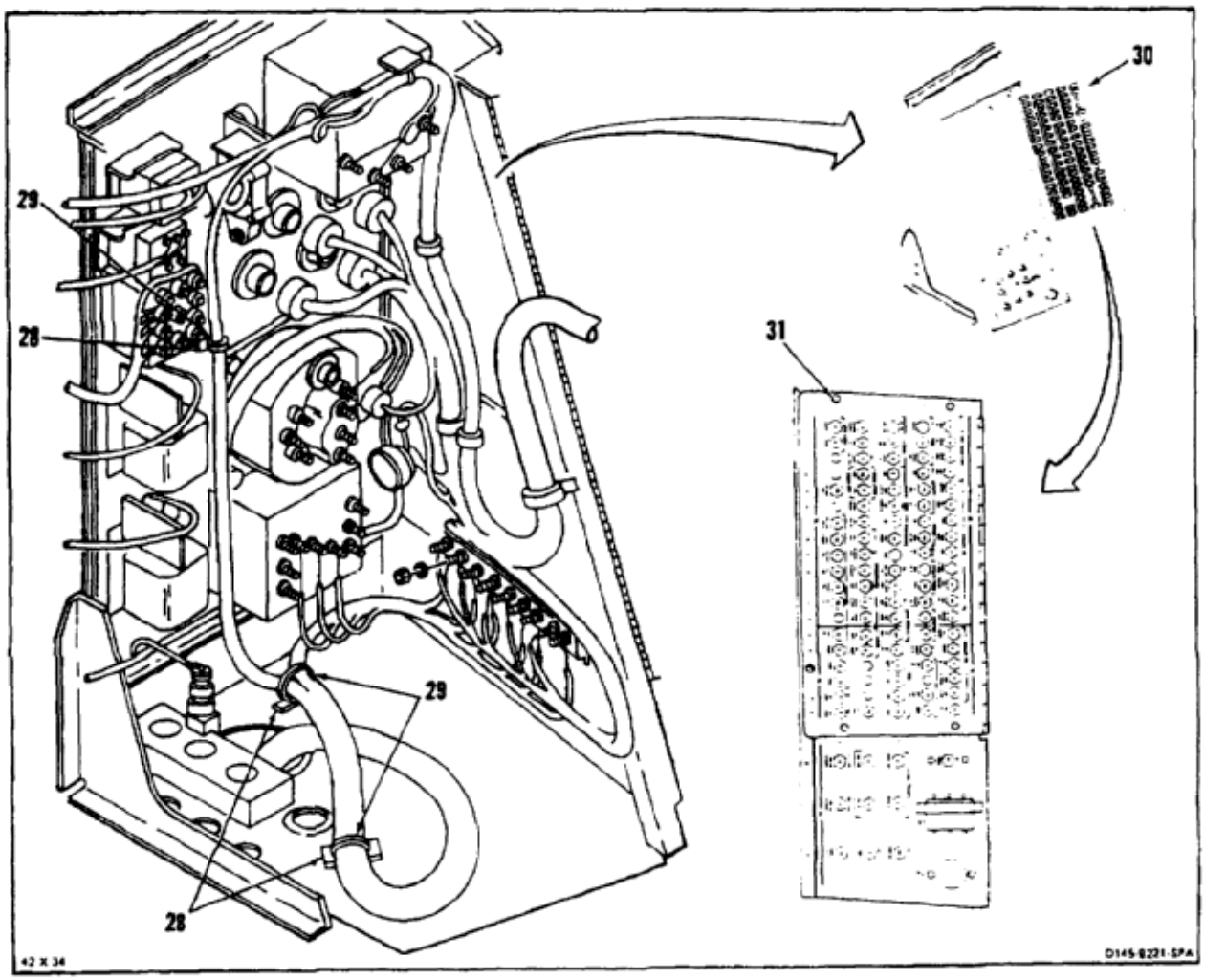
11. Position cable on three mounts (28). Install three straps (29) (E374).

***INSPECT***

12. Close panel (30). Tighten six fasteners (31).

***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).




END OF TASK

## 9-9.1 INSPECT CIRCUIT BREAKERS 9-9.1

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Electrical Tool Kit, NSN 5180-00-323-4915

***Personnel Required:***

Aircraft Electrician

***Equipment Required:***

Battery Disconnected
Electrical Power Off
Hydraulic Power Off

***References:***

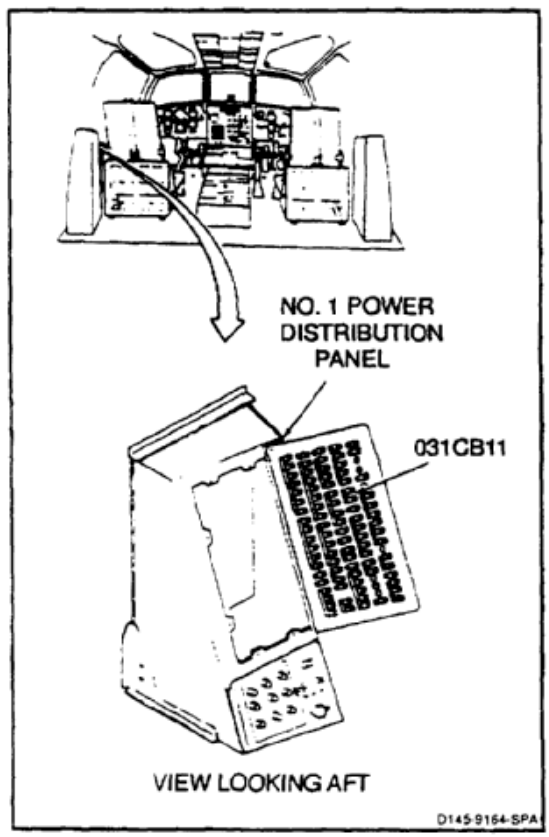
TM 55-1500-323-24
Task 9-10
Task 9-11

1. Visually inspect all No. 1 and No. 2 PDP circuit breakers for evidence of water/moisture entry, arcing/burning, and corrosion.
2. Replace dc circuit breakers that show any evidence of arcing/burning or that show excessive corrosion in terminal contact areas (Tasks 9-10 and 9-11).

**NOTE**

Multi-phase (ac) circuit breakers are more susceptible to phase shorts due to corrosion forming a conductive path between case terminal and metal restraint pins.

3. Replace ac circuit breakers that show any evidence of water/moisture entry or arcing/burning. Pay particular attention to terminals, case seams, lower hardware, and case restraint pins for any signs of forming corrosion. As a general rule, corrosion in these areas shall require circuit breaker replacement (Tasks 9-10 and 9-11).
4. Replace any power distribution/feeder wire showing sign of fraying/chaffing or arcing/burning. Refer to TM 55-1500-323-24, Section 14.




***FOLLOW-ON MAINTENANCE:***

As Required

END OF TASK

## 9-10 REMOVE POWER DISTRIBUTION PANEL (PDP) CIRCUIT BREAKERS 9-10

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Electrical Tool Kit, NSN 5180-00-323-4915

***Materials:***

Paper Tags (E264)
Tape (E385)

***Personnel Required:***

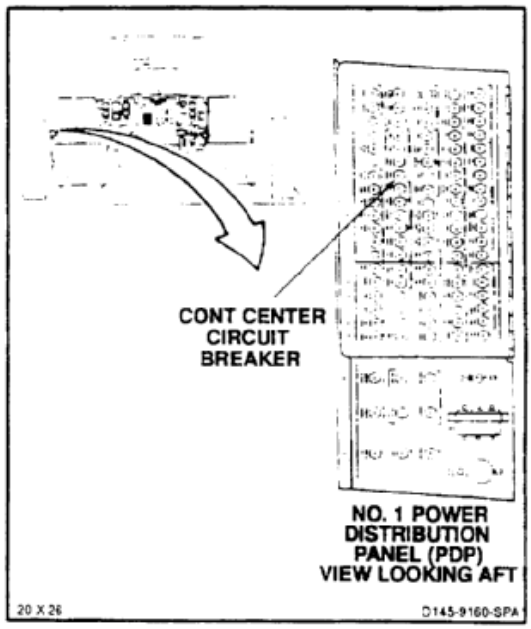
Aircraft Electrician

***Equipment Required:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off

***References:***

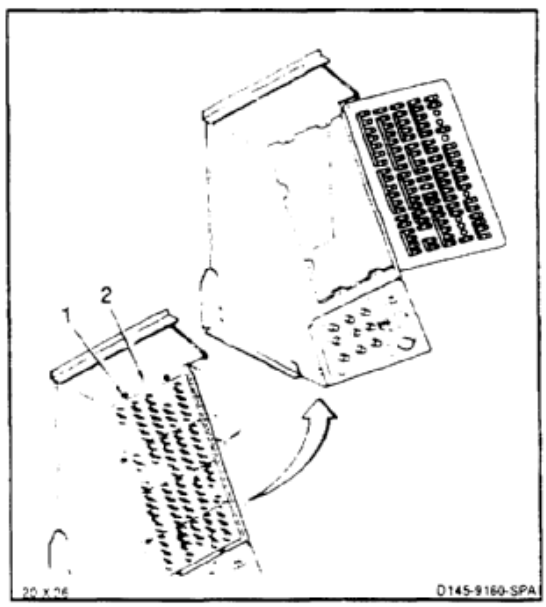
TM 55-1520-240-23P



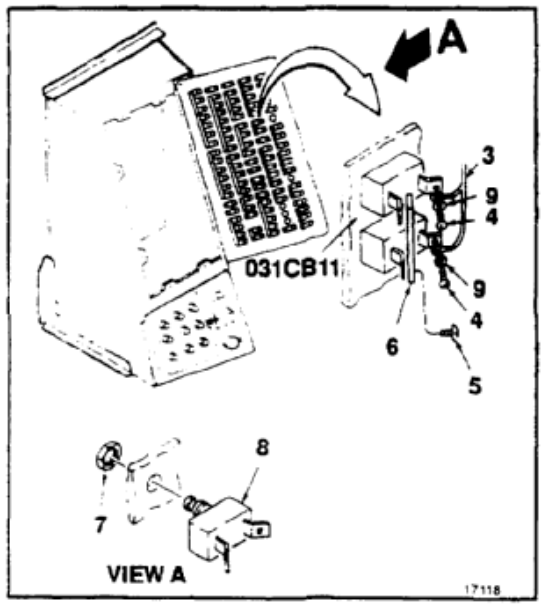

**NOTE**

Procedure to remove push-pull type circuit breakers from No. 1 and No. 2 PDP is the same. Removal of CONT CENTER circuit breaker on No. 1 PDP is shown here.

1. Loosen six fasteners (1). Open panel (2).



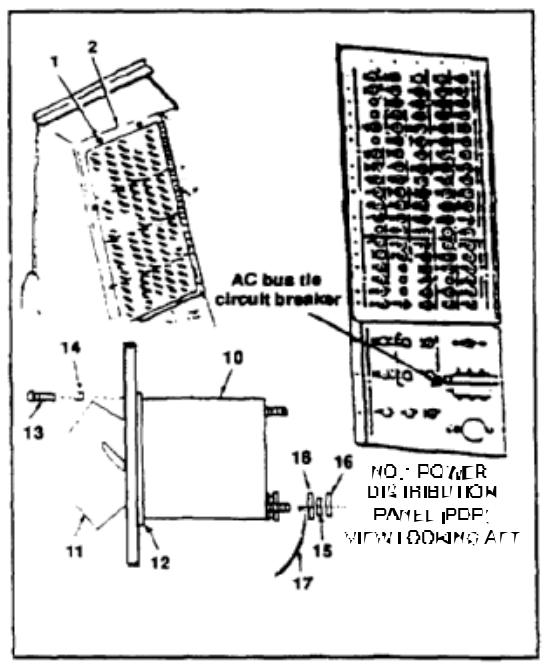
2. Tag and disconnect two wires (3) by removing two screws (4) and washers (9). Tape wire ends. Use tags (E264) and tape (E385).
3. Remove screw (5). Remove bus bar (6).
4. Remove nut (7). Remove circuit breaker (8).




**NOTE**

Procedure to remove bar type circuit breaker from No. 1 and No. 2 PDP is the same. Removal of ac bus tie circuit breaker with boot and flange on No. 1 PDP is shown here.

5. Loosen six fasteners (1). Open panel (2).
6. Tag and disconnect six wires (17), by removing six nuts (16), lock washers (15), and washers (18). Tape wire ends. Use tags (E264) and tape (E385).
7. Remove six screws (13) with O-rings (14).
8. Remove circuit breaker (10), flange (12), and plastic boot (11).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-11 INSTALL POWER DISTRIBUTION PANEL (PDP) CIRCUIT BREAKERS 9-11

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Electrical Tool Kit, NSN 5180-00-323-4915

***Materials:***

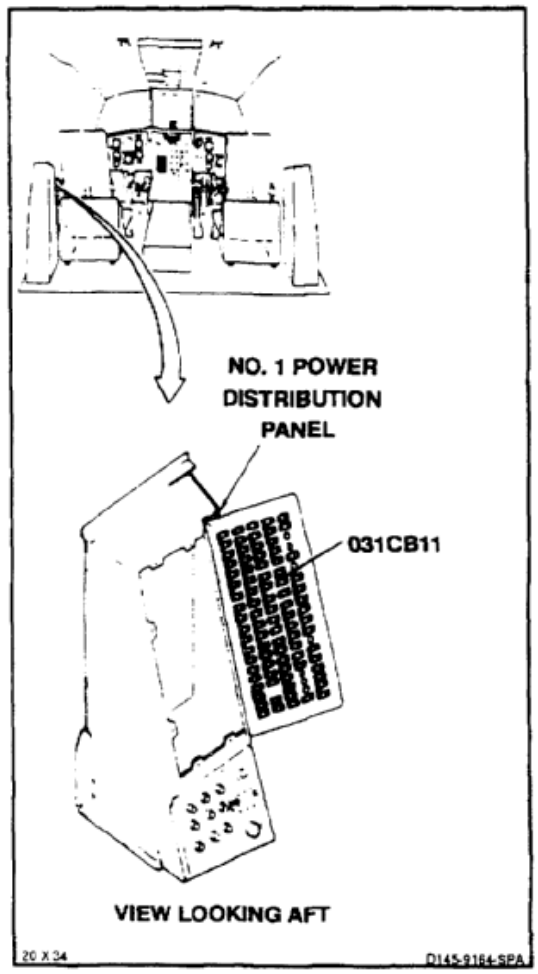
None

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P

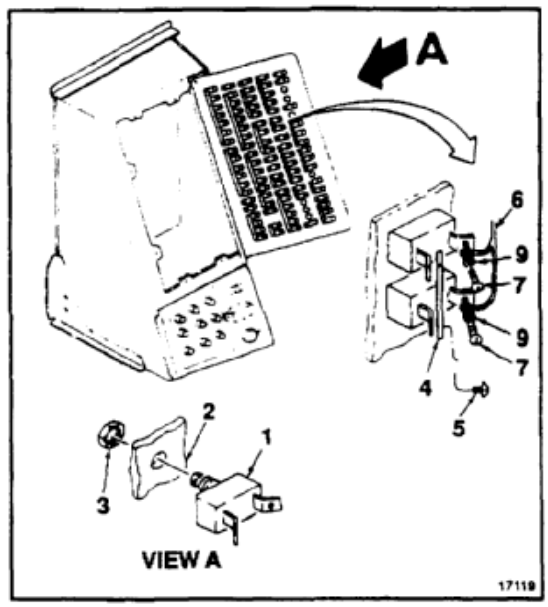


**NOTE**

Procedure to install push-pull type circuit breakers on No. 1 and No. 2 PDP is the same. Removal of CONT CENTER circuit breaker on No. 1 PDP is shown here.

1. Position circuit breaker (1) in panel (2). Install nut (3).
2. Position bus bar (4) on circuit breaker (1). Install screw (5).
3. Remove tape and connect two wires (6) by installing two washers (9) and two screws (7). Remove tags.

***INSPECT***



**NOTE**

Procedure to install gang bar type circuit breaker on No. 1 or No. 2 PDP is the same. Removal of ac bus tie circuit breaker with boot and flange on No. 1 PDP is shown here.

4. Position plastic boot (11) through the PDP, inside circuit breaker opening.

**NOTE**

Ensure the molded word "ON" on the plastic boot is in proper alignment with the printed word "ON" on the circuit breaker.

5. Install the steel frame (12) with the flanged side facing FWD.

**NOTE**

To attain the proper seal, ensure that the flange is not installed upside down and that the plastic boot contacts the flanged side of the steel frame symmetrically.

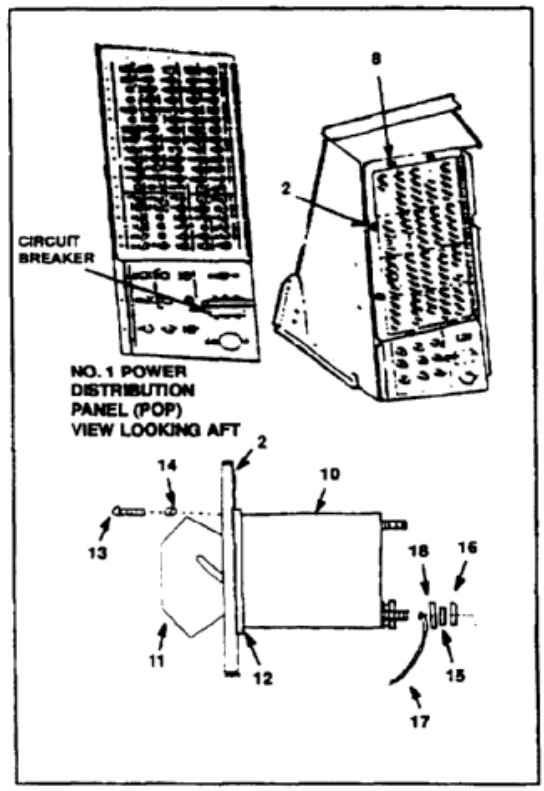
6. Install the circuit breaker (10) through the back side of PDP panel (2).
7. Install six screws (13) with O-rings (14).
8. Remove tape and connect wires (17). Remove tags.
9. Install six washers (18), lockwashers (15), and nuts (16).

***INSPECT***

10. Close panel (2). Tighten six fasteners (8).

***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).




END OF TASK

## 9-12 REMOVE REVERSE CURRENT CUTOUT (RCCO) RELAY 9-12

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5160-00-323-4915

***Materials:***

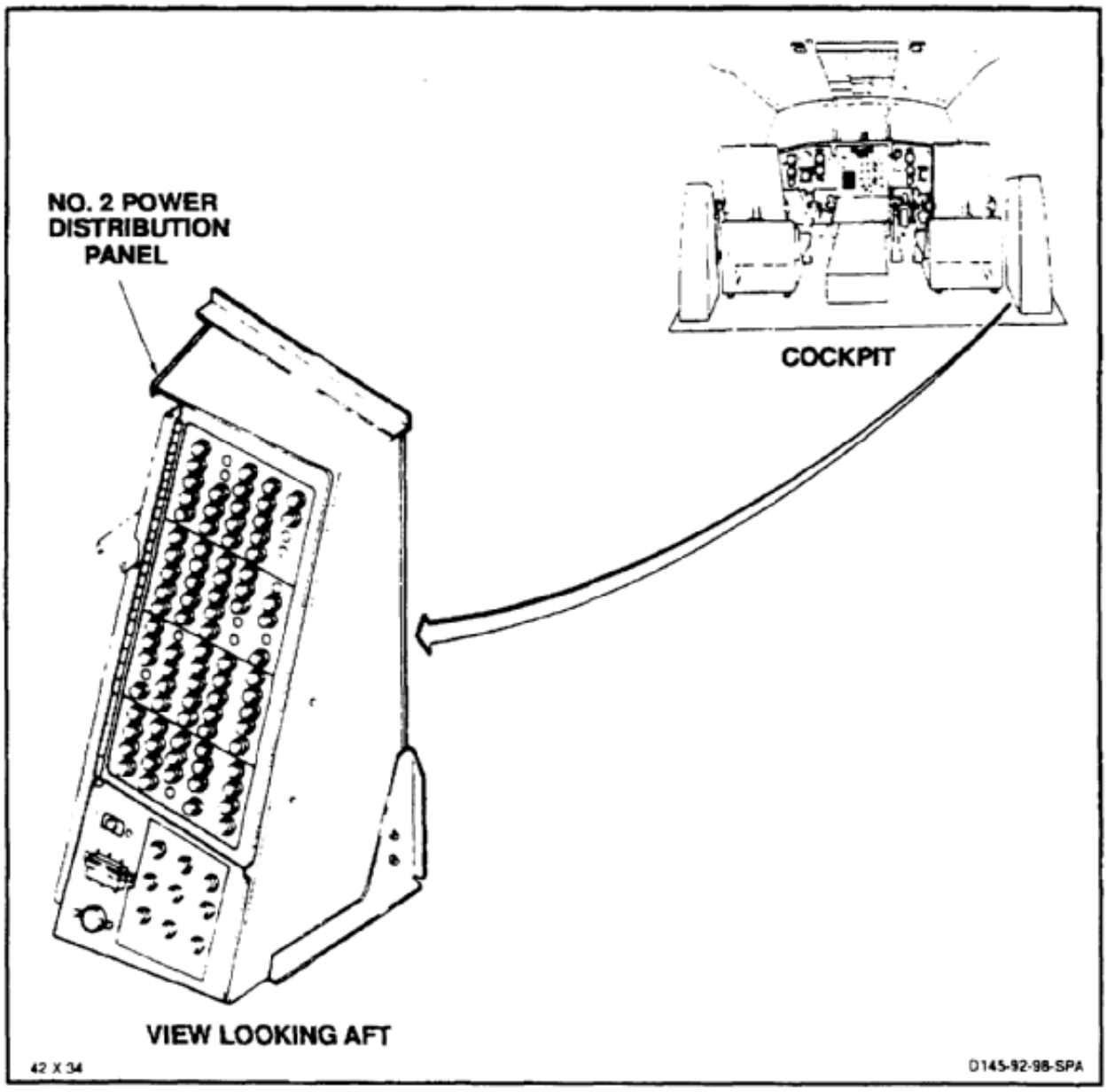
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

Aircraft Electrician

***Equipment Required:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off

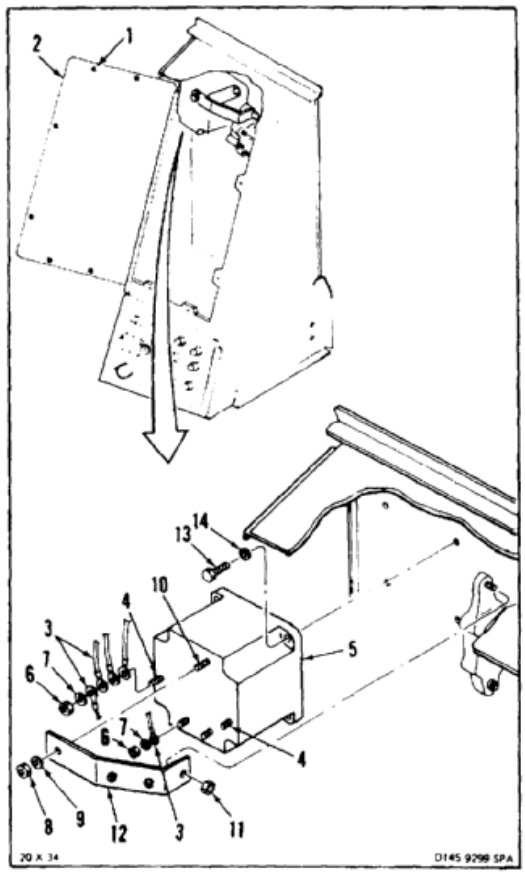


## 9-12 REMOVE REVERSE CURRENT CUTOUT (RCCO) RELAY (Continued) 9-12

**NOTE**

Procedure is same for removal of reverse current cutout relay from No. 1 or No. 2 power distribution panel. Removal of RCCO relay from No. 2 power distribution panel is shown here.

1. Loosen six fasteners (1) and open power distribution panel door (2).
2. Tag and disconnect seven wires (3) from four terminals (4) on RCCO relay (5) by removing four nuts (6) and washers (7). Tape ends. Use tags (E264) and tape (E385).
3. Remove nut (8) and washer (9) from terminal (10).
4. Loosen nut (11) and move bar (12) to clear (5).
5. Remove four bolts (13) and washers (14). Remove relay (5).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-13 INSTALL REVERSE CURRENT CUTOUT (RCCO) RELAY 9-13

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

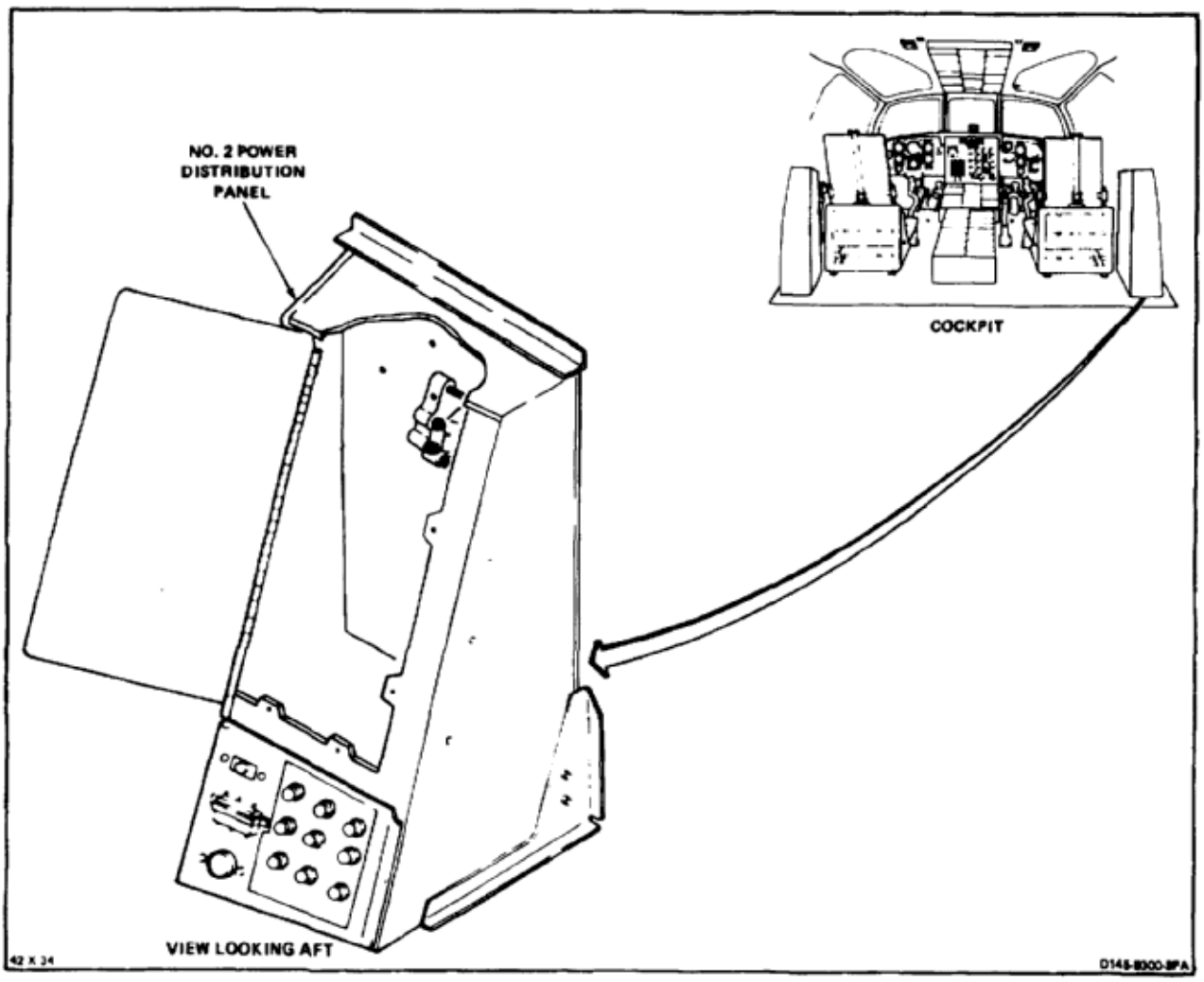
None

***Personnel Required:***

Aircraft Electrician
Aircraft Inspector

***References:***

TM 55-1520-240-23P



**NOTE**

Procedure is same for installation of reverse current cutout (RCCO) relay in No. 1 or No. 2 power distribution panel. Installation of RCCO relay in No. 2 power distribution panel is shown here.

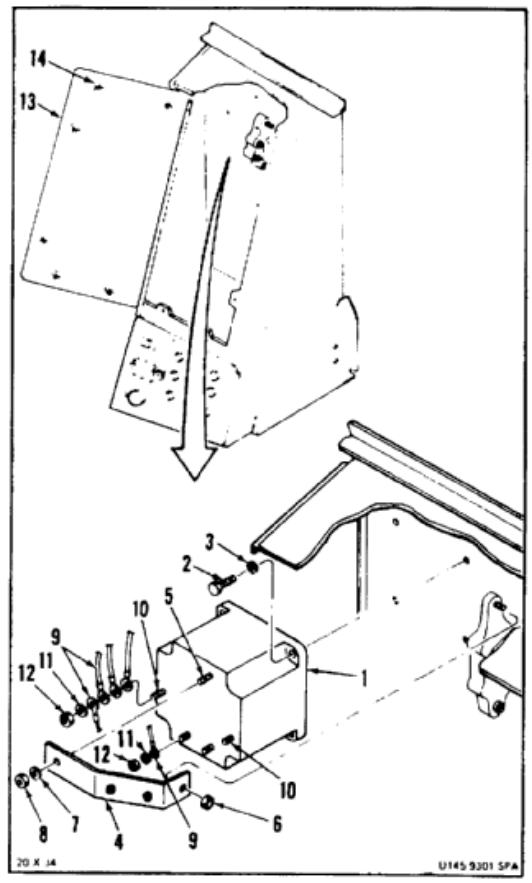
1. Position RCCO relay (1). Install four bolts (2) and washers (3).
2. Position bar (4) on terminal (5) and tighten nut (6).
3. Install washer (7) and nut (8) on terminal (5).
4. Remove tape. Connect seven wires (9) to four terminals (10) by installing four washers (11) and nuts (12). Remove tags.

***INSPECT***

5. Close panel (13). Tighten six fasteners (14).

***FOLLOW-ON MAINTENANCE:***

Perform operational check of dc power system (TM 55-1520-240-T).




END OF TASK

## 9-14 REMOVE DC BUS TIE RELAY 9-14

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

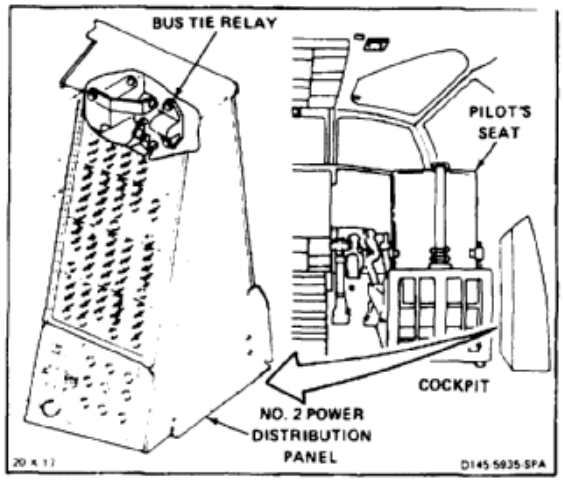
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

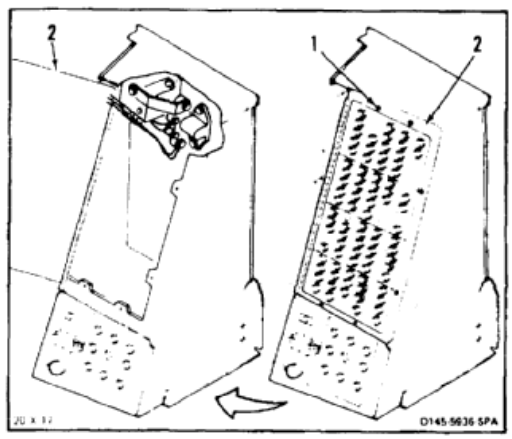
Aircraft Electrician

***Equipment Condition:***

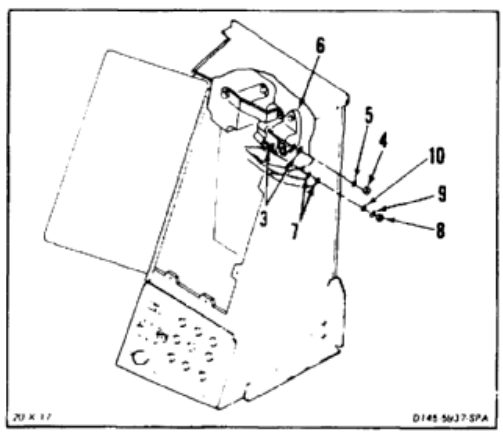
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




1. Release six fasteners (1) in upper circuit breaker panel (2). Open circuit breaker panel (2).
2. Tag two wires (3). Remove nuts (4), and washers (5). Disconnect wires from bus tie relay (6). Use tags (E264). Tape exposed ends of wires. Use tape (E385).



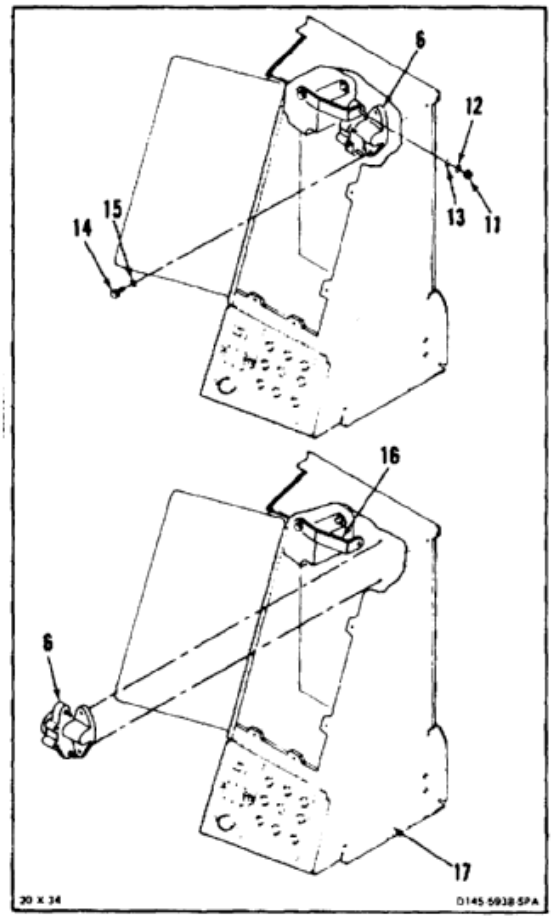

3. Tag two wires (7). Remove nut (8), lockwasher (9), and washer (10). Disconnect wires from relay (6). Use tags (E264). Tape exposed ends of wires. Use tape (E385).



4. Remove nut (11), lockwasher (12), and washer (13) from relay (6).
5. Remove two bolts (14) and washers (15) from relay (6).
6. Slide relay (6) to left until it clears tie bar (16). Remove relay from power distribution panel (17).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-15 INSTALL DC BUS TIE RELAY 9-15

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

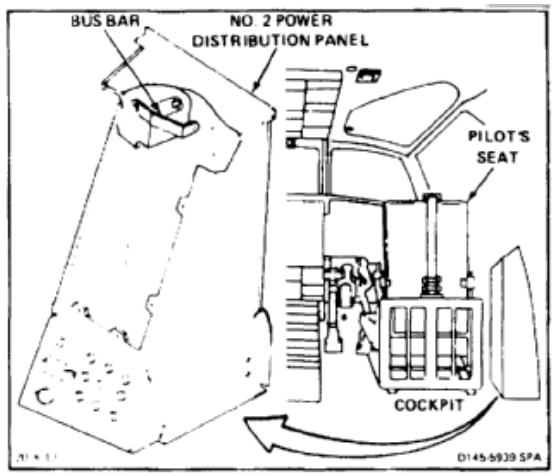
None

***Personnel Required:***

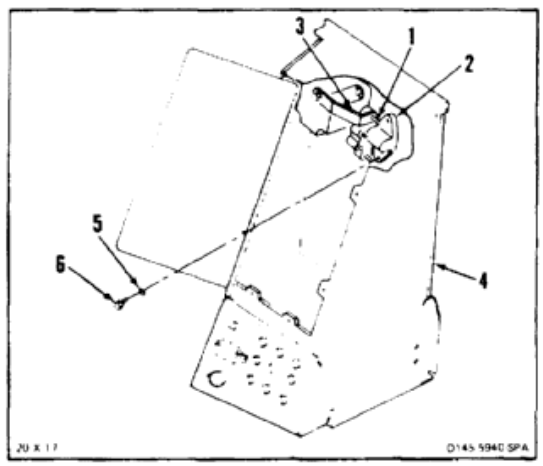
Aircraft Electrician
Inspector

***References:***

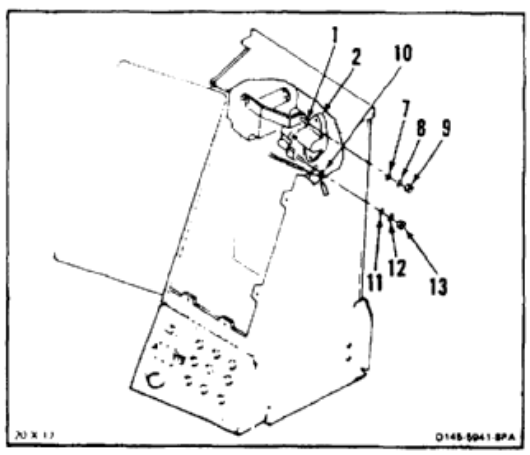
TM 55-1520-240-23P




1. Position stud (1) of bus tie relay (2) in hole of bus bar (3).
2. Align two mount holes in relay (2) with holes in power distribution panel (4) and install two washers (5) and bolts (6).



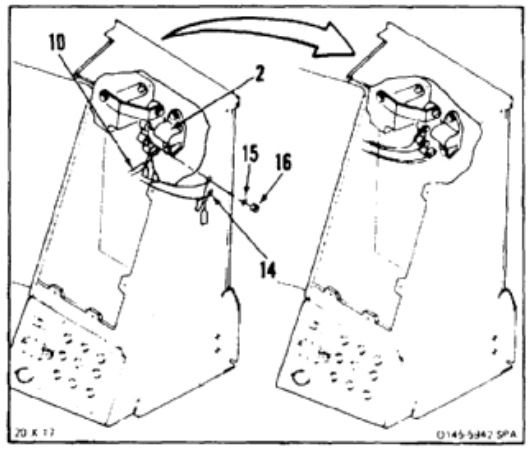

3. Install washer (7), lockwasher (8), and nut (9) on stud (1).
4. Remove tape from ends of two wires (10).
5. Connect wires (10) to relay (2). Install washer (11), lockwasher (12), and nut (13).



6. Remove tape from ends of two wires (14).
7. Connect wires (14) to relay (2). Install two washers (15) and nuts 16).

***INSPECT***

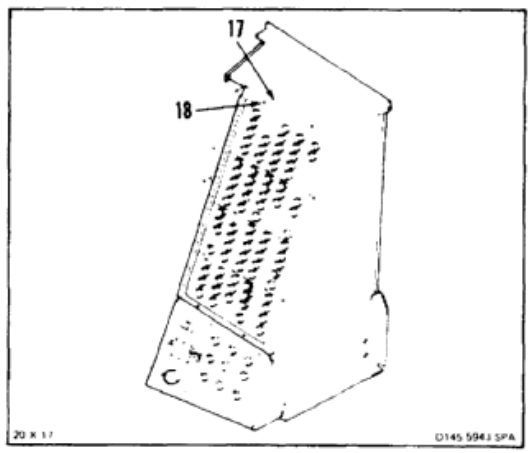
8. Remove tags from wires (10 and 14).




9. Close upper circuit breaker panel (17). Tighten six fasteners (18).

***FOLLOW-ON MAINTENANCE:***

Perform operational check of dc power system (TM 55-1520-240-T).




END OF TASK

## 9-16 REMOVE DC POWER SUPPLY (TR) FAIL RELAY 9-16

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

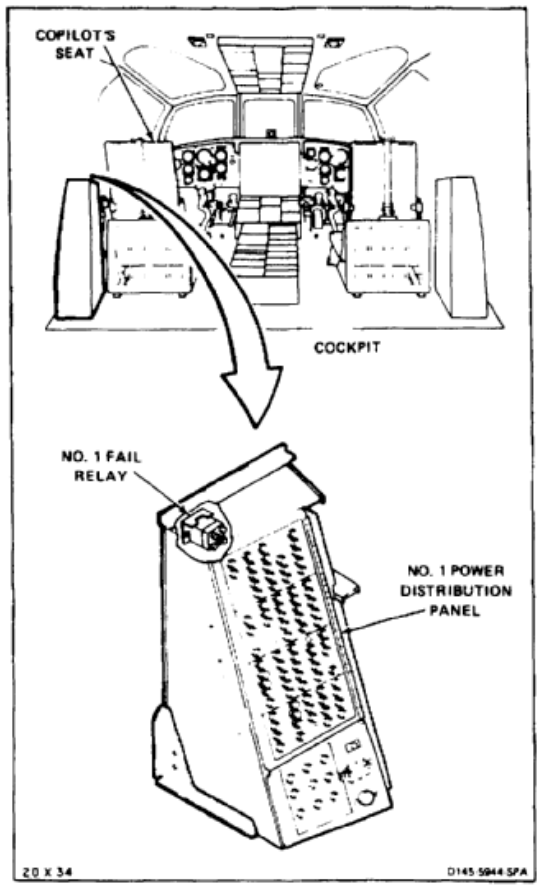
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

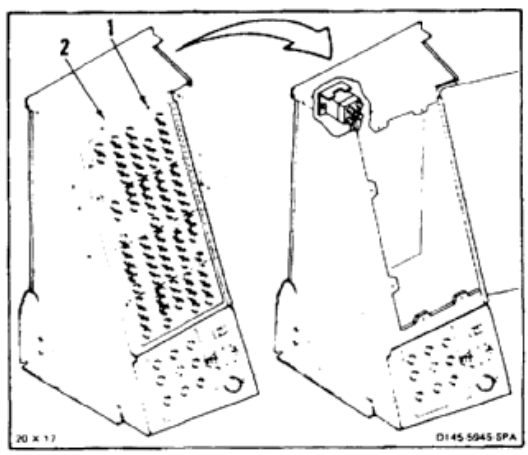
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off



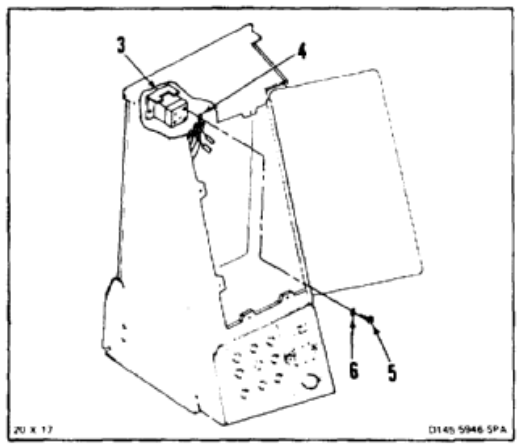

**NOTE**

Procedure is similar to remove No. 1 or No. 2 dc power supply TR fail relay. Differences are noted in text. Removal of No. 1 relay shown here.

1. Release six fasteners (1) in upper circuit breaker panel (2). Open panel.



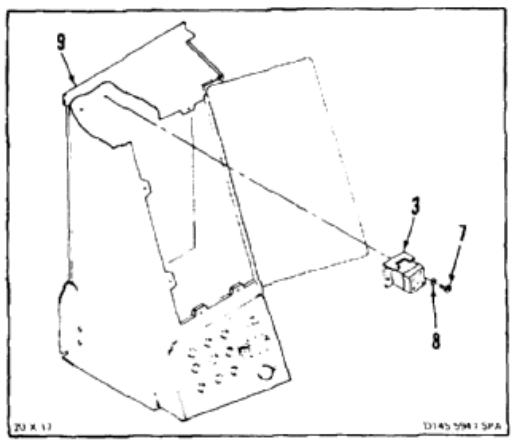
2. For No. 1 relay (3), tag nine wires (4). Disconnect wires by removing seven screws (5), and lockwashers (6). Use tags (E264).
3. For No. 2 relay, tag 10 wires (4). Disconnect wire by removing eight screws (5) and lockwashers (6). Use tags (E264).
4. Tape exposed ends of wires (4). Use tape (E385).




5. Remove two screws (7), washers (8), and relay (3) from power distribution panel (9).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-17 INSTALL DC POWER SUPPLY (TR) FAIL RELAY 9-17

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

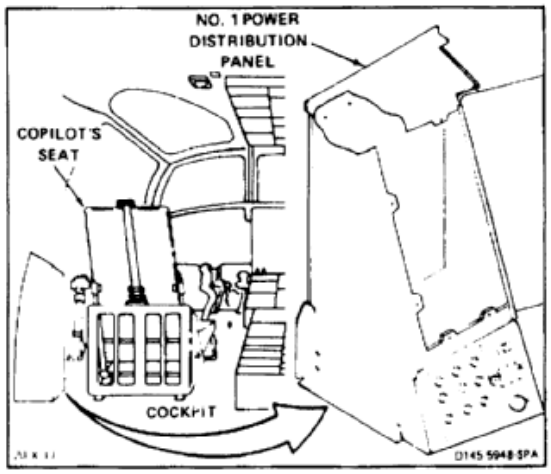
None

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

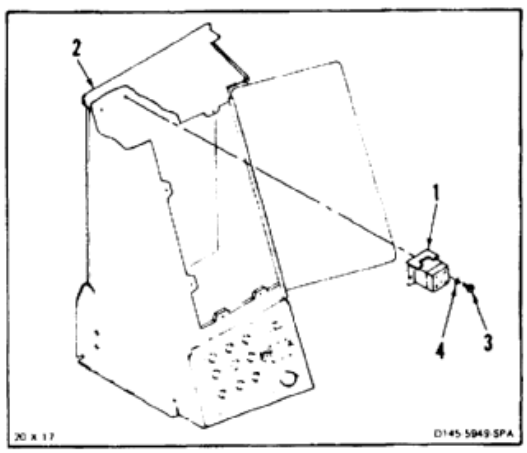
TM 55-1520-240-23P



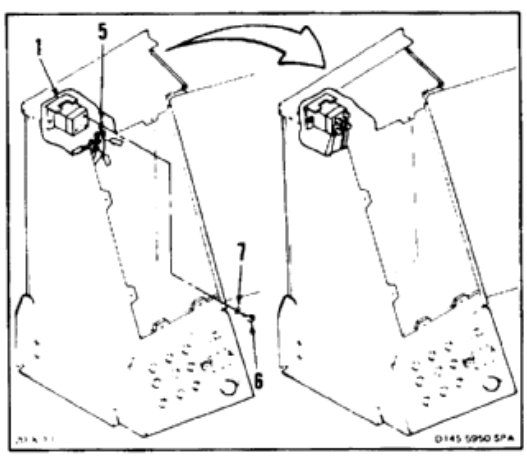

**NOTE**

Procedure is similar to install No. 1 or No. 2 dc power supply TR fail relay except as noted in text. No. 1 relay shown here.

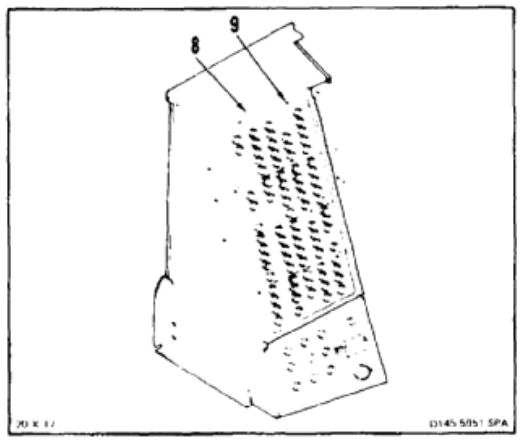
1. Position fail relay (1), X2 terminal up in No. 1 power distribution panel (2).
2. Install two screws (3) and washers (4).




3. Remove tape from ends of wires (5).
4. For No. 1 relay (1), connect eight wires (5) by installing seven screws (6) and lockwashers (7). Remove tags.
5. For No. 2 relay, connect 10 wires (5) by installing eight screws (6) and lockwashers (7). Remove tags.



6. Close circuit breaker panel (8). Fasten six fasteners (9).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check of dc power system (TM 55-1520-240-T).

END OF TASK

## 9-18 REMOVE SWITCHED BATTERY BUS RELAY 9-18

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

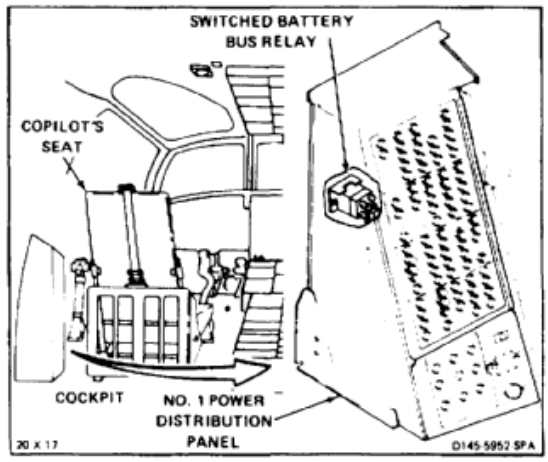
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

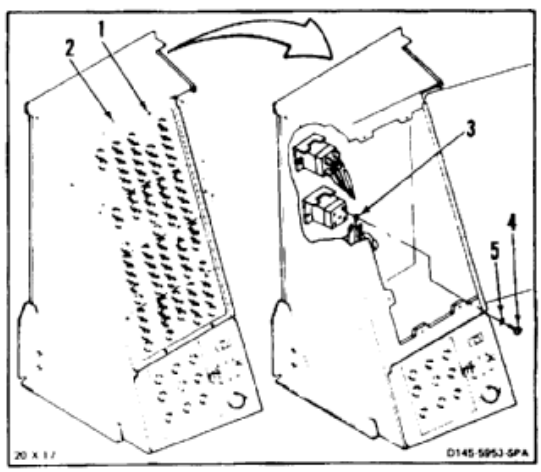
Aircraft Electrician

***Equipment Condition:***

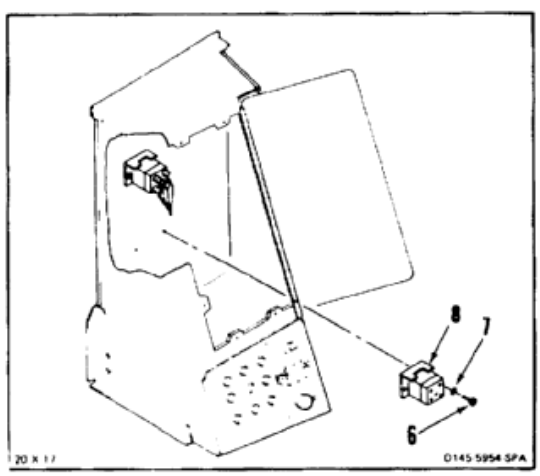
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




1. Release six fasteners (1) in upper circuit breaker panel (2). Open panel.
2. Tag five wires (3). Remove five screws (4) and lockwashers (5). Disconnect wires. Use tags (E264).




3. Tape exposed ends of wires (3). Use tape (E385).
4. Remove two screws (6), washers (7), and switched battery bus relay (8).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-19 INSTALL SWITCHED BATTERY BUS RELAY 9-19

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

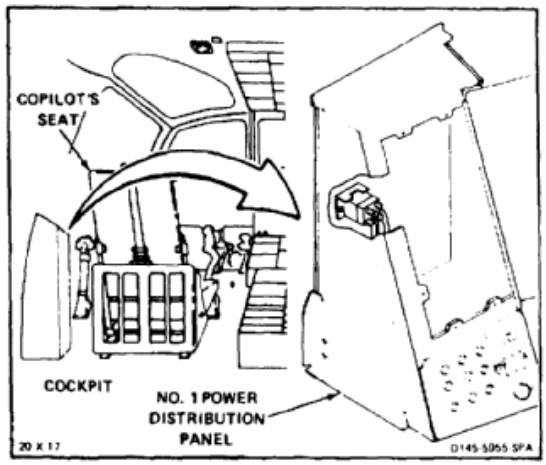
None

***Personnel Required:***

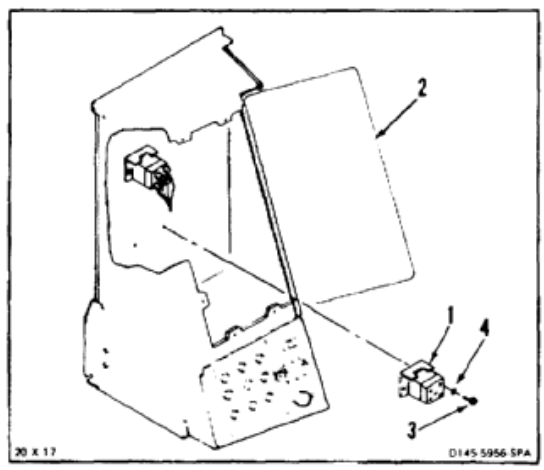
Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P

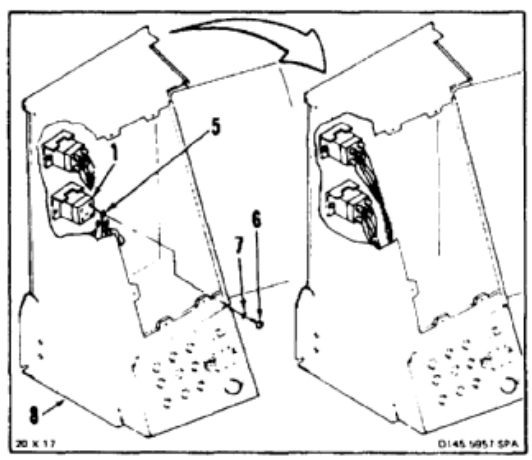



1. Position switched battery bus relay (1), X2 terminal up, in No. 1 power distribution.
2. Install two screws (3) and washers (4).




3. Remove tape from ends of wires (5).
4. Connect five wires (5) to relay (1). Install five screws (6) and lockwashers (7). Remove tags.

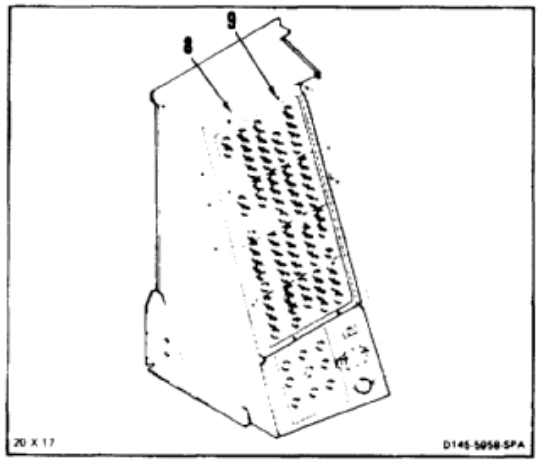
***INSPECT***



5. Close circuit breaker panel (8). Tighten six fasteners (9).

***FOLLOW-ON MAINTENANCE:***

Perform operational check of dc power system (TM 55-1520-240-T).




END OF TASK

## 9-20 REMOVE BATTERY RELAY 9-20

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

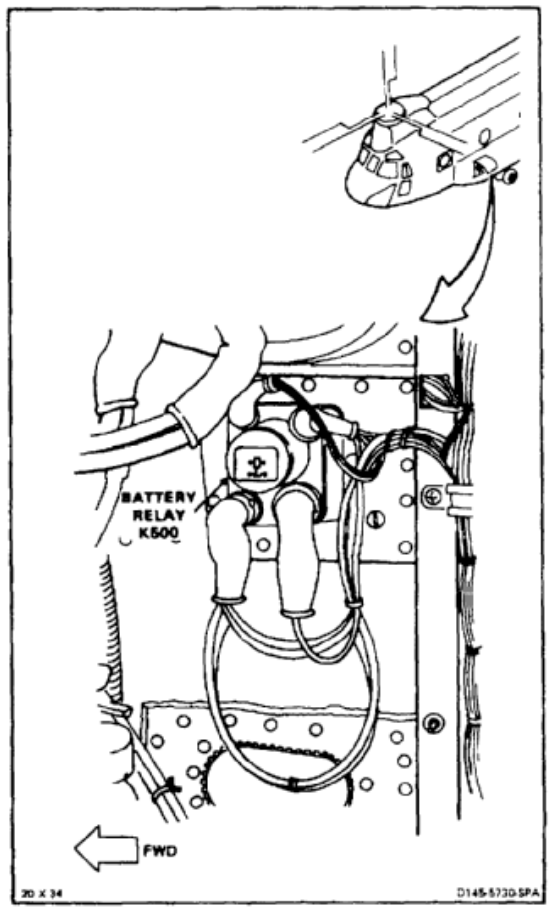
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

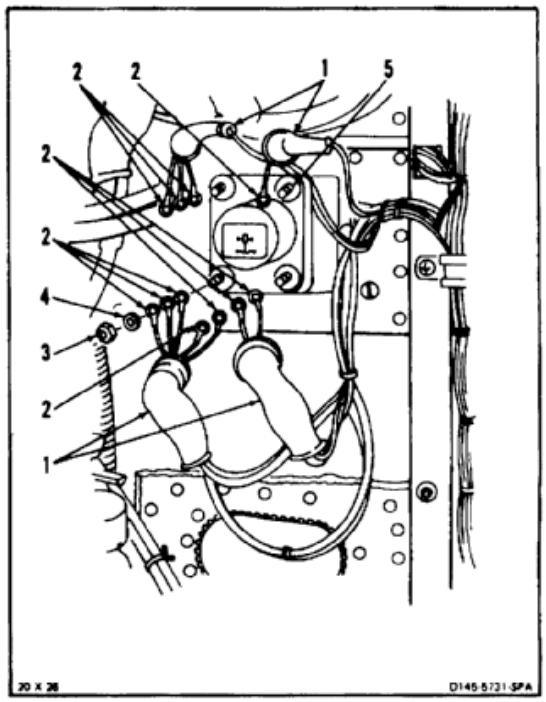
Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Left Electrical Compartment Access (Task 2-2)



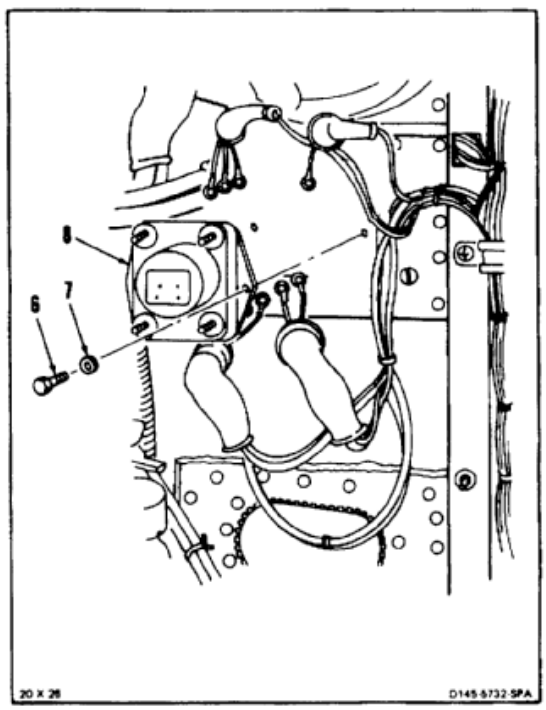
1. Slide back four boots (1) on 11 wires (2).
2. Tag wires (2). Remove four nuts (3) and washers (4) from studs (5). Disconnect 11 wires. Use tags (E264).
3. Tape ends of wires (2). Use tape (E385).




4. Remove two bolts (6) and washers (7).
5. Remove relay (8).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-21 INSTALL BATTERY RELAY 9-21

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

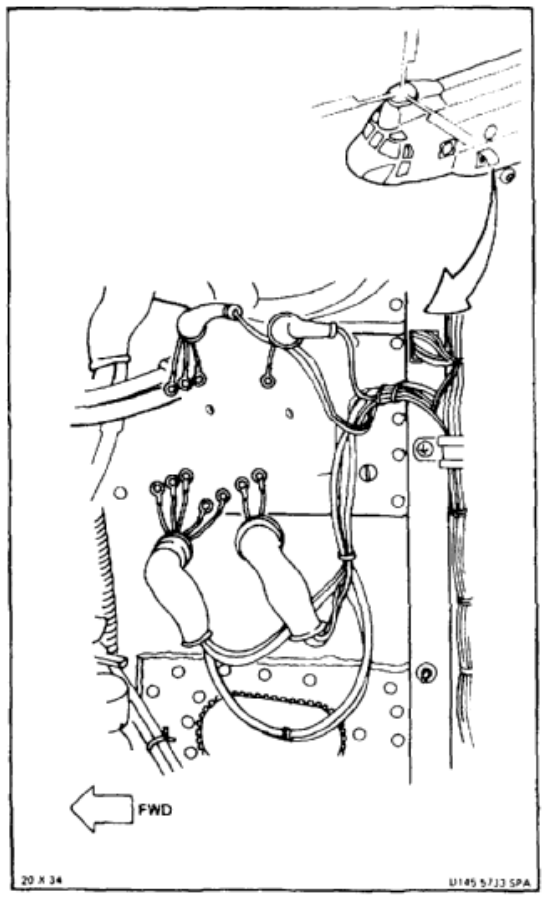
None

***Personnel Required:***

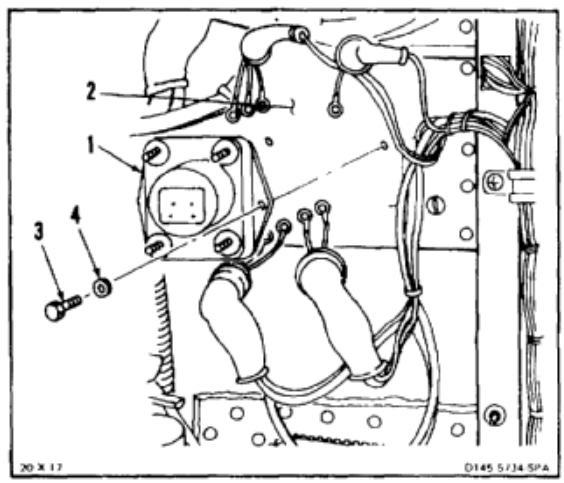
Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P



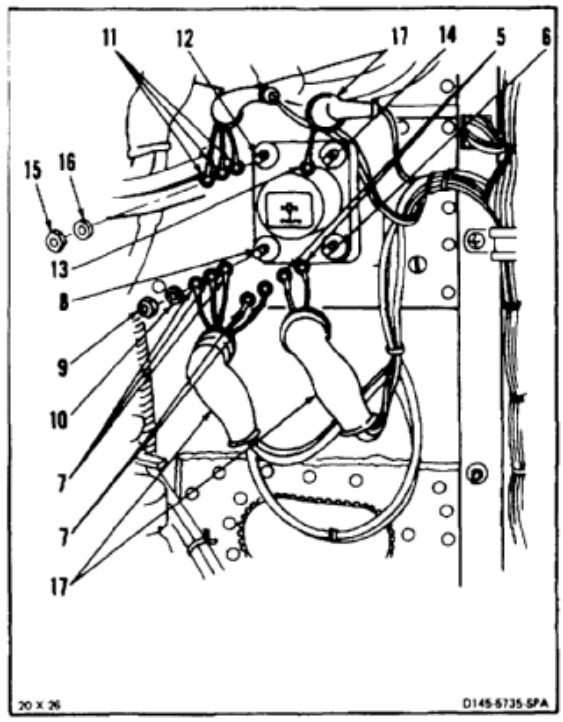

1. Position relay (1) on structure (2). Install two bolts (3) and washers (4).



2. Remove tape and connect two wires (5) to terminal A2 (6).
3. Remove tape and connect five wires (7) to terminal A1 (8).
4. Install two nuts (9) and washers (10). Remove tags.
5. Remove tape and connect three wires (11) to terminal X1 (12).
6. Remove tape and connect wire (13) to terminal X2 (14).
7. Install two nuts (15) and washers (16). Remove tags.

***INSPECT***

8. Slide four boots (17) over terminals (6, 8,12, and 14).




***FOLLOW-ON MAINTENANCE:***

Close left electrical compartment access door (Task 2-2).
Perform operational check of dc power system (TM 55-1520-240-T).

END OF TASK

## 9-22 REMOVE ESSENTIAL DC BUS RELAY 9-22

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

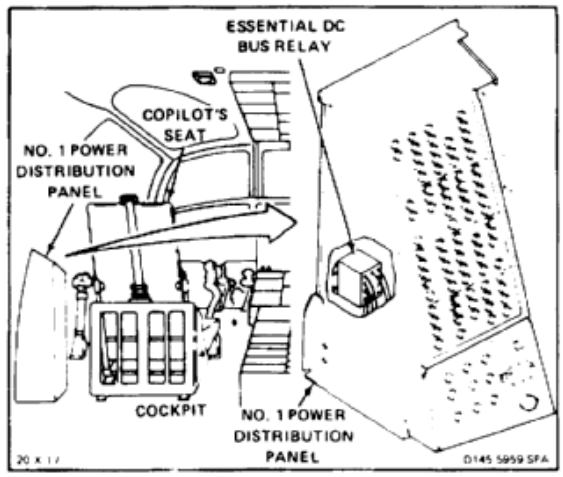
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

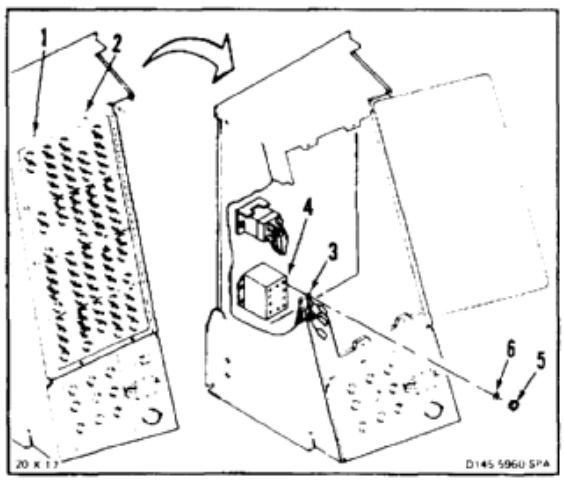
Aircraft Electrician

***Equipment Condition:***

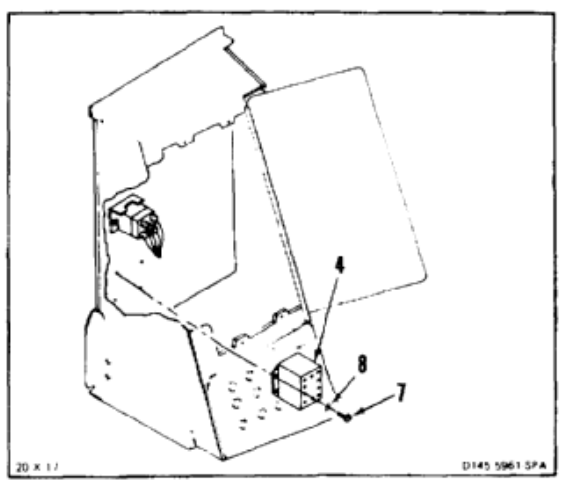
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




1. Release six fasteners (1) in upper circuit breaker panel (2). Open panel.
2. Tag 11 wires (3) on essential dc bus relay (4). Remove eight nuts (5) and lockwashers (6). Disconnect wires. Use tags (E264).
3. Tape ends of wires (3). Use tape (E385).




4. Remove four screws (7), washers (8), and relay (4).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-23 INSTALL ESSENTIAL DC BUS RELAY 9-23

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

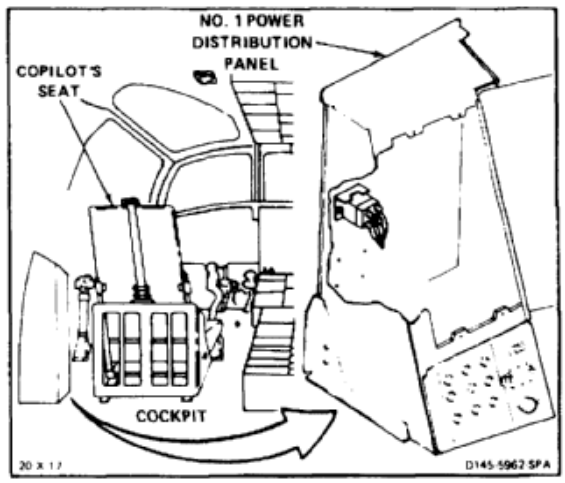
None

***Personnel Required:***

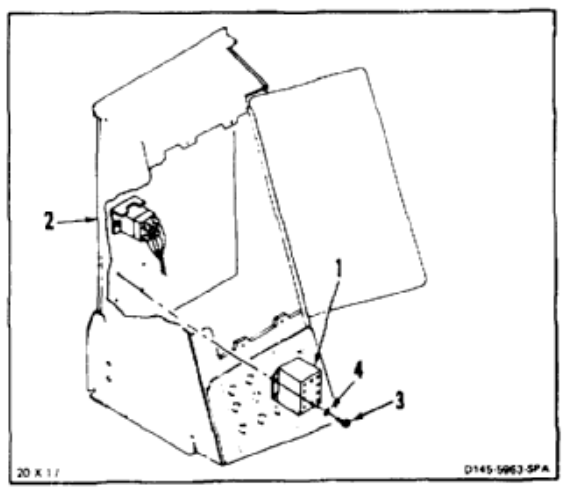
Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P

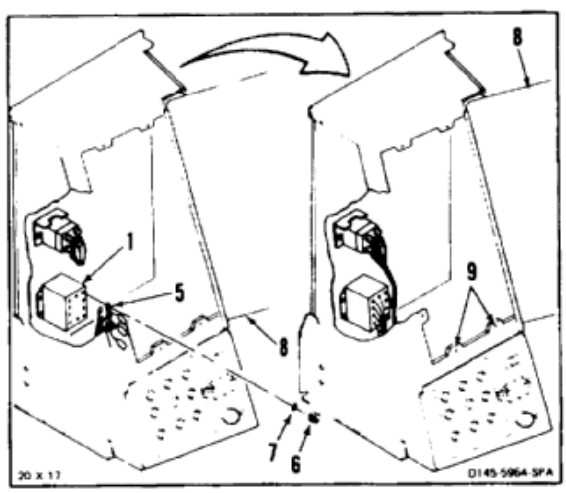



1. Position essential dc bus relay (1) C2 terminal up, in No. 1 power distribution panel (2).
2. Install four screws (3) and washers (4).

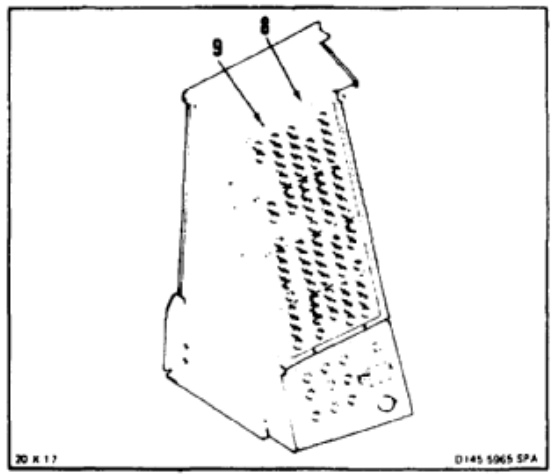



3. Remove tape from ends of 11 wires (5). Connect 11 wires (5) to relay (1). Install eight nuts (6) and lockwashers (7). Remove tags.

***INSPECT***



4. Close circuit breaker panel (8). Tighten six fasteners (9).




***FOLLOW-ON MAINTENANCE:***

Perform operational check of dc power system (TM 55-1520-240-T).

END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Apron
Face Shield

***Materials:***

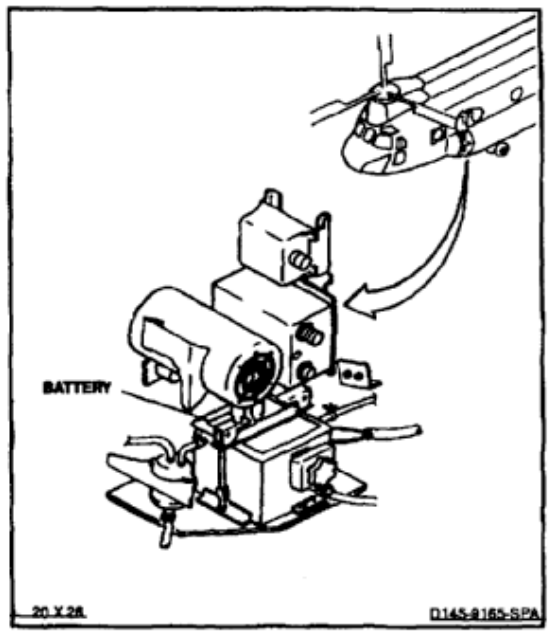
Gloves (E184.1)
Boric Acid (E83)
Cloths (E135)

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Left Electrical Compartment Access Door Open (Task 2-2)




**WARNING**

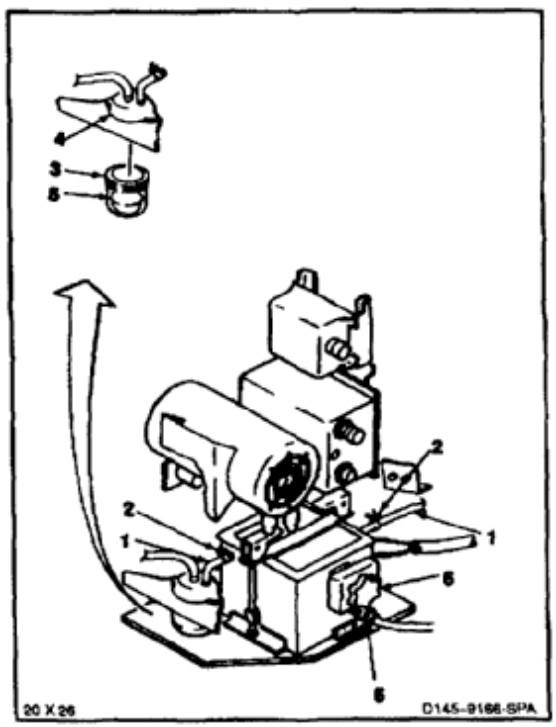
Wear gloves (E184.1), apron, and face shield when handling batteries. The potassium hydroxide in the battery electrolyte is very corrosive. If any electrolyte is spilled on your clothing, hands, or on other material, immediately flood the affected area with cold water or boric acid solution. Consult a physician if your eyes are affected.

1. Check four vent hoses (1) for security. Tighten hose clamps (2) if needed.

**NOTE**

The sump jar shall contain a water solution of **3 percent** boric acid, by weight, sufficient to thoroughly soak the pad.

2. Remove sump jar (3) from cover (4). Check pad (5) for wetness. If needed, add **1 teaspoon** of boric acid (E83) to thoroughly soaked pad. Use cloths (E135) for spilled fluid.
3. Install sump jar (3) on cover (4).
4. Check two electrical connectors (6) and four clamps (2) for corrosion. Clean connectors if corroded.




***FOLLOW-ON MAINTENANCE:***

Close left electrical compartment access door (Task 2-2).

END OF TASK

## 9-25 REMOVE BATTERY 9-25

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Apron
Face Shield

***Materials:***

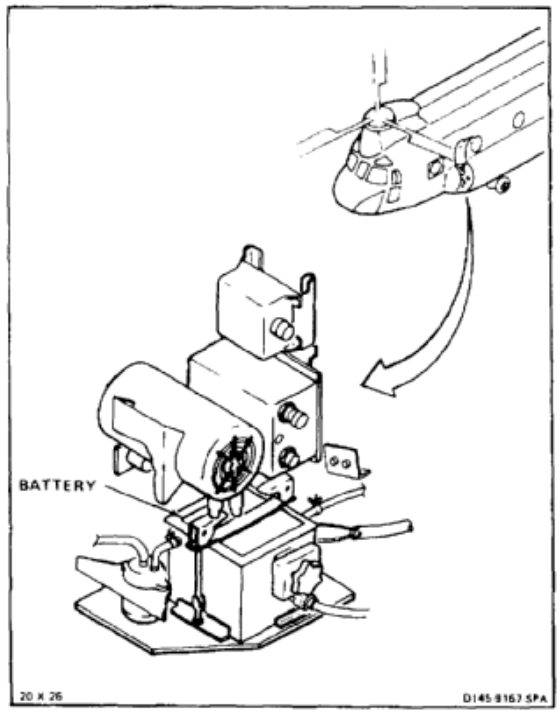
Gloves (E814.1)
Paper Tags (E264)

***Personnel Required:***

Medium Helicopter Repairer

***Equipment Condition:***

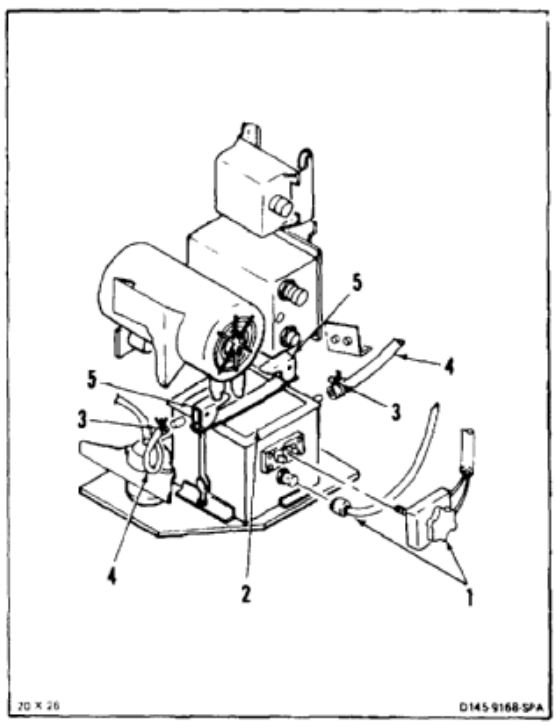
Electrical Power Off
Hydraulic Power Off
Left Electrical Compartment Access Door Open (Task 2-2)




**WARNING**

Wear gloves (E184.1), apron, and face shield when handling leaking batteries. The potassium hydroxide in the battery electrolyte is very corrosive. If any electrolyte is spilled on your clothing, hands, or on other material, immediately flood the affected area with cold water or boric acid solution. Consult a physician if your eyes are affected.

1. Tag and disconnect two electrical connectors (1) from battery (2). Use tags (E264).
2. Loosen two wingnuts (3) on two lines (4). Remove lines (4).
3. Release two clamps (5). Remove battery (2).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-25.1 REMOVE BATTERY CABLE (AVIM) 9-25.1

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Battery Service Tool Kit, NSN 5180-00-542-5812

***Materials:***

None

***Personnel Required:***

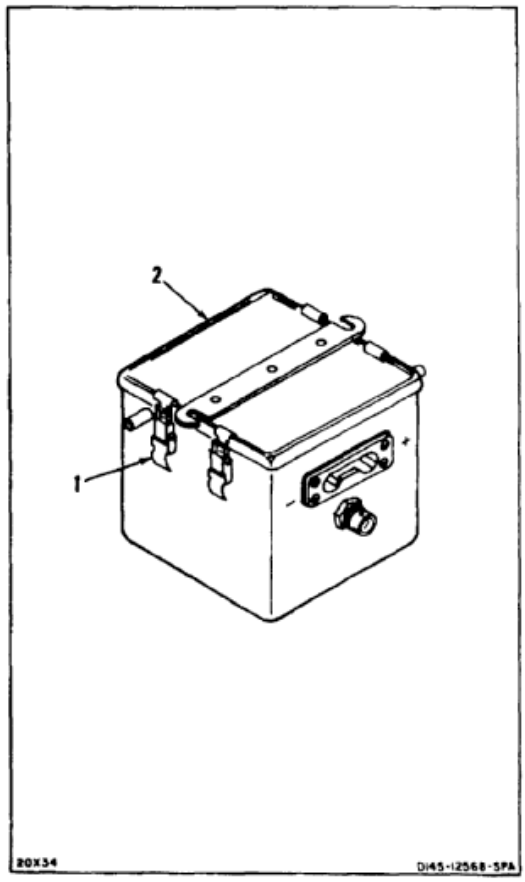
Aircraft Electrician

***References:***

TM 11-6140-203-14-2

***Equipment Condition:***

Off Helicopter Task



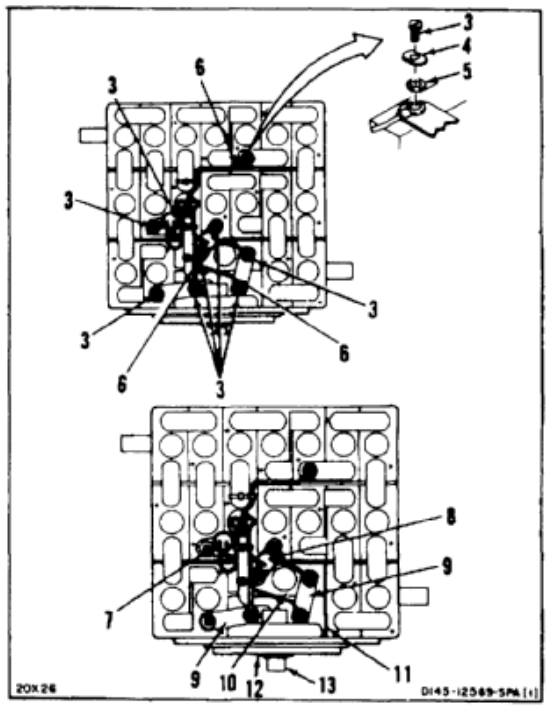

1. Release four snap fasteners (1) and remove battery cover (2).

CAUTION

Do not use a discharge fixture device as specified in TM 11-6140-203-14-2, para 5-7(4). Fixture could cause damage to battery cable.

2. Discharge battery using resistor load method. Refer to TM 11-6140-203-14-2.

3. After battery is discharged, remove nine screws (3), nine washers (4), and nine spring washers (5) from the battery links.
4. Carefully remove all cable connections (6) from battery cell studs including battery temperature switch (7) and thermistor (8).
5. Remove two battery cell links (9).
6. Remove battery cell (10). Refer to TM 11-6140-203-14-1.
7. Remove U-shaped plastic liner (11).
8. Remove lockwire and retaining nut (12) from connector (13).




***FOLLOW-ON MAINTENANCE:***

Perform serviceability inspection (Task 9-25.2).

END OF TASK

## 9-25.2 REPAIR AND TEST BATTERY CABLE (AVIM) 9-25.2

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Battery Service Tool Kit, NSN 5180-00-542-5812
Exhaust Gas Temperature Tester (BH-112JB-53)
Heater Probe, BH22231
Multimeter (2)
Insulation Breakdown Test Set (AN/GSM-6), NSN 6625-00-5422-1331
Dial Indicating Scale, 0 to 10 Pounds
Compressed Air Source

***Materials:***

Boric Acid, ACS (E83)
Brush, Acid Swabbing (E86)
Cloth (E134)

***Personnel Required:***

Aircraft Electrician

***References:***

TM 11-6625-273-12
TM 11-6140-203-14-2
TM 55-4920-401-13&P
TM 55-1500-323-25

***Equipment Condition:***

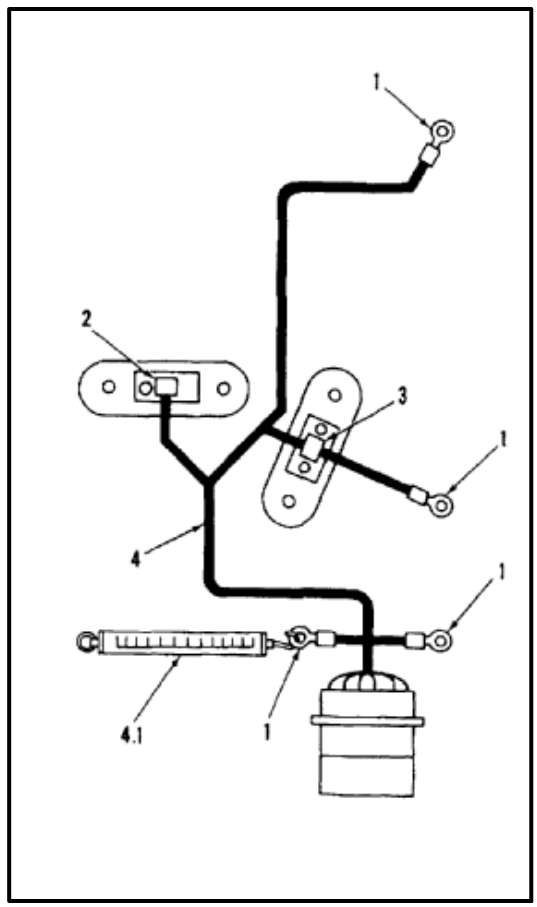
Off Helicopter Task

1. Remove corrosion or foreign deposits from terminals (1), thermal switch (2), thermistor (3), and insulation. Use a mixture of **3 percent** by weight of boric acid (E83) and water, and a brush (E86).

**WARNING**

Do not use more than **30 psi** compressed air for cleaning purposes. Debris trajected under pressure can cause injury to eyes. Use source of compressed air under **30 psi** and eye protection to prevent injury to personnel.

2. Thoroughly clean off battery cable (4) with tap water and brush (E86). Do not immerse harness assembly into water. Wipe harness with cloth (E134) and dry off with dry compressed air as necessary.
3. Use dial indicating scale (4.1). Apply a **2.5 to 3.5 pound** pull on each connection. If any terminal comes off, replace it. Refer to TM 55-1500-323-25.
4. Check battery cable wires. If any wire is damaged, replace battery cable.

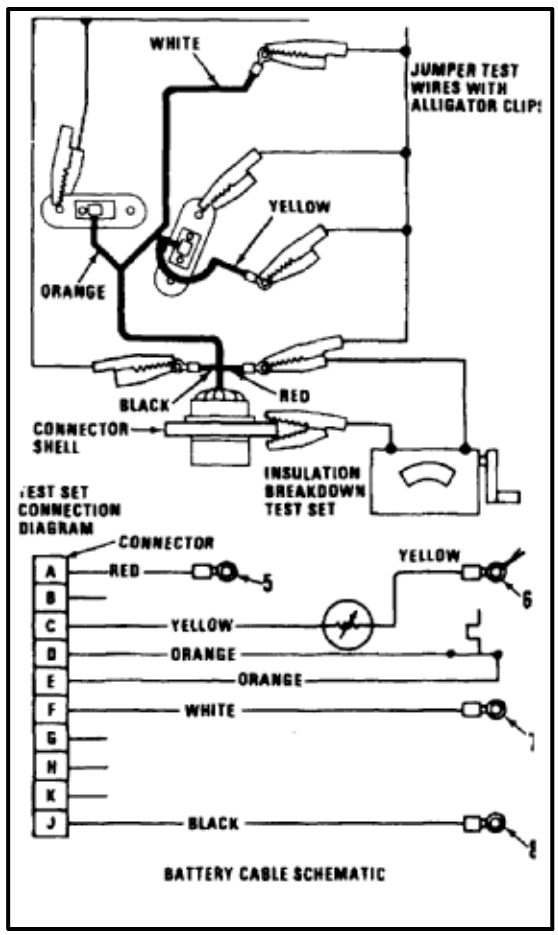


5. Connect cable assembly to insulation breakdown test set. Use jumper wires to connect all terminals and temperature devices together.
6. Operate test set. Refer to TM 11-6625-273-12. Resistance measurement must not be below **500,000 ohms**. Discard battery cable that does not meet this requirement.
7. Check continuity of battery cable with a multimeter. Connect multimeter. Connect multimeter leads to connector pins and terminals as indicated and measure resistance value. Discard battery cable if values are not as shown.

| Connector Pin | To | Connector Pin or Terminal | Resistance |
|---|---|---|---|
| Pin A | | Terminal (5) | 0 to 0.5 ohms |
| Pin C | | Terminal (6) | See note |
| Pin D | | Pin E | 0 to 0.5 ohms |
| Pin F | | Terminal (7) | 0 to 0.5 ohms |
| Pin J | | Terminal (8) | 0 to 0.5 ohms |

**NOTE**

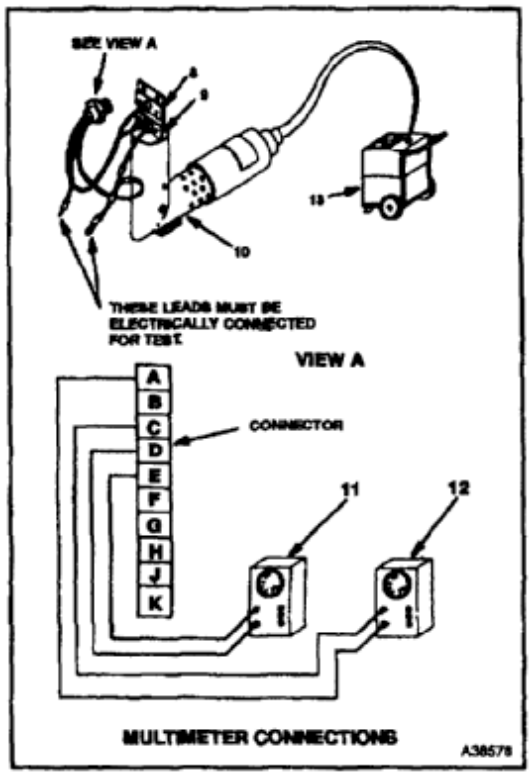
At **50ºF**, resistance should be **1600 to 2400 ohms**. At **75ºF**, resistance should be **800 to 1200 ohms**. At **100ºF**, resistance should be **400 to 600 ohms**.



8. Fasten temperature switch (8) and thermistor (9) to heater probe (10). Connect heater probe to Exhaust Gas Temperature Tester. (Refer to TM 55-4920-401-13&P Heat Detection System Check.)
9. Connect multimeter (11) to connector pins D and E. Set multimeter range switch to RX100.
10. Connect multimeter (12) to connector pins A and C. Set multimeter range switch to RX100.
11. Set Exhaust Gas Temperature Tester (13) controls for **140ºF** and set power switch to ON.
12. Check multimeter (11) when tester (13) stabilizes at a temperature between **135º and 145ºF**. Multimeter (11) reading shall change from continuity to infinity. If it does not change, discard battery cable.

**NOTE**

The thermistor must be heat soaked and stabilized at **140ºF** prior to taking the multimeter reading.




13. Check multimeter (12) when tester (13) stabilizes at a temperature of **140ºF**. Multimeter (12) shall indicate between **200 and 300 ohms**. If it does not, discard battery cable.
14. Set Exhaust Gas Temperature Tester (13) controls for **115ºF**.
15. Check multimeter (12) when tester (13) stabilizes at a temperature of **110º to 120ºF**. Multimeter (12) reading shall change from infinity to continuity. If it does not, discard battery cable.

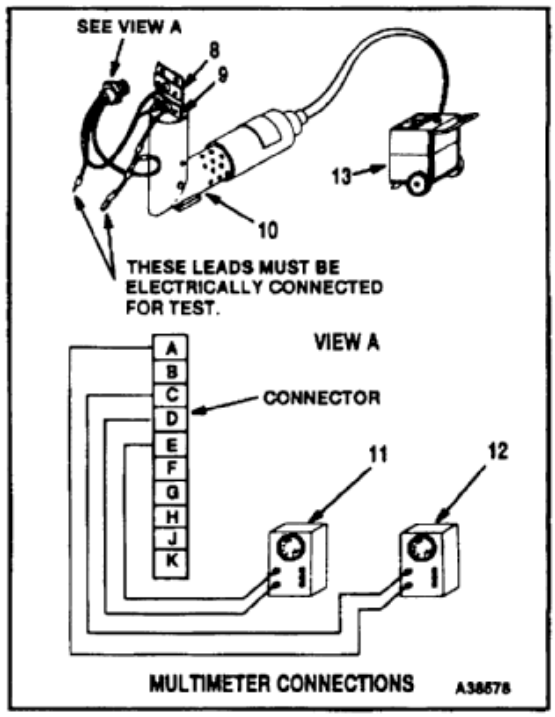
16. Set tester (13) power switch to OFF.

17. Disconnect both multimeters (11 and 12) from battery cable connector.

**WARNING**

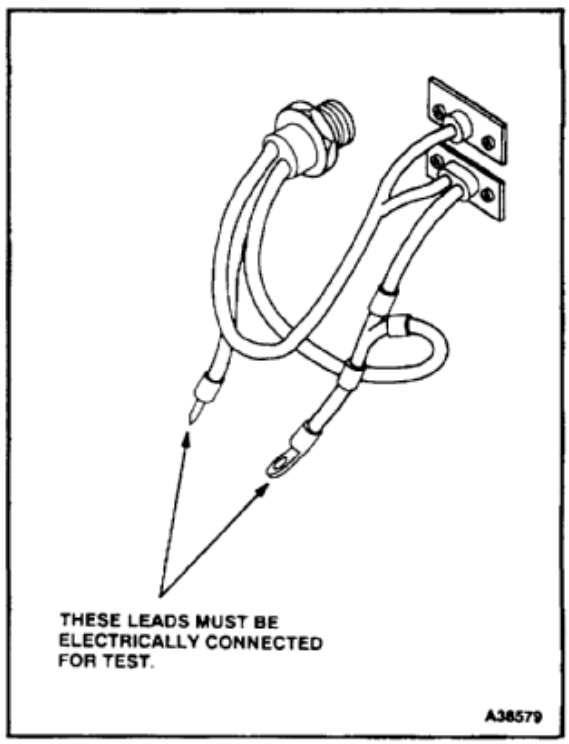
Allow heater probe to cool before removing battery cable. Hot probe can burn hands and fingers. If personnel are burned while handling hot heater probe, seek medical attention immediately.

18. Remove temperature switch (8) and thermister (9) from heater probe (10).




***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-25.3 INSTALL BATTERY CABLE (AVIM) 9-25.3

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Battery Service Tool Kit, NSN 5180-00-542-5812

***Materials:***

Lockwire (E231)
Corrosion Preventive Compound (E153)

***Personnel Required:***

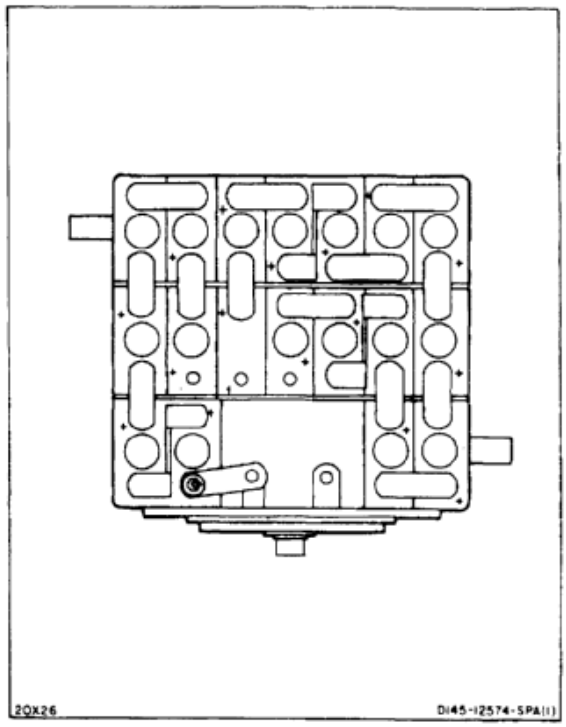
Aircraft Electrician

***References:***

TM 11-6140-203-14-2

***Equipment Condition:***

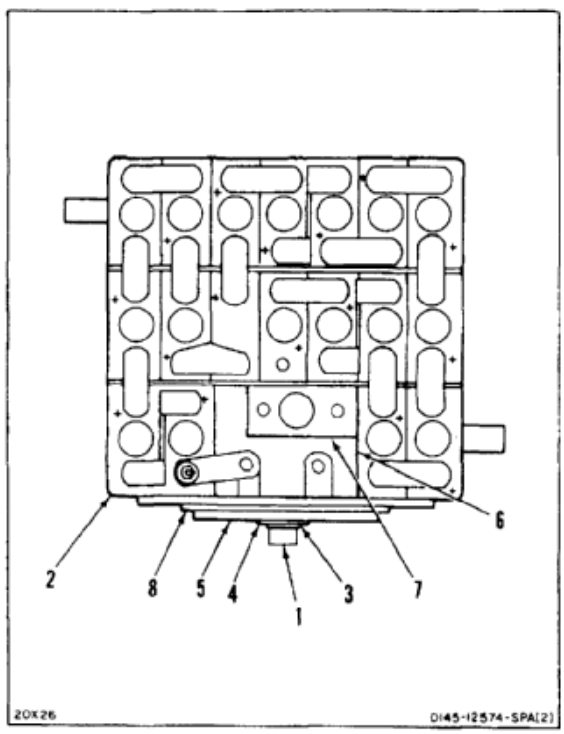
Off Helicopter Task
Battery Cleaned, Discharged, and Shorting Strips Installed



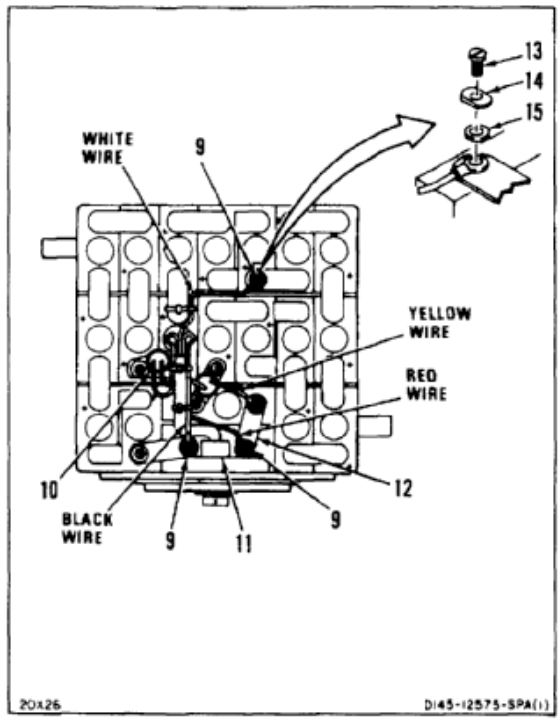

1. Remove all shorting strips. Refer to TM 11-6140-203-14-2.
2. Install connector (1) in hole in battery case (2). Install locknut (3) and tighten to **50 to 60 inch-pounds**.
3. Lockwire nut (3) to lockwire tab (5) on battery case. Use lockwire (E231).
4. Install U-shaped liner (6).
5. Install battery cell (7). Refer to TM 11-6140-203-14-2. Ensure + terminal is directly behind + post on battery connector (8).

CAUTION

Improper installation or connection of cable assembly could result in damage to cable assembly and battery.



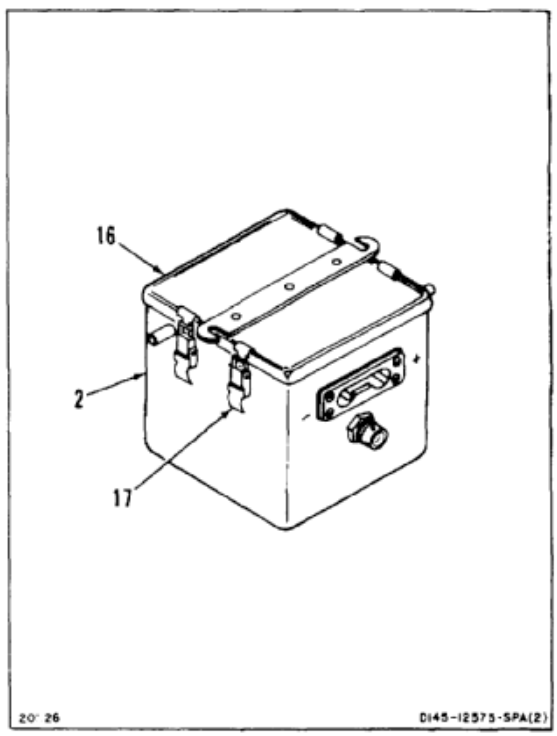
6. Connect battery cable terminals (9) to battery cells.
7. Connect temperature switch (10) and thermistor (11) to battery cells.
8. Connect battery links (12) to battery cells.
9. Secure all items in steps 6, 7, and 8 using nine screws (13), nine washers (14), and nine spring washers (15).
10. Tighten battery terminal screws (13) to **20 to 25 inch-pounds**.
11. Coat all cell terminals, connections, and sensors with corrosion preventive compound (E153). Refer to TM 11-6140-203-14-2.
12. Charge battery. Refer to TM 11-6140-203-14-2.




13. Install cover (16) on battery case (2) and close snap locks (17) over cover.

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-26 REPAIR BATTERY (AVIM) 9-26

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

None

***Personnel Required:***

Aircraft Electrician

***References:***

TM 11-1520-240-23

***Equipment Condition:***

Off Helicopter Task

Repair battery (TM 11-1520-240-23).

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-27 INSTALL BATTERY 9-27

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Apron
Face Shield

***Materials:***

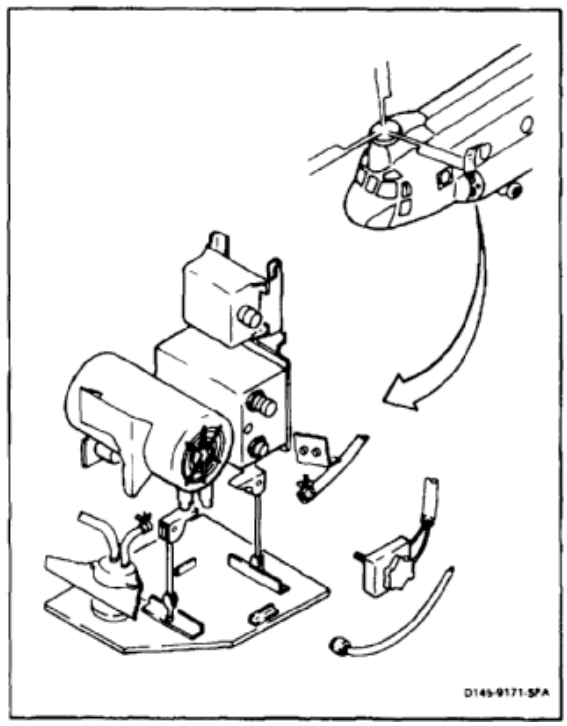
Rubber Gloves

***Personnel Required:***

Medium Helicopter Repairer
Inspector

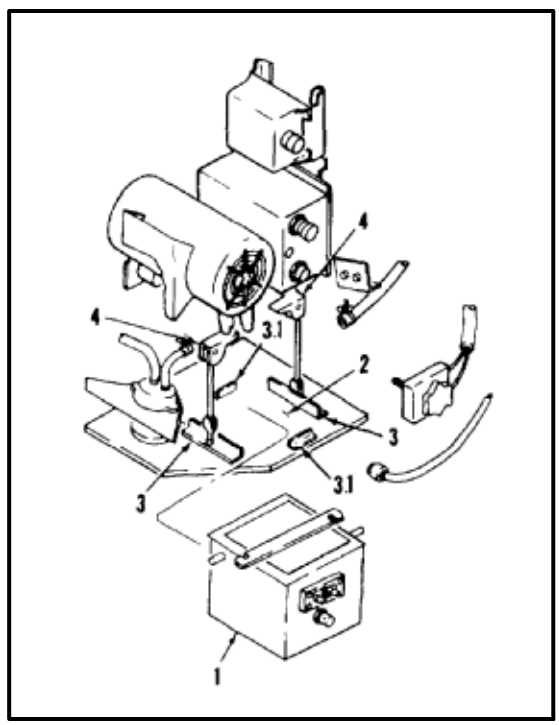
***References:***

TM 55-1520-240-23P



**WARNING**

Wear rubber gloves, apron, and face shield when handling batteries. The potassium hydroxide in the battery electrolyte is very corrosive. If any electrolyte is spilled on your clothing, hands, or on other material, immediately flood the affected area with cold water or boric acid solution. Consult a physician if your eyes are affected.




1. Position battery (1) on shelf (2) within two brackets (3) and two brackets (3.1).
2. Position two clamps (4) on battery (1). Tighten clamps.

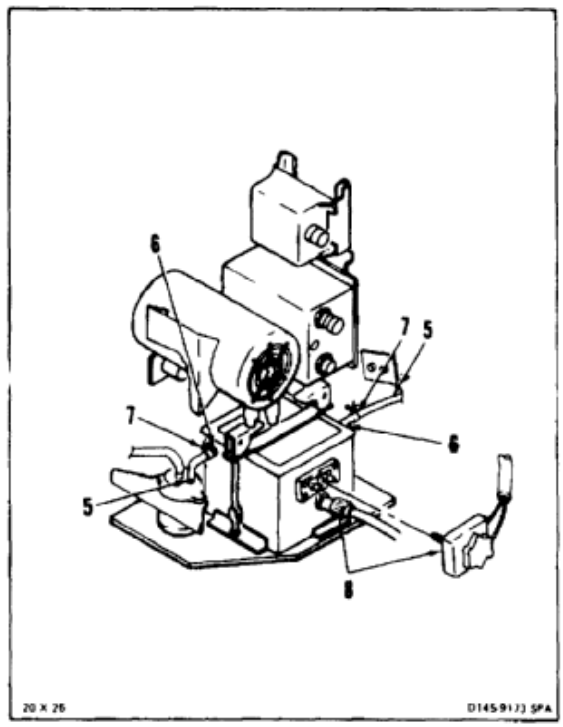
**WARNING**

Failure to ensure that the battery sump jar and vent hoses are properly connected could result in hydrogen gas entering the pod and the cabin. Hydrogen gas can cause explosion or fire.

3. Install two lines (5) to two vents (6). Tighten wingnuts (7).
4. Connect two electrical connectors (8 and 9). Remove tags.

**CAUTION**

To prevent damage to the battery pins when connecting electrical connector (9), apply inward pressure as the knob is being tightened.




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).
Close left electrical compartment access door (Task 2-2).

END OF TASK

## 9-28 REMOVE BATTERY CHARGER 9-28

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

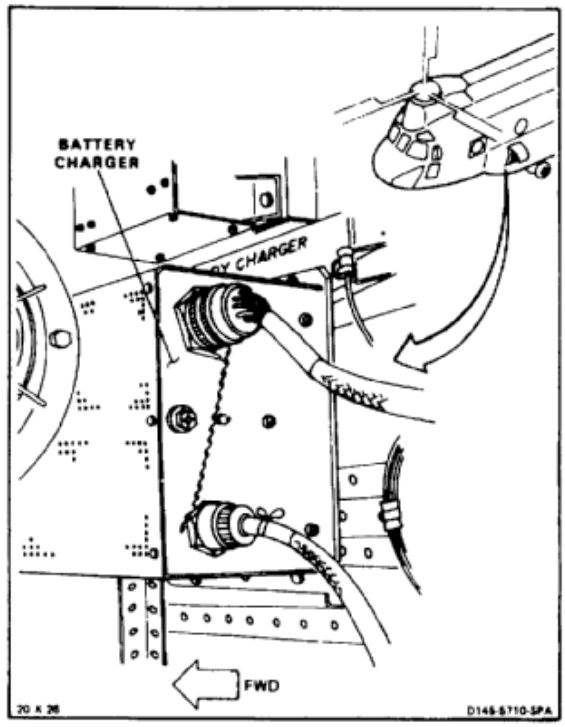
Paper Tags (E264)

***Personnel Required:***

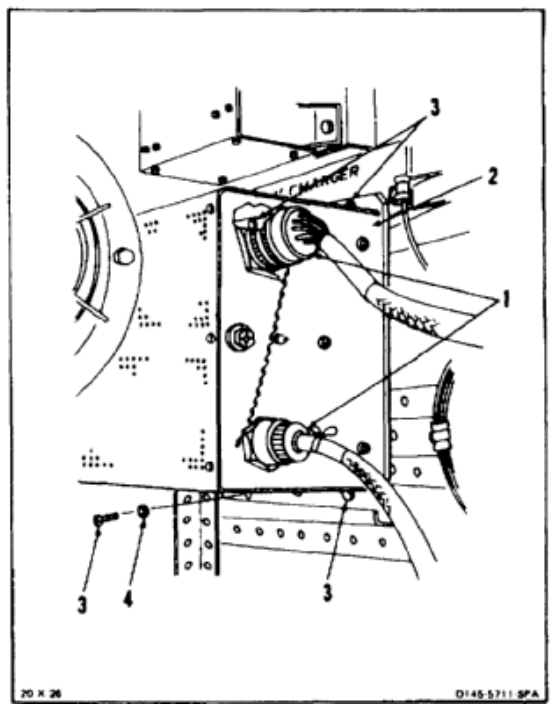
Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Left Electrical Compartment (Task 2-2)




1. Tag and disconnect two electrical plugs (1) from charger (2). Use tags (E264).
2. Remove four screws (3) and washers (4).
3. Remove charger (2).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-29 INSTALL BATTERY CHARGER 9-29

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

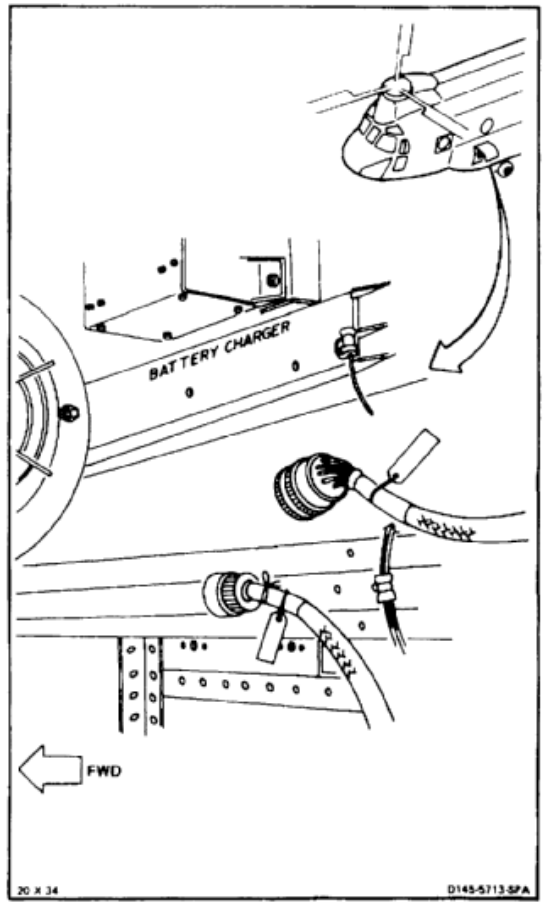
None

***Personnel Required:***

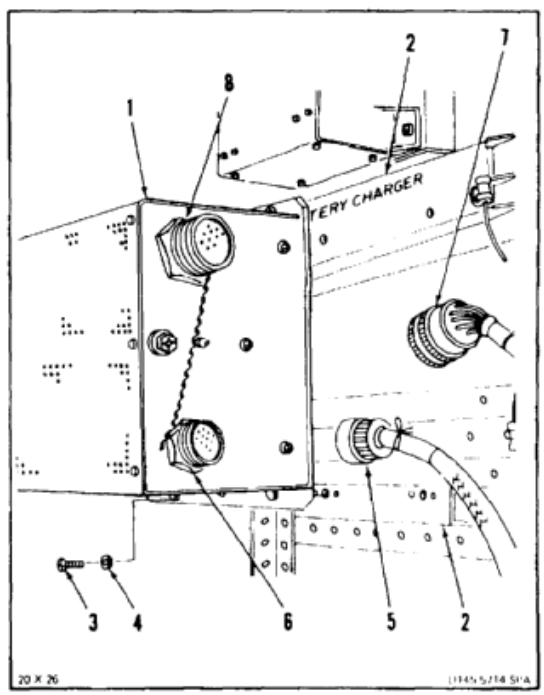
Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P




1. Position charger (1) on brackets (2). Install four screws (3) and washers (4).
2. Connect electrical plug (5) to receptacle (6). Remove tag.
3. Connect electrical plug (7) to receptacle (8). Remove tag.




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Close left electrical compartment access door (Task 2-2).
Perform operational check of battery charger (TM 55-1520-240-T).

END OF TASK

# SECTION III
# ALTERNATING CURRENT (AC) POWER DISTRIBUTION SYSTEM DESCRIPTION AND THEORY OF OPERATION

## 9-30 ALTERNATING CURRENT (AC) POWER DISTRIBUTION 9-30

### *DESCRIPTION*

Alternating current (ac) is the primary source of electrical power for the helicopter. The ac power distribution system has four power sources: two main generators, a secondary generator, and external power.

The two main generators are mounted on and driven by the aft transmission. The secondary generator is mounted on and driven by the auxiliary power unit. A receptacle for connecting external power to the helicopter is at the forward end of the left pod.

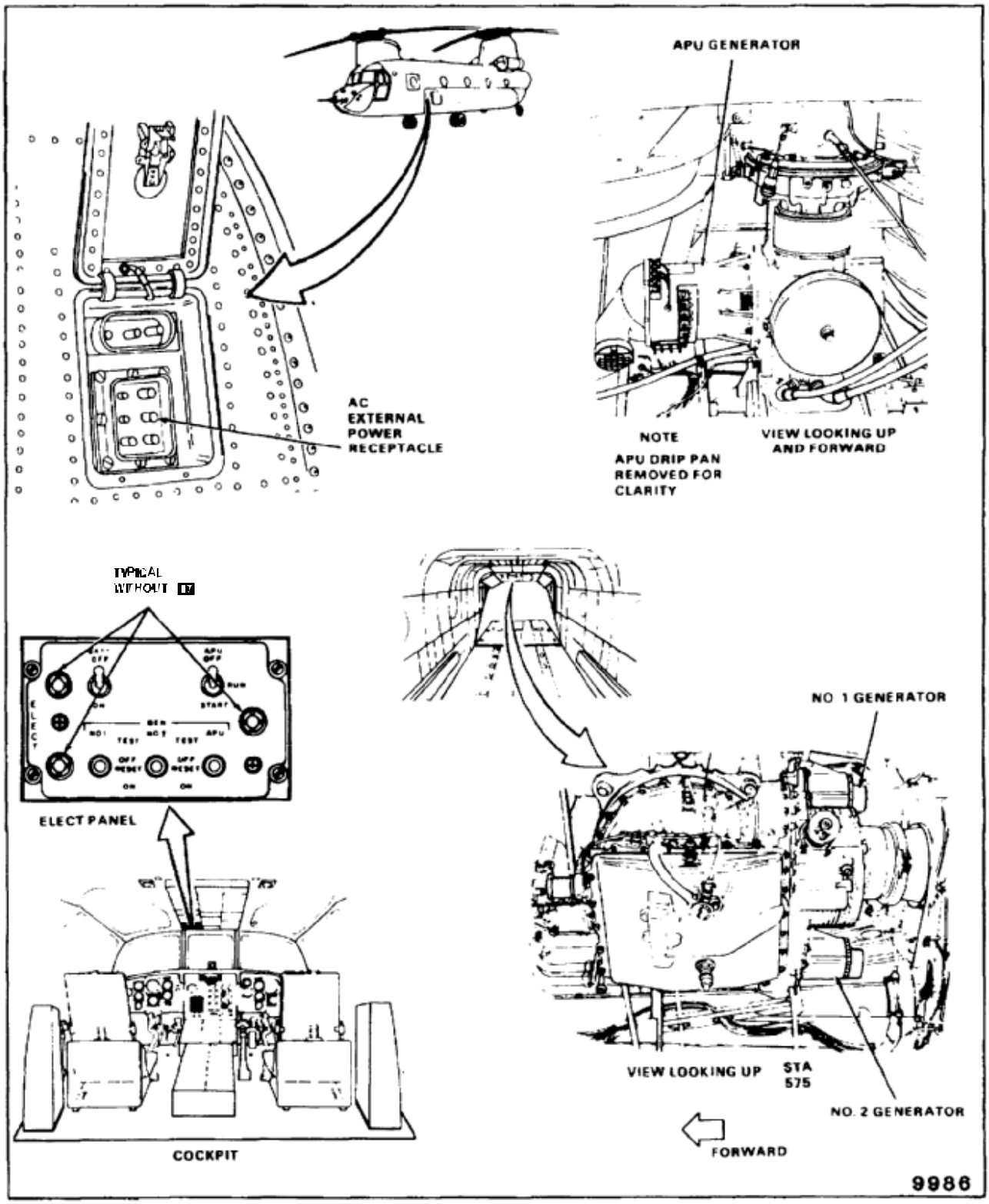
Each power source delivers **115 volt** 3-phase power to one or both of two ac buses. The buses distribute the power to all ac electrical components on the helicopter. Each of the power sources has its own control unit, panel, or monitor that ensures that it is operating properly before its output is delivered to the buses.

During normal operation, with rotors turning minimum of **85 percent**, the No. 1 generator, driven off the left side of the aft transmission, supplies power to the No. 1 ac bus. The No. 2 generator, driven off the right side of the transmission, powers the No. 2 bus. When either main generator is running, output from the auxiliary power unit (APU) and external power is blocked from the buses.

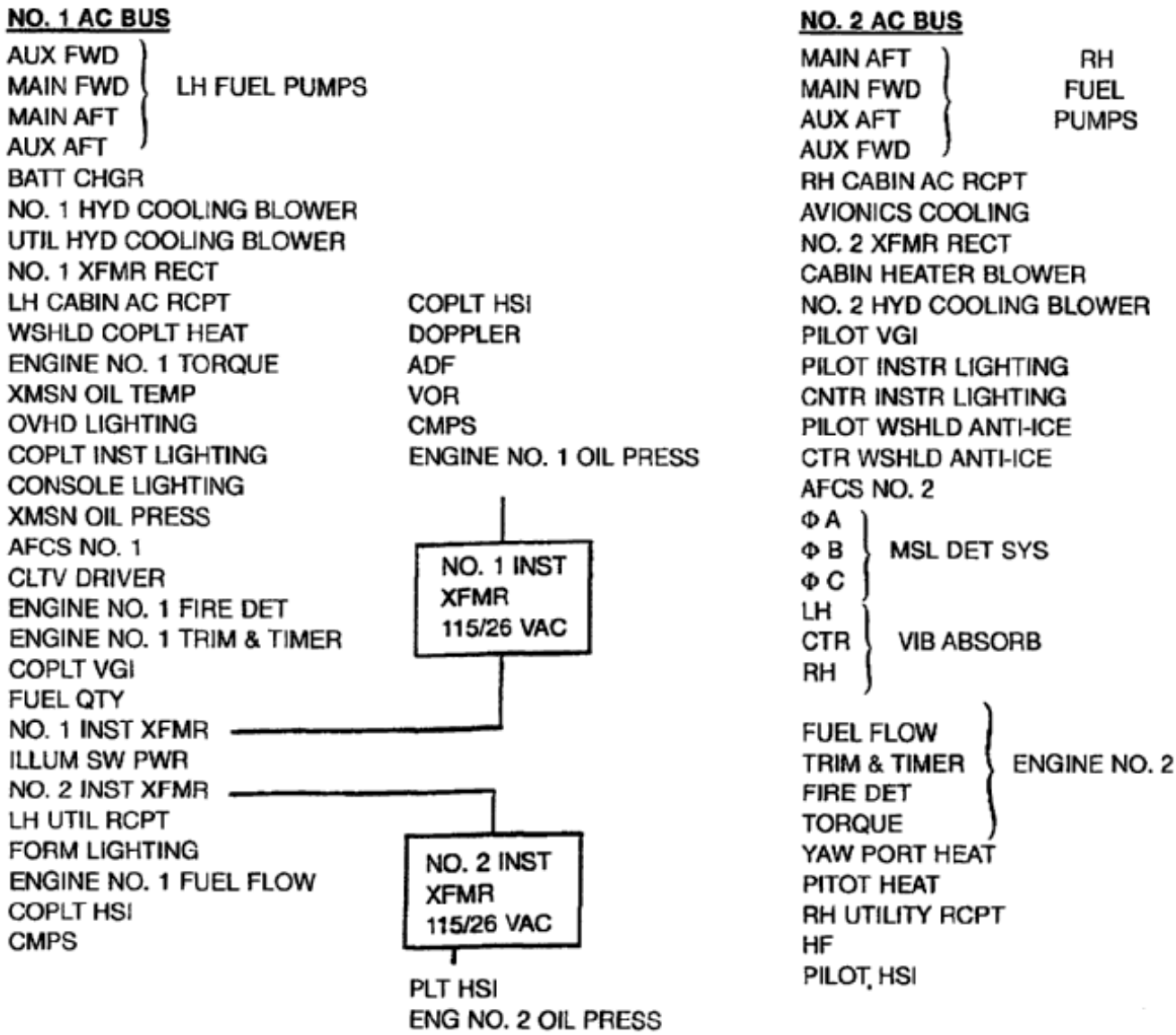
If the main generators are not operating, but the auxiliary power unit is running, the APU generator supplies power to both ac buses. When the APU generator is operating, the external power circuits are blocked from the ac bus. Only if both the main and the secondary generators are not operating can external power be used to supply the ac buses.

Control switches for each of the three generators are on the overhead ELECT panel in the cockpit. The master caution panel has lights to indicate the status of the system.

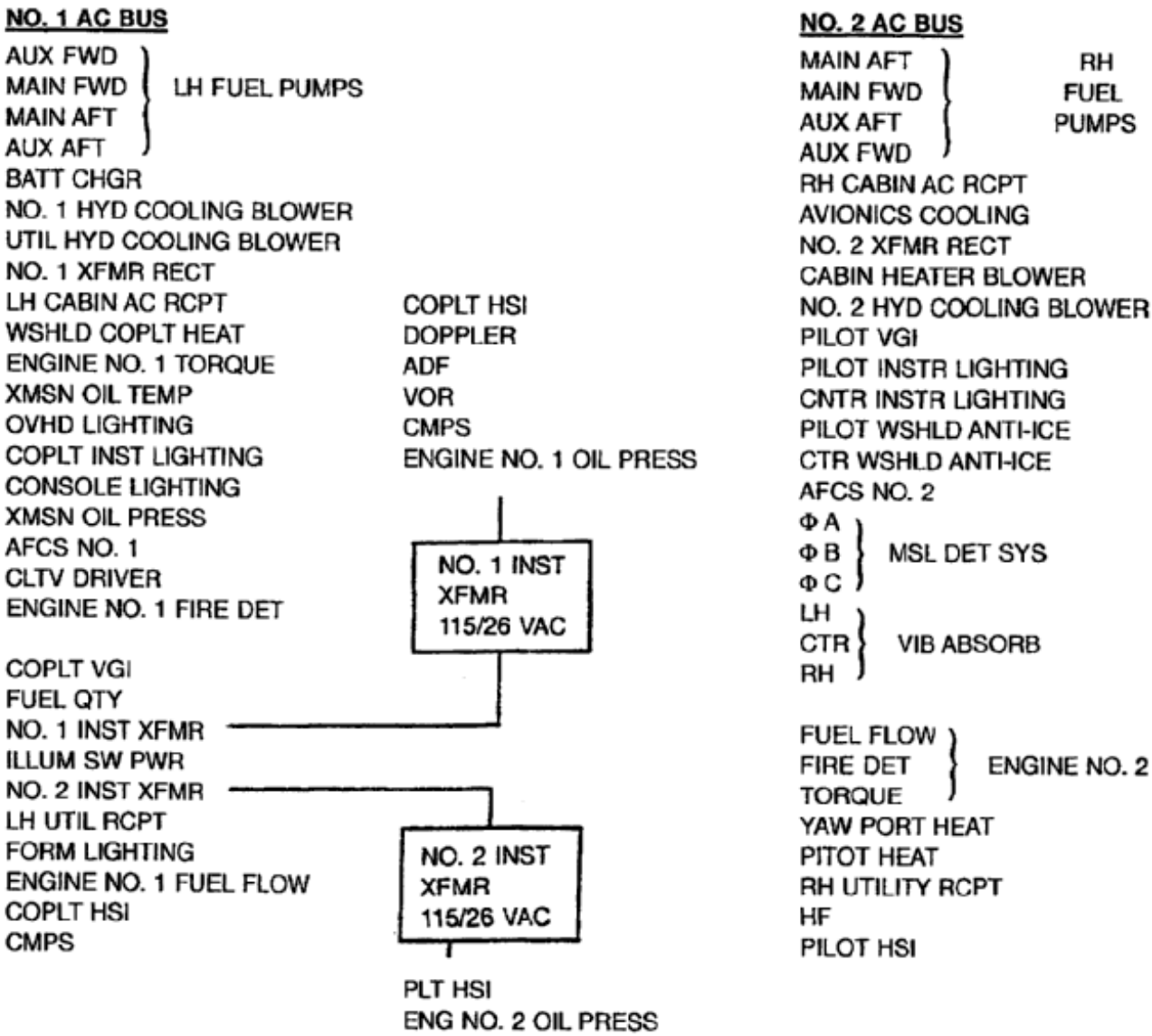
Most of the electrical connectors used on the aircraft have a fully-coupled indicator which is utilized to prevent over or under engagement of the connector by the installer, and is also utilized during inspection as a quick visual indication of proper installation. This indicator consists of three axial stripes, usually blue in color, placed on the plug shell which will align with three corresponding stripes on the coupling ring when completely coupled. Do not over-tighten the coupling ring beyond the blue stripes.


APU GENERATOR
AC
EXTERNAL
POWER
RECEPTACLE
NOTE
APU DRIP PAN
REMOVED FOR
CLARITY
VIEW LOOKING UP
AND FORWARD
TYPICAL
WITHOUT DY
ELECT PANEL
COCKPIT
NO. 1 GENERATOR
VIEW LOOKING UP
STA
575
NO. 2 GENERATOR
FORWARD
9986

*Without* 74


NO. 1 AC BUS
AUX FWD
MAIN FWD
MAIN AFT
AUX AFT
LH FUEL PUMPS
BATT CHGR
NO. 1 HYD COOLING BLOWER
UTIL HYD COOLING BLOWER
NO. 1 XFMR RECT
LH CABIN AC RCPT
WSHLD COPLT HEAT
ENGINE NO. 1 TORQUE
XMSN OIL TEMP
OVHD LIGHTING
COPLT INST LIGHTING
CONSOLE LIGHTING
XMSN OIL PRESS
AFCS NO. 1
CLTV DRIVER
ENGINE NO. 1 FIRE DET
ENGINE NO. 1 TRIM & TIMER
COPLT VGI
FUEL QTY
NO. 1 INST XFMR
ILLUM SW PWR
NO. 2 INST XFMR
LH UTIL RCPT
FORM LIGHTING
ENGINE NO. 1 FUEL FLOW
COPLT HSI
CMPS
COPLT HSI
DOPPLER
ADF
VOR
CMPS
ENGINE NO. 1 OIL PRESS
NO. 1 INST XFMR 115/26 VAC
NO. 2 INST XFMR 115/26 VAC
PLT HSI
ENG NO. 2 OIL PRESS
NO. 2 AC BUS
MAIN AFT
MAIN FWD
AUX AFT
AUX FWD
RH FUEL PUMPS
RH CABIN AC RCPT
AVIONICS COOLING
NO. 2 XFMR RECT
CABIN HEATER BLOWER
NO. 2 HYD COOLING BLOWER
PILOT VGI
PILOT INSTR LIGHTING
CNTR INSTR LIGHTING
PILOT WSHLD ANTI-ICE
CTR WSHLD ANTI-ICE
AFCS NO. 2
Φ A
Φ B
Φ C
MSL DET SYS
LH
CTR
RH
VIB ABSORB
FUEL FLOW
TRIM & TIMER
FIRE DET
TORQUE
ENGINE NO. 2
YAW PORT HEAT
PITOT HEAT
RH UTILITY RCPT
HF
PILOT HSI

*With 74*


NO. 1 AC BUS
AUX FWD
MAIN FWD
MAIN AFT
AUX AFT
LH FUEL PUMPS
BATT CHGR
NO. 1 HYD COOLING BLOWER
UTIL HYD COOLING BLOWER
NO. 1 XFMR RECT
LH CABIN AC RCPT
WSHLD COPLT HEAT
ENGINE NO. 1 TORQUE
XMSN OIL TEMP
OVHD LIGHTING
COPLT INST LIGHTING
CONSOLE LIGHTING
XMSN OIL PRESS
AFCS NO. 1
CLTV DRIVER
ENGINE NO. 1 FIRE DET
COPLT HSI
DOPPLER
ADF
VOR
CMPS
ENGINE NO. 1 OIL PRESS
NO. 1 INST XFMR 115/26 VAC
COPLT VGI
FUEL QTY
NO. 1 INST XFMR
ILLUM SW PWR
NO. 2 INST XFMR
LH UTIL RCPT
FORM LIGHTING
ENGINE NO. 1 FUEL FLOW
COPLT HSI
CMPS
NO. 2 INST XFMR 115/26 VAC
PLT HSI
ENG NO. 2 OIL PRESS
NO. 2 AC BUS
MAIN AFT
MAIN FWD
AUX AFT
AUX FWD
RH FUEL PUMPS
RH CABIN AC RCPT
AVIONICS COOLING
NO. 2 XFMR RECT
CABIN HEATER BLOWER
NO. 2 HYD COOLING BLOWER
PILOT VGI
PILOT INSTR LIGHTING
CNTR INSTR LIGHTING
PILOT WSHLD ANTI-ICE
CTR WSHLD ANTI-ICE
AFCS NO. 2
Φ A
Φ B
Φ C
MSL DET SYS
LH
CTR
RH
VIB ABSORB
FUEL FLOW
FIRE DET
TORQUE
ENGINE NO. 2
YAW PORT HEAT
PITOT HEAT
RH UTILITY RCPT
HF
PILOT HSI

***MAIN AC GENERATOR***

Each of the two **40 kilovolt ampere (kva)** 3-phase **400 Hz ac** generators (alternators) is mounted on and driven by the aft transmission. The generators are oil cooled and brushless. Phase rotation of the generators is A-B-C, with phase-to-phase potential of **208 volts**, regulated to **200 volts**. The phase-to-neutral (ground) potential is **120 volts**, regulated to **115 volts**. These generators produce all the ac power required for flight operation of the helicopter. Oil to cool windings and lubricate splines and bearings is provided by the main pump in the transmission oil system.

***APU GENERATOR***

A **20 kva** 3-phase brushless generator (alternator) is mounted on and driven by the auxiliary power unit (APU). The generator is air cooled by a built-in fan. As with the main generators, phase rotation is A-B-C, with potential between phases of **208 volts**, regulated to **200 volts**. The potential between each phase and neutral (ground) is **120 volts**, regulated to **115 volts**. The APU generator provides helicopter electrical power during ground operations.

***GENERATOR CONTROL UNITS***

The ac electrical system has two main generator control units (GCU), one for each system. The No. 1 unit is located in the electrical compartment at the forward end of the left pod. The No. 2 unit is in the electrical compartment of the right pod.

Each GCU monitors its generator for under voltage, over voltage, under-frequency and feeder faults. It also regulates generator output voltage and controls the connection of the generator to the distribution system.

When an abnormal condition is detected, the generator is shut down and disconnected from the ac bus. The condition also trips an annunciator on the front panel of the GCU, changing the normal black flag to white. Each control unit is connected to the helicopter wiring through one plug and one receptacle.

***APU GENERATOR CONTROL UNIT***

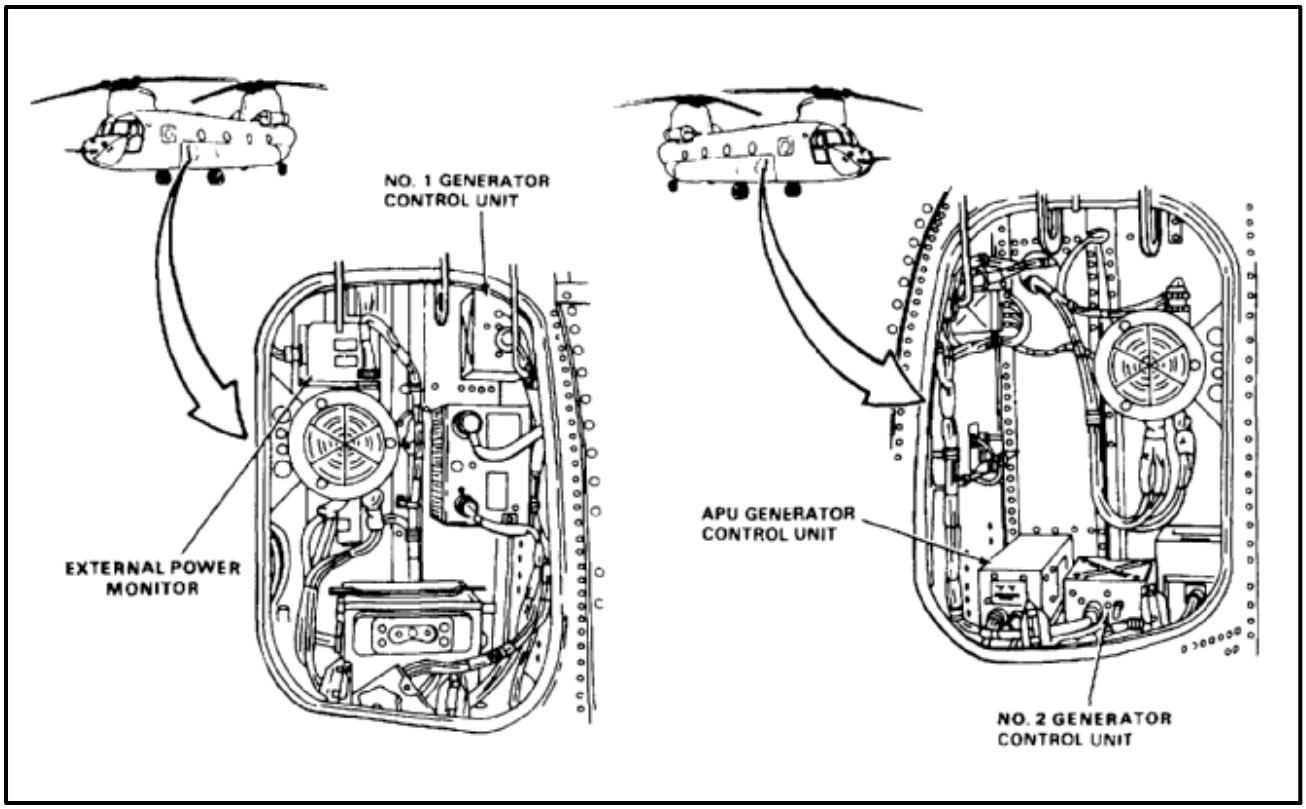
The APU generator control unit (GCU) is located in the electrical compartment of the right pod, directly aft of the No. 2 GCU. It monitors and regulates generator output in the same manner as the GCU for each main generator.

The control unit is connected to the helicopter wiring through a receptacle (J9) on the front. A second receptacle (J6) is connected to a conversion plug to make the GCU compatible with the brushless APU generator.

***EXTERNAL POWER MONITOR***

An external power monitor is located in the electrical compartment of the left pod. It monitors the applied input from an external power source for correct voltage, frequency, and phase sequence. When an abnormal condition is detected, the external power is disconnected from the No. 1 and No. 2 ac buses.

The monitor is connected to the helicopter wiring through one receptacle.


NO. 1 GENERATOR
CONTROL UNIT
EXTERNAL POWER
MONITOR
APU GENERATOR
CONTROL UNIT
NO. 2 GENERATOR
CONTROL UNIT

***POWER DISTRIBUTION PANEL***

Two power distribution panels (PDP) are the electrical load centers for the ac power distribution system. The panels contain circuit breakers, relays, and transformers associated with both power systems.

The No. 1 PDP is outboard of the copilot seat on the left side of the cockpit. Its contents are associated with the No. 1 ac system and it services the left side of the helicopter.

The No. 2 PDP is outboard of the pilot seat on the right side of the cockpit. Its contents are associated with the No. 2 ac system. It services the right side of the helicopter.

The following major components are in one or both PDP:

**Circuit Breakers** (No. 1 and No. 2 PDP): All of the helicopter ac circuit breakers are on one or the other PDP. All **5 through 50 ampere** circuit breakers are single-hole mounted. The **70 ampere ac and 100 ampere dc** bus tie circuit breakers are mounted with screws, nuts, and washers.

**Main Generator Current Transformer** (No. 1 and No. 2 PDP): Feeder current from the main generators passes through coils in the transformer, inducing voltages that are routed to the generator control unit, where they are used to detect ground fault currents.

**APU Generator Feeder Current Transformers** (No. 2 PDP): Feeder current from the APU generator passes through coils in the three current transformers, inducing voltages that are routed to the APU generator control unit in the right electrical compartment, where they are used to detect ground fault currents.

**Instrument Transformer** (No. 1 and No. 2 PDP): This transformer steps down **115 vac to 26 vac** to operate cockpit instruments.

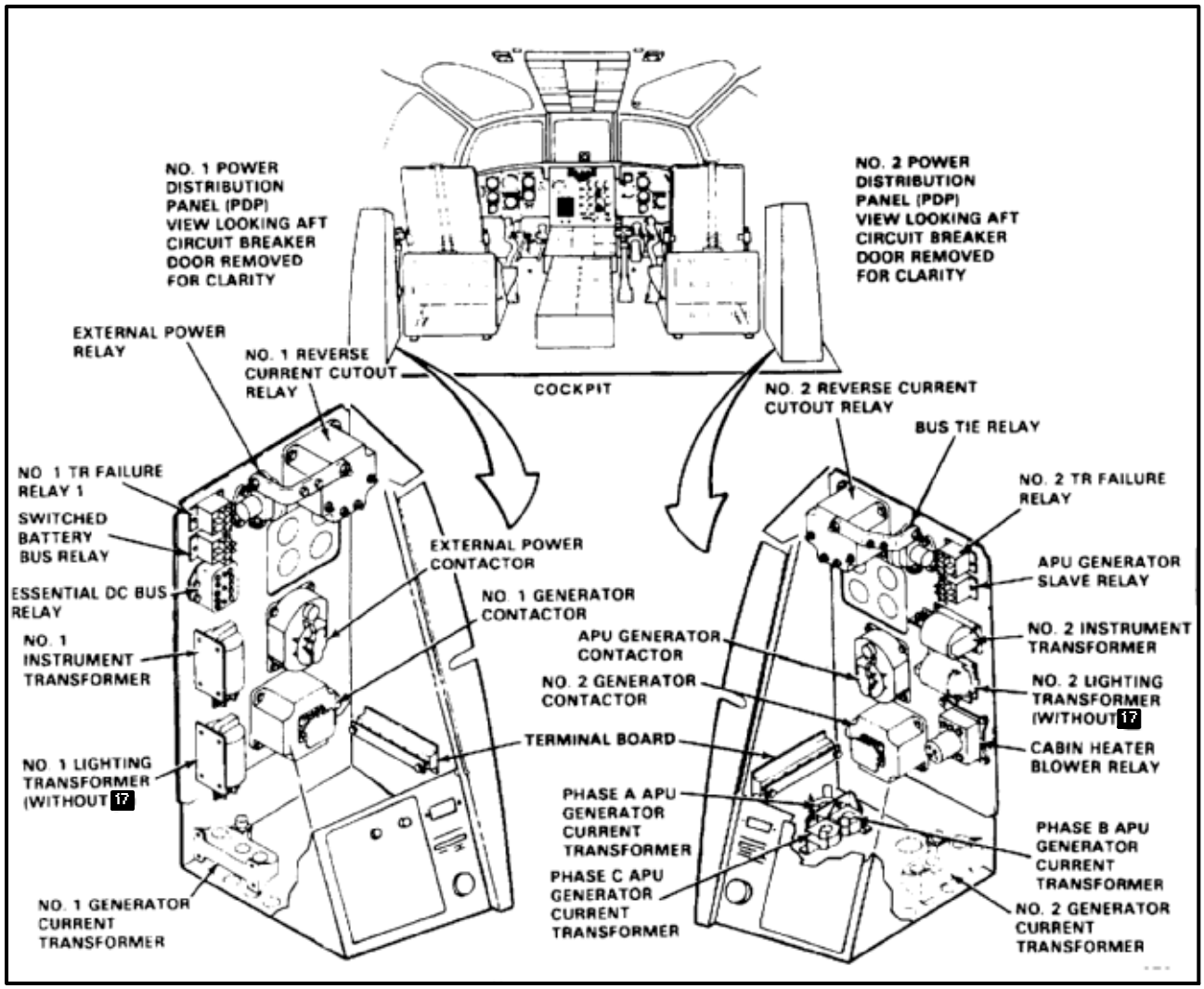
**Lighting Transformer** (No. 1 and No. 2 PDP): This transformer steps down **115 vac** to **26 vac** to operate instrument lamps. It is installed only on helicopters without **17**.

**Generator Contactor** (No. 1 and No. 2 PDP): This contactor connects generator output to its associated ac bus. It also controls various monitoring and control functions through sets of auxiliary contacts.

**External Power Contactor** (No. 1 PDP): When energized in one mode, this contactor connects ac external power to the No. 1 ac bus. In another mode, it provides part of the crosstie connection between No. 1 and No. 2 ac buses.

**APU Generator Contractor** (No. 2 PDP): When energized in one mode, this contactor connects power from the APU generator to the No. 1 ac bus. In another mode, it provides part of the crosstie connection between No. 1 and No. 2 when external power is applied.

**APU Generator Slave Relay** (No. 2 PDP): This relay disconnects the APU generator from the ac buses when either main generator is operating. It also provides a portion of the logic that determines the operating mode of the external power contactor and the APU generator contactor.


NO. 1 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT CIRCUIT BREAKER DOOR REMOVED FOR CLARITY
NO. 2 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT CIRCUIT BREAKER DOOR REMOVED FOR CLARITY
EXTERNAL POWER RELAY
NO. 1 REVERSE CURRENT CUTOUT RELAY
COCKPIT
NO. 2 REVERSE CURRENT CUTOUT RELAY
BUS TIE RELAY
NO. 1 TR FAILURE RELAY 1
SWITCHED BATTERY BUS RELAY
ESSENTIAL DC BUS RELAY
NO. 1 INSTRUMENT TRANSFORMER
EXTERNAL POWER CONTACTOR
NO. 1 GENERATOR CONTACTOR
TERMINAL BOARD
NO. 1 LIGHTING TRANSFORMER (WITHOUT 17)
NO. 1 GENERATOR CURRENT TRANSFORMER
NO. 2 TR FAILURE RELAY
APU GENERATOR SLAVE RELAY
APU GENERATOR CONTACTOR
NO. 2 INSTRUMENT TRANSFORMER
NO. 2 GENERATOR CONTACTOR
NO. 2 LIGHTING TRANSFORMER (WITHOUT 17)
CABIN HEATER BLOWER RELAY
PHASE A APU GENERATOR CURRENT TRANSFORMER
PHASE B APU GENERATOR CURRENT TRANSFORMER
PHASE C APU GENERATOR CURRENT TRANSFORMER
NO. 2 GENERATOR CURRENT TRANSFORMER

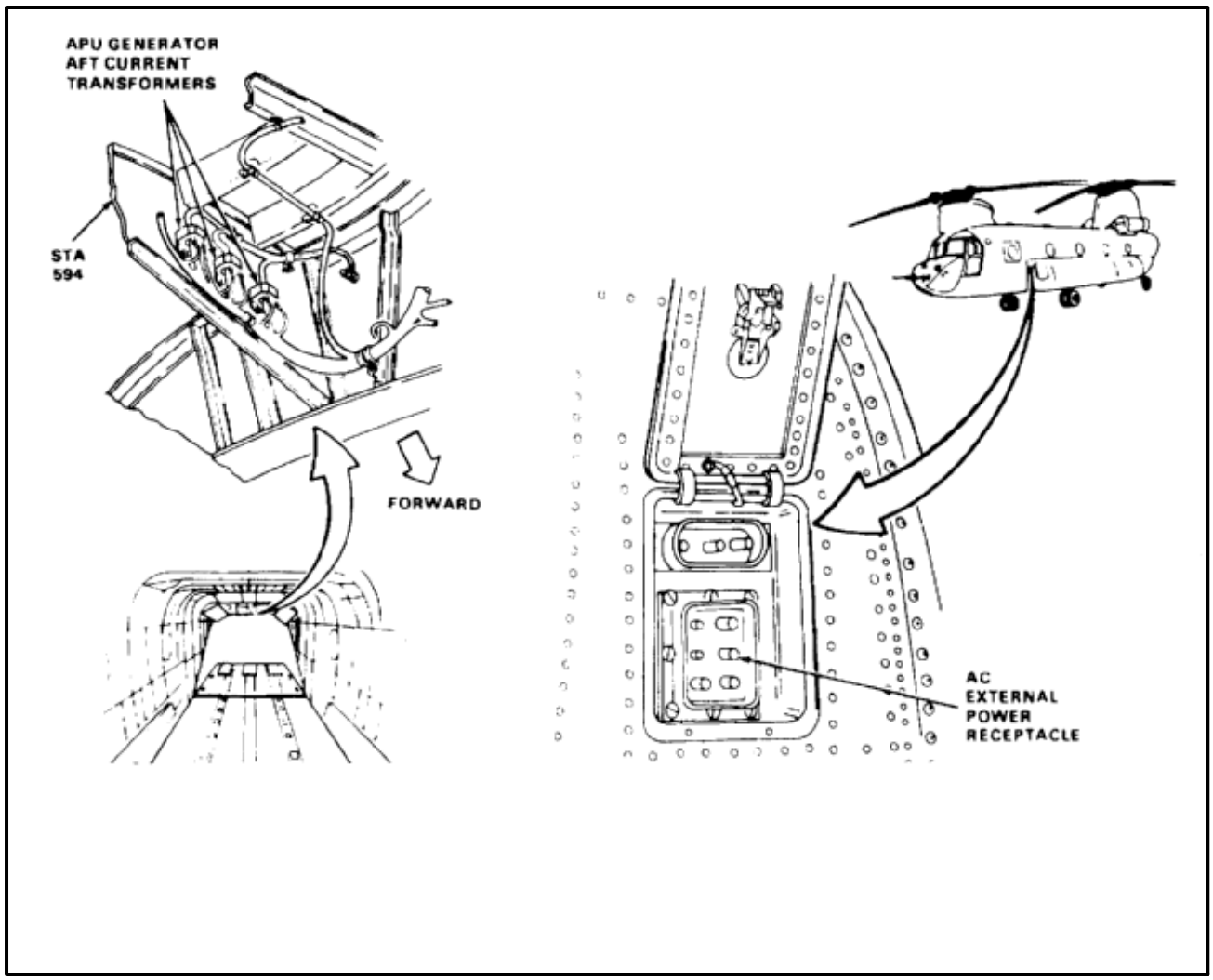
### *APU GENERATOR RETURN CURRENT TRANSFORMERS*

Return current from the APU generator circuit passes through coils in three current transformers, inducing voltages that are routed to the APU GCU in the right pod, where they are used to detect ground fault currents. They work in conjunction with three feeder current transformers in the No. 2 PDP.

The three transformers are mounted on a bulkhead at sta. 594, just forward of the APU generator.

### *EXTERNAL POWER*

An ac external power receptacle accepts the cable from a power supply cart to connect **115 vac 400 Hz** power to the helicopter. The receptacle is located inside a hinged access door at the forward end of the left pod.



***THEORY OF OPERATION***

The four sources of ac power for the helicopter have the following order of operation:

When one or both engines are running, the No. 1 and No. 2 generators supply power to their respective buses. If either generator fails or is shut down, that source will be isolated from its bus and the remaining generator will then supply both buses through crosstie circuitry. With either or both of the main generators operating, the APU generator and the external power receptacle are disconnected from the buses and can supply no power.

If the APU is operating while both engines are shut down or both generators are manually switched off. The APU generator is automatically connected to both ac buses. The external power receptacle remains disconnected from the buses.

Only if both main generators and the APU generator are not operating is it possible to apply external power to the buses. If, while an external power source is connected, any of the three generators is turned on, the external power source will be disconnected at the buses.

In all cases, the appropriate power source is connected to the buses by power contactors, operated by **28 vdc**.

***MAIN AC GENERATOR AND CONTROL UNIT***

Each of the generators consists of three units: a permanent magnet generator (PMG), a main exciter and rotor assembly, and the main generator stator windings.

The output of the PMG is fed to a generator control unit (GCU) in one of the electrical equipment compartments. Sensing circuits in the GCU average the three phases of generator output voltage and apply this signal to an integral voltage regulator. The voltage regulator uses this signal to regulate the current applied to the generator exciter and rotor section, keeping output voltage between **113 and 117 volts**.

If generator output voltage drops below **102 volts** for more than **five to seven seconds**, or exceeds **122 to 125 volts** for a period of time depending on the magnitude of the overvoltage, relays within the GCU will shut down the generator and de-energize generator contactor 241 K1 in the PDP, disconnecting the generator from the bus.

Similarly, if generator frequency drops below **330 Hz for three to seven seconds**, a relay within the GCU will disconnect the generator from the system. However, the generator will continue to operate, and if frequency rises above **335 Hz**, it will automatically be reconnected to the system.

If generator frequency drops below **320 Hz**, the generator is disconnected from the bus and is also shut down. To get the generator back on line after it has been shut down, the generator control switch on the overhead ELECT panel in the cockpit must be cycled from ON to OFF/RESET to ON.

***APU GENERATOR AND CONTROL UNIT***

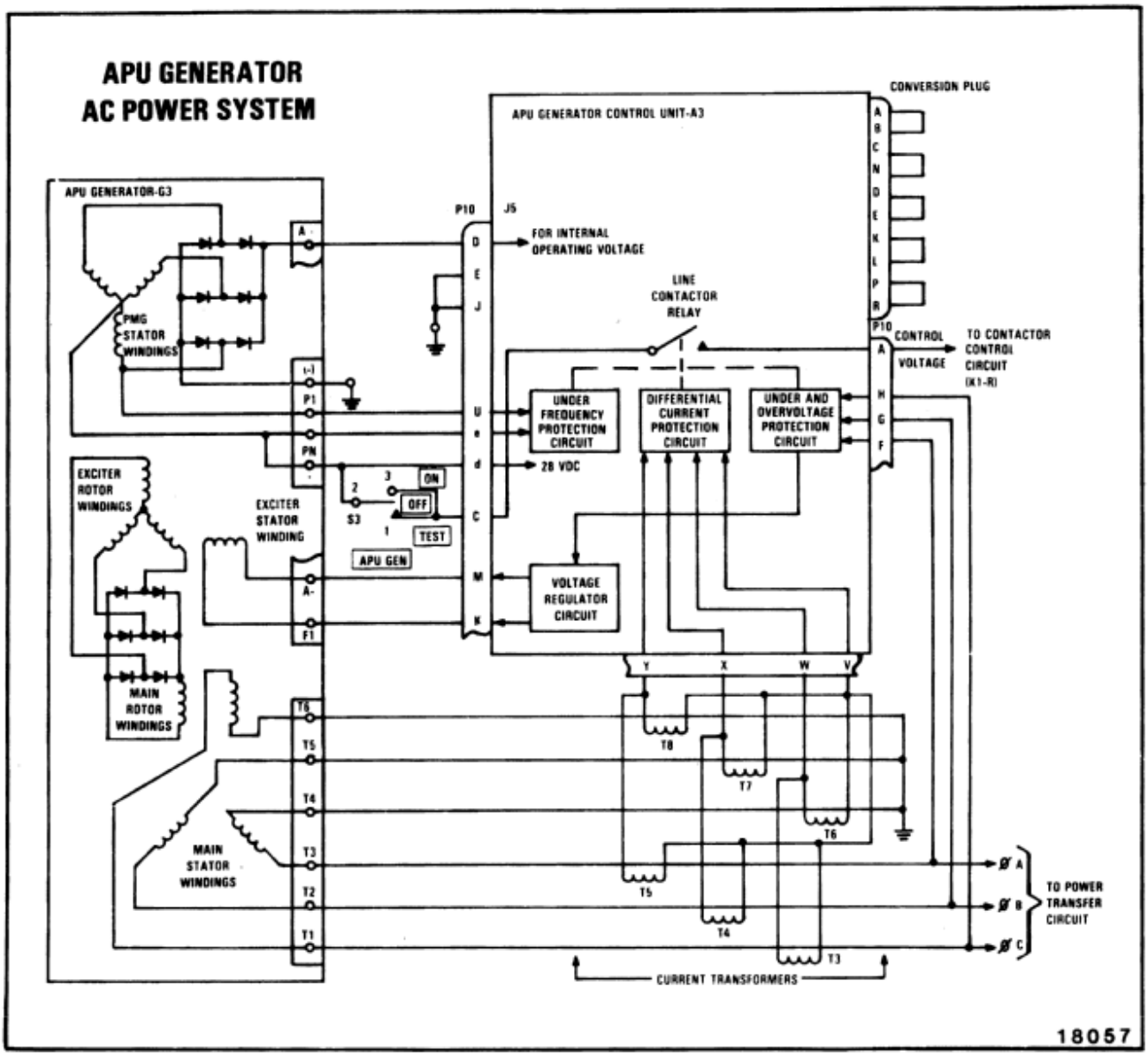
The APU generator system is similar to that of each of the two main generators. The generator supplies power to the No. 1 and No. 2 ac buses when the main generators are not running. Like the main generators, it consists of three units: a permanent magnet generator (PMG), an exciter generator, and a main generator section.

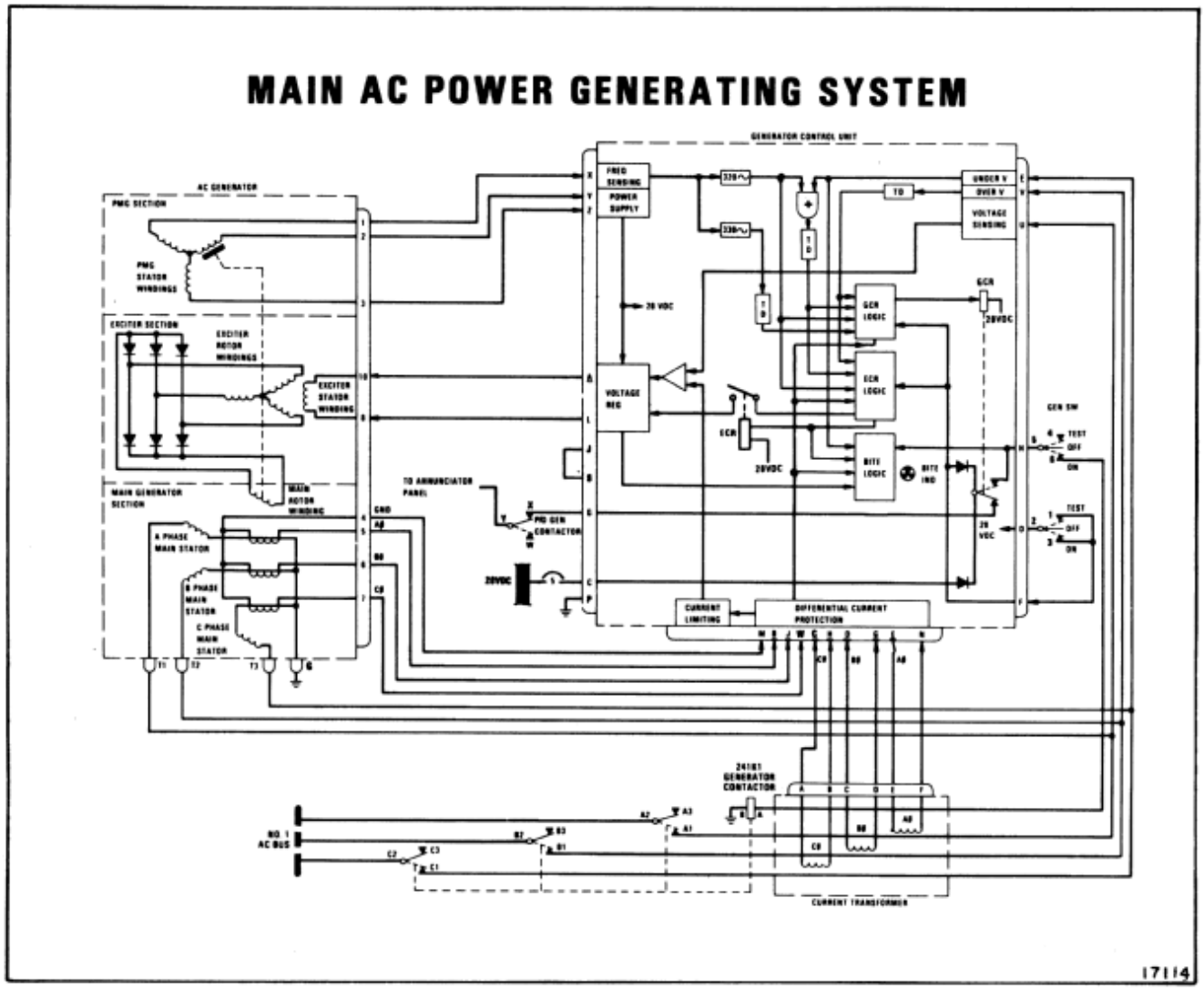
The PMG is used to monitor generator frequency for input to the generator control unit. It supplies ac and dc power as soon as the generator begins turning. The ac terminals (P1-PN) provide a minimum of **20 volts** at no load. The dc terminals (+ –) provide between **29 and 40 volts**.

The exciter generator provides main generator section excitement and regulation. Terminals (F1 -A-) of the exciter section supply **3 to 14 volts** during operation.

The main generator section supplies **115/200 volt, 400 Hz ac** output to the APU contactor in the No. 2 power distribution panel. Cross-tie to the No. 1 PDP is through external power control relay 241K5 in the No. 1 PDP.

The generator control unit (GCU) is in the right electrical equipment pod. It receives input from the PMG section of the generator to monitor generator operation and regulate its output to between **113 and 117 volts**. If generator frequency drops below **345 Hz**, or if voltage exceeds **132 volts** for more than **three seconds** or drops below **100 volts**, relays within the GCU shut down the generator. At the same time, the GCU will de-energize a contactor in the No. 2 PDP to disconnect the generator from the bus.

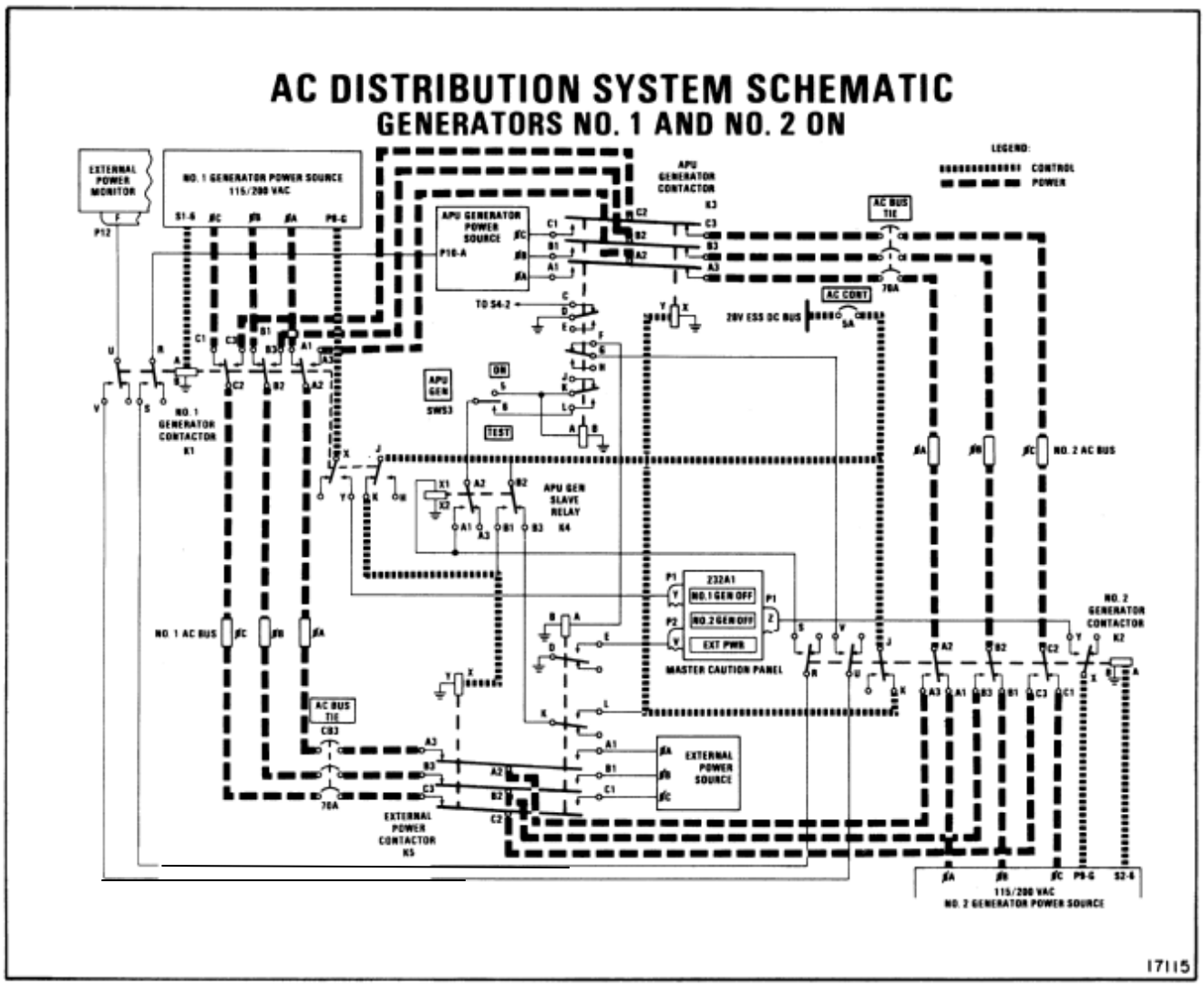



MAIN AC POWER GENERATING SYSTEM
GENERATOR CONTROL UNIT
AC GENERATOR
PMG SECTION
PMG STATOR WINDINGS
EXCITER SECTION
EXCITER ROTOR WINDINGS
EXCITER STATOR WINDING
MAIN GENERATOR SECTION
MAIN ROTOR WINDING
A PHASE MAIN STATOR
B PHASE MAIN STATOR
C PHASE MAIN STATOR
FREQ SENSING
POWER SUPPLY
VOLTAGE REG
VOLTAGE SENSING
UNDER V
OVER V
TD
GCR LOGIC
BITE LOGIC
BITE IND
GCR
28VDC
GCR SW
TEST
OFF
ON
TO ANNUNCIATOR PANEL
PRI GEN CONTACTOR
CURRENT LIMITING
DIFFERENTIAL CURRENT PROTECTION
24181 GENERATOR CONTACTOR
NO. 1 AC BUS
CURRENT TRANSFORMER
17114

***NORMAL OPERATION***

When both main generator switches (GEN NO. 1 and GEN NO. 2) on the overhead ELECT panel are set to ON, **28 vdc** is applied to each generator contactor 241K1 and 241K2 in the respective PDP. At the same time, **28 vdc** from the essential bus is applied to APU generator contactor 241K3 in the No. 2 PDP, and external power contactor 241K5 in the No. 1 PDP. This makes voltage available at the crosstie circuits so that if one generator fails, its bus will be supplied by the operating generator.

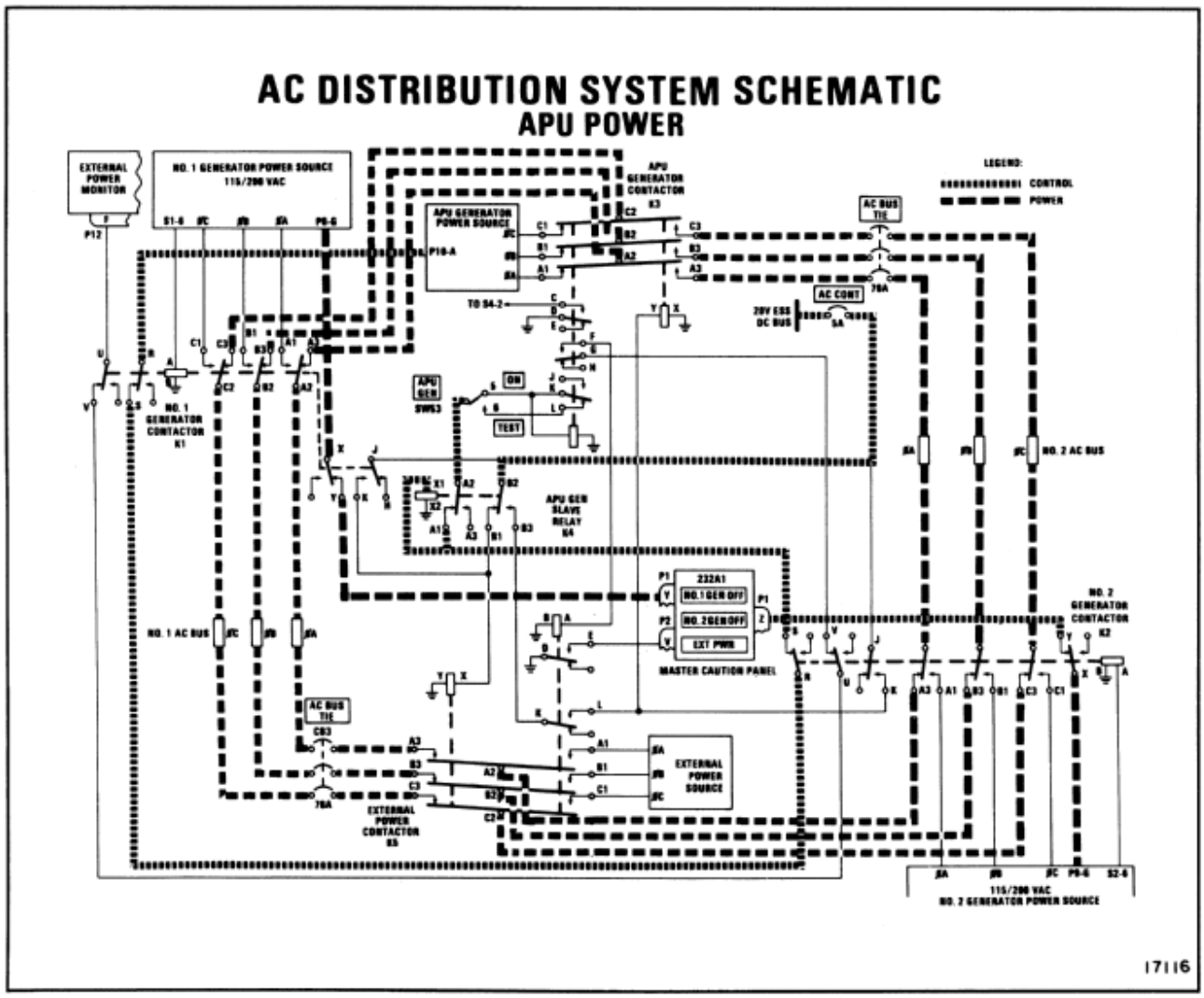
If either main generator fails or is shut down, the associated NO. 1 or NO. 2 GEN OFF light on the master caution panel will come on.



***APU GENERATOR OPERATION***

When the APU generator is operating, dc voltage is applied to APU generator slave relay 241K4 through contacts of No. 1 and No. 2 generator contractors 241K1 and K2. When 241K4 is energized, it puts dc voltage at the GEN APU switch on the overhead panel, It also energizes external power contactor 241K5 with **28 vdc** from the essential bus.

Placing the GEN APU switch to ON energizes generator contactor 241K3 to allow **115 vac** from the APU generator to power the No. 1 and No. 2 ac buses.

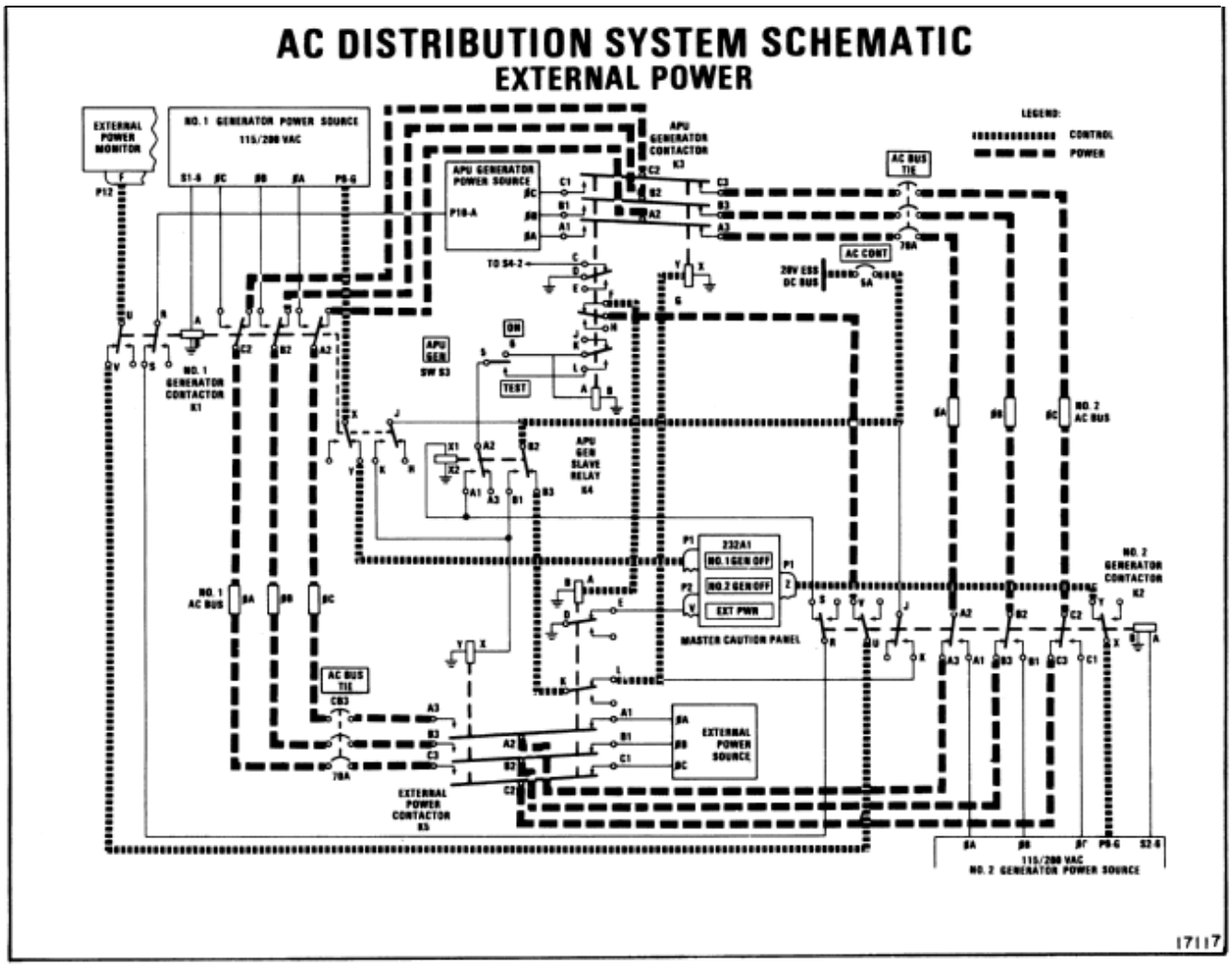


***EXTERNAL POWER OPERATION***

When an external power source is connected to the helicopter, the ground power monitor in the left electrical compartment checks that the source meets the proper input requirements. If it does, the monitor supplies **28 vdc** to energize external power contactor 241K5. This allows **28 vdc** from the essential bus to energize APU generator contactor 241K3, putting voltage from the external power source at the No. 1 and No. 2 buses.

When power is being supplied by external power, contactor 241K5 provides a ground to light the EXT PWR light on the master caution panel.

External power cannot be applied if the APU or main generators are operating.




END OF TASK

# SECTION IV
# ALTERNATING CURRENT (AC) POWER DISTRIBUTION SYSTEM

## 9-31 REMOVE MAIN AC GENERATOR 9-31

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Workstand

***Materials:***

Tape (E385)
Paper Tags (E264)

***Personnel Required:***

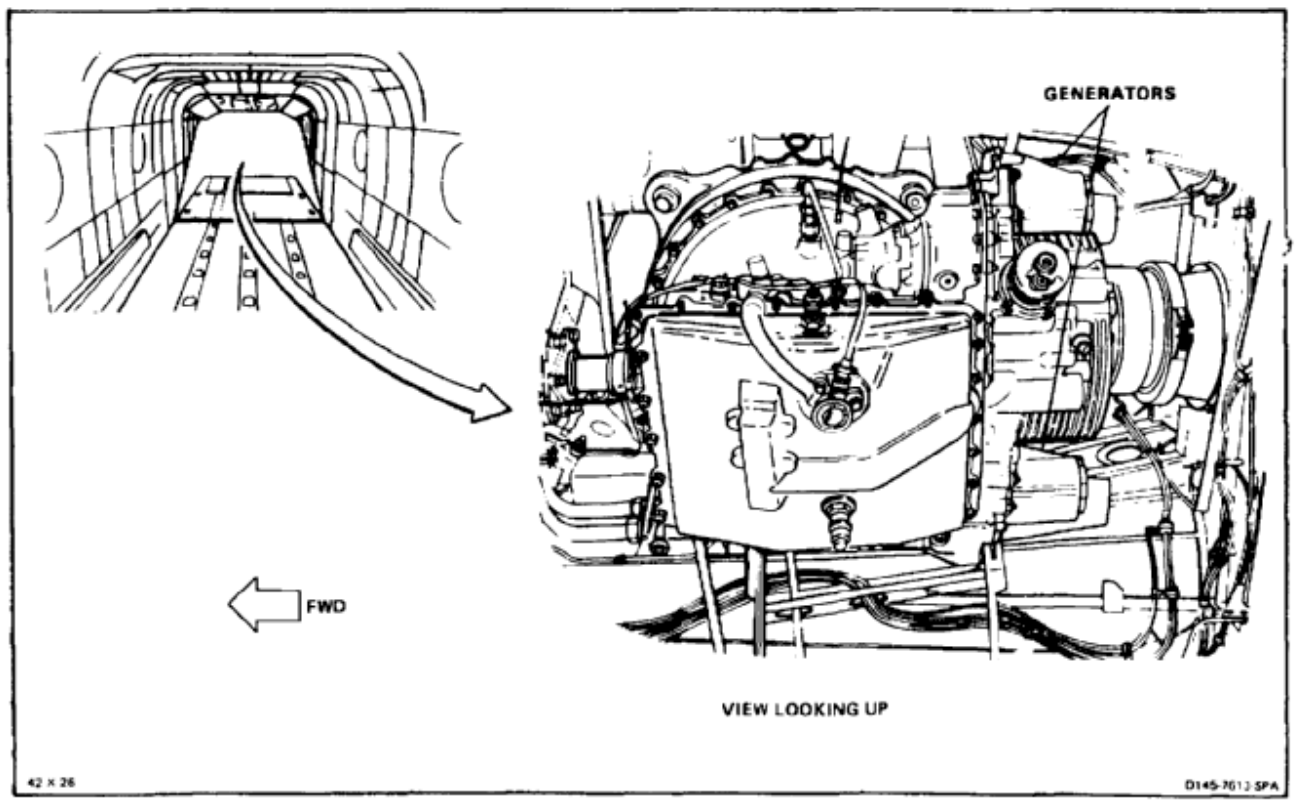
Medium Helicopter Repairer

***References:***

Task 6-158.2

***Equipment Condition:***

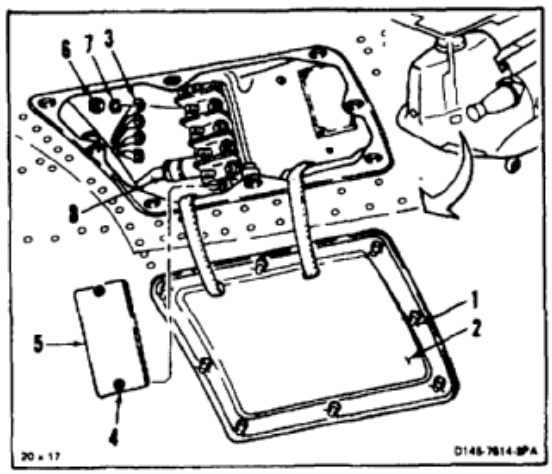
Battery Disconnected (Task 1-39)
Electrical Power Off
Aft Transmission Drip Pan Removed (Task 2-3)
Transmission Open (Task 2-2)



**NOTE**

Procedures are same for No. 1 or No. 2 generator. No. 2 is shown.

1. Loosen eight fasteners (1) and remove panel (2) to gain access to No. 2 ac generator wiring (3).
2. Loosen two fasteners (4) and remove terminal cover (5).
3. Tag and disconnect wiring (3) by removing four nuts (6) and washers (7). Tape ends. Disconnect plug (8). Use tags (E264) and tape (E385).




**WARNING**

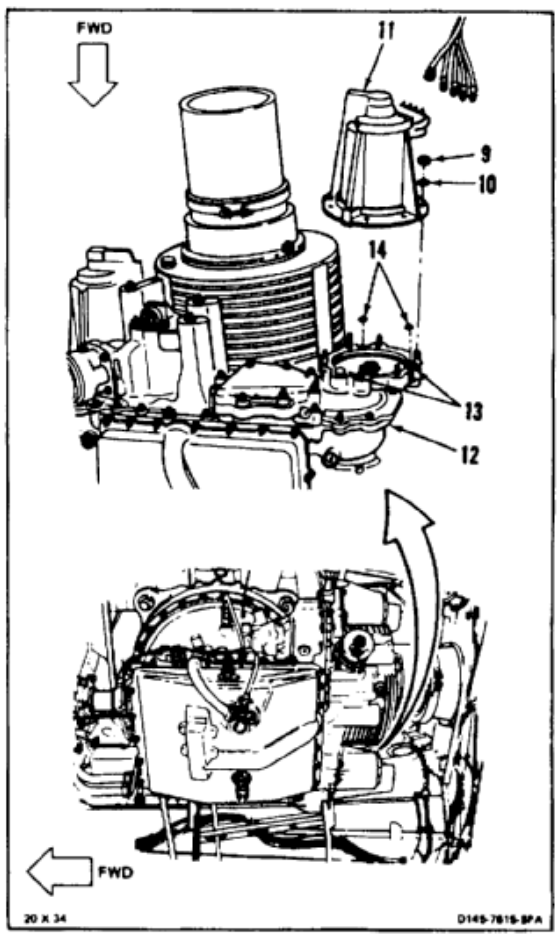
Generator is heavy and can injure personnel if it drops. Generator must be held firmly and moved carefully to prevent injury to personnel.

4. Remove eight nuts (9) and washers (10) from No. 2 ac generator (11).

**CAUTION**

Do not damage oil transfer tubes when removing generator.

5. Pull generator (11) straight back from transmission (12) and two oil transfer tubes (13). Remove generator.
6. Remove packings (14) from transfer tubes (13).
7. If generator (11) was removed because it failed, inspect generator oil screen (Task 6-158.2).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-32 INSTALL MAIN AC GENERATOR 9-32

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 30 to 150 Inch-Pounds
Workstand

***Materials:***

Oil (E254)

***Parts:***

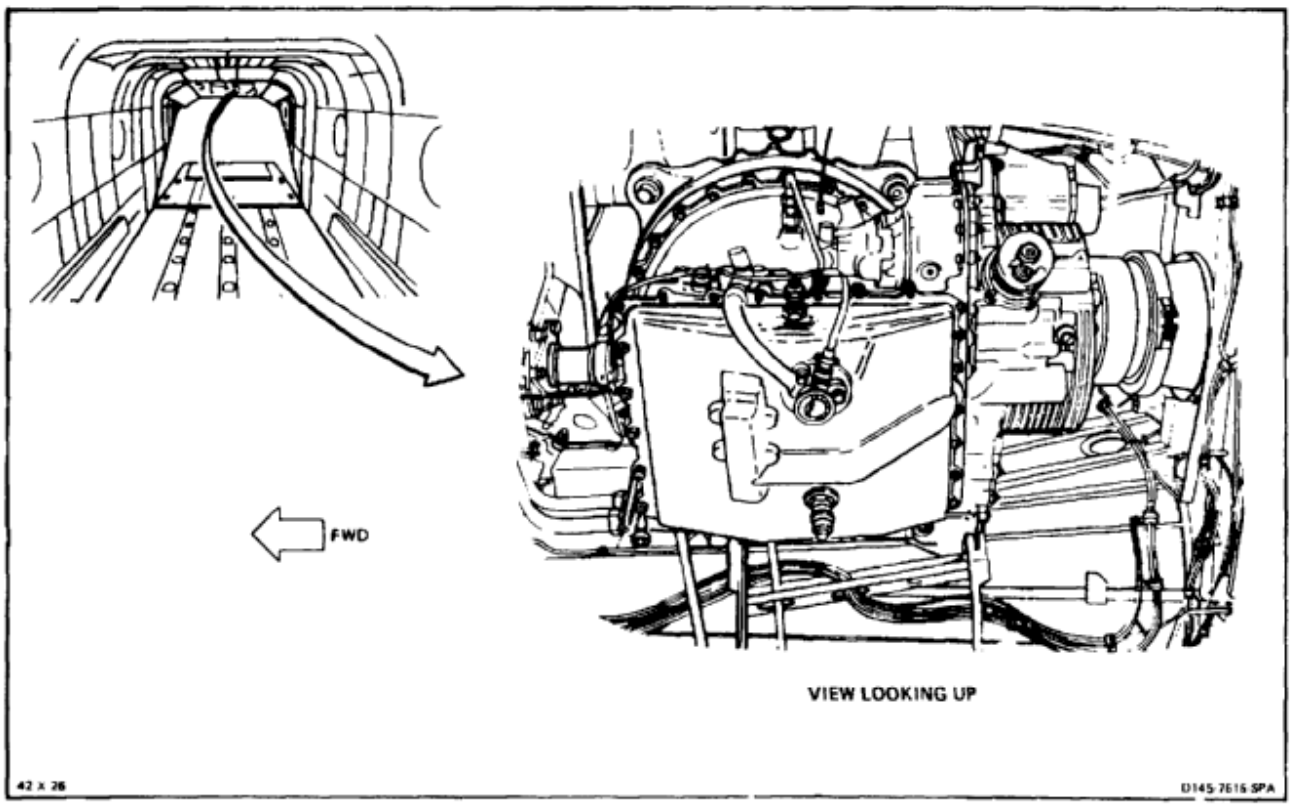
Packings

***Personnel Required:***

Medium Helicopter Repairer
Inspector

***References:***

TM 55-1520-240-23P



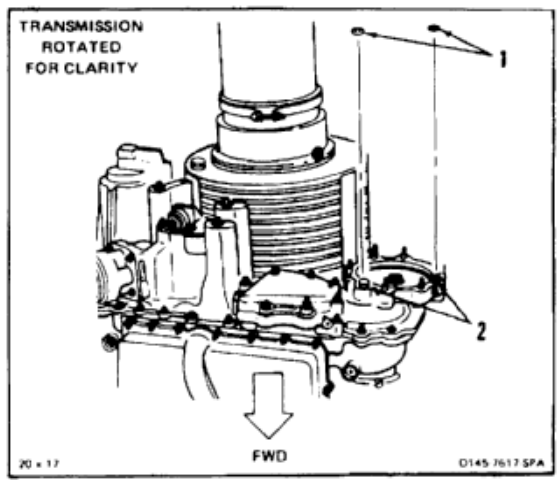
**WARNING**

Oil (E254) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for least **15 minutes**. Get medical attention for eyes.

**NOTE**

Procedures are same for No. 1 or No. 2 generator. No. 2 is shown.

1. Install new packings (1) on oil transfer tubes (2).




**WARNING**

Generator is heavy and can injure personnel if it drops. Generator must be held firmly and moved carefully to prevent injury to personnel.

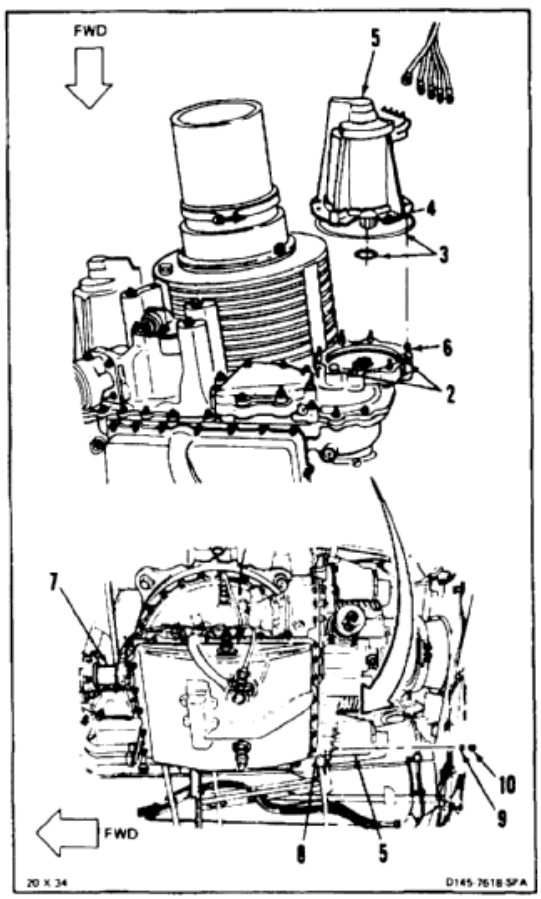
2. Install new packings (3) on generator shaft (4) and generator (5).

2.1. Lubricate splines of shaft (4) with oil.

3. Align generator (5) with studs (6) and transfer tubes (2). If needed, turn adapter and plate assembly (7) to align with splines of shaft (4).

4. Position generator (5) on transmission (8).

5. Install eight washers (9) and nuts (10). Torque nuts to **120 inch-pounds**.



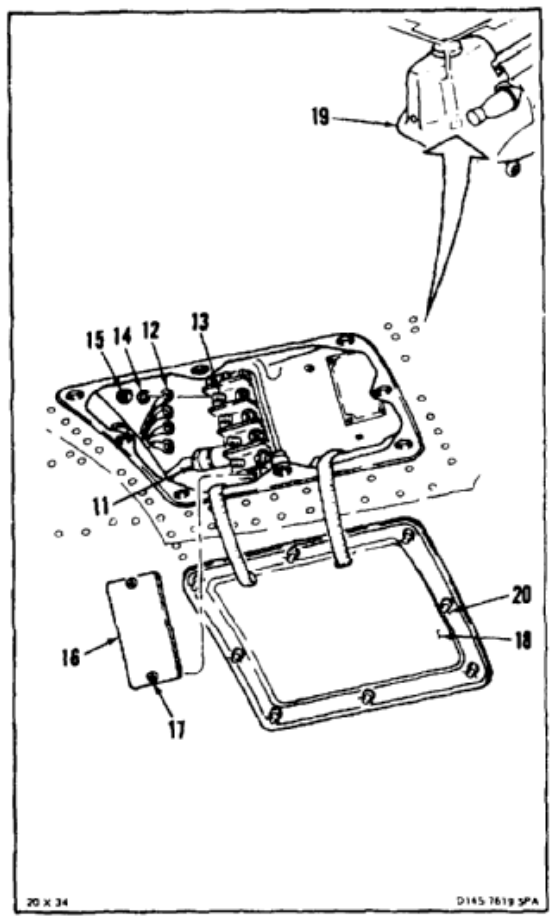
6. Connect plug (11). Remove tag.
7. Remove tape and install four wires (12) on terminals (13) using four washers (14) and nuts (15).

***INSPECT***

8. Position terminal cover (16) on terminals (13) and tighten two fasteners (17).
9. Position panel (18) on helicopter (19) and tighten eight fasteners (20).

***FOLLOW-ON MAINTENANCE:***

Perform operational test (TM 55-1520-240-T).
Close transmission baffles (Task 2-2).
Install aft transmission drip pan (Task 2-3).




END OF TASK

## 9-33 REMOVE APU GENERATOR 9-33

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Workstand

***Materials:***

Paper Tags (E264)
Tape (E385)

***Personnel Required:***

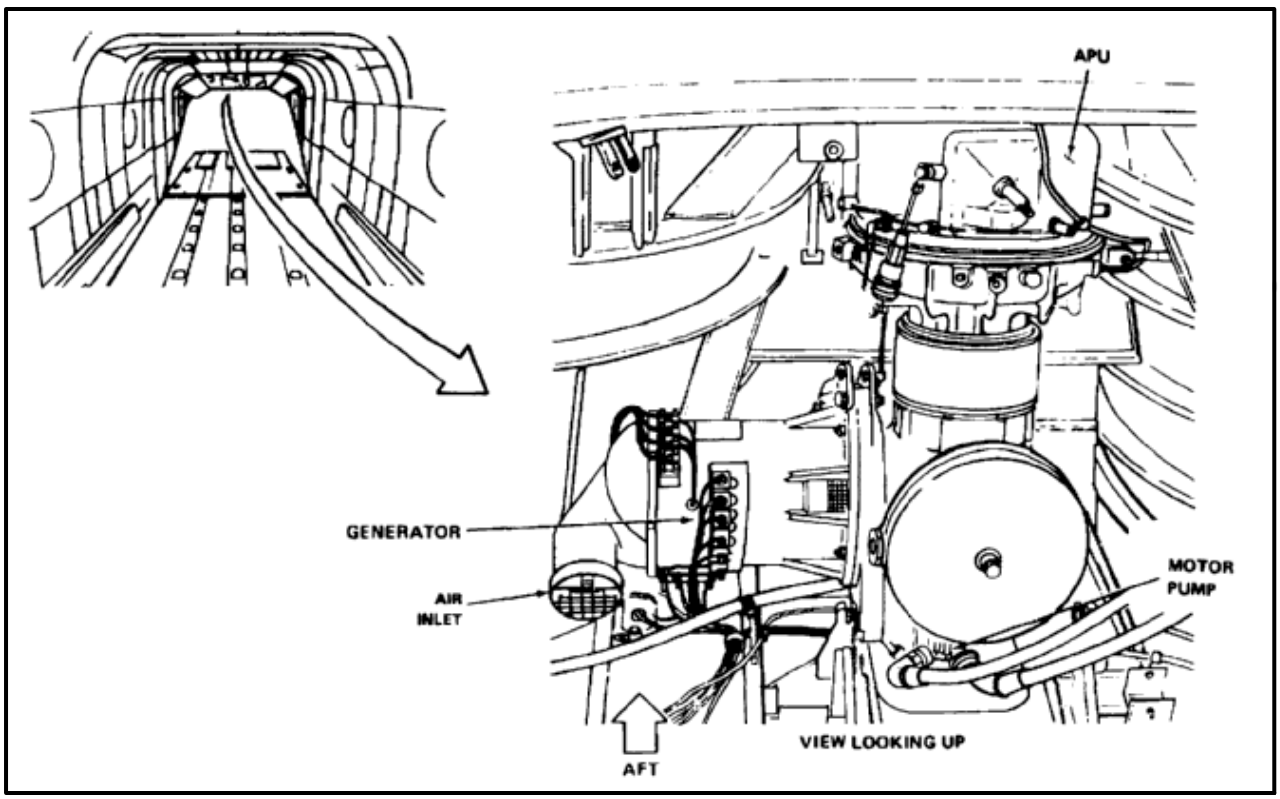
Medium Helicopter Repairer (2)

***References:***

TM 55-1520-240-10

***Equipment Condition:***

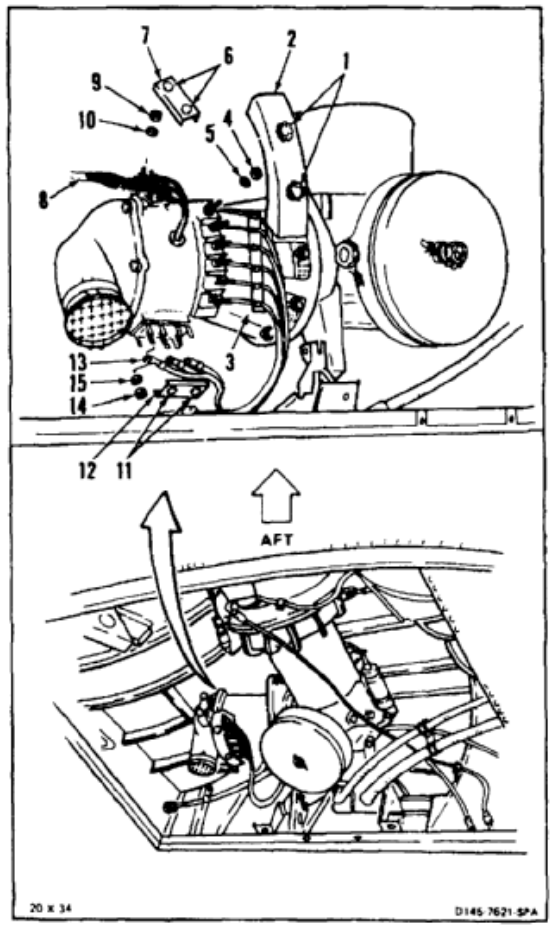
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Cargo Ramp Open and Level (Task 2-2)
APU Drip Pan Removed (Task 2-3)
Auxiliary Loading Ramp Extended (TM 55-1520-240-10)



**NOTE**

Ensure APU generator wires are properly tagged as the APU generator manufacturer (Lucas and Leland) have different wire terminal attachment points.

1. Loosen two fasteners (1) and remove terminal cover (2). Tag and disconnect six wires (3) by removing six nuts (4) and washers (5). Tape wire ends. Use tape (E385).
2. Loosen two fasteners (6) and remove terminal cover (7). Tag and disconnect four wires (8) by removing four nuts (9) and washers (10). Tape wire ends. Use tape (E385).
3. Loosen two fasteners (11) and remove terminal cover (12). Tag and disconnect three wires (13). By removing three nuts (14) and washers (15). Tape wire ends. Use tape (E385).

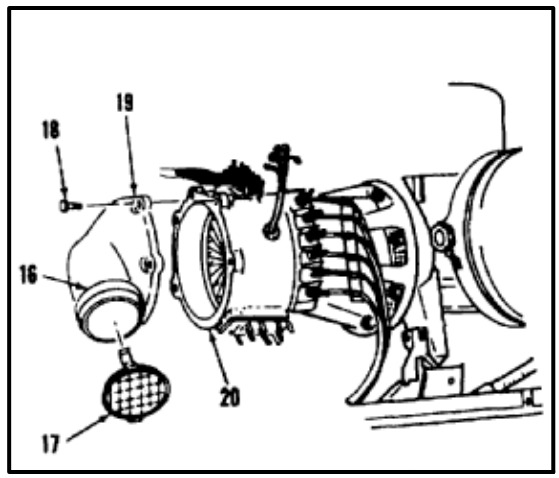


4. Loosen clamp (16) and remove screen (17).

**NOTE**

Top screw in air inlet is omitted to aid removal.

5. Remove lockwire, five screws (18), and air inlet (19) from generator (20).




**WARNING**

APU generator is heavy and can injure personnel if it drops. Generator must be held firmly and moved carefully to prevent injury to personnel.

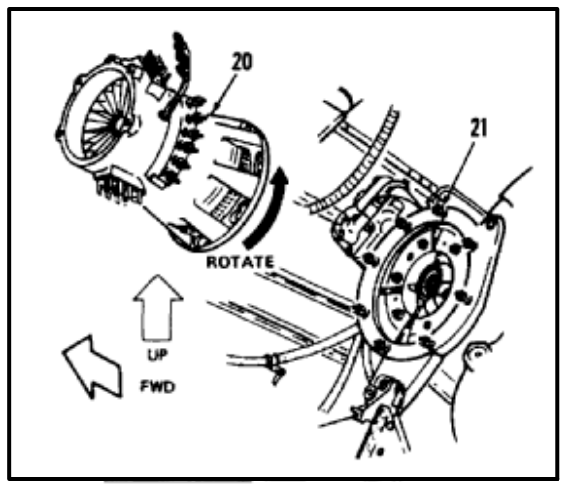
6. Loosen eight nuts (21). Rotate generator (20) counterclockwise and remove generator.

7. Deleted.

8. Deleted.

9. Deleted.

10. Deleted.




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-34 INSTALL APU GENERATOR 9-34

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-23-4692
Workstand

***Materials:***

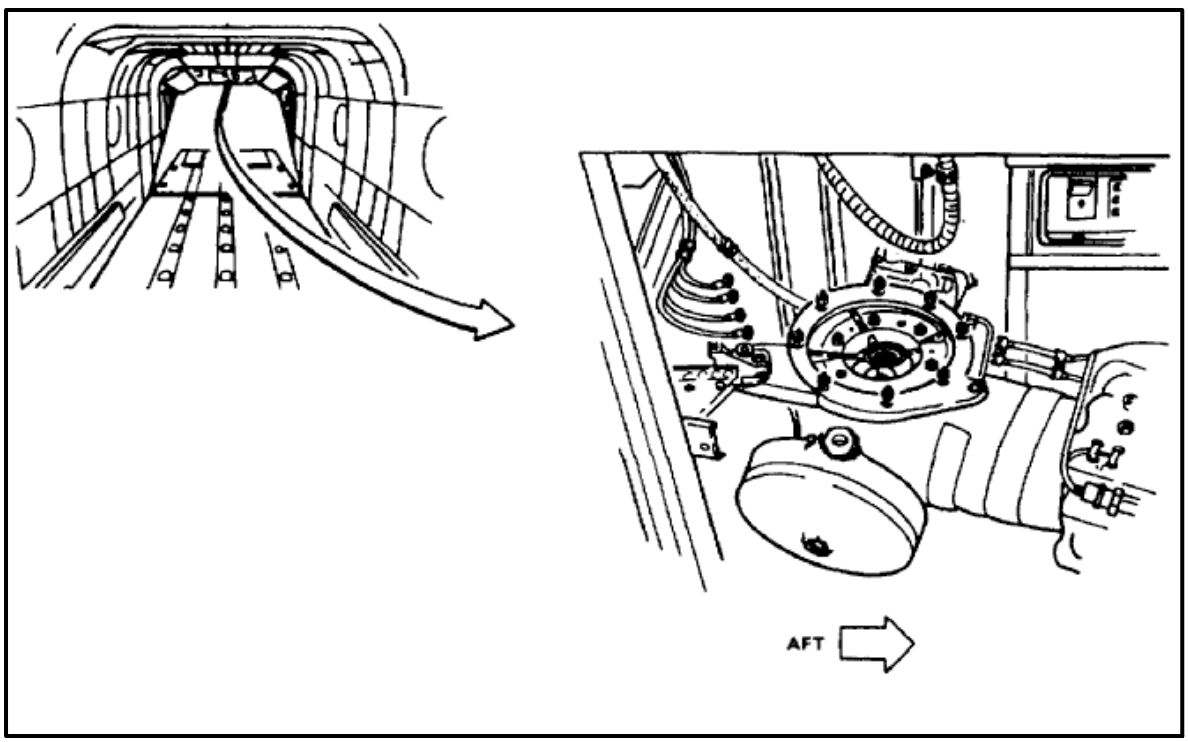
Grease (E190)
Lockwire (E231)

***Personnel Required:***

Medium Helicopter Repairer (2)
Inspector

***References:***

TM 55-1520-240-23P
TM 55-1520-240-10



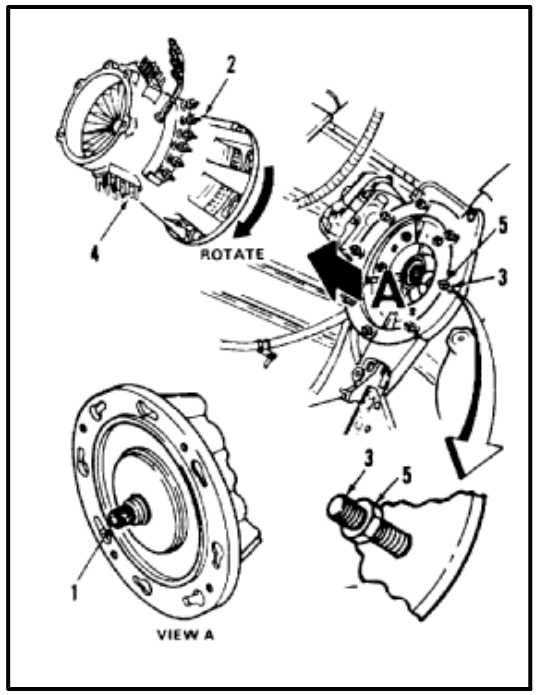
## 9-34 INSTALL APU GENERATOR (Continued) 9-34

1. Apply a light coating of grease (E190) to generator shaft splines (1).

**WARNING**

APU generator is heavy and can injure personnel if it drops. Generator must be held firmly and moved carefully to prevent injury.

2. Install generator (2) over studs (3) with nuts (5), large terminal board (4) down. Rotate generator clockwise. Tighten nuts (5).

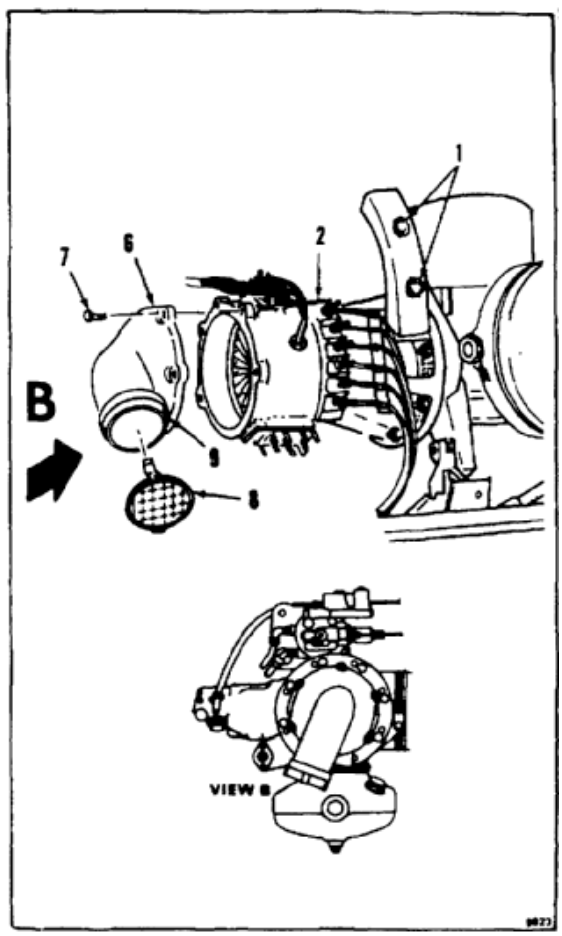



3. Position air inlet (6) on generator (2) and install five screws (7).

**NOTE**

Top screw in air inlet is omitted.

4. Lockwire (E231) screws (7).
5. Install screen (8) and clamp (9).



6. Remove tape and connect three wires (10) to terminals (11) by installing three washers (12) and nuts (13). Remove tags.
7. Install terminal cover (14) and tighten two fasteners (15).
8. Remove tape and connect four wires (16) to terminals (17) by installing four washers (18) and nuts (19). Remove tags. Install terminal cover (20) and tighten two fasteners (21).

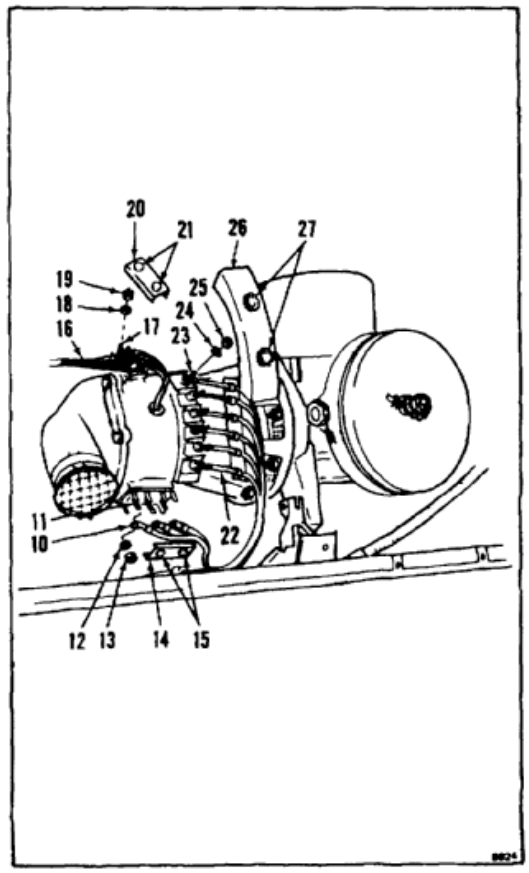
**NOTE**

Ensure APU generator wires are properly connected to the APU generator as the APU generator manufacturers (Lucas and Leland) have different wire terminal attachment points.

**NOTE**

If Leland APU generator is installed, Lucas generator terminal board will not fit. Use rubber nipple (P/N MS 25171-4S - NSN 5975-00-553-7077) or equivalent.

9. Remove tape and connect six wires (22) to terminals (23) by installing six washers (24) and nuts (25). Remove tags. Install terminal cover (26) and tighten two fasteners (27).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check of generator (TM 55-1520-240-T).
Install APU drip pan (Task 2-3).
Fold auxiliary loading ramp (TM 55-1520-240-10).
Close cargo ramp (Task 2-2).

END OF TASK

## 9-34.1 REMOVE APU FUEL SHUT-OFF RELAY 9-34.1

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

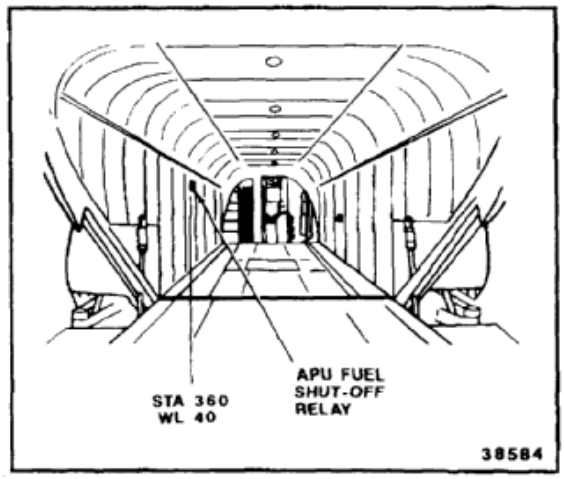
Paper Tags (E264)

***Personnel Required:***

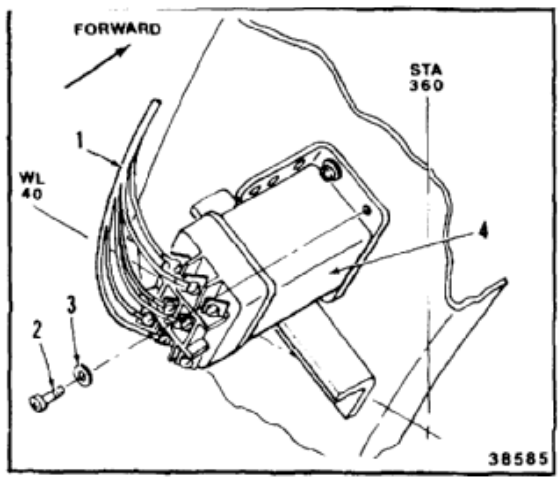
Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Cabin Acoustic Blanket Remove Sta. 360 (Task 2-208)




1. Tag and disconnect seven wires (1). Use tags (E264).
2. Remove four screws (2) and washers (3).
3. Remove APU fuel shut-off relay (4) from aircraft.




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-34.2 INSTALL APU FUEL SHUT-OFF RELAY 9-34.2

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Biddle Ohmmeter (T7) or Equivalent

***Materials:***

Cloths (E120)
Gloves (E184.1)
Naphtha (E245)

***Personnel Required:***

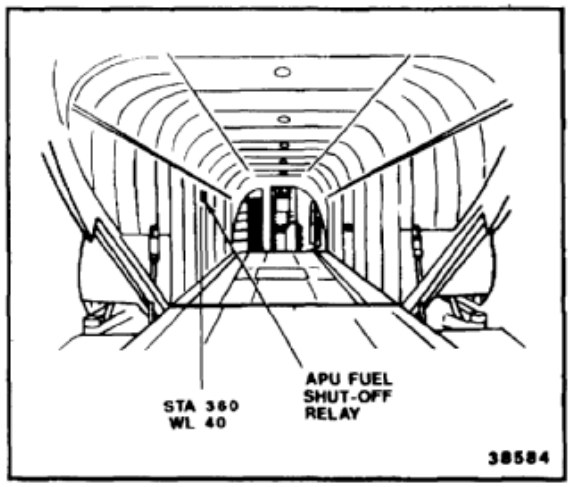
Aircraft Electrician

***References:***

TM 9-6625-975-35
TM 55-1500-323-24
TM 55-1500-343-23

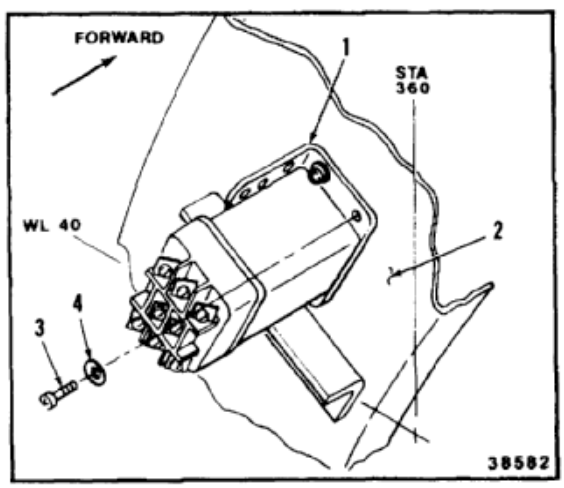
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Cabin Acoustic Blanket Removed Sta. 360 (Task 2-208)




**WARNING**

Naphtha (E245) is flammable and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from heat or open flame. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

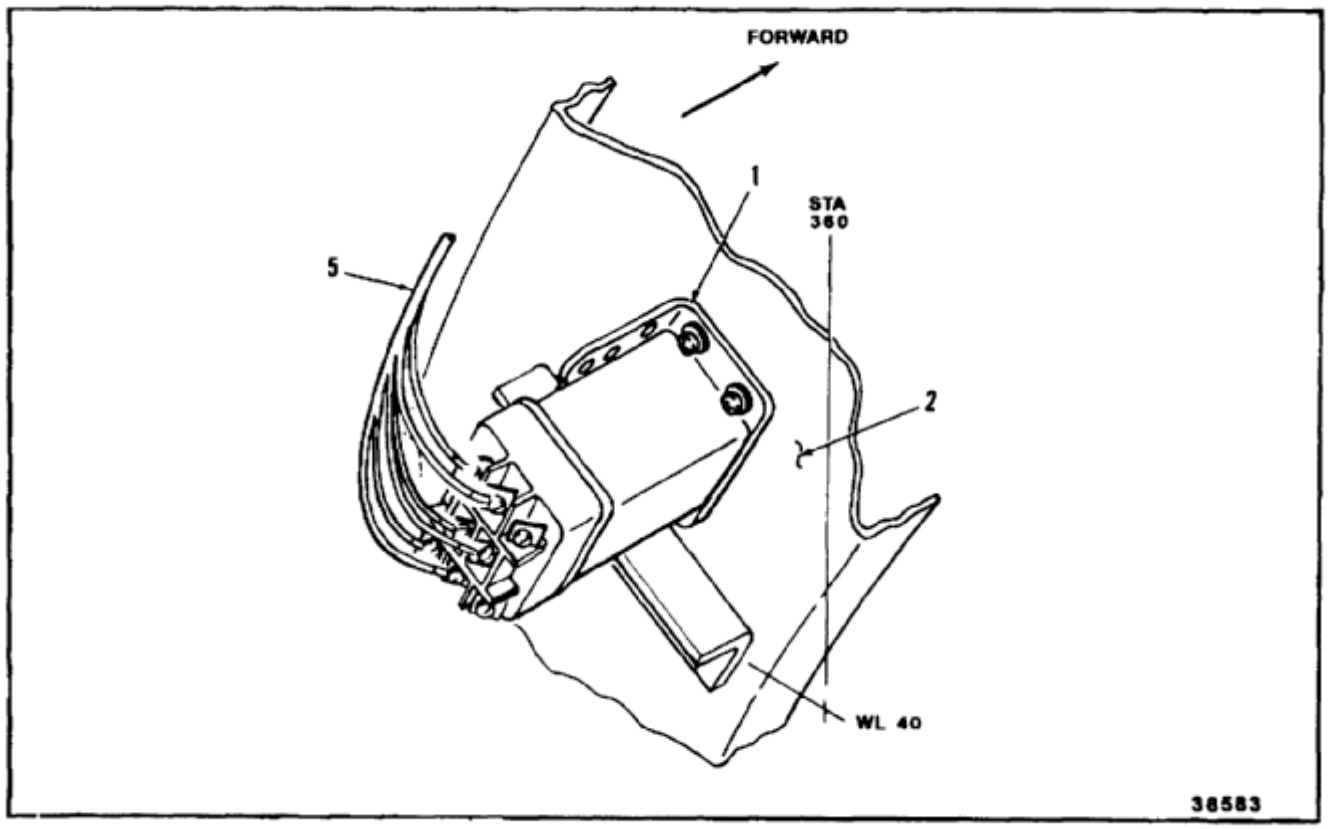



1. Clean bonding and grounding surfaces thoroughly before installing APU fuel shut-off relay (1). Use naphtha (E245) and cloths (E120). Wear gloves (E184.1) and goggles.
2. Install APU fuel shut-off relay (1) on aircraft structure (2) with four screws (3) and washers (4).

3. Perform bonding check from relay (1) to structure (2). Use biddle ohmmeter (T7) or equivalent to test the resistance between the cleaned areas. Resistance shall be **0.0025 ohms or less** (TM 9-6625-975-35 and TM 55-1500-323-24).
4. Refinish exposed surfaces in accordance with applicable corrosion control directives (TM 55-1500-343-23).
5. Connect seven wires (5) to relay (1). Remove and discard tags.

***FOLLOW-ON MAINTENANCE:***

Cabin acoustic blanket installed sta. 360 (Task 2-210).




END OF TASK

## 9-35 REMOVE GENERATOR CONTROL PANEL 9-35

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

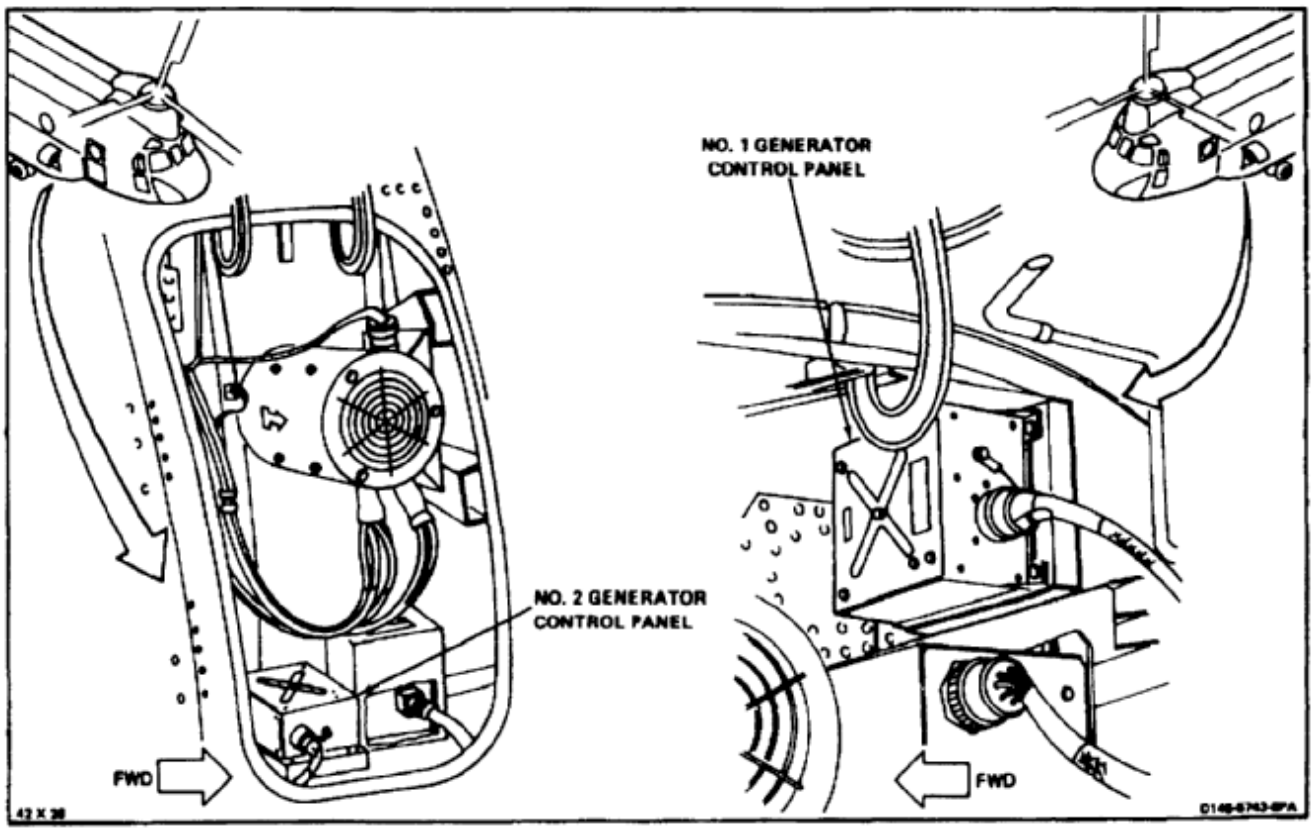
None

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

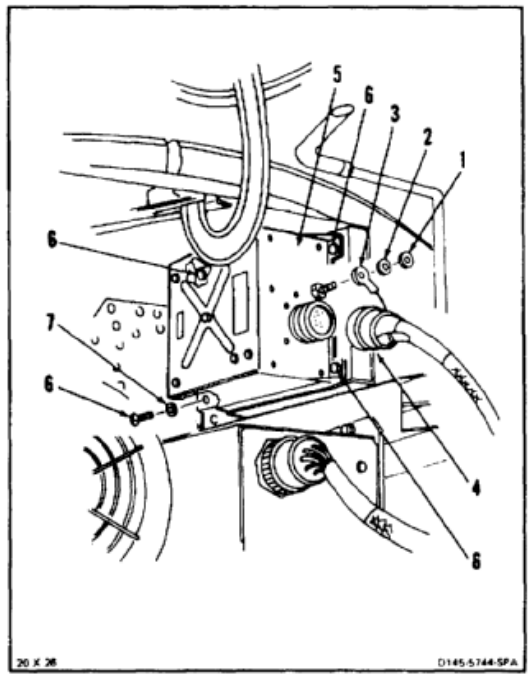
Battery Disconnected (Task 1-39)
Electrical Power Off
Left or Right Electrical Compartment Access Door Open (Task 2-2)



**NOTE**

Procedure is same to remove No. 1 or No. 2 generator control panel. Removal of No. 1 panel is shown here.

1. Remove nut (1) and washer (2). Disconnect wire (3).
2. Disconnect electrical connector (4) from panel (5).
3. Remove four screws (6) and washers (7).
4. Remove panel (5).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-36 INSTALL GENERATOR CONTROL PANEL 9-36

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

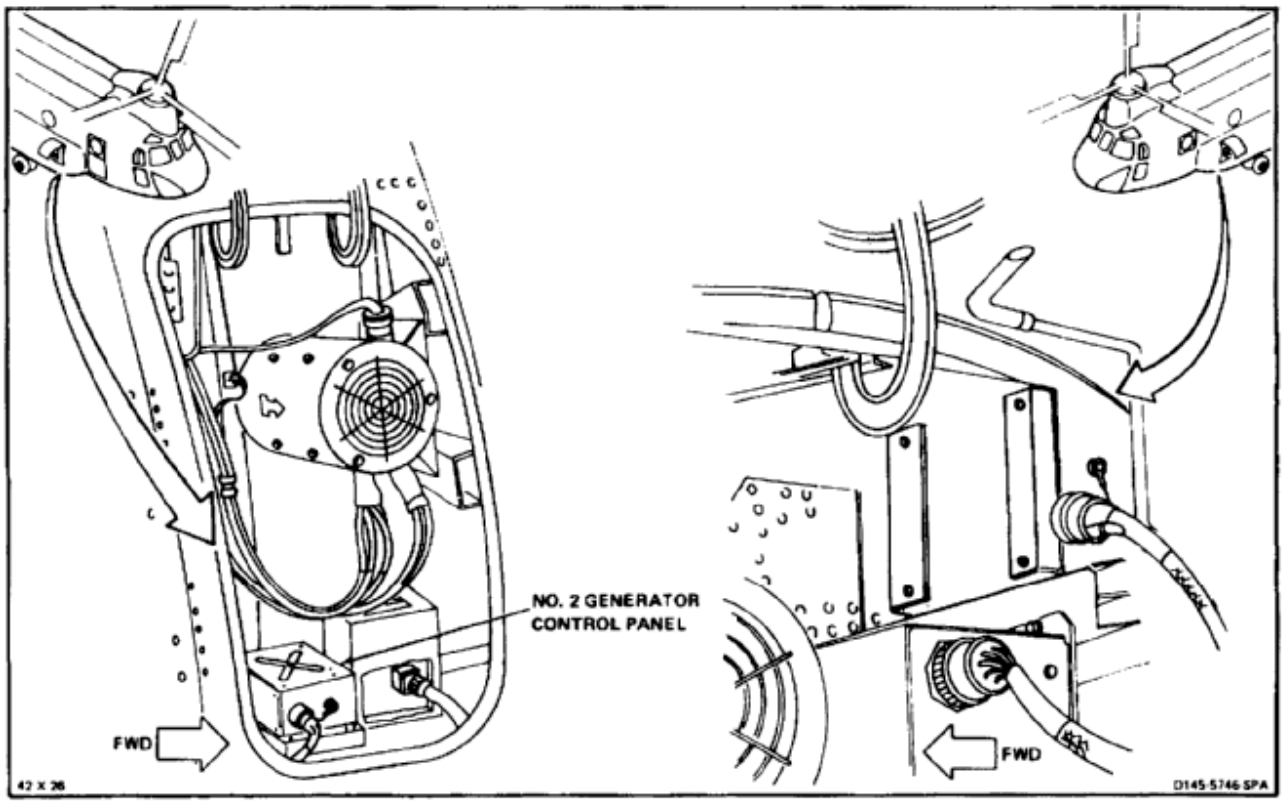
None

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P

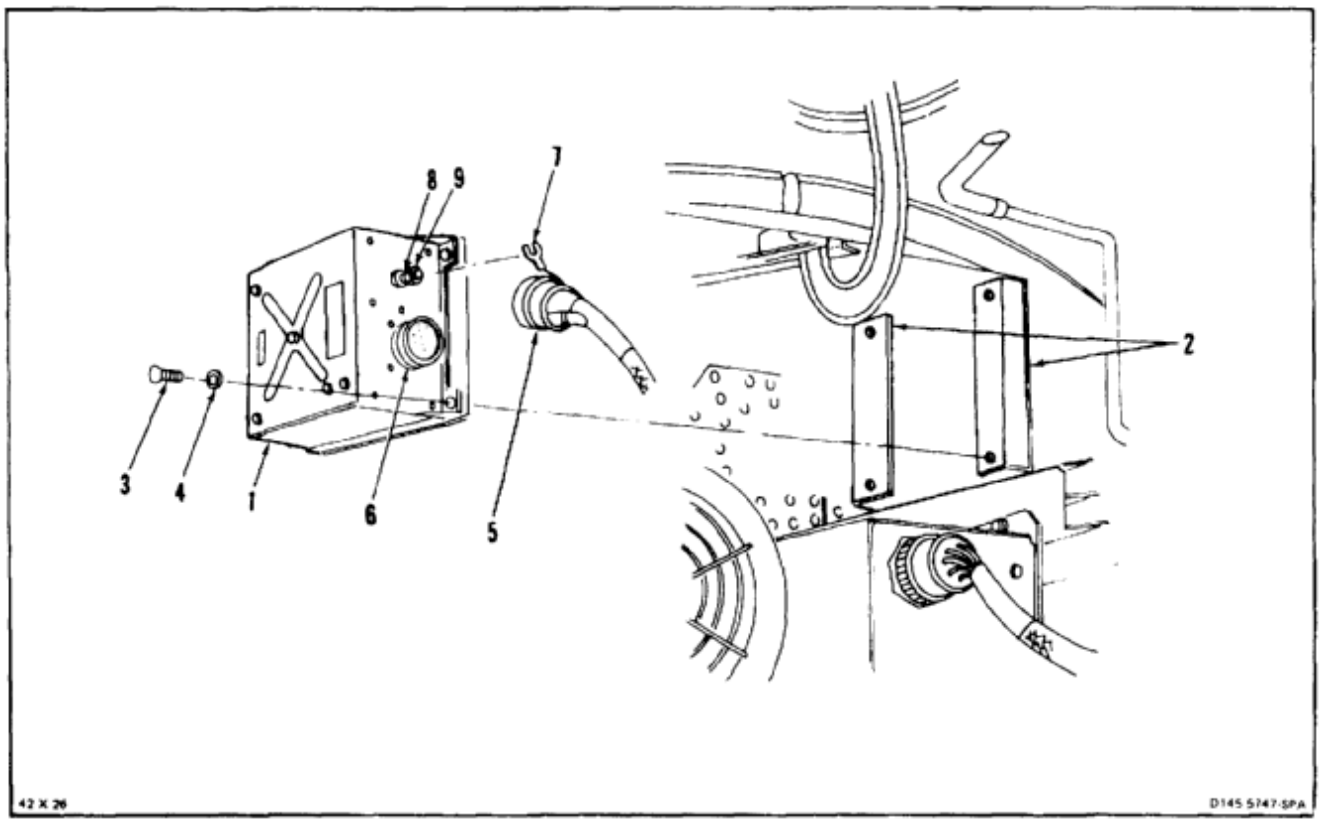


**NOTE**

Procedure is same to install No. 1 or No. 2 generator control panel. Installation of No. 1 is shown here.

1. Position panel (1) on brackets (2). Install four screws (3) and washers (4).
2. Connect electrical connector (5) to receptacle (6).
3. Connect wire (7) on stud (8). Tighten nut (9).

***INSPECT***




***FOLLOW-ON MAINTENANCE:***

Close left or right electrical compartment access door (Task 2-2).
Perform operational check of ac power system (TM 55-1520-240-T).

END OF TASK

## 9-36.1 REPLACE APU GENERATOR CONTROL PANEL 9-36.1

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

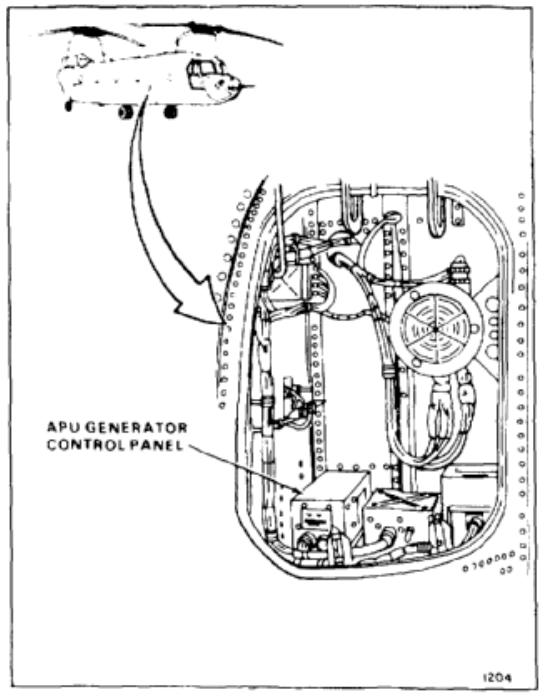
None

***Personnel Required:***

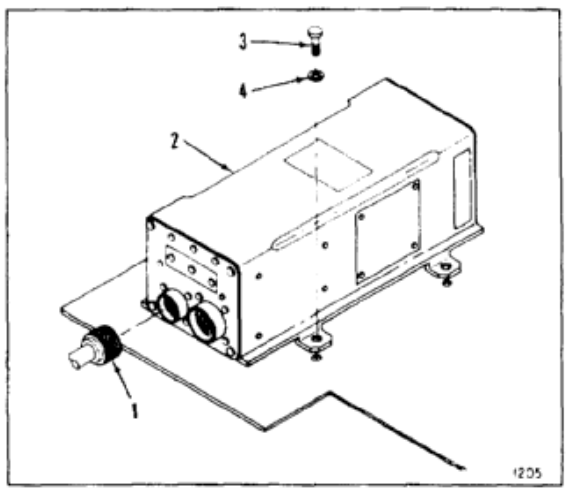
Aircraft Electrician
Inspector

***Equipment Condition:***

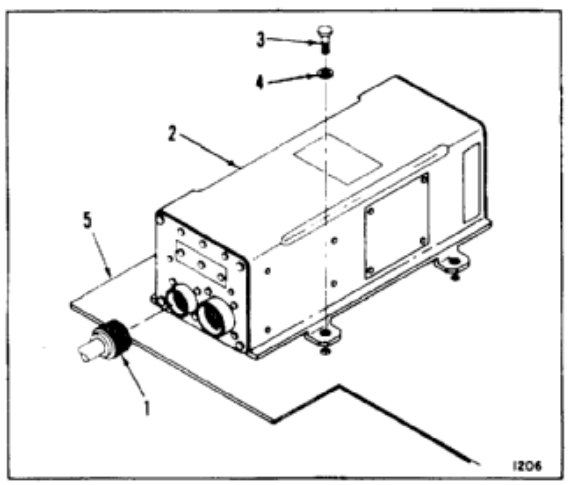
Battery Disconnected (Task 1-39)
Electrical Power Off
Right Electrical Compartment Access Door Open (Task 2-2)




1. Disconnect electrical connector (1) from control panel (2).
2. Remove four screws (3) and washers (4). Remove panel (2).




3. Position control panel (2) on shelf (5). Install four screws (3) and washers (4).
4. Connect electrical connector (1).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Close right electrical compartment access door (Task 2-2).
Perform operational check of ac power system (TM 55-1520-240-T).

END OF TASK

## 9-37 REMOVE EXTERNAL POWER MONITOR 9-37

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

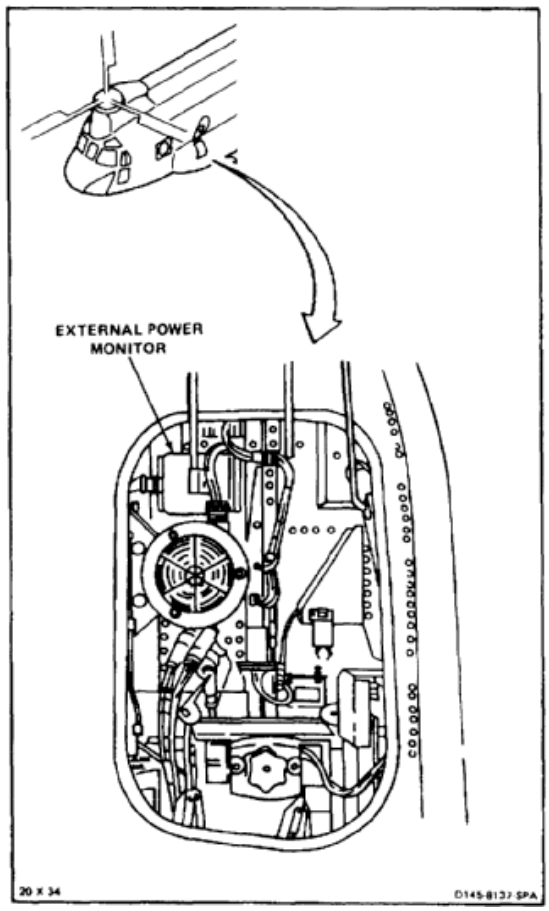
Paper Tags (E264)

***Personnel Required:***

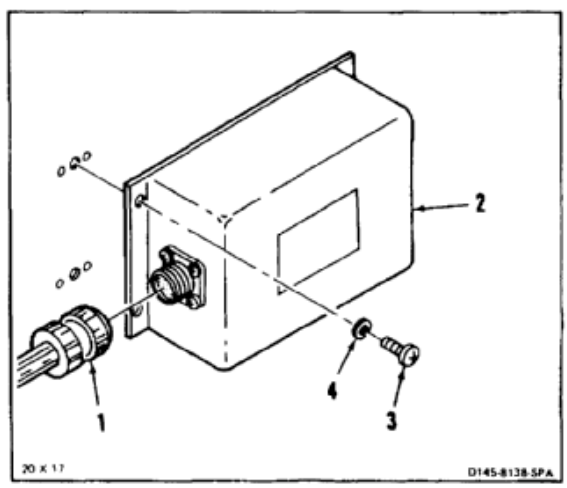
Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Electrical Compartment Left Forward Access Cover Open (Task 2-2)




1. Disconnect connector (1) from external power monitor (2).
2. Remove four screws (3) and washers (4) from monitor (2). Remove monitor.




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-38 INSTALL EXTERNAL POWER MONITOR 9-38

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

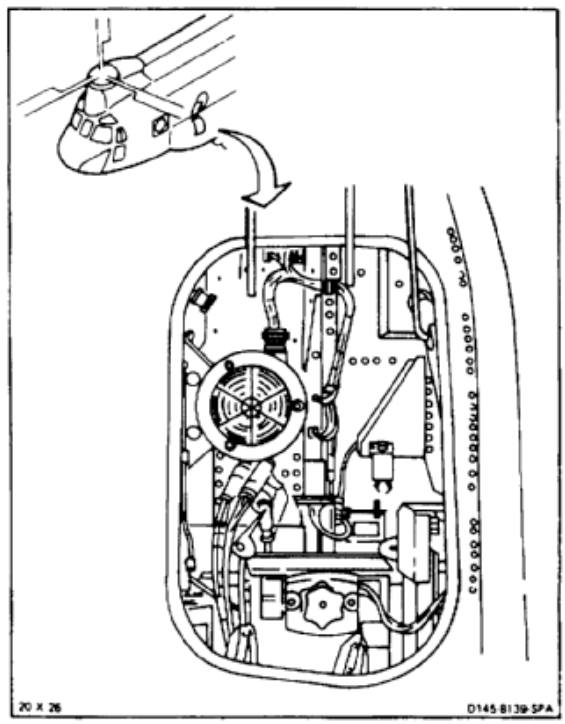
None

***Personnel Required:***

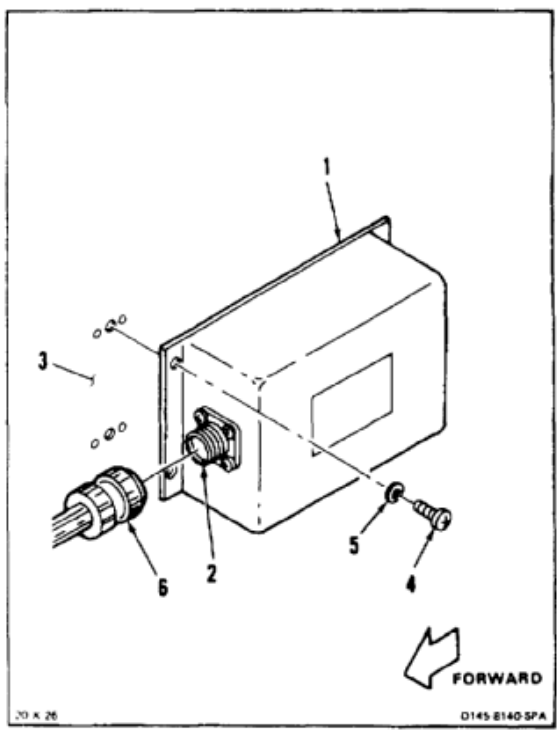
Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P




1. Position external power monitor (1), receptacle (2) forward, on unboard panel (3) of electrical compartment upper forward side.
2. Install four screws (4) and washers (5) in monitor (1).
3. Connect connector (6) to receptacle (2) of monitor (1).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check of electrical system (TM 55-1520-240-T).
Close left forward access cover of electrical compartment (Task 2-2).

END OF TASK

## 9-38.1 REPLACE EXTERNAL POWER CONTACTOR 9-38.1

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

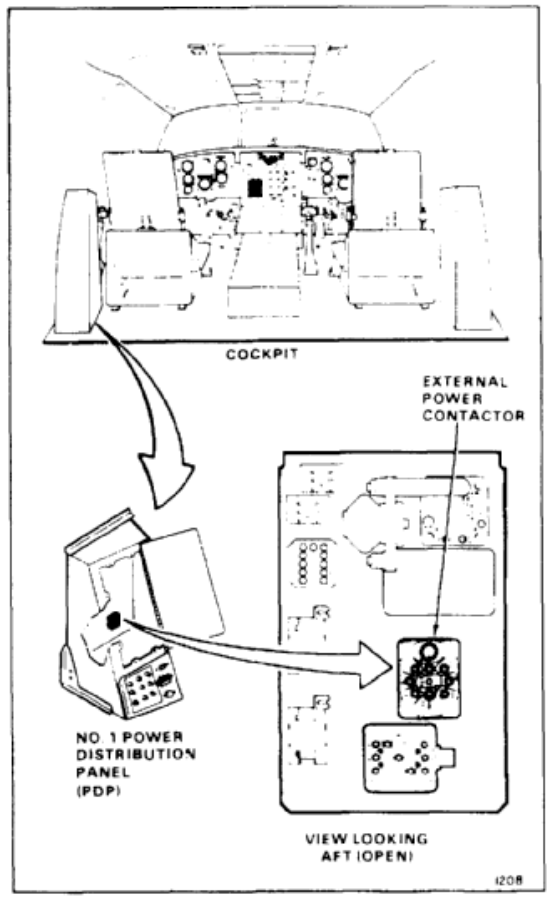
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

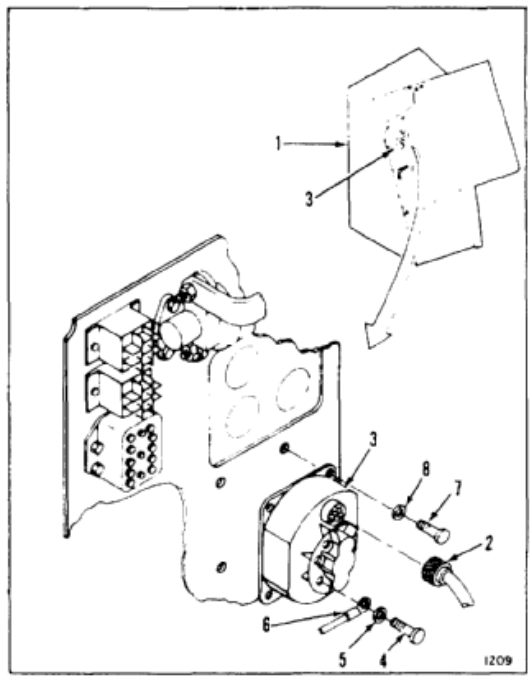
Aircraft Electrician
Inspector

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off



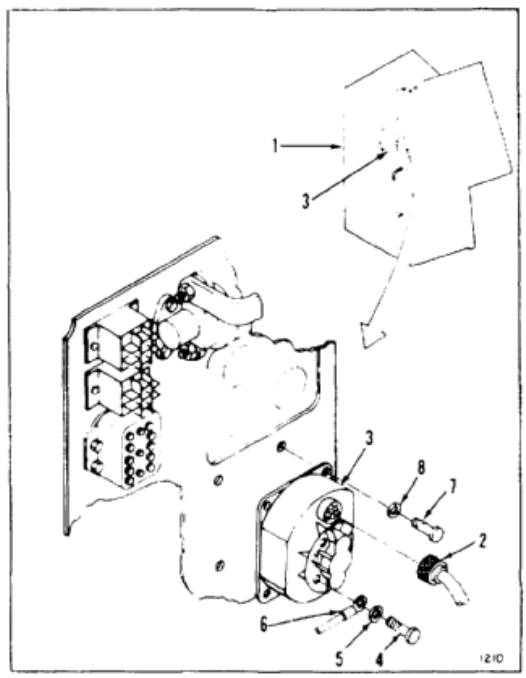
1. Open No. 1 power distribution panel (PDP) (1).
2. Disconnect electrical connector (2) from external power contactor (3).
3. Remove nine screws (4) and washers (5). Tag and remove nine wires (6). Use tags (E264). Tape ends of wires. Use tape (E385).
4. Remove four screws (7) and washers (8). Remove contactor (3).




5. Position contactor (3) on No. 1 PDP (1). Install four screws (7), and washers (8).
6. Remove tape from nine wires (6). Position wires on contactor (3). Install nine screws (4) and washers (5). Remove tags.
7. Connect electrical connector (2).

***INSPECT***

8. Close No. 1 PDP (1).




***FOLLOW-ON MAINTENANCE:***

Perform operational check of ac power system (TM 55-1520-240-T).

END OF TASK

## 9-39 REMOVE MAIN CURRENT TRANSFORMER 9-39

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

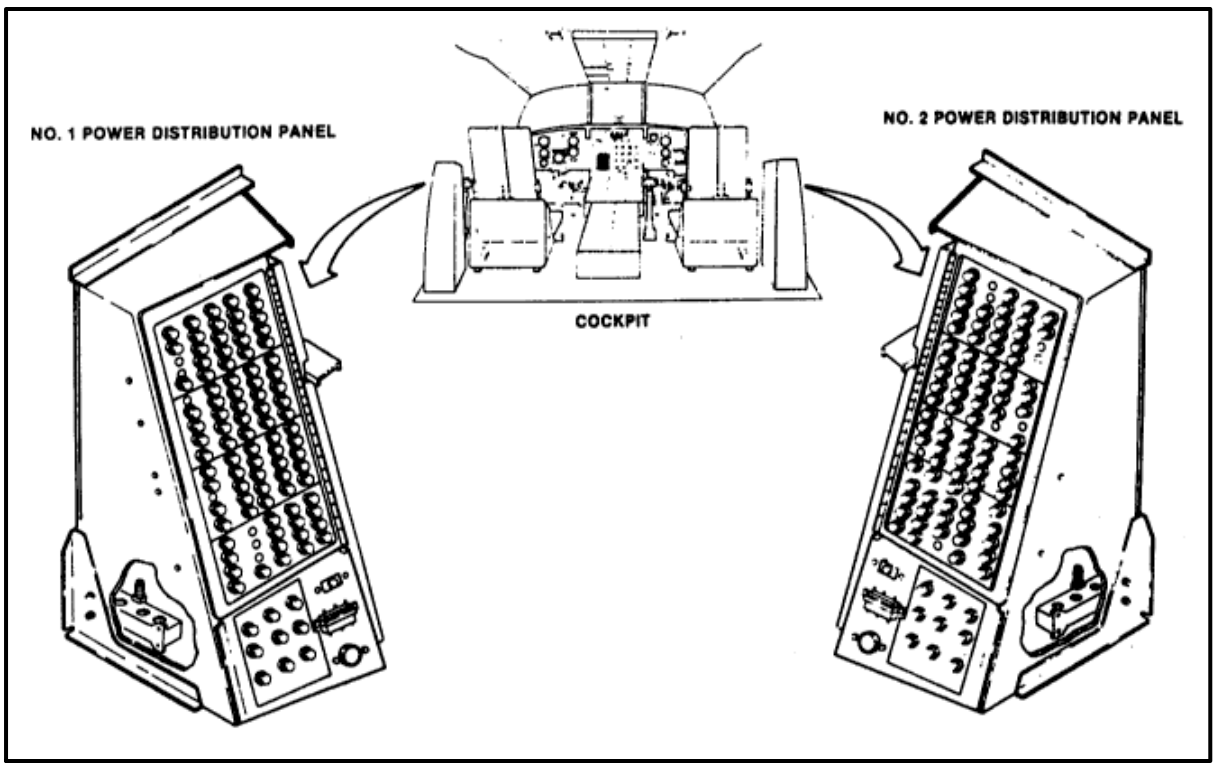
Tags (E264)
Tape (E385)

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

Battery Disconnect (Task 1-39)
Hydraulic Power Off



## 9-39 REMOVE MAIN CURRENT TRANSFORMER (Continued) 9-39

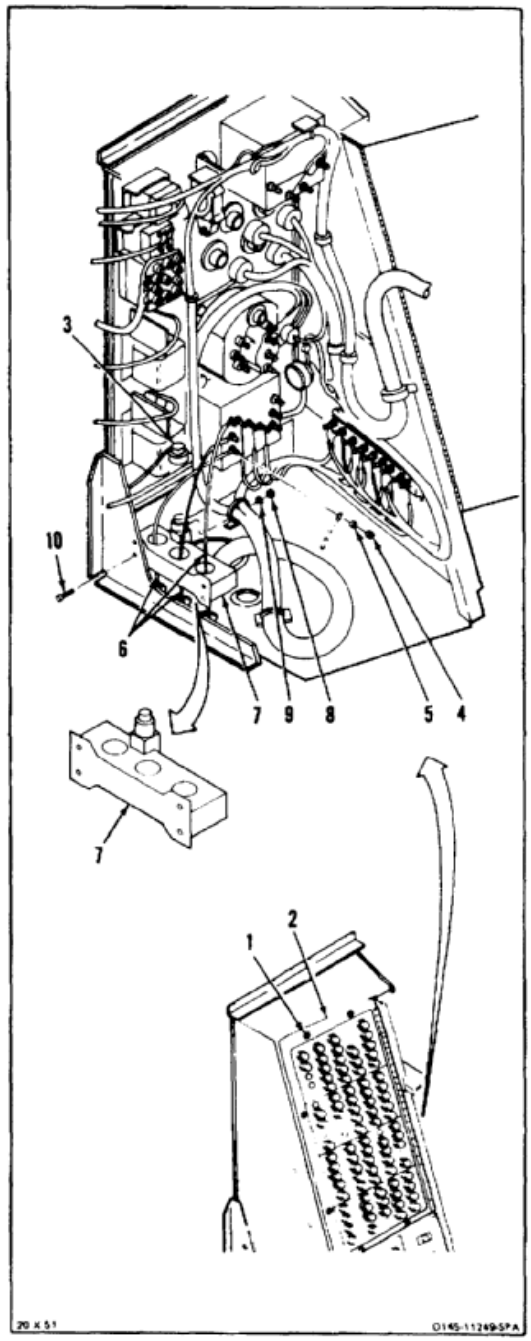
**NOTE**

Procedure is same to remove main current transformer from either power distribution panel (PDP). Left hand No. 1 PDP is shown here.

1. Loosen six fasteners (1). Open panel (2).
2. Disconnect electrical connector (3).
3. Remove three nuts (4) and washers (5). Disconnect three wires (6). Pull wires down through hole in transformer (7).
4. Tag wires (6). Wrap ends of wires. Use tape (E385).
5. Remove four nuts (8), washers (9), and bolts (10). Remove transformer (7).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-40 INSTALL MAIN CURRENT TRANSFORMER 9-40

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

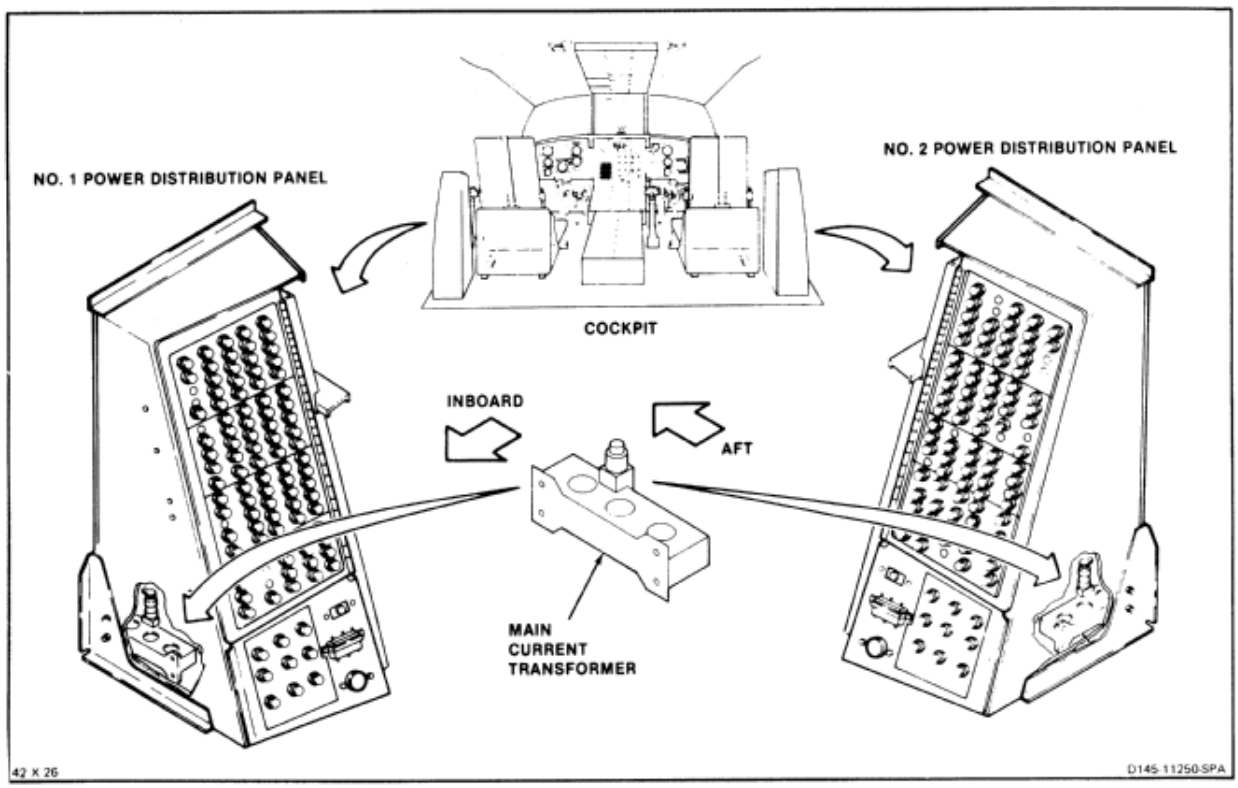
None

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P

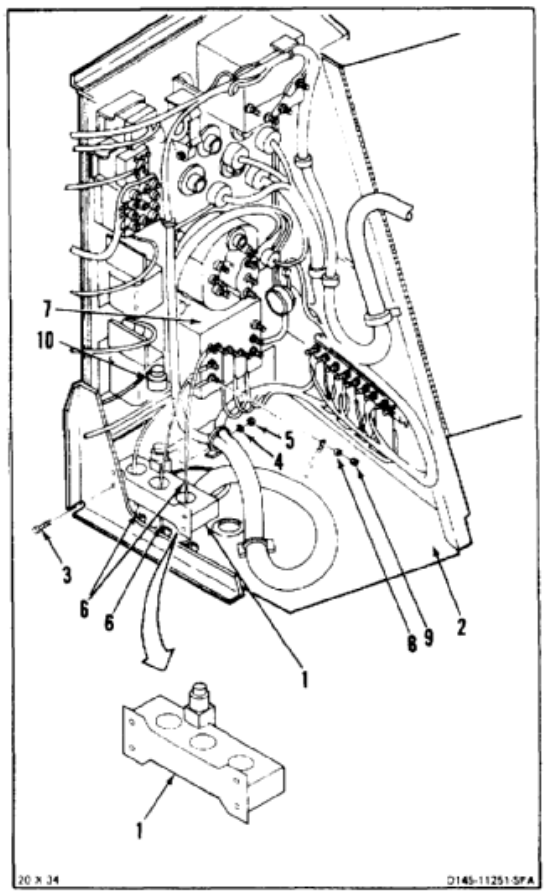


**NOTE**

Procedure is same to install main current transformers in either power distribution panel (PDP). No. 1 left PDP is shown here.

1. Position main current transformer (1) in PDP (2). Install four bolts (3), washers (4), and nuts (5).
2. Pull wires (6) through holes in transformer (1).
3. Remove tag and tape from three wires (6).
4. Connect three wires (6) to generator bus contactor (7). Install three washers (8) and nuts (9).
5. Connect electrical connector (10).

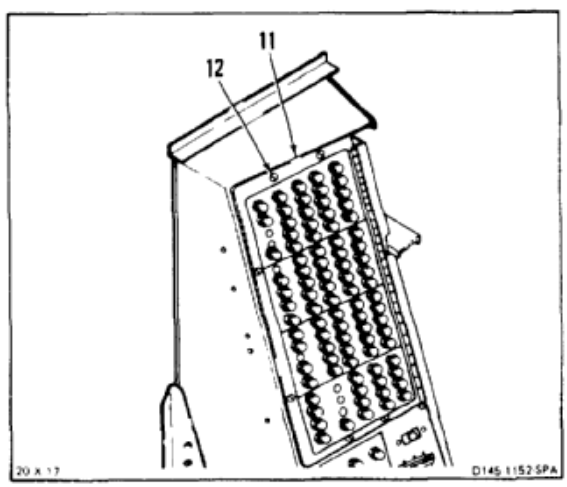
***INSPECT***




6. Close panel (11). Secure six fasteners (12).

***FOLLOW-ON MAINTENANCE:***

Perform generator operational check (TM 55-1520-240-T).




END OF TASK

## 9-41 REMOVE APU GENERATOR CURRENT TRANSFORMER — AFT 9-41

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Workstand

***Materials:***

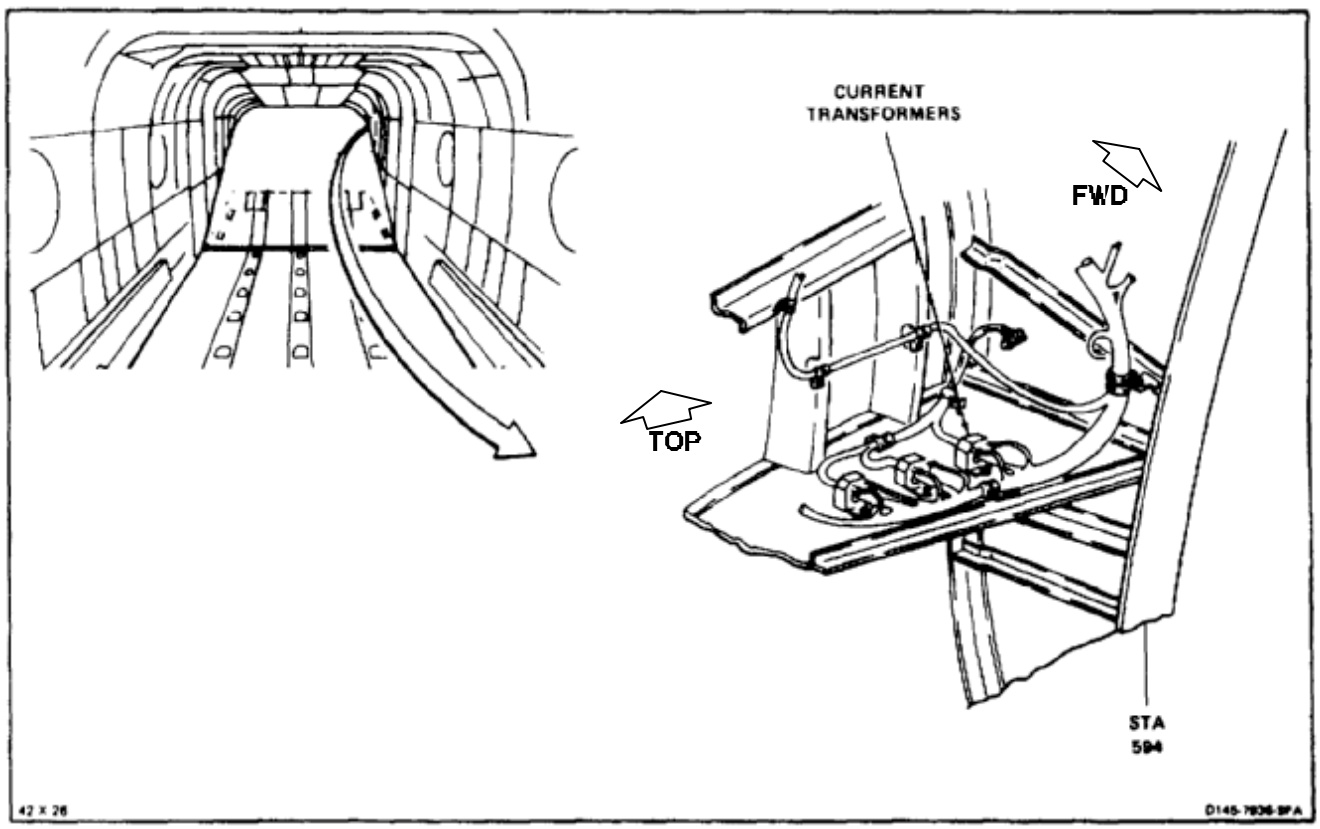
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Cargo Ramp Open and Level (Task 2-2)

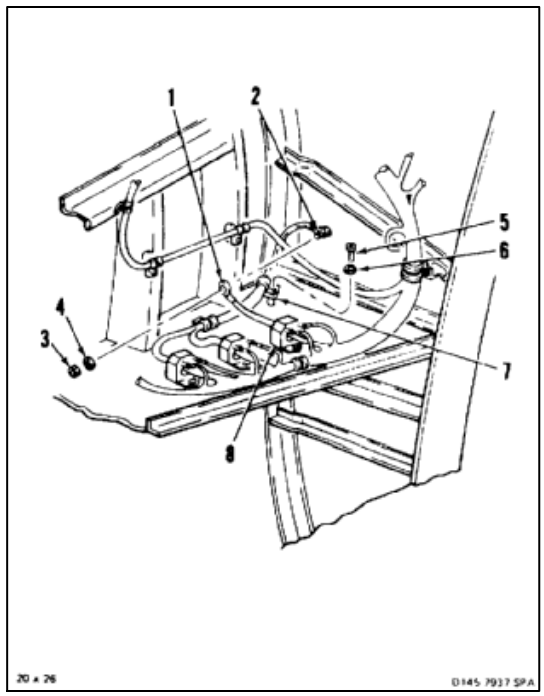


## 9-41 REMOVE APU GENERATOR CURRENT TRANSFORMER — AFT (Continued) 9-41

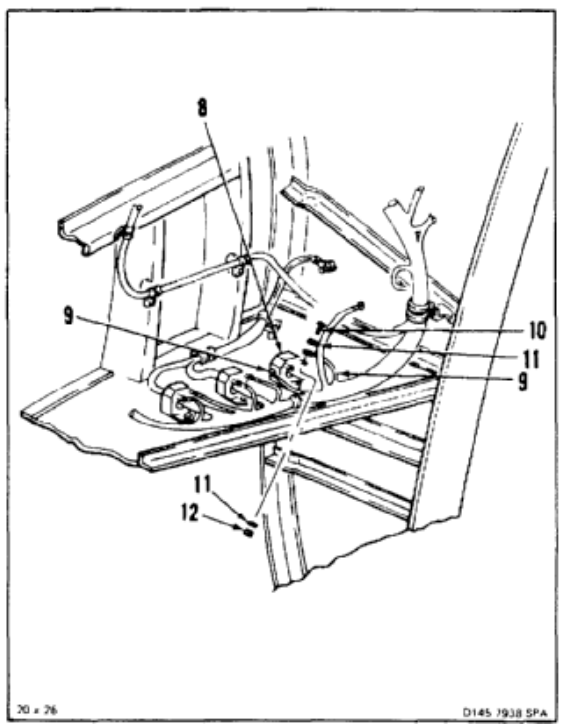
**NOTE**

Procedure is same for removal of three APU current transformers. Removal of one transformer is shown here.

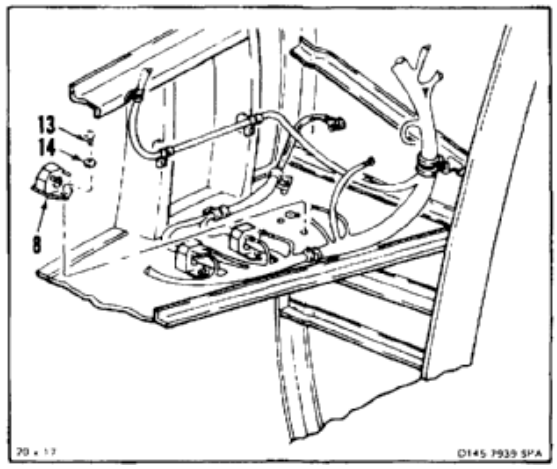
1. Tag and disconnect wire (1) from ground stud (2) by removing nut (3) and washer (4). Tape end.
2. Remove screw (5) and washer (6) from clamp (7).
3. Remove wire (1) from clamp (7) and feed through transformer (8).




4. Tag and disconnect two wires (9) from transformer (8) by removing two screws (10), four washers (11), and two nuts (12). Tape ends.



5. Remove two screws (13) and washers (14). Remove transformer (8).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-42 INSTALL APU GENERATOR CURRENT TRANSFORMER — AFT 9-42

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Workstand

***Materials:***

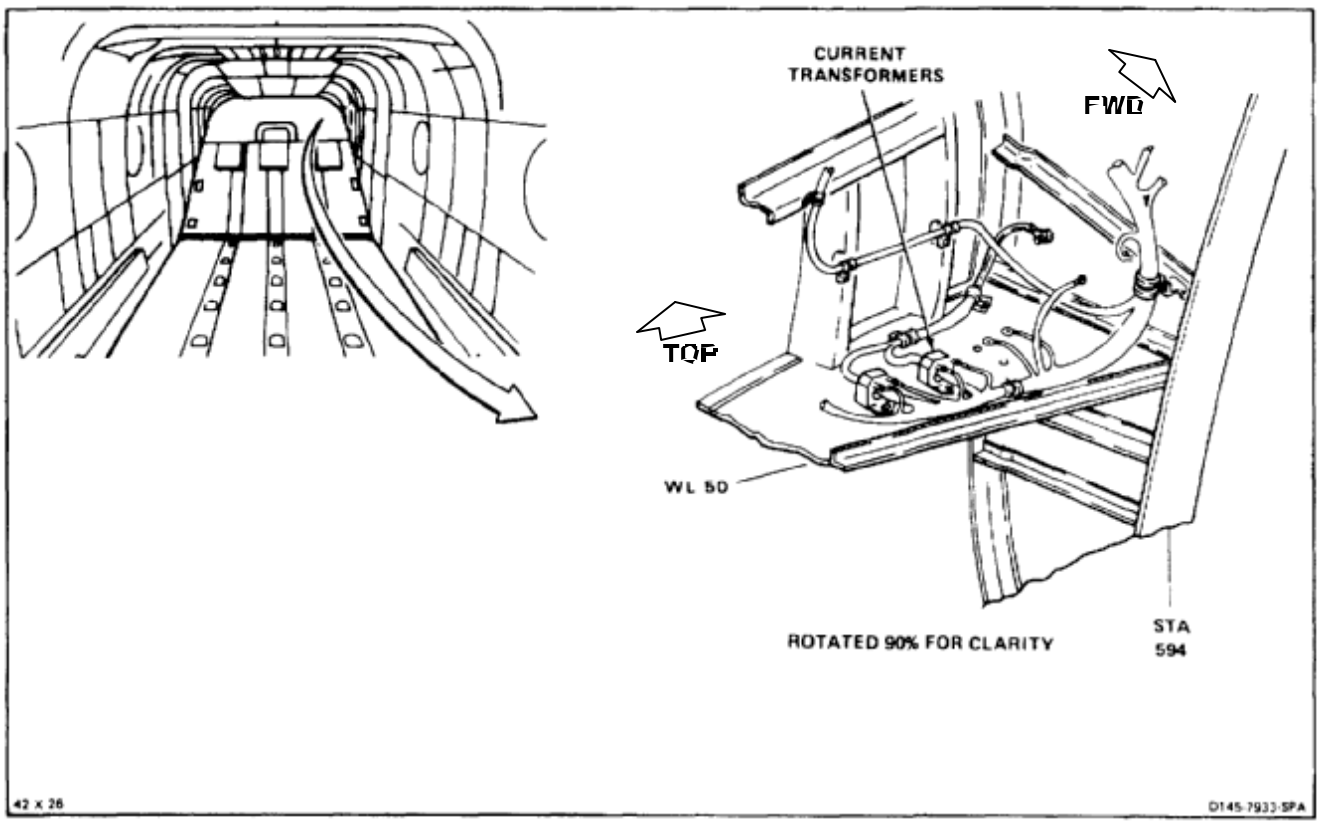
None

***Personnel Required:***

Aircraft Electrician (2)

***References:***

TM 55-1520-240-23P



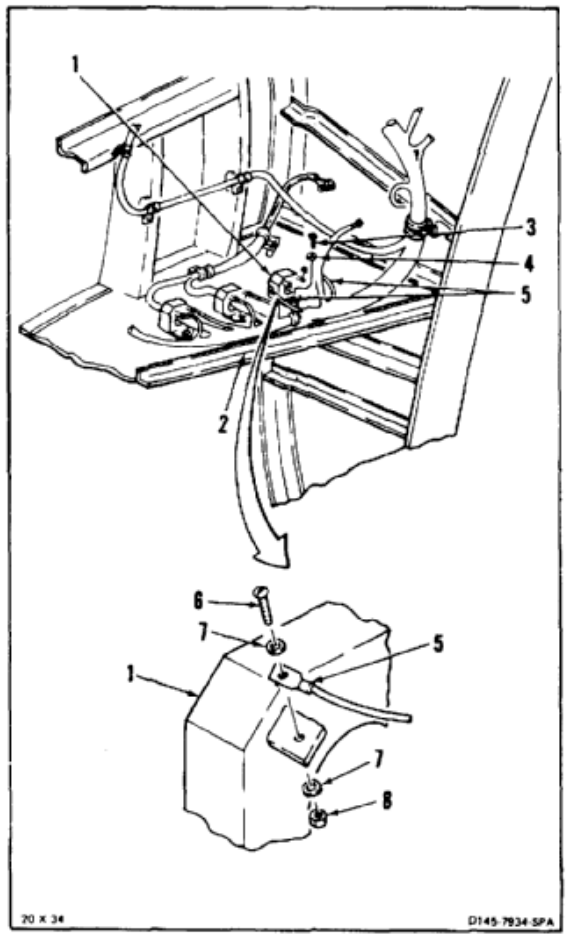
**WARNING**

If current transformer is not positioned as shown with terminals facing away from ground stud, power feeders will overheat when a ground fault occurs resulting in a serious fire.

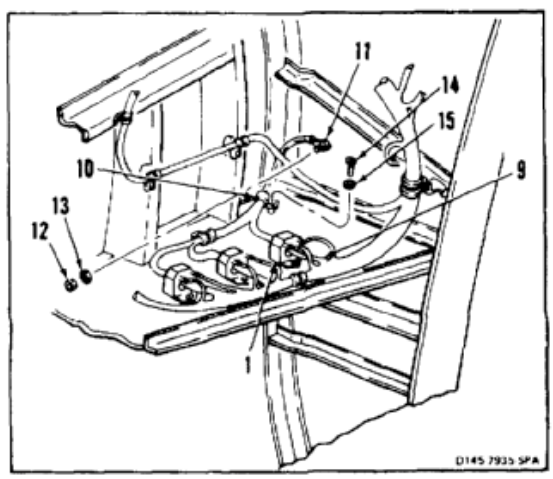
**NOTE**

Procedure is same for installation of three APU current transformers. Installation of one transformer is shown here.

1. Position transformer (1) on structure (2). Install two screws (3) and washers (4).
2. Remove tape and connect two wires (5) to transformer (1) by installing two screws (6), four washers (7), and two nuts (8). Remove tags.




3. Feed wire (9) through transformer (1) and clamp (10).
4. Remove tape and connect wire (9) to ground stud (11) by installing nut (12) and washer (13). Remove tags.
5. Install screw (14) and washer (15) in clamp (10).




***FOLLOW-ON MAINTENANCE:***

Perform operational check of APU generator (TM 55-1520-240-T).
Close cargo ramp (Task 2-2).

END OF TASK

## 9-43 REMOVE APU GENERATOR CURRENT TRANSFORMER — FORWARD 9-43

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

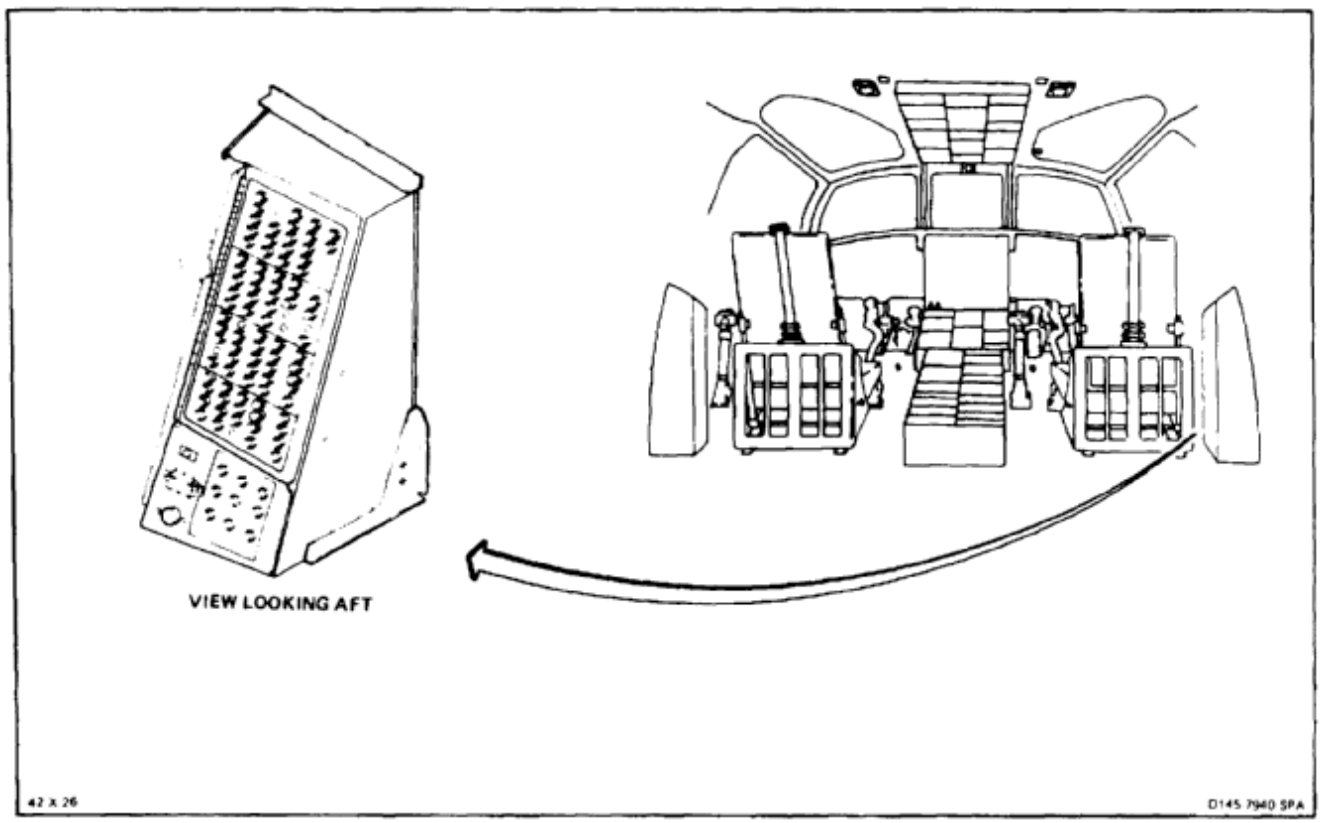
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Pressure Off



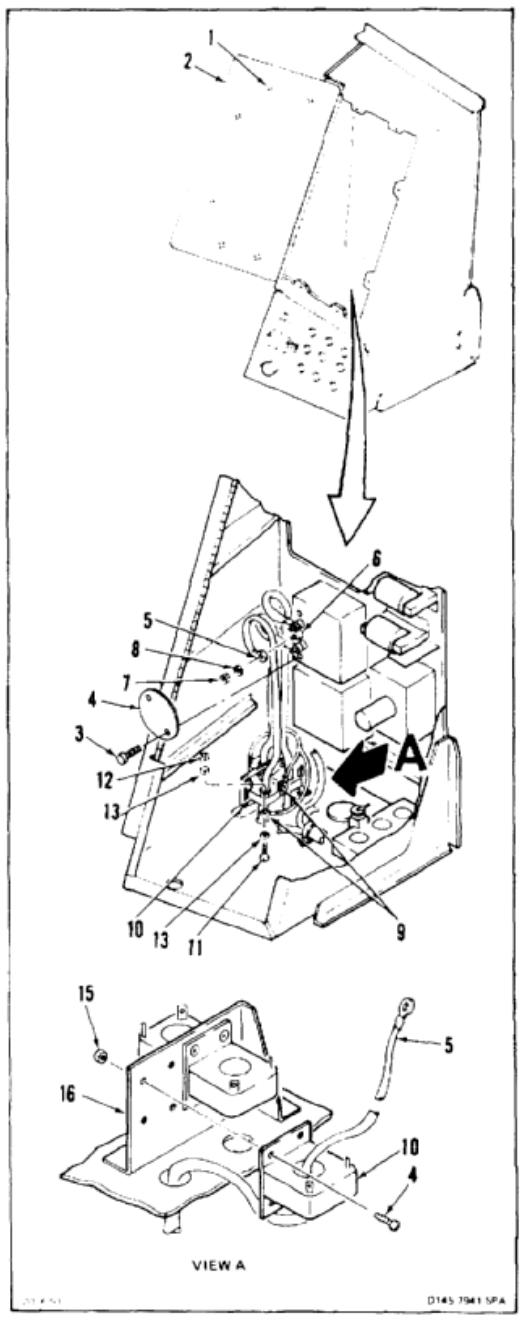
**NOTE**

Procedure is same for removal of three APU current transformers. Removal of one transformer is shown here.

1. Loosen six fasteners (1) and open power distribution panel door (2).
2. Remove two screws (3) and terminal cover (4). Tag and disconnect wire (5) from terminal (6) by removing nut (7) and washer (8). Tape ends. Use tape (E385).
3. Tag and disconnect two wires (9) from transformer (10) by removing two screws (11), two nuts (12), and four washers (13). Tape ends. Use tape (E385).
4. Remove four screws (14) and nuts (15). Feed wire (5) through transformer (10) and remove transformer from bracket (16).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-44 INSTALL APU GENERATOR CURRENT TRANSFORMER — FORWARD 9-44

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

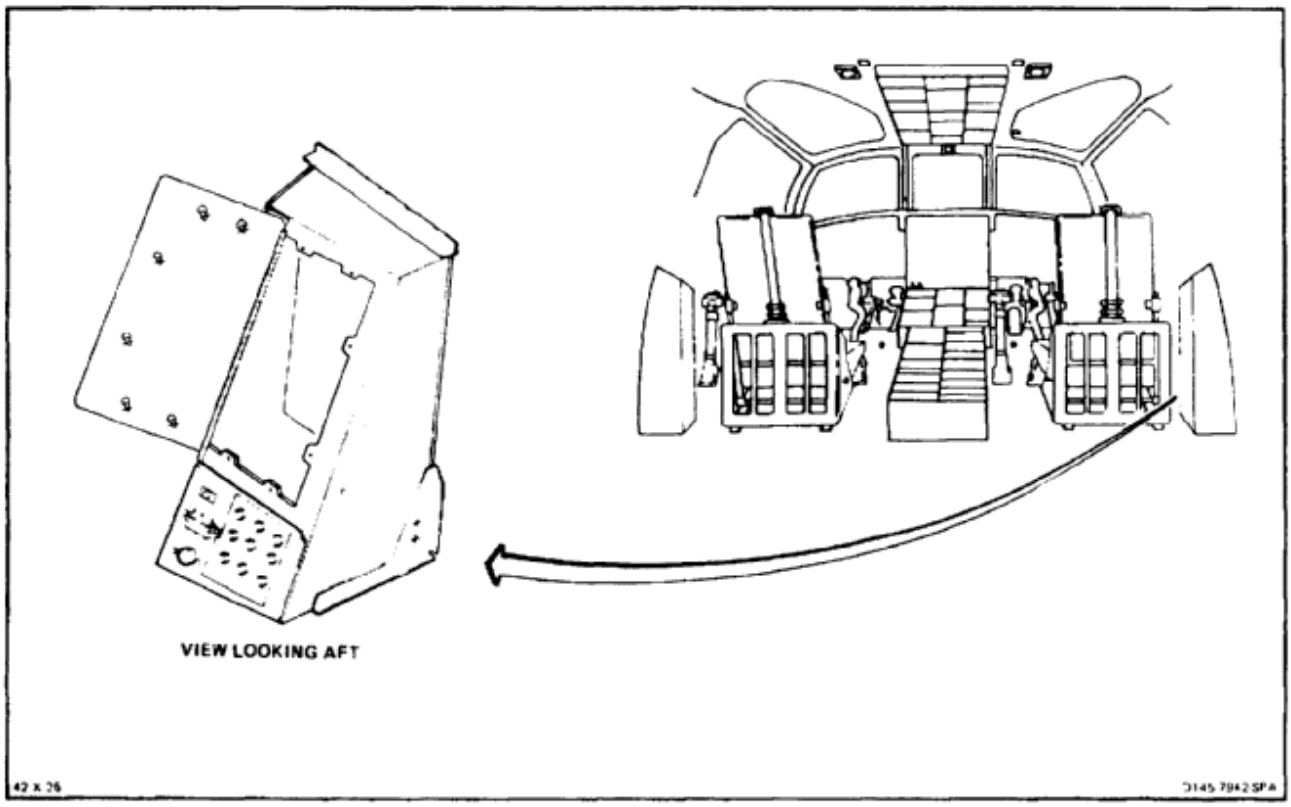
None

***Personnel Required:***

Aircraft Electrician (2)

***References:***

TM 55-1520-240-23P

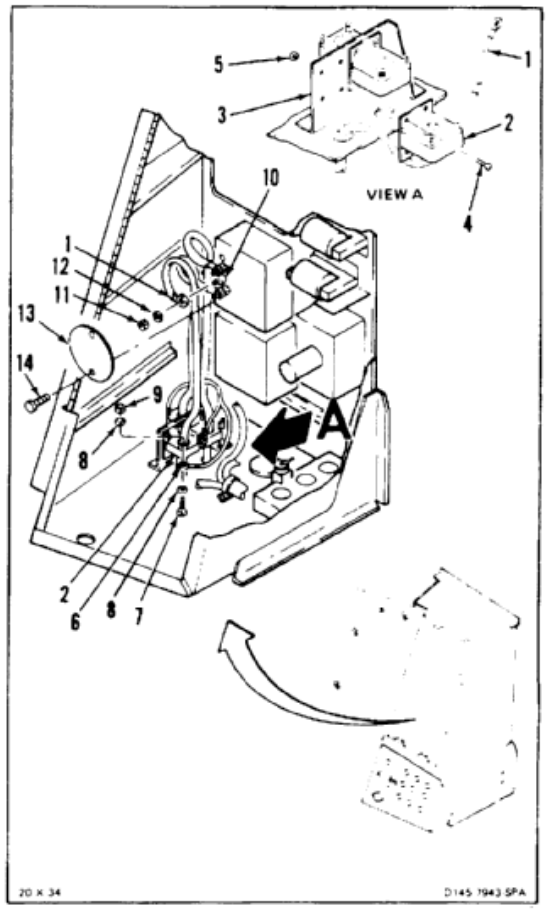


**WARNING**

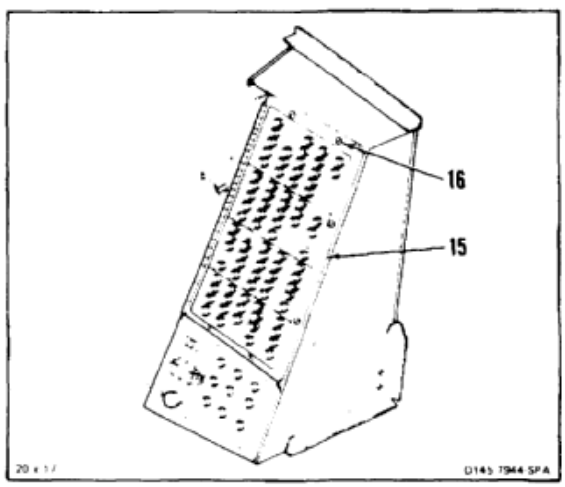
Current transformer must be installed with terminals facing contactor (up). If installed in reverse, overcurrent protection system will not clear a ground fault and a fire will result.

**NOTE**

Procedure is same for installation of three APU current transformers. Installation of one transformer is shown here.




1. Feed wire (1) through transformer (2). Position transformer on bracket (3). Install four screws (4) and nuts (5).
2. Remove tape and connect two wires (6) to transformers (2) by installing two screws (7), four washers (8), and two nuts (9). Remove tags.
3. Route wire (1) to terminal (10).
4. Remove tape. Connect wire (1) to terminal (10) and install nut (11) and washer (12). Install terminal cover (13) and two screws (14).




5. Close PDP door (15). Tighten six fasteners (16).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check of generator (TM 55-1520-240-T).

END OF TASK

## 9-45 REMOVE INSTRUMENT TRANSFORMER 9-45

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

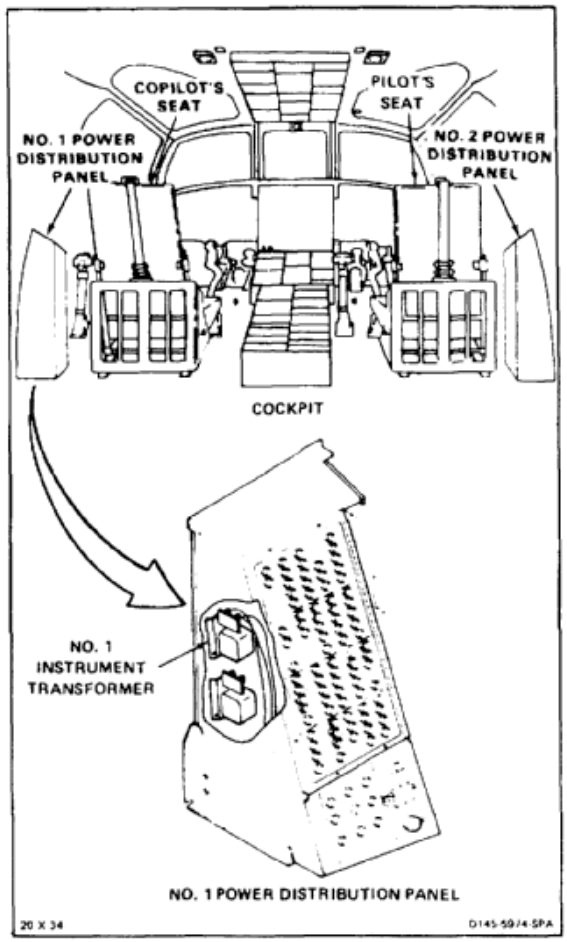
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

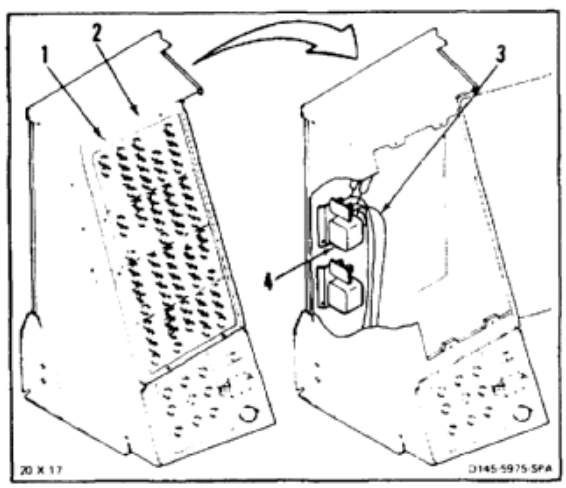
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off



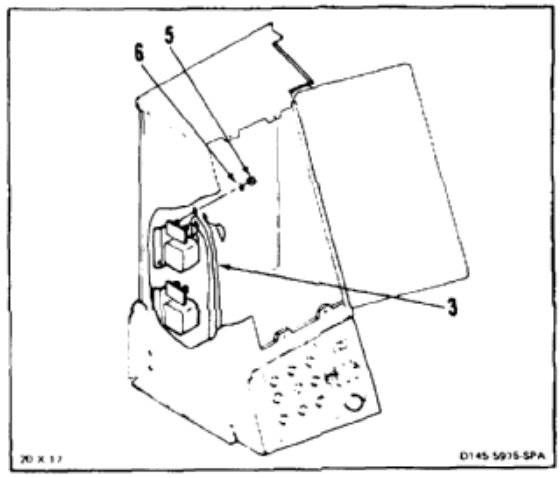

**NOTE**

Procedure is same to remove No. 1 or No. 2 instrument transformer. Removal of No. 1 instrument transformer is shown here.

1. Release six fasteners (1) in upper circuit breaker panel (2). Open panel.
2. Tag three wires (3) on No. 1 instrument transformer (4).



3. Remove three nuts (5) and lockwashers (6). Disconnect three wires (3).
4. Tape ends of wires (3). Use tape (E385).




5. Remove three screws (7), washers (8), and transformer (4).

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-46 INSTALL INSTRUMENT TRANSFORMER 9-46

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

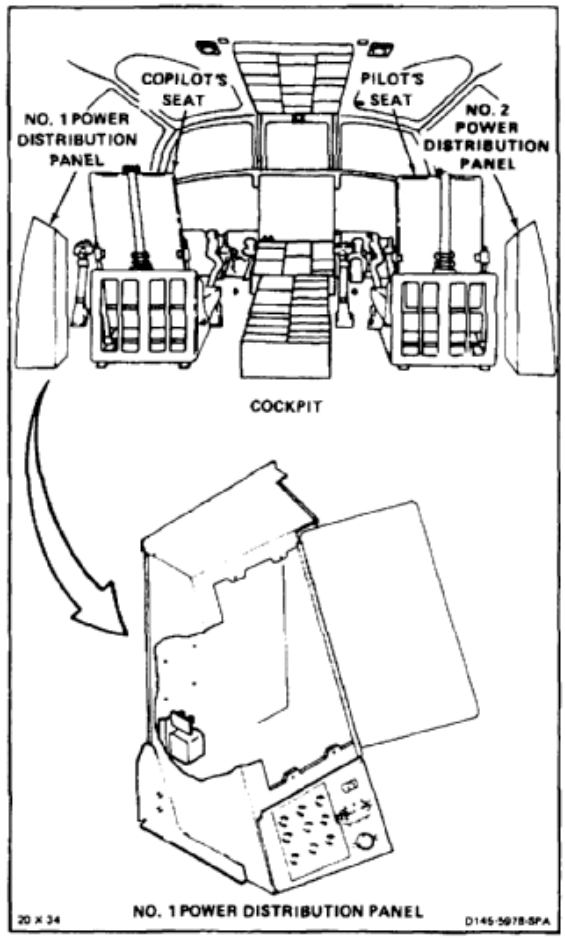
None

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

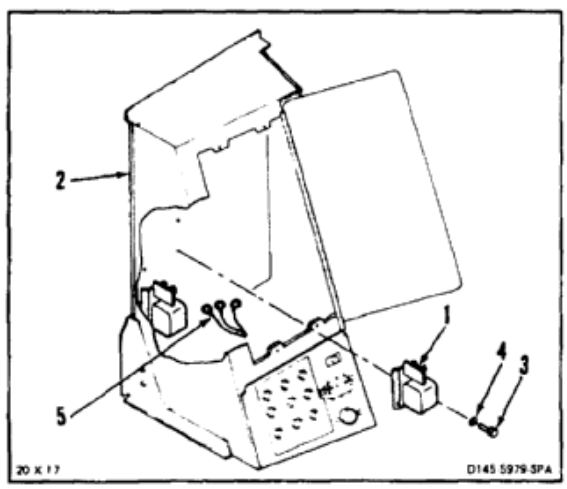
TM 55-1520-240-23P



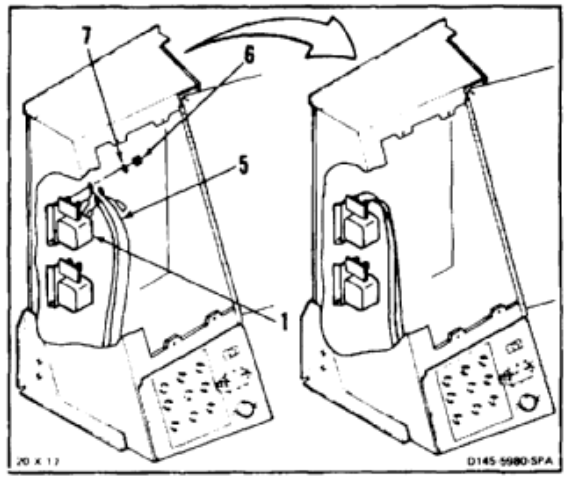

**NOTE**

Procedure is same to install No. 1 or No. 2 instrument transformer. Installation of No. 1 instrument transformer is shown here.

1. Position No. 1 instrument transformer (1) in power distribution panel (2).
2. Install three screws (3) and washers (4).
3. Remove tape from ends of three wires (5).

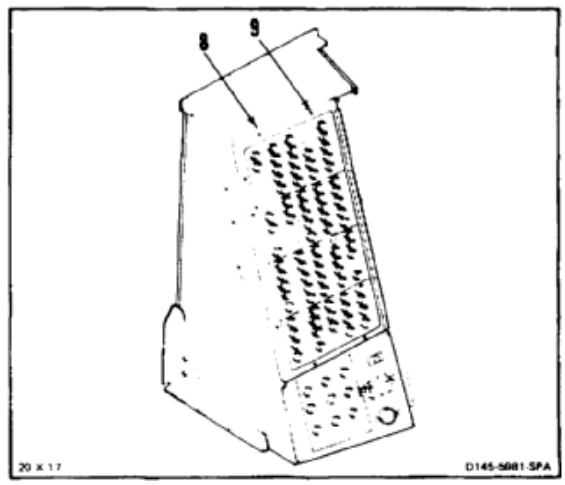


4. Connect three wires (5) to transformer (1). Install three nuts (6) and lockwashers (7). Remove tags.




***INSPECT***

5. Close circuit breaker panel (8). Tighten six fasteners (9).




***FOLLOW-ON MAINTENANCE:***

For No. 1 instrument transformer, perform operational check of No. 1 engine oil pressure indicating system (TM 55-1520-240-T).
For No. 2 instrument transformer, perform operational check of No. 2 engine oil pressure indicating system (TM 55-1520-240-T).

END OF TASK

## 9-46.1 REMOVE NOSE COMPARTMENT TRANSFORMERS 9-46.1

INITIAL SETUP

***Applicable Configurations:***

With 17

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

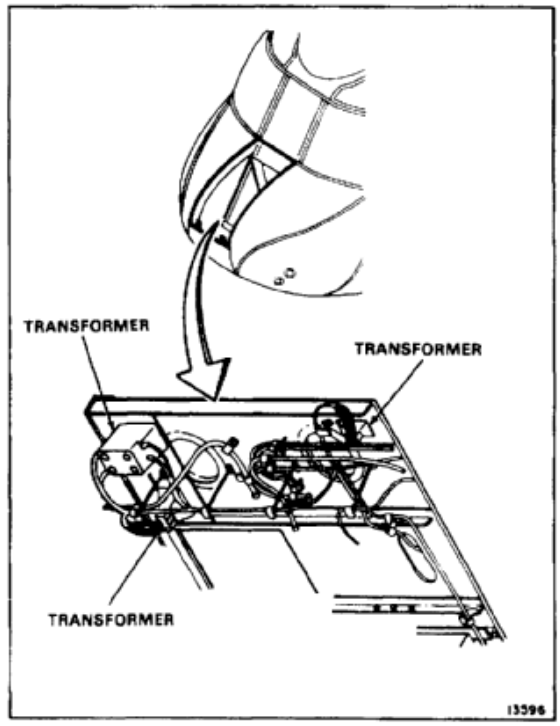
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

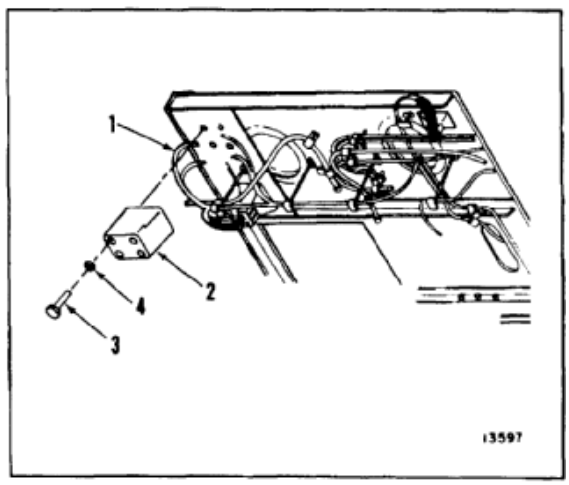
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Nose Dynamic Absorber Removed (Task 2-139)




**NOTE**

Procedures are same for removing all three transformers. Only one is shown being removed here.

1. Tag and remove wires (1) from transformer (2).
2. Tape wire ends. Use tape (E385).
3. Remove four screws (3) and washers (4).
4. Remove transformer (2).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-46.2 INSTALL NOSE COMPARTMENT TRANSFORMERS 9-46.2

INITIAL SETUP

***Applicable Configurations:***

With 17

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

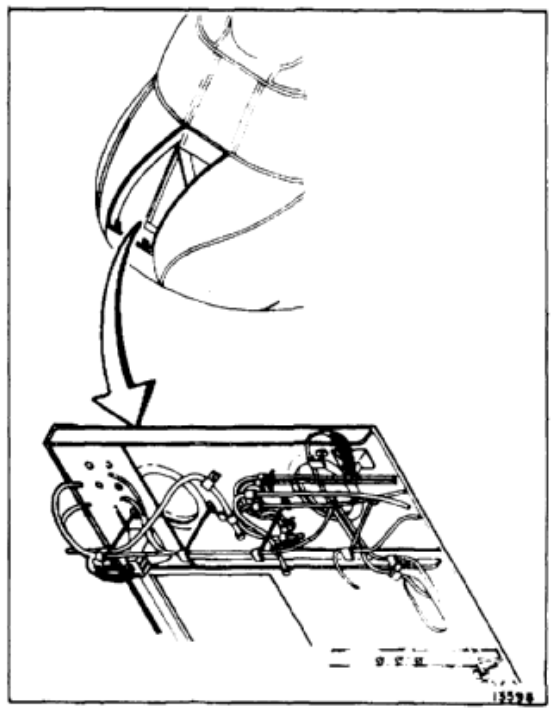
None

***Personnel Required:***

Aircraft Electrician

***References:***

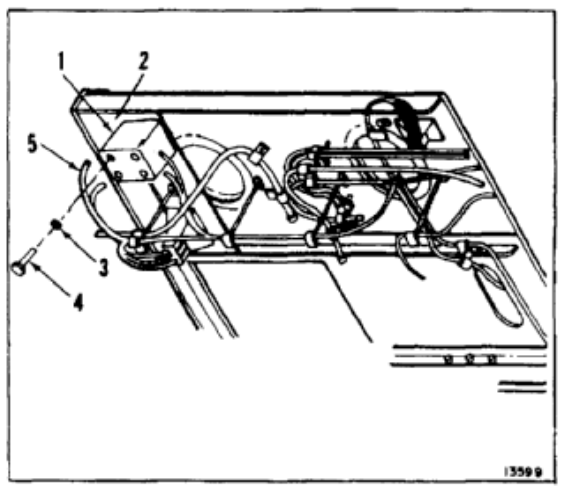
TM 55-1520-240-23P



**NOTE**

Procedures are the same for installing all three transformers. Only one is shown being installed here.

1. Position transformer (1) on support (2).
2. Install four washers (3) and screws (4).
3. Remove tape from wire ends.
4. Connect wires (5) to transformer (1) and remove tags.




***FOLLOW-ON MAINTENANCE:***

Install nose dynamic absorber (Task 2-143).

END OF TASK

## 9-47 REMOVE AC POWER RECEPTACLE 9-47

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

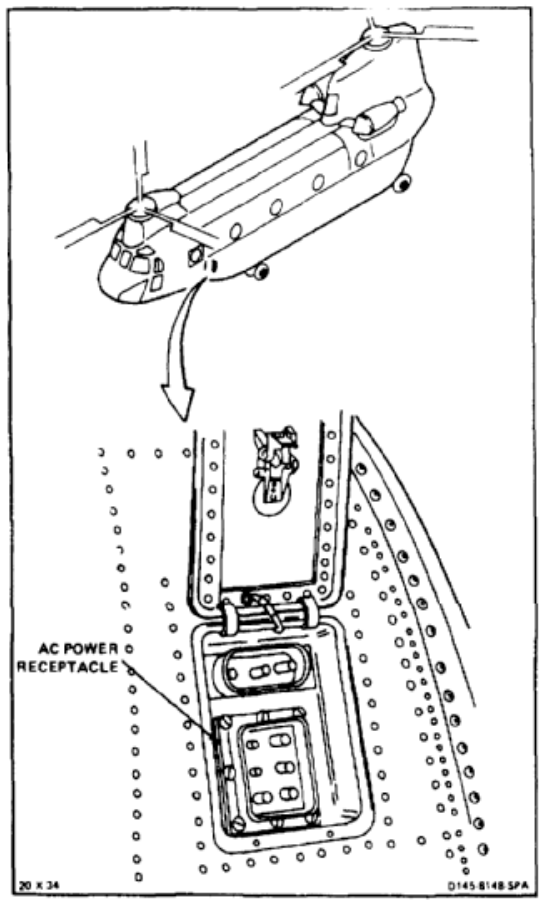
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

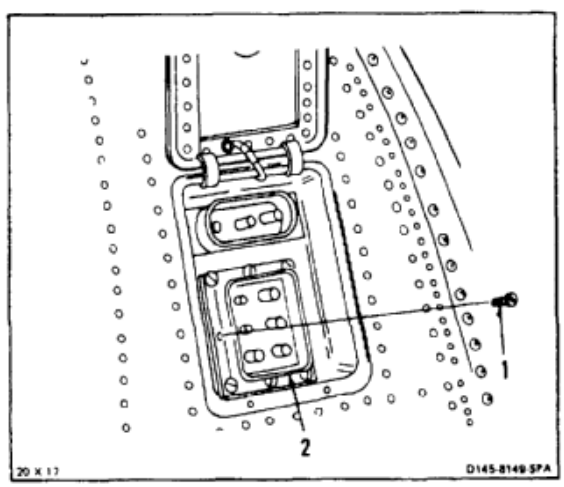
Aircraft Electrician

***Equipment Condition:***

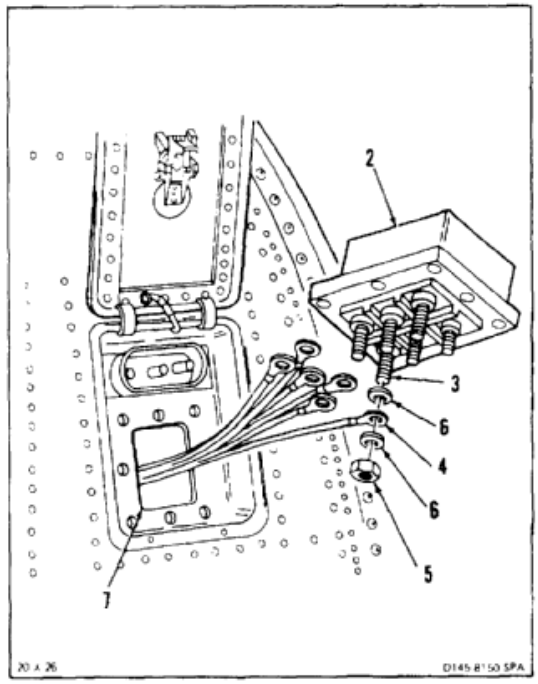
Battery Disconnected (Task 1-39)
Electrical Power Off
EXT PWR DC-AC Access Cover Open (Task 2-2)




1. Cut sealant away from eight screws (1) of ac receptacle (2).
2. Remove eight screws (1) from receptacle (2).



3. Pull receptacle (2) outboard for access to terminals (3).
4. Tag six wires (4). Remove six nuts (5) and washers (6) from terminals (3). Use tags (E264).
5. Disconnect six wires (4) from terminals (3). Remove receptacle (2).
6. Install washers (6) and nuts (5) loosely on terminals (3).
7. Tape ends of six wires (4). Use tape (E385).
8. Scrape sealant from around receptacle (2) and hole (7).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-48 INSTALL AC POWER RECEPTACLE 9-48

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

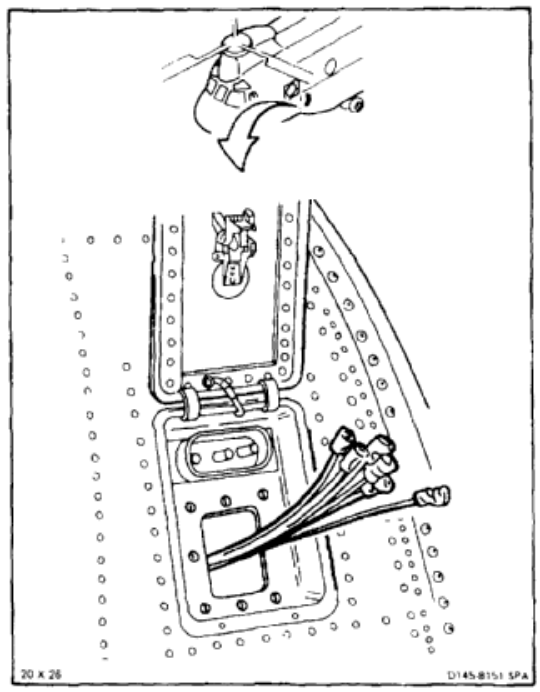
Acetone (E20)
Sealant (E336)
Cloths (E120)
Gloves (E186)

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P



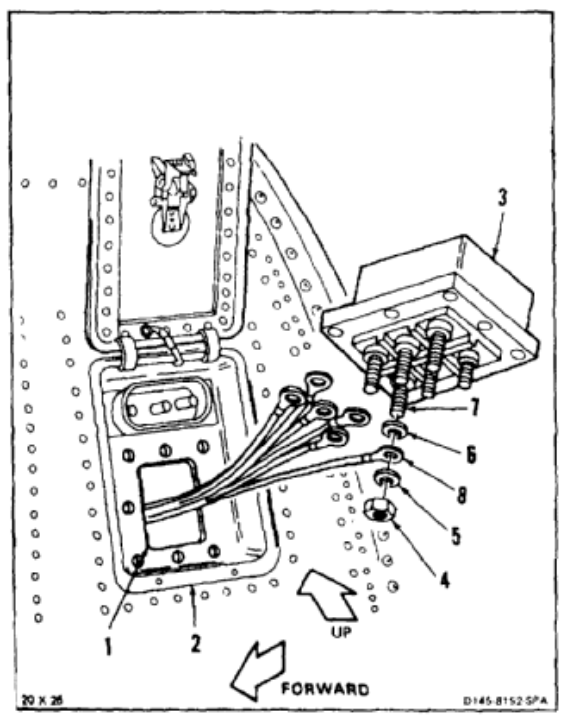

**WARNING**

Acetone (E20) can form toxic vapors if exposed to flame. Use in well-ventilated area, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

1. Clean surfaces around hole (1) of box (2) and receptacle (3). Use acetone (E20) and cloths (E120). Wear gloves (E186).
2. Remove six nuts (4), washers (5) and washers (6) from terminals (7).
3. Remove tape from ends of six wires (8). Connect wires to terminals (7) of receptacle (3). Install six washers (6), washers (5) and nuts (4) on terminals. Remove tags from wires.

***INSPECT***

4. Position receptacle (3), two small terminals (7) up and forward, in hole (1) of box (2).

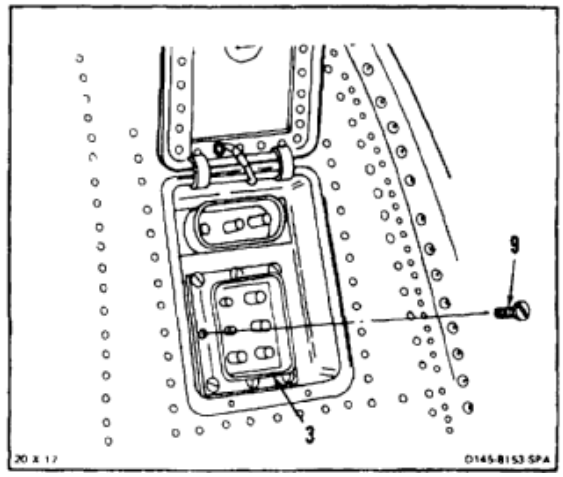


5. Install eight screws (9) in receptacle (3).

**WARNING**

Sealant (E336) can irritate skin and cause burns. Avoid contact with skin, eyes, and clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

6. Apply sealant to eight screws (9) and edge of receptacle (3). Use sealant (E336). Wear gloves (E186).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).
Close EXT PWR DC-AC access cover (Task 2-2).

END OF TASK

## 9-49 REMOVE NO. 2 GENERATOR CONTACTOR 9-49

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

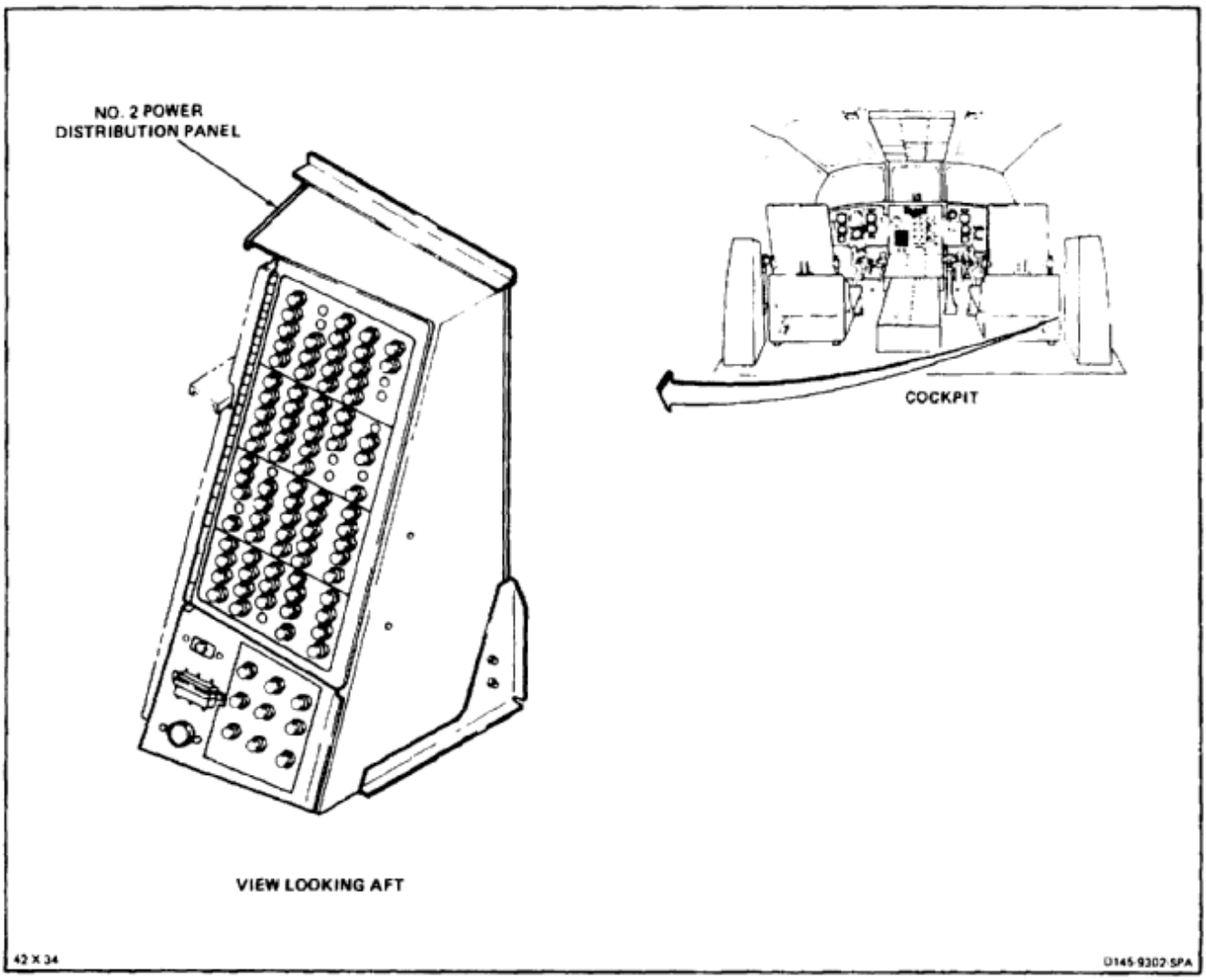
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off



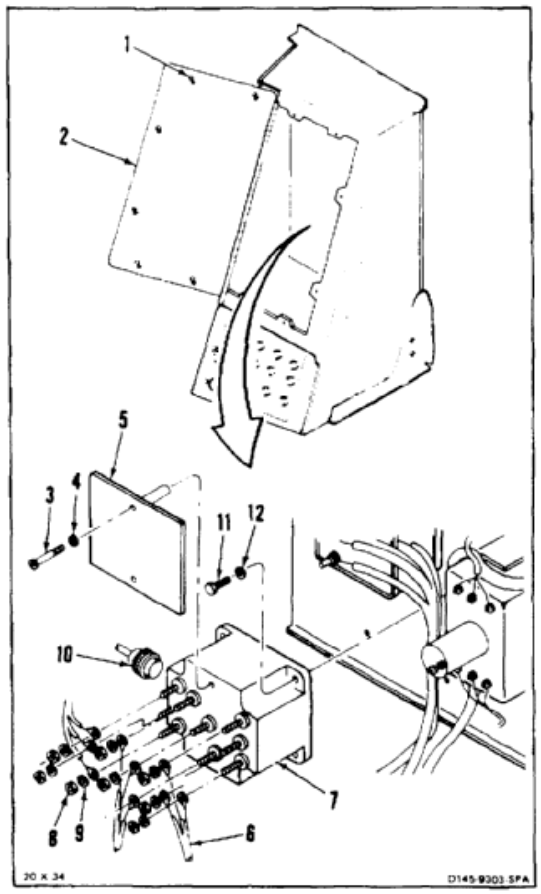
**NOTE**

Procedure is same for removal of generator contactor from No. 1 or No. 2 power distribution panel. Removal of generator contactor from No. 2 power distribution panel is shown here.

1. Loosen six fasteners (1) and open power distribution panel door (2).
2. Remove two screws (3) and washers (4). Remove contactor cover (5).
3. Tag and disconnect nine wires (6) from contactor (7) by removing nine nuts (8) and washers (9). Tape ends. Use tape (E385).
4. Disconnect electrical connector (10).
5. Remove four bolts (11) and washers (12). Remove contactor (7).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-50 INSTALL NO. 2 GENERATOR CONTACTOR 9-50

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

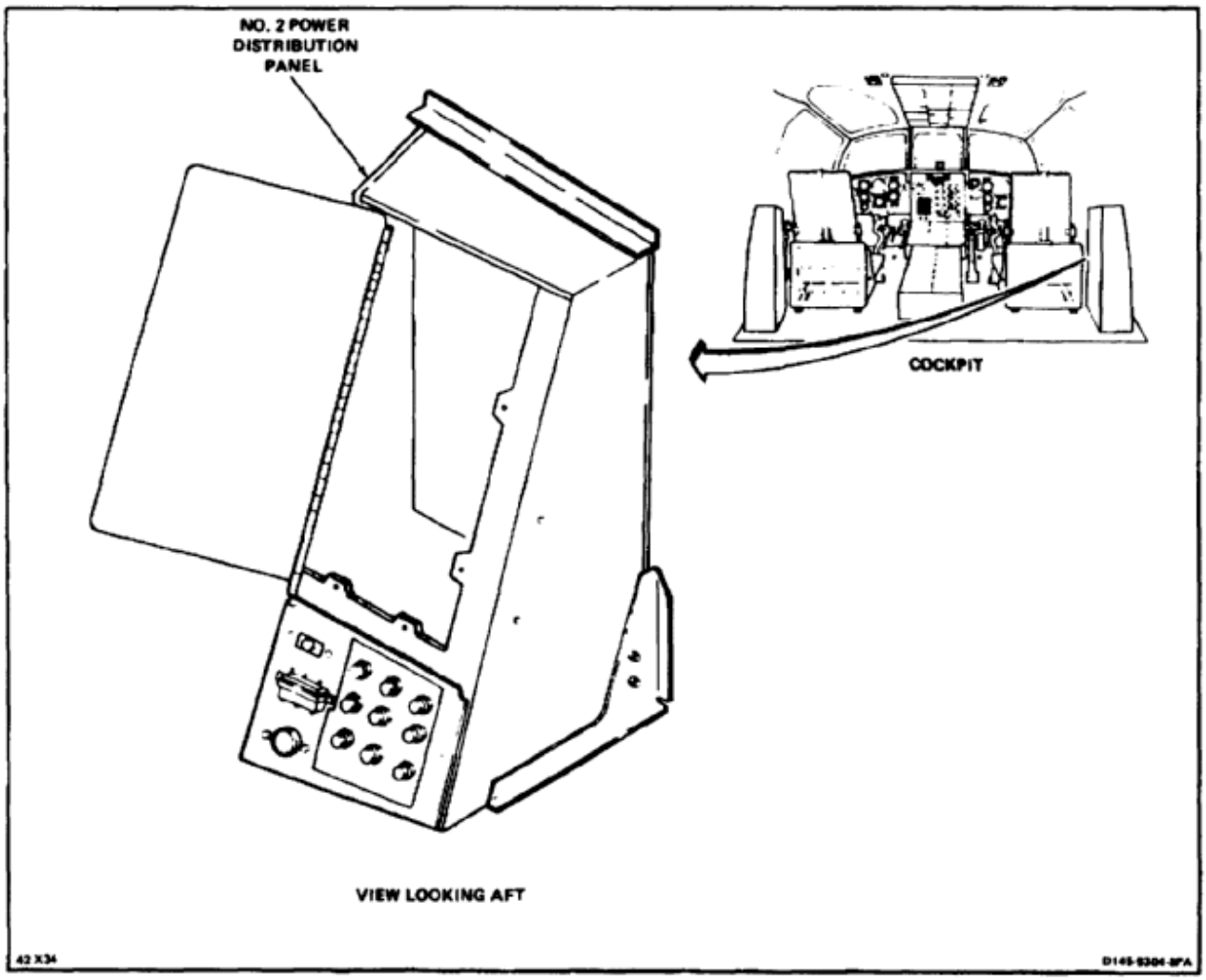
None

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P



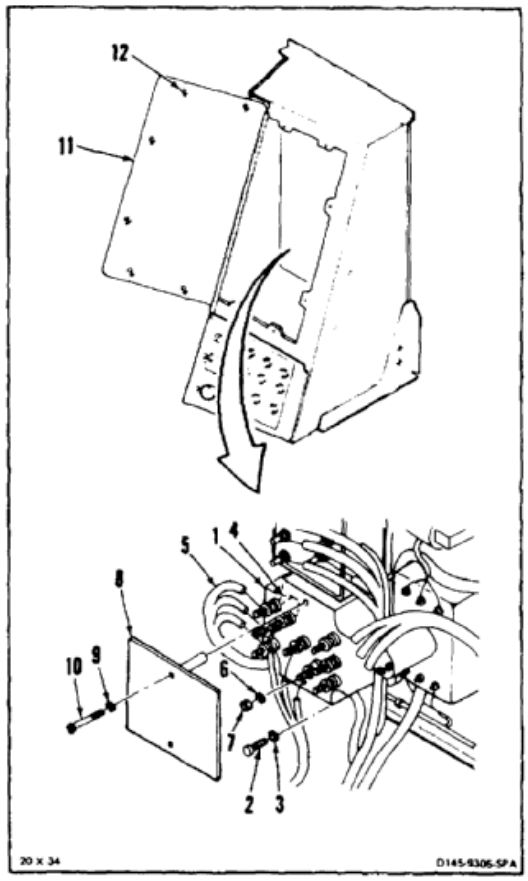
**NOTE**

Procedure is same for installation of generator contact in No. 1 or No. 2 power distribution panel. Installation of contactor in No. 2 power distribution panel is shown here.

1. Position generator contactor (1). Install four bolts (2) and washers (3).
2. Connect electrical connector (4).
3. Remove tape and connect wires (5) by installing washers (6) and nuts (7). Remove tags.
4. Position contactor cover (8). Install two washers (9) and screws (10).
5. Close panel (11). Tighten six fasteners (12).

***FOLLOW-ON MAINTENANCE:***

Perform operational check of generators (TM 55-1520-240-T).




END OF TASK

## 9-51 REMOVE APU GENERATOR CONTACTOR 9-51

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

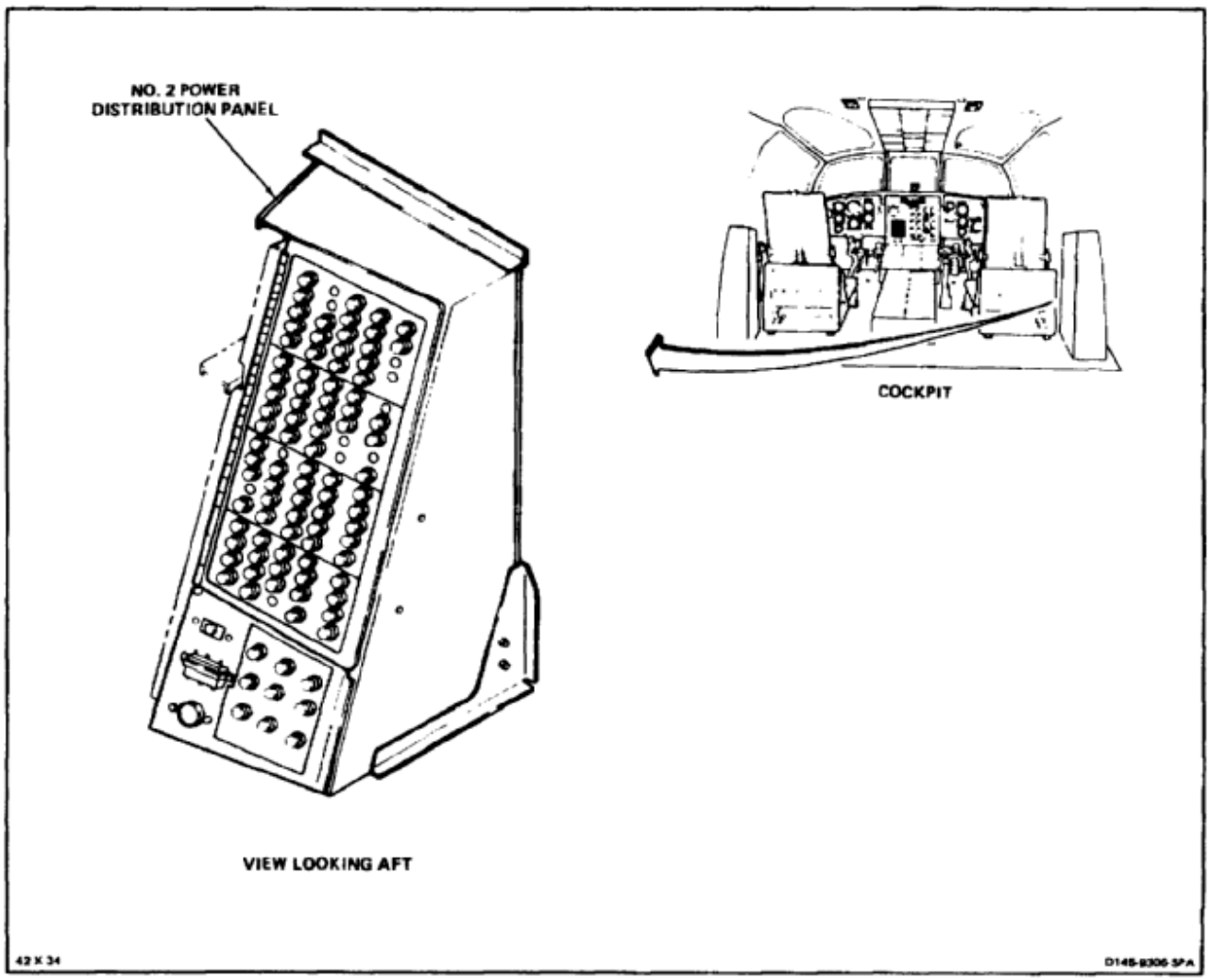
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off



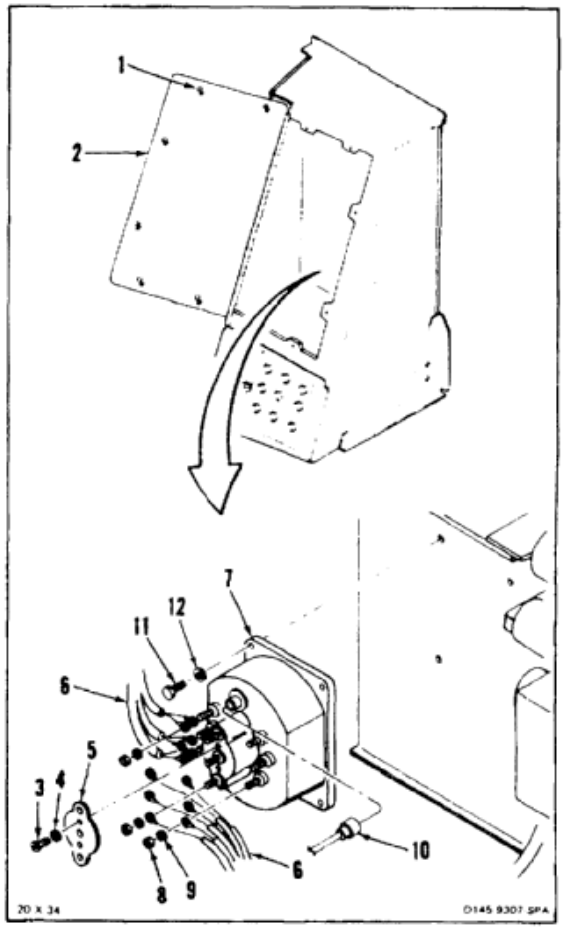
**NOTE**

Procedure is same for removal of APU Generator Contactor from No. 1 or No. 2 power distribution panel. Removal of APU Generator Contactor from No. 2 power distribution panel is shown here.

1. Loosen six fasteners (1) and open power distribution panel door (2).
2. Remove two screws (3) and washers (4). Remove contactor cover (5).
3. Tag and disconnect 12 wires (6) from contactor (7) by removing 9 nuts (8) and washers (9). Tape ends. Use tape (E385).
4. Disconnect electrical connector (10).
5. Remove four bolts (11) and washers (12). Remove contactor (7).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-52 INSTALL APU GENERATOR CONTACTOR 9-52

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

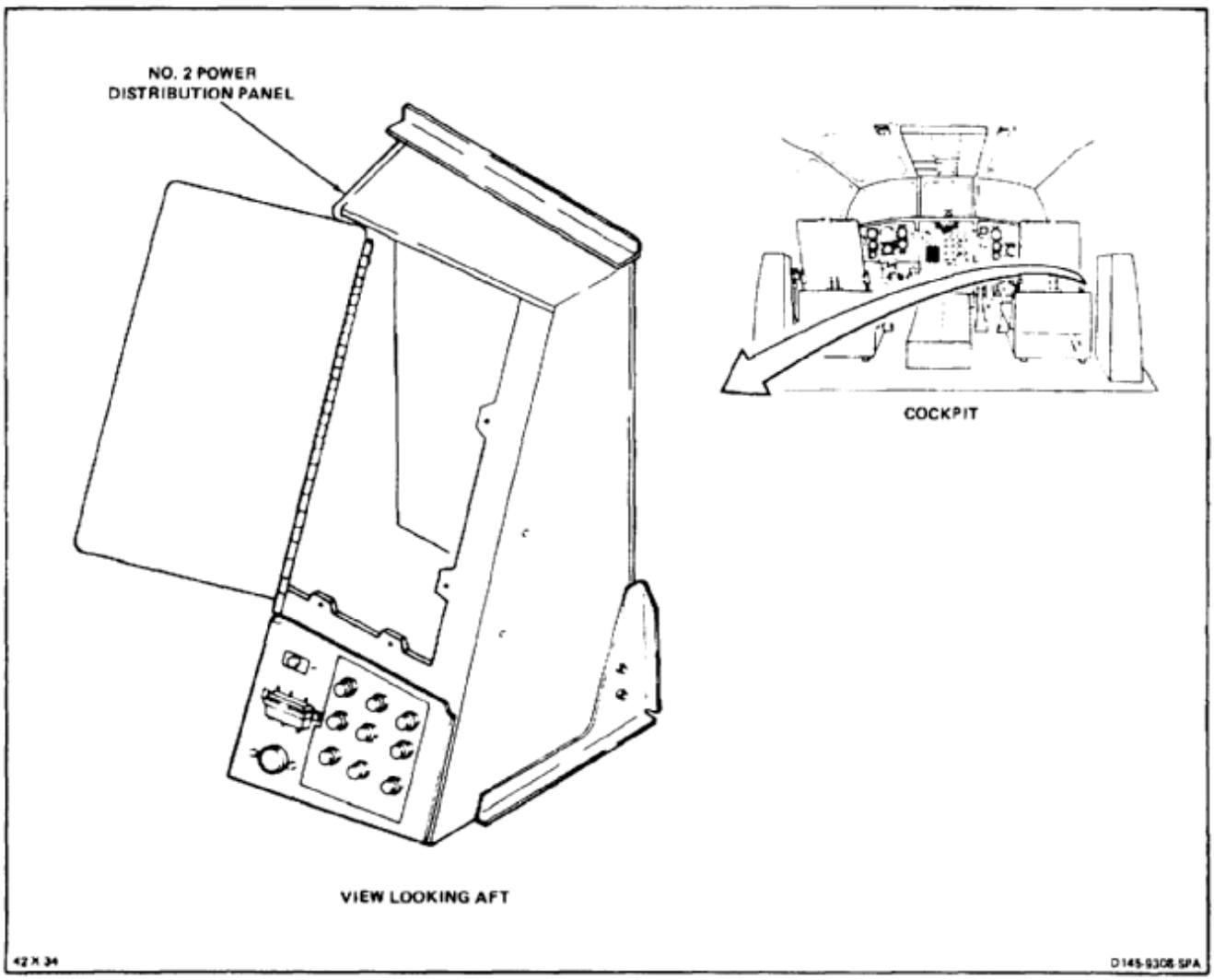
None

***Personnel Required:***

Aircraft Electrician (2)

***References:***

TM 55-1520-240-23P



**NOTE**

Procedure is same for removal of APU Generator Contactor from No. 1 or No. 2 power distribution panel. Removal of APU Generator Contactor from No. 2 power distribution panel is shown here.

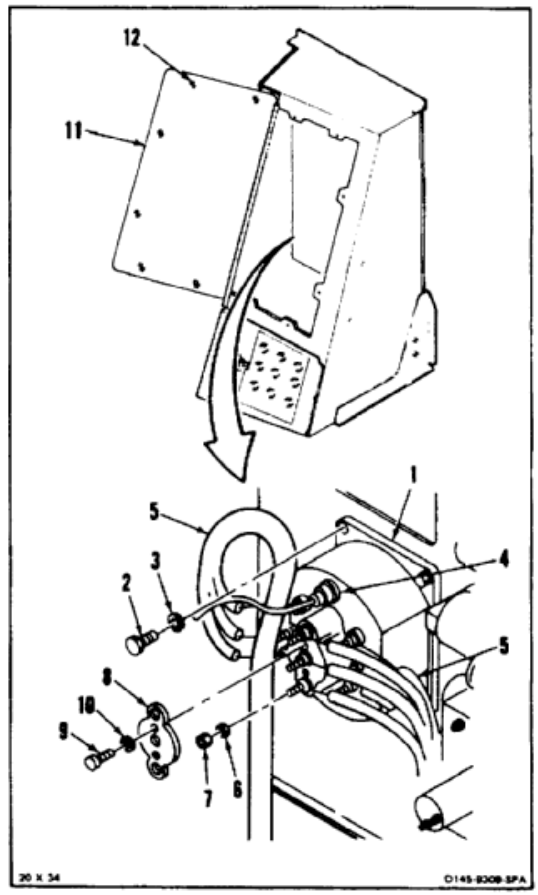
1. Position generator contactor (1). Install four bolts (2) and washers (3).
2. Connect electrical connector (4).
3. Remove tape and connect 12 wires (5) by installing 9 washers (6) and nuts (7). Remove tags.
4. Position contactor cover (8). Install two screws (9) and washers (10).

***INSPECT***

5. Close panel (11). Tighten six fasteners (12).

***FOLLOW-ON MAINTENANCE:***

Perform operational check of generators (TM 55-1520-240-T).




END OF TASK

## 9-52.1 REPLACE APU GENERATOR SLAVE RELAY 9-52.1

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

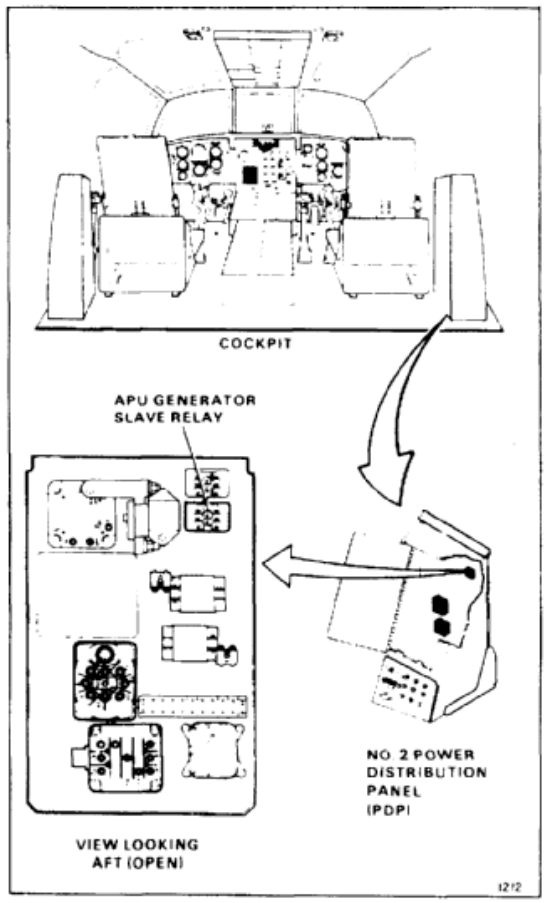
Tags (E264)
Tape (E385)

***Personnel Required:***

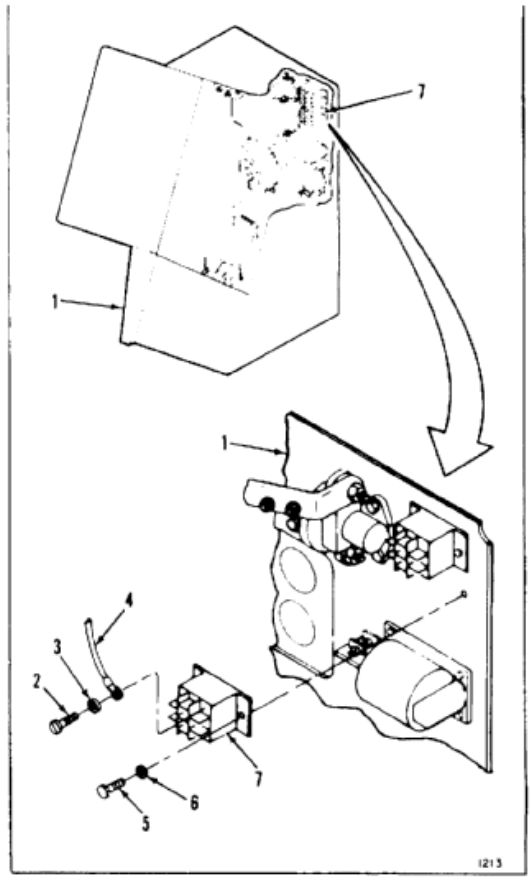
Aircraft Electrician
Inspector

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off



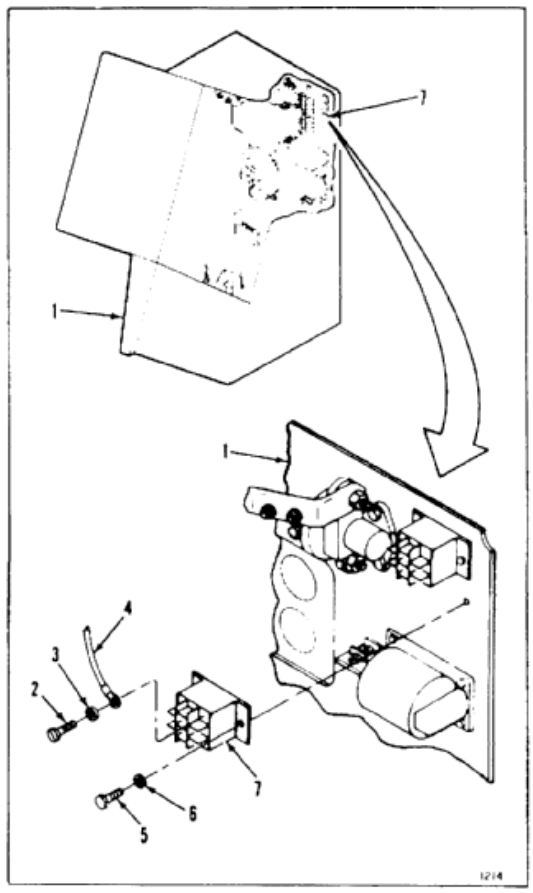
1. Open No. 2 power distribution panel (PDP) (1).
2. Remove eight screws (2) and washers (3). Tag and remove eight wires (4). Use tags (E264). Tape ends of wires. Use tape (E385).
3. Remove two screws (5) and washers (6). Remove generator slave relay (7).



4. Position relay (7) on No. 2 PDP (1). Install two screws (5) and washers (6).
5. Remove tape from eight wires (4). Position wires on relay (7). Install eight screws (2) and washers (3). Remove tags.

***INSPECT***

6. Close No. 2 PDP (1).




***FOLLOW-ON MAINTENANCE:***

Perform operational check of ac power system (TM 55-1520-240-T).

END OF TASK

## 9-53 REMOVE HEATER FAN RELAY 9-53

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

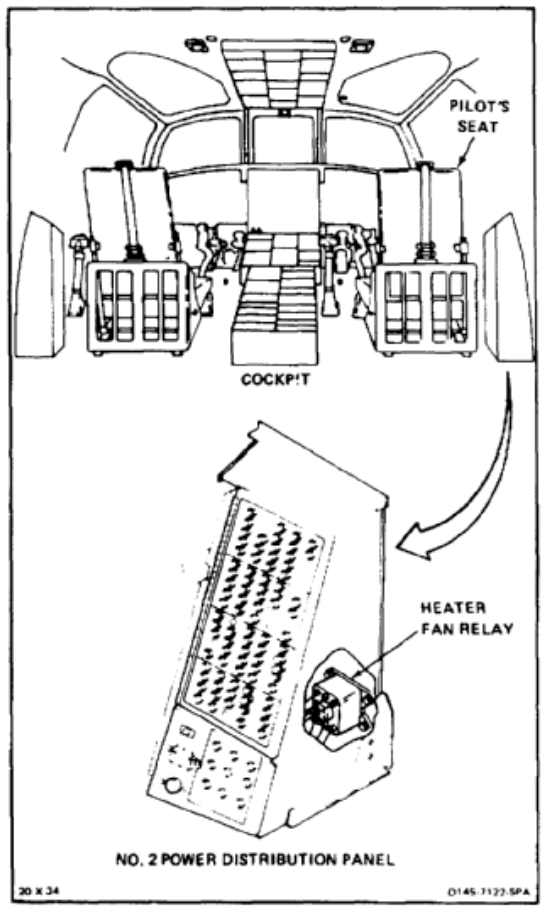
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

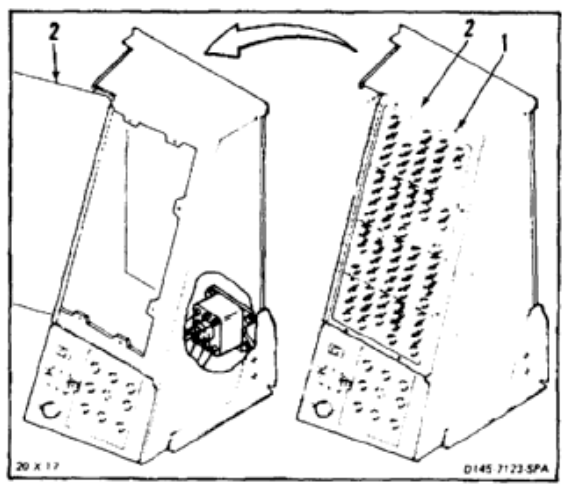
Aircraft Electrician

***Equipment Condition:***

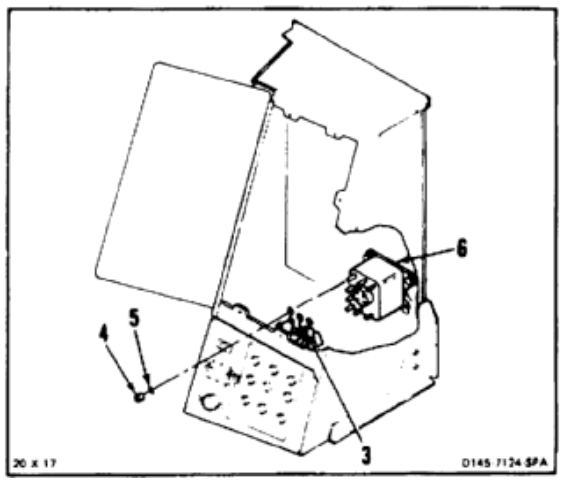
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off



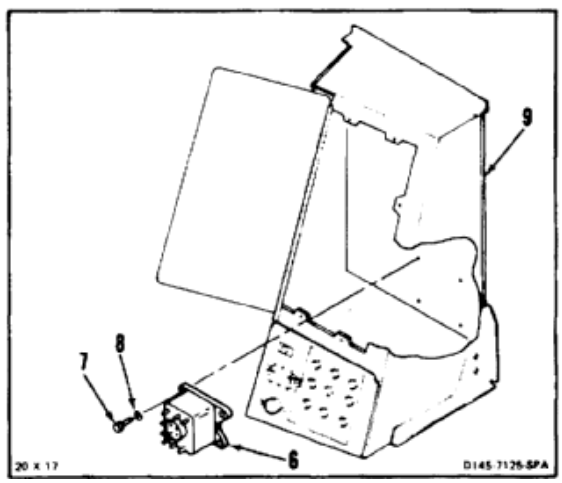

1. Release six fasteners (1) in upper circuit breaker panel (2). Open circuit breaker panel.



2. Tag eight wires (3). Remove eight nuts (4), washers (5) and wires from heater fan relay (6). Tape exposed ends of wires. Use tags (E264) and tape (E385).




3. Remove four bolts (7), washers (8), and heater fan relay (6) from No. 2 power distribution panel (9).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-54 INSTALL HEATER FAN RELAY 9-54

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials.***

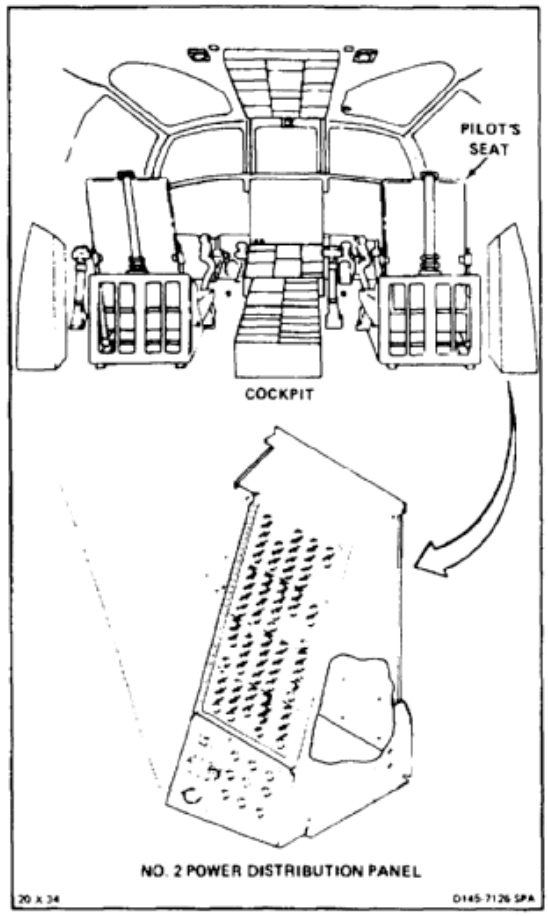
RTV 732, NSN 8040-00-877-9872 (E340)

***Personnel Required:***

Aircraft Electrical
Inspector

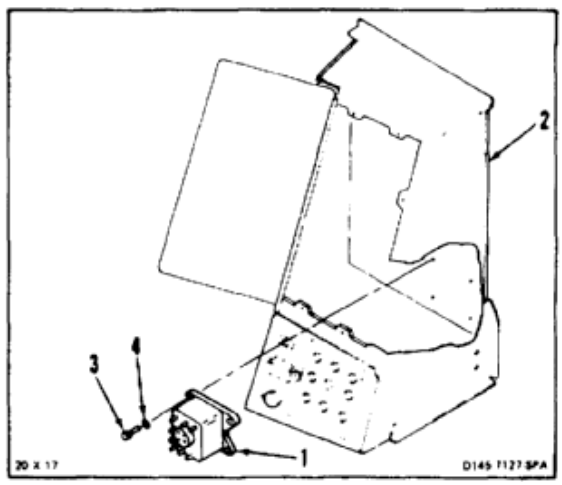
***References:***

TM 55-1520-240-23P




**NOTE**

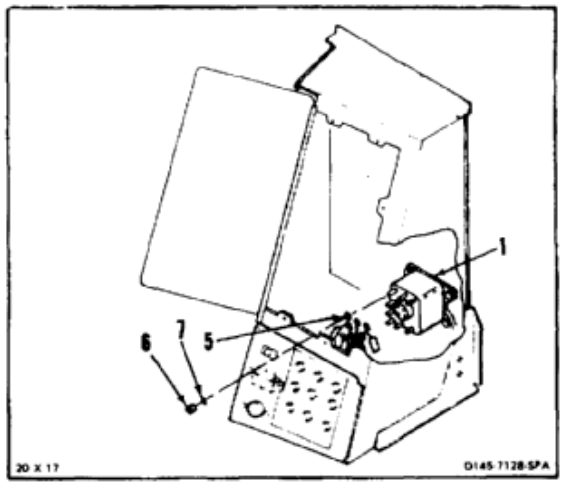
Before reinstalling heater fan relay, remove existing Diode Assy IN4005 from relay and reinstall on replacing heater fan relay. (Refer to MWO 55-1520-240-50-9.)




***INSTALLATION OF DIODE:***

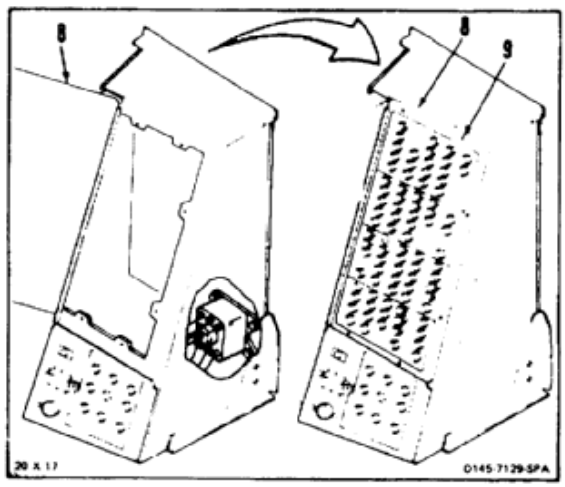
1. On relay 082K1 (1), remove attaching hardware from terminals X1 and X2. Connect the end of the diode marked with band (cathode) to terminal marked X1 and install attaching hardware. Connect opposite end of diode to terminal marked X2 and install attaching hardware. Press diode body down and in contact with relay case. Secure diode to relay case using RTV silicone adhesive.
2. Position heater blower relay (1), terminals A2, B2, and C2 facing up, in power distribution panel (2). Install four bolts (3) and washers (4).

3. Remove tape from ends of wires (5). Connect eight wires to relay (1). Install eight nuts (6), and washers (7). Remove tags.




***INSPECT***

4. Close upper circuit breaker panel (8). Tighten six fasteners (9).




***FOLLOW-ON MAINTENANCE:***

Perform operational check of cabin heating system (TM 55-1520-240-T).

END OF TASK

## 9-55 REMOVE AVIONICS COOLING FAN 9-55

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

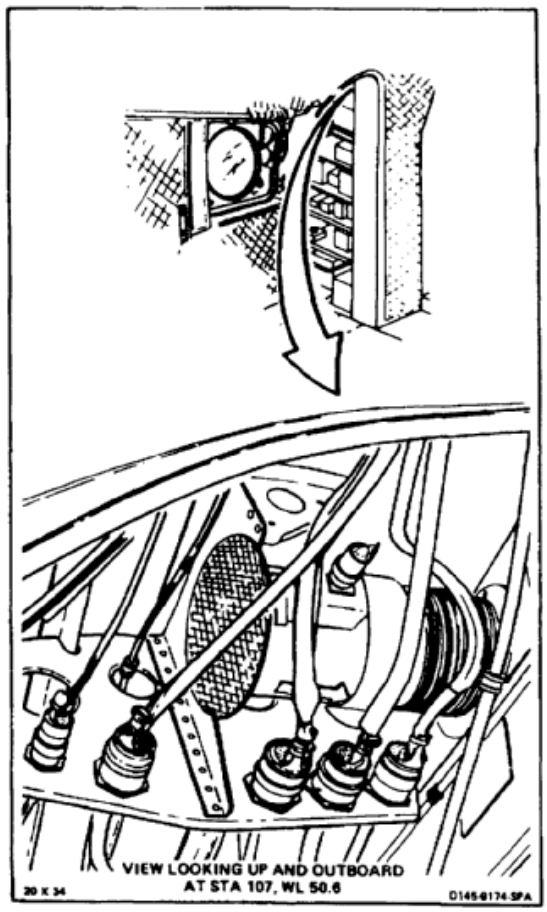
Paper Tags (E264)

***Personnel Required:***

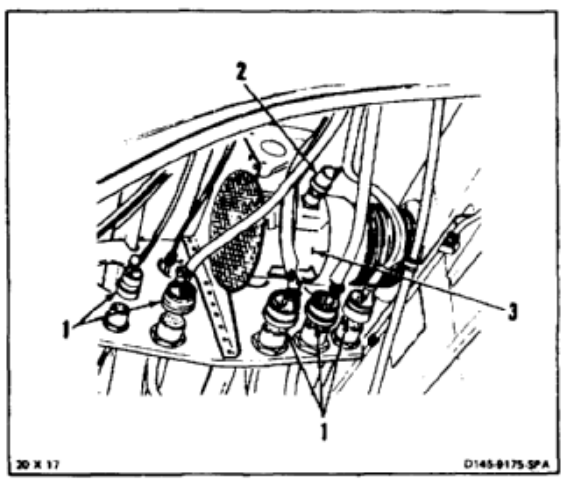
Aircraft Electrician

***Equlpment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Avionics Compartment Acoustic Blanket Removed (Task 2-208)




1. Tag and disconnect five connectors (1).
2. Tag and disconnect connector (2) from cooling fan (3).

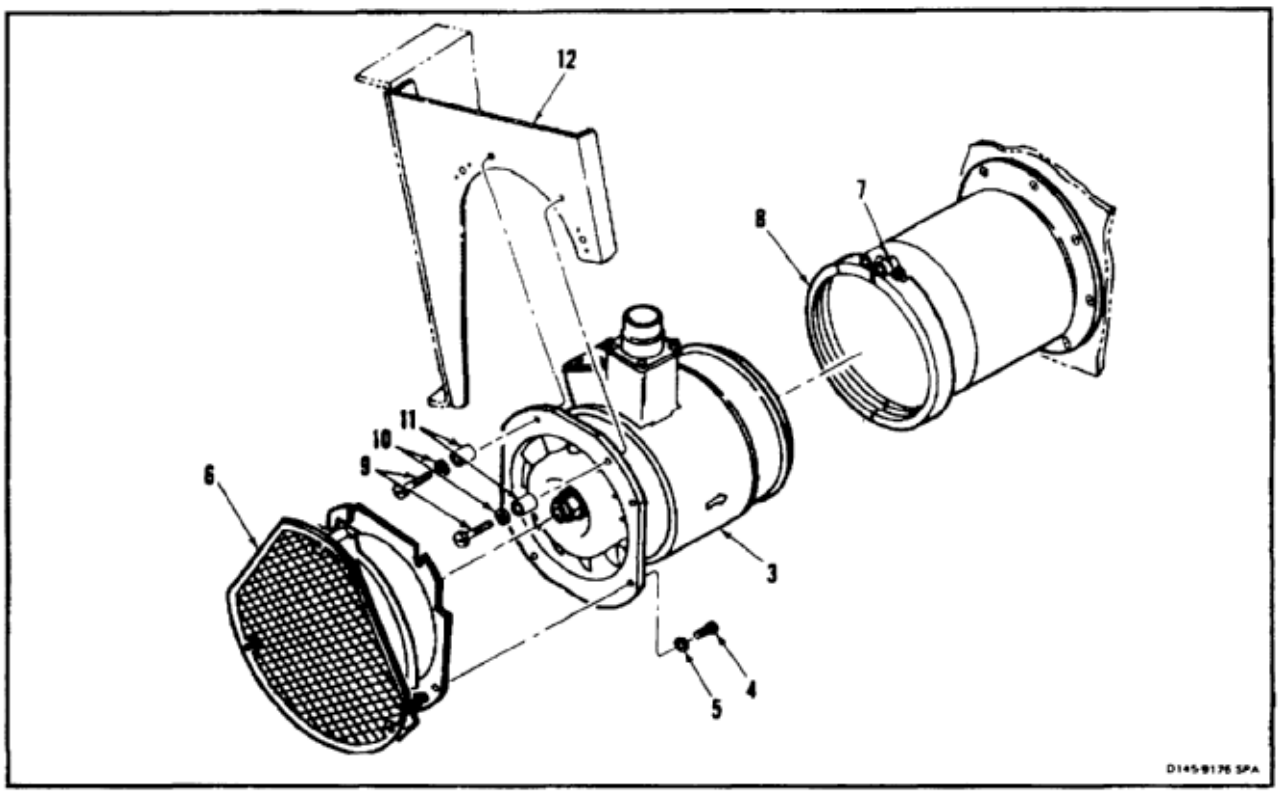


**9-55 REMOVE AVIONICS COOLING FAN (Continued) 9-55**

3. Remove six screws (4) and washers (5). Remove bellmouth (6).
4. Loosen nut (7) to open clamp (8).
5. Remove four screws (9) and washers (10), and two spacers (11).
6. Remove fan (3) from support bracket (12).

***FOLLOW-ON MAINTENANCE:***

None




**Tasks 9-56, 9-57, and 9-58 have been deleted.**

END OF TASK

## 9-59 INSTALL AVIONICS COOLING FAN 9-59

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

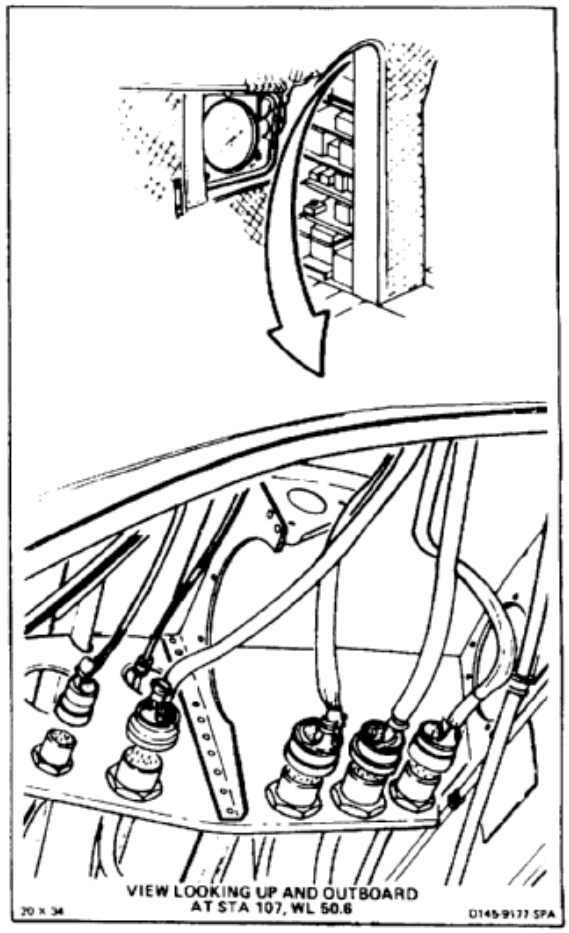
Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

None

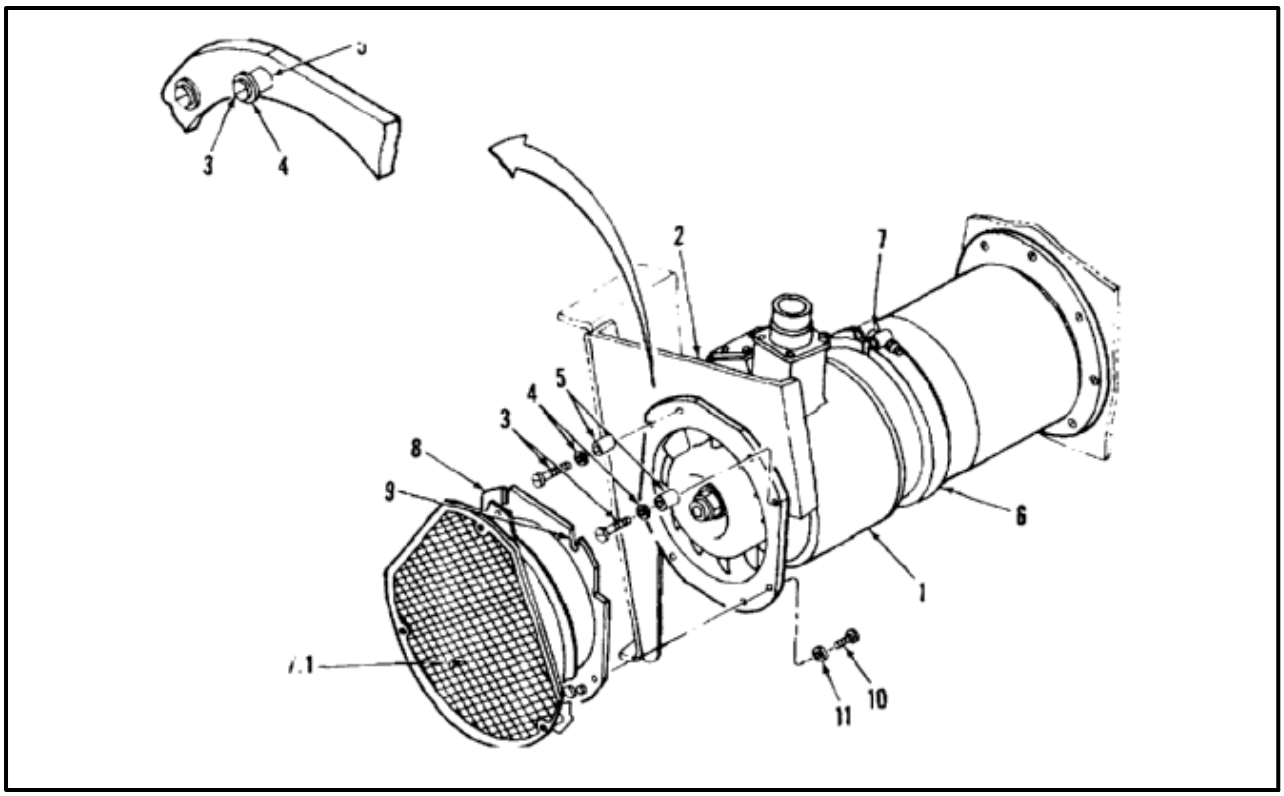
***Personnel Required:***

Aircraft Electrician
Inspector

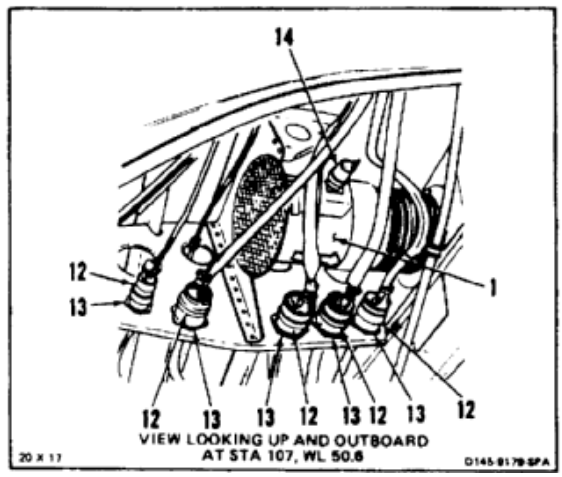


## 9-59 INSTALL AVIONICS COOLING FAN (Continued) 9-59

1. Install fan (1) in support bracket (2) using four screws (3) and washers (4), and two spacers (5).
2. Position clamp (6) and tighten nut (7).
3. Clean screen (7.1). Use a paint brush.
3.1. Inspect screen (7.1) for broken wires or wires broken away from bellmouth (8).
3.2. Position bellmouth (8) with two slots (9) under two washers (4).
4. Install four screws (10) and washers (11).



5. Connect five electrical connectors (12) to bulkhead connectors (13). Remove tags and one electrical connector (14) to fan (1).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).
Install avionics compartment acoustical blankets (Task 2-210).

END OF TASK

# SECTION V
# LIGHTING SYSTEMS DESCRIPTION AND OPERATION

One warning and 14 lighting systems are covered in this section. The emergency exits lights are covered in Chapter 17. The lighting systems are as follows:

1. Navigation (position) lights
2. Landing lights
3. Formation lights
4. Anticollision lights
5. Transmission oil level check light
6. Pilot's instrument panel lights
7. Center instrument panel lights
8. Copilot's instrument panel lights
9. Overhead panel lights
10. Console lights
11. Secondary cockpit lights
12. Cockpit dome and utility lights
13. Cabin and ramp lights
14. Troop warning system

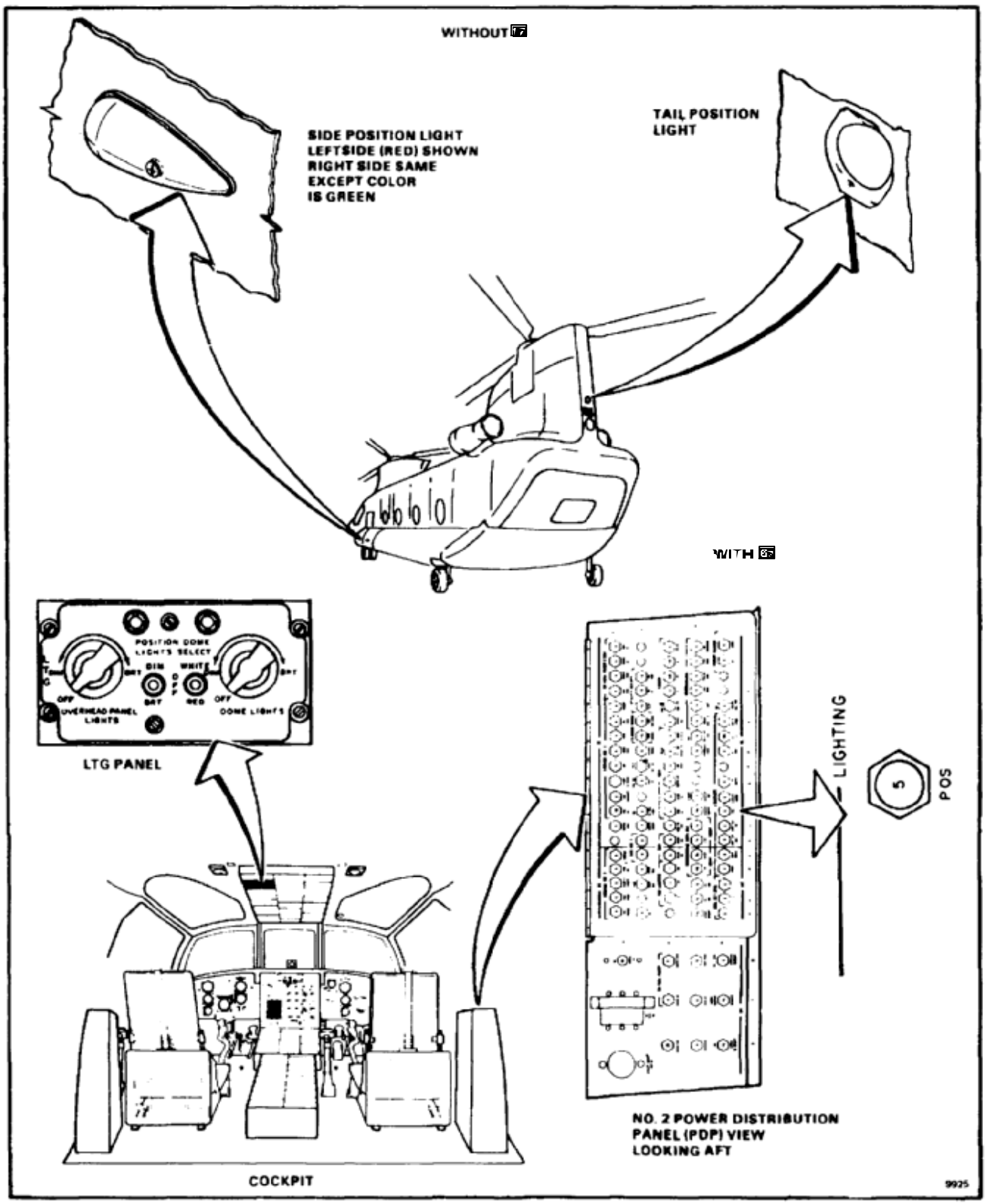
### *NAVIGATION (POSITION) LIGHT SYSTEM WITHOUT 17*

#### Description

The navigation (position) lighting system includes three position lights, dimming resistors, a switch in the cockpit overhead panel, and on aircraft with 67, a remote switch in the aft cabin. The red position light is on the left pod at sta. 242. The green position light is on the right pod at sta. 242. The white position light is on the tail at sta. 627. Dc power is connected to the lights through the POSITION LIGHTS switch on the overhead panel which also controls their brightness.

#### Operation

1. Power for the position lights comes from the **28 volt** No. 2 dc bus. When POS LIGHTING circuit breaker is closed, **28 vdc** is applied to terminals of POSITION LIGHTS switch S1.
2. When the switch is at BRT, **28 vdc** is applied directly to the three position lights. When the switch is at DIM, **28 vdc** is applied through dimming resistor R1 to the side position lights and through dimming resistor R2 to the tail position light.
3. On aircraft with 67, setting the remote AFT POS LIGHT switch at sta. 534 to OFF, removes power from the aft or tail position light. The AFT POS LIGHT switch shall be normally kept in the ON position.


WITHOUT 17
SIDE POSITION LIGHT
LEFTSIDE (RED) SHOWN
RIGHT SIDE SAME
EXCEPT COLOR
IS GREEN
TAIL POSITION
LIGHT
WITH 85
POSITION DOME
LIGHTS SELECT
BRT
DIM
OFF
BAT
WHITE
RED
OFF
BRT
OVERHEAD PANEL
LIGHTS
DOME LIGHTS
LTG PANEL
LIGHTING
5
POS
COCKPIT
NO. 2 POWER DISTRIBUTION
PANEL (PDP) VIEW
LOOKING AFT
9925

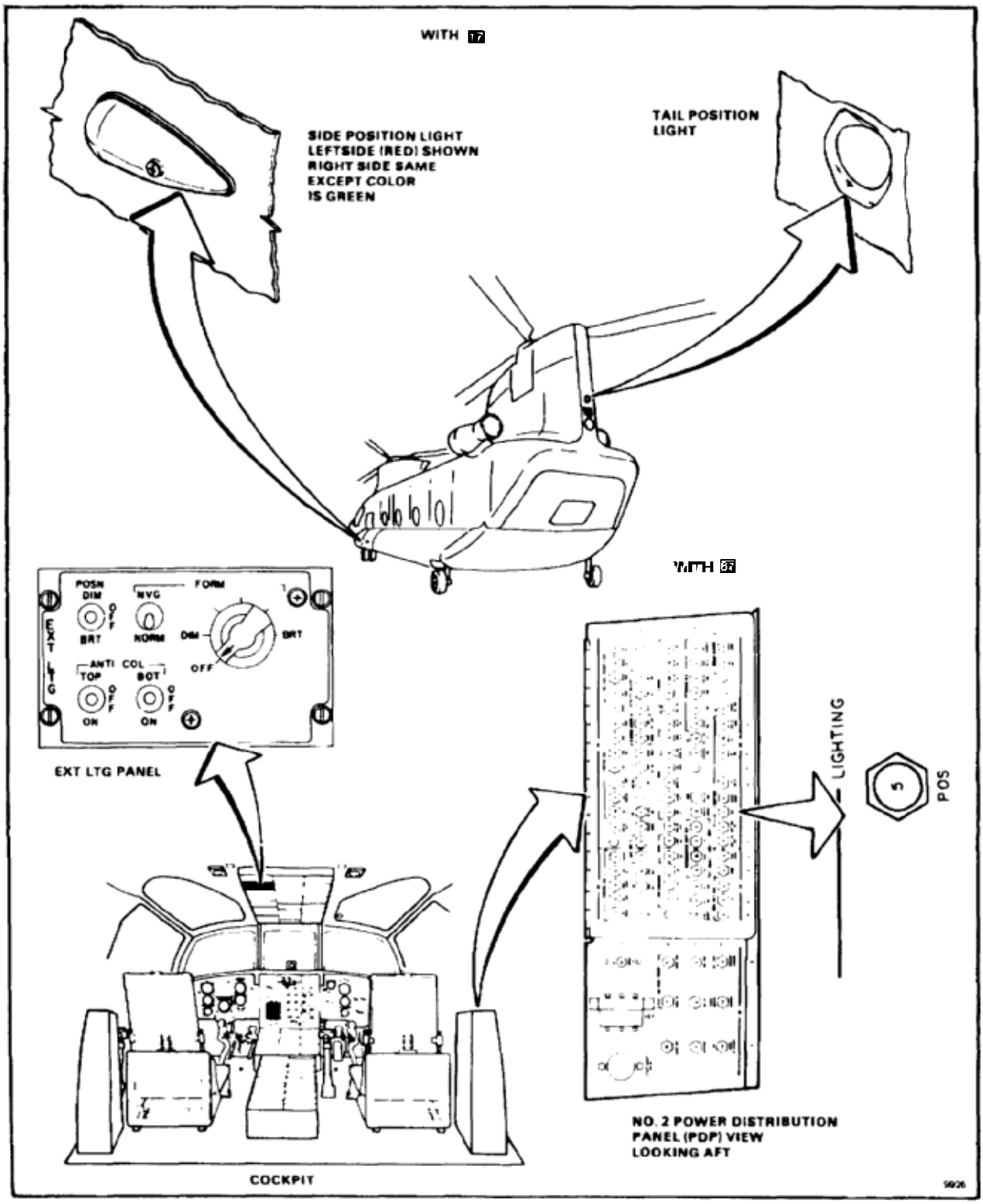
### *NAVIGATION (POSITION) LIGHT SYSTEM WITH 67*

#### Description

The navigation (position) lighting system includes three normal position lights, dimming resistors, a switch in the cockpit overhead panel, and on aircraft with **67**, a remote switch in the aft cabin. The red position light is on the left pod at sta. 242. The green position light is on the right pod at sta. 242. The white position light is on the tail at sta. 627. Dc power is connected to the lights through the POS EXT LTG switch on the overhead panel which also controls their brightness. The remote AFT POS LIGHT switch at sta. 534 on aircraft with **67**, provides control of the aft or tail position light.

#### Operation

1. Power for the position lights comes from the **28 volt** No. 2 dc bus. When POS LIGHTING circuit breaker is closed, **28 vdc** is applied to terminals of POS EXT LTG.
2. When the switch is at BRT, **28 vdc** is applied directly to the three position lights. When the switch is at DIM, **28 vdc** is applied through dimming resistor R1 to the side position lights and through dimming resistor R2 to the tail position light.
3. On aircraft with **67**, setting the remote AFT POS LIGHT switch at sta. 534 to OFF, removes power from the aft or tail position light. The AFT POS LIGHT switch shall be normally kept in the ON position.


WITH T7
SIDE POSITION LIGHT
LEFTSIDE (RED) SHOWN
RIGHT SIDE SAME
EXCEPT COLOR
IS GREEN
TAIL POSITION
LIGHT
WITH 26
POSN
DIM
BRT
OFF
NVG
NORM
FORM
DIM
BRT
OFF
ANTI COL
TOP
BOT
ON
OFF
EXT LTG
EXT LTG PANEL
LIGHTING
5
POS
NO. 2 POWER DISTRIBUTION
PANEL (PDP) VIEW
LOOKING AFT
COCKPIT
5926

### *LANDING LIGHT (SEARCHLIGHT) SYSTEM*

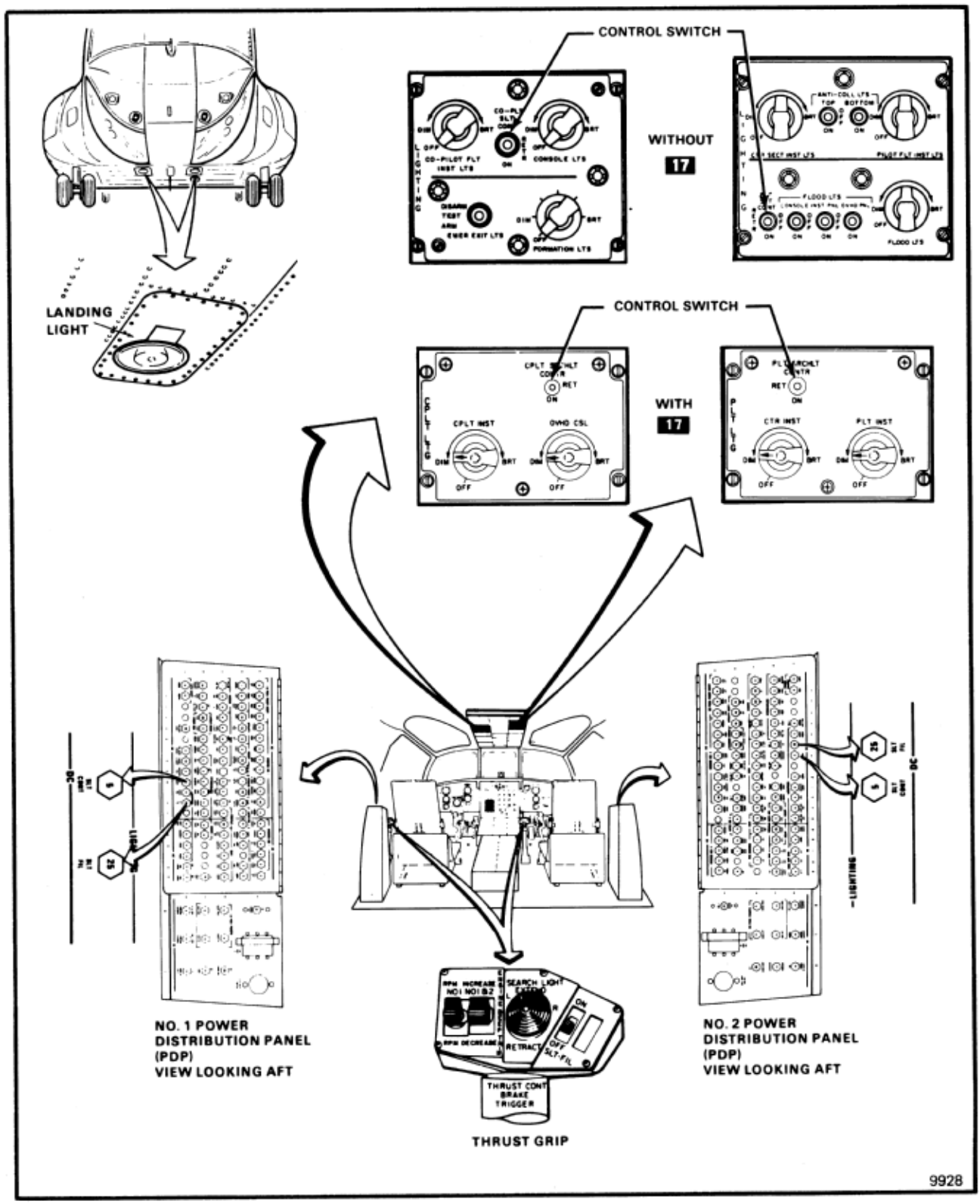
#### Description

The helicopter landing light (searchlight) system includes two similar controllable lights. They are located on the underside of the cockpit on either side of the helicopter centerline at sta. 65. Both light assemblies contain two motors that extend and rotate the light. The left light is controlled by the copilot and the right by the pilot.

Separate controls for each light consist of a switch and a control button on the operator's thrust control and a switch on the overhead LIGHTING panel. The overhead switch arms the motors. The switch on the thrust control turns the light on and off. The control button extends, rotates, and retracts the light.

On helicopters with 17, the left searchlight has a **150 watt** lamp and a filter that provides infra-red lighting that is invisible to the naked eye. It is used for missions calling for night vision goggles (NVG). The right searchlight has a conventional **450 watt** lamp. It is used during non-NVG missions.

Power to operate each light comes from the No. 1 (left light) or No. 2 (right light) **28 vdc** bus.


CONTROL SWITCH
WITHOUT 17
LANDING LIGHT
CONTROL SWITCH
WITH 17
NO. 1 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT
NO. 2 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT
THRUST GRIP
9928

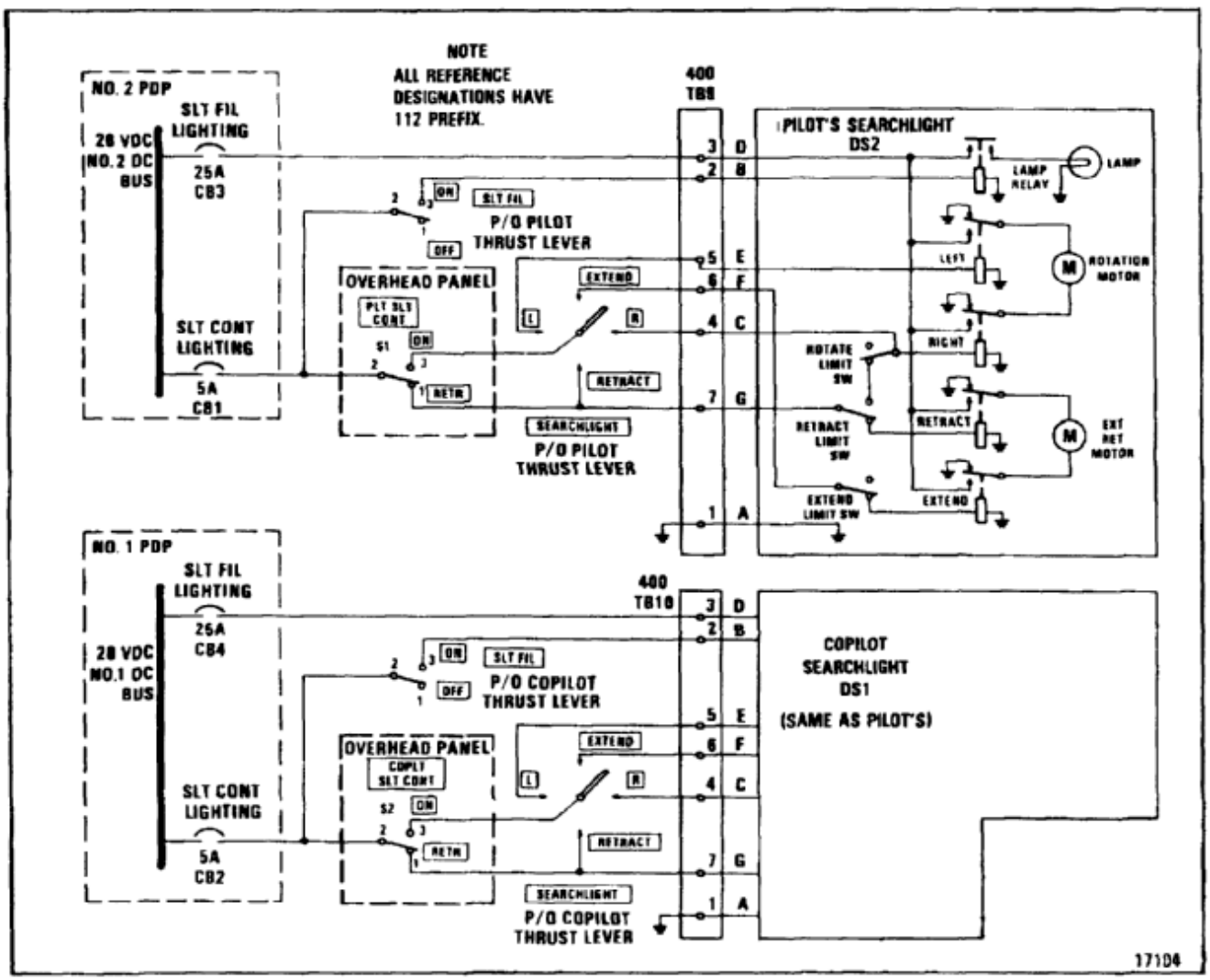
**Theory of Operation**

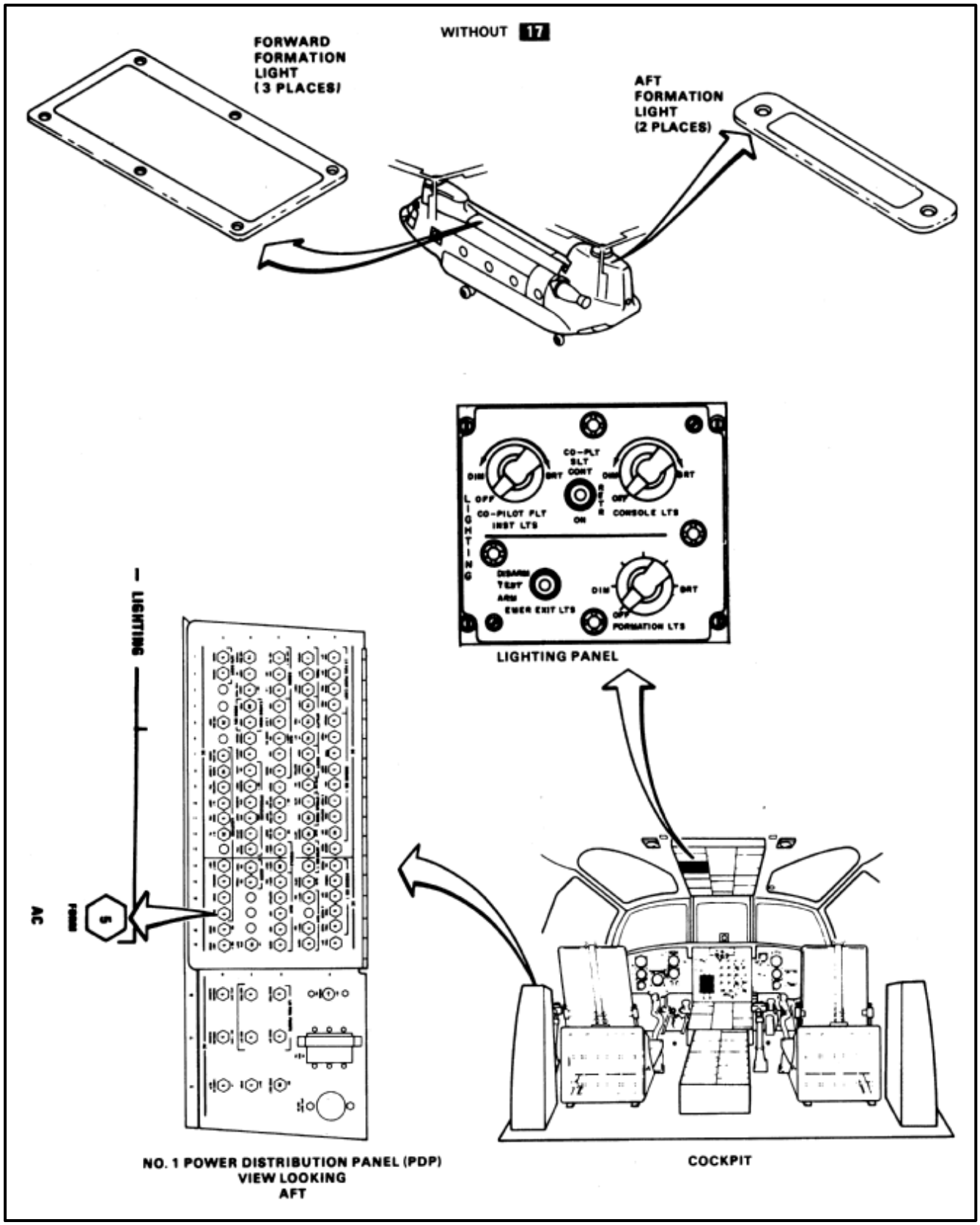
Power to operate the lamp and motors of each searchlight assembly comes through a SLT FIL LIGHTING circuit breaker on the associated **28 vdc** bus. Control of the lamp and motors is through relays energized by power from the same bus through a SLT CONT LIGHTING circuit breaker.

With both circuit breakers in, turning the SLT FIL switch on the thrust lever to ON energizes a lamp relay to provide **28 vdc** to light the lamp. Turning the control switch on the overhead panel to ON arms the SEARCHLIGHT control button on the thrust lever. When it has been armed, moving the spring-loaded button to EXTEND, RETRACT, L, or A energizes one of four relays in the searchlight assembly. The energized relay puts power to one of the two searchlight motors to extend or retract the light or rotate it left or right.

Moving the switch on the overhead panel to RETR overrides the switch on the thrust lever. The light automatically retracts and rotates to point straight down, regardless of the thrust lever switch position. However, the light will remain lit until the SLT FIL switch is turned OFF.

Limit switches in the motor circuits open to cut power to the relevant motor when the light is fully extended or retracted with the lamp rotated to face downward.




WITHOUT 17
FORWARD FORMATION LIGHT (3 PLACES)
AFT FORMATION LIGHT (2 PLACES)
LIGHTING PANEL
LIGHTING
AC
NO. 1 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT
COCKPIT

### *FORMATION LIGHT SYSTEM WITH 17*

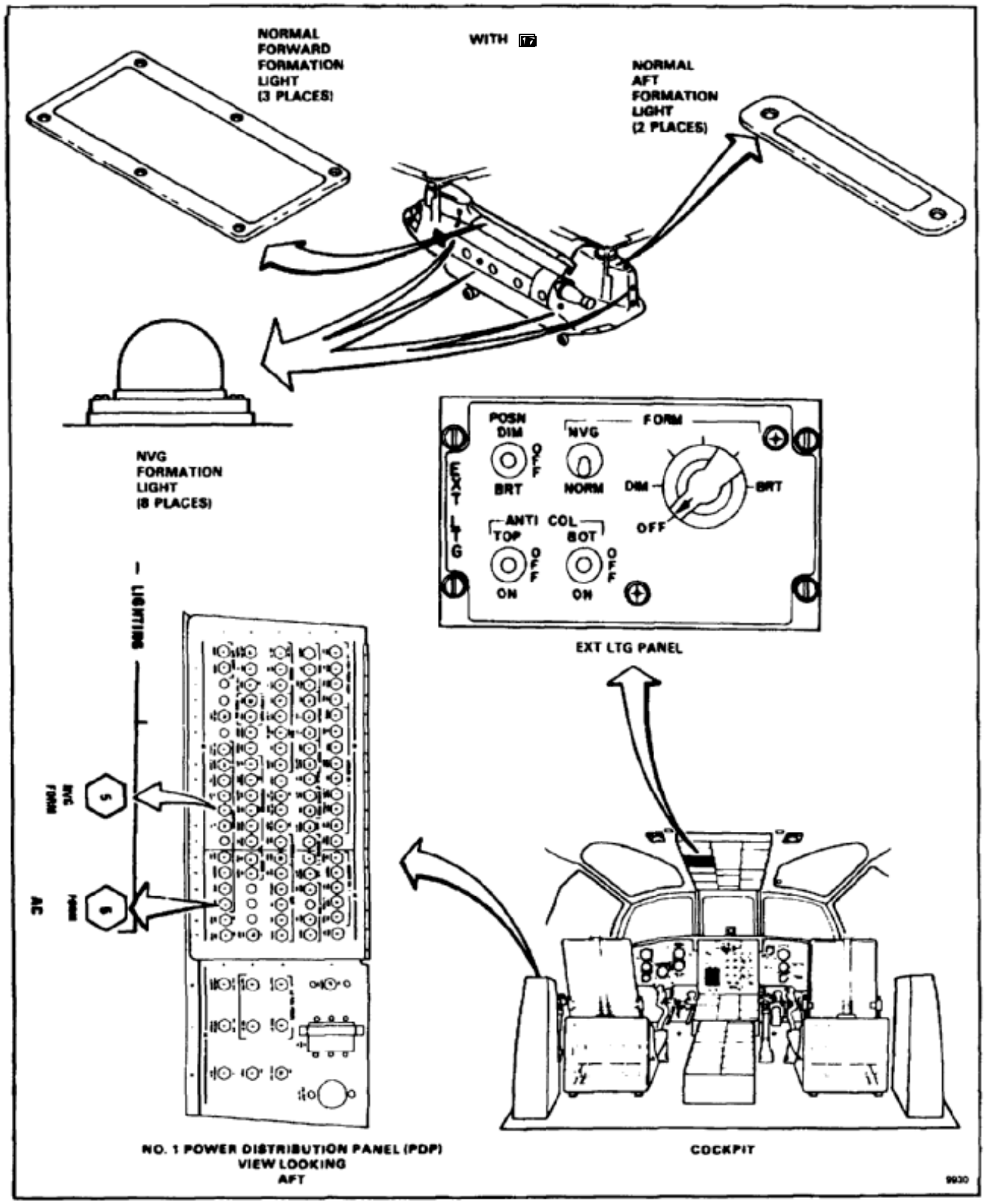
**Description**

There are two formation light systems on the helicopter. One system provides infra-red (invisible to the unaided eye) NVG-compatible lighting. The other system provides normal lighting for non-NVG missions. A switch on the overhead panel selects NVG or NORM formation lighting and a FORM DIM-BRIGHT control is common to both systems. Each system includes four dimming resistors, also in the overhead panel.

1. There are eight NVG formation lights. Two are on the aft end of the forward transmission fairing. One is on each side between the first and second cabin windows. One is on each side aft of the fourth cabin window. One is on top of the pylon and one is on the aft end of the pylon. Each light contains two light emitting diodes connected in parallel.
2. The normal formation lights include five electro-luminescent lights on top of the helicopter. Three lights are on the forward section of the helicopter and two lights are side-by-side on the pylon. In the forward group, one light is on the centerline at sta. 200, the other two are **30 inches** from the centerline on each side at sta. 253.

**Operation**

1. When the FORM switch is at NVG, power for the eight formation lights comes from **28 volt** No. 1 dc bus. When NVG FORM LIGHTING circuit breaker is closed, **28 vdc** is connected to the moving contact of the FORM DIM/BRIGHT control.
2. When the FORM control is at DIM, power is supplied through resistors, 113R5, 113R6, 113R7 and 113R8. Rotating the switch towards BRT drops resistor out of the circuit, until at the BRT position power is applied directly to the lights for maximum brightness.
3. Power for the normal formation lights comes from **115 volt** No. 1 ac bus. When FORM LIGHTING circuit breaker is closed, **115 vac** is connected to the moving contact of the FORM DIM/BRIGHT control.
4. When the FORM control is at DIM, power is applied to the lights through resistor R1. In the next three positions of the switch, power is applied to the lights through lower-value resistors. At each succeeding position, brightness of the lamps is increased. When the switch is at BRT, power is applied directly to the lights. In this position, the lights are at maximum brightness.


NORMAL FORWARD FORMATION LIGHT (3 PLACES)
WITH
NORMAL AFT FORMATION LIGHT (2 PLACES)
NVG FORMATION LIGHT (8 PLACES)
POSN DIM
OFF
BRT
NVG
NORM
FORM
DIM
BRT
OFF
EXT LTG
ANTI COL
TOP
BOT
OFF
ON
OFF
ON
EXT LTG PANEL
LIGHTING
NVG FORM
FORM
AC
NO. 1 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT
COCKPIT
9930

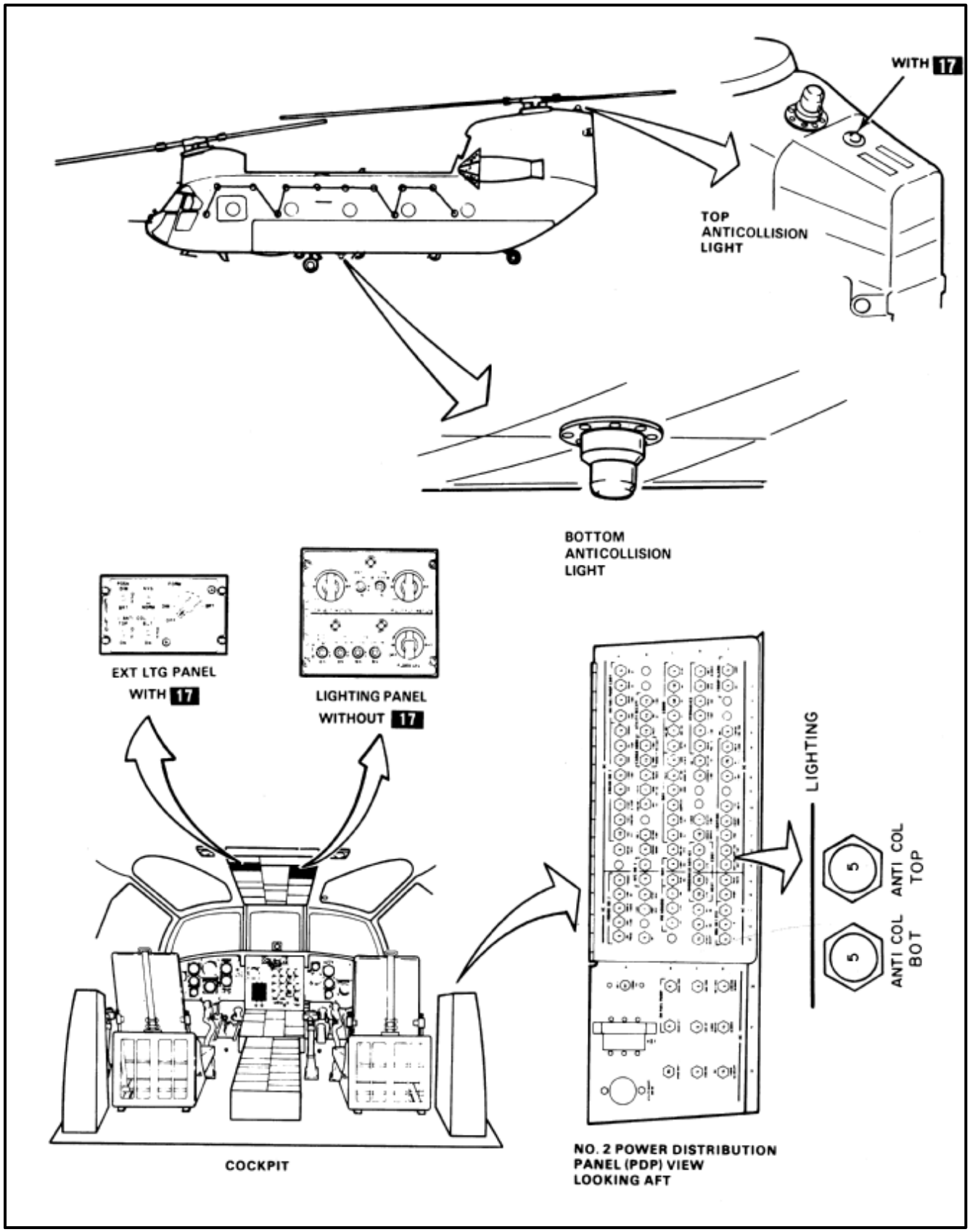
### *ANTICOLLISION LIGHT SYSTEM*

**Description**

The anticollision light system includes two anticollision lights, each controlled by an associated switch. One anticollision light is at the top of the pylon at sta. 594 and the other anticollision light is on the helicopter bottom centerline at sta. 290. Two ANTI-COL switches, TOP and BOTTOM, on the overhead panel turn their respective lights on or off.

**Operation**

1. Power for the anticollision lights comes from the **28 volt** No. 2 dc bus. When ANTI-COL TOP LIGHTING circuit breaker is closed, **28 vdc** is applied to terminal 2 of TOP ANTICOL switch. When ANTI-COL BOT LIGHTING circuit breaker is closed, **28 vdc** is applied to terminal 2 of BOTTOM ANTI-COL switch.
2. When TOP ANTI-COL switch is at ON, **28 vdc** from the switch operates the top anticollision light. When BOTTOM ANTI-COL switch is at ON, **28 vdc** from the switch operates the bottom anticollision light.


WITH 17
TOP ANTICOLLISION LIGHT
BOTTOM ANTICOLLISION LIGHT
EXT LTG PANEL WITH 17
LIGHTING PANEL WITHOUT 17
COCKPIT
NO. 2 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT
LIGHTING
5
ANTI COL TOP
5
ANTI COL BOT

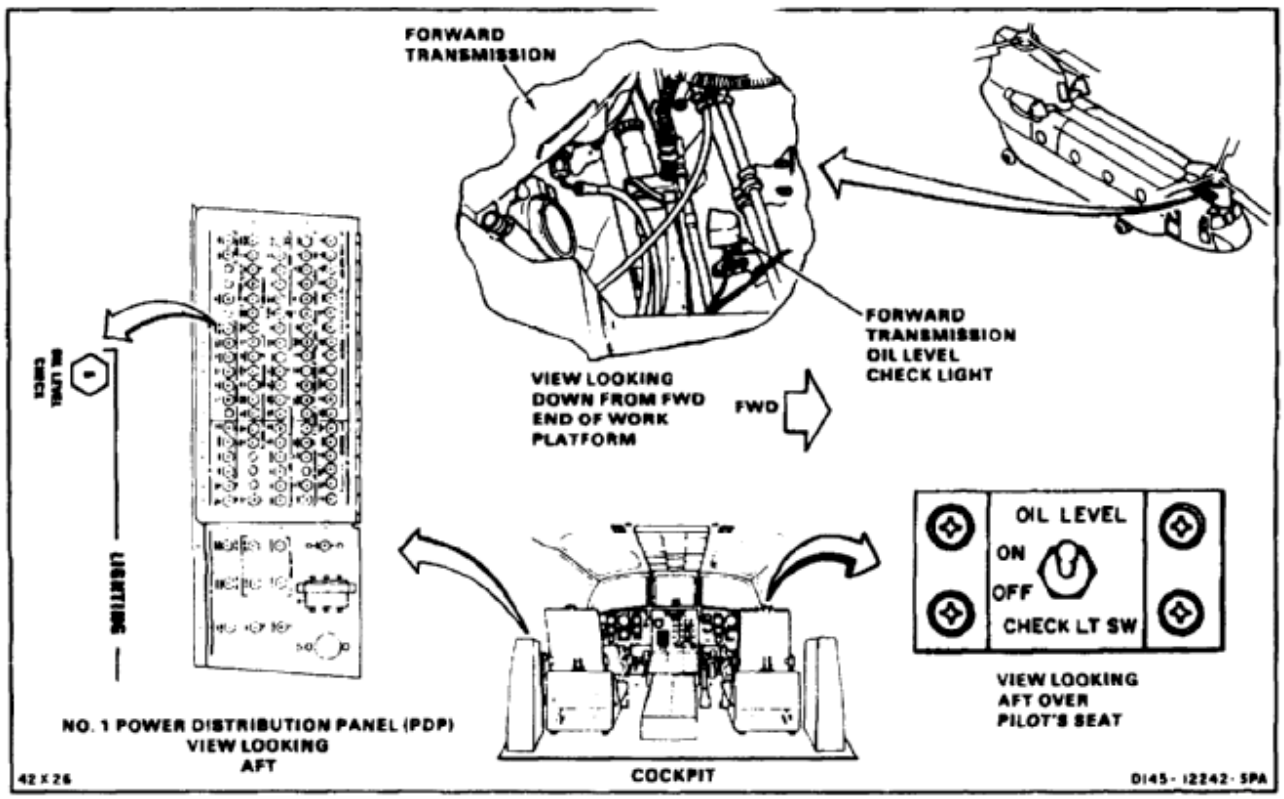
### *FORWARD TRANSMISSION OIL LEVEL CHECK LIGHT*

#### Description

The transmission oil check light system includes a switch, and a light. It lights the oil level sight gage on the forward transmission. The switch, marked OIL LEVEL CHECK LT SW, is on a structural member above the pilot's seat. Power for the transmission oil level check light system comes from the **28 volt** switched battery bus.

#### Operation

When OIL LEVEL CHECK LIGHTING circuit breaker is closed, **28 vdc** is applied to terminal 2 of OIL LEVEL CHECK LT SW. When the switch is at ON, **28 vdc** lights the forward transmission check light.



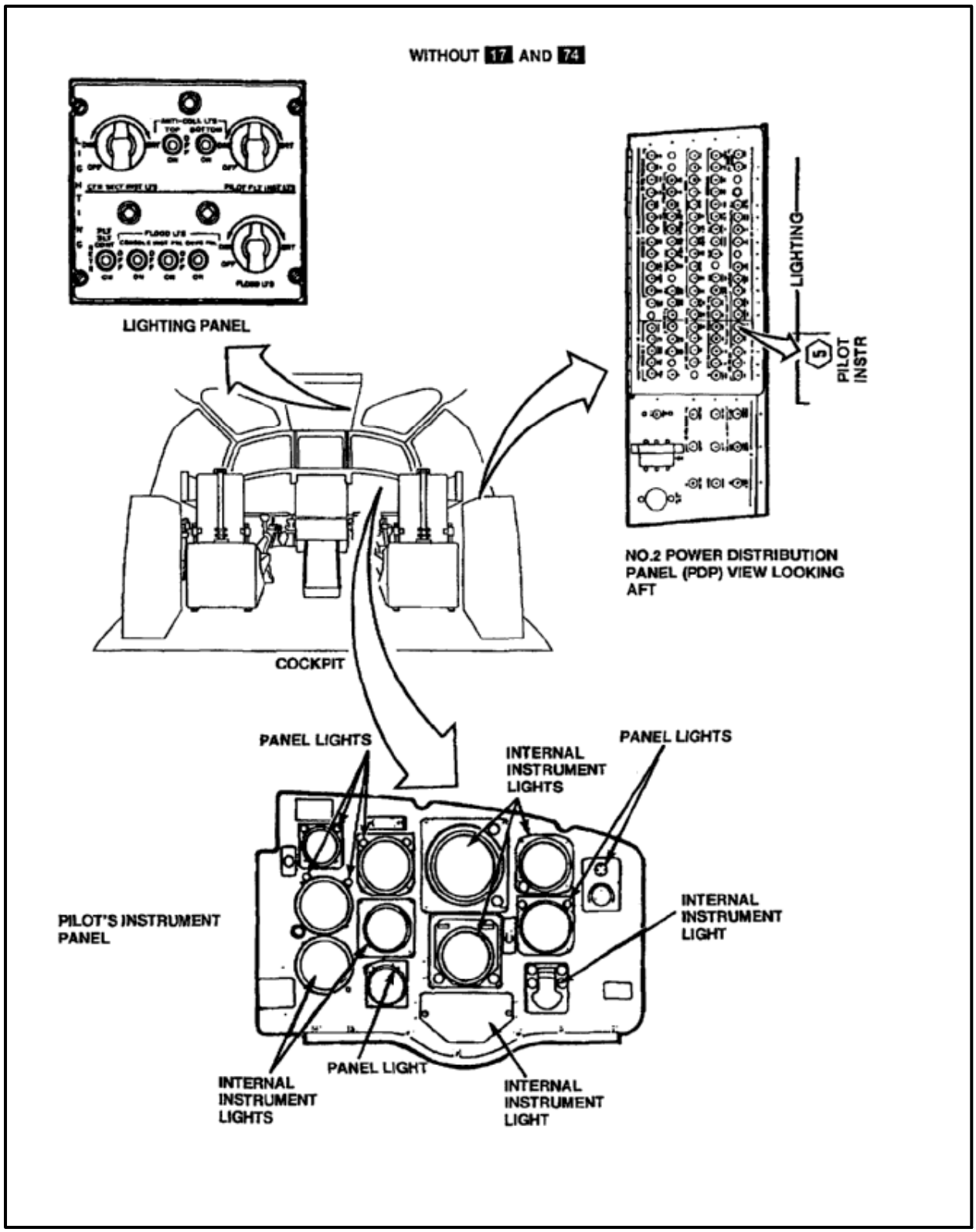
### *PILOT'S FLIGHT INSTRUMENT PANEL LIGHT SYSTEM WITHOUT 17 AND 74*

#### Description

The pilot's flight instrument panel lights system contains a PILOT FLT INST LTS control, autotransformer, variable resistor, and lamps to light the instruments and the RAD ALT dimming panel. Panel lights illuminate the following instruments: clock, cruise guide indicator (CGI), rate of climb, turn and slip, course, airspeed indicators, and the dual engine torquemeter. The system also supplies **26 vac** to the integral lamp in the vertical gyro indicator (VGI) and the standby compass and **5 vac** to integral lamps in the AIMS altimeter, horizontal situation indicator (HSI), radar altimeter, and the rotor tachometer.

#### Operation

Power for the system comes from No. 2, **26 vac**, lighting transformer. When the PILOT INSTR LIGHTING circuit breaker is closed, **26 vac** is applied to the PILOT FLT INST LTS control which is used to vary the brightness of the lamps. Should a loss of **26 vac** occur on the No. 2 **26 vac** bus, the lamps for the turn and slip indicator can be controlled through the secondary cockpit lighting circuit.


WITHOUT 17 AND 74
LIGHTING PANEL
LIGHTING
5
PILOT INSTR
NO.2 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT
COCKPIT
PANEL LIGHTS
INTERNAL INSTRUMENT LIGHTS
PANEL LIGHTS
PILOT'S INSTRUMENT PANEL
INTERNAL INSTRUMENT LIGHT
INTERNAL INSTRUMENT LIGHTS
PANEL LIGHT
INTERNAL INSTRUMENT LIGHT

### *PILOT'S FLIGHT INSTRUMENT PANEL LIGHT SYSTEM WITH 17 AND WITHOUT 74*

#### Description

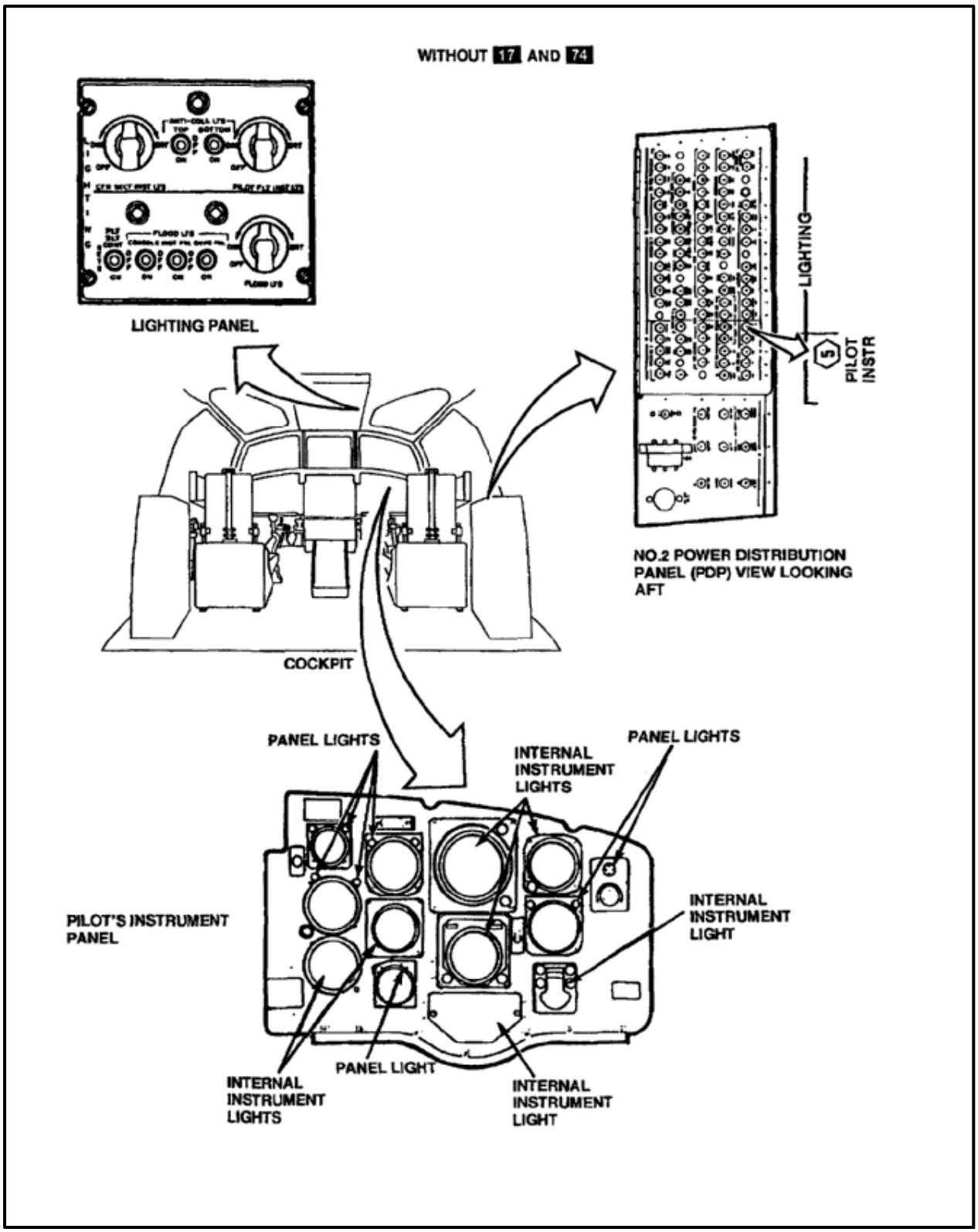
The pilot's instrument panel light system includes a PLT INST LTG control, **0-115 volt** variable transformer, **115 to 5 volt** autotransformer, and lamps to light the instruments and the RAD ALT dimming panel. Panel lights light the following instruments: cruise guide indicator (CGI), rate of climb, AIMS altimeter, rotor tachometer, airspeed indicator, and the dual engine torquemeter. Internal lights light the following instruments: turn and slip indicator (lightplate), RAD ALT DIM attitude indicator, horizontal situation indicator (HSI) and mode select panel (lightplate), radar altimeter, and attitude direction indicator.

The pilot's clock is lighted by a **28 vdc** circuit.

#### Operation

Power for the **5 vac** system comes from the **115 volt** No. 2 ac bus. When the PILOT INSTR LIGHTING circuit breaker is closed, **115 vac** is applied to the PILOT INST LTS control which varies the **5 volt** output to vary the brightness of the lamps. When the control is turned from DIM, a switch arms a circuit in the secondary lighting circuit which turns on the floodlights in an ac power failure, and also provides dimming for pushbutton lighting in the cockpit.

When the PLT CLOCK circuit breaker is closed, **28 vdc** from No. 2 essential bus is routed to the clock.


WITHOUT 17 AND 74
LIGHTING PANEL
LIGHTING
5
PILOT INSTR
NO.2 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT
COCKPIT
PANEL LIGHTS
INTERNAL INSTRUMENT LIGHTS
PANEL LIGHTS
PILOT'S INSTRUMENT PANEL
INTERNAL INSTRUMENT LIGHT
INTERNAL INSTRUMENT LIGHTS
PANEL LIGHT
INTERNAL INSTRUMENT LIGHT

### *PILOT'S FLIGHT INSTRUMENT PANEL LIGHT SYSTEM WITH 17 AND 74*

#### Description

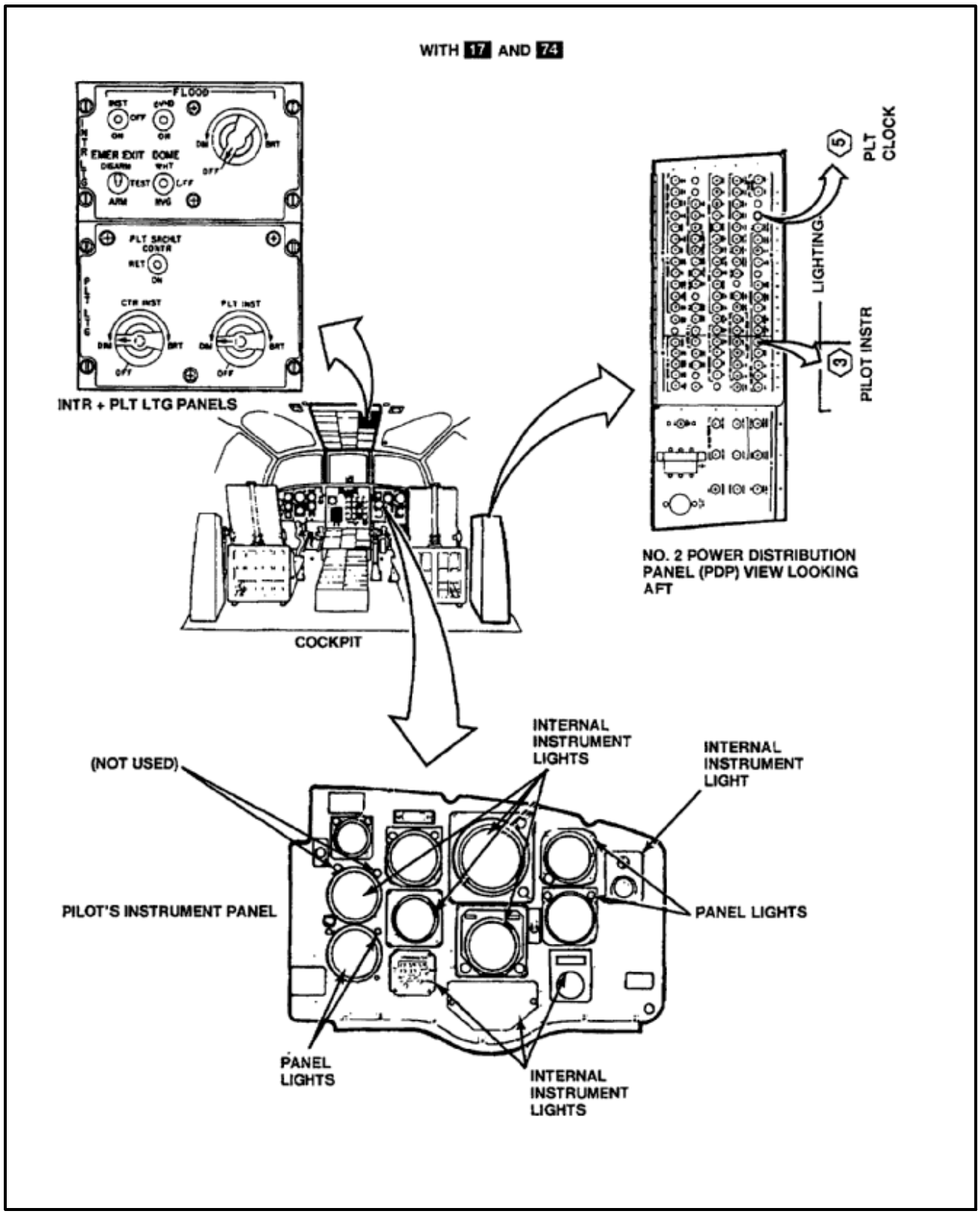
The pilot's instrument panel light system includes a PLT INST LTG control, **0-115 volt** variable transformer, **115 to 5 volt** autotransformer, and lamps to light the instruments and the RAD ALT dimming panel. Panel lights light the following instruments: cruise guide indicator (CGI), rate of climb, AIMS altimeter, rotor tachometer, and the airspeed indicator. Internal lights light the following instruments: turn and slip indicator (lightplate), RAD ALT DIM attitude indicator, horizontal situation indicator (HSI) and mode select panel (lightplate), radar altimeter, attitude direction indicator, and the dual engine torquemeter.

The pilot's clock is lighted by a **28 vdc** circuit.

#### Operation

Power for the **5 vac** system comes from the **115 volt** No. 2 ac bus. When the PILOT INSTR LIGHTING circuit breaker is closed, **115 vac** is applied to the PILOT INST LTS control which varies the **5 volt** output to vary the brightness of the lamps. When the control is turned from DIM, a switch arms a circuit in the secondary lighting circuit which turns on the floodlights in an ac power failure, and also provides dimming for pushbutton lighting in the cockpit.

When the PLT CLOCK circuit breaker is closed, **28 vdc** from No. 2 essential bus is routed to the clock.


WITH 17 AND 74
FLOOD
EMER EXIT
DOME
PLT SHOULT CONTR
CTR INST
PLT INST
INTR + PLT LTG PANELS
COCKPIT
5
PLT CLOCK
LIGHTING
3
PILOT INSTR
NO. 2 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT
(NOT USED)
INTERNAL INSTRUMENT LIGHTS
INTERNAL INSTRUMENT LIGHT
PILOT'S INSTRUMENT PANEL
PANEL LIGHTS
PANEL LIGHTS
INTERNAL INSTRUMENT LIGHTS

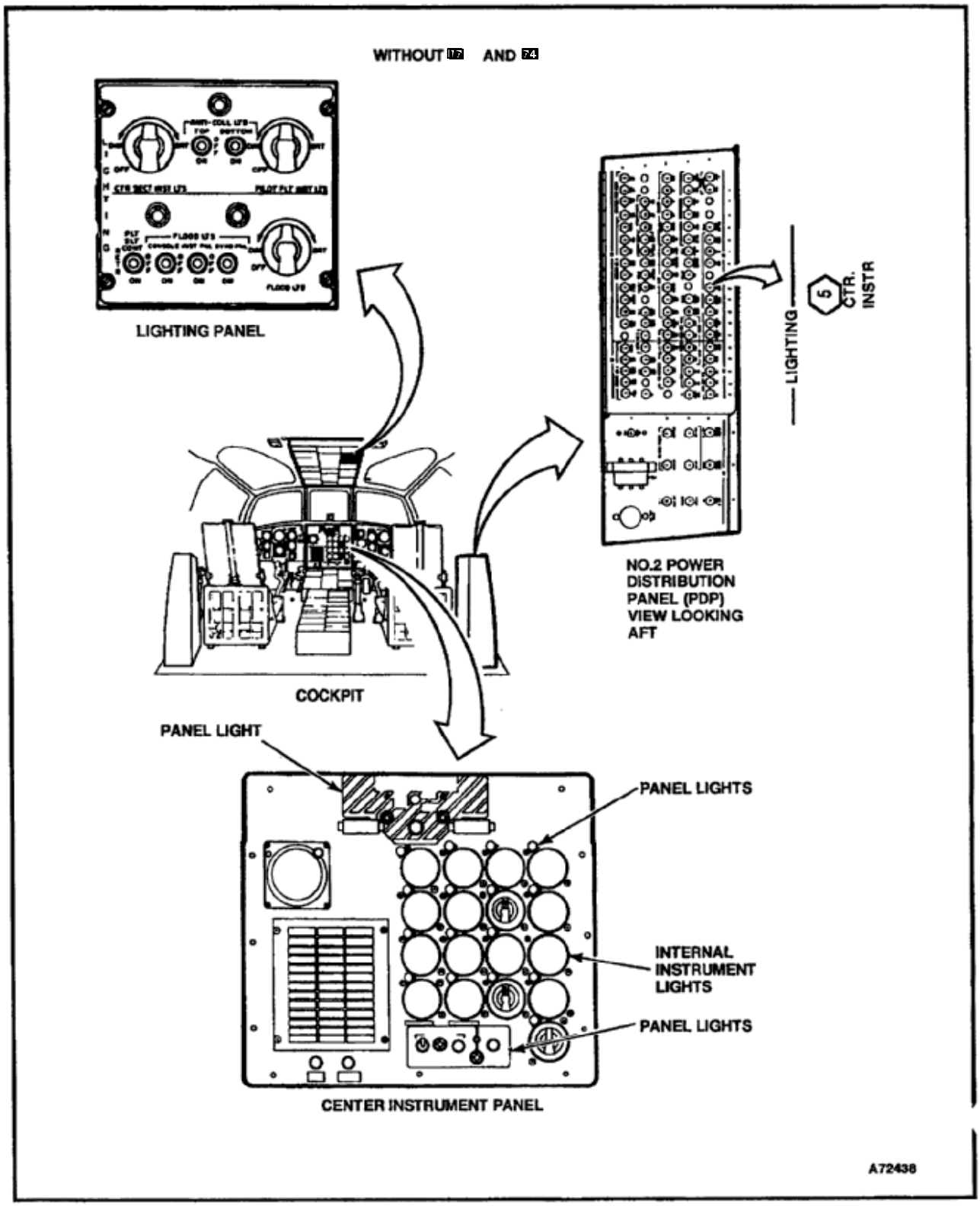
### *CENTER FLIGHT INSTRUMENT PANEL LIGHTS SYSTEM WITHOUT 17 AND 74*

**Description**

The center flight instrument panel lighting system includes CTR SECT INST LTS control, adjustable resistor, and lamps to light the instruments and the FIRE DETECTOR panel. Panel lights illuminate the FIRE DETECTOR panel and 16 instruments and 3 controls.

**Operation**

Power for the system comes from the **28 volt** No. 2 dc bus. When CTR INSTR LIGHTING circuit breaker is closed, **28 volts** is applied to CTR SECT INST LTS control which controls brightness of the lamps.


WITHOUT 17 AND 74
LIGHTING PANEL
LIGHTING
5
CTR. INSTR
NO.2 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT
COCKPIT
PANEL LIGHT
PANEL LIGHTS
INTERNAL INSTRUMENT LIGHTS
PANEL LIGHTS
CENTER INSTRUMENT PANEL
A72438

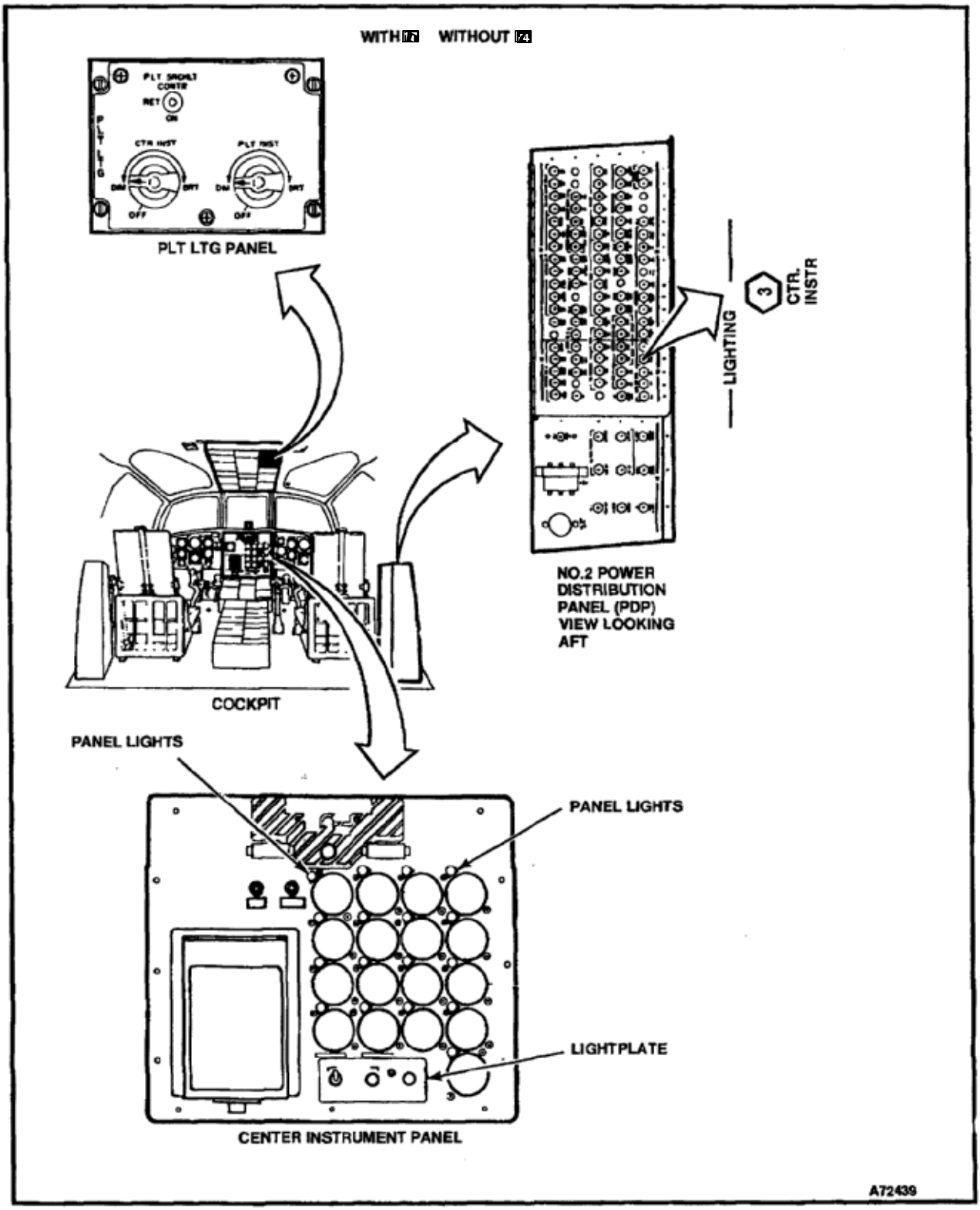
### *CENTER FLIGHT INSTRUMENT PANEL LIGHTS SYSTEM WITH 17 AND WITHOUT 74*

**Description**

The center panel lighting system includes CTR INST LTG control **0-115** variable transformer, **0-115 volt** variable transformer, **0-115 volt** variable autotransformer, lamps to light 17 instruments, standby compass, and lightplates for FIRE DETECTOR panel, and CAUTION LIGHTS/VHF ANT SEL panel.

**Operation**

Power for the system comes from the **115 volt** No. 2 ac bus. When CTR INSTR LIGHTING circuit breaker is closed, **115 vac** is applied to CTR INST LTG control which varies the **5 volt** output to vary the brightness of the lamps and lightplates.


WITH
WITHOUT
PLT LTG PANEL
LIGHTING
3
CTR. INSTR
NO.2 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT
COCKPIT
PANEL LIGHTS
PANEL LIGHTS
LIGHTPLATE
CENTER INSTRUMENT PANEL
A72439

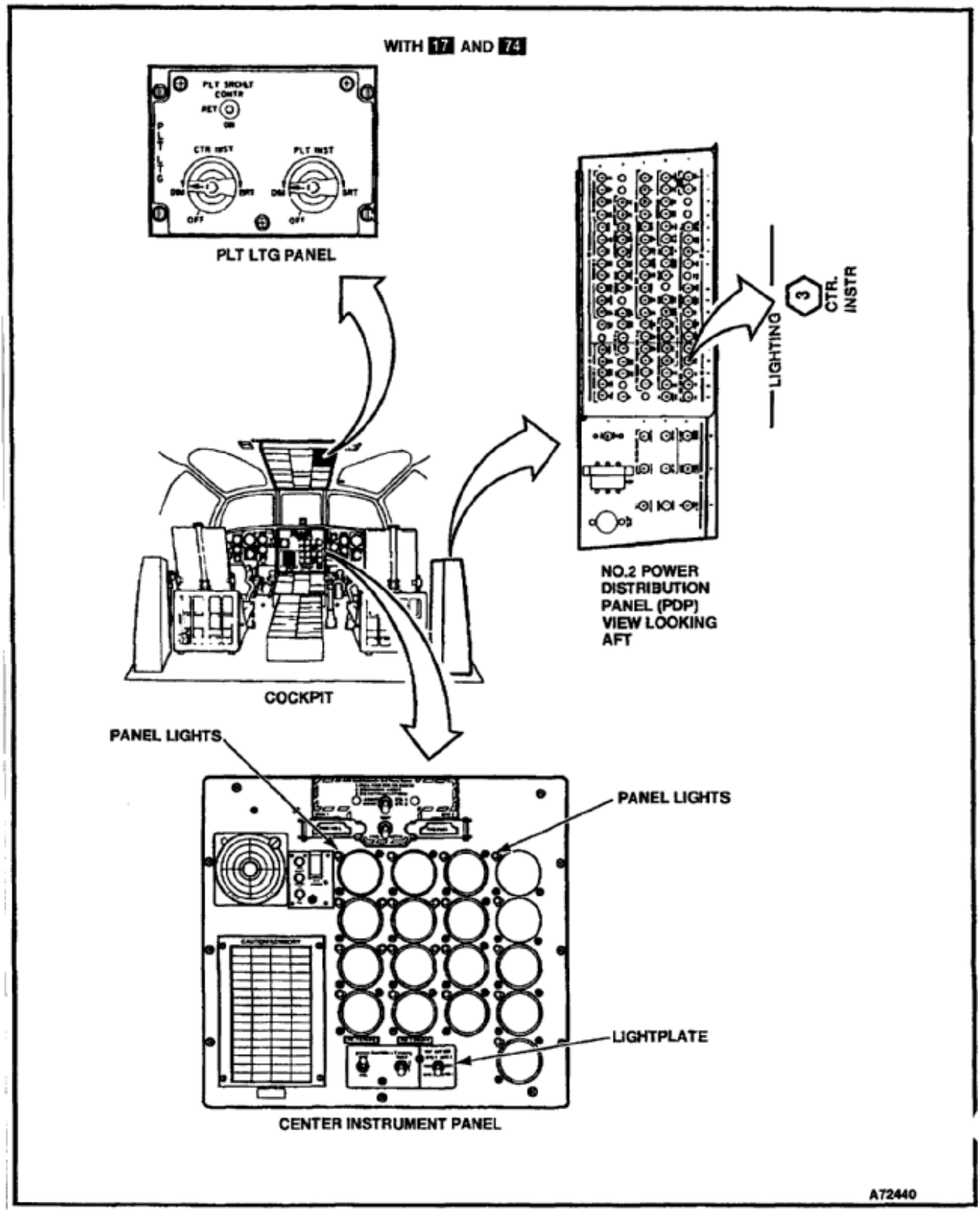
### *CENTER FLIGHT INSTRUMENT PANEL LIGHTS SYSTEM WITH 17 AND 74*

**Description**

The center instrument panel lighting system includes CTR INST LTG control **0-115** variable transformer, **115 to 5 volt** autotransformer, lamps to light 17 instruments, standby compass, and lightplates for FIRE DETECTOR panel, and CAUTION LT/VHF ANT SEL panel.

**Operation**

Power for the system comes from the **115 volt** No. 2 ac bus. When CTR INSTR LIGHTING circuit breaker is closed, **115 vac** is applied to CTR INST LTG control which varies the **5 volt** output to vary the brightness of the lamps and lightplates.


WITH 17 AND 74
PLT LTG PANEL
LIGHTING
3
CTR. INSTR
NO.2 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT
COCKPIT
PANEL LIGHTS
PANEL LIGHTS
LIGHTPLATE
CENTER INSTRUMENT PANEL
A72440

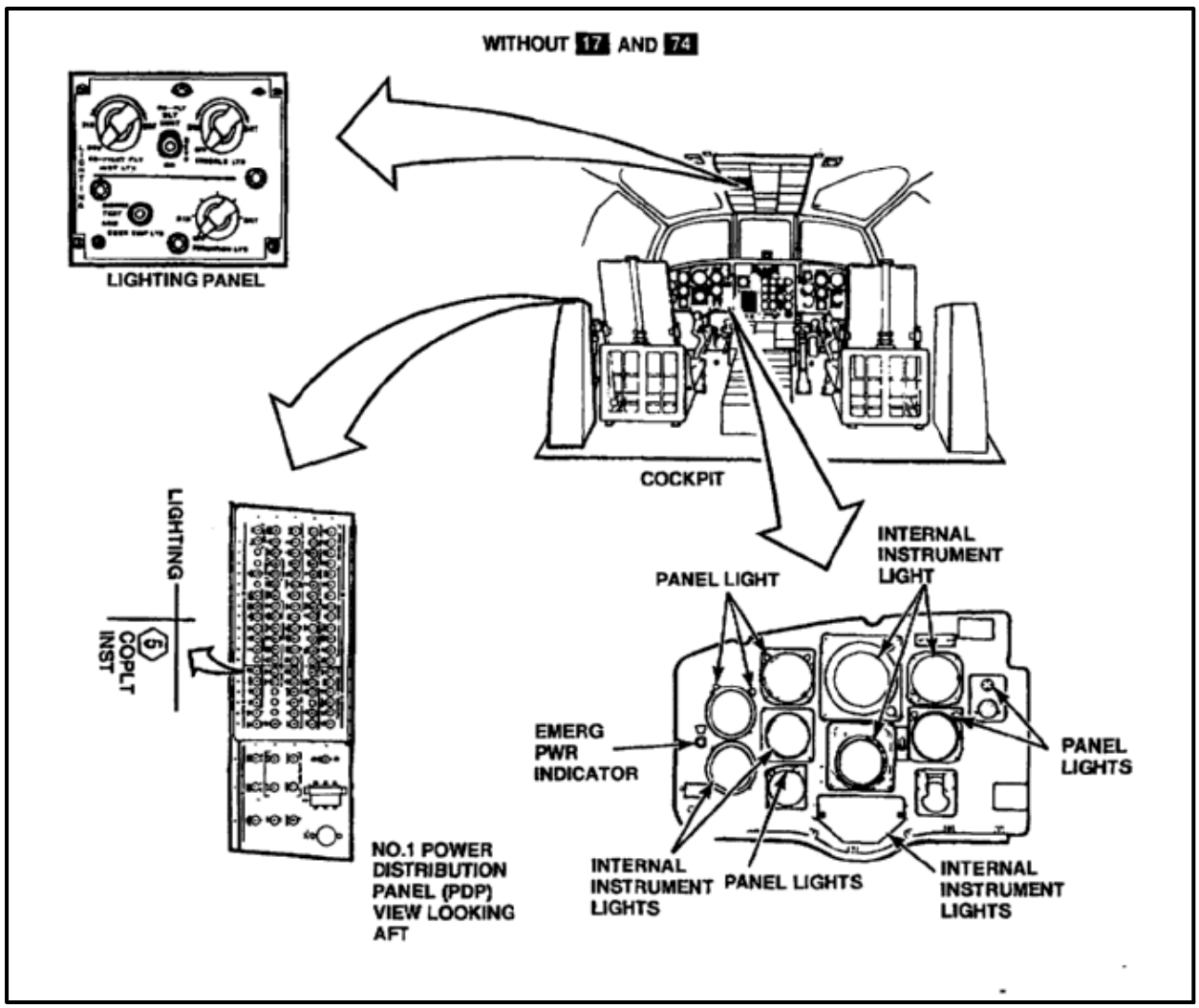
### *COPILOT'S FLIGHT INSTRUMENT PANEL LIGHTS SYSTEM WITHOUT 17 AND 74*

#### Description

The copilot's flight instrument panel lights system contains a CO-PILOT FLT INST LTS control, autotransformer, variable resistor, and lamps to light the instruments and the RAD ALT dimming panel. Shield lights illuminate the following instruments: clock, horizontal situation indicator (HSI), rate of climb, turn and slip, airspeed, and course indicators. Postlights illuminate the dual engine torquemeter. The system also provides **26 vac** to the integral lamps in the VGI and **5 vac** to the integral lamps in the AIMS altimeter, radar altimeter, and rotor tachometer.

#### Operation

Power for the system comes from No. 1 **26 vac** lighting transformer. When COPILOT INSTR LIGHTING circuit breaker is closed, **26 vac** is applied to the CO-PILOT FLT INST LTS control, which is used to vary the brightness of the lamps. Should a loss of **26 vac** occur on the No. 1 **26 vac** bus, the lamps for the turn and slip indicator can be controlled through the secondary cockpit lighting circuit.



### *COPILOT'S FLIGHT INSTRUMENT PANEL LIGHTS SYSTEM WITH 17 AND WITHOUT 74*

**Description**

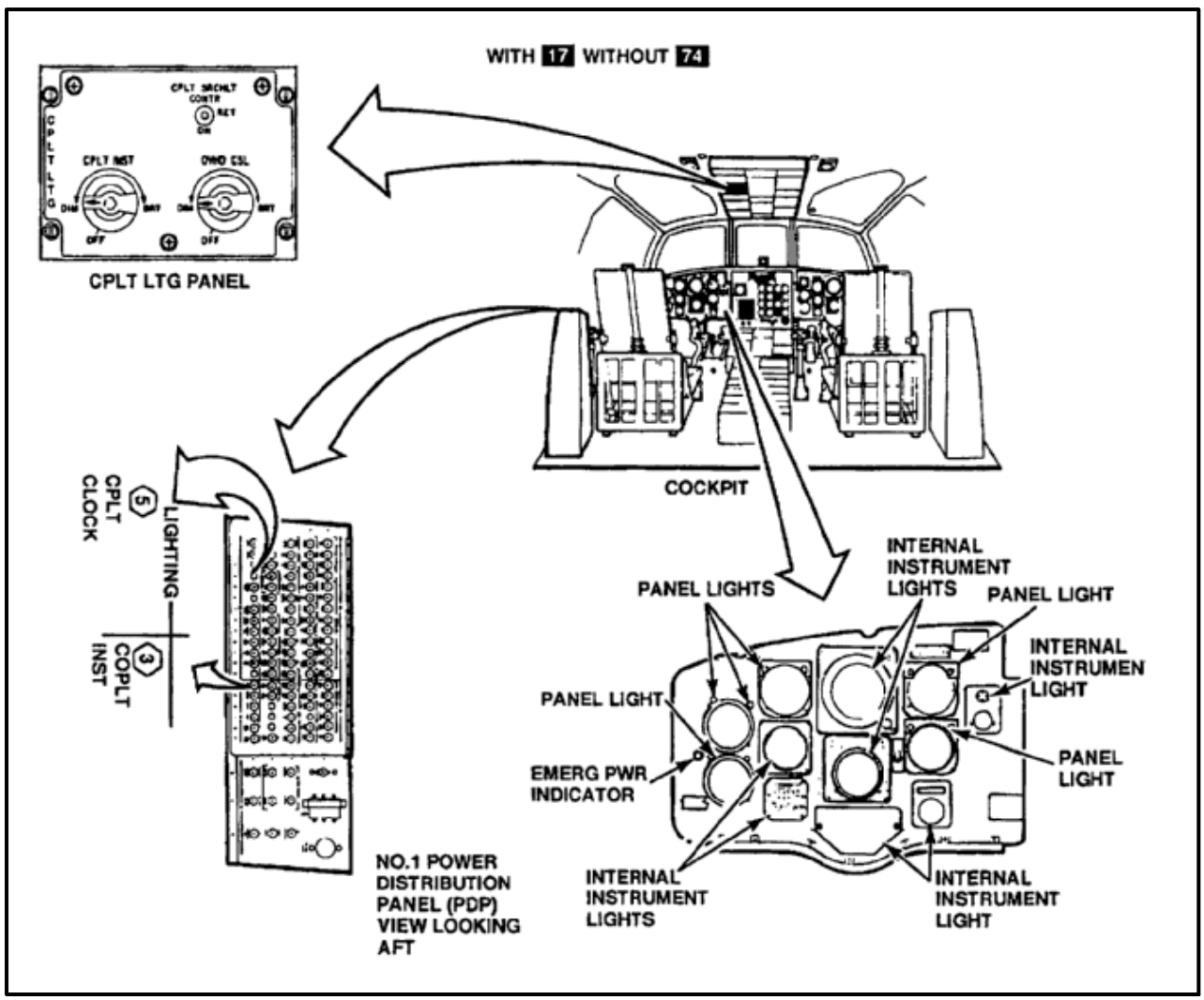
The copilot's instrument panel light system includes a CPLT INST LTG control **0-115 volt** variable transformer, **115 to 5 volt** autotransformer, and lamps to light the instruments and the RAD ALT dimming panel. Panel lights light the following instruments: AIMS altimeter, cruise guide indicator, rate of climb, airspeed indicators, rotor tachometer, and dual engine torquemeter. Internal lights light the following instruments: turn and slip indicator, RAD ALT DIM indicator (lightplate) attitude indicators, horizontal situation indicator (HSI) and mode select panel (lightplate), radar altimeter, and attitude direction indicator.

The copilot's clock is lighted by a **28 vdc** circuit.

**Operation**

Power for the **5 vac** system comes from **115 volt** No. 1 ac bus. When INSTR LIGHTING circuit breaker is closed, **115 vac** is applied to the CPLT INST control, which varies the **5 volt** output to vary the brightness of the lamps.

When the CPLT CLOCK circuit breaker is closed, **28 vdc** from No. 1 essential bus is connected to the clock.



### *COPILOT'S FLIGHT INSTRUMENT PANEL LIGHTS SYSTEM WITH 17 AND 74*

#### Description

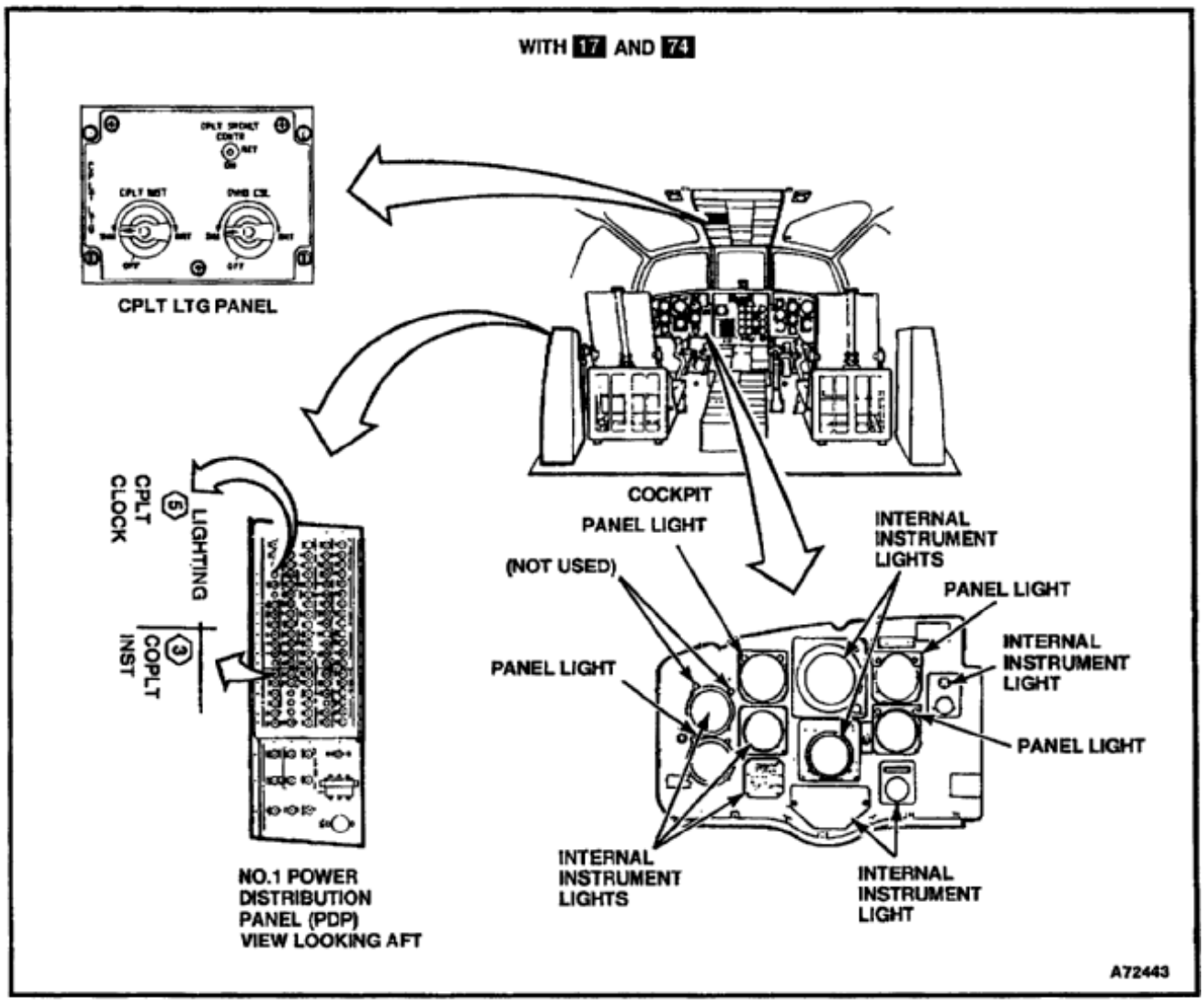
The copilot's instrument panel light system includes a CPLT INST LTG control **0-115 volt** variable transformer, **115 to 5 volt** autotransformer, and lamps to light the instruments and the RAD ALT dimming panel. Panel lights light the following instruments: AIMS altimeter, cruise guide indicator, rate of climb, airspeed indicators, and rotor tachometer. Internal lights light the following instruments: turn and slip indicator, RAD ALT DIM indicator (lightplate) attitude indicators, horizontal situation indicator (HSI) and mode select panel (lightplate), radar altimeter, attitude direction indicator, and dual engine torquemeter.

The copilot's clock is lighted by a **28 vdc** circuit.

#### Operation

Power for the **5 vac** system comes from **115 volt** No. 1 ac bus. When INSTR LIGHTING circuit breaker is closed, **115 vac** is applied to the CPLT INST control, which varies the **5 volt** output to vary the brightness of the lamps.

When the CPLT CLOCK circuit breaker is closed, **28 vdc** from No. 1 essential bus is connected to the clock.



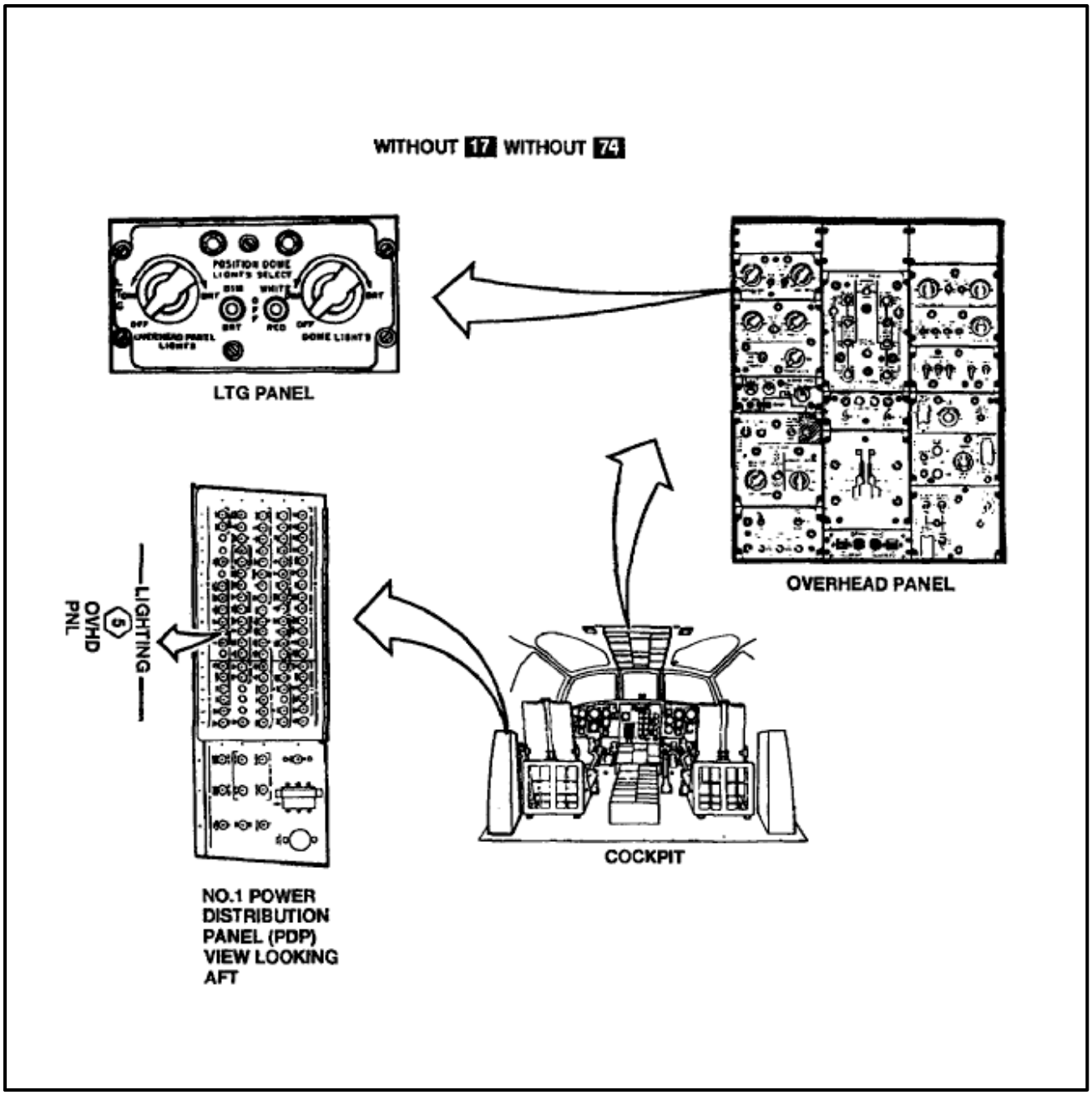
### *OVERHEAD PANEL LIGHTS SYSTEM WITHOUT 17 AND 74*

#### Description

The overhead panel lighting system includes 31 panel lights distributed among nine individual panels and an OVERHEAD PANEL LIGHTS control. The system also provides **28 vdc** to panel lights in engine control panel and hoist/cargo hook control panel.

#### Operation

Power for the overhead panel lighting system comes from the **28 volt** No. 1 dc bus. When OVHD PNL LIGHTING circuit breaker is closed. **28 vdc** is applied to OVERHEAD PANEL LIGHTS control which controls the brightness of the lamps.



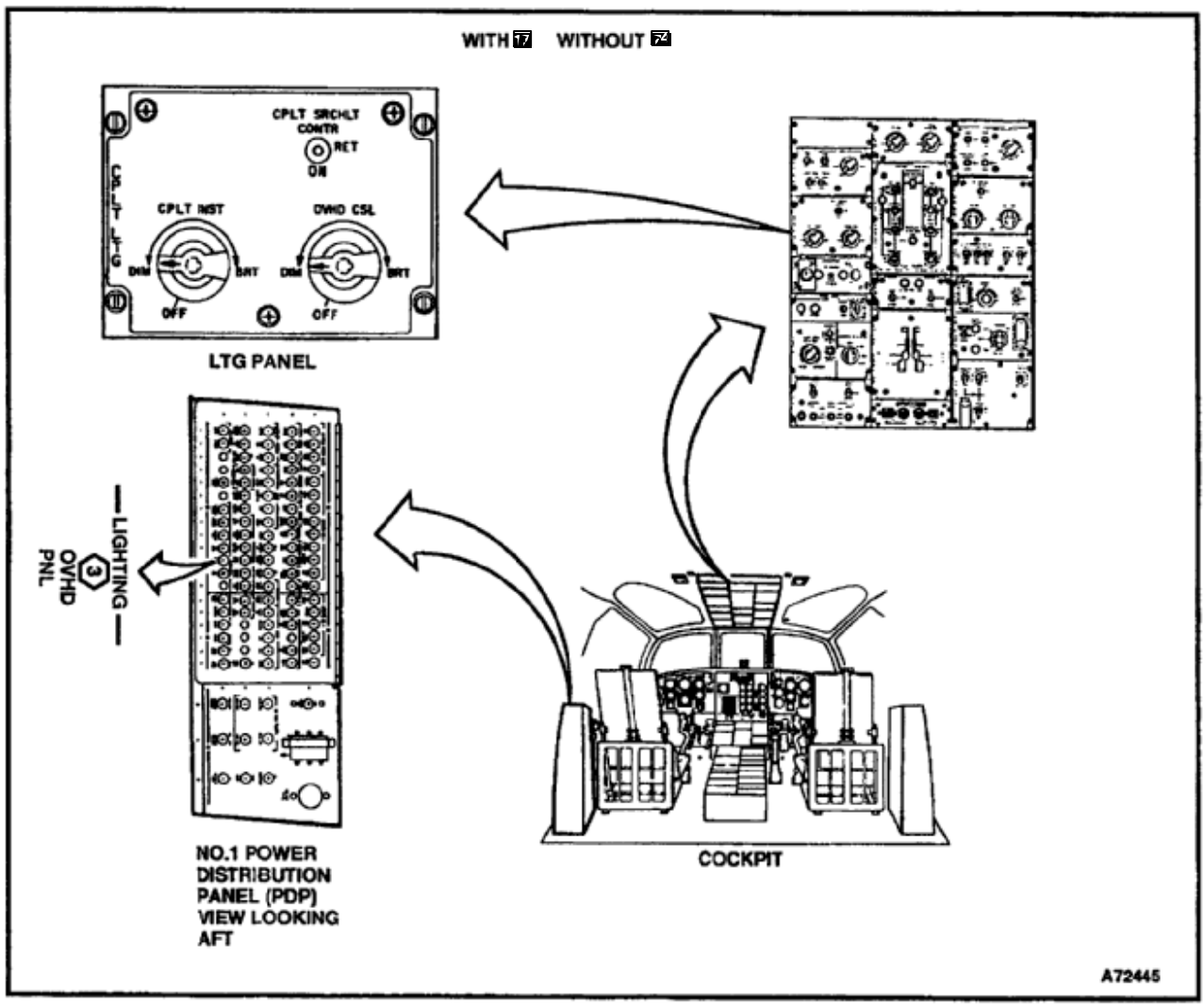
### *OVERHEAD PANEL LIGHTS SYSTEM WITH 17 AND WITHOUT 74*

#### Description

The overhead panel lighting system includes lightplates for 11 individual panels, an OVHD CSL DIM/BRT control (**0-115 volt** variable transformer), and a **115 to 5 volt** autotransformer. The system also provides controlled ac from the DIM/BRT control to lightplates for the engine control and hoist/cargo hook control panels. Controlled **5 vac** is provided to the compass controller.

#### Operation

Power for the overhead panel lighting system comes from the **115 volt** No. 1 ac bus. When OVHD PNL LIGHTING circuit breaker is closed, **115 vac** is applied to OVHD CSL control which controls the brightness of the lamps. It also controls the level of the voltage fed to the compass controller from the **5 volt** autotransformer.



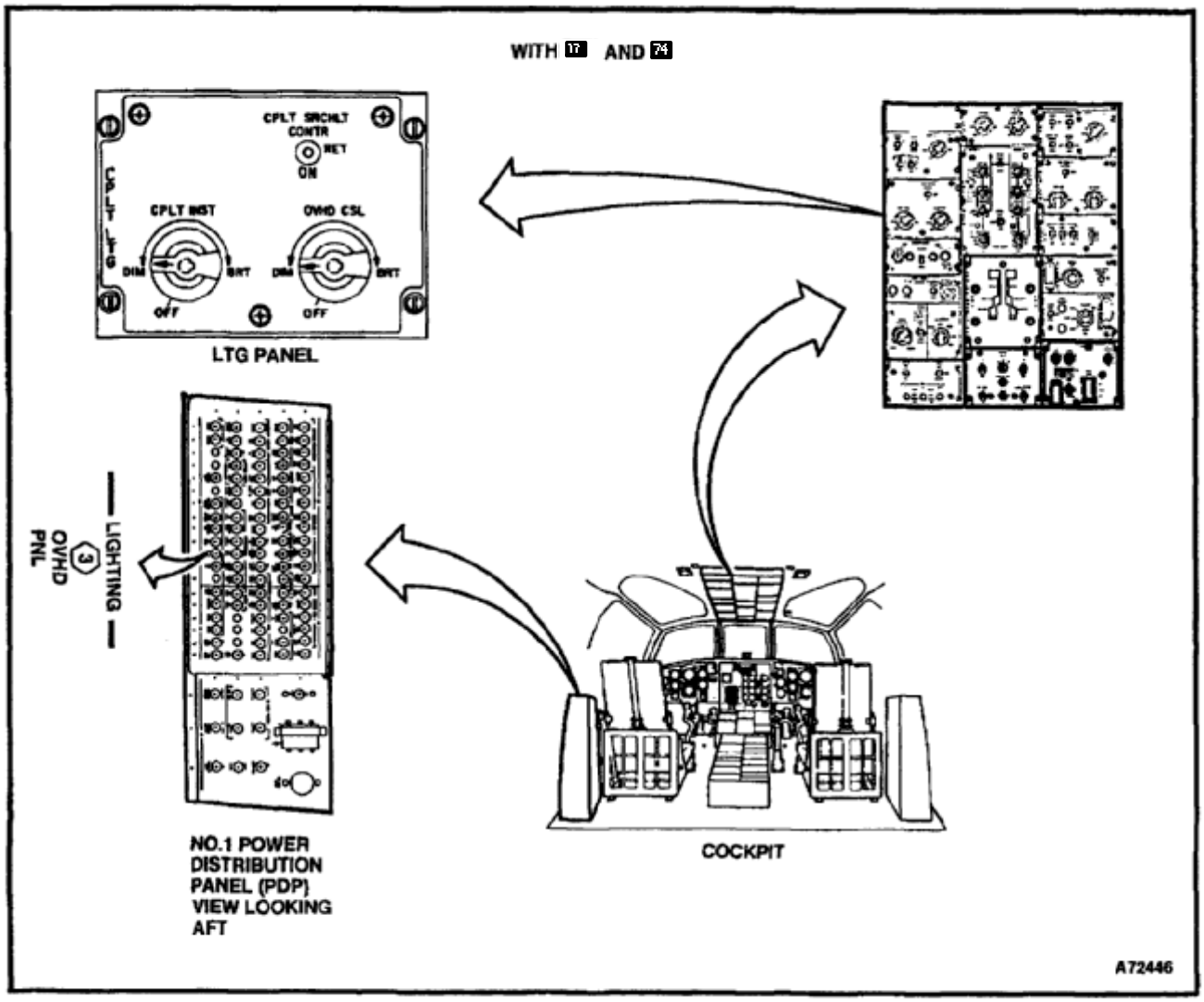
### *OVERHEAD PANEL LIGHTS SYSTEM WITH 17 AND 74*

#### Description

The overhead panel lighting system includes lightplates for 12 individual panels, an OVHD CSL DIM/BRT control (**0-115 volt** variable transformer), and a **115 to 5 volt** autotransformer. The system also provides controlled ac from the DIM/BRT control to the lightplate for the hoist/cargo hook control panel. Controlled **5 vac** is provided to the compass controller.

#### Operation

Power for the overhead panel lighting system comes from the **115 volt** No. 1 ac bus. When OVHD PNL LIGHTING circuit breaker is closed, **115 vac** is applied to OVHD CSL control which controls the brightness of the lamps. It also controls the level of the voltage fed to the compass controller from the **5 volt** autotransformer.



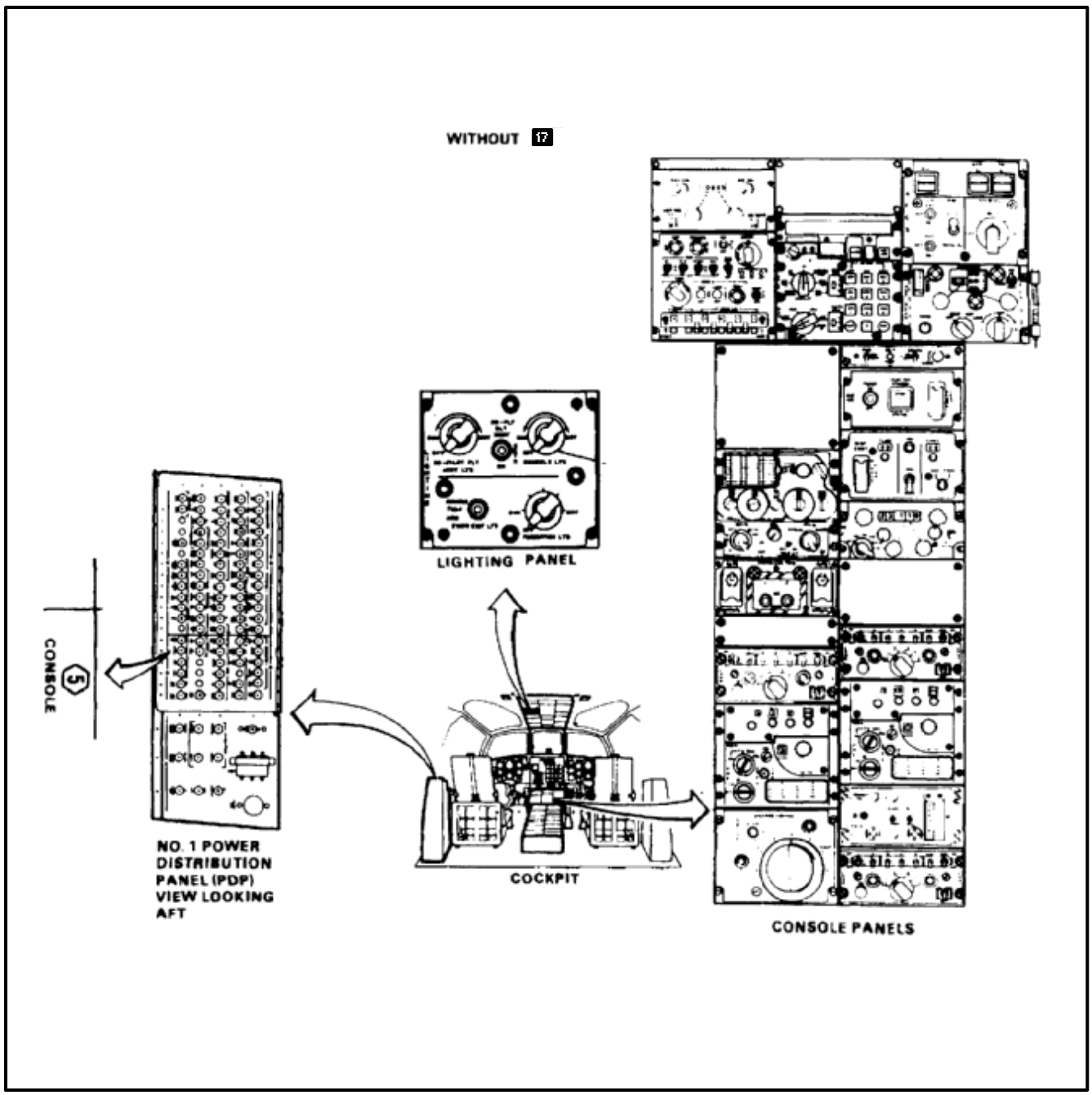
### *CONSOLE LIGHT SYSTEM WITHOUT* 17

#### Description

The console lighting system provides **26 vac** and **5 vac** to the panel lights in the console. The system includes the CONSOLE LTS control and a **5 volt** autotransformer. The autotransformer provides **5 volts** and **1.5 vac** through caution lights dimming relay to the AFCS control panel lights.

#### Operation

Power for the console lighting system comes from the **26 vac** No. 1 bus. When CONSOLE LIGHTING circuit breaker is closed, **26 vac** is applied to terminal 1, 2, and 3 of CONSOLE LTS control. When the control is set to BRT, **26 vac** is applied to autotransformer and to the **26 volt** lamps. All panel lights are simultaneously turned off or set to a level between dim and bright with the CONSOLE LTS control.



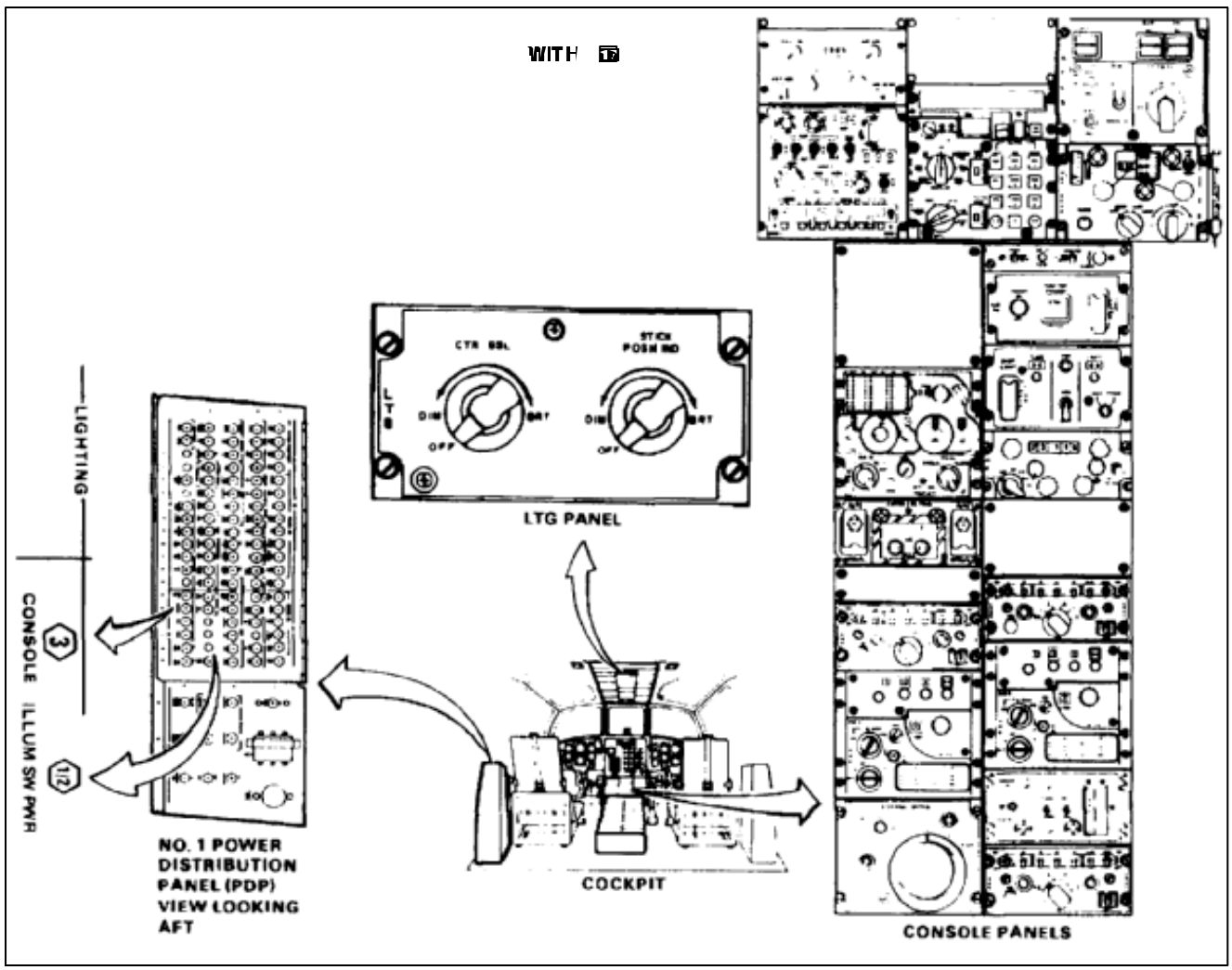
### *CONSOLE LIGHT SYSTEM WITH 17*

#### Description

The console lighting system provides controlled **28 vac** and **5 vac** to the panel lights in the console. It also provides controlled **3 volt** or **5 vac** to the lighted switches in the console and the instrument panels. The system includes the CTR CSL control and a STICK POSN IND control on the overhead panel, and three autotransformers in the console.

#### Operation

Power for console lighting system comes from the **115 volt** No.1 ac bus. When CONSOLE LIGHTING circuit breaker is closed, **115 vac** is applied to the CTR CSL LTG control and the STICK POSN IND LTG controls. When turned from OFF, the STICK POSN IND LTG control supplies controlled **115 vac** to the indicator. When turned from OFF, the CTR CSL LTG control supplies controlled **115 vac** to a **115-28 volt** autotransformer. The autotransformer supplies controlled **28 vac** to a **28 volt** autotransformer and to 14 control panels: ILS, UHF, APR 39, ADF RCVR, HF, IFF, EMER ENG TRIM, TSEC/KY-28, STEERING CONTROL, two VHF, and three COMM. The **26-5 volt** autotransformer supplies controlled **5 vac** to four panels: DPLR NAV, DISP CONT, AFCS, and MPS (ALQ-156). When the ILLUM SW PWR circuit breaker is closed, **115 vac** is connected to an autotransformer with **5 volt** and **3 volt** outputs. The illuminated pushbutton lights dimming relay 232K3 selects one of these for the lighted switches in the AFCS and mode select panels (not shown).



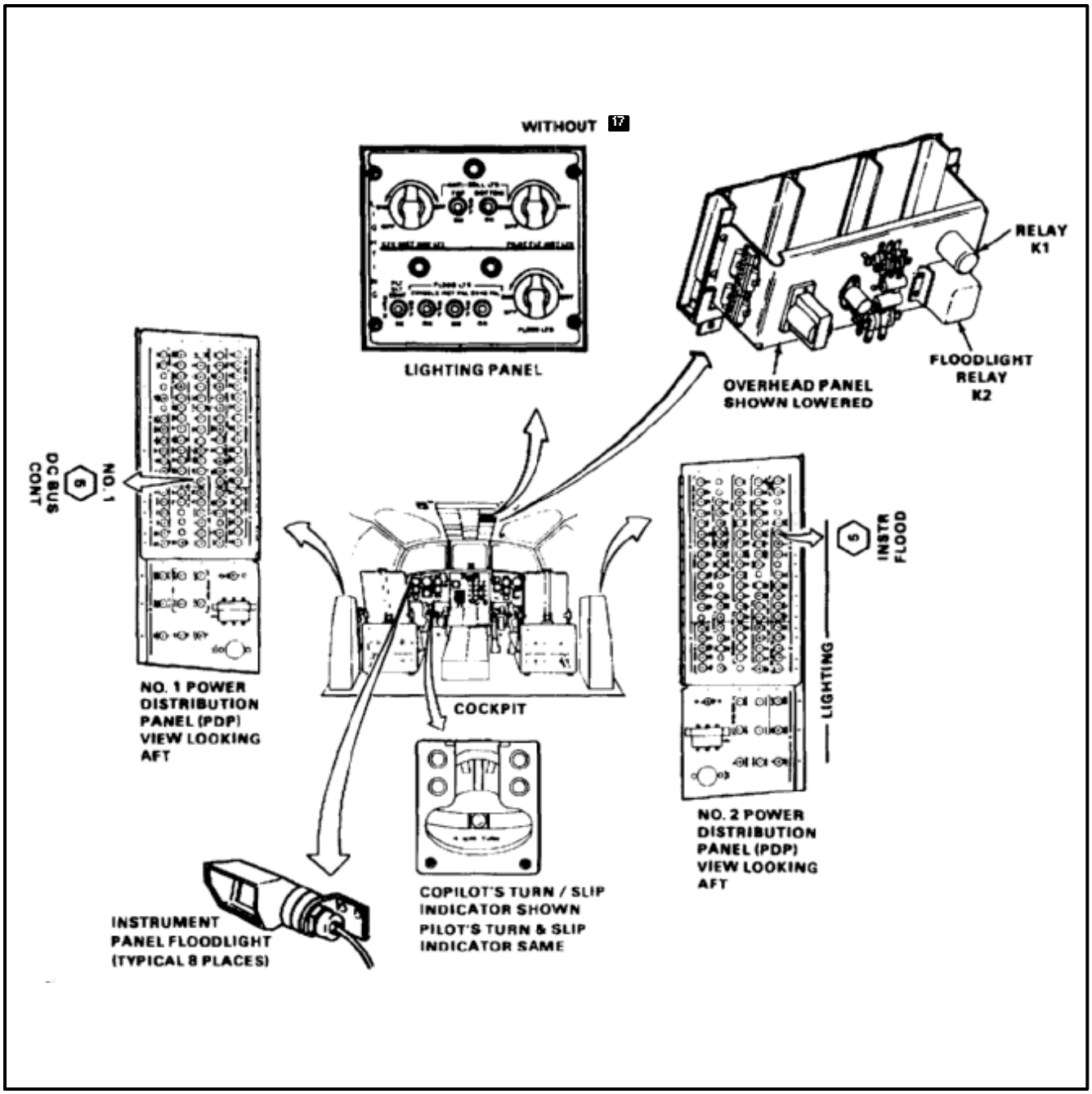
***SECONDARY COCKPIT LIGHT SYSTEM WITHOUT 17***

**Description**

The secondary cockpit lighting system provides lighting for the overhead panel, instrument panel, and console. The lighting system consists of 10 floodlights, two relays, three toggle switches, and a dimming control. Two of the floodlights provide lighting for the overhead panel, and eight provide lighting for the instrument panel, and console. The instrument panel and console floodlights are located under the glareshield. The system also includes an interlock circuit for pilot's and copilot's turn and slip indicator lights. The interlock circuit provides **28 vdc**, instead of **26 vac**, if No. 1 ac bus or No. 1 dc bus is not powered. The secondary cockpit lighting system operates from the **28 volt** essential dc bus.

**Operation**

1. When INSTR FLOODLIGHTING circuit breaker is closed, **28 vdc** power from the essential dc bus is connected to FLOOD LTS control. When the control is turned from OFF, power is connected through the control to pins 2 of INST PNL switch, CONSOLE switch, and OVHD PNL switch. When any switch is set to ON, power is applied to the respective floodlights. FLOOD LTS control provides on-off and brightness control of all the secondary cockpit lights.
2. During normal operation transfer relay K1 is operated when **115 vac** is available from the No. 1 ac bus. Floodlight relay K2 is operated from the **28 volt** No. 1 dc bus through NO. 1 DC BUS CONT circuit breaker and contacts of relay K1. This circuit provides **26 vac** to the pilot's and copilot's turn and slip indicator lights.
3. If **28 vdc** is lost from the No. 1 dc bus, relay K2 releases. If **115 vac** is lost from the No. 1 ac bus relay, K1 releases, causing relay K2 to release. With relay K2 released, the pilot's and copilot's turn and slip indicator lights are connected to the **28 volt** essential dc bus. This connection is made through contacts of relay K2 and a switch on PILOTS FLT INST LTS control if PILOTS FLT INST LTS control is not positioned at OFF. Contacts of relay K2 also provide an alternate circuit for the instrument panel and overhead panel floodlights. This circuit is through the switch on control 121R1 and contacts of the relay. The circuit bypasses FLOOD LTS control, INST PNL switch, and OVHD PNL switch which will illuminate all secondary cockpit lighting.


WITHOUT 17
LIGHTING PANEL
RELAY K1
FLOODLIGHT RELAY K2
OVERHEAD PANEL SHOWN LOWERED
NO. 1 DC BUS CONT
NO. 1 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT
COCKPIT
INSTR FLOOD
LIGHTING
NO. 2 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT
COPILOT'S TURN / SLIP INDICATOR SHOWN PILOT'S TURN & SLIP INDICATOR SAME
INSTRUMENT PANEL FLOODLIGHT (TYPICAL 8 PLACES)

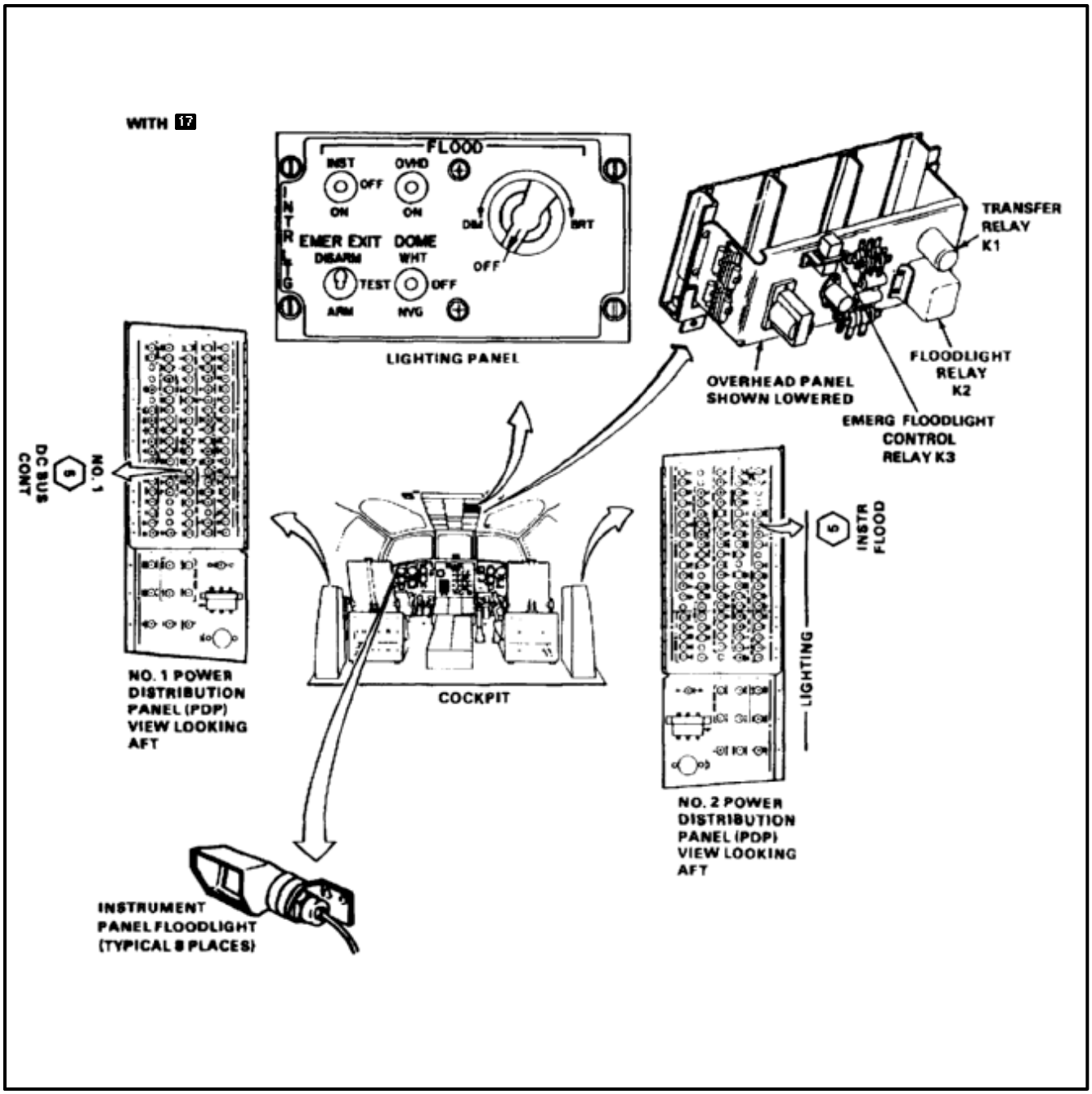
### *SECONDARY COCKPIT LIGHT SYSTEM WITH 17*

#### Description

The secondary cockpit lighting system provides lighting for the overhead panel, instrument panel, and console. The lighting system consists of eight floodlights, three relays, two toggle switches, and a dimming control. The relays and toggle switches are in the overhead panel. Two of the floodlights are on the overhead panel and six are on the instrument panel. An interlock turns on the floodlights if ac power or No. 1 dc bus were to fail. An ac power failure disables the normal instrument lights. The secondary cockpit lighting system operates from the **28 volt** essential dc bus.

#### Operation

1. When INSTR FLOODLIGHTING circuit breaker is closed, **28 vdc** power from the essential dc bus is connected to FLOOD DIM/BRT control. When the control is turned from OFF, power is connected through the control to pins 2 of INST FLOOD and OVHD FLOOD light switches. When either switch is set to ON, power is applied to the respective floodlights. FLOOD DIM/BRT control provides on-off and brightness control for all secondary cockpit lights.
2. During normal operation, transfer relay K1 is operated when **115 vac** is available from No. 1 ac bus. Floodlight relay K2 is operated from **28 volt** No. 1 dc bus through NO. 1 DC BUS CONT circuit breaker and contacts of relay K1.
3. If **28 vdc** is lost from No. 1 dc bus, relay K2 releases. If **115 vac** is lost from No. 1 ac bus, relay K1 releases, causing relay K2 to release. When the pilot's INST DIM/BRT control on the PLT LTG panel is turned from OFF, control relay K3 is operated by **28 vdc** from the dc essential bus through the COCKPIT LIGHTS DIM CONT circuit breaker. Relay K3 arms a bypass circuit. If the FLOOD light switches were at OFF in an ac power failure, relay K3 bypasses the open FLOOD light switches and turns on the floodlights. Power to bypass the open switches is routed from the FLOOD DIM/BRT control through closed contacts A1-A2 of relay K3 and normal contacts D2-D3, C2-C3, and B2-B3 of relay K2.


WITH 17
FLOOD
INST
OVHD
OFF
ON
ON
INTR LTG
EMER EXIT
DOME
DISARM
WHT
TEST
OFF
ARM
NVG
DIM
BRT
OFF
LIGHTING PANEL
TRANSFER RELAY K1
FLOODLIGHT RELAY K2
OVERHEAD PANEL SHOWN LOWERED
EMERG FLOODLIGHT CONTROL RELAY K3
NO. 1 DC BUS CONT
5
NO. 1 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT
COCKPIT
5
INSTR FLOOD
LIGHTING
NO. 2 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT
INSTRUMENT PANEL FLOODLIGHT (TYPICAL 8 PLACES)

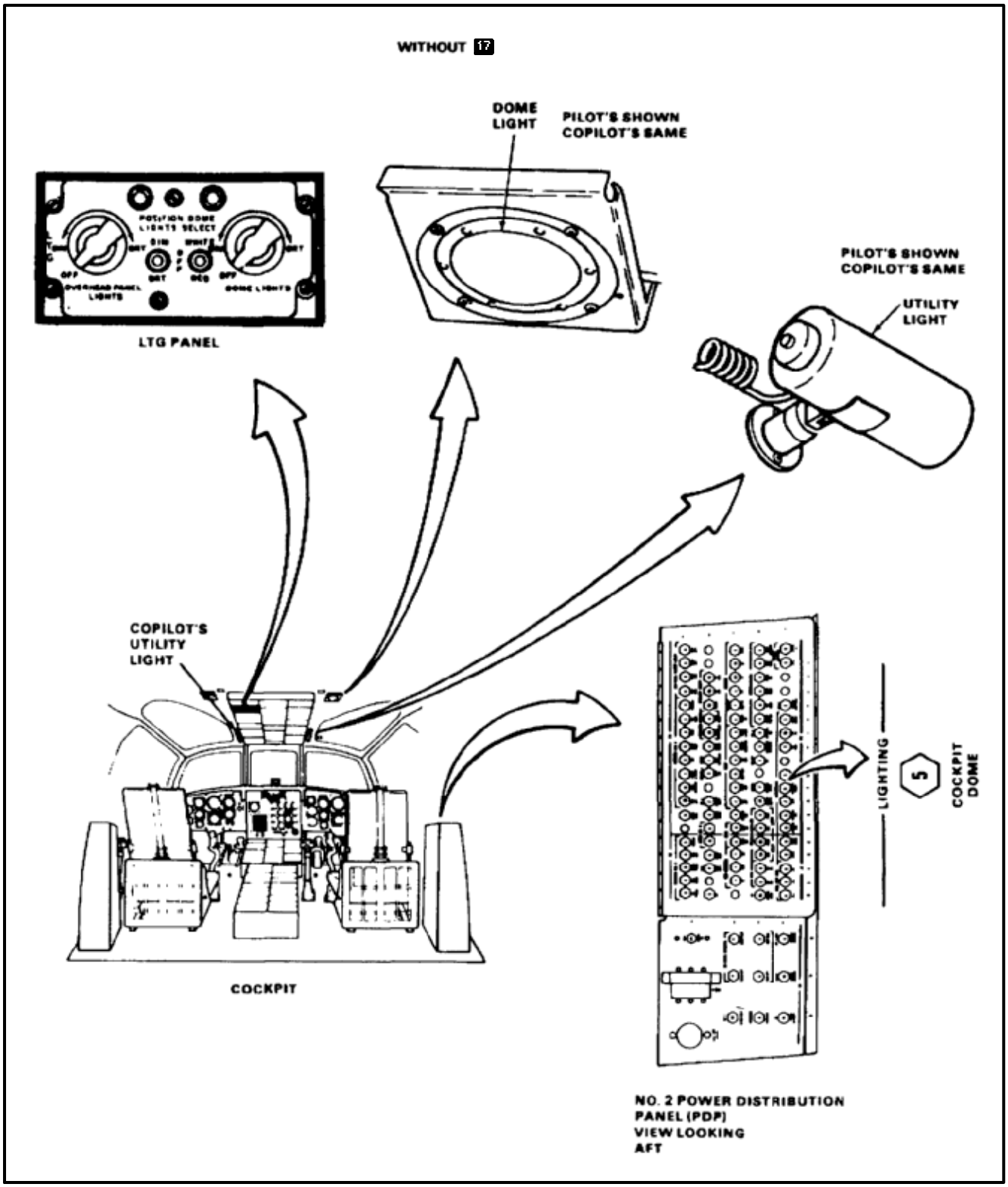
### *COCKPIT DOME AND UTILITY LIGHT SYSTEM WITHOUT* 17

#### Description

The cockpit dome and utility lighting system provides lighting for the cockpit section. This system includes two cockpit dome lights and two utility lights. The system operates from the **28 volt** No. 2 dc bus.

#### Operation

When COCKPIT DOME circuit breaker is closed, **28 vdc** from No. 2 dc bus is applied to system switches or controls. When DOME SELECT switch is set to WHITE or RED, **28 vdc** is applied to DOME LIGHTS control. DOME LIGHTS control varies the brightness of the cockpit dome lights. **28 vdc** is also applied to each utility light. The brightness of each light is varied by an integral control.


WITHOUT 17
DOME LIGHT
PILOT'S SHOWN
COPILOT'S SAME
LTG PANEL
PILOT'S SHOWN
COPILOT'S SAME
UTILITY LIGHT
COPILOT'S UTILITY LIGHT
COCKPIT
LIGHTING
5
COCKPIT DOME
NO. 2 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT

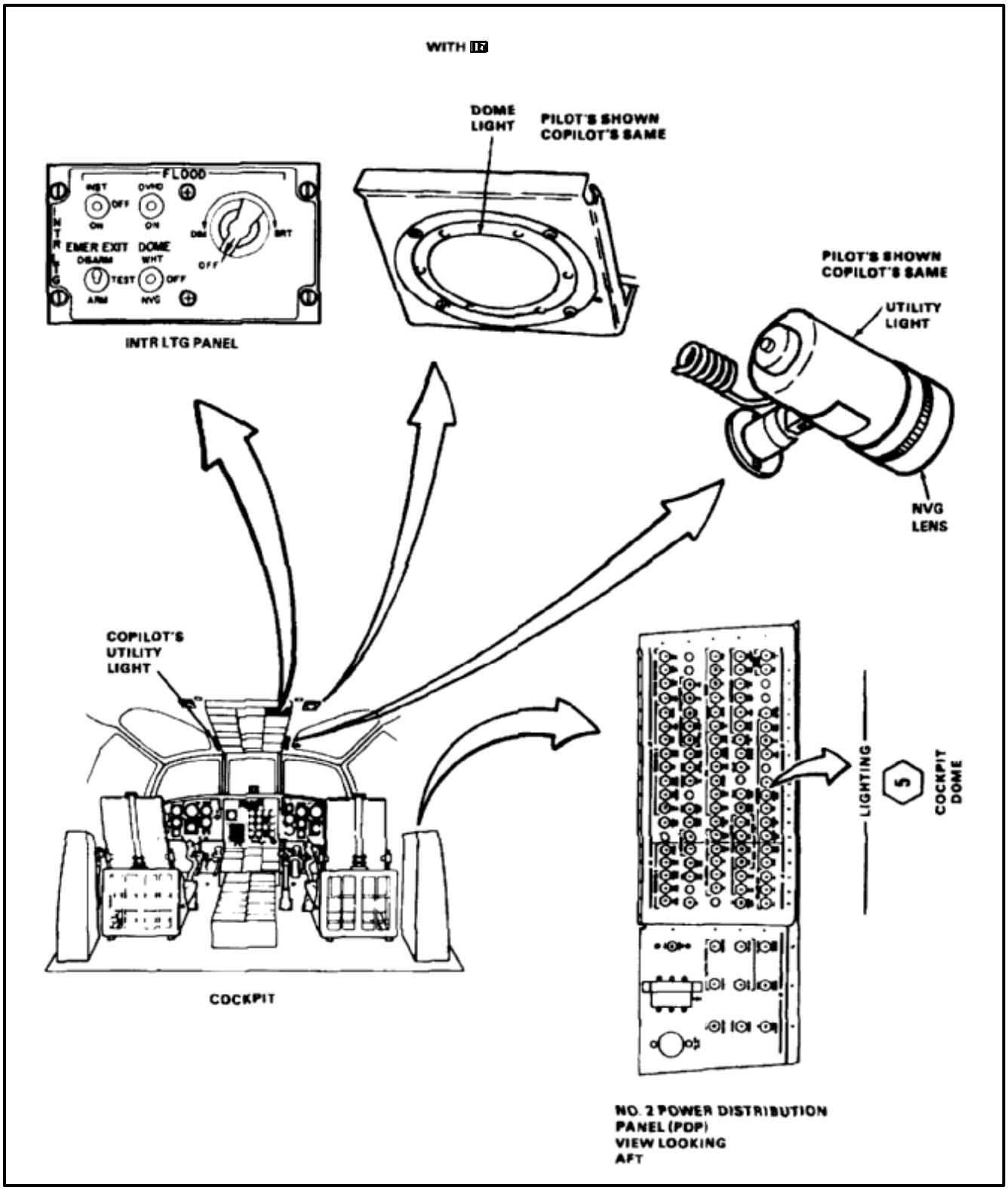
### *COCKPIT DOME AND UTILITY LIGHT SYSTEM WITH 17 AND 53*

#### Description

The cockpit dome and utility lighting system provides lighting for the cockpit. This system includes two cockpit dome lights, two utility lights, and a WHT/OFF/NVG three-position positive-locking select switch. This positive-locking switch prevents inadvertent white light (WHT) activation during NVG operation. The system operates from the **28 volt** No. 2 dc essential bus.

#### Operation

When COCKPIT DOME circuit breaker is closed, **28 vdc** from No. 2 dc essential bus is applied to the moving contact of the WHT/OFF/NVG three-position positive-locking select switch and directly to the utility lights. When the select switch is at WHT, **28 vdc** is connected to the white lamps in the dome lights. When the switch is at NVG, **28 vdc** is connected to the "blue" lamps (inside each light, there is an NVG filter over the lamp). There is also an NVG filter over the lens of each utility light.


WITH
DOME LIGHT
PILOT'S SHOWN
COPILOT'S SAME
FLOOD
INST
OVHD
OFF
ON
ON
DIM
BRT
OFF
EMER EXIT
DISARM
TEST
ARM
DOME
WHT
OFF
NVG
INTR LTG
INTR LTG PANEL
PILOT'S SHOWN
COPILOT'S SAME
UTILITY LIGHT
NVG LENS
COPILOT'S UTILITY LIGHT
COCKPIT
LIGHTING
5
COCKPIT DOME
NO. 2 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT

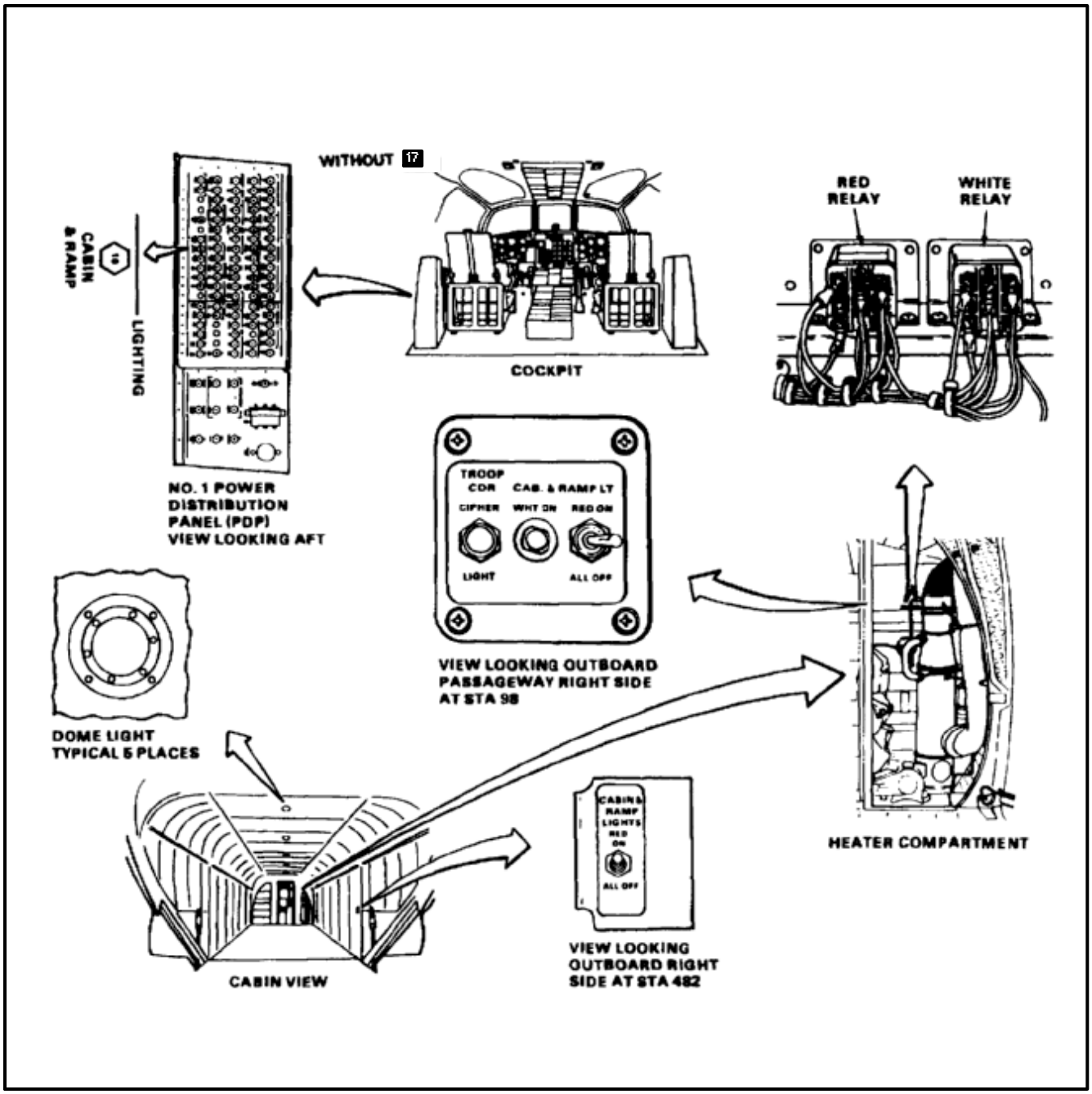
### *CABIN AND RAMP LIGHTING SYSTEM WITHOUT* 17

**Description**

The cabin and ramp lighting system provides white and red lighting for the cabin and ramp areas. The system includes five dome lights, two toggle switches, a pushbutton switch, and two relays. The system operates from the **28 vdc** switched battery bus.

**Operation**

1. When CABIN & RAMP LIGHTING circuit breaker is closed, **28 vdc** from the switched battery bus is applied to terminals B2 of red relay K1 and white relay K2. Both relays cannot be operated at the same time. When red relay K1 is operated, the **28 vdc** is applied through relay K1. This voltage lights the red lamp in each of the five dome lights. When white relay K2 is operated, the **28 vdc** is applied through relay K2. This voltage lights the white lamp in each of the five dome lights.
2. When both relays are released, the red and white lamps are out. When momentary WHT ON switch is pressed, **28 vdc** from the circuit breaker is applied to white relay K2. The relay energizing circuit is completed to ground through CABIN & RAMP LIGHTS switch. Contacts A1-A2 provide a holding circuit for relay K2. The holding circuit provides **28 vdc** for relay K2 through CAB & RAMP LTS switch. When the WHT ON switch is released, white-relay K2 remains energized until either CAB & RAMP LTS switch or CABIN & RAMP LIGHTS switch is set to ALL OFF.
3. When either CAB & RAMP LTS switch is momentarily set to RED ON, **28 vdc** is applied through a switch to terminal X1 of red relay K1. The relay control circuit is completed to ground through CABIN & RAMP LIGHTS switch. Contacts A1-A2 provide a holding circuit for relay K1. The holding circuit provides **28 vdc** for relay K1. When either switch is released, red relay K1 remains energized until either CAB & RAMP LTS switch is set to ALL OFF.
4. When the red lamps of the dome lights are on, **28 vdc** is applied to the troop warning system to dim the red and green jump lights.


WITHOUT 17
CABIN & RAMP
LIGHTING
NO. 1 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT
COCKPIT
RED RELAY
WHITE RELAY
TROOP COR
CAB. & RAMP LT
CIPHER
WHT ON
RED ON
LIGHT
ALL OFF
VIEW LOOKING OUTBOARD PASSAGEWAY RIGHT SIDE AT STA 98
DOME LIGHT TYPICAL 5 PLACES
HEATER COMPARTMENT
CABIN & RAMP LIGHTS
RED ON
ALL OFF
VIEW LOOKING OUTBOARD RIGHT SIDE AT STA 482
CABIN VIEW

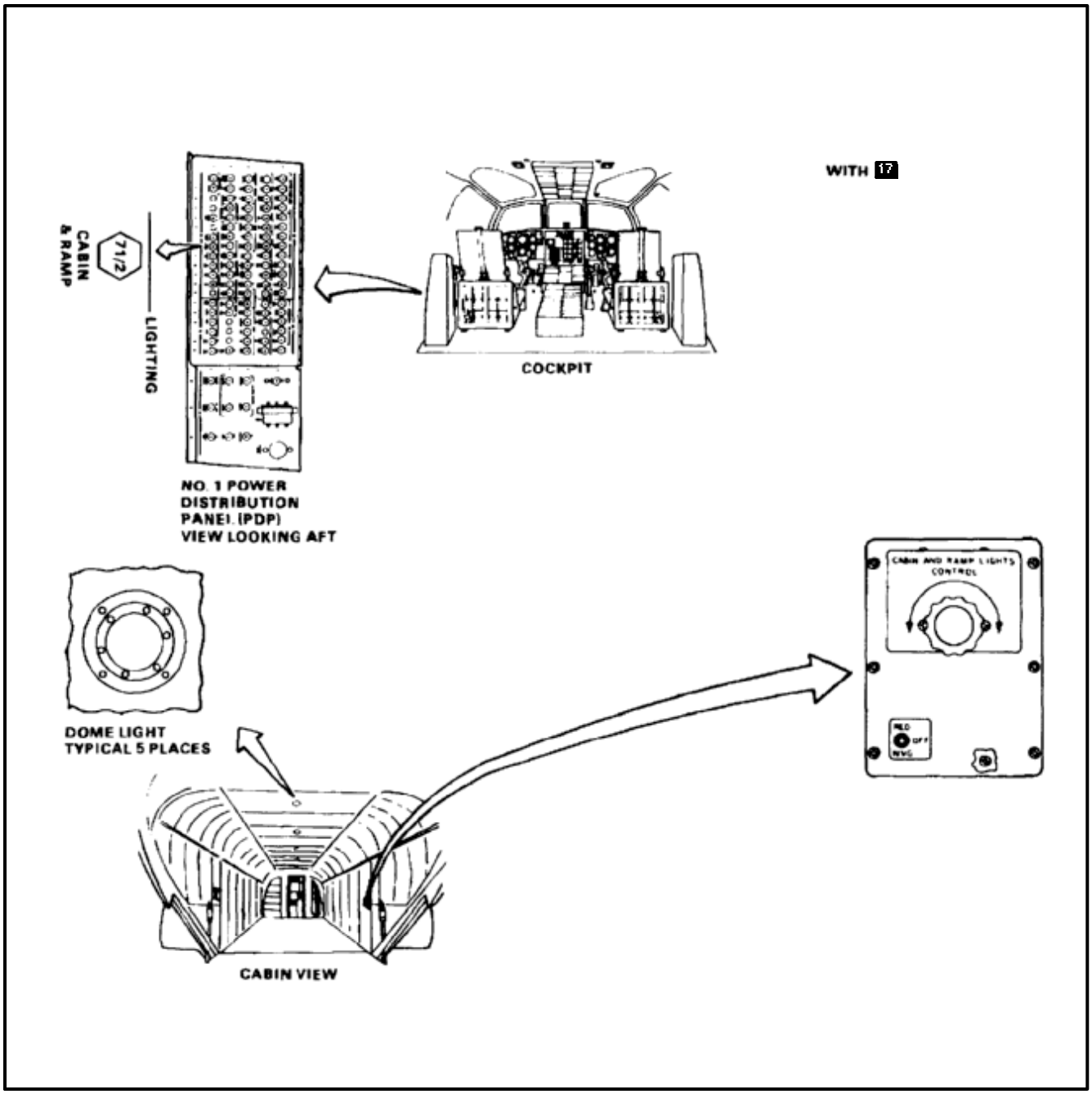
### *CABIN AND RAMP LIGHTING SYSTEM WITH 17*

**Description**

The cabin and ramp lighting system provides blue-green NVG or red lighting for the cabin and ramp areas. The system includes five dome lights, a RED/OFF/NVG select switch, and a dimming control. The system operates from the **28 vdc** switched battery bus.

**Operation**

1. When CABIN & RAMP LIGHTING circuit breaker is closed, **28 vdc** from the switched battery bus is applied to a moving contact of the RED/OFF/NVG select switch and to the dimming control.
2. When the switch is set to NVG, **28 vdc** is connected through the moving contact of the dimming control to the clear lamps in five dome lights. Inside the lights, there are NVG filters over the clear lamps.
3. When the switch is set to RED, **28 vdc** is connected through the moving contact of the dimming control to the red lamps in the five dome lights.
4. When the red lamps of the dome lights are on, **28 vdc** is applied to the troop warning system to dim the red and green jump lights.


WITH 17
CABIN & RAMP
71/2
LIGHTING
NO. 1 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT
COCKPIT
DOME LIGHT TYPICAL 5 PLACES
CABIN VIEW

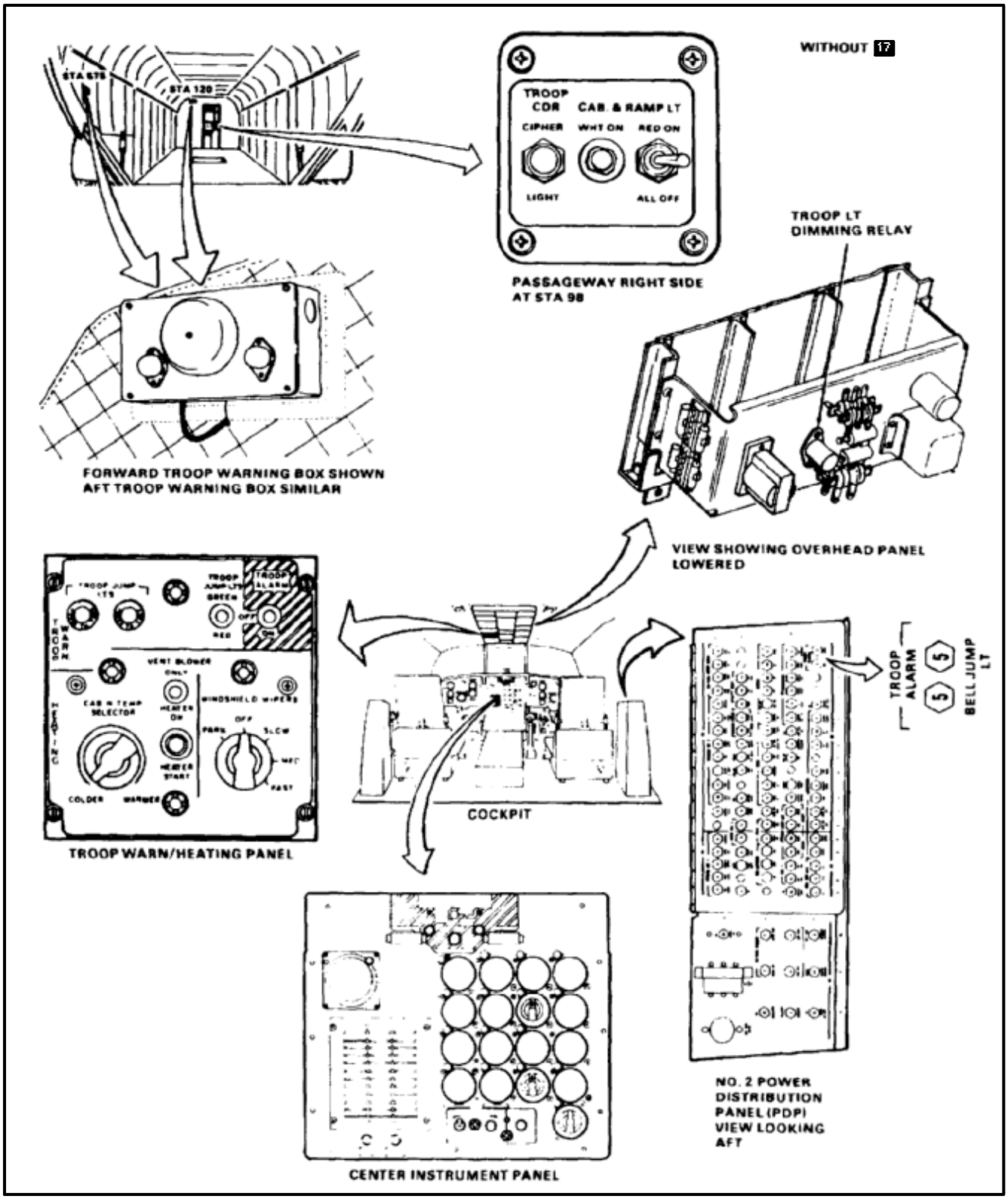
### *TROOP WARNING SYSTEM WITHOUT* 17

#### Description

The troop warning system provides visual and audible signals for the troops. The system has two troop warning boxes, one in the forward section of the cabin at sta. 120 and the other in the ramp area at sta. 575. The system also includes two indicator lights, two switches, and a relay in the overhead panel. The system operates from the **28 volt** No. 2 dc bus.

#### Operation

1. When TROOP ALARM BELL circuit breaker is closed, **28 vdc** from No. 2 dc bus is applied to TROOP ALARM switch. When this switch is ON, **28 vdc** sounds both alarm bells. The bells continue to sound until the switch is set to OFF.
2. When TROOP ALARM JUMP LT circuit breaker is closed, **28 vdc** from No. 2 dc bus is applied to TROOP JUMP LTS switch and to TROOP JUMP LTS indicator-switches. The **28 vdc** to the indicator-switches is used to test the lamps. When the lens on the indicator-switches are pressed, **28 vdc** lights the integral lamp.
3. There are two dimming relays in this system. Jump lights dimming relay controls the brightness of the jump lights in both troop warning boxes. Signal lights dimming relay controls the brightness of the TROOP JUMP LTS in the overhead panel. When either relay is released, its associated lights come on at full brightness. When either relay is operated, its associated lights come on at reduced brightness. These relays are coordinated with other systems to ensure that the jump lights are not bright when nearby lights are dim. When the red cabin and ramp dome lights are on, **28 vdc** from the cabin and ramp lighting system operates jump lights dimming relay. When the caution lights are set to DIM, **28 vdc** from the master caution panel circuit operates signal lights dimming relay. When TROOP JUMP LTS switch is set to RED, three red jump lights come on. When TROOP JUMP LTS switch is set to GREEN, three green jump lights come on.


STA 675
STA 120
TROOP CDR
CAB. & RAMP LT
CIPHER
WHT ON
RED ON
LIGHT
ALL OFF
WITHOUT 17
PASSAGEWAY RIGHT SIDE AT STA 98
TROOP LT DIMMING RELAY
FORWARD TROOP WARNING BOX SHOWN
AFT TROOP WARNING BOX SIMILAR
VIEW SHOWING OVERHEAD PANEL LOWERED
TROOP WARN/HEATING PANEL
COCKPIT
TROOP ALARM
BELL JUMP LT
NO. 2 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT
CENTER INSTRUMENT PANEL

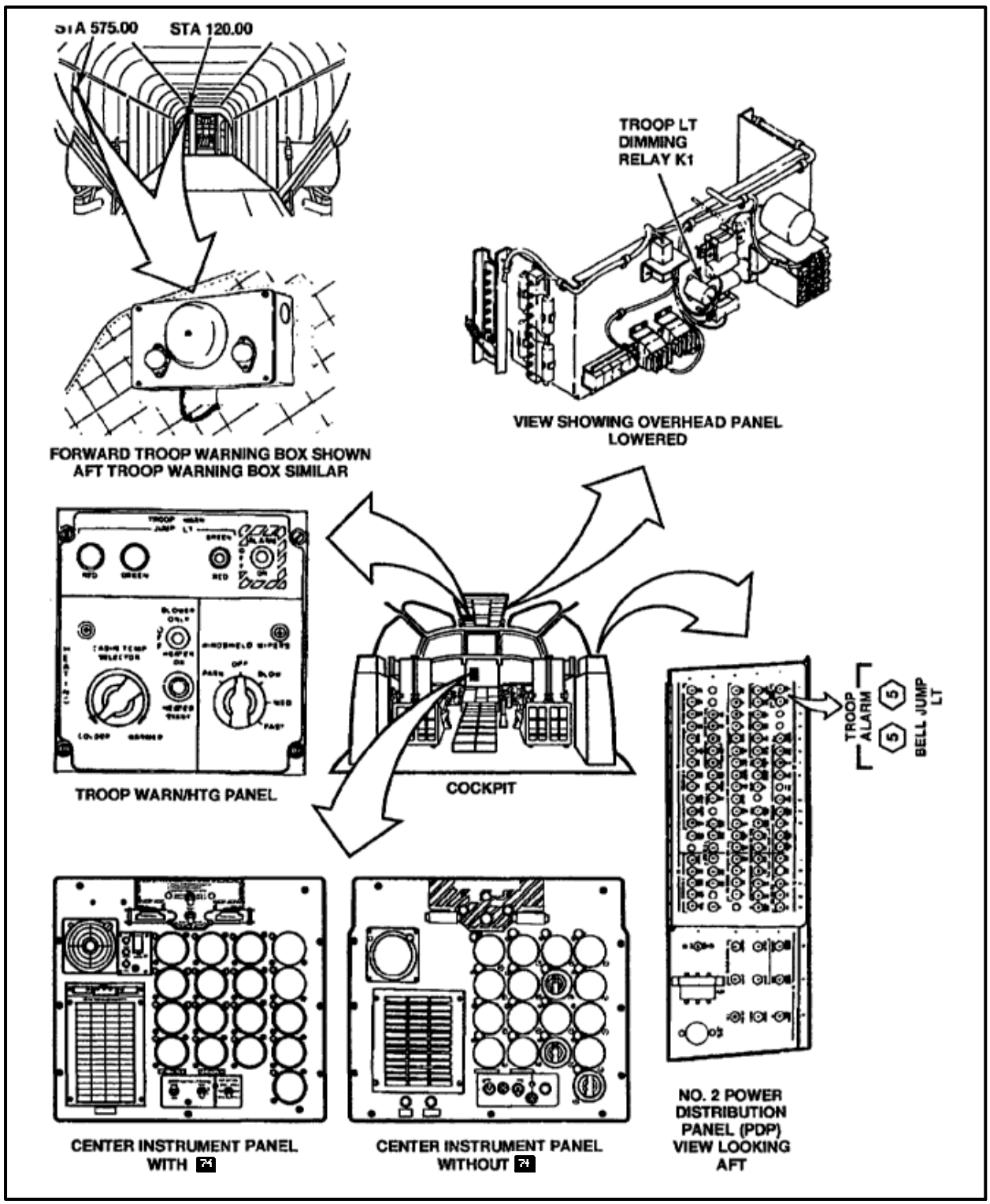
***TROOP WARNING SYSTEM WITH 17***

**Description**

The troop warning system provides visual and audible signals for the troops. The system has two troop warning boxes, one in the forward section of the cabin at sta. 120 and the other in the ramp area at sta. 575. The system also includes two indicator lights, two switches, and a relay in the overhead panel. The indicator lights are blue-green NVG compatible. The lights in the troop warning boxes are normal red and green. The system operates from the **28 volt** No. 2 dc bus.

**Operation**

1. When TROOP ALARM BELL circuit breaker is closed, **28 vdc** from No. 2 dc bus is applied to TROOP ALARM switch. When this switch is ON, **28 vdc** sounds both alarm bells. The bells continue to sound until the switch is set to OFF.
2. When TROOP ALARM JUMP LT circuit breaker is closed, **28 vdc** from No. 2 dc bus is applied to TROOP JUMP LTS switch and to TROOP JUMP LTS indicator-switches. The **28 vdc** to the indicator-switches is used to test the lamps. When the lens on the indicator-switches are pressed, **28 vdc** lights the integral lamp.
3. There are two dimming relays in this system. Jump lights dimming relay controls the brightness of the jump lights in both troop warning boxes. Signal lights dimming relay controls the brightness of the TROOP JUMP LTS in the overhead panel. When either relay is released, its associated lights come on at full brightness. When either relay is operated, its associated lights come on at reduced brightness. These relays are coordinated with other systems to ensure that the jump lights are not bright when nearby lights are dim. When the red cabin and ramp dome lights are on, **28 vdc** from the cabin and ramp lighting system operates jump lights dimming relay. When the PILOT INST DIM/BRT control is moved away from the OFF position, the signal lights dimming relay is operated, unless the WHT-OFF-NVG DOME light switch is in the WHT position. When TROOP JUMP LTS switch is set to RED, three red jump lights come on. When TROOP JUMP LTS switch is set to GREEN, three green jump lights come on.


STA 575.00
STA 120.00
FORWARD TROOP WARNING BOX SHOWN
AFT TROOP WARNING BOX SIMILAR
TROOP LT
DIMMING
RELAY K1
VIEW SHOWING OVERHEAD PANEL
LOWERED
TROOP WARN/HTG PANEL
COCKPIT
TROOP
ALARM
5
5
BELL JUMP
LT
CENTER INSTRUMENT PANEL
WITH 74
CENTER INSTRUMENT PANEL
WITHOUT 74
NO. 2 POWER
DISTRIBUTION
PANEL (PDP)
VIEW LOOKING
AFT

END OF TASK

# SECTION VI
# LIGHTING SYSTEMS

## 9-61 REMOVE 26V LIGHTING TRANSFORMER 9-61

INITIAL SETUP

***Applicable Configurations:***

Without 17

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

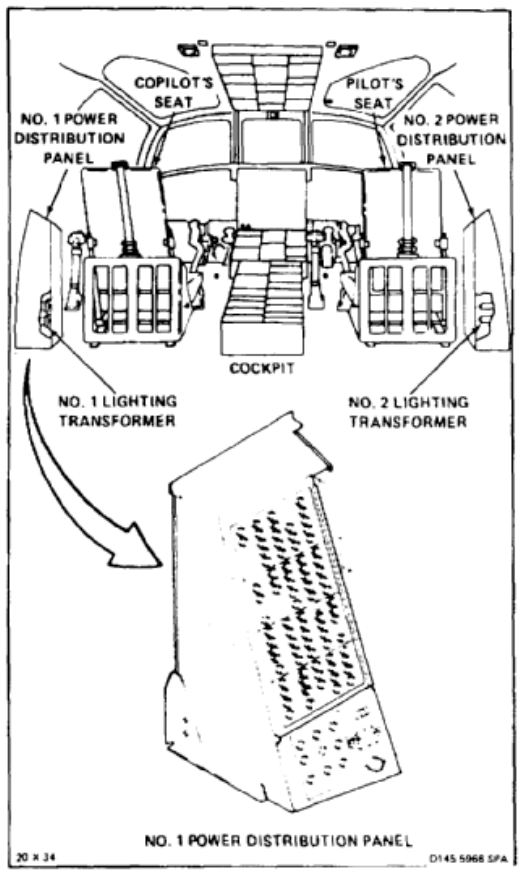
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

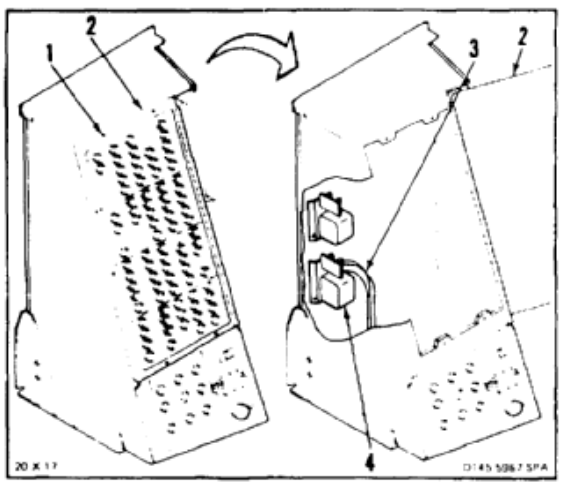
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off



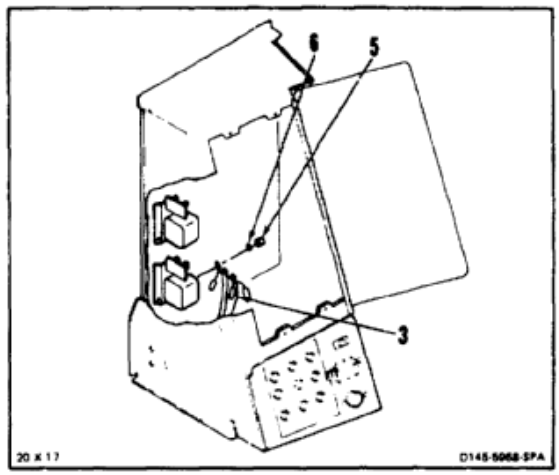

**NOTE**

Procedure is same to remove No. 1 or No. 2 lighting transformer. Removal of No. 1 lighting transformer is shown here.

1. Release six fasteners (1) in upper circuit breaker panel (2). Open panel.
2. Tag three wires (3) on No. 1 lighting transformer (4). Use tags (E264).



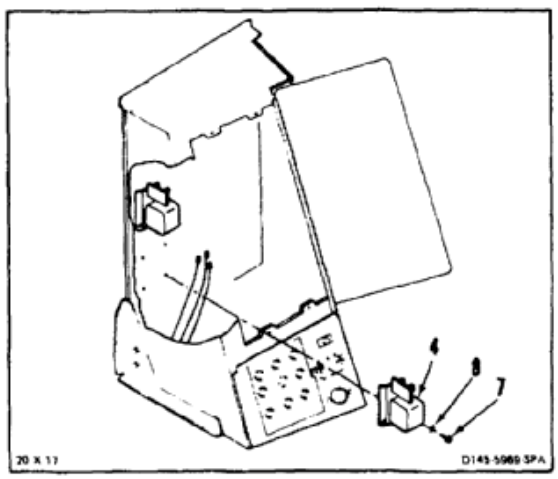
3. Remove three nuts (5) and lockwashers (6). Disconnect three wires (3).
4. Tape ends of wires (3). Use tape (E385).




5. Remove three screws (7), washers (8) and No. 1 lighting transformer (4).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-62 INSTALL 26V LIGHTING TRANSFORMER 9-62

INITIAL SETUP

***Applicable Configurations:***

Without 17

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

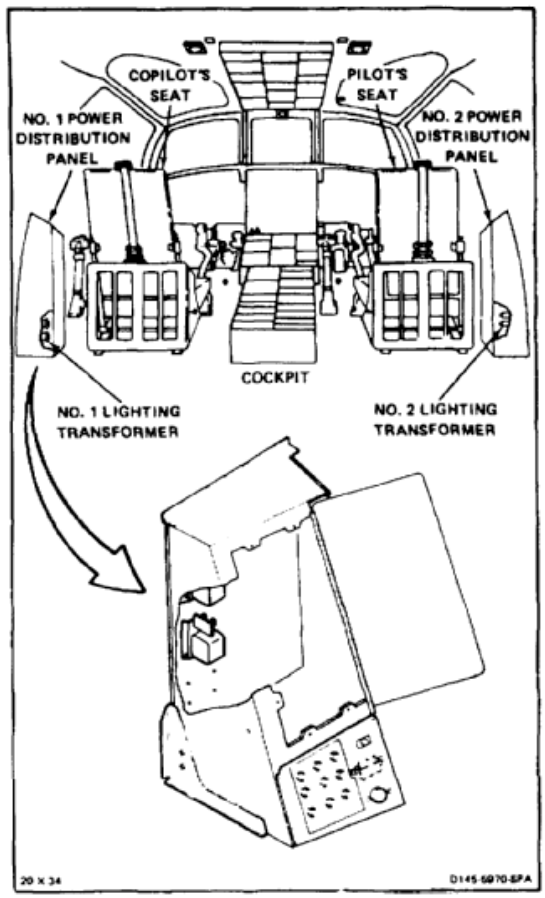
None

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

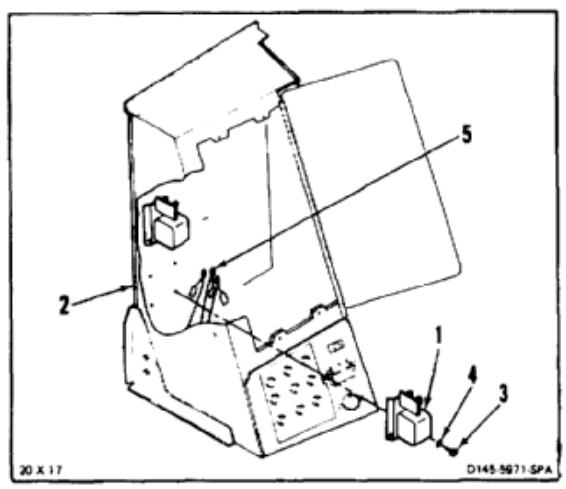
TM 55-1520-240-23P



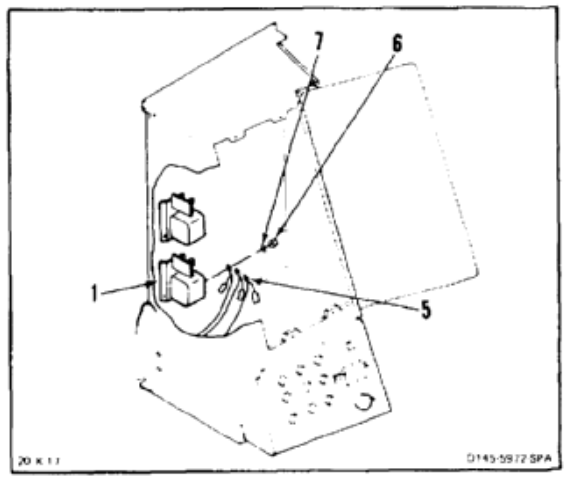

**NOTE**

Procedure is same to install No. 1 or No. 2 lighting transformer. Installation of No. 2 lighting transformer is shown here.

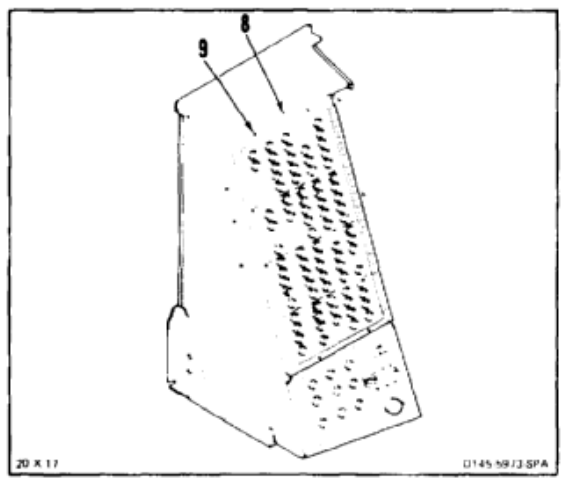
1. Position No. 1 lighting transformer (1) in No. 1 power distribution panel (2).
2. Install three screws (3) and washers (4).
3. Remove tape from ends of three wires (5).



4. Connect three wires (5) to No. 1 lighting transformer (1). Install three nuts (6) and lockwashers (7). Remove tags.




5. Close circuit breaker panel (8). Tighten six fasteners (9).




***FOLLOW-ON MAINTENANCE:***

For No. 1 lighting transformer, perform operational check of copilot's flight instrument panel lights (TM 55-1520-240-T).
For No. 2 lighting transformer, perform operational check of pilot's flight instrument panel lights (TM 55-1520-240-T).

END OF TASK

## 9-63 REMOVE TAIL POSITION LIGHT 9-63

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Work Stand

***Materials:***

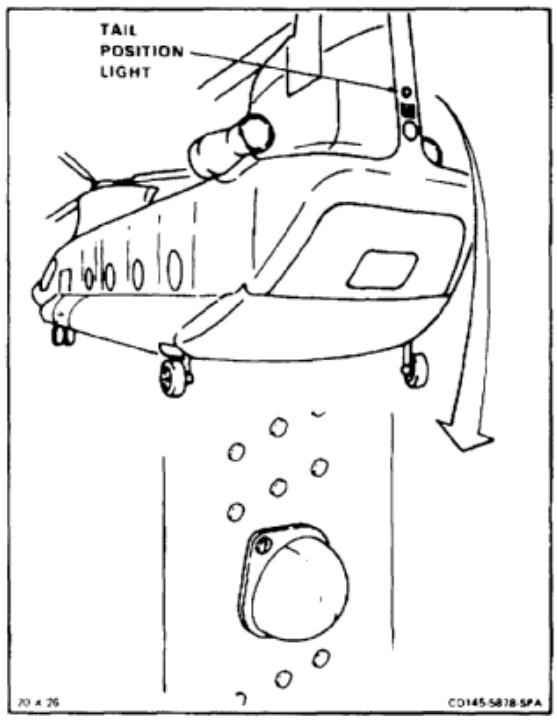
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

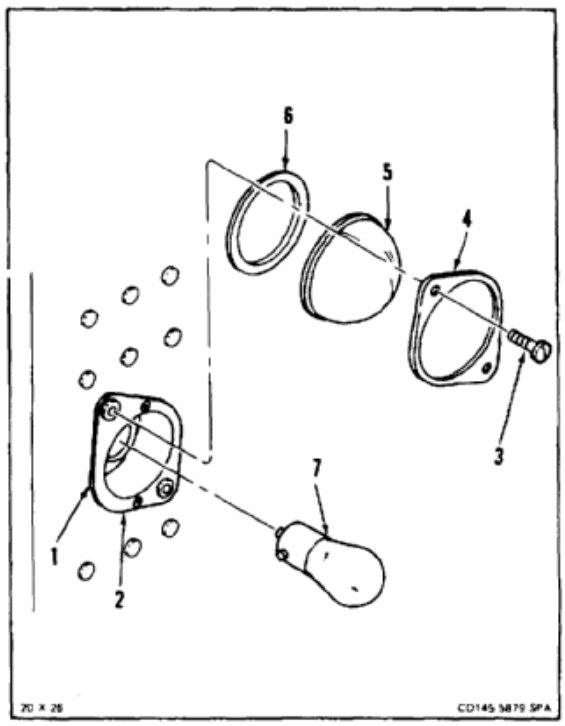
Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off



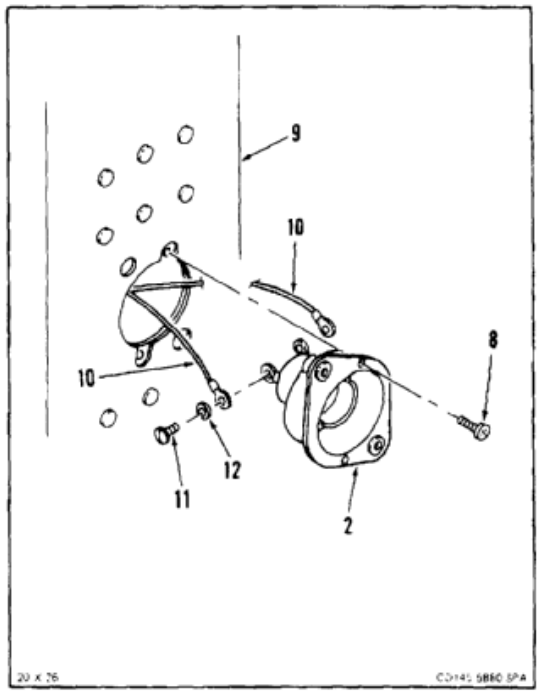

1. Cut through sealant (1) at edge of light (2).
2. Remove two screws (3), lens retainer (4), lens (5), and seal (6).
3. Remove lamp (7) from light (2).



4. Remove two screws (8). Withdraw light (2) from structure (9).
5. Tag and disconnect two wires (10) by removing two screws (11) and washers (12). Tape ends. Use tape (E385).
6. Remove light (2).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-64 INSTALL TAIL POSITION LIGHT 9-64

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Workstand

***Materials:***

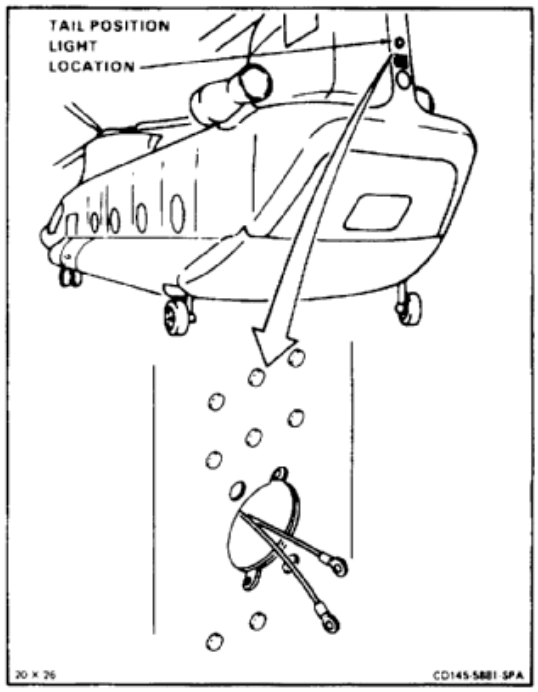
Sealant (E336)
Acetone (E20)
Cloths (E120)
Gloves (E186)

***Personnel Required:***

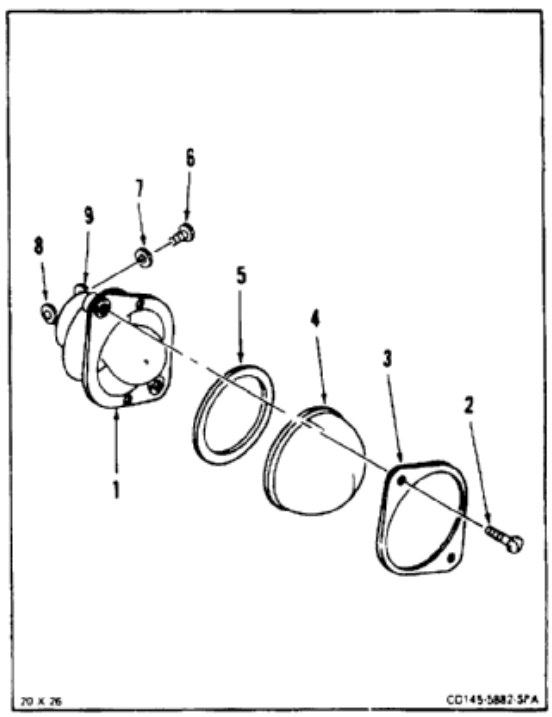
Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P



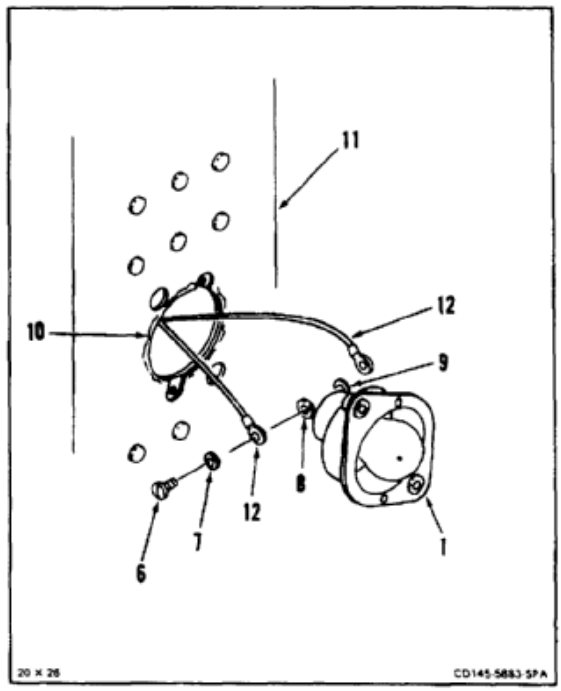

1. If light (1) is replacement, perform the following:
   a. Remove two screws (2), retainer (3), lens (4), and seal (5) from light (1).
   b. Remove two screws (6) and washers (7) from terminals (8 and 9).



**WARNING**

Acetone (E20) is flammable and toxic. It can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

2. Remove old sealant (10) from fuselage (11). Use acetone (E20). Wipe with cloth (E120). Wear gloves (E186).
3. Remove tape and connect two wires (12) to terminals (8 and 9). Install screws (6) and washers (7). Remove tags.




4. Position light (1) in fuselage (11) and install two screws (13).
5. Install seal (5), lens (4), retaining ring (3) and two screws (2).

**WARNING**

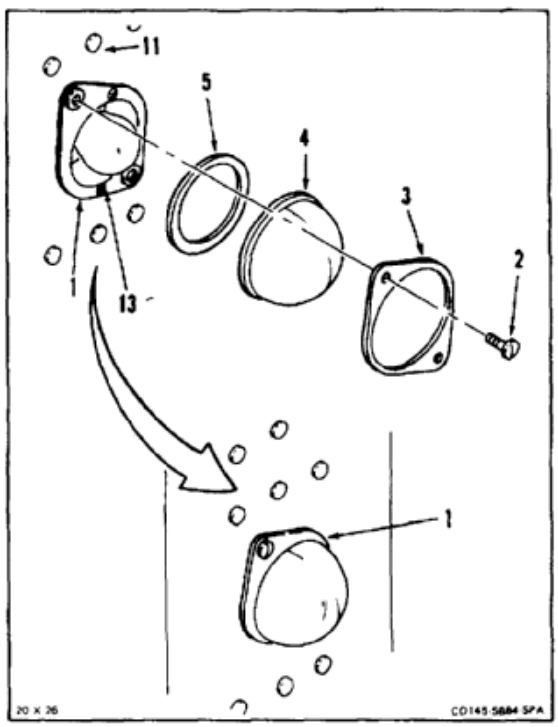
Sealant (E336) can irritate skin and cause burns. Avoid contact with skin, eyes, and clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

6. Seal outer edge of light (1). Use sealant (E336).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).




END OF TASK

## 9-65 REPLACE TAIL POSITION LIGHT LAMP 9-65

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Work Stand

***Materials:***

None

***Parts:***

Lamp

***Personnel Required:***

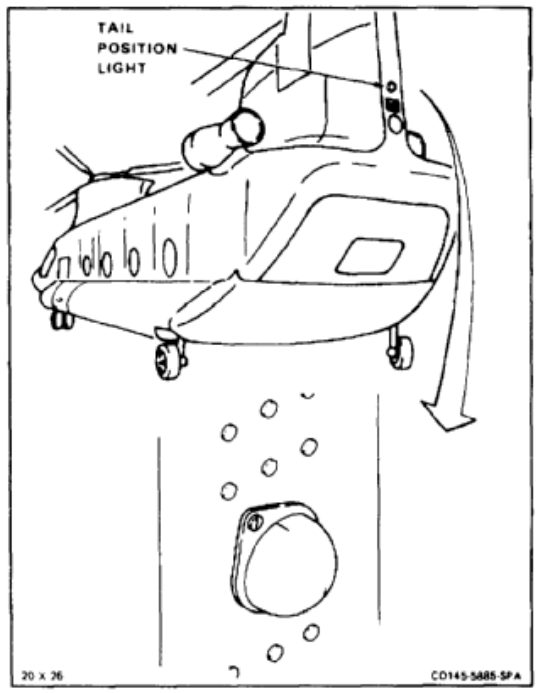
Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off

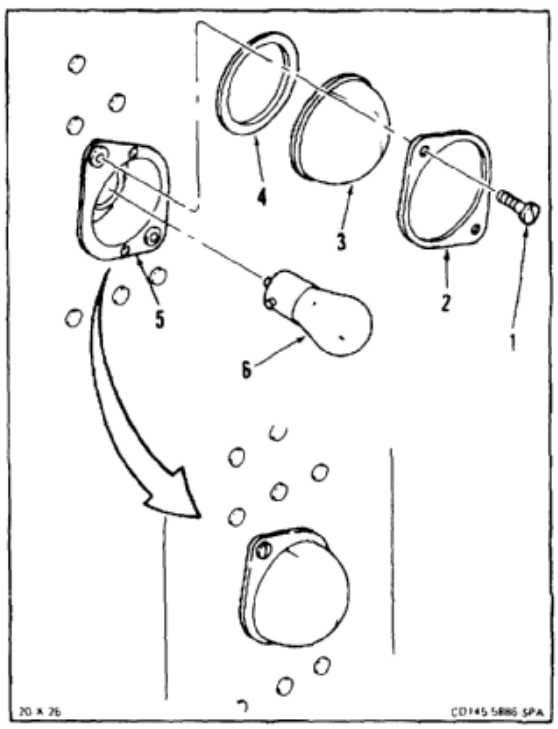



1. Remove two screws (1), lens retainer (2), lens (3), and seal (4) from light (5).
2. Remove lamp (6).
3. Install new lamp (6).
4. Install seal (4), lens (3), retainer (2), and two screws (1).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).




END OF TASK

## 9-66 REMOVE SIDE POSITION LIGHT 9-66

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

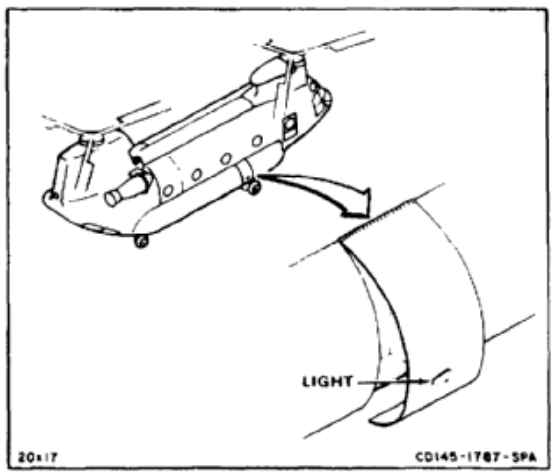
Tape (E397)

***Personnel Required:***

Aircraft Electrician (2)

***Equipment Condition:***

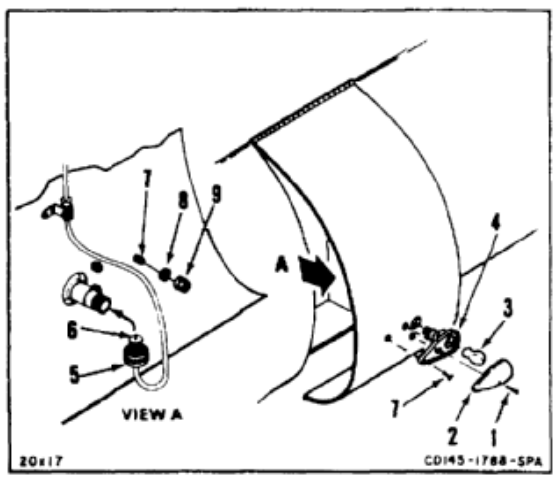
Battery Disconnected (Task 1-39)
Electrical Power Off
Forward Landing Gear Access Panel Open (Task 2-2)




**NOTE**

Procedure is same for removing left or right position light. Right side light is shown here.

1. Remove screw (1), lens (2), and lamp (3) from light (4).
2. Disconnect electrical socket (5) from back of light.
3. Unsolder wire (6) from socket (5). Tape exposed end. Use tape (E397).
4. Remove three washers (8) and nuts (9) from screws (7).
5. Remove three screws (7) and light (4).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-67 INSTALL SIDE POSITION LIGHT 9-67

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

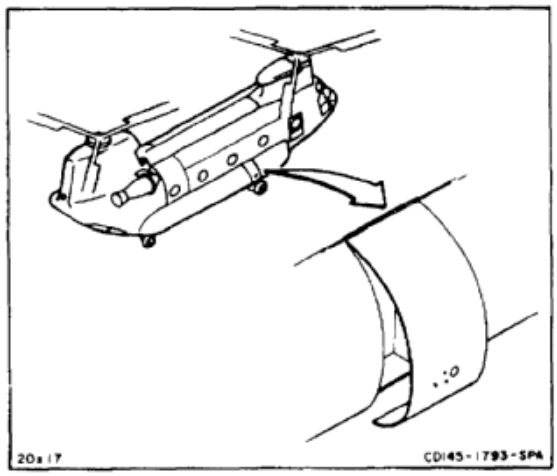
Acetone (E20)
Sealant (E336)
Solder (E360)
Cloth (E120)
Gloves (E186)

***Personnel Required:***

Aircraft Electrician

***References:***

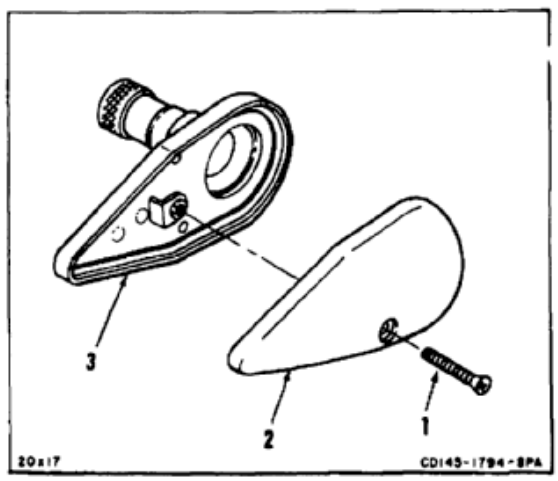
TM 55-1520-240-23P




**NOTE**

Procedure is same for installing left or right position light. Right side light is shown here.

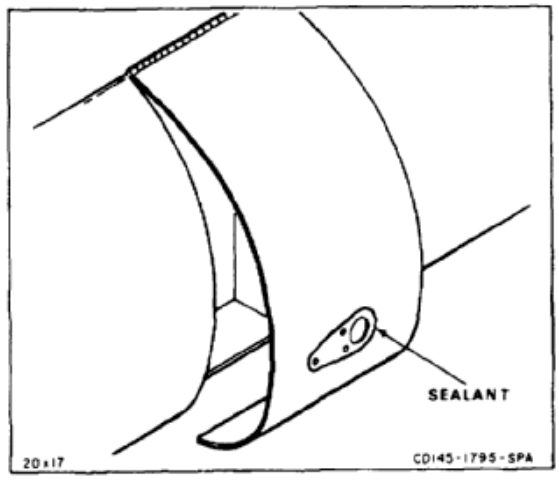
1. Remove screw (1) and lens (2) from light (3).



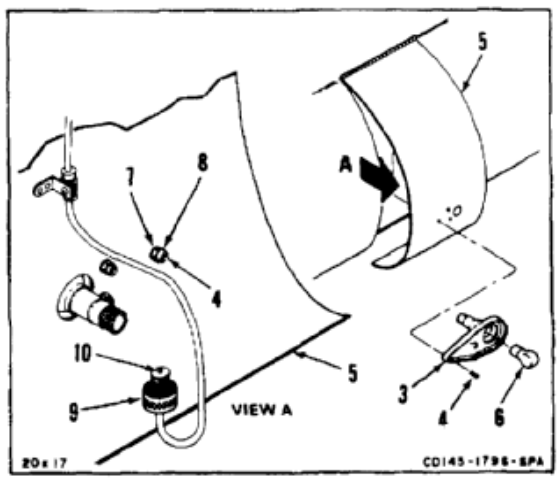
**WARNING**

Acetone (E20) can form toxic vapors if exposed to flame. Use in well-ventilated area, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

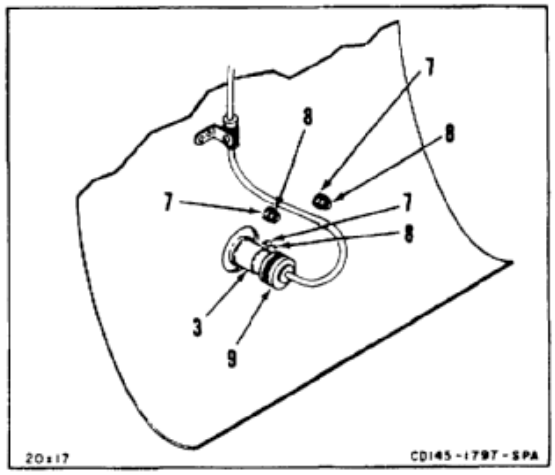
2. Remove old sealant from access panel. Use acetone (E20). Wipe with cloth (E120). Use gloves (E186).



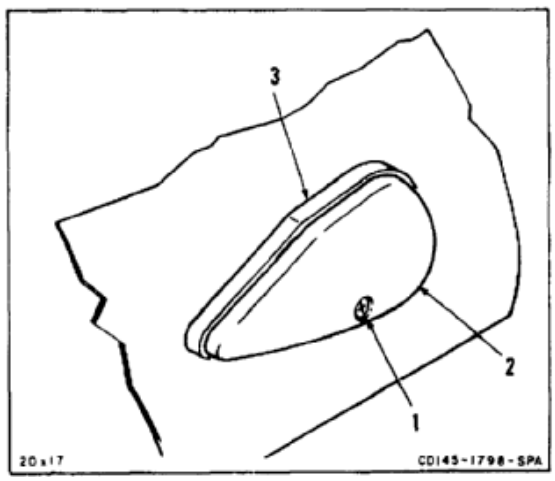

3. Install light (3) and three screws (4) on panel (5). Install lamp (6) in light.
4. Install three washers (7) and nuts (8) on screws (4).
5. Disconnect light socket (9).
6. Insert wire (10) through back of socket (9). Solder wire to socket. Use solder (E360).



7. Connect socket (9) to light (3).
8. Seal back of light socket (9). Seal mounting washers (7) and nuts (8). Use sealant (E336).




9. Install lens (2) and screw (1).
10. Seal outer edge of light (3). Use sealant (E336). Wear gloves (E186).




***FOLLOW-ON MAINTENANCE:***

Close forward landing gear access panel (Task 2-2).
Check operation of side position light (TM 55-1520-240-T).

END OF TASK

## 9-68 REPLACE SIDE POSITION LIGHT LAMP 9-68

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

***Materials:***

Cloth (E120)

***Parts:***

Lamp

***Personnel Required:***

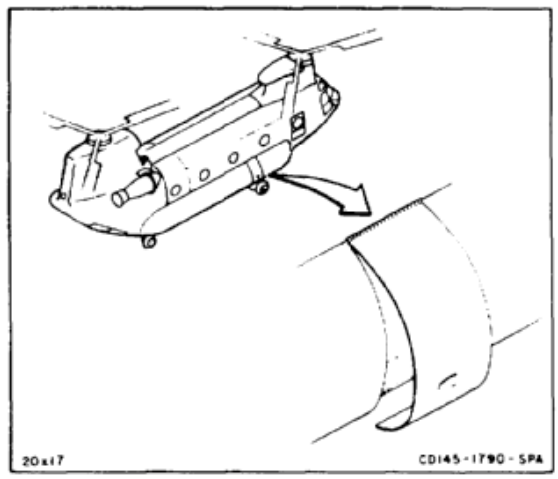
Helicopter Repairer

***References:***

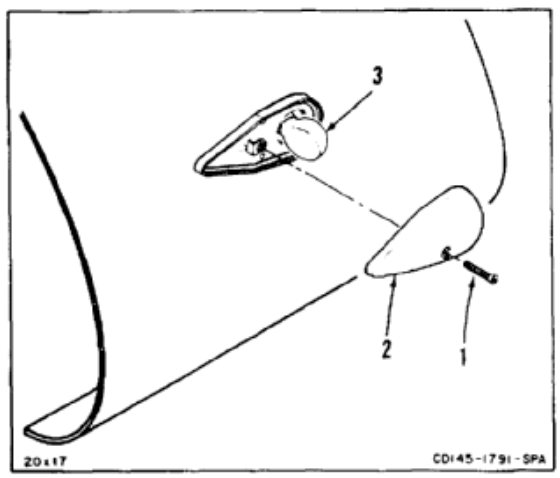
TM 55-1520-240-23P

***Equipment Condition:***

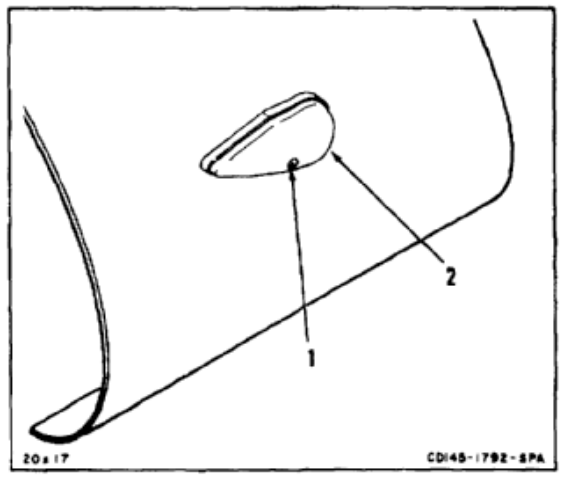
Battery Disconnected (Task 1-39)
Electrical Power Off
Right Forward Landing Gear Panel Open (Task 2-2)




1. Remove lens retaining screw (1) and lens (2).
2. Remove lamp (3). Install new lamp.
3. Clean inside of lens (2). Use cloth (E120).



4. Position lens (2) and install retaining screw (1).




***FOLLOW-ON MAINTENANCE:***

Check operation of side position lamp (TM 55-520-240-T).

END OF TASK

## 9-69 REMOVE LANDING LIGHT 9-69

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

***Materials:***

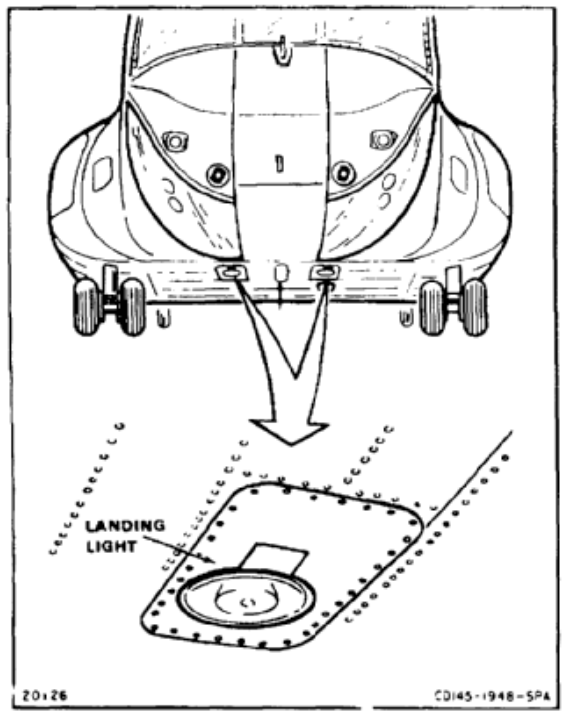
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

Medium Helicopter Repairer (2)

***Equipment Condition:***

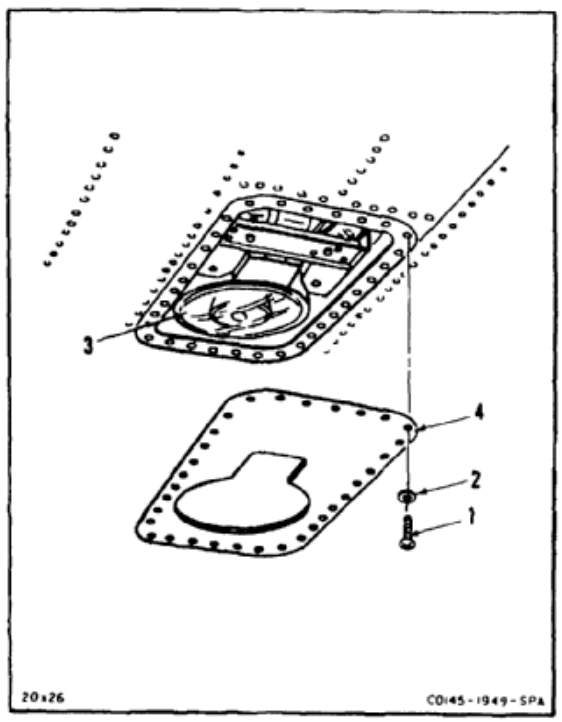
Battery Disconnected (Task 1-39)
Electrical Power Off



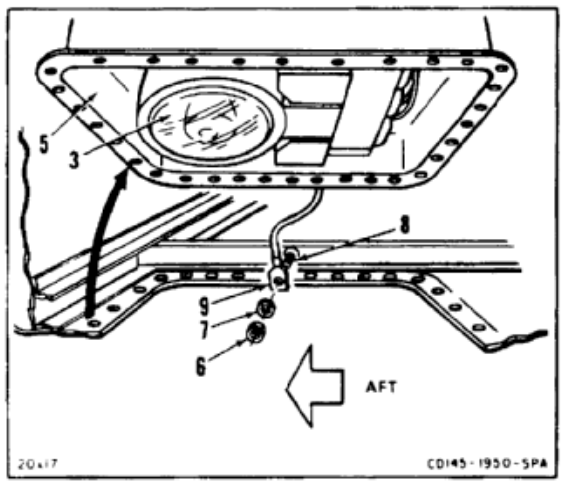

**NOTE**

Procedures are same for right or left landing light. Right light is shown here. With **17**, the left landing light has NVG lamp and lens.

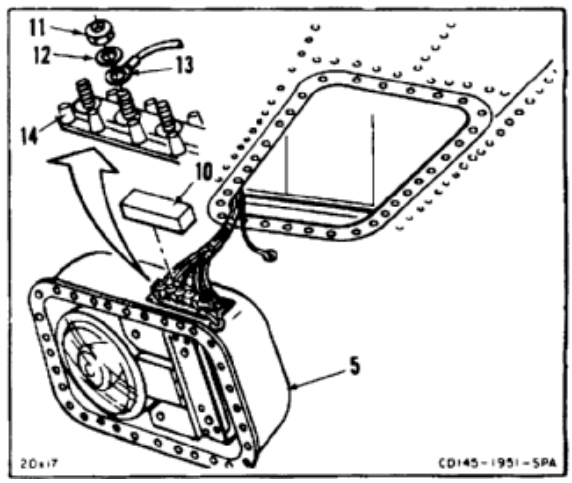
1. Remove 32 screws (1) and washers (2) from landing light (3) and housing (4).
2. Remove housing (4).



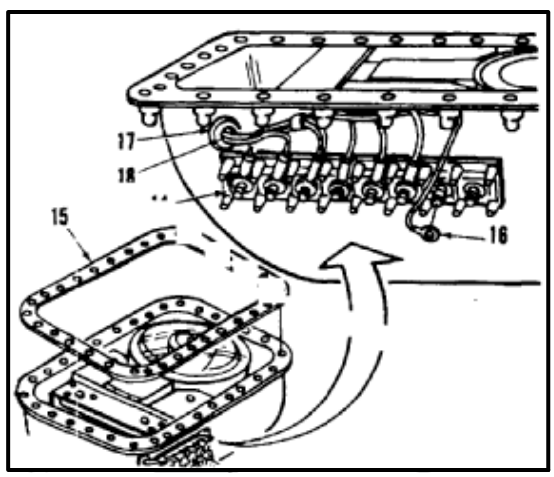
3. Tilt light (3) and housing assembly (5) to one side and hold up.
4. Remove nut (6) and washer (7) from ground stud (8). Disconnect electrical lead (9).



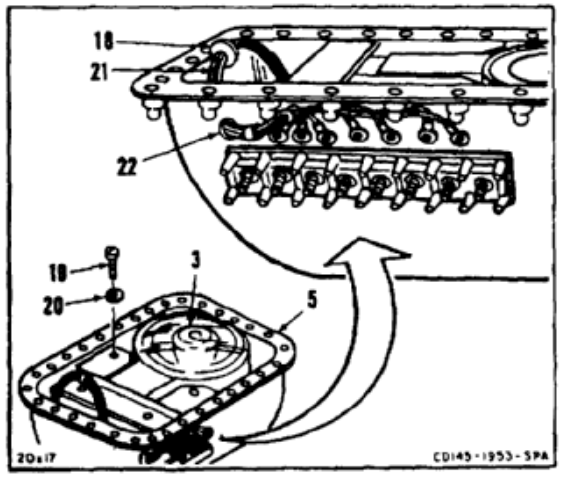

5. Lower housing assembly (5). Have helper support housing assembly so it does not hang.
6. Remove terminal cover (10).
7. Remove eight nuts (11) and washers (12). Tag and remove ten wires (13) from terminal board (14). Tape wires. Use tape (E385).
8. Remove housing assembly (5).



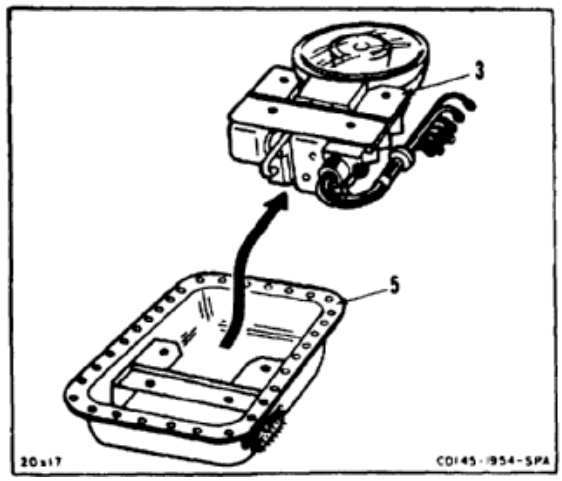

9. Remove gasket (15).
10. Tag and disconnect seven wires (16) from terminal board (14).
11. Cut sealant (17) away from edge of grommet (18). Use sharp knife.



12. Remove four screws (19) and washers (20) from light (3) in housing assembly (5).
13. Guide harness (21) through hole (24) in housing assembly (5). Remove grommet (18) with harness.




14. Remove light (3) from housing assembly (5).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-70 DISASSEMBLE LANDING LIGHT (AVIM) 9-70

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

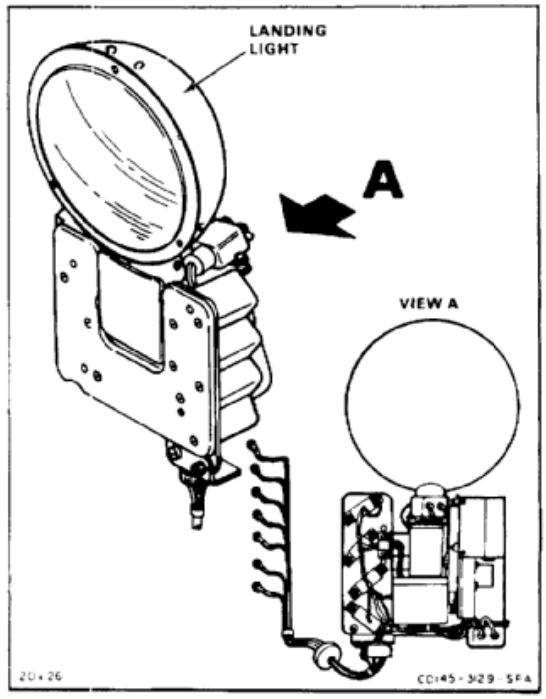
Paper Tags (E264)

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

Off Helicopter Task

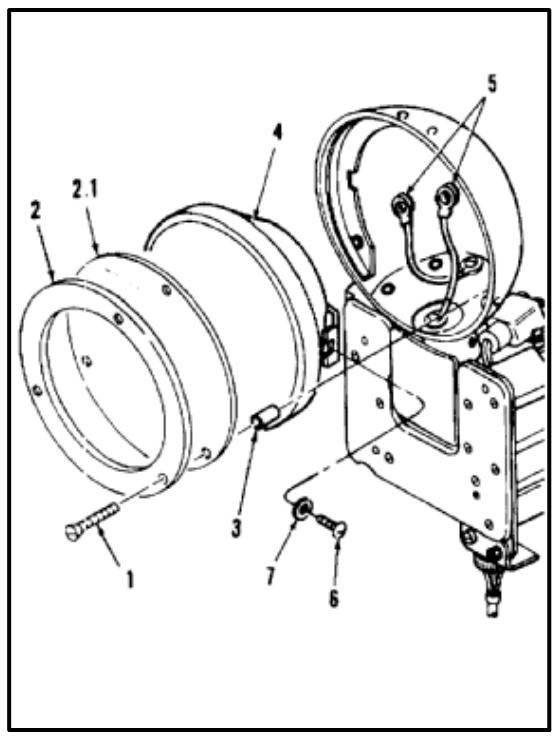



**NOTE**

Tag and disconnect wires only to the extent required to replace defective parts.

Screws are captive in ring.

On helicopters with 17, left landing light has NVG lamp and lens. NVG lens includes a retaining ring.



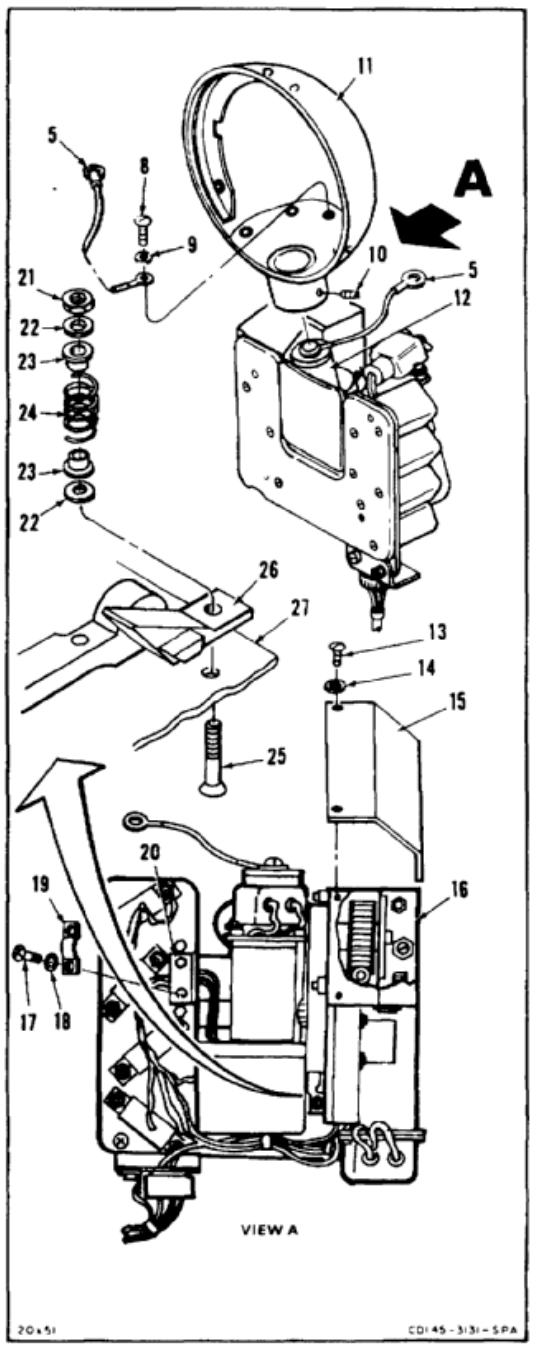

1. Loosen three screws (1). Remove retaining ring (2) and NVG lens stowed (2.1) with three screws and sleeves (3).
2. Remove lamp (4).
3. Tag and disconnect two wires (5) by removing two screws (6) and washers (7) from lamp (4).

4. Remove screw (8) and washer (9). Remove wire (5).
5. Remove setscrew (10) and canopy (11) from rotating mechanism (12).

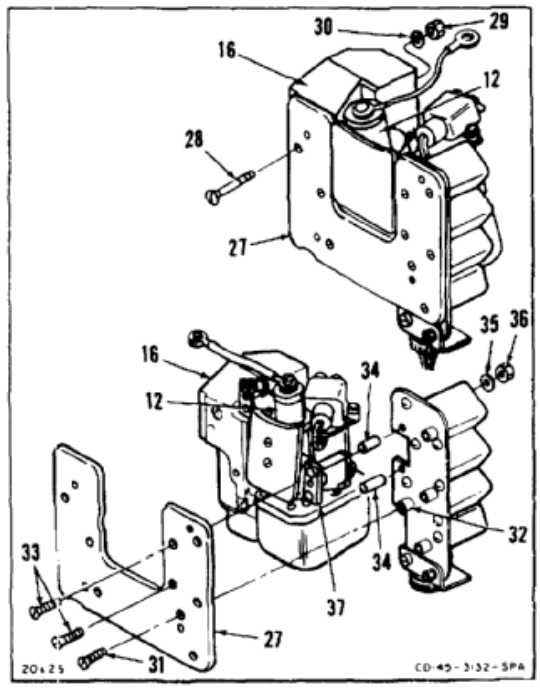
**NOTE**

Light may have one or two setscrews.

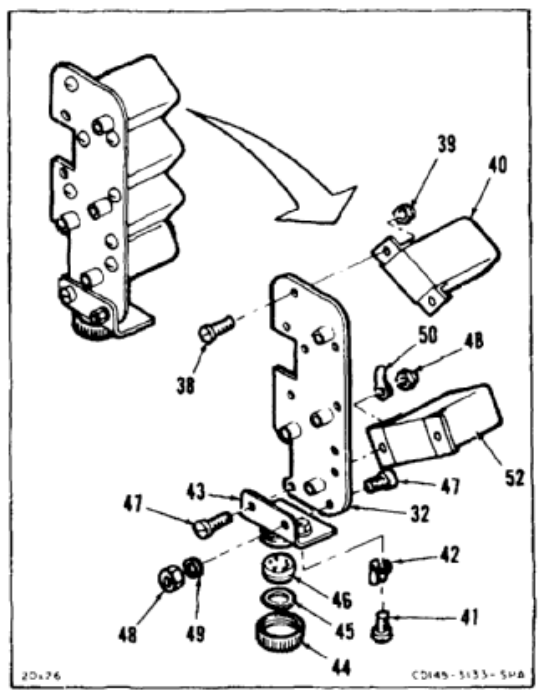
6. Remove four screws (13) and washers (14). Cut through sealer around edge of cover (15). Remove cover from gearbox (16).
7. Remove two screws (17) and washers (18). Remove wire damp (19) from block (20).
8. Remove nut (21), two washers (22), eyelets (23), and spring (24).
9. Remove screw (25) from bumper (26) and base (27).



10. Remove two screws (28), nut (29), and washer (30) from gearbox (16) and base (27).
11. Remove four screws (31) from spacer (32) and base (27).
12. Remove two screws (33), spacers (34), washers (35), and nuts (36) from shaft and block (37), spacer (32) and base (27).
13. Separate gearbox (16), rotating mechanism (12), and shaft and block (37) from spacer (32).

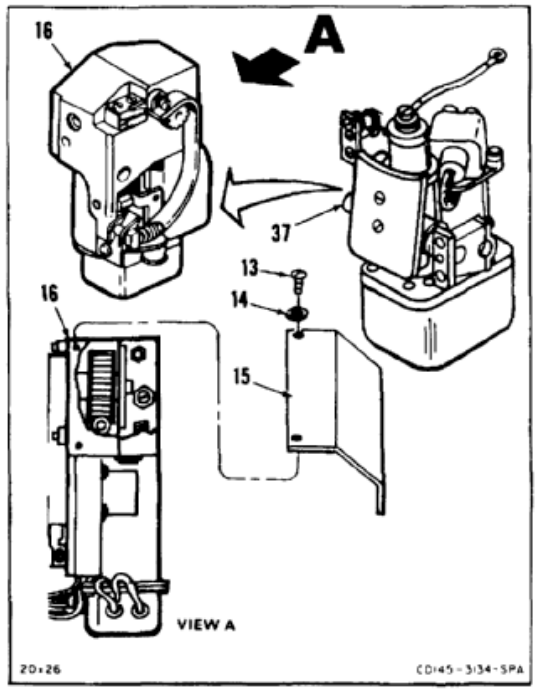



14. Remove six screws (38) and nuts (39). Remove three relays (40) from spacer (32).
15. Remove screw (41) and terminal lug (42) from conduit bracket (43).
16. Remove nut (44) from bracket (43). Remove washer (45) and rubber bushing (46).
17. Remove two screws (47) and nuts (48). Remove washer (49) and terminal (50).
18. Remove bracket (43) and relay (52) from spacer (32).



19. Remove gearbox (16) from end of shaft and block (37).

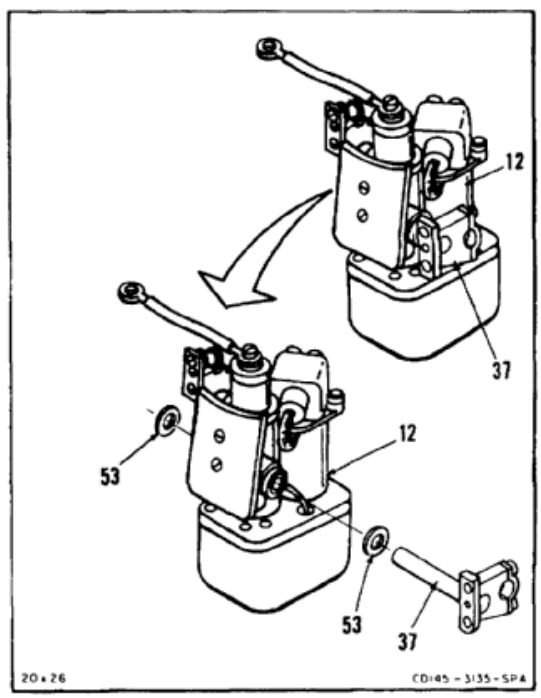
20. Position cover (15) on gearbox (16). Install four screws (13) and washers (14).




21. Remove shaft and block (37) and two extend pivot spacers (53) from rotating mechanism (12).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-71 DISASSEMBLE LANDING LIGHT EXTEND GEARBOX (AVIM) 9-71

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Drill Press
Arbor Press
Spanner Wrench
Drill, 1/16 Inch
Bearing Puller

***Materials:***

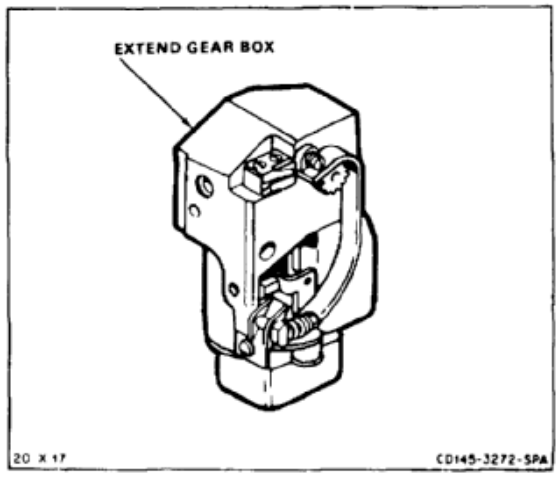
Paper Tags (E264)

***Personnel Required:***

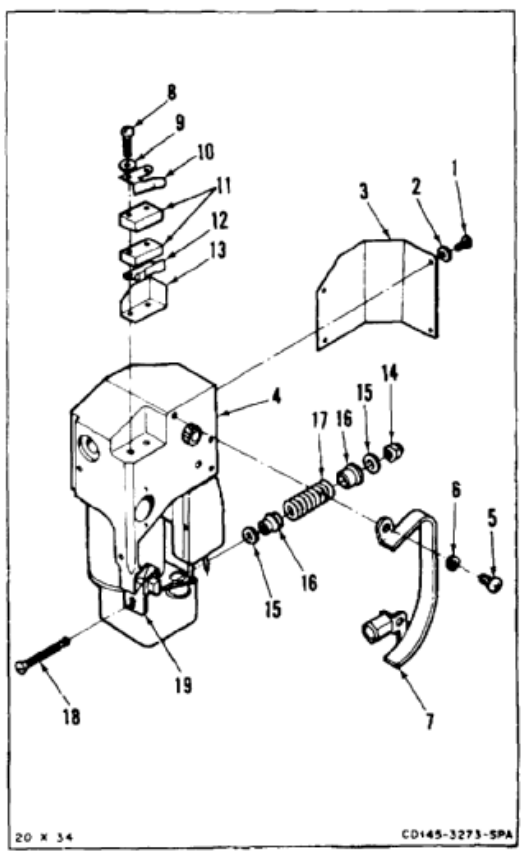
Aircraft Electrician (2)
Machinist

***Equipment Condition:***

Off Helicopter Task




1. Remove four screws (1) and washers (2). Cut through sealant and remove cover (3) from gearbox (4).
2. Remove two screws (5) and washers (6). Remove gear cover (7).
3. Remove two screws (8) and washer (9). Remove retract switch actuator (10), two switches (11), extend switch actuator (12), and switch insulator (13).
4. Remove nut (14), two washers (15), two eyelets (16), and spring (17) from screw (18). Remove screw from bumper (19).

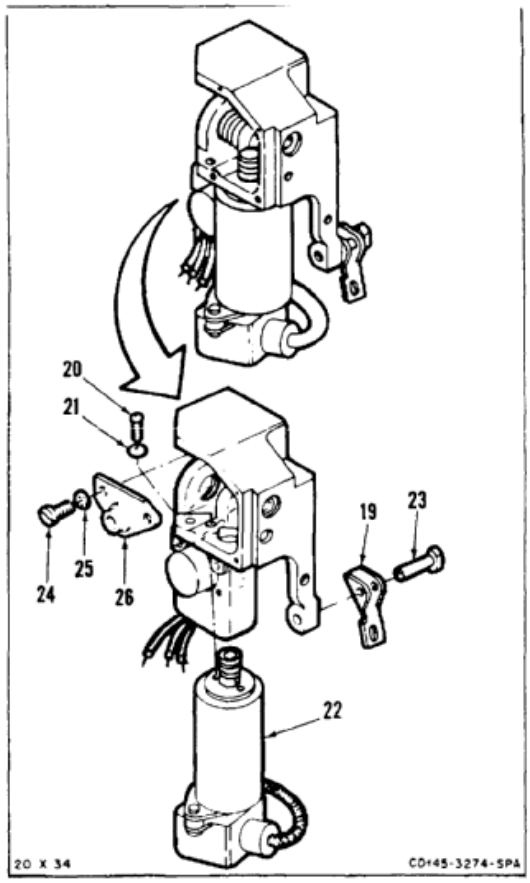


5. Remove two screws (20) and washers (21).

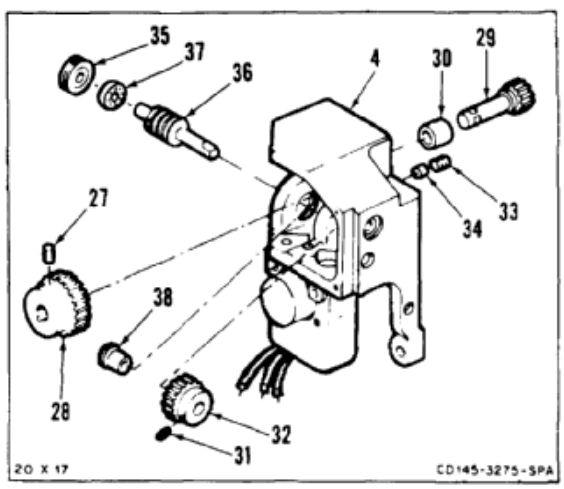
**NOTE**

Apply some side pressure to loosen sealant, when removing motor.

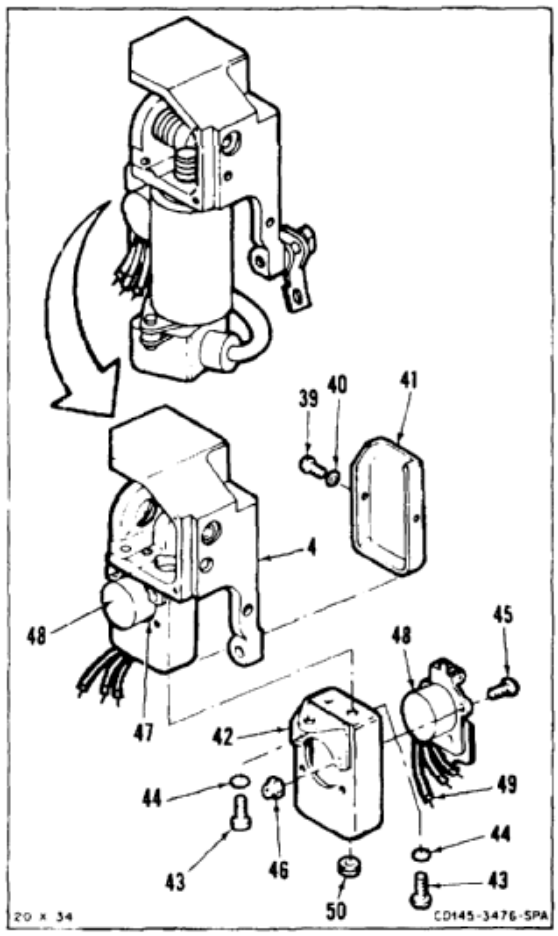
6. Remove extend motor (22).
7. Drill out end of bumper shaft (23) using **1/16 inch** drill. Remove shaft and bumper (19).
8. Remove two screws (24) and washers (25). Remove bearing and bridge assembly (26).




9. Remove two setscrews (27). Remove gear (28).
10. Remove pinion gear and shaft (29). Press bearing (30) from housing (4) using arbor press.
11. Remove two screws (31) from gear (32).
12. Remove setscrew (33) and nylon rod (34).
13. Remove bearing thrust adjustment (35) from gearbox (4) using spanner wrench.
14. Remove worm and shaft assembly (36) from gearbox (4).
15. Remove thrust bearing (37) from end of worm and shaft assembly (36).
16. Remove gear (32) from gearbox (4).
17. Remove bearing sleeve (38) from gearbox (4). Use bearing puller.



18. Remove two screws (39) and washers (40). Cut through sealant at edge of cover (41) and housing (42). Remove cover.
19. Remove three screws (43) and washers (44). Remove housing (42) from gearbox (4).
20. Remove four screws (45) and nuts (46). Cut through sealant (47) around edge of relay (48) extending through housing (42).
21. Tag wires (49). Identify which side of housing (42) wires route through.
22. Remove relay (48) and two grommets (50) from housing (42).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-72 DISASSEMBLE LANDING LIGHT ROTATING MECHANISM (AVIM) 9-72

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Bearing Puller
Soldering Gun

***Materials:***

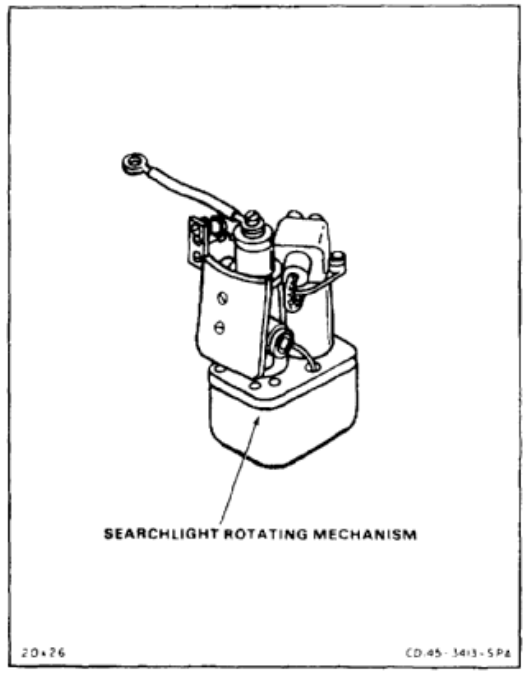
Paper Tags (E264)

***Personnel Required:***

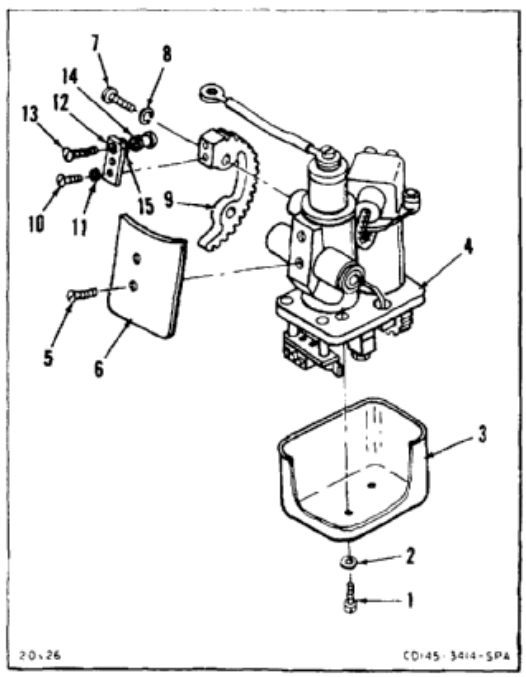
Aircraft Electrician (2)

***Equipment Condition:***

Off Helicopter Task
Landing Light Disassembled (Task 9-70)




1. Remove two screws (1) and washers (2). Cut through sealant around edge of cover (3). Remove cover from rotating mechanism (4).
2. Remove two screws (5) and cover (6).
3. Remove two screws (7), washers (8), and sector gear (9).
4. Remove two screws (10), washers (11), and actuator (12).
5. Remove screw (13) and button (14) from actuator nut (15).



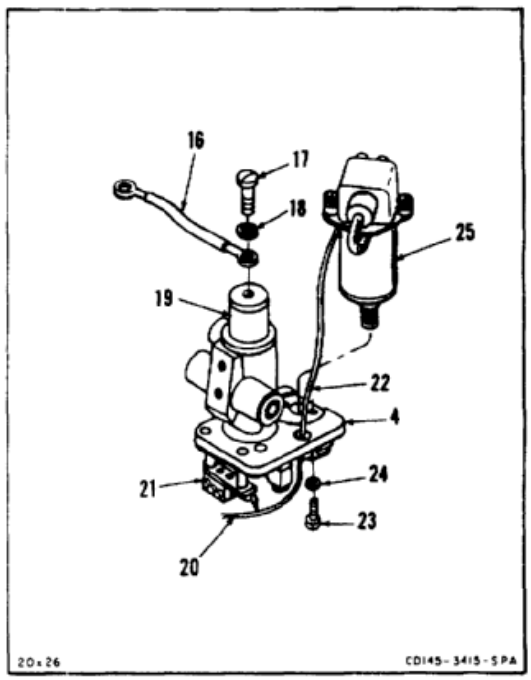
6. Tag and disconnect electrical lead (16) by removing screw (17) and washer (18) from shaft (19). Install screw and washer on shaft.

**NOTE**

Install screw and washer to retain pivot bus shaft and contact until rotate shaft is removed.

7. Tag and unsolder two wires (20) from rotate limit switch (21). Use soldering gun. Withdraw wire harness (22) through hole in rotating mechanism (4).

8. Remove two screws (23), washers (24) and motor (25).




9. Remove two screws (26), two washers (27), adapter (28), switch (21), and insulator (29).

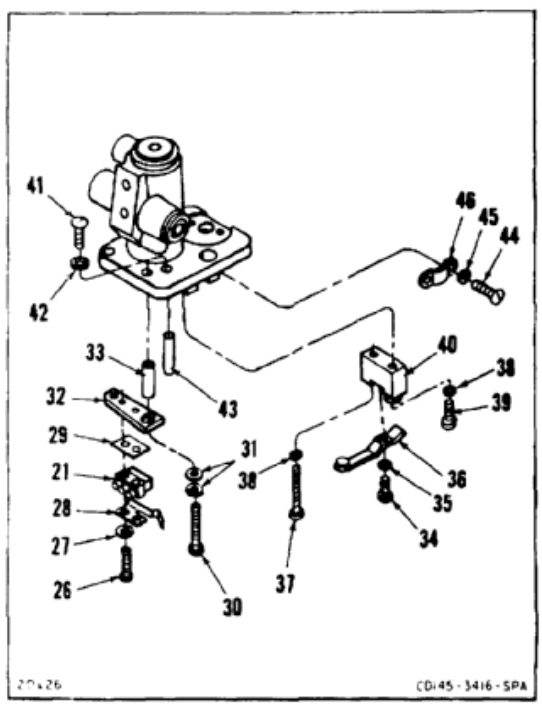
10. Remove two screws (30), four washers (31), adjusting plate (32), and two posts (33).

11. Remove screw (34), washer (35), and contact (36).

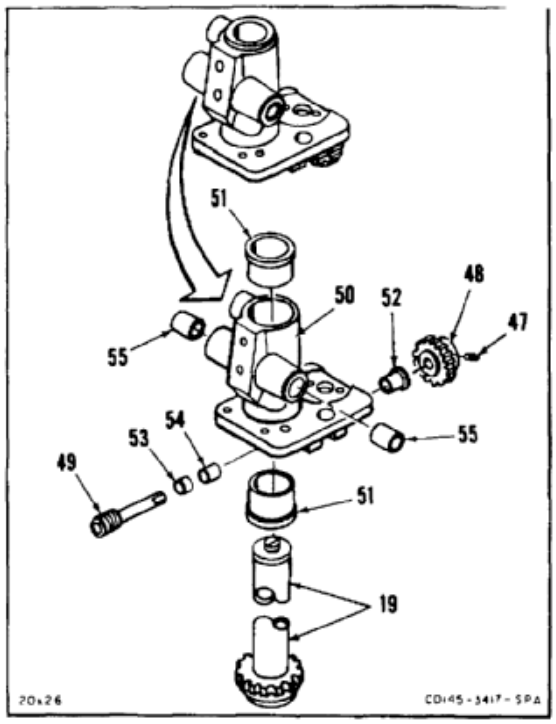
12. Remove screw (37), two washers (38), and stud (39). Remove insulator (40).

13. Remove screw (41), washer (42), and post (43).

14. Remove two screws (44), washers (45), and clamp (46).



15. Remove two setscrews (47), and gear (48) from worm and shaft assembly (49). Remove worm and shaft.
16. Remove shaft (19) from casting (50).
17. Remove two bearings (51) from casting (50). Use bearing puller.
18. Remove bearing (52), bearing (53), spacer (54), and two bearings (55) from casting (50). Use bearing puller.



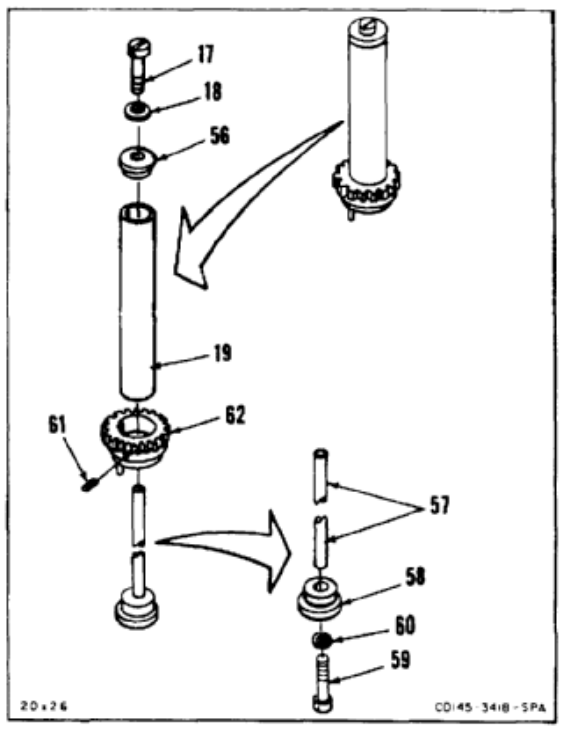

**NOTE**

Pivot bus shaft, with lower insulator, contact, washer and screw, can be removed from rotate shaft as a unit.

19. Remove screw (17), washer (18), and insulator (56).
20. Remove pivot bus shaft (57) with insulator (58) from rotate shaft (19).
21. Remove contact (59), washer (60), and insulator (58) from pivot shaft (57).
22. Remove two setscrews (61) and rotate control wheel (62) from shaft (19).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-73 DISASSEMBLE LANDING LIGHT MOTOR (AVIM) 9-73

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

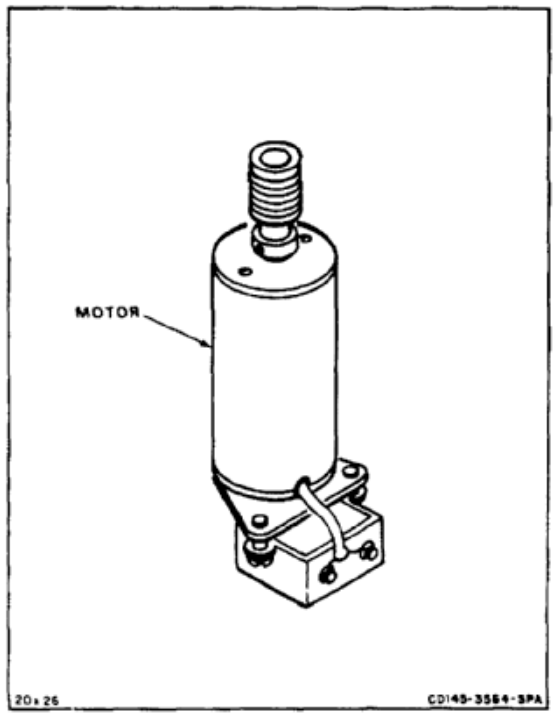
Paper Tags (E264)

***Personnel Required:***

Aircraft Electrician (2)

***Equipment Condition:***

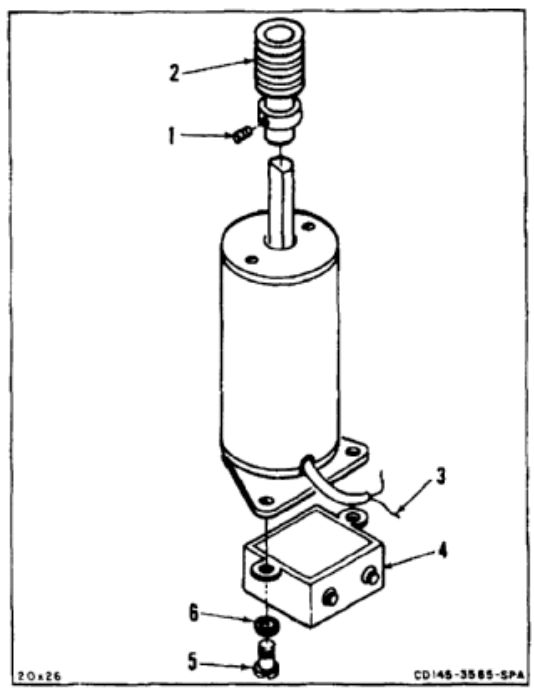
Off Helicopter Task
Landing Light Motor Removed (Task 9-71)



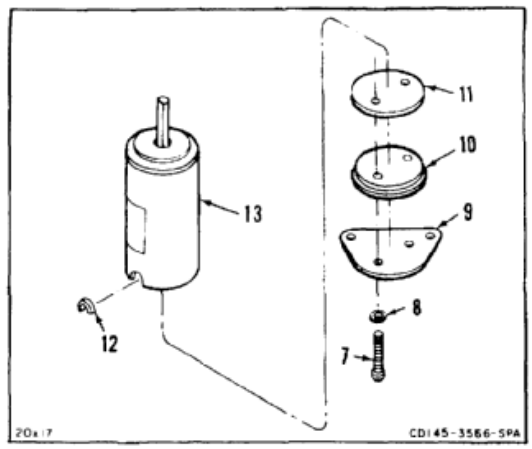

**NOTE**

Disconnect wires only to the extent required to replace defective parts.

1. Remove two setscrews (1) and worm gear (2).
2. Tag and unsolder two wires (3) from filter (4). Remove two screws (5), washers (6), and filter.



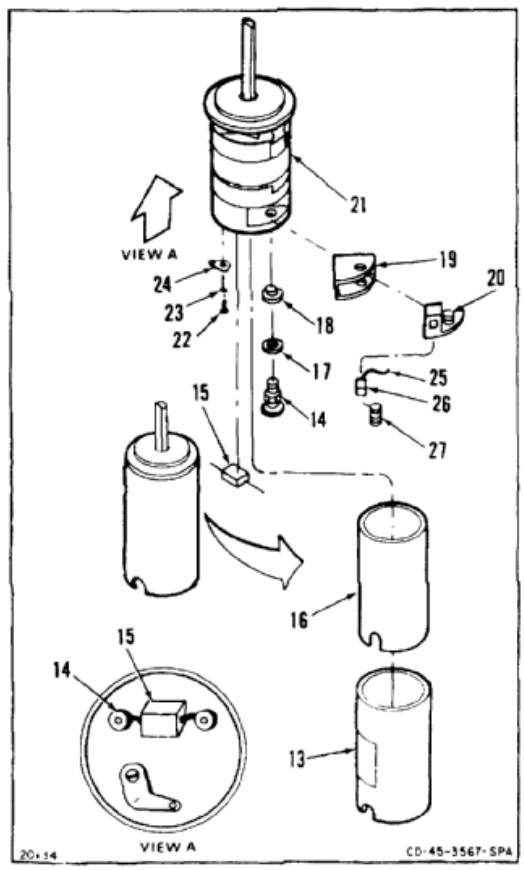
3. Remove two screws (7) and lock washers (8).
4. Cut through sealant and remove plate (9), cap (10), and insulator (11).
5. Remove grommet (12) from cover (13).




6. Tag and unsolder wires from two terminals (14). Remove capacitor (15).
7. Remove cover (13).
8. Remove insulator (16) from cover (13).
9. Remove two terminals (14).
10. Remove two washers (17), washers (18), insulators (19), and brush and spring holders (20) from motor (21).
11. Remove screw (22), washer (23), and terminal (24).
12. Unsolder brush wires (25) from holders (20).
13. Remove brushes (26) and springs (27).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-74 ASSEMBLE LANDING LIGHT MOTOR (AVIM) 9-74

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

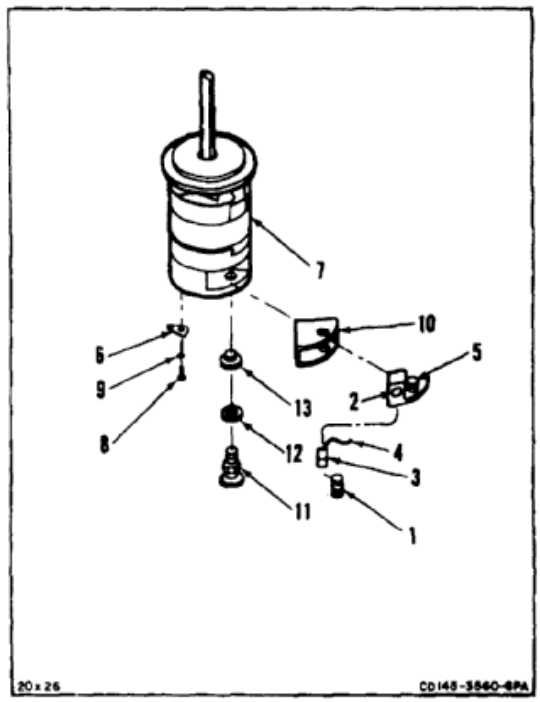
Acetone (E20)
Sealant (E336)
Solder (E360)
Cloths (E120)
Gloves (E186)

***Personnel Required:***

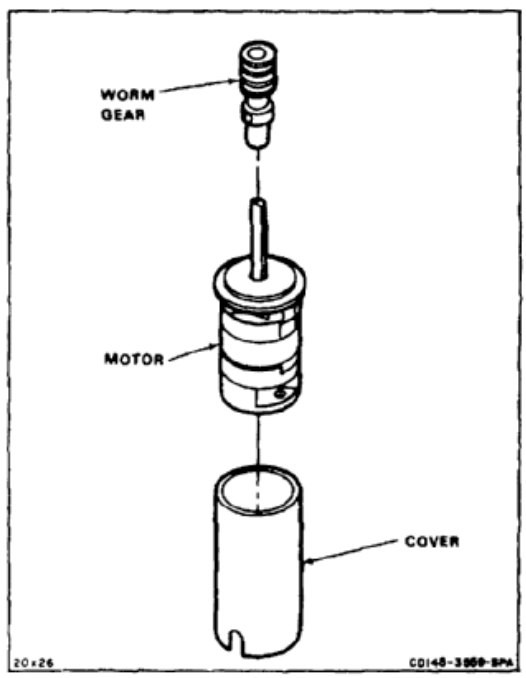
Aircraft Electrician (2)
Inspector

***References:***

TM 55-1520-240-23P




1. Install two springs (1) in holders (2).
2. Install two brushes (3) in holders (2).
3. Guide brush wires (4) through spring slots in brush and spring holders (2). Chamfer on brush (3) shall face away from brush spring (1).
4. Solder two wires (4) to ends of posts (5) on holders (2). Use solder (E360).
5. Install terminal (6) on motor (7). Install screw (8) and washer (9).
6. Position two holders (2) and insulators (10) on motor (7).
7. Install two terminals (11), washers (12), and washers (13).



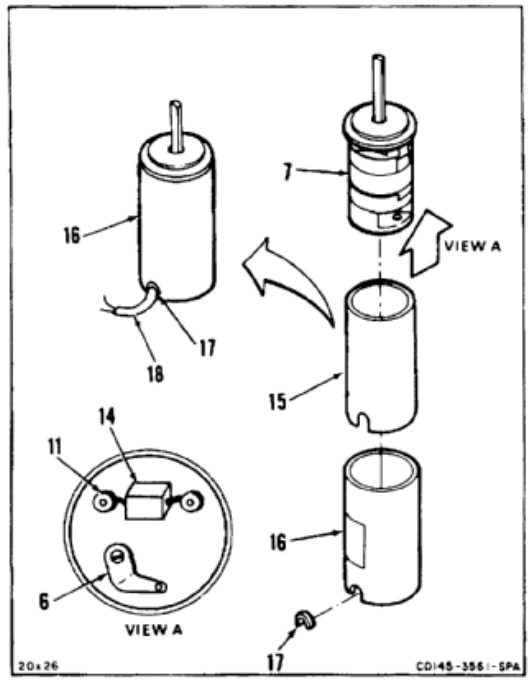
8. Connect capacitor (14) across terminals (11). Do not solder.
9. Position insulator (15) inside cover (16). Install insulator and cover on motor (7).
10. Install grommet (17) in opening at end of cover (15).

**NOTE**

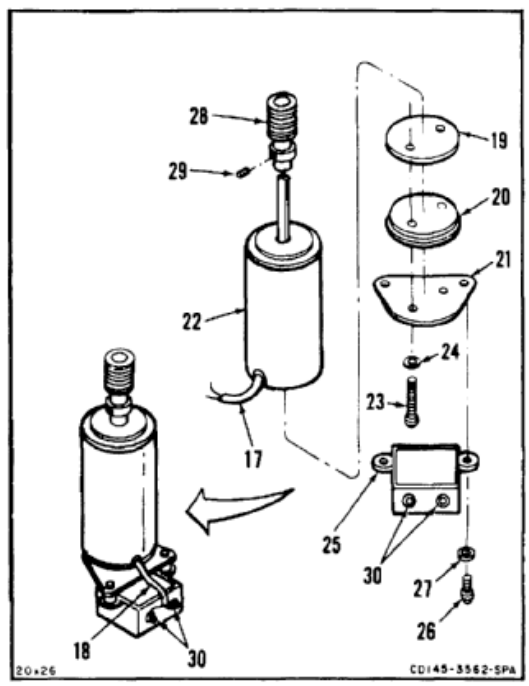
Connect wiring that was disconnected during disassembly as tagged.

11. Solder motor wires and capacitor (14) to terminals (11). Use solder (E360). Remove tags.
12. Solder two shields to terminal (6). Use solder (E360). Remove tags.
13. Guide motor filter wires (18) through grommet (17).

***INSPECT***




14. Position insulator (19), cap (20), and plate (21) on motor (22). Install two screws (23) and washers (24).
15. Position filter (25) on plate (21). Install two screws (28) and washers (27).
16. Install worm gear (28) and two setscrews (29).
17. Solder two wires (18) to filter terminals (30). Use solder (E360). Remove tags.



**WARNING**

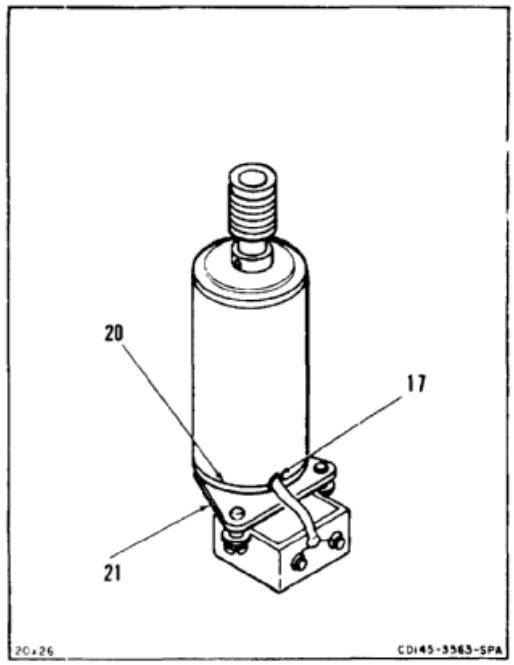
Acetone (E20) can form toxic vapors if exposed to flame. Use in well-ventilated area, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

18. Clean edges of cap (20), plate (21), and grommet (17). Use acetone (E20). Use gloves (E186).

**WARNING**

Sealant (E336) can irritate skin and cause burns. Avoid contact with skin, eyes, and clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

19. Seal edges of cap (20), plate (21), and grommet (17). Use sealant (E336). Use gloves (E186).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-75 ASSEMBLE LANDING LIGHT ROTATING MECHANISM (AVIM) 9-75

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

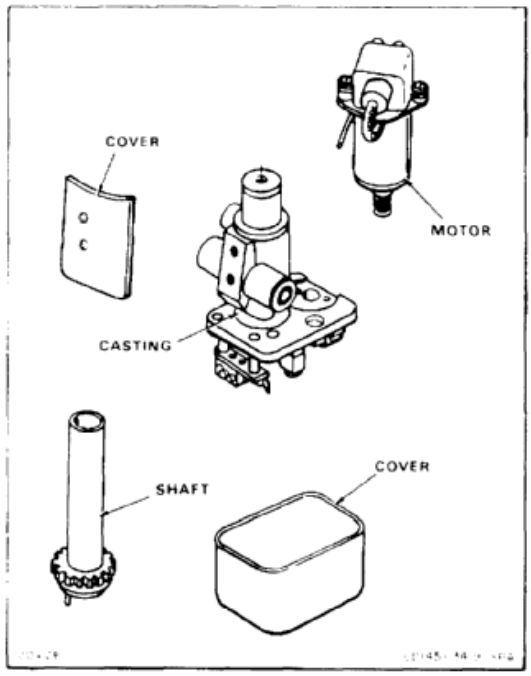
Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Arbor Press
Soldering Gun

***Materials:***

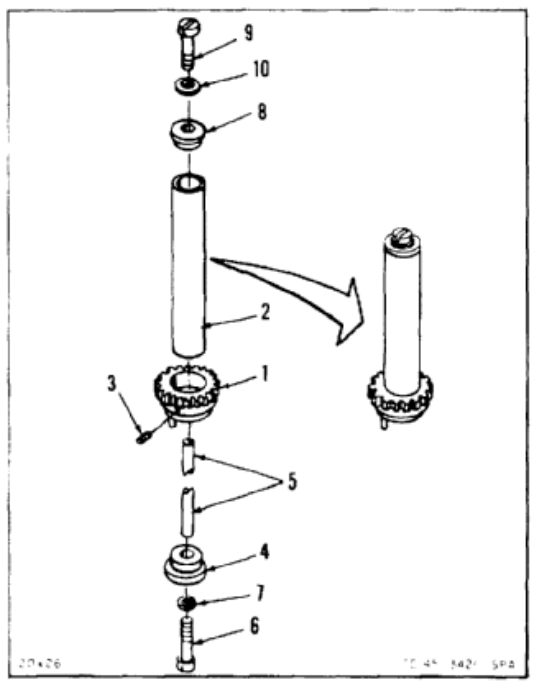
Sealant (E336)
Solder (E360)
Acetone (E20)
Cloths (E120)
Lubricating Oil (E257)
Gloves (E186)

***Personnel Required:***

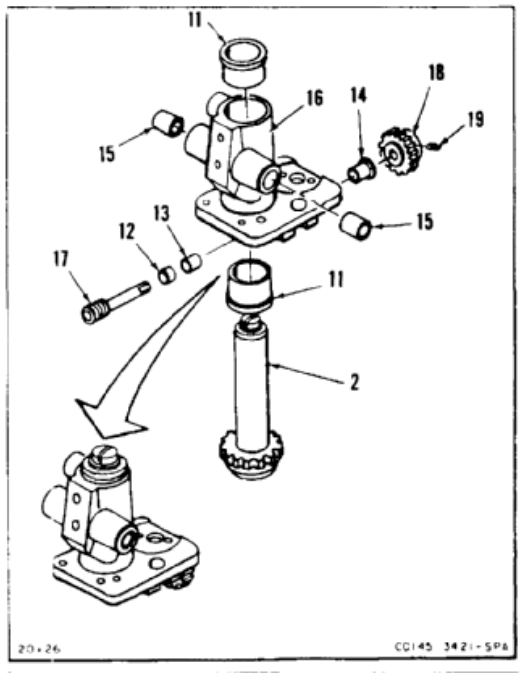
Aircraft Electrician
Machinist
Inspector



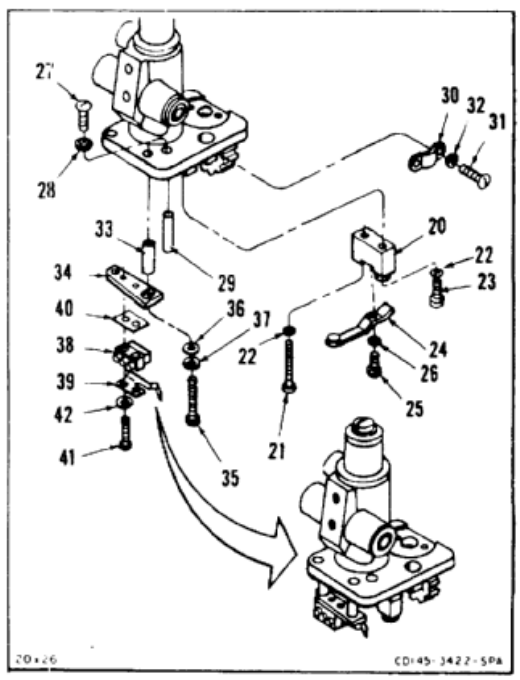

1. Install rotate control wheel (1) in shaft (2). Install two setscrews (3).
2. Position insulator (4) on pivot bus shaft (5). Install contact (6), and washer (7). Position insulator (4), and pivot bus shaft (5) inside shaft (2).
3. Position insulator (8) on shaft (2). Install screw (9) and washer (10).



4. Install two bearings (11). Use arbor press.
5. Install bearing (12), spacer (13), and bearing (14). Use arbor press.
6. Install two bearings (15). Use arbor press.
7. Lubricate shaft (2) by coating lightly with oil. Use lubricating oil (E257). Install shaft in casting (16).
8. Lubricate worm and shaft (17) by coating lightly with oil. Use lubricating oil (E257). Install worm and shaft in casting (16).
9. Lubricate gear (18) by coating lightly with oil. Use lubricating oil (E257). Install gear on shaft end of worm and shaft (17). Install two setscrews (19).



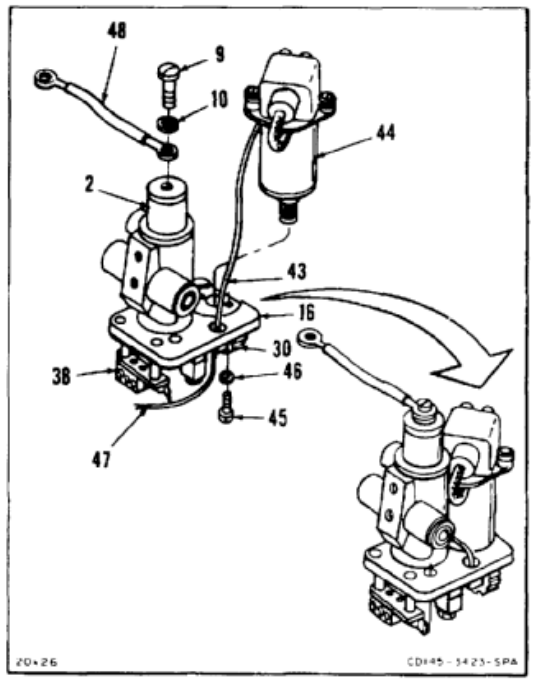

10. Install insulator (20), screw (21), two washers (22), and stud (23).
11. Install contact (24), screw (25), and washer (26).
12. Install screw (27), washer (28), and post (29).
13. Install clamp (30), two screws (31), and washers (32).
14. Install two posts (33), adjusting plate (34), two screws (35), two flat washers (36), and two lock washers (37).
15. Install switch (38), adapter (39), and insulator (40) using two screws (41) and washers (42).



16. Guide wire harness (43) through hole in casting (16) and through clamp (30). Position motor (44) on casting and install two screws (45) and washers (46).

17. Solder two wires (47) to switch (38). Use solder (E360). Remove tags.

18. Remove screw (9) and washer (10). Position electrical lead (48) to top of shaft (2). Install screw (9) and washer (10). Remove tag.



19. Install screw (49) through actuator nut (50) on actuator (51). Install button (52) as shown.
20. Position actuator (51) on sector gear (53). Install two screws (54) and washers (55).
21. Position sector gear (53) on rotating mechanism (56). Install two screws (57) and washers (58).

**WARNING**

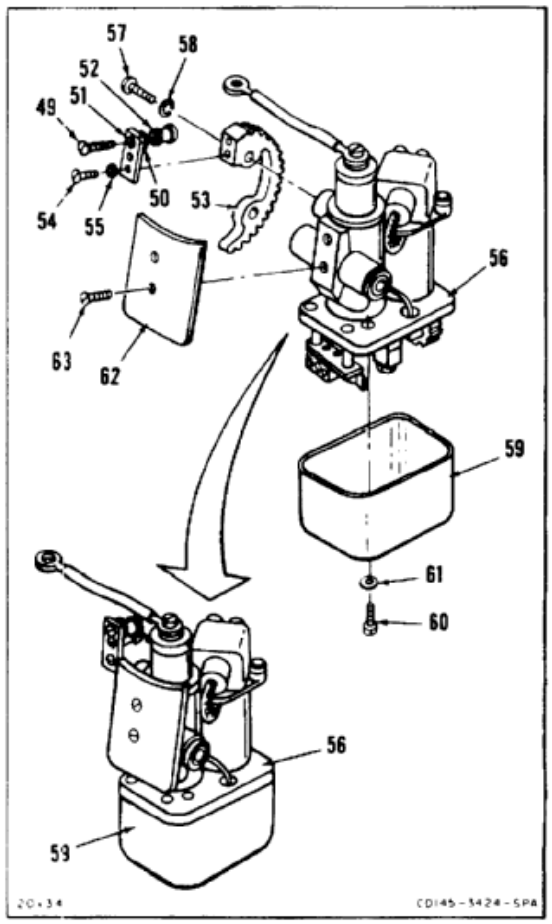
Acetone (E20) can form toxic vapors if exposed to flame. Use in well-ventilated area, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

22. Clean mating surfaces of cover (59) and rotating mechanism (56). Use cloths (E120) and acetone (E20). Use gloves (E186).
23. Install cover (59), two screws (60) and washers (61).
24. Install cover (62) using two screws (63).

**WARNING**

Sealant (E336) can irritate skin and cause burns. Avoid contact with skin, eyes, and clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

25. Seal outer edges of cover (59). Use sealant (E336). Use gloves (E186).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-76 ASSEMBLE LANDING LIGHT EXTEND GEARBOX (AVIM) 9-76

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Arbor Press
Spanner Wrench

***Materials:***

Acetone (E20)
Cloths (E120)
Sealant (E336)
Gloves (E186)

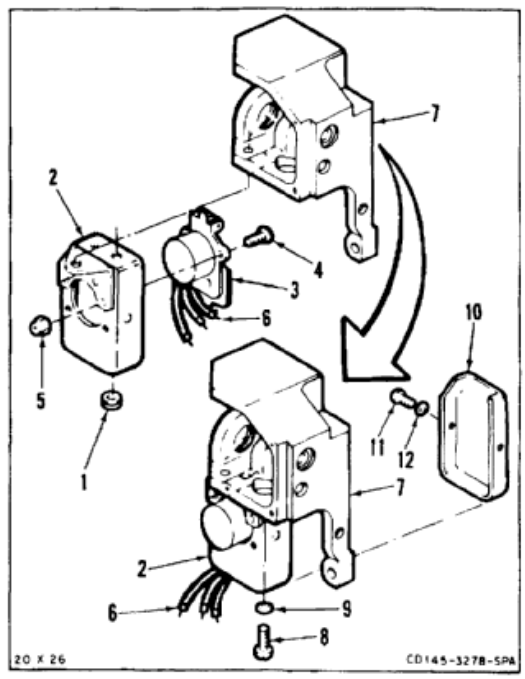
***References:***

TM 55-1520-240-23P

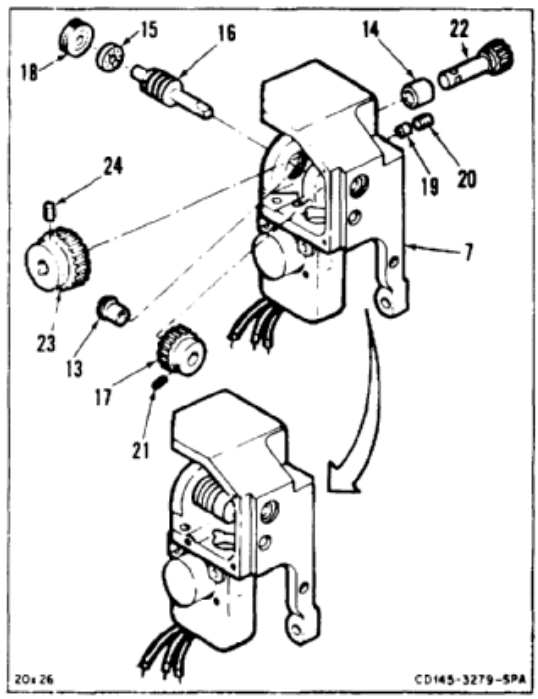
***Personnel Required:***

Aircraft Electrician (2)
Machinist
Inspector

1. Install two rubber grommets (1) in housing (2).
2. Position relay (3) in housing (2). Install four screws (4) and nuts (5). Route three wires (6) through two rubber grommets (1). Remove tags.
3. Position relay housing (2) on gearbox (7). Install three screws (8) and washers (9).
4. Position cover (10) on housing (2). Install two screws (11) and washers (12).



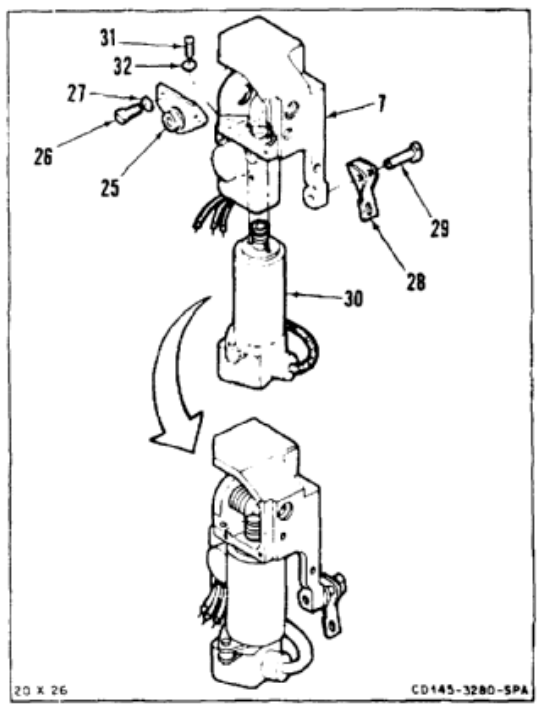
5. Install bearing sleeve (13) and pinion shaft bearing (14) in gearbox (7). Use arbor press.
6. Install thrust bearing (15) on end of worm and shaft assembly (16).
7. Install gear (17) in gearbox (7) and hold in position. Install worm and shaft (16) into gearbox through bearing sleeve (13) and into gear.
8. Install bearing thrust adjustment (18) in gearbox (7). Tighten so that worm and shaft (16) turns freely with minimal end play. Use spanner wrench.
9. Install nylon rod (19) and setscrew (20).
10. Install two setscrews (21) in gear (17).
11. Install pinion gear and shaft (22) in gearbox (7).
12. Install gear (23) on shaft (22). Install two setscrews (24) on gear.




***INSPECT***

13. Position bearing and bridge assembly (25) in gearbox (7). Install two screws (26) and washers (27).
14. Install bumper (28) and bumper shaft (29). Crimp end of bumper shaft, use arbor press.
15. Position motor (30) on gearbox (7). Install two screws (31) and washers (32).

***INSPECT***

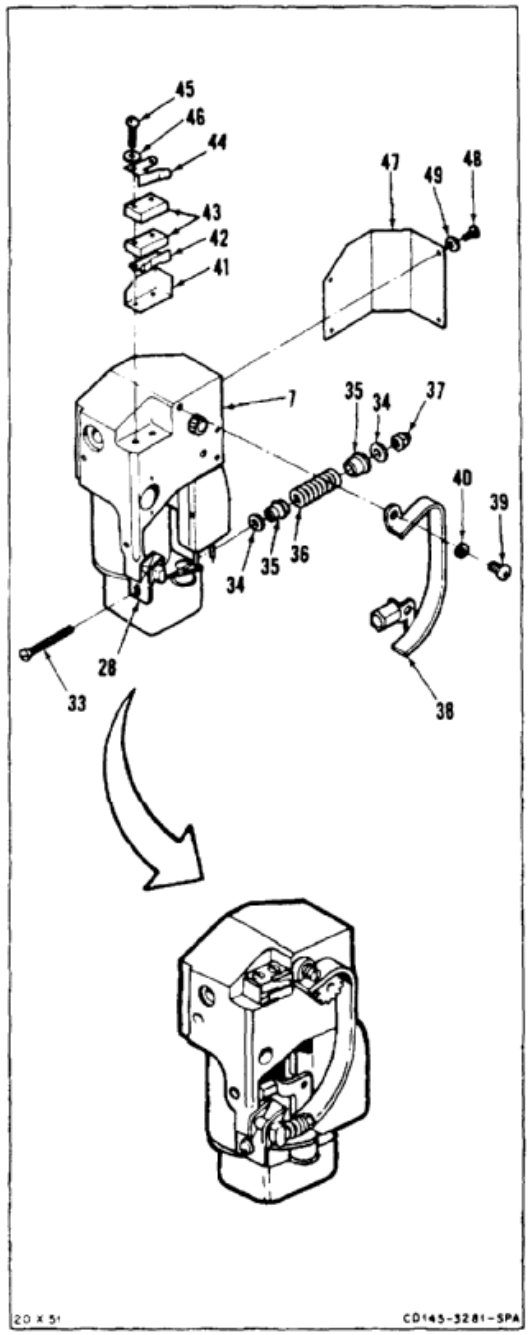


16. Install screw (33) through hole in bumper (28). Install two washers (34), eyelets (35), and spring (36) on screw. Install nut (37).

17. Position gear cover (38) on gearbox (7). Install two screws (39) and washers (40).

18. Position switch insulator (41), extend switch actuator (42), two limit switches (43) and retract switch actuator (44) on housing (7). Install two screws (45) and washer (46).

19. Position gearbox cover (47). Install four screws (48) and washers (49).



**WARNING**

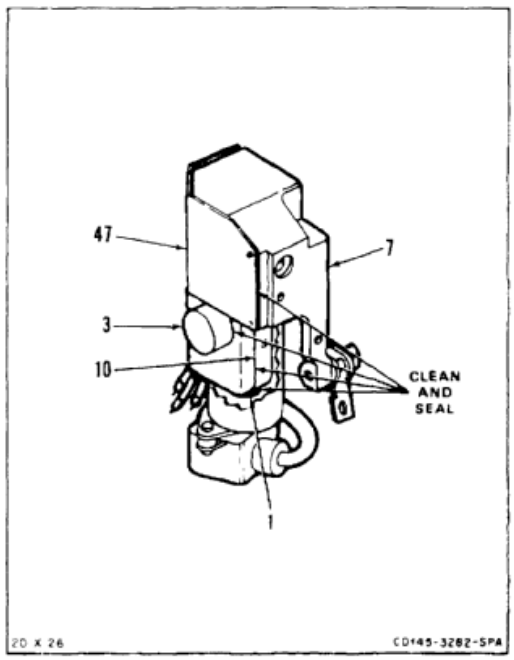
Acetone (E20) can form toxic vapors if exposed to flame. Use in well-ventilated area, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

20. Clean mating edges of gearbox (7), gearbox cover (47), relay housing cover (10), relay (3), and two grommets (1). Use acetone (E20) and cloths (E120). Use gloves (E186).

**WARNING**

Sealant (E336) can irritate skin and cause burns. Avoid contact with skin, eyes, and clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

21. Seal edge of gearbox (7) and gearbox cover (47), relay housing cover (10), and edges of relay (3) which extend through relay housing cover. Use sealant (E336). Use gloves (E186).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-77 ASSEMBLE LANDING LIGHT (AVIM) 9-77

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

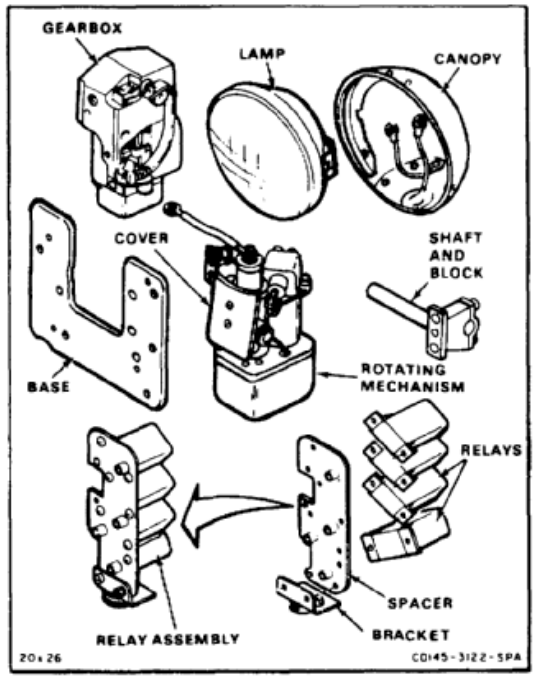
Sealant (E336)
Enamel (Glyptal) (E164)
Sealant (E341)
Solder (E360)
Methyl Alcohol (E243)
Gloves (E186)

***Personnel Required:***

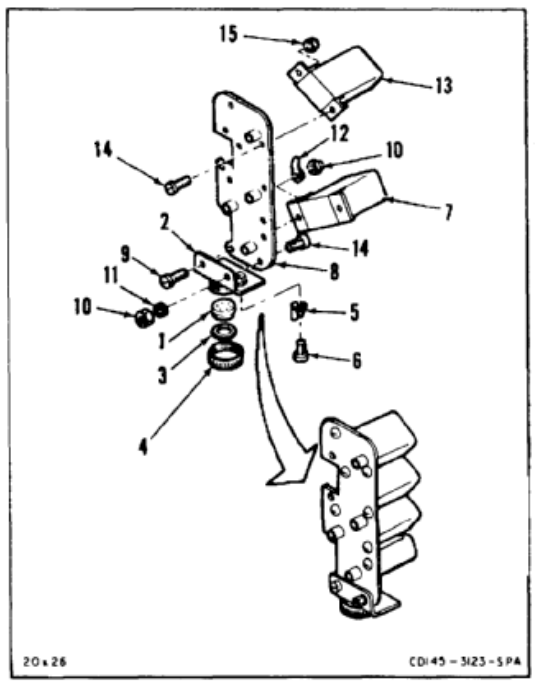
Aircraft Electrician (2)
Inspector

***References:***

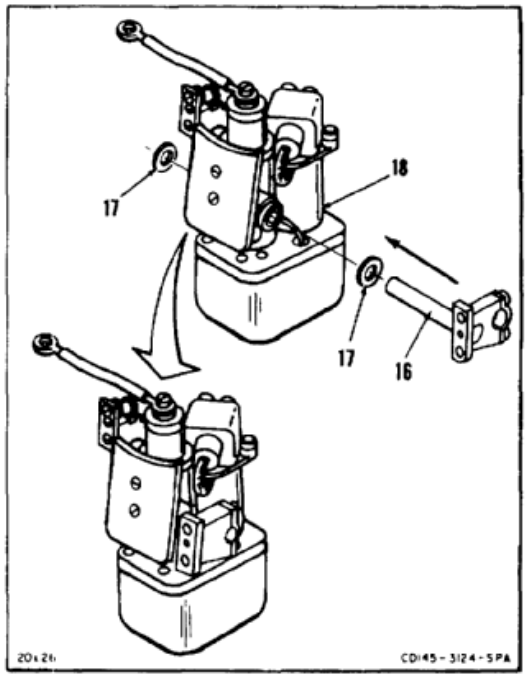
TM 55-1520-240-23P
TM 55-1500-323-25




1. Position rubber bushing (1) in conduit bracket (2). Install washer (3) and nut (4) on bracket.
2. Install terminal lug (5) and screw (6) in bracket (2).
3. Position conduit bracket (2) and relay (7) on spacer (6).
4. Install two screws (9), nuts (10), washer (11), and terminal (12).
5. Position three relays (13) on spacer (8). Install six screws (14) and nuts (15).

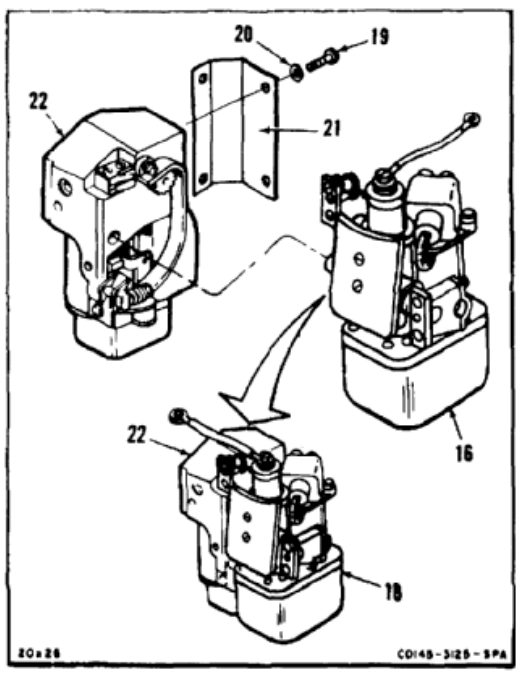


6. Install shaft and block assembly (16) and two extend pivot spacers (17) on rotating mechanism (18).




7. Remove four screws (19), washers (20), and cover (21) from gearbox (22).

8. Position gearbox (22) on end of shaft and block (16), as shown.



9. Position gearbox (22), rotating mechanism (18), shaft and block (16), two spacers (23), and relay assembly (24) on base (25).

10. Install four screws (26) through relay assembly (24) and base (25). Seal screws with glyptal (E164).

11. Install two screws (27) through shaft and block assembly (16), two spacers (23), relay assembly (24), and base (25).

12. Install two washers (28) and nuts (29) on screws (27). Seal screws with glyptal (E164).

13. Install two screws (30), washer (31) and nut (32) or gearbox (22), and base (25). Seal screws with glyptal (E164).

14. Route wires (33) from rotating mechanism (18) through block (34).

15. Route wires (35) from gearbox (22) on base (25) to relay (24). Position wires along relay with wires (36) from conduit bracket (2).

16. Position clamp (37) on block (34). Install two screws (38) and washers (39).

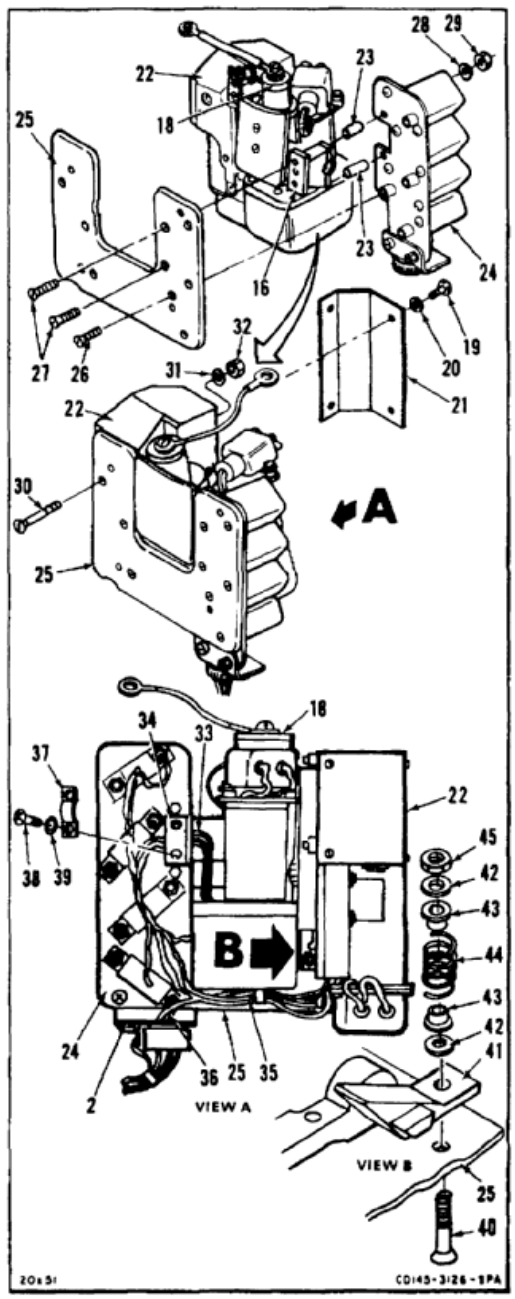
16.1 Connect wires that were disconnected during disassembly.

17. Solder wires to relays, using solder (E360). Remove tags. Clean solder joints with methyl alcohol (E243). Seal soldered connections with sealant (E341). Use gloves (E186).

18. Install cover (21), four screws (19) and washers (20). Seal around edge of cover. Use sealant (E336).

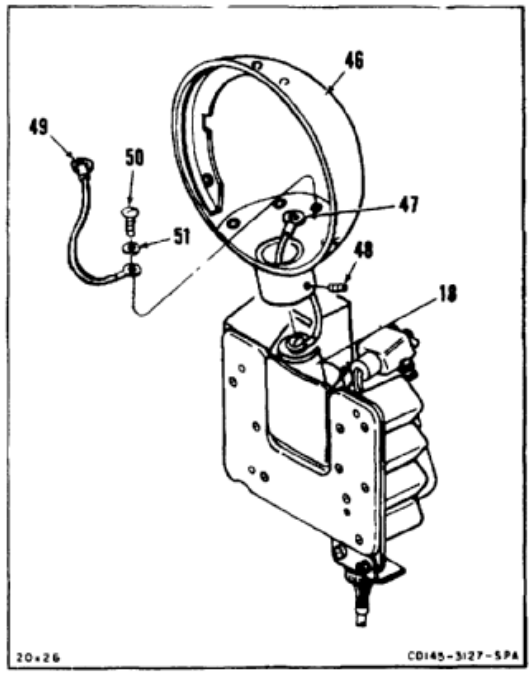
19. Install screw (40) through base (25) and bumper (41).

20. Install two washers (42), two eyelets (43), spring (44), and nut (45) on screw (40).



21. Position canopy (46) on rotate mechanism (18) with wire (47) inside canopy. Install setscrew (48).

22. Connect wire (49) to canopy (46) using screw (50) and washer (51). Remove tag.




23. Support lamp (52) at canopy (46).

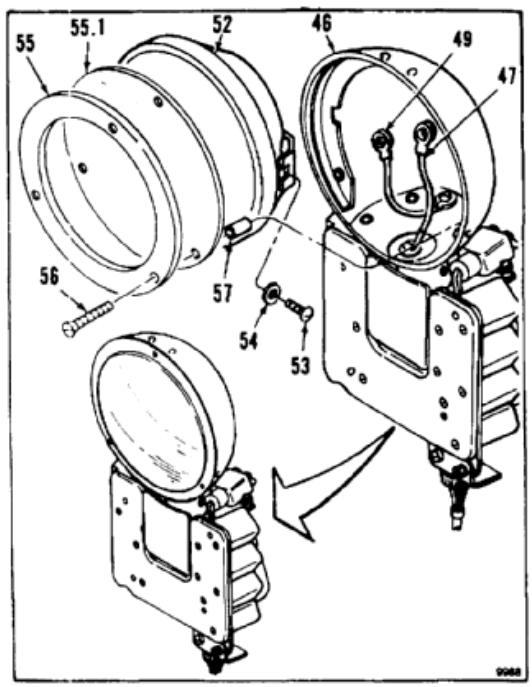
24. Connect two wires (47 and 49) to lamp (52). Install two screws (53) and washers (54).

25. Position NVG or normal lamp (52) in canopy (46).

**NOTE**

On helicopters with 17, left landing light has NVG lamp and lens.

26. Install retaining ring (55) or NVG lens (55.1) and three screws (56) and sleeves (57) in canopy (46). Tighten screws.




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-78 TEST AND ADJUST LANDING LIGHT 9-78

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Power Switch, Two-Position
Control Switch, Five-Position
Terminal Board, Eight Terminal
DC Power Supply, 25 Ampere

***Materials:***

None

***Personnel Required:***

Aircraft Electrician (2)
Inspector

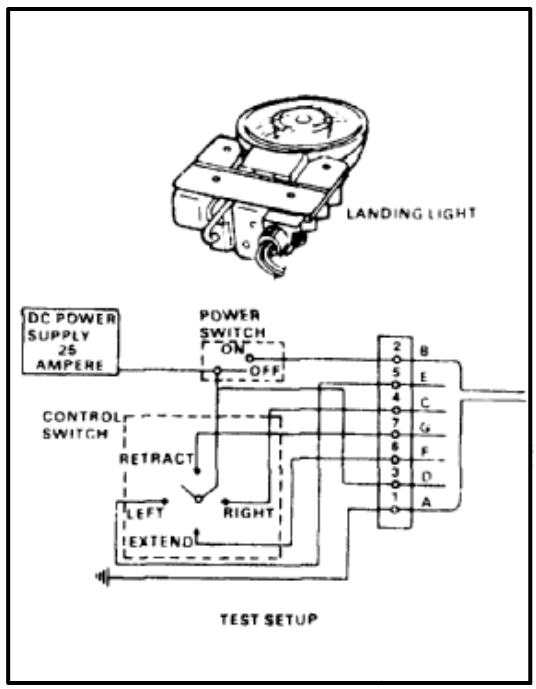
***Equipment Condition:***

Off Helicopter Task
Test Setup

***General Safety Instructions:***

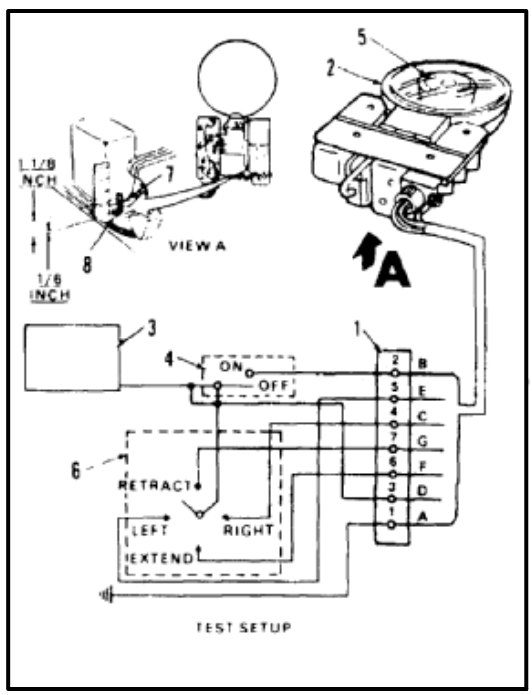
**WARNING**

Do not look into lighted NVG landing light. Infra-red light output can seriously injure eyes.

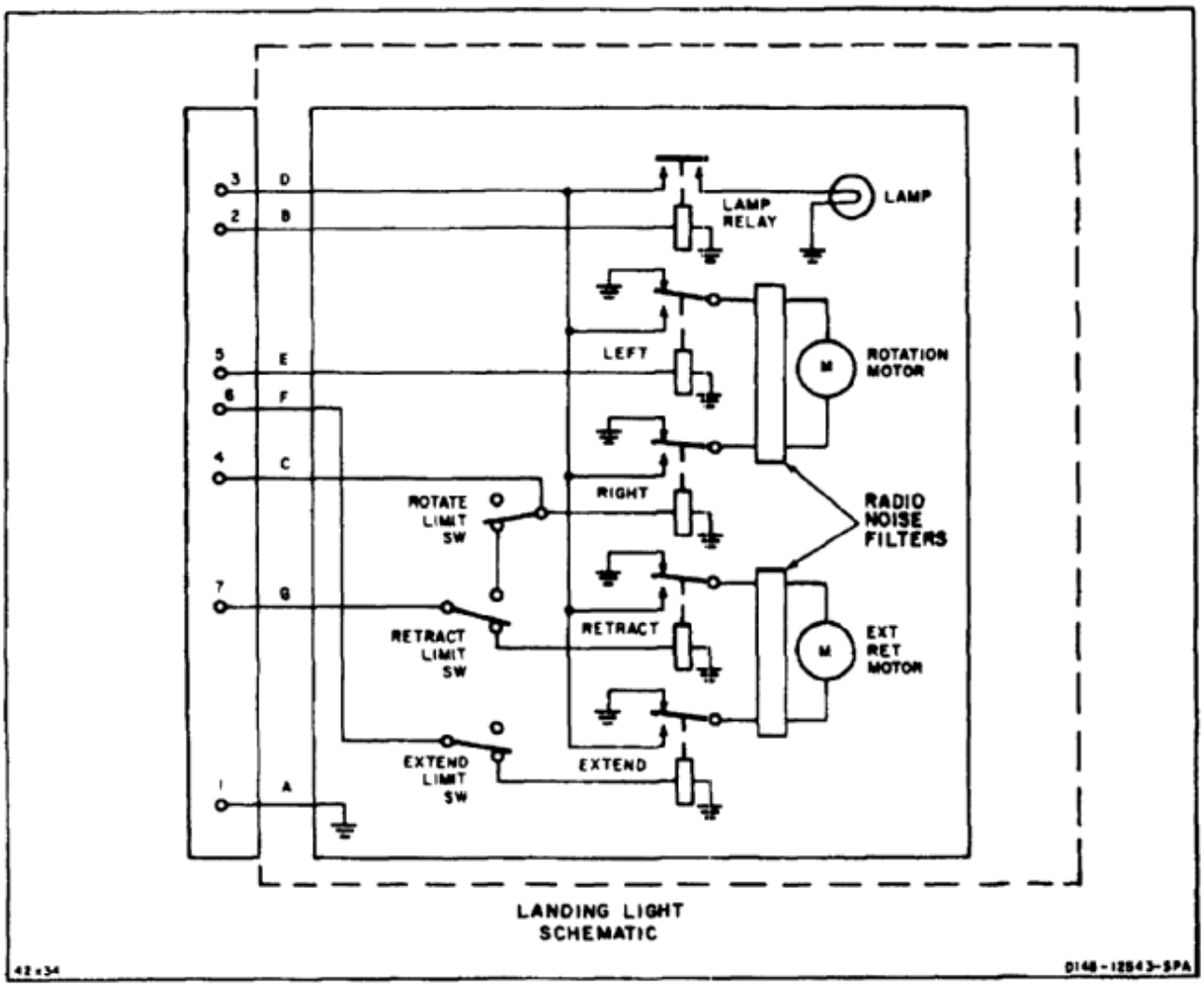


TEST SETUP

1. Connect test setup (1) to landing light (2).
2. Turn on power supply (3). Adjust power supply output to **28 vdc**.
3. Set power switch (4) to on. Check lamp (5). Lamp shall come on. Check visually without 17. Check for heat output with 17.
4. Set power switch (4) to off. Check lamp (5). Lamp shall go off. Check visually without 17. Check for heat output with 17.
5. Set control switch (6) to EXTEND. Check light (2). Light shall fully extend and stop.
6. Measure length of spring (7). Record length.
7. Set control switch (6) to RETRACT. Check light (2). Light shall fully retract and stop.

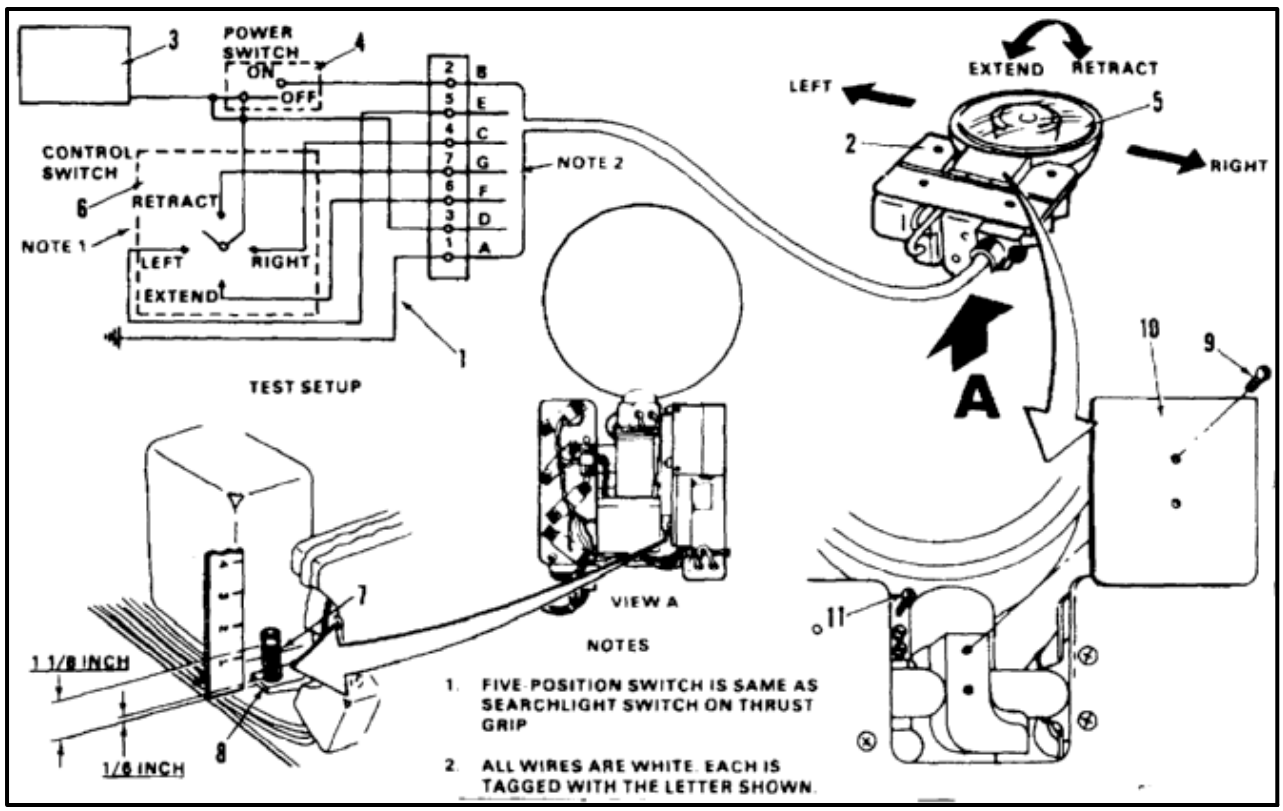


TEST SETUP

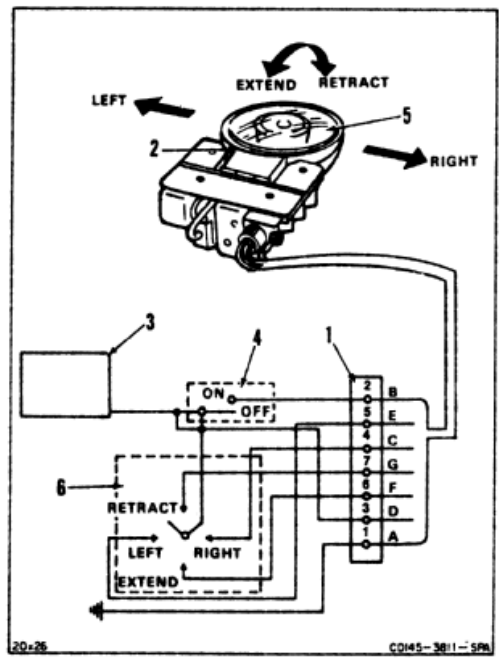



LANDING LIGHT SCHEMATIC

8. Check bumper spring (7). Bumper (8) shall have compressed bumper spring (7) **1/16 inches** maximum. If spring is not compressed, adjust light as follows.
   a. Remove two screws (9) and coverplate (10).
   b. Turn adjustment screw (11) counterclockwise to increase spring (7) compression. Turn adjustment screw clockwise to decrease spring compression.
   c. Set switch (6) to extend and retract three times.
   d. Check bumper (8). Bumper shall have compressed spring (7) **1/16 inches** maximum. Readjust if necessary.
   e. Position coverplate (10) and install two screws (9).



9. Set switch (6) to RIGHT. Check light (2). Light shall rotate to right. Complete revolution to right shall take no longer than **40 seconds**.
10. Set switch (6) to LEFT. Check light (2). Light shall rotate to left. Complete revolution to left shall take no longer than **40 seconds**.
11. Set switch (6) to EXTEND. Check light (2). Light shall fully extend within **20 seconds**.
12. Set switch (6) to RETRACT. Check light (2). Light shall fully retract within **20 seconds**.
13. Set switch (6) to EXTEND and fully extend light (2).
14. Set switch (6) to RIGHT or LEFT and partially rotate light (2).
15. Set switch (6) to RETRACT. Check light (2). Light shall fully retract and rotate to stowed position.




***INSPECT***

16. Disconnect power supply (3).
17. Disconnect test setup (1).

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-79 INSTALL LANDING LIGHT 9-79

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

***Materials:***

Acetone (E20)
Cloths (E120)
Sealant (E336)
Gloves (E186)
Tape (E385)

***Parts:***

Gasket
Grommet

***Personnel Required:***

Medium Helicopter Repairer (2)
Inspector

***References:***

TM 55-1520-240-23P

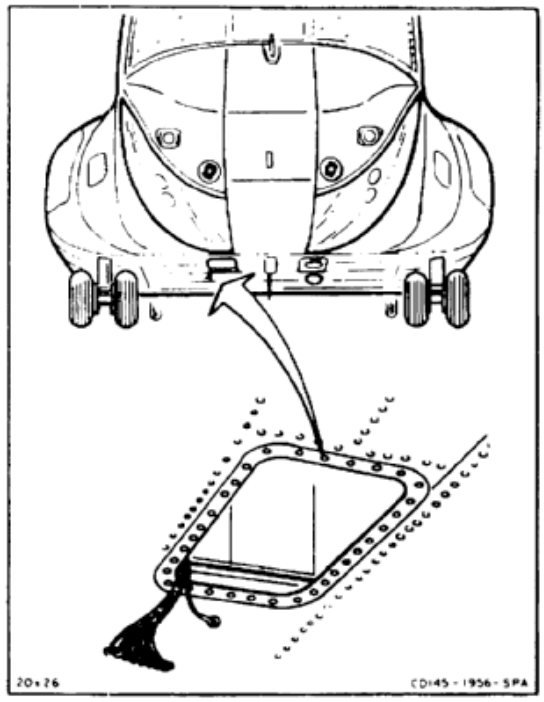
***General Safety Instructions:***

**WARNING**

Sealant (E336) can irritate skin and cause burns. Avoid contact with skin, eyes, and clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

**WARNING**

Acetone (E20) can form toxic vapors if exposed to flame. Use in well-ventilated area, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

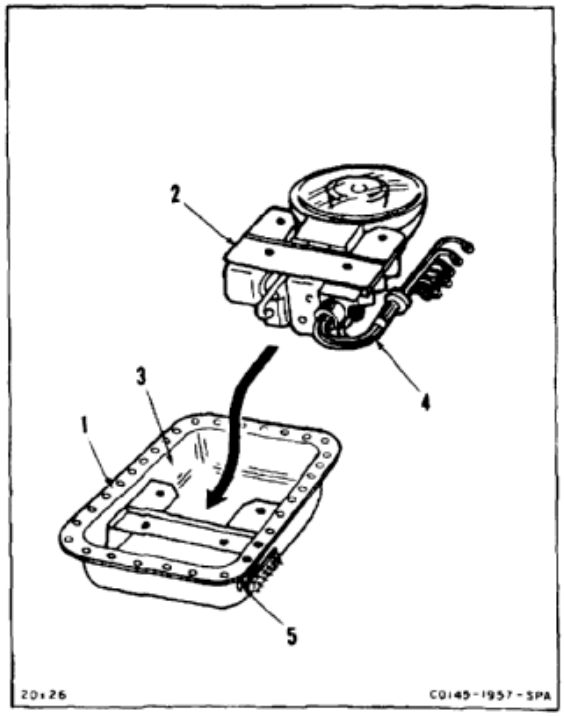


1. Clean old sealant from flange (1). Use acetone (E20) and cloths (E120). Use gloves (E186).

**NOTE**

With 17, left landing light has NVG lamp and lens.

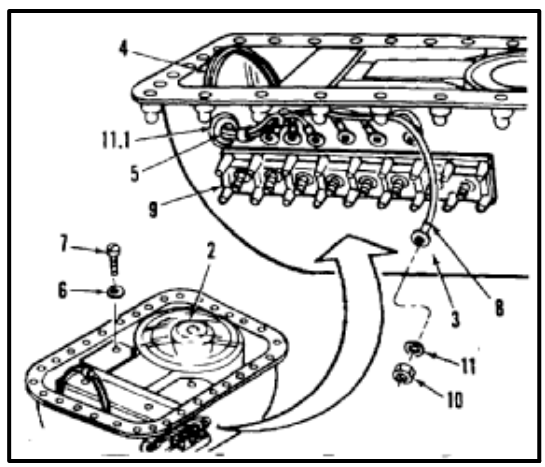
2. Position light (2) in housing (3). Make sure wiring harness (4) is aligned with hole (5).



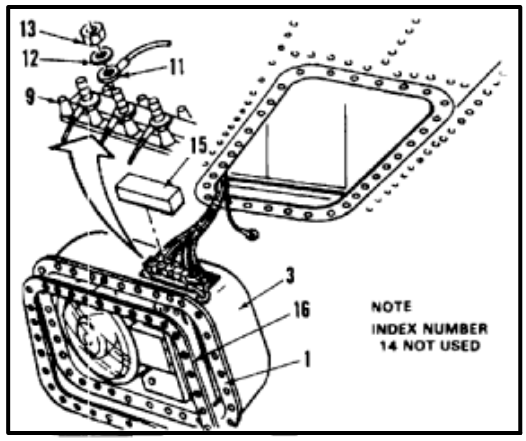

3. Guide wiring harness (4) through hole (5) in side of housing (3).

***INSPECT***

4. Install four washers (6) and screws (7) in light (2).
5. Remove tape from seven wires (8). Connect wires to terminal board (9). Install seven nuts (10) and washers (11). Remove tags from wires.
6. Install grommet (11.1). Apply sealant (E336) around edge of grommet and wiring harness (4). Use gloves (E186).



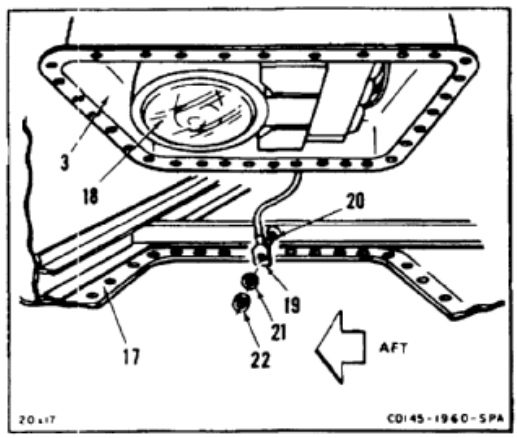
7. Have helper support housing (3) and connect ten electrical wires (11) to terminal board (9). Install washers (12) and nuts (13). Remove tags from wires.



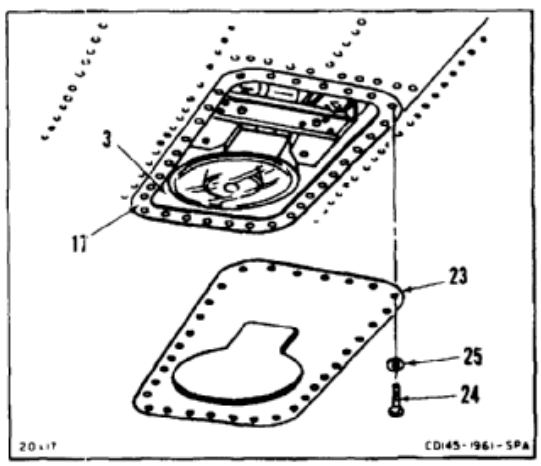

***INSPECT***

8. Install terminal board cover (15).
9. Apply sealant (E336) to both sides of gasket (16). Install gasket on flange (1). Use gloves (E186).

10. Tilt housing (3) to one side and guide it up and inside structure (17). Make sure lamp (18) is aft.
11. Connect electrical lead (19) to stud (20). Install washer (21) and nut (22).




12. Position housing (3) and align holes with mounting holes on structure (17).
13. Position housing (23) and install 32 washers (25) and screws (24).




***FOLLOW-ON MAINTENANCE:***

Check operation of landing light (TM 55-1520-240-T).

END OF TASK

## 9-80 REMOVE LANDING LIGHT LAMP 9-80

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

***Materials:***

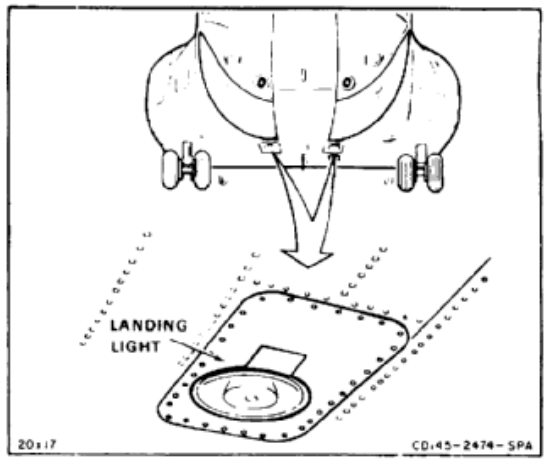
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

Medium Helicopter Repairer

***Equipment Condition:***

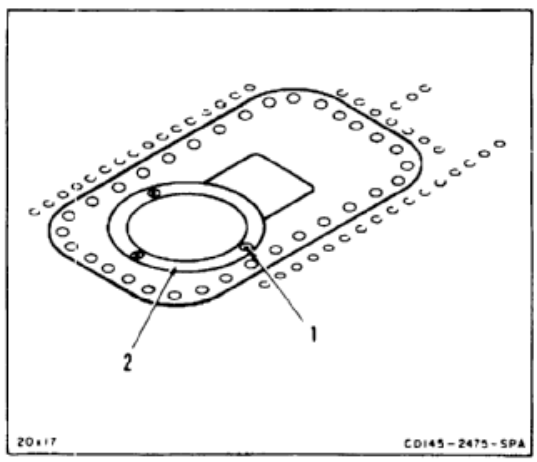
Battery Disconnected (Task 1-39)
Electrical Power Off



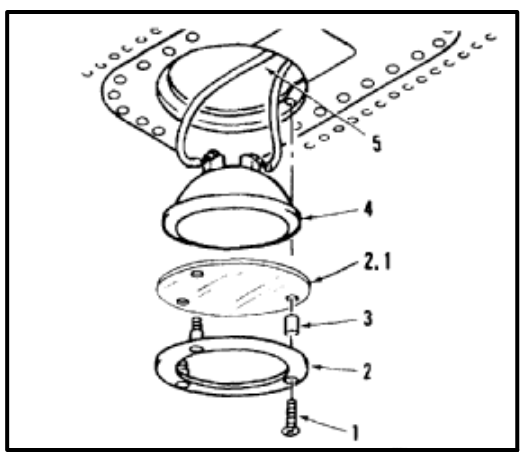

**NOTE**

Procedures are similar to remove left or right landing light lamp. Without 17, both lights are same. With 17, left light has NVG lens and lamp.

1. Loosen three screws (1) on retaining ring (2).

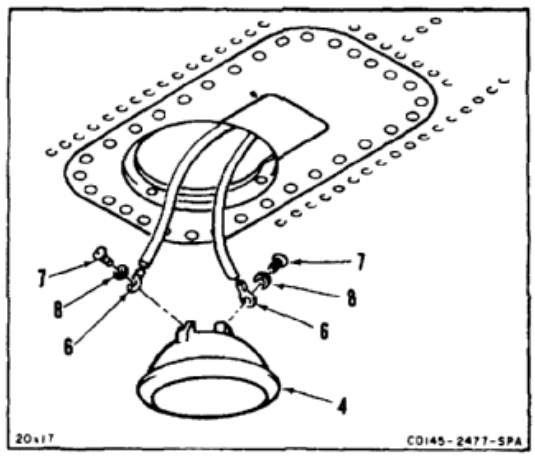



2. Remove retaining ring (2) or NVG lens (2.1), three screws (1), and sleeving (3) from lamp (4).
3. Lower lamp (4) from light (5).

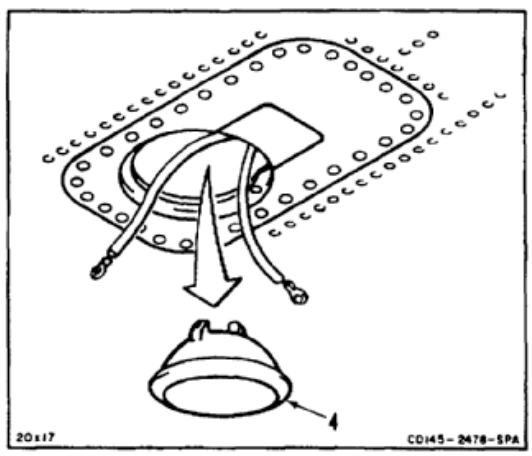


4. Tag two wires (6).

5. Remove two screws (7) and washers (8). Disconnect two wires (6) from lamp (4).




6. Tape exposed ends of wire. Use tape (E385). Remove lamp (4).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-81 INSTALL LANDING LIGHT LAMP 9-81

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

***Materials:***

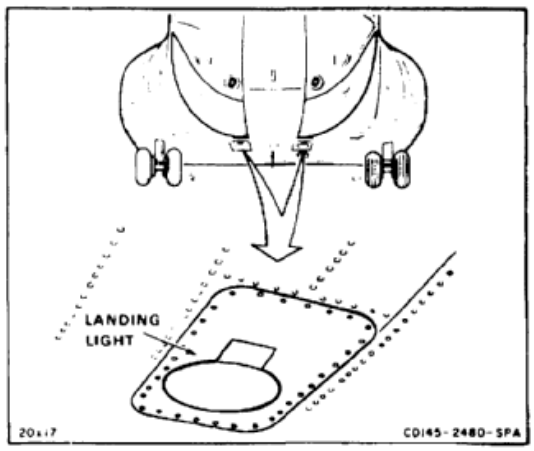
None

***Personnel Required:***

Medium Helicopter Repairer
Inspector

***References:***

TM 55-1520-240-23P

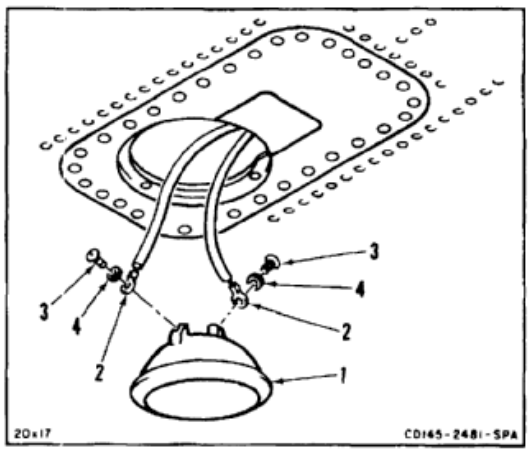



**NOTE**

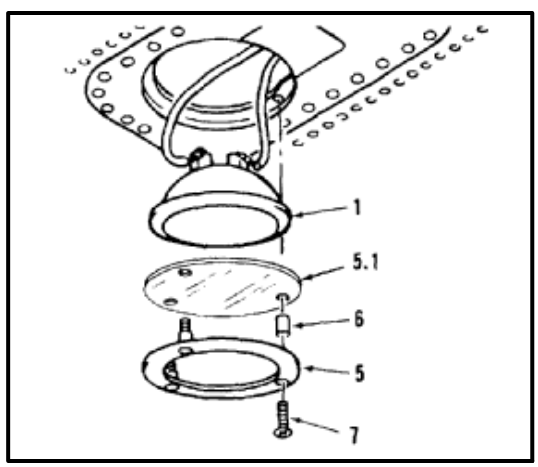
Procedures are similar to install left or right landing light lamp. Without **17**, both lights are same. With **17**, left light has NVG lens and lamp.

1. Remove tape, support lamp (1), and connect two wires (2). Install two screws (3), and washers (4). Remove tags.

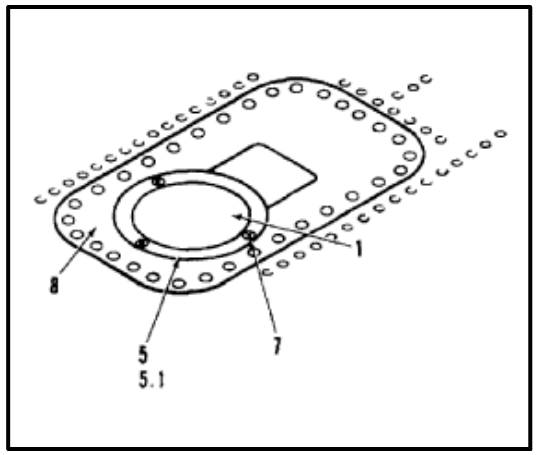
***INSPECT***




2. Position retaining ring (5) or NVG lens (5.1) with three sleeves (6) and screws (7) aligned on lamp (1).



3. Install lamp (1), retaining ring (5) or NVG lens (5.1), and three screws (7) in light (8).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check of landing light (TM 55-1 520-240-T).

END OF TASK

## 9-82 REMOVE FORWARD FORMATION LIGHTS 9-82

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

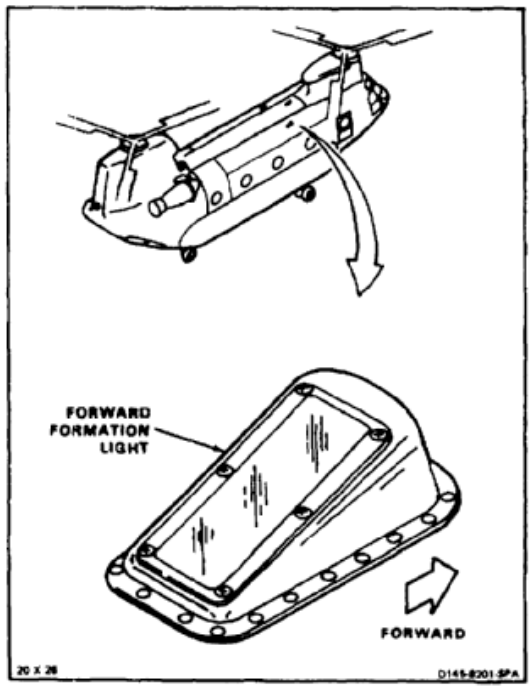
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

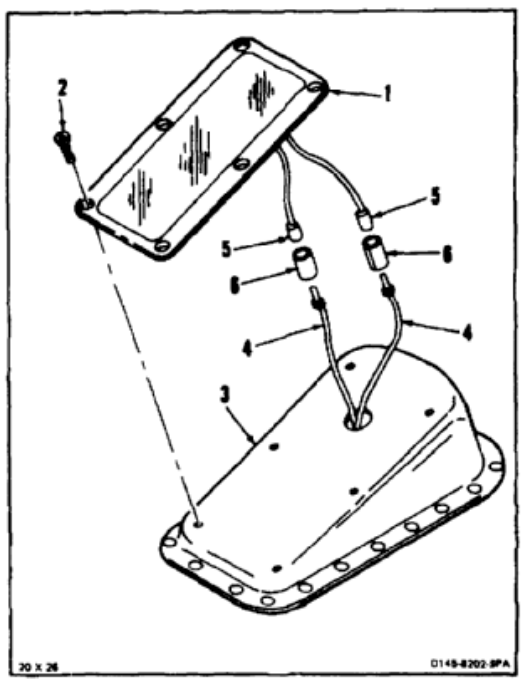
Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off




1. Cut sealant from edge of light (1), and six screws (2).
2. Remove screws (2) from light (1).
3. Pry light (1) from housing (3).
4. Pull two wires (4) from housing (3) until two connectors (5) are out of housing. Tag two wires. Use tags (E264).
5. Cut two sleeves (6) from connectors (5). Disconnect connectors. Remove light (1).
6. Tape ends of wires (4). Use tape (E385).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-83 REMOVE AFT FORMATION LIGHTS 9-83

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Work Stand

***Materials:***

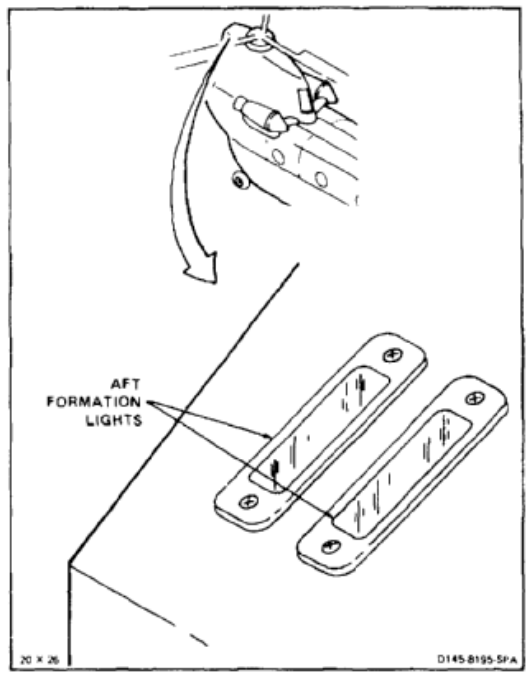
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

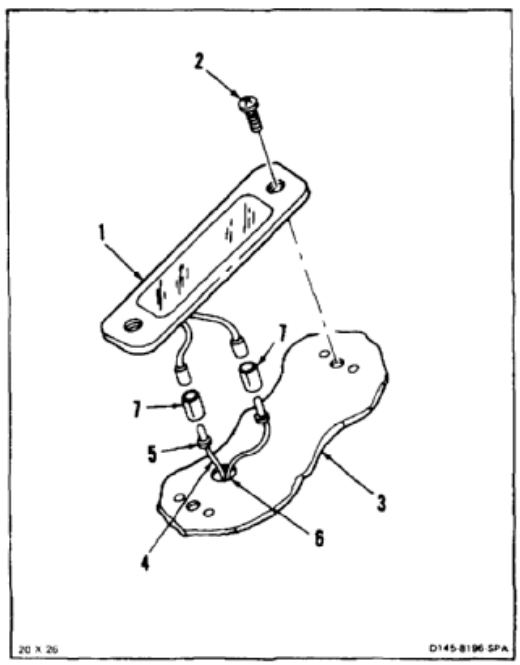
Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off




1. Cut sealant from edge of light (1) and two screws (2).
2. Remove screws (2) from light (1).
3. Pry light (1) from structure (3).
4. Pull two wires (4) from structure (3) until two connectors (5) are out of hole (6), in structure. Tag two wires. Use tags (E264).
5. Cut two sleeves (7) from connectors (5). Disconnect connectors. Remove light (1).
6. Tape ends of wires (4). Use tape (E385).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-84 INSTALL FORWARD FORMATION LIGHTS 9-84

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

Twine (E433)
Insulation Sleeving (E204)
Cloths (E120)
Acetone (E20)
Sealant (E336)
Gloves (E186)

***Parts:***

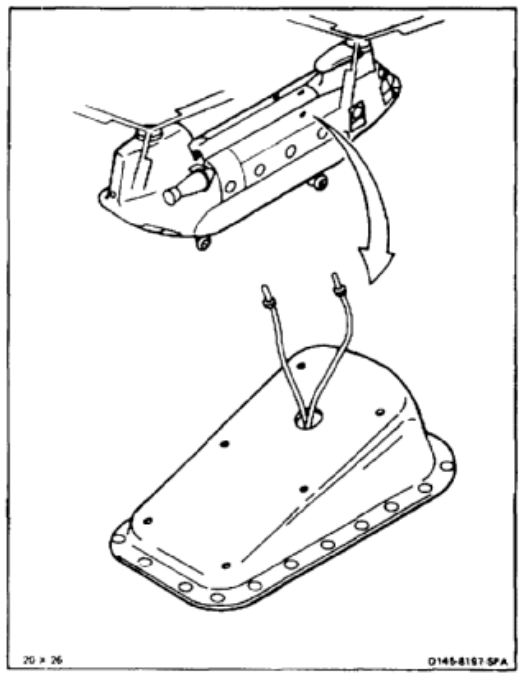
Electrical Connectors

***Personnel Required:***

Aircraft Electrician
Inspector

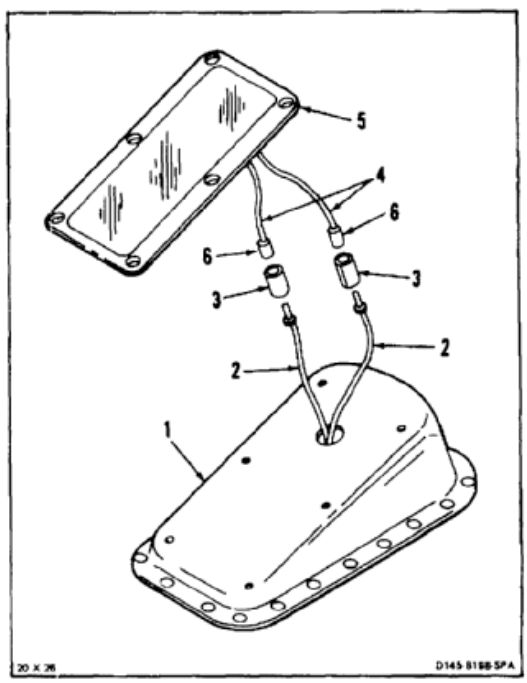
***References:***

TM 55-1520-240-23P



**WARNING**

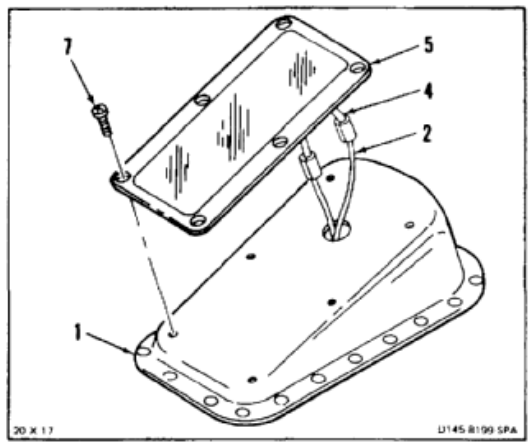
Acetone (E20) can form toxic vapors if exposed to flame. Use in well-ventilated area, away from open flame. In case of contact, immediately flush skin or eyes with water for at last **15 minutes**. Get medical attention for eyes.




1. Clean sealant from top of housing (1). Use acetone (E20) and cloths (E120). Wear gloves (E186).
2. Remove tape from ends of two wires (2).
3. Cut two sleeves (3) about **1.5 inches** long. Slide on two wires (4) of light (5). Use sleeving (E204).
4. Connect wires (4) to wires (2) with connectors (6). Remove tags.
5. Slide sleeves (3) over connectors (6). Tie ends of sleeves. Use twine (E433).

***INSPECT***

6. Slide wires (2 and 4) in housing (1). Position light (5) on housing. Install six screws (7).




**WARNING**

Sealant (E336) can irritate skin and cause burns. Avoid contact with skin, eyes, and clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

7. Apply sealant (E336) to six screws (7) and edge of light (5) on housing (1). Wear gloves (E186).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).

END OF TASK

## 9-85 INSTALL AFT FORMATION LIGHTS 9-85

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Work Stand

***Materials:***

Twine (E43)
Insulation Sleeving (E204)
Cloths (E120)
Acetone (E20)
Sealant (E336)
Gloves (E186)

***Parts:***

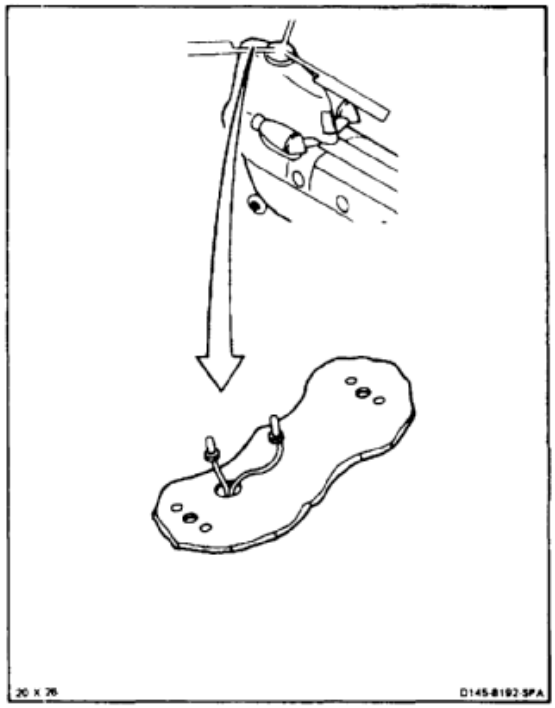
Electrical Connectors

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

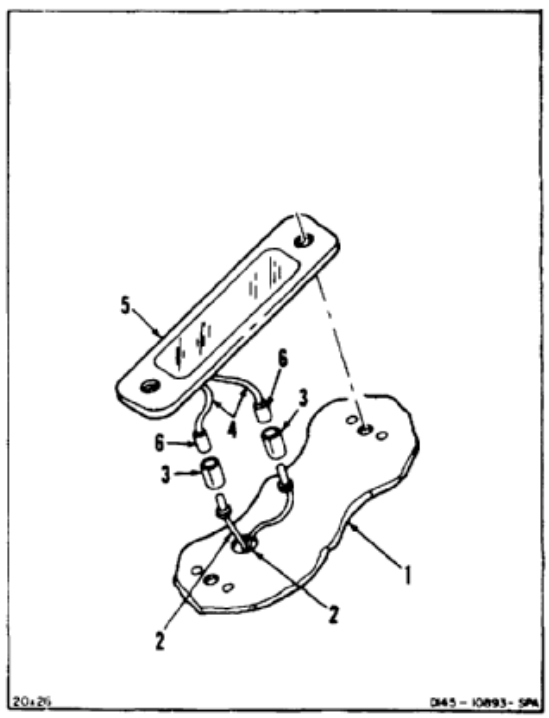
TM 55-1520-240-23P



**WARNING**

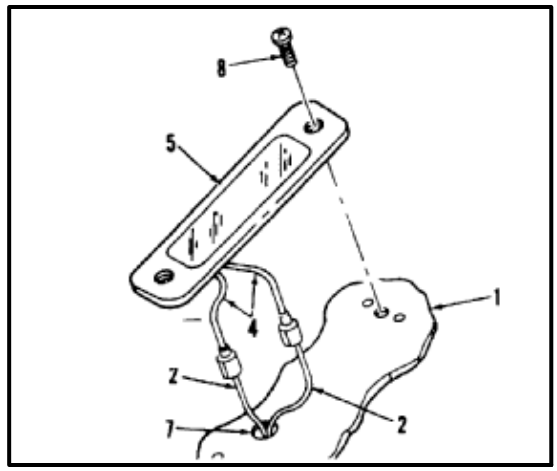
Acetone (E20) can form toxic vapors if exposed to flame. Use in well-ventilated area, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

1. Clean sealant from structure (1). Use acetone (E20) and cloths (E120). Wear gloves (E186).
2. Remove tape from ends of two wire (2).
3. Cut two sleeves (3) about **1.5 inches** long. Slide two wires (4) of light (5) through sleeves. Use sleeving (E204).
4. Connect wires (4) to wires (2) with connectors (6). Remove tags.
5. Slide sleeves (3) over connectors (6). Tie ends of sleeves. Use twine (E433).




***INSPECT***

6. Slide wires (2 and 4) in hole (7) of structure (1). Position light (5) on structure. Install two screws (8).




**WARNING**

Sealant (E336) can irritate skin and cause burns. Avoid contact with skin, eyes, and clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

7. Apply sealant (E336) to two screws (8) and edge of light (5) on structure (1). Wear gloves (E186).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).

END OF TASK

## 9-85.1 REMOVE NVG FORMATION LIGHT 9-85.1

INITIAL SETUP

***Applicable Configurations:***

With 17

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

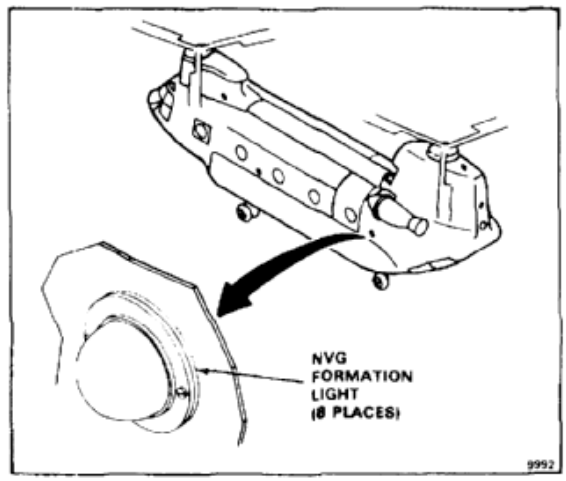
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

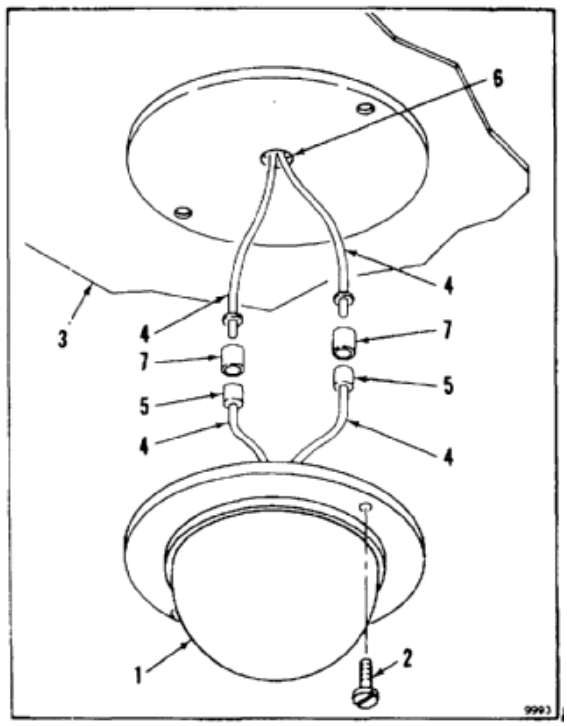
Battery Disconnected (Task 1-39)
Electrical Power Off




**NOTE**

Procedure is same to remove any light.

1. Cut sealant from edge of light (1) and screws (2).
2. Loosen two screws (2) and lift light (1) from fuselage (3).
3. Pull two wires (4) from structure (3) until two connectors (5) are out of hole (6) in structure. Tag two wires. Use tags (E264).
4. Cut two sleeves (7) from connectors (5). Disconnect connectors. Remove light (1).
5. Tape ends of wires (4). Use tape (E385).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-85.2 INSTALL NVG FORMATION LIGHT 9-85.2

INITIAL SETUP

***Applicable Configurations:***

With 17

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

Insulating Sleeving (E204)
Cloths (E120)
Twine (E433)
Acetone (E20)
Sealant (E336)
Gloves (E186)

***Parts:***

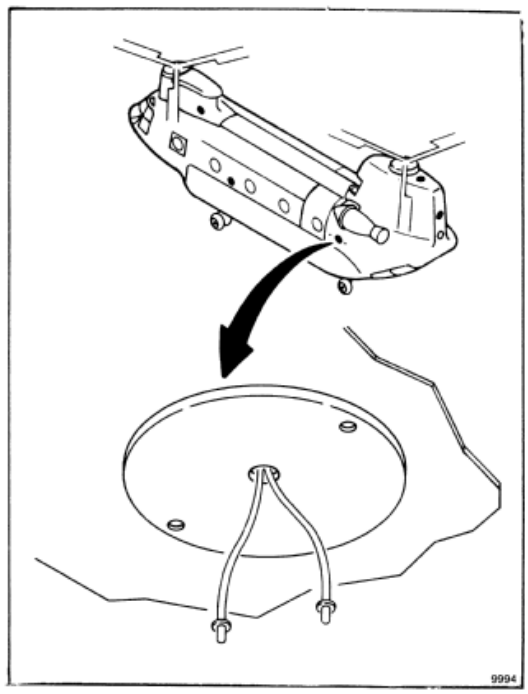
Wire Splices

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

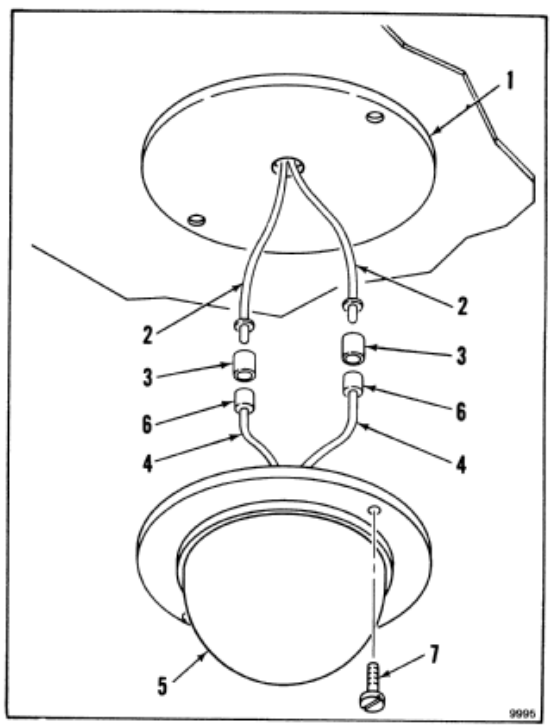
TM 55-1520-240-23P




**WARNING**

Acetone (E20) is extremely flammable. It can be toxic. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. Keep away from heat, sparks, or open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

1. Clean sealant from skin around doubler (1). Use acetone (E20) and cloths (E120). Wear gloves (E186).
2. Remove tape from ends of two wires (2). Cut two sleeves (3) about **1.5 inches** long. Slide onto two wires (4) of light (5). Use sleeving (E204).
3. Connect wires (4) to wires (2) with connectors (6). Remove tags.
4. Slide sleeves (3) over connectors (6). Tie ends of sleeves. Use twine (E433).

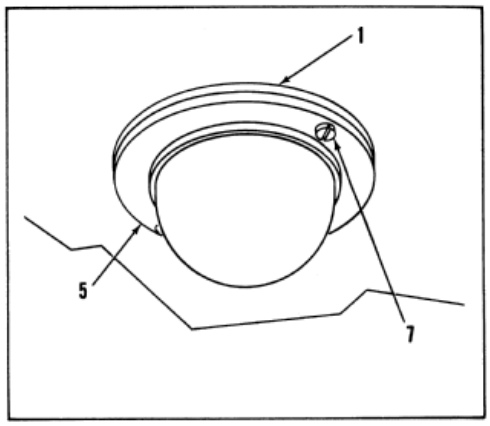


5. Position light (5) on doubler (1).
6. Tighten two screws (7).

**WARNING**

Sealant (E336) can irritate skin and cause burns. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

7. Apply sealant (E336) to two screws (7) and edge of light (5) at skin.




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).

END OF TASK

## 9-86 INSPECT ANTICOLLISION LIGHT 9-86

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Workstand

***Materials:***

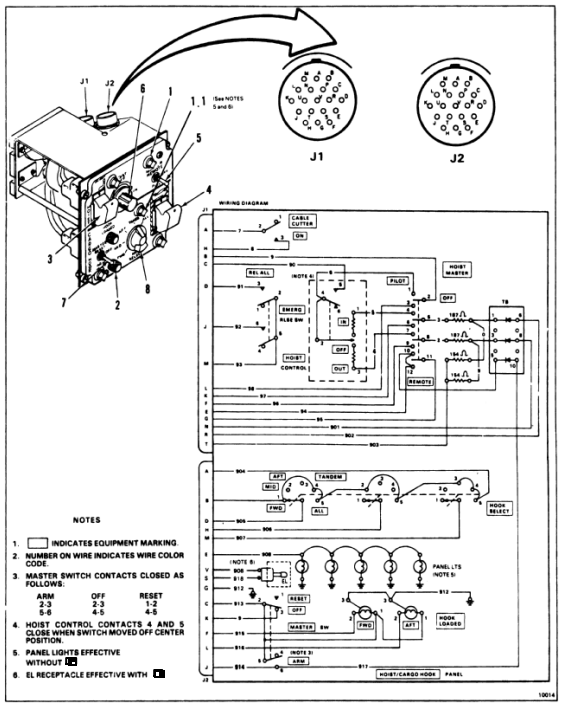
Cloths (E120)

***Personnel Required:***

Aircraft Electrician
Inspector

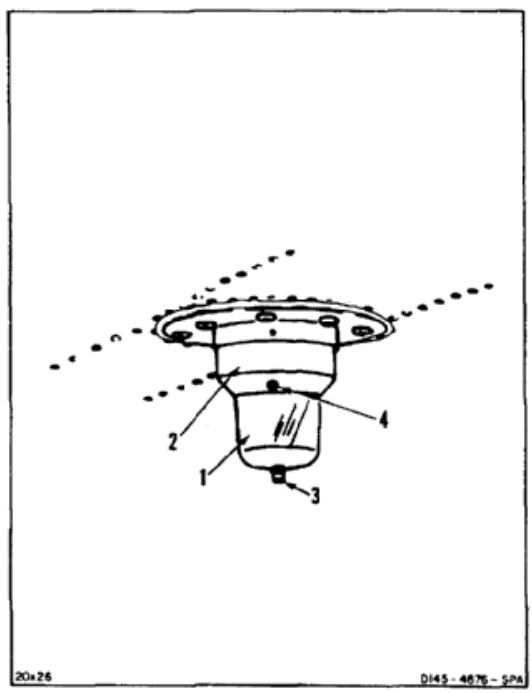
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off




**NOTE**

Procedure is similar for top or bottom light, except where noted. Bottom light is shown here.




1. Check that lens (1) is clean. If lens is dirty, wipe off dirt with cloths (E120).
2. Check lens (1) for cracks. Lens shall not be cracked.
3. Check that light (2) is mounted securely.
4. Check that lens (1) interior is free of moisture and that water drain screw (3) is tight. If bottom light has moisture, open drain screw (3), drain trapped moisture, tighten drain screw.
5. Check holes (4) are sealed on bottom lights only.

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-87 REMOVE ANTICOLLISION LIGHT 9-87

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Workstand

***Materials:***

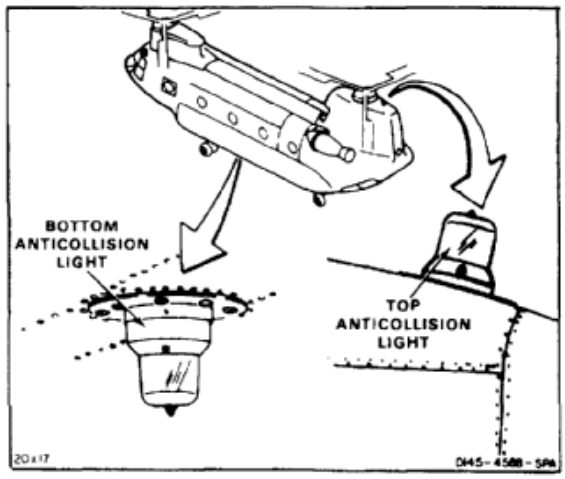
None

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

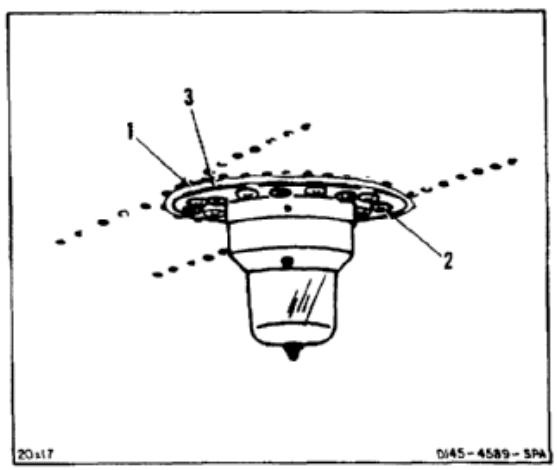
Battery Disconnected (Task 1-39)
Electrical Power Off



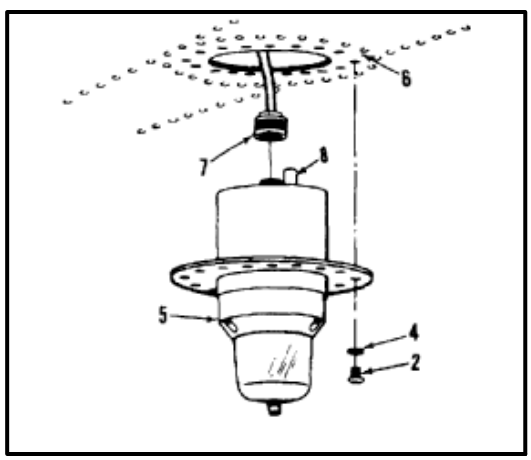

**NOTE**

Procedure is similar for removing top or bottom light. Removal of bottom light is shown here.

1. Cut sealant (1) from screws (2) and edge of flange (3).




2. Remove 18 screws (2) and washers (4).
3. Withdraw light (5) from fuselage (6).
4. Remove lockwire from connector (7). Disconnect connector.
5. Remove light (5).
6. On bottom light only, remove two pieces of shrink tubing (8) from base of light.




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-88 DISASSEMBLE ANTICOLLISION LIGHT (AVIM) 9-88

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

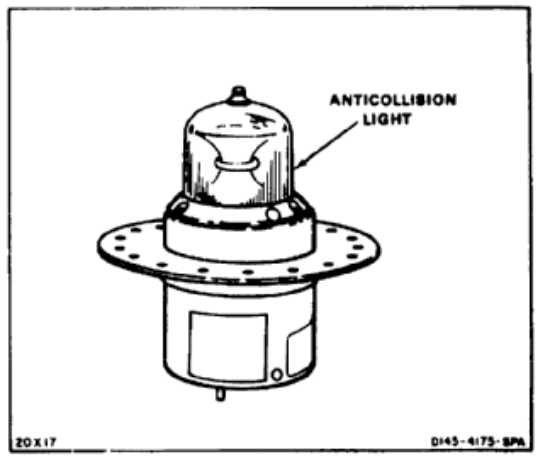
Paper Tags (E264)

***Personnel Required:***

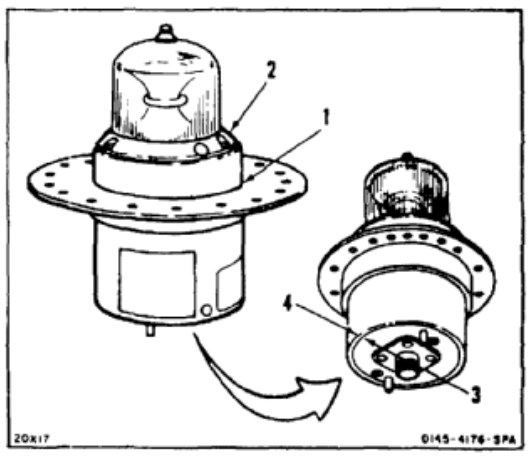
Aircraft Electrician (2)

***Equipment Condition:***

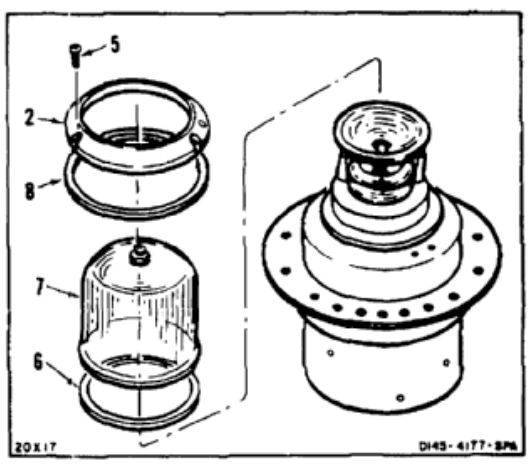
Off Helicopter Task



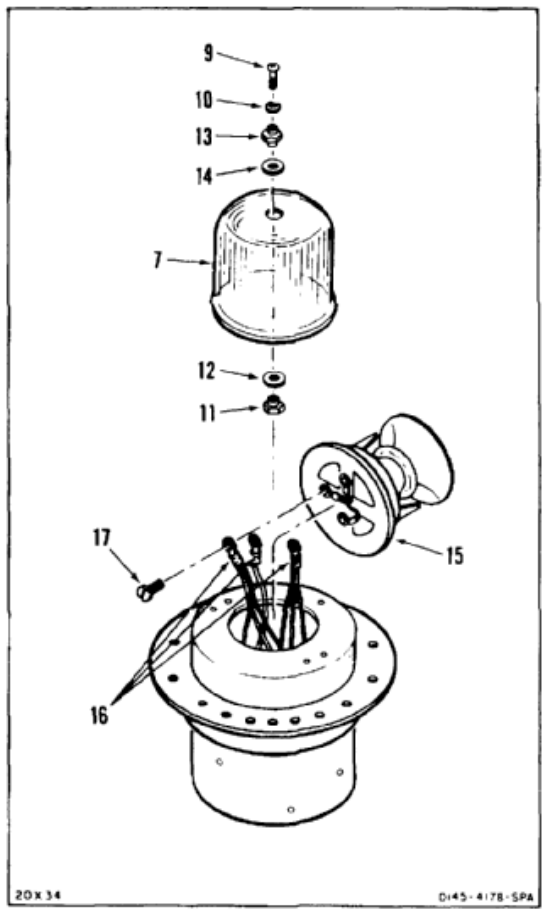

1. Cut through sealant at edges of mounting flange (1), lens retainer (2), and mating edges of base (3) and case (4).



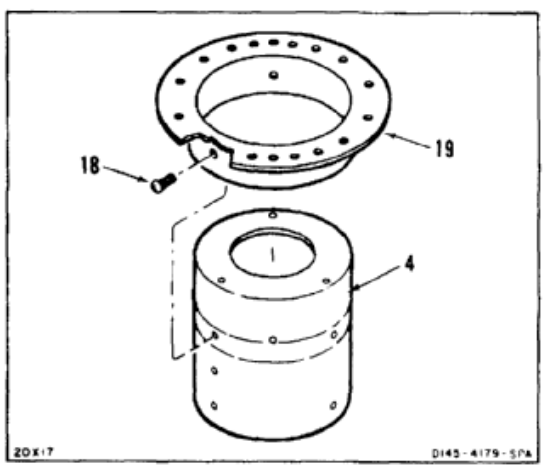

2. Remove three screws (5) from retainer (2). Remove retainer, gasket (6), lens (7) and gasket (8).



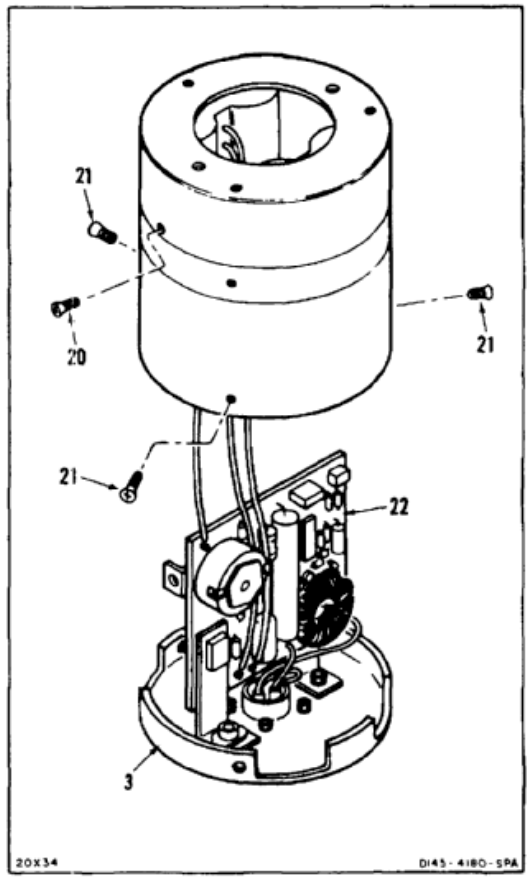
3. Remove screw (9) and washer (10) from lens (7).
4. Remove insert (11), washer (12), drain tube (13) and washer (14).
5. Withdraw lamp (15). Tag and disconnect seven wires (16) by removing three screws (17).
6. Install three screws (17).



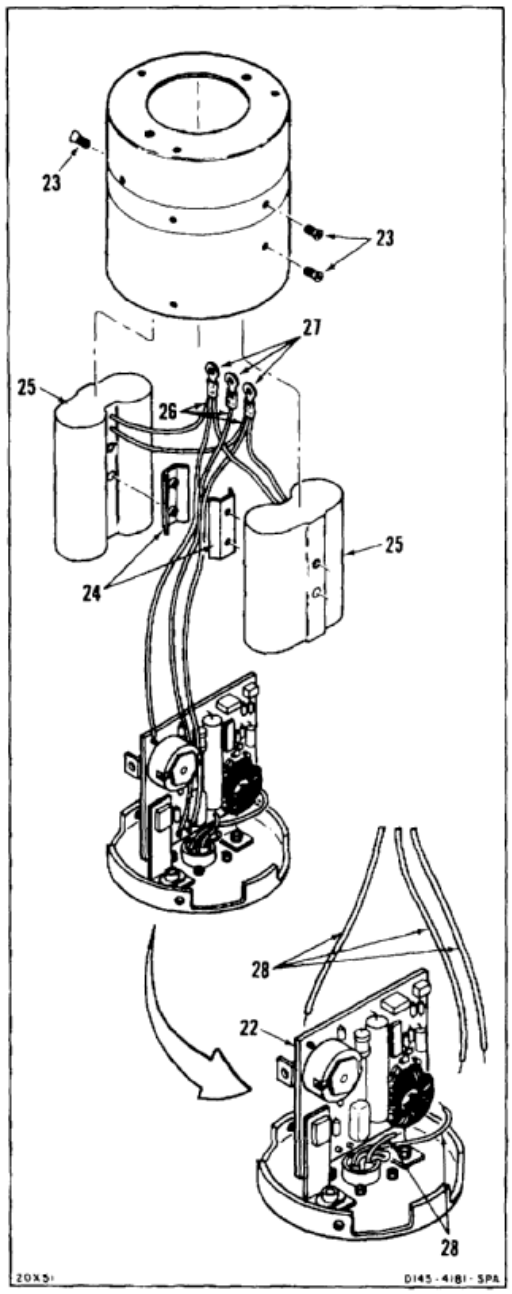

7. Cut away sealant from three screws (18). Remove three screws and flange (19) from case (4).



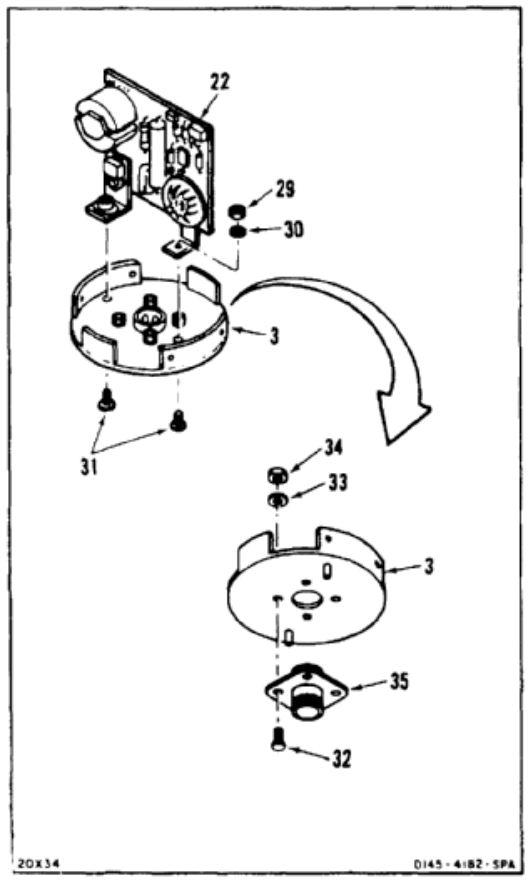
8. Cut away sealant from screw (20). Remove screw.
9. Cut away sealant from three screws (21). Remove three screws and pull out base (3) with circuit board (22) attached.



10. Cut away sealant from three screws (23). Remove three screws.
11. Remove two retainers (24) and electronic components (25).
12. Tag and disconnect six wires (26) from three lug terminals (27).
13. Tag and unsolder five wires (28) from circuit board (22).



14. Remove nut (29), washer (30) and two screws (31).
15. Remove circuit board (22) from base (3).
16. Cut away sealant from four screws (32). Remove four screws, washers (33) and nuts (34).
17. Cut away sealant from connector (35) and remove connector.




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-89 ASSEMBLE ANTICOLLISION LIGHT (AVIM) 9-89

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

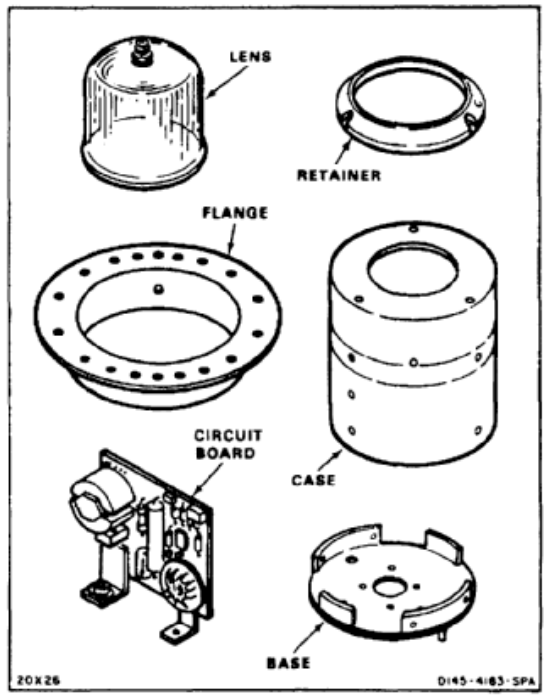
Sealant (E336)
Solder (E360)
Acetone (E20)
Cloths (E120)
Gloves (E186)

***Personnel Required:***

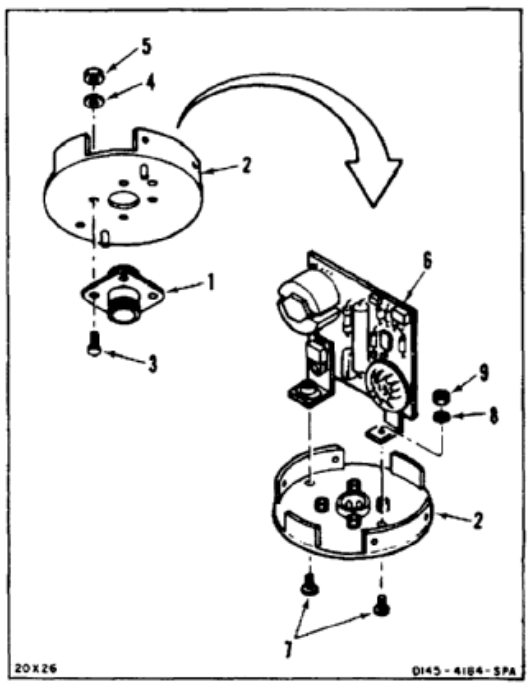
Aircraft Electrician (2)
Inspector

***References:***

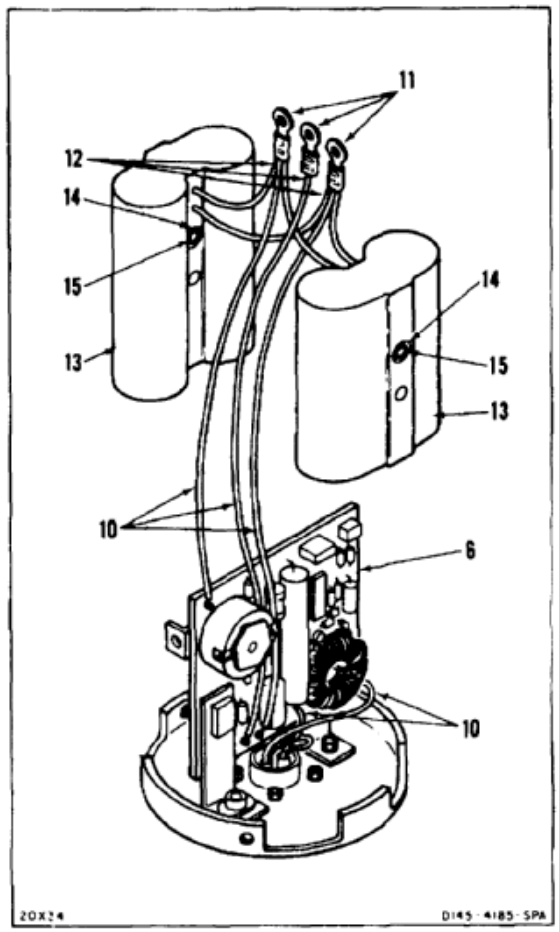
TM 55-1520-240-23P



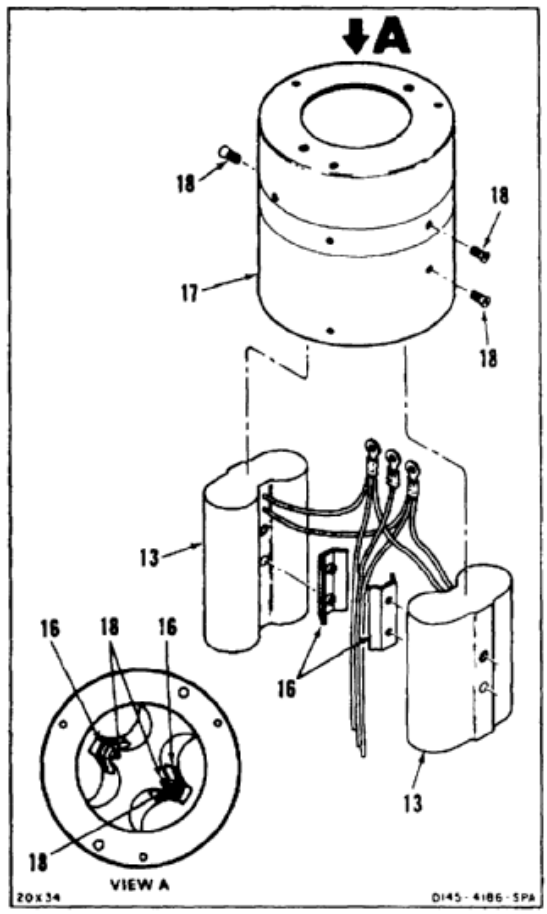

1. Position connector (1) on base (2). Install four screws (3), washers (4), and nuts (5).
2. Position circuit board (6) on base (2). Install two screws (7), washer (8) and nut (9).



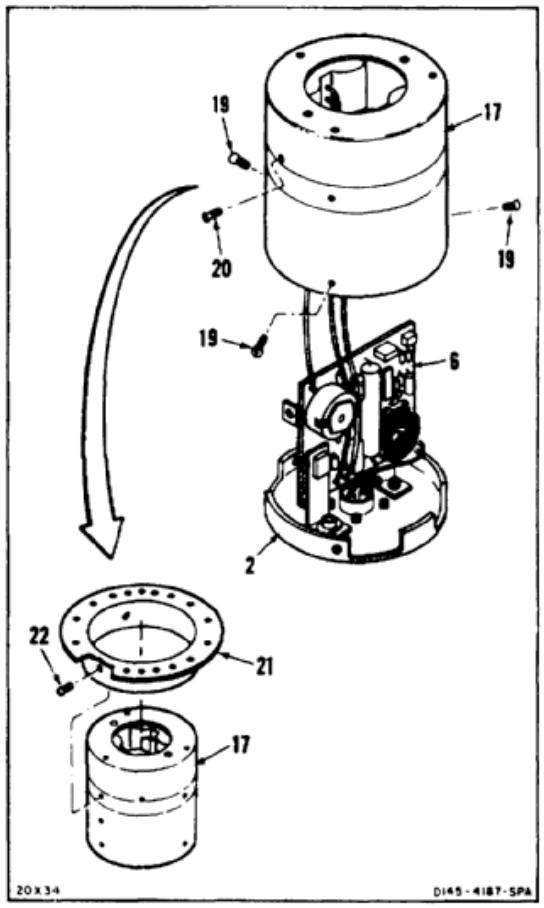
3. Solder five wires (10) to circuit board (6). Use solder (E360). Remove tags.
4. Install three lug terminals (11) on seven wires (12) from circuit board (6) and electronic components (13).
5. Check mounting holes (14) of two electronic components (13). Install insulating sleeving (15).



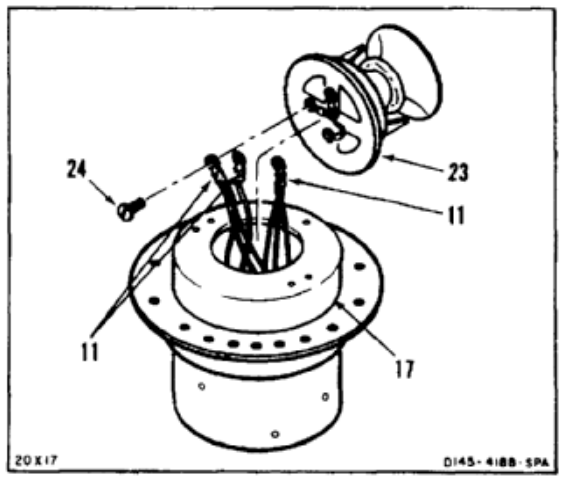
6. Position two electronic components (13) and retainers (16) in case (17). Install three screws (18).



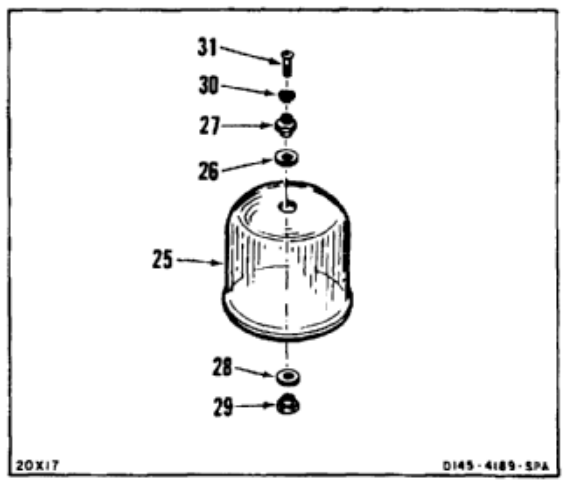
7. Position base (2) with circuit board (6), in case (17). Install three screws (19) and screw (20).
8. Position flange (21) on case (17). Install three screws (22).



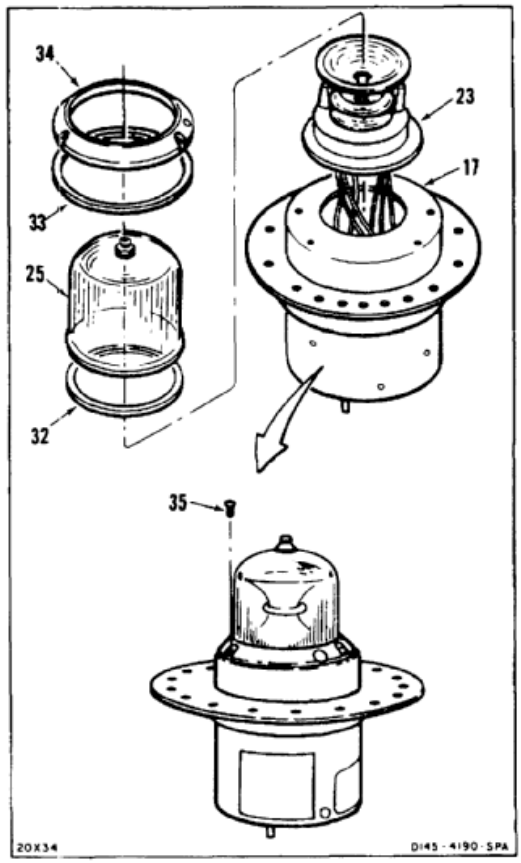
9. Support lamp (23) and remove three screws (24).
10. Position lamp (23) next to case (17).
11. Connect three terminal lugs (11) to lamp (23). Install three screws (24). Remove tags.




12. Support lens (25) and install washer (26), drain tube (27), washer (28), and insert (29).
13. Install washer (30) and screw (31) in drain tube (27).



14. Position lamp (23), gasket (32), lens (25), gasket (33) and retainer (34) on case (17). Install three screws (35).



**WARNING**

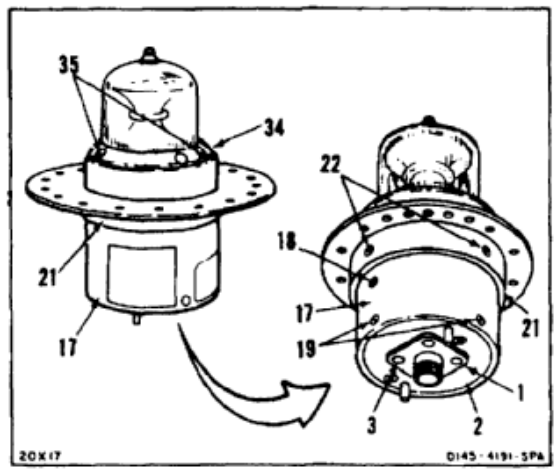
Acetone (E20) can form toxic vapors if exposed to flame. Use in well-ventilated area, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

15. Clean edge of retainer (34) and case (17), edges of flange (21), case (17), base (2), and edges of connector (1). Clean all exposed screw heads (3, 18, 19, 22, and 35). Use cloths (E120) and acetone (E20). Wear gloves (E186).

**WARNING**

Sealant (E336) can irritate skin and cause burns. Avoid contact with skin, eyes, and clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

16. Seal edge of retainer (34) and case (17), edges of flange (21), case (17), base (2), and edges of connector (1). Seal all exposed screw heads (3, 18, 19, 22, and 35). Use sealant (E336).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-90 TEST ANTICOLLISION LIGHT (AVIM) 9-90

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Power Supply, 28 VDC Capability
Stopwatch

***Materials:***

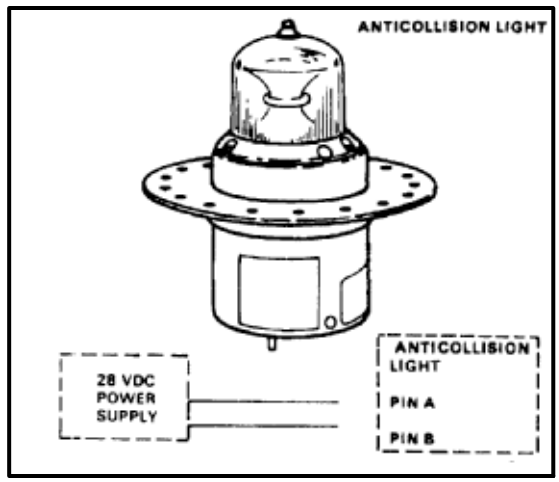
None

***Personnel Required:***

Aircraft Electrician
Inspector

***Equipment Condition:***

Off Helicopter Task



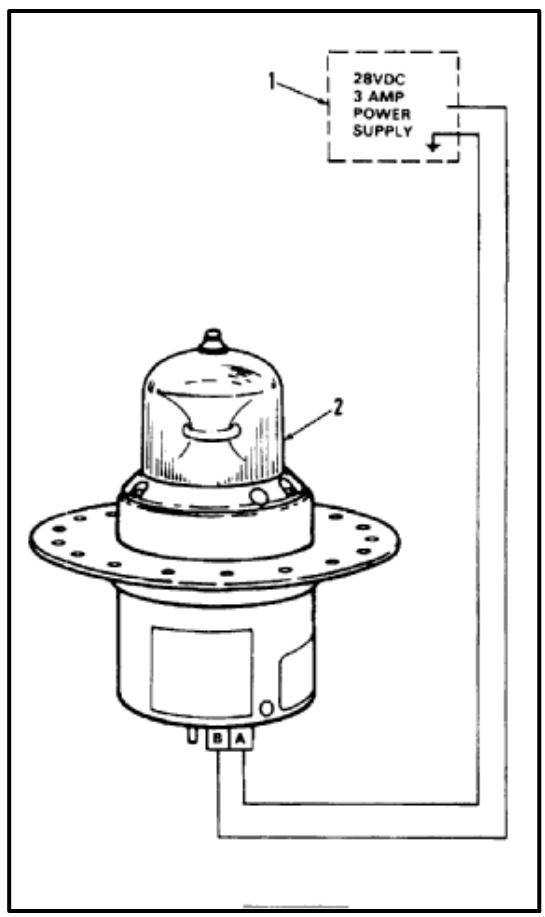

1. Connect power supply (1) to anticollision light (2). Pin A is negative, Pin B is positive.
2. Turn on power supply (1). Adjust power supply to **28 volts**.
3. Check light (2). Light shall flash at **40 to 60 times per minute**.

***INSPECT***

4. Shut down power supply (1).
5. Disconnect power supply (1) from anticollision light (2).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-91 INSTALL ANTICOLLISION LIGHT 9-91

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Heat Gun
Workstand

***Materials:***

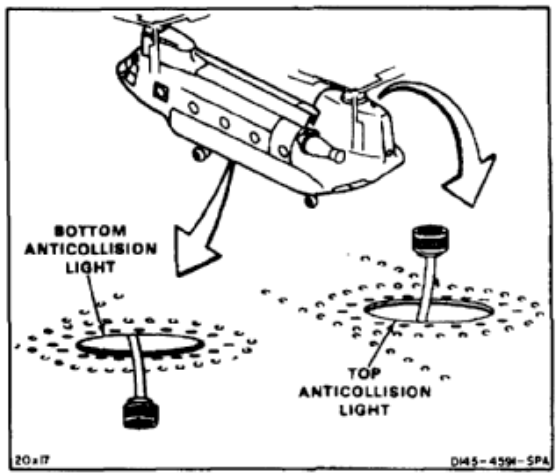
Acetone (E20)
Cloths (E120)
Sealant (E336)
Shrinkable Tubing (E431)
Gloves (E186)
Lockwire (E231)

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

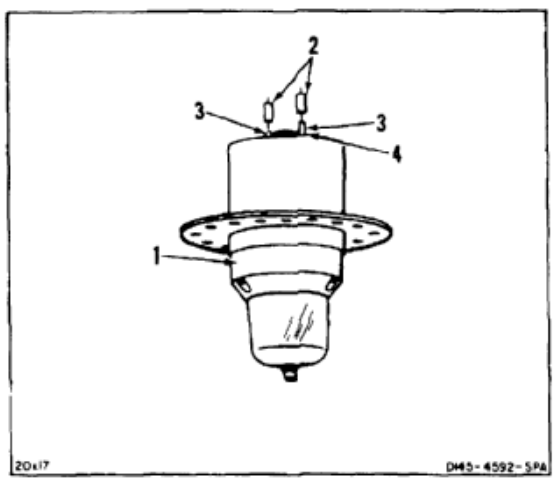
TM 55-1520-240-23P




**NOTE**

Procedure is similar for installing top or bottom light, except where noted. Installation of bottom light is shown here.

1. Install shrinkable tubing (2) **3 inches** long to extend two vent studs (3). Use shrinkable tubing (E431).
2. Shrink tubing (2) when it contacts vent (4). Use heat gun.



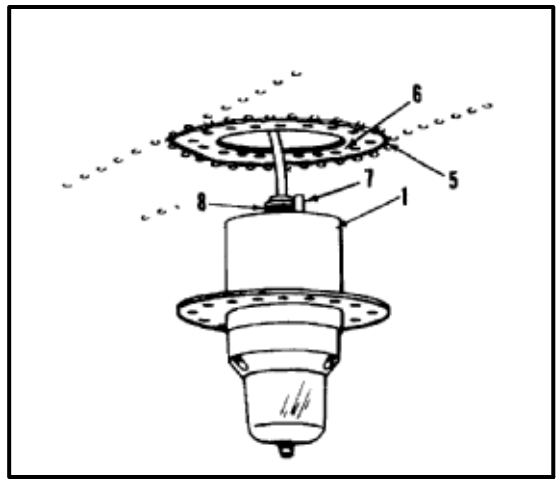
**WARNING**

Acetone (E20) can form toxic vapors if exposed to flame. Use in well-ventilated area, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

3. For either light (1), clean old sealant (5) from fuselage (6). Use acetone (E20) and cloths (E120). Wear gloves (E 186).

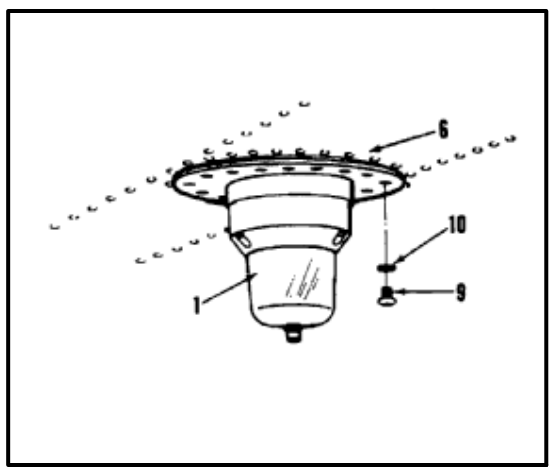
3.1. On bottom light only, install two pieces of shrink tubing (7).

4. Support light (1). Connect connector (8) to light. Lockwire (E231) connector to light.




5. Position light (1) on fuselage (6).

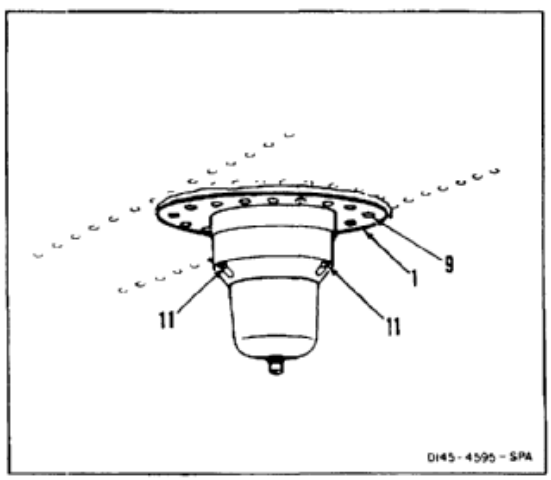
6. Install 18 screws (9) and washers (10).




**WARNING**

Sealant (E336) can irritate skin and cause burns. Avoid contact with skin, eyes, and clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

7. Seal 18 screws (9) and edge of light (1). Remove decals and seal three drain holes (11). Use sealant (E336). Wear gloves (E186).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).

END OF TASK

## 9-92 REMOVE OIL LEVEL CHECK LIGHT 9-92

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

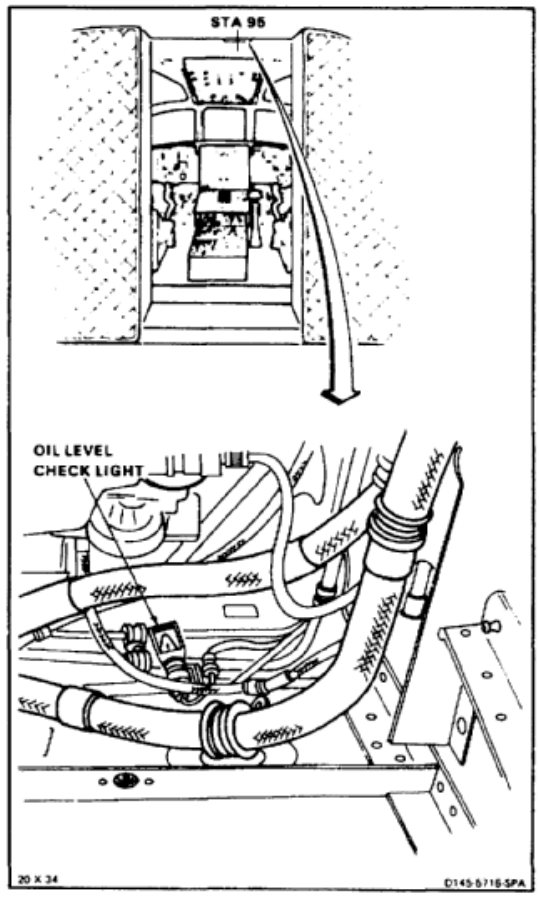
Tape (E385)

***Personnel Required:***

Aircraft Electrician

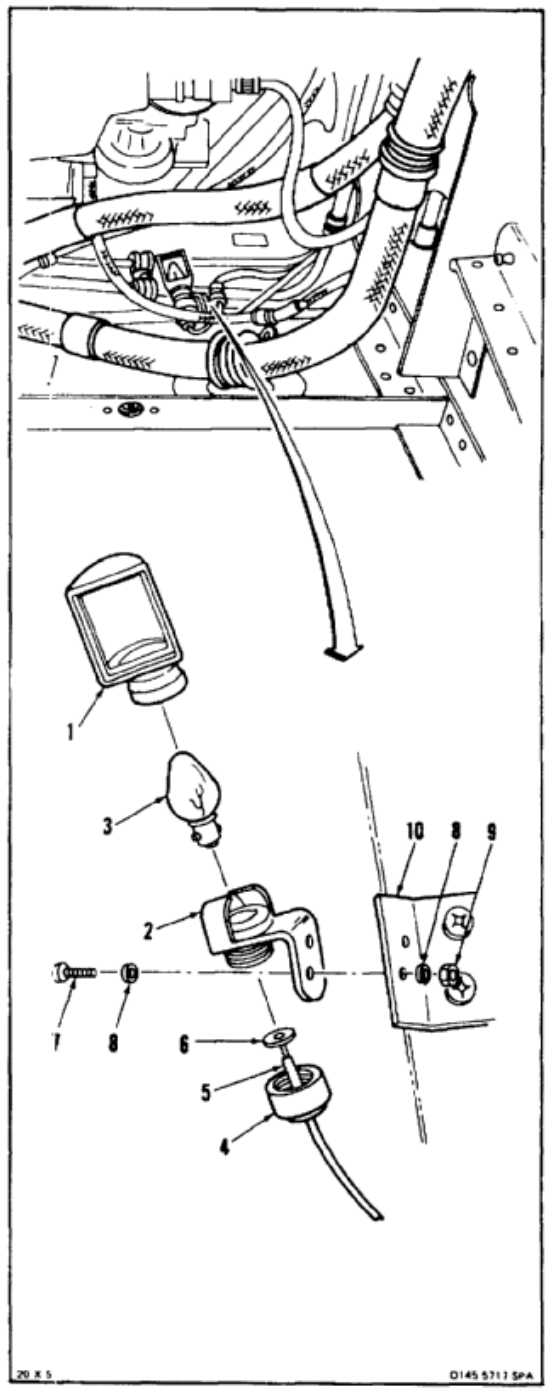
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Forward Transmission Drip Pan Removed (Task 2-3)



## 9-92 REMOVE OIL LEVEL CHECK LIGHT (Continued) 9-92

1. Remove housing (1) from light (2).
2. Remove lamp (3) from light (2). Retain lamp for installation.
3. Remove cover (4). Unsolder wire (5) from washer (6). Tape wire end. Use tape (E385).
4. Remove two screws (7), four washers (8), and two nuts (9).
5. Remove cover (4) from wire (5).
6. Remove light (2) from bracket (10).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-93 INSTALL OIL LEVEL CHECK LIGHT 9-93

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

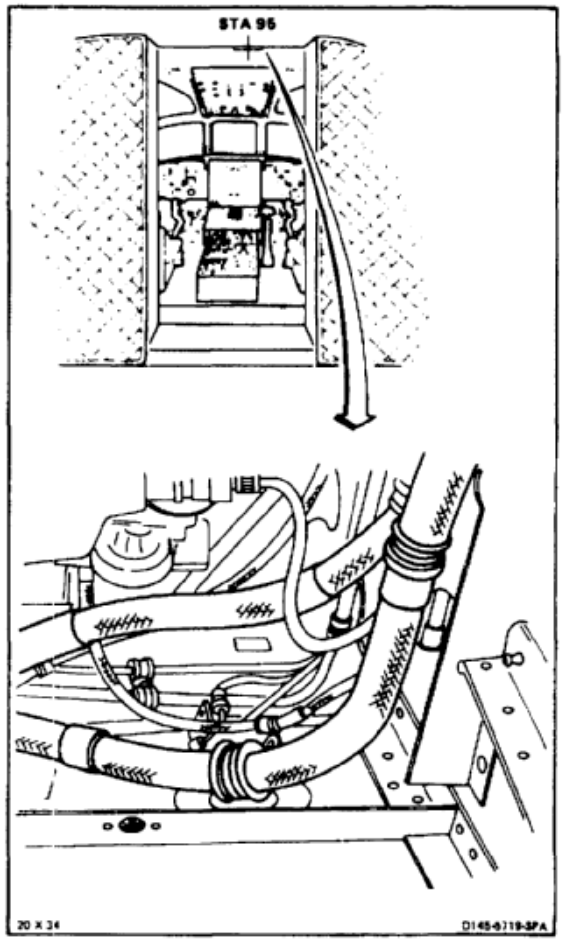
Solder (E360)

***Personnel Required:***

Aircraft Electrician
Inspector

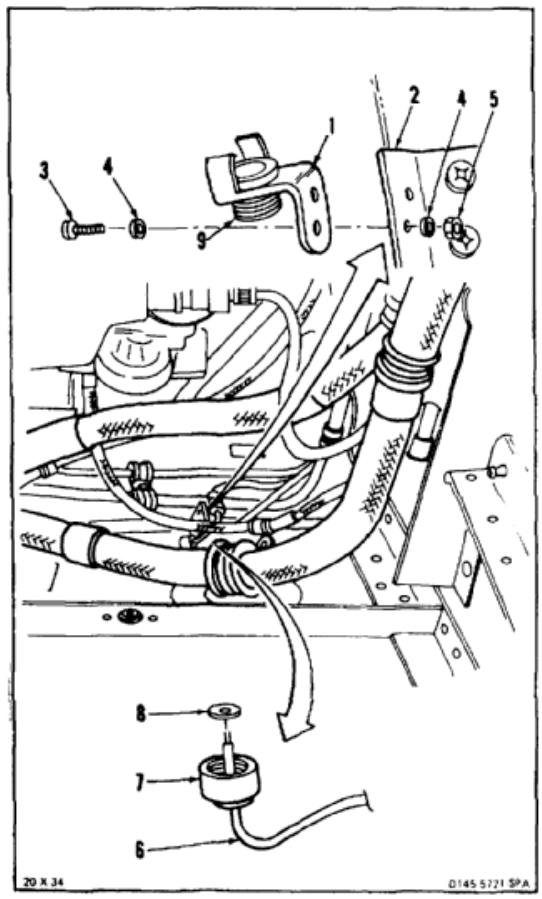
***References:***

TM 55-1520-240-23P



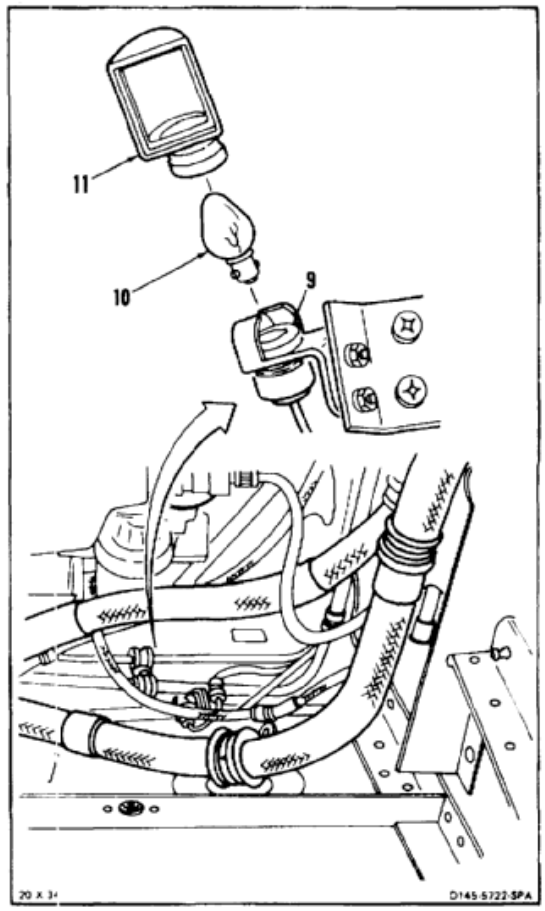
## 9-93 INSTALL OIL LEVEL CHECK LIGHT (Continued) 9-93

1. Position bracket (1) on support (2). Install two screws (3), four washers (4), and two nuts (5).
2. Insert wire (6) through cover (7).
3. Remove tape and solder wire (6) to wafer (8). Use solder (E360).
4. Install cover (7) on light (9).



5. Install lamp (10) in fitting (9).
6. Install housing (11) on fitting (9).

***INSPECT***




***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).
Install forward transmission drip pan (Task 2-3).

END OF TASK

## 9-94 REMOVE OIL LEVEL CHECK LIGHT SWITCH 9-94

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

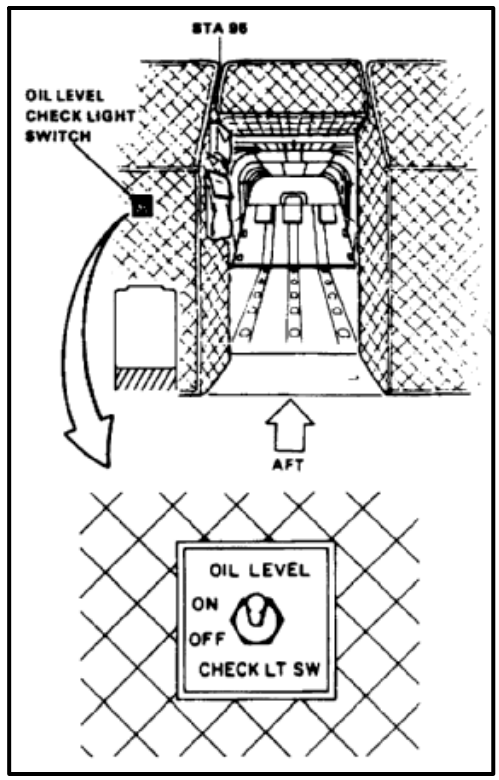
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

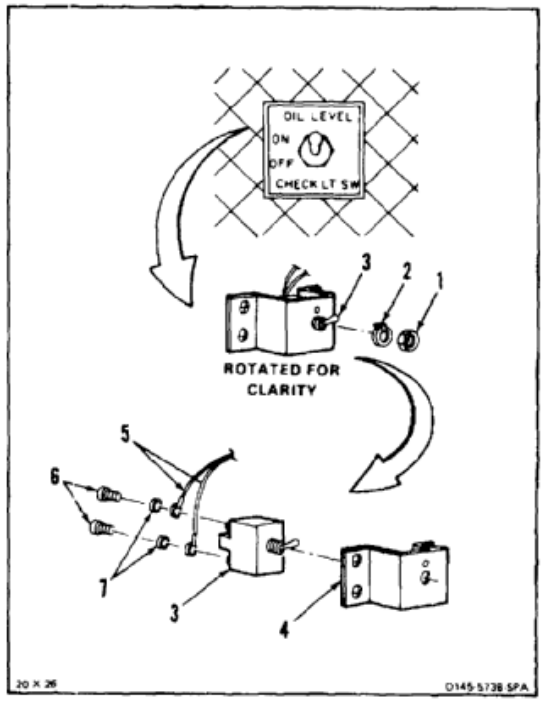
Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off



1. Remove nut (1) and washer (2) from switch (3).
2. Remove switch (3) from bracket (4).
3. Tag two wires (5). Remove two screws (6) and washers (7). Disconnect two wires.
4. Tape ends of wires (5). Use tape (E385).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-95 INSTALL OIL LEVEL CHECK LIGHT SWITCH 9-95

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

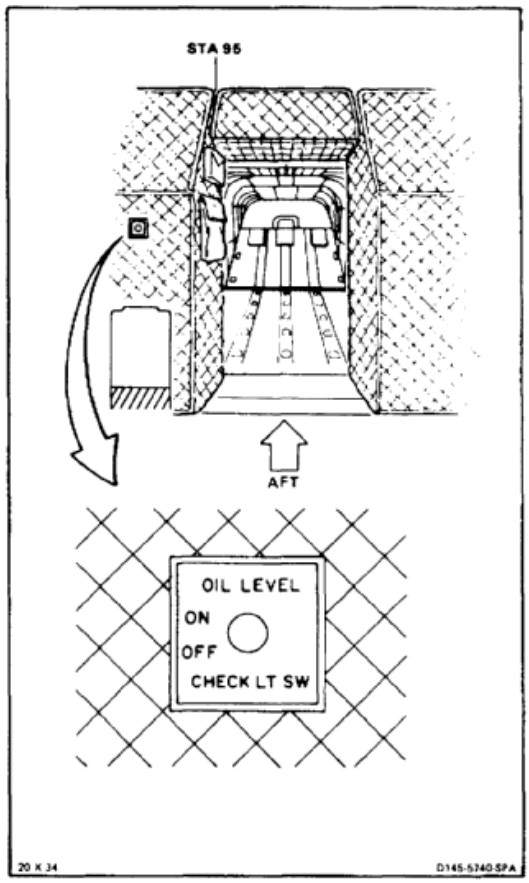
None

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

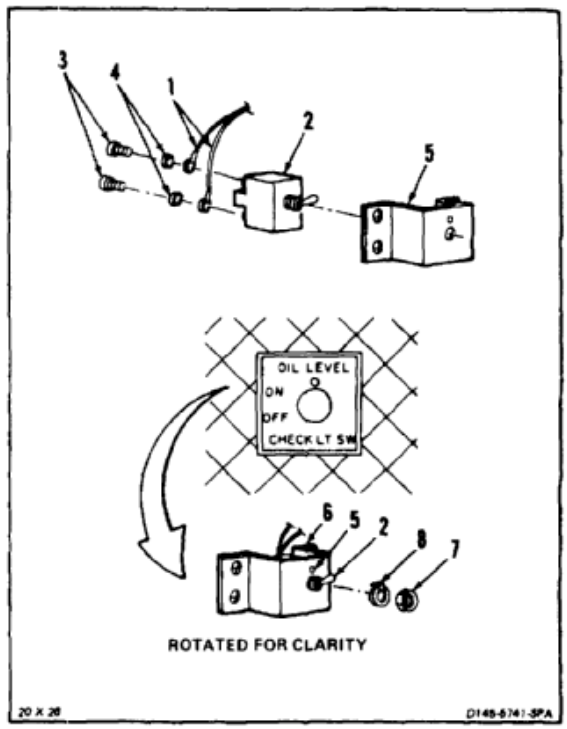
TM 55-1520-240-23P



## 9-95 INSTALL OIL LEVEL CHECK LIGHT SWITCH (Continued) 9-95

1. Remove tape from wires (1). Connect two wires to switch (2). Install two screws (3) and washers (4). Remove tags.
2. Position switch (2), tab (5) up, in bracket (6). Install nut (7) and washer (8).

***INSPECT***




***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).

END OF TASK

INITIAL SETUP

***Applicable Configurations:***

Without 17

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

None

***Parts:***

Lamp

***Personnel Required:***

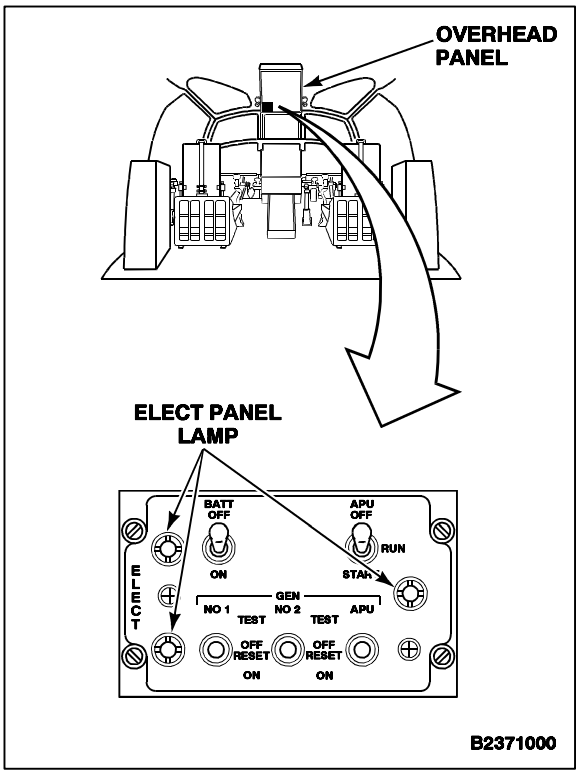
Aircraft Electrician

***References:***

TM 55-1520-240-23P

***Equipment Condition:***

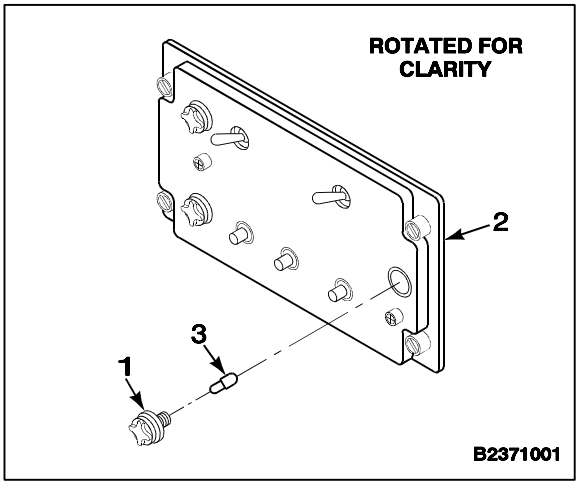
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




**NOTE**

Procedure is same to replace lamp in any overhead panel. ELECT panel lamp replacement is shown here.

1. Rotate lens (1). Remove cap from panel (2).
2. Remove lamp (3) from lens (1).
3. Install new lamp (3) in cap (1).
4. Install cap (1) in panel (2).




***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).

END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

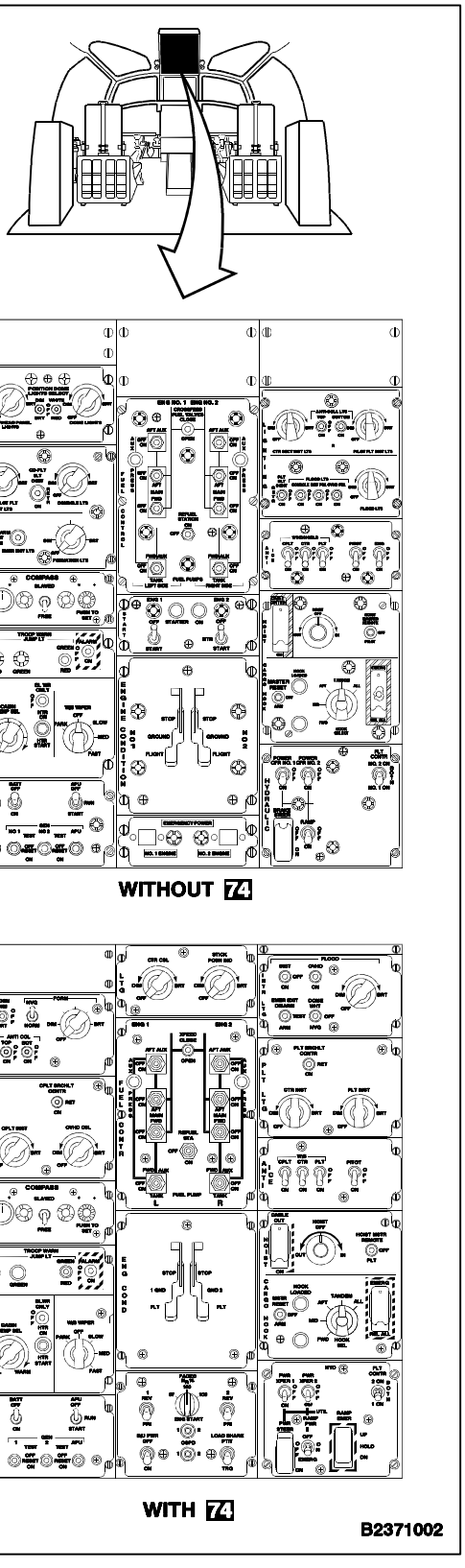
Paper Tags (E264)
Tape (E395)

***Personnel Required:***

Aircraft Electrician (2)

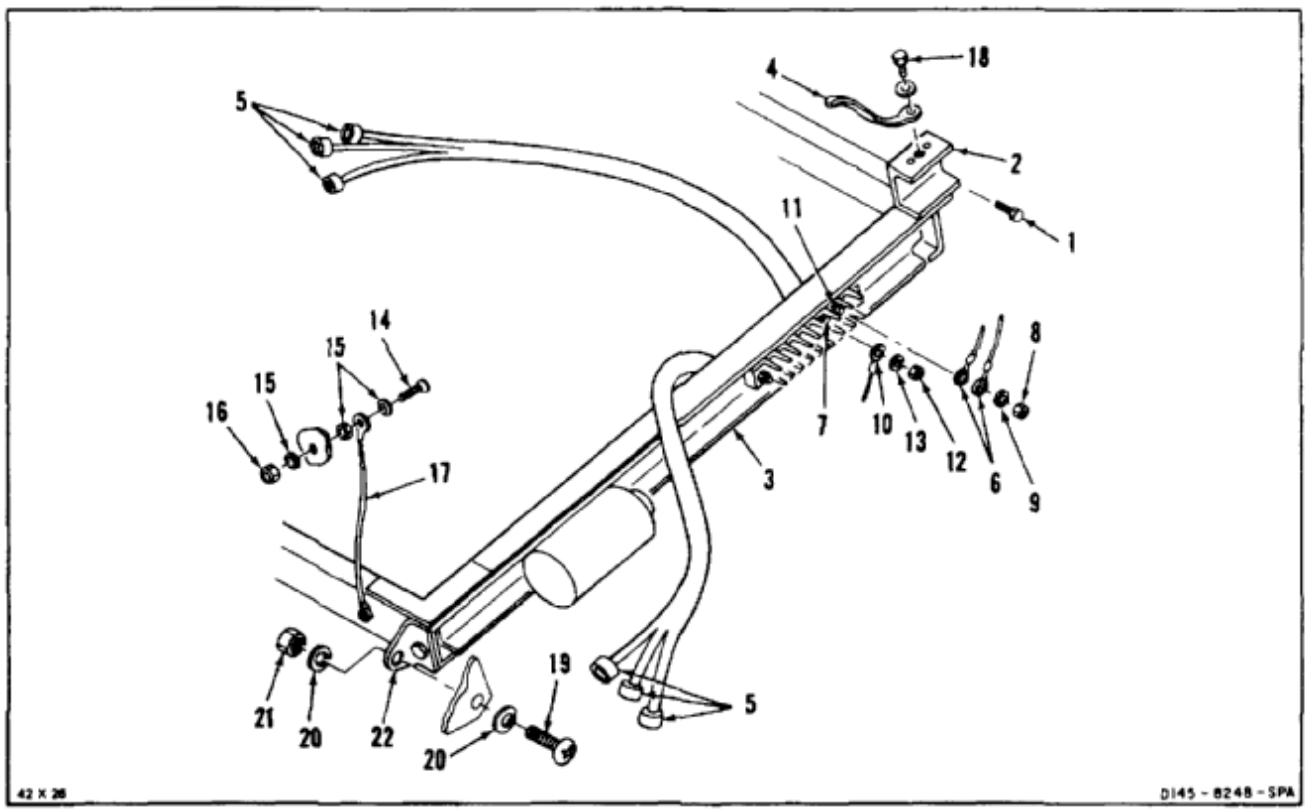
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off



## 9-97 REMOVE OVERHEAD PANEL (Continued) 9-97

1. Remove two bolts (1) from brackets (2).
2. Pivot panel (3) down until strap (4) stops travel.
3. Tag and disconnect six connectors (5).
4. Tag and disconnect two wires (6) from terminal (7) by removing nut (8) and washer (9). Tape wire ends. Use tape (E395).
5. Tag and disconnect wire (10) from terminal (11) by removing nut (12) and washer (13). Tape wire ends. Use tape (E395).
6. Remove screw (14), three washers (15), and nut (16) from ground wire (17).
7. Have helper support panel (3). Remove two bolts (18) from strap (4).
8. Remove two bolts (19), four washers (20), and two nuts (21) from bracket (22).
9. Remove panel (3).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-98 INSTALL OVERHEAD PANEL 9-98

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

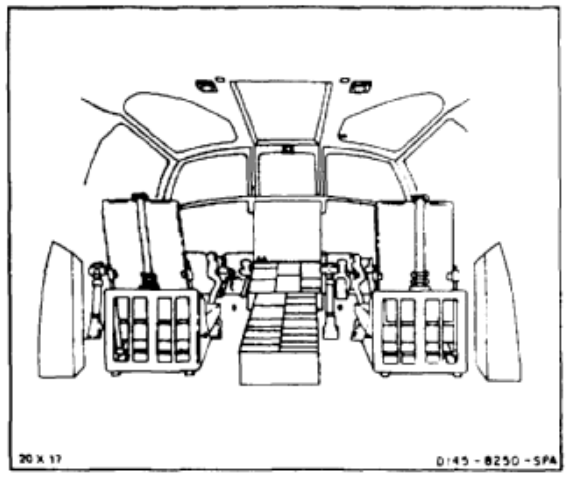
None

***Personnel Required:***

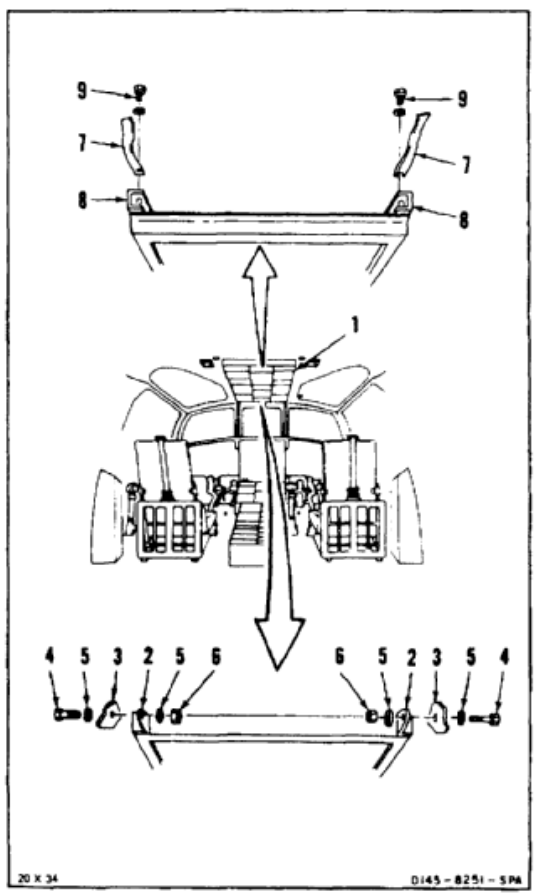
Aircraft Electrician (2)
Inspector

***References:***

TM 55-1520-240-23P

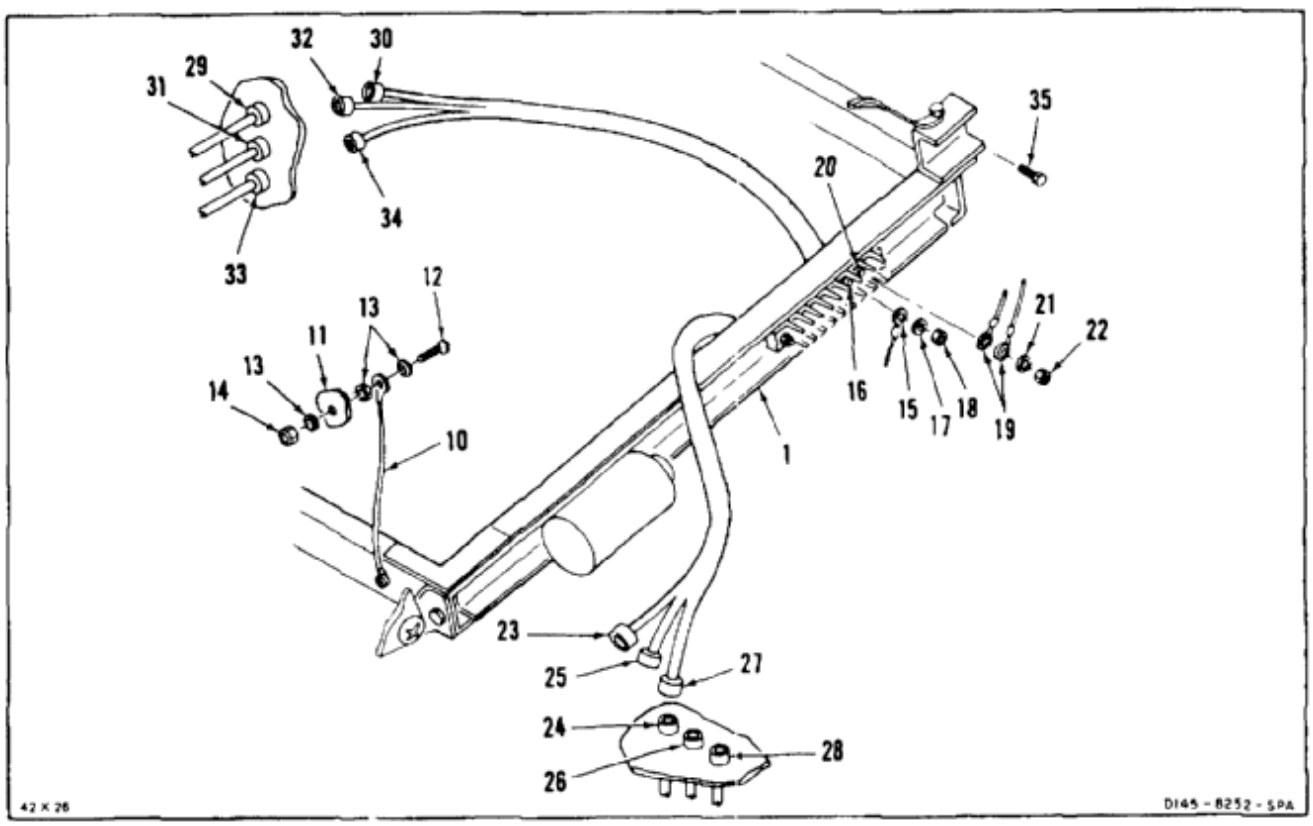



1. Have helper support panel (1). Align brackets (2) with brackets (3). Install two bolts (4), four washers (5), and two nuts (6).
2. Have helper support panel (1). Align two straps (7) with brackets (8). Install two bolts (9).



3. Connect ground wire (10) to structure (11). Install screw (12), three washers (13), and nut (14).
4. Remove tape and install wire (15) on terminal (16) using washer (17) and nut (18). Remove tag.
5. Remove tape and install two wires (19) on terminal (20) using washer (21) and nut (22). Remove tag.
6. Connect connector (23) to receptacle (24). Remove tag.
7. Connect connector (25) to receptacle (26). Remove tag.
8. Connect connector (27) to receptacle (28). Remove tag.
9. Connect connector (29) to receptacle (30). Remove tag.
10. Connect connector (31) to receptacle (32). Remove tag.
11. Connect connector (33) to receptacle (34). Remove tag.
12. Check all wire bundles in the vicinity of the overhead panel to ensure none are chafed. If chafing is noted, rewire the bundle. If rewiring will not correct the chafing, apply spiral wrap, NSN 9390-00-836-8493 or equivalent, to the chafed area of the bundle. If the insulation has been worn away to expose a conductor, replace affected components.
13. Pivot panel (1) up. Install two bolts (35).

***INSPECT***




***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).

END OF TASK

## 9-98.1 REMOVE OVERHEAD PANELS FROM PANEL 9-98.1

INITIAL SETUP

***Applicable Configurations:***

With 17

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

Paper Tags (E264)
Tape (E395)

***Personnel Required:***

Aircraft Electrician

***References:***

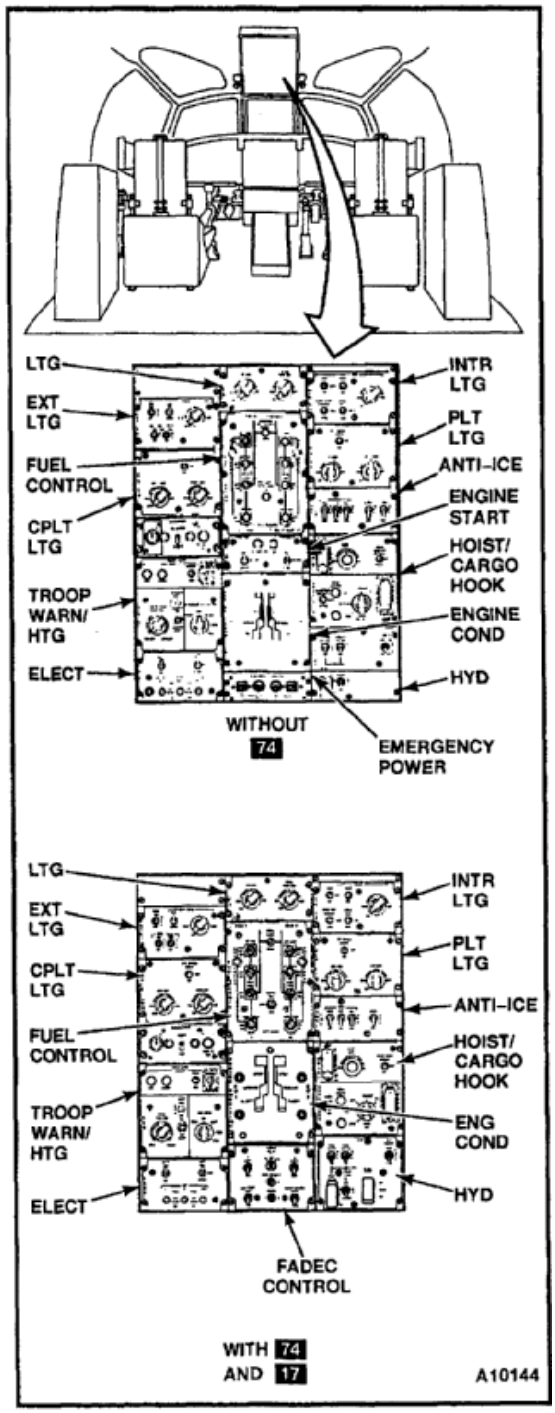
TM 11-1520-240-23
Task 4-150

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off

**NOTE**

On helicopters with 74, go to Task 4-150 for removal of FADEC panel.



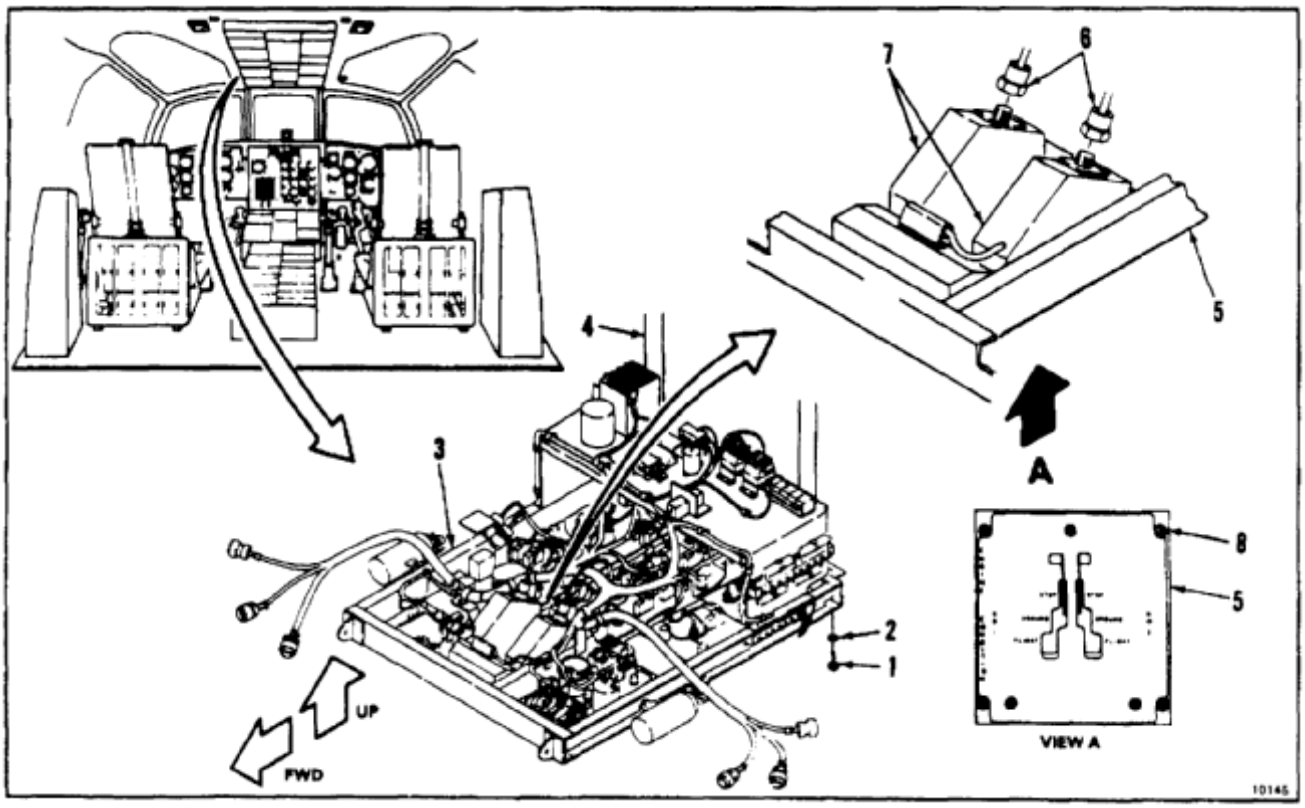
**NOTE**

The three plugs on each of two wire harnesses at the back of the panel do not have to be disconnected to lower the panel.

1. Remove two bolts (1) and washers (2). Lower panel (3) on straps (4).

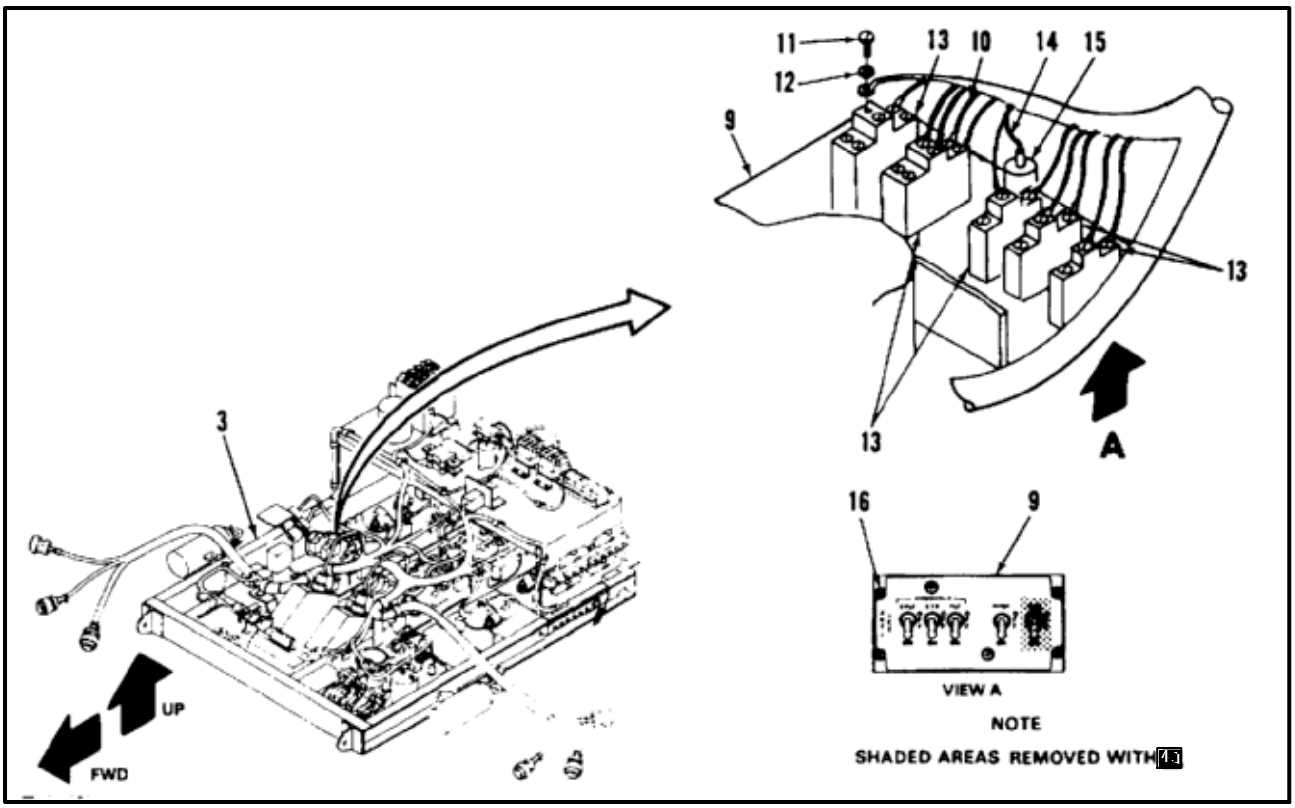
***ENG COND PANEL***

2. Remove ENG COND panel (5) as follows:
   a. Tag and disconnect two electrical connectors (6) from engine controls (7).
   b. Loosen four screws (8). Remove panel (5) from panel (3).



***ANTI-ICE PANEL***

3. Remove ANTI-ICE panel (9) as follows:
   a. Tag and disconnect 15 wires (10) by removing screws (11) and washers (12) from five switches (13). Tape wire ends.
   b. Tag and disconnect wire (14) from receptacle (15). Tape wire ends.
   c. Loosen four screws (16). Remove panel (9) from panel (3).



***LTG PANEL***

4. Remove LTG panel (17) as follows:

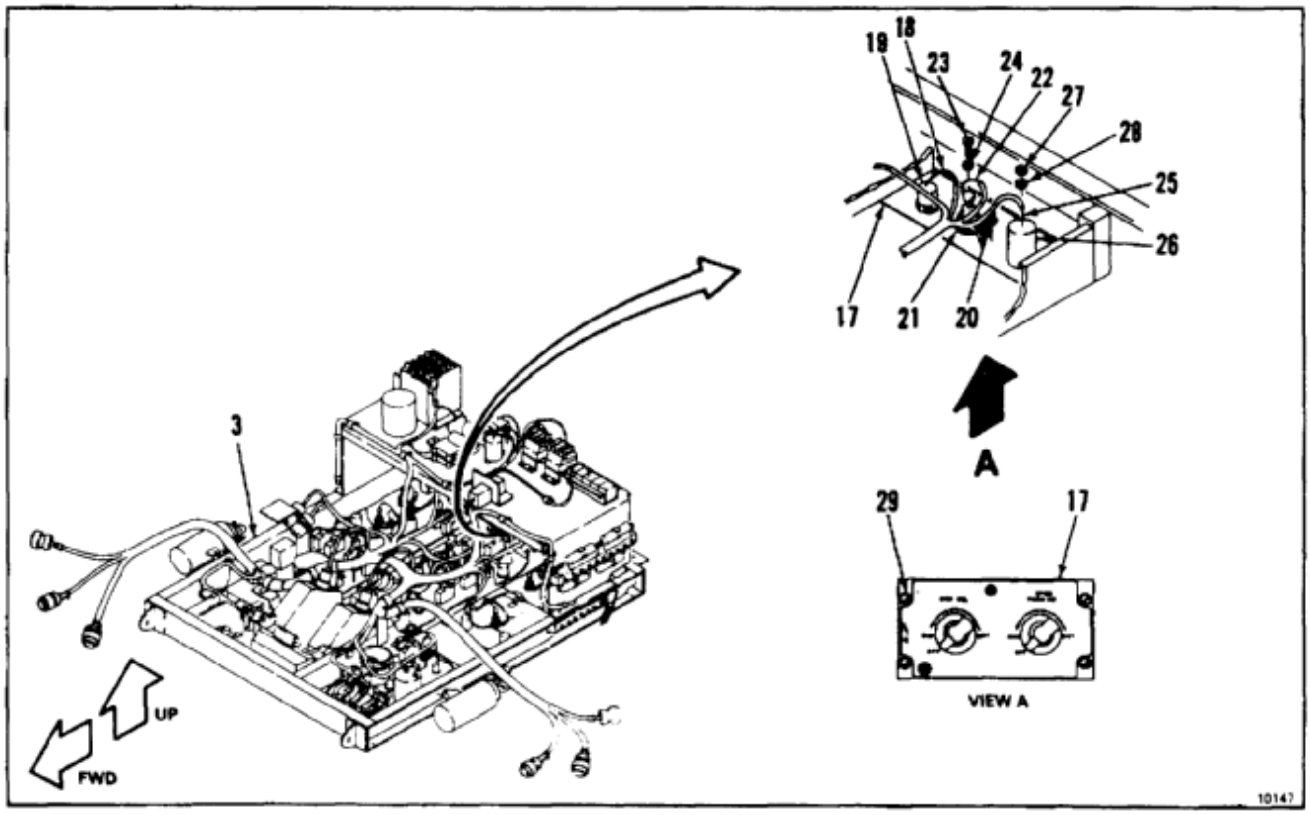
   a. Tag and unsolder four wires (18) from potentiometer (19). Tape wire ends.

   b. Tag and disconnect wire (20) from receptacle (21). Tape wire ends.

   c. Tag and remove wire (22) from receptacle (21) by removing screw (23) and washer (24). Tape wire end.

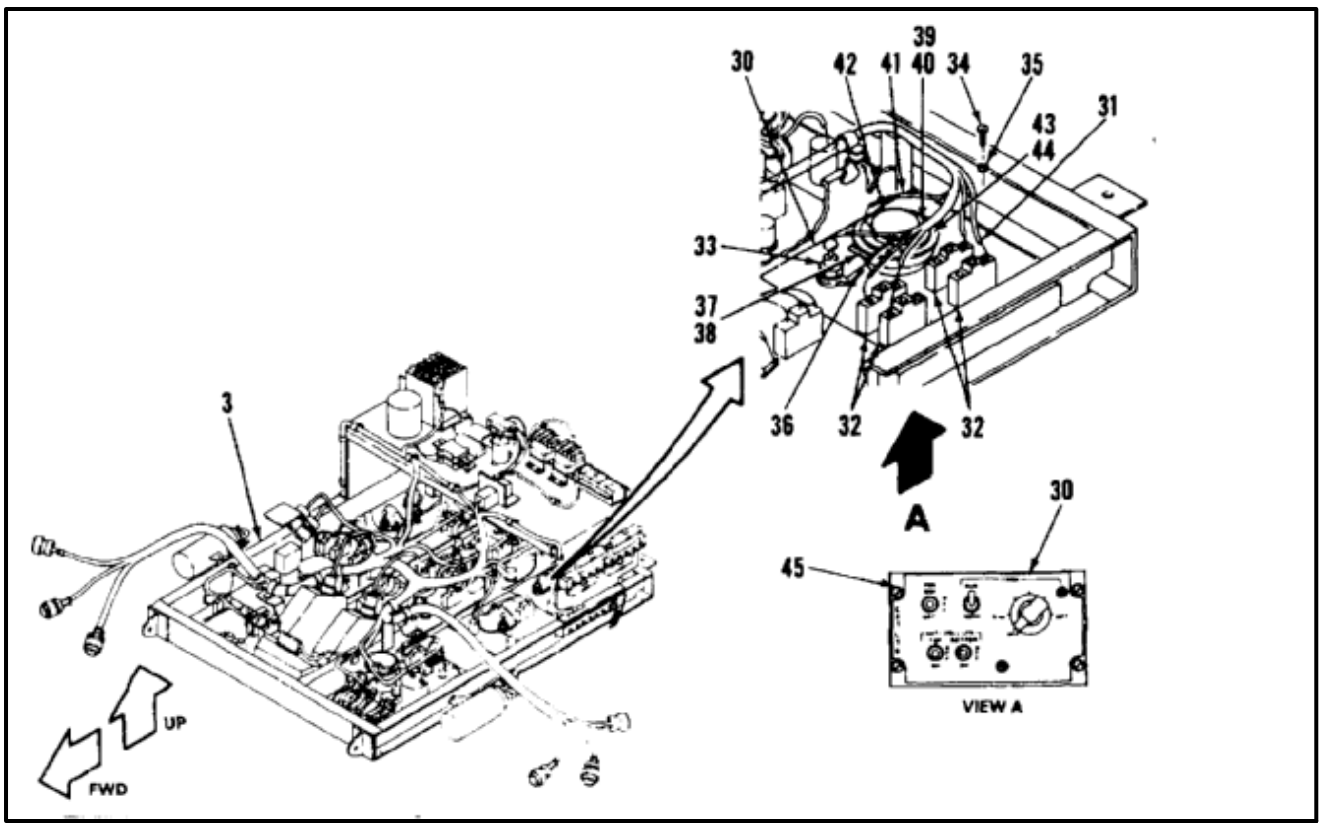
   d. Tag and remove four wires (25) from transformer (26) by removing four nuts (27) and washers (28). Tape wire ends.

   e. Loosen four screws (29). Remove panel (17) from panel (3).



***EXT LTG PANEL***

5. Remove EXT LTG panel (30) as follows:
   a. Tag and remove 18 wires (31) from four switches (32) and one receptacle (33) by removing screws (34) and washers (35). Tape wire ends.
   b. Tag and disconnect wire (36) from receptacle (33). Tape wire end.
   c. Tag and remove two wires (37) from four resistors (38) by removing screws (39) and washers (40). Tape wire ends.
   d. Tag and remove six wires (41) from switch (42) by removing screws (43) and washers (44). Tape wire ends.
   e. Loosen four screws (45). Remove panel (30) from panel (3).

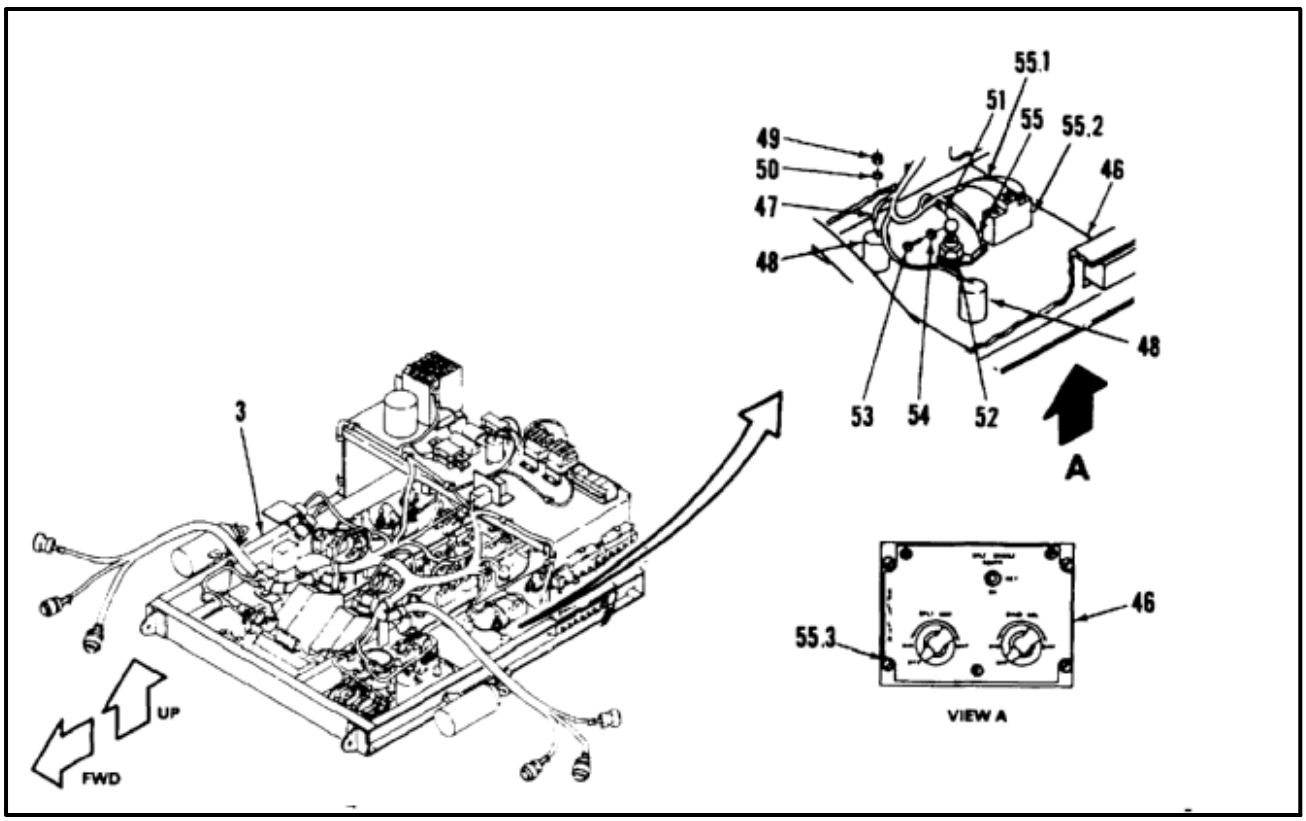


***CPLT LTG PANEL***

6. Remove CPLT LTG panel (46) as follows:
   a. Tag and remove seven wires (47) from two transformers (48) by removing nuts (49) and washers (50). Tape wire ends.
   b. Tag and remove wire (51) from receptacle (52) by removing screw (53) and washer (54). Tape wire end.
   c. Tag and disconnect wire (55) from receptacle (52). Tape wire end.
   d. Tag and remove three wires (55.1) from switch (55.2).
   e. Loosen four screws (55.3). Remove panel (46) from panel (3).

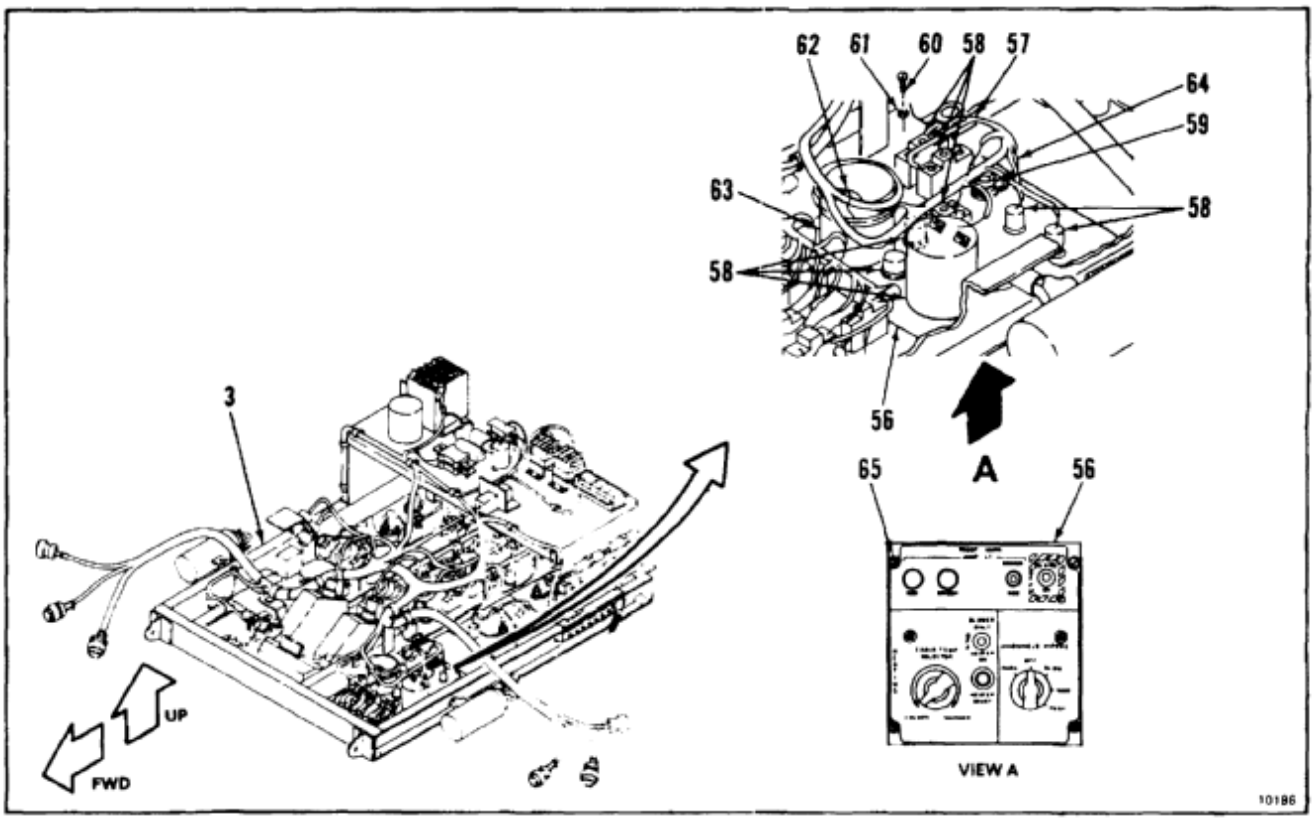
***COMPASS PANEL***

7. Remove COMPASS panel (TM 11-1520-240-23).



***TROOP WARN/HTG PANEL***

8. Remove TROOP WARN/HTG panel (56) as follows:
   a. Tag and remove 26 wires (57) from eight switches (58) and one receptacle (59) by removing screws (60) and washers (61). Tape wire ends.
   b. Tag and unsolder six wires (62) from switch (63). Tape wire ends.
   c. Tag and disconnect wire (64) from receptacle (59). Tape wire end.
   d. Loosen four screws (65). Remove panel (56) from panel (3).



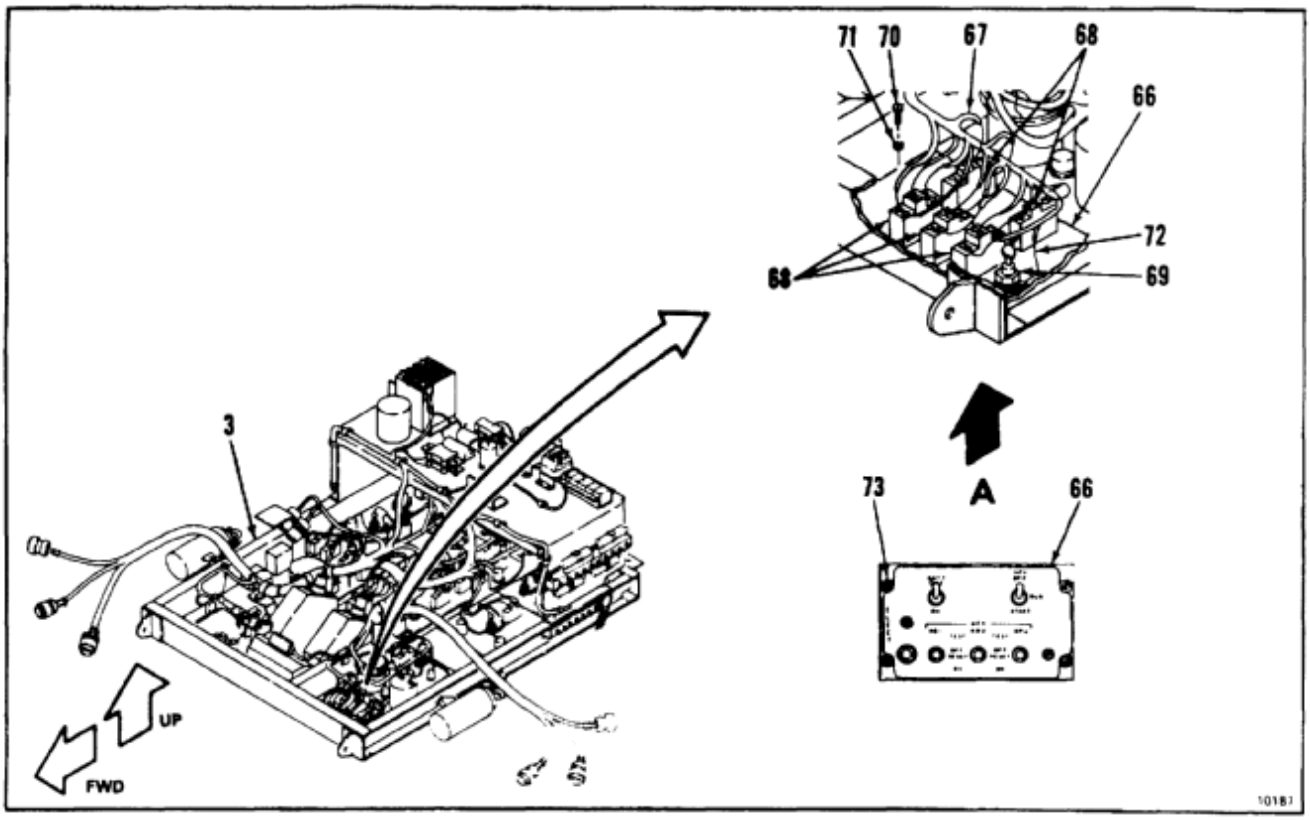
***ELECT PANEL***

9. Remove ELECT panel (66) as follows:

   a. Tag and remove 23 wires (67) from five switches (68) and one receptacle (69) by removing screws (70) and washers (71). Tape wire ends.

   b. Tag and disconnect wire (72) from receptacle (69). Tape wire end.

   c. Loosen four screws (73). Remove panel (66) from panel (3).



***FUEL CONTR PANEL***

10. Remove FUEL CONTR panel (74) as follows:

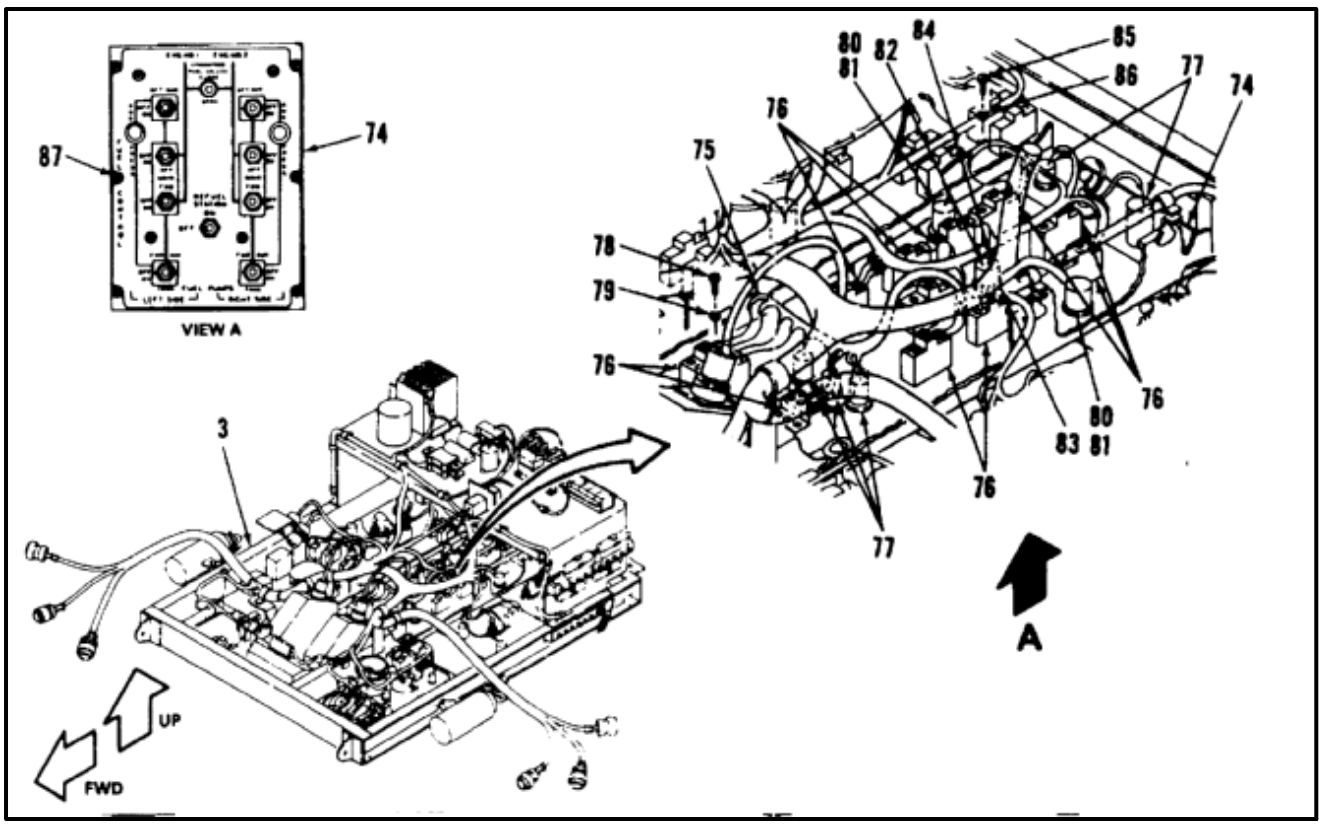
a. Tag and remove 34 wires (75) from 10 switches (76) and five receptacles (77) by removing screws (78) and washers (79). Tape wire ends.

b. Tag and unsolder six wires (80) from two receptacles (81). Tape wire ends.

c. Tag and disconnect wire (82) from receptacle (83). Tape wire end.

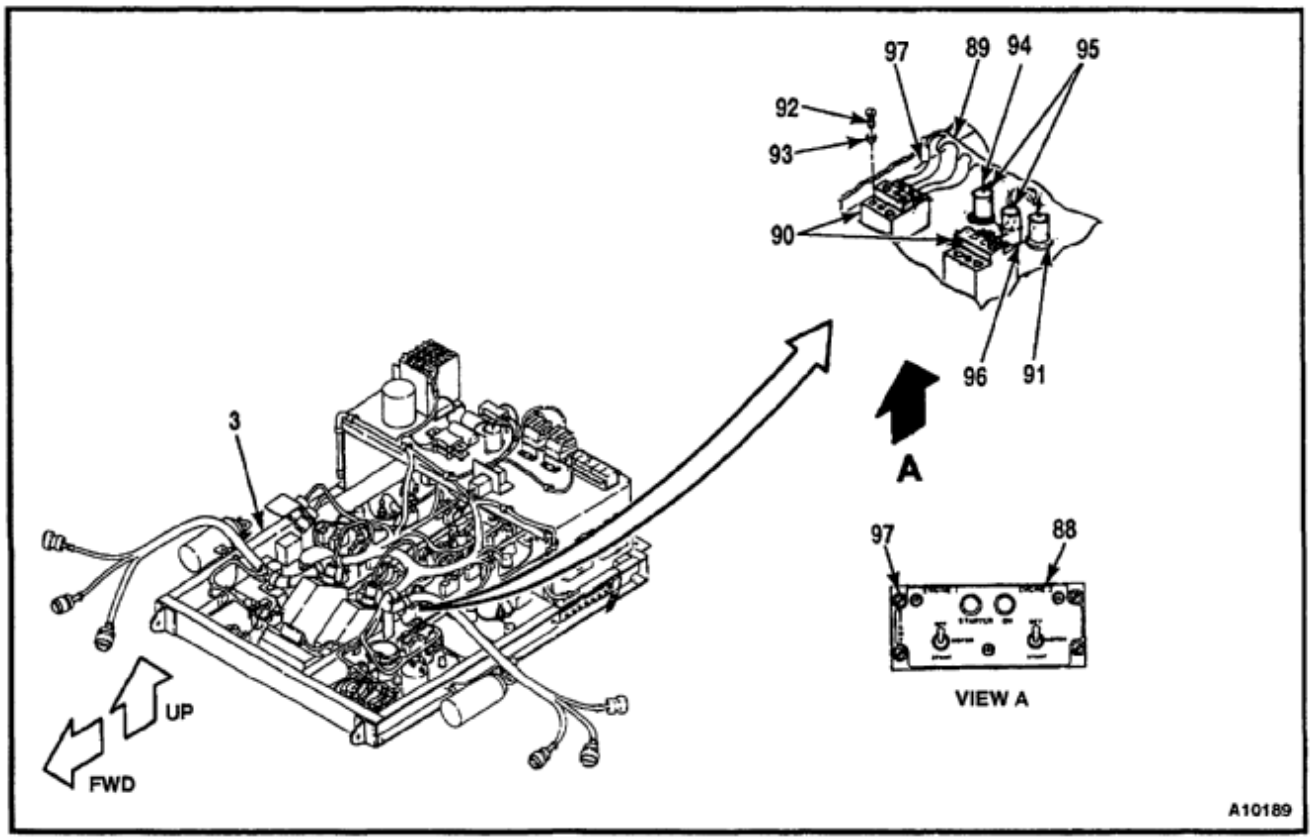
d. Tag and remove wire (84) from receptacle (83) by removing screw (85) and washer (86). Tape wire end.

e. Loosen six screws (87). Remove panel (74) from panel (3).



***START PANEL WITHOUT 17***

11. Remove START panel (88) as follows:
    a. Tag and remove 23 wires (89) from two switches (90) and one receptacle (91) by removing screws (92) and washers (93). Tape wire ends.
    b. Tag and unsolder six wires (94) from two lamps (95). Tape wire ends.
    c. Tag and disconnect wire (96) from receptacle (91). Tape wire end.
    d. Loosen four screws (97). Remove panel (88) from panel (3).

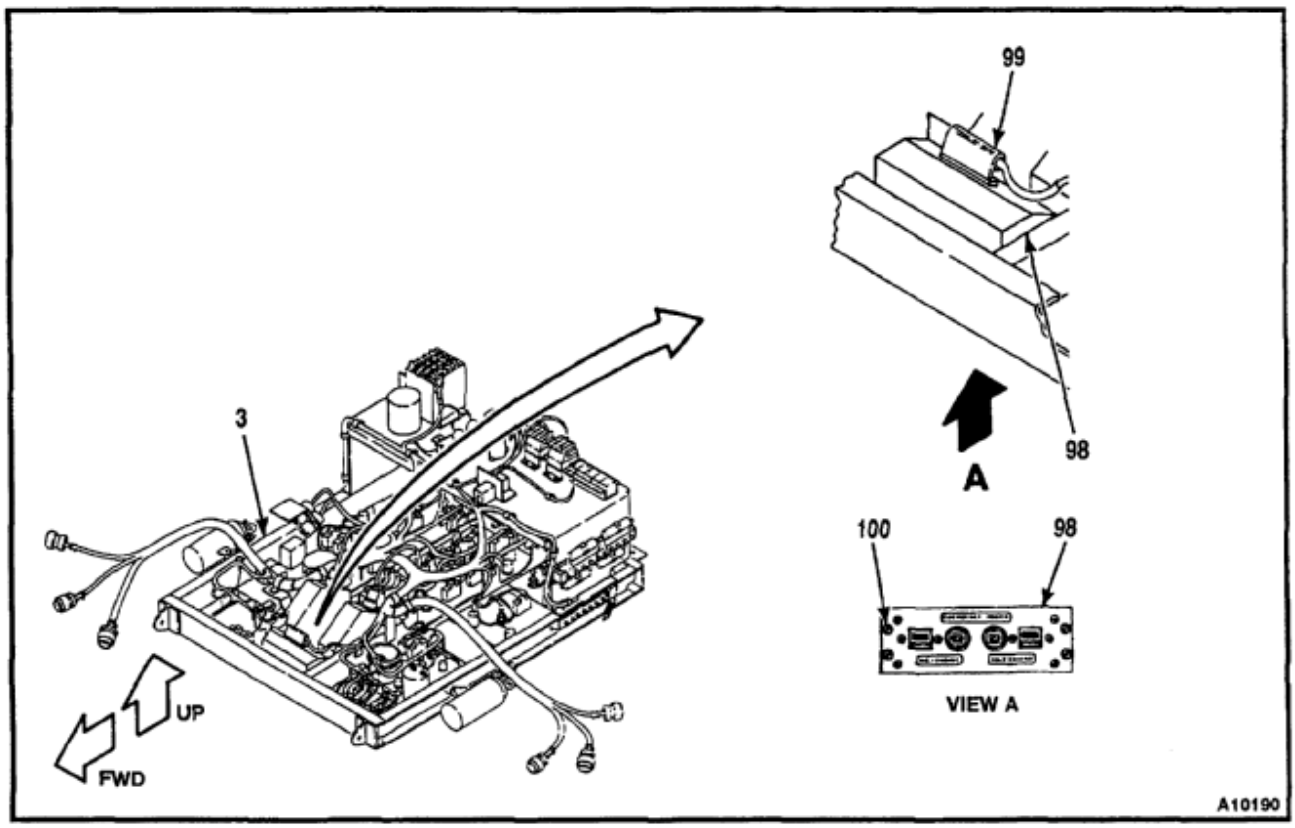


***EMERGENCY POWER PANEL WITHOUT 74***

12. Remove EMERGENCY POWER panel (98) as follows:

    a. Tag and disconnect plug (99) from panel (98).

    b. Loosen four screws (100). Remove panel (98) from panel (3).



***INTR LTG PANEL***

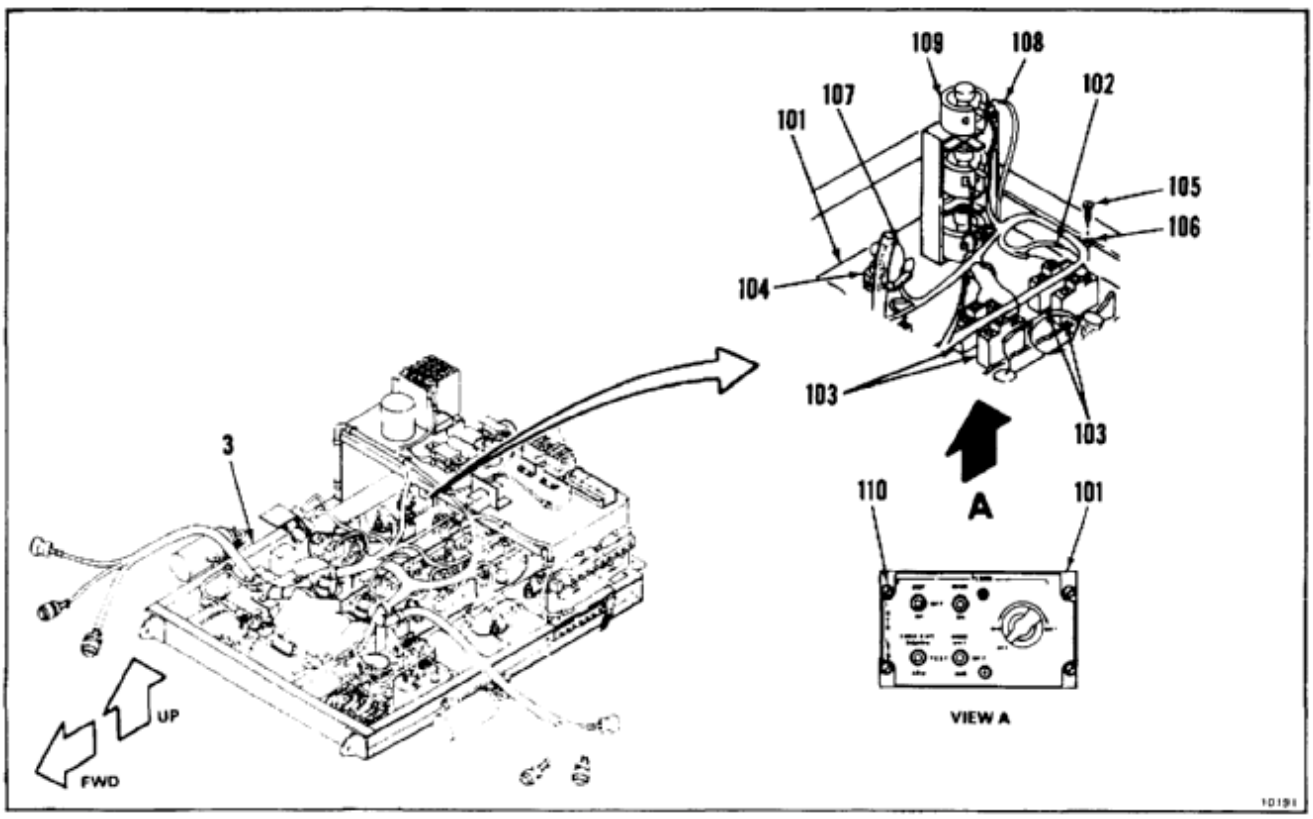
13. Remove INTR LTG panel (101) as follows:

a. Tag and disconnect 17 wires (102) from four switches (103) and one receptacle (104) by removing screws (105) and washers (106). Tape wire ends.

b. Tag and disconnect wire (107) from receptacle (104). Tape wire end.

c. Tag and unsolder five wires (108) from potentiometer (109). Tape wire ends.

d. Loosen four screws (110). Remove panel (101) from panel (3).



***PLT LTG PANEL***

14. Remove PLT LTG panel (111) as follows:

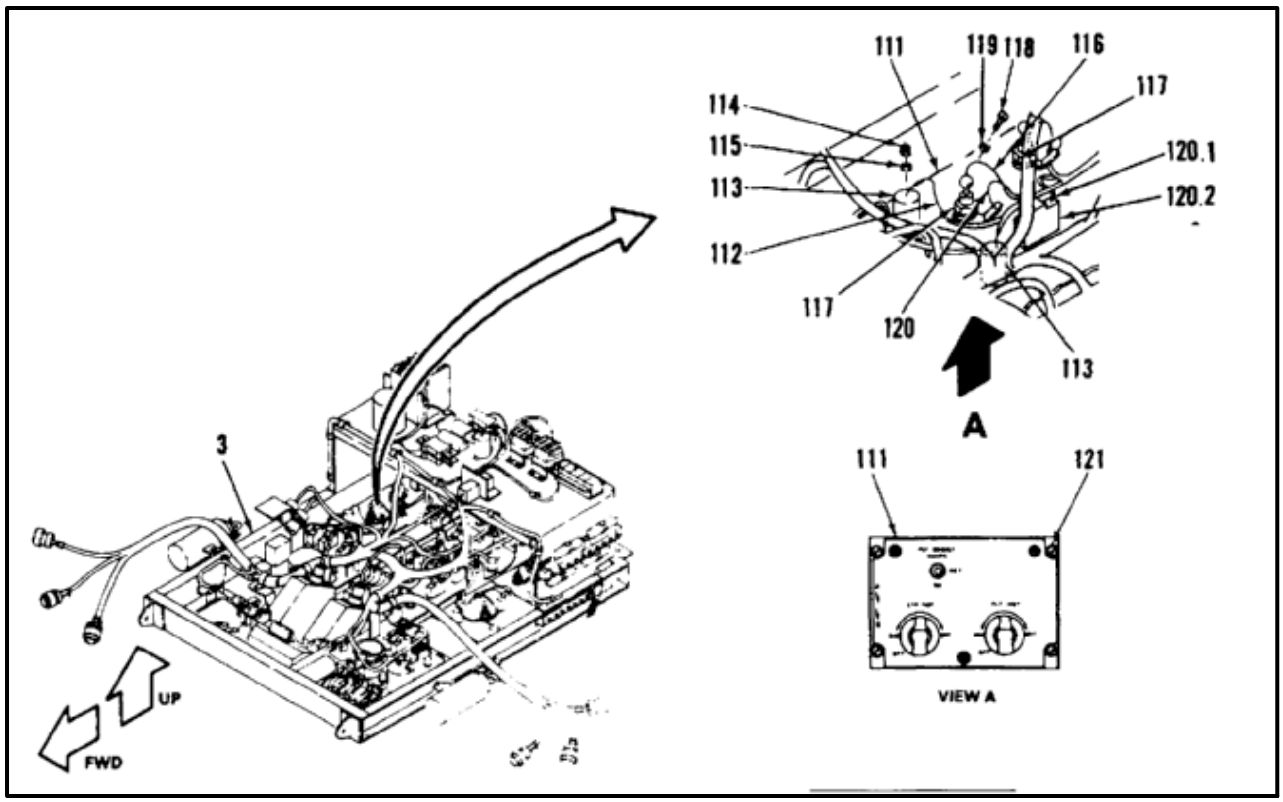
    a. Tag and remove seven wires (112) from two transformers (113) by removing nuts (114) and washers (115). Tape wire ends.

    b. Tag and remove wire (116) from each of two receptacles (117) by removing screw (118) and washer (119). Tape wire end.

    c. Tag and disconnect wire (120) from receptacle (117). Tape wire end.

    d. Tag and remove three wires (120.1) from switch (120.2).

    e. Loosen four screws (121). Remove panel (111) from panel (3).

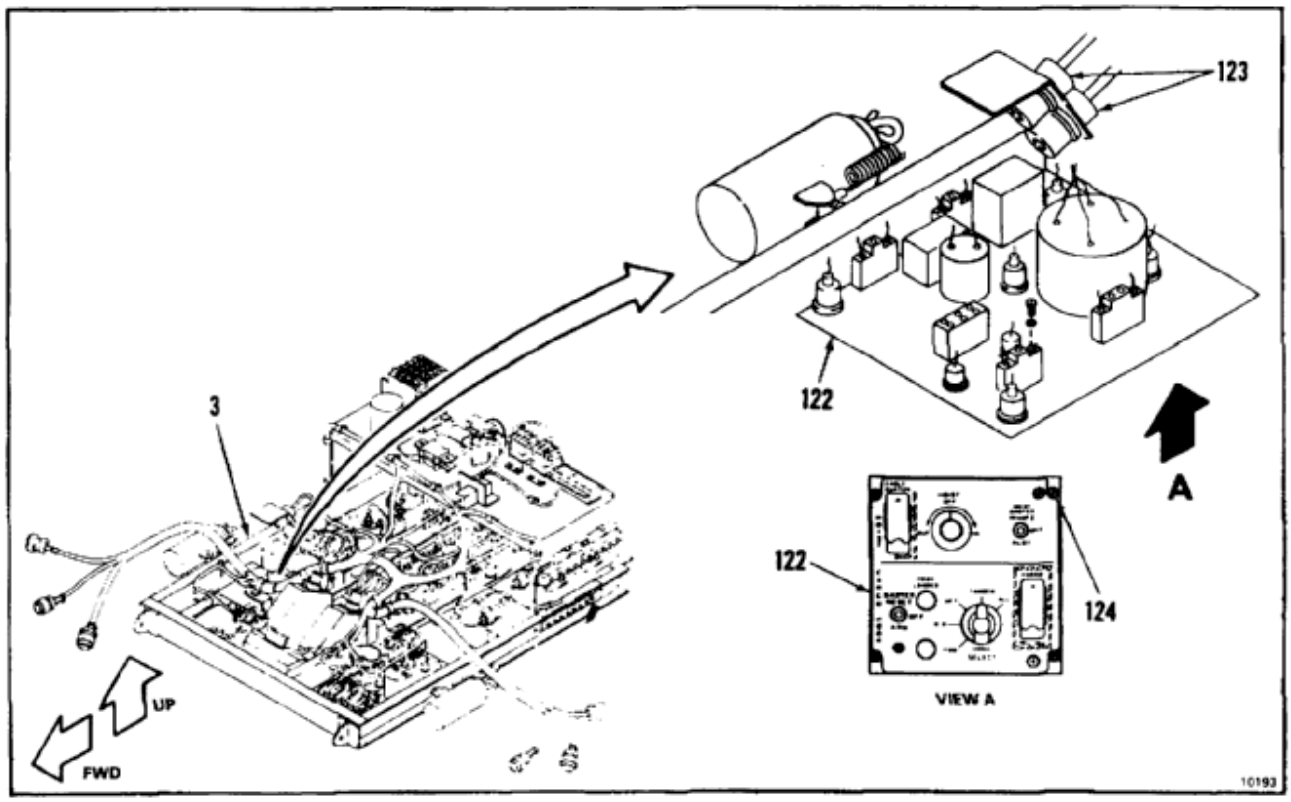


***HOIST/CARGO HOOK PANEL***

15. Remove HOIST/CARGO HOOK panel (122) as follows:

    a. Tag and disconnect two plugs (123).

    b. Loosen four screws (124). Remove panel (122) from panel (3).



**9-98.1 REMOVE OVERHEAD PANELS FROM PANEL (Continued) 9-98.1**

***HYD PANEL WITHOUT 65***

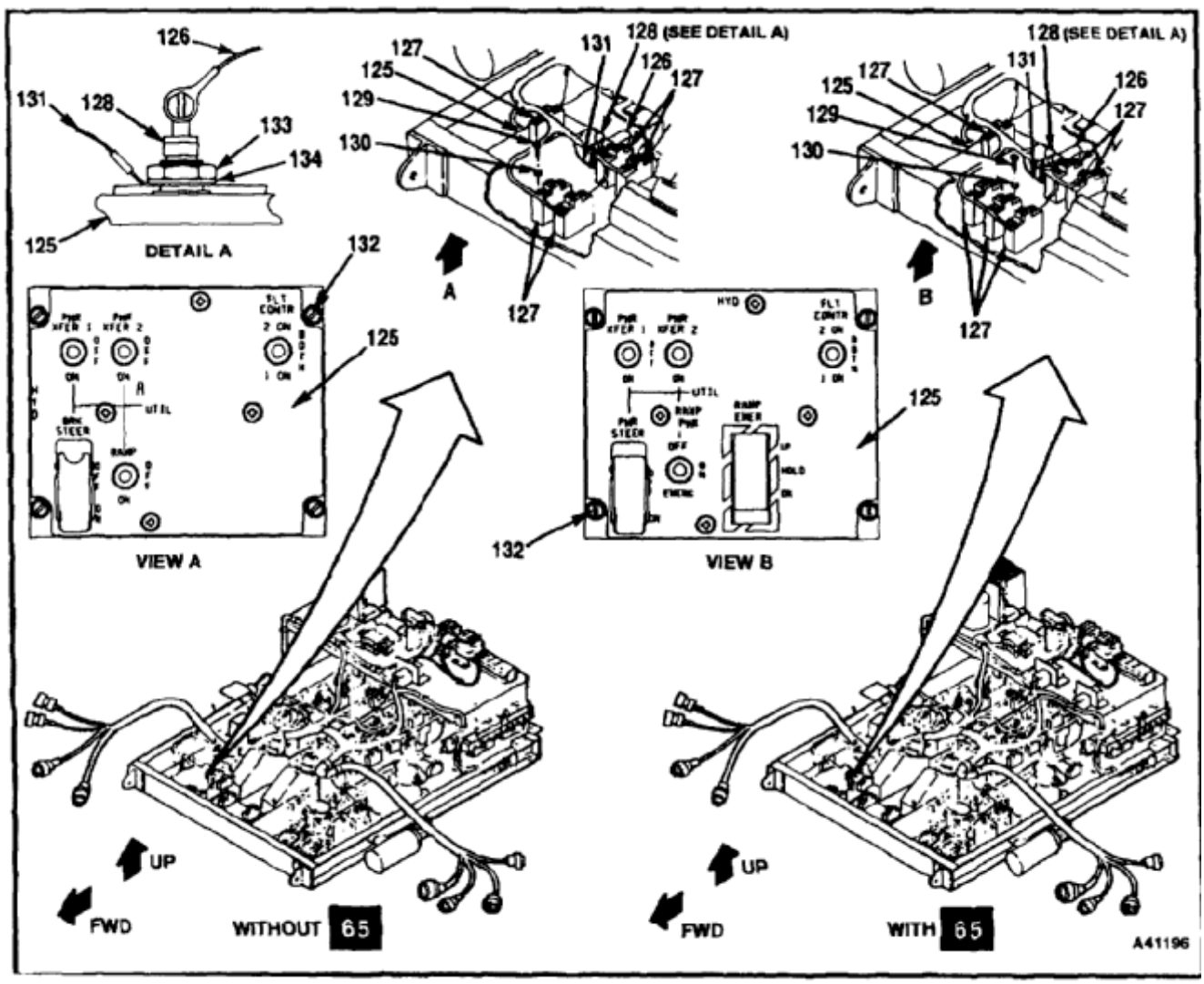
16. Remove HYD panel (125) as follows:
    a. Tag and remove 17 wires (126) from five switches (127) and one receptacle (128) by removing screws (129) and washers (130). Tape wire ends.
    b. Tag and disconnect ground wire (131) from receptacle (128) by removing nut (133) and lockwasher (134) on receptacle (see Detail A). Tape wire ends.
    c. Loosen four screws (132). Remove panel (125).

***HYD PANEL WITH 65***

17. Remove HYD panel (125) as follows:
    a. Tag and remove 24 wires (126) from six switches (127) and one receptacle (128) by removing screws (129) and washers (130). Tape wire ends.
    b. Tag and disconnect ground wire (131) from receptacle (128) by removing nut (133) and lockwasher (134) (see Detail A). Tape wire ends.
    c. Loosen four screws (132). Remove panel (125).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-98.2 INSTALL OVERHEAD PANELS IN PANEL 9-98.2

INITIAL SETUP

***Applicable Configurations:***

With 17

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

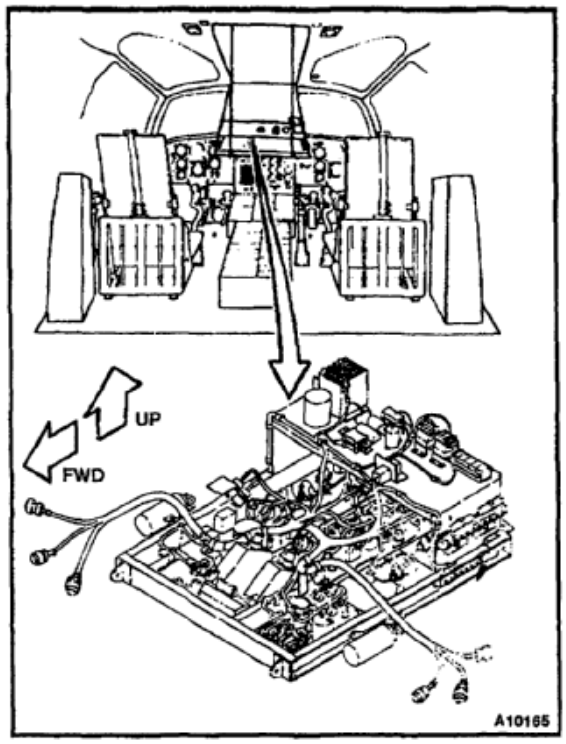
Solder (E360)

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 11-1520-240-23
Task 4-151




**NOTE**

On helicopters with 74, go to Task 4-151 or installation of FADEC panel.

CAUTION

Wires must not touch moving components; otherwise damage to wires or fire can result.

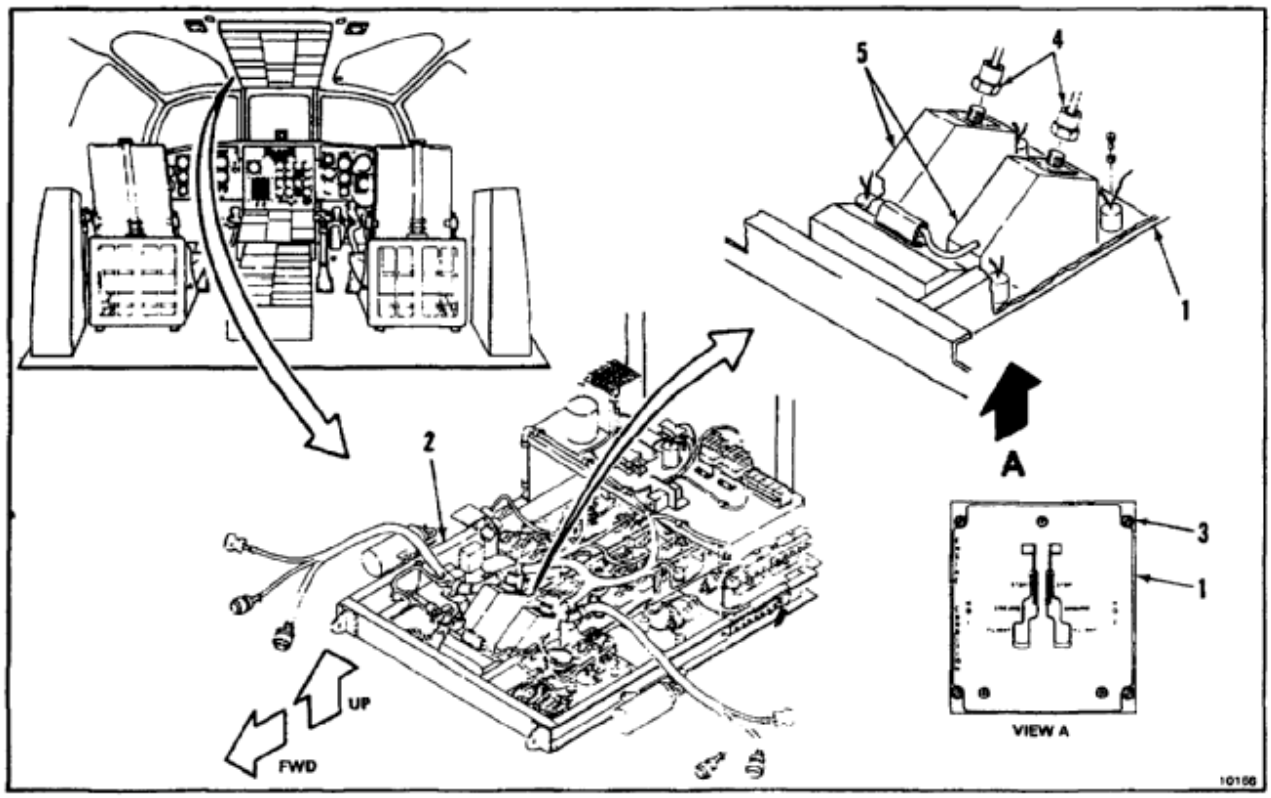
***ENG COND PANEL***

1. Install ENG COND panel (1) as follows:
   a. Position panel (1) on panel (2). Tighten four screws (3).
   b. Connect two electrical connectors (4) to two engine controls (5). Remove tags.

***INSPECT***

**NOTE**

If no other panels are to be installed, go to step 15.



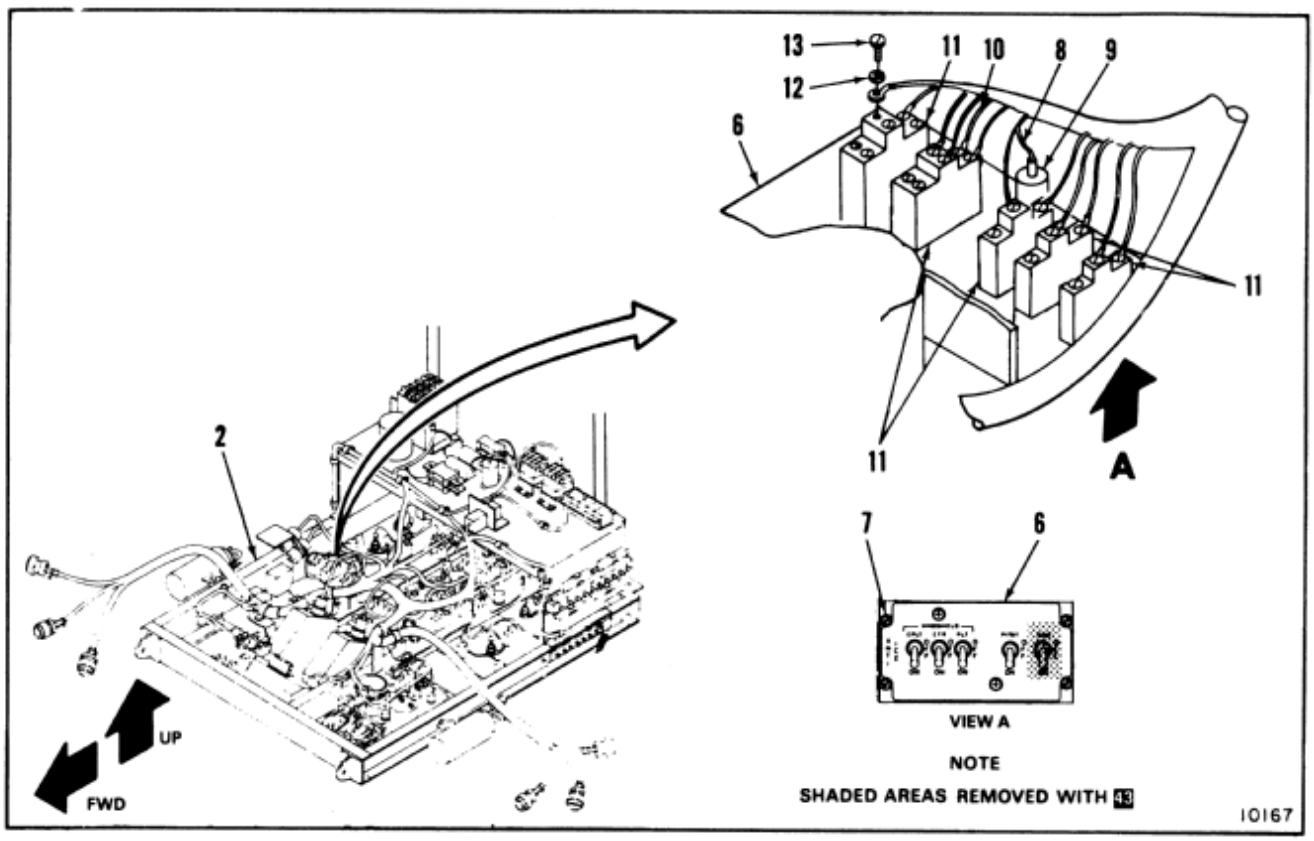
***ANTI-ICE PANEL***

2. Install ANTI-ICE panel (6) as follows:
   a. Position panel (6) on panel (2). Tighten four screws (7).
   b. Remove tape. Connect wire (8) to receptacle (9). Remove tags.
   c. Remove tape. Connect 15 wires (10) to five switches (11) by installing washers (12) and screws (13). Remove tags.

***INSPECT***

**NOTE**

If no other panels are to be installed go to step 15.



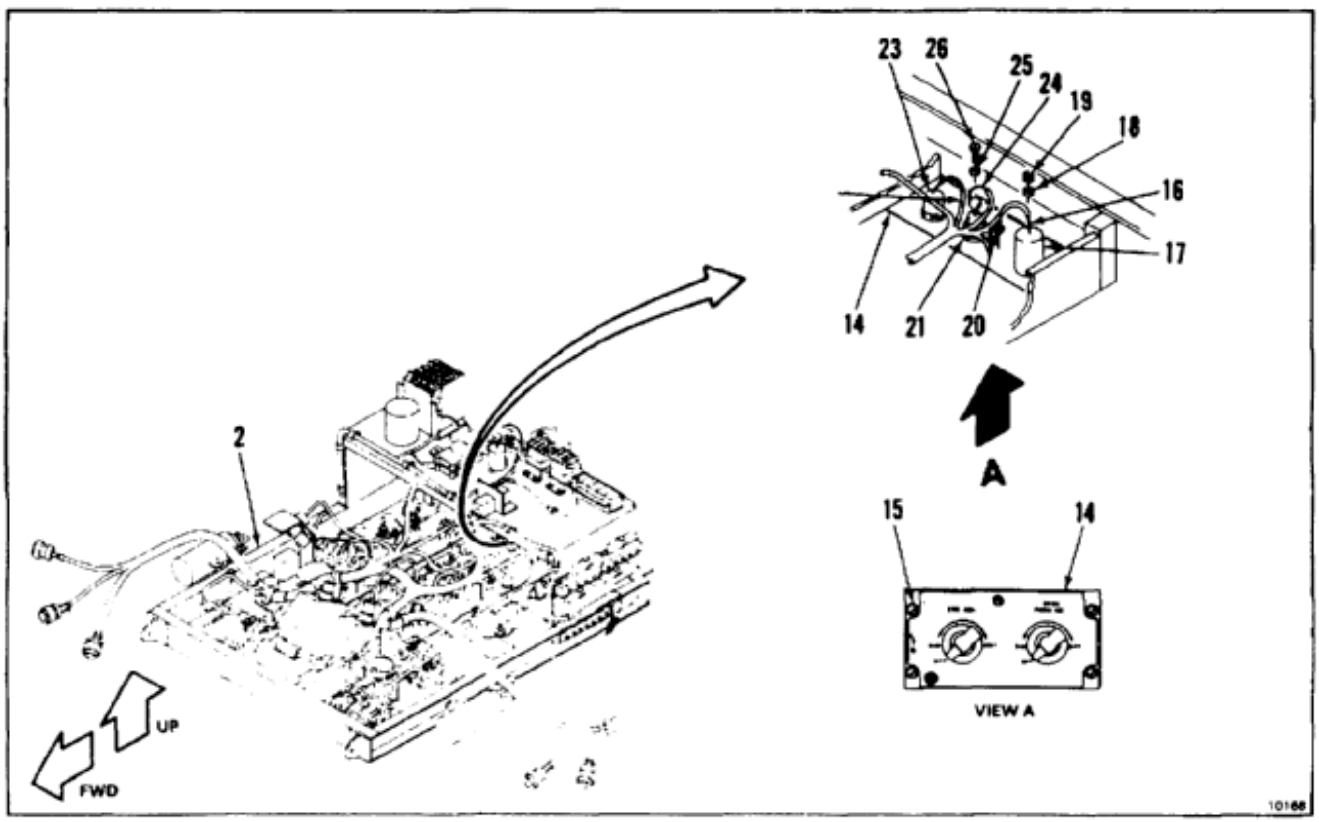
***LTG PANEL***

3. Install LTG panel (14) as follows:
   a. Position panel (14) on panel (2). Tighten four screws (15).
   b. Remove tape. Connect four wires (16) to transformer (17) by installing washers (18) and nuts (19). Remove tags.
   c. Remove tape. Connect one wire (20) to receptacle (21). Remove tags.
   d. Remove tape. Connect and solder four wires (22) to potentiometer (23). Use solder (E360). Remove tags.
   e. Remove tape and install wire (24) to receptacle (21) by installing washer (25) and screw (26). Remove tags.

***INSPECT***

**NOTE**

If no other panels are to be replaced, go to step 15.



***EXT LTG PANEL***

4. Install EXT LTG panel (27) as follows:

   a. Position panel (27) on panel (2). Tighten four screws (28).

   b. Remove tape. Connect two wires (29) to switch (30). Remove tags.

   c. Remove tape. Connect six wires (31) to four resistors (32) by installing washers (33) and screws (34). Remove tags.

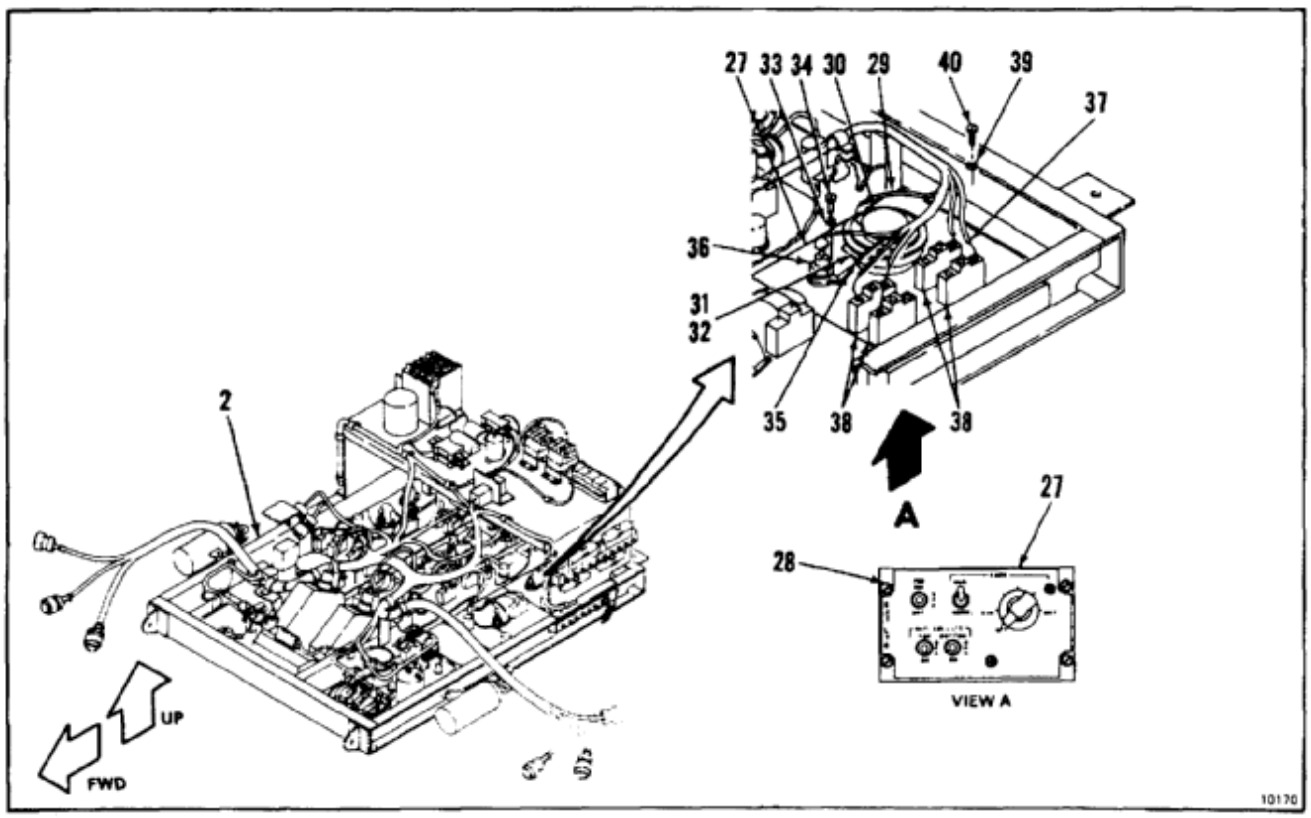
   d. Remove tape. Connect wire (35) to receptacle (37). Remove tags.

   e. Remove tape. Connect 18 wires (37) to four switches (38) and one receptacle (36) by installing washers (39) and screws (40). Remove tags.

***INSPECT***

**NOTE**

If no other panels are to be replaced, go to step 15.



***CPLT LTG PANEL***

5. Remove CPLT LTG panel (41) as follows:

   a. Position panel (41) on panel (2). Tighten four screws (42).

   b. Remove tape. Connect wire (43) to receptacle (44). Remove tags.

   c. Remove tape. Connect wire (45) to receptacle (44) by installing washer (46) and screw (47). Remove tape.

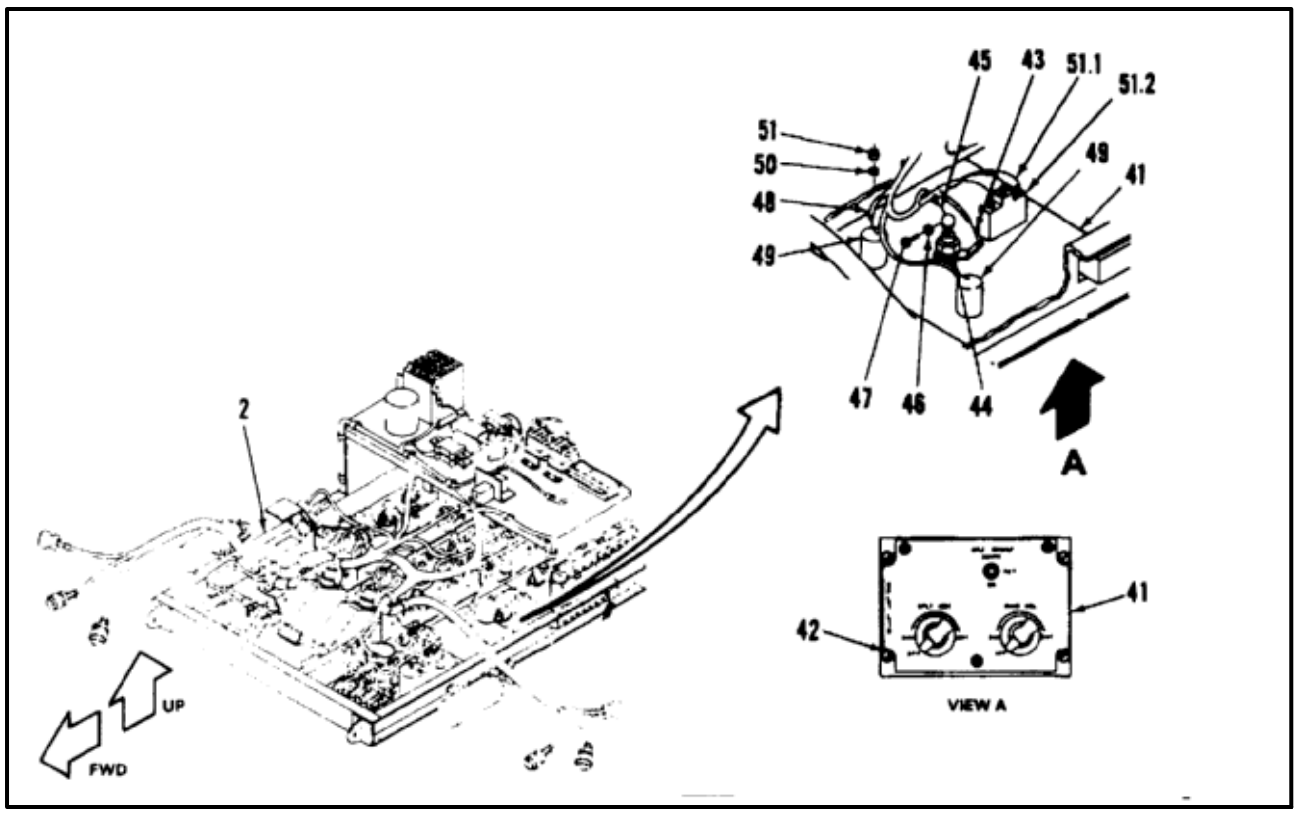
   d. Remove tape. Connect seven wires (48) to two transformers (49) by installing washers (50) and nuts (51). Remove tags.

   e. Connect three wires (51.1) to switch (51.2). Remove tags.

***INSPECT***

**NOTE**

If no other panels are to be replaced, go to step 15.



***TROOP WARN/HTG PANEL***

6. Install TROOP WARN/HTG panel (52) as follows:

   a. Position panel (52) on panel (2). Tighten four screws (53).

   b. Remove tape. Connect wire (54) to receptacle (55). Remove tags.

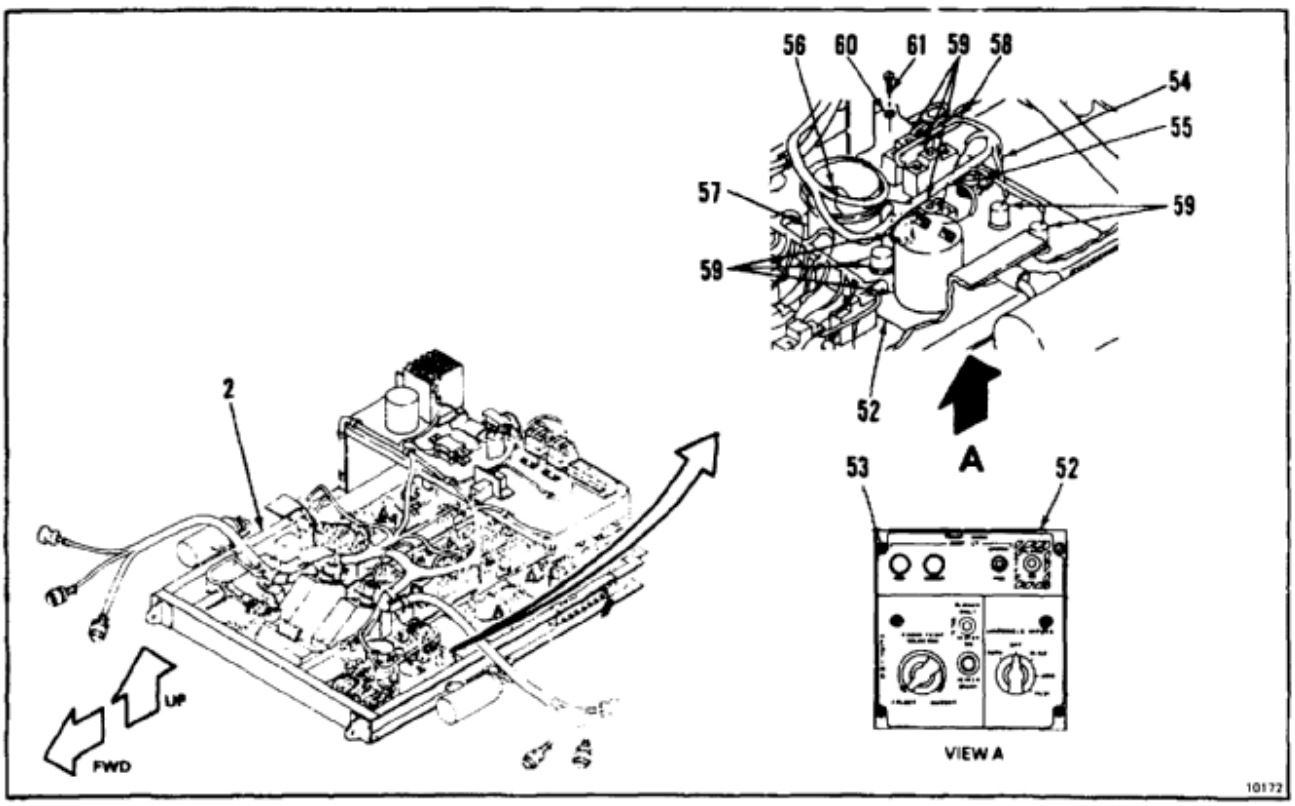
   c. Remove tape. Connect and solder six wires (56) to switch (57). Use solder (E360). Remove tags.

   d. Remove tape. Connect 26 wires (58) to eight switches (59) and one receptacle (55) by installing washers (60) and screws (61). Remove tags.

***INSPECT***

**NOTE**

If no other panels are to be replaced, go to step 15.



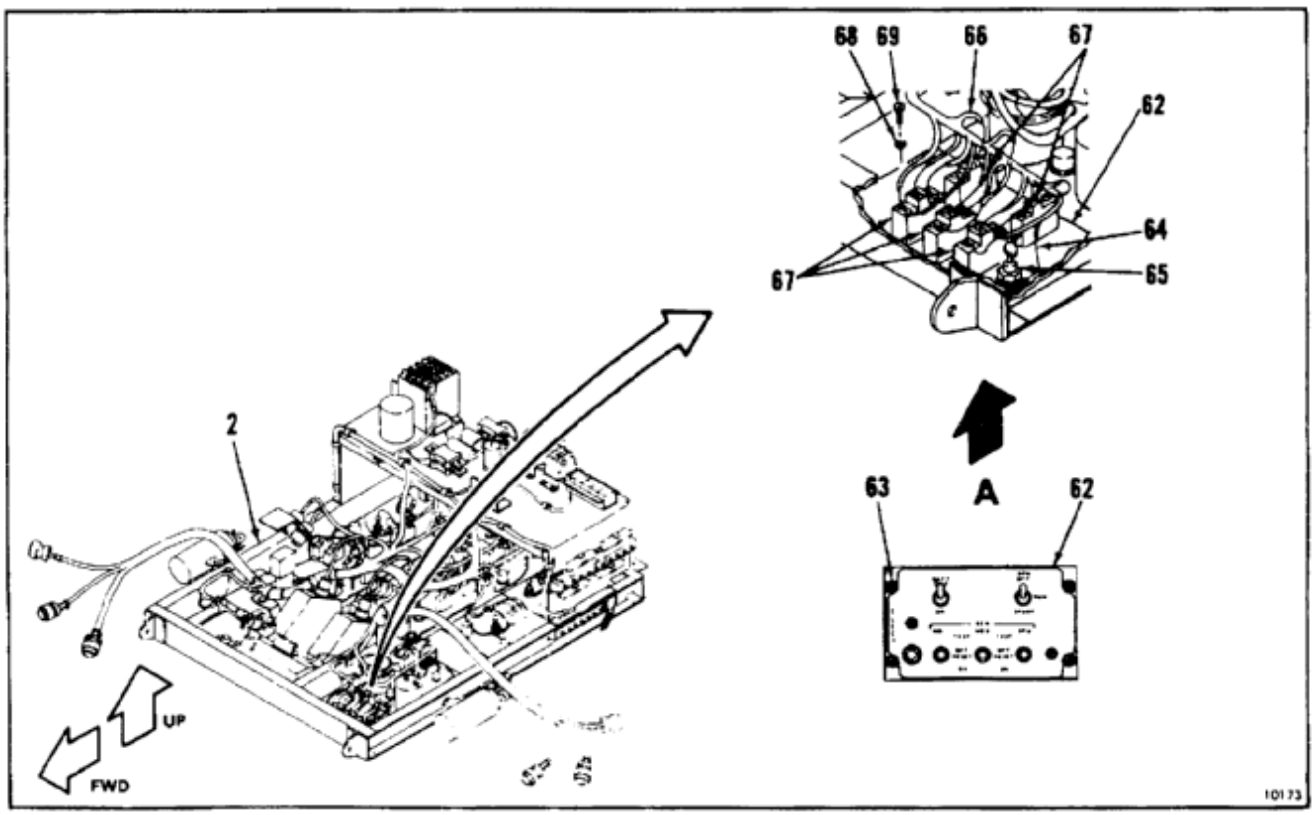
***ELECT PANEL***

7. Install ELECT panel (62) as follows:
   a. Position panel (62) on panel (2). Tighten four screws (63).
   b. Remove tape. Connect wire (64) to receptacle (65). Remove tags.
   c. Remove tape. Connect 23 wires (66) to five switches (67) and one receptacle (65) by installing washers (68) and screws (69). Remove tags.

***INSPECT***

**NOTE**

If no other panels are to be replaced, go to step 15.



***FUEL CONTR PANEL***

8. Install FUEL CONTR panel (70) as follows:

   a. Position panel (70) on panel (2). Tighten six screws (71).

   b. Remove tape. Connect wire (72) to receptacle (73) by installing washer (74) and screw (75). Remove tag.

   c. Remove tape. Connect wire (76) to receptacle (73). Remove tag.

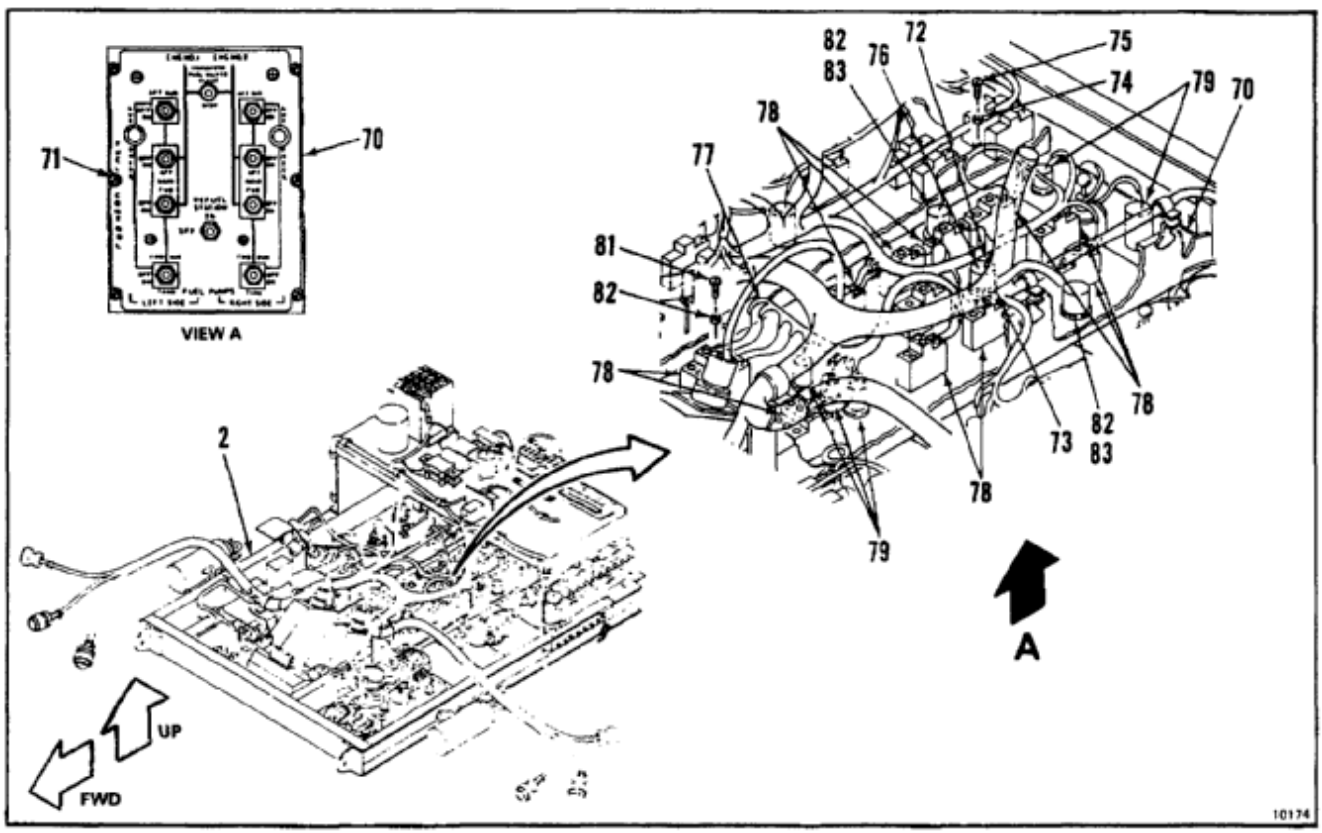
   d. Remove tape. Connect 40 wires (77) to 10 switches (78) and five receptacles (79) by installing washers (80) and screws (81). Remove tags.

   e. Remove tape. Connect and solder six wires (82) from two receptacles (83). Use solder (E360). Remove tags.

***INSPECT***

**NOTE**

If no other panels are to be replaced, go to step 15.



***START PANEL WITHOUT 74***

9. Install START panel (84) as follows:

   a. Position panel (84) on panel (2). Tighten four screws (85).

   b. Remove tape. Connect wire (86) to receptacle (87). Remove tag.

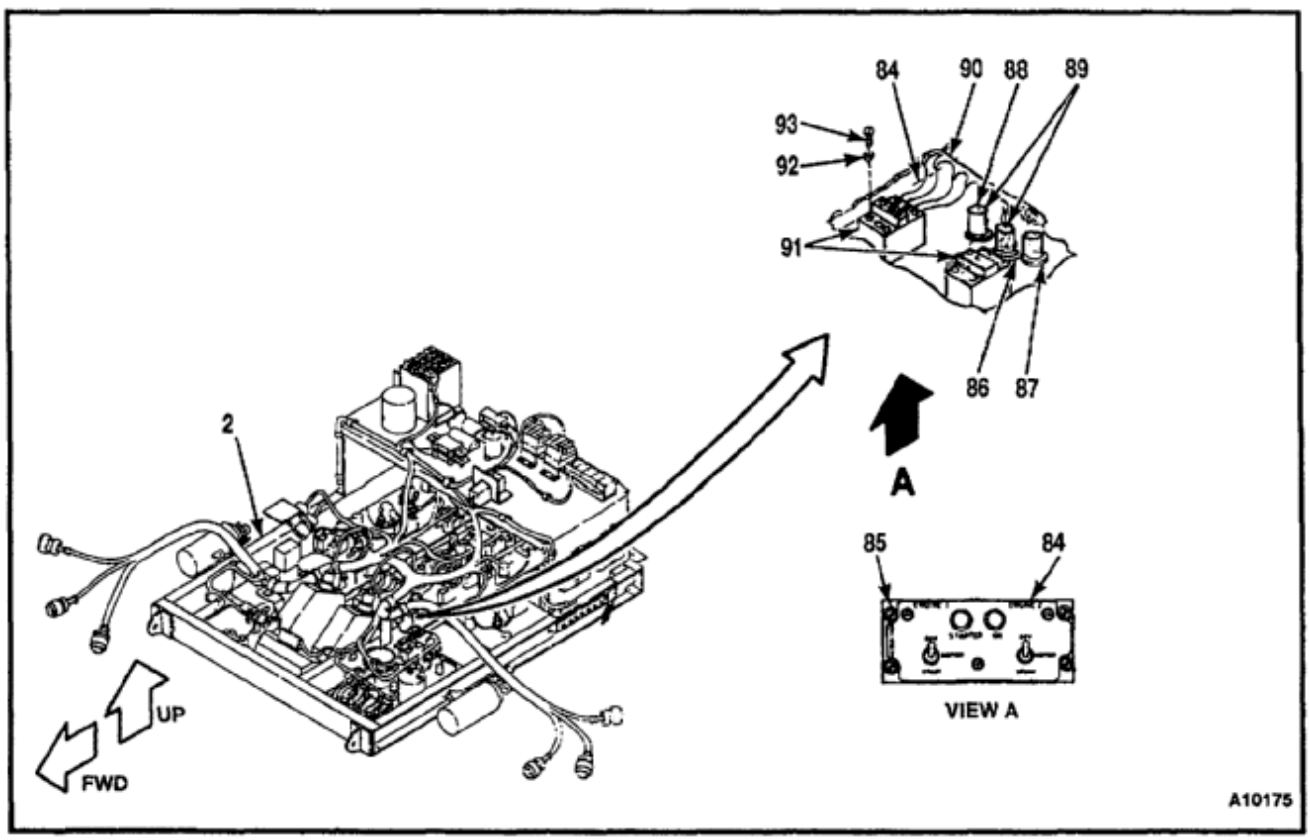
   c. Remove tape. Connect and solder six wires (88) to two receptacles (89). Use solder (E360). Remove tags.

   d. Remove tape. Connect 23 wires (90) to two switches (91) and one receptacle (87) by installing washers (92) and screws (93). Remove tags.

***INSPECT***

**NOTE**

If no other panels are to be replaced, go to step 15.



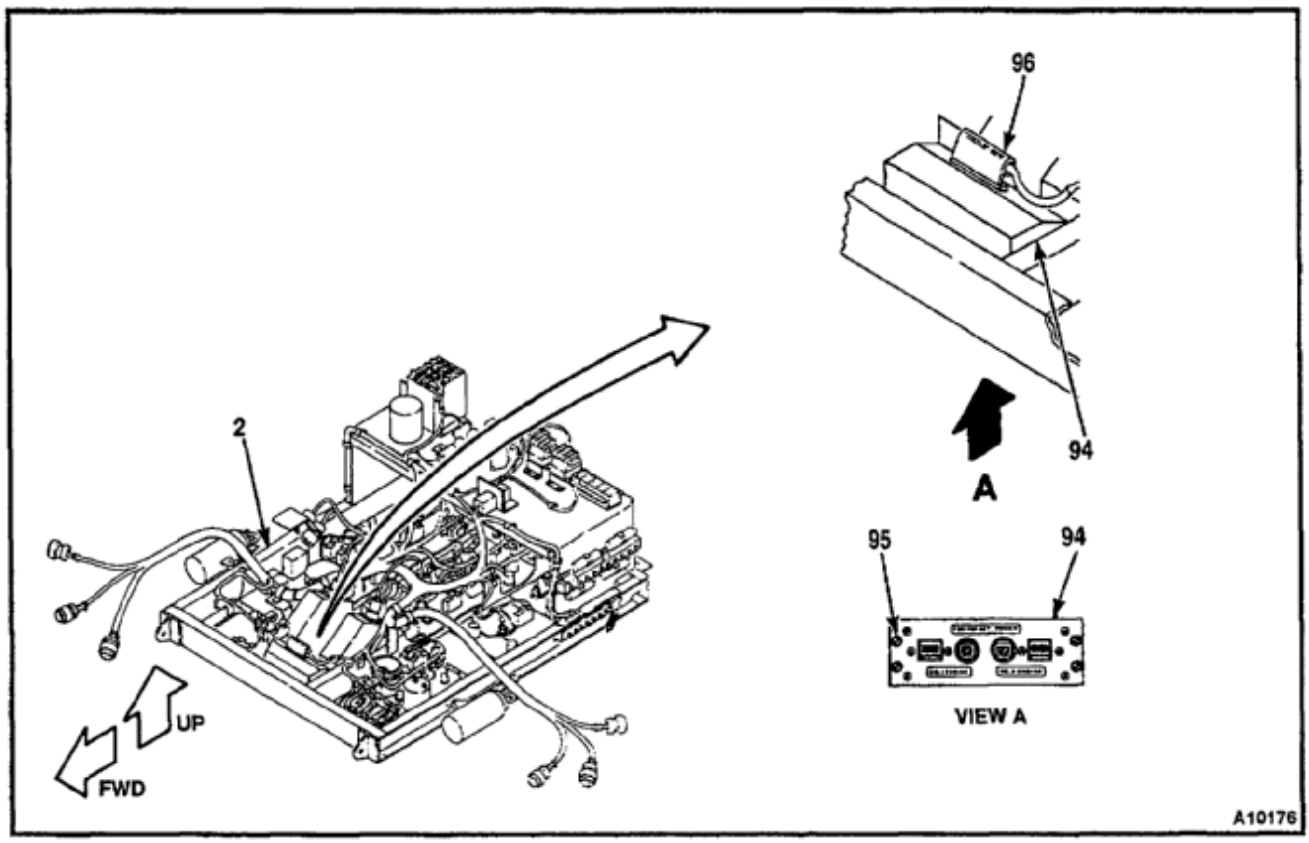
***EMERGENCY POWER PANEL WITHOUT 74***

10. Install EMERGENCY POWER panel (94) as follows:
    a. Position panel (94) on panel (2). Tighten four screws (95).
    b. Connect plug (96) to panel (94).

***INSPECT***

**NOTE**

If no other panels are to be replaced, go to step 15.



***INTR LTG PANEL***

11. Install INTR LTG panel (97) as follows:

    a. Position panel (97) on panel (2). Tighten four screws (98).

    b. Remove tape. Connect and solder five wires (99) to potentiometer (100). Remove tags.

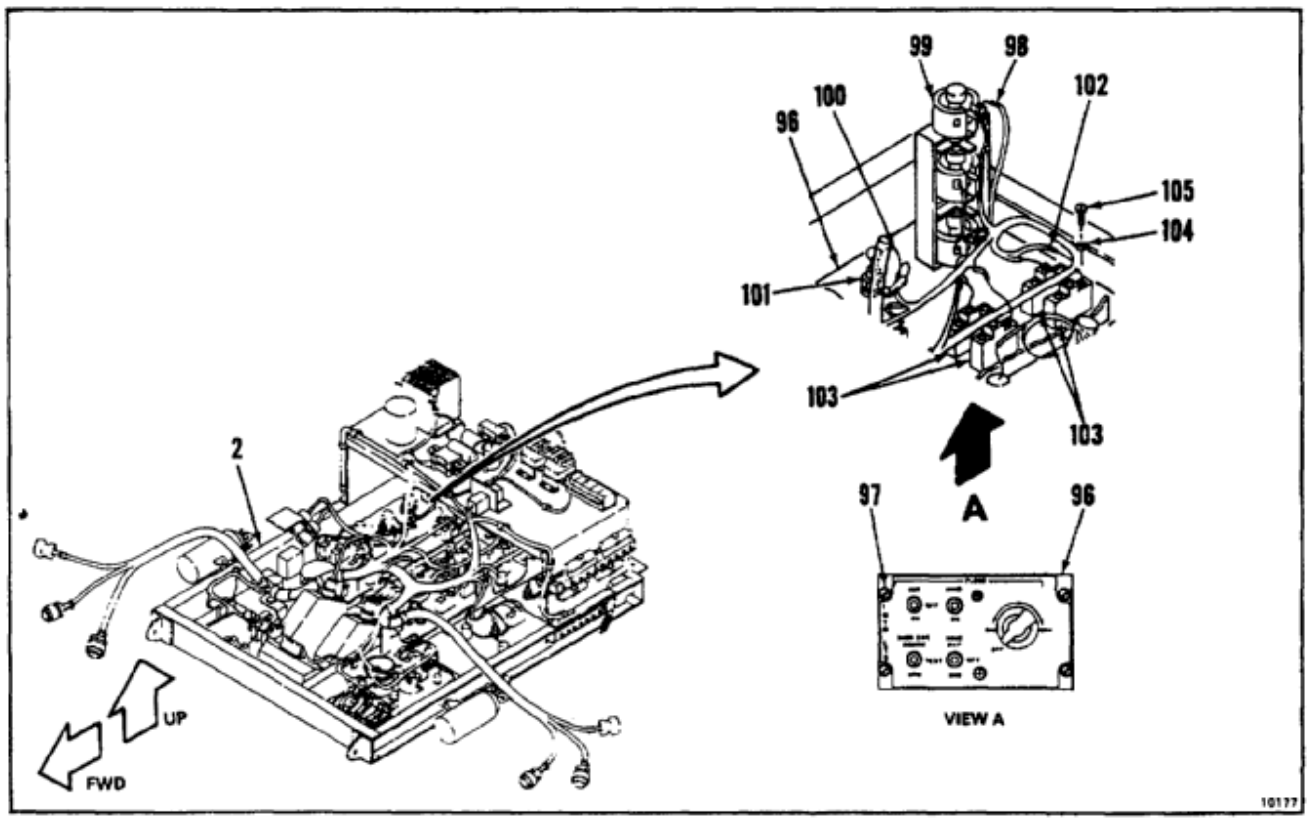
    c. Remove tape. Connect wire (101) to receptacle (102). Remove tag.

    d. Remove tape. Connect 17 wires (103) to four switches (104) and one receptacle (102) by installing washers (105) and screws (106). Remove tags.

***INSPECT***

**NOTE**

If no other panels are to be replaced, go to step 15.



***PLT LTG PANEL***

12. Install PLT LTG panel (107) as follows:

    a. Position panel (107) on panel (2). Tighten four screws (108).

    b. Remove tape. Connect wire (109) to each of two receptacles (110). Remove tag.

    c. Remove tape. Connect wire (111) to receptacle (110) by installing washer (112) and screw (113). Remove tag.

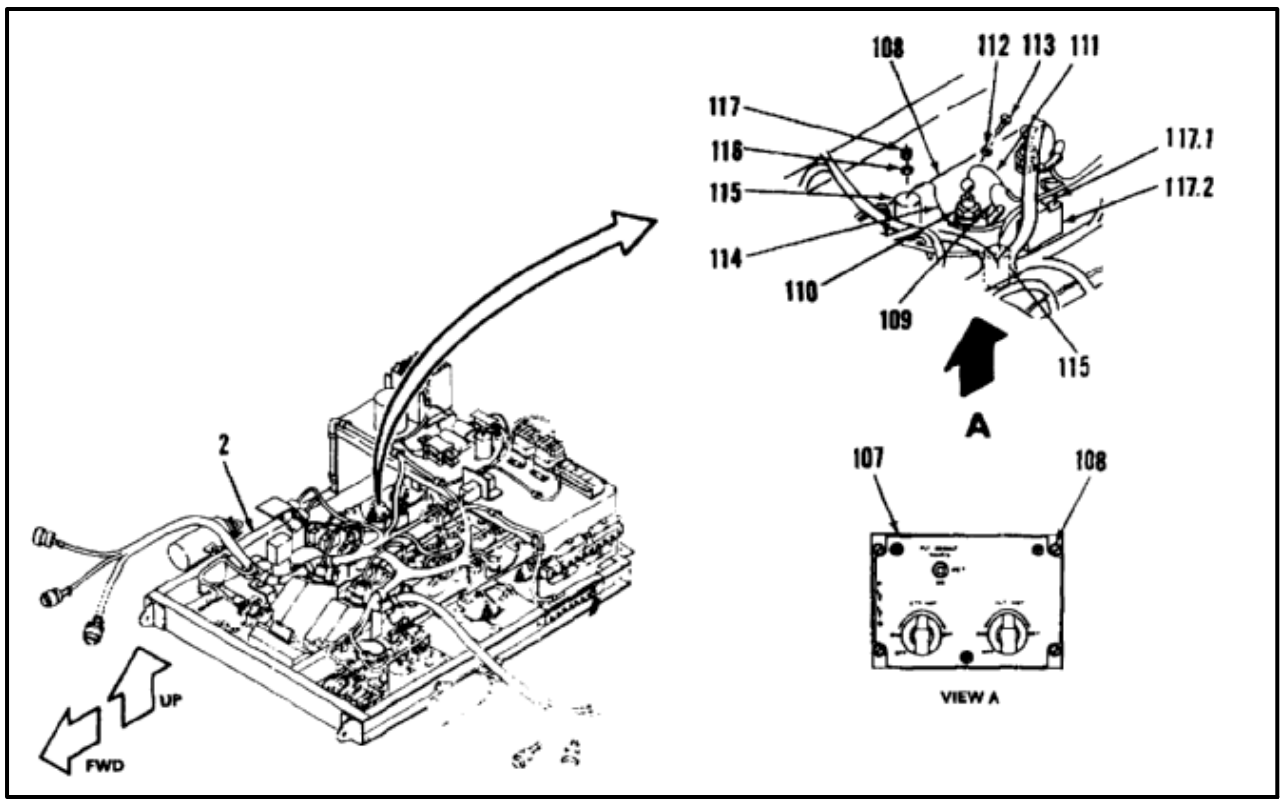
    d. Remove tape. Connect seven wires (114) to two transformers (115) by installing washers (116) and nuts (117). Remove tags.

    e. Connect three wires (117.1) to switch (117.2). Remove tags.

***INSPECT***

**NOTE**

If no other panels are to be replaced, go to step 15.



*HOIST/CARGO HOOK PANEL*

13. Install HOIST/CARGO HOOK panel (118) as follows:

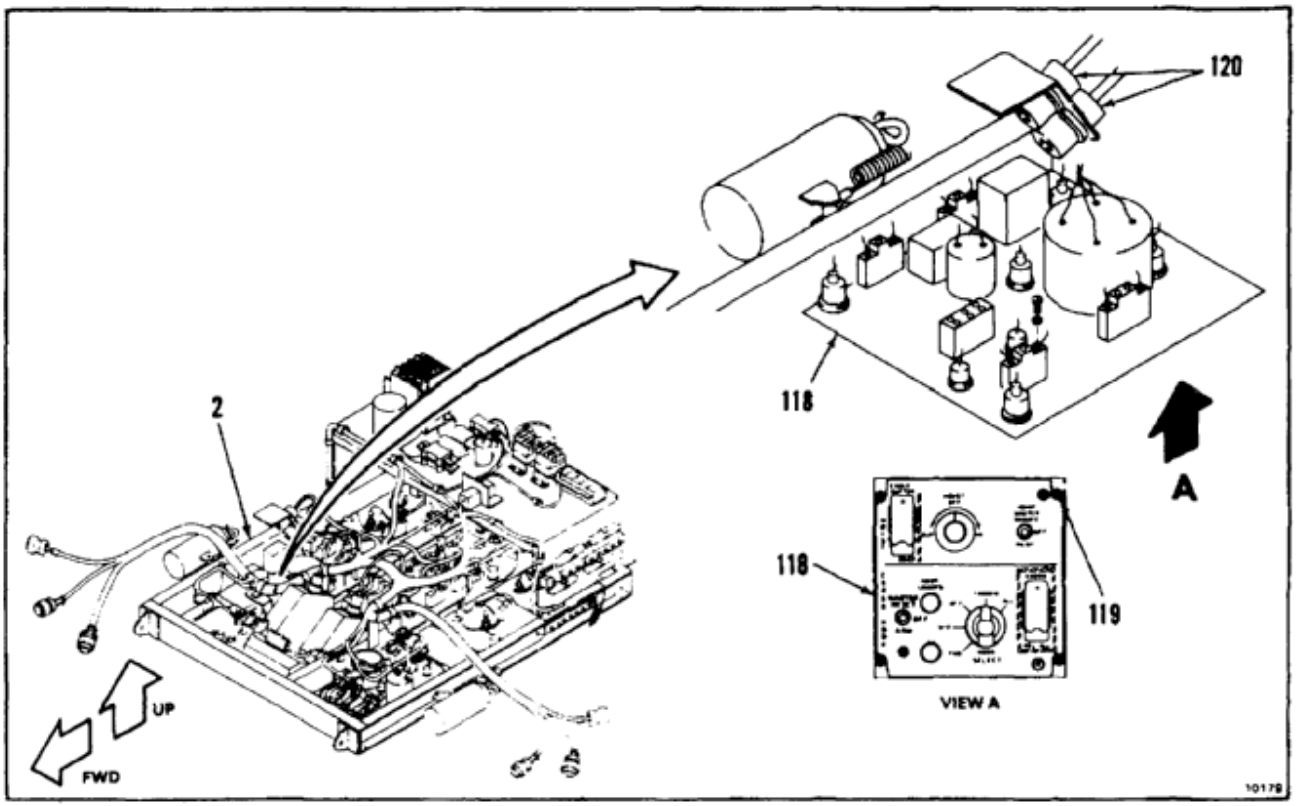
    a. Position panel (118) on panel (2). Tighten four screws (119).

    b. Connect two plugs (120) to panel (118). Remove tags.

*INSPECT*

**NOTE**

If no other panels are to be replaced, go to step 15.



***HYDRAULIC PANEL WITHOUT 65***

14. Install HYDRAULIC panel (121) as follows:

    a. Position panel (121) on panel (2). Tighten four screws (122).

    b. Remove tape. Install ground wire (123) on receptacle (124) with nut (124.1) and lockwasher (124.2). Make sure wire terminal is against metal panel. Remove tag.

    c. Remove tape. Connect 17 wires (125) to five switches (126) and one receptacle (124) by installing washers (127) and screws (128). Remove tags.

***HYDRAULIC PANEL WITH 65***

14.1. Install HYDRAULIC panel (121) as follows:

    a. Position panel (121) on panel (2). Tighten four screws (122).

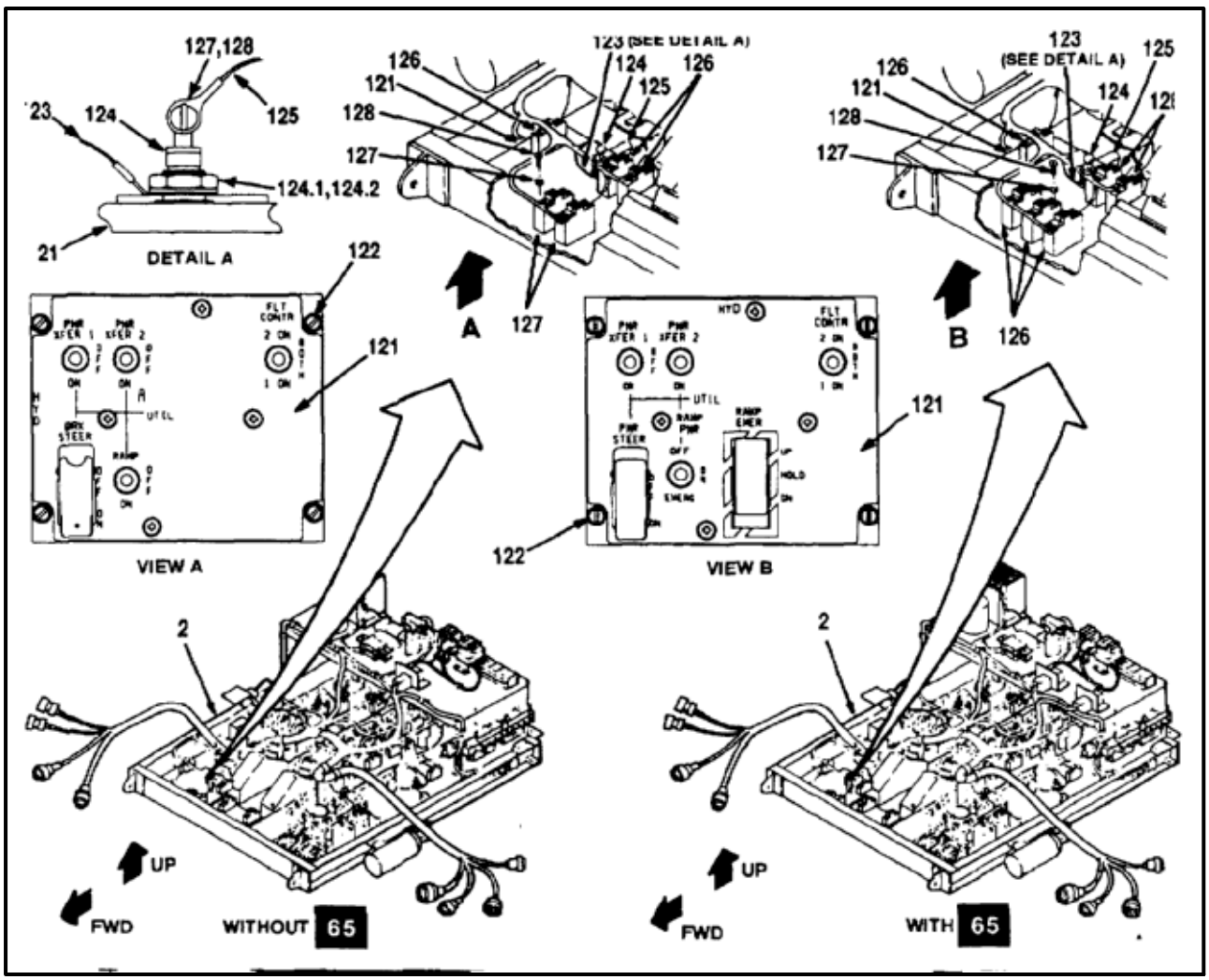
    b. Remove tape. Install ground wire (123) on receptacle (124) with nut (124.1) and lockwasher (124.2). Make sure wire terminal is against metal panel. Remove tag.

    c. Remove tape. Connect 24 wires (125) to six switches (126) and one receptacle (124) by installing washers (127) and screws (128). Remove tags.

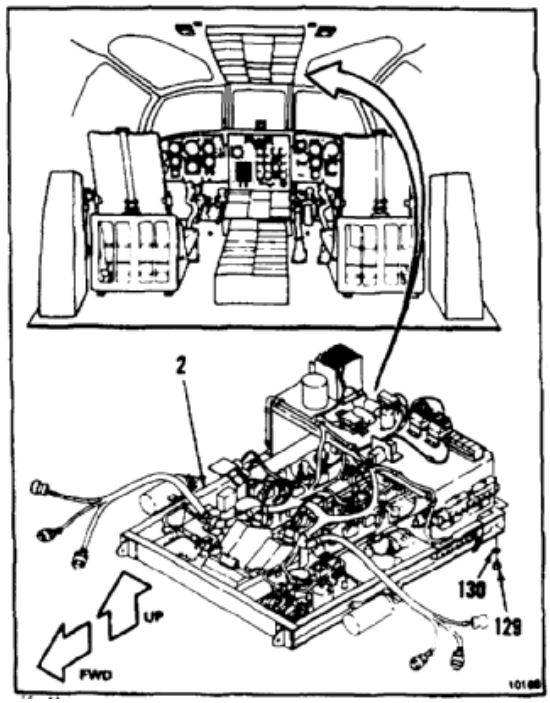
***INSPECT***

**NOTE**

If no other panels are to be replaced, go to step 15.



15. Raise panel (2). Install two bolts (129) and washers (130).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).

END OF TASK

## 9-98.3 REPAIR OVERHEAD PANELS 9-98.3

INITIAL SETUP

***Applicable Configurations:***

With 17

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun
Heat Gun

***Materials:***

Tape (E395)
Tags (E264)
Solder (E360)
Tubing (E431)

***Personnel Required:***

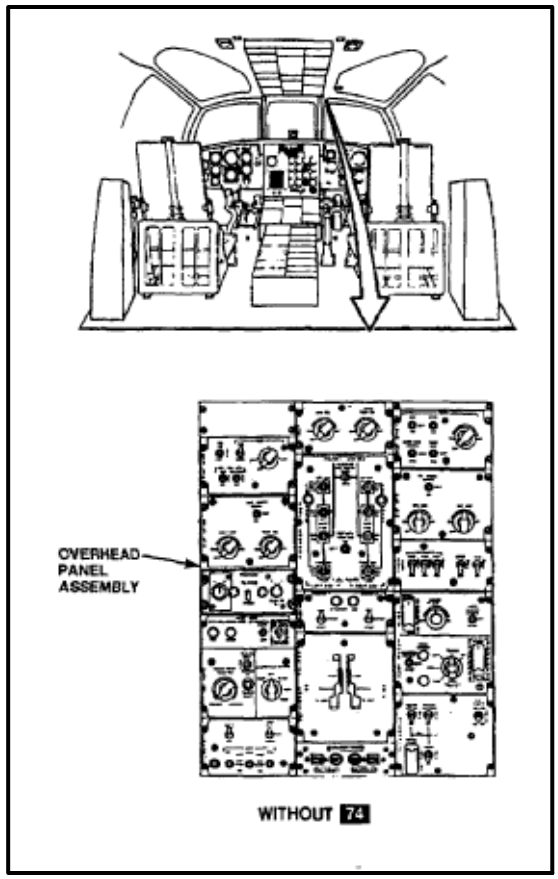
Aircraft Electrician

***References:***

Task 9-98.1
Task 9-98.2
TM 55-1520-240-23P

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off



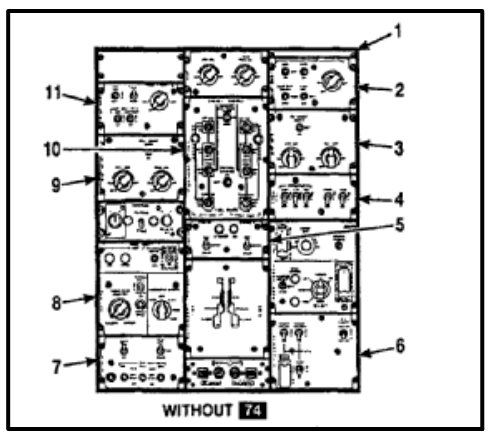

**NOTE**

FADEC panel, helicopters with 74 is repaired the same as panels shown.

1. On helicopters without 74, repair the following panels on overhead panel (1) by replacing individual defective components.

**NOTE**

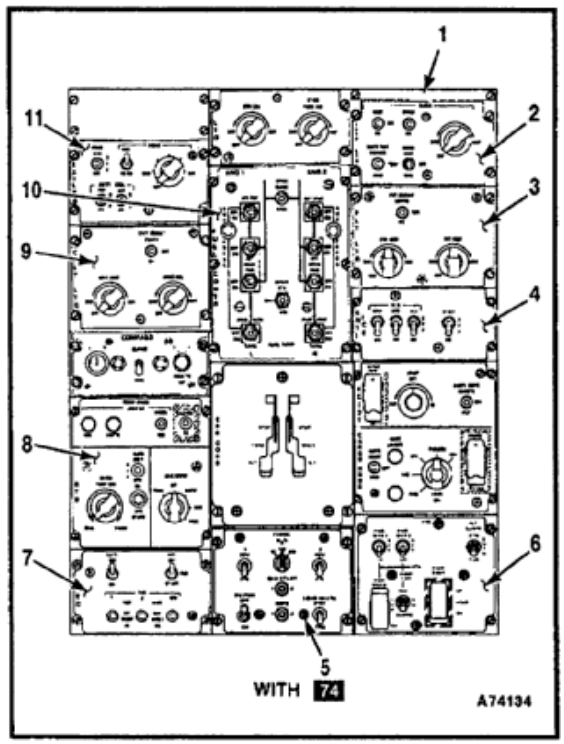
Panels depicted are typical for use in identifying position of panels on overhead panel. HYD panel shown is on aircraft with 65. Refer to Task 9-98.1 or 9-98.2 for HYD panel on aircraft without 65.




. INTR LTG (2)
PLT LTG (3)
ANTI-ICE (4)
ENGINE START (5)
HYD(6)
ELECT (7)
TROOP WARN/HEATING (8)
CPLT LTG (9)
FUEL CONTROL (10)
EXT LTG(11)

1.1. On helicopters with 74, repair the following panels on overhead panel (1) by replacing individual defective components:

INTR LTG (2)
PLT LTG (3)
ANTI-ICE (4)
FADEC (5)
HYD (6)
ELECT (7)
TROOP WARN/HTG (8)
CPLT LTG (9)
FUEL CONTR (10)
EXT LTG (11)



*LIGHT PLATE*

**NOTE**

The lightplate on all panels is replaced in the same manner. TROOP WARN/HEATING panel shown here.

2. Remove lightplate (12) as follows:

   a. If installed, remove knobs (13) by loosening setscrew (14). Unscrew lamps (15).

**NOTE**

White cross on face of lightplate indicates location of electrical plug.

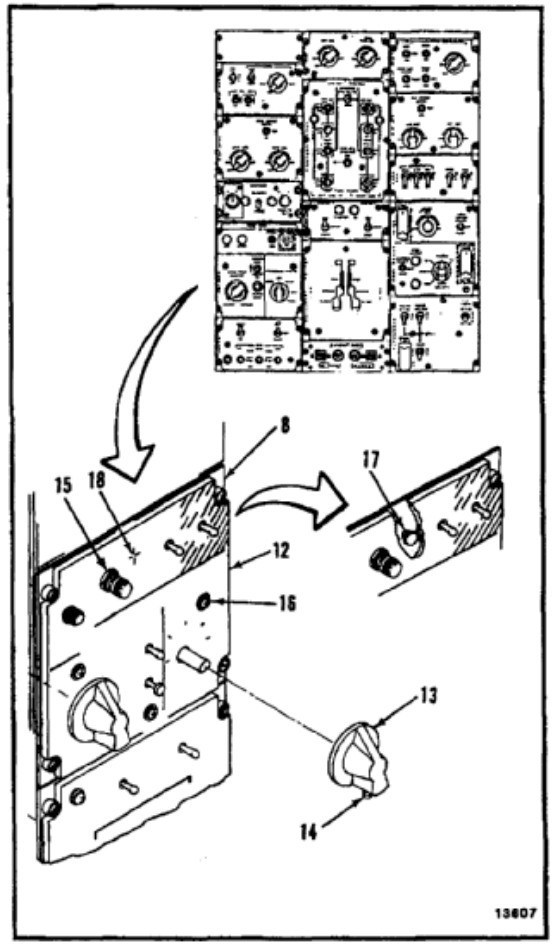
   b. Loosen captive screws (16). Carefully pull lightplate (12) away from panel (8) to separate lightplate from connector (17) behind white cross (18).

3. Install lightplate (12) as follows:

   a. Align cross (18) on lightplate with connector (17). Push plug behind cross into connector. Press on cross to ensure plug is seated.

   b. Tighten captive screws (16).

   c. If applicable, install knobs (13). Tighten knob setscrew (14). Install lamps (15).

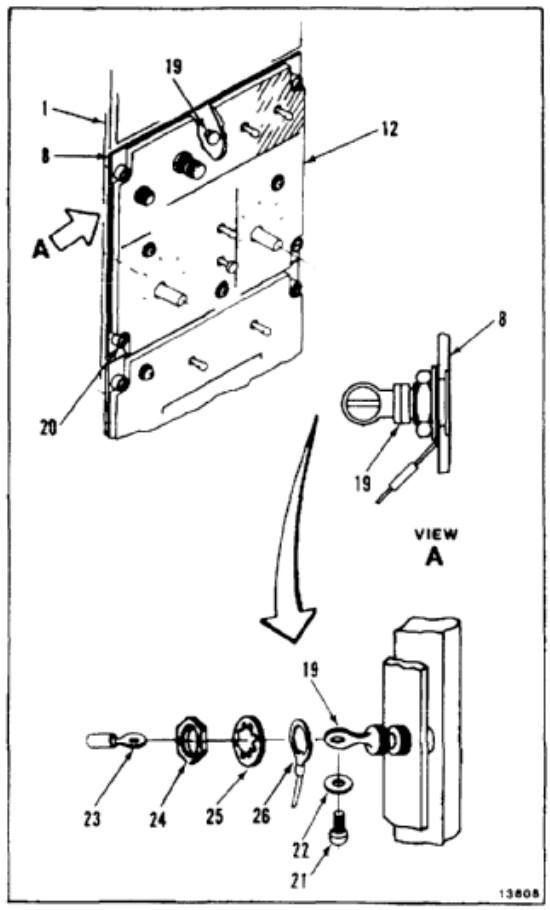


*RECEPTACLE*

**NOTE**

The receptacle in all panels is replaced in the same manner. TROOP WARN/HEATING panel shown here.

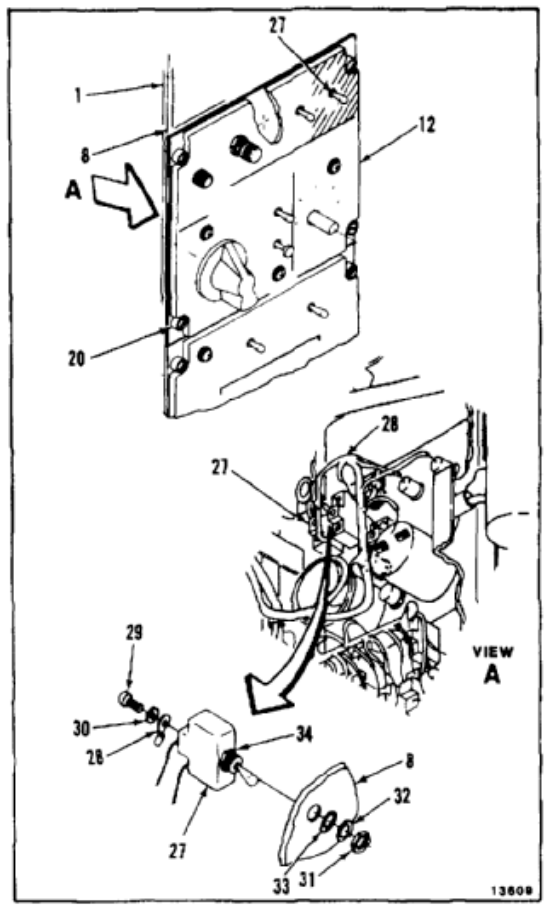
4. Remove receptacle (19) as follows:
   a. Remove lightplate (12). (Refer to step 2.)
   b. Turn fasteners (20) **1/4 turn** counterclockwise. Pull panel (8) away from overhead panel (1) far enough to gain access to receptacle (19).
   c. Remove screw (21) and washer (22). Remove wire (23). Tag wire with tag (E264).
   d. Remove nut (24), lockwasher (25), and ground lug (26).
   e. Remove receptacle (19) from panel (8).
5. Install receptacle (19) as follows:
   a. Insert a serviceable receptacle (19) in panel (8).
   b. Inspect wire on ground lug (26). Install lug, lockwasher (25), and nut (24) on receptacle (19).
   c. Inspect wire (23). Install wire, washer (22), and screw (21). Remove tag.
   d. Position panel (8) on overhead panel (1). Turn fasteners (20) **1/4 turn** clockwise to secure panel.
   e. Install lightplate (12). (Refer to step 3.)



*TOGGLE SWITCHES*

**NOTE**

Toggle switches on all panels are replaced in the same manner. TROOP WARN/HEATING panel shown here.

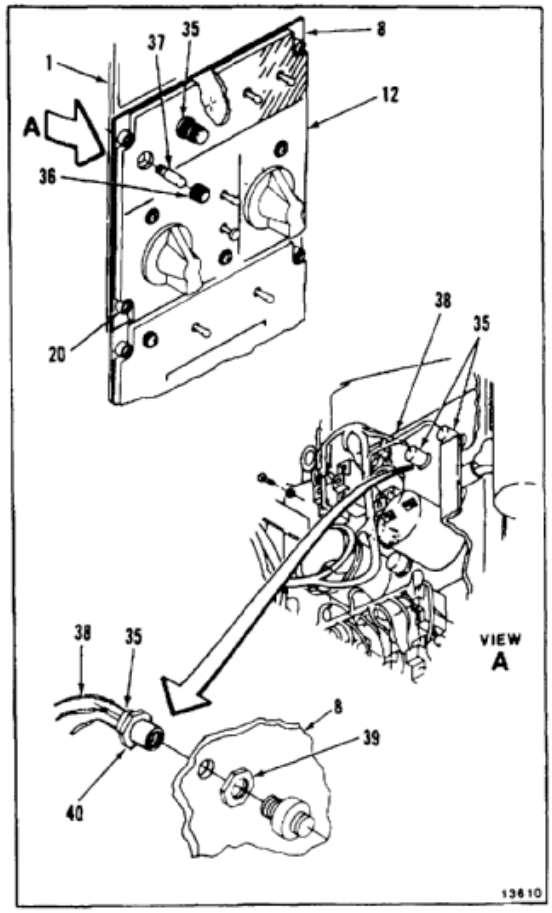



6. Remove switch (27) as follows:
   a. Remove lightplate (12). (Refer to step 2.)
   b. Turn fasteners (20) **1/4 turn** counterclockwise. Pull panel (8) away from overhead panel (1) far enough to gain access to switch (27).
   c. Tag wires (28). Use tags (E264). Remove screws (29), washers (30), and wires.
   d. Remove nut (31), lockwasher (32), and locking ring (33) from front of panel (8). Remove switch (27) from back of panel (8).
7. Install switch (27) as follows:
   a. Remove top nut (31), lockwasher (32), and locking ring (33) from serviceable switch (27). Adjust locknut (34) to same position as on removed switch.
   b. Insert switch (27) through back of panel (8). Install locking ring (33), lockwasher (32), and nut (31) from front of panel.
   c. Inspect wires (28). Install wires, washers (30), and screws (29) on switch (27). Remove tags.
   d. Position panel (8) on overhead panel (1). Turn fasteners (20) **1/4 turn** clockwise to secure panel.
   e. Install lightplate (12). (Refer to step 3.)

***PRESS-TO-TEST LIGHT ASSEMBLIES***

**NOTE**

Press-to-test light assemblies are on the FUEL CONTROL, ENGINE START, and TROOP WARN/HEATING panels. All are replaced in the same manner. TROOP WARN/HEATING panel shown here.




8. Remove light assembly (35) as follows:
   a. Remove lightplate (12). (Refer to step 2.)
   b. Remove cap (36) and bulb (37).
   c. Turn fasteners (20) **1/4 turn** counterclockwise. Pull panel (8) away from overhead panel (1), far enough to gain access to assembly (35).
   d. Tag wires (38). Use tags (E264). Cut wires close to soldered joints.
   e. Remove nut (39) at front of panel (8). Remove assembly (35).
9. Install light assembly (35) as follows:
   a. Remove cap (36), bulb (37), and nut (39) from serviceable assembly (35). Adjust locknut (40) to same position as on removed assembly.
   b. Insert assembly (35) through back of panel (8). Install nut (39) from front of panel.
   c. Solder wires (38) to lugs on assembly (35). Use heat-shrinkable tubing over connections. Remove tags from wires.
   d. Install bulb (37) and cap (36).
   e. Position panel (8) on overhead panel (1). Turn fasteners (20) **1/4 turn** clockwise to secure panel.
   f. Install lightplate (12). (Refer to step 3.)

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-98.4 REMOVE OVERHEAD PANEL MODULE 9-98.4

INITIAL SETUP

***Applicable Configurations:***

With 17

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Contact Insertion/Removal Tool, M83721-31-20
Module Extraction Tool CTJ-ROO

***Materials:***

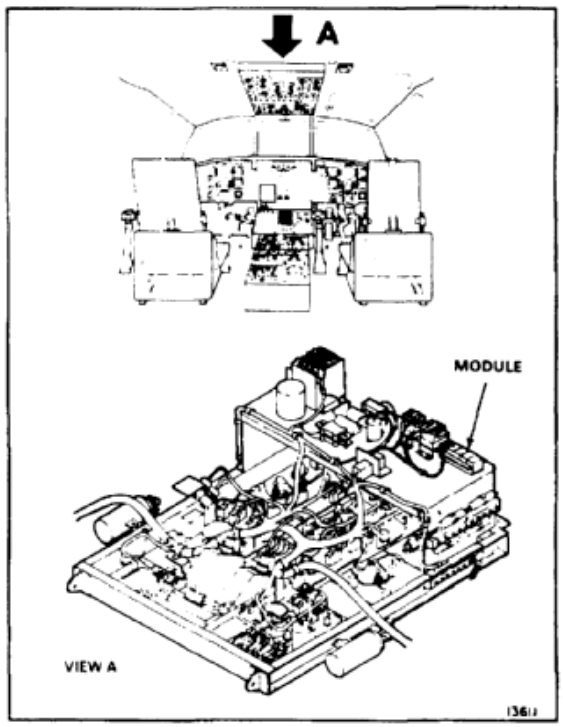
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

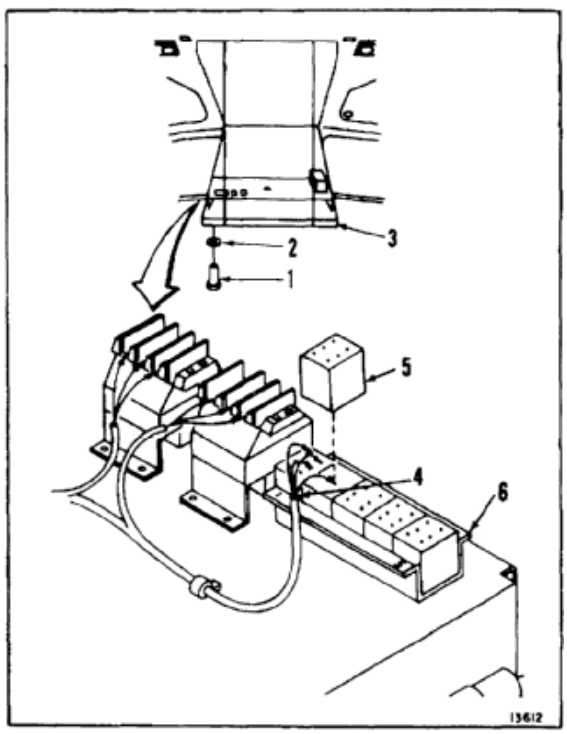
Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




1. Remove two bolts (1) and washers (2) from panel (3). Lower panel.
2. Tag and remove wires (4) from module (5). Use contact insertion/removal tool.
3. Tape wire ends. Use tape (E385).
4. Remove module (5) from terminal rail (6). Use module extraction tool.




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-98.5 INSTALL OVERHEAD PANEL MODULE 9-98.5

INITIAL SETUP

***Applicable Configurations:***

With **17**

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Contact Insertion/Removal Tool, M83723-31-30

***Materials:***

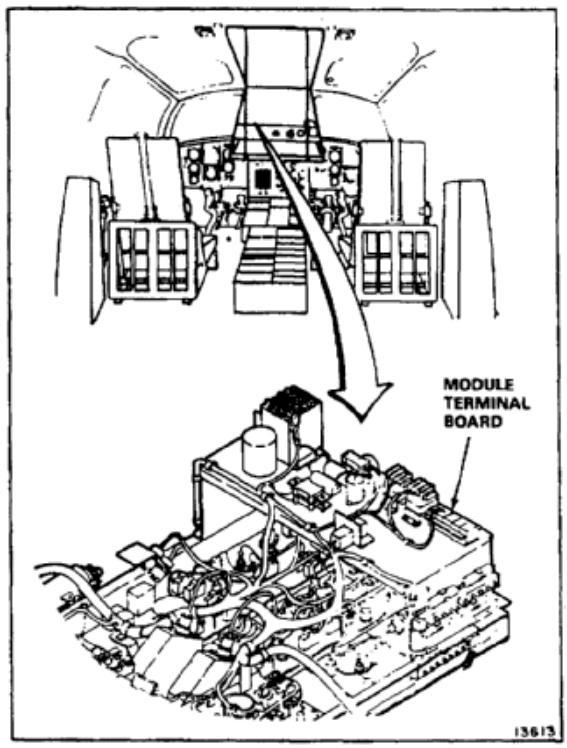
None

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P




**CAUTION**

Wires must not touch moving components. Damage to wires or a short circuit can result.

**NOTE**

If a click is not heard, module is not seated.

1. Remove tape from wires (3).
2. Install wires (3) in module (1). Use a contact/insertion removal tool. Remove tags.

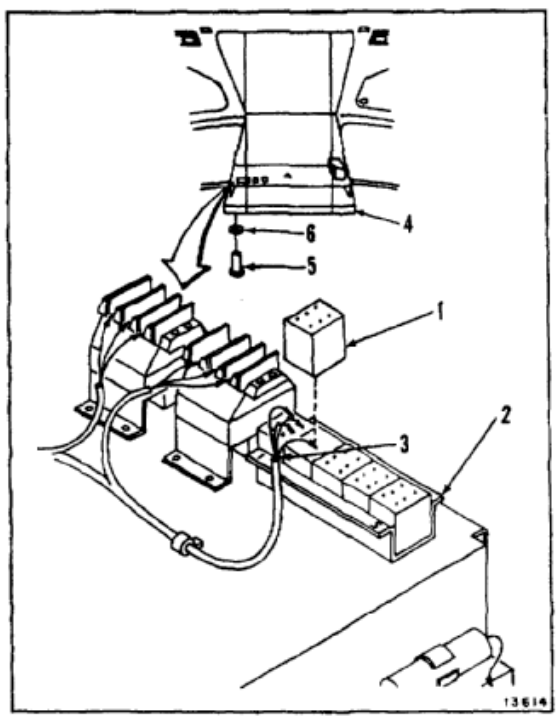
***INSPECT***

3. Install module (1) by pressing it into terminal rail (2) until a click is heard.
4. Raise panel (4). Install two bolts (5) and washers (6).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).




END OF TASK

## 9-99 REMOVE OVERHEAD PANEL PANELS 9-99

INITIAL SETUP

***Applicable Configurations:***

Without 17
Without 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

Paper Tags (E264)
Tape (E395)

***Personnel Required:***

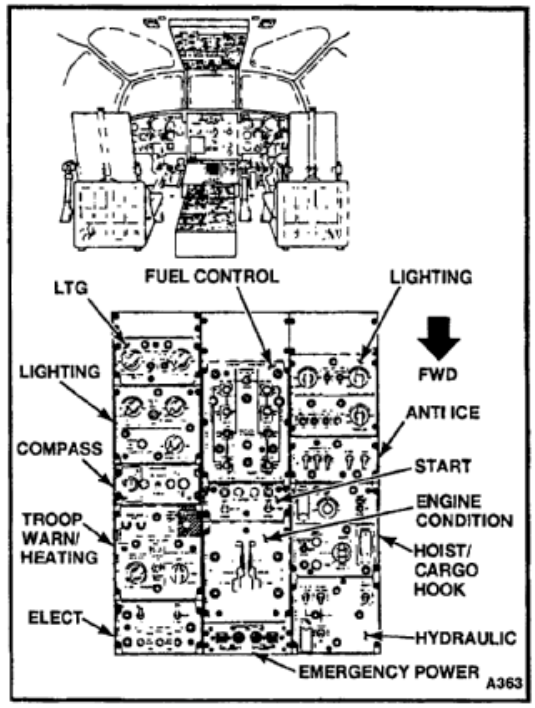
Aircraft Electrician

***References:***

TM 11-1520-240-23

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off



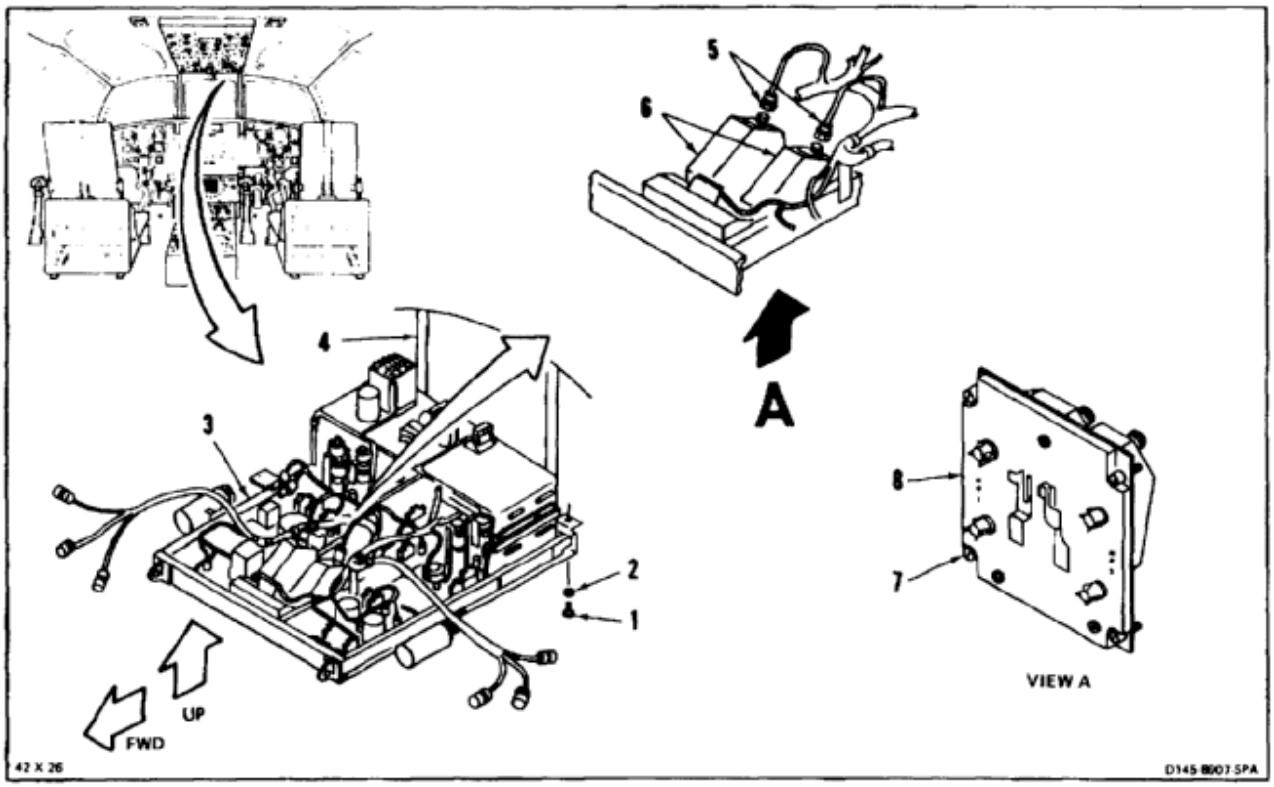
1. Remove two bolts (1) and washers (2). Lower panel (3) on straps (4).

***ENGINE CONDITION PANEL***

2. Remove ENGINE CONDITION panel as follows:

a. Tag and disconnect two electrical connectors (5) from engine controls (6).

b. Loosen four screws (7). Remove panel (8) from panel (3).



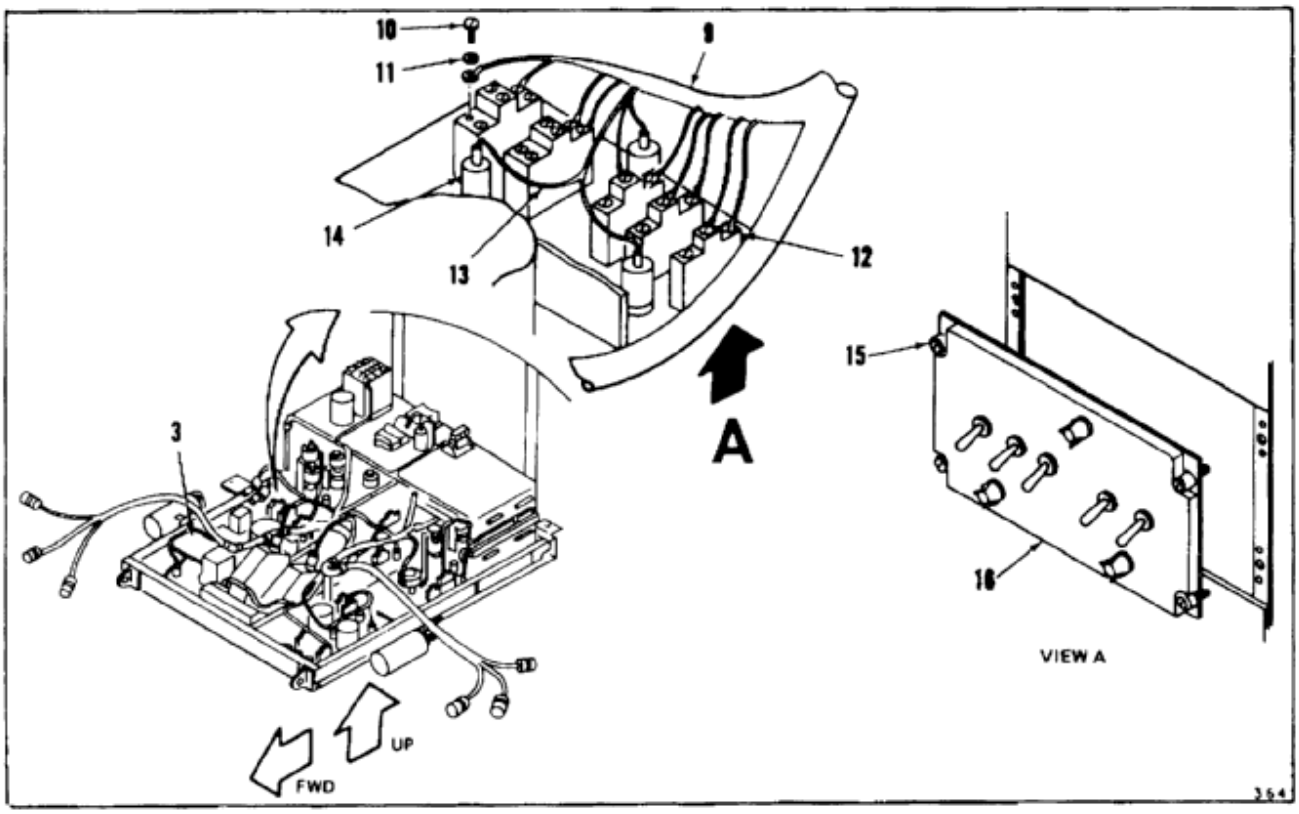
***ANTI-ICE PANEL***

3. Remove ANTI-ICE panel as follows:

   a. Tag and disconnect 10 wires (9) by removing screws (10) and washers (11) from 5 switches (12). Tape wire ends.

   b. Tag and unsolder three wires (13) from three lamps (14). Tape wire ends.

   c. Loosen four screws (15). Remove panel (16) from panel (3).



*LTG PANEL*

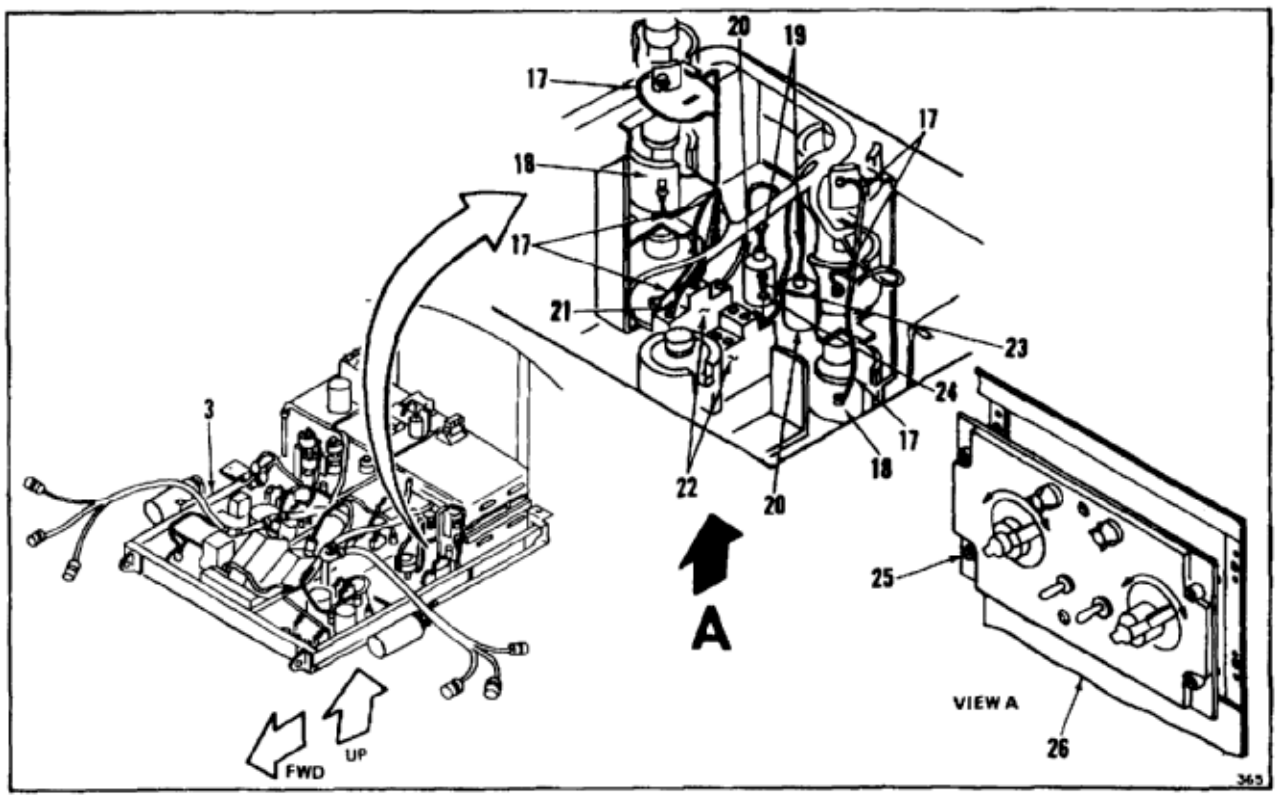
4. Remove LTG panel as follows:

   a. Tag and unsolder 19 wires (17) from two potentiometers (18). Tape wire ends.

   b. Tag and unsolder two wires (19) from two lamps (20). Tape wire ends.

   c. Tag and remove 15 wires (21) from two switches (22) by removing screws (23) and washers (24). Tape wire ends.

   d. Loosen four screws (25). Remove panel (26) from panel (3).

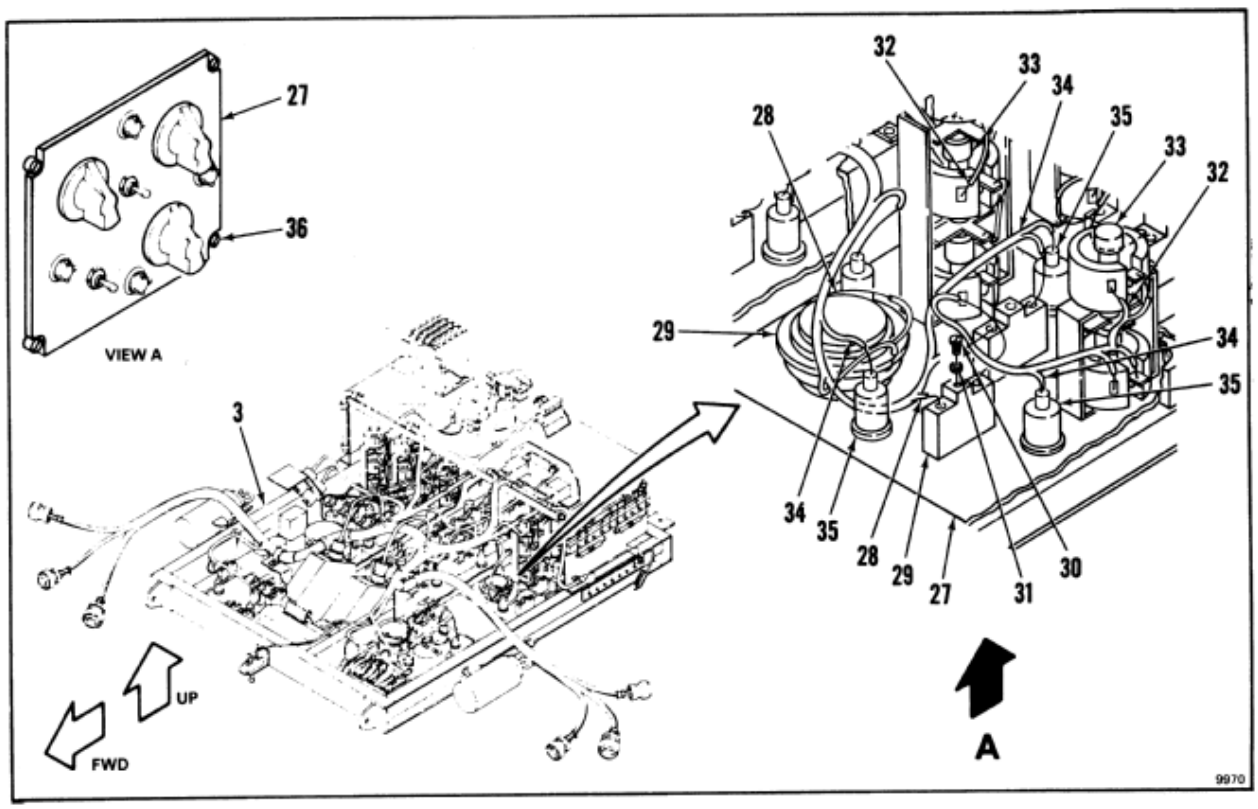


***LIGHTING PANEL***

5. Remove LIGHTING panel (27) as follows:
   a. Tag and disconnect nine wires (28) from two switches (29) by removing screws (30) and washers (31). Tape wire ends.
   b. Tag and unsolder 16 wires (32) from two potentiometers (33). Tape wire ends.
   c. Tag and unsolder five wires (34) from three lamps (35). Tape wire ends.
   d. Loosen four screws (36). Remove panel (27) from panel (3).

***COMPASS PANEL***

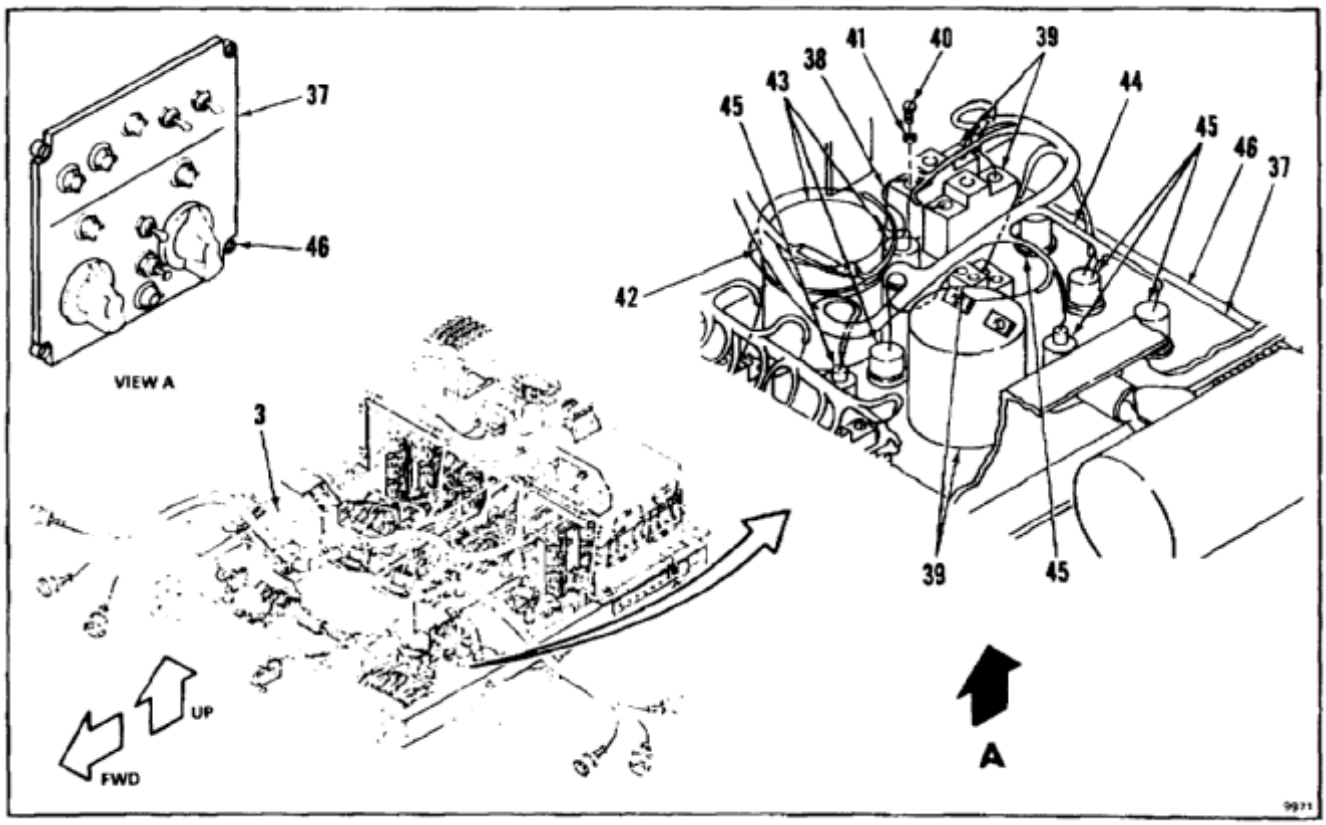
6. Refer to TM 11-1520-240-23.



**9-99 REMOVE OVERHEAD PANEL PANELS (Continued) 9-99**

***TROOP WARN/HEATING PANEL***

7. Remove TROOP WARN/HEATING panel (37) as follows:
   a. Tag and disconnect 12 wires (38) from four switches (39) by removing screws (40) and washers (41). Tape wire ends.
   b. Tag and unsolder eight wires (42) from three switches (43). Tape wire ends.
   c. Tag and unsolder six wires (44) from five lamps (45). Tape wire ends.
   d. Loosen four screws (46). Remove panel (37) from panel (3).



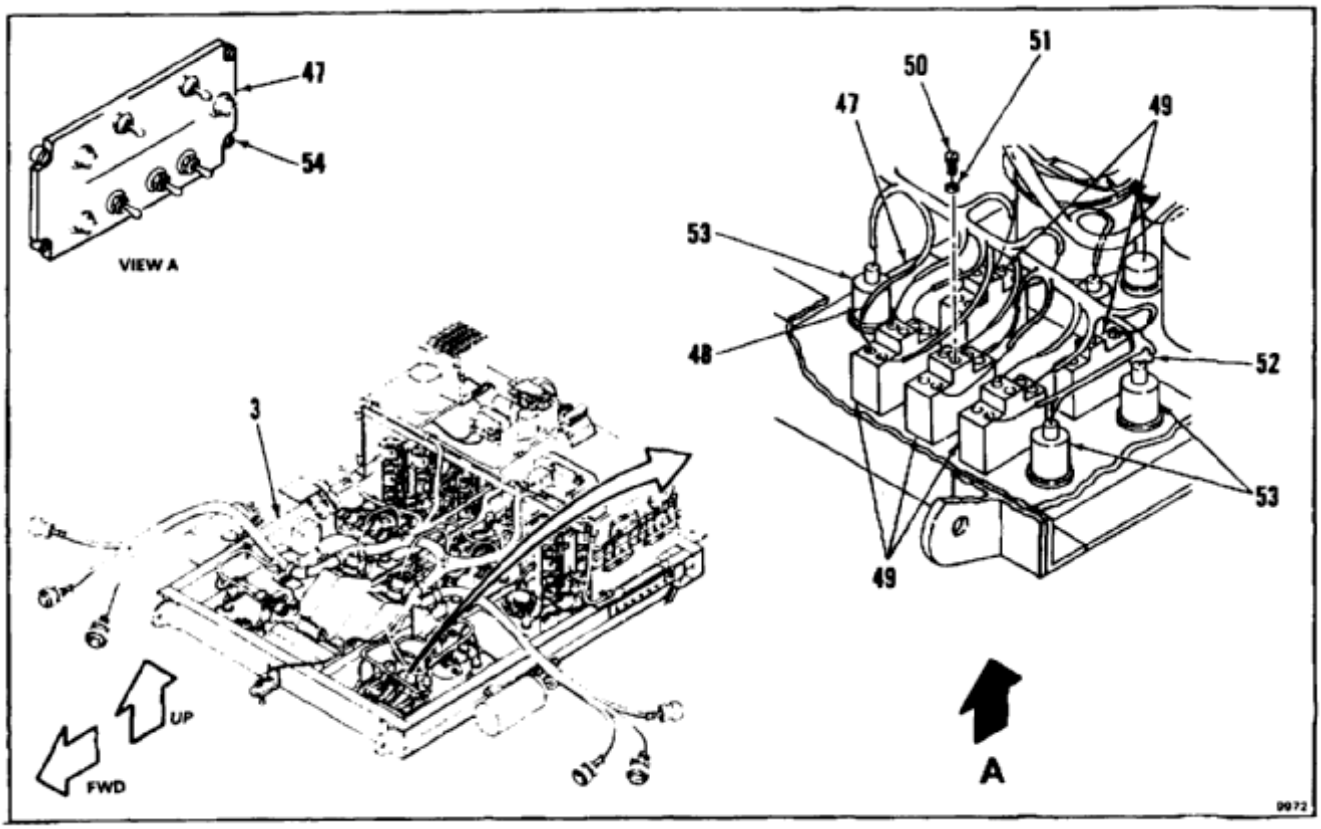
***ELECT PANEL***

8. Remove ELECT panel (47) as follows:

   a. Tag and disconnect 26 wires (48) from five switches (49) by removing screws (50) and washers (51). Tape wire ends.

   b. Tag and unsolder five wires (52) from three lamps (53). Tape wire ends.

   c. Loosen four screws (54). Remove panel (47) from panel (3).



**9-99 REMOVE OVERHEAD PANEL PANELS (Continued) 9-99**

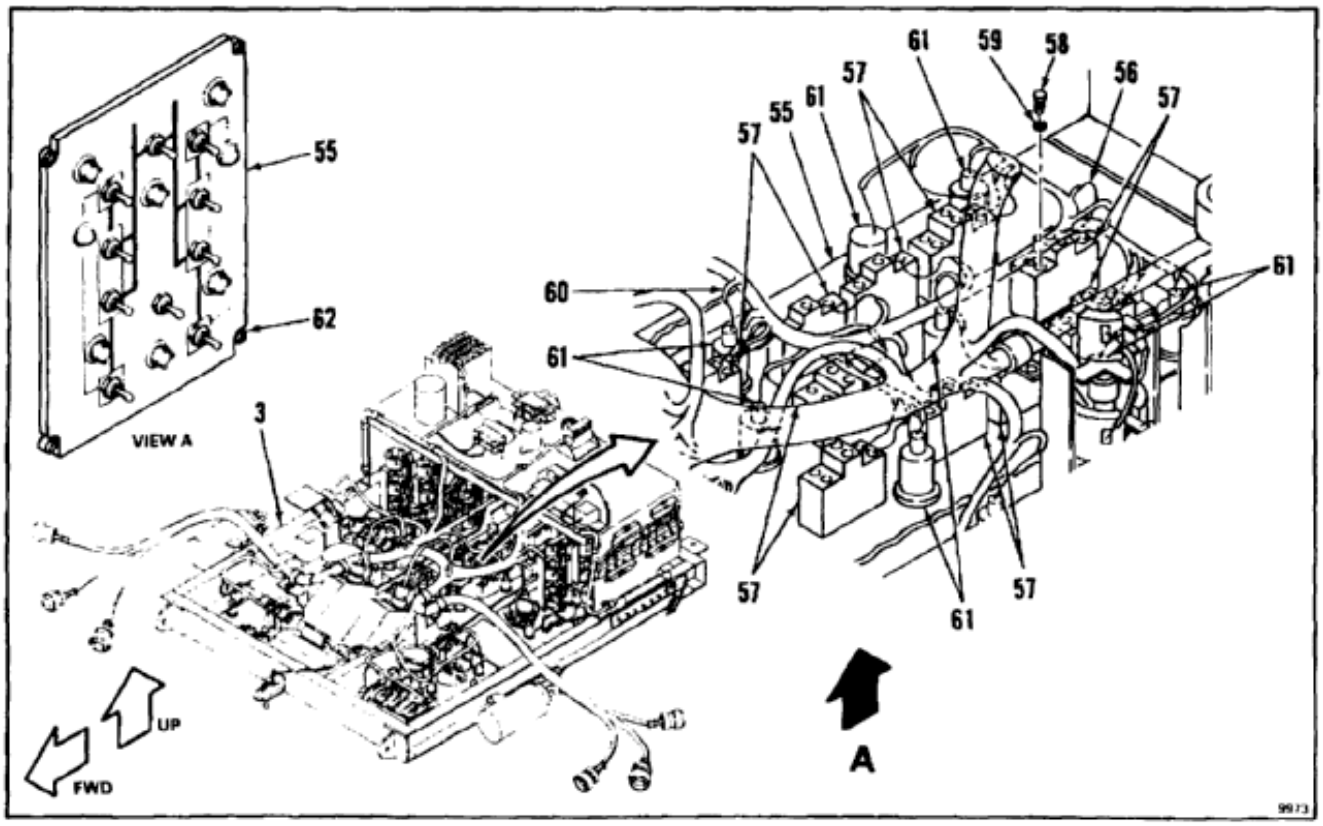
***FUEL CONTROL PANEL***

9. Remove FUEL CONTROL panel (55) as follows:

   a. Tag and disconnect 35 wires (56) from 10 switches (57) by removing screws (58) and washers (59). Tape wire ends.

   b. Tag and unsolder 17 wires (60) from eight lamps (61). Tape wire ends.

   c. Loosen six screws (62). Remove panel (55) from panel (3).

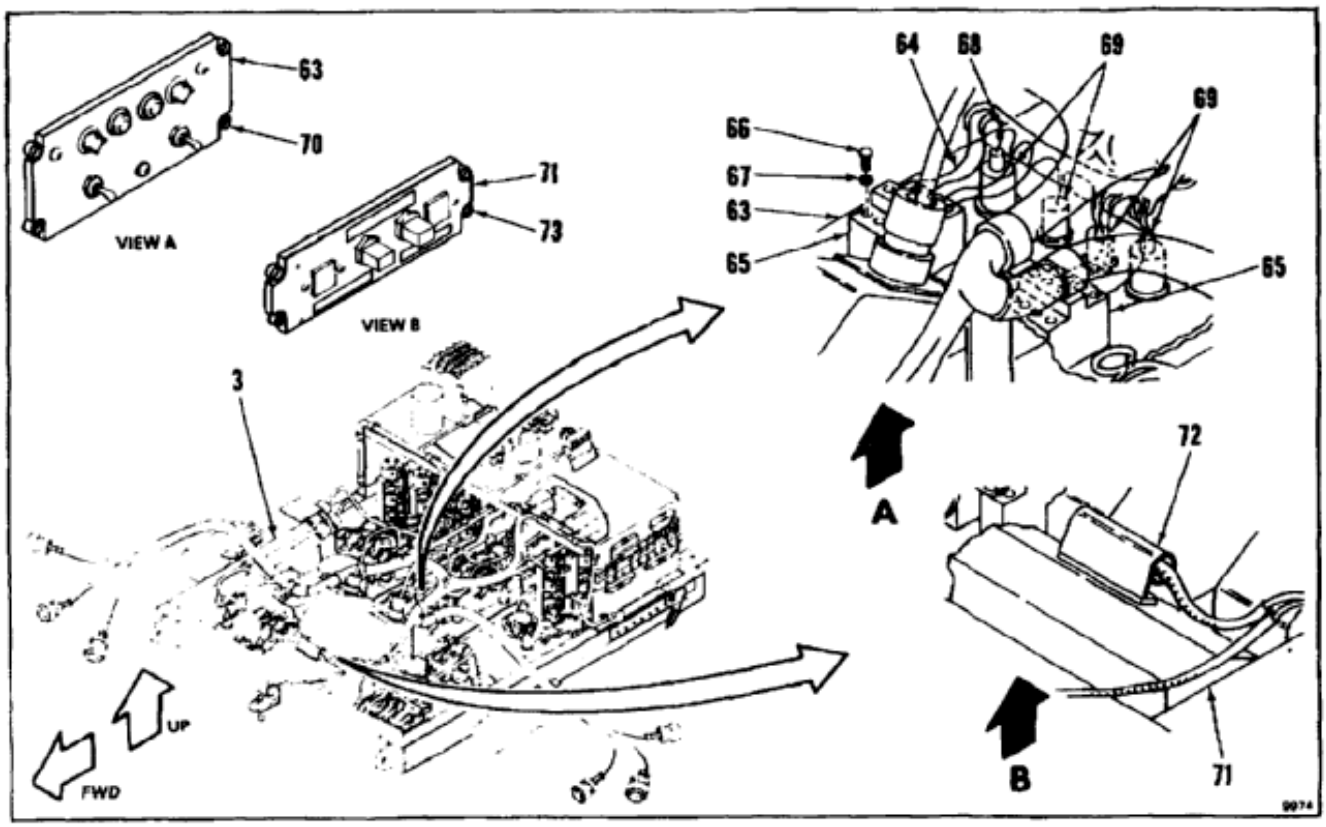


*START PANEL*

10. Remove START panel (63) as follows:
    a. Tag and disconnect 22 wires (64) from two switches (65) by removing screws (66) and washers (67). Tape wire ends.
    b. Tag and unsolder nine wires (68) from four lamps (69). Tape wire ends.
    c. Loosen four screws (70). Remove panel (63) from panel (3).

*EMERGENCY POWER PANEL*

11. Remove EMERGENCY POWER panel (71) as follows:
    a. Tag and disconnect plug (72) from panel (71).
    b. Loosen four screws (73). Remove panel (71) from panel (3).



*LIGHTING PANEL*

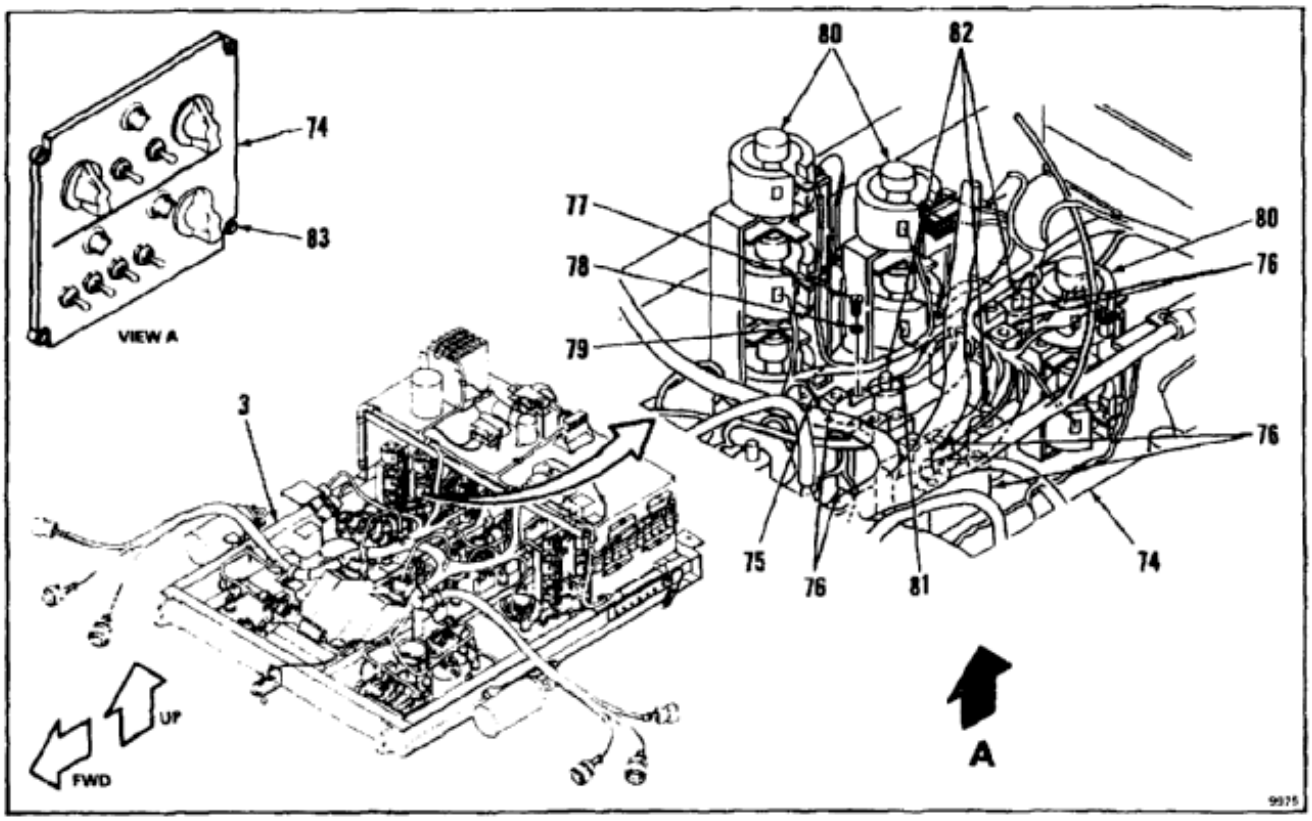
12. Remove LIGHTING panel (74) as follows:

a. Tag and disconnect 17 wires (75) from six switches (76) by removing screws (77) and washers (78). Tape wire ends.

b. Tag and unsolder 25 wires (79) from three potentiometers (80). Tape wire ends.

c. Tag and unsolder five wires (81) from three lamps (82). Tape wire ends.

d. Loosen four screws (83). Remove panel (74) from panel (3).

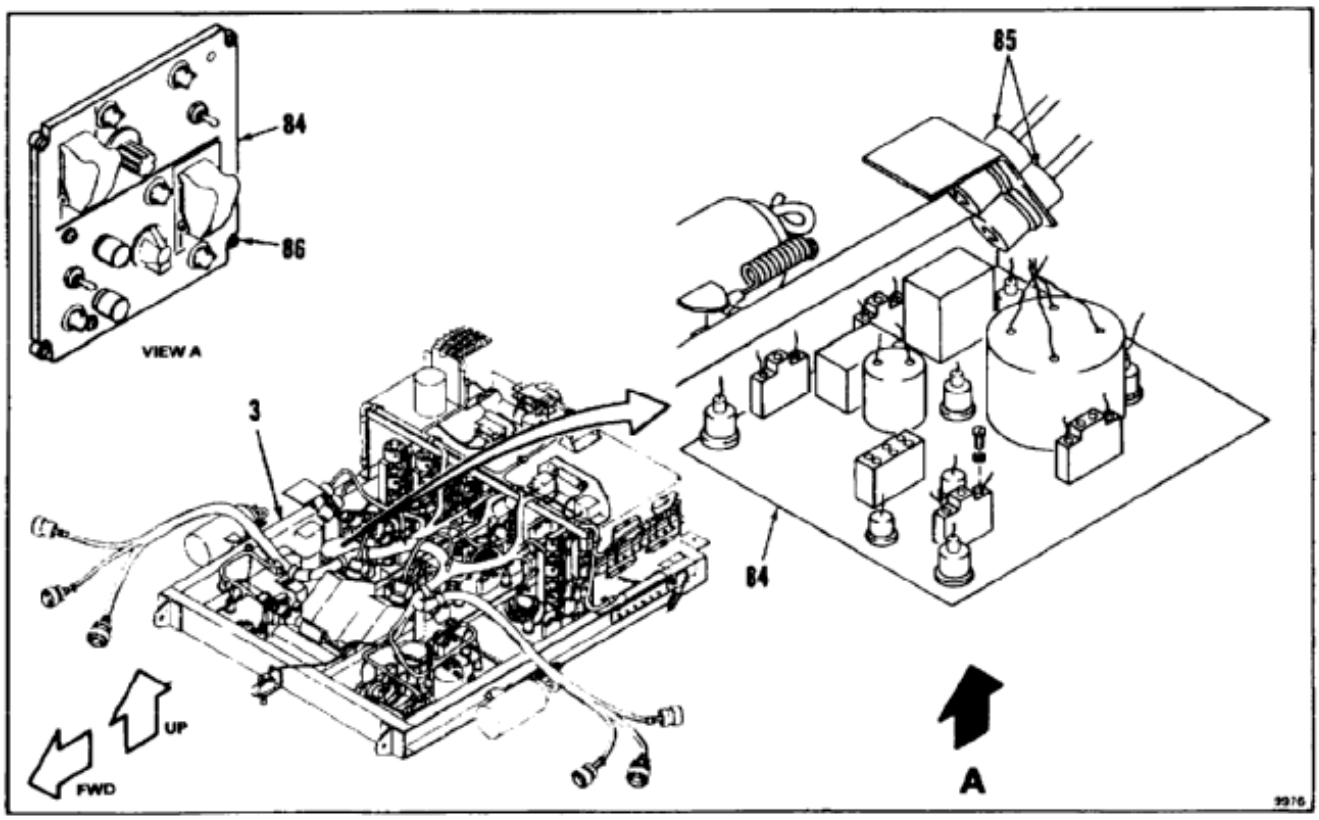


***HOIST/CARGO HOOK PANEL***

13. Remove HOIST/CARGO HOOK panel (84) as follows:

    a. Tag and disconnect two plugs (85).

    b. Loosen four screws (86). Remove panel (84) from panel (3).



***HYDRAULIC PANEL***

14. Remove HYDRAULIC panel (87) as follows:

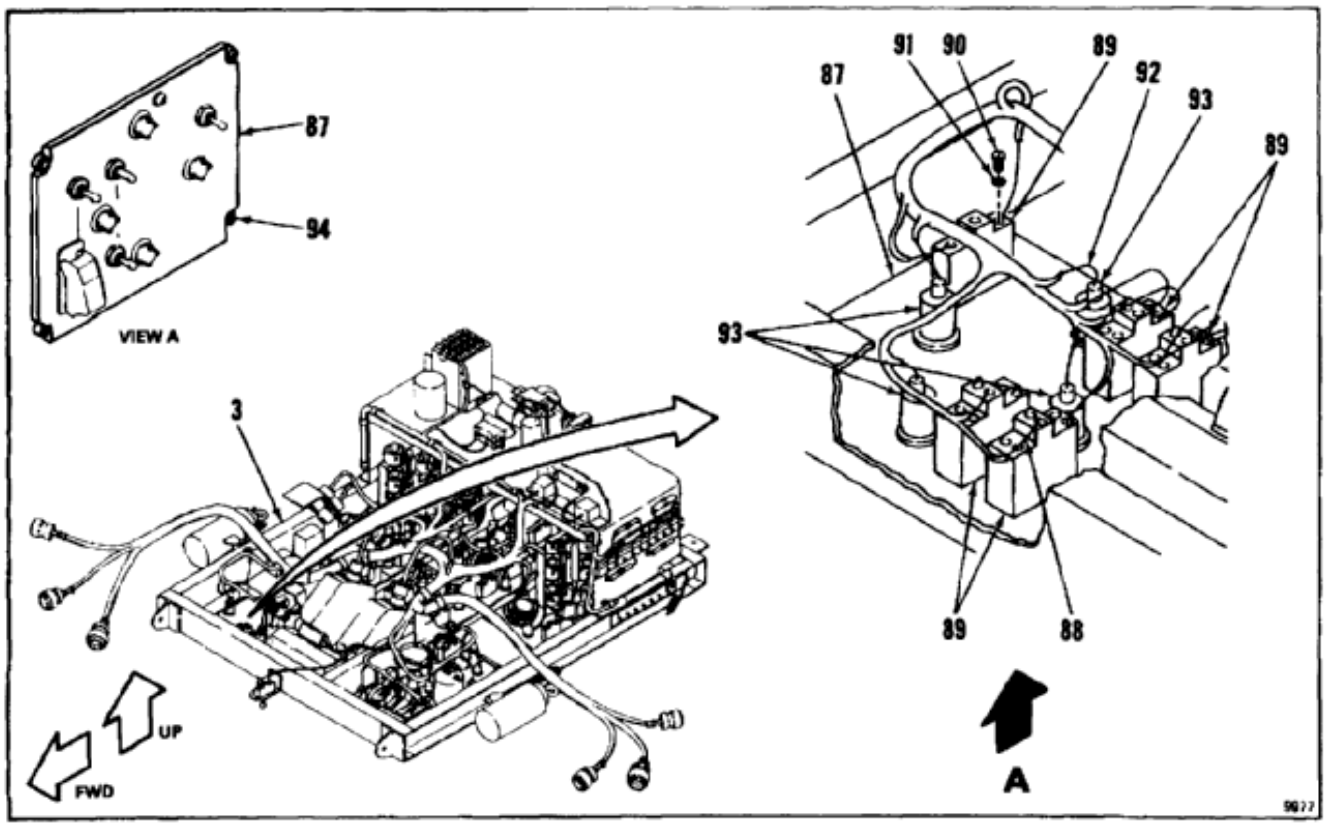
    a. Tag and disconnect 15 wires (88) from five switches (89) by removing screws (90) and washers (91). Tape wire ends.

    b. Tag and unsolder seven wires (92) from four lamps (93). Tape wire ends.

    c. Loosen four screws (94). Remove panel (87) from panel (3).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-99.1 DISASSEMBLE EMERGENCY POWER PANEL (AVIM) 9-99.1

INITIAL SETUP

***Applicable Configurations:***

Without 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Iron

***Materials:***

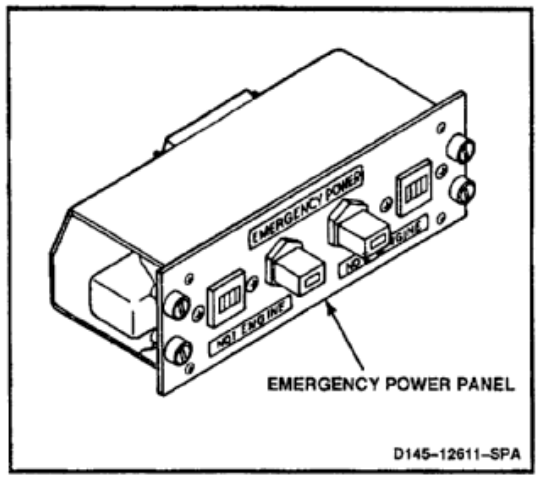
Tags (E264)

***Personnel Required:***

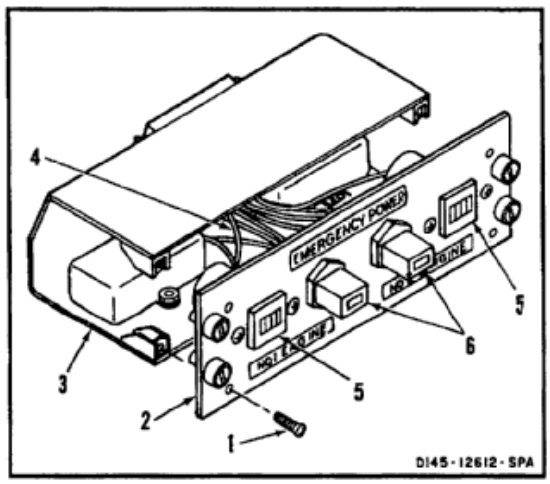
Aircraft Electrician

***Equipment Condition:***

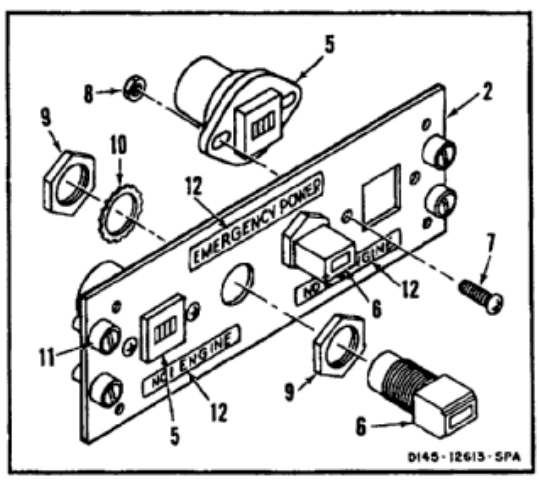
Off Helicopter Task



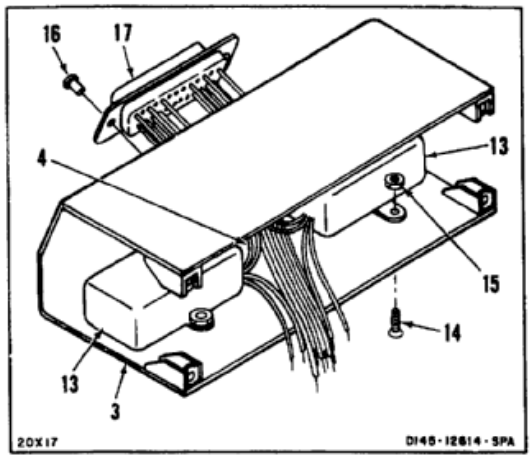

1. Remove four screws (1) and separate panel (2) from housing (3).
2. Tag and unsolder 10 wires (4) from 2 timers (5) and 2 indicators (6).




3. Remove four screws (7) and nuts (8). Remove two timers (5) from panel (2).
4. Remove nut (9) and washer (10) from back of each indicator (6). Remove two indicators (6) from panel (2). Remove nut (9) from body of each indicator (6).
5. Remove four turnlocks (11).
6. Remove three foil markers (12) if damaged.



7. Tag and unsolder remaining eight wires (4) from two relays (13).
8. Remove four screws (14) and nuts (15). Remove two relays (13) from housing (3).
9. Remove two posts (16). Remove receptacle (17) from housing (3).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-99.2 ASSEMBLE EMERGENCY POWER PANEL (AVIM) 9-99.2

INITIAL SETUP

***Applicable Configurations:***

Without 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Iron
Gun-Type Heater

***Materials:***

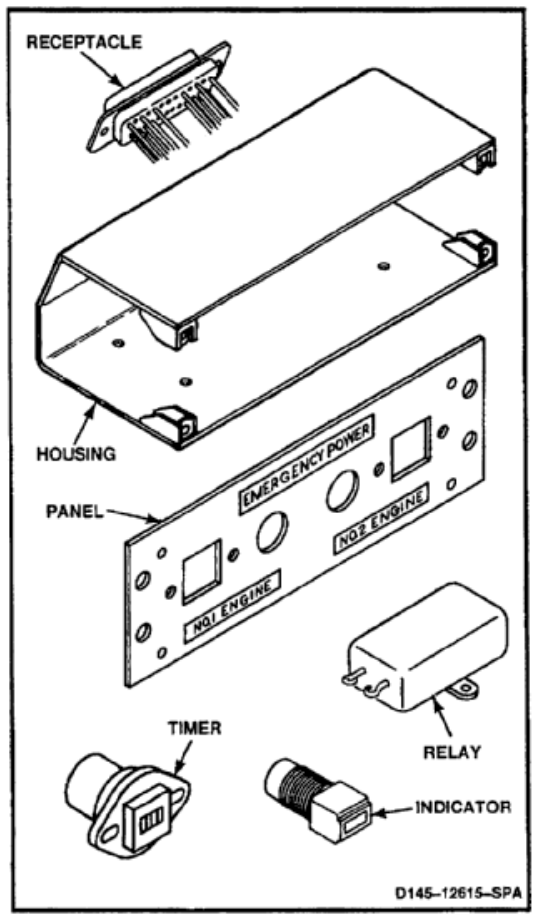
Flux (E178)
Solder (E360)
Tubing, Heat Shrinkable (E431)

***Personnel Required:***

Aircraft Electrician
Inspector

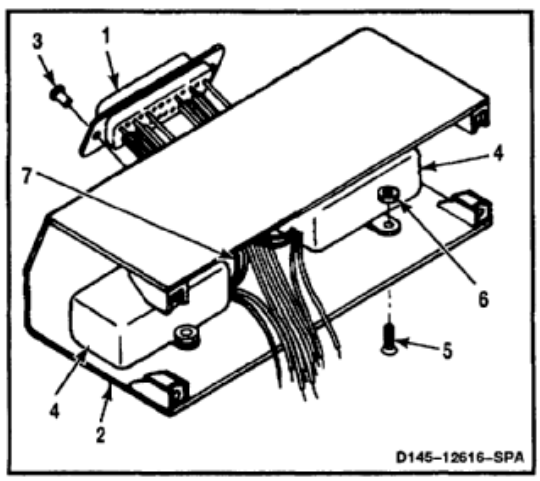
***References:***

TM 55-1520-240-23P
TM 55-1500-323-25



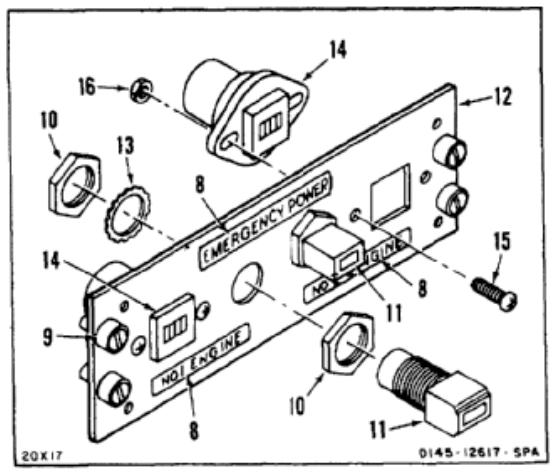

1. Position receptacle (1) in housing (2). Install two posts (3).
2. Position two relays (4) in housing (2). Install four screws (5) and nuts (6).
3. Connect eight wires (7) to relays (4). Use solder (E360) and tubing (E431) (TM 55-1500-323-25). Remove tags.

***INSPECT***



4. Install three foil markers (8) if needed.
5. Install four turnlocks (9).
6. Install one nut (10) on each indicator (11). Position two indicators in panel (12) and install washer (13) and one more nut (10) on each indicator.
7. Position two timers (14) in back of panel (12). Install four screws (15) and nuts (16).

***INSPECT***



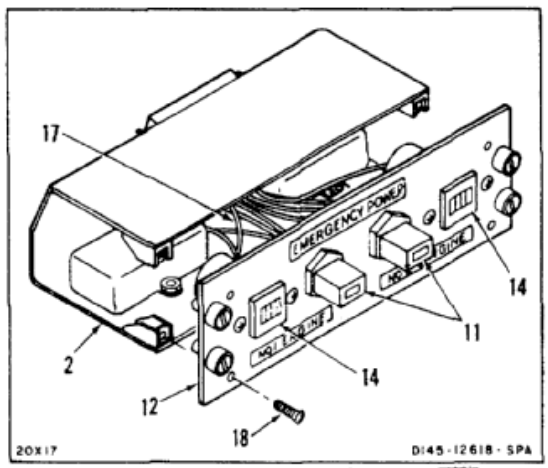

8. Connect 10 wires (17) to 2 timers (14) and 2 indicators (11). Use solder (E360) and tubing (E431) (TM 55-1500-323-25). Remove tags.

***INSPECT***

9. Position panel (12) on housing (2). Install four screws (18).

***FOLLOW-ON MAINTENANCE:***

Test emergency power panel (Task 9-99.3).




END OF TASK

## 9-99.3 TEST EMERGENCY POWER PANEL (AVIM) 9-99.3

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Power Supply, 28 VDC
Power Supply, 115 VAC, 400 Hz

***Materials:***

None

***Personnel Required:***

Aircraft Electrician
Inspector

***Equipment Condition:***

Off Helicopter Task

**NOTE**

Once a power connection is made, keep power applied until told to disconnect it.

***NO. 1 ENGINE***

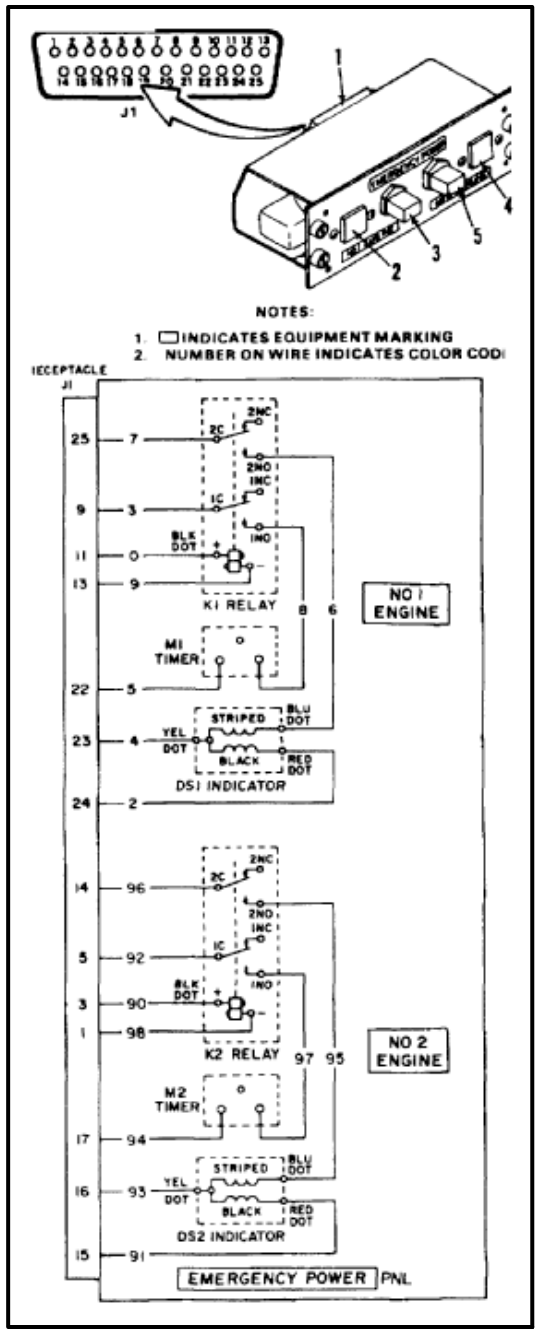
1. Apply **115 vac** to pin 9 and ground to pin 22 of receptacle (1). Timer (2) shall not operate.
2. Apply **28 vdc** to pin 24 and ground to pin 23 of receptacle (1). Indicator (3) shall turn black.
3. Remove **28 vdc** from pin 24 only. Indicator (3) shall stay black. Apply **28 vdc** to pin 25.
4. Apply **28 vdc** to pin 11 and ground to pin 13 of receptacle (1). After **5 seconds** indicator (3) shall become striped and timer (2) shall operate.
5. Remove **28 vdc** from pin 25 only. Indicator (3) shall stay striped. Momentarily apply **28 vdc** to pin 24. Indicator shall turn black and stay black.
6. Remove all power connections.

***NO. 2 ENGINE***

7. Apply **115 vac** to pin 5 and ground to pin 17 of receptacle (1). Timer (4) shall not operate.
8. Apply **28 vdc** to pin 15 and ground to pin 16 of receptacle (1). Indicator (5) shall turn black.
9. Remove **28 vdc** from pin 15 only. Indicator (5) shall stay black. Apply **28 vdc** to pin 14.
10. Apply **28 vdc** to pin 3 and ground to pin 1 of receptacle (1). After **5 seconds** indicator (5) shall become striped and timer (4) shall operate.
11. Remove **28 vdc** from pin 14 only. Indicator (5) shall stay striped. Momentarily apply **28 vdc** to pin 15. Indicator shall turn black and stay black.
12. Remove all power connections.

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-99.4 DISASSEMBLE HOIST/CARGO HOOK PANEL (AVIM) 9-99.4

INITIAL SETUP

***Applicable Configurations:***

Without 17

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Iron
Drill
Twist Drill Set

***Materials:***

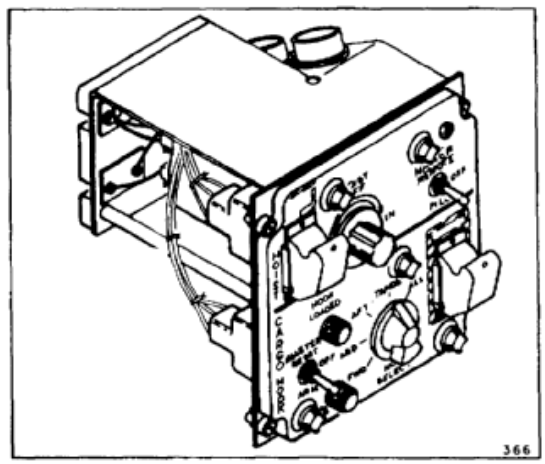
Tags (E264)

***Personnel Required:***

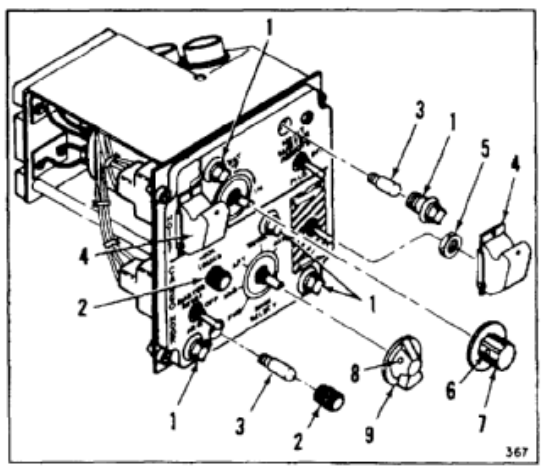
Machinist
Aircraft Electrician

***Equipment Condition:***

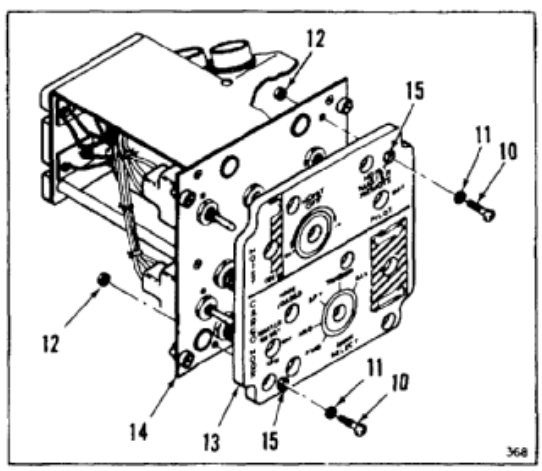
Off Helicopter Task



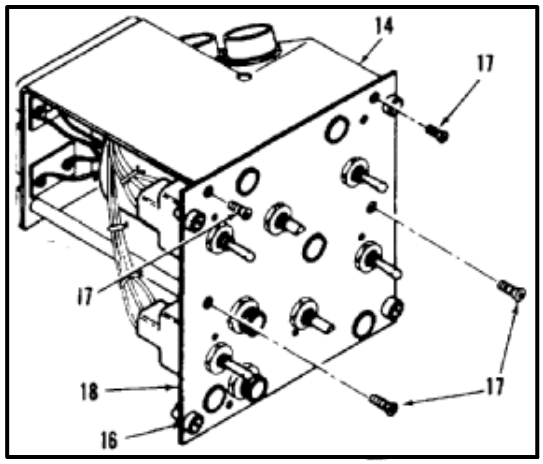

1. Remove five lenses (1) and two indicator lenses (2).
2. Remove seven lamps (3) from lenses (1 and 2).
3. Open both switch guards (4), remove nuts (5) and remove two guards.
4. Loosen setscrew (6) on HOIST knob (7). Remove knob.
5. Loosen setscrew (8) on HOOK SELECT knob (9). Remove knob.



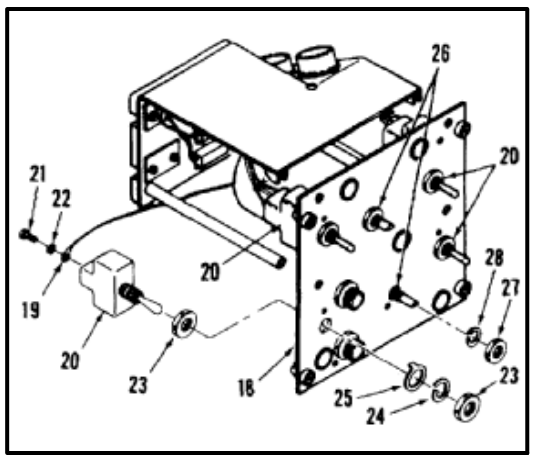

6. Remove two screws (10), washers (11), and nuts (12). Remove plastic panel (13) from housing (14).
7. Remove two grommets (15) from panel (13).



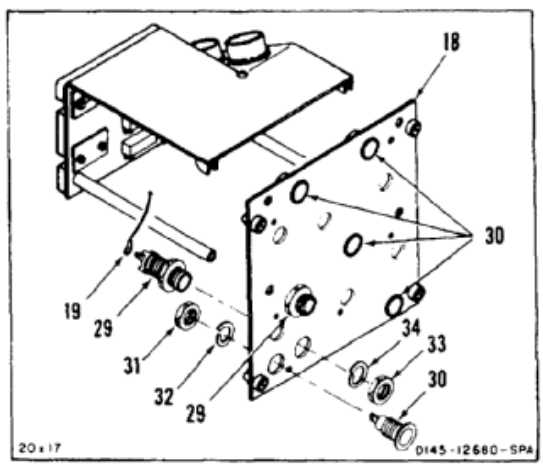
8. Remove four turnlocks (16).
9. Remove four screws (17). Pull metal panel (18) away from housing (14).



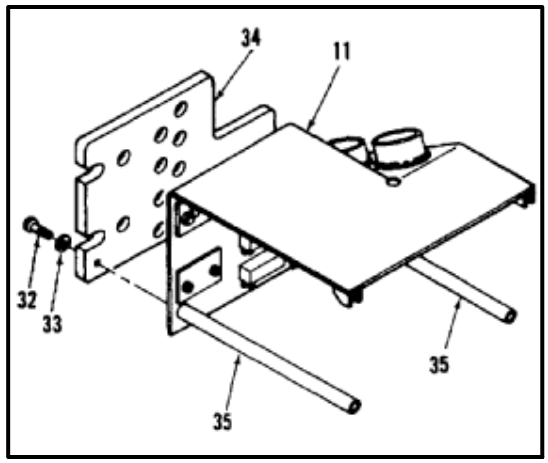

10. Tag and disconnect wires (19) from four toggle switches (20) by removing screws (21) and washers (22).
11. Remove four nuts (23), lockwashers (24), and lock ring (25). Remove four toggle switches (20) from panel (18). Remove nut from body of each switch.
12. Tag and disconnect wires (19) from two rotary switches (26).
13. Remove two nuts (27) and lock rings (28). Remove two rotary switches (26) from panel (18).




14. Tag and disconnect wires (19) from two indicator lights (29) and five light assemblies (30).
15. Remove five nuts (31) and lockwashers (32) from back of panel (18). Remove five light assemblies (30).
16. Remove two nuts (33) and lockwashers (34) from front of panel (18). Remove two indicator lights (29).
17. Remove panel (18).



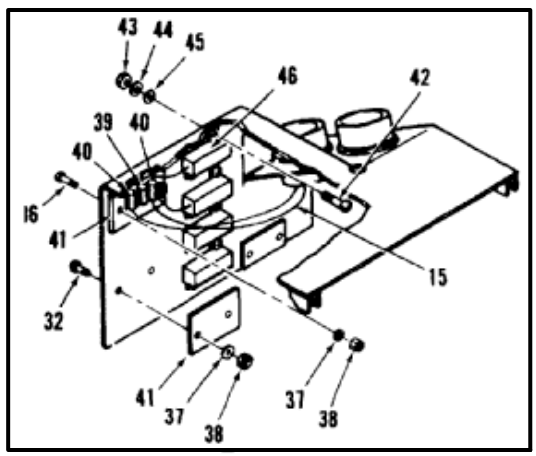
18. Remove two screws (32) and lockwashers (33) from back of housing (11). Remove insulator (34) and two spacers (35).




19. Tag and unsolder wires (15) As required.

20. Remove four screws (36), washers (37), and nuts (38). Remove diode (39), two semiconductors (40) and two terminal boards (41).

21. Remove eight screws (42), nuts (43), lockwashers (44), and flat washers (45). Remove four resistors (46).



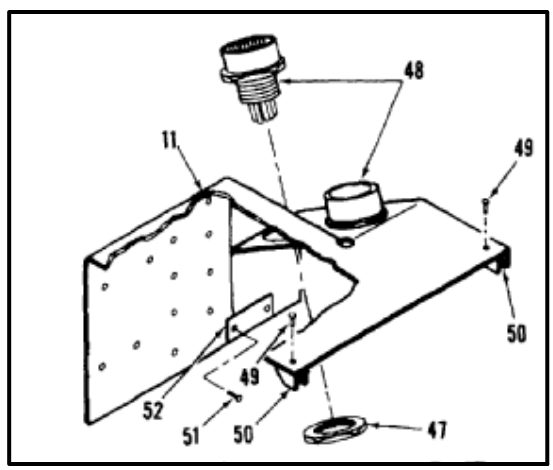

22. Remove two jam nuts (47) and two receptacles (48) from housing (11).

23. Remove two rivets (49) and two nut plates (50).

24. Remove two rivets (51) and brace (52).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-99.4.1 DISASSEMBLE HOIST/CARGO HOOK PANEL (AVIM) 9-99.4.1

INITIAL SETUP

***Applicable Configurations:***

With 17

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Iron
Drill
Twist Drill Set

***Materials:***

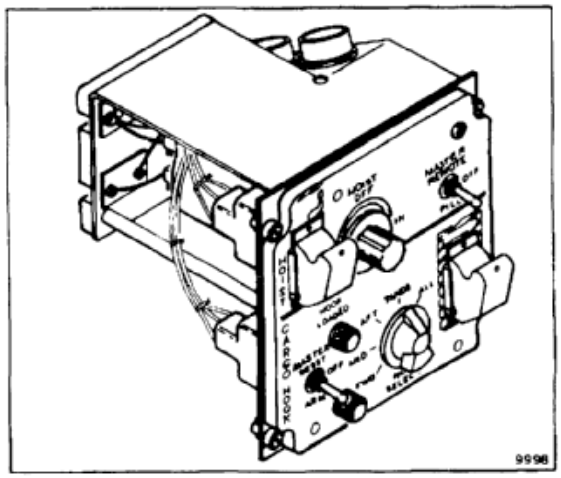
Tags (E264)

***Personnel Required:***

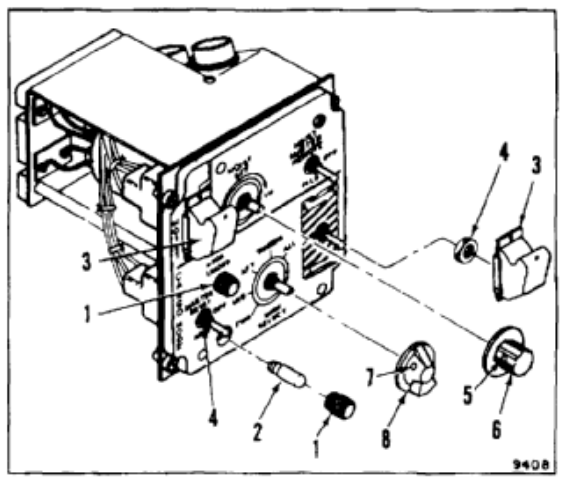
Machinist
Aircraft Electrician

***Equipment Condition:***

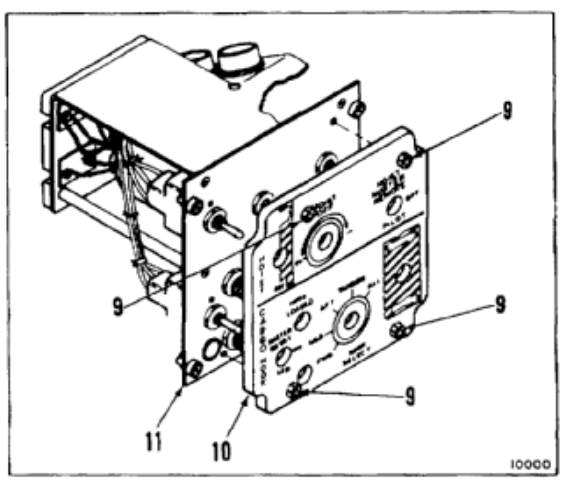
Off Helicopter Task



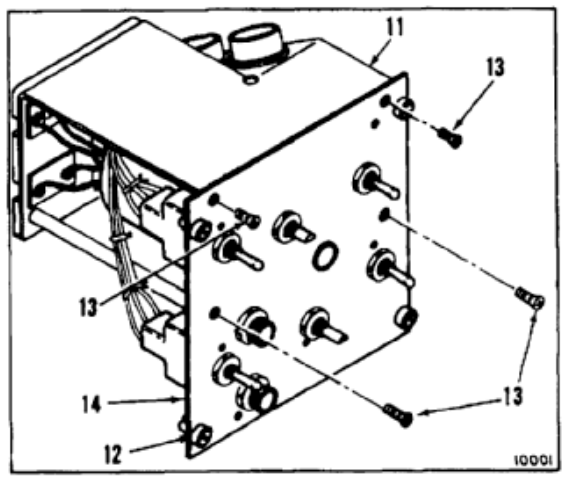
1. Remove two indicator lenses (1).
2. Remove lamps (2) from lenses (1).
3. Open both switch guards (3), remove nuts (4), and remove two guards.
4. Loosen setscrew (5) on HOIST knob (6). Remove knob.
5. Loosen setscrew (7) on HOOK SELECT knob (8). Remove knob.



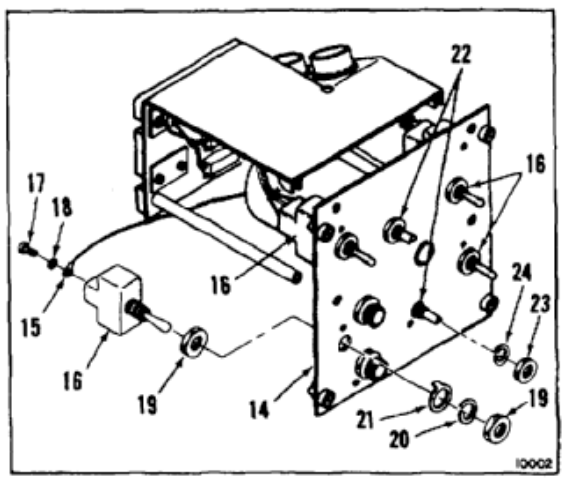

6. Loosen four captive screws (9).
7. Remove plastic panel (10) from housing (11).



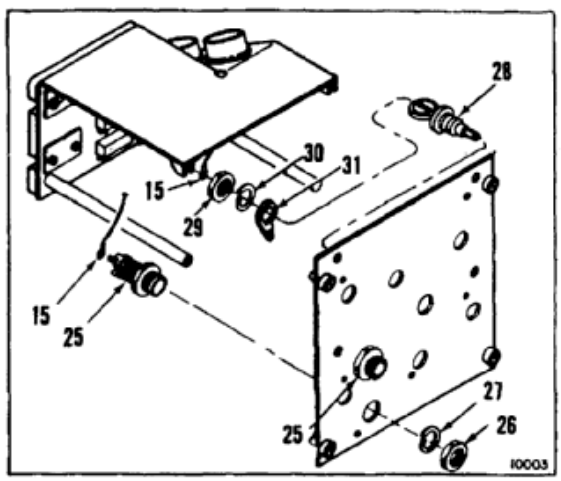
8. Remove four turnlocks (12).
9. Remove four screws (13). Pull metal panel (14) away from housing (11).
10. Tag and disconnect wires (15) from four toggle switches (16) by removing screws (17) and washers (18).




11. Remove four nuts (19), lockwashers (20), and lock ring (21). Remove four toggle switches (16) from panel (14). Remove nut from body of each switch.
12. Tag and disconnect wires (15) from two rotary switches (22).
13. Remove two nuts (23) and lock rings (24). Remove two rotary switches (22) from panel (14).
14. Tag and disconnect wires (15) from two indicator lights (25).



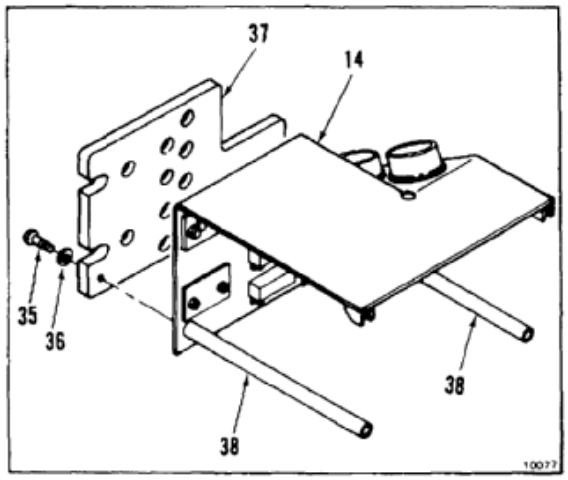

15. Remove two nuts (26) and lockwashers (27) from front of panel (14). Remove two indicator lights (25).
16. Tag and disconnect wires (15) from receptacle (28). Remove nut (29), lockwasher (30), terminal lug (31), and receptacle (28).
17. Remove panel (14).



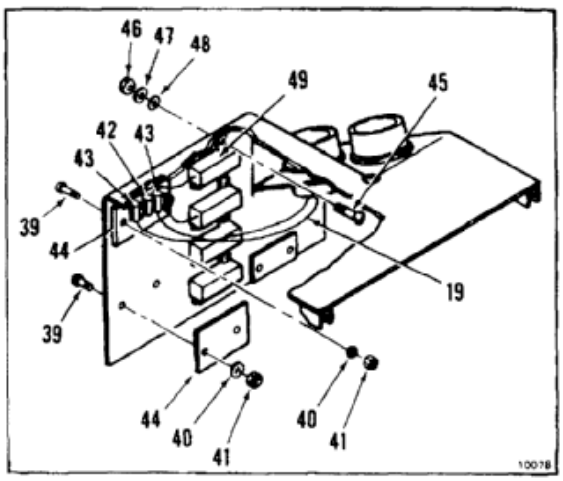
**NOTE**

Index numbers 32, 33, 34 not used.

18. Remove two screws (35) and lockwashers (36) from back of housing (14). Remove insulator (37) and two spacers (38).



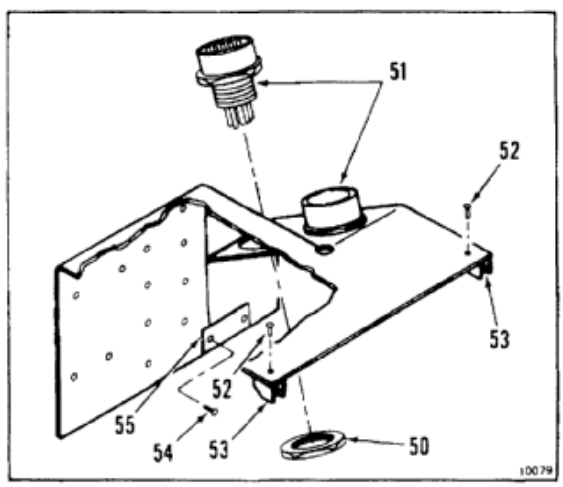

19. Tag and unsolder wires (19) As required.
20. Remove four screws (39), washers (40), and nuts (41). Remove diode (42), two semiconductors (43), and two terminal boards (44).
21. Remove eight screws (45), nuts (46), lockwashers (47), and flat washers (48). Remove four resistors (49).




22. Remove two jam nuts (50) and two receptacles (51) from housing.
23. Remove two rivets (52) and two nut plates (53).
24. Remove two rivets (54) and brace (55).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-99.5 ASSEMBLE HOIST/CARGO HOOK PANEL (AVIM) 9-99.5

INITIAL SETUP

***Applicable Configurations:***

Without 17

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Iron
Rivet Set
Gun-Type Heater

***Materials:***

Soldering Flux (E178)
Solder (E360)
Tubing, Heat Shrinkable (E431)
Heat Sink (E195)

***Parts:***

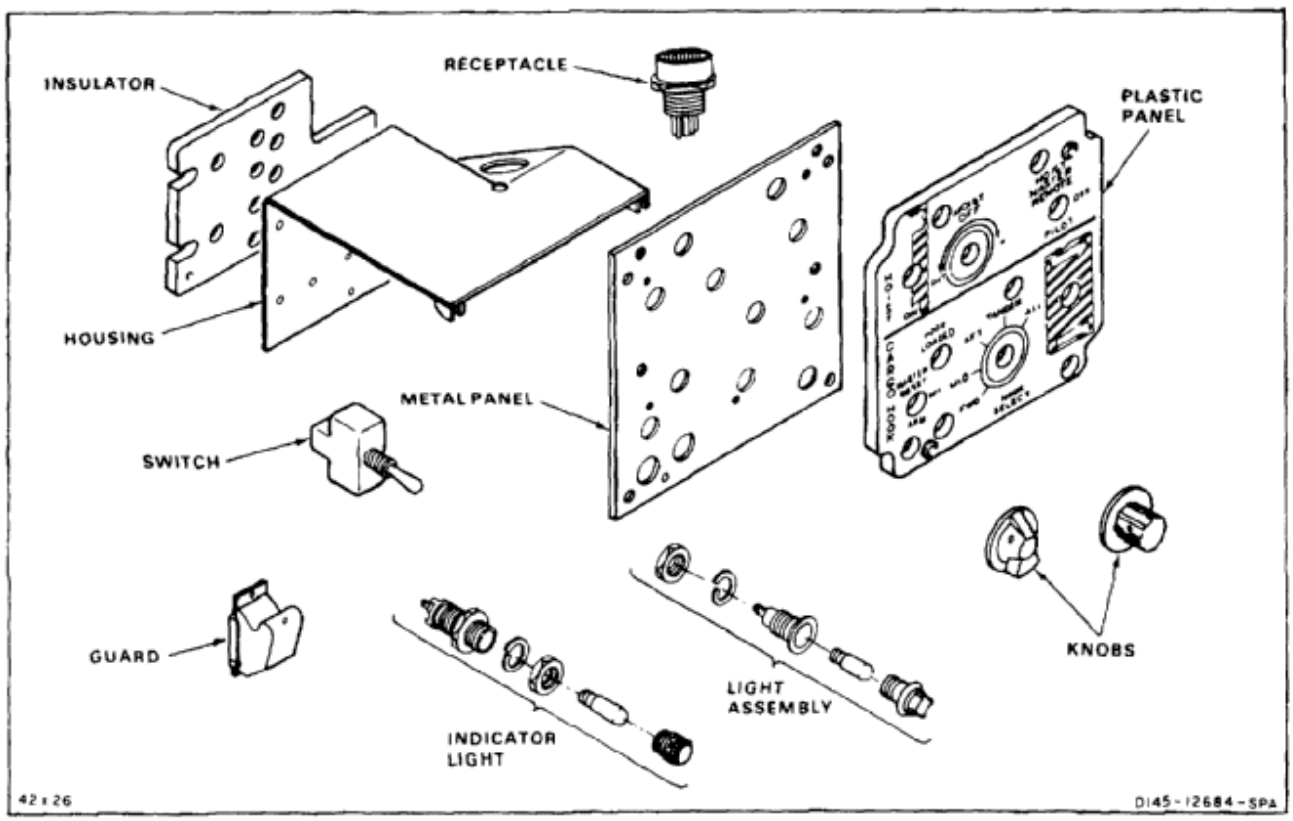
Rivets

***Personnel Required:***

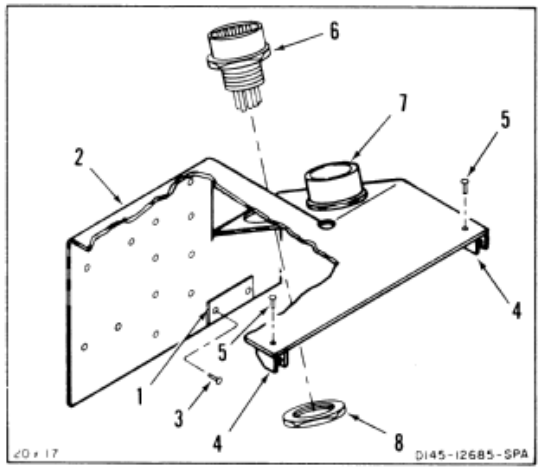
Machinist
Aircraft Electrician
Inspector

***References:***

TM 55-1500-323-25
TM 55-1520-240-23P
Task 9-99.6



1. Position brace (1) on housing (2). Install two rivets (3).
2. Position two nut plates (4) and install two rivets (5).
3. Install receptacles (6 and 7) and install two jam nuts (8).

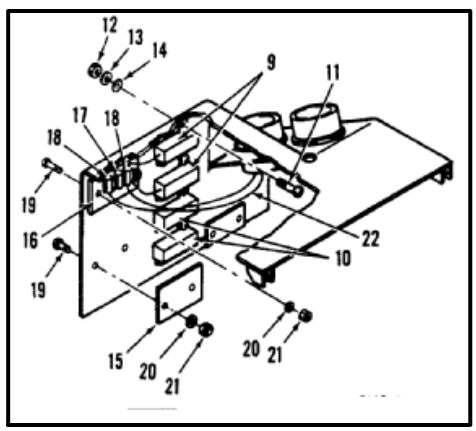



4. Install two **187 ohm** resistors (9), two **154 ohm** resistors (10), eight screws (11), nuts (12), lockwashers (13), and flat washers (14).
5. Install two terminal boards (15 and 16), diode (17), two semiconductors (18), four screws (19), washers (20), and nuts (21).

**NOTE**

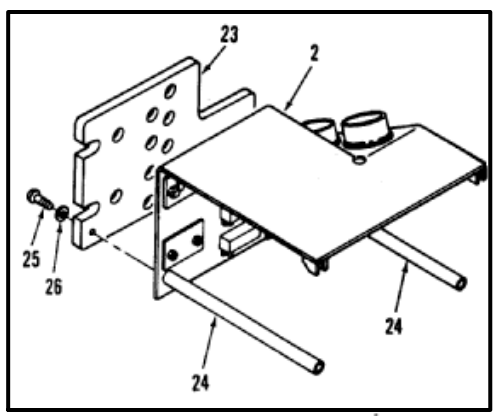
Wiring diagram is shown in Task 9-99.6

6. Remove tags and solder wires (22) as required. Use solder (E360), heat sink (E195), and tubing (E431) (TM 55-1500-323-25).

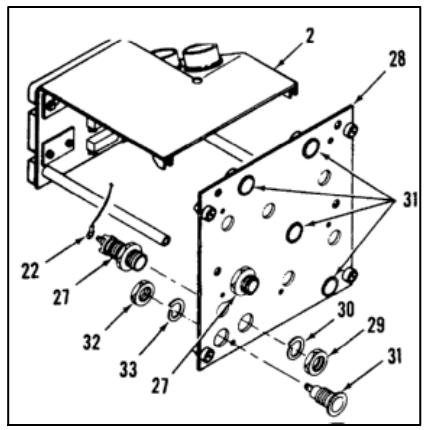



***INSPECT***

7. Install insulator (23), two spacers (24), screws (25), and lockwashers (26) on housing (2).

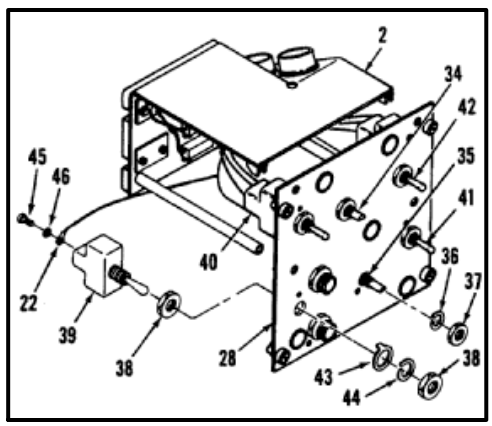


8. Position two indicator lights (27) through rear of metal panel (28) and install two nuts (29) and lockwashers (30).
9. Position five light assemblies (31) through front of panel (28) and install five nuts (32) and lockwashers (33).
10. Remove tags and connect wires (22) from housing (2) to two indicator lights (27) and five light assemblies.



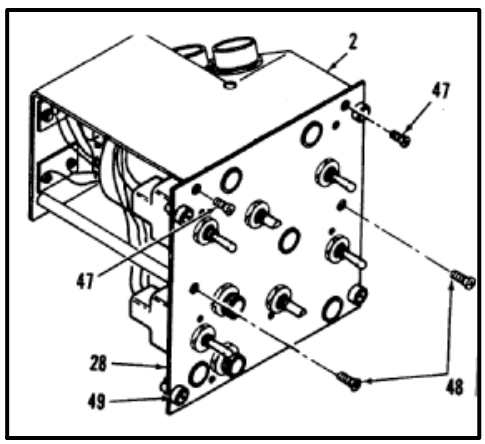

***INSPECT***

11. Position two rotary switches (34 and 35) through back of panel (28) and install two lock rings (36) and nuts (37).
12. Install one nut (38) each on body of four toggle switches (39, 40, 41, and 42). Position four switches through back of panel (28) and install four lock rings (43), lockwashers (44), and nuts.
13. Remove tags and connect wires (22) to two rotary switches (34 aned 35). Connect wires to four toggle switches (39, 40, 41, and 42) by installing screws (45) and washers (46).

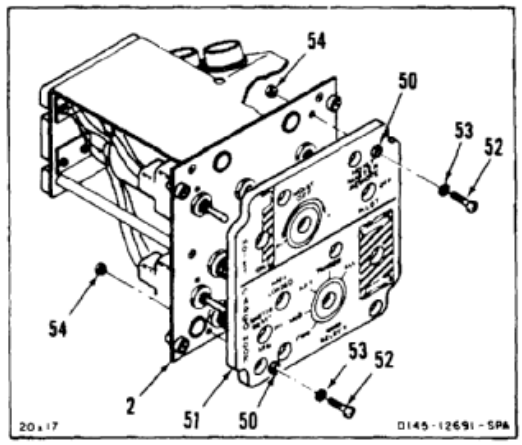



***INSPECT***

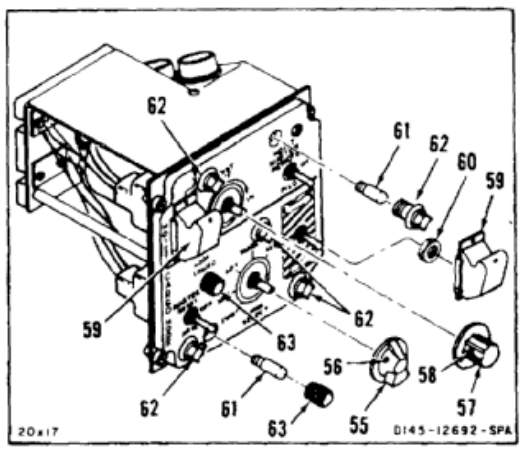
14. Position panel (28) on housing (2) and install four screws (47 and 48).
15. Install four turnlocks (49).



16. Install two grommets (50) in plastic panel (51).
17. Position panel (51) on housing (2). Install two screws (52), washers (53), and nuts (54).




18. Install HOOK SELECT knob (55) and tighten setscrew (56).
19. Install HOIST knob (57) and tighten setscrew (58).
20. Open both switch guards (59). Install two guards and nuts (60). Close guards.
21. Install seven lamps (61) in five lenses (62) and two indicator lenses (63).
22. Install five lenses (62) and two indicator lenses (63).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Test hoist/cargo hook panel (Task 9-99.6).

END OF TASK

## 9-99.5.1 ASSEMBLE HOIST/CARGO HOOK PANEL (AVIM) 9-99.5.1

INITIAL SETUP

***Applicable Configurations:***

With 17

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Iron
Rivet Set
Gun-Type Heater

***Materials:***

Soldering Flux (E178)
Solder (E360)
Tubing, Heat Shrinkable (E431)
Heat Sink (E195)

***Parts:***

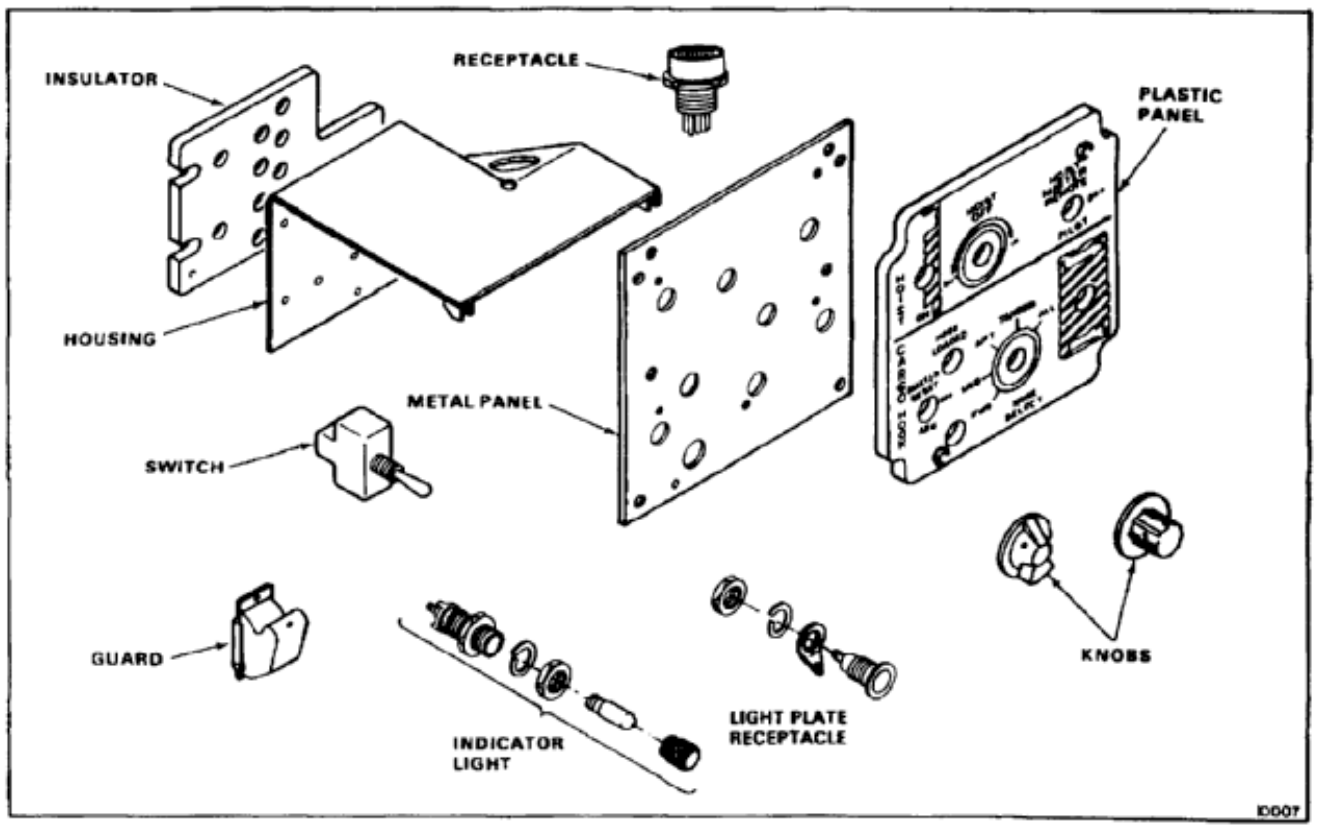
Rivets

***Personnel Required:***

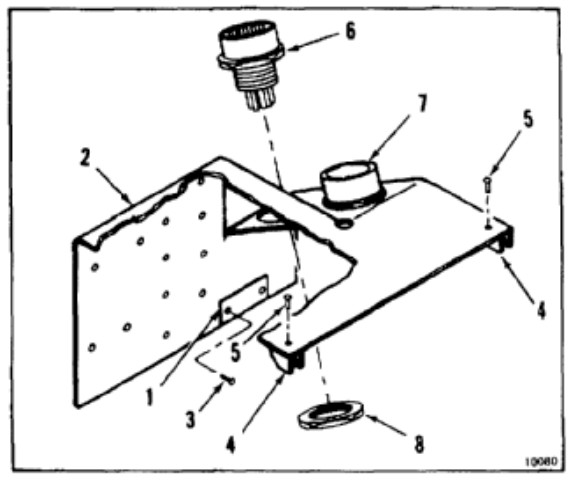
Machinist
Aircraft Electrician
Inspector

***References:***

TM 55-1500-323-25
TM 55-1520-240-23P
Task 9-99.6



1. Position brace (1) on housing (2). Install two rivets (3).
2. Position two nut plates (4) and install two rivets (5).
3. Install receptacles (6 and 7) and install two jam nuts (87).



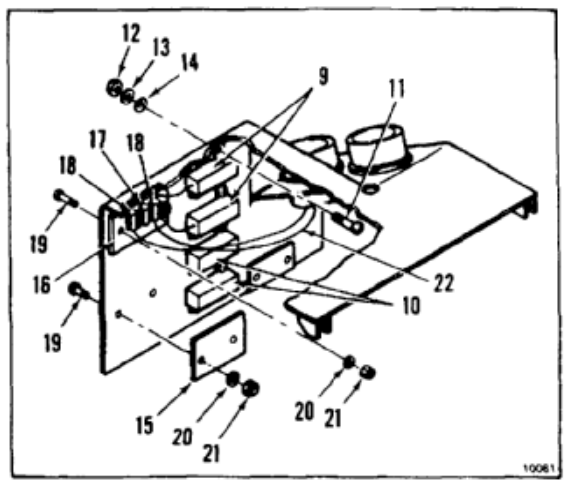

4. Install two **187 ohm** resistors (9), two **154 ohm** resistors (10), eight screws (11), nuts (12), lockwashers (13), and flat washers (14).
5. Install two terminal boards (15 and 16), diode (17), two semiconductors (18), four screws (19), washers (20), and nuts (21).

**NOTE**

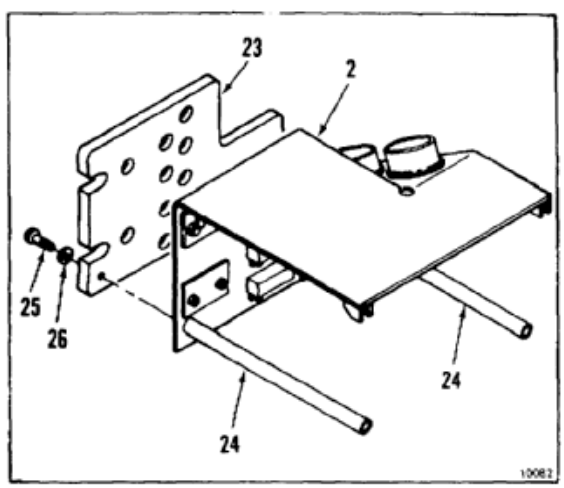
Wiring diagram is shown in Task 9-99.6.

6. Remove tags and solder wires (22) as required. Use solder (E360), heat sink (E195), and tubing (E431) (TM 55-1500-323-25).

***INSPECT***

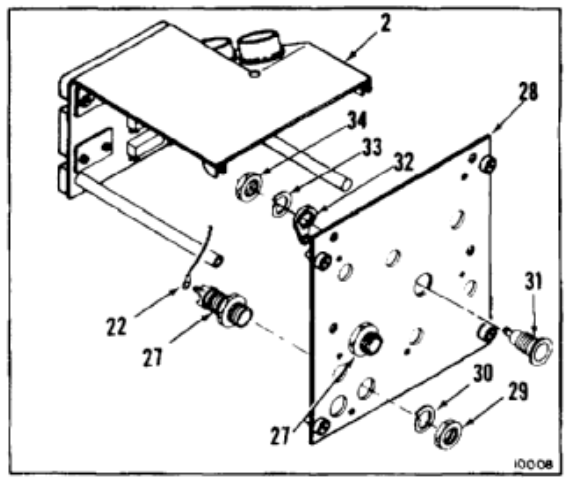



7. Install insulator (23), two spacers (24), screws (25), and lockwashers (26) on housing (2).



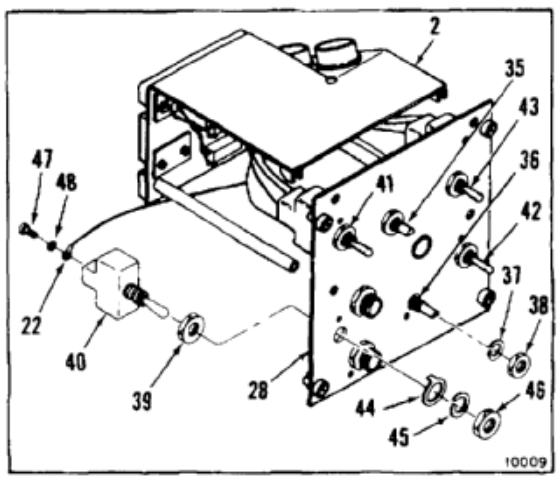
8. Position two indicator lights (27) through rear of metal panel (28) and install two nuts (29) and lockwashers (30).
9. Position receptacle (31) through front of panel (28) and install terminal lug (32), lockwasher (33), and nut (34).
10. Remove tags and connect wires (22) from housing (2) to two indicator lights (27).

***INSPECT***

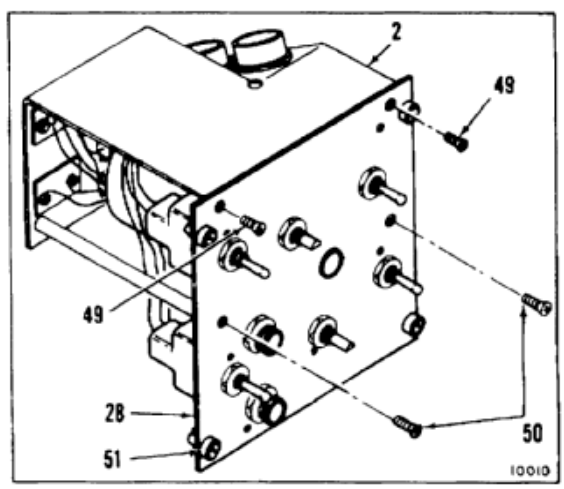



11. Position two rotary switches (35 and 36) through back of panel (28) and install two lock rings (37) and nuts (38).
12. Install one nut (39) each on body of four toggle switches (40, 41, 42, and 43). Position four switches through back of panel (28) and install four lock rings (44), lockwashers (45), and nuts (46).
13. Remove tags and connect wires (22) to two rotary switches (35 and 36). Connect wires to four toggle switches (40, 41, 42, and 43) by installing screws (47) and washers (48).

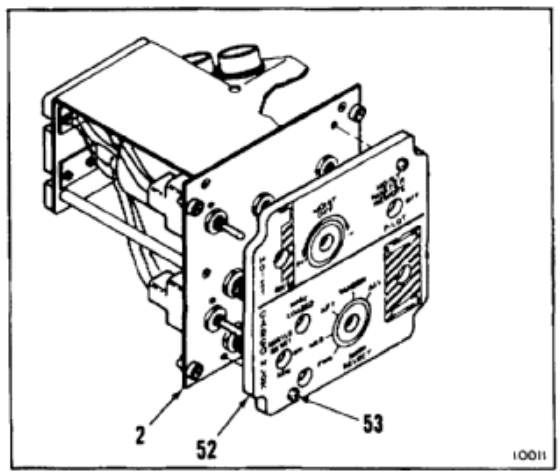
***INSPECT***




14. Position panel (28) on housing (2) and install four screws (49 and 50).
15. Install four turnlocks (51).

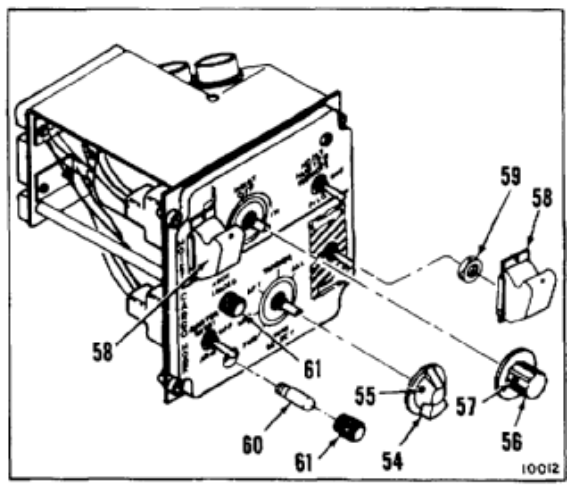


16. Position panel (52) on housing (2). Tighten four captive screws (53).




17. Install HOOK SELECT knob (54) and tighten setscrew (55).
18. Install HOIST knob (56) and tighten setscrew (57).
19. Open both switch guards (58). Install two guards and nuts (59). Close guards.
20. Install two lamps (60) in two indicator lenses (61).
21. Install two indicator lenses (61).

***INSPECT***




***FOLLOW-ON MAINTENANCE:***

Test hoist/cargo hook panel (Task 9-99.6).

END OF TASK

## 9-99.6 TEST HOIST/CARGO HOOK PANEL (AVIM) 9-99.6

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Power Supply, 28 VDC
Multimeter

***Materials:***

None

***Personnel Required:***

Aircraft Electrician
Inspector

***Equipment Condition:***

Off Helicopter Task

1. Without 17 apply **28 vdc** to pin E and ground to pin G of receptacle J2. Five panel lights (1) shall come on.

1.1. With 17 apply **115 vac** to pin V(+) and S. Lightplate (11.1) shall illuminate.

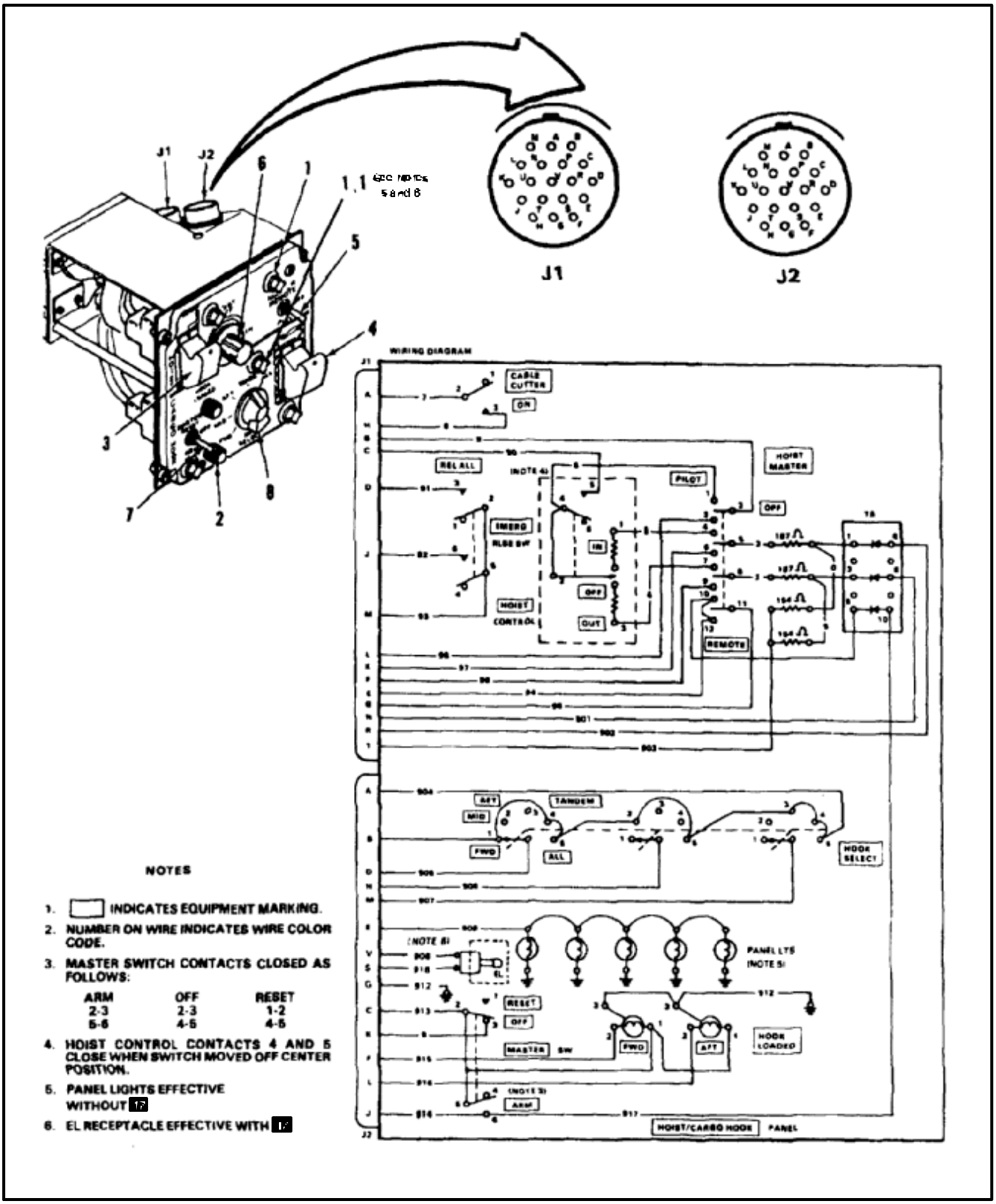
2. Apply **28 vdc** to pin C and around to pins F and L of receptacle J2. HOOK LOADED lights (2) shall come on.

3. Remove ground from pins F and L and apply ground to pin G. Press both HOOK LOADED lights (2). Lights shall come on. Remove power.

4. Test switches as listed below. Use multimeter.

| Switch | Position | Receptacle | Pins | Meter Reading (ohms) |
|---|---|---|---|---|
| CABLE CUTTER (3) | OFF | J1 | A and H | No Continuity |
| | ON | J1 | A and H | Continuity |
| EMERG Release (4) | Norm | J1 | D and M | No Continuity |
| | Norm | J1 | J and M | No Continuity |
| | REL ALL | J1 | D and M | Continuity |
| | REL ALL | J1 | D and J | Continuity |
| | REL ALL | J1 | J and M | Continuity |
| HOIST MASTER (5) | PILOT | | | |
| HOIST Control (6) | OFF | J1 | B and C | No Continuity |
| HOIST MASTER (5) | OFF | | | |
| HOIST Control (6) | Rotate Both Ways | J1 | B and C | No Continuity |
| HOIST MASTER (5) | PILOT | | | |
| HOIST Control (6) | Rotate Both Ways | J1 | B and C | Continuity |
| Cargo Hook MASTER (7) | ARM | J2 | C and K | Continuity |
| | OFF | J2 | C and K | Continuity |
| | RESET | J2 | C and K | No Continuity |
| HOIST MASTER (5) | OFF | J1 | E and G | No Continuity |
| | PILOT | J1 | E and G | Continuity |
| | REMOTE | J1 | E and G | Continuity |
| | REMOTE | J1 | F and T | 341 ± 15 |
| HOIST MASTER (5) | PILOT | | | |
| HOIST Control (6) | Rotate from OUT almost to OFF | J1 | T and B | 341 ± 15 at OUT<br>841 ± 65 short of OFF |
| HOIST MASTER (5) | PILOT | | | |
| HOIST Control (6) | Rotate from IN almost to OFF | J1 | T and B | 341 ± 15 at IN<br>841 ± 65 short of OFF |

## 9-99.6 TEST HOIST/CARGO HOOK PANEL (AVIM) (Continued) 9-99.6




NOTES

1. [ ] INDICATES EQUIPMENT MARKING.
2. NUMBER ON WIRE INDICATES WIRE COLOR CODE.
3. MASTER SWITCH CONTACTS CLOSED AS FOLLOWS:

| ARM | OFF | RESET |
|---|---|---|
| 2-3 | 2-3 | 1-2 |
| 5-6 | 4-5 | 4-5 |

4. HOIST CONTROL CONTACTS 4 AND 5 CLOSE WHEN SWITCH MOVED OFF CENTER POSITION.
5. PANEL LIGHTS EFFECTIVE WITHOUT [illegible]
6. EL RECEPTACLE EFFECTIVE WITH [illegible]

| Switch | Position | Receptacle | Pins | Meter Reading (ohms) |
|---|---|---|---|---|
| HOIST MASTER (5) | PILOT | J1 | B and L | No Continuity |
| | REMOTE | J1 | B and L | Continuity |
| | PILOT | J1 | K and T | No Continuity |
| | REMOTE | J1 | K and T | 341 ± 15 |
| N/A | | J1 | N (+) and T (–) | 164 ± 15 |
| (Diode Check) | | J1 | N (–) and T (+) | No Continuity |
| | | J1 | R (+) and T (–) | 164 ± 15 |
| | | J1 | R (–) and T (+) | No Continuity |
| | | | J of J2 (+) and E of J1 (–) | 65 ± 5 |
| | | | J of J2 (–) and E of J1 (+) | No Continuity |
| HOOK SELECT (8) | FWD | J2 | A and B | Continuity |
| | FWD | J2 | B and D | Continuity |
| | MID | J2 | B and D | No Continuity |
| | MID | J2 | H and B | Continuity |
| | AFT | J2 | B and D | No Continuity |
| | AFT | J2 | B and H | No Continuity |
| | AFT | J2 | B and M | Continuity |
| | TANDEM | J2 | B and D | Continuity |
| | TANDEM | J2 | B and H | No Continuity |
| | TANDEM | J2 | B and M | Continuity |
| | ALL | J2 | B and D | Continuity |
| | ALL | J2 | B and H | Continuity |
| | ALL | J2 | B and M | Continuity |
| N/A | | J2 | G and Case Grd | Continuity |
| Cargo Hook MASTER (7) | ARM | J2 | C and J | Continuity |
| | OFF | J2 | C and J | No Continuity |

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-100 INSTALL OVERHEAD PANEL PANELS 9-100

INITIAL SETUP

***Applicable Configurations:***

Without 17
Without 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

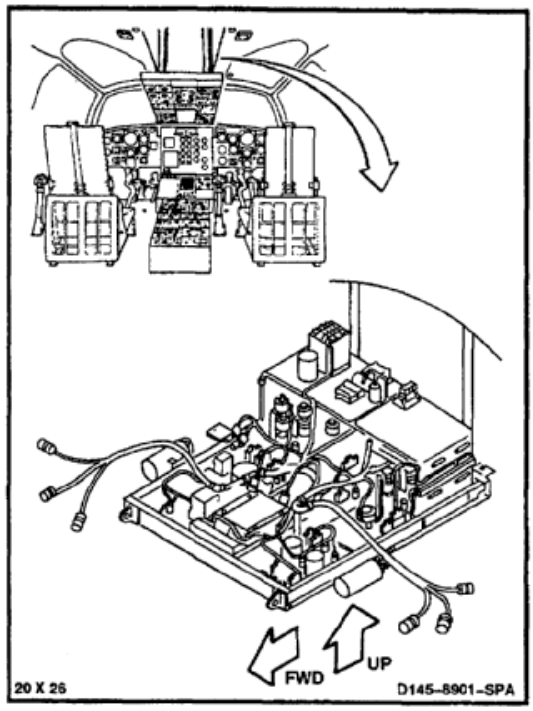
Solder (E360)

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 11-1520-240-23



CAUTION

Wires must not touch moving components; otherwise damage to wires or fire can result.

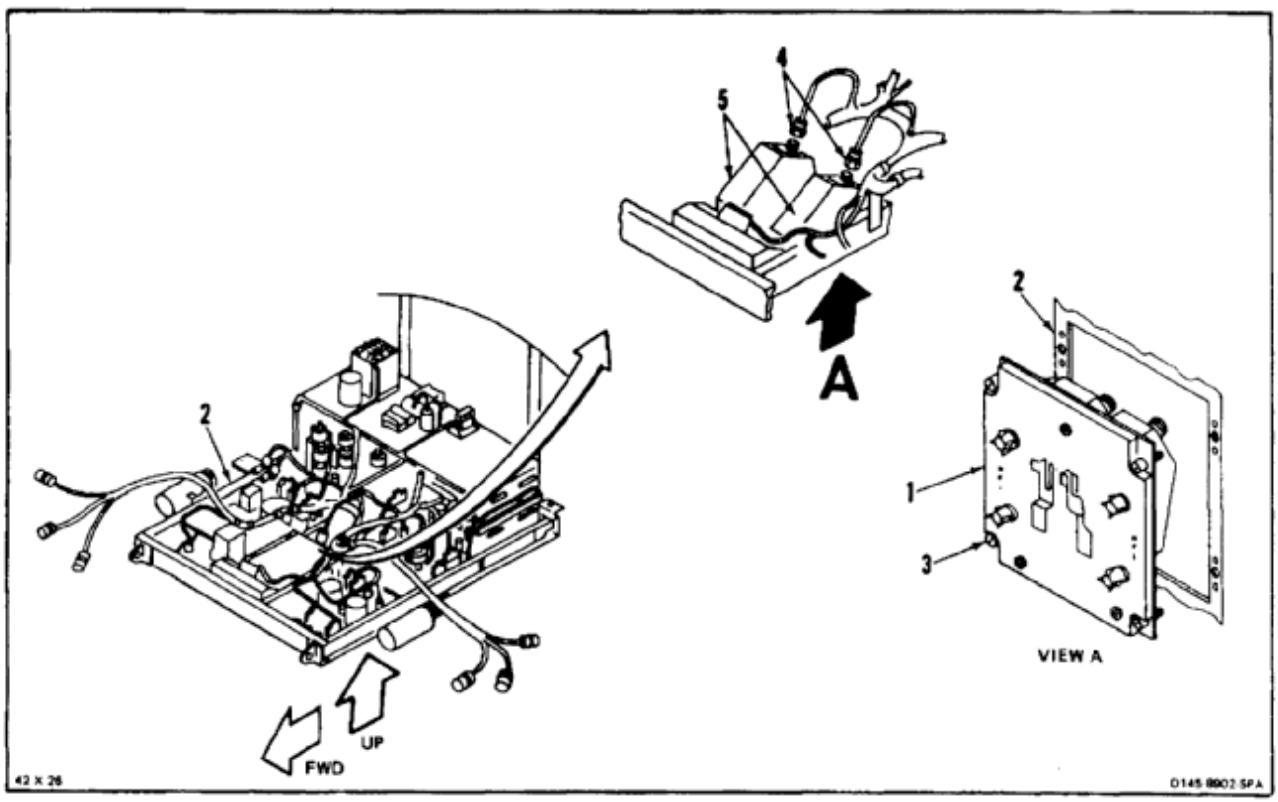
***ENGINE CONDITION PANEL***

1. Install ENGINE CONDITION panel as follows:
   a. Position panel (1) on panel (2). Tighten four screws (3).
   b. Connect two electrical connectors (4) to two engine controls (5). Remove tags.

***INSPECT***

**NOTE**

If no other panels are to be installed, go to step 13.



***ANTI-ICE PANEL***

2. Install ANTI-ICE panel as follows:

   a. Position panel (6) on panel (2). Tighten four screws (7).

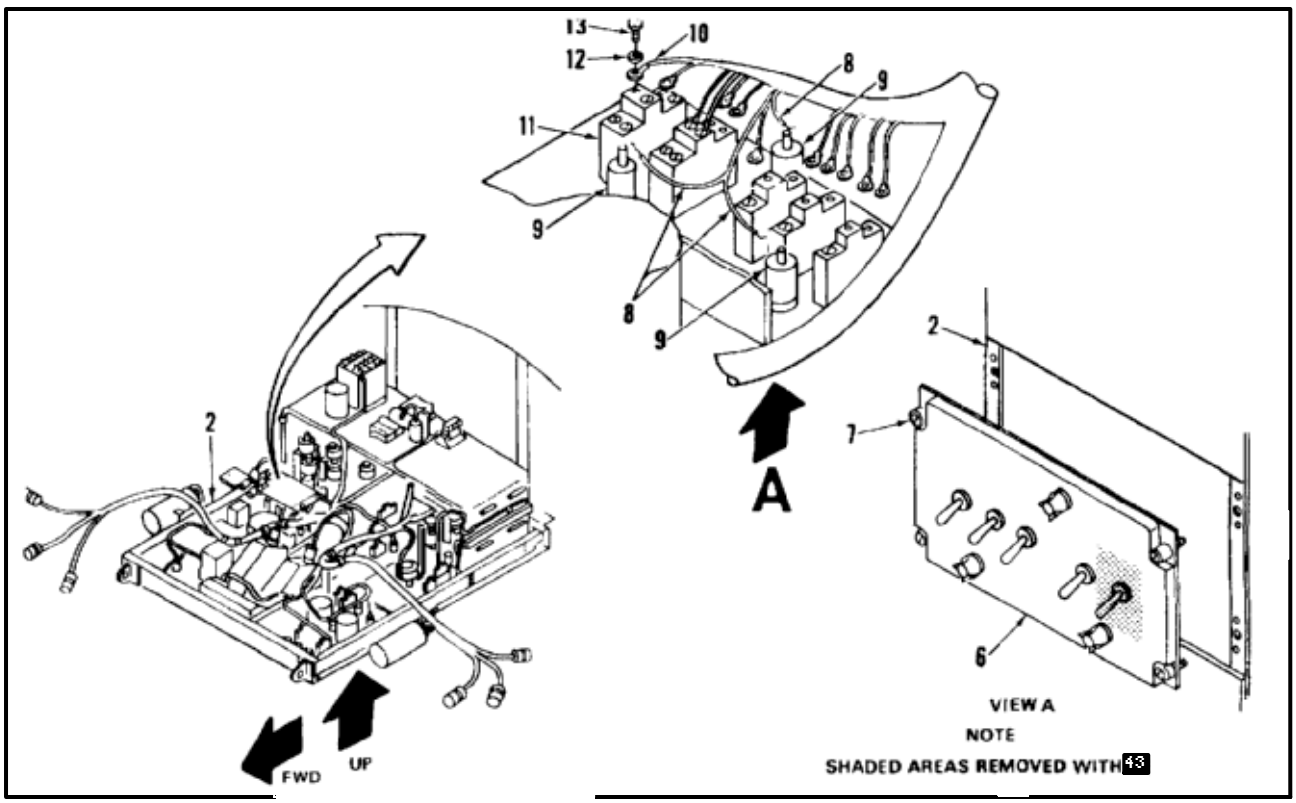
   b. Remove tape. Connect and solder three wires (8) to three lamps (9). Remove tags. Use solder (E360).

   c. Remove tape. Connect 10 wires (10) to 5 switches (11) by installing washers(12) and screws (13). Remove tags.

***INSPECT***

**NOTE**

If no other panels are to be installed, go to step 13.



***LTG PANEL***

3. Install LTG panel as follows:

   a. Position panel (14) on panel (2). Tighten four screws (15).

   b. Remove tape. Connect 15 wires (16) to two switches (17) by installing washers (18) and screws (19). Remove tags.

   c. Remove tape. Connect and solder two wires (30) to two lamps (31). Remove tags. Use solder (E360).

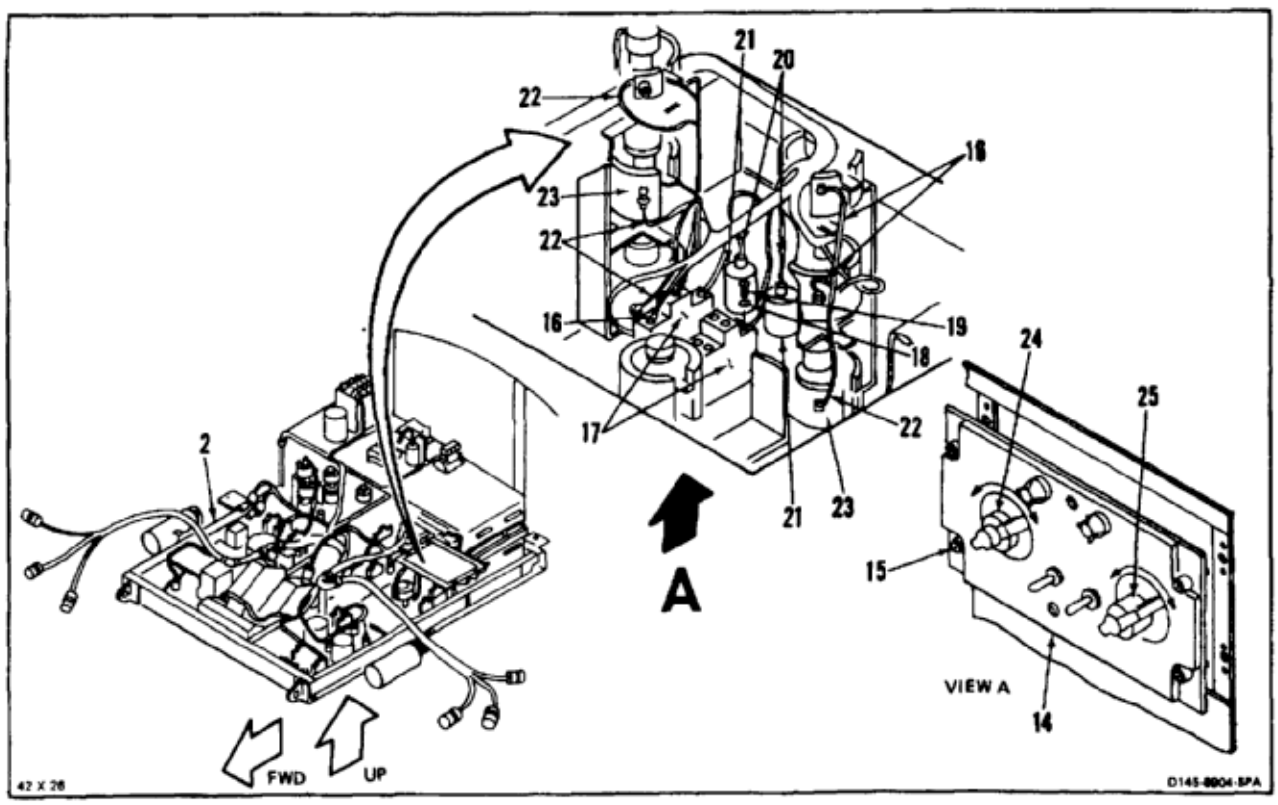
   d. Remove tape. Connect and solder 19 wires (22) to two potentiometers (23). Use solder (E360).

   e. Operate controls (24 and 25) through full range. Wires must not touch moving components.

***INSPECT***

**NOTE**

If no other panels are to be replaced, go to step 13.



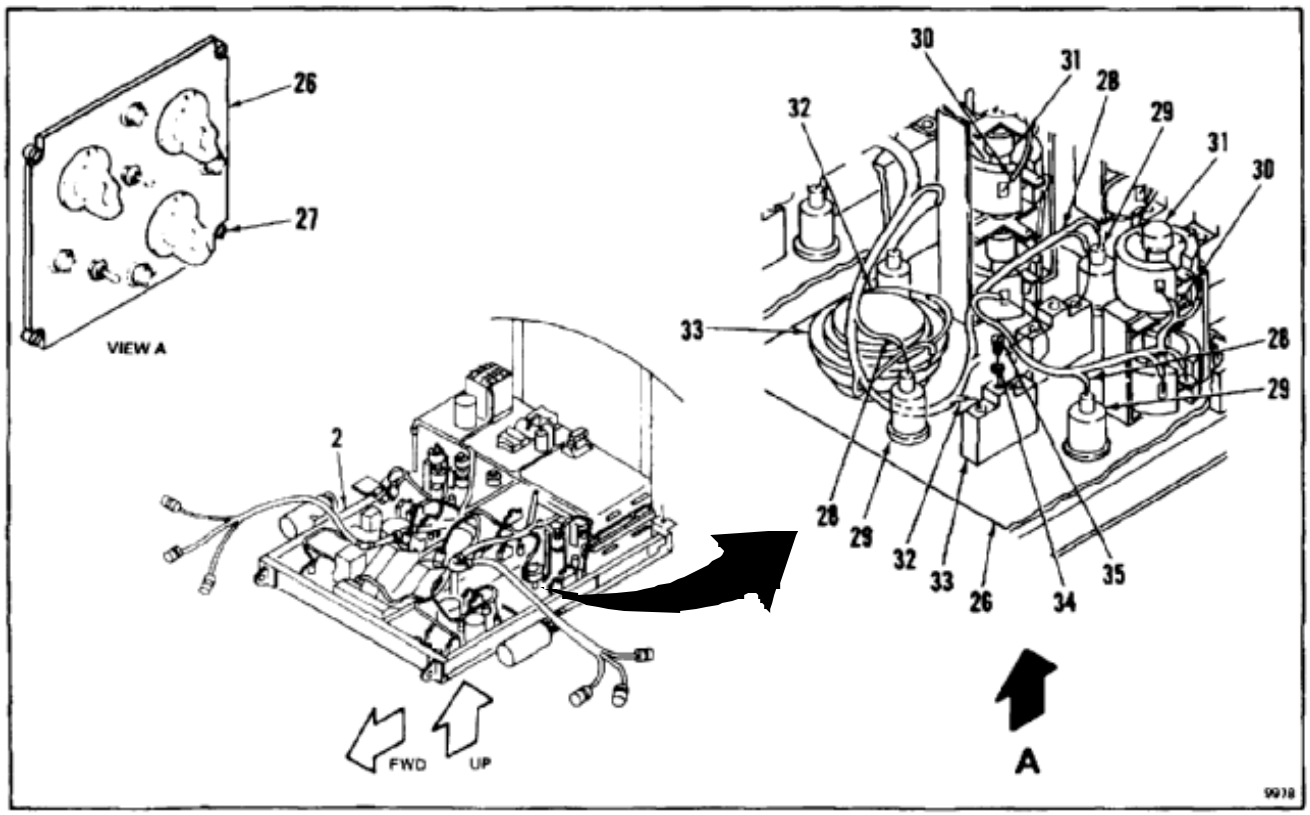
*LIGHTING PANEL*

4. Install LIGHTING panel (26) as follows:
   a. Position panel (26) on panel (2). Tighten four screws (27).
   b. Remove tape. Connect and solder five wires (28) to three lamps (29). Remove tags.
   c. Remove tape. Connect and solder 16 wires (30) to two potentiometers (31). Remove tags.
   d. Remove tape. Connect nine wires (32) to two switches (33) by installing washers (34) and screws (35). Remove tags.

*INSPECT*

**NOTE**

If no other panels are to be installed, go to step 13.



**9-100 INSTALL OVERHEAD PANEL PANELS (Continued) 9-100**

***TROOP WARN/HEATING PANEL***

5. Install TROOP WARN/HEATING panel (36) as follows:

   a. Position panel (36) on panel (2). Tighten four screws (37).

   b. Remove tape. Connect and solder six wires (38) to five lamps (39). Remove tags.

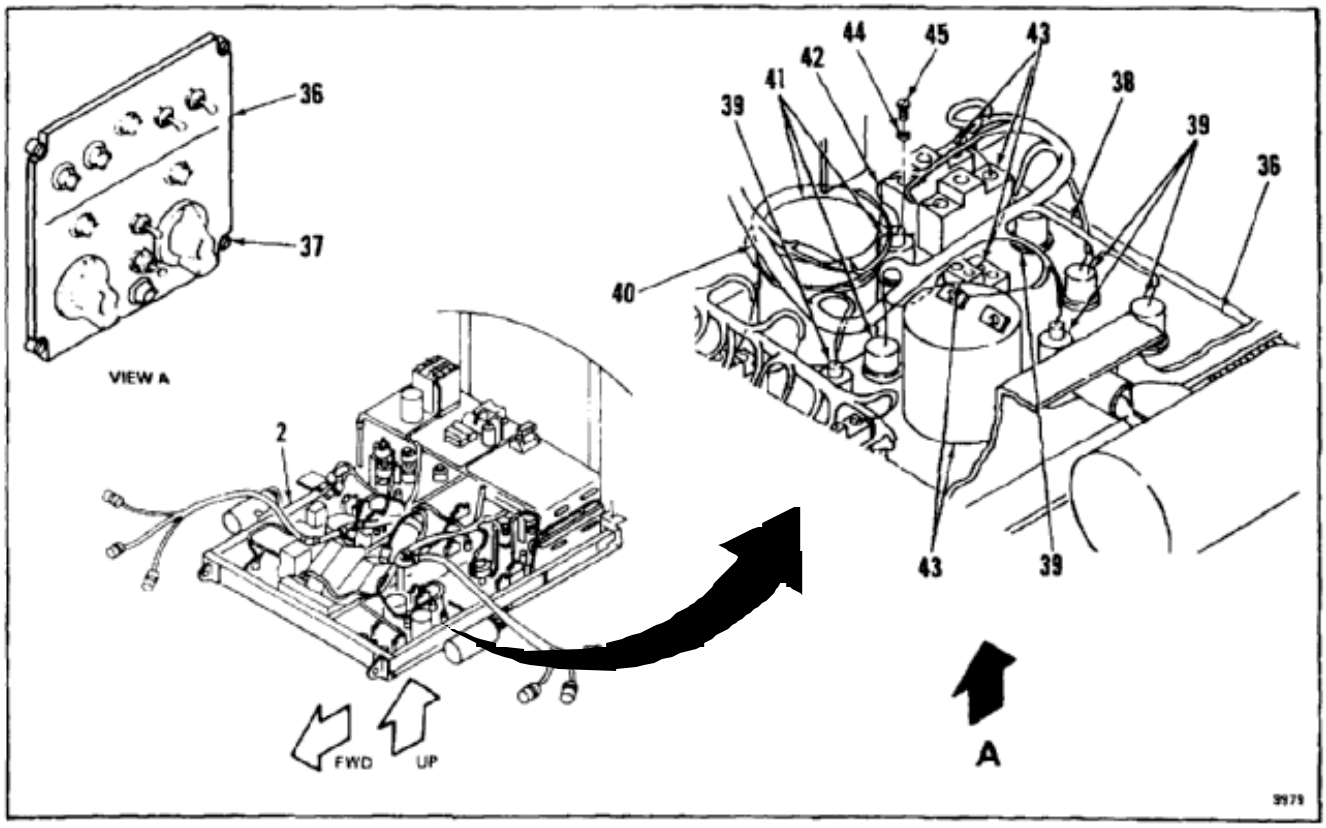
   c. Remove tape. Connect and solder eight wires (40) to three switches (41). Remove tags.

   d. Remove tape. Connect 12 wires (42) to four switches (43) by installing washers (44) and screws (45). Remove tags.

***INSPECT***

**NOTE**

If no other panels are to be installed, go to step 13.



*ELECT PANEL*

6. Install ELECT panel (46) as follows:

   a. Position panel (46) on panel (2). Tighten four screws (47).

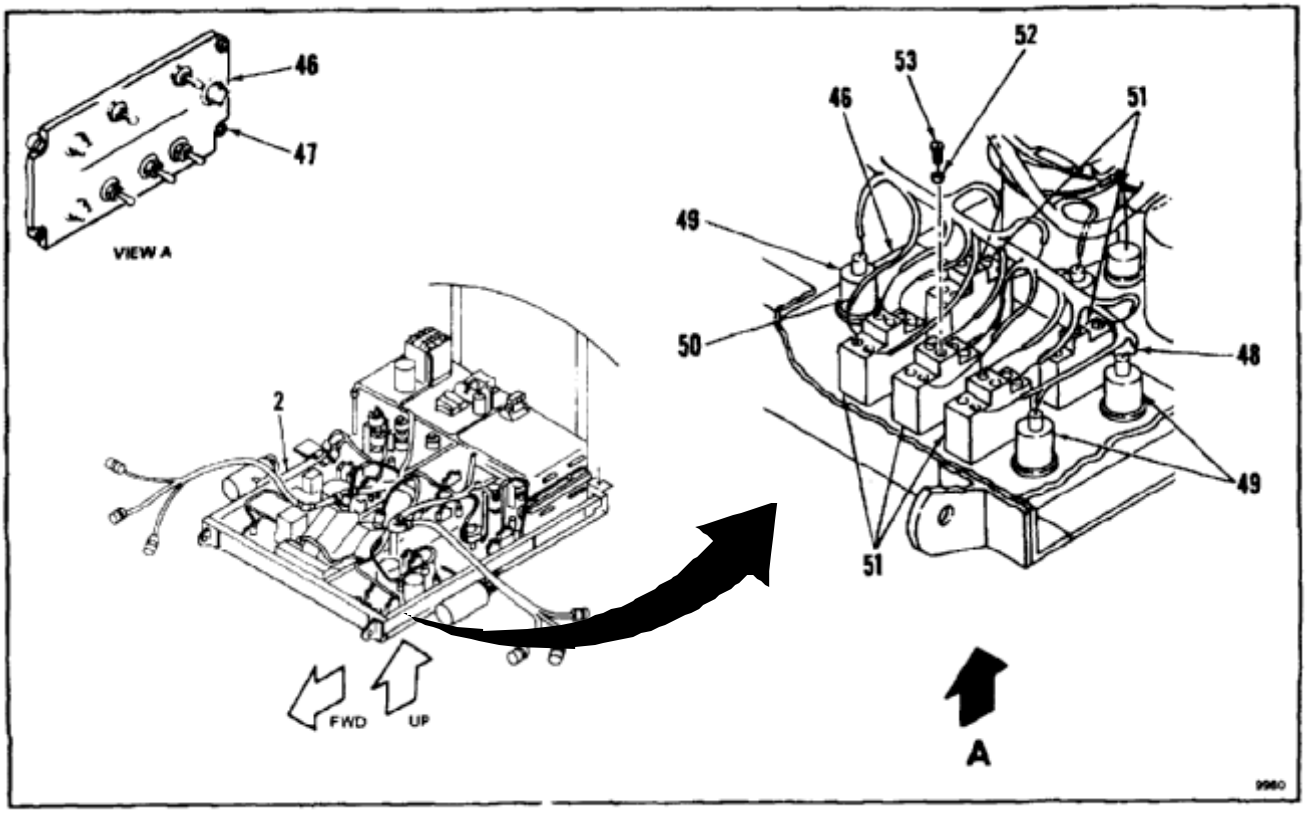
   b. Remove tape. Connect and solder five wires (48) to three lamps (49). Remove tags.

   c. Remove tape. Connect 26 wires (50) to five switches (51) by installing washers (52) and screws (53). Remove tags.

*INSPECT*

**NOTE**

If no other panels are to be installed, go to step 13.



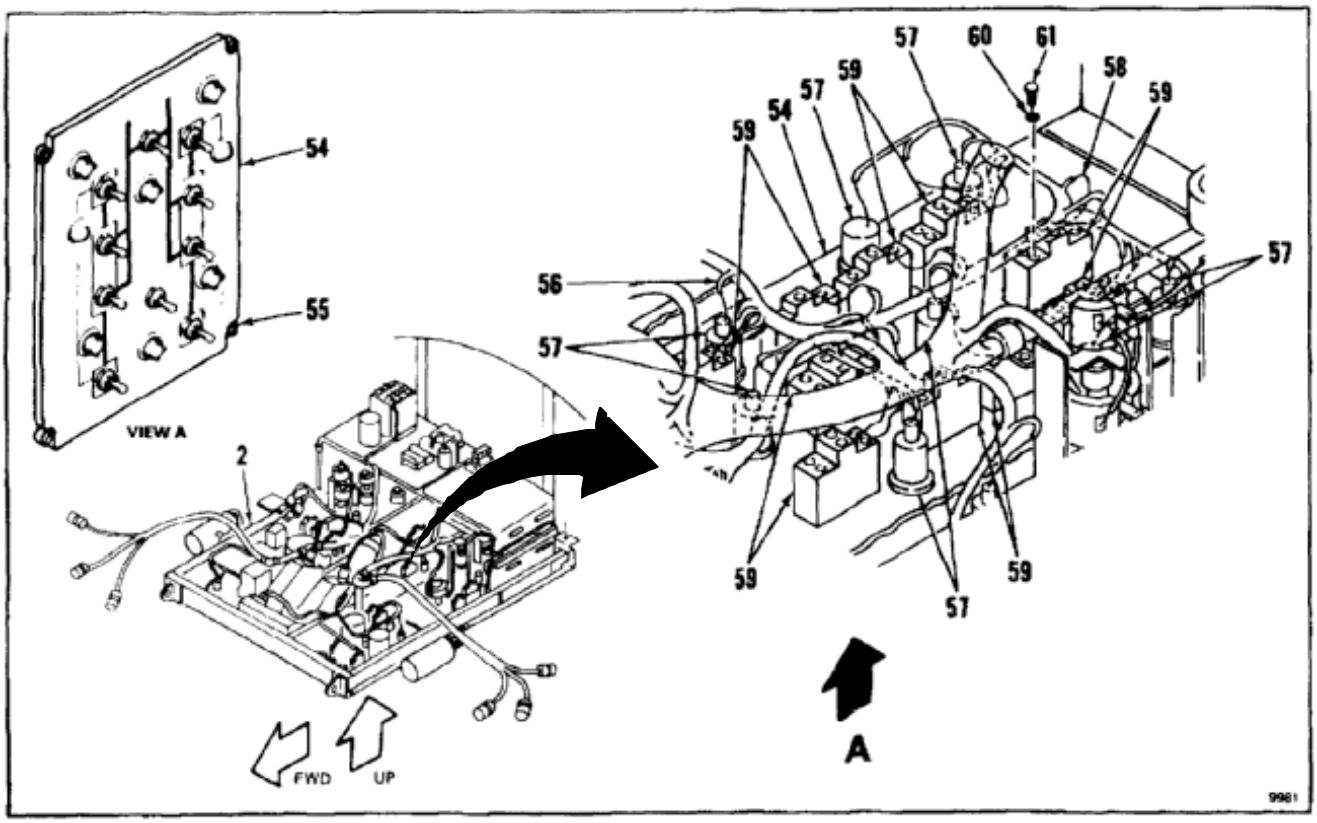
***FUEL CONTROL PANEL***

7. Install FUEL CONTROL panel (54) as follows:
   a. Position panel (54) on panel (2). Tighten six screws (55).
   b. Remove tape. Connect and solder 17 wires (56) to eight lamps (57). Remove tags.
   c. Remove tape. Connect 35 wires (58) to 10 switches (59) by installing washers (60) and screws (61). Remove tags.

***INSPECT***

**NOTE**

If no other panels are to be installed, go to step 13.



***START PANEL***

8. Install START panel (62) as follows:
   a. Position panel (62) on panel (2). Tighten four screws (63).
   b. Remove tape. Connect and solder nine wires (84) to four lamps (65). Remove tags.
   c. Remove tape. Connect 22 wires (66) to two switches (67) by installing washers (68) and screws (69). Remove tags.

***INSPECT***

**NOTE**

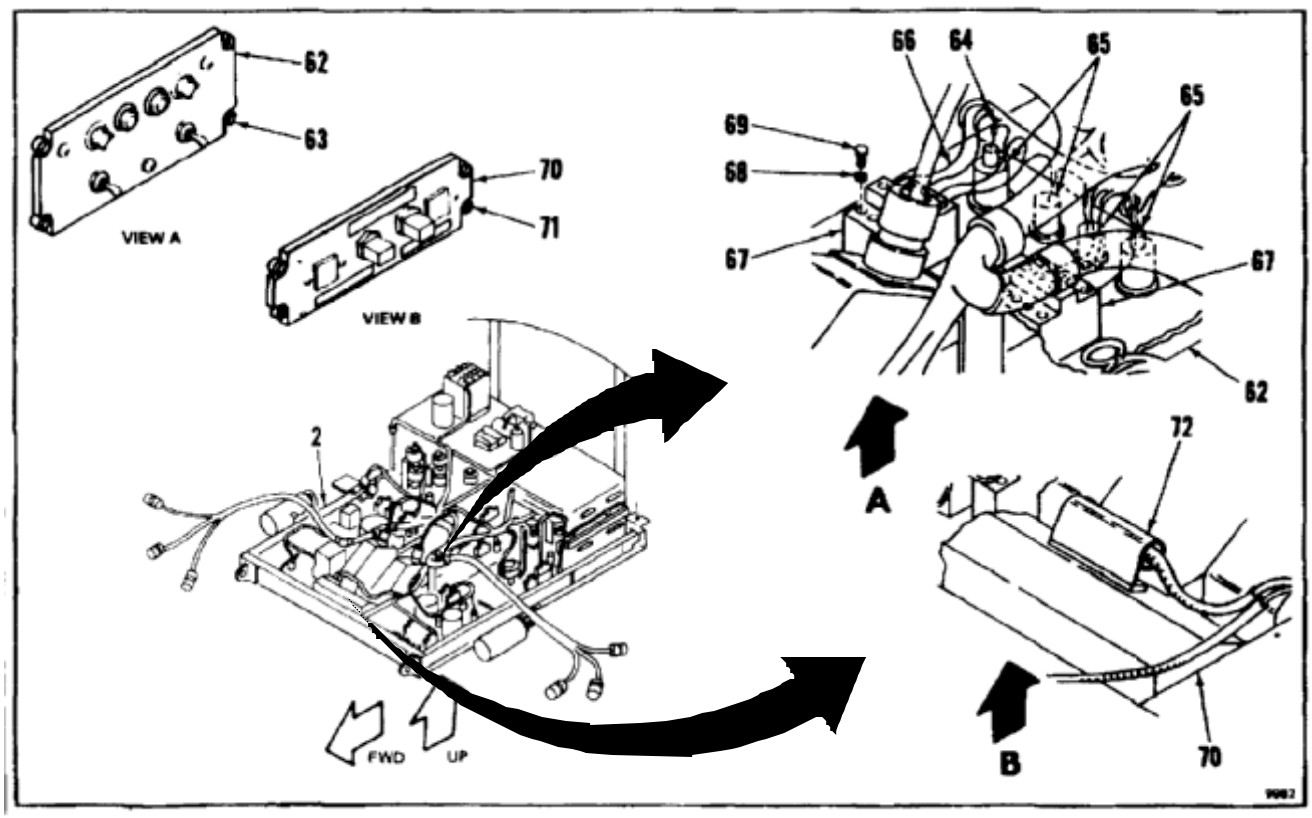
If no other panels are to be installed, go to step 13.

***EMERGENCY POWER PANEL***

9. Install EMERGENCY POWER panel (70) as follows:
   a. Position panel (70) on panel (2). Tighten four screws (71).
   b. Connect plug (72) to panel (70). Remove tag.

**NOTE**

If no other panels are to be installed, go to step 13.



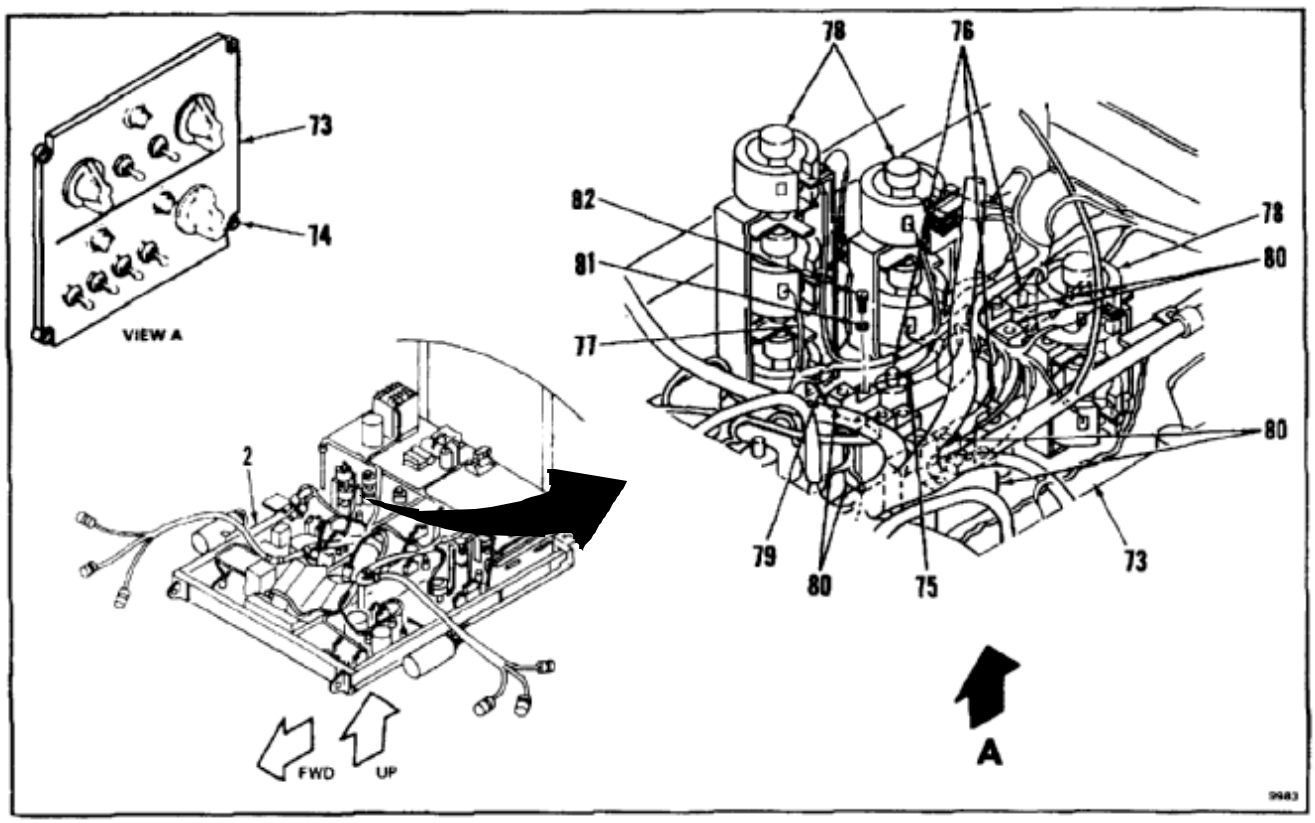
***LIGHTING PANEL***

10. Install LIGHTING panel (73) as follows:
    a. Position panel (73) on panel (2). Tighten four screws (74).
    b. Remove tape. Connect and solder five wires (75) to three lamps (76). Remove tags.
    c. Remove tape. Connect and solder 25 wires (77) to three potentiometers (78). Remove tags.
    d. Remove tape. Connect 17 wires (79) to six switches (80) by installing washers (81) and screws (82). Remove tags.

***INSPECT***

**NOTE**

If no other panels are to be installed, go to step 13.



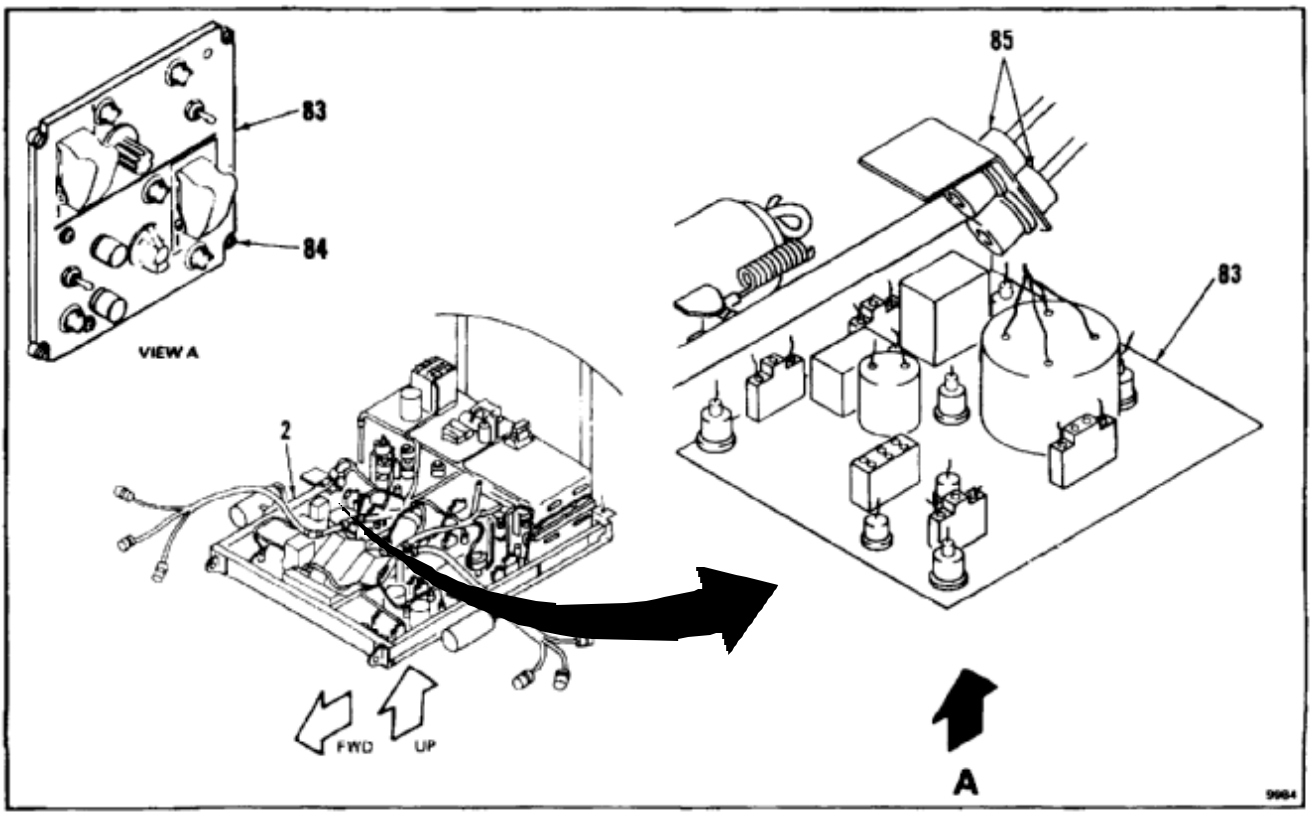
*HOIST/CARGO HOOK PANEL*

11. Install HOIST/CARGO HOOK panel (83) as follows:
    a. Position panel (83) on panel (2). Tighten four screws (84).
    b. Connect two plugs (85) to panel (83). Remove tags.

*INSPECT*

**NOTE**

If no other panels are to be installed, go to step 13.



## 9-100 INSTALL OVERHEAD PANEL PANELS (Continued) 9-100

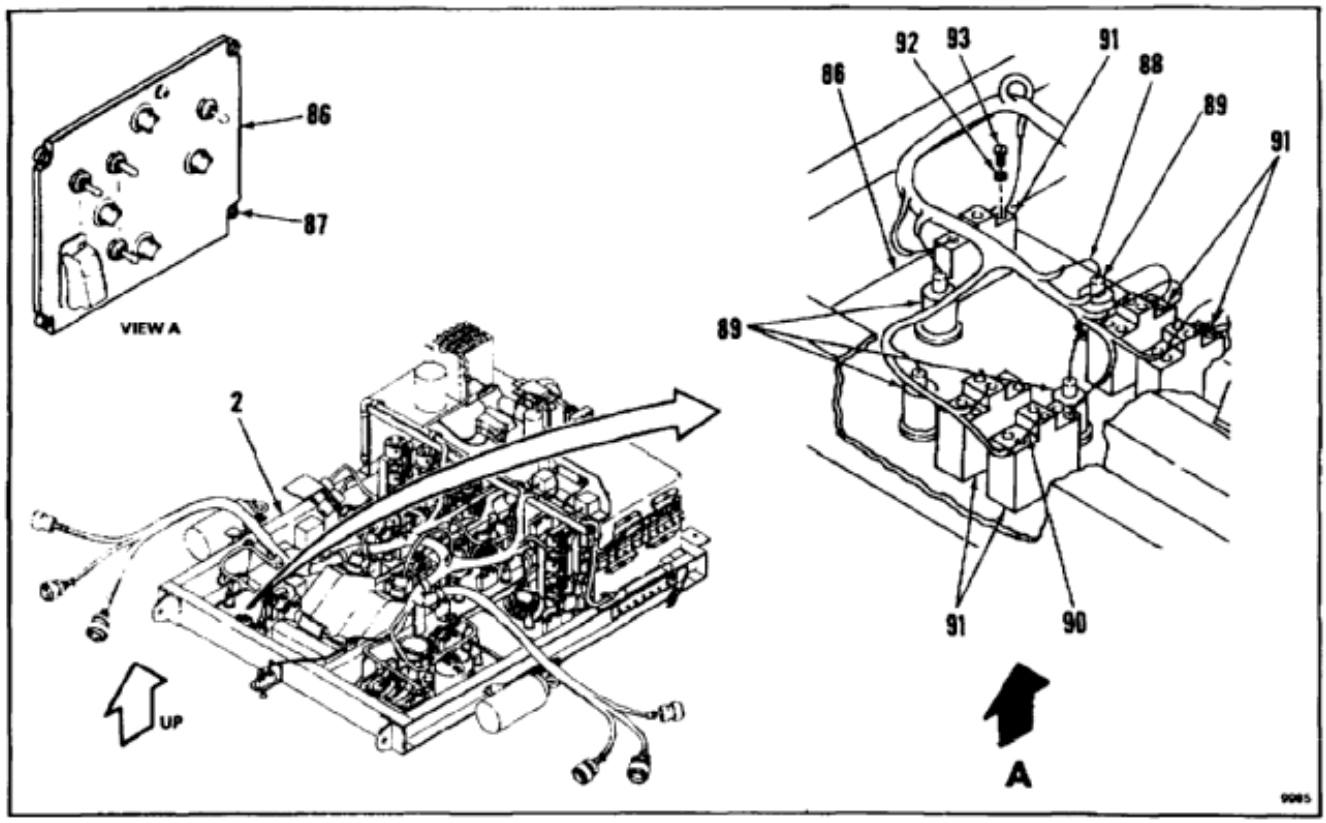
***HYDRAULIC PANEL***

12. Install HYDRAULIC panel (86) as follows:
    a. Position panel (86) on panel (2). Tighten four screws (87).
    b. Remove tape. Connect and solder seven wires (88) to four lamps (89). Remove tags.
    c. Remove tape. Connect 15 wires (90) to five switches (91) by installing washers (92) and screws (93). Remove tags.

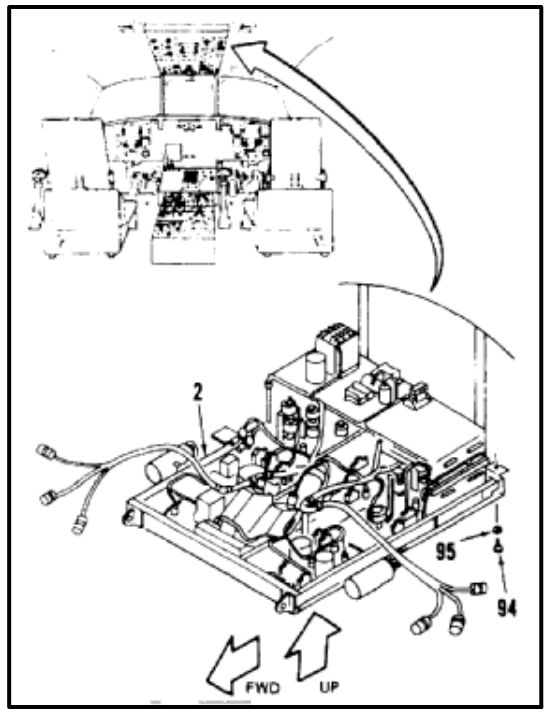
***INSPECT***

**NOTE**

If no other panels are to be installed, go to step 13.



13. Raise panel (2). Install two bolts (94) and washers (95).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).

END OF TASK

## 9-100.1 REPLACE PRESS-TO-TEST LAMP FROM FUEL CONTROL PANEL 9-100.1

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

None

***Parts:***

Lamp

***Personnel Required***

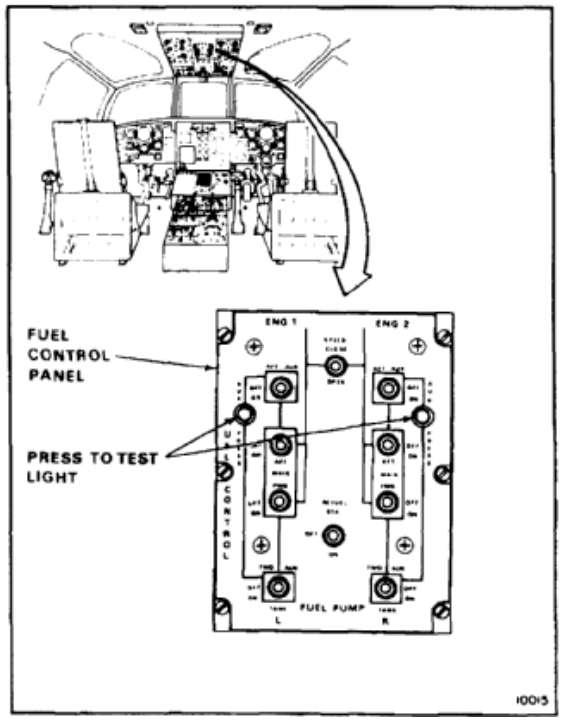
Aircraft Electrician

***References:***

TM 55-1520-240-23P

***Equipment Condition:***

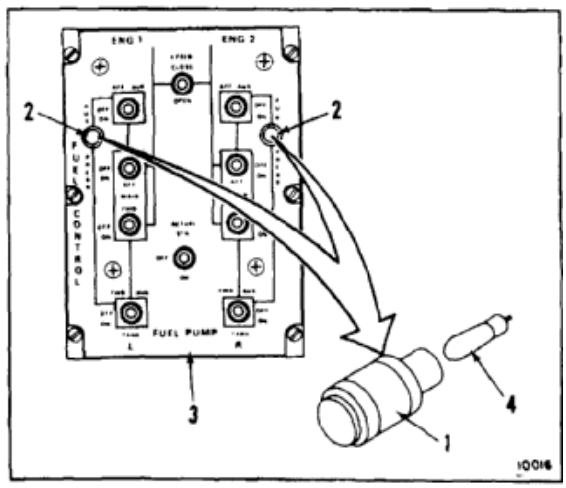
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




**NOTE**

Replacement of press-to-test lamp in panel with **17** is shown here. Replacement of press-to-test lamp in panel without **17** is same.

1. Remove lens cap (1), turn counterclockwise, from press-to-test light (2) of FUEL CONTR panel (3).
2. Remove lamp (4) from cap (1).
3. Install new lamp (4) in cap (1).
4. Install cap (1), turn clockwise, in panel (3).




***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).

END OF TASK

## 9-101 REMOVE OVERHEAD PANEL VARIABLE RESISTOR 9-101

INITIAL SETUP

***Applicable Configurations:***

Without 17

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

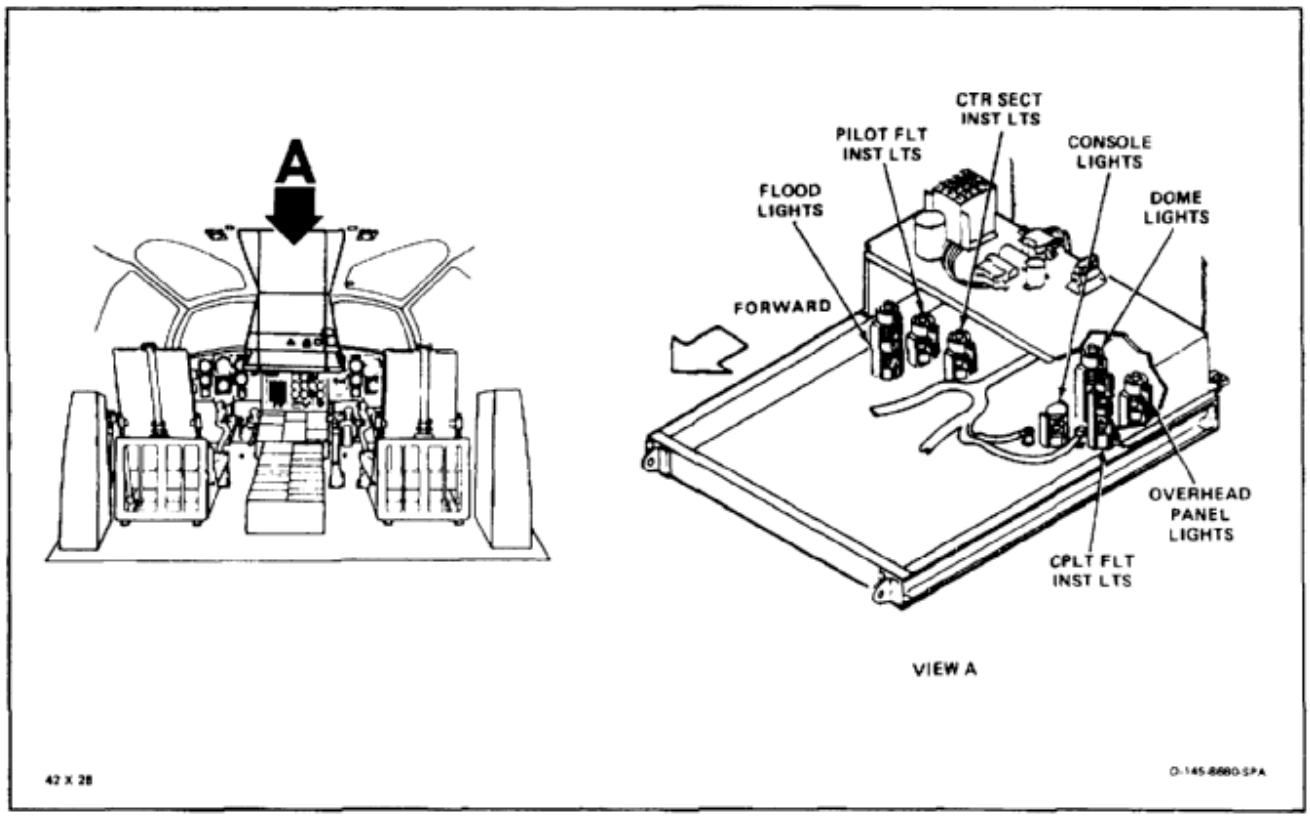
Paper Tags (E264)

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off



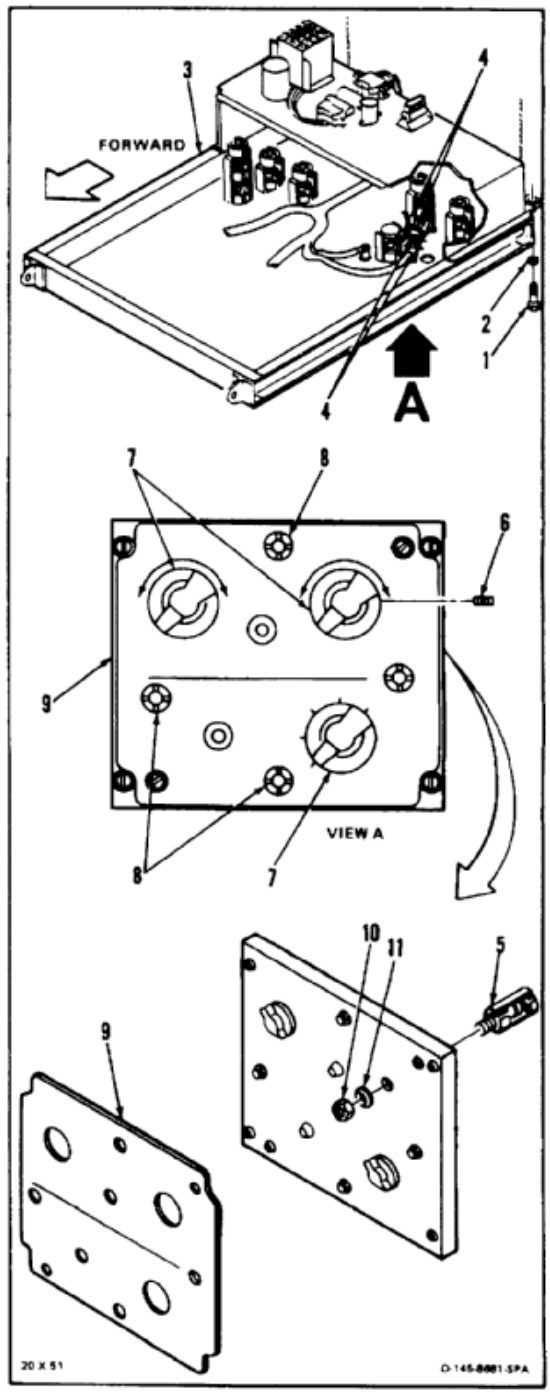
**NOTE**

Procedure is similar to remove CTR SECT INST LTS resistor, PILOT or COPILOT INST LTS resistor, FLOOD LTS resistor, CONSOLE LTS resistor, DOME LTS resistor, and OVERHEAD PANEL LIGHTS resistor. Removal of CONSOLE LTS resistor is shown here.

1. Remove two bolts (1) and washers (2) from panel (3). Lower panel.
2. Tag and unsolder eight wires (4) from resistor (5). Tape wire ends. Use tape (E395).
3. Remove three screws (6) from three knobs (7).
4. Remove three knobs (7).
5. Remove three holders (8).
6. Remove panel (9) from panel (10).
7. Remove nut (11) and washer (12) from resister (5).
8. Remove resistor (5).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-101.1 REMOVE OVERHEAD PANEL LIGHTING POTENTIOMETER, LIGHTING CONTROL TRANSFORMER, OR ROTARY SWITCH 9-101.1

INITIAL SETUP

***Applicable Configurations:***

With **17**

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

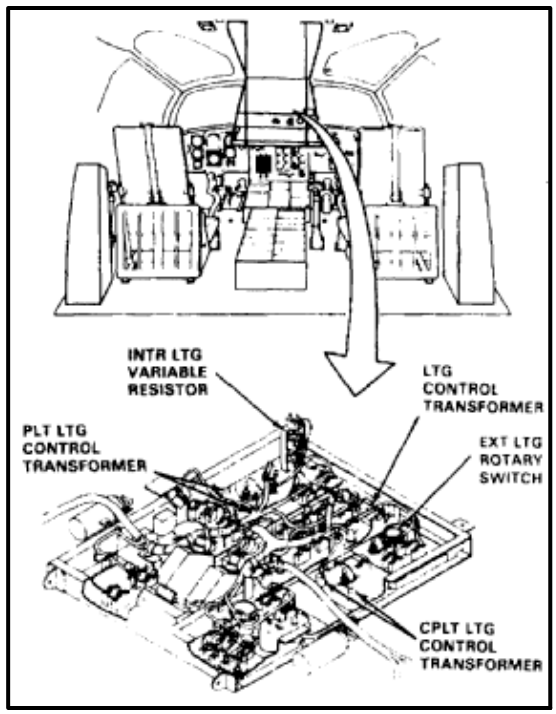
Paper Tags (E264)
Tape (E395)

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off



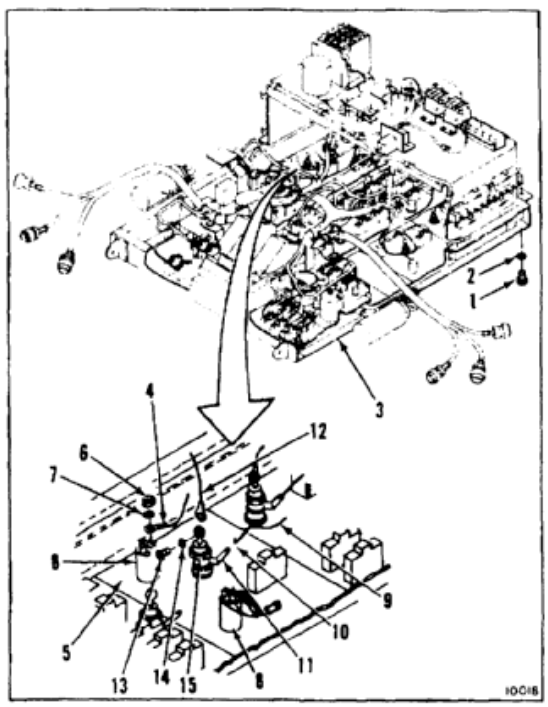

**NOTE**

Procedure is similar to remove control transformers from PLT LTG, LTG, or CPLT LTG panels. Removal of PLT LTG panel control transformer and INTR LTG resistor is shown here.

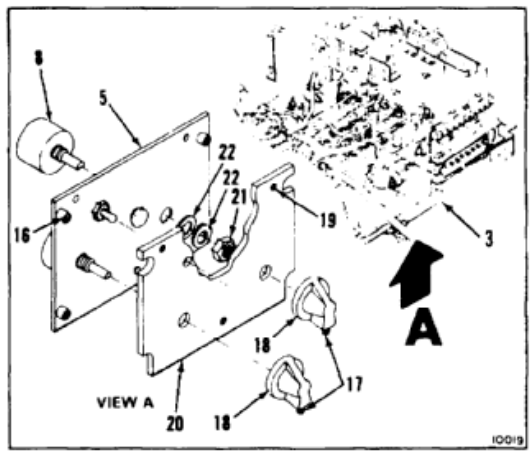
1. Remove two bolts (1) and washers (2) from overhead panel (3). Lower panel.

***LTG CONTROL TRANSFORMER***

2. Identify six wires (4) of PLT LTG panel (5). Use tags (E264). Remove nuts (6) and washers (7) from two control transformers (8).
3. Remove six wires (4). Cover wire ends. Use tape (E395).
4. Identify wire (9). Use tag (E264), Unsolder wire end (10) from terminal (11). Cover wire end. Use tape (E395).
5. Identify wire (12) Use tag (E264). Remove screw (13) and washer (14) from light housing (15).
6. Remove wire (12). Cover wire end. Use tape (395).

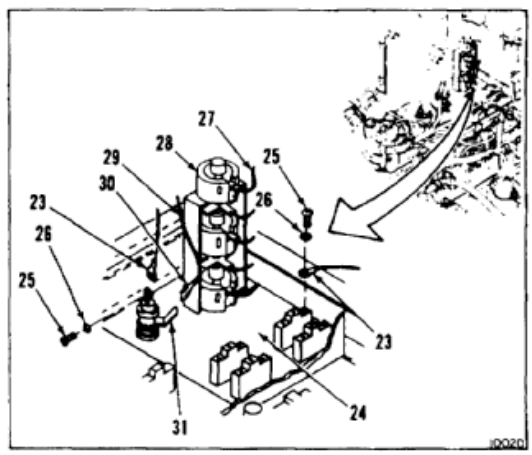


7. Loosen four screws (16). Remove panel (5) from panel (3).
8. Loosen two screws (17). Remove knobs (18).
9. Loosen three screws (19) of panel (20).
10. Remove panel (20).
11. Remove nuts (21) and washers (22) from control transformer (8).
12. Remove transformer (8).

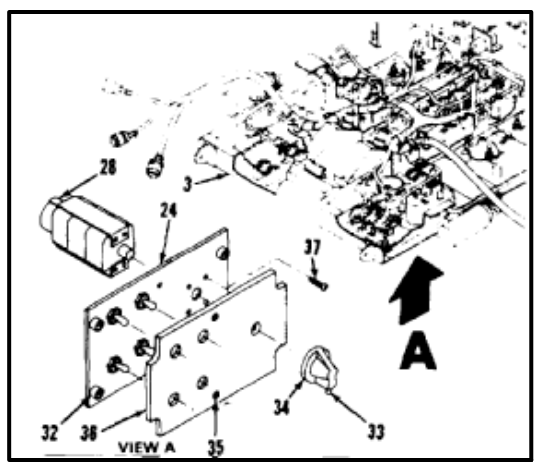



***FLOODLIGHTING POTENTIOMETER — INTR LTG PANEL***

13. Identify 16 wires (23) of INTR LTG panel (24). Use tags (E264). Remove screws (25) and washers (26).
14. Remove 16 wires (23). Cover wire ends. Use tape (E395).
15. Identify five wires (27) from INTR LTG variable resistor (28). Use tags (E264). Unsolder wires. Cover wire ends. Use tape (E395).
16. Identify one wire (29). Use tag (E264). Remove wire. Unsolder wire end (30) from terminal (31). Cover wire end. Use tape (E395).



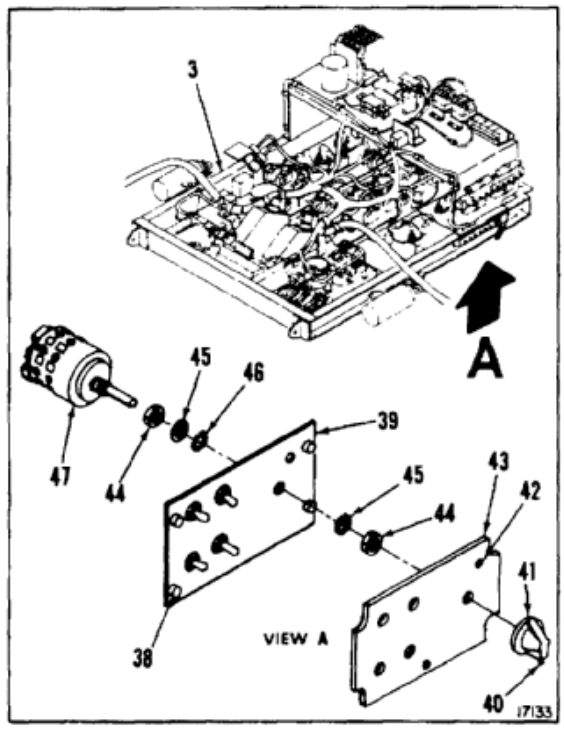

17. Loosen four screws (32). Remove panel (24) from panel (3).
18. Loosen screw (33). Remove knob (34).
19. Loosen two screws (35) of panel (36).
20. Remove panel (36).
21. Remove four screws (37) from resistor (28).
22. Remove resistor (28).



**9-101.1 REMOVE OVERHEAD PANEL LIGHTING POTENTIOMETER, LIGHTING CONTROL TRANSFORMER, OR ROTARY SWITCH (Continued)** **9-101.1**

***ROTARY SWITCH — EXT LTG PANEL***

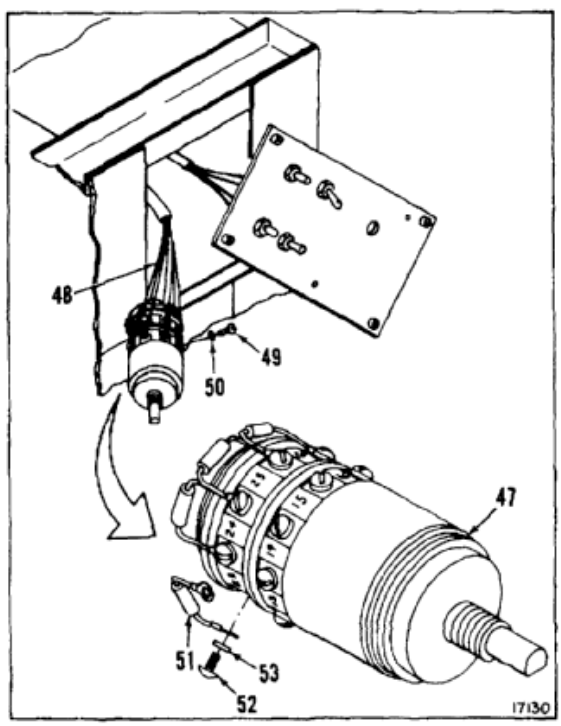
23. Loosen four screws (38). Lower panel (39) from panel (3).
24. Loosen screw (40). Remove knob (41).
25. Loosen two screws (42). Remove panel (43).
26. Remove nut (44) and lockwasher (45) from rotary switch (47) shaft.
26.1. Remove rotary switch (47) from panel (39).
26.2. Remove lockring (46), lockwasher (45) and nut (44) from rotary switch (47) shaft.




27. Identify eight wires (48) on rotary switch (47). Use tags (E264).
28. Remove screws (49) and washers (50). Remove wires (48). Cover wire ends. Use tape (E395).
29. Remove rotary switch (47).
30. Identify four resistors (51). Use tags (E264).
31. Remove screws (52) and washers (53).
32. Remove resistors (51).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-101.2 INSTALL OVERHEAD PANEL LIGHTING POTENTIOMETER, LIGHTING CONTROL TRANSFORMERS, OR ROTARY SWITCH 9-101.2

INITIAL SETUP

***Applicable Configurations:***

With 17

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

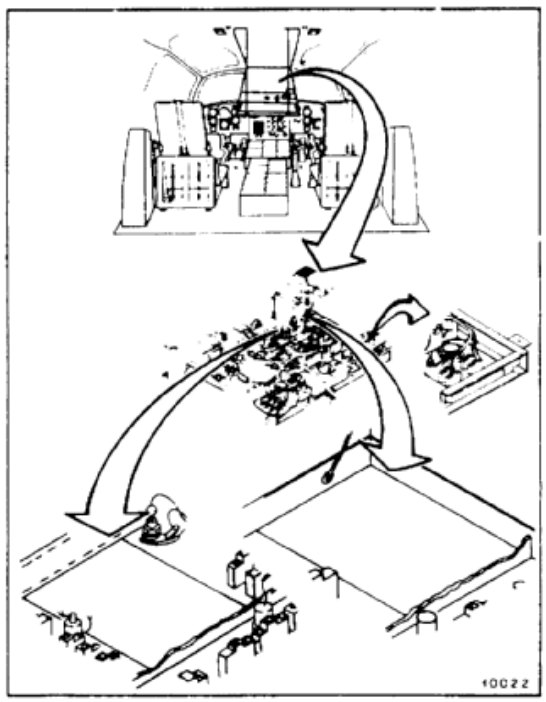
Solder (E360)

***Personnel Required:***

Aircraft Electrician
Inspector

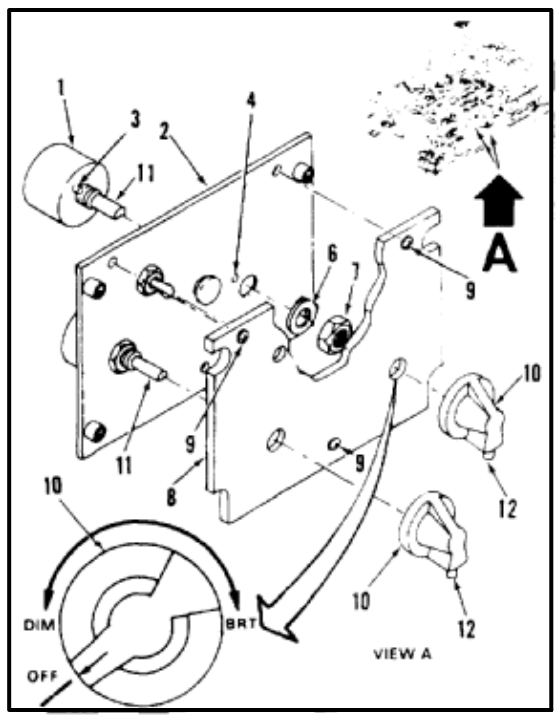
***References:***

TM 55-1520-240-23P




**NOTE**

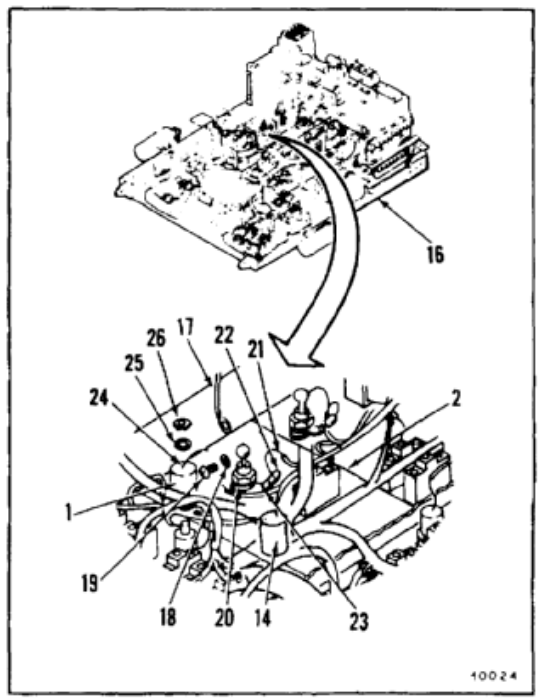
Procedure is similar to install control transformers on PLT LTG, LTG, or CPLT LTG panels. Installation of PLT LTG panel control transformers and INTR LTG resistor is shown here.




***CONTROL TRANSFORMER — PLT LTG PANEL***

1. Position control transformer (1) in PLT LTG panel (2). Be sure pin (3) is in hole (4).
2. Install washer (6) and nut (7) on transformer (1).
3. Position panel (8) on panel (2). Tighten three screws (9).
4. Install two knobs (10) on two shafts (11). Be sure screws (12) contact flat part of shafts. Tighten screws.
5. Turn knobs (10) to OFF position.
6. Deleted.
7. Deleted.
8. Deleted.
9. Deleted.

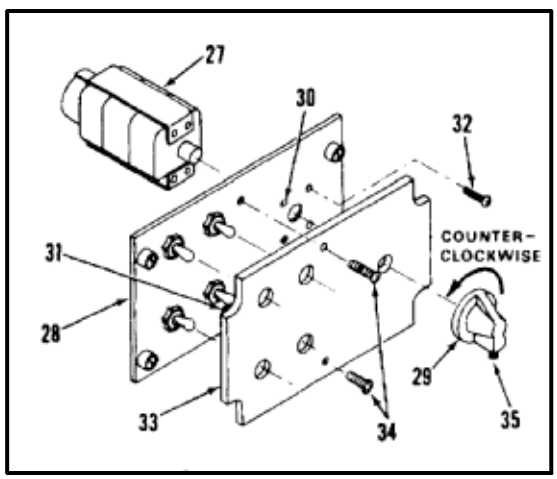
10. Install panel (2) in overhead panel (16).
11. Remove tape and install wire (17), washer (18), and screw (19) on light housing (20). Remove tag.
12. Remove tape and install wire (21). Solder wire end (22) onto terminal (23) of housing (20). Remove tag.
13. Remove tape and install six wires (24), washers (25), and nuts (26) on transformers (1 and 14). Remove tags.



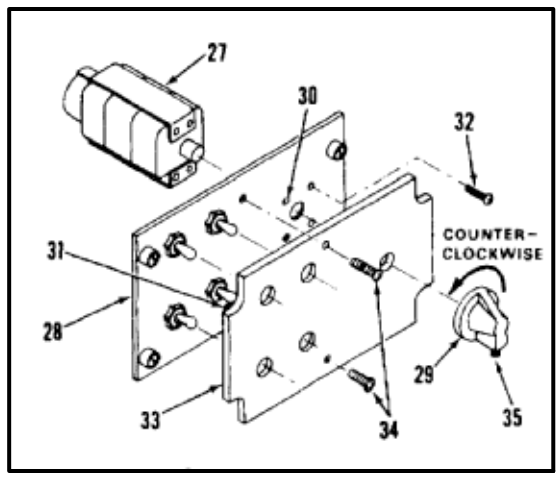

***INSPECT***

***FLOODLIGHTING POTENTIOMETER — INTR LTG PANEL***

14. Position INTR LTG resistor (27) in INTR LTG panel (28).
15. Install knob (20) on resistor (27).
16. Hold resistor (27). Turn knob (29) fully counterclockwise.
17. Align resistor with holes (30), knob (29) pointing towards screw hole (31).
18. Remove knob (29).
19. Install four screws (32) in resistor (27).
20. Install panel (33) on panel (28). Tighten two screws (34).
21. Install knob (29) on resistor (27). Tighten screw (35).

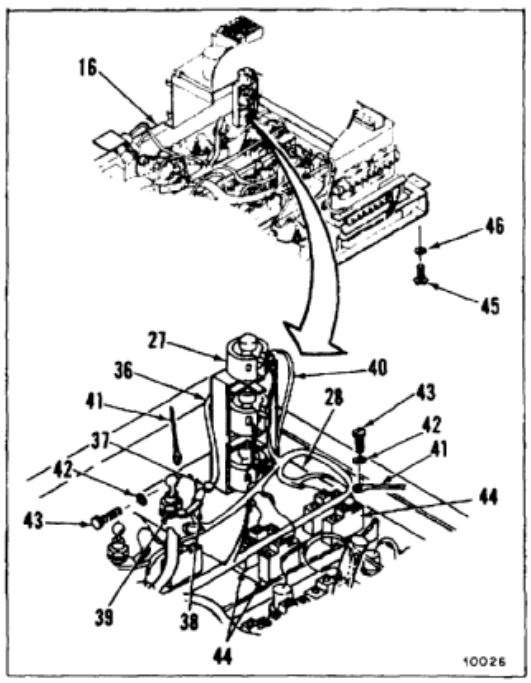


22. Install panel (28) in overhead panel (16).
23. Remove tape and install wire (36). Solder wire end (37) onto terminal (38) of light housing (39). Remove tag.
24. Remove tape and solder five wires (40) to resistor (27). Remove tags.
25. Remove tape and install 16 wires (41), washers (42) and screws (43) on four switches (44). Remove tags.




***INSPECT***

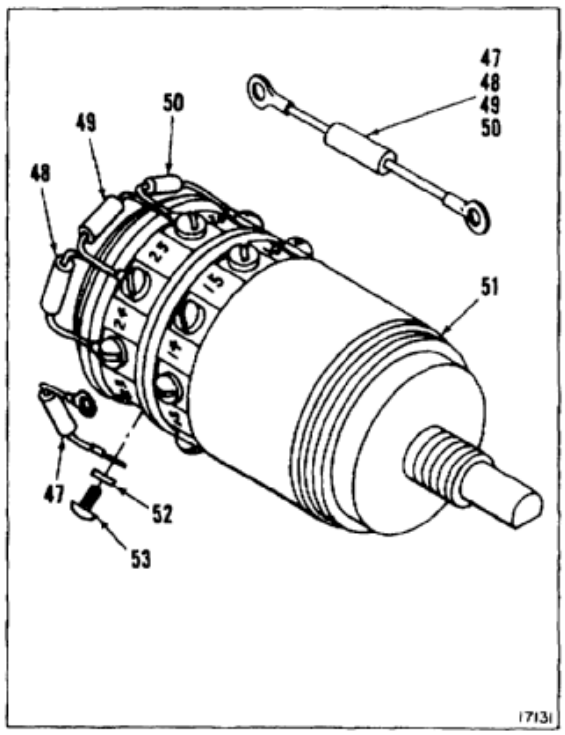
26. Raise panel (16). Install two bolts (45) and washer (46).



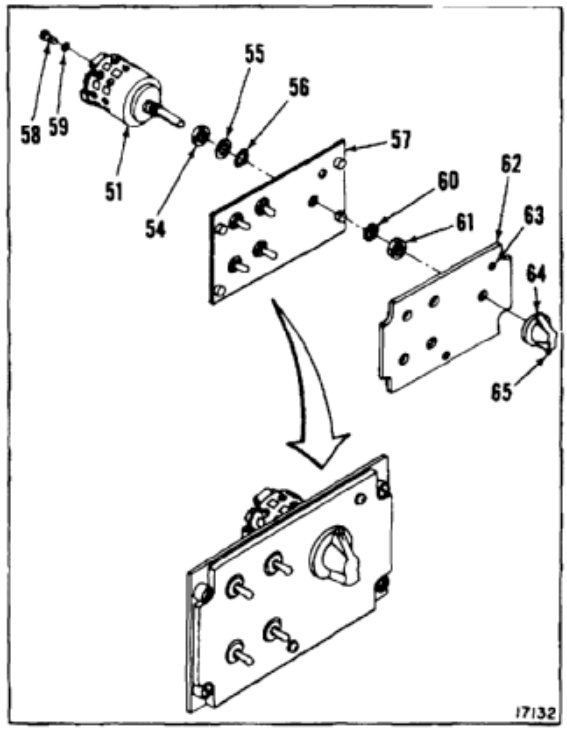
27. Position resistor assemblies (47), (48), (49), and (50) on rotary switch (51) as follows:

| Part No. | Value | Between Terminals |
|---|---|---|
| (47) 145E2318-2 | 68,000 Ω, 1W | 22 and 23 |
| (48) 145E2318-3 | 2700 Ω, 1W | 23 and 24 |
| (49) 145E2318-4 | 470 Ω, 3W | 24 and 25 |
| (50) 145E2318-5 | 160 Ω, 5W | 25 and 26 |

28. Install four resistors (47), (48), (49), and (50) with five washers (52) and five screws (53) on rotary switch (51).



29. Install nut (54), washer (55), and lockring (56) on shaft of rotary switch (51).
30. Position rotary switch (51) in panel (57) with shaft flat opposite terminal 11. Engage bent tab of lockring (56) with locking hole in mounting panel.
31. Install two limit screws (58) and washers (59) into tapped holes on rear cover plate of switch between terminals 26 and 27 and between terminals 28 and 21.
32. Install washer (60) and nut (61) on shaft of rotary switch (51) and panel (57).
33. Install lighting panel (62) on panel (57) with two screws (63). Tighten screws.
34. Install knob (64) on rotary switch (51). Tighten screw (65).



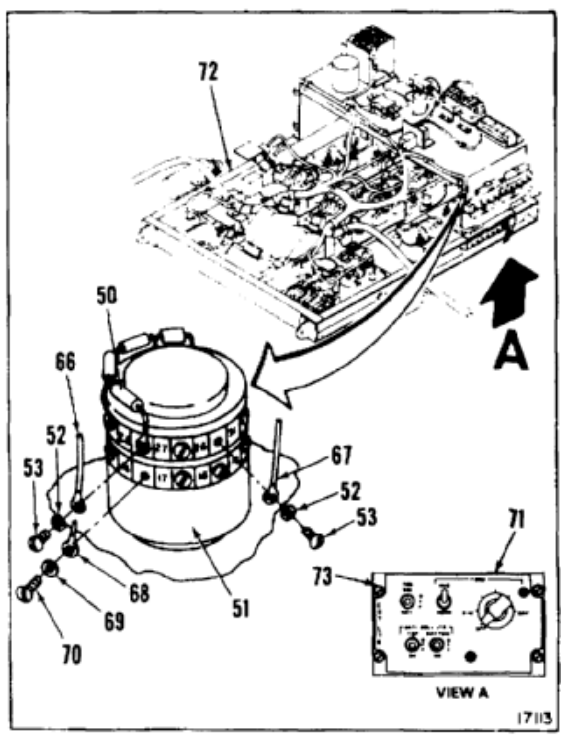

35. Remove tape and install one wire (66) with washer (52), screw (53), along with one end of the installed resistor (50) on terminal 26 of rotary switch (51).
36. Remove tape and install one wire (67) with washer (52) and screw (53) on terminal 21 of rotary switch (51).
37. Remove tape and install six wires (68) with washers (69) and screws (70) on first wafer of rotary switch (51). Remove tags.

***INSPECT***

38. Install panel (71) in overhead panel (72). Tighten four screws (73).

***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).




END OF TASK

## 9-102 INSTALL OVERHEAD PANEL LIGHTING POTENTIOMETER 9-102

INITIAL SETUP

***Applicable Configurations:***

Without 17

***Tools:***

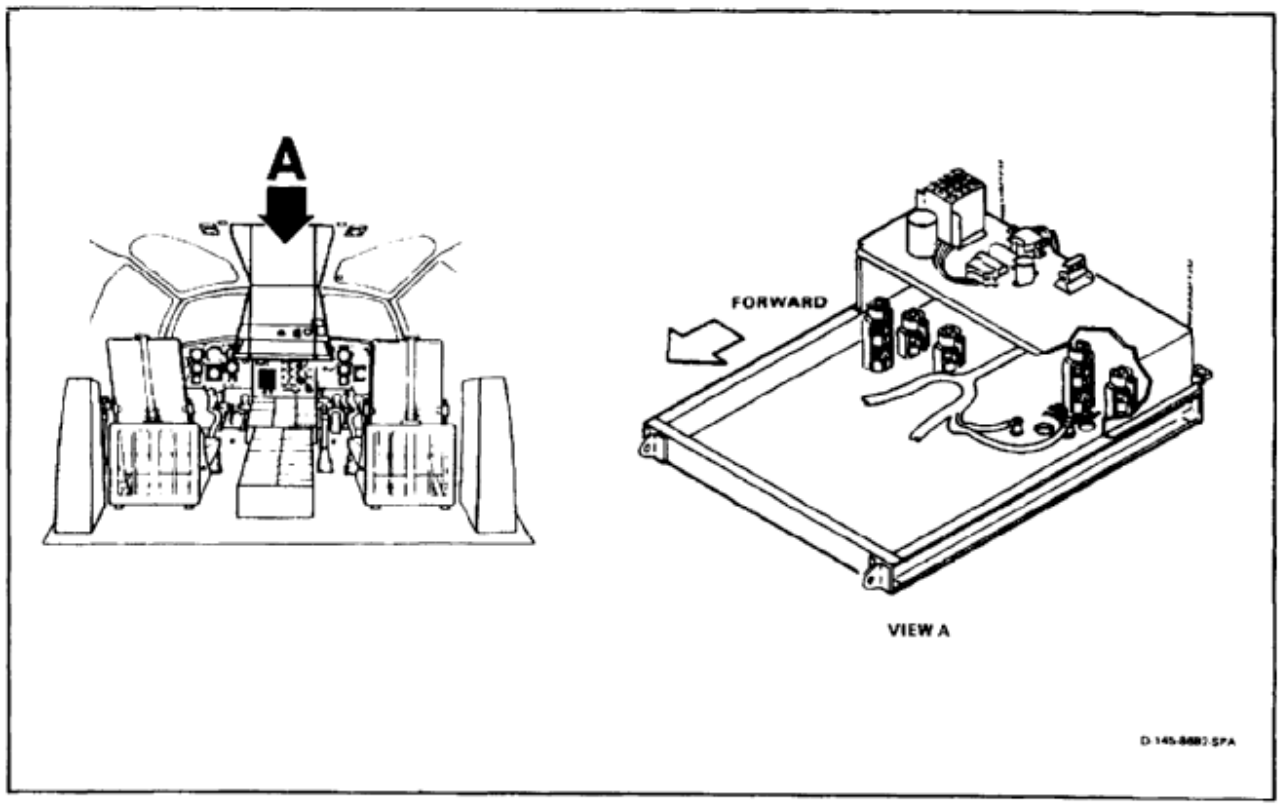
Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

Solder (E360)

***Personnel Required:***

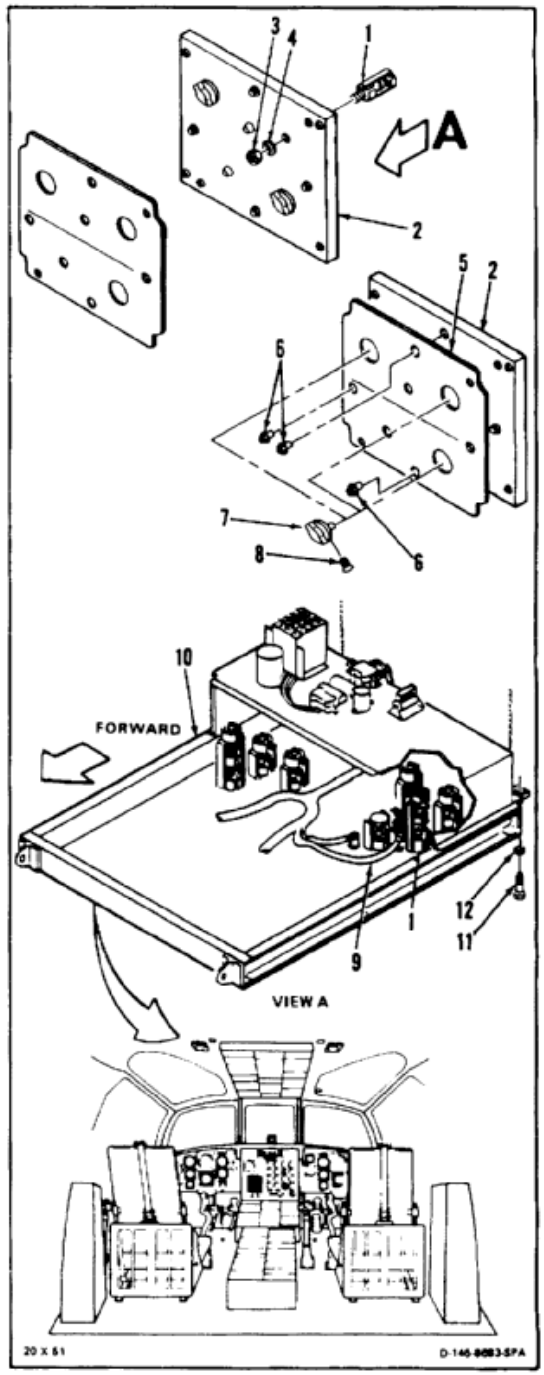
Aircraft Electrician
Inspector



**NOTE**

Procedure is similar to install CTR SECT INST LTS resistor, PILOT OR COPILOT INST LTS resistor, FLOOD LTS resistor, CONSOLE LTS resistor, DOME LTS resistor, and OVERHEAD PANEL LIGHTS resistor. Installation of CONSOLE LTS resistor is shown here.

1. Position resistor (1) in panel (2). Install nut (3) and washer (4).
2. Position panel (5) on panel (2). Install three holders (6).
3. Install three knobs (7). Tighten three screws (8).
4. Remove tape and solder eight wires (9) to resistor (1). Use solder (E360). Remove tags.
5. Raise panel (10). Install two bolts (11) and washers (12).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).

END OF TASK

## 9-103 REMOVE CONSOLE COMPONENTS 9-103

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

Paper Tags (E264)
Tape (E385)

***Personnel Required:***

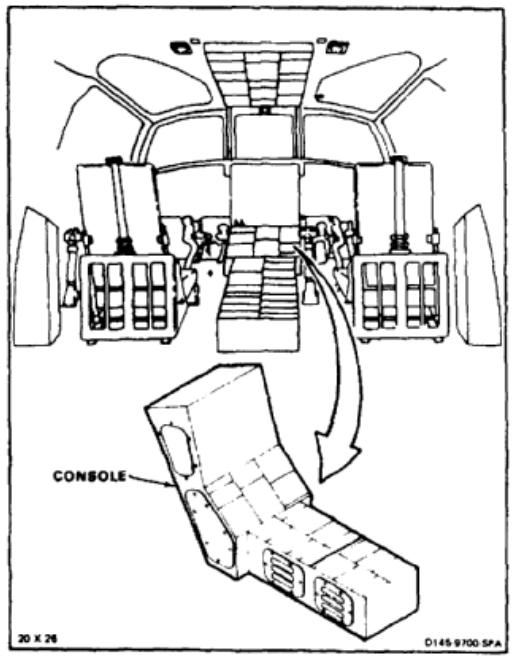
Aircraft Electrician

***References:***

Task 9-165

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




**NOTE**

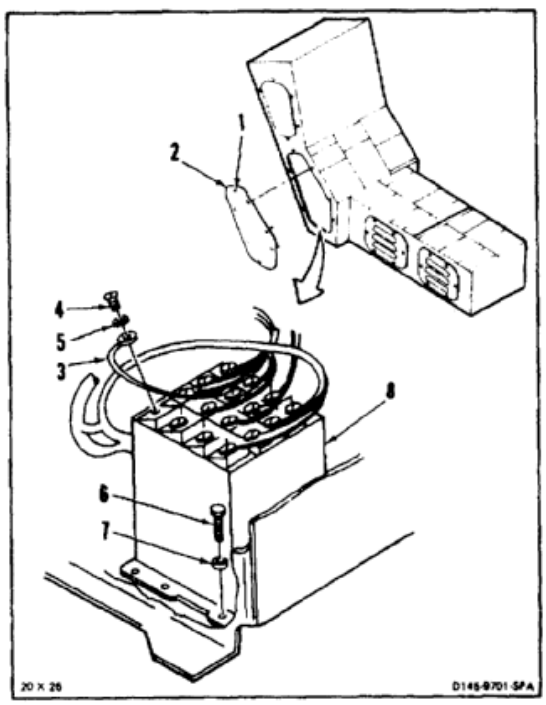
Procedure is similar to remove like components. Task includes four separate tasks.

1. Loosen seven fasteners (1). Remove panel (2).

**NOTE**

Procedure is similar to remove dimming lockout relay. Caution light dimming relay, power steering relay, copilot interphone key relay, and pilot interphone key relay. Pilot interphone key relay is shown here.

2. Remove pilot interphone key relay 232K2 as follows:
   a. Tag and disconnect 13 wires (3) by removing 13 screws (4) and washers (5). Tape wire ends.
   b. Remove six bolts (6) and washers (7).
   c. Remove relay 232K2.



3. Loosen seven fasteners (1). Remove panel (2).

**NOTE**

Procedure is same to remove pilot or copilot lighting transformer. Pilot's lighting transformer is shown here.

4. Remove pilot's lighting transformer as follows:

***WITHOUT 17***

a. Tag and disconnect three wires (9) by unsoldering from terminal (10). Tape wire ends. Use tape (E385).

b. Remove four screws (11) and washers (12).

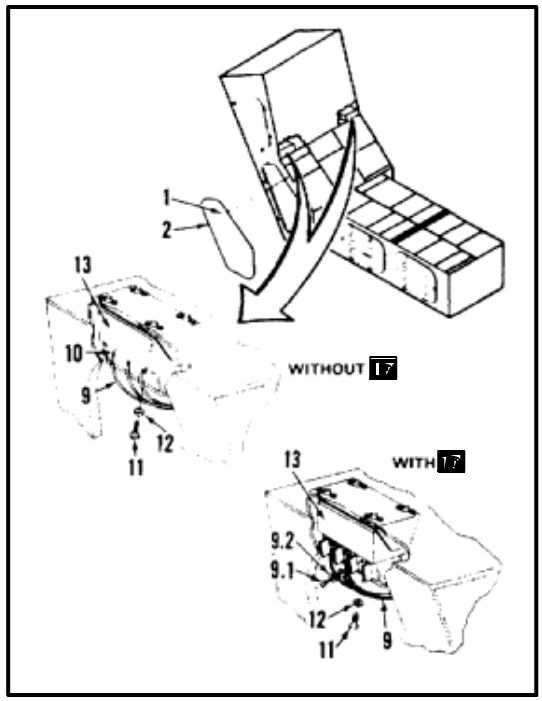
c. Remove transformer 122T1 (13).

***WITH 17***

d. Tag and disconnect three wires (9) by removing screws (9.1) and washers (9.2) from terminal (10). Tape wire ends. Use tape (E385).

e. Remove four screws (11) and washers (12).

f. Remove transformer 310-18742-01 (13).

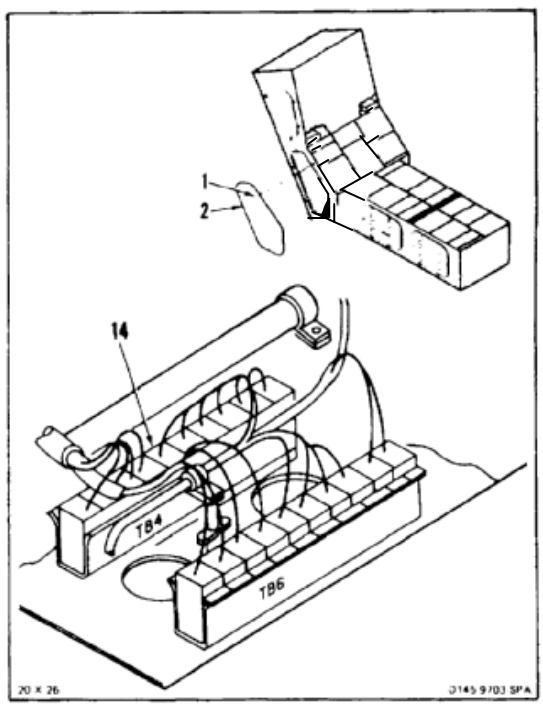



5. Loosen seven fasteners (1). Remove panel (2).

**NOTE**

Procedure is same to remove any terminal board module.

6. Remove module (14) (Task 9-165).



7. On helicopters without 74, disassemble EMERG ENG TRIM panel as follows:

   a. Open two switch guards (15). Remove nut (16) and washer (17) from switch guards. Remove switch guards.

   b. Remove two lens (18) from panel (19).

   c. Remove two lamps (20) from lens (18).

   d. Remove two screws (21) from panel (19). Remove panel.

   e. Loosen four fasteners (22) on panel (23). Lift EMERG ENG TRIM panel from console (24).

**NOTE**

Do not lift panel by switches.

   f. Tag (E264) eight wires (25). Remove wires from four switches (26) by removing screws (27) and washers (28). Tape (E385) ends of wires.

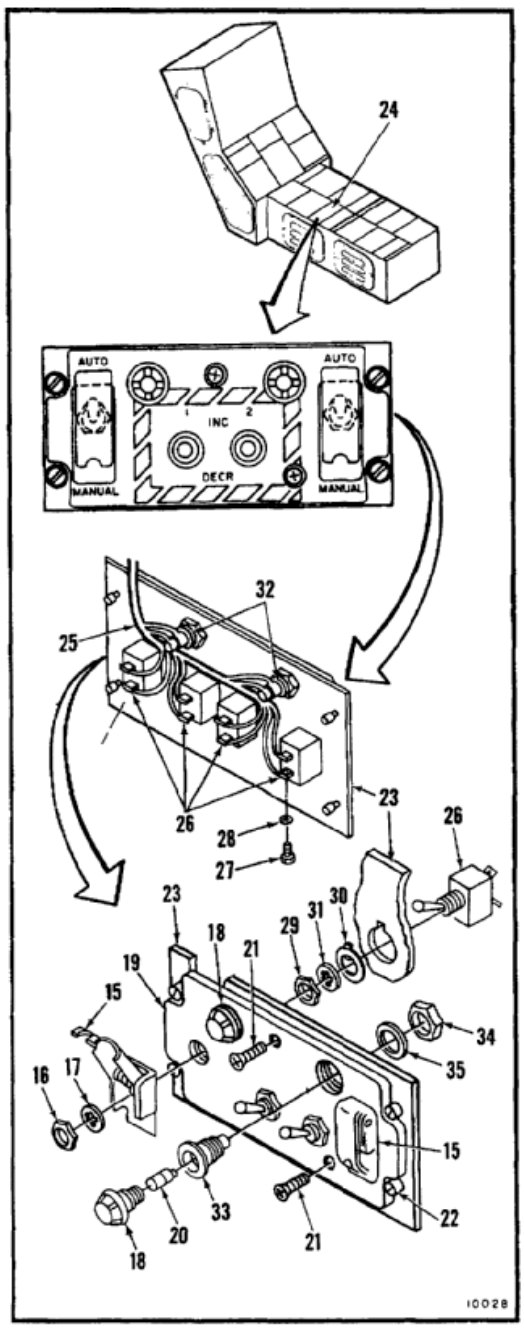
   g. Remove nuts (29), lock rings (30), and lockwashers (31) from switches (26). Remove switches.

   h. Tag (E264) four wires (32) on two lamp receptacles (33). Desolder wires from receptacles. Tape (E385) ends of wires.

   i. Remove nuts (34) and washers (35) from receptacles (33). Remove receptacles.

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-104 INSTALL CONSOLE COMPONENTS 9-104

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

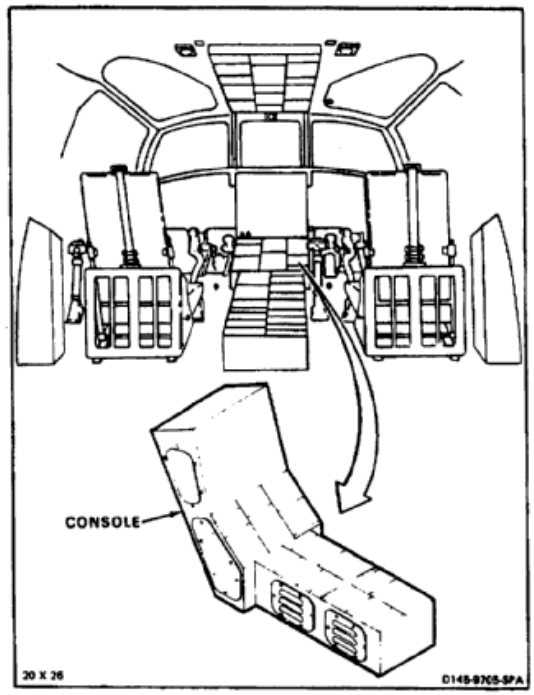
Solder (E360)

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

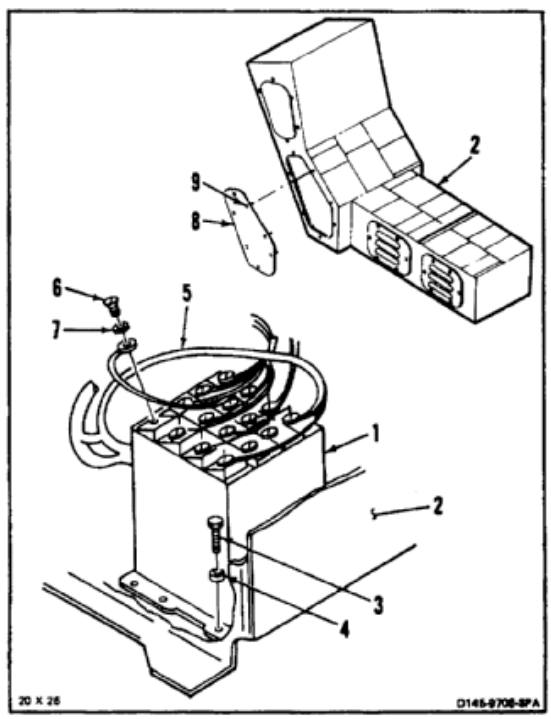
TM 55-1520-240-23P
Task 9-166




**NOTE**

Procedure is similar to install like components. Task includes four separate tasks.

1. Install pilot interphone key relay as follows:
   a. Position relay 232K2 (1) in console (2). Install six bolts (3) and washers (4).
   b. Remove tape and install 13 wires (5) by installing 13 screws (6) and washers (7). Remove tags.
   c. Position panel (8) on console (2). Tighten seven fasteners (9).




***INSPECT***

**NOTE**

If no other components are being installed, go to Follow-On Maintenance.

2. Install pilot's lighting transformer as follows:

***WITHOUT 17***

a. Position transformer 122T1 (10) in console (2). Install four screws (11) and washers (12).

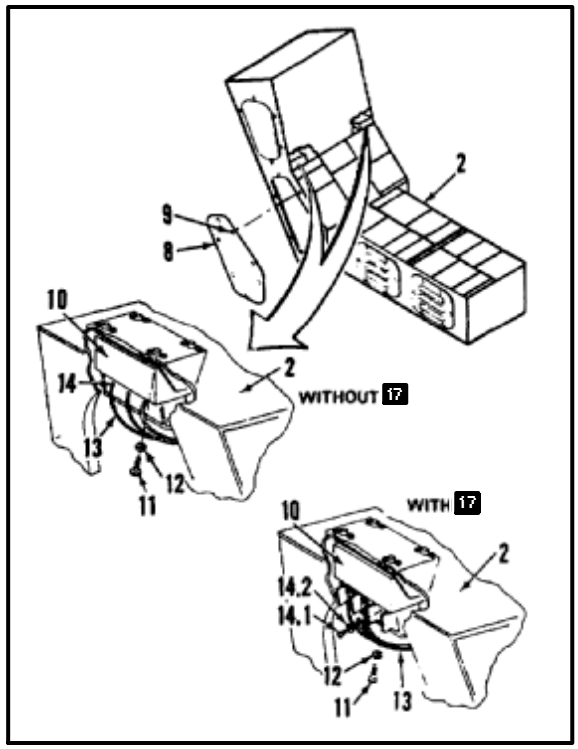
b. Remove tape and install three wires (13) by soldering to terminals (14). Use solder (E360). Remove tags.

***WITH 17***

c. Position transformer 310-18742-01 (10) in console (2). Install four screws (11) and washers (12).

d. Remove tape and connect three wires (13) by using screws (14.1) and washers (14.2). Remove tags.

e. Position panel (8) on console (2). Tighten seven fasteners (9).




***INSPECT***

**NOTE**

If no other components are being installed, go to Follow-On Maintenance.

3. Install terminal board module as follows:

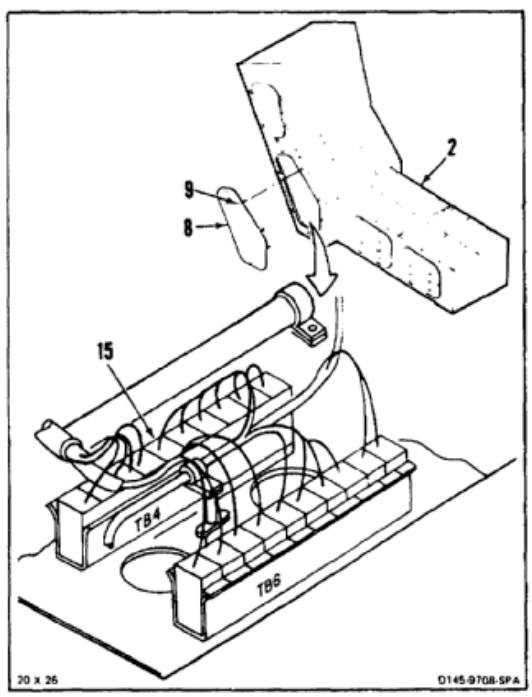
a. Install module (15) (Task 9-166).

b. Position panel (8) on console (2). Tighten seven fasteners (9).

***INSPECT***

**NOTE**

If no other components are being installed, go to Follow-On Maintenance.

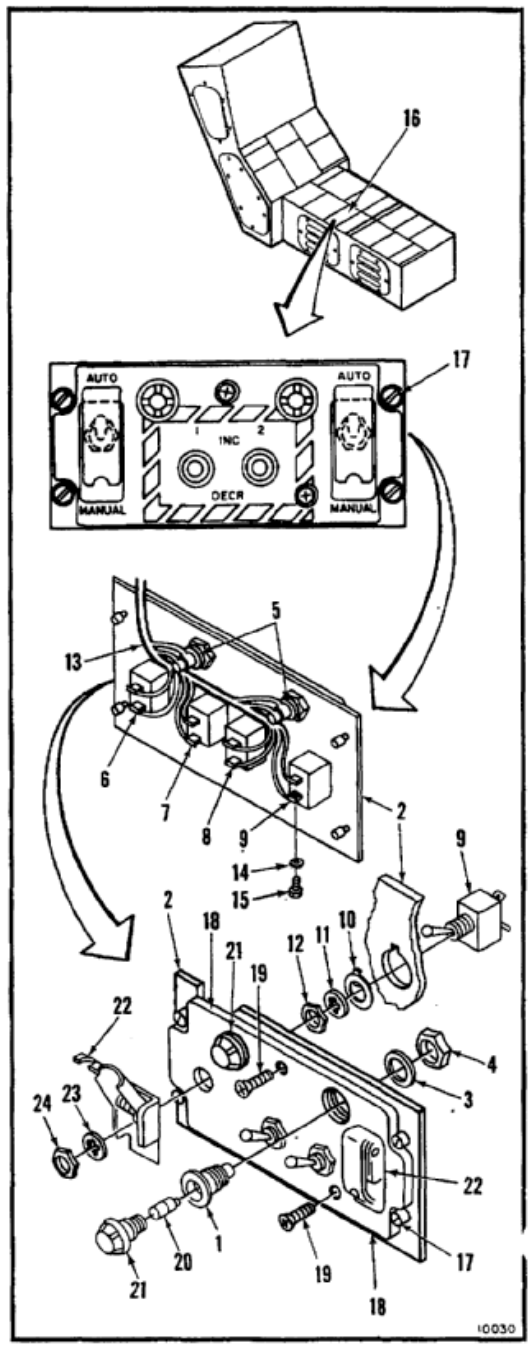


4. On helicopters without 74, assemble EMERG ENG TRIM panel as follows:
   a. Position two lamp receptacles (1) in panel (2). Install washers (3) and nuts (4) on receptacles.
   b. Solder four wires (5) on receptacles (1). Remove tags.
   c. Position four switches (6, 7, 8 and 9) in panel (2). Install lock rings (10), lockwasher (11) and nuts (12) on switches.
   d. Connect eight wires (13) to four switches (6, 7, 8, and 9) using washers (14) and screws (15). Remove tags.
   e. Position EMERG ENG TRIM panel (2) in console (16). Tighten four fasteners (17).
   f. Position panel (18) on panel (2). Install two screws (19) in panel (18).
   g. Install two lamps (20) in lens (21).
   h. Install lens (21) in receptacle (1).
   i. Position switch guards (22) on switches (6 and 9). Install washers (23) and nuts (24) on switches.

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).




END OF TASK

## 9-104.1 REPLACE OVERHEAD PANEL CONTROL TRANSFORMER FUSES 9-104.1

INITIAL SETUP

***Applicable Configurations:***

With **17**

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

None

***Parts:***

Fuses

***Personnel Required:***

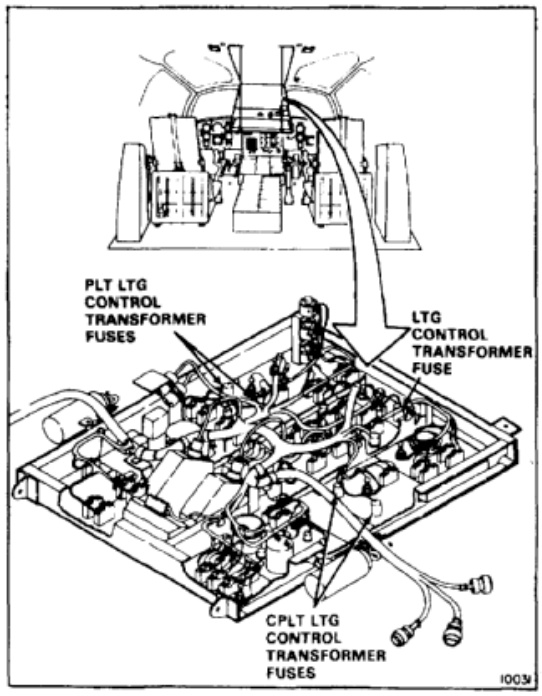
Aircraft Electrician

***References:***

TM 55-1520-240-23P

***Equipment Condition:***

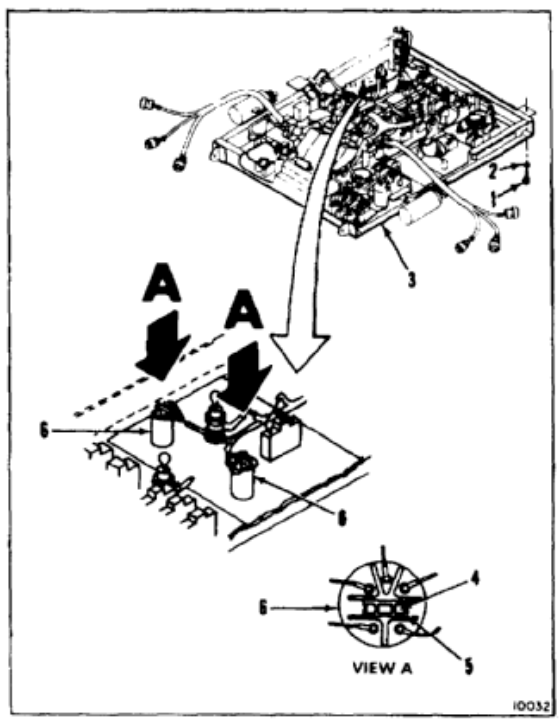
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




**NOTE**

Procedure is same to replace PLT LTG, LTG, and CPLT LTG panel control transformer fuses. Replacement of PLT LTG panel control transformer fuses is shown here.

1. Remove two bolts (1) and washers (2) from overhead panel (3). Lower panel.
2. Remove fuses (4). Pry fuse from fuse holder (5) of PLT LTG panel control transformer (6).
3. Install new fuse (4) in holder (5).
4. Raise panel (3). Install two washers (2) and bolts (1).




***FOLLOW-ON MAINTENANCE:***

Perform operational check of lights (TM 55-1520-240-T).

END OF TASK

## 9-105 REMOVE FLOODLIGHT 9-105

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

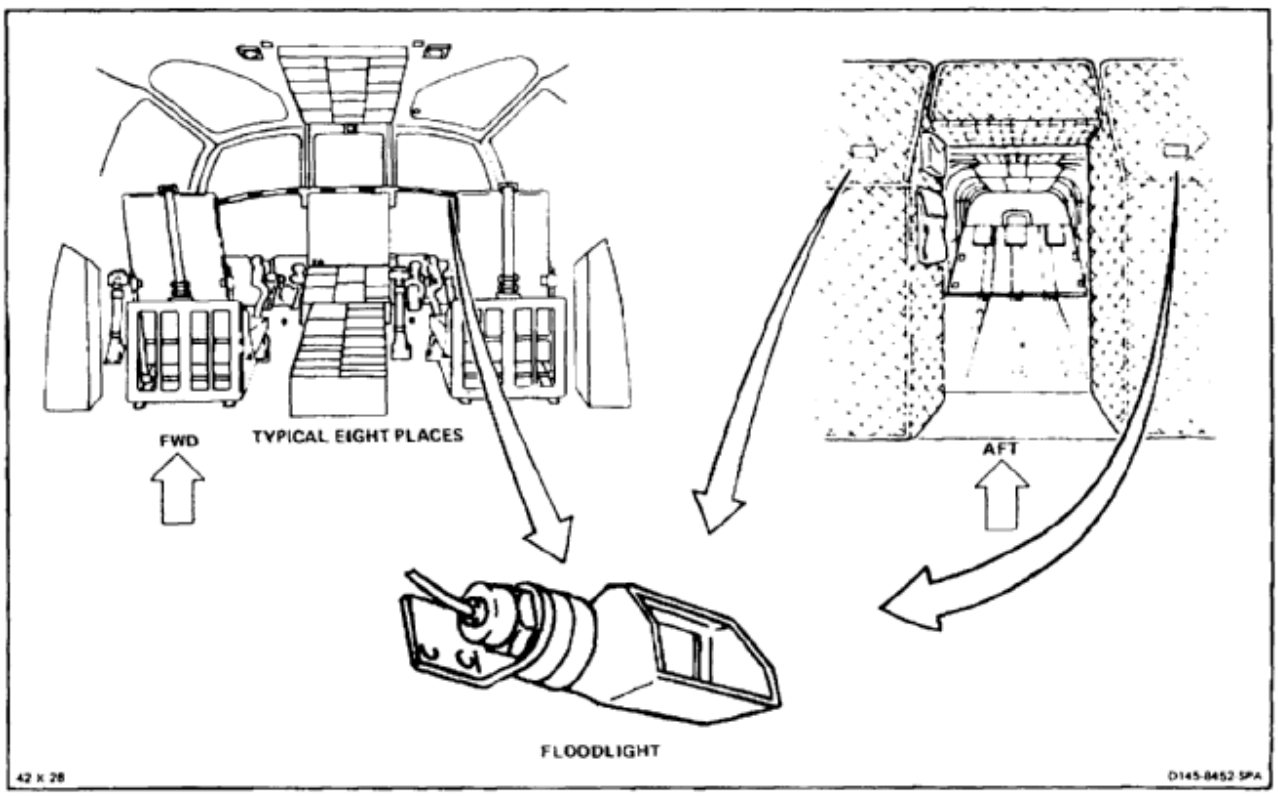
None

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off

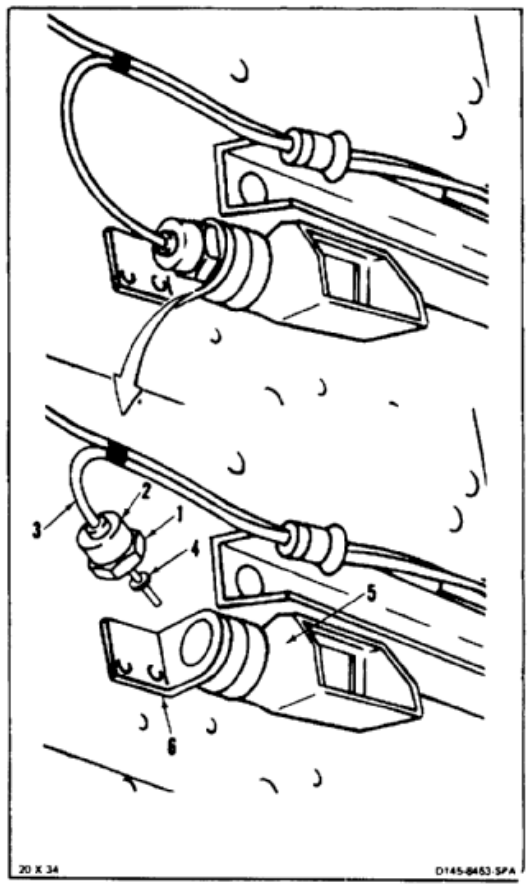


## 9-105 REMOVE FLOODLIGHT (Continued) 9-105

**NOTE**

Procedure is same to remove any floodlight. Removal of copilot's overhead floodlight is shown here.

1. Loosen nut (1). Slide nut and cover (2) over wire (3).
2. Unsolder wire (3) from terminal (4).
3. Remove nut (1) and cover (2).
4. Remove floodlight (5) from bracket (6).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-106 INSTALL FLOODLIGHT 9-106

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

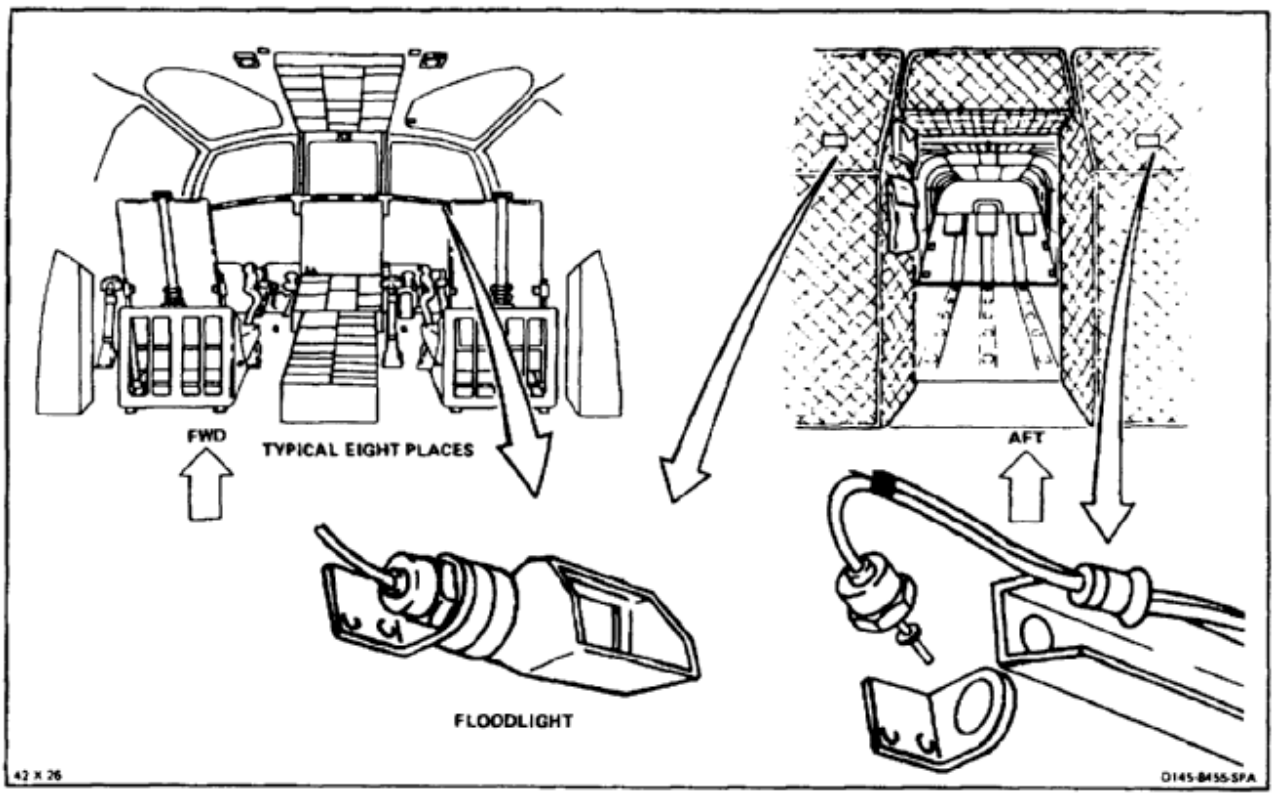
Solder (E360)

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

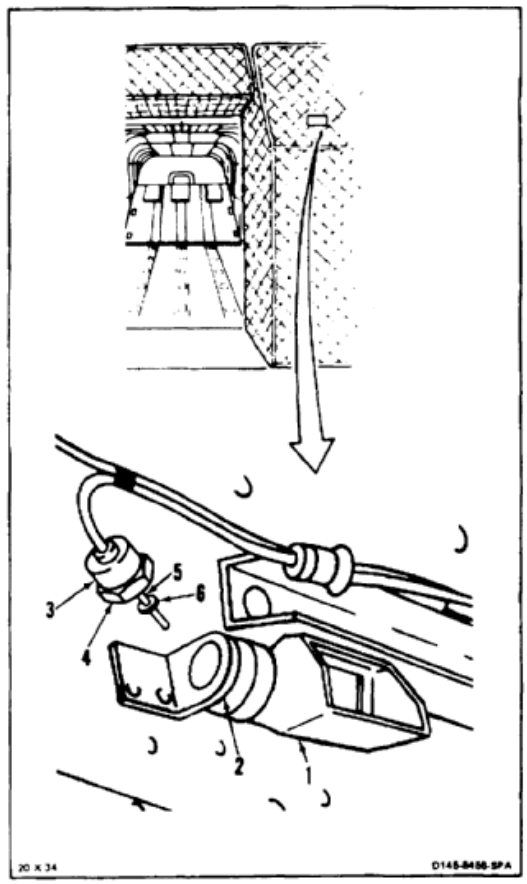
TM 55-1520-240-23P



**NOTE**

Procedure is same to install any floodlight. Installation of copilot's overhead floodlight is shown here.

1. Position floodlight (1) in bracket (2).
2. Slide cover (3) and nut (4) over wire (5).
3. Solder wire (5) to terminal (6).
4. Install cover (3) and nut (4) on floodlight (1).




***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).

END OF TASK

## 9-107 REPLACE FLOODLIGHT LAMP 9-107

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

None

***Materials:***

None

***Parts:***

Lamp

***Personnel Required:***

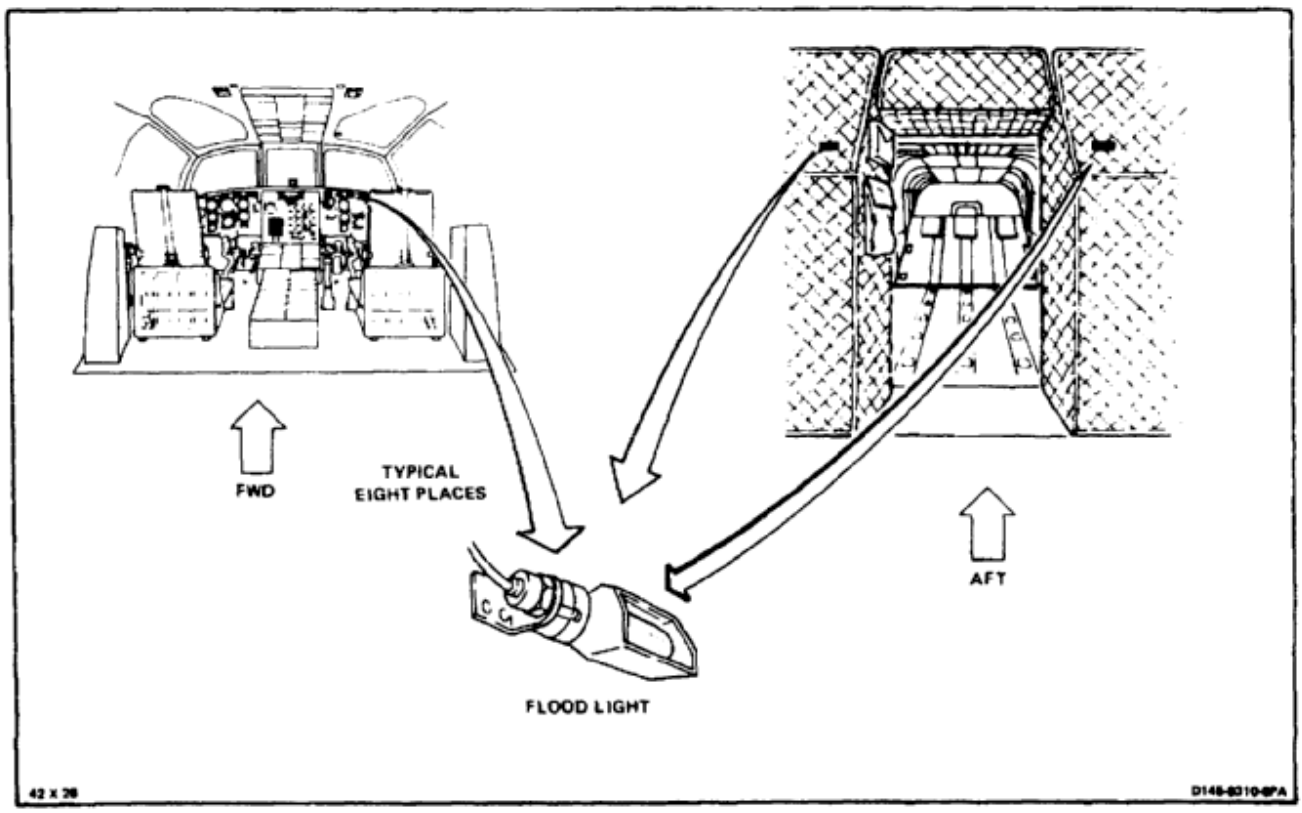
Aircraft Electrician

***References:***

TM 55-1520-240-23P

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off

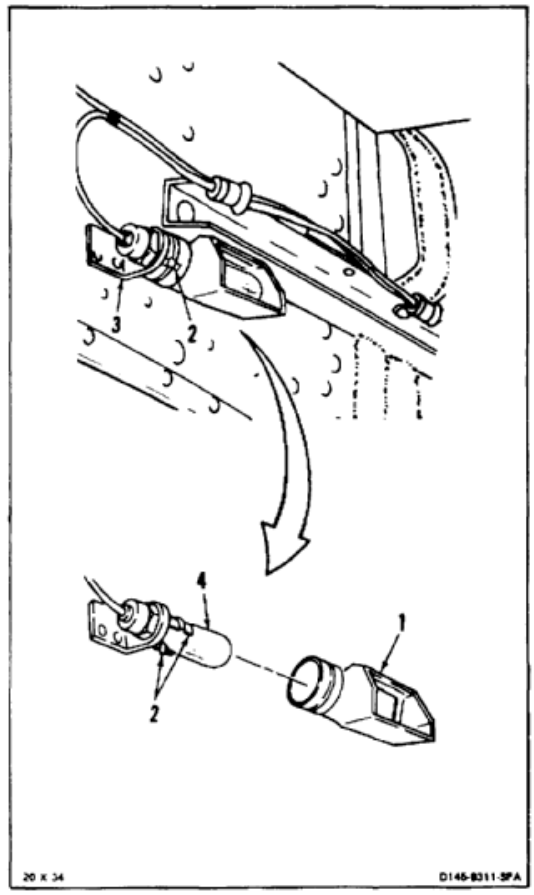


**NOTE**

Without **17**, floodlights have lamp MS25069-1495 and red diffusing glass.

With **17**, glareshield floodlights have lamps MS25231-313 and NVG lens and overhead floodlights have lamps MS25069-1495X and NVG lens.

1. Pull housing (1) from two clips (2) on base (3). Remove housing.
2. Remove lamp (4).
3. Install new lamp (4).
4. Install housing (1) on base (3). Make sure two clips (2) snap in position.




***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).

END OF TASK

## 9-108 REMOVE COCKPIT DOME LIGHT 9-108

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

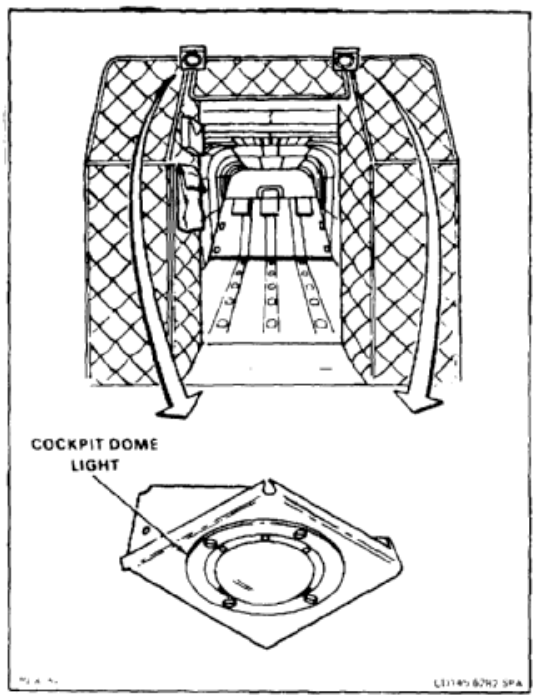
Tape (E385)
Paper Tag (E264)

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off



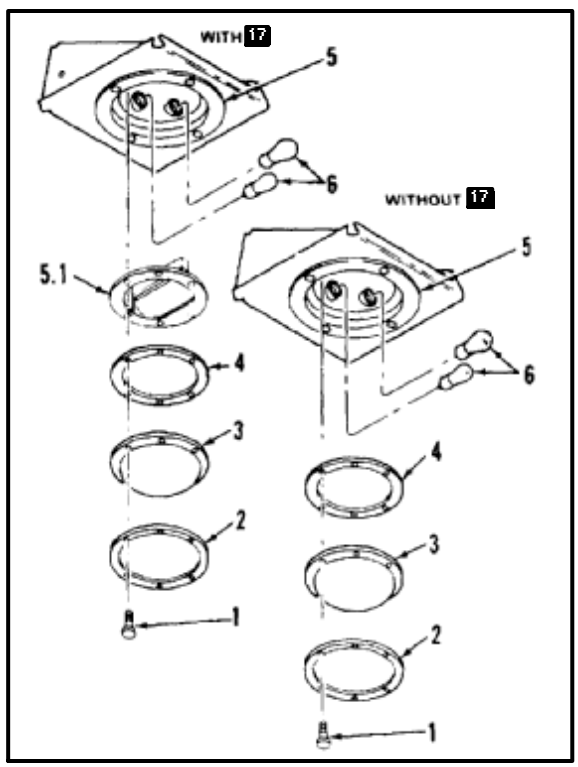

**NOTE**

Procedure is same to remove either cockpit dome light.

Without 17, light has one clear, one red lamp.

With 17, light has two cleat lamps and NVG filter which covers one.

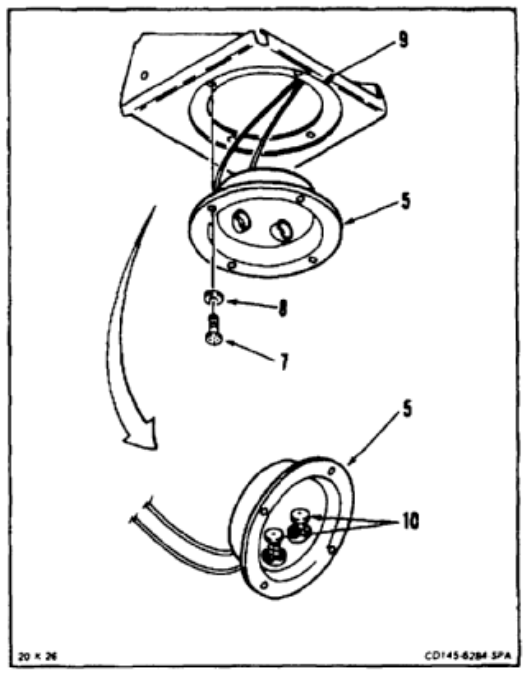
1. Remove six screws (1), retainer (2), lens (3), and gasket (4) from housing (5). If installed, remove NVG filter (5.1).
2. Remove two lamps (6).



3. Remove four screws (7) and washers (8). Withdraw housing (5) from structure (9).
4. Tag and unsolder two wires (10). Tape wire ends. Use tape (E385).
5. Remove housing (5).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-109 REPLACE COCKPIT DOME LIGHT LAMP 9-109

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

***Materials:***

None

***Parts:***

Lamp, Red
Lamp, Clear

***Personnel Required:***

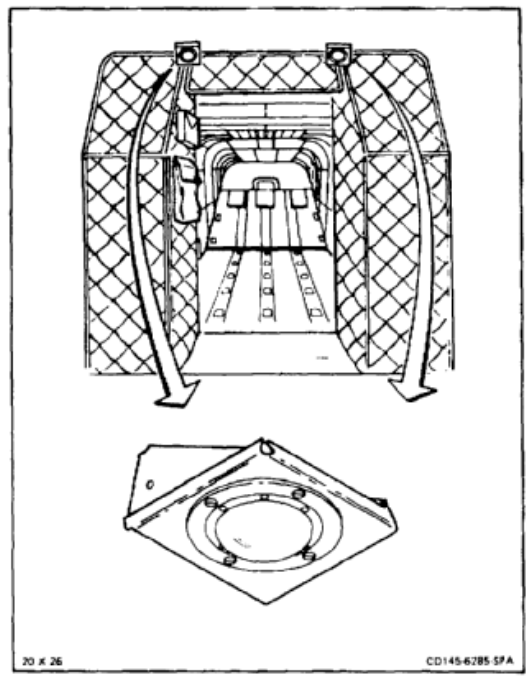
Medium Helicopter Repairer

***References:***

TM 55-1520-240-23P

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off

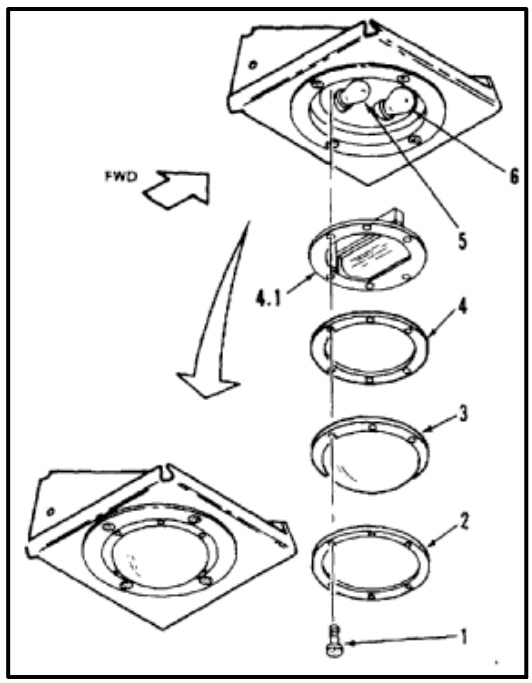



**NOTE**

Procedure is same to replace lamp in either cockpit dome light.

Without **17**, light has one clear, one red lamp.

With **17**, light has two clear lamps and a blue NVG filter which cobers one.




1. Remove six lens retaining screws (1). Remove retainer (2), lens (3), gasket (4), and NVG filter (4.1), if installed.
2. Remove defective lamp (5 or 6).
3. Install new lamp (5 or 6).
4. Install gasket (4), NVG filter (4.1), if installed, lens (3), retainer (2), and six screws (1).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check of cabin lighting (TM 55-1520-240-T).

END OF TASK

## 9-110 INSTALL COCKPIT DOME LIGHT 9-110

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

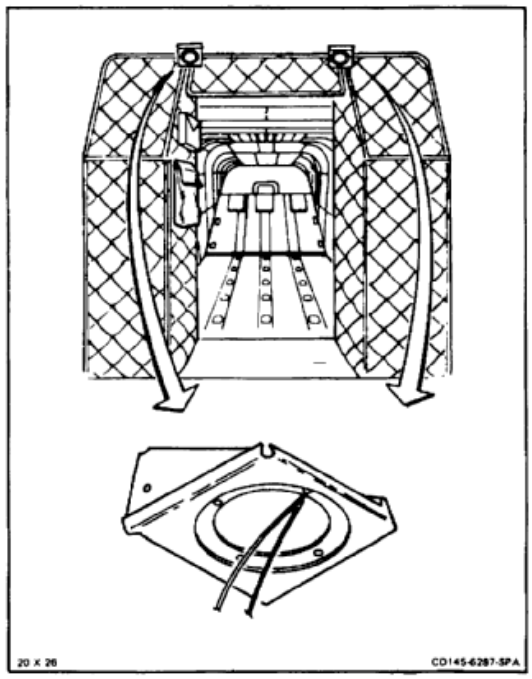
Solder (E360)

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P



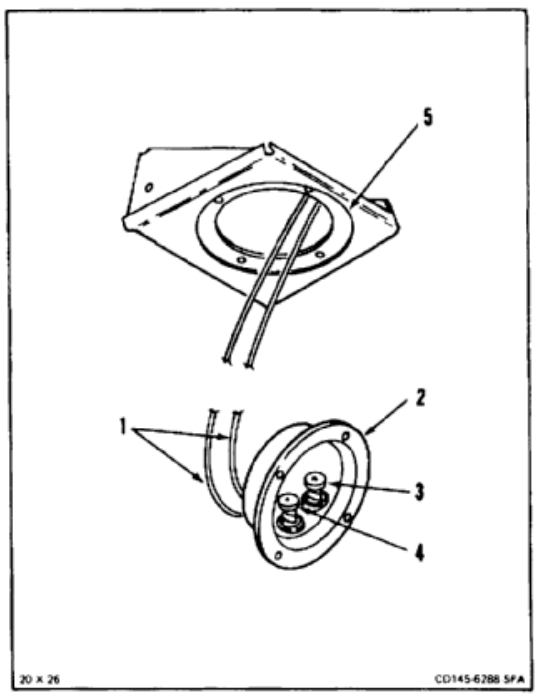

**NOTE**

Procedure is same to install either cockpit dome light.

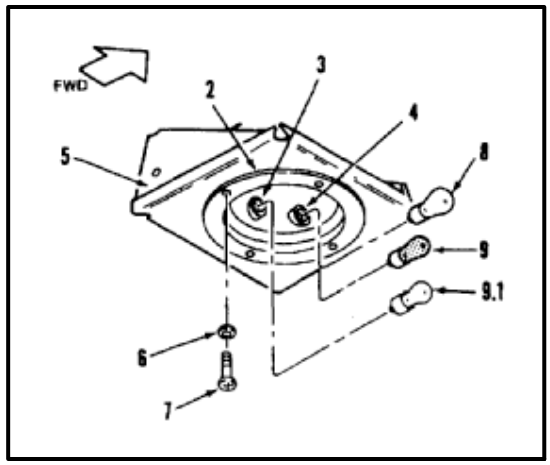
Without **17**, light has one clear, one red lamp.

With **17**, light has two clear lamps and NVG filter over one. Retainer screws are longer.

1. Remove tape from two wires (1). Route wires through hole in housing (2) and solder wires to sockets (3 and 4). Use solder (E360). Remove tags.



2. Position housing (2) on structure (5). Install four washers (6) and screws (7).
3. Install lamp (8) in socket (4).
4. Without 17, install lamp (9) in socket (3).
5. With 17, install lamp (9.1) in socket (3).

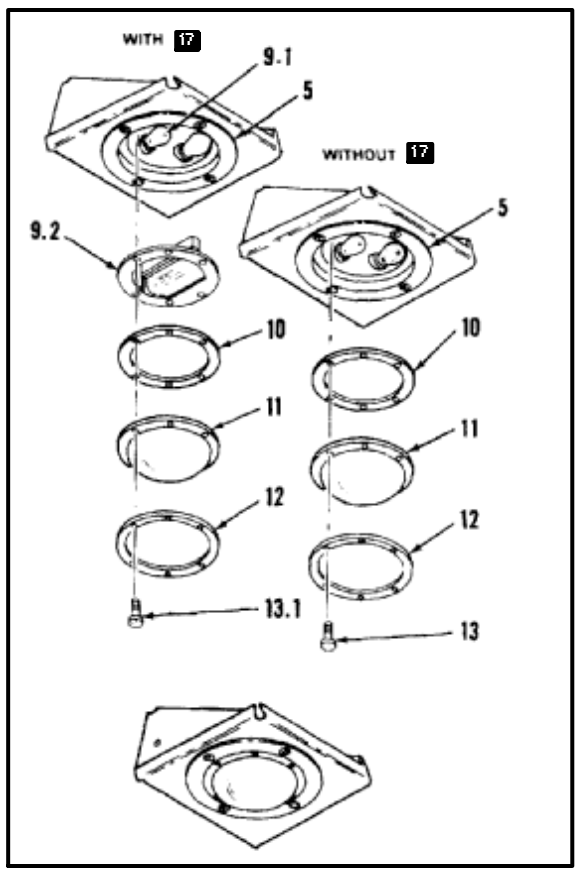



6. With 17, install NVG lens (9.2) over lamp (9.1).
7. Position gasket (10), lens (11), and retainer (12). Install six screws (13 or 13.1).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check of cabin lighting (TM 55-1520-240-T).




END OF TASK

## 9-111 REMOVE UTILITY LIGHT 9-111

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

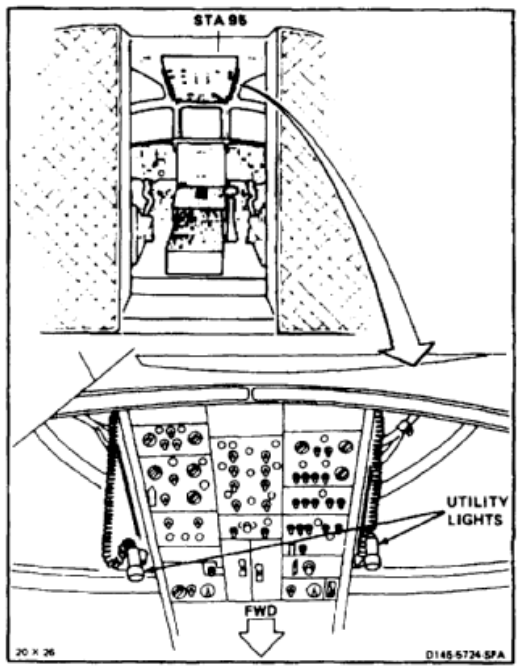
Paper Tags (E264)

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

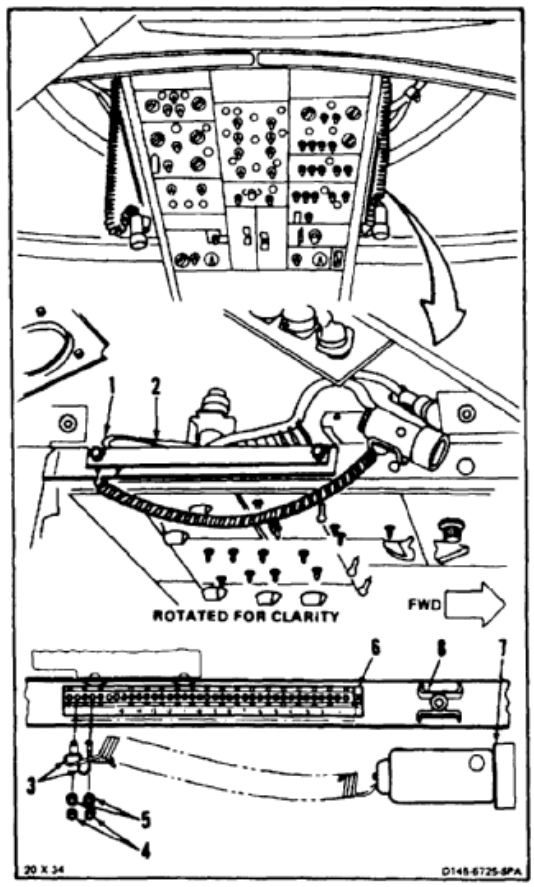
Battery Disconnected (Task 1-39)
Electrical Power Off



**NOTE**

Procedure is same to remove pilot's or copilot's utility light. Removal of pilot's utility light is shown here.

1. Remove two nuts (1) from cover (2).
2. Remove cover (2).
3. Tag two wires (3). Remove two nuts (4) and washers (5) from terminal board (6). Disconnect two wire.
4. Remove light (7) from mount (8).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-111.1 REPLACE UTILITY LIGHT LAMP OR LENS 9-111.1

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Snap Ring Pliers

***Materials:***

None

***Parts:***

Lamp
Lens

***Personnel Required:***

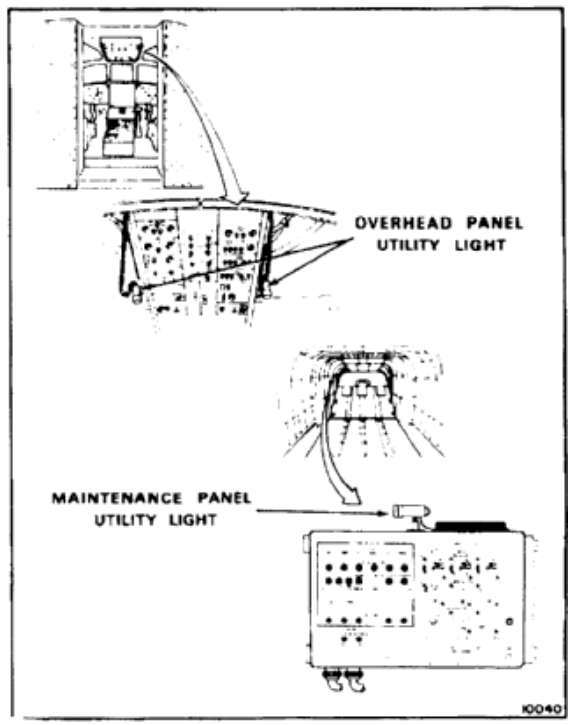
Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off

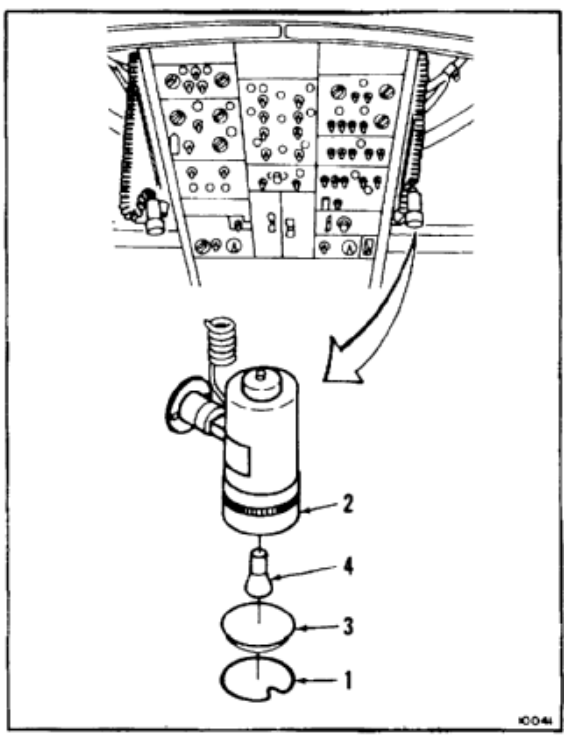



**NOTE**

Procedure is same to replace lamp or lens in overhead panel lights or maintenance panel light, for helicopters with or without 17. Replacement of overhead panel light lamp or lens is shown here.

***WITHOUT 17***

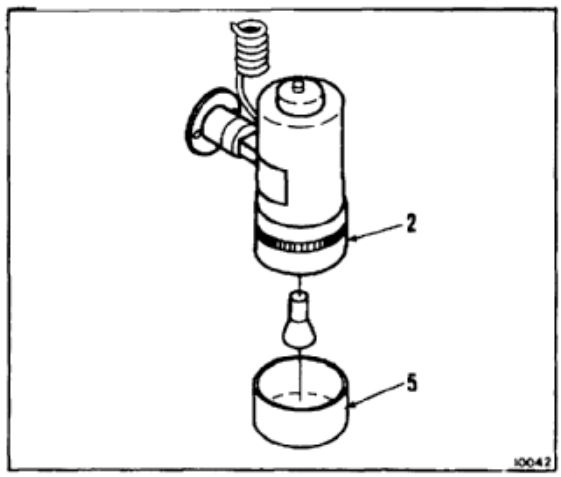
1. Remove snap ring (1) from adjustable housing (2). Remove lens (3). Use snap ring pliers.
2. Turn housing (2) until lamp (4) is fully extended.
3. Replace lamp (4).
4. Turn housing (2) to retract lamp (4).
5. Install lens (3) and ring (1) in housing (2).



***WITH 17***

6. Pry and remove lens cap (5) from housing (2).
7. Repeat steps 2, 3, and 4.
8. Install lens cap (5) on housing (2). Push cap fully onto housing.

***INSPECT***




***FOLLOW-ON MAINTENANCE:***

Perform operational check of utility light TM 55-1520-240-T).

END OF TASK

## 9-112 INSTALL UTILITY LIGHT 9-112

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

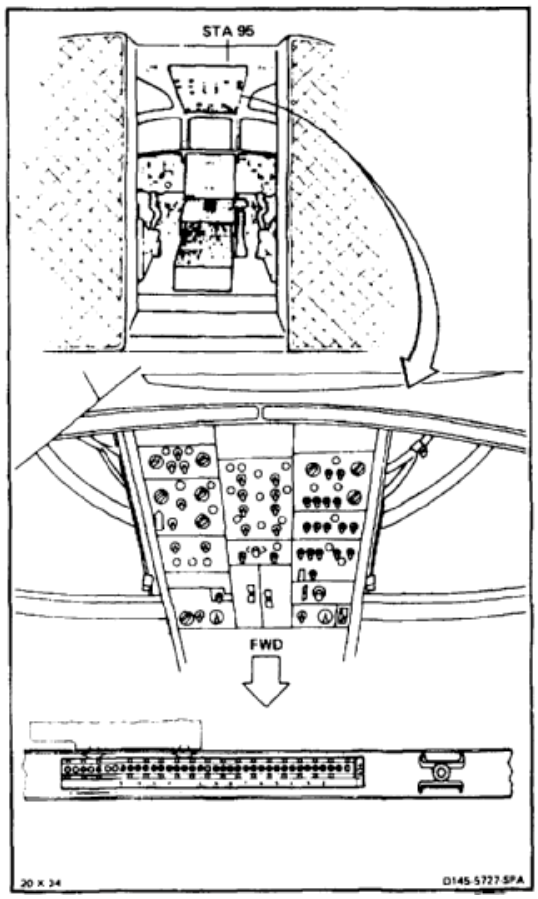
None

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

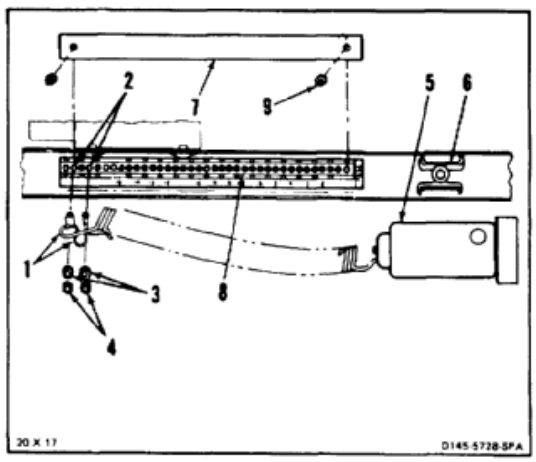
TM 55-1520-240-23P




**NOTE**

Procedure is same to install pilot's or copilot's utility light. Installation of pilot's utility light is shown here.

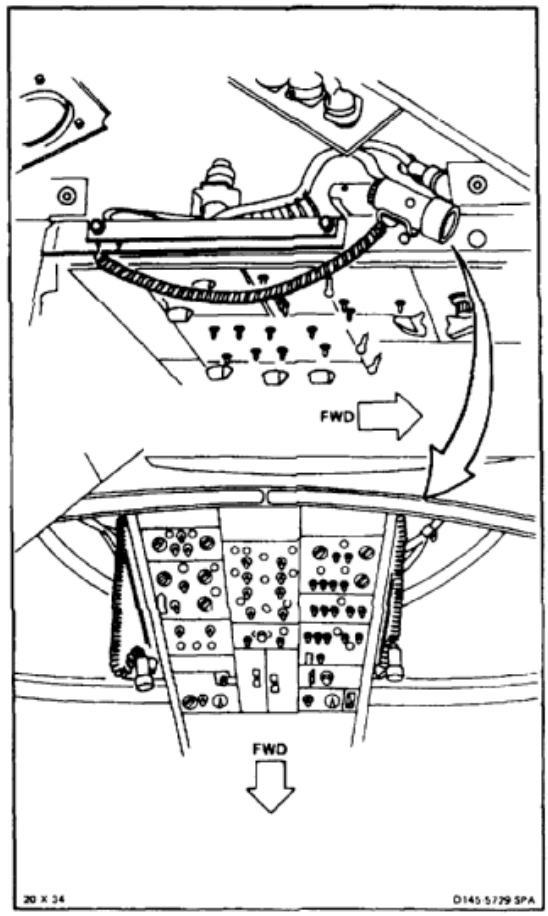
1. Connect two wires (1) to terminals (2). Install two washers (3) and nuts (4). Remove tags.
2. Install light (5) in mount (6).
3. Position cover (7) on terminal board (8). Install two nuts (9).



***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check of utility lights (TM 55-1520-240-T).




END OF TASK

## 9-113 REPLACE CABIN/RAMP DOME LIGHT LAMPS 9-113

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Workstand

***Materials:***

None

***Parts:***

Lamp, Clear
Lamp, Red

***Personnel Required:***

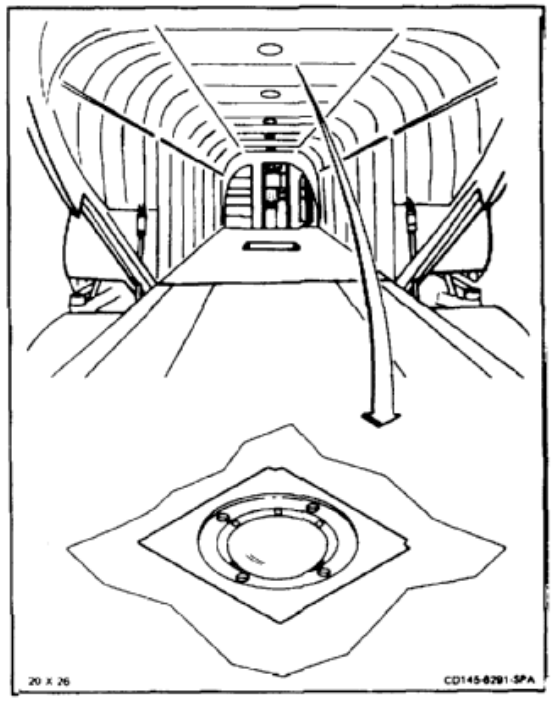
Medium Helicopter Repairer

***References:***

TM 55-1520-240-23P

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Cargo Ramp Open and Level (Task 2-2)

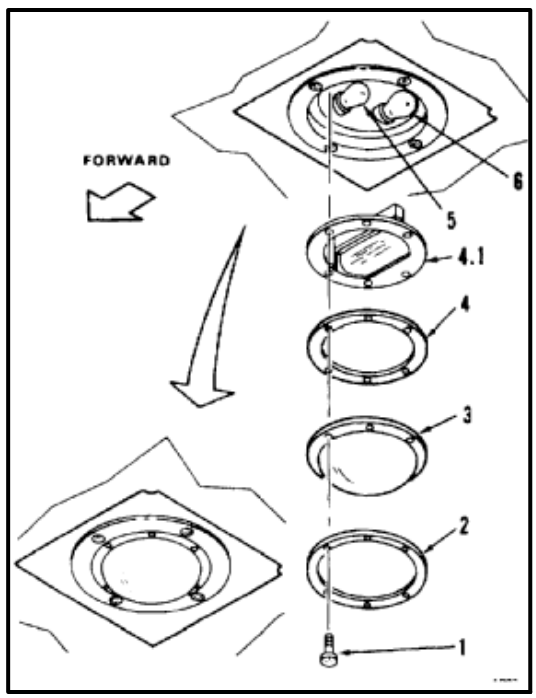


**NOTE**

Procedure is same to replace lamps in cabin or ramp dome light.

With 17, NVG filter covers clear lamp.

1. Remove six lens retaining screws (1), retainer (2), lens (3), and gasket (4).
2. With 17, remove NVG filter (4.1).
3. Replace defective lamp (5 or 6).
4. With 17, position NVG filter (4.1) over clear lamp (5).
5. Install gasket (4), lens (3), retainer (2), and six screws (1).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-114 REMOVE CABIN/RAMP DOME LIGHT 9-114

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun
Workstand

***Materials:***

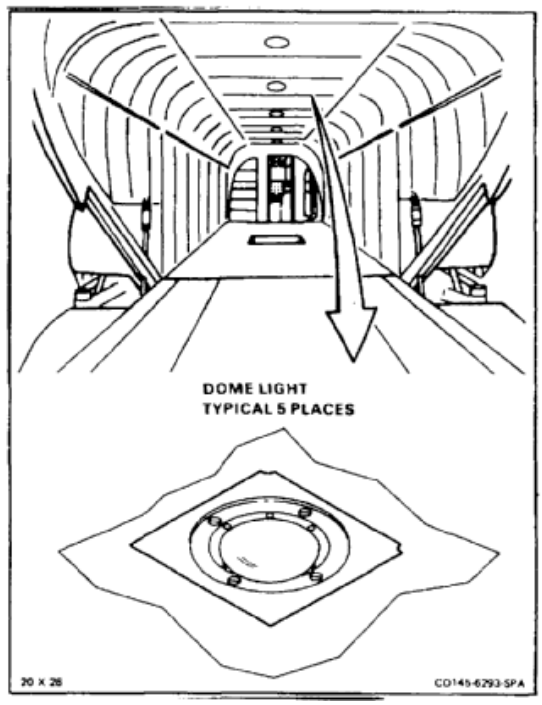
Tape (E385)
Paper Tag (E264)

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off

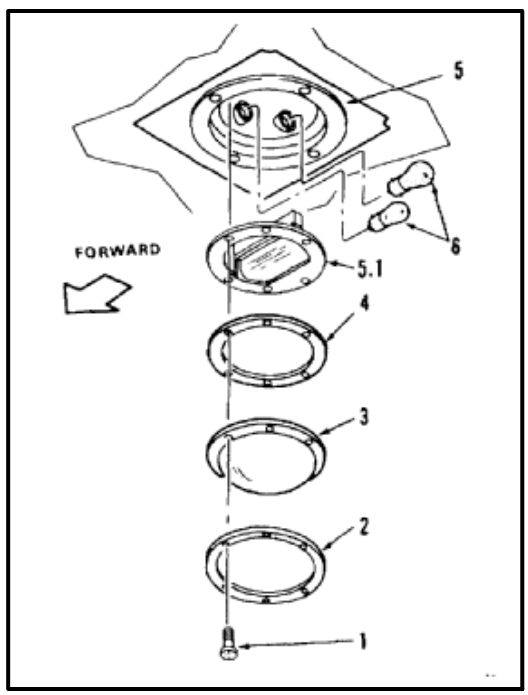



**NOTE**

Procedure is similar to remove cabin or ramp lights. Differences are noted in text.

With 17, NVG filter covers clear lamp.

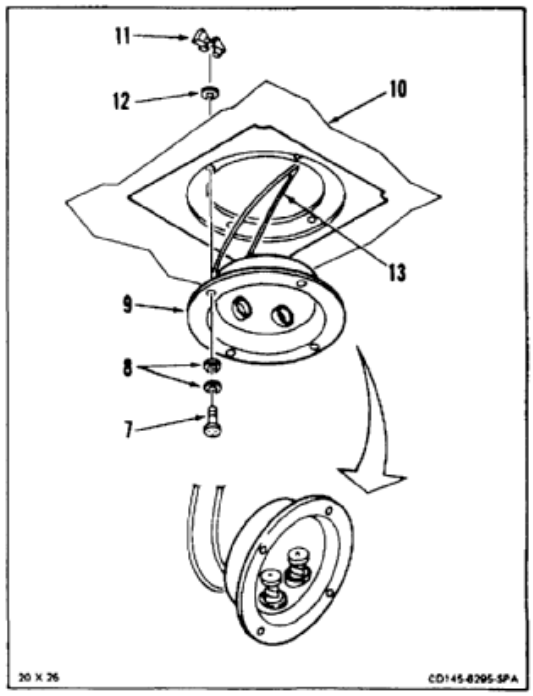
1. Remove six screws (1), retainer (2), lens (3), and gasket (4) from light (5).
2. With 17, remove NVG filter (5.1).
3. Remove two lamps (6).



4. For cabin location only, remove four screws (7) and eight washers (8). Withdraw housing (9) from structure (10). Remove four spring nuts (11) and washers (12) from structure (10).
5. For ramp location only, remove four screws (7) and washers (8). Withdraw housing (9) from structure (10).
6. Tag and unsolder two wires (13). Tape ends. Use tape (E385).
7. Remove housing (9).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-115 INSTALL CABIN/RAMP DOME LIGHT 9-115

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

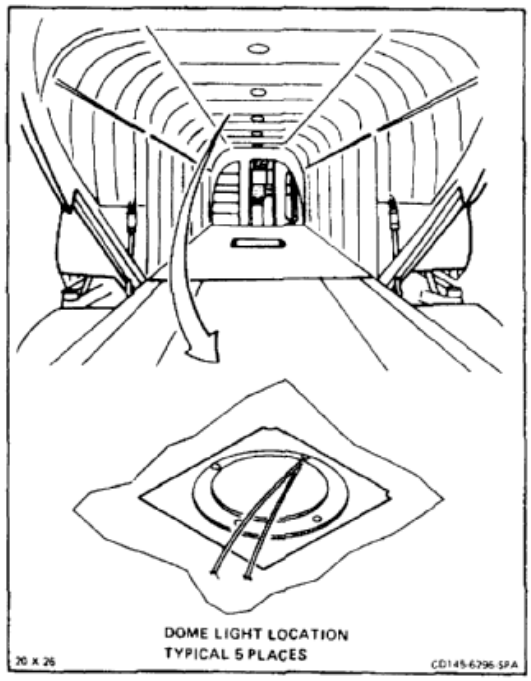
Solder (E360)

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

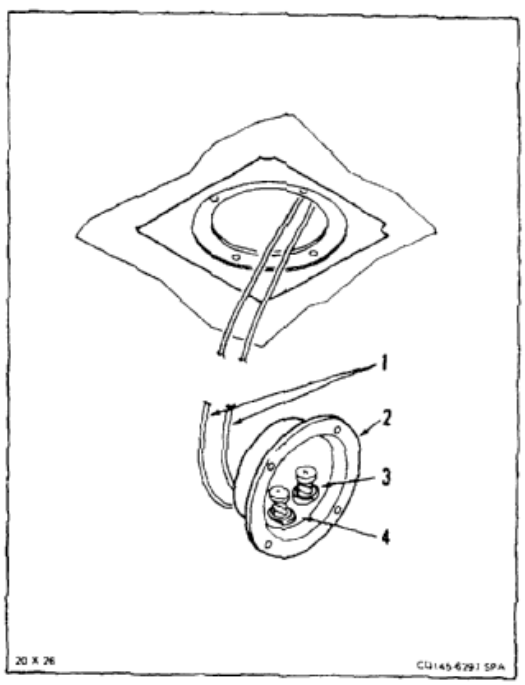
TM 55-1520-240-23P



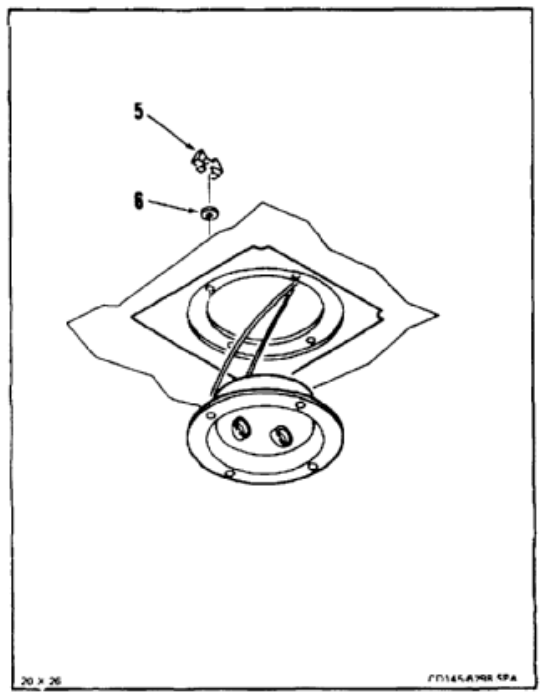

**NOTE**

Procedure is similar to install cabin or ramp lights. Differences are noted in text.

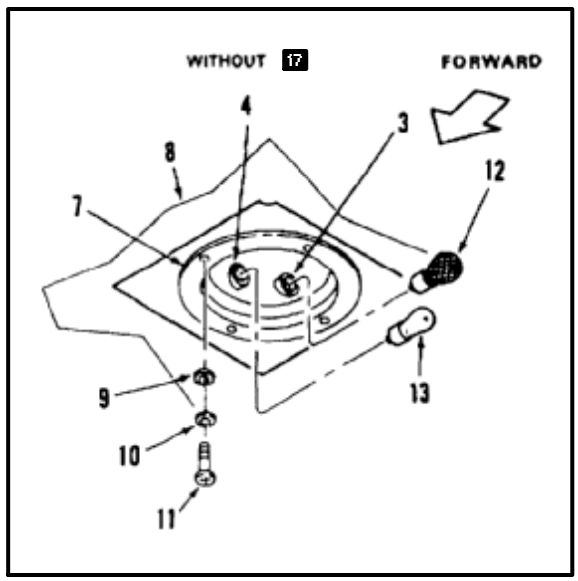
1. Remove tape from two wires (1). Route wires through hole in housing (2) and solder wires to sockets (3 and 4). Use solder (E360). Remove tags.



2. For cabin location only, install four spring nuts (5) and washers (6).

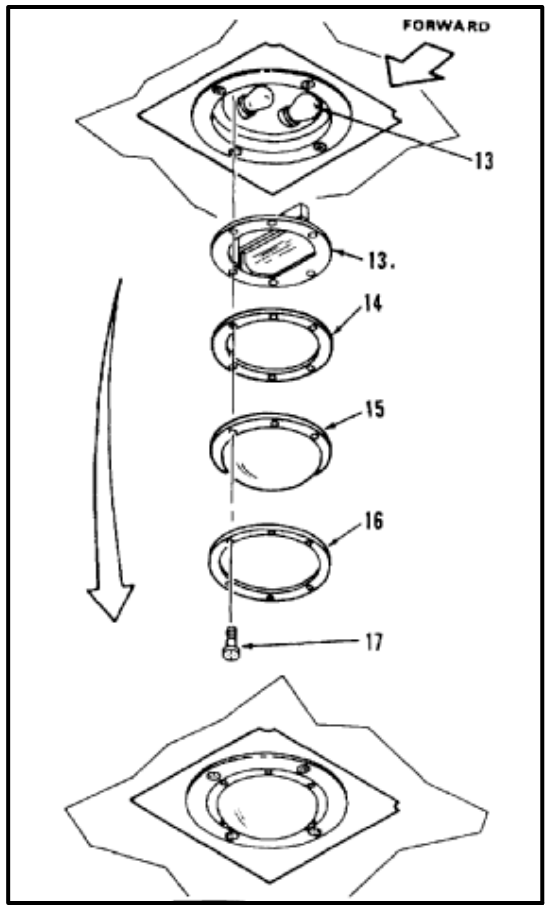



3. For cabin location only, position housing (7) in structure (8). Install four washers (9), washers (10) and screws (11).
4. For ramp location only, position housing (7) in structure (8). Install four washers (9) and screws (11).
5. Install lamp (12) in socket (3). Install lamp (13) in socket (4).



6. With 17, position NVG filter (13.1) over lamp (13).
7. Position gasket (14), lens (15), and retainer (16). Install six screws (17).

***INSPECT***




***FOLLOW-ON MAINTENANCE:***

Perform operational check of cabin lighting (TM 55-1520-240-T).
Close cargo ramp (Task 2-2).

END OF TASK

## 9-116 REMOVE CABIN AND RAMP LIGHTING RELAYS 9-116

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

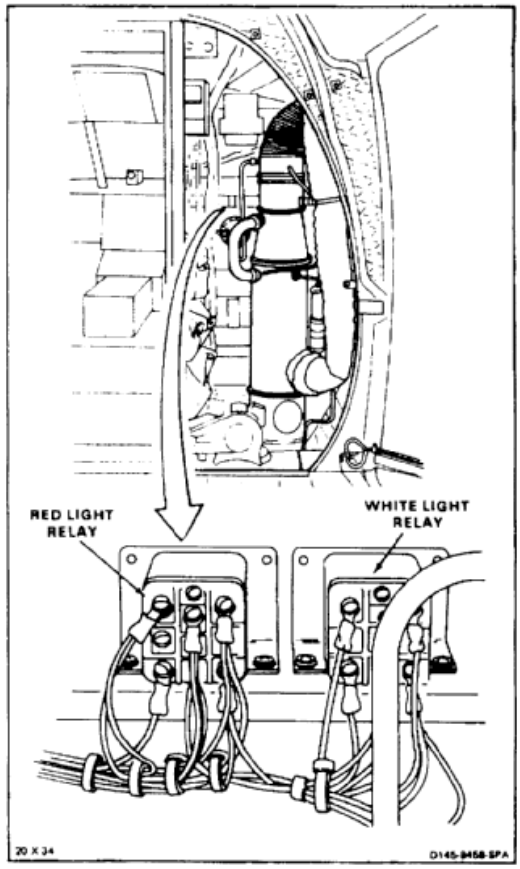
Paper Tags (E264)
Tape (E395)

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

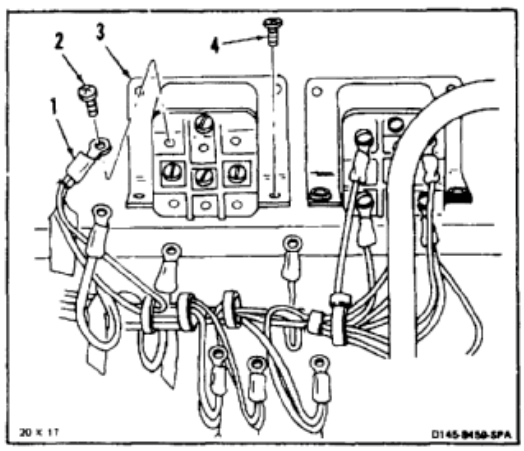
Battery Disconnected (Task 1-39)
Electrical Power Off
Heater Compartment Acoustic Blanket Removed (Task 2-208)




**NOTE**

Procedure is same to remove white light relay or red light relay. Removal of red light relay is shown here.

1. Tag and disconnect eleven wires (1) by removing six screws (2) from relay (3). Tape wire ends.
2. Remove two screws (4).
3. Remove relay (3).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-117 INSTALL CABIN AND RAMP LIGHTING RELAYS 9-117

INITIAL SETUP

***Applicable Configurations:***

Without 17

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

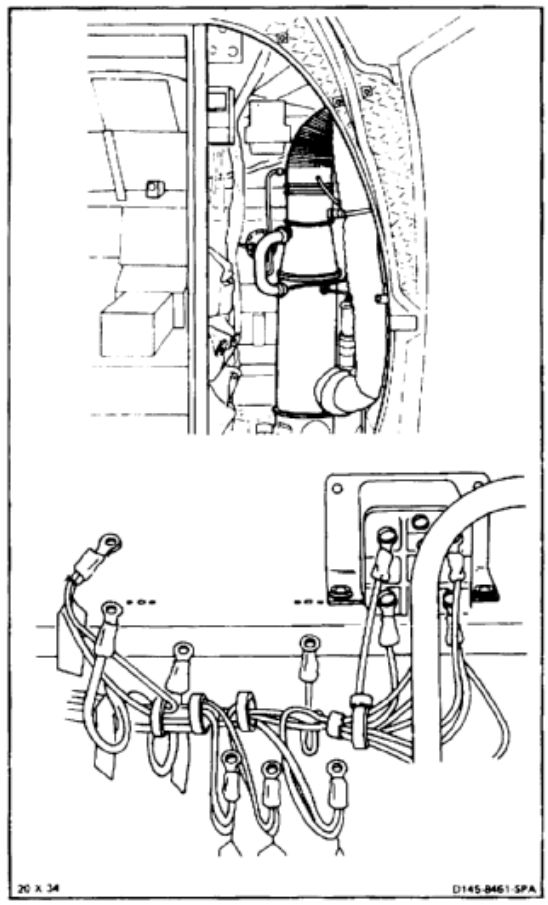
None

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

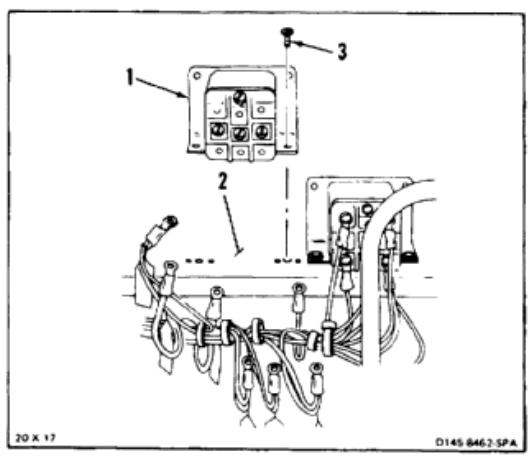
TM 55-1520-240-23P



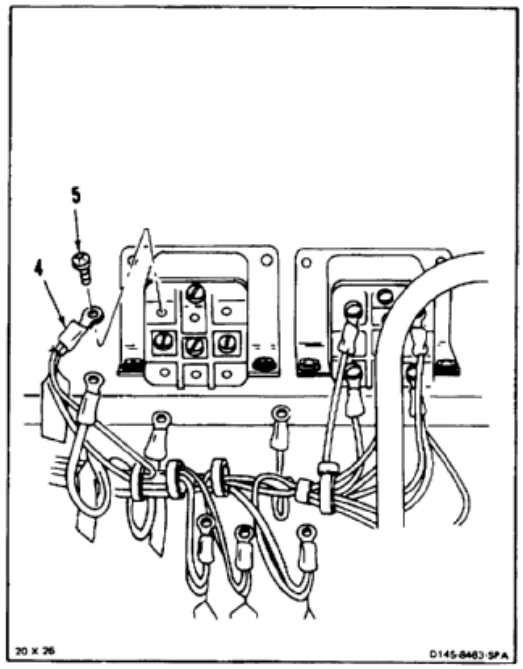
**NOTE**

Procedure is same to install white light relay or red light relay. Installation of red light relay is shown here.

1. Position relay (1) on structure (2). Install two screws (3).



2. Remove tape and install eleven wires (4) using six screws (5). Remove tags.




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Install heater compartment acoustic blanket (Task 2-210).
Perform operational check (TM 55-1520-240-T).

END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

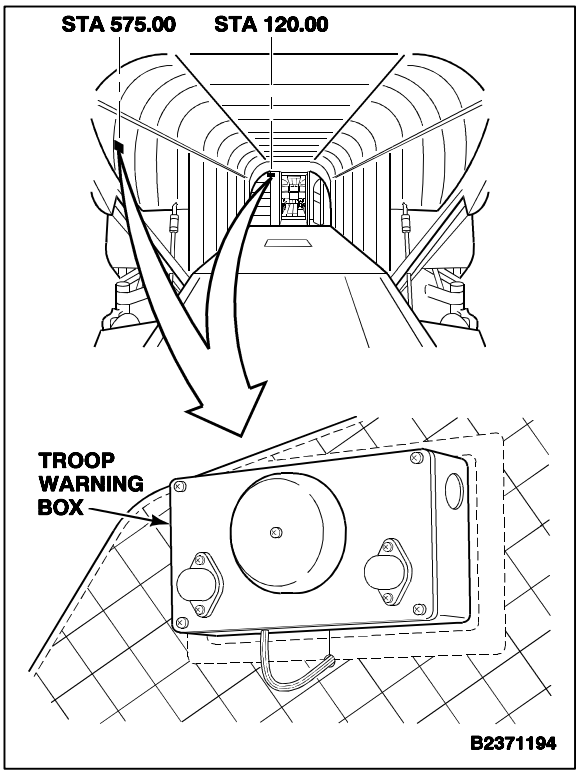
Tape (E385)
Paper Tags (E264)

***Personnel Required:***

Aircraft Electrician (2)

***Equipment Condition:***

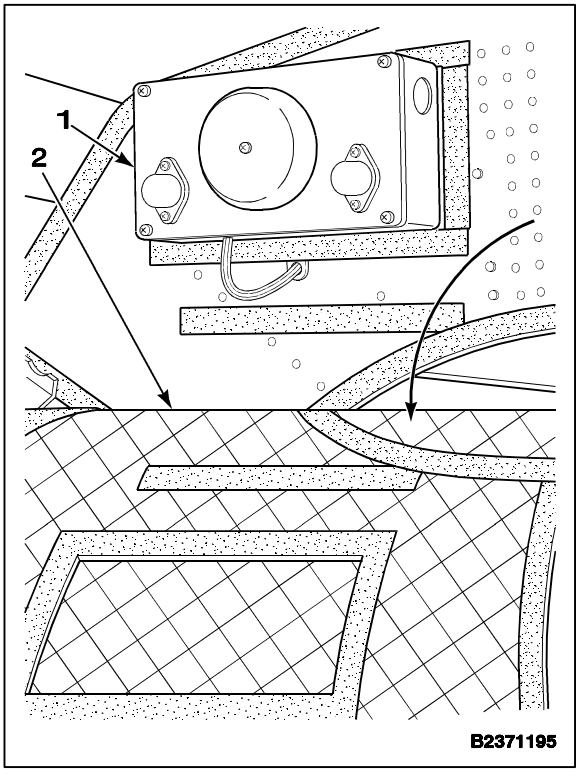
Battery Disconnected (Task 1-39)
Electrical Power Off



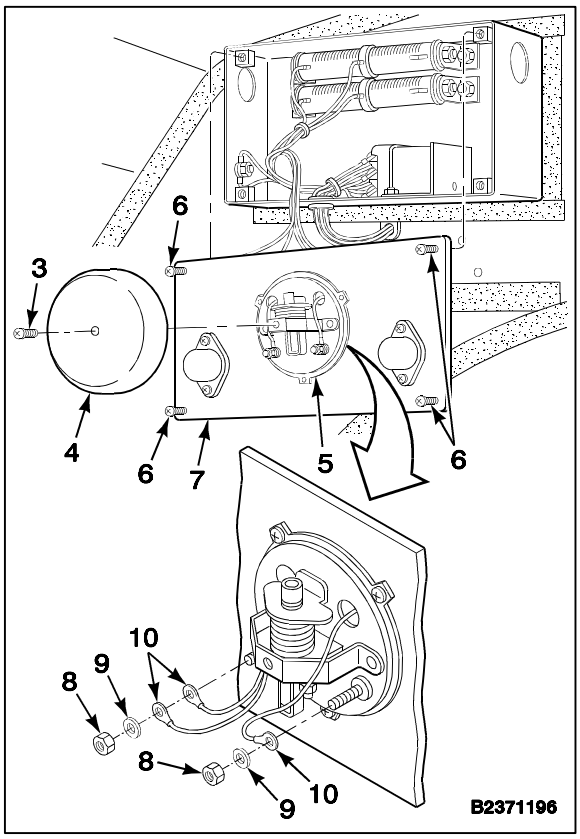

**NOTE**

Procedures are similar for removing forward or aft box. Forward box is shown here. When removing aft box (STA 575.00), do not perform steps 1, 11, and 12. Parts removed in steps 1, 11, and 12 are removed from forward box only.

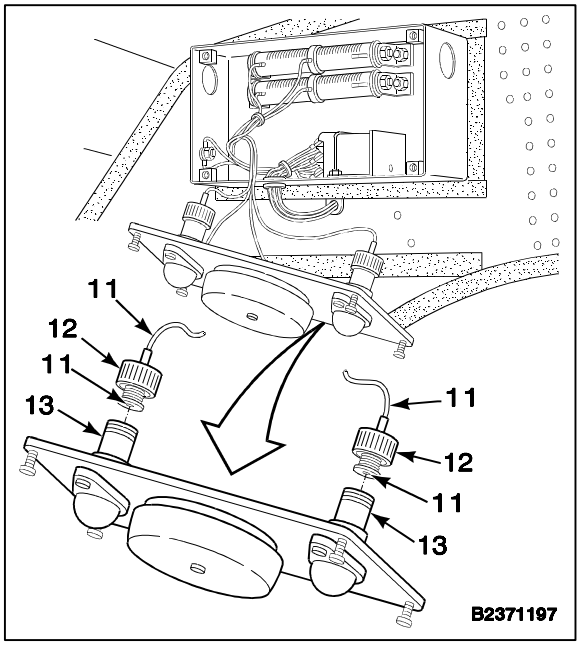
1. On forward troop warning box (1) only, remove blanket (2) from around box.



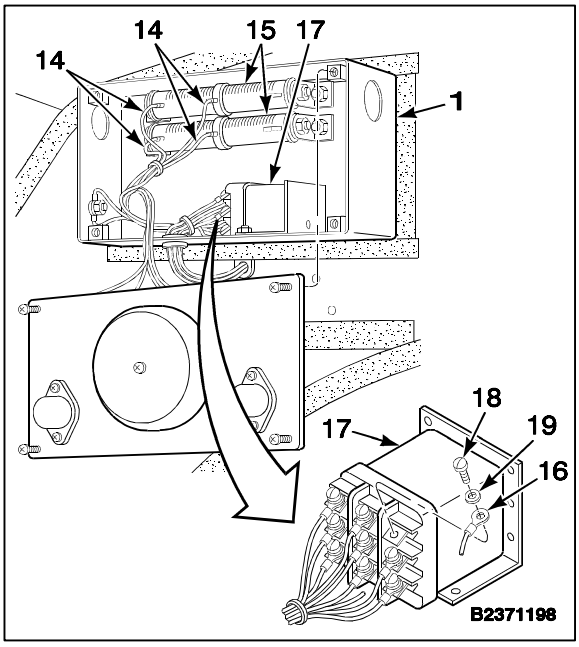
2. Remove screw (3) and gong (4) from bell (5).
3. Loosen four screws (6) and remove cover (7). Have helper hold cover.
4. Remove two nuts (8) and washers (9).
5. Tag and disconnect three wires (10) from bell (5). Tape exposed ends of wires. Use tape (E385).
6. Reinstall two washers (9) and nuts (8).
7. Reinstall gong (4) and screw (3).



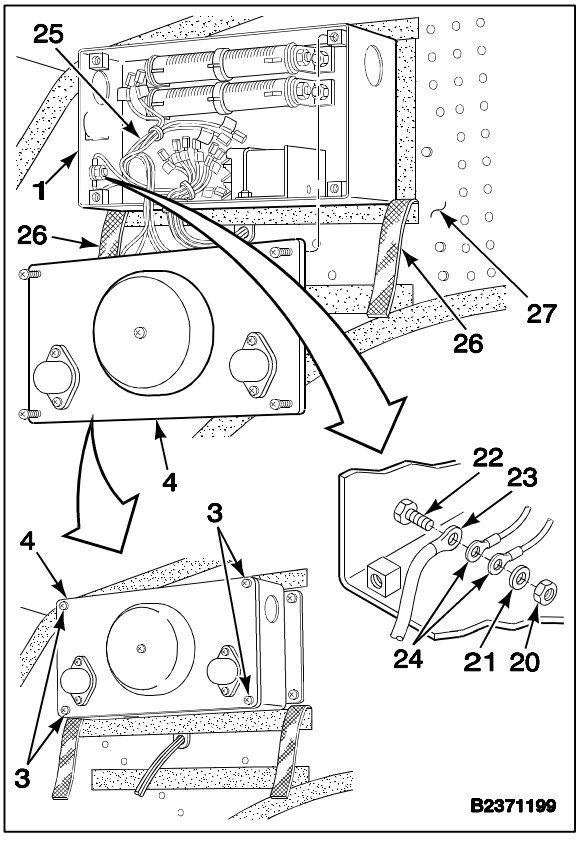

8. Tag two wires (11) and disconnect two connectors (12).
9. Unsolder two wires (11) from two connectors (12). Tape exposed ends of wires. Use tape (E385).
10. Reconnect two connectors (12) to lights (13).



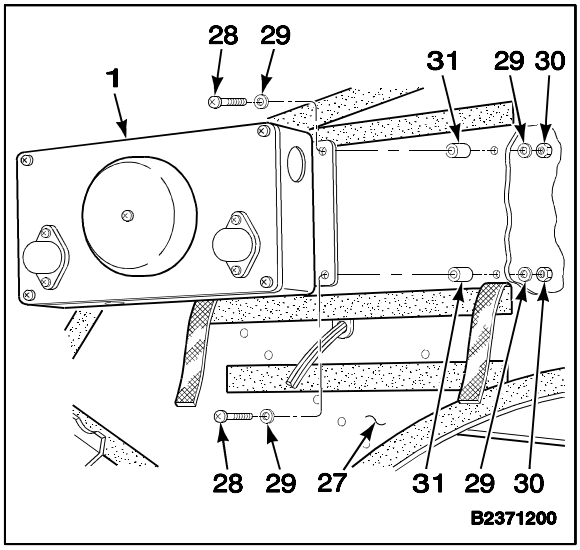
11. On forward box (1) only, tag and unsolder four wires (14) from resistors (15). Tape exposed ends of wires. Use tape (E385).
12. On forward box (1) only, tag and disconnect 12 wire terminals (16) from relay (17) by removing eight screws (18) and washers (19). Tape exposed ends of wires. Use tape (E385).
13. Reinstall eight washers (19) and screws (18) on relay (17).




14. Remove nut (20) and washer (21) from ground stud (22).
15. Tag and disconnect two wires (24). Tape ends. Use tape (E385). Electrical lead (23) shall stay on ground stud (22).
16. Install washer (21) and nut (20) on ground stud (22).
17. Carefully route wiring harness (25) clear of box (1).
18. Remove pile tape (26) from structure (27) on both sides of box (1).
19. Install cover (4) and tighten four screws (3).



20. Remove screw (28), washer (29), spacer (31), washer (29), and nut (30) from box (1) and structure (27) in four places.
21. Remove box (1).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-119 DISASSEMBLE TROOP WARNING BOX 9-119

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

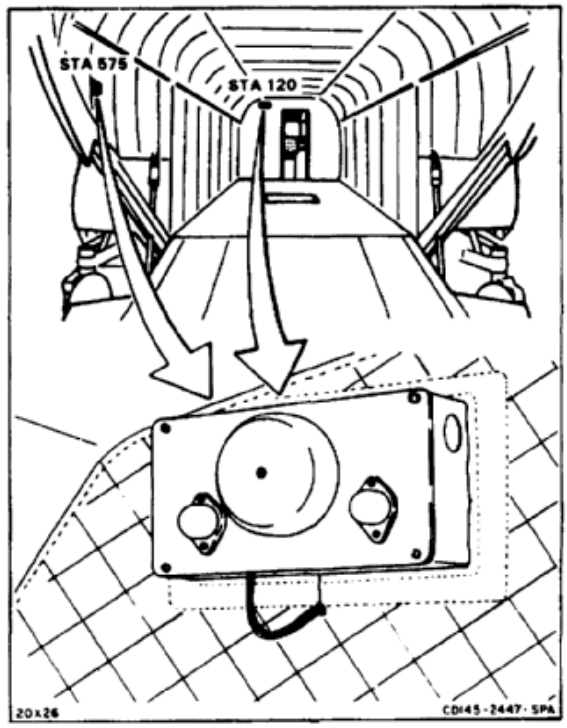
Tape (E385)
Paper Tags (E264)

***Personnel Required:***

Aircraft Electrician (2)

***Equipment Condition:***

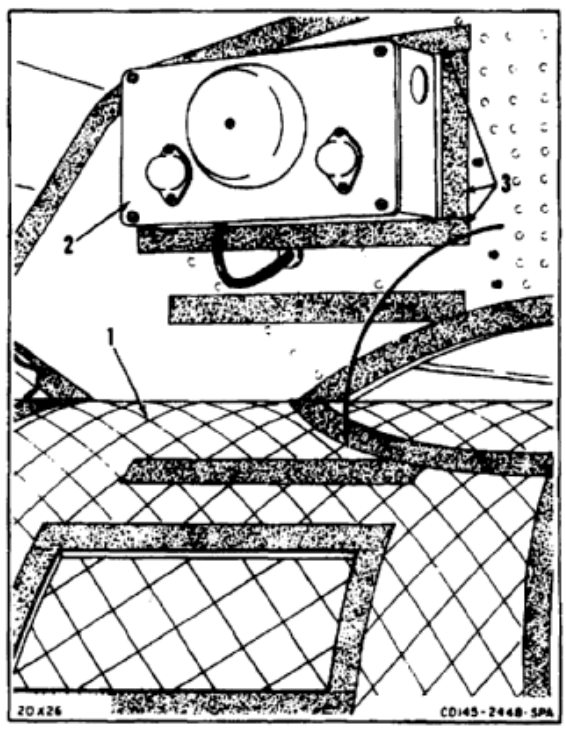
Battery Disconnected (Task 1-39)



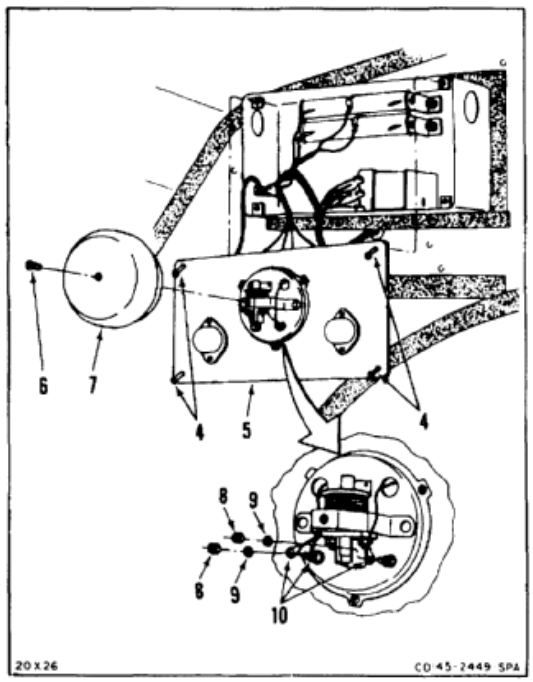

**NOTE**

Procedures are similar to disassemble forward or aft box. Forward box is shown here. When disassembling aft box (sta. 575), do not perform steps 1, 17, and 20. Parts removed in steps 1, 17, and 20 apply to forward box only.

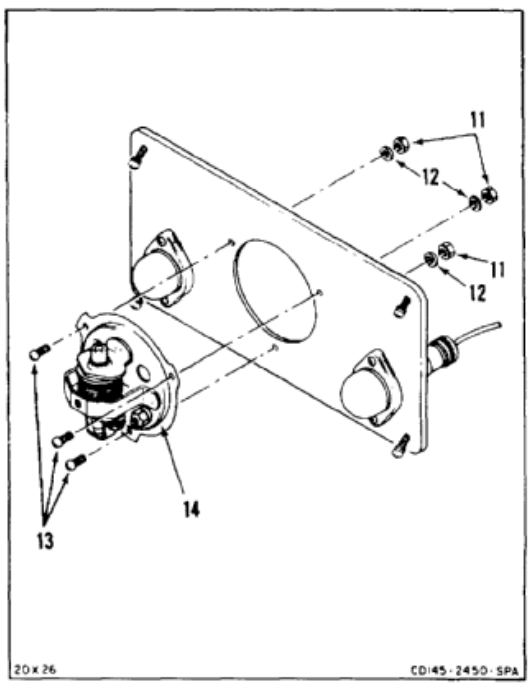
1. On forward box only, remove blanket (1) from troop warning box (2). Pull blanket away from pile tape (3).



2. Loosen four screws (4) and remove cover (5). Have helper support cover.
3. Remove screw (6) and gong (7).
4. Remove two nuts (8), and washers (9).
5. Tag and disconnect three wires (10). Tape exposed end of wires. Use tape (E385).
6. Install two nuts (8) and washers (9).



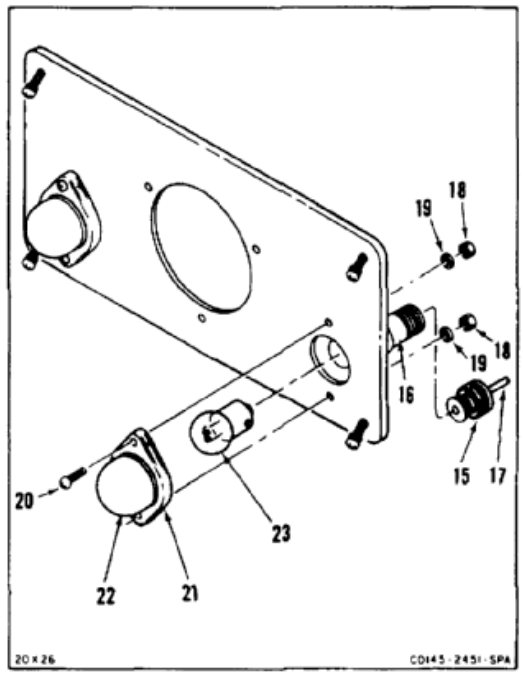

7. Remove three nuts (11), washers (12), and screws (13).
8. Remove bell (14).



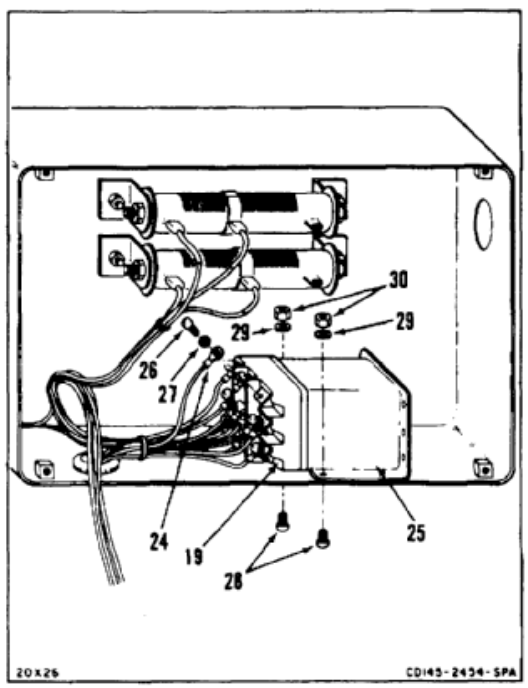
**NOTE**

Procedure is same to remove either light. To remove lamp only, go to step 11.

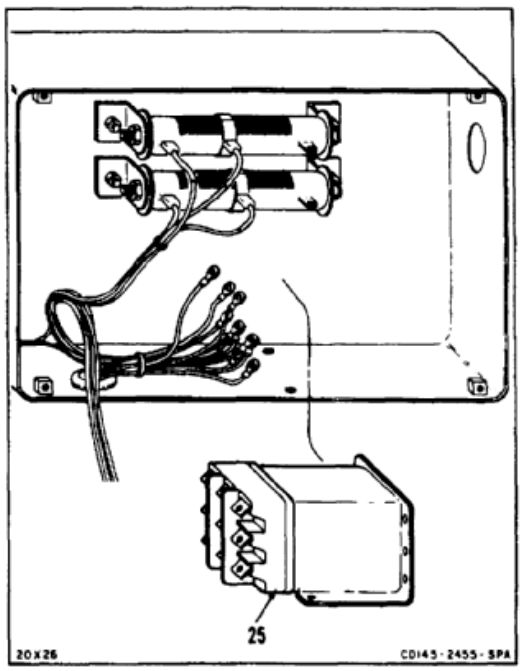
9. Disconnect connector (15) from light (16).
10. Tag and unsolder wire (17) from connector (15). Use soldering gun.
11. Remove two nuts (18), washers (19), and screws (20).
12. Remove lamp (23).
13. Remove light (16).
14. Remove retainer (21) and lens (22).




15. On forward box only, tag and disconnect 12 wires (24) from relay (25) by removing screws (26) and washers (27). Tape exposed ends. Use tape (E385).
16. Remove two screws (28), washers (29), and nuts (30).



17. Remove relay (25).

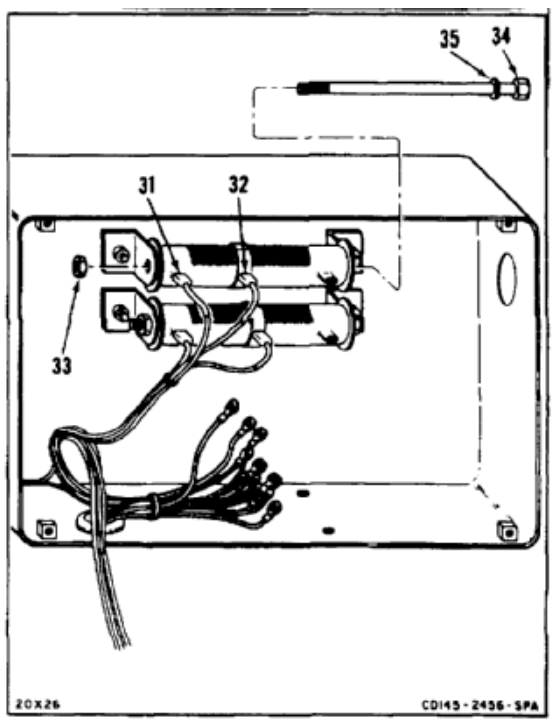



**NOTE**

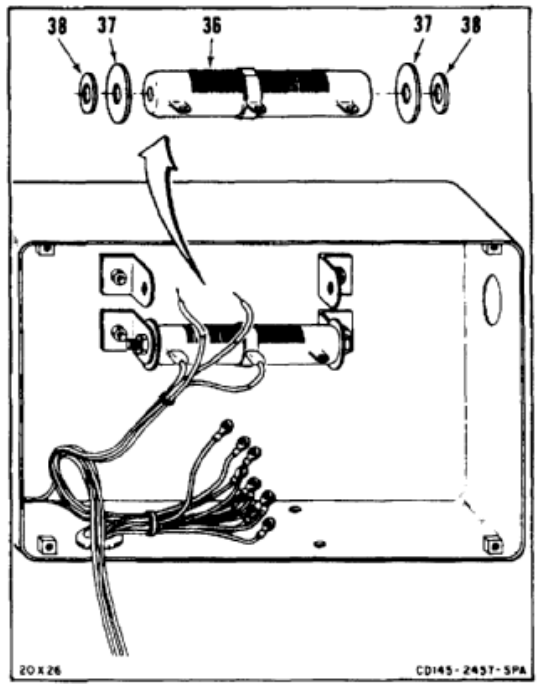
Procedures are similar to remove upper or lower resistors. Upper resistor is shown here.

18. On forward box only, tag and unsolder wires (31 and 32). Tape exposed ends. Use tape (E385).

19. Remove nut (33), screw (34), and washer (35).



20. Remove resistor (36), two insulators (37), and washers (38).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-120 ASSEMBLE TROOP WARNING BOX 9-120

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

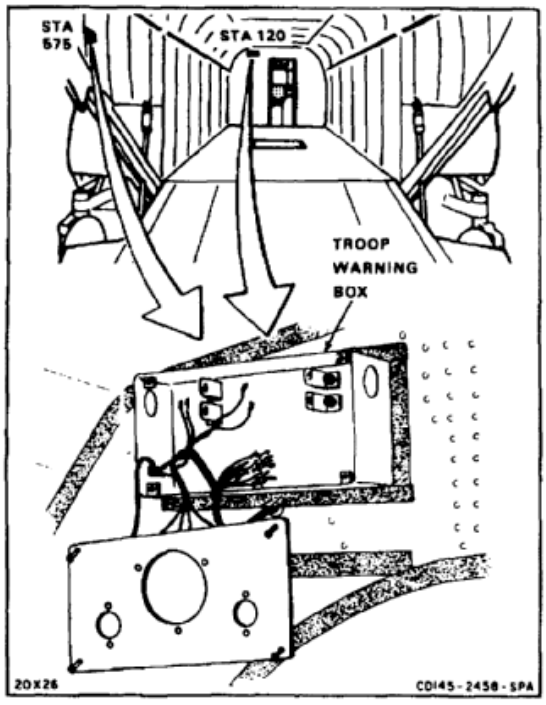
Solder (E360)

***Personnel Required:***

Aircraft Electrician (2)
Inspector

***References:***

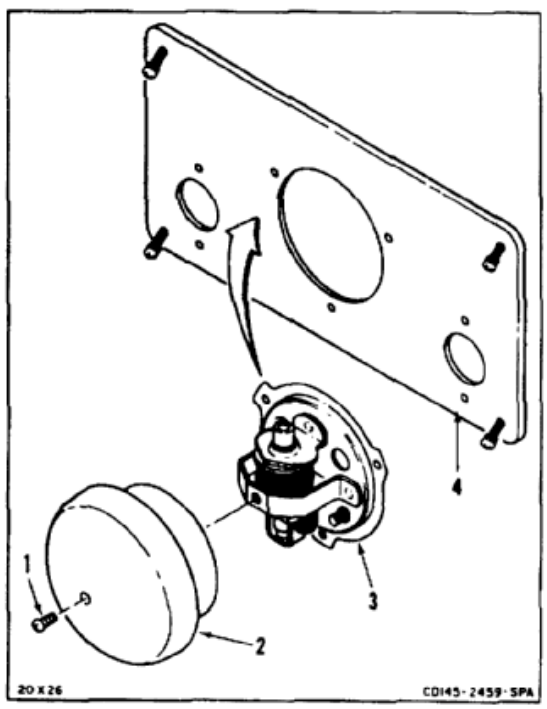
TM 55-1520-240-23P



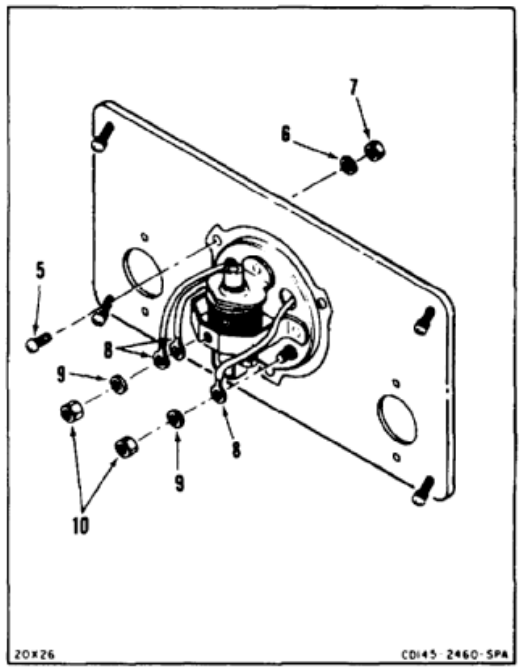

**NOTE**

Procedures are similar to assemble forward or aft box. Forward box is shown here. When assembling aft box (sta. 575), do not perform steps 14, 17, and 21. Parts installed in steps 14, 17, and 21 apply to forward box only.

1. Remove screw (1) and gong (2) from bell (3).
2. Position bell (3) on cover (4).



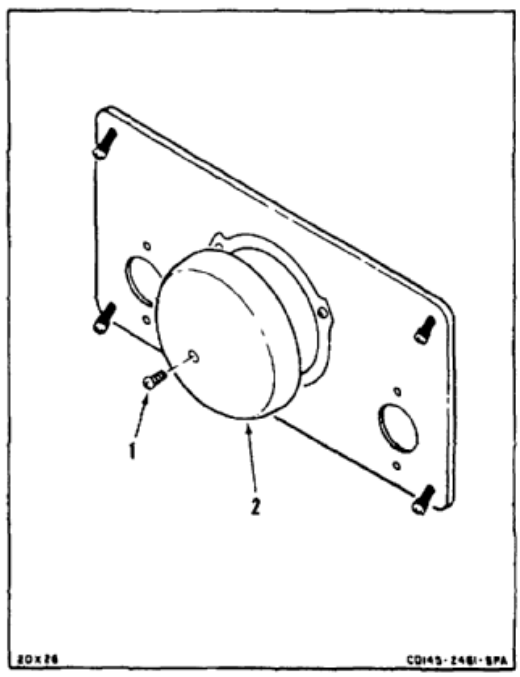
3. Install three screws (5), washers (6), and nuts (7).
4. Remove tape and connect three wires (8). Install two washers (9) and nuts (10). Remove tags.




5. Install gong (2) and screw (1).

**NOTE**

Procedure is same to install either light. To install lamp only, go to step 9.

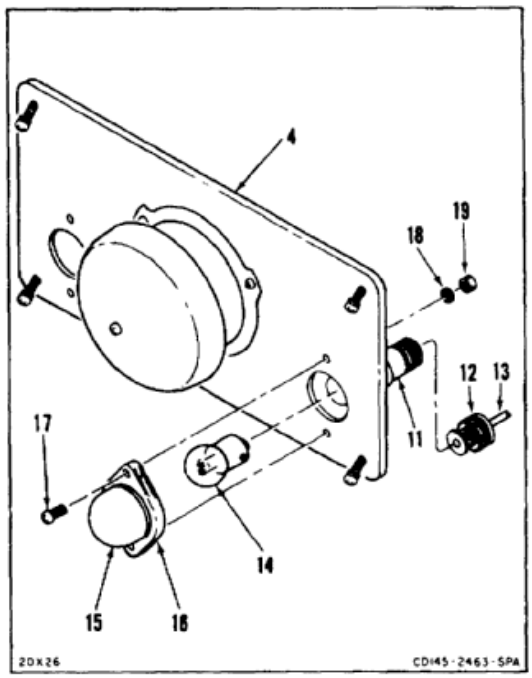


6. Position light (11) in cover (4).
7. Remove tape and insert wire (13) through back of socket (12).
8. Solder wire (13) to socket (12). Use solder (E360). Remove tag.

**NOTE**

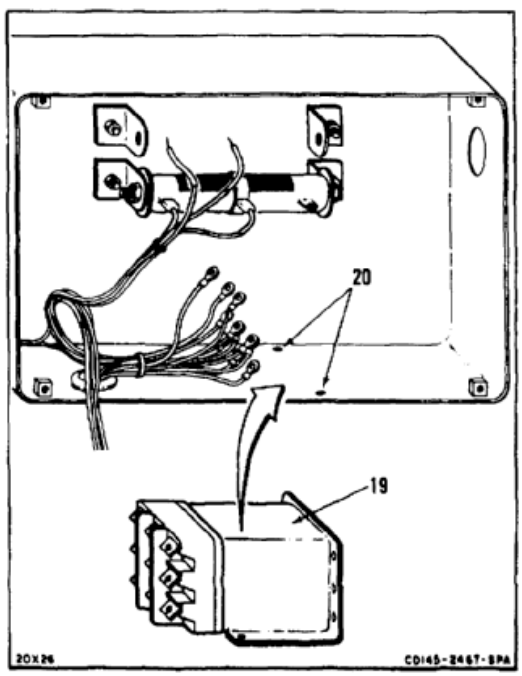
Procedure is same to install either lamp.

9. Install lamp (14) in light (11).
10. Position lens (15) and retainer (16), on cover (4).
11. Install two screws (17), washers (18), and nuts (19).
12. Connect socket (12) to light (11).



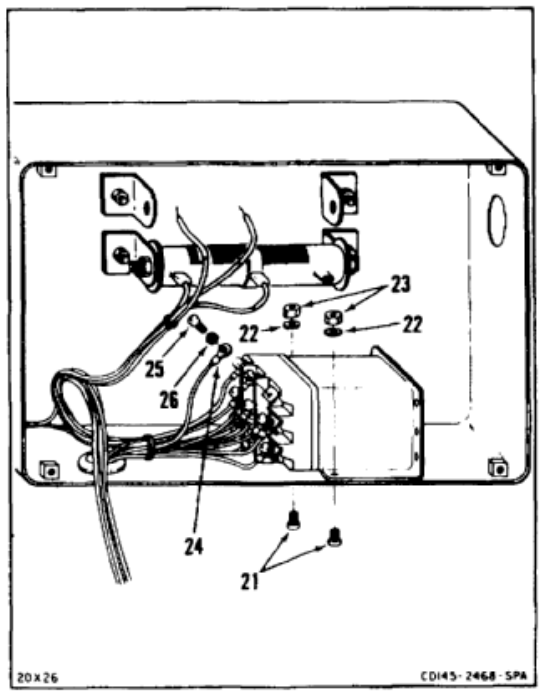

***INSTALL RELAY***

13. On forward box only, position relay (19) over two mounting holes (20).



14. Install two screws (21), washers (22), and nuts (23).

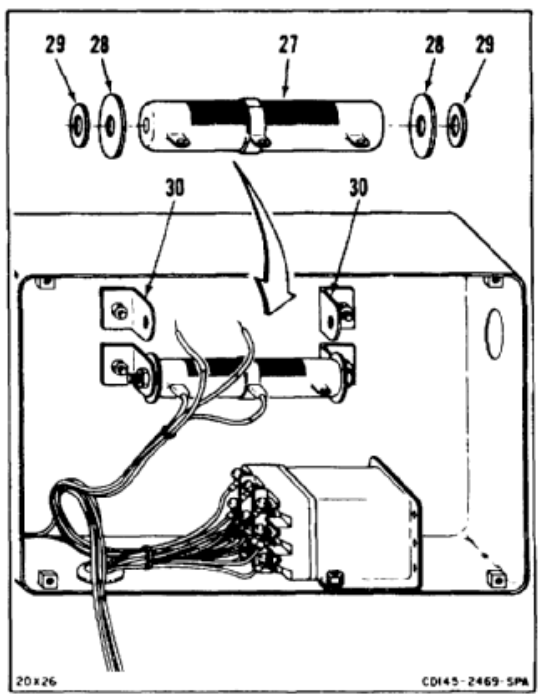
15. Remove tape and connect 12 wires (24). Install screws (25) and washers (26). Remove tags.



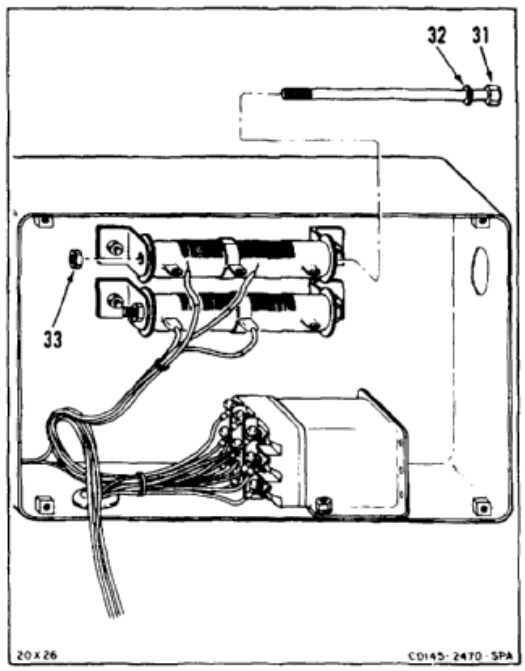

**NOTE**

Procedures are similar to install upper or lower resistors. Upper resistor is shown here.

16. On forward box only, position resistor (27), two insulators (28), and washers (29), between brackets (30).

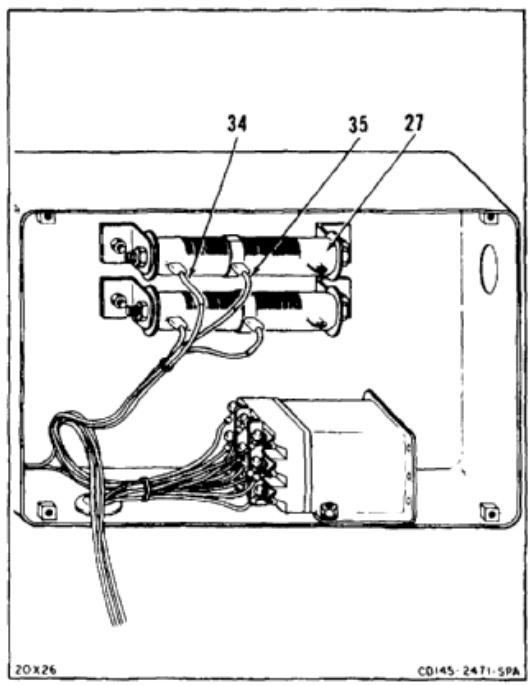


17. Install screw (31), washer (32), and nut (33).

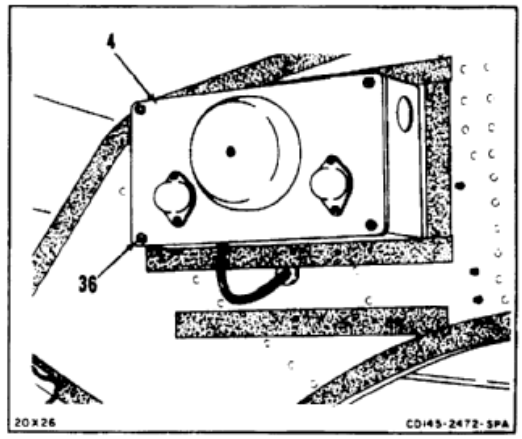



18. Remove tape and solder wires (34 and 35) to resistor (27). Use solder (E360). Remove tags.

***INSPECT***



19. Install cover (4) and tighten four screws (36).

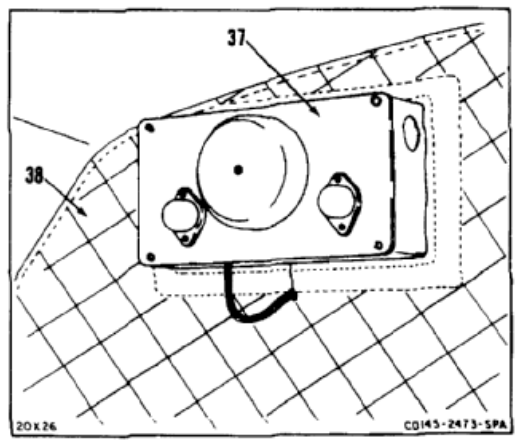



20. Forward box (37) only, install blanket (38).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operation check (TM 55-1520-240-T).




END OF TASK

## 9-121 INSTALL TROOP WARNING BOX 9-121

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

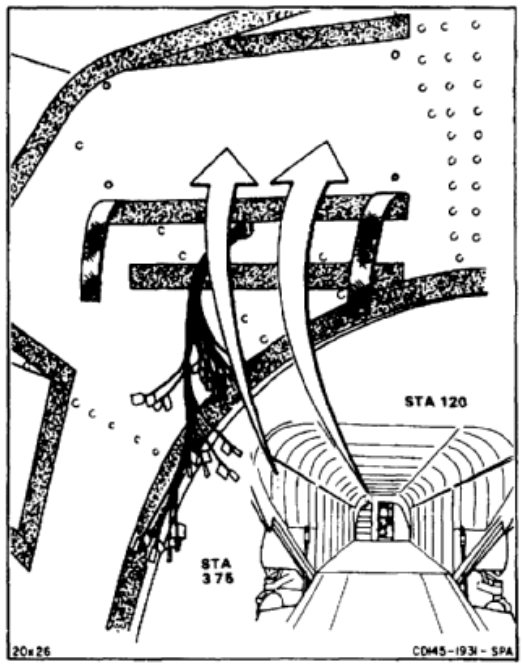
Cement (E107)
Solder (E360)
Pile Tape (E402)
Gloves (E186)

***Personnel Required:***

Aircraft Electrician (2)
Inspector

***References:***

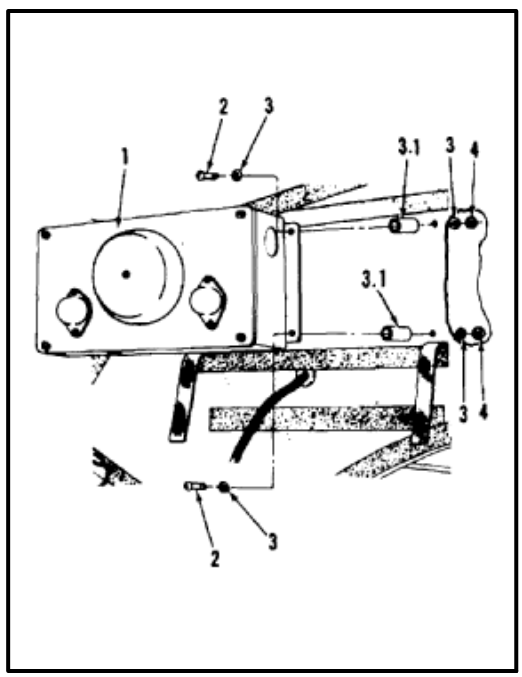
TM 55-1520-240-23P



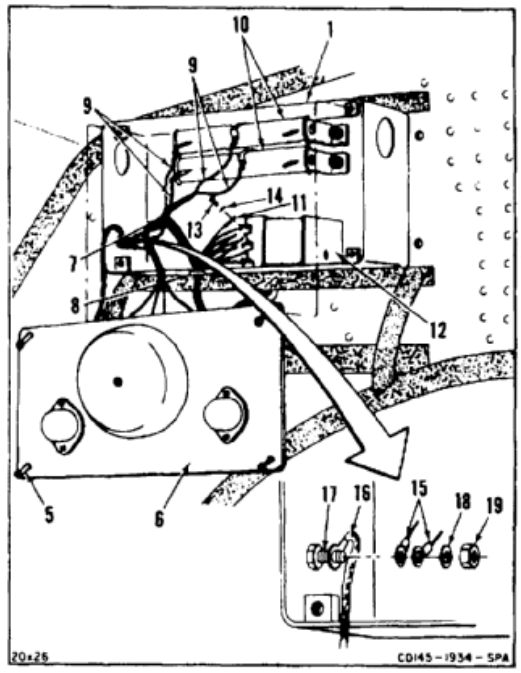

**NOTE**

Procedures are similar for installing forward or aft box. Forward box is shown here. When installing aft box (sta. 575), do not perform steps 4 and 5. Parts installed in steps 4 and 5 are installed in forward box only.

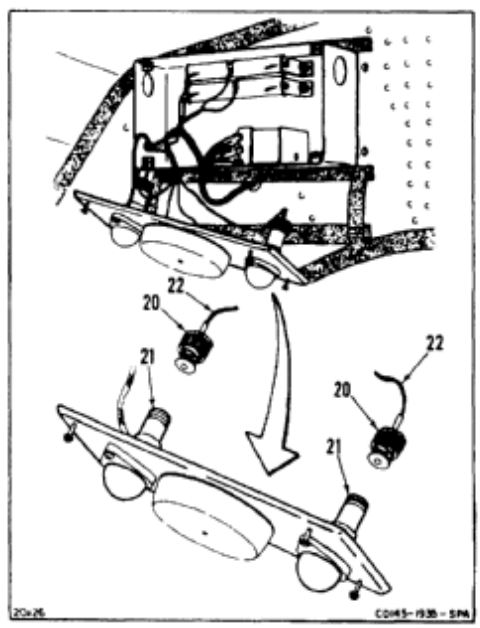
1. Position box (1) and install screw (2), washer (3), spacer (3.1) between box and structure, washer (3), and nut (4) in four places.



2. Loosen four screws (5). Have helper hold cover (6).
3. Route harness (7) through lower grommet (8) into box (1).
4. On forward box (1) only, remove tape and solder four wires (9) to resistors (10). Remove tags from wires.
5. On forward box (1) only, remove tape from wire terminals (11). Connect 12 wire terminals to relay (12). Install 12 screws (13) and washers (14). Remove tags from wires.
6. Remove nut (19) and washer (18) from ground stud (17).
7. Remove tape and connect two wires (15) over electrical lead (16) to ground stud (17). Install washer (18) and nut (19). Remove tags.

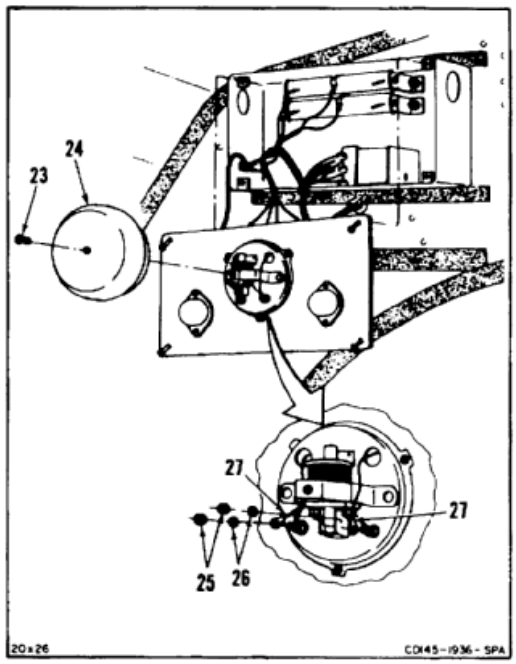



8. Disconnect connectors (20) from light (21).
9. Have helper hold connectors (20). Remove tape from wires (22) and install wires through back of connector.
10. Solder wires (22) to connector (20). Use solder (E360). Remove tags.
11. Connect two connectors (20) to lights (21).



12. Remove screw (23) and gong (24).
13. Remove two nuts (26) and washers (27).
14. Remove tape and connect three wires (25). Install two nuts (26) and washers (27). Remove tags.
15. Install gong (24) and screw (23).

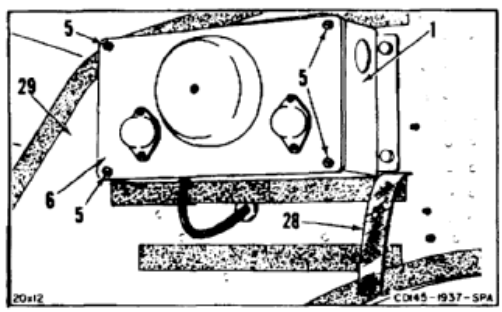
***INSPECT***




16. Position cover (6) on box (1) and tighten four screws (5).

**WARNING**

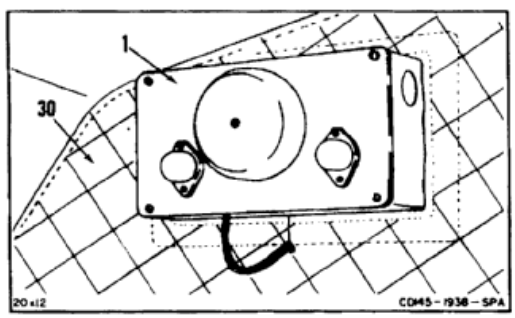
Cement (E107) is flammable and toxic. It can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with plenty of water for at least **15 minutes**. Get medical attention for eyes.




17. Cut pile tape (28) (E402) to required length, and apply cement (E107) to back of tape. Use gloves (E186).
18. Install pile tape (28) (E402) on structure (29) as shown.
19. On forward box (1) only, install blanket (30) around box.

***FOLLOW-ON MAINTENANCE:***

Test operation of troop warning box (TM 55-1520-240-T).




END OF TASK

## 9-122 REMOVE TROOP/JUMP SIGNAL OR POSITION LIGHT DIMMING RESISTORS 9-122

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

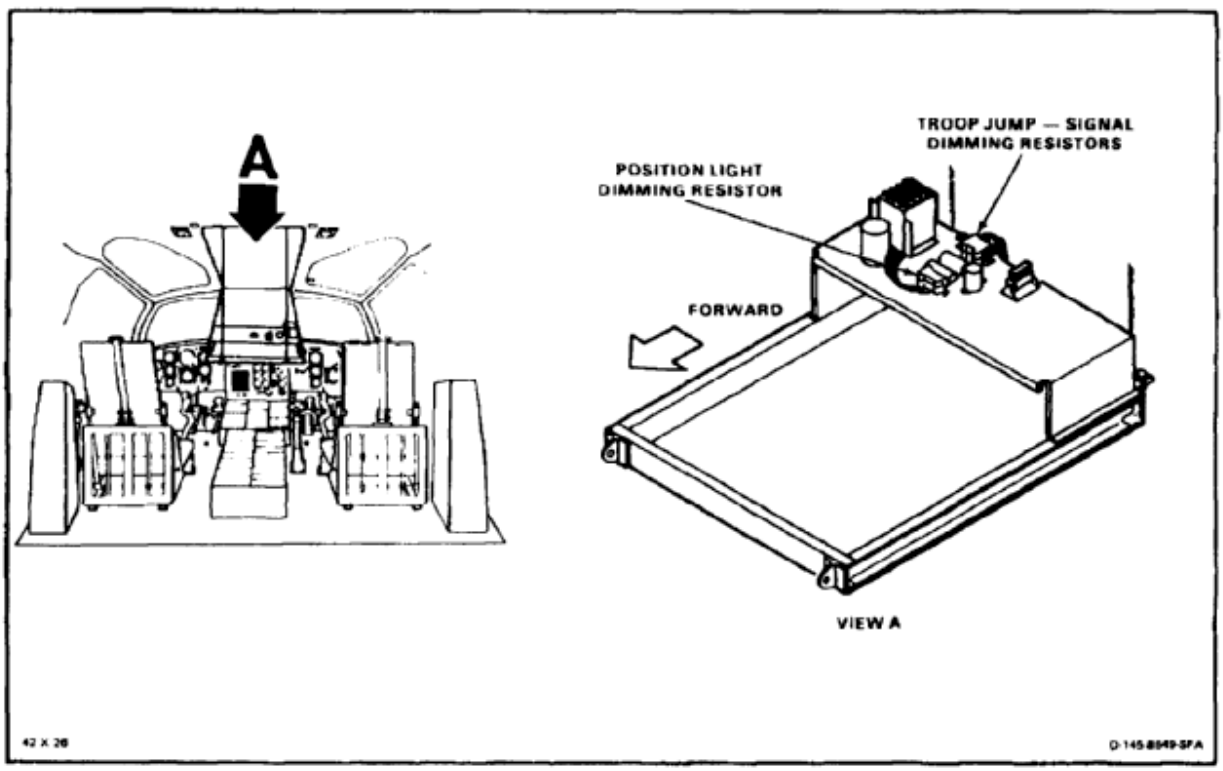
Paper Tags (E264)
Tape (E395)

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off

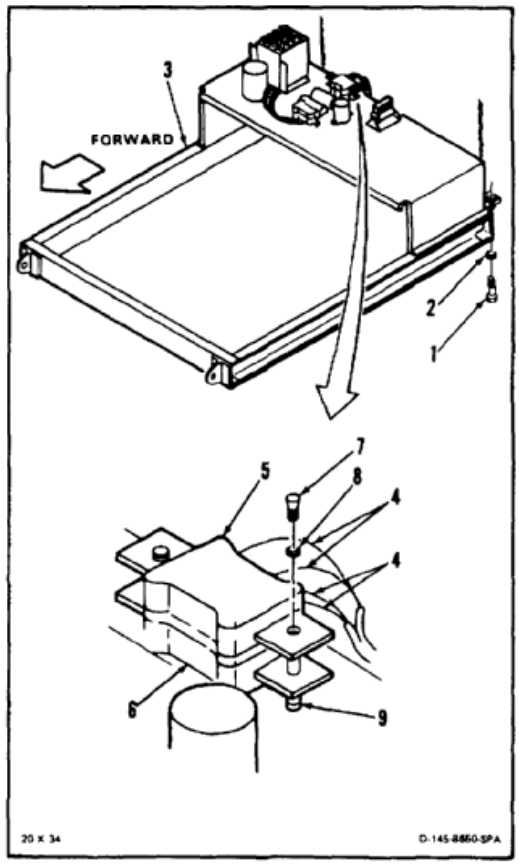


## 9-122 REMOVE TROOP/JUMP SIGNAL OR POSITION LIGHT DIMMING RESISTORS (Continued) 9-122

**NOTE**

Procedure is same to install troop/jump or position light dimming resistor. Installation of troop/jump dimming resistor is shown here.

1. Remove two bolts (1) and washers (2) from panel (3). Lower panel.
2. Tag and unsolder four wires (4) from resistors (5 and 6). Tape wire ends.
3. Remove two screws (7), washers (8), and spacers (9).
4. Remove two resistors (5 and 6).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-123 INSTALL TROOP/JUMP SIGNAL OR POSITION LIGHT DIMMING RESISTORS 9-123

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

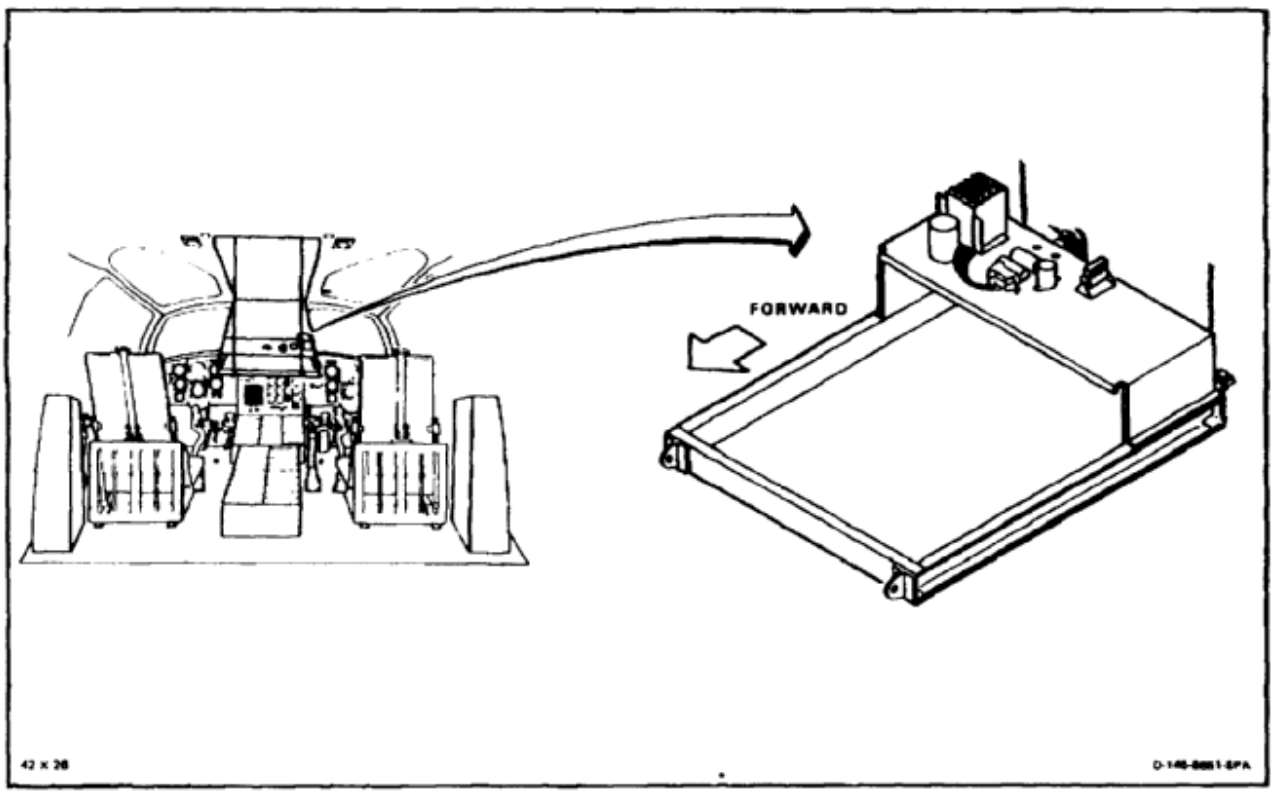
Solder (E360)

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P



## 9-123 INSTALL TROOP/JUMP SIGNAL OR POSITION LIGHT DIMMING RESISTORS (Continued) 9-123

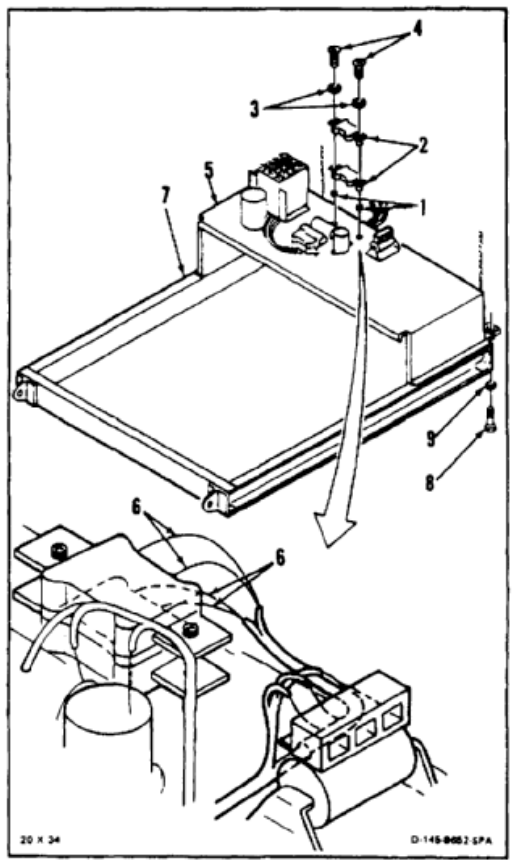
**NOTE**

Procedure is same to install troop/jump or position light dimming resistor. Installation of troop/jump dimming resistor is shown here.

1. Install two spacers (1), two resistors (2), washers (3), and screws (4) on panel (5).
2. Remove tape from four wires (6). Solder wires to resistors (2). Remove tags.

***INSPECT***

3. Raise panel (7). Install two bolts (8) and washers (9).




***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).

END OF TASK

## 9-123.1 REMOVE OVERHEAD PANEL TRANSFORMERS AND RELAY 9-123.1

INITIAL SETUP

***Applicable Configurations:***

With 17

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

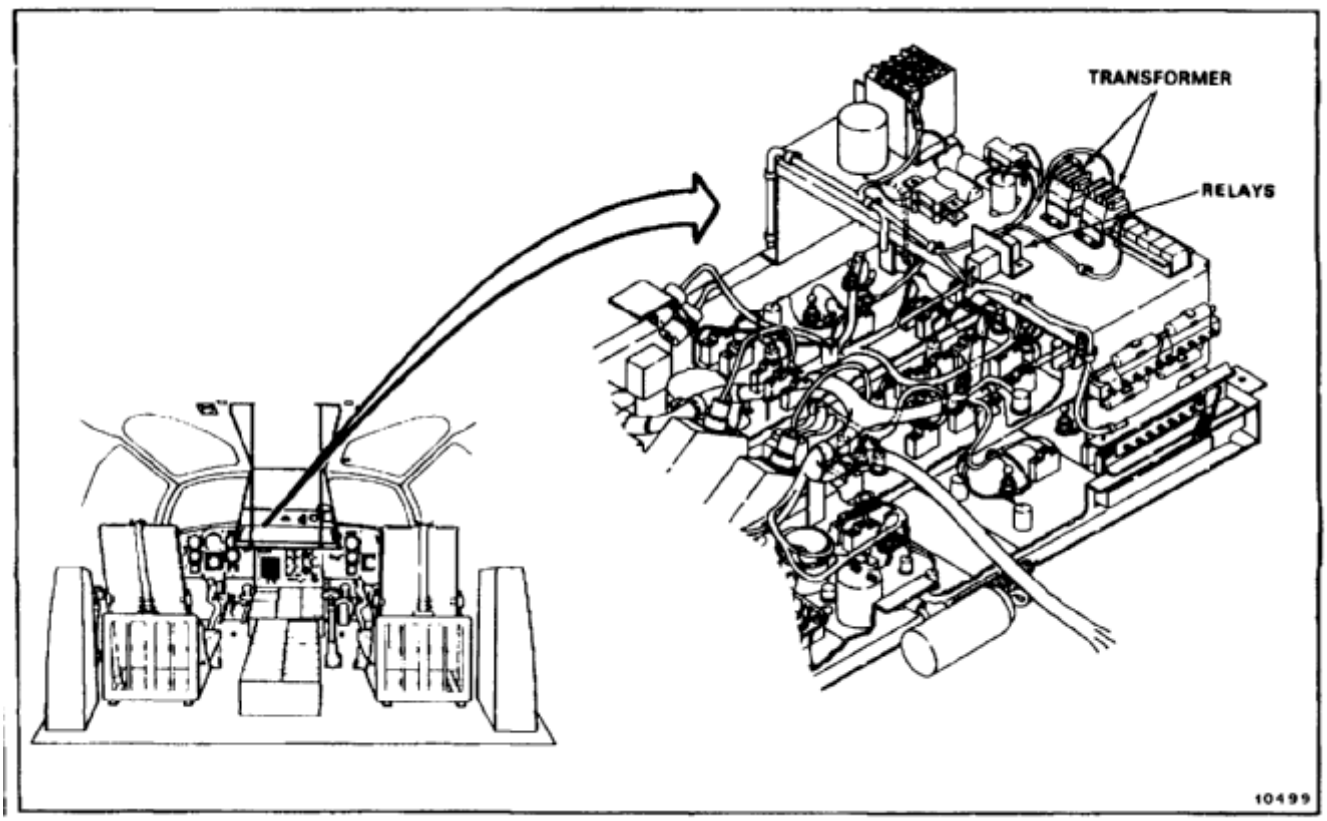
Paper Tags (E264)
Tape (E395)

***Personnel Required:***

Aircraft Electrician

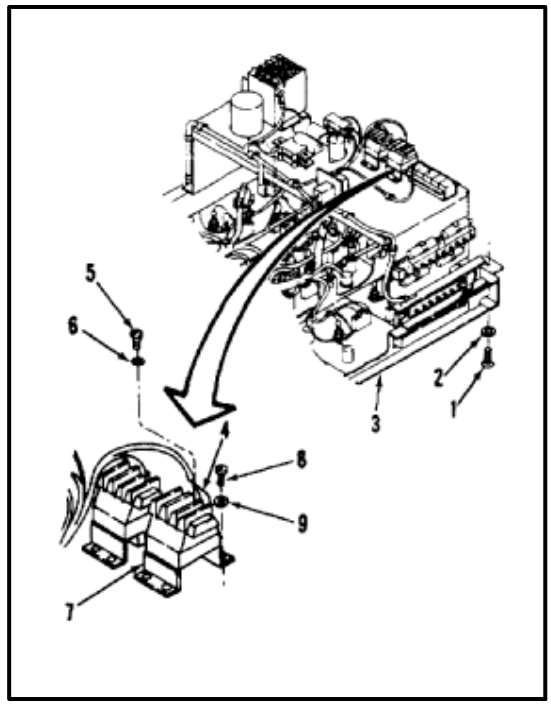
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off



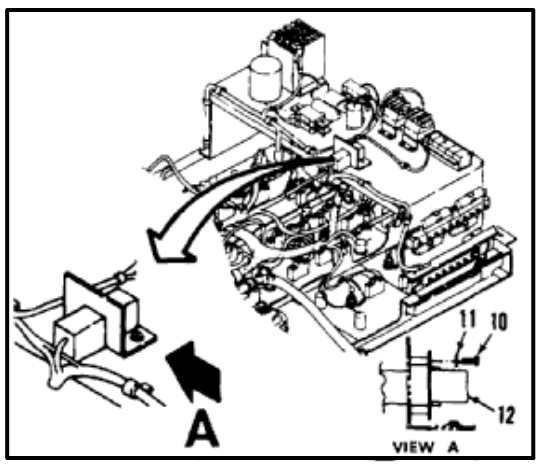
***TRANSFORMER***

1. Remove two bolts (1) and washers (2) from overhead panel (3). Lower panel.
2. Tag three wires (4). Use tags (E264). Remove three screws (5) and washers (6). Remove wires from transformer (7). Tape wire ends. Use tape (E395).
3. Remove four screws (8) and washers (9) from transformer (7). Remove transformer.




***RELAY***

4. Remove three screws (10) and washers (11) from relay (12) and holding hex nut. Unplug relay.




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-123.2 INSTALL OVERHEAD PANEL TRANSFORMERS AND RELAY 9-123.2

INITIAL SETUP

***Applicable Configurations:***

With 17

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

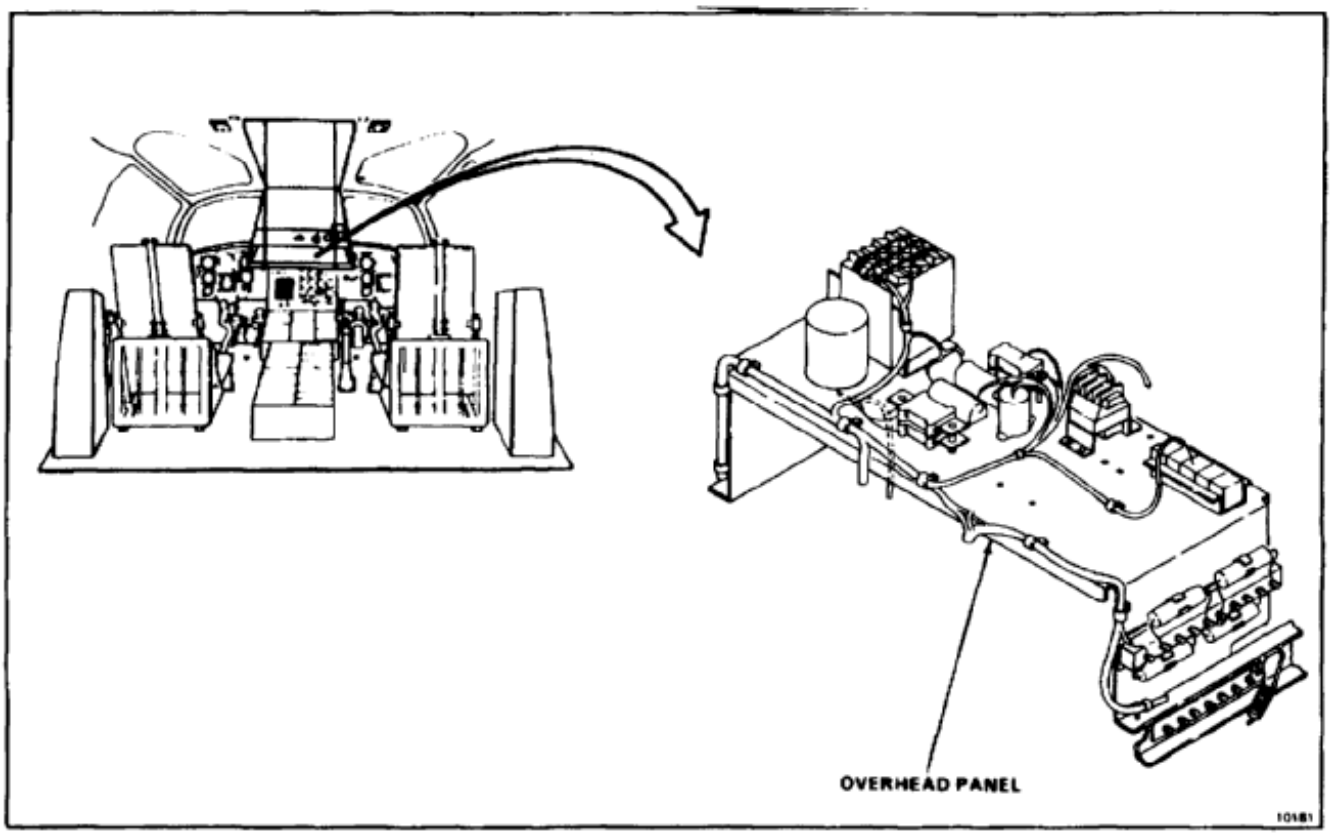
Solder (E360)

***Personnel Required:***

Aircraft Electrician
Inspector

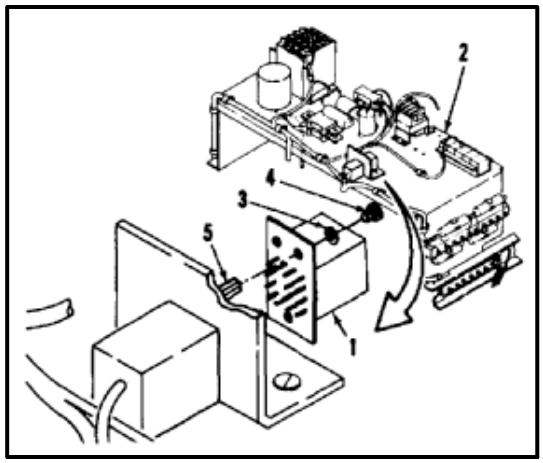
***References:***

TM 55-1520-240-23P



***RELAY***

1. Plug relay (1) into socket on mounting bracket on overhead panel (2). Install three washers (3) and screws (4) in relay and standoff (5).
2. Deleted.

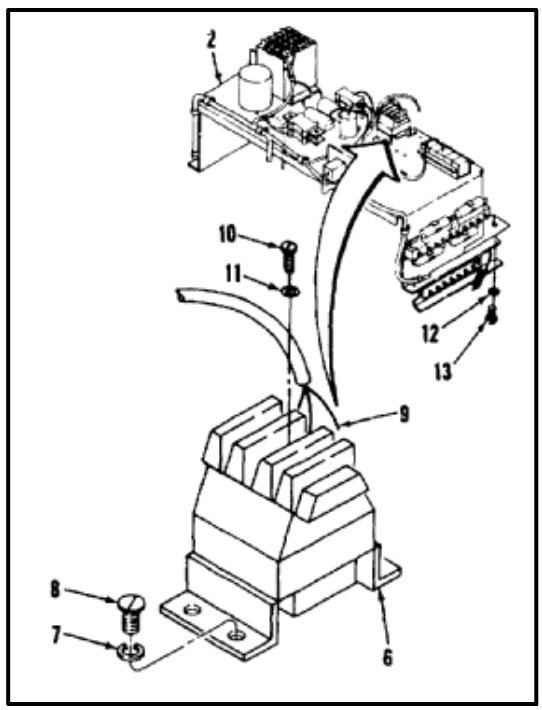



***TRANSFORMERS***

**NOTE**

Procedure is same to install either transformer.

3. Position transformer (6) on panel (2). Install four washers (7) and screws (8) in transformer.
4. Remove tape from three wires (9). Connect wires to transformer (6). Install screws (10) and washers (11). Remove tags.
5. Raise panel (2). Install two washers (12) and bolts (13) in panel.




***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).

END OF TASK

## 9-124 ADJUST TROOP JUMP SIGNAL DIMMING RESISTOR 9-124

INITIAL SETUP

***Applicable Configurations:***

Without 17

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Multimeter:

***Materials:***

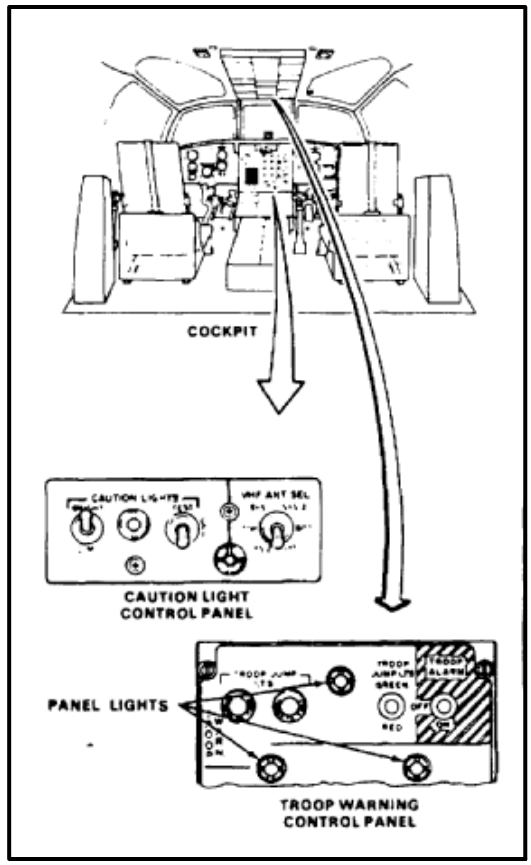
None

***Personnel Required:***

Aircraft Electrician
Inspector

***Equipment Condition:***

Hydraulic Power Off
Electrical Power On
Battery Connected (Task 1-39)



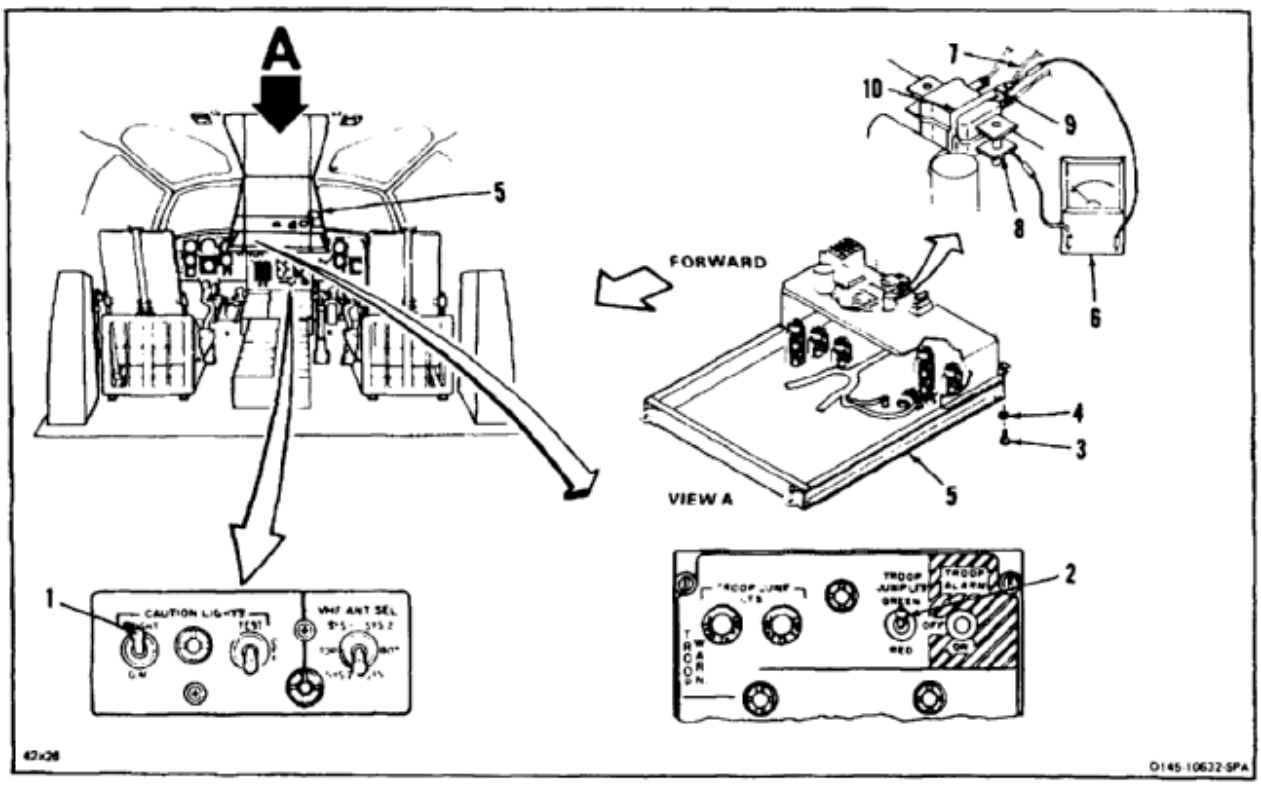
## 9-124 ADJUST TROOP JUMP SIGNAL DIMMING RESISTOR (Continued) 9-124

1. Set caution light switch (1) to DIM.
2. Set troop jump light switch (2) to GREEN.
3. Remove two bolts (3) and washers (4) from panel (5). Lower panel.

**WARNING**

Do not touch wires or circuits when adjusting resistors. Injury to personnel can occur.

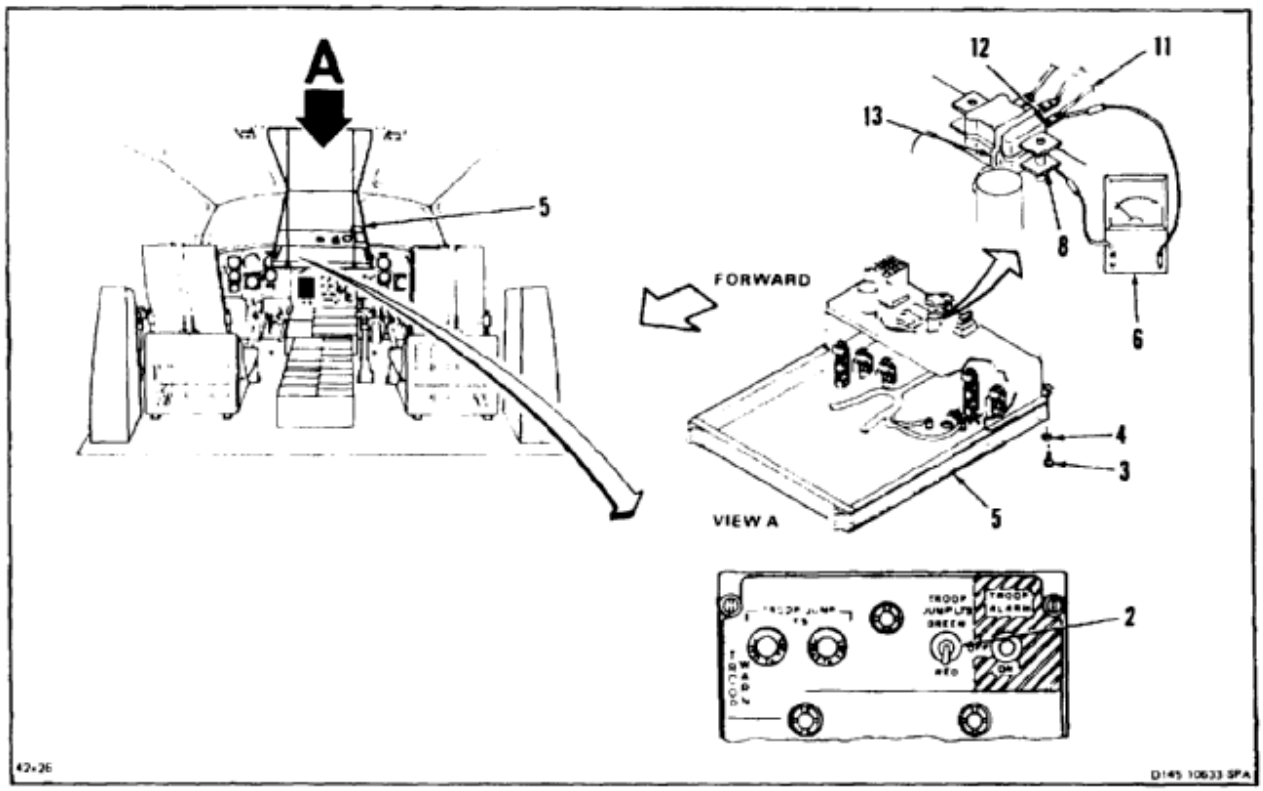
4. Connect multimeter (6) to resistor terminal (7) and aircraft ground (8).
5. Loosen screw (9). Move slider band (10) until multimeter (6) indicates **14 to 16 volts**.
6. Tighten screw (9). Disconnect multimeter (6).



7. Connect multimeter (6) to resistor terminal (11) and aircraft ground (8).
8. Set Troop JUMP LIGHT switch (2) to RED.
9. Loosen screw (12) and move slider band (13) until multimeter (6) indicates **14 to 16 volts**.
10. Tighten screw (12). Disconnect multimeter (6).
11. Raise panel (5) and install two bolts (3) and washers (4).
12. Shut down electrical power.
13. Disconnect battery.

***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).




END OF TASK

## 9-124.1 LIGHT LEAK TEST 9-124.1

INITIAL SETUP

***Applicable Configurations:***

With 17 and 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

None

***Personnel Required:***

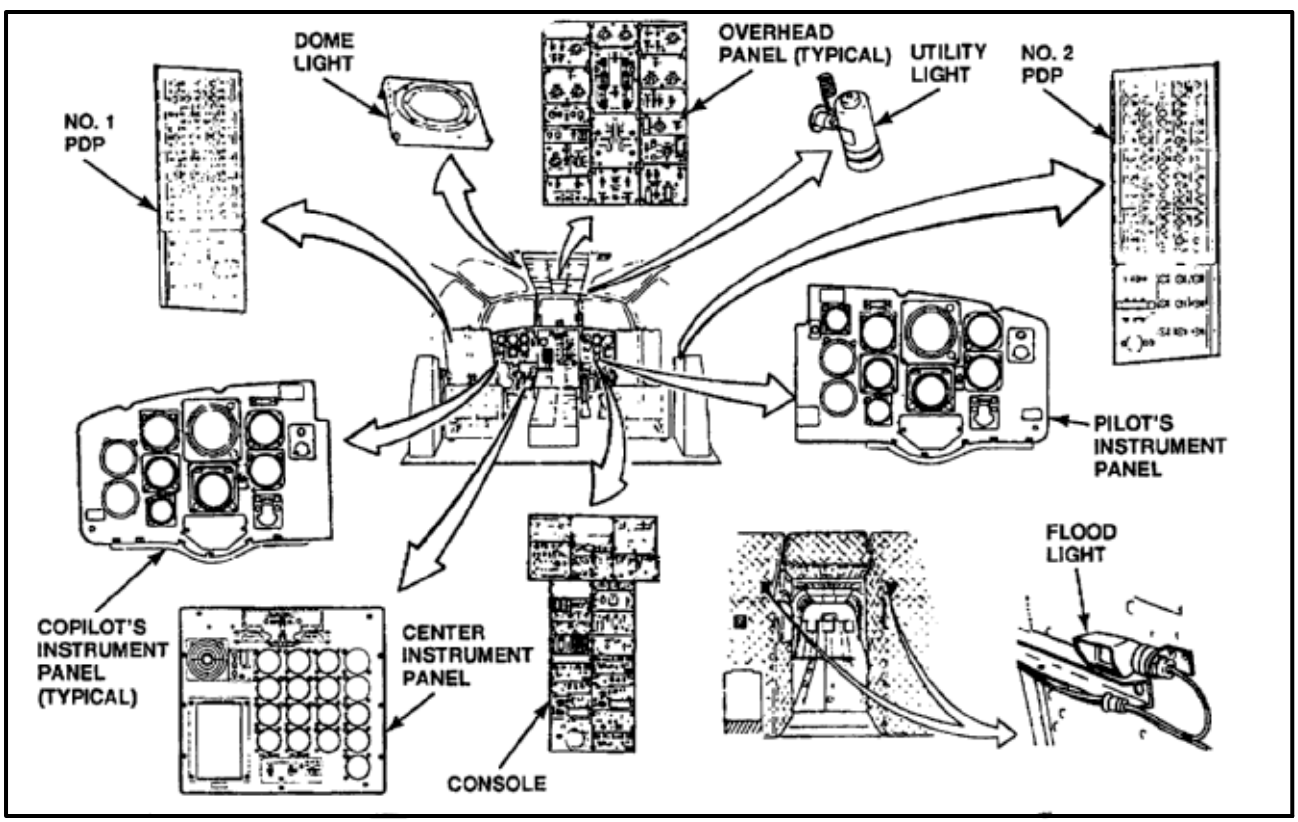
Aircraft Electrician
Inspector

***References:***

TM 11-1520-240-23
TM 55-1520-240-T

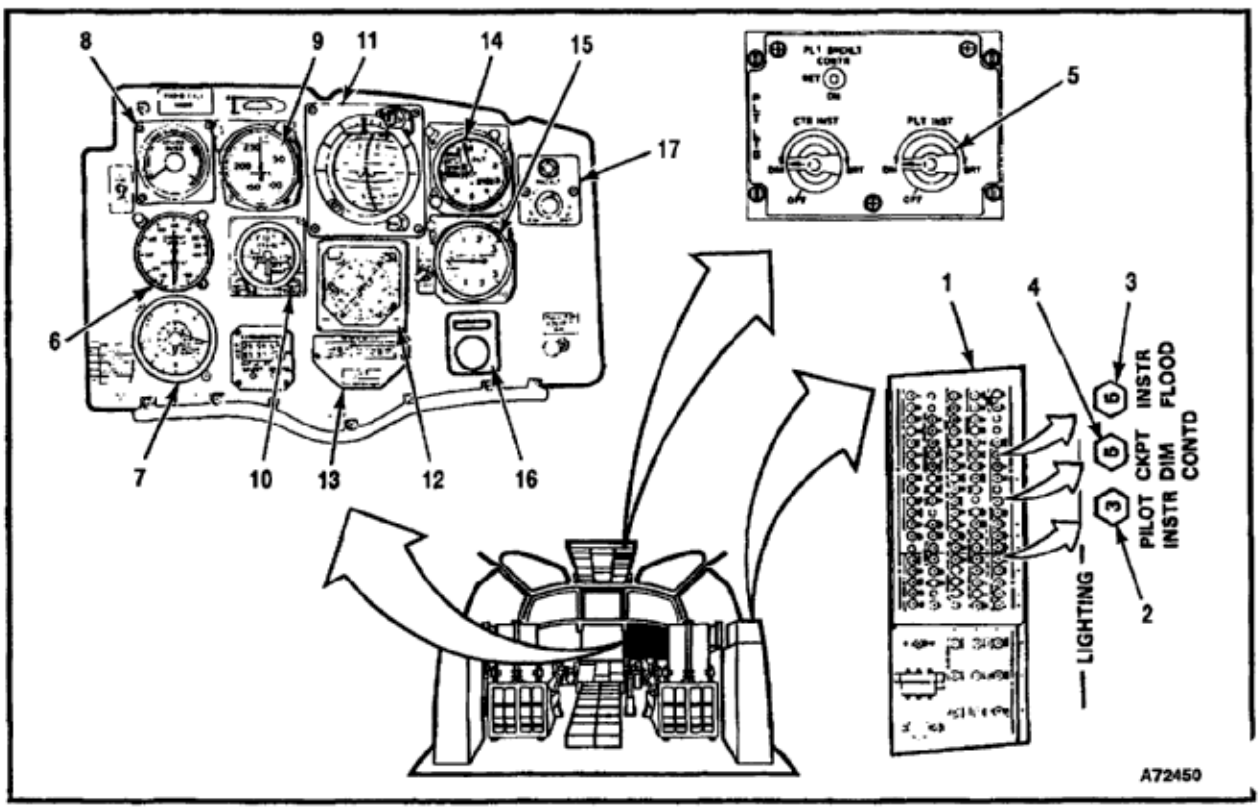
***Equipment Condition:***

Battery Connected (Task 1-39)
NO. 2 AC BUS TIE Circuit Breaker Closed
DC 2 CROSS TIE Circuit Breaker Closed
NO. 2 XFMR RECT Circuit Breaker Closed
NO. 2 REV CUR CO Circuit Breaker Closed
NO. 2 DC BUS CONT Circuit Breaker Closed
NO. 1 AC BUS TIE Circuit Breaker Closed
DC 1 CROSS TIE Circuit Breaker Closed
NO. 1 XFMR RECT Circuit Breaker Closed
NO. 1 REV CUR CO Circuit Breaker Closed
NO. 1 DC BUS CONT Circuit Breaker Closed
EXT PWR CONT Circuit Breaker Closed
CONT AC Circuit Breaker Closed
ESS BUS FEED Circuit Breaker Closed
CAUTION PNL Circuit Breaker Closed
XMSN OIL TEMP Circuit Breaker Closed
Battery Switch ON
External AC Power Applied (Task 1-37)
Cockpit Windows Covered With Blanket
Master Caution Panel NVG Filter Installed Without 74
Pilot's and Copilot's Master Caution Indicator
NVG Filters Installed
Engine 1 and Engine 2 Fire Handle NVG Filters Installed
Passageway Blackout Curtain Closed



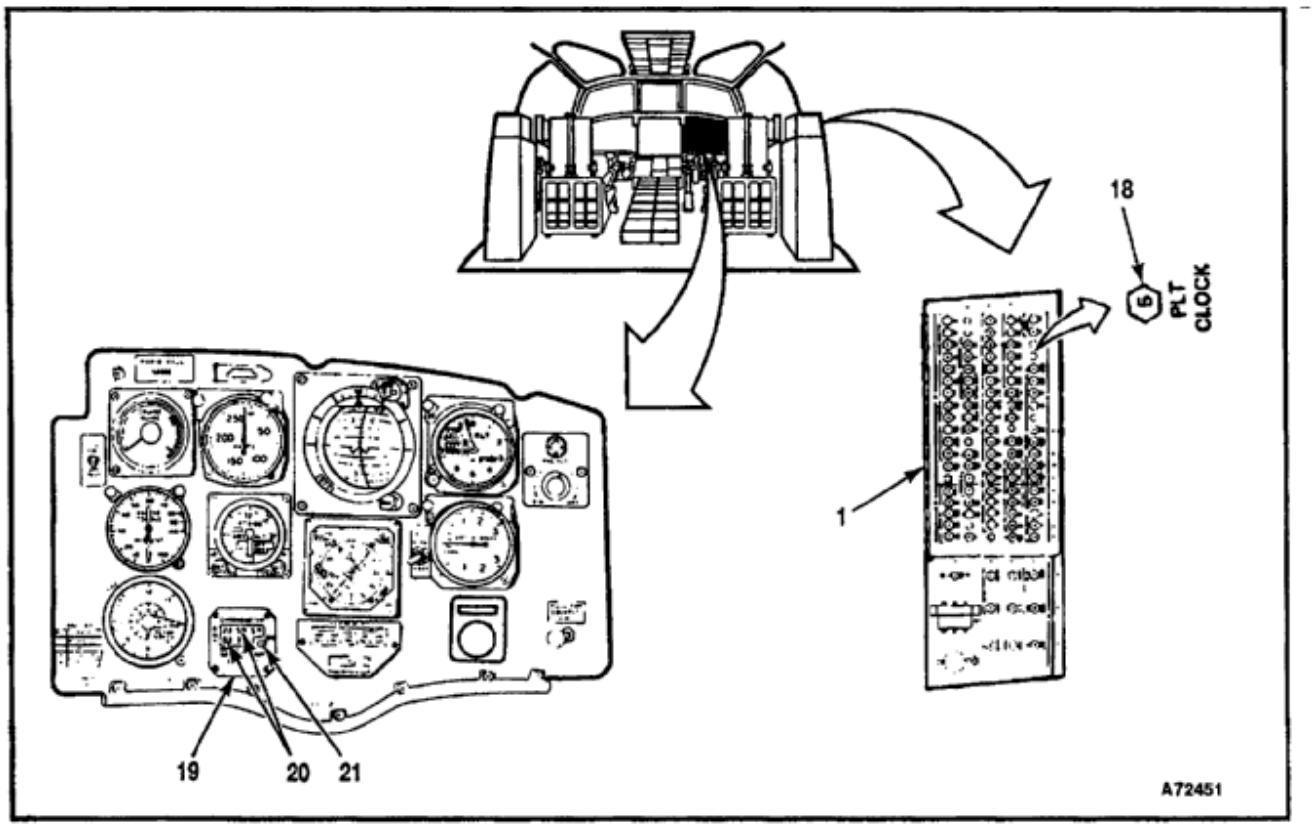
***PILOT'S INSTRUMENT PANEL LIGHTS***

1. While performing steps 2 through 4, check pilot's instrument lighting. There shall be no white light leaks from NVG blue/green color lights.
2. Close circuit breakers in No. 2 PDP (1) as follows:
   a. PILOT INSTR breaker (2).
   b. INTR FLOOD breaker (3).
   c. CKPT DIM CONT breaker (4).
3. Turn PLT INST control (5) to BRT. Check the following lights. Brightness shall increase evenly as control is turned and light color shall be blue/green.
   a. Torquemeter (6) has two postlights. Without 74 is internally lit (With 74).
   b. Rotor Tachometer (7) two postlights.
   c. Cruise Guide Indicator (8) two lights in brow.
   d. Airspeed Indicator (9) two lights in brow.
   e. Radar Altimeter (10) bezel light.
   f. Attitude Direction Indicator (11) bezel light.
   g. Horizontal Situation Indicator (12) bezel light.
   h. HSI Mode Select Panel (13) lightplate.
   i. Barometric Altimeter (14) two lights in brow.
   j. Rate of Climb Indicator (15) two lights in brow.
   k. Turn and Slip Indicator (16) bezel light.
   l. Radar Altimeter Lighting Control (17) lightplate.
   m. HSI Mode Select Panel (13) pushbutton function markings.
4. Turn control (5) to OFF. Check instrument and panel lights of step 3. They shall decrease in brightness as control is turned. When control is at OFF, panel lights shall be off.
5. Open circuit breakers (2, 3 and 4) in No. 2 PDP (1).



***PILOT'S CHRONOMETER LIGHT***

6. While performing steps 7 through 10, check lighting. There shall be no white light leaks from NVG blue/green lighting.
7. Close PLT CLOCK breaker (18) in No. 2 PDP (1).
8. Check pilot's CHRONOMETER (19). Upper and lower numbers (20) shall be visible and blue/green color lighting shall be on.
9. Turn DIM control (21) of chronometer (19). Check chronometer light. Light shall dim over full range of control.
10. Turn control (21) to brightest light position.
11. Open breaker (18) in No. 2 PDP (1). Check CHRONOMETER (19). Numbers (20) shall not be visible and light shall be out.



***COPILOT'S INSTRUMENT PANEL LIGHTS***

12. While performing steps 13 through 15, check copilot's instrument lighting. There shall be no white light leaks from NVG blue/green lighting.

13. Close CPLT INST LIGHTING circuit breaker (22) of No. 1 PDP (23).

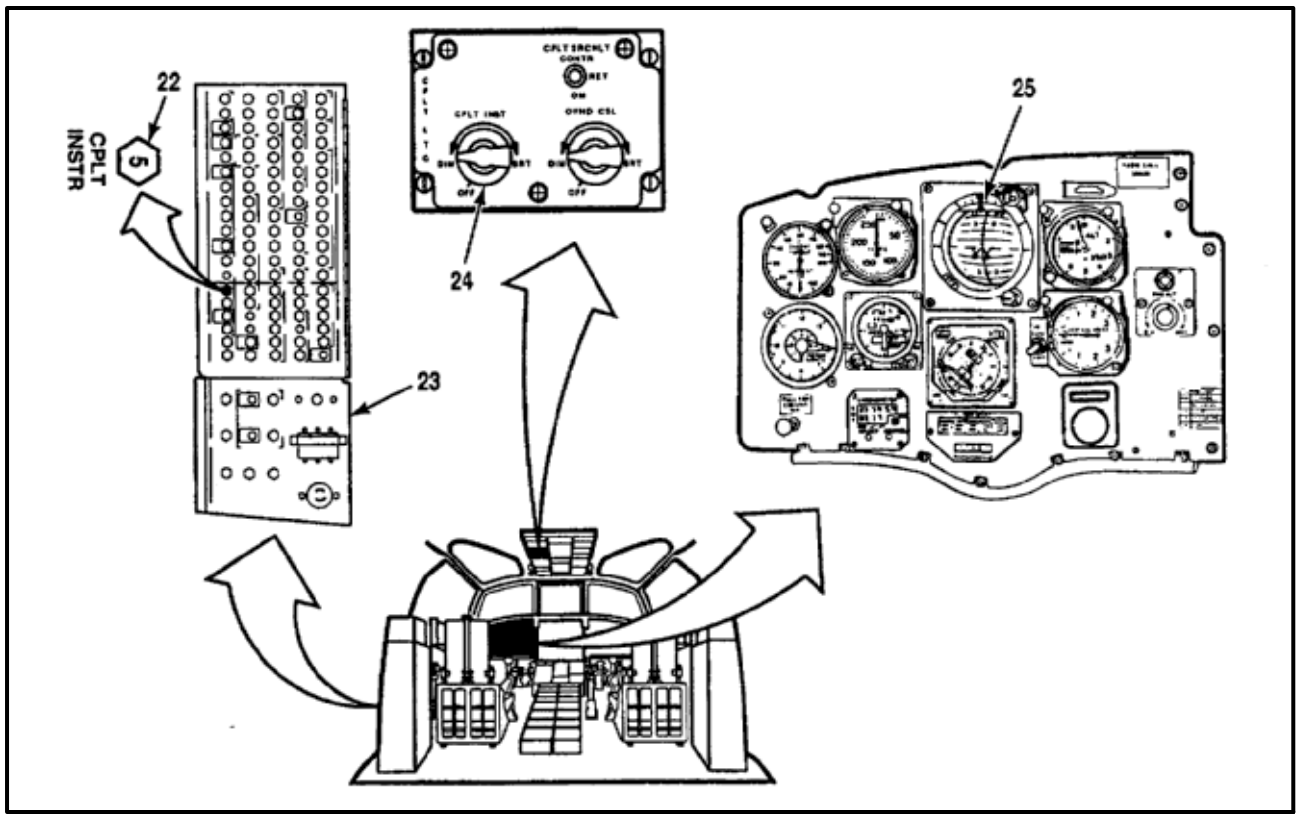
14. Turn CPLT INST control (24) to BRT. Check lights given in step 3 of pilot's instrument panel (25). Brightness shall increase evenly as control is turned and light color shall be blue/green.

**NOTE**

There is no cruise guide indicator on copilot's instrument panel.

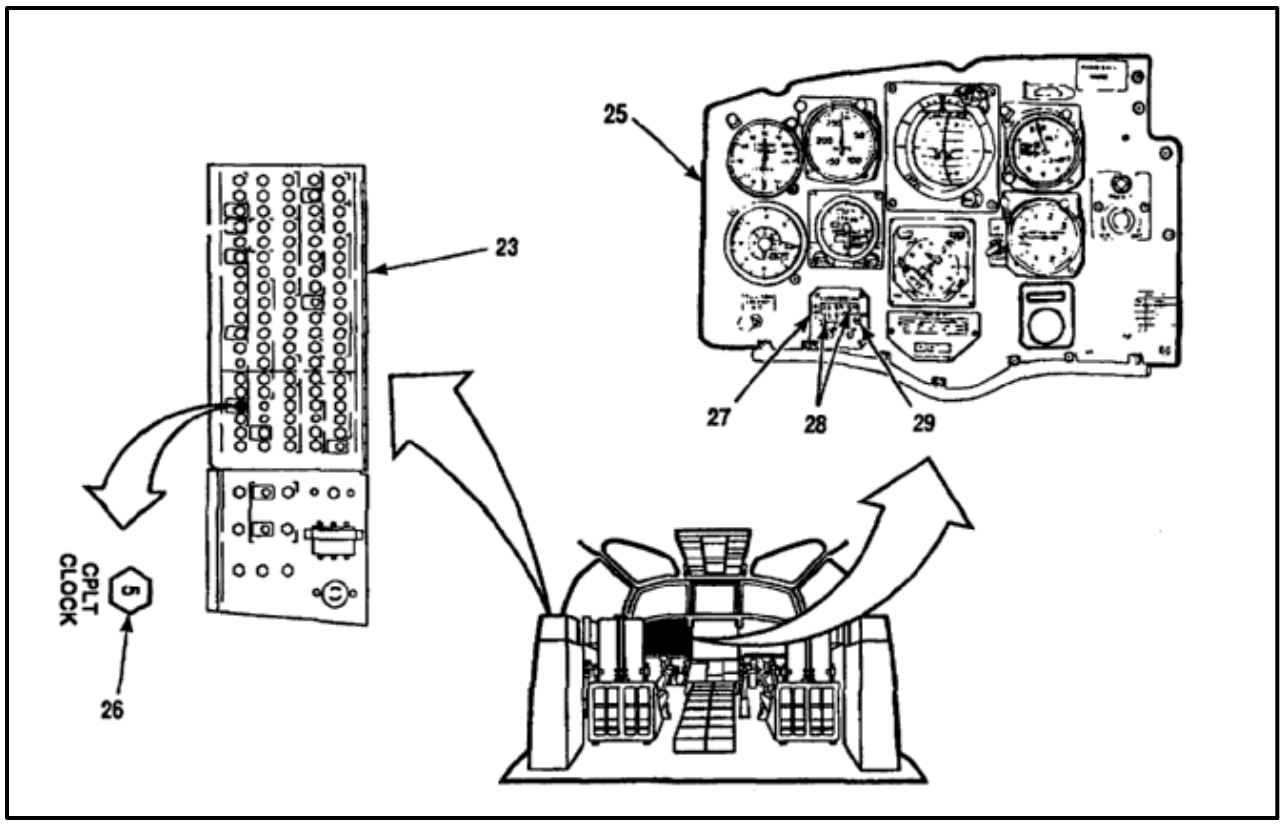
15. Turn control (24) to OFF. Check instrument and panel lights of step 14. They shall decrease in brightness as control is turned. When control is at OFF, panel lights shall be off.

16. Open circuit breaker (22) in No. 1 PDP (23).



***COPILOT'S CHRONOMETER LIGHT***

17. While performing steps 18 through 21, check lighting. There shall be no white light leaks from NVG blue/green lighting.
18. Close CPLT CLOCK circuit breaker (26) in No. 1 PDP (23).
19. Check copilot's CHRONOMETER (27). Upper and lower numbers (28) shall be visible and blue/green. Color lighting shall be on.
20. Turn DIM control (29) of chronometer (27). Check chronometer light. Light shall dim over full range of control.
21. Turn control (29) to brightest light position.
22. Open breaker (26) in No. 1 PDP (23). Check CHRONOMETER (27). Numbers (28) shall not be visible and light shall be out.



***CENTER INSTRUMENT PANEL LIGHTS***

23. While performing steps 24 through 26, check lighting. There shall be no white light leaks from NVG blue/green lighting.

24. Close CTR INSTR LIGHTING circuit breaker (30) in No. 2 PDP (1).

25. Turn CTR INST control (31) to BRT. Check the following lights. Brightness shall increase evenly as control is turned, and light color shall be blue/green.

    a. Two Gas Generator Tachometers (32) postlights.

    b. Four Power Turbine Inlet Temperature indicators (33) postlights.

    c. Four Engine Oil Temperature Indicators (34) postlights.

    d. Two Engine Oil Pressure Indictors (35) postlights.

    e. XMSN Oil Temperature Indicator (36) postlight.

    f. XMSN Oil Temperature Seletor Switch (37) postlight.

    g. XMSN Oil Pressure Indicator (38) postlight.

    h. XMSN Oil Pressure Selector Switch (39) postlight.

    i. Two Cyclic Trim Indicators (40) postlights.

    j. Fuel Flow Indicator (41) postlight.

    k. Fuel Quantity Indicator (42) postlight.

    l. Fuel Quantity Selector Switch (43) postlight.

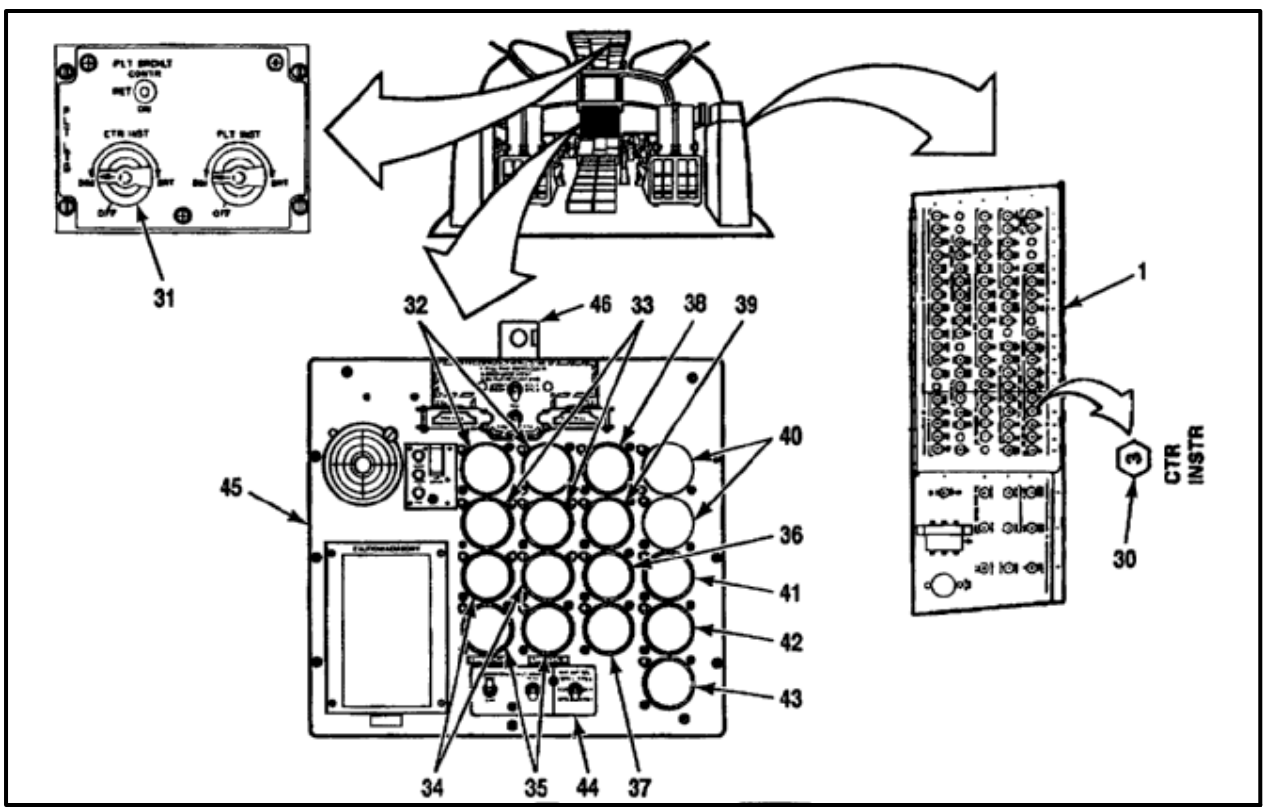
    m. Caution Panel/VHF Antenna Select Panel (44) lightplate.

    n. Fire Emergency Warning Panel (45) Lightplate.

    o. Two Standby Compass (46) postlights.

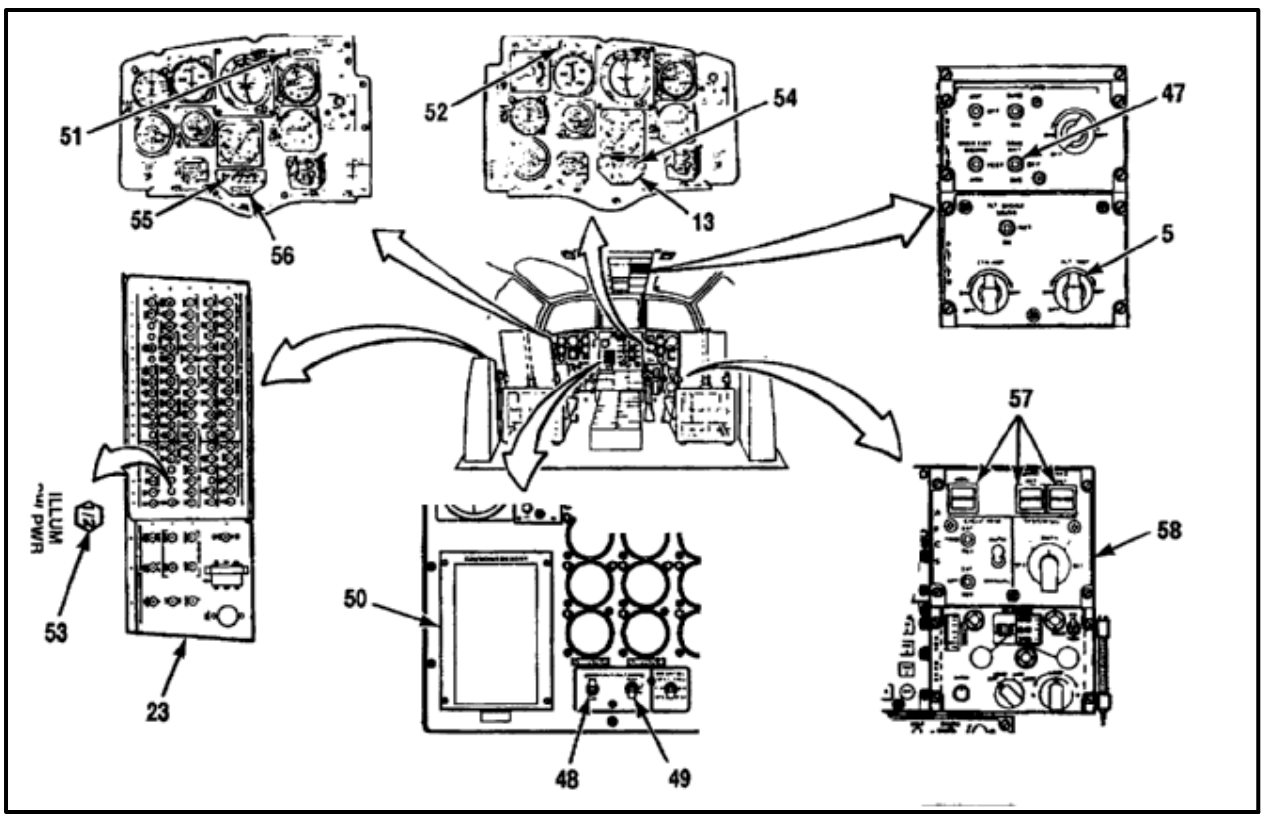
26. Turn control (31) to OFF. Check instrument panel lights of step 25. They shall decrease in brightness as control is turned. When control is at OFF, panel lights shall be off.

27. Open circuit breaker (30) of No. 2 PDP (1).

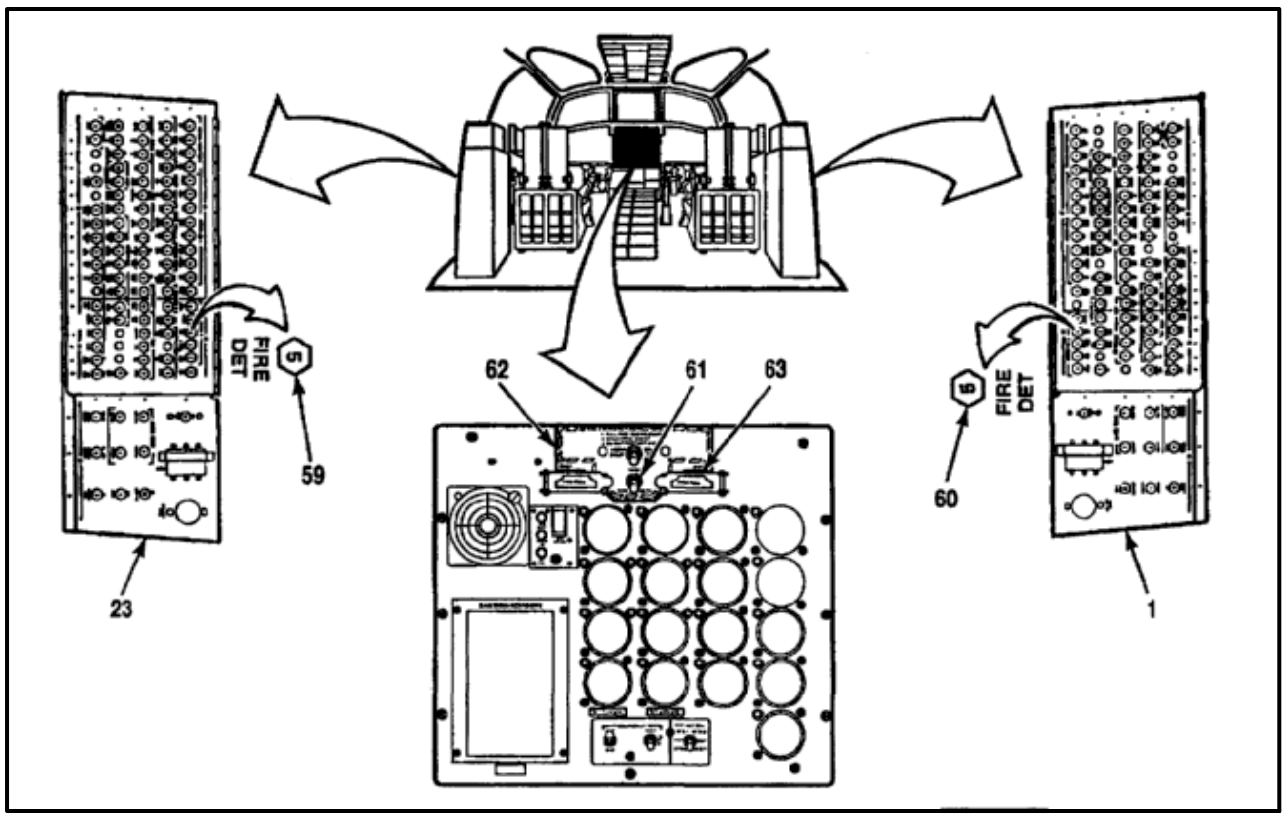


## 9-124.1 LIGHT LEAK TEST (Continued) 9-124.1

28. Set DOME LIGHTS switch (47) to OFF.
29. Set CAUTION LT DIM-BRT switch (48) to BRT.
30. Set and hold CAUTION LT TEST switch (49) at TEST. Check master caution panel (50). There shall be no white light leaks.
31. Check two master caution indicators (51 and 52). There shall be no white light leaks.
32. Release switch (49) to OFF position.
33. Close ILLUM SW PWR circuit breaker (53) in No. 1 PDP (23).
34. Check PLT INST control (5) is set to OFF.
35. Press five switches (54) of pilot's HSI mode select panel (13). There shall be no white light leaks when each switch light is on.
36. Repeat step 35 for five switches (55) of copilot's HSI panel (56).
37. Press three switches (57) of AFCS panel (58). There shall be no white light leaks when each switch light is on.
38. Open ILLUM SW PWR breaker (53) in No. 1 PDP (23).

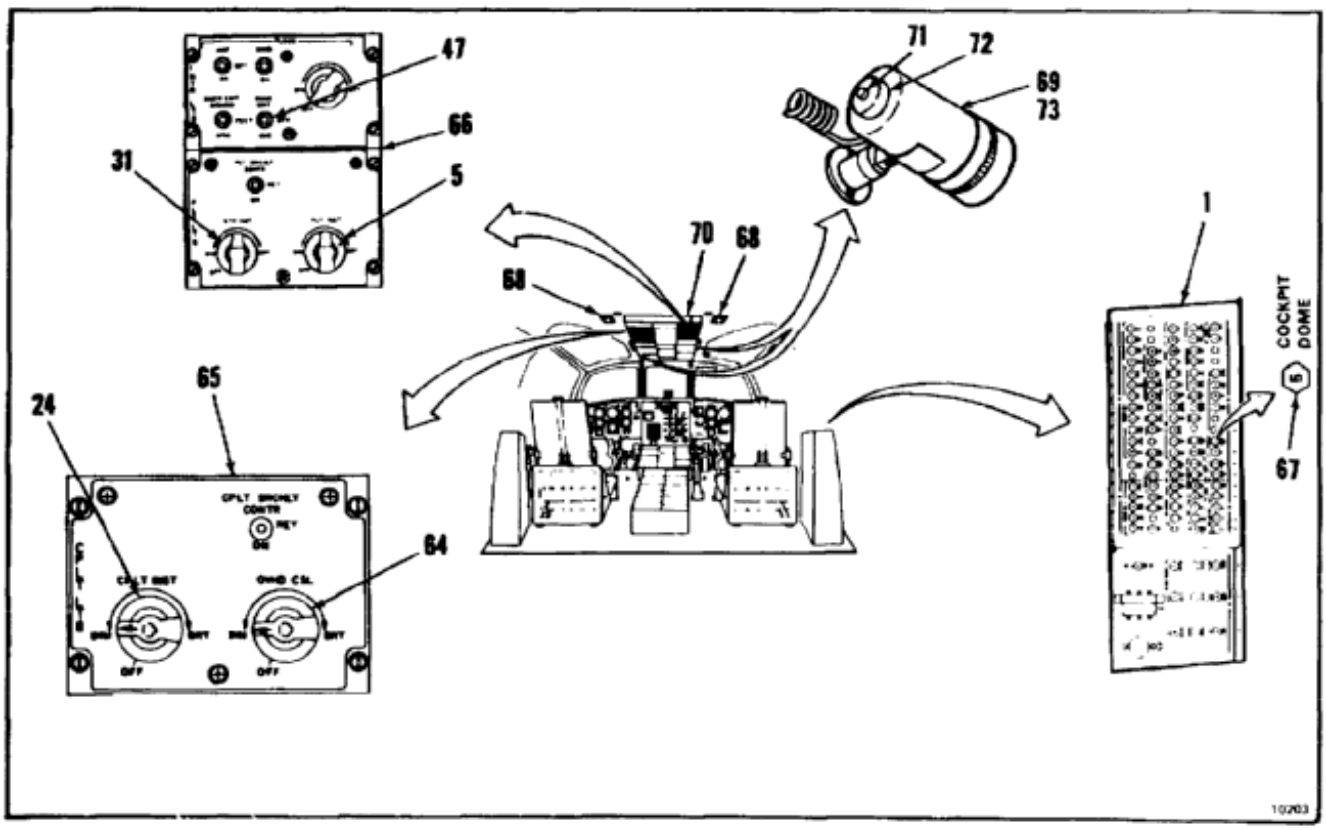


39. Close ENGINE NO. 1 FIRE DET circuit breaker (59) in No. 1 PDP (23).
40. Close ENGINE NO. 2 FIRE DET circuit breaker (60) in No. 2 PDP (1).
41. Set and hold fire detection test switch (61) to TEST. Check No. 1 and No. 2 fire handles (62 and 63). There shall be no white light leaks.
42. Set switch (61) to OFF.
43. Open two circuit breakers (59 and 60).



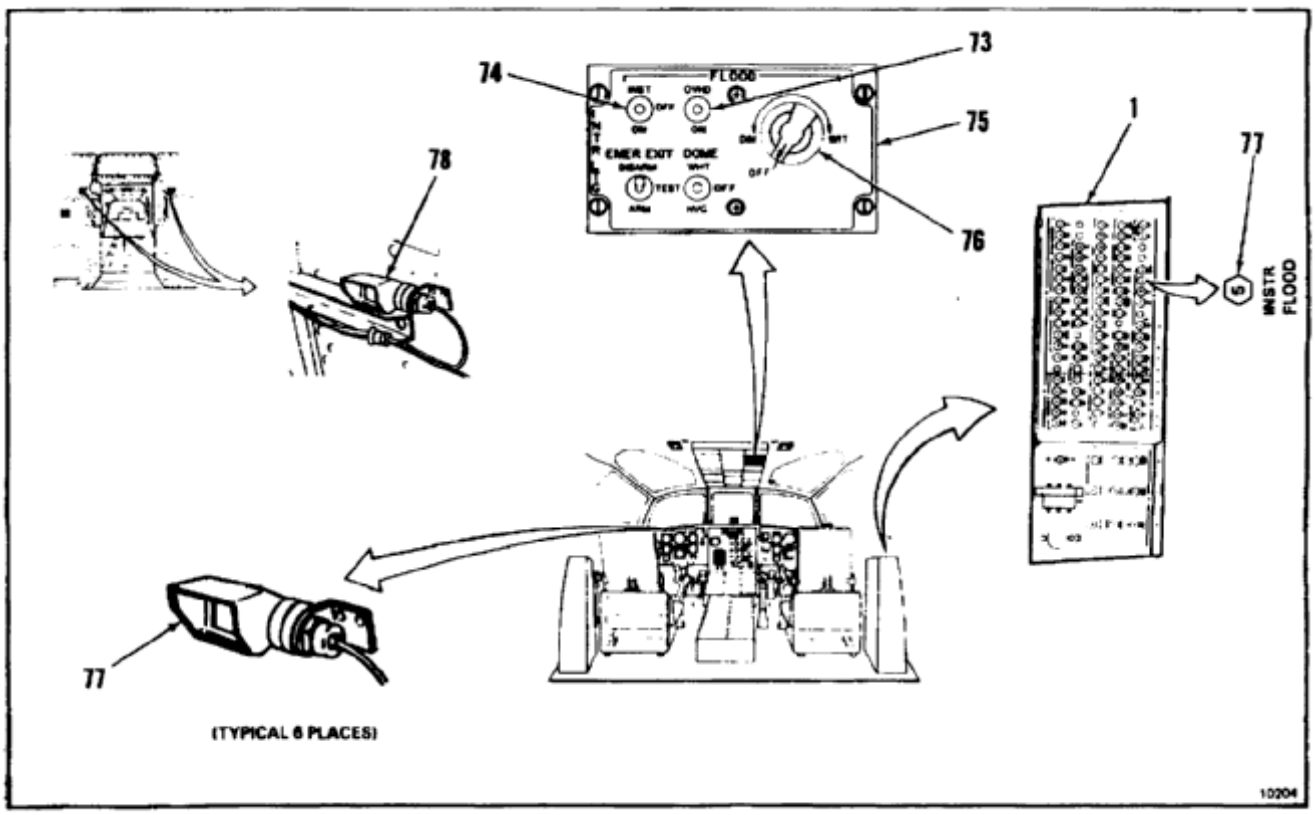
***COCKPIT DOME AND UTILITY LIGHTS***

44. Set cockpit DOME light switch (47) to OFF.
45. Set CPLT INST switch (24) and OVHD CSL switch (64) on CPLT LTG panel (65) to OFF.
46. Set CTR INST switch (31) and PLT INST switch (5) on PLT LTG panel (66) to OFF.
47. Close COCKPIT DOME LIGHTING circuit breaker (67) in No. 2 PDP (1).
48. Set switch (47) to WHT. Check pilot's and copilot's dome lights (68). Light color shall be white.
49. Set switch (47) to NVG. Check pilot's and copilot's dome lights (68). Light color shall be blue/green. No white light leaks.
50. Set switch (47) to OFF. Check pilot's and copilot's dome lights (68). They shall be off.
51. Remove pilot's utility light (69) from overhead panel (70). Press and release switch (71). Turn dimming control (72) through full on range. Check light. Light shall increase in brightness when control is turned and shall be blue/green in color. No white light leaks.
52. Turn control (72) to OFF. Press and release switch (71).
53. Install light (69) in panel (70).
54. Repeat steps 49, 50, and 51 for copilot's utility light (73).
55. Open circuit breaker (67) in No. 2 PDP (1).



***SECONDARY COCKPIT LIGHTS***

56. Set OVHD and INST FLOOD switches (73 and 74) on INTR LTG panel (75) to OFF.
57. Turn FLOOD control (76) to OFF.
58. Close INSTR FLOOD LIGHTING circuit breaker (77) in No. 2 PDP (1).
59. Set switches (73 and 74) to ON.
60. Turn control (76) to BRT. Check the following lights. Brightness shall increase evenly as control is turned and light color shall be blue/green.
    a. Six instrument floodlights (77).
    b. Two overhead floodlights (78).
61. Set switch (73) to OFF. Floodlights (78) shall be OFF.
62. Set switch (73) to ON. Floodlights (78) shall be ON.
63. Set switch (74) to OFF. Floodlights (77) shall be OFF.
64. Set switch (74) to ON. Floodlights (77) shall be ON.
65. Turn control (76) to OFF. Check floodlights (77 and 78). Brightness shall decrease evenly as control is turned, and go off when control is at OFF.
66. Set switches (73 and 74) to OFF.
67. Open circuit breaker (77) in No. 2 PDP (1).



***DOPPLER SYSTEM LIGHTS***

68. Set doppler system lights to ON (TM 11-1520-240-23). There shall be no white light leaks, displays only. Lightplate still green.

69. Set lights to OFF.

***COUNTERMEASURE SYSTEM LIGHTS***

70. Set countermeasures system lights to ON (TM 11-1520-240-23).There shall be no white light leaks, push button on ALQ-156 only. Lightplate still green.

71. Set lights to OFF.

***FLARE DISPENSER SYSTEM LIGHTS***

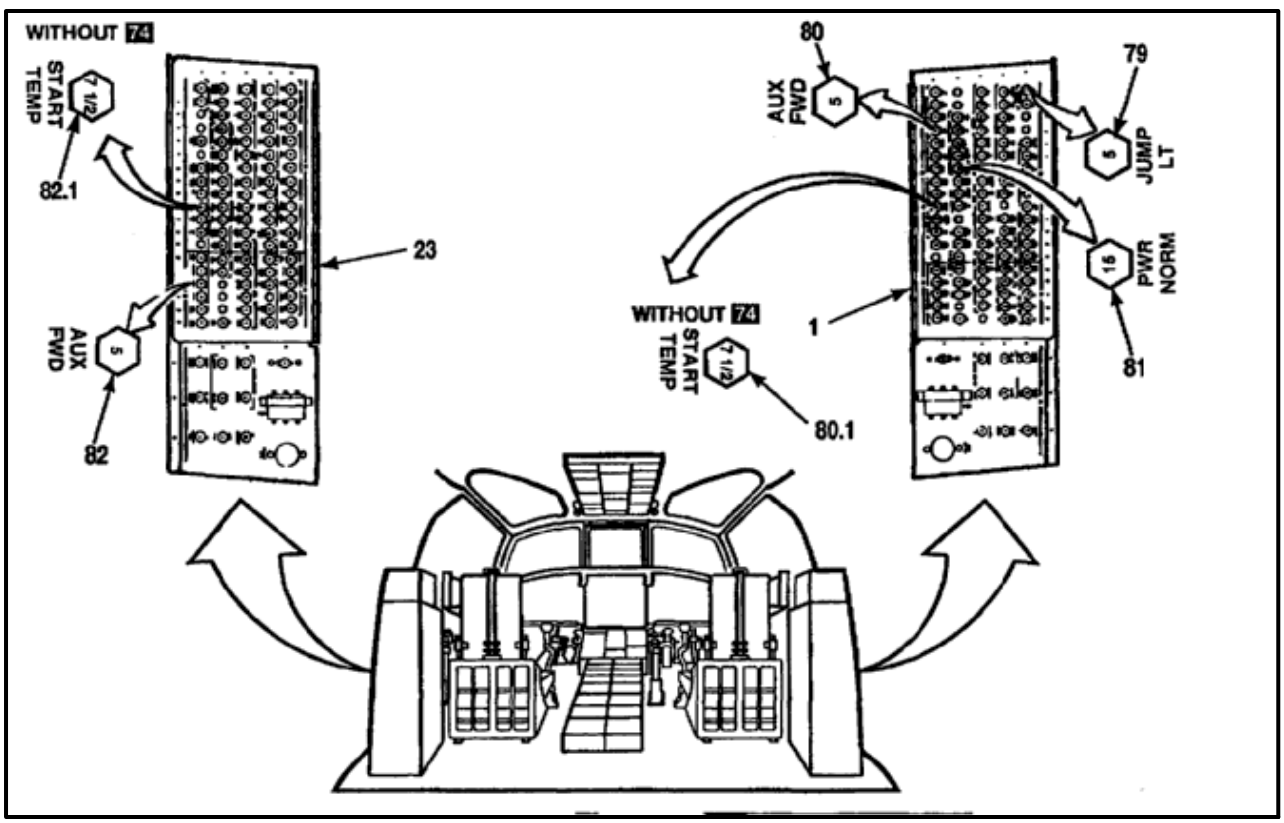
72. Set flare dispenser system lights to ON (TM 11-1520-240-23). There shall be no white light leaks.

73. Set lights to OFF.

***PRESS-TO-TEST LIGHTS***

74. Close the following circuit breakers on the No. 2 PDP (1):
    a. TROOP JUMP IT (79).
    b. RH AUX FWD FUEL PUMP (80).
    c. ENG NO. 2 START AND TEMP (80.1) (Without 74).
    d. CARGO HOOK PWR NORM (81).

75. Close the following circuit breakers on the No. 1 PDP (23).
    a. LH AUX FWD FUEL PUMP (82).
    b. ENG NO. 1 START AND TEMP (82.1) (Without 74).



76. Apply power to press-to-test lamps of IFF system (TM 11-1520-240-23).

77. Apply power to press-to test lamps of interphone system (TM 11-1520-240-23).

78. Press the following press-to-test lamps. There shall be no white light leaks.

a. Overhead Panel:

(1) Two lights (83) on TROOP WARN panel.

(2) Two lights (84) on FUEL CONTROL panel.

(3) Two lights (85) on CARGO HOOK panel.

(4) Two lights (85.1) on START panel (Without 74).

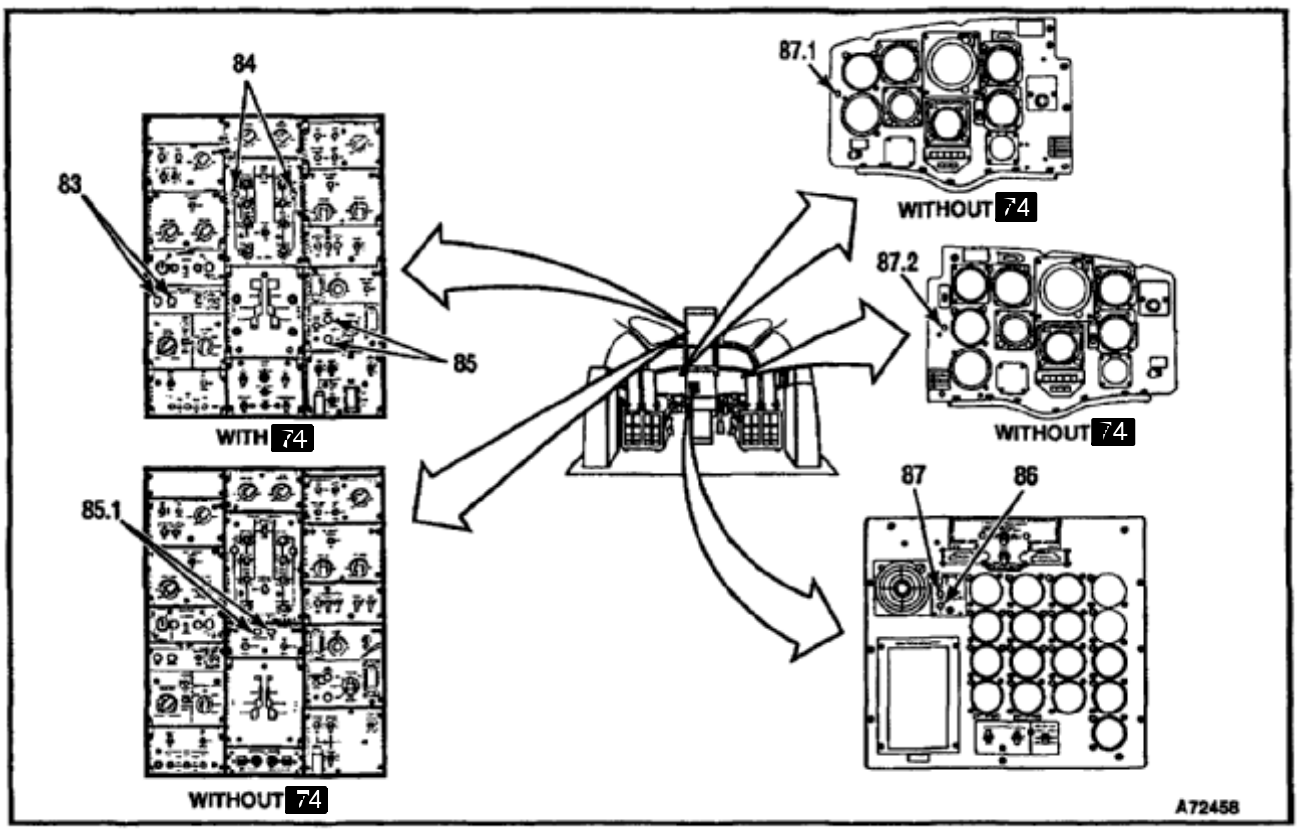
b. Center Instrument Panel:

(1) IFF FAIL light (86).

(2) CIPHER ON light (87).

c. Copilot's instrument panel Emergency Power light (87.1) (Without 74).

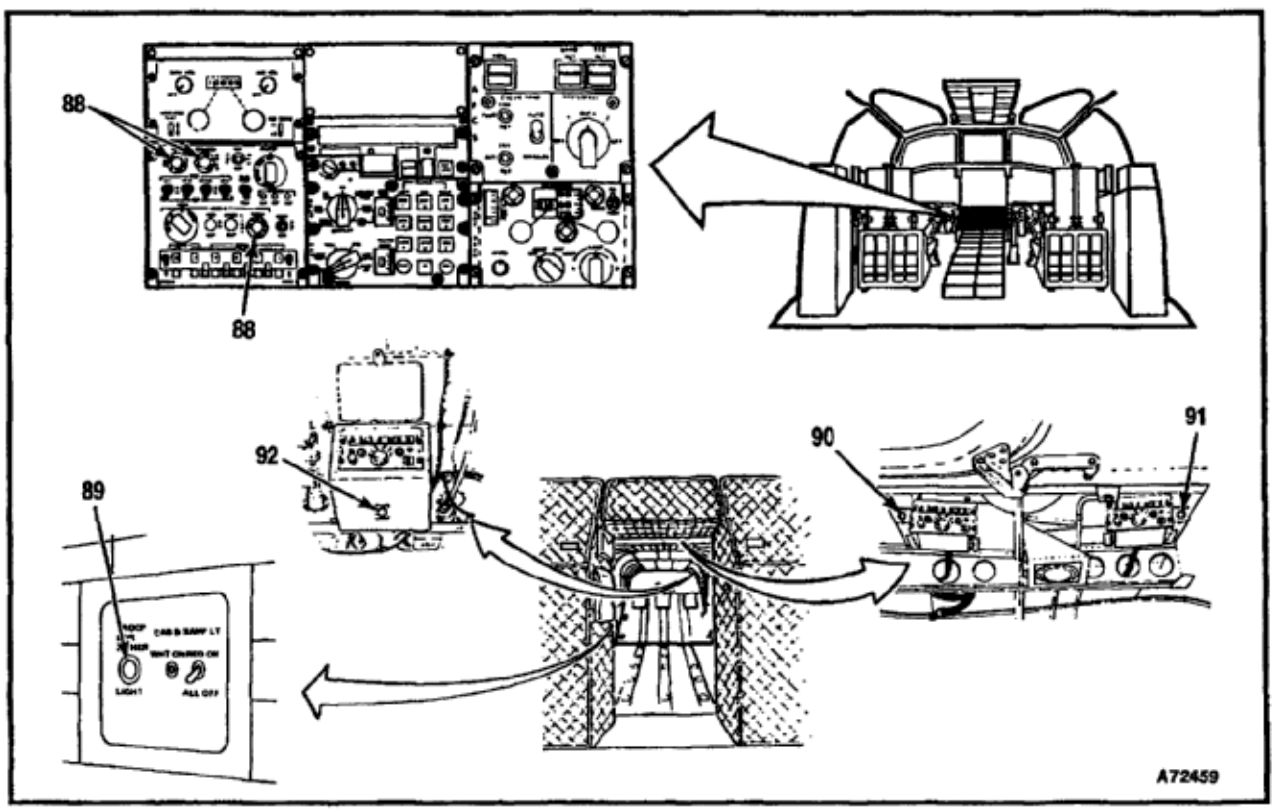
d. Pilot's instrument panel Emergency Power light (87.2) (Without 74).



79. Press the following press-to-test lamp. There shall be no white light leaks:
    a. Console: Three lights (88) on IFF panel.
    b. Cockpit Passageway: Troop commander's cipher on light (89).
    c. Cabin:
        (1) Right gunner's cipher on light (90).
        (2) Left gunners cipher on light (91).
        (3) Aft interphone (92).
80. Remove power from interphone system (TM 11-1520-240-23).
81. Remove power from IFF system (TM 11-1520-240-23).

***FOLLOW-ON MAINTENANCE:***

Remove external ac power (Task 1-37).
Set battery switch to OFF.
Remove cockpit window covers.
Open passageway blackout curtain.
Disconnect battery (Task 1-39).
Open NO. 2 AC BUS TIE circuit breaker.
Open DC 2 CROSS TIE circuit breaker.
Open NO. 2 XFMR RECT circuit breaker.
Open NO. 2 REV CUR CO circuit breaker.
Open NO. 2 DC BUS CONT circuit breaker.
Open NO. 1 AC BUS TIE circuit breaker.
Open DC 1 CROSS TIE circuit breaker.
Open NO. 1 XFMR RECT circuit breaker.
Open NO. 1 REV CUR CO circuit breaker.
Open NO. 1 DC BUS CONT circuit breaker.
Open EXT PWR CONT circuit breaker.
Open CONT AC circuit breaker.
Open ESS BUS FEED circuit breaker.
Open CAUTION PNL circuit breaker.
Open XMSN OIL TEMP circuit breaker.



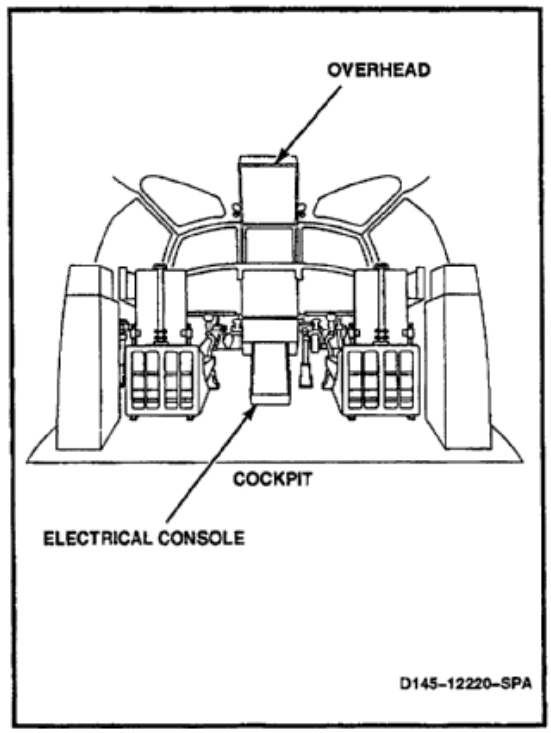

END OF TASK

# SECTION VII
# MISCELLANEOUS EQUIPMENT DESCRIPTION AND OPERATION

## 9-125 MISCELLANEOUS EQUIPMENT 9-125

Miscellaneous equipment includes all electrical equipment not covered under the ac and dc power and control system, and lighting. Following is a list of miscellaneous equipment.

a. Electrical console
b. Overhead panel
c. Master caution panel
d. Hoist operators panel
e. Winch control grip
f. Thrust control grips
g. Pitch and roll control grips
h. Emergency hook release relay box
i. Dual cargo hook release box
j. APU electronic control unit (ECU)
k. Power steering control box
l. Three-phase utility receptacles
m. High density terminal junctions
n. Maintenance panel




### *ELECTRICAL CONSOLE*

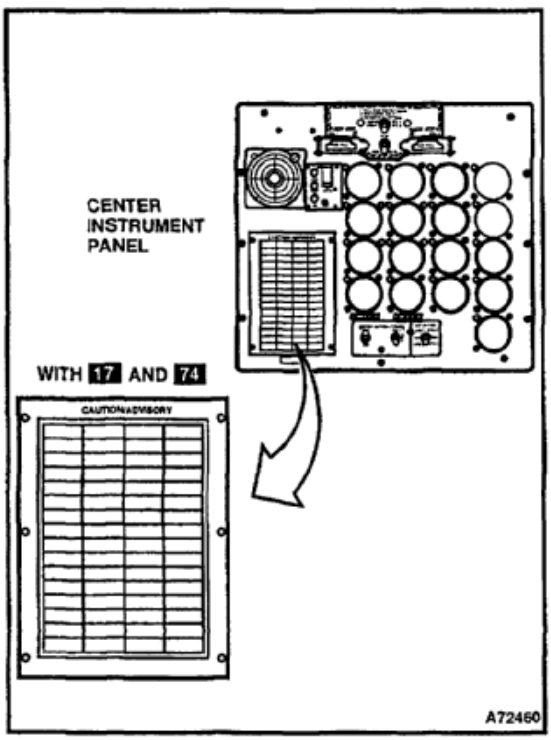
The electrical console is divided into two sections, located between the pilot's seats. The center console and canted console contain various panel-mounted assemblies and 25 internally mounted electrical components such as relays, transformers, and resistors. The canted console supports the center instrument panel. Most of the panel-mounted assemblies are connected to helicopter wiring through connectors. The engine trim panel components (helicopters without 74), are connected directly to helicopter wiring.

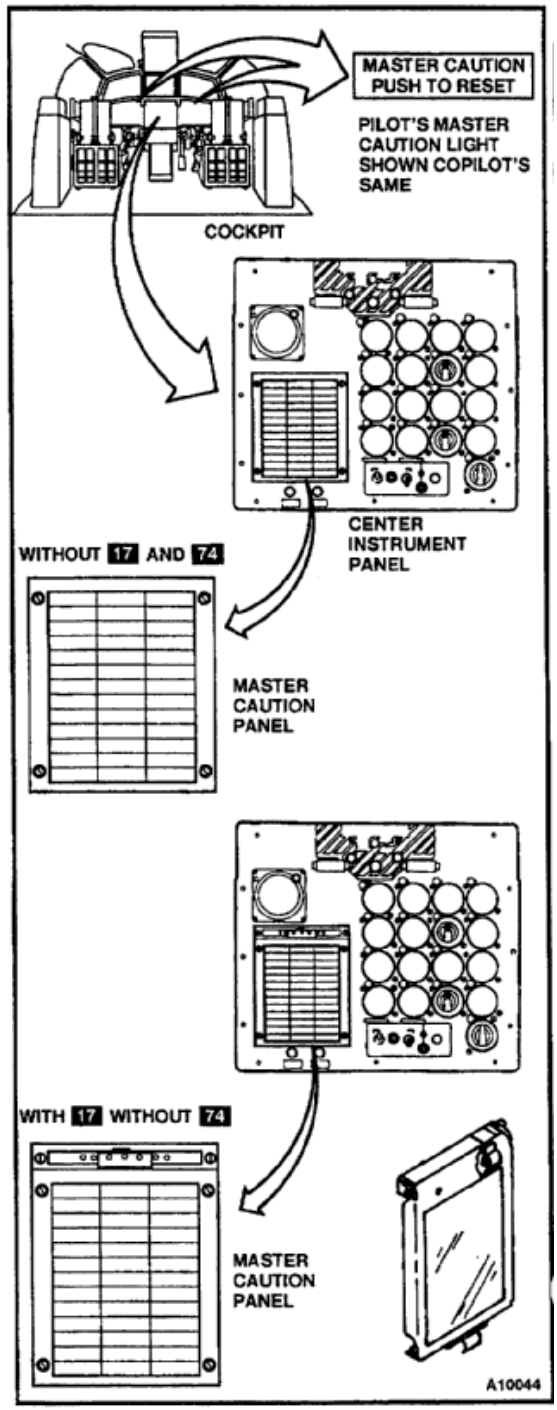
### *OVERHEAD PANEL*

The overhead panel is in the overhead above the electrical console. It includes front-mounted panels, utility lights, terminal boards, and rear mounted panels for resistors and relays. The overhead panel pivots down for maintenance. Downward travel of the panel is limited by two cloth straps. Each strap is connected between the side of the panel and an overhead structure. Front-mounted ENGINE CONDITION control, EMERGENCY POWER panel (helicopters without 74), FADEC panel (helicopters with 74), and HOIST/CARGO HOOK panel are connected to the overhead panel wiring through connectors. The other front-mounted panels and rear-mounted components are hard-wired to other components of the overhead panel.

### *MASTER CAUTION PANEL*

The master caution system provides an indication when a sensor in any of 37 circuits (helicopters without 74), or 41 circuits (helicopters with 74) detects the operating condition or the abnormal condition which is being monitored. The sensor circuit lights the associated capsule in the master caution panel on the center instrument panel. When any capsule on the caution panel comes on, two MASTER CAUTION lights also come on. The MASTER CAUTION lights are on the pilot's and copilot's instrument panels. These lights have an integral switch that turns off both CAUTION lights when pressed but does not turn off the lighted capsule. The capsule remains on as long as the fault or the condition in the monitored circuit is present. All lamps in the system can be operated at full brightness (bright) or at a reduced brightness (dim). The system also has a test circuit that lights all lamps in the system. On helicopters with 17 and without 74, an NVG filter is stored on guides behind the instrument panel. When required, the filter is pulled out and down to cover the master caution panel. On helicopters with 74, the NVG filters are incorporated in the master caution panel light capsules.



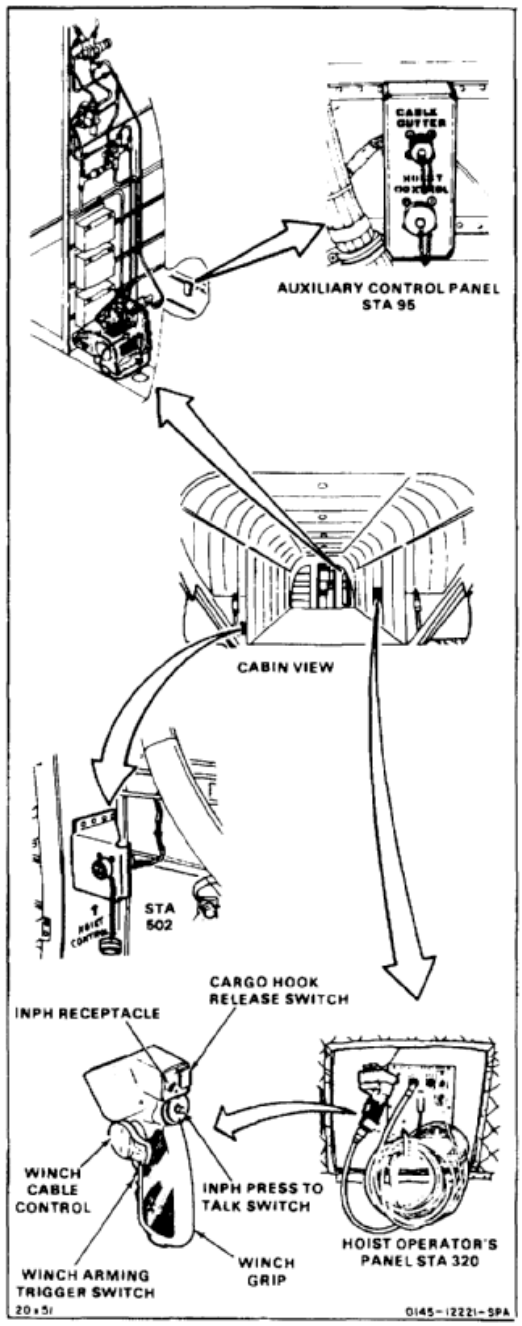



### *HOIST OPERATOR'S PANEL*

The hoist operator's panel is on the right side of the cabin at sta. 320. The CARGO HOOK switch, the winch control grip receptacle, the hoist operator's HOT MIKE switch and the INPH jack are also on the panel. These last two components are part of the interphone system.

### *WINCH CONTROL GRIP*

The winch control grip and cable are used to control operation of the hoist system from any of three remote stations. The stations are the hoist operator's panel at sta. 320, right side, hoist connector at sta. 95, right side, and hoist connector at sta. 502, left side. The control grip assembly has a winch arming trigger switch and a speed control. It also has cargo hook release, press to talk, and cable cutter switches.

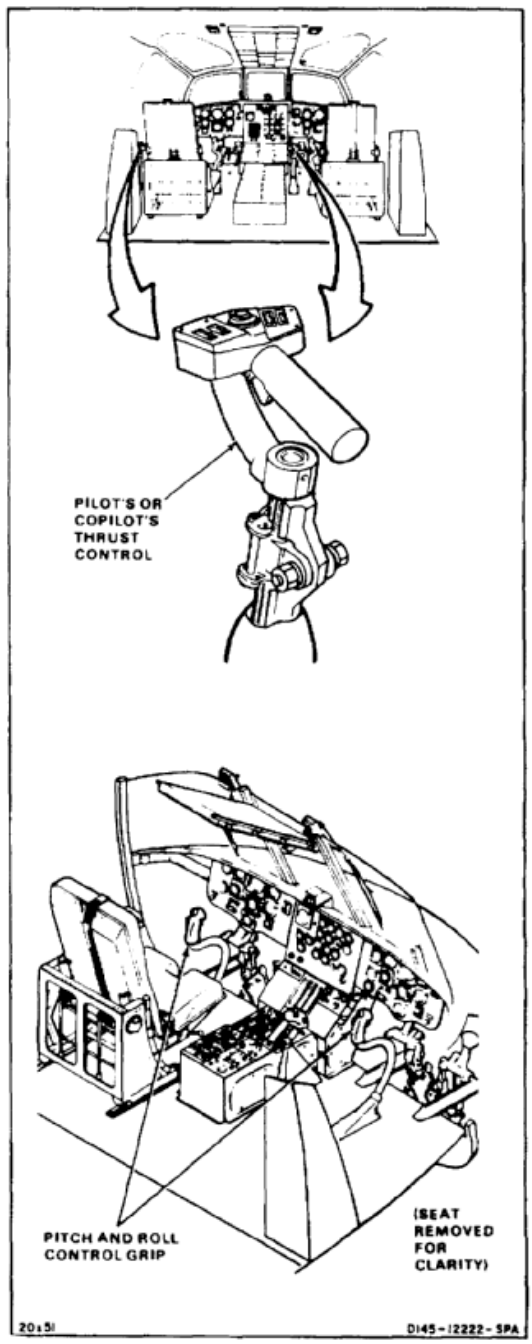


### *THRUST CONTROL GRIPS*

Two identical grips are bolted on the pilot's and copilot's thrust control levers. Each grip has a switch panel and a THRUST CONT BRAKE TRIGGER switch. The switch panel contains SEARCHLIGHT control switches and ENGINE BEEP TRIM switches. Switch wiring is routed through the grip and lever to a connector under the floor at sta. 71. Plastic tubing protects the wiring.

### *PITCH AND ROLL CONTROL GRIPS*

Two identical grips are on the pilot's and copilot's pitch and roll control sticks. Each grip has an interphone-radio TRIGGER switch, CARGO HOOK RELEASE switch, FLARE DISPENSER switch, CENTERING DEVICE RELEASE switch and a pitch and roll trim control switch. The switch wiring terminates in a connector at sta. 71. The grip is attached to the control stick by a screw.

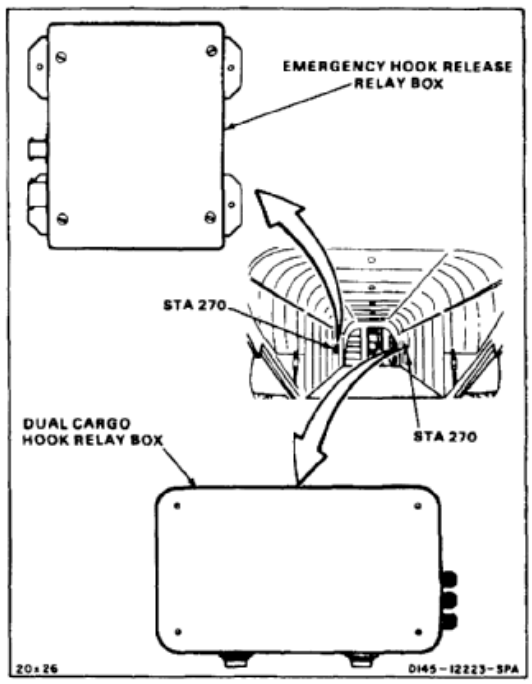


### *EMERGENCY HOOK RELEASE RELAY BOX*

The emergency hook release relay box is located on the left side at sta. 270. The relay box contains 3 relays, 4 diodes, 3 resistors and a time delay relay which controls the operation of all three cargo hooks in the emergency mode. When the emergency release switch is set to RELEASE ALL, the forward and aft cargo hooks when loaded will open and close and remain unlatched for between **10 to 14 seconds**. The mid cargo hook will open and remain open for between **10 to 14 seconds**. Helicopter wiring is connected to box components through two plugs and receptacles.

### *DUAL CARGO HOOK RELAY BOX*

The dual cargo hook relay box is located on the right side at sta. 270. It contains relays, diodes, and PRESS-TO-TEST lamps. Helicopter wiring is connected to the box components through two plugs and two receptacles. The relay box controls the operation of all three cargo hooks in the normal mode of operation.

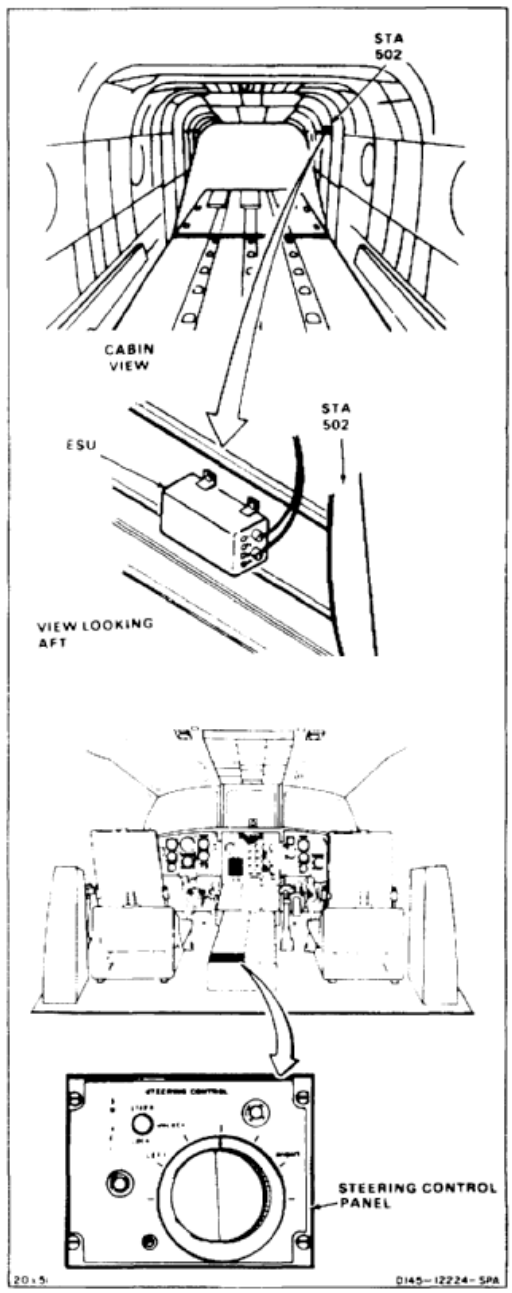


### *APU ELECTRONIC CONTROL UNIT (ECU)*

The control unit is on the left side at sta. 502. Helicopter wiring is connected to the unit components through two connectors and receptacles. The control unit controls APU starting and operation. It also monitors the APU for overtemperature, overspeed, underspeed and the ECU internal circuits. Should a malfunction occur during start or while the APU is operating, the ECU will automatically shut down the APU. Four built in BITE indicators are located on the receptacle end of the ECU without 33 and give a visual indication of failure mode.

### *POWER STEERING CONTROL BOX*

The power steering control box is part of the power steering system. The control box is located in the console and is used to steer the helicopter while ground taxiing. When the SWIVEL switch is set to STEER and STEERING CONTROL knob is turned left or right, power is applied to a servovalve on the aft right landing gear which causes hydraulic pressure to flow to the power steering actuator which in turn cause the wheel to move left or right. This system eliminates the need to make pedal turns while ground taxiing. Power for the steering control box is from HYDRAULIC BRAKE STEER circuit breaker from the **28 vdc** No. 1 bus. The control box is connected to helicopter wiring through a connector and receptacle.

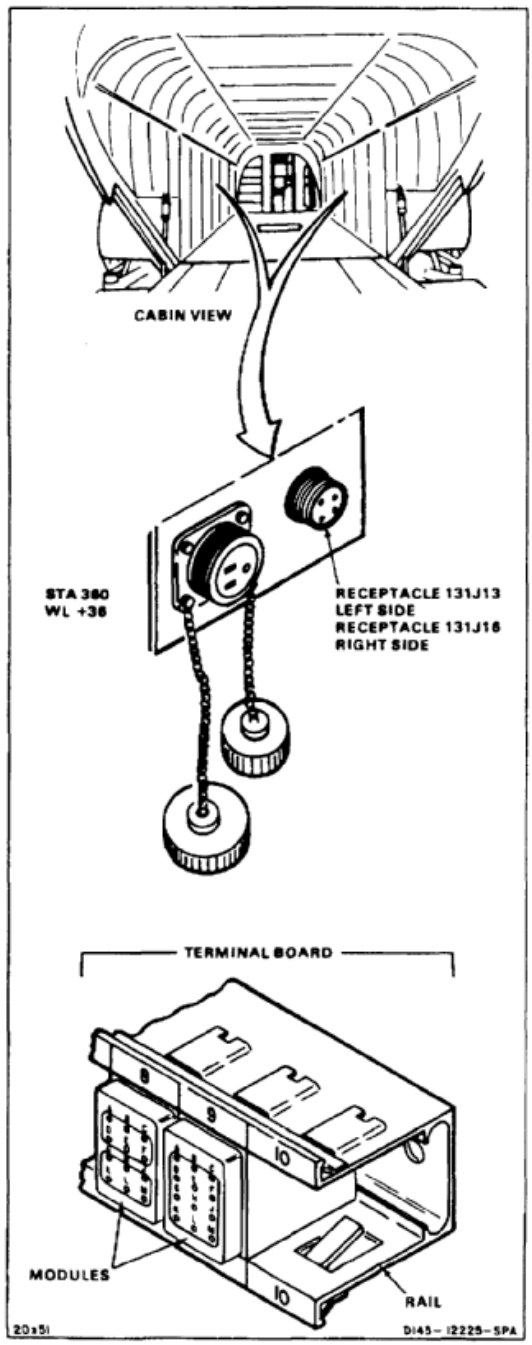


### *THREE-PHASE UTILITY RECEPTACLES*

Two three-phase **115/200 volt** utility receptacles are on the right and left side of the cabin section at sta. 360. Each receptacle is on a bracket that also contains a single-phase utility receptacle. Each receptacle has a screw on dust cover with a retaining chain. The right side receptacle 131J16 is powered from No. 2 ac bus through RH CABIN AC RECEPT circuit breaker. The left side receptacle 131J13 is powered from No. 1 ac bus through LH CABIN AC RECEPT circuit breaker.

### *HIGH DENSITY TERMINAL JUNCTIONS*

Terminal junctions are used as terminal boards and ground devices and are located throughout the helicopter. A terminal board is composed of a rail and up to ten modules. The rail is U-shaped and contains ten slots with retaining clips for holding the modules in place. There are three types of modules each with 12 cavities. The modules contain either 1, 2, or 4 bus bars depending on their part number. The bus bars in the modules are used to connect wires together. The wires inserted into the cavities are terminated with a contact pin.




END OF TASK

# SECTION VIII
# MISCELLANEOUS EQUIPMENT

## 9-125.1 REMOVE CAUTION PANEL NVG FILTER 9-125.1

INITIAL SETUP

***Applicable Configurations:***

With 17 and Without 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

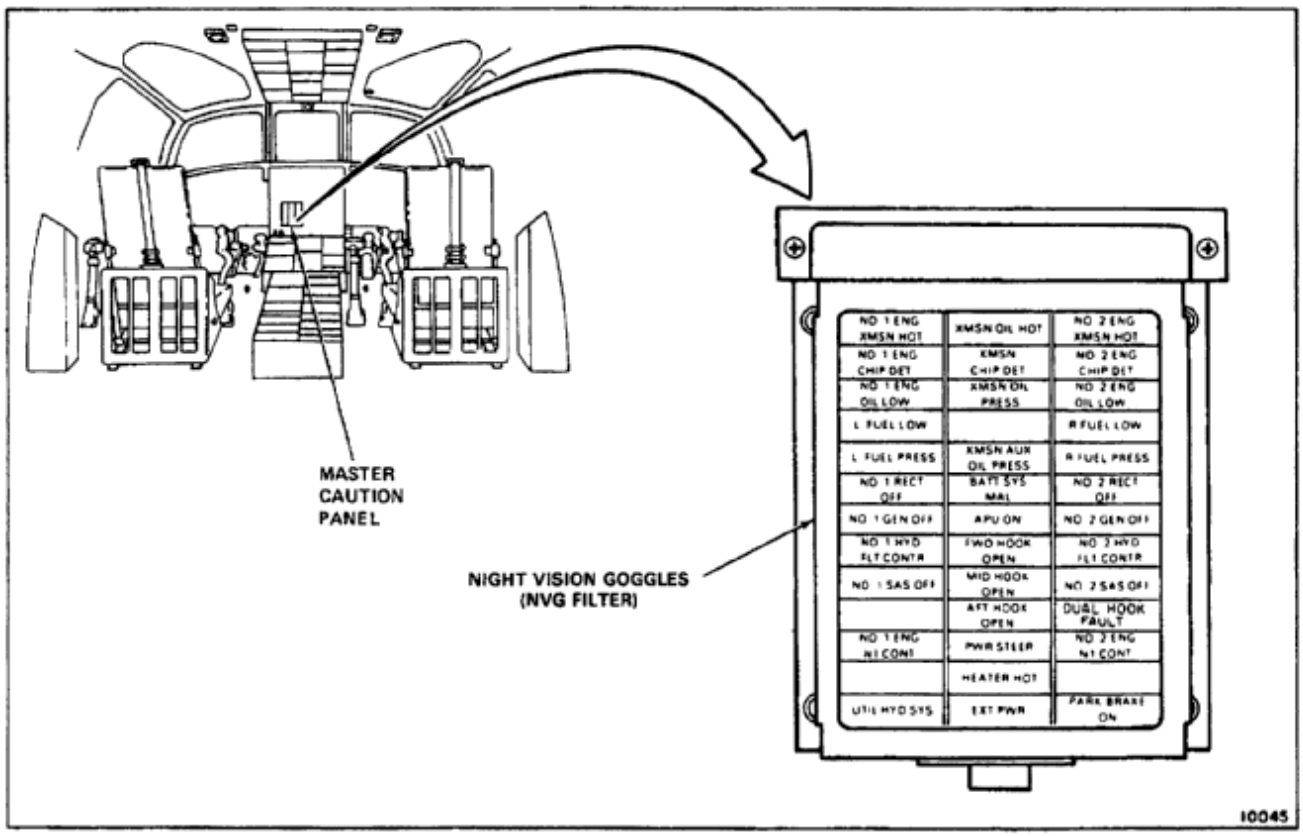
None

***Personnel Required:***

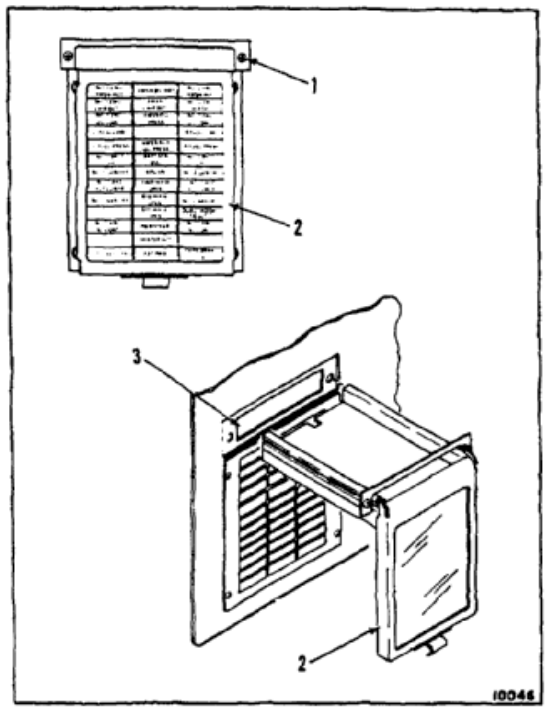
Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off



1. Remove two screws (1) from filter (2).
2. Pull filter (2) aft, away from opening (3).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-125.2 REPAIR OF CAUTION PANEL NVG FILTER 9-125.2

INITIAL SETUP

***Applicable Configurations:***

With 17 and Without 74

***Tools:***

Airframe Repairer's Tool Kit, NSN 5180-00-323-4876
Drill
Twist Drill Set
Utility Knife

***Materials:***

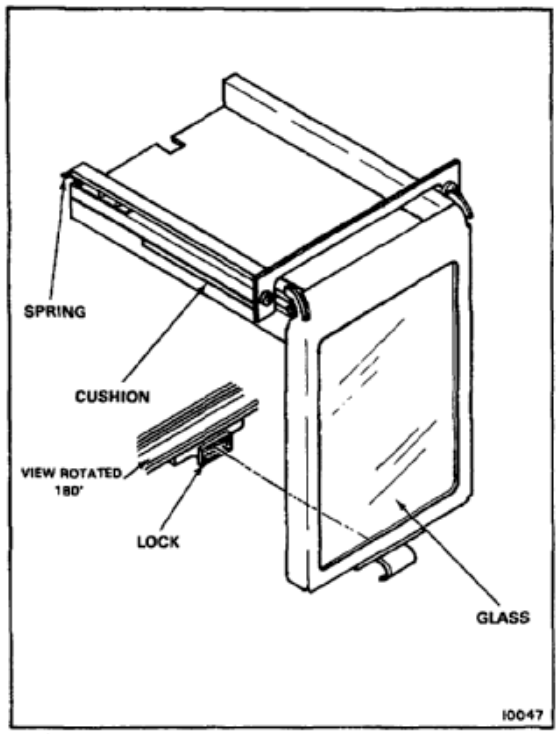
Acetone (E20)
Sealant (E336)
Cloths (E120)
Tape (E402)
Gloves (E186)

***Personnel Required:***

Aircraft Structural Repairer

***Equipment Condition:***

Off Helicopter Task




***General Safety Instructions:***

**WARNING**

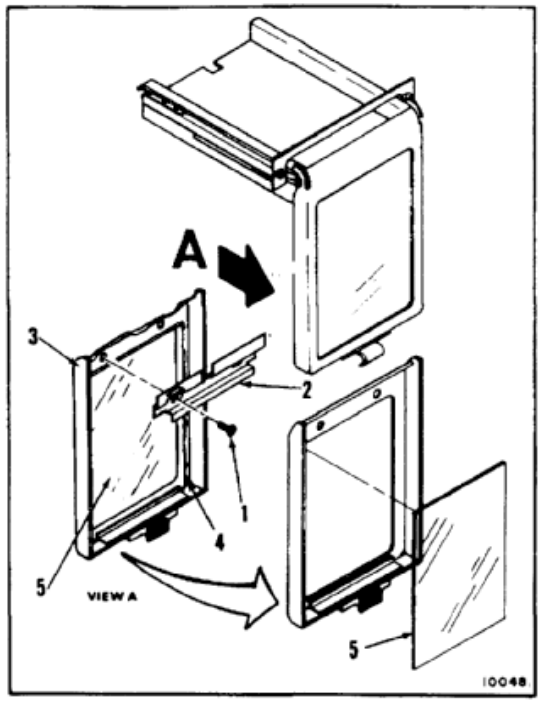
Acetone (E20) is extremely flammable. It can be toxic. Avoid inhaling. Use only with adequite ventilation. Avoid contact with skin, eyes, or clothing. Keep away from heat, sparks, or open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

**NOTE**

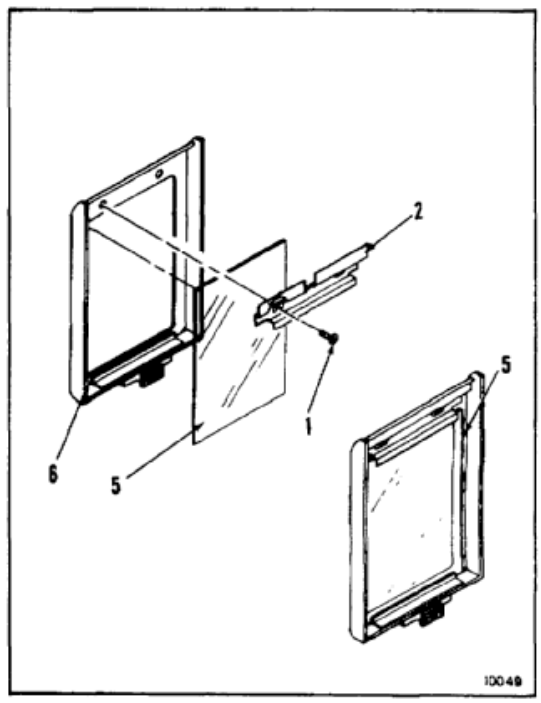
Repair of the NVG caution panel filter is limited to replacement of four parts: glass, spring, cushion, and lock.

***REPLACE FILTER GLASS***

1. Remove two screws (1) and retainer (2) from frame (3).
2. Remove sealant (4) from both sides of glass (5). Use a utility knife.
3. Remove glass (5).
4. Remove old sealant. Use acetone (E20) and cloths (E120).




5. Position replacement glass (5). Seat firmly in slot (6) in bottom of frame.
6. Position retainer (2) and install two screws (1).
7. Apply sealant (E336) to both sides of glass (5). Allow to cure **6 hours**. Wear gloves (E186).

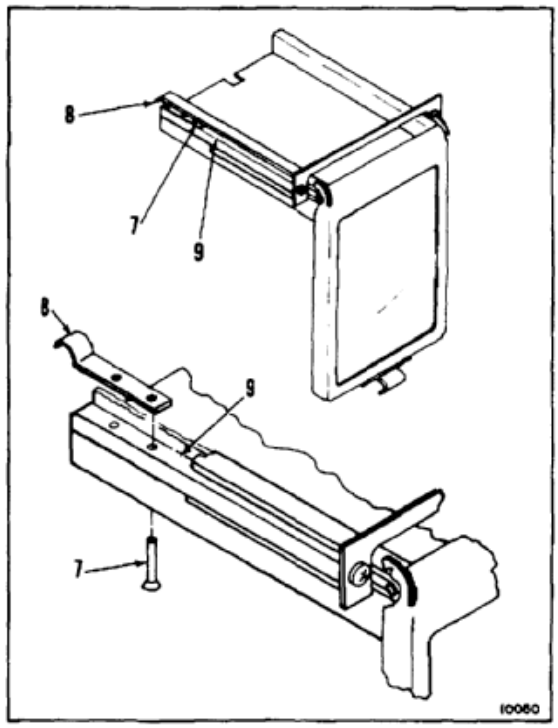


***REPLACE SPRING***

**NOTE**

Procedure is same to replace either spring.

8. Drill out two rivets (7). Use a **3/32 inch** drill. Remove spring (8) from support (9).
9. Position replacement spring (8) on support (9).
10. Install two 3/32 rivets (7), countersink at support (9).

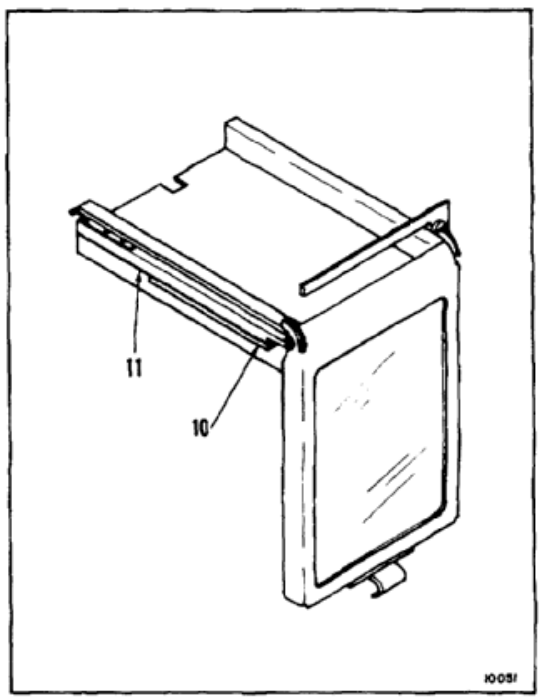



***REPLACE CUSHION***

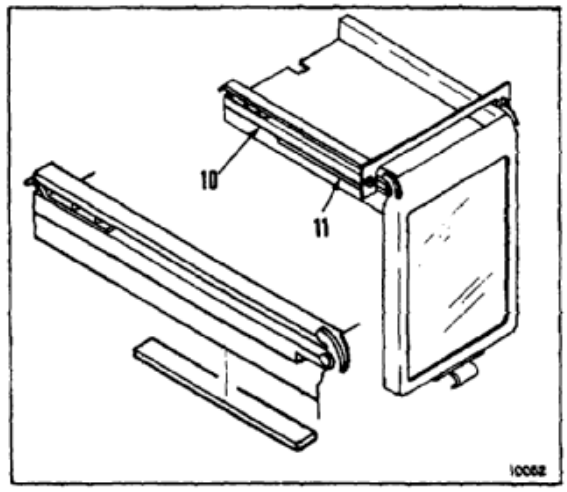
**NOTE**

Procedure is same to replace either cushion.

11. Remove cushion (10) from track (11). Use a utility knife.
12. Remove old sealant. Use acetone (E20). Wear gloves (E186).

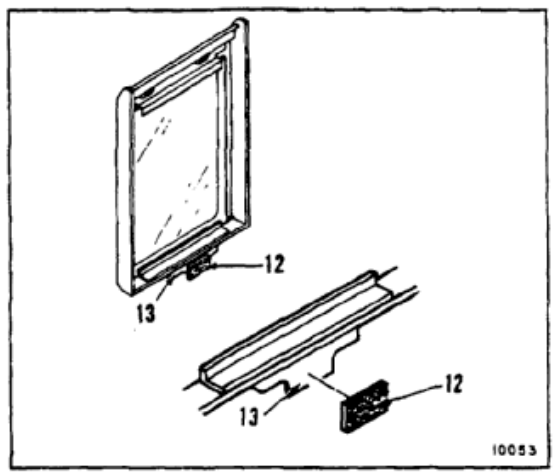


13. Coat replacement cushion (10) and faying area of track (11) with sealant (E336). Wear gloves (E186).
14. Press replacement cushion (10) on track (11). Cure for **6 hours**.




***REPLACE LOCK***

15. Remove lock (12) from grip (13). Use a utility knife.
16. Clean adhesive from grip. Use acetone (E20) wear gloves (E186).
17. Peel protective backing from lock (12). Position lock on grip (13) and press firmly. Allow to cure for **2 hours**.




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-125.3 INSTALL CAUTION PANEL NVG FILTER 9-125.3

INITIAL SETUP

***Applicable Configurations:***

With 17 and Without 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

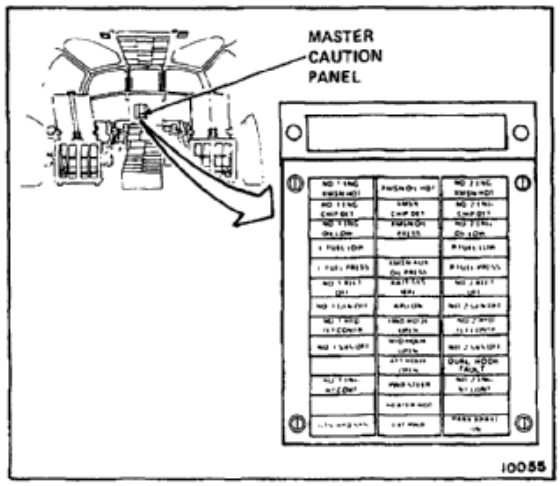
None

***Personnel Required:***

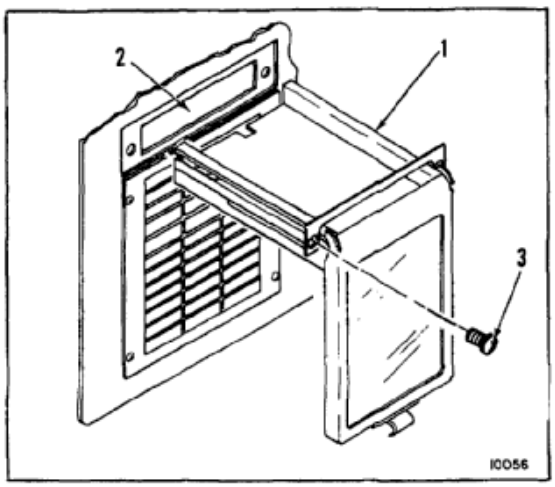
Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P




1. Slide tracks (1) into opening (2).
2. Align mounting holes and install screws (3).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-126 REMOVE MASTER CAUTION PANEL LAMP 9-126

INITIAL SETUP

***Applicable Configurations:***

Without 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

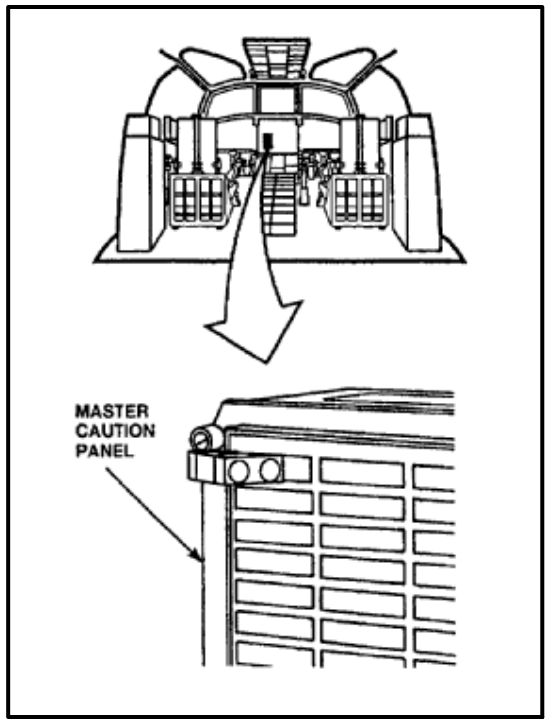
None

***Personnel Required:***

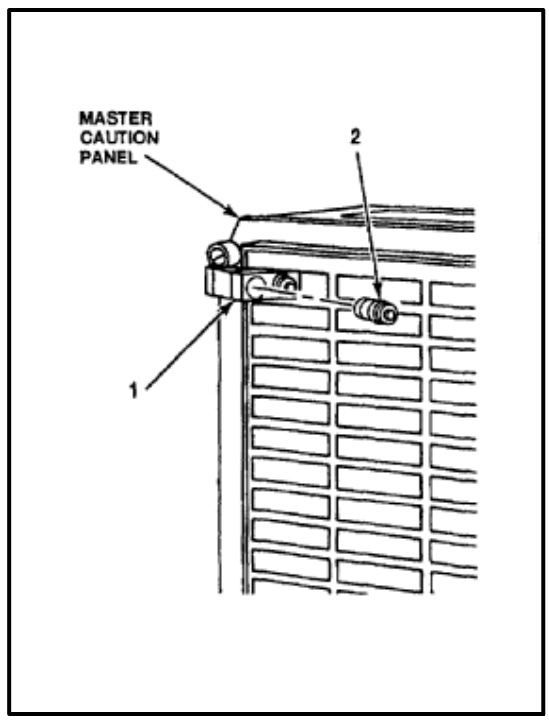
Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
NVG Filter Stowed (With 17) (Task 9-125.1)




1. Press left side of capsule (1).
2. Remove lamp (2) from capsule (1).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-126.1 REMOVE MASTER CAUTION PANEL LAMP 9-126.1

INITIAL SETUP

***Applicable Configurations:***

With 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

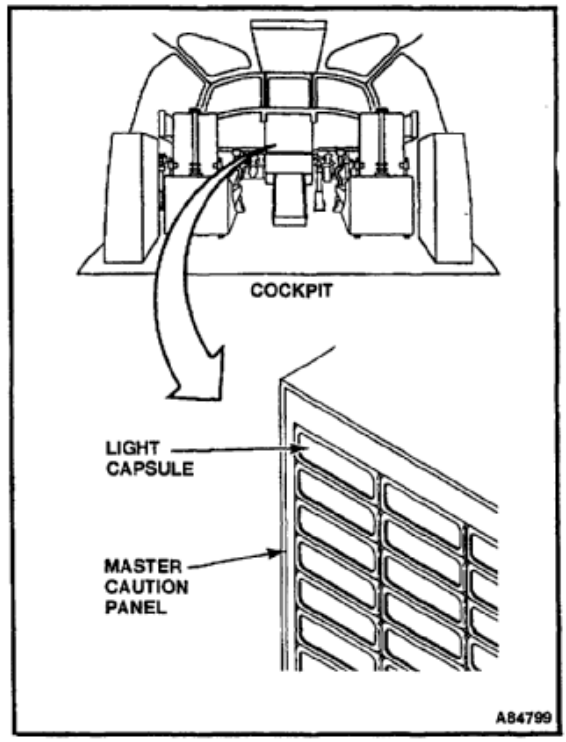
None

***Personnel Required:***

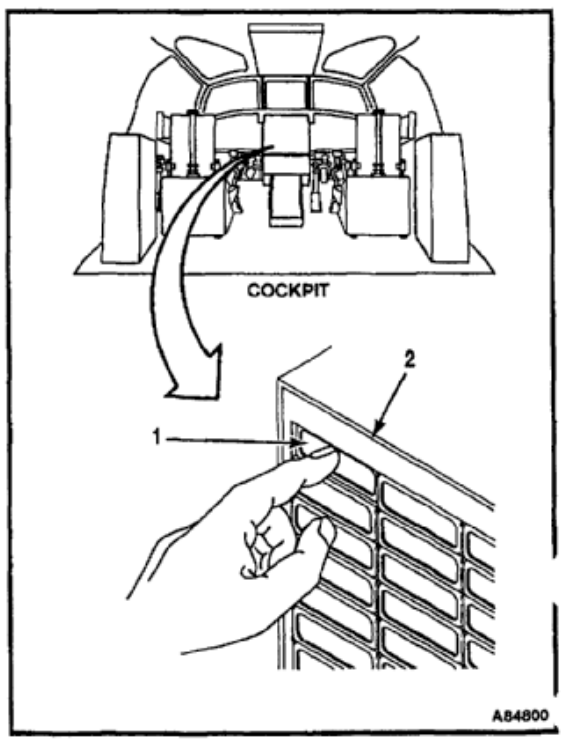
Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off



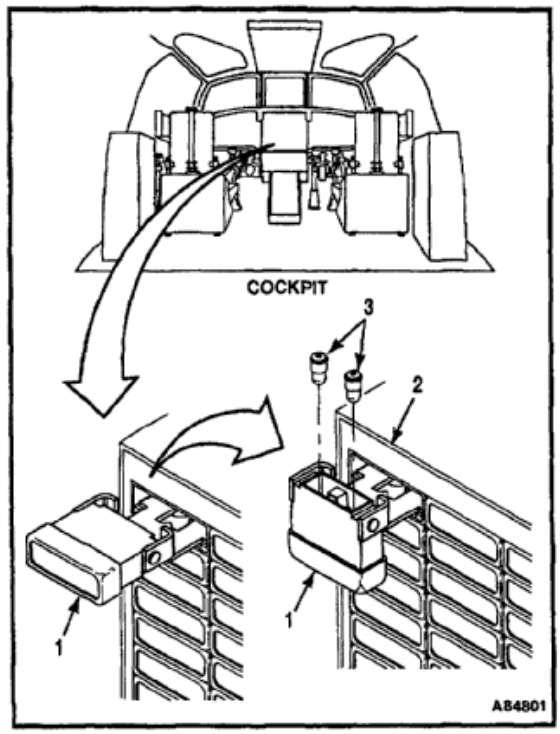

1. Depress capsule (1) to release it from the master caution panel (2).



2. Slide capsule (1) out and rotate the lamp housing downward.
3. Remove lamp(s) (3).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-127 INSTALL MASTER CAUTION PANEL LAMP 9-127

INITIAL SETUP

***Applicable Configurations:***

Without 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

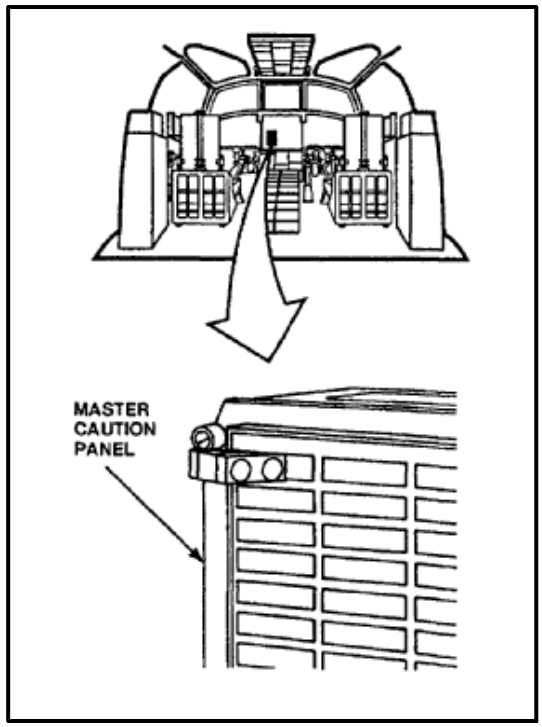
None

***Personnel Required:***

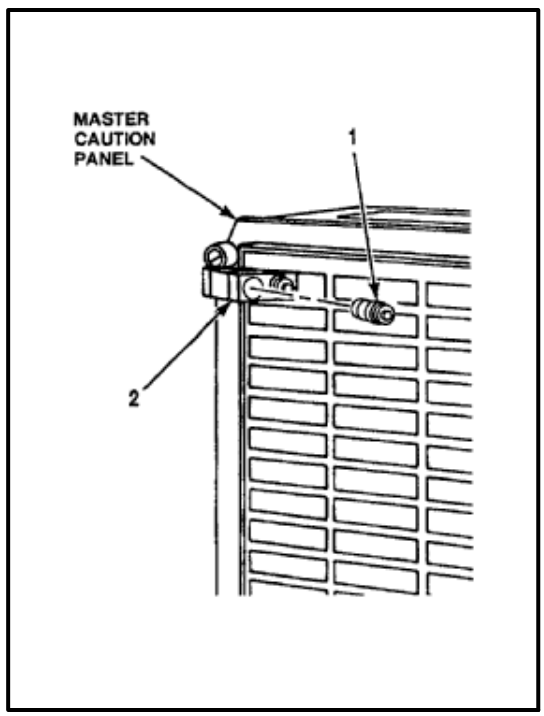
Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P




1. Install lamp (1) in capsule (2).
2. Press right side of capsule (2).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).

END OF TASK

## 9-127.1 INSTALL MASTER CAUTION PANEL LAMP 9-127.1

INITIAL SETUP

***Applicable Configurations:***

With 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

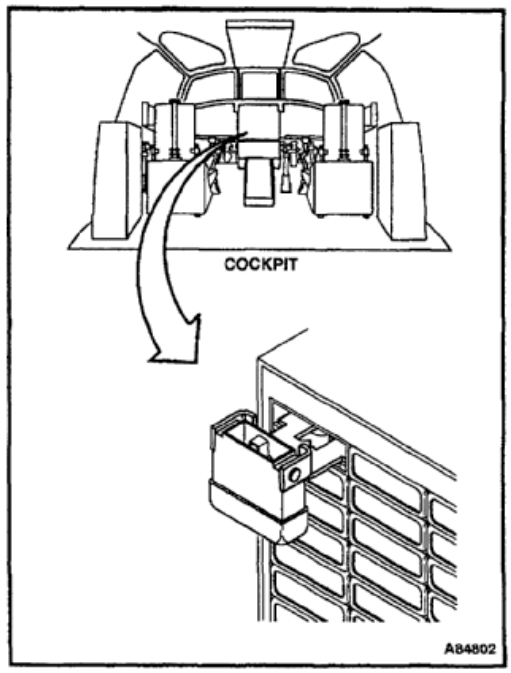
None

***Personnel Required:***

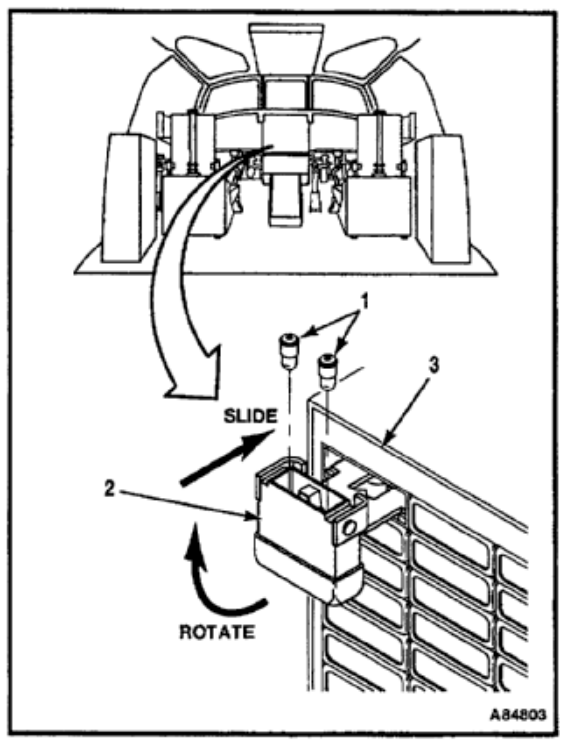
Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P




1. Install lamps (1) in capsule (2). Ensure that the lamps are properly seated in capsule.
2. Rotate capsule (2) upward and gently push it into master caution panel (3).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).

END OF TASK

## 9-128 REMOVE MASTER CAUTION PANEL 9-128

INITIAL SETUP

***Applicable Configurations:***

Without 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

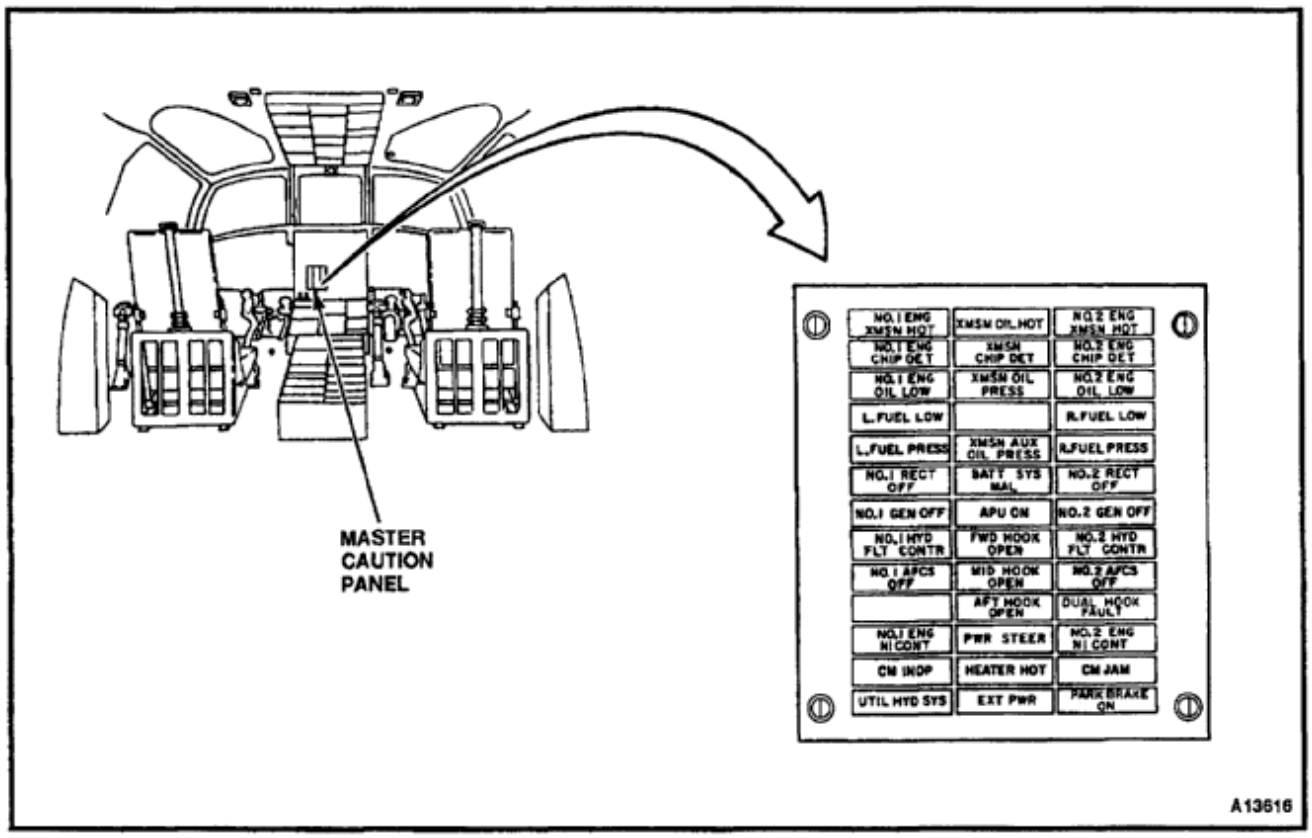
None

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

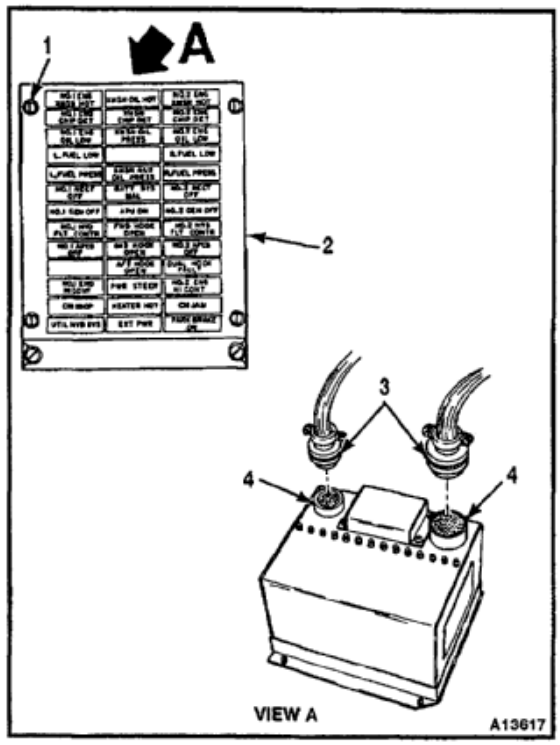
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off



1. Loosen four fasteners (1). Lift panel (2) out of center instrument panel.
2. Disconnect two connectors (3) from receptacles (4).
3. Remove panel (2).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-128.1 REMOVE MASTER CAUTION PANEL 9-128.1

INITIAL SETUP

***Applicable Configurations:***

With 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

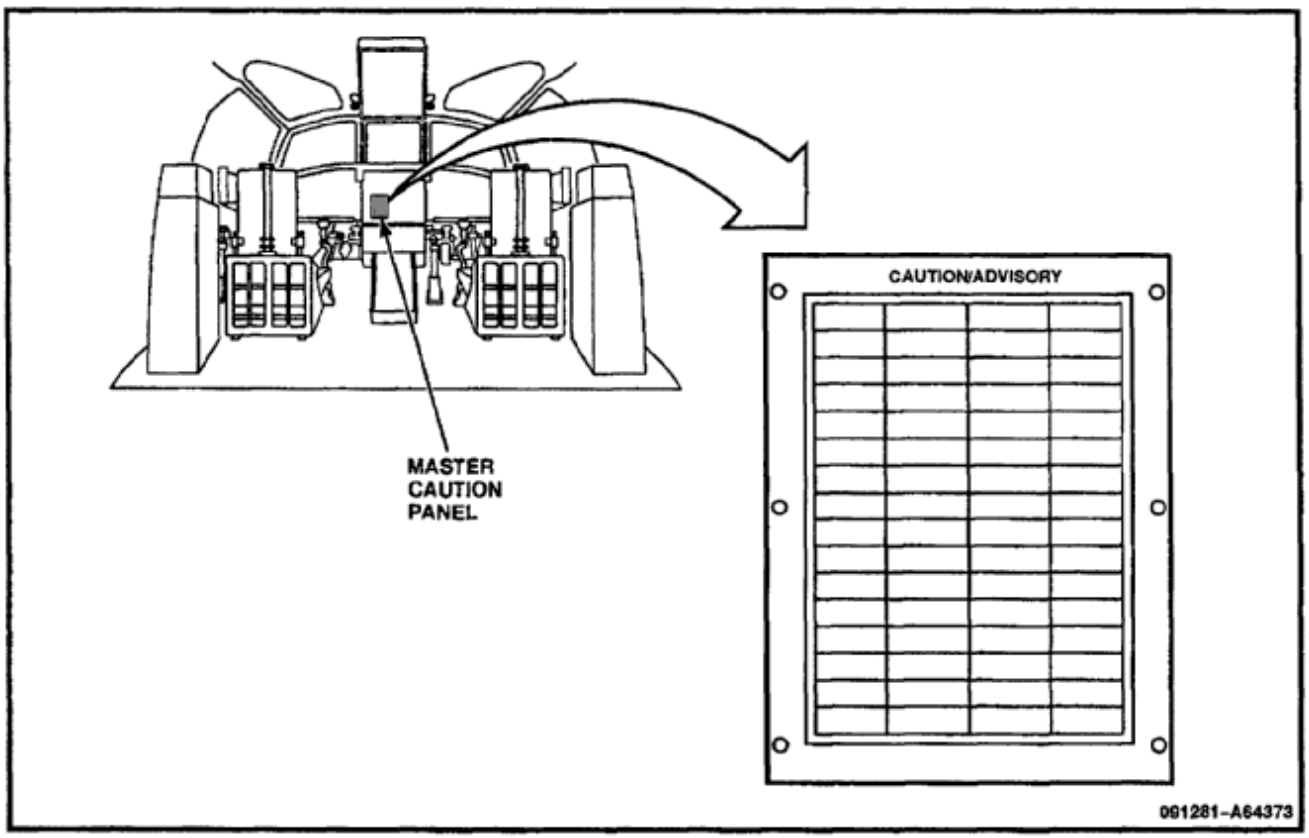
Paper Tags (E264)

***Personnel Required:***

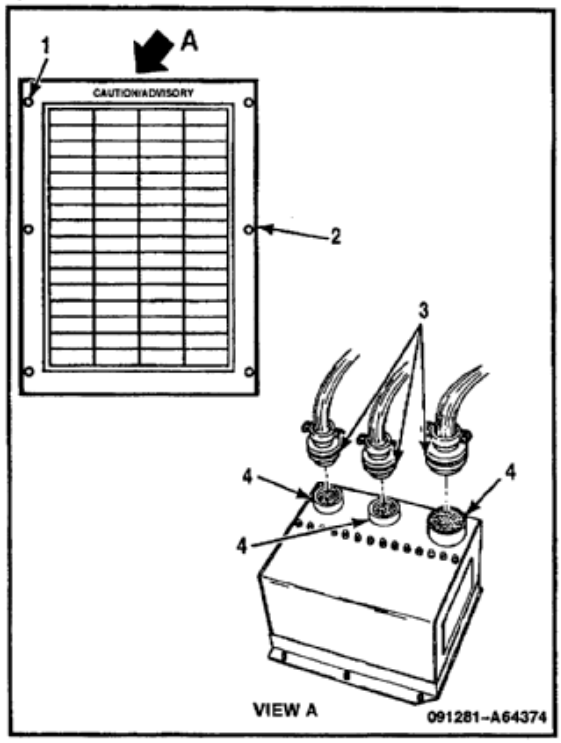
Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off



1. Loosen six fasteners (1). Lift panel (2) out of center instrument panel.
2. Tag and disconnect three connectors (3) from receptacles (4).
3. Remove master caution panel.




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-129 DISASSEMBLE MASTER CAUTION PANEL (AVIM) 9-129

INITIAL SETUP

***Applicable Configurations:***

Without 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

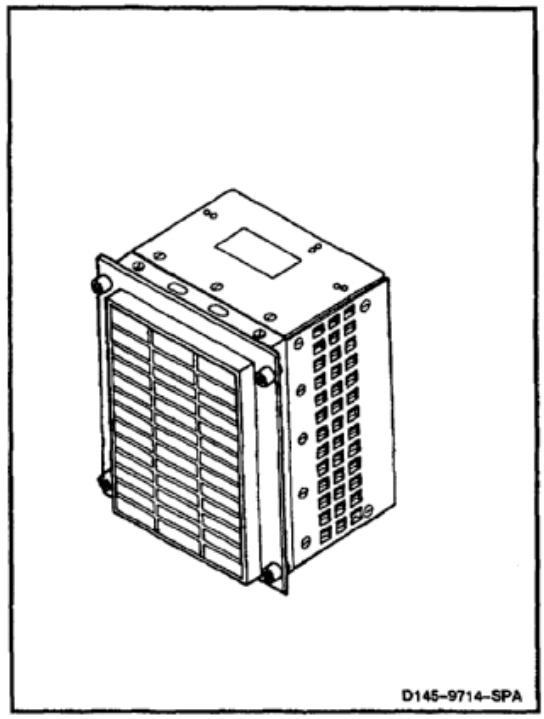
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

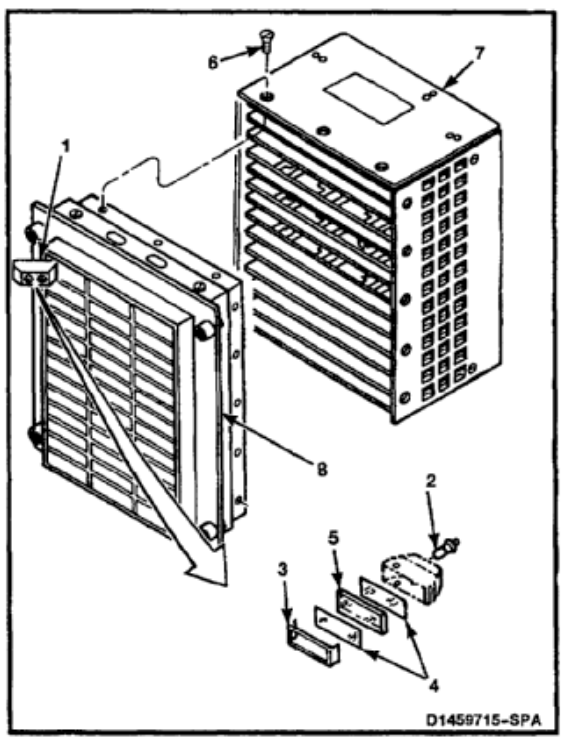
Aircraft Electrician

***Equipment Condition:***

Off Helicopter Task

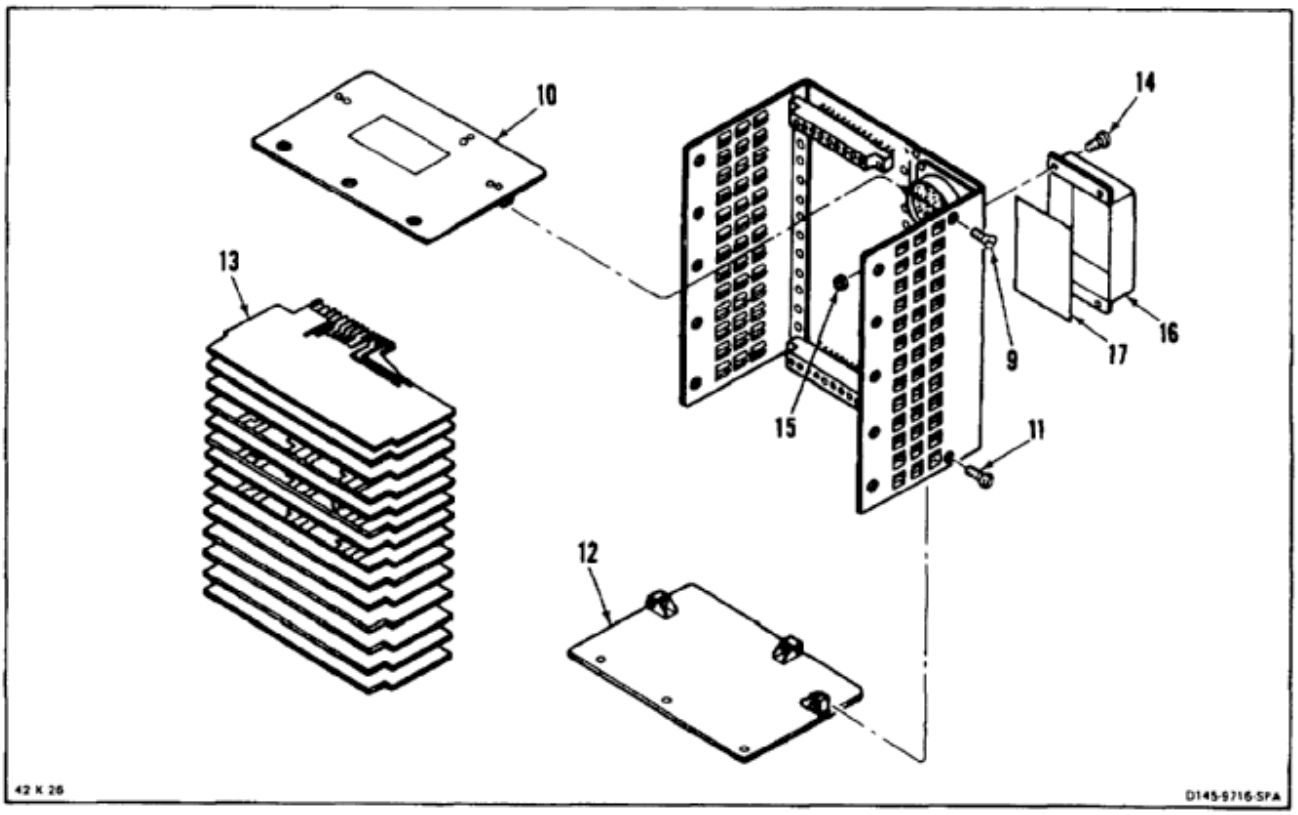



1. Press left corner of 39 lenses (1). Open lenses.
2. Remove 78 lamps (2).
3. Remove 39 retainers (3).
4. Remove 39 filters (4).
5. Tag and remove 39 lenses (5).
6. Remove 39 filters (4).
7. Remove 16 screws (6) from housing (7).
8. Separate housing (7) from housing (8).



## 9-129 DISASSEMBLE MASTER CAUTION PANEL (AVIM) (Continued) 9-129

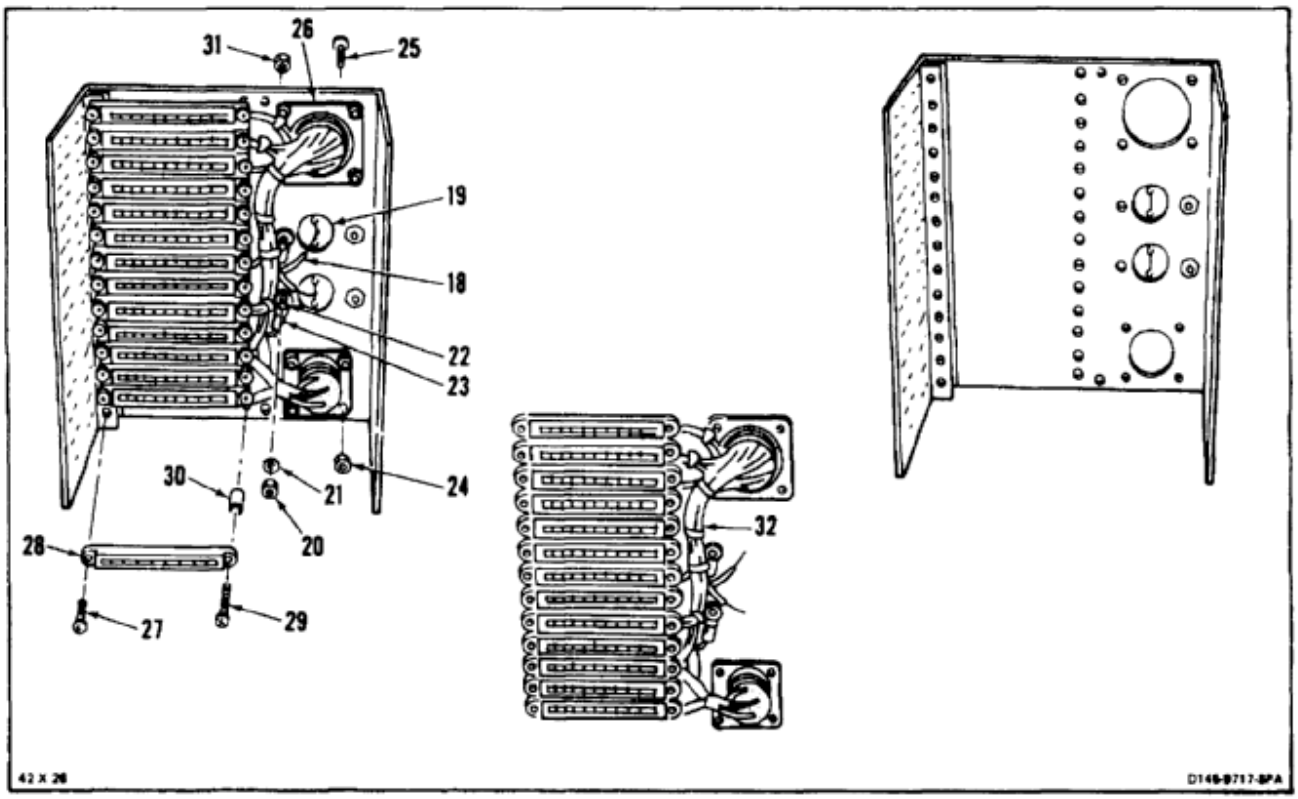
9. Remove three screws (9) from plate (10). Remove plate.
10. Remove three screws (11) from cover (12). Remove cover.
11. Tag and remove 14 boards (13).
12. Remove four screws (14) and nuts (15) from cover (16).
13. Remove cover (16) and insulator (17).



14. Tag and unsolder two wires (18) from two semiconductors (19). Tape wire ends.
15. Remove two nuts (20) and washers (21) from two studs (22). Remove two wires (23).
16. Remove eight nuts (24) and screws (25) from two receptacles (26).
17. Remove 14 screws (27) from receptacles (28).
18. Remove 14 screws (29), spacers (30), and nuts (31) from receptacles (28).
19. Remove harness (32).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-129.1 DISASSEMBLE MASTER CAUTION PANEL (AVIM) 9-129.1

INITIAL SETUP

***Applicable Configurations:***

With 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

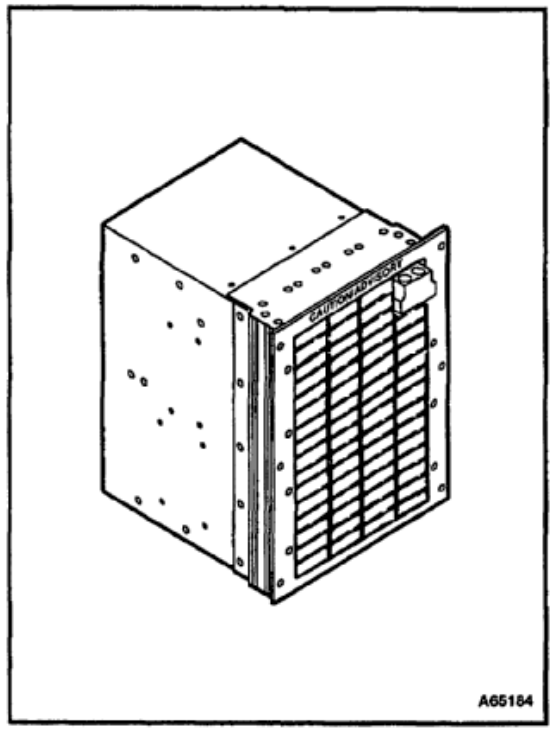
Paper Tags (E264)
Static Free Bags (E468)

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

Off Helicopter Task

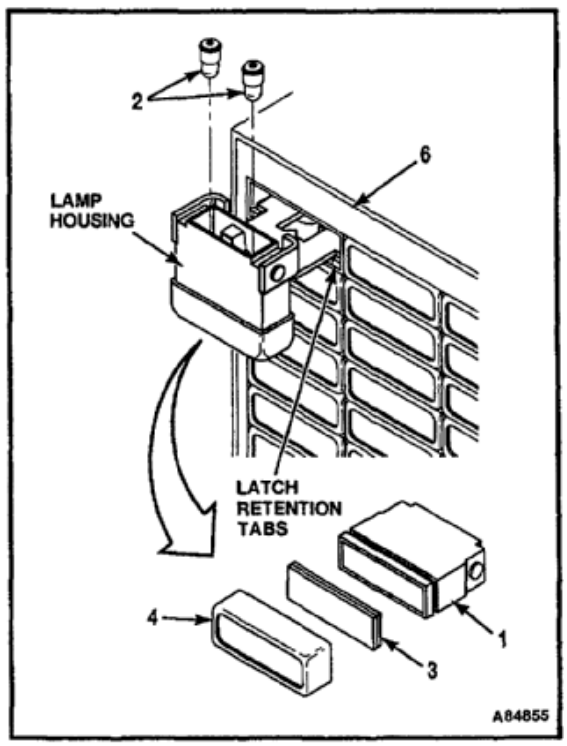



1. Depress 64 capsules (1) to release them from the master caution panel.
2. Slide capsules (1) out and rotate the lamp housings downward. Remove 128 lamps (2).

CAUTION

Use care when depressing the latch retention tabs. They are fragile and easily broken.

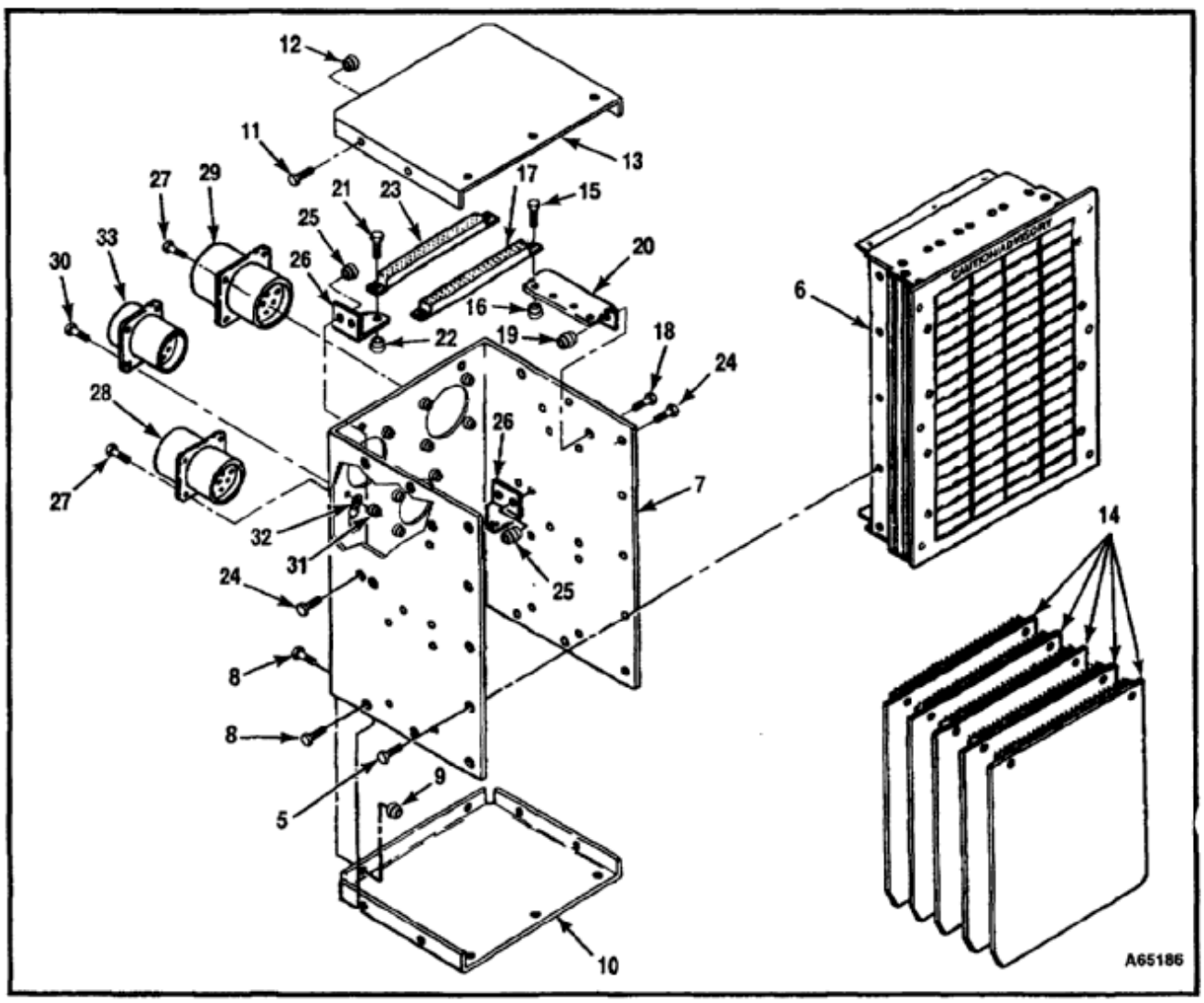
3. Carefully depress the two latch retention tabs. Use a small flat blade screwdriver. Remove 64 capsules (1) from light housing (6).
4. Remove 64 legend caps (4) from the lamp housings. Remove 64 legend assemblies (3) from legend caps (4).



5. Remove 16 screws (5) from light housing (6).
6. Separate light housing (6) from housing (7).
7. Remove six screws (8) and six nuts (9) from bottom cover (10). Remove bottom cover (10) from housing (7).
8. Remove six screws (11) and nuts (12) from top cover (13). Remove top cover (13) from housing (7).
9. Tag and remove five circuit card boards (14) from housing (7). Use tag (E264).
10. Place each circuit card board (14) in a static free bag. Use bags (E468).
11. Remove eight screws (15) and nuts (16) from four pin connectors (17). Remove pin connectors.
12. Remove four screws (18) and nuts (19) from brackets (20). Remove brackets.
13. Remove two screws (21) and nuts (22) from pin connector (23). Remove pin connector.
14. Remove four screws (24) and nuts (25) from brackets (26). Remove brackets.
15. Remove eight screws (27) from connectors (28 and 29). Remove connectors from housing (7).
16. Remove four screws (30) and nuts (31) from terminal (32) and connector (33). Remove terminal and connector from housing (7).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-129.2 ASSEMBLE MASTER CAUTION PANEL (AVIM) 9-129.2

INITIAL SETUP

***Applicable Configurations:***

With 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

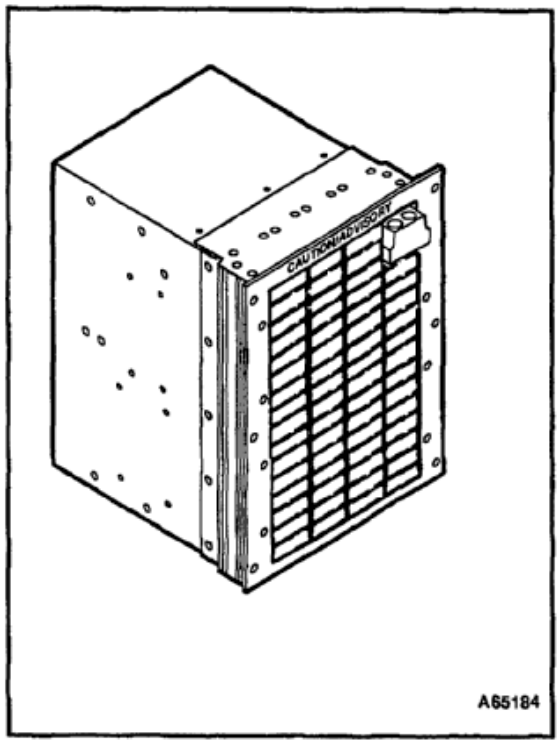
None

***Personnel Required:***

Aircraft Electrician
Inspector

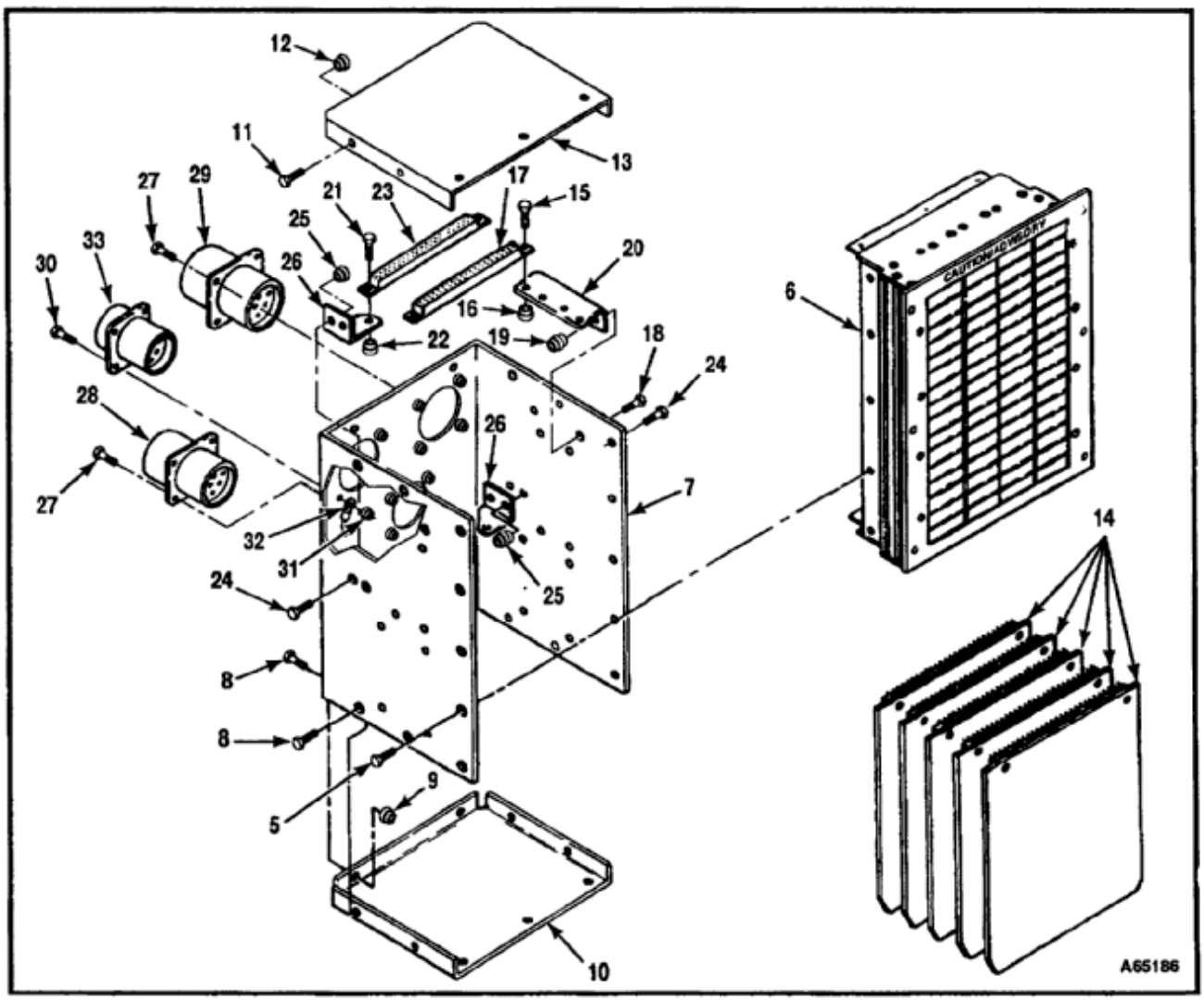
***References:***

TM 55-1520-240-23P



## 9-129.2 ASSEMBLE MASTER CAUTION PANEL (AVIM) (Continued) 9-129.2

1. Position terminal (32) and connector (33) on housing (7). Install four screws (30) and nuts (31) in terminal (32) and connector (33).
2. Position connectors (28 and 29) on housing (7). Install eight screws (27) in two connectors (28 and 29).
3. Position brackets (26) on housing (7). Install four screws (24) and nuts (25) in brackets.
4. Position pin connector (23) on bracket (26). Install two screws (21) and nuts (22) in pin connector.
5. Position brackets (20) on housing (7). Install four screws (18) and nuts (19) in brackets.
6. Position pin connectors (17) on brackets (20). Install eight screws (15) and nuts (16) in pin connectors.
7. Remove each circuit card board (14) from static free bag.
8. Remove tag and install circuit card boards (14) into housing (7).
9. Position top cover (13) on housing (7). Install six screws (11) and nuts (12) in cover.
10. Position bottom cover (10) on housing (7). Install six screws (8) and nuts (9) in cover.
11. Position light housing (6) in housing (7).
12. Install 16 screws (5) in light housing.



13. Install 64 legend assemblies (3) in legend caps (4). Install 64 legend caps (4) in the lamp housings.

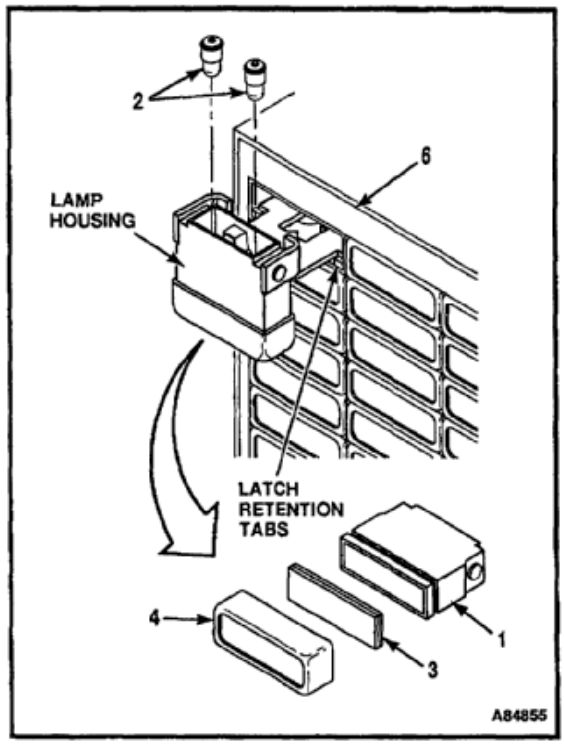
CAUTION

Use care when depressing the latch retention tabs. They are fragile and easily broken.

14. Carefully depress the two latch retention tabs. Use a small flat blade screwdriver. Install 64 capsules (1) in light housing (6).

15. Install 128 lamps (2) in lamp housings.

16. Rotate lamp housing upward and push into light housing (6). Lamp housing should seat in capsule (1).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-130 ASSEMBLE MASTER CAUTION PANEL (AVIM) 9-130

INITIAL SETUP

***Applicable Configurations:***

Without 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

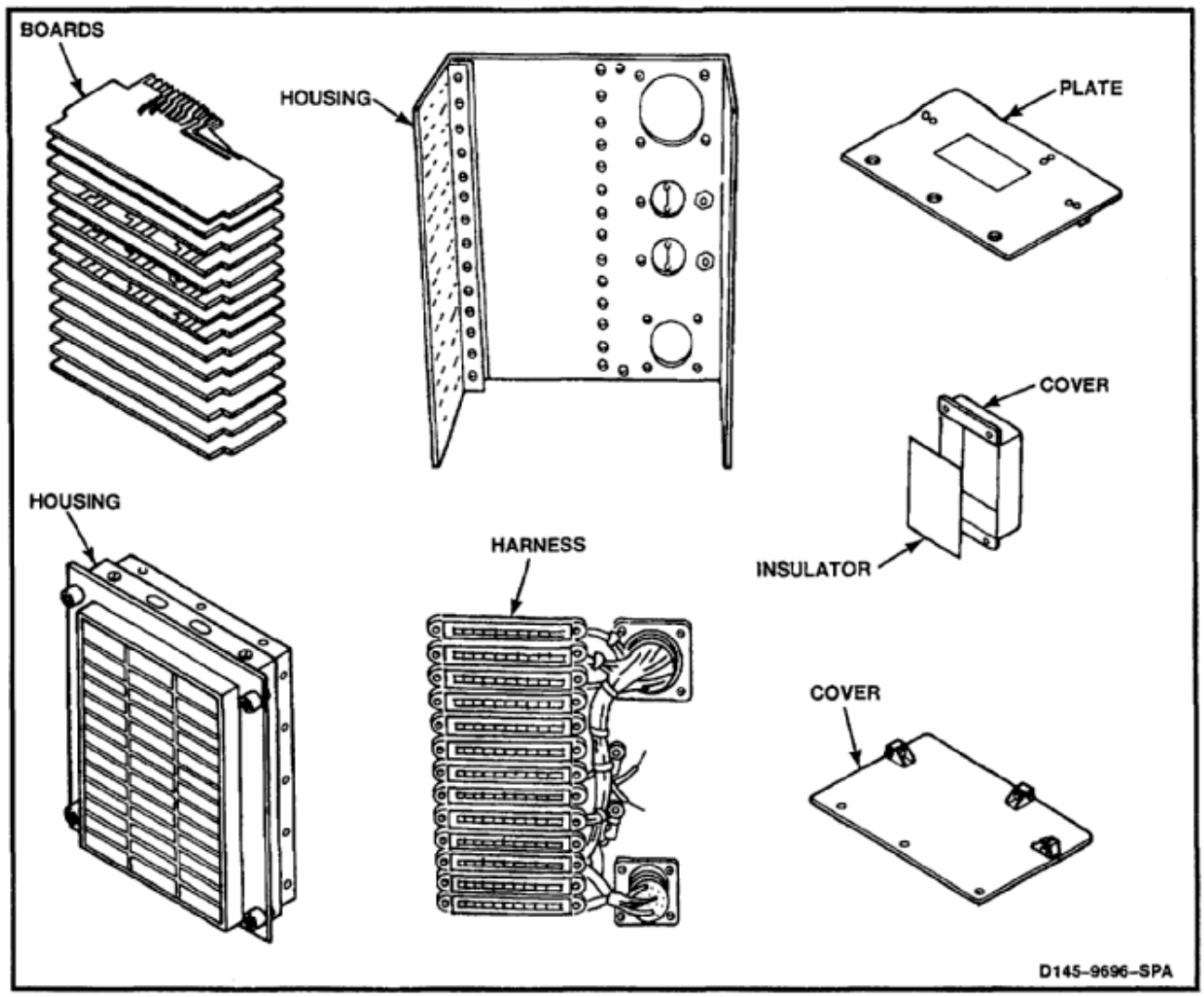
Solder (E360)

***Personnel Required:***

Aircraft Electrician
Inspector

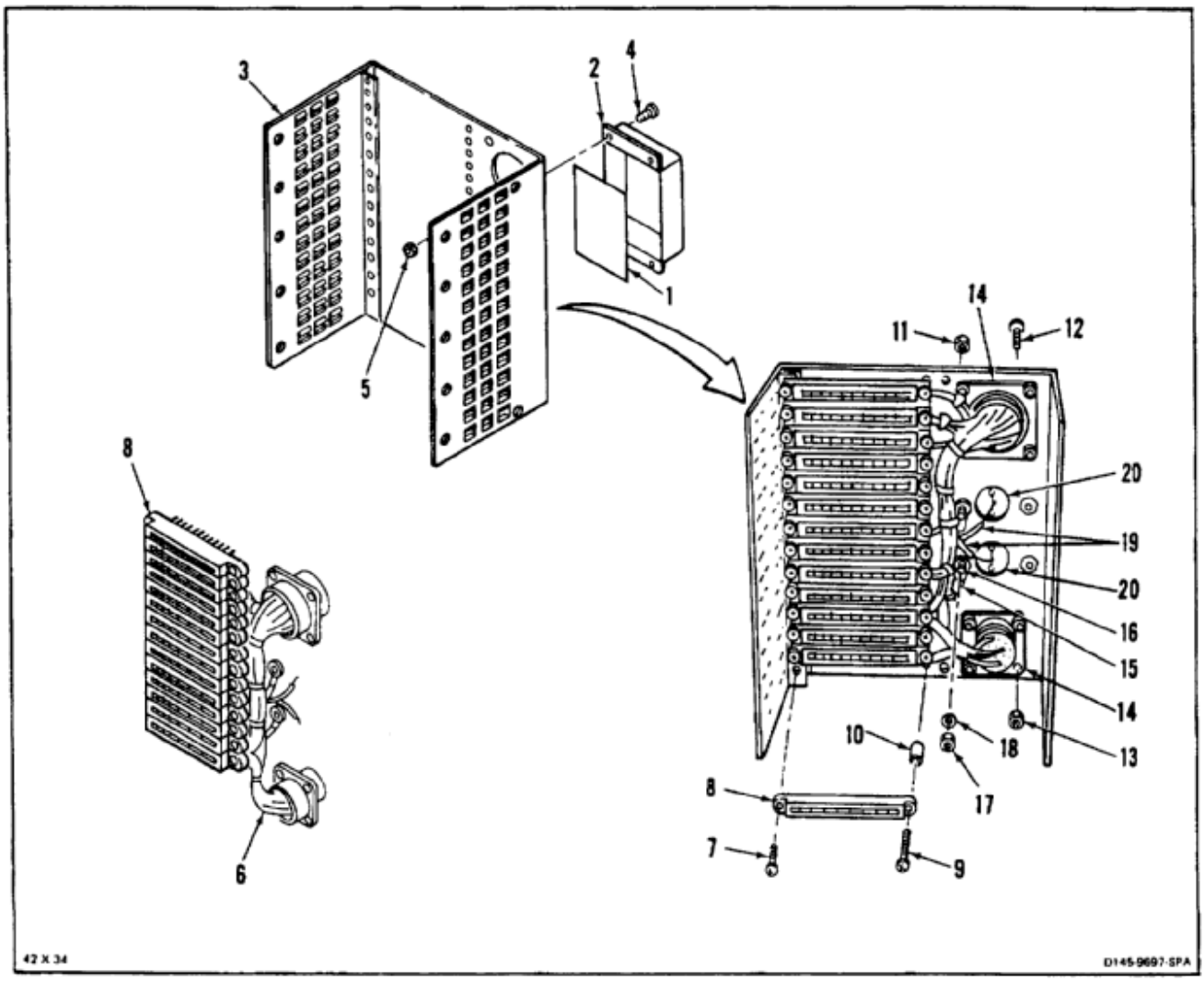
***References:***

TM 55-1520-240-23P

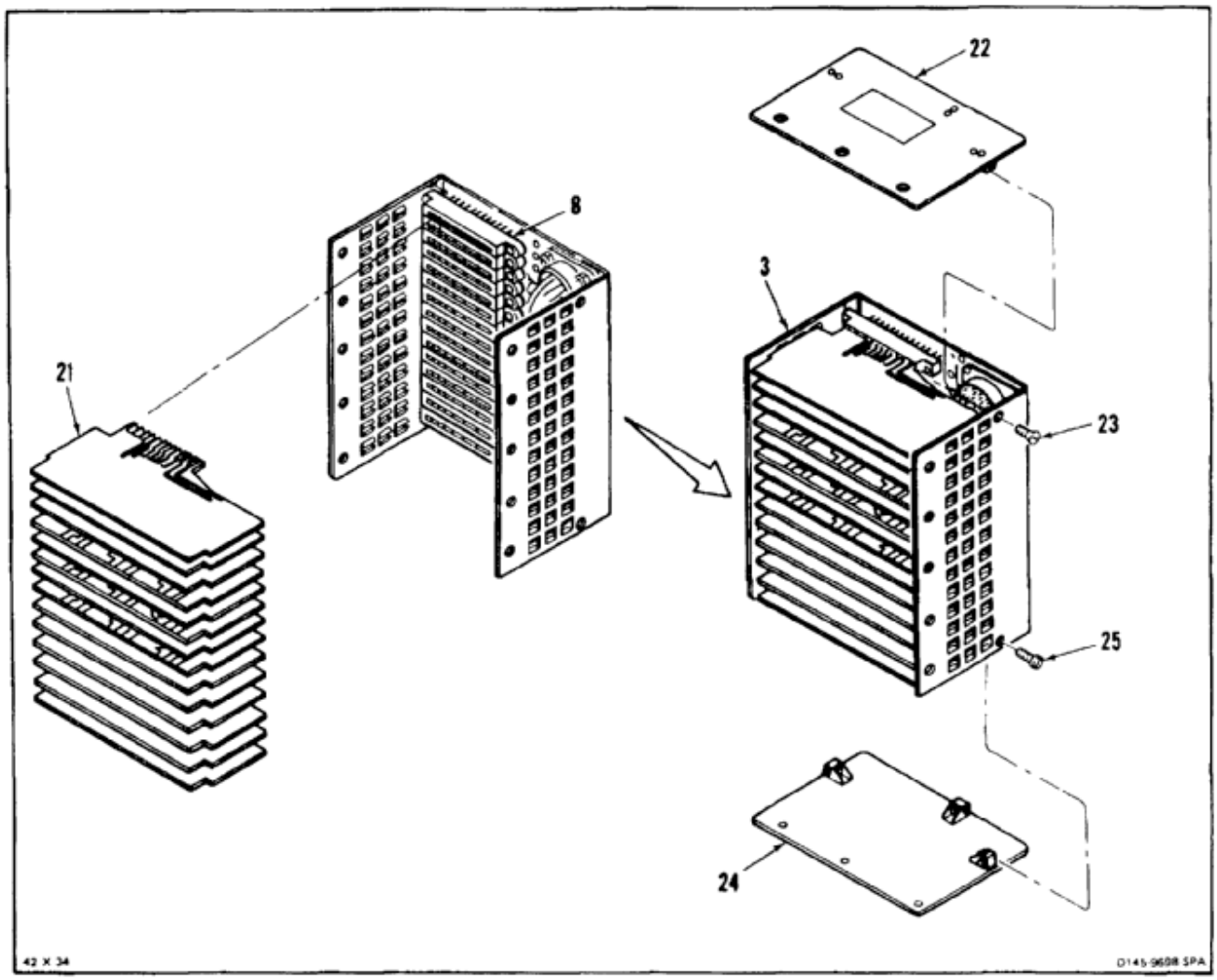


1. Position insulator (1) and cover (2) on housing (3). Install four screws (4) and nuts (5).
2. Position harness (6) in housing (3). Install 14 screws (7) in receptacle (8).
3. Install 14 screws (7), spacers (10), and nut (11) in receptacles (8).
4. Install eight screws (12) and nuts (13) in two connectors (14).
5. Remove tape and position two wires (15) on studs (16). Install two nuts (17) and washers (18). Remove tags.
6. Solder two wires (19) to semiconductors (20). Remove tags.

***INSPECT***



7. Install 14 boards (21) in receptacles (8). Remove tags.
8. Position plate (22) on housing (3). Install three screws (23) in plate (22).
9. Position cover (24) on housing (3). Install three screws (25) in cover (24).

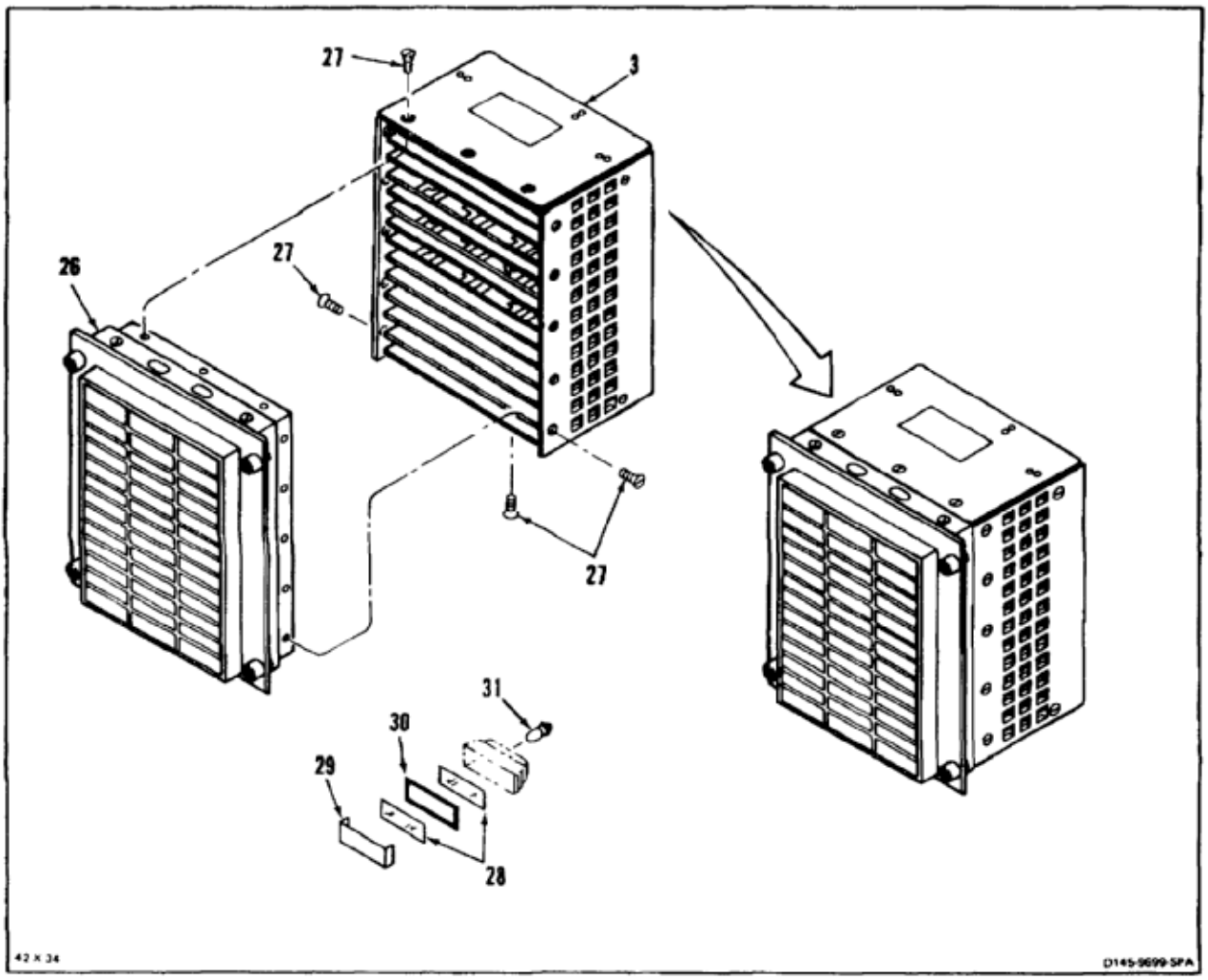


10. Position housing (26) in housing (3). Install 16 screws (27).
11. Install 39 filters (28) in retainer (29).
12. Install 39 lenses (30) in retainers (29).
13. Install 39 filters (28) in retainer (29).
14. Install 39 retainers (29).
15. Install 78 lamps (31).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-130.1 TEST MASTER CAUTION PANEL (AVIM) 9-130.1

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
DC Power Supply, (0 to 30) VDC
Multimeter
Soldering Gun
Alligator Clip
Light Assembly, 28 VDC (3)
Diode, 1N645
Fuse, 5 Amp
Switch, Single Pole, Single Throw (39 ea)
Switch, Double Pole, Single Throw (3 ea)
Switch, Single Pole, Momentary On, Pushbutton
P1 Connector MS3476W20-41S
P2 Connector MS3476W16-26S

***Materials:***

Solder (E360)

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23

***Equipment Condition:***

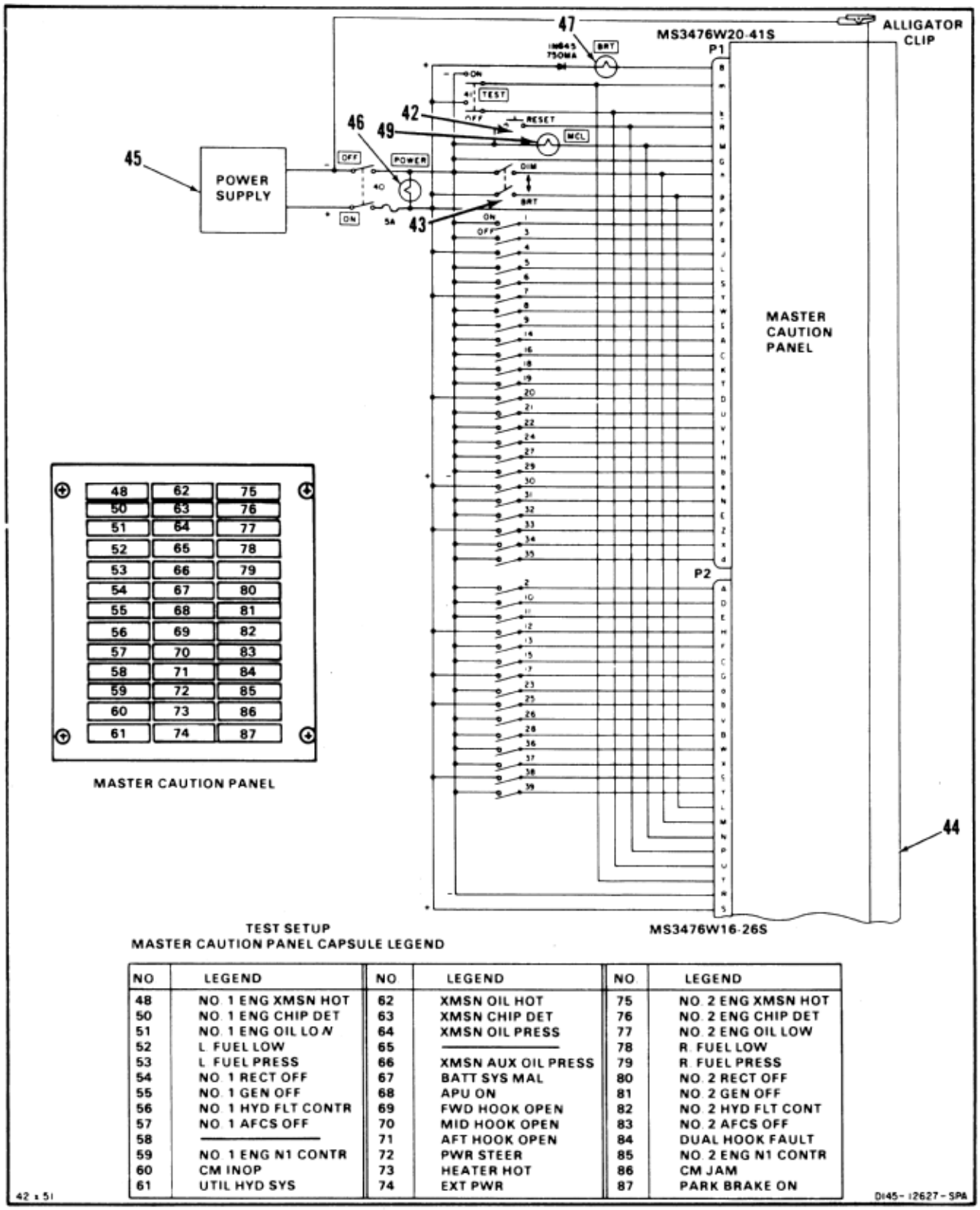
Off Helicopter Task
Test Setup

1. Set test switches (1 through 42) to off.
2. Set test switch (43) to BRT.
3. Connect master caution panel (44) to test setup and attach alligator clip to caution panel case.
4. Connect power supply (45) to dc(+) and dc(–) on test setup.
5. Turn power supply (45) on.
6. Set test switch (40) to on. POWER lamp (46) and BRT lamp (47) shall come on.

***TEST NO. 1 CAPSULE***

7. Set test switch (43) to DIM. BRT indicator lamp (47) shall go out.
8. Set test switch (1) to on. Capsule (48) shall come on dim. Master caution lamp (MCL) (49) shall also come on.
9. Press reset test switch (43). MCL lamp (49) shall go out.
10. Set test switch (1) to off. Capsule (48) shall go out.
11. Set test switch (43) to BRT. BRT indicator lamp (47) shall come on.
12. Set test switch (1) to on. Capsule (48) and MCL lamp (47) shall come on bright.
13. Set test switch (1) to off. Capsule (48) and MCL lamp (47) shall go out.
14. Repeat steps 7 thru 13 for switches (2 through 39) and capsules (50 through 87), then go to step 15.
15. Set test switch (43) to DIM. BRT indicator lamp shall go out.
16. Set test switch (41) to on. MCL lamp (49) and all capsules (48, 50 through 87) shall come on dim.

## 9-130.1 TEST MASTER CAUTION PANEL (AVIM) (Continued) 9-130.1




TEST SETUP

MASTER CAUTION PANEL CAPSULE LEGEND

| NO | LEGEND | NO | LEGEND | NO | LEGEND |
|---|---|---|---|---|---|
| 48 | NO. 1 ENG XMSN HOT | 62 | XMSN OIL HOT | 75 | NO. 2 ENG XMSN HOT |
| 50 | NO. 1 ENG CHIP DET | 63 | XMSN CHIP DET | 76 | NO. 2 ENG CHIP DET |
| 51 | NO. 1 ENG OIL LOW | 64 | XMSN OIL PRESS | 77 | NO. 2 ENG OIL LOW |
| 52 | L. FUEL LOW | 65 | ——— | 78 | R. FUEL LOW |
| 53 | L. FUEL PRESS | 66 | XMSN AUX OIL PRESS | 79 | R. FUEL PRESS |
| 54 | NO. 1 RECT OFF | 67 | BATT SYS MAL | 80 | NO. 2 RECT OFF |
| 55 | NO. 1 GEN OFF | 68 | APU ON | 81 | NO. 2 GEN OFF |
| 56 | NO. 1 HYD FLT CONTR | 69 | FWD HOOK OPEN | 82 | NO. 2 HYD FLT CONT |
| 57 | NO. 1 AFCS OFF | 70 | MID HOOK OPEN | 83 | NO. 2 AFCS OFF |
| 58 | ——— | 71 | AFT HOOK OPEN | 84 | DUAL HOOK FAULT |
| 59 | NO. 1 ENG N1 CONTR | 72 | PWR STEER | 85 | NO. 2 ENG N1 CONTR |
| 60 | CM INOP | 73 | HEATER HOT | 86 | CM JAM |
| 61 | UTIL HYD SYS | 74 | EXT PWR | 87 | PARK BRAKE ON |

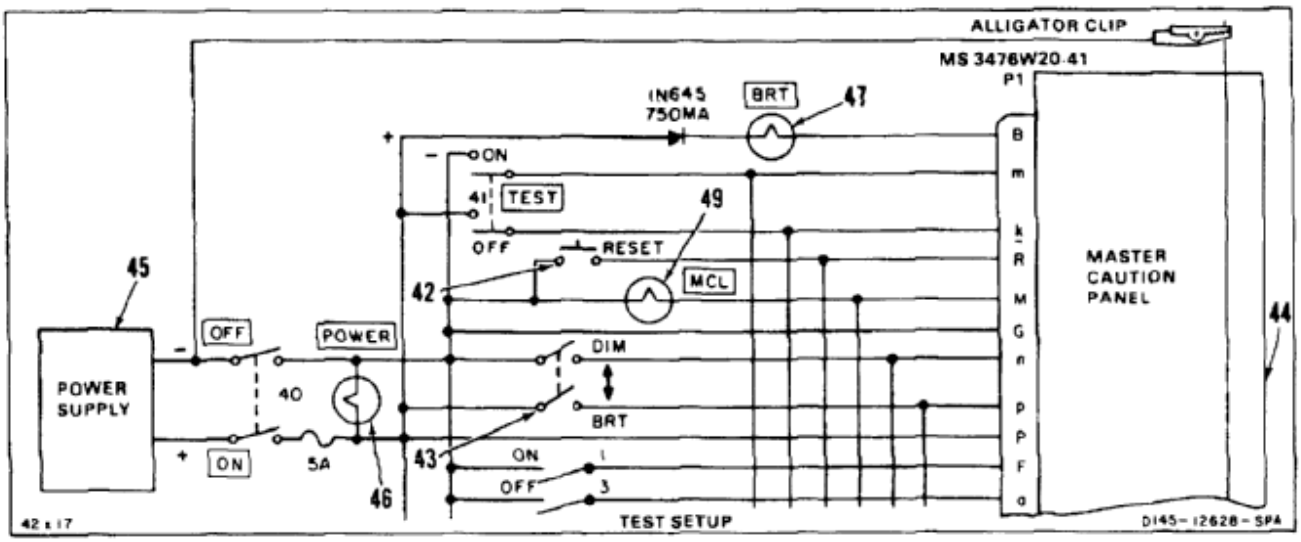
42 x 51

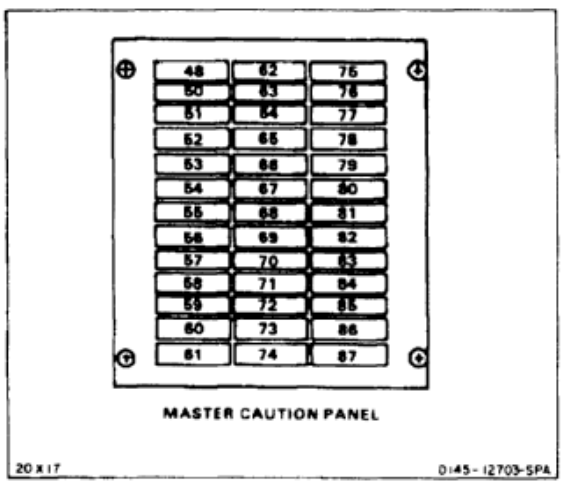
DH45-12627-SP4

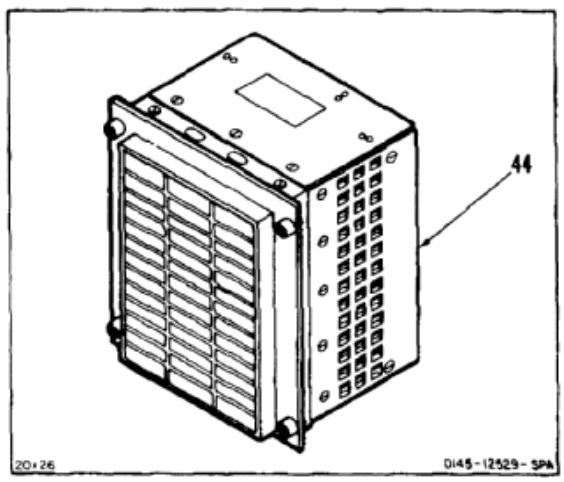
17. Set test switch (43) to BRT. BRT indicator lamp (47) shall come on. All capsules (48, 50 through 87) shall go bright.
18. Slowly reduce dc supply (45) voltage to **18 vdc**. All capsules shall light dimmer as voltage is reduced to **18 vdc**.
19. Press reset test switch (42). MCL lamp (49) shall go out.
20. Set test switch (41) to off. All capsules (48, 50 through 87) shall go out.
21. Turn off power supply (45).
22. Disconnect power supply (45) from test setup. Disconnect caution panel (44) from test setup.

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-131 INSTALL MASTER CAUTION PANEL 9-131

INITIAL SETUP

***Applicable Configurations:***

Without 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

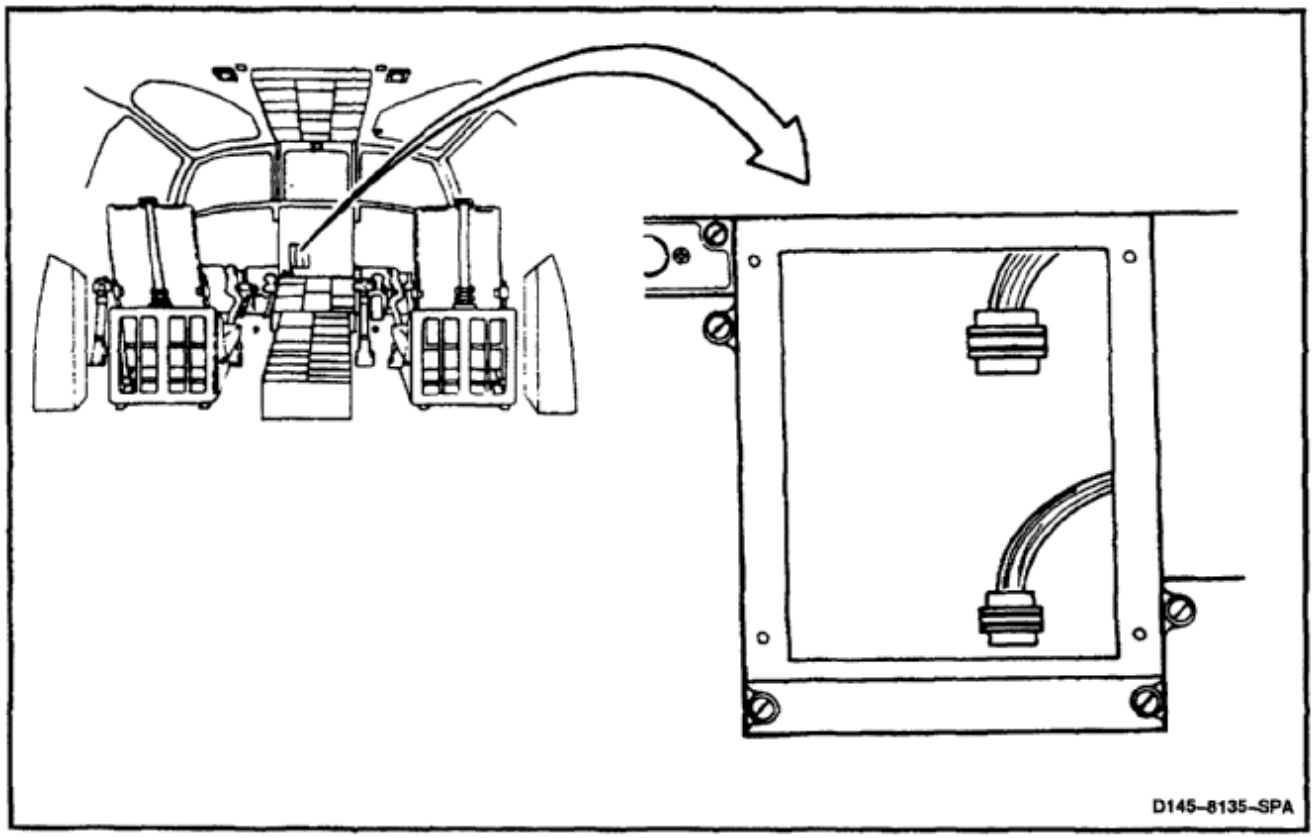
None

***Personnel Required:***

Aircraft Electrician
Inspector

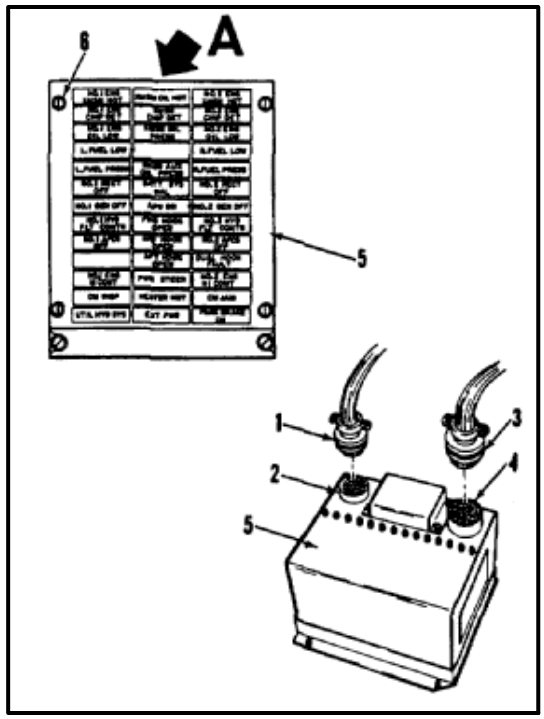
***References***

TM 55-1520-240-23P



1. Connect plug (1) to receptacle (2).
2. Connect plug (3) to receptacle (4).
3. Position panel (5) to center instrument panel.
4. Tighten four fasteners (6).

***INSPECT***




***FOLLOW-ON MAINTENANCE:***

Install NVG Filter (With **17**) (Task 9-125.3).
Perform operational check (TM 55-1520-240-T).

END OF TASK

## 9-131.1 INSTALL MASTER CAUTION PANEL 9-131.1

INITIAL SETUP

***Applicable Configurations:***

With 74

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

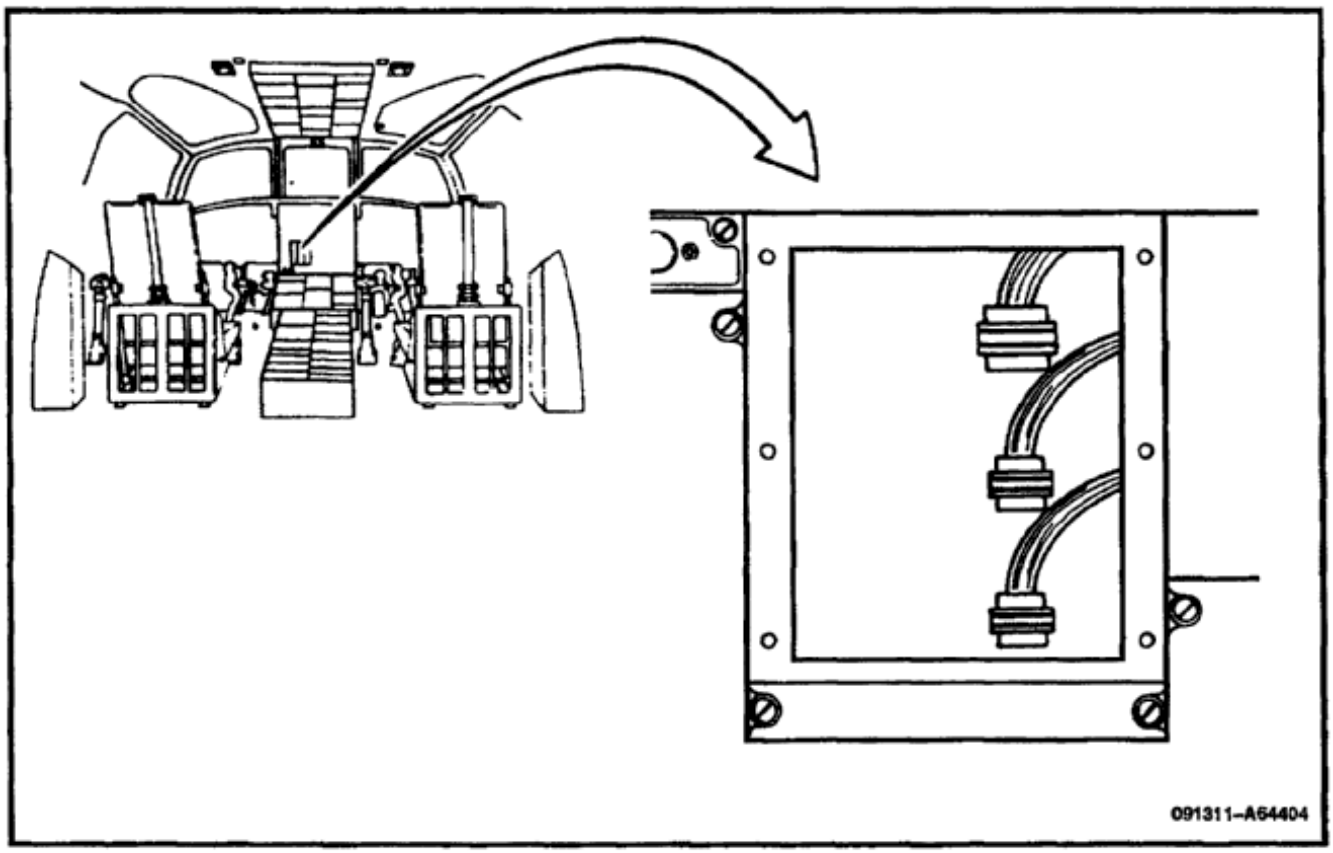
None

***Personnel Required:***

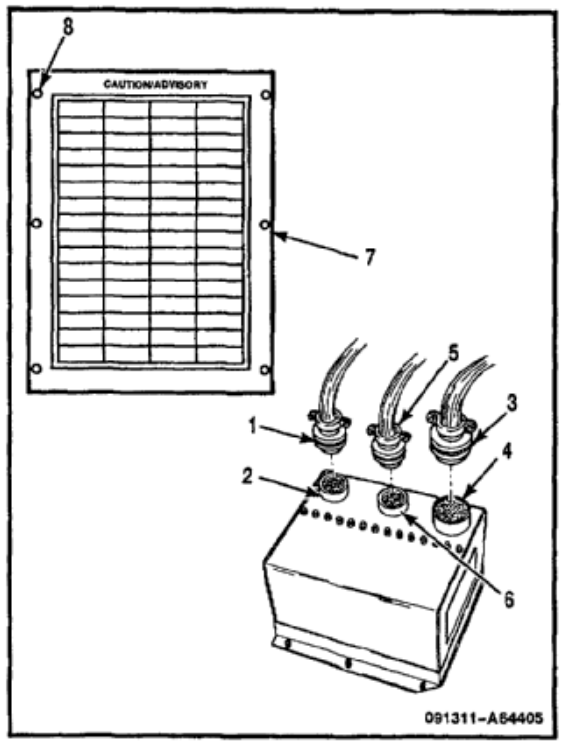
Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P



1. Remove tag and connect plug (1) to receptacle (2).
2. Remove tag and connect plug (3) to receptacle (4).
3. Remove tag and connect plug (5) to receptacle (6).
4. Position panel (7) to center instrument panel.
5. Tighten six fasteners (8).




***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).

END OF TASK

## 9-132 REMOVE CAUTION LIGHTS AND VHF SWITCH PANEL 9-132

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

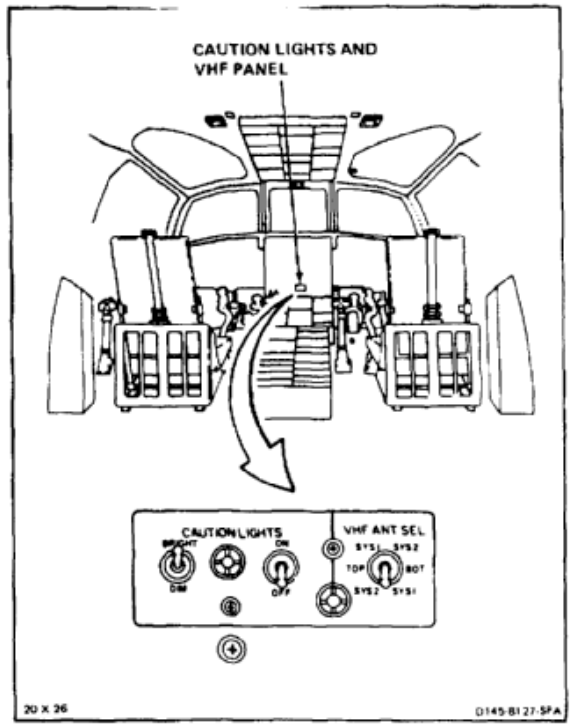
None

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

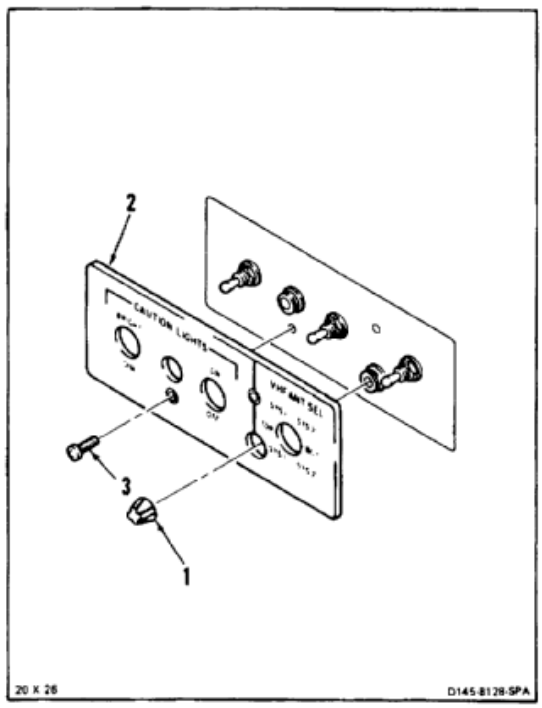
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




1. Remove two caps (1) from panel (2).
2. Remove two screws (3).
3. Remove panel (2).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-133 INSTALL CAUTION LIGHTS AND VHF SWITCH PANEL 9-133

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

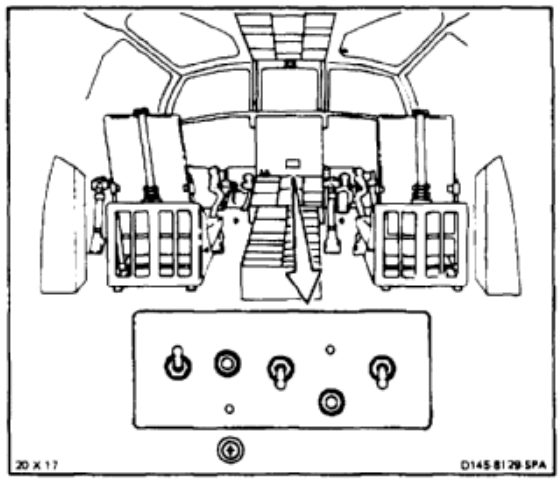
None

***Personnel Required:***

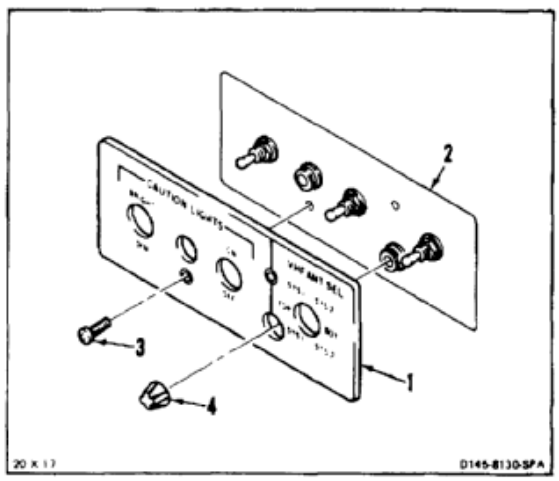
Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P




1. Position panel (1) on panel (2).
2. Install two screws (3).
3. Install two caps (4).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-134 REMOVE PITCH AND ROLL CONTROL STICK GRIP 9-134

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Contact Insertion/Removal Tool, M83723-31-20

***Materials:***

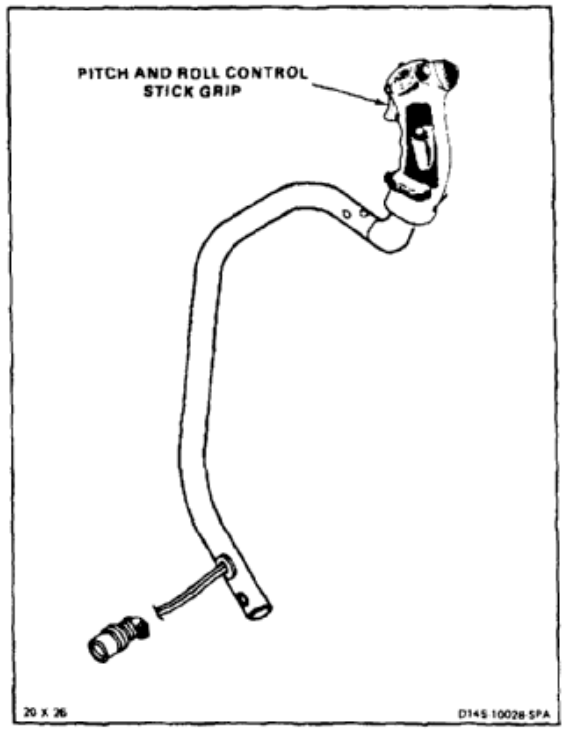
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

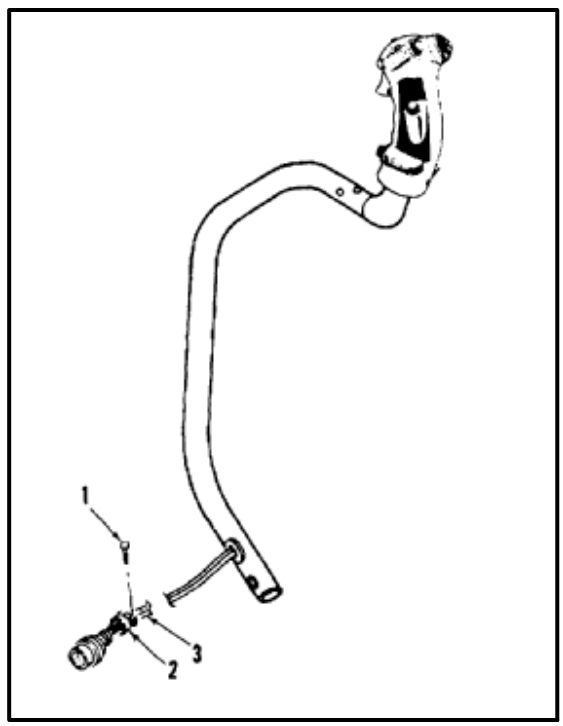
Aircraft Electrician

***Equipment Condition:***

Off Helicopter Task



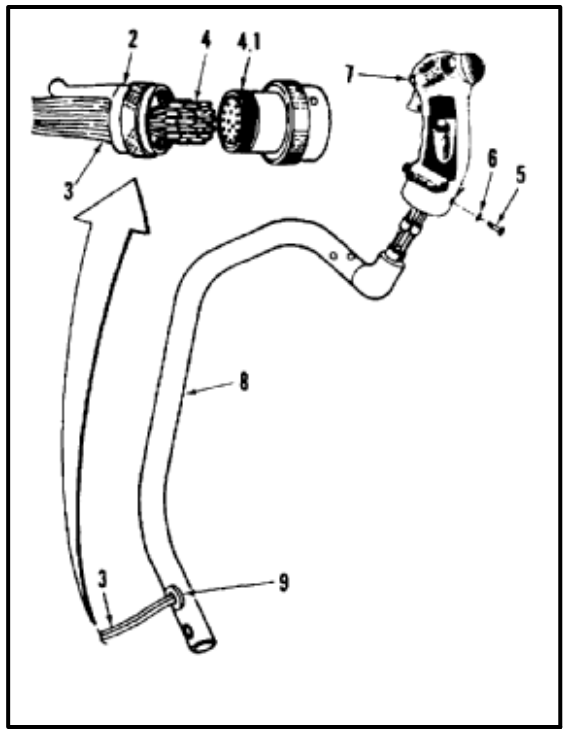

1. Remove two screws (1) from backshell (2). Slide backshell over wires (3).



2. Disconnect and tag 15 contact pins (4) from connector (4.1). Use contact insertion/removal tool. Wrap tape tightly around bundle of contact pins for protection. Use tape (E385).
3. Remove backshell (2) from wires (3).
4. Remove screw (5) and washer (6) from grip (7).
5. Remove grip (7) while feeding 15 wires (3) through tube (8).
6. Remove grommet (9) from tube (8).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-135 DISASSEMBLE PITCH AND ROLL CONTROL STICK GRIP (AVIM) 9-135

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

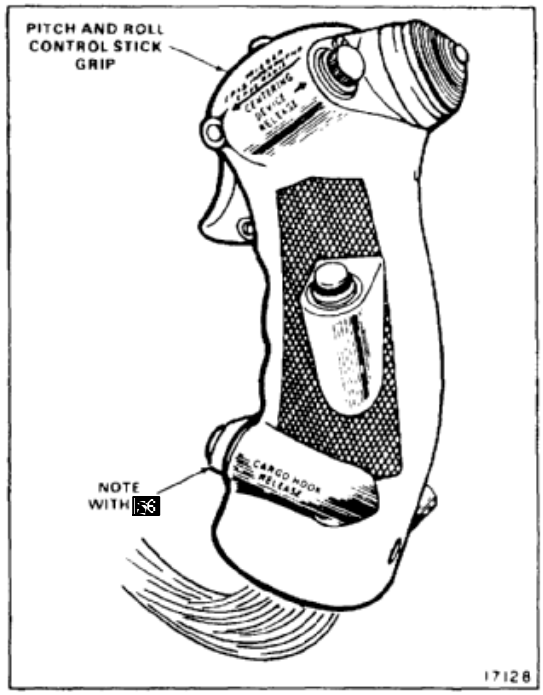
Paper Tags (E264)
Tape (E385)

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

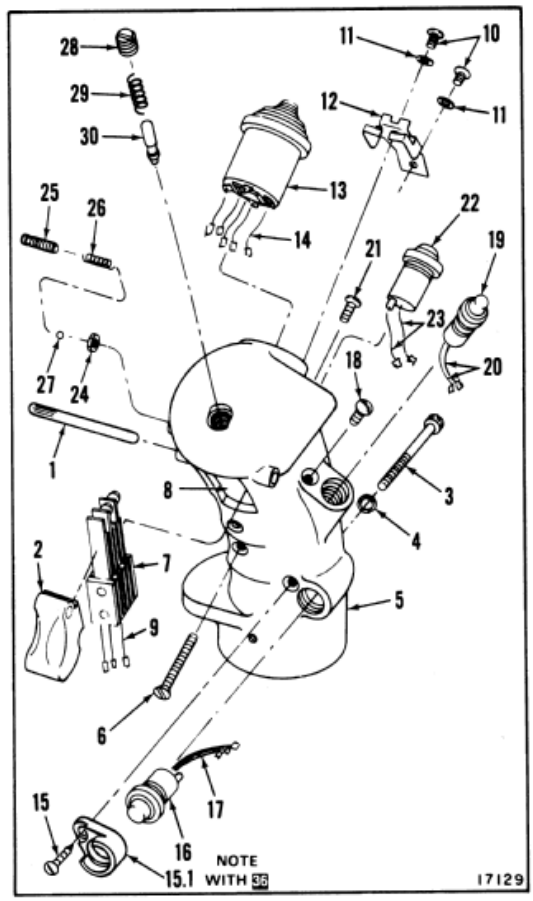
Off Helicopter Task



1. Remove pin (1) from right side of trigger (2). Remove trigger.
2. Remove screw (3) and washer (4) from grip (5).
3. Remove two screws (6). Remove switch (7) through trigger opening (8).
4. Tag and unsolder three wires (9) from switch (7).
5. Remove two screws (10) and washers (11) from bracket (12).
6. Remove bracket (12) and switch (13).
7. Tag and unsolder five wires (14) from switch (13). Tape wire ends.
8. Without 36, remove screws (15) from switch (16). Remove switch.

8.1. With 36, remove screw (15) from switch ring guard (15.1) and switch (16). Remove switch ring guard and switch.

9. Tag and unsolder three wires (17) from switch (16). Tape wire ends.
10. Remove screw (18) from switch (19). Remove switch.
11. Tag and unsolder two wires (20) from switch (19). Tape wire ends.
12. Remove screw (21) from switch (22). Remove switch.
13. Tag and unsolder two wires (23) from switch (22). Tape wire ends.
14. Loosen nut (24). Remove screw (25), spring (26), and ball (27). Remove nut (24).
15. Remove screw cap (28), spring (29), and pin (30).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-136 ASSEMBLE PITCH AND ROLL CONTROL STICK GRIP (AVIM) 9-136

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

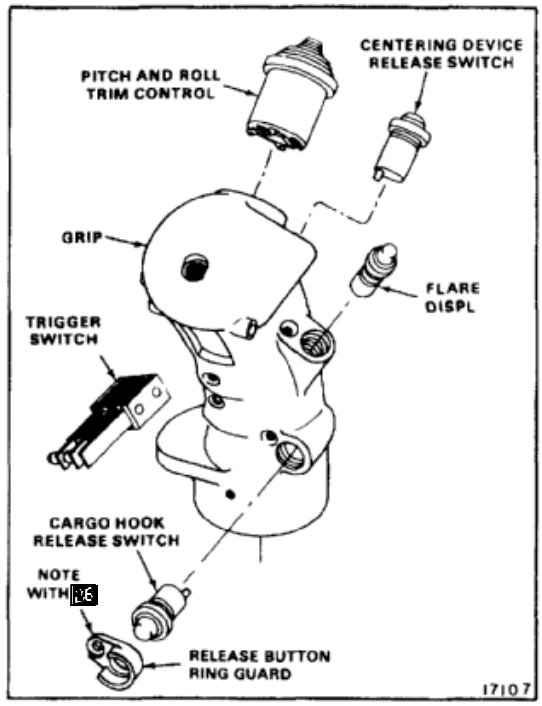
Grease (E189)
Solder (E360)

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P



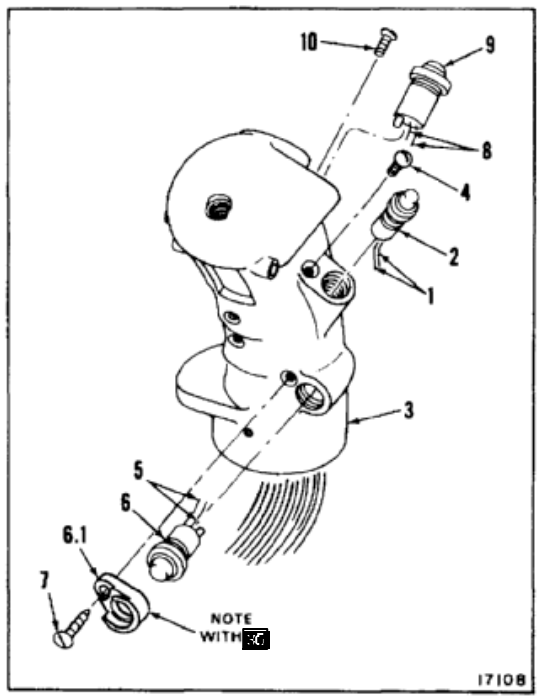

1. Remove tape and solder two wires (1) to switch (2). Remove tags. Use solder (E360).
2. Position switch (2) in grip (3). Install screw (4).
3. Remove tape and solder two wires (5) to switch (6). Remove tags. Use solder (E360).
4. Position switch (6) in grip (3). Install screw (7).

CAUTION

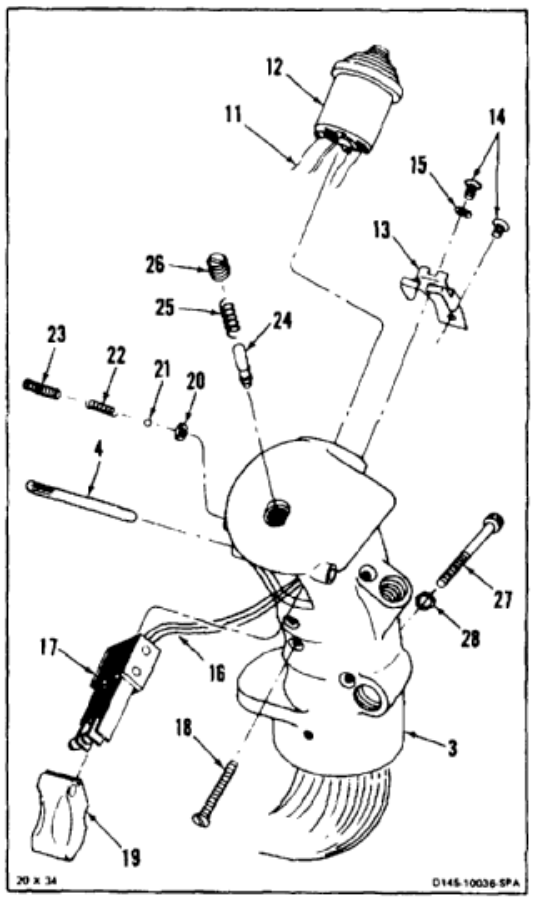
Take care not to overtorque screw (7) and strip thread.

4.1. With 36, position switch button ring guard (6.1) over switch (6). Install screw (7).

5. Remove tape and solder two wires (8) to switch (9). Remove tags. Use solder (E360).
6. Position switch (9) in grip (3). Install screw (10).



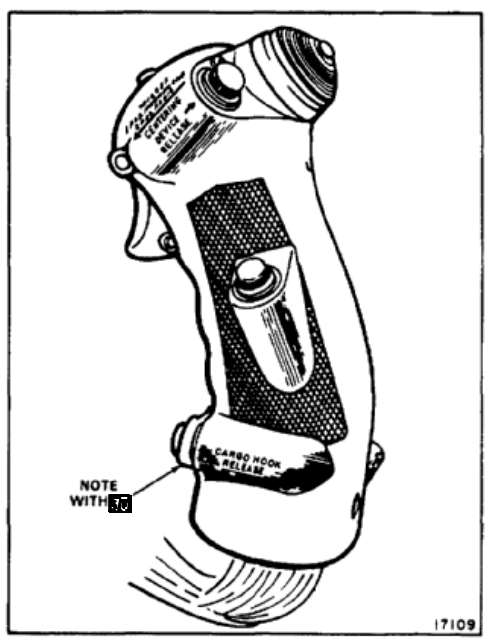
7. Remove tape and solder five wires (11) to switch (12). Remove tags. Use solder (E360).
8. Position switch (12) in grip (3). Install bracket (13), two screws (14), and washers (15).
9. Remove tape and solder three wires (16) to switch (17). Remove tags. Use solder (E360).
10. Position switch (17) in grip (3). Install two screws (18).
11. Position trigger (19) on switch (17). Install pin (4).
12. Install nut (20) loosely on grip (3).
13. Install ball (21), spring (22), and screw (23). Turn screw full clockwise then back out **one and one half turns**. Tighten nut (20).
14. Grease (E189) pin (24). Install pin, spring (25), and nut (26).
15. Install screw (27) and washer (28).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-136.1 TEST PILOT'S OR COPILOT'S PITCH AND ROLL CONTROL STICK GRIP (AVIM) 9-136.1

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Meter, Simpson 260 or Equivalent

***Materials:***

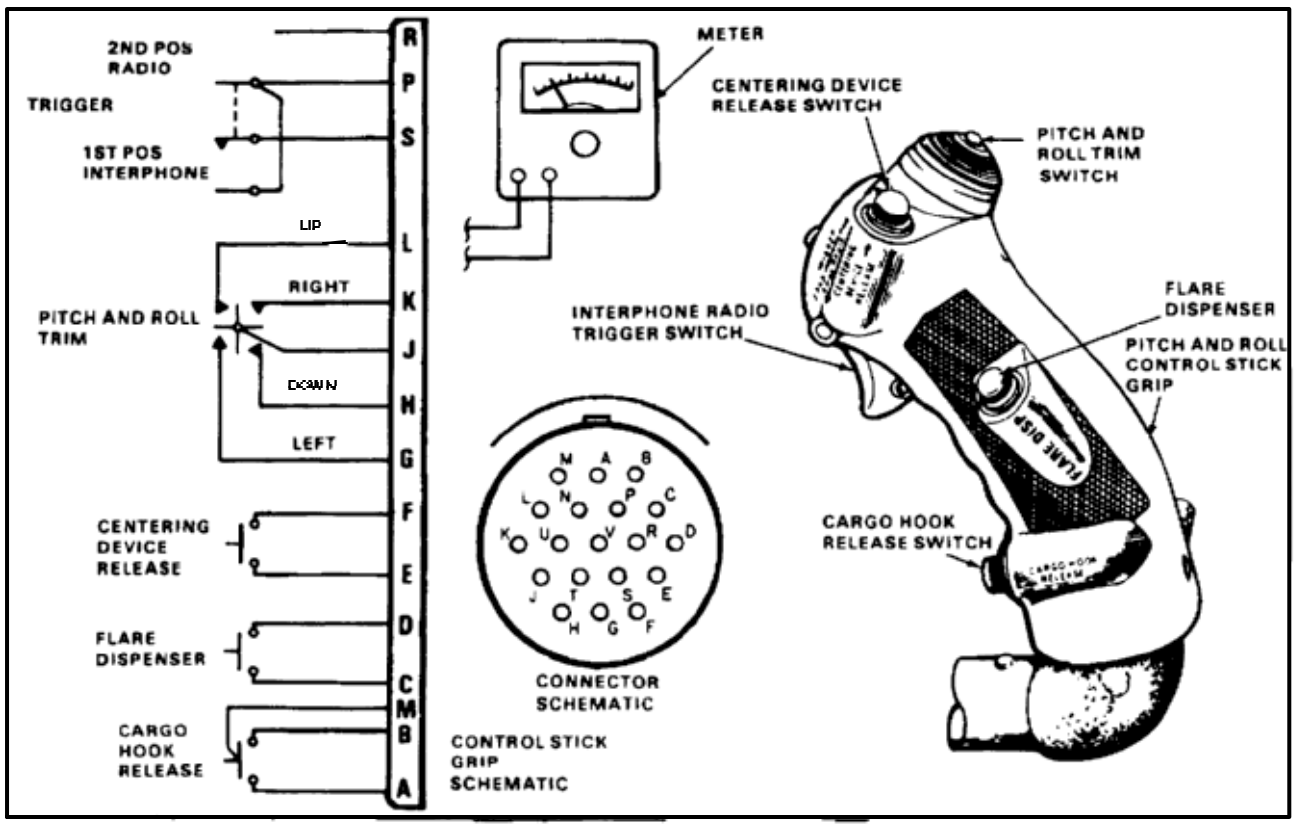
None

***Personnel Required:***

Aircraft Electrician
Inspector

***Equipment Condition:***

Off Helicopter Task



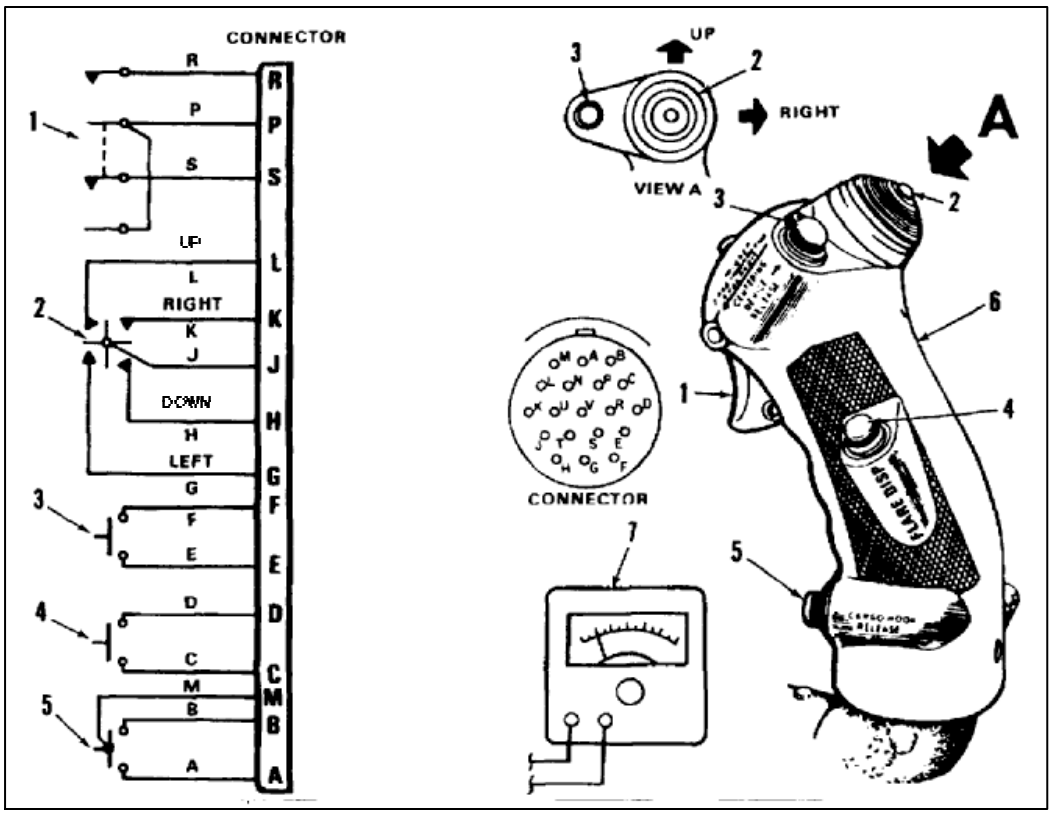
## 9-136.1 TEST PILOT'S OR COPILOT'S PITCH AND ROLL CONTROL STICK GRIP (AVIM) (Continued) 9-136.1

1. Test six switches (1, 2, 3, 4, and 5) of pitch and roll control stick grip (6). Set meter (7) to RX1 and connect meter to wires of grip as listed below. Check meter indication.

**NOTE**

Connector pin letters are listed. Use letters to find wire numbers.

| SWITCH | SWITCH POSITION | CONNECTOR PINS | METER INDICATION |
|---|---|---|---|
| INTERPHONE-RADIO | Released | P and R | None |
| TRIGGER (1) | Released | P and S | None |
| | Pressed to 1ST | P and S | 0 ohm |
| | POS INTER PHONE | P and R | None |
| | Pressed to 2ND | P and S | None |
| | POS RADIO | P and R | 0 ohm |
| PITCH AND ROLL | Released | J and G | None |
| TRIM (2) | Released | J and H | None |
| | Released | J and K | None |
| | Released | J and L | None |
| | Pressed LEFT | J and G | 0 ohm |
| | Pressed UP | J and H | 0 ohm |
| | Pressed RIGHT | J and K | 0 ohm |
| | Pressed DOWN | J and L | 0 ohm |
| CENTERING DEVICE | Released | F and E | None |
| RELEASE (3) | Pressed | F and E | 0 ohm |
| FLARE DISPENSER (4) | Released | D and C | None |
| | Pressed | D and C | 0 ohm |
| CARGO HOOK | Released | M and A | None |
| RELEASE (5) | Released | M and B | None |
| | Pressed | M and A | 0 ohm |
| | Pressed | M and B | 0 ohm |




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-137 INSTALL PITCH AND ROLL CONTROL STICK GRIP 9-137

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Contact Insertion/Removal Tool, M83723-31-20

***Materials:***

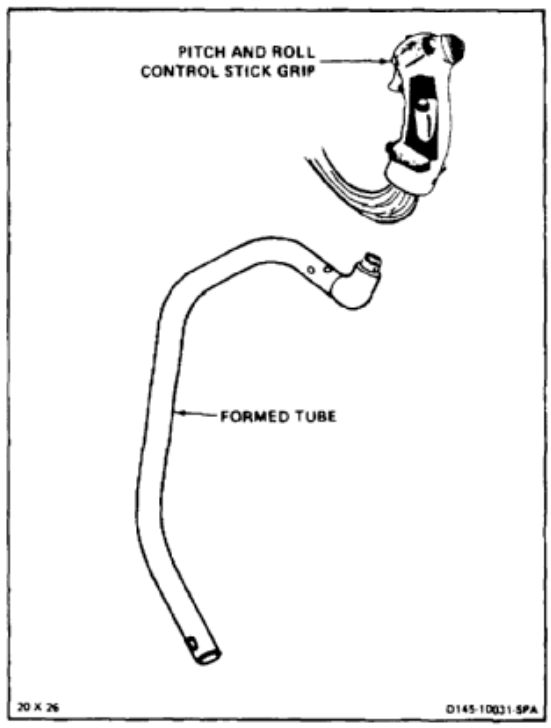
Dry Cleaning Solvent (E162)
Cloths (E120)
Gloves (E186)

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

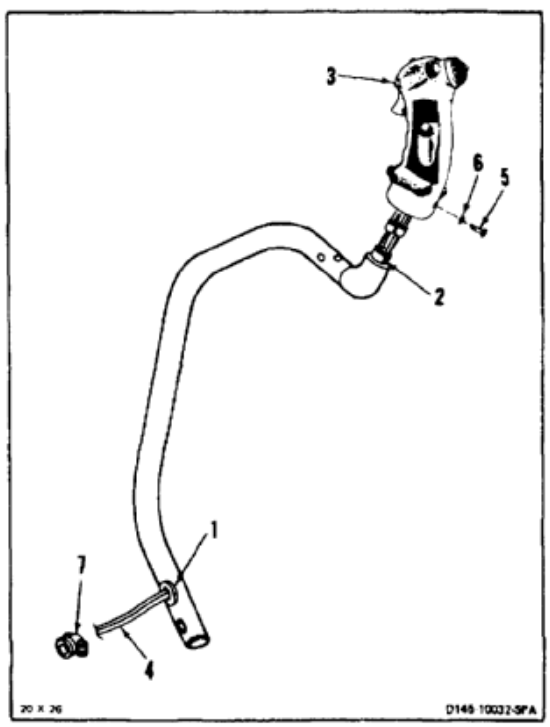
TM 55-1520-240-23P



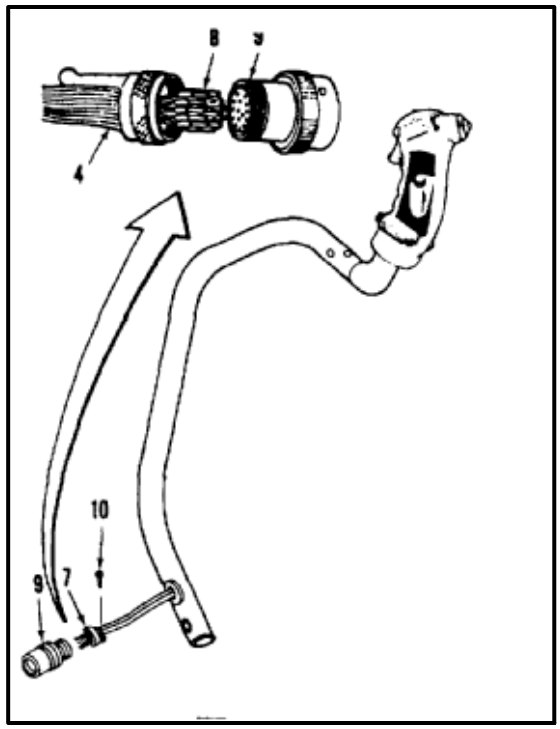

**WARNING**

Dry cleaning solvent (E162) is combustible and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

1. Install grommet (1) in tube (2).
2. Install grip (3) on tube (2) while feeding wires (4) through tube.
3. Install screw (5) and washer (6) in grip (2). Position screw through middle of wires (4).
4. Slide backshell (7) over wires (4).



5. Remove tape from end of wires (4). Clean all contact pins (8) with dry cleaning solvent (E162) and cloth (E120). Wear goggles to protect eyes. Wear gloves (E186).
6. Insert 15 contact pins (8) into plug (9). Use inserter/extractor tool. Match letter on wire to letter on connector.
7. Install backshell (7) on plug (9).
8. Install two screws (10) in backshell (7).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-138 REMOVE THRUST CONTROL GRIP 9-138

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

None

***Materials:***

None

***Personnel Required:***

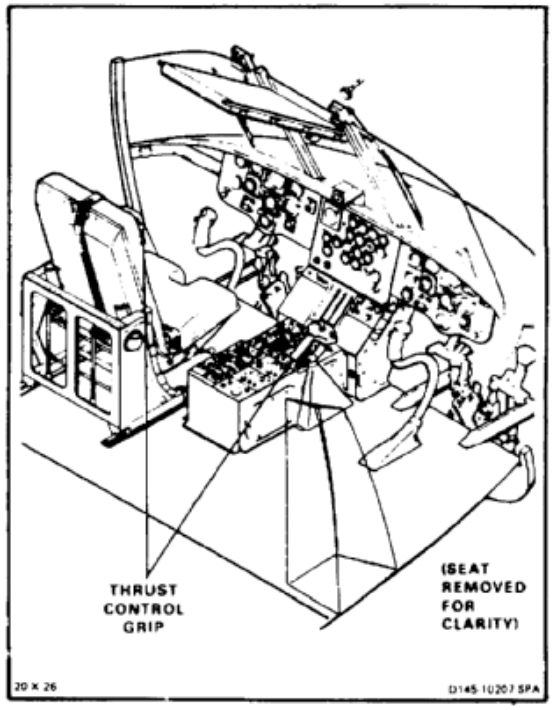
Aircraft Electrician

***References:***

Task 11-61
Task 11-62

***Equipment Condition:***

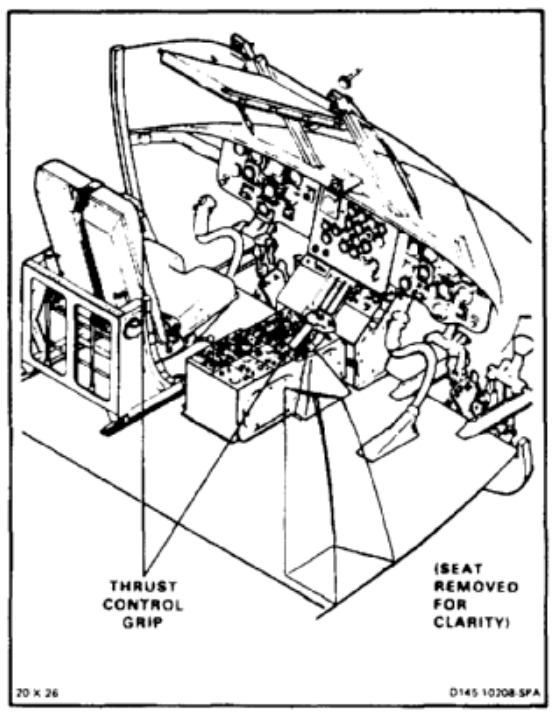
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




1. Remove thrust control (Task 11-61 or 11-62).
2. Remove grip from thrust control.

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-139 DISASSEMBLE THRUST CONTROL GRIP 9-139

INITIAL SETUP

***Applicable Configurations:***

Without 60

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

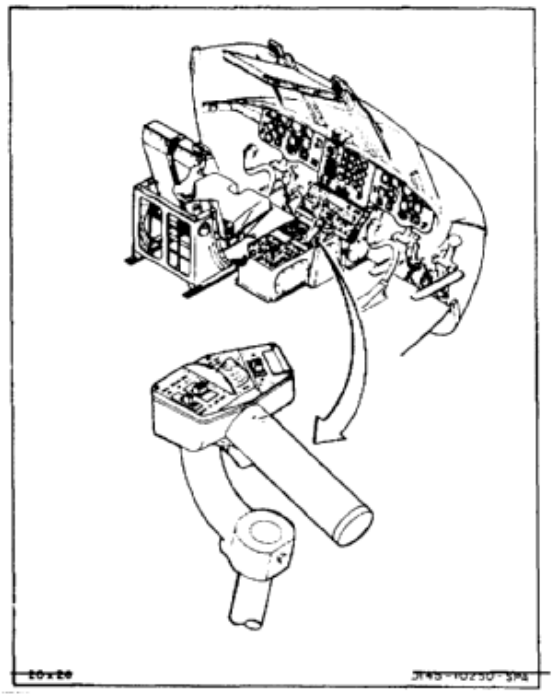
Tape (E385)
Paper Tags (E264)

***Personnel Required:***

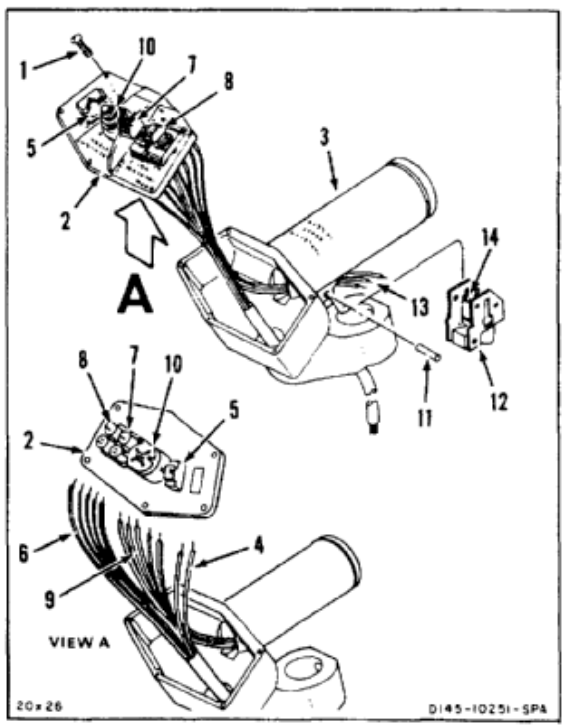
Aircraft Electrician

***Equipment Condition:***

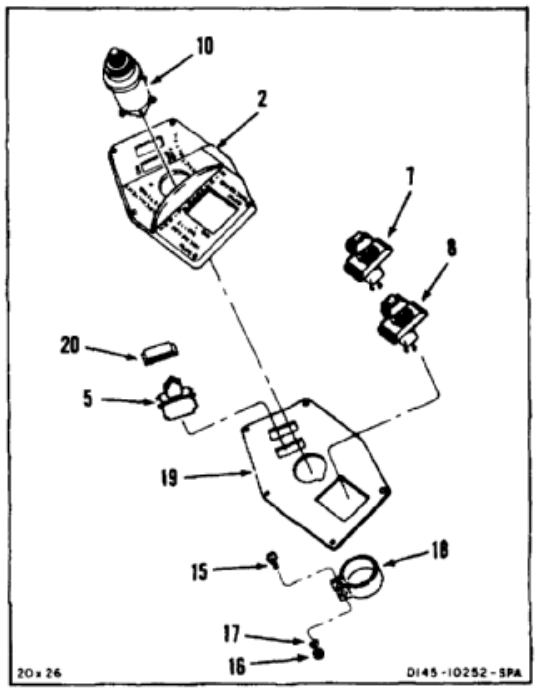
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off



1. Remove five screws (1). Remove switch panel (2) from grip (3).
2. Tag and unsolder two wires (4) from switch (5). Tape ends (E385).
3. Tag and unsolder five wires (6) from switches (7 and 8). Tape ends (E385).
4. Tag and unsolder five wires (9) from switch (10). Tape ends (E385).
5. Remove switch panel (2).
6. Remove pin (11) and switch assembly (12) from grip (3).
7. Tag and unsolder three wires (13) from switch (14). Tape ends (E385).



8. Remove screw (15), nut (16), washer (17), and switch mounting clamp (18).
9. Remove switch (10) from switch panel (2).
10. Remove switch retaining plate (19) from switch panel (2).
11. Remove switches (5, 7, and 8), and panel insert (20) from retaining plate (19).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-140 ASSEMBLE THRUST CONTROL GRIP 9-140

INITIAL SETUP

***Applicable Configurations:***

Without 60

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

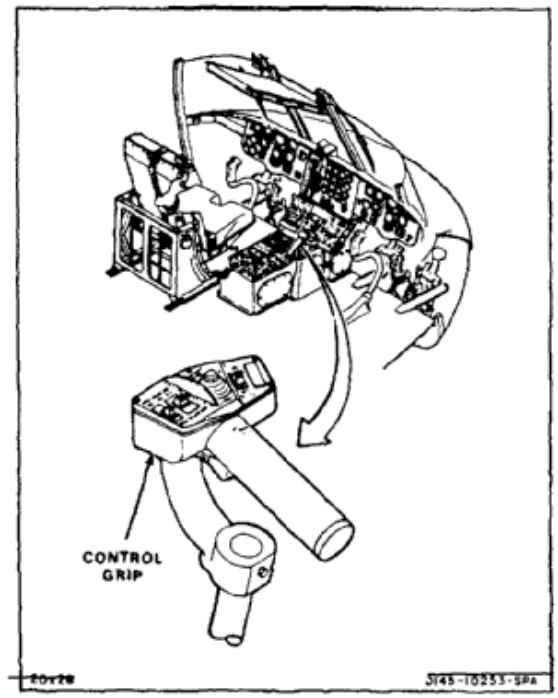
Solder (E360)
Varnish (E435)
Gloves (E186)

***Personnel Required:***

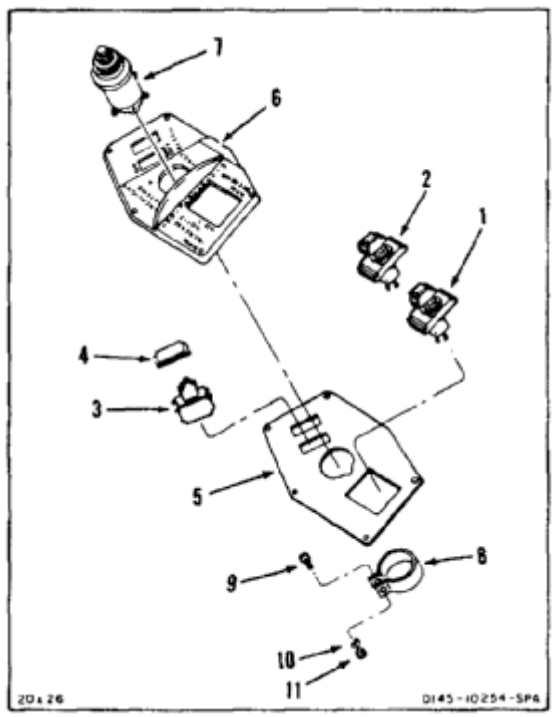
Aircraft Electrician
Inspector

***References:***

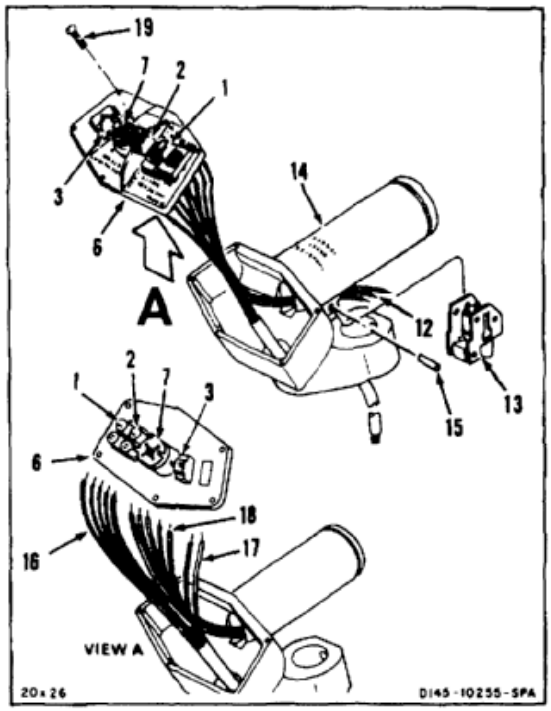
TM 55-1520-240-23P




1. Position switches (1, 2, and 3) and insert (4) on switch retaining plate (5).
2. Position retaining plate (5) with switches (1, 2, and 3) and insert (4) on switch panel (6).
3. Push switch (7) through panel (6) and install clamp (8), screw (9), washer (10), and nut (11).



4. Remove tape, solder three wires (12) to switch (13). Use solder (360). Remove tags.
5. Position switch (13) in thrust control grip (14). Install pin (15).
6. Remove tape. Solder five wires (16) to switches (1 and 2). Use solder (E360). Remove tags.
7. Remove tape, solder two wires (17) to switch (3). Use solder (E360). Remove tags.
8. Remove tape. Solder five wires (18) to switch (7). Use solder (E360). Remove tags.




**WARNING**

Varnish (E435) is flammable and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from heat or open flame. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

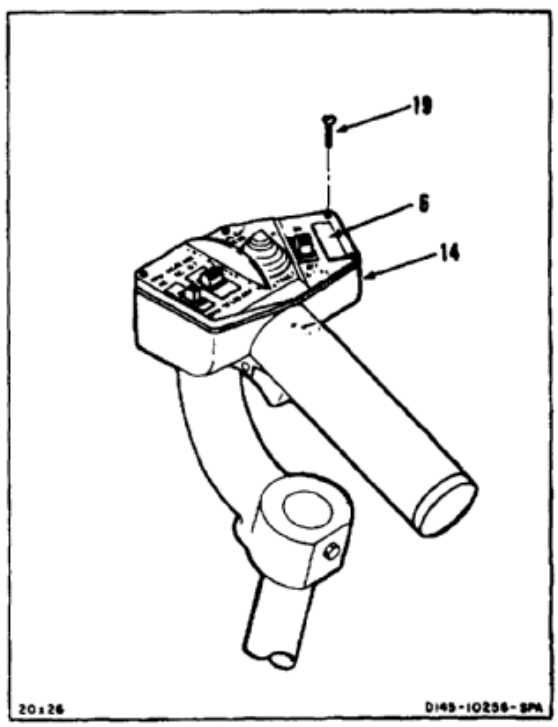
9. Apply varnish (E435) to all soldered joints. Wear gloves (E186).

***INSPECT***

10. Position panel (6) on grip (14). Install five screws (19).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-140.1 TEST THRUST CONTROL GRIP 9-140.1

INITIAL SETUP

***Applicable Configurations:***

Without 60 and 74

***Tools:***

Multimeter, Simpson 260 or Equivalent

***Materials:***

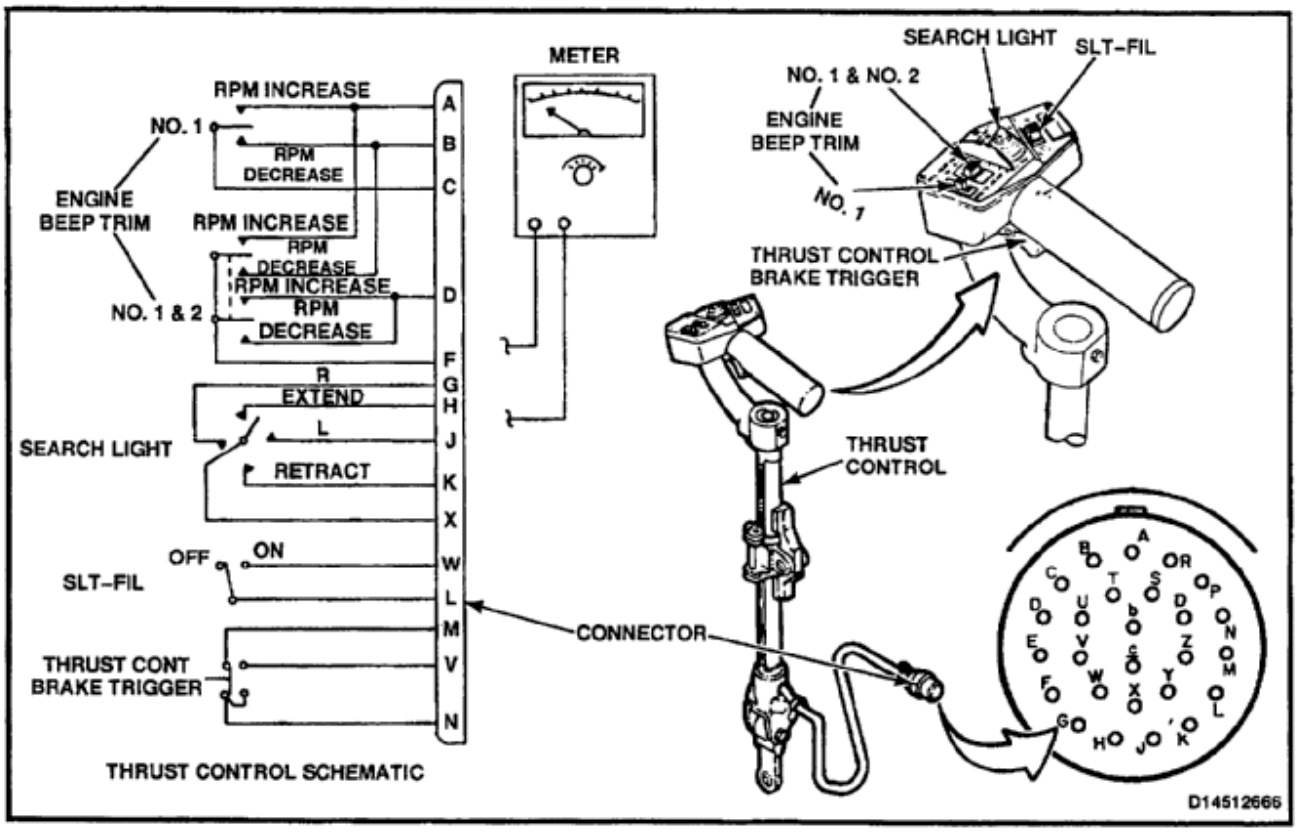
None

***Personnel Required:***

Aircraft Electrician
Inspector

***Equipment Condition:***

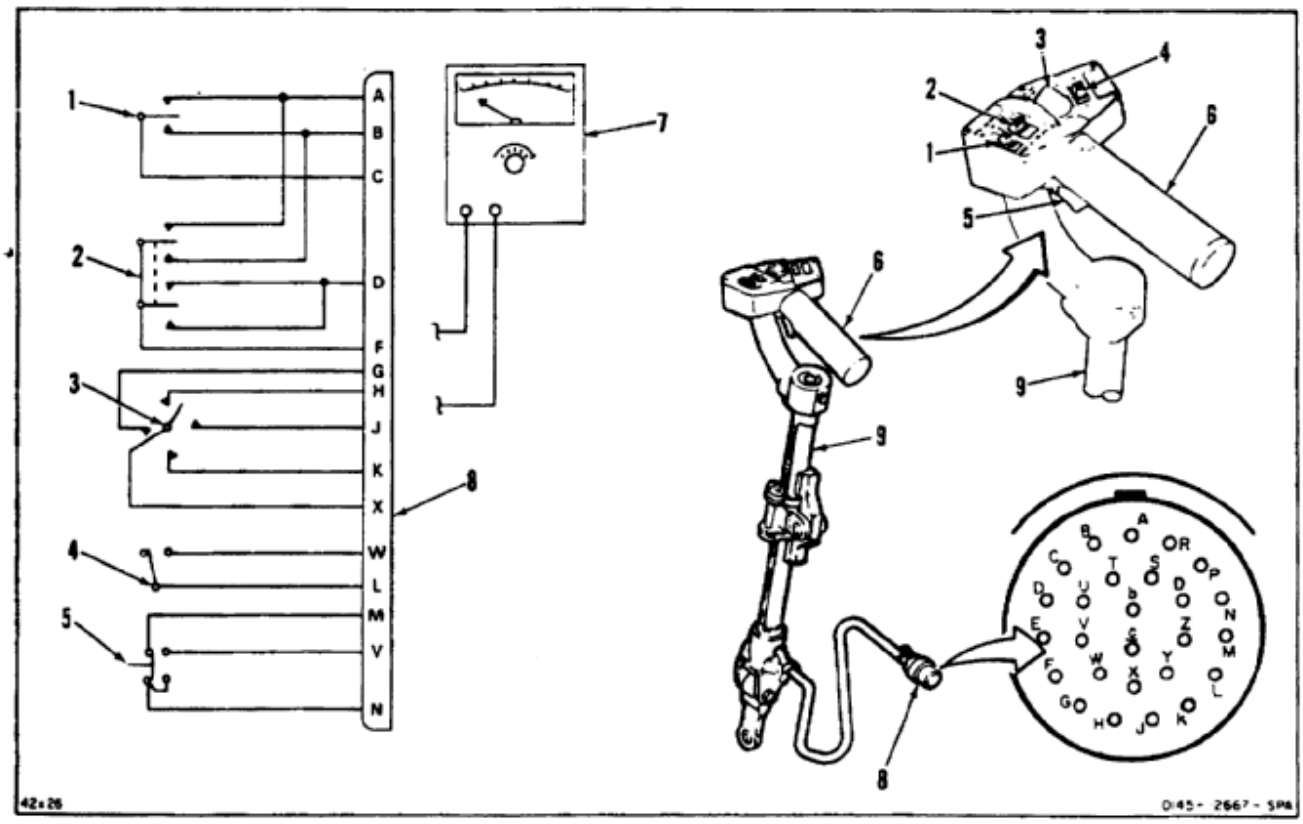
Off Helicopter Task



1. Test five switches (1, 2, 3, 4, and 5) of thrust control grip (6). Set meter (7) to RX1 and connect meter to pins of connector (8) listed below. Check meter indication.
2. Connect meter (7) between pin A and shaft (9). Check meter indication. There shall be no indication.
3. Repeat step 2 for pins B, C, D, F, G, H, J, K, X, W, L, M, V, and N.

| SWITCH | SWITCH POSITION | CONNECTOR PINS | METER INDICATION |
|---|---|---|---|
| ENGINE BEEP TRIM NO. 1 (1) | RPM INCREASE | A and C | 0 ohm |
| | RPM DECREASE | B and C | 0 ohm |
| | Center | A and C then B and C | Inf |
| ENGINE BEEP TRIM NO. 1 & NO. 2 (2) | RPM INCREASE | F and A then F and D | 0 ohm |
| | RPM DECREASE | F and B then F and D | 0 ohm |
| SEARCH LIGHT (3) | EXTEND | X and H | 0 ohm |
| | RETRACT | X and K | 0 ohm |
| | L | X and J | 0 ohm |
| | R | X and G | 0 ohm |
| | Center | X and G, then X and H, then X and J, than X and K | Inf |
| SLT-FIL (4) | ON | L and W | 0 ohm |
| | OFF | L and W | Inf |
| THRUST CONT BRAKE TRIGGER (5) | Released | M and N | 0 ohm |
| | Released | N and V | Inf |
| | Pressed | N and V | 0 ohm |
| | Pressed | N and M | Inf |

***INSPECT***




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-140.2 DISASSEMBLE THRUST CONTROL GRIP 9-140.2

INITIAL SETUP

***Applicable Configurations:***

With 60

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

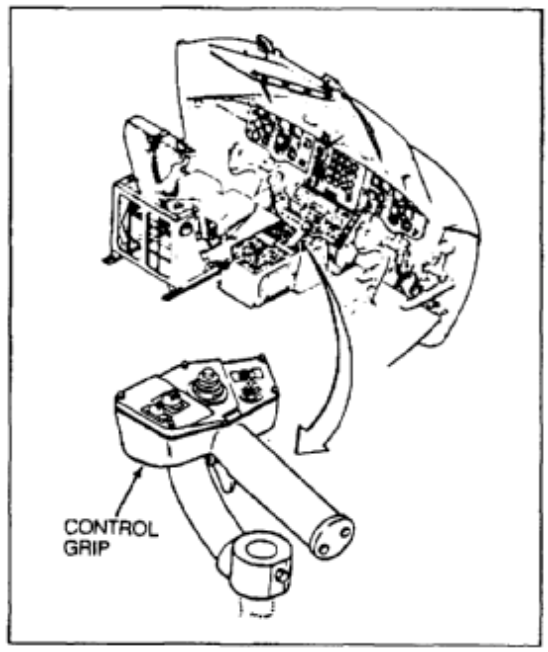
Tape (E385)
Paper Tags (E264)

***Personnel Required:***

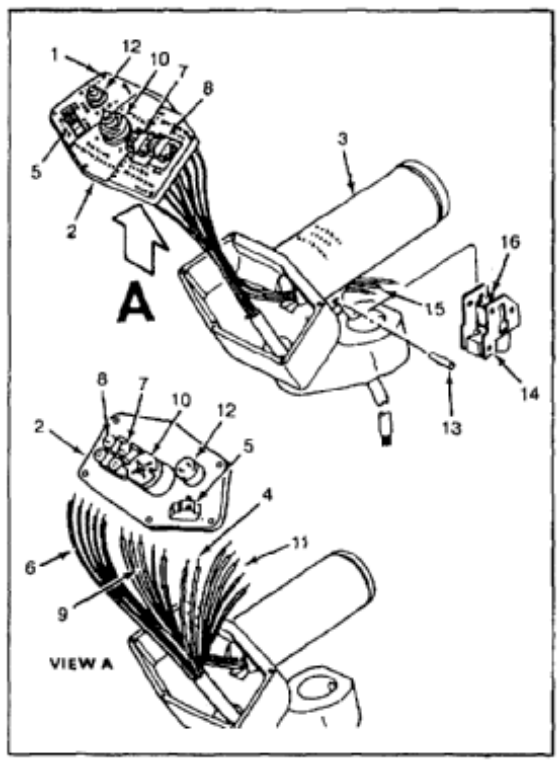
Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off



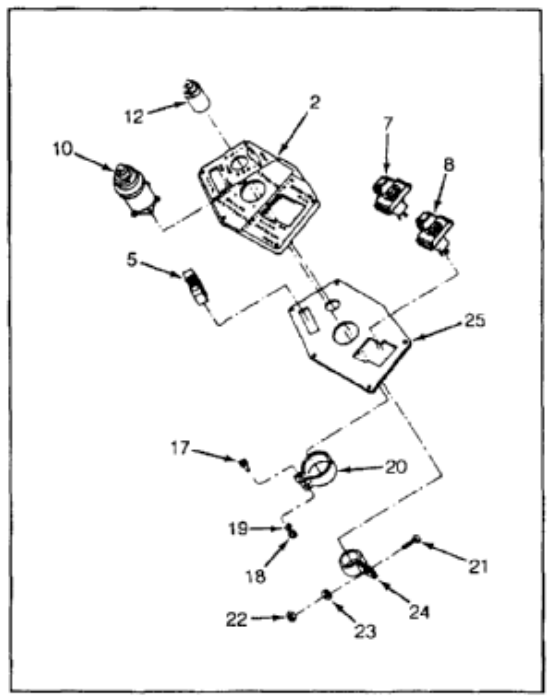

1. Remove five screws (1). Remove switch panel (2) from grip (3).
2. Tag and unsolder two wires (4) from switch (5). Tape ends (E385).
3. Tag and unsolder five wires (6) from switches (7 and 8). Tape ends (E385).
4. Tag and unsolder five wires (9) from switch (10). Tape ends (E385).
5. Tag and unsolder five wires (11) from switch (12). Tape ends (E385).
6. Remove switch panel (2).
7. Remove pin (13) and switch assembly (14) from grip (3).
8. Tag and unsolder three wires (15) from switch (16). Tape ends.



9. Remove screw (17), nut (18), washer (19), and switch mounting clamp (20).
10. Remove switch (10) from switch panel (2).
11. Remove screw (21), nut (22), washer (23), and switch mounting clamp (24).
12. Remove switch (12) from switch panel (2).
13. Remove switch retaining plate (25) from switch panel (2).
14. Remove switches (5, 7, and 8) from retaining plate (25).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-140.3 ASSEMBLE THRUST CONTROL GRIP 9-140.3

INITIAL SETUP

***Applicable Configurations:***

With 60

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

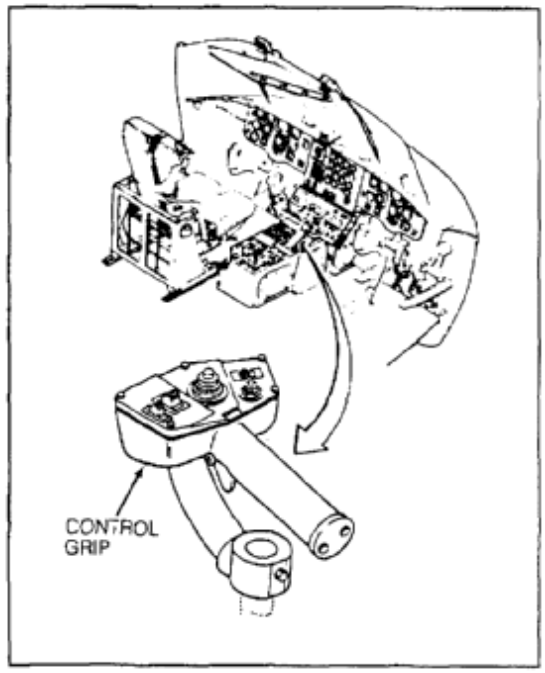
Solder (E360)
Varnish (E435)
Gloves (E186)

***Personnel Required:***

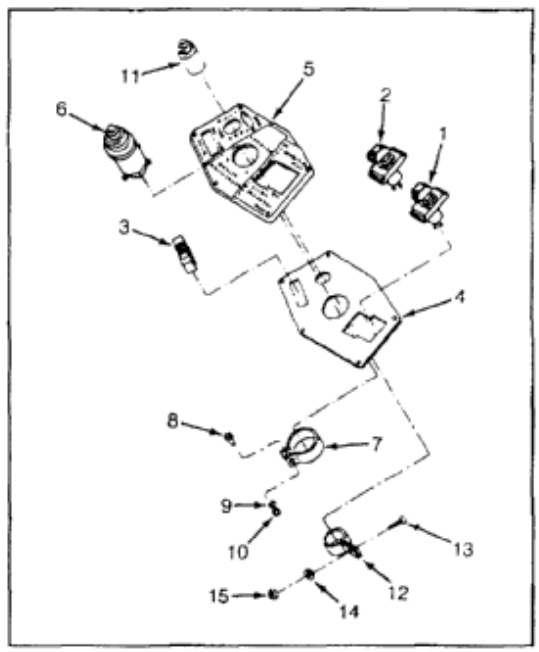
Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P




1. Position switches (1, 2, and 3) on switch retaining plate (4).
2. Position retaining plate (4) with switches (1, 2, and 3) on switch panel (5).
3. Push switch (6) through switch panel (5) and install clamp (7), with screw (8), washer (9), and nut (10).
4. Push switch (11) through panel (5) and install clamp (12), with screw (13), washer (14), and nut (15).



5. Remove tape, solder three wires (16) to switch (17). Use solder (E360). Remove tags.
6. Position switch assembly (18) in thrust control grip (19). Install pin (20).
7. Remove tape, solder five wires (21) to switches (1 and 2). Use solder (E360). Remove tags.
8. Remove tape, solder two wires (22) to switch (3). Use solder (E360). Remove tags.
9. Remove tape, solder five wires (23) to switch (6). Use solder (E360). Remove tags.
10. Remove tape, solder five wires (24) to switch (11). Use solder (E360). Remove tags.

**WARNING**

Varnish (E435) is flammable and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from heat or open flame. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

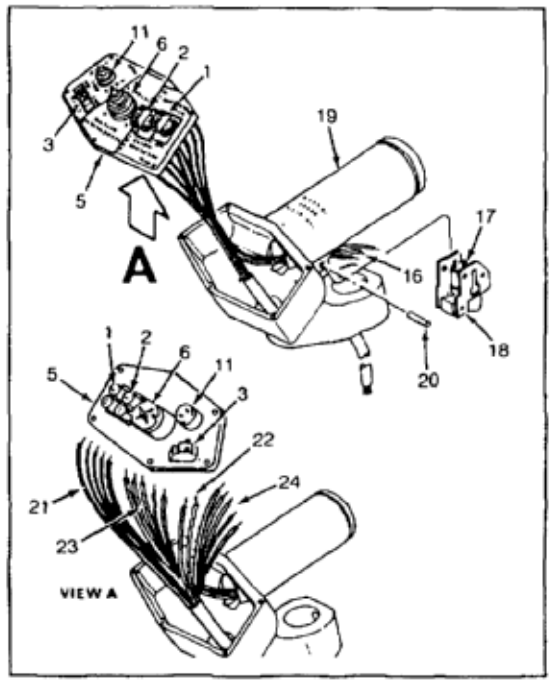
11. Apply varnish (E435) to all soldered joints. Wear gloves (E186).

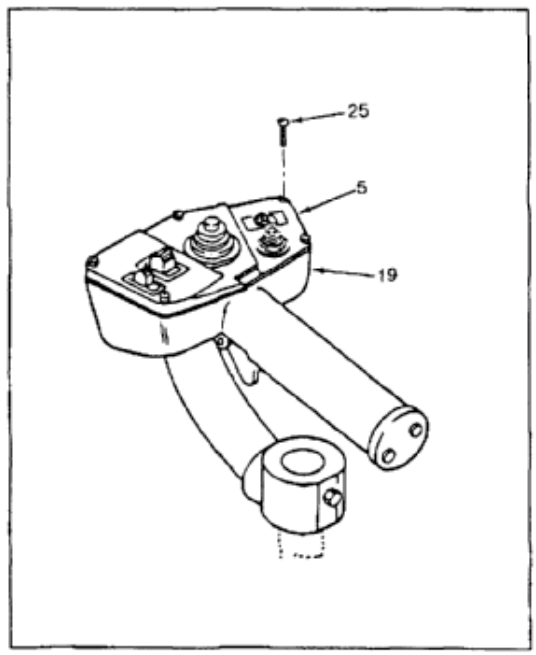
***INSPECT***

12. Position switch panel (5) on grip (19). Install five screws (25).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-140.4 TEST THRUST CONTROL GRIP 9-140.4

INITIAL SETUP

***Applicable Configurations:***

With 60 and Without 74

***Tools:***

Meter, Simpson 260 or Equivalent

***Materials:***

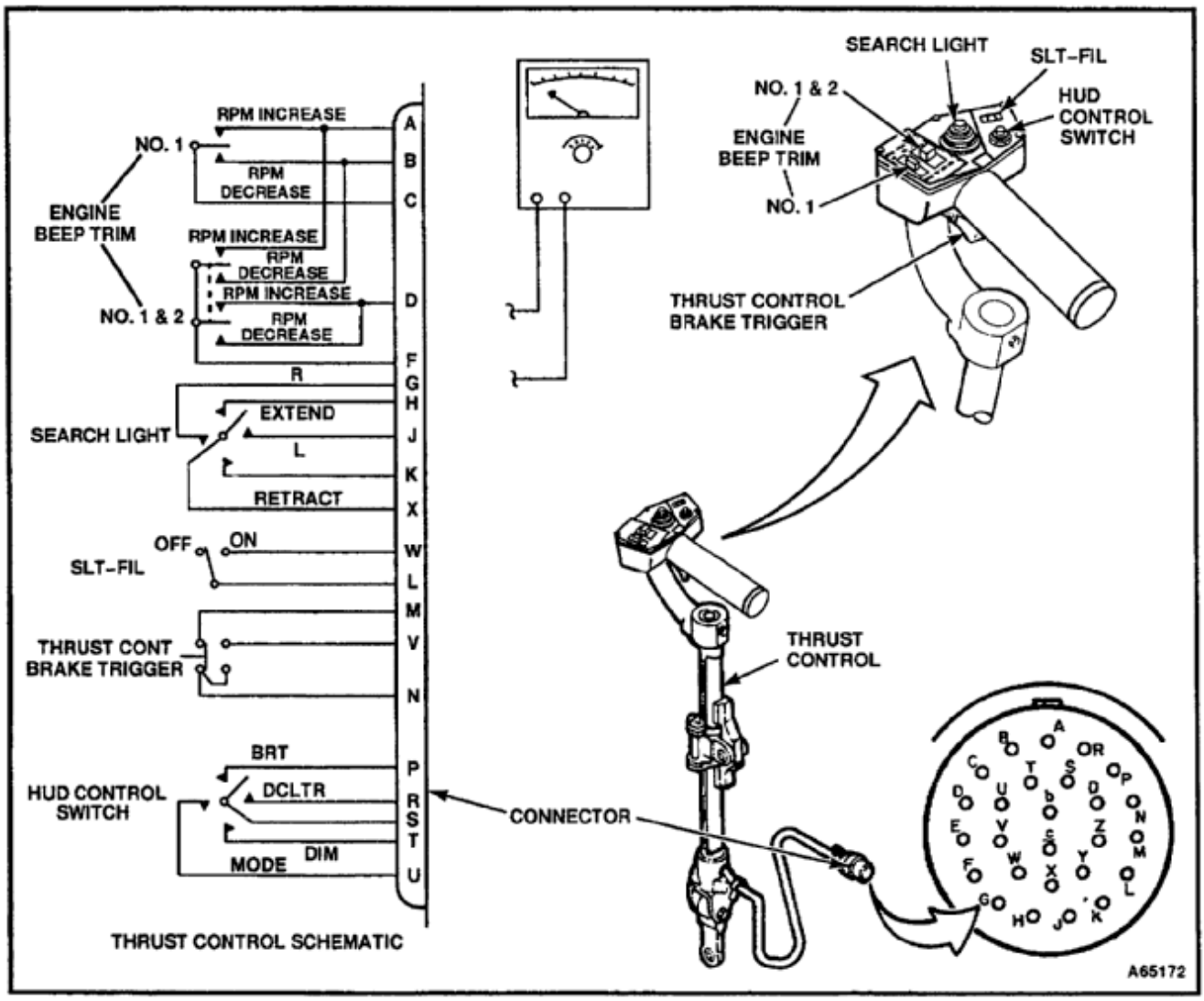
None

***Personnel Required:***

Aircraft Electrician
Inspector

***Equipment Condition:***

Off Helicopter Task

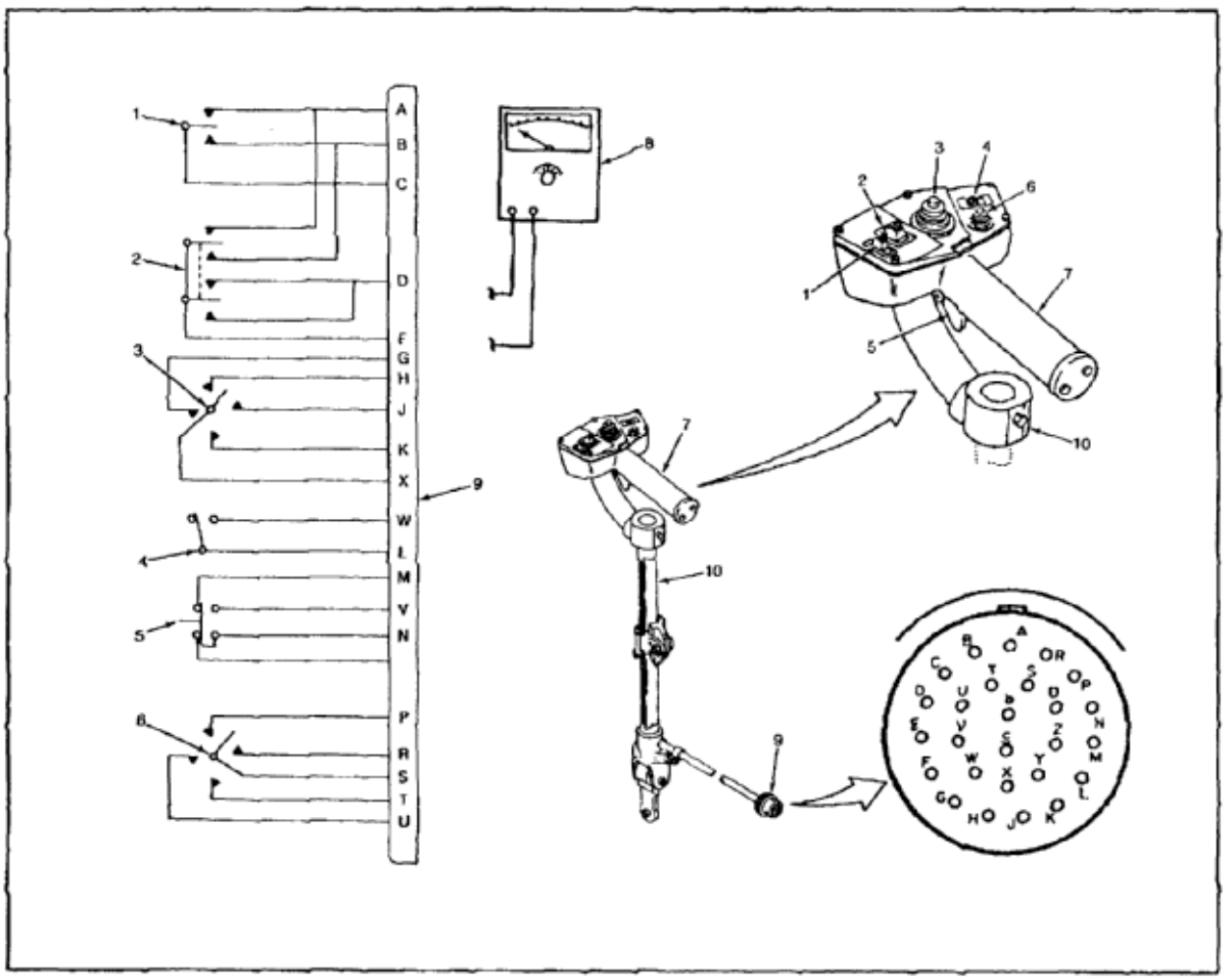


## 9-140.4 TEST THRUST CONTROL GRIP (Continued) 9-140.4

1. Test six switches (1,2, 3, 4, 5, and 6) of thrust control grip (7). Set meter (8) to RX1 and connect meter to pins of connector (9) listed below. Check meter indication.
2. Connect meter (8) between pin A and shaft (10). Check meter indication. There shall be no indication.
3. Repeat step 2 for pins B, C, D, F, G, H, J, K, X, W, L, M, N, P, R, S, T, and U.

| SWITCH | SWITCH POSITION | CONNECTOR PIN | METER INDICATION |
|---|---|---|---|
| ENGINE BEEP TRIM NO. 1 (1) | RPM INCREASE | A and C | 0 ohm |
| | RPM DECREASE | B and C | 0 ohm |
| | Center | A and C then B and C | None |
| ENGINE BEEP TRIM NO. 1 & No. 2 (2) | RPM INCREASE | F and A then F and D | 0 ohm |
| | RPM DECREASE | F and B then F and D | 0 ohm |
| SEARCH LIGHT (3) | EXTEND | X and H | 0 ohm |
| | RETRACT | X and K | 0 ohm |
| | L | X and J | 0 ohm |
| | R | X and G | 0 ohm |
| | Center | X and G, then X and H, then X and J, then X and K | None |
| SLT-FIL (4) | ON | L and W | 0 ohm |
| | OFF | L and W | None |
| THRUST CONT BRAKE TRIGGER (5) | Released | M and N | 0 ohm |
| | Released | N and V | None |
| | Pressed | N and V | 0 ohm |
| | Pressed | N and M | None |
| HUD CONTROL SWITCH (6) | BRT | P and S | 0 ohm |
| | DCLTR | R and S | 0 ohm |
| | DIM | T and S | 0 ohm |
| | MODE | U and S | 0 ohm |
| | Center | P and S, the R and S, then T and S, then U and S | 0 ohm |

***INSPECT***




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-140.5 TEST THRUST CONTROL GRIP 9-140.5

INITIAL SETUP

***Applicable Configurations:***

Without 60 and With 74

***Tools:***

Multimeter, Simpson 260 or Equivalent

***Materials:***

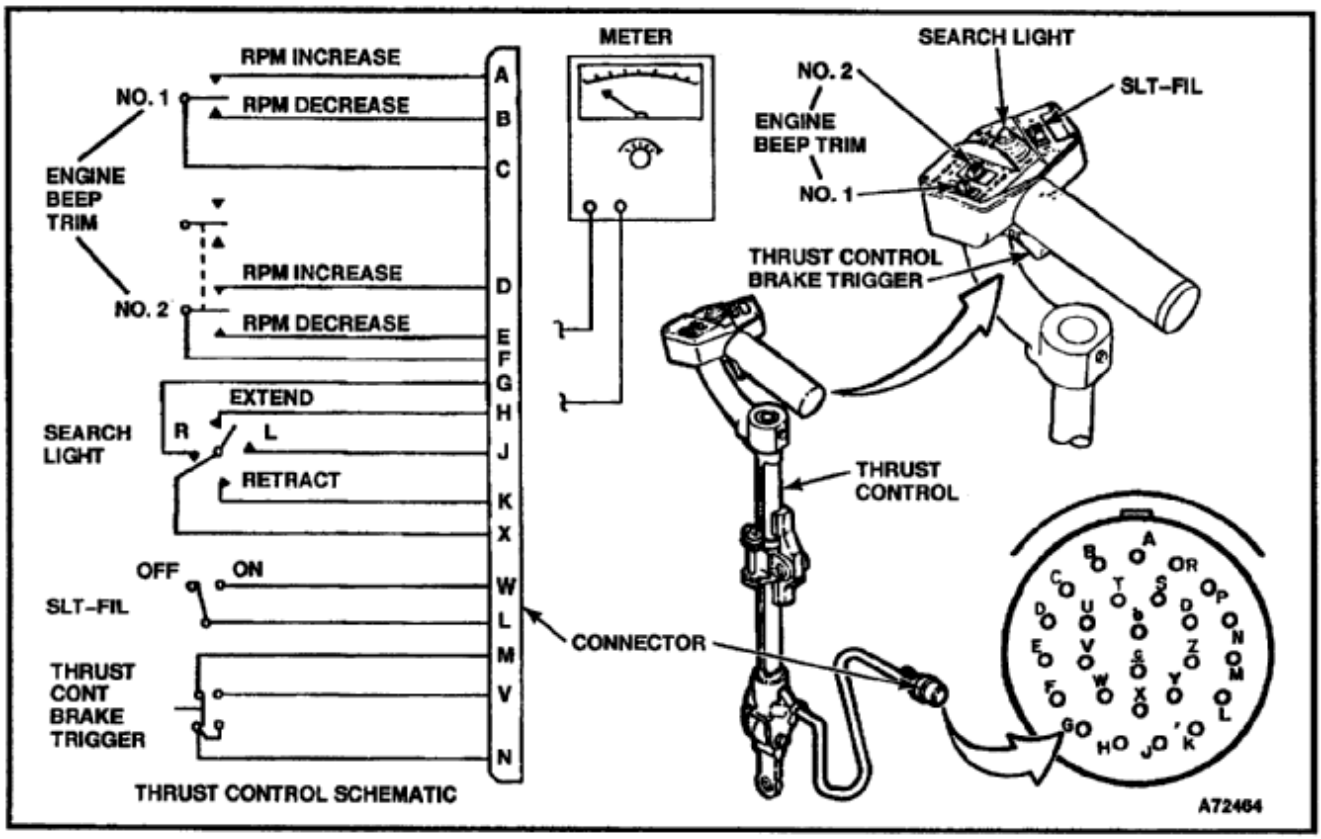
None

***Personnel Required:***

Aircraft Electrician
Inspector

***Equipment Condition:***

Off Helicopter Task

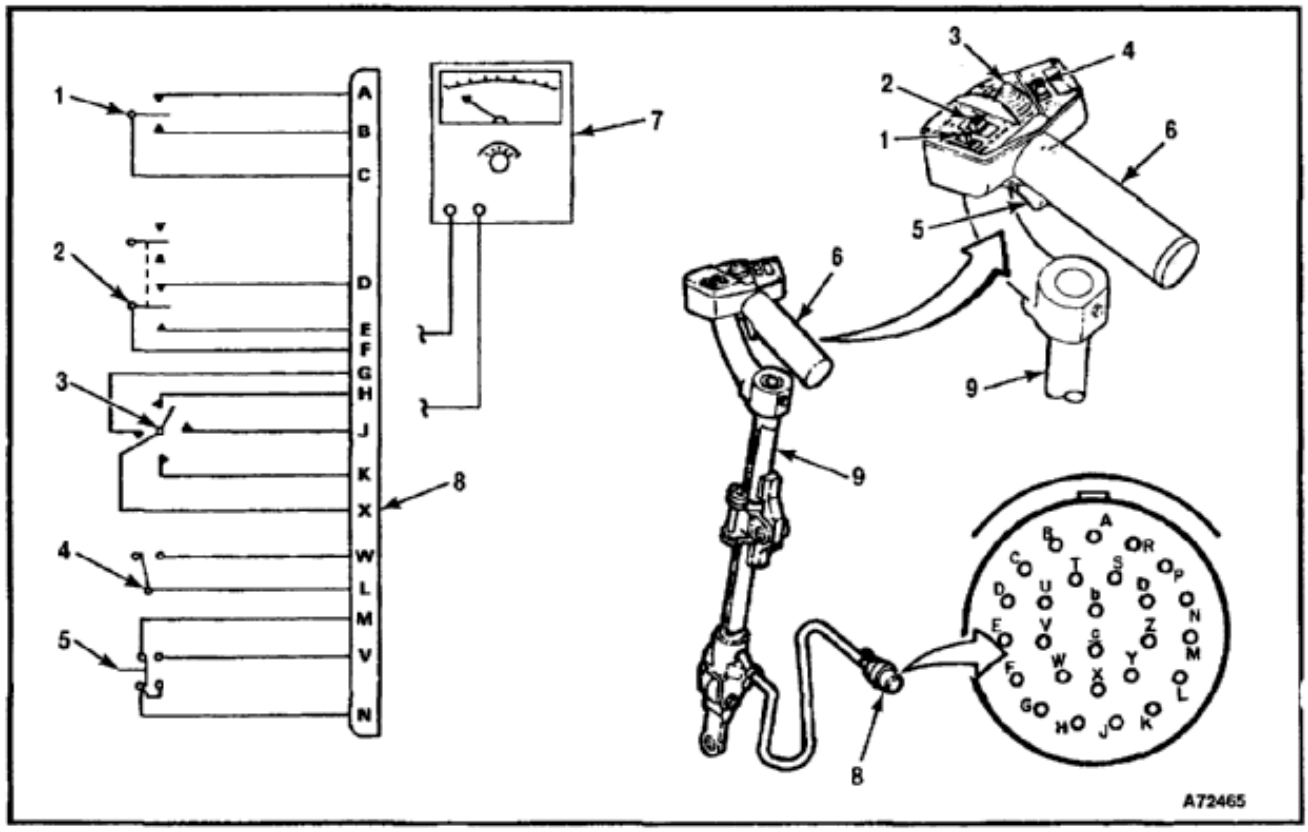


## 9-140.5 TEST THRUST CONTROL GRIP (Continued) 9-140.5

1. Test five switches (1, 2, 3, 4, and 5) of thrust control grip (6). Set meter (7) to RX1 and connect meter to pins of connector (8) listed below. Check meter indication.
2. Connect meter (7) between pin A and shaft (9). Check meter indication. There shall be no indication.
3. Repeat step 2 for pins B, C, D, E, F, G, H, J, K, X, W, L, M, V, and N.

| SWITCH | SWITCH POSITION | CONNECTOR PINS | METER INDICATION |
|---|---|---|---|
| ENGINE BEEP TRIM NO. 1 (1) | RPM INCREASE | A and C | 0 ohm |
| | RPM DECREASE | B and C | 0 ohm |
| | Center | A and C then B and C | Inf |
| ENGINE BEEP TRIM NO. 2 (2) | RPM INCREASE | F and D | 0 ohm |
| | RPM DECREASE | F and E | 0 ohm |
| SEARCH LIGHT (3) | EXTEND | X and H | 0 ohm |
| | RETRACT | X and K | 0 ohm |
| | L | X and J | 0 ohm |
| | R | X and G | 0 ohm |
| | Center | X and G, then X and H, then X and J, then X and K | Inf |
| SLT-FIL (4) | ON | L and W | 0 ohm |
| | OFF | L and W | Inf |
| THRUST CONT BRAKE TRIGGER (5) | Released | M and N | 0 ohm |
| | Released | N and V | Inf |
| | Pressed | N and V | 0 ohm |
| | Pressed | N and M | Inf |

***INSPECT***




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-140.6 TEST THRUST CONTROL GRIP 9-140.6

INITIAL SETUP

***Applicable Configurations:***

With 60 and 74

***Tools:***

Meter, Simpson 260 or Equivalent

***Materials:***

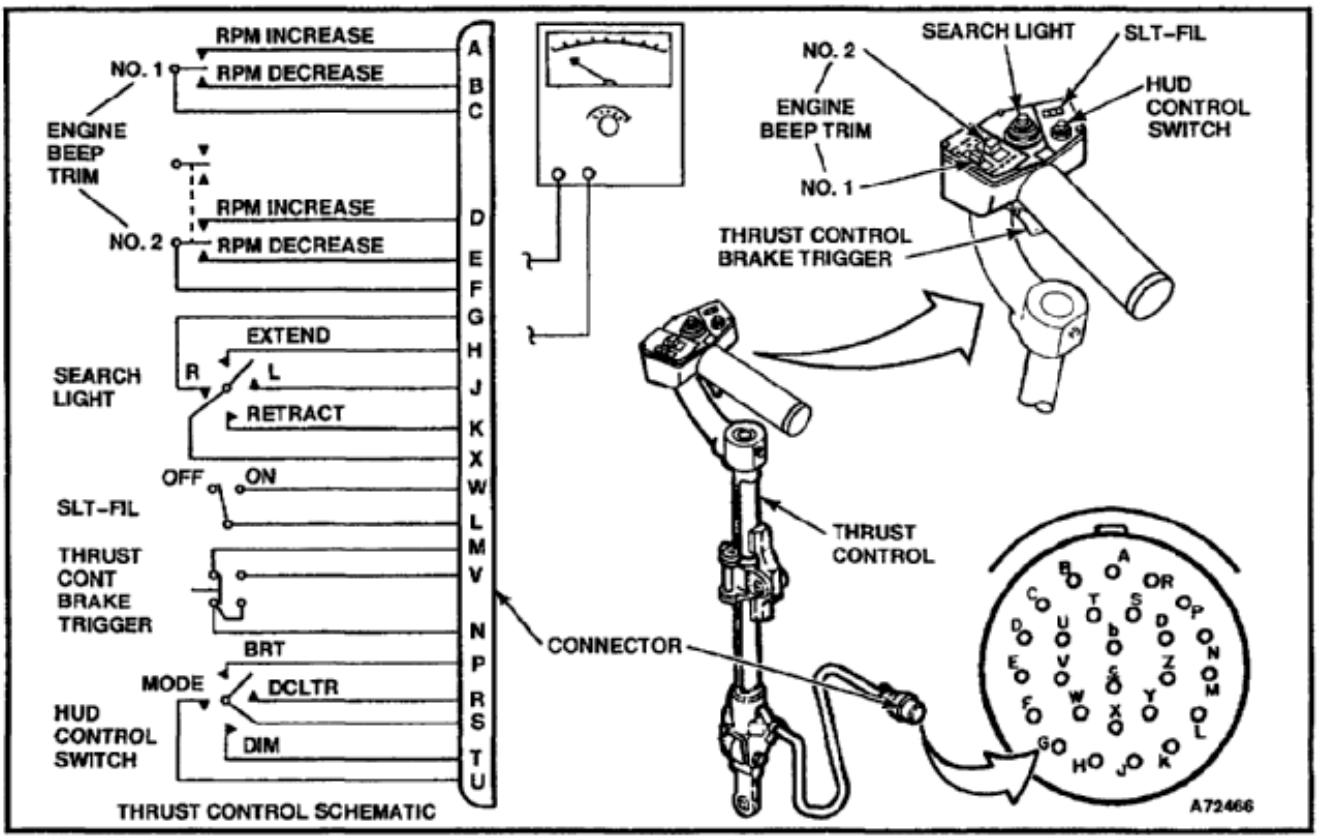
None

***Personnel Required:***

Aircraft Electrician
Inspector

***Equipment Condition:***

Off Helicopter Task

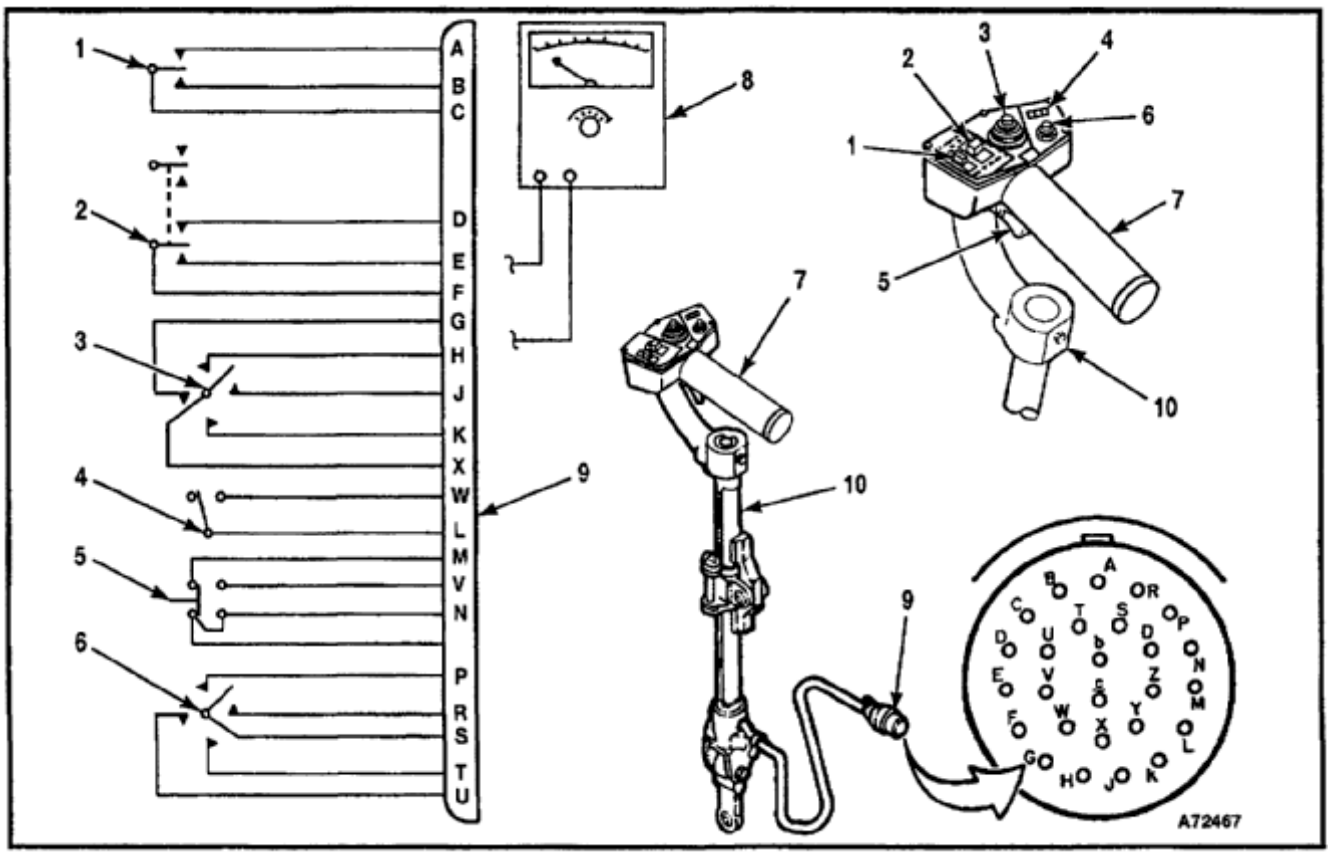


**9-140.6 TEST THRUST CONTROL GRIP (Continued) 9-140.6**

1. Test six switches (1, 2, 3, 4, 5, and 6) of thrust control grip (7). Set meter (8) to RX1 and connect meter to pins of connector (9) listed below. Check meter indication.
2. Connect meter (7) between pin A and shaft (10). Check meter indication. There shall be no indication.
3. Repeat step 2 for pins B, C, D, E, F, G, H, J, K, X, W, L, M, N, P, R, S, T, and U.

| SWITCH | SWITCH POSITION | CONNECTOR PINS | METER INDICATION |
|---|---|---|---|
| ENGINE BEEP TRIM NO. 1 (1) | RPM INCREASE | A and C | 0 ohm |
| | RPM DECREASE | B and C | 0 ohm |
| | Center | A and C then B and C | None |
| ENGINE BEEP TRIM NO. 2 (2) | RPM INCREASE | F and D | 0 ohm |
| | RPM DECREASE | F and E | 0 ohm |
| SEARCH LIGHT (3) | EXTEND | X and H | 0 ohm |
| | RETRACT | X and K | 0 ohm |
| | L | X and J | 0 ohm |
| | R | X and G | 0 ohm |
| | Center | X and G, then X and H, then X and J, then X and K | None |
| SLT-FIL (4) | ON | L and W | 0 ohm |
| | OFF | L and W | None |
| THRUST CONT BRAKE TRIGGER (5) | Released | M and N | 0 ohm |
| | Released | N and V | None |
| | Pressed | N and V | 0 ohm |
| | Pressed | N and M | None |
| HUD CONTROL SWITCH (6) | BRT | P and S | 0 ohm |
| | DCLTR | R and S | 0 ohm |
| | DIM | T and S | 0 ohm |
| | MODE | U and S | 0 ohm |
| | Center | P and S, then R and S, then T and S, then U and S | 0 ohm |

***INSPECT***




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-141 INSTALL THRUST CONTROL GRIP 9-141

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

None

***Materials:***

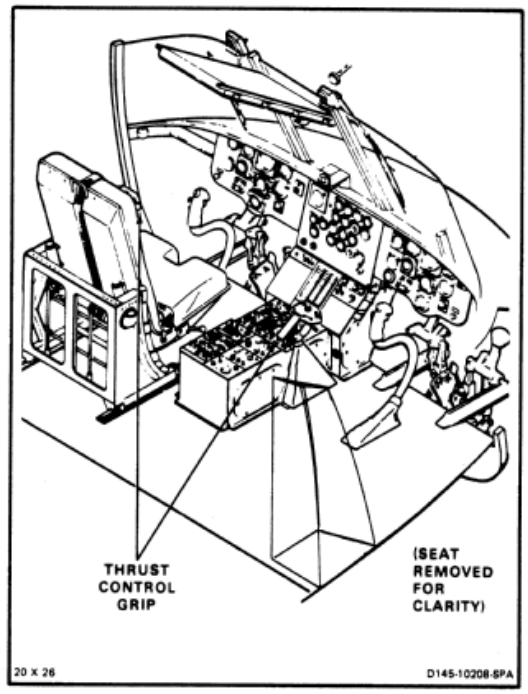
None

***Personnel Required:***

Aircraft Electrician

***References:***

Task 11-65
Task 11-66
Task 11-67




1. Install grip on thrust control (Task 11-65).
2. Install thrust control (Task 11-66 or 11-67).

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-142 REMOVE POWER STEERING CONTROL BOX 9-142

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

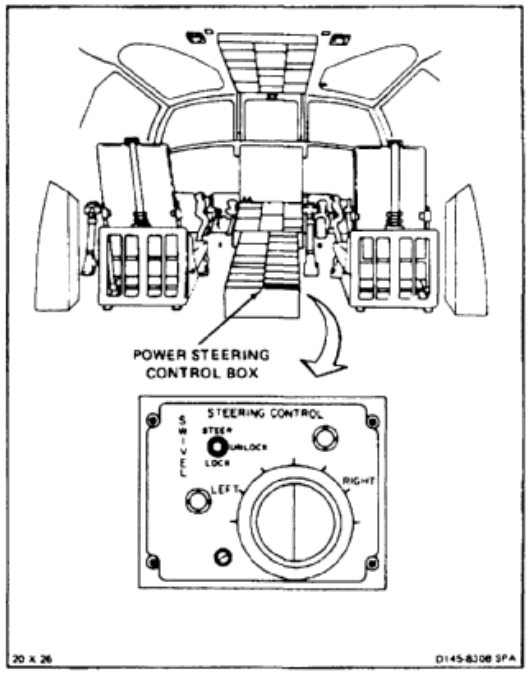
None

***Personnel Required:***

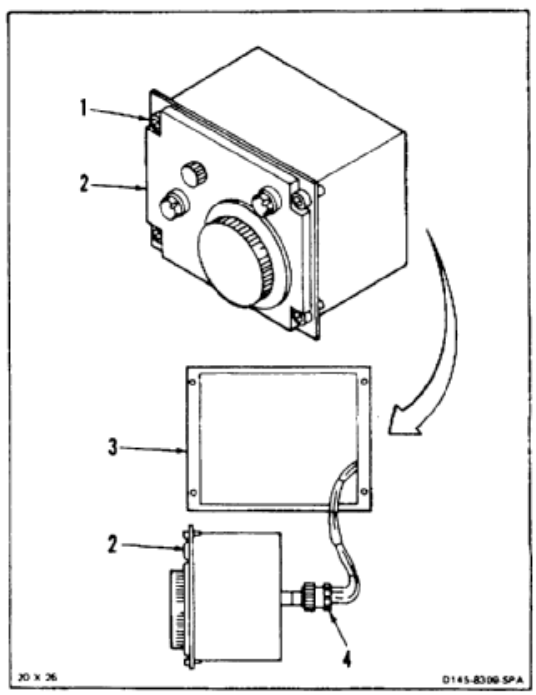
Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




1. Loosen four fasteners (1). Lift box (2) out of console (3).
2. Disconnect electrical connector (4) from box (2).
3. Remove box (2).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-143 DISASSEMBLE POWER STEERING CONTROL BOX (AVIM) 9-143

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun
Contact Removal/Insertion Tool, M81969/14-03

***Materials:***

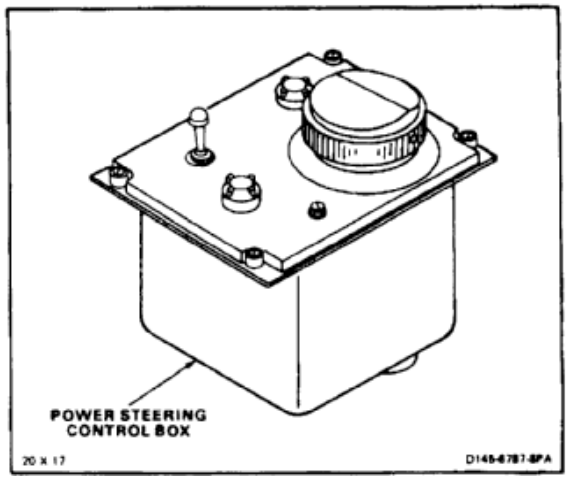
Paper Tags (E264)

***Personnel Required:***

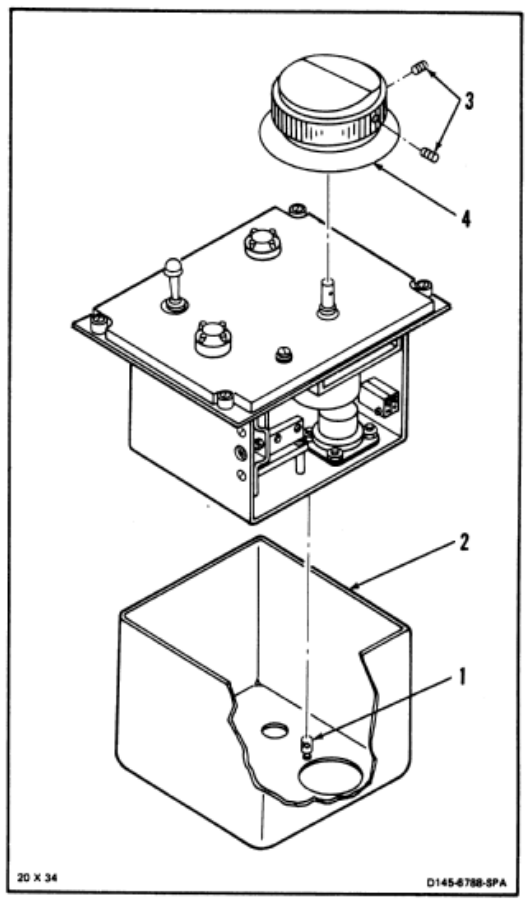
Aircraft Electrician (2)

***Equipment Condition:***

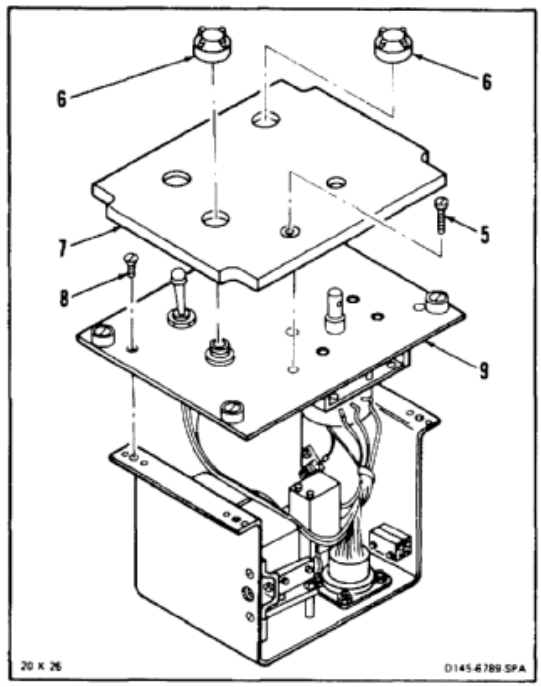
Off Helicopter Task



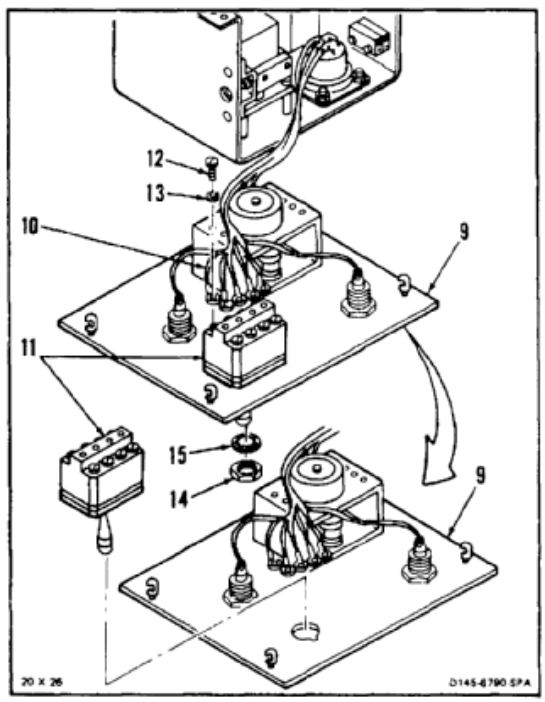

1. Loosen fastener(1) and remove cover (2).
2. Remove two screws (3). Remove knob (4).



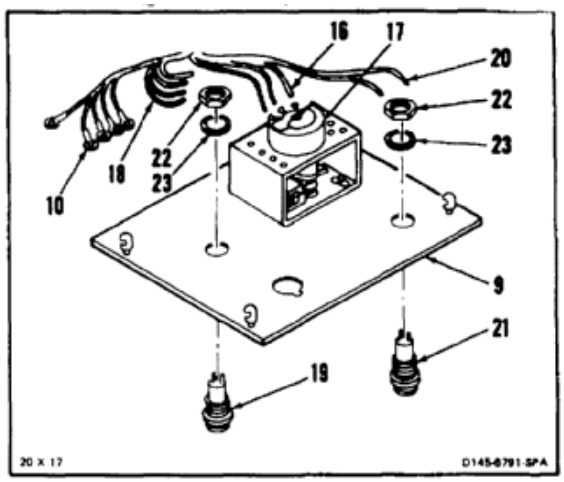
3. Remove screw (5) and two lamp holders (6). Remove panel (7).
4. Remove four screws (8) from top plate (9). Remove plate (9).



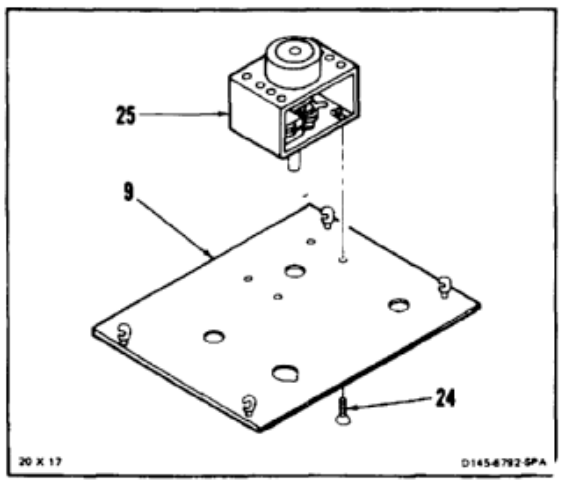

5. Tag and disconnect five wires (10) from switch (11) by removing six screws (12) and washers (13).
6. Remove nut (14) and washer (15). Remove switch (11) from plate (9).



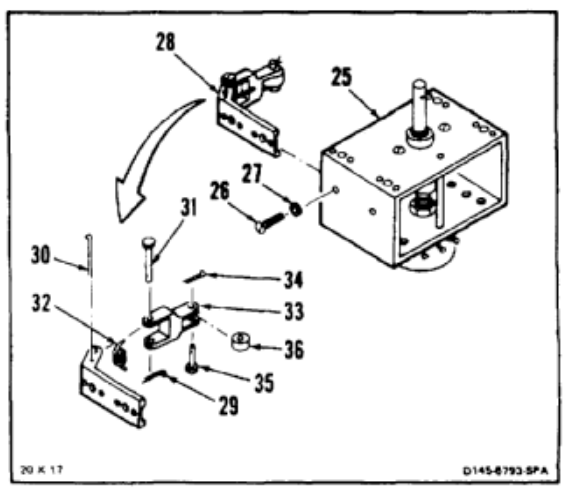
7. Tag and unsolder three wires (16) from resistor (17).
8. Tag and unsolder four wires (18) from light socket (19).
9. Tag and unsolder two wires (20) from light socket (21).
10. Remove two nuts (22) and washers (23) from light sockets (19 and 21). Remove light sockets.



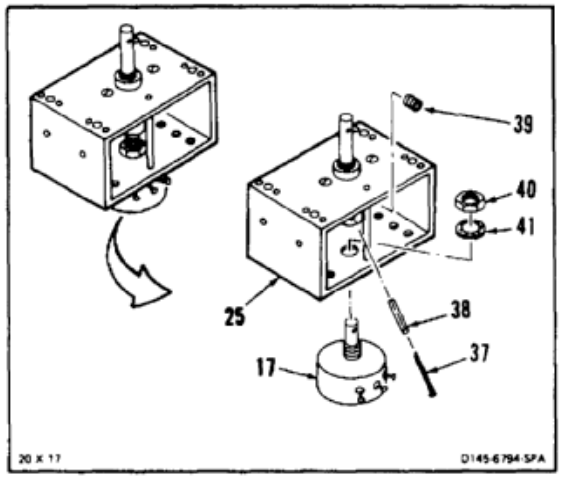

11. Remove four screws (24) from cam housing (25). Remove cam housing from plate (9).



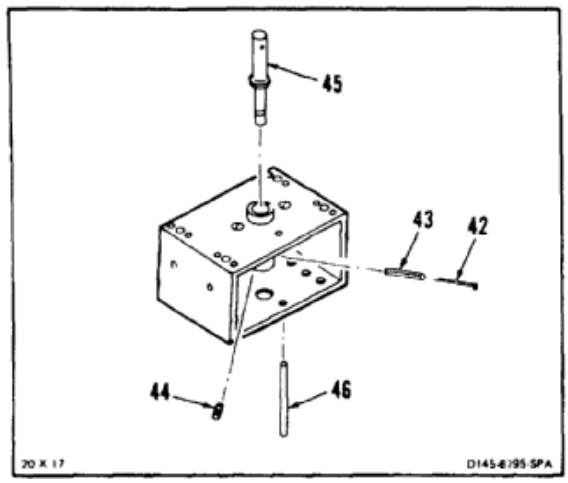

12. Remove two screws (26) and washers (27).
13. Remove bracket assembly (28) from housing (25).
14. Remove two cotter pins (29 and 30), pin (31), spline (32), and roller link (33).
15. Remove cotter pin (34), pin (35) and roller (36).



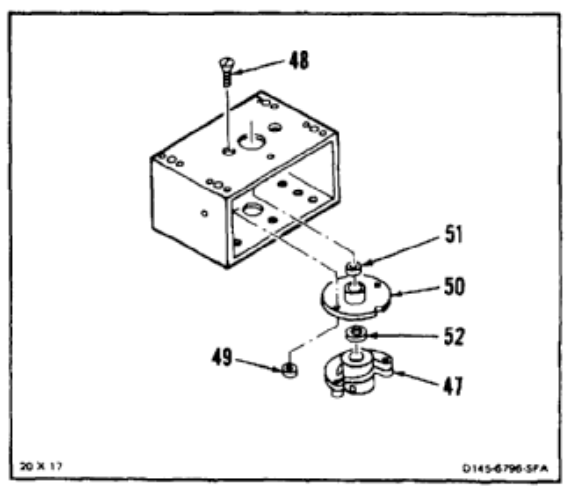
16. Remove cotter pin (37), roll pin (38) and screw (39).
17. Remove nut (40) and washer (41).
18. Remove resistor (17) from housing (25).



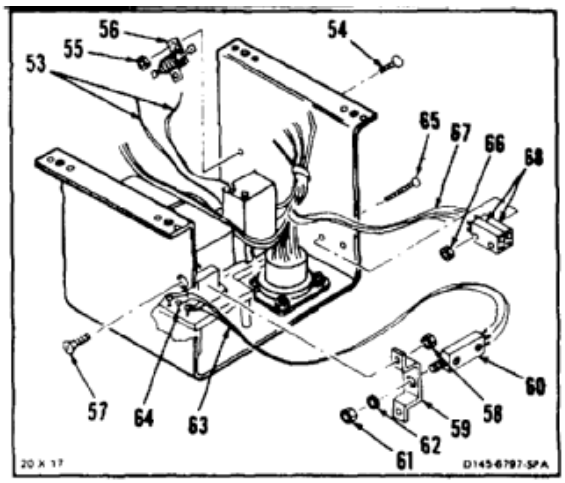

19. Remove cotter pin (42), roll pin (43), and screw (44).
20. Remove shoulder pin (45) and pin (46).



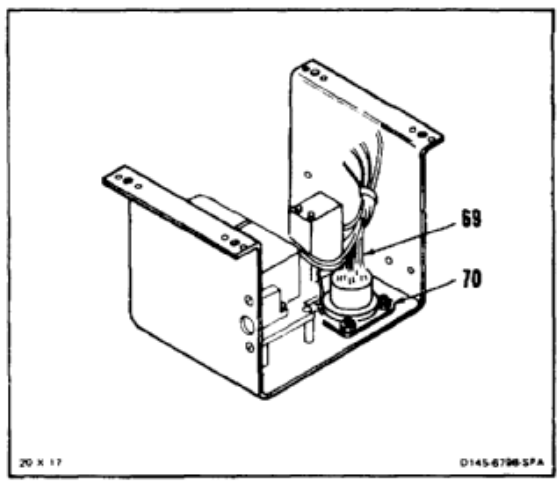

21. Remove cam (47). Remove two screws (48) and nuts (49).
22. Remove sleeve bushing (50), bearing (51), and bushing (52).



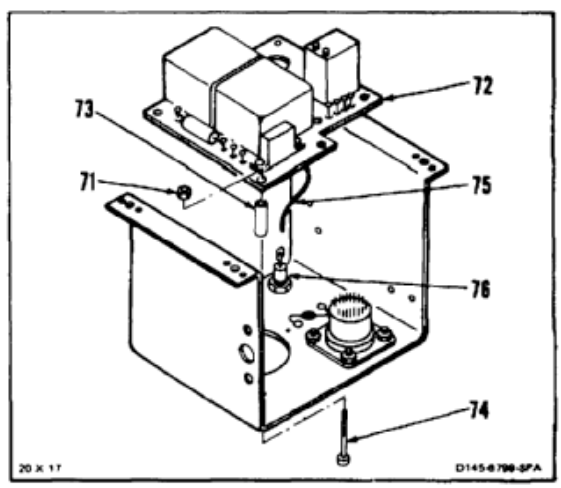
23. Tag and unsolder two wires (53).
24. Remove two screws (54) and nuts (55). Remove resistor (56).
25. Remove two screws (57) and nuts (58). Remove bracket (59) and potentiometer (60).
26. Remove nut (61) and washer (62). Remove potentiometer (60) from bracket (59).
27. Tag and unsolder three wires (63) from terminals (64).
28. Remove two screws (65) and nuts (66). Tag and unsolder six wires (67). Remove two resistors (68).



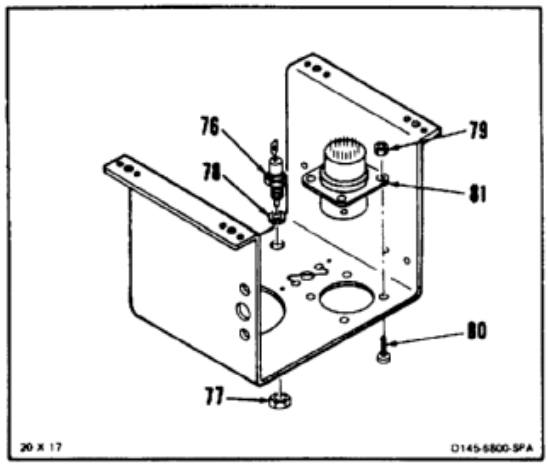

29. Tag and remove 16 wires (69) from connector (70). Use contact tool.




30. Remove five nuts (71). Remove plate assembly (72). Remove five spacers (73) and screws (74).
31. Tag and unsolder wire (75) from diode (76).



32. Remove nut (77). Remove diode (76) and washer (78).
33. Remove four nuts (79) and screws (80). Remove connector (81).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-144 ASSEMBLE POWER STEERING CONTROL BOX (AVIM) 9-144

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun
Contact Removal/Insertion Tool, M81969/14-03

***Materials:***

Solder (E360)

***Parts:***

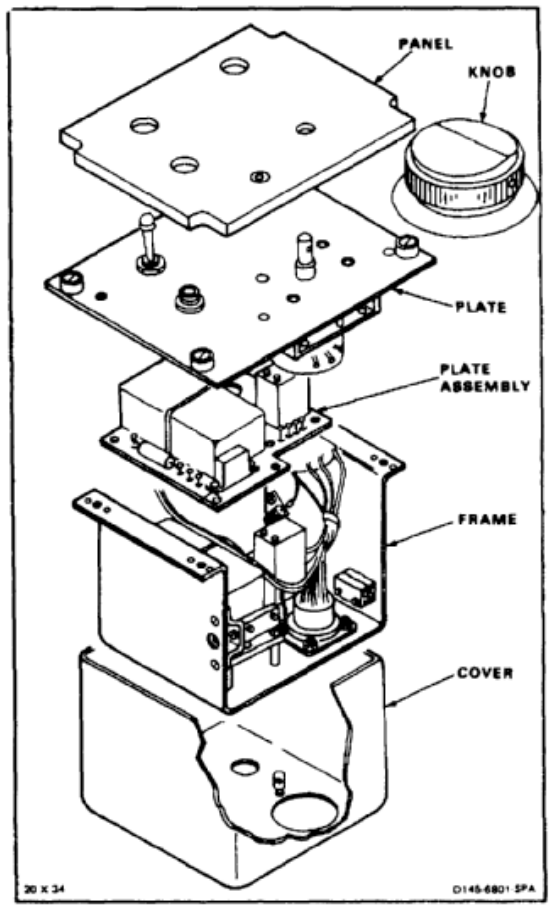
Cotter Pins

***Personnel Required:***

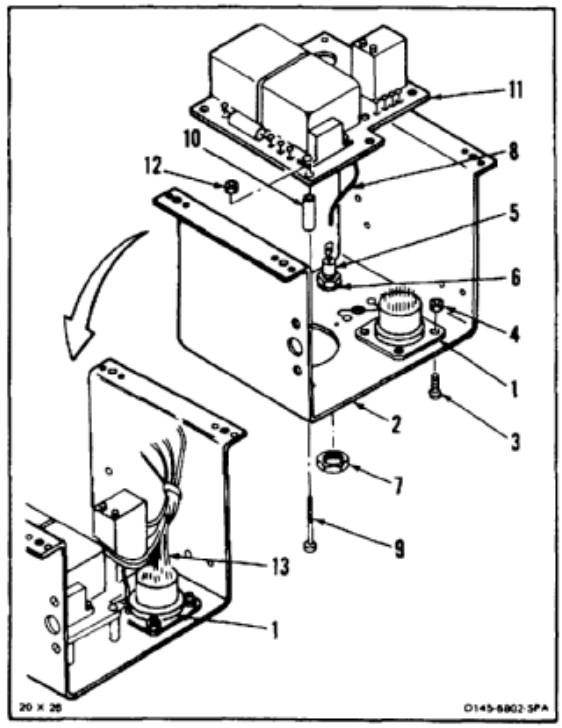
Aircraft Electrician (2)
Inspector

***References:***

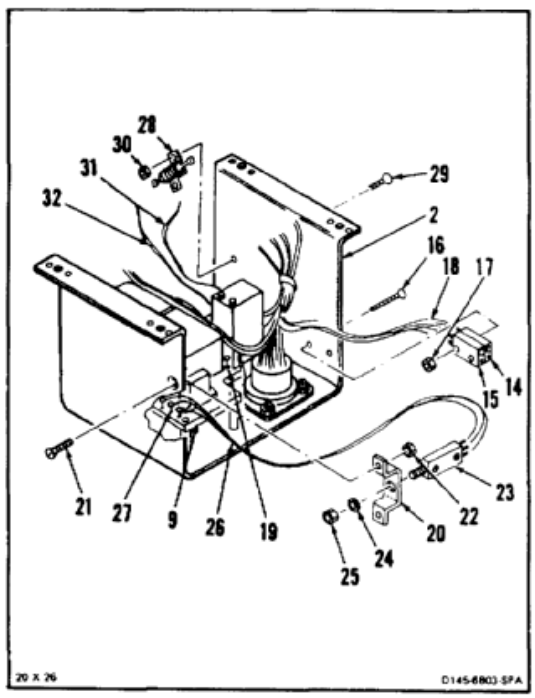
TM 55-1520-240-23P



1. Position connector (1) on frame (2). Install four screws (3) and nuts (4).
2. Position diode (5) and washer (6) on frame (2). Install nut (7).
3. Solder wire (8) to diode (5). Use solder (E360).
4. Install five screws (9) and spacers (10) in frame (2). Position plate assembly (11) on five screws and spacers. Install five nuts (12) on screws (9).
5. Install 16 wires (13) in connector (1). Use contact tool.

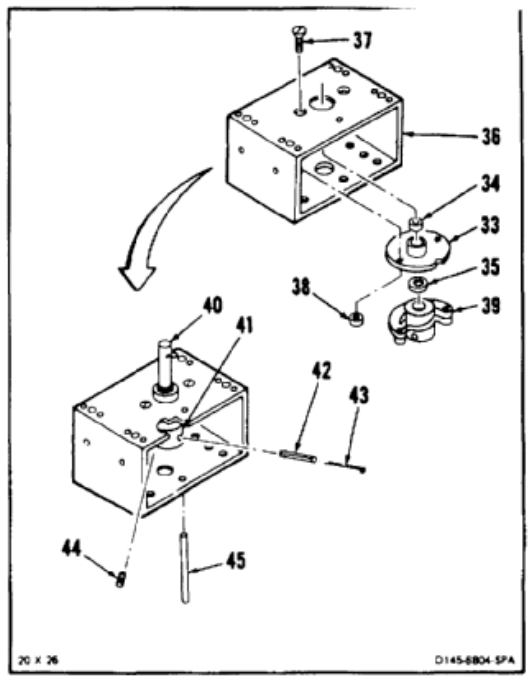



6. Position two resistors (14 and 15) on side of frame (2). Install two screws (16) and nuts (17).
7. Solder six wires (18) to terminals (19) on plate assembly (9). Use solder (E360). Remove tags.
8. Position bracket (20) on frame (2). Install two screws (21) and nuts (22).
9. Position potentiometer (23) on bracket (20). Install washer (24) and nut (25).
10. Solder three wires (26) to terminals (27) on plate assembly (9). Use solder (E360). Remove tags.
11. Position resistor (28) on frame (2).
12. Install two screws (29) and nuts (30).
13. Solder two wires (31 and 32) to resistor. Use solder (E360). Remove tags.

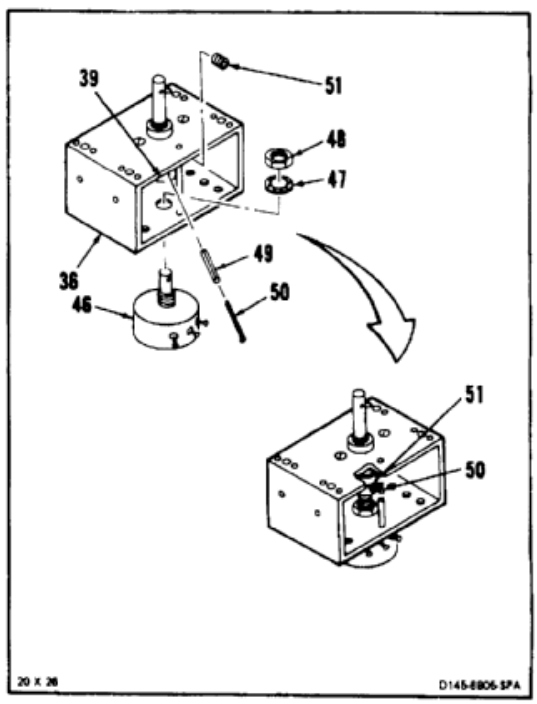


***INSPECT***

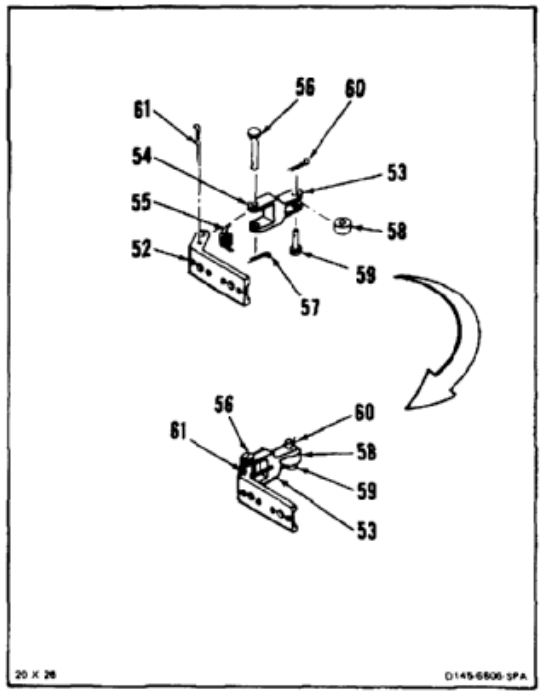
14. Position sleeve bushing (33), bearing (34), and bushing (35) in housing (36). Install two screws (37) and nuts (38).
15. Position cam (39) and install shoulder pin (40).
16. Align holes (41) in shoulder pin (40) and cam (39). Install roll pin (42) and cotter pin (43). Install screw (44).
17. Install pin (45).




18. Position resistor (46) in housing (36).
19. Install washer (47) and nut (48).
20. Align hole in shaft of resistor (46) and cam (39). Install roll pin (49) and cotter pin (50). Install screw (51).

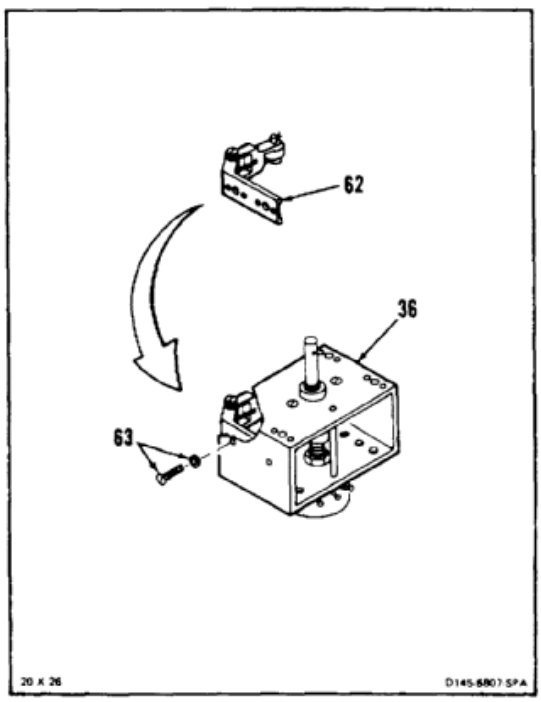


21. Position bracket (52) and roller link (53) with holes (54) aligned. Position spring (55) and install pin (56) and cotter pin (57).
22. Position roller (58) in roller link (53) and install pin (59). Install cotter pin (60).
23. Install cotter pin (61).

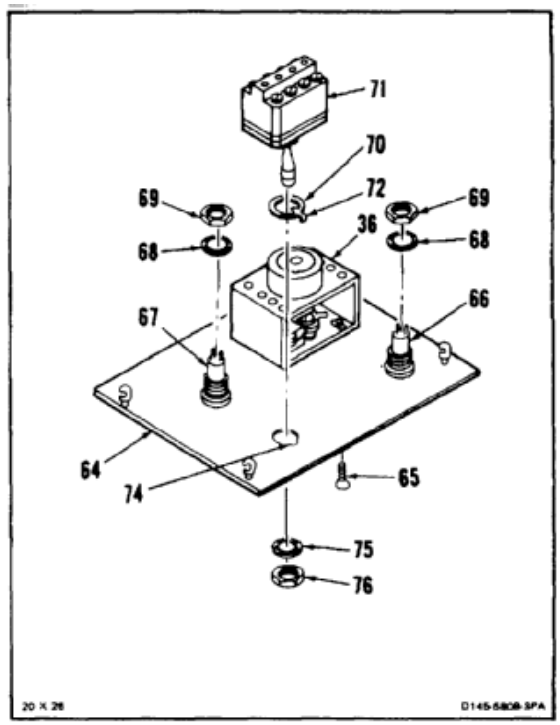



24. Position bracket assembly (62) in cam housing (36). Install two screws and washers (63).

***INSPECT***

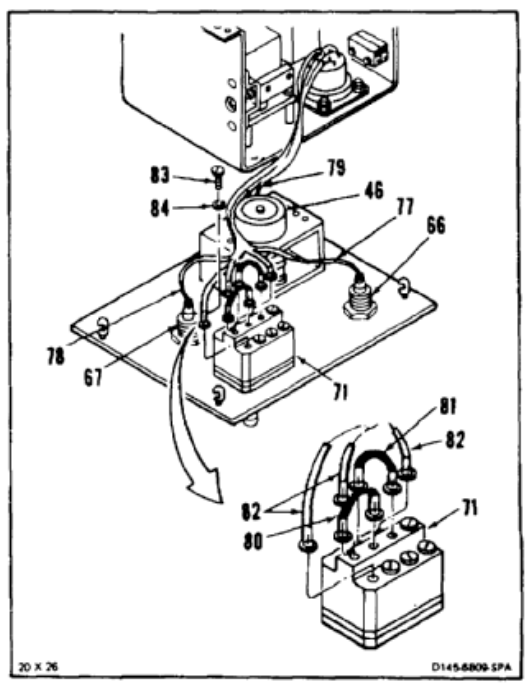


25. Position cam housing (36) on plate (64). Install four screws (65).
26. Install two light sockets (66 and 67) through plate (64). Install two washers (68) and nuts (69) on light sockets.
27. Install washer (70) on switch (71).
28. Install switch (71) with tab (72) on washer (70) positioned in alignment hole (74) in plate (64).
29. Install washer (75) and nut (76) on switch (71).

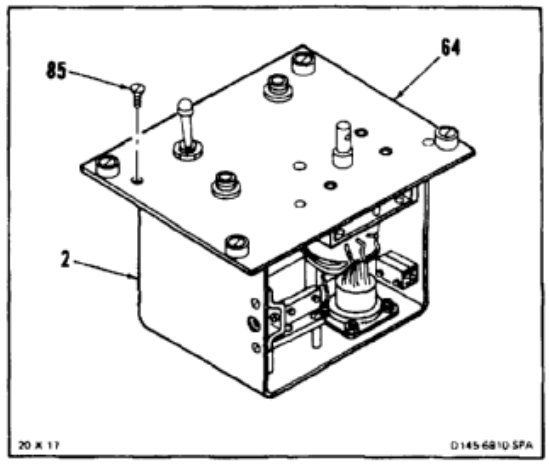



30. Solder four wires (77) to light socket (66). Solder two wires (78) to light socket (67). Use solder (E360). Remove tags.
31. Solder three wires (79) to resistor (46). Use solder (E360). Remove tags.
32. Install two jumper wires (80 and 81) and three wires (82) to switch (71) using six screws (83) and washers (84). Remove tags.

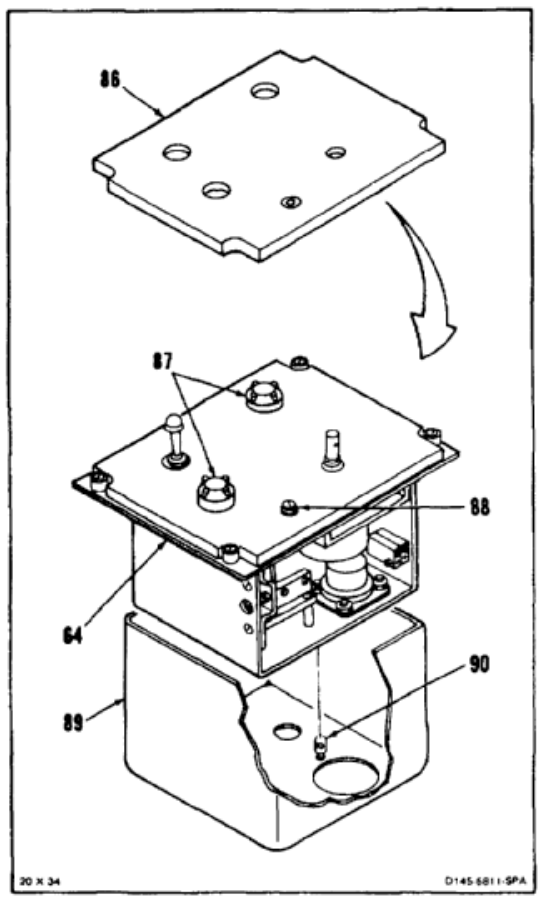
***INSPECT***



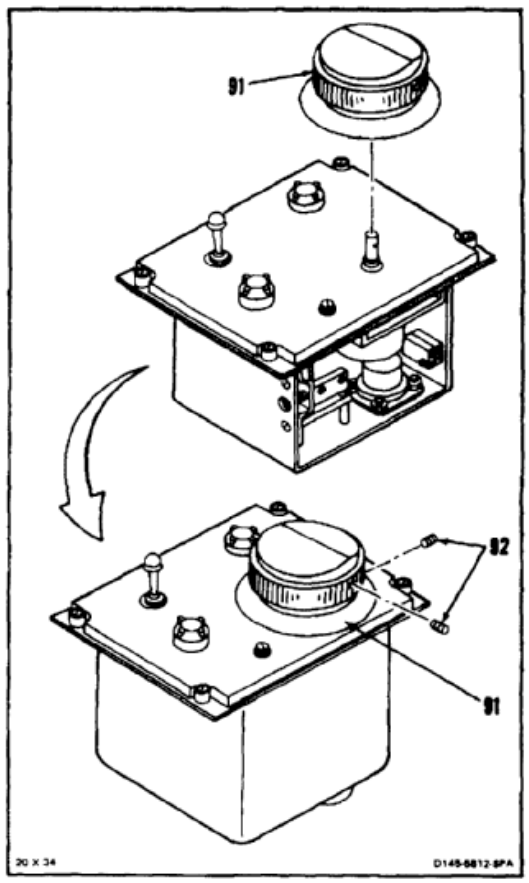
33. Position plate (64) frame (2). Install four screws (85).
34. Position panel (86) on top plate (64). Install two lamp holders (87) and screw (88).
35. Install cover (89). Tighten fastener (90).




***INSPECT***



36. Install knob (91) and two screws (92).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-145 TEST AND ADJUST POWER STEERING CONTROL BOX (AVIM) 9-145

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

R1, R4, Resistor, 250 Ohms ±12, 1/2 Watt (2)
R3, Resistor, 500 Ohms, Variable, 1/2 Watt
R2, Resistor, 200 Ohms, Variable 1/2 Watt
R5, R6, Resistor, 1000 Ohms ±50, 1/2 Watt (2)
Circuit Breaker, 5 Amp
S1 Switch, Three Pole Rotary
S2 Switch, Single Pole
S3 Switch, Momentary
Milliammeter Simpson, 1227C or Equivalent (2 ea)
Light Assembly, 28 VDC
Connector Bendix SP06SE-16-23S
DC Power Supply, 0-28 Volts

***Materials:***

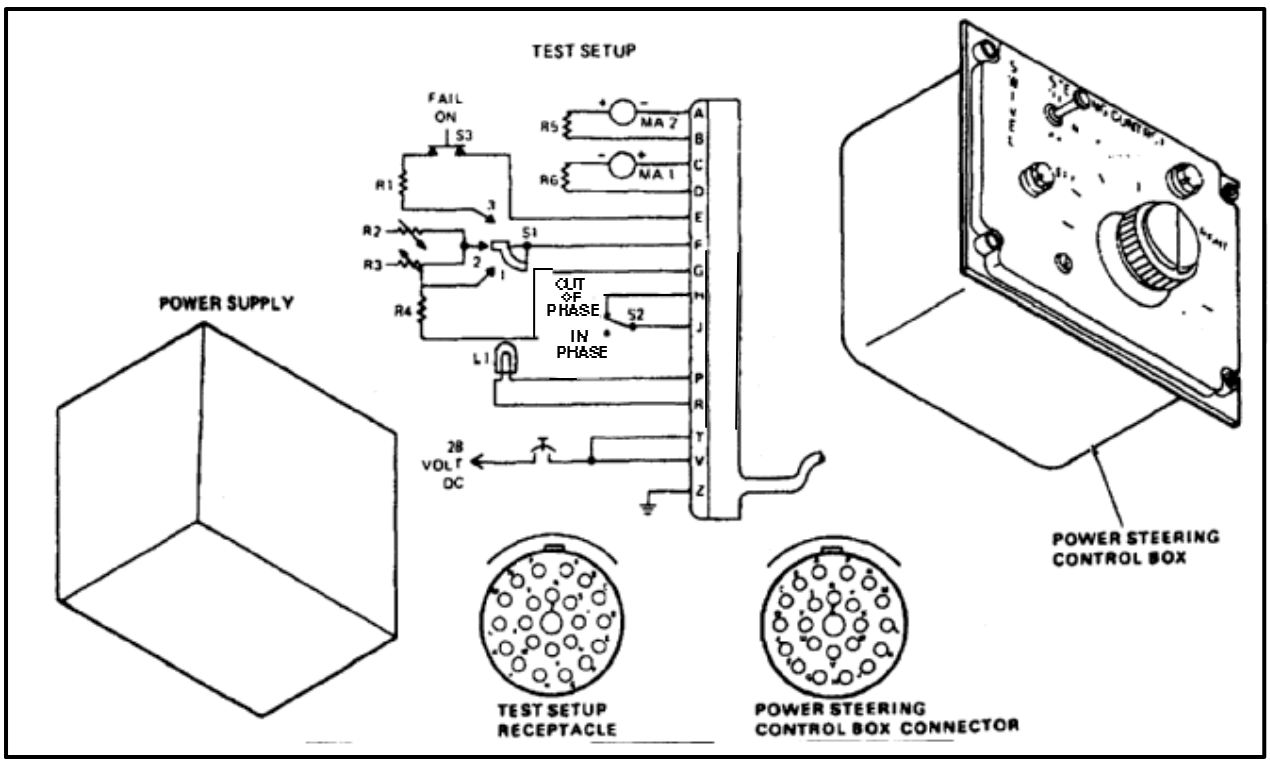
None

***Personnel Required:***

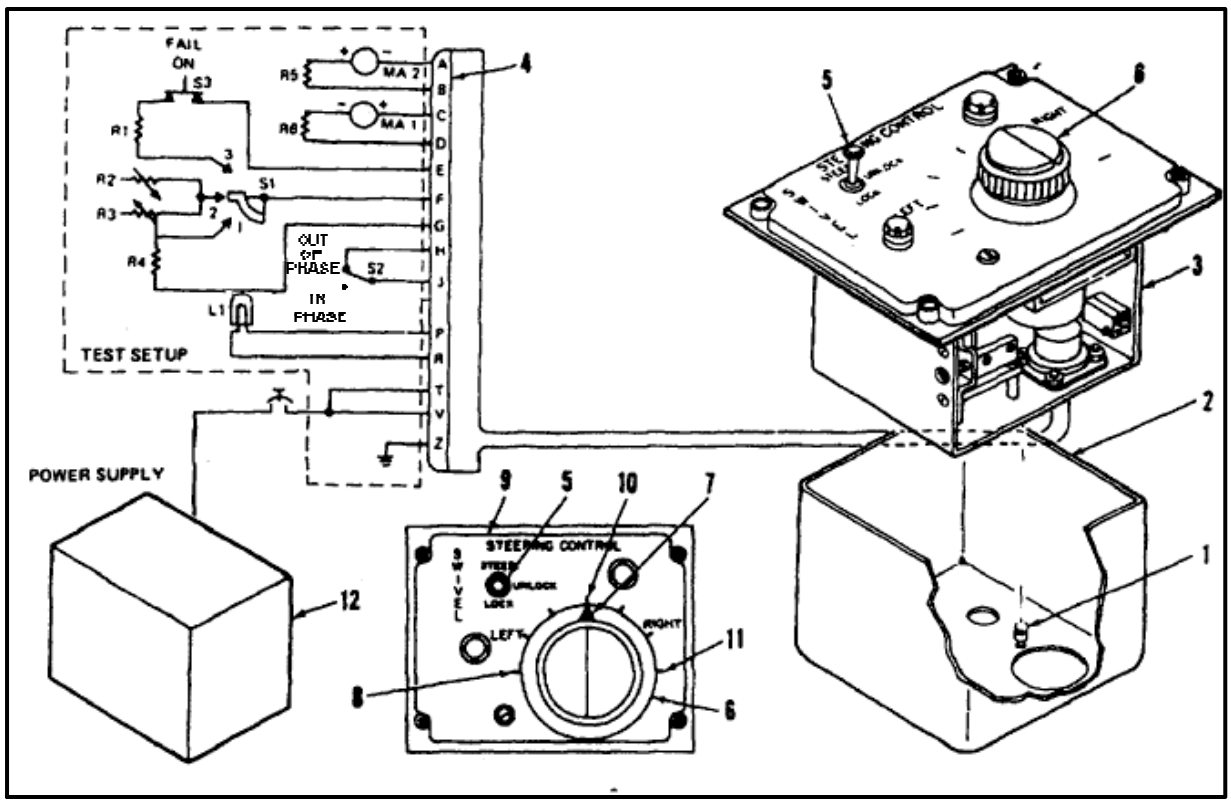
Aircraft Electrician
Inspector

***Equipment Condition:***

Off Helicopter Task
Test Setup



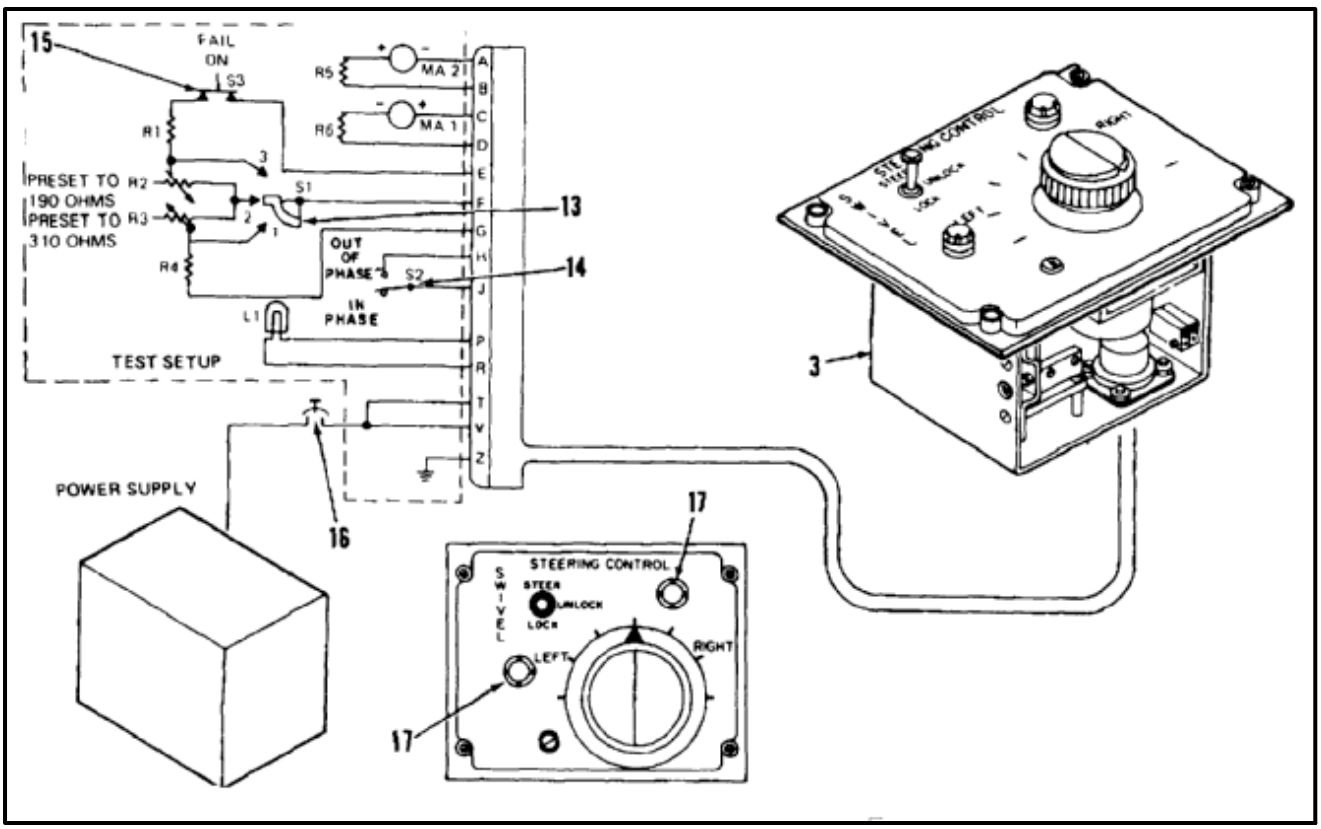
1. Loosen fastener (1) and remove control box cover (2) from steering control box (3).
2. Connect test setup (4) to steering control box (3).
3. Set LOCK-UNLOCK-STEER switch (5) on control box (3) to LOCK.
4. Turn control knob (6) fully to LEFT. Check knob position. Pointer (7) shall be aligned with mark (8) on panel (9).
5. Release knob (6). Check knob position. Pointer (7) on knob will be aligned with mark (10).
6. Turn control knob (6) fully to right. Check knob position pointer (7) shall be aligned with mark (11).
7. Release knob (6). Check knob position. Pointer (7) shall be aligned with mark (10).
8. Connect power supply (12) to test setup (4).



9. Set switches on test set as follows:
   a. Set switch S1 (13) to position 2.
   b. Set switch S2 (14) to IN-PHASE.
   c. Set switch S3 (15) to ON.

10. Close circuit breaker (16) and apply **28 vdc** to test setup.

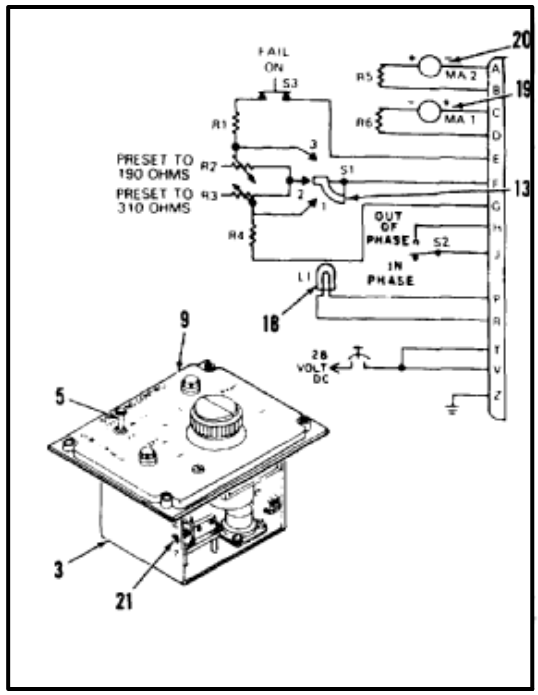
11. Check panel edge lights (17) on control box (3). Lights shall come on.

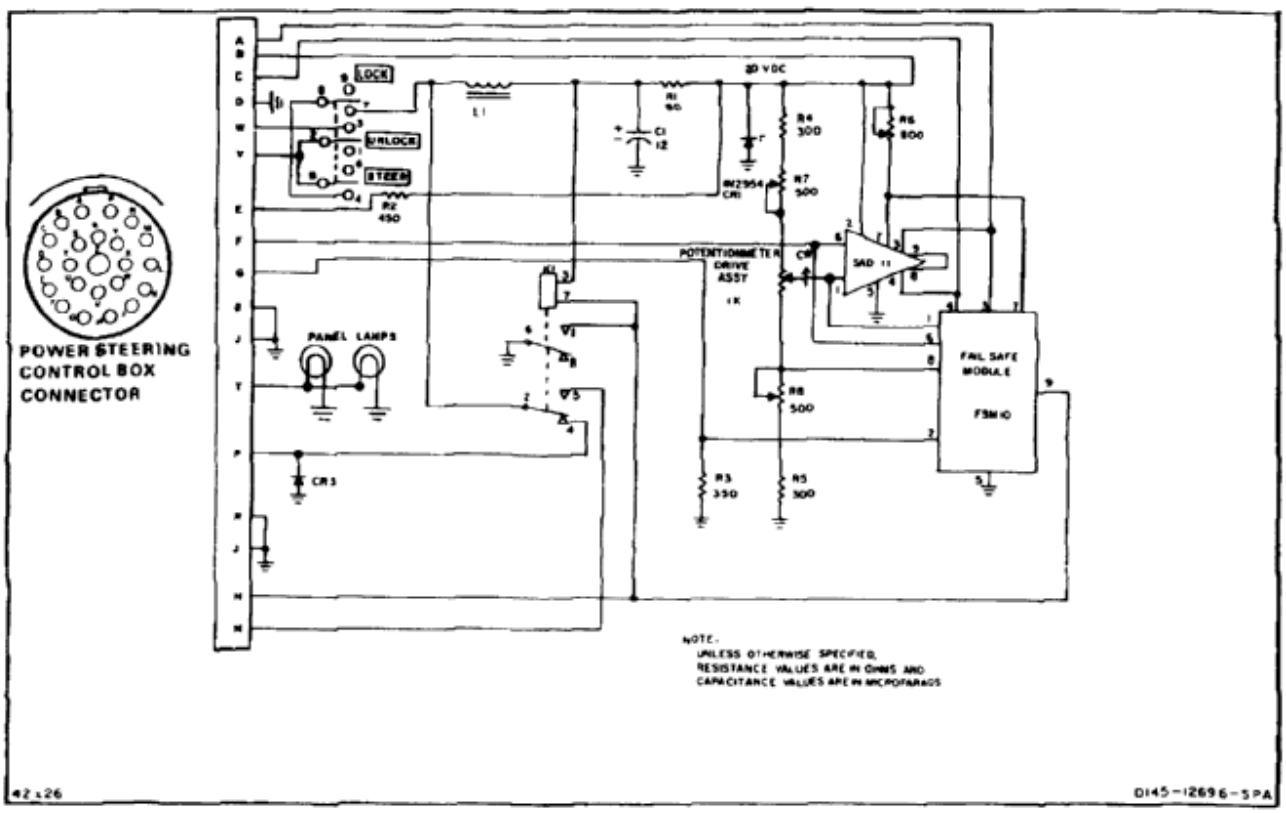


12. Set SWIVEL SWITCH (5) on panel (9) to STEER. Check lamp (18). Lamp shall come on.

13. Check meters MA1 (19) and MA2 (20). Meters shall indicate **0 to 1 milliampere (ma)**. If meters do not indicate **0 to 1 ma**, adjust screw (21) of control box (3) as necessary until both meters indicate less than **1 ma**.

14. Set switch S1 (13) to 1. Check meter (19). Meter shall indicate about **10 ma**. Check meter (20). Meter shall indicate less than **1 ma**.



15. Slowly turn knob (6) RIGHT **45º**. Check meters (19 and 20). Meter (19) shall return to below **1 ma**. Meter (20) shall remain below **1 ma**.

16. Continue turning knob (6) slowly RIGHT until mechanical stop is reached. Check meters (19 and 20). Meter (19) shall read less than **1 ma**. Meter (20) shall indicate about **10 ma**.

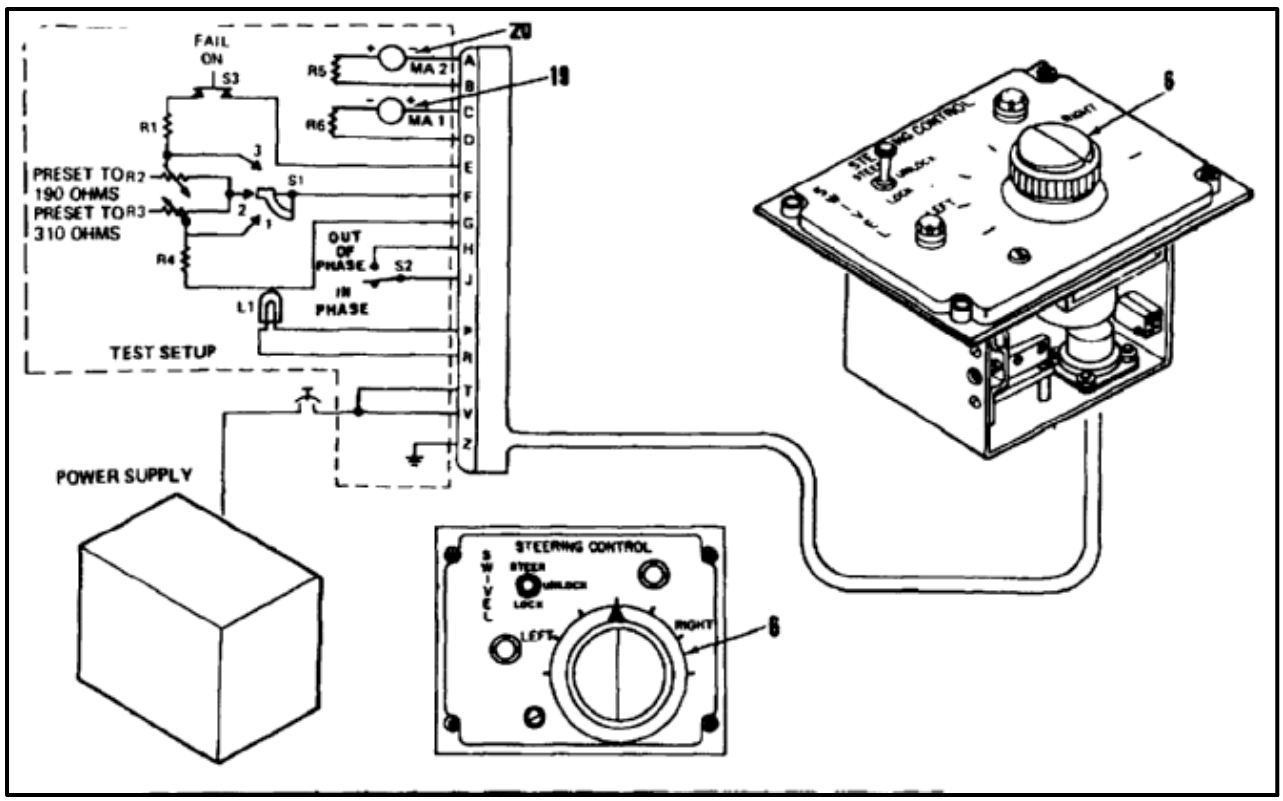
**NOTE**

During knob rotation, meter movement shall be free of erratic movement.

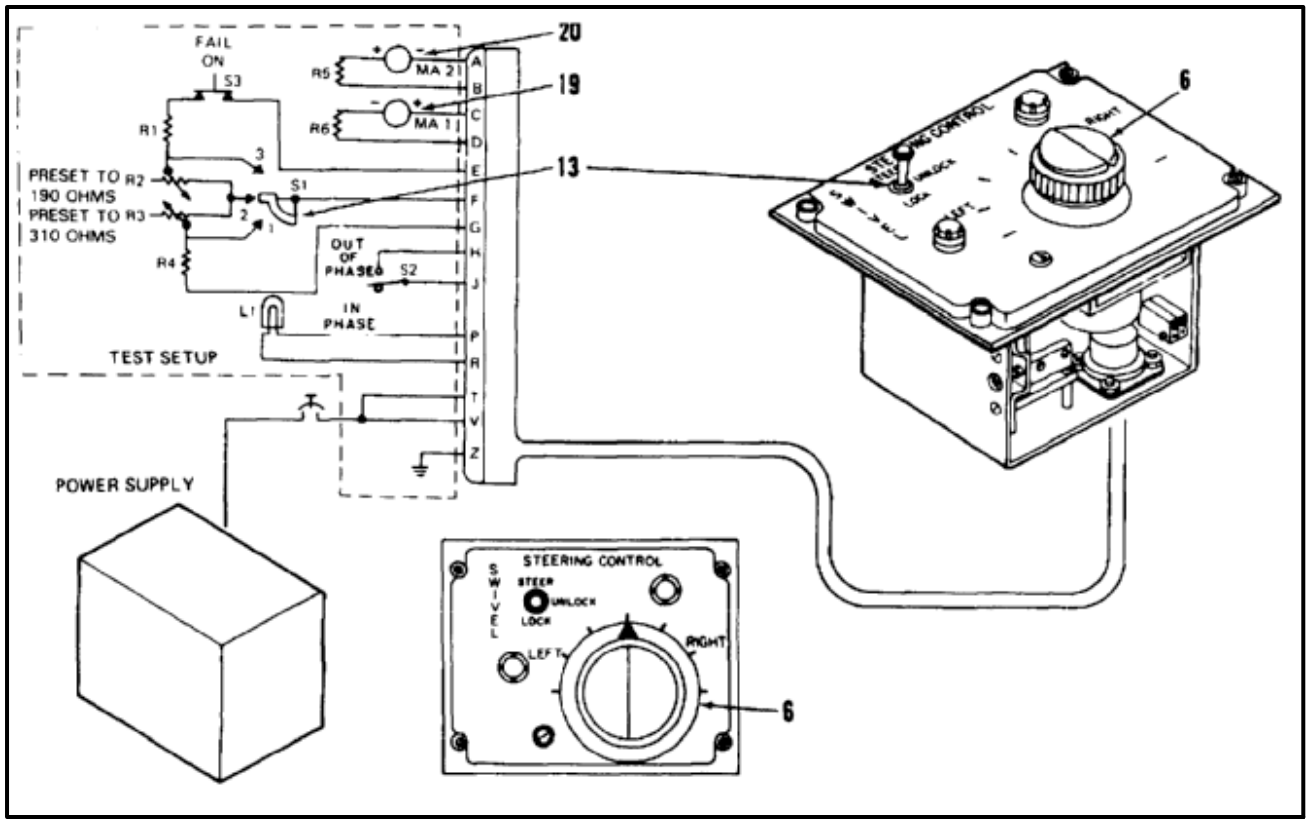
17. Allow knob (6) to return slowly to neutral position. Check meter (19 and 20).

    a. Meter (19) shall indicate **10 ma** when knob is about **45º** and shall remain at that reading when the knob is at neutral position.

    b. Meter (20) shall indicate less than **1 ma** as the knob passes the **45º** position and retain this reading when the knob is at neutral.



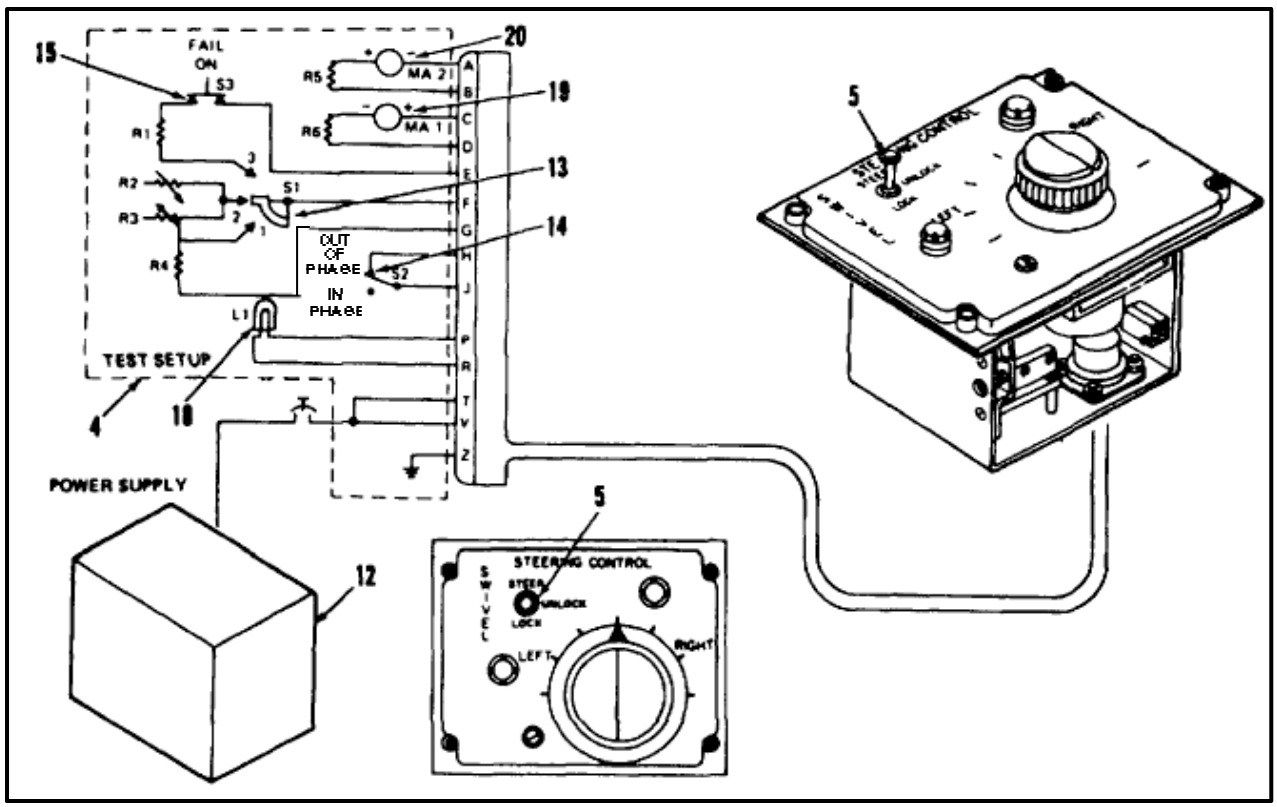
18. Set switch S1 (13) to 2 (UNLOCK). Check meters (19 and 20). Meters shall indicate less than **1 ma**.
19. Set switch S1 (13) to 3 (STEER). Check meters (19 and 20). Meter (19) shall indicate less than **1 ma**. Meter (20) shall indicate about **10 ma**.
20. Slowly turn knob (6) LEFT **45º**. Check meters (19 and 20). Meter (19) shall remain below **1 ma**. Meter (20) shall return to less than **1 ma**.
21. Continue turning knob (6) slowly LEFT until mechanical STOP is reached. Check meters (19 and 20). Meter (19) shall indicate about **10 ma**. Meter (20) shall indicate less than **1 ma**.



22. Allow knob (6) to return slowly to neutral position. Check motor (19 and 20).
    a. Meter (19) shall indicate less than **1 ma** when knob is about **45º**.
    b. Meter (20) shall indicate **10 ma** as the knob passes the **45º** position and remain at that reading when the knob is at neutral.
23. Set switch (13) to 2. Check meters (19 and 20). Meters shall indicate between **0 and 1 ma**.
24. Set switch (15) to fail. Check lamp (18). Lamp shall go out.
25. Set switch (5) on control box to LOCK, then STEER. Check lamp (18). Lamp shall come on and stay on.
26. Repeat steps 24 and 25.
27. Set switch (14) to OUT OF PHASE, then to IN PHASE. Check lamp (18). Lamp shall go out and stay out.
28. Repeat step 25.
29. Repeat step 27.
30. Repeat step 25.

***INSPECT***

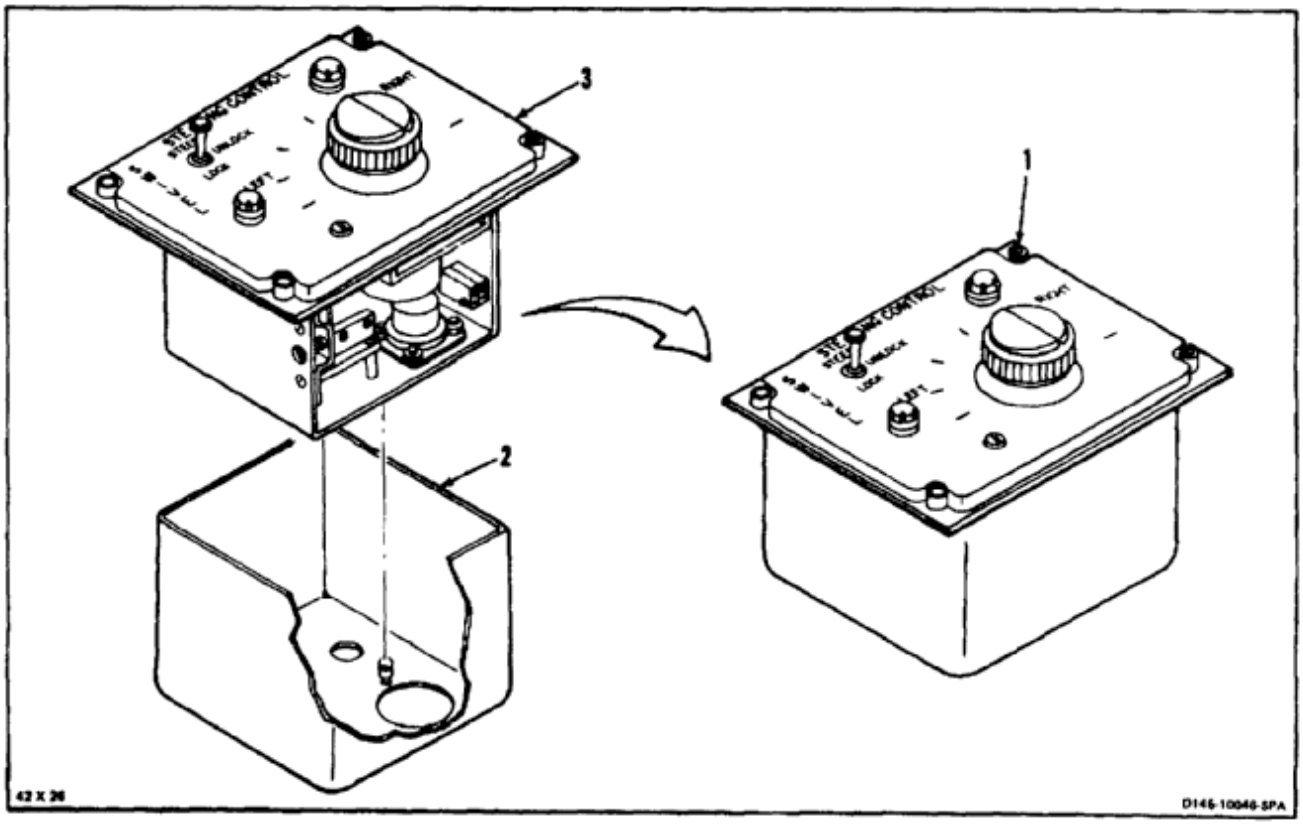
31. Shut down power supply (12).
32. Disconnect test setup (4).



33. Position control box cover (2) on steering control box (3). Tighten fastener (1).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-146 INSTALL POWER STEERING CONTROL BOX 9-146

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

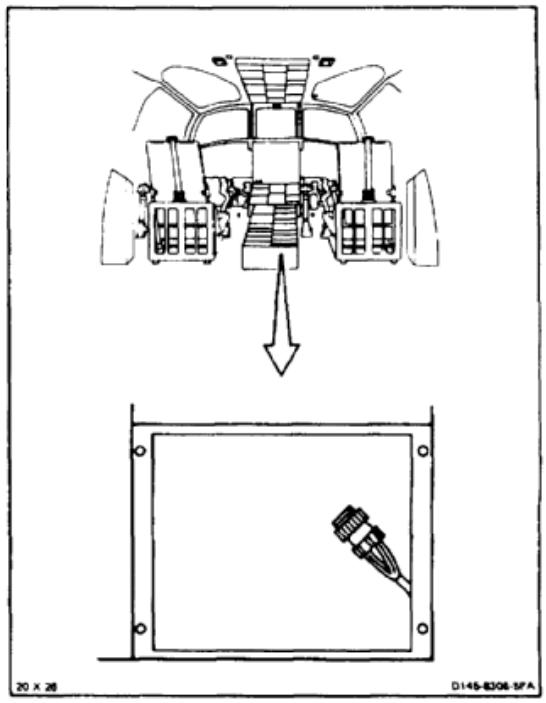
None

***Personnel Required:***

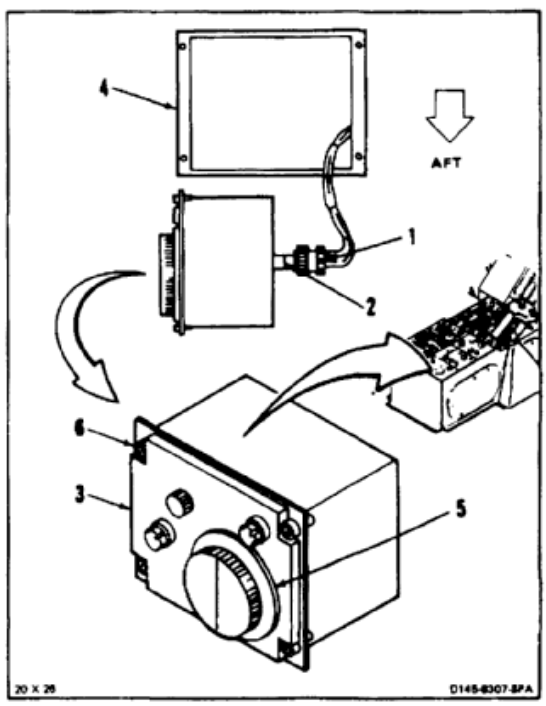
Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P



1. Connect electrical connector (1) to receptacle (2).
2. Position box (3) on console (4) with knob (5) aft.
3. Tighten four fasteners (6).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).

END OF TASK

## 9-146.1 CHECK AND ADJUST POWER STEERING CONTROL BOX ON AIRCRAFT (AVIM) 9-146.1

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Electrical Power Supply, 115/200 Volt, 3-Phase Grounded Neutral, 400 Hz AC
Hydraulic Power Supply External System
Jack 1214-151, or Equal
Multimeter

***Materials:***

None

***Personnel Required:***

Aircraft Electrician
Medium Helicopter Repairer
Inspector

***References:***

Task 1-24
Task 1-37
Task 1-38
TM 55-1520-240-T

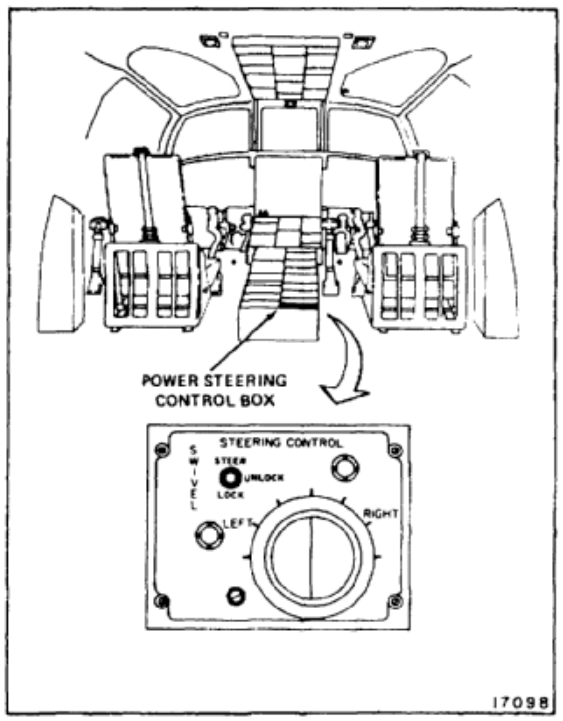
***Equipment Condition:***

Electrical Power Off
Hydraulic Power Off
In Sheltered Area

***General Safety Instructions:***

**WARNING**

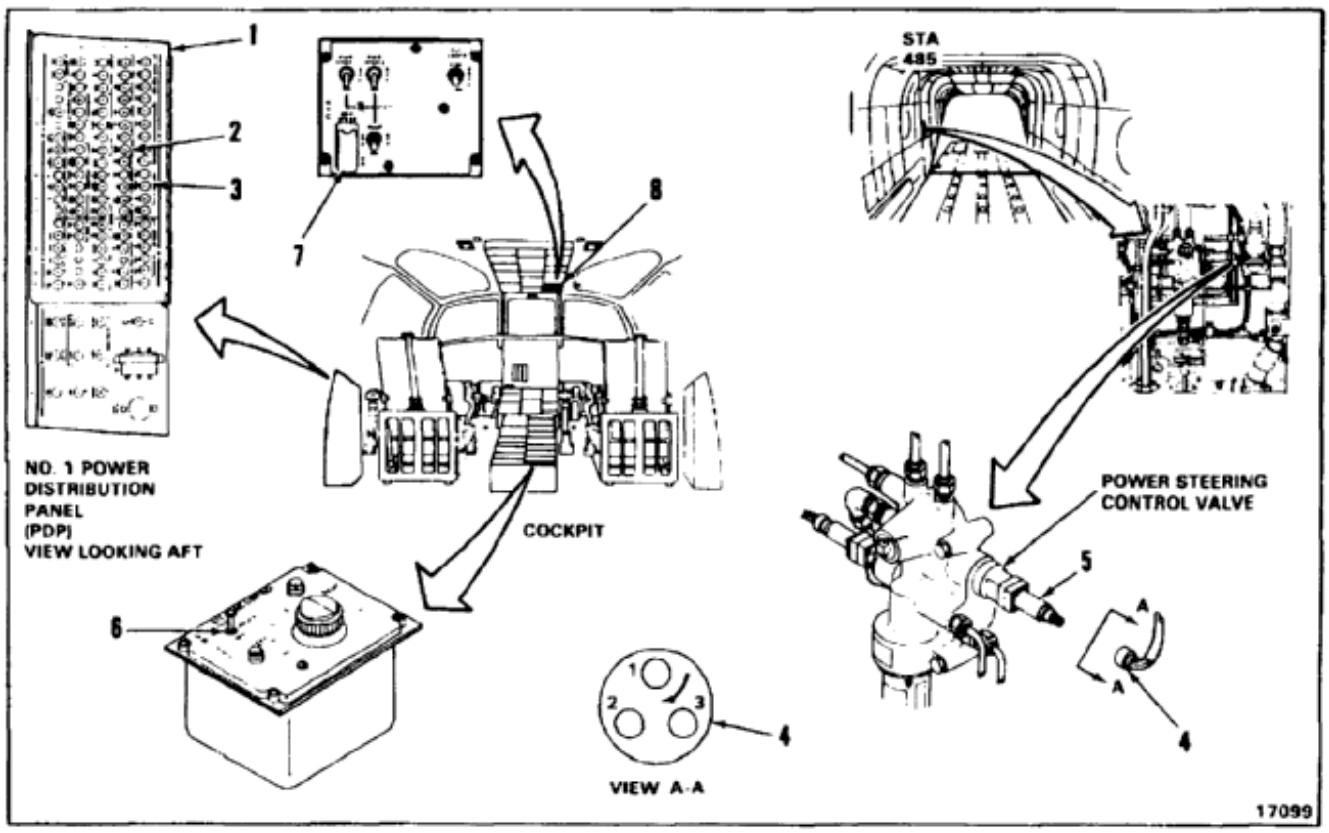
Exercise care when working near the aft right wheel. Sudden wheel movement can cause injury.



## 9-146.1 CHECK AND ADJUST POWER STEERING CONTROL BOX ON AIRCRAFT (AVIM) (Continued) 9-146.1

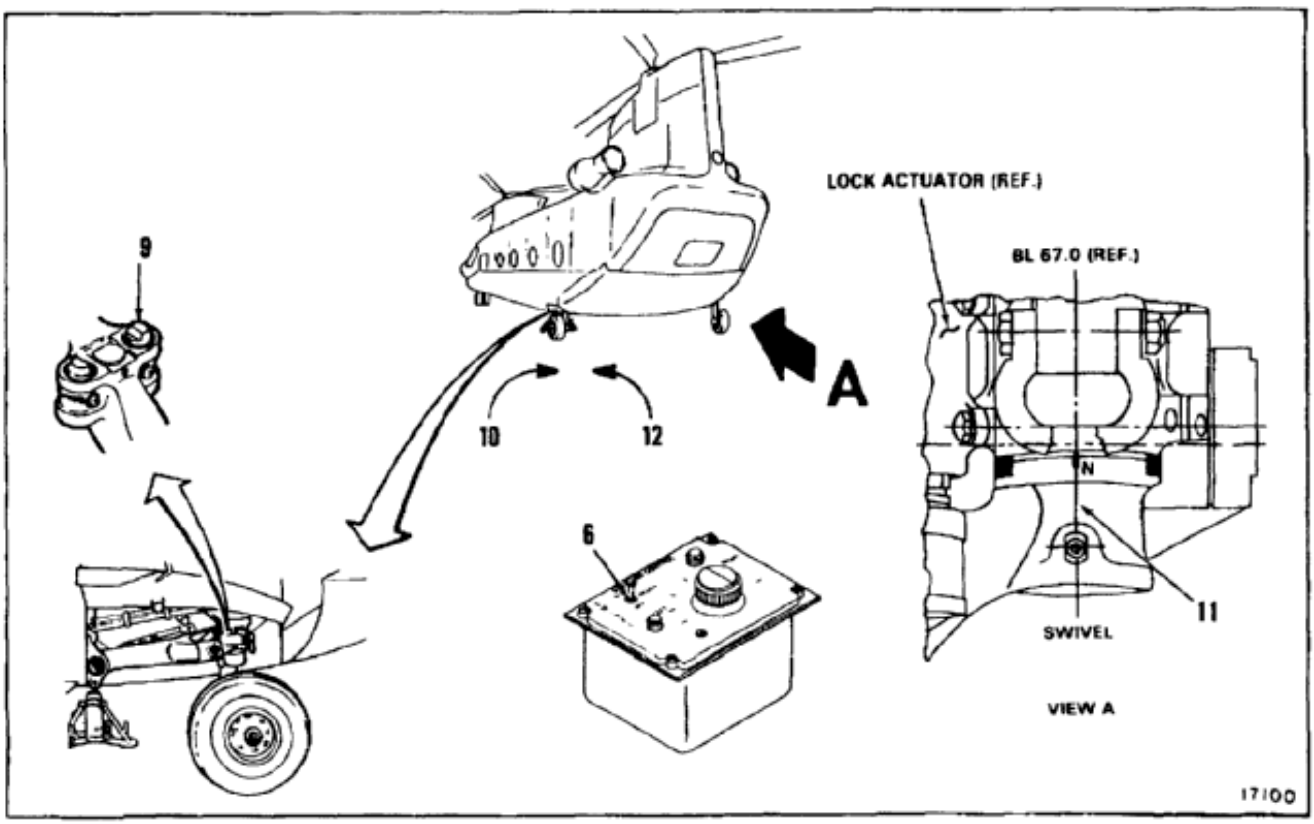
***WIRING AND CIRCUIT CHECK***

1. On No. 1 PDP (1), close (push in) BRAKES & STEERING (2) and CAUTION PANEL (3) circuit breakers.
2. Disconnect connector (4) from valve (5).
3. Set the LOCK-UNLOCK-STEER switch (6) to LOCK.
4. Apply external electric power (Task 1-37).
5. Measure voltage between contacts 1 and 3 of connector (4). There shall be bus voltage of approximately **28 vdc**.
6. Measure voltage between contacts 2 and 3 of connector (4). There shall be no voltage.
7. Set LOCK-UNLOCK-STEER switch (6) to UNLOCK.
8. Measure voltage between contacts 1 and 3 of connector (4). There shall be no voltage.
9. On No. 1 PDP (1), open (pull out) BRAKES & STEERING (2) circuit breaker.
10. Connect connector (4) to valve (5).
11. Set LOCK-UNLOCK-STEER switch (6) to UNLOCK.
12. On No. 1 PDP (1), close (push in) BRAKES & STEERING (2) circuit breaker.
13. Turn on BRK STEER switch (7) in overhead HYD panel (8).
14. Set LOCK-UNLOCK-STEER switch (6) to LOCK.



***SYSTEM OPERATION CHECK AND ADJUSTMENT***

15. Jack aft end of helicopter (Task 1-24).
16. Connect external hydraulic power supply (Task 1-38).
17. Check that swivel locks on both aft wheels are locked (TM 55-1520-240-T).
18. Set the LOCK-UNLOCK-STEER switch (6) to UNLOCK.
19. Check that swivel locks (9) on both aft wheels are unlocked (TM 55-1520-240-T).
20. Manually swivel left aft wheel clockwise approximately **90°** (10). Release it.
21. Set the LOCK-UNLOCK-STEER switch (6) to LOCK and check that:
    a. Wheel returns to neutral (11).
    b. Swivel lock engages and locks wheel in trail aft position.
22. Set the LOCK-UNLOCK-STEER switch (6) to UNLOCK. Swivel lock shall unlock.
23. Manually swivel left aft wheel counterclockwise approximately **90°** (12). Release it.
24. Set the LOCK-UNLOCK-STEER switch (6) to LOCK and check that:
    a. Wheel returns to neutral (11).
    b. Swivel lock engages and locks wheel in trail aft position.



## 9-146.1 CHECK AND ADJUST POWER STEERING CONTROL BOX ON AIRCRAFT (AVIM) (Continued) 9-146.1

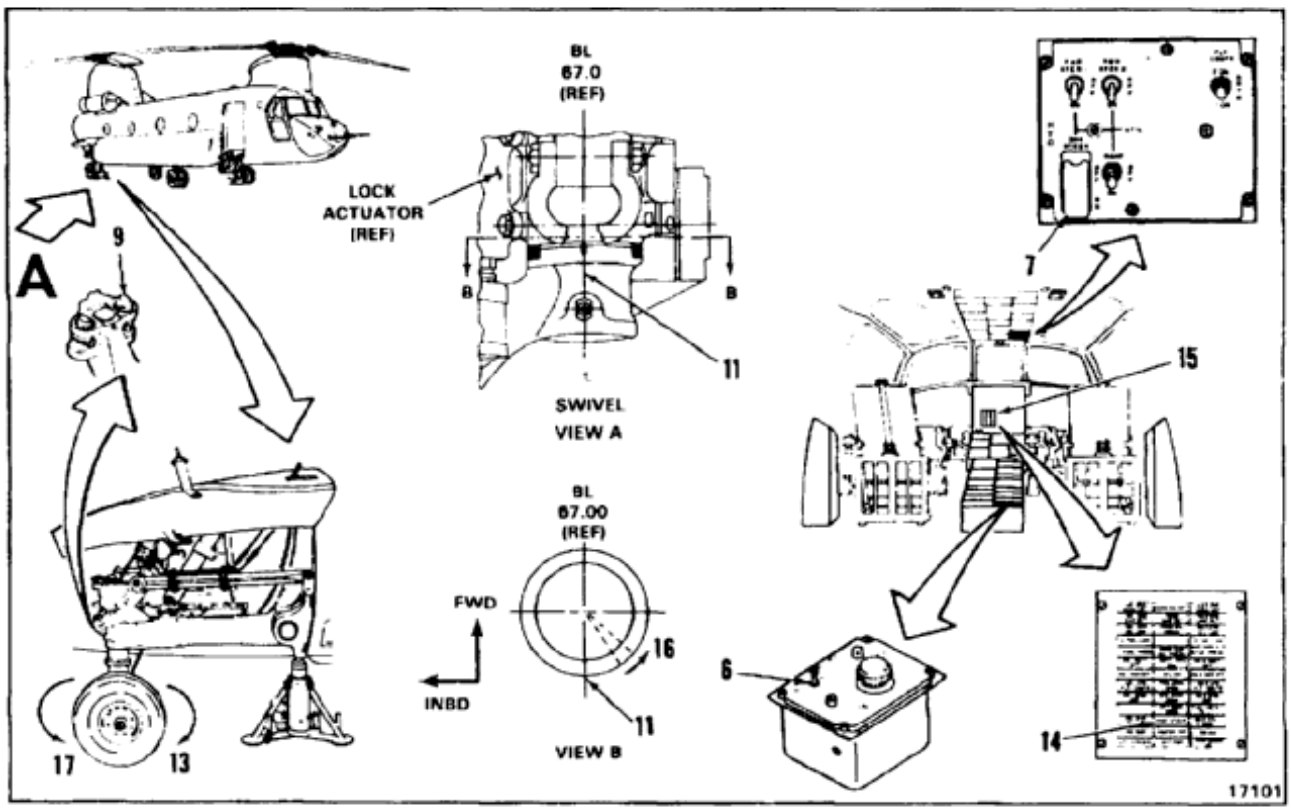
***ELECTRICAL ZERO ADJUSTMENT***

25. Paint a thin vertical red line "N" (11) on the right aft landing gear. Make line from **1/2 inch** above to **1/2 inch** below swivel bushing shoulder.
26. Set LOCK-UNLOCK-STEER switch (6) to UNLOCK.
27. Set BRK STEER switch (7) to OFF and set LOCK-UNLOCK-STEER switch (6) to STEER.
28. Manually swivel right aft wheel clockwise (13) until the PWR STEER caution light (14) on CAUTION PANEL (15) illuminates.

**NOTE**

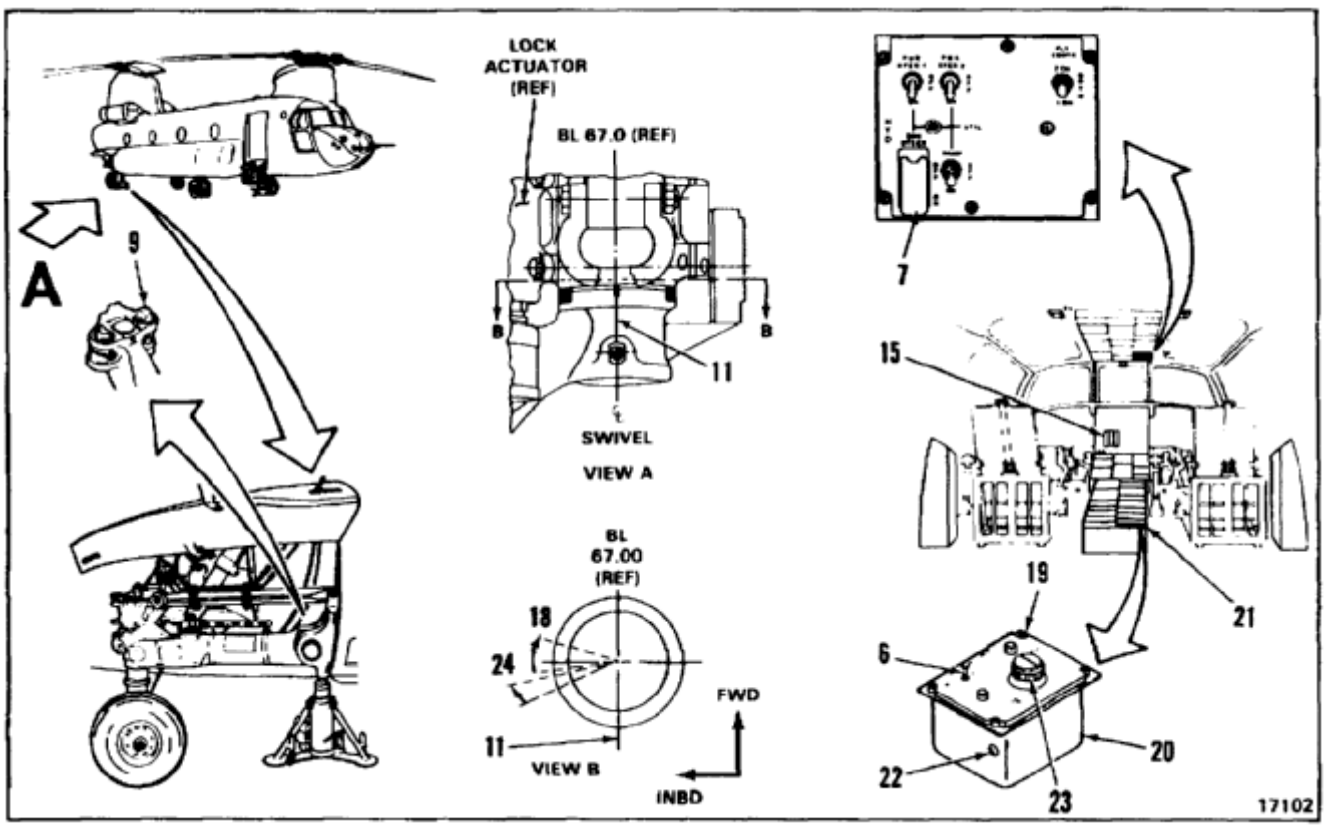
Dimensions are measured from neutral position on circumference of swivel housing.

29. Measure difference between line "N" on swivel fork (16) and line "N" on housing (11) when CAUTION PANEL (15) illuminates.
30. Panel shall illuminate when line (16) is within **2-3/16 to 2-15/32 inches** from line (11).
31. Set BRK STEER switch (7) to ON and set LOCK-UNLOCK-STEER switch (6) to LOCK.
    a. Check that wheel returns to within **1/4 inch** of lock position.
    b. Check that swivel lock (9) extends to lock position.
32. Set LOCK-UNLOCK-STEER switch (6) to UNLOCK.
33. Check that swivel lock (9) is unlocked.
34. Set BRAKE STEER switch (7) to OFF and set LOCK-UNLOCK-STEER switch (6) to STEER.
35. Manually swivel right aft wheel counterclockwise (17) until PWR STEER caution light (14) on CAUTION PANEL (15) illuminates.



## 9-146.1 CHECK AND ADJUST POWER STEERING CONTROL BOX ON AIRCRAFT (AVIM) (Continued) 9-146.1

36. Measure difference between line "N" on swivel fork (18) and line "N" on housing (11) when CAUTION PANEL (15) illuminates.
37. Panel (15) shall illuminate when line (18) is within **3-3/16 to 3-13/16 inches** from line (11).
38. Set BRK STEER switch (7) to ON and set LOCK-UNLOCK-STEER switch (6) to LOCK.
    a. Check that wheel returns to within **1/4 inch** of lock position.
    b. Check that swivel lock (9) extends to lock position.
39. Set LOCK-UNLOCK-STEER switch (7) to UNLOCK.
40. Check that swivel lock (9) is unlocked.
41. Set LOCK-UNLOCK-STEER switch (7) to STEER.
42. Loosen fasteners (19). Remove power steering box (20) from console (21).
43. Check right aft wheel for drifting clockwise or counterclockwise from neutral position.
44. Turn adjust-screw (22) in half turn increments in the required direction to bring upper and lower line "N" (11) together.
45. Maintain hand pressure on wheel to simulate ground friction and prevent overtravel while performing step 46.
46. Monitor right aft wheel and rotate steering control knob (23) clockwise **90°** and hold.
    a. Check that wheel rotates counterclockwise and line "N" on fork (24) stops within **2-11/16 to 3-1/8 inches** of line "N" on housing (11).
    b. Check that rotation is smooth and does not exceed **7 seconds**.

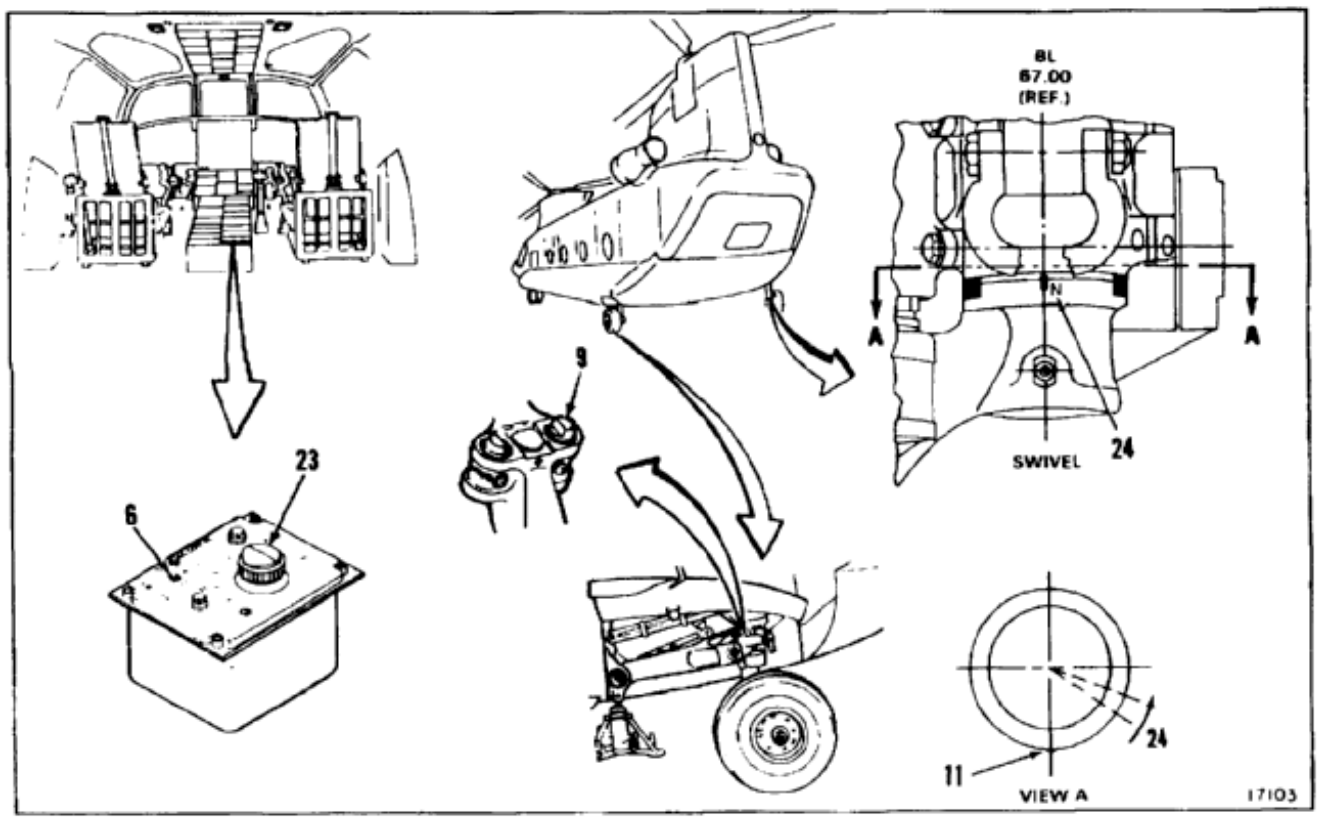


**9-146.1 CHECK AND ADJUST POWER STEERING CONTROL BOX ON AIRCRAFT (AVIM) (Continued)** **9-146.1**

47. Stand clear of wheel and release steering control knob (23).
    a. Check that steering control knob and right aft wheel return smoothly to neutral position.
    b. Check that travel time does not exceed **7 seconds**.
48. Maintain hand pressure on wheel to simulate ground friction and prevent overtravel while performing step 49.
49. Monitor right aft wheel and rotate steering control knob (23) counterclockwise **90º** and hold.
    a. Check that wheel rotates clockwise and line "N" on fork (24) stops within **1-15/16 to 2-5/32 inches** of line "N" on housing (11).
    b. Check that rotation is smooth and does not exceed **5 seconds**.
50. Stand clear of wheel and release steering control knob (23).
    a. Check that steering control knob and right aft wheel return smoothly to neutral position.
    b. Check that travel time does not exceed **5 seconds**.
51. Repeat steps 45 thru 50.
52. Set LOCK-UNLOCK-STEER switch (6) to LOCK.
53. Check that swivel lock (9) is locked.

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-147 REMOVE EMERGENCY HOOK RELEASE RELAY BOX 9-147

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

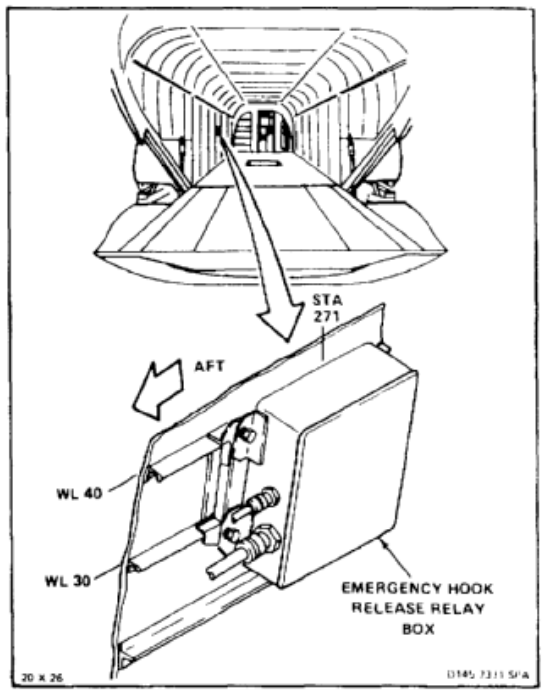
Paper Tags (E264)

***Personnel Required:***

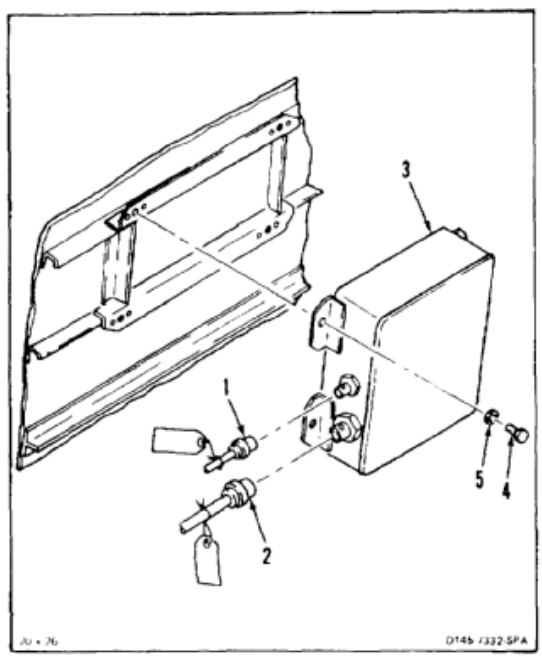
Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




1. Tag and disconnect two electrical connectors (1 and 2) from emergency hook release relay box (3).
2. Remove four bolts (4), washers (5), and relay box (3).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-148 DISASSEMBLE EMERGENCY HOOK RELEASE RELAY BOX (AVIM) 9-148

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Contact Removal/Insertion Tool, M83723-31/20
Contact Removal/Insertion Tool, M81969/14-03
Heat Sink, NSN 3439-00-973-2249
Soldering Gun

***Materials:***

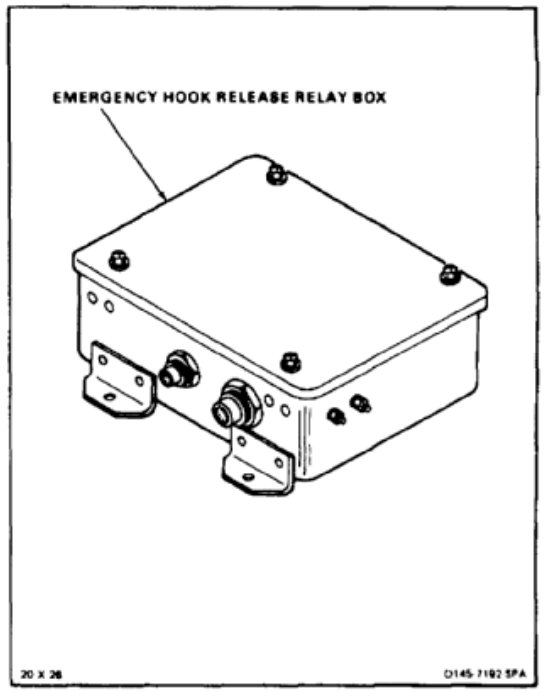
Paper Tags (E264)

***Personnel Required:***

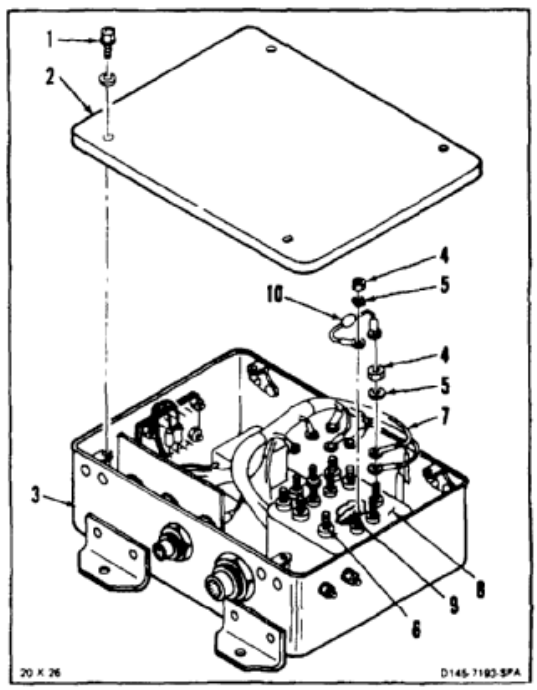
Aircraft Electrician

***Equipment Condition:***

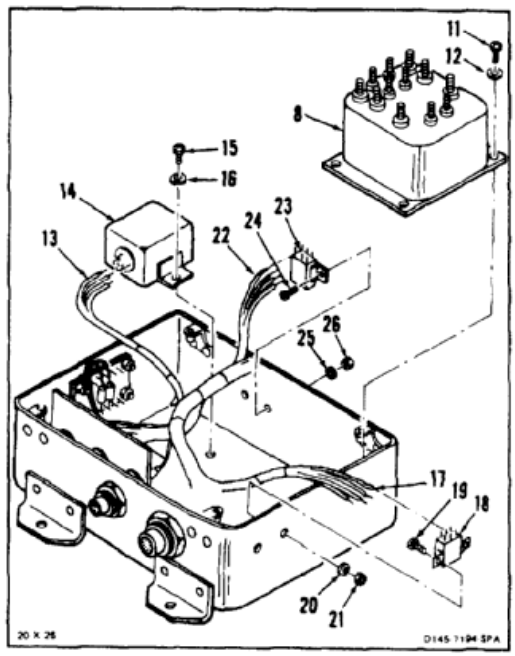
Off Helicopter Task



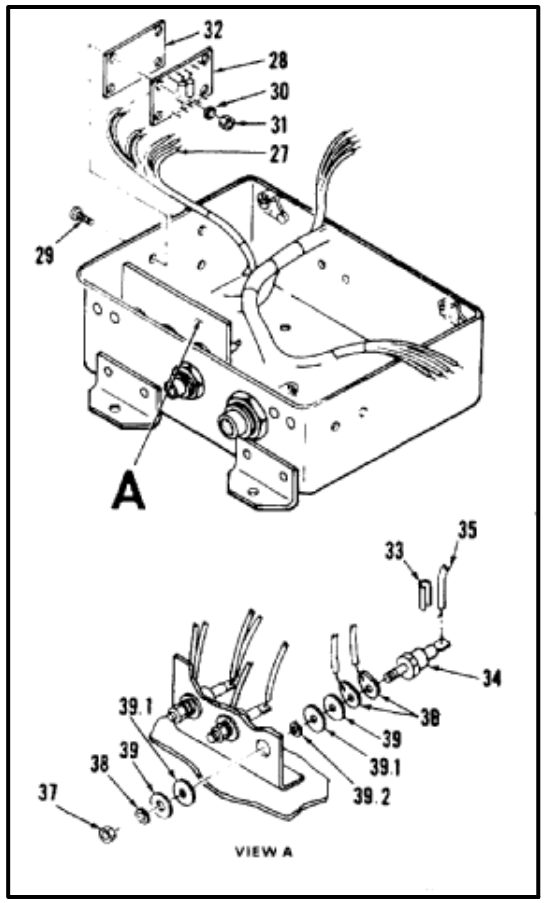

1. Remove four screws (1). Remove cover (2) from box (3).
2. Remove 12 nuts (4) and washers (5) from relay (6).
3. Tag and disconnect 22 wires (7) from relay (8).
4. Cut through coating (9); use sharp knife. Remove diode (10).



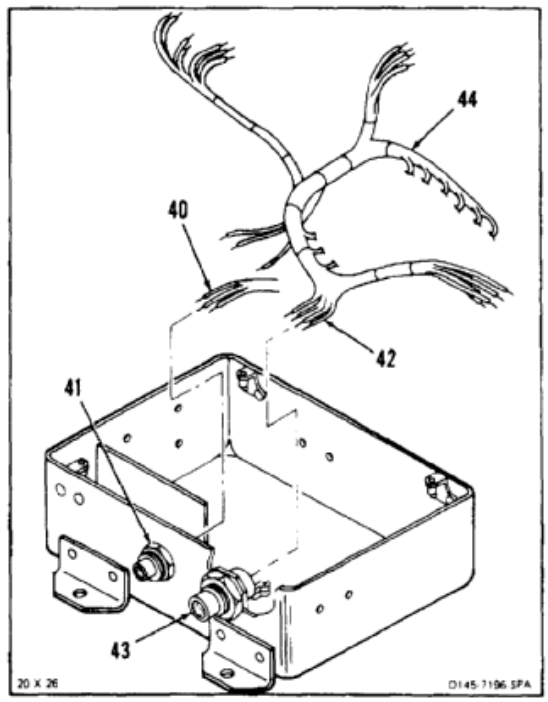
5. Remove four screws (11) and washers (12). Remove relay (8).
6. Tag and unsolder six wires (13) from relay (14).
7. Remove two screws (15) and washers (16). Remove relay (14).
8. Tag and unsolder five wires (17) from relay (18). Remove two screws (19), washers (20), and nuts (21).
9. Remove relay (18).
10. Tag and unsolder five wires (22) from relay (23).
11. Remove two screws (24), washers (25), and nuts (26). Remove relay (23).



12. Tag and unsolder three wires (27) from terminal board (28).
13. Remove four screws (29), washers (30), and nuts (31). Remove terminal board (28) and insulator (32).
14. Remove insulation sleeving (33) from three diodes (34). Cut sleeving with sharp knife.
15. Unsolder four wires (35) from three diodes (34). Use soldering gun and heat sink.
16. Tag five wires (36).
17. Remove three nuts (37), lockwashers (38), steel washers (39), and mica washers (39.1) from three diodes (34).
18. Remove three diodes (34), Teflon spacers (39.2), mica washers (39.1), steel washers (39), and wires (36).



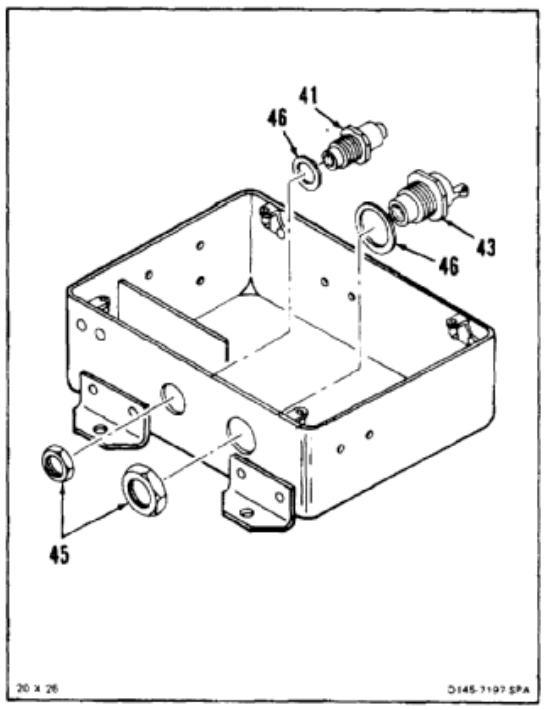
19. Tag and remove six wires (40) from connector (41). Use contact removal tool.
20. Tag and remove eight wires (42) from connector (43). Use contact removal tool.
21. Remove wire harness (44).




22. Remove lockwire from nuts (45).
23. Remove two nuts (45), connectors (41 and 43), and two packings (46).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-149 ASSEMBLE EMERGENCY HOOK RELEASE RELAY BOX (AVIM) 9-149

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Contact Removal/Insertion Tool, M83723-31/20
Contact Removal/Insertion Tool, M81969/14-03
Heat Gun

***Materials:***

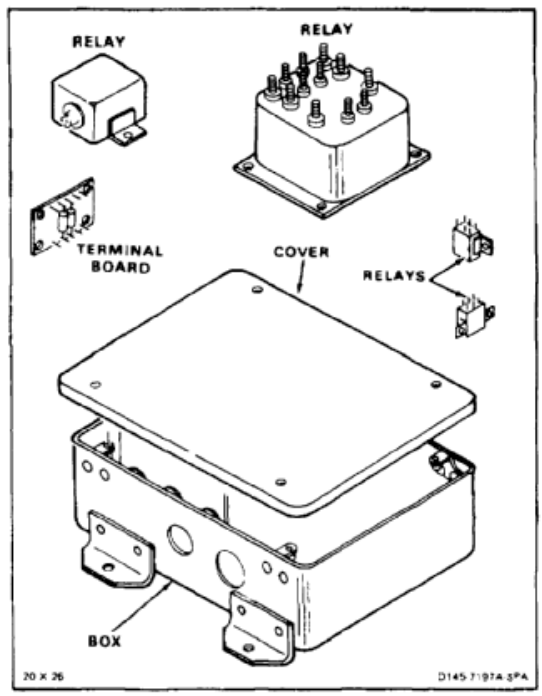
Protective Coating EC1103 (E305)
Lockwire (E231)
Solder (E360)
Insulation Sleeving (E204)
Heat Sink Compound (E173)

***Personnel Required:***

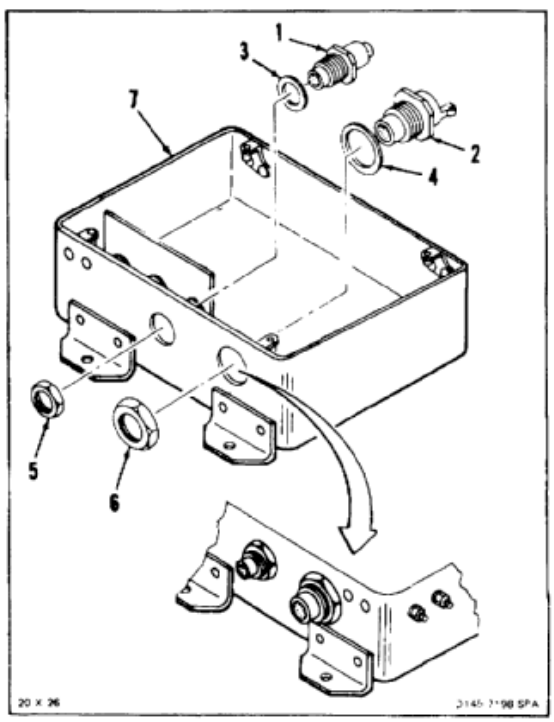
Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P

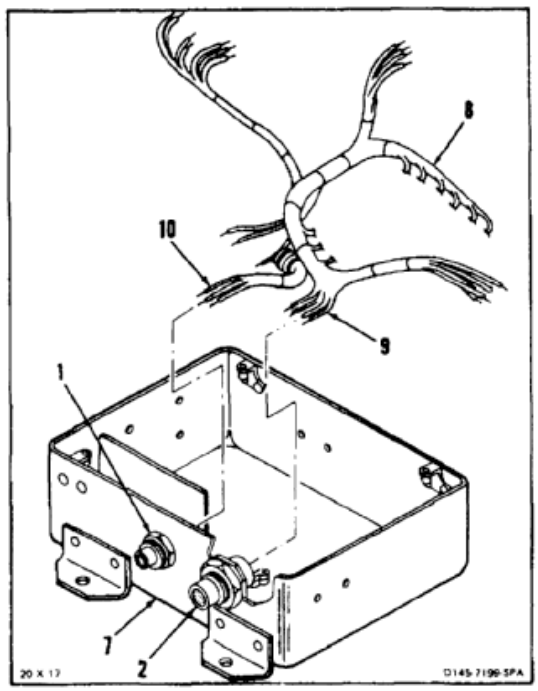



1. Install two connectors (1 and 2), packings (3 and 4), and nuts (5 and 6) on box (7).
2. Lockwire two nuts (5 and 6). Use lockwire (E231).

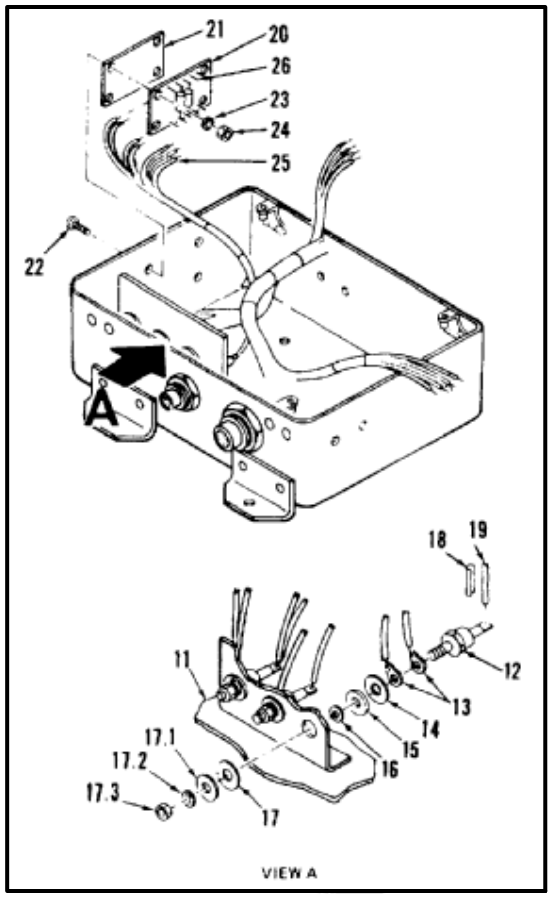


3. Position harness (8) in box (7) and connect eight wires (9) to connector (2). Use insertion tool. Remove tags.

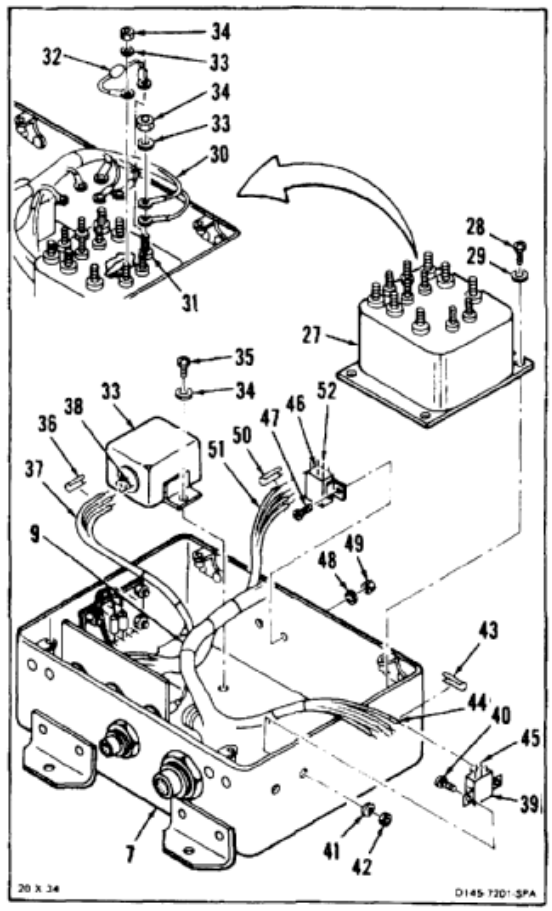
4. Connect six wires (10) to connector (1). Use insertion tool. Remove tags.



5. Apply heat sink compound (E173) to support (11).
6. Install three diodes (12), five wires (13), three steel washers (14), mica washers (15), and Teflon spacers (16) in support (11).
6.1. Install three mica washers (17), steel washers (17.1), lockwashers (17.2), and nuts (17.3).
7. Install sleeving (18) over four wires (19).
8. Connect four wires (19) to three diodes (12). Use solder (E360). Remove tags.
9. Position insulation sleeving (18) against diode (12). Shrink sleeving with heat gun.
10. Position terminal board (20) and insulator (21). Install four screws (22), washers (23), and nuts (24).
11. Solder three wires (25) to terminals (26). Use solder (E360). Remove tags.

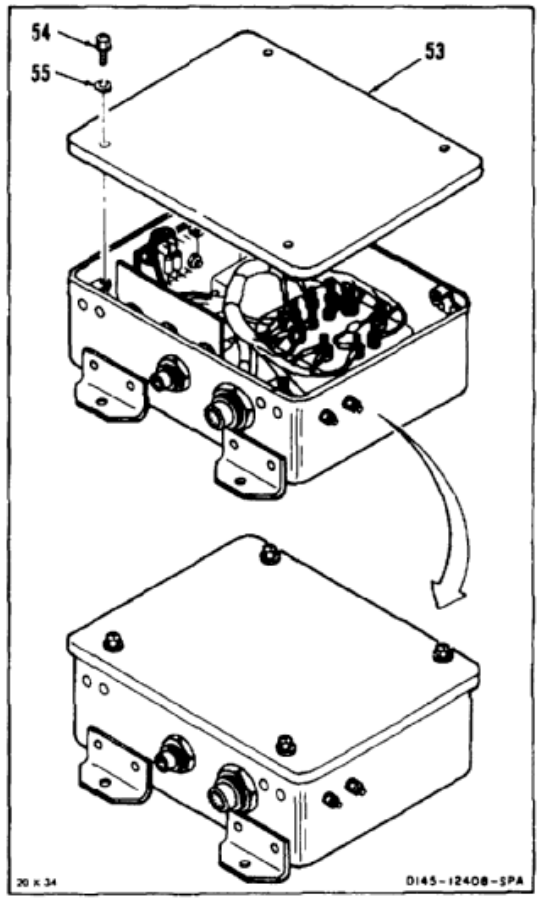


12. Position relay (27) in box (7).
13. Install harness (9) and relay (27).
14. Install four screws (28) and washers (29).
15. Connect 22 wires (30) on terminals (31). Remove tags.
16. Connect diode (32). Install 12 washers (33) and nuts (34).
17. Cement diode (32) to relay (27). Use protective coating (E305).
18. Install relay (33), two washers (34), and screws (35).
19. Install insulation sleeving (36) on wires (37). Use insulation sleeving (E204).
20. Solder six wires (37) to terminals (38). Use solder (E360). Remove tags.
21. Position insulation sleeving (36) against relay. Shrink sleeving with heat gun.
22. Position relay (39). Install two screws (40), washers (41), and nuts (42).
23. Install insulation sleeving (43) on five wires (44). Use insulation sleeving (E204).
24. Solder five wires (44) to terminals (45). Use solder (E360).
25. Position sleeving (43) against relay (39). Shrink sleeving with heat gun.
26. Position relay (46) on box (7). Install two screws (47), washers (48), and nuts (49).
27. Install insulation sleeving (50) on five wires (51). Use insulation sleeving (E204).
28. Solder wires (51) to terminals (52). Use solder (E360).
29. Position sleeving (50) against relay (46). Shrink sleeving with heat gun.




***INSPECT***

30. Install cover (53). Install four screws (54) and washers (55).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-149.1 TEST EMERGENCY HOOK RELEASE RELAY BOX (AVIM) 9-149.1

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Multimeter
Power Supply, 28 VDC
Stopwatch

***Materials:***

None

***Personnel Required:***

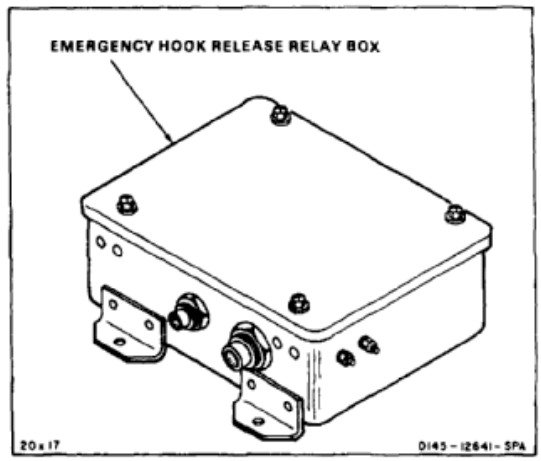
Aircraft Electrician
Inspector

***References:***

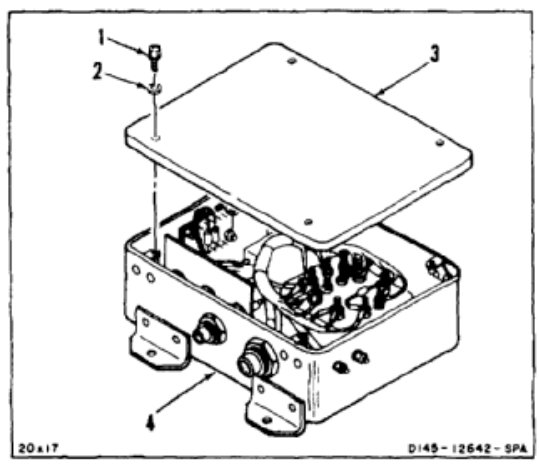
TM 55-1520-240-T

***Equipment Condition:***

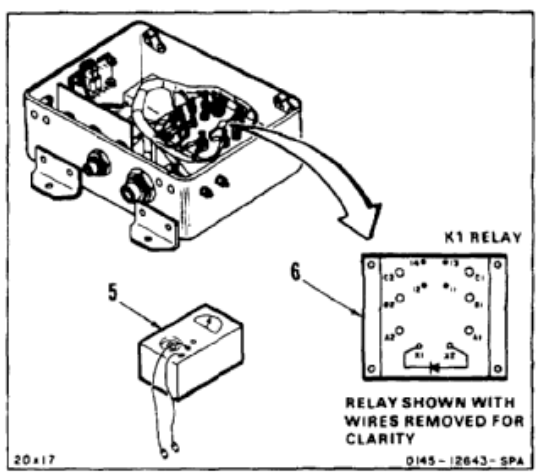
Off Helicopter Task



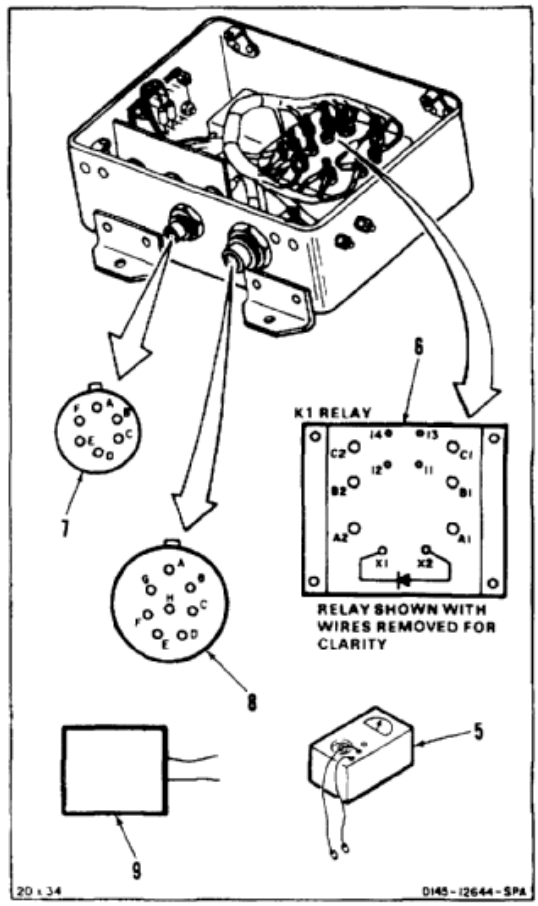

1. Remove four screws (1) and four washers (2). Remove cover (3) from box (4).



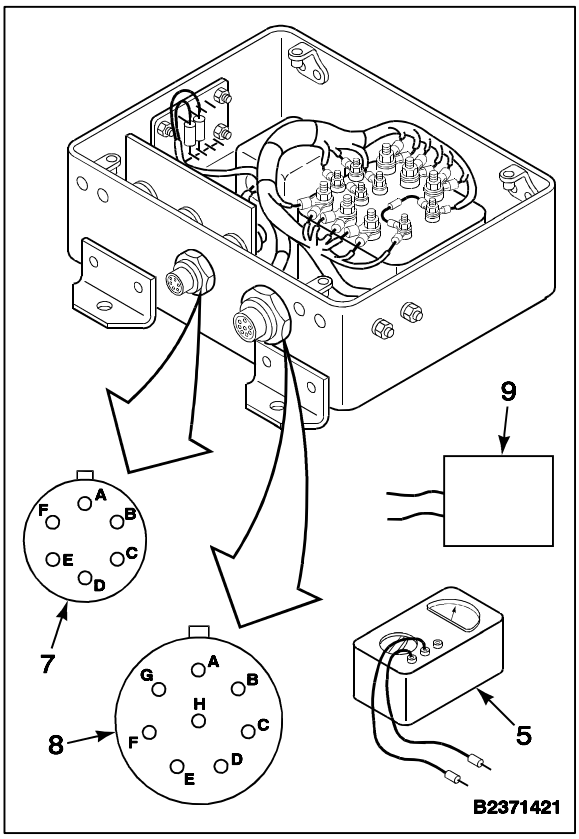

2. Connect multimeter (5) set to RX1 between terminals 13 and 14 and X1 and 12 on relay (6). Multimeter shall indicate continuity.
3. Connect multimeter (5) set to RX1 between terminals 11 and 12, C1 and C2, B1 and B2, and A1 and A2 on relay (6). Multimeter shall indicate open.



4. Connect multimeter (5) set to RX1 between receptacle (7) pin E and receptacle (8) pin E. Multimeter shall indicate continuity.
5. Connect power supply (9) to receptacle (7) pins B(+) and C(–).
6. Connect multimeter (5) set to RX1 between terminals C1 and C2, 11 and 12, B1 and B2, and A1 and A2 on relay (6). Multimeter shall indicate open.
7. Turn power supply (9) on. Multimeter shall indicate continuity for terminal pairs in step 6.
8. Turn power supply (9) off and disconnect power supply from receptacle (7).
9. Connect multimeter (5) set to RX1 between relay (6) terminals C1(+) and receptacle (8) pin A(–). Multimeter shall indicate between **6 and 9 ohms**.
10. Connect multimeter (5) set to RX1 between relay (6) terminal C1(–) and receptacle (8) pin A(+). Multimeter shall indicate open.
11. Connect multimeter (5) set to RX1 between relay (6) terminal C1(+) and receptacle (8) pin B(–). Multimeter shall indicate between **6 and 9 ohms**.
12. Connect multimeter (5) set to RX1 between relay (6) terminal C1(–) and receptacle (8) pin B(+). Multimeter shall indicate open.
13. Connect multimeter (5) set to RX1 between relay (6) terminal C(+) and receptacle (8) pin C(–). Multimeter shall indicate between **6 and 9 ohms**.
14. Connect multimeter (5) set to RX1 between relay (6) terminal C1(–) and receptacle (8) pin C(+). Multimeter shall indicate open.
15. Connect multimeter (5) set to RX10 between receptacle (8) pins A and D and C and D. Multimeter shall indicate between **460 and 660 ohms** on each pair of pins.



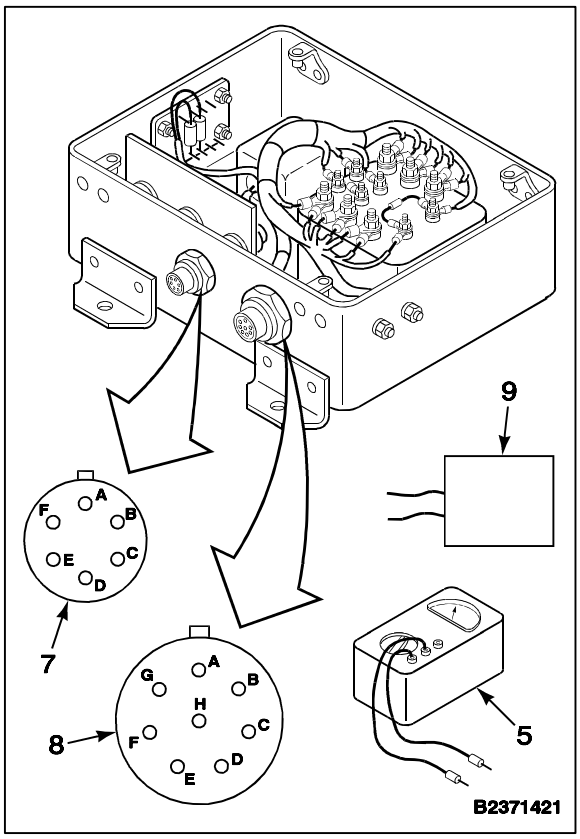
16. Connect multimeter (5), set to RX 100 between receptacle (8) pin F and G and E and H. Mulimeter shall indicate between **1040 and 1560 ohms** on each pair of pins.
17. Connect multimeter (5), set to RX 1 between receptacle (7) pins F and D. Multimeter shall indicate continuity.
18. Connect power supply (9) to receptacle (8) pins G(+) and F(–).
19. Connect multimeter (5), set to RX 1 between receptacle (7) pins F and D.
20. Turn power supply (9) on. Multimeter shall indicate continuity.
21. Turn power supply (9) off.
22. Connect power supply (9) to receptacle (8) pins H(+) and E(–).
23. Repeat steps 19 thru 21. Then go to step 24.
24. Connect jumper wire between receptacle (8) pins G and H and a jumper wire between pins F and E.
25. Connect power supply (9) to receptacle (8) between jumpers at pins G and H(+) and F and E(–).
26. Repeat step 19.
27. Turn power supply (9) on. Multimeter shall indicate open.



28. Turn power supply (9) off.
29. Connect power supply (9) to receptacle (8) pin D(+) and receptacle (7) pin C(–).
30. Connect multimeter (5), set to dc between receptacle (8) pin B(+) and receptacle (7) pin C(–).
31. Connect a jumper between pins A and B on receptacle (7).
32. Turn power supply (9) on.
33. Momentarily apply **+28 vdc** to jumper on receptacle (7). Multimeter shall indicate **28 vdc 8 to 12 seconds** after **28 vdc** has been removed from receptacle (7) pins A and B.

***INSPECT***

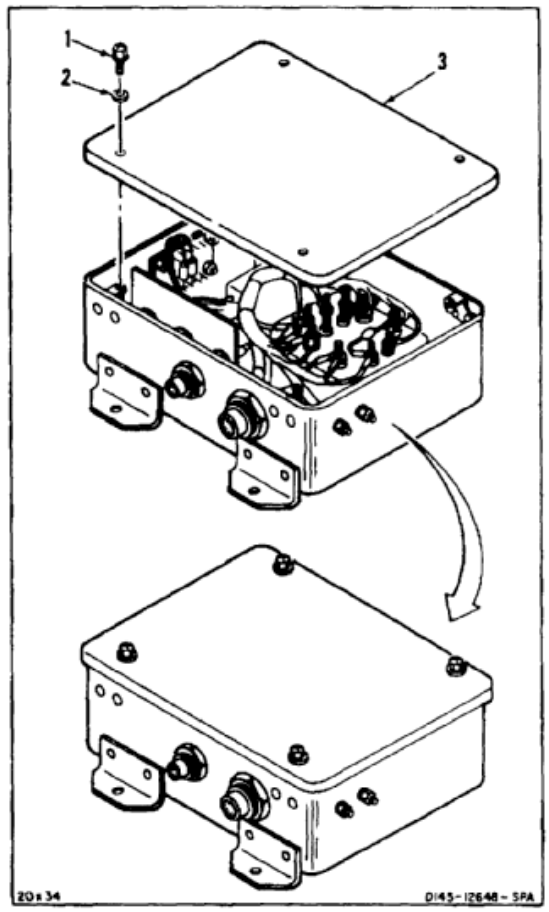
34. Turn power supply (9) off. Disconnect power supply from receptacles (7 and 8).
35. Disconnect multimeter (5) from receptacles (7 and 8).

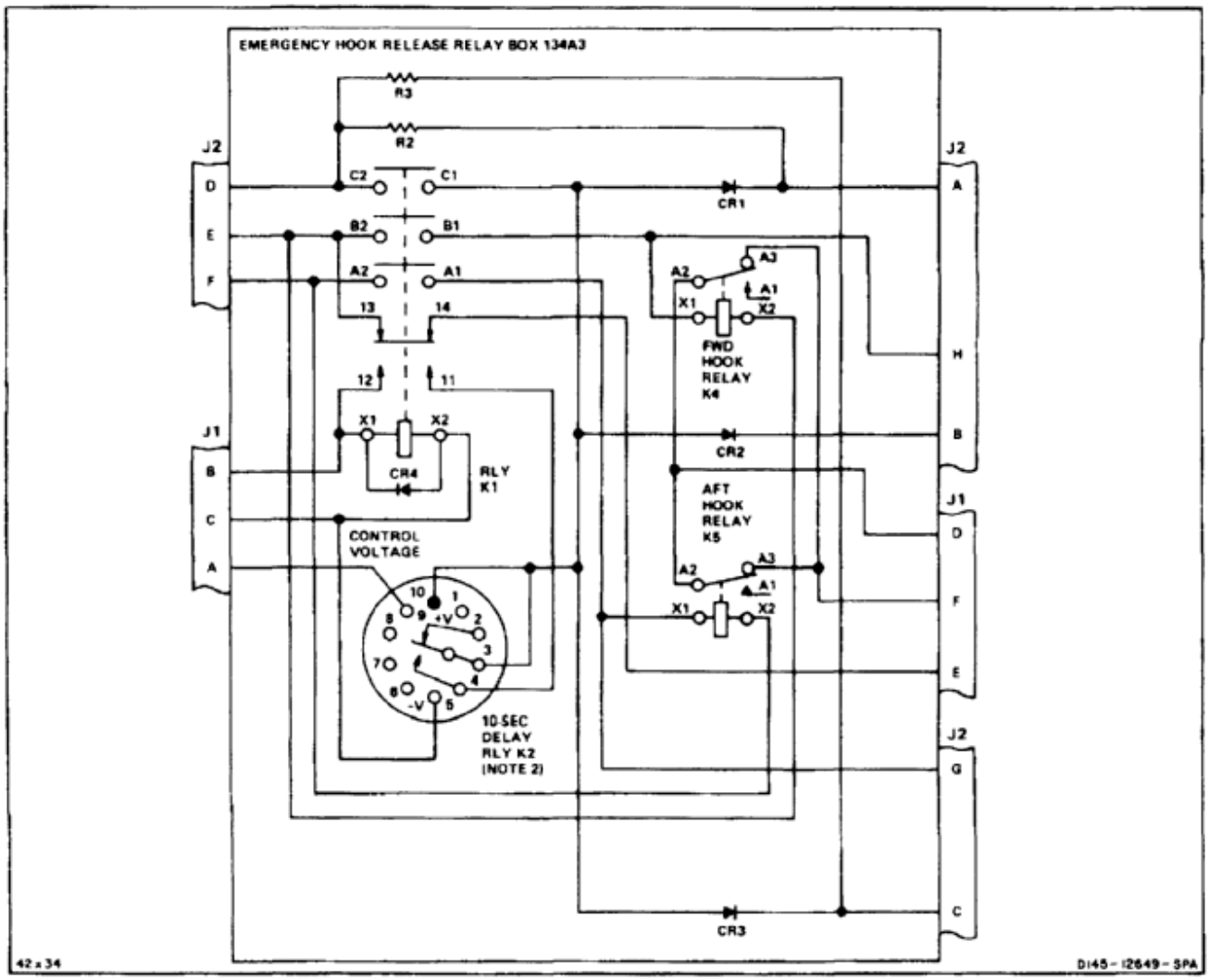


36. Install cover (3). Install four screws (1) and four washers (2).

***FOLLOW-ON MAINTENANCE:***

None




EMERGENCY HOOK RELEASE RELAY BOX 134A3
R3
R2
J2
D
E
F
C2
C1
B2
B1
A2
A1
13
14
12
11
X1
X2
CR4
RLY K1
J1
B
C
A
CONTROL VOLTAGE
10
1
9
+V
2
8
3
7
4
6
-V
5
10-SEC DELAY RLY K2 (NOTE 2)
CR1
A3
FWD HOOK RELAY K4
CR2
AFT HOOK RELAY K5
CR3
H
G
42 x 34
D145-12649-SPA

END OF TASK

## 9-150 INSTALL EMERGENCY HOOK RELEASE RELAY BOX 9-150

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

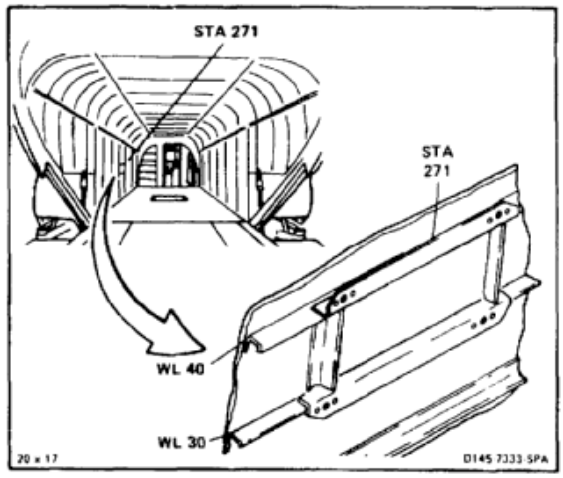
None

***Personnel Required:***

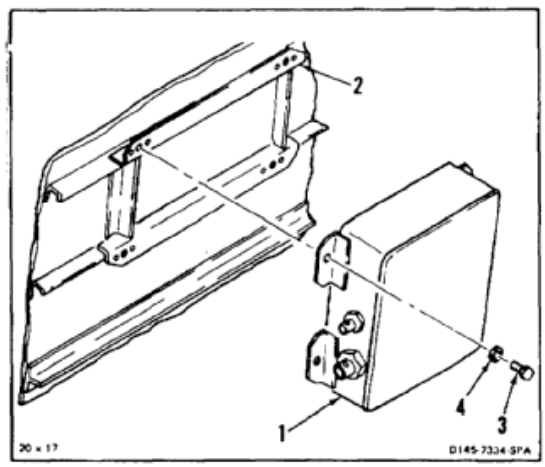
Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P




1. Position relay box (1) on structure (2). Install four bolts (3) and washers (4).

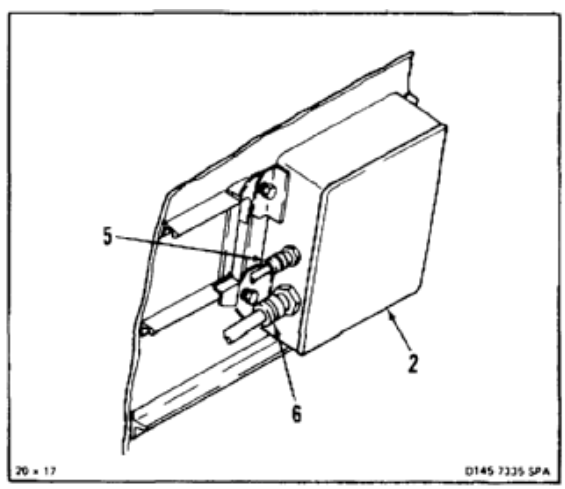



2. Connect two electrical connectors (5 and 6) to relay box (2). Remove tags.

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check of external cargo hook system (TM 55-1520-240-T).




END OF TASK

## 9-151 REMOVE CARGO HOOK RELEASE RELAY BOX 9-151

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

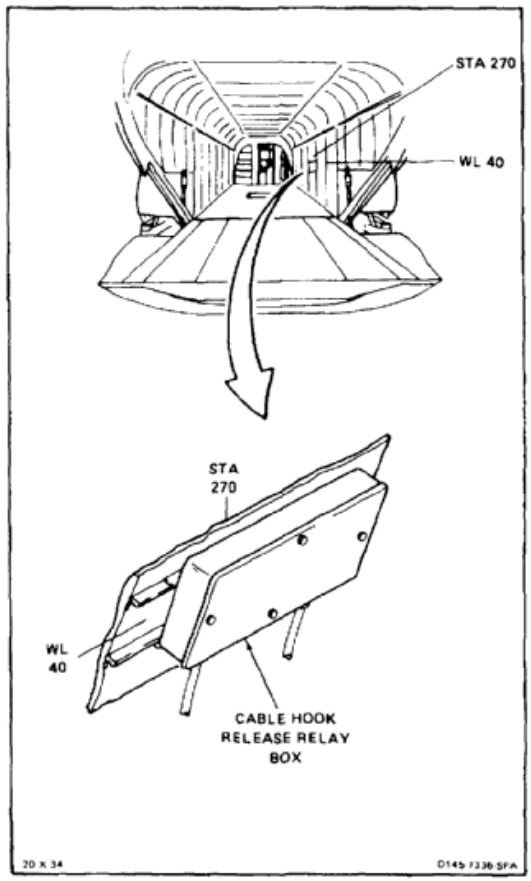
Paper Tags (E264)

***Personnel Required:***

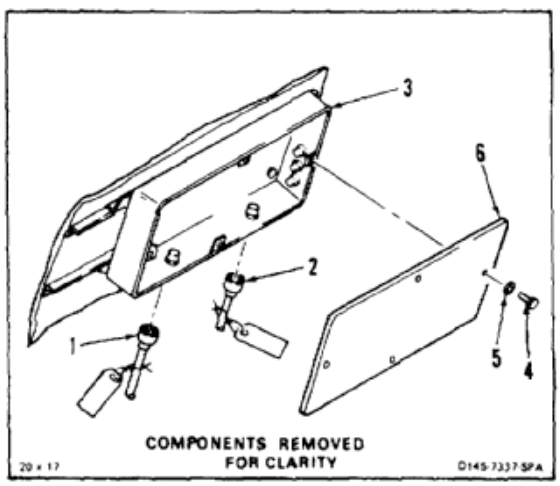
Aircraft Electrician

***Equipment Condition:***

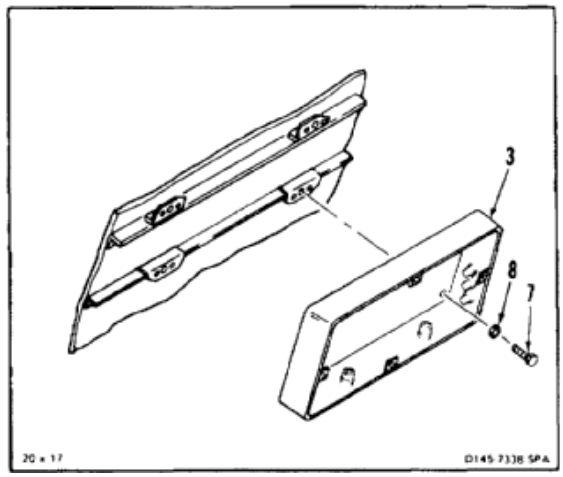
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




1. Tag and disconnect two electrical connectors (1 and 2) from cargo hook relay box (3).
2. Remove four bolts (4), washers (5), and cover (6) from relay box (3).



3. Remove four bolts (7), washers (8), and relay box (3).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-152 DISASSEMBLE DUAL HOOK RELAY BOX (AVIM) 9-152

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun
Contact Removal/Insertion Tool, MS3447-20

***Materials:***

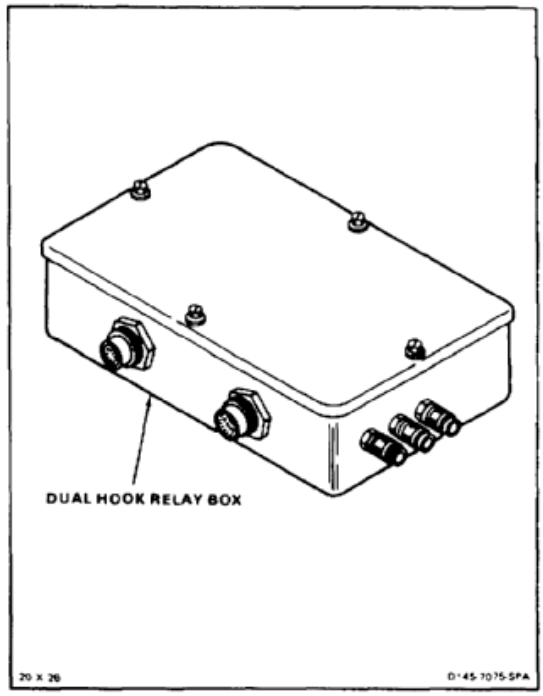
Paper Tags (E264)

***Personnel Required:***

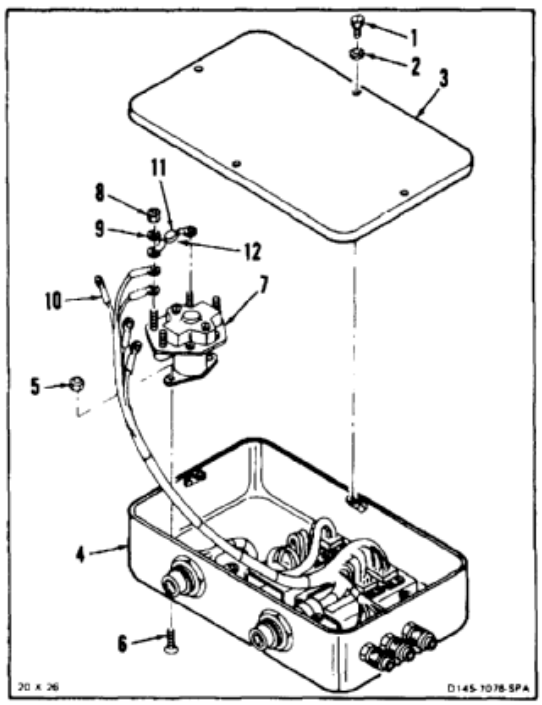
Aircraft Electrician (2)

***Equipment Condition:***

Off Helicopter Task



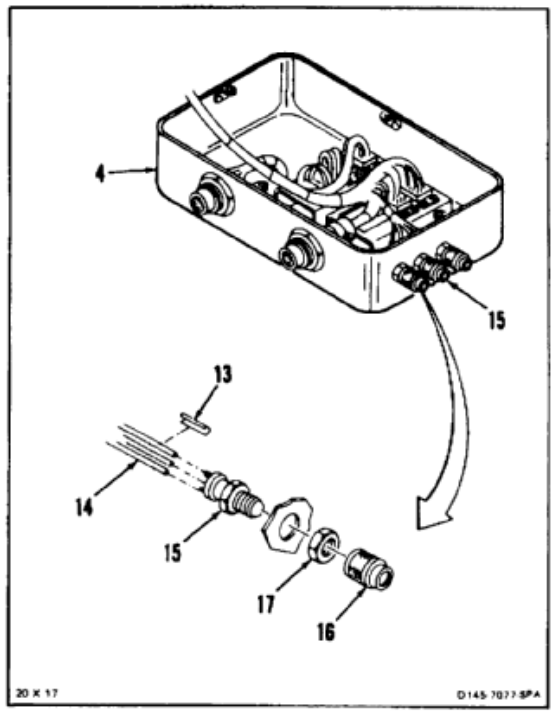

1. Remove four screws (1) and washers (2). Remove cover (3) from box (4).
2. Remove two nuts (5) and screws (6). Remove relay (7) from box (4).
3. Remove four nuts (8) and washers (9) from relay (7). Tag and disconnect seven wires (10) and diode (11) from relay (7).
4. Cut through protective coating (12) and remove diode (11).



**NOTE**

Procedure is same to remove all three lights. Removal of one light is shown here.

5. Cut and remove insulation sleeving (13) from three wires (14) on light (15). Use sharp knife.
6. Tag and solder three wires (14) from light (15).
7. Remove lens (16), nut (17), and light (15) from box (4).
8. Repeat steps 5 thru 7 for other two lights (15).

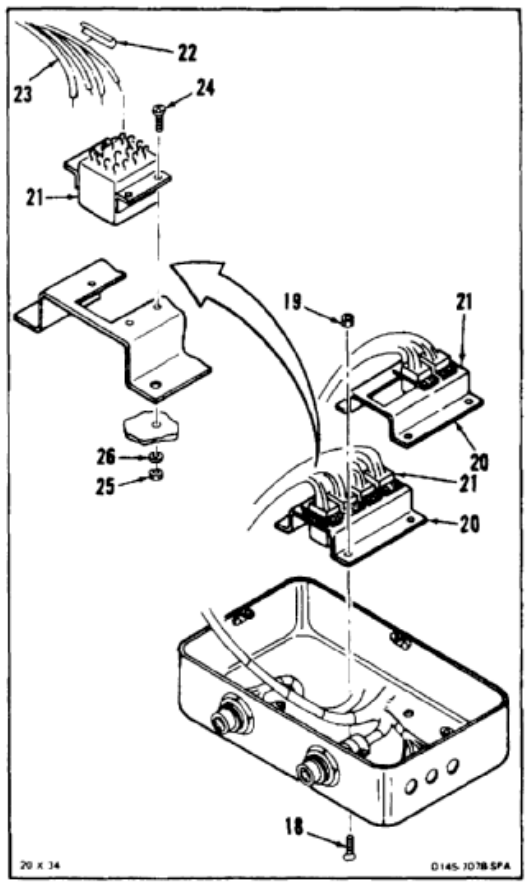


9. Remove nine screws (18) and nuts (19).
10. Remove two relay brackets (20) with relays (21).

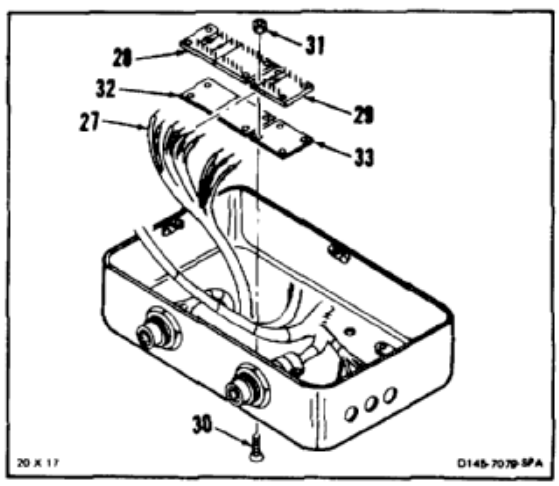
**NOTE**

Procedure is same to remove all six relays. Removal of one relay is shown here.

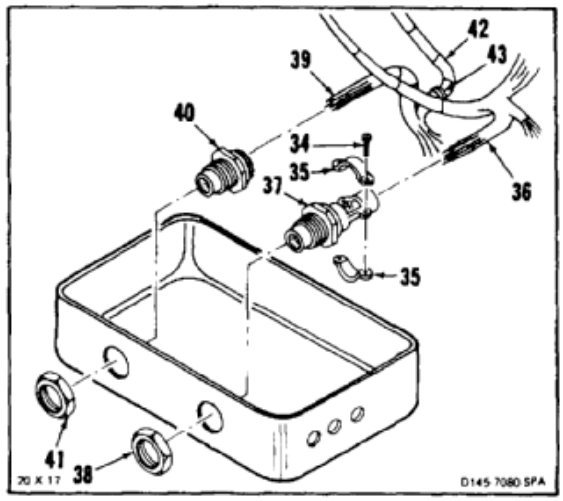
11. Cut and remove insulation sleeving (22) from wires (23). Use sharp knife.
12. Tag and unsolder six wires (23) from relay (21).
13. Remove three screws (24), nuts (25), and washers (26). Remove relay (21).
14. Repeat steps 9 thru 13 for remaining five relays (21).




15. Tag and unsolder 51 wires (27) from terminal boards (28 and 29).
16. Remove six screws (30) and nut (31).
17. Remove terminal boards (28 and 29) and insulators (32 and 33).



18. Remove two screws (34) and strain relief (35).
19. Tag and disconnect 17 wires (36) from connector (37). Use contact tool.
20. Remove nut (38) and connector (37).
21. Tag and disconnect seven wires (39) from connector (40). Use contact tool.
22. Remove nut (41) and connector (40).
23. Remove harness (42) and clamp (43).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-153 ASSEMBLE DUAL HOOK RELAY BOX (AVIM) 9-153

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun
Contact Removal/Insertion Tool, M83723-31-20
Heat Gun

***Materials:***

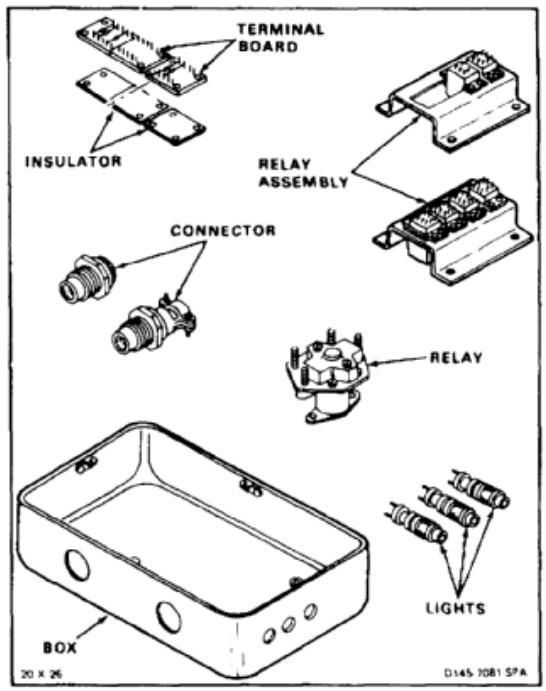
Protective Coating (E305)
Solder (E360)
Shrinkable Tubing (E431)

***Personnel Required:***

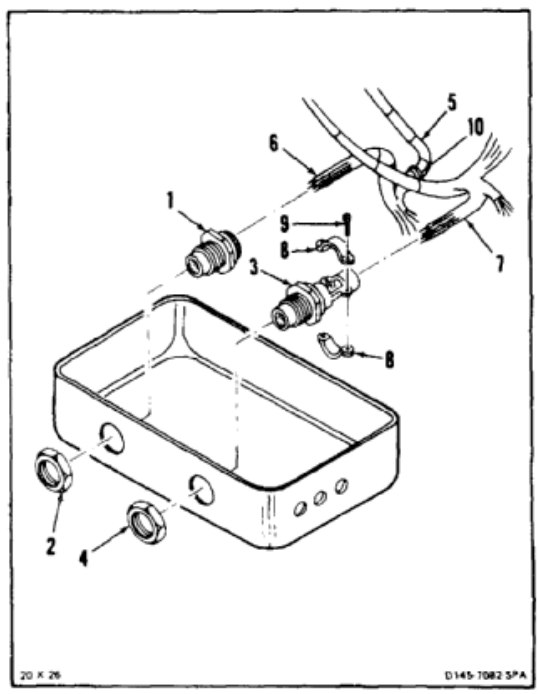
Aircraft Electrician (2)
Inspector

***References:***

TM 55-1520-240-23P

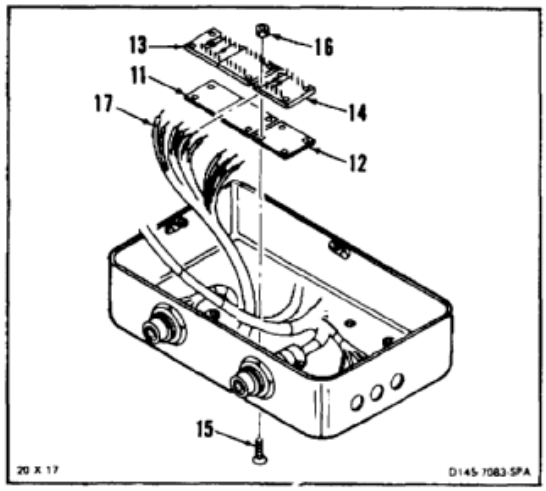



1. Install connector (1) and nut (2), key up.
2. Install connector (3) and nut (4), key up.
3. Position harness (5). Connect seven wires (6) to connector (1). Use contact tool. Remove tags.
4. Connect 17 wires (7) to connector (3). Use contact tool. Remove tags.
5. Install strain relief (8) and two screws (9).
6. Position clamp (10) on harness (5).



7. Position insulators (11 and 12) and terminals boards (13 and 14).
8. Install six screws (15) and nuts (16).
9. Solder 51 wires (17) to terminal boards (13 and 14). Use solder (E360). Remove tags.

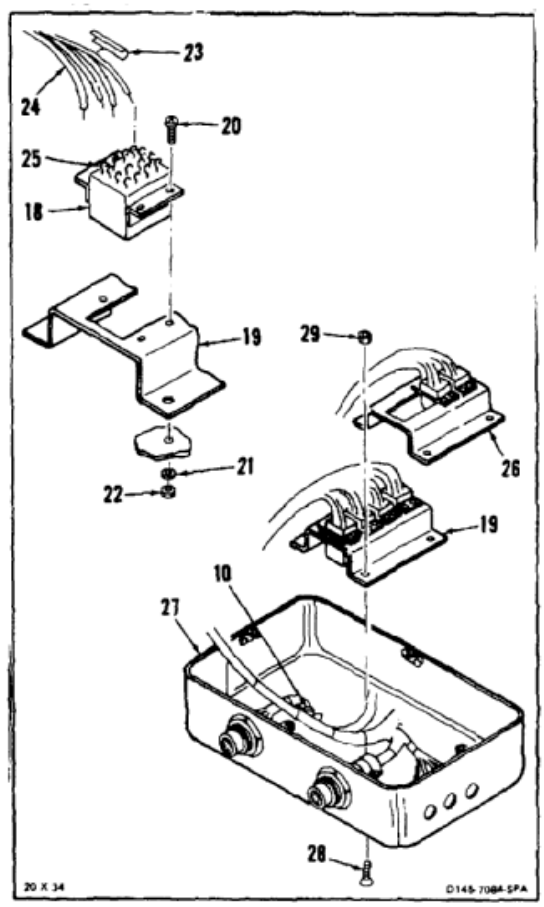
***INSPECT***




**NOTE**

Procedure is same to install all six relays. Installation of one relay is shown here.

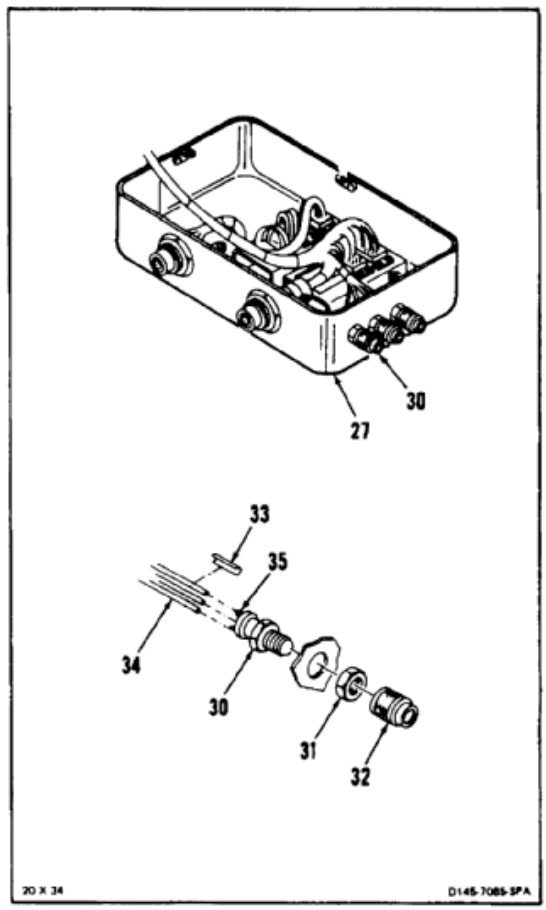
10. Position relay (18) in bracket (19). Install three screws (20), washers (21), and nuts (22).
11. Position tubing (23) on wires (24). Use shrinkable tubing (E431).
12. Solder six wires (24) to relay (18). Use solder (E360). Remove tags.
13. Slide tubing (23) over relay pins (25). Shrink tubing with heat gun.
14. Repeat steps 10 thru 13 for other five relays (18).
15. Position two relay brackets (19 and 26) and clamp (10) in box. Install nine screws (28) and nuts (29).



**NOTE**

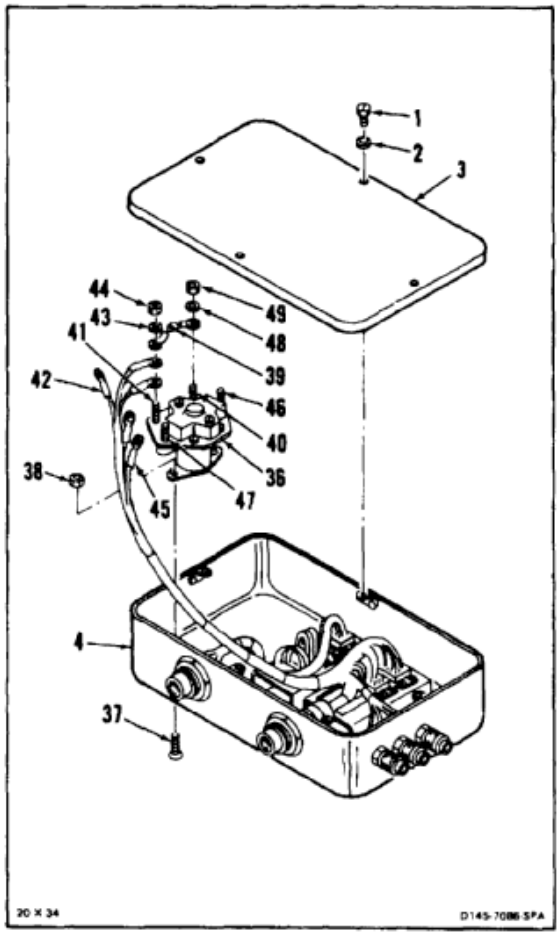
Procedure is same to install all three lights. Installation of one light is shown here.

16. Install light (30) and nut (31) in box (27).
17. Install lens (32).
18. Position tubing (33) on wires (34). Use shrinkable tubing (E431).
19. Solder three wires (34) to light (30). Use solder (E360). Remove tags.
20. Slide tubing (33) over terminals (35). Shrink tubing with heat gun.
21. Repeat steps 16 thru 20 for other three lights (30).



22. Position relay (36). Install two screws (37) and nuts (38).
23. Connect diode (39) between terminals (40 and 41), band towards terminal (41).
24. Connect four wires (42) to terminals (40 and 41) by installing two washers (43) and nuts (44). Remove tags.
25. Connect three wires (45) to terminals (46 and 47) by installing two washers (48) and nuts (49). Remove tags.
26. Connect diode (39) to relay (36). Use protective coating (E305).

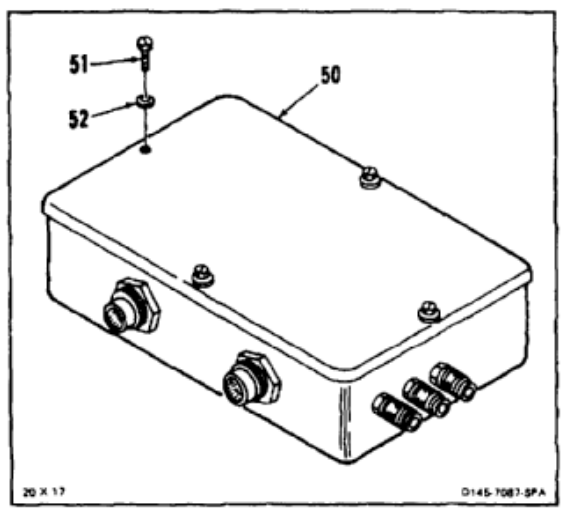
***INSPECT***




27. Install cover (50), four screws (51), and washer (52).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-153.1 TEST DUAL HOOK RELAY BOX (AVIM) 9-153.1

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Power Supply, 28 VDC
Multimeter

***Materials:***

None

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 55-1500-323-25

***Equipment Condition:***

Off Helicopter Task

1. Perform continuity checks as listed:

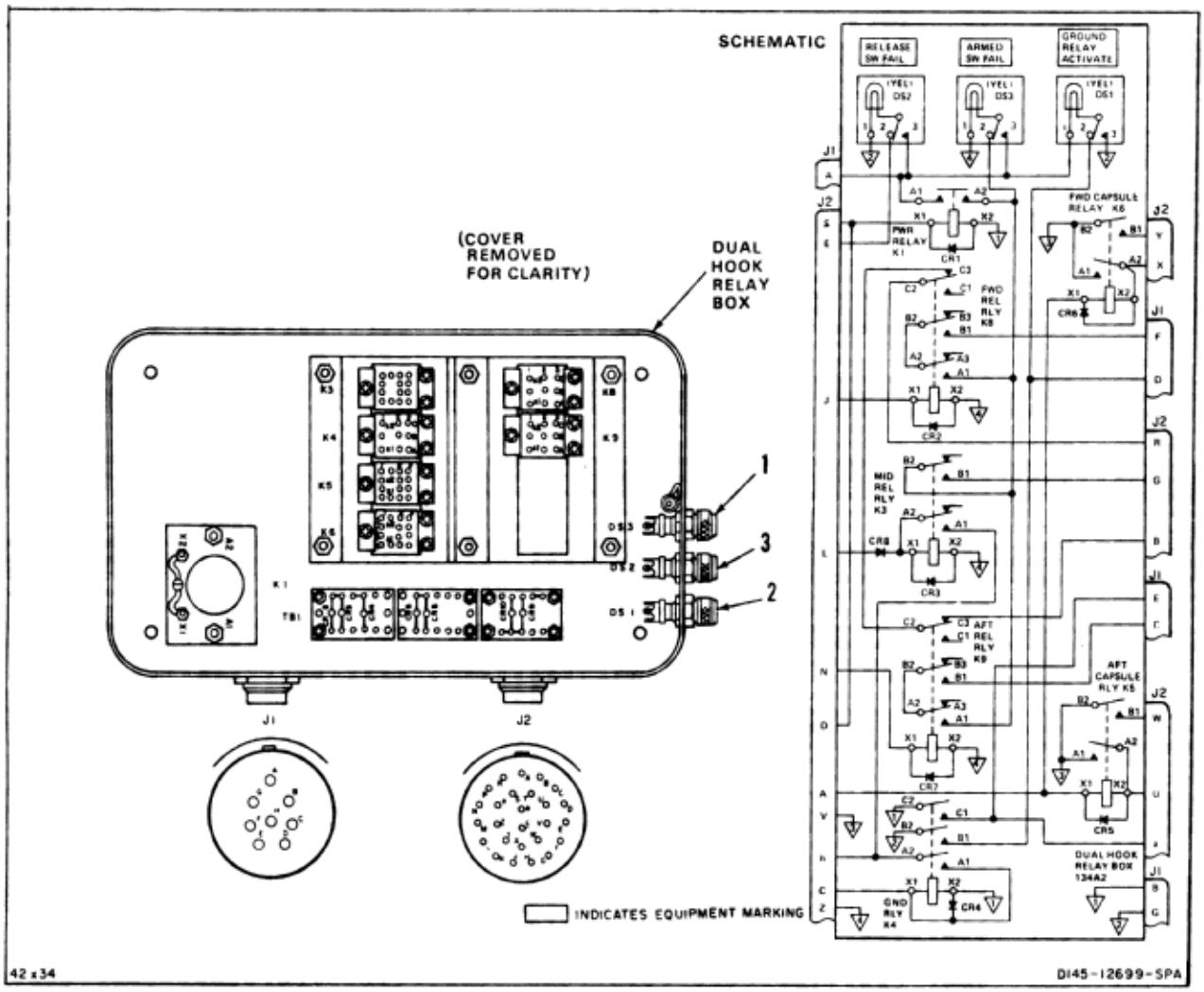
| Receptacle | Pins | Meter Reading |
|---|---|---|
| J2 | R and B | Continuity |
| | J2-a and J1-E | Continuity |
| J2 | L(+) and b(–) | No Continuity |
| J1 | B and E | No Continuity |
| J2 | C and b | No Continuity |
| J1 | G and D | No Continuity |
| J2 | V and Y | No Continuity |
| J2 | V(+) and A(–) | No Continuity |
| J2 | V and W | No Continuity |
| J2 | V and U | No Continuity |

**NOTE**

Once a power connection is made, keep power applied until told to disconnect it.

2. Apply **28 vdc** to J2-D and ground to J1-B.
   a. There shall be **0 vdc** across F(+) and B(–) of J1.
   b. There shall be **0 vdc** across C(+) and B(–) of J1.
   c. There shall be **0 vdc** across J2-G(+) and J1-B(–).
3. Apply **28 vdc** to J2-J and J1-A and ground to Z of J2. There shall be **28 vdc** across F(+) and B(–) of J1 and indicator light DS3 (1) shall come on.
4. Apply **28 vdc** to N of J2.
   a. There shall be **28 vdc** across C(+) and B(–) of J1.
   b. There shall be no continuity between R and B of J2.
5. Apply **28 vdc** to L of J2.
   a. There shall be **28 vdc** across J2-G(+) and J1-B(–).
   b. There shall be **28 vdc** across J2-b(+) and J1-B(–).

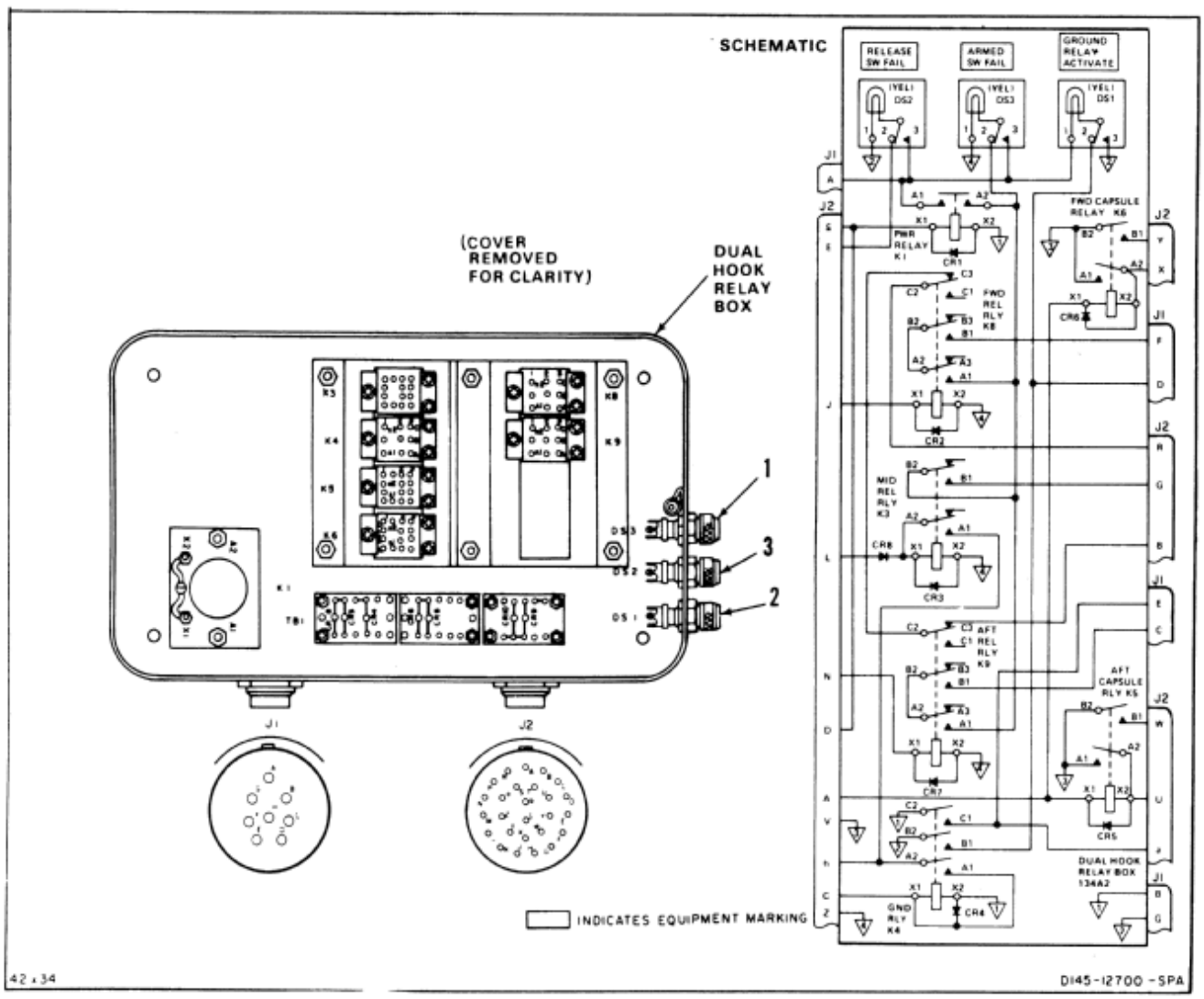
## 9-153.1 TEST DUAL HOOK RELAY BOX (AVIM) (Continued) 9-153.1



6. Remove **28 vdc** from L of J2 only and apply to C of J2.
   a. There shall be **28 vdc** across J2-b(+) and J1-B(–).
   b. There shall be continuity between J1-B and J2-a.
7. Apply ground to G of J1. There shall be continuity between G and D of J1 and indicator light DS1 (2) shall come on.
8. Apply **28 vdc** to E of J2. Indicator light DS2 (3) shall come on.
9. Press three lights (1, 2, and 3). Lights shall come on.
10. Apply **28 vdc** to A and ground to V of J2. Apply and remove ground to U of J2. There shall be continuity between W and U of J2.
11. Apply and remove ground to X of J2. There shall be continuity between X and Y of J2.
12. Remove all power connections.

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-154 INSTALL CARGO HOOK RELEASE RELAY BOX 9-154

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

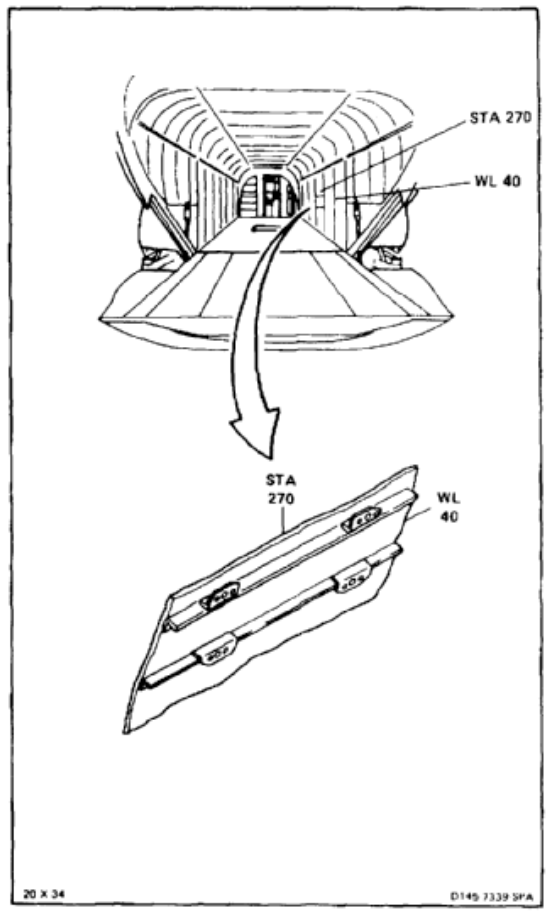
Cloths (E135)

***Personnel Required:***

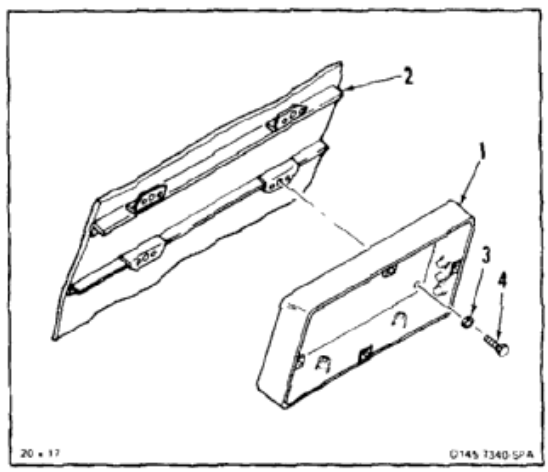
Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P




1. Position relay box (1) on structure (2). Install washers (3) and bolts (4).
2. Install cover (3), four washers (4), and bolts (5) on relay box (2).
3. Connect two electrical connectors (6 and 7) to relay box (2). Remove tags.




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check of external cargo hook system (TM 55-1520-240-T).

END OF TASK

## 9-155 REMOVE HOIST OPERATOR'S PANEL 9-155

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Electrical Tool Kit, NSN 5180-00-323-4915

***Materials:***

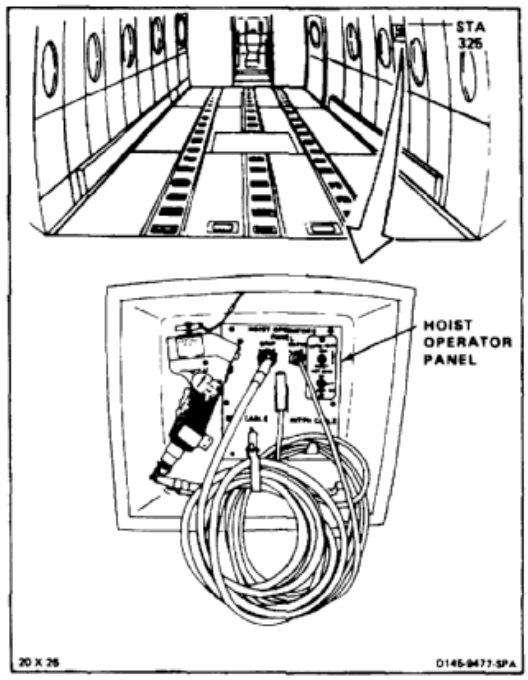
Paper Tags (E264)

***Personnel Required:***

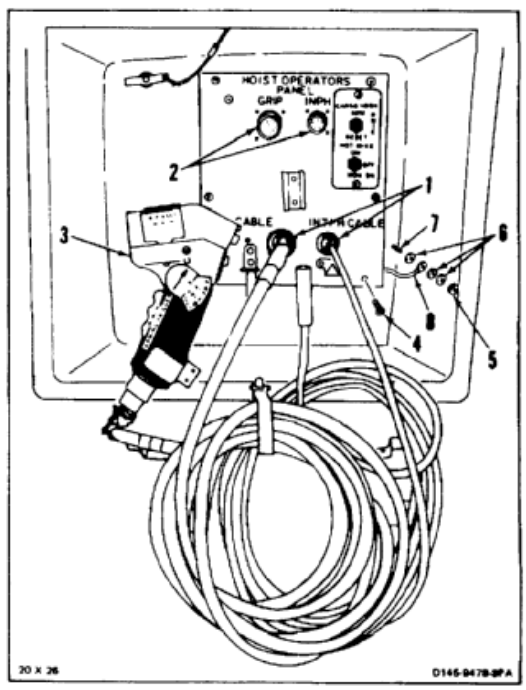
Aircraft Electrician

***Equipment Condition:***

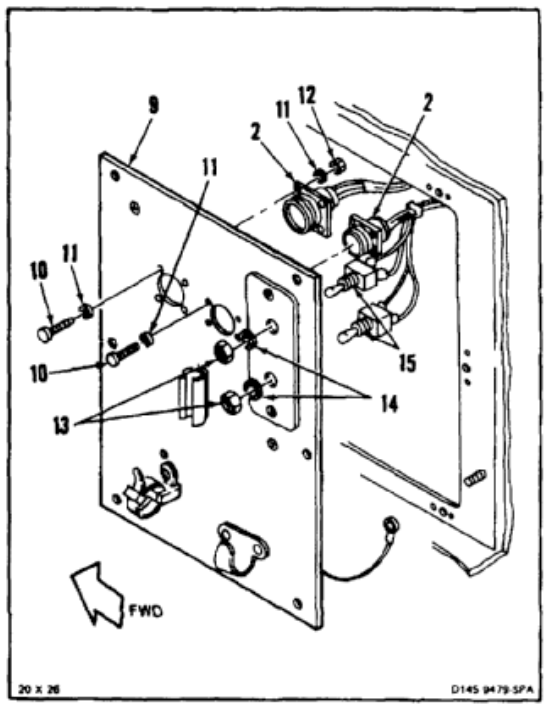
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Acoustical Blanket Removed (Task 2-208)




1. Tag and disconnect two electrical connectors (1) from two receptacles (2).
2. Remove grip (3).
3. Remove six screws (4).
4. Remove nut (5) and three washers (6) from stud (7).
5. Disconnect jumper (8).



6. Tilt panel (9) forward. Remove eight screws (10), 16 washers (11), and eight nuts (12) from receptacles (2). Tag receptacle.
7. Remove two nuts (13) and washers (14). Tag and remove two switches (15).
8. Remove panel (9).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-156 REPAIR HOIST OPERATOR'S PANEL 9-156

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Heat Gun

***Materials:***

Cloths (E120)
Methyl-Ethyl-Ketone (E244)
Paper Tags (E264)
Gloves (E186)

***Personnel Required:***

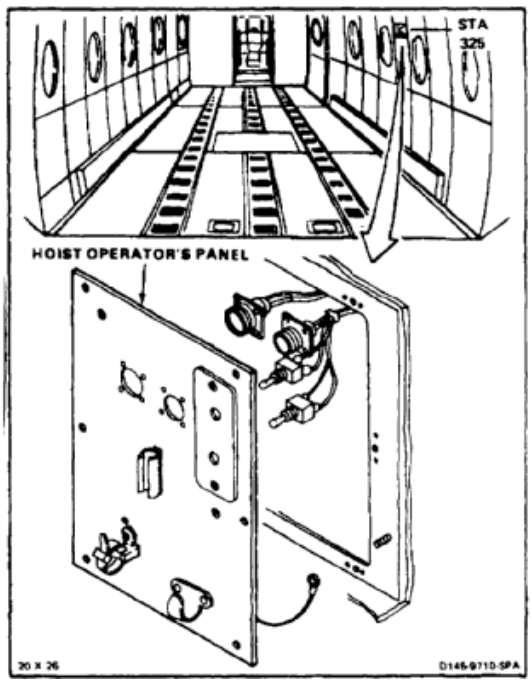
Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P

***Equipment Condition:***

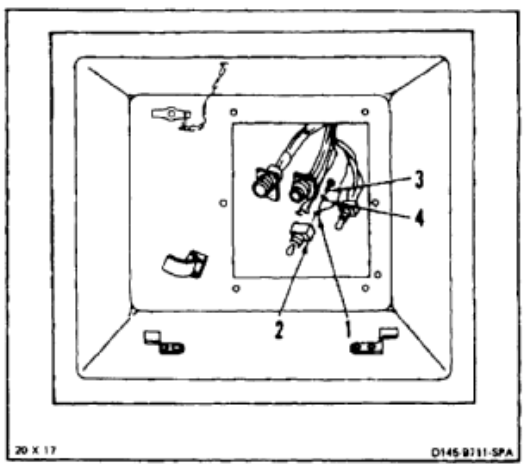
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Hoist Operator's Panel Removed (Task 9-155)




**NOTE**

Repair hoist operator's panel only to the extent required.

Procedure is same to replace CARGO HOOK or HOT MIKE switch. CARGO HOOK switch is shown here.




1. Remove CARGO HOOK switch as follows:
   a. Tag and disconnect three wires (1) from switch (2) by removing three screws (3) and washers (4).
   b. Remove switch (2).
   c. Connect three wires (1) to new switch (2) by installing three screws (3) and washers (4).

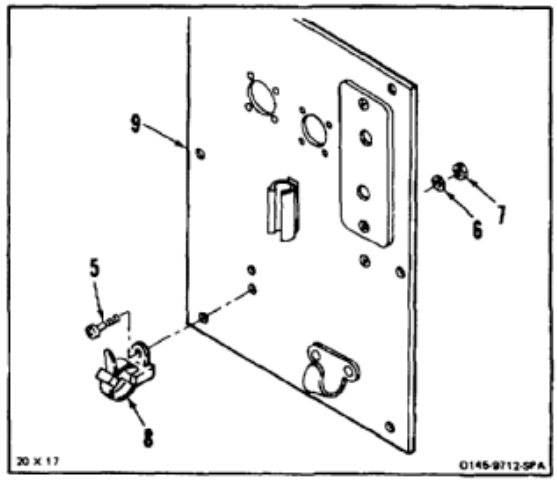
***INSPECT***

2. Replace strap assembly as follows:

   a. Remove screw (5), washers (6), and nut (7) from strap (8).

   b. Remove strap (8).

   c. Position new strap (8) on panel (9). Install screw (5), washer (6), and nut (7).



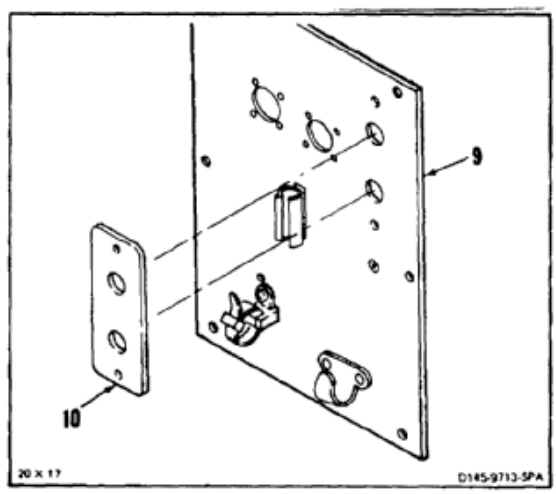

***INSPECT***

3. Replace decal as follows:

   a. Heat decal (10). Remove decal.

**WARNING**

Methyl-ethyl-ketone (E244) is flammable and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from heat or open flame. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.




   b. Clean panel (9) decal surface with methyl-ethyl-ketone (E244). Use cloths (E120) to clean. Wear gloves (E186).

   c. Peel protective backing from new decal (10). Install decal on panel (9).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Install hoist operator's panel (Task 9-157).

END OF TASK

## 9-157 INSTALL HOIST OPERATOR'S PANEL 9-157

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Electrical Tool Kit, NSN 5180-00-323-4915

***Materials:***

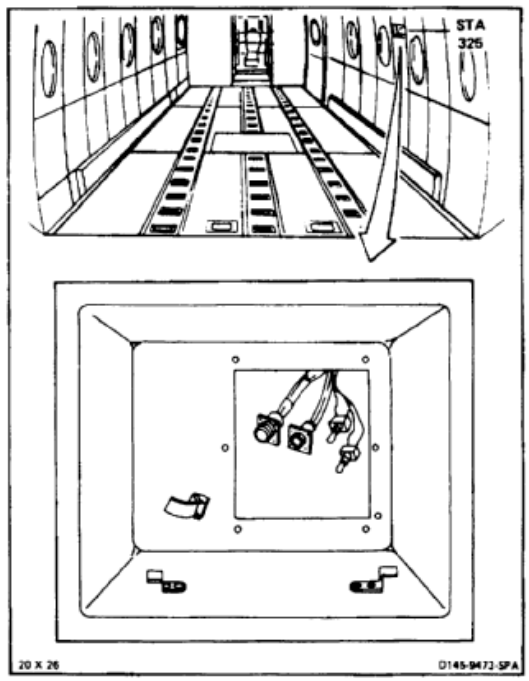
None

***Personnel Required:***

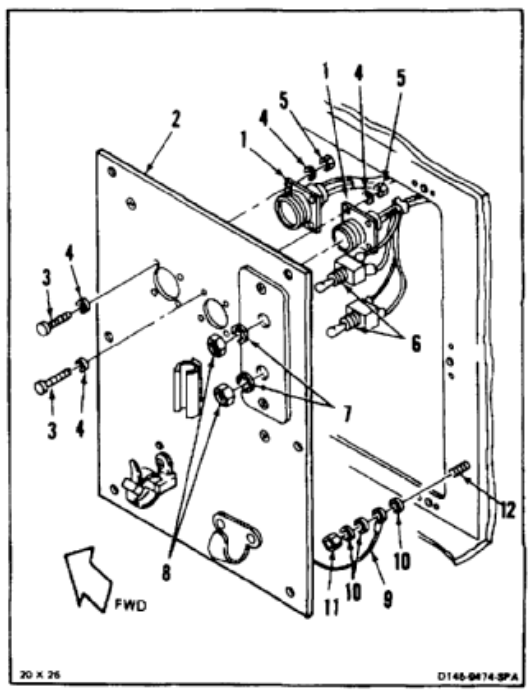
Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P

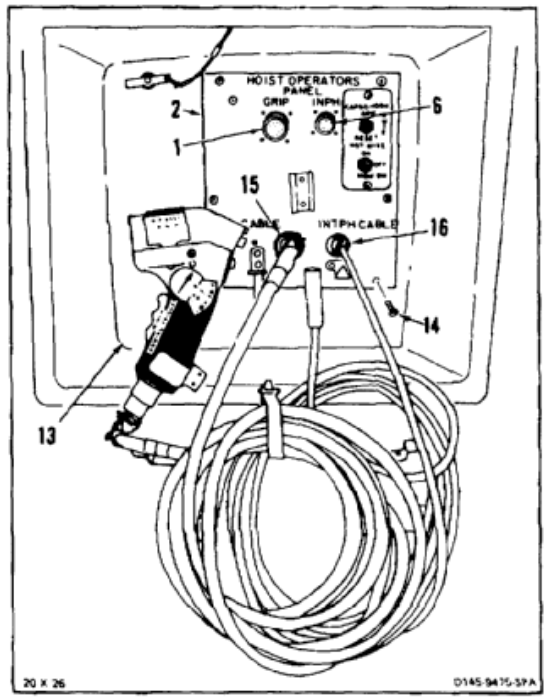



1. Position electrical receptacles (1) on rear of panel (2). Install eight screws (3), 16 washers (4), and eight nuts (5). Remove tags.
2. Position two switches (6) on rear of panel (2). Install two washers (7) and nuts (8). Remove tags.
3. Install jumper (9), three washers (10), and nut (11) on stud (12).



4. Position panel (2) on structure (13). Install six screws (14).
5. Connect electrical connector (15) to receptacle (1).
6. Connect cable (16) to receptacle (6).

***INSPECT***




***FOLLOW-ON MAINTENANCE:***

Install acoustical blanket (Task 2-210).
Perform operational check (TM 55-1520-240-T).

END OF TASK

## 9-158 REMOVE WINCH CONTROL GRIP 9-158

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

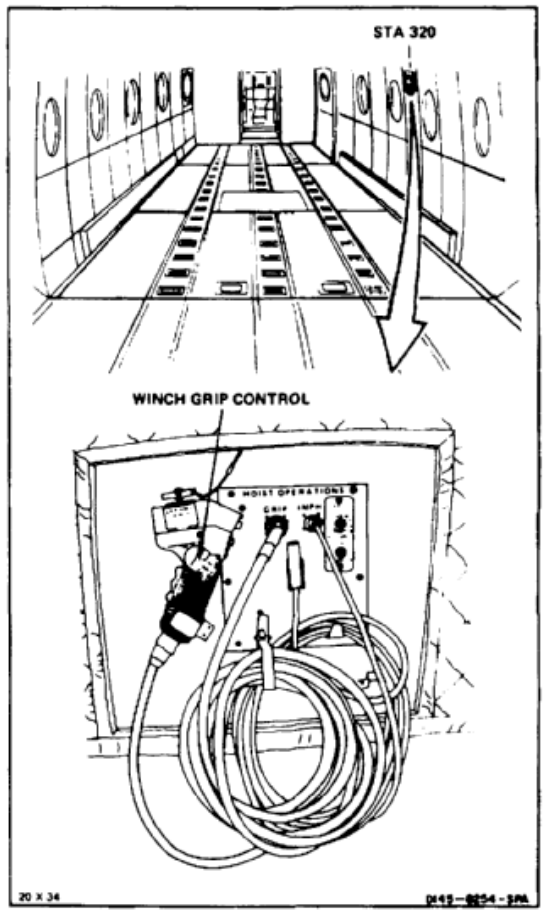
None

***Personnel Required:***

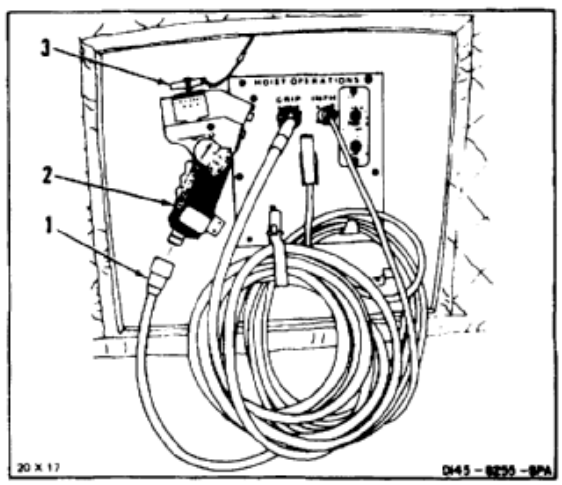
Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off




1. Disconnect electrical connector (1) from grip (2).
2. Remove pin (3).
3. Remove grip (2).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-159 DISASSEMBLE WINCH CONTROL GRIP (AVIM) 9-159

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun

***Materials:***

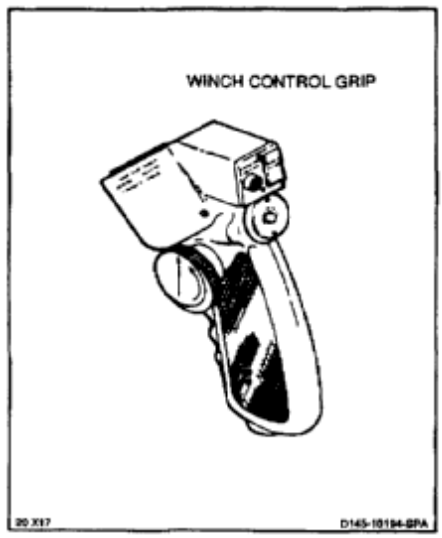
Paper Tags (E264)
Guard (E311, APP E) If Installed

***Personnel Required:***

Aircraft Electrician

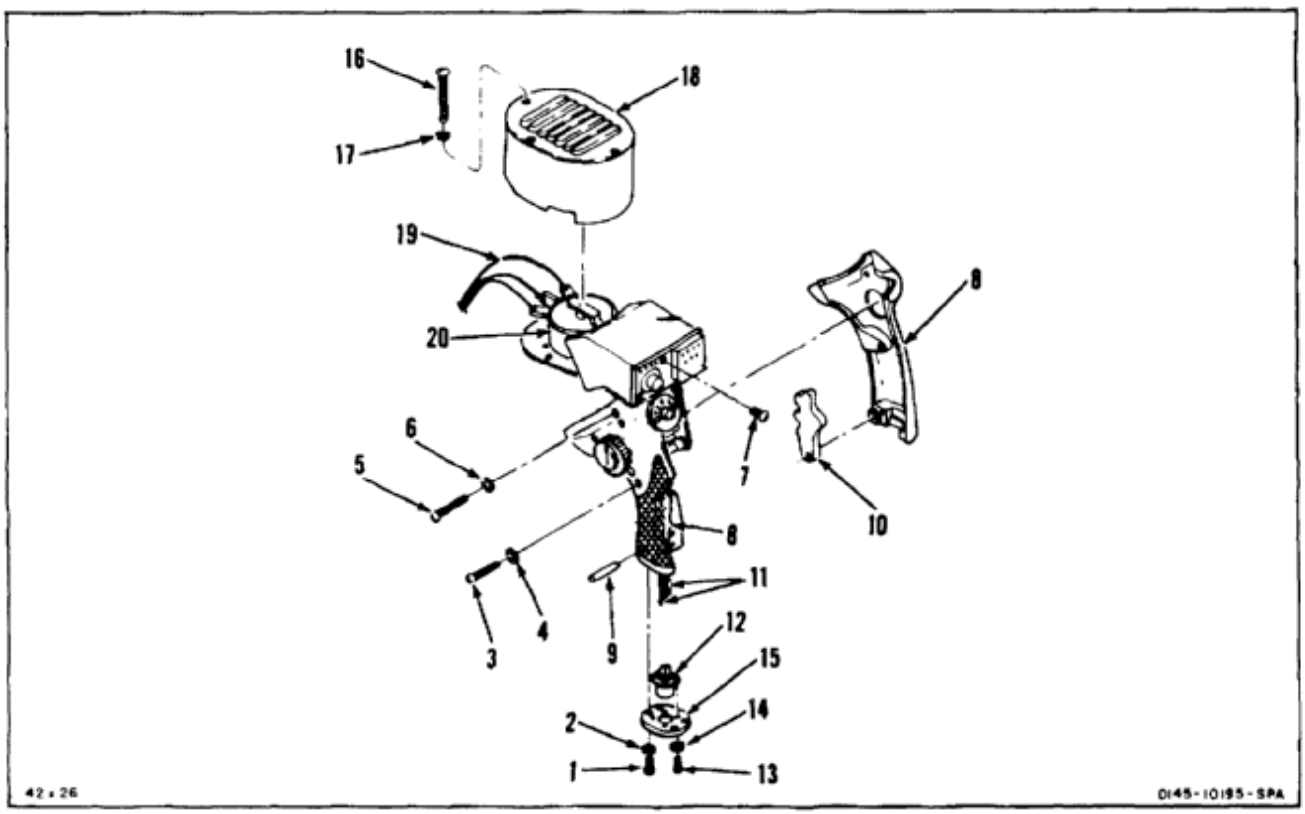
***Equipment Condition:***

Off Helicopter Task



## 9-159 DISASSEMBLE WINCH CONTROL GRIP (AVIM) (Continued) 9-159

1. Remove four screws (1) and washers (2).
2. Remove screw (3) and washer (4).
3. Remove screw (5) and washer (6).
4. Remove screw (7) from handle (8).
5. Remove left half of handle (8).
6. Remove pin (9) and trigger (10).
7. Tag and unsolder 12 wires (11) from connector (12).
8. Remove four screws (13) and washers (14).
9. Remove connector (12) and cover (15).
10. Remove three screws (16) and washers (17).
11. Remove cover (18).
12. Tag and unsolder five wires (19) from switch (20).

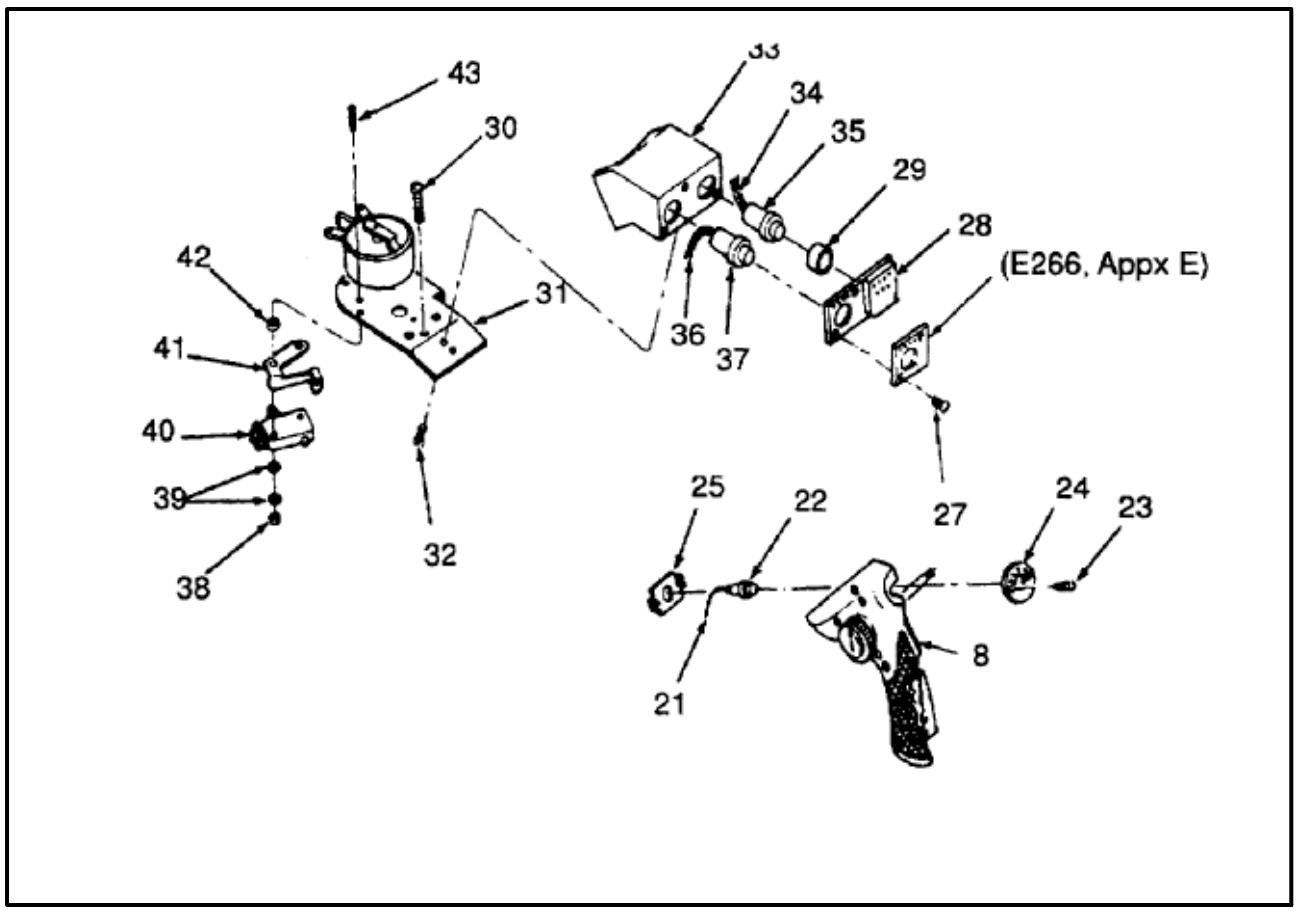


13. Tag and unsolder two wires (21) from switch (22).
14. Remove screw (23) from plate (24).
15. Remove switch (22), plate (24) and bracket (25).

**NOTE**

Cargo hook release guard (E311, APP E) must be installed on winch control grips that do not have a raised guard as part of the retainer and guard assy (28).

16. Remove three screws (27) from guard (28) and cargo hook release switch guard (E311, APP E) if installed.
17. Remove guard (28) and bushing (29).
18. Remove screw (30) from handle (8). Remove plate (31).
19. Remove two screws (32) from housing (33).
20. Turn housing over. Tag and unsolder two wires (34) from switch (35). Remove switch.
21. Tag and unsolder three wires (36) from switch (37). Remove switch and housing (33).
22. Remove nut (38), two washers (39), switch (40), arm (41), spacer (42), and screw (43) from plate (31).

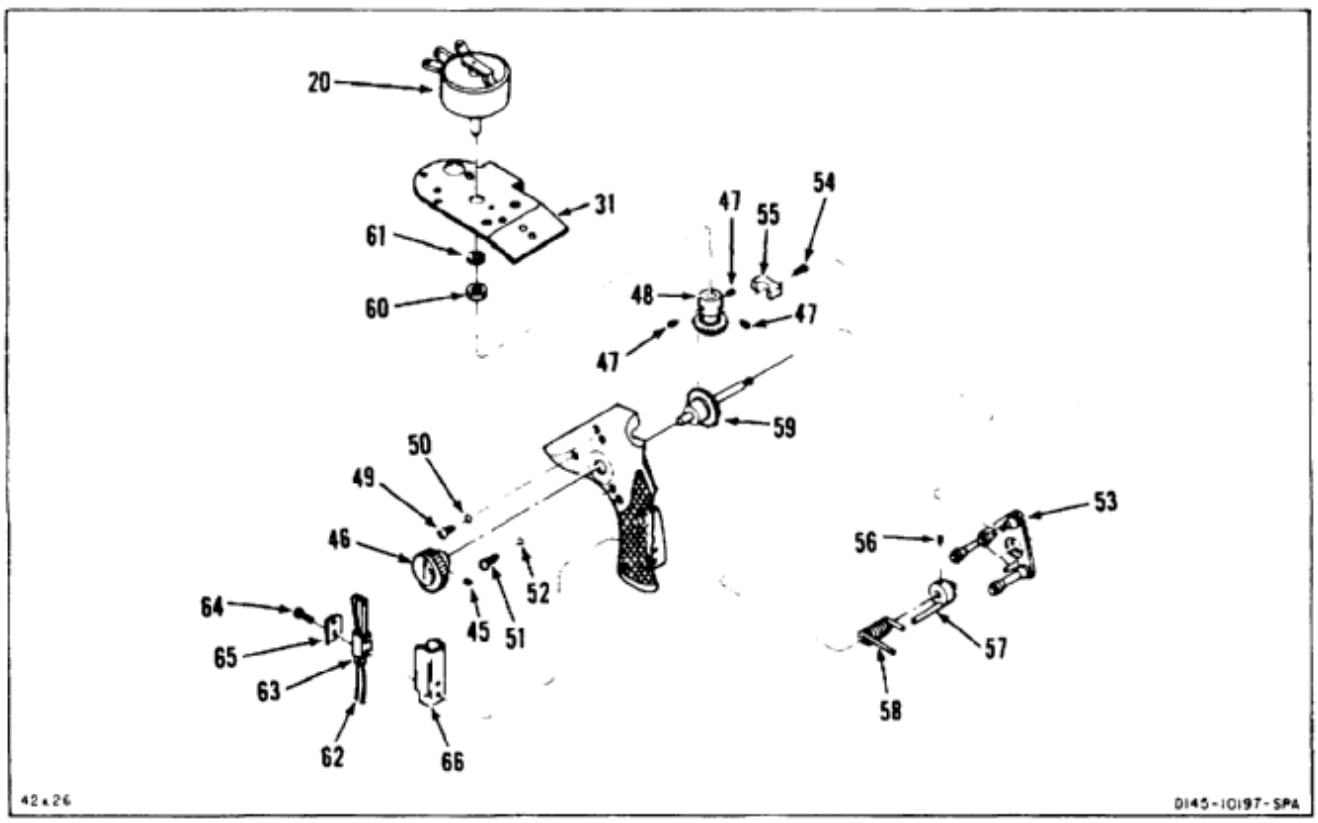


**9-159 DISASSEMBLE WINCH CONTROL GRIP (AVIM) (Continued) 9-159**

23. Remove screw (45) from knob (46). Remove knob.
24. Remove three screws (47) and gear (48).
25. Remove screw (49) and washer (50).
26. Remove screw (51) and washer (52). Remove plate (53).
27. Remove two screws (54) from bearing (55). Remove bearing.
28. Remove screw (56). Remove bushing (57) and spring (58) from shaft (59).
29. Remove nut (60) and washer (61). Remove switch (20).
30. Tag and unsolder two wires (62) from switch (63).
31. Remove two screws (64). Remove plate (65), switch (63) and insulator (66).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-160 ASSEMBLE WINCH CONTROL GRIP (AVIM) 9-160

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun
Feeler Gage, NSN 5210-00-221-1999
Push-Pull Indicating Scale

***Materials:***

Insulation Sleeving (E204)
Varnish (E435)
Zinlac (E456)
Twine (E433)
Gloves (E186)
Guard (E311, APP E) If Installed

***Personnel Required:***

Aircraft Electrician
Inspector

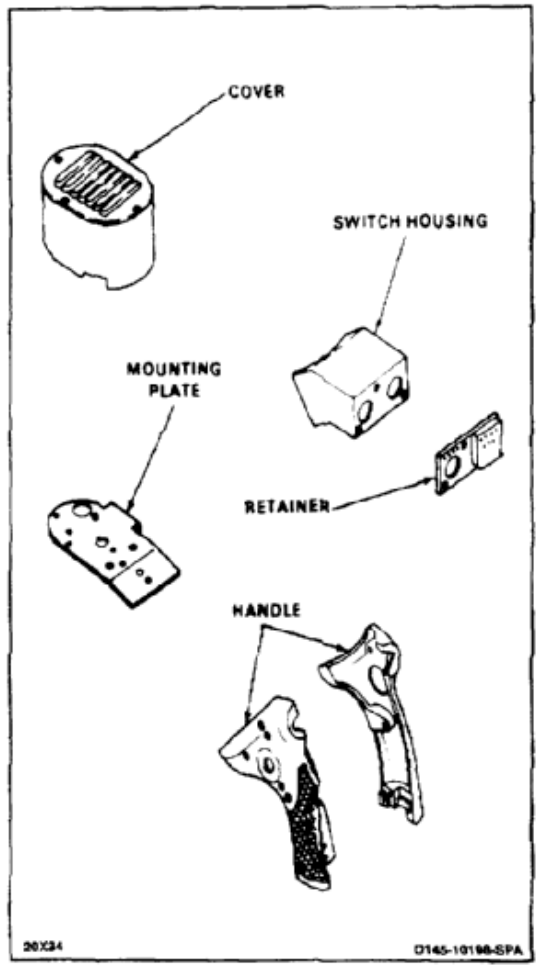
***References:***

TM 55-1520-240-23P

***General Safety Instructions:***

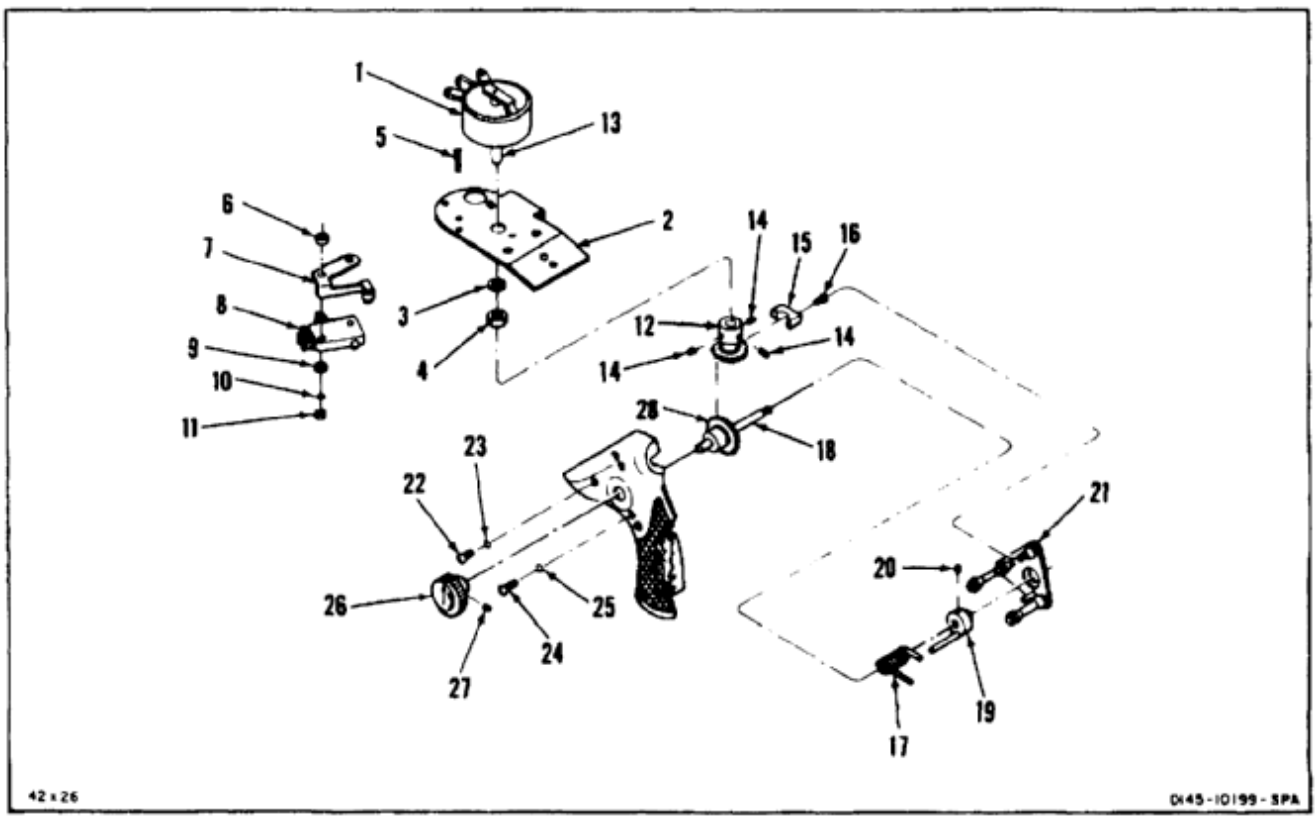
**WARNING**

Varnish (E435) is flammable and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from heat or open flame. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.



## 9-160 ASSEMBLE WINCH CONTROL GRIP (AVIM) (Continued) 9-160

1. Position switch (1) on plate (2). Install washer (3) and nut (4).
2. Install screw (5), spacer (6), arm (7), switch (8), washer (9), lockwasher (10), and nut (11) on plate (2).
3. Position gear (12) on shaft (13). Install three screws (14) loosely.
4. Position bearing (15) to gear (12). Install two screws (16).
5. Install spring (17) with longer tang towards shaft gear (18).
6. Install shaft (19) on shaft (18). Install screw (20). Position plate (21) on shaft (19).
7. Position shaft (19) in handle. Install screw (22), washer (23), screw (24), and washer (25).
8. Position knob (26) on shaft (18). Install screw (27).
9. Set knob to OFF. Mate shaft (18), gear (28) to gear (12). Check groove in gear (12) is engaged by roller of arm (7).
10. Set switch (1) to mid-range. Tighten three screws (14).
11. Adjust bearing (12) for proper mesh by adjusting screws (16). Coat screws with Zinlac (E456).

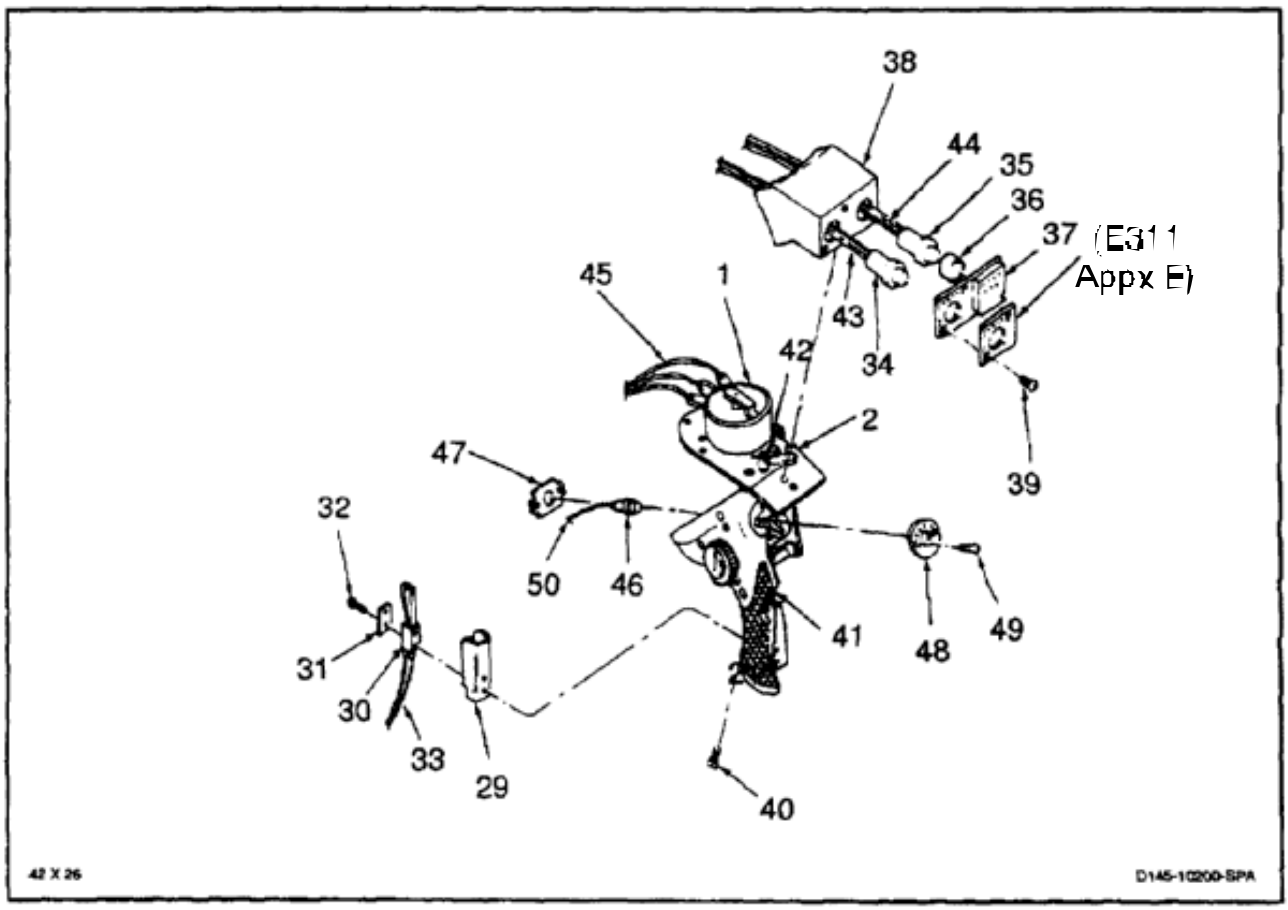


12. Position insulator (29), switch (30), and plate (31) in handle. Install two screws (32).
13. Solder two wires (33) to switch (30). Remove tags. Tie wires where they run past gears using twine (E433). Coat switch connection with varnish (E435). Wear gloves (E186).

**NOTE**

Cargo hook release guard (E311, APP E) must be installed on winch control grips that do not have a raised guard as part of the retainer and guard assy (37).

14. Position two switches (34 and 35), bushing (36) and retainer (37) and cargo hook release switch guard (E311, APP E), if required, in housing (38). Install three screws (39).
15. Position housing (38) on plate (2). Install two screws (40).
16. Position plate (2) on left handle (41). Install screws (42).
17. Solder three wires (43) to switch (34). Remove tags. Coat switch connections with varnish (E435). Wear gloves (E186).
18. Solder two wires (44) to switch (35). Remove tags. Coat switch connections with varnish (E435). Wear gloves (E186).
19. Solder five wires (45) to switch (1). Remove tags. Coat switch connections with varnish (E435). Wear gloves (E186).
20. Position switch (46), bracket (47), and plate (48) to handle (41). Install screw (49).
21. Solder two wires (50) to switch (46). Remove tags. Coat switch connections with varnish (E435). Wear gloves (E186).



22. Position trigger (51) in right handle (56). Install pin (52).
23. Adjust rear contact (53) gap to **0.060 inch** minimum to front contact (54).
24. Using push-pull indicating scale (55) against the trigger (51), apply a pressure of **6 to 8 ounces**. Switch (30) shall activate. If not within **6 to 8 ounce** range, repeat step 23.

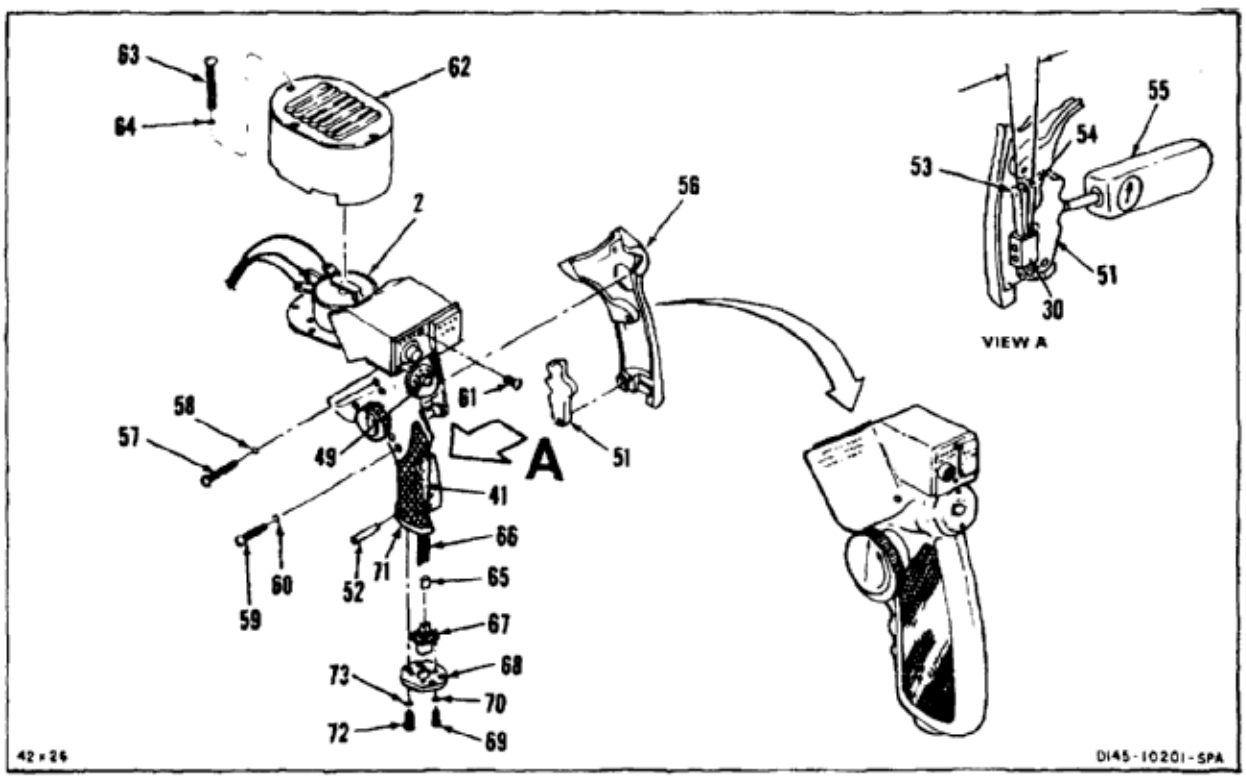
***INSPECT***

25. Position right handle (56) to left handle (41). Install screw (57), washer (58), screw (59), and washer (60).
26. Install screw (61) in plate (48).
27. Position cover (62) on plate (2). Install three screws (63) and washers (64).
28. Install sleevings (E204) (65) on 12 wires (66).
29. Remove tape and solder twelve wires (66) to receptacle (67). Remove tags. Coat receptacle connections with varnish (E435). Slide twelve sleeves (65) over receptacle connections. Wear gloves (E186).
30. Position receptacle (67) to cover (68). Install four screws (69) and washers (70).
31. Position cover (68) in opening (71). Install four screws (72) and washers (73).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Test winch control grip (Task 9-161).




END OF TASK

## 9-161 TEST WINCH CONTROL GRIP (AVIM) 9-161

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Meter, Simpson 260 or Equivalent

***Materials:***

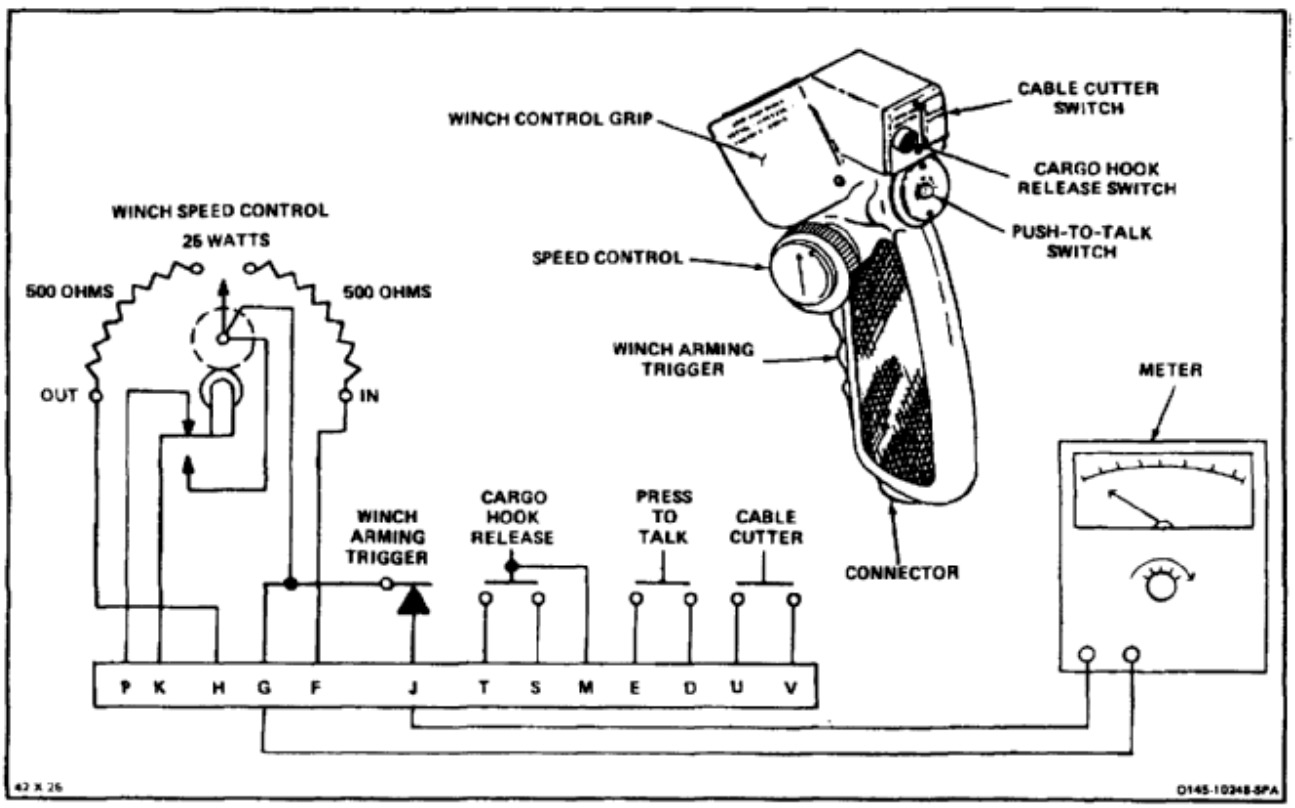
None

***Personnel Required:***

Aircraft Electrician
Inspector

***Equipment Condition:***

Off Helicopter Task



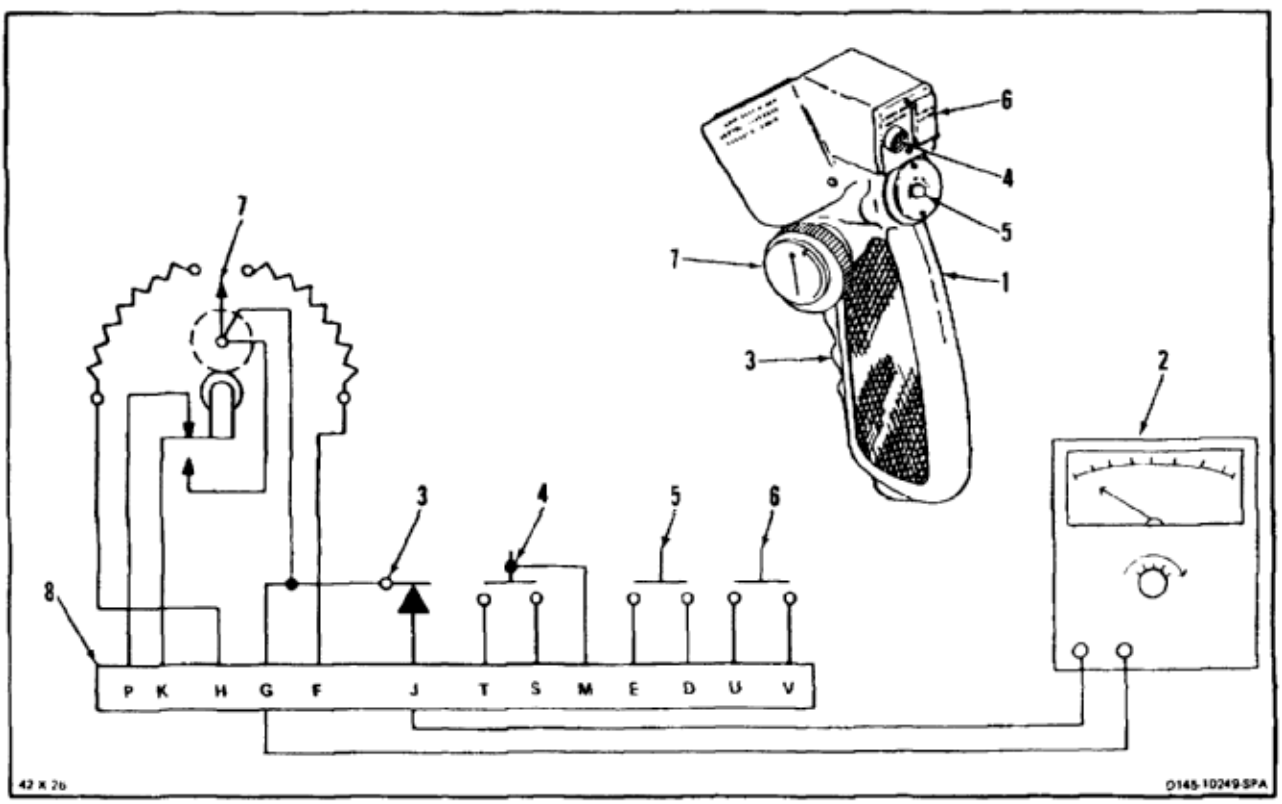
## 9-161 TEST WINCH CONTROL GRIP (AVIM) (Continued) 9-161

1. Test grip (1) switches using meter (2). Connect meter to pins listed below and observe meter indications.

| SWITCH | SWITCH POSITION | CONNECTOR PINS | METER INDICATION |
|---|---|---|---|
| WINCH ARMING Trigger (3) | PRESSED | G and J | Zero ohm |
| | RELEASED | G and J | Infinity |
| CARGO HOOK RELEASE (4) | PRESSED | T and S | Zero ohm |
| | RELEASED | T and S | Infinity |
| PUSH-TO-TALK (5) | PRESSED | E and D | Zero ohm |
| | RELEASED | E and D | Infinity |
| CABLE CUTTER (6) | PRESSED | U and V | Zero ohm |
| | RELEASED | U and V | Infinity |
| WINCH SPEED CONTROL (7) | OFF | H and G | Infinity |
| | | G and F | Infinity |

2. Slowly turn WINCH SPEED CONTROL (7) towards IN until meter (2) indicates **450 to 550 ohms**. Meter deflection shall be smooth.

3. Slowly release WINCH SPEED CONTROL (7) towards IN. Observe meter (2) indicates resistance decreases smoothly to **0 to 1 ohm**, with control centered OFF.

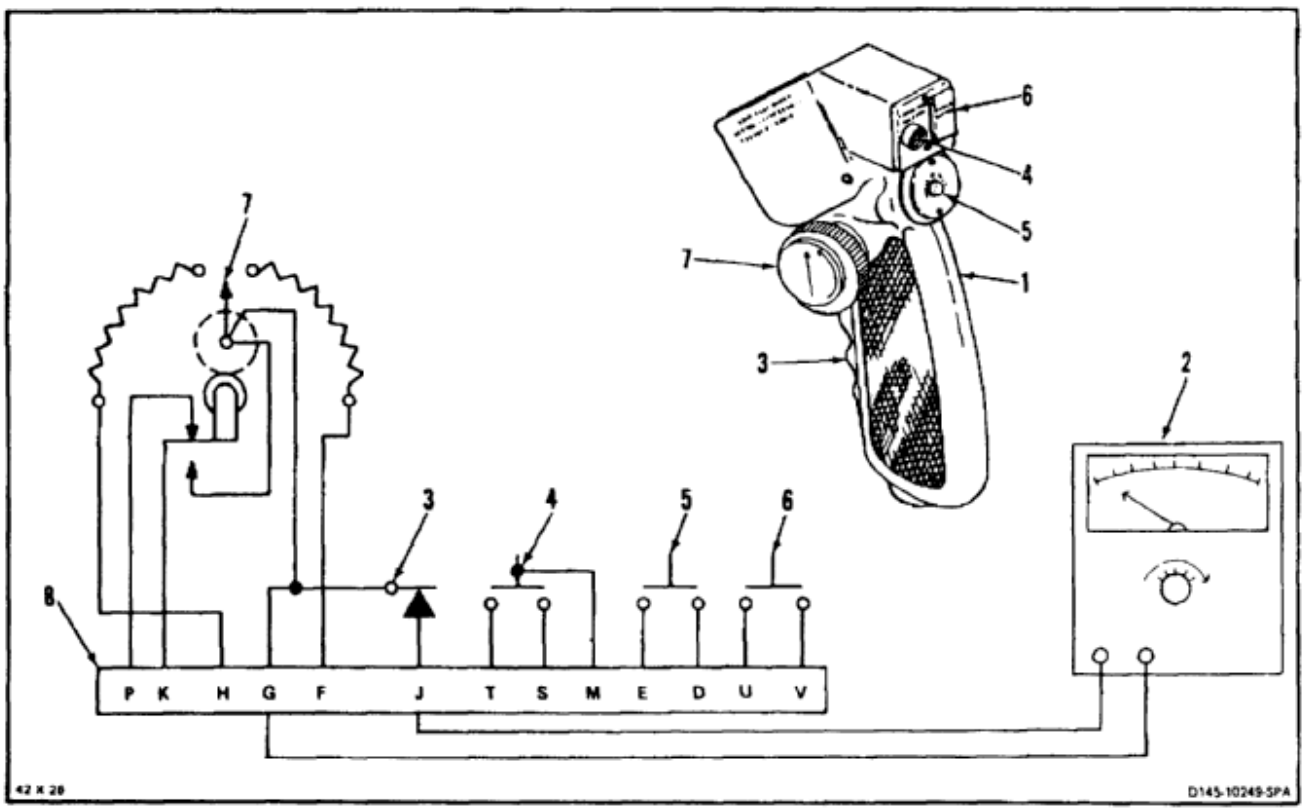


4. Connect meter (2) to pins J and K of connector (8). Repeat step 2.
5. Press WINCH ARMING trigger (3). Read meter (2). Reading shall be **0 ohm**. Release trigger and control (7).
6. Connect meter (2) to G and H of connector (8).
7. Slowly turn WINCH SPEED CONTROL (7) towards OUT until meter (2) indicates **450 to 550 ohms**.
8. Slowly release WINCH SPEED CONTROL (7) towards OUT. Observe meter (2) indicates resistance decreases smoothly to **0 to 1 ohm**, with control centered OFF.
9. Connect meter (2) to pins J and K of connector (8). Repeat step 7.
10. Press WINCH ARMING trigger (3). Read meter (2). Reading shall be **0 ohm**. Release trigger and control (7).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-162 INSTALL WINCH CONTROL GRIP 9-162

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

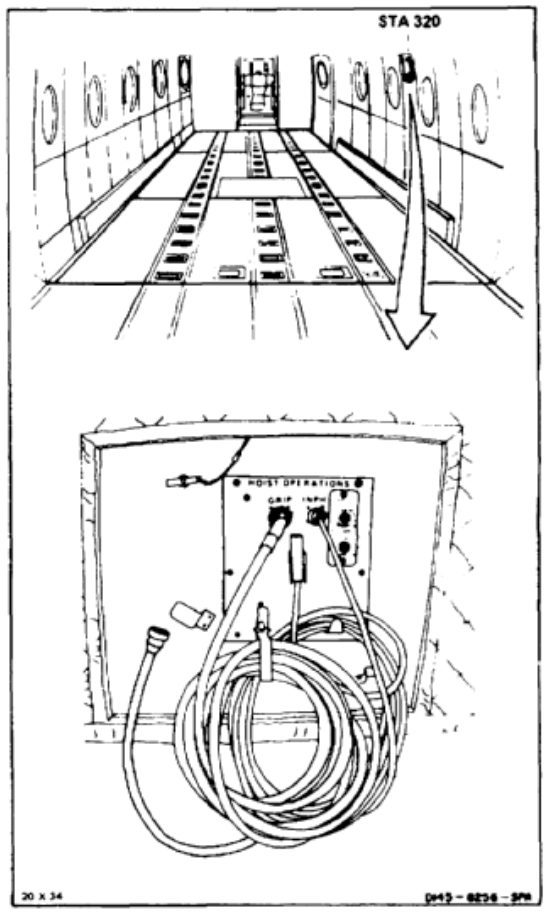
None

***Personnel Required:***

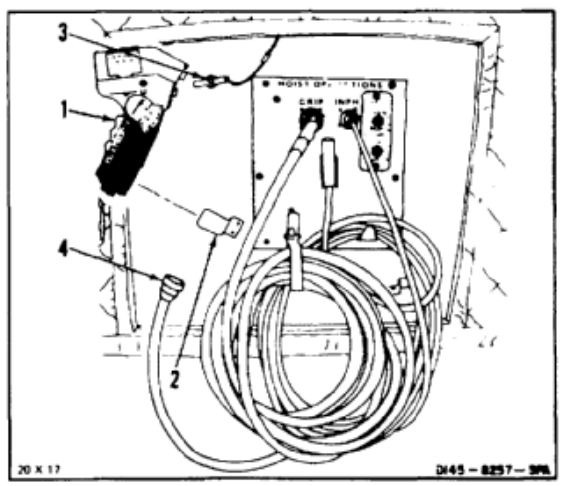
Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P




1. Install grip (1) in bracket (2).
2. Install pin (3) in grip (1).
3. Connect electrical connector (4) to grip (1).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520 240-T).

END OF TASK

## 9-162.1 REMOVE FUZZ BURNOFF POWER MODULE 9-162.1

INITIAL SETUP

***Applicable Configurations:***

With 37

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

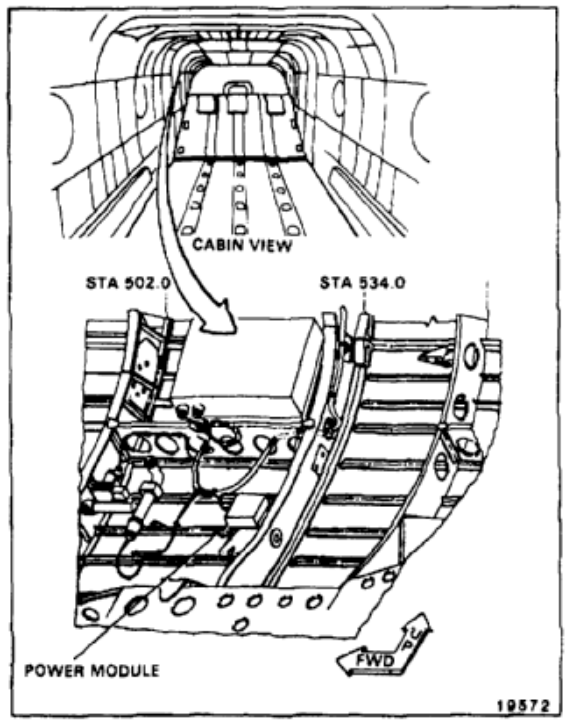
None

***Personnel Required:***

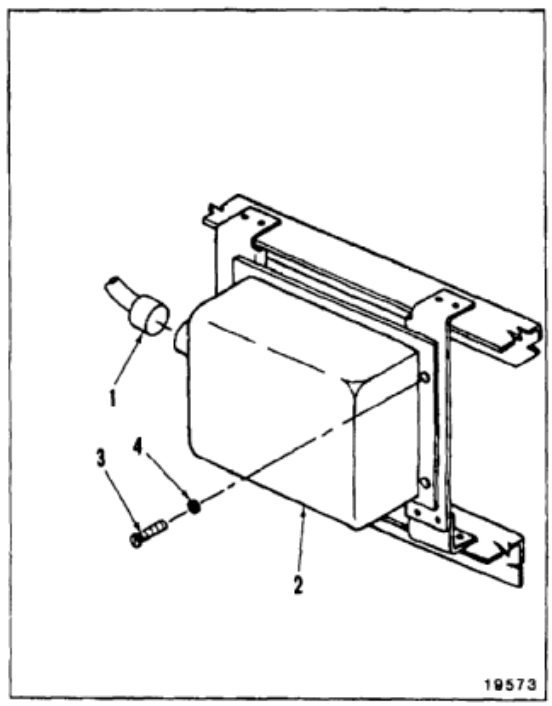
Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off




1. Disconnect electrical connector (1) from module (2).
2. Remove four screws (3) and washers (4) from module (2). Remove module.




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-162.2 INSTALL FUZZ BURNOFF POWER MODULE 9-162.2

INITIAL SETUP

***Applicable Configurations:***

With **37**

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

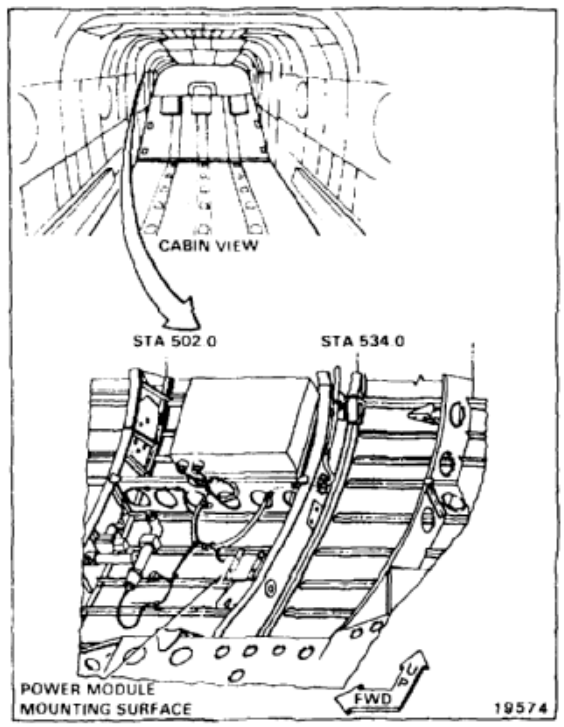
None

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P

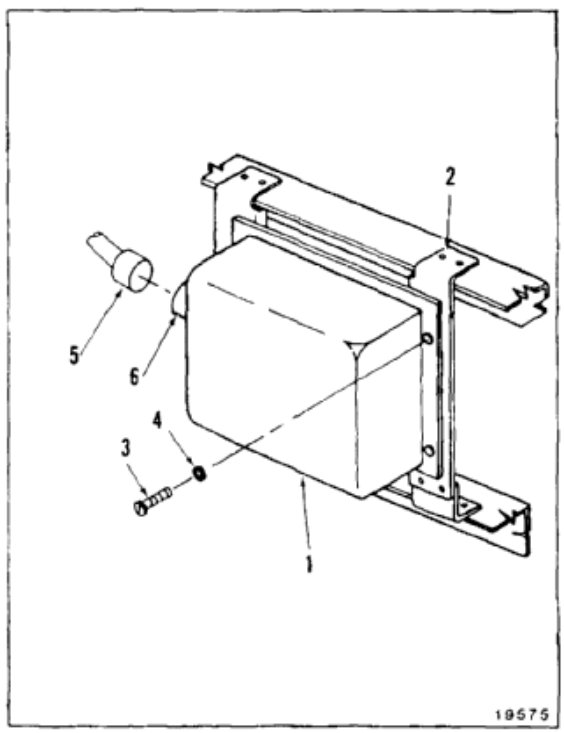



1. Position module (1) against angle assemblies (2). Install four screws (3) and washers (4).
2. Connect electrical connector (5) to receptacle (6).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check of chip burnoff system (TM 55-1520-240-T).




END OF TASK

## 9-163 REMOVE APU ELECTRONIC CONTROL UNIT 9-163

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

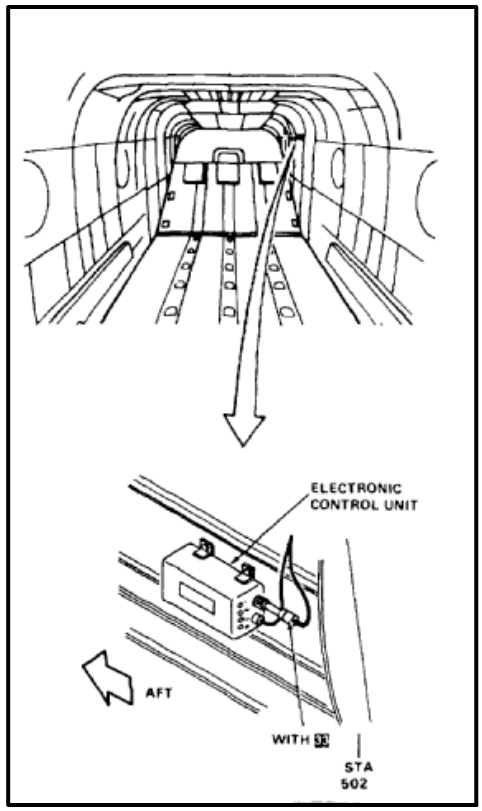
Paper Tags (E264)

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off

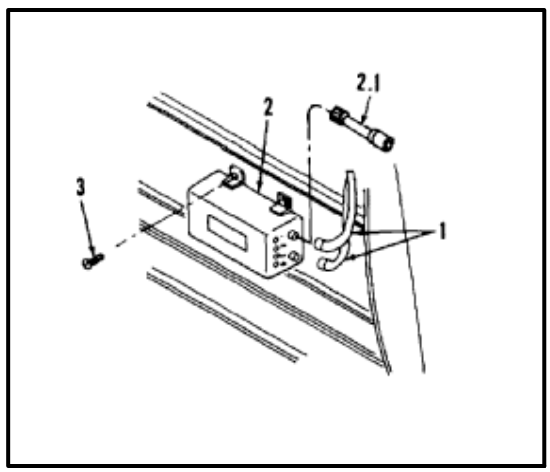



1. Tag and disconnect two electrical connectors (1) from unit (2).

1.1. With 33 only, remove cable adapter (2.1).

2. Remove four screws (3).

3. Remove unit (2).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-164 INSTALL APU ELECTRONIC CONTROL UNIT 9-164

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

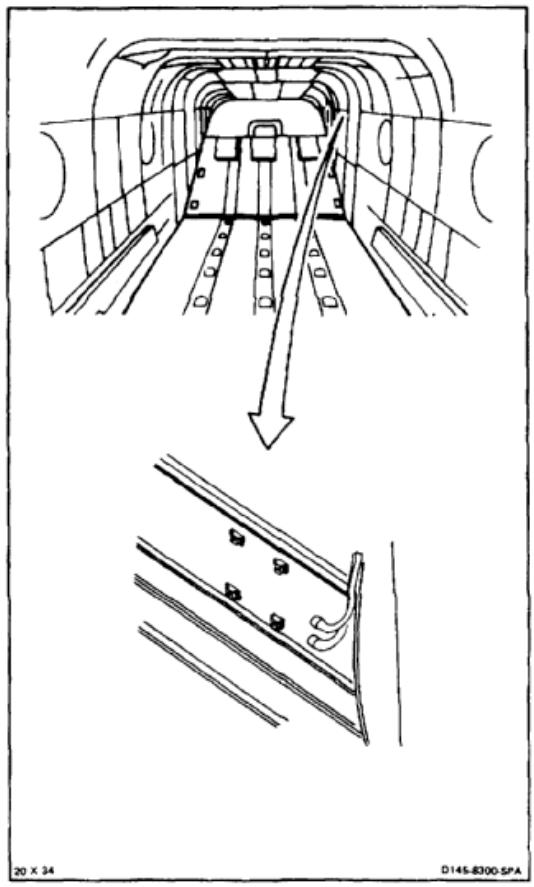
None

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P

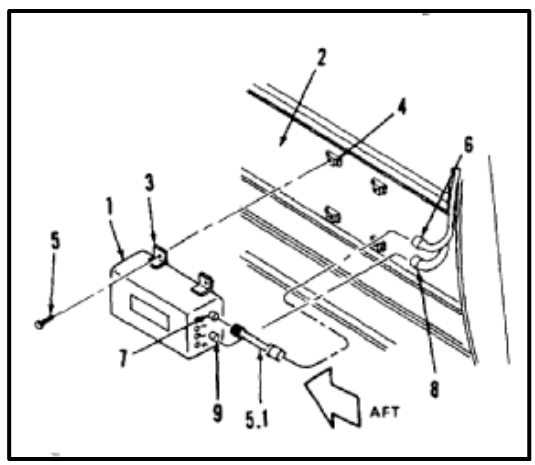



1. Position unit 1 on structure (2). Align brackets (3) with nutplates (4). Install four screws (5).

1.1. With 33 only install cable adapter (5.1).

2. Connect electrical connector (6) to receptacle (7). Remove tag.

3. Connect electrical connector (8) to receptacle (9). Remove tag.




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check (TM 55-1520-240-T).

END OF TASK

## 9-164.1 REMOVE FUEL QUANTITY INVERTER 9-164.1

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

***Materials:***

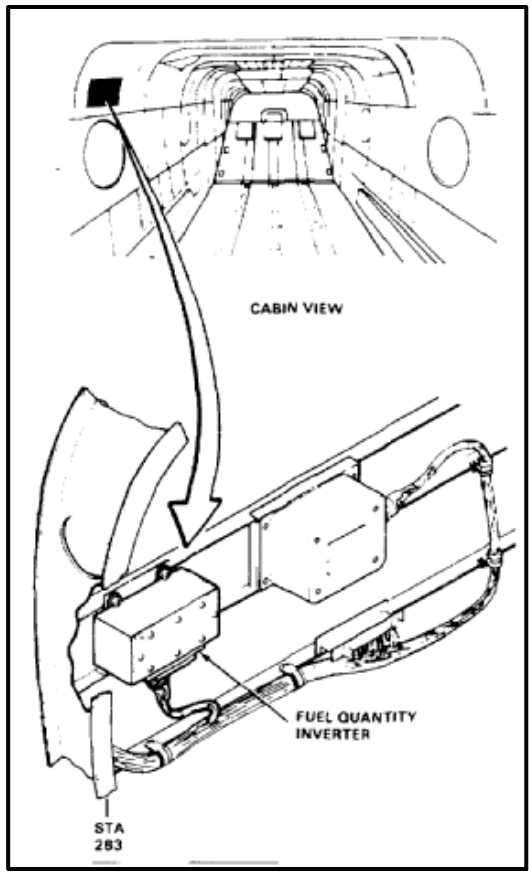
None

***Personnel Required:***

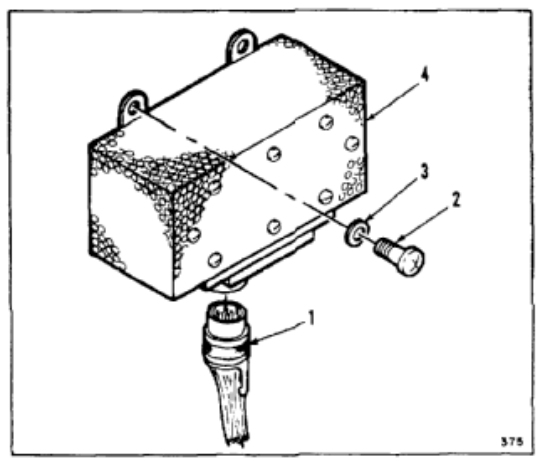
Medium Helicopter Repairer

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off




1. Disconnect electrical connector (1).
2. Remove four screws (2), four washers (3), and inverter (4).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-164.2 INSTALL FUEL QUANTITY INVERTER 9-164.2

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

***Materials:***

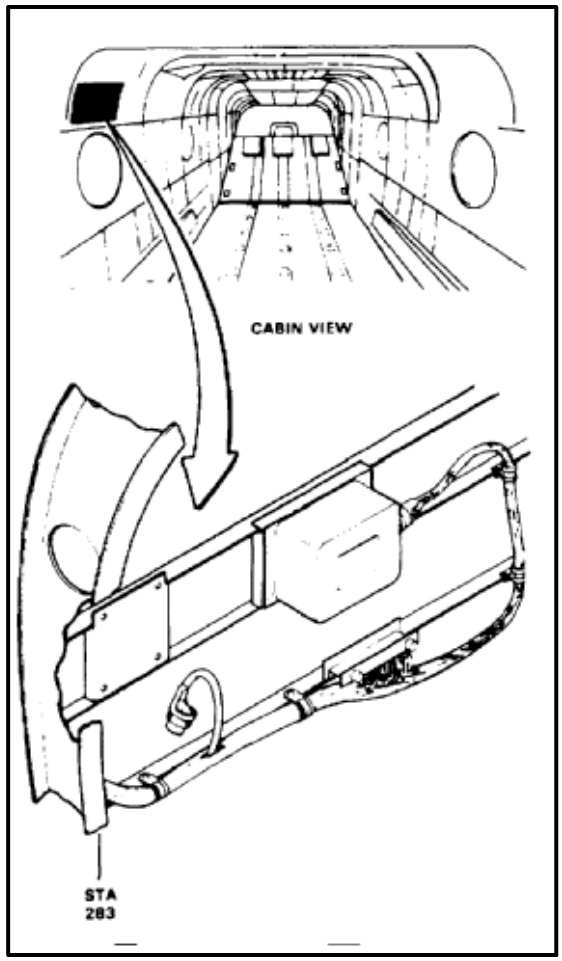
None

***Personnel Required:***

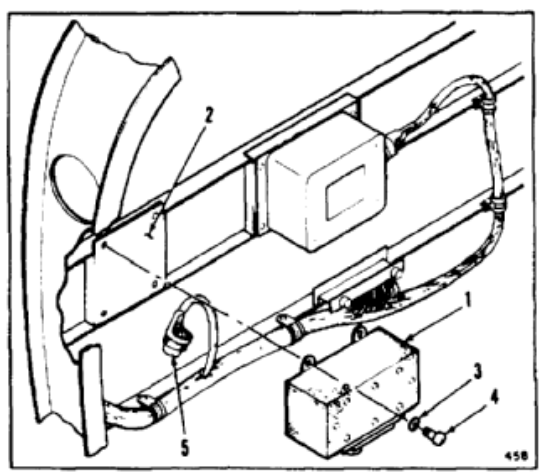
Medium Helicopter Repairer

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off




1. Position inverter (1) on bracket (2).
2. Install four washers (3) and screws (4).
3. Connect electrical connector (5).




***FOLLOW-ON MAINTENANCE:***

Perform operational check of single point refueling system (TM 55-1520-240-T).

END OF TASK

## 9-164.3 REMOVE FUEL PRE-CHECK PANEL 9-164.3

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

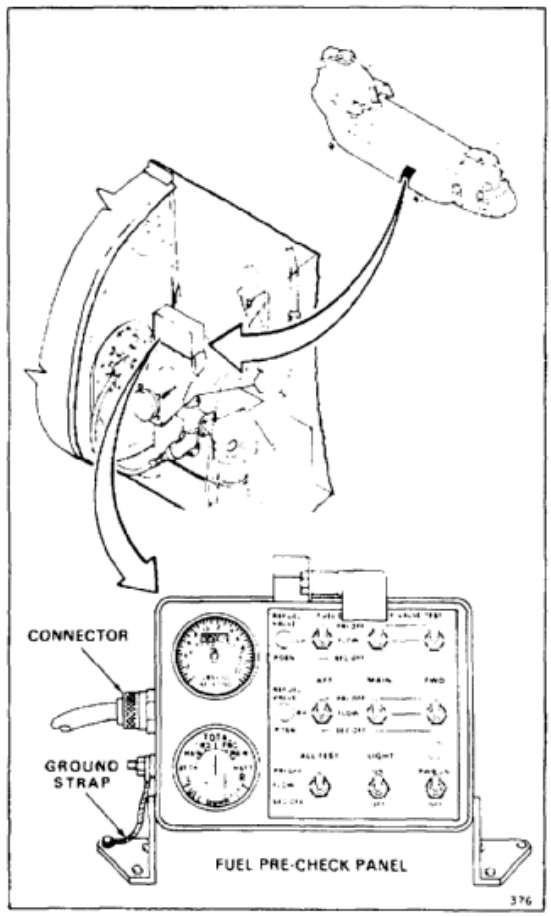
Paper Tags (E264)

***Personnel Required:***

Aircraft Electrician

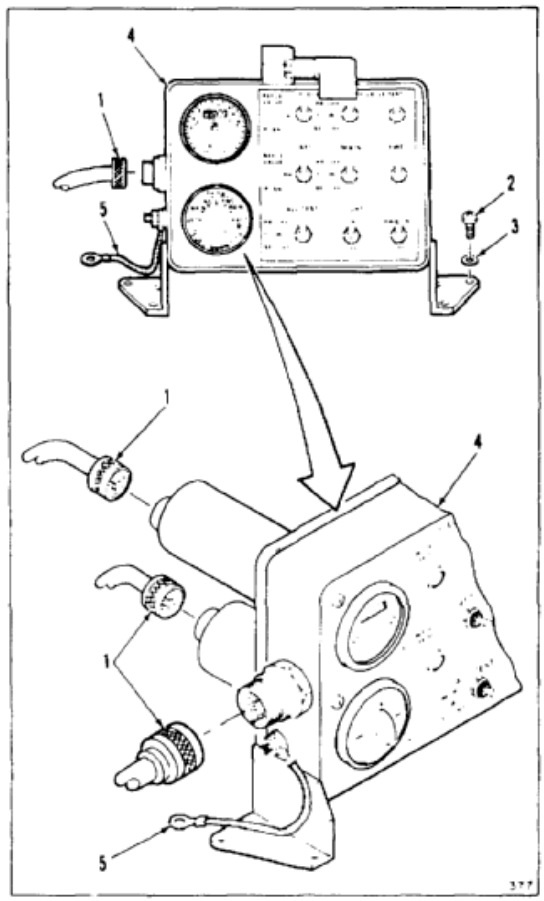
***Equipment Condition:***

Battery Disconnected
Electrical Power Off
Forward Right Landing Gear Access Panel Open



## 9-164.3 REMOVE FUEL PRE-CHECK PANEL (Continued) 9-164.3

1. Disconnect three electrical connectors (1). Tag wires. Use tags (E264).
2. Remove six screws (2) and washers (3).
3. Remove panel (4) with bonding cable (5) attached.



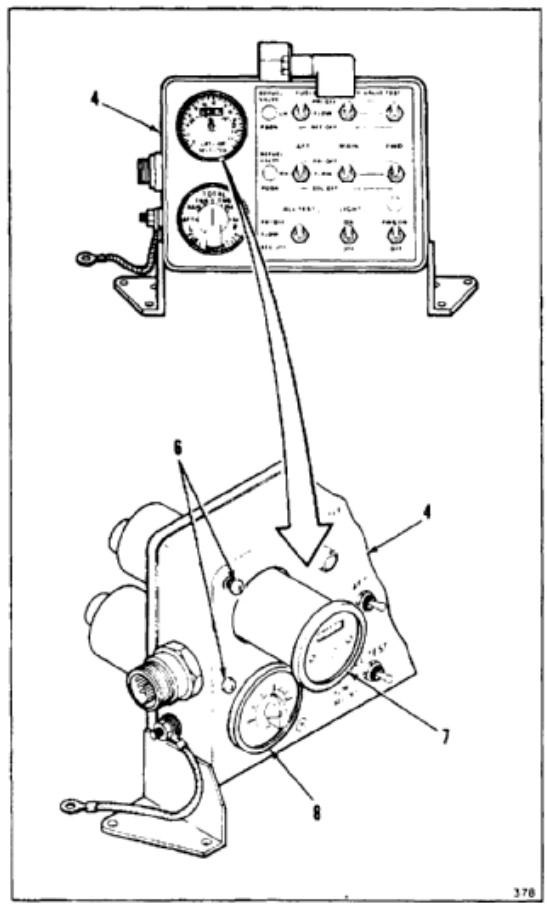
4. If fuel pre-check panel is to be replaced, perform the following:

   a. Loosen round head clamp screw (6).

   CAUTION

   Be careful when handling indicator and switch. Rough handling will damage parts.

   b. Grasp indicator (7) or switch (8) at case rim, then pull out of panel (4).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 9-164.4 DISASSEMBLE FUEL PRE-CHECK PANEL 9-164.4

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Contact Insertion/Removal Tool, M83723-31-20
Heat Sink

***Materials:***

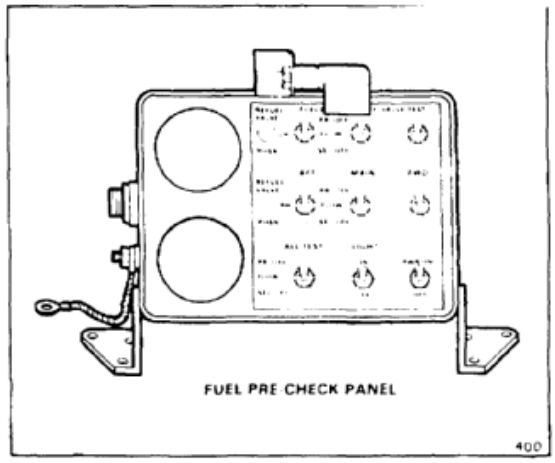
Tags (E264)
Tape (E385)

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

Off Helicopter Task



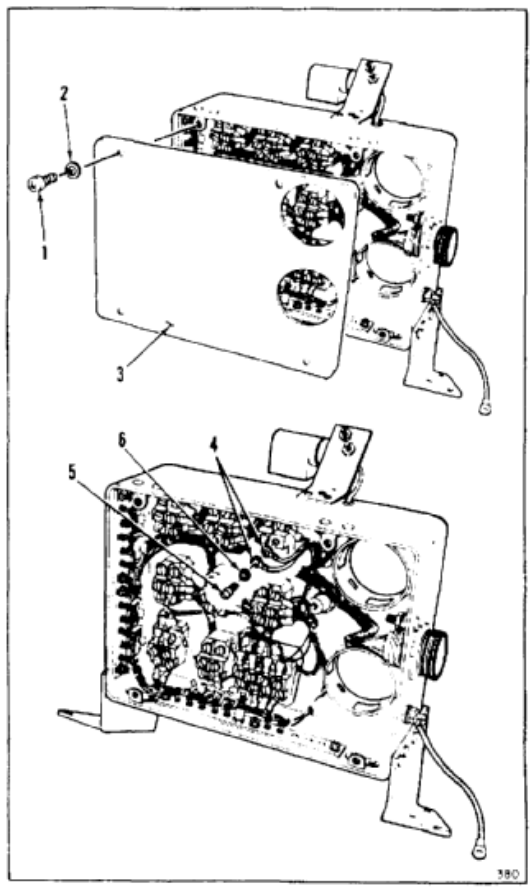

1. Remove four screws (1) and washers (2) and remove cover (3).

***REMOVE SWITCH***

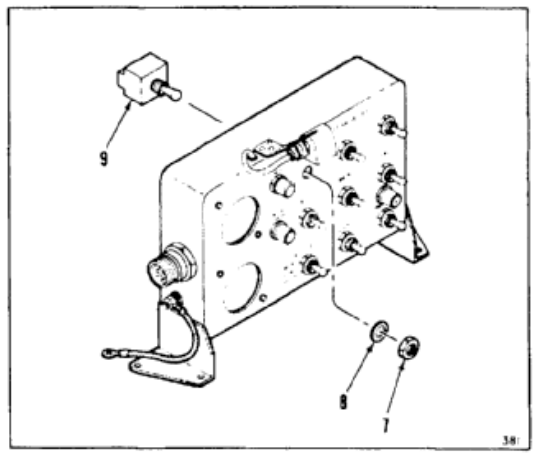
**NOTE**

Procedure is same to remove nine toggle switches. Removal of LH FUEL CELL SHUTOFF VALVE switch is shown here.

2. Tag six wires (4). Use tags (E264).
3. Disconnect six wires (4) by removing three screws (5) and washers (6).



4. Remove nut (7), washer (8) and switch (9).

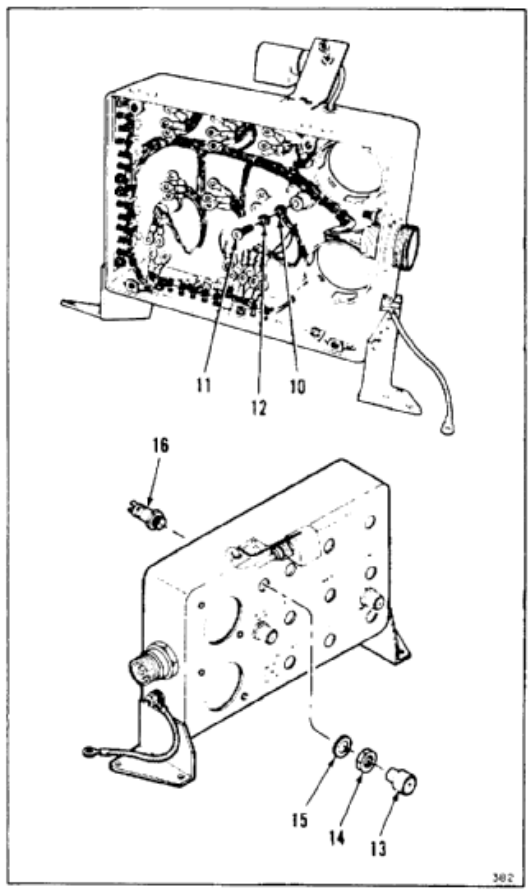



***REMOVE INDICATOR LIGHT***

**NOTE**

Procedure is same to remove three indicator lights. Removal of LH REFUEL VALVE light is shown here.

5. Tag three electrical wires (10).
6. Disconnect three wires (10) by removing two screws (11) and washers (12).
7. Remove lens cap (13), nut (14), washer (15), and lampholder (16).

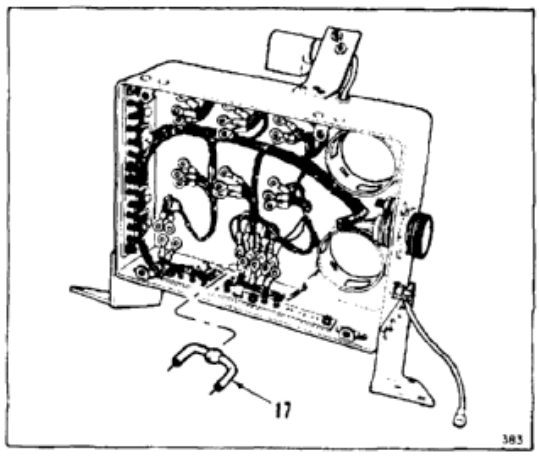


***REMOVE DIODE***

**NOTE**

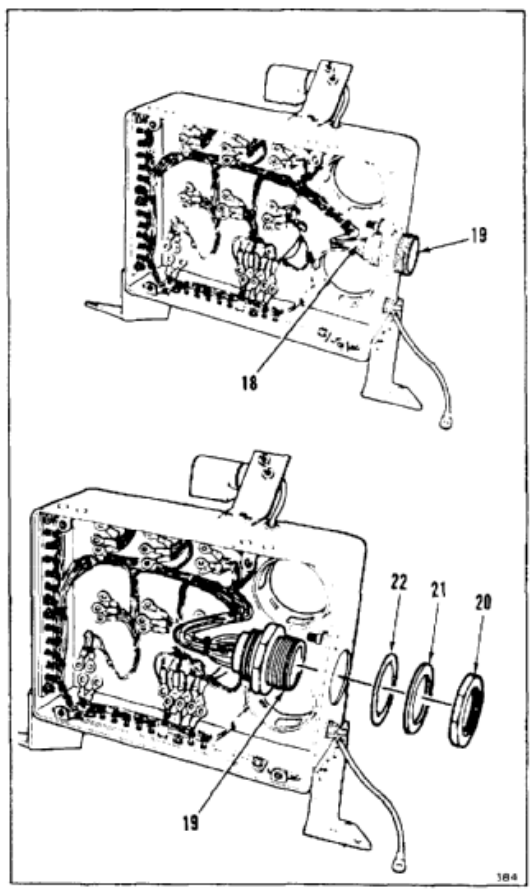
Procedure is similar to remove eight diodes.

8. Tag diode (17), noting polarity. Use tags (E264).
9. Disconnect wires of diode (17). Use heat sink.
10. Remove diode (17).



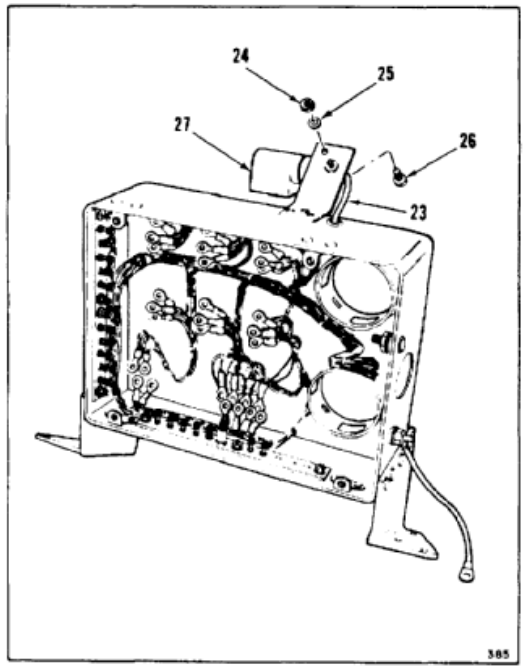

***REMOVAL OF RECEPTACLE***

11. Tag 24 wires (18) to receptacle (19). Use tags (E264). Disconnect 24 wires (18). Use contact insertion/removal tool.
12. Remove nut (20), washer (21), and packing (22). Remove receptacle (19).



***REMOVE FLOODLIGHT***

13. Disconnect wire (23).
14. Remove two nuts (24), washers (25), and screws (26).
15. Remove light (27).

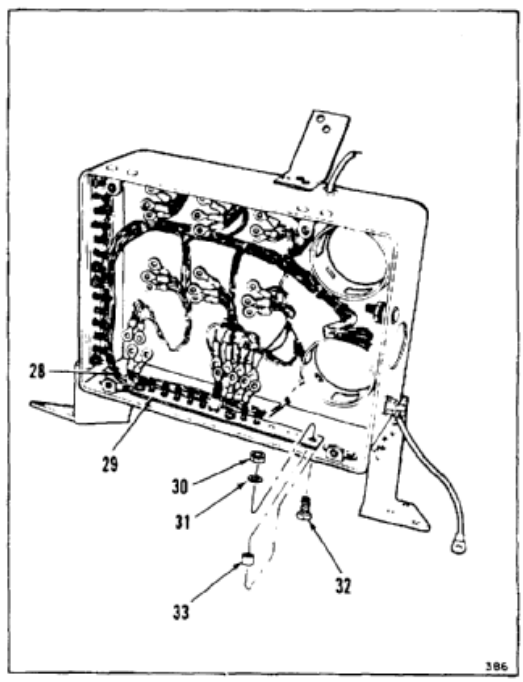



***REMOVE TERMINAL BOARD***

**NOTE**

Procedure is similar to remove two terminal boards. Removal of terminal board TB1 is shown here.

16. Tag and disconnect 10 wires (28) from terminal board TB1 (29). Use a heat sink.
17. Remove four nuts (30), washers (31), screws (32), and spacers (33). Remove terminal board (29).



***REMOVE CLAMP***

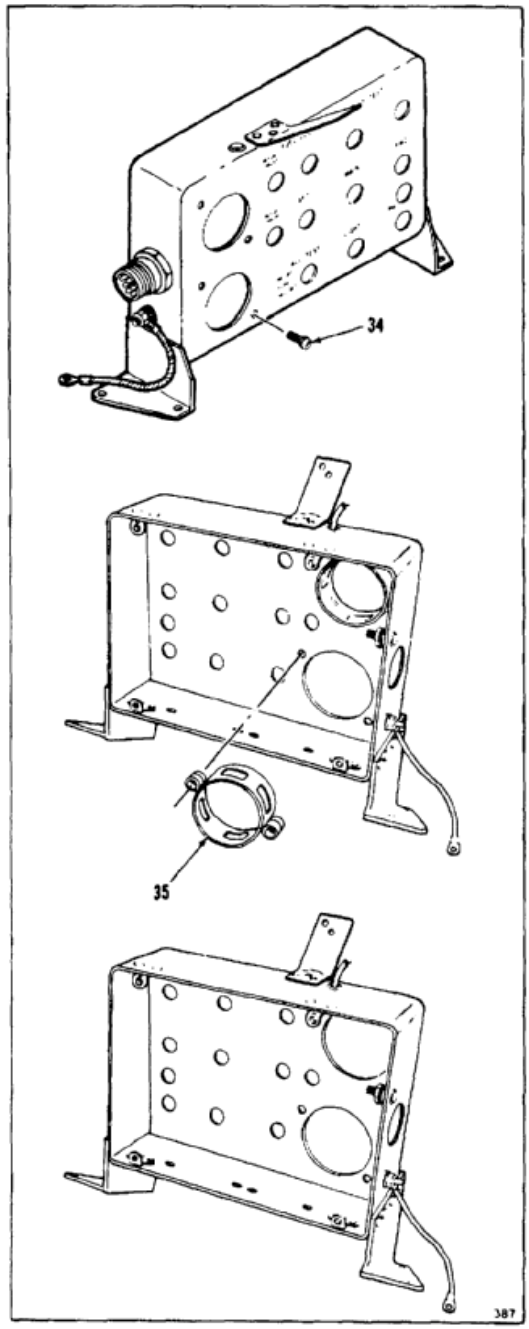
**NOTE**

Procedure is same to remove two clamps.

18. Remove two screws (34).
19. Remove clamp (35).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-164.5 ASSEMBLE FUEL PRE-CHECK PANEL 9-164.5

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Soldering Gun
Heat Sink
Contact Insertion/Removal Tool, M83723-31-20

***Materials:***

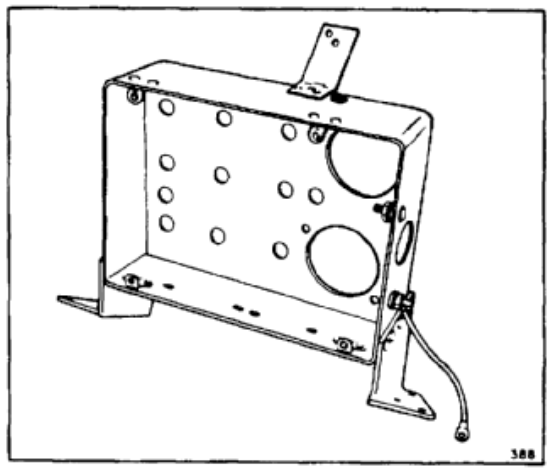
Solder (E319)

***Personnel Required:***

Aircraft Electrician
Inspector

***Equipment Condition:***

Off Helicopter Task

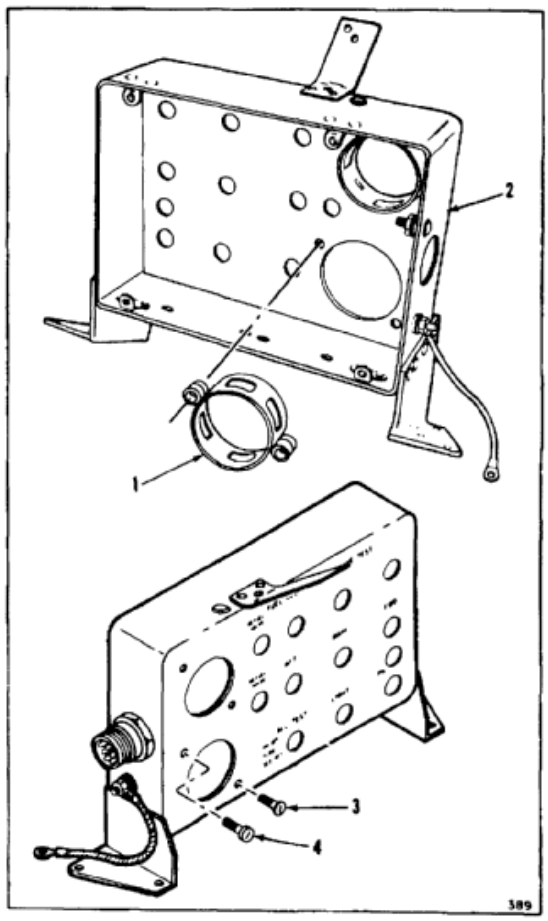



***INSTALL CLAMP***

**NOTE**

Procedure is same to install two clamps.

1. Position clamp (1) on panel (2).
2. Install flat-head retaining screw (3).
3. Install round head adjusting screw (4).



*INSTALL TERMINAL BOARD*

**NOTE**

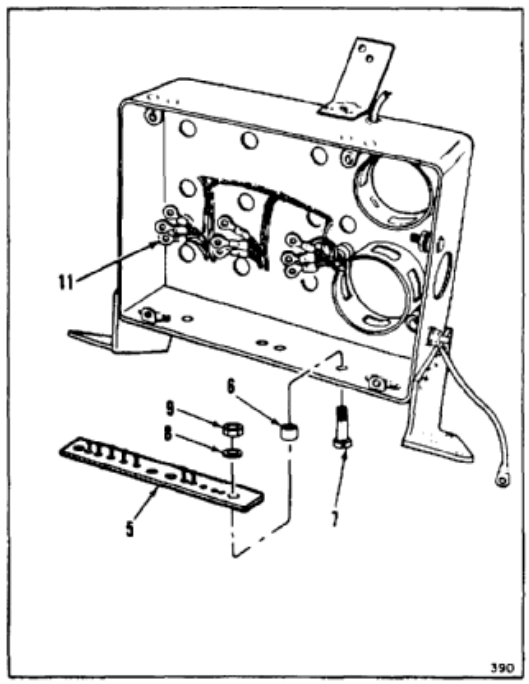
Procedure is similar to install two terminal boards. Installation of terminal board TB1 is shown here.

4. Position terminal board (5).

**NOTE**

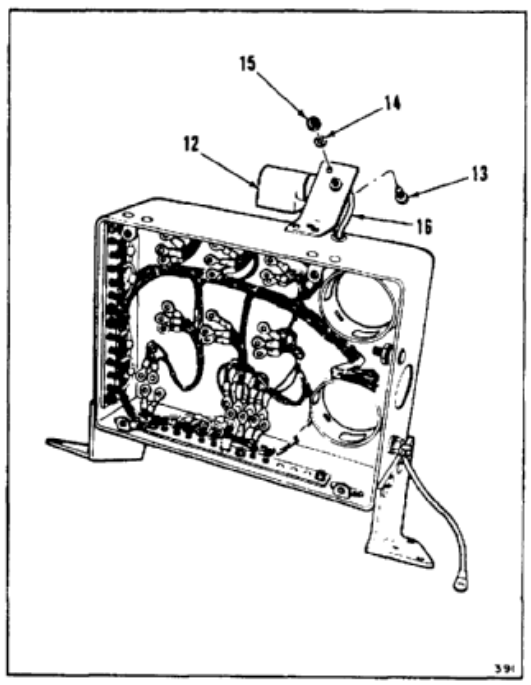
If holes in box are elongated, add washer under head of screw.

5. Install four spacers (6), screws (7), washers (8), and nuts (9).
6. Connect 10 wires (11). Use a heat sink. Use solder (E319).




*INSTALL FLOODLIGHT*

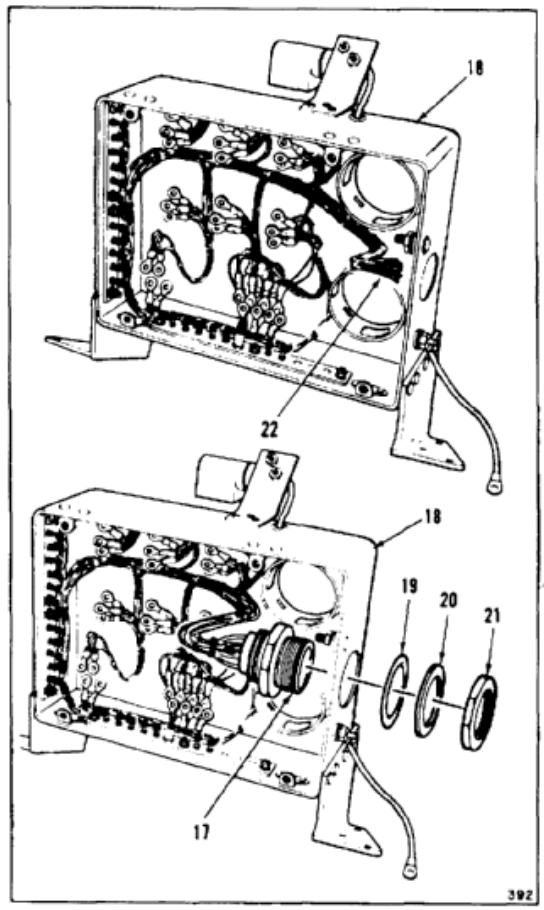
7. Position light (12). Install two screws (13), washers (14), and nuts (15).
8. Connect wire (16). Use solder (E319).



***INSTALL RECEPTACLE***

9. Position receptacle (17) in panel (18). Install packing (19), washer (20), and nut (21).

10. Connect 24 wires (22). Use insertion/removal tool. Remove tags.

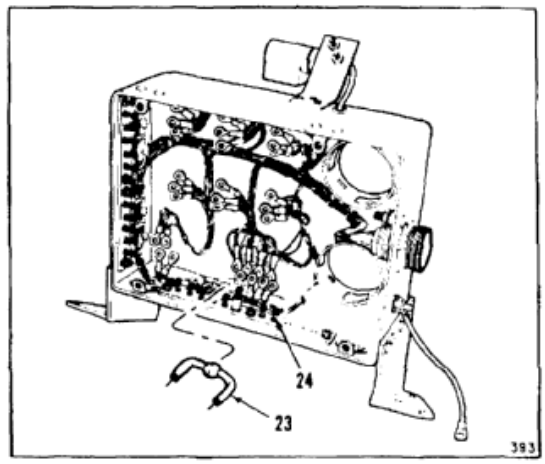


*INSTALL DIODE*

**NOTE**

Procedure is similar to install eight diodes.

11. Connect diode (23) to terminals (24). Observe polarity. Use heat sink. Use solder (E319).
12. Remove tags.

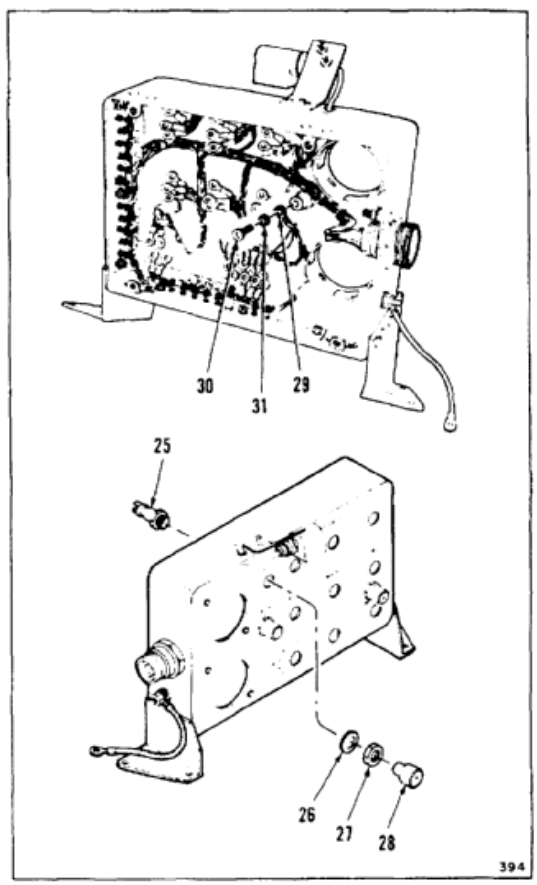



*INSTALL INDICATOR LIGHT*

**NOTE**

Procedure is same to install three indicator lights. Installation of LH REFUEL VALVE light is shown here.

13. Install lampholder (25), washer (26), and nut (27). Install lens cap (28).
14. Connect three wires (29) by installing two screws (30) and washers (31).



***INSTALL SWITCH***

**NOTE**

Procedure is similar to install nine switches. Installation of LH FUEL CELL SHUTOFF VALVE switch is shown here.

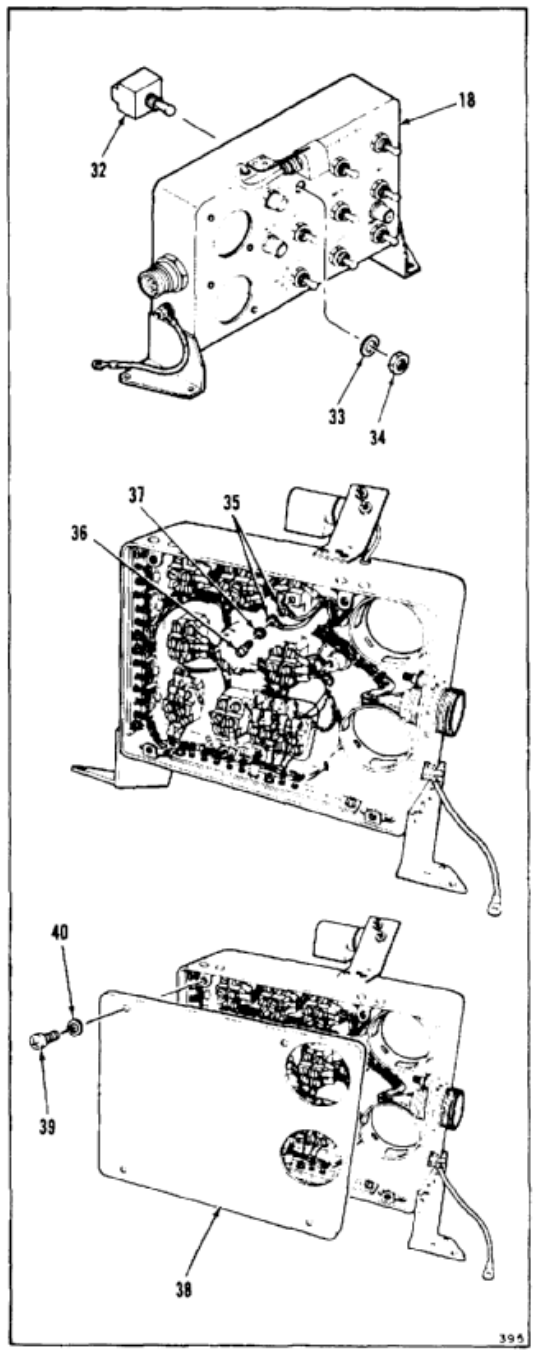
15. Position switch (32) in panel (18). Install washer (33) and nut (34).
16. Connect six wires (35) by installing three screws (36) and washers (37).
17. Remove tags.

***INSPECT***

18. Position cover (38) on panel (18). Install four screws (39) and washers (40).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-164.6 INSTALL FUEL PRE-CHECK PANEL 9-164.6

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

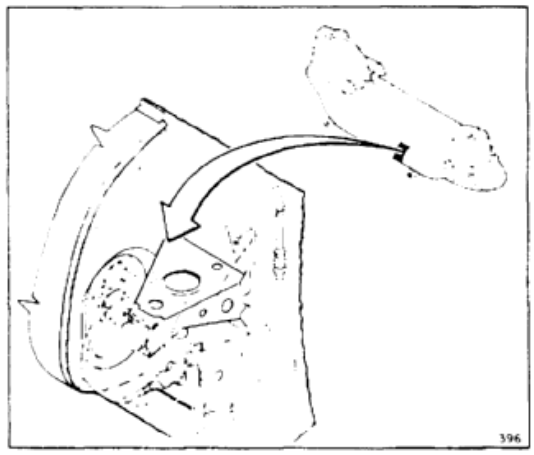
Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

***Materials:***

None

***Personnel Required:***

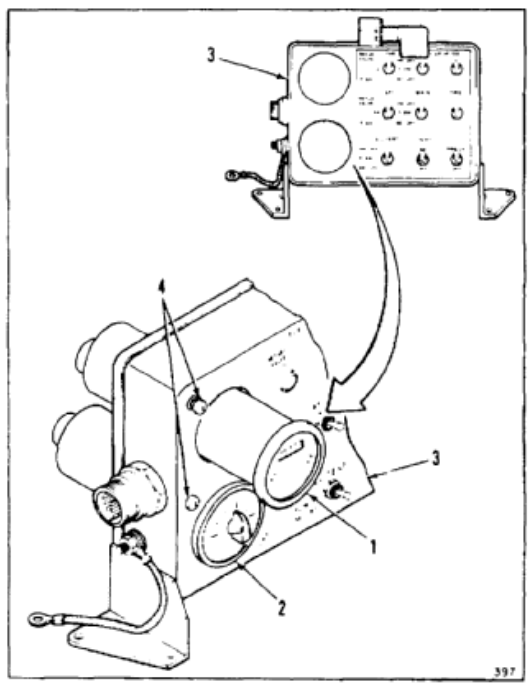
Aircraft Electrician



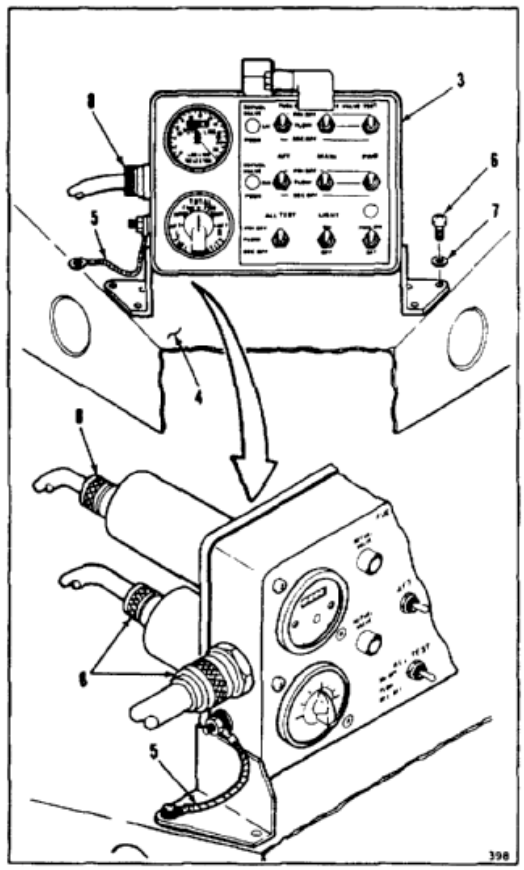

CAUTION

Be careful when handling indicators. Rough handling will damage indicators.

1. If indicator (1) and switch (2) were removed, install them in panel (3).
2. Tighten round head clamp screw (4).



3. Position pre-check panel (3) on support (4).
4. Attach bonding jumper (5) with one bolt (6) and washer (7). Install the other five bolts (6) and washers (7).
5. Connect three electrical connectors (8).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Test and Adjust Fuel Quantity Indicator (Task 8-80.5).
Perform operational check of single point refueling system (TM 55-1520-240-T).

END OF TASK

## 9-165 REMOVE TERMINAL BOARD MODULE 9-165

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Contact Insertion/Removal Tool
Module Extraction Tool

***Materials:***

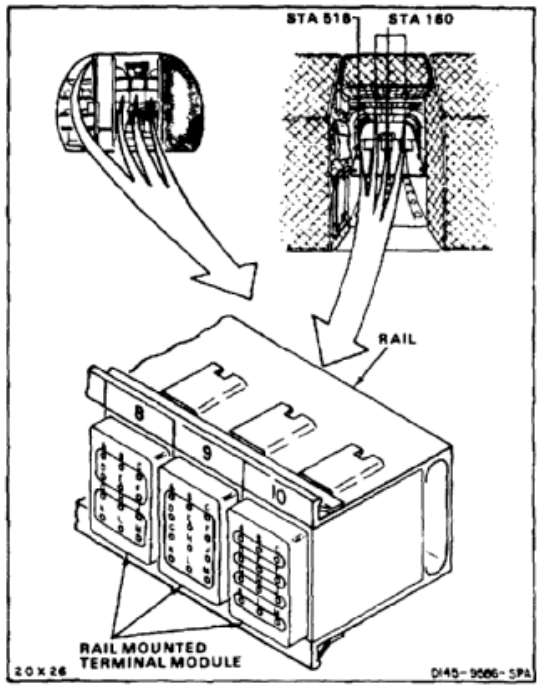
Paper Tags (E264)

***Personnel Required:***

Aircraft Electrician

***Equipment Condition:***

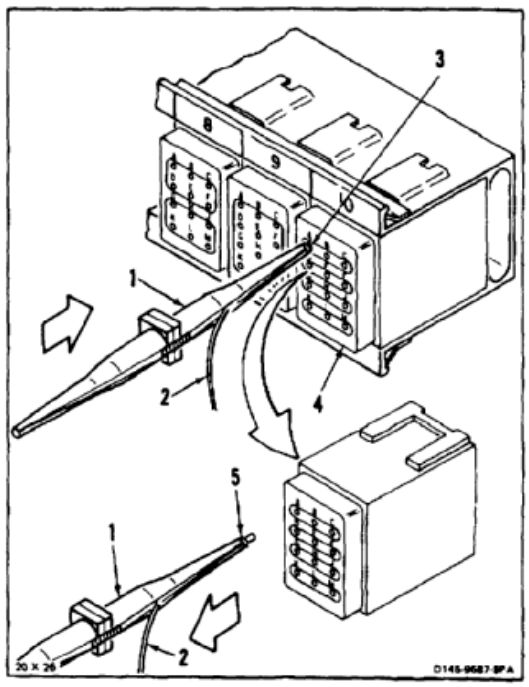
Battery Disconnected (Task 1-39)
Electrical Power Off




**NOTE**

Module can be removed with or without wires attached.

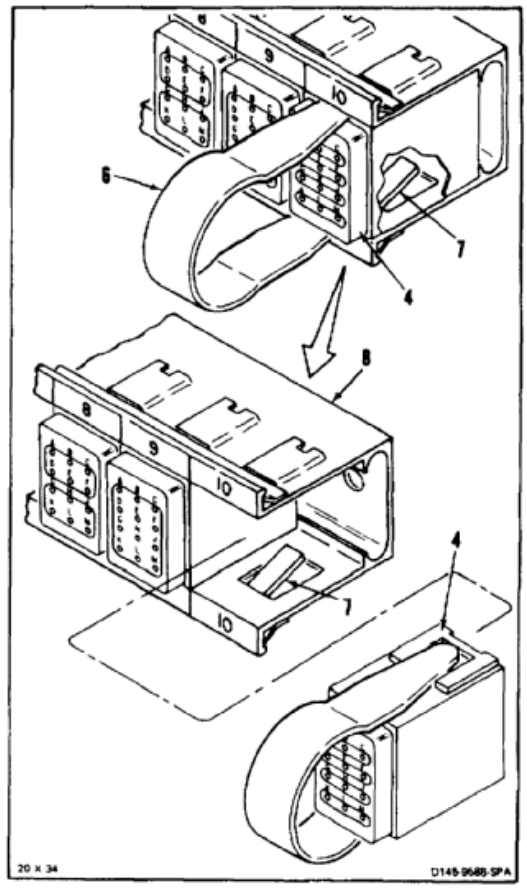
1. Tag wires to be removed.
2. Slide end of removal tool (1) over wire (2) and into cavity (3) in module (4).
3. Remove tool (1), wire (2), and contact (5).



4. Insert ends of module extraction tool (6) into slots on module (4).
5. Push tool (6) towards module (4) and release retaining clips (7).
6. Pull module (4) and tool (6) from rail (8).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-166 INSTALL TERMINAL BOARD MODULE 9-166

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Contact Insertion/Removal Tool

***Materials:***

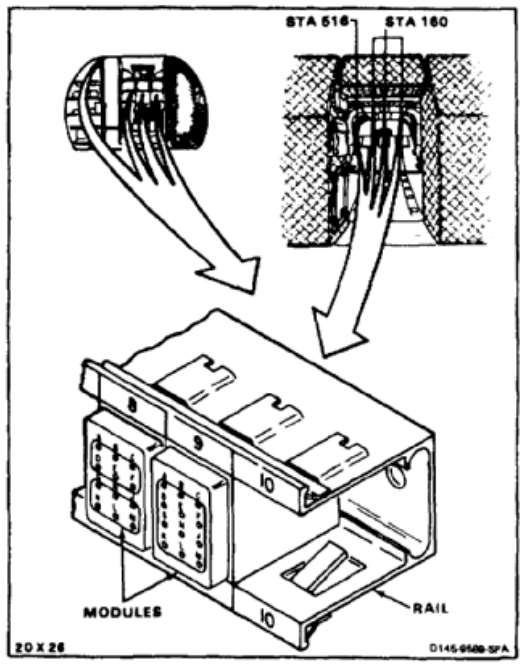
None

***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

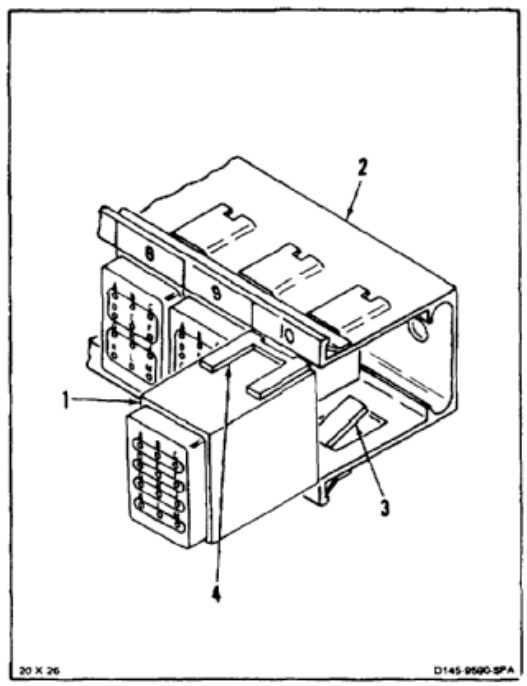
TM 55-1520-240-23P




**NOTE**

Module can be installed with or without wires.

1. Install module (1) in rail (2). Make sure clips (3) snap into notches (4).

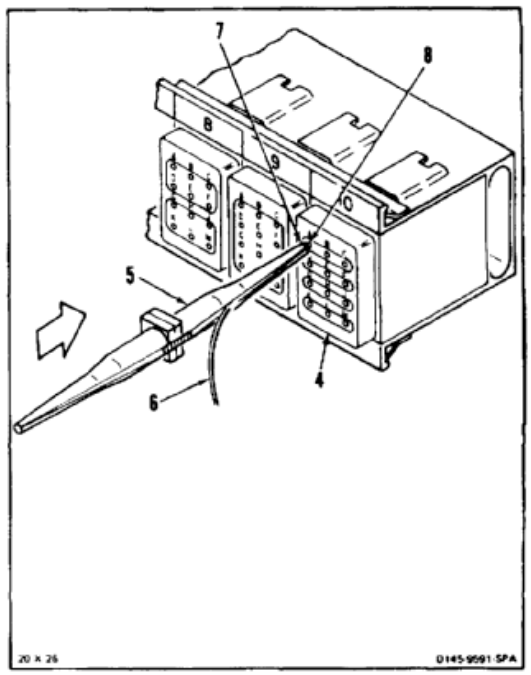


2. Slide end of insertion tool (5) over wire (6) and position contact (7) against tip of insertion tool.
3. Push contact (7) into cavity (8) until contact snaps into place.
4. Remove insertion tool (5).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check of system (TM 55-1520-240-T).




END OF TASK

## 9-167 REMOVE GROUND DEVICE MODULE 9-167

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Contact Insertion/Removal Tool

***Materials:***

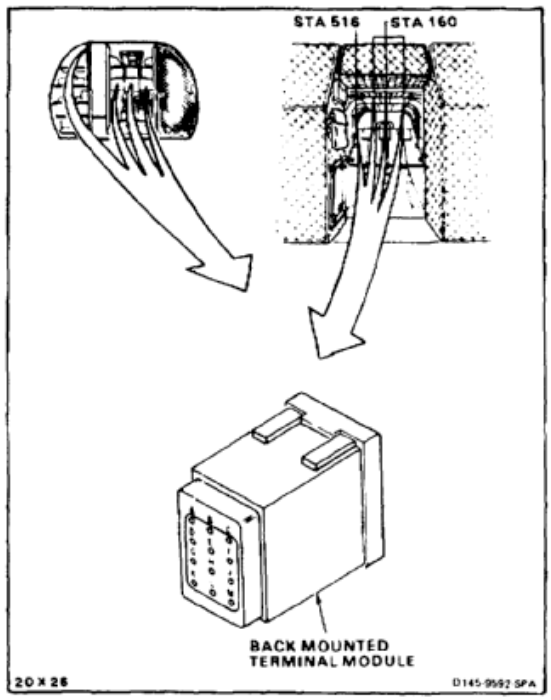
Paper Tags (E264)

***Personnel Required:***

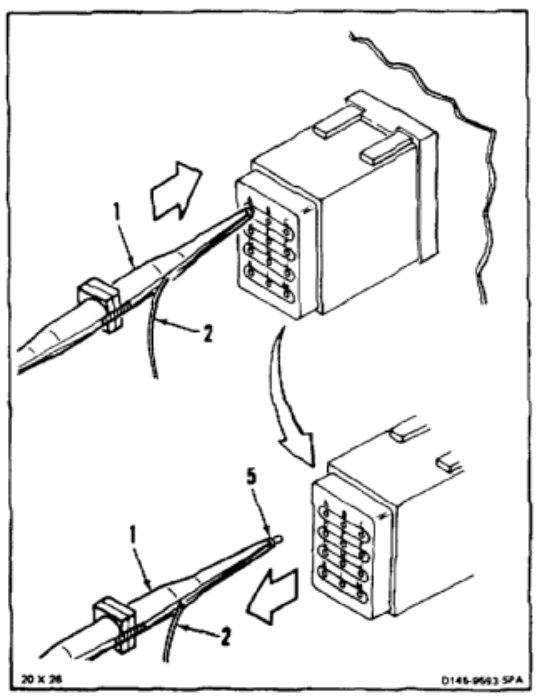
Aircraft Electrician

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off



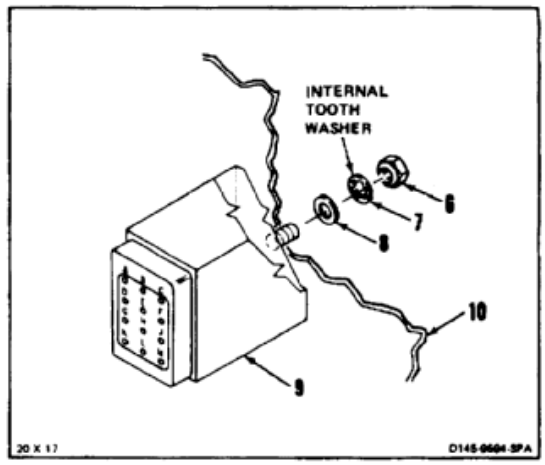

1. Tag wires to be removed.
2. Slide end of removal tool (1) over wire (2) and into cavity (3) in module (4).
3. Remove tool (1), wire (2), and (5).



4. Remove nut (6), and two washers (7 and 8).
5. Remove module (9) from structure (10).

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 9-168 INSTALL GROUND DEVICE MODULE 9-168

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Contact Insertion/Removal Tool

***Materials:***

None

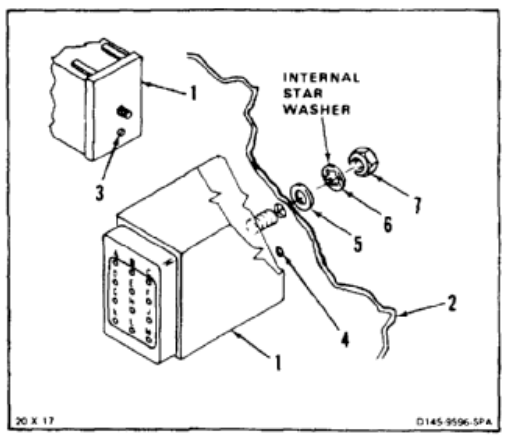
***Personnel Required:***

Aircraft Electrician
Inspector

***References:***

TM 55-1520-240-23P

1. Position module (1) on structure (2). Make sure tab (3) of module engages locator hole (4) of structure (2).
2. Install washer (5), washer (6), and nut (7).

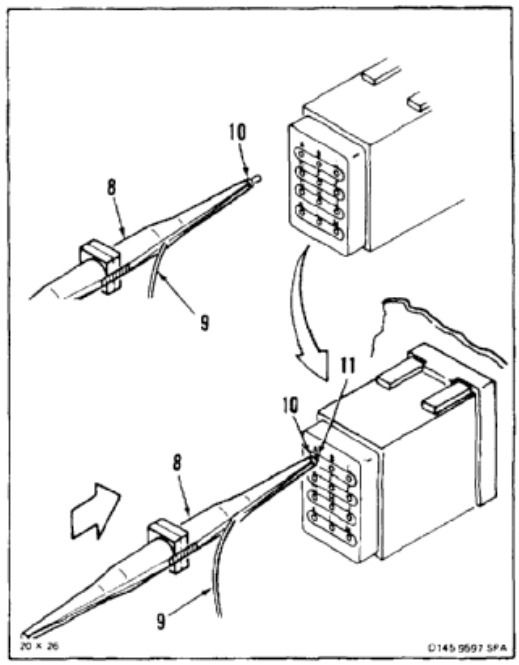


3. Slide end of insertion tool (8) over wire (9) and position contact (10) against tip of insertion tool.
4. Push contact (10) into cavity (11) until contact snaps into place.
5. Remove insertion tool (8).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Perform operational check of system (TM 55-1520-240-T).




END OF TASK

By Order of the Secretary of the Army:

Official:

**ERIC K. SHINSEKI**
*General, United States Army*
*Chief of Staff*

**JOEL B. HUDSON**
*Administrative Assistant to the*
*Secretary of the Army*
0220711

DISTRIBUTION:
To be distributed in accordance w ith Initial Distribution N umber (IDN) 311199, requirements for TM 55-1520-240-23-7.

## *These are the instructions for sending an electronic 2028*

The following format must be used if submitting an electronic 2028. The subject line must be exactly the same and all fields must be included; however only the following fields are mandatory: 1, 3, 4, 5, 6, 7, 8, 9, 10, 13, 15, 16, 17, and 27.

From: "Whomever" <whomever@wherever.army.mil>
To: 2028@redstone.army.mil

Subject: DA Form 2028

1. ***From:*** Joe Smith
2. *Unit:* home
3. ***Address:*** 4300 Park
4. ***City:*** Hometown
5. ***St:*** MO
6. ***Zip:*** 77777
7. ***Date Sent:*** 19−OCT−93
8. ***Pub no:*** 55−2840−229−23
9. ***Pub Title:*** TM
10. ***Publication Date:*** 04−JUL−85
11. *Change Number:* 7
12. *Submitter Rank:* MSG
13. ***Submitter FName:*** Joe
14. *Submitter MName:* T
15. ***Submitter LName:*** Smith
16. ***Submitter Phone:*** 123−123−1234
17. ***Problem:*** **1**
18. *Page:* 2
19. *Paragraph:* 3
20. *Line:* 4
21. *NSN:* 5
22. *Reference:* 6
23. *Figure:* 7
24. *Table:* 8
25. *Item:* 9
26. *Total:* 123
27. ***Text:***

This is the text for the problem below line 27.

**RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS**

For use of this form, see AR 25–30; the proponent agency is ODISC4.

Use Part II (*reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/ Supply Manuals (SC/SM)

DATE: 8/30/02

TO: (*Forward to proponent of publication or form)(Include ZIP Code)*
Commander, U.S. Army Aviation and Missile Command
ATTN: AMSAM–MMC–MA–NP
Redstone Arsenal, 35898

FROM: (*Activity and location)(Include ZIP Code)*
MSG, Jane Q. Doe
1234 Any Street
Nowhere Town, AL 34565

**PART 1 – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS**

| PUBLICATION/FORM NUMBER | DATE | TITLE |
|---|---|---|
| TM 9–1005–433–24 | 16 Sep 2002 | Organizational, Direct Support, And General Support Maintenance Manual for Machine Gun, .50 Caliber M3P and M3P Machine Gun Electrical Test Set Used On Avenger Air Defense Weapon System |

| ITEM NO. | PAGE NO. | PARA–GRAPH | LINE NO. * | FIGURE NO. | TABLE NO. | RECOMMENDED CHANGES AND REASON |
|---|---|---|---|---|---|---|
| 1 | WP0005 PG 3 | | 2 | | | Test or Corrective Action column should identify a different WP number. |

SAMPLE

** Reference to line numbers within the paragraph or subparagraph.*

| TYPED NAME, GRADE OR TITLE | TELEPHONE EXCHANGE/ AUTOVON, PLUS EXTENSION | SIGNATURE |
|---|---|---|
| MSG, Jane Q. Doe, SFC | 788–1234 | |

| **TO:** (*Forward direct to addressee listed in publication)* | **FROM:** (*Activity and location) (Include ZIP Code)* | **DATE** |
|---|---|---|
| Commander, U.S. Army Aviation and Missile Command<br>ATTN: AMSAM–MMC–MA–NP<br>Redstone Arsenal, 35898 | MSG, Jane Q. Doe<br>1234 Any Street<br>Nowhere Town, AL 34565 | 8/30/02 |

**PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS**

| PUBLICATION NUMBER | DATE | TITLE |
|---|---|---|
| | | |

| PAGE NO. | COLM NO. | LINE NO. | NATIONAL STOCK NUMBER | REFERENCE NO. | FIGURE NO. | ITEM NO. | TOTAL NO. OF MAJOR ITEMS SUPPORTED | RECOMMENDED ACTION |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |

SAMPLE

**PART III – REMARKS** (*Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

| TYPED NAME, GRADE OR TITLE | TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION | SIGNATURE |
|---|---|---|
| MSG, Jane Q. Doe, SFC | 788–1234 | |

| RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS<br>For use of this form, see AR 25–30; the proponent agency is ODISC4. | Use Part II (*reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/ Supply Manuals (SC/SM) | DATE |
|---|---|---|
| TO: (*Forward to proponent of publication or form)(Include ZIP Code)* | FROM: (*Activity and location)(Include ZIP Code)* | |

**PART 1 – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS**

| PUBLICATION/FORM NUMBER | DATE | TITLE |
|---|---|---|
| TM 9–1005–433–24 | 16 Sep 2002 | Organizational, Direct Support, And General Support Maintenance Manual for Machine Gun, .50 Caliber M3P and M3P Machine Gun Electrical Test Set Used On Avenger Air Defense Weapon System |

| ITEM NO. | PAGE NO. | PARA–GRAPH | LINE NO. * | FIGURE NO. | TABLE NO. | RECOMMENDED CHANGES AND REASON |
|---|---|---|---|---|---|---|
| | | | | | | |

** Reference to line numbers within the paragraph or subparagraph.*

| TYPED NAME, GRADE OR TITLE | TELEPHONE EXCHANGE/ AUTOVON, PLUS EXTENSION | SIGNATURE |
|---|---|---|
| | | |

| **TO:** (*Forward direct to addressee listed in publication)* | **FROM:** (*Activity and location) (Include ZIP Code)* | **DATE** |
|---|---|---|
| | | |

**PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS**

| PUBLICATION NUMBER | DATE | TITLE |
|---|---|---|
| | | |

| PAGE NO. | COLM NO. | LINE NO. | NATIONAL STOCK NUMBER | REFERENCE NO. | FIGURE NO. | ITEM NO. | TOTAL NO. OF MAJOR ITEMS SUPPORTED | RECOMMENDED ACTION |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |

**PART III – REMARKS** (*Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

| TYPED NAME, GRADE OR TITLE | TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION | SIGNATURE |
|---|---|---|
| | | |

## The Metric System and Equivalents

### *Linear Measure*

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

### *Weights*

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 decagram = 10 grams = .35 ounce
1 hectogram = 10 decagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

### *Liquid Measure*

1 centiliter = 10 milliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

### *Square Measure*

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

### *Cubic Measure*

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

## Approximate Conversion Factors

| *To change* | *To* | *Multiply by* | *To change* | *To* | *Multiply by* |
|---|---|---|---|---|---|
| inches | centimeters | 2.540 | ounce-inches | Newton-meters | .007062 |
| feet | meters | .305 | centimeters | inches | .394 |
| yards | meters | .914 | meters | feet | 3.280 |
| miles | kilometers | 1.609 | meters | yards | 1.094 |
| square inches | square centimeters | 6.451 | kilometers | miles | .621 |
| square feet | square meters | .093 | square centimeters | square inches | .155 |
| square yards | square meters | .836 | square meters | square feet | 10.764 |
| square miles | square kilometers | 2.590 | square meters | square yards | 1.196 |
| acres | square hectometers | .405 | square kilometers | square miles | .386 |
| cubic feet | cubic meters | .028 | square hectometers | acres | 2.471 |
| cubic yards | cubic meters | .765 | cubic meters | cubic feet | 35.315 |
| fluid ounces | milliliters | 29,573 | cubic meters | cubic yards | 1.308 |
| pints | liters | .473 | milliliters | fluid ounces | .034 |
| quarts | liters | .946 | liters | pints | 2.113 |
| gallons | liters | 3.785 | liters | quarts | 1.057 |
| ounces | grams | 28.349 | liters | gallons | .264 |
| pounds | kilograms | .454 | grams | ounces | .035 |
| short tons | metric tons | .907 | kilograms | pounds | 2.205 |
| pound-feet | Newton-meters | 1.356 | metric tons | short tons | 1.102 |
| pound-inches | Newton-meters | .11296 | | | |

## Temperature (Exact)

| | | | | |
|---|---|---|---|---|
| °F | Fahrenheit temperature | 5/9 (after subtracting 32) | Celsius temperature | °C |

PIN:  053345-000