CHANGE
NO. 24

Aviation Unit and Aviation Intermediate Troubleshooting Manual

CH-47D HELICOPTER

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**CH-47D HELICOPTER**

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CH-47 Helicopter

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Warnings, cautions, and notes emphasize important critical instructions. They are defined as follows:

WARNING

An operating procedure or practice which, if not correctly followed, will result in personnel injury or loss of life.

CAUTION

An operating procedure or practice which, if not strictly observed, will result in damage or destruction of equipment.

NOTE

An operating procedure or condition which it is essential to highlight.

Personnel performing instructions involving operations, procedures, materials, 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 or death. Refer to FM 21-11 for first aid data to treat injuries resulting from working on the helicopter.

Dangerous Static Charges. Ground the helicopter during parking, fueling, or defueling.

Dangerous Voltage Exist in the Electronic Equipment. Be careful when working on the 150- and 300-volt dc circuits and on the ac generator 115 and 200 volt ac outputs.

Dangerous Voltage may Exist at Antenna Terminals. Be careful when working near the antenna or the antenna terminals. Radio-frequency (rf) high voltages exist at these points when transmitters are operating. Contact with radiating antennas can cause serious rf burns.

Poisonous Carbon Monoxide Fumes. Toxic carbon monoxide fumes may be present inside the helicopter whenever the apu or engines are operating with the cargo ramp open. Ventilate the cockpit.

Dangerous Fuel Handling. Incorrect fuel handling causes fire hazards. Ground the helicopter when fueling or defueling.

Corrosive Battery Electrolyte (Potassium Hydroxide). Wear rubber gloves, apron, and face shield when handling leaking batteries. If potassium hydroxide is spilled on clothing, or other material wash immediately with clean water. If personnel contact is made, immediately start flushing the affected area with clean water. Continue washing until medical assistance arrives.

Acids and Alkalines. Do not add water to acids. A violent action will result. Acids should be added to water in small quantities. Ruststripper is an alkaline solution. Avoid contact with the skin. Wear protective clothing. Wash thoroughly after using.

Solvent and Cleaning Solutions. These materials are generally toxic and many (toluene, benzene, xylene, methyl-ethyl-ketone, perchloroethylene, naphtha, trichloroethylene) are highly flammable. Work in a well ventilated area away from open flames. Avoid inhaling fumes and prolonged contact with the skin. Wear protective clothing and goggles. Wash thoroughly after using.

Windshield Repellant. Do not let windshield rain repellent contact open flame. Deadly hydrogen fluoride gas can be generated. Wash hands with soap and water after handling repellent.

Antiseize Compounds. Some antiseize compounds are irritants. Avoid inhaling fumes and contact with the skin. Wear protective clothing. Wash thoroughly after using.

Paints, Varnishes, Dopes, Thinners, Lubricants, and Fuels. 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 the skin. Wash thoroughly after using.

Epoxy Resins, 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 the skin. Wash thoroughly after using.

Radiation Hazard. Some instruments contain radioactive material. (See TB 55-1500-314-25.) 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 aircraft until you consult 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).

Fin Extinguishing Agents. Avoid repeated or prolonged exposure to high concentration of bromochloromethane (CB) or decomposition products. CB is a narcotic agent of moderate intensity but prolonged duration. It is less toxic than carbon tetrachloride, methylbromide, or products of combustion. Take normal precautions while using bromochloromethane. Use oxygen masks when available.

Monobromotrifluoromethane (CF3Br) is highly volatile but is not easily detected by its odor. Although nontoxic, it is about the same as other freons and carbon dioxide, causing danger to personnel primarily by reduction of oxygen available for proper breathing. Do not allow the liquid to come into contact with your skin. It may cause frostbite or low temperature burns.

Noise. Sound pressure levels in this aircraft during some operating conditions exceed the Surgeon General’s hearing conservation criteria, as defined in TB MED 251. Hearing protection devices, such as the aviator helmet or ear plugs, are required to be worn by all personnel in and around the aircraft during its operation.

FOD. Make sure area is clear of foreign objects before closing access doors, panels, and fairings. If the area is not cleared, damage to components and systems could result in personal injury or death.

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, 1/2-inch thickness or more, when applying pressures over 250 psi, to prevent injury to personnel.

Compressed Air. Do not use more than 30 psi compressed air for cleaning purposes. Debris thrown under pressure can cause injury to eyes. Use source of compressed air under 30 psi and eye protection to prevent injury to personnel.

Flare Dispenser. Remove all power from helicopter before installing loaded payload module on dispenser assembly. Keep hands and face away from end of payload module during installation. Flares can accidentally fire, sometimes from stray voltage, resulting in injury or death.
### LIST OF EFFECTIVE PAGES

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

**NOTE:** On a changed page, the portion of the text affected by the latest change is indicated by a vertical line in the outer margin of the page. Changes to illustrations are indicated by miniature pointing hands.

**Dates of issue for original and changed pages are:**

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TECHNICAL MANUAL
No. 55-1520-240-T

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 10 May 1983

Aviation Unit and Aviation Intermediate
Troubleshooting Manual
CH-47D HELICOPTER

REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS
You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U.S. Army Aviation and Missile Command, ATTN: AMSAM-MMC-LS-LP, Redstone Arsenal, AL 35898-5230. A reply will be furnished to you. You may also send your comments electronically to our e-mail address: ls-lp@redstone.army.mil or by fax 205-842-6546/DSN 788-6546. Instructions for sending an electronic 2028 may be found at the back of this manual immediately preceding the hard copy 2028.

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<td>12-3. Fire Extinguisher System</td>
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<td>12-4. Windshield Wipers</td>
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<table>
<thead>
<tr>
<th>CHAPTER 13.</th>
<th>Environmental Control System Troubleshooting</th>
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<td>13-1. Heating and Ventilating System</td>
<td>13-2.1</td>
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<table>
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<tr>
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<th>Hoist and Winch Troubleshooting</th>
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<td>14-1. Cargo/Rescue Winch System</td>
<td>14-2.1</td>
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</table>
HOW TO USE THIS MANUAL (TM 55-1520-240-1)

This manual has 17 Chapters that have instructions for troubleshooting 72 CH-47 Helicopter Systems.

Chapter 1 has:
- The Complete List of Troubleshooting Symptoms you will find in this manual. This list outlines each chapter by system and symptom.
- Complete wiring for 300 Series Connectors and Receptacles, Terminal Boards, and Ground Devices.

Chapters 2 thru 17 have sets of troubleshooting instructions that include:
- A Chapter outline of all systems and symptoms found in the beginning of each Chapter.
- Connector part numbers and pin patterns for each connector and receptacle in systems contained in chapter. Also included are relay termination views and ground termination types and location.
- System Component Diagrams
- System Block Diagrams
- System Schematics, Ladder Schematics and Wiring Diagrams
- Fuel Piping Diagrams
- Hydraulic Piping Diagrams
- Tables
- Visual Checks with locator figures and step by step procedures.
- Operational Checks with locator figures and step by step procedures.
- Fault Isolation Procedures with locator figures and troubleshooting logic for specific system faults.

HOW TO FIND WHAT YOU NEED

Maintenance - Refer to TM 55-1520-240-23.

Troubleshooting - Use the index in Chapter 1 or in the beginning of each chapter. This is where you will find the system troubleshooting procedures (visual checks, operational checks and fault isolation procedures).

1. The troubleshooting procedures are listed under the name of the system that the component or system belongs to.
2. Each system has a number:
   * Example:
     - System No.
     - 9-15
     - Cabin and Ramp Lights
3. Each item in your set of troubleshooting instructions has a task number. The system number is prefixed to each of the item task numbers.
   * Example:
     - System No.
     - 9-15
     - Cabin and Ramp Lights
     - Wiring Diagram
     - 9-15.1
     - Visual Check
     - 9-15.2
     - Operational Check
     - 9-15.3
     - Cabin and Ramp Circuit Breaker
     - Does not Stay Closed
     - 9-15.4

TASK PREPARATION

Each Troubleshooting procedure begins with INITIAL SETUP information. Read it carefully before starting. It tells you what you need and what you have to know before you begin the job.

1. Applicable Configurations. Tells you what configurations or effectivity the task applies to.
2. Tools. If any tools from your tool kit are needed, just the kit is listed. Tools needed that are not in the kit are called for by name. Special ground support tools, containers, and test equipment are listed by tool number (Txx). Find these items in TM 55-1520-240-23.
3. Materials. Materials needed are listed by expendable number (EXX). Find these items in TM 55-1520-240-23.
4. Parts. New parts required, such as gaskets, packings, and washers, are listed by name only. If parts are not needed, you will not see this heading.
5. Personnel Required. Each MOS needed to do the task is listed. When more than one of any MOS is needed, the number is shown in parentheses.
6. References. Lists references such as TM 55-1520-240-23. These references will provide where information can be found when you need to repair or replace a part or component. When more than one reference is listed, the Fault Isolation Procedure blocks will contain a refer to statement for all references other than TM 55-1520-240-23.
7. Equipment Condition. Procedures which must be done before starting the task are listed and TM number is given. Tasks that are not indented under a TM manual can be found in this manual. Refer to the TM manual listed above the indented tasks.
8. General Safety Instructions. These are safety precautions that must be observed throughout task. Warnings include basic first aid instructions.
9. Locator Figure. The area of the helicopter where the task will be performed is shown, with components to be worked on called out.

TASK PERFORMANCE

1. Visual Checks are performed to determine if the cause of the system fault is visually apparent.
2. Operational Checks are performed step by step on the system to determine the system fault. Continue the operational check TASK until the symptom is confirmed in the RESULT column.
3. Fault Isolation Procedures are performed to identify the specific trouble in the system. Start with the first block. Read it through and answer the question. The questions will always have a YES or NO answer. If you answer the question YES, follow the direction of the YES arrow to the next block. If you answer the question NO, follow the direction of the NO arrow to the next block. Continue troubleshooting until the symptom cause is identified.
4. Use the integrated schematic during troubleshooting for a view of system component connections and system interfaces.
5. Use the wiring diagram when the troubleshooting instructions require wire tests to isolate the symptom cause.
6. Before starting, read the entire task. Familiarize yourself with the entire procedure before beginning the task.

7. As you read, pay attention to **WARNINGS, CAUTIONS, and NOTES**.

8. **When the word INSPECT** is in your procedures, an inspector must ok the completed step(s).

9. **Major steps and key words are printed in boldface for experienced repairers**.

10. A glossary is on page 1-87. It lists the abbreviations, special words and terms used in this manual and gives their meaning.

11. **When a special tool is used or a common tool is used in an unusual way, the use of the tool will be shown**.

12. **When a block states, “Repair or replace wire as required.”**, refer to **TM 55-1500-323-24** for recommended maintenance practices.

13. Voltages specified in blocks are nominal values unless a range is given. These nominal values and their acceptable ranges are as follows:

<table>
<thead>
<tr>
<th>Nominal voltage</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>28 VDC</td>
<td>24 to 30</td>
</tr>
<tr>
<td>26 VAC</td>
<td>24 to 28</td>
</tr>
<tr>
<td>24 VDCV (Battery)</td>
<td>20 to 74</td>
</tr>
<tr>
<td>5 VAC</td>
<td>4 to 6</td>
</tr>
<tr>
<td>115 VAC</td>
<td>110 to 120</td>
</tr>
</tbody>
</table>

14. **In the event of the necessity to add or replace electrical wiring, the colors of wire received from supply may not be the same as the original wire colors. Use wire numbers only for identification of wires. Tag or identify wires by proper number when disconnecting or replacing.**

**AIRCRAFT MODIFICATION (ECP/MWO) RETROFIT INFORMATION**

Throughout this manual, black squares containing white numerals are used to distinguish information relating to helicopters modified by an MWO or ECP. Refer to Helicopter Configuration Legend on the following pages for specific modification and effectivities relating to each numeral. A list of delivered helicopters serial numbers is included with the legend. 

Information pertaining only to unmodified helicopters is identified by the appropriate effectivity symbol preceded by WITHOUT. For example, WITHOUT indicates that the information that follows is applicable only to helicopters not modified by ECP Do18. Information pertaining only to helicopters that have been modified by ECP Do18 is preceded by WITH. All information not preceded by an effectivity symbol is common to all helicopters.

The following helicopter Designation Legend pages are solely for user convenience. They have no official status.

**DELIVERED HELICOPTER SERIAL NUMBERS**

| 81-23382 through 82-23389 | 82-23762 through 83-24125 | 84-24152 through 85-24322 |

<p>| 85-24322 through 85-24336 |</p>
<table>
<thead>
<tr>
<th>CODE</th>
<th>ECP/MWO NO.</th>
<th>TITLE</th>
<th>EFFECTIVITY</th>
<th>PRODUCTION (Serial Number)</th>
<th>RETROFIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ECP D003R1</td>
<td>Improved Synch Shaft Vibration Mount</td>
<td>84-24108 and on</td>
<td>Attribution</td>
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<tr>
<td>2</td>
<td>ECP DO10R2C1</td>
<td>Fuel Cell Manifold Control Bracket</td>
<td>82-23389 and on</td>
<td>Attribution</td>
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<tr>
<td>3</td>
<td>ECP DO8</td>
<td>Rotor Hub Protective Cover Enlargement</td>
<td>85-24322 and on</td>
<td>Attribution</td>
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<tr>
<td>4</td>
<td>ECP D018R2</td>
<td>Composite Fuel Pods</td>
<td>84-24162 and on</td>
<td>Attribution</td>
<td></td>
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<tr>
<td>5</td>
<td>ECP D006</td>
<td>Removable Support Structure Pylion Hyd. Module</td>
<td>81-23385 and on</td>
<td>By Kit all D</td>
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<tr>
<td>6</td>
<td>ECP D037R2</td>
<td>Shorter 114C1014 Yaw Connecting Link</td>
<td>85-24322 and on</td>
<td>Attribution</td>
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<tr>
<td>7</td>
<td>ECP D034</td>
<td>Pilot and Co-Pilot Seat Armor</td>
<td>81-23386 and on</td>
<td>Attribution</td>
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<tr>
<td>8</td>
<td>ECP D042</td>
<td>Redesign Link Assy for Increased Parked Blade Loads</td>
<td>83-24105 and on</td>
<td>Attribution</td>
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<td>9</td>
<td>ECP D048C1</td>
<td>Flare Dispenser Blanket Mod and Stowage Provision</td>
<td>83-24107 and on</td>
<td>None</td>
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<tr>
<td>10</td>
<td>ECP D061R</td>
<td>Floor Former/Fuselage Edge Paint (Special paint for 14 aircraft)</td>
<td>83-24107 and on</td>
<td>None</td>
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<td>11</td>
<td>ECP D065</td>
<td>Second Source 114PS494 Fuel Shutoff Valve (Motorized)</td>
<td>82-23776 and on</td>
<td>Attribution</td>
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<td>12</td>
<td>ECP D071</td>
<td>2-Inch Dia. Fuel Breakaway Fittings 83-24110 and on</td>
<td>Attribution</td>
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<td>13</td>
<td>ECP D074C1</td>
<td>Install Steel Control Rods Alt Pylon 83-24103 and on</td>
<td>83-2381 and on 83-24102 by Tech Bulletin</td>
<td>Attribution</td>
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<tr>
<td>14</td>
<td>ECP D015C2</td>
<td>Install Bubble Windows</td>
<td>85-24322 and on</td>
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<td>15</td>
<td>ECP D051C1</td>
<td>Rainshields Design</td>
<td>84-24158 and on</td>
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<td>16</td>
<td>ECP D075</td>
<td>Heater Modification</td>
<td>85-24322 and on</td>
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<tr>
<td>17</td>
<td>ECP D07RC1</td>
<td>Night Vision Goggles (NVG)</td>
<td>85-24322 and on</td>
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<td>18</td>
<td>ECP D036R1</td>
<td>Improved N1 System</td>
<td>85-24322 and on</td>
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<tr>
<td>19</td>
<td>ECP D069R4</td>
<td>Ferry Fuel Provisions</td>
<td>85-24322 and on</td>
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<td>20</td>
<td>ECP D064R1</td>
<td>Alt Pylon Work Platform Redesign</td>
<td>85-24322 and on</td>
<td>Attribution</td>
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<tr>
<td>21</td>
<td>ECP D029C1</td>
<td>ILCA Actuator and Manifold Seal Change</td>
<td>85-24322 and on</td>
<td>Attribution</td>
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<tr>
<td>22</td>
<td>ECP D060R1</td>
<td>Ramp Skin and Ramp End Former</td>
<td>85-24322 and on</td>
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<tr>
<td>23</td>
<td>ECP D001R1</td>
<td>Improved N2 Control Box</td>
<td>85-24156 and on</td>
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<tr>
<td>24</td>
<td>ECP D065R2</td>
<td>Redesign Droop Stop Arm to Increase Clearance With Shroud; Modify Spring Limiter</td>
<td>85-24322 and on</td>
<td>Contractor Kit</td>
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<td>25</td>
<td>ECP D081R2</td>
<td>Ground Contact Annunciator</td>
<td>87-0069 and on</td>
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**TM 55-1520-240-T**

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<td>Improved Heat Resistance of Flight System Bellcranks and Connecting Rods</td>
<td>85-24353 and on</td>
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<td>27</td>
<td>ECP D054R1</td>
<td>Combining Transmission Support Fitting Redesign</td>
<td>84-24154 and on</td>
<td>Attribution</td>
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<tr>
<td>28</td>
<td>ECP D128C1</td>
<td>Accumulator, APU/Flight Control Modules</td>
<td>86-1635 and on</td>
<td>Attribution</td>
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<tr>
<td>29</td>
<td>ECP D085C1</td>
<td>Reduced Length Servo-Cylinder Safety Blocks</td>
<td>GSE</td>
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<td>30</td>
<td>ECP 712R7</td>
<td>Portable Calculator and Hardware for Vibrex</td>
<td>OBSOLETE</td>
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<td>31</td>
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<td>Alt Transmission Torque Reactor Improvement</td>
<td>GSE</td>
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<td>32</td>
<td>ECP D111</td>
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<td>33</td>
<td>ECP D133</td>
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<td>86-1650 and on</td>
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<td>34</td>
<td>ECP D122</td>
<td>Change Drop Stop Shroud From Installed to Flyaway Equipment</td>
<td>85-24361 and on</td>
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<td>35</td>
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<td>Hook Release Button Ring Guard on Cyclic Grip</td>
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<td>89-0139 and on</td>
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<td>38</td>
<td>ECP D154R1</td>
<td>Installation of Stainless Steel Flight 88-0091 and on</td>
<td>Control Connecting Links</td>
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<td>39</td>
<td>ECP D069R4</td>
<td>Ramp Extension/Center Skid Pad Modification for Compatibility With HICHS</td>
<td>90-0180 and on</td>
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<tr>
<td>40</td>
<td>ECP D121R2</td>
<td>Fine Mesh Inlet Screen</td>
<td>88-0095 and on</td>
<td>Retrofit</td>
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<td>41</td>
<td>ECP D105R1</td>
<td>Shotpeen Horizontal Hinge Pins</td>
<td>88-0107 and on</td>
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<td>42</td>
<td>ECP D135</td>
<td>Improved Rotor Blade Grounding Strap</td>
<td>88-0103 and on</td>
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<td>43</td>
<td>ECP D089</td>
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<td>87-0077 and on</td>
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<td>ECP D101</td>
<td>Engine Oil Pressure Transmitter</td>
<td>90-0180 and on</td>
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<td>ECP D092R1</td>
<td>Elastomeric Lag Damper and Pitch Link Bearings</td>
<td>90-0180 and on</td>
<td>MWO</td>
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<td>46</td>
<td>ECP D114C2</td>
<td>Upper and Middle Drive Scissors Positive Locking Bolts</td>
<td>90-0180 and on</td>
<td>MWO</td>
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<tr>
<td>47</td>
<td>ECP D095R1</td>
<td>Airframe Structural Improvements</td>
<td>90-0180 and on</td>
<td>Attribution</td>
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<td>48</td>
<td>ECP D173</td>
<td>Combining Transmission Sync Shaft Shielding Baffle</td>
<td>88-0099 and on</td>
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<tr>
<td>49</td>
<td>ECP D131R1</td>
<td>Transmission Dip Pan Material Change</td>
<td>90-0214 and on</td>
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<th>TITLE</th>
<th>PRODUCTION SERIAL NUMBER</th>
<th>EFFECTIVITY</th>
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<tbody>
<tr>
<td>ECP D145R1C1</td>
<td>Both/Bushing Assembly Improvements</td>
<td>90-0180 and on</td>
<td>MWO 1-1520-240-50-37</td>
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<tr>
<td>ECP D157R1</td>
<td>One Piece Engine Drive Shaft</td>
<td>90-0180 and on</td>
<td>MWO 55-1520-240-50-43</td>
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<tr>
<td>ECP D164</td>
<td>Improved Clamshell Door Latch Positive Locking Lever Switch</td>
<td>91-0252 and on</td>
<td>MWO 55-1520-240-50-50</td>
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<tr>
<td>ECP D154R1</td>
<td>Control System Hardening and Smoke Containment (Phase 2)</td>
<td>81-23381 thru 89-0177</td>
<td>MWO 1-1520-250-50-40</td>
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<tr>
<td>ECP D185R1</td>
<td>Separate Fuel Control Relay Box Ground Connections</td>
<td>90-0202 and on</td>
<td>MWO 1-1520-240-50-58</td>
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<tr>
<td>ECP D183</td>
<td>Helicopter Internal Cargo Handling System (HICHS) Ramp Centerline Attachment</td>
<td>81-23381 thru 91-0227</td>
<td>MWO 1-1520-240-50-59</td>
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<tr>
<td>ECP D175</td>
<td>Engine Aft Mount Adjustable Link Improved Bolt/Bushing Connection</td>
<td>81-23381 thru 92-0302</td>
<td>MWO 1-1520-240-50-60</td>
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<tr>
<td>ECP D145R2</td>
<td>Polyurethane Paint for CH-47D Aircraft</td>
<td>&quot;</td>
<td>Attrition</td>
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<td>ECP A098</td>
<td>Heads Up Display System (HUD) AN/AVS-7</td>
<td>81-23381 thru 91-0271</td>
<td>MWO 1-1520-240-50-56</td>
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<tr>
<td>ECP A0027</td>
<td>Global Positioning System (GPS) AN/ASN-149(V)11</td>
<td>81-23381 thru 92-0302</td>
<td>MWO 1-1520-240-50-68</td>
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<tr>
<td>ECP AEEMH-03009</td>
<td>Altitude Voice Warning System Radar Altimeter, AN/APN-209(V)</td>
<td>81-23381 thru 93-0934</td>
<td>MWO 1-1520-240-50-61</td>
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<tr>
<td>ECP D200 (Phase 2)</td>
<td>Replace Lower Pitch Link Elastomeric Bearing</td>
<td>90-0180 and on</td>
<td>MWO 1-1520-240-50-64 and MWO 1-1520-240-50-63</td>
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<tr>
<td>ECP D194R1</td>
<td>Stainless Steel Bellcranks in Combining Transmission Area</td>
<td>81-23381 and on</td>
<td>MWO 1-1520-240-50-65</td>
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### HELICOPTER CONFIGURATION LEGEND (Continued)

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<td>ECP D168R1</td>
<td>Cockpit Remote Emergency Ramp Extension System</td>
<td>81-23381 thru 92-0309</td>
<td>MWO 1-1520-240-50-48</td>
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<tr>
<td>ECP D199</td>
<td>Non-Metallic Spline Adapters for Combining Transmission Cooling Fan Drive Shaft</td>
<td>76-18479 and 81-23381 thru 93-00934</td>
<td>MWO 1-1520-240-50-67</td>
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<tr>
<td>ECP D214R1</td>
<td>Aft Position Lights Switch</td>
<td>76-18479 and 81-23381 thru 93-00934</td>
<td>MWO 1-1520-240-50-75</td>
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<td>ECP D216</td>
<td>Pressure Refueling Vacuum Relief Valve</td>
<td>76-18479 and 81-23381 thru 93-00934</td>
<td>MWO 1-1520-240-50-81</td>
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<td>ECP D215</td>
<td>NVG Bezel</td>
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<td>ECP D210R1</td>
<td>Easily Replaceable Cabin Escape Hatch</td>
<td>76-18479 and 81-23381 thru 93-00934</td>
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<td>ECP END</td>
<td>Installation of AN/ASN-128B Doppler GPS Navigation System</td>
<td>76-18479 and on 93-00934</td>
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<td>ECP D209</td>
<td>Installation of Radar Altimeter in Center Hook Compartment</td>
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<td>ECP EJCH 007016</td>
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CHAPTER 10

FUEL SYSTEMS TROUBLESHOOTING
CHAPTER 10
FUEL SYSTEMS TROUBLESHOOTING

CHAPTER OVERVIEW

[Chapter 10] contains procedures for Fuel Systems troubleshooting. Each fuel system and failure symptom is listed below. Included in this chapter are locations and views of all electrical connectors, receptacles, relays, and ground connections for Fuel System.
Refer to TM 55-1520-240-23 for required Fuel System maintenance procedures.

<table>
<thead>
<tr>
<th>SYSTEM</th>
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<tr>
<td>ENGINE FUEL SHUTOFF AND CROSS-FEED VALVES</td>
<td>10-1</td>
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<tr>
<td>FUEL BOOST PUMPS</td>
<td>10-2</td>
</tr>
<tr>
<td>SINGLE POINT PRESSURE REFUELING</td>
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FAILURE SYMPTOM LIST

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<td>ENGINE FUEL SHUTOFF AND CROSSFEED VALVES</td>
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CROSSFEED FUEL VALVE HANDLE IS NOT AT CLSD WITH CROSSFEED FUEL VALVES SWITCH AT CLOSE

CROSSFEED FUEL VALVE HANDLE IS NOT AT OPEN WITH CROSSFEED VALVES SWITCH AT OPEN

CROSSFEED FUEL VALVE LIGHT DOES NOT COME ON, VALVE OPERATION NORMAL

ENGINE FUEL SHUTOFF CIRCUIT BREAKER DOES NOT STAY CLOSED

ENGINE FUEL VALVE HANDLE IS NOT AT OPEN WITH FIRE HANDLE IN

ENGINE FUEL VALVE LIGHT DOES NOT COME ON, VALVE OPERATION NORMAL

ENGINE FUEL VALVE HANDLE IS NOT AT CLSD WITH FIRE HANDLE PULLED

FUEL XFED CONT CIRCUIT BREAKER DOES NOT STAY CLOSED

LEFT CROSSFEED FUEL VALVE LIGHT DOES NOT COME ON DURING PRESS-TO-TEST

NO. 1 ENGINE FUEL VALVE LIGHT DOES NOT COME ON DURING PRESS-TO-TEST

NO.2 ENGINE FUEL VALVE LIGHT DOES NOT COME ON DURING PRESS-TO-TEST

RIGHT CROSSFEED FUEL VALVE LIGHT DOES NOT COME ON DURING PRESS-TO-TEST

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### CHAPTER 10
#### FUEL SYSTEMS TROUBLESHOOTING

**CHAPTER OVERVIEW**

**FAILURE SYMPTOM LIST (Continued)**

#### FUEL BOOST PUMPS

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<th>SYMPTOM</th>
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<td>LH FUEL PUMP AUX AFT CIRCUIT BREAKER WILL NOT STAY CLOSED</td>
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<tr>
<td>LH FUEL PUMPS AUX FWD CIRCUIT BREAKER WILL NOT STAY CLOSED</td>
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</tr>
<tr>
<td>LH FUEL PUMP CONT AUX AFT CIRCUIT BREAKER WILL NOT STAY CLOSED</td>
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</tr>
<tr>
<td>L FUEL PRESS CAPSULE DOES NOT GO OUT WHEN LEFT SIDE MAIN AFT FUEL PUMP SWITCH IS SET TO ON</td>
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<tr>
<td>R FUEL PRESS CAPSULE DOES NOT GO OUT WHEN RIGHT SIDE MAIN FUEL PUMP SWITCH IS SET TO ON</td>
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<td>RIGHT SIDE AUX PRESS LIGHT COMES ON WHEN RIGHT SIDE AUX FWD FUEL PUMP SWITCH IS SET TO ON</td>
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<td>LEFT OR RIGHT SIDE AUX PRESS LIGHT DOES COME ON WHEN PRESSED TO TEST LEFT SIDE AUX PRESS LIGHT COMES ON WHEN LEFT SIDE AUX AFT FUEL PUMP SWITCH IS SET TO ON</td>
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10-2.2
### Single Point Pressure Refueling

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<tr>
<td>Fuel does not stop flowing within 4 seconds with all test switch at SEC off</td>
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<tr>
<td>Fuel refuel circuit breaker will not stay closed</td>
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<thead>
<tr>
<th>Symptom</th>
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<tbody>
<tr>
<td>LH or RH refuel valve posn light does not come on or comes on and stays on</td>
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<tr>
<td>LH or RH refuel valve posn light does not come on when pressed</td>
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<td>LH or RH refuel valve posn light is on</td>
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### Extended Range Fuel System (ERFS II) (with 82)

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<tr>
<td>ERFS II refuel valve handle not at open position and control panel refuel valve in transit light stays on</td>
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<td>ERFS II control panel refuel valve in transit light does not come on with ERFS II refuel valve operation normal</td>
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<td>Fuel refuel circuit breaker will not stay closed when ERFS II fuel control panel is connected</td>
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Change 22 10-2.3
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<td>M83723-73W2461N</td>
<td>28</td>
<td>CONSOLE, UNDERFLOOR DISCONNECT</td>
<td>85 -20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>400J58</td>
<td>M83723-76W2461N</td>
<td>28</td>
<td>CONSOLE, UNDERFLOOR DISCONNECT</td>
<td>85 -20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>400P58</td>
<td>M83723-76W2461N</td>
<td>28</td>
<td>CONSOLE, UNDERFLOOR DISCONNECT</td>
<td>85 -20</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
FUEL SYSTEM ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST (Continued)

Change 22  10-2.7/(10-2.8 blank)
10-1 ENGINE FUEL SHUTOFF AND CROSSFEED VALVES
10-1.2 ENGINE FUEL SHUTOFF AND CROSSFEED VALVES WIRING DIAGRAM
10-1.3 ENGINE FUEL SHUTOFF AND CROSSFEED VALVES
VISUAL CHECK

Personnel Required:
67U10 Medium Helicopter Repairer

Applicable Configurations:
All

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

Equipment Condition:
TM 55-1520-240-23:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off

Materials:
None

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Check left crossfeed valve (1).</td>
<td>If valve (1) is loose or damaged, tighten or replace it as required. If wiring or connector (2) is damaged, repair or replace wiring or connector as required.</td>
</tr>
<tr>
<td>2. Check No. 1 engine fuel valve (3).</td>
<td>If valve (3) is loose or damaged, tighten or replace it as required. If wiring or connector (4) is damaged, repair or replace wiring or connector as required.</td>
</tr>
<tr>
<td>3. Check left crossfeed valve and No. 1 engine fuel valve lights (5).</td>
<td>If either light (5) is damaged, replace it. If wiring to either light is damaged, repair or replace it as required.</td>
</tr>
<tr>
<td>4. Check right crossfeed valve (6).</td>
<td>If valve (6) is loose or damaged, tighten or replace it as required. If wiring or connector (7) is damaged, repair or replace wiring or connector as required.</td>
</tr>
<tr>
<td>5. Check No. 2 engine fuel valve (8).</td>
<td>If valve (8) is loose or damaged, tighten or replace it as required. If wiring or connector (9) is damaged, repair or replace wiring or connector as required.</td>
</tr>
<tr>
<td>6. Check right crossfeed valve and No. 2 engine fuel valve lights (10).</td>
<td>If either light (10) is damaged, replace it. If wiring to either light is damaged, repair or replace it as required.</td>
</tr>
<tr>
<td>7. Check CROSSFEED FUEL VALVES switch (11).</td>
<td>If switch (11) is loose or damaged, tighten or replace it as required.</td>
</tr>
</tbody>
</table>

FOLLOW-ON MAINTENANCE:
None
10-1.4 ENGINE FUEL SHUTOFF AND CROSSFEED VALVES
OPERATIONAL CHECK

INITIAL SETUP

References:
TM 55-1520-240-23

Applicable Configurations:
All

Equipment Condition:
TM 55-1520-240-23:
- Battery Connected
- Electrical Power On
- Hydraulic Power Off
- Engine Fuel Shutoff And Crossfeed Valves Visual Check Performed [TASK 10-1.3]

Tools:
None

Materials:
None

Personnel Required:
68F20 Aircraft Electrician
67U10 Medium Helicopter Repairer
10-1.4 ENGINE FUEL SHUTOFF AND CROSSFEED VALVES
OPERATIONAL CHECK (Continued)

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CHECK CIRCUIT BREAKERS</strong></td>
<td></td>
</tr>
<tr>
<td>1. Check that FUEL XFEED CONT circuit breaker (1) is closed.</td>
<td>If XFEED CONT circuit breaker (1) is open, close it. If it opens again, go to [task 10-1.6]</td>
</tr>
<tr>
<td>2. Check that ENGINE NO. 1 FUEL SHUTOFF circuit breaker (2) is closed.</td>
<td>If FUEL SHUTOFF circuit breaker (2) is open, close it. If it opens again, go to [task 10-1.6]</td>
</tr>
<tr>
<td>3. Check that ENGINE NO. 2 FUEL SHUTOFF circuit breaker (3) is closed.</td>
<td>If FUEL SHUTOFF circuit breaker (3) is open, close it. If it opens again, go to [task 10-1.6]</td>
</tr>
</tbody>
</table>

**CHECK ENGINE FUEL SHUTOFF VALVES**

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Press and release No. 1 engine fuel valve light (4).</td>
<td>Light (4) shall momentarily come on. If it does not, go to [task 10-1.7]</td>
</tr>
<tr>
<td>5. Press and release No. 2 engine fuel valve light (5).</td>
<td>Light (5) shall momentarily come on. If it does not, go to [task 10-1.8]</td>
</tr>
<tr>
<td>6. Open ENGINE NO. 1 FUEL SHUTOFF circuit breaker (2) and ENGINE NO. 2 FUEL SHUTOFF circuit breaker (3).</td>
<td></td>
</tr>
<tr>
<td>7. Set handles (6) on No 1 engine fuel valve (7) and No 2 engine fuel valve (8) to CLSD.</td>
<td></td>
</tr>
<tr>
<td>8. Close ENGINE NO. 1 FUEL SHUTOFF circuit breaker (2).</td>
<td></td>
</tr>
</tbody>
</table>

**CAUTION**

Do not operate FIRE AGENT switch while fire handles are out. Fire bottles will discharge into engines.

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. Pull out No. 1 ENGINE fire handle (9).</td>
<td>Handle (6) on No. 1 engine fuel valve (7) shall move to CLSD. No. 1 engine fuel valve light (4) shall come on and remain on until handle is at CLSD. If handle is not at CLSD or light (4) comes on and stays on, go to [task 10-1.11]. If light did not come on but handle is at CLSD, go to [task 10-1.10]. If light is on and handle is at CLSD, replace No. 1 engine fuel valve.</td>
</tr>
<tr>
<td>11. Pull out No. 2 ENGINE fire handle (10).</td>
<td>Handle (6) on No. 2 engine fuel valve (8) shall move to CLSD. No. 2 engine fuel valve light (5) shall come on and remain on until handle is at CLSD. If handle is not at CLSD or light comes on and stays on, go to [task 10-1.11]. If light (4) did not come on but handle is at CLSD, go to [task 10-1.10]. If light is on and handle is at CLSD, replace No. 2 engine fuel valve.</td>
</tr>
<tr>
<td>12. Open ENGINE NO. 1 FUEL SHUTOFF circuit breaker (2) and ENGINE NO. 2 FUEL SHUTOFF circuit breaker (3).</td>
<td>Handle (6) on No. 1 engine fuel valve (7) shall move to OPEN. No. 1 engine fuel valve light (4) shall come on and remain on until handle is at OPEN. If handle is not at OPEN or light comes on and stays on, go to [task 10-1.11]. If light did not come on but handle is at OPEN, go to [task 10-1.10]. If light is on and handle is at OPEN, replace No. 1 engine fuel valve.</td>
</tr>
<tr>
<td>13. Set handles (6) on No. 1 engine fuel valve (7) and No. 2 engine fuel valve (8) to OPEN.</td>
<td>Handle (6) on No. 2 engine fuel valve (8) shall move to OPEN. No. 2 engine fuel valve light (5) shall come on and remain on until handle is at OPEN. If handle is not at OPEN or light comes on and stays on, go to [task 10-1.11]. If light did not come on but handle is at OPEN, go to [task 10-1.10]. If light is on and handle is at OPEN, replace No. 2 engine fuel valve.</td>
</tr>
<tr>
<td>15. Close ENGINE NO. 2 FUEL SHUTOFF circuit breaker (3).</td>
<td></td>
</tr>
<tr>
<td>16. Push in No. 1 ENGINE fire handle (9).</td>
<td>Handle (6) on No. 1 engine fuel valve (7) shall move to OPEN. If handle is not at OPEN or light comes on, go to [task 10-1.11]. If light did not come on but handle is at OPEN, go to [task 10-1.10]. If light is on and handle is at OPEN, replace No. 1 engine fuel valve.</td>
</tr>
<tr>
<td>17. Push in No. 2 ENGINE fire handle (10).</td>
<td>Handle (6) on No. 2 engine fuel valve (8) shall move to OPEN. If handle is not at OPEN or light comes on, go to [task 10-1.11]. If light did not come on but handle is at OPEN, go to [task 10-1.10]. If light is on and handle is at OPEN, replace No. 2 engine fuel valve.</td>
</tr>
</tbody>
</table>

**CHECK CROSSFEED VALVES**

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>18. Press and release left crossfeed fuel valve light (11).</td>
<td>Light (11) shall momentarily come on. If it does not, go to [task 10-1.12]</td>
</tr>
</tbody>
</table>

GO TO NEXT PAGE

20. Set CROSSFEED FUEL VALVES switch (13) to OPEN.

Light (12) shall momentarily come on. If it does not, go to 10-1.13

Handles (6) on left crossfeed fuel valve (14) and right crossfeed fuel valve (15) shall move to OPEN. Left and right crossfeed fuel valve lights (11 and 12) shall come on and remain on until handles are at OPEN. If either crossfeed fuel valve handle is not at OPEN or light comes on and stays on, go to 10-1.14. If either light did not come on or handle is at OPEN, go to 10-1.15. If either light is on and handle is at OPEN, replace faulty crossfeed fuel valve.

21. Open FUEL XFEED CONT circuit breaker (1).

If handle (6) cannot be moved to CLSD, replace left or right crossfeed fuel valve, as required.

Handles (6) on left and right crossfeed fuel valves (14 and 15) shall move to CLSD. Left and right crossfeed fuel valve lights (11 and 12) shall come on and remain on until handles are at OPEN. If not, replace faulty crossfeed fuel valve.

22. Set handle (6) on left and right crossfeed fuel valves (14 and 15) to CLSD.

23. Close FUEL XFEED CONT circuit breaker (1).

24. Set CROSSFEED FUEL VALVES switch (13) to CLOSE.

Handles (6) on left and right crossfeed fuel valves (14 and 15) shall move to CLSD. Left and right crossfeed fuel valve lights (11 and 12) shall come on and remain on until handles are at CLSD. If either crossfeed fuel valve handle is not at CLSD or light comes on and stays on, go to 10-1.16. If either light did not come on but handles are at CLSD, go to 10-1.15. If light is on and handle is at OPEN, replace faulty crossfeed fuel valve.

25. Open FUEL XFEED CONT circuit breaker (1).

26. Set handle (6) on left and right crossfeed fuel valves (14 and 15) to OPEN.

Handles (6) on left and right crossfeed fuel valves (14 and 15) shall move to OPEN. Left and right crossfeed fuel valve lights (11 and 12) shall come on and remain on until handles are at CLSD. If either handle is not at CLSD or light comes on and stays on, replace faulty crossfeed fuel valve.
10-1.5 FUEL XFEED CONT CIRCUIT BREAKER DOES NOT STAY CLOSED

FAULT ISOLATION PROCEDURE
INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
68F10 Aircraft Electrician
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off

Tools:
Electrical Repairer’s Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials:
None
10-1.5 FUEL XFEED CONT CIRCUIT BREAKER DOES NOT STAY CLOSED (Continued)

- War Crossfeed Fuel Valves SW at Close Position When CB Found Open?
  - No: Replace Left Crossfeed Fuel Valve.
  - Yes: Disconnect Plug from Left Crossfeed Fuel Valve. Check for Ground on Plug 173P1 Pin B Is Ground Present?
    - No: Replace Left Crossfeed Fuel Valve.
    - Yes: Disconnect Plug from Right Crossfeed Fuel Valve. Check for Ground on Plug 173P1 Pin B Is Ground Present?
      - No: Replace Right Crossfeed Fuel Valve.
      - Yes: Get Crossfeed Fuel Valves SW to Open. Check for Ground on Plug 173P1 Pin B Is Ground Present?
        - No: Replace Wire as Required.

END OF TASK
10-1.6 ENGINE FUEL SHUTOFF CIRCUIT BREAKER DOES NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
68F10 Aircraft Electrician
68F20 Aircraft Electrician

References:
TM 55-1520-240-23
Equipment Condition:
TM 55-1520-240-23:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off

GO TO NEXT PAGE
10-1.6 ENGINE FUEL SHUTOFF CIRCUIT BREAKER DOES NOT STAY CLOSED (Continued)

ENGINE NO. 1 FUEL SHUTOFF CIRCUIT BREAKER DOES NOT STAY CLOSED

1. WAS NO. 1 ENGINE FIRE HANDLE PULLED OUT WHEN CR FOUND OPEN?
   YES
   DISCONNECT PLUG FROM NO. 1 ENGINE FUEL VALVE, CHECK FOR GROUND ON PLUG 172P1 PIN B IS GROUND PRESENT?
     NO
     DISCONNECT PLUG FROM NO. 1 ENGINE FUEL VALVE, CHECK FOR GROUND ON PLUG 172P1 PIN A IS GROUND PRESENT?
       NO
       REPLACE NO. 1 ENGINE FUEL VALVE
         YES
         LOCATE GROUND FAULT ON WIRE W557-172P1, W666-102-20, W666-102-20, W666-55-20 BETWEEN FUEL SHUTOFF SW ON NO. 1 ENGINE FIRE FULL CONTROL AND NO. 1 ENGINE FUEL VALVE, REPAIR OR REPLACE WIRE AS REQUIRED
       NO
       PULL OUT NO. 1 ENGINE FIRE HANDLE, CHECK FOR GROUND ON PLUG 172P1 PIN A IS GROUND STILL PRESENT?
         NO
         LOCATE GROUND FAULT ON WIRE W557-172P1, W666-100-20, W666-48-20 BETWEEN WIRE W557-172P1, W666-100-20, W666-48-20, OR W666-102-20, OR W666-55-20 BETWEEN FUEL SHUTOFF SW ON NO. 1 ENGINE FIRE FULL CONTROL AND ENGINE NO. 1 FUEL SHUTOFF CB, REPAIR OR REPLACE WIRE AS REQUIRED
         YES
         LOCATE GROUND FAULT ON WIRE W557-172P1, W666-102-20, W666-55-20 BETWEEN FUEL SHUTOFF SW ON NO. 1 ENGINE FIRE FULL CONTROL AND ENGINE NO. 1 FUEL SHUTOFF CB, REPAIR OR REPLACE WIRE AS REQUIRED
     YES

ENGINE NO. 2 FUEL SHUTOFF CIRCUIT BREAKER DOES NOT STAY CLOSED

1. WAS NO. 2 ENGINE FIRE HANDLE PULLED OUT WHEN CR FOUND OPEN?
   YES
   DISCONNECT PLUG FROM NO. 2 ENGINE FUEL VALVE, CHECK FOR GROUND ON PLUG 172P2 PIN B IS GROUND PRESENT?
     NO
     DISCONNECT PLUG FROM NO. 2 ENGINE FUEL VALVE, CHECK FOR GROUND ON PLUG 172P2 PIN A IS GROUND PRESENT?
       NO
       REPLACE NO. 2 ENGINE FUEL VALVE
         YES
         LOCATE GROUND FAULT ON WIRE W557-172P2, W666-102-20, W666-55-20 BETWEEN FUEL SHUTOFF SW ON NO. 2 ENGINE FIRE FULL CONTROL AND NO. 2 ENGINE FUEL VALVE, REPAIR OR REPLACE WIRE AS REQUIRED
       NO
       PULL OUT NO. 2 ENGINE FIRE HANDLE, CHECK FOR GROUND ON PLUG 172P2 PIN A IS GROUND STILL PRESENT?
         NO
         LOCATE GROUND FAULT ON WIRE W557-172P2, W666-100-20, W666-48-20, OR W666-102-20, OR W666-55-20 BETWEEN FUEL SHUTOFF SW ON NO. 2 ENGINE FIRE FULL CONTROL AND ENGINE NO. 2 FUEL SHUTOFF CB, REPAIR OR REPLACE WIRE AS REQUIRED
         YES
         LOCATE GROUND FAULT ON WIRE W557-172P2, W666-102-20, W666-55-20 BETWEEN FUEL SHUTOFF SW ON NO. 2 ENGINE FIRE FULL CONTROL AND ENGINE NO. 2 FUEL SHUTOFF CB, REPAIR OR REPLACE WIRE AS REQUIRED
     YES

END OF TASK
10-1.7 NO. 1 ENGINE FUEL VALVE LIGHT DOES NOT COME ON DURING PRESS-TO-TEST

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
- 68F10 Aircraft Electrician
- 68F20 Aircraft Electrician

References:
- TM 55-1520-240-23

Equipment Condition:
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power Off

GO TO NEXT PAGE
10-1.8 NO. 2 ENGINE FUEL VALVE LIGHT DOES NOT COME ON DURING PRESS-TO-TEST

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
68F10 Aircraft Electrician
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

GO TO NEXT PAGE
10-1.8 NO. 2 ENGINE FUEL VALVE LIGHT DOES NOT COME ON DURING PRESS-TO-TEST (Continued)

- **Replace Lamp Press to Test Light Does Light Come On?**
  - **Yes**: Fault Corrected
  - **No**: Check for 28 VDC between Term 311 of No. 2 engine fuel valve LT and ground is 28 VDC present?
    - **Yes**: Pull out No. 2 engine fire handle move to close and NO. 2 engine fuel valve LT come on?
      - **Yes**: Push in No. 2 engine fire handle move to open?
        - **Yes**: Locate open in wire W666-50-20 between No. 2 engine fuel valve LT and splice to wire W666-48-20 and W666-51-20. Repair or replace wire as required.
        - **No**: Locate open in wire W666-001-00 between LT and fuselage ground. Repair or replace wire as required.
      - **No**: Remove Elec Pwr. Pullout center instrument PNL AP ply elec pwr. check for 28 VDC between Term C41 of fuel shut off SW on No. 2 engine fire pull control and ground is 28 VDC present?
        - **Yes**: Replace No. 2 engine fire pull control.
        - **No**: Replace engine No. 2 fuel shut off C8174242.
    - **No**: Remove Elec Pwr. open No. 2 PDP. check for cont. continuity between circuit side of engine No. 2 fuel shut off C8 172282 and Term A of fuel shut off SW on No. 2 engine fire pull control is continuity present?
      - **Yes**: Locate open in wire W552-50-20, W552-184-20, or W557-189-20 between C8174242 and fuel shut off SW on No. 2 engine fire pull control. Repair or replace wire as required.
      - **No**: Replace No. 2 engine fuel valve LT.
10-1.9 ENGINE FUEL VALVE HANDLE IS NOT AT OPEN WITH FIRE HANDLE IN

**FAULT ISOLATION PROCEDURE**

**INITIAL SETUP**

**Applicable Configurations:**
All

**Tools:**
- Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
- Multimeter

**Materials:**
None

**Personnel Required:**
68F20 Aircraft Electrician

**References:**
TM 55-1520-240-23

**Equipment Condition:**
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power Off
10-1.9 ENGINE FUEL VALVE HANDLE IS NOT AT OPEN WITH FIRE HANDLE IN (Continued)

NO. 1 ENGINE FUEL VALVE HANDLE IS NOT AT OPEN WITH NO. 1 ENGINE FIRE HANDLE IN

10-1.9

END OF TASK
10-1.10 ENGINE FUEL VALVE LIGHT DOES NOT COME ON, VALVE OPERATION NORMAL

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
10-1.10 ENGINE FUEL VALVE LIGHT DOES NOT COME ON, VALVE OPERATION NORMAL (Continued)

NO. 1 ENGINE FUEL VALVE LIGHT DOES NOT COME ON, VALVE OPERATION NORMAL

1. Disconnect plug 172P1 from No. 1 engine fuel valve. Check for continuity between plug 172P1 pin C and term 2 of No. 1 engine fuel valve LT is continuity present?
   - YES: Replace No. 1 engine fuel valve.
   - NO: Locate open in wire W666-56-30 between plug 172P1 and No. 1 engine fuel valve LT; repair or replace wire as required.

NO. 2 ENGINE FUEL VALVE LIGHT DOES NOT COME ON, VALVE OPERATION NORMAL

2. Disconnect plug 172P2 from No. 2 engine fuel valve. Check for continuity between plug 172P2 pin C and term 2 of No. 2 engine fuel valve LT is continuity present?
   - YES: Replace No. 2 engine fuel valve.
   - NO: Locate open in wire W666-52-20 between plug 172P2 and No. 2 engine fuel valve LT; repair or replace wire as required.

END OF TASK

10-21
10-1.11 ENGINE FUEL VALVE HANDLE IS NOT AT CLSD WITH FIRE HANDLE PULLED

FAULT ISOLATION PROCEDURE

INITIAL SETUP
Applicable Configurations:
All

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

Materials:
None

Personnel Required:
68F20 Aircraft Electrician

Applicable Configurations:

References:
- TM 55-1520-240-23

Equipment Condition:
- Battery Connected
- Electrical Power On
- Hydraulic Power Off

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

Materials:
None
10-1.11 ENGINE FUEL VALVE HANDLE IS NOT AT CLSD
WITH FIRE HANDLE PULLED (Continued)

NO. 1 ENGINE FUEL VALVE HANDLE IS NOT AT CLSD
WITH NO. 1 ENGINE FIRE HANDLE PULLED

10-1.11 ENGINE FUEL VALVE HANDLE IS NOT AT CLSD
WITH NO. 1 ENGINE FIRE HANDLE PULLED

NO. 2 ENGINE FUEL VALVE HANDLE IS NOT AT CLSD
WITH NO. 2 ENGINE FIRE HANDLE PULLED

END OF TASK

10-23
10-1.12 LEFT CROSSFEED FUEL VALVE LIGHT DOES NOT COME ON DURING PRESS-TO-TEST

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
68F10 Aircraft Electrician
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
10-1.12 LEFT CROSSFEED FUEL VALVE LIGHT DOES NOT COME ON DURING PRESS-TO-TEST (Continued)

- **Replace lamp, press-to-test light, does light come on?**
  - **Yes**: Fault corrected.
  - **No**: Press-to-test right crossfeed fuel valve light, does light come on?

- **Check for 28 VDC between term 3 (+) of left crossfeed fuel valve and ground is 28 VDC present?**
  - **Yes**: Replace left crossfeed fuel valve light.
  - **No**: Disconnect plug 173P1 from left crossfeed fuel valve, check for 28 VDC between plug (173P1) pin 8 and ground is 18 VDC present?

- **Lower fuel control panel from OVHD panel, check for 28 VDC between term 3 (+) of crossfeed fuel valves SW and ground is 28 VDC present?**
  - **Yes**: Locate open in wire W558-134-20, W645-105-20, W697-37-20, or W668-58-20 between crossfeed fuel valves SW and left crossfeed fuel valve plug, repair or replace wire as required.
  - **No**: Replace crossfeed fuel valves SW.

- **Locate open in wire W668-58-20 between left crossfeed fuel valve LT and fuselage ground, repair or replace wire as required.

End of task.
10-1.13 RIGHT CROSSFEED FUEL VALVE LIGHT DOES NOT COME ON DURING PRESS-TO-TEST

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

\[ \text{Diagram of fuel control panel} \]
10-1.13 RIGHT CROSSFEED FUEL VALVE LIGHT DOES NOT COME ON DURING PRESS-TO-TEST (Continued)
10-1.14 CROSSFEED FUEL VALVE HANDLE IS NOT AT OPEN WITH CROSSFEED FUEL VALVES SWITCH AT OPEN

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

GO TO NEXT PAGE
10-1.14 CROSSFEED FUEL VALVE HANDLE IS NOT AT OPEN
WITH CROSSFEED FUEL VALVES SWITCH AT OPEN (Continued)

LEFT CROSSFEED FUEL VALVE HANDLE IS NOT AT OPEN
WITH CROSSFEED FUEL VALVES SWITCH AT OPEN

RIGHT CROSSFEED FUEL VALVE HANDLE IS NOT AT OPEN
WITH CROSSFEED FUEL VALVES SWITCH AT OPEN

END OF TASK
10-1.15 CROSSFEED FUEL VALVE LIGHT DOES NOT COME ON, VALVE OPERATION NORMAL

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
68F20 Aircraft Electrician

Equipment Condition:

TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

References:
TM 55-1520-240-23
10-1.15 CROSSFEED FUEL VALVE LIGHT DOES NOT COME ON, VALVE OPERATION NORMAL (Continued)

LEFT CROSSFEED FUEL VALVE LIGHT DOES NOT COME ON, VALVE OPERATION NORMAL

- **SET CROSSFEED FUEL VALVE SW TO CLOSE, PRESS TO TEST LEFT CROSSFEED FUEL VALVE LT DOES IT COME ON?**
  - **NO**
    - REFER TO TROUBLE SYMPTOM TASK 10-1.12
  - **YES**
    - LOCATE OPEN IN WIRE W668, 81-2D BETWEEN PLUG 173P1 AND LT, REPAIR FOR REPLACE WIRE AS REQUIRED

- **DISCONNECT PLUG 173P1 FROM LEFT CROSSFEED FUEL VALVE, CHECK FOR CONTINUITY BETWEEN PLUG 173P1 PIN C AND TERMINAL 2 OF LEFT CROSSFEED FUEL VALVE LT IS CONTINUITY PRESENT?**
  - **NO**
    - REFER TO TROUBLE SYMPTOM TASK 10-1.13
  - **YES**
    - REPLACE LEFT CROSSFEED FUEL VALVE

RIGHT CROSSFEED FUEL VALVE LIGHT DOES NOT COME ON, VALVE OPERATION NORMAL

- **SET CROSSFEED FUEL VALVE SW TO CLOSE, PRESS TO TEST RIGHT CROSSFEED FUEL VALVE LT DOES IT COME ON?**
  - **NO**
    - REFER TO TROUBLE SYMPTOM TASK 10-1.13
  - **YES**
    - LOCATE OPEN IN WIRE W568-55-20 BETWEEN PLUG 173P2 AND LT, REPAIR OR REPLACE WIRE AS REQUIRED

- **DISCONNECT PLUG 173P2 FROM RIGHT CROSSFEED FUEL VALVE, CHECK FOR CONTINUITY BETWEEN PLUG 173P2 PIN C AND TERMINAL 2 OF RIGHT CROSSFEED FUEL VALVE LT IS CONTINUITY PRESENT?**
  - **NO**
    - REFER TO TROUBLE SYMPTOM TASK 10-1.13
  - **YES**
    - REPLACE RIGHT CROSSFEED FUEL VALVE

END OF TASK
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations: All

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

Materials: None

Personnel Required: 68F20 Aircraft Electrician

References: TM 55-1520-240-23

Equipment Condition: TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
10-1.16 CROSSFEED FUEL VALVE HANDLE IS NOT AT CLSD WITH CROSSFEED FUEL VALVES SWITCH AT CLOSE (Continued)

LEFT CROSSFEED FUEL VALVE HANDLE IS NOT AT CLSD WITH CROSSFEED FUEL VALVES SWITCH AT CLOSE.

1. IS LEFT CROSSFEED FUEL VALVE LT ON?
   - YES: DISCONNECT PLUG 173P1 FROM LEFT CROSSFEED FUEL VALVE, CHECK FOR GROUND ON PLUG 173P1 PIN 1-8, GROUND PRESENT?
   - NO: LOCATE OPEN IN WIRE W668-900MAJ4 OR BETWEEN PLUG 173P1 AND FUSELAGE GROUND, REPAIR OR REPLACE WIRE AS REQUIRED.

2. IS FUEL XFEED CONT CB OPEN?
   - YES: REFER TO TROUBLE SYMPTOM TASK 10-15.
   - NO: LOWER FUEL CONTROL PNL FROM OVHD PNL, CHECK FOR 28 VDC BETWEEN TERM 4+1 OF CROSSFUEL VALVES SW AND GROUND 1E 28 VDC PRESENT?

3. NO: REPLACE CROSSFUEL VALVES SW.

RIGHT CROSSFEED FUEL VALVE HANDLE IS NOT AT CLSD WITH CROSSFEED FUEL VALVES SWITCH AT CLOSE.

1. IS RIGHT CROSSFEED FUEL VALVE LT ON?
   - YES: DISCONNECT PLUG 173P2 FROM RIGHT CROSSFUEL VALVE, CHECK FOR GROUND ON PLUG 173P2 PIN 1-8, GROUND PRESENT?
   - NO: LOCATE OPEN IN WIRE W668-900MAJ4 OR BETWEEN PLUG 173P2 AND FUSELAGE GROUND, REPAIR OR REPLACE WIRE AS REQUIRED.

2. IS FUEL XFEED CONT CB OPEN?
   - YES: REFER TO TROUBLE SYMPTOM TASK 10-15.
   - NO: LOWER FUEL CONTROL PNL FROM OVHD PNL, CHECK FOR 28 VDC BETWEEN TERM 1+1 OF CROSSFUEL VALVES SW AND GROUND 1E 28 VDC PRESENT?

3. NO: REPLACE CROSSFUEL VALVES SW.

END OF TASK
10-2 FUEL BOOST PUMPS
MAIN FUEL PUMPS RIGHT SIDE

NOTES:

1. INDICATES EQUIPMENT DISCONNECTED

2. INDICATES EQUIPMENT WITHOUT

3. INDICATES EQUIPMENT WITH

4. INDICATES EQUIPMENT WITHOUT THERMAL CIRCUIT BREAKER

5. AN INDICATES A LOWERCASE LETTER IN PARAGRAPHS

S. AN INDICATES A LOWERCASE LETTER IN PARAGRAPHS

FUEL CONTROL RELAY BOX 171A1 STRAPAD RIGHT

ENGINE FUEL PRESSURE SWITCH 171B1

GO TO NEXT PAGE
10-2.2 FUEL BOOST PUMP SYSTEM VISUAL CHECK

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off
Left and Right Forward Landing Gear Access Panels Open
Left and Right Aft Intank Pod Panels Open
1. On **FUEL CONTROL** panel, check **LEFT SIDE AUX**, **FWD** and **AFT MAIN**, and **FWD AUX** boost pump switches (1, 2, 3, and 4).

If switches (1, 2, 3, and 4) are loose or damaged, tighten or replace them as required.

2. On **FUEL CONTROL** panel, check **LEFT SIDE AUX PRESS** light (5).

If light (5) is loose or damaged, tighten or replace it as required.

3. On **FUEL CONTROL** panel, check **RIGHT SIDE AUX**, **FWD** and **AFT MAIN**, and **FWD AUX** boost pump switches (6, 7, 8, and 9).

If switches (6, 7, 8, and 9) are loose or damaged, tighten or replace them as required.

4. On **FUEL CONTROL** panel, check **RIGHT SIDE AUX PRESS** light (10).

If light (10) is loose or damaged, tighten or replace it as required.

5. On left **FWD AUX** tank access panel, check wiring and connector (11). If connector (11) is loose or damaged, tighten or replace it as required. If wiring to connector is damaged, repair or replace as required.

6. On left **MAIN** tank forward access panel, check wiring and connector (11). If connector (11) is loose or damaged, tighten or replace it as required. If wiring to connector is damaged, repair or replace as required.

7. On left **MAIN** tank aft access panel, check wiring and connector (11). If connector (11) is loose or damaged, tighten or replace it as required. If wiring to connector is damaged, repair or replace as required.

8. On left **AFT AUX** tank access panel, check wiring and connector (11). If connector (11) is loose or damaged, tighten or replace it as required. If wiring to connector is damaged, repair or replace as required.

9. On right **FWD AUX** tank access panel, check wiring and connector (11). If connector (11) is loose or damaged, tighten or replace it as required. If wiring to connector is damaged, repair or replace as required.

10. On right **MAIN** tank forward access panel, check wiring and connector (11). If connector (11) is loose or damaged, tighten or replace it as required. If wiring to connector is damaged, repair or replace as required.

11. On right **MAIN** tank aft access panel, check wiring and connector (11). If connector (11) is loose or damaged, tighten or replace it as required. If wiring to connector is damaged, repair or replace as required.

12. On right **AFT AUX** tank access panel, check wiring and connector (11). If connector (11) is loose or damaged, tighten or replace it as required. If wiring to connector is damaged, repair or replace as required.

13. Check right fuel control relay box (12). If box (12) is loose or damaged, tighten or replace it as required. If either connector to box (12) is loose or damaged, tighten or replace it as required. If wiring to either connector is damaged, repair or replace it as required.

14. Check right fuel pump thermister control (13). If control (13) is loose or damaged, tighten or replace it as required. If connector to control is loose or damaged, tighten or replace it as required. If wiring to connector is damaged, repair or replace it as required.

15. Repeat steps 13 and 14 for left fuel control relay box (12) and left fuel pump thermister control (13).

**FOLLOW-ON MAINTENANCE:**

**TM 55-1520-240-23:**
- Left and Right Forward Landing Gear Access Panels Closed
- Left and Right Aft Intertank Pod Panel Closed

**END OF TASK**
INITIAL SETUP
Applicable Configurations:
All

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

Materials:
None

Personnel Required:
Aircraft Electrician
Rotary-Wing Aviator

References:
TM 55-1520-240-10
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Visual Check of Fuel Boost Pump System Performed

Personnel Required:
(Task 10-2.2)
Aircraft Electrician
Rotary-Wing Aviator
<table>
<thead>
<tr>
<th>TASK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Check that LH FUEL PUMPS MAIN FWD, MAIN AFT, AUX FWD, and AUX AFT AC circuit breakers (1, 2, 3, and 4) are closed. If circuit breaker (1) is open, close it. If it opens again, go to Task 10-2.4. If circuit breaker (2) is open, close it. If it opens again, go to Task 10-2.5. If circuit breaker (3) is open, close it. If it opens again, go to Task 10-2.6. If circuit breaker (4) is open, close it. If it opens again, go to Task 10-2.7.</td>
</tr>
<tr>
<td>2. Check that LH FUEL PUMP CONT AUX FWD, MAIN AFT, MAIN FWD, and AUX FWD DC circuit breakers (5, 6, 7, and 8) are closed. If circuit breaker (5) is open, close it. If it opens again, go to Task 10-2.8. If circuit breaker (6) is open, close it. If it opens again, go to Task 10-2.9. If circuit breaker (7) is open, close it. If it opens again, go to Task 10-2.10. If circuit breaker (8) is open, close it. If it opens again, go to Task 10-2.11.</td>
</tr>
<tr>
<td>3. Check that RH FUEL PUMPS MAIN FWD, MAIN AFT, AUX FWD, and AUX AFT AC circuit breakers (9, 10, 11, and 12) are closed. If circuit breaker (9) is open, close it. If it opens again, go to Task 10-2.12. If circuit breaker (10) is open, close it. If it opens again, go to Task 10-2.13. If circuit breaker (11) is open, close it. If it opens again, go to Task 10-2.14. If circuit breaker (12) is open, close it. If it opens again, go to Task 10-2.15.</td>
</tr>
<tr>
<td>4. Check that RH FUEL PUMP CONT AUX FWD, MAIN AFT, MAIN FWD, and AUX FWD, DC circuit breakers (13, 14, 15, and 16) are closed. If circuit breaker (13) is open, close it. If it opens again, go to Task 10-2.16. If circuit breaker (14) is open, close it. If it opens again, go to Task 10-2.17. If circuit breaker (15) is open, close it. If it opens again, go to Task 10-2.18. If circuit breaker (16) is open, close it. If it opens again, go to Task 10-2.19.</td>
</tr>
<tr>
<td>5. Check that all FUEL PUMP switches (21, 22, 23, 24, 25, 26, 27, 28 and 29) on FUEL CONTROL PANEL are set to OFF. If switches are ON, set them to OFF.</td>
</tr>
<tr>
<td>6. Press and release LEFT SIDE AUX PRESSURE light (17).</td>
</tr>
<tr>
<td>7. Press and release RIGHT SIDE AUX PRESSURE light (18).</td>
</tr>
</tbody>
</table>

**RESULT**

- If capsule (19) is not lit, go to Task 10-2.21.
- If capsule (20) is not lit, go to Task 10-2.21.
- Capsule (19) shall go out. If not, go to Task 10-2.22.
- Capsule (20) shall go out. If not, go to Task 10-2.23.
- Capsule (19) shall come on. If not, go to Task 10-2.21.
- Capsule (20) shall come on. If not, go to Task 10-2.21.
- Capsule (19) shall go out. If not, go to Task 10-2.23.
- Capsule (20) shall go out. If not, go to Task 10-2.24.
- Capsule (20) shall come on. If not, go to Task 10-2.21.
- Capsule (19) shall come on. If not, go to Task 10-2.21.

**WARNING**

An inoperative fuel pump in main tanks cannot be detected unless the following methods, steps 8 thru 17, are utilized. Flight operations with an undetected pump failure can result in engine flameout when operative pump fails. This could result in loss of helicopter lift.

8. Check that L FUEL PRESS capsule (19) is lit. If capsule (19) is not lit, go to Task 10-2.21.
9. Check that R FUEL PRESS capsule (20) is lit. If capsule (20) is not lit, go to Task 10-2.21.
10. Have pilot start engines and stabilize rotors at ground idle. Set eight FUEL PUMP switches (21 through 28) to OFF. Capsule (19) shall go out. If not, go to Task 10-2.22.
11. Set LEFT SIDE MAIN AFT FUEL PUMP switch (21) to ON. Capsule (19) shall come on. If not, go to Task 10-2.21.
12. Set LEFT SIDE MAIN AFT FUEL PUMP switch (21) to OFF. Capsule (19) shall go out. If not, go to Task 10-2.23.
13. Set LEFT SIDE MAIN FWD FUEL PUMP switch (22) to ON. Capsule (19) shall come on. If not, go to Task 10-2.21.
14. Set LEFT SIDE MAIN FWD FUEL PUMP switch (22) to OFF. Capsule (19) shall go out. If not, go to Task 10-2.23.
15. Set RIGHT SIDE MAIN FWD FUEL PUMP switch (23) to ON. Capsule (20) shall go out. If not, go to Task 10-2.24.
16. Set RIGHT SIDE MAIN FWD FUEL PUMP switch (23) to OFF. Capsule (20) shall come on. If not, go to Task 10-2.21.
17. Set RIGHT SIDE MAIN AFT FUEL PUMP switch (23) to ON. Capsule (20) shall come on. If not, go to Task 10-2.21.
18. Set RIGHT SIDE MAIN AFT FUEL PUMP switch (23) to OFF. Capsule (20) shall come on. If not, go to Task 10-2.21.
<table>
<thead>
<tr>
<th>TASK</th>
</tr>
</thead>
<tbody>
<tr>
<td>19. Set LEFT SIDE AFT AUX FUEL PUMP switch (25) to ON.</td>
</tr>
<tr>
<td>20. Set LEFT SIDE AFT AUX FUEL PUMP switch (25) to OFF.</td>
</tr>
<tr>
<td>21. Set LEFT SIDE FWD AUX FUEL PUMP switch (26) to ON.</td>
</tr>
<tr>
<td>22. Set LEFT SIDE FWD AUX FUEL PUMP switch (26) to OFF.</td>
</tr>
<tr>
<td>23. Set RIGHT SIDE AFT AUX FUEL PUMP switch (27) to ON.</td>
</tr>
<tr>
<td>24. Set RIGHT SIDE AFT AUX FUEL PUMP switch (27) to OFF.</td>
</tr>
<tr>
<td>25. Set RIGHT SIDE FWD AUX FUEL PUMP switch (28) to ON.</td>
</tr>
<tr>
<td>26. Set RIGHT SIDE FWD AUX FUEL PUMP switch (28) to OFF.</td>
</tr>
<tr>
<td>27. Have pilot shut down engines.</td>
</tr>
<tr>
<td>CHECK AUX TANK FUEL PUMP SHUTOFF (NO FUEL)</td>
</tr>
<tr>
<td>28. Check that fuel level in main tank is low enough to accept transfer of fuel from associated auxiliary tanks.</td>
</tr>
<tr>
<td>If too much fuel is in main tank, remove quantity required. Refer to TM 55-1520-240-23.</td>
</tr>
<tr>
<td>29. (Deleted.)</td>
</tr>
<tr>
<td>30. (Deleted.)</td>
</tr>
</tbody>
</table>
31. Set RIGHT SIDE FWD AUX FUEL PUMP switch (28) to ON. Have helper standby right side fwd aux tank and listen for operation of boost pump.

AUX PRESS light (18) will go out. If not, go to task 10-2.20.
Fuel will transfer from RIGHT SIDE FWD AUX tank to RIGHT SIDE MAIN TANK. AUX PRESS light (18) will come on when RIGHT SIDE FWD AUX tank is depleted. The fuel pump will shut off automatically. If fuel pump continues running after AUX PRESS light comes on and tank is empty, replace right side thermistor control box.

32. Set RIGHT SIDE AFT AUX FUEL PUMP switch (27) to ON. Have helper standby right side aft aux tank and listen for operation of boost pump.

AUX PRESS light (18) will go out. If not, go to task 10-2.28.
Fuel will transfer from RIGHT SIDE AFT AUX tank to RIGHT SIDE MAIN TANK. AUX PRESS light (18) will come on when RIGHT SIDE AFT AUX tank is depleted. The fuel pump will shut off automatically. If fuel pump continues running after AUX PRESS light comes on and tank is empty, replace right side thermistor control box.
33. Set LEFT SIDE FWD AUX FUEL PUMP switch (26) to ON. Have helper standby left side fwd aux tank and listen for operation of boost pump.

AUX PRESS light (17) will go out. If not, go to task 10-2.27.

Fuel will transfer from LEFT SIDE FWD AUX TANK to LEFT SIDE MAIN TANK. AUX PRESS light (17) will come on when LEFT SIDE FWD AUX tank is depleted. The fuel pump will shut off automatically. If fuel pump continues running after AUX PRESS light comes on and tank is empty, replace left side thermistor control box.

Fuel will transfer from LEFT SIDE FWD AUX TANK to LEFT SIDE MAIN TANK. AUX PRESS light (17) will come on when LEFT SIDE FWD AUX tank is depleted. The fuel pump will shut off automatically. If fuel pump continues running after AUX PRESS light comes on and tank is empty, replace left side thermistor control box.

34. Set LEFT SIDE AFT AUX FUEL PUMP switch (25) to ON. Have helper standby left side aft aux tank and listen for operation of boost pump.

FOLLOW-ON MAINTENANCE:
- TM 55-1520-240-23:
  - Battery Disconnected
  - Electrical Power Off

END OF TASK
Change 3 10-45
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
Aircraft Electrician (2)

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Side Acoustical Blanket Removed Between Sta 320 and 360
Left Fwd Landing Gear Access Panel Open

GO TO NEXT PAGE
10-2.4 LH FUEL PUMPS MAIN FWD CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

10-2.4 GO TO NEXT PAGE

TM 55-1520-240-T

10-2.4 LH FUEL PUMPS MAIN FWD CB OPEN WHEN FUEL PUMPS LEFT SIDE MAIN FWD SWITCH IS SET TO UVR

YES

REPLACE LH FUEL PUMPS MAIN FWD CB

REPLACE ELEC PWR DISCONNECT HANGER PLUG AT LEFT MAIN TANK FWD ACCESS DOOR. CHECK FOR GROUND ON PLUG AT FWD ACCESS DOOR PIN A, B, AND C. IS GROUND PRESENT ON ANY WIRE?

YES

IS GROUND PRESENT ON HANGER PLUG PIN A?

YES

REPLACE LEFT MAIN TANK FWD FUEL PUMP. PERFORM OPERATIONAL CHECK TASK 10-2.3. DID LH FUEL PUMPS MAIN FWD CB OPEN WHEN FUEL PUMPS LEFT SIDE MAIN FWD SWITCH IS SET TO UVR?

NO

LOCATE GROUND FAULT ON WIRE W625-49.22C. IS GROUND PRESENT?

NO

DISCONNECT PLUG 171P3 FROM FUEL CONTROL RELAY BOX. CHECK FOR GROUND ON PLUG 171P3 PIN S. IS GROUND PRESENT?

NO

LOCATE GROUND FAULT ON WIRE W529-6.22C. IS GROUND PRESENT?

NO

REPLACE RELAY 171K1.
10-2.4 LH FUEL PUMPS MAIN FWD CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

DISCONNECT PLUG 171P3 FROM FUEL CONTROL RELAY BOX. CHECK FOR GROUND ON PLUG 171P3 PIN U. IS GROUND PRESENT?

YES

REPLACE RELAY 171K1.

NO

REMOVE ELECT PWR. REMOVE FUEL CONTROL RELAY BOX COVER. DISCONNECT WIRE W529-4-22A FROM RELAY 171K1 TERM A. CHECK FOR GROUND ON THIS WIRE. IS GROUND PRESENT?

YES

DISCONNECT PLUG 171P3 FROM FUEL CONTROL RELAY BOX. CHECK FOR GROUND ON PLUG 171P3 PIN T. IS GROUND PRESENT?

NO

REPLACE RELAY 171K1.

YES

LOCATE GROUND FAULT ON WIRE W529-4-22 BETWEEN PLUG 171P3 AND RECEPTACLE. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

LOCATE GROUND FAULT ON WIRE W529-4-22A. REPAIR OR REPLACE WIRE AS REQUIRED.

YES

LOCATE GROUND FAULT ON WIRE W529-48-22 BETWEEN PLUG 171P3 AND RECEPTACLE. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

LOCATE GROUND FAULT ON WIRE W529-6-22B FROM RELAY 171K1 TERM B. CHECK FOR GROUND ON THIS WIRE. IS GROUND PRESENT?
FAULT /ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations: All

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

Materials: None

Personnel Required:
- Aircraft Electrician (2)

References
- TM 55-1520-240-23

Equipment Condition:
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power Off
  - Side Acoustical Blanket Removed Between Sta 320 and 360
  - Left Aft Intertank Access Panel Open
10-2.5 LH FUEL PUMPS MAIN AFT CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

**Diagram: Flowchart**

1. **Does LH fuel pumps main aft CB open when fuel pumps left side main aft switch is set to on?**
   - **Yes:**
     - **Remove elect. pwr. disconnect harness plug 171PS from fuel control relay box. Check for ground on plug 171PS pin 8 and LH fuel pumps main aft CB 171CB2.**
     - **Yes:**
       - **Replace LH fuel pumps main aft CB.**
     - **No:**
       - **Locate ground fault on wire W645-55-22B, W645-95-20B, or W550-42-20B between plug 171PS and LH fuel pumps main aft CB 171CB2. Repair or replace wire as required.**
       - **Yes:**
         - **Check for ground on plug 171PS pin G.**
          - **Yes:**
            - **Replace LH fuel pumps main aft CB.**
          - **No:**
            - **Locate ground fault on wire W625-52-22C, W645-55-22B, W645-95-20B, or W550-42-20B between plug 171PS and LH fuel pumps main aft CB 171CB2. Repair or replace wire as required.**
          - **Yes:**
            - **Remove elect. pwr. disconnect plug 171PS from fuel control relay box. Check for ground on plug 171PS pin 8 and LH fuel pumps main aft CB 171CB2.**
              - **Yes:**
                - **Replace left main tank aft fuel pump.**
              - **No:**
                - **Perform operational check. Task 10-2.3.**
        - **No:**
          - **Locate ground fault on wire W645-55-22B, W645-95-20B, or W550-42-20B between plug 171PS and LH fuel pumps main aft CB 171CB2. Repair or replace wire as required.**
          - **Yes:**
            - **Check for ground on plug 171PS pin G.**
              - **Yes:**
                - **Replace LH fuel pumps main aft CB.**
              - **No:**
                - **Locate ground fault on wire W625-52-22C, W645-55-22B, W645-95-20B, or W550-42-20B between plug 171PS and LH fuel pumps main aft CB 171CB2. Repair or replace wire as required.**
      - **No:**
        - **Check for ground on plug 171PS pin G is ground present?**
          - **Yes:**
            - **Replace LH fuel pumps main aft CB.**
          - **No:**
            - **Locate ground fault on wire W625-52-22C, W645-55-22B, W645-95-20B, or W550-42-20B between plug 171PS and LH fuel pumps main aft CB 171CB2. Repair or replace wire as required.**

2. **Is ground present on harness plug pin A?**
   - **Yes:**
     - **Fault corrected.**
   - **No:**
     - **Replace left main tank aft fuel pump.**

3. **Is ground present on harness plug pin B?**
   - **Yes:**
     - **Fault corrected.**
   - **No:**
     - **Locate ground fault on wire W625-52-22C, W645-55-22B, W645-95-20B, or W550-42-20B between plug 171PS and LH fuel pumps main aft CB 171CB2. Repair or replace wire as required.**

Change 3 10-48.1/(10-48.2 blank)
10-2.5 LH FUEL PUMPS MAIN AFT CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

- **YES**
  - Disconnect plug 171PS from fuel control relay box. Check for ground on plug 171PS pin A. Is ground present?
  - **NO**
    - Replace relay 171K2.
  - **YES**
    - Remove elect pwr. Remove fuel control relay box cover. Disconnect wire W529-13-22A from relay 171K2 term A1. Check for ground on this wire. Is ground present?
    - **NO**
      - Replace relay 171K2.
    - **YES**
      - Disconnect plug 171PS from fuel control relay box. Check for ground on plug 171PS pin B. Is ground present?
      - **NO**
        - Locate ground fault on wire W529-13-22A between plug 171PS and receptacle 174US. Repair or replace wire as required.
      - **YES**
        - Locate ground fault on wire W529-13-22A. Repair or replace wire as required.

**END OF TASK**

Change 3
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required
Aircraft Electrician (2)

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Side Acoustical Blanket Removed Between Sta 320 and 360
Left Forward Landing Gear Access Panel Open
10-2.6 LH FUEL PUMPS AUX FWD CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

- **DOES LH FUEL PUMPS AUX FWD CB OPEN WHEN FUEL PUMPS LEFT SIDE AUX FWD SWITCH IS SET TO ON?**
  - **YES**
    - REPLACE LH FUEL PUMPS AUX FWD CB
  - **NO**
    - REMOVE ELEC PWR. DISCONNECT HARNES PLUG AT LEFT AUX TANK, FWD ACCESS DOOR PINS A, B, AND C. IS GROUND PRESENT ON ANY WIRE?
      - **YES**
        - IS GROUND PRESENT ON HARNESS PLUG PIN A?
          - **YES**
            - FAULT CORRECTED
          - **NO**
            - DISCONNECT PLUG 171P3 FROM FUEL CONTROL RELAY BOX. CHECK FOR GROUND ON PLUG 171P3 PIN 1. IS GROUND PRESENT?
              - **YES**
                - LOCATE GROUND FAULT ON WIRE W625-61-22B, W645-114-20C, W650-52-20C BETWEEN PLUG 171P3 AND LH FUEL PUMPS AUX FWD CB 174CB1. REPAIR OR REPLACE WIRE AS REQUIRED
              - **NO**
                - CHECK FOR GROUND ON PLUG 171P3 PIN 1. IS GROUND PRESENT?
                  - **YES**
                    - LOCATE GROUND FAULT ON WIRE W625-61-22B, W645-114-20C, OR W650-52-20C BETWEEN PLUG 171P3 AND LH FUEL PUMPS AUX FWD CB 174CB1. REPAIR OR REPLACE WIRE AS REQUIRED
                  - **NO**
                    - LOCATE GROUND FAULT ON WIRE W625-61-22B, W645-114-20C, OR W650-52-20C BETWEEN PLUG 171P3 AND LH FUEL PUMPS AUX FWD CB 174CB1. REPAIR OR REPLACE WIRE AS REQUIRED

- **REPLACE LH FUEL PUMPS AUX FWD CB**
  - **YES**
  - **NO**
    - REPLACE LEFT AUX TANK FWD FUEL PUMP PERFORM OPERATIONAL CHECK TASK 10-2.3 DID LH FUEL PUMPS AUX FWD CB OPEN WHEN FUEL PUMPS LEFT SIDE AUX FWD SWITCH IS SET TO ON?
      - **YES**
        - IS GROUND PRESENT ON HARNESS PLUG PIN A?
          - **YES**
            - FAULT CORRECTED
          - **NO**
            - DISCONNECT PLUG 171P3 FROM FUEL CONTROL RELAY BOX. CHECK FOR GROUND ON PLUG 171P3 PIN 1. IS GROUND PRESENT?
              - **YES**
                - LOCATE GROUND FAULT ON WIRE W625-61-22B, W645-114-20C, W650-52-20C BETWEEN PLUG 171P3 AND LH FUEL PUMPS AUX FWD CB 174CB1. REPAIR OR REPLACE WIRE AS REQUIRED
              - **NO**
                - LOCATE GROUND FAULT ON WIRE W625-61-22B, W645-114-20C, OR W650-52-20C BETWEEN PLUG 171P3 AND LH FUEL PUMPS AUX FWD CB 174CB1. REPAIR OR REPLACE WIRE AS REQUIRED

- **REPLACE LEFT AUX TANK FWD FUEL PUMP**
  - **YES**
  - **NO**
  - **GO TO NEXT PAGE**
10-2.6 LH FUEL PUMPS AUX FWD CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

- Disconnect plug 171P3 from fuel control relay box. Check for ground on plug 171P3 pin A. Is ground present?
  - Yes
    - Locate ground fault on wire W525-57-22 between plug 171P3 and receptacle 300U3A. Repair or replace wire as required.
  - No
    - Replace relay 174K1.

- Replace relay 174K1.

- Locate ground fault on wire W529-20-22A repair or replace wire as required.

- Disconnect plug 171P3 from fuel control relay box. Cover. Disconnect wire W529-21-22B from relay 174K1 term B1. Check for ground on this wire. Is ground present?
  - Yes
    - Locate ground fault on wire W525-59-22 between plug 171P3 and receptacle repair or replace wire as required.
  - No
    - Replace relay 174K1.
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
Aircraft Electrician (2)

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Side Acoustical Blanket Removed Between Sta 320 and 360
Left Aft Intertank Access Panel Open

GO TO NEXT PAGE
10-2.7 LH FUEL PUMPS AUX AFT CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

10-2.7 GO TO NEXT PAGE

Change 7 10-52.1/(10-52.2 blank)
YES

DISCONNECT PLUG 171PS FROM FUEL CONTROL RELAY BOX. CHECK FOR GROUND ON PLUG 171PS PIN U. IS GROUND PRESENT?

YES

LOCATE GROUND FAULT ON WIRE W529-28-22A BETWEEN PLUG 171PS AND RECEPTACLE 174K2. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

REPLACE RELAY 174K2.

NO

REMOVE ELECT PWR. REMOVE FUEL CONTROL RELAY BOX COVER. DISCONNECT WIRE W529-28-22A FROM RELAY 174K2 TERM A1. CHECK FOR GROUND ON THIS WIRE. IS GROUND PRESENT?

YES

LOCATE GROUND FAULT ON WIRE W529-28-22A. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

DISCONNECT PLUG 171PS FROM FUEL CONTROL RELAY BOX. CHECK FOR GROUND ON PLUG 171PS PIN T. IS GROUND PRESENT?

YES

LOCATE GROUND FAULT ON WIRE W529-65-22 BETWEEN PLUG 171PS AND RECEPTACLE 174K2. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

REPLACE RELAY 174K2.

NO

REMOVE ELECT PWR. REMOVE FUEL CONTROL RELAY BOX COVER. DISCONNECT WIRE W529-28-22B FROM RELAY 174K2 TERM B1. CHECK FOR GROUND ON THIS WIRE. IS GROUND PRESENT?

YES

LOCATE GROUND FAULT ON WIRE W529-28-22B. REPAIR OR REPLACE WIRE AS REQUIRED.

END OF TASK
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
68F10 Aircraft Electrician
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Side Acoustical Blanket Removed Between
Sta 320 and 360

GO TO NEXT PAGE
10-2.8 LH FUEL PUMP CONT AUX AFT CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

10-2.8

END OF TASK

10-55
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
Aircraft Electrician (2)

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Side Acoustical Blanket Removed Between Sta 320 and 360
10-2.9 LH FUEL PUMP CONT MAIN AFT CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

**Diagram:**

- **Does LH Fuel Pump Cont Main Aft CB open when fuel pumps left side main aft switch is set to on?**
    - Yes: Locate ground fault on wire W550-38-20, W550-39-20, or W559-129-20 between push button fuel pumps left side main aft switch. Repair or replace wire as required.
    - No: Replace LH fuel pump cont main aft cb.
  - No: Replace relay 171K2.

  - Yes: Locate ground fault on wire W559-126-20, W545-91-20, or W65-53-22 between plug fuel pumps left side main aft switch. Repair or replace wire as required.
  - No: Replace relay 171K2.
10-2.10 LH FUEL PUMP CONT MAIN FWD CIRCUIT BREAKER WILL NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
Aircraft Electrician (2)

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Side Acoustical Blanket Removed Between Sta 320 and 360

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Side Acoustical Blanket Removed Between Sta 320 and 360
DOES LH FUEL PUMP CONT MAIN FWD CB BE OPEN WHEN FUEL PUMPS LEFT SIDE MAIN FWD SWITCH IS SET TO ON?

YES

REMOVE ELECT PWR DISCON-NECT PLUG 171P3 FROM FUEL CONTROL RELAY BOX CHECK FOR UPS/UNJUN/UN PLUG 171P3 PIN P. IS GROUND PRESENT?

NO

LOCATE GROUND FAULT ON WIRE W560-127-20, W560-92-20, OR W566-128-20 BETWEEN CB 171CB AND LH FUEL PUMPS MAIN FWD SWITCH. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

REPLACE LH FUEL PUMP CONT MAIN FWD CB.

YES

LOCATE GROUND FAULT ON WIRE W560-127-20, W560-92-20, OR W566-128-20 BETWEEN CB 171CB AND LH FUEL PUMPS MAIN FWD SWITCH. REPAIR OR REPLACE WIRE AS REQUIRED.

REMOVE FUEL CONTROL RELAY BOX COVER. CHECK FOR GROUND ON RELAY 171X1. IS GROUND PRESENT?

NO

REPLACE RELAY 171X1.

YES

REMOVE FUEL CONTROL RELAY BOX COVER. CHECK FOR GROUND ON RELAY 171X1. IS GROUND PRESENT?

NO

REPLACE RELAY 171X1.

END OF TASK

Change 3 10-59
10-2.11 LH FUEL PUMP CONT AUX FWD CIRCUIT BREAKER WILL NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
Aircraft Electrician (2)

References:
TM 55-1520-240-23
Equipment Condition:
Battery Connected
Electrical Power On
Hydraulic Power Off
Side Acoustical Blanket Removed Between Sta 320 and 360

TM 55-1520-240-T
10-2.11 LH FUEL PUMP CONT AUX FWD CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

 DOES LH FUEL PUMP CONT AUX FWD CR OPEN WHEN FUEL PUMPS LEFT SIDE PWD AUX SWITCH IS SET TO ON?  

NO

YES

REPLACE LEFT FUEL PUMP THERMISTOR CONTROL.

LOCATE GROUND FAULT ON WIRE W560-48, W645-110-20, W645-148-20, OR W558-147-20 BETWEEN CB 174CB3, 8IN8T SIDE AUXgeführt LIGHT, AND FUEL PUMPS LEFT SIDE PWD AUX SWITCH. REPAIR OR REPLACE WIRES AS REQUIRED.

REPLACE LH FUEL PUMP CONT Aux FWD CR

REPLACE LEFT FUEL PUMP THERMISTOR CONTROL.

LOCATE GROUND FAULT ON WIRE W560-124-22. IS GROUND PRESENT?  

NO

YES

DISCONNECT PLUG 174P7 FROM LEFT FUEL PUMP THERMISTOR CONTROL. CHECK FOR GROUND ON PLUG 174P7 PIN S. IS GROUND PRESENT?

END OF TASK
10-2.12 RH FUEL PUMP MAIN FWD CIRCUIT BREAKER WILL NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
Aircraft Electrician (2)

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Side Acoustical Blanket Removed Between Sta
320 and 360
Right Forward Landing Gear Access Panel Open
10-2.12 RH FUEL PUMP MAIN FWD CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

- **YES**
  - DISCONNECT PLUG 171P4 FROM FUEL CONTROL RELAY BOX. CHECK FOR GROUND ON PLUG 171P4 PIN U. IS GROUND PRESENT?
  - NO
  - REPLACE RELAY 171K1.
  - YES
  - REMOVE ELECT PWR. REMOVE FUEL CONTROL RELAY BOX COVER. DISCONNECT WIRE W629-4-224 FROM RELAY 171K1 TERM A. CHECK FOR GROUND ON THIS WIRE. IS GROUND PRESENT?
  - NO
  - REPLACE RELAY 171K1.
  - YES
  - DISCONNECT PLUG 171P4 FROM FUEL CONTROL RELAY BOX. CHECK FOR GROUND ON PLUG 171P4 PIN T. IS GROUND PRESENT?
  - NO
  - REMOVE ELECT PWR. REMOVE FUEL CONTROL RELAY BOX COVER. DISCONNECT WIRE W629-5-228 FROM RELAY 171K1 TERM B1. CHECK FOR GROUND ON THIS WIRE. IS GROUND PRESENT?
  - YES
  - LOCATE GROUND FAULT ON WIRE W629-4-22 BETWEEN PLUG 171P4 AND RECEPTACLE 300J35. REPAIR OR REPLACE WIRE AS REQUIRED.
  - NO
  - LOCATE GROUND FAULT ON WIRE W629-4-22 BETWEEN PLUG 171P4 AND RECEPTACLE 300J35. REPAIR OR REPLACE WIRE AS REQUIRED.

END OF TASK

Change 3 10-63
10-2.13 RH FUEL PUMP MAIN AFT CIRCUIT BREAKER WILL NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
Aircraft Electrician (2)

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Side Acoustical Blanket Removed Between Sta
320 and 360
Right Aft Intertank Access Panel Open
10-2.13 RH FUEL PUMP MAIN AFT CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

YES

DISCONNECT PLUG 1719P FROM FUEL CONTROL RELAY BOX. CHECK FOR GROUND ON PLUG 1719P PIN A. IS GROUND PRESENT?

YES

LOCATE GROUND FAULT ON WIRE W528-44-22 BETWEEN PLUG 1719P AND RECEPTACLE 1719J. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

REPLACE RELAY 171K2.

NO

REMOVE ELECT PWR. REMOVE FUEL CONTROL RELAY BOX COVER. DISCONNECT WIRE W529-13-22A FROM RELAY 171K2 TERM A1. CHECK FOR GROUND ON THIS WIRE. IS GROUND PRESENT?

NO

DISCONNECT PLUG 1719P FROM FUEL CONTROL RELAY BOX. CHECK FOR GROUND ON PLUG 1719P PIN B. IS GROUND PRESENT?

NO

REMOVE ELECT PWR. REMOVE FUEL CONTROL RELAY BOX COVER. DISCONNECT WIRE W529-12-22B FROM RELAY 171K2 TERM B1. CHECK FOR GROUND ON THIS WIRE. IS GROUND PRESENT?

YES

LOCATE GROUND FAULT ON WIRE W528-46-22 BETWEEN PLUG 1719P AND RECEPTACLE 1719J. REPAIR OR REPLACE WIRE AS REQUIRED.

END OF TASK

Change 3
10-65
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
- Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
- Multimeter

Materials:
None

Personnel Required:
Aircraft Electrician (2)

References:
TM 55-1520-240-23

Equipment Condition:
- Battery Connected
- Electrical Power On
- Hydraulic Power Off
- Side Acoustical Blanket Removed Between Sta 320 and 360
- Right Forward Landing Gear Access Panel Open

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10-2.14 RH FUEL PUMP AUX FWD CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

- **YES**
  - 10-2.14 RH FUEL PUMP AUX FWD CB OPEN WHEN FUEL PUMPS RIGHT SIDE AUX FWD SWITCH IS SET TO ON?
  - REMOVE ELEC PWR. DISCONNECT PLUG 171P4 FROM FUEL CONTROL RELAY BOX. CHECK FOR GROUND ON PLUG 171P4 PIN K. IS GROUND PRESENT?
  - CHECK FOR GROUND ON PLUG 171P4 PIN J. IS GROUND PRESENT?
  - LOCATE GROUND FAULT ON WIRE W629-56-22C. W639-197-20C OR W629-55-22C BETWEEN PLUG 171P4 AND RH FUEL PUMPS AUX FWD CB 174K1. REPAIR OR REPLACE WIRE AS REQUIRED.
  - IS GROUND PRESENT ON HARNESS PLUG PIN A?
  - IS GROUND PRESENT ON HARNESS PLUG PIN B?
  - DISCONNECT PLUG 171P4 FROM FUEL CONTROL RELAY BOX. CHECK FOR GROUND ON PLUG 171P4 PIN C. IS GROUND PRESENT?
  - LOCATE GROUND FAULT ON WIRE W629-53-22 BETWEEN PLUG 171P3 AND RECEPTACLE. REPAIR OR REPLACE WIRE AS REQUIRED.
  - REMOVE ELEC PWR. REMOVE FUEL CONTROL RELAY BOX COVER. DISCONNECT WIRE W629-22-22C. REMOVE PLUG 114K1 AND CIRCUIT BREAKER. CHECK FOR GROUND ON THIS WIRE. IS GROUND PRESENT?
  - LOCATE GROUND FAULT ON WIRE W629-52-22C. REPAIR OR REPLACE WIRE AS REQUIRED.

- **NO**
  - REPLACE RELAY 174K1.
10-2.14 RH FUEL PUMP AUX WD CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

- **YES**
  - DISCONNECT PLUG 171P4 FROM FUEL CONTROL RELAY BOX. CHECK FOR GROUND ON PLUG 171P4 PIN A. IS GROUND PRESENT?
  - **NO**
    - REPLACE RELAY 174K1.
  - **YES**
    - LOCATE GROUND FAULT ON WIRE WS29-21-22B BETWEEN PLUG 171P4 AND RECEPTACLE 3000.04. REPAIR OR REPLACE WIRE AS REQUIRED.

- **YES**
  - DISCONNECT PLUG 171P4 FROM FUEL CONTROL RELAY BOX. CHECK FOR GROUND ON PLUG 171P4 PIN B. IS GROUND PRESENT?
  - **NO**
    - REPLACE RELAY 174K1.
  - **YES**
    - LOCATE GROUND FAULT ON WIRE WS29-20.22A. REPAIR OR REPLACE WIRE AS REQUIRED.

- **YES**
  - REMOVE ELECT PWDR. REMOVE FUEL CONTROL RELAY BOX COVER. DISCONNECT WIRE WS29-20.22A FROM RELAY 174K TERMINAL. CHECK FOR GROUND ON THIS WIRE. IS GROUND PRESENT?
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
Aircraft Electrician (2)

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Side Acoustical Blanket Removed Between Sta 320 and 360
Right Aft Intertank Access Panel Open

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10-2.15 RH FUEL PUMP AUX AFT CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

10-2.15

DOES RH FUEL PUMPS AUX AFT CB OPEN WHEN FUEL PUMPS RIGHT SIDE AUX AFT SWITCH IS SET TO ON?

YES

REPLACE RH FUEL PUMPS AUX AFT CB.

NO

REPLACE RIGHT AUX TANK FUEL PUMP. PERFORM OPERATIONAL CHECK TASK 10-2.2 DID RH FUEL PUMPS AUX AFT CB OPEN WHEN FUEL PUMPS RIGHT SIDE AUX AFT SWITCH IS SET TO ON?

YES

LOCATION GROUND FAULT ON WIRE W629-612 22A, W639-198 20A, OR W552 58 20A BETWEEN PLUG 171P6 AND RH FUEL PUMPS AUX AFT CB 174CB. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

FAULT CORRECTED

IS GROUND PRESENT ON HARNESS PLUG PIN B?

YES

DISCONNECT PLUG 171P6 FROM FUEL CONTROL RELAY BOX. CHECK FOR GROUND ON PLUG 171P6 PIN S. IS GROUND PRESENT?

YES

LOCATE GROUND FAULT ON WIRE W629-612 22A, W639-198 20A, OR W552 58 20A BETWEEN PLUG 171P6 AND RH FUEL PUMPS AUX AFT CB 174CB. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

REMOVE ELECT PWR DISCONNECT HARNESS PLUG AT RIGHT AFT AUX TANK ACCESS DOOR. CHECK FOR GROUND ON PLUG AT AFT ACCESS DOOR PINS A, B, AND C. IS GROUND PRESENT ON ANY WIRE?

YES

IS GROUND PRESENT ON HARNESS PLUG PIN A?

YES

LOCATE GROUND FAULT ON WIRE W629-60 22 DC BETWEEN PLUG 171P6 AND RECEPTACLE 300 23B. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

REMOVE ELECT PWR DISCONNECT PLUG 171P6 FROM FUEL CONTROL RELAY BOX. CHECK FOR GROUND ON PLUG 171P6 PIN V. IS GROUND PRESENT?

YES

LOCATE GROUND FAULT ON WIRE W639-200 20C, OR W552 58 20C BETWEEN PLUG 171P3 AND RH FUEL PUMPS AUX AFT CB 174CB. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

CHECK FOR GROUND ON PLUG 171P6 PIN V. IS GROUND PRESENT?

YES

LOCATE GROUND FAULT ON WIRE W629-612 22A, W639-198 20A, OR W552 58 20A BETWEEN PLUG 171P6 AND RH FUEL PUMPS AUX AFT CB 174CB. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

REPLACE RELAY 174K2

GO TO NEXT PAGE

Change 3 10-68.1/(10-68.2 blank)
10-2.15 RH FUEL PUMP AUX AFT CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

**YES**

- Disconnect plug 171P6 from fuel control relay box. Check for ground on plug 171P6 pin U. Is ground present?
  - **YES**
    - Locate ground fault on wire W629-58-22 between plug 171P6 and receptacle 174/5. Repair or replace wire as required.
  - **NO**
    - Replace relay 174K7?

**REPLACE RELAY 174K7?**

  - **YES**
    - Locate ground fault on wire W629-58-22A. Repair or replace wire as required.
  - **NO**
    - Replace relay 174K7?

**REPLACE RELAY 174K7?**

- Disconnect plug 171P6 from fuel control relay box. Check for ground on plug 171P6 pin T. Is ground present?
  - **YES**
    - Locate ground fault on wire W629-58-22A and receptacle 174/5. Repair or replace wire as required.
  - **NO**
    - Replace relay 174K7?

  - **YES**
    - Locate ground fault on wire W629-58-22A. Repair or replace wire as required.
  - **NO**

**END OF TASK**

Change 3 10-69
10-2.16 RH FUEL PUMP CONT AUX AFT CIRCUIT BREAKER WILL NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
68F10 Aircraft Electrician
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Side Acoustical Blanket Removed Between Sta 320 and 360.

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Side Acoustical Blanket Removed Between Sta 320 and 360.

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10-2.16 RH FUEL PUMP CONT AUX AFT CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

Does RH Fuel Pump Aux Aft Cir Open When Fuel Pumps Right Side Aft Aux Switch Is Set To On?

Yes

Remove Elect Pwr Disconnect Plug 174PF From Right Fuel Pump Thermistor Control.

Yes


No

Replace Right Fuel Pump Thermistor Control.

No


Yes


No

Check For Ground On Wire WS32-141-22, Is Ground Present?

Yes

Disconnect Plug 174PF From Right Fuel Pump Thermistor Control. Check For Ground On Plug 174PF Pin S Is Ground Present?

Yes


No

Replace RH Fuel Pump Cont Aux Aft Cir.

No

Replace RH Fuel Pump Thermistor Control.

END OF TASK

10-71
10-2.17 RH FUEL PUMP CONT MAIN AFT CIRCUIT BREAKER WILL NOT STAY CLOSED

Fault Isolation Procedure

Initial Setup

Applicable Configurations: All

Tools:
- Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
- Multimeter

Materials: None

Personnel Required:
- Aircraft Electrician (2)

References:
- TM 55-1520-240-23

Equipment Condition:
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power Off
  - Side Acoustical Blanket Removed Between Sta 320 and 360

Side Acoustical Blanket Removed Between Sta 320 and 360
10-2.17 RH FUEL PUMP CONT MAIN AFT CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

- **YES**: REMOVE ELECT PWR. DISCONNECT WIRE FROM RH FUEL PUMP CONT MAIN AFT CB 171K2. CHECK FOR GROUND ON WIRE W552-49-20, IS GROUND PRESENT?
  - **YES**: LOCATE GROUND FAULT ON WIRE W552-49-20, W552-130-20, OR W552-125-20 BETWEEN RELAY BOX COVER AND FUEL PUMPS RIGHT SIDE MAIN AFT SWITC.
  - **NO**: REPLACE RELAY 171K2.
- **NO**: REPLACE RH FUEL PUMP CONT MAIN AFT CB.

- **YES**: LOCATE GROUND FAULT ON WIRE W552-125-20, W552-130-20, OR W552-125-20 BETWEEN RELAY BOX AND FUEL PUMPS RIGHT SIDE MAIN AFT SWITCH. REPAIR OR REPLACE WIRE AS REQUIRED.
  - **YES**: REPEAT FOR GROUND ON WIRE 171K3 ON BETWEEN 171K3 AND X1. IS GROUND PRESENT?
  - **NO**: LOCATE GROUND FAULT ON WIRE W552-125-20 BETWEEN RELAY 171K3 AND X1. REPAIR OR REPLACE WIRE AS REQUIRED.
10-2.18 RH FUEL PUMP CONT MAIN FWD CIRCUIT BREAKER WILL NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
Aircraft Electrician (2)

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Side Acoustical Blanket Removed Between Sta 320 and 360

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Side Acoustical Blanket Removed Between Sta 320 and 360

Side Acoustical Blanket Removed Between Sta 320 and 360

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10-2.18 RH FUEL PUMP CONT MAIN FWD CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

10-2.18

**YES**

Does RH FUEL PUMP CONT MAIN FWD SWCH SET TO ON?

**NO**

Remove ELEC PWR, open NO 2 PDP, disconnect wire from RH FUEL PUMP CONT MAIN FWD SWCH 171C67 OR CUTOFF, check for ground on wire W552-48-20, is ground present?

**YES**

Locate ground fault on wire W552-48-20, W538-18-1, SWCH CB 171C67 and RIGHT SIDE MAIN FWD SWCH, repair or replace wire as required.

**NO**

Replace RH FUEL PUMP CONT MAIN FWD SWCH.

**YES**

Remove ELEC PWR, disconnect plug 171P4 PIN P. Is ground present?

**NO**

Locate ground fault on wire W559-134-20, W539-174-20, or W528 57-25, repair or replace SWCH CB 171C67 and RIGHT SIDE MAIN FWD SWCH, repair or replace wire as required.

**YES**

Replace relay 171K1.

**END OF TASK**

Change 3 10-75
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
Aircraft Electrician (2)

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Side Acoustical Blanket Removed Between Sta 320 and 360
10-2.19 RH FUEL PUMP CONT AUX FWD CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

Does RH FUEL PUMP CONT AUX FWD CB OPEN WHEN FUEL PUMPS RIGHT SIDE FWD AUX SWITCH IS SET TO ON?

Yes

Remove elect pwr disconnect plug 174PB from right fuel pump thermistor control. Check for ground on plug 174PB pin 2 is ground present?

Yes

Locate ground fault on wire W569-150-20, W479-189-20, or W562-61-22 between plug 174PB and right side fwd aux switch. Repair or replace wire as required.

No

Replace right fuel pump thermistor control.

No

Replace RH FUEL PUMP CONT AUX FWD CB.

No

Remove elect pwr open no. 2 for disconnect wires from RH FUEL PUMP CONT AUX FWD CB 174PB. Circuit side check for ground on wire W562-122, W562-193-20, W569-150-20, or W569-128-20 between CB 174PB left side aux press light and right side fwd aux.

Yes

Locate ground fault on wire W562-61-22, W562-193-20, W569-150-20, or W569-128-20 between CB 174PB and wires as required.

No

Check for ground on wire W562-122, W562-193-20, W569-150-20, or W569-128-20 between CB 174PB and wires as required.

Yes

Disconnect plug 174PB from right fuel pump thermistor control. Check for ground on plug 174PB pin 2 is ground present?

Yes

Locate ground fault on wire W562-61-22, W562-310-22, or W562-87-22 between plug 174PB and CB 174PB. Repair or replace wires as required.

No

Replace right fuel pump thermistor control.

Change 2 10-77
10-2.20 LEFT OR RIGHT SIDE AUX PRESS LIGHTS DOES NOT COME ON WHEN PRESSED TO TEST

**FAULT ISOLATION PROCEDURE**

**INITIAL SETUP**

**Applicable Configurations:**

All

**Tools:**

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

**Materials:**

- None

**Personnel Required:**

- 68F20 Aircraft Electrician

**References:**

- TM 55-1520-240-23

**Equipment Condition:**

- Battery Connected
- Electrical Power On
- Hydraulic Power Off
LEFT OR RIGHT SIDE AUX PRESS LIGHTS DOES NOT COME ON
WHEN PRESSED TO TEST (Continued)

LEFT SIDE AUX PRESS LIGHT DOES NOT COME ON
WHEN PRESSED TO TEST

- Remove lens cap on left side aux press light.
- Replace lens cap. Does lamp come on?
  - Yes: Fault corrected.
  - No: Replace left side aux press light.
- Lower fuel control panel check for 28VDC between left side aux press light term 3 and ground (is 28VDC present)?
  - Yes: Open no. 2 PNP check for 28VDC between fuel pump cont aux PNP cr 17ACB and left side aux press light. Repair or replace wires as required.
  - No: Locate open in wire WSS3-51 (2), WSS2-132 (2), WSS2-146 (2), or WSS3-147 (2) and replace wires as required.
- Replace left side aux press.

RIGHT SIDE AUX PRESS LIGHT DOES NOT COME ON
WHEN PRESSED TO TEST

- Remove lens cap on right side aux press light.
- Replace lens cap. Does lamp come on?
  - Yes: Fault corrected.
  - No: Replace right side aux press light.
- Lower fuel control panel check for 28VDC between right side aux press light term 3 and ground (is 28VDC present)?
  - Yes: Open no. 1 PNP check for 28VDC between right side aux press light term 3 and ground (is 28VDC present)?
    - Yes: Locate open in wire WSS3-48 (2), WSS3-132 (2), WSS2-146 (2), or WSS3-147 (2) and repair or replace wires as required.
    - No: Replace right side aux press light term 3 and ground (is 28VDC present)?
- Replace right side aux press.

END OF TASK

Change 2 10-79
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials
None

Personnel Required:
Aircraft Electrician (2)

References
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23;
Battery Connected
Electrical Power On
Hydraulic Power Off
10-2.22 L FUEL PRESS CAPSULE DOES NOT GO OUT WHEN LEFT SIDE MAIN AFT FUEL PUMPS SWITCH IS SET TO ON

**FAULT ISOLATION PROCEDURE**

**INITIAL SETUP**

**Applicable Configurations:**
All

**Tools:**
- Electrical Repairer's Tool Kit
  - NSN 5180-00-323-4915
- Multimeter

**Materials:**
None

**Personnel Required:**
- Left Aft Intertank Access Panel Open
- Aircraft Electrician (2)

**References:**
- TM 55-1520-240-10
- TM 55-1520-240-23

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**Equipment Condition:**
- TM 55-1520-240-10:
  - Both Engines Shut Down
- TM 55-1520-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power Off
  - Side Acoustical Blanket Removed Between Sta 320 and 360
  - Left Aft Intertank Access Panel Open
10-2.22 L FUEL PRESS CAPSULE DOES NOT GO OUT WHEN LEFT SIDE MAIN AFT FUEL PUMPS SWITCH IS SET TO ON (Continued)

- Disconnect plug 171PS at fuel control relay box. Check for 110VAC between plug 171PS pin H and ground. Is 110VAC present?
  - No
    - Remove elec pwr. Open no. 1 PDP open LH fuel pump cont main aft CB 171CB2 B phase circuit side and plug 171PS pin G. Is continuity present?
      - No
        - Locate open in wire W925-55-22B, W945-84-208, or W950-41-208 between plug 171PS and CB 171CB2. Repair or replace wires as required.
      - Yes
        - Replace LH fuel pump cont main aft CB 171CB2.
  - Yes
    - Replace LH fuel pump cont main aft CB 171CB2.

- Remove elec pwr. Open no. 1 PDP open LH fuel pump cont main aft CB. Check for continuity between LH fuel pump cont main aft CB 171CB2 and plug 171PS pin D. Is ground present?
  - No
    - Locate open in wire W925-55-22B, W945-84-208, or W950-41-208 between plug 171PS and CB 171CB2. Repair or replace wires as required.
  - Yes
    - Replace LH fuel pump cont main aft CB 171CB2.

- Disconnect plug 171PS at fuel control relay box. Check for 28VDC between plug 171PS pin E and ground. Is 28VDC present?
  - No
    - Locate open in wire W925-55-22B, W945-84-208, or W950-41-208 between plug 171PS and CB 171CB2. Repair or replace wires as required.
  - Yes
    - Replace fuel pumps left side main aft switch. Repair or replace wires as required.

- Lower fuel control panel. Check for 28VDC between fuel pumps left side main aft switch term 9 and ground. Is 28VDC present?
  - No
    - Locate open in wire W925-55-22B, W945-84-208, or W950-41-208 between plug 171PS and CB 171CB2. Repair or replace wires as required.
  - Yes
    - Replace fuel pumps left side main aft switch.

- Check for 28VDC between plug 171PS pin D and ground. Is 28VDC present?
  - No
    - Locate open in wire W925-55-22B, W945-84-208, or W950-41-208 between plug 171PS and CB 171CB2. Repair or replace wires as required.
  - Yes
    - Check for continuity between plug 171PS pin A and plug at aft access door pin A. Is continuity present?
      - No
        - Locate open in wire W925-55-22B, W945-84-208, or W950-41-208 between plug 171PS and CB 171CB2. Repair or replace wires as required.
      - Yes
        - Go to next page.
10-2.22 L FUEL PRESS CAPSULE DOES NOT GO OUT WHEN LEFT SIDE MAIN AFT FUEL PUMPS SWITCH IS SET TO ON (Continued)

END OF TASK
Change 23 10-85
10-2.23 L FUEL PRESS CAPSULE DOES NOT GO OUT WHEN LEFT SIDE MAIN FWD FUEL PUMPS SWITCH IS SET TO ON

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
Aircraft Electrician (2)

References:
TM 55-1520-240-10
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-10:
Both Engines Shut Down

TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Side Acoustical Blanket Removed Between Sta 320 and 360
Left Fwd Landing Gear Access Panel Open
10-2.23 L FUEL PRESS CAPSULE DOES NOT GO OUT WHEN LEFT SIDE MAIN FWD FUEL PUMPS SWITCH IS SET TO ON (Continued)

HAVE HELPER SET FUEL PUMPS LEFT SIDE MAIN FWD SWITCH TO ON. CAN LEFT MAIN FWD FUEL PUMP BE HEARD OPERATING?

DISCONNECT PLUG OF HARNESS 171W1 AT L MAIN TANK FWD ACCESS DOOR. CHECK FOR 115VAC BETWEEN PLUG OF HARNESS 171W1 AT FWD ACCESS DOOR PINS A, B, AND C AND GROUND. IS 115VAC PRESENT ON ALL 3 PINS?

SET FUEL PUMPS LEFT SIDE MAIN FWD SWITCH TO OFF. REMOVE ELEC PWR. CHECK FOR GROUND ON PLUG OF HARNESS 171W1 AT ACCESS DOOR PINS E AND D. IS GROUND PRESENT?

CHECK FOR 115VAC BETWEEN PLUG OF HARNESS 171W1 AT FWD ACCESS DOOR PIN A AND GROUND. IS 115VAC PRESENT?

DISCONNECT PLUG 171P3 AT FUEL CONTROL RELAY BOX. CHECK FOR 115VAC BETWEEN PLUG 171P3 PIN M AND PLUG OF HARNESS 171W1 AT FWD ACCESS DOOR PIN B. IS 115VAC PRESENT?

SET FUEL PUMPS LEFT SIDE MAIN FWD SWITCH TO OFF. DISCONNECT PLUG 171P1 FROM NO. 1 ENGINE FUEL PRESS SWITCH. DOES L FUEL PRESS CAPSULE GO OUT?

REPLACE LEFT MAIN FWD FUEL PUMP.

CHECK FOR 115VAC BETWEEN PLUG OF HARNESS 171W1 AT FWD ACCESS DOOR PIN B. IS 115VAC PRESENT?

DISCONNECT PLUG 171P3 AT FUEL CONTROL RELAY BOX. CHECK FOR CONTINUITY BETWEEN PLUG 171P3 PIN M AND PLUG OF HARNESS 171W1 AT FWD ACCESS DOOR PIN B. IS CONTINUITY PRESENT?

REPLACE ELEC PWR. CHECK FOR CONTINUITY BETWEEN PLUG 171P3 PIN S AND PLUG OF HARNESS 171W1 AND PLUG 230P1. REPAIR OR REPLACE WIRE AS REQUIRED.

LOCATE OPEN IN WIRE W625-48-22 BETWEEN PLUG 171P3 AND PLUG OF HARNESS 171W1 AT FWD ACCESS DOOR. REPAIR OR REPLACE WIRE AS REQUIRED.

REPLACE RELAY 171K1 IN FUEL CONTROL RELAY BOX.

REPLACE MASTER CAUTION PANEL.
10-2.23 L FUEL PRESS CAPSULE DOES NOT GO OUT WHEN LEFT SIDE MAIN FWD FUEL PUMPS SWITCH IS SET TO ON (Continued)
10-2.23 L FUEL PRESS CAPSULE DOES NOT GO OUT WHEN LEFT SIDE MAIN FWD FUEL PUMPS SWITCH IS SET TO ON (Continued)

End of Task

Change 23 10-89
10-2.24 R FUEL PRESS CAPSULE DOES NOT GO OUT WHEN RIGHT SIDE MAIN FWD FUEL PUMPS SWITCH IS SET TO ON

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
Aircraft Electrician (2)

References:
TM 55-1520-240-10
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-10:
Both Engines Shut Down
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Side Acoustical Blanket Removed Between Sta 320 and 360
Right Fwd Landing Gear Access Panel Open

GO TO NEXT PAGE
10-2.24 R FUEL PRESS CAPSULE DOES NOT GO OUT WHEN RIGHT SIDE MAIN FWD FUEL PUMPS SWITCH IS SET TO ON (Continued)

10-2.24

GO TO NEXT PAGE

Change 23  10-91
10-2.24 R FUEL PRESS CAPSULE DOES NOT GO OUT WHEN RIGHT SIDE MAIN FWD FUEL PUMPS SWITCH IS SET TO ON (Continued)
R FUEL PRESS CAPSULE DOES NOT GO OUT WHEN RIGHT SIDE MAIN FWD FUEL PUMPS SWITCH IS SET TO ON (Continued)
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Equipment Condition:
TM 55-1520-240-10
Both Engines Shut Down
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Side Acoustical Blanket Removed Between Sta 320 and 360
Right Side Intertank Access Panel Open

Tools:
Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
Aircraft Electrician (2)

References:
TM 55-1520-240-10
TM 55-1520-240-23
10-2.26 LEFT SIDE AUX PRESS LIGHT COMES ON WHEN LEFT SIDE AFT AUX FUEL PUMP SWITCH IS
SET TO ON

FAULT ISOLATION PROCEDURE

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 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Side Acoustical Blanket Removed Between Sta
320 and 360
Left Aft Intertank Access Panel Open

GO TO NEXT PAGE
10-2.26 LEFT SIDE AUX PRESS LIGHT COMES ON WHEN LEFT SIDE AFT AUX FUEL PUMP SWITCH IS SET TO ON (Continued)

HAVE HELPER SET FUEL PUMPS LEFT SIDE AFT AUX SWITCH TO ON. CAN LEFT AFT AUX TANK FUEL PUMP BE HEARD OPERATING?

NO

DISCONNECT PLUG AT L AUX TANK FWD ACCESS DOOR CHECK FOR 115VAC BETWEEN PLUG AT FWD ACCESS DOOR PINS A, B, AND C AND GROUND, IS 115VAC PRESENT ON ALL 3 PINS?

NO

SET LEFT SIDE AFT AUX SWITCH TO OFF. REMOVE ELECTRIC PLUG CHECK FOR GROUND ON PLUG AT FWD ACCESS DOOR PIN C AND E. IS GROUND PRESENT?

NO

REPLACE LEFT AFT AUX TANK FUEL PUMP

YES

DISCONNECT PLUG AT 174P2 FROM LEFT AFT FUEL PRESS SWITCH. DOES LEFT SIDE AUX PRESS LIGHT GO OUT?

YES

REPLACE LEFT AFT AUX FUEL PRESS SWITCH

NO

CHECK FOR GROUND ON PLUG 174P2 PIN A. IS GROUND PRESENT?

YES

LOCATE GROUND FAULT ON WIRE W625-G6D1904220 AND W625-G6D11904220 BETWEEN PLUG 174P2 AND LEFT SIDE AUX PRESS LIGHT. REPAIR OR REPLACE WIRE AS REQUIRED

NO

REPLACE LEFT SIDE AFT AUX PRESS LIGHT

IS 115VAC PRESENT ON ANY WIRE?

NO

LOCATE OPEN IN WIRE W625-G7W65-6W22 AND W625-G7W65-6W22 BETWEEN PLUG 171PS AT FUEL PUMP RELAY BOX AND PLUGS AT FWD ACCESS DOOR PIN C. REPLACE WIRE AS REQUIRED.

NO

CHECK FOR 115VAC BETWEEN PLUG 171PS PIN J. AND K. AND GROUND IS 115VAC PRESENT?

NO

LOCATE OPEN IN WIRE W625-G6D1904220 AND W625-G6D11904220 BETWEEN PLUG 171PS AND LEFT SIDE AUX PRESS LIGHT. REPAIR OR REPLACE WIRE AS REQUIRED.

YES

DISCONNECT PLUG 171PS FROM FUEL PUMP RELAY BOX CHECK FOR 115VAC BETWEEN PLUG 171PS PIN J, K, AND L. IS 115VAC PRESENT ON ALL PINS?

YES

REMOVE ELECTRIC PLUG OPEN NO 1 POP OPEN LM FUEL PUMPS AFT CB 174C2 A PHASE CIRCUIT SIDE AND PLUG 171PS PIN J. IS CONTINUITY PRESENT?

NO

Yes

CHECK FOR 115VAC BETWEEN PLUG 171PS PIN K AND GROUND IS 115VAC PRESENT?

NO

LOCATE OPEN IN WIRE W625-G7W65-6W22 AND W625-G7W65-6W22 BETWEEN PLUG 171PS AND LEFT SIDE AUX PRESS LIGHT. REPAIR OR REPLACE WIRE AS REQUIRED.

YES

REPLACE ELECTRIC PLUG OPEN NO 1 POP OPEN LM FUEL PUMPS AFT CB 174C2 A PHASE CIRCUIT SIDE AND PLUG 171PS PIN X. IS CONTINUITY PRESENT?

NO

LOCATE OPEN IN WIRE W625-G7W65-6W22 AND W625-G7W65-6W22 BETWEEN PLUG 171PS AND LEFT SIDE AUX PRESS LIGHT. REPAIR OR REPLACE WIRE AS REQUIRED.

YES

REPLACE LM FUEL PUMPS AFT CB 174C2

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Change 6

10-99
10-2.26 LEFT SIDE AUX PRESS LIGHT COMES ON WHEN LEFT SIDE AFT AUX FUEL PUMP SWITCH IS SET TO ON (Continued)

- **Check for 28VDC between plug 174P7 pin 6 and ground. Is 28VDC present?**
  - No: Replace LH fuel pumps aux AFT C6.
  - Yes: Disconnect plug 174P7 from left fuel pump thermistor control. Check for continuity between plug 174P7 pin D and plug 171P9 pin N. Is continuity present?
    - No: Locate open in wire 6825-70-22 between plug 174P7 and plug 171P9. Repair or replace wire as required.
    - Yes: Check for 28VDC between plug 174P7 pin H and ground. Is 28VDC present?
      - Yes: Go to the next page.
      - No: Lower fuel control panel. Check for 28VDC between left side AFT aux switch and plug 174P7. Repair or replace wire as required.

- **Without**
  - Locate open in wire 6825-70-22 between plug 171P9 and ground. Repair or replace wire as required.
  - With
    - Locate open in wire 6825-70-22 between plug 171P9 and ground. Repair or replace wire as required.

- **Yes:**
  - Replace LH fuel pumps aux AFT C6.
  - Replace relay 174K2 in fuel control relay box.
  - Replace LH fuel pump cont aux AFT C8.

- **No:**
  - Remove elec pwr. Open No. 1 POP open LH fuel pump cont AFT aux C8. Check for continuity between LH fuel pumps cont aux AFT C8 174CB4 circuit side and plug 174P7 pin H. Is continuity present?
    - Yes: Replace LH fuel pump cont aux AFT C8.
    - No: Replace left side AFT aux switch.
10-2.26 LEFT SIDE AUX PRESS LIGHT COMES ON WHEN LEFT SIDE AFT AUX FUEL PUMP SWITCH IS SET TO ON (Continued)
10-2.26 LEFT SIDE AUX PRESS LIGHT COMES ON WHEN LEFT SIDE AFT AUX FUEL PUMP SWITCH IS SET TO ON (Continued)

YES

REPLACE LEFT FUEL PUMP THERMISTOR CONTROL.

NO

CHECK FOR RESISTANCE BETWEEN PLUG 174P7 AND CENTER PIN A. IS 1/16 OHMS PRESENT?

YES

LOCATE OPEN IN WIRE W626-76-22, W625-89-22, OR W626-79-22 BETWEEN PLUG 174P7 AND CENTER PLUG. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

PLACE A JUMPER WIRE BETWEEN PLUG 174P7 AND CENTER PLUG. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

CHECK FOR CONTINUITY BETWEEN CENTER PLUG 174P7 AND CENTER PIN E AND A OF HARNES 300W3 ON LEFT AFT AUX TANK ACCESS DOOR. CHECK FOR CONTINUITY BETWEEN PIN E AND A OF CENTER PLUG. IS CONTINUITY PRESENT?

YES

LOCATE OPEN IN WIRE W625-86-22, W626-89-22, OR W626-79-22 BETWEEN PLUG 174P7 AND CENTER PLUG. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

REPLACE LEFT AFT AUX TANK THERMISTOR.

NO

LOCATE OPEN IN WIRE W625-86-22, W626-89-22, OR W626-79-22 BETWEEN PLUG 174P7 AND CENTER PLUG. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

CHECK FOR CONTINUITY BETWEEN CENTER PLUG 174P7 AND CENTER PIN E AND A OF HARNES 300W3 ON LEFT AFT AUX TANK ACCESS DOOR. CHECK FOR CONTINUITY BETWEEN PIN E AND A OF CENTER PLUG. IS CONTINUITY PRESENT?

YES

REPLACE LEFT FUEL PUMP THERMISTOR CONTROL.

NO

CHECK FOR RESISTANCE BETWEEN PLUG 174P7 AND CENTER PIN A. IS 1/16 OHMS PRESENT?

YES

LOCATE OPEN IN WIRE W625-86-22, W626-89-22, OR W626-79-22 BETWEEN PLUG 174P7 AND CENTER PLUG. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

PLACE A JUMPER WIRE BETWEEN PLUG 174P7 AND CENTER PLUG. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

CHECK FOR CONTINUITY BETWEEN CENTER PLUG 174P7 AND CENTER PIN E AND A OF HARNES 300W3 ON LEFT AFT AUX TANK ACCESS DOOR. CHECK FOR CONTINUITY BETWEEN PIN E AND A OF CENTER PLUG. IS CONTINUITY PRESENT?

YES

LOCATE OPEN IN WIRE W625-86-22, W626-89-22, OR W626-79-22 BETWEEN PLUG 174P7 AND CENTER PLUG. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

CHECK FOR RESISTANCE BETWEEN PLUG 174P7 AND CENTER PIN A. IS 1/16 OHMS PRESENT?

YES

LOCATE OPEN IN WIRE W625-86-22, W626-89-22, OR W626-79-22 BETWEEN PLUG 174P7 AND CENTER PLUG. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

PLACE A JUMPER WIRE BETWEEN PLUG 174P7 AND CENTER PLUG. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

CHECK FOR CONTINUITY BETWEEN CENTER PLUG 174P7 AND CENTER PIN E AND A OF HARNES 300W3 ON LEFT AFT AUX TANK ACCESS DOOR. CHECK FOR CONTINUITY BETWEEN PIN E AND A OF CENTER PLUG. IS CONTINUITY PRESENT?

YES

LOCATE OPEN IN WIRE W625-86-22, W626-89-22, OR W626-79-22 BETWEEN PLUG 174P7 AND CENTER PLUG. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

CHECK FOR RESISTANCE BETWEEN PLUG 174P7 AND CENTER PIN A. IS 1/16 OHMS PRESENT?

YES

LOCATE OPEN IN WIRE W625-86-22, W626-89-22, OR W626-79-22 BETWEEN PLUG 174P7 AND CENTER PLUG. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

PLACE A JUMPER WIRE BETWEEN PLUG 174P7 AND CENTER PLUG. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

CHECK FOR CONTINUITY BETWEEN CENTER PLUG 174P7 AND CENTER PIN E AND A OF HARNES 300W3 ON LEFT AFT AUX TANK ACCESS DOOR. CHECK FOR CONTINUITY BETWEEN PIN E AND A OF CENTER PLUG. IS CONTINUITY PRESENT?

YES

LOCATE OPEN IN WIRE W625-86-22, W626-89-22, OR W626-79-22 BETWEEN PLUG 174P7 AND CENTER PLUG. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

CHECK FOR RESISTANCE BETWEEN PLUG 174P7 AND CENTER PIN A. IS 1/16 OHMS PRESENT?
10-2.26 LEFT SIDE AUX PRESS LIGHT COMES ON WHEN LEFT SIDE AFT AUX FUEL PUMP SWITCH IS SET TO ON (Continued)

END OF TASK
Fault Isolation Procedure

Initial Setup

Applicable Configurations:
All

Tools:
- Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
- Multimeter

Materials:
None

Personnel Required:
- Aircraft Electrician (2)

References:
- TM 55-1520-240-23

Equipment Condition:
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power Off
  - Side Acoustical Blanket Removed Between Sta 320 and 360
  - Left Forward Landing Gear Access Panel Open
10-2.27 LEFT SIDE AUX PRESS LIGHT COMES ON WHEN LEFT SIDE FWD AUX FUEL PUMP SWITCH IS SET TO ON (Continued)

- **Have helper set fuel pumps left side fwd aux switch to on.** Can I fwd aux tank fuel pump be heard operating? **Yes**

  - Disconnect fuel pump plug at l aux tank aft access door. Check for 115vac between plug at aft access door pins a, b, and c, and ground. Is 115vac present on all 3 pins? **No**

    - **Set left side fwd aux switch to off.** Remove elec pwr. Check for ground on plug at aft access door pin d. Is ground present? **Yes**

        - Replace left fwd aux tank fuel pump.

    - Disconnect plug at 174p1 from left fwd fuel press switch. Does left side aux press light go out? **Yes**

        - Replace left fwd fuel press switch.

    - Locate ground fault on wire w645-1-22. W645-74-22, w645-107-20, w559-142-20, w559-140-20, or w559-138-20 between plug 174p1 and left side aux press light. Repair or replace wire as required? **No**

        - Replace left fwd aux press light.

- **Is 115vac present on any wire?** **No**

  - Disconnect plug 171p3 from fuel pump relay box. Check for 115vac between plug 171p3 pin k, j, and h. Is 115vac present on all pins? **Yes**

    - **Locate open in wire w625-57-22, w625-69-22, or w625-58-22 between plug 171p3 at fuel pump relay box and plug at aft access door.** Repair or replace wire as required? **No**

        - Check for 115vac between plug 171p3 pin k and ground. Is 115vac present? **Yes**

            - Locate open in wire w625-80-32a, w645-112-20a, or w650-50-20a between plug 171p3 and cb 174c1. Repair or replace wire as required? **No**

                - Replace elec pwr. Check for continuity between lh fuel pumps aux fwd cb and plug 171p3 pin k. Is continuity present? **Yes**

        - Locate open in wire w625-60-9a, w645-114-20c, or w550-52-20c between plug 171p3 and cb 174c1. Repair or replace wire as required? **No**

            - Replace elec pwr. Open no 1 pdr. Open lh fuel pumps aux fwd cb. Check for continuity between lh fuel pumps aux fwd cb 174c81 a phase circuit side and plug 171p3 pin k. Is continuity present? **Yes**

- **Locate open in wire w625-61-22b, w645-113-20b, or w550-51-20b between plug 171p3 and cb 174c81. Repair or replace wire as required?** **No**

  - Locate open in wire w625-62-22c, w645-114-20c, or w550-52-20c between plug 171p3 and cb 174c81 circuit side and plug 171p3 pin h. Is continuity present? **Yes**

    - Replace lh fuel pumps aux fwd cb.

**Go To Next Page**

Change 9 10-105
10-2.27 LEFT SIDE AUX PRESS LIGHT COMES ON WHEN LEFT SIDE FWD AUX FUEL PUMP SWITCH IS SET TO ON (Continued)

- **YES**
  - CHECK FOR 28VDC BETWEEN PLUG 17A/P17 PIN F+ AND GROUND. IS 28VDC PRESENT?
  - DISCONNECT PLUG 17A/P7 FROM LEFT FUEL PUMP THERMISTOR CONTROL. CHECK FOR CONTINUITY BETWEEN PLUG 17A/P7 PIN U AND PLUG 17A/P3 PIN F. IS CONTINUITY PRESENT?
  - CHECK FOR 28VDC BETWEEN PLUG 17A/P7 PIN S AND GROUND. IS 28VDC PRESENT?
  - CHECK FOR 28VDC BETWEEN PLUG 17A/P7 PIN S+ AND GROUND. IS 28VDC PRESENT?
  - REPLACEMENT LH FUEL PUMPS AUX FWD CB
  - LOCATE OPEN IN WIRE W25-63 BETWEEN PLUG 17A/P7 AND PLUG 17A/P3. REPAIR OR REPLACE WIRE AS REQUIRED.
  - LOWER FUEL CONTROL PANEL. CHECK FOR 28VDC BETWEEN LEFT SIDE FWD AUX SWITCH TERMINALS 56-1 AND GROUND. IS 28VDC PRESENT?
  - LOCATE OPEN IN WIRE W25-75, 76, W445-10935, W558-141-20 BETWEEN LEFT DIDE FWD AUX SWITCH AND PLUG 17A/P7. REPAIR OR REPLACE WIRE AS REQUIRED.
  - REPLACEMENT LH FUEL PUMPS AUX FWD CB
  - REPLACE LH FUEL PUMPS AUX FWD CB
  - REPLACE LH FUEL PUMPS AUX FWD CB
  - REPLACE LH FUEL PUMPS AUX FWD CB
  - REPLACE LH FUEL PUMPS AUX FWD CB
  - LOCATION OPEN IN WIRE W25-75, 76, W445-10935, W558-141-20 BETWEEN LEFT DIDE FWD AUX SWITCH AND PLUG 17A/P7. REPAIR OR REPLACE WIRE AS REQUIRED.

- **NO**
  - REPLACE RELAY 17A/K1 IN FUEL CONTROL RELAY BOX
  - REPLACE RELAY 17A/K1 IN FUEL CONTROL RELAY BOX
  - REMOVE ELECTRICAL CHECK FOR GROUND ON PLUG 17A/P3 PIN S AND GROUND. IS GROUND PRESENT?
  - REMOVE ELECTRICAL OPEN NO. 1, 2, 3, OR 4 OPEN LH FUEL PUMP CONT AUX FWD CB. CHECK FOR CONTINUITY BETWEEN LH FUEL PUMPS CONT AUX FWD CB 17A/K2 GROUND 56-1 terminals 75-1 AND 56-1. IS CONTINUITY PRESENT?
  - REPLACE LH FUEL PUMP CONT AUX FWD CB
  - REPLACE LH FUEL PUMP CONT AUX FWD CB
  - REMOVE ELECTRICAL OPEN NO. 1, 2, 3, OR 4 OPEN LH FUEL PUMP CONT AUX FWD CB. CHECK FOR CONTINUITY BETWEEN LH FUEL PUMPS CONT AUX FWD CB 17A/K2 GROUND 56-1 terminals 75-1 AND 56-1. IS CONTINUITY PRESENT?
  - LOCATION OPEN IN WIRE W25-75, 76, W445-10935, W558-141-20 BETWEEN LEFT DIDE FWD AUX SWITCH AND PLUG 17A/P7. REPAIR OR REPLACE WIRE AS REQUIRED.

**GO TO NEXT PAGE**
10-2.27 LEFT SIDE AUX PRESS LIGHT COMES ON WHEN LEFT SIDE FWD AUX FUEL PUMP SWITCH IS SET TO ON
(Continued)
10-2.27 LEFT SIDE AUX PRESS LIGHT COMES ON WHEN LEFT SIDE FWD AUX FUEL PUMP SWITCH IS SET TO ON (Continued)

- **10-2.27**
  - **YES** REMOVE ELEC PWR, CHECK FOR GROUND ON PLUG 174F7 PIN G, V, AND F, IS GROUND PRESENT?
    - **NO** LOCATE OPEN IN WIRE W625-0024A22R, W625-0024A2P2, OR W625-0024A2Z2 BETWEEN PLUG 174F7 AND FUSELAGE GROUND, REPAIR OR REPLACE WIRE AS REQUIRED.
  - **YES** CHECK FOR RESISTANCE BETWEEN PLUG 174F7 PIN M AND L, IS RESISTANCE APPROXIMATELY 1.5 OHMS PRESENT?
    - **NO** LOCATE OPEN IN WIRE W625-0024A22R, W625-0024A2P2, OR W625-0024A2Z2 BETWEEN PLUG 174F7 AND CENTER PLUG OF HARNESS 300W2 ON LEFT FWD AUX TANK ACCESS DOOR, PINS G AND F, IS CONTINUITY PRESENT?
      - **YES** PLACE A JUMPER WIRE BETWEEN PLUG 174F7 PIN M AND DISCONNECT CENTER PLUG OF HARNESS 300W2 ON LEFT FWD AUX TANK ACCESS DOOR, CHECK FOR CONTINUITY BETWEEN PIN E AND L OF CENTER PLUG, IS CONTINUITY PRESENT?
        - **YES** CHECK FOR CONTINUITY BETWEEN PLUG 174F7 PIN N AND CENTER PLUG OF HARNESS 300W2 ON LEFT FWD AUX TANK ACCESS DOOR, PINS G AND F, IS CONTINUITY PRESENT?
          - **YES** REPLACE LEFT FWD AUX TANK THERMISTOR.
          - **YES** REPLACE LEFT FWD AUX THERMISTOR CONTROL.
          - **YES** LOCATE OPEN IN WIRE W625-0024A22R, W625-0024A2P2, OR W625-0024A2Z2 BETWEEN PLUG 174F7 AND CENTER PLUG, REPAIR OR REPLACE WIRE AS REQUIRED.

- **10-108 Change 9**
10-2.27 LEFT SIDE AUX PRESS LIGHT COMES ON WHEN LEFT SIDE FWD AUX FUEL PUMP SWITCH IS SET TO ON (Continued)
TM 55-1520-240-T

10-2.28 RIGHT SIDE AUX PRESS LIGHT COMES ON WHEN RIGHT SIDE AFT AUX FUEL PUMPS SWITCH IS SET TO ON

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Equipment Condition:

Equipment Condition:

TM 55-1520-240-23:
- Battery Connected
- Electrical Power On
- Hydraulic Power Off
- Side Acoustical Blanket Removed Between Sta 320 and 360.
- Right Aft Intertank Access Panel Open

Tools:
Electrical Repairer's Tool Kit, Battery Connected
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
Aircraft Electrician (2)

References:
TM 55-1520-240-23

GO TO NEXT PAGE
10-2.28 RIGHT SIDE AUX PRESS LIGHT COMES ON WHEN RIGHT SIDE AFT AUX FUEL PUMP SWITCH IS SET TO ON

CHECK FOR 28VDC BETWEEN PLUG 171P6 PIN R+1 AND GROUND. IS 28VDC PRESENT?

DISCONNECT PLUG 174P6 FROM RIGHT FUEL PUMP THERMOSTAT CONTROL. CHECK FOR CONTINUITY BETWEEN PLUG 174P6 PIN D AND PLUG 171P6 PIN N. IS CONTINUITY PRESENT?

CHECK FOR 28VDC BETWEEN PLUG 174P6 PIN E+1 AND GROUND. IS 28VDC PRESENT?

LOCATE OPEN IN WIRE W629-84-22 BETWEEN PLUG 174P6 AND PLUG 171P6. REPAIR OR REPLACE WIRE AS REQUIRED.


REPLACE RH FUEL PUMPS AUX AFT CB 174C8B.

REPLACE RH FUEL PUMPS AUX AFT CB 174C8B.

REPLACE RELAY 174C2 IN FUEL CONTROL RELAY BOX.

REPLACE RH FUEL PUMP CONT AUX AFT CB 174C8B.

REPLACE RH FUEL PUMP CONT AUX AFT CB 174C8B.
10-2.28 RIGHT SIDE AUX PRESS LIGHT COMES ON WHEN RIGHT SIDE AFT AUX FUEL PUMP SWITCH IS SET TO ON

(Continued)
10-2.28 RIGHT SIDE AUX PRESS LIGHT DOES NOT COME ON WHEN RIGHT SIDE AUX AFT FUEL PUMP SWITCH IS SET TO ON (Continued)

- **10-2.28**
  - **GO TO NEXT PAGE**
10-2.28 RIGHT SIDE AUX PRESS LIGHT COMES ON WHEN RIGHT SIDE AFT AUX FUEL PUMP SWITCH IS SET TO ON (Continued)
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
Aircraft Electrician (2)

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Side Acoustical Blanket Removed Between Sta 320 and 360
Right Forward Landing Gear Access Panel Open
10-2.29 RIGHT SIDE AUX PRESS LIGHT COMES ON WHEN RIGHT SIDE FWD AUX FUEL PUMP SWITCH IS SET TO ON (CONTINUED)

- HAVE HELPER SET FUEL PUMPS RIGHT SIDE FWD AUX SWITCH TO ON. CAN RIGHT FWD AUX TANK FUEL PUMP BE HEARD UPDATING?
  - NO: DISCONNECT PLUG AT R AUX TANK F/T ACCESS DOOR. CHECK FOR 115VAC BETWEEN PLUG AT F/T ACCESS DOOR PIN A, B, AND C AND GROUND. IS 115VAC PRESENT ON ALL 3 PINS?
    - YES: GET RIGHT SIDE FWD AUX SWITCH TO OFF. REMOVE ELEC PWR. CHECK FOR GROUND ON PLUG AT F/T ACCESS DOOR AND FUSE/LAGE GROUND. REPAIR OR REPLACE WIRE AS REQUIRED.
    - NO: DISCONNECT PLUG AT 174P3 FROM RIGHT FWD FUEL PRESS SWITCH. RIGHTSIDE FUEL PRESS SWITCH G9U?
  - YES: REPLACE D/FWD AUX TANK FUEL PUMP.

- IS 115VAC PRESENT ON ANY WIRE?
  - NO: CHECK FOR 115VAC BETWEEN 174P3 PIN J AND GROUND. IS 115VAC PRESENT?

- DISCONNECT PLUG 171P4 FROM FUEL PUMP RELAY BOX. CHECK FOR 115VAC BETWEEN 171P4 PIN K AND H. IS 115VAC PRESENT ON ALL 3 PINS?
  - YES: REMOVE ELECTRIC OPEN NO. 3 POP OPEN RH FUEL PUMPS AUX FWD CB. CHECK FOR CONTINUITY BETWEEN RH FUEL PUMPS AUX FWD CB 174P3 AND RH FUEL PUMP RELAY BOX. REPAIR OR REPLACE WIRE AS REQUIRED.

- LOCATE GROUND FAULT ON WIRE W629-68-22, W639-190-22, W655-10-1-10, OR W655-148-22 BETWEEN 174P3 AND RIGHT SIDE AUX PRESS LIGHT. REPAIR OR REPLACE WIRE AS REQUIRED.


- REMOVE ELECTRIC OPEN NO. 5 POP OPEN RH FUEL PUMPS AUX FWD CB. CHECK FOR CONTINUITY BETWEEN RH FUEL PUMPS AUX FWD CB 174P3 AND RH FUEL PUMP RELAY BOX. REPAIR OR REPLACE WIRE AS REQUIRED.

- G0 TO NEXT PAGE
10-2.29 RIGHT SIDE AUX PRESS LIGHT COMES ON WHEN RIGHT SIDE FWD AUX FUEL PUMP SWITCH IS SET TO ON (Continued)

- **YES**
  - **NO**
    - **YES**
      - **NO**
        - **YES**
          - **NO**
            - **YES**
              - **NO**
                - **YES**
                  - **NO**
                    - **YES**
                      - **NO**
                        - **YES**
10-2.29 RIGHT SIDE AUX PRESS LIGHT COMES ON WHEN RIGHT SIDE FWD AUX FUEL PUMP SWITCH IS SET TO ON

(Continued)
10-2.29 RIGHT SIDE AUX PRESS LIGHT COMES ON WHEN RIGHT SIDE FWD AUX FUEL PUMP SWITCH IS SET TO ON (Continued)

- **REMOVE ELEC PWR. CHECK FOR GROUND ON PLUG 174PB**
  - YES → CHECK FOR RESISTANCE BETWEEN PLUG 174PB PIN L, AND N, IS APPROXIMATELY 115 OHMS PRESENT?
    - NO → LOCATE OPEN IN WIRE W629-0029-22 OR W629-0029-22. REPLACE WIRE AS REQUIRED.
    - YES → PLACE A JUMPER WIRE BETWEEN PLUG 174PB PIN L AND M. DISCONNECT CENTER PLUG OF HARNESS 300W4 AT RIGHT FWD AUX TANK ACCESS DOOR. CHECK FOR CONTINUITY BETWEEN PINS E AND A OF CENTER PLUG IS CONTINUITY PRESENT?
      - NO → LOCATE OPEN IN WIRE W629-76-22 OR W629-76-22 BETWEEN PLUG 174PB AND CENTER PLUG. REPAIR OR REPLACE WIRE AS REQUIRED.
      - YES → CHECK FOR CONTINUITY BETWEEN PLUG 174PB PIN N AND CENTER PLUG OF HARNESS 300W4 ON RIGHT FWD AUX TANK ACCESS DOOR. PINS G AND F IS CONTINUITY PRESENT?
        - NO → REPLACE RIGHT FWD AUX TANK THERMISTOR.
        - YES → REPLACE RIGHT FUEL PUMP THERMISTOR CONTROL.
10-2.29 RIGHT SIDE AUX PRESS LIGHT COMES ON WHEN RIGHT SIDE FWD AUX FUEL PUMP SWITCH IS SET TO ON (Continued)
10-3 SINGLE POINT PRESSURE REFUELING SYSTEM
END OF TASK
10-3.3 SINGLE POINT PRESSURE REFUELING SYSTEM VISUAL CHECK

INITIAL SETUP
Applicable Configurations:
All

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

Materials:
None

Personnel Required:
Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Electrical Power Off
Battery Disconnected
Hydraulic Power Off
Forward Right Landing Gear Access Panel Open

TASK RESULT

1. Check REFUEL STATION switch (1).
   If switch (1) is loose or damaged, tighten or replace it as required.

2. Check pre-check panel (2).
   If panel (2) is loose or damaged, tighten, repair, or replace it as required.

3. Check light (3).
   If light (3) is loose or damaged, tighten or replace it as required.

4. Check three lights (4).
   If any light (4) is damaged, repair or replace it as required.

5. Check nine switches (5).
   If any switch (5) is loose or damaged, tighten or replace as required.

6. Check fuel quantity indicator (6).
   If indicator (6) is loose or damaged, tighten or replace it as required.

7. Check fuel quantity selector switch (7).
   If switch (7) is loose or damaged, tighten or replace it as required.

8. Check inverter (8).
   If inverter (8) is loose or damaged, tighten or replace it as required.

9. On aircraft with check installation of vacuum relief valve (9), security of hose (10) at clamps (11), and connection (12) on refueling adapter (13).
   If components are loose or damaged, tighten or replace as required.

FOLLOW-ON MAINTENANCE:
None
10-3.4 SINGLE POINT PRESSURE REFUELING SYSTEM OPERATIONAL CHECK

INITIAL SETUP

Applicable Configurations: All

Tools: None

Materials: None

Personnel Required: Medium Helicopter Repairer

References:

- TM 55-1520-240-23

Equipment Condition:

- Electrical Power Off
- Battery Connected
- Hydraulic Power Off
- Visual Check of Single Point Pressure Refueling System Performed Task 10-3.3

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Make sure FUEL REFUEL circuit breaker (1) is closed.</td>
<td>If circuit breaker (1) is open, dose it. If it opens again, go to Task 10-3.3.</td>
</tr>
<tr>
<td>2. Set REFUEL STATION switch (2) to ON.</td>
<td>Both lights (3 and 4) shall be out. If either light is on, go to Task 10-3.4.</td>
</tr>
<tr>
<td>3. Make sure LH REFUEL VALVE POSN and RH REFUEL VALVE POSN lights (3 and 4).</td>
<td>Both lights (3 and 4) shall momentarily come on. If either light does not come on, go to Task 10-3.5.</td>
</tr>
<tr>
<td>4. Press and release LH REFUEL VALVE POSN and RH REFUEL VALVE POSN lights (3 and 4).</td>
<td>Light (6) shall come on. LH REFUEL VALVE POSN and RH REFUEL VALVE POSN lights (3 and 4) shall come on and go out. If light (6) does not come on, go to Task 10-3.6. If either (3 or 4) does not come on, go to Task 10-3.7. If either light comes on and stays on, go to Task 10-3.8.</td>
</tr>
<tr>
<td>5. Set PWR switch (5) to ON.</td>
<td>Light (8) shall come on. If it does not, go to Task 10-3.10.</td>
</tr>
<tr>
<td>6. Set LIGHT switch (7) to ON.</td>
<td>Pointer on indicator (10) shall indicate fuel level in tank selected. If pointer does not move for any switch position, go to Task 8-13.18. If pointer indicates fuel amount for all but one position, go to Task 8-13.19.</td>
</tr>
<tr>
<td>7. Turn FUEL QTY SEL switch (9) through its positions.</td>
<td>If fuel does not stop flowing within 4 seconds with ALL TEST switch (11) at PRI OFF, stop refueling and go to Task 10-3.12.</td>
</tr>
</tbody>
</table>

NOTE

A small amount of fuel will continue to flow through me open primary and secondary valves when the refueling valve is closed.

8. Perform single point refueling of all tanks or individual tank as required. Refer to TM 55-1520-240-23.

If fuel does not stop flowing within 4 seconds with ALL TEST switch (11) at SEC OFF, stop refueling and go to Task 10-3.13.

If fuel does not flow in one or more tanks during single point refueling, go to Task 10-3.14.

On aircraft with , if fuel leaks from vacuum relief valve (12), remove and clean valve. Refer to TM 55-1520-240-23, Task 10-119.

On aircraft with , if fuel leaks around nipple or fitting (13) to vacuum relief line, remove hardware and repair or replace components as required. Refer to TM 55-1520-240-23, Task 10-119.

FOLLOW-ON MAINTENANCE:

- TM 55-1520-240-23:
  - Battery disconnected.
10-3.5 FUEL REFUEL CIRCUIT BREAKER WILL NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
Medium Helicopter Repairer
Aircraft Electrician (2)

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off

GO TO NEXT PAGE
10-3.5 FUEL REFUEL CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

NO

DISCONNECT PLUG 057P11 FROM REFUEL PRECHECK PANEL. CHECK FOR GROUND ON PLUG 057P11 PIN 1 IS GROUND PRESENT?

YES

REPLACE FUEL REFUEL CB 057CB3

NO

CHECK FOR GROUND ON PLUG 057P11 PIN 2 IS GROUND PRESENT?

YES

REPLACE FUEL PRECHECK PANEL

NO

CHECK FOR GROUND ON PLUG 057P11 PIN 3 IS GROUND PRESENT?

YES

OPEN LEFT FWD LANDING GEAR BAY ACCESS DOOR. DISCONNECT TURBOCOMPRESSOR Hoses. REMOVE HARNESS AT FUEL CELL ACCESS DOOR. CHECK FOR GROUND ON HARNESS 057P11 PIN 2 IS GROUND PRESENT?

NO

REPLACE LEFT FWD AUX TANK FUEL CONTROL VALVE

YES

DISCONNECT PLUG 057P4 FROM FUEL QUANTITY SW BOX. CHECK FOR GROUND ON PLUS 057P4 PIN 4 IS GROUND PRESENT?

NO

DISCONNECT PLUS 057P6 FROM FUEL QUANTITY SW BOX. CHECK FOR GROUND ON PLUS 057P6 PIN 4 IS GROUND PRESENT?

YES

DISCONNECT PLUG 057P4 FROM FUEL QUANTITY SW BOX. CHECK FOR GROUND ON PLUS 057P4 PIN 3 IS GROUND PRESENT?

YES

DISCONNECT PLUG 057P6 FROM FUEL QUANTITY SW BOX. CHECK FOR GROUND ON PLUS 057P6 PIN 1 IS GROUND PRESENT?

YES

LOCATE GROUND FAULT ON WIRE W229-94-22 OR W229-30-22 BETWEEN PLUS 057P4 AND PLUS 057P11. REPAIR OR REPLACE WIRE AS REQUIRED

NO

DISCONNECT PLUG 057P6 FROM FUEL QUANTITY SW BOX. CHECK FOR GROUND ON PLUS 057P6 PIN 1 IS GROUND PRESENT?

YES

LOCATE GROUND FAULT ON WIRE W229-94-22 OR W229-30-22 BETWEEN PLUS 057P6 AND PLUS 057P11. REPAIR OR REPLACE WIRE AS REQUIRED

NO

LOCATE GROUND FAULT ON WIRE W229-94-22 OR W229-30-22 BETWEEN PLUS 057P4 AND PLUS 057P11. REPAIR OR REPLACE WIRE AS REQUIRED

NO

LOCATE GROUND FAULT ON WIRE W229-10-22 BETWEEN PLUS 057P6 AND RECEPTACLE 300C34V. REPAIR OR REPLACE WIRE AS REQUIRED

GO TO NEXT PAGE
10-3.5 FUEL REFUEL CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)
10-3.5 FUEL REFUEL CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

10-3.5

- **Check for Ground on Plug 05771 11 Pin 9, Is Ground Present?**
  - **Yes** → **Open Intertank Access Bay Panel, Disconnect Lower Harness at Aft Aux Tank Access Door, Check for Ground on Harness Plug Pin C, Is Ground Present?**
    - **Yes** → **Replace Main Tank Fuel Level Control Valve**
    - **No** → **Replace Left Main Tank Fuel Quantity Switch Box**
  - **No** → **Replace Fuel Quantity Switch Box**

- **Check for Ground on Plug 05771 11 Pin 9, Is Ground Present?**
  - **Yes** → **Replace Left Aft Tank Fuel Level Control Valve**
  - **No** → **Locate Ground Fault on Wire W239-99-22 or W265-34-22 Between Plug 05774 and Plug 05771, Repair or Replace Wire as Required**

- **Locate Ground Fault on Wire W239-99-22 or W265-34-22 Between Plug 05774 and Plug 05771, Repair or Replace Wire as Required**
  - **Yes** → **Replace Fuel Quantity Switch Box**
  - **No** → **Locate Ground Fault on Wire W239-21-22 Between Plug 05774 and Receiptacle 11710, Repair or Replace Wire as Required**

- **Locate Ground Fault on Wire W239-21-22 Between Plug 05774 and Receiptacle 11710, Repair or Replace Wire as Required**
  - **Yes** → **Replace Fuel Quantity Switch Box**
  - **No** → **Replace Fuel Quantity Switch Box**
10-3.5 FUEL REFUEL CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)
10-3.5 FUEL REFUEL CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

10-3.5

- **CHECK FOR GROUND ON PLUG 057P1 PIN 7 IS GROUND PRESENT?**
  - **NO**
  - **YES**
    - REPLACE RIGHT FWD TANK FUEL LEVEL CONTROL VALVE

- **OPEN INTERTANK ACCESS BAY PANEL, DISCONNECT LOWER HARNESS AT AFT AUX TANK ACCESS PANEL, CHECK FOR GROUND ON HARNESS PLUG PIN 3 IS GROUND PRESENT?**
  - **NO**
  - **YES**
    - DISCONNECT PLUG 057P4 FROM FUEL QUANTITY SW BOX, IS GROUND STILL PRESENT ON HARNESS PLUG PIN 3?
      - **NO**
        - **YES**
          - RECONNECT PLUG 057P6 FROM FUEL QUANTITY SW BOX, CHECK FOR GROUND ON PLUG 057P6 PIN 7 IS GROUND PRESENT?
      - **YES**
        - **YES**
          - LOCATE GROUND FAULT ON WIRE, WIRE 057P11 BETWEEN WIRE 057P11 AND RECEPTACLE 100X28, REPAIR OR REPLACE WIRE AS REQUIRED

- **CHECK FOR GROUND ON PLUG 057P1 PIN 8 IS GROUND PRESENT?**
  - **NO**
  - **YES**
    - OPEN RIGHT FORWARD LANDING GEAR BAY, DISCONNECT LOWER HARNESS AT AFT AUX TANK ACCESS PANEL, CHECK FOR GROUND ON HARNESS PLUG PIN 1 IS GROUND PRESENT?
      - **NO**
        - **YES**
          - LOCATE GROUND FAULT ON WIRE, WIRE 057P4 BETWEEN WIRE 057P4 AND RECEPTACLE 300X26, REPAIR OR REPLACE WIRE AS REQUIRED
      - **YES**
        - **YES**
          - DISCONNECT PLUG 057P6 FROM FUEL QUANTITY SW BOX, CHECK FOR GROUND ON PLUG 057P6 PIN 7 IS GROUND PRESENT?
            - **NO**
              - **YES**
                - LOCATE GROUND FAULT ON WIRE, WIRE 057P11 BETWEEN WIRE 057P11 AND RECEPTACLE 100X28, REPAIR OR REPLACE WIRE AS REQUIRED
            - **YES**
              - **YES**
                - REPLACE FUEL QUANTITY SWITCH BOX

- **CHECK FOR GROUND ON PLUG 057P1 PIN 10 IS GROUND PRESENT?**
  - **NO**
  - **YES**
    - OPEN RIGHT INTERTANK ACCESS BAY PANEL, DISCONNECT LOWER HARNESS AT RIGHT MAIN TANK ACCESS PANEL, CHECK FOR GROUND ON HARNESS PLUG PIN A IS GROUND PRESENT?
      - **NO**
        - **YES**
          - LOCATE GROUND FAULT ON WIRE, WIRE 057P4 BETWEEN WIRE 057P4 AND RECEPTACLE 100X26, REPAIR OR REPLACE WIRE AS REQUIRED
      - **YES**
        - **YES**
          - REPLACE MAIN TANK FUEL LEVEL CONTROL VALVE.
10-3.5 FUEL REFUEL CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)
10-3.5 FUEL REFUEL CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

- **Check for ground on plug 057P11 pin 11 is ground present?**
  - **Yes**: Open left intertank access panel, disconnect plug 057P13 from left tank fuel shutoff valve, check for ground on plug pin 1, is ground present?
  - **No**: Replace left tank fuel shutoff valve.

- **Check for ground on plug 057P11 pin 12 is ground present?**
  - **Yes**: Open right intertank access bay panel, disconnect lower harness at aft right tank access panel, check for ground on harness plug pin 3, is ground present?
  - **No**: Replace right aft tank fuel level control valve.

- **Check for ground on plug 057P11 pin 13 is ground present?**
  - **Yes**: Disconnect plug 057P14 from fuel quantity sw box, is ground still present on plug 057P13 pin 17?
  - **No**: Locate ground fault on wire W629-100-22 or W655-39-22 between plug 057P4 and plug 057P11, repair or replace wire as required.

- **Check for ground on plug 057P11 pin 15 is ground present?**
  - **Yes**: Locate ground fault on wire W628-36-22 or W655-44-22 between receptacle 171J7 and plug 057P11, repair or replace wire as required.
  - **No**: Open right intertank access panel, disconnect lower harness at right main tank access panel, check for ground on harness plug pin C, is ground present?
  - **Yes**: Replace right main tank fuel level control valve.

- **Locate ground fault on wire W628-36-22 or W655-44-22 between receptacle 171J7 and plug 057P11, repair or replace wire as required.**
10-3.5 FUEL REFUEL CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

NO

CHECK FOR GROUND ON PLUG 057F11 PIN 16 IS GROUND PRESENT?

YES

OPEN RIGHT INTERTANK ACCESS BAY PANEL DISCONNECT PLUG 057P13 FROM RIGHT TANK FUEL SHUTOFF VALVE CHECK FOR GROUND ON PLUG 057P12 PIN 1 IS GROUND PRESENT?

NO

REPLACE RIGHT TANK FUEL SHUTOFF VALVE

YES

DISCONNECT PLUG 057P7 FROM INVERTER CHECK FOR GROUND ON PLUG 057P7 PIN 8 IS GROUND PRESENT?

NO

REPLACE INVERTER

NO

REPLACE FUEL REFUEL CB

LOCATE GROUND FAULT ON WIRE W655-4-22. W629-34. 22. OR W655-42.22 BETWEEN PLUG 057P7 AND PLUG 057P11. REPAIR OR REPLACE WIRE AS REQUIRED.
10-3.5 FUEL REFUEL CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)
10-3.6 LH OR RH REFUEL VALVE POSN LIGHT IS ON

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required
67U10 Medium Helicopter Repairer
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
RIGHT REFUEL VALVE POSN LIGHT IS ON

OPEN RIGHT INTERTANK ACCESS PANEL, DISCONNECT PLUG 057P12 FROM RIGHT FUEL SHUTOFF VALVE.

YES

REPLACE RIGHT FUEL SHUTOFF VALVE.

NO

LOCATE OPEN IN WIRE 8654-8-22 OR 8629-60180A427N BETWEEN PLUG 057P13 AND FUSELAGE GROUND. REPAIR OR REPLACE WIRE AS REQUIRED.

LEFT REFUEL VALVE POSN LIGHT IS ON

OPEN LEFT INTERTANK ACCESS PANEL, DISCONNECT PLUG 057P13 FROM LEFT FUEL SHUTOFF VALVE.

YES

REPLACE LEFT FUEL SHUTOFF VALVE.

NO

LOCATE OPEN IN WIRE 8654-8-22 OR 8629-60180A427N BETWEEN PLUG 057P13 AND FUSELAGE GROUND. REPAIR OR REPLACE WIRE AS REQUIRED.

END OF TASK

Change 6 10-143
10-3.7 LH OR RH REFUEL VALVE POSN LIGHT DOES NOT COME ON WHEN PRESS

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations: All

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

Materials: None

Personnel Required: 68F20 Aircraft Electrician

References: TM 55-1520-240-23

Equipment Condition:
- Battery Connected
- Electrical Power On
- Hydraulic Power Off

GO TO NEXT PAGE
10-3.7 LH OR RH REFUEL VALVE POSN LIGHT DOES NOT COME ON WHEN PRESSED (Continued)

1. **DID EITHER LH OR RH REFUEL VALVE POSN LIGHT COME ON WHEN PRESSED?**
   - **YES**: REPLACE LAMP IN UNLIT LIGHT. PRESS LIGHT. DOES IT COME ON?
     - **YES**: FAULT CORRECTED.
     - **NO**: REPLACE REFUEL PANEL.

2. **DISCONNECT PLUG 057P11 FROM REFUEL PRECHECK PANEL. CHECK FOR 28VDC BETWEEN PLUG 057P11 PIN 23I AND GROUND. IS 28VDC PRESENT?**
   - **YES**: CHECK FOR GROUND ON PLUG 057P11 PIN 24. IS GROUND PRESENT?
     - **YES**: REPLACE REFUEL PRECHECK PANEL.
     - **NO**: LOCATE OPEN IN WIRE W559-303-20, W528-327-20, W529-103-20, OR W558-61-22 BETWEEN REFUEL STATION SW AND PLUG 057P11. REPAIR OR REPLACE WIRE AS REQUIRED.

3. **REMOVE ELECT PWR. LOWER FUEL CONTROL PNL. APPLY ELECT PWR. CHECK FOR 28VDC BETWEEN TERM 23I (OF REFUEL STATION SW AND GROUND IS 28VDC PRESENT?**
   - **YES**: LOCATION OPEN IN WIRE W559-318-20, W564-267-20, OR W565-24-20 BETWEEN REFUEL STATION SW AND FUEL REFUEL CB. REPAIR OR REPLACE WIRE AS REQUIRED.
   - **NO**: LOCATION OPEN IN WIRE W559-318-20, W564-267-20, OR W565-24-20 BETWEEN REFUEL STATION SW AND FUEL REFUEL CB. REPAIR OR REPLACE WIRE AS REQUIRED.

END OF TASK

10-145
10-3.8 PWR LIGHT DOES NOT COME ON

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations: All

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

Materials:
- None

Personnel Required:
- 68F20 Aircraft Electrician

References:
- TM 55-1520-240-23

Equipment Condition:
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power Off
10-3.8 PWR LIGHT DOES NOT COME ON (Continued)

PRESS PWR LT. DOES IT COME ON? YES REPLACE REFUEL PRECHECK PANEL

NO

REPLACE LAMP IN PWR LT. DOES IT COME ON? YES FAULT CORRECTED.

NO

DISCONNECT PLUG 057P11 FROM REFUEL PANEL. CHECK FOR 28VDC BETWEEN PLUG 057P11 PIN 20C+ AND GROUND. IS 28VDC PRESENT? YES REPLACE REFUEL PANEL

NO

REMOVE ELEC PWR LOWER FUEL CONTROL PN. FROM OYHE PN. APPLY ELEC PWR CHECK FOR 28VDC BETWEEN REFUEL STATION SW TERM 31C+ AND GROUND. IS 28VDC PRESENT? YES LOCATE OPEN IN WIRE W559-315-20, W635-313-20, W629-29-20, OR W655-28-20 IN BETWEEN REFUEL STATION SW AND PLUG 057P11. REPAIR OR REPLACE WIRE AS REQUIRED

NO

REPLACE REFUEL STATION SW.

END OF TASK

Change 3  10-147
10-3.9 LH OR RH REFUEL VALVE POSN LIGHT DOES NOT COME ON OR COMES ON AND STAY ON

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
68F10 Aircraft Electrician
68F20 Aircraft Electrician

References:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

GO TO NEXT PAGE
10-3.9 LH OR RH REFUEL VALVE POSN LIGHT DOES NOT COME ON OR COMES ON AND STAYS ON

(Continued)

DID EITHER LH OR RH REFUEL VALVE POSN LT COME ON?

YES

DID RH REFUEL VALVE POSN LT COME ON?

YES

OPEN LEFT INTERTANK ACCESS BAY PANEL. DISCONNECT PLUG 057P13 FROM LEFT TANK FUEL SHUTOFF VALVE. CHECK FOR 28VDC BETWEEN PLUG 057P13 PIN 1 (+) AND GROUND. IS 28VDC PRESENT?

YES

REPLACE LEFT TANK FUEL SHUTOFF VALVE.

NO

DISCONNECT PLUG 057P4 FROM FUEL QUANTITY SW BOX. CHECK FOR CONTINUITY BETWEEN PLUG 057P4 PIN 12 (+) AND GROUND. IS 28VDC PRESENT?

YES

REPLACE FUEL QUANTITY SW BOX.

NO

DISCONNECT PLUG 057P11 FROM REFUEL PANEL. CHECK FOR CONTINUITY BETWEEN PLUG 057P11 PIN 16 AND PLUG 057P12 PIN 1. IS CONTINUITY PRESENT?

YES

REPLACE REFUEL PRECHECK PANEL.

NO

LOCATE OPEN IN WIRE W655-35-22 OR W659-100-22 BE. TWEEN PLUG 057P4 AND PLUG 057P11. REPAIR OR REPLACE WIRE AS REQUIRED.

NO


NO

DISCONNECT PLUG 057P12 FROM RIGHT TANK FUEL SHUTOFF VALVE. CHECK FOR 28VDC BETWEEN PLUG 057P12 PIN 11 (+) AND GROUND. IS 28VDC PRESENT?

YES

REPLACE RIGHT TANK FUEL SHUTOFF VALVE.

NO

DISCONNECT PLUG 057P11 FROM REFUEL PANEL. CHECK FOR CONTINUITY BETWEEN PLUG 057P11 PIN 15 AND PLUG 057P4 PIN 12. IS CONTINUITY PRESENT?

YES

REPLACE REFUEL PRECHECK PANEL.

NO

LOCATE OPEN IN WIRE W655-35-22 OR W659-100-22 BE. TWEEN PLUG 057P4 AND PLUG 057P11. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

DISCONNECT PLUG 057P12 FROM REFUEL PANEL. CHECK FOR CONTINUITY BETWEEN PLUG 057P12 PIN 11 (+) AND GROUND. IS 28VDC PRESENT?

YES

REPLACE REFUEL PRECHECK PANEL.

NO


END OF TASK

Change 6 10-149
10-3.10 REFUEL PANEL LIGHT DOES NOT COME ON

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required
68F10 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

END OF TASK
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Task 10-3.11 Deleted.
Pages 10-152 and 10-153 Deleted.
10-3.12 FUEL DOES NOT STOP FLOWING WITHIN 4 SECONDS WITH ALL TEST SWITCH AT PRIOFF

FAULT ISOLATION PROCEDURE

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
- Multimeter

Personnel Required:
- 67U20 Medium Helicopter Repairer
- 68F20 Aircraft Electrician

References:
- TM 55-1520-240-23

Equipment Condition:
- TM 55-1520-240-23:
  - Battery Connected
  - Aircraft Being Refueled
  - Hydraulic Power Off

Materials:
None
10-3.12 FUEL DOES NOT STOP FLOWING WITHIN 4 SECONDS WITH ALL TEST SWITCH AT PRI OFF

(Continued)

1. STOP REFUELING.
2. DEFUEL AIRCRAFT.
3. SET ALL TEST SW TO SEC OFF.
4. MOVE FUEL NOZZLE COUNTERCLOCKWISE TO OPEN FOR 30 SECONDS, STOP REFUELING.
5. TURN FUEL QUANTITY SELECT SW TO EACH TANK AND RECORD QUANTITY IN EACH TANK. DO ALL TANKS HAVE MORE THAN 50 POUNDS OF FUEL?

NO

1. REMOVE GRAVITY FILL CAP FROM TANK WHICH CONTAINS MORE THAN 50 POUNDS OF FUEL.
2. WATCH FUEL LEVEL CONTROL VALVE FLOATS IN TANK.
3. MOVE ALL TEST SW FROM SEC OFF TO PRI OFF AND BACK TO SEC OFF TWO TIMES.
4. REPLACE FUEL SHUTOFF VALVE.

NO

1. CHECK CONNECTOR ON TANK FUEL LEVEL CONTROL VALVE. IF IT IS BROKEN, REPLACE. IF IT IS NOT, REPLACE REFUEL PRECHECK PANEL.

NO

1. IS FAULT WITH MAIN TANK?

NO

1. CHECK TWO INCH TRANSFER LINE IN MAIN TANK. IS IT SECURE?

NO

1. REPLACE FUEL SHUTOFF VALVE.

NO

1. CHECK FUEL LINES AT FUEL LEVEL CONTROL VALVE. ARE THEY LOOSE?

NO

1. REPLACE FUEL SHUTOFF VALVE.

YES

1. CHECK SENSE LINES ON FUEL SHUTOFF VALVE. IS ANY LINE LOOSE?

NO

1. TIGHTEN LINES.

YES

1. REATTACH TRANSFER LINE.

NO

1. REPLACE REFUEL PRECHECK PANEL.

YES

1. SET ALL TEST SW TO PRI OFF.
2. SET RH AFT, RH MAIN, RH FWD, LH AFT, LH MAIN, AND LH FWD SWITCHES TO PRI OFF.
3. WATCH HIGH LEVEL SHUT-OFF VALVE IN TANK.
4. MOVE FUEL NOZZLE CONTROL LEVER COUNTERCLOCKWISE FOR 30 SECONDS. DOES FUEL SPOUT OUT OF HIGH LEVEL CONTROL VALVE?

YES

1. REPLACE FUEL SHUTOFF VALVE.

NO

1. 10-3.12 FUEL DOES NOT STOP FLOWING WITHIN 4 SECONDS WITH ALL TEST SWITCH AT PRI OFF

GO TO NEXT PAGE
10-3.12 FUEL DOES NOT STOP FLOWING WITH IN 4 SECONDS WITH ALL TEST SWITCH AT PRI OFF (Continued)
10-3.12 FUEL DOES NOT STOP FLOWING WITHIN 4 SECONDS WITH ALL TEST SWITCH AT PRI OFF

(Continued)

**Flowchart:**

**Decision Points:**
1. **IS FAULT WITH RIGHT FWD AUX TANK FUEL LEVEL CONTROLS VALVE?**
   - **NO**
   - **YES**
2. **DISCONNECT LOWER HARNESS 300W4 FROM AUX TANK ACCESS PANEL, CHECK FOR GROUND ON HARNESS PLUG PIN 2, IS GROUND PRESENT?**
   - **NO**
   - **YES**
3. **DISCONNECT OTHER END OF HARNESS 300W4, CHECK FOR CONTINUITY BETWEEN HARNESS PLUG PIN 2 AND HARNESS PLUG PIN U, IS CONTINUITY PRESENT?**
   - **NO**
   - **YES**
4. **LOCATE OPEN IN WIRE W629-GO214A20 BETWEEN RECEPTACLE 300,396 AND FUSELAGE GROUND, REPAIR OR REPLACE WIRE AS REQUIRED.**
5. **CHECK FOR 28VDC BETWEEN HARNESS PLUG PIN 2 AND GROUND, IS 28VDC PRESENT?**
   - **NO**
   - **YES**
7. **DISCONNECT OTHER END OF HARNESS 300W4, CHECK CONTINUITY BETWEEN HARNESS PLUG PIN T, IS CONTINUITY PRESENT?**
   - **NO**
   - **YES**
8. **LOCATE OPEN IN WIRE W629-GO214A22 BETWEEN RECEPTACLE 300,396 AND FUSELAGE GROUND, REPAIR OR REPLACE WIRE AS REQUIRED.**
9. **DISCONNECT TANK HARNESS 057W12 PLUG FROM FWD AUX TANK FUEL LEVEL CONTROLS VALVE, CHECK FOR CONTINUITY BETWEEN HARNESS PLUG PIN 2 AND HARNESS RECEPTACLE PIN 1,2, IS CONTINUITY PRESENT BETWEEN BOTH SETS OF PINS?**
   - **NO**
   - **YES**
10. **REPLACE RIGHT FWD AUX FUEL LEVEL CONTROLS VALVE.**
11. **REPLACE TANK HARNESS 057W12.**
12. **REPLACE REFUEL PRECHECK PANEL.**

10-3.12 FUEL DOES NOT STOP FLOWING WITHIN 4 SECONDS WITH ALL TEST SWITCH AT PRI OFF (Continued)
10-3.12 FUEL DOES NOT STOP FLOWING WITHIN 4 SECONDS WITH ALL TEST SWITCH AT PRI OFF (Continued)
10-3.12 FUEL DOES NOT STOP FLOWING WITHIN 4 SECONDS WITH ALL TEST SWITCH AT PRI OFF

(Continued)

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GO TO NEXT PAGE
10-3.12 FUEL DOES NOT STOP FLOWING WITHIN 4 SECONDS WITH ALL TEST SWITCH AT PRI OFF (Continued)
10-3.12 FUEL DOES NOT STOP FLOWING WITHIN 4 SECONDS WITH ALL TEST SWITCH AT PRI OFF

(Continued)

10-164 Change 9
10-3.12 FUEL DOES NOT STOP FLOWING WITH IN 4 SECONDS WITH ALL TEST SWITCH AT PRI OFF (Continued)
10-3.13 FUEL DOES NOT STOP FLOWING WITHIN 4 SECONDS WITH ALL TEST SWITCH AT SEC OFF

FAULT ISOLATION PROCEDURE

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
Multimeter

Materials:
None

Personnel Required:
67U20 Medium Helicopter Repairer
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Aircraft Being Refueled
Hydraulic Power Off

GO TO NEXT PAGE
10-3.13 FUEL DOES NOT STOP FLOWING WITHIN 4 SECONDS WITH ALL TEST SWITCH AT SEC OFF

(Continued)

1. STOP REFUELING.
2. DEFLUE AIRCRAFT.
3. MOVE FUEL NOZZLE COUNTERCLOCKWISE TO OPEN FOR 30 SECONDS.
4. IF FUEL QUANTITY SELECT SW TO EACH TANK TO LOCATE TANK CONTAINING MORE THAN 20 POUNDS OF FUEL.
5. REMOVE GASOLINE FILL CAP FROM THIS TANK.
6. WATCH FUEL LEVEL CONTROL VALVE FLOAT IN TANK.
7. MOVE TANK SHUTOFF VALVE SW FROM SEC OFF TO FLOW TO SEC OFF. DOES ONE VALVE FLOAT MOVE?

YES

IS FAULT WITH RIGHT AFT AUX TANK FUEL LEVEL CONTROL VALVE?

NO

REPLACE TANK FUEL LEVEL CONTROL VALVE

YES

OPEN RIGHT INTERTANK ACCESS BAY PANEL. DISCONNECT LOWER HARNESS 200V5 FROM AFT AUX ACCESS PANEL. CHECK HARNESS PLUG PIN 4. IS GROUND PRESENT?

NO

REPLACE TANK FUEL LEVEL CONTROL VALVE

YES

DISCONNECT OTHER END OF HARNESS 300W8. CHECK CONTINUITY BETWEEN HARNESS PLUG PIN 4 AND HARNESS PLUG PIN V. IS CONTINUITY PRESENT?

NO

REPLACE HARNESS 300W8

YES

DISCONNECT OTHER END OF HARNESS 300W9. CHECK CONTINUITY BETWEEN HARNESS PLUG PIN 3 AND HARNESS PLUG PIN V. IS CONTINUITY PRESENT?

NO

DISCONNECT PLUG 06711 FROM REFUEL PRECHECK PANEL. CHECK FOR CONTINUITY BETWEEN PLUG 06711 PIN 13 AND RECEPTACLE 300U39 PIN V. IS CONTINUITY PRESENT?

YES

DISCONNECT TANK HARNESS 057W16 PLUG FROM AFT AUX TANK HIGH LEVEL SHUTOFF VALVE. UNLATCH TANK CUTOFF VALVE. CHECK 42-amp HARNESS RECEPTACLE PIN 3, 4 AND HARNESS RECEPTACLE PIN 3, 4. IS CONTINUITY PRESENT BETWEEN BOTH SETS OF PINS?

NO

REPLACE TANK HARNESS 057W16

YES

REPLACE FUEL LEVEL CONTROL VALVE 06716

REPLACE REFUEL PRECHECK PANEL

GO TO NEXT PAGE
10-3.13 FUEL DOES NOT STOP FLOWING WITHIN 4 SECONDS WITH ALL TEST SWITCH AT SEC OFF

(Continued)

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FUEL DOES NOT STOP FLOWING WITHIN 4 SECONDS WITH ALL TEST SWITCH AT SEC OFF (Continued)
10-3.13 FUEL DOES NOT STOP FLOWING WITHIN 4 SECONDS WITH ALL TEST SWITCH AT SEC OFF

(Continued)

10-3.13

- Is fault with left aft aux tank fuel level control valve?
  - Yes: Open left intertank access bay panel, disconnect lower harness from aft tank access panel. Check for grounding on harness plug pin 4. Is ground present?
    - Yes: Disconnect other end of harness; check continuity between harness plug pin 5/1 and harness plug pin 5/1. Is continuity present?
      - Yes: Locate open in wire W62G-0021D220 between receptacle 300J38 and fuselage ground. Repair or replace wire as required.
      - No: Replace harness.
    - No: Replace fuel quantity switch box.
  - No: Disconnect plug 0576R from fuel quantity switch box. Check for continuity between plug 0576R pin 7 and ground. Is plug 0576R present?
    - Yes: Connect plug 0576R from fuel quantity switch box. Check for continuity between plug 0576R pin 7 and receptacle 300J38. Repair or replace wire as required.
    - No: Locate open in wire W62B-0023E22 between plug 0576R and receptacle 300J38. Repair or replace wire as required.

- Check for 28VDC between harness plug pin 3/1 and ground. Is 28VDC present?
  - Yes: Disconnect plug from aft aux tank fuel level control valve. Check for continuity between harness plug pin 3, 4, and harness receptacle pin 3, 4. Is continuity present between both sets of pins?
    - Yes: Replace fuel level control valve 057L7.
    - No: Replace tank harness.
  - No: Locate open in wire W655-38-22 or W62B-0023E22 between plug 057P11 and plug 067R4. Repair or replace wire as required.

GO TO NEXT PAGE
10-3.13 FUEL DOES NOT STOP FLOWING WITHIN 4 SECONDS WITH ALL TEST SWITCH AT SEC OFF (Continued)
10-3.13 FUEL DOES NOT STOP FLOWING WITHIN 4 SECONDS WITH ALL TEST SWITCH AT SEC OFF

(Continued)

NO

 IS FAULT WITH LEFT MAIN
 TANK FUEL LEVEL CONTROL
 VALVE?

NO

 OPEN LEFT INTERTANK ACCESS
 BAY PANEL. DISCONNECT
 LOWER HARNESS 171W3
 FROM MAIN TANK ACCESS
 PANEL. CHECK FOR GROUND
 ON HARNESS PLUG PIN D. IS
 GROUND PRESENT?

YES

DISCONNECT OTHER END OF
 HARNESS 171W3. CHECK CON-
 TINUITY BETWEEN HARNESS
 PLUG PIN D AND HARNESS
 PLUG PIN 1. IS CONTINUITY
 PRESENT?

YES

LUCA 16. OPEN IN WIRE W620-
 G029142N BETWEEN RECEPT-
 ACLE 171J8 AND FUELAGE
 GROUND. REPAIR OR REPLACE
 WIRE AS REQUIRED.

NO

REPLACE HARNESS 171W3.

NO

CHECK FOR 28VDC BETWEEN
 HARNESS PLUG PIN C (+) AND
 GROUND. IS 28VDC PRESENT?

YES

DISCONNECT OTHER END OF
 HARNESS. CHECK CONTINUITY
 BETWEEN HARNESS PLUG PIN
 C AND HARNESS PLUG PIN 1.
 IS CONTINUITY PRESENT?

YES

DISCONNECT PLUG 057/14
 FROM FUEL QUANTITY SW
 BOX. CHECK FOR 28VDC BE-
 TWEEN PLUG 057/14 PIN 6 (+)
 AND GROUND. IS 28VDC PRE-
 sent?

YES

DISCONNECT PLUG 057/14
 FROM FUEL QUANTITY SW
 BOX. CHECK FOR CONTINUITY
 BETWEEN PLUG 057/14 PIN 9
 AND RECEPTACLE 171J8 PIN 5
 IS CONTINUITY PRESENT?

NO

REPLACE FUEL QUANTITY
 SWITCH BOX.

YES

DISCONNECT TANK HARNESS
 057W13 PLUG FROM LEFT
 MAIN TANK FUEL LEVEL
 CONTROL VALVE. CHECK FOR CON-
 TINUITY BETWEEN HARNESS
 PLUG PIN 3, 4, AND HARNESS
 RECEPTACLE 171J8. IS CON-
 TINUITY PRESENT BETWEEN
 BOTH SETS OF PINS?

YES

REPLACE FUEL LEVEL CONTROL
 VALVE 057/10.

NO

DISCONNECT TANK HARNESS
 057W13.

NO

REPLACE TANK HARNESS
 057W13.

NO

LOCATE OPEN IN WIRE W620-
 G029142 OR W629 B822 BE-
 TWEEN PLUG 057P11 AND
 PLUG 057/14. REPAIR OR RE-
 PLACE WIRE AS REQUIRED.

YES

DISCONNECT PLUG 057P11
 FROM FUEL-PRECHECK PAN-
 EL. CHECK FOR CONTINUITY
 BETWEEN PLUG 057P11 PIN 5
 AND PLUG 057/14 PIN 10.
 IS CONTINUITY PRESENT?

NO

REPLACE FUEL-PRECHECK
 PANEL.

YES

REPLACE FUEL-PRECHECK
 PANEL.
10-3.13 FUEL DOES NOT STOP FLOWING WITHIN 4 SECONDS WITH ALL TEST SWITCH AT SEC OFF (Continued)
10-3.13 FUEL DOES NOT STOP FLOWING WITHIN 4 SECONDS WITH ALL TEST SWITCH AT SEC OFF

(Continued)

- **OPEN LEFT FWD LANDING GEAR ACCESS PANEL. DISCONNECT LOWER HARNESs 300W2 FROM FWD TANK ACCESS PANEL. CHECK FOR GROUND ON HARNESS PLUG PIN 4. IS GROUND PRESENT?**
  - NO
  - YES
- **DISCONNECT OTHER END OF HARNESS 300W2. CHECK CONTINUITY BETWEEN HARNESS PLUG PIN 4 AND HARNESS PLUG PIN 1. IS CONTINUITY PRESENT?**
  - NO
  - YES
  - **LOCATE OPEN IN WIRE W625-20. CHECK FOR CONTINUITY BETWEEN 300L34 AND FUSELAGE GROUND. REPAIR OR REPLACE WIRE AS REQUIRED.**
- **CHECK FOR 28VDC BETWEEN HARNESS PLUG PIN 3 AND GROUND. IS 28VDC PRESENT?**
  - NO
  - YES
- **DISCONNECT OTHER END OF HARNESS 300W2. CHECK CONTINUITY BETWEEN HARNESS PLUG PIN 3 AND HARNESS PLUG PIN 1, IS CONTINUITY PRESENT?**
  - NO
  - YES
  - **DISCONNECT PLUG O87PA FROM FUEL QUANTITY SW BOX. CHECK FOR 28VDC BETWEEN PLUG O87PA PIN 1, IS CONTINUITY PRESENT?**
  - NO
  - YES
  - **DISCONNECT PLUG O87PA FROM FUEL QUANTITY SW BOX. CHECK FOR CONTINUITY BETWEEN PLUG O87PA PIN 4 AND RECEPTACLE 300L34 PIN 5. IS CONTINUITY PRESENT?**
  - NO
  - YES
- **DISCONNECT TANK HARNESS O57W11 PLUG FROM LEFT FWD AUX TANK FUEL (FV), CONTROL VALVE. CHECK FOR CONTINUITY BETWEEN HARNESS PLUG PIN 3, 4 AND HARNESS RECEPTACLE PIN 4, IS CONTINUITY PRESENT BETWEEN BOTH SETS OF PINS?**
  - NO
  - YES
  - **REPLACE FUEL LEVEL CONTROL VALVE O57W1.**
- **REPLACE TANK HARNESS O57W11.**
- **LOCATE OPEN IN WIRE W625-22 OR W625-25 BETWEEN PLUG O87PA PIN 4 AND PLUG O57PA. REPAIR OR REPLACE WIRE AS REQUIRED.**
- **DISCONNECT PLUG O57PA FROM FUEL PRECHECK PANEL. CHECK FOR CONTINUITY BETWEEN PLUG O57PA PIN 3 AND PLUG O57PA PIN 4, IS CONTINUITY PRESENT?**
  - NO
  - YES
  - **REPLACE FUEL PRECHECK PANEL.**
10-3.13 FUEL DOES NOT STOP FLOWING WITHIN 4 SECONDS WITH ALL TEST SWITCH AT SEC OFF (Continued)
10-3.14 TANK WILL NOT ACCEPT FUEL WHILE PRESSURE REFUELING

FAULT ISOLATION PROCEDURE

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
Multimeter

Personnel Required
Medium Helicopter Repairer
Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Aircraft Being Refueled

Materials:
None
10-3.14 TANK WILL NOT ACCEPT FUEL WHILE PRESSURE REFUELING (Continued)

1. STOP REFUELING.
2. DISCONNECT FUEL NOZZLE.
3. SET ALL TEST, RH AFT, RH MAIN, RH FWEL, LH FWEL, LH MAIN, AND LH AFT SWITCHES ON REFUEL PRECHECK PANEL TO FLOW.
4. OPEN GRAVITY FILL CAP ON TANK THAT DID NOT FILL.

Check floats on fuel level control valve is one stuck in up position?

- YES
- NO

DEFUEL AIRCRAFT. DISCONNECT PLUG FROM FUEL LEVEL CONTROL VALVE. APPLY 28VDC PWR. CHECK FOR 28VDC BETWEEN PLUG PIN 1(+) AND GROUND AND PIN 3(-) AND GROUND IS 28VDC PRESENT ON EITHER PIN?

- YES
- NO

REPLACE FUEL PRECHECK PANEL.

DEFUEL AIRCRAFT. REMOVE FITTING FROM FUEL LEVEL SHUTOFF VALVE. IS FITTING DEFECTIVE?

- YES
- NO

REPLACE FITTING.

REPLACE FUEL LEVEL SHUTOFF VALVE.

REPLACE FUEL LEVEL CONTROL VALVE.

REMOVE FUEL LEVEL SHUTOFF VALVE. BLOW INTO BOTH SENSE HOSES. DOES AIR BLOW FREELY INTO BOTH HOSES AND THROUGH LEVEL CONTROL VALVE?

- YES
- NO

REPLACE FUEL LEVEL SHUTOFF VALVE.

CLEAN OR REPLACE FUEL LEVEL VALVE AS REQUIRED.

REMOVE BOTH SENSE HOSES. BLOW INTO BOTH HOSES. DOES AIR BLOW FREELY THROUGH BOTH HOSES?

- YES
- NO

CLEAN OR REPLACE HOSES AS REQUIRED.
SECTION 10-4 EXTENDED RANGE FUEL SYSTEM (ERFS II) (WITH 32)
INITIAL SETUP
Applicable Configurations: With 12
Tools: Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Materials: None
Personnel Required: Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
- Electrical Power Off
- Battery Disconnected
- Hydraulic Power Off
- Forward Left Landing Gear Access Panel Open

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Check ERFS II refuel valve (1).</td>
<td>If valve (1) is loose or damaged, tighten or replace it as required. If wiring or connector (2) is damaged, repair or replace wiring or connector as required.</td>
</tr>
</tbody>
</table>

FOLLOW-ON MAINTENANCE:
None

END OF TASK
INITIAL SETUP

Applicable Configurations:
With None
Tools: None
Materials: None
Personnel Required: Medium Helicopter Repairer

References:
TM 55-1520-240-23

Equipment Condition:
TM 1-1560-312-10:
- ERFS II Fuel Control Panel Connected
- Visual Check of ERFS II Airframe Components Performed [Task 10-4.3]

TM 55-1520-240-23:
- Electrical Power Off
- Battery Connected
- Hydraulic Power Off

TASK RESULT

1. Check that FUEL REFUEL circuit breaker (1) is closed.
   If circuit breaker (1) is open, close it. If it opens again, go to [Task 10-4.6]

2. Set REFUEL STATION switch (2) to ON.

3. Set ERFS II REFUEL VALVE switch (3) to OPEN.
   IN-TRANSIT light (4) comes on during valve (5) operation and goes out when valve is open. Check that ERFS II refuel valve handle (6) is in OPEN position. If light (4) does not come on and handle is not at OPEN, go to [Task 10-4.7]
   If light comes on and stays on but handle is not at OPEN, go to [Task 10-4.2]. If light comes on and stays on but handle is at OPEN, replace ERFS II refuel valve.

4. Set ERFS II REFUEL VALVE switch (3) to CLOSE.
   IN-TRANSIT light (4) comes on during valve (5) operation and goes out when valve is closed. Check that ERFS II refuel valve handle (6) is in CLSD position. If light (4) does not come on and handle is not at CLSD, go to [Task 10-4.8]
   If light comes on and stays on but handle is at CLSD, replace ERFS II refuel valve.

FOLLOW-ON MAINTENANCE:
TM 55-1520-240-23:
- Battery disconnected.
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
- With

Tools:
- Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
- Multimeter

Materials:
- None

Personnel Required:
- Aircraft Electrician

References:
- TM 55-1520-240-23
- TM 1-1560-312-23 & P

Equipment Condition:
- TM 55-1520-240-23:
  - Battery Disconnected
  - Electrical Power On
  - Hydraulic Power Off

GO TO NEXT PAGE
10-4.5 FUEL REFUEL CIRCUIT BREAKER WILL NOT STAY CLOSED WHEN ERFS II FUEL CONTROL PANEL IS CONNECTED (Continued)

1. **WIRING CIRCUIT BREAKER (SWITCH) FOUND OPEN BEFORE ERFS II REFUEL VALVE UNIT OS1 TO OPEN?**
   - NO
     - REMOVE POWER, DISCONNECT FUEL CIRCUIT BREAKER POWER HARNESS CONNECTOR FROM RECEPTACLE 057/13. APPLY POWER. CHECK FOR GROUND ON RECEPTACLE 067/13 PIN 6 IS GROUND PRESENT?
   - YES
     - GO TO TASK 10-3.5

2. **CHECK FOR GROUND ON RECEPTACLE 057/13 PIN A. IS GROUND PRESENT?**
   - NO
     - REPLACE ERFS II FUEL CONTROL PANEL. (REF TM 1-1000-302-10.)
   - YES
     - OPEN TWO LEFT LANDING GEAR ACCESS PANELS. REMOVE POWER. DISCONNECT PLUG 057/15 FROM ERFS II REFUEL VALVE. APPLY POWER. CHECK FOR GROUND ON PLUG 057/15 PIN A. IS GROUND PRESENT?
     - NO
       - OPEN TWO LEFT LANDING GEAR ACCESS PANEL. REMOVE POWER. DISCONNECT PLUG 057/15 FROM ERFS II REFUEL VALVE. APPLY POWER. CHECK FOR GROUND ON PLUG 057/15 PIN 4. IS GROUND PRESENT?
       - YES
         - REPLACE ERFS II REFUEL VALVE. (REF TM 15-1020-249-23.)
       - NO
         - REPLACE ERFS II FUEL CONTROL PANEL. (REF TM 1-1000-302-10.)
     - YES
       - LOCATE GROUND FAULT ON WIRE W125-102-20 OR W154-57/15 BETWEEN RECEPTACLE 057/13 AND PLUG 057/15. REPAIR OR REPLACE WIRE AS REQUIRED.

3. **REPLACE ERFS II FUEL CONTROL PANEL. (REF TM 1-1000-302-10.)**
   - NO
     - RFPL AC E.RFS II REFUEL VALUE. (REF TM 15-1020-249-23.)
   - YES
     - END OF TASK

Change 22 10-187

END OF TASK
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
With B2

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

Materials:
None

Personnel Required:
Aircraft Electrician

References:
TM 55-1520-240-23
TM 1-1560-312-23 & P

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
10-4.6 ERFS II REFUEL VALVE HANDLE NOT AT OPEN POSITION WITH CONTROL PANEL REFUEL VALVE SWITCH SET TO OPEN (Continued)

TM 55-1520-240-T

10-4.6

END OF TASK
Change 22 10-189
10-4.7 ERFS II REFUEL VALVE HANDLE NOT AT OPEN POSITION AND CONTROL PANEL REFUEL VALVE IN TRANSIT LIGHT STAYS ON

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
With B2

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

Materials:
None

Personnel Required:
Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Power Off
Hydraulic Power Off

END OF TASK
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
With 

Tools:
Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915

Materials:
None

Personnel Required:
Aircraft Electrician

References:
TM 55-1520-240-23
TM 1-1560-312-23 & P

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

ERFS II CONTROL PANEL VALVE IN TRANSIT LIGHT DOES NOT COME ON WITH ERFS II REFUEL VALVE OPERATION NORMAL

GO TO NEXT PAGE
10-4.8 ERFS II CONTROL PANEL VALVE IN TRANSIT LIGHT DOES NOT COME ON WITH ERFS II REFUEL VALVE OPERATION NORMAL (Continued)

10-4.8

- **PRESS IN TRANSIT LIGHT DOES LIGHT COME ON?**
  - **YES**
    - **REMOVE ELECTRICAL POWER, DISCONNECT ERFS II REFUEL VALVE PLUG GT710. CHECK FOR OPEN CIRCUIT BETWEEN PLUG GT716 PIN 3 AND GROUND. IS CONTINUITY PRESENT?**
    - **NO**
      - **REPLACE LAMP, PRESS IN TRANSIT LIGHT. DOES LIGHT COME ON?**
    - **YES**
      - **FAULT CORRECTED.**
    - **NO**
      - **DISCONNECT ROBERTSON POWER HARNESS PLUG FROM RECEPTACLE GT715. CHECK FOR CONTINUITY BETWEEN RECEPTACLE GT715 PIN D AND GROUND. IS CONTINUITY PRESENT?**
        - **NO**
          - **LOCATE OPEN IN WIRE W025, W033 OR W064-32-23 BETWEEN RECEPTACLE GT715 AND PLUG 100-1215 AND GROUND. REPAIR OR REPLACE WIRE AS REQUIRED.**
        - **YES**
          - **LOCATE FAULT IN ROBERTSON ERFS II FUEL CONTROL PANEL. (REF TM 1-1560-313-35 & P)**
  - **NO**
    - **REPLACE ERFS II REFUEL VALVE.**

END OF TASK
INITIAL SETUP

Applicable Configurations:
With [ ]

Tools:
Electrical Repairer’s Tool Kit,
NSN 5180-00-3234915

Materials:
None

Personnel Required:
Aircraft Electrician

References:
TM 55-1520-240-23
TM 1-1560-312-23 & P

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power Off
Hydraulic Power Off

10-194 Change 22
END OF TASK
CHAPTER 11
FLIGHT CONTROLS SYSTEMS
TROUBLESHOOTING
**CHAPTER 11**

**FLIGHT SYSTEM TROUBLESHOOTING**

**CHAPTER OVERVIEW**

Chapter 11 contains procedures for Flight System troubleshooting. Each system and failure symptom is listed below. Included in this chapter are locations and views of all electrical connectors, receptacles, relays, and ground connections for the Flight System.

Refer to TM 55-1520-240-23 for required maintenance procedures.

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### FAILURE SYMPTOM LIST

**ARTIFICIAL FEEL - MAGNETIC BRAKES**

- **SYMPTOM** CONT CENTER CIRCUIT BREAKER DOES NOT STAY CLOSED
  - **TASK** 11-2.3
- **SYMPTOM** CONTROL STICK AND PEDALS WILL NOT STAY CENTERED AFTER PILOT'S CENTERING DEVICE RELEASE SWITCH RELEASED
  - **TASK** 11-2.4
- **SYMPTOM** CONTROL STICK DOES NOT REMAIN AT SELECTED POSITION
  - **TASK** 11-2.3

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<td>PILOT'S THRUST CONTROL DOES NOT EASILY MOVE OR DOES NOT REMAIN AT SELECTED POSITION</td>
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<tr>
<td>THRUST BRAKE CIRCUIT BREAKER DOES NOT STAY CLOSED</td>
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Change 3  11-2.1
# ADVANCED FLIGHT CONTROLS SYSTEM

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<td>AFT LCT INDICATOR NOT IN GND POSITION</td>
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<td>AFCS ROLL STABILIZATION ERRATIC OR OSCILLATORY OR ROLL ATTITUDE HOLD WEAK OR INOPERATIVE</td>
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<td>CLTV DRIVER ACTR CIRCUIT BREAKER WILL NOT STAY CLOSER</td>
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<td>CYCLIC TRIM AFT ACTR CIRCUIT BREAKER WILL NOT STAY CLOSER</td>
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<td>CYCLIC TRIM FWD ACTR CIRCUIT BREAKER WILL NOT STAY CLOSER</td>
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<td>CYCLIC TRIM MNL CIRCUIT BREAKER WILL NOT STAY CLOSER</td>
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<td>FORWARD LCT INDICATOR DOES NOT INDICATE EXTEND OR RETRACT DURING MANUAL CONTROL</td>
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<td>FORWARD LCT INDICATOR NOT IN GND POSITION</td>
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<td>HDG SWITCH ENGAGE CAPTION DOES NOT LIGHT</td>
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<td>HEADING SELECT MODE RESPONSE WEAK OR INOPERATIVE (BOTH SYSTEMS)</td>
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<td>NO. 1 AFCS AC CIRCUIT BREAKER WILL NOT STAY CLOSER</td>
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<td>NO. 1 AFCS COMPUTER BITE INDICATES 85 OR 86</td>
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<td>NO. 1 AFCS COMPUTER BITE INDICATES 89</td>
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<td>NO. 1 AFCS HEADING SELECT MODE RESPONSE WEAK OR INOPERATIVE</td>
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<td>NO. 1 AFCS OFF (WITHOUT 74) OR AFCS 1 (WITH 74) CAPSULE DOES NOT GO OUT WHEN SYSTEM SELECTED</td>
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<td>NO. 1 AFCS OFF (WITHOUT 74) OR AFCS 1 (WITH 74) CAPSULE IS OUT WITH SYSTEM SELECTED OFF</td>
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<td>NO. 1 ROLL ILCA DOES NOT EXTEND OR RETRACT WITH LATERAL STICK MOTION</td>
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<td>NO. 1 ROLL ILCA DOES NOT MOVE WHEN PILOT'S PITCH AND ROLL TRIM SWITCH MOVED RIGHT OR LEFT</td>
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<td>NO. 1 ROLL ILCA HAS ENGAGE TRANSIENT</td>
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## CHAPTER 11
### FLIGHT CONTROLS SYSTEMS TROUBLESHOOTING

#### CHAPTER OVERVIEW (Continued)

#### FAILURE SYMPTOM LIST (Continued)

**AFCS COMPUTER**

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Go to next page
FLIGHT SYSTEM ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST (Continued)

RECEPTACLE

9

15

17

PLUG

9

15

17

RECEPTACLE

21

24

26

PLUG

21

24

26
FLIGHT SYSTEM ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST (Continued)

RECEPTACLE

43

PLUG

43

RELAY

103

GND MODULE

150

GND STUD

151
11-1 FLIGHT CONTROL SYSTEM
11-1.1 FLIGHT CONTROL SYSTEM SCHEMATIC (Continued)
11-1.2 FLIGHT CONTROL SYSTEM CONNECTION DIAGRAM (Continued)
INITIAL SETUP

Applicable Configurations:
| All |

Tools:
None

Materials:
None

Personnel Required:
Medium Helicopter Repairer (2)

References:
TM 55-1520-240-23

Equipment Condition:
- Flight Control Closet Acoustic Blanket Removed
- Flight Control Closet Backup Panel Removed
- Forward Work Platform Open
- Pylon Work Platform Open
- Tunnel Covers Open
- One Aft Blade Positioned Behind and Off Helicopter Centerline
- Battery Connected
- Electrical Power On
- Hydraulic Power On

General Safety Instructions:

WARNING
Keep head, hands, and other body parts clear of moving flight controls. Hydraulic forces are strong enough to cause severe injury.
11-1.3 FLIGHT CONTROL SYSTEM OPERATIONAL CHECK (Continued)

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
</table>
| 1. Set FLT CONTR switch (1) to NO. 1 ON. | Control travel shall be smooth and easy.  
Hydraulic fluid leakage shall not exceed that specified in TM 55-1520-240-23.  
If control travel is stiff or binding, check controls for interference or defective bearings. Correct interference or replace defective bearings.  
If unusual noises are heard, replace noisy component.  
NOTE:  
It is not unusual for swashplate slider bearings to make some noise and chatter during ground operational checks. If hydraulic fluid is observed, refer to TM 55-1520-240-23 to determine allowable leakage. |
| 3. Release pilot CENTERING DEVICE RELEASE switch (2) and CP BRAKE TRIGGER switch (3). | |
| 4. Set FLT CONTR switch (1) to NO. 2 ON. | |
| 5. Repeat step 2 and step 3, then go to step 6. | |
| 6. Set FLT CONTR switch (1) to BOTH. | |

FOLLOW-ON MAINTENANCE:  
TM 55-1520-240-23:  
Hydraulic power off.  
Electrical power off.  
Battery disconnected.  
Flight control closet backup panel installed.  
Flight control closet acoustic blanket installed.  
Tunnel covers closed.  
Pylon work platforms closed.  
Forward work platforms closed.
11-2 ARTIFICIAL FEEL - MAGNETIC BRAKES
INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
Medium Helicopter Repairer

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off
Flight Controls Closet - Insulation Blanket
Removed
Flight Controls Closet Panel Opened
1. Check THRUST CONT BRAKE TRIGGER switch (1) on pilot’s and copilot’s thrust grips (2 and 3).
2. Check CENTERING DEVICE RELEASE switch (4) on pilot’s and copilot’s pitch and roll control grips (5 and 6).
3. Chock longitudinal centering spring (7).
4. Check longitudinal cockpit control driver actuator (ccda) (8).
5. Check roll magnetic brake (9).
6. Check roll centering spring (10).

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Check THRUST CONT BRAKE TRIGGER switch (1) on pilot’s and copilot’s thrust grips (2 and 3).</td>
<td>If either switch (1) is damaged, replace it.</td>
</tr>
<tr>
<td>2. Check CENTERING DEVICE RELEASE switch (4) on pilot’s and copilot’s pitch and roll control grips (5 and 6).</td>
<td>If either switch (4) is damaged, replace it.</td>
</tr>
<tr>
<td>3. Chock longitudinal centering spring (7).</td>
<td>If centering spring (7) is bent or has damaged pans, replace it.</td>
</tr>
<tr>
<td>4. Check longitudinal cockpit control driver actuator (ccda) (8).</td>
<td>If ccda (8) is loose or damaged, tighten or replace it as required. If wiring to ccda is damaged, repair or replace it as required.</td>
</tr>
<tr>
<td>5. Check roll magnetic brake (9).</td>
<td>If brake (9) is loose or damaged, tighten or replace it as required. If wiring to brake is damaged, repair or replace it as required.</td>
</tr>
<tr>
<td>6. Check roll centering spring (10).</td>
<td>If centering spring (10) is bent or has damaged parts, replace it.</td>
</tr>
<tr>
<td>7. Check yaw centering spring (11).</td>
<td>If centering spring (11) is bent or has damaged parts, replace it.</td>
</tr>
<tr>
<td>8. Check yaw magnetic brake (12).</td>
<td>If brake (12) is loose or damaged, tighten or replace it as required. If wiring to brake is damaged, repair or replace it as required.</td>
</tr>
<tr>
<td>9. Check collective ccda (13).</td>
<td>If ccda (13) is loose or damaged, tighten or replace it as required. If wiring to ccda is damaged, repair or replace it as required.</td>
</tr>
</tbody>
</table>

FOLLOW-ON MAINTENANCE: None
Initial Setup

References:
TM 55-1520-240-23

Equipment Condition:
Battery Connected
Hydraulic Power On

Personnel Required:
Medium Helicopter Repairer

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CHECK CIRCUIT BREAKERS</strong></td>
<td>If circuit breaker (1) is open, close it. If it opens again, go to [task 11-2.4]. If circuit breaker (2) is open, close it. If it opens again, go to [task 11-2.5].</td>
</tr>
<tr>
<td><strong>CHECK ARTIFICIAL FEEL AND PILOT CONTROL OF MAGNETIC BRAKES</strong></td>
<td>Control stick and directional pedals shall center easily and remain there after CENTERING DEVICE RELEASE switch (3) is released. If both control stick and directional pedals do NOT remain centered, go to [task 11-2.7]. If either control stick or directional pedals do not remain centered, continue operational check to identify problem.</td>
</tr>
<tr>
<td>1. Check that THRUST BRAKE circuit breaker (1) is closed.</td>
<td>Control stick shall move easily through longitudinal travel range and remain at selected position when switch (3) is released. If it does not, go to [task 11-2.7].</td>
</tr>
<tr>
<td>2. Check that CONT CENTER circuit breaker (2) is closed.</td>
<td>Control stick shall return to original position when control stick is released. If it does not, go to [task 11-2.7].</td>
</tr>
<tr>
<td>5. Move pilot control stick 1 inch forward and release control stick. Move pilot control stick 1 inch aft and release control stick.</td>
<td></td>
</tr>
</tbody>
</table>
11-2.3 ARTIFICIAL FEEL - MAGNETIC BRAKES OPERATIONAL CHECK (Continued)

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Press and hold pilot's CENTERING DEVICE RELEASE switch (3). Move pilot's control stick through lateral travel range. Position control stick 1 inch left of center position. Release switch.</td>
<td>Control stick shall move easily through lateral travel range and remain at selected position when switch (3) is released. If it does not, go to <strong>Task 11-2.7</strong>.</td>
</tr>
<tr>
<td>7. Move pilot's control stick 1 inch left and release control stick. Move pilot's control stick 1 inch right and release control stick.</td>
<td>Control stick shall return to original position when control stick is released. If it does not, go to <strong>Task 11-2.7</strong>.</td>
</tr>
<tr>
<td>8. Press and hold pilot's CENTERING DEVICE RELEASE switch (3). Move pilot's pedals through directional range. Position left pedal 1 inch forward of center. Release switch.</td>
<td>Pedals shall move easily through directional range and remain at selected position when switch (3) is released. If they do not, go to <strong>Task 11-2.8</strong>.</td>
</tr>
<tr>
<td>9. Move pilot's left pedal 1 inch forward and release it. Move pilot's right pedal 1 inch forward and release it.</td>
<td>Pedals shall return to original position when pedals are released. If they do not, go to <strong>Task 11-2.8</strong>.</td>
</tr>
<tr>
<td>10. Press and hold pilot's THRUST CONT BRAKE TRIGGER switch (4). Move pilot's thrust control full up. Release switch.</td>
<td>Thrust control shall move easily to full up and remain there after switch (4) is released. If not, go to <strong>Task 11-2.9</strong>.</td>
</tr>
</tbody>
</table>

**CHECK COPILOT CONTROL OF MAGNETIC BRAKES**

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. Press and hold pilot's THRUST CONT BRAKE TRIGGER switch (4). Move pilot's thrust control full down. Release switch.</td>
<td>Thrust control shall move easily and remain down after switch (4) is released. If not, go to <strong>Task 11-2.9</strong>.</td>
</tr>
</tbody>
</table>

**NOTE**

Thrust control down stop is spring loaded. Control will raise up from full down to a predetermined position when released.

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>12. Press and hold copilot's THRUST CONT BRAKE TRIGGER switch (4). Move copilot's thrust control from full down to full up and back to mid position. Release switch.</td>
<td>Thrust control shall move easily and remain at selected position after switch (4) is released. If not, go to <strong>Task 11-2.10</strong>.</td>
</tr>
<tr>
<td>13. Press and hold copilot's CENTERING DEVICE RELEASE switch (3). Move copilot's pitch and roll control stick forward. Release switch.</td>
<td>Control stick shall remain at selected position after switch (3) is released. If it does not, go to <strong>Task 11-2.11</strong>.</td>
</tr>
</tbody>
</table>

**FOLLOW-ON MAINTENANCE:**

**TM 55-1520-240-23:**

- Battery disconnected.
- Electrical power off.
- Hydraulic power off.
- Flight controls closet panel closed.
- Flight controls insulated blanket installed.

**END OF TASK**
11-2.4 THRUST BRAKE CIRCUIT BREAKER DOES NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off
Electronic Compartment Acoustic Blanket Removed
11-2.4 THRUST BRAKE CIRCUIT BREAKER DOES NOT STAY CLOSED (Continued)

**WAS CB OPEN BEFORE THRUST CONT BRAKE TRIGGER SW OPERATED?**

- **YES**
  - DISCONNECT COPILOT THRUST GRIP PLUG. IS GROUND PRESENT ON WIRE W896-57-22?
  - NO: REPLACE COPILOT THRUST GRIP.
  - YES: LOCATE GROUND FAULT ON WIRE W896-57-22 BETWEEN TB18 AND 300/25. REPAIR OR REPLACE WIRE AS REQUIRED.

- **NO**
  - DISCONNECT THREE WIRES FROM TB18 TERM 11. CHECK FOR GROUND ON WIRE W845-367-20. IS GROUND PRESENT?
  - NO: CHECK FOR GROUND ON WIRE W896-58-20. IS GROUND PRESENT?
    - NO: REPLACE PILOT THRUST GRIP.
    - YES: LOCATE GROUND FAULT ON WIRE W896-58-20 BETWEEN TB18 AND 300/25. REPAIR OR REPLACE WIRE AS REQUIRED.
  - YES: DISCONNECT PILOT THRUST GRIP PLUG. CHECK FOR GROUND ON WIRE W896-60-20. IS GROUND PRESENT?
    - NO: REPLACE PILOT THRUST GRIP.
    - YES: LOCATE GROUND FAULT ON WIRE W896-60-20 BETWEEN TB18 AND 300/25. REPAIR OR REPLACE WIRE AS REQUIRED.

**DISCONNECT 031PB FROM NO. 1 AFCS COMPUTER. CHECK FOR UNJUNG ON WIRE W854-23.20 AT TB18 TERM 11. IS GROUND PRESENT?**

- **NO**
  - REPLACE NO. 1 AFCS COMPUTER.

**END OF TASK**
Change 6 11-17
11-2.5 CONT CENTER CIRCUIT BREAKER DOES NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off
Electronic Compartment Acoustic Blanket Removed
11-2.5 CONT CENTER CIRCUIT BREAKER DOES NOT STAY CLOSED

(Continued)

WAS CB OPEN BEFORE CENTERING DEVICE RELEASE (SW OPERATED)?

NO

DISCONNECT SEVEN WIRES FROM TB18 TERMINALS 1 AND 2. CHECK FOR GROUND ON WIRE W666-234-20: IS GROUND PRESENT?

YES

REPLACE LONGITUDINAL CCDA.

NO

DISCONNECT PLUG FROM LONGITUDINAL CCDA: IS GROUND STILL PRESENT ON WIRE W666-234-20?

YES

LOCATE GROUND FAULT ON WIRE W666-234-20 BETWEEN TB18 AND 031327: REPAIR OR REPLACE WIRE AS REQUIRED.

NO

DISCONNECT PILOT PITCH AND ROLL CONTROL GRIP PLUG: IS GROUND STILL PRESENT ON WIRE W666-234-20?

YES

LOCATE GROUND FAULT ON WIRE W666-14-20 BETWEEN TB18 AND 302272: REPAIR OR REPLACE WIRE AS REQUIRED.

NO

DISCONNECT PILOT PITCH AND ROLL CONTROL GRIP PLUG: IS GROUND STILL PRESENT ON WIRE W666-14-20?

YES

DISCONNECT PILOT PITCH AND ROLL CONTROL GRIP.

NO

REPLACE PILOT PITCH AND ROLL CONTROL GRIP.

YES

DISCONNECT PLUG FROM YAW MAGNETIC BRAKE: IS GROUND STILL PRESENT ON WIRE W666-233-20?

NO

LOCATE GROUND FAULT ON WIRE W666-233-20 BETWEEN TB18 AND 031328: REPAIR OR REPLACE WIRE AS REQUIRED.

YES

DISCONNECT PILOT PITCH AND ROLL CONTROL GRIP.

NO

REPLACE PILOT PITCH AND ROLL CONTROL GRIP.

YES

DISCONNECT PLUG FROM ROLL MAGNETIC BRAKE: IS GROUND STILL PRESENT ON WIRE W666-232-20?

NO

LOCATE GROUND FAULT ON WIRE W666-232-20 BETWEEN TB18 AND 031329: REPAIR OR REPLACE WIRE AS REQUIRED.

YES

LOCATE GROUND FAULT ON WIRE W666-11-20 BETWEEN TB18 AND 031311: REPAIR OR REPLACE WIRE AS REQUIRED.

NO

DISCONNECT PILOT PITCH AND ROLL CONTROL GRIP.

YES

DISCONNECT COPILOT PITCH AND ROLL CONTROL GRIP PLUG: IS GROUND STILL PRESENT ON WIRE W666-20-20?

NO

REPLACE COPILOT PITCH AND ROLL CONTROL GRIP.

YES

DISCONNECT PILOT PITCH AND ROLL CONTROL GRIP.

NO

REPLACE PILOT PITCH AND ROLL CONTROL GRIP.

YES

DISCONNECT PLUG FROM ROLL MAGNETIC BRAKE.

NO

LOCATE GROUND FAULT ON WIRE W666-232-20 BETWEEN TB18 AND 031329: REPAIR OR REPLACE WIRE AS REQUIRED.

GO TO NEXT PAGE

11-19
11-2.5 CONT CENTER CIRCUIT BREAKER DOES NOT STAY CLOSED

(Continued)

NO

CHECK FOR GROUND ON WIRE W664-230-20 IS GROUND PRESENT?

NO

DISCONNECT PLUG O31P10 FROM NO. 2 AFCS COMPUTER.
CHECK FOR GROUND ON WIRE W664-230-20 AT TB18 IS GROUND PRESENT?

NO

REPLACE NO. 2 AFCS COMPUTER.

YES

LOCATE GROUND FAULT ON WIRE W664-230-20 BETWEEN TB18 AND O31P10. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

REPLACE NO. 1 AFCS COMPUTER.

YES

DISCONNECT PLUG O31P10 FROM NO. 1 AFCS COMPUTER.
IS GROUND STILL PRESENT ON WIRE W664-230-20?

NO

REPLACE COPILOT PITCH AND ROLL CONTROL GRIP.

YES

LOCATE GROUND FAULT ON WIRE W664-19-20 BETWEEN TB18 AND O31P10. REPAIR AND REPLACE WIRE AS REQUIRED.

DISCONNECT COPILOT PITCH AND ROLL CONTROL GRIP
PLUG IS GROUND STILL PRESENT ON WIRE W664-19-20?

NO

REPLACE YAW MAGNETIC BRAKE.

YES
11.2.6 CONTROL STICK AND PEDALS WILL NOT STAY CENTERED AFTER PILOT'S CENTERING DEVICE RELEASE SWITCH RELEASED

FAULT ISOLATION PROCEDURE
INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
67U10 Medium Helicopter Repairer
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power On
11-2.6 STICK AND PEDALS WILL NOT STAY CENTERED
AFTER PILOT’S CENTERING DEVICE RELEASE SWITCH
RELEASED (Continued)

- Disconnect pilot's pitch and roll control grip.
- Check for 28 VDC between 30023 pin 1 and ground, is 28 VDC present?
- Yes: Locate open in wire WS96-14-20 between 30022 and TB18 term 2, repair or replace wire as required.
- No: Replace pilot's pitch and roll control grip.
- No: Refer to trouble symptom [TASK 11-2.6].

- Disconnect pilot's pitch and roll control grip.
- Check for continuity between plug 30023 pins 5 and 7 when centering device release sw is pressed, is continuity present?
- Yes: Replace control center CB.
- No: Refer to trouble symptom [TASK 11-2.6].

- Move pedals without pressing centering device release sw, look at yaw magnetic brake, put pilot's arm and pedals in and out, does output arm move?
- Yes: Refer to trouble symptom [TASK 11-2.6].
- No: Locate open in wire WS96-11.22 or WS96-25.6-20 between LD CB11 and TB18 term 5, repair or replace wire as required.

- Press control center 3 centering device release sw.
- Center control center 3 pitch and roll stick and directional pedals, release sw, are controls stay centered?
- Yes: Yes.
- No: Move pedals without pressing centering device release sw, look at yaw magnetic brake, put pilot's arm and pedals in and out, does output arm move?
- Yes: Refer to trouble symptom [TASK 11-2.6].
- No: Replace control center CB.

END OF TASK
Change 2 11-23
11-2.7 CONTROL STICK DOES NOT REMAIN AT SELECTED POSITION

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Application Configurations:
All

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

Materials:
None

Personnel Required:
67U10 Medium Helicopter Repairer
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power On

GO TO NEXT PAGE
11-2.7 CONTROL STICK DOES NOT REMAIN AT SELECTED POSITION (Continued)

- **IS PROBLEM WITH LONGITUDINAL STICK POSITIONING?**
  - **YES**
    - MOVE CONTROL STICK FORE AND AFT WITHOUT PRESSING CENTERING DEVICE RELEASE SW. LOOK AT LONGITUDINAL CCDA OUTPUT ARM. DOES OUTPUT ARM MOVE WHEN STICK IS MOVED?
    - **NO**
      - REPLACE LONGITUDINAL CCDA.
      - **YES**
        - REPLACE LONGITUDINAL CENTERING SPRING.
    - **NO**
      - PRESS CENTERING DEVICE RELEASE SW AND MOVE STICK FORE AND AFT. LOOK AT LONGITUDINAL CCDA AS STICK IS MOVED. DOES OUTPUT ARM MOVE FREELY?
      - **NO**
        - DISCONNECT PLUG FROM LONGITUDINAL CCDA. PRESS CENTERING DEVICE RELEASE SW AND CHECK FOR 28 VDC BETWEEN 031P27 PIN 6 (I+) AND GND. IS CONTINUITY PRESENT?
        - **YES**
          - CHECK FOR CONTINUITY BETWEEN 031P27 PIN C AND GROUND. IS CONTINUITY PRESENT?
          - **YES**
            - REPLACE LONGITUDINAL CCDA.
          - **NO**
            - LOCATE OPEN IN WIRE WBB-224-2W BETWEEN TB18 AND PLUG 031P27. REPAIR OR REPLACE WIRE AS REQUIRED.
        - **NO**
          - LOCATE OPEN IN GROUND WIRE WBB-224-2W BETWEEN 031P27 AND GROUND STUD. REPAIR OR REPLACE WIRE AS REQUIRED.
      - **YES**
        - CHECK FOR CONTINUITY BETWEEN 031P26 PIN 2 AND GROUND. IS CONTINUITY PRESENT?
        - **YES**
          - REPLACE ROLL MAGNETIC BRAKE.
        - **NO**
          - LOCATE OPEN IN WIRE WBB-232-2W BETWEEN 031P26 AND TB18. REPAIR OR REPLACE WIRE AS REQUIRED.
          - LOCATE OPEN IN GROUND WIRE WBB-222-1AZON BETWEEN 031P26 AND GROUND STUD. REPAIR OR REPLACE WIRE AS REQUIRED.

- **IF PROBLEM IS WITH LATERAL STICK POSITIONING: MOVE CONTROL STICK LEFT AND RIGHT WITHOUT PRESSING CENTERING DEVICE RELEASE SW. LOOK AT ROLL MAGNETIC BRAKE OUTPUT ARM. DOES OUTPUT ARM MOVE WHEN STICK IS MOVED?**
  - **YES**
    - REPLACE ROLL MAGNETIC BRAKE.
  - **NO**
    - PRESS CENTERING DEVICE RELEASE SW AND MOVE STICK LEFT AND RIGHT. LOOK AT ROLL MAGNETIC BRAKE OUTPUT ARM. DOES OUTPUT ARM MOVE FREELY WHEN STICK IS MOVED?
    - **NO**
      - DISCONNECT PLUG FROM ROLL MAGNETIC BRAKE. PRESS CENTERING DEVICE RELEASE SW AND CHECK FOR 28 VDC BETWEEN 031P28 PIN 1 (I+) AND GND. IS 28 VDC PRESENT?
      - **YES**
        - CHECK FOR CONTINUITY BETWEEN 031P26 PIN 2 AND GROUND. IS CONTINUITY PRESENT?
        - **YES**
          - REPLACE ROLL MAGNETIC BRAKE.
        - **NO**
          - LOCATE OPEN IN WIRE WBB-232-2W BETWEEN 031P26 AND TB18. REPAIR OR REPLACE WIRE AS REQUIRED.
11-2.8 PEDALS DO NOT REMAIN AT SELECTED POSITION

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required
67U10 Medium Helicopter Repairer
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
Battery Connected
Electrical Power On
Hydraulic Power On
11-2.8 PEDALS DO NOT REMAIN AT SELECTED POSITION

(Continued)

- Press pilot's centering device release (fly mode control stick 1 inch forward. Release SW and stick, does stick stay at selected position?)
  - Yes: Move pedals back and forth without pressing centering device. Release SW. Look at yaw magnetic brake output arm. Does output arm freely move when pedals are moved back and forth?
  - No: Press centering device release SW and move pedal link arm forward, look at yaw magnetic brake output arm. Does output arm freely move when pedals are moved back and forth?

- Disconnect plug from yaw magnetic brake, press centering device release SW and check 28 VDC between 031/P2B pin 1 and GND. Is continuity present?
  - Yes: Replace yaw magnetic brake.
  - No: Check for continuity between 031/P2B pin 2 and GND. Is continuity present?

- Replace yaw magnetic brake.

- Replace yaw centering spring.

- Locate open in wire W664-233-30 between TR 1 and 031/P2B. Repair or replace wire as required.

- Replace pilot pitch and roll control grip.

END OF TASK
11-2.9 PILOT'S THRUST CONTROL DOES NOT EASILY MOVE OR DOES NOT REMAIN AT SELECTED POSITION

FAULT ISOLATION PROCEDURE

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
Multimeter

Materials:
None

Personnel Required:
67U10 Medium Helicopter Repairer
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power On
11-2.9 PILOT'S THRUST CONTROL DOES NOT EASILY MOVE OR DOES NOT REMAIN AT SELECTED POSITION (Continued)

- **Move Thrust Control UP and DOWN without pressng either PILOT'S THRUST CONTROL TRIMMER switch. THRUST CONTROL MOVE EASILY?**
  - **YES:** Replace copilot's thrust control grip.
  - **NO:** Disconnect copilot's thrust grip plug, press pilot's thrust cont brake trigger switch, move thrust control up and down, release switch does thrust control, stay at new position.

- **Connect copilot's thrust grip plug, disconnect pilot's thrust cont brake trigger switch, move thrust control and release switch does thrust control, easier to move than pilot's thrust control**
  - **YES:** Replace pilot's thrust control grip.
  - **NO:** Disconnect plug from pilot's thrust cont brake trigger switch and check for continuity between 30P23 Pin N and V, is continuity present?

- **Disconnect plug from collective CCDa, press copilot's thrust cont brake trigger switch and check for 28 VDC between 031F22 Pin 0 and GND, is 28 VDC present?**
  - **YES:** Replace no. 1 ACPS computer.
  - **NO:** Disconnect rod from collective CCDa, up and down is it any easier to move?

- **Is thrust brake pin open?**
  - **YES:** Refer to trouble symptom (ASK 11-2.1)
  - **NO:** Disconnect plug from collective CCDa, pin E, and GND, is 28 VDC present?

- **Check for 28 VDC between TE19 terminal B+1 and GND when pilot's thrust cont brake trigger switch is pressed, is 28 VDC present?**
  - **YES:** Locate open in wire W684-251-20 between TE19 and 031F22, repair or replace wire as required.
  - **NO:** Release switch, check for continuity between 031F22 Pin C and GND, is continuity present?

- **Locate open in ground wire W684-03220002 between 031F22 and fuse 1.80 A, check for continuity, repair or replace wire as required.**

- **Locate open in wire W684-158-20 between plug 031F22 and plug 031F23, repair or replace wire as required.**

- **Connect plug 031F2 from no. 1 ACPS computer, check for continuity, between plug 031F23 pin D and plug 031F2 Pin 0, is continuity present?**
  - **YES:** Clean ball, splined part of both thrust controls.
  - **NO:** Replace collective CCDa.
11-2.9 PILOT'S THRUST CONTROL DOES NOT EASILY MOVE OR
DOES NOT REMAIN AT SELECTED POSITION (Continued)
11-2.9 PILOT'S THRUST CONTROL DOES NOT EASILY MOVE OR DOES NOT REMAIN AT SELECTED POSITION (Continued)
11-2.10 COPILOT'S THRUST CONTROL DOES NOT EASILY MOVE OR DOES NOT REMAIN AT SELECTED POSITION

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
Aircraft Electrician (2)

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power On

END OF TASK
11-2.11 CONTROL STICK WILL NOT REMAIN AT SELECTED POSITION AFTER COPILOT'S CENTERING DEVICE RELEASE SWITCH RELEASED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
- All

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

Materials:
- None

Personnel Required:
- 66F10 Aircraft Electrician
- 66F20 Aircraft Electrician

References:
- TM 55-1520-240-23

Equipment Condition:
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power On

### Fault Isolation Procedure

**Initial Setup**

- **Applicable Configurations:** All
- **Tools:** Electrical Repairer's Tool Kit, NSN 5180-00-323-4915, Multimeter
- **Materials:** None
- **Personnel Required:** 66F10 Aircraft Electrician, 66F20 Aircraft Electrician
- **References:** TM 55-1520-240-23
- **Equipment Condition:** TM 55-1520-240-23: Battery Connected, Electrical Power On, Hydraulic Power On

---

**Fault Isolation Procedure Diagram:**

1. **Press Pilot's Centering Device Release Switch, Move Control Stick Left, Release SW, Does Stick Stay Left?**
   - **Yes:**
     - Disconnect Copilot's Pitch and Roll Control Grip Plug, Press Centering Device Release SW, Check for Continuity Between Plug 300V Pin 1 and Pin 3 is Continuity Present?
   - **Yes:**
     - Replace Copilot's Pitch and Roll Control Grip
   - **No:**
     - Refer to Trouble Symptom LT 2.6
   - **No:**
     - Disconnect Copilot's Pitch and Roll Control Grip Plug, Press Centering Device Release SW, Check for Continuity Between Plug 300V Pin 1 and Pin 3 is Continuity Present?

2. **Locate Open in Wire W69-19-20 or W69-20-20 Between 300J0 and TB18, Repair or Replace Wire as Required**

---

**End of Task**

11-33/(11-34 blank)
11-3 AFCS
11-3 AFCS

11-3.1 AFCS SCHEMATIC (AFCS SENSOR INPUTS AND COMPONENT INTERFACES)
11-3.1 AFCS SCHEMATIC (AFCS POWER AND CONTROL) (Continued)
11-3.1 AFCS SCHEMATIC (COLLECTIVE AXIS LOGIC)
11-3.1 AFCS SCHEMATIC (PROXIMITY SWITCHES POWER AND CONTROL)

- NO 1 AFCS COMPUTER
  - PITCH RATE LOOP
    - FULL GAIN
    - HALF GAIN
  - LONG POS CONT Ckt
    - ENABLED
    - DISABLED

- LH GROUND CONTACT
  - MAINTENANCE PANEL

- NO 1 PDP
  - 28V DC BUS
  - 03/08
  - TO NO 1 AFCS COMPUTER

- LEFT LANDING GEAR PROXIMITY SWITCH
  - OUTPUT
  - NEG

- NO 2 AFCS COMPUTER
  - PITCH RATE LOOP
    - FULL GAIN
    - HALF GAIN
  - LONG POS CONT Ckt
    - ENABLED
    - DISABLED

- RH GROUND CONTACT
  - MAINTENANCE PANEL

- NO 2 PDP
  - 03/09
  - TO NO 2 AFCS COMPUTER

- RIGHT LOG GEAR PROXIMITY SWITCH
  - OUTPUT
  - NEG

NOTE: 1 2

Change 9 11-42.1
GO TO NEXT PAGE
11-3.1 AFCS SCHEMATIC (PITCH ILCA SIGNAL CIRCUIT)
11-3.1 AFCS SCHEMATIC (HEADING HOLD LOGIC)

Diagram showing the heading hold logic circuitry. The diagram includes various components such as steering control box, swivel brake, cyclic and collective switches, and logic gates for yaw out of detent, airspeed, yaw rate, and bank angle logic. The schematic also includes notes and references to other figures or sections.

NOTE:
1. See Bank Angle Logic Schematic.
11-3.1 AFCS SCHEMATIC (AFCS BIT POWER AND CONTROL)

NOTE:
1. SWITCH CLOSED WITH LEVER IN STOR

END OF TASK
11-3.1.1 AFCS WIRING DIAGRAM (Continued)
<table>
<thead>
<tr>
<th>NO.</th>
<th>TEST NAME</th>
<th>MONITOR POINT</th>
<th>OUTPUT (SEC)</th>
<th>DELAY (SEC)</th>
<th>STIM POINT</th>
<th>STIM LEVEL</th>
<th>REMARKS</th>
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<tbody>
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<td>0</td>
<td>BITE POS. GO</td>
<td>STIM GEN OUTPUT</td>
<td>&lt; -4.0</td>
<td>-6.0</td>
<td>MON, MULTIPLEXER</td>
<td>+3.760</td>
<td>SAME</td>
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<tr>
<td>1</td>
<td>BITE NEG. GO</td>
<td>STIM GEN OUTPUT</td>
<td>&gt; -4.0</td>
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<td>3</td>
<td>DER V. RATE</td>
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<td>PITCH ATT DEMOD</td>
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<td>4</td>
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<td>LCP FONK POT.</td>
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<tr>
<td>8</td>
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<td>8 DEG R. ATT L &amp; DET</td>
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</tbody>
</table>

END OF TASK
11-3.2 AFCS VISUAL CHECK

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
35K10 Avionic Mechanic

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23
Battery Disconnected
Electrical Power Off
Hydraulic Power Off
Pylon Left Work
Platform Open
Forward Left Work
Platform Open
Flight Controls Closet Acoustic Blanket Removed
Electronic Compartment Acoustic Blanket Removed
Flight Controls Closet Panel Open

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Check AFCS panel.</td>
<td>If knob (1) is loose, tighten it. If any switch (2 or 3) is damaged, replace AFCS panel.</td>
</tr>
<tr>
<td>2. Check FWD and AFT CYC TRIM indicators (4 and 5).</td>
<td>If either indicator (4 or 5) is damaged, replace it.</td>
</tr>
<tr>
<td>3. Check pilot’s radar altimeter (6).</td>
<td>If altimeter (6) is damaged, replace it.</td>
</tr>
<tr>
<td>4. Check pilot’s HSI (7).</td>
<td>IF HSI (7) is damaged, replace it.</td>
</tr>
<tr>
<td>5. Check pilot’s HSI MODE SELECT panel (8).</td>
<td>If panel (8) is damaged, replace it.</td>
</tr>
<tr>
<td>6. Check pilot’s pitch and roll trim switch (9).</td>
<td>If switch (9) is damaged, replace it.</td>
</tr>
<tr>
<td>7. Repeat steps 4, 5, and 6 for copilot’s radar altimeter, HSI, and HSI MODE SELECT panel (6, 7, and 8), then go to step 8.</td>
<td></td>
</tr>
<tr>
<td>8. Check copilot’s pitch and roll trim switch (9).</td>
<td>If switch (9) is damaged, replace it.</td>
</tr>
</tbody>
</table>
9. Check NO. 1 AFCS computer (10).
   If computer (10) is loose or damaged, tighten or replace it as required. If any of four lines (11) are loose or damaged, tighten or replace them as required. If either connector (12) is loose or damaged, tighten or replace it as required. If wiring to either connector (12) is damaged, repair or replace it as required.

10. Check NO. 2 AFCS computer (13).
    If computer (13) is loose or damaged, tighten or replace it as required. If any of four lines (14) are loose or damaged, tighten or replace them as required. If either connector (15) is loose or damaged, tighten or replace it as required. If wiring to either connector (15) is damaged, repair or replace it as required.

11. Check directional gyro (16).
    If gyro (16) is damaged, replace it. If connector to gyro is loose or damaged, tighten or replace it as required. If wiring to connector is damaged, repair or replace it as required.

12. Check pilot's vertical gyro (17).
    If gyro (17) is damaged, replace it. If connector to gyro is loose or damaged, tighten or replace it. If wiring to connector is damaged, repair or replace it as required.

13. Check copilot's vertical gyro (18).
    If gyro (18) is damaged, replace it. If connector to gyro is loose or damaged, tighten or replace it. If wiring to connector is damaged, repair or replace it as required.
<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>14. Check yaw linear transducer (cpt) (19).</td>
<td>If transducer (19) is damaged, replace it. If either connector (10) is loose or damaged, tighten or replace it. If wiring to either connector is damaged, replace transducer.</td>
</tr>
<tr>
<td>15. Check collective cockpit control actuator (ccda) (21).</td>
<td>If ccda (21) is loose or damaged, tighten or replace it as required. If connector to ccda is loose or damaged, tighten or replace it as required. If wiring to connector is damaged, repair or replace it as required.</td>
</tr>
<tr>
<td>16. Check dash actuator (22).</td>
<td>If actuator (22) is damaged, replace it. If connector (23 or 24) is loose or damaged, tighten or replace it as required. If wiring to either connector is damaged, repair or replace it as required.</td>
</tr>
<tr>
<td>17. Check pitch and roll linear transducer (25).</td>
<td>If either transducer (25) is damaged, replace it. If any connector (26) is loose or damaged, tighten or replace it as required. If wiring to any connector is damaged, replace transducer.</td>
</tr>
<tr>
<td>18. Check longitudinal ccda (27).</td>
<td>If ccda (27) is loose or damaged, tighten or replace it as required. If connector to ccda is loose or damaged, tighten or replace it as required. If wiring to connector is damaged, repair or replace it as required.</td>
</tr>
<tr>
<td>18.1 Check all electrical connectors in flight control closet.</td>
<td>If any connector contains hydraulic fluid, clean it thoroughly.</td>
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</table>
11-3.2 AFCS VISUAL CHECK (Continued)

<table>
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</thead>
<tbody>
<tr>
<td>19 Check aft longitudinal cyclic trim actuator (28).</td>
<td>If actuator (28) is damaged, replace it. If connector to actuator is loose or damaged, tighten or replace it as required. If wiring to connector is damaged, repair or replace it as required.</td>
</tr>
<tr>
<td>20 Check forward longitudinal cyclic trim actuator (29).</td>
<td>If actuator (29) is damaged, replace it. If connector to actuator is loose or damaged, tighten or replace it as required. If wiring to connector is damaged, repair or replace it as required.</td>
</tr>
</tbody>
</table>

FOLLOW-ON MAINTENANCE:

- TM 55-1520-240-23:
  - Close Flight Controls Closet Panel
  - Flight Controls Closet Acoustic Blanket Installed
  - Forward Left Work Platform Closed
  - Pylon Left Work Platform Closed

END OF TASK
11-3.3  AFCS OPERATIONAL CHECK

INITIAL SETUP

Applicable Configurations:
All

Tools:
None

Materials:
None

Personnel Required:
35K20 Avionic Mechanic

References:
TM 11-1520-240-20
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power On
Aircraft Weight Supported By Its Own Wheels.
Visual Check of AFCS Performed [Task 11-3.2]

TASK

CHECK CIRCUIT BREAKERS

1. Check that following circuit breakers in NO. 1 PDP are closed:
   a. AFCS NO. 1 (1)
   b. CLTV DRIVER ACTR (2)
   c. NAV COPLT VG I (3)
   d. NAV COPLT HS I (4)
   e. NAV CMPS (5)
   f. NAV COPLT HSI (6)
   g. NAV CMPS (7)
   h. DC
   i. AFCS NO. 1 (8)
   j. CLTV DRIVER ACTR (9)
   k. CYCLIC TRIM MNL (10)
   l. and FWD ACTR (11)
   m. NAV COPLT HSI
   n. MODE SEL (12)
   o. HYDRAULICS BRAKE STEER (13)
   p. CONT CENTER (14)
   q. THRUST BRAKE (15)

If any circuit breaker (1 through 14) is open close it. If AFCS NO. 1 circuit breaker (1) opens again, go to [Task 11-3.3].
If CLTV DRIVER ACTR circuit breaker (2) opens again, go to [Task 11-3.3].
If NAV COPLT VG I, COPLT HSI, CMPS, COPLT HS I, CMPS circuit breaker (3, 4, 5, 6, or 7) open again, refer to TM 11-1520-240-20.
If AFCS NO. 1 circuit breaker (8) opens again, go to [Task 11-3.3].
If CLTV DRIVER ACTR circuit breaker (9) opens again, go to [Task 11-3.3].
If CYCLIC TRIM MNL circuit breaker (10) opens again, go to [Task 11-3.3].
If CYCLIC TRIM FWD ACTR circuit breaker (11) opens again, go to [Task 11-3.3].
If NAV COPLT HSI MODE SEL circuit breaker (12) opens again, refer to TM 11-1520-240-20.
If BRAKE STEER circuit breaker (13) opens again, go to task 7-4.4.
If CONT CENT or THRUST BRAKE circuit breaker (14 or 15) opens again, go to 11-2.3.
2. Check that following circuit breakers in NO. 2 PDP are closed.
   AC
   AFCS NO. 2 (16)
   NAV PILOT VGI (17)
   NAV PLT HSI (19)
   DC
   AFCS NO. 2 (20)
   CYCLIC TRIM AFT ACTR (21)
   NAV CONT VG 1 (22)
   NAV RAD ALT (23)
   NAV PLT HSI
   MODE SEL (24)

CHECK NO. 1 AFCS

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>If any circuit breaker (16 through 24) is open, close it. If AFCS NO. 2 circuit breaker (16) opens again, go to [Task 11-3.10]. If NAV PILOT VGI, PLT HSI or PLT HSI circuit breaker (17, 18, or 19) opens again, refer to TM 11-1520-240-20 for troubleshooting information. If AFCS NO. 2 circuit breaker (20) opens again, go to [Task 11-3.11]. If CYCLIC TRIM AFT ACTR circuit breaker (21) opens again, go to [Task 11-3.12]. If NAV CONT VGI, RAD ALT, or PLT HSI MODE SEL circuit breaker (22, 23, or 24) opens again, refer to TM 11-1520-240-20 for troubleshooting information.</td>
<td></td>
</tr>
</tbody>
</table>
11-3.3 AFCS OPERATIONAL CHECK (Continued)

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Set SYSTEM SEL switch (26) to OFF.</td>
<td>NO. 1 AFCS OFF and NO. 2 AFCS OFF (Without 74 capsules (27 and 28) shall come on. If NO. 1 AFCS OFF (Without 74) AFCS 1 and 2 (With 74) AFCS 1 and 2 (With 74) capsules (27 and 28) are out, go to Task 11-3.13. If NO. 2 AFCS OFF (Without 74) AFCS 2 (With 74) capsule (28) is out, go to Task 11-3.14.</td>
</tr>
<tr>
<td>5. Set SWIVEL switch (29) to LOCK.</td>
<td>Radar altimeter OFF flag shall go out of view. Digital readout shall indicate 0 to 5 feet after 1 minute warmup. If OFF flag is still in view or digital indication is not 0 to 5 feet, refer to TM 11-1520-240-20 for troubleshooting information.</td>
</tr>
<tr>
<td>6. Turn pilot's radar altimeter LO SET knob (30) until lo</td>
<td>CMD SEL caption shall come on. If it does not, refer to TM 11-1520-240-20.</td>
</tr>
<tr>
<td>7. Turn pilot's HSI HDG knob (32) until heading cursor (33) is 30° degrees clockwise from aircraft heading.</td>
<td>Points on both indicators (38 and 39) shall be in GND position. If both pointers are not in GND position, go to Task 11-3.17. If FWD CYC TRIM indicator pointer is not at GND position, go to Task 11-3.17.</td>
</tr>
<tr>
<td>8. Press and release pilot’s CMD SEL switch (34).</td>
<td>Set switch to AUTO if required.</td>
</tr>
<tr>
<td>9. Check that both ENGINE CONDITION levers (35 and 36) are at STOP.</td>
<td>No. 1 roll ILCA output shaft shall extend when switch (40) right then left. Release switch.</td>
</tr>
<tr>
<td>10. Check that CYCLIC TRIM AUTO MANUAL switch (37) is at AUTO.</td>
<td>No. 1 roll ILCA output shaft shall extend when switch (40) right then left. Release switch.</td>
</tr>
</tbody>
</table>

11-3.4 TASK RESULT

12. Set SYSTEM SEL switch (26) to 1. | NO. 1 AFCS OFF (Without 74) AFCS 1 (With 74) capsule (27) shall go out. No large Integrated Lower Control Actuator (ILCA) engagement transients (hardovers) shall occur. No large ILCA engagement transients (hardovers) occurs, go to Task 11-3.19 for pitch transient, Task 11-3.20 for roll transient, or Task 11-3.21 for yaw transient. |
<p>| 13. Move pilot's directional pedals right, then left. Return pedals to center. | No. 1 roll ILCA output shaft shall extend with pedal right and retract with pedal left. If No. 1 yaw ILCA output shaft does not extend or retract, go to Task 11-3.22. |
| 14. Move pilot’s pitch and roll control stick right, then left. Return grip to center. | No. 1 roll ILCA output shaft shall extend with stick right and retract with stick left. If No. 1 roll ILCA output shaft does not extend or retract, go to Task 11-3.22. |
| 15. Momentarily set pilot’s pitch and roll trim switch (40) right then left. Release switch. | Set switch to AUTO if required. |
| 15.1 Momentarily set co-pilot's pitch and roll trim switch (40) right then left. Release switch. | No. 1 roll ILCA output shaft shall extend when switch (40) right and retract when switch is left. If No. 1 roll ILCA output shaft does not extend or retract, go to Task 11-3.22. |
| 16. Press and hold pilot’s CENTERING DEVICE RELEASE switch (25). Center pilot’s pitch and roll control stick and directional pedals. Release CENTERING DEVICE RELEASE switch. | No. 1 roll ILCA output shaft shall extend when switch (40) right and retract when switch is left. If No. 1 roll ILCA output shaft does not extend or retract, go to Task 11-3.22. |</p>
<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WARNING</strong></td>
<td>Keep head, hands, and other body parts clear of flight controls, especially those in flight controls closet. AFCS BITE automatically causes actuator and controls motion. Severe injury can occur.</td>
</tr>
<tr>
<td>17. Set NO. 1 ENGINE CONDITION lever (35) to FLIGHT.</td>
<td></td>
</tr>
<tr>
<td>18. Press and release NO. 1 AFCS computer BITE switch (41).</td>
<td>Computer digital test counter (42) shall remain blank. BITE switch (41) shall not flash. If counter does not remain blank or BITE switch flashes, go to task 11-3.25</td>
</tr>
<tr>
<td>19. Set NO. 1 ENDING CONDITION lever (35) to STOP. Set NO. 2 ENGINE CONDITION lever (36) to FLIGHT. Repeat step 18 then go to step 20.</td>
<td></td>
</tr>
<tr>
<td>20. Set NO. 2 ENGINE CONDITION lever (36) to STOP.</td>
<td></td>
</tr>
<tr>
<td>21. Press and release BITE switch (41).</td>
<td>Computer counter (42) shall step and display from 1 through 3 and stop at 3. BITE switch (41) shall light and flash while display is stepping and then glow steadily after display indicates 3. If display is blank and BITE switch does not light, go to task 11-3.25. If counter steps to and stops at 3 but BITE switch does not light, replace NO. 1 AFCS computer. If BITE switch lights but display stops at 1 or 2, repeat operational check. If same result occurs, replace NO. 1 AFCS computer.</td>
</tr>
<tr>
<td>22. Press and release BITE switch (41).</td>
<td>Computer counter (42) shall step and display from 4 through 95 (end of test) and go blank. BITE switch shall flash while display is stepping. If BITE switch lights steadily, and counter stops at an intermediate number, record that number. Push BITE switch to continue test. Go to table 11-3.3 to determine maintenance action. At end of test, counter shall go blank and BITE switch light shall go out. If BITE switch lamp flashes at step 95, the PUSH TO TEST switch on the Pilots or Copilots radar altimeter indicator must be actuated within 20 seconds in order to avoid a false failure indication.</td>
</tr>
</tbody>
</table>
11-3.3 AFCS OPERATIONAL CHECK (Continued)

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>23. Set SYSTEM SEL switch (26) to BOTH, pause for 10 seconds then set it to OFF through position 2.</td>
<td>NO. 1 AFCS OFF and NO. 2 AFCS OFF (Without 74) capsules (27 and 28) shall come on. If NO. 1 AFCS OFF (Without 74) AFCS 1 (With 74) capsule (27) is out, go to Task 11-3.13. If NO. 2 AFCS OFF (Without 74) AFCS 2 (With 74) capsule (28) is out, go to Task 11-3.14.</td>
</tr>
<tr>
<td>24. Set SWIVEL switch (26) to LOCK.</td>
<td>Radar altimeter OFF flag shall go out of view. Digital readout shall indicate 0 to 5 feet after 1 minute warmup.</td>
</tr>
<tr>
<td>25. Turn pilot's radar altimeter LO SET knob (30) until load index (31) is at 100.</td>
<td>Digital set index (31) is at 100.</td>
</tr>
<tr>
<td>26. Turn pilot's HSI HDG knob (32) until heading cursor (33) is 30° degrees clockwise from aircraft heading.</td>
<td>CMD SEL caption shall come on. If it does not, refer to TM 11-1520-240-20.</td>
</tr>
<tr>
<td>27. Press and release pilot's CMD SEL switch (34).</td>
<td>Set them to STOP if required.</td>
</tr>
<tr>
<td>28. Check that both ENGINE CONDITION levers (35 and 36) are at STOP.</td>
<td>Set switch to AUTO if required.</td>
</tr>
<tr>
<td>29. Check that Cylindrical TRIM AUTO MANUAL switch (37) is at AUTO.</td>
<td>Pointers on both indicators (38 and 39) shall be in GND position. If both pointers are not in GND position, go to Task 11-3.10. If FWD CYC TRIM indicator pointer is not at GND position, go to Task 11-3.16. If AFT CYC TRIM indicator pointer is not at GND position, go to Task 11-3.17.</td>
</tr>
<tr>
<td>30. Check FWD and AFT CYC TRIM indicators (38 and 39).</td>
<td>No. 2 AFCS OFF (Without 74) capsules (27 and 28) shall go out. No large Integrated Lower Control Actuator (ILCA) engagement transients (hardovers) shall occur. If capsule (28) is still on, go to Task 11-3.27. If large ILCA engagement transients (hardovers) occur, go to Task 11-3.28 for pitch transient, Task 11-3.29 for roll transient, or Task 11-3.30 for yaw transient. No. 2 yaw ILCA output shaft shall extend with pedal right and retract with pedal left. If No. 2 yaw ILCA output shaft does not extend or retract, go to Task 11-3.31. No. 2 roll ILCA output shaft shall extend with stick right and retract with stick left. If No. 2 roll ILCA output shaft does not extend or retract, go to Task 11-3.32. Momentarily set pilot's pitch and roll trim switch (40) right then left. Release switch.</td>
</tr>
<tr>
<td>31. Set SYSTEM SEL switch (26) to 2.</td>
<td>No. 2 roll ILCA output shaft shall extend when switch (40) is right and retract when switch is left. If No. 2 roll ILCA output shaft does not extend or retract, go to Task 11-3.33.</td>
</tr>
<tr>
<td>32. Move pilot's directional pedals right, then left. Return pedals to center.</td>
<td>No. 2 roll ILCA output shaft shall extend when switch (40) is right and retract when switch is left. If No. 2 roll ILCA output shaft does not extend or retract, go to Task 11-3.33.</td>
</tr>
<tr>
<td>33. Move pilot's pitch and roll control stick right, then left. Return grip to center.</td>
<td>No. 2 roll ILCA output shaft shall extend when switch (40) is right and retract when switch is left. If No. 2 roll ILCA output shaft does not extend or retract, go to Task 11-3.33.</td>
</tr>
<tr>
<td>34. Momentarily set pilot's pitch and roll trim switch (40) right then left. Release switch.</td>
<td>No. 2 roll ILCA output shaft shall extend when switch (40) is right and retract when switch is left. If No. 2 roll ILCA output shaft does not extend or retract, go to Task 11-3.33.</td>
</tr>
<tr>
<td>34.1 Momentarily set copilot's pitch and roll trim switch (40) right then left. Release switch.</td>
<td>No. 2 roll ILCA output shaft shall extend when switch (40) is right and retract when switch is left. If No. 2 roll ILCA output shaft does not extend or retract, go to Task 11-3.33.</td>
</tr>
<tr>
<td>35. Press and hold pilot's CENTERING DEVICE RELEASE switch (25). Center pilot's pitch and roll control stick and directional pedals. Release CENTERING DEVICE RELEASE switch.</td>
<td>No. 2 roll ILCA output shaft shall extend when switch (40) is right and retract when switch is left. If No. 2 roll ILCA output shaft does not extend or retract, go to Task 11-3.33.</td>
</tr>
</tbody>
</table>
11-3.3 AFCS OPERATIONAL CHECK (Continued)

11-3.3

36. Set NO. 1 ENGINE CONDITION lever (35) to FLIGHT.

37. Press and release NO. 2 AFCS computer BITE switch (43).

38. Set NO. 1 ENGINE CONDITION lever (35) to STOP. Set NO. 2 ENGINE CONDITION lever (36) to FLIGHT. Repeat step 37 then go to step 39.

39. Set NO. 2 ENGINE CONDITION lever (36) to STOP.

40. Press and release BITE switch (43).

41. Press and release BITE switch (43).

**WARNING**
Keep head, hands, and other body parts clear of flight controls, especially those in flight controls closet. AFCS BITE automatically causes actuator and controls motion. Severe injury can occur.

Computer digital test counter (44) shall remain blank. BITE switch (43) shall not flash. If counter does not remain blank or BITE switch flashes, go to task 11-3.25.

Computer counter (44) shall step and display from 1 through 3 and stop at 3. BITE switch (41) shall light and flash while display is stopping and then glow steadily after display indicates 3. If display is blank and BITE switch does not light, go to task 11-3.34.
If counter stops at 1 or 2, repeat operational check. If same result occurs, replace NO. 2 AFCS computer.

Computer counter (44) shall step and display from 4 through 95 (end of test) and go blank. BITE switch shall flash while display is stepping. If BITE switch lights steadily, and counter stops at an intermediate number, record that number. Push BITE switch to continue test. Go to table 11-3.1 to determine maintenance action. At end of test, counter shall go blank and BITE switch light shall go out. If BITE switch lamp flashes at step 95, the PUSH TO TEST switch on the Pilots or Copilots radar altimeter indicator must be actuated within 20 seconds in order to avoid a false failure indication.
11-3.3 AFCS OPERATIONAL CHECK (Continued) 11-3.3

CHECK LONGITUDINAL CYCLIC TRIM ACTUATOR CONTROL

42. Set CYCLIC TRIM AUTO MANUAL switch (37) to MANUAL.

43. Set and hold FWD switch (45) to EXT. FWD CYC TRIM indicator (38) pointer shall move from GND to EXT position. If it does not, go to task 11-3.35.

44. Set and hold FWD switch (45) to RET. FWD CYC TRIM indicator (38) pointer shall move from EXT to RET position. If it does not, go to task 11-3.35.

45. Release FWD switch (45). Set and hold AFT switch (46) to EXT. AFT CYC TRIM indicator (39) pointer shall move from GND to EXT position. If it does not, go to task 11-3.36.

46. Set and hold AFT switch (46) to RET. AFT CYC TRIM indicator (39) pointer shall move from EXT to RET position. If it does not, go to task 11-3.36.

47. Release AFT switch (46).

48. Set CYCLIC TRIM AUTO MANUAL switch (37) to AUTO. Pointers on FWD and AFT CYC TRIM indicators (38 and 39) shall move to GND positions.

CHECK HDG, RAD ALT, AND BARO ALT SWITCHES

49. Check that SYSTEM SEL switch (26) is at BOTH. If not, set it to BOTH.

50. Press and hold HDG switch (47). HDG switch (47) ENGAGED caption shall come on. If not, go to task 11-3.37.

51. Release HDG switch (47).

52. Press and release RAD ALT switch (48). RAD ALT switch (48) ENGAGED caption shall come on and stay on. If not, go to task 11-3.39.

CHECK LONGITUDINAL COCKPIT CONTROL DRIVER ACTUATOR

55. Set and hold pilot's pitch and roll trim switch (40) forward. Pitch and roll control sticks shall move forward. If not, go to task 11-3.39.

56. Set and hold pilot's pitch and roll trim switch (40) aft. Pitch and roll control sticks shall move aft. If not, go to task 11-3.39.

57. Repeat steps 55 and 56 using copilot's pitch and roll trim switch (40).

NOTE
If a problem with AFCS occurred during flight and could not be verified by the AFCS operational check, refer to table 11-3.2 to locate trouble symptom task number.

| TABLE 11-3.1 |
|----------------|----------------|
| BITE TEST NUMBER | TASK NO. OR MAINTENANCE ACTION |
| 4, 5, 7, 8, 10-17, 19-47, 49-69 | Replace computer  |
| 75-84, 88, 90-94, 96-127 |  |
| 6, 9, 18 | 11-3.40 |
| 48 | 11-3.41 |
| 70-74 | 11-3.42 |
| 85, 86 | 11-3.43 or 11-3.44 |
| 87 | 11-3.45 |
| 89 | 11-3.46 or 11-3.47 |
| 95 | 11-3.48 |

11-58 Change 2
### TABLE 11-3.2

<table>
<thead>
<tr>
<th>TROUBLE SYMPTOM</th>
<th>NO. 1 AFCS</th>
<th>NO. 2 AFCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Longitudinal Axis:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AFCS Pitch Stabilization Erratic or Oscillatory</td>
<td>NO. 1-3-49</td>
<td>NO. 1-3-49</td>
</tr>
<tr>
<td>AFCS Pitch Attitude/Airspeed Hold Weak or Inoperative</td>
<td>NO. 1-3-30</td>
<td>NO. 1-3-30</td>
</tr>
<tr>
<td>AFCS Longitudinal Control Position Out of Trim</td>
<td>NO. 1-3-52</td>
<td>NO. 1-3-52</td>
</tr>
<tr>
<td>Lateral Axis:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AFCS Roll Stabilization Erratic/Oscillatory or Roll Attitude Hold Weak or Inoperative</td>
<td>NO. 1-3-53</td>
<td>NO. 1-3-53</td>
</tr>
<tr>
<td>Heading Select Mode Response Weak or Inoperative (Both Systems)</td>
<td>NO. 1-3-31</td>
<td>NO. 1-3-31</td>
</tr>
<tr>
<td>AFCS Heading Select Mode Response Weak or Inoperative</td>
<td>NO. 1-3-35</td>
<td>NO. 1-3-35</td>
</tr>
<tr>
<td>Directional Axis:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>YAW Stability Erratic/Oscillatory</td>
<td>NO. 1-3-57</td>
<td>NO. 1-3-57</td>
</tr>
<tr>
<td>AFCS Heading Hold Weak or Inoperative</td>
<td>NO. 1-3-55</td>
<td>NO. 1-3-55</td>
</tr>
<tr>
<td>AFCS Lateral Stick Only Turns Not Coordinated</td>
<td>NO. 1-3-60</td>
<td>NO. 1-3-60</td>
</tr>
<tr>
<td>Collective Axis:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barometric Altitude Hold Inoperative or Response Erratic (Radar Altitude Hold Okay)</td>
<td>NO. 1-3-54</td>
<td>NO. 1-3-54</td>
</tr>
<tr>
<td>Radar Altitude Hold Inoperative or Response Erratic (Barometric Altitude Hold Okay)</td>
<td>NO. 1-3-62</td>
<td>NO. 1-3-62</td>
</tr>
<tr>
<td>Barometric and Radar Altitude Hold Inoperative or Response Erratic</td>
<td>NO. 1-3-65</td>
<td>NO. 1-3-65</td>
</tr>
</tbody>
</table>

### FOLLOW-ON MAINTENANCE:

- TM 55-1520-240-23:
  - Hydraulic Power Off
  - Electrical Power Off
  - Battery Disconnected
  - Flight Controls Closet Acoustic Blanket Installed.

- Electronic Compartment Acoustic Blanket Installed
- Pylon Left Work Platform Closed.
- Forward Left Work Platform Closed.
11-3.4 NO. 1 AFCS AC CIRCUIT BREAKER WILL NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
35K20 Avionic Mechanic

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23
Battery Disconnected
Electrical Power Off
Hydraulic Power Off

END OF TASK
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit,
NSN 5180-00-323-4915
Multimeter

Personnel Required:
35K10 Avionic Mechanic
35K20 Avionic Mechanic

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23
Battery Disconnected
Electrical Power Off
Hydraulic Power Off

Materials:
None
DISCONNECT PLUG 031P22 FROM COLLECTIVE CCD, CHECK FOR GROUND ON PIN B, IS GROUND PRESENT?

YES

NO

DISCONNECT PLUG 031P27 FROM LONGITUDINAL CCD, CHECK FOR GROUND ON PLUG 031P27 PIN B, IS GROUND PRESENT?

YES

NO

OPEN NO. 1 PDP, DISCONNECT TWO WIRES FROM CLTV DRIVER ACTR CB 031CB7, CHECK FOR GROUND ON WIRE W550-114-22, IS GROUND PRESENT?

YES

NO

LOCATE GROUND FAULT ON WIRE W550-114-22 OR W864-198-20 BETWEEN CB 031CB7 AND PLUG 031P27, REPAIR OR REPLACE WIRE AS REQUIRED.

REPLACE COLLECTIVE CCD.

REPLACE LONGITUDINAL CCD.

END OF TASK
11-3.6 AFCS NO. 1 DC CIRCUIT BREAKER WILL NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Personnel Required:
35K10 Avionic Mechanic
35K20 Avionic Mechanic

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23
Battery Disconnected
Electrical Power Off
Hydraulic Power Off

Materials:
None
11-3.6 AFCS NO. 1 DC CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

DISCONNECT PLUG 031PB FROM NO. 1 AFCS COMPUTER. CHECK FOR GROUND ON PLUG PIN A. IS GROUND PRESENT?

DISCONNECT PLUG 031PB FROM COPLOT ROLL ERECTION CUTOUT RELAY. CHECK FOR GROUND ON PLUG PIN 2. IS GROUND PRESENT?

OPEN AFT LANDING GEAR ACCESS PANEL. DISCONNECT PLUG 148P2 FROM LEFT LANDING GEAR PROXIMITY SWITCH. CHECK FOR GROUND ON PLUG PIN 8. IS GROUND PRESENT?

OPEN NO. 1 PDF DISCONNECT WIRE W550-115-20 FROM NO. 1 AFCS DC 98-551385. CHECK FOR GROUND AT NO. 1 AFCS COMPUTER PLUG 031PB PIN A. IS GROUND PRESENT?


REPLACE NO. 1 AFCS COMPUTER.

REPLACE AFCS PANEL.

REPLACE COPLOT ROLL ERECTION CUTOUT RELAY.

REPLACE LEFT LANDING GEAR PROXIMITY SWITCH.

REPLACE LEFT LANDING GEAR PROXIMITY SW RELAY.
11-3.6 AFCS NO. 1 DC CIRCUIT BREAKER WILL NOT STAY CLOSED
(Continued)

END OF TASK
11-3.7 CLTV DRIVER ACTR CIRCUIT BREAKER WILL NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
35K10 Avionic Mechanic
35K20 Avionic Mechanic

References:
TM 55-1520-240-23

Equipment Condition:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off
11-3.8 CYCLIC TRIM MNL CIRCUIT BREAKER WILL NOT STAY CLOSED

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
Avionic Mechanic (2)

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off

Fault Isolation Procedure

1. **REPLACE AFCS PANEL.**

2. **OPEN NO. 1 POP AND DISCONNECT WIRE W550-109-20 FROM CYCLIC TRIM MNL CB 031B3. CHECK FOR GROUND ON WIRE W550-109-20. IS GROUND PRESENT?**
   - **YES**
     - **LOCATE GROUND FAULT ON WIRE W550-109-20, W645-180-20, OR W557-894-20 BETWEEN CYCLIC TRIM MNL CB AND AFCS PANEL. REPAIR OR REPLACE WIRE AS REQUIRED.**
   - **NO**
     - **NO. 1 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT**

3. **LOCATE GROUND FAULT ON WIRE W550-110-20, W645-180-20, OR W557-105-22 BETWEEN CYCLIC TRIM MNL CB AND AFCS PANEL. REPAIR OR REPLACE WIRE AS REQURED.**

END OF TASK
11-3.9 CYCLIC TRIM FWD ACTR CIRCUIT BREAKER WILL NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
35K10 Avionic Mechanic
35K20 Avionic Mechanic

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23
Battery Disconnected
Electrical Power Off
Hydraulic Power Off

END OF TASK
INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
Avionic Mechanic

References:
TM 55-1520-240-23

Equipment Condition:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off

11-70 Change 9

END OF TASK
Fault Isolation Procedure

Initial Setup

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
35K10 Avionic Mechanic
35K20 Avionic Mechanic

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23
Battery Disconnected
Electrical Power Off
Hydraulic Power Off
11-3.11 AFCS NO. 2 DC CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

**DIAGRAM**

- **DISCONNECT FROM NO. 2 AFCS COMPUTER PLUG 031P4.**
  - **CHECK FOR GROUND ON PLUG PIN A. IS GROUND PRESENT?**
    - NO: REPLACE NO. 3 AFCS COMPUTER.
    - YES: REMOVE AFCS CONTROL PANEL AND DISCONNECT PLUG 031P3B. CHECK FOR GROUND ON PIN A. IS GROUND PRESENT?
      - NO: REPLACE AFCS PANEL.
      - YES: DISCONNECT PLUG 031PS FROM PILOT ROLL EJECTION CUTOUT RELAY. CHECK FOR GROUND ON PLUG PIN 2. IS GROUND PRESENT?
        - NO: REPLACE PILOT ROLL EJECTION CUTOUT RELAY.
        - YES: DISCONNECT PLUG 148P1 FROM RIGHT LANDING GEAR PROXIMITY SWITCH. CHECK FOR GROUND ON PLUG PIN B. IS GROUND PRESENT?
          - NO: REPLACE RIGHT LANDING GEAR PROXIMITY SWITCH.
          - YES: REMOVE RIGHT LANDING GEAR PROXIMITY RELAY. CHECK FOR GROUND ON RELAY SOCKET TERMINAL X1. IS GROUND PRESENT?
            - NO: REPLACE RIGHT LANDING GEAR PROXIMITY SW RELAY.
            - YES: OPEN NO. 3 PEP DISCONNECT D25-133-220 FROM NO. 2 AFCS COMPUTER PLUG 031P4 ON PIN A. IS GROUND PRESENT?

11-3.11 AFCS NO. 2 DC CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

Disconnect wire W694-226-20 from TB17 term 11. Check for ground on wire W694-226-20. Is ground present?

- Yes: Locate ground fault on wire W694-226-20. Repair or replace wire as required.
- No: Locate ground fault on wire W694-226-20. Repair or replace wire as required.

11-74
11-3.12 CYCLIC TRIM AFT ACTUATOR CIRCUIT BREAKER WILL NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
Avionic Mechanic (2)

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off

DISCONNECT PLUG 031P10 ON
NO. 2 AFCS COMPUTER. CHECK
FOR GROUND ON PLUG 031P10
PIN E. IS GROUND PRESENT?

YES

LOCATE GROUND FAULT ON
WIRE W654-113-20, W645-
140-20, OR W652-130-20 BE-
TWEEN NO. 2 AFCS COMPUTER
AND NO. 2 PIP/ CYCLIC TRIM
AFT ACT CB 031CB1. REPAIR
OR REPLACE WIRE AS RE-
QUIRED.

NO

REPLACE NO. 2 AFCS COMPUT-
ER.

END OF TASK
Change 6 11-75
11-3.13 NO. 1 AFCS OFF (WITHOUT 74) OR AFCS 1 (WITH 74) CAPSULE IS OUT WITH SYSTEM SELECTED OFF

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Personnel Required:
Avionic Mechanic (2)

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On

Tools:
Electrical Repairer’s Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials:
None

GO TO NEXT PAGE

11-76 Change 23
11-3.13 NO. 1 AFCS OFF (WITHOUT 74) OR AFCS 1 (WITH 74) CAPSULE IS OUT WITH SYSTEM SELECTED OFF (Continued)

REMOVE AFCS PANEL AND DISCONNECT PLUG 031P7. CHECK CONTINUITY BETWEEN AFCS PANEL J1 RECEPTACLE PINS A AND M WITH SYSTEM SEL SWITCH TO:

SYSTEM SELECT SWITCH POSITION
OFF
1
2

CONTINUITY?
NO
YES
YES
NO

IS CONTINUITY PRESENT AS NOTED?

YES

DISCONNECT PLUG 031P3 FROM NO. 1 AFCS COMPUTER. GROUND PLUG 031P3 PIN 8. DOES CAPSULE COME ON?

NO

REPLACE MASTER CAUTION PANEL.

REPLACE NO. 1 AFCS COMPUTER.

YES

REPLACE AFCS PANEL.

NO

REPLACE MASTER CAUTION PANEL AND DISCONNECT PLUG 220P1. CHECK FOR CONTINUITY BETWEEN PLUG 220P1 PIN 9 (WITH 74) AND PLUG 031P3 PIN 8. IS CONTINUITY PRESENT?

NO

LOCATE OPEN IN WIRE W664-151-03, W664-270(03), OR W577-707-22 BETWEEN PLUG 220P1 AND PLUG 031P3. REPAIR OR REPLACE WIRE AS REQUIRED.

YES

REPLACE MASTER CAUTION PANEL.

END OF TASK

Change 23 11-77
11-3.14 NO. 2 AFCS OFF (WITHOUT 74) OR AFCS 2 (WITH 74) CAPSULE IS OUT WITH SYSTEM SELECTED OFF

Fault Isolation Procedure

Initial Setup
Applicable Configurations:
- All

Tools:
- Electrical Repairer’s Tool Kit
  - NSN 5180-00-323-4915
- Multimeter

Materials:
- None

Personnel Required:
- Avionic Mechanic (2)

References:
- TM 55-1520-240-23
- TM 55-1520-240-23
- Battery Connected
- Electrical Power On
- Hydraulic Power On

GO TO NEXT PAGE
11-3.14 NO. 2 AFCS OFF (WITHOUT OR AFCS 2 (WITH 24) CAPSULE IS OUT WITH SYSTEM SELECTED OFF (Continued)

END OF TASK

Change 23  11-79
11-3.15 BOTH LCT INDICATORS NOT IN GROUND POSITION

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
- AFCS Line Test Set 145G0009-1
  Prepared For Use

Personnel Required:
- 35K10 Avionic Mechanic
- 35K20 Avionic Mechanic

References:
- TM 55-1520-240-23
- TM 55-4920-429-13

Equipment Condition:
- TM 55-1520-240-23
  Battery Connected
  Electrical Power On
  Hydraulic Power On
- TM 55-4920-429-13
  Electrical Power On
  Multimeter Hydraulic Power On
- TM 55-1520-240-23

GO TO NEXT PAGE
11-3.15 BOTH LCT INDICATORS NOT IN GROUND POSITION (Continued)

AT CONSOLE, DISCONNECT PLUG 300P60 FROM RECEPTACLE 300U600. AT NO. 2 AFCS COMPUTER, DISCONNECT PLUG 031P4. AT NO. 1 AFCS COMPUTER, DISCONNECT PLUG 031P3. CHECK FOR CONTINUITY BETWEEN PLUG 031P4 PINS 11 AND 12, IS CONTINUITY PRESENT?

NO

CONNECT PLUG 300P60. REMOVE ELECTRICAL POWER. DISCONNECT RELAY 148K2 FROM SOCKET 148K2. PLACE A JUMPER WIRE BETWEEN 148K2 PINS 11 AND 12. CHECK FOR CONTINUITY BETWEEN PLUG 031P4 PINS 11 AND 12, IS CONTINUITY PRESENT?

NO


YES

REPLACE RELAY 148K1.

END OF TASK

Change 9

11-81/(11-82 blank)
11-3.16 FORWARD LCT INDICATOR NOT IN GND POSITION

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations: All

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

Materials: None

Personnel Required:
- Avionic Mechanic (2)

References:
- TM 55-1520-240-23

Equipment Condition:
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power On

GO TO NEXT PAGE
11-3.16 FORWARD LCT INDICATOR NOT IN GND POSITION (Continued)

- SET CYCLIC TRIM AUTO/MANUAL SWITCH TO MANUAL, MANUALLY TRIM FWD LCT ACTUATOR TO GND POSITION. CHECK FOR GND Position with FWD SW. BSTY, USE CYCLIC TRIM INDICATOR DRIVE TO GND POSITION?
  - Yes: CHECK FOR CONTINUITY BETWEEN NO. 1 AFCS COMPUTER PIN 031P6 PIN 6 AND NO. 1 AFCS COMPUTER PLUG 031P7 PIN 7. IS CONTINUITY PRESENT?
    - No: LOCATE OPEN IN WIRE W66-1-20, W66-1-20, OR W57-696-20 BETWEEN AFCS PANEL AND NO. 1 AFCS COMPUTER COMPUTER PLUG 031P6 PIN 6 AND 031P7 PIN 7. IS CONTINUITY PRESENT?
    - Yes: REPLACE NO. 1 AFCS COMPUTER.

- SET FWD SW TO EXT POSITION. THEN TO RET POSITION, DOES FWD LCT ACTUATOR EXTEND AND RETRACT?
  - Yes: CHECK FOR CONTINUITY BETWEEN FWD CYCLIC TRIM INDICATOR PLUG 031P32 PIN 7 AND NO. 1 AFCS COMPUTER PLUG 031P3 T PIN. IS CONTINUITY PRESENT?
    - No: DISCONNECT PLUG FROM FWD LCT ACTUATOR. REMOVE AFCS PANEL AND DISCONNECT PLUG 031P7. CHECK FOR CONTINUITY BETWEEN PLUG 031P7 PIN 5 AND FWD LCT ACTUATOR RECEP TACLE 031P128 PIN 5. IS CONTINUITY PRESENT?
    - Yes: PERFORMANCE LCT ACTUATOR OUTPUT MOTION TEST ON FWD ACTUATOR REFER TO TM 55-1520-240-23. DOES ACTUATOR CHECK OKAY?
    - No: REPLACE NO. 1 AFCS COMPUTER.

- DISCONNECT WIRE W57-696-20 OR W66-1-20, OR W66-1-20 BETWEEN AFCS PANEL AND NO. 1 AFCS COMPUTER PLUG 031P7 PIN 7.
  - Yes: CHECK CONTINUITY BETWEEN NO. 1 AFCS COMPUTER PLUG 031P32 PIN 7 AND LCT ACTUATOR RECEPTACLE 031P128 PIN 6 AND PLUG 031P7 PIN 7. IS CONTINUITY PRESENT?
    - No: REPLACE NO. 1 AFCS COMPUTER.
  - No: PERFORMANCE LCT ACTUATOR OUTPUT MOTION TEST ON FWD ACTUATOR REFER TO TM 55-1520-240-23. DOES ACTUATOR CHECK OKAY?
    - Yes: REPLACE NO. 1 AFCS COMPUTER.

END OF TASK

Change 6 11-85
11-3.17 AFT LCT INDICATOR NOT IN GND POSITION

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required
35K10 Avionic Mechanic
35K20 Avionic Mechanic

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power On
11-3.17 AFT LCT INDICATOR NOT IN GND POSITION (Continued)

**SET CYCLIC TRIM AUTO/MANUAL SWITCH TO MAN. MANUALLY TRIM AFT.**

- **YES**
  - CHECK FOR CONTINUITY BETWEEN NO. 2 AFCS COMPUTER PLUG 031PA PIN 2 AND AFCS PANEL PLUG 031PA PIN 3. YES = CONTINUITY PRESENT?
    - **NO**
      - REPLACE NO. 2 AFCS COMPUTER.
    - **YES**
      - REPLACE NO. 2 AFCS COMPUTER.

- **NO**
  - LOCATE OPEN IN WIRE W664-192-20 BETWEEN PLUG 031PA AND RELAY SOCKET. REPAIR OR REPLACE WIRE AS REQUIRED.

**SET AFT SW TO EXT POSITION. THEN TO RET POSITION, DOES AFT LCT ACTUATOR EXTEND AND RETRACT?**

- **YES**
  - CHECK FOR CONTINUITY BETWEEN AFT CYCLIC TRIM INDICATOR PLUG 031P3 PIN 2 AND NO. 2 AFCS COMPUTER PLUG 031PA PIN 1. YES = CONTINUITY PRESENT?
    - **NO**
      - REPLACE AFT CYCLIC TRIM INDICATOR.
    - **YES**
      - FAULT CORRECTED.

- **NO**
  - LOCATE OPEN IN WIRE W557-712-22 OR W664-198-20 BETWEEN PLUG 031P3 AND PLUG 031PA. REPAIR OR REPLACE WIRE AS REQUIRED.

- **CHECK CONTINUITY BETWEEN AFCS CONTROL PR. PLUG 031PA PIN P. AND AFT LCT ACTUATOR RECEPTACLE 033L1 PIN 8. AFCS PR. PLUG 036PIN R AND LCT ACTUATOR PLUG 031PA. IS CONTINUITY PRESENT?**

- **YES**
  - PERFORM LCT ACTUATOR OUTPUT MOTION TEST FOR AFT LCT ACTUATOR. REFER TO TM 55-1520-240-23. DOES ACTUATOR CHECK OKAY?
    - **NO**
      - REPLACE AFT LCT ACTUATOR.
    - **YES**
      - REPLACE AFT LCT ACTUATOR.

- **NO**

END OF TASK

Change 13 11-87
No. 1 AFCS off (without 74) or AFCS 1 (with 74) capsule does not go out when system selected

Fault Isolation Procedure

Initial Setup

References:
TM 55-1520-240-23

Applicable Configurations:
All

Tools:
Electrical Repairer Tool Kit,
NSN 5180-00-323-4915
Multimeter

Equipment Condition:
Battery Connected
Electrical Power On

Materials:
None

Personnel Required:
Avionic Mechanic (2)

Fault Isolation Procedure

References:
TM 55-1520-240-23
TM 11-1520-240-23

Electrical Power On

Materials:
Hydraulic Power On

Personnel Required:
Avionic Mechanic (2)
NO. 1 AFCS OFF (WITHOUT 74) OR AFCS 1 (WITH 74) CAPSULE DOES NOT GO OUT WHEN SYSTEM SELECTED (Continued)
11-3.18 NO. 1 AFCS OFF (WITHOUT 74) OR AFCS 1 (WITH 74) CAPSULE DOES NOT GO OUT WHEN SYSTEM SELECTED (Continued)
NO AFCS OFF (WITHOUT 74) OR AFCS 1 (WITH 74) CAPSULE DOES NOT GO OUT WHEN SYSTEM SELECTED (Continued)

**Diagram:***

1. **NO**
   - Disconnect AFCS PNL plug 031P7. Check for 28 VDC between plug 031P7 pin A and ground. Is 28 VDC present?
   - **YES**
     - Check for continuity between plug 031P7 pin 4 and plug 021P7 pin M. Is continuity present?
   - **YES**
     - Replace AFCS panel.
   - **NO**
     - Locate open in wire W557-700-20 or W564-221-20 between plug 031P7 and TRP2 term 3K. Repair or replace wire as required.

2. **YES**
   - Locate open in wire W564-130-20 or W57-950-20 between plug 031P7 and plug 031P7. Repair or replace wire as required.

---

**Notes:**
- Change 23 11-90.1
11.3.18 NO. 1 AFCS OFF (WITHOUT $74$) OR AFCS 1 (WITH $74$) CAPSULE DOES NOT GO OUT WHEN SYSTEM SELECTED (Continued)
11-3.18 NO. 1 AFCS OFF CAPSULE DOES NOT GO OUT WHEN SYSTEM SELECTED (Continued)
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
35K10 Avionic Mechanic
35K20 Avionic Mechanic

References:
TM 55-1520-240-23
TM 55-4920-429-13

Equipment Condition:
TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power On

AFCS Line Test Set 145G0009-1
Prepared for Use

GO TO NEXT PAGE
11-3.19 NO. 1 PITCH ILCA HAS ENGAGE TRANSIENT (Continued)

Perform Pitch ILCA NULL Test. Refer to TMA-1520-240-22. Does Pitch ILCA Null Check Okay?

Yes

Was Pitch ILCA Authority Phasing Test Performed Before Null Test?

Yes

Replace No. 1 AFCS Computer.

No

No

Replace Pitch ILCA.

Yes

Yes

Locate Open in Wire W664-17-20, W664-65-20, W664-24-20 (or W664-64-20) for Pins 1 and 2 or Wire W664-24-20, W664-65-20, W664-30-20 or W664-67-20 for Pins 11 and 12. Repair or Replace Wire as Required.

Yes

Check for Ground on Plug 031P13 Pin 7 Is Ground Present?

Yes

Replace Pitch ILCA.

No


Select SW Positions

<table>
<thead>
<tr>
<th>A-Select Switch</th>
<th>B-Select Switch</th>
<th>Resistance (Ohms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-18</td>
<td>B-19</td>
<td>Less Than 1100</td>
</tr>
<tr>
<td>A-45</td>
<td>B-80</td>
<td>1500 to 2200</td>
</tr>
<tr>
<td>A-11</td>
<td>B-17</td>
<td>Less Than 1100</td>
</tr>
<tr>
<td>A-13</td>
<td>B-12</td>
<td>Less Than 1100</td>
</tr>
</tbody>
</table>

Are All Resistance Values Present?

No


Select SW Positions

<table>
<thead>
<tr>
<th>A-Select Switch</th>
<th>B-Select Switch</th>
<th>Plug 031P13 Pins jumpered</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-18</td>
<td>B-19</td>
<td>3 and 4</td>
</tr>
<tr>
<td>A-45</td>
<td>B-80</td>
<td>8 and 10</td>
</tr>
<tr>
<td>A-06</td>
<td>B-07</td>
<td>11 and 12</td>
</tr>
<tr>
<td>A-11</td>
<td>B-12</td>
<td>13 and 14</td>
</tr>
<tr>
<td>A-13</td>
<td>B-12</td>
<td>13 and 14</td>
</tr>
</tbody>
</table>

Does Test Set Meter Read Continuity?

No


Select SW Position

<table>
<thead>
<tr>
<th>Plugs 031P13 to Plug 031P13 Pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-18</td>
</tr>
<tr>
<td>B-19</td>
</tr>
<tr>
<td>A-45</td>
</tr>
<tr>
<td>B-80</td>
</tr>
<tr>
<td>A-11</td>
</tr>
<tr>
<td>B-12</td>
</tr>
<tr>
<td>A-13</td>
</tr>
</tbody>
</table>

Plug Wires to Plug 031P13 Pin WIRE NO.

<table>
<thead>
<tr>
<th>Wire No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>W664-25-20</td>
</tr>
<tr>
<td>W664-26-20</td>
</tr>
<tr>
<td>W664-27-20</td>
</tr>
<tr>
<td>W664-15-10 OR W664-66-20</td>
</tr>
<tr>
<td>W664-19-20 OR W664-66-20</td>
</tr>
</tbody>
</table>

Repair or Replace Wiring As Identified For Any Plug Pin Pair Where Continuity Is Not Present.
11-3.20 NO. 1 ROLL HAS ILCA ENGAGE TRANSIENT

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations: All

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

Materials: None

Personnel Required:
35K10 Avionic Mechanic
35K20 Avionic Mechanic

References:
TM 55-1520-240-23
TM 55-4920-429-13

Equipment Condition:
TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power On

TM 55-4920-429-13
AFCS Line Test Set Prepared For Use

Note

Cockpit

APCS Panel

No. 1 ILCA Receptacle

Roll

Forward

Rotated For Clarity

No. 1 APCS Computer
11-3.20 NO. 1 ROLL ILCA HAS ENGAGE TRANSIENT (Continued)

Perform Roll ILCA Null Test. Refer to TM 55-1520-240-23. Does Roll ILCA Null Check Okay?

Yes

No

Was Roll ILCA Authority Phasing Test Performed Before Null Test?

Yes

No

Replace No. 1 AFCS Computer.

Get Test Set Meter Source Switch No Continuity Set AFC Panel System Select Switch to OFF. Turn Test Set A-SELECT and B-SELECT Switches and Check Resistance As Follows:

<table>
<thead>
<tr>
<th>SELECT SWITCH POSITIONS</th>
<th>RESISTANCE (OHMS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-34</td>
<td>B-36</td>
</tr>
<tr>
<td>A-49</td>
<td>B-48</td>
</tr>
<tr>
<td>A-29</td>
<td>B-30</td>
</tr>
<tr>
<td>A-31</td>
<td>B-30</td>
</tr>
</tbody>
</table>

Are All Resistance Values Present?

Yes

Replace Roll ILCA.

No

Disconnect Plug 031P15 From Roll ILCA. Turn A-SELECT and B-SELECT Switches to Position That Resistance Value Was Not Present. Connect Jumper Wire Between Plug 031P15 Pins for That Position As Follows:

<table>
<thead>
<tr>
<th>SELECT SWITCH POSITIONS</th>
<th>PLUG 031P15 PINS JUMPERED</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-34</td>
<td>B-35 3 and 4</td>
</tr>
<tr>
<td>A-49</td>
<td>B-48 8 and 10</td>
</tr>
<tr>
<td>A-29</td>
<td>B-30 11 and 12</td>
</tr>
<tr>
<td>A-31</td>
<td>B-30 13 and 14</td>
</tr>
</tbody>
</table>

Does Test Set Meter Read Continuity?

Yes

Remove Electrical Power. Remove Jumper uninsulated 26/2 Wire. Check For Continuity Between Plug 031P15 Pins and Plug 031P15 Pins for Select Switch Position That Failed As Follows:

<table>
<thead>
<tr>
<th>SELECT SWITCH POSITION</th>
<th>PLUG 031P15 PIN</th>
<th>PLUG 031P15 PIN</th>
<th>WIRE NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-34</td>
<td>B-35 3</td>
<td>A-49 B-48 4</td>
<td>W664-37-20</td>
</tr>
<tr>
<td>A-49</td>
<td>B-48 10</td>
<td>A-29 B-30 14</td>
<td>W664-40-20</td>
</tr>
<tr>
<td>A-29</td>
<td>B-30 8</td>
<td>A-31 B-20 13</td>
<td>W664-41-20</td>
</tr>
<tr>
<td>A-31</td>
<td>B-20 14</td>
<td></td>
<td>W664-45-20</td>
</tr>
</tbody>
</table>

Repair or Replace Wiring as Identified for Any Plug Pin Pair Where Continuity Is Not Present.

Check For Ground On Plug 031P15 Pin 7 Is Ground Present?

Yes

Replace Roll ILCA.

No

Locate Open In Wire W664-17-20, W664-24-20 Or W664-27-20 For Pins 1 And 2 Or W664-22-20, W664-23-20, W664-20-20 Or W664-16-20 For Pins 11 And 13. Repair Or Replace Wire As Required.
11-3.21 NO. 1 YAW ILCA HAS ENGAGE TRANSIENT

FAULT ISOLATION PROCEDURE

INITIAL SETUP

**Applicable Configurations:**
All

**Tools:**
- Electrical Repairer's Tool Kit,
  NSN 5180-00-323-4915
- Multimeter

**Materials:**
None

**Personnel Required:**
- 35K10 Avionic Mechanic
- 35K20 Avionic Mechanic

**References:**
- TM 55-1520-240-23
- TM 55-1520-240-23
- TM 55-4920-429-13
- TM 55-4920-429-13
- AFCS Line Test Set 145G0009-1
- Prepared For Use

**Equipment Condition:**
- TM 55-1520-240-23
- Battery Connector
- Electrical Power On
- Hydraulic Power On
- TM 55-1520-240-23
- AFCS Line Test Set 145G0009-1
- Prepared For Use
11-3.21 NO. 1 YAW ILCA HAS ENGAGE TRANSIENT (Continued)


- **TM 55-1520-240-T**: Was Yaw ILCA authority phasing test performed before null test?

**Set Test Set Meter Source**

- Switch to continuity set AFCS panel system select switch to OFF turn test set A-select and B-select switches and check resistance as follows:

<table>
<thead>
<tr>
<th>A-Select</th>
<th>B-Select</th>
<th>Resistance (Ohms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-42</td>
<td>B-43</td>
<td>Less than 1100</td>
</tr>
<tr>
<td>A-44</td>
<td>B-38</td>
<td>1500 to 2200</td>
</tr>
<tr>
<td>A-47</td>
<td>B-46</td>
<td>Less than 1100</td>
</tr>
<tr>
<td>A-41</td>
<td>B-46</td>
<td>Less than 1100</td>
</tr>
</tbody>
</table>

Are all resistance values present?

**Disconnect Plug 031P17 from Yaw ILCA**

- Turn A-select and B-select switches to position that resistance value was not present. Connect jumper wire between plug 031P17 pins for that position as follows:

<table>
<thead>
<tr>
<th>A-Select</th>
<th>B-Select</th>
<th>Plug 031P17 Pins Jumpered</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-42</td>
<td>B-43</td>
<td>2 and 4</td>
</tr>
<tr>
<td>A-44</td>
<td>B-36</td>
<td>8 and 10</td>
</tr>
<tr>
<td>A-47</td>
<td>B-46</td>
<td>11 and 12</td>
</tr>
<tr>
<td>A-41</td>
<td>B-46</td>
<td>13 and 14</td>
</tr>
</tbody>
</table>

Does test set meter read continuity?

- **TM 55-1520-240-23**: Replace No. 1 AFCS computer.

- **TM 55-1520-240-T**: Replace Yaw ILCA.

**Remove Electrical Power**

- Disconnect plug 031P17 from Yaw ILCA. Turn A-select and B-select switches to OFF. Turn test set A-select and B-select switches and check resistance as follows:

<table>
<thead>
<tr>
<th>A-Select</th>
<th>B-Select</th>
<th>Resistance (Ohms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-42</td>
<td>B-43</td>
<td>Less than 1100</td>
</tr>
<tr>
<td>A-44</td>
<td>B-38</td>
<td>1500 to 2200</td>
</tr>
<tr>
<td>A-47</td>
<td>B-46</td>
<td>Less than 1100</td>
</tr>
<tr>
<td>A-41</td>
<td>B-46</td>
<td>Less than 1100</td>
</tr>
</tbody>
</table>

Are all resistance values present?

- **TM 55-1520-240-23**: Check for ground on plug 031P17 pin 7. Is ground present?

- **TM 55-1520-240-T**: Locate open in wire W664-20-20 or W664-34-20 for pins 7 and 8. Repair or replace wire as required.

End of task.
11-3.22 NO. 1 YAW ILCA DOES NOT EXTEND OR RETRACT WHEN PEDALS ARE MOVED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
- Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
- Multimeter

Materials:
- None

Personnel Required:
- 35K10 Avionic Mechanic
- 35K20 Avionic Mechanic

References:
- TM 55-1520-240-23
- TM 55-4920-429-13

Equipment Condition:
- TM 55-1520-240-23
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power On
- TM 55-4920-429-13
  - AFCS Line Test Set 145G0009-1
  - Prepared For Use
11-3.22 NO. 1 YAW ILCA DOES NOT EXTEND OR RETRACT WHEN PEDALS ARE MOVED (Continued)

PERFORM YAW ILCA AUTHORITY/PHASING TEST. REFER TO TM 15-1352-240-23. DOES YAW ILCA AUTHORITY/PHASING CHECK OK??

NO

SET TEST SET METER SOURCE SWITCH TO CONTINUITY TEST 50G PANEL. SYSTEM SELECT SWITCH TO OFF. TURN TEST SET A-SELECT AND B-SELECT SWITCHES AND CHECK RESISTANCE AS FOLLOWS:

<table>
<thead>
<tr>
<th>SELECT SWITCH POSITIONS</th>
<th>RESISTANCE (OHMS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-42</td>
<td>B-43</td>
</tr>
<tr>
<td>A-44</td>
<td>B-36</td>
</tr>
<tr>
<td>A-47</td>
<td>B-46</td>
</tr>
<tr>
<td>A-41</td>
<td>B-46</td>
</tr>
</tbody>
</table>

ARE ALL RESISTANCE VALUES PRESENT??

REPLACE YAW ILCA.

DISCONNECT PLUG O31P17 FROM YAW ILCA. TURN A-SELECT AND B-SELECT SWITCHES TO POSITION THAT RESISTANCE VALUE WAS NOT PRESENT. CONNECT JUMPER WIRE BETWEEN PLUG O31P17 PINS FOR THAT POSITION AS FOLLOWS:

<table>
<thead>
<tr>
<th>SELECT SWITCH POSITIONS</th>
<th>A-SELECT SWITCH</th>
<th>B-SELECT SWITCH</th>
<th>PLUG O31P17 PINS JUMPERED</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-42</td>
<td>B-43</td>
<td>3 AND 4</td>
<td></td>
</tr>
<tr>
<td>A-44</td>
<td>B-36</td>
<td>6 AND 10</td>
<td></td>
</tr>
<tr>
<td>A-46</td>
<td>B-57</td>
<td>11 AND 12</td>
<td></td>
</tr>
<tr>
<td>A-41</td>
<td>B-46</td>
<td>13 AND 14</td>
<td></td>
</tr>
</tbody>
</table>

DOES TEST SET METER READ CONTINUITY??

REPLACE YAW ILCA.

REPLACE YAW ILCA.

REMOVE ELECTRICAL POWER. DISCONNECT PLUG O31P17 FROM YAW ILCA. TURN A-SELECT AND B-SELECT SWITCHES TO A 00 AND B 07. APPLY ELECTRICAL POWER JUMPER PLUG O31P17 PINS 1 AND 2 AND THEN PINE 11 AND 12 DOES TEST SET METER INDICATE CONTINUITY FOR EACH SET OF JUMPERED PIN?

YES

CHECK FOR GROUND ON PLUG O31P17 PIN 7. IS GROUND PRESENT??

REPLACE YAW ILCA.

LOCATE OPEN IN WIRE W664-17-20, W664-71-20, W664-24-20 OR W664-72-20 FOR PINS 1 AND 2 OR WIRE W664-22-20, W664-69-20, W664-20-20 OR W664-70-20 FOR PINS 11 AND 12. REPAIR OR REPLACE WIRE AS REQUIRED.

GO TO NEXT PAGE

TM 55-1520-240-T

Change 2

11-99
11-3.22 NO. 1 YAW ILCA DOES NOT EXTEND OR RETRACT WHEN PEDALS ARE MOVED (Continued)

**Perform Directional (Yaw) Cpt Null and Output Test**: Refer to TM 55-1520-230-20. DOES YAW CPT NULL AND OUTPUT TEST CHECK OKAY?

**Yes**
- REPLACE NO. 1 APCG COMPUTER

**No**
- SET TEST SET METER SOURCE SWITCH TO CONTINUITY SET AFCG PANEL SYSTEM SELECT SWITCH TO OFF. TURN TEST SET A-SELECT AND B-SELECT SWITCHES AND CHECK RESISTANCE AS FOLLOWS:
  - A-39 B-38 LESS THAN 200
  - A-39 B-40 LESS THAN 200
- ARE ALL RESISTANCE VALUES PRESENT?

**Yes**
- REMOVE ELECTRICAL POWER DISCONNECT YAW CPT PLUG WITH GREEN BAND FROM RECEPTACLE 03111. TURN A-SELECT AND B-SELECT SWITCHES TO 03 AND 04. APPLY ELECTRICAL POWER JUMPER YAW CPT RECEPTACLE PIN A AND B. DOES TEST SET METER INDICATE CONTINUITY?

**Yes**
- CHECK FOR GROUND ON YAW CPT RECEPTACLE PIN + 75 GROUND PRESENT?

**Yes**
- REPLACE YAW CPT.

**No**

**DISCONNECT YAW CPT PLUG WITH GREEN BAND FROM RECEPTACLE 03111. TURN A-SELECT AND B-SELECT SWITCHES TO POSITION THAT RESISTANCE VALUE WAS NOT PRESENT. CONNECT JUMPER WIRE BETWEEN YAW CPT RECEPTACLE PIN FOR THAT POSITION AS FOLLOWS:

<table>
<thead>
<tr>
<th>SELECT SWITCH</th>
<th>YAW CPT RECEPTACLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-39 B-38</td>
<td>E AND C</td>
</tr>
<tr>
<td>A-39 B-40</td>
<td>E AND D</td>
</tr>
</tbody>
</table>
- DOES TEST SET METER READ CONTINUITY?

**Yes**
- REPLACE YAW CPT

**No**
- REMOVE ELECTRICAL POWER REMOVE JUMPERS. DISCONNECT TEST SET. CHECK FOR CONTINUITY BETWEEN PLUG 031IB AND YAW CPT RECEPTACLE PIN FOR SELECT SWITCH POSITION THAT FAILED AS FOLLOWS:

<table>
<thead>
<tr>
<th>SELECT SWITCH</th>
<th>PLUG 031IB</th>
<th>YAW CPT RECEPTACLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-39 B-38</td>
<td>E</td>
<td>W66A-16-20</td>
</tr>
<tr>
<td>A-39 B-40</td>
<td>AA D</td>
<td>W66A-14-20</td>
</tr>
</tbody>
</table>

REPAIR OR REPLACE WIRING AS IDENTIFIED FOR ANY PLUG PIN PAIR WHERE CONTINUITY IS NOT PRESENT.
11-3.22 NO. 1 YAW ILCA DOES NOT EXTEND OR RETRACT WHEN PEDALS ARE MOVED (Continued)
11-3.23 NO. 1 ROLL ILCA DOES NOT EXTEND OR RETRACT WITH LATERAL STICK MOTION

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
- Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
- Multimeter

Materials:
None

Personnel Required:
- 35K10 Avionic Mechanic
- 35K20 Avionic Mechanic

References:
- TM 55-1520-240-23
- TM 55-4920-429-13

Equipment Condition:
- TM 55-1520-240-23
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power On
- TM 55-4920-429-13
  - AFCS Line Test Set 145G0009-1
  - Prepared For Use
11-3.23 NO. 1 ROLL ILCA DOES NOT EXTEND OR RETRACT WITH LATERAL STICK MOTION (Continued)

**Perform Roll ILCA Authority-Phasing Test**
Refer to TM 55-1520-240-23. Does Roll ILCA Authority Phasing Check OK?

**Set Test Set Meter Source Switch to Continuity; Set AFCS Panel System Select Switch to Off; Turn Test Set A-Select and B-Select Switches and Check Resistance As Follows:**

- **Select Switch Positions**
  - A-Select
    - B-34
    - B-35
  - B-Select
    - B-34
    - B-35

- **Resistance (Ohms):**
  - Less than 1100

- **ARE ALL RESISTANCE VALUES PRESENT?**
  - Yes
  - No

**Disconnect plug 031P15 from Roll ILCA; Turn A-Select and B-Select Switches to Position That Resistance Value Was Not Present; Connect Jumper Wire Between Plug 031P15 Pins for That Position as Follows:**

- **Select Switch Positions**
  - A-Select
    - B-34
    - B-48
    - B-56
    - A-39
    - B-30
    - A-31
  - B-Select
    - B-35

- **Plug 031P15 Pins Jumpered:**
  - 3 and 4
  - 5 and 10
  - 11 and 12
  - 13 and 14

- **Does Test Set Meter Read Continuity?**
  - Yes
  - No

**Remove Electrical Power; Remove Jumper; Disconnect Test Set:**
Check for continuity between plug 031P15 and plug 031P15 pins for select switch position that failed as follows:

<table>
<thead>
<tr>
<th>Select Switch Position</th>
<th>Pin</th>
<th>Plug 031P15 to Plug 031P15</th>
<th>Wire No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-34</td>
<td>B-35</td>
<td>3</td>
<td>W664-31-20</td>
</tr>
<tr>
<td>A-49</td>
<td>B-48</td>
<td>4</td>
<td>W664-38-20</td>
</tr>
<tr>
<td>A-49</td>
<td>B-48</td>
<td>10</td>
<td>W664-45-20</td>
</tr>
<tr>
<td>A-39</td>
<td>B-30</td>
<td>8</td>
<td>W664-38-20</td>
</tr>
<tr>
<td>A-39</td>
<td>B-30</td>
<td>14</td>
<td>W664-45-20 OR W664-41-20</td>
</tr>
<tr>
<td>A-31</td>
<td>B-30</td>
<td>13</td>
<td>W664-41-20</td>
</tr>
</tbody>
</table>

**Repair or Replace Wiring as Identified for Any Plug Pin Pair Where Continuity is Not Present**

**Check for Ground on Plug 031P15 Pin 7; Is Ground Present?**

- Yes
- No

**Locate Open in Wire W664-17-20, W664-17-20, W664-14-20 OR W664-14-20 FOR PINS 1 AND 2 OR WIRE W664-25-20, W664-25-20, OR W664-25-20 FOR PINS 11 AND 12, Repair or Replace Wiring as Required**

**Locate Open in Wire W664-233A28INBETWEEN PLUG 031P15 AND FUSELAGE GROUND, Repair or Replace Wiring as Required**

**Replace Roll ILCA.**

GOTO NEXT PAGE
11-3.23 NO. 1 ROLL ILCA DOES NOT EXTEND OR RETRACT WITH LATERAL STICK MOTION (Continued)

11-3.23

**PERFORM LATERAL (ROLL) CPT NULL AND OUTPUT TEST REFER TO TM 55-1520-240-20.**

**REPLACE NO. 1 AFCS COMPUTER.**

**SET TEST SET METER SOURCE SWITCH TO CONTINUITY. SET AFCS PANEL SYSTEM SELECT SWITCH TO OFF.**

**TURN TEST SET A-SELECT AND B-SELECT SWITCHES AND CHECK RESISTANCE AS FOLLOWS:**

<table>
<thead>
<tr>
<th>SELECT SWITCH POSITION</th>
<th>RESISTANCE (OHMS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-27</td>
<td>B-28</td>
</tr>
<tr>
<td></td>
<td>LESS THAN 200</td>
</tr>
</tbody>
</table>

ARE ALL RESISTANCE VALUES PRESENT?

**REPLACE NO. 1 AFCS COMPUTER.**

**DISCONNECT ROLL CPT PLUG WITH GREEN BAND FROM RECEPTECT 0316**

**TURNS A-SELECT B-SELECT SWITCH TO POSITIONS THAT RESISTANCE VALUE WAS NOT PRESENT. CONNECT JUMPER WIRE BETWEEN ROLL CPT RECEPTACLE PIN FOR THAT POSITION AS FOLLOWS:**

<table>
<thead>
<tr>
<th>SELECT SWITCH POSITION</th>
<th>ROLL CPT RECEPTACLE PINS JUMPERED</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-27</td>
<td>B-20</td>
</tr>
<tr>
<td></td>
<td>E AND C</td>
</tr>
<tr>
<td>A-27</td>
<td>B-28</td>
</tr>
<tr>
<td></td>
<td>E AND D</td>
</tr>
</tbody>
</table>

**DOES TEST SET METER READ CONTINUITY?**

**REPLACE ROLL CPT.**

**REMOVE ELECTRICAL POWER, REMOVE JUMPER. DISCONNECT TEST SET CHECK FOR CONTINUITY BETWEEN PLUG 0316 AND ROLL CPT RECEPTACLE PINS FOR SELECT SWITCH POSITION THAT FAILED AS FOLLOWS:**

<table>
<thead>
<tr>
<th>SELECT SWITCH POSITION</th>
<th>PLUG 0316 PIN</th>
<th>ROLL CPT RECEPTACLE PIN</th>
<th>WIRE NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-27</td>
<td>B-26</td>
<td>E</td>
<td>W664-12-20</td>
</tr>
<tr>
<td>A-27</td>
<td>B-28</td>
<td>E</td>
<td>W664-13-20</td>
</tr>
</tbody>
</table>

REPAIR OR REPLACE WIRING AS IDENTIFIED FOR ANY PLUG PIN PAIR WHERE CONTINUITY IS NOT PRESENT.

**GO TO NEXT PAGE**
11-3.23 NO. 1 ROLL ILCA DOES NOT EXTEND OR RETRACT WITH LATERAL STICK MOTION (Continued)

END OF TASK
11-3.24 NO. 1 ROLL ILCA DOES NOT MOVE WHEN PILOT'S OR COPILOT'S PITCH AND ROLL TRIM SWITCH MOVED RIGHT OR LEFT

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
Avionic Mechanic (2)

References.
TM 55-1520-240-23

Equipment Condition:
Battery Connected
Electrical Power On
Hydraulic Power On

GO TO NEXT PAGE
11-3.24 NO. 1 ROLL ILCA DOES NOT MOVE WHEN PILOT'S OR COPILOT'S PITCH AND ROLL TRIM SWITCH MOVED RIGHT OR LEFT (Continued)

**Diagram:**

- **Watch No. 1 Roll ILCA:** Move Pilot's and then Co-pilot's pitch and roll trim sw left then right. Is problem only associated with co-pilot's trim sw?
  - **Yes:** Nothing to do.
  - **No:** Move pilot's and roll trim sw fwd and aft. Does pilot control stick move fwd and aft?
    - **Yes:** Disconnect from No. 1 AFCS computer plug 031P3. Set pilot's pitch and roll trim switch right. Check for 13VAC between plug 031P3 pin G and ground. Is 13VAC present?
      - **Yes:** Replace No. 1 AFCS computer. Replace pilot's pitch and roll stick.
      - **No:** Replace pilot's pitch and roll control stick.
    - **No:** Refer to trouble symptom task 11-3.39.

- **Remove floor panel, disconnect plug at base of pilot's control stick.** Check for 13VAC between receptacle 300/29 pin J and ground. Is 13VAC present?
  - **Yes:** Locate open in wire W664-238-20 or W650-113-22 between plug 031P27 and CLTV driver actr C3.
    - **300/29 pin B:** Repair or replace wire as required.
    - **300/29 pin C:** Replace pilot's pitch and roll stick.
  - **No:** Check for continuity between pilot control stick receptacle 300/29 pin K and plug 031P27 pin F. Is continuity present?
    - **Yes:** Replace longitudinal ccda.
    - **No:** Locate open in wire W664-16-20 or W684-27-20 between receptacle 300/29 and plug 031P2. Repair or replace wire as required.
11-3.25 AFCS BITE OPERATES WITH ENQINK CONDITION LEVER IN FLIGHT POSITION

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
35K10 Avionic Mechanic
33K20 Avionic Mechanic

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power On
11-3.25 AFCS BITE OPERATES WITH ENGINE CONDITION LEVER IN FLIGHT POSITION (Continued)

DISCONNECT NO. 1 AFCS COMPUTER FROM PLUG 031P3. CHECK FOR GROUND ON PLUG 031P3 PIN B. IS GROUND PRESENT?

NO

REPLACE NO. 1 AFCS COMPUTER.

YES

DISCONNECT NO. 2 AFCS COMPUTER FROM PLUG 031P4. CHECK FOR GROUND ON PLUG 031P4 PIN B. IS GROUND PRESENT?

NO

REPLACE NO. 2 AFCS COMPUTER.

YES

LOWER OVERHEAD PANEL. DISCONNECT PLUG 102P9 FROM ENGINE CONDITION QUADRANT. CHECK FOR GROUND ON PLUG 102P9 PIN K. IS GROUND PRESENT?

NO

LOCATE GROUND FAULT ON WIRE W559-324-22 BETWEEN PLUG 102P9 AND PLUG 102P9. REPAIR OR REPLACE WIRE AS REQUIRED.

YES

DISCONNECT PLUG 102P9 FROM ENGINE CONDITION QUADRANT. CHECK FOR GROUND ON PLUG 102P9 PIN K. IN BOTH QUADRANT RECEPTACLES. IS GROUND PRESENT?

NO


YES

REPLACE ENGINE CONDITION QUADRANT.

CHECK FOR GROUND ON PLUG 102P9 PIN K. IS GROUND PRESENT?

NO

REPLACE ENGINE CONDITION QUADRANT.

END OF TASK

Change 2 11-109
11-3.26 NO. 1 AFCS COMPUTER BITE SWITCH DOES NOT LIGHT AND COUNTER DOES NOT STEP WHEN BITE SWITCH IS PRESSED AND RELEASED

FAULT ISOLATION PROCEDURE
INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required
35K10 Avionic Mechanic
35K20 Avionic Mechanic

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23
Battery Disconnected
Electrical Power Off
Hydraulic Power Off
11-3.26 NO. 1 AFCS COMPUTER BITE SWITCH DOES NOT LIGHT AND COUNTER DOES NOT STEP WHEN BITE SWITCH IS PRESSSED AND RELEASED (Continued)

- Disconnect plug 03 IP3 from No. 1 AFCS computer.
- Check for ground on plug 03(1)P3 pin B. Is ground present?
  - Yes: Replace No. 1 AFCS computer.
  - No: Lower overhead panel. Disconnect plug 102PS from engine condition quadrant. Check for continuity between plug 03(1)P3 pin B and engine plug 102PS pin K. Is continuity present?
    - Yes: Check for continuity between plug 102PS pin J and plug 102PS pin K. Is continuity present?
      - Yes: Check for ground on TB36 term 12. Is ground present?
        - Yes: Replace engine condition quadrant.
        - No: Replace engine condition quadrant.
      - No: Replace engine condition quadrant.
    - No: Locate open in wire W559-187-20, W545-170-20, or W559-224-22 between plug 03(1)P3 and plug 102PS. Repair or replace wire as required.

END OF TASK

Change 6 11-111
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Equipment Condition:
TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power On

Tools:
Electrical Repairer’s Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
Avionic Mechanic (2)

References:
TM 55-1520-240-23
TM 11-1120-240-23

TM 55-1520-240-T

11-3.27  NO. 2 AFCS OFF (WITHOUT T4) OR AFCS 2 (WITH T4) CAPSULE DOES NOT GO OUT WHEN SYSTEM SELECTED

11-112  Change 23
11-3.27 NO. 2 AFCS OFF (WITHOUT 27 OR AFCS 2 (WITH 74) CAPSULE DOES NOT GO OUT WHEN SYSTEM SELECTED (Continued)

CHECK PILOT'S ATTITUDE INDICATOR, IS OFF FLAG IN VIEW?

IS NO. 2 HYD FLT CONTR (WITHOUT 27) HYD 2 (WITH 74) LIGHT ON?

YES

IS HYDRAULIC "PULLING" SOUND HEARD IN FLT CONTROL COUPLER WHEN SYS SELECT SWITCH IS MOVED FROM 2 TO OFF AND BACK TO 2?

YES

REPLACE VALVE 031A14.

NO

CHECK RESISTANCE FROM 031P4 PIN A TO GROUND WITH 031P1 CONNECTED, IS RESISTANCE APPROX 40 OHMS?

NO

CHECK FOR CONTINUITY FROM 031P4 PIN A TO 031P1 PIN 1, IS CONTINUITY PRESENT?

NO

REPAIR OR REPLACE WIRE 0664-204-20.

YES

CHECK FOR CONTINUITY FROM 031P1 PIN 3 TO AIRFRAME GROUND, IS GROUND PRESENT?

NO

REPLACE VALVE 031A14.

YES

REFRESH TO TRouble SYMPTOM TASK 7-3.3.

REMOVE ELECTRICAL POWER, DISCONNECT PLUG 031P4 FROM NO. 2 AFCS COMPUTER, TURN ON ELECTRICAL POWER, DOES NO. 2 AFCS OFF (WITHOUT 27 OR AFCS 2 (WITH 74) CAPSULE NOT GO OUT WHEN SYSTEM SELECTED?

YES

LOCATE GROUND FAULT ON WIRE 0664-271-20, 0664-190-20, 0664-272-20, OR 0667-708-22 BETWEEN PLUG 032P1 (WITH OUT 27) 232P2 (WITH 27) FROM MASTER CAUTION PANEL, CHECK FOR GROUND ON PIN D (WITH 27) OR PLUG 031P4, REPAIR OR REPLACE WIRE AS NEEDED?

YES

NO

REPLACE MASTER CAUTION PANEL.

NO

REPLACE NO. 2 BOOST PRESSURE SWITCH 033S2.

YES

CHECK FOR CONTINUITY BETWEEN PLUG 031P4 PIN A AND PLUG 033S3 PIN 2, IS CONTINUITY PRESENT?

YES

REPLACE NO. 2 BOOST PRESSURE SWITCH 033S2.

NO

REPAIR OR REPLACE WIRE 0664-204-20.

NO

REPAIR OR REPLACE WIRE 0664-00205-20.

NO

REPORT THIS CONCERN TO YOUR AFCS MAINTENANCE TECHNICIAN FOR ADDITIONAL ASSESSMENT AND REPAIR.
11-3.27 NO. 2 AFCS OFF (WITHOUT 74) OR AFCS 2 (WITH 74) CAPSULE DOES NOT GO OUT WHEN SYSTEM SELECTED (Continued)

11-3.27

INTERCHANGE PILOT'S AND CO-PILOT'S VALID GYRO RELAYS, CHECK PILOT'S ATTITUDE INDICATOR, IS OFF FLAP STILL IN VIEW?

YES

TROUBLESHOOT VERTICAL GYRO SYSTEM, REFER TO TM 11-1520-240-23.

NO

REPLACE RELAY THAT IS IN CO-PILOT'S VALID GYRO RELAY POSITION.

REPLACE NO. 2 AFCS COMPUTER.

YES

CHECK NO. 2 AFCS COMPUTER PLUG 031P4 PIN R FOR GROUND, IS GROUND PRESENT?

NO

YES

REPAIR OR REPLACE WIRE W664-210-20, W528-20, OR TB17.

REPLACE PILOT'S VALID GYRO RELAY.

LOCATE OPEN IN WIRE W529-133-20, W639-144-20, OR W664-110-20 BETWEEN PLUG 031P10 AND NO. 2 AFCS CB 031CB9. REPAIR OR REPLACE WIRE AS REQUIRED.

LOCATE OPEN IN WIRE W529-114-20 BETWEEN PLUG 031P10 AND NO. 2 AFCS CB 031CB10. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

DISCONNECT NO. 2 AFCS COMPUTER FROM PLUG 031P10. CHECK FOR 28VDC BETWEEN PLUG 031P10 PIN 3(A) AND GROUND. IS 28VDC PRESENT?

YES

CHECK FOR 115VAC BETWEEN PLUG 031P10 PIN B AND GROUND. IS 115VAC PRESENT?

NO

CHECK FOR 28VDC BETWEEN PLUG 031P4 PIN 3(A) AND GROUND. IS 28VDC PRESENT?

NO

YES

NO

GO TO NEXT PAGE

11-114 Change 23
11-3.27 NO. 2 AFCS OFF (WITHOUT 4) OR AFCS 2 (WITH 4) CAPSULE DOES NOT GO OUT WHEN SYSTEM SELECTED (Continued)

**Flowchart:**

1. **DISCONNECT AFCS PNL PLUG 031P38. CHECK FOR 28VDC BETWEEN PLUG 031P38 PIN A (+) AND GROUND. IS 28VDC PRESENT?**
   - **NO:**
     - **LOCATE OPEN IN WIRE W557-187-20 OR W557-701-20 BETWEEN PLUG 031P38 AND TB17. REPAIR OR REPLACE WIRE AS REQUIRED.**
   - **YES:**
     - **CHECK FOR CONTINUITY BETWEEN PLUG 031P4 PIN 8 AND AFCS PNL PLUG 031P38 PIN M. IS CONTINUITY PRESENT?**
       - **NO:**
         - **REPLACE AFCS PANEL.**
       - **YES:**
         - **GO TO NEXT PAGE**

**Change 23 11-114.1**
11-3.27 NO. 2 AFCS OFF (WITHOUT \( \text{74} \)) OR AFCS 2 (WITH \( \text{74} \)) CAPSULE DOES NOT GO OUT WHEN SYSTEM SELECTED (Continued)

END OF TASK
11-3.27 NO. 2 AFCS OFF CAPSULE DOES NOT GO OUT WHEN SYSTEM SELECTED (Continued)
11-3.28 NO. 2 PITCH ILCA HAS ENGAGE TRANSIENT

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Equipment Condition:

TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power On

TM 55-4920-429-13
AFCS Line Test Set 145G0009-1
Prepared For Use

References:
TM 55-1520-240-23
TM 55-4920-429-13

Personnel Required:
35K10 Avionic Mechanic
35K20 Avionic Mechanic
11-3.28 NO. 2 PITCH ILCA HAS ENGAGE TRANSIENT (Continued)

Perform pitch ILCA null test, refer to TM 55-1520-240-23. Does pitch ILCA null check okay?

Was pitch ILCA authority phasing test performed before the null test?

Replace no 2 AFCS computer

Set test set meter source switch to continuity. Set AFCS panel system select switch to OFF. Turn test set A-select and B-select switches to 0 and 8-07. Amply electrical power. Jumper plug 031P14 pins 1 and 2 and then pins 11 and 12. Does test set meter in ULRI has continuity for each set of jumpered pins?

Locate open in wire W664-86-20, W664-134-20, W664-84-20, OR W664-132-20 FOR 11TH OR 13TH PINS. W664-136-20, W664-87-20, OR W664-132-20 FOR 11TH AND 12TH REPAIR OR REPLACE WIRE AS REQUIRED.

Locate open in wire (openings open to twist), plug 031P14 and fuselage ground. Repair or replace wire as required.

Replace pitch ILCA.

Remove electrical power. Remove jumper. Disconnect test set. Check for continuity between plug 031P10 and plug 031P14 pins for select switch position that failed as follows.

Remove electrical power. Disconnect plug 031P14 from pitch ILCA. Turn A-select and B-select switches to position that resistance value was not present. Connect jumper wire between plug 031P14 pins for that position as follows.

Does test set meter read continuity?

Replace pitch ILCA.

Change 9 11-117
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
35K10 Avionic Mechanic
35K20 Avionic Mechanic

References:
TM 55-1520-240-23
TM 55-4920-429-13

Equipment Condition:
TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power On

(TM 55-4920-429-13)
AFCS Line Test Set 145G0009-1
Prepared For Use
11-3.29 NO. 2 ROLL ILCA HAS ENGAGE TRANSIENT (Continued)

**Perform Roll ILCA NULL Test: Refer to TM 55-1520-240-23. Does Roll ILCA NULL Check OK?**

**Was Roll ILCA Authority Phasing Test Performed Before the NULL Test?**

**Replace No. 2 AFCS Computer.**

**Set Test Set Meter Source Switch to Continuity. Set AFCS Panel System Select Switch to Off. Turn Test Set A-Select and B-Select Switches On. Check Resistance as follows:**

<table>
<thead>
<tr>
<th>A-Select</th>
<th>B-Select</th>
<th>Resistance (Ohms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-34</td>
<td>B-33</td>
<td>Less than 1000</td>
</tr>
<tr>
<td>A-49</td>
<td>B-48</td>
<td>1500 to 2000</td>
</tr>
<tr>
<td>A-30</td>
<td>B-30</td>
<td>Less than 1000</td>
</tr>
</tbody>
</table>

Are all resistance values present?

**Disconnect Plug 031P16 from Roll ILCA. Turn A-Select and B-Select Switches to Position that Resistance Value Was Not Present. Connect jumper wire between Plug 031P16 Pins for that position as follows:**

<table>
<thead>
<tr>
<th>A-Select</th>
<th>B-Select</th>
<th>PLUG 031P16 PINS JUMPED</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-34</td>
<td>B-35</td>
<td>3 AND 4</td>
</tr>
<tr>
<td>A-49</td>
<td>B-48</td>
<td>5 AND 10</td>
</tr>
<tr>
<td>A-30</td>
<td>B-30</td>
<td>11 AND 12</td>
</tr>
<tr>
<td>A-29</td>
<td>B-30</td>
<td>13 AND 14</td>
</tr>
<tr>
<td>A-31</td>
<td>B-30</td>
<td>13 AND 14</td>
</tr>
</tbody>
</table>

Does Test Set Meter Read Continuity?

**Remove Electrical Power. Remove Jumper. Disconnect Test Set Check for Continuity between Plug 031P10 Pins and Plug 031P16 Pins for Select Switch Position that Failed as follows:**

<table>
<thead>
<tr>
<th>Select Switch Position</th>
<th>PLUG 031P10 TO PLUG 031P16 Wire No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-34</td>
<td>W664-106-20</td>
</tr>
<tr>
<td>A-49</td>
<td>W664-107-20</td>
</tr>
<tr>
<td>A-29</td>
<td>W664-108-20</td>
</tr>
<tr>
<td>A-31</td>
<td>W664-110-20</td>
</tr>
</tbody>
</table>

Repair or replace wiring as identified for any plug pin pair where continuity is not present.

**Check for Ground on Plug 031P16 Pin 7. Is Ground Present?**

**Replace Roll ILCA.**

**Locate open in wire W664-86-20, W664-137-20, W664-91-20 OR W664-129-20 for Pins 1 AND 2 OR Wire W664-86-20, W664-125-20, W664-87-20 OR W664-126-20 FOR Pins 1 AND 12. Repair or replace wire as required.**

**Replace Roll ILCA.**

END OF TASK
11-3.30 NO. 2 YAW ILCA HAS ENGAGE TRANSIENT

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required
35K10 Avionic Mechanic
35K20 Avionic Mechanic

References:
TM 55-1520-240-23
TM 55-4920-429-13

Equipment Condition:
TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power On
TM 55-4920-429-13
AFCS Line Test Set 145G0009-1
Prepared for Use
11-3.30 NO. 2 YAW ILCA HAS ENGAGE TRANSIENT (Continued)

- Perform Yaw ILCA null test, refer to TM 32-1320-240-23. Does Yaw ILCA null check okay?
  - Yes
  - No

- Was Yaw ILCA authority phasing test performed before the null test?
  - Yes
  - No

- Replace no. 2 AFCS computer.

- Set test set meter sourcE SWitch to continuity set afcs panel, system select switch to diff turn test set A-select and B-select switches and check resistance as follows:
  - A-42 B-43
  - A-44 B-36
  - A-47 B-46
  - A-41 B-46
  - Resistance (Ohms)
    - Less than 1100
    - 1500 to 2000
    - Less than 1100
    - Less than 1100
  - Are all resistance values present?
  - Yes
    - Yes
    - No
    - Yes
      - Replace Yaw ILCA
  - No

- Remove electrical power, disconnect plug D01P18 from Yaw ILCA turn A-select and B-select switches to position 5-6 and 8-10. Apply electrical power jumper plug D01P18 pins 1 and 2 and then pins 11 and 12. Does test set meter indicate continuity for each set of jumpered pins?
  - Yes
    - Yes
    - Replace Yaw ILCA
  - No

- Disconnect plug D01P18 from Yaw ILCA turn A-select and B-select switches to position 5-6 and 8-10. Apply electrical power jumper plug D01P18 pins 1 and 2 and then pins 11 and 12. Repair or replace wire as required.
  - Yes
    - Yes
    - Replace Yaw ILCA
  - No

- Remove electrical power. Disconnect test set check for continuity between plug D01P10 pins and plug D01P18 pins for select switch position that failed as follows:

<table>
<thead>
<tr>
<th>SELECT SWITCH POSITION</th>
<th>PLUG D01P10 TO D01P18 WIRE</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-42 B-43</td>
<td>GG 3 W664-105-20</td>
</tr>
<tr>
<td>A-44 B-36</td>
<td>FF 4 W664-131-20</td>
</tr>
<tr>
<td>A-47 B-46</td>
<td>HH 8 W664-132-20</td>
</tr>
<tr>
<td>A-41 B-46</td>
<td>KK 14 W664-104-20</td>
</tr>
<tr>
<td></td>
<td>BB 13 W664-100-20 OR W664-116-20</td>
</tr>
<tr>
<td></td>
<td>LL 13 W664-99-20 OR W664-116-20</td>
</tr>
</tbody>
</table>

- Repair or replace wiring as identified for any plug pin pair where continuity is not present

END OF TASK

Change 2 11-121
11-3.31 NO. 2 YAW ILCA DOES NOT EXTEND OR RETRACT WHEN PEDALS ARE MOVED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
35K10 Avionic Mechanic
35K20 Avionic Mechanic

References:
TM 55-1520-240-23
TM 55-4920-429-13

Equipment Condition:
TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power On

TM 55-4920-429-13
AFCS Line Test Set 14SG0009-1
Prepared For Use
11-3.31 NO. 2 YAW ILCA DOES NOT EXTEND OR RETRACT WHEN PEDALS ARE MOVED (Continued)

- **Perform Yaw ILCA Authority/Phasing Test**
  - YES: Refer to TM 55-1520-240-23
  - NO: Does Yaw ILCA Authority Phasing Check OKAY?

- **Set Test Set Meter Source Switch to Continuity Set APCS Panel System Select Switch to OFF, Turn Test Set A-Select and B-Select Switches and Check Resistance As Follows**
  - Are all resistance values present?

- **Disconnect Plug 031P18 from Yaw ILCA, Turn A-Select and B-Select Switches to Position That Resistance Value Was Not Present**
  - Connect jumper wire between plug 031P18 pins for that position as follows:

- **Locate Open Wire W664-88-20, W664-121-20, W664-91-20 or W664-132-20 for Pins 1 and 2 on Wire W664-88-20, W664-121-20, W664-91-20 or W664-132-20 For Pins 11 and 12, Repair or Replace Wire As Required.

- **Check for Ground on Plug 031P18 Pin 7, Is Ground Present?**
  - YES: Replace Yaw ILCA.
  - NO: Locate open in wire W664-91-20, disconnect jumper and fuselage ground repair or replace wire as required.

- **Remove Electrical Power, Disconnect Plug 031P18 from Yaw ILCA, Turn A-Select and B-Select Switches to A-06 and B-07 Apply Electrical Power Jumpers Plug 031P18 Pins 1 and 2 and Then Pins 11 and 12 No Test Set Meter Indicate Continuity For Each Set of Jumpers Pins?**

- **Does Test Set Meter Read Continuity?**
  - YES: Go to Next Page.
  - NO: Repair or replace wiring as identified for any plug pin pair where continuity is not present.
11-3.31 NO. 2 YAW ILCA DOES NOT EXTEND OR RETRACT WHEN PEDALS ARE MOVED (Continued)

Perform directional (YAW) CPT NULL AND OUTPUT TEST. REFER TO TM 55-1520-240-23. NO. 2 YAW LT. NULL AND OUTPUT TEST CHECK OKAY?

Yes

Replace No. 2 AFCS COMPUTER.

No

Yes

Set test set meter source switch to continuity. Set AFCS panel system select switch to off. Turn test set a-select and b-select switches and check resistance as follows:

<table>
<thead>
<tr>
<th>A-39</th>
<th>B-38</th>
<th>Resistance (in ohms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-39</td>
<td>B-40</td>
<td>Less than 200</td>
</tr>
</tbody>
</table>

Are all resistance values present?

Yes

Unlock for ground on yaw CPT receptacle pin F. Is ground present?

Yes

Replace yaw CPT.

No

Yes


No

Locate open in wire W664-02335A20N between yaw CPT receptacle F and fuse. Replace ground repair or replace wire as required.

Yes

Replace yaw CPT.

No

Disconnect yaw CPT plug with red band from receptacle 031112. Turn a-select and b-select switches to position that permits if value was not present. Connect jumper wire between yaw CPT receptacle pins for that position as follows:

<table>
<thead>
<tr>
<th>A-39</th>
<th>B-38</th>
<th>E and D</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-39</td>
<td>B-40</td>
<td>E and D</td>
</tr>
</tbody>
</table>

Does test set meter read continuity?

Yes

No

Remove electrical power. Remove jumper. Disconnect test set. Check for continuity between plug 031010 and yaw CPT receptacle pins for select switch position that failed as follows:

<table>
<thead>
<tr>
<th>Select switch position</th>
<th>Plug 031010 pin</th>
<th>Yaw CPT receptacle pin</th>
<th>Wire no</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-39 B-38</td>
<td>E</td>
<td>E</td>
<td>W664-85-30</td>
</tr>
<tr>
<td>A-39 B-40</td>
<td>E</td>
<td>D</td>
<td>W664-84-30</td>
</tr>
<tr>
<td>A-39 B-40</td>
<td>E</td>
<td>E</td>
<td>W664-85-20</td>
</tr>
<tr>
<td>A-39 B-40</td>
<td>AA</td>
<td>C</td>
<td>W664-00-20</td>
</tr>
</tbody>
</table>

Repair or replace wiring as identified for any plug pin pair where continuity is not present.
11-3.31 NO. 2 YAW ILCA DOES NOT EXTEND OR RETRACT WHEN PEDALS ARE MOVED (Continued)

END OF TASK

11-125
11-3.32 NO. 2 ROLL ILCA DOES NOT EXTEND OR RETRACT WITH LATERAL STICK MOTION

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations: All

Tools:
- Electrical Repairer's Tool Kit, NSN 5160-00-323-4915
- Multimeter

Materials: None

Personnel Required:
- 35K10 Avionic Mechanic
- 35K20 Avionic Mechanic

References:
- TM 55-1520-240-23
- TM 55-4920-429-13

Equipment Condition:
- Battery Connected
- Electrical Power On
- Hydraulic Power On
- TM 55-4920-429-13
- AFCS Line Test Set 145G0009-1
- Prepared For Use

GO TO NEXT PAGE
11-3.32 NO. 2 ROLL ILCA DOES NOT EXTEND OR RETRACT WITH LATERAL STICK MOTION (Continued)

**Perform Roll ILCA**

Refer to TM 55-1520-240-23.

**Does Roll ILCA Authority Phasing Check okay?**

**Yes**

**Set Test Set Meter Source Switch to Continuity.**

Set AFCS Panel System SEL Switch to OFF. Turn Test Set A-SELECT and B-SELECT switches and check resistance as follows:

<table>
<thead>
<tr>
<th>SELECT SW POSITION</th>
<th>A-SELECT</th>
<th>B-SELECT</th>
<th>RESISTANCE (OHMS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-34</td>
<td>B-35</td>
<td>LESS THAN 1500</td>
<td></td>
</tr>
<tr>
<td>A-49</td>
<td>B-48</td>
<td>1500 TO 2200</td>
<td></td>
</tr>
<tr>
<td>A-29</td>
<td>B-30</td>
<td>LESS THAN 1500</td>
<td></td>
</tr>
<tr>
<td>A-31</td>
<td>B-30</td>
<td>LESS THAN 1500</td>
<td></td>
</tr>
</tbody>
</table>

Are all resistance values present?

**No**

**Disconnect Plug 031P16 from Roll ILCA.**

Select A-SELECT and B-SELECT switches to position that resistance value was not present. Connect jumper wire between plug 031P16 pins for that position as follows:

<table>
<thead>
<tr>
<th>SELECT SW POSITION</th>
<th>A-SELECT</th>
<th>B-SELECT</th>
<th>PLUG 031P16</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-34</td>
<td>B-35</td>
<td>3 AND 4</td>
<td></td>
</tr>
<tr>
<td>A-49</td>
<td>B-48</td>
<td>8 AND 12</td>
<td></td>
</tr>
<tr>
<td>A-29</td>
<td>B-30</td>
<td>11 AND 12</td>
<td></td>
</tr>
<tr>
<td>A-31</td>
<td>B-30</td>
<td>13 AND 14</td>
<td></td>
</tr>
</tbody>
</table>

Does test set meter read Continuity?

**Yes**

Replace Roll ILCA.

**Remove Electrical Power.**

Disconnect plug 031P16 from Roll ILCA. Turn A-SELECT and B-SELECT switches to 14 and 19. Connect jumper plug 031P16 pins 1 and 2 and then pins 11 and 12. Does test set meter indicate continuity for each set of jumpered pins?

**Yes**

Check for ground on plug 031P16 pin 7. Is ground present?

**Yes**

Replace Roll ILCA.

**No**

Locate open in wire W664-86-20, W664-172-10, W664-91-20, or W664-126-20 for pins 1 and 2 or wire W664-56-20, W664-125-20, W664-81-20, or W664-129-25 for pins 11 and 12. Repair or replace wire as required.

Locate open in wire W664-222568 between plug and fuselage ground. Repair or replace wire as required.

**Remove electrical power.**

Remove jumper. Disconnect test set. Check for continuity between plug 031P16 pins and plug 031P16 pins for select switch position that failed as follows:

<table>
<thead>
<tr>
<th>SELECT SW POSITION</th>
<th>PLUG 031P10 TO PLUG 031P16</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-34</td>
<td>B-35</td>
</tr>
<tr>
<td>A-49</td>
<td>B-48</td>
</tr>
<tr>
<td>A-29</td>
<td>B-30</td>
</tr>
<tr>
<td>A-31</td>
<td>R-55</td>
</tr>
</tbody>
</table>

Wire NO.

- W664-106-20
- W664-107-20
- W664-108-20
- W664-110-20
- W664-111-20 OR W664-117-20
- W664-112-20 OR W664-117-20

Repair or replace wiring as identified for any plug pin pair where continuity is not present.

**Go to Next Page**

Change 9

11-127
11-3.32 NO. 2 ROLL ILCA DOES NOT EXTEND OR RETRACT WITH LATERAL STICK MOTION (Continued)

**Check for Ground on Roll CPT Receptacle Pin F. Is ground present?**

**Locate Open in Wire W564-G03050206 Between Roll CPT Receptacles and Fuse/Relay Ground. Repair or Replace Wire as Required.**

**Replace Roll CPT.**

**Disconnect Roll CPT Plug with RED Band from Receptacle Q1130. Turn A-Select and B-Select Switches to Position that Resistance Value was Not Present. Connect Jumper Wire Between Roll CPT Receptacle Pins for That Position as follows.**

<table>
<thead>
<tr>
<th>A-Select Switch</th>
<th>B-Select Switch</th>
<th>Roll CPT Receptacle Pins Jumpered</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-27</td>
<td>B-26</td>
<td>E and C</td>
</tr>
<tr>
<td>A-27</td>
<td>B-26</td>
<td>E and D</td>
</tr>
</tbody>
</table>

**Does Test Set Meter Read Continuity?**


**Yes**

**Replace Roll CPT.**

**No**

**ARE All Resistance Values Present?**

**Replace No. 2 AFCS Computer.**

**Disconnect Roll CPT Plug with RED Band from Receptacle Q1130. Turn A-Select and B-Select Switches to Position that Resistance Value was Not Present. Connect Jumper Wire Between Roll CPT Receptacle Pins for That Position as follows.**

<table>
<thead>
<tr>
<th>A-Select Switch</th>
<th>B-Select Switch</th>
<th>Roll CPT Receptacle Pins Jumpered</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-27</td>
<td>B-26</td>
<td>E and C</td>
</tr>
<tr>
<td>A-27</td>
<td>B-26</td>
<td>E and D</td>
</tr>
</tbody>
</table>

**Does Test Set Meter Read Continuity?**

**Remove Electrical Power. Remove Jumper. Disconnect Test Set. Check for Continuity Between Plug G31101 and Roll CPT Receptacle Pins for SELECT Switch Position that Failed as follows.**

<table>
<thead>
<tr>
<th>SELECT SW Position</th>
<th>PLUG G31101</th>
<th>ROLL CPT RECEPTACLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-27</td>
<td>B-28</td>
<td>E</td>
</tr>
<tr>
<td>A-27</td>
<td>B-28</td>
<td>W564-80-20</td>
</tr>
</tbody>
</table>

**Repair or Replace Wiring as identified for any plug pin pair where continuity is not present.**
11-3.32 NO. 2 ROLL ILCA DOES NOT EXTEND OR RETRACT WITH LATERAL STICK MOTION (Continued)

END OF TASK

END OF TASK
11-3.33 NO. 2 ROLL ILCA DOES NOT MOVE WHEN PILOT'S OR COPILOT'S PITCH AND ROLL TRIM SWITCH MOVED RIGHT OR LEFT

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
Avionic Mechanic (2)

References:
TM 55-1520-240-23

Equipment Condition:
Battery Connected
Electrical Power On
Hydraulic Power Off
11-3.33 NO. 2 ROLL ILCA DOES NOT MOVE WHEN PILOT'S OR COPILOT'S PITCH AND ROLL TRIM SWITCH MOVED RIGHT OR LEFT (Continued)

**WATCH NO. 2 ROLL ILCA MOVE PILOT'S AND COPILOT'S PITCH AND ROLL TRIM SW LEFT THEN RIGHT, IS PROBLEM ONLY ASSOCIATED WITH PILOT'S TRIM SW?**

**NO**

**YES**

**REFER TO TROUBLE SYMPTOM TASK 11-3.33**

**DISCONNECT PLUG FROM RECEPTACLE 300/30 AT BASE OF COPILOT'S TRIM STICK. CHECK FOR 13V AC BETWEEN PLUGS 031P4 PIN GG AND GROUND. IS 13V AC PRESENT?**

**NO**

**YES**

**DISCONNECT PLUG 031P27 FROM 13VAC RELAY 2X14. CHECK FOR CONTINUITY BETWEEN COPILOT'S TRIM STICK RECEPTACLE 300/30 AND PLUG 031P27 PIN FF. IS CONTINUITY PRESENT?**

**NO**

**YES**

**REPLACE ADJUSTER 030/27**

**DISCONNECT PLUG FROM RECEPTACLE 300/30 AT BASE OF COPILOT'S TRIM STICK. CHECK FOR 13V AC BETWEEN PLUGS 031P4 PIN GG AND GROUND. IS 13V AC PRESENT?**

**NO**

**YES**

**DISCONNECT FROM NO. 2 AFCS COMPUTER PLUG 031P4. SET COPILOT'S PITCH AND ROLL TRIM SWITCH RIGHT CHECK FOR 13V AC BETWEEN PLUGS 031P4 PIN GG AND GROUND. IS 13V AC PRESENT?**

**NO**

**YES**

**SET COPILOT'S PITCH AND ROLL TRIM SWITCH LEFT. CHECK FOR 13VAC BETWEEN PLUGS 031P4 PIN FF AND GROUND. IS 13VAC PRESENT?**

**NO**

**YES**

**REPLACE NO. 2 AFCS COMPUTER**

**END OF TASK**

Change 2 11-131
INITIAL SETUP

Applicable Configurations:
- All

Tools:
- Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
- Multimeter

Materials:
- None

Personnel Required:
- Avionic Mechanic (2)

References:
- TM 55-1520-240-23

Equipment Condition:
- Battery Connected
- Electrical Power On
- Hydraulic Power On

Fault Isolation Procedure

1. Disconnect plug 031P4 from No. 2 AFCS computer. Check for ground on pin B. Is ground present?
   - YES: Replace No. 2 AFCS computer.
   - NO: Locate open in wire 45664 213-20 between plug 031P4 and 7111. Repair or replace wire as required.
# 11-3.34.1 FORWARD LCT ACTUATOR OPERATIONAL CHECK

## INITIAL SETUP

### Applicable Configurations:
- All

### Tools:
- Digital Ohmmeter

### Materials:
- None

### Personnel Required:
- Aircraft Electrician
- Medium Helicopter Repairer

### Equipment Condition:
- TM 55-1520-240-23: Battery Connected, Electrical Power On
- Work Platform Open

### Task Result

<table>
<thead>
<tr>
<th>Task</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Set cyclic trim switch (1) to Manual position.</td>
<td></td>
</tr>
<tr>
<td>2. Using FWD (EXT-RET) switch (2), fully retract the FWD LCT actuator (3).</td>
<td></td>
</tr>
<tr>
<td>3. Remove electrical power from the actuator and disconnect the connector.</td>
<td></td>
</tr>
<tr>
<td>5. Reconnect the actuator and apply electrical power.</td>
<td></td>
</tr>
<tr>
<td>6. Using FWD (EXT-RET) switch (2), fully extend the FWD LCT actuator (3).</td>
<td></td>
</tr>
<tr>
<td>7. Remove electrical power from the actuator and disconnect the connector.</td>
<td></td>
</tr>
<tr>
<td>9. Reconnect the actuator and apply electrical power.</td>
<td></td>
</tr>
<tr>
<td>10. Using FWD (EXT-RET) switch (2), operate the FWD actuator from full extend to full retract. Clock the travel time.</td>
<td>Time must not exceed 25 seconds.</td>
</tr>
<tr>
<td>11. Using FWD (EXT-RET) switch (2), operate the FWD actuator from full retract to full extend. Clock the travel time.</td>
<td>Time must not exceed 25 seconds.</td>
</tr>
<tr>
<td>12. Manually operate the actuator to full retract.</td>
<td></td>
</tr>
<tr>
<td>13. Move cyclic trim switch (1) to AUTO.</td>
<td></td>
</tr>
<tr>
<td>14. Perform an AFCS BITE TEST on the No. 1 and No. 2 systems [Task 11-3.3].</td>
<td></td>
</tr>
<tr>
<td>15. Monitor the cockpit LCT indicator (4).</td>
<td></td>
</tr>
</tbody>
</table>

### Time
- Time must not exceed 25 seconds.

### Follow-on Maintenance:

---

*References:*
- TM 55-1520-240-23
*Applicable Configurations:*
- All
*Equipment Condition:*
- TM 55-1520-240-23: Battery Connected, Electrical Power On
*Work Platform Open*
11-3.34.2 AFT LCT ACTUATOR OPERATIONAL CHECK

INITIAL SETUP

References:
TM 55-1520-240-23

Applicable Configurations:
All

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power On
Work Platform Open

Tools:
Digital Ohmmeter

Materials:
None

Personnel Required:
Aircraft Electrician
Medium Helicopter Repairer

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Set cyclic trim switch (1) to MANUAL position.</td>
<td></td>
</tr>
<tr>
<td><strong>CAUTION</strong></td>
<td>Do not operate the LCT actuators without hydraulic power on the helicopter.</td>
</tr>
<tr>
<td>2. Using AFT (EXT-RET) switch (2), fully retract the AFT LCT actuator (3).</td>
<td></td>
</tr>
<tr>
<td>3. Remove electrical power from the actuator and disconnect the connector.</td>
<td></td>
</tr>
<tr>
<td>5. Reconnect the actuator and apply electrical power.</td>
<td></td>
</tr>
<tr>
<td>6. Using AFT (EXT-RET) switch (2), fully extend the AFT LCT actuator (3).</td>
<td></td>
</tr>
<tr>
<td>7. Remove electrical power from the actuator and disconnect the connector.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. Reconnect the actuator and apply electrical power.</td>
<td></td>
</tr>
<tr>
<td>10. Using AFT (EXT-RET) switch (2), operate the AFT actuator (3) from full extend to full retract. Clock the travel time.</td>
<td>Time must not exceed 25 seconds.</td>
</tr>
<tr>
<td>11. Using AFT (EXT-RET) switch (2), operate the AFT actuator (3) from full retract to full extend. Clock the travel time.</td>
<td>Time must not exceed 25 seconds.</td>
</tr>
<tr>
<td>12. Manually operate the actuator to full retract.</td>
<td></td>
</tr>
<tr>
<td>13. Move cyclic trim switch (1) to AUTO.</td>
<td></td>
</tr>
<tr>
<td>14. Perform an AFCS BITE TEST on the No. 1 and No. 2 systems [Task 11-3.3].</td>
<td></td>
</tr>
<tr>
<td>15. Monitor the cockpit LCT indicator (4).</td>
<td></td>
</tr>
</tbody>
</table>

FOLLOW-ON MAINTENANCE:

TM 55-1520-240-23:
Hydraulic power off.
Electrical power off.
Battery disconnected.
Work platform closed.

Cockpit LCT indicator (4) should show GND.
Failure of any AFCS BITE steps for LCT operation indicates possible actuator defect. Replace defective actuator (TM 55-1520-240-23).
Erratic indicator movement indicates possible actuator defect. Replace defective actuator (TM 55-1520-240-23).
11-3.34.3 LCT ACTUATOR CONTROL TRANSISTOR BURNS OUT

INITIAL SETUP

Applicable Configurations:
All

Tools:
None

Materials:
None

Personnel Required:
Aircraft Electrician
Medium Helicopter Repairer

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23
Battery Connected
Hydraulic Power On
Work Platform Open

Equipment Condition:
TM 55-1520-240-23

Personnel Required:
Aircraft Electrician
Medium Helicopter Repairer

TASK RESULT

1. Perform forward and aft LCT actuator operational checks (Tasks 11-3.34.1 and 11-3.34.2).

2. Inspect forward and aft LCT actuators. Replace LCT actuators as required (TM 55-1520-240-23).

3. Inspect helicopter wires and connectors for damage and contamination (Task 11-3.31).
References:
- TM 55-1520-240-23

Equipment Condition:
- Battery Connected
- Electrical Power On
- Hydraulic Power On

INITIAL SETUP

Applicable Configurations:
All

Tools:
- Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
- Multimeter

Materials:
None

Personnel Required:
- Avionic Mechanic
- Avionic Mechanic
11-34.1 FORWARD LCT ACTUATOR OPERATIONAL CHECK

INITIAL SETUP

Personnel Required:
Aircraft Electrician
Medium Helicopter Repairer

Applicable Configurations:
All

Tools:
Digital Ohmmeter

Materials:
None

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power On
Work Platform Open

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Set cyclic trim switch (1) to MANUAL position.</td>
<td>Do not operate the LCT actuators manually without hydraulic power on the helicopter.</td>
</tr>
<tr>
<td>CAUTION</td>
<td></td>
</tr>
<tr>
<td>2. Using FWD (EXT-RET) switch (2), fully retract the FWD LCT actuator (3).</td>
<td></td>
</tr>
<tr>
<td>3. Remove electrical power from the actuator and disconnect the connector.</td>
<td></td>
</tr>
<tr>
<td>5. Reconnect the actuator and apply electrical power.</td>
<td></td>
</tr>
<tr>
<td>6. Using FWD (EXT-RET) switch (2), fully extend the FWD LCT actuator (3).</td>
<td></td>
</tr>
<tr>
<td>7. Remove electrical power from the actuator and disconnect the connector.</td>
<td></td>
</tr>
<tr>
<td>9. Reconnect the actuator and apply electrical power.</td>
<td>Time must not exceed 25 seconds.</td>
</tr>
<tr>
<td>10. Using FWD (EXT-RET) switch (2), operate the FWD actuator from full extend to full retract. Clock the travel time.</td>
<td></td>
</tr>
<tr>
<td>11. Using FWD (EXT-RET) switch (2), operate the FWD actuator from full retract to full extend. Clock the travel time.</td>
<td>Time must not exceed 25 seconds.</td>
</tr>
<tr>
<td>12. Manually operate the actuator to full retract.</td>
<td>If acceptable FWD actuator operation is not obtained in all preceding steps, replace defective actuator (TM 55-1520-240-23).</td>
</tr>
<tr>
<td>13. Move cyclic trim switch (1) to AUTO.</td>
<td>Cockpit LCT indicator (4) should show GND.</td>
</tr>
</tbody>
</table>

FOLLOW-ON MAINTENANCE

TM 55-1520-240-23
Hydraulic Power Off
Electrical Power Off
Battery Disconnected
Work Platform Closed
### INITIAL SETUP

**Applicable Configurations:**
- All

**Tools:**
- Digital Ohmmeter

**Materials:**
- None

**Personnel Required:**
- Aircraft Electrician
- Medium Helicopter Repairer

**References:**
- TM 55-1520-240-23

**Equipment Condition:**
- TM 55-1520-240-23
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power On
  - Work Platform Open

### TASK RESULT

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Set cyclic trim switch (1) to manual position.</td>
</tr>
<tr>
<td></td>
<td><strong>CAUTION</strong> Do not operate the LCT actuators manually without hydraulic power on the helicopter.</td>
</tr>
<tr>
<td>2.</td>
<td>Using AFT (EXT-RET) switch (2), fully retract the AFT LCT actuator.</td>
</tr>
<tr>
<td>3.</td>
<td>Remove electrical power from the actuator and disconnect the connector.</td>
</tr>
<tr>
<td>5.</td>
<td>Reconnect the actuator and apply electrical power.</td>
</tr>
<tr>
<td>6.</td>
<td>Using AFT (EXT-RET) switch (2), fully extend the AFT LCT actuator (3).</td>
</tr>
<tr>
<td>7.</td>
<td>Remove electrical power from the actuator and disconnect the connector.</td>
</tr>
<tr>
<td>9.</td>
<td>Reconnect the actuator and apply electrical power. Time must not exceed 25 seconds.</td>
</tr>
<tr>
<td>10.</td>
<td>Using AFT (RET-EXT) switch (2), operate the AFT actuator (3) from full extend to full retract. Clock the travel time.</td>
</tr>
<tr>
<td>11.</td>
<td>Using AFT (RET-EXT) switch (2), operate the AFT actuator (3) from full retract to full extend. Clock the travel time.</td>
</tr>
<tr>
<td>12.</td>
<td>Manually operate the actuator to full retract. If acceptable AFT actuator operation is not obtained in all preceding steps, replace defective actuator (TM 55-1520-240-23).</td>
</tr>
<tr>
<td>13.</td>
<td>Move cyclic trim switch (1) to AUTO. Cockpit LCT indicator (4) should show GND.</td>
</tr>
</tbody>
</table>

### FOLLOW-ON MAINTENANCE:
- TM 55-1520-240-23
- Hydraulic Power Off
- Electrical Power Off
- Battery Disconnected
- Work Platform Closed
11-3.34.3 LCT ACTUATOR CONTROL TRANSISTOR BVRNS OUT

INITIAL SETUP

Personnel Required:
- Aircraft Electrician
- Medium Helicopter Repairer

Applicable Configurations:
- All

Tools:
- None

Materials:
- None

Equipment Condition
- TM 55-1520-240-23
- Buttery Disconnected
- Electrical Power Off
- Hydraulic Power Off
- Work Platform Open

TASK RESULT

1. Perform forward and aft LCT actuator operational checks (Tasks 11-3.34.1 and 11-3.34.2).

2. Inspect forward and aft LCT actuators.

3. Inspect helicopters wires and connectors for damage and contamination (Task 11-3.1).

Replace LCT actuators as required (TM 55-1520-240-23).
11-3.35 FORWARD LCT INDICATOR DOES NOT INDICATE EXTEND OR RETRACT DURING MANUAL CONTROL (Continued)

11-3.35 FORWARD LCT INDICATOR DOES NOT INDICATE EXTEND OR RETRACT DURING MANUAL CONTROL

NO

YES

NO

YES

DISCONNECT PLUG 031P3 FROM FWD LCT ACTUATOR REMOVE AFCS PANEL AND DISCONNECT PLUG 031P1
CHECK FOR CONTINUITY BETWEEN AFCS 031P1 031P3 PIN P AND FWD LCT ACTUATOR RECEPTACLE 031J2 PIN P
AND PLUG 031P3 PIN P AND LCT ACTUATOR RECEPTACLE 031J2 PIN P IS CONTINUITY PRESENT?

LOCATE OPEN IN WIRE W557-698-22 OR W664-142-20 BETWEEN PLUG 031P3 AND PLUG 031P3 REPAIR OR REPLACE WIRE AS REQUIRED.

REPLACE NO 1 AFCS COMPUTER IF FWD CYCLIC TRIM INDICATOR DOES NOT REACT AS EXPECTED.

REPLACE AFCS COMPUTER.

REPLACE FWD CYCLIC TRIM INDICATOR.

PERFORM LCT ACTUATOR OUTPUT MOTION TEST REFER TO TM 55-1520-240-23 FOR FWD LCT IS TEST OK?

REPLACE AFCS PANEL.

END OF TASK

Change 9 11-135
11-3.36 AFT LCT INDICATOR DOES NOT INDICATE EXTEND OR RETRACT DURING MANUAL CONTROL

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
38K10 Avionic Mechanic
35K20 Avionic Mechanic

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power Off
11-3.36 AFT LCT INDICATOR DOES NOT SHOW EXTENSION OR RETRACTION IN MANUAL CONTROL

(Continued)

11-3.36

HURL API SWITCH TO EXT POSITION, THEN TO RET POSITION. DOES AFT LCT ACTUATOR BOTH EXTEND AND RETRACT?

YES

CHECK FOR CONTINUITY BETWEEN AFT CYCLIC TRIM INDICATOR PLUG O31P33 PIN 7 AND NO. 2 AFCS COMPUTER PLUG O31P4 PIN 2. IS CONTINUITY PRESENT?

YES

CHECK CONTINUITY BETWEEN NO. 2 AFCS COMPUTER PLUG O31P4 PIN C. AND LCT ACTUATOR RECEPTACLE O31J1 PIN D. AND COMPUTER PLUG O31P4 PIN 7, AND LCT ACTUATOR PLUG O31J1 PIN 7. IS CONTINUITY PRESENT?

YES

REPLACE AFT CYCLIC TRIM INDICATOR. DOES REPLACEMENT INDICATOR SHOW OND POSITION?

YES

REPLACE ORIGINAL AFT CYCLIC TRIM INDICATOR.

NO

DISCONNECT PLUG FROM AFT LCT ACTUATOR RECEPTACLE. REMOVE AFCS PANEL. DISCONNECT PLUG O31P36 CHECK FOR CONTINUITY BETWEEN PLUG O31P36 PIN 9 AND AFT LCT ACTUATOR RECEPTACLE O31J1 PIN B. O31P36 PIN 9 AND LCT ACTUATOR RECEPTACLE O31J1 PIN A. IS CONTINUITY PRESENT?

YES

PERFORM LCT ACTUATOR OUTPUT MOTION TEST ON AFT LCT ACTUATOR. REFER TO TM 55-1520-240-23. DOES ACTUATOR CHECK OKAY?

YES

REPLACE AFCS PANEL.

NO

LOCATE OPEN AND REPAIR OR REPLACE W564-108-20 AS REQUIRED.

NO

DISCONNECT PLUG FROM AFT LCT ACTUATOR RECEPTACLE. REMOVE AFCS PANEL. DISCONNECT PLUG O31P36 CHECK FOR CONTINUITY BETWEEN PLUG O31P36 PIN 9 AND AFT LCT ACTUATOR RECEPTACLE O31J1 PIN B. O31P36 PIN 9 AND LCT ACTUATOR RECEPTACLE O31J1 PIN A. IS CONTINUITY PRESENT?

NO

REPLACE AFT LCT ACTUATOR.

NO

REPLACE AFT LCT ACTUATOR.

END OF TASK
Change 10 11-137
11-3.37 HDG SWITCH ENGAGED CAPTION DOES NOT LIGHT

FAULT ISOLATION PROCEDURE
INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
35K10 Avionic Mechanic
36K20 Avionic Mechanic

References:
TM 55-1520-240-23
Equipment Condition
TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power Off
11-3.37 HDG SWITCH ENGAGED CAPTION DOES NOT LIGHT (Continued)

- **REMOVE AFCS PANEL AND DISCONNECT PLUG 031P06. CHECK FOR 5 VAC BETWEEN PLUG 031P06 PIN D AND GROUND. IS 5 VAC PRESENT?**
  - YES: REPLACE AFCS PANEL.
  - NO: SET MASTER CAUTION DIM/BRIGHT SWITCH TO DIM. CHECK FOR 3 VAC BETWEEN PLUG 031P06 PIN D AND GROUND. IS 3 VAC PRESENT?
    - YES: CHECK FOR 3 VAC BETWEEN DIMMING RELAY TERM C1 AND GROUND. IS 3 VAC PRESENT?
      - YES: REPLACE DIMMING RELAY.
      - NO: LOCATE OPEN IN WIRE W557-764-22 AS REQUIRED.
    - NO: CHECK FOR 3 VAC BETWEEN DIMMING RELAY TERM C2 AND GROUND. IS 3 VAC PRESENT?
      - YES: LOCATE OPEN AND REPAIR OR REPLACE WIRE W557-764-22 AS REQUIRED.
      - NO: REPLACE LIGHTING TRANSFORMER 031T1.

**END OF TASK**
11-139
11-3.38 RADAR OR BARO ALT ENGAGED CAPTIONS DO NOT COME ON
WHEN PRESSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
35K10 Avionic Mechanic
35K20 Avionic Mechanic

References:
TM 55-1520-240-23

Equipment Condition:
Battery Connected
Electrical Power On
Hydraulic Power Off

END OF TASK
11-3.39 PITCH AND ROLL CONTROL STICK DOES NOT MOVE FORWARD OR AFT WHEN PILOT’S OR COPILOT’S PITCH AND ROLL TRIM SWITCH IS MOVED FORWARD AND AFT

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
Avionic Mechanic (2)

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
11-3.39 PITCH AND ROLL CONTROL STICK DOES NOT MOVE FORWARD OR AFT WHEN PILOT’S OR COPILOT’S PITCH AND ROLL TRIM SWITCH IS MOVED FORWARD AND AFT (Continued)

SET AND HOLD COPILT’S PITCH AND ROLL TRIM SW FORWARD AND AFT. DOES CONTROL STICK MOVE FORWARD AND AFT?

NO

SET AND HOLD PILOT’S PITCH AND ROLL TRIM SW FORWARD AND AFT. DOES CONTROL STICK MOVE FORWARD AND AFT?

NO

DISCONNECT PLUGS 031P27 FROM LONGTUDINAL CODA. HOLD PILOT’S PITCH AND ROLL TRIM SW FORWARD. CHECK FOR CONTINUITY BETWEEN PLUG 031P27 PIN F AND PIN M. IS CONTINUITY PRESENT?

YES

REPLACE PILOT’S PITCH AND ROLL CONTROL STICK.

NO

RELEASE SW. LOCATE OPEN IN WIRE W564-230-30 BETWEEN PLUG 031P27 AND TB18 TERM 17. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

LOCATE OPEN IN WIRE W564- 21-20 OR W566-16-20 BETWEEN RECEPTACLE 300 PIN N AND TB18. REPAIR OR REPLACE WIRE AS REQUIRED.

YES

DISCONNECT PLUG FROM LONGTUDINAL CODA. REMOVE FLOOR PANELS AND DISCONNECT PILOT’S CONTROL STICK PLUG. CHECK FOR CONTINUITY BETWEEN RECEPTACLE 300T28 PIN H AND PLUG 031P27 PIN N.

NO

DISCONNECT PLUG FROM LONGTUDINAL CODA. REMOVE FLOOR PANELS AND DISCONNECT COPILT’S CONTROL STICK PLUG. CHECK FOR CONTINUITY BETWEEN RECEPTACLE 300T28 PIN N AND BETWEEN RECEPTACLE PIN L AND PLUG PIN M. IS CONTINUITY PRESENT AT BOTH SETS OF PINS?

YES

REPLACE COPILT’S PITCH AND ROLL CONTROL STICK.

NO

RELEASE SW. LOCATE OPEN IN WIRE W564-236-20 BETWEEN PLUG 031P27 AND TB18 TERM 17. REPAIR OR REPLACE WIRE AS REQUIRED.
Fault Isolation Procedure

Initial Setup

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
35K10 Avionic Mechanic
35K20 Avionic Mechanic

References:
TM 55-1520-240-23

Equipment Condition:
Battery Connected
Electrical Power On
Hydraulic Power On
11-3.40 AFCS COMPUTER BITE INDICATES 6, 9, OR 18 (Continued)

**NO. 1 AFCS COMPUTER BITE INDICATES 6, 9, OR 18.**

1. **SET CYCLIC TRIM AUTO/MANUAL SW TO MANUAL, SET FWD SW TO EXT THEN TO RET, DOES FWD LCT INDICATOR POINTER MOVE?**
   - **YES**
     - REPLACE NO. 1 AFCS COMPUTER.
   - **NO**
     - REFER TO TROUBLE SYMPTOM [TASK 11-6.12]

**NO. 2 AFCS COMPUTER BITE INDICATES 6, 9, OR 18.**

1. **SET CYCLIC TRIM AUTO/MANUAL SW TO MANUAL, SET AFT SW TO EXT THEN TO RET, DOES AFT LCT INDICATOR POINTER MOVE?**
   - **YES**
     - REPLACE NO. 2 AFCS COMPUTER.
   - **NO**
     - REFER TO TROUBLE SYMPTOM [TASK 11-3.17]

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11-3.41 AFCS COMPUTER BITE INDICATES 48

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
35K10 Avionic Mechanic
35K20 Avionic Mechanic

References:
TM 55-1520-240-23
TM 55-4920-429-13

Equipment Condition:
Battery Connected
Electrical Power On
Hydraulic Power On

TM 55-4920-429-13
AFCS Line Test Set 145G0009-1
Prepared for Use

Cockpit

NO. 1 AFCS COMPUTER

NO. 2 AFCS COMPUTER

PILOT'S HSI MODE
SELECT PANEL SHOWN
COPILOT'S HSI MODE
SELECT PANEL SAME

GO TO NEXT PAGE
NO. 1 AFCS COMPUTER BITE INDICATES 48

11-3.41 AFCS COMPUTER BITE INDICATES 48 (Continued)

PERFORM HSI HEADING TEST ON NO. 1 AFCS SYSTEM. REFER TO TM 55-1520-240-23. DOES HSI HEAD CHECK OKAY?

YES \rightarrow REPLACE NO. 1 AFCS COMPUTER.

NO \rightarrow PRESS CMD SW ON COPLOT HSI MODE SELECT PANEL. PERFORM HSI HEADAGING TEST. REFER TO TM 11-1520-240-20. DOES HSI HEAD CHECK OKAY?

NO \rightarrow TROUBLESHOOT HSI. REFER TO TM 11-1520-240-20.

DO CHECK FOR CONTINUITY BETWEEN NO. 1 AFCS PLUG O31P3 PIN 7 AND COPLOT HSI MODE SELECT PLUG 006P6 PIN 8. IS CONTINUITY PRESENT?

YES \rightarrow REPLACE NO. 1 AFCS COMPUTER.


PERFORM HSI HEADATING TEST ON NO. 2 AFCS SYSTEM. REFER TO TM 55-1520-240-23. DOES HSI HEAD CHECK OKAY?

YES \rightarrow REPLACE NO. 2 AFCS COMPUTER.

NO \rightarrow PRESS CMD SW ON COPLOT HSI MODE SELECT PANEL. PERFORM HSI HEADATING TEST. REFER TO TM 11-1520-240-20. DOES HSI HEAD CHECK OKAY?

NO \rightarrow TROUBLESHOOT HSI. REFER TO TM 11-1520-240-20.

USING CABLE I PLUG FROM COPLOT HSI MODE SELECT PANEL. DISCONNECT PLUG O31P4 FROM NO. 2 AFCS COMPUTER. CHECK CONTINUITY BETWEEN NO. 2 AFCS PLUG O31P4 PIN 7 AND COPLOT HSI MODE SELECT PLUG 006P6 PIN 6. IS CONTINUITY PRESENT?

YES \rightarrow REPLACE NO. 2 AFCS COMPUTER.

11-3.42 AFCS COMPUTER BITE INDICATES 70-74

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
35K10 Avionic Mechanic
35K20 Avionic Mechanic

References:
TM 55-1520-240-23
TM 55-4920-429-13

Equipment Condition:
TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power On
TM 55-4920-429-13
AFCS Line Test Set 145G0009-1
Prepared for Use
NO. 1 AFCS COMPUTER BITE INDICATES 70-74.

- **Perform Pitch ILCA Authority/Phasing Test.** Refer to TM 55-1520-240-23. Does Pitch ILCA Authority/Phasing Check OKAY?
  - **Yes** → Replace No. 1 AFCS Computer.
  - **No** → Refer to Trouble Symptom [Task 11-3.11]

NO. 2 AFCS COMPUTER BITE INDICATES 70-74.

- **Perform Pitch ILCA Authority/Phasing Test.** Refer to TM 55-1520-240-23. Does Pitch ILCA Authority/Phasing Check OKAY?
  - **Yes** → Replace No. 2 AFCS Computer.
  - **No** → Refer to Trouble Symptom [Task 11-3.21]
11-3.43 NO. 1 AFCS COMPUTER BITE INDICATES 85 OR 86

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

References:
TM 55-1520-240-23
TM 55-4920-429-13

Equipment Condition:
TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power On
TM 55-4920-429-13
AFCS Line Test Set 145G0009-1
Prepared for Use

Personnel Required
35K10 Avionic Mechanic
35K20 Avionic Mechanic

GO TO NEXT PAGE
11-3.43 NO. 1 AFCS COMPUTER BITE INDICATES 85 OR 86 (Continued)

DISCONNECT PLUG 031P19 FROM DASH ACTUATOR RECEPTACLE J1. CHECK FOR CONTINUITY BETWEEN PINS 4 AND 8, AND PINS 5 AND 8 ON RECEPTACLE J1. IS CONTINUITY PRESENT?

YES

NO

REPLACE DASH ACTUATOR 031A12.

PERFORM DASH ACTUATOR OUTPUT MOTION TEST. REFER TO TM 55-1520-240-23. DOES ACTUATOR CHECK OKAY?

YES

NO

REPLACE NO. 1 AFCS COMPUTER.

SET TEST SET METER SOURCE SWITCH TO CONTINUITY. SET AFCS PANEL SYSTEM SELECT SWITCH TO NO. 1. TURN TEST SET A-SELECT AND B-SELECT SWITCHES AND CHECK RESISTANCE AS FOLLOWS:

SELECT SWITCH POSITIONS

A-SELECT

B-SELECT

RESISTANCE (OHMS)

A- 102
B- 103
LESS THAN 200

A- 90
B- 73
1800 TO 2200

A- 73
B- 91
LESS THAN 1900

ARE ALL RESISTANCE VALUES PRESENT?

YES

NO

CHECK FOR GROUND ON NO. 1 DASH ACTUATOR PLUG. 031P19 PIN B IS GROUND PRESENT?

YES

NO

REPLACE NO. 1 DASH ACTUATOR.

LOCATE OPEN IN WIRE W664-166-20 BETWEEN DASH ACTUATOR PLUG AND FUSE LAGE GROUND. REPAIR OR REPLACE WIRE AS REQUIRED.

DISCONNECT PLUG 031P19 FROM NO. 1 DASH ACTUATOR. TURN A-SELECT AND B-SELECT SWITCHES TO POSITION THAT RESISTANCE VALUE WAS NOT PRESENT. CONNECT JUMPER WIRE BETWEEN PLUG 031P19 PINS FOR THAT POSITION AS FOLLOWS:

SELECT SWITCH POSITIONS

A-SELECT

B-SELECT

PLUG 031P19

PINS JUMPERED

A- 102
B- 103
2 AND 3

A- 90
B- 73
2 AND 3

A- 73
B- 91
4 AND 6

DOES TEST SET METER READ CONTINUITY?

YES

NO

REPLACE NO. 1 DASH ACTUATOR.

REMOVE ELECTRICAL POWER. REMOVE JUMPER. DISCONNECT TEST SET. CHECK FOR CONTINUITY BETWEEN PLUG 031P3 PINS AND PLUG 031P19 PINS FOR SELECT SWITCH POSITION THAT FAILED AS FOLLOWS:

SELECT SWITCH POSITION

PLUG 031P3 TO PLUG 031P19

PIN

WIRE NO.

A- 107
B- 103
HH
2
W664-166-20

A- 90
B- 73
JJ
3
W664-164-20

A- 73
B- 91
MM
5
W664-162-20

W684-217-20 OR W684-161-20

W664-161-20

REPAIR OR REPLACE WIRING AS IDENTIFIED FOR ANY PLUG PIN PAIR WHERE CONTINUITY IS NOT PRESENT.
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
- Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
- Multimeter

Equipment Condition:
- TM 55-1520-240-23
- Battery Connected
- Electrical Power On
- Hydraulic Power On
- TM 55-4920-429-13
- AFCS Line Test Set 145G0009-1
- Prepared for Use

Materials:
None

Personnel Required:
- 35K10 Avionic Mechanic
- 35K20 Avionic Mechanic

References:
- TM 55-1520-240-23
- TM 55-4920-429-13

GO TO NEXT PAGE
11-3.44 NO. 2 AFCS COMPUTER BITE INDICATES 85 OR 86 (Continued)

DISCONNECT PLUG 031P20 FROM DASH ACTUATOR RECEPTACLE J2. CHECK FOR CONTINUITY BETWEEN PINS 4 AND 8, AND PINS 5 AND 8 ON RECEPTACLE J2. IS CONTINUITY PRESENT?

NO

YES

REPLACE DASH ACTUATOR 031A12

PERFORM DASH ACTUATOR OUTPUT MOTION TEST. REFER TO TM 55-1520-240-03. DOES ACTUATOR CHECK OKAY?

NO

YES

REPLACE NO. 2 AFCS COMPUTER

SET TEST SET METER SOURCE SWITCH TO CONTINUITY. SET AFCS PANEL SYSTEM SELECT SWITCH TO NO. 2. TURN TEST SET A-SELECT AND B-SELECT SWITCHES AND CHECK RESISTANCE AS FOLLOWS:

SELECT SWITCH POSITIONS:

A-SELECT

B-SELECT

RESISTANCE (OHMS)

A-102

B-103

LESS THAN 200

A-90

B-73

200 TO 2200

A-73

B-91

LESS THAN 1900

ARE ALL RESISTANCE VALUES PRESENT?

NO

YES

CHECK FOR GROUND ON NO. 2 DASH ACTUATOR PLUG 031P20 PIN 8. IS GROUND PRESENT?

NO

YES

REPLACE NO. 2 DASH ACTUATOR

LOCATE OPEN IN WIRE W664-207-20 BETWEEN DASH ACTUATOR PLUG AND FLANGE GROUND. REPAIR OR REPLACE WIRE AS REQUIRED.

DISCONNECT PLUG 031P20 FROM NO. 2 DASH ACTUATOR. TURN A-SELECT AND B-SELECT SWITCHES TO POSITION THAT RESISTANCE VALUE WAS NOT PRESENT. CONNECT JUMPER WIRE BETWEEN PLUG 031P20 PINS FOR THAT POSITION AS FOLLOWS:

SELECT SWITCH POSITIONS:

A-SELECT

B-SELECT

PLUG 031P20

A-102

B-103

1 AND 2

A-90

B-73

3 AND 4

A-73

B-91

5 AND 6

DOES TEST SET METER READ CONTINUITY?

NO

YES

REPLACE NO. 2 DASH ACTUATOR

REMOVE ELECTRICAL POWER. REMOVE JUMPER. DISCONNECT TEST SET. CHECK FOR CONTINUITY BETWEEN PLUG 031A12 PIN 6 AND PLUG 031P30 PIN 6 PIN FOR SELECT SWITCH POSITION THAT SATISFIES CONTINUITY.

SELECT SWITCH POSITION

PLUG 031P3 TO PLUG 031P20

WIRE NO.

A-102

B-103

W664-209-20

A-90

B-73

W664-208-20

A-73

B-91

W664-207-20

REPAIR OR REPLACE WIRING AS IDENTIFIED FOR ANY PLUG PIN PAIR WHERE CONTINUITY IS NOT PRESENT.
11-3.45 NO. 1 AFCS COMPUTER BITE INDICATES 87

**FAULT ISOLATION PROCEDURE**

**INITIAL SETUP**

**Applicable Configurations:**
- All

**Tools:**
- Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
- Multimeter

**Materials:**
- None

**Personnel Required:**
- 35K10 Avionic Mechanic
- 35K20 Avionic Mechanic

**References:**
- TM 55-1520-240-23
- TM 55-4920-429-13

**Equipment Condition:**
- TM 55-1520-240-23
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power On
- TM 55-4920-429-13
  - AFCS Line Test Set 145G0009-1
  - Prepared For Use
11-3.45 NO. 1 AFCS COMPUTER BITE INDICATES 87 (Continued)

- **PERFORM COLLECTIVE CCDA SERVO LOOP OPERATION TEST REFER TO TM 55-1520-240-23.**
- **DOES COLLECTIVE CCDA CHECK OKAY?**
  - **YES**
  - **REPLACE NO. 1 AFCS COMPUTER**
  - **NO**
    - **SET TEST SET METER SOURCE SWITCH TO CONTINUITY. SET AFCS PANEL SYSTEM SELECT SWITCH TO NO. 1 TURN TEST SET A-SELECT AND B-SELECT SWITCHES AND CHECK RESISTANCE AS FOLLOWS:**
    - **SELECT SWITCH POSITIONS**
      - **A-SELECT**
        - **A**: 23
        - **B**: B-03
        - **C**: B-03
        - **D**: B-55
        - **A**: B-76
      - **B-SELECT**
        - **RESISTANCE**
          - **LESS THAN 20 OHMS**
          - **LESS THAN 200**
          - **3800 TO 4000**
          - **LESS THAN 200**
    - **ARE ALL RESISTANCE VALUES PRESENT?**
      - **YES**
      - **NO**
    - **REPLACE COLLECTIVE CONTROL DRIVER ACTUATOR**
    - **END OF TASK**
- **REMOVE ELECTRICAL POWER DISCONNECT TEST SET CONNECT PLUGS 031P3 AND 031P8 TO AFCS COMPUTER DISCONNECT PLUG 031P22**
- **CHECK FOR GROUND ON PLUG 031P22 PIN C IS GROUND PRESENT?**
  - **YES**
  - **NO**
    - **LOCATE OPEN IN WIRE W664-G0220C20N BETWEEN PLUG AND FUSELAGE GROUND REPAIR OR REPLACE WIRE AS REQUIRED**
- **OPEN NO. 1 PDP CHECK FOR 28VDC BETWEEN COLLECTIVE DRIVER ACTUATOR CB 031CB6 CIRCUIT SIDE AND GROUND IS 28VDC PRESENT?**
  - **YES**
  - **REPLACE COLLECTIVE DRIVER ACTUATOR CIRCUIT BREAKER**
- **LOCATE OPEN IN WIRE W664-198-20 OR W650-114-22 BETWEEN PLUG 031P22 AND COLLECTIVE DRIVER ACTUATOR CB 031CB7 REPAIR OR REPLACE WIRE AS REQUIRED**
- **CHECK FOR 115VAC BETWEEN PLUG 031P22 PIN B AND GROUND IS 115VAC PRESENT?**
  - **YES**
  - **NO**
    - **REPLACE COLLECTIVE CONTROL DRIVER ACTUATOR**
- **LOCATE OPEN IN WIRE W664-203.20 BETWEEN PLUG 031P22 AND TB-2 MODULE 5 TERMINAL 2, REPAIR OR REPLACE WIRE AS REQUIRED**
- **CHECK FOR 120VAC BETWEEN PLUG 031P22 PIN P AND GROUND IS 120VAC PRESENT?**
  - **YES**
  - **NO**
- **DISCONNECT PLUG 031P22 FROM COLLECTIVE CONTROL DRIVER ACTUATOR TURN A-SELECT AND B-SELECT SWITCHES TO POSITION THAT RESISTANCE VALUE WAS NOT PRESENT CONNECT JUMPER WIRE BETWEEN PLUG 031P22 PINS FOR THAT POSITION AS FOLLOWS:**
  - **SELECT SWITCH POSITIONS**
    - **A-SELECT**
      - **A:** 23
      - **B:** B-03
      - **C:** B-55
      - **A:** B-76
    - **B-SELECT**
      - **PLUG 031P22 PINS JUMPERED**
      - **G TO C**
      - **H TO G**
      - **D TO E**
      - **L TO J**
    - **DOES TEST SET METER READ CONTINUITY?**
      - **YES**
      - **NO**
        - **REPAIR OR REPLACE WIRING AS IDENTIFIED FOR ANY PLUG PIN PAIR WHERE CONTINUITY IS NOT PRESENT**

**END OF TASK**

Change 6 11-153
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
- Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
- Multimeter

Materials:
- None

Personnel Required:
- 35K10 Avionic Mechanic
- 35K20 Avionic Mechanic

References:
- TM 55-1520-240-23
- TM 55-4920-429-13

Equipment Condition:
- TM 55-1520-240-23
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power On
- TM 55-4920-429-13
  - AFCS. Line Test Set 145G0009-1
  - Prepared for Use
11-3.46 NO. 1 AFCS COMPUTER BITE INDICATES 89 (Continued)

**Perform Longitudinal Pitch Cpt Null and Output Test. Refer to TM 55-1520-00-32. Does Pitch Cpt Null and Output Test Check Okay?**

- **Yes**: Replace No. 1 AFCS Computer.
- **No**: Set Test Set Meter Source Switch to Continuity Set AFCS Panel System Select Switch to Off, Turn Test Set A-Select and B-Select Switches to Continuity and Check Resistance As Follows:
  - Select Switch Positions: A-Select
    - A-09
  - B-Select
    - B-09: Less than 200
    - B-10: Less than 200
  - Are All Resistance Values Present?
    - **Yes**: Replace Pitch Cpt Transducer.
    - **No**: Disconnect Pitch Cpt Plug With Red Band From Receptacle 031-D, Turn A-Select and B-Select Switches to Position That Resistance Value Was Not Present, Connect Jumper Wire Between Pitch Cpt Receptacle Pins for That Position As Follows:
      - Select Switch Positions: A-Select
        - A-09
      - B-Select
        - B-09: E and C
        - B-10: E and D
      - Does Test Set Meter Read Continuity?
        - **Yes**: Replace Pitch Cpt Transducer.
        - **No**: Remove Electrical Power, Remove Jumper, Disconnect Test Set, Check for Continuity Between Plug and Pitch Cpt Receptacle Pins for Select Switch Position That Failed As Follows:
          - Select Switch Position: A-09
            - B-09: J, E, W664-10, A
            - B-10: J, E, W664-10, B-20
          - Repair or Replace Wiring As Identified For Any Plug Pin Pair Where Continuity Is Not Present.

**Check for Ground On Pitch Cpt Receptacle Pin A is Ground Present?**

- **Yes**: Replace Longitudinal Cpt.
- **No**: Locate Open in Wire W66-22-20, W66-09-20, W664-20-20 Or W664-05-20 For Pins A and B, Repair or Replace Wire As Required.
NO. 2 AFCS COMPUTER BITE INDICATES 89

FAULT ISOLATION PROCEDURE

INITIAL SETUP

References:
TM 55-1520-240-23
TM 55-4920-429-13

Applicable Configurations:
All

Equipment Condition:
TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power On
TM 55-4920-429-13
AFCS Line Test Set 145G0009-1
Prepared for Use

Tools:
Electrical Repairer’s Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
35K10 Avionic Mechanic
35K20 Avionic Mechanic

GO TO NEXT PAGE
11-3.47 NO. 2 AFCS COMPUTER BITE INDICATES 89 (Continued)

**Perform longitudinal (pitch) CPT null and output test.** Refer to TM 55-1520-240-23. Does test pass? CPT null and output test check okay?

NO

- **Replace no. 2 AFCS computer.**

YES

**Set test set meter source switch to continuity.** Set AFCS panel system select switch to OFF. Turn test set A-select and B-select switches and check resistance as follows:

<table>
<thead>
<tr>
<th>A-select switch</th>
<th>B-select switch</th>
<th>Resistance (ohms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-09</td>
<td>B-08</td>
<td>Less than 200</td>
</tr>
<tr>
<td>A-09</td>
<td>B-10</td>
<td>Less than 200</td>
</tr>
</tbody>
</table>

Are all resistance values present?

NO

**Disconnect pitch CPT plug with red band from receptacle 03115. Turn A-select and B-select switches to position that resistance value was not present. Connect jumper wire between pitch CPT receptacle pins for that position as follows:**

<table>
<thead>
<tr>
<th>Select switch positions</th>
<th>Pitch CPT receptacle pins jumpered</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-09</td>
<td>B-08 E and C</td>
</tr>
<tr>
<td>A-09</td>
<td>B-10 E and D</td>
</tr>
</tbody>
</table>

Does test set meter read continuity?

NO

**Remove electrical power. Disconnect pitch CPT plug with red band from receptacle 03115. Turn A-select and B-select switches to A-06 and B-01. Apply electrical power. Pitch CPT CPT plug pins A and E. Does test set meter indicate continuity?**

NO

**Locate open in wire W564-0029904020 between pitch CPT receptacle and fuse. Ground repair or replace wire as required.**

YES

**Check for ground on pitch CPT receptacle pin F. Is ground present?**

YES

**Replace longitudinal CPT.**

NO

**Replace pitch CPT transducer.**

YES

**Remove electrical power. Remove jumper. Disconnect test set. Check for continuity between plug 03119 and pitch CPT receptacle pins for select switch position that failed as follows:**

<table>
<thead>
<tr>
<th>Select switch position</th>
<th>Plug 03119 pitch CPT receptacle</th>
<th>Wire no</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-09</td>
<td>B-08</td>
<td>J</td>
</tr>
<tr>
<td>A-09</td>
<td>B-10</td>
<td>I</td>
</tr>
</tbody>
</table>

Repair or replace wiring as identified for any plug pin pair where continuity is not present.

END OF TASK

Change 9 11-157
11-3.48 AFCS COMPUTER BITE INDICATES 95

FAULT ISOLATION PROCEDURE
INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
35K10 Avionic Mechanic
35K20 Avionic Mechanic

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23
Battery connected
Electrical Power On
Hydraulic Power Off
11-3.48 AFCS COMPUTER BITE INDICATES 95 (Continued)

- Press test switch on pilot's altimeter indicator, does indicator read 1000 feet?
  - Yes: Remove electrical power. Disconnect plug 03193 pins from No. 1 AFCS computer. Disconnect plug 18505 from pilot's radar altimeter. Check for continuity between plug 03193 pin 8 and 18505 pin 7. Is continuity present?
  - No: Replace No. 1 AFCS computer.

- No: Troubleshoot radar altimeter system. Refer to TM 11-1520-240-20.
  - Yes: Locate open in wire W594-039-20. W57-482-22 or W557-470-22 between plug 03193 and plug 18505. Repair or replace wire as required.

END OF TASK
11-3.49 AFCS PITCH STABILIZATION ERRATIC OR OSCILLATORY

FAULT ISOLATION PROCEDURE
INITIAL SETUP

Applicable Configurations: All
Tools: Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Multimeter
Materials: None

Personnel Required:
35K10 Avionic Mechanic
35K20 Avionic Mechanic

References:
TM 55-1520-240-23
TM 55-4920-429-13

Equipment Condition:
TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power On
TM 55-4920-429-13
AFCS Line Test Set 145G0009-1
Prepared for Use
11-3.49 AFCS PITCH STABILIZATION ERRATIC OR OSCILLATORY

(Continued)

**NO. 1 AFCS PITCH STABILIZATION ERRATIC OR OSCILLATORY**

1. **PERFORM VERTICAL GYRO PITCH ATTITUDE TEST ON COPILOT'S VERTICAL GYRO. REFER TO TM 55-1520-240-23. DOES GYRO CHECK OKAY?**
   - **YES**
   - REFER TO TROUBLE SYMPTOM TASK 11-3.42
   - **NO**
   - DISCONNECT NO. 1 AFCS COMPUTER PLUG 031P5 AND COPILOT'S VERTICAL GYRO PLUG 062P5. CHECK CONTINUITY BETWEEN 031P5 PIN P AND BETWEEN 031P5 PIN N AND 062P5 PIN N. IS CONTINUITY PRESENT?
     - **YES**
     - TROUBLESHOOT COPILOT'S VERTICAL GYRO SYSTEM REFER TO TM 11-1520-240-20
     - **NO**

**NO. 2 AFCS PITCH STABILIZATION ERRATIC OR OSCILLATORY**

1. **PERFORM VERTICAL GYRO PITCH ATTITUDE TEST ON PILOT'S VERTICAL GYRO. REFER TO TM 55-1520-240-23. DOES GYRO CHECK OKAY?**
   - **YES**
   - REFER TO TROUBLE SYMPTOM TASK 11-3.42
   - **NO**
   - DISCONNECT NO. 2 AFCS COMPUTER PLUG 031P4 AND PILOT'S VERTICAL GYRO PLUG 062P4. CHECK CONTINUITY BETWEEN 031P4 PIN P AND 062P4 PIN P AND BETWEEN 031P4 PIN N AND 062P4 PIN N. IS CONTINUITY PRESENT?
     - **YES**
     - TROUBLESHOOT PILOT'S VERTICAL GYRO SYSTEM REFER TO TM 11-1520-20
     - **NO**

END OF TASK
11-3.50 NO. 1 AFCS PITCH ATTITUDE/AIR SPEED HOLD WEAK OR INOPERATIVE

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations: All

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

Materials: None

Personnel Required:
- 35K10 Avionic Mechanic
- 35K20 Avionic Mechanic

References:
- TM 55-1520-240-23
- TM 55-4920-429-13

Equipment Condition:
- TM 55-1520-240-23
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power On
- TM 55-4920-429-13
  - AFCS Line Test Set 145G0009-1
  - Prepared For Use
11-3.50 NO. 1 AFCS PITCH ATTITUDE/AIR SPEED HOLD WEAK OR INOPERATIVE (Continued)

**Perform Vertical Gyro Pitch Attitude Test on Copilot's Vertical Gyro**
- Yes: Refer to TM 55-1520-240-23, Check Okay?
- No: Refer to TM 55-1520-240-23, Check Okay?

**Perform LCT Actuator Output Motion Test on Forward LL1 Actuator**
- Yes: Refer to TM 55-1520-240-23, Check Okay?
- No: Refer to TM 55-1520-240-23, Check Okay?

**Perform DASH Actuator Output Motion Test on No. 1 DASH Actuator**
- Yes: Refer to TM 55-1520-240-23, Check Okay?
- No: Check Adjustment on Left Landing Gear Proximity Sw. Refer to TM 55-1520-240-23, Is Switch Adjusted Correctly?

**Disconnect No. 1 AFCS Computer Plug 031P3 and Copilot's Vertical Gyro Plug 062P3**
- Yes: Troubleshoot Copilot's Vertical Gyro System Refer to TM 11-1520-240:20

**Perform Longitudinal Cpt Null and Output Test on No. 1 Longitudinal Cpt**
- Yes: Refer to TM 55-1520-240-23, Check Okay?
- No: Adjust Sw. Refer to TM 55-1520-240-23.

**Refer to Trouble Symptom Task 11-3.18**

**Refer to Trouble Symptom Task 11-3.17**

**Refer to Trouble Symptom Task 11-3.43**

**Replace No. 1 AFCS Computer**

---

END OF TASK

Change 3 11-163
11-3.51 NO. 2 AFCS PITCH ATTITUDE/AIR SPEED HOLD WEAK OR INOPERATIVE

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
35K10 Avionic Mechanic
35K20 Avionic Mechanic

References:
TM 55-1520-240-23
TM 55-4920-429-13

Equipment Condition:
TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power On

TM 55-4920-429-13
AFCS Line Test Set 145G0009-1
Prepared For Use
11-3.51 NO. 2 AFCS PITCH ATTITUDE/AIR SPEED HOLD WEAK OR INOPERATIVE (Continued)
TM 55-1520-240-T

11-3.52 AFCS LONGITUDINAL CONTROL POSITION OUT OF TRIM

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
35K10 Avionic Mechanic
35K20 Avionic Mechanic

References:
TM 55-1520-240-23
TM 55-4920-429-13

Equipment Condition:
TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power On
TM 55-4920-429-13
AFCS Line Test Set 145G0009-1
Prepared For Use

GO TO NEXT PAGE
11-3.52 AFCS LONGITUDINAL CONTROL POSITION OUT OF TRIM (Continued)

NO. 1 AFCS LONGITUDINAL CONTROL POSITION OUT OF TRIM

- Perform Dash Actuator Output Motion Test on No. 1 Dash Actuator. Refer to TM 55-1520-240-23. Does Actuator Check Okay?
  - Yes: Replace No. 1 AFCS Computer.
  - No: Refer to Trouble Symptom [Task 11-3.42].

- Perform Longitudinal CPT Null and Output Test on No. 1 Long. CPT. Refer to TM 55-1520-240-23. Does CPT Check Okay?
  - Yes: Replace No. 1 AFCS Computer.
  - No: Refer to Trouble Symptom [Task 11-3.41].

NO. 2 AFCS LONGITUDINAL CONTROL POSITION OUT OF TRIM

- Perform Dash Actuator Output Motion Test on No. 2 Dash Actuator. Refer to TM 55-1520-240-23. Does Actuator Check Okay?
  - Yes: Replace No. 2 AFCS Computer.
  - No: Refer to Trouble Symptom [Task 11-3.42].

- Perform Longitudinal CPT Null and Output Test on No. 2 Long. CPT. Refer to TM 55-1520-240-23. Does CPT Check Okay?
  - Yes: Replace No. 2 AFCS Computer.
  - No: Refer to Trouble Symptom [Task 11-3.41].

END OF TASK
11-3.53 AFCS ROLL STABILIZATION ERRATIC/OSCILLATORY OR ROLL ATTITUDE HOLD WEAK OR INOPERATIVE

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
35K10 Avionic Mechanic
35K20 Avionic Mechanic

References:
TM 55-1520-240-23
TM 55-4920-429-13

Equipment Condition:
Battery Connected
Electrical Power On
Hydraulic Power On
AFCS Line Test Set 145G0009-1
Prepared For Use

GO TO NEXT PAGE
11-3.53 AFCS ROLL STABILIZATION ERRATIC/OSCILLATORY OR ROLL ATTITUDE HOLD WEAK OR INOPERATIVE (Continued)

NO. 1 AFCS ROLL STABILIZATION ERRATIC/OSCILLATORY OR ROLL ATTITUDE HOLD WEAK OR INOPERATIVE

- **PERFORM VERTICAL GYRO ROLL ATTITUDE TEST ON COPILOT'S VERTICAL GYRO. REFER TO TM 55-1520-240-23 DOES GYRO CHECK OKAY?**
  - YES: REFER TO TROUBLE SYMPTOM TASK 11-3.23
  - NO: DISCONNECT NO. 1 AFCS COMPUTER PLUG 03/13 AND COPILOT'S VERTICAL GYRO PLUG 06/23 CHECK CONTINUITY BETWEEN 03/13 PIN T AND 06/23 PIN T, ALSO BETWEEN 03/13 PIN U AND 06/23 PIN U. ALSO BETWEEN 03/13 PIN V AND 06/23 PIN V IS CONTINUITY PRESENT ON ALL WIRES?
    - YES: TROUBLESHOOT COPYLIT'S VERTICAL GYRO SYSTEM REFER TO TM 11-1520-240-30.

NO. 2 AFCS ROLL STABILIZATION ERRATIC/OSCILLATORY OR ROLL ATTITUDE HOLD WEAK OR INOPERATIVE

- **PERFORM VERTICAL GYRO ROLL ATTITUDE TEST ON PILOT'S VERTICAL GYRO. REFER TO TM 55-1520-240-23 DOES GYRO CHECK OKAY?**
  - YES: REFER TO TROUBLE SYMPTOM TASK 11-3.32
  - NO: DISCONNECT NO. 2 AFCS COMPUTER PLUG 03/13 AND PILOT'S VERTICAL GYRO PLUG 06/24. CHECK CONTINUITY BETWEEN 03/13 PIN T AND 06/24 PIN T, ALSO BETWEEN 03/13 PIN U AND 06/24 PIN U. ALSO BETWEEN 03/13 PIN V AND 06/24 PIN V IS CONTINUITY PRESENT ON ALL WIRES?
    - YES: TROUBLESHOOT PILOT'S VERTICAL GYRO SYSTEM REFER TO TM 11-1520-20.

END OF TASK 11-169
11-3.54 HEADING SELECT MODE RESPONSE WEAK OR INOPERATIVE (BOTH SYSTEMS)

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
- Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
- Multimeter

Materials:
None

Personnel Required:
- 35K10 Avionic Mechanic
- 35K20 Avionic Mechanic

References:
- TM 55-1520-240-23
- TM 55-4920-429-13

Equipment Condition:
- TM 55-1520-240-23
  Battery Connected
  Electrical Power On
  Hydraulic Power On
- TM 55-4920-429-13
  AFCS Line Test Set 145G0009-1
  Prepared for Use
11-3.54 HEADING SELECT MODE RESPONSE WEAK OR INOPERATIVE (BOTH SYSTEMS) (Continued)

- **TM 55-1520-240-23**

**PERFORM HSI HEADING TEST. REFER TO TM 55-1520-240-23.**

YES

**PERFORM AFCS HEADING ENGAGE TEST. REFER TO TM 55-1520-240-23.**

YES

**DISCONNECT TEST SET AND CONNECT PLUGS 031P9 AND 031P8 TO AFCS COMPUTER. DISCONNECT AFCS PANEL PLUG 031P7.**

YES

**PRESS AND HOLD HEADING SW ON AFCS PNL. CHECK CONTINUITY BETWEEN AFCS PNL. CHECK PNL.**

YES

**REPLACE NO. 1 AFCS COMPUTER.**

NO

**DISCONNECT NO. 1 AFCS COMPUTER PLUG 031P9 AND AFCS PANEL PLUG 031P7. CHECK CONTINUITY BETWEEN 031P9 PIN N AND 031P7 PIN N.**

YES

**REPLACE AFCS PANEL.**

NO

**LOCATE OPEN ON WIRE W664-142-20, W664-143-20, W667-69-22, W664-137-20, OR W657-888-20.**

YES

**REPLACE WIRE AS REQUIRED.**

NO

**ENGAGE CMD SEL ON CO-PILOT'S HSI MODE SELECT PANEL.**

YES

**DISCONNECT NO. 1 AFCS COMPUTER PLUG 031P9.**

YES

**REPLACE NO. 1 AFCS COMPUTER.**

NO

**DISCONNECT COPilot'S HSI MODE SELECT PNL.**

YES


YES

**REPAIR OR REPLACE WIRE AS REQUIRED.**

NO

**DISCONNECT COPilot'S HSI MODE SELECT PNL.**

YES

**ENLIST PILOT'S HSI MODE SELECT PNL.**

YES

**CHECK CONTINUITY BETWEEN 031P9 AND 031P7.**

YES

**REPLACE PILOT'S HSI MODE SELECT PANEL.**

NO

**TROUBLESHOOT PILOT'S HSI MODE SELECT PANEL. REFER TO TM 55-1520-240-20.**

YES

**REPLACE PILOT'S HSI MODE SELECT PANEL.**

NO

**END OF TASK**

Change 3 11-171
Fault Isolation Procedure

Initial Setup

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
35K10 Avionic Mechanic
35K20 Avionic Mechanic

References:
TM 55-1520-240-23
TM 55-4920-429-13

Equipment Condition:
Battery Connected
Electrical Power On
Hydraulic Power On
AFCS Line Test Set 146G0009-1
Prepared For Use
11-3.55 NO. 1 AFCS HEADING SELECT MODE RESPONSE WEAK OR INOPERATIVE (Continued)

END OF TASK

Change 3 11-173
11-3.56 NO. 2 AFCS HEADING SELECT MODE RESPONSE WEAK OR INOPERATIVE

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
35K10 Avionic Mechanic
35K20 Avionic Mechanic

References:
TM 55-1520-240-23
TM 55-4920-429-13

Equipment Condition:
TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power On
TM 55-4920-420-13
AFCS Line Test Set 145G0009-1
Prepared For Use
11-3.56 NO. 2 AFCS HEADING SELECT MODE RESPONSE WEAK OR INOPERATIVE (Continued)

- **Perform HST heading test on No. 2 AFCS**
  - Yes: Continue
  - No: **Disengage CMB SEL ON PILOT'S HSI MODE SELECT PANEL**

- **Perform AFCS heading cutout test**
  - Yes: Continue
  - No: **Connect No. 2 AFCS computer plug O31P4 and AFCS panel plug O31P6. Check continuity between O31P4 pin N and O31P6 pin N. Also, between O31P4 pin H and O31P6 pin H. Is continuity present?**
    - Yes: Continue

- **Troubleshoot pilot's HSI and HSI mode select**
  - Yes: Continue
  - No: **Disengage CMB SEL ON PILOT'S HSI MODE SELECT PANEL. Repeat HST heading test. Does HST heading engage okay?**

- **Replace AFCS panel**
  - Yes: Continue
  - No: **Replace AFCS computer.**

**End of Task**
Fault Isolation Procedure

Initial Setup

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
Avionic Mechanic (2)

References:
TM 55-1520-240-23
TM 55-4920-429-13

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power On
TM 55-4920-429-13:
AFCS Line Test Set 145G0009-1 Prepared for Use
11-3.57 NO. 1 AFCS YAW STABILITY ERRATIC/OSCILLATORY (Continued)

**Perform Yaw ILCA Authority/Phasing Test**
Refer to TM 55-1520-240-22.
Does Yaw ILCA Authority Phasing Check Okay?

**Set Test Set Meter Sources Switch to Continuity. Set AFCS Panel System Select Switch to OFF.**
Turn test set A-Select and B-Select switches and check resistance as follows:

<table>
<thead>
<tr>
<th>A-Select Switch</th>
<th>B-Select Switch</th>
<th>Resistance (Ohms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-42</td>
<td>B-43</td>
<td>Less than 1100</td>
</tr>
<tr>
<td>A-47</td>
<td>B-46</td>
<td>1000 to 2000</td>
</tr>
<tr>
<td>A-41</td>
<td>B-46</td>
<td>Less than 1100</td>
</tr>
</tbody>
</table>

Are all resistance values present?

**Disconnect Plug 031P17 from Yaw ILCA, Turn A-Select and B-Select Switches to Position That Resistance Value Was Not Present. Connect Jumper Wire Between Plug 031P17 Pins For That Position As Follows:**

<table>
<thead>
<tr>
<th>A-Select Switch</th>
<th>B-Select Switch</th>
<th>PIN 031P17 PINS JUMPERED</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-42</td>
<td>B-43</td>
<td>3 and 4</td>
</tr>
<tr>
<td>A-47</td>
<td>B-36</td>
<td>8 and 10</td>
</tr>
<tr>
<td>A-46</td>
<td>B-26</td>
<td>11 and 13</td>
</tr>
<tr>
<td>A-41</td>
<td>B-46</td>
<td>13 and 4</td>
</tr>
</tbody>
</table>

Does test set meter read continuity?

**Perform Leak Check on Pneumatic Lines From NO. 1 System Left and Right Side.**
IF 0-1 AFCS Computer Refer to Task B-1.3 Is Leak Check OK?

**Remove Electrical Power-**
Disconnect Plug 031P17 From Yaw ILCA, Turn A-Select and B-Select Switches To A-36 and B-67 Apply Electrical Power Jumper Plug 031P17 Pins 1 and 2 and Then Pins 11 and 12. Does Test Set Meter Indicate Continuity For Each Set of Jumped PINS?

**Locate Open in Wire W664-17, W664-17.20, W664-06, W664-06.20, or W664-72.20 For Pins 1 and 2 or Wire W664-20, W664-20.20, W664-20, W664-20.20, or W664-70.20 For Pins 11 and 12 Repair or Replace Wire as Required.**

**Replace NO. 1 AFCS Computer**

**Locate Open in Wire W664-06,06.20,20.20 Between Plug 031P17 and Fuse/Age Ground Repair or Replace Wire as Required.**

**Replace Yaw ILCA.**

**Remove Electrical Power-**
Disconnect Jumper Wire/Looped 1 Test Set Check for Continuity Between Plug 031P8 Pins and Plug 031P17 Pins for Select Switch Position That Failed As Follows:

<table>
<thead>
<tr>
<th>SELECT SW POSITION</th>
<th>PLUG 031P8 PIN</th>
<th>PLUG 031P17 PIN</th>
<th>WIRE NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-42</td>
<td>B-43</td>
<td>FF</td>
<td>W664-36-20</td>
</tr>
<tr>
<td>A-44</td>
<td>B-36</td>
<td>MI</td>
<td>W664-32-20</td>
</tr>
<tr>
<td>A-47</td>
<td>B-46</td>
<td>BB</td>
<td>W664-33-20</td>
</tr>
<tr>
<td>A-41</td>
<td>B-46</td>
<td>KK</td>
<td>W664-31-20 OR W664-44-20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LL</td>
<td>W664-30-20 OR W664-44-20</td>
</tr>
</tbody>
</table>

**Repair or Replace Wiring as Identified for Any Plug Pin Pair Where Continuity Is Not Present.**

**End of Task**
11.3.58 NO. 2 AFCS YAW STABILITY ERRATIC/OSCILLATORY

**FAULT ISOLATION PROCEDURE**

**INITIAL SETUP**

**Applicable Configurations:**
All

**Tools:**
- Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
- Multimeter

**Materials:**
None

**Personnel Required:**
- 35K10 Avionic Mechanic
- 35K20 Avionic Mechanic

**References:**
- TM 55-1520-240-23
- TM 55-4920-429-13

**Equipment Condition:**
- TM 55-1520-240-23
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power On
- TM 55-4920-429-13
  - AFCS Line Test Set 145G009-1
  - Prepared For Use
11-3.58 NO. 2 AFCS YAW STABILITY ERRATIC/OSSILLATORY

(Continued)

PerformYawILCA
Authority/Phasing Test.
Refer to TM 55-1520-240-23.
Does Yaw ILCA Authority Phasing Check OKAY?

Perform Leak Check on Pneumatic Lines from NO. 2 System Left and Right Side Slip Ports to NO. 2 AFCS Computer.
Refer to Task 11-3-13, Is Leak Check OKAY?

Repair or Replace Leaking Pneumatic Lines.
11-3.59 AFCS HEADING HOLD WEAK OR INOPERATIVE

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
35K10 Avionic Mechanic
35K20 Avionic Mechanic

References:
TM 55-1520-240-23
TM 55-4920-429-13

Equipment Condition:
Battery Connected
Electrical Power On
Hydraulic Power On
AFCS Line Test Set 146G0009-1
Prepared For Use
NO. 1 AFCS HEADING HOLD WEAK OR INOPERATIVE

PERFORM DIRECTIONAL GYRO OUTPUT TEST. REFER TO TM 11-120-240-23. DOES GYRO CHECK OKAY?

YES

DISCONNECT NO. 1 AFCS COMPUTER PLUG 031PS AND DIRECTIONAL GYRO PLUG 063PI. CHECK CONTINUITY BETWEEN 031PS PIN W AND 063PI PIN J. ALSO, BETWEEN 031PS PIN Y AND 063PI PIN G. IS CONTINUITY PRESENT ON ALL WIRES?

NO

LOCATE OPEN IN WIRE W664-150-22 OR W507-816-22. REPAIR OR REPLACE WIRING AS REQUIRED.

YES

TROUBLESHOOT GYRO COMPASS SYSTEM. REFER TO TM 11-1520-240-20.

NO

DISCONNECT NO. 1 AFCS COMPUTER PLUG 031PS AND DIRECTIONAL GYRO PLUG 063PI. CHECK CONTINUITY BETWEEN 031PS PIN W AND 063PI PIN J. ALSO, BETWEEN 031PS PIN Y AND 063PI PIN G. IS CONTINUITY PRESENT ON ALL WIRES?

NO


YES

END OF TASK

NO. 2 AFCS HEADING HOLD WEAK OR INOPERATIVE

PERFORM DIRECTIONAL GYRO OUTPUT TEST. REFER TO TM 55-120-240-23. DOES GYRO CHECK OKAY?

YES

DISCONNECT NO. 2 AFCS COMPUTER PLUG 031PS AND DIRECTIONAL GYRO PLUG 063PI. CHECK CONTINUITY BETWEEN 031PS PIN W AND 063PI PIN J. ALSO, BETWEEN 031PS PIN Y AND 063PI PIN G. IS CONTINUITY PRESENT ON ALL WIRES?

NO

LOCATE OPEN IN WIRE W664-150-22 OR W507-816-22. REPAIR OR REPLACE WIRING AS REQUIRED.

YES

TROUBLESHOOT GYRO COMPASS SYSTEM. REFER TO TM 11-1520-240-20.

NO

DISCONNECT NO. 2 AFCS COMPUTER PLUG 031PS AND DIRECTIONAL GYRO PLUG 063PI. CHECK CONTINUITY BETWEEN 031PS PIN W AND 063PI PIN J. ALSO, BETWEEN 031PS PIN Y AND 063PI PIN G. IS CONTINUITY PRESENT ON ALL WIRES?

NO

11-3.60 AFCS LATERAL STICK ONLY TURNS NOT COORDINATED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations: All

Tools:
Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915

Materials:
None

Personnel Required:
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23
  - Battery Disconnected
  - Electrical Power Off
  - Hydraulic Power Off
11-3.60 AFCS LATERAL STICK ONLY TURNS NOT COORDINATED

(Continued)

NO. 1 AFCS LATERAL STICK ONLY TURNS NOT COORDINATED

PERFORM LEAK CHECK ON PNEUMATIC LINES FROM NO. 1 SYSTEM LEFT AND RIGHT SIDESLIP PORTS TO NO. 1 AFCS COMPUTER. REFER TO TASK 8.13. IS LEAK CHECK OK?

YES

REPLACE NO. 1 AFCS COMPUTER

NO

REPLACE LEAKING PNEUMATIC LINES.

NO. 2 AFCS LATERAL STICK ONLY TURNS NOT COORDINATED

PERFORM LEAK CHECK ON PNEUMATIC LINES FROM NO. 2 SYSTEM LEFT AND RIGHT SIDESLIP PORTS TO NO. 2 AFCS COMPUTER. REFER TO TASK 8.13. IS LEAK CHECK OK?

YES

REPLACE NO. 2 AFCS COMPUTER

NO

REPLACE LEAKING PNEUMATIC LINES. REFER TO TM 55-1520-240-23.

END OF TASK

11-183
Fault Isolation Procedure

Initial Setup

Applicable Configurations:
All

Tools:
- Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
- Multimeter

Materials:
None

Personnel Required:
Avionic Mechanic (2)

References:
- TM 55-1520-240-23
- TM 55-4920-429-13

Equipment Condition:
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power On
- TM 55-4920-429-13
  - AFCS Line Test Set 145G0009-1 Prepared for Use

Perform Barometric Altimeter Select Test on No. 1 AFCS Computer. Refer to TM 55-1520-240-23 Does Altimeter Check Okay?

Yes: Replace No. 1 AFCS Computer.

No: Disconnect No. 1 AFCS Computer Plug 031P3 and AFCS Panel Plug 031P7. Check Continuity Between 031P3 Pin Connector and 031P7 Pin N. Also, Between 031P3 Pin 1 and 031P7 Pin G. Is Continuity Present on Both Wires?

Yes: Replace AFCS Panel.

11-3.62 RADAR ALTITUDE HOLD INOPERATIVE OR RESPONSE ERRATIC (BAROMETRIC ALTITUDE HOLD OKAY)

FAULT ISOLATION PROCEDURE
INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
35K10 Avionic Mechanic
35K20 Avionic Mechanic

References:
TM 55-1520-240-23
TM 55-4920-429-13

Equipment Condition:
TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power Off

TM 55-4920-429-13
AFCS Line Test Set 145G0009-1
Prepared for Use.
11-3.62 RADAR ALTITUDE HOLD INOPERATIVE OR RESPONSE ERRATIC (BAROMETRIC ALTITUDE HOLD OKAY) (Continued)

- **Perform Radar Altimeter Select Test.** Refer to TM 55-1520-240-23. Does Altimeter Check okay?
  - **Yes**: Operate Pressure Test Switch on Plotter's Altimeter Indicator. Does Indicator Read 1000 Feet?
    - **Yes**: Replace AFCS Panel.
    - **No**: Replace No. 1 AFCS Computer.
  - **No**: Disconnect No. 1 AFCS Computer Plug O31P3 and AFCS Panel Plug O31P7. Check continuity between O31P3 Pin 2 and 19SP2 Pin 3. Also, between O31P3 Pin AA and 19SP2 Pin 11. Also, between O31P3 Pin LL and 19SP2 Pin 6. Is continuity Present all Wires?
    - **Yes**: Locate Open in Wire W664-139-20 or W557-691-20. Pair or Replace Wire as Required.
    - **No**: Replace No. 1 AFCS Computer.
11-3.63 BAROMETRIC AND RADAR ALTITUDE HOLD INOPERATIVE OR RESPONSE ERRATIC

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
- Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
- Multimeter

Materials:
None

Personnel Required:
- 35K10 Avionic Mechanic
- 35K20 Avionic Mechanic

References:
- TM 55-1520-240-23
- TM 55-4920-429-13

Equipment Condition:
- TM 55-1520-240-23
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power On
- TM 55-4920-429-13
  - AFCS Line Test Set 145G0009-1
  - Prepared for Use
11.3.63 BAROMETRIC AND RADAR ALTITUDE HOLD INOPERATIVE OR RESPONSE ERRATIC (Continued)

**Diagram:**
- **Perform Collective CCA:**
  - **Yes:** Refer to Trouble Symptom Task 11.3.61
  - **No:** Refer to Trouble Symptom Task 11.3.65

**END OF TASK**

Change 2
11-189/(11-190 blank)
11-4 AFCS CONTROL PANEL
### 11-4.2 AFCS CONTROL PANEL VISUAL CHECK

#### INITIAL SETUP

**Applicable Configurations:** All

**Tools:**
- Electronic Repairer's Tool Kit, NSN 5180-00-064-5178
- Multimeter

**Materials:** None

#### Personnel Required:

#### References:
- TM 55-1520-240-23

#### Equipment Condition:
- AFCS Control Panel Disconnected From AFCS Bench Test Set
- AFCS Control Panel Rear Cover Removed

#### TASK RESULT

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Check pins in receptacles (1 and 2).</td>
<td>If any pin is bent, straighten it. If any pin is broken, corroded, or burnt, replace it.</td>
</tr>
<tr>
<td>2. Check switches (3 thru 9).</td>
<td>If any switch is loose or damaged, tighten or replace it as required. If knob on switch (6) is loose, tighten or replace it. If any wire termination is loose, tighten it. If any wire is damaged, replace it.</td>
</tr>
<tr>
<td>3. Check panel wires.</td>
<td></td>
</tr>
</tbody>
</table>

#### FOLLOW-ON MAINTENANCE:
- None

---

**END OF TASK**
FAULT ISOLATION PROCEDURE

IN INITIAL SETUP

Applicable Configurations:

All

Tools:

Electronic Repairer’s Tool Kit,
NSN 5180-00-064-5178
Multimeter

Materials:

None

Personnel Required:


References:

TM 55-1520-240-23

Equipment Condition:

Visual Check of AFCS Control Panel Performed (Task 11-4.2)

END OF TASK
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electronic Repairer’s Tool Kit,
NSN 5180-00-064-5178
Multimeter

Materials:
None

Personnel Required:

References:
TM 55-1520-240-23

Equipment Condition:
Visual Check of AFCS Control Panel Performed

END OF TASK
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electronic Repairer's Tool Kit, NSN 5180-00-054-5178
Multimeter

Materials:
None

Personnel Required:
Avionic Navigation and Flight Control Equipment
Repairer

References:
TM 55-1520-240-23
Equipment Condition:
Visual Check of AFCS Control Panel Performed

D14S-1244S SPA

END OF TASK
11-4.6 AFCS CONTROL PANEL FAILS HEADING TEST

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electronic Repairer's Tool Kit,
NSN 5180-00-064-5178
Multimeter

Materials:
None

Personnel Required:

References:
TM 55-1520-240-23

Equipment Condition:
Visual Check of AFCS Control Panel Performed [Task 11-4.2]

END OF TASK
11-4.7 AFCS CONTROL PANEL FAILS CYCLIC TRIM - MANUAL TEST

Fault Isolation Procedure

Initial Setup

Applicable Configurations:
All

Tools:
Electronic Repairer's Tool Kit, NSN 5180-00-064-5178
Multimeter

Materials:
None

Personnel Required:

References:
TM 55-1520-240-23

Equipment Condition:
Visual Check of AFCS Control Panel Performed [Task 11-4.2]

END OF TASK
11-4.8 AFCS CONTROL PANEL FAILS CYCLIC TRIM - AUTOMATIC TEST

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electronic Repairer’s Tool Kit,
NSN 5180-00-064-5178
Multimeter

Materials:
None

Personnel Required:

References:
TM 55-1520-240-23

Equipment Condition:
Visual Check of AFCS Control Panel Performed [Task 11-4.2]

END OF TASK
11-4.9 AFCS CONTROL PANEL FAILS PANEL ILLUMINATION TEST

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electronic Repairer's Tool Kit, NSN 5180-00-064-5178
Multimeter

Materials:
None

Personnel Required:

References:
TM 55-1520-240-23

Equipment Condition:
Visual Check of AFCS Control Panel Performed [Task 11-4.2]

END OF TASK
11-4.10 AFCS CONTROL PANEL FAILS DIODE TEST

Fault Isolation Procedure

Initial Setup

Applicable Configurations:

All

Tools:

Electronic Repairer’s Tool Kit,
NSN 5180-00-064-5178
Multimeter

Materials:

None

Personnel Required:


References:

TM 55-1520-240-23

Equipment Condition:

Visual Check of AFCS Control Panel Performed [Task 11-4.12]

END OF TASK
11-5 AFCS COMPUTER
INITIAL SETUP

Applicable Configurations:
All

Tools:
Electronic Repairer's Tool Kit,
NSN 5180-00-064-5178

Materials:
None

Personnel Required:

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
AFCS Computer Base Separated
From AFCS Computer Box

11-5.2 AFCS COMPUTER VISUAL CHECK

TASK

1. Check components on base (1).

2. Check wiring on bottom of box (2).

RESULT

If any component is loose or damaged, tighten or replace it as required. If wiring to any component is damaged, replace it.

If any wire is broken, forward computer to depot for disposition.

FOLLOW-ON MAINTENANCE:

TM 55-1520-240-23:
AFCS computer base connected to box.
Test AFCS computer.

END OF TASK
11-5.3 AFCS COMPUTER FAILS TEST 1 (CONTINUITY TEST)

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
None

Personnel Required:

References:
TM 55-1520-240-23

Equipment Condition:
None

RETURN AFCS COMPUTER TO DEPOT FOR DISPOSITION

END OF TASK
11-5.4 AFCS COMPUTER FAILS TEST 2 (POWER SUPPLY TEST)

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electronic Repairer's Tool Kit, NSN 5180-00-064-5178
Multimeter

Materials:
None

Personnel Required:

References:
TM 55-1520-240-23

Equipment Condition:
Visual Check of AFCS Computer Performed

11-5.4

END OF TASK
11-5.5 AFCS COMPUTER FAILS TEST 3 (LOGIC TEST)

**Fault Isolation Procedure**

- **Initial Setup**
- **Applicable Configurations:**
  - All
- **Tools:**
  - Electronic Repairer's Tool Kit,
    - NSN 5180-00-064-5178
- **Materials:**
  - None
- **Personnel Required:**
- **References:**
  - TM 55-1520-240-23
- **Equipment Condition:**
  - Visual Check of AFCS Computer Performed
  - Task 11-5.2
  - TM 55-1520-240-23
  - AFCS Computer Cover Removed

---

**Flowchart Diagram**

- GO TO NEXT PAGE
### TABLE A. LOGIC TEST

**FAULT ANALYSIS**

<table>
<thead>
<tr>
<th>BENCH TEST STEP NO.</th>
<th>SUSPECT CIRCUIT CARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>34</td>
<td>A12, A6, A1</td>
</tr>
<tr>
<td>36-38</td>
<td>A12, A1, A6</td>
</tr>
<tr>
<td>42-47</td>
<td>A1, A12</td>
</tr>
<tr>
<td>48-70</td>
<td>A1</td>
</tr>
<tr>
<td>73-80</td>
<td>A1, A2</td>
</tr>
<tr>
<td>83-85</td>
<td>A1, A4, A6</td>
</tr>
<tr>
<td>87</td>
<td>A1, A2</td>
</tr>
<tr>
<td>88-95</td>
<td>A1, A2, A6</td>
</tr>
<tr>
<td>102</td>
<td>A12, A7, A1</td>
</tr>
<tr>
<td>105-108</td>
<td>A1</td>
</tr>
</tbody>
</table>
11-5.6 AFCS COMPUTER FAILS TEST 4 (PITCH AXIS TEST)

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
   All

Tools:
   Electronic Repairer’s Tool Kit, NSN 5180-00-064-5178

Materials:
   None

Personnel Required:

References:
   TM 55-1520-240-23

Equipment Condition:
   Visual Check of AFCS Computer Performed
      (Task 11-5.2)
   TM 55-1520-240-23:
      AFCS Computer Cover Removed

GO TO NEXT PAGE
### TABLE B. PITCH AXIS TEST
**FAULT ANALYSIS**

<table>
<thead>
<tr>
<th>BENCH TEST STEP NO.</th>
<th>SUSPECT CIRCUIT CARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>113-137</td>
<td>A3</td>
</tr>
<tr>
<td>145</td>
<td>A3, A4, A2</td>
</tr>
<tr>
<td>147</td>
<td>A1</td>
</tr>
<tr>
<td>157-162</td>
<td>A3</td>
</tr>
</tbody>
</table>

END OF TASK
11-5.7 AFCS COMPUTER FAILS TEST 5 (ROLL AXIS TEST)

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electronic Repairer's Tool Kit,
NSN 5180-00-064-5178

Materials:
None

Personnel Required:

References:
TM 55-1520-240-23

Equipment Condition:
Visual Check of AFCS Computer Performed

Task 11-5.2

Equipment Condition:
Visual Check of AFCS Computer Performed

TM 55-1520-240-23
AFCS Computer Cover Removed
### TABLE C. ROLL AXIS TEST
#### FAULT ANALYSIS

<table>
<thead>
<tr>
<th>BENCH TEST STEP NO.</th>
<th>SUSPECT CIRCUIT CARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>177-209</td>
<td>A2</td>
</tr>
<tr>
<td>216-219</td>
<td>A1, A2, A7</td>
</tr>
<tr>
<td>223-226</td>
<td>A1, A2</td>
</tr>
<tr>
<td>228-232</td>
<td>A2</td>
</tr>
<tr>
<td>234-236</td>
<td>A1, A2</td>
</tr>
<tr>
<td>243-247</td>
<td>A2</td>
</tr>
<tr>
<td>267-275</td>
<td>A7, A1</td>
</tr>
<tr>
<td>283</td>
<td>A7, A2</td>
</tr>
<tr>
<td>284-347</td>
<td>A2</td>
</tr>
</tbody>
</table>
Fault Isolation Procedure

Initial Setup

Applicable Configurations:
All

Tools:
Electronic Repairer's Tool Kit, NSN 5180-00-064-5178

Equipment Condition:
Visual Check of AFCS Computer Performed

Personnel Required:

References:
TM 55-1520-240-23
TM 55-1520-240-23
AFCS Computer Cover Removed

Materials:
None
### TABLE D. YAW AXIS TEST
#### FAULT ANALYSIS

<table>
<thead>
<tr>
<th>BENCH TEST STEP NO.</th>
<th>SUSPECT CIRCUIT CARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>352</td>
<td>A4, A14, A6</td>
</tr>
<tr>
<td>360</td>
<td>A4, A8</td>
</tr>
<tr>
<td>366-370</td>
<td>A4</td>
</tr>
<tr>
<td>378</td>
<td>A6, A8</td>
</tr>
<tr>
<td>390</td>
<td>A4, A7</td>
</tr>
<tr>
<td>398</td>
<td>A4, A2</td>
</tr>
<tr>
<td>404-407</td>
<td>A6, A1, A4</td>
</tr>
<tr>
<td>410-415</td>
<td>A4, A1</td>
</tr>
<tr>
<td>419-420</td>
<td>A4, A7</td>
</tr>
<tr>
<td>433</td>
<td>A4</td>
</tr>
<tr>
<td>435-445</td>
<td>A4, A8, A6</td>
</tr>
<tr>
<td>458-464</td>
<td>A4</td>
</tr>
</tbody>
</table>
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electronic Repairer's Tool Kit,
NSN 5180-00-064-5178

Materials:
None

Personnel Required:

References:
TM 55-1520-240-23

Equipment Condition:
Visual Check of AFCS Computer Performed
(TM 55-1520-240-23; AFCS Computer Cover Removed)

GO TO NEXT PAGE
### TABLE E. DASH TEST FAULT ANALYSIS

<table>
<thead>
<tr>
<th>BENCH TEST STEP NO.</th>
<th>SUSPECT CIRCUIT CARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>474</td>
<td>A6</td>
</tr>
<tr>
<td>490</td>
<td>A3</td>
</tr>
<tr>
<td>491</td>
<td>A3, A12</td>
</tr>
<tr>
<td>498, 503</td>
<td>A1, A6</td>
</tr>
<tr>
<td>500-506</td>
<td>A6, A3</td>
</tr>
<tr>
<td>511-524</td>
<td>A3</td>
</tr>
<tr>
<td>531</td>
<td>A1, A3</td>
</tr>
<tr>
<td>535-543</td>
<td>A3</td>
</tr>
<tr>
<td>551-570</td>
<td>A6, A12</td>
</tr>
</tbody>
</table>

END OF TASK

Change 13 11-217
11-5.10 AFCS COMPUTER FAILS TEST 8 (LONGITUDINAL CYCLIC TRIM (LCT) TEST)

**FAULT ISOLATION PROCEDURE**

**INITIAL SETUP**

**Applicable Configurations:** All

**Tools:**
Electronic Repairer's Tool Kit, NSN 5180-00-064-5178

**Materials:** None

**Personnel Required:**

**References:**
TM 1520-240-23

**Equipment Condition:**
Visual Check of AFCS Computer Performed (Task 11-5.2)

TM 55-1520-240-23:
AFCS Computer Cover Removed

GO TO TABLE F AND LOCATE BENCH TEST STEP THAT COMPUTER FAILED. REPLACE FIRST SUSPECT CIRCUIT CARD FOR THAT STEP AND REPEAT TEST. DOES COMPUTER PASS TEST?

IF MORE THAN ONE CARD LISTED IN TABLE F FOR THIS FAILED STEP, INSTALL ORIGINAL CIRCUIT CARD IN COMPUTER AND REPLACE FOURTH SUSPECT CIRCUIT CARD. REPEAT STEP. DOES COMPUTER PASS TEST?

INSTALL ORIGINAL CIRCUIT CARD IN COMPUTER FORWARD COMPUTER TO DEPOT FOR DISPOSITION.
## TABLE F. LCT TEST FAULT ANALYSIS

<table>
<thead>
<tr>
<th>BENCH TEST STEP NO.</th>
<th>SUSPECT CIRCUIT CARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>582</td>
<td>A8, A12, A6, A3</td>
</tr>
<tr>
<td>584-592</td>
<td>A8</td>
</tr>
<tr>
<td>594</td>
<td>A12</td>
</tr>
<tr>
<td>600-602</td>
<td>A8</td>
</tr>
</tbody>
</table>

END OF TASK

Change 13  11-219
11-5.11 AFCS COMPUTER FAILS TEST 9 (COLLECTIVE CONTROL DRIVER ACTUATOR (CCDA) TEST)

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electronic Repairer's Tool Kit,
NSN 5180-00-064-5178

Materials:
None

Personnel Required:

References:
TM 55-1520-240-23

Equipment Condition:
Visual Check of AFCS Computer Performed

TM 55-1520-240-23:
AFCS Computer Cover Removed

GO TO NEXT PAGE

11-220

GO TO NEXT PAGE
### TABLE G. CCDA TEST

**FAULT ANALYSIS**

<table>
<thead>
<tr>
<th>BENCH TEST STEP NO.</th>
<th>SUSPECT CIRCUIT CARD</th>
</tr>
</thead>
<tbody>
<tr>
<td>618-630</td>
<td>A8, A2</td>
</tr>
<tr>
<td>641-693</td>
<td>A8, A7</td>
</tr>
</tbody>
</table>

**CIRCUIT CARD**

---

END OF TASK

Change 13 11-221
**FAULT ISOLATION PROCEDURE**

**INITIAL SETUP**

**Applicable Configurations:**
- All

**Tools:**
- Electronic Repairer's Tool Kit, NSN 5180-00-064-5178
- Multimeter

**Materials:**
- None

**Personnel Required:**

**References:**
- TM 55-1520-240-23
- Visual Check of AFCS Computer Performed
- TM 55-1520-240-23

**Equipment Condition:**
- Visual Check of AFCS Computer Performed

**Equipment Condition:**
- Visual Check of AFCS Computer Performed

**TM 55-1520-240-23**
11-5.13 AFCS COMPUTER FAILS TEST 11 (NORMAL ACCELERATION TEST)

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electronic Repairer's Tool Kit,
NSN 5180-00-064-5178
Multimeter

Materials:
None

Personnel Required:

References:
TM 55-1520-240-23

Equipment Condition:
Visual Check of AFCS Computer Performed

![Decision Tree Diagram]

11-5.13 GO TO NEXT PAGE
11-223
11-5.14 AFCS COMPUTER FAILS TEST 12 (PRESSURE TRANSDUCERS TEST)

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electronic Repairer’s Tool Kit,
NSN 5180-00-064-5178
Multimeter

Materials:
None

Personnel Required:

References:
TM 55-1520-240-23

Equipment Condition:
Visual Check of AFCS Computer Performed (Task 11-5.2)

GO TO NEXT PAGE
11-5.14 AFCS COMPUTER FAILS TEST 12 (PRESSURE TRANSDUCERS TEST) (Continued)

DISCONNECT COMPUTER FROM TEST SET. SEPARATE COMPUTER BASE FROM ITS BOX. REFER TO TM 55-1520-240-23. CHECK TUBES BETWEEN TRANSDUCER THAT FAILED TEST AND FITTINGS IS ANY TUBE DAMAGED OR DISCONNECTED?

YES

CHECK NULL ADJUSTMENT OF TRANSDUCER THAT FAILED TEST. REFER TO TM 55-1520-240-23. IS TRANSDUCER NULLED?

YES

DISCONNECT CONNECTOR FROM BASE CIRCUIT CARD. CHECK FOR CONTINUITY BETWEEN TERMINAL BOARD AND CIRCUIT CARD AS FOLLOWS:

- **AIRSPEED**:
  - 1 TO 22
  - 5 TO 32
  - 6 TO 32
  - 7 TO 26

- **ALTITUDE**:
  - 1 TO 35

- **SIDELIP**:
  - 1 TO 31
  - 4 TO 8
  - 5 TO 30

CHECK FOR RESISTANCE ON TERMINAL BOARD AS FOLLOWS:

- **AIRSPEED**:
  - 2 TO 5: 80K TO 92K OHMS
  - 2 TO 7: 82K TO 92K OHMS

- **ALTITUDE**:
  - 2 TO 7: 19K TO 21K OHMS
  - 2 TO 5: 11K TO 21K OHMS

- **SIDELIP**:
  - 3 TO 2: 90K TO 92K OHMS
  - 3 TO 5: 82K TO 92K OHMS

IF RESISTANCE VALUES LISTED PRESENT?

YES

REPLACE TRANSDUCER THAT FAILED TEST.

NO

REPLACE RESISTOR 1, R2 OR R3 ON TERMINAL BOARD.

YES

REPAIR OR REPLACE OPEN WIRE.

END OF TASK

11-225
11-5.15 AFCS COMPUTER FAILS TEST 13 (BITE TEST)

**Fault Isolation Procedure**

**Initial Setup**

**Applicable Configurations:**
All

**Tools:**
Electronic Repairer's Tool Kit, NSN 5180-00-064-5178

**Materials:**
None

**Personnel Required:**

**References:**
TM 55-1520-240-23

**Equipment Condition:**
Visual Check of AFCS Computer Performed

TM 55-1520-240-23:
AFCS Computer Cover Required

---

**Flowchart Diagram:**

[Diagram showing decision points and actions for fault isolation procedures]

---

Go to Next Page
### TABLE H. BITE TEST
#### FAULT ANALYSIS

<table>
<thead>
<tr>
<th>STEP NO.</th>
<th>CIRCUIT CARD OR SUSPECT COMPONENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3</td>
<td>A5, A6, A11</td>
</tr>
<tr>
<td>4, 5</td>
<td>A3</td>
</tr>
<tr>
<td>6</td>
<td>A8, A12, A3, A6</td>
</tr>
<tr>
<td>7, 6</td>
<td>A3, A2, A4</td>
</tr>
<tr>
<td>9</td>
<td>A8, A12, A3, A6</td>
</tr>
<tr>
<td>11-16</td>
<td>A2, A1</td>
</tr>
<tr>
<td>17</td>
<td>A4, A2</td>
</tr>
<tr>
<td>18</td>
<td>A8, A12</td>
</tr>
<tr>
<td>19-25</td>
<td>A3, A12, A6, A1</td>
</tr>
<tr>
<td>26-31</td>
<td>A8, A1, A12</td>
</tr>
<tr>
<td>32-44</td>
<td>A4, A8, A1, A7, A6, A14</td>
</tr>
<tr>
<td>45-52</td>
<td>A2, A7, A1</td>
</tr>
<tr>
<td>54</td>
<td>A8, A14, A2</td>
</tr>
<tr>
<td>56-57</td>
<td>A4, A1, A14</td>
</tr>
<tr>
<td>70, 73</td>
<td>A3</td>
</tr>
<tr>
<td>75-76</td>
<td>A4</td>
</tr>
<tr>
<td>80, 81</td>
<td>A2</td>
</tr>
<tr>
<td>85-86</td>
<td>A12</td>
</tr>
<tr>
<td>87</td>
<td>A8</td>
</tr>
<tr>
<td>89</td>
<td>A3</td>
</tr>
<tr>
<td>91</td>
<td>A4</td>
</tr>
<tr>
<td>93</td>
<td>A2</td>
</tr>
<tr>
<td>95</td>
<td>A8, A1</td>
</tr>
</tbody>
</table>
11-6 COCKPIT CONTROL DRIVE ACTUATOR (CCDA)
11-6.2 COCKPIT CONTROL DRIVE ACTUATOR (CCDA)
VISUAL CHECK

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electronic Repairer's Tool Kit,
NSN 5180-00-064-5178

Materials:
None

Personnel Required:

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23
CCDA Cover Removed.

TASK

RESULT

1. Check pins in receptacle (1).

If any pin is bent, straighten it. If any pin is burnt, broken, or corroded, replace receptacle (1).

2. Check parts mounted on inside of actuator (2).

If any part is loose, tighten it. If any part is burnt or damaged, replace it.

FOLLOW-ON MAINTENANCE

TM 55-1520-240-23:
CCDA Cover Installed
Test Pitch or Thrust Cockpit Control Drive Actuator (CCDA)

END OF TASK

11-231
**FAULT ISOLATION PROCEDURE**

**INITIAL SETUP**

**Applicable Configurations:**
- All

**Tools:**
- Electronic Repairer's Tool Kit, NSN 5180-00-064-5178
- Multimeter

**Materials:**
- None

**Personnel Required:**

**Reference:**
- TM 55-1520-240-23

**Equipment Condition:**
- Visual Check of CCDA Performed (Task 11-6.2)

---

**Fault Isolation Procedure Diagram:**

1. **DO ACTUATOR FAIL TEST STEP 1 OR STEP 2?**
   - NO: FORWARD ACTUATOR TO DEPOT FOR DISPOSITION
   - YES: PICK ONE PIN OF FAILED CIRCUIT RESISTANCE TEST AND LOCATE OTHER END OF WIRE. REFER TO WIRING DIAGRAM 11-6.1.

2. **CHECK CONTINUITY ON THIS WIRE. IS CONTINUITY PRESENT?**
   - YES: LOCATE WIRE END OF OTHER PIN THAT FAILED TEST. REFER TO WIRING DIAGRAM 11-6.1.
   - NO: REPLACE COMPONENT CONNECTED TO THESE WIRES.

3. **REPAIR OR REPLACE OPEN WIRE.**

---

**END OF TASK**
11-6.4 THRUST COCKPIT CONTROL DRIVE ACTUATOR FAILS
BRAKE FUNCTION TEST

FAULT ISOLATION PROCEDURE

INITIAL STEP

Applicable Configurations:
All

Tools:
Electronic Repairer's Tool Kit.
NSN 5180-00-064-5178
Multimeter

Materials:
None

Personnel Required:

Reference:
TM 55-1520-240-23

Equipment Condition:
Visual Check of CCDA performed [Task 11-6.2]
**FAULT ISOLATION PROCEDURE**

**INITIAL SETUP**

**Applicable Configurations:**
All

**Tools:**
Electronic Repairer's Tool Kit,
NSN 5180-00-064-5178
Multimeter

**Materials:**
None

**Personnel Required:**

**Reference:**
TM 55-1520-240-23

**Equipment Condition:**
Visual Check of CCDA Performed [Task 11-6.2]

---

**Fault Resolution Flowchart:**

1. **Replace Amplifier, Repeat Test. Does CCDA Pass Test?**
   - **Yes:** Fault Corrected.
   - **No:** Replace Servo Motor, Repeat Test. Does CCDA Pass Test?

2. **Replace Servo Motor, Repeat Test. Does CCDA Pass Test?**
   - **No:** Forward Thrust CCDA To Depot For Disposition.
   - **Yes:** Fault Corrected.

---

END OF TASK
11-6.6 PITCH COCKPIT CONTROL DRIVE ACTUATOR FAILS CIRCUIT RESISTANCE TEST

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electronic Repairer’s Tool Kit,
NSN 5180-00-064-5178
Multimeter

Materials:
None

Personnel Required:

Reference:
TM 55-1520-240-23

Equipment Condition:
Visual Check of CCDA Performed

END OF TASK
Change 14 11-235
11-6.7 PITCH COCKPIT CONTROL DRIVE ACTUATOR
FAILS BRAKE FUNCTION TEST

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electronic Repairer's Tool Kit,
NSN 5180-00-064-5178
Multimeter

Materials:
None

Personnel Required
35M20 Avionic Navigation and Flight Control
Equipment Repairer.

Reference:
TM 55-1520-240-23

Equipment Condition:
Visual Check of CCDA Performed [Task 11-6.2]

END OF TASK
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
- All

Tools:
- Electronic Repairer's Tool Kit, NSN 5180-00-064-5178
- Multimeter

Materials:
- None

Personnel Required:

Reference:
- TM 55-1520-240-23

Equipment Condition:
- Visual Check of CCDA Performed [Task 11-6.2]

END OF TASK
CHAPTER 12

UTILITY SYSTEMS TROUBLESHOOTING
# Chapter 12
## Utility System Troubleshooting

### Chapter Overview

Chapter 12 contains procedures for Utility System troubleshooting. Each system and failure symptom is listed below. Included in this chapter are locations and views of all electrical connectors, receptacles, relays, and ground connections for the Utility System. Refer to TM 55-1520-240-23 for required maintenance procedures.

### System

<table>
<thead>
<tr>
<th>System</th>
<th>Para</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windshield Anti-Icing</td>
<td>12-1</td>
</tr>
<tr>
<td>Fire Detection</td>
<td>12-2</td>
</tr>
</tbody>
</table>

### Failure Symptom List

#### Windshield Anti-Icing

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ctr Wshld Anti-Ice Cont Circuit Breaker Will Not Stay Closed</td>
<td>12-1.3</td>
</tr>
<tr>
<td>Ctr Wshld Anti-Ice Heat Circuit Breaker Will Not Stay Closed</td>
<td>12-1.3</td>
</tr>
<tr>
<td>Center Windshield Continues To Heat When Ctr Windshield Switch Is At Off</td>
<td>12-1.3</td>
</tr>
<tr>
<td>Center Windshield Does Not Get Warm</td>
<td>12-1.3</td>
</tr>
<tr>
<td>Fire Det Circuit Breaker Will Not Stay Closed</td>
<td>12-2.4</td>
</tr>
<tr>
<td>No. 1 Engine And No. 2 Engine Fire Handle Fire Pull/Fuel Shut-Off Captions Do Not Light During Test</td>
<td>12-2.4</td>
</tr>
</tbody>
</table>

#### Fire Detection

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copilot Wshld Cont Circuit Breaker Will Not Stay Closed</td>
<td>12-1.3</td>
</tr>
<tr>
<td>Copilot's Windshield Continues To Heat When Cplt Windshield Anti-Ice Switch Is At Off</td>
<td>12-1.3</td>
</tr>
<tr>
<td>Copilot's Windshield Does Not Get Warm</td>
<td>12-1.3</td>
</tr>
<tr>
<td>Copilot Wshld Heat Circuit Breaker Will Not Stay Closed</td>
<td>12-1.3</td>
</tr>
<tr>
<td>No. 1 Engine Fire Handle Fire Pull/Fuel Shut-Off Caption Does Not Light During Test</td>
<td>12-2.4</td>
</tr>
<tr>
<td>No. 1 Engine Fire Handle Fire Pull/Fuel Shut-Off Caption Lit</td>
<td>12-2.4</td>
</tr>
<tr>
<td>No. 2 Engine Fire Handle Fire Pull/Fuel Shut-Off Caption Does Not Light During Test</td>
<td>12-2.4</td>
</tr>
<tr>
<td>No. 2 Engine Fire Handle Fire Pull/Fuel Shut-Off Caption Lit</td>
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<tr>
<td>SYMPTOM</td>
<td>TASK</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
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<tr>
<td>FIRE EXT CIRCUIT BREAKER WILL NOT STAY CLOSED</td>
<td>12-3.4</td>
</tr>
<tr>
<td>MULTIMETER DOES NOT INDICATE 28 VDC WITH NO. 1 ENGINE FIRE HANDLE OUT AND FIRE EXT AGENT SWITCH AT BOTTLE NO. 1</td>
<td>12-3.4</td>
</tr>
<tr>
<td>WINDSHIELD WIPERS ARE NOISY</td>
<td>12-4.3</td>
</tr>
<tr>
<td>WINDSHIELD WIPER CIRCUIT BREAKER WILL NOT STAY CLOSED</td>
<td>12-4.3</td>
</tr>
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<thead>
<tr>
<th>SYMPTOM</th>
<th>TASK</th>
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<tr>
<td>MULTIMETER DOES NOT INDICATE 28 VDC WITH NO. 1 ENGINE FIRE HANDLE OUT AND FIRE EXT AGENT SWITCH AT BOTTLE NO. 2</td>
<td>12-3.4</td>
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<tr>
<td>MULTIMETER DOES NOT INDICATE 28 VDC WITH NO. 2 ENGINE FIRE HANDLE OUT AND FIRE EXT AGENT SWITCH AT BOTTLE NO. 1</td>
<td>12-3.4</td>
</tr>
<tr>
<td>WINDSHIELD WIPERS</td>
<td>12-4.3</td>
</tr>
<tr>
<td>WINDSHIELD WIPERS DO NOT RETURN TO PARK POSITION</td>
<td>12-4.3</td>
</tr>
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<thead>
<tr>
<th>SYMPTOM</th>
<th>TASK</th>
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<tr>
<td>MULTIMETER DOES NOT INDICATE 28 VDC WITH NO. 2 ENGINE FIRE HANDLE OUT AND FIRE EXT AGENT SWITCH AT BOTTLE NO. 2</td>
<td>12-3.4</td>
</tr>
<tr>
<td>WINDSHIELD WIPER OR WIPERS DO NOT OPERATE AT ONE SWITCH POSITION OR ANY SWITCH POSITION</td>
<td>12-4.3</td>
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<td>REF DESIG</td>
<td>PART NUMBER</td>
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<td>MS24149D1</td>
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<td>MS3476W16-8S</td>
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<td>MS3456W10SL-3S</td>
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<td>35303-11</td>
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<td>231P6</td>
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<td>300J1</td>
<td>M83723-73A225S</td>
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<td>300J2</td>
<td>M83723-73A225S</td>
</tr>
<tr>
<td>300J3</td>
<td>M83723-73A225S</td>
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<tr>
<td>300J9</td>
<td>M83723-73A225S</td>
</tr>
<tr>
<td>300J10</td>
<td>M83723-73A225S</td>
</tr>
</tbody>
</table>
12-1 WINDSHIELD ANTI-ICING SYSTEM
12-1.2 WINDSHIELD ANTI-ICING SYSTEM VISUAL CHECK

INITIAL SETUP

Applicable Configurations: All

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

Materials: None

Personnel Required: 67U10 Medium Helicopter Repairer

References: TM 55-1520-240-23

Equipment Condition: TM 55-1520-240-23:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off

---

TASK RESULT

1. Check pilot's, center, and copilot's windshields (1, 2, and 3).
   If any windshield (1, 2, or 3) is damaged or dis-colored, replace it. If wiring to windshield terminals is loose or damaged, tighten terminals or repair or replace wire as required.

2. Check PLT, CTR, and CPLT WINDSHIELD anti-ice switches (4, 5, 6).
   If any switch (4, 5, or 6) is loose or damaged, tighten or replace it as required.

---

FOLLOW-ON MAINTENANCE:
None

---

END OF TASK

12-3
12-1.3 WINDSHIELD ANTI-ICING SYSTEM OPERATIONAL CHECK

INITIAL SETUP

Applicable Configurations: All

Tools: None

Materials: None

Personnel Required: 68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Visual Check of Windshield Anti-Icing System Performed [Task 12-1.2]

Outside Air Temperature Below 70° F (20°C) or Windshields Cooled With Water Hose.
12-1.3 WINDSHIELD ANTI-ICING SYSTEM OPERATIONAL CHECK (Continued)

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CHECK COPILOTS WINDSHIELD ANTI-ICING</strong></td>
<td></td>
</tr>
<tr>
<td>1. Check that COPLT WSHLD CONT and COPLT WSHLD HEAT circuit breakers (1 and 2) are closed.</td>
<td></td>
</tr>
<tr>
<td>2. Set CPLT WINDSHIELD anti-ice switch (3) to ON. Touch copilot’s windshield (4).</td>
<td></td>
</tr>
<tr>
<td>3. Set CPLT WINDSHIELD anti-ice switch (3) to OFF. Touch copilot’s windshield (4).</td>
<td></td>
</tr>
<tr>
<td><strong>CHECK CENTER WINDSHIELD ANTI-ICING</strong></td>
<td></td>
</tr>
<tr>
<td>4. Check that CTR WSHLD ANTI-ICE CONT and CTR WSHLD ANTI-ICE HEAT circuit breakers (5 and 6) are closed.</td>
<td></td>
</tr>
<tr>
<td>5. Set CTR WINDSHIELD anti-ice switch (7) to ON. Touch center windshield (8).</td>
<td></td>
</tr>
<tr>
<td>6. Set CTR WINDSHIELD anti-ice switch (7) to OFF. Touch center windshield (8).</td>
<td></td>
</tr>
</tbody>
</table>

FOLLOW-ON MAINTENANCE:

If COPLT WSHLD CONT or COPLT WSHLD HEAT circuit breaker (1 or 2) is open, close it. If COPLT WSHLD CONT circuit breaker opens again, go to [task 12-1.6]. If COPLT WSHLD HEAT circuit breaker opens again, go to [task 12-1.5].

If CPLT WINDSHIELD anti-ice switch (3) to ON, copilot’s windshield (4) shall begin to get warm and heat up before automatic heat cycling begins. If windshield does not get warm, go to [task 12-1.6]. If windshield temperature does not cycle, replace copilot’s windshield anti-icing control box.

If CPLT WINDSHIELD anti-ice switch (3) to OFF, copilot’s windshield (4) shall stop heating. If it continues to heat, go to [task 12-1.7].

If CTR WSHLD ANTI-ICE CONT or CTR WSHLD ANTI-ICE HEAT circuit breaker (5 or 6) is open, close it. If CTR WSHLD ANTI-ICE CONT circuit breaker opens again, go to [task 12-1.8]. If CTR WSHLD ANTI-ICE HEAT circuit breaker opens again, go to [task 12-1.9].

If CTR WINDSHIELD anti-ice switch (7) to ON, center windshield (8) shall begin to get warm and heat up before automatic heat cycling begins. If windshield does not get warm, go to [task 12-1.10]. If windshield temperature does not cycle, replace center windshield anti-icing control box.

If CTR WINDSHIELD anti-ice switch (7) to OFF, center windshield (8) shall stop heating. If it continues to heat, go to [task 12-1.11].

If PILOT WSHLD ANTI-ICE CONT or PILOT WSHLD ANTI-ICE HEAT circuit breaker (9 or 10) is open, close it. If PILOT WSHLD ANTI-ICE CONT circuit breaker opens again, go to [task 12-1.12]. If PILOT WSHLD ANTI-ICE HEAT circuit breaker opens again, go to [task 12-1.13].

If PILOT WINDSHIELD anti-ice switch (11) to ON, pilot’s windshield (12) shall begin to get warm and heat up before automatic heat cycling begins. If windshield does not get warm, go to task 17-7.14. If windshield temperature does not cycle, replace pilot’s windshield anti-icing control box.

If PILOT WINDSHIELD anti-ice switch (11) to OFF, pilot’s windshield (12) shall stop heating. If it continues to heat, go to [task 12-1.15].

FOLLOW-ON MAINTENANCE:

- TM 55-1520-240-23: Electrical Power Off
- Battery Disconnected

END OF TASK
12-1.4 COPLT WSHLD CONT CIRCUIT BREAKER WILL NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials: None

Personnel Required:
- 68F20 Aircraft Electrician

References:
- TM 55-1520-240-23

Equipment Condition:
- Battery Disconnected
- Electrical Power Off
- Hydraulic Power Off

12-1.4.1 COPLT WSHLD CONT CIRCUIT BREAKER WILL NOT STAY CLOSED

Did CB open before COPLT WSHLD ANTI-ICE SW set to ON?

NO

OPEN NOSE ACCESS PANEL. REMOVE DYNAMIC ABSORBER. DISCONNECT PLUG D83P1 FROM COPLT WSHLD ANTI-ICE CONTROL BOX. CHECK FOR GROUND ON PLUG D83P1 PIN A IS GROUND PRESENT.

YES


NO

REPLACE COPLT'S WINDSHIELD ANTI-ICE CONTROL BOX.

END OF TASK
12-1.5 COPLT WSHLD HEAT CIRCUIT BREAKER WILL NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations: All

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

Materials: None

Personnel Required: 68F20 Aircraft Electrician

References: TM 55-1520-240-23

Equipment Condition: TM 55-1520-240-23:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off

DID CB OPEN BEFORE CPLT WINDSHIELD ANTI-ICE SW SET TO ON?

YES

OPEN NOSE ACCESS DOOR. REMOVE DYNAMIC ABSORBER. DISCONNECT PLUG 083P1 FROM COPLT'S WINDSHIELD ANTI-ICE CONTROL BOX. CHECK FOR GROUND ON PLUG 083P1 PIN E. IS GROUND PRESENT?

YES

LOCATE GROUND FAULT ON WIRE W558-18-16, W558-23, 12, OR W550-24-12 BETWEEN PLUG 083P1 AND COPLT WSHLD HEAT CB. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

LOCATE GROUND FAULT ON WIRE W556-22-12 BETWEEN COPLT'S WINDSHIELD AND COPLT ANTI-ICE RELAY. REPAIR OR REPLACE WIRE AS REQUIRED.

END OF TASK
12-1.6 COPILOT'S WINDSHIELD DOES NOT GET WARM

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
68F1O Aircraft Electrician
68F20 Aircraft Electrician

References:
TM 55-1520-240-23
Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
12-1.6 COPILOT'S WINDSHIELD DOES NOT GET WARM (Continued)

1. IS COPLT WSHLD CONT CB OPEN?
   - YES: REFER TO TROUBLE SYMPTOM TASK 12-1.5.
   - NO: SET COPLT WINDSHIELD ANTI-ICE SW TO OFF. DISCONNECT TWO WIRES FROM SENSOR TERMINALS ON COPILOT'S WINDSHIELD. CHECK RESISTANCE BETWEEN SENSOR TERMINALS IS RESISTANCE 180 TO 340 OHMS. CHECK FOR GROUND ON WINDSHIELD GROUND TERMINAL. IS GROUND PRESENT?
     - YES: SET COPLT WINDSHIELD ANTI-ICE SW TO OFF. DISCONNECT TWO WIRES FROM SENSOR TERMINALS ON COPilot's WINDSHIELD. CHECK RESISTANCE BETWEEN SENSOR TERMINALS IS RESISTANCE 180 TO 340 OHMS. CONNECT SENSOR WIRES TO SPARE SENSOR TERMINALS IF AVAILABLE. IF NOT AVAILABLE, REPLACE COPLT WINDSHIELD.
     - NO: LOCATE OPEN IN WIRE W558-110-22, W558-22-22 BETWEEN WINDSHIELD AND FUSELAGE GROUND REPAIR OR REPLACE WIRE AS REQUIRED.
2. IS COPLT WSHLD HEAT CB OPEN?
   - YES: REFER TO TROUBLE SYMPTOM TASK 12-1.5.
   - NO: SET COPLT WINDSHIELD ANTI-ICE SW TO OFF. DISCONNECT TWO WIRES FROM SENSOR TERMINALS ON COPILOT'S WINDSHIELD. CHECK RESISTANCE BETWEEN SENSOR TERMINALS IS RESISTANCE 180 TO 340 OHMS.
3. CONNECT SENSOR WIRES TO SPARE SENSOR TERMINALS IF AVAILABLE. IF NOT AVAILABLE, REPLACE COPLT WINDSHIELD.
5. REMOVE ELEC PWR OPEN NO. 1 PDP. CHECK FOR CONTINUITY BETWEEN TERMINAL 2 OF COPLT WINDSHIELD ANTI-ICE SW AND CIRCUIT SIDE OF COPilot WSHLD CONT CB 083CB2. IS CONTINUITY PRESENT?
   - YES: REPLACE COPLT WSHLD CONT CB.
6. LOWER OVHD PNL, CHECK FOR 28 VDC BETWEEN TERM 3 (+) OF COPLT WINDSHIELD ANTI-ICE SW AND GROUND IS 28 VDC PRESENT?
   - YES: REPLACE COPLT WINDSHIELD ANTI-ICE SW, CHECK FOR 28 VDC BETWEEN TERM 2 (+) OF COPLT WINDSHIELD ANTI-ICE SW AND GROUND IS 28 VDC PRESENT?
   - NO: REPLACE COPLT WINDSHIELD ANTI-ICE SW.

GO TO NEXT PAGE
12-1.6 COPILOT'S WINDSHIELD DOES NOT GET WARM (Continued)

12-1.6 COPILOT'S WINDSHIELD DOES NOT GET WARM (Continued)

- Check for 115 VAC between plug 8361 pin 5 and ground is 115 VAC present?
  - Yes
  - Check for ground on plug 8361 pin 5 is ground present?
    - Yes
    - Check resistance between plug 8361 pin C and D is 180 to 340 ohms?
      - Yes
      - Check for continuity between plug 8361 pin B and term A1 of copilot's windshield anti-icing relay is continuity present?
        - Yes
        - Check for continuity between term A2 of copilot's windshield anti-icing relay and copilot's windshield power terminal is continuity present?
          - Yes
          - Replace copilot's windshield anti-icing relay
        - No
          - Check for continuity between term A1 and circuit side of copilot's windshield anti-icing relay is continuity present?
            - Yes
            - Replace windshield coplts heat C
          - No
            - Locate open in wire 8550-23-12 or 8550-54-13 between copilot's windshield anti-icing relay and copilot's windshield anti-icing relay repair or replace wire as required
  - No
    - Locate open in wire 8550-22-12 between relay and windshield repair or replace wire as required

- Check for 115 VAC between term A1 of copilot's windshield anti-icing relay and ground is 115 VAC present?
  - Yes
  - Remove 115 VAC terminal A1 and circuit side of copilot's windshield anti-icing relay repair or replace wire as required

- Replace windshield coplts heat C

- Locate open in wire 8550-23-12 or 8550-54-13 between copilot's windshield anti-icing relay and copilot's windshield anti-icing relay repair or replace wire as required

GO TO NEXT PAGE
12-1.6 COPILOT'S WINDSHIELD DOES NOT GET WARM (Continued)

END OF TASK
12-1.7 COPILOT'S WINDSHIELD CONTINUES TO HEAT WHEN CPLT WINDSHIELD ANTI-ICE SWITCH IS AT OFF

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

OPEN NOSS ACCESS DOOR
REMOVE DYNAMIC ABSORBER
DISCONNECT PLUG 085-931
FROM COPILOT'S WINDSHIELD ANTI-ICE CONTROL BOX
CHECK FOR 28 VDC BETWEEN PLUG 085-931 PIN A+1 AND GROUND IS 28 VDC PRESENT?

YES

REPLACE CPLT WINDSHIELD ANTI-ICE SW

NO

CHECK FOR CONTINUITY BETWEEN TERMS A1 AND A2 ON COPILOT ANTI-ICING RELAY IS CONTINUITY PRESENT?

YES

REPLACE COPILOT ANTI-ICING RELAY

NO

REPLACE COPILOT WINDSHIELD ANTI-ICING CONTROL BOX

END OF TASK
12-1.8 CTR WSHLD ANTI-ICE CONT CIRCUIT BREAKER WILL NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations: All

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

Materials: None

Personnel Required:
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off

DID CB OPEN BEFORE CTR WINDSHIELD ANTI-ICE SW SET TO ON?

YES

OPEN NOSE ACCESS PANEL
DISCONNECT PLUG OBD3P2 FROM CENTER WINDSHIELD ANTI-ICE CONTROL BOX
CHECK FOR GROUND ON PLUG OBD3P2 PIN A IS GROUND PRESENT?

YES

LOCATE GROUND FAULT ON WIRE W550-20-22, W539-138-22, OR W550 139-22 BETWEEN CTR WINDSHIELD ANTI-ICE CONT CB AND CTR WINDSHIELD ANTI-ICE SW REPAIR OR REPLACE WIRE AS REQUIRED

NO

REPLACE CENTER WINDSHIELD ANTI-ICE CONTROL BOX

NO

LOCATE GROUND FAULT ON WIRE W558-16-20, W539-140-20, OR W559-112-22 BETWEEN PLUG OBD3P2 AND CTR WINDSHIELD ANTI-ICE SW REPAIR OR REPLACE WIRE AS REQUIRED
12-1.9 CTR WSHLD ANTI ICE HEAT CIRCUIT BREAKER WILL NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations: All

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

Materials: None

Personnel Required: 68F20 Aircraft Electrician

Equipment Condition:
- TM 55-1520-240-23
  - Battery Disconnected
  - Electrical Power Off
  - Hydraulic Power Off

References: TM 55-1520-240-23

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

Materials: None

Fault Isolation Procedure:

1. Did CB open before CTR WINDSHIELD ANTI-ICE SW set to ON?
   - Yes
     - Open nose access door, remove dynamic absorber, disconnect plug 083P1 from center windshield anti-icing control box. Check for ground on plug 083P2 pin E, is ground present?
   - No
     - Locate ground fault on wire W5SB 13-16 between center windshield and center anti-icing relay. Repair or replace wire as required.

2. Replace center windshield anti-icing control box.

3. Locate ground fault on wire W5SB 14-16, W5SB 2-16, or W5SB 20-16 between plug 083P2 and CTR WINDSHIELD ANTI-ICE HEAT CB. Repair or replace wire as required.

4. No 2 power distribution panel (PDP) view looking aft

5. CTR WINDSHIELD ANTI-ICE SWITCH

6. ANTI-ICE PANEL

7. COCKPIT

8. CENTER ANTI-ICING RELAY

9. CENTER WINDSCREEN ANTI-ICING CONTROL BOX

END OF TASK
12-1.10 CENTER WINDSHIELD DOES NOT GET WARM

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
68F10 Aircraft Electrician
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

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GO TO NEXT PAGE
CENTER WINDSHIELD DOES NOT GET WARM (Continued)

12-1.10

IS CTR WSHLD ANTI-ICE CONT CS OPEN?

YES

REFER TO TROUBLE SYMPTOM
TASK 12-1.8.

NO

IS CTR WSHLD ANTI-ICE HEAT CS OPEN?

YES

REFER TO TROUBLE SYMPTOM
TASK 12-1.2.

NO

SET CTR WINDSHIELD ANTI-ICE SW TO ON. CHECK FOR 115VAC BETWEEN CENTER WINDSHIELD POWER TERMINALS. IS 115VAC PRESENT?

YES

LOCATE OPEN IN WIRE W558-4-16 OR W568-CD644-A12M BETWEEN WINDSHIELD AND FUSELAGE GROUND. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

SET CTR WINDSHIELD ANTI-ICE SW TO OFF. DISCONNECT TWO WIRES FROM SENSOR TERMINALS ON CENTER WINDSHIELD. CHECK RESISTANCE BETWEEN SENSOR TERMINALS. IS RESISTANCE 180 TO 340 OHMS?

YES

CONNECT SENSORS WIRE OPEN.
CLOSE ACCESS DOOR. REMOVE DYNAMIC ABSORBER. SUBSTITUTE A CENTER WINDSHIELD CONTROL BOX. SET CTR WINDSHIELD ANTI-ICE SW TO ON. DOES CENTER WINDSHIELD GET WARM?

NO

CONNECT PLUG 08P3 TO PILOT CONTROL BOX. CHECK FOR 28VDC BETWEEN PIN A1+1 OF PLUG 08P3 AND GROUND. IS 28VDC PRESENT?

YES

LOCATE OPEN IN WIRE W558-10-20, W558-145-20, OR W558-112-22 BETWEEN PLUG 08P3 AND CTR WINDSHIELD ANTI-ICE SW. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

LOWER DUAL PN, CHECK FOR 28VDC BETWEEN TERM 2,1 OF CTR WINDSHIELD ANTI-ICE SW AND GROUND. IS 28VDC PRESENT?

YES

REPLACE CTR WINDSHIELD ANTI-ICE SW.

NO

CHECK FOR 28VDC BETWEEN TERM 2,1+1 OF CTR WINDSHIELD ANTI-ICE SW AND GROUND. IS 28VDC PRESENT?

YES

REPLACE CTR WSHLD ANTI-ICE CONT CS.

NO


GO TO NEXT PAGE

Change 12 12-17
12-1.10 CENTER WINDSHIELD DOES NOT GET WARM (Continued)

12-1.10  CENTER WINDSHIELD DOES NOT GET WARM (Continued)
12-1.10 CENTER WINDSHIELD DOES NOT GET WARM (Continued)

END OF TASK
12-1.11 CENTER WINDSHIELD CONTINUES TO HEAT WHEN CTR WINDSHIELD SWITCH IS AT OFF

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Nose Dynamic Absorber Removed

END OF TASK
12-1.12 PILOT WSHLD ANTI ICE CONT CIRCUIT BREAKER WILL NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off

END OF TASK
12-1.13 PILOT WSHLD ANTI ICE HEAT CIRCUIT BREAKER WILL NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials:
Note

Personnel Required:
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off

END OF TASK
12-1.14 PILOT'S WINDSHIELD DOES NOT GET WARM

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations: All

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

Materials:
None

Personnel Required:
68F10 Aircraft Electrician
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
Battery Connected
Electrical Power On
Hydraulic Power Off
12-1.14 PILOT'S WINDSHIELD DOES NOT GET WARM (Continued)

IS PILOT WINDSHIELD ANTI-ICE CONT OR OPEN?

NO

IS PILOT WINDSHIELD ANTI-ICE HEAT OR OPEN?

NO

SET PLT WINDSHIELD ANTI-ICE SW TO ON. CHECK FOR 115 VAC BETWEEN PILOT'S WINDSHIELD POWER TERMINALS IS 115 VAC PRESENT?

NO

CHECK FOR GROUND ON WINDSHIELD GROUND TERMINAL, IS GROUND PRESENT?

YES

LOCATE OPEN IN WIRE W558-5-12 OR W558-50041 AT ZN BETWEEN WINDSHIELD AND FUSELAGE GROUND. REPAIR OR REPLACE WIRE AS REQUIRED

YES

LOCATE OPEN IN WIRE W558-108-22 W558-137-22 OR W558-28-22 BETWEEN PLT WINDSHIELD ANTI-ICE SW AND CB D8201. REPAIR OR REPLACE WIRE AS REQUIRED

YES

LOCATE OPEN IN WIRE W558-108 OR W558-137 BETWEEN PLT WINDSHIELD ANTI-ICE SW AND CB D8201. REPAIR OR REPLACE WIRE AS REQUIRED

YES

CONNECT SENSOR WIRE. REMOVE NOSE DYNAMIC ASSEMBLY. CONNECT CODE PILOT'S WINDSHIELD ANTI-ICE CONTROL BOX TO PILOT'S WINDSHIELD ANTI-ICE SW TO ON. DOES PILOT'S WINDSHIELD GET WARM?

NO

CONNECT PLUG 083P1 TO CO-PILOT'S CONTROL BOX. CHECK FOR 28 VDC BETWEEN PIN A1 OF PLUG 083P1 AND GROUND IS 28 VDC PRESENT?

NO

LOWER OVHD PNLS. CHECK FOR 28 VDC BETWEEN TERM 3 OF PLT WINDSHIELD ANTI-ICE SW AND GROUND IS 28 VDC PRESENT?

NO

CHECK FOR 28 VDC BETWEEN TERM 2 OF PLT WINDSHIELD ANTI-ICE SW AND GROUND IS 28 VDC PRESENT?

NO

REPLACE PLT WINDSHIELD ANTI-ICE SW

NO

REPLACE PLT WINDSHIELD ANTI-ICE CONT CB

YES

REPLACE PILOT WINDSHIELD ANTI-ICE SW

YES

REPLACE PILOT WINDSHIELD ANTI-ICE CONT CB

YES

GO TO NEXT PAGE

12-25
12-1.14 PILOT'S WINDSHIELD DOES NOT GET WARM (Continued)

- **Check for 115 VAC between plug 083P pin 5 and ground - is 115 VAC present?**
  - **Yes**
    - Locates open in wire W558-720 between plug 083P and anti-icing relay repair or replace wire as required.
  - **No**
    - **Check for ground on plug 083P pin 5 - is ground present?**
      - **Yes**
        - Locate open in wire W558-G028/A3ON between plug 083P and fuselage ground repair or replace wire as required.
      - **No**
        - **Check for resistance between plug 083P pin C and D - is resistance 180 to 340 ohms?**
          - **Yes**
            - **Check for continuity between plug 083P pin B and term X1 of pilot's anti-icing relay - is continuity present?**
              - **Yes**
                - ***Replace pilot's anti-icing relay***
              - **No**
                - **Check for continuity between term X2 of pilot's anti-icing relay and ground - is continuity present?**
                  - **Yes**
                    - ***Replace pilot's anti-icing relay***
                  - **No**
                    - **Check for continuity between term A2 of pilot's anti-icing relay and pilot's windshield power terminal - is continuity present?**
                      - **Yes**
                        - ***Replace pilot's anti-icing relay***
                      - **No**
                        - Locate open in wire W558-G028/A3ON between relay and fuselage ground repair or replace wire as required.
        - **No**
          - **Remove elec pair open no 2 PDP check for continuity between relay term A1 and a lead side of pilot world anti-ice heat or replace wire as required.**
    - **Yes**
      - **Replace pilot world anti-ice heat**
      - **Locate open in wire W558-112 or W558-711 between pilot's windshield shield anti-icing relay and or 083C8A repair or replace wire as required.**
- **Repair or replace wire W558-216 between pilot's control anti-icing box and anti-icing relay.**
12-1.14 PILOT'S WINDSHIELD DOES NOT GET WARM (Continued)
12-1.15 PILOT'S WINDSHIELD CONTINUES TO HEAT WHEN PLT WINDSHIELD SWITCH IS AT OFF

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Reparer's Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Nose Dynamic Absorber Removed

END OF TASK
12-2 FIRE DETECTION SYSTEM
INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
68F10 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off
No. 1 and No. 2 Engine
Access Covers Open

1. Check Fire Detector switch (1).

2. Check No. 1 engine and No. 2 engine fire handles (2).

3. Check No. 1 and No. 2 engine fire detection controls (4).

4. Check sensing elements (5) around No. 1 engine.

5. Check sensing elements (7) around No. 2 engine.

If switch (1) is loose or damaged, tighten or replace it as required.
If either fire handle (2) is loose or damaged, tighten or replace it as required. If any light (3) is loose or damaged, tighten or replace it as required.
If either control (4) is loose or damaged, tighten or replace it as required. If wiring to either control is damaged, repair or replace it as required.
If any element (5) is damaged or kinked, replace it.
If element connector (6) is loose, tighten it.
If any element (7) is damaged or kinked, replace it.
If any element connector (6) is loose, tighten it.

FOLLOW-ON MAINTENANCE:

TM 55-1520-240-23:
Close No. 1 and No. 2 engine access covers.

GO TO NEXT PAGE
12-2.4 FIRE DETECTION SYSTEM OPERATIONAL CHECK

INITIAL SETUP
Applicable Configurations:
All
Tools:
None
Materials:
None
Personnel Required:
Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Visual Check of Fire Detection System Performed

FOLLOW-ON MAINTENANCE:
TM 55-1520-240-23:
Electrical power off.
Battery disconnected.

TASK

RESULT

1. Check that ENGINE NO. 1 FIRE DET circuit breaker (1) is closed.

If ENGINE NO. 1 FIRE DET circuit breaker (1) is open, close it. If it opens again, go to \( \text{task 12-2.5} \).

2. Check that ENGINE NO. 2 FIRE DET circuit breaker (2) is closed.

If ENGINE NO. 2 FIRE DET circuit breaker (2) is open, close it. If it opens again, go to \( \text{task 12-2.5} \).

3. Check NO. 1 ENGINE and NO. 2 ENGINE fire handles (3 and 4).

If either fire handle (3 or 4) caption FIRE PULL/FUEL SHUTOFF is lit, go to \( \text{task 12-2.6} \) or \( \text{task 12-2.7} \).

4. Set and hold FIRE DETECTOR switch (5) to TEST.

FIRE PULL/FUEL SHUTOFF captions in NO. 1 ENGINE and NO. 2 ENGINE fire handle (3 and 4) shall light. If both captions do not come on, go to \( \text{task 12-2.8} \). If either caption does not come on, go to \( \text{task 12-2.9} \) or \( \text{task 12-2.10} \).

5. Release FIRE DETECTOR switch (5).

Both FIRE PULL/FUEL SHUTOFF captions in NO. 1 ENGINE and NO. 2 ENGINE fire handles (3 and 4) shall go out. If both captions do not go out, replace FIRE DETECTOR switch (5).
12-2.5 FIRE DET CIRCUIT BREAKER WILL NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off

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GO TO NEXT PAGE
12-2.5 FIRE DET CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

ENGINE NO. 1 FIRE DET CIRCUIT BREAKER WILL NOT STAY CLOSED

- Disconnect plug 231p5 from no. 1 fire detection control. Check for ground on plug 231p5 pin 8. Is ground present?
  - No: Replace no. 1 fire detection control.
  - Yes: Locate ground fault on wire W668-60-20, W697-43-20, W645-118-20, or W550-56-20 between plug 231p5 and engine no. 1 fire det cb. Repair or replace wire as required.

ENGINE NO. 2 FIRE DET CIRCUIT BREAKER WILL NOT STAY CLOSED

- Disconnect plug 231p6 from no. 2 fire detection control. Check for ground on plug 231p6 pin 8. Is ground present?
  - No: Replace no. 2 fire detection control.
  - Yes: Locate ground fault on wire W666-60-20, W673-52-20, W639-201-20, or W562-52-20 between plug 231p6 and engine no. 2 fire det cb. Repair or replace wire as required.

END OF TASK
FAULT ISOLATION PROCEDURE

INITIAL SETUP
Applicable Configurations: All

Personnel Required:
Aircraft Electrician

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

Equipment Condition:
TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power Off

Materials:
Cloth (E120)
12-2.6 NO. 1 ENGINE FIRE HANDLE FIRE PULL/FUEL SHUTOFF CAPTION LIT (Continued)

DISCONNECT PLUG 231PS FROM NO. 1 FIRE DETECTION CONTROL. CHECK FOR MORE THAN 5 MEGOHMS RESISTANCE BETWEEN PLUG 231PS PIN D AND GROUND. IS RESISTANCE MORE THAN 5 MEGOHMS?

YES
REPLACE NO. 1 ENGINE FIRE DETECTION CONTROL.

NO
CONNECT 231PS TO NO. 1 CONTROL. OPEN NO. 1 ENGINE ACCESS COVER. DISCONNECT LEFT AND RIGHT SENSING ELEMENTS FROM AFT SENSING ELEMENT AT POINTS A AND B. IS FIRE HANDLE STILL LIT?

YES
DISCONNECT RIGHT SENSING ELEMENT PLUG AT ENGINE DISCONNECT PAN. IS FIRE HANDLE STILL LIT?

NO
REPLACE AFT SENSING ELEMENT.

YES
DISCONNECT LEFT SENSING ELEMENT PLUG AT ENGINE DISCONNECT PAN. IS FIRE HANDLE STILL LIT?

NO
DISCONNECT 231PS FROM NO. 1 ENGINE FIRE DETECTION CONTROL. CHECK FOR GROUND ON PLUG 231PS PIN D. IS GROUND PRESENT?

YES
LOCATE GROUND FAULT ON WIRE W668-66-20 BETWEEN PLUG 231PS AND PLUG 231PS2. REPAIR OR REPLACE WIRE AS REQUIRED.

NO
DISCONNECT 231PS FROM NO. 1 ENGINE FIRE DETECTION CONTROL. CHECK FOR GROUND ON PLUG 231PS PIN D. IS GROUND PRESENT?

INSPECT RIGHT SENSING ELEMENT PLUGS FOR WATER. IS EITHER PLUG ON RIGHT SENSING ELEMENT WET?

YES
DRY PLUG.

NO
REPLACE RIGHT SENSING ELEMENT.

INSPECT LEFT SENSING ELEMENT PLUGS FOR WATER. IS EITHER PLUG ON LEFT SENSING ELEMENT WET?

YES
DRY PLUG.

NO
REPLACE LEFT SENSING ELEMENT.

END OF TASK

12-39
INITIAL SETUP

Applicable Configurations:
All

Tools:
- Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
- Multimeter

Materials:
- Cloth (E120)

Personnel Required:
- Aircraft Electrician

Equipment Condition:
- TM 55-1520-240-23 Electrical Repairer’s Tool Kit
- Battery Connected
- Electrical Power On
- Hydraulic Power Off

TM 55-1520-240-23:
- Multimeter Battery Connected
- Electrical Power On
- Cloth (E120) Hydraulic Power Off

NOTE:
- TAIL CONES REMOVED FOR CLARITY
WITH 74

CABIN VIEW

NO. 2 ENGINE FIRE DETECTION CONTROL

RIGHT SIDE (LOOKING FWD)

WL +10

AFT SENSING ELEMENT

LEF SENSING ELEMENT

NO. 2 (RIGHT) ENGINE – L SIDE

POINT A

LEF SENSING ELEMENT

AFT SENSING ELEMENT

RIGHT SENSING ELEMENT

NO. 2 (RIGHT) ENGINE – R SIDE

POINT B

LEFT SENSING ELEMENT

RIGHT SENSING ELEMENT

PLUG

NOTE:
TAIL CONES REMOVED FOR CLARITY

A6546B

NO. 2 ENGINE FIRE HANDLE FIRE PULL/FUEL SHUTOFF CAPTION LIT (Continued)
12-2.7 NO. 2 ENGINE FIRE HANDLE FIRE PULL/FUEL SHUTOFF CAPTION LIT (Continued)

DISCONNECT PLUG 231P6 FROM NO. 2 ENGINE FIRE DETECTION CONTROL CHECK FOR MORE THAN 5 MEGOHMS RESISTANCE BETWEEN PLUG 231P6 PIN D AND GROUND IS RESISTANCE MORE THAN 5 MEGOHMS?

YES

REPLACE NO. 2 ENGINE FIRE DETECTION CONTROL.

NO

CONNECT 231P6 TO NO. 2 ENGINE FIRE DETECTION CONTROL OPEN 231P6 ENGINE ACCESS COVER DISCONNECT LEFT AND RIGHT SENSING ELEMENTS FROM AFT SENSING ELEMENT AT POINTS A AND B IS FIRE HANDLE STILL LIT?

YES

DISCONNECT RIGHT SENSING ELEMENT PLUG AT ENGINE DISCONNECT PAN IS FIRE HANDLE STILL LIT?

NO

REPLACE AFT SENSING ELEMENT.

YES

DISCONNECT LEFT SENSING ELEMENT PLUG AT ENGINE DISCONNECT PAN IS FIRE HANDLE STILL LIT?

NO

DISCONNECT 231P6 FROM NO. 2 ENGINE FIRE DETECTION CONTROL CHECK FOR GROUND ON PLUG 231P6 PIN D IS GROUND PRESENT?

NO

LOCATE GROUND FAULT ON WIRE W666-31-20 BETWEEN PLUG 231P6 AND PLUG 231P4 REPAIR OR REPLACE WIRE AS REQUIRED.

YES

INSPECT RIGHT SENSING ELEMENT PLUGS FOR WATER IS EITHER PLUG ON RIGHT SENSING ELEMENT WET?

NO

REPLACE RIGHT SENSING ELEMENT.

YES

DISCONNECT 231P6 FROM NO. 2 ENGINE FIRE DETECTION CONTROL CHECK FOR GROUND ON PLUG 231P6 PIN D IS GROUND PRESENT?

NO

LOCATE GROUND FAULT ON WIRE W666-32-20 BETWEEN PLUG 231P6 AND PLUG 231P3 REPAIR OR REPLACE WIRE AS REQUIRED.

YES

INSPECT LEFT SENSING ELEMENT PLUGS FOR WATER IS EITHER PLUG ON LEFT SENSING ELEMENT WET?

NO

REPLACE LEFT SENSING ELEMENT.

YES

DRY PLUG.

NO

END OF TASK

12-41
Fault Isolation Procedure

Initial Setup

- Personnel Required:
  - Aircraft Electrician

- Applicable Configurations
  - All

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

- Equipment Condition:
  - TM 55-1520-240-23: Battery Connected
  - Electrical Power On
  - Hydraulic Power Off

- References:
  - TM 55-1520-240-23
12-2.8 NO. 1 AND NO. 2 ENGINE FIRE HANDLE FIRE PULL/FUEL

SHUTOFF-CAPTIONS DO NOT LIGHT DURING TEST (Continued)

12-2.8

**END OF TASK**

12-43
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations
All

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

Materials:
None

Personnel Required
- Aircraft Electrician

References:
- TM 55-1520-240-23

Equipment Condition:
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power Off
12-2.9 NO. 1 ENGINE FIRE HANDLE FIRE PULL/FUEL SHUTOFF
CAPTION DOES NOT LIGHT DURING TEST (Continued)

Was only one lamp out in NO. 1 ENGINE FIRE HANDLE?
YES
- Replace lamp on unit side

NO

Is engine No. 1 fire detection control closed?
YES
- Replace no. 1 control

NO

Remove no. 2 fire detection control and substitute for no. 1 control. Perform operational check. Task 12-2.7 Does fire handle caption come on?
YES
- Replace no. 1 control

NO

Disconnect plug 231PS from control. Return control to no. 2 engine position. Check for continuity between plug 231PS pins A and H. Is ground present on both pins?
YES
- Check for ground on plug 231PS pins A and H. Is ground present on both pins?

NO

Locate open in wire W66B-33 to control. Repair or replace wire as required.

YES

Open no. 1 engine access cover. Disconnect left and right sensing elements from aft sensing element at points A and B. Check for continuity between ends of center conductor of left sensing element. Is continuity present?
YES
- Disconnect left sensing element plug at engine.
- Disconnect pan. Check for continuity between ends of center conductor of left sensing element. Is continuity present?

NO

Replace left sensing element.

YES

Disconnect right sensing element plug at engine.
- Disconnect pan. Check for continuity between ends of center conductor of right sensing element. Is continuity present?

NO

Replace right sensing element.

YES
- Check for continuity between plug 231PS pin D and center conductor on plug 231PS. Is continuity present?

NO

Locate open in wire W66B-33 to control. Repair or replace wire as required.

YES

Locate open in wire W66B-33 to control. Repair or replace wire as required.

Change 2 12-45
12-2.9 NO. 1 ENGINE FIRE HANDLE FIRE PULL/FUEL SHUTOFF
CAPTION DOES NOT LIGHT DURING TEST (Continued)

1. CHECK FOR 115VAC BETWEEN PLUG 231PS PIN 6 AND GROUND. IS 115VAC PRESENT?
   - YES
   - NO

2. REMOVE ELECT PWR OPEN CENTER INSTRUMENT PNL.
3. SET AND HOLD FIRE DETC. SW TO TEST. CHECK FOR 28VDC BETWEEN PLUG 231PS PIN E AND GROUND. IS 28VDC PRESENT?
   - YES
   - NO

4. REMOVE ELECT PWR OPEN CENTER INSTRUMENT PNL.
5. CHECK FOR CONTINUITY BETWEEN OTHER BUTT SPICE AND PLUG 231PS PIN C. IS CONTINUITY PRESENT?
   - YES
   - NO


12-2.9 NO. 1 ENGINE FIRE HANDLE FIRE PULL/FUEL SHUTOFF

CAPTION DOES NOT LIGHT DURING TEST (Continued)

END OF TASK

12-47
12-2.10 NO. 2 ENGINE FIRE HANDLE FIRE PULL/FUEL SHUTOFF CAPTION DOES NOT LIGHT DURING 12-2.10

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations

All

Tools:

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

Materials:

None

Personnel Required:

Aircraft Electrician

References:

TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

GO TO NEXT PAGE
WITH 7A

NO. 2 ENGINE FIRE HANDLE

FIRE DETECTOR SWITCH

CENTER INSTRUMENT PANEL

COCKPIT

NO. 2 POWER DISTRIBUTION PANEL (PDP) VIEW LOOKING AFT

NO. 2 ENGINE FIRE DETECTION CONTROL

RIGHT SIDE (LOOKING FWD)

LEFT SIDE (LOOKING OUTRD)

NOTE: TAIL CONES REMOVED FOR CLARITY

STA 482 STA 482 CASIN VIEW

NO. 2 (RIGHT) ENGINE – L SIDE

LEFT SENSING ELEMENT AFT SENSING ELEMENT

POINT A

NO. 2 (RIGHT) ENGINE – R SIDE

LEFT SENSING ELEMENT AFT SENSING ELEMENT

POINT B

RIGHT SENSING ELEMENT PLUG

LEFT SENSING ELEMENT PLUG

Change 23 12-48.1/(12-48.2 blank)
12-2.10 NO. 2 ENGINE FIRE HANDLE FIRE PULL/FUEL SHUTOFF
CAPTION DOES NOT LIGHT DURING TEST (Continued)
12-3 FIRE EXTINGUISHING SYSTEM
12-3 FIRE EXTINGUISHING SYSTEM

12-3.1 FIRE EXTINGUISHING SYSTEM SCHEMATIC DIAGRAM
### INITIAL SETUP

**Applicable Configurations:**
- All

**Tools**
- Aircraft Mechanic’s Tool Kit,
  NSN 5180-00-323-4692

**Equipment Condition:**
- TM 55-1520-240-23:
  - Battery Disconnected
  - Electrical Power Off
  - Hydraulic Power Off

**Materials:**
- None

**Personnel Required:**
- Medium Helicopter Repairer

### TASK RESULT

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Check FIRE EXT AGENT switch (1).</td>
<td>If switch (1) is loose or damaged, tighten or replace it as required.</td>
</tr>
<tr>
<td>2. Check NO. 1 ENGINE and NO. 2 ENGINE fire handles (2).</td>
<td>If either fire handle (2) is loose or damaged, tighten or replace it as required.</td>
</tr>
<tr>
<td>3. Check fire extinguisher (3).</td>
<td>If either fire extinguisher (3) is loose, tighten it. If wiring to cartridges (4) is damaged, repair or replace it as required.</td>
</tr>
<tr>
<td>4. Read gage (5) on each fire extinguisher (3).</td>
<td>If either gage (5) pressure reading is below following limits, replace fire bottle.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>-40°C (-40°F)</td>
<td>292 - 370 psi</td>
</tr>
<tr>
<td>-29°C (-20°F)</td>
<td>320 - 400 psi</td>
</tr>
<tr>
<td>-18°C (0°F)</td>
<td>355 - 437 psi</td>
</tr>
<tr>
<td>-7°C (19°F)</td>
<td>396 - 486 psi</td>
</tr>
<tr>
<td>4°C (39°F)</td>
<td>449 - 540 psi</td>
</tr>
<tr>
<td>15°C (59°F)</td>
<td>518 - 618 psi</td>
</tr>
<tr>
<td>23°C (81°F)</td>
<td>593 - 702 psi</td>
</tr>
<tr>
<td>30°C (86°F)</td>
<td>691 - 784 psi</td>
</tr>
<tr>
<td>52°C (126°F)</td>
<td>765 - 902 psi</td>
</tr>
</tbody>
</table>

### FOLLOW-ON MAINTENANCE:
- None
12-3.4 FIRE EXTINGUISHING SYSTEM OPERATIONAL CHECK

INITIAL SETUP

Applicable Configurations
All

Tools:
Multimeter

Materials:
Paper Tags (E264)

Personnel Required:
Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
1. Check that ENGINE NO. 1 FIRE EXT circuit breaker (1) is open. If it is open, go to task 12-3.5.

2. Check that ENGINE NO. 2 FIRE EXT circuit breaker (2) is closed.

3. Tag and disconnect two wires (3 and 4) from each cartridge (5) on fire extinguishers (6).

   **CAUTION**
   Make sure wire terminal lugs do not touch cartridge terminals or fuselage. Aircraft damage or fire extinguisher discharge could occur.

   **CAUTION**
   Do not connect multimeter to cartridge. This could discharge extinguisher agent or reduce cartridge life.

4. Connect multimeter, set to measure 28 VDC, between wires W668-68-20(+) and W668-GD125A20N(-) at forward cartridge (5) on No. 1 fire extinguisher (6).

5. Pull out NO. 1 ENGINE fire handle (7).

6. Set and hold FIRE EXT AGENT switch (8) to BOTTLE NO. 1.

   **Multimeter shall indicate 28 VDC.** If not, go to task 12-3.5.

   **Fire extinguisher No. 1 did not discharge on No. 1 engine, was reported, replace forward cartridge (5) on No. 1 fire extinguisher (6).**

7. Release FIRE EXT AGENT switch (8).

8. Disconnect multimeter. Connect multimeter to wires W668-69-20(+) and W668-GD246A20N(-) at forward cartridge (5) on No. 2 fire extinguisher (6).

9. Set and hold FIRE EXT AGENT switch (8) to BOTTLE NO. 2.

   **Multimeter shall indicate 28 VDC.** If not, go to task 12-3.5.

   **Fire extinguisher No. 2 did not discharge on No. 2 engine, was reported, replace forward cartridge (5) on No. 2 fire extinguisher (6).**

10. Release FIRE EXT AGENT switch (8).

11. Disconnect multimeter. Connect multimeter to wires W666-64-20(+) and W666-GD247A20N at aft cartridge (5) on No. 1 fire extinguisher (6).

12. Connect multimeter, set to measure 28 VDC, between wires W666-69-20(+) and W666-GD124A20N(-) at forward cartridge (5) on No. 1 fire extinguisher (6).

**Multimeter shall indicate 28 VDC.** If not, go to task 12-3.5.

**Fire extinguisher No. 1 did not discharge on No. 2 engine, was reported, replace aft cartridge (5) on No. 1 fire extinguisher (6).**

13. Release FIRE EXT AGENT switch (8).

14. Push in NO. 2 ENGINE fire handle (9).

   **CAUTION**
   Insure wires are connected to right terminals on cartridge. Reverse connections will prevent agent release when a fire occurs. Ground wire must be connected to terminal on side of cartridge.

15. Release FIRE EXT AGENT switch (8).

16. Disconnect multimeter. Connect multimeter to wires W668-65-20(+) and W668-GD125A20N at aft cartridge (5) on No. 2 fire extinguisher (6).

17. Set and hold FIRE EXT AGENT switch (8) to BOTTLE NO. 2.

   **Multimeter shall indicate 28 VDC.** If not, go to task 12-3.5.

   **Fire extinguisher No. 2 did not discharge on No. 2 engine, was reported, replace aft cartridge (5) on No. 2 fire extinguisher (6).**

18. Release FIRE EXT AGENT switch (8).

19. Push in NO. 2 ENGINE fire handle (9).

20. Connect two wires (3 and 4) to each cartridge (5) on fire extinguishers (6). See tags and wiring diagram 12-3.2. Remove tags.

**FOLLOW-ON MAINTENANCE:**
Perform operational check of engine fuel shutoff valves. Battery Disconnected
Electrical Power Off
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Personnel Required:
Aircraft Electrician

Applicable Configurations
All

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

Equipment Condition:
TM 55-1520-240-23:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off

References
TM 55-1520-240-23

Materials
None
12-3.5 FIRE EXT CIRCUIT BREAKER WILL NOT STAY CLOSED

(Continued)

ENGINE NO. 1 FIRE EXT CIRCUIT BREAKER WILL NOT STAY CLOSED

- WAS CB OPEN BEFORE FIRE EXT AGENT SW moved?
  - YES
    - LOCATE GROUND FAULT ON WIRE W505-92-20, W545-121-20, OR W537-181-20 BETWEEN ENGINE NO. 1 FIRE EXT CB AND FIRE EXT AGENT SW.
    - REPAIR OR REPLACE WIRE AS REQUIRED.
  - NO
    - WAS CB OPEN AFTER FIRE EXT AGENT SW SET TO BOTTLE NO. 1?
      - YES
        - REPAIR OR REPLACE WIRE AS REQUIRED.
      - NO
        - REPAIR OR REPLACE WIRE AS REQUIRED.

ENGINE NO. 2 FIRE EXT CIRCUIT BREAKER WILL NOT STAY CLOSED

- WAS CB OPEN BEFORE FIRE EXT AGENT SW moved?
  - YES
    - LOCATE GROUND FAULT ON WIRE W505-92-20, W545-121-20, OR W537-181-20 BETWEEN ENGINE NO. 2 FIRE EXT CB AND FIRE EXT AGENT SW.
    - REPAIR OR REPLACE WIRE AS REQUIRED.
  - NO
    - WAS CB OPEN AFTER FIRE EXT AGENT SW SET TO BOTTLE NO. 1?
      - YES
        - REPAIR OR REPLACE WIRE AS REQUIRED.
      - NO
        - REPAIR OR REPLACE WIRE AS REQUIRED.

END OF TASK
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations
All

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

Materials
None

Personnel Required:
Aircraft Electrician (2)

References
TM 55-1520-240-23

Equipment Condition:
Battery Connected
Electrical Power On
Hydraulic Power Off

12-3.6 MULTIMETER DOES NOT INDICATE 28 VDC WITH NO. 1 ENGINE FIRE HANDLE OUT AND FIRE EXT AGENT SWITCH AT BOTTLE NO. 1
12-3.6 MULTIMETER DOES NOT INDICATE 28 VDC WITH NO. 1 ENGINE FIRE HANDLE OUT AND FIRE EXT AGENT SWITCH AT BOTTLE NO. 1 (Continued)

IS ENGINE NO. 2 FIRE EXT CR OPEN?

YES

REFER TO TROUBLE SYMPTOM TASK 12-3.5

NO

IS FIRE EXTINGUISHER CHEK FOR 28 VDC BETWEEN WIRE WS58-68-20 AND GROUND, IS 28 VDC PRESENT?

YES

LOCATE OPEN IN GROUND WIRE WS58-82125A20N. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

OPEN CENTER INSTRUMENT PNL CHECK FOR 28 VDC BETWEEN TERMINAL 2 OF FIRE EXT AGENT SW AND GROUND, IS 28 VDC PRESENT?

YES

REPLACE ENGINE NO. 2 FIRE EXT CR.

NO

CHECK FOR CONTINUITY BETWEEN TERMINAL 2 OF FIRE EXT AGENT SW AND TERMINAL H OF NO. 1 ENGINE FIRE FULL CONTROL SW, IS CONTINUITY PRESENT?

YES

REPLACE ENGINE NO. 2 FIRE EXT CR.

NO

LOCATE OPEN IN WIRE WS57-182-20, WS57-122-20, WS57-38-20, OR WS56-66-20. REPLACE WIRE OR FIRE EXTINGUISHER REPAIR OR REPLACE WIRE AS REQUIRED.

CHECK FOR CONTINUITY ACROSS TERMINAL G AND H OF NO. 1 ENGINE FIRE FULL CONTROL SW, IS CONTINUITY PRESENT?

YES

REPLACE FIRE EXT AGENT SW.

NO

REPLACE WIRE WS57-182-20 BETWEEN FIRE EXT AGENT SW AND NO. 1 ENGINE FIRE FULL CONTROL SWITCH.

END OF TASK
12-3.7 MULTIMETER DOES NOT INDICATE 28 VDC WITH NO. 1 ENGINE FIRE HANDLE OUT AND FIRE EXT AGENT SWITCH AT BOTTLE NO. 2

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations
All

Personnel Required:
Aircraft Electrician (2)

References
TM 55-1520-240-23

Equipment Condition:
Battery Connected
Electrical Power On

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

Materials
None

GO TO NEXT PAGE
12-3.7 MULTIMETER DOES NOT INDICATE 28 VDC WITH NO.1 ENGINE FIRE HANDLE OUT AND FIRE EXT AGENT SWITCH AT BOTTLE NO. 2 (Continued)

- **If Engine No. 1 Fire Ext CR Open?**
  - **Yes:** Refer to trouble symptom box 12-3.6
  - **No:**
    - Hold Fire Ext Agent SW to Bottle No. 2, check for continuity between Term 2 of Fire Ext Agent SW and ground. Is 28 VDC Present?
      - **Yes:**
        - Locate open in ground wire WSW0-0D20-200 and replace wire as required.
      - **No:**
        - Open center instrument panel, check for continuity between Term 2 of Fire Ext Agent SW and ground. Is 28 VDC Present?
          - **Yes:**
            - Remove elec pair, hold Fire Ext agent SW to bottle No. 2, check for continuity between Term 5 of Fire Ext Agent SW and Term 6 of No. 1 Engine Fire Full Control SW. Is continuity Present?
              - **Yes:**
                - Locate open in wire WEST-169-20, WSW1123-22, WSE-30-20 or WSW0-0D20 between No. 1 Engine Fire Full Control SW and No. 2 Fire Extinguisher. Repair or replace wire as required.
              - **No:**
                - Check for continuity between Term 5 of Fire Ext Agent SW and Term 6 of No. 1 Engine Fire Full Control SW. Is continuity Present?
                  - **Yes:**
                    - Replace Fire Ext Agent SW.
                  - **No:**
                    - Replace Engine No. 1 Fire Ext CR.
          - **No:**
            - Replace Engine No. 1 Fire Ext CR.

- **Check for continuity across Term 2 and 5 of No. 1 Engine Fire Full Control SW. Is continuity Present?**
  - **Yes:**
    - Replace Fire Ext Agent SW.
  - **No:**
    - Replace Wire WEST-169-20 between Fire Ext Agent SW and No. 1 Engine Fire Full Control Switch.

END OF TASK
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations: All

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

Materials: None

Personnel Required:
- Aircraft Electrician (2)

References:
- TM 55-1520-240-23

Equipment Condition:
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power Off

12-3.8 MULTIMETER DOES NOT INDICATE 28 VDC WITH NO. 2 ENGINE FIRE HANDLE OUT AND FIRE EXT AGENT SWITCH AT BOTTLE NO. 1
12-3.8 MULTIMETER DOES NOT INDICATE 28 VDC WITH NO. 2 ENGINE FIRE HANDLE OUT AND FIRE EXT AGENT SWITCH AT BOTTLE NO. 1 (Continued)

12-3.8

**END OF TASK**
12-3.9 MULTIMETER DOES NOT INDICATE 28 VDC WITH NO. 2 ENGINE FIRE HANDLE OUT AND FIRE EXT AGENT SWITCH AT BOTTLE NO. 2

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations
All

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

Materials
None

Personnel Required:
Aircraft Electrician (2)

References
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

GO TO NEXT PAGE
12-3.9 MULTIMETER DOES NOT INDICATE 28 VDC WITH NO. 2 ENGINE FIRE HANDLE OUT AND FIRE EXTINGUENT SWITCH AT BOTTLE NO. 2 (Continued)

- **IS ENGINE NO. 2 FIRE EX TUBE OPEN?**
  - **YES** REFER TO TROUBLE SYMPTOM TASK 12-33
  - **NO**
    - **NO**
      - **NO**
        - **NO** CHECK FOR CONTINUITY BETWEEN TERM 1 OF FIRE EXTINGUENT SW AND TERM E OF NO. 2 ENGINE FIRE PULL CONTROL SW IS PRESENT?
        - **YES** REPLACE FIRE EXTINGUENT SW
        - **NO**
          - **NO** CHECK FOR CONTINUITY ACROSS TERMS D AND E OF NO. 2 ENGINE FIRE PULL CONTROL SW IS CONTINUITY PRESENT?
          - **YES** REPLACE WIRE WS37-183-20 BETWEEN FIRE EXTINGUENT SW AND NO. 2 ENGINE FIRE PULL CONTROL SWITCH
          - **NO**
            - **NO** REPLACE NO. 2 ENGINE FIRE PULL CONTROL SW.
12-4 WINDSHIELD WIPERS
12-4.2 WINDSHIELD WIPERS VISUAL CHECK

INITIAL SETUP
Applicable Configurations:
All
Tools:
Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Work Stand
Materials:
None
Personnel Required:
67U10 Medium Helicopter Repairer
References:
TM 55-1520-240-23
Equipment Condition:
TM 55-1520-240-23:
Battery Disconnected
Electrical Power Off
Hydraulic Off

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Check windshield wiper arms (1) and wiper blades (2).</td>
<td>If either arm (1) is damaged, replace it. If either blade (2) is cracked, torn, or loose, replace it.</td>
</tr>
<tr>
<td>2. Check WINDSHIELD WIPERS switch (3).</td>
<td>If switch (3) is loose or damaged tighten or replace it as required.</td>
</tr>
<tr>
<td>3. Lower overhead panel.</td>
<td>If windshield wiper motor (4) is loose or damaged, tighten or replace it as required. If either shaft (5) is damaged, replace it. If either actuator (6) is loose or damaged, tighten or replace it as required.</td>
</tr>
<tr>
<td>4. Check windshield wiper motor (4), shafts (5), and actuators (6).</td>
<td></td>
</tr>
</tbody>
</table>

FOLLOW-ON MAINTENANCE:
TM 55-1520-240-23:
Secure overhead panel

END OF TASK
12-4.3 WINDSHIELD WIPERS OPERATIONAL CHECK

INITIAL SETUP

Applicable Configurations:
All

Tools:
Water Hose
Stop Watch

Materials:
None

Personnel Required:
67U10 Medium Helicopter Repairer
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:

Battery Connected
Electrical Power On
Hydraulic Power Off
Visual Check Of Windshield Wipers Performed

TM 55-1520-240-23

END OF TASK
**FAULT ISOLATION PROCEDURE**

**INITIAL SETUP**

**Applicable Configurations:** All

**Tools:**
- Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
- Multimeter

**Materials:** None

**Personnel Required:** 68F20 Aircraft Electrician

**References:**
- TM 55-1520-240-23

**Equipment Condition:**
- Battery Disconnected
- Electrical Power Off
- Hydraulic Power Off

---

**Fault Isolation Procedure:**

1. **Switch Open Before WIPER Circuit Breaker Will Not Stay Closed**
   - **Yes:** Replace Windshield Wiper Motor
   - **No:** Replace Wiper CIRCUIT BREAKER

2. **Lower OVHD PN, Disconect 300P20; Check for Ground at 300/20 Pin 42 Is Ground Present?**
   - **Yes:** Disconnect Plug 123P1 From Windshield Wiper Motor Is Ground Still Present At 300/20 Pin 42?
   - **No:** Locate Ground Fault On Wire 300/20, 3050-20, 3052-20, Or 3059-20 Between Windshield Wipers SW And Windshield Wipers SW Illustration.

3. **WIPER Switch SW To Off Check For Infinite Resistance Between 300P/20 Pin 42 And Ground Is Resistance Infinite?**
   - **Yes:** Replace WIPER CIRCUIT BREAKER
   - **No:** Locate Ground Fault On Wire 300/20, 3050-20, 3052-20, Or 3059-20 Between 300P/20 And Windshield Wipers SW Illustration.
12-4.5 WINDSHIELD WIPER OR WIPERS DO NOT OPERATE AT ONE SWITCH POSITION OR ANY SWITCH POSITION

FAULT ISOLATION PROCEDURE
INITIAL SETUP
Applicable Configurations:
All
Tools:
Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915
Multimeter
Materials:
None

Personnel Required:
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
Battery Connected
Electrical Power On
Hydraulic Power Off
Windshields Clean And Wet
12-4.5 WINDSHIELD WIPER OR WIPERS DO NOT OPERATE AT ONE SWITCH POSITION OR AT ANY SWITCH POSITION (Continued)

- IS PROBLEM WITH BOTH WIPERS?
  - YES
    - TURN WINDSHIELD WIPERS SW FROM OFF TO SLOW, MED, AND FAST. DID WIPERS OPERATE AT ANY SW POSITION?
      - NO
        - IS WSHLD WIPER CB OPEN?
          - NO
            - SET WINDSHIELD WIPERS SW TO FAST. LOWER DHC PNL DISCONNECT PLUG 133P1 FROM WINDSHIELD WIPER MOTOR. CHECK FOR 28 VDC BETWEEN PLUG 133P1 PIN A + AND GROUND. IS 28 VDC PRESENT?
              - NO
                - REPLACE ADJUSTMENT SLEEVE.
              - YES
                - LOCATE OPEN IN WIRE WS59-31-20 OR WS39-111-20 BETWEEN PLUG 133P1 AND RESISTOR 133R1. REPAIR OR REPLACE WIRE AS REQUIRED.
        - YES
          - REFER TO TROUBLE SYMPTOM FAK5 12-4.4
      - NO
        - REPLACE WINDSHIELD WIPER ACTUATOR.
    - NO
      - DISCONNECT WIPER ARM FROM ACTUATOR SHAFT CHECK INSIDE AND OUTSIDE GROOVES ON ADJUSTMENT SLEEVE. ARE THEY STRIPPED?
        - NO
          - REPLACE DRIVE SHAFT.
        - YES
          - LOCATE OPEN IN WIRE WS59-25.20; WS69-16.20; OR WS62-5.20 BETWEEN WINDSHIELD WIPER ARM CB 133C81 AND CIRCUIT SIDE OF WSHLD WIPER CIRCUIT 21 AND 133C81. REPAIR OR REPLACE WIRE AS REQUIRED.
  - NO
    - IS PROBLEM WITH BOTH WIPERS?
12-4.5 WINDSHIELD WIPER OR WIPERS DO NOT OPERATE AT ONE
SWITCH POSITION OR AT ANY SWITCH POSITION (Continued)
12-4.5 WINDSHIELD WIPER OR WIPERS DO NOT OPERATE AT ONE SWITCH POSITION OR AT ANY SWITCH POSITION (Continued)
12-4.6 WINDSHIELD WIPERS ARE NOISY

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
67U20 Medium Helicopter Repairer

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Overhead Panel Lowered
Windshields Clean And Wet

END OF TASK
12-4.7 WINDSHIELD WIPERS DO NOT RETURN TO PARK POSITION

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

Tools:
Electrical Repairer’s Tool Kit, 
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
Battery Connected
Electrical Power On
Hydraulic Power Off
Overhead Panel Lowered

GO TO NEXT PAGE
12-4.7 WINDSHIELD WIPERS DO NOT RETURN TO PARK POSITION

(Continued)

1. Disconnect plug 123P1 from windshield wiper motor set and hold.

2. Windshield wipers switch to park, check for 28VDC between plug 123P1 pin A1 and ground. Is 28VDC present?

   NO

   - Remove elec pwr, check for continuity between plug 123P1 pin B and term 18 of windshield wipers switch. Is continuity present?

   NO

   - Locate open in wire W550 112.20 or W559 32.20 between plug 123P1 and windshield wipers switch. Repair or replace wire as required.

   YES

   - Replace windshield wipers switch.

   NO

   - Replace wire W550 28.20 on windshield wipers switch.

   YES

   - With switch still at park, check for ground on plug 123P1 pin B and ground. Is ground present?

   NO

   - Replace windshield wiper motor.

END OF TASK

12-83/(12-84)
CHAPTER 13

ENVIRONMENTAL CONTROL SYSTEM
TROUBLESHOOTING
Chapter 13 contains procedures for Environmental Control System Troubleshooting. Each environmental control system failure symptom is listed below. Included in this Chapter are locations and views of all electrical connectors, receptacles, relays, and ground connections for the Environmental Control System. Refer to TM 55-1520-240-23 for required Environmental Control System maintenance procedures.

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**FAILURE SYMPTOM LIST**

**HEATING AND VENTILATION**

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<td>AIR FLOW NOT FELT AT JETTISONABLE DOOR DEFROSTER DUCTS OR NOSE BUBBLE VENTS</td>
<td>13-1.4</td>
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<tr>
<td>AIR FLOW NOT FELT AT PILOT OR COPILOT AIR OUTLET</td>
<td>13-1.4</td>
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<td>CABIN HEATER BLOWER CIRCUIT BREAKER WILL NOT STAY CLOSED</td>
<td>13-1.4</td>
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<td>CABIN HEATER CONT CIRCUIT BREAKER WILL NOT STAY CLOSED</td>
<td>13-1.4</td>
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<tr>
<td>HEATER DOES NOT PROVIDE WARM AIR</td>
<td>13-1.4</td>
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<tr>
<td>HEATER FAN CANNOT BE HEARD RUNNING</td>
<td>13-1.4</td>
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<tr>
<td>HEATER FAN CANNOT BE HEARD RUNNING AFTER HEATER START SWITCH PRESSED AND RELEASED</td>
<td>13-1.4</td>
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<tr>
<td>HEATER FAN STOPS RUNNING IMMEDIATELY AFTER HEATER FAN SWITCH SET TO OFF</td>
<td>13-1.4</td>
</tr>
<tr>
<td>HEATER HOT (WITHOUT 74) HTR HOT (WITH 74) LIGHT COMES ON</td>
<td>13-1.4</td>
</tr>
<tr>
<td>SYSTEM DOES NOT RESPOND TO CHANGES IN CABIN TEMP SELECTOR SETTING</td>
<td>13-1.4</td>
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</table>
### ENVIRONMENTAL SYSTEM ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST

<table>
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<tr>
<th>REF PART STATION LOCATION</th>
<th>DESIGN NUMBER</th>
<th>TYPE</th>
<th>MATE WITH/LOCATION</th>
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<th>WL</th>
<th>BL</th>
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</thead>
<tbody>
<tr>
<td>GD007 150 HEATER COMPARTMENT</td>
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<td>5</td>
<td>45R</td>
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<td>GD047 150 NO. 2 PDP SIDEWALL</td>
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<td>GD160 151 LH CABIN</td>
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<td>TB17 WALKWAY- UNDERFLOOR</td>
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<td>082K5 66 HEATER RELAY BOX INTERNAL</td>
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<td>-5</td>
<td>52R</td>
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<td>082P3 MS3456W14S-6S 50 HEATER TEMP CONT</td>
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<td>25R</td>
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<tr>
<td>082P4 MS3456W14S-SS 115 HEATER FUEL CONT</td>
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<td>082P5 MS3456W10SL-4S 46 HEATER IGN ASSY</td>
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<td>45R</td>
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<td>082P6 MS3456W16-11S 52 HEATER DIFF PRES SW</td>
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<td>20R</td>
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<tr>
<td>082J7 MS3457W14-19P 21 HEATER RELAY BOX - RECEPT</td>
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<tr>
<td>082P7 MS3476W14-19S 21 HEATER RELAY BOX</td>
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<td>-10</td>
<td>50R</td>
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<th>TYPE</th>
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<td>NO. 1 PDP</td>
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</tbody>
</table>
13-2.4 Change 3
### INITIAL SETUP

**Applicable Configurations:**
- All

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

**Materials:**
- Battery Disconnected
- Electrical Power Off
- Hydraulic Power Off
- None Electrical Power Off
- Blanket Removed

**Personnel Required:**
- 67U10 Medium Helicopter Repairer

---

### TASK RESULT

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Check air pressure switch (1).</td>
<td>If switch (1) is loose or damaged, tighten or replace it as required. If tubes, wiring, or electrical connector to switch are damaged, repair or replace them as required.</td>
</tr>
<tr>
<td>2. Check heater fan (2).</td>
<td>If fan (2) is loose or damaged, tighten or replace it as required. If wiring or electrical connector to fan is damaged, repair or replace it as required.</td>
</tr>
<tr>
<td>3. Check heater control relay box (3).</td>
<td>If box (3) is loose or damaged, tighten or replace it as required. If wiring or electrical connector to box is damaged, repair or replace it as required.</td>
</tr>
<tr>
<td>4. Check temperature controller (4).</td>
<td>If controller (4) is loose or damaged, tighten or replace it as required. If wiring or electrical connector to controller is damaged, repair or replace it as required.</td>
</tr>
<tr>
<td>5. Check air inlet duct (5).</td>
<td>If duct (5) is loose or torn, tighten or replace it as required.</td>
</tr>
<tr>
<td>6. Check heater fuel control (6).</td>
<td>If control (6) is loose or damaged, tighten or replace it as required. If fuel hoses, wiring or electrical connector to control is damaged, repair or replace it as required.</td>
</tr>
<tr>
<td>7. Check heater ignition unit (7).</td>
<td>If ignition unit (7) is loose or damaged, tighten or replace it as required. If wiring, electrical connector, or shielded lead (8) to ignition unit is damaged, repair or replace it as required.</td>
</tr>
<tr>
<td>8. Check boater (9).</td>
<td>If heater (9) is damaged, replace it.</td>
</tr>
<tr>
<td>9. Check exhaust shroud (10).</td>
<td>If shroud (10) is damaged, repair or replace it as required.</td>
</tr>
<tr>
<td>10. Check three temperature switches (11).</td>
<td>If any switch (11) is loose or damaged, tighten or replace it as required. If wiring to any switch is damaged, repair or replace it as required.</td>
</tr>
</tbody>
</table>
### 13-1.3 HEATING AND VENTILATING SYSTEM VISUAL CHECK (Continued)

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. Check cabin thermostat (12).</td>
<td>If thermostat (12) is loose or damaged, tighten or replace it as required.</td>
</tr>
<tr>
<td>12. Check pilot's jettisonable door defroster (13).</td>
<td>If defroster (13) is damaged, repair or replace it as required.</td>
</tr>
<tr>
<td>13. Check copilot's jettisonable door defroster (13).</td>
<td>If defroster (13) is damaged, repair or replace it as required.</td>
</tr>
<tr>
<td>14. Check TROOP WARN/HEATING panel (14).</td>
<td>If knob (15) is loose, tighten or replace it as required. If switch (16 or 17) is damaged, replace it.</td>
</tr>
</tbody>
</table>

**FOLLOW-ON MAINTENANCE:**

TM 55-1520-240-23
Install heater compartment acoustic blanket.
**13-1.4 HEATING AND VENTILATING SYSTEM OPERATIONAL CHECK**

**INITIAL SETUP**
- **Applicable Configurations:**
  - All

**Equipment Condition:**
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power Off
  - Heater Air Inlet Protective Shield Removed
  - Heater Exhaust Outlet Protective Shield Removed
  - Visual Check of Heating and Ventilating System Performed

**Tools:**
- Stopwatch

**Materials**
- None

**Personnel Required:**
- Medium Helicopter Repairer

**References:**
- TM 55-1520-240-23

---

### TASK RESULT

1. **Press and release HEATER START switch (15).**
   - **NOTE:** Heater will not operate if cabin thermostat senses a temperature of 34°C (93°F) or greater.

2. **Turn CABIN TEMP SELECTOR (14) to COLDER position.**

3. **Set RIGHT SIDE FWD and AFT MAIN FUEL PUMP switches (5 and 6) to OFF.**

---

**FOLLOW-ON MAINTENANCE:**
- TM 55-1520-240-23:
  - Electrical power off.
  - Battery disconnected.
13-1.4 HEATING AND VENTILATING SYSTEM OPERATIONAL CHECK (Continued)
13-1.5 CABIN HEATER CONT CIRCUIT BREAKER WILL NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer's Tool Kit. NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-20:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off
Heater Compartment Acoustic Blanket Removed

GO TO NEXT PAGE
13-1.5 CABIN HEATER CONT CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

- **DID CB OPEN BEFORE HEATER FAN SW SET TO VENT BLOWER ONLY OR HEATER ON?**
  - **YES**
    - DISCONNECT PLUG 082P7 FROM RELAY BOX. CHECK FOR GROUND ON PLUG 082P7 PIN C. IS GROUND PRESENT?
    - **NO**
      - REPLACE RELAY BOX.
    - **YES**
      - SET HEATER FAN SW TO VENT BLOWER ONLY. IS GROUND STILL PRESENT ON PLUG 082P7 PIN C?
      - **NO**
        - LOCATE GROUND FAULT ON WIRE: W559-50-20 OR W539-85-20 BETWEEN HEATER FAN SW AND PLUG 082P7. REPAIR OR REPLACE WIRE AS REQUIRED.
        - **NO**
          - WAS GROUND ON PLUG 082P7 PIN A? (CHECK FOR GROUND ON PLUG 082P7 PINS A, B, AND N. IS GROUND ON ANY PIN?)
          - **NO**
            - REPLACE RELAY BOX.
          - **YES**
            - LOCATE GROUND FAULT ON WIRE: W539-88-20, W559-88-20, OR W559-54-20 BETWEEN PLUG 082P7 AND HEATER START SW. REPAIR OR REPLACE WIRE AS REQUIRED.
            - **NO**
              - WAS GROUND ON PLUG 082P7 PIN B? (CHECK FOR GROUND ON PLUG 082P7 PINS A, B, AND N. IS GROUND ON ANY PIN?)
              - **NO**
                - LOCATE GROUND FAULT ON OR W559-53-20 BETWEEN PLUG 082P7 AND HEATER FAN SW OR HEATER FAN RELAY REMOVED. REPAIR OR REPLACE WIRE AS REQUIRED.
13-1.6 CABIN HEATER BLOWER CIRCUIT BREAKER WILL NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP
Applicable Configurations:
- All
Tools:
- Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
- Multimeter
Materials:
- None
Personnel Required:
- Aircraft Electrician
References:
- TM 55-1520-240-23
Equipment Condition:
- Battery Disconnected
- Electrical Power Off
- Hydraulic Power Off
- Heater Compartment Acoustic Blanket Removed

DID CB OPEN BEFORE HEATER FAN SW SET TO VENT BLOWER ONLY OR HEATER ON?

NO

LOCATE GROUND FAULT ON WIRE W552-20-16A, W552-21-16A, OR W562-23-16C BETWEEN FAN RELAY AND CABIN HEATER BLOWER CB 082CB. REPAIR OR REPLACE WIRE AS REQUIRED.

YES

DISCONNECT PLUG 082PB FROM HEATER FAN. CHECK FOR GROUND AT PLUG TERMINALS. IF PIN A, B, OR C IS GROUND PRESENT ON ANY PIN?

NO

REMOVE FOREIGN OBJECT IF PRESENT. TRY TO TURN IMPELLER WILL IT STILL LOCKED. REPLACE HEATER FAN.

YES

LOCATE GROUND FAULT ON WIRE W639-78-16A, W639-78-16B, OR W639-40-16C BETWEEN HEATER FAN RELAY AND HEATER FAN RELAY. REPAIR OR REPLACE WIRE AS REQUIRED.

REPLACE HEATER FAN.

INLET DUCT

HEATER FAN SWITCH

TROOP WARRIORS HEATING PANEL

Cockpit

END OF TASK
13-1.7 HEATER FAN CANNOT BE HEARD RUNNING

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
68F10 Aircraft Electrician
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Heater Compartment Acoustic Blanket Removed

Page 13-11 is a blank page.
13-1.7 HEATER FAN CANNOT BE HEARD RUNNING (Continued)

- **Check for ground on term K2 on heater fan relay**
  - Yes: Go to next step.
  - No: Locate open in wire W552-008B-099 between heater fan relay and fuselage ground; repair or replace wire as required.

- **Check for 115VAC between term L1, L2, L3 on heater fan relay and ground**
  - Yes: Go to next step.
  - No: Locate open in wire W552-008B-099 between term L1 and L2 on heater fan relay and ground.

- **Check for continuity between heater fan relay term and plug 086P.**
  - Yes: Go to next step.
  - No: Locate open in wire W552-008B-099 between heater fan relay and fuselage ground; repair or replace wire as required.

- **Replace heater fan relay**

- **Was 115VAC present on any term?**
  - Yes: Go to previous step.
  - No: Replace cabin heater blower CS.
HEATER FAN CANNOT BE HEARD RUNNING (Continued)
13-1.8 AIR FLOW NOT FELT AT JETTISONABLE DOOR DEFROSTER DUCTS OR NOSE BUBBLE VENTS

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations: All

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

Materials: None

Personnel Required: 67U20 Medium Helicopter Repairer

Equipment Condition:
- Battery Disconnected
- Electrical Power Off
- Hydraulic Power Off
- Passageway Floor Removed
- Heater Compartment Acoustic Blanket Removed

References: TM 55-1520-240-23

Equipment Condition:
- TM 55-1520-240-23:
  - Battery Disconnected
  - Electrical Power Off
  - Hydraulic Power Off
  - Passageway Floor Removed
  - Heater Compartment Acoustic Blanket Removed

Fault Isolation Procedure:

1. **Watch Cockpit Air Butterfly Valve Arm**:
   - Check if the arm is loose. Adjust as required.

2. **Tighten Arm to Valve Shaft**:
   - Ensure the arm is tight. Adjust as required.

3. **Disconnect Butterfly Valve Cable**:
   - If the arm is loose, check ducting for blockage or disconnection.

4. **Replace Cable Between Bellcrank and Butterfly Valve**:
   - Replace if necessary.

END OF TASK
13-1.9 AIR FLOW NOT FELT AT PILOT OR COPILOT AIR OUTLET

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
- All

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

Materials:
- None

Personnel Required:
- 67U20 Medium Helicopter Repairer

References:
- TM 55-1520-240-23

Equipment Condition:
- TM 55-1520-240-23: Battery Disconnected
- Electrical Power Off
- Hydraulic Power Off

END OF TASK
13-1.10 AIR FLOW NOT FELT AT CABIN VENTS

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
67U10 Medium Helicopter Repairer
67U20 Medium Helicopter Repairer

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off

END OF TASK
13-1.11 HEATER FAN CAN NOT BE HEARD RUNNING AFTER HEATER START SWITCH PRESSED AND RELEASED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
68F10 Aircraft Electrician
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Heater Compartment Acoustic Blanket Removed

Page 13-19 is a blank page.
13-1.11 HEATER FAN CAN NOT BE HEARD RUNNING AFTER HEATER START SWITCH PRESSED AND RELEASED

(Continued)

1. Press and hold heater start sw for 2 seconds, release sw did heater fan sound like it was running?

   - Yes: Replace heater relay box.
   - No: Locate open in wire W289-90-20 between plug 08277 and overheater sw. Repair or replace wire as required.

2. Press and hold heater start sw, check for 28 vdc between each term of overheater sw and ground is 28 vdc present on each term?

   - Yes: Release sw. Lower troop warn/heating pln, from qvih pln, check for 28 vdc between each term of heater start sw and ground, is 28 vdc present on one term?
   - No: Replace overheater sw.

3. Check for 28 vdc between terms of heater fan sw and ground is 28 vdc present?

   - Yes: Replace heater start sw.
   - No: Replace heater fan sw.

4. Disconnect plug 08277 from heater relay box, pin a and either term of overheater sw is continuity present?

   - Yes: Release sw. Set heater fan sw to vent slower only. Check for 28 vdc between plug 08277 pin n and ground is 28 vdc present?
   - No: Replace heater relay box.

5. Locate open in wire W289-90-20 or W289-95-20 between plug 08277 and splice to wires W289-82-20 and W289-84-20. Repair or replace wire as required.

6. Locate open in wire W289-95-20 or W289-95-20 between plug 08277 and splice to wires W289-82-20 and W289-84-20. Repair or replace wire as required.

END OF TASK 13-21
13-1.12 HEATER DOES NOT PROVIDE WARM AIR

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915
Multimeter
Stopwatch

Materials:
None

Personnel Required:
67U10 Medium Helicopter Repairer
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Heater Compartment Acoustic Blanket
Removed
13-1.12 HEATER DOES NOT PROVIDE WARM AIR (Continued)

1. CHECK HEATER DRAIN LINE IS FUEL DIPPING FROM DRAIN?
   - NO
   - YES
     - FAULT CORRECTED

2. CHECK FOR 28 VDC BETWEEN BOTH TERMINES OF CYCLING SW (1 & 1) AND GROUND, IS 28 VDC PRESENT ON BOTH TERMS?
   - NO
   - YES
     - IS 28 VDC ON ONE TERM OF CYCLING SWITCH?
       - NO
       - YES
         - DISCONNECT PLUG DB2P3 FROM TEMP CONTROL, CHECK FOR 28 VDC BETWEEN PLUG DB2P3 PIN A & 1 AND GROUND, IS 28 VDC PRESENT?
           - NO
           - YES
             - SET HEATER FAN SW TO OFF, CHECK FOR GROUND ON PLUG DB2P3 PIN A IS GROUND PRESENT?
               - NO
               - YES

   - NO
   - YES

3. DISCONNECT PLUG DB2P3 FROM TEMP CONTROL, CHECK FOR 28 VDC BETWEEN PLUG DB2P3 PIN A & 1 AND GROUND, IS 28 VDC PRESENT?
   - NO
   - YES

4. SET HEATER FAN SW TO OFF, CHECK FOR GROUND ON PLUG DB2P3 PIN A IS GROUND PRESENT?
   - NO
   - YES

5. REPLACE CYCLING SWITCH.

13-1.12 HEATER DOES NOT PROVIDE WARM AIR (Continued)

- CHECK FOR GROUND ON PLUG 08273 PIN F: IS GROUND PRESENT?
  - YES
    - DISCONNECT PLUG 08273 FROM CABIN THERMOSTAT: IS GROUND STILL PRESENT ON PLUG 08273 PIN F?
      - YES
        - LOCATE GROUND FAULT ON WIRE W638-10820 OR W638-4422 BETWEEN PLUG 08273 AND PLUG 08272, REPAIR OR REPLACE WIRE AS REQUIRED
      - NO
        - REPLACE CABIN THERMOSTAT
    - NO
      - REPLACE CABIN THERMOSTAT
  - NO
    - CHECK FOR CONTINUITY BETWEEN PLUG 08273 PIN E AND BOTH TERMINALS OF CYCLING SW: IS CONTINUITY PRESENT?
      - YES
        - REPLACE TEMP CONTROL
      - NO
        - LOCATE OPEN IN WIRE W638-10820 BETWEEN PLUG 08273 AND CYCLING SWITCH, REPAIR OR REPLACE WIRE AS REQUIRED

GO TO NEXT PAGE
HEATER DOES NOT PROVIDE WARM AIR (Continued)

END OF TASK
13-1.13 HEATER HOT (WITHOUT 74) LIGHT COMES ON

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
- Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
- Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
- Multimeter

Materials:
- None

Personnel Required:
- Medium Helicopter Repairer
- Aircraft Electrician

Equipment Condition:
- Battery Connected
- Electrical Power On
- Hydraulic Power Off
- Heater Compartment Acoustic Blanket Removed

References:
- TM 55-1520-240-23

Equipment Condition:
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power Off

Materials:
- Heater Compartment Acoustic Blanket

END OF TASK

13-28 Change 23
13-1.14 SYSTEM DOES NOT RESPOND TO CHANGES IN CABIN TEMP SELECTOR SETTING

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations: All

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

Personnel Required:
- 68F10 Aircraft Electrician
- 68F20 Aircraft Electrician

Equipment Condition:
- TM 55-1520-240-23
- Battery Connected
- Electrical Power On
- Hydraulic Power Off
- Heater Compartment Acoustic Blanket Removed

References:
- TM 55-1520-240-23
- Equipment Condition:
- TM 55-1520-240-23:
- Battery Connected
- Electrical Power On
- Hydraulic Power Off
- Heater Compartment Acoustic Blanket Removed
13-1.14 SYSTEM DOES NOT RESPOND TO CHANGES IN CABIN TEMP SELECTION SETTING (Continued)

- **DISCONNECT PLUG 08Z2P FROM CABIN THERMOSTAT**
  - SHORT PLUG 08Z2P PIN B TO GROUND. DOES COOL AIR COME FROM DUCTS AND VENTS?
  - **YES**
  - **NO**

- **CHECK FOR GROUND ON PLUG 08Z2P PIN A. IS GROUND PRESENT?**
  - **YES**
  - **REPLACE CABIN THERMOSTAT**
  - **NO**

- **CHECK FOR 5 TO 20 VDC BETWEEN PLUG 08Z2P PIN B (1 & 3) AND GROUND. IS IT 5 TO 20 VDC PRESENT?**
  - **YES**
  - **REPLACE CABIN THERMOSTAT**
  - **NO**

- **LOCATE OPEN IN WIRE W639 GD.124A20H BETWEEN PLUG 08Z2P AND FUSELESS GROUND. REPAIR OR REPLACE WIRE AS REQUIRED.**

- **SET HEATER FAN SW TO OFF. DISCONNECT PLUG 08Z3P FROM TEMP CONTROL. CHECK FOR CONTINUITY BETWEEN PLUG 08Z3P PIN B AND PLUG 08Z2P PIN C. IS CONTINUITY PRESENT?**
  - **YES**
  - **REPLACE TEMP CONTROL**
  - **NO**

- **LOCATE OPEN IN WIRE W688 43-22 OR W689 101-20 BETWEEN PLUG 08Z3P AND PLUG 08Z2P, REPAIR OR REPLACE WIRE AS REQUIRED.**

- **LOCATE OPEN IN WIRE W559 54-20 OR W689 115-20 BETWEEN CABIN TEMP SELECTOR AND PLUG 08Z2P, REPAIR OR REPLACE WIRE AS REQUIRED.**

- **LOCATE OPEN IN WIRE W559 55-20 OR W689 89-20 BETWEEN CABIN TEMP SELECTOR AND BOX W689 101-20.**

- **LOWER TROOP/ARM SW AND CHECK FOR RESISTANCE BETWEEN PLUG 08Z3P PIN C AND BOTH TERMINALS OF CABIN TEMP SELECTOR. IS 800 OHMS PRESENT?**
  - **YES**
  - **REPLACE TEMP CONTROL**
  - **NO**

END OF TASK
13-1.15 HEATER FAN STOPS RUNNING IMMEDIATELY AFTER HEATER FAN SWITCH SET TO OFF

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915
Multi meter

Materials:
None

Personnel Required:
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Heater Compartment Acoustic Blanket Removed

END OF TASK
CHAPTER 14

HOIST AND WINCH TROUBLESHOOTING
## CHAPTER OVERVIEW

Chapter 14 contains procedures for Hoist and Winch System troubleshooting. Hoist and winch system failure symptoms are listed below. Included in this Chapter are locations and views of all electrical connectors, receptacles, relays, and ground connections for Hoist and Winch System.

Refer to TM 55-1520-240-23 for required Hoist and Winch maintenance procedures.

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## FAILURE SYMPTOM LIST

### HOIST AND WINCH

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<td>CABLE DOES NOT REEL OUT WHEN WINCH IS CONTROLLED AT HOIST/CARGO HOOK PANEL</td>
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<td>CABLE DOES NOT REEL OUT WHEN WINCH IS CONTROLLED BY WINCH CONTROL GRIP AT STA 95 AUXILIARY PANEL</td>
<td>14-1.4</td>
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<tr>
<td>CABLE DOES NOT REEL OUT WHEN WINCH IS CONTROLLED BY WINCH GRIP AT HOIST OPERATOR OR AUXILIARY PANEL</td>
<td>14-1.4</td>
</tr>
<tr>
<td>HOIST CABLE CUTTER CIRCUIT BREAKER DOES NOT STAY CLOSED</td>
<td>14-1.4</td>
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<tr>
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<td>14-1.4</td>
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<tr>
<td>28 VDC NOT MEASURED AT STA 340 CABLE CUTTER RECEPTACLE WHEN HOIST/CARGO HOOK PANEL CABLE CUTTER SWITCH IS SET TO ON</td>
<td>14-1.4</td>
</tr>
<tr>
<td>28 VDC NOT MEASURED AT STA 340 CABLE CUTTER RECEPTACLE WHEN WINCH GRIP CABLE CUTTER SWITCH PRESSED AT HOIST OPERATOR OR AUXILIARY PANEL</td>
<td>14-1.4</td>
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<tr>
<td>REF DESIG</td>
<td>PART NUMBER</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
</tr>
<tr>
<td>GD034</td>
<td>150</td>
</tr>
<tr>
<td>GD 194</td>
<td>151</td>
</tr>
<tr>
<td>TB 17</td>
<td>105</td>
</tr>
<tr>
<td>TB 27</td>
<td>330</td>
</tr>
<tr>
<td>TB 36</td>
<td>80</td>
</tr>
<tr>
<td>TB 37</td>
<td>80</td>
</tr>
<tr>
<td>132P1</td>
<td>MS3476W10-6S</td>
</tr>
<tr>
<td>132P2</td>
<td>M83723-95A1005N</td>
</tr>
<tr>
<td>132P3</td>
<td>M83723-95A0803N</td>
</tr>
<tr>
<td>132P4</td>
<td>MS3456W10S-3S</td>
</tr>
<tr>
<td>132P5</td>
<td>MS3456W10S-2S</td>
</tr>
<tr>
<td>132P6</td>
<td>MS3476W14-19P</td>
</tr>
<tr>
<td>132P7</td>
<td>MS3476W14-19S</td>
</tr>
<tr>
<td>132J8</td>
<td>MS3450W10SL-3P</td>
</tr>
<tr>
<td>132J9</td>
<td>MS3470W14-19S</td>
</tr>
<tr>
<td>132J11</td>
<td>MS3470W14-19S</td>
</tr>
<tr>
<td>132J12</td>
<td>MS3470W14-19S</td>
</tr>
<tr>
<td>134P1</td>
<td>MS3476W14-19S</td>
</tr>
</tbody>
</table>
14-1 CARGO/RESCUE WINCH SYSTEM
14-1.3 CARGO/RESCUE WINCH SYSTEM VISUAL CHECK

INITIAL SETUP

Personnel Required:
67U10 Medium Helicopter Repairer

Applicable Configurations:
All

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

Equipment Condition:

Battery Disconnected
Electrical Power Off
Hydraulic Power Off
Heater Compartment Acoustic Blanket Removed
Cable Cutter Inspected

Reference:
TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:

Materials:

None

Heater Compartment Acoustic Blanket Removed
Cable Cutter Inspected

TASK

RESULT

1. Check shutoff valve (1).

If valve (1) is loose or damaged, tighten or replace it as required. If hydraulic tubes to valve are loose or damaged, tighten or replace them as required. If electrical connector or wires to valve are damaged, repair or replace as required.

2. Check winch control valve (2).

If valve (2) is loose or damaged, tighten or replace it as required. If hydraulic tubes to valve are loose or damaged, tighten or replace them as required. If electrical connector or wires to valve are damaged, repair or replace as required.

If any hydraulic tube or component is loose or damaged, repair or replace as required.

3. Check hydraulic tubes and components between winch control valve (2) and winch (3).

4. Check winch (3).

If winch (3) is loose or damaged, tighten or replace it. If brake (4) is loose or damaged, tighten or replace it as required. If winch motor (5) is loose or damaged, tighten or replace it as required. If connector or wires to winch are damaged repair or replace as required.
14-1.3 CARGO/RESCUE WINCH SYSTEM VISUAL CHECK (Continued)

5. Check CABLE CUTTER and HOIST CONTROL receptacles (6 and 7).
6. Pull down cover and check CABLE CUTTER receptacle (8).
7. Check winch operator’s grip (9) and cable (10).
8. Check HOIST CONTROL receptacle (11).
9. Check HOIST/CARGO HOOK panel (12).

If either receptacle or wiring to receptacle (6 or 7) is damaged, repair or replace as required.
If receptacle (8) is damaged; replace it.
If grip (9) is cracked or cable (10) is cut exposing wires, replace it.
If receptacle (11) is damaged, replace it. If receptacle dust cover is damaged or missing, replace it.
If knob (13) is loose or damaged, tighten or replace as required. If switchguard (14) is loose or damaged, tighten or replace as required. If switch (15 or 16) is loose or damaged, replace HOIST/CARGO HOOK panel (12).

FOLLOW-ON MAINTENANCE:
None

END OF TASK
14-1.4 CARGO/RESCUE WINCH SYSTEM OPERATIONAL CHECK

INITIAL SETUP

Applicable Configurations:
- All

Tools:
- Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
- Multi meter
- Asbestos Gloves (E187)
- Stopwatch
- Load, 600 pounds
- Load, 3100-3300 pounds

Materials:
- Lockwire (E228)

Personnel Required:
- 68F10 Aircraft Electrician
- 67U10 Medium Helicopter Repairer
- 67U20 Medium Helicopter Repairer

References:
- TM 55-1520-240-23
- TM 55-1520-240-10

Equipment Condition:
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power On
  - Center Cargo Hook Removed
  - Visual Check of Cargo/Rescue Winch System Performed [Task 14-1.3]

General Safety Instructions:

**WARNING**

Wear gloves when handling wire rope (cable). Otherwise, injury to hands can result.
1. Check that HOIST CONT and HOIST CABLE CUTTER circuit breakers (1 and 2) are closed.

2. Check that winch shift lever (3) is set to RESCUE.

3. Hold pressure line (5) to shutoff valve (6). Set HOIST MASTER switch (7) to PILOT.

4. Hold pressure line (8) to brake on winch (4). Push in and turn pushbutton (9) on shutoff valve (6). Release pushbutton.

5. Remove lockwire from knob (10) on winch control valve (11).


7. Rig winch (4) for rescue mode (TM 56-1620-240-10).

8. Turn and release pushbutton (9).


10. Turn HOIST control (13) to OUT. Release control to OFF when cable (12) stops reeling out.

   **NOTE**

   Do not allow cable end to reel in and jam in a pulley. Damage to winch, pulley, or airframe can occur.

   Winch (4) shall reel in cable (12) within 90 seconds and stop automatically when 26 to 26-1/2 feet of cable remain extended. Cable length is measured from sta 120 passageway bulkhead to cable ball end. If winch does not reel in cable, go to [task 14-1.6](#). If cable takes longer than 90 seconds to reel in, or cable binds or spools unevenly, replace winch. If winch stops too soon or too late, (26 - 26-1/2 feet of cable not reel), adjust rescue in-limit switch, TM 55-1520-240-23. If switch can not be adjusted, replace winch.

   **NOTE**

   With cable reeled out, an inspection for broken strands or definite bends can be performed.

   Do not allow cable end to reel in and jam in a pulley. Damage to winch, pulley, or airframe can occur.

   **NOTE**

   With cable reeled out, an inspection for broken strands or definite bends can be performed.

   **NOTE**

   With cable reeled out, an inspection for broken strands or definite bends can be performed.
14-1.4 CARGO/RESCUE WINCH SYSTEM OPERATIONAL CHECK
(Continued)
14-1.4 CARGO/RESCUE WINCH SYSTEM OPERATIONAL CHECK

(Continued)

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.</td>
<td>Set HOIST MASTER switch (7) to REMOTE.</td>
</tr>
<tr>
<td>13.</td>
<td>Connect winch control grip (14) to auxiliary panel (15) with cable (16).</td>
</tr>
<tr>
<td>14.</td>
<td>On winch control grip (14), press and hold WINCH ARMING TRIGGER switch (17) and set WINCH CABLE control (18) to OUT. Reel out enough cable to hook up a load in rescue mode (TM 55-1520-240-10). Then release controls (17 and 18).</td>
</tr>
<tr>
<td>15.</td>
<td>Connect 600-pound load to cable hook.</td>
</tr>
<tr>
<td>16.</td>
<td>On winch control grip (14), press and hold WINCH ARMING TRIGGER switch (17) and set WINCH CABLE control (18) to IN. Release controls (17 and 18) after load clears ground.</td>
</tr>
<tr>
<td>17.</td>
<td>On winch control grip (14), press and hold WINCH ARMING TRIGGER switch (17) and set WINCH CABLE control (18) to OUT. Release controls (17 and 18) after tension is off cable. Disconnect 600-pound load.</td>
</tr>
<tr>
<td>18.</td>
<td>On winch control grip (14), press and hold WINCH ARMING TRIGGER switch (17) and set WINCH CABLE control (18) to OUT. Reel out enough cable to hook up an external load. Then release controls (17 and 18).</td>
</tr>
<tr>
<td>19.</td>
<td>Set winch shift lever (3) to CARGO.</td>
</tr>
<tr>
<td>20.</td>
<td>Rig winch (4) for cargo mode (TM 55-1520-240-16).</td>
</tr>
<tr>
<td>22.</td>
<td>Connect winch control grip (14) to sta 502 HOIST CONTROL receptacle (19) with cable (16).</td>
</tr>
<tr>
<td></td>
<td><strong>TASK</strong></td>
</tr>
<tr>
<td>23.</td>
<td>Winch (4) shall raise load and hold it steady. If winch does not raise load, go to [task 14-1.10] If winch sounded like it was beginning to operate but stopped, replace winch. If load creeps down after grip controls released, replace winch.</td>
</tr>
<tr>
<td>24.</td>
<td>On winch control grip (14), press and hold WINCH ARMING TRIGGER switch (17) and set WINCH CABLE control (18) to IN.</td>
</tr>
<tr>
<td>25.</td>
<td>Connect winch control grip (14) to HOIST OPERATOR’S panel receptacle (20) with cable (16).</td>
</tr>
<tr>
<td>26.</td>
<td>On winch control grip (14), press and hold WINCH ARMING TRIGGER switch (17) and set WINCH CABLE control (18) to OUT. Release controls (17 and 18) when several feet of cable (12) are reeled out. Have helper keep slight tension on cable. Helper must wear gloves.</td>
</tr>
</tbody>
</table>

**NOTE**

If necessary, reel in several feet of cable to perform following step.

**WARNING**

Cable failure during loading operations will result in cable whiplash within the cabin. This may result in personnel injury. Stand aft and to one side of load to avoid whiplash exposure.

Cable (12) shall reel off winch. If it does not, go to [task 14-1.9]

Winch (4) shall reel in cable (12) and stop when second layer of cable starts on cable drum. If winch does not reel in cable, go to [task 14-1.11] If winch continues to operate, release controls (17 and 18). Adjust overload limit switch. If switch is adjusted, repeat steps 18 thru 23. If winch still does not stop when second layer of cable wraps begins, replace winch.

Cable (12) shall reel off winch (4). If winch does not operate, locate open in wire W668-33-20, W697-16-20, or W645-238-20 between receptacle 132J12 and TB17. Repair or replace wire as required.

Cable (12) shall reel off winch (4). If it does not, go to [task 14-1.12]
14-1.4 CARGO/RESCUE WINCH SYSTEM OPERATIONAL CHECK

(Continued)
### Task 14-1.4 Cargo/Rescue Winch System Operational Check (Continued)

<table>
<thead>
<tr>
<th>TASK</th>
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<tbody>
<tr>
<td>27. On winch control grip (14), press and hold WINCH ARMING TRIGGER switch (17) and set WINCH CABLE control (18) to IN.</td>
</tr>
<tr>
<td>28. Connect multimeter, set to measure 28 vdc between pin A (+) of CABLE CUTTER receptacle (21) and ground.</td>
</tr>
<tr>
<td>29. Lift switch guard (22) and set and hold CABLE CUTTER switch (23) to ON.</td>
</tr>
<tr>
<td>30. Release CABLE CUTTER switch (23) and close switchguard (22).</td>
</tr>
<tr>
<td>31. On winch control grip (14), lift switch guard (24) and press and hold CABLE CUTTER switch (25).</td>
</tr>
<tr>
<td>32. Release CABLE CUTTER switch (25) and close switchguard (24).</td>
</tr>
<tr>
<td>33. Repeat steps 31 and 32 with winch control (14) connected to auxiliary panel (15) with cable (16). Then disconnect multimeter and proceed to step 34.</td>
</tr>
<tr>
<td>34. Set HOIST MASTER switch (6) to OFF.</td>
</tr>
<tr>
<td>35. Check that index on control valve knob (10) aligns with stripe on valve body. Lockwire knob to structure, Use lockwire (E228).</td>
</tr>
</tbody>
</table>

### Follow-On Maintenance:

- Battery disconnected
- Hydraulic power off
- Electrical power off
- Disconnect and stow winch control grip
- Disconnect and stow cable cutter.
- Install heater compartment acoustic blanket
- Install center cargo hook.

---

**Cautions:**

- Do not allow cable end to reel in and jam in a pulley. Damage to winch, pulley, or airframe can occur.

Winch (4) shall reel in cable (12) and stop when 12 to 20 inches of cable remain out. If winch does not operate, locate open in wire W508-4-20, W639-402-20 or W639-402-20 between receptacle 132J11 and TB17. Repair or replace wire as required.

If more or less than 12 to 20 inches of cable is out when winch stops, adjust cargo in-limit switch, if switch is adjusted, repeat steps 18 thru 27. If more or less than 12 to 20 inches of cable is out, replace winch.

- Multimeter shall indicate 28vdc. If it does not, go to Task 14-1.13.
- Align stripe if required.
14-1.5 HOIST CONT CIRCUIT BREAKER DOES NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Equipment Condition:
TM 55-1520-240-23:
Battery Disconnected
Electrical Power Off

Materials:
None

Personnel Required:
68F10 Aircraft Electrician
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

GO TO NEXT PAGE
14-1.5 HOIST CONT CIRCUIT BREAKER DOES NOT STAY CLOSED (Continued)

Was CB found open before hoist master SW set to pilot or remote?

- Yes, locate ground fault on wire W662-21-20 or W663-20 or W664-20 or W665-11-20 between plug 134P1 and hoist cont CB. Repair or replace wire as required.

- No, was CB found open after hoist master SW set to pilot?

  - Yes, locate ground fault on wire W662-21-20 or W664-20 or W665-11-20 between plug 134P1 and hoist cont CB. Repair or replace wire as required.

  - No, disconnect plug 132P3 from shutoff valve. Is ground still present on plug 134P1 pin C? Is ground present?

    - Yes, locate ground fault on wire W665-20-20 or W665-14-20 or W666-24-20 between TB17 and receptacle 132J12. Repair or replace wire as required.

    - No, remove passageway floor. Remove wire W665-23-20 or W665-14-20 or W666-24-20 between TB17 and receptacle 132J12. Repair or replace wire as required.

    - No, replace hoist/cargo hook pin.

  - No, remove passageway floor. Remove wire W665-23-20 or W665-14-20 or W666-24-20 between TB17 and receptacle 132J12. Repair or replace wire as required.

  - No, replace shutoff valve.

  - No, remove wire W665-213-20 from TB17 term 4C. Check for ground on this wire. Is ground present?

    - Yes, locate ground fault on wire W665-213-20 or W666-21-20 or W666-30-20 between TB17 and plug 134P1. Repair or replace wire as required.

    - No, locate ground fault on wire W665-213-20 or W666-21-20 or W666-30-20 between TB17 and plug 134P1. Repair or replace wire as required.

- No, replace hoist/cargo hook pin.

- No, remove wire W689-403-20 from TB17 term 5J. Check for ground on this wire. Is ground present?

  - Yes, locate ground fault on wire W689-276-20 or W689-211-20 or W689-211-20 between TB17 and receptacle 132J12. Repair or replace wire as required.

  - No, locate ground fault on wire W689-289-20 between TB17 and plug 134P1. Repair or replace wire as required.

- No, locate ground fault on wire W665-213-20 or W666-21-20 or W666-30-20 between TB17 and plug 134P1. Repair or replace wire as required.

- No, locate ground fault on wire W689-289-20 between TB17 and plug 134P1. Repair or replace wire as required.

End of task.
Fault Isolation Procedure

Initial Setup

Applicable Configurations:
All

References:
TM 55-1520-240-23

Tools:
Electrical Repairer’s Tool Kit,
NSN 5180-00-323-4915
Multimeter

Equipment Condition:
TM 55-1520-240-23:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off

Personnel Required:
68F10 Aircraft Electrician
68F20 Aircraft Electrician

Materials:
None
14-1.7 CABLE DOES NOT REEL OUT WHEN WINCH IS CONTROLLED AT HOIST/CARGO HOOK PANEL

_FAULT ISOLATION PROCEDURE_

 INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Multimeter
Asbestos Gloves (E187)

Materials:
None

Personnel Required:
67U10 Medium Helicopter Repairer
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power On

General Safety Instructions:
WARNING
Wear gloves when handling wire rope (cable). Otherwise, injury to hands can result.

NOTE
Have helper keep tension on wire rope (cable) when reeling cable. Cable will reel evenly and will not snarl. Helper must wear gloves.
14-1.7 Cable does not reel out when winch is controlled at hoist/cargo hook panel (Continued)

- **Check Hoist Cont CB is it closed?**
  - **YES**
  - Set hoist master SW to remote, connect winch grip to auxiliary panel, press and hold winch arm trigger SW and set winch cable control to out, does cable reel out?
  - **NO**
  - **Refer to trouble symptom task 14-1.5**

**Release winch grip controls, hold winch brake hose, press and hold winch arm trigger SW and set winch cable control to out, is pressure surge felt on brake line?**
- **YES**
  - Replace hoist/cargo hook panel
- **NO**
  - **Release winch grip controls, disconnect plug 132P3 from shutoff valve press and hold winch arm trigger SW and set winch cable control to out, check for 28 VDC between plug 132P3 pin 11-G and ground if 28VDC present?**
    - **YES**
      - Replace shutoff valve
    - **NO**
      - Locate open in wire W539-6201454 between plug 132P3 and fuselage ground, repair or replace wire as required

**Locate open in wire W559-113-20 or W645-44-20 or W550-31-20 between plug 134P1 and hoist cont CB 132C82 repair or replace wire as required.**

**Remove elec pwr, open hoist cont CB, open No 1 PDP, check for continuity between circuit 406 of hoist cont CB 132C82 and plug 134P1 pin 13-4 and ground is continuity present?**
- **YES**
  - Replace hoist cont CB
- **NO**
  - Replace hoist/cargo hook p/n.

**Locate open in wire W639-350-20 between plug 137B and plug 137B repair or replace wire as required.**

**GO TO NEXT PAGE**
14-1.7 CABLE DOES NOT REEL OUT WHEN WINCH IS CONTROLLED AT HOIST/CARGO HOOK PANEL (Continued)

14-18 Change 2
14-1.7 CABLE DOES NOT REEL OUT WHEN WINCH IS CONTROLLED AT HOIST/CARGO HOOK PANEL (Continued)

END OF TASK
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit,
NSN 5180-00-323-4915
Multimeter
Asbestos Gloves (E187)

Materials:
None

Personnel Required:
Aircraft Electrician (2)

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power On

General Safety Instructions:

WARNING
Cable cutter contains an electro explosive device (EED). Do not measure cutter resistance at plug pin A. Multimeter may fire EED resulting in personnel injury.

WARNING
Wear gloves when handling wire rope (cable). Otherwise injury to hands can result.

NOTE
Have helper keep tension on wire rope (cable) when reeling cable. Cable will reel evenly and will not snarl. Helper must wear gloves.
14-1.8 CABLE DOES NOT REEL IN WHEN WINCH IS CONTROLLED AT HOIST/CARGO HOOK PANEL

(Continued)

- **Set Hoist Master SW to Remote.** Connect Winch Grip to Auxiliary Panel Press and Hold Winch Arming Trigger SW and Set Winch Cable Control to IN. Does Cable Reel In?

- **Release Winch Controls.** Disconnect Plug 132P2. From Winch Control Valve Set Hoist Master SW to Pilot. Turn and Hold Hoist Controls to IN. Check for 28Vdc Between Plug 132P2 Pin 4 and Ground. Is 28Vdc Present?

- **Release Control — Open Hoist Cont CB.** Check for Ground on Plug 132P2 Pin 4 Is Ground Present?

- **Discard Plug 132P1.** From Winch, Check for Continuity Between Winch Receptacle Pins A and B. Is Continuity Present?

- **Replace Winch.**

- **Discard Plug 132P1.** Check for Ground on Plug 132P1 Pin A. Is Ground Present?

- **Replace Winch.**

- **Locate Ground Fault on Wire W639-105-20 or W659-117-20 Between Plug 132P1 and Plug 134P1. Repair or Replace Wire As Required.**

- **Discard Cable Cutter Plug at 51A.** Check for Continuity Between Cable Cutter Plug 132P4 Pins B and C. Is Continuity Present?

- **Repair or Replace Wire W513-1-20 on Plug 132P4.**

- **Close Hoist Cont CB.** Turn and Hoist Master Control to IN. Check for 28Vdc Between Plug 132P1 Pin A and Ground. Is 28Vdc Present?

- **GO TO NEXT PAGE**

Change 6 14-21
14-1.8 CABLE DOES NOT REEL IN WHEN WINCH IS CONTROLLED AT HOIST/CARGO HOOK PANEL (Continued)

- **NO**
  - REMOVE ELEC PWR LOWER OVHD PNL, DISCONNECT PLUG 134P1 FROM HOIST/CARGO HOOK PNL. CHECK FOR CONTINUITY BETWEEN PLUG 134P1 PIN 8 AND PLUG 132P1 PIN A. IS CONTINUITY PRESENT?
  - **YES**
    - REPLACE HOIST/CARGO HOOK PNL.
  - **NO**
    - LOCATE OPEN IN WIRE W538-408-20 OR W550-117-20 BETWEEN PLUG 132P1 AND PLUG 134P1, REPAIR OR REPLACE WIRE AS REQUIRED.

- **YES**
  - CONNECT PLUG 132P1 TO WINCH, TURN AND HOLD HOIST CONTROL TO IN, CHECK FOR 28VDC BETWEEN RECEPTACLE 132J10 PIN C+ AND GROUND. IS 28VDC PRESENT?
  - **NO**
    - LOCATE OPEN IN WIRE W697-11-20, W694-283-20, OR W638-392-20 BETWEEN RECEPTACLE 132J10 AND TB17 OR PLUG 132P2. REPAIR OR REPLACE WIRE AS REQUIRED.
  - **YES**
    - LOCATE OPEN IN WIRE W639-408-20, W673-167-20, OR W697-10-20 BETWEEN PLUG 132P1 AND RECEPTACLE 132J10. REPAIR OR REPLACE WIRE AS REQUIRED.
14-1.8 CABLE DOES NOT REEL IN WHEN WINCH IS
CONTROLLED AT HOIST/CARGO HOOK PANEL (Continued)
14-1.9 CABLE DOES NOT REEL OUT WHEN WINCH IS CONTROLLED BY WINCH CONTROL GRIP AT STA 95 AUXILIARY PANEL

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
- All

Equipment Condition:
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power On

Tools:
- Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
- Multimeter
- Asbestos Gloves (E187)

General Safety Instructions:
- Wear gloves when handling wire rope (cable). Otherwise injury to hands can result.
- Have helper keep tension on wire rope (cable) when reeling cable. Cable will reel evenly and will not snarl.
- Helper must wear gloves.

References:
- TM 55-1520-240-23

Personnel Required:
- 68F10 Aircraft Electrician
- 68F20 Aircraft Electrician

Materials:
- Wear gloves when handling wire rope (cable). Otherwise injury to hands can result.
- Have helper keep tension on wire rope (cable) when reeling cable. Cable will reel evenly and will not snarl.
- Helper must wear gloves.

GO TO NEXT PAGE
14-1.9 CABLE DOES NOT REEL OUT WHEN WINCH IS CONTROLLED BY WINCH CONTROL GRIP AT STA 95 AUXILIARY PANEL (Continued)

- **Check Hoist Cont is it closed?**
  - **Yes:** Connect winch grip to Hoist operator station receptacle. Press and hold winch arming trigger SW and set winch cable control to OUT. Does cable reel out?
  - **No:** Refer to trouble symptom (Task 14-1.9)

- **Yes:** Release winch controls. Check for 28VDC between receptacle 132J8 pin J11 and ground is 28VDC present?
  - **Yes:** Release winch controls. Disconnect winch grip cable from hoist operator station. Check for continuity between receptacle 132J8 pin J11 and ground is 28VDC present?
    - **Yes:** Locate open in wire W639-399-20 between receptacle 132J8 and TB17. Repair or replace wire as required.
    - **No:** Remove elec pwr. Disconnect winch grip cable from hoist operator station. Check for continuity between receptacle 132J8 pin F10 and ground is 28VDC present?
      - **Yes:** Locate open in wire W639-399-20 between receptacle 132J8 and TB17. Repair or replace wire as required.
      - **No:** Locate open in wire W639-399-20 between receptacle 132J8 and TB17. Repair or replace wire as required.

- **No:** Release winch controls. Disconnect winch grip cable from hoist operator station. Check for 28VDC between receptacle 132J8 pin J11 and ground is 28VDC present?
  - **Yes:** Press and hold winch arming trigger SW. Turn and hold winch cable control all way to IN. Check for resistance between cable receptacle pins F and J. Is resistance between 40 to 50 Ohms?
    - **Yes:** With controls in same position. Check for continuity between cable receptacle pins J and K. Is continuity present?
      - **Yes:** Replace winch grip.
      - **No:** Disconnect cable from winch grip. Check for continuity between ends of cable. Is continuity present between pin J to J and pin F to F?
        - **Yes:** Replace cable.
        - **No:** Replace cable.

**Go to Next Page**
14-1.9 CABLE DOES NOT REEL OUT WHEN WINCH IS CONTROLLED BY WINCH CONTROL GRIP AT STA 95 AUXILIARY PANEL (Continued)
14-1.9 CABLE DOES NOT REEL OUT WHEN WINCH IS CONTROLLED BY WINCH CONTROL GRIP AT STA 95 AUXILIARY PANEL (Continued)

END OF TASK
14-1.10 CABLE DOES NOT REEL IN WHEN WINCH IS CONTROLLED BY WINCH GRIP AT STA 95 AUXILIARY PANEL

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
- Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
- Multimeter
- Asbestos Gloves (E187)

Materials:
None

Personnel Required:
- 68F10 Aircraft Electrician
- 68F20 Aircraft Electrician

References:
- TM 55-1520-240-23

Equipment Condition:
- Battery Connected
- Electrical Power On
- Hydraulic Power On

General Safety Instructions:

WARNING
Wear gloves when handling wire rope (cable). Otherwise injury to hands can result.

NOTE
Have helper keep tension on wire rope (cable) when reeling cable. Cable will reel evenly and will not snarl. Helper must wear gloves.
14-1.10 CABLE DOES NOT REEL IN WHEN WINCH IS CONTROLLED BY WINCH GRIP AT STA 95 AUXILIARY PANEL (Continued)

CONNECT WINCH GRIP TO HOIST OPERATOR STATION RECEPTACLE. PRESS AND HOLD WINCH ARMING TRIGGER SW AND SET WINCH CABLE CONTROL TO IN. DOES CABLE REEL IN?

YES

RELEASE WINCH CONTROLS. LOCATE OPEN IN WIRE WES9-387-20 BETWEEN RECEPTACLE T527 and T517. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

RELEASE WINCH CONTROLS. DISCONNECT WINCH GRIP CABLE FROM HOIST OPERATOR STATION RECEPTACLE. PRESS AND HOLD WINCH ARMING TRIGGER SW. TURN AND HOLD WINCH CABLE CONTROL ALL IN WAY TO OUT. CHECK FOR RESISTANCE BETWEEN CABLE RECEPTACLE PIN H AND J. IS RESISTANCE BETWEEN 45 Ω TO 55 Ω?

YES

REPLACE HOIST/CARGO HOOK PIN.

NO

DISCONNECT WINCH GRIP. CHECK FOR CONTINUITY BETWEEN ENDS OF CABLE. IS CONTINUITY PRESENT BETWEEN PIN H TO PIN H?

YES

REPLACE WINCH GRIP.

NO

LOCATE OPEN IN WIRE WES9-120-20 OR WES2-14-20 BETWEEN PLUG 134P1 AND T517. REPAIR OR REPLACE WIRE AS REQUIRED.

REMOVE ELECTRONIC REMOTE PASSAGEWAY FLOOR LOWER 32ND PIN. DISCONNECT PLUG 134P1 FROM HOIST/CARGO HOOK PIN. CHECK FOR CONTINUITY BETWEEN PLUG 134P1 PIN I AND T517. 134P1 PIN I CONTINUITY PRESENT?
14-1.11 CABLE DOES NOT REEL IN WHEN WINCH IS CONTROLLED BY WINCH GRIP AT STA 502 RECEPTACLE

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
- Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
- Multimeter

Materials:
None

Personnel Required:
- 68F10 Aircraft Electrician
- 68F20 Aircraft Electrician

References:
- TM 55-1520-240-23

Equipment Condition:
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power On

GO TO NEXT PAGE
14-1.11 CABLE DOES NOT REEL IN WHEN WINCH IS CONTROLLED BY WINCH GRIP AT STA 502 RECEPTACLE (Continued)

- **HOLD WINCH BRAKE LINE PRESS WINCH ARMING TRIGGER SW IS PRESSURE SURE FEEL ON BRAKE LINE?**
  - **YES**
    - PRESS AND HOLD WINCH ARMING TRIGGER SW AND TURN AND HOLD WINCH CABLE CONTROL TO IM CHECK FOR 28VDC BETWEEN HOBRT OPERATOR PIN (X) AND GROUND IS 28VDC PRESENT?
      - **YES**
        - DISCONNECT CABLE CUTTER PLUG FROM STA 95 AUXILIARY PANEL RECEPTACLE MAINTAIN WINCH GRIP CONTROL POSITIONS CHECK FOR 28VDC BETWEEN RECEPTACLE PIN 11 AND GROUND IS 28VDC PRESENT?
          - **YES**
            - LOCATE OPEN IN WIRE W639-380-20 BETWEEN RECEPTACLE 132JE AND TB17 REPAIR OR REPLACE WIRE AS REQUIRED
          - **NO**
            - RELEASE CONTROLS DISCONNECT PLUG 132F1 FROM WINCH CHECK FOR CONTINUITY BETWEEN WINCH RECEPTACLE PINS A AND C: 10 CONTINUITY PRESENT?
              - **YES**
                - LOCATE OPEN IN WIRE W639-380-20 BETWEEN WINCH RECEPTACLE 132JE AND TB17 REPAIR OR REPLACE WIRE AS REQUIRED
              - **NO**
                - REPLACE WINCH
      - **NO**
        - LOCATE OPEN IN WIRE W668-31-20, W669-14-20, OR W645: 230-20 BETWEEN RECEPTACLE 132JE AND TB17 REPAIR OR REPLACE WIRE AS REQUIRED
  - **NO**
    - DISCONNECT WINCH GRIP CABLE FROM STA 502 RECEPTACLE CHECK FOR 28VDC BETWEEN RECEPTACLE PIN 31 AND GROUND IS 28VDC PRESENT?
      - **YES**
        - LOCATE OPEN IN WIRE W668-30-20, W669-12-20, OR W645: 240-20 BETWEEN RECEPTACLE 132JE AND TB17 REPAIR OR REPLACE WIRE AS REQUIRED
      - **NO**
        - LOCATE OPEN IN WIRE W668-31-20, W669-14-20, OR W645: 230-20 BETWEEN RECEPTACLE 132JE AND TB17 REPAIR OR REPLACE WIRE AS REQUIRED
14-1.12 CABLE DOES NOT REEL OUT WHEN WINCH IS CONTROLLED BY WINCH GRIP AT HOIST OPERATOR STATION

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
68F10 Aircraft Electrician
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
Battery Connected
Electrical Power On
Hydraulic Power On

END OF TASK
14-1.13 28VDC NOT MEASURED AT STA 340 CABLE CUTTER RECEPTACLE WHEN HOIST/CARGO HOOK PANEL CABLE CUTTER SWITCH SET TO ON

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
Multimeter

Personnel Required:
68F10 Aircraft Electrician
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On

Materials:
None

Hydraulic Power On
14-1.13 28VDC NOT MEASURED AT STA 340 CABLE CUTTER RECEPTACLE WHEN HOIST/CARGO HOOK PANEL CABLE CUTTER SWITCH SET TO ON (Continued)

- **Scenario**: 28VDC NOT MEASURED AT STA 340 CABLE CUTTER RECEPTACLE
- **Action**: Check for 28VDC between HOIST OPERATOR PNL RECEPTACLE PIN V- and ground. Is 28VDC present?
- **Decision Points**:
  - **Yes**: Locate open in wire W597: 18-20 or W446: 336-20 between receptacle 132/10 and TB17. Repair or replace wire as required.
  - **No**: Refer to trouble symptom TASK 14-15.
- **Additional Steps**:
  - **NO**
    - **Scenario**: Lower OHVD PNL. Disconnect plug 134P1 from HOIST/CARGO HOOK PNL.
    - **Action**: Check for 28VDC between plug 134P1 PIN 2C- and ground. Is 28VDC present?
    - **Decision Points**:
      - **Yes**: Replace HOIST/CARGO HOOK PNL.
      - **No**: Replace HOIST CABLE CUT-TER CB.
  - **NO**
    - **Scenario**: Remove elec PWR. Open NO 1-HOP. Check for continuity between plug 134P1 PIN A and circuit side of HOIST CABLE CUT-TER CB 132/252. Is continuity present?
    - **Decision Points**:
      - **Yes**: Replace HOIST CABLE CUT-TER CB.
      - **No**: Locate open in wire W599: 114-20, W446: 63-20, OR W590: 30-20 between plug 134P1 AND HOIST CABLE CUT-TER CB. Repair or replace wire as required.
- **END OF TASK**
14-1.14 28VDC NOT MEASURED AT STA340 CABLE CUTTER RECEPTACLE WHEN WINCH GRIP CABLE CUTTER SWITCH PRESSED AT HOIST OPERATOR OR AUXILIARY PANEL

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
68F10 Aircraft Electrician
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

GO TO NEXT PAGE
14-1.14 28VDC NOT MEASURED AT STA 340 CABLE CUTTER RECEPTACLE WHEN WINCH GRIP CABLE CUTTER SWITCH PRESSED AT HOIST OPERATOR OR AUXILIARY PANEL (Continued)

END OF TASK
CHAPTER 15

AUXILIARY POWER UNIT TROUBLESHOOTING
CHAPTER 15
AUXILIARY POWER UNIT SYSTEM TROUBLESHOOTING

CHAPTER OVERVIEW

Chapter 15 contains procedures for Auxiliary Power Unit System troubleshooting. Each system and failure symptom is listed below. Included in this chapter are locations and views of all electrical connectors, receptacles, relays, and ground connections for the Auxiliary Power Unit System.

Refer to TM 55-1520-240-23 for required maintenance procedures.

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>PARA</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUXILIARY POWER UNIT</td>
<td>15-1</td>
</tr>
</tbody>
</table>

**FAILURE SYMPTOM LIST**

### AUXILIARY POWER UNIT

<table>
<thead>
<tr>
<th>SYMPTOM</th>
<th>TASK</th>
</tr>
</thead>
<tbody>
<tr>
<td>APU CONT NORM OR APU CONT EMERG CIRCUIT BREAKER DOES NOT STAY CLOSED</td>
<td>15-1.4</td>
</tr>
<tr>
<td>APU DOES NOT MOTOR WHEN APU SWITCH IS SET TO START (WITHOUT 15)</td>
<td>15-1.4</td>
</tr>
<tr>
<td>APU DOES NOT MOTOR WHEN APU SWITCH IS SET TO START (WITH 15)</td>
<td>15-1.4</td>
</tr>
<tr>
<td>APU HAS HOT START</td>
<td>15-1.4</td>
</tr>
<tr>
<td>APU MOTORS BUT DOES NOT START, ESU BITE INDICATES ��</td>
<td>15-1.4</td>
</tr>
<tr>
<td>APU MOTORS BUT DOES NOT START, ESU BITE INDICATES �� OR �� THEN ��</td>
<td>15-1.4</td>
</tr>
<tr>
<td>APU MOTORS BUT DOES NOT START; ESU BITE INDICATES �� THEN ��</td>
<td>15-1.4</td>
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<thead>
<tr>
<th>SYMPTOM</th>
<th>TASK</th>
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</thead>
<tbody>
<tr>
<td>APU CAPSULE GOES OUT (APU SHUTS DOWN) WHEN APU CONT CIRCUIT BREAKER OPENED</td>
<td>15-1.4</td>
</tr>
<tr>
<td>APU CAPSULE OUT WHEN APU OPERATING NORMALLY</td>
<td>15-1.4</td>
</tr>
<tr>
<td>APU SHUTS DOWN WHEN APU GEN SWITCH IS SET TO OFF</td>
<td>15-1.4</td>
</tr>
<tr>
<td>APU STARTS AND RUNS BUT ESU BITE INDICATES ��</td>
<td>15-1.4</td>
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<table>
<thead>
<tr>
<th>SYMPTOM</th>
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<tr>
<td>APU STARTS BUT SHUTS DOWN, ESU BITE INDICATES ��</td>
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<tr>
<td>APU STARTS BUT SHUTS DOWN, ESU BITE INDICATES ��</td>
<td>15-1.4</td>
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<td>APU STARTS BUT SHUTS DOWN, ESU BITE INDICATES ��</td>
<td>15-1.4</td>
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<tr>
<td>ESU BITE INDICATORS ARE NOT BLACK OR APU FUEL BOOST PUMP CANNOT BE HEARD OPERATING BEFORE APU SWITCH SET TO START</td>
<td>15-1.4</td>
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<td>REF DESIGN</td>
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<td>GD 128</td>
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<td>136K 1</td>
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<td>136J3</td>
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<td>MS3474W14-19S</td>
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| 232P1      | MS3476W20-41S |      |                    |                  |    |    |    |
| 300J1      | M83723-74A2041N |   |                    |                  |    |    |    |
| 300P1      | M83723-75A2041N |   |                    |                  |    |    |    |
| 300J19     | M83723-73A2041N |   |                    |                  |    |    |    |
| 300P19     | M83723-76A2041N |   |                    |                  |    |    |    |
| 300J21     | M83723-74A2461N |   |                    |                  |    |    |    |
| 300P21     | M83723-75A2461N |   |                    |                  |    |    |    |
| 300J50     | M83723-73A2461N |   |                    |                  |    |    |    |
| 300P50     | M83723-76A2461N |   |                    |                  |    |    |    |
| 300J54     | M83723-74A2461N |   |                    |                  |    |    |    |
| 300P54     | M83723-75A2461N |   |                    |                  |    |    |    |
| 300J61     | M83723-73A24619 |   |                    |                  |    |    |    |
| 300P61     | M83723-76A24619 |   |                    |                  |    |    |    |
AUXILIARY POWER UNIT SYSTEM ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST (Continued)
AUXILIARY POWER UNIT ELECTRICAL COMPONENT
LOCATION AND CONFIGURATION LIST (Continued)

RECEPTACLE

PLUG

RELAY

GND STUD

40

40

43

43

46

46

106

151
15-1 APU
CHAPTER 15
AUXILIARY POWER UNIT SYSTEM TROUBLESHOOTING

CHAPTER OVERVIEW

Chapter 15 contains all procedures for the Auxiliary Power Unit Troubleshooting including the interface to the Main Engine Starter. The Auxiliary Power Unit failure symptoms are listed in Table No. 15-1. Included in this chapter are locations and views of all electrical connectors, receptacles, relays and ground connections for the Auxiliary Power Unit and the interface control systems of the Airframe. Refer to TM 55-1520-240-23 for required maintenance procedures.

DIAGRAMS AND ILLUSTRATIONS

Included in this chapter are block diagrams, illustrations, maintenance tables, schematic diagrams, wiring diagrams, piping diagrams and troubleshooting logic trees which are necessary to troubleshoot the APU system components including the interface to the Main Engine Starter components. All APU systems troubleshooting instructions are contained in this chapter and are listed in the seven (7) groups described in the order listed below. The application of the APU Field Tester is described in paragraph 15-7.

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<th>APU SYSTEMS MAJOR TITLES PARA.</th>
<th>VISUAL CHECKS PARA.</th>
<th>OPERATIONAL CHECKS PARA.</th>
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<td>APU TO AIRFRAME INTERFACE 15-1</td>
<td>APU VISUAL 15-1.4</td>
<td>APU NORMAL OPERATION 15-1.5</td>
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<td>APU ELECTRICAL SYSTEM 15-2</td>
<td>APU HYDRAULIC 15-4.7</td>
<td>APU - HYDRAULIC STARTING 15-4.8</td>
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<tr>
<td>APU FUEL SYSTEM 15-3</td>
<td>ENGINE HYDRAULIC 15-5.4</td>
<td>ENGINE - HYDRAULIC STARTING 15-5.5</td>
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<td>APU HYDRAULIC SYSTEM 15-4</td>
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<td>APU TESTER OPERATION 15-7.3</td>
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<td>APU / ENGINE HYDRAULIC STARTER 15-5</td>
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<td>APU MICROPROCESSOR ELECTRONIC SEQUENCE UNIT (ESU) 15-6</td>
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<tr>
<td>APU TESTER 15-7.7</td>
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TABLE 15-1 APU COMPOSITE FAILURE SYMPTOM LIST

<table>
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<tr>
<th>ITEM NO.</th>
<th>SYMPTOM</th>
<th>APPLICABLE SYSTEM</th>
<th>TASK</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>APU DOES NOT MOTOR</td>
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</tr>
<tr>
<td>APU DOES NOT MOTOR</td>
<td>ELECTRICAL 15-2.10</td>
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<tr>
<td>APU DOES NOT MOTOR, ESU BITE INDICATES O O O</td>
<td>ELECTRICAL 15-2.10</td>
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</tr>
<tr>
<td>APU DOES NOT MOTOR, ESU BITE INDICATES O O O</td>
<td>ELECTRICAL 15-2.10</td>
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</tr>
<tr>
<td>APU DOES NOT MOTOR, ESU BITE INDICATES O O O</td>
<td>ELECTRICAL 15-2.10</td>
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</tr>
<tr>
<td>APU DOES NOT MOTOR, ESU BITE INDICATES O O O</td>
<td>ELECTRICAL 15-2.10</td>
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</tr>
<tr>
<td>APU DOES NOT MOTOR, ESU BITE INDICATES O O O</td>
<td>ELECTRICAL 15-2.10</td>
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</tr>
<tr>
<td>APU DOES NOT MOTOR</td>
<td>HYDRAULIC 15-4.10</td>
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<tr>
<td>ITEM NO.</td>
<td>SYMPTOM</td>
<td>APPLICABLE SYSTEM</td>
<td>TASK</td>
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<td>--------------------------------------------------------------------------</td>
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<tr>
<td>3</td>
<td>APU STARTS BUT SHUTS DOWN</td>
<td>ELECTRONIC</td>
<td>15-6.14</td>
</tr>
<tr>
<td></td>
<td>APU STARTS BUT SHUTS DOWN, ESU BITE INDICATES ○ ○ ○ ○ THEN ● ● ● ●</td>
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<td>APU STARTS BUT SHUTS DOWN, ESU BITE INDICATES ○ ○ ○ ○ THEN ● ● ● ●</td>
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<td>APU STARTS AND RUNS</td>
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<td>15-6.17</td>
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<td>APU STARTS AND RUNS THEN SHUTS DOWN, ESU BITE INDICATES ○ ○ ○ ○ THEN ● ● ● ●</td>
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<td>APU STARTS AND RUNS BUT ESU BITE INDICATES ● ● ● ●</td>
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<td>5</td>
<td>APU SHUTS DOWN</td>
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<td>APU SHUTS DOWN WHEN GEN APU SWITCH PLACED TO ON ESU BITE INDICATES ● ● ● ●</td>
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<td>APU SHUTS DOWN WHEN APU GEN SWITCH IS SET TO OFF</td>
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<td></td>
<td>APU CONT NORM OR APU CONT EMERG CIRCUIT BREAKER DOES NOT STAY CLOSED</td>
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<td>ESU BITE INDICATORS DO NOT CYCLE AFTER APU SWITCH SET TO RUN</td>
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**TABLE 15-1 APU COMPOSITE FAILURE SYMPTOM LIST (Continued)**

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<td>APU FUEL BOOST PUMP</td>
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<td>APU FUEL BOOST PUMP CANNOT BE HEARD OPERATING BEFORE APU SWITCH SET TO START</td>
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<td>9</td>
<td>APU ON CAPSULE GOES OUT</td>
<td>ELECTRICAL</td>
<td>15-211</td>
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<tr>
<td></td>
<td>APU ON CAPSULE GOES OUT (APU SHUTS DOWN)</td>
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<td></td>
<td>WHEN APU CONT CIRCUIT BREAKER OPENED</td>
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<td>APU ON CAPSULE OUT WHEN APU OPERATING NORMALLY</td>
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<td>APU DOES NOT STOP</td>
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<td>APU DOES NOT STOP, ESU INDICATORS ARE BLACK ● ● ● ●</td>
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<td>11</td>
<td>APU PUMP FAULT LIGHT</td>
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<tr>
<td></td>
<td>APU PUMP FAULT LIGHT IS ON</td>
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<tr>
<td>12</td>
<td>NO. 1 OR NO. 2 ENGINE DOES NOT MOTOR</td>
<td>HYDRAULIC</td>
<td>15-5.6</td>
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<td>NO 1 OR NO 2 ENGINE KEEPS MOTORING WHEN ENGINE START SWITCH SET TO OFF</td>
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<td>14</td>
<td>APU START ACCUMULATOR GAGE</td>
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<td>APU START ACCUMULATOR GAGE DOES NOT INDICATE AT LEAST 2850 PSI</td>
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15-1 APU TO AIRFRAME INTERFACE
# Paragraph 15-1

## APU to Airframe Interface Troubleshooting

<table>
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<td>15-5</td>
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<tr>
<td>15-1.1</td>
<td>APU System Components</td>
<td>Drawing</td>
<td>15-8</td>
</tr>
<tr>
<td>15-1.2</td>
<td>Overall Electrical Cabling Inter-Connections of APU System Components, &quot;Interfaced&quot; To Main Engine &quot;Starter&quot; Components</td>
<td>Drawing</td>
<td>15-10</td>
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<tr>
<td>15-1.3</td>
<td>Overall Piping Interrelationship of APU System Components, &quot;Interfaced&quot; To Main Engine &quot;Starter&quot; Components</td>
<td>Drawing</td>
<td>15-13</td>
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<td>15-1.4</td>
<td>APU Visual Check</td>
<td>Task</td>
<td>15-14</td>
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<tr>
<td>15-1.5</td>
<td>APU Operational Check</td>
<td>Task</td>
<td>15-16</td>
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Change 8 15-7
15-1.2 OVERALL ELECTRICAL CABLING INTERCONNECTIONS OF APU SYSTEM COMPONENTS, "INTERFACED" TO MAIN ENGINE "STARTER" COMPONENTS
15-1.2 OVERALL ELECTRICAL CABLING INTERCONNECTIONS OF APU SYSTEM COMPONENTS, "INTERFACED" TO MAIN ENGINE "STARTER" COMPONENTS (Continued)

A continued on the next page.
A. OVERVIEW - OF APU INTERFACED TO MAIN ENGINE STARTERS

The APU Interfaced to the Main Engine Starters includes the activation of the following components and interconnections as shown in paragraph 15-1.2:

1. Hydraulic STARTERS on each engine
2. Engine START valves
3. Solenoid-operated pilot valves on the Utility System Pressure Control Modules
4. Start switches and relays
5. Caution lights
6. Ignition LOCK switch
7. Start Fuel Solenoid Valve
8. APU Fuel Solenoid Valve
9. APU Fuel Boost Pump
10. APU Electronic Sequence Unit (ESU)
11. APU FAULT RELAY
12. APU Ignition Exciter

B. BRIEF OPERATIONAL DESCRIPTION OF MAIN ENGINE START SYSTEM

On helicopters without \( ^{74} \), when the Main Engine START switch is moved to MOTOR, the STARTER ON caution light comes "ON" and the Engine Start valve "OPENS". The START VALVE applies UTILITY SYSTEM PRESSURE from the APU to the Main Engine starter, thus rotating the Engine Starter and Compressor.

On helicopters with \( ^{74} \), when the main ENG START switch is set to 1 or 2, the engine start valve "OPENS". The START VALVE applies UTILITY SYSTEM PRESSURE from the APU to the Main Engine starter, thus rotating the Engine Starter and Compressor.

NOTE

For additional information, refer to [task 15-1.5] APU Operational Check.

C. BRIEF OPERATIONAL DESCRIPTION OF APU SYSTEM

The Gas Turbine Auxiliary Power Unit T62-T-2B (APU) is mounted in the aft cabin above the ramp. The basic components of the APU are the gas turbine engine, hydraulic motor-pump, fuel control, accessory drive, and ac generator. An APU control box, ESU, which monitors APU operation is on the left side of the cabin above the ramp. The motor-pump on the APU pressurizes the utility and flight control hydraulic systems for main engine starting and ground checks. The APU also drives an ac generator which supplies power to No. 1 and No. 2 electrical systems. The APU receives fuel from the left fuel system thru a booster pump, a manual fuel shutoff valve, and a solenoid valve.

The APU control switch is on the electrical power panel on the overhead switch panel. It is a three-position switch marked APU OFF, RUN, and START. The switch is spring loaded from RUN to START. To start the APU, the switch is moved from OFF to RUN for 3 to 5 seconds, then set to START for 2 seconds, then released to RUN. APU start is then automatic and controlled by the control box. The APU ON caution light will come on in about 10 to 12 seconds.

NOTE

For additional information, refer to [task 15-1.5] APU Operational Check.
15-1.3 OVERALL PIPING INTERRELATIONSHIP OF APU SYSTEM COMPONENTS, "INTERFACED" TO MAIN ENGINE STARTER COMPONENTS

---

**Without F4**

**BITES #**

**DECODED BIT INFORMATION**

START SEQUENCE

- RESET
- START FUEL VALVE & EXCITER SIGNAL OUT (5%)
- START FUEL VALVE SIG OUT (14%)
- START FUEL VALVE & EXCITER SIGNAL OFF (79%)
- 90 RPM SWITCH ON

OPERATION

- READY FOR SERVICE (90% + 1.5 SEC.)
- SENSOR / DATA BOARD FAILURE
- OVERTEMPERATURE
- OVERSPEED
- UNDERSPEED
- FAILURE TO START
- SHORTED FUEL, MORE (WARNING)
- OPEN THERMOCOUPLE
- PROCESSOR SEQUENCE FAIL
- NO TEMP DATA
- NO SPEED DATA

---

**Legend**

- Electrical
- Hydraulic
- Fuel
- Compress Disc Press

---

GO TO NEXT PAGE

Change 23 15-12.1(15-12.2 blank)
15-1.3 OVERALL PIPING INTERRELATIONSHIP OF APU SYSTEM COMPONENTS, "INTERFACED" TO MAIN ENGINE STARTER COMPONENTS (Continued)

END OF TASK

Change 23  15-13
15-1.4 APU VISUAL CHECK

INITIAL SETUP

Applicable Configurations:
All

Equipment Condition:

Tools:
- Battery Disconnected
- Ext Electrical Power Off
- Ext Hydraulic Power Off
- Access Door Open
- APU Drip Pan Removed
- Ramp Opened and Level

Materials:
None

Personnel Required:
Medium Helicopter Repairer

References:
- TM 55-1520-240-23

TM 55-1520-240-23:
- Battery Disconnected
- Ext Electrical Power Off
- Ext Hydraulic Power Off
- Access Door Open
- APU Drip Pan Removed
- Ramp Opened and Level

GO TO NEXT PAGE
15-1.4  APU VISUAL CHECK (CONTINUED)

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Check APU fuel valve (1).</td>
<td>If fuel valve (1) is loose or damaged, tighten or replace it as required. If electrical connector or wiring to valve is damaged, replace connector or repair or replace wiring as required.</td>
</tr>
<tr>
<td>2. Check APU fuel boost pump (2).</td>
<td>If fuel boost pump (2) is loose or damaged, tighten or replace it as required. If electrical connector or wiring to pump is damaged, replace connector or repair or replace wiring as required.</td>
</tr>
<tr>
<td>3. Check APU combustor drain line (3).</td>
<td>If drain line (3) is kinked or damaged, replace it. If it is loose, tighten it.</td>
</tr>
<tr>
<td>4. Check APU spark plug (4), exciter cable (5), and ignition exciter (6).</td>
<td>If spark plug (4), exciter cable (5), or ignition exciter (6) is loose or damaged, tighten or replace it as required.</td>
</tr>
<tr>
<td>5. Check APU thermocouple cable (7).</td>
<td>If cable (7) is loose or damaged, tighten or replace it as required.</td>
</tr>
<tr>
<td>6. Check two APU fuel lines (8).</td>
<td>If any fuel line (8) is damaged, replace it.</td>
</tr>
<tr>
<td>7. Check APU air inlet screen (9).</td>
<td>If screen (9) is clogged, clean it.</td>
</tr>
<tr>
<td>8. Check APU oil level sight gage (10).</td>
<td>If oil level is low, service APU.</td>
</tr>
<tr>
<td>9. Check APU combustor case (11) and turbine case (12).</td>
<td>If either case (11 or 12) is cracked or damaged, replace APU.</td>
</tr>
<tr>
<td>10. Check APU fuel line (13).</td>
<td>If fuel line (13) is kinked or damaged, replace it.</td>
</tr>
<tr>
<td>11. Check APU fuel shutoff manual valve (14).</td>
<td>If valve (14) is loose or damaged, tighten or place it as required. If valve handle (15) is not in line with fuel line, set it in that position.</td>
</tr>
<tr>
<td>12. Check electronic sequence unit (ESU) (16).</td>
<td>If ESU (16) is loose or damaged, tighten or replace as required. If electrical connector or wiring to ESU is damaged, replace connector or repair or place wiring as required. If bite information art (17) is damaged, replace it.</td>
</tr>
<tr>
<td>13. Check APU switch (18).</td>
<td>If switch (18) is loose or damaged, tighten or place it as required.</td>
</tr>
<tr>
<td>14. On helicopter with <strong>3</strong>, check cable adapter (19).</td>
<td>If cable adapter (19) is loose or damaged, tighten or replace it as required.</td>
</tr>
</tbody>
</table>

FOLLOW-ON MAINTENANCE:
TM 55-1520-240-23:
Left aft intertank bay access door closed
APU drip pan installed.
**INITIAL SETUP**

Applicable Configurations:
All

Tools:
Stopwatch

Materials:
None

General Safety Instructions:
None

Personnel Required:
Medium Helicopter Repairer (2)
Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Ext Electrical Power Off

**WARNING**

Keep hands away from flight controls. Application of hydraulic power will cause flight controls to move and rotor blades to flap. Injury to personnel can occur.

**TASK RESULT**

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Set BATT switch (1) to ON.</td>
<td>MASTER CAUTION lights (2) shall come on. If not, go to task 9-1.4.</td>
</tr>
<tr>
<td>2. Press pilot's MASTER CAUTION light (2).</td>
<td>MASTER CAUTION lights (2) shall go out. If not, go to task 9-18.3.</td>
</tr>
<tr>
<td>3. Check that APU CONT NORM and EMERG circuit breakers (3 and 4) are closed.</td>
<td>BITE indicator #1 on ESU (7) changes from black to white and then is reset to black. All other indicators remain black or are reset to black.</td>
</tr>
</tbody>
</table>

**NOTE**

Post fireguard at APU.

If switches (5 or 6) are ON, set them to OFF.

If switches (5 and 6) are at OFF.

Position helper to observe bite indicators on ESU (7).

Set APU switch (8) to RUN. Hold at RUN for a minimum of 3 seconds.

If Bite #1 is already white, this task resets it to black, along with the other BITE indicators.
15-1.5 APU OPERATIONAL CHECK (Continued)

If BITE indicators do not remain black, go to [task 15-2.9].

If fuel boost pump cannot be heard operating, go to [task 15-2.9].

CAUTION

If a roar is heard and a flame is seen at APU exhaust during APU start, shut down APU to prevent APU damage.

CAUTION

If there is no hydraulic pressure in 30 seconds after APU switch is released to RUN, shut down APU.

CAUTION

If APU is to be restarted or another start attempt tried, wait at least 30 seconds after APU has stopped before setting APU switch to START. This allows residual fuel to drain from APU, thereby preventing overspeed or overtemp condition.

7. Set APU switch (8) to START for a minimum of 2 seconds then release it to RUN.

NOTE

Observe ESU bite indicators sequencing during start. Note last two sequences when automatic shutdown occurs. Do not move APU switch until EIS indications are recorded unless hot start occurs.

8. Set APU GEN switch (11) to ON.

NOTE

If APU does not motor, go to [task 15-2.10].

If APU motors but does not start or starts and automatically shuts down, check ESU bite indicators and refer to table 15-2.2.

9. Set POWER XFR NO. 1 and POWER XFR NO. 2 switches (5 and 6) to ON.

NOTE

If APU runs and ESU bite is black but APU ON capsule is not on, go to [task 15-2.13].

10. Open then close APU CONT NORM circuit breaker (3).

NOTE

Cycling of the APU switch during APU coastdown may cause the APU to restart with a possible overtemperature.

11. Set APU switch (8) to OFF.

NOTE

If APU runs and ESU BITE capsule (9) does not go out, go to [task 15-2.12].
15-2 APU ELECTRICAL SYSTEM
### PARAGRAPH 15-2

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**APU ELECTRICAL SYSTEM TROUBLESHOOTING**

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<td>APU ELECTRICAL SYSTEM COMPONENTS</td>
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<td>15-2.11</td>
<td>APU ON CAPSULE GOES OUT (APU SHUTS DOWN) WHEN APU CONT CIRCUIT BREAKER OPENED</td>
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<td>TASK</td>
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<tr>
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<td>TASK</td>
<td>15-46</td>
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<td>15-2.15</td>
<td>APU SHUTS DOWN WHEN APU GEN SWITCH IS SET TO OFF</td>
<td>TASK</td>
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<td>LH AFT CABIN</td>
<td>360</td>
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<td>151</td>
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<td>MAGNETIC PICKUP-APU</td>
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### TABLE NO. 15-2.1 APU STARTING SEQUENCE FAILURES

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END OF TASK

Change 8  15-27
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer's Tool Kit.
NSN 5180-00-323-4915

Materials:
None

Personnel Required:
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off
15-2.7 APU CONT NORM OR APU CONT EMERG CIRCUIT BREAKER DOES NOT STAY CLOSED (CONTINUED)

APU CONT "NORM" CIRCUIT BREAKER DOES NOT STAY CLOSED

REMOVE ELEC PWR OPEN NO 1 PDP; LOCATE GROUND FAULT ON WIRE WS50-172-22 BETWEEN APU CONT NORM CB 136CB1 AND TB3 TERM 1; REPAIR OR REPLACE WIRE AS REQUIRED

APU CONT "EMERG" CIRCUIT BREAKER DOES NOT STAY CLOSED

REMOVE ELEC PWR OPEN NO 1 PDP; LOCATE GROUND FAULT ON WIRE WS50-174-22 BETWEEN APU CONT EMERG CB 136CR2 AND TB3 TERM 3; REPAIR OR REPLACE WIRE AS REQUIRED
15-2.8 ESU BITE INDICATORS DO NOT CYCLE AFTER APU SWITCH SET TO RUN

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer's Tool Kit.
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
Aircraft Electrician (2)

References:
TM 55-1520-240-23
TM 55-1500-343-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

GO TO NEXT PAGE
15-2.8 ESU BITES INDICATORS DO NOT CYCLE AFTER APU SWITCH SET TO RUN (Continued)

END OF TASK
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
- Electrical Repairer’s Tool Kit
- NSN 5180-00-323-4915 Multimeter

Materials:
None

Personnel Required:
- Aircraft Electrician (2)

References:
- TM 55-1520-240-23
- TM 55-1500-343-23

Equipment Condition:
- Battery Connected
- Electrical Power On
- Hydraulic Power Off

References:
- TM 55-1520-240-23

Equipment Condition:
- Battery Connected
- Electrical Power On
- Hydraulic Power Off

Materials:
None
15-2.9 APU FUEL BOOST PUMP CANNOT BE HEARD OPERATING BEFORE APU SWITCH SET TO START (Continued)

15-37

Refer to electrical troubleshooting task 15-1.5.

Task 15-6.5

Replace APU fuel boost pump.

End of task.

TM 55-1520-240-T

Change 23  15-37
15-2.10 APU DOES NOT MOTOR WHEN APU SWITCH IS SET TO START

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer's Tool Kit.
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
Aircraft Electrician (2)

References:
TM 55-1520-240-23
TM 55-1500-343-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
15-2.10 APU DOES NOT MOTOR WHEN APU SWITCH IS SET TO START
(CONTINUED)

Refer to Table 5-27 for additional details.

END OF TASK
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Personnel Required:
Aircraft Electrician

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit.
NSN 5180-00-323-4915
Multi meter

Equipment Condition:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off

Materials:
None

APU ON CAPSULE GOES OUT (APU SHUTS DOWN)
WHEN APU CONT “EMERG” CIRCUIT BREAKER OPENED

OPEN NO. 1 PDP.
CHECK FOR CONTINUITY BETWEEN CIRCUIT SIDE OF APU CONT.
EMERG CB 136CR1 AND TB3.
TERM 3 IS CONTINUITY PRESENT?

YES
REPLACE DIODE 136CR2 BETWEEN TB3 TERMS 2 AND 3.

NO
LOCATE OPEN IN WIRE
W550-174-22 BETWEEN TB3
TERM 2 AND APU CONT.
EMERG CB 136CR2 REPAIR
OR REPLACE WIRE AS REQUIRED.

APU ON CAPSULE GOES OUT (APU SHUTS DOWN)
WHEN APU CONT “NORM” CIRCUIT BREAKER OPENED

OPEN NO. 1 PDP.
CHECK FOR CONTINUITY BETWEEN CIRCUIT SIDE OF APU CONT.
NORM CB 136CR1 AND TB3.
TERM 1 IS CONTINUITY PRESENT?

YES
REPLACE DIODE 136CR1 BETWEEN TB3 TERMS 1 AND 2.

NO
LOCATE OPEN IN WIRE
W550-173-22 BETWEEN TB3
TERM 1 AND APU CONT.
NORM CB 136CR1 REPAIR
OR REPLACE WIRE AS REQUIRED.

END OF TASK
Change 8 15-41
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Aircraft Mechanic's Tool Kit.
NSN 5180-00-323-4692
Electrical Repairer's Tool Kit.
NSN 5180-00-323-4915

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

Material Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

Materials:
Cloth (E120)
Tape (E385)

Personnel Required:
Aircraft Electrician
Medium Helicopter Repairer

General Safety Instructions:

WARNING

All regulations and instructions for handling fuels shall be strictly observed.
15-2.12 APU DOES NOT STOP. ESU BITE INDICATES ● ● ● ● (Continued)

- SET APU SWITCH TO OFF. DOES APU STOP?
  - YES: TASK COMPLETE.
  - NO: FULL APU CONTROL NORM AND EMERG CIRCUIT BREAKERS. DOES APU STOP?
    - YES: LOWER ELUC PNL OVHD PNL REPLACE APU START SWITCH.
    - NO: OPEN LEFT AFT INTERTANK BAY ACCESS COVER. DISCONNECT PLUG 136P4 FROM APU FUEL VALVE. DOES APU STOP?
      - YES: CHECK FOR 28VDC BETWEEN PIN A OF PLUG 136P4 AND FRAME. IS 28VDC PRESENT?
        - YES: REMOVE WIRE FROM TERMINAL A2 OF APU FAULT RELAY. CHECK FOR 28VDC BETWEEN WIRE AND FRAME. IS 28VDC PRESENT?
          - YES: CHECK WIRING BETWEEN FAULT RELAY AND APU START SWITCH FOR SHORT TO POWER LINE AND REPAIR.
          - NO: CHECK WIRING BETWEEN FAULT RELAY AND FUEL VALVE FOR SHORT TO POWER LINE AND REPAIR.
        - NO: CLOSE APU FUEL SHUTOFF MANUAL VALVE. DOES APU STOP?
          - YES: REPLACE APU FUEL VALVE.
          - NO: CHECK FUEL LINES FOR INTER-CHANGED CONNECTIONS AND CORRECT.

⚠️ REFER TO WIRING DIAGRAM 1554.3 FOR FURTHER DETAILS.
FAULT ISOLATION PROCEDURE

INITIAL SETUP
Applicable Configurations:
All

Tools: Equipment Condition:
Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials
None

Personnel Required:
Aircraft Electrician (2)

References:
TM 55-1520-240-23
TM 55-1500-343-23

TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power Off

GO TO NEXT PAGE

15-44 Change 23
15-2.13 APU ON CAPSULE OUT WHEN APU OPERATING NORMALLY (Continued)

TM 55-1500-343-23, PARA 4-76
THRU 4-87

TASK 15-6.5

15-2.13 APU ON CAPSULE OUT WHEN APU OPERATING NORMALLY (Continued) 15-2.13

END OF TASK
Change 23  15-45

REFER TO WIRING DIAGRAM IN TASK 15-43 FOR FURTHER DETAILS.
15-2.14 APU SHUTS DOWN WHEN GEN APU SWITCH PLACED TO ON.

ESU BITE INDICATES • • • • (READY FOR SERVICE)

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairs Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On

Yes, Fault Corrected

NO

PULL APU CONT NORM CIRCUIT BREAKER OPEN
NO 1 PDR IS THERE 24-28VDC BETWEEN TERMINAL 2 OF TB3 AND GROUND?

Yes

Reference Trouble-Shooting Task 15-4.15
AND/OR Task 15-3.7

NO

Is there 24-28VDC BETWEEN TERMINAL 3 OF TB3 AND GROUND?

Yes

Replace Diode 136CR2 BETWEEN TERMINALS 3 AND 2

NO

Replace APU CONT EMERG CIRCUIT BREAKER.
15-2.15 APU SHUTS DOWN WHEN APU GEN SWITCH IS SET TO OFF. ESU BITE INDICATES

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
Aircraft Electrician

References:
TM 55-1520-240-23
TM 55-1500-343-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

END OF TASK

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15-3 APU FUEL SYSTEM
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## APU FUEL SYSTEM TROUBLESHOOTING

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<td>15-64</td>
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</table>
15-3 APU FUEL SYSTEM

15-3.1 APU FUEL SYSTEM COMPONENTS

APU MANUAL FUEL SHUTOFF VALVE (LH SIDE, STA 540)

LEFT AFT INTER TANK ACCESS DOOR

PUMP MOTOR

APU FUEL SOLENOID VALVE

APU FUEL BOOST PUMP

AUXILIARY POWER UNIT

TOP VIEW

FUEL INLET FILTER

FUEL PUMP FILTER

FUEL PUMP

ACCELERATION CONTROL

MAIN FUEL SOLENOID VALVE

START FUEL SOLENOID VALVE

MAIN FUEL INJECTORS (SIX)

MAIN FUEL MANIFOLD

RESTRICTOR ASSEMBLY

COMBUSTOR DRAIN VALVE

START FUEL NOZZLE

FRONT VIEW

SIDE VIEW
15-3.3 APU FUEL SYSTEM PIPING DIAGRAM

NOTES

⚠️ WIRES TO J301 (MAGNETIC PICKUP WIRE)

• ONLY PLUMBING RELATED TO APU FUEL

Refer to TASK 15-3.10

15-3.3

TM 55-1520-240-T

15-55
15-3.6 APU MOTORS BUT DOES NOT START, ESU BITE INDICATES  THEN (FAILURE TO START; FUEL SYSTEM)

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
Multimeter

Materials:
Cloth (E120)
Tape (E385)

Personnel Required:
Aircraft Electrician
Medium Helicopter Repairer

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power Off

General Safety Instructions

WARNING
All regulations and instructions for handling fuels shall be strictly observed.
15-3.6 APU MOTORS BUT DOES NOT START, ESU BITE INDICATES

THEN

(CONTINUED: FUEL SYSTEM)

END OF TASK

Change 8  15-59
15-3.7 APU MOTORS BUT DOES NOT START, ESU BITE INDICATES \( \circ \circ \circ \) THEN \( \circ \circ \circ \) (FAILURE TO START)

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations
All

Equipment Condition:
TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power Off

General Safety Instructions

WARNING
All regulations and instructions for handling fuels shall be strictly observed.

Personnel Required:
Aircraft Electrician
Medium Helicopter Repairer

Equipment Condition:
TM 55-2835-205-23

Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915
Multimeter

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

Materials:
WARNING
None

Personnel Required:
Aircraft Electrician
Medium Helicopter Repairer

References
TM 55-1520-240-23

GO TO NEXT PAGE
15-60 Change 23
15-3.7 APU MOTORS BUT DOES NOT START, ESU BITE INDICATES\(\bigcirc \bigcirc \bigcirc\) THEN \(\bigcirc \bigcirc \bigcirc\) (CONTINUED)

1. Set APU SW to OFF.
2. Disconnect plug 136P1 from ESU check for resistance between pins 9 and 10 of plug 136P1. Is resistance less than 500 ohms?
   - Yes: Replace APU fuel inlet filter and reconnect plug 136P1. Repeat operation. Check task 15-15. Does APU on capsule come on?
   - No: Refer to ESU trouble-shooting task 15-6.13.

3. Set APU SW to OFF.
4. Check task 15-15. Does APU on capsule come on?
   - Yes: Fault corrected.
   - No: Refer to ESU trouble-shooting task 15-6.13.

5. Set APU SW to OFF.
   - Yes: Fault corrected.
   - No: Refer to ESU trouble-shooting task 15-6.13.

7. Set APU SW to OFF.
8. Replace APU acceleration control. Repeat operation. Check task 15-15. Does APU on capsule come on?
   - Yes: Fault corrected.
   - No: Refer to ESU trouble-shooting task 15-6.13.

9. Set APU SW to OFF.
10. Remove fuel injectors and check for restrictions. Refer to TM 55-2855-005-23. Are any injectors blocked or restricted?
    - Yes: Clean or replace blocked or restricted fuel injectors.
    - No: Replace fuel pump. Repeat operational check task 15-15. Does APU on capsule come on?

END OF TASK
TABLE NO. 15-3.1 - APU FUEL BOOST PUMP AND FUEL SOLENOID VALVE - ELECTRICAL TESTS

<table>
<thead>
<tr>
<th>TYPE OF TEST</th>
<th>TEST CONDITION</th>
<th>PROCEDURE</th>
<th>METER READING OR TEST RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>RESISTANCE CHECK OF APU FUEL BOOST PUMP.</td>
<td>APU SWITCH TO OFF.</td>
<td>1. OPEN AFT FUEL INTERTANK BAY DOOR.</td>
<td>15 OHMS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. DISCONNECT PLUG 136P3 (AT TOP RIGHT SIDE OF COMPARTMENT).</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. MEASURE RESISTANCE BETWEEN PINS A AND B ON 136P3.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. RECONNECT 136P3 TO 136L3.</td>
<td></td>
</tr>
<tr>
<td>RESISTANCE CHECK OF APU FUEL SOLENOID VALVE.</td>
<td>APU SWITCH TO OFF.</td>
<td>1. OPEN AFT FUEL INTERTANK BAY DOOR.</td>
<td>180-220 OHMS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. DISCONNECT PLUG 174P5 (AT TOP RIGHT SIDE OF COMPARTMENT).</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. MEASURE RESISTANCE BETWEEN PINS E AND F ON 174P5.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. RECONNECT 174P5 TO 174J5.</td>
<td></td>
</tr>
<tr>
<td>VOLTAGE CHECK AT APU FUEL BOOST PUMP PLUG.</td>
<td>APU SWITCH TO RUN.</td>
<td>1. BOOST PUMP SHOULD BE HEARD RUNNING AS APU SWITCH IS PLACED TO RUN POSITION. IF NOT, CHECK VOLTAGE.</td>
<td>28VDC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. DISCONNECT PLUG AT BOOST PUMP AND MEASURE VOLTAGE BETWEEN PINS D AND A.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. RECONNECT PLUG TO BOOST PUMP.</td>
<td></td>
</tr>
<tr>
<td>VOLTAGE CHECK AT APU FUEL SOLENOID VALVE</td>
<td>APU SWITCH TO RUN.</td>
<td>1. DISCONNECT PLUG AT APU FUEL BOOST PUMP.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. DISCONNECT PLUG 136P4 AT APU FUEL SOLENOID VALVE.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. PLACE APU SWITCH TO RUN AND MEASURE VOLTAGE BETWEEN PINS A AND B OF 136P4.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. RECONNECT BOTH PLUGS.</td>
<td>28VDC</td>
</tr>
</tbody>
</table>
### TABLE NO. 15-3.2 - APU FAULT RELAY - ELECTRICAL TESTS

<table>
<thead>
<tr>
<th>TYPE OF TEST</th>
<th>TEST CONDITION</th>
<th>PROCEDURE</th>
<th>METER READING OR TEST RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INITIAL SET-UP</strong></td>
<td>APU SW. TO OFF</td>
<td>1. REMOVE WIRE W625-84-22 FROM B3.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. REMOVE WIRE W625-85-22 FROM A3.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. REMOVE WIRE W625-172-22 FROM X1.</td>
<td></td>
</tr>
<tr>
<td><strong>B2-B3 CONTACT CHECK WITH ZERO VOLTS ON COIL</strong></td>
<td>APU SW. TO OFF</td>
<td>PLACE OHMMETER TEST LEADS ACROSS B2 AND B3 AND MEASURE RESISTANCE.</td>
<td>0&quot; OHMS</td>
</tr>
<tr>
<td><strong>A2-B3 CONTACT CHECK WITH ZERO VOLTS ON COIL</strong></td>
<td>APU SW. TO OFF</td>
<td>PLACE OHMMETER TEST LEADS ACROSS A2 AND A3 AND MEASURE RESISTANCE.</td>
<td>0&quot; OHMS</td>
</tr>
<tr>
<td><strong>COIL RESISTANCE CHECK.</strong></td>
<td>APU SW. TO OFF</td>
<td>PLACE OHMMETER TEST LEADS ACROSS X1 AND X2 AND MEASURE RESISTANCE.</td>
<td>150 OHMS</td>
</tr>
<tr>
<td><strong>VOLTAGE TO RELAY CONTACTS CHECK.</strong></td>
<td>APU SW. TO ON</td>
<td>PLACE Voltmeter test leads between frame ground and wire W625-171-22 (which was removed from B2).</td>
<td>28 VDC</td>
</tr>
<tr>
<td><strong>RELAY COIL CHECK.</strong></td>
<td>APU SW. TO ON</td>
<td>PLACE JUMPER CLIP LEADS BETWEEN WIRE W697-171-22 AND X1. RELAY COIL &quot;CLICK&quot; SHOULD BE HEARD.</td>
<td></td>
</tr>
<tr>
<td><strong>B2-B3 CONTACT CHECK WITH VOLTAGE ON COIL</strong></td>
<td>APU SW. TO ON</td>
<td>RETAIN JUMPER BETWEEN WIRE W697-171-22 AND X1. MEASURE RESISTANCE ACROSS B2 AND B3.</td>
<td>METER INDICATES &quot;OPEN&quot; CIRCUIT.</td>
</tr>
<tr>
<td><strong>A2-B3 CONTACT CHECK WITH VOLTAGE ON COIL</strong></td>
<td>APU SW. TO ON</td>
<td>RETAIN JUMPER BETWEEN WIRE W697-171-22 AND X1. MEASURE RESISTANCE ACROSS A2 AND A3.</td>
<td>METER INDICATES &quot;OPEN&quot; CIRCUIT.</td>
</tr>
<tr>
<td><strong>RETURN OF WIRES TO TERMINALS ON RELAY.</strong></td>
<td>APU SW. TO OFF</td>
<td>1. REMOVE JUMPER.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. REPLACE WIRE W625-84-22 ON B3.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. REPLACE WIRE W625-85-22 ON A3.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. REPLACE WIRE W625-172-22 ON X1.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. USE WIRING DIAGRAM TO DOUBLE CHECK RELAY WIRING.</td>
<td></td>
</tr>
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**Notes:**
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TABLE NO. 15-3.3  APU START AND MAIN FUEL VALVES  ELECTRICAL TESTS

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<th>COMPONENT</th>
<th>TEST POINTS</th>
<th>MULTIMETER READINGS</th>
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<tr>
<td></td>
<td>Start Fuel Solenoid Valve</td>
<td>Terminal Board Terminals 3 &amp; GND</td>
<td>28 Volts Between 5% &amp; 70% APU Speed</td>
</tr>
<tr>
<td></td>
<td>Terminal Board Terminals 5 &amp; GND</td>
<td>0 Volts At all Times</td>
<td>...</td>
</tr>
<tr>
<td>Move Start/Run Switch to DOWN position</td>
<td>Main Fuel Solenoid Valve</td>
<td>Terminal Board Terminals 1 &amp; GND</td>
<td>28 Volts Above 15% APU Speed</td>
</tr>
<tr>
<td></td>
<td>Terminal Board Ground Connection</td>
<td>Terminal 4 and GND</td>
<td>...</td>
</tr>
<tr>
<td></td>
<td>Terminal 5 and GND</td>
<td>...</td>
<td></td>
</tr>
<tr>
<td>Remove ESU Plug 136P1</td>
<td>Start Fuel Solenoid Valve</td>
<td>Terminals 3 and 5</td>
<td>...</td>
</tr>
<tr>
<td></td>
<td>Main Fuel Solenoid Valve</td>
<td>Terminals 1 and 5</td>
<td>...</td>
</tr>
</tbody>
</table>

NOTE: ▲ IGNITION EXCITER IS ALSO CONNECTED TO TERMINAL 3. RESISTANCE READING WOULD INCREASE WITH IGNITION EXCITER DISCONNECTED.
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APU HYDRAULIC SYSTEM TROUBLESHOOTING

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15-4.3 MAJOR INTERCONNECTING APU HYDRAULIC SYSTEM SCHEMATIC (Continued)

Note:
- Refer to [Task 15-3.2] for additional electrical details
- Continued in paragraph 7-2
- Refer to [Task 15-3.5] for additional electrical details

END OF TASK

Change 23 15-71
15-4.7 APU HYDRAULIC STARTING SYSTEM VISUAL CHECK

INITIAL SETUP

Applicable Configurations: All

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

Materials:
None

Personnel Required:
Medium Helicopter Repairer

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Electrical Power Off
Battery Disconnected
Hydraulic Power Off
Right Aft Transmission
Battle Open
Cargo Ramp Operational Level
(Task 7-3.4)

TASK RESULT

1. Check APU start module accumulator (1).
   If accumulator (1) or accumulator gage (2) is damaged, replace accumulator.

2. Check APU start module (3).
   If any tube to module (3) is loose or damaged, tighten or replace it as required. If electrical connector to module is loose or damaged, tighten or replace it as required. If wiring to connector is damaged, repair or replace it as required.

3. Check APU start accumulator gage (4).
   If gage (4) is loose or damaged, tighten or replace it as required.

4. Check APU start accumulator (5).
   If accumulator (5) is loose or damaged, tighten or replace it as required. If any tube to accumulator is loose or damaged, tighten or replace it as required.

5. Check APU motor pump (6).
   If pump (6) is loose or damaged, tighten or replace it as required. If any hose to pump is loose or damaged, tighten or replace it as required.

FOLLOW-ON MAINTENANCE:
None

END OF TASK
Change 8 15-75
### INITIAL SETUP

**Applicable Configurations:**
- All

**Tools:**
- None

**Materials:**
- None

**Personnel Required:**
- Medium Helicopter Repairer (2)

**References:**
- TM 55-1520-240-23

**Equipment Condition:**
- Battery Connected
- Electrical Power Off
- Hydraulic Power Off
- Visual Check of APU Hydraulic Starting System Performed (Task 15-4.7)

### TASK RESULT

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
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</thead>
<tbody>
<tr>
<td>1. Check APU start accumulator gage (1).</td>
<td>Gage (1) shall indicate between 2850 and 3100 psi. If it does not, use hand pump to charge accumulator. If gage still does not indicate between 2850 and 3100 psi, go to task 15-4.9.</td>
</tr>
<tr>
<td>2. Start APU. Refer to task 15-1.5.</td>
<td>APU shall begin to motor and accelerate to running speed within 30 seconds. UTILITY HYDRAULICS indicator (2) shall indicate 3200 to 3500 psi. If indicator does not indicate 3200 to 3500 psi, stop APU and go to task 15-2.4. If APU does not motor, go to task 15-4.10. If APU motors but does not start and ESU bite indicates 0-0-0-0, then 0-0-0-0, go to task 15-4.11.</td>
</tr>
<tr>
<td>3. Stop APU. Refer to task 15-1.5.</td>
<td></td>
</tr>
</tbody>
</table>

### FOLLOW-ON MAINTENANCE:
- TM 55-1520-240-23
15-4.9 APU START ACCUMULATOR GAGE DOES NOT INDICATE AT LEAST 2850 PSI

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Took:
Aircraft Mechanic’s Tool Kit,
NSN 5180-00-323-4692
Hydraulic Power Source
Pressure Gage 5000 PSI

Materials:
None

Personnel Required:
Medium Helicopter Repairer (2)

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off except as needed

GO TO NEXT PAGE
15-4.9 APU START ACCUMULATOR GAGE DOES NOT INDICATE AT LEAST 2850 PSI (CONTINUED)

1. **Check Emerg Util Press Valve: Is it at Normal?**
   - No
   - Yes
     - **Check APU Start Module Accumulator Gage Does it Indicate at Least 2850 PSI?**
       - No
         - **Connect External Hydraulic Supply to Utility System Refer to Tasks 15-30, 15-31. Apply External Hydraulic Power Check APU. Gage Motoring**
         - Yes
         - **Replace APU Start Module Check and Depressurizing Valve**
         - No
         - **Hold Pressure and Return Lines On APU Start Module Check and Return Line Hot**
         - Yes
           - **Replace APU Start Module Start Valve**
           - No
             - **Replace Relief Valve at Reservoir Pressurization Accumulator is Return Line Hot**
             - Yes
               - **Replace APU Start Accumulator**
               - No
                 - **Disconnect Pressure Line at Hand Pump Connect 0.5000 PS pressure gage to PUMP Pressure Port Operate Pump Does Gage Indicate Pressure Increase Above 2850 PSI?**
                 - Yes
                   - **Replace APU Start Accumulator**
                   - No
                     - **Replace Hand Pump**
     - Yes
       - **Fault Corrected**
       - **Replace APU Start Accumulator**

END OF TASK
15-4.10 APU DOES NOT MOTOR

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations: All

Tools:
- Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
- Multimeter
- Hydraulic Power Source

Materials: None

Personnel Required:
- Aircraft Electrician
- Medium Helicopter Repairer

References:
- TM 55-1520-240-23
- TM 55-1500-343-23

Equipment Condition:

GO TO NEXT PAGE
15-4.10 APU DOES NOT MOTOR (CONTINUED)

ATTEMPT APU START REFER TO PARAGRAPHS 15-4.11-15-4.15 DOES APU MOTOR PUMP SOUND LIKE IT IS OPERATING?

NO

HOLD SIGNAL HOSE TO APU MOTOR PUMP ATTEMPT APU START IS PRESSURE SURGE FELT ON HOSE?

NO

REPLACE APU MOTOR PUMP

NO

REMOVE ELECTRICAL SYSTEM REMOVE APU MOTOR PUMP TRY TO TURN MOTOR PUMP SHAFT DOES IT TURN?

YES

REPLACE APU

DISCONNECT PLUG 138PS

NO

MUCH APU START PLUG Valve CHECK FOR 28 VDC BETWEEN PLUG 138PS PIN 11 V AND GROUND IS 28 VDC PRESENT WHEN APU SW IS MOVED FROM OFF TO START?

YES

RELEASE SW CHECK PUMP GROUND ON PLUG 138PS PIN 3 IS GROUND PRESENT?

REPLACE APU START VALVE

NO

REPLACE APU START VALVE

YES

REPLACE OPERATIONAL CHECK TASK 15-1.5 DOES SYSTEM CHECK OKAY?

FAULT CORRECTED

RELEASE SW DISCONNECT PLUG 138PS FROM ELECTRONIC SEQUENCE UNIT CHECK FOR CONTINUITY BETWEEN PLUG 138PS PIN 9 AND PLUG 138PS PIN 11 IS CONTINUITY PRESENT?

NO

LOCATE OPEN IN WIRE WIRE 6268-136-22 BETWEEN PLUG 138PS AND PLUG 138PS REPAIR OR REPLACE WIRE AS REQUIRED

LOCATE OPEN IN WIRE WIRE 6268-136-22 BETWEEN PLUG 138PS AND PLUG 138PS REPAIR OR REPLACE WIRE AS REQUIRED

SEE APU WIRING DIAGRAM IN TASK 15-2.8 FOR ADDITIONAL DETAILS

REFER TO TASK 1 68 IN TM 55-1520-240-23 FOR DETAILS

END OF TASK

Change 10 15-81
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Aircraft Mechanic's Tool Kit,
NSN 6180-00-323-4692
Hydraulic Power Source

Materials:
None

Personnel Required:
Medium Helicopter Repairer (2)

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

APU MOTOR/PUMP

APU VIEW OF APU LOOKING UP AND AFT

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15-4.11 APU MOTORS BUT DOES NOT START, ESU BITE INDICATES ♦ ♦ ♦ ♦ OR ♦ ♦ ♦ ♦ THEN ♦ ♦ ♦ ♦ ♦ (HYDRAULIC FAULT) (CONTINUED)

CHECK APU PUMP FAULT LIGHT IS IT ON?

YES

REPLACE APU MOTOR PUMP

NO

CONNECT EXTERNAL HYDRAULIC SOURCE TO UTILITY SYSTEM. REFER TO TM55-1520-240-23 APPLY HYDRAULIC POWER ATTEMPT APU START REFER TO TASK 15-153 DOES APU START?

YES

REPLACE APU

NO

DOES APU HAVE HISTORY OF HOT STARTS?

YES

REPLACE APU

NO

REMOVE HYDRAULIC POWER REPLACE APU MOTOR PUMP ATTEMPT APU START REFER TO TASK 15-153 DOES APU START?

YES

FAULT CORRECTED

NO

REPLACE APU

YES

CHECK APU START ACCUMULATOR DOES IT INDICATE AIR PRECHARGE REFER TO TM 55-1520-240-23

NO

REPLACE APU START ACCUMULATOR

YES

SERVICE ACCUMULATOR

NO

REFER TO TASK 1-64 IN TM 55-1520-240-23 FOR DETAILS

END OF TASK
15-4.12 APU PUMP FAULT LIGHT IS ON

FAULT ISOLATION PROCEDURE

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
- Multimeter

Personnel Required:
- Medium Helicopter Repairer
- Aircraft Electrician

References:
- TM 55-1520-280-23

Equipment Condition:
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power On

Materials:
None
15-4.12 APU PUMP FAULT LIGHT IS ON (CONTINUED)

CHECK APU PUMP FAULT INDICATING BUTTON IS IT EXTENDED?

YES

PUSH IN BUTTON REPEAT OPERATIONAL CHECK TAB
   DOES APU PUMP FAULT LIGHT COME ON?

YES

REPLACE APU MOTOR PUMP

NO

FAULT CORRECTED

DISCONNECT PLUG 14403 FROM APU PUMP CHANGE PRESSURE SWITCH ON UTILITY RETURN CONTROL MODULE DOES APU PUMP FAULT LIGHT GO OUT?

YES

REPLACE APU PUMP FAULT PRESSURE SWITCH

NO

LOCATE GROUND FAULT ON WIRE W3510 053 ZZ BETWEEN PLUG 14403 AND APU PUMP FAULT LIGHT REPAIR OR REPLACE WIRE AS REQUIRED

NOTE: REFER TO UTILITY HYDRAULIC SYSTEM WIRING DIAGRAM PAR. 7-2-2

END OF TASK
15-5 APU / ENGINE HYDRAULIC STARTER SYSTEM
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<td>ENGINE START SYSTEM Wiring Diagram (HYDRAULIC PORTION)</td>
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<td>15-5.6</td>
<td>NO. 1 OR NO. 2 ENGINE DOES NOT MOTOR (HYDRAULIC SYSTEM) (WITHOUT 74)</td>
<td>TASK</td>
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<td>15-5.6.1</td>
<td>NO. 1 OR NO. 2 ENGINE DOES NOT MOTOR (HYDRAULIC SYSTEM) (WITH 74)</td>
<td>TASK</td>
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<td>15-5.7</td>
<td>NO. 1 OR NO. 2 ENGINE KEEPS MOTORING WHEN ENGINE START SWITCH SET TO OFF</td>
<td>TASK</td>
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</table>
15-5.3  ENGINE START SYSTEM WIRING DIAGRAM (HYDRAULIC PORTION) (Continued)

WITH A

WITH B

END OF TASK
Change 23  15-94.1
## INITIAL SETUP

### Applicable Configurations:
All

### Equipment Condition:

### Tools:
- Aircraft Mechanic’s Tool Kit,
- NSN 5180-00-323-4692

### Materials:
None

### Personnel Required:
- Medium Helicopter Repairer

## References:
- TM 551520-240-23
- TM 55-1520-240-23:
  - Battery Disconnected
  - Electrical Power Off
  - Hydraulic Power Off
  - No. 1 or No. 2 Engine Work Platforms and Access Doors Open

## Task Result

### CHECK NO. 1 ENGINE STARTER INSTALLATION

1. **Check No. 1 engine starter (1).**
   - If starter (1) is loose or damaged, tighten or replace it as required.

2. **Check disconnect couplings (2 and 3) for extended buttons (4) or evidence of leaks.**
   - If coupling (2 or 3) is not secured or buttons (4) are not extended, connect coupling. If buttons are still not extended, replace coupling. If buttons are extended and leaks are evident, repair or replace coupling or replace hose.

### CHECK NO. 2 ENGINE STARTER INSTALLATION

3. **Check No. 2 engine starter (1).**
   - If starter (1) is loose or damaged, tighten or replace it as required.

4. **Check disconnect couplings (5 and 6) for extended buttons (4) or evidence of leaks.**
   - If coupling (5 or 6) is not secured or buttons (4) are not extended, connect coupling. If buttons are still not extended, replace coupling. If buttons are extended and leaks are evident, repair or replace coupling or replace hose.

## Follow-on Maintenance:
- TM 55-1520-240-23:
  - Close No. 1 or No. 2 engine work platform and access door.

---

15-94.2 Change 23
15-5.4 ENGINE HYDRAULIC STARTING SYSTEM VISUAL CHECK (Continued)

END OF TASK

Change 23  15-95
### INITIAL SETUP
**Applicable Configurations:**  
Without  

**Tools:**  
None  

**Materials:**  
None  

**Personnel Required:**  
Medium Helicopter Repairer (2)  

**References:**  
TM 55-1520-240-23

---

### Equipment Condition:
- Battery Connected
- Electrical Power On
- Ignition Switch Key Removed

### General Safety Instructions:
**WARNING**
Make sure that rotor blades are clear of obstructions and that personnel are aware that rotor blades may turn during engine motoring. Turning blades can cause damage or serious injury to personnel.

---

### TASK

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
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<tbody>
<tr>
<td>1. Check that ENGINE NO. 1 START &amp; TEMP circuit breaker (1) is closed. If START &amp; TEMP circuit breaker (1) is open, close it. If it opens again, go to task 4-4.6.</td>
<td></td>
</tr>
<tr>
<td>2. Check that ENGINE NO. 2 START &amp; TEMP circuit breaker (2) is closed. If START &amp; TEMP circuit breaker (2) is open, close it. If it opens again, go to task 4-4.8.</td>
<td></td>
</tr>
<tr>
<td>3. Press and release ENGINE 1 STARTER ON light (3). Light (3) shall momentarily come on. If it does not light, go to task 4-4.9.</td>
<td></td>
</tr>
<tr>
<td>4. Press and release ENGINE 2 STARTER ON light (4). Light (4) shall momentarily come on. If it does not light, go to task 4-4.10.</td>
<td></td>
</tr>
<tr>
<td>5. Set ENGINE 1 START switch (5) to MOTOR. ENGINE 1 STARTER ON light (3) shall come on. NO. 1 ENGINE gas producer tachometer (6) shall indicate 10 to 15% N1 as starter motors engine. If ENGINE 1 STARTER light does not come on, go to task 4-4.9. If engine does not motor, go to  15-5.6.</td>
<td></td>
</tr>
</tbody>
</table>
### 15-5.5 ENGINE HYDRAULIC STARTING SYSTEM OPERATIONAL CHECK (Continued)

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Set ENGINE 1 START switch (5) to OFF.</td>
<td>NO. 1 ENGINE gas producer tachometer (6) indication shall decrease to 0. If tachometer indication does not decrease or engine continues to motor, go to <a href="#">task 15-5.7</a>.</td>
</tr>
<tr>
<td><strong>MOTOR NO. 2 ENGINE</strong></td>
<td></td>
</tr>
<tr>
<td>7. Set ENGINE 2 START switch (7) to MOTOR.</td>
<td>ENGINE 2 STARTER ON light (4) shall come on. NO. 2 ENGINE gas producer tachometer (8) shall indicate 10 to 15% N1 as starter motors engine. If ENGINE 2 STARTER light does not come on, go to task 4-4.10. If engine does not motor, go to <a href="#">task 15-5.6</a>.</td>
</tr>
<tr>
<td>8. Set ENGINE 2 START switch (7) to OFF.</td>
<td>NO. 2 ENGINE gas producer tachometer (8) indication shall decrease to 0. If tachometer indication does not decrease or engine continues to motor, go to <a href="#">task 15-5.7</a>.</td>
</tr>
</tbody>
</table>

**FOLLOW-ON MAINTENANCE:**

- Battery disconnected.
- Electrical power off.
- Hydraulic power off.
INITIAL SETUP
Applicable Configurations:
With 74 Battery Connected
Electrical Power On
Ignition Switch Off (Key Removed)

Tools:
None

Materials:
None

Personnel Required:
Medium Helicopter Repairer (2)

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power On

General Safety Instructions:
WARNING
Make sure that rotor blades are clear of obstructions and that personnel are aware that rotor blades may turn during engine motoring. Turning blades can cause damage or serious injury to personnel.

TASK RESULT

1. Check that ENGINE NO. 1 START & IGN circuit breaker (1) is closed.
   If START & IGN circuit breaker (1) is open, close it. If it opens again, go to task 4-10.4.

2. Check that ENGINE NO. 2 START & IGN circuit breaker (2) is closed.
   If START & IGN circuit breaker (2) is open, close it. If it opens again, go to task 4-10.4.

3. Check that ENGINE NO. 1 and ENGINE NO. 2 PRI CONT circuit breakers (3) and (4) are closed.
   If PRI CONT circuit breakers (3) and (4) are open, go to task 4-10.4.

4. Check that ENGINE NO. 1 and ENGINE NO. 2 REV CONT circuit breakers (5) and (6) are closed.
   If REV CONT circuit breakers (5) and (6) are open, go to task 4-10.4.

MOTOR NO. 1 ENGINE

5. On the FADEC panel, set and hold ENG START switch (7) to 1.

   The NO. 1 ENGINE N1 tachometer (8) must indicate 10 to 15% N1 as starter motors engine. If the engine does not motor, go to task 15-5.6.1.

6. Release the ENG START switch (7) to its center position.

   The NO. 1 ENGINE N1 tachometer (8) indication must decrease to 0% N1. If the tachometer indication does not decrease or the engine continues to motor, go to task 15-5.5.
### TASK RESULT

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MOTOR NO. 2 ENGINE</strong></td>
<td></td>
</tr>
<tr>
<td>7. <strong>On the FADEC panel, set and hold ENG START switch (7) to 2.</strong></td>
<td>The NO. 2 ENGINE 2 N1 tachometer (9) must indicate 10 to 15% N1 as starter motors engine. If the engine does not motor, go to <a href="#">Task 15-5.6.1</a>.</td>
</tr>
<tr>
<td>8. <strong>Release the ENG START switch (7) to its center position.</strong></td>
<td>The NO. 2 ENGINE (9) indication must decrease to 0% N1. If the tachometer indication does not decrease or the engine continues to motor, go to <a href="#">Task 15-5.7</a>.</td>
</tr>
</tbody>
</table>

**FOLLOW-ON MAINTENANCE:**

- Battery disconnected.
- Electrical power off.
- Hydraulic power off.

---

END OF TASK

Change 23  15-97
FAULT ISOLATION PROCEDURE

INITIAL SETUP

References:
TM 55-1520-240-23

Equipment Condition:
- Without 74
- Battery Connected
- Electrical Power On
- Hydraulic Power On
- No. 1 or No. 2 Engine Work Platforms and Access Doors Open

Applicable Configurations:
- TM 55-1520-240-23

Tools:
- Aircraft Mechanic's Tool Kit, NSN 5180-00-3234692

Materials:
- None

Personnel Required:
- Medium Helicopter Repairer (2)

---

IF ICING CONDITIONS ARE PRESENT, DIRECT HOT AIR INTO COMPRESSOR TO REMOVE ANY ICE BUILDUP. IF ICING CONDITIONS ARE NOT PRESENT, REPLACE STARTER.

YES

REPLACE STARTER.

NO

REPLACE APPLICABLE ENGINE PILOT VALVE.

NO

INTERCHANGE NO. 1 AND NO. 2 ENGINE START VALVES. SET APPLICABLE ENGINE START SW TO MOTOR. DOES ENGINE MOTOR?

NO

REPLACE FAULTY ENGINE START VALVE.

YES

ENGINE NO. 2 START SWITCH

START PANEL

ENGINE NO. 1 START SWITCH

COCKPIT

START

START

START

START

OFF

ON

OFF

MOTOR

MOTOR

MOTOR
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:

With - 74

Equipment Condition:

TM 55-1520-240-23

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

Tools:

Battery Connected
Aircraft Mechanic’s Tool Kit,
NSN 5180-00-323-4692

Hydraulic Power On
No. 1 or No. 2 Engine Work Platforms and
Access Doors Open

Materials:

None

Personnel Required:

Medium Helicopter Repairer (2)

References:

TM 55-1520-240-23

Fault Isolation Procedure:

1. **Initial Setup**
   - **Applicable Configurations:**
     - With - 74
   - **Equipment Condition:**
     - TM 55-1520-240-23
     - Battery Connected
     - Aircraft Mechanic’s Tool Kit
     - NSN 5180-00-323-4692
     - Hydraulic Power On
     - No. 1 or No. 2 Engine Work Platforms and
     - Access Doors Open
   - **Materials:**
     - None
   - **Personnel Required:**
     - Medium Helicopter Repairer (2)

2. **Fault Isolation Procedure**

   - **Flowchart:**
     - **References:**
       - TM 55-1520-240-23
     - **Equipment Condition:**
       - TM 55-1520-240-23
       - Battery Connected
       - Aircraft Mechanic’s Tool Kit
       - NSN 5180-00-323-4692
       - Hydraulic Power On
       - No. 1 or No. 2 Engine Work Platforms and
       - Access Doors Open
     - **Tools:**
       - Battery Connected
       - Aircraft Mechanic’s Tool Kit
       - NSN 5180-00-323-4692
     - **Materials:**
       - None
     - **Personnel Required:**
       - Medium Helicopter Repairer (2)
15-5.6.1 NO. 1 OR NO. 2 ENGINE DOES NOT MOTOR (HYDRAULIC SYSTEM) (Continued)

WITH 7A

ENGINE STARTER

STARTER PRESSURE HOSE

NO. 1 (LEFT) ENGINE LEFT SIDE

DISCONNECT COUPLING

DISCONNECT COUPLINGS

NOTE:
ENGINE EXHAUST CONES AND ACCESS DOORS NOT SHOWN FOR CLARITY

END OF TASK
Change 23 15-99
TASK 15-5.5

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
Medium Helicopter Repairer (2)

Fault isolated:

15-5.7 NO. 1 OR NO. 2 ENGINE KEEPS MOTORING WHEN ENGINE START SWITCH SET TO OFF

15-5.7

References:
TM 5-1520-240-23

Equipment Condition:
TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power On

Materials:
None

Personnel Required:
Medium Helicopter Repairer (2)

15-100 Change 23

END OF TASK
15-6 MICROPROCESSOR ELECTRONIC SEQUENCE UNIT (ESU)
## APU Microprocessor Electronic Sequence Unit (ESU) Troubleshooting

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<td>APU Starts and Runs But ESU BITE INDICATES  ●●○○ (SHORTED THERMO. PROBE) (WARNING)</td>
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<td>APU STARTING SEQUENCE FAILURES - BITE INDICATION TABLE</td>
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<td>15-6.3</td>
<td>ESU PRINTED CIRCUIT BOARD FAILURES - BITE INDICATION TABLE</td>
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</tbody>
</table>
## 15-6 ELECTRONIC SEQUENCE UNIT (ESU)

### 15-6.1 ESU COMPONENTS

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<th>DECODED BITE INFORMATION</th>
</tr>
</thead>
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<tr>
<td>● ● ● ●</td>
<td>RESET</td>
</tr>
<tr>
<td>○ ● ● ●</td>
<td>START FUEL VALVE &amp; EXCITER SIGNAL OUT (5%)</td>
</tr>
<tr>
<td>○ ○ ● ●</td>
<td>MAIN FUEL VALVE SIGNAL OUT (14%)</td>
</tr>
<tr>
<td>○ ○ ○ ●</td>
<td>START FUEL VALVE &amp; EXCITER SIGNAL OFF (70%)</td>
</tr>
<tr>
<td>○ ○ ○ ○</td>
<td>90% RPM SWITCH ON</td>
</tr>
<tr>
<td>● ● ● ●</td>
<td>READY FOR SERVICE (90% + 1.5 SEC.)</td>
</tr>
<tr>
<td>○ ● ● ●</td>
<td>PROCESSOR BOARD FAILURE</td>
</tr>
<tr>
<td>● ● ● ●</td>
<td>SENSOR /DATA BOARD FAILURE</td>
</tr>
<tr>
<td>○ ● ● ●</td>
<td>OVERTEMPERATURE</td>
</tr>
<tr>
<td>● ● ● ●</td>
<td>OVERSPEED</td>
</tr>
<tr>
<td>○ ● ● ●</td>
<td>UNDERSPEED</td>
</tr>
<tr>
<td>● ○ ○ ○</td>
<td>FAILURE TO START</td>
</tr>
<tr>
<td>● ● ● ○</td>
<td>SHORTED THERMOCOUPLE PROBE (WARNING)</td>
</tr>
<tr>
<td>● ● ○ ○</td>
<td>OPEN THERMOCOUPLE</td>
</tr>
<tr>
<td>● ● ○ ○</td>
<td>PROCESSOR SEQUENCE FAIL</td>
</tr>
<tr>
<td>○ ○ ○ ○</td>
<td>NO TEMP DATA</td>
</tr>
<tr>
<td>○ ● ○ ○</td>
<td>NO SPEED DATA</td>
</tr>
</tbody>
</table>

### Start Sequence
- POWER REGULATOR
- SENSOR / DATA BOARD
- PROCESSOR BOARD

### Operation
- DECODED INFORMATION DECAL
- ESU REAR COVER
<table>
<thead>
<tr>
<th>NO.</th>
<th>BITE INDICATION</th>
<th>SYMPTOM</th>
<th>DECODED BITE DESCRIPTION</th>
<th>Maintenance Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>○●●●●</td>
<td>ESU Bite indicates ○●●●●</td>
<td>PROCESSOR BOARD FAILURE</td>
<td>15-2.10</td>
</tr>
<tr>
<td>2</td>
<td>●○●●</td>
<td>ESU Bite indicates ●○●●</td>
<td>SENSOR/DATA BOARD FAILURE</td>
<td>15-2.10</td>
</tr>
<tr>
<td>3</td>
<td>●●●●</td>
<td>ESU Bite indicates ●●●●</td>
<td>PROCESSOR SEQUENCE FAIL</td>
<td>15-2.10</td>
</tr>
<tr>
<td>4</td>
<td>○○○○</td>
<td>ESU Bite indicates ○○○○</td>
<td>NO TEMP DATA</td>
<td>15-2.10</td>
</tr>
</tbody>
</table>

**APU DOES NOT MOTOR:**

<table>
<thead>
<tr>
<th>NO.</th>
<th>BITE INDICATION</th>
<th>SYMPTOM</th>
<th>DECODED BITE DESCRIPTION</th>
<th>Maintenance Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>○●●●● then ○●●●</td>
<td>ESU Bite indicates ●●●●</td>
<td>FAILURE TO START</td>
<td>15-3.6</td>
</tr>
<tr>
<td>6</td>
<td>○●●●● then ○●●●</td>
<td>ESU Bite indicates ●●●●</td>
<td>FAILURE TO START</td>
<td>15-3.7</td>
</tr>
<tr>
<td>7</td>
<td>○●●●● or ○○○○ then ○●●●</td>
<td>ESU Bite indicates ●●●●</td>
<td>FAILURE TO START</td>
<td>15-4.11</td>
</tr>
<tr>
<td>8</td>
<td>○●○○</td>
<td>ESU Bite indicates ○●○○</td>
<td>NO SPEED DATA</td>
<td>15-6.11</td>
</tr>
<tr>
<td>9</td>
<td>○●●●● or ○○○○ then ○●●●</td>
<td>ESU Bite indicates ●●●●</td>
<td>FAILURE TO START</td>
<td>15-6.12</td>
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<tr>
<td>10</td>
<td>○●○○● then ○●●●</td>
<td>ESU Bite indicates then ●●●●</td>
<td>FAILURE TO START</td>
<td>15-6.13</td>
</tr>
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</table>
### TABLE NO. 15-6.1 BITE INDICATION TABLE FOR APU SYSTEMS FAILURES (Continued)

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<th>SYMPTOM</th>
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<th>Maintenance Action</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>APU STARTS BUT SHUTS DOWN</td>
<td></td>
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<tr>
<td>11</td>
<td>○○○○○ then</td>
<td>ESU Bite indicates ●●○●</td>
<td>OVERSPEED</td>
<td>15-6.14</td>
</tr>
<tr>
<td></td>
<td>●●●●●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>○○○●● then</td>
<td>ESU Bite indicates ○●○●</td>
<td>UNDERSPEED</td>
<td>15-6.15</td>
</tr>
<tr>
<td></td>
<td>○●●●●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>○○○○● then</td>
<td>ESU Bite indicates ○○●●</td>
<td>OVERTEMPERATURE (HOT START)</td>
<td>15-6.16</td>
</tr>
<tr>
<td></td>
<td>○○●●●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>○○●●● then</td>
<td>ESU Bite indicates ●●○○</td>
<td>OPEN THERMOCOUPLE</td>
<td>15-6.18</td>
</tr>
<tr>
<td></td>
<td>●●●●●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>APU STARTS AND RUNS BUT SHUTS DOWN</td>
<td></td>
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<tr>
<td>15</td>
<td>○○○○○ then</td>
<td>ESU Bite indicates ○○●●</td>
<td>OVERTEMPERATURE (HOT START)</td>
<td>15-6.17</td>
</tr>
<tr>
<td></td>
<td>○○●●●</td>
<td></td>
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<td></td>
</tr>
<tr>
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<td></td>
<td></td>
<td>APU STARTS AND RUNS</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>●●●●○</td>
<td>ESU Bite indicates ●●○○</td>
<td>SHORTED THERMO. PROBE (WARNING)</td>
<td>15-6.19</td>
</tr>
<tr>
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<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>APU SHUTS DOWN WHEN GEN APU SWITCH PLACED TO ON</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>●●●●●</td>
<td>ESU Bite indicates ●●●●</td>
<td>READY FOR SERVICE</td>
<td>15-2.14</td>
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<td>APU SHUTS DOWN WHEN APU GEN SWITCH IS SET TO OFF</td>
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<td>READY FOR SERVICE</td>
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<td>APU DOES NOT STOP</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>●●●●●</td>
<td>ESU Bite indicates ●●●●</td>
<td>READY FOR SERVICE</td>
<td>15-2.12</td>
</tr>
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</table>
### TABLE NO. 15-6.2 APU STARTING SEQUENCE FAILURES

<table>
<thead>
<tr>
<th>No.</th>
<th>SYMPTOM</th>
<th>BIT INDICATION</th>
<th>DECODED BITE INFORMATION</th>
<th>TASK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>APU DOES NOT MOTOR</td>
<td>○ ○ ○ ○</td>
<td>NO TEMP DATA</td>
<td>15-2.10</td>
</tr>
<tr>
<td>2</td>
<td>APU MOTORS BUT DOES NOT START</td>
<td>○ ● ○ ○</td>
<td>NO SPEED DATA</td>
<td>15-6.11</td>
</tr>
<tr>
<td>3</td>
<td>APU MOTORS BUT DOES NOT START</td>
<td>○ ● ● ●</td>
<td>or then ○ ○ ● ●</td>
<td>FAILURE TO START</td>
</tr>
<tr>
<td>4</td>
<td>APU MOTORS BUT DOES NOT START</td>
<td>○ ○ ○ ●</td>
<td>then ● ○ ○ ●</td>
<td>FAILURE TO START</td>
</tr>
</tbody>
</table>

###テーブル 15-6.3 ESU PRINTER CIRCUIT BOARD FAILURES - BIT INDICATION TABLE

<table>
<thead>
<tr>
<th>BIT INDICATION</th>
<th>BITE INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>○ ● ● ●</td>
<td>PROCESSOR BOARD FAILURE.</td>
</tr>
<tr>
<td>● ○ ○</td>
<td>SENSOR/DATA BOARD FAILURE.</td>
</tr>
<tr>
<td>○ ○ ○</td>
<td>PROCESSOR SEQUENCE FAIL</td>
</tr>
</tbody>
</table>

###テーブル 15-6.3 ESU PRINTER CIRCUIT BOARD FAILURES - BIT INDICATION TABLE

<table>
<thead>
<tr>
<th>BIT INDICATION</th>
<th>BITE INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>● ● ○ ○</td>
<td>PROCESSOR BOARD FAILURE.</td>
</tr>
<tr>
<td>○ ○ ○ ○</td>
<td>SENSOR/DATA BOARD FAILURE.</td>
</tr>
<tr>
<td>● ○ ○ ○ ○</td>
<td>PROCESSOR SEQUENCE FAIL</td>
</tr>
</tbody>
</table>

###テーブル 15-6.2 APU STARTING SEQUENCE FAILURES

<table>
<thead>
<tr>
<th>No.</th>
<th>SYMPTOM</th>
<th>BIT INDICATION</th>
<th>DECODED BITE INFORMATION</th>
<th>TASK</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>APU STARTS BUT SHUTS DOWN</td>
<td>● ● ○ ●</td>
<td>OVERSPEED</td>
<td>15-6.14</td>
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<tr>
<td>6</td>
<td>APU STARTS BUT SHUTS DOWN</td>
<td>○ ● ○ ●</td>
<td>UNDERSPEED</td>
<td>15-6.15</td>
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<tr>
<td>7</td>
<td>APU STARTS BUT SHUTS DOWN</td>
<td>● ● ○ ○</td>
<td>OPEN THERMOCOUPLE</td>
<td>15-6.16</td>
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</tbody>
</table>

###TABLE NO. 15-6.3 ESU PRINTED CIRCUIT BOARD FAILURES - BIT INDICATION TABLE

<table>
<thead>
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<th>BIT INDICATION</th>
<th>BITE INFORMATION</th>
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<tbody>
<tr>
<td>○ ○ ●</td>
<td>OVERTEMPERATURE</td>
</tr>
<tr>
<td>● ○ ○ ○</td>
<td>SHORTED THERMO.</td>
</tr>
<tr>
<td>○ ○ ○</td>
<td>PROBE (warning)</td>
</tr>
</tbody>
</table>

###TABLE NO. 15-6.2 APU STARTING SEQUENCE FAILURES

<table>
<thead>
<tr>
<th>No.</th>
<th>SYMPTOM</th>
<th>BIT INDICATION</th>
<th>DECODED BITE INFORMATION</th>
<th>TASK</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>APU STARTS BUT SHUTS DOWN</td>
<td>○ ○ ● ●</td>
<td>OVERTEMPERATURE</td>
<td>15-6.17</td>
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<tr>
<td>9</td>
<td>APU STARTS AND RUNS but</td>
<td>● ○ ● ○</td>
<td>SHORTED THERMO. PROBE (warning)</td>
<td>15-6.19</td>
</tr>
</tbody>
</table>
15-6.7 INITIALIZING BITE LOGIC BLOCK DIAGRAM

1. Normal BITE sequence when APU is moved from OFF to RUN.

2. Initial indication will show a failure condition if the previous APU shutdown was due to a malfunction.

Change 8 15-113
15-6.9 MALFUNCTION BITE LOGIC BLOCK DIAGRAM (BEFORE START)
15-6.10 MALFUNCTION BITE LOGIC BLOCK DIAGRAM
(DURING STARTING AND RUNNING)
Fault Isolation Procedure

Initial Setup

Applicable Configurations:
All

Tools:
Electrical Repairer's Tool Kit.
NSN 5180-00-329-4915
Multimeter

Materials:
None

Personnel Required:
Aircraft Electrician

Equipment Condition:
NSN 5180-00-329-4915 TM 55-1520-240-23:
Multimeter Battery Disconnected
Electrical Power Off

Hydraulic Power Off
15-6.11 APU MOTORS BUT DOES NOT START, ESU BITE INDICATES (NO SPEED DATA) (Continued)

15-6.11

DISCONNECT Plug 135P1 FROM ESU. CHECK FOR RESISTANCE BETWEEN PINS 12 AND 13 OF PLUG 135P1. IS 1150 TO 1430 OHMS PRESENT?

YES

CHECK ADJUSTMENT OF MAGNETIC PICKUP. REFER TO TM 55-2855-200-03. REPEAT OPERATIONAL CHECK DOES APU START?

YES

FAULT CORRECTED.

NO

REPLACE ESU.

DISCONNECT Plug 302 FROM MAGNETIC PICKUP ON APU. JUMPER PlUG PINS A AND B. CHECK FOR CONTINUITY BETWEEN PLUG 135P1 PINS 12 AND 13. IS CONTINUITY PRESENT?

YES

REMOVE JUMPER, REPLACE MAGNETIC PICKUP.

NO

REMOVE JUMPER, DISCONNECT PLUG 135P6 FROM APU. JUMPER PLUG 135P6 PINS 12 AND 13. CHECK FOR CONTINUITY BETWEEN PLUG 135P6 PINS 12 AND 13. IS CONTINUITY PRESENT?

YES

REMOVE JUMPER. REPAIR OR REPLACE SHIELDED WIRE 83420 ON APU.

NO


REFER TO WIRING DIAGRAM TASK 15-6.3 FOR FURTHER DETAILS.
**FAULT ISOLATION PROCEDURE**

**INITIAL SETUP**

References:
- TM 55-1520-240-23
- TM 55-2835-205-23
- TM 55-4920-431-13

Applicable Configurations:
- All

Tools:
- Aircraft Mechanic’s Tool Kit, NSN 5180-00-323-4692
- Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
- Multimeter
- APU Tester 161226-200

Equipment Condition:
- TM 55-1520-240-23
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power Off

Materials:
- Cloth (E120)
- Tape (E385)

Personnel Required:
- Aircraft Mechanic
- Medium Helicopter Repairer

**WARNING**

All regulations and instructions for handling fuels shall be strictly observed.
15-6.12 APU MOTORS BUT DOES NOT START, ESU BITE INDICATES OR THEN (FAILURE TO START) (Continued)

GO TO NEXT PAGE
15-6.12 APU MOTORS BUT DOES NOT START, ESU BITE INDICATES ○ ○ ○ ○ OR ○ ○ ○ ○ THEN ○ ○ ○ ○ (FAILURE TO START) (Continued)

NO

DISCONNECT PLUG 136P4 FROM APU FUEL VALVE. CHECK FOR GROUND ON PLUG 136P4 PIN B, IS GROUND PRESENT?

NO

SET APU SW TO OFF, OR CONNECT APU IN CASE POSITION. CHECK FOR GROUND ON PLUG 136P4 PIN B, IS GROUND PRESENT?

YES

LOCATE OPEN IN WIRE W654-12-22 OR W625-60122 BETWEEN PLUG 136P4 AND FUSE- LADGE GROUND. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

TIGHTEN NUT. DISCONNECT FUEL NOZZLE FROM START PLUG 136P1 FROM ESU, CHECK FOR RESISTANCE BETWEEN PLUS 136P1 PIN 10 AND 17, IS RESISTANCE LESS THAN 500 OHMS?

YES

DISCONNECT EXCITING PLUG. CHECK FOR CONTINUITY BETWEEN PLUG PIN B AND TERMINAL 3 CENTERD ON APU. IS CONTINUITY PRESENT?

NO

LOCATE OPEN IN WIRE P1B20 BETWEEN EXCITING PLUG AND TB30-3. REPAIR OR REPLACE WIRE AS REQUIRED.

YES

CHECK FOR CONTINUITY BETWEEN PLUG PIN A AND APU GROUND, IS CONTINUITY PRESENT?

NO

LOCATE OPEN IN WIRE P1B30N BETWEEN EXCITING PLUG AND TB30-5. REPAIR OR REPLACE WIRE AS REQUIRED.

YES

LOCATE OPEN IN WIRE W654-12-22 OR W625-60-22 BETWEEN PLUG 136P4 AND APU FAULT RELAY AND GROUND, IS 28VDC PRESENT?

YES

REPLACE START FUEL VALVE CONNECT EXCITING PLUG AND ESU PLUG, REPEAT OPERATIONAL CHECK TASK 15-1.5. DOES APU ON CAPSULE COME ON?

NO

REPLACE START FUEL NOZZLE OR NOZZLE FILTER.

NO

REPLACE RESTRICTOR.

NO

REPLACE EXCITING CABLE. CONNECT EXCITING PLUG. REPEAT OPERATIONAL CHECK TASK 15-1.5. DOES APU ON CAPSULE COME ON?

YES

FAULT CORRECTED.

NO

REPLACE EXCITING.

NO

REPLACE APU FUEL VALVE.

YES

REPLACE APU FUEL VALVE.

NO

REPLACE RESTRICTOR.

NO

REPLACE RESTRICTOR.

NO

REPLACE RESTRICTOR.

YES

FAULT CORRECTED.

NO

REPLACE APU FAULT RELAY.

NO

REPLACE FUEL PUMP.

YES

FAULT CORRECTED.

NO

REPLACE APU FAULT RELAY.

NO

REPLACE FUEL PUMP.

YES

FAULT CORRECTED.

NO

REPLACE FUEL PUMP.

YES

FAULT CORRECTED.
15-6.12 APU MOTORS BUT DOES NOT START, ESU BIT E INDICATES ○ ○ ○ ○ OR ○ ○ ○ ○ THEN ○ ○ ○ (FAILURE TO START) (Continued)
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations
All I

Tools:
- Aircraft Mechanic’s Tool Kit, NSN 5180-00-323-4692
- Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
- Multimeter
- APU Tester 161226-200

Materials:
- None
- Battery Connected
- Electrical Power On
- Hydraulic Power Off

Personnel Required:
- Aircraft Electrician
- Medium Helicopter Repairer

References:
- TM 55-1520-240-23
- TM 55-2835-203-23
- TM 55-1500-343-23
- TM 55-4920-431-13

Equipment Condition:
- TM 55-1520-240-23
- Battery Connected
- Electrical Power On
- Hydraulic Power Off

Additional diagrams showing electrical connections and components involved in APU operations.
15-6.13 APU MOTORS BUT DOES NOT START, ESU BITE INDICATES THEN (FAILURE TO START) (Continued)

15-124 Change 23
15-6.13 APU MOTORS BUT DOES NOT START, ESU BITE INDICATES \(\circ\) \(\circ\) \(\circ\) \(\circ\) THEN \(\circ\) \(\circ\) \(\circ\) \(\circ\) \(\circ\) (FAILURE TO START) (Continued)

1. **TESTER SWITCH IS DOWN AND DISCONNECT TESTER. DISCONNECT PLUG 136P1 FROM ESU. CHECK FOR RESISTANCE BETWEEN PLUG 136P1 PIN 9 AND 10. IS RESISTANCE LESS THAN 500 OHMS?**

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15-6.13 APU MOTORS BUT DOES NOT START, ESU BITE INDICATES • • • • • THEN • • • • • (FAILURE TO START) (Continued)

END OF TASK
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
- Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
- Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
- APU Tester 161226-200

Equipment Condition:
- TM 55-1520-240-23
- Battery Connected
- Electrical Power On
- Hydraulic Power On
- APU Tester Connected Between ESU and Airframe
- Wiring. All Tester Switches Set Down

Materials:
- None

Personnel Required:
- Aircraft Electrician
- Medium Helicopter Repairer

References:
- TM 55-1520-240-23
- TM 55-2835-203-23
- TM 55-4920-431-13
15-6.14 APU STARTS BUT SHUTS DOWN, ESU BITE INDICATES (OVERSPEED) (CONTINUED)

15-6.14

YES

FAULT CORRECTED.

NO

SET TESTER SWITCHES DOWN AND DISCONNECT TESTER REPLACE ESU

SET APU SW TO RUN SET APU TESTER MASTER AND LOCAL/REMOTE SWITCHES UP WATCH TESTER SPEED INDICATOR AND START FUEL LT SET TESTER START RUN STOP SW UP DOES START FUEL LT GO OUT WHEN SPEED INDICATOR READING PASSES 70%?

YES

NO

REPLACE APU ACCELERATION CONTROL

WITH A

CABLE FROM AIRFRAME

CABLE TO ENGINE

WITH

APU ENGINE

APU HARNESS

ESU

START FUEL LT

TEMP INDICATOR

MASTER SWITCH

START RUN STOP SWITCH

LOCAL REMOTE SWITCH

APU TESTER

136P2

136P1

P2 AC HARNESS

J1 ENGINE HARNESS

P1 ESU

P2 ESU

P5 ESU

END OF TASK
Fault Isolation Procedure

Initial Setup

Equipment Condition:
- TM 55-1520-240-23
- Battery Connected
- Electrical Power On
- Hydraulic Power On

Applicable Configurations:
- All

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

General Safety Instructions:

WARNING

All regulations and instructions for handling fuels shall be strictly observed

Materials:
- Cloth (E120)
- Tape (E385)

Personnel Required:
- Medium Helicopter Repairer (2)

References:
- TM 55-1520-240-23
- TM 55-2835-203-23

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15-6.15 APU STARTS BUT SHUTS DOWN, ESU BITE INDICATES (CONTINUED)

DISCONNECT AND INSULATE APU IGNITION EXCITER PLUG WITH TAPE. LOOSEN NUT ON OUTPUT LINE ON APU FUEL INLET FILTER. PLACE CLOTH AROUND NUT. SET APU SW TO RUN. DOES CLOTH GET DAMP WITH FUEL RAPIDLY?

YES

SET APU SW TO OFF. REMOVE FUEL PUMP FILTER AND CLEAN IT. INSTALL FILTER. CONNECT PLUG TO EXCITER. REPEAT OPERATIONAL CHECK. DOES APU ON CAPSULE STAY ON?

YES

FAULT CORRECTED.

NO

REPLACE DAMAGED FUEL INJECTORS.

NO

REPLACE FUEL INJECTORS AND CHECK FOR DAMAGE. REFER TO TM 55-2835-205-23. ARE ANY DAMAGED?

YES

REPLACE APU ACCELERATION CONTROL.

NO
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations
All

Tools
Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915
APU Tester 161226-200

Equipment Condition:
TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power On
APU Tester Connected Between ESU and Airframe
Wiring. All Tester Switches Set Down

Materials
None

Personnel Required
Aircraft Electrician
Medium Helicopter Repairer

References
TM 55-1520-240-23
TM 55-2835-203-23
TM 55-1500-343-23
TM 55-4920-431-13

GO TO NEXT PAGE
15-6.16 APU STARTS BUT SHUTS DOWN, ESU BITE INDICATES (OVERTEMPERATURE) (CONTINUED)

END OF TASK
FAULT ISOLATION PROCEDURE

INITIAL SETUP
Applicable Configurations:
All
Tools:
Aircraft Mechanic's Tool Kit,
NSN 5180-00-323-4692
APU Tester 161226-200
Source Low Pressure Compressed Air
Goggles
Materials:
None
Personnel Required:
Medium Helicopter Repairer
References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23
Battery Disconnected
Electrical Power Off
Hydraulic Power Off

General Safety Instructions:

**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.
15-6.17 APU STARTS AND RUNS THEN SHUTS DOWN, ESU BITE INDICATES (OVERTEMPERATURE) (HOT START) (CONTINUED)

15-134 Change 8
15-6.18 APU STARTS BUT SHUTS DOWN, ESU BITE INDICATES ○ ○ ○ (OPEN THERMOCOUPLE)

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations
All

Tools
Electrical Repairer’s Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials
None

Personnel Required
Aircraft Electrician

References
TM 55-1520-240-23
TM 55-1500-343-23

Equipment Condition:
TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power Off

DISCONNECT PLUG 136P1 FROM ESU. CHECK FOR RESISTANCE BETWEEN PINS 1 AND 2 OF PLUG 136P1. IS 3 TO 5 OHMS PRESENT?

YES

REPLACE ESU.
NOTE
BEFORE REPLACING ANY ESU, DISCONNECT, CLEAN, AND TREAT CONNECTORS IAW TM 55-1500-343-23, PARA 4-76 THRU 4-87. RECONNECT AND REPEAT THE CHECKS.

NO

DISCONNECT PLUG 136P6 FROM APU. CHECK FOR CONTINUITY BETWEEN PLUG 136P1 PINS 1 AND 2 AND PLUG 136P6 PINS 1 AND 2. IS CONTINUITY PRESENT?

YES

REPLACE APU THERMOCOUPLE AND HARNESS.

NO

REPAIR OR REPLACE THERMOCOUPLE WIRE W668-138 AL RED AND W668-139 CR YEL.

WARNING
REFER TO WIRING DIAGRAM IN TASK 15-6.5 FOR FURTHER DETAILS.
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations
All

Tools
Electrical Repairer's Tool Kit,
NSN 5160-00-3234915
Multimeter

Materials
None

Personnel Required
Aircraft Electrician

References
TM 55-1520240-23
TM 55-1500-343-23

Equipment Condition:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off

References
TM 55-1520240-23
TM 55-1500-343-23

Applicable Configurations
TM 55-1500-343-23
All

Tools
Electrical Repairer's Tool Kit,
NSN 5160-00-3234915
Multimeter

Materials
None

Personnel Required
Aircraft Electrician
15-7  APU TESTER
### PARAGRAPH 15-7

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**APU TESTER**

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**ELECTRONIC SEQUENCE UNIT (ESU) TROUBLESHOOTING**

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<td>FUNCTION OF CONTROLS AND INDICATORS ON APU TESTER</td>
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**TABLE 15-7.1**

**FUNCTION OF CONTROLS AND INDICATORS ON APU TESTER**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>NOMENCLATURE</th>
<th>FUNCTION</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>SPEED meter</td>
<td>Displays % engine speed from 0 to 120.</td>
</tr>
<tr>
<td>2</td>
<td>Color coded LED indicators</td>
<td>Lighted: a. BYPASS (grn) - indicates voltage is applied to start bypass valve. b. MAIN POWER (red) - indicates main power is on. c. MALF (red) - indicates malfunction has occurred and unit is shutdown.Check indication on ESU is checked for cause. d. READY TO LOAD (gm) - indicates APU is ready to accept load. e. START COMMAND (gm) - indicates start command is initiated. f. MAX. AIR (red) - indicates max. fuel voltage on, approximately 90% RPM + 5 sec. time out. g. OIL PRESSURE (yel) - indicates Oil Pressure. h. BLEED VALVE OPEN (gm) - (Not applicable) m. REMOTE (red) - indicates remote analog converter selected. (Actual magnetic pickup and thermocouple probe.)</td>
</tr>
<tr>
<td>3</td>
<td>MASTER switch</td>
<td>Controls 28 VDC power to Tester and ESU.</td>
</tr>
<tr>
<td>4</td>
<td>START/ RUN /STOP switch</td>
<td>Initiates start sequence of ESU and generates start signal input to tester.</td>
</tr>
<tr>
<td>5</td>
<td>BLEED AIR OPEN/CLOSE switch</td>
<td>(Not applicable)</td>
</tr>
<tr>
<td>6</td>
<td>OVERSPEED TEST switch</td>
<td>(Not applicable)</td>
</tr>
<tr>
<td>7</td>
<td>MAX. AIR switch</td>
<td>(Not applicable)</td>
</tr>
<tr>
<td>8</td>
<td>ECONO AIR switch</td>
<td>(Not applicable)</td>
</tr>
<tr>
<td>9</td>
<td>LOCAL/REMOTE switch</td>
<td>Selects local or remote analog converter. LOCAL (down position) selects analog converter in aircraft. REMOTE (up position) selects analog converter in tester. Always used in the REMOTE position.</td>
</tr>
<tr>
<td>10</td>
<td>TACH INPUT jacks</td>
<td>To monitor magnetic pickup input and input simulation signals.</td>
</tr>
<tr>
<td>11</td>
<td>BLEED VALVE VOLTS/CURRENT jacks</td>
<td>(Not applicable)</td>
</tr>
<tr>
<td>12</td>
<td>DIAGNOSTIC connector</td>
<td>(Not applicable)</td>
</tr>
<tr>
<td>13</td>
<td>Connector J5</td>
<td>Output connector for harness connection to APU.</td>
</tr>
<tr>
<td>14</td>
<td>Connector J1</td>
<td>Input connector for harness connection to ESU.</td>
</tr>
<tr>
<td>15</td>
<td>Connector J2</td>
<td>Input /Output connector for harness connection to ESU and Airframe harness.</td>
</tr>
<tr>
<td>16</td>
<td>TEMP meter</td>
<td>Displays exhaust gas temperature (EGT) in °F from 0 to 1500.</td>
</tr>
<tr>
<td>17</td>
<td>PANEL Lights</td>
<td>Lighted - indicates 28 VDC power is available to tester. Illuminates panel meters.</td>
</tr>
</tbody>
</table>

---

Refer to Paragraph 15-7.3 for location of items.
15-7.3 APU TESTER OPERATION

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit.
NSN 5180-00-329-4915
APU Tester 161226-200

Materials:
None

Personnel Required:
Aircraft Electrician

References:
TM 55-1520-240-23
TM 55-4920-431-13

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
External Electrical Power Off

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Turn pressure equalizer knob to OPEN.</td>
<td>Pressure on cover is released.</td>
</tr>
<tr>
<td>2. Open case.</td>
<td></td>
</tr>
<tr>
<td>3. Remove P1, P2, and P5 harnesses.</td>
<td></td>
</tr>
<tr>
<td>4. Inspect equipment for any physical damage.</td>
<td>Repair or replace as required.</td>
</tr>
<tr>
<td>5. Zero meters.</td>
<td></td>
</tr>
<tr>
<td>6. Connect harnesses to the applicable J1, J2, and J5 connectors on test set.</td>
<td></td>
</tr>
<tr>
<td>7. Remove 136P1 and 136P2 from ESU and connect to the corresponding cable connectors of harnesses.</td>
<td></td>
</tr>
<tr>
<td>8. Connect the remaining harness plugs to J1 and J2 of ESU.</td>
<td>Wiring should be similar to that shown in accompanying diagram.</td>
</tr>
<tr>
<td>9. Perform test in accordance with applicable task.</td>
<td></td>
</tr>
</tbody>
</table>

NOTE

During tests, leave BLEED AIR OPEN/CLOSE switch, MAX. AIR switch, and ECONO AIR switch in down position.

10. After completion of task, return all tester switches to DOWN position.

11. Disconnect harnesses and stow in cover.

12. Close cover and rotate pressure equalizer knob to CLOSE.

13. Report any tester operation problems on proper form as described in DA Pam 738-751.

FOLLOW-ON MAINTENANCE:
TM 55-4920-431-13
REFER TO TASK BEING PERFORMED.

GO TO NEXT PAGE
15-7.3 APU TESTER OPERATION (Continued)

NOTES:
DISCONNECT 136P2 FROM ESU J2 AND CONNECT TO TESTER AS SHOWN.
DISCONNECT 136P1 FROM ESU J1 AND CONNECT TO TESTER AS SHOWN.
136P2 AND 136 P1 ARE AIRCRAFT CONNECTORS. ALL OTHER
DESIGNATIONS APPLY TO APU TESTER HARNESSES.

END OF TASK

Change 15
15-143/(15-144 blank)
CHAPTER 16

MISSION EQUIPMENT TROUBLESHOOTING
**CHAPTER 16**

**MISSION EQUIPMENT TROUBLESHOOTING**

**CHAPTER OVERVIEW**

Chapter 16 contains procedures for Mission Equipment troubleshooting. Each system and failure symptom is listed below. Included in this chapter are locations and views of all electrical connectors, receptacles, relays, and ground connections for the Mission Equipment.

Refer to TM 55-1520-240-23 for required maintenance procedures.

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### FAILURE SYMPTOM LIST

#### EXTERNAL CARGO HOOK SYSTEM

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<td>FORWARD OR AFT HOOK LOADED LIGHT DOES NOT COME ON WHEN PRESSED</td>
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<td>CARGO HOOK PWR EMER REL CIRCUIT BREAKER DOES NOT STAY CLOSED</td>
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<td>CARGO HOOK CONT EMER REL CIRCUIT BREAKER DOES NOT STAY CLOSED</td>
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<td>CARGO HOOK PWR NORM RLSE CIRCUIT BREAKER DOES NOT STAY CLOSED</td>
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<tr>
<td>CARGO HOOK CONT NORM RLSE CIRCUIT BREAKER DOES NOT STAY CLOSED</td>
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<td>FWD HOOK OPEN CAPSULE LIT WHEN FORWARD CARGO HOOK CLOSED</td>
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<td>MID HOOK OPEN CAPSULE LIT WHEN CENTER CARGO HOOK CLOSED</td>
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<tr>
<td>AFT HOOK OPEN CAPSULE LIT WHEN AFT CARGO HOOK CLOSED</td>
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<td>DUAL HOOK FAULT CAPSULE LIT</td>
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<td>DUAL HOOK RELAY BOX LIGHT(S) DO NOT COME ON WHEN PRESSED</td>
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<td>RELEASE SW FAIL LIGHT OR GROUND RELAY ACTIVATED LIGHT NOT ON WHEN COPILOT’S CARGO HOOK RELEASE SWITCH PRESS</td>
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<td>CENTER CARGO HOOK DOES NOT OPEN</td>
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<td>AFT CARGO HOOK DOES NOT OPEN</td>
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<td>AFT HOOK OPEN CAPSULE DOES NOT COME ON WHEN AFT CARGO HOOK OPENS</td>
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<tr>
<td>CARGO HOOK OR HOOKS DO NOT RELEASE WHEN EMER SWITCH SET TO REL ALL</td>
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<td>CENTER CARGO HOOK DOES NOT STAY OPEN FOR 10 TO 14 SECONDS AFTER EMERG SWITCH RE-LEASED FROM REL ALL</td>
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<td>FORWARD OR AFT CARGO HOOK DOES NOT OPEN WHEN TANDEM HOOK RELEASE LEVER IS PULLED</td>
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Change 24  16-2.1
### FLARE DISPENSER SYSTEM

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<td>LDG GR SW STATUS READY TO FIRE, OR LDG GR SW BYPASS LIGHTS DO NOT COME ON WHEN Pressed</td>
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<td>READY TO FIRE LIGHT DOES NOT COME ON LDG GR SW STATUS AND READY TO FIRE AND LDG GR SW BYPASS LIGHTS DO NOT COME ON</td>
<td>16-2.8</td>
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<tr>
<td>FLARE COUNTER SEQUENCES FROM 30 TO 00 WHEN DISP CONT PANEL ARM SAFE SWITCH SET TO ARM</td>
<td>16-2.9</td>
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<tr>
<td>ARM LIGHT DOES NOT COME ON WHEN ARM SAFE SWITCH SET TO ARM</td>
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<td>FLARE COUNTER OR TEST SET LIGHTS DO NOT CHANGE WHEN PILOT OR COPILOT FLARE DISP PRESSED AND RELEASED</td>
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<td>FLARE COUNTER OR TEST SET LIGHTS DO NOT CHANGE WHEN A CABIN FIRING SWITCH PRESSED AND RELEASED</td>
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<td>EAPS 1 FAN. FAN CONT OR BYPASS DOORS CIRCUIT BREAKER WILL NOT STAY CLOSED</td>
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<td>EAPS 2 FAN. FAN CONT OR BYPASS DOORS CIRCUIT BREAKER WILL NOT STAY CLOSED</td>
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<td>NO. 1 OR NO. 2 ENG EAPS BYPASS DOORS OPEN LIGHT DOES NOT COME ON WHEN Pressed</td>
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<td>115 VAC IS NOT PRESENT WITH EAPS ENG 1 FAN SWITCH SET TO ON</td>
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<td>28 VDC IS NOT PRESENT ON RECEPTACLE 151J1 PIN U WITH EAPS ENG 1 DOORS SWITCH AT OPEN</td>
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<td>GROUND IS NOT PRESENT ON RECEPTACLE 151J1 PIN a WITH EAPS ENG 1 DOORS SWITCH AT OPEN</td>
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<td>28 VDC IS NOT PRESENT ON RECEPTACLE 151J1 PIN a WITH EAPS ENG 1 DOORS SWITCH AT CLOSE</td>
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<tr>
<td>GROUND IS NOT PRESENT ON RECEPTACLE 151J1 PIN U WITH EAPS ENG 1 DOORS SWITCH AT CLOSE</td>
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<td>EAPS 1 FAIL CAPSULE DOES NOT COME ON</td>
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<td>28 VDC IS NOT PRESENT ON RECEPTACLE 151J2 PIN U WITH EAPS ENG 2 DOORS SWITCH AT OPEN</td>
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<td>GROUND IS NOT PRESENT ON RECEPTACLE 151J2 PIN a WITH EAPS ENG 2 DOORS SWITCH AT OPEN</td>
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<td>28 VDC IS NOT PRESENT ON RECEPTACLE 151J2 PIN a WITH EAPS ENG 2 DOORS SWITCH AT CLOSE</td>
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<td>GROUND IS NOT PRESENT ON RECEPTACLE 151J2 PIN U WITH EAPS ENG 2 DOORS SWITCH AT CLOSE</td>
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### HEAD UP DISPLAY SYSTEM

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<td>FAIL LAMP ON CCU IS ON</td>
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<td>ON/AND OR FAIL LAMPS WILL NOT ILLUMINATE</td>
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<td>PILOT’S AND/OR COPILOT’S DISPLAY HAS NO DISPLAY</td>
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<td>PILOT’S AND/OR COPILOT’S DISPLAY REMAINS AT MAXIMUM INTENSITY</td>
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<td>PDU AND CPDU TEST DISPLAY INDICATES INCORRECT TYPE AIRCRAFT</td>
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<td>PILOT CANNOT SELECT DECLUTTER ON CCU</td>
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<td>COPILOT CANNOT SELECT DECLUTTER ON CCU</td>
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<td>CANNOT CYCLE THROUGH MODES AT PILOT’S THRUSTER GRIP</td>
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</tr>
<tr>
<td>CANNOT CYCLE THROUGH DECLUTTER AT PILOT’S THRUSTER GRIP</td>
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<td>PILOT’S BRT CONTROL ON THRUSTER DOES NOT VARY DISPLAY INTENSITY</td>
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<td>PILOT’S DIM CONTROL ON THRUSTER DOES NOT VARY DISPLAY INTENSITY</td>
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<td>COPILOT’S THRUSTER GRIP</td>
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<td>COPILOT’S BRT CONTROL ON THRUSTER DOES NOT VARY DISPLAY INTENSITY</td>
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<tr>
<td>COPILOT’S DIM CONTROL ON THRUSTER DOES NOT VARY DISPLAY INTENSITY</td>
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<td>CANNOT VARY PILOT’S DISPLAY LEFT/RIGHT</td>
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<td>CANNOT VARY COPILOT’S DISPLAY UP/DOWN</td>
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<tr>
<td>Cannot cycle through pilot's declutter at CCU or pilot's thruster grip HUD control switch</td>
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<table>
<thead>
<tr>
<th>Symptom</th>
<th>Task</th>
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<tr>
<td>Cannot cycle through copilot's mode selection at CCU or copilot's thruster grip HUD control switch</td>
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<tr>
<td>Cannot cycle through copilot's declutter at CCU or copilot's thruster grip HUD control switch</td>
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<th>Symptom</th>
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<td>Landing gear switch status light is on</td>
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<td>Landing gear switch status, ready to fire, or landing gear bypass lights do not light during press to test</td>
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<td>Landing gear switch status light does not come on</td>
<td>16-5.7</td>
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<thead>
<tr>
<th>Symptom</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ready to fire light does not come on</td>
<td>16-5.8</td>
</tr>
<tr>
<td>Countermeasures dispenser test set does not indicate a fired expendable when copilot's flare disp switch is pressed</td>
<td>16-5.9</td>
</tr>
<tr>
<td>Countermeasures dispenser test set does not indicate a fired expendable when pilot's flare disp switch is pressed</td>
<td>16-5.10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Countermeasures dispenser test set does not indicate a fired expendable when one crew dispense switch is pressed</td>
<td>16-5.11</td>
</tr>
<tr>
<td>DCDU displays incorrect quantity of expendables</td>
<td>16-5.12</td>
</tr>
<tr>
<td>Landing gear bypass switch light does not come on</td>
<td>16-5.13</td>
</tr>
</tbody>
</table>

### COUNTERMEASURES DISPENSER SYSTEM

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>No or improper altitude (MSL) or airspeed displayed</td>
<td>16-4.29</td>
</tr>
<tr>
<td>No or improper trim (slide ball) displayed</td>
<td>16-4.30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Countermeasures dispenser test set does not indicate a fired expendable when one crew dispense switch is pressed</td>
<td>16-5.11</td>
</tr>
<tr>
<td>DCDU displays incorrect quantity of expendables</td>
<td>16-5.12</td>
</tr>
<tr>
<td>Landing gear bypass switch light does not come on</td>
<td>16-5.13</td>
</tr>
<tr>
<td>REF</td>
<td>DESIG</td>
</tr>
<tr>
<td>-----</td>
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</tr>
<tr>
<td>GD005</td>
<td>150</td>
</tr>
<tr>
<td>GD006</td>
<td>150</td>
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</table>

**Continued on next page...**
<table>
<thead>
<tr>
<th>REF PART</th>
<th>REF PART</th>
</tr>
</thead>
<tbody>
<tr>
<td>300J52 M83723-74A225SN</td>
<td>42 AFT CROWN</td>
</tr>
<tr>
<td>300J53 M83723-74A225SN</td>
<td>42 AFT CROWN</td>
</tr>
<tr>
<td>300P53 M83723-75A225SN</td>
<td>42 AFT CROWN</td>
</tr>
<tr>
<td>300J54 M83723-74A2461N</td>
<td>43 AFT CROWN</td>
</tr>
<tr>
<td>300P54 M83723-75A2461N</td>
<td>43 AFT CROWN</td>
</tr>
<tr>
<td>300U64 M83723-73A24617</td>
<td>43 CONSOLE – UNDERFLOOR</td>
</tr>
<tr>
<td>300P64 M83723-76A24617</td>
<td>43 CONSOLE – UNDERFLOOR</td>
</tr>
<tr>
<td>300J68 M83723-73A22556</td>
<td>42 HEATER COMPARTMENT – OVHD</td>
</tr>
<tr>
<td>300P68 M83723-76A22556</td>
<td>42 HEATER COMPARTMENT – OVHD</td>
</tr>
<tr>
<td>P2000R D38999/26WC98S N 160 LH ELECTRONICS BAY</td>
<td></td>
</tr>
<tr>
<td>P2001R D38999/26WH35SA 162 LH ELECTRONICS BAY</td>
<td></td>
</tr>
<tr>
<td>P2002R D38999/26WH35SN 162 LH ELECTRONICS BAY</td>
<td></td>
</tr>
<tr>
<td>P2003R MS27506E13835P 164 BULKHEAD 95 PILOT’S SIDE</td>
<td></td>
</tr>
<tr>
<td>P2004R MS27505E13825P 164 BULKHEAD 95 COPILOT’S SIDE</td>
<td></td>
</tr>
<tr>
<td>P2005R D38999/26WD35SN 166 UPPER CONSOLE</td>
<td></td>
</tr>
<tr>
<td>P2009R D38999/26WA35SN 168 LH ELECTRONICS BAY</td>
<td></td>
</tr>
</tbody>
</table>
MISSION EQUIPMENT ELECTRICAL COMPONENT
LOCATION AND CONFIGURATION LIST (Continued)

16-2.6 Change 3
MISSION EQUIPMENT COMPONENT LOCATION AND CONFIGURATION LIST (Continued)

RECEPTACLE

PLUG

END OF TASK
16-1 EXTERNAL CARGO HOOK SYSTEM
16-1 EXTERNAL CARGO HOOK SYSTEM

16-1.1 EXTERNAL CARGO HOOK SYSTEM SCHEMATIC - HOOK RELEASE MODES

NOTES:
1. CARGO HOOKS SHOWN IN LATCHED POSITION.
2. HYDRAULIC SYMBOLS
   - PRESSURE
   - RETURN
   - RELEASE OR LATCH
   - FLEXIBLE HOSE
   - VENT, DRAIN
3. HOOK MECHANICAL LEVERS NOT DETAILED.

NORMAL RELEASE
CONTROL, FROM COCKPIT
OR CABIN. SEE TRIPLE
CARGO HOOK SCHEMATIC,
NORMAL RELEASE
CIRCUIT.

EMERGENCY
RELEASE CONTROL,
FROM COCKPIT,
IF THE TRIPLE
CARGO HOOK SCHEMATIC,
EMERGENCY RELEASE
CIRCUIT.

FORWARD CARGO HOOK
ROTARY SOLENOID
MANUAL RELEASE

CENTER CARGO HOOK
EMERGENCY
RELEASE VALVE
MANUAL
RELEASE
WITH

CENTER CARGO HOOK
CHARGING
VALVE

AFT CARGO HOOK
ROTARY SOLENOID
MANUAL RELEASE

TO NO. 1
POWER TRANSFER
MODULE AND
RESERVE
HOOK/CARGO
WINCH SYSTEMS

TO NO. 2
POWER TRANSFER
MODULE

FROM
UTILITY HYDRAULIC
SYSTEM PRESSURE
CONTROL MODULE AND
RETURN CONTROL MODULE
PTU PORTS.

GO TO NEXT PAGE
EXTERNAL CARGO HOOK SYSTEM WIRING DIAGRAM (Continued)

16-1.2.1 EXTERNAL CARGO HOOK SYSTEM WIRING DIAGRAM (Continued)

WITH 2A

DUAL HOOK RELAY BOX 1MA

FUSE BOX

WIRE A

ELECTRIC OPERATING PANEL

WIRE B

END OF TASK

Change 23  16-5
16-1.3 EXTERNAL CARGO HOOK SYSTEM VISUAL CHECK

INITIAL SETUP

**Applicable Configurations:**
All

**Tools:**
- Aircraft Mechanic’s Tool Kit.
  - NSN 5180-00-323-4692

**Materials:**
- NSN 5180-00-323-4692 (TM 55-1520-240-23)
  - Battery Disconnected
  - Electrical Power Off
  - Center Cargo Hook Access Panel Open
  - Center Cargo Hook Unstowed
  - Center Tunnel Cover Open

**Equipment Condition:**
- Electrical Power Off
- None
- Hydraulic Power Off

**Personnel Required:**
- 67U20 Medium Helicopter Repairer

**TASK RESULT**

1. **Check forward cargo hook (1).**

   If load beam (2) is open, close it. If it does not stay closed check rigging of tandem hook release rigging. Adjust as required (TM 55-1520-240-23). If rigging is okay and load beam is still open, replace cargo hook. If control assembly (3) is damaged, replace it. If keeper (4) is damaged, replace it. If wire harness (5) is damaged replace it. If window (6) is damaged, replace it.

2. **Repeat step (1) for aft cargo hook (7).**

3. **Check center cargo hook (8).**

   If hook (9) is open, close it. If it does not stay closed service cargo hook actuator and check manual release cams (TM 55-1520-240-23). If hook still cannot be closed, replace cargo hook (8). If keeper (10) is forward of hook (9) or damaged, adjust or replace it. If release mechanism (11) is damaged, replace it. If wire harness or hydraulic hose (12 or 13) is damaged, replace it.
16-1.3 EXTERNAL CARGO HOOK SYSTEM VISUAL CHECK

(Continued)

4. Lift emergency cargo hook release lever (14) from stowed position. Check lever mechanism (15).
5. Check hoist operator's grip (16) and cable assembly (17).
6. Check CARGO HOOK switch (18).
7. Check dual hook relay box (19).
8. Check emergency hook release relay box (21).

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lift emergency cargo hook release lever (14) from stowed position. Check lever mechanism (15).</td>
<td>If lever (14) or any part of mechanism (15) is loose or damaged, tighten or replace it as required.</td>
</tr>
<tr>
<td>Check hoist operator's grip (16) and cable assembly (17).</td>
<td>If grip (16) is damaged, replace it. If cable assembly (17) is damaged, replace it.</td>
</tr>
<tr>
<td>Check CARGO HOOK switch (18).</td>
<td>If switch (18) is loose or damaged, tighten or replace it as required.</td>
</tr>
<tr>
<td>Check dual hook relay box (19).</td>
<td>If box (19) is loose or damaged, tighten or replace it as required. If wiring or connectors to box are damaged, repair or replace them as required.</td>
</tr>
<tr>
<td>Check emergency hook release relay box (21).</td>
<td>If box (21) is loose or damaged, tighten or replace it as required. If wiring or connectors to box are damaged, repair or replace them as required.</td>
</tr>
</tbody>
</table>
16-1.3 EXTERNAL CARGO HOOK SYSTEM VISUAL CHECK
(Continued)

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. Check HOIST/CARGO HOOK panel (22).</td>
<td>If switch (23 or 24), knob (25), or light (26 or 27) is loose or damaged, replace panel (22).</td>
</tr>
<tr>
<td>10. Check cargo hook normal release valve (28).</td>
<td>If valve (28) is loose or damaged, tighten or replace it. If wiring or connector to valve is damaged, repair or replace it as required.</td>
</tr>
</tbody>
</table>

FOLLOW-ON MAINTENANCE:

TM 55-1520-240-23:
Close center tunnel cover.

END OF TASK
16-1.4  EXTERNAL CARGO HOOK SYSTEM OPERATIONAL CHECK

INITIAL SETUP
Applicable Configurations:
All

Tools:
- Rope, 15 Foot
- Without 35 Load 20-25 Pounds (3)
- With 35 Load, 20-25 Pounds (2) Fwd and Aft Hook
- Load, 45-50 Pounds (1) Center Hook
- Wood Plank, 2-Inches x 4-Inches x 4-Feet
- Dial Indicating Scale, 0 to 50 Pounds
- Stopwatch
- Inspection Mirror

Materials:
- None

Personnel Required:
- Medium Helicopter Repairer (2)

References:
- TM 55-1520-240-23
- Equipment Condition:
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power On
  - Visual Check Of External Cargo Hook System Performed [Task 16-1.3]
  - Area Beneath Three Cargo Hooks Clear Of Obstructions

Equipment Condition:
- Without

35 Load 20-25 Pounds (3) TM 55-1520-240-23:
- With

35 Load, 20-25 Pounds (2) Fwd and Aft Hook Battery Connected
- Load, 45-50 Pounds (1) Center Hook Electrical Power On
- Hydraulic Power On
- Visual Check Of External Cargo Hook System Performed [Task 16-1.3]
- Area Beneath Three Cargo Hooks Clear Of Obstructions

TASK RESULT

1. Check that MASTER switch (1) is OFF.
   If switch (1) is not OFF, set it to OFF.

2. Check that HOOK SELECT switch (2) is at FWD.
   If switch (2) is not at FWD, set it to FWD.

3. Check that switch guard (3) over EMERG switch is down.
   If switch guard (3) is up, close it.

4. Check that CARGO HOOK switch (4) is at RMTE.
   If switch (4) is not at RMTE, set it to RMTE.

5. Check FWD and AFT HOOK LOADED LIGHT lights (5 and 6).
   Both lights (5 and 6) shall be out. If either light is on, go to [Task 16-1.5]

6. Press and release FWD HOOK LOADED light (5).
   Light (5) shall momentarily come on. If it does not, go to [Task 16-1.6]

7. Press and release AFT HOOK LOADED light (6).
   Light (6) shall momentarily come on. If it does not, go to [Task 16-1.6]

8. Check that CARGO HOOK EMR REL PWR and CONT circuit breakers (7 and 8) are closed.
   If CARGO HOOK EMER REL PWR or CONT circuit breaker (7 or 8) is open, close it.
   If EMER REL PWR circuit breaker (7) opens again, go to [Task 16-1.7]
   If EMER REL CONT circuit breaker (8) opens again, go to [Task 16-1.8]

9. Check that CARGO HOOK NORM RLSE PWR and CONT circuit breakers (9 and 10) are closed.
   If CARGO HOOK NORM RLSE PWR or CONT circuit breaker (9 or 10) is open, close it.
   If NORM RLSE PWR circuit breaker (9) opens again, go to [Task 16-1.9]
   If NORM RLSE CONT circuit breaker (10) opens again, go to [Task 16-1.10]
16-1.4 EXTERNAL CARGO HOOK SYSTEM OPERATIONAL CHECK (Continued)

10. Check FWD HOOK OPEN, MID HOOK OPEN, AFT HOOK OPEN, and DUAL HOOK FAULT capsules (11, 12, 13, and 14).

If FWD HOOK OPEN capsule (11) is lit, go to task 16-1.11. If MID HOOK OPEN capsule (12) is lit, go to task 16-1.12. If AFT HOOK OPEN capsule (13) is lit, go to task 16-1.13. If DUAL HOOK FAULT capsule (14) is lit, go to task 16-1.14.

11. Check center cargo hook gage (15).

**WARNING**

If gage indication is below 2100 psi, inadvertent cargo hook operation could occur resulting in loss of external load. Injury or death can occur to personnel.

Gage shall indicate at least 2100 psi if it does not, service center cargo hook actuator (TM 55-1520-240-23).

12. Press down on hook (16) on center cargo hook. Use wood plank.

Hook (16) on center cargo hook shall not move to open position. If it does, replace center cargo hook.

**WARNING**

If a status light is on, it indicates that a first failure has occurred in one of the redundant protective circuits. A second failure while the system is in this condition can result in loss of external loads, resulting in personnel injury or death.

13. Check ARMED SW FAIL status light (17).

Light (17) shall be out. If it is on, replace HOIST/CARGO HOOK panel.

14. Press and release ARMED SW FAIL, RELEASE SW FAIL, and GROUND RELAY ACTIVATE lights (17, 18 and 19).

Lights (17, 18 and 19) shall come on when pressed and go out when released. If any light does not come on, go to task 16-1.15.
<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>15. Disconnect forward cargo hook connector (20).</td>
<td>DUAL HOOK FAULT capsule (14) shall come on. If it does not, go to <a href="#">Task 16-1.16</a>.</td>
</tr>
<tr>
<td>16. Set MASTER switch (1) to ARM.</td>
<td>ARMED SW FAIL light (17) shall come on. If it does not, go to <a href="#">Task 16-1.17</a>.</td>
</tr>
<tr>
<td>17. Press and release pilot’s CARGO HOOK RELEASE switch (21).</td>
<td>RELEASE SW FAIL light (18) shall momentarily come on. GROUND RELAY ACTIVATE light (19) shall come on and stay on. If either or both lights do not come on, go to <a href="#">Task 16-1.19</a>.</td>
</tr>
<tr>
<td>18. Set MASTER switch (1) to OFF and then back to ARM.</td>
<td>ARMED SW FAIL light (17) shall go out and come back on. GROUND RELAY ACTIVATE light (19) shall go out. If both lights stay on, replace HOIST/CARGO HOOK Panel.</td>
</tr>
<tr>
<td>19. Press and release CARGO HOOK RELEASE switch (21) on copilot’s pitch and roll control grip.</td>
<td>RELEASE SW FAIL light (18) shall momentarily come on. GROUND RELAY ACTIVATE light (19) shall come on and stay on. If either light does not come on, go to <a href="#">Task 16-1.19</a>.</td>
</tr>
<tr>
<td>20. Repeat step 18, then go to step 21.</td>
<td></td>
</tr>
<tr>
<td>21. Press and release CARGO HOOK RELEASE switch (22).</td>
<td>RELEASE SW FAIL light (18) and GROUND RELAY ACTIVATE light (19) shall stay out. If either light comes on, replace CARGO HOOK switch (4).</td>
</tr>
<tr>
<td>22. Set CARGO HOOK switch (4) to ARM.</td>
<td></td>
</tr>
<tr>
<td>23. Press and release CARGO HOOK RELEASE switch (22).</td>
<td>RELEASE SW FAIL light (18) shall momentarily come on. GROUND RELAY ACTIVATE light (19) shall come on and stay on. If either light does not come on, go to <a href="#">Task 16-1.20</a>.</td>
</tr>
<tr>
<td>24. Set CARGO HOOK switch (4) to RESET then to RMTE.</td>
<td>GROUND RELAY ACTIVATE light (19) shall go out. If it does not, replace CARGO HOOK switch (4).</td>
</tr>
</tbody>
</table>
16-1.4  EXTERNAL CARGO HOOK SYSTEM OPERATIONAL CHECK (Continued)

25. Set MASTER switch (1) to RESET then to OFF.

26. Connect forward cargo hook connector (20) to fuselage receptacle. 
DUAL HOOK FAULT capsule (14) shall go out.

27. Disconnect aft cargo hook connector (20).
DUAL HOOK FAULT capsule (14) shall come on. If it does not, replace emergency hook release relay box.

28. Connect aft cargo hook connector (20) to fuselage receptacle.
DUAL HOOK FAULT capsule (14) shall go out.

29. Set MASTER switch (1) to ARM.

30. Suspend one 20-25 pound load to each load beam (23) on forward and aft cargo hooks.

31. Press and release pilot’s CARGO HOOK RELEASE switch (21).
NOTE
If CARGO HOOK RELEASE switch is held pressed, a hammering sound be heard from forward cargo hook. 
Forward cargo hook shall open and drop load then relatch closed. FWD HOOK OPEN capsule (11) shall come on. Pilot and copilot master caution lights (24) shall come on. If forward cargo hook does not open will go to task 16-1.21. If hook opens and FWD HOOK OPEN capsule does not come on, go to task 16-1.22.

32. Set MASTER switch (1) to RESET, then to ARM.
Forward cargo hook shall stay closed. FWD HOOK OPEN capsule (11) shall go out. Pilot and copilot master caution lights (24) shall go out. If capsule is still lit, go to task 16-1.1. If lights (24) are still lit, replace master caution panel.

33. Suspend one 20-25 pound load to load beam (23) on forward cargo hook.
### Task Result

<table>
<thead>
<tr>
<th>Task</th>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>34.</td>
<td>Set HOOK SELECT switch (2) to MID.</td>
<td>Center cargo hook shall open and remain open. MID HOOK OPEN capsule (12) shall come on. Pilot and copilot master caution lights (24) shall come on. If center cargo hook does not open, go to Task 16-1.24.</td>
</tr>
<tr>
<td>35.</td>
<td>Press and release pilot’s CARGO HOOK RELEASE switch (21).</td>
<td>If hook opens and MID HOOK OPEN capsule does not come on, go to Task 16-1.24.</td>
</tr>
<tr>
<td>36.</td>
<td>Set MASTER switch (1) to RESET then to ARM.</td>
<td>Center cargo hook shall close and remain closed. MID HOOK OPEN capsule (12) shall go out. Pilot and copilot master caution lights (24) shall go out. If center cargo hook does not close, replace it. If capsule is still lit when center cargo hook closed, go to Task 16-1.12.</td>
</tr>
<tr>
<td>37.</td>
<td>Set HOOK SELECT switch (2) to AFT.</td>
<td>Aft cargo hook shall open and drop load then relatch closed. AFT HOOK OPEN capsule (13) shall come on. Pilot and copilot master caution lights (24) shall come on. If aft cargo hook does not open, go to Task 16-1.25. If hook opens and AFT HOOK OPEN capsule does not come on, go to Task 16-1.26.</td>
</tr>
<tr>
<td>38.</td>
<td>Press and release pilot’s CARGO HOOK RELEASE switch (21).</td>
<td>Aft cargo hook shall stay closed. AFT HOOK OPEN capsule (13) shall go out. Pilot and copilot master caution lights (24) shall go out. If capsule is still lit, go to Task 16-1.13.</td>
</tr>
<tr>
<td>39.</td>
<td>Set MASTER switch (1) to RESET then to ARM.</td>
<td>Aft cargo hook shall stay closed. AFT HOOK OPEN capsule (13) shall go out. Pilot and copilot master caution lights (24) shall go out. If capsule is still lit, go to Task 16-1.13.</td>
</tr>
<tr>
<td>TASK</td>
<td>RESULT</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>--------</td>
<td></td>
</tr>
<tr>
<td>40. Suspend 20-25 pound load from load beam (23) on aft cargo hook.</td>
<td>Forward and aft cargo hooks shall open and drop load then relatch closed. FWD HOOK OPEN and AFT HOOK OPEN capsules (11 and 13) shall come on. Pilot and copilot's master caution lights (24) shall come on. If both hooks do not open, replace HOIST/CARGO HOOK panel.</td>
<td></td>
</tr>
<tr>
<td>41. Set HOOK SELECT switch (2) to TANDEM.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>42. Press and release pilot’s CARGO HOOK RELEASE switch (21).</td>
<td>Forward and aft cargo hooks shall stay closed. FWD HOOK OPEN and AFT HOOK OPEN capsules (11 and 13) shall go out. If capsules are still on, replace CARGO HOOK switch (4).</td>
<td></td>
</tr>
<tr>
<td>43. Set CARGO HOOK switch (4) to RESET and then to RMTE.</td>
<td>Forward and aft cargo hooks shall open and drop loads then relatch closed. Center cargo hook shall open and stay open. FWD HOOK OPEN, MID HOOK OPEN, and AFT HOOK OPEN capsules (11, 12, and 13) shall come on. Pilot and copilot master caution lights (24) shall come on. If all hooks do not open, replace HOIST/CARGO HOOK panel.</td>
<td></td>
</tr>
<tr>
<td>44. Suspend one 20-25 pound load from each load beam (23) on forward and aft cargo hooks.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45. Set HOOK SELECT switch (2) to ALL.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>46. Press and release pilot’s CARGO HOOK RELEASE switch (21).</td>
<td>Note: It is normal for MID HOOK OPEN capsule to come on at 2 to 3 seconds after FWD HOOK OPEN and AFT HOOK OPEN capsules come on.</td>
<td></td>
</tr>
</tbody>
</table>

**Change 23 16-15**
16-1.4 EXTERNAL CARGO HOOK SYSTEM OPERATIONAL CHECK (Continued)

| TASK |
| TASK RESULT |

47. Set MASTER switch (1) to RESET, then to OFF. Forward and aft cargo hooks shall remain closed. Center cargo hook shall close and remain closed. FWD HOOK OPEN, MID HOOK OPEN, and AFT HOOK OPEN capsules (11, 12 and 13) shall go out. Pilot and copilot master caution lights (24) shall go out.

48. Suspend one 20-25 pound load from each load beam (23) on forward and aft cargo hooks.

49. Check center cargo hook gage (15). Gage (15) shall indicate at least 2100 psi. If it does not, service center cargo hook actuator (TM 55-1520-240-23).

**WARNING**

- If gage indication is below 2100 psi, inadvertent cargo hook operation could occur resulting in loss of external load. Injury or death to personnel can occur.
- Do not stand near center cargo hook when EMERG switch is set to REL ALL. High pressure air, possibly mixed with oil, will be vented from cargo hook. Injury to personnel can occur.

50. Lift switchguard over EMERG switch (3). Momentarily set EMERG switch to REL ALL. All cargo hooks shall open and following shall occur for 10 to 14 seconds: Forward and aft cargo hook load beams (23) shall open, drop loads and then close. Center cargo hook shall remain open. FWD HOOK OPEN, MID HOOK OPEN, and AFT HOOK OPEN capsules (11, 12 and 13) shall come on and pilot and copilot master caution lights (24) shall come on. Center cargo hook shall close after 10 to 14 seconds. The MID HOOK OPEN capsule (12) shall go out. If any cargo hook does not open, go to Task 16-1.27. If center cargo hook opens but does not stay open for 10 to 14 seconds, go to Task 16-1.28.

50.1 Set MASTER switch (1) to RESET, then to OFF. Capsules (11 and 13) and lights (24) shall go out.

51. Close switchguard over EMERG switch (3).


GO TO NEXT PAGE
16-1.4 EXTERNAL CARGO HOOK SYSTEM OPERATIONAL CHECK (Continued)

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CAUTION</strong></td>
<td>When manual release has been pulled, do not press any CARGO HOOK RELEASE switch or EMERG switch. Damage to cargo hook can occur.</td>
</tr>
<tr>
<td>53. Without <strong>CONNECT</strong> dial indicating scale to center cargo hook manual release handle (26). Pull up dial indicating scale.</td>
<td></td>
</tr>
</tbody>
</table>

Center cargo hook shall open and drop load. Dial indicating scale shall indicate less than **20 pounds** when center cargo hook opens. MID HOOK OPEN capsule (12) and both master caution lights (24) shall come on. If hook does not open or dial indicating scale reads more than **20 pounds** before hook opens, go to **task 16-1.29**. If MID HOOK OPEN capsule (12) does not come on, go to **task 16-1.24**.

55. Press down on hook (16) of center cargo hook. Use wood plank.

56. Swing center cargo hook right until pivot block (26) contacts beam (27) and pull on hook (16).

57. Repeat step 56 to the left. Then go to step 58.

58. Without pull tandem hook release lever (28) aft then to vertical position.

59. Push lever (28) forward to stowed position.

**CAUTION**

When manual release has been pulled, do not press any CARGO HOOK RELEASE switch or EMERG switch. Damage to cargo hook can occur.

59.1. With suspend a weight of 20-25 pounds from the forward and aft cargo hooks (23). Suspend a weight of 45 to 50 pounds from the center cargo hook (16).

59.2. Pull the triple hook manual release lever aft then back to the vertical position.

59.3. Push lever (28.1) forward to stowed position.

The forward, center, and aft cargo hooks shall open and drop loads. The forward and aft hook shall latch closed. FWD HOOK OPEN, MID HOOK OPEN, and AFT HOOK OPEN capsules (11, 12, and 13) and MASTER CAUTION lights (24) shall come on. If a cargo hook (or hooks) fails to open, go to task 16-1.29.

MID HOOK OPEN capsule (12) and both master caution lights (24) shall go out.

Center cargo hook shall not open. If it does, manually relatch center cargo hook (TM 55-1520-240-23), and repeat step 55. If hook opens again, replace center cargo hook.

Center cargo hook shall not open. If it does, check rigging of manual release mechanism (TM 55-1520-240-23). Repeat step 56.

Forward and aft cargo hooks shall open and latch closed. FWD HOOK OPEN and AFT HOOK OPEN capsules (11 and 13) and master caution lights (24) shall come on. If either or both hooks do not open, go to task 16-1.29.
60. Pull down on forward and aft cargo hook load beams (23).

61. Set MASTER switch (1) to RESET, then to OFF.

62. Turn forward cargo hook manual release (29) counterclockwise. Pull down and hold open load beam (23).

63. Slowly move forward cargo hook load beam (23) up towards closed position.

64. Manually relatch forward cargo hook. Pull down on load beam (23).

65. Set MASTER switch (1) to RESET, then to OFF.

66. Turn aft cargo hook manual release (29) counterclockwise. Pull down and hold open load beam (23).

67. Slowly move aft cargo hook load beam (23) up towards closed position.

Both hooks shall remain closed. If a hook opens, pull load beam (23) to full open position and release it. Hook should then relatch.

Capsules (11 and 13) and master caution lights (24) shall go out. Forward and aft cargo hooks shall remain closed.

FWD HOOK OPEN capsule (11) and both master caution lights (24) shall come on.

FWD HOOK LOADED light (5) shall flash on just before hook is fully closed. If it does not, go to task 16-1.30.

Forward cargo hook shall not open. If it does, relatch it.

FWD HOOK OPEN capsule (11) and master caution lights (24) shall go out.

AFT HOOK OPEN capsule (13) and both master caution lights (24) shall come on.

AFT HOOK LOADED light (6) shall flash on just before hook is fully closed. If it does not, go to task 16-1.30.
16.4 EXTERNAL CARGO HOOK SYSTEM OPERATIONAL CHECK (Continued)

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>68. Manually relatch aft cargo hook. Pull down on load beam (23).</td>
<td>Aft cargo hook shall not open.</td>
</tr>
<tr>
<td>69. Set MASTER switch (1) to RESET, then to OFF.</td>
<td>AFT HOOK OPEN capsule (13) and master caution lights (24) shall go out.</td>
</tr>
<tr>
<td>70. Suspend one 20-25 pound load from each load beam (23) on forward and aft cargo hooks.</td>
<td>Each cargo hook shall open when its release (29) is turned and relatch closed. If load is not released, replace cargo hook.</td>
</tr>
<tr>
<td>71. Turn manual release (29) counter-clockwise on forward and aft cargo hooks and release it.</td>
<td>Clearance between cable ball end (30) and arm (31) shall be 0 to 3/16 inch. If it is not, adjust clearance. (TM 55-1520-240-23.)</td>
</tr>
<tr>
<td>72. Manually move forward cargo hook full forward. Visually check clearance between cable ball end (30) and arm (31). Move cargo hook full aft. Visually check clearance between cable ball end and arm. Release cargo hook.</td>
<td>Forward cargo hook shall not open. If it does, check tandem hook release rigging. Adjust as required. (TM 55-1520-240-23). Clearance between cable ball end (30) and arm (31) shall be 0 to 3/16 inch. If it is not, adjust clearance.</td>
</tr>
<tr>
<td>73. Attach 15-foot rope to forward cargo hook load beam (23). Pull hook full left, then full right. Visually check clearance between cable ball and arm at both extremes. Use inspection mirror. Remove rope. Clearance (TM 55-1520-240-23).</td>
<td>If linkage position is UNLOCKED, replace cargo hook.</td>
</tr>
<tr>
<td>74. Visually check position of linkage (32), and compare it with placard (33).</td>
<td>Clearance between cable ball end (34) and quadrant (35) shall be 0 to 3/32 inch. If it is not, adjust clearance (TM 55-1520-240-23).</td>
</tr>
</tbody>
</table>

WARNING
Failure to perform following step can result in loss of external loads when lateral sway occurs resulting in personnel injury or death.

75. Repeat steps 71 through 74 on aft cargo hook. |

76. With center cargo hook control cable ball end and quadrant. |

FOLLOW-ON MAINTENANCE:
TM 55-1520-240-23:
Battery disconnected. Electrical power off. Hydraulic power off. Center cargo hook serviced. Center cargo hook stowed. Center cargo hook access panel closed.

END OF TASK
Change 23 16-19
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer's Tool Kit
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

GO TO NEXT PAGE
16-1.5 FWD OR AFT HOOK LOADED LIGHT IS LIT WHEN CARGO HOOK IS UNLOADED (Continued)

FWD HOOK LOADED LIGHT IS LIT WHEN CARGO HOOK IS UNLOADED

AFT HOOK LOADED LIGHT IS LIT WHEN CARGO HOOK IS UNLOADED

DISCONNECT FORWARD CARGO HOOK PLUG. CHECK FWD HOOK LOADED LT. IS IT STILL LIT?

YES

NO

REPLACE FORWARD CARGO HOOK.

NO

REPLACE HOIST/CARGO HOOK PN.

LOCATE GROUND FAULT ON WIRE W65B-181-20, W65B-218-20, OR W65B-7-20 BETWEEN PLUG 134F2 AND RECEPTACLE 134F7. REPAIR OR REPLACE WIRE AS REQUIRED.

DISCONNECT AFT CARGO HOOK PLUG. CHECK AFT HOOK LOADED LT. IS IT STILL LIT?

YES

NO

REPLACE AFT CARGO HOOK.

REPLACE HOIST/CARGO HOOK PN.

REMOVE ELEC PWR. LOWER OYHD PN. DISCONNECT PLUG 134F2 FROM HOIST/CARGO HOOK PN. CHECK FOR GROUND ON PLUG 134F2 PIN F. IS GROUND PRESENT?

YES

NO

REMOVE ELEC PWR. LOWER OYHD PN. DISCONNECT PLUG 134F2 FROM HOIST/CARGO HOOK PN. CHECK FOR GROUND ON PLUG 134F2 PIN F. IS GROUND PRESENT?

YES

NO

LOCATE GROUND FAULT ON WIRE W65B-181-20, W65B-218-20, OR W65B-7-20 BETWEEN PLUG 134F2 AND RECEPTACLE 134F7. REPAIR OR REPLACE WIRE AS REQUIRED.

END OF TASK

16-21
16-1.6 FWD OR AFT HOOK LOADED LIGHT DOES NOT COME ON WHEN PRESSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

GO TO NEXT PAGE
16-1.6 FWD OR AFT HOOK LOADED LIGHT DOES NOT COME ON WHEN PRESSED (Continued)

- **DOS FWD OR AFT HOOK LOADED LT COME ON WHEN PRESSED?**
  - **YES**
    - REPLACE LAMP IN UNLIT LT. PRESS LT DOES IT COME ON?
    - **YES**
      - FAULT CORRECTED.
    - **NO**
      - CLOSE CB IF IT OPENS AGAIN. REFER TO TROUBLE SYMPTOM TASK 16-1.10.
  - **NO**
    - REPLACE HOIST/CARGO HOOK CNTR
    - REPLACE HOIST/CARGO HOOK CNTR
    - **NO**
      - REMOVE ELECTRICAL OPEN CARGO HOOK CNTR
        - OPEN NO. 2 PDF.
        - CHECK FOR CONTINUITY BETWEEN PLUG 134F1 PIN C1 AND CIRCUIT SIDE OF CARGO HOOK CNTR.
        - OPEN NO. 134C1 IS CONTINUITY PRESENT?
        - **YES**
          - REPLACE CARGO HOOK CNTR.
        - **NO**
          - Repair or replace wire as required.

END OF TASK

16-23
16-1.7 CARGO HOOK PWR EMER REL CIRCUIT BREAKER
DOES NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off

END OF TASK
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off

Materials:
None

Personnel Required:
68F20 Aircraft Electrician

TM 55-1520-240-T

16-1.8 CARGO HOOK CONT EMER RELCIRCUIT BREAKER
DOES NOT STAY CLOSED

Page 15-25 is a blank page.

GO TO NEXT PAGE
16-1.9 CARGO HOOK PWR NORM RLSE CIRCUIT BREAKER DOES NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off
Tunnel Access Doors Opened
16-1.9 CARGO HOOK PWR NORM RLSE CIRCUIT BREAKER
DOES NOT STAY CLOSED (Continued)

16-1.9

END OF TASK

16-29
16-1.10 CARGO HOOK CONT NRM RLSE CIRCUIT BREAKER DOES NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off
16-1.10 CARGO HOOK CONT NORM RLSE CIRCUIT BREAKER DO NOT STAY CLOSED (Continued)

16-32
FAULT ISOLATION PROCEDURE

INITIAL SETUP
Applicable Configurations
All

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

Materials:
None

Personnel Required:
Aircraft Electrician

Equipment Condition:
TM 55-1520-240-23
Battery Connected
Electrical Power On
Hydraulic Power Off

References:
TM 55-1520-240-23

TM 55-1520-240-23:
NSN 5180-00-323-4915

DISCONNECT FORWARD CARGO HOOK PLUG, SET MASTER SW TO RESET THEN TO OFF. CHECK YES FWD HOOK OPEN CAPSULE IS IT STILL LIT?

DISCONNECT PLUG 134P4 FROM DUAL HOOK RELAY BOX SET MASTER SW TO RESET THEN TO OFF. IS FWD HOOK OPEN CAPSULE STILL LIT?

LOCATE GROUND FAULT ON WIRE W696-10-20, W699-214-20, OR W657-219-20 BETWEEN PLUG 134P4 AND MASTER CAUTION PNL. REPAIR OR REPLACE WIRE AS REQUIRED.

LOCATE GROUND FAULT ON WIRE W699-1922 BETWEEN PLUG 134P4 AND RECEPTACLE 134UT. REPAIR OR REPLACE WIRE AS REQUIRED.

CHECK FOR GROUND ON PLUG 134P4 PIN X. IS GROUND PRESENT?

REPLACE FORWARD CARGO HOOK.

REPLACE DUAL HOOK RELAY BOX.
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
Battery Connected
Electrical Power On
Hydraulic Power Off

DISCONNECT CENTER CARGO HOOK PLUG, CHECK MID HOOK OPEN CAPSULE, IS IT OUT?

CHECK ADJUSTMENT OF UPPER AND LOWER HOOK OPEN SWITCHES ON CENTER CARGO HOOK, SEE TM 55-1350-240-23, CAN SWITCHES BE ADJUSTED?

FAULT CORRECTED.

LOCATE GROUND FAULT ON WIRE W598-12-20, W529-378-20 OR W557-271-20 BETWEEN CENTER CARGO HOOK RECEPTACLE 134UA AND MASTER CAUTION PNL. REPAIR OR REPLACE WIRE AS REQUIRED.

REPLACE LOWER HOOK OPEN LIMIT SWITCH, SPlice UPPER HOOK OPEN LIMIT SWITCH WIRES.

OUT WIRE SPLICES GOING TO UPPER SWITCH ON CENTER CARGO HOOK, SEPARATE WIRES FROM SPLICES, CHECK FOR CONTINUITY BETWEEN UPPER SWITCH WIRES 1 AND 2 AND 4 AND 5. IS CONTINUITY PRESENT?

YES

REPLACE UPPER HOOK OPEN LIMIT SWITCH.

NO

END OF TASK
Change 23 16-35
**FAULT ISOLATION PROCEDURE**

**INITIAL SETUP**

**Applicable Configurations:**
- All

**Personnel Required:**
- Aircraft Electrician

**Equipment Condition:**
- Battery Connected
- Electrical Power On
- Hydraulic Power Off

**Tools:**
- Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
- Multimeter

**References:**
- TM 55-1520-240-23

**Materials:**
- None

---

**DISCONNECT AFT CARGO HOOK PLUG, SET MASTER SW TO RESET THEN TO OFF. CHECK AFT CARGO HOOK OPEN CAPSULE. IS IT STILL LIT?**

- **YES**
  - DISCONNECT PLUG 13M4 FROM DUAL HOOK RELAY BOX, SET MASTER SW TO RESET THEN TO OFF. IS AFT CARGO HOOK OPEN CAPSULE STILL LIT?
  - **YES**
    - LOCATE GROUND FAULT ON WIRE W698-11-20, W689-210-20, OR W697-200-20 BETWEEN PLUS 13M4 AND MASTER CAUTION PNL. REPAIR OR REPLACE WIRE AS REQUIRED.
    - **NO**
      - CHECK FOR GROUND ON PLUG 13M4 PIN U. IS GROUND PRESENT?
      - **YES**
        - LOCATE GROUND FAULT ON WIRE W698-20.22 BETWEEN PLUS 13M4 AND RECEPTACLE 104J6. REPAIR OR REPLACE WIRE AS REQUIRED.
      - **NO**
        - REPLACE AFT CARGO HOOK.

- **NO**
  - REPLACE DUAL HOOK RELAY BOX.

---

**END OF TASK**
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer's Tool Kit,
NSN 5180-00-3234915
Multimeter

Materials:
None

Personnel Required:
Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
16-1.15 DUAL HOOK RELAY BOX LIGHT(S) DO NOT COME ON WHEN Pressed

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

GO TO NEXT PAGE
16-1.15 DUAL HOOK RELAY BOX LIGHT(S) DO NOT COME ON WHEN Pressed (Continued)

**DIAGRAM:**

1. **DID ANY DUAL HOOK RELAY BOX LIGHT COME ON WHEN Pressed?**
   - **YES:** Replace lamp in unit Lt. Press Lt. Does it come on?
   - **NO:** Disconnect plug 134P4 from dual hook relay box. Check for ground on plug 134P4 pin 2 is ground present?
   - **YES:** Replace dual hook relay box.
   - **NO:** Locate open in wire W550-6018A4 in between plug 134P4 and fuse link. Ground repair or replace wire as required.

2. **IS CARGO HOOK PWR NORM RLSE (OR CLOSED)?**
   - **YES:** Disconnect plug 134P3 from dual hook relay box. Check for 28 VDC between plug 134P3 pin A(1) and ground. Is 28 VDC present?
   - **NO:** Remove elec pwr. Open no. 2 DSP. Check for continuity between plug 134P3 pin A and ground side of cargo hook pwr norm rlse CB 134CB3. Is continuity present?
   - **YES:** Replace cargo hook pwr norm rlse CB 134CB3.
   - **NO:** Locate open in wire W560-27-19, W10-6-16, W562-125-18 between plug 134P3 and cargo hook pwr norm rlse CB 134CB3. Repair or replace wire as required.

**END OF TASK**

16-41
16-1.16 DUAL HOOK FAULT LIGHT DOES NOT COME ON WITH HOOK DISCONNECTED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
- TM 55-1520-240-23
- Electrical Repairer's Tool Kit, NSN 5180-00-323-4915
- Multimeter

References

Personnel Required:
Applicable Configurations: Aircraft Electrician

Equipment Condition:
- TM 55-1520-240-23: Battery Connected
- Electrical Power On
- Hydraulic Power Off

Materials:
None

GO TO NEXT PAGE
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations
All

Tools
Electrical Repairer's Tool Kit.
NSN 5180-00-323-4915
Multimeter

Materials
None

Personnel Required:
Aircraft Electrician

References
TM 55-1520-240-23

Equipment Condition
Battery Connected
Electrical Power On
Hydraulic Power Off

END OF TASK
16-1.18 RELEASE SW FAIL LIGHT OR GROUND RELAY ACTIVATE
LIGHT NOT ON WHEN PILOT'S CARGO HOOK RELEASE
SWITCH PRESSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
Battery Connected
Electrical Power On
Hydraulic Power Off
16-1.18 RELEASE SW FAIL LIGHT OR GROUND RELAY ACTIVATE
LIGHT NOT ON WHEN PILOT'S CARGO HOOK RELEASE
SWITCH PRESSED (Continued)

DID EITHER LIGHT COME ON?

[Diagram]

WAS GROUND RELAY ACTIVATE LT ON?

[Diagram]

PRESS AND RELEASE CO-PILOT'S CARGO HOOK RELEASE SW. DOES GROUND RELAY ACTIVATE LT COME ON?

[Diagram]

DISCONNECT PLUG 134P4 FROM DUAL HOOK RELAY BOX. PRESS AND HOLD CO-PILOT'S CARGO HOOK RELEASE SW. CHECK FOR 28 VDC BETWEEN PLUG 134P4 PIN C1 AND GROUND. IS 28 VDC PRESENT?

[Diagram]

RELEASE CARGO HOOK RELEASE SW. LOCATE OPEN IN WIRE W698-28-20, W698-9-20, OR W696-216-20 BETWEEN PLUG 134P4 AND TB18. REPAIR OR REPLACE WIRE AS REQUIRED.

[Diagram]

PRESS AND RELEASE CO-PILOT'S CARGO HOOK RELEASE SW. DO RELEASE SW FAIL AND GROUND RELAY ACTIVATE LTS COME ON?

[Diagram]

DISCONNECT PILOT'S PITCH AND ROLL CONTROL STICK PLUG. CHECK FOR CONTINUITY BETWEEN RECEPTACLE 300U2B PIN A AND TB18 TERMINAL. IS CONTINUITY PRESENT?

[Diagram]

DISCONNECT PILOT'S PITCH AND ROLL CONTROL STICK PLUG. CHECK FOR CONTINUITY BETWEEN RECEPTACLE 300U2B PIN A AND TB18 TERMINAL. IS CONTINUITY PRESENT?

[Diagram]

DISCONNECT PILOT'S PITCH AND ROLL CONTROL STICK PLUG. CHECK FOR CONTINUITY BETWEEN RECEPTACLE 300U2B PIN A AND TB18 TERMINAL. IS CONTINUITY PRESENT?

[Diagram]

DISCONNECT PILOT'S PITCH AND ROLL CONTROL STICK PLUG. CHECK FOR CONTINUITY BETWEEN RECEPTACLE 300U2B PIN A AND TB18 TERMINAL. IS CONTINUITY PRESENT?

[Diagram]

DISCONNECT PILOT'S PITCH AND ROLL CONTROL STICK PLUG. CHECK FOR CONTINUITY BETWEEN RECEPTACLE 300U2B PIN A AND TB18 TERMINAL. IS CONTINUITY PRESENT?

[Diagram]

DISCONNECT PILOT'S PITCH AND ROLL CONTROL STICK PLUG. CHECK FOR CONTINUITY BETWEEN RECEPTACLE 300U2B PIN A AND TB18 TERMINAL. IS CONTINUITY PRESENT?

[Diagram]

DISCONNECT PILOT'S PITCH AND ROLL CONTROL STICK PLUG. CHECK FOR CONTINUITY BETWEEN RECEPTACLE 300U2B PIN A AND TB18 TERMINAL. IS CONTINUITY PRESENT?

[Diagram]

DISCONNECT PILOT'S PITCH AND ROLL CONTROL STICK PLUG. CHECK FOR CONTINUITY BETWEEN RECEPTACLE 300U2B PIN A AND TB18 TERMINAL. IS CONTINUITY PRESENT?

[Diagram]

DISCONNECT PILOT'S PITCH AND ROLL CONTROL STICK PLUG. CHECK FOR CONTINUITY BETWEEN RECEPTACLE 300U2B PIN A AND TB18 TERMINAL. IS CONTINUITY PRESENT?

[Diagram]

DISCONNECT PILOT'S PITCH AND ROLL CONTROL STICK PLUG. CHECK FOR CONTINUITY BETWEEN RECEPTACLE 300U2B PIN A AND TB18 TERMINAL. IS CONTINUITY PRESENT?

[Diagram]

DISCONNECT PILOT'S PITCH AND ROLL CONTROL STICK PLUG. CHECK FOR CONTINUITY BETWEEN RECEPTACLE 300U2B PIN A AND TB18 TERMINAL. IS CONTINUITY PRESENT?

[Diagram]

DISCONNECT PILOT'S PITCH AND ROLL CONTROL STICK PLUG. CHECK FOR CONTINUITY BETWEEN RECEPTACLE 300U2B PIN A AND TB18 TERMINAL. IS CONTINUITY PRESENT?

[Diagram]

DISCONNECT PILOT'S PITCH AND ROLL CONTROL STICK PLUG. CHECK FOR CONTINUITY BETWEEN RECEPTACLE 300U2B PIN A AND TB18 TERMINAL. IS CONTINUITY PRESENT?

[Diagram]

DISCONNECT PILOT'S PITCH AND ROLL CONTROL STICK PLUG. CHECK FOR CONTINUITY BETWEEN RECEPTACLE 300U2B PIN A AND TB18 TERMINAL. IS CONTINUITY PRESENT?

[Diagram]

DISCONNECT PILOT'S PITCH AND ROLL CONTROL STICK PLUG. CHECK FOR CONTINUITY BETWEEN RECEPTACLE 300U2B PIN A AND TB18 TERMINAL. IS CONTINUITY PRESENT?

[Diagram]

DISCONNECT PILOT'S PITCH AND ROLL CONTROL STICK PLUG. CHECK FOR CONTINUITY BETWEEN RECEPTACLE 300U2B PIN A AND TB18 TERMINAL. IS CONTINUITY PRESENT?

[Diagram]

DISCONNECT PILOT'S PITCH AND ROLL CONTROL STICK PLUG. CHECK FOR CONTINUITY BETWEEN RECEPTACLE 300U2B PIN A AND TB18 TERMINAL. IS CONTINUITY PRESENT?

[Diagram]

DISCONNECT PILOT'S PITCH AND ROLL CONTROL STICK PLUG. CHECK FOR CONTINUITY BETWEEN RECEPTACLE 300U2B PIN A AND TB18 TERMINAL. IS CONTINUITY PRESENT?

[Diagram]

DISCONNECT PILOT'S PITCH AND ROLL CONTROL STICK PLUG. CHECK FOR CONTINUITY BETWEEN RECEPTACLE 300U2B PIN A AND TB18 TERMINAL. IS CONTINUITY PRESENT?

[Diagram]

DISCONNECT PILOT'S PITCH AND ROLL CONTROL STICK PLUG. CHECK FOR CONTINUITY BETWEEN RECEPTACLE 300U2B PIN A AND TB18 TERMINAL. IS CONTINUITY PRESENT?

[Diagram]

DISCONNECT PILOT'S PITCH AND ROLL CONTROL STICK PLUG. CHECK FOR CONTINUITY BETWEEN RECEPTACLE 300U2B PIN A AND TB18 TERMINAL. IS CONTINUITY PRESENT?

[Diagram]

DISCONNECT PILOT'S PITCH AND ROLL CONTROL STICK PLUG. CHECK FOR CONTINUITY BETWEEN RECEPTACLE 300U2B PIN A AND TB18 TERMINAL. IS CONTINUITY PRESENT?

[Diagram]

DISCONNECT PILOT'S PITCH AND ROLL CONTROL STICK PLUG. CHECK FOR CONTINUITY BETWEEN RECEPTACLE 300U2B PIN A AND TB18 TERMINAL. IS CONTINUITY PRESENT?

[Diagram]

DISCONNECT PILOT'S PITCH AND ROLL CONTROL STICK PLUG. CHECK FOR CONTINUITY BETWEEN RECEPTACLE 300U2B PIN A AND TB18 TERMINAL. IS CONTINUITY PRESENT?

[Diagram]

DISCONNECT PILOT'S PITCH AND ROLL CONTROL STICK PLUG. CHECK FOR CONTINUITY BETWEEN RECEPTACLE 300U2B PIN A AND TB18 TERMINAL. IS CONTINUITY PRESENT?

[Diagram]

DISCONNECT PILOT'S PITCH AND ROLL CONTROL STICK PLUG. CHECK FOR CONTINUITY BETWEEN RECEPTACLE 300U2B PIN A AND TB18 TERMINAL. IS CONTINUITY PRESENT?
16-1.18 RELEASE SW FAIL LIGHT OR GROUND RELAY ACTIVATE LIGHT NOT ON WHEN PILOT CARGO HOOK RELEASE SWITCH PRESSED (Continued)

**Press and Release Co-Pilot's Cargo Hook Release SW Does Not Come On Momentarily?**

**Yes**

Disconnect Pilot's Pitch and Roll Control Stick Plug. Check for Continuity Between Receptacle 300U23 Pin B and TB18 Term B Is Continuity Present?

**Yes**

Replace Pilot's Pitch and Roll Control Stick.

**No**

Locate Open in Wire WSSB-181-20, WSSB-220-20, WSSB-5-20, or WSSB-25-20 Between Plug 134P2 and Plug 134P4 Pin E Is Continuity Present?

**Yes**

Replace Hoist/Cargo Hook Pln.

**No**

Check for Continuity Between Plug 134P2 Pin B and Plug 134P4 Pin E Is Continuity Present?

**Yes**

Replace Hoist/Cargo Hook Pln.

**No**

Locate Open in Wire WSSC-117-20 or WSSC-225-20 Between Plug 134P2 and TB18. Repair or Replace Wire As Required.

**End of Task**
16-1.19 RELEASE SW FAIL LIGHT OR GROUND RELAY
ACTIVATE LIGHT NOT ON WHEN COPILOT'S CARGO
HOOK RELEASE SWITCH PRESSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
- All

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

Materials:
- None

Personnel Required:
- 6F20 Aircraft Electrician

References:
- TM 55-1520-240-23

Equipment Condition:
- TM 55-1520-240-23:
  - Battery Disconnected
  - Electrical Power Off
  - Hydraulic Power Off

END OF TASK
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
Battery Connected
Electrical Power On
Hydraulic Power Off

16-50 Change 10
16-1.20 RELEASE SW FAIL LIGHT OR GROUND RELAY ACTIVATE LIGHT NOT ON WHEN HOIST OPERATOR'S CARGO HOOK RELEASE SWITCH PRESSED (Continued)

DISCONNECT WINCH GRIP CABLE FROM WINCH GRIP. CHECK FOR 28 VDC BETWEEN WINCH CABLE PLUG PIN T AND GROUND IS 28 VDC PRESENT?

NO

YES

REMOVE HOIST OPERATORS PANEL. CHECK FOR 28VDC BETWEEN CARGO HOOK RMT SW TERMS 2 I AND GROUND IS 28 VDC PRESENT?

NO

YES

REPLACE CARGO HOOK RMT SW.

DISCONNECT WINCH CABLE FROM HOIST OPERATORS PANEL. CHECK CABLE FOR CONTINUITY BETWEEN TERMS 5 AND 8 OF CAR GO HOOK RMT SW. IS CONTINUITY PRESENT?

NO

YES

DISCONNECT WINCH GRIP TO CABLE. DISCONNECT WINCH GRIP CABLE FROM HOIST OPERATORS PANEL. PRESS AND HOLD CARGO HOOK RELEASE SW ON WINCH GRIP CABLE OR FOR CONTINUITY BETWEEN WINCH CABLE PLUG PIN T AND PIN M AND S. IS CONTINUITY PRESENT AT BOTH POINTS?

YES

NO

DISCONNECT PLUG 13MP4 FROM DUAL HOOG RELAY BOX. CHECK FOR CONTINUITY BETWEEN PLUG 13MP4 PIN 8 AND RECEPTACLE 13J11 PIN M. IS CONTINUITY PRESENT?

YES

NO

LOCATE OPEN IN WIRE WS08-11-20 OR WS08-6-20 BETWEEN RECEPTACLE 13J11 AND CARGO HOOK RMT SW. REPAIR OR REPLACE WIRE AS REQUIRED.

YES

NO

DISCONNECT WINCH GRIP FROM CABLE. CHECK CABLE FOR CONTINUITY BETWEEN PINS S TO 5 AND PINS M TO M. IS CONTINUITY PRESENT AT BOTH POINTS?

YES

NO

REPLACE WINCH GRIP.

REPLACE WINCH GRIP CABLE.

CHANGE 2 16-51
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
68F10 Aircraft Electrician
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
16-1.21 FORWARD CARGO HOOK DOES NOT OPEN (Continued)

DISCONNECT FORWARD CARGO HOOK PLUG. PRESS AND HOLD PILOT'S CARGO HOOK RELEASE SW. CHECK FOR 28 VDC BETWEEN RECEPTACLE 134J7 PIN C AND GROUND. IS 28 VDC PRESENT?

NO

DISCONNECT PLUG 134P4 FROM DUAL HOOK RELAY BOX. CHECK FOR 28 VDC BETWEEN PLUG 134P4 PIN A AND GROUND. IS 28 VDC PRESENT?

NO

RELEASE PILOT'S SW. DISCONNECT PLUG 134P3 FROM DUAL HOOK RELAY BOX. CHECK FOR CONTINUITY BETWEEN PLUG 134P3 PIN F AND RECEPTACLE 134J7 PIN C. IS CONTINUITY PRESENT?

NO

LOCATION OPEN IN WIRE W539-19B-20 OR W539-223-20, OR W538-2-20 BETWEEN PLUG 134P4 PIN D AND PLUG 134P4 RECEPTACLE IS CONTINUITY PRESENT?

NO

REPLACE MOIST/CARGO HOOK PNL.

YES

CHECK FOR GROUND ON RECEPTACLE 134J7 PIN D. IS GROUND PRESENT?

NO

REPLACE DUAL HOOK RELAY BOX.

YES

REPLACE DUAL HOOK RELAY BOX.

END OF TASK

Change 9 16-53
**FAULT ISOLATION PROCEDURE**

**INITIAL SETUP**

**Applicable Configurations:**
All

**Personnel Required:**
Aircraft Electrician

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

**References**
TM 55-1520-240-23

**Equipment Condition:**
Battery Connected
Electrical Power On
Hydraulic Power Off

**Materials**
None

---

[Image of a diagram showing various components and connections related to fault isolation and cargo hook operations.]
16-1.22 FWD HOOK OPEN CAPSULE DOES NOT COME ON
WHEN FORWARD CARGO HOOK OPENS (Continued)

1. Check for 28 VDC between TRG7 module 82-1 and ground. Is 28 VDC present?
   - Yes
     - Locate open in wire W888-47-20 between TRG7 and plug T34P4. Repair or replace wire as required.
   - No
     - Remove ELEC PWR, pull out HOST OPERATORS PNL, check for continuity between terms 11 and 12 on CARGO HOOK SW. IS CONTINUITY PRESENT?
       - Yes
         - Replace CARGO HOOK SWITCH
       - No

END OF TASK
16-1.23 CENTER CARGO HOOK DOES NOT OPEN

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
- Electrical Repairer’s Tool Kit,
  NSN 5180-00-323-4915
  Multimeter

Personnel Required:
- 67U10 Medium Helicopter Repairer
- 68F20 Aircraft Electrician

Equipment Condition:
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power On

References:
- TM 55-1520-240-23
- Electrical Repairer’s Tool Kit,
  NSN 5180-00-323-4915

Materials:
None
16-1.23 CENTER CARGO HOOK DOES NOT OPEN (Continued)

HOLD HYDRAULIC HOSE GOING TO CENTER CARGO HOOK.
PRESS AND RELEASE PILOT'S CARGO HOOK RELEASE SW.
IS SURGE FEEL ON HYDRAULIC HOSE?

YES

REPLACE CENTER CARGO HOOK.

NO

DISCONNECT PLUG 134P10
FROM CARGO HOOK NORMAL
RELEASE VALVE. PRESS AND
HOLD PILOT'S CARGO HOOK
RELEASE SW. CHECK FOR 28
VDC BETWEEN PLUG 134P10
PIN 1 (+) AND GROUND. IS 18
VDC PRESENT?

YES

REPLACE CENTER CARGO HOOK.

NO

DISCONNECT PLUG 134P4
FROM DUAL HOOK RELAY BOX.
CHECK FOR 28 VDC BETWEEN
PLUG 134P4 PIN 1 (+) AND
GROUND. IS 18 VDC PRESENT?

YES

RELEASE PILOT'S SW CHECK
CONTINUITY BETWEEN PLUG
134P4 PIN G AND PLUG
134P10 PIN 1. IS CONTINUITY
PRESENT?

YES

REPLACE DUAL HOOK RELAY
BOX.

NO

LOCATE OPEN IN WIRE W539-
185-2D, W639-222-2D, OR
W989-3-2D BETWEEN PLUG
134P4 AND PLUG 134P10.
REPAIR OR REPLACE WIRE AS
REQUIRED.

NO

REPLACE HOIST/CARGO
HOOK PIN.

CHECK FOR GROUND ON PLUG
134P10 PIN 2. IS GROUND
PRESENT?

YES

RELEASE PILOT'S SW RE-
PLACE CARGO HOOK NORMAL
RELEASE VALVE.

NO

RELEASE PILOT'S SW DISCON-
NECT PLUG 134P3 FROM DUAL
HOOK RELAY BOX. CHECK FOR
CONTINUITY BETWEEN PLUG
134P3 PIN E AND PLUG
134P10 PIN 2. IS CONTINUITY
PRESENT?

YES

REPLACE DUAL HOOK RELAY
BOX.

NO

LOCATE OPEN IN WIRE W869-
39-2D, OR W689-1-2D
BETWEEN PLUG 134P4 AND
PLUG 134P10. REPAIR OR RE-
PLACE WIRE AS REQUIRED.

END OF TASK

Change 2 16-59
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

References:
TM 55-1520-240-23

Personnel Required:
Aircraft Electrician

Equipment Condition:
Battery Connected
Electrical Power On
Hydraulic Power On

Materials:
None
16-1.24 MID HOOK OPEN CAPSULE DOES NOT COME ON WHEN CENTER CARGO HOOK OPENS (Continued)

END OF TASK
INITIAL SETUP

Applicable Configurations: All

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

Equipment Condition:
- TM 55-1520-240-23
  - Battery Connected
- Electrical Power On
- Hydraulic Power Off

Materials: None
16-1.25 AFT CARGO HOOK DOES NOT OPEN (Continued)

END OF TASK

16-63
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
Battery Connected
Electrical Power On
Hydraulic Power Off
16-1.26 AFT HOOK OPEN CAPSULE DOES NOT COME ON WHEN AFT CARGO HOOK OPENS (Continued)

- Set caution lights test sw to test. Is aft hook open capsule lit?
  - Yes: Disconnect plug 134p4 from dual hook relay box. Short plug 134p4 pin w with 6356 and plug 134p4 pin w is continuity present?
    - Yes: Replace dual hook relay box.
    - No: Replace master caution pnl.
  - No: Remove short. Remove elec pwr. Remove master caution pnl and disconnect plug 232p2. Check for continuity between plug 232p2 pin 8 with 6356 or 232p2 pin 8 with 6356 and plug 134p4. Repair or replace wire as required.

- Replace lamps in aft hook open capsule. Set caution lights test sw to test. Does capsule come on?
  - Yes: Fault corrected.
  - No: Replace master caution pnl.

- Hold hook load beam open. Disconnect aft cargo hook plug. Check for continuity between hook plug pins b and f is continuity present?
  - Yes: Release hook load beam. Replace aft cargo hook.
  - No: Locate open in wire w58-20-20 between receptacle 134q5 pin b and plug 134p4 pin u. Repair or replace wire as required.

END OF TASK

Change 23  16-65
16-1.27 CARGO HOOK OR HOOKS DO NOT RELEASE WHEN EMERG SWITCH SET TO REL ALL

Fault Isolation Procedure

Initial Setup

Applicable Configurations:
All

Tools:
Electrical Repairer's Tool Kit.
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

GO TO NEXT PAGE
16-1.27 CARGO HOOK OR HOOKS DO NOT RELEASE WHEN EMERG SWITCH SET TO REL ALL (Continued)

DID ANY HOOK OPEN?  
YES

IS CARGO HOOK CONT EMER REL CS OPEN?  
YES

REFER TO TROUBLE SYMPTOM TASK 16-1.8

NO

DISCONNECT PLUG 134PS FROM EMERGENCY HOOK RELEASE RELAY BOX. SET AND HOLD EMERG SW TO REL ALL. CHECK FOR 28 VDC BETWEEN PLUG 134PS PIN B (x) AND GROUND. IS 28 VDC PRESENT?

NO

RELEASE SW CHECK FOR GROUND ON PLUG 134PS PIN C. IS GROUND PRESENT?

YES

REPLACE EMERGENCY HOOK RELEASE RELAY BOX.

NO

CHECK FOR CONTINUITY BETWEEN CENTER HOOK PLUG 134PS PIN 1 AND PIN B AND BUTT SPLICES TO EMERGENCY RELEASE SOLENOID WIRES IS CONTINUITY PRESENT?

NO

RELEASE EMERGENCY RELEASE SOLENOID. REPEAT OPERATIONAL CHECK TASK 16-1.1.

YES

REPLACE CENTER CARGO HOOK.

END OF TASK

Change 9 16-67
16-1.28 CENTER CARGO HOOK DOES NOT STAY OPEN FOR 10 TO 14 SECONDS AFTER EMERG SWITCH RELEASED FROM REL ALL

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

END OF TASK
Fault Isolation Procedure

Initial Setup

Applicable Configurations:
- All

Tools:
- Electrical Repairer Tool Kit, NSN 5180-00-323-4915
- Aircraft Mechanic Tool Kit, NSN 5180-00-323-4692

Personnel Required:
- Medium Helicopter Repairer (2)

References:
- TM 55-1520-240-23
- TM 55-1520-240-23:
  - Battery Disconnected
  - Electrical Power Off
  - Hydraulic Power Off

Equipment Condition:
- TM 55-1520-240-23:
  - Battery Disconnected
  - Electrical Power Off
  - Hydraulic Power Off

Materials:
- None
16-1.29 FORWARD CENTER OR AFT CARGO HOOK DOES NOT OPEN WHEN TRIPLE/TANDEM HOOK OR CENTER HOOK RELEASE LEVER IS PULLED (Continued)

FORWARD OR AFT CARGO HOOK DOES NOT OPEN

- WAS FAULT WITH FORWARD HOOK?
  - YES
    - DISCONNECT RELEASE CABLE AT FORWARD CARGO HOOK. LOOSEN NUT ON FORWARD CARGO HOOK. RELEASE CABLE AND SLIDE SLEEVE AWAY FROM FITTING. MOVE TANDEM HOOK RELEASE AFT. DOES CABLE ATTACHMENT MOVE?
      - YES
        - REPLACE RELEASE CABLE TO FORWARD HOOK
      - NO
        - REPLACE INTERIOR CABLE TO FORWARD CARGO HOOK FEED THRU FITTING.
    - NO
      - DISCONNECT RELEASE CABLE AT AFT CARGO HOOK. LOOSEN NUT ON AFT CARGO HOOK RELEASE CABLE AND SLIDE SLEEVE AWAY FROM FITTING. MOVE TANDEM HOOK RELEASE AFT. DOES CABLE ATTACHMENT MOVE?
        - YES
          - REPLACE RELEASE CABLE TO AFT HOOK
        - NO
          - REPLACE INTERIOR CABLE TO AFT CARGO HOOK FEED THRU FITTING.

CENTER CARGO HOOK DOES NOT OPEN

- IS THE CENTER CARGO HOOK AT FAULT EQUIPPED WITH A JETTISON HANDLE "D" RING ATTACHED TO THE CARGO HOOK BEAM?
  - NO
    - PULL TRIPLE HOOK EMERGENCY CARGO RELEASE LEVER AFT WHILE OBSERVING LEVERS AND CAM ROLLER ON EACH SIDE OF HOOK. DO THE LEVERS RETRACT ALLOWING THE ROLLERS TO PIVOT DOWN?
      - YES
        - REPAIR OR REPLACE CENTER CARGO HOOK.
      - NO
        - REPLACE CONTROL CABLE FROM QUADRANT TO CARGO HOOK RELEASE MECHANISM.
    - YES
      - PULL UPWARD ON "D" RING WHILE OBSERVING THE LEVERS AND CAM ROLLER ON EACH SIDE OF HOOK. DO THE LEVERS RETRACT ALLOWING THE ROLLERS TO PIVOT DOWN?
        - YES
          - REPAIR OR REPLACE CENTER CARGO HOOK.
        - NO
          - REPLACE CONTROL CABLE OR QUICK DISCONNECT.
16-1.30 HOOK LOADED LIGHT DOES NOT COME ON WHEN FORWARD OR AFT CARGO HOOK IS LOADED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
68F20 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
16-1.30 HOOK LOADED LIGHT DOES NOT COME ON WHEN FORWARD OR AFT CARGO HOOK IS LOADED (Continued)

FWD HOOK LOADED LIGHT DOES NOT COME ON WHEN FORWARD CARGO HOOK IS LOADED

AFT HOOK LOADED LIGHT DOES NOT COME ON WHEN AFT CARGO HOOK IS LOADED

END OF TASK
16-2 FLARE DISPENSER SYSTEM
TM 55-1520-240-T
16-2.2 FLARE DISPENSER SYSTEM VISUAL CHECK

INITIAL SETUP

Applicable Configurations:
- All

Tools:
- Electronic Equipment Tool Kit, NSN 5180-00-064-5178

Materials:
- Cloth (E 120)

Personnel Required:
- Avionics Mechanic

References:
- TM 55-1520-240-10
- TM 55-1520-240-23

Equipment Condition:
- TM 55-1520-240-10:
  - Flare Dispenser Assembly Safety Pin Installed
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power Off
  - Hydraulic Power Off
### TASK RESULT

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Check DISP CONT panel (1).</td>
<td>If any switch, counter, or light on panel (1) is damaged, replace panel.</td>
</tr>
<tr>
<td>2. Check flare DISP switch (2) on pilot’s and copilot’s pitch and roll control grips (3 and 4).</td>
<td>If either switch (2) is damaged, replace grip (3 or 4).</td>
</tr>
<tr>
<td>3. Check four cable assemblies (5).</td>
<td>If any cable assembly (5) is damaged, repair or replace it as required. If any switch (6) in cable assembly (5) is damaged replace cable assembly.</td>
</tr>
<tr>
<td>4. Check timer (7).</td>
<td>If timer (7) is loose or damaged tighten or replace it as required. If connector to timer is loose or damaged, tighten or replace it as required. If wiring to connector is damaged, repair or replace it as required.</td>
</tr>
<tr>
<td>5. Check dispenser status panel (8).</td>
<td>If any light or switch on panel (8) is damaged, replace it. If connector to panel is loose or damaged, tighten or replace it as required. If wiring to connector is damaged repair or replace it as required.</td>
</tr>
<tr>
<td>6. Check flare dispenser viewing window (9).</td>
<td>If window (9) is clouded or broken, clean or replace it as required.</td>
</tr>
<tr>
<td>7. Check flare dispenser wiring and electrical plug and receptacle (10).</td>
<td>If plug or receptacle (10) is loose or damaged, tighten or replace it as required. If wiring to plug or receptacle is damaged, repair or replace it as required.</td>
</tr>
<tr>
<td>8. Check flare dispenser assembly (11).</td>
<td>If dispenser is loose or damaged, tighten or replace it as required.</td>
</tr>
</tbody>
</table>

**FOLLOW-ON MAINTENANCE:**

None
INITIAL SETUP
Applicable Configurations:
All

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178

Materials:
None

Personnel Required:
Avionics Mechanic

References:
TM 55-1520-240-23
Equipment Condition:
TM 55-1520-240-23:
Flare Dispenser Assembly Removed

Battery Connected
Electrical Power On
Hydraulic Power Off
Visual Check of Flare Dispenser System Performed

General Safety Instructions:

WARNING
Do not perform test with flare dispenser assembly installed. System could fire resulting in damage injury or death.

WARNING
Keep personnel clear of flight controls.
16-2.3 FLARE DISPENSER SYSTEM OPERATIONAL CHECK (Continued)

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Check that CHAFF circuit breaker (1) is closed. If circuit breaker (1) is open, close it. If it opens again, go to task 16-2.4</td>
</tr>
<tr>
<td>2.</td>
<td>Check that LDG GR SW STATUS light (2) is out. If light (2) is on, go to task 16-2.5</td>
</tr>
<tr>
<td>3.</td>
<td>Press and release LDG GR SW STATUS, READY TO FIRE and LDG GR SW BYPASS lights (2, 3, and 4). Each light (2, 3, and 4) shall momentarily come on. If any light does not come on, go to task 16-2.6</td>
</tr>
<tr>
<td>4.</td>
<td>Disconnect right landing gear proximity switch plug (5). LDG GR SW STATUS light (2) shall come on. If it does not come on, go to task 16-2.7</td>
</tr>
<tr>
<td>5.</td>
<td>Set DISP CONT panel ARM SAFE switch (6) to ARM. READY TO FIRE light (3) shall come on. If light does not come on, go to task 16-2.8</td>
</tr>
<tr>
<td>6.</td>
<td>Connect right landing gear proximity switch plug (5). LDG GR SW STATUS and READY TO FIRE light (2 and 3) shall go out.</td>
</tr>
<tr>
<td>7.</td>
<td>Lift switchguard (7) and set LDG GR SW BYPASS switch (8) to BYPASS. LDG GR SW STATUS, READY TO FIRE, and LDG GR SW BYPASS LIGHTS (2, 3 and 4) shall come on. If they do not, go to task 16-2.10</td>
</tr>
<tr>
<td>8.</td>
<td>Set DISP CONT panel ARM SAFE switch (6) to SAFE. READY TO FIRE light (3) shall go out.</td>
</tr>
<tr>
<td>9.</td>
<td>Set LDG GR SW BYPASS switch (8) to NORMAL and close switchguard (7). LDG GR SW STATUS light (2) and LDG GR SW BYPASS light (4) shall go out.</td>
</tr>
<tr>
<td>10.</td>
<td>Perform functional test of flare dispenser system, Refer to TM 55-1520-240-23. If a problem occurs during functional test of flare dispenser system, refer to table 16-2.1 to locate trouble symptom task number.</td>
</tr>
</tbody>
</table>

**NOTE**

<table>
<thead>
<tr>
<th>TROUBLE SYMPTOM</th>
<th>TASK NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLARE COUNTER SEQUENCES FROM 30 TO 00 WHEN DISP CONT PANEL ARM SAFE SWITCH SET TO ARM.</td>
<td>16-2.11</td>
</tr>
<tr>
<td>ARM LIGHT DOES NOT COME ON WHEN ARM SAFE SWITCH SET TO ARM.</td>
<td>16-2.12</td>
</tr>
<tr>
<td>FLARE COUNTER OR TEST SET LIGHTS 00 NOT CHANGE WHEN PILOT OR COPILOT FLARE DISP SWITCH PRESSED AND RELEASED.</td>
<td>16-2.13</td>
</tr>
<tr>
<td>FLARE COUNTER OR TEST SET LIGHTS DO NOT CHANGE WHEN A CABIN FIRING SWITCH PRESSED AND RELEASED.</td>
<td>16-2.14</td>
</tr>
<tr>
<td>FLARE COUNTER DOES NOT INDICATE 00 WHEN RIPPLE FIRE SWITCH IS HELD UP.</td>
<td>16-2.15</td>
</tr>
</tbody>
</table>

**FOLLOW-ON MAINTENANCE:**

- TM 55-1520-240-23:
  - Remove Electrical Power
  - Disconnect Battery
  - Install Flare Dispensers Assembly
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electronic Equipment Tool Kit.

References:
TM 55-1520-240-23

Equipment Condition:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off

Materials:
Battery Disconnected
Electrical Power Off
None

Personnel Required:
Avionics Mechanic
16-2.4 CHAFF CIRCUIT BREAKER WILL NOT STAY CLOSED
(Continued)

OPEN NO. 1 PDP.
DISCONNECT WIRE FROM
CHAFF CB 147CB1 CIRCUIT
SIDE. CHECK FOR GROUND
ON WIRE WS5G-248-20.
NO?

YES

LOCATE GROUND FAULT
ON WIRE WS50-248-20.
WIRE 156-22 BETWEEN
CB 147CB1 AND RELAY
167K1. REPAIR OR REPLACE
WIRES AS REQUIRED.

NO

REPLACE CHAFF CIRCUIT
BREAKER.
Fault Isolation Procedure

Initial Setup

Applicable Configurations:
All

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178

Materials:
None

Personnel Required:
Avionics Mechanic (2)

References:
TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
16-2.5 LANDING GEAR SWITCH STATUS LIGHT IS ON (Continued)

- **Check that LDG GR SWITCH BYPASS SWITCH is set to NORMAL.** If switch is set to BYPASS, set to NORMAL. Does LDG GR SWITCH STATUS LIGHT go out?
  - **YES**
    - Fault corrected.
  - **NO**
    - Disconnect plug 147P4 at remote bypass switch panel. Check feed through between plug 147P4 pin C (+) and ground. Is 28VDC present?
      - **YES**
        - Check for ground on plug 147P4 pin D. Is ground present?
          - **YES**
            - Remove relay 148K2. Check for ground on relay socket pin C2. Is ground present?
              - **YES**
                - Replace relay 147K1.
              - **NO**
                - Check longitudinal cyclic trim indicators. Are indicator pointers in ground position?
                  - **YES**
                    - Replace relay 148K2.
                  - **NO**
                    - Refer to trouble symptom (Task: 17.3).
      - **NO**
        - Locate ground fault on wire W668-154-22, W668-179-22, W668-180-22, or relay socket plug 147P4, and relay 148K1. Repair or replace wire as required.

END OF TASK

Change 6 16-87
16-2.6 LDG GR SW STATUS, READY TO FIRE, OR LDG GR SW BYPASS LIGHTS DO NOT COME ON WHEN PRESSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178

Materials:
None

Personnel Required:
Avionics Mechanic

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
16-2.6 LDG GR SW STATUS, READY TO FIRE, OR LDG GR SW BYPASS LIGHTS DO NOT COME ON WHEN PRESSED (Continued)

DO EITHER LDG GR SW STATUS READY TO FIRE, OR LDG GR SW BYPASS LIGHTS COME ON WHEN PRESSED TO TEST?  

YES

DOES LDG GR SW BYPASS LIGHT COME ON WHEN PRESSED TO TEST?  

YES

REPLACE LAMP AND PRESS TO TEST; DOES LAMP COME ON?  

YES

FAULT CORRECTED.

NO

LOCATE FAULT IN REMOTE BYPASS SWITCH PANEL, REPAIR OR REPLACE AS REQUIRED.

NO

DISCONNECT PLUG 14794 AT REMOTE BYPASS SW PANEL; CHECK FOR 28VDC BETWEEN WIRE PIN 10 AND GROUND IS 28VDC PRESENT?  

NO

CHECK FOR GROUND ON PLUG 14794 PIN A IS GROUND PRESENT?  

YES

LOCATE FAULT IN REMOTE BYPASS SWITCH PANEL, REPAIR OR REPLACE AS REQUIRED.

NO

LOCATE OPEN IN WIRE W689-200892B2N BETWEEN PLUG 14794 AND FIBERGLASS GROUND, REPAIR OR REPLACE WIRE AS REQUIRED.

YES

LOCATE OPEN IN WIRE W887-16720 OR W888-17732 BETWEEN RELAY 147X1 AND PLUG 14794, REPAIR OR REPLACE WIRES AS REQUIRED.

NO

OPEN LEFT ELECTRICAL COMPARTMENT DOOR; CHECK FOR 28VDC BETWEEN CB 147X1 TERMINAL AD21 AND GROUND IS 28VDC PRESENT?  

NO

OPEN NO. 1 PDP AND CHECK FOR 28VDC BETWEEN CB 147X1 CIRCUIT SIDE A1 AND GROUND IS 28VDC PRESENT?  

NO

REPLACE CHAFF CIRCUIT BREAKER.

YES

REPLACE LAMP IN READY TO FIRE LIGHT AND PRESS TO TEST; DOES LAMP COME ON?  

YES

FAULT CORRECTED.

NO

LOCATE FAULT IN REMOTE BYPASS SW PANEL, REPAIR OR REPLACE AS REQUIRED.

END OF TASK
FAULT ISOLATION PROCEDURE

INITIAL SETUP
Applicable Configurations:
All
Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178
Materials:
None
Personnel Required:
Avionics Mechanic (2)

References:
TM 55-1520-240-23
Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Right Landing Gear Proximity Switch Plug Disconnected

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Right Landing Gear Proximity Switch Plug Disconnected
16-2.7 LDG GR SW STATUS LIGHT DOES NOT COME ON

(Continued)

1. Check for ground on relay 147K1 term X1 and ground is 28VDC present?
   - Yes: Replace relay 147K1.
   - No: Check for ground on relay 148K2 socket pin C3, is ground present?
     - Yes: Replace relay 148K2.
     - No: Locate open in wire W66-154-22, W66-180-22 or W66-180-20 between relay 148K2 and relay 147K1, repair or replace wires as required.

2. Locate open in wire W66-154-22, W66-180-22 or W66-180-20 between relay 148K2 and fuseable ground: repair or replace wires as required.

3. Disconnect plug 147P4 from remote bypass switch panel, check for 28VDC on plug 147P4 pin C1 and ground is 28VDC present?
   - Yes: Locate fault in remote bypass switch panel, repair or replace as required.
   - No: Open left electrical compartment door, check for ground on relay 147K1 term X1 and ground is 28VDC present?
     - Yes: Refer to trouble symptom task 11.3.3.
     - No: Check for 28VDC between relay 147K1 term X1 and ground is 28VDC present?
       - Yes: Replace relay 147K1.
       - No: Locate open in wire W66-154-22, W66-180-22 or W66-180-20 between relay 148K2 and fuseable ground: repair or replace wires as required.

END OF TASK
Fault Isolation Procedure

Initial Setup

Applicable Configurations:
All

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178

Materials:
None

Personnel Required:
Avionics Mechanic (2)

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
16-2.8 READY TO FIRE LIGHT DOES NOT COME ON (Continued)

- **REPLACE LAMP IN READY TO FIRE LIGHT DOES LIGHT COME ON?**
  - **YES**
    - FAULT CORRECTED
  - **NO**
    - **DISCONNECT PLUG 147F4 FROM REMOTE BYPASS SWITCH PANEL, CHECK FOR 28 VDC BETWEEN PLUG 147F4 PIN F (+) AND GROUND IS 28 VDC PRESENT?**
      - **YES**
        - LOCATE FAULTY COMPONENT IN REMOTE BYPASS SWITCH PANEL, REPAIR OR REPLACE AS REQUIRED
      - **NO**
        - **REMOVE DISPB CONT PANEL, DISCONNECT PLUG 147F1, CHECK FOR 28VDC BETWEEN PLUG 147F1 PIN F (+) AND GROUND IS 28VDC PRESENT?**
          - **YES**
            - **REPLACE DISPB CONT PANEL**
          - **NO**
            - **OPEN LEFT ELECTRICAL COMPARTMENT DOOR, CHECK FOR OPEN IN WIRE 147F1 TERMINAL AT (+) AND GROUND IS 28 VDC PRESENT?**
              - **YES**
                - **LOCATE OPEN IN WIRE W687-129-22, W688-311-22 OR W657-862-20 BETWEEN PLUG 147F1 AND RELAY 147K1, REPAIR OR REPLACE WIRE AS REQUIRED**
              - **NO**
                - **REPLACE RELAY 147K1**

**TASK 16-2.9 DELETED**

**END OF TASK**
16-2.10  LDG GR SW STATUS AND READY TO FIRE LIGHTS DO NOT COME ON

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations: All

Tools:
Electronic Equipment Tool Kit, NSN 5180-00-064-5178

Materials:
None

Personnel Required:
Avionics Mechanic (2)

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
16-2.10  LDG GR SW STATUS READY TO FIRE AND LDG GR SW BYPASS LIGHTS DO NOT COME ON (Continued)

SET NORM BYPASS SWITCH TO Bypass DO NOT LDG GR SW STATUS OR READY TO FIRE

DOES LDG GR SW BYPASS LIGHT COME ON?

YES

DISCONNECT PLUG 147P4 FROM REMOTE BYPASS SWITCH PANEL. CHECK FOR GROUND ON PLUG 147P4 PIN A. IS GROUND PRESENT?

NO

LOCATE FAULT IN REMOTE BYPASS SWITCH PANEL. REPAIR OR REPLACE WIRE AS REQUIRED.

YES

LOCATE FAULT IN REMOTE BYPASS SWITCH PANEL. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

LOCATE OPEN IN WIRE W668-GD39822N BETWEEN PLUG 147P4 AND FUSELAGE GROUND. REPAIR OR REPLACE WIRE AS REQUIRED.

YES

LOCATE OPEN IN WIRE W668-GD39822N BETWEEN PLUG 147P4 AND FUSELAGE GROUND. REPAIR OR REPLACE WIRE AS REQUIRED.

NO

LOCATE FAULT IN REMOTE BYPASS SWITCH PANEL. REPAIR OR REPLACE WIRE AS REQUIRED.

END OF TASK

Change 2 16-95
FAULT ISOLATION PROCEDURE

INITIAL SETUP
Applicable Configurations:
All

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178
Multimeter

Materials:
None

Personnel Required:
Avionics Mechanic (2)

References:
TM 9-1095-206-13 & P
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
FLARE COUNTER SEQUENCES FROM 30 TO 00
WHEN DISP CONT PANEL ARM SAFE SWITCH SET TO ARM (Continued)

16-2.11

PERFORM ELECTRONICS MODULE DIELECTRIC ASSEMBLY TEST AS G-185-206-15 
& F DO BOTH PARTS CHECK (GRAY)?

YES

NO

REPLACE DEFECTIVE PART.

REPLACE DISPB GOND PANEL.

REPLACE SWITCH THAT CAUSED CONTINUITY TO DISAPPEAR.

DISCONNECT FOUR CABIN FIRRING SWITCHES ONE AT-A-TIME WHILE WATCHING MULTIMETER. IS CONTINUITY PRESENT BETWEEN PLUG 14772 PINS A AND C? IS CONTINUITY PRESENT BETWEEN PLUG 14772 WHEN EACH SWITCH DISCONNECTED?

YES

NO

DISCONNECT PLT'S PITCH AND ROLL CONTROL GRIP PLUG FROM RECEPTABLE DOOLE 300D30. IS CONTINUITY STILL PRESENT BETWEEN PLUG 14772 PINS A AND C?

YES

NO

DISCONNECT CPTL'S PITCH AND ROLL CONTROL GRIP PLUG FROM RECEPTABLE DOOLE 300D30. IS CONTINUITY STILL PRESENT BETWEEN PLUG 14772 PINS A AND C?

YES

NO

REPLACE CPTL'S PITCH AND ROLL CONTROL GRIP.

REPLACE PLT'S PITCH AND ROLL CONTROL GRIP.

REPLACE GOND PANEL.

LOCATE SHORT BETWEEN V JRES W878 222 RED AND W899 226 RED AND W899 226 BLU.

YES

NO

DISCONNECT WIRES W878, 222 RED AND W899. 222 BLU FROM TB401. IS CONTINUITY STILL PRESENT BETWEEN PLUG 14772 PINS A AND C?

YES

NO

LOCATE SHORT BETWEEN V JRES W878 222 RED AND W899. 226 RED AND W899 226 BLU.

DISCONNECT WIRES W878, 222 RED AND W899. 222 BLU FROM TB401. IS CONTINUITY STILL PRESENT BETWEEN PLUG 14772 PINS A AND C?

YES

NO

LOCATE SHORT BETWEEN V JRES W878 222 RED AND W899. 226 RED AND W899 226 BLU.

DISCONNECT WIRES W878, 222 RED AND W899. 222 BLU FROM TB401. IS CONTINUITY STILL PRESENT BETWEEN PLUG 14772 PINS A AND C?

YES

NO

LOCATE SHORT BETWEEN V JRES W878 222 RED AND W899. 226 RED AND W899 226 BLU.

DISCONNECT WIRES W878, 222 RED AND W899. 222 BLU FROM TB401. IS CONTINUITY STILL PRESENT BETWEEN PLUG 14772 PINS A AND C?

YES

NO

LOCATE SHORT BETWEEN V JRES W878 222 RED AND W899. 226 RED AND W899 226 BLU.

DISCONNECT WIRES W878, 222 RED AND W899. 222 BLU FROM TB401. IS CONTINUITY STILL PRESENT BETWEEN PLUG 14772 PINS A AND C?

YES

NO

LOCATE SHORT BETWEEN V JRES W878 222 RED AND W899. 226 RED AND W899 226 BLU.

DISCONNECT WIRES W878, 222 RED AND W899. 222 BLU FROM TB401. IS CONTINUITY STILL PRESENT BETWEEN PLUG 14772 PINS A AND C?

YES

NO

LOCATE SHORT BETWEEN V JRES W878 222 RED AND W899. 226 RED AND W899 226 BLU.

DISCONNECT WIRES W878, 222 RED AND W899. 222 BLU FROM TB401. IS CONTINUITY STILL PRESENT BETWEEN PLUG 14772 PINS A AND C?

YES

NO

LOCATE SHORT BETWEEN V JRES W878 222 RED AND W899. 226 RED AND W899 226 BLU.

DISCONNECT WIRES W878, 222 RED AND W899. 222 BLU FROM TB401. IS CONTINUITY STILL PRESENT BETWEEN PLUG 14772 PINS A AND C?

YES

NO

LOCATE SHORT BETWEEN V JRES W878 222 RED AND W899. 226 RED AND W899 226 BLU.

DISCONNECT WIRES W878, 222 RED AND W899. 222 BLU FROM TB401. IS CONTINUITY STILL PRESENT BETWEEN PLUG 14772 PINS A AND C?

YES

NO

LOCATE SHORT BETWEEN V JRES W878 222 RED AND W899. 226 RED AND W899 226 BLU.

DISCONNECT WIRES W878, 222 RED AND W899. 222 BLU FROM TB401. IS CONTINUITY STILL PRESENT BETWEEN PLUG 14772 PINS A AND C?

YES

NO

LOCATE SHORT BETWEEN V JRES W878 222 RED AND W899. 226 RED AND W899 226 BLU.

DISCONNECT WIRES W878, 222 RED AND W899. 222 BLU FROM TB401. IS CONTINUITY STILL PRESENT BETWEEN PLUG 14772 PINS A AND C?

YES

NO

LOCATE SHORT BETWEEN V JRES W878 222 RED AND W899. 226 RED AND W899 226 BLU.

DISCONNECT WIRES W878, 222 RED AND W899. 222 BLU FROM TB401. IS CONTINUITY STILL PRESENT BETWEEN PLUG 14772 PINS A AND C?

YES

NO

LOCATE SHORT BETWEEN V JRES W878 222 RED AND W899. 226 RED AND W899 226 BLU.

DISCONNECT WIRES W878, 222 RED AND W899. 222 BLU FROM TB401. IS CONTINUITY STILL PRESENT BETWEEN PLUG 14772 PINS A AND C?

YES

NO

LOCATE SHORT BETWEEN V JRES W878 222 RED AND W899. 226 RED AND W899 226 BLU.

DISCONNECT WIRES W878, 222 RED AND W899. 222 BLU FROM TB401. IS CONTINUITY STILL PRESENT BETWEEN PLUG 14772 PINS A AND C?

YES

NO

LOCATE SHORT BETWEEN V JRES W878 222 RED AND W899. 226 RED AND W899 226 BLU.

DISCONNECT WIRES W878, 222 RED AND W899. 222 BLU FROM TB401. IS CONTINUITY STILL PRESENT BETWEEN PLUG 14772 PINS A AND C?

YES

NO

LOCATE SHORT BETWEEN V JRES W878 222 RED AND W899. 226 RED AND W899 226 BLU.

DISCONNECT WIRES W878, 222 RED AND W899. 222 BLU FROM TB401. IS CONTINUITY STILL PRESENT BETWEEN PLUG 14772 PINS A AND C?

YES

NO

LOCATE SHORT BETWEEN V JRES W878 222 RED AND W899. 226 RED AND W899 226 BLU.

DISCONNECT WIRES W878, 222 RED AND W899. 222 BLU FROM TB401. IS CONTINUITY STILL PRESENT BETWEEN PLUG 14772 PINS A AND C?

YES

NO

LOCATE SHORT BETWEEN V JRES W878 222 RED AND W899. 226 RED AND W899 226 BLU.

DISCONNECT WIRES W878, 222 RED AND W899. 222 BLU FROM TB401. IS CONTINUITY STILL PRESENT BETWEEN PLUG 14772 PINS A AND C?

YES

NO

LOCATE SHORT BETWEEN V JRES W878 222 RED AND W899. 226 RED AND W899 226 BLU.

DISCONNECT WIRES W878, 222 RED AND W899. 222 BLU FROM TB401. IS CONTINUITY STILL PRESENT BETWEEN PLUG 14772 PINS A AND C?

YES

NO

LOCATE SHORT BETWEEN V JRES W878 222 RED AND W899. 226 RED AND W899 226 BLU.

DISCONNECT WIRES W878, 222 RED AND W899. 222 BLU FROM TB401. IS CONTINUITY STILL PRESENT BETWEEN PLUG 14772 PINS A AND C? END OF TASK

Change 2 16-97
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178
Multimeter

Materials:
None

Personnel Required:
Avionics Mechanic (2)

References:
TM 9-1095-206-13 & P
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

Cockpit

Dedicated Disp. Cont.
ARM
FLARE
CHAFF
ARM
MAN FORM

Disp. Cont. Panel

Receptacle 16723

Flare Dispenser Assembly

Flare Dispenser Timer

STA 300-01

17320

16-98 Change 12
16-2.12 ARM LIGHT DOES NOT COME ON WHEN ARM SAFE SWITCH SET TO ARM (Continued)

- Replace lamp in arm light; press light, does it come on?
  - Yes: Fault corrected.
  - No: Perform electronic module dispenser assembly test (refer to TM 9-1085-206-13 & P. Does dispenser assembly check okay?
    - Yes: Disconnect flare dispenser assembly plug, set arm safe switch to arm, check for 24VDC between receptacle 1472-28 pin 5-1 and ground. Is 24VDC present?
      - Yes: Disconnect electrical power, remove shroud, turn pin and disconnect plug 1471. Check for continuity between plug 1471 pin 1 and receptacle 1410 22-pin. Is continuity present?
        - Yes: Replace shroud cover panel.
        - No: Locate open in wire WSS7-881.30, WSS8-378.22 WSS7-148.22, or WSS8-171.22 between plug 1471 pin 1 and receptacle 1472-28. Repair or replace wire as required.
      - No: Replace dispenser assembly.
    - No: Locate open in wire WSS6-170.32 between receptacle 1472-28 and splice to wires WSS6-173.32 and WSS8-179.22. Repair or replace wire as required.

END OF TASK
Fault Isolation Procedure

Initial Setup

Applicable Configurations:
All

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178
Multimeter

Materials:
None

Personnel Required:
Avionics Mechanic (2)

References:
TM 9-1095-206-13&P
TM 55-1520-240-23

Equipment Condition:
BH 55-1520-240-23;
Battery Connected
Electrical Power On
Hydraulic Power Off
16-2.13 FLARE COUNTER OR TEST SET LIGHTS DO NOT CHANGE WHEN PILOT OR COPILOT FLARE DISP SWITCH PRESSED AND RELEASED (Continued)

YES

PERFORM TEST ON DISPENSER ASSEMBLY. REFER TO TM 9-1090-206-13P. DOES IT CHECK OKAY?

YES

REPLACE FLARE DISPENSER ASSEMBLY.

NO

REPLACE DISP CONT PANEL.

NO


DISCONNECT CPLT'S PITCH AND ROLL CONTROL PLUG FROM RECEPTACLE 300J3D. PRESS AND HOLD CPLT'S FLARE DISP SW. CHECK FOR CONTINUITY BETWEEN CONTROL PLUG PIN S AND D. IS CONTINUITY PRESENT?

YES

REPLACE CPLT'S PITCH AND ROLL CONTROL GRIP.

NO

LOCATE OPEN IN WIRE W096-53-22 RED OR W096-64-22 BLU BETWEEN RECEPTACLE 300J3D AND 18. REPAIR OR REPLACE WIRE AS REQUIRED.
16-2.14 FLARE COUNTER OR TEST SET LIGHTS DO NOT CHANGE WHEN A CABIN FIRING SWITCH PRESSED AND RELEASED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electronic Equipment Tool Kit, NSN 5180-00-064-5178
Multimeter

Materials:
None

Personnel Required:
Avionics Mechanic (2)

References:
TM 9-1095-206-13&P
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

GO TO NEXT PAGE
16-2.14 FLARE COUNTER OR TEST SET LIGHTS DO NOT CHANGE WHEN A CABIN FIRING SWITCH PRESSED AND RELEASED (Continued)

Substitute another cabin firing switch in place of one that failed test. Refer to TM 9-1055-206-15M. Does substitute switch check okay?

If yes, replace defective cabin firing switch.

If no, locate open in wire W873: 156-12 BLU or W873: 160-12 RED between receptacle 147-J8 and TB401. Repair or replace wire as required.

If IS SWITCH LOCATED AT STA 200 RIGHT?

If yes, locate open in wire W873: 156-12 BLU or W873: 160-12 RED between receptacle 147-J8 and TB401. Repair or replace wire as required.

If no, locate open in wire W874: 156-12 BLU or W874: 160-12 RED between receptacle 147-J8 and TB401. Repair or replace wire as required.

END OF TASK
Change 3 16-105
16-2.15 FLARE COUNTER DOES NOT INDICATE 00 WHEN RIPPLE FIRE SWITCH IS HELD UP

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178
Multimeter

Materials:
None

Personnel Required:
Avionics Mechanic (2)

References:
TM 9-1095-206-13&P
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

GO TO NEXT PAGE
16-2.15 FLARE COUNTER DOES NOT INDICATE 00 WHEN RIPPLE FIRE SWITCH IS HELD UP (Continued)

PLUG IN ELECTRONICS MOD- ULE-DISPENSER ASSEMBLY TEST ON AIRCRAFT USED FOR FLARE. REFER TO TM 5-1066 206-130/3. DO BOTH PARTS CHECK OKAY?

NO

REPLACE DEFECTIVE PART.

DISCONNECT FLARE DISPENSER ELECTRONIC P harness. REMOVE DISP ONN PIN 50C AND DISCONNECT PLUG 147P1. CHECK FOR CONTINUITY BETWEEN PLUG 147P1 PIN 50C AND RECEPTACLE 147J3. IO CONTINUITY PRESENT?

YES

CHECK FOR OPEN CIRCUIT BETWEEN PLUG 147P1 PIN 50C AND GROUND IS AN OPEN CIRCUIT PRESENT?

YES

REPLACE DISP CONT PANEL

NO


NO

LOCATE GROUND FAULT ON WIRE WS57/ 863-20, WS45-37-2-2 OR W668-167-22 BETWEEN PLUG 147P1 AND RECEPTACLE 147J3. REPAIR OR REPLACE WIRE AS REQUIRED.
16-3 ENGINE AIR PARTICLE SEPARATOR SYSTEM
16-3.1 ENGINE NO. 1 AIR PARTICLE SEPARATOR WIRING DIAGRAM (Continued)
### INITIAL SETUP
- **Applicable Configurations:** Helicopters with Engine Air Particle Separator Provisions
- **Equipment Condition:**
  - None
- **Materials:**
  - Battery Disconnected
- **Personnel Required:**
  - Medium Helicopter Repairer

### TASK RESULT

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Check NO. 1 PDP extension box (1).</td>
<td>No. 1 PDP extension box (1) should be tightly secured and in good condition. If extension box (1) is loose or damaged, repair or replace it as required.</td>
</tr>
<tr>
<td>2. Check NO. 2 PDP extension box (2).</td>
<td>No. 2 PDP extension box (2) should be tightly secured and in good condition. If extension box (2) is loose or damaged, repair or replace it as required.</td>
</tr>
<tr>
<td>3. Check EAPS control panel (3).</td>
<td>EAPS control panel (3) and 4 switches should be in good condition. If control panel (3) or switches are damaged, repair or replace them as required.</td>
</tr>
<tr>
<td>4. Check NO. 1 EAPS control box (4).</td>
<td>No. 1 EAPS control box (4) should be tightly secured and in good condition. If control box (4) is loose or damaged, repair or replace it as required.</td>
</tr>
<tr>
<td>5. Check NO. 2 EAPS control box (5).</td>
<td>No. 2 EAPS control box (5) should be tightly secured and in good condition. If control box (5) is loose or damaged, repair or replace it as required.</td>
</tr>
<tr>
<td>6. Check receptacle 151J1 (6).</td>
<td>Receptacle (6) should be tightly secured to aircraft skin and in good condition. All receptacle pins should be in good condition and properly seated. If receptacle or pins are damaged, repair or replace them as required.</td>
</tr>
<tr>
<td>7. Check receptacle 151J2 (7).</td>
<td>Receptacle (7) should be tightly secured to aircraft skin and in good condition. All receptacle pins should be in good condition and properly seated. If receptacle or pins are damaged, repair or replace them as required.</td>
</tr>
</tbody>
</table>

### FOLLOW-ON MAINTENANCE:
- None
16-3.3 ENGINE AIR PARTICLE SEPARATOR PROVISIONS VISUAL CHECK (Continued)

EAPS CONTROL PANEL WITH NVG

Cockpit

NO. 1 POWER DISTRIBUTION PANEL

NO. 2 POWER DISTRIBUTION PANEL

EAPS CONTROL PANEL WITH INTERIM NVG

STA 400

STA 440.0 (REF)

STA 440.0 (REF)

RBL 17.0

Change 16 16-115
## INITIAL SETUP

**Applicable Configurations:**
- Helicopters with Engine Air Particle Separator Provisions

**Tools:**
- Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
- Multimeter

**Materials:**
- None

**Personnel Required:**
- Aircraft Electrician (2)

**References:**
- TM 55-1520-240-23

**Equipment Condition:**
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power Off

**Visual Check of Engine Air Particle Separator Provisions Performed**

---

### TASK RESULT

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.</td>
<td>Check for ground on receptacle 151J1 pins G, D and V.</td>
</tr>
<tr>
<td>9.</td>
<td>If any circuit breaker opens, close it. If EAPS 1 FAN circuit breaker (1) opens again, go to task 4-5. If EAPS 1 FAN CONT circuit breaker (2) opens again, go to task 4-5. If EAPS 1 BYPASS DOORS circuit breaker (3) opens again, go to task 4-5.</td>
</tr>
<tr>
<td>10.</td>
<td>If 28VDC is not present on pin U, go to task 16-3-15.</td>
</tr>
<tr>
<td>11.</td>
<td>If 115VAC is not present on any pin, go to task 16-3-14.</td>
</tr>
</tbody>
</table>

### FOLLOW ON MAINTENANCE:
- Turn Off Electrical Power
- Disconnect Battery

---

**16-3.4 ENGINE AIR PARTICLE SEPARATOR PROVISIONS OPERATION CHECK**

### CHECK CIRCUIT BREAKERS

1. **On NO. 1 PDP extension box, close the following circuit breakers:**
   - EAPS 1 FAN (1)
   - EAPS 1 FAN CONT (2)
   - EAPS 1 BYPASS DOORS (3)

2. **On NO. 2 PDP extension box, close the following circuit breakers:**
   - EAPS 2 FAN (4)
   - EAPS 2 FAN CONT (5)
   - EAPS 2 BYPASS DOORS (6)

3. **On NO. 1 Engine EAPS control box (7), press to test EAPS BYPASS DOORS OPEN light (8).**

4. **On NO. 2 Engine EAPS control box (9), press to test EAPS BYPASS DOORS OPEN light (10).**

5. **On EAPS control panel (11) set EAPS ENG 1 FAN switch (12) to ON. At receptacle 151J1 (13) check for 115VAC between pin A and ground, pin B and ground, and pin P and ground.**

6. **On EAPS control panel (11) set EAPS ENG 1 DOORS switch (14) to OPEN. At receptacle 151J1 (13) check for 28VDC between pin U and ground.**

7. **On EAPS control panel (11) set EAPS ENG 1 DOORS switch (14) to CLOSE. At receptacle 151J1 (13) check for 28VDC between pin U and ground.**

---

115VAC should be present on pins A, B and P. If 115VAC is not present on any pin, go to task 16-3-14.

If 28VDC is not present on pin U, go to task 16-3-15.

---

If 28VDC is not present on pin U, go to task 16-3-16.

---

If 28VDC is not present on pin a, go to task 16-3-17.

---

If 28VDC is not present on pin a, go to task 16-3-18.

---

If ground is not present, repair or replace wire between receptacle and ground.

---

If ground is not present, repair or replace wire between receptacle and ground.

---

If 115VAC is not present on any pin, go to task 16-3-13.

---

If ground is not present on pin a, go to task 16-3-10.

---

If ground is not present on pin U, go to task 16-3-12.
16-3.5 EAPS 1 FAN, FAN CONT OR BYPASS DOORS CIRCUIT BREAKER WILL NOT STAY CLOSED

**FAULT ISOLATION PROCEDURE**

**INITIAL SETUP**

**Applicable Configurations:**
- Helicopters with Engine Air Particle Separator Provisions

**Tools:**
- Electrical Repairer's Tool Kit, NSN 5990-00-323-4915
- Multimeter

**Materials:**
- None

**Personnel Required:**
- Aircraft Electrician (2)

**References:**
- TM 55-1520-240-23

**Equipment Condition:**
- TM 55-1520-240-23:
  - Battery Disconnected
  - Electrical Power On
  - Hydraulic Power Off

---

![Image of cockpit and control panel with labels for EAPS, ENG 1, ENG 2, FAN, DOORS, and switches]

- EAPS ENG 1 DOORS SWITCH
- EAPS DOORS CONTROL PANEL WITH NVG
- COCKPIT
- NO 1 POWER DISTRIBUTION PANEL
- NO 1 ENG EAPS CONTROL BOX
- EAPS 1 FAN CIRCUIT BREAKER
- EAPS 1 BYPASS DOORS CIRCUIT BREAKER
16-3.5 EAPS 1 FAN CONT OR BYPASS DOORS CIRCUIT BREAKER WILL NOT STAY CLOSED (CONTINUED)

**EAPS 1 FAN CB WILL NOT STAY CLOSED**

- **Do circuit breaker open 15P5 from No. 1 Eng EAPS fan?**
  - **Yes:** Repair or replace No. 1 Eng EAPS control box 15P5.
  - **No:** Repair or replace No. 1 Eng EAPS control box as required.

**EAPS 1 FAN CONT CB WILL NOT STAY CLOSED**

- **Was EAPS fans 1 fan switch set to on when circuit breaker opened?**
  - **Yes:** Repair or replace No. 1 Eng EAPS control box.
  - **No:** Repair or replace No. 1 Eng EAPS control box as required.

**EAPS 1 BYPASS DOORS CB WILL NOT STAY CLOSED**

- **Remove electrical power. Disconnect wire W960-005-20 from EAPS 1 bypass doors circuit breaker.**
  - **Yes:** Disconnect plug 15P5 from No. 1 Eng EAPS control box. Check for ground on pins 3, 4, and 5. Is ground present?
  - **No:** Repair or replace wire as required.

**LOCATE GROUND FAULT ON WIRE W960-005-20.**

- **Between plugs 15P5 and receptacle 15J1.**
  - **Yes:** Repair or replace wire as required.
  - **No:** Repair or replace No. 1 Eng EAPS control box as required.

**LOCATE GROUND FAULT ON WIRE W960-005-20, W960-331-20, or W960-003-20 BETWEEN PLUG 15P5 AND RECEPTACLE 15J1.**

- **Repair or replace wire as required.**
16-3.6 EAPS 2 FAN, FAN CONT OR BYPASS DOORS CIRCUIT BREAKER WILL NOT STAY CLOSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
- Helicopters with Engine Air Particle Separator Provisions

Tools:
- Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
- Multimeter

Materials:
- None

Personnel Required:
- Aircraft Electrician (2)

References:
- TM 55-1520-240-23

Equipment Condition:
- TM 55-1520-240-23:
  - Battery Disconnected
  - Electrical Power On
  - Hydraulic Power Off

NO. 2 ENG EAPS CONTROL BOX

STA 400

COCKPIT

EAPS ENG 2 FAN SWITCH

EAPS ENG 2 DOORS SWITCH

EAPS CONTROL PANEL WITH INTERIM NVG

EAPS CONTROL PANEL WITH NVG

EAPS 2 FAN CIRCUIT BREAKER

EAPS 2 BYPASS DOORS CIRCUIT BREAKER

EAPS 2 FAN CONT CIRCUIT BREAKER

NO. 2 POWER DISTRIBUTION PANEL 22518
**FAULT ISOLATION PROCEDURE**

**INITIAL SETUP**

**Applicable Configurations:**
Helicopters with Engine Air Particle Separator Provisions

**Tools:**
Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
Multimeter

**Materials:**
None

**Personnel Required:**
Aircraft Electrician (2)

**References:**
TM 55-1520-240-23

**Equipment Condition:**
TM 55-1520-240-J3:
Battery Connected
Electrical Power On
Hydraulic Power Off

---

**NO. 1 EAPS BYPASS DOORS OPEN LIGHT DOES NOT COME ON WHEN PRESSED TO TEST**

1. **DISCONNECT PLUG 15/19 FROM NO. 1 EAPS CONTROL BOX.** Check for ground on plug 15/19 pin 7. Is ground present?
   - **YES:** Repair or replace wire as required.
   - **NO:** Locate open in wire W960-122-20. W960-321-20 or W960-594-20 between plug 15/19 and EAPS 1 bypass doors circuit breaker. Repair or replace W960-122-20 as required.

2. **CHECK FOR 28VDC BETWEEN PLUG 15/19 PIN 7 AND GROUND IS 28VDC PRESENT?**
   - **YES:** Repair or replace NO. 1 ENG EAPS control box as required.
   - **NO:** Locate open in wire W960-122-20, W960-321-20 or W960-594-20 between plug 15/19 and EAPS 1 bypass doors circuit breaker. Repair or replace W960-122-20 as required.

---

**NO. 2 EAPS BYPASS DOORS OPEN LIGHT DOES NOT COME ON WHEN PRESSED TO TEST**

1. **DISCONNECT PLUG 15/19 FROM NO. 2 EAPS CONTROL BOX.** Check for ground on plug 15/19 pin 7. Is ground present?
   - **YES:** Repair or replace wire as required.
   - **NO:** Locate open in wire W960-122-20. W960-321-20 or W960-594-20 between plug 15/19 and EAPS 2 bypass doors circuit breaker. Repair or replace W960-122-20 as required.

2. **CHECK FOR 28VDC BETWEEN PLUG 15/19 PIN 7 AND GROUND IS 28VDC PRESENT?**
   - **YES:** Repair or replace NO. 2 ENG EAPS control box as required.
   - **NO:** Locate open in wire W960-122-20, W960-321-20 or W960-594-20 between plug 15/19 and EAPS 2 bypass doors circuit breaker. Repair or replace W960-122-20 as required.
16-3.8.115 VAC IS NOT PRESENT WITH EAPS ENG 1 FAN SWITCH SET TO ON

INITIAL SETUP

**Applicable Configurations:**
- Helicopters with Engine Air Particle Separator Provisions

**Tools:**
- Electrical Repairer's Tool Kit
- NSN 5180-00-323-4915
- Multimeter

**Materials:**
- None

**Personnel Required:**
- Aircraft Electrician (2)

**References:**
- TM 55-1520-240-23

**Equipment Condition:**
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power Off

---

**Diagram Description:**

- EAPS ENG 1 FAN SWITCH
- EAPS ENG 1 FAN CIRCUIT BREAKER
- EAPS 1 FAN CNT CONT CIRCUIT BREAKER
- NO. 1 POWER DISTRIBUTION PANEL
- NO. 1 ENG EAPS CONTROL BOX
- EAPS CONTROL PANEL WITH INTRMN VGD
- STA 400
- RECEPTACLE 151/1

---

Change 16 16-123
16-3.8 115 VAC IS NOT PRESENT WITH EAPS ENG 1 FAN SWITCH SET TO ON (Continued)

**DISCONNECT PLUG 151P3 FROM NO. 1 ENG EAPS CONTROL BOX. CHECK FOR 115VAC BETWEEN 151P3 PIN 1 AND GROUND. IS 115VAC PRESENT?**

**NO**

**REPAIR OR REPLACE NO. 1 ENG EAPS CONTROL BOX AS REQUIRED.**

**YES**

**LOCATE OPEN IN WIRE W960-032-20; OR W960-127-20 BETWEEN EAPS ENG 1 FAN SWITCH AND PLUG 151P3. REPAIR OR REPLACE WIRE AS NEEDED.**

**CHECK FOR 28VDC BETWEEN EAPS ENG 1 FAN SWITCH TERMINAL 3 AND GROUND. IS 28VDC PRESENT?**

**NO**

**REPLACE EAPS ENG 1 FAN SWITCH.**

**YES**

**LOCATE OPEN IN WIRE W960-001-20; OR W960-002-20 BETWEEN EAPS 1 FAN CONT CIRCUIT BREAKER AND EAPS ENG 1 FAN SWITCH. REPAIR OR REPLACE WIRE AS REQUIRED.**

**WAS 115VAC PRESENT ON ANY OF THE PINS CHECKED?**

**NO**

**REPAIR OR REPLACE NO. 1 ENG EAPS CONTROL BOX AS REQUIRED.**

**YES**

**LOCATE OPEN IN WIRE W960-176-12A; OR W960-031-12A BETWEEN PLUG 151P3 AND EAPS 1 FAN CIRCUIT BREAKER REPAIR OR REPLACE WIRE AS NEEDED.**

**WAS 115VAC PRESENT ON PIN A?**

**NO**

**LOCATE OPEN IN WIRE W960-229-12A. REPAIR OR REPLACE WIRE AS NEEDED.**

**YES**

**DISCONNECT PLUG 151P3 FROM NO. 1 ENG EAPS CONTROL BOX. CHECK FOR 115VAC BETWEEN 151P3 PIN 3 AND RECEPTACLE. 151P3 PIN 3 IS CONTINUITY PRESENT?**

**NO**

**REPAIR OR REPLACE NO. 1 ENG EAPS CONTROL BOX AS REQUIRED.**

**YES**

**LOCATE OPEN IN WIRE W960-177-12B; OR W960-052-12B BETWEEN PLUG 151P3 AND EAPS 1 FAN CIRCUIT BREAKER. REPAIR OR REPLACE WIRE AS NEEDED.**

**WAS 115VAC PRESENT ON PIN B?**

**NO**

**LOCATE OPEN IN WIRE W960-230-12B. REPAIR OR REPLACE WIRE AS NEEDED.**

**YES**

**DISCONNECT PLUG 151P3 FROM NO. 1 ENG EAPS CONTROL BOX. CHECK FOR 115VAC BETWEEN 151P3 PIN 8 AND GROUND. IS 115VAC PRESENT?**

**NO**

**LOCATE OPEN IN WIRE W960-053-12C; OR W960-054-12C BETWEEN PLUG 151P3 AND EAPS 1 FAN CIRCUIT BREAKER REPAIR OR REPLACE WIRE AS NEEDED.**

**YES**

**CHECK FOR CONTINUITY BETWEEN PLUG 151P3 PIN 3 AND RECEPTACLE 151P3 PIN 8. IS CONTINUITY PRESENT?**

**NO**

**LOCATE OPEN IN WIRE W960-231-12C. REPAIR OR REPLACE WIRE AS NEEDED.**

**YES**

**REPAIR OR REPLACE NO. 1 ENG EAPS CONTROL BOX AS REQUIRED.**
16-3.9 28 VDC IS NOT PRESENT ON RECEPTACLE 151J1 PIN U WITH EAPS ENG 1 DOORS SWITCH AT OPEN

Initial Setup

Applicable Configurations:
- Helicopters with Engine Air Particle
- Separator Provisions

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

Materials:
- None

Personnel Required:
- Aircraft Electrician (2)

References:
- TM 55-1520-240-23

Equipment Condition:
- TM 55-1520-240-23:
- Battery Connected
- Electrical Power On
- Hydraulic Power Off

Diagram:
- Diagram showing electrical components and wiring connections.

Note:
- Change 16
- TM 55-1520-240-T
16-3.10 GROUND IS NOT PRESENT ON RECEPTACLE 151J1 PIN # WITH EAPS ENG 1 DOORS SWITCH AT OPEN

INITIAL SETUP

Applicable Configurations:
- Helicopters with Engine Air Pipe
- Separator Provisions

Tools:
- Electrical Repairer's Tool Kit
- NSN 5180-00-323-4915
- Multimeter

Materials:
None

Personnel Required:
- Aircraft Electrician (2)

References:
- TM 55-1520-240-23

Equipment Condition:
- TM 55-1520-240-23:
  - Battery Connected
- Electrical Power Off
- Hydraulic Power Off

---

Diagram Description:

1. Lower overhead panel. Check for open wire EAPS ENG 1 DOORS SWITCH TERMINALS 6. If ground present, yes, check for ground on EAPS ENG 1 DOORS SWITCH TERMINAL 6. If ground present, yes, locate open wire in wire 253-20, 253-13, 253-20, or 253-2027-20 between EAPS ENG 1 DOORS SWITCH AND RECEPTACLE 151J1. Repair or replace wire as required.

2. Locate open in wire 253-20 (if wire 253-20-20, 253-20-20, or 253-20-2027-20 between EAPS ENG 1 DOORS SWITCH AND GROUND STUD, REPAIR OR REPLACE WIRE AS REQUIRED.

Legend:
- EAPS
- DEAF
- FAN
- DOORS
- OPEN
- SET
- OFF

16-126 Change 16
18-3.11  28 VDC IS NOT PRESENT ON RECEPTACLE 151J1 PIN 8 WITH EAPS ENG 1 DOORS SWITCH AT CLOSE

INITIAL SETUP

Applicable Configurations:
- Helicopters with Engine Air Particle Separator Provisions

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

Materials:
- None

Personnel Required:
- Aircraft Electrician (2)

References:
- TM 55-1520-240-23

Equipment Condition:
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power Off

Diagram:
- Diagram showing the connections and components related to the 28 VDC input and EAPS ENG 1 doors switch.
16-3.12  GROUND IS NOT PRESENT ON RECEPTACLE 151J1 PIN U WITH EAPS ENG 1 DOORS SWITCH AT CLOSE

INITIAL SETUP

Applicable Configurations:
- Helicopters with Engine Air Particle Separator Provisions

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

Materials:
- None

Personnel Required:
- Aircraft Electrician (2)

References:
- TM 55-1520-240-23

Equipment Condition:
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power Off
  - Hydraulic Power Off

Diagram:
- Diagram showing wiring connections and components relevant to the procedure.
16-3.13 EAPS 1 FAIL CAPSULE DOES NOT COME ON

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

INITIAL SETUP

Applicable Configurations:
Helicopters with Engine Air Particle Separator Provisions

Tools:
Electrical Repairer's Tool Kit,
NSN 5190-00-323-4915
Multimeter

Materials:
None

Personnel Required:
Aircraft Electrician (2)

ARE ANY CAPSULES ON THE MASTER CAUTION PANEL LT 1?

YES

NO

PERFORM TROUBLESHOOTING OF THE MASTER CAUTION PANEL. LIGHTS:
TM 55-1520-240-T. SECTION 9-18

REPLACE LAMP IN EAPS 1 FAIL CAPSULE DOES EAPS 1 FAIL CAPSULE COME ON?

YES

FAULT CORRECTED

NO

CHECK FOR GROUND ON RECEPTACLE 1811/1 PIN 5. IS GROUND PRESENT?

NO

LOCATE OPEN IN WIRE WMD-206-20, WMD-324-20, OR WMS-190-20 BETWEEN RECEPTACLE 1811/1 AND PIN 5. OPEN OR SHORTED. REPAIR OR REPLACE WIRE AS REQUIRED.

YES

LOCATE OPEN IN WIRE WMD-206-20, WMD-324-20, OR WMS-190-20 BETWEEN RECEPTACLE 1811/1 AND GROUND STUD. REPAIR OR REPLACE WIRE AS REQUIRED.
16.3.14 115 VAC IS NOT PRESENT WITH EAPS ENG 2 FAN SWITCH SET TO ON

INITIAL SETUP

Applicable Configurations:
- Helicopters with Engine Air Particle Separator Provisions

Tools:
- Electrical Repairer's Tool Kit
  - NSN 5180-00-323-4915
  - ohmmeter

Materials:
- None

Personnel Required:
- Aircraft Electrician (2)

References:
- TM 55-1520-240-23

Equipment Condition:
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power Off

Diagram Description:
- Diagram of EAPS ENG 2 FAN SWITCH and related components
- Cockpit view showing EAPS control panel
- EAPS control panel with interim NVG
- EAPS 2 FAN circuit breaker
- No. 2 EAPS control box
- STA 400 receptacle
- RBl 17.0

Change 16
10-1.1528 VDC IS NOT PRESENT ON RECEPTACLE 15J2 PIN 0 WITH EAPS ENG 2 DOORS SWITCH AT OPEN

INITIAL SETUP
Applicable Configurations:
- Helicopters with Engine Air Particle Separator Provisions

Tools:
- Electrical Repairer's Tool Kit,
  NSN 5160-00-323-4915
- Multimeter

Materials:
- None

Personnel Required:
- Aircraft Electrician (2)

Below
- TM 55-1520-240-23
- TM 55-1520-240-23:
  Battery Connected
  Electrical Power On
  Hydraulic Power Off

Lower the overhead panel. Check forward between EAPS ENG 2 DOORS SWITCH TERMINAL 3 AND GROUND IS 26VDC PRESENT?
- Yes
- No

Check forward between EAPS ENG 2 DOORS SWITCH TERMINAL 2 AND GROUND IS 26VDC PRESENT?
- Yes
- No

Locate open in wire W600-011-20, W600-012-20 OR W600-013-20 between EAPS ENG 2 DOORS SWITCH AND EAPS ENG 2 DOORS SWITCH. Repair or replace wire as required.

Locate open in wire W600-012-20, W600-013-20 OR W600-014-20 between EAPS ENG 2 DOORS SWITCH AND EAPS ENG 2 DOORS SWITCH. Repair or replace wire as required.
16-3.16 GROUND IS NOT PRESENT ON RECEPTACLE 151J2 PIN 8 WITH EAPS ENG 2 DOORS SWITCH AT OPEN

INITIAL SETUP

Applicable Configurations:
- Helicopters with Engine Air Particle Separator Provisions

Tools:
- Electrical Repairer's Tool Kit
- NSN 5180-00-323-4915
- Multimeter

Materials:
- None

Personnel Required:
- Aircraft Electrician (2)

References:
- TM 55-1520-240-23

Equipment Condition:
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power Off

--- Decision Tree Diagram ---

Lower overhead panel. Check for ground on EAPS ENG 2 doors switch terminal 5. Is ground present?

Yes

Check for ground on EAPS ENG 3 doors switch terminal 5. Is ground present?

Yes

Replace EAPS ENG 3 doors switch.

No

Locate open in wire W6860-016-20 on wire 10/12 gauge between EAPS ENG 2 doors switch and ground stud. Repair or replace wire as required.

No
16-3.17 28 VDC IS NOT PRESENT ON RECEPTACLE 151J2 PIN 3 WITH EAPS ENG 2 DOORS SWITCH AT CLOSE

INITIAL SETUP
Applicable Configurations:
Helicopters with Engine Air Particle Separator Provisions

Tools:
Electrical Repairer’s Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
Aircraft Electrician (2)

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

1. Lower overhead panel, check for 28 VDC between EAPS ENG 2 doors switch terminal 1 and ground, is 28 VDC present?
   - Yes: Locate open-in wire 2860-001-02, 2860-237-20 between EAPS ENG 2 doors switch and receptacle 151J2, repair or replace wire as required.
   - No: Check for 28 VDC between EAPS ENG 2 doors switch terminal 2 and ground, is 28 VDC present?
     - Yes: Replace EAPS ENG 2 doors switch.
     - No: Locate open-in wire 2860-001-02, 2860-237-20, or 2860-201-20 between EAPS ENG 3 doors switch and EAPS 2 bypass doors switch, repair or replace wire as required.
16-3.18 GROUND IS NOT PRESENT ON RECEPTACLE 151J2 PIN U WITH EAPS ENG 2 DOORS SWITCH AT CLOSE

References:
TAM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

Initial Setup

Applicable Configurations:
Helicopters with Engine Air Particle
Separator Provisions

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

Materials:
None

Personnel Required:
Aircraft Electrician (2)

LOWERS THE OVERHEAD PANEL CHECK FOR GROUND ON EAP ENG 2 DOORS SWITCH TERMINAL 4. IS GROUND PRESENT?


CHECK FOR GROUND ON EAP ENG 2 DOORS SWITCH TERMINAL 5. IS GROUND PRESENT?

REPLACE EAP ENG 2 DOORS SWITCH.

LOCATE OPEN IN WIRE W960-018-20 OR W960-018-20 A GROUND BETWEEN EAPS ENG 2 DOORS SWITCH AND GROUND STUD. REPAIR OR REPLACE WIRE AS REQUIRED.
16-3.19 EAPS 2 FAIL CAPSULE DOES NOT COME ON

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

Initial Setup

Applicable Configurations:
Helicopters with Engine Air Particle Separator Provisions

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

Materials:
None

Personnel Required:
Aircraft Electrician (2)

flowchart:

- Are any capsules on the master caution panel lit?
  - No: Replace lamp in EAPS 2 fail capsule does on.

- Replace lamp in EAPS 2 fail capsule does on?
  - Yes: Fault corrected.
  - No: Check for ground on receptacle 15-2 pin 9. Is ground present?

- Check for ground on receptacle 15-2 pin 9. Is ground present?
  - Yes: Locate open in wire W860-224-40422 between receptacle 15-2 and 15-2 pin 9, repair or replace wire as required.
  - No: Locate open in wire W860-224-40422 between receptacle 15-2 and 15-2 pin 9, repair or replace wire as required.
16-3.21 MASTER CAUTION LIGHTS OPERATIONAL CHECK

References:
Refer to Task 9-18.3 (TM 55-1520-240-T)
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Visual Check of Master Caution Lights Performed
(Task 9-18.2)

INITIAL SETUP
Applicable Configurations:
Helicopters with Engine Air Particle
Separator Provisions

Tools:
None

Materials:
None

Personnel Required:
Aircraft Electrician
## Initial Setup

**Applicable Configurations:**
- Helicopters with Engine Air
- Particle Separator Provisions

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

**Materials:**
- None

**Personnel Required:**
- Aircraft Electrician

## References
- TM 55-1520-240-23

## Equipment Condition:
- TM 55-1520-240-23:
  - Battery Disconnected
  - Electrical Power Off
  - Hydraulic Power Off

## Task

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Check OVHD CSL lights control (1).</td>
<td>If control (1) is loose or damaged, tighten or replace it as required.</td>
</tr>
<tr>
<td>2. Check 16 lightplate panels (2).</td>
<td>If any lightplate panel (2) is loose or damaged, tighten or replace it as required.</td>
</tr>
</tbody>
</table>

## Follow-on Maintenance
- None

---

**Diagram:**
- Overhead panel diagram highlighting panels and controls.

---

**Cockpit Diagram:**
- Cockpit view showing overhead panel location.
OVERHEAD PANEL LIGHTS OPERATIONAL CHECK

INITIAL SETUP

Applicable Configurations:
- Helicopters with Engine Air
- Particle Separator Provisions

Tools:
- None

Materials:
- None

Personnel Required:
- Aircraft Electrician

References:
- TM 55-1520-240-23
- TM 55-1520-240-T

Equipment Condition:
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power Off
  - Overhead Panel Lights Visual Check Performed
  - Refer to Task 9-1.7 (TM 55-1520-240-T)

TASK RESULT

1. Check that LIGHTING OVHD PNL circuit breaker (1) is closed.
2. Turn OVHD CSL lights control (2) from OFF through DIM to BRT.
3. Turn OVHD CSL lights control (2) to OFF.

FOLLOW-ON MAINTENANCE:
- TM 55-1520-240-23:
  - Battery Disconnected
  - Electrical Power Off
4.2 HEADS UP DISPLAY SYSTEM VISUAL CHECK

INITIAL SETUP:

Reference: TM 55-1520-240-33

Applicable Configurations:
All

Equipment Condition:
Electronic Equipment Tool Kit, NSN 5180-00-064-5178
Battery Connected
Electrical Power Off

Tools:
Electronic Equipment Tool Kit, NSN 5180-00-064-5178

Materials:
None

Personnel Required:
Avionics Mechanic
Aircraft Electrician

GO TO NEXT PAGE
### 16-4.2 HEADS UP DISPLAY SYSTEM VISUAL CHECK (Continued)

**FOLLOW-ON MAINTENANCE:**
If the Converter Control Unit (1), Air Data Transducer (8), Signal Data Converter (9), Inclinometer (10), or a Display Unit (11) and Power Supply Calibration Unit (12) is replaced, an operational check [16-4.3] must be performed.

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Check Converter Control Unit (1).</td>
<td>If any switch, indicator, or control panel (1) is damaged, replace item as required.</td>
</tr>
<tr>
<td>2. Check HUD control switch (2) on pilot's (3) and copilot's (4) thruster grip.</td>
<td>If either switch (2) is damaged, replace HUD Control Switch.</td>
</tr>
<tr>
<td>3. Check HUD SYS circuit breaker (5) and HUD REF circuit breaker (6) on copilot's circuit breaker panel (7).</td>
<td>If either circuit breaker (5 or 6) is damaged, replace circuit breaker.</td>
</tr>
<tr>
<td>4. Check Air Data Transducer (8).</td>
<td>If transducer (8) is loose or damaged, tighten or replace it as required. If connector to transducer is loose or damaged, tighten or replace as required. If wiring to connector is damaged, repair or replace it as required.</td>
</tr>
<tr>
<td>5. Check Signal Data Converter (9).</td>
<td>If converter (9) is damaged or any LED on the converter is defective, replace it. If converter is loose, tighten it. If any connector to converter is loose or damaged, tighten or replace it as required. If wiring to a connector is damaged, repair or replace it as required.</td>
</tr>
<tr>
<td>6. Check Inclinometer (10).</td>
<td>If Inclinometer (10) is loose or damaged, tighten or replace it as required. If connector to Inclinometer is loose or damaged, tighten or replace it as required. If wiring to the connector is damaged, repair or replace it as required.</td>
</tr>
<tr>
<td>7. Check pilot's or copilot's Display Unit's (if available) Optical Unit (11) and Power Supply Calibration Unit (12).</td>
<td>If either Optical Unit (11) or Power Supply Calibration Unit (12) is damaged, replace the Display Unit. If the cable between the units is damaged, repair or replace it as required.</td>
</tr>
</tbody>
</table>

**END OF TASK**
Change 18 16-149
INITIAL SETUP
Applicable Configurations:
All

Tools:
Electronic Equipment Tool Kit, NSN 5180-00-064-5178
Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

Materials:
None

Personnel Required:
Avionics Mechanic
Aircraft Electrician

References:
TM 55-1520-240-23
TM 11-5855-300-10
TM 11-5855-300-23&P

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
Visual Check of Heads Up Display Performed

General Safety Instructions:
WARNING
Keep personnel clear of flight controls.

Task 16-4.3 Heads Up Display System Operational Check

**Initial Setup**

**Applicable Configurations:**
All

**Tools:**
Electronic Equipment Tool Kit, NSN 5180-00-064-5178
Electrical Repairer's Tool Kit, NSN 5180-00-323-4915

**Materials:**
None

**Personnel Required:**
Avionics Mechanic
Aircraft Electrician

**References:**
TM 55-1520-240-23
TM 11-5855-300-10
TM 11-5855-300-23&P

**Task Result**

1. **With converter control unit (CCU) (1) off, connect heads up display (HUD) optical unit (2) and power supply calibration unit (3) to aircraft ANVIS system then turn on (push in) aircraft circuit breakers.**

   If CCU (1) panel is not illuminated, go to task 16-4.4

2. **Place CCU P-PGM/OPC/P-GM switch to OP and ADJ/ON/OFF switch to ON.**

   If FAIL light does not extinguish, go to task 16-4.5. If ON and FAIL lights do not illuminate, go to task 16-4.3

   **BIT** proceeds automatically. After 10 seconds BIT is complete and FAIL light extinguishes.

3. **Place CCU PLT and CPLT BRT/DIM controls to full BRT.**

   If PLT and/or CPLT display has no display, go to task 16-4.7

4. **Place CCU PLT and CPLT BRT/DIM controls to full DIM.**

   If PLT and/or CPLT display remains at maximum intensity, go to task 16-4.5

---

16-150 Change 18
5. Press and hold CCU BIT/ACK switch to BIT, allow 20 seconds for BIT to run then note that pilot and copilot displays show symbol generator test mode. Release CCU BIT/ACK switch to return display units to operating mode. If one test display is incorrect, replace that display unit. If both test displays are incorrect, replace the signal data converter. If both displays indicate incorrect type aircraft, go to task 16-4.3.

6. Refer to TM 11-5855-300-10 and program the pilot's then the copilot's display. On completion of programming, return CPU P-PGM/OP/CP-PGM switch to OP. If a symbol does not stop blinking when programmed, go to task 16-4.10. If PLT DCLT will not select, go to task 16-4.11. If CPLT DCLT will not select, go to task 16-4.12.

7. Set pilot's/copilot's thruster grip HUD control switch (4) to cycle through four MODE/DCLT positions and check the BRT and DIF operation. If the pilot thruster grip HUD switch will not cycle through all modes, through declutter, and brighten or dim display, go to tasks 16-4.13, 16-4.14, and 16-4.16 or 16-4.20. If the pilot's display will not follow the UR or the D/U (down/up) positions, go to tasks 16-4.23 or 16-4.24 respectively. For the copilot, go to tasks 16-4.23 or 16-4.24 respectively.

8. On the CCU, rotate pilot's/copilot's DISPL POS control to full LIR (left/right) then D/U (down/up) positions. Check that the display follows the control. If the MSL altitude (1) or airspeed (3) is improperly displayed, go to task 16-4.29. If the trim (2) is improperly displayed, go to task 16-4.30. If any adjustment can be made, refer to TM 11-5855-30-23&P to troubleshoot the HUD.

FOLLOW-ON MAINTENANCE:
TM 55-1520-240-23:
Remove power from HUD system
Remove Electrical Power
Disconnect Battery

NOTE: VERSION NUMBER AND DATE WILL CHANGE AS SOFTWARE IS UPDATED.
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

References:
TM 55-1520-240-23
TM 11-5855-300-23&P

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178
Multimeter

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On

Materials:
None

Personnel Required:
Avionics Mechanic

INITIAL SETUP

Applicable Configurations: All

References:
TM 55-1520-240-23
TM 11-5855-300-23&P

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178
Multimeter

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On

Materials:
None

16-152 Change 18

END OF TASK
FAULT ISOLATION PROCEDURE

Personnel Required:
Avionics Mechanic

References:
TM 55-1520-240-23
TM 11-5855-300-23&P

Applicable Configurations:
All

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178
Multimeter

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On

Materials:
None

INITIAL SETUP

END OF TASK

TM 55-1520-240-T

16-4.5 FAIL LAMP ON CCU IS ON

<table>
<thead>
<tr>
<th>CHECK FAULTS INDICATORS OF SDC IS A FAULT INDICATED?</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO</td>
</tr>
<tr>
<td>YES</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REPLACE FAILED LRU/CCA</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHECK CONTINUITY BETWEEN PIN 4 OF CCU CONNECTOR P2005R AND CONNECTOR SHELL. IS CONTINUITY PRESENT?</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO</td>
</tr>
<tr>
<td>YES</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>REPAIR/REPLACE WIRING AS REQUIRED.</th>
</tr>
</thead>
</table>

END OF TASK

Change 18 16-153
16-4.6 ON AND/OR FAIL LAMPS WILL NOT ILLUMINATE

FAULT ISOLATION PROCEDURE
Avionics Mechanic

INITIAL SETUP
Applicable Configurations:
All

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178
Multimeter

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On

Materials:
None

References:
TM 55-1520-240-23
TM 11-5855-300-23&P

Personnel Required:
Avionics Mechanic

INITIAL SETUP
Applicable Configurations:
All

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178
Multimeter

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On

Materials:
None

ARE LAMPS BURNT OUT?

YES
REPLACE LAMPS

NO

ARE BOTH LIGHTS OFF?

YES

CHECK FOR 28VDC BETWEEN P200R PINS A
AND B TO GROUND AT SDC. IS VOLTAGE PRESENT?

YES

REPAIR/REPLACE SDC.

NO

IS THE HUD SYS CIRCUIT BREAKER OPEN?

YES

CHECK FOR CONTINUITY BETWEEN PIN 17 OF CIRCUIT BREAKER PANEL 300P2
AND SDC CONNECTOR P200R PINS 4,5, AND 6 OF CCD CONNECTOR P200R.
IS CONTINUITY PRESENT?

YES

TROUBLE SHOOT CCD.
IF TROUBLE REMAINS, REPAIR/REPLACE SDC.

NO

NO

CHECK FOR CONTINUITY BETWEEN PIN 17 OF CIRCUIT BREAKER PANEL 300P2
AND SDC CONNECTOR P200R PINS 4,5, AND 6 OF CCD CONNECTOR P200R.
IS CONTINUITY PRESENT?

YES

REPAIR/REPLACE SDC.

NO

TROUBLE SHOOT CCD.
IF TROUBLE REMAINS, REPAIR/REPLACE SDC.
16-4.6 ON AND/OR FAIL LAMPS WILL NOT ILLUMINATE (Continued)

NO

IS ON LIGHT OFF?

YES

NO

CHECK FOR CONTINUITY BETWEEN PIN 4 OF CCU CONNECTOR P2000R AND PIN 13 OF SDC CONNECTOR P2001R. IS CONTINUITY PRESENT?

NO

REPAIR/REPLACE WIRING AS REQUIRED.

YES

REPAIR/REPLACE WIRING AS REQUIRED.

NO

REPAIR/REPLACE WIRING AS REQUIRED.

NO

REPAIR/REPLACE WIRING AS REQUIRED.

YES

TROUBLE SHOOT CCU. IF TROUBLE REMAINS, REPAIR/REPLACE SDC.

END OF TASK
Change 18  16-155
FAULT ISOLATION PROCEDURE
Personnel Required:
Avionics Mechanic

References:
TM 55-1520-240-23
TM 11-5855-300-23&P

Applicable Configurations:
All

Tools:
Electronic Equipment Tool Kit, NSN 5180-00-064-5178
Multimeter

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On

Materials:
None

INITIAL SETUP

DOES PLT AND CPLT BRT CONTROL ON CCU HAVE ANY EFFECT?

YES

NO

REPAIR/REPLACE SDC.

CHECK FOR CONTINUITY BETWEEN PIN 10 OF CCU CONNECTOR P200R AND PIN 13 OF SDC CONNECTOR P3001R. IS CONTINUITY PRESENT?

YES

NO

CHECK FOR CONTINUITY BETWEEN PIN 8 OF CCU CONNECTOR P200R AND PIN 6 OF SDC CONNECTOR P2001R. IS CONTINUITY PRESENT?

YES

NO

REPAIR/REPLACE WIRING AS REQUIRED.

TROUBLE SHOOT CCU. IF TROUBLE REMAINS, REPAIR/REPLACE SDC.

END OF TASK
FAULT ISOLATION PROCEDURE
Avionics Mechanic

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electronic Equipment Tool Kit, NSN 5180-00-064-5178
Multimeter

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On

Materials:
None

Personnel Required:
Avionics Mechanic

References:
TM 55-1520-240-23
TM 11-5855-300-23&P

END OF TASK
Change 18 16-157
FAULT ISOLATION PROCEDURE

Personnel Required:
Avionics Mechanic

References:
TM 55-1520-240-23
TM 11-5855-300-23&P

Applicable Configurations:
All

Tools:
Electronic Equipment Tool Kit, NSN 5180-00-064-5178
Multimeter

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On

Materials:
None

---

END OF TASK
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations: All

Tools:
Electronic Equipment Tool Kit, NSN 5180-00-064-5176
Multimeter

Materials:
None

Personnel Required:
Avionics Mechanic

References:
TM 55-1520-240-23
TM 11-5855-300-23&P

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On

Does HUD pass BIT test?

YES

NO

Replace failed LRU/CCA.

Check for continuity between Pin 4 of SDC connector and Pin 9 of CCU connector.

YES

IS CONTINUITY PRESENT?

REPAIR/REPLACE WIRING AS REQUIRED.

NO

WITH SEL SWITCH HELD
TOGGLED, IS THERE
CONTINUITY BETWEEN PIN
3 AND 19 OF CCU
CONNECTOR?

YES

Repair/replace CCU.

NO

Repair/replace SDC.

END OF TASK

Change 18 16-159
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5176
Multimeter

Materials:
None

Personnel Required:
Avionics Mechanic

References:
TM 55-1520-240-23
TM 11-5855-300-23&P

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On

Fault Isolation Procedure

Does HUD pass BIT test?

NO

REPLACE FAILED LRUCCA.

YES

CHECK FOR CONTINUITY BETWEEN PIN 23 OF SDC CONNECTOR P2001R AND PIN 15 OF CCU CONNECTOR P2005R. IS CONTINUITY PRESENT?

NO

REPAIR/REPLACE WIRING AS REQUIRED.

YES

WITH PLT MODE 1/4/DCLT SWITCH HELD IN DCLT POSITION IS THERE CONTINUITY BETWEEN PINS 3 AND 15 OF CCU CONNECTOR?

NO

REPAIR/REPLACE CCU.

YES

REPAIR/REPLACE SDC.

END OF TASK
16-4.12 COPILOT CANNOT SELECT DECLUTTER ON CCU

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electronic Equipment Tool Kit, NSN 5180-00-064-5176
Multimeter

Personnel Required:
Avionics Mechanic

References:
TM 55-1520-240-23
TM 11-5855-300-23&P

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On

Materials:
None

END OF TASK

Change 18    16-161
16-4.13 CANNOT CYCLE THROUGH MODES AT PILOT'S THRUSTER GRIP

**FAULT ISOLATION PROCEDURE**

**Personnel Required:**
Avionics Mechanic

**Applicable Configurations:**
- All

**References:**
- TM 55-1520-240-23
- TM 11-5855-300-23&P

**Tools:**
Electronic Equipment Tool Kit,
- NSN 5180-00-064-5178
- Multimeter

**Equipment Condition:**
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On

**Materials:**
None

---

**INITIAL SETUP**

**Applicable Configurations:**
- All

**Tools:**
Electronic Equipment Tool Kit,
- NSN 5180-00-064-5178
- Multimeter

**Equipment Condition:**
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On

**Materials:**
None

---

**END OF TASK**
16-4.14 CANNOT CYCLE THROUGH DECLUTTER AT PILOT'S THRUSTER GRIP

FAULT ISOLATION PROCEDURE

Personnel Required:
Avionics Mechanic

Applicable Configurations:
All

References:
TM 55-1520-240-23
TM 11-5855-300-23&P

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178
Multimeter

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On

Materials:
None

INITIAL SETUP

DOES HUD PASS BIT TEST?

YES

REPLACE FAILED LRUCCA.

NO

CAN PILOT'S DECLUTTER BE CYCLED AT CCU?

YES

DOES HUD PASS BIT TEST?

YES

REPLACE PILOT'S HBD CONTROL SWITCH.

NO

REPAIR/REPLACE WIRING AS REQUIRED.

CHECK FOR CONTINUITY BETWEEN PIN 5 OF CONNECTOR 300325 AT PILOT'S THRUSTER AND PIN 5 OF CCU CONNECTOR P2005R. IS CONTINUITY PRESENT?

NO

REPAIR/REPLACE WIRING AS REQUIRED.

YES

CHECK FOR CONTINUITY BETWEEN PIN R OF CONNECTOR 300325 AT PILOT'S THRUSTER AND PIN 15 OF CCU CONNECTOR P2005R. IS CONTINUITY PRESENT?

NO

REPAIR/REPLACE WIRING AS REQUIRED.

YES

CHECK FOR CONTINUITY BETWEEN PIN S R AND S OF CONNECTOR 30092S AT PILOT'S THRUSTER WITH PILOT'S HBD CONTROL SWITCH HELD IN DCON. IS CONTINUITY PRESENT?

NO

RERUN OPERATIONAL CHECK [TASK 16-1.3]

YES

END OF TASK

Change 18 16-163
PILOT'S BRT CONTROL ON THRUSTER DOES NOT VARY DISPLAY INTENSITY

16-4.15 FAULT ISOLATION PROCEDURE

Personnel Required:
Avionics Mechanic

Initial Setup

Applicable Configurations:
All

References:
TM 55-1520-240-23
TM 11-5855-300-23&P

Tools:
Electronic Equipment Tool Kit, NSN 5180-00-064-5178
Multimeter

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On

Materials:
None

Electrical Power On

DOES HMD PASS BIT TEST?

YES

NO

REPLACE FAILED LRU/CCA

CAN PILOT BRT INTENSITY BE VARED AT CCU?

YES

NO

GO TO TASK 16-4.7

CHECK FOR CONTINUITY BETWEEN PIN 5 OF CONNECTOR 300/25 AT PILOT'S THRUSTER AND PIN 3 OF CCU CONNECTOR P2005R. IS CONTINUITY PRESENT?

YES

REPAIR/REPLACE WIRING AS REQUIRED.

NO

REPAIR/REPLACE WIRING AS REQUIRED.

CHECK FOR CONTINUITY BETWEEN PIN P OF CONNECTOR 300/25 AT PILOT'S THRUSTER AND PIN 10 OF CCU CONNECTOR P2005R. IS CONTINUITY PRESENT?

YES

CHECK FOR CONTINUITY BETWEEN PINS P AND S OF CONNECTOR 300/25 AT PILOT'S THRUSTER WITH PILOT'S HUD CONTROL SWITCH HELD IN BRT. IS CONTINUITY PRESENT?

YES

REPLACE PILOT'S HUD CONTROL SWITCH.

NO

RERUN OPERATIONAL CHECK, TASK 16-4.3.

END OF TASK
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178
Multimeter

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On

Materials:
None

Personnel Required:
Avionics Mechanic

References:
TM 55-1520-240-23
TM 11-5855-300-23&P

Does HUD pass bit test?

YES

NO

REPLACE FAILED U/I/CCA.

Can PILOT's INTENSITY be varied at CGU?

YES

GO TO TASK 16-4.6.

NO

CHECK FOR CONTINUITY
BETWEEN PIN S OF
CONNECTOR 30025 AT
PILOT'S THRUSTER
AND PIN 3 OF CGU
CONNECTOR P2005R.
IS CONTINUITY PRESENT?

YES

REPAIR/REPLACE WIRING
AS REQUIRED.

NO

CHECK FOR CONTINUITY
BETWEEN PIN T OF
CONNECTOR 30025 AT
PILOT'S THRUSTER
AND PIN 11 OF CGU
CONNECTOR P2005R.
IS CONTINUITY PRESENT?

YES

REPAIR/REPLACE WIRING
AS REQUIRED.

NO

CHECK FOR CONTINUITY
BETWEEN PINS T AND S OF
CONNECTOR 30025 AT
PILOT'S THRUSTER WITH
PILOT'S HUD CONTROL
SWITCH HELD IN DIM.
IS CONTINUITY PRESENT?

YES

REPLACE PILOT'S
HUD CONTROL SWITCH.

NO

RERUN OPERATIONAL
CHECK. TASK 16-4.3.1

END OF TASK

Change 18 16-165
FAULT ISOLATION PROCEDURE

Personnel Required:
Avionics Mechanic

Applicable Configurations:
All

References:
TM 55-1520-240-23
TM 11-5855-300-23&P

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178
Multimeter

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On

Materials:
None

INITIAL SETUP

Does HUD pass BIT test? NO

YES

Replace Failed LRU/CCA.

CAN COPILOT MODES BE CYCLED AT CCU?

NO

YES

Go to TASK 16-4.27.

CHECK FOR CONTINUITY BETWEEN PIN S OF CONNECTOR 300J26 AT COPILOT'S THRUSTER AND PIN S OF CCU CONNECTOR P009R.

IS CONTINUITY PRESENT?

NO

REPAIR/REPLACE WIRING AS REQUIRED.

YES

CHECK FOR CONTINUITY BETWEEN PIN U OF CONNECTOR 300J26 AT COPILOT'S THRUSTER AND PIN 12 OF CCU CONNECTOR P009R.

IS CONTINUITY PRESENT?

NO

REPAIR/REPLACE WIRING AS REQUIRED.

YES

CHECK FOR CONTINUITY BETWEEN PINS U AND S OF CONNECTOR 300P25 AT COPILOT'S THRUSTER WITH COPILOT'S HUD CONTROL SWITCH HELD IN MODE.

IS CONTINUITY PRESENT?

NO

REPLACE COPILOT'S HUD CONTROL SWITCH.

YES

RERUN OPERATIONAL CHECK, TASK 16-4.3.

END OF TASK
16-4.18 CANNOT CYCLE THROUGH DECLUTTER AT COPILOT’S THRUSTER GRIP

FAULT ISOLATION PROCEDURE

Personnel Required:
Avionics Mechanic

Applicable Configurations:
All

References:
TM 55-1520-240-23
TM 11-5855-300-23&P

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On

Materials:
None

INITIAL SETUP

Applicable Configurations:
References:
All

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On

Materials:
None

Does HUD pass BIT test?

Yes

No

Replace failed UUCU.

Can copilot’s declutter be cycled at CCU?

Yes

No

Go to TASK 16-4.28.

Check for continuity between pin 5 of connector 30G26 at copilot’s thruster and pin 3 of CCU connector P200SR.

Is continuity present?

Yes

No

Repair/replace wiring as required.

Repair/replace wiring as required.

Check for continuity between pin R of connector 30G26 at copilot’s thruster and pin 13 of CCU connector P200SR.

Is continuity present?

Yes

No

Replace copilot’s HUD control switch.

Check for continuity between pins R and S of connector 30G23 at copilot’s thruster with copilot’s HUD control switch held in DCLT.

Is continuity present?

Yes

No

Rerun operational check. [TASK 16-4.3]

END OF TASK
**FAULT ISOLATION PROCEDURE**

**Personnel Required:**
Avionics Mechanic

**Applicable Configurations:**
All

**References:**
TM 55-1520-240-23
TM 11-5855-300-23&P

**Tools:**
Electronic Equipment Tool Kit, NSN 5180-00-064-5178
Multimeter

**Equipment Condition:**
TM 55-1520-240-23:
Battery Connected
Electrical Power On

**Materials:**
None

---

**INITIAL SETUP**

**Applicable Configurations:**
All

**References:**
TM 55-1520-240-23
TM 11-5855-300-23&P

**Tools:**
Electronic Equipment Tool Kit, NSN 5180-00-064-5178
Multimeter

**Equipment Condition:**
TM 55-1520-240-23:
Battery Connected
Electrical Power On

**Materials:**
None

---

**END OF TASK**
FAULT ISOLATION PROCEDURE

Personnel Required:
Avionics Mechanic

Applicable Configurations:
All

References:
TM 55-1520-240-23
TM 11-5855-300-23&P

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178
Multimeter

Equipment Condition:
TM 55-1520-240-23;
Battery Connected
Electrical Power On

Materials:
None

INITIAL SETUP

Applicable Configurations: References:
All

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178
Multimeter

Equipment Condition:
TM 55-1520-240-23;
Battery Connected
Electrical Power On

Materials:
None

DOES HUD PASS BIT TEST?
NO
REPLACE FAILED LRU/CCA

YES

CAN CPLOT DIM INTENSITY BE VARIED AT CCU?
NO
GO TO TASK 16-4.8

YES

CHECK FOR CONTINUITY BETWEEN PIN S OF CONNECTOR 303,26 AT CPLOT’S THRUSTER AND PIN S OF CCU CONNECTOR P3005R.
IS CONTINUITY PRESENT?
NO
REPAIR/REPLACE WIRING AS REQUIRED.

YES

CHECK FOR CONTINUITY BETWEEN PIN T OF CONNECTOR 300,26 AT CPLOT’S THRUSTER AND PIN S OF CCU CONNECTOR P3005R.
IS CONTINUITY PRESENT?
NO
REPAIR/REPLACE WIRING AS REQUIRED.

YES

CHECK FOR CONTINUITY BETWEEN PINS T AND S OF CONNECTOR 300,25 AT CPLOT’S THRUSTER WITH CPLOT’S HUD CONTROL SWITCH HELD IN DIM.
IS CONTINUITY PRESENT?
NO
REPLACE CPLOT’S HUD CONTROL SWITCH.

YES

RERUN OPERATIONAL CHECK [TASK 16-4.1]
**Fault Isolation Procedure**

**Initial Setup**

**Applicable Configurations:** All

**Tools:**
- Electronic Equipment Tool Kit, NSN 5180-00-064-5178
- Multimeter

**Equipment Condition:**
- TM 55-1520-240-23: Battery Connected
- Electrical Power On

**Personnel Required:** Avionics Mechanic

**References:**
- TM 55-1520-240-23
- TM 11-5855-300-23&P

**Materials:** None

---

**Decision Tree:**

1. **Does COPilot's Display Follow Switch Left/Right when Used in Pilot's Position?**
   - **Yes:** Replace Pilot's Display Unit.
   - **No:**
     - **Check for Continuity Between CCU Connector P2005R Pins 22,23, and 28 SDC Connector P2001R Pins 03,02, and 65 Respectively. Is Continuity Present?**
     - **Yes:** Replace/Repair Wiring as Required.
     - **No:** Replace/Repair CCU.

2. **With Left/Right Switch Centered, Check for Approx. 3.7 Kohms Between Pins 26 and 22 (or 23) of CCU J1. Is Resistance Correct?**
   - **Yes:** Replace/Repair CCU.
   - **No:** Replace/Repair SDC.

**End of Task**
FAULT ISOLATION PROCEDURE

Personnel Required:
Avionics Mechanic

References:
TM 55-1520-240-23
TM 11-5855-300-23&P

Applicable Configurations:
All

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178
Multimeter

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electronic Power On

Materials:
None

INITIAL SETUP

Applicable Configurations: All

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178
Multimeter

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electronic Power On

Materials:
None

Does copilot's display follow switch up/down when used in pilot's position?

YES

REPLACE PILOT'S DISPLAY UNIT.

NO

CHECK FOR CONTINUITY BETWEEN CCU CONNECTOR P2005R PINS 22,23, AND 27 AND SDC CONNECTOR P2069R PINS 93,92, AND 64 RESPECTIVELY IS CONTINUITY PRESENT?

YES

REPAIR/REPLACE CCU.

NO

CHECK FOR APPROX. 2.5 KOHMS BETWEEN PINS 22 AND 23 OF CCU J1. IS RESISTANCE CORRECT?

YES

REPAIR/REPLACE CCU.

NO

WITH U/P/DOWN SWITCH CENTERED, CHECK FOR APPROX. 3.7 KOHMS BETWEEN PINS 27 AND 22 (OR 23) OF CCU J1. IS RESISTANCE CORRECT?

YES

REPAIR/REPLACE SDC.

NO

END OF TASK

Change 18 16-171
16-4.23 CANNOT VARY COPILOT'S DISPLAY LEFT/RIGHT

**FAULT ISOLATION PROCEDURE**

**Personnel Required:**
- Avionics Mechanic

**References:**
- TM 55-1520-240-23
- TM 11-5855-300-23&P

**Applicable Configurations:**
- All

**Tools:**
- Electronic Equipment Tool Kit, NSN 5180-00-064-5178
- Multimeter

**Equipment Condition:**
- TM 55-1520-240-23: Battery Connected
- Electrical Power On

**Materials:**
- None

---

**INITIAL SETUP**

**Applicable Configurations:**
- All

**Tools:**
- Electronic Equipment Tool Kit, NSN 5180-00-064-5178
- Multimeter

**Materials:**
- None

**Equipment Condition:**
- TM 55-1520-240-23: Battery Connected
- Electrical Power On

---

**END OF TASK**

16-172 Change 18
16-4.24 CANNOT VARY COPILOT'S DISPLAY UP/DOWN

FAULT ISOLATION PROCEDURE

Personnel Required:
Avionics Mechanic

Applicable Configurations:
All

References:
TM 55-1520-240-23
TM 11-5855-300-23&P

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178
Multimeter

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On

Materials:
None

INITIAL SETUP

Applicable Configurations:
All

References:
TM 55-1520-240-23
TM 11-5855-300-23&P

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178
Multimeter

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On

Materials:
None

END OF TASK
Fault Isolation Procedure

Personnel Required:
Avionics Mechanic

References:
TM 55-1520-240-23
TM 11-5855-300-23&P

Applicable Configurations:
All

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178
Multimeter

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On

Materials:
None

INITIAL SETUP


NO

REPAIR/REPLACE WIRING AS REQUIRED.

END OF TASK

END OF TASK
CANNOT CYCLE THROUGH PILOT'S DECLUTTER AT CCU OR PILOT'S THRUSTER GRIP HUD CONTROL SWITCH

FAULT ISOLATION PROCEDURE

PERSONNEL REQUIRED:
Avionics Mechanic

INITIAL SETUP

APPLICABLE CONFIGURATIONS:
All

REFERENCES:
TM 55-1520-240-23
TM 11-5855-300-23&P

TOOLS:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178
Multimeter

EQUIPMENT CONDITION:
TM 55-1520-240-23:
Battery Connected
Electrical Power On

MATERIALS:
None

INITIAL SETUP

CHECK FOR CONTINUITY BETWEEN PINS R OF PILOT'S THRUSTERS 300, 25, 15 OF CCU CONNECTOR P000R, AND 23 OF SDC CONNECTOR P000R, IS CONTINUITY PRESENT?

YES

REPAIR/REPLACE SDC.

NO

REPAIR/REPLACE WIRING AS REQUIRED.

END OF TASK

Change 18 16-175
**FAULT ISOLATION PROCEDURE**

**Personnel Required:**
Avionics Mechanic

**Applicable Configurations:**
All

**References:**
- TM 55-1520-240-23
- TM 11-5855-300-23&P

**Tools:**
- Electronic Equipment Tool Kit, NSN 5180-00-064-5178
- Multimeter

**Equipment Condition:**
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On

**Materials:**
- None

---

**INITIAL SETUP**

**Applicable Configurations:**
- All

**Tools:**
- Electronic Equipment Tool Kit, NSN 5180-00-064-5178
- Multimeter

**Equipment Condition:**
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On

---

**CHECK FOR CONTINUITY BETWEEN PINS U OF COPILOT'S THRUSTER 300,20, 12 OF CCU CONNECTOR P2005R, AND 31 OF SOC CONNECTOR P2001R. IS CONTINUITY PRESENT?**

- **NO** REPAIR/REPLACE WIRING AS REQUIRED.
- **YES** REPAIR/REPLACE SOC.

---

**END OF TASK**
FAULT ISOLATION PROCEDURE

Personnel Required:
Avionics Mechanic

Applicable Configurations:
All

References:
TM 55-1520-240-23
TM 11-5855-300-23&P

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178
Multimeter

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On

Materials:
None

CHECK FOR CONTINUITY
BETWEEN PINS R OF COPILOT'S THRUSTER 30028,
13 OF CCU CONNECTOR P200R, AND 15 OF SDC
CONNECTOR P200R. IS CONTINUITY PRESENT?

NO
REPAIR/REPLACE WIRING AS REQUIRED.

YES

REPAIR/REPLACE SDC.

END OF TASK

Change 18  16-177
Fault Isolation Procedure

Personnel Required:
Avionics Mechanic

References:
TM 55-1520-240-23
TM 11-5855-300-23&P

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178
Multimeter

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On

Materials:
None

Initial Setup
Applicable Configurations:
All

References:
All TM 55-1520-240-23
TM 11-5855-300-23&P

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178
Multimeter

Materials:
None

END OF TASK
16-4.30 NO OR IMPROPER TRIM (SLIDE BALL) DISPLAYED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178
Multimeter

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On

Personnel Required:
Avionics Mechanic

References:
TM 55-1520-240-23
TM 11-5855-300-23&P

Materials:
None

END OF TASK

Change 18 16-179/(16-180 Blank)
16-5  AN/ALE-47 COUNTERMEASURES DISPENSER SYSTEM
NOTE:

AN/ALE-47 Countermeasures Dispenser System wiring diagrams are located on pages 16-183 through 16-187 (Sheets 2 of 6 through 6 of 6). Page 16-188 contains the wiring diagram for the Miscellaneous Control Panel which contains the AN/ALE-47 Digital Control Display Unit (DCDU), the LED Lighting Control and the Radar Altimeter Audio Control.
16-5.1 AN/ALE-47 COUNTERMEASURES DISPENSER SYSTEM WIRING DIAGRAMS (Continued)

SEE TM 55-1520-240-T-2 SECTION 9 FOR COMPLETE CENTER CONSOLE LIGHTING CIRCUIT
16-5.1 AN/ALE-47 COUNTERMEASURES DISPENSER SYSTEM WIRING DIAGRAMS (Continued)

PILOTS ICS
CO-PILOTS ICS
HOIST OPS ICS

187P27
187P36
187P31

APN209-31B22
APN209-31D20
APN209-31C22

APN209-32A22N

END OF TASK
INITIAL SETUP

Applicable Configurations:
All

Tools:
Electronic Equipment Tool Kit, NSN 5180-00-064-5178

Materials:
- Cloth (E120)

Equipment Condition:
- TM 55-1520-240-10
- AN/ALE-47 Safety Switch pin installed
- TM 55-1520-240-23
- Battery connected
- Electrical power Off
- Hydraulic power Off

References:
- TM 55-1520-240-10
- TM 55-1520-240-23
- TM 1-1500-343-23

GO TO NEXT PAGE
### 16-5.2 AN/ALE-47 COUNTERMEASURES DISPENSER SYSTEM VISUAL CHECK (Continued)

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Check FLARE DISPENSE switches (13) on pilot's and copilot's cyclic stick grips.</td>
<td>If switch is damaged, replace cyclic stick grip.</td>
</tr>
<tr>
<td>2. Check DCDU (15) switches, indicators, displays, and lights.</td>
<td>If any switch, indicator, display, or light is damaged, replace DCDU (15).</td>
</tr>
<tr>
<td>3. Check miscellaneous control panel (14).</td>
<td>If miscellaneous control panel (14) is loose or damaged, tighten or replace as required.</td>
</tr>
<tr>
<td>4. Check programmer (2), electrical connectors, and plugs.</td>
<td>If programmer (2) is loose or damaged, tighten or replace as required. If connectors or plugs are loose or damaged, tighten or replace as required.</td>
</tr>
<tr>
<td>5. Check No. 1 (9) and No. 2 (7) sequencers, switches, electrical connectors, and plugs.</td>
<td>If sequencer (7 or 9) is loose or damaged, tighten or replace as required. If switch is damaged, replace sequencer. If connector or plug is damaged, tighten or replace as required.</td>
</tr>
<tr>
<td>6. Check landing gear bypass status panel (1), lights, switches, electrical connectors, and plugs.</td>
<td>If any light or switch on panel (1) is damaged, replace as required. If connector to panel is loose or damaged, tighten or replace as required. If wiring to connector is damaged, repair or replace as required.</td>
</tr>
<tr>
<td>7. Check safety switch (12), safety pin, electrical connectors, and plugs.</td>
<td>If safety switch (12) is loose or damaged, tighten or replace as required. If safety pin is damaged, replace it. If safety pin streamer is missing or frayed, replace it. If connector or plugs are loose or damaged, tighten or replace as required.</td>
</tr>
<tr>
<td>8. Check junction box (3), connectors, and plugs.</td>
<td>If junction box (3) is loose or damaged, tighten or replace as required. If connector or plug is loose or damaged, tighten or replace as required.</td>
</tr>
<tr>
<td>9. Check MLV interface port (4), electrical connector.</td>
<td>If MLV interface port (4) is loose or damaged, tighten or replace as required. If connector is loose or damaged, tighten or replace as required.</td>
</tr>
<tr>
<td>10. Check crew dispense switches (8), electrical connectors, and plugs.</td>
<td>If crew dispense switch (8) is loose or damaged, tighten or replace as required. If connector or plug is loose or damaged, tighten or replace as required.</td>
</tr>
<tr>
<td>11. Check payload modules (6 and 10) and dispenser assemblies (5 and 11) wiring, electrical connectors, and electrical plugs.</td>
<td>If payload modules (6 and 10) or dispenser assemblies (5 or 11) are loose or damaged, tighten or replace as required. If module or dispenser wiring, connector, or plugs are loose or damaged, tighten or replace as required.</td>
</tr>
</tbody>
</table>

#### WARNING

Dirty, loose or damaged electrical contact between the payload module EMI gasket/breech plate and dispenser assembly contacts and ground springs can cause misfires of the counter-measures munitions.

12. Check payload modules (6 and 10) EMI gasket/breech plate and dispenser assembly (5 and 11) contacts and ground springs. If payload modules (6 and 10) EMI gasket/breech plate or dispenser assembly (5 and 11) contacts and ground springs are dirty, loose or damaged, clean, tighten or replace as required.

#### FOLLOW-ON MAINTENANCE:

None
INITIAL SETUP

Applicable Configurations:
All

Tools:
Electronic Equipment Tool Kit
NSN 5180-00-064-5178
Countermeasures Dispenser Test Set
PN 341000-7001

Materials:
None

Personnel Required:
Avionics Mechanic

Equipment Condition:
TM 55-1520-240-10
AN/ALE-47 safety switch safety pin installed
AN/ALQ-156 MWS installed
TM 55-1520-240-23
Battery connected
Payload modules removed (TM 55-1520-240-23-10)
Visual check of CMDS performed (Task 16-5.2)
Electrical power Off
Hydraulic power Off

References:
TM 55-1520-240-10
TM 55-1520-240-23

General Safety Instructions:

WARNING
Do not perform operational check with payload modules (magazines) installed. During checkout procedures, voltage is applied to dispenser assemblies which may result in inadvertent dispensing of expendables causing death or injury to personnel or damage to equipment.

GO TO NEXT PAGE
### 16-5.3 AN/ALE-47 COUNTERMEASURES DISPENSER SYSTEM OPERATIONAL CHECK (Continued)

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NOTE</strong></td>
<td>Do not install CDTs into Countermeasures Dispenser System (CMDS) dispenser assemblies before performing CDT BIT check.</td>
</tr>
<tr>
<td>1. Set CDT MODE switch (18) to FIRE TEST.</td>
<td>BIT begins automatically. The following displays appear on the CDT:</td>
</tr>
<tr>
<td></td>
<td>All CDT indicators illuminate briefly.</td>
</tr>
<tr>
<td></td>
<td><strong>BIT</strong> is displayed on upper display field.</td>
</tr>
<tr>
<td></td>
<td>“S-&quot; and software version number is displayed</td>
</tr>
<tr>
<td></td>
<td>If no fault is detected <strong>PASS</strong> message is displayed. If fault is detected <strong>FAIL</strong> message is displayed, set MODE switch to OFF and replace CDT.</td>
</tr>
<tr>
<td>2. Set CDT DATA switch (19) to COUNT or DUAL COUNT (chaff use).</td>
<td><strong>WARNING</strong> Do not perform operational checkout of CMDS with payload modules installed in dispenser assemblies. System could inadvertently dispense flares resulting in damage to aircraft or injury or death to personnel.</td>
</tr>
<tr>
<td>3. Check CDT display (20) for battery message.</td>
<td>If <strong>LOW BAT</strong> is displayed, refer to TM 341003 (Operation and Maintenance Technical Manual) accompanying CDTs.</td>
</tr>
<tr>
<td>4. Set CDT MODE switch (18) to OFF.</td>
<td></td>
</tr>
<tr>
<td><strong>NOTE</strong></td>
<td>Install CDTs (16) into flare dispenser assemblies (15) being tested; secure CDTs (16) by tightening two fastening knobs (17).</td>
</tr>
<tr>
<td>5. Install CDTs (16) into flare dispenser assemblies (15) being tested; secure CDTs (16) by tightening two fastening knobs (17).</td>
<td>DC followed by <strong>AC</strong> is displayed on CDT display (20) for 4 seconds. If stray voltage is not detected, <strong>PASS</strong> is displayed. If <strong>FAIL</strong> message is displayed, failed pin numbers will then be displayed. Record failed pin numbers. This is an indication that stray voltage was detected on the dispenser breechplate terminals. This condition must be corrected before proceeding with the operational check. Power down the AN/ALQ-156 MWS and remove power from aircraft. Starting at the dispenser pins, use multimeter to locate the source of stray voltage. If CMDS is not the source of the stray voltage, the aircraft wiring must be checked to locate and repair the stray voltage condition.</td>
</tr>
<tr>
<td>6. Apply electrical power to aircraft.</td>
<td><strong>WARNING</strong> Do not perform operational checkout of CMDS with payload modules installed in dispenser assemblies. System could inadvertently dispense flares resulting in damage to aircraft or injury or death to personnel.</td>
</tr>
<tr>
<td><strong>NOTE</strong></td>
<td>Proceed with AN/ALE-47 CMDS operational checkout while AN/ALQ-156 MWS is warming up.</td>
</tr>
<tr>
<td>7. Set AN/ALQ-156 POWER switch (10) to ON; press AN/ALQ-156 PUSH FOR STANDBY switch (9) to initiate standby mode.</td>
<td>If DCALE47 DCDU circuit breaker is open, close it. If it does not stay closed, go to Task 16-5.4.</td>
</tr>
<tr>
<td>After 10 minutes, <strong>STBY</strong> light on AN/ALQ-156 illuminates.</td>
<td><strong>WARNING</strong> Do not perform operational checkout of CMDS with payload modules installed in dispenser assemblies. System could inadvertently dispense flares resulting in damage to aircraft or injury or death to personnel.</td>
</tr>
<tr>
<td>8. Set CDT MODE switch (18) to S.V. (stray voltage).</td>
<td></td>
</tr>
<tr>
<td>10. Set CDT MODE switch (18) to OFF.</td>
<td>b. <strong>BIT</strong> is displayed on upper display field.</td>
</tr>
<tr>
<td><strong>WARNING</strong></td>
<td>c. “S-&quot; and version number is displayed on CDT.</td>
</tr>
<tr>
<td></td>
<td>d. BIT begins automatically.</td>
</tr>
</tbody>
</table>
| | e. **BIT FAIL** message is displayed, press RESET TEST button (21) on CDT; **FIRE** and **00** messages are displayed. | **GO TO NEXT PAGE**
## 16-5.3 AN/ALE-47 COUNTERMEASURES DISPENSER SYSTEM OPERATIONAL CHECK (Continued)

### TASK

**NOTE**

- If no expendable counts or an erroneous counts are displayed, the CDTs the payload MAG ID Encoding pin switches S2, S3, S4 or S5 may be set incorrectly.

- Press and turn payload coding pins (33) on CDTs (16) to lock-in, set payload MAG ID codes as follows. All other coding pins should be unlocked-out:

<table>
<thead>
<tr>
<th>CDT POSITION</th>
<th>CODING PIN POSITIONS</th>
<th>MAG ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>DISP #1 (37)</td>
<td>X O O O 1</td>
<td></td>
</tr>
<tr>
<td>DISP #2 (34)</td>
<td>O O X 8</td>
<td></td>
</tr>
<tr>
<td>DISP #3 (36)</td>
<td>X O O O 1</td>
<td></td>
</tr>
<tr>
<td>DISP #4 (35)</td>
<td>O O O X 8</td>
<td></td>
</tr>
</tbody>
</table>

- "X" = Locked (Pressed in) Coding Pin
- "O" = Unlocked (Out) Coding Pin

- Set DCDU MODE switch (7) to STBY.

**NOTE**

- The CDT has a battery saver feature which will turn the CDT off after approximately 20 minutes of inactivity. If this occurs, set CDT MODE switch (18) to OFF, then back to FIRE TEST.

- Press the following DCDU INHIBIT pushbutton switches (24): O’1, O’2, CH, FL, RWR, JMR, and MWS.

- Press and hold DCDU ENT/BIT switch until MAINTENANCE BIT is displayed, then release DCDU ENT/BIT switch to view BIT status.

- Press and release DCDU ENT/BIT switch to view DCDU failures.

### RESULT

**NOTE**

- If erroneous expendable counts are displayed, fastening knobs may require additional tightening.

- Confirm displayed OFP and MDF match the version numbers of the OFP and MDF documents for your unit.

- If NO GO is displayed on the DCDU go to step 20. If DISPENSE READY is displayed go to step 23.

- LED for each switch illuminates when the switch is depressed. If LED for any INHIBIT switch fails to illuminate, remove and replace DCDU.

- MAINTENANCE BIT, then BITSTAT=00000000 is displayed on DCDU.

- NO CDU FAILURES is displayed on DCDU.

- Verify DCDU display scrolls through letters, numbers, symbols, and alphanumeric and symbology display test.

- On Pilot’s Cyclic Grip, press and release the dispense switch. Repeat for Copilots dispense switch.

- On landing gear status panel, place the landing gear switch to BYPASS.

- On landing gear status panel, place the landing gear switch to NORMAL.

- On DCDU press and release the ENT/BIT switch.

### TASK

**RESULT**

- Verify DCDU display scrolls through letters, numbers, symbols, and alphanumeric and symbology display test.

- Verify DCDU displays MANUAL DISPENSE, and then displays MANUAL DISP OFF. For pilot and 16-5.9 for copilot.

- Verify payload inventory is displayed, and all payload and sensor inhibit light go out.

- In cabin, press and release the crew dispense switch. Repeat for each forward L/H and R/H, and aft L/H and R/H crew dispense switch.

- Actuate each DCDU switch and verify DCDU display registers the engagement and disengagement of the associated switch and discrete interfaces.

- Actuate each switch to view Alphanumeric and symbology display test.

- On landing gear status panel, place the landing gear switch to BYPASS.

- On landing gear status panel, place the landing gear switch to NORMAL.

- Verify DCDU display scrolls through letters, numbers, symbols, and alphanumeric and symbology display test.

- Verify DCDU displays WOW INACTIVE.

- Verify DCDU displays WOW ACTIVE.

- Verify payload inventory is displayed, and all payload and sensor inhibit light go out.

- Verify DCDU displays MANUAL9 DISPENSE, and then displays MANUAL9 DISP OFF.

- Verify DCDU display scrolls through letters, numbers, symbols, and alphanumeric and symbology display test.

- Verify DCDU displays MANUAL DISPENSE, and then displays MANUAL DISP OFF.

- In cabin, press and release the crew dispense switch. Repeat for each forward L/H and R/H, and aft L/H and R/H crew dispense switch.

- Actuate each DCDU switch and verify DCDU display registers the engagement and disengagement of the associated switch and discrete interfaces.

- Actuate each switch to view Alphanumeric and symbology display test.

- On landing gear status panel, place the landing gear switch to BYPASS.

- On landing gear status panel, place the landing gear switch to NORMAL.

- Verify DCDU display scrolls through letters, numbers, symbols, and alphanumeric and symbology display test.

- Verify DCDU displays WOW INACTIVE.

- Verify DCDU displays WOW ACTIVE.

- Verify payload inventory is displayed, and all payload and sensor inhibit light go out.

- In cabin, press and release the crew dispense switch. Repeat for each forward L/H and R/H, and aft L/H and R/H crew dispense switch.

- Actuate each DCDU switch and verify DCDU display registers the engagement and disengagement of the associated switch and discrete interfaces.

- Actuate each switch to view Alphanumeric and symbology display test.

- On landing gear status panel, place the landing gear switch to BYPASS.

- On landing gear status panel, place the landing gear switch to NORMAL.
### Task 16-5.3: AN/ALE-47 Countermeasures Dispenser System Operational Check (Continued)

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NOTE</strong></td>
<td>Ensure all DCDU INHIBIT LEDs remain illuminated when performing steps 19 – 22.</td>
</tr>
</tbody>
</table>

28. Press DCDU ENT/BIT switch (25) momentarily to select maintenance mode.

When IBIT is complete, **MAINT MODE???** prompt will appear.

29. While **MAINT MODE???** is displayed, press DCDU ENT/BIT switch (25) momentarily to display the DCDU and sequencer firmware identification numbers. The following displays appear:

- **OFP # XXXX**
- **CCU FIRM ID ####**
- **SEQ 1A ID ####**
- **SEQ 2A ID ####**
- **SEQ 1A SAFE**
- **SEQ 2A SAFE**

30. When **HIST DATA???** appears, press DCDU ENT/BIT switch (23) momentarily.

System fault messages are displayed. Refer to table at end of this task for explanation of fault messages. After fault messages are displayed, **CLR FLT LST** is displayed.

**NOTE**

The number (inventory) displayed on the DCDU will vary based on the number of CDTs being used to perform the AN/ALE-47 operational check.

**Examples:**

- 1 CDT installed: 10 10 _ _ 10 will be displayed
- 2 CDTs installed: 20 20 _ _ 20 will be displayed
- 3 CDTs installed: 30 30 _ _ 30 will be displayed
- 4 CDTs installed: 40 40 _ _ 40 will be displayed

31. Press DCDU ENT/BIT switch (25) momentarily after **CLR FAULT LIST?** prompt appears to clear the MFL.

**NOTE**

The CDT has a battery saver feature which will turn the CDT off after approximately 15 minutes of inactivity. If this occurs, set CDT MODE switch (18) to OFF, then back to FIRE TEST; press RESET TEST button.

32. Adjust DCDU LED indicator (5) brightness from dim to bright; set as desired using ALE-47 dim switch (2) located on miscellaneous control panel (3).

**NOTE**

Loose, damaged or dirty contacts for the fire pins and ground spring of the dispenser assemblies can cause misfires of the expendables.

33. Press DCDU INHIBIT O1, O2, CH, FL, RWR, JMR, and MWS switches (24). LED for each switch goes out as switch is depressed.

34. Ensure sequencer switches (43 and 44) are set as follows: No. 1 sequencer (32): 1/A; No. 2 sequencer (26): 2/A.

35. Remove safety pin (30) from AN/ALE-47 safety switch (31).

36. Set LDG GR SW BYPASS switch (28) on LDG GR BYPASS STATUS panel (27) to BYPASS (up). LDG GR SW BYPASS light (29) on LDG GR BYPASS STATUS panel illuminates. If LDG GR SW BYPASS light (29) on LDG GR BYPASS STATUS panel does not illuminate, troubleshoot per Task 16-5.13.

37. Set DCDU MODE switch (7) to MAN and MANUAL O1: 20 O2: 20 CH: _ _ FL: 20 is displayed on DCDU. O1: 20 O2: 20 CH: _ _ FL: 20 is displayed on DCDU. If DCDU does not display full simulated payload module quantities, check DCDU for BIT failure messages. If no BIT failure messages are displayed, verify that CDTS are installed correctly and powered up.

38. Press and release FLARE DISP button (22) on pilot’s cyclic stick grip (23) one time. Expendable count on DCDU counts down by XX CDTs count up by XX. (“Note: XX represents the expendable count as determined by the MDF loaded in the CMDS and the number of CDTs installed). If DCDU does not indicate correct dispense count, isolate faulty LRU; if CDT does not indicate correct count, go to Task 16-5.10.

39. Dispense all remaining simulated payloads by repeatedly pressing FLARE DISP button (22).

**NOTE**

Loose, damaged or dirty contacts for the fire pins and ground spring of the dispenser assemblies can cause misfires of the expendables.

**Examples:**

- O1: 0 O2: 0 CH: _ _ FL: 0 is displayed on DCDU; 36 is displayed on CDTS.
- If CDT does not show all expendables fired, isolate the faulty LRU; remove and replace LRU per TM 55-1520-240-23-10.

---

**GO TO NEXT PAGE**
16-5.3 AN/ALE-47 COUNTERMEASURES DISPENSER SYSTEM OPERATIONAL CHECK (Continued)
<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>40. Set CDT MODE switch (18) to FIRE TEST and DATA switch (19) to NO FIRE.</td>
<td>CDTs display <strong>PASS</strong>.&lt;br&gt; If either CDT displays unfired pin numbers, check DCDU for BIT failure messages to determine faulty LRU; refer to TM 55-1520-240-23-10 for LRU removal and replacement procedures.</td>
</tr>
</tbody>
</table>

**NOTE**<br>Record firing sequences as they are displayed on each CDT to compare them with the MDF programmed sequences.  

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
</table>
| 41. Set CDT DATA switch (19) to SEQ to check detected firing sequences with the MDF sequences. | Firing sequence of expendables is displayed.<br> If detected fire sequence is correct go to step 32.  
If detected firing sequence was incorrect, analyze CDT recorded test data and/or CMDs BIT results to isolate faulty LRU; Refer to TM 55-1520-240-23-10 for LRU removal and replacement procedures. |

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<tbody>
<tr>
<td>42. Set CDT DATA switch (19) to BAD GND.</td>
<td>CDT LCD main display field displays <strong>PASS</strong>.&lt;br&gt; If CDT LCD displays <strong>Exx</strong>, isolate faulty LRU or cable; repair cable; or replace LRU per TM 55-1520-240-23-10.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
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<tbody>
<tr>
<td>43. Set CDT DATA switch (19) to COUNT, press RESET TEST switch (21).</td>
<td>CDTs display <strong>00</strong>.</td>
</tr>
<tr>
<td>44. Set DCDU MODE switch (7) to OFF, then to MAN.</td>
<td>O1: 20  O2: 20  CH: _ _  FL: 20  is displayed on DCDU.</td>
</tr>
<tr>
<td>45. Set DCDU MANUAL switch (6) to 2.</td>
<td>O1: 20  O2: 20  CH: _ _  FL: 20  is displayed on DCDU; press RESET TEST switch (21) on CDTs (16).</td>
</tr>
</tbody>
</table>

46. Press and release FLARE DISP button (22) on pilot’s cyclic stick grip (23). <br>Expendable count on DCDU counts down by **XX**; CDTs count up by **XX**. <br> If DCDU does not indicate correct dispense count, isolate faulty LRU; if CDT does not indicate correct count, go to [Task 16-5.10].  

47. Press and release FLARE DISP button (39) on copilot’s cyclic stick grip (38). <br>Expendable count on DCDU counts down by **XX**; CDTs count up by **XX**. <br> If DCDU does not indicate correct dispense count, isolate faulty LRU; if CDT does not indicate correct count, go to [Task 16-5.9].  

48. Repeat steps 39 through 41 to verify correct expendable sequence IAW MDF for each operating mode; (MAN 1 through 4) SEMI, AUTO and the aft station dispense switches (manual mode 6).  

49. Set DCDU MODE switch (7) to OFF, then MAN; set DCDU MANUAL switch (6) to 3; press RESET TEST switch (21) on CDTs (16). <br> O1: 20  O2: 20  CH: _ _  FL: 20  is displayed on DCDU; 00 is displayed on CDTs. <br> If DCDU does not display full simulated payload module quantities, check DCDU for BIT failure messages. If no BIT failure messages are displayed, verify that CDTs are installed correctly and powered up.  

50. Press and release FLARE DISP button (22) on pilot’s cyclic stick grip (23). <br>Expendable count on DCDUs counts down by **XX**; CDTs count up by **XX**. <br> If DCDU does not indicate correct dispense count, isolate faulty LRU; if CDT does not indicate correct count, go to [Task 16-5.10].  

51. Press and release FLARE DISP button (39) on copilot’s cyclic stick grip (38). <br>Expendable count on DCDUs counts down by **XX**; CDT LCD flare counts up by **XX**. <br> If DCDU does not indicate correct dispense count, isolate faulty LRU; if CDT does not indicate correct count, go to [Task 16-5.9].  

52. Repeat steps 39 through 41 to verify correct expendable sequence IAW MDF for each operating mode; (MAN 1 through 4) SEMI, AUTO and the aft station dispense switches (manual mode 6).  

53. Set DCDU MODE switch (7) to OFF, then MAN; set DCDU MANUAL switch (6) to 4; press RESET TEST switch (21) on CDTs (16). <br> O1: 20  O2: 20  CH: _ _  FL: 20  is displayed on DCDU; 00 is displayed on CDTs. <br> If DCDU does not display full simulated payload module quantities, check DCDU for BIT failure messages. If no BIT failure messages are displayed, verify that CDTs are installed correctly and powered up.  

54. Press and release FLARE DISP button (22) on pilot’s cyclic stick grip (23). <br>Expendable count on DCDUs counts down by **XX**; CDTs count up by **XX**. <br> If DCDU does not indicate correct dispense count, isolate faulty LRU; if CDT does not indicate correct count, go to [Task 16-5.10].  

55. Press and release FLARE DISP button (39) on copilot’s cyclic stick grip (38). <br>Expendable count on DCDUs counts down by **XX**; CDTs count up by **XX**. <br> If DCDU does not indicate correct dispense count, isolate faulty LRU; if CDT does not indicate correct count, go to [Task 16-5.9].
16-5.3 AN/ALE-47 COUNTERMEASURES DISPENSER SYSTEM OPERATIONAL CHECK (Continued)
### TASK 16-5.3 AN/ALE-47 COUNTERMEASURES DISPENSER SYSTEM OPERATIONAL CHECK (Continued)

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<tr>
<td>56. Repeat steps 39 through 41 to verify correct expendable sequence IAW MDF for each operating mode; (MAN 1 through 4) SEMI, AUTO and the aft station dispense switches (manual mode 6).</td>
<td>O1:20 O2:20 CH:__ FL:20 is displayed on DCDU; 00 is displayed on CDTs. If DCDU does not display full simulated payload module quantities, check DCDU for BIT failure messages. If no BIT failure messages are displayed, verify that CDTs are installed correctly and powered up.</td>
</tr>
<tr>
<td>57. Set DCDU MODE switch (7) to OFF, then MAN; press RESET TEST switch (21) on CDTs (16).</td>
<td>If DCDU does not display full simulated payload module quantities, check DCDU for BIT failure messages. If no BIT failure messages are displayed, verify that CDTs are installed correctly and powered up.</td>
</tr>
<tr>
<td>58. Press and release four hand-held crew dispense switches (40 and 41) located in cabin at STA 200 and 400 left and right; observe DCDU and CDTs expendable counts after each switch is pressed.</td>
<td>If DCDU or CDT does not indicate correct expendable dispense count, isolate faulty LRU and replace per TM 55-1520-240-23-10.</td>
</tr>
<tr>
<td>59. Repeat steps 39 through 41 to verify correct expendable sequence IAW MDF for each operating mode; (MAN 1 through 4) SEMI, AUTO and the aft station dispense switches (manual mode 6).</td>
<td>O1:20 O2:20 CH:__ FL:20 is displayed on DCDU; 00 is displayed on CDTs. If DCDU does not display full simulated payload module quantities, check DCDU for BIT failure messages. If no BIT failure messages are displayed, verify that CDTs are installed correctly and powered up.</td>
</tr>
<tr>
<td>60. Set DCDU MODE switch (7) to OFF, then SEMI; press RESET TEST switch (21) on CDTs (16).</td>
<td>O1:20 O2:20 CH:__ FL:20 is displayed on DCDU; 00 is displayed on CDTs. If DCDU does not display full simulated payload module quantities, check DCDU for BIT failure messages. If no BIT failure messages are displayed, verify that CDTs are installed correctly and powered up.</td>
</tr>
<tr>
<td>61. Ensure AN/ALQ-156 POWER switch (10) is on and in standby mode</td>
<td>STBY light (9) on ALQ-156 control panel is illuminated.</td>
</tr>
<tr>
<td>62. Raise AN/ALQ-156 TEST FLARE switch guard and move switch (42) forward (on) and release.</td>
<td>Expendable count on DCDU counts down by XX; CDT LCD flare counts up by XX. If DCDU or CDT does not indicate correct expendable dispense count, isolate faulty LRU and replace per TM 55-1520-240-23-10.</td>
</tr>
<tr>
<td>63. Repeat steps 39 through 41 to verify correct expendable sequence IAW MDF for each operating mode; (MAN 1 through 4) SEMI, AUTO and the aft station dispense switches (manual mode 6).</td>
<td>STBY light (9) on ALQ-156 control panel is illuminated.</td>
</tr>
<tr>
<td>64. Move AN/ALQ-156 TEST FLARE switch guard (42) to closed position.</td>
<td>O1:20 O2:20 CH:__ FL:20 is displayed on DCDU; 00 is displayed on CDTs.</td>
</tr>
<tr>
<td>65. Set DCDU MODE switch to (7) OFF, then AUTO; press RESET TEST switch (21) on CDTs (16).</td>
<td>01:20 O2:20 CH:__ FL:20 is displayed on DCDU; 00 is displayed on CDTs.</td>
</tr>
<tr>
<td>66. Raise AN/ALQ-156 TEST FLARE switch guard and move switch (42) forward (on) and release.</td>
<td>If DCDU does not display full simulated payload module quantities, check DCDU for BIT failure messages. If no BIT failure messages are displayed, verify that CDTs are installed correctly and powered up.</td>
</tr>
<tr>
<td>67. Repeat steps 39 through 41 to verify correct expendable sequence IAW MDF for each operating mode; (MAN 1 through 4) SEMI, AUTO and the aft station dispense switches (manual mode 6).</td>
<td>Expendable count on DCDU counts down by XX; CDTs count up by XX. If DCDU or CDT does not indicate correct expendable dispense count, isolate faulty LRU and replace per TM 55-1520-240-23-10.</td>
</tr>
<tr>
<td>68. Move AN/ALQ-156 TEST FLARE switch guard (42) to closed position.</td>
<td>O1:20 O2:20 CH:__ FL:20 is displayed on DCDU; 00 is displayed on CDTs.</td>
</tr>
<tr>
<td>69. Set DCDU MODE switch (7) to OFF, then MAN; press RESET TEST switch (21) on CDTs (16).</td>
<td>If DCDU does not display full simulated payload module quantities, check DCDU for BIT failure messages. If no BIT failure messages are displayed, verify that CDTs are installed correctly and powered up.</td>
</tr>
<tr>
<td>70. Set AN/ALQ-156 power switch (10) to OFF.</td>
<td>Set LDG GR SW BYPASS switch (28) LDG GR SW BYPASS panel (27) to NORMAL.</td>
</tr>
<tr>
<td>71. Pull out AN/ALE-47 SQUIB PWR NO. #1 SEQ (14) and NO. #2 SEQ (13) circuit breakers located on EAPS 1 PDP (11).</td>
<td>BYPASS light on LDG GR SW BYPASS STATUS panel (27) goes out.</td>
</tr>
<tr>
<td>72. Set LDG GR SW BYPASS switch (28) LDG GR SW BYPASS panel (27) to NORMAL.</td>
<td>Install safety pin (30) in AN/ALE-47 safety switch (31).</td>
</tr>
<tr>
<td>73. Install safety pin (30) in AN/ALE-47 safety switch (31).</td>
<td>DCDU expendable count remains the same; CDT count stays at 00.</td>
</tr>
<tr>
<td>75. Lower DCDU JETTISON switch guard (8).</td>
<td>GO TO NEXT PAGE</td>
</tr>
<tr>
<td>76. Close AN/ALE-47 SQUIB PWR NO. #1 SEQ (14) and NO. #2 SEQ (13) circuit breakers on EAPS 1 PDP (11).</td>
<td>Close AN/ALE-47 SQUIB PWR NO. #1 SEQ (14) and NO. #2 SEQ (13) circuit breakers on EAPS 1 PDP (11).</td>
</tr>
</tbody>
</table>
16-5.3 AN/ALE-47 COUNTERMEASURES DISPENSER SYSTEM OPERATIONAL CHECK (Continued)

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
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<tbody>
<tr>
<td>77. Raise DCDU JETTISON switch guard (8) and move switch to on (forward).</td>
<td>DCDU expendable count remains the same; CDT count stays at 00.</td>
</tr>
<tr>
<td>78. Lower DCDU JETTISON switch guard (8).</td>
<td></td>
</tr>
<tr>
<td>79. Set LDG GR BYPASS switch (28) on LDG GR SW BYPASS panel (27) to BYPASS.</td>
<td>BYPASS light on LDG GR SW BYPASS panel (27) illuminates.</td>
</tr>
<tr>
<td>80. Raise DCDU JETTISON switch guard (8) and move switch to on (forward).</td>
<td>DCDU will count down and displays 01:0 02:0 CH: FL:0; 00 is displayed on CDTs.</td>
</tr>
<tr>
<td>81. Lower DCDU JETTISON switch guard (8).</td>
<td></td>
</tr>
<tr>
<td>82. Set DCDU MODE switch (7) to OFF, then to MAN</td>
<td>01:0 02:0 CH: FL:0 is displayed on DCDU.</td>
</tr>
<tr>
<td>83. Remove safety pin (30) from AN/ALE-47 safety switch (31).</td>
<td></td>
</tr>
<tr>
<td>84. Raise DCDU JETTISON switch guard (8) and move switch to on (forward).</td>
<td>DCDU counts down and 01:0 02:0 CH: FL:0 is displayed; 30-60 is displayed on CDTs.</td>
</tr>
<tr>
<td>85. Lower DCDU JETTISON switch guard (8).</td>
<td></td>
</tr>
<tr>
<td>86. Set DCDU MODE switch (7) to OFF; press RESET TEST switch (21) on CDTs (16).</td>
<td>DCDU display is blank; 00 is displayed on CDTs.</td>
</tr>
<tr>
<td>87. Raise DCDU JETTISON switch guard (8) and move switch to on (forward).</td>
<td>All INHIBIT lights illuminate momentarily; JETTISON ON is displayed on DCDU; 01:0 02:0 CH: FL:0 is displayed on DCDU; 30-60 is displayed on CDTs.</td>
</tr>
<tr>
<td>88. Lower DCDU JETTISON switch guard (8).</td>
<td>O1:0 O2:0 CH: FL:0 displayed on DCDU goes out.</td>
</tr>
</tbody>
</table>

**NOTE**
DCDU MODE switch must be pressed while it is turned to access BYP (bypass) mode.

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<tr>
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<tbody>
<tr>
<td>89. Set DCDU MODE switch (7) to BYP; press RESET TEST switch (21) on CDTs (16).</td>
<td>DCDU displays are blank; 00 is displayed on CDTs.</td>
</tr>
<tr>
<td>90. Press and release FLARE DISP switch (22) on pilot’s or copilot’s cyclic grip (23).</td>
<td>DCDU displays remain blank; CDTs will count up by XX.</td>
</tr>
<tr>
<td>91. Set DCDU MODE switch (7) to OFF and then BYP; press RESET TEST switch (21) on CDTs (16).</td>
<td></td>
</tr>
<tr>
<td>92. Set DCDU JETTISON switch (8) to on (forward).</td>
<td>DCDU expendable displays remain blank; CDTs display 30-60.</td>
</tr>
<tr>
<td>93. Set DCDU JETTISON switch (8) to off (aft).</td>
<td></td>
</tr>
<tr>
<td>94. Set CDT MODE switch (18) to OFF.</td>
<td></td>
</tr>
<tr>
<td>95. Set DCDU MODE switch (7) to OFF.</td>
<td></td>
</tr>
<tr>
<td>96. Install safety pin (30) in AN/ALE-47 safety switch (31).</td>
<td></td>
</tr>
<tr>
<td>97. Set LDG GR SW BYPASS switch (28) on LDG GR SW STATUS panel (27) to NORMAL.</td>
<td>BYPASS light (29) on LDG GR SW STATUS panel (28) goes out.</td>
</tr>
<tr>
<td>98. Remove electrical power from aircraft.</td>
<td></td>
</tr>
<tr>
<td>99. Remove CTDs (16) from dispenser assemblies (15).</td>
<td></td>
</tr>
<tr>
<td>100. Repeat AN/ALE-47 Countermeasures Dispenser System Operational Check on remaining dispenser assemblies, if required.</td>
<td></td>
</tr>
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<th>MFL Message</th>
<th>Failure</th>
<th>Effect On System</th>
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<tbody>
<tr>
<td>SEMI FAIL</td>
<td>AUTO FAIL</td>
<td>Loss of Track file Data</td>
<td>N/A</td>
</tr>
<tr>
<td>N/A</td>
<td>SEQ ## FAIL</td>
<td>No Sequencer Squib Power (Safety Switch)</td>
<td>Unable to Dispense</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>Instruction Set</td>
<td>Loss of Programmer</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>Internal Timer A</td>
<td>Loss of Programmer</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>Internal Timer B</td>
<td>Loss of Programmer</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>RAM High Byte</td>
<td>Loss of Programmer</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>RAM Low Byte</td>
<td>Loss of Programmer</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>PBIT Timer A &gt;chek_timers= routine</td>
<td>Loss of Programmer</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>Interrupt Test</td>
<td>Loss of Programmer</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>PBIT Local RAM High Byte</td>
<td>Loss of Programmer</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>PBIT Local RAM Low Byte</td>
<td>Loss of Programmer</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>OPF EEPROM Checksum</td>
<td>Loss of Programmer</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>PBIT Timer A &gt;tim_tst= routine</td>
<td>Loss of Programmer</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>OPF RAM High Byte</td>
<td>Loss of Programmer</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>OPF RAM Low Byte</td>
<td>Loss of Programmer</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>RAM Test MDF RAM High Byte</td>
<td>Loss of Programmer</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>RAM Test MDF RAM Low Byte</td>
<td>Loss of Programmer</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>MMU Power up Configuration</td>
<td>Loss of Programmer</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>MMU Instruction Pg Write Affects Operand Pg</td>
<td>Loss of Programmer</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>MMU Operand Pg Write Affects Instruction Pg</td>
<td>Loss of Programmer</td>
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<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>Timer A Failure Detected By CBIT</td>
<td>Loss of Programmer</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>HW Reset Due to Watchdog Timer Logic</td>
<td>Loss of Programmer</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>Polling Execution Timeout</td>
<td>Loss of Programmer</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>CBIT Execution Timeout</td>
<td>Loss of Programmer</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>Address FFFF Corruption</td>
<td>Loss of Programmer</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>Machine Error Detected</td>
<td>Loss of Programmer</td>
</tr>
<tr>
<td>SEMI FAIL</td>
<td>PROG FAIL</td>
<td>Discrete Output Line 1</td>
<td>Semi-Auto Disp Ready Output Fail</td>
</tr>
<tr>
<td>N/A</td>
<td>PROG FAIL</td>
<td>Discrete Output Line 2</td>
<td>Ready Discrete Output Fail</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>PROG FAIL</td>
<td>Discrete Output Line 3</td>
<td>BIT Fail Output Fail</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>Back plane Test</td>
<td>Loss of Programmer</td>
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<td>PROG FAIL</td>
<td>DEG</td>
<td>Power Sense</td>
<td>Programmer Degraded</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>DEG</td>
<td>Watch Dog Timer</td>
<td>Programmer Degraded</td>
</tr>
<tr>
<td>MWS</td>
<td>JMR FAIL</td>
<td>Discrete Input 1 Line 1</td>
<td>MWS 1/JMR 1 Input Fail</td>
</tr>
<tr>
<td>MWS</td>
<td>JMR FAIL</td>
<td>Discrete Input 1 Line 2</td>
<td>MWS 2/JMR 2 Input Discrete Fail</td>
</tr>
<tr>
<td>MWS</td>
<td>JMR FAIL</td>
<td>Discrete Input 1 Line 3</td>
<td>MWS 3/JMR 3 Input Discrete Fail</td>
</tr>
<tr>
<td>MWS</td>
<td>JMR FAIL</td>
<td>Discrete Input 1 Line 4</td>
<td>MWS 4/JMR 4 Input Discrete Fail</td>
</tr>
<tr>
<td>MWS</td>
<td>JMR FAIL</td>
<td>Discrete Input 1 Line 5</td>
<td>JMR 5 Input Discrete Fail</td>
</tr>
<tr>
<td>MWS</td>
<td>JMR FAIL</td>
<td>Discrete Input 1 Line 6</td>
<td>JMR 6 Input Discrete Fail</td>
</tr>
<tr>
<td>PROG</td>
<td>JET INPT FAIL</td>
<td>Discrete Input 1 Line 7</td>
<td>Jettison Input Discrete Fail</td>
</tr>
<tr>
<td>N/A</td>
<td>PROG FAIL</td>
<td>Discrete Input 1 Line 8</td>
<td>LV Present Input Discrete Fail</td>
</tr>
<tr>
<td>PROG</td>
<td>FAIL</td>
<td>Discrete Input 1 Line 9</td>
<td>Manual 5 Dispense Input Discrete Fail</td>
</tr>
<tr>
<td>MAN FAIL</td>
<td>PROG FAIL</td>
<td>Discrete Input 1 Line 10</td>
<td>Manual Initiate Input Discrete Fail</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>Discrete Input 1 Line 11</td>
<td>WOW Input Discrete Fail</td>
</tr>
<tr>
<td>SEMI FAIL</td>
<td>PROG FAIL</td>
<td>Discrete Input 1 Line 12</td>
<td>Semi-Auto Dispense Discrete Fail</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>UART Channel 1 Internal Loop Back</td>
<td>Loss of CDU Data Link</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>UART Channel 1 External Loop Back</td>
<td>Loss of CDU Data Link</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>UART Channel 1 Operational Comm Failure</td>
<td>Loss of CDU Data Link</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>UART Channel 2 Internal Loop Back</td>
<td>Loss of Sequencer Data Link</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>GO BYP</td>
<td>UART Channel 2 External Loop Back</td>
<td>Loss of CDU Data Link</td>
</tr>
<tr>
<td>PROG FAIL</td>
<td>CHK BYP</td>
<td>UART Channel 2 Operational Comm Failure</td>
<td>Loss of Sequencer Data Link</td>
</tr>
<tr>
<td>ADAT FAIL</td>
<td>PROG FAIL</td>
<td>UART Channel 3 Internal Loop Back</td>
<td>Loss of Data Link</td>
</tr>
<tr>
<td>ADAT FAIL</td>
<td>PROG FAIL</td>
<td>UART Channel 3 External Loop Back</td>
<td>Loss of Data Link</td>
</tr>
<tr>
<td>ADAT FAIL</td>
<td>PROG FAIL</td>
<td>UART Channel 3 Operational Comm Failure</td>
<td>Loss of Data Link</td>
</tr>
<tr>
<td>BDAT FAIL</td>
<td>PROG FAIL</td>
<td>UART Channel 4 Internal Loop Back</td>
<td>Loss of Data Link</td>
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<tr>
<td>BDAT FAIL</td>
<td>PROG FAIL</td>
<td>UART Channel 4 External Loop Back</td>
<td>Loss of Data Link</td>
</tr>
<tr>
<td>BDAT FAIL</td>
<td>PROG FAIL</td>
<td>UART Channel 4 Operational Comm Failure</td>
<td>Loss of Data Link</td>
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<td>PROG FAIL A2 36</td>
<td>Discrete Input 3 Line 1 (AC ID Address 0)</td>
<td>Loss of Programmer</td>
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<td>PROG FAIL GO BYP</td>
<td>PROG FAIL A2 37</td>
<td>Discrete Input 3 Line 2 (AC ID Address 1)</td>
<td>Loss of Programmer</td>
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<tr>
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<td>PROG FAIL A2 38</td>
<td>Discrete Input 3 Line 3 (AC ID Address 2)</td>
<td>Loss of Programmer</td>
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<td>Discrete Input 3 Line 4 (AC ID Address 3)</td>
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<td>PROG FAIL A2 40</td>
<td>Discrete Input 3 Line 5 (AC ID Address 4)</td>
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<td>Loss of Programmer</td>
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<td>PROG FAIL GO BYP</td>
<td>PROG FAIL A2 42</td>
<td>Discrete Input 3 Line 7 (AC ID Address 6)</td>
<td>Loss of Programmer</td>
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<tr>
<td>PROG FAIL GO BYP</td>
<td>PROG FAIL A2 43</td>
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<td>Loss of Programmer</td>
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<td>AUTO DEG</td>
<td>PROG FAIL A3 01</td>
<td>EW Bus Address Latch</td>
<td>Loss of EW Interface</td>
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<td>AUTO DEG</td>
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<td>EW Bus Test Latch</td>
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<td>AUTO DEG</td>
<td>PROG FAIL A3 03</td>
<td>EW Bus Time Tag Register</td>
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<td>EW Bus Base Pointer Register</td>
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<td>PROG FAIL A3 05</td>
<td>EW Bus A/B Mode Select</td>
<td>Loss of EW Interface</td>
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<tr>
<td>AUTO DEG</td>
<td>PROG FAIL A3 06</td>
<td>EW Bus Last Command Register</td>
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<td>AUTO DEG</td>
<td>PROG FAIL A3 07</td>
<td>EW Bus Control Register</td>
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<tr>
<td>AUTO DEG</td>
<td>PROG FAIL A3 08</td>
<td>EW Bus A Mode Chnl A Command Test</td>
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<tr>
<td>AUTO DEG</td>
<td>PROG FAIL A3 09</td>
<td>EW Bus A Mode Chnl A RT Address Test</td>
<td>Loss of EW Interface</td>
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<tr>
<td>AUTO DEG</td>
<td>PROG FAIL A3 10</td>
<td>EW Bus A Mode Chnl A Invalid Mode Code Tst</td>
<td>Loss of EW Interface</td>
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<tr>
<td>AUTO DEG</td>
<td>PROG FAIL A3 11</td>
<td>EW Bus A Mode Chnl B Command Test</td>
<td>Loss of EW Interface</td>
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<tr>
<td>AUTO DEG</td>
<td>PROG FAIL A3 12</td>
<td>EW Bus A Mode Chnl B RT Address Test</td>
<td>Loss of EW Interface</td>
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<tr>
<td>AUTO DEG</td>
<td>PROG FAIL A3 13</td>
<td>EW Bus A Mode Chnl B Invalid Mode Code Tst</td>
<td>Loss of EW Interface</td>
</tr>
<tr>
<td>AUTO DEG</td>
<td>PROG FAIL A3 14</td>
<td>EW Bus Operational Status Register</td>
<td>Loss of EW Interface</td>
</tr>
<tr>
<td>AUTO DEG</td>
<td>PROG FAIL A3 15</td>
<td>EW Bus B Mode Chnl A Command Test</td>
<td>Loss of EW Interface</td>
</tr>
<tr>
<td>AUTO DEG</td>
<td>PROG FAIL A3 16</td>
<td>EW Bus B Mode Chnl B RT Address Test</td>
<td>Loss of EW Interface</td>
</tr>
<tr>
<td>AUTO DEG</td>
<td>PROG FAIL A3 17</td>
<td>EW Bus B Mode Chnl A Invalid Mode Code Tst</td>
<td>Loss of EW Interface</td>
</tr>
<tr>
<td>AUTO DEG</td>
<td>PROG FAIL A3 18</td>
<td>EW Bus B Mode Chnl B Command Test</td>
<td>Loss of EW Interface</td>
</tr>
</tbody>
</table>

| AUTO DEG | PROG FAIL A3 19 | EW Bus B Mode Chnl B RT Address Test | Loss of EW Interface |
| AUTO DEG | PROG FAIL A3 20 | EW Bus B Mode Chnl B Invalid Mode Code Tst | Loss of EW Interface |
| AUTO DEG | PROG FAIL A3 21 | EW Bus Operational Status Register | Loss of EW Interface |
| AUTO FAIL GO MAN | PROG FAIL A4 01 | AV Bus Address Latch | Loss of AV Interface |
| AUTO FAIL GO MAN | PROG FAIL A4 02 | AV Bus Test Latch | Loss of AV Interface |
| AUTO FAIL GO MAN | PROG FAIL A4 03 | AV Bus Time Tag Register | Loss of AV Interface |
| AUTO FAIL GO MAN | PROG FAIL A4 04 | AV Bus Base Point Register | Loss of AV Interface |
| AUTO FAIL GO MAN | PROG FAIL A4 05 | AV Bus A/B Mode Select | Loss of AV Interface |
| AUTO FAIL GO MAN | PROG FAIL A4 06 | AV Bus Last Cmd Register | Loss of AV Interface |
| AUTO FAIL GO MAN | PROG FAIL A4 07 | AV Bus Control Register | Loss of AV Interface |
| AUTO FAIL GO MAN | PROG FAIL A4 08 | AV Bus A Mode Chnl A Command Test | Loss of AV Interface |
| AUTO FAIL GO MAN | PROG FAIL A4 09 | AV Bus A Mode Chnl A RT Address Test | Loss of AV Interface |
| AUTO FAIL GO MAN | PROG FAIL A4 10 | AV Bus A Mode Chnl B Invalid Mode Code Tst | Loss of AV Interface |
| AUTO FAIL GO MAN | PROG FAIL A4 11 | AV Bus A Mode Chnl B Command Test | Loss of AV Interface |
| AUTO FAIL GO MAN | PROG FAIL A4 12 | AV Bus A Mode Chnl B RT Address Test | Loss of AV Interface |
| AUTO FAIL GO MAN | PROG FAIL A4 13 | AV Bus A Mode Chnl B Invalid Mode Code Tst | Loss of AV Interface |
| AUTO FAIL GO MAN | PROG FAIL A4 14 | AV Bus Operational Status Register | Loss of AV Interface |
| AUTO FAIL GO MAN | PROG FAIL A4 15 | AV Bus B Mode Chnl A Command Test | Loss of AV Interface |
| AUTO FAIL GO MAN | PROG FAIL A4 16 | AV Bus B Mode Chnl A RT Address Test | Loss of AV Interface |
| AUTO FAIL GO MAN | PROG FAIL A4 17 | AV Bus B Mode Chnl A Invalid Mode Code Tst | Loss of AV Interface |
| AUTO FAIL GO MAN | PROG FAIL A4 18 | AV Bus B Mode Chnl B Command Test | Loss of AV Interface |
| AUTO FAIL GO MAN | PROG FAIL A4 19 | AV Bus B Mode Chnl B RT Address Test | Loss of AV Interface |
| AUTO FAIL GO MAN | PROG FAIL A4 20 | AV Bus B Mode Chnl B Invalid Mode Code Tst | Loss of AV Interface |
| AUTO FAIL GO MAN | PROG FAIL A4 21 | AV Bus Operational Status Register | Loss of AV Interface |

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### AN/ALE-47 Countermeasures Dispenser System Operational Check (Continued)

**PFL Message** | **MFL Message** | **Failure** | **Effect On System**
--- | --- | --- | ---
**AUTO FAIL GO MAN** | PROG AV COMM FAIL | AV Bus Operational Communications Failure | Loss of AV Interface *
**N/A** | CDU FAIL A1 01 | Power Fail Detection | Loss of CDU
**N/A** | CDU FAIL A1 02 | Watchdog Timer | Loss of CDU
**CDU FAIL GO BYP** | CDU FAIL A1 03 | ROM Checksum | Loss of CDU
**CDU FAIL GO BYP** | CDU FAIL A1 04 | CPU Failure | Loss of CDU
**N/A** | CDU FAIL A1 | SR1 (CPU) | Loss of CDU
**MAN DISP 1-4 FAIL** | CDU FAIL A2 01 | Manual Dispense Input | Loss of Manual Dispense Input to CDU
**SEMI FAIL** | CDU FAIL A2 02 | Semi-Automatic Dispense Input Discrete | Loss of Semi Auto Dispense Input to CDU
**CDU BUMP FAIL** | CDU FAIL A2 03 | Manual 5 Dispense Input Discrete | Loss of Manual 5 Dispense Input to CDU
**CDU FAIL GO BYP** | CDU FAIL A2 04 | Weight On Wheels Discrete Input | Loss of WOW Input to CDU *
**CDU FAIL MAN-6** | CDU FAIL A2 05 | Manual 6 Discrete Input | Loss of Manual 6 Disperse Input to CDU *
**N/A** | CDU FAIL A2 06 | Cockpit Data Link | Loss of CDU
**N/A** | CDU FAIL A2 | SRU 2 (Discrete I/O) | Loss of CDU
**DISPLAY DEGRADED** | CDU FAIL A3 01 | Display | Loss of CDU Display
**CDU FAIL GO BYP** | CDU FAIL A3 02 | External RAM | Loss of CDU
**CH ENAB SW FAIL** | CDU FAIL A3 03 | Chaff Inhibit Switch | Loss of Chaff Inhibit
**FL ENAB SW FAIL** | CDU FAIL A3 04 | Flare Inhibit Switch | Loss of Flare Inhibit
**01 ENAB SW FAIL** | CDU FAIL A3 05 | Other 1 Inhibit Switch | Loss of Other 1 Inhibit
**02 ENAB SW FAIL** | CDU FAIL A3 06 | Other 2 Inhibit Switch | Loss of Other 2 Inhibit
**RWR ENAB SW FAIL** | CDU FAIL A3 07 | RWR Inhibit Switch | Loss of RWR Inhibit
**JMR ENAB SW FAIL** | CDU FAIL A3 08 | Jammer Inhibit Switch | Loss of Jammer Inhibit
**MWS ENAB SW FAIL** | CDU FAIL A3 09 | MWS Inhibit Switch | Loss of MWS Inhibit
**REM  BYP FAIL** | CDU FAIL A3 10 | Remote BYP | Loss of Remote BYP *
**REM JETT FAIL** | CDU FAIL A3 11 | Remote Jetison | Loss of Remote Jetison *
**REM PROG FAIL** | CDU FAIL A3 12 | Remote Program | Loss of Remote Program *
**REM MODE FAIL** | CDU FAIL A3 13 | Remote Mode | Loss of Remote Mode *
**JETF FAIL** | CDU FAIL A3 14 | Jetison Switch | Loss of Jetison Switch
**MAN FAIL CHG PROG** | CDU FAIL A3 15 | Program Switch | Loss of Program Switch
**N/A** | CDU FAIL CHG 16 | Mode Switch | Loss of CDU Mode Switch
**CDU FAIL REM** | CDU FAIL A3 17 | Remote Control | Loss of Remote Control Input *
**CDU FAIL GO BYP** | CDU FAIL A3 18 | Switch buffer | Loss of CDU
**N/A** | CDU FAIL A3 | SRU 3 (Front Panel) | Loss of CDU
**SEQ ## INV DEG** | SEQ ## MAGA FAIL | Magazine A | Magazine A Functional Fault (Misfire/Polling) *
**SEQ ## INV DEG** | SEQ ## MAGB FAIL | Magazine B | Magazine B Functional Fault (Misfire/Polling) *
**SEQ ## BYP DEG** | SEQ ## A1 01 | BYP Flare Dispense | BYP Flare Dispense Loss
**SEQ ## BYP DEG** | SEQ ## A1 02 | BYP Other 1 Dispense | BYP Other 1 Dispense Loss *
**SEQ ## BYP DEG** | SEQ ## A1 03 | BYP Other 2 Dispense | BYP Other 2 Dispense Loss
**SEQ ## INV DEG** | SEQ ## A1 04 | Magazine A I.D Register | Loss of Magazine

### MFL Message

**SEQ ## INV DEG** | SEQ ## A1 05 | Magazine B I.D Register | Loss of Magazine
**SEQ ## BYP DEG** | SEQ ## A1 06 | Other 1 Cascade/Magazine Sense B | BYP Other 1 Cascade/MAG B Test Fail *
**SEQ ## BYP DEG** | SEQ ## A1 07 | Other 2 Cascade | BYP Other 2 Cascade Test Failure *
**SEQ ## BYP DEG** | SEQ ## A1 08 | Flare Cascade Relay Closed | Flare BYP Cascade Failure
**SEQ ## BYP DEG** | SEQ ## A1 09 | Flare Cascade Relay Open | Flare BYP Cascade Failure
**SEQ ## BYP DEG** | SEQ ## A1 10 | Chaff Cascade Relay Closed | Chaff BYP Cascade Failure
**SEQ ## BYP DEG** | SEQ ## A1 11 | Chaff Cascade Relay Open | Chaff BYP Cascade Failure
**SEQ ## BYP DEG** | SEQ ## A1 12 | Chaff Dispense | BYP Chaff Dispense Loss
**SEQ ## INV DEG** | SEQ ## A1 13 | EEPROM Write | Sequencer MDI Loss
**SEQ ## BYP DEG** | SEQ ## A1 14 | Other 2 Relay Closed | Other 2 Cascade Failure *
**SEQ ## BYP DEG** | SEQ ## A1 15 | Other 2 Relay Open | Other 2 Cascade Failure *
**SEQ ## BYP DEG** | SEQ ## A1 16 | Other 2 Relay Open | Other 1 Cascade Failure *
**SEQ ## BYP DEG** | SEQ ## A1 17 | Other 1 Relay Closed | Other 1 Cascade Failure *
**SEQ ## BYP DEG** | SEQ ## A1 18 | Other 1 Relay Open | Other 1 Cascade Failure *
**SEQ ## OP FAIL** | SEQ ## A1 19 | High Squib Power | Unable to Sense High Squib Power
**SEQ ## INV DEG** | SEQ ## A1 20 | Squib Power Present | Loss of Sequencer
**SEQ ## INV DEG** | SEQ ## A1 21 | Squib Power High/Low | Loss of Sequencer
**SEQ ## INV DEG** | SEQ ## A1 22 | Fire Current Status | Loss of Sequencer
**SEQ ## BYP FAIL** | SEQ ## A1 23 | BYP Discrete | Loss of BYP Function
**SEQ ## JETT FAIL** | SEQ ## A1 24 | Jettison Discrete | Loss of Jettison Switch
**SEQ ## INV DEG** | SEQ ## A1 25 | Jettison Discrete | Loss of BYP Jettison
**SEQ ## INV DEG** | SEQ ## A1 26 | Mag Present | Loss of MAG A Inventory *
**SEQ ## INV DEG** | SEQ ## A1 27 | Mag Present | Loss of MAG B Inventory *
**SEQ ## FAIL** | SEQ ## A1 | Control I/O (Signal Conditioner) | Loss of Sequencer
**SEQ ## INV DEG** | SEQ ## A2 08 | Fire Mux D | Sequencer Loss of Inventory/Dispenser
**SEQ ## INV DEG** | SEQ ## A2 09 | Fire Mux C | Sequencer Loss of Inventory/Dispenser
**SEQ ## INV DEG** | SEQ ## A2 10 | Fire Mux B | Sequencer Loss of Inventory/Dispenser
**SEQ ## INV DEG** | SEQ ## A2 11 | Fire Mux A | Sequencer Loss of Inventory/Dispenser
**SEQ ## FAIL** | SEQ ## A2 12 | Mux | Loss of Inventory
**SEQ ## INV DEG** | SEQ ## A3 01 | Fire Source D | Loss of Inventory
**SEQ ## INV DEG** | SEQ ## A3 02 | Fire Source C | Loss of Inventory
**SEQ ## INV DEG** | SEQ ## A3 03 | Fire Source B | Loss of Inventory
**SEQ ## INV DEG** | SEQ ## A3 04 | Fire Source A | Loss of Inventory
**SEQ ## OP FAIL** | SEQ ## A3 05 | Fire Source A Inhibit | Sequencer Safety Feature Fail
**SEQ ## INV DEG** | SEQ ## A3 06 | Fire Source A Low Fire | Loss of Inventory
**SEQ ## INV DEG** | SEQ ## A3 07 | Poll High/Low | Loss of MAG B Inventory *
**SEQ ## OP FAIL** | SEQ ## A3 08 | Fire Source D Inhibit | Sequencer Safety Feature Fail
**SEQ ## OP FAIL** | SEQ ## A3 09 | Fire Source D Low Fire | Loss of Inventory
**SEQ ## OP FAIL** | SEQ ## A3 10 | Fire Source C Inhibit | Sequencer Safety Feature Fail

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### AN/ALE-47 COUNTERMEASURES DISPENSER SYSTEM OPERATIONAL CHECK (Continued)

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<td>SEQ ## A3 11</td>
<td>Fire Source C Low Fire</td>
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<td>SEQ ## OP FAIL</td>
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<td>Sequencer Safety Feature Fail</td>
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<td>SEQ ## A3 13</td>
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<td>Loss of Inventory</td>
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<td>SEQ ## INV DEG</td>
<td>SEQ ## A3 14</td>
<td>Poll Leakage</td>
<td>Loss of Inventory</td>
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<td>SEQ ## FAIL</td>
<td>SEQ ## A3</td>
<td>Fire Source</td>
<td>Loss of Inventory</td>
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* Refers to AN/ALE-47 feature not used with M-130 dispensers.
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electronic Equipment Tool Kit, NSN 5180-00-064-5178

Materials:
None

Personnel Required:
Avionics Mechanic

References:
TM 55-1520-240-23

Equipment Conditions:
TM 55-1520-240-23:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off

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16-5.4  DCDU CIRCUIT BREAKER WILL NOT STAY CLOSED (Continued)

OPEN NO. 1 EAPS/MEAPS CIRCUIT BREAKER PANEL. CHECK DCDU CIRCUIT BREAKER FOR FAULTY CONDITION. IS DCDU CIRCUIT BREAKER OPERATIONAL?

YES

DISCONNECT PLUG 147P30 FROM DCDU. DOES CB STILL OPEN WHEN SYSTEM IS POWERED UP?

NO

WITH DCDU CB OPEN, IS GROUND PRESENT ON PLUG 147P30 PIN 27?

YES

CHECK WIRE NO. ALE47-013A22 FOR FAULTY CONDITION.

NO

REMOVE AND REPLACE DCDU.

REPAIR/REPLACE FAULTY WIRING/COMPONENT ON REMOTE BYPASS SW PANEL.

NO

DISCONNECT PLUG 147P4 FROM REMOTE BYPASS SW PANEL. DOES CB STILL OPEN?

YES

REMOVE & REPLACE DCDU CIRCUIT BREAKER.

NO

OPEN LEFT ELECTRICAL COMPARTMENT DOOR. REMOVE WIRE W697-156-20 FROM RELAY 147K1 TERMINAL AZ. DOES CB STILL OPEN?

YES

LOCATE AND REPAIR FAULT TO WIRING W697-156-20 OR ASSOCIATED WIRING TO DCDU CB.

NO

INSTALL WIRE W697-156-20 ON RELAY 147K1 TERMINAL AZ. DISCONNECT PLUG 300P52 AT STA. 460L OVERHEAD. DOES CB STILL OPEN?

YES

CHECK WIRES W668-177-20 FOR FAULTY CONDITION.

NO

CHECK WIRES W697-158-20, W697-159-20, AND W697-157-20 FOR FAULTY CONDITION. DOES CB STILL OPEN?

YES

REMOVE AND REPLACE RELAY 147K1.

NO

CHECK WIRE W668-177-20 FOR FAULTY CONDITION.

END OF TASK
16-5.5 LANDING GEAR SWITCH STATUS LIGHT IS ON

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations: All

Tools:
Electronic Equipment Tool Kit, NSN 5180-00-064-5178

Materials:
None

Personnel Required:
Avionics Mechanic

References:
TM 55-1520-240-23

Equipment Conditions:
TM 55-1520-240-23: Battery Connected
Electrical Power On
Hydraulic Power Off

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16-5.5 LANDING GEAR SWITCH STATUS LIGHT IS ON (Continued)

ON REMOTE BYPASS SW PANEL, SET LDG GR BYP SWITCH TO NORMAL. DID LDG GR SW LIGHT GO OUT?

---YES---

FAULT CORRECTED.

---NO---

DISCONNECT PLUG 147P4 FROM REMOTE BYPASS SW PANEL. CHECK FOR 28VDC ON PIN C. IS 28VDC PRESENT?

---NO---

REPAIR/REPLACE FAULTY WIRING/COMPONENT ON REMOTE BYPASS SW PANEL.

---YES---

DISCONNECT PLUG 147P4 FROM REMOTE BYPASS SW PANEL. CHECK FOR 28VDC ON PIN D. IS 28VDC PRESENT?

---NO---

IS GROUND PRESENT ON PLUG 147P4 PIN D?

---YES---

DISCONNECT PLUG 300P52. IS GROUND STILL PRESENT?

---YES---

DISCONNECT PLUG 147P34 FROM ALE-47 PROGRAMMER. IS GROUND STILL PRESENT?

---NO---

DISCONNECT PLUG 147P34 FROM ALE-47 PROGRAMMER. IS GROUND STILL PRESENT?

---NO---

IS GROUND STILL PRESENT?

---YES---

CHECK WIRE NUMBERS 148K2.

---NO---

OPEN LEFT ELECTRICAL COMPARTMENT DOOR. CHECK RELAY147K1 AND ASSOCIATED WIRING FOR GROUND FAULT CONDITIONS. REPAIR/REPLACE AS REQUIRED.

---YES---

REPAIR/REPLACE FAULTY WIRING/COMPONENT ON REMOTE BYPASS SW PANEL.

---NO---

IS CONTINUITY PRESENT ON PLUG 147J4 PINS D TO E OR PINS D TO A?

---YES---

REPLACE ALE-47 PROGRAMMER.

---NO---

REPLACE ALE-47 PROGRAMMER.

---NO---

REPLACE ALE-47 PROGRAMMER.

---YES---

END OF TASK
16-5.6 LANDING GEAR SWITCH STATUS, READY TO FIRE, OR LANDING GEAR BYPASS LIGHTS DO NOT LIGHT DURING PRESS TO TEST

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations: All

Tools: Electronic Equipment Tool Kit, NSN 5180-00-064-5178

Materials: None

Personnel Required: Avionics Mechanic

References: TM 55-1520-240-23

Equipment Conditions: TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

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DO ANY OF THE THREE LIGHTS ILLUMINATE DURING PRESS-TO-TEST?

YES

DOES LDG GEAR BYPASS LIGHT ILLUMINATE DURING PRESS-TO-TEST?

YES

REPLACE LAMP AND PRESS TO TEST, DOES LAMP ILLUMINATE?

NO

DISCONNECT PLUG 147P4 FROM REMOTE BYPASS SWITCH PANEL. IS 28 VDC PRESENT ON PIN B?

NO

LOCATE AND REPAIR FAULT IN REMOTE BYPASS SWITCH PANEL.

YES

REPAIR/REPLACE FAULTY WIRING/COMPONENT ON LDG GEAR REMOTE BYPASS PANEL.

IS GROUND PRESENT ON CONNECTOR 147P4 PIN A?

NO

LOCATE AND REPAIR FAULT ON REMOTE BYPASS SWITCH PANEL.

YES

REPAIR/REPLACE FAULTY WIRING/COMPONENT ON LDG GEAR REMOTE BYPASS PANEL.

ISO 28VDC PRESENT ON BUS SIDE OF DCDU CIRCUIT BREAKER?

NO

TRoubleshoot NO. 1 DC BUS. (Task 9-1.4)

YES

TROUBLESHOOT NO. 1 DC BUS. (Task 9-1.4)

REPAIR FAULTY WIRING BETWEEN DCDU AND CONNECTOR 147P4 PIN B.

NO

OPEN EAPS/MEAPS CB PANEL, CHECK FOR CONTINUITY FROM DCDU CB CIRCUIT SIDE TO PLUG 147P4 PIN B. IS CONTINUITY PRESENT?

YES

REPAIR FAULTY WIRING BETWEEN DCDU AND CONNECTOR 147P4 PIN B.

NO

LOCATE AND REPAIR FAULT IN WIRE W688-6D28920N.

YES

LOCATE AND REPAIR FAULT ON REMOTE BYPASS SWITCH PANEL.

NO

FAULT CORRECTED.

YES

REPLACE LAMP IN READY TO FIRE LIGHT AND PRESS TO TEST, DOES LAMP ILLUMINATE?

NO

REPLACE LAMP AND PRESS TO TEST, DOES LAMP ILLUMINATE?

YES

REPLACE LAMP AND PRESS TO TEST, DOES LAMP ILLUMINATE?

NO

REPLACE LAMP IN READY TO FIRE LIGHT AND PRESS TO TEST, DOES LAMP ILLUMINATE?

YES

FAULT CORRECTED.

NO

REPAIR/REPLACE FAULTY WIRING/COMPONENT ON LDG GEAR REMOTE BYPASS PANEL.

END OF TASK
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations: All

Tools:
Electronic Equipment Tool Kit, NSN 5180-00-064-5178

Materials:
None

Personnel Required:
Avionics Mechanic

References:
TM 55-1520-240-23

Equipment Conditions:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

16-5.7 LANDING GEAR SWITCH STATUS LIGHT DOES NOT COME ON
16-5.7 LANDING GEAR SWITCH STATUS LIGHT DOES NOT COME ON (Continued)

If lamp illuminates during press-to-test:

- **YES**
  - Place LDG gear bypass switch to bypass; does light come on?
  - **NO**
    - Correct open condition on wire W697-158-20.
  - **YES**

If lamp does not illuminate during press-to-test:

- **NO**
  - Disconnect plug 147P4 from remote bypass switch panel; is 28 VDC present on pin C?
  - **NO**
    - Repair faulty condition of wire W697-158-20.
  - **YES**
    - Repair faulty wiring/ component on remote bypass switch panel.

- **NO**
  - Open left electrical compartment door; is 28 VDC present on relay 147K1 terminal B2?
    - **YES**
      - Repair faulty condition of wire W668-178-20.
    - **NO**
      - Correct open condition on wire W697-158-20.

- **YES**
  - Repair faulty condition of wire W697-161-20.

**Task 16-5.6**

- **YES**
  - Repair faulty wiring/ component on remote bypass switch panel.

**Task 16-5.7**

- **NO**
  - Repair faulty condition of wire W697-161-20.

Fault corrected.

END OF TASK
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations: All

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178

Materials:
None

Personnel Required:
Avionics Mechanic

References:
TM 55-1520-240-23

Equipment Conditions:
Battery Connected
Electrical Power On
Hydraulic Power Off

GO TO NEXT PAGE
16-5.8  READY TO FIRE LIGHT DOES NOT COME ON (Continued)

**Diagram Flowchart**

- **Does Ready To Fire Lamp Illuminate During Press To Test?**
  - Yes: Go To [Task 16-5.8]
  - No: Disconnect Plug 147P4 From Remote Bypass Switch Panel. Is 28VDC Present On Pin F?
    - Yes: Repair/Replace Faulty Component/Wiring On Remote Bypass Switch Panel.
    - No: Repair Open Condition On Wire Ale-47-014D22.

- Disconnect Plug 147P32U2 From Ale-47 J-Box. Is 28VDC Present On Pin 21?
  - Yes: Repair Open Condition On Wire Ale-47-014D22.
  - No: Disconnect Plug 147P32U1 From Ale-47 J-Box. Is 28VDC Present On Plug 147P32 Pin 3T?
    - Yes: Remove And Replace Faulty Ale-47 J-Box.
    - No: Is Continuity Present Between 147P32 Pin 3 And Ale-47 DCDU Plug 147P30 Pin 11?
      - Yes: Is 28VDC Present On Plug 147P30 Pin 27?
          - Yes: Is 28VDC Present On Circuit Breaker Side Of Ale-47 DCDU Circuit Breaker?
            - Yes: Repair Faulty Condition Of Wires Ale47-003B22 Or Ale47-003A22.
              - No: Troubleshoot NO. 1 28VDC Bus (Task 9-1.4).
            - No: Repair/Replace Faulty Ale-47 DCDU Circuit Breaker.
        - No: Repair Open Condition On Wires Ale-47-014D22.
      - No: Remove And Replace Faulty DCDU.

- No: Remove And Replace Faulty Ale-47-014A22.
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations: All

Tools: Electronic Equipment Tool Kit, NSN 5180-00-064-5178

Materials: None

Personnel Required: Avionics Mechanic

References: TM 55-1520-240-23

Equipment Conditions: Battery Connected

Electrical Power On

Hydraulic Power Off

Materials: None

Electrical Power On

None
16-5.9 COUNTERMEASURES DISPENSER TEST SET DOES NOT INDICATE A FIRED EXPENDABLE WHEN COPILOT’S FLARE DISP SWITCH IS PRESSED (Continued)

DISCONNECT PLUG 300J30 FROM COPILOT’S CYCLIC STICK. IS 28 VDC PRESENT AT PLUG PIN D?

- YES
- NO

WITH COPILOT’S FLARE DISP SWITCH DEPRESSED, IS CONTINUITY PRESENT BETWEEN 300P30 PINS C AND D?

- YES
- NO

IS 28 VDC PRESENT ON DCBUS WHEN COPILOT’S FLARE DISP SWITCH IS DEPRESSED?

- YES
- NO

REPAIR FAULTY WIRING BETWEEN DCDU CB AND COPILOT’S CYCLIC STICK GRIP.

REPLACE FAULTY COPILOT’S CYCLIC STICK GRIP.

REMOVE AND REPLACE DCDU.

OPEN NO. 1 EAPS/MEAPS CB PANEL. IS 28 VDC PRESENT ON CIRCUIT SIDE OF DCDU CIRCUIT BREAKER?

- YES
- NO

IS 28 VDC PRESENT ON BUS SIDE OF DCDU CIRCUIT BREAKER?

- YES
- NO

REPAIR FAULTY WIRING BETWEEN DCDU CB AND COPILOT’S CYCLIC STICK GRIP.

TROUBLESHOOT NO. 1 DC BUS IAW TASK 9-4.1.

REPLACE FAULTY WIRING BETWEEN DCDU CB AND COPILOT’S CYCLIC STICK GRIP.

REPAIR FAULTY WIRING BETWEEN DCDU CB AND COPILOT’S CYCLIC STICK GRIP.

REPLACE DCDU.

END OF TASK
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Personnel Required:
Avionics Mechanic

Applicable Configurations:
All

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178

Equipment Conditions:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

Materials:
None

References:
TM 55-1520-240-23

GO TO NEXT PAGE
6-5.10 COUNTERMEASURES DISPENSER TEST SET DOES NOT INDICATE A FIRED EXPENDABLE WHEN PILOT'S FLARE DISP SWITCH IS Pressed (Continued)

DISCONNECT PLUG 300J29 FROM PILOT'S CYCLIC STICK. IS 28 VDC PRESENT AT PIN D7?

WITH PILOT'S FLARE DISP SWITCH DEPRESSED, IS CONTINUITY PRESENT BETWEEN 300J29 PINS C AND D7?

IS 28 VDC PRESENT ON DCDU PLUG 147P30 PIN 27 WHEN PILOT'S FLARE DISP SWITCH IS DEPRESSED?

OPEN EAPS/MEAPS CB PANEL. IS 28 VDC PRESENT ON CIRCUIT SIDE OF DCDU CIRCUIT BREAKER?

REPAIR FAULTY WIRING BETWEEN DCDU CB AND PILOT'S CYCLIC STICK GRIP.

TROUBLESHOOT NO. 1 DC BUS. (TASK 9-4.1)

REPAIR FAULTY WIRING BETWEEN DCDU AND PILOT'S CYCLIC STICK GRIP.

REPLACE DCDU.
16-5.11 COUNTERMEASURES DISPENSER TEST SET DOES NOT INDICATE A FIRED EXPENDABLE WHEN ONE CREW DISPENSE SWITCH IS PRESSED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations: All

Tools: Electronic Equipment Tool Kit, NSN 5180-00-064-5178

Materials: None, Hydraulic Power Off

Personnel Required: Avionics Mechanic

References:
TM 55-1520-240-23

Equipment Conditions:
TM 55-1520-240-23: Battery Connected, Electrical Power On
16-5.11 COUNTERMEASURES DISPENSER TEST SET DOES NOT INDICATE A FIRED EXPENDABLE WHEN ONE CREW DISPENSE SWITCH IS PRESSED (Continued)

**REMOVE AND REPLACE**

**SUSPECT SWITCH WITH**

**KNOWN GOOD SWITCH.**

**DOES CDT TESTER**

**INDICATE FIRED**

**EXPENDABLE WHEN**

**REPLACEMENT SWITCH IS**

**PRESSED?**

**YES**

**RETURN REPLACEMENT**

**SWITCH TO ORIGINAL**

**POSITION. REPLACE**

**FAULTY CREW DISPENSE**

**SWITCH.**

**NO**

**IS SWITCH LOCATED**

**AT STA. 200 RIGHT?**

**NO**

**IS SWITCH LOCATED**

**AT STA. 200 LEFT?**

**NO**

**IS SWITCH LOCATED**

**AT STA. 400 RIGHT?**

**YES**

**IS CONTINUITY**

**PRESENT BETWEEN 147J5**

**PIN 1 AND PLUG**

**147P33 PIN 32 AND**

**FROM 147J5 PIN 3 TO**

**PLUG 147P33 PIN 37?**

**YES**

**REPAIR FAULTY**

**WIRING.**

**NO**

**YES**

**REPAIR FAULTY**

**WIRING.**

**REMOVE AND**

**REPLACE AN/ALE-47**

**J-BOX.**

**NO**

**IS CONTINUITY**

**PRESENT FROM 147J6**

**PIN 1 TO AN/ALE-47 J-**

**BOX 147P33 PIN 33**

**AND FROM 147J6 PIN**

**3 TO 147P33 PIN 36?**

**YES**

**REPAIR FAULTY**

**WIRING.**

**NO**

**REPAIR FAULTY**

**WIRING.**

**REMOVE AND**

**REPLACE AN/ALE-47 J-**

**BOX.**

**YES**

**IS CONTINUITY**

**PRESENT BETWEEN 147J8**

**PIN 1 TO AN/ALE-47 J-**

**BOX 147P33 PIN 31 AND**

**FROM 147J8 PIN 3 TO**

**PLUG 147P33 PIN 36?**

**YES**

**REPAIR FAULTY**

**WIRING.**

**NO**

**REPAIR FAULTY**

**WIRING.**

**REMOVE AND**

**REPLACE AN/ALE-47 J-**

**BOX.**

**YES**

**IS CONTINUITY**

**PRESENT FROM 147J6**

**PIN 1 TO AN/ALE-47 J-**

**BOX 147P33 PIN 33**

**AND FROM 147J6 PIN**

**3 TO 147P33 PIN 36?**

**YES**

**REPAIR FAULTY**

**WIRING.**

**NO**

**REPAIR FAULTY**

**WIRING.**

**REMOVE AND**

**REPLACE AN/ALE-47 J-**

**BOX.**

**YES**

**IS CONTINUITY**

**PRESENT BETWEEN 147J5**

**PIN 1 AND PLUG**

**147P33 PIN 32 AND**

**FROM 147J5 PIN 3 TO**

**PLUG 147P33 PIN 37?**

**YES**

**REPAIR FAULTY**

**WIRING.**

**NO**

**REPAIR FAULTY**

**WIRING.**

**REMOVE AND**

**REPLACE AN/ALE-47 J-**

**BOX.**

**YES**

**IS SWITCH LOCATED**

**AT STA. 400 LEFT?**

**NO**

**IS SWITCH LOCATED**

**AT STA. 400 RIGHT?**

**YES**

**IS CONTINUITY**

**PRESENT BETWEEN 147J7**

**PIN 1 AND PLUG**

**147P33 PIN 30 AND**

**FROM 147J7 PIN 3 TO**

**PLUG 147P33 PIN 39?**

**YES**

**REPAIR FAULTY**

**WIRING.**

**NO**

**REPAIR FAULTY**

**WIRING.**

**REMOVE AND**

**REPLACE AN/ALE-47 J-**

**BOX.**

**YES**

**IS CONTINUITY**

**PRESENT FROM 147J8**

**PIN 1 TO AN/ALE-47 J-**

**BOX 147P33 PIN 31 AND**

**FROM 147J8 PIN 3 TO**

**PLUG 147P33 PIN 36?**

**YES**

**REPAIR FAULTY**

**WIRING.**

**NO**

**REPAIR FAULTY**

**WIRING.**

**REMOVE AND**

**REPLACE AN/ALE-47 J-**

**BOX.**

**YES**

**IS CONTINUITY**

**PRESENT BETWEEN**

**147J7 PIN 1 AND**

**PLUG147P33 PIN 30**

**AND FROM 147J7 PIN**

**3 AND PLUG 147P33**

**PIN 39?**

**YES**

**REPAIR FAULTY**

**WIRING.**

**NO**

**REPAIR FAULTY**

**WIRING.**

**REMOVE AND**

**REPLACE AN/ALE-47 J-**

**BOX.**

**YES**

**IS CONTINUITY**

**PRESENT FROM 147J6**

**PIN 1 TO AN/ALE-47 J-**

**BOX 147P33 PIN 33**

**AND FROM 147J6 PIN**

**3 TO 147P33 PIN 36?**

**YES**

**REPAIR FAULTY**

**WIRING.**

**NO**

**REPAIR FAULTY**

**WIRING.**

**REMOVE AND**

**REPLACE AN/ALE-47 J-**

**BOX.**

**YES**

**IS CONTINUITY**

**PRESENT BETWEEN 147J8**

**PIN 1 AND PLUG**

**147P33 PIN 30 AND**

**FROM 147J8 PIN 3 TO**

**PLUG 147P33 PIN 39?**

**YES**

**REPAIR FAULTY**

**WIRING.**

**NO**

**REPAIR FAULTY**

**WIRING.**

**REMOVE AND**

**REPLACE AN/ALE-47 J-**

**BOX.**

**YES**

**IS CONTINUITY**

**PRESENT BETWEEN**

**147J7 PIN 1 AND**

**PLUG147P33 PIN 30**

**AND FROM 147J7 PIN**

**3 AND PLUG 147P33**

**PIN 39?**

**YES**

**REPAIR FAULTY**

**WIRING.**

**NO**

**REPAIR FAULTY**

**WIRING.**

**REMOVE AND**

**REPLACE AN/ALE-47 J-**

**BOX.**
16-5.12 DCDU DISPLAYS INCORRECT QUANTITY OF EXPENDABLES

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electronic Equipment Tool Kit,
NSN 5180-00-064-5178

Materials:
None

Personnel Required:
Avionics Mechanic

References:
TM 55-1520-240-23

Equipment Conditions:
Battery Connected
Electrical Power On
Hydraulic Power Off
AN/ALE-47 Safety Switch Pin Installed
DOES DCDU INVENTORY DISPLAY ZERO FOR PAYLOAD MODULE CONTAINING EXPENDABLES?

YES

NO

IS DISPLAYED INVENTORY COUNT INCORRECT BY ONE, TWO, OR THREE?

YES

NO

ENSURE PAYLOAD MODULE IS PROPERLY INSTALLED IN DISPENSER ASSEMBLY. ARE RETAINING BOLTS TORQUED TO 40+5/-0 IN. LBS. DOES DCDU DISPLAY CORRECT INVENTORY?

NO

YES

TORQUE BOLTS TO 40+5/-0 IN. LBS. DOES DCDU DISPLAY CORRECT INVENTORY?

NO

YES

FAULT CORRECTED.

ISOLATE FAULTY WIRING/CONNECTORS BETWEEN DISPENSER ASSEMBLY AND SEQUENCER.

YES

NO

REMOVE PAYLOAD MODULE; REMOVE BREECHPLATE AND CHECK MAGAZINE ADDRESS. ARE ENCODING PINS INSTALLED IN CORRECT POSITIONS PER MDF?

YES

NO

REMOVE PAYLOAD MODULE. ARE GROUND SPRINGS ON DISPENSER BROKEN?

YES

DOES DCDU DISPLAY CORRECT INVENTORY?

NO

YES

REPLACE DISPENSER. DOES DCDU DISPLAY CORRECT INVENTORY?

NO

YES

FAULT CORRECTED.

MOVE ENCODING PINS TO CORRECT LOCATIONS. DOES DCDU DISPLAY CORRECT INVENTORY?

NO

YES

ENSURE PAYLOAD MODULE IS PROPERLY INSTALLED IN DISPENSER ASSEMBLY. ARE RETAINING BOLTS TORQUED TO 40+5/-0 IN. LBS.

FAULT CORRECTED.

REPLACE DISPENSER. DOES DCDU DISPLAY CORRECT INVENTORY?

END OF TASK
16-5.13 LANDING GEAR BYPASS SWITCH LIGHT DOES NOT COME ON

**FAULT ISOLATION PROCEDURE**

**INITIAL SETUP**

**Applicable Configurations:**

All

**Personnel Required:**

Avionics Mechanic

**References:**

TM 55-1520-240-23

**Tools:**

Electronic Equipment Tool Kit,

NSN 5180-00-064-5178

**Equipment Conditions:**

Battery Connected

Electrical Power On

Hydraulic Power Off

**Materials:**

None

---

**Fault Isolation Procedure:**

**Does Ldg Gr Bypass Lamp Illuminate During Press To Test?**

**Yes**

**Set Ldg Gr Bypass Switch To Bypass. Does Lamp Illuminate?**

**Yes**

**Fault Corrected.**

**No**

**Go To Task 6-5.6.**

**Does Ldg Gr Bypass Lamp Illuminate During Press To Test?**

**Yes**

**Repair/Replace Faulty Component/Wiring On Remote Bypass Switch Panel.**

**No**

**Disconnect Plug 147P4 From Remote Bypass Switch Panel. Is 28 VDC Present On Pin E?**

**Yes**

**Repair Wire W668-GD323A-20N.**

**No**

**Fault Corrected.**

**End Of Task**
CHAPTER 17

EMERGENCY EQUIPMENT TROUBLESHOOTING
Chapter 17 contains procedures for Emergency Equipment troubleshooting. Emergency equipment system failure symptom is listed below. Included in this Chapter are locations and views of all electrical connectors, receptacles, relays, and ground connections for Emergency Equipment system.

Refer to TM 55-1520-240-23 for required Emergency Equipment system maintenance procedures.

<table>
<thead>
<tr>
<th>SYSTEM PARA</th>
<th>SYMPTOM TASK</th>
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<tr>
<td>EMERGENCY EXIT LIGHTS</td>
<td>17-1.3</td>
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</tbody>
</table>

**FAILURE SYMPTOM LIST**

**EMERGENCY EXIT LIGHTS**

<table>
<thead>
<tr>
<th>SYMPTOM TASK</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHARGE INDICATOR LAMPS ON ONE OR MORE EMERGENCY EXIT LIGHTS DO NOT COME ON WHEN SWITCH IS SET TO ARM</td>
</tr>
<tr>
<td>CHARGE INDICATOR LAMPS ON ONE OR MORE EMERGENCY EXIT LIGHTS DO NOT COME ON WHEN SWITCH IS AT TEST</td>
</tr>
<tr>
<td>EMERGENCY EXIT LIGHT MAIN LAMPS COME ON WHEN SWITCH IS AT ARM</td>
</tr>
<tr>
<td>EMERGENCY EXIT LIGHT MAIN LAMPS DO NOT COME ON WHEN SWITCH IS AT TEST</td>
</tr>
<tr>
<td>ONE OR MORE EMERGENCY EXIT LIGHTS WILL NOT GO OUT WHEN SWITCH IS SET TO DISARM</td>
</tr>
<tr>
<td>REF DESIG</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>GD 119</td>
</tr>
<tr>
<td>GD 120</td>
</tr>
<tr>
<td>GD 168</td>
</tr>
<tr>
<td>GD 169</td>
</tr>
<tr>
<td>129P1</td>
</tr>
<tr>
<td>300J1</td>
</tr>
<tr>
<td>300P1</td>
</tr>
<tr>
<td>300J19</td>
</tr>
<tr>
<td>300P19</td>
</tr>
<tr>
<td>300J20</td>
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<tr>
<td>300P20</td>
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<tr>
<td>300J45</td>
</tr>
<tr>
<td>300P45</td>
</tr>
<tr>
<td>300J47</td>
</tr>
<tr>
<td>300P47</td>
</tr>
<tr>
<td>300J51</td>
</tr>
<tr>
<td>300P51</td>
</tr>
</tbody>
</table>

17-2.2 Change 3
17-1 EMERGENCY EXIT LIGHTS
17.1 EMERGENCY EXIT LIGHTS

17.1.1 EMERGENCY EXIT LIGHTS WIRING DIAGRAM

OVERHEAD PANEL

EMERGENCY EXIT LIGHTS WIRING DIAGRAM

NOTES:
1. (C) INDICATES EQUIPMENT MARKING
2. WITHOUT MARKING
3. WITH MARKING
4. SAME AS 129A3
### 17-1.2 EMERGENCY EXIT LIGHTS VISUAL CHECK

**INITIAL SETUP**

**Applicable Configurations:**
- All

**Tools:**
- Electrical Repairer's Tool Kit.
- NSN 5180-00-323-4915

**Materials:**
- None

**Personnel Required:**
- Aircraft Electrician

**References:**
- TM 55-1520-240-23

**Equipment Condition:**
- Battery Disconnected
- Electrical Power Off
- Hydraulic Power Off

---

#### TASK RESULT

1. **Check EMER EXIT LTS or EMER EXIT switch (1).** If switch (1) is loose or damaged, tighten or replace it as required.
2. **Check escape hatch emergency exit light (2).** If emergency exit light (2) is loose or damaged, tighten or replace it as required.
3. **Check cabin door emergency exit light (3).** If emergency exit light (3) is loose or damaged, tighten or replace it as required.
4. **Check inertia switch (4) at sta 482, bl 15R.** If inertia switch (4) is loose or damaged, repair or replace it. If connector is loose or damaged, tighten or replace it. If wires to connector are broken or damaged, repair or replace wires as required.
5. **Check ramp emergency exit light (5).** If emergency exit light (5) is loose or damaged, tighten or replace it as required.
6. **Check emergency exit lights (2, 3, 4, and 5) PULL handles.** If PULL handles are not recessed into body of exit lights (2, 3, 4, and 5) remove and reinstall lights pushing PULL handles against light assembly.

---

**FOLLOW-ON MAINTENANCE:**
- None

---

**END OF TASK**
Change 3 17-3
INITIAL SETUP

Applicable Configurations:
All

Tools:
None

Materials:
None

Personnel Required:
Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
- Electrical Power Off
- Battery Disconnected
- Hydraulic Power Off
- Visual Check of Emergency Exit Lights Performed

(Task 17-1.2)
17-1.3 EMERGENCY EXIT LIGHTS OPERATIONAL CHECK (Continued)

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Set EMER EXIT LTS or EMER EXIT switch (1) to DISARM.</td>
<td>9. Set EMER EXIT LTS or EMER EXIT switch (1) to DISARM. Main lamps on emergency exit lights (3, 4, and 5) shall go out. If not, go to task 17-1.6 Charge indicator lamps on emergency exit lights (3, 4, and 5) shall be on. If not, go to task 17-1.8.</td>
</tr>
<tr>
<td>2. Connect battery. Refer to TM 55-1520-240-23.</td>
<td></td>
</tr>
<tr>
<td>3. Without check CABIN &amp; RAMP lighting circuit breaker (2). If breaker (2) is open, close it. If it opens again, go to task 9-15-4. If breaker (2.1) is open, close it. If it opens again, go to task 17-1.6. Charge indicator lamps shall come on and main lamps shall be off at each emergency exit light (3, 4, and 5). If charge indicator lamps are not on, go to task 17-1.5. If main lamps are on, go to task 17-1.6. Main lamps shall come on and charge indicator lamps shall be off at each emergency exit light (3, 4, and 5). If main lamps do not come on, go to task 17-1.6. Main lamps on emergency exit lights (3, 4, and 5) shall go out. If not, go to task 17-1.6. If charge indicator lamps do not go out, replace EMER EXIT LTS or EMER EXIT switch.</td>
<td></td>
</tr>
<tr>
<td>4. With check EMER EXIT lighting circuit breaker (2.1).</td>
<td></td>
</tr>
<tr>
<td>5. Check emergency exit lights (3, 4, and 5). If breaker (2) is open, close it. If it opens again, go to task 9-15-4. If breaker (2.1) is open, close it. If it opens again, go to task 17-1.6. Charge indicator lamps shall come on and main lamps shall be off at each emergency exit light (3, 4, and 5). If charge indicator lamps are not on, go to task 17-1.5. If main lamps are on, go to task 17-1.6. Main lamps shall come on and charge indicator lamps shall be off at each emergency exit light (3, 4, and 5). If main lamps do not come on, go to task 17-1.6. Main lamps on emergency exit lights (3, 4, and 5) shall go out. If not, go to task 17-1.6. If charge indicator lamps do not go out, replace EMER EXIT LTS or EMER EXIT switch.</td>
<td></td>
</tr>
<tr>
<td>6. Set EMER EXIT LTS or EMER EXIT switch (1) to ARM.</td>
<td></td>
</tr>
<tr>
<td>7. Set EMER EXIT LTS or EMER EXIT switch (1) to TEST.</td>
<td></td>
</tr>
<tr>
<td>8. Set EMER EXIT LTS or EMER EXIT switch (1) to ARM.</td>
<td></td>
</tr>
</tbody>
</table>

NOTE
Leave EMER EXIT LTS switch at ARM for 10 minutes before doing next step.

CAUTION
EMER EXIT LTS or EMER EXIT switch must be at DISARM when electrical power is removed. If switch is in ARM and battery switch is turned off, exit lights will come on and discharge internal batteries.

FOLLOW-ON MAINTENANCE:
TM 55-1520-240-23:
Battery Disconnected
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Electrical Power On
Battery Connected
IS ANY EMERGENCY EXIT LIGHT OUT?

- NO
  - REPLACE RAMP EMER EXIT LIGHT 129A2
  - REMOVE ELEC PWR, LOWER LH LITG PANEL OR UPPER INTR LTG PNL. APPLY ELECTRICAL POWER CHECK FOR 28VDC BETWEEN EMER EXIT LTS OR EMER EXIT SWITCH 1-2 AND GROUND. IS 28VDC PRESENT?
  - NO
    - CHECK FOR 28VDC BETWEEN EMER EXIT LTS OR EMER EXIT SWTCH 2-1 AND GROUND. IS 28VDC PRESENT?
    - NO
      - IS PROBLEM ON HELICOPTERS WITH
      - NO
        - SET CABIN RAMP LIGHTS SWITCH TO RED ON. DID CAB IN DOME RED LIGHTS COME ON?
        - NO
          - REPLACE CABIN & RAMP LTG CIRCUIT BREAKER
  - YES
    - REPLACE EMER EXIT LTS OR EMER EXIT SWITCH
  - YES
    - REMOVE ELEC PWR, OPEN EMER EXIT CB. OPEN NO. 1 POP. CHECK FOR CONTINUITY BETWEEN CIRCUIT SIDE OF EMER EXIT CB 129CB1 AND EMER EXIT SW SWTCH 2. IS CONTINUITY PRESENT?
    - NO
      - LOCATE OPEN WIRE W550-21-20, W565-60-20 OR W559-105-20 BETWEEN EMER EXIT LTS SWITCH TERM 2 AND CABIN & RAMP CB 129CB1. REPAIR OR REPLACE WIRE AS REQUIRED.
    - YES
      - LOCATE OPEN WIRE W550-21-20, W565-60-20, OR W559-105-20 BETWEEN EMER EXIT CB AND EMER EXIT SW. REPAIR OR REPLACE WIRE AS REQUIRED.

IS RAMP EMERGENCY EXIT LIGHT OUT?

- NO
  - REMOVE ELEC PWR, CHECK FOR CONTINUITY BETWEEN EMER EXIT LT BRACKET TERM 2 AT STA 140 AND PLUG 300P47 PIN 8 AT STA 105. IS CONTINUITY PRESENT?
  - NO
    - LOCATE OPEN IN WIRE W673-109-20. REPAIR OR REPLACE WIRE AS REQUIRED.
  - YES
    - REPLACE CABIN DOOR EMER EXIT LIGHT 129A4.

IS CABIN DOOR EMERGENCY EXIT LIGHT OUT?

- NO
  - REMOVE ELEC PWR, CHECK FOR CONTINUITY BETWEEN EMER EXIT LT BRACKET TERM 2 AT STA 170 AND PLUG 300P47 PIN 8 AT STA 105. IS CONTINUITY PRESENT?
  - NO
    - LOCATE OPEN IN WIRE W673-107-20 OR W673-108-20. REPAIR OR REPLACE WIRE AS REQUIRED.
  - YES
    - REPLACE CABIN DOOR EMER EXIT LIGHT 129A4.

IS ANY EMERGENCY EXIT LIGHT OUT?

- YES
  - REPLACE ESCAPE HATCH EMER EXIT LIGHT 129A3.

END OF TASK

Change 3 17-7
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Electrical Power On
Battery Power On
Hydraulic Power Off
17-1.5 CHARGE INDICATOR LAMPS ON ONE OR MORE EMERGENCY EXIT LIGHTS DO NOT COME ON WHEN SWITCH IS SET TO ARM (Continued)

TM 55-1520-240-T

17-10/(17-11 blank) Change 3

END OF TASK
FAULT ISOLATION PROCEDURE

INITIAL SETUP
Applicable Configurations:
  All
Tools:
  Electrical Repairer's Tool Kit,
  NSN 5180-00-323-4915
  Multimeter
Materials:
  None

Personnel Required:
  Aircraft Electrician

References:
  TM 55-1520-240-23

Equipment Condition:
  TM 55-1520-240-23:
  Battery Power On
  Electrical Power On
  Hydraulic Power Off
17-1.6 EMERGENCY EXIT LIGHT MAIN LAMPS COME ON WHEN SWITCH IS AT ARM (Continued)

- **Do all three emer exit light main lamps come on when emer exit switch is at arm?**
  - **Yes:** Disconnect inertia switch plug 128P1, check for 28VDC between plug 128P1 pin A+1 and unbonded riser 28VDC present?
    - **Yes:** Replace inertia switch.
    - **No:** Locate open in wire W639-1, 19-20, or W666-40-20 between emer exit switch term 3 and plug 128P1 pin A, repair or replace wire as required.
  - **No:** Replace emer exit lbs or emer exit switch.

- **Did ramp emer exit light main lamp come on?**
  - **Yes:** Locate open in wire W639-1, 19-20, or W666-40-20 between emer exit switch term 1 and plug 128P1 pin A, repair or replace wire as required.
  - **No:** Did cabin door emer exit light main lamp come on?
    - **Yes:** Locate open in wire W669-32-20 between ramp emer exit light bracket term 1 and splice to wire W669-94-20, repair or replace wire as required.
    - **No:** Locate open in wire W873-106-20 between cabin door emer exit light bracket term 1 and plug 300P3 pin 27, repair or replace wire as required.

**END OF TASK**

Chage 3 17-13
17-1.7 EMERGENCY EXIT LIGHT MAIN LAMPS DO NOT COME ON WHEN SWITCH IS AT TEST

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Required Equipment:
Electrical Repairer’s Tool Kit,
NSN 5180-00-323-4915

Materials
None

Personnel Required:
Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Electrical Power On
Battery Power On

END OF TASK
17-1.8 CHARGE INDICATOR LAMPS ON ONE OR MORE EMERGENCY EXIT LIGHTS DO NOT COME ON
WHEN SWITCH IS AT DISARM

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit,
NSN 5180-00-323-4915
Multimeter

Materials:
None

Personnel Required:
Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23.
Electrical Power On
Battery Power On
Hydraulic Power Off
17-1.8 \textbf{CHARGE INDICATOR LAMPS ON ONE OR MORE EMERGENCY EXIT LIGHTS DO NOT COME ON WHEN SWITCH IS AT DISARM} (Continued)

- WITHOUT IS CABIN & RAMP LT OPEN?
  \begin{itemize}
    \item YES
    \item NO
  \end{itemize}

- IS ANY CHARGE INDICATOR LIGHT ON?
  \begin{itemize}
    \item YES
    \item NO
  \end{itemize}

- SST EMER EXIT LTS OR EMER EXIT SW TO ARM, DO CHARGE LIGHTS COME ON?
  \begin{itemize}
    \item YES
    \item NO
  \end{itemize}

- REMOVE UNIT EMER EXIT LT, CHECK FOR GROUND ON RECEPTACLE TERM 3. IS GROUND PRESENT?
  \begin{itemize}
    \item YES
    \item NO
  \end{itemize}

- REPAIR OR REPLACE GROUND WIRE.

- LOWER LEFT LIGHTING PNL OR RIGHT INTR LT? FROM CENTER PNL OR 28VDC BETWEEN EMER EXIT LTS OR EMER EXIT SW TERMINAL 2417 AND GROUND IS 28VDC PRESENT?
  \begin{itemize}
    \item YES
    \item NO
  \end{itemize}

- CHECK FOR 28VDC BETWEEN EMER EXIT LTS OR EMER EXIT SW TERMINAL 1417 AND GROUND. IS 28VDC PRESENT?
  \begin{itemize}
    \item YES
    \item NO
  \end{itemize}


- IS PROBLEM ON HELICOPTERS WITH ??
  \begin{itemize}
    \item YES
    \item NO
  \end{itemize}

- REMOVE ELEC PWR. OPEN EMER EXIT CB, OPEN NO. 1 POP. CHECK FOR CONTINUITY BETWEEN CIRCUIT SIDE OF EMER EXIT CB AND EMER EXIT SW TERMINAL 2. IS CONTINUITY PRESENT?
  \begin{itemize}
    \item YES
    \item NO
  \end{itemize}

- REPLACE EMER EXIT CB 125031

- PRESS AND RELEASE CABIN & RAMP LT WH ON PUSHBUTTON, DO DOME WHITE LIGHTS COME ON?
  \begin{itemize}
    \item YES
    \item NO
  \end{itemize}

- REPLACE CABIN & RAMP CB.
TM 55-1520-240-T

17-1.8 CHARGE INDICATOR LAMPS ON ONE OR MORE EMERGENCY EXIT LIGHTS DO NOT COME ON WHEN SWITCH IS AT DISARM (Continued)

GO TO NEXT PAGE
17-1.8 CHARGE INDICATOR LAMPS ON ONE OR MORE EMERGENCY EXIT LIGHTS DO NOT COME ON WHEN SWITCH IS AT DISARM (Continued)
CHAPTER 18
INSTALLED AVIONIC SYSTEMS TROUBLESHOOTING

CHAPTER OVERVIEW

Chapter 18 contains procedures for Installed Avionic Systems troubleshooting. Each avionic system and failure symptom is listed below. Included in this chapter are locations and views of all electrical connectors, receptacles, relays, and ground connections for each installed Avionic System.

Refer to TM 55-1520-240-23 for required Avionic System maintenance procedures.

<table>
<thead>
<tr>
<th>SYSTEM PARA</th>
<th>PARA</th>
</tr>
</thead>
<tbody>
<tr>
<td>GLOBAL POSITIONING</td>
<td>18-1</td>
</tr>
<tr>
<td>ALTITUDE VOICE WARNING SYSTEM</td>
<td>18-2</td>
</tr>
<tr>
<td>(RADAR ALTIMETER)</td>
<td></td>
</tr>
<tr>
<td>DOPPLER/GPS NAVIGATION SYSTEM (DGNS)</td>
<td>18-3</td>
</tr>
<tr>
<td>HF LIAISON FACILITY</td>
<td>18-4</td>
</tr>
</tbody>
</table>

FAILURE SYMPTOM LIST

GLOBAL POSITIONING SYSTEM

<table>
<thead>
<tr>
<th>SYMPTOM</th>
<th>TASK</th>
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<tbody>
<tr>
<td>GPS DISPLAY DOES NOT TURN ON OR VARY WITH CDU BRT CONTROL</td>
<td>18-1.3</td>
</tr>
<tr>
<td>NO MOVEMENT OF GPS RCVR TIME TOTALIZING METER</td>
<td>18-1.5</td>
</tr>
<tr>
<td>GPS CDU DISPLAYS &quot;FAIL&quot; MESSAGE</td>
<td>18-1.6</td>
</tr>
<tr>
<td>GPS SYSTEM TRACKS LESS THAN FOUR SATELLITES AND ESTIMATED POSITION ERROR (EPE) IS NOT WITHIN LIMITS OF THE SYSTEMS FIGURE OF MERIT (FM)</td>
<td>18-1.7</td>
</tr>
<tr>
<td>DATA LOADER MODULE INFORMATION DOES NOT LOAD INTO GPS SYSTEM BUT NO ERROR MESSAGE APPEARS ON CDU</td>
<td>18-1.8</td>
</tr>
<tr>
<td>KYK-13 KEY LOADING DISCREPANCIES</td>
<td>18-1.9</td>
</tr>
<tr>
<td>GPS ALERT INDICATOR DISCREPANCIES</td>
<td>18-1.10</td>
</tr>
<tr>
<td>PILOT/COPILOT HSI DISCREPANCIES</td>
<td>18-1.11</td>
</tr>
<tr>
<td>GPS SYSTEM WILL NOT ZEROIZE</td>
<td>18-1.12</td>
</tr>
<tr>
<td>GPS SYSTEM WILL NOT RETAIN LOADED DATA AFTER AIRCRAFT POWER IS REMOVED</td>
<td>18-1.13</td>
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GO TO THE NEXT PAGE
### FAILURE SYMPTOM LIST (Continued)

ALTITUDE VOICE WARNING SYSTEM
(RADAR ALTIMETER)

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<thead>
<tr>
<th>SYMPTOM</th>
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<tr>
<td>ALTITUDE VOICE WARNING MESSAGE NOT AUDIBLE IN PILOT, COPILOT, OR AFT STATION/ HOIST OPERATOR'S HEADSET WHEN PILOT'S RADAR ALTIMETER POINTER IS BELOW OR ABOVE PRESET ALTITUDE LIMITS</td>
<td>18-2.4</td>
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<tr>
<td>ALTITUDE VOICE WARNING MESSAGE VOLUME DOES NOT FLUCTUATE WHEN PRESS-TO-TEST KNOB IS MOMENTARILY DEPRESSED</td>
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<td>ALTITUDE VOICE WARNING MESSAGE IS AUDIBLE WHEN ALTITUDE POINTER IS WITHIN THE HI/LO SET INDEX ENVELOPE</td>
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## DOPPLER/GPS NAVIGATION SYSTEM (DGNS)

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<tr>
<th>SYMPTOM</th>
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<tbody>
<tr>
<td>EDGE LIT PANEL DOES NOT LIGHT OR VARY</td>
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<tr>
<td>CDU MAL LAMP AND ALL LED SEGMENTS ARE NOT ILLUMINATED</td>
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<tr>
<td>CDU DISPLAY NOT GO ALL</td>
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<table>
<thead>
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<th>SYMPTOM</th>
<th>TASK</th>
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<tbody>
<tr>
<td>GPS ALERT INDICATOR DOES NOT ILLUMINATE</td>
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</tr>
<tr>
<td>PRESENT POSITION NOT DISPLAYED ON CDU</td>
<td>18-3.8</td>
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<tr>
<td>CDU DOES NOT DISPLAY DOWNLOAD WAYPTS DURING WAYPOINT LOADING</td>
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<table>
<thead>
<tr>
<th>SYMPTOM</th>
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<tr>
<td>INDICATIONS ON THE FOUR-LINE DISPLAY AND HSI ARE NOT THE SAME</td>
<td>18-3.10</td>
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<tr>
<td>GPS DOES NOT ZEROZE</td>
<td>18-3.11</td>
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<tr>
<td>GPS HAVE QUICK TIMING NOT WORKING</td>
<td>18-3.12</td>
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<tr>
<td>REF DESIG</td>
<td>TYPE</td>
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<td>ASN149GD002</td>
<td>CANTED CONSOLE - FWD FLOOR</td>
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<td>ASN149GD003</td>
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<td>GD306</td>
<td>HEATER COMPARTMENT</td>
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<td>GD319</td>
<td>AVIONICS COMP - LEFT SIDE</td>
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<tr>
<td>TB4</td>
<td>CONSOLE - FWD FLOOR</td>
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<tr>
<td>TB6</td>
<td>CONSOLE - FWD FLOOR</td>
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<td>185P1</td>
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<td>187P26</td>
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<td>187P31</td>
<td>M28748/6-G30L1A</td>
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<td>RAD ALT RT IND</td>
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<td>JTXM19500/51902</td>
<td>ELECTRONICS COMPARTMENT, GPS FILL PANEL</td>
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<td>199DS1</td>
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<td>CONSOLE CANTED, C-11702/UR, GPS CONTROL DISPLAY UNIT</td>
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<td>ELECTRONICS COMPARTMENT, DATA LOADER RECEPTACLE</td>
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<td>ON241775-1</td>
<td>ELECTRONICS COMPARTMENT, KYK-13 RECEPTACLE</td>
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<td>M83723/73A2461N</td>
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END OF TASK
### DOPPLER GPS/NAVIGATION SYSTEM ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST

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<thead>
<tr>
<th>REF DESG</th>
<th>PART NUMBER</th>
<th>TYPE</th>
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<td>RT-1167C/ARC-164 UHF</td>
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<td>197P8</td>
<td>2031-5011-00</td>
<td>COAX</td>
<td>ANTENNA 2243-40</td>
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<td>8</td>
<td>SIG DATA CONVERTER</td>
<td>108 30 28L</td>
<td></td>
</tr>
<tr>
<td>P2002R</td>
<td>D39999/26WH35SN</td>
<td>C</td>
<td>ANVIS/HUD SIG DATA CONV</td>
<td>105 -10 29L</td>
<td></td>
</tr>
<tr>
<td>197J10</td>
<td>MB3723/73A2461N</td>
<td>43</td>
<td>PEDESTAL DISCONNECT PANEL</td>
<td>80 -30 0</td>
<td></td>
</tr>
<tr>
<td>197P10</td>
<td>MB3723/76A2461N</td>
<td>43</td>
<td>PEDESTAL DISCONNECT PANEL</td>
<td>50 -30 0</td>
<td></td>
</tr>
</tbody>
</table>
DOPPLER GPS/NAVIGATION SYSTEM ELECTRICAL COMPONENT LOCATION
AND CONFIGURATION LIST (Continued)

[Diagram of electrical component locations]

Change 19
DOPPLER GPS/NAVIGATION SYSTEM ELECTRICAL COMPONENT LOCATION AND CONFIGURATION LIST (Continued)

18-6.2 Change 19
18-1 GLOBAL POSITIONING SYSTEM
TM 55-1520-240-T

END OF TASK

Change 18 18-11
18-1.2 GLOBAL POSITIONING SYSTEM VISUAL CHECK

INITIAL SETUP

References:
Applicable Configurations
TM 55-1520-240-23

Equipment Condition:
Tools:
All
Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915

Materials:
None

Personnel Required:
68F10 Aircraft Electrician

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Check GPS CDU (1).</td>
<td>Loosen Dzus fasteners and check connector of GPS CDU (1). If connector is loose or damaged tighten or replace it as required. If wiring to connector is loose or damaged, tighten, repair, or replace it as required. If display screen is damaged in any way replace CDU (1). If knobs are loose or broken tighten or replace as required. If pushbutton is damaged replace CDU (1). Reinstall CDU (1) in the canted console tightening the Dzus fasteners.</td>
</tr>
<tr>
<td>2. Check GPS Alert Light Indicator (2).</td>
<td>If indicator (2) is loose or damaged tighten or replace as required.</td>
</tr>
<tr>
<td>3. Check GPS Zeroize Switch/Cover (3).</td>
<td>If switch or cover (3) is loose or damaged tighten or replace as required. If wiring to switch is loose or broken tighten, repair, or replace as required.</td>
</tr>
<tr>
<td>4. Check GPSIDOP SEL Indicator (4).</td>
<td>If indicator lens (4) is damaged replace.</td>
</tr>
<tr>
<td>5. Check GPS RCVR and GPS CONT Circuit Breaker(s) (5)</td>
<td>If breaker(s) (5) is loose or damaged tighten or replace as required. If wiring to breaker(s) is loose or broken tighten, repair, or replace as required.</td>
</tr>
<tr>
<td>6. Check GPS Radio Receiver R-2400( )A (6).</td>
<td>If receiver (6) is loose or damaged tighten or replace as required. If connectors to the receiver are loose or damaged tighten or replace as required. If wiring or cables to receiver are loose or damaged tighten, repair, or replace as required.</td>
</tr>
<tr>
<td>7. Check GPS Data Loader Receptacle (7).</td>
<td>If receptacle (7) is loose or damaged tighten or replace as required. If pushbutton is loose or damaged replace Data Loader Receptacle. If the connector to the receptacle is loose or damaged tighten or replace as required. If wiring to the connector is loose or damaged tighten, repair, or replace as required.</td>
</tr>
<tr>
<td>8. Check KYK/GPS Fill Connector (J1) (8).</td>
<td>If connector (8) is loose or damaged tighten or replace as required. If wiring to the connector is loose or damaged tighten, repair, or replace as required.</td>
</tr>
<tr>
<td>9. Check INIT Load Push Button Switch (9).</td>
<td>If switch (9) is loose or damaged tighten or replace as required. If wiring to the connector is loose or damaged tighten, repair, or replace as required.</td>
</tr>
<tr>
<td>10. Check Load Status LED (10).</td>
<td>If LED (10) is loose or damaged tighten or replace as required.</td>
</tr>
<tr>
<td>11. Check AE-4 Antenna Amplifier (11).</td>
<td>If amplifier (11) is loose or damaged tighten or replace as required. If connectors to the amplifier are loose or damaged tighten or replace as required. If cable to amplifier J1 and J3 are loose or damaged tighten, repair, or replace as required. If cable to J2 is loose tighten, if damaged replace ONLY. DO NOT REPAIR THIS LOW-LOSS CABLE GOING TO GPS ANTENNA (12).</td>
</tr>
<tr>
<td>12. Check GPS Antenna (13).</td>
<td>If antenna (13) is loose or damaged tighten or replace as required. If cable (12) to antenna is loose or broken tighten or replace as required. DO NOT REPAIR THIS CABLE.</td>
</tr>
</tbody>
</table>

FOLLOW-ON MAINTENANCE:
Close No. 2 Access Door (Tunnel Cover)
18-1.2 GLOBAL POSITIONING SYSTEM VISUAL CHECK (Continued)

END OF TASK
1. Check that the following circuit breakers on No. 2 pdp are closed:

- GPS CONT (2)
- GPS RCVR (1)

2. Start APU. Refer to TASK 18-1.4.

CHECK GPS CDU C: 11702/UR
3. Turn aircraft CTR CSL LTG control (3) clockwise and counterclockwise while checking CDU (4) panel lighting.

4. Turn the CDU (4) BRT control (5) clockwise and counterclockwise while checking CDU data display screen (6) intensity level.

5. Turn CDU Mode Switch (7) to TEST.

CHECK GPS RECEIVER R-2400( )/A
6. Check the time totalizing meter (8) on front panel of GPS receiver (9).

7. With 4 satellites being tracked and the Figure of Merit (FM) being 5 or less, set the Data switch (10) on the CDU (4) to STAT. Slew (11) down to page 2 and write down the Almanac Age displayed on line 2 (ALM followed by numbers). Information will be needed later.

8. Depress the GPS Alert Indicator (18).

9. With the Data switch (10) of the CDU set to MSN, slew (11) down to page 2. Press line select key two (12) until THRESH: ENRT is displayed. Enter a figure of merit on display (6) line three at least one level below the existing GPS system figure of merit (FM) displayed on line 1.

10. Depress the GPS/DOP lenses (13) on each of the two HSI Mode Select Panels (14) (one each in pilot and copilot instrument panels).

11. Set the Data switch (10) of the CDU set to VARDTM. Enter at least one known waypoint. Set the Data switch (10) to POS and call up the waypoint previously flown.

12. Connect a KYK-13 fill device to the KYK/GPS Fill J1 connector (15). Set the GPS CDU Data switch (10) to STAT. Set the fill device Address Select switch to desired setting and the Mode switch to ON. Press and release the aircraft's INIT LOAD switch (16). If any circuit breaker (1 through 2) is open, close it.

APU ON capsule shall come on.

CDU (4) panel light shall vary with the changing setting of the aircraft dimmer control (3). If CDU (4) panel light is not visible or intensity level does not vary with aircraft dimmer control (3) refer to TM 55-1520-240-T-2, Chapter 5.

CDU data display screen (6) intensity level shall vary with the changing setting of the CDU BRT control (5). If no display appears or intensity level does not vary, go to TASK 18-1.4.

After a 30-second warm-up the CDU data display (6) shall remain on. If failure data is displayed instead of TEST COMPLETE go to TASK 18-1.5. After the test is completed TEST COMPLETE shall be displayed on line 1 and TEST OK shall be displayed on line 2 of the CDU data display (6). If failure data is displayed, go to TASK 18-1.6.

The pointer on the left side of the time totalizing meter window shall have an up/down movement. If no up/down movement, go to TASK 18-1.5.

The GPS Alert Indicator (18) shall illuminate. If indicator does not illuminate, go to TASK 18-1.10.

The SEL indication at the lower half of each GPS/DOP (13) lens shall be illuminated. If SEL not illuminated, go to TASK 18-1.11.

If the number one needle (20) does not swing to show bearing to the station or the Range (22) and Course (23) readouts do not illuminate, go to TASK 18-1.10.

Successful loading of keys shall be indicated by the flashing of the aircraft's LOAD STATUS indicator lamp (24) within approximately 5 seconds of pressing the aircraft's INIT LOAD switch. If lamp (24) does not flash, go to TASK 18-1.5. Observe the GPS CDU data display (6). If an error message is present, go to TASK 18-1.5.

References:
- TM 11-1520-240-23
- TM 11-5826-308-12
- TM 55-1520-240-23

Equipment Condition:

- Global Positioning System Visual Check Performed

Equipment Condition:
- TM 55-1520-240-23
- TM 11-5826-308-12
- TM 11-1520-240-23

NOTE

Continue with the following checks only after the Start-up procedures given in TM 11-5826-30812 or local directives have been completed (for a COLD start) and the GPS System is tracking 4 satellites. The Mode switch (7) shall be positioned on NAV.

If 4 satellites cannot be tracked, go to TASK 18-1.7.

The SEL indication at the lower half of each GPS/DOP (13) lens shall be illuminated. If SEL not illuminated, go to TASK 18-1.11.

The number one needle (20) of each HSI indicator (25) shall swing to show the bearing to the station with the course deviation bar (21) centered. The Range (22) and Course (23) readouts shall also be accurate. If the number one needle (20) does not swing to show bearing to the station or the Range (22) and Course (23) readouts are not accurate, go to TASK 18-1.11.

Successful loading of keys shall be indicated by the flashing of the aircraft's LOAD STATUS indicator lamp (24) within approximately 5 seconds of pressing the aircraft's INIT LOAD switch. If lamp (24) does not flash, go to TASK 18-1.5. Observe the GPS CDU data display (6). If an error message is present, go to TASK 18-1.5.
Set the GPS CDU Data switch (10) to STAT. Lift switch guard and toggle the Zeroize switch (17).

Insert a Data Loader Module which contains almanac information into the Data Loader Receptacle (19) located on shelf five of the cabin avionic/electronic compartment. Leave in for at least 20 seconds, then remove Data Loader Module.

15. With the GPS CDU Data switch (10) still at STAT, slew (11) down to page 2 and compare the Almanac Age located on display (6) line 2 with the age recorded earlier in step 7.

16. Turn the GPS CDU Mode switch (7) to OFF. Leave OFF for a few minutes then turn back ON with the Mode switch (7) in the NAV position.

17. Stop APU. Refer to task 15-1.4

The CDU data display (6), line 2 shall display ZEROED. If ZERO FAIL is displayed, go to task 181.12

No error messages shall be displayed on the CDU data display (6). If an error message is displayed, go to task 18-1.6

The two values shall be different if the Almanac stored in the Data Loader Module has been successfully loaded into the GPS system. If the Almanac Age is the same as before loading data with the Data Module, go to task 18-1.8

After warmup and test completion, GNAV shall appear on CDU data display (6) line 1. This means that the previously loaded almanac has been stored by the GPS receiver (9). If COLD appears on CDU data display (6) line 1 instead, go to task 18-1.13

FOLLOW-ON MAINTENANCE:
TM 55-1520-240-23:
Battery Disconnected
Electrical Power Off
18-1.3 GLOBAL POSITIONING SYSTEM OPERATIONAL CHECK (Continued)

END OF TASK
Change 18 18-17
18-1.4 GPS DISPLAY DOES NOT TURN ON OR INTENSITY DOES NOT VARY WITH CDU BRT CONTROL

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit,
NSN 5180-00-323-4915
Multimeter, AN/USM-223,
NSN 6625-00-999-7465

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

Materials:
None

Personnel Required:
Aircraft Electrician

References:
TM 11-5826-308-12
TM 55-1520-240-23
18-1.4 GPS DISPLAY DOES NOT TURN ON OR INTENSITY DOES NOT VARY WITH CDU BRT CONTROL (Continued)

Does GPS CDU turn on at all?

NO

Is GPS CONT circuit breaker closed?

NO

Close GPS CONT circuit breaker

YES

Replace GPS CDU, 199A2, C-11702/UR.

Is there 115VAC between pins 1 and 2 of 199J6, Pedestal Disconnect Panel?

YES

Replace GPS CDU, 199A2, C-11702/UR.

NO

Is there 115VAC between pin 34 of No. 2 PDP DISC, 300P6, and ground?

YES

Is there 115VAC between pins 300P6, No. 2 PDP DISC, pin 32 and ground?

NO

With GPS RCVR circuit breaker closed, is there 115VAC between 300P6, No. 2 PDP DISC, pin 32 and ground?

NO

Troubleshoot No. 2 AC Bus system, see task 9-XX.

YES

Check continuity of wire ASN149-3A20, between 300P6, pin 34 and GPS CONT CB (aircraft side). Is there continuity?

NO

Repair/replace wire as required.

YES

Replace GPS CONT CB, 199CB2

END OF TASK
Change 18 18-19
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915

Equipment Condition:
TM 55-1520-240-23

Materials:
None

Personnel Required:
Aircraft Electrician

References:
TM 11-5826-308-12
TM 55-1520-240-23

Equipment Condition:
Battery Connected
Electrical Power On
Hydraulic Power Off

Replace GPS RCVR R-2400( )/A.
FAIL ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

Materials:
None

Personnel Required:
Aircraft Electrician
GPS CDU DISPLAYS "FAIL" MESSAGE WHEN ATTEMPTING TO LOAD KEYS USING DATA LOADER MODULE OR KYK-13 FILL DEVICE

Note Error Message and Report to Organizational Maintenance
18-1.6 GPS CONTROL DISPLAY UNIT (CDU) DISPLAYS "FAIL" MESSAGE

(Continued)
GPS CDU DISPLAYS "FAIL" MESSAGE DURING TEST MODE

Does CDU Data Display, line 1, display H/W FAILURE and line 2 display RCV?

YES → Replace GPS RCVR R-2400( )/A.

NO →

Does CDU Data Display, line 1, display H/W FAILURE and line 2 display CDU 1?

YES → Replace GPS CDU C-11702/UR

NO →

Does CDU Data Display, line 1, display H/W FAILURE and line 2 display AE?

YES → Replace GPS Antenna Amplifier (AE-4), AM-7314/URN.

NO →

Does CDU Data Display, line 1, display H/W FAILURE and line 2 display BT1?

YES → Replace GPS RCVR memory batteries.

NO →

Note Error Message and Report to Organizational Maintenance.

END OF TASK
Change 18 18-25
18-1.7 LESS THAN 4 SATELLITES CAN BE TRACKED AND ESTIMATED POSITION ERROR (EPE) IS NOT WITHIN LIMITS OF GPS SYSTEM’S FIGURE OF MERIT (FM)

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915
Multimeter, AN/USM-223,
NSN 6625-00-999-7465

Materials:
None

Personnel Required:
Aircraft Electrician

References:
TM 11-5826-306-12
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

199A1 GPS RECEIVER

VIEW LOOKING LEFT (SHELF 1)

199E1 GPS ANTENNA (FRPA-3)

NO. 2 ACCESS DOOR (TUNNEL COVER)

(AIRCRAFT CABIN CEILING SKIN)

199A3 GPS ANTENNA AMPLIFIER (AE-4)
VIEW LOOKING RIGHT PS 226

GO TO NEXT PAGE
LESS THAN 4 SATELLITES CAN BE TRACKED AND ESTIMATED POSITION ERROR (EPE) IS NOT WITHIN LIMITS OF GPS SYSTEM'S FIGURE OF MERIT (FM)

(Continued)

Check with organizational maintenance for satellite availability. Are all satellites available?

NO

YES

When all satellites are available try to track 4 satellites again. Can 4 satellites be tracked?

NO

YES

Replace GPS RCVR R-2400( )/A. Can four satellites be tracked and EPE within limits of system FM?

NO

YES

Replace AE-4 Antenna Electronics AM-7314/URN. Can four satellites be tracked and EPE within limits of system FM?

NO

YES

Check coaxial cables between AE-4 and GPS Antenna/GPS RCVR: ASN149-6A, ASN149-7A, and ASN149-8A. Repair/Replace as required. Were any discrepancies found?

NO

YES

Replace GPS Antenna AS-3922/URN FRPA-3.

Can 4 satellites can be tracked and EPE within limits of system FM?

NO

YES

Is EPE within limits of FM?

Fault Corrected.
18-1.8 DATA LOADER MODULE INFORMATION DOES NOT LOAD INTO GPS SYSTEM BUT NO ERROR MESSAGE APPEARS ON CONTROL DISPLAY UNIT (CDU)

FAULT ISOLATION PROCEDURE

INITIAL SETUP

References:
TM 11-5826-308-12
TM 55-1520-240-23

Applicable Configurations:
All

Tools:
Electrical Repairer's Tool Kit,
NSN 5160-00-323-4915
Multimeter, AN/USM-223,
NSN 6625-00-999-7465

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

Materials:
None

Personnel Required:
Aircraft Electrician

Using a different Data Loader Module, can information be loaded into the GPS system?

YES Fault Corrected.

NO

Check for open/short in wires between 199P4, Data Loader RPT and 199P2, GPS RVR:
ASIN49-22A22(WHT)-23A22(BLU)
ASIN49-30A22
ASIN49-31A22
ASIN49-32A22
Repair/Replace as required.
INITIAL SETUP

References:
- Applicable Configurations: TM 11-5826-306-12
- TM 55-1520-240-23

Tools:
- Electrical Repairer's Tool Kit, NSN 51 80-00-323-4915
- Multimeter, AN/USM-223, NSN 6625-00-999-7465
- NSN 55-1520-240-23: Battery Connected
- Electrical Power On
- Hydraulic Power Off

Materials:
- None

Personnel Required:
- Aircraft Electrician
KYK-13 KEYS CANNOT BE LOADED INTO THE GPS SYSTEM

Remove Load Switch, 199S2, disconnect attached wires, and depress switch. Is there continuity between contacts?

NO

Replace Load Switch, 199S2.
Do KYK-13 keys load?

YES

Fault Corrected.

YES

Replace GPS RCVR R-2400( )/A.
Do KYK-13 keys load?

NO

Check wires between Load Switch and GPS RCVR, 199P2:
ASN149-39A22
ASN149-41A22
ASN149-41B22
Repair/replace as required.

YES
LOAD STATUS INDICATOR, 199CR1, DOES NOT FLASH WHEN LOADING KYK-13 KEYS

1. Are keys being loaded into the GPS system?
   - **NO**: Go to task 18-X.X to test Load Switch, 199S2.
   - **YES**: Remove Load Status Indicator, 199CR1, and disconnect wires. Is there continuity between the leads?
     - **NO**: Replace Load Status Indicator, 199CR1.
     - **YES**: Check wires between Load Status Indicator, 199CR1, and GPS RCVR, 199P2:
       - ASN149-40A22
       - ASN149-41C22
       - Repair/Replace as required. Were any discrepancies found?
         - **NO**: Replace GPS RCVR R-2400( /A)
18-1.10 GPS ALERT INDICATOR DISCREPANCIES

FAULT ISOLATION PROCEDURE

INITIAL SETUP

References:
- TM 11 - 1520-240-23
- TM 11-5826-308-12
- TM 55-1520-240-23

Applicable Configurations:
- All

Tools:
- Electrical Repairer's Tool Kit,
  NSN 5180-00-323-4915
- Multimeter, AN/USM-223,
  NSN 6625-00-999-7465

Equipment Condition:
- TM 55-1520-240-23:
  Battery Connected
  Electrical Power On
  Hydraulic Power Off

Materials:
- None

Personnel Required:
- Aircraft Electrician
GPS ALERT INDICATOR, 199DS1, DOES NOT ILLUMINATE DURING SELF-TEST "ONLY"

Check continuity of wire ASN149-82A20N between GPS Alert Indicator contact 3 and ground stud ASN149GD002. Is there continuity?

YES
Replace GPS Alert Indicator Assy, 199DS1

NO
Repair/replace wire ASN149-82A20N as required.

With Power On and the GPS system operational, set Data switch on the CDU to MSN, slew down to page 2, observe the value displayed on line 3. Is the value less than or equal to the value displayed on line 1 for system Figure of Merit (FM)?

YES
Replace GPS Alert Indicator Assy, 923-104-28-B

NO
Change the value on line 3 to a value at least one number greater than the GPS system Figure of Merit (FM). Does the GPS Alert Indicator light extinguish?

YES
Fault Corrected.

NO
Change the value on line 3 back to the original value.
GPS ALERT INDICATOR DISCREPANCIES (Continued)

GPS ALERT INDICATOR, 199DS1, DOES NOT ILLUMINATE FOR GPS SYSTEM ALERT CONDITION "ONLY"

Is 28VDC present between GPS RCVR 199P2, pins 79 and 78?  
YES → Replace GPS RCVR R-2400( )A

NO → Is 28VDC present between Pedestal DISC, 199P6, pins 45 and 46?  
YES → Check continuity of wires ASN149-69A22 and ASN149-70A22 between GPS RCVR and Pedestal Disc 199J6. Repair/replace as required.

NO → Check continuity between 199P6, pins 46 and ground.  
NO → Repair/replace wire ASN149-70B22N, between 199P6 and ground stud ASN149GD003, as required.

YES → Repair/replace wire ASN149-69B22, between 199DS1 and 199P6, as required.
GPS ALERT INDICATOR, 199DS1, DOES NOT ILLUMINATE AT ALL

- Energize No. 2 DC Bus and ensure KY-28, 182CB4, is depressed. Is 28VDC present on aircraft side of circuit breaker?
  - No: Is 28VDC present on Bus side of 182CB4?
  - No: Go to task IX.X to check No. 2 DC system.
  - Yes: Replace 182CB4.
  - YES: Separate 300P11 from 300J11 and check for 28VDC between 300J11, pin 31 and ground? Is 28VDC present?
    - NO: De-energize No. 2 DC Bus, separate wires W557-411-22 and W557-409-22 at splice. Check continuity. Repair/replace wire(s) as required.
    - YES: Check for 28VDC between 199DS1, GPS Alert Indicator, pins 1 and 3, is 28VDC present?
      - NO: Replace bulb or indicator assembly as required.
      - YES: Does KY-28 Control Panel turn on?
        - NO: Check continuity of wire W557-311-22 between TB5-5C and 300P11-31. Is there continuity?
          - NO: Replace TB6.
          - YES: Repair/replace wire AEN140-81A42 as required.
        - YES: Repair/replace wire W557-611-22 as required.
18-1.11 PILOT/COPILOT HORIZONTAL SITUATION INDICATOR (HSI) DISCREPANCIES

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
- Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915
- Multimeter, AN/USM-223, NSN 6625-00-999-7465

Equipment Condition:
- TM 55-1520-240-23: Battery Connected
- TM 55-1520-240-23: Electrical Power On
- TM 55-1520-240-23: Hydraulic Power Off

Materials:
None

Personnel Required:
Aircraft Electrician
PILOT/COPILOT HORIZONTAL SITUATION INDICATOR (HSI) DISCREPANCIES

PILOT/COPILOT HSI DOES NOT DISPLAY GPS BEARING INFORMATION “ONLY”

Is GPS/DOP SEL switch on the HSI Mode Select panel depressed?

NO

Depress GPS/DOP SEL switch.

GPS/DOP SEL LENS ON PILOT/COPILOT HSI MODE SELECT PANEL DOES NOT ILLUMINATE

Do all other switches on HSI Mode Select Panel illuminate when depressed?

NO

Check HSI Mode Select Panel switch lighting wiring. Repair/replace wiring/Mode Select Panel as required.

YES

Replace GPS/DOP SEL indicator bulb. Does indicator illuminate when depressed?

YES

Fault Corrected.

NO

Replace GPS/DOP SEL switch body.
18-1.11 PILOT/COPILOT HORIZONTAL SITUATION INDICATOR (HSI) DISCREPANCIES

(Continued)
PILOT/COPILOT HSI DOES NOT DISPLAY "ANY" GPS INFORMATION
WHEN GPS/DOP SEL SWITCH IS DEPRESSED

Does either pilot or copilot
HSI display GPS Bearing, Range
and Course correctly?

YES

Replace the HSI not displaying
GPS information. Does the replaced
HSI display accurate GPS Bearing,
Range, and Course Information?

YES

NO

Check TW SHLD PR wiring between
splices before the HSI's and
affected HSI's:
PLT HSI: W557-436-22RED/ W557-439-22BLU
COPLT HSI: W557-440-22RED/ W557-441-22BLU
Repair/Replace as required.

NO

Replace GPS RCVR R-2400(1/2A)
Does both PLT and COPLT HSI
display accurate GPS Bearing,
Range, and Course Information?

YES

Fault Corrected.

NO

Check TW SHLD PR wiring between
GPS RCVR R-2400(1/2A), 199P2 and
splices before PLT/COPLT HSI's:
ASN149-52A22(WHT)/53A22(BLU)
ASN149-52B22(WHT)/53B22(BLU)
W557-436-22RED/W557-437-22BLU
Repair/Replace as required.
18-1.12 GPS SYSTEM WILL NOT ZEROIZE

FAULT ISOLATION PROCEDURE

INITIAL SETUP

References:
All

Applicable Configurations:
TM 11-5826-308-12
TM 55-1520-240-23

Tools:
Electrical Repairer's Tool Kit,
NSN 5180-00-323-4915
Multimeter, AN/USM-223,
NSN 6625-00-999-7465

Equipment Condition:
TM 55-1520-240-23:
Battery Disconnected
Electrical Power Off
Hydraulic Power Off

Materials:
None

Personnel Required:
Aircraft Electrician
With aircraft power removed, isolate GPS Zeroize switch, 199S1, contacts 2 and 3. Toggle the switch and hold. Is there continuity?

YES

Is there continuity between contact 2 of zeroize switch and ground?

NO

Repair/replace wire ASN149-80A20N, between switch contact 2 and ground stud ASN149GD002, as required.

YES

Is there continuity between contact 3 of zeroize switch and GPS RCVR, 199P2 pin 727?

NO

Repair/Replace wires between zeroize switch and GPS RCVR 199P2; ASN149-71A22 and ASN149-71B22. Repair/replace as required.

YES

Replace GPS RCVR R-2400( V/A).

Replace GPS Zeroize switch, 199S1.
18-1.13 GPS SYSTEM WILL NOT RETAIN LOADED DATA AFTER AIRCRAFT POWER IS REMOVED

FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

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

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On

Materials:
None

Personnel Required:
Aircraft Electrician

References:
TM 11-5826-308-12
TM 55-1520-240-23

YES
Fault Corrected.

NO
Replace the three C-cell batteries in the GPS RCVR R-2400( )/A, reload data, remove power for a few minutes, re-apply power. Was loaded data retained?

Replace GPS RCVR R-2400( )/A.

END OF TASK
ALTITUDE VOICE WARNING SYSTEM
(RADAR ALTIMETER)

Change 18 18-47/(18-48 blank)
18-2.2 ALTITUDE VOICE WARNING SYSTEM VISUAL CHECK

INITIAL SETUP

References:
Applicable Configurations:
   All

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

Equipment Condition:
   Battery Disconnected
   Electrical Power Off

Materials:
   No. 2 Access Door (Tunnel Cover)
   Open

Personnel Required:
   68F10 Aircraft Electrician

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Check AVWS Radar Altimeter Indicator</td>
<td>Remove from Pilot's instrument panel and (AN/APN209) (1). Check connector of AVWS Radar Altimeter Indicator (1). If connector is loose or damaged, tighten, repair, or replace as required. If wiring to connector is loose or damaged, tighten, repair, or replace it as required. If indicator glass is cracked or broken, or if pointers(indices) are bent or broken replace altimeter. Check knobs for looseness or binding. Repair, replace, or adjust as required.</td>
</tr>
<tr>
<td>2. Check the following Interphone Control Panels: Pilot (2) Copilot (3) Aft Station (4).</td>
<td>Remove each panel and check connector. If connector is loose or damaged, tighten, repair, or replace as required. If wiring to connector is loose or damaged, tighten, repair, or replace as required. Check knobs for looseness or binding. Repair, replace, or adjust as required. Check switches for looseness or binding. Replace as required.</td>
</tr>
</tbody>
</table>

FOLLOW-ON MAINTENANCE:
None
18-2.2 ALTITUDE VOICE WARNING SYSTEM VISUAL CHECK (Continued)

END OF TASK
Change 18 18-51
INITIAL SETUP

**Applicable Configurations:**
- All

**Tools:**
- Electrical Repairer’s Tool Kit
- NSN 5180-00-323-4915

**Equipment Condition:**
- TM 55-1520-240-23: Battery Connected
- TM 55-1520-240-23: Hydraulic Power Off

**Materials:**
- None

**Personnel Required:**
- Aircraft Electrician (2)

**References:**
- TM 11-1520-240-23
- TM 55-1520-240-23

**CHECK CIRCUIT BREAKERS**

1. Check that the following circuit breaker on No. 1 pdp are closed:
   - INTPH LH (1)
   - If circuit breaker is open (1), close it.

2. Check that the following circuit breakers on No. 2 pdp are closed:
   - INTPH RH (2)
   - RAD ALT (3)
   - If any circuit breaker is open (2 and 3), close it.

3. Start APU. Refer to [task 15-1.4] APU ON capsule shall come on.

**CHECK AVWS OPERATION**

- The following checks will only cover the Altitude Voice Warning portion of the Radar Altimeter operation. For indication discrepancies, refer to TM 11-1520-240-23.

- Ensure that the pilot, copilot, and aft interphone stations are all operational.

- With the pilot's Radar Altimeter (4) turned ON and the **OFF Flag** (5) not visible, and with a headset connected to the pilot's headset jack, rotate the **LO SET** knob (6) to position the **LO SET** Index (7) just above the **OFF** detent. Adjust the **HI SET** knob (8) to position the **HI SET** Index (9) at 100 feet.

**TASK**

5. Adjust the **LO SET** Index (7) to approximately the 10 foot position on the indicator.

6. Momentarily depress the **PUSH-TO-TEST** knob (6) once.

7. Reset the **LO SET** Index (7) to a point just above the **OFF** detent, wait 11 seconds, and return **LO SET** index to the 10 feet mark.

8. Press and hold the **PRESS-TO-TEST** knob (8) to activate the self-test.

9. Release the **PUSH-TO-TEST** knob.

10. Repeat steps 4 thru 9 with a headset connected to the copilot's headset jack.

11. Repeat steps 4 thru 9 with a headset connected to the hoist operator's headset jack.

**RESULT**

- The warning message "ALTITUDE LOW, TOO LOW" shall be heard at FULL volume. If this message is NOT heard or volume is NOT FULL, go to [task 18-2.4].

- The volume of the low altitude warning message shall decrease by one-half (1/2). If volume stays full, or NOT heard at all, go to [task 18-2.4].

- The low altitude warning message shall be heard at FULL volume. If message is NOT heard at all, or if volume is NOT full, go to [task 18-2.4].

- The warning message "ALTITUDE HIGH, CHECK ALTIMETER" shall be audible at FULL volume. If message is NOT heard, or if volume is NOT FULL, go to [task 18-2.4].

- Results shall be as specified in steps 4 thru 9. If altitude warning messages are not audible, even after replacing Radar Altimeter (4), go to [task 18-2.4].

- Results shall be as specified in steps 4 thru 9. If altitude warning messages are not audible, even after replacing Radar Altimeter (4), go to [task 18-2.4].

FOLLOW-ON MAINTENANCE:

- TM 55-1520-240-23: Battery Disconnected
- Electrical Power Off

---

TM 55-1520-240-23

18-52 Change 18
18-2.3 ALTITUDE VOICE WARNING SYSTEM OPERATIONAL CHECK (Continued)

END OF TASK
Change 18 18-3
FAULT ISOLATION PROCEDURE

INITIAL SETUP

Applicable Configurations:
All

Tools:
Electrical Repairer's Tool Kit
NSN 5180-00-323-4915
Multimeter, AN/USM-223
NSN 6625-00-999-7465

Equipment Condition:
Battery Connected
Electrical Power On

Materials:
None

Personnel Required:
Aircraft Electrician (2)

References:
TM 11-1520-240-23
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power Off

GO TO NEXT PAGE
18-2.4 ALTIMETER ALTITUDE WARNING NOT AUDIBLE AT PILOT, COPILOT, OR AFT STATION/HOST OPERATOR'S HEADSET WHEN PILOT'S RADAR ALTIMETER ALTITUDE POINTER IS BELOW OR ABOVE PRESET LIMITS (Continued)

ALTIMETER ALTITUDE WARNING NOT AUDIBLE AT ALL INTERPHONE STATIONS (PILOT, COPILOT, AND AFT/HOST OPERATOR)

1. Replace altitude voice warning radar altimeter receiver.

   YES \rightarrow \text{Fault corrected.}

   NO \rightarrow \text{Check wire APN209-31422 between radar altimeter 18892 and TS4-6, terminal A, is wire open?}

   NO \rightarrow \text{Replace TS4-6.}

   YES \rightarrow \text{Repair or replace wire APN209-31422 as required.}

ALTIMETER ALTITUDE WARNING NOT AUDIBLE AT PILOT STATION ONLY

1. Check wire APN209-31422 between TS4-6, terminal B, and pilot interphone control panel connector 187427, pin 9, is wire open?

   YES \rightarrow \text{Repair or replace wire APN209-31422 as required.}

   NO \rightarrow \text{Move wire APN209-31422 from TS4-6, terminal B, to terminal D or E, is altitude voice warning message audible at pilot station?}

   YES \rightarrow \text{Fault corrected.}

   NO \rightarrow \text{Replace pilot interphone control panel connector 187427.}

   \text{Replace TS4-6.}
18-2.4 ALTITUDE VOICE WARNING NOT AUDIBLE AT PILOT, COPILOT, OR AFT STATION/HOIST OPERATOR'S HEADSET WHEN PILOT'S RADAR ALTIMETER ALTITUDE POINTER IS BELOW OR ABOVE PRESET ALTITUDE LIMITS (Continued)
ALTITUDE VOICE WARNING NOT AUDIBLE AT PILOT, COPILOT, OR AFT STATION/HOIST OPERATOR'S HEADSET WHEN PILOT'S RADAR ALTIMETER ALTITUDE POINTER IS BELOW OR ABOVE PRESET ALTITUDE LIMITS (Continued)

ALTITUDE VOICE WARNING NOT AUDIBLE AT COPILOT STATION ONLY.

CHECK WIRE APN209-31C22 BETWEEN TB4-9, TERMINAL D, AND COPILOT INTERPHONE CONTROL PANEL CONNECTOR 187P28, PIN R1L IS WIRE OPEN?

YES
REPAIR OR REPLACE WIRE APN209-31C22 AS REQUIRED.

NO
MOVE WIRE APN209-31C22 FROM TB4-9, TERMINAL D, TO TERMINAL B OR E, IS ALTITUDE VOICE WARNING MESSAGE NOW AUDIBLE AT COPILOT STATION?

YES
REPLACE TB4-9.

NO
REPLACE COPILOT INTERPHONE CONTROL PANEL CONNECTOR 187P28.

ALTITUDE VOICE WARNING NOT AUDIBLE AT AFT/HOIST OPERATOR STATION ONLY.

CHECK WIRE APN209-31D20 BETWEEN TB4-9, TERMINAL E, AND AFT STATION INTERPHONE CONTROL PANEL CONNECTOR 187P31, PIN R1L IS WIRE OPEN?

YES
REPAIR OR REPLACE WIRE APN209-31D20 AS REQUIRED.

NO
MOVE WIRE APN209-31D20 FROM TB4-9, TERMINAL E, TO TERMINAL B OR D, IS ALTITUDE VOICE WARNING MESSAGE NOW AUDIBLE AT AFT/HOIST OPERATOR STATION?

YES
REPLACE TB4-9.

NO
REPLACE AFT INTERPHONE CONTROL PANEL CONNECTOR 187P31.

END OF TASK
Change 18 18-57
18-2.5 ALTITUDE VOICE WARNING MESSAGE VOLUME LEVEL DOES NOT FLUCTUATE WHEN PILOT RADAR ALTIMETER PRESS-TO-TEST KNOB IS MOMENTARILY DEPRESSED

REPLACE PILOT'S ALTITUDE VOICE WARNING RADAR ALTIMETER
18-2.6 ALTITUDE VOICE WARNING MESSAGE IS AUDIBLE WHEN
ALTITUDE POINTER IS WITHIN THE HI/LO SET INDEX
ENVELOPE

REPLACE PILOT'S ALTITUDE
VOICE WARNING RADAR
ALTIMETER
18-3 DOPPLER/GPS NAVIGATION SYSTEM
18-3 DOPPLER/GPS NAVIGATION SYSTEM
18-3.1 DOPPLER/GPS NAVIGATION SYSTEM WIRING DIAGRAM

[Diagram of DOPPLER/GPS NAVIGATION SYSTEM Wiring Diagram]
18-3.2 DOPPLER/GPS NAVIGATION SYSTEM VISUAL CHECK

INITIAL SETUP

Applicable Configurations: All

Tools:
Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915

Materials: None

Personnel Required: 68F10 Aircraft Electrician

References:
TM 55-1520-240-23

Equipment Condition:

<table>
<thead>
<tr>
<th>Equipment Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery Disconnected</td>
</tr>
<tr>
<td>Electrical Power Off</td>
</tr>
<tr>
<td>No. 2 Access Door (Tunnel Cover) Open</td>
</tr>
</tbody>
</table>

Personnel Required: 68F10 Aircraft Electrician

TASK RESULT

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Check DGNS CDU (1).</td>
<td>Loosen Dzus fasteners and check rear connectors of DGNS CDU (1). If connectors are loose or damaged tighten or replace it as required. If wiring to connector is loose or damaged, tighten, repair, or replace it as required. If display screen is damaged in any way replace CDU (1). If knobs are loose or broken tighten or replace as required. If pushbuttons are damaged replace CDU (1). Reinstall CDU (1) in the canted console tightening the Dzus fasteners.</td>
</tr>
<tr>
<td>2. Check GPS Alert Light Indicator (2).</td>
<td>If indicator (2) is loose or damaged tighten or replace as required.</td>
</tr>
<tr>
<td>3. Check GPS Zeroize Switch/Cover (3).</td>
<td>If switch or cover (3) is loose or damaged tighten or replace as required. If wiring to switch is loose or broken tighten, repair, or replace as required.</td>
</tr>
<tr>
<td>4. Check GPS/DOP SEL Indicator (4).</td>
<td>If indicator lens (4) is damaged replace.</td>
</tr>
<tr>
<td>5. Check DOPPLER Circuit Breakers (5).</td>
<td>If breakers (5) are loose or damaged tighten or replace as required. If wiring to breaker is loose or broken tighten, repair, or replace as required.</td>
</tr>
<tr>
<td>6. Check RADAR Signal Data Converter CV-3338A/ASN-128B (SDC) (6).</td>
<td>If SDC (6) is loose or damaged tighten or replace as required. If connectors to the SDC are loose or damaged tighten or replace as required. If wiring or cables to SDC are loose or damaged tighten, repair, or replace as required.</td>
</tr>
<tr>
<td>7. Check GPS Data Loader Receptacle (7).</td>
<td>If receptacle (7) is loose or damaged tighten or replace as required. If pushbutton is loose or damaged replace Data Loader Receptacle. If the connector to the receptacle is loose or damaged tighten or replace as required. If wiring to the connector is loose or damaged tighten, repair, or replace as required.</td>
</tr>
<tr>
<td>8. Check GPS Antenna (8).</td>
<td>If antenna (8) is loose or damaged tighten or replace as required. If cable (9) to antenna is loose or broken tighten or replace as required. DO NOT REPAIR THIS CABLE.</td>
</tr>
</tbody>
</table>

FOLLOW-ON MAINTENANCE:
Close No. 2 Access Door (Tunnel Cover)
### DOPPLER/GPS NAVIGATION SYSTEM OPERATIONAL CHECK

#### INITIAL SETUP

**Applicable Configurations:**
All

**References:**
- TM 11-1520-240-23
- TM 11-5841-305-12
- TM 55-1520-240-23

**Equipment Condition:**
- TM 55-1520-240-23: Battery Connected
- Electrical Power Off
- Hydraulic Power Off
- Doppler/GPS Navigation System Visual Check Performed (Task 18-3.2)

**Tools:**
- Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915

**Materials:**
None

**Personnel Required:**
Aircraft Electrician (2)

### TASK RESULT

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Set CDU (3) MODE switch (4) to TEST.</td>
<td>After Doppler and/or GPS self tests have been completed (approximately 15 seconds for Doppler, up to 2 minutes for GPS) one of the following indications will be observed in left and right displays. If the display is not GO ALL go to Task 18-3.6.</td>
</tr>
</tbody>
</table>

#### NOTE

In the event TEST mode display is not GO ALL the system should be recycled through OFF to verify that the failure is not momentary one.

### LEFT DISPLAY | RIGHT DISPLAY | REMARKS
---|---|---
GO | GO | Doppler has completed Built In Test (BIT) and is operating satisfactorily. GPS is still performing BIT (GPS has a 2 minute BIT cycle maximum). Note that a rotating bar in the display indicates that the GPS is still performing self test.
GO | ALL | The entire system has completed BIT and is operating satisfactorily.
GO | P | Pitch or Roll data is missing or exceeds 90 degrees. In this case, pitch and roll in the computer are both set to zero and navigation in the Doppler mode continues with degraded operation. Problem may be in the vertical gyro or aircraft cabling.
NG | C, R, S or H followed by a numeric code | A failure has occurred in the Computer Display Unit or the Signal Data Converter Power Supply. The operator should not use the System.
DN | GPS failure code | GPS has failed but operator can use Doppler to perform all navigation.
DF | Doppler failure code | Doppler has failed. GPS is still performing self test.
GN | Doppler failure code | Doppler has failed but operator can use GPS to perform all code navigation.

**REMARKS**

- Doppler has completed Built In Test (BIT) and is operating satisfactorily.
- GPS is still performing BIT (GPS has a 2 minute BIT cycle maximum). Note that a rotating bar in the display indicates that the GPS is still performing self test.
- The entire system has completed BIT and is operating satisfactorily.
- Pitch or Roll data is missing or exceeds 90 degrees. In this case, pitch and roll in the computer are both set to zero and navigation in the Doppler mode continues with degraded operation. Problem may be in the vertical gyro or aircraft cabling.
- A failure has occurred in the Computer Display Unit or the Signal Data Converter Power Supply. The operator should not use the System.
- GPS has failed but operator can use Doppler to perform all navigation.
- Doppler has failed. GPS is still performing self test.
- Doppler has failed but operator can use GPS to perform all code navigation.
### 18-3.3 DOPPLER/GPS NAVIGATION SYSTEM OPERATIONAL CHECK (Continued)

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Depress GPS Alert Indicator (7).</td>
<td>GPS Alert Indicator (6) illuminates. If indicator does not illuminate, go to [task 18-3.7].</td>
</tr>
<tr>
<td>8. Place CDU DISPLAY switch (8) to PP.</td>
<td>Present position is displayed. If present position is not displayed, go to [task 18-3.5].</td>
</tr>
<tr>
<td>9. Perform the following for downloading of waypoints from Data Loader Cartridge:</td>
<td>CDU (3) displays DOWNLOAD WAYPTS IN PROGRESS and WAIT ACK during waypoint loading and DOWNLOAD WAYPTS COMPLETE within one minute to indicate that waypoint loading is complete. If display is incorrect go to [task 18-3.9].</td>
</tr>
<tr>
<td>a. Place CDU (3) MODE switch (4) to OFF</td>
<td></td>
</tr>
<tr>
<td>b. Insert a programmed Data Loader in Receptacle (8).</td>
<td></td>
</tr>
<tr>
<td>c. Set CDU Mode switch to MGRS.</td>
<td></td>
</tr>
<tr>
<td>d. Make sure Mode of the GPS is in M.</td>
<td></td>
</tr>
<tr>
<td>e. Set CDU Display switch to WIND UTC/DATA.</td>
<td></td>
</tr>
<tr>
<td>f. Depress ENT twice to display the selection menu.</td>
<td></td>
</tr>
<tr>
<td>g. Enter 4 to select the data load page.</td>
<td></td>
</tr>
<tr>
<td>h. To begin downloading, depress KYBD and enter “Y” (yes).</td>
<td></td>
</tr>
<tr>
<td>10. Turn CDU (3) MODE switch (4) to OFF, remove Data loader cartridge from the receptacle and turn the MODE switch (4) to MGRS.</td>
<td></td>
</tr>
<tr>
<td>11. Turn CDU (3) DISPLAY switch to (9) DIST/BRG/TIME and select several waypoints.</td>
<td>The four-line display will display distance, bearing and time information for each waypoint. If any four-line display is incorrect, replace the CDU.</td>
</tr>
<tr>
<td>12. Depress the GPS/DOP lenses (10) on each of the two HSI Mode Select Panels (11) (one each in pilot and copilot Instrument panels).</td>
<td>The SEL indication at the lower half of each GPS/DOP (6) lens shall be illuminated. If SEL not illuminated, go to TM 11-1520-240-23.</td>
</tr>
<tr>
<td>13. Observe each HSI (12).</td>
<td>The number one needle (13) of each HSI indicator (12) shall swing to show the bearing to the station with the course deviation bar (14) centered. The Range (15) and Course (16) readouts shall also be accurate. If the number one needle (13) does not swing to show bearing to the station or the Range (15) and Course (16) readouts are not accurate, go to TM 11-1520-240-23.</td>
</tr>
<tr>
<td>14. Observe each HSI (12) and four-line display on the CDU (3).</td>
<td>The indications on the four-line display and each HSI are the same. If the indications are not the same, go to [task 18-3.10].</td>
</tr>
<tr>
<td>15. In the center instrument panel switch GPS ZEROGE switch (17) up then down. On the CDU (3) set DISPLAY switch to DIST/BRG/TIME and observe the four-line display.</td>
<td>All waypoints have disappeared. If waypoints have not disappeared, go to [task 18-3.11].</td>
</tr>
<tr>
<td>16. Reperform steps 6, 9 and 10 above.</td>
<td>This task shows that the system is functional and ready. If waypoints could not be downloaded, go to [task 18-3.5].</td>
</tr>
<tr>
<td>17. Perform HAVEQUICK checks on the HF, UHF and SINCGARS Radio Sets.</td>
<td>The Radio Sets have HAVEQUICK Timing. If any or all Radio Sets do not have HAVEQUICK Timing go to [task 18-3.12].</td>
</tr>
<tr>
<td>18. Turn CDU (3) MODE switch (4) to OFF.</td>
<td>The Doppler/GPS Navigation System is off.</td>
</tr>
<tr>
<td>19. Stop APU. Refer to [task 15-1.4].</td>
<td></td>
</tr>
</tbody>
</table>
18-3.4 EDGE LIT PANEL DOES NOT LIGHT OR VARY

FAULT ISOLATION PROCEDURES

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
TM 11-5841-305-12
TM 55-1520-240-23

Equipment Condition:

TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
18-3.4 EDGE LIT PANEL DOES NOT LIGHT OR VARY (Continued)

**Steps:**

1. **Does CDU Edge Lit Panel and Keyboard Keys vary when CTR Collision Control is varied?**
   - **NO**
   - **YES**

2. **Are other Instillents and Edge Lit Panels vary when CTR Collision Control is varied?**
   - **NO**
   - **YES**

3. **Troubleshoot as described in Chapter 9 of TM 55-1520-240-1.**

4. **Troubleshoot as described in Chapter 9 of TM 55-1520-240-1.**

5. **Remove CDU. Is there 2150 VAC DEP When Panel K and M When CTR Collision Control is varied?**
   - **NO**
   - **YES**

6. **Replace CDU.**

**End of Task**
FAULT ISOLATION PROCEDURES

INITIAL SETUP

Applicable Configurations: All

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

References:
- TM 11-1520-240-23
- TM 11-5841-305-12
- TM 55-1520-240-23

Equipment Condition:

Materials: None

Personnel Required: Aircraft Electrician
18-3.5 CDU MAL LAMP AND ALL LED SEGMENTS ARE NOT ILLUMINATED

(Continued)

18-3.5 END OF TASK
18-3.6 CDU DISPLAY IS NOT GO ALL

FAULT ISOLATION PROCEDURES

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
TM 11-5841-305-12
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

GO TO NEXT PAGE
18-3.6 CDU DISPLAY IS NOT GO ALL (Continued)

**Flowchart Diagram**

1. **Repeat Self Test:**
   - **Exit**
   - **Yes**
   - **No**

2. **Does Doppler/GPS Left Display Go and Right Display All?**
   - **Yes**
   - **No**

3. **Does Doppler/GPS Left Display Em?**
   - **Yes**
   - **No**

4. **AHL Doppler/GPS Left Display Go and Right Display P?**
   - **Yes**
   - **No**

5. **Press Kybd Button and Set Mode Switch to Off, Wait 2 Minutes, Then Set Mode Switch to Lamp Test (Does Doppler/GPS Left Display Em)?**
   - **Yes**
   - **No**

6. **Refer to TM 11-1520-240-25 VSI 18-4.4.3**
   - **Yes**
   - **No**

7. **Does Doppler/GPS Left Display Go and the Left Display C, Followed by a Numeric Code?**
   - **Yes**
   - **No**

8. **Does Doppler/GPS Left Display Go and the Left Display B, Followed by a Numeric Code?**
   - **Yes**
   - **No**

9. **Replace Memory Battery (See Vol. 4), 11-6380-106-01, 11-6380-106-02**
   - **Yes**
   - **No**

10. **Kybd Button and Set Mode Switch to Off 2 Minutes, Then Set Mode Switch to Lamp Test (Does Doppler/GPS Left Display Em)?**
    - **Yes**
    - **No**

11. **Replace CUU, Does Doppler/GPS Left Display Go and the Left Display C, Followed by a Numeric Code?**
    - **Yes**
    - **No**

12. **Replace CUU, Does Doppler/GPS Left Display Go and the Left Display B, Followed by a Numeric Code?**
    - **Yes**
    - **No**

13. **Check CUU Wiring, Repeat Self Test. Does Doppler/GPS Left Display Go and Right Display All?**
    - **Yes**
    - **No**

14. **Check 3DC Wiring, Repeat Self Test. Does Doppler/GPS Left Display Go and Right Display All?**
    - **Yes**
    - **No**

**18-80 Change 19**

**GO TO NEXT PAGE**
FAULT ISOLATION PROCEDURES

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
TM 11-5841-305-12
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
18-3.6 CDU DISPLAY IS NOT GO ALL (Continued)

REPEAT SELF TEST, DOES DOPPLER/GPS LEFT DISPLAY GO AND RIGHT DISPLAY ALL?

DOES DOPPLER/GPS LEFT DISPLAY EN?

ARE DOPPLER/GPS LEFT DISPLAY 00 AND RIGHT DISPLAY 00?

DOES DOPPLER/GPS LEFT DISPLAY 00 AND THE LEFT DISPLAY C, R, S, OR M FOLLOWED BY A NUMERIC CODE?

DOES DOPPLER/GPS LEFT DISPLAY GO AND THE LEFT DISPLAY C, FOLLOWED BY A NUMERIC CODE?

DOES DOPPLER/GPS LEFT DISPLAY GO AND THE LEFT DISPLAY B, FOLLOWED BY A NUMERIC CODE?

PRESS KYBD BUTTON AND SET MODE SWITCH TO OFF, WAIT 2 MINUTES, THEN SET MODE SWITCH TO LAMP TEST, DOPPLER/GPS LEFT DISPLAY EN?

REPLACE MEMORY BATTERY (VOLTS) AS REQUIRED IN TM 11-5641-305-12, PRESS KYBD BUTTON AND SET MODE SWITCH TO LAMP TEST, DOPPLER/GPS LEFT DISPLAY EN?

REPLACE CDU, DOES DOPPLER/GPS LEFT DISPLAY GO AND THE LEFT DISPLAY C, FOLLOWED BY A NUMERIC CODE?

CHECK CDU WIRING, REPEAT SELF TEST, DOES DOPPLER/GPS LEFT DISPLAY GO AND RIGHT DISPLAY ALL?

REPLACE CDU, DOES DOPPLER/GPS LEFT DISPLAY GO AND THE LEFT DISPLAY B, FOLLOWED BY A NUMERIC CODE?
18-3.6 CDU DISPLAY IS NOT GO ALL (Continued)

Does Doppler/GPS left display go and the left display right followed by a numeric code?

No

Yes

Replace receiver/transmitter antenna.

Check heading reference system.

Repeat self test.

Does Doppler/GPS left display go and right display all?

Yes

No

Replace CDU. Does Doppler/GPS left display go and display right?

Check wiring.

Repeat self test. Does Doppler/GPS left display go and right display all?

Yes

No

End of Task

Change 19 18-83
FAULT ISOLATION PROCEDURES

INITIAL SETUP

Applicable Configurations:
All

References:
TM 11-1520-240-23
TM 11-5841-305-12
TM 55-1520-240-23

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

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

Materials:
None

Personnel Required:
Aircraft Electrician

18-84 Change 19
18-3.7 GPS ALERT INDICATOR DOES NOT ILLUMINATE (Continued)

**Diagram: Flowchart**

1. **Does GPS Alert Indicator Illuminate When Depressed?**
   - **No**
   - **Is there 28 VDC at pin 1 of 197DS1?**
     - **No**
     - **Is there 28 VDC at pin A of TSEC block 5?**
       - **No**
       - **Is TSEC KY-28 Circuit Breaker Closed?**
         - **Yes**
         - **Check TSEC KY-28 Wiring.**
         - **No**
         - **Close Circuit Breaker and Repeat Test.**
       - **Yes**
       - **Repair/Replace Wire ASY1050-GA290.**
     - **Yes**
     - **Is There Continuity Between Ground and Pin 3 of 197DS1?**
       - **No**
       - **Replace Indicator 197DS1.**
       - **Yes**
       - **Replace ACF Ground Wire ASY1050-GA290 and Repeat Test.**
   - **Yes**
   - **Replace GPS Alert Lamp Does GPS Alert Indicator Illuminate When Depressed?**
     - **Yes**
     - **End Test.**
     - **No**

**Change 19 18-85**

END OF TASK
FAULT ISOLATION PROCEDURES

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
TM 11-5841-305-12
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

18-3.8 PRESENT POSITION NOT DISPLAYED ON CDU
18-3.8 PRESENT POSITION NOT DISPLAYED ON CDU (Continued)

IS THERE ANY DISPLAY?

| YES | SET CDU DISPLAY SWITCH TO XPT/TKE/KEY AND MOVE SWITCH TO LAT/LONG MARKS MAY BE USUAL. AND THERE IS I.H. MORE THAN VEHICLES (SV) INDICATION ON THE 3RD LINC. |
| NO | MOVE AIRCRAFT TO IMPROVE RECEPTION. SET THE DISPLAY SWITCH TO RP - IS GPS PRESENT POSITION DISPLAYED? |

| YES | EXIT |
| NO | REPLACE SDU. IS THE DISPLAYED PRESENT POSITION CORRECT? |

| YES | EXIT |
| NO | REPLACE CDU. IS THE DISPLAYED PRESENT POSITION CORRECT? |

| YES | EXIT |
| NO | CHECK CONTINUITY OF GPS ANTENNA CABLE. IS THERE CONTINUITY? |

| YES | REPLACE GPS ANTENNA. IS PRESENT POSITION DISPLAYED? |
| NO | REPLACE GPS ANTENNA CABLE. DO NOT REPAIR THIS CABLE. IS THE DISPLAYED PRESENT POSITION CORRECT? |

| YES | EXIT |
| NO | CHECK CONTINUITY OF GPS WIRING |

END OF TASK
18-3.9 CDU DOES NOT DISPLAY DOWNLOAD WAYPTS IN PROCESS DURING WAYPOINT LOADING

FAULT ISOLATION PROCEDURES

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
TM 11-5841-305-12
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off
18-3.9 CDU DOES NOT DISPLAY DOWNLOAD WAYPTS IN PROCESS DURING WAYPOINT LOADING (Continued)

- **Is the data loader module properly secured to the data loader receptacle?**
  - **Yes:** Proceed to the next step.
  - **No:** Continue without changing the module and perform the task again.

- **Is the data loader module have data?**
  - **Yes:** Replace the data loader module, perform waypoint loading. Does CDU display "Download Waypts in Process" and "Wait Ack" then "Download Waypts Complete" within 1 minute?
  - **No:** Replace data loader receptacle, perform waypoint loading. Does CDU display "Download Waypts in Process" and "Wait Ack" then "Download Waypts Complete" within 1 minute?

- **Does the data loader module have data?**
  - **Yes:** Replace data loader module, perform waypoint loading. Does CDU display "Download Waypts in Process" and "Wait Ack" then "Download Waypts Complete" within 1 minute?
  - **No:** Replace CDU, perform waypoint loading. Does CDU display "Download Waypts in Process" and "Wait Ack" then "Download Waypts Complete" within 1 minute?

**End of Task**
## 18-3.10 INDICATIONS ON THE FOUR-LINE DISPLAY AND HSI ARE NOT THE SAME

### FAULT ISOLATION PROCEDURES

**INITIAL SETUP**

<table>
<thead>
<tr>
<th>Applicable Configurations:</th>
<th>References:</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>TM 11-1520-240-23</td>
</tr>
<tr>
<td></td>
<td>TM 11-5841-305-12</td>
</tr>
<tr>
<td></td>
<td>TM 55-1520-240-23</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tools:</th>
<th>Equipment Condition:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915</td>
<td>Battery Connected Electrical Power On Hydraulic Power Off</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Materials:</th>
<th>Personnel Required:</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Aircraft Electrician</td>
</tr>
</tbody>
</table>

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**Equipment Condition:**

- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power On
  - Hydraulic Power Off
18-3.10 INDICATIONS ON THE FOUR-LINE DISPLAY AND HSI ARE NOT THE SAME (Continued)

ARE THERE ANY INDICATIONS IN THE HSI?

NO

YES

ARE BEARING, RANGE AND COURSE IN THE PILOT AND CO-PILOT HSI THE SAME, BUT NOT THE
SAME ON THE CDU?

NO

YES

ARE BEARING, RANGE AND COURSE IN THE PILOT AND CO-PILOT HSI DIFFERENT?

NO

YES

REPLACE THE HSI FROM THE CDU IF PICTURE, BRIGHTNESS, RANGE AND COURSE IN THE PILOT
AND CO-PILOT HSI STILL DIFFERENT?

NO

YES

IS THERE CONTINUITY BETWEEN PIN 47 OF 6867 AND PIN 52 OF 1976?

NO

YES

REPLACE HSI CONTROL UNIT ON THE SAME SIDE AS THE HSI WAS REPLACED.

NO

YES

TROUBLESHOOT HSI WIRING AMONG SDG, CDU, HSI'S AND HF RADIO. REPAIR/REPLACE WIRES AS NEEDED.

END OF TASK
18-3.11 GPS DOES NOT ZEROIZE

FAULT ISOLATION PROCEDURES

INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
Aircraft Electrician

Equipment Condition:
TM 11-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

References:
TM 11-1520-240-23
TM 11-5841-305-12
TM 55-1520-240-23

TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

18-92 Change 19
18-3.11 GPS DOES NOT ZEROIZE (Continued)

1. TURN OFF POWER AND DISCONNECT 18795 FROM 1, 2, OF 552. CHECK CONTINUITY BETWEEN PINS 1 AND 2 OF 18795 WITH GPS ZEROIZE SWITCH CLOSED, IS THERE CONTINUITY?
   - YES
   - REPLACE SOC AND PERFORM GPS ZEROIZE, DOES GPS ZEROIZE?
   - NO

2. CHECK CONTINUITY BETWEEN PINS 2 AND 3 OF GPS ZEROIZE SWITCH 197/21, IF IN HLS SWITCH CLOSED, IS THERE CONTINUITY?
   - NO
   - REPLACE GPS ZEROIZE SWITCH 197/21.
   - YES

3. CHECK CONTINUITY BETWEEN PINS 1 OF 197/21 AND PIN 26 OF 197/16, IS THERE CONTINUITY?
   - NO
   - REPAIR/REPLACE WIRE AS/N1285-95622 (WH/T).
   - YES

4. CHECK CONTINUITY BETWEEN PIN 3 OF 197/21 AND PIN 27 OF 197/16, IS THERE CONTINUITY?
   - NO
   - REPAIR/REPLACE WIRE AS/N1285-57622 (BLU).
   - YES

5. CHECK CONTINUITY BETWEEN PIN 26 OF 197/16 AND PIN 2 OF GPS ZEROIZE SWITCH 197/21, IS THERE CONTINUITY?
   - NO
   - REPAIR/REPLACE WIRE AS/N1285-56822 (WH/T).
   - YES

6. CHECK CONTINUITY BETWEEN PIN 27 OF 197/16 AND PIN 3 OF GPS ZEROIZE SWITCH 197/21, IS THERE CONTINUITY?
   - NO
   - REPAIR/REPLACE WIRE AS/N1285-57622 (BLU).

END OF TASK
FAULT ISOLATION PROCEDURES

INITIAL SETUP

Applicable Configurations:
All

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

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power On
Hydraulic Power Off

References:
TM 11-1520-240-23
TM 11-5841-305-12
TM 55-1520-240-23

Materials:
None

Personnel Required:
Aircraft Electrician

GO TO NEXT PAGE
18-3.12 GPS HAVEQUICK TIMING NOT WORKING (Continued)

---

**SET CDU DISPLAY SWITCH TO VT/KEY/KEY AND MODE SWITCH TO LAT/LONG (GPS MAY BE USED). ARE THERE 4 OR MORE SPACE VEHICLES (SV) INDICATION ON THE 3RD LINE?**

- **NO**
  - **EXIT**
  - **YES**
    - **MUSIC AIRCRAFT TO IMPROVE RECEPTION. SET THE DISPLAY SWITCH TO PP IF GPS PRESENT POSITION DISPLAYED.**

---

**REPLACE SDC, IS THE GPS HAVEQUICK TIMING WORKING?**

- **NO**
  - **EXIT**
  - **YES**
    - **ARE ALL RADIO RECEIVERS INDICATING THEY ARE NOT RECEIVING HAVEQUICK TIMING?**
      - **YES**
        - **IS THERE CONTINUITY BETWEEN PIN 3 OF 197PS AND PIN A BLK B +400TB37?**
          - **NO**
            - **REPAIR/REPLACE WIRE ASN12489-26A22 (WHT).**
          - **YES**
            - **IS THERE CONTINUITY BETWEEN PIN 5 OF 197PS AND PIN G BLK B 400TB53?**
              - **NO**
                - **REPAIR/REPLACE WIRE ASN12488-27A22 (BLU).**
              - **YES**

---

**CHECK CONTINUITY BETWEEN THE RADIO SET AND PINS 3 AND 4 OF P187PS AND REPAIR / REPLACE THE DEFECTIVE WIRE.**

---

END OF TASK

Change 19 18-95/(18-96 blank)
END OF TASK
INITIAL SETUP

Applicable Configurations: All

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

Materials: None

Personnel Required:
- 68F10 Aircraft Electrician

References:
- TM 55-1520-240-23
- Equipment Condition:
  - Battery Disconnected
  - Electrical Power Off
  - Avionics Equipment Rack Cover - Cabin

Personnel Required:
- 68F10 Aircraft Electrician

TASK RESULT

1. Check HF Control (1).

   Loosen Dzus fasteners and check connector of HF Control (1). If connector is loose or damaged tighten or replace it as required. If wiring to connector is loose or damaged, tighten, repair, or replace it as required. If display screen is damaged in any way replace HF Control (1). If knobs are loose or broken tighten or replace as required. If pushbuttons are damaged replace HF Control (1) in center console tightening the Dzus fasteners.

2. Check KY-100 Control (2).

   Loosen Dzus fasteners and check connector of KY-100 Control (2). If connector is loose or damaged tighten or replace it as required. If wiring to connector is loose or damaged, tighten, repair, or replace it as required. If display screen is damaged in any way replace KY-100 Control (2). If knobs are loose or broken tighten or replace as required. If pushbuttons are damaged replace KY-100 Control (2) in center console tightening the Dzus fasteners.

3. Check HF and KY-100 HF COMM Circuit Breakers (3).

   If breaker(s) (3) are loose or damaged tighten or replace as required. If wiring to breaker(s) are loose or broken tighten, repair, or replace as required.


   If receiver (4) is loose or damaged tighten or replace as required. If connectors to the receiver are loose or damaged tighten or replace as required. If wiring or cables to receiver are loose or damaged tighten, repair, or replace as required.

5. Check TSEC/KY-100 Processor (5).

   Loosen Dzus fasteners and check connector of KY-100 Processor (5). If connector is loose or damaged tighten or replace as required. If wiring to connector is loose or damaged, tighten, repair, or replace it as required. If display screen is damaged in any way replace KY-100 Processor (5). If knobs are loose or broken tighten or replace as required. If pushbuttons are damaged replace KY-100 Processor (5) in bracket under shelf number 2 tightening the Dzus fasteners.

6. Check HF Receiver/Transmitter Battery Box, CY-8515/ARC-201 (6).

   If Battery Box (6) is loose or damaged tighten or replace as required. If connector (7) is loose or damaged tighten or replace as required. If wiring to the connector is loose or damaged tighten, repair, or replace as required.

7. Check Power Amplifier-Coupler AM-7531/URC (9).

   If Amplifier-Coupler (9) is loose or damaged tighten or replace as required. If connectors to the amplifier are loose or damaged tighten or replace as required. If cables to Amplifier-Coupler J9724, J9721 and J9726 are loose or damaged tighten, repair, or replace as required. If cable to J9725 is loose tighten, if damaged replace ONLY, DO NOT REPAIR THIS CABLE GOING TO ANTENNA.

FOLLOW-ON MAINTENANCE:

Replace Avionics Equipment Rack Cover - Cabin.
**INITIAL SETUP**

References:
- TM 11-1520-240-23
- TM 11-0821-357-12
- TM 55-1520-240-10
- TM 55-1520-240-23

**Applicable Configurations:**
- All

**Tools:**
- Electrical Repairer’s Tool Kit, NSN 5180-00-323-4915

**Equipment Condition:**
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power Off
  - Hydraulic Power Off
  - HF Liaison Facility Visual Check Performed

**Materials:**
- None

**Personnel Required:**
- Aircraft Electrician (2)

**References:**
- TM 11-1520-240-23
- TM 11-5821-357-12
- TM 55-1520-240-10
- TM 55-1520-240-23

**TASK RESULT**

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Turn KY-100 Control (5) Mode Switch (9) to OFFLINE and press the HF Control (4) upper brightness switch (6) and turn the KY-100 Control (5) BRT DISPL knob (24) clockwise and counterclockwise while checking the display screen (10) intensity level.</td>
<td>KY-100 Control display screen (10) intensity level shall vary with the changing setting of the brightness control knob (8). If no display appears or intensity level does not vary, go to Task 18-4.8.</td>
</tr>
<tr>
<td>7. Turn HF Control (4) Mode Switch (7) to STBY.</td>
<td>The HF Receiver-Transmitter is now ready to receive data from a Data Transfer Device (DTD). Connect DTD to HF Control (4) DATA connector (13) and initiate datafill from DTD. LOADING is displayed during datafill. LOAD COMPLETE is displayed if datafill is successful. If LOAD FAIL is displayed, go to Task 18-4.9.</td>
</tr>
<tr>
<td>8. While still in STBY mode, depress the line-select switch (3) which points to TEST then depress BIT line-select switch (3) to initiate RCV BIT.</td>
<td>After a 30-second warm-up the HF Control Display (5) shall display SYSTEM TESTING while power-up BIT (P-BIT) is in process. After the test is complete SYSTEM-GO is displayed if all checked good. If a fault is detected, SYSTEM-NO GO is displayed. Go to Task 18-4.7 if SYSTEM-NO GO is displayed.</td>
</tr>
<tr>
<td>9. Upon successful completion of RCV BIT and after KEY HF FOR TRANSMIT TEST or PTT FOR XMT BIT is displayed on HF Control (4) Display (8) depress and hold headset PTT switch to Initiate XMT BIT. Release PTT switch.</td>
<td>Wait 90 seconds. Upon successful completion of RCV BIT, RCV BIT GO is displayed. If any other message is displayed, go to Task 18-4.8.</td>
</tr>
<tr>
<td>10. While still in STBY mode, press FILL line-select switch (3). Use HF Control (4) VALUE switches (12) to select DATA In TYPE: field on line 1 of HF Control Display (8).</td>
<td>Wait 90 seconds. Upon successful completion of XMT BIT, XMT BIT GO is displayed. If any other message is displayed, go to Task 18-4.8.</td>
</tr>
<tr>
<td>11. While still in STBY mode, press FILL line-select switch (3). Use HF Control (4) VALUE switches (12) to select KEY In TYPE: field on line 1 of HF Control Display (8).</td>
<td>The HF Receiver-Transmitter is now ready to receive secure keys from a Data Transfer Device (DTD). Connect DTD to HF Control (4) KEY connector (20) and initiate keyfill from DTD. LOADING is displayed during fill. LOAD COMPLETE is displayed if keyfill is successful. If LOAD FAIL is displayed, go to Task 18-4.9.</td>
</tr>
</tbody>
</table>

The HF Receiver-Transmitter is now ready to receive data from a Data Transfer Device (DTD). Connect DTD to HF Control (4) DATA connector (13) and initiate datafill from DTD. LOADING is displayed during datafill. LOAD COMPLETE is displayed if datafill is successful. If LOAD FAIL is displayed, go to Task 18-4.9. The HF Receiver-Transmitter is now ready to receive secure keys from a Data Transfer Device (DTD). Connect DTD to HF Control (4) KEY connector (20) and initiate keyfill from DTD. LOADING is displayed during fill. LOAD COMPLETE is displayed if keyfill is successful. If LOAD FAIL is displayed, go to Task 18-4.9.
18-4.3 HF LIASON FACILITY OPERATIONAL CHECK (CONTINUED)

12. Turn HF Control (4) Function Switch (7) to T/R, Mode Switch (11) to MAN, Channel/Net Selector (14) to 1, and press the Edit line-select switch (3). Using the cursor keys (23), move cursor to beginning of RCV field and use the Value switches (12) to enter frequency of 2.5 MHz, AM mode. Press RTN line-select switch (3).

13. While still tuned to 2.5 MHz, AM, set SQUELCH to minimum by depressing SQL pushbuttons (16). Adjust VOL control (15) to a comfortable listening level. Note pitch of audio tone received. Then change to USB then to LSB mode. Also, vary squelch setting by depressing SQL pushbuttons (16) to verify audio can be muted and unmuted.

14. Repeat steps 12 and 13 for the following frequencies: 3.334, 5.0, 7.335, 10.0, 15.0 Hz.

15. Using either a preset or manually entered authorized test frequency, establish communications with a known properly functioning ground station (NOTE: If ground station is on the same field, set the output power to LOW so communications will not be distorted).

16. Set HF Control (4) Function Switch (7) to T/R, and Mode Switch (11) to ALE. Establish communication with a known properly functioning ground station with a compatible ALE fill. Set Channel/Net selector (14) of aircraft radio to call address of ground station. Place a call from aircraft HF radio to ground station. After a link is established and a call made to the ground station, allow the link to be broken by not using the radio for a period of time (normally around 30 seconds, the exact time is programmed in the fill). Set Channel/Net selector of ground station to ECCM net of the aircraft radio under test and place a call to aircraft radio.

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
</table>

17. Set HF Control (4) Function Switch (7) to T/R, and Mode Switch (7) to ECCM. Establish communication with a known functional ground station with a compatible ECCM fill. Set Channel/Net selector (14) of aircraft radio to ECCM net of ground station. Place a call from aircraft HF radio to ground station. After a link is established and a call made to the ground station, allow the link to be broken by not using the radio for a period of time (normally around 30 seconds, the exact time is programmed in the fill). Set Channel/Net selector of ground station to ECCM net of the aircraft radio under test and place a call to aircraft radio.

18. Gently pull and turn HF Control (4) Function Switch (7) to ZERO position.

<table>
<thead>
<tr>
<th>TASK</th>
<th>RESULT</th>
</tr>
</thead>
</table>

This tests reception of a distant station which broadcasts time and frequency primary standards. If reception is not clear, go to task 18-4.10.

19. If the pitch of the audio tone received changes significantly, go to next task. If squelch does not vary while depression SQL pushbuttons (16) or audio cannot be muted or unmuted, replace HF Control C-12436/URC.

NOTE

Ensure Keys and Data are loaded into ARC-220 (steps 10 and 11) before performing step 17.

If reception is not clear, go to task 18-4.10.

If the HF Control displays UNTUNED or UNSYNCH after an ECCM net is chosen, either press TUNE line-select switch or microphone PTT switch. HF Control (4) will display TUNING followed by SYNCHING while the process is occurring. When SYNCHING is no longer displayed, the system is ready for ECCM operation. If system cannot be tuned or synched, go to task 18-4.17. The radio from which a call is initiated the following will occur: preamble tones will be heard, wait until they cease before communicating; when link is established a short gong tone sounds in headset, LINKED is displayed and headset audio is restored. If this calling sequence does not occur, go to tasks 18-4.13 and 18-4.14 after a period of inactivity the link is broken, go to task 18-15. When a call is being received RCVING PREAMBLE is displayed before communications from the calling station is heard. If RCVING PREAMBLE is not displayed go to task 18-4.16. If communications is not received from calling station, go to task 18-4.10.

NOTE

Perform the following step after all checks are complete and just before shutdown.

All preprogrammed information, including datafile and keyfill data, will be erased. The HF Control (4) will display ZEROIZED. If ZEROIZED is not displayed, go to task 18-4.17.

ALE address. When a link is established, a short gong tone is heard in the headset and LINKED is displayed on display line 3. Communication should then be generated by the calling station. If reception is not clear, go to task 18-4.10.

GO TO THE NEXT PAGE
CHECK TSEC/KY-100 PROCESSOR

19. Turn KY-100 Control (5) MODE switch (9) to OFFLINE and PRESET switch (17) to MAN. Connect a fill device to KY-100 Control (5) fill connector (18). Push up arrow (22) until KEY OPS is displayed on display (10). Push INIT button (19) to display LOAD KEY. Push INIT button (19), LOAD N with a flashing N will be shown on KY-100 Control (5) display (10), where the N indicates currently selected key location, which can be changed by pressing the up or right arrow as needed. Press INIT button (19). The entire LOAD N message will now be flashing. Turn on fill device and select key to be loaded. Press the INIT button (19) on KY-100 control (5). When keyfill is complete, turn off and disconnect the fill device from KY-100 control (5). Rotate KY-100 Control (5) Mode switch out of OFFLINE to exit key load.

NOTE
Perform the following step after all checks are complete and just before shutdown.
20. Pull the KY-100 Control (5) Mode Switch (9) and rotate it to Z ALL position.

SECURE VOICE CHECK - RT-17429/URC AND TSEC/KY-100

NOTE
Ensure both KY-100 and HF Radio have appropriate keys loaded for mode used.
21. Utilizing a known functional ground station with compatible HF and KY-100 keys loaded and an appropriate test frequency, turn aircraft KY-100 Control (5) Mode switch (9) to CT. Go into CT menu and set to CT. Set the ground station KY-100 Control Mode switch to CT. Transmit from the ground station to aircraft HF system.

22. Utilizing a known functional ground station with compatible HF and KY-100 keys loaded and an appropriate test frequency, turn the aircraft KY-100 Control (5) Mode switch (9) to CT. Go into the CT menu and set to CT. Set the ground station KY-100 Control Mode switch to CT. Transmit from the ground station to aircraft HF system.

23. Utilizing a known functional ground station with compatible HF and KY-100 keys loaded and an appropriate test frequency, turn the aircraft KY-100 Control (5) Mode switch (9) to CT. Go into CT menu and set to CT. Set the ground station KY-100 Control Mode switch to CT. Transmit from the aircraft HF system to the ground station.

24. Utilizing a known functional ground station with compatible HF and KY-100 keys loaded and an appropriate test frequency, turn the aircraft KY-100 Control (5) Mode switch (9) to CT. Go into the CT menu and set to CT ONLY. Set the ground station KY-100 Control Mode switch to PT. Transmit from the ground station to aircraft HF system.

25. Utilizing a known functional ground station with compatible HF and KY-100 keys loaded and an appropriate test frequency, turn the aircraft KY-100 Control (5) Mode switch (9) to PT. With the CT menu set to CT. Set the ground station KY-100 Control Mode switch to CT. Transmit from the ground station to aircraft HF system.

SYSTEM SHUTDOWN

26. Rotate HF Control (4) Function Switch (7) and KY-100 Control (5) Mode switch (9) to OFF. Pull HF (COMM) and HF KY-100 (COMM) circuit breakers on No. 2 pdp.

27. Stop APU. Refer to task 15.15.

FOLLOW-ON MAINTENANCE:
TM 55-1520-240-23:
Electrical Power Off
Battery Disconnected

GO TO THE NEXT PAGE
END OF TASK
18-4.4 AN/ARC-220 CONTROL - DISPLAY SCREEN INTENSITY LEVEL DOES NOT VARY WITH BRIGHTNESS SWITCHES:

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 11-1520-240-23
TM 11-5821-357-12
TM 55-1520-240-10
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power Off
Hydraulic Power Off
HF Liaison Facility Visual Check Performed

GO TO THE NEXT PAGE
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 11-1520-240-23
TM 11-5821-357-12
TM 55-1520-240-10
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power Off
Hydraulic Power Off
HF Liaison Facility Visual Check Performed
[Task 18-4.21]
18-4.6 TSEC/KY-100 CONTROL RCU - NO DISPLAY.

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 11-1520-240-23
TM 11-5821-357-12
TM 55-1520-240-10
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power Off
Hydraulic Power Off
HF Liaison Facility Visual Check Performed

GO TO THE NEXT PAGE
END OF TASK
INITIAL SETUP

Applicable Configurations:
All

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

Materials:
None

Personnel Required:
Aircraft Electrician (2)

References:
18-4.7
TM 11-1520-240-23
TM 11-5821-357-12
TM 55-1520-240-10
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power Off
Hydraulic Power Off
HF Liaison Facility Visual Check Performed
18-4.7 AN/ARC-220 CONTROL DISPLAYS "SYSTEM-NOGO" AFTER POWER UP BIT (P-BIT TEST) (CONTINUED).

- Get control switch to STBY and depress INOP line select switch. INOP indications are displayed. Is there messages stating: ALE/NO DATA, ALE/NO KEYS, ECCM/NO DATA, ECCM/NO KEYS?
  - NO
  - YES
    - Proceed to step 8 in task 18-4.

- Depress TEST line-select switch and press the LRU line select switch to view failed LRU's. Are FAILED LRU'S displayed?
  - NO
  - YES
    - Press the TRN line select switch and resume normal operation.

- Replace first LRU listed and perform P BIT again. Are FAILED LRU'S displayed?
  - NO
  - YES
    - Check aircraft wiring as shown in HF Liaison wiring diagram.

END OF TASK
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 11-520-240-23
- TM 11-5821-357-12
- TM 55-1520-240-10
- TM 55-1520-240-23

Equipment Condition:
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power Off
  - Hydraulic Power Off
  - HF Liaison Facility Visual Check Performed

GO TO THE NEXT PAGE
18-4.8 AN/ARC-220 CONTROL DISPLAYS "SYSTEM-NOGO RT-CDU COMM FAIL" DURING RCV OR XMT TEST (CONTINUED).

Replace HF Receiver Transmitter RT-1749/URC and retest. Does fault disappear?

YES

Problem solved

NO

Replace HF Control C-124365/URC. Does fault disappear?

YES

Problem solved

NO

Troubleshoot wiring/connection points between 188P13 and (66P1). Check for shorts/opens. Repair/replace as necessary and retest.

END OF TASK
18-4.9 AN/ARC-220 CONTROL “LOAD FAIL” DURING DATA/KEY FILL.

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 11-1520-240-23
TM 11-5821-357-12
TM 55-1520-240-10
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power Off
Hydraulic Power Off
HF Liaison Facility Visual Check Performed
(Task 18-4.2)
18-4.9 AN/ARC-220 CONTROL "LOAD FAIL" DURING DATA/KEY FILL (CONTINUED).

Is the fill device being properly enabled during fill?

Perform test again with fill device properly enabled

Is the fill device properly connected to RF Control DATA or KEY fill ports?

Perform test again with fill device properly connected to fill port.

YES

NO

YES

Press RTN line-select switch to get back to standby screen. Depress INOP line-select switch, then LRU line-select switch since screen changes to INOP MODES screen. Replace first listed LRU.
18-4.10 AN/ARC-220 RECEIVER TRANSMITTER RECEPTION/TRANSMISSION NOT CLEAR OR MISSING IN ALL MODES.

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 11-1520-240-23
TM 11-5821-357-12
TM 55-1520-240-10
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
- Battery Connected
- Electrical Power Off
- Hydraulic Power Off
- HF Liaison Facility Visual Check Performed

Task 18-4.21

GO TO THE NEXT PAGE
18-4.11 HF LIAISON FACILITY - "CALL FAIL" DISPLAYED WHEN PLACING ALE OR ECCM CALL

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 11-1520-240-23
TM 11-5821-357-12
TM 55-1520-240-10
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power Off
Hydraulic Power Off
HF Liaison Facility Visual Check Performed [Task 18-4.2]
18-4.12 HF LIAISON FACILITY-SYSTEM CANNOT BE TUNED OR SYNCHED DURING ECCM OPERATION

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 11-1520-240-23
- TM 11-5821-357-12
- TM 55-1520-240-10
- TM 55-1520-240-23

**Equipment Condition:**
- TM 55-1520-240-23:
  - Battery Connected
  - Electrical Power Off
  - Hydraulic Power Off
  - HF Liaison Facility Visual Check Performed

[Task 18-4.2]
18-4.12 HF LIAISON FACILITY-SYSTEM CANNOT BE TUNED OR SYNCHED DURING ECCM OPERATION (CONTINUED)

Replace HF PA coupler and retest. Does system synch or tune?

YES: Problem solved.

NO

Replace HF Receiver: Transmitter and retest. Does system synch or tune?

YES: Problem solved.

NO

Replace HF Control and retest. Does system synch or tune?

YES: Problem solved.

NO

Check wiring/connection points between: HF Control 186P103 and HF RT 186P1; HF RT 186P1 and PA coupler 186P10 for open/short. Repair/replace as required.
18-4.13 HF LIAISON FACILITY-PREAMBLE TONES NOT HEARD WHEN PLACING A CALL IN ECCM MODE

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 11-1520-240-23
TM 11-5821-357-12
TM 55-1520-240-10
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power Off
Hydraulic Power Off
HF Liaison Facility Visual Check Performed
(Task 18-4.2)
18-4.13 HF LIAISON FACILITY-PREAMBLE TONES NOT HEARD WHEN PLACING A CALL IN ECCM MODE (CONTINUED)

1. Replace HF Receiver/Transmitter and retest. Is preamble heard?
   - Problem solved.

2. Replace HF Control and retest. Is preamble heard?
   - Problem solved.


END OF TASK
18-4.14 HF LIAISON FACILITY—“LINKED” IS NOT DISPLAYED ON HF CONTROL WHEN PLACING ALE OR ECCM CALL

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 11-1520-240-23
TM 11-5821-357-12
TM 55-1520-240-10
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power Off
Hydraulic Power Off
HF Liaison Facility Visual Check Performed
(Task 18-4.2)
18-4.14 HF LIAISON FACILITY--LINKED" IS NOT DISPLAYED ON HF CONTROL WHEN PLACING ALE OR ECCM CALL (CONTINUED)

Replace HF PA coupler and retest. Is "LINKED" displayed when placing ALE or ECCM call?

YES → Problem solved.

NO → Replace HF Receiver-Transmitter and retest. Is "LINKED" displayed when placing ALE or ECCM call?

YES → Problem solved.

NO → Check the DISPLAY UA 1A and CONTROL DATA lines going between HF Control and RT. Any fault(s) in wire(s) or connection points between 18SP13 and 18SP17?

YES → Repair/replace wire(s) or connection point as necessary.

NO → Check appropriate wire between HF RT and HF PA coupler (18SP11 and 18SP10). Repair/replace wire(s) as necessary.

YES → Problem solved.

END OF TASK
18-4.15 HF LIAISON FACILITY-HEADSET AUDIO IS NOT RESTORED AFTER LINK ESTABLISHED WHEN PLACING ALE OR ECCM CALL

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 11-1520-240-23
TM 11-5821-357-12
TM 55-1520-240-10
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power Off
Hydraulic Power Off
HF Liaison Facility Visual Check Performed
(Task 18-4.2)
18-4.15 HF LIAISON FACILITY-HEADSET AUDIO IS NOT RESTORED AFTER LINK ESTABLISHED WHEN PLACING ALE OR ECCM CALL (CONTINUED)

Replace HF Receiver-Transmitter and retest. Is audio restored after link established when placing ALE or ECCM call?

YES

Problem solved.

NO

Replace HF Control and retest. Is audio restored after link established when placing ALE or ECCM call?

YES

Problem solved.

NO

Check appropriate wires between HF Control and HF RT (165913 and 165971). Repair/replace wire(s) as necessary.

END OF TASK
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 11-1520-240-23
TM 11-5821-357-12
TM 55-1520-240-10
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power Off
Hydraulic Power Off
HF Liaison Facility Visual Check Performed
(Task 18-4.2)
18-4.16 HF LIAISON FACILITY "RECEIVING PREAMBLE" NOT DISPLAYED BEFORE AN ECCN CALL IS RECEIVED (CONTINUED)

Replace HF Receiver: Transmitter and retest. Is "RCVING PREAMBLE" displayed before an ECCM call is received?

YES

Problem solved.

NO

Replace HF Control and retest. Is "RCVING PREAMBLE" displayed before an ECCM call is received?

YES

Problem solved.

NO

Check appropriate wires between HF Control and HF RT (186P19 and 186P11). Repair/replace wires as necessary.

END OF TASK
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 11-1520-240-23
TM 11-5821-357-12
TM 55-1520-240-10
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power Off
Hydraulic Power Off
HF Liaison Facility Visual Check Performed
(Task 18-4.2)
18-4.17 HF LIAISON FACILITY - PREPROGRAME information CANNOT BE ZEROIZED (CONTINUED)

Replace HF Control and reset. Can HF Liaison Facility be zeroed?

Problem solved.

Replace HF Receiver-Transmitter and reset. Can HF Liaison Facility be zeroed?

Problem solved.

YES

NO

NO

Check wiring and connection points between HF Control 186F13-e and HF Receiver-Transmitter 186F1-FF. Rep/replace wire/ connection points as necessary.

END OF TASK
18-4.18 TESC/KY-100 CONTROL RCU CANNOT KEY FILL FROM KEY FILL DEVICE

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 11-1520-240-23
TM 11-5821-357-12
TM 55-1520-240-10
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power Off
Hydraulic Power Off
HF Liaison Facility Visual Check Performed
(Task 18-4.2)

(UNDER # SHELF)
18-4.18 TESC/KY-100 CONTROL RCU CANNOT KEY FILL FROM KEY FILL DEVICE
(CONTINUED)

Is key fill device functional? NO Replace key fill device.

YES

Retry key fill. Does TESC/KY-100 have key fill?

YES

NO

Are key fill connectors 184P18 and 184P20 properly seated?

NO Reconnect connectors. Does TESC/KY-100 have key fill?

YES

NO

Replace KY-100 Main Processor Retry key fill.

NO Replace KY-100 Control Z-AVH

YES

Perform manual key fill on TESC/KY-100. Does TESC/KY-100 have key fill?

NO

YES

Insure codes used are correct. Retry key fill.

NO Replace KY-100 Main Processor Retry key fill. Does TESC/KY-100 have correct key fill?

YES

NO

Replace KY-100 Control Z-AVH

YES

Replace KY-100 Main Processor Retry key fill. Does TESC/KY-100 have correct key fill?

NO

YES

Replace KY-100 Main Processor Retry key fill.

End of Task

Exit

Replace KY-100 Control Z-AVH

Exit

Replace KY-100 Main Processor Retry key fill. Does TESC/KY-100 have correct key fill?

YES

NO

Replace KY-100 Control Z-AVH

Exit

Replace key fill device.

Exit

Replace KY-100 Control Z-AVH

Exit

Replace KY-100 Control Z-AVH

Exit

End of Task
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 11-1520-240-23
TM 11-5821-357-12
TM 55-1520-240-10
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power Off
Hydraulic Power Off
HF Liaison Facility Visual Check Performed
(Task 18-4.2)
18-4.19 TESC/KY-100 CONTROL RCU CANNOT KEYS CANNOT BE ZEROED (CONTINUED)

Replace TESC/KY-100 Processor. Is TESC/KY-100 RCU able to zeroize loaded data? 

YES → Problem solved.

NO → Replace TESC/KY-100 RCU. Is TESC/KY-100 RCU able to zeroize loaded data?

YES → Problem solved.

NO → Check wiring/connection points between 300P9 pin 5 and 186P19 pin J for short/open. Is there a short or open?

YES → Repair/replace wire as necessary and restart.

NO → Check wiring/connection points between 186P19 pin D and 300U9 pin 59 short/open. Is there a short or open?

YES → Repair/replace wire as necessary and restart.

NO → Check wiring/connection points between 300P9 pin 59 and 186P19 pin H for short/open. Is there a short or open?

YES → Repair/replace wire as necessary and restart.

NO → END OF TASK
18-4.20 SECURE VOICE OPERATION - WITH KY-100 CONTROL SET TO CT MODE AND
PLAINTEXT TRANSMITTED TO RADIO UNDER TEST, COMMUNICATION NOT
HEARD

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 11-1520-240-23
TM 11-5821-357-12
TM 55-1520-240-10
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power Off
Hydraulic Power Off
HF Liaison Facility Visual Check Performed
(Task 18-4.21)
18-4.20 SECURE VOICE OPERATION - WITH KY-100 CONTROL SET TO CT MODE AND PLAINTEXT TRANSMITTED TO RADIO UNDER TEST, COMMUNICATION NOT HEARD (CONTINUED)

Replace TSEC/KY-100 Processor. Is communications established?

YES

Problem solved.

NO

Replace TSEC/KY-100 RCU. Is communications established?

YES

Problem solved.

NO

Check wiring/connection points between 186P17 pin J and 186F7 pin 11 for short/open. Is there a short or open?

YES

Repair/replace wire as necessary and restart.

NO

End of Task.
18-4.21 SECURE VOICE OPERATION - WITH KY-100 CONTROL SET TO VARIOUS
POSITIONS AND BOTH CIPHERTX AND PLAINTX TRANSMITTED TO RADIO
UNDER TEST ABNORMAL COMMUNICATIONS AND ANNUNCIATOR OCCUR

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 11-1520-240-23
TM 11-5821-357-12
TM 55-1520-240-10
TM 55-1520-240-23

Equipment Condition:
TM 55-1520-240-23:
Battery Connected
Electrical Power Off
Hydraulic Power Off
HF Liaison Facility Visual Check Performed
(Task 18-4.21)
18-4.21 SECURE VOICE OPERATION - WITH KY-100 CONTROL SET TO VARIOUS
POSITIONS AND BOTH CIPHERTEXT AND PLAINTEXT TRANSMITTED TO RADIO
UNDER TEST ABNORMAL COMMUNICATIONS AND ANNUNCIATOR OCCUR
(CONTINUED)

Replace TSEC/KY-100 Processor. Is normal communications established and annunciator working properly?

YES

Problem solved.

NO

Replace TSEC/KY-100 RCU. Is communications normal established and annunciator working properly?

YES

Problem solved.

NO

Check wiring and connection points between TSEC/KY-100 Processor and TSEC/KY-100 RCU. Repair/replace wiring connection points as necessary.

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By Order of the Secretary of the Army:

E. C. MEYER
General, United States Army
Chief of Staff

ROBERT M. JOYCE
Major General, United States Army
The Adjutant General

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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
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.
**PART 1 – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS**

**TM 9–1005–433–24**

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*Reference to line numbers within the paragraph or subparagraph.*

**MSG, Jane Q. Doe, SFC**

**DATE**

**16 Sep 2002**

**TITLE**

TO: (Forward direct to addressee listed in publication)  
Commander, U.S. Army Aviation and Missile Command  
ATTN: AMSAM--MMC--MA--NP  
Redstone Arsenal, AL  35898  

FROM: (Activity and location) (Include ZIP Code)  
MSG, Jane Q. Doe  
1234 Any Street  
Nowhere Town, AL  34565  

DATE  
8/30/02  

PART II -- REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS  

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PART III -- REMARKS  
(Any general remarks, suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)

TYPED NAME, GRADE OR TITLE  
MSG, Jane Q. Doe, SFC  

TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION  
788–1234  

SIGNATURE  

USAPA V3.01
RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS
For use of this form, see AR 25-3t; the proponent agency is ODSC.

Use Part II (reverse) for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM)

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, AL 35898

FROM: (Activity and location)/(Include ZIP Code)

PART 1 – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

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TYPED NAME, GRADE OR TITLE

TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION

SIGNATURE

DA FORM 2028, FEB 74
REPLACES DA FORM 2028, 1 DEC 68, WHICH WILL BE USED.
USAPA V3.01
PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

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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

USAPA V3.01
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 decameter = 10 meters = 32.8 feet
- 1 hectometer = 10 decameters = 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 decigrams = .035 ounce
- 1 decagram = 10 grams = .35 ounce
- 1 quintal = 10 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 = 33.81 fl. ounces
- 1 liter = 10 deciliters = 2.64 gallons
- 1 dekaliter = 10 liters = 26.42 gallons
- 1 hectoliter = 10 dekaliters = 264.18 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 = 100 sq. decimeters = 10.76 sq. feet
- 1 sq. dekameter = 100 sq. meters = 107.63 sq. feet
- 1 sq. hectometer = 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

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