# TECHNICAL MANUAL

# AVIATION UNIT AND AVIATION INTERMEDIATE MAINTENANCE MANUAL

# CH-47D HELICOPTER

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



**HEADQUARTERS, DEPARTMENT OF THE ARMY**
**19 SEPTEMBER 2002**

# WARNING AND FIRST AID DATA

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

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

**WARNING**

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

**CAUTION**

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

**NOTE**

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

**WARNING**

## Cleaning Solvents

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

Saturated clothing should be removed immediately.

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

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

**WARNING**

## Electrical and Electronic Equipment Maintenance

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

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

WARNING

### Dangerous Static Charges

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

WARNING

### Dangerous Voltages at Antenna Terminals

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

WARNING

### Poisonous Carbon Monoxide Fumes

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

WARNING

### Corrosive Battery Electrolyte (Potassium Hydroxide)

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

Contact with skin or eyes will cause burns.

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

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

WARNING

### Explosive Battery Hazard

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

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

WARNING

## Electrolyte Contamination

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

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

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

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

WARNING

## Acids and Alkalines

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

Rust stripper is an alkaline solution.

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

WARNING

## Windshield Rain Repellent

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

Wash hands with soap and water after handling repellent.

WARNING

## Antiseize Compounds

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

Wear protective clothing. Wash thoroughly after using.

WARNING

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

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

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

WARNING

## Epoxy 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 skin. Wash thoroughly after using.

WARNING

## Radiation Hazard

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

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

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

WARNING

## Fire Extinguishing Agents

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

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

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

WARNING

## Noise

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

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

WARNING

## FOD

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

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

WARNING

## JP-4/JP-5/JP-8 Fuel MIL-T-5624

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

Use only with adequate ventilation.

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

Remove saturated clothing immediately.

Do not smoke when handling fuel.

Do not take internally.

Store in approved, metal safety containers.

WARNING

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

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

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

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

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

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

WARNING

## Lifting Components With Hoist

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

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

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

Before lifting, alert personnel in immediate areas.

Before lifting, balance the load.

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

Do not stand under load to do maintenance work.

WARNING

## Hydraulic Pressures

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

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

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

WARNING

## Hydraulic Fluid

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

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

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

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

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

WARNING

## Alcohol With Hydraulic Fluid Impairment

Do not use alcohol to clean components which contact hydraulic fluids. Residue can form which could impair operation of the component.

WARNING

## Compressed Air

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

Use eye protection to prevent injury to personnel.

WARNING

## Flare Dispenser

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

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

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

WARNING

## Maintenance Platforms/Workstands

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

WARNING

## Black Light Inspection Eyewear

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

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

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

WARNING

## Cadmium-Plated Tools

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

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

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

**CHANGE**
**NO. 4**

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Aviation Unit and Aviation Intermediate
Maintenance Manual

# CH-47D HELICOPTER

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# CH-47D HELICOPTER

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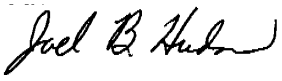

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# CH-47D HELICOPTER

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| Original | 19 September 2002 | Change 3 | 30 September 2003 |
| Change 1 | 4 November 2002 | Change 4 | 20 February 2004 |
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TECHNICAL MANUAL
NO. 55-1520-240-23-1

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

# AVIATION UNIT AND AVIATION INTERMEDIATE MAINTENANCE MANUAL

## CH-47D HELICOPTER

**REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS**

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

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PAGE NO.

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# HOW TO USE THIS MANUAL (TM 55-1520-240-23)

This manual has 17 chapters and 10 appendixes.

1. Chapter 1 has instructions on servicing, ground handling, and other tasks that apply to the entire helicopter.
2. Chapter 2 thru Chapter 17 have descriptions and maintenance instructions for major systems of the helicopter. They are arranged as follows:
   SYSTEM DESCRIPTION, with locator figure.
   MAINTENANCE TASKS, with step-by-step procedures and figures.
3. The appendixes contain general reference information.

## HOW TO FIND WHAT YOU NEED

**Troubleshooting.** Refer to TM 55-1520-240-T.

**Operational Tests.** Part of troubleshooting procedures. Refer to TM 55-1520-240-T.

**Wiring and Schematic Diagrams.** Refer to TM 55-1520-240-T.

**Inspections.** Refer to Chapter 1. There are three kinds of inspection requirements listed:

**1. Calendar Inspections/Maintenance Actions**. This category includes scheduled inspections based on elapsed calendar time.

**2. Operating Time Special Inspections/Actions**. This category includes inspections and maintenance actions based on aircraft operating time which are not compatible with phased inspection intervals.

**3. Inspections/Maintenance Actions as a Result of Specific Conditions or Incidents**. This category covers actions/inspections required as a result of overspeed, overtorque, hard landing, unusual environmental conditions, etc. It also covers items such as retorque of attaching hardware a certain number of hours after installation.

**Maintenance.** To find a task, use the alphabetical index in the back of Volume 11. Each task is listed to enable the user to find important items under those names most likely to be looked for.

## TASK PREPARATION

Each task begins with INITIAL SETUP information. Read it carefully before starting. It tells what you will need and what you have to know to do 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 tools, containers, and test equipment are listed by tool number (TXX). Find these items in Chapter 1, Section IV.

**3. Materials**. Materials needed are listed by expendable number (EXX). Find these items in Chapter 1, Section IV.

**4. Parts**. New parts required, such as gaskets, packings, and washers, are listed by name only.

**5. Personnel Required**. Each skill level needed to do the task is listed. When more than one person of any skill level is needed, the number of persons is shown in parentheses. The assigned skill level should not be construed as the only skill level authorized to accomplish that task. (Refer to Appendix B.) The Maintenance Allocation Chart (MAC) assigns maintenance functions to the authorized maintenance level without regard to the MOS skill level.

**6. References**. Lists applicable maintenance manuals. Lists the TM 55-1520-240-23P if it supports installation, assembly, and/or replacement of maintenance-significant components. Also lists related tasks or texts which are references in Task steps.

**7. Equipment Condition**. Procedures which must be done before starting the task are listed and task numbers are given. Install tasks and assembly tasks do not normally list Equipment Conditions.

**8. General Safety Instructions**. These are safety precautions that must be observed throughout the task. Warnings include basic first aid instructions. Safety goggles must be worn when handling or working in close proximity to all fluids and compressed air.

**9. Locator Figure**. The area of the helicopter where the task will be performed is shown, with components to be worked on called out. On off helicopter tasks, the component to be worked on is shown.

## TASK PERFORMANCE

1. Before starting, read the entire task. Familiarize yourself with the entire procedure before beginning the task. The task heading at the top of each page specifies the task to be performed and the lowest maintenance level authorized to perform that task. Tasks to be accomplished by the Aviation Intermediate Maintenance level only, will be reflected by the term (AVIM) at the end of the task heading. If the term AVIM is not at the end of the task heading, then either the Aviation Unit or Aviation Intermediate Maintenance (AVUM or AVIM) level can accomplish that task.
2. As you read, pay attention to **WARNINGS, CAUTIONS**, and **NOTES**.
   **WARNINGS** are used when there is danger of injury or death.
   **CAUTIONS** are used when there is danger of damage to equipment.
   **NOTES** are used to bring special attention to a step or subject.
3. When critical torques and dimensions are bolded, you may not see the word inspect; however, an inspector must ok the completed step.
4. Tasks are written in detail for inexperienced personnel.
5. The **GLOSSARY** lists special words and terms used in this manual and gives their meaning.
6. When the special tool is used or a common tool is used in an unusual way, the use of the tool will be shown.
7. When the word **INSPECT** is in a task, an inspector must approve the completed steps.

## STANDARD MAINTENANCE PRACTICES

The following are considered standard maintenance practices. Instructions about these practices will not normally be included in Task steps. Task steps will tell you when standard maintenance practices do not apply.

1. Tag tubes, hoses, and wires before they are disconnected. Tubes will be capped and open ports will be plugged when tubes or hoses are disconnected.

2. Discard used performed packings and retainers. Install new packings and retainers. Packings, retainers, and thread of fittings are coated with system lubricant before they are installed.
3. Tie tubes, hoses, and related parts out of the way with twine, not lockwire.
4. Disassembly procedures reflect the total breakdown of a part as it is provisioned. You may not need to disassemble a part as far as described in the task. Follow the steps to disassemble as far as needed to replace worn or damaged parts.
5. Use judgment when performing Follow-On Maintenance. Depending on the nature of the task performed, it may only be necessary to perform certain relevant parts of the referenced follow-on task to ensure that the affected system is working properly. This is especially true of Follow-On requirements for extensive tasks such as rigging and operational checks.
6. Before inspecting a component or the disassembled parts of a component, clean them if required.
7. Inspect components and installation area for condition before installation.
   a. Inspect procedures do not assume failure. Procedures are written as passing inspection.
   b. There will be no references or direction in inspection procedures to repair, replace, or adjust.
   c. Should a part fail inspection, either a repair, replacement, or adjust task in maintenance manual will determine what has to be done.
8. Use guide lines when any item is hoisted overhead.
9. Make-item specifics are listed in Appendix E.
10. When a nut is tightened or loosened on a bolt, hold the bolthead with a wrench.
11. A special torque will be cited when the words torque to are used. A standard torque is required when word install is used.
12. When torquing hardware, observe compliance with friction torque as required (TM 1-1500-204-23).
13. Task 1-13 contains tables of standard torque limits for threaded fasteners, hose and tube coupling nuts, and pipe thread fittings. Included in the torque tables are the applicable torque wrenches. These standard torques apply only when special torques are not specified in procedures. In the instances where additional tools are required, as a duplication of tools found in the Army tool kits, those tools shall be listed individually in the INITIAL SETUP.
14. Task 1-13 also contains tables of standard torque limits for positive retention and impedance bolts. Included in the torque tables are the applicable torque wrenches. These standard torques apply only when special torques are not specified in procedures.
15. Task 1-13 also contains a table of standard torque limits for general type nuts and bolts. These standard torques apply only when special torques are not specified in procedures. Included in the torque tables are the applicable torque wrenches.

16. When cotter pin is required, torque nuts to lowest value of allowable torque range. Continue tightening only as needed to align cotter pin holes. Do not exceed maximum value of allowable range.

17. Following installation, paint will be touched up as needed. Components which are issued with a primer coat will be painted.

18. Following maintenance, work area will be inspected for foreign objects.

19. Testing hydraulic components in OFF HELICOPTER tasks shall be conducted behind a protective shield, **5/8 inch** plexiglass or equivalent.

20. Test setups are shown as schematics. Specific attaching hardware is not listed to allow you flexibility in using equivalent equipment.

21. Dissimilar Metal Protection:

    a. Where dissimilar metal protection is required in a procedure involving three or more steps, you will see the following note preceding the first step of the task.

**NOTE**

All dissimilar metal parts are coated with primer.

    b. Then each time you see a part where (dissimilar metal) follows the part name, you must apply primer to that item. For example:

        1. Install bellcrank (dissimilar metal) (12), etc.
           This bellcrank requires a coat of primer applied before it is installed.

    c. The type of primer you will need will be listed in each task, as required.

22. "Replace" means remove old part and install serviceable part.

23. When it is required to hold components, tubing, or fittings made of aluminum or other soft material in a vise, a soft-jawed vise shall be used. All components, tubing, and fittings used in the hydraulic systems shall also be held in a soft-jawed vise.

24. To ensure a good grounding bond, make sure all electrical components and mating surfaces are clean and free of paint before installation. Make sure all wire contact points are clean.

# CHAPTER 1
# INTRODUCTION AND HELICOPTER GENERAL

## SECTION I
## GENERAL INFORMATION

### 1-1. SCOPE

This manual is for the use of AVUM and AVIM personnel in maintaining the CH-47D medium-lift helicopter.

### 1-2. MAINTENANCE, FORMS, RECORDS, AND REPORTS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-751, The Army Maintenance System-Aviation (TAMMS-A).

### 1-3. DESTRUCTION OF ARMY MATERIAL TO PREVENT ENEMY USE

For destruction of Army material to prevent enemy use, refer to TM 750-244-1-5.

### 1-4. PREPARATION FOR STORAGE OR SHIPMENT

Storage requirements for the helicopter are in Chapter 1. Refer to TM 740-90-1 and TM 1-1500-204-23 for general storage information.

### 1-5. QUALITY ASSURANCE/QUALITY CONTROL

Quality assurance/quality control personnel shall verify the dimensions and tolerances contained in this manual are met. Qualified personnel shall inspect completed work for full compliance with technical requirements of instructions. Inspection shall be in accordance with an approved prescribed inspection system to be determined at work site.

### 1-6. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your equipment needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Put it on a SF 368 (Quality Deficiency Report). Mail it to us at:

Commander, USA AMCOM
ATTN: AMSAM-MMC-RE-FD
Redstone Arsenal, AL 35898-5230

We'll send you a reply.

## 1-7. AUTHORITY FOR SUBSTITUTION

Substitution or interchange of items or material for maintenance of Department of the Army aircraft shall not be authorized, nor shall orders be issued for shipment. Substitution or interchangeability shall be only by US Army Aviation and Missile Command.

## 1-8. CALIBRATION

Within the scope of this manual there are no helicopter components, accessories, or instruments that require calibration. Special tools and test equipment shall be calibrated as specified in TB 750-25, Army Metrology and Calibration System.

## 1-9. EXPLANATION OF CHANGE SYMBOLS

Changes, except as noted below, to the text and table and including new material on added pages, are indicated by a vertical line in the outer margin extending close to the entire area of the material affected. An exception is that pages with emergency markings, which consists of black diagonal lines around three edges, may have the vertical line or change symbol placed along the inner margins. Symbols show current pages only. A miniature pointing hand symbol is used to denote a change to an illustration. However, a vertical line in the outer margin, rather than miniature pointing hands, is used if the illustration is new, or when there have been extensive changes made. Change symbols are not used to indicate changes in the following:

a. Introductory material.

b. Indexes and tabular data where the changes cannot be identified.

c. Blank space resulting from the deletion of text, an illustration, or a table.

d. Correction of minor inaccuracies, such as spelling, punctuation, relocation of material, etc. unless such correction changes the meaning of instructive information and procedures.

### 1-9.1. 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 modifications 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 4) indicates that the information that follows is applicable only to helicopters not modified by ECP D018. Information pertaining only to helicopters that have been modified by ECP D018 is preceded by (WITH 4). 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 | 82-23762 | 83-24102 | 84-24152 | 85-24322 |
| through | through | through | through | through |
| 81-23389 | 82-23780 | 83-24125 | 84-24187 | 85-24336 |

## *HELICOPTER CONFIGURATION LEGEND*

| | | | EFFECTIVITY | |
|---|---|---|---|---|
| **CODE** | **ECP/MWO NO.** | **TITLE** | **PRODUCTION (Serial Number)** | **RETROFIT** |
| 1 | ECP D003R1 | Improved Synch Shaft Vibration Mount | 84-24108 and on | Attrition |
| 2 | ECP D010R2C1 | Fuel Cell Manifold Control Bracket | 82-23389 and on | Attrition |
| 3 | ECP D008 | Rotor Hub Protective Cover Enlargement | 85-24322 and on | Attrition |
| 4 | ECP D018R2 | Composite Fuel Pods | 84-24162 and on | Attrition |
| 5 | ECP D006 | Removable Support Structure Pylon Hyd. Module | 81-23385 and on | By Kit all D |
| 6 | ECP D037R2 | Shorter 114C1014 Yaw Connecting Link | 85-24322 and on | Attrition |
| 7 | ECP D034 | Pilot and Co-pilot Seat Armor | 81-23386 and on | Attrition |
| 8 | ECP D042 | Redesign Link Assy for Increased Parked Blade Loads | 83-24105 and on | Attrition |
| 9 | ECP D048C1 | Flare Dispenser Blanket Mod and Stowage Provision | 83-24107 and on | None |
| 10 | ECP D061R | Floor Former/Fuselage Bilge Paint | 83-24107 and on (Interior) | None |
| | | Special Paint for 14 Aircraft | 83-24105 thru 83-24118 (Exterior) | |
| 11 | ECP D065R1 | Second Source 114PS494 Fuel Shutoff Valve (Motorized) | 82-23776 and on | Attrition |
| 12 | ECP D071 | 2 inch Dia. Fuel Breakaway Fittings | 83-24110 and on | Attrition |
| 13 | ECP D074C1 | Install Steel Control Rods Aft Pylon | 83-24103 and on | 81-23381 thru 83-24102 by Tech Bulletin |
| 14 | ECP D015C2 | Install Bubble Windows | 85-24322 and on | Attrition |
| 15 | ECP D051C1 | Rainshield Redesign | 84-24158 and on | Attrition |
| 16 | ECP D075 | Heater Modification | 85-24322 and on | Attrition |
| 17 | ECP D027R1C1 | Night Vision Goggles (NVG) | 85-24322 and on | MWO 55-1520-240-50-3 |
| 18 | ECP D036R1 | Improved N1 System | 85-24322 and on | Attrition |
| 19 | ECP D069R4 | Ferry Fuel Provisions | 90-0180 and on | MWO 55-1520-240-50-6 |
| 20 | ECP D0064R1 | Aft Pylon Work Platform Redesign | 85-24322 and on | Attrition |
| 21 | ECP D029C1 | ILCA Actuator and Manifold Seal Change | 85-24322 and on | Attrition |
| 22 | ECP D060R1 | Ramp Skin and Ramp End Former | 85-24322 and on | Attrition |
| 23 | ECP D001R1 | Improved N2 Control Box | 84-24156 and on | Attrition |
| 24 | ECP D056R2 | Redesigned Droop Stop Arm to Increase Clearance With Shroud; Modify Spring Limiter | 85-24322 and on | Contractor Kit |
| 25 | ECP D081R2 | Radar Altitude Hold/Ground Contact Annunciator | 87-0069 and on | MWO 55-1520-240-55-1 |
| 26 | ECP D118C1 | Improved Heat Resistance of Flight Control System Bellcranks and Connecting Rods | 85-24353 and on | MWO 55-1520-240-50-38 |
| 27 | ECP D054R1 | Combining Transmission Support Fitting Redesign | 8424154 and on | Attrition |

| | | | EFFECTIVITY | |
|---|---|---|---|---|
| CODE | ECP/MWO NO. | TITLE | PRODUCTION (Serial Number) | RETROFIT |
| 28 | ECP D126C1 | Accumulator APU/Flight Control Modules | 86-1635 and on | Attrition |
| 29 | ECP D085C1 | Reduced Length Servo-Cylinder Safety Blocks | GSE | MWO 55-1520-240-50-16 |
| 30 | ECP 712R7 | Portable Calculator and Hardware for Vibrex | OBSOLETE | ---------- |
| 31 | ECP D108 | Aft Transmission Torque Reactor Improvement | GSE | MWO 55-1730-240-50-1 |
| 32 | ECP D111 | Deletion of KY-28 Secure Voice Control Panel | 87-0069 and on | AMCOM MSG. |
| 33 | ECP D133 | Install New UH60/CH-47D Common APU in CH-47D | 86-1650 and on | MWO 55-1520-240-50-21 |
| 34 | ECP D122 | Change Droop Stop Shroud from Installed to Flyaway Equipment | 85-24361 and on | N/A |
| 35 | ECP D016R1 | Single Handle Cargo Hook Release | 88-0079 and on | MWO 55-1520-240-50-15 |
| 36 | ECP D113 | Hook Release Button Ring Guard on Cyclic Grip | 88-0085 and on | MWO 55-1520-240-50-23 |
| 37 | ECP D115 | Transmission and Engine Chip Burnoff System | 89-0139 and on | MWO 55-1520-240-50-24 |
| 38 | ECP D154R1 (Phase 1) | Installation of Stainless Steel Flight Control Connecting Links | 88-0091 and on | MWO 55-1520-240-50-39 |
| 39 | ECP D069R4 | Ramp Extension/Center Skid Pad Modification for Compatibility With HICHS | 90-0180 and on | Attrition |
| 40 | ECP D121R2 | Fine Mesh Inlet Screen | 88-0095 and on | Retrofit |
| 41 | ECP D105R1 | Shotpeen Horizontal Hinge Pins | 88-0107 and on | MWO 55-1520-240-55-6 |
| 42 | ECP D135 | Improved Rotor Blade Grounding Strap | 88-0103 and on | MWO 55-1520-240-50-32 |
| 43 | ECP D089 | Delete Engine Anti-Ice System | 87-0077 and on | MWO 1-1520-240-50-22 |
| 44 | ECP D101 | Engine Oil Pressure Transmitter Vib. Isolation Mounts | 90-0180 and on | MWO 55-1520-240-50-17 |
| 45 | ECP D092R1 (Phase 1) | Elastomeric Lag Damper and Pitch Link Bearings | 90-0180 and on | ---------- |
| 46 | ECP D114C2 | Drive Scissors Positive Locking Bolts | 90-0180 and on | MWO 1-1520-240-50-51 |
| 47 | ECP D095R1 | Airframe Structural Improvements | 90-0180 and on | Attrition |
| 48 | ECP D173 | Combining Transmission Sync Shaft Shielding Baffle | 88-0099 and on | MWO 55-1520-240-50-45 |
| 49 | ECP D131R1 | Transmission Drip Pan Material Change | 90-0214 and on | Attrition |
| 50 | ECP D145R1C1 | Bolt/Bushing Assembly Improvements | 90-0180 and on | MWO 1-1520-240-50-37 |
| 51 | ECP D157R1 | One Piece Engine Drive Shaft | 90-0180 and on | MWO 55-1520-240-50-43 |
| 52 | ECP D190R1 | Improved Clamshell Door Latch | 92-0282 and on | MWO 1-1520-240-50-62 |
| 53 | ECP D164 | Incorporation of Dome Light Positive Locking Lever Switch | 91-0252 and on | MWO 55-1520-240-50-50 |
| 54 | ECP D154R1 (Phase 2) | Control System Hardening and Smoke Containment | 81-23381 thru 89-0177 | MWO 1-1520-240-50-40 |

| | | | EFFECTIVITY | |
|---|---|---|---|---|
| CODE | ECP/MWO NO. | TITLE | PRODUCTION (Serial Number) | RETROFIT |
| 55 | ECP D185R1 | Separate Fuel Control Relay Box Ground Connections | 90-0202 and on | MWO 1-1520-240-50-58 |
| 56 | ECP D183 | Helicopter Internal Cargo Handling System (HICHS) Ramp Centerline Attachment | 81-23381 thru 91-0277 | MWO 1-1520-240-50-59 |
| 57 | ECP D175 | Engine Aft Mount Adjustable Link | 81-23381 thru 92-0302 | MWO 1-1520-240-50-60 |
| 58 | ECP D145R2 | Improved Bolt/Bushing Connection | N/A | MWO 1-1520-240-50-69 |
| 59 | ECP D198A1 | Polyurethane Paint for CH-47D Aircraft | — | Attrition |
| 60 | ECP A098 | Heads Up Display System (HUD) AN/AVS-7 | 81-23381 thru 91-0271 | MWO 1-1520-240-50-56 |
| 61 | ECP A0027 | Global Positioning System (GPS) AN/ASN-149(V)1 | 81-23381 thru 92-0302 | MWO 1-1520-240-50-68 |
| 62 | ECP AEEMH-03009 | Altitude Voice Warning System Radar Altimeter, AN/APN-209(V) | 81-23381 thru 93-0934 | MWO 1-1520-240-50-61 |
| 63 | ECP D200 (Phase 2) | Replace Lower Pitch Link Elastomeric Bearing | 90-0180 and on | MWO 1-1520-240-50-64 and MWO 1-1520-240-50-63 |
| 64 | ECP D194R1 | Stainless Steel Bellcranks in Combining Transmission Area | 81-23381 and on | MWO 1-1520-240-50-65 |
| 65 | ECP D168R1 | Cockpit Remote Emergency Ramp Extension System | 81-23381 thru 92-0309 | MWO 1-1520-240-50-48 |
| 66 | ECP D199 | Nonmetallic Spline Adapters for Combining Transmission Cooling Fan Drive Shaft | 76-18479 and 81-23381 thru 93-00934 | MWO 1-1520-240-50-67 |
| 67 | ECP D214R1 | Aft Position Lights Switch | 76-18479 and 81-23381 thru 93-00934 | MWO 1-1520-240-50-75 |
| 68 | ECP D216 | Pressure Refueling Vacuum Relief Valve | 76-18479 and 81-23381 thru 93-00934 | MWO 1-1520-240-50-81 |
| 69 | ECP D215 | NVG Bezel | 76-18479 and 81-23381 thru 93-00934 | MWO 1-1520-240-50-71 |
| 70 | ECP D210R1 | Easily Replaceable Cabin Escape Hatch | 76-18479 and 81-23381 thru 93-00934 | MWO 1-1520-240-50-76 |
| 71 | ECP END H030015 | Installation of AN/ASN-128B Doppler GPS Navigation System | 76-18479 and on | MWO 1-1520-240-50-73 |
| 72 | ECP D209 | Installation of Radar Altimeter in Center Hook Compartment | 76-18479 and 81-23381 thru 93-00934 | MWO 1-1520-240-50-72 |
| 73 | EJCH007016 | ARC-220/KY-100 | 76-18479 and 81-23381 thru 93-00934 | MWO 1-1520-240-50-74 |
| 74 | ECP D218 | 714/FADEC | 76-18479 and 81-23381 thru 93-00934 | MWO 1-1520-240-50-83 |
| 75 | ECP D219 | Pylon Clamshell Door Latch | 76-18479 and 81-23381 thru 93-00934 | MWO 1-1520-240-50-80 |
| 76 | ECP D220 (Pending) | Pylon Platform Latch | 76-18479 and 81-23381 thru 93-00934 | MWO 1-1520-240-50-77 |
| 77 | ECP D221 (Pending) | Improved Engine Cross Shaft Adapters | 76-18479 and 81-23381 thru 93-00934 | MWO 1-1520-240-50-XX |
| 78 | ECP D223 | Cargo Hatch Handhold | 76-18479 and 81-23381 thru 93-00934 | MWO 1-1520-240-50-79 |
| 79 | ECP D225 (Pending) | Cad Bolts | 76-18479 and 81-23381 thru 93-00934 | Attrition |

| CODE | ECP/MWO NO. | TITLE | EFFECTIVITY PRODUCTION (Serial Number) | EFFECTIVITY RETROFIT |
|---|---|---|---|---|
| 80 | Deleted | | | |
| 81 | ECP D229 (Pending) | Transmission Bushings | 76-18479 and 81-23381 thru 93-00934 | MWO 1-1520-240-50-XX |
| 82 | ECP D230 | Extended Range Fuel System (ERFS II) | 76-18479 and 81-23381 thru 93-00934 | MWO 1-1520-240-50-84 |
| 83 | ECP D227 | Upper Swashplate Dust Seal | 76-18479 and 81-23381 thru 93-00934 | Attrition |
| 84 | Deleted | | | |

# SECTION II
# EQUIPMENT DESCRIPTION AND DATA

## 1-10. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

The CH-47D is a tandem rotor cargo helicopter. It is powered by two T55-L-series engines in nacelles on the aft cabin fuselage section.

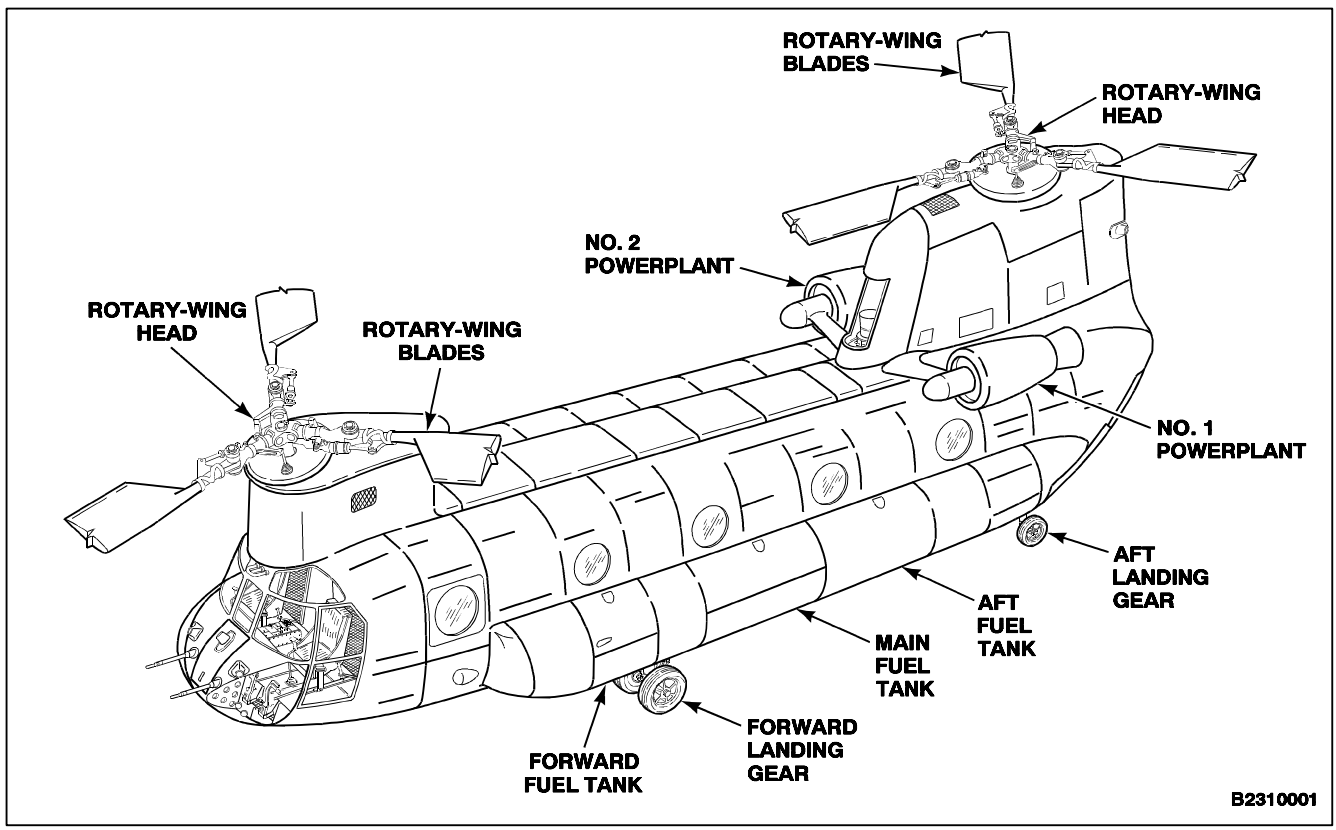
Torque from engines is transmitted to rotary-wing blades through a series of mechanical transmissions. These transmissions are interconnected by a system of synchronizing drive shafts.

Each rotor system consists of a rotary-wing head and three rotary-wing blades. Rotor systems are controllable from the cockpit by both pilot and copilot through dual hydraulic-boosted control systems. The helicopter is equipped with four landing gears, with dual wheels on each forward landing gear and a single wheel on each aft landing gear. Each aft gear can swivel **360**$^{O}$. Power steering is connected to the right aft gear.

A hydraulically operated cargo ramp and door is incorporated in the aft end of the fuselage. A hydraulically operated rescue and cargo handling winch is located in the forward cabin area.

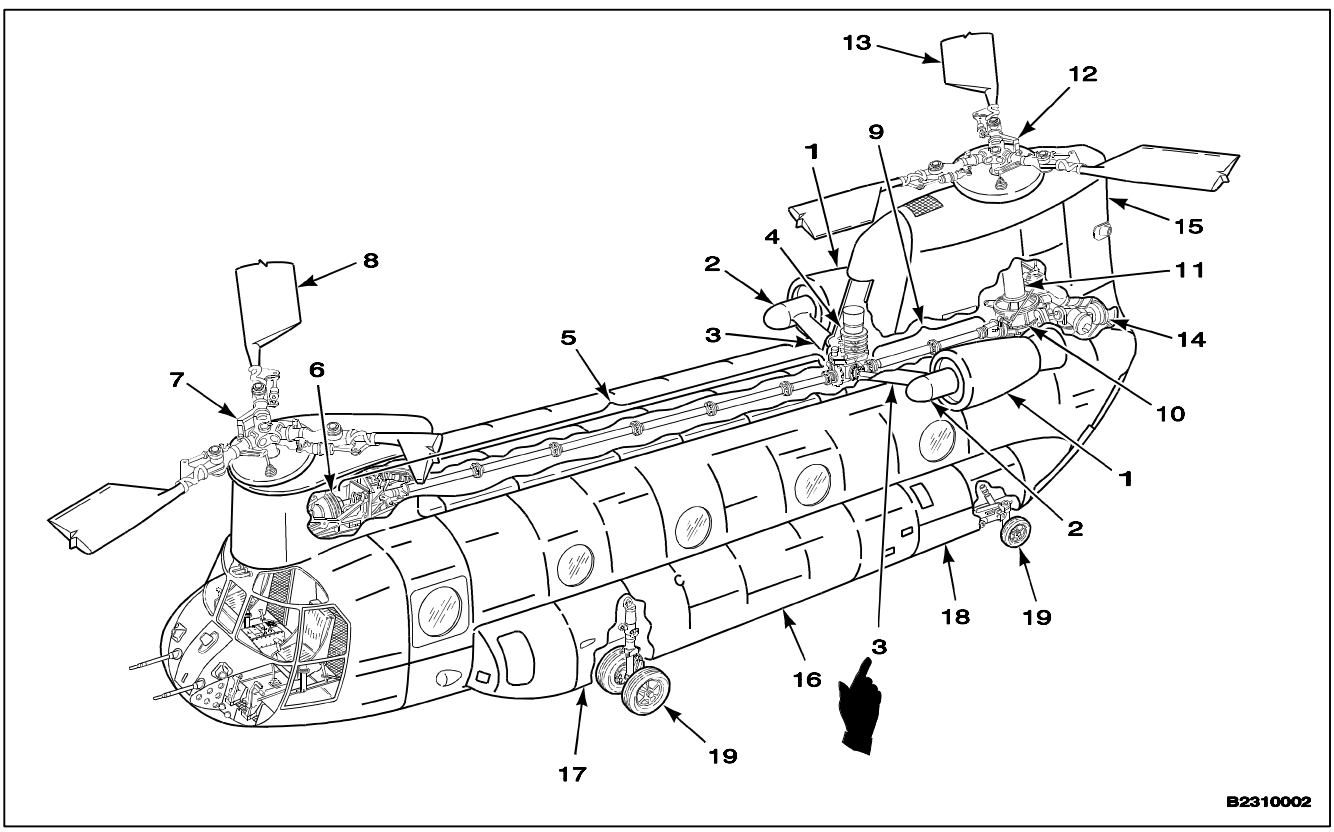
An auxiliary power unit mounted above the cargo ramp area in the aft pylon permits operation of all helicopter systems without the use of a ground power source.

Additional descriptive and operational data can be found in Operator's Manual TM 1-1520-240-10.



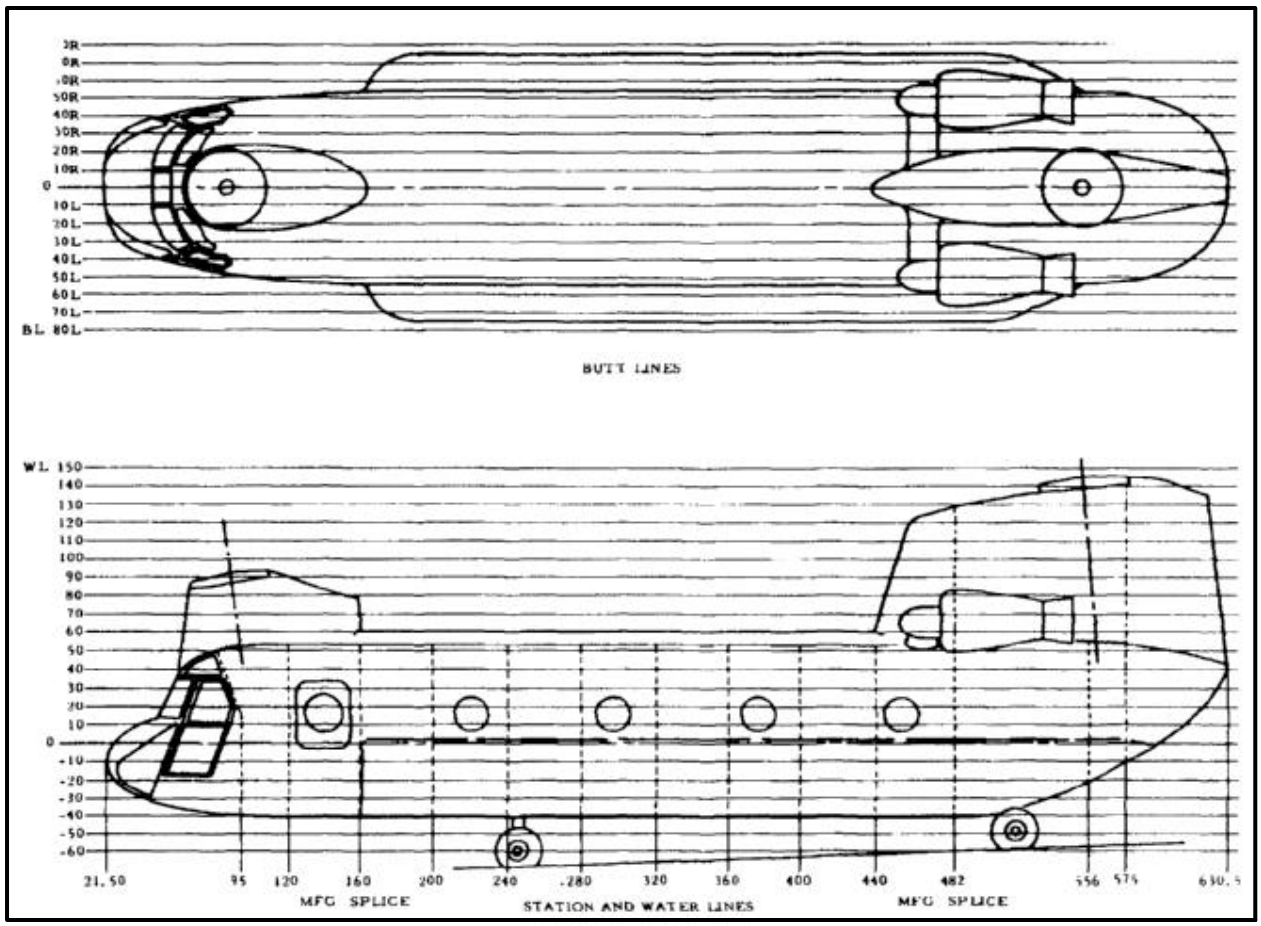
## 1-11. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

1. Powerplant — Provides power to helicopter.
2. Engine Transmission — Directs power from engine to combining transmission.
3. Engine Drive Shaft — Transmits power from engine transmission to combining transmission.
4. Combining Transmission — Combines power from two engines.
5. Forward Drive Shafting — Transmits power from combining transmission to forward transmission.
6. Forward Transmission — Transmits power to forward rotor head.
7. Forward Rotary-Wing Head — Transmits power and flight control input to forward blades.
8. Forward Rotary-Wing Blades — Provide lift to helicopter.
9. Aft Drive Shafting — Transmits power from combining transmission to aft transmission.
10. Aft Transmission — Transmits power to aft rotor shaft.
11. Aft Rotor Shaft — Transmits power to aft rotary-wing head.
12. Aft Rotary-Wing Head — Transmits power and flight control input to aft blades.
13. Aft Rotary-Wing Blades — Provide lift to helicopter.
14. Auxiliary Power Unit — Provides power for ground operation and powerplant starting.
15. Pylon — Encloses aft drive system components.
16. Main Fuel Tank
17. Forward Fuel Tank — Holds fuel for powerplants and APU.
18. Aft Fuel Tank
19. Landing Gear — Supports and allows ground movement of helicopter.



## 1-12. HELICOPTER DIMENSIONS AND DETAILS

The locations of primary fuselage stations, water lines, and butt lines are shown. Station numbers in inches are marked at four places on the aft side of cabin frames. Water line 0.0 is marked at each side of the cabin along a beam below windows.



# SECTION III
# MAINTENANCE DATA

## 1-13 STANDARD TORQUE LIMIT APPLICATION 1-13

This task provides standard torque limits for threaded fasteners, hose and tube coupling nuts, bulkhead fittings, and pipe thread fittings, and the minimum breakaway torque values for determining reusability of self-locking nuts. These standard torque values apply only when special torque values are not specified in procedures. General instructions for installation and fit of threaded fasteners are as follows:

1. Thread shall not be in bearing when thickness of sheet or fitting is **3/32 inch** or less. If thickness is more than **3/32 inch**, a maximum of two threads in bearing is permissible.
2. In shear applications, thread shall not be in bearing regardless of material thickness.
3. Washers are used for the following purposes:
   a. To compensate for differences in bolt grip length and material thickness due to manufacturing tolerances, protective coating, and other surface variances.
   b. To distribute bearing load over a greater area to prevent damage to material under a bolt head or nut.
   c. To protect the material surface when a bolt or nut is tightened.
   d. Prevent galling of aluminum or other soft material when bolt or nut is tightened.
   e. To insulate dissimilar metals to prevent corrosion. The washer material should be similar to the material on which it rests rather than the bolt or nut material. This insures that it corrosion occurs, if will be between the bolt and washer, which can be replaced.
4. When nut-bolt assemblies are installed, the nut shall not engage the first incomplete thread next to the bolt shank.
5. Nuts are properly installed when all threads are engaged and the bolt chamfer extends thru the nut. When flat-end bolts are used, the threaded end must extend at least **1/32 inch** thru the nut.
6. Threads shall be clean and dry before installation. If threads are lubricated, torque limits are reduced by **30 percent**.
7. The tightening sequence in multiple fitting installation is as follows:
   a. Finger tighten all bolts or nuts.
   b. Snug up opposite bolts or nuts all around.
   c. Tighten opposite bolts or nuts all around to proper torque. Do not torque adjacent bolts or nuts in sequence.
8. All-metal self-locking nuts shall be replaced with new identical parts at each installation. If new nuts are not available, all metal self-locking nuts may be reused. The reused nuts must meet the required minimum friction torque. See "Friction Torque in Inch-Pounds for Threaded Fasteners" in this task.

## 1-13 STANDARD TORQUE LIMIT APPLICATION (Continued) 1-13

***Standard Torque Limits in Inch-Pounds for Threaded Fasteners***

CAUTION

Overtightening fasteners can cause equipment damage or failure of fastener.

| BOLT & NUT MATERIAL | STEEL & CORROSION RESISTANT STEEL | | | | | ALUMINUM | |
|---|---|---|---|---|---|---|---|
| NUT | SELF-LOCKING NUTS, NUT PLATES, CASTELLATED NUTS, 12 POINT NUTS | | | | | | |
| TYPE | TENSION | SHEAR | TENSION | SHEAR | SHEAR | TENSION | SHEAR |
| NUT PART NUMBER EXAMPLES | AN310, AN315, MS20161<br>MS21069 MS21071<br>MS20365 MS21072<br>MS21044 MS21073<br>MS21045 NAS679<br>MS20500 NAS1021<br>MS21055 NAS1068<br>MS21056 BACN10MK<br>MS21059 BACN10JZ<br>MS21060 BACN10FX<br>MS21076 BACN10HY | AN320<br>AN316<br>AN315C<br>MS21083<br>NAS1022<br>MS51967<br>MS51968<br>MS51971 | MS17825 | MS17826<br>MS21224 | MS21244 | AN310<br>AN315<br>MS21044 | AN320<br>MS21083 |

**TORQUE LIMITS (INCH-POUNDS)**

| THREAD SIZE | SEE NOTE 1 | SEE NOTE 3 | SEE NOTE 1 | SEE NOTE 3 | SEE NOTE 5 | SEE NOTE 5 | | | |
|---|---|---|---|---|---|---|---|---|---|
| 8-32 | 12 - 15 | 20 | 7 - 9 | 12 | | | | — | — |
| 10-32 | 20 - 25 | 40 | 12 - 15 | 25 | 25 - 35 | 15 - 20 | 15 - 20 | — | — |
| 1/4-28 | 50 - 70 | 100 | 30 - 40 | 60 | 55 - 80 | 30 - 45 | 35 - 50 | 35 - 40 | 20 - 25 |
| 5/16-24 | 100 - 140 | 225 | 60 - 85 | 140 | 120 - 170 | 60 - 90 | 70 - 100 | 95 - 100 | 55 - 65 |
| 3/8-24 | 160 - 190 | 390 | 95 - 110 | 240 | 230 - 325 | 85 - 125 | 130 - 190 | 150 - 165 | 90 - 100 |
| 7/16-20 | 450 - 500 | 840 | 270 - 300 | 500 | 370 - 530 | 155 - 220 | 210 - 300 | 225 - 250 | 135 - 150 |
| 1/2-20 | 480 - 690 | 1100 | 290 - 410 | 660 | 580 - 830 | 195 - 280 | 315 - 450 | 300 - 375 | 180 - 225 |
| 9/16-18 | 800 - 1000 | 1600 | 480 - 600 | 960 | 770 - 1100 | 280 - 400 | 460 - 660 | 400 - 500 | 240 - 300 |
| 5/8-18 | 1100 - 1300 | 2400 | 660 - 780 | 1400 | 1120 - 1600 | 420 - 600 | 660 - 940 | 550 - 650 | 300 - 390 |
| 3/4-16 | 2300 - 2500 | 5000 | 1300 - 1500 | 3000 | 1400 - 2500 | 950 - 1100 | 1310 - 1560 | 1150 - 1250 | 690 - 750 |
| 7/8-14 | 2500 - 3000 | 7000 | 1500 - 1800 | 4200 | 2300 - 3000 | 1500 - 1800 | 2075 - 2500 | 1750 - 2000 | 1050 - 1200 |
| 1-12 or 1-14 | 3700 - 5500 | 10000 | 200 - 3300 | 6000 | 3400 - 5500 | 2000- 3000 | 2275 - 3410 | 2325 - 3000 | 1400 - 1800 |
| 1/8-12 | 5000 - 7000 | 15000 | 3000 - 4200 | 9000 | 5000 - 7000 | — | — | 2900 - 3900 | 1740 - 2340 |

**TORQUE WRENCHES**

**5 - 50 Inch-Pounds**
**30 - 150 Inch-Pounds**
**100 - 750 Inch-Pounds**
**700 - 1600 Inch-Pounds**
**0 - 600 Foot-Pounds**

## 1-13 STANDARD TORQUE LIMIT APPLICATION (Continued) 1-13

**NOTES**

1. Torque limits apply to nut tightening only. When tightening bolt, the higher limit ± **10 percent** is used.
2. Torque values are for dry (unlubricated) threads. It threads are lubricated, limit is **70 percent** of unlubricated value.
3. Maximum torque allowed for cotter pin hole alignment. If limit is exceeded, discard nut and bolt and inspect parts secured by the nut and bolt.
4. Torque limits apply only to tightening nut on stud.
5. When tightening self-locking castellated nut MS21224, MS17825, and MS17826, first tighten to minimum torque. If slot in nut is aligned with cotter pin hole in bolt, tighten nut an additional **60°** (one castellation) and install cotter pin. If slot in nut is not aligned with cotter pin hole in bolt, tighten nut until aligned and install cotter pin. In either case maximum torque must not be exceeded.

CAUTION

Do not apply antiseize compound to bolt or nut threads.

6. Apply a coating of antiseize compound (E75) or equivalent to the bushing OD on bolts 114R3650 series only.

### *Friction Torque in Inch-Pounds for Threaded Fasteners*

| THREAD SIZE | MINIMUM FRICTION TORQUE |
|---|---|
| 8 - 32 | 1.5 |
| 10 - 32 | 2.0 |
| 1/4 - 28 | 3.5 |
| 5/16 - 24 | 6.5 |
| 3/8 - 24 | 9.5 |
| 7/16 - 20 | 14.0 |
| 1/2 - 20 | 18.0 |
| 9/16 - 18 | 24.0 |
| 5/8 - 18 | 32.0 |
| 3/4 - 16 | 50.0 |
| 7/8 - 14 | 70.0 |
| 1 - 12 | 90.0 |
| 1-1/8 - 12 | 117.0 |
| 1-1/4 - 12 | 143.0 |

NOTE

To determine friction torque, thread the nut onto the screw or bolt until at least two threads protrude. The nut shall not make contact with a mating part. Stop the nut. The torque necessary to begin turning the nut again is the breakaway torque. Do not reuse self-locking nuts that do not meet minimum friction torque.

**TORQUE WRENCHES**

**5 to 50 Inch-Pounds**

**30 to 150 Inch-Pounds**

## 1-13 STANDARD TORQUE LIMIT APPLICATION (Continued) 1-13

### *Standard Torque Limits in Inch-Pounds for Hose and Tube Coupling Nuts*

| TUBE OD | HOSE SIZE | NUT HEX | A | B | C | D | E |
|---|---|---|---|---|---|---|---|
| 1/4 | –4 | 9/16 | 105-115 | 135-145 | 50-65 | 135-150 | 100-120 |
| 3/8 | –6 | 11/16 | 160-180 | 255-285 | 100-125 | 270-300 | 210-250 |
| 1/2 | –8 | 7/8 | 265-295 | 475-525 | 210-250 | 450-500 | 340-420 |
| 5/8 | –10 | 1 | 355-375 | 665-735 | 300-350 | 650-700 | 400-480 |
| 3/4 | –12 | 1-1/4 | 430-470 | 855-945 | 425-500 | 900-1000 | 725-850 |
| 1 | –16 | 1-1/2 | 715-785 | | 600-700 | 1200-1400 | 900-1150 |
| 1-1/4 | –20 | 2 | 855-945 | | 680-800 | 1200-1400 | 950-1150 |

Overtightening of hose and tube coupling outs will cause thread and seal damage resulting in fitting leakage. Torque values are for threads lubricated with hydraulic fluid (E197), antiseize compound (E75), petrolatum (E274), or aircraft and instrument grease (E189), as applicable.

**NOTE**

This table not applicable to permaswage nuts coupled to Rosan fittings.

**TORQUE WRENCHES**

**30 to 150 Inch-Pounds** **700 to 1600 Inch-Pounds**
**100 to 750 Inch-Pounds**

KEY

A — Aluminum Permaswage tube coupling nuts.

B — Steel Permaswage tube coupling nuts.

C — Steel or aluminum flared fitting nuts, AN818, AN924, NAS591-593, and NAS594-596: used on aluminum tube[1]

D — Steel or aluminum flared fitting nuts, AN818, AN924, NAS591-593, and NAS594-596: used on steel tube[1]

E — Steel or aluminum flared fitting hose coupling nuts[1]

[1]Where use of a torque wrench would be difficult, use a conventional wrench to tighten coupling nuts. Tighten until a distinct increase in the torque required is noted. Continue tightening an additional **1/6 of a turn**. Back off the nut. Again tighten until a distinct increase in the torque required is noted. Continue tightening an additional **1/6 to 1/3 of a turn**.

### *Standard Torque Limits in Inch-Pounds for Connecting Coupling Nuts to Rosan Fittings*

| TUBE OD | HOSE SIZE | NUT HEX | STEEL | ALUMINUM |
|---|---|---|---|---|
| 1/4 | –4 | 9/16 | 140-150 | 140-150 |
| 3/8 | –6 | 11/16 | 290-300 | 250-260 |
| 1/2 | –8 | 7/8 | 525-575 | 410-430 |
| 5/8 | –10 | 1 | 735-805 | 530-550 |
| 3/4 | –12 | 1-1/4 | 960-1000 | 660-690 |
| 1 | –16 | 1-1/2 | 1360-1400 | 1110-1150 |

**NOTES**

1. Rosan fittings are used on the following hydraulic system components:

| | |
|---|---|
| Utility Pressure Module | Flight Control Power Control Module |
| Utility Return Module | Lower Controls Module |
| APU Start Module | ILCA Manifold |
| APU Start Accumulator | APU Motor Pump |
| Utility Cooler Reservoir | |
| Flight Control Cooler Reservoir | |

2. Torque values are for fittings lubricated with hydraulic fluid (E197).

**TORQUE WRENCHES**

**30 to 150 Inch-Pounds** **700 to 1600 Inch-Pounds**
**100 to 750 Inch-Pounds**

## 1-13 STANDARD TORQUE LIMIT APPLICATION (Continued) 1-13

### *Standard Torque Limits in Inch-Pounds for Pipe Thread Fittings*

CAUTION

Be careful when tightening fitting. Overtightening causes distortion, cracking, and leaks.

| THREAD SIZE | WORKING TORQUE[1] | MAXIMUM TORQUE[1] |
|---|---|---|
| 1/8-27 | 100 | 175 |
| 1/4-18 | 150 | 300 |
| 3/6-18 | 225 | 450 |

**TORQUE WRENCHES**

**30 to 150 Inch-Pounds**

**100 to 750 Inch-Pounds**

[1]Antiseize compound (E75) shall be used on threads to prevent seizing and to aid in sealing. The compound shall be applied to the male fitting so that it does not contaminate the fluid in the system. Male and female fittings should be of different materials.

### *Bulkhead Fitting Hole Diameter, Washer Thickness, and Nut Torque Limits*

CAUTION

Be careful when tightening fittings. Overtightening causes distortion, cracking, and leaks.

| | TUBE FITTING | | BULKHEAD HOLE DIA (INCH) | | WASHER THICKNESS | TORQUE (INCH-POUND) AN924 NUT | |
|---|---|---|---|---|---|---|---|
| TUBE SIZE | OD (INCH) | THREAD | MIN | MAX | (INCH) | MIN | MAX |
| -4 | 1/4 | 7/16 - 20 | .443 | .463 | .063 | 85 | 105 |
| -5 | 5/16 | 1/2 - 20 | .505 | .525 | .063 | 105 | 125 |
| -6 | 3/8 | 9/16 - 16 | .568 | .588 | .063 | 120 | 150 |
| -8 | 1/2 | 3/4 - 16 | .755 | .775 | .090 | 240 | 280 |
| -10 | 5/8 | 7/8 - 14 | .880 | .990 | .090 | 320 | 380 |
| -12 | 3/4 | 1-1/16 - 12 | 1.068 | 1.088 | .090 | 500 | 600 |
| -16 | 1.0 | 1-5/16 - 12 | 1.318 | 1.338 | .090 | 720 | 880 |
| -20 | 1-1/4 | 1-5/8 - 12 | 1.630 | 1.650 | .090 | 960 | 1200 |

END OF TASK

**WARNING**

Standard bolts must not be substituted for self-retaining bolts at any connection where self-retaining bolts are installed. Loss of a bolt from any one of these flight control connections could result in the loss of the helicopter.

Two types of self-retaining bolts are used. They are positive retention bolts and impedance bolts. Both types have a fail-safe feature which prevents loss of bolt, if nut comes off. A nut, safetied with a cotter pin, must be installed on each self-retaining bolt.

Positive retention bolts have a pawl at threaded end of bolt shank. The pawl is spring-loaded to an extended position. When extended the pawl prevents the nut from being removed. Finger pressure compresses the pawl for removal of the nut and for removal of the bolt from the parts. Some of the bolts contain a heat shrunk bushing which replaces the sliding bushing in the fastener build-up. This prevents installation of the bolt without the bushing being installed. Placards are installed at each location for positive retention bolts.

Impedance bolts have either spring-loaded balls, or a spring ring on the bolt shank above the threads. These retaining elements extend beyond the diameter of the bolt and prevent it from sliding from the parts.

1. Remove positive retention bolts as follows:
   a. Remove cotter pin.
   b. Backoff nut until it is next to pawl. Depress pawl and backoff nut from bolt. Depress pawl and remove washer.
   c. Pull bolt out until pawl is next to lug. Depress pawl and pull bolt out until pawl is inside lug.
   d. Hold parts stack-up together and pull bolt out.

**NOTE**

If stack-up separates while removing bolt, pawl may extend and catch on edge of fastener, bearing, or bushing. If pawl extends while removing bolt, use a thin piece of metal such as knife edge or rule to depress pawl. Do not hammer bolt out.

   e. On bolts with integral bushings, examine the bushing for galling. If there is galling, rework the bolt to reduce bushing diameter.

2. Rework of Positive Retention Bolts. If the bushing of a removed bolt is galled, rework it as follows:
   a. Measure the diameter of the bushing. If it is greater than the diameter after rework shown in table below, reduce the diameter by machine turning or grinding. Maintain a surface finish of **63 microinches** or less.

***Positive Retention Bolt Assembly Rework Diameters***

| Bolt Assembly Part No. | Bushing Diameter Before Rework | Bushing Diameter After Rework |
|---|---|---|
| 114R3650-1 | 0.8744 to 0.8749 | 0.8708 to 0.8713 |
| 114R3650-3 | 0.8744 or 0.8749 | 0.8708 to 0.8713 |
| 114R3650-6 | 0.6244 to 0.6249 | 0.6218 to 0.6223 |
| 114R3650-7 | 0.7806 to 0.7811 | 0.7774 to 0.7779 |
| 114R3650-9 | 0.9382 to 0.9387 | 0.9343 to 0.9348 |
| 114R3650-11 | 0.7507 to 0.7512 | 0.7476 to 0.7481 |
| 114R3650-16 | 0.6244 to 0.6249 | 0.6218 to 0.6223 |
| 114R3650-17 | 0.6244 to 0.6249 | 0.6218 to 0.6223 |

All Dimensions In Inches

   b. If galling extends below the reduced diameter, discard the bolt.
   c. Inspect the reworked bolt assembly. Use magnetic particle inspection per MIL-I-6868. Use circular magnetization thru the ends of the assembly at **800 to 100 amperes**. Use longitudinal inspection, charged coil, at **800 to 1200 amperes**.

3. Install positive retention bolts as follows:
   a. Place countersunk washer under bolt head. Make sure countersink is next to bolt head. For helicopters (With 46), the positive retention bolt-bushing assembly does not have a washer under the head.

**CAUTION**

Do not apply antiseize compound on thread of bolt or nut.

b. Apply a light coat of antiseize compound (E75) to OD of bushing and bolt shank of 114R3650 series bolts. Wear gloves (E184.1).

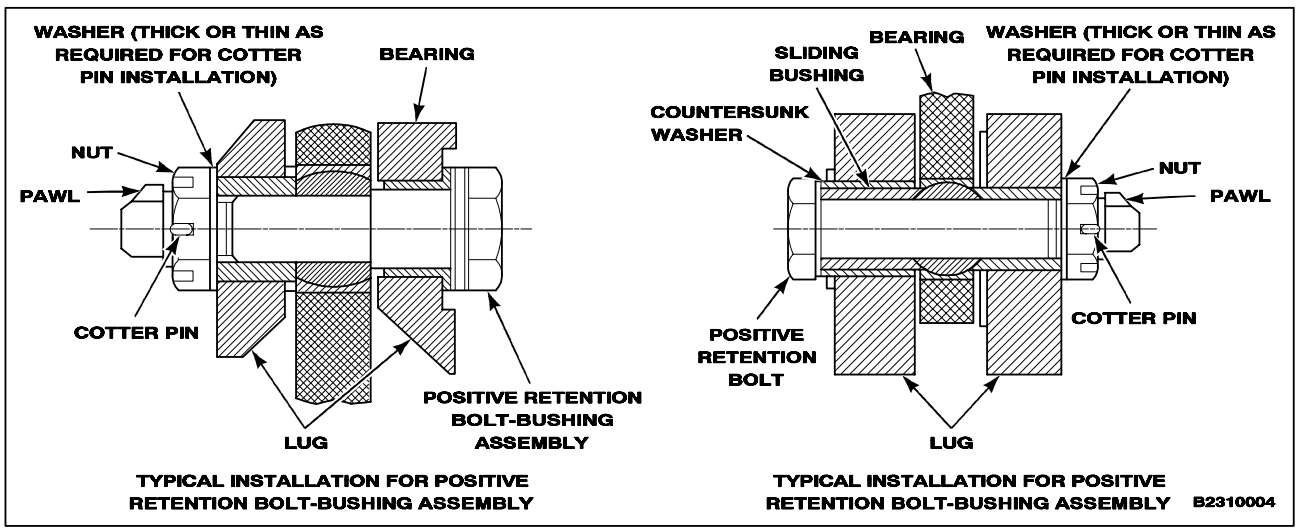
c. Align bearing, lugs, bolt, and bushing. Install bolt.

d. Place washer(s) on the bolt. Use thick or thin washers as necessary for cotter pin installation.

e. Install nut. Torque it to minimum applicable torque. If cotter pin holes are not aligned, tighten nut to align holes. Do not exceed maximum torque.

f. Install cotter pin.

g. Make sure pawl on bolt is extended. Make sure placards are installed near fastener installation.




***Torque for Nuts Used With Positive Retention Bolts***

CAUTION

Do not exceed maximum torque for cotter pin hole alignment.

| NUT AN320 | MINIMUM TORQUE (INCH-POUNDS) | MAXIMUM TORQUE (INCH-POUNDS) (SEE CAUTION) |
|---|---|---|
| –5 | 60 | 140 |
| –6 | 95 | 240 |
| –7 | 270 | 500 |
| –8 | 290 | 660 |
| –9 | 480 | 960 |
| –10 | 660 | 1400 |
| –12 | 1300 | 3000 |

**TORQUE WRENCHES**

**30-150 Inch-Pounds**

**100-750 Inch-Pounds**

**700-1600 Inch-Pounds**

**0-600 Foot-Pounds**

## 1-14 SELF-RETAINING BOLTS INSTALLATION (Continued) 1-14

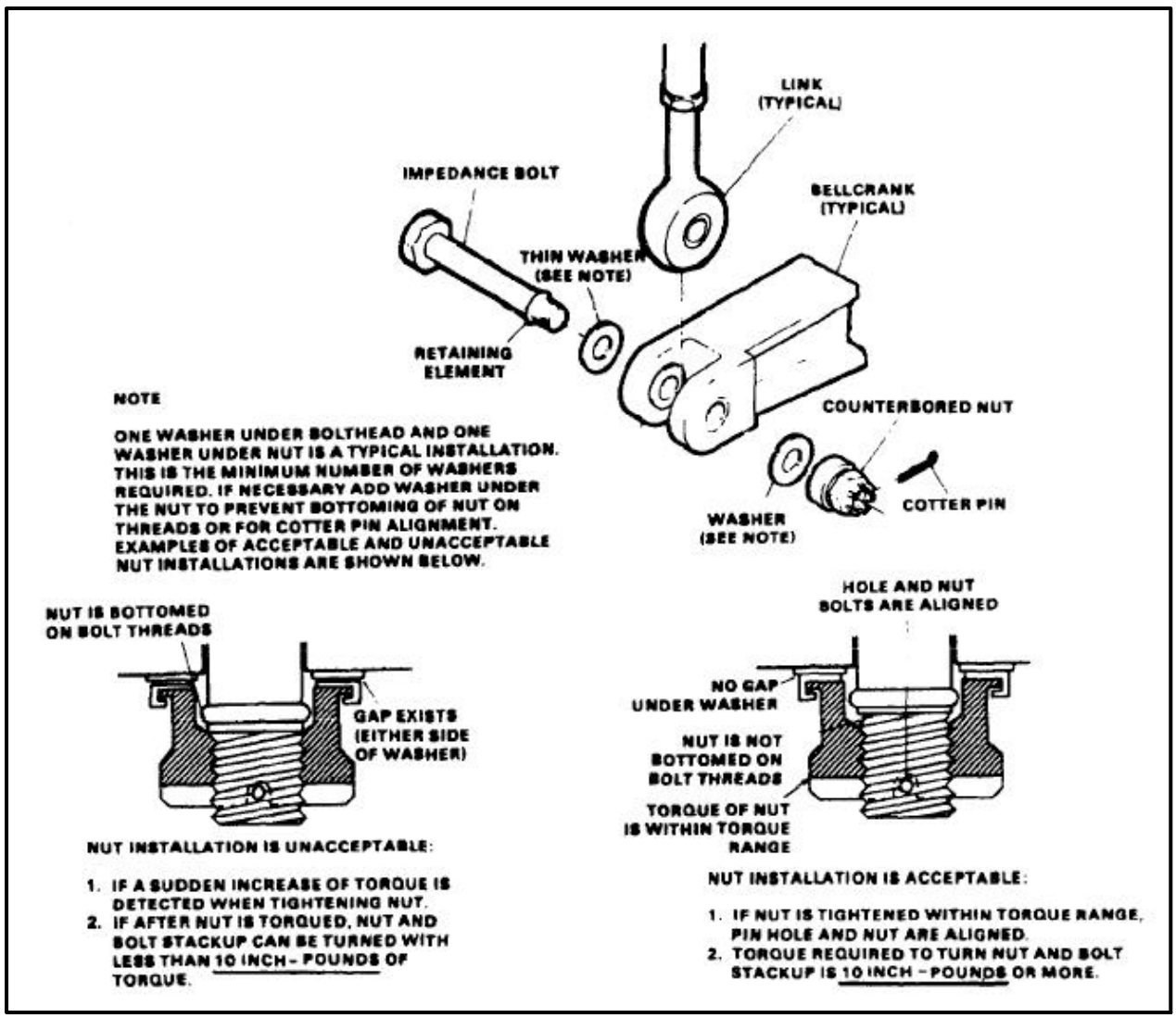
4. Remove impedance bolts as follows:
   a. Remove cotter pin and nut.
   b. Push bolt shank in removal direction until retaining element is compressed. Do not hammer on bolt.
   c. Grasp bolthead and pull bolt out of parts.

5. Install impedance bolts as follows:

**NOTE**

No lubricant shall be applied to bolt shank or threads.

   a. When a washer is required under bolthead, place washer on bolt shank.
   b. Push bolt thru parts until retaining element protrudes beyond connected parts.



c. Place washer(s) on bolt.

d. Install nut as follows:

CAUTION

If a thin washer is used under the nut, do not let the inner diameter of the washer become caught on the bolt retaining element. False torque readings and damage to the hardware can result.

(1) Torque nut to the minimum applicable torque. Check that no axial looseness exists in bolt-nut stackup. CHECK THAT MINIMUM TORQUE OF **10 INCH-POUNDS** IS REQUIRED TO ROTATE BOLT-NUT STACKUP. Correct low rotation torque or axial looseness by adding a washer under nut, repeat torquing.

(2) Install cotter pin if nut castellations are aligned with pin hole. If castellations are not in line with pin hole, tighten nut as required for alignment. Install cotter pin. Do not exceed maximum allowable torque.

**NOTE**

Abrupt increases in torque required to tighten nut is an indication of bottomed thread or jammed washer. Remove nut and examine hardware if such damage is suspected.

***Torque in Inch-Pounds for Nuts Used With Impedance Bolts***

| NUT | MINIMUM TORQUE | MAXIMUM TORQUE |
|---|---|---|
| MS21224-3 | 15 | 20 |
| MS21224-4 | 30 | 45 |
| MS21224-5 | 60 | 90 |
| MS21224-6 | 85 | 125 |
| MS21224-7 | 155 | 220 |
| MS21224-8 | 195 | 280 |
| MS21224-9 | 280 | 400 |
| MS17826-4 | 30 | 45 |
| MS17826-9 | 280 | 400 |
| **TORQUE WRENCHES** | | |
| **5 to 50 Inch-Pounds** | | |
| **100 to 750 Inch-Pounds** | | |
| **30 to 150 Inch-Pounds** | | |

END OF TASK

## 1-15 REPLACE LOCKED-IN STUD (AVIM) 1-15

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Machine Shop Set, NSN 4920-00-405-9279
Rosan Tool Kit, NSN 5180-00-778-3789
Plier Wrench
Source of Low Pressure Compressed Air (30 Psi or Less)
Goggles

***Materials:***

Barrier Material (E80)
Tape (E388)
Epoxy Primer (E292.1)
Gloves (E184.1)

***Parts:***

Lock Ring

***Personnel Required:***

Machinist
Inspector

***References:***

TM 43-0104
TM 55-1520-240-23P

***Equipment Condition:***

Off Helicopter Task

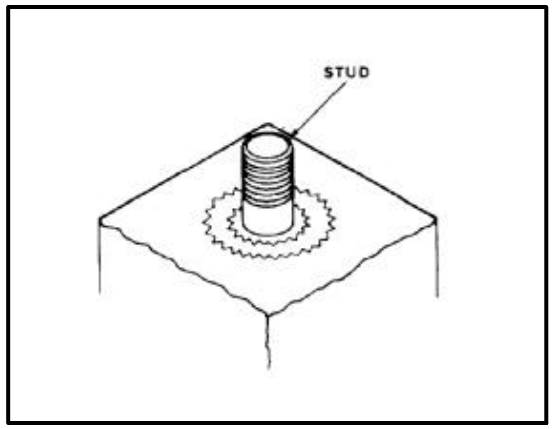
**NOTE**

Task can be done on installed component if stud is accessible.

***General Safety Instructions:***

**WARNING**

Epoxy primer (E292.1) is flammable and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from heat or open flame. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.



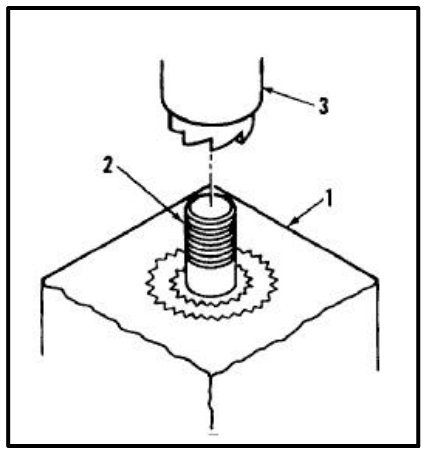
## 1-15 REPLACE LOCKED-IN STUD (AVIM) (Continued) 1-15

**NOTE**

Procedure is same to replace any locked-in stud. Typical stud shown here.

For more information on locked-in studs, refer to TM 43-0104.

If stud is broken off close to mounting surface, or if drill with speed below **700 rpm** is not available, go to step 9.



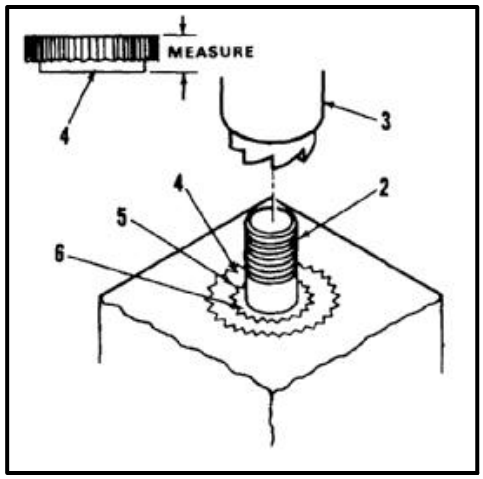

***REMOVE STUD WITH REMOVAL TOOLS***

1. Cover openings in component housing (1) in area of stud (2). Use barrier material (E80) and tape (E388).
2. Install removal tool (3) in drill or drill press.

| For Stud: | Use Tool: |
|---|---|
| MS51989-104 | SM91-16 |
| MS51989-105 | SM101-18 |
| MS51989-106 | SM111-20 |
| MS51989-107 | SM121-22 |
| MS51992B-504-13 | B1575 |
| SHF101-9SA(8)A | SM101-18 |
| ST-10045 | SM101-18 |

3. Measure and record thickness of replacement lock ring (4).

4. Position removal tool (3) over stud (2) and against lock ring (4).




**WARNING**

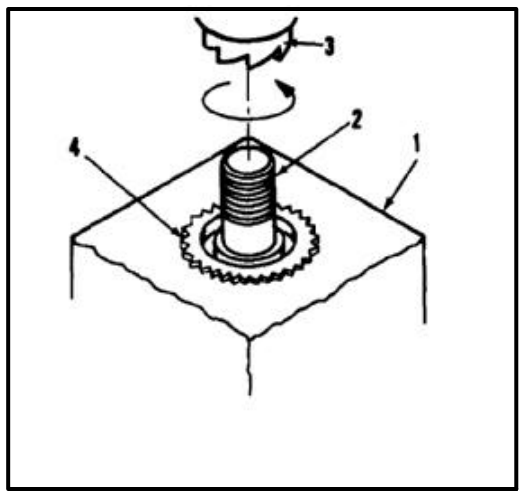
Do not operate removal tool above **700 rpm**. Make sure tool is against lock ring before operating. Otherwise, personal injury could result. If **700 rpm** drill is not available, go to step 9.

**NOTE**

Interlock area need not be cut away to full depth. Three-quarters depth is enough.

5. Cutaway interlock area (5) between stud flange (6) and lock ring (4) with tool (3). Do not drill deeper than lock ring thickness recorded in step 3. Use several light cuts. Pull back tool between cuts to clear chips and check depth.

6. Turn and remove stud (2) and remaining part of lock ring (4) from housing (1). Use plier wrench.



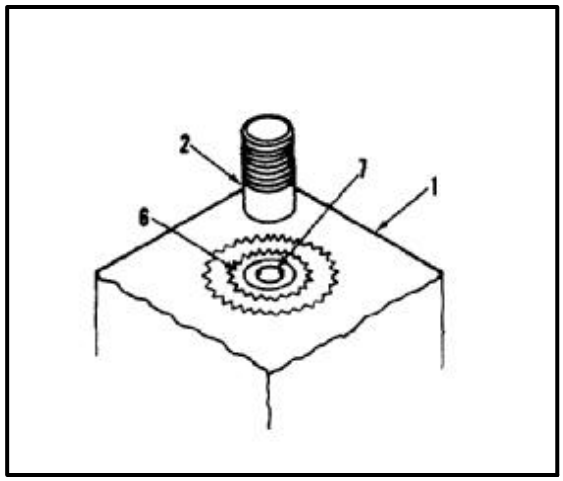

**NOTE**

As stud comes out, it will lift out remaining lock ring. If it does not, use punch to collapse and remove remaining part of ring.

7. Remove tool (3) from drill or drill press.

8. Go to step 15.

***REMOVE STUD WITH SCREW EXTRACTOR***

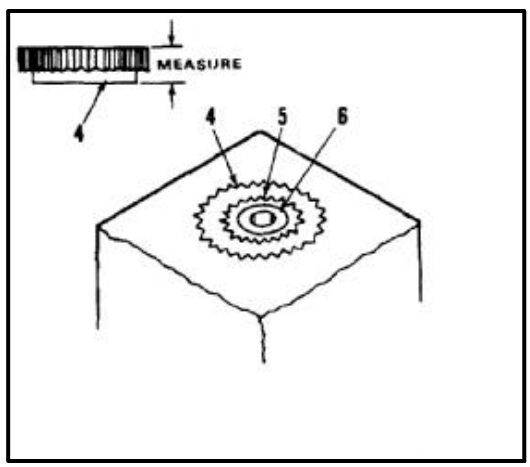



**NOTE**

Use screw extractor when stud is broken off or if drill with speed below **700 rpm** is not available.

9. Cut off stud (2) flush with housing (1).

10. Drill pilot hole (7) in center of stud flange (6) for screw extractor. Use drill smaller in diameter than stud (2). Do not drill through bottom of stud.




11. Install twist drill in drill or drill press.

| For Stud: | Use Drill: |
|---|---|
| MS51989-104 | 7 (0.201 Inch) |
| MS51989-105 | F (0.257 Inch) |
| MS51989-106 | 5/16 (0.312 Inch) |
| MS51989-107 | U (0.368 Inch) |
| MS519928-504-13 | 0.4375 Inch |
| SHF101-9SA(8)A | F (0.257 Inch) |
| ST-10045 | F (0.257 Inch) |

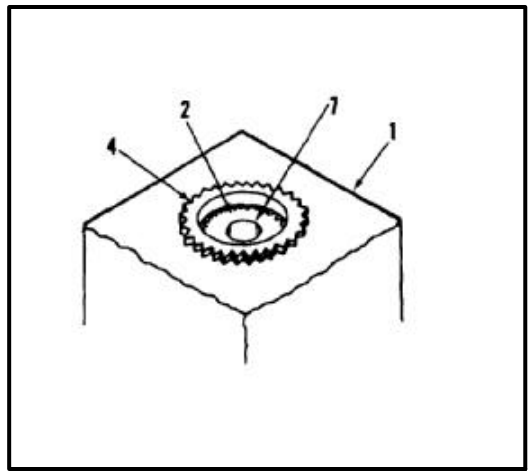
12. Measure and record thickness of replacement lock ring (3).

**NOTE**

Interlock need not be cut away to full depth. Three-quarters depth is enough.

13. Drill out interlock (5) between stud flange (6) and lock ring (4). Do not drill deeper than lock ring thickness recorded in step 12. Use several light cuts. Pull back drill between cuts to clear chips.

14. Turn and remove stud (2) and remaining part of lock ring (4) from housing (1). Use screw extractor in pilot hole (7).




**NOTE**

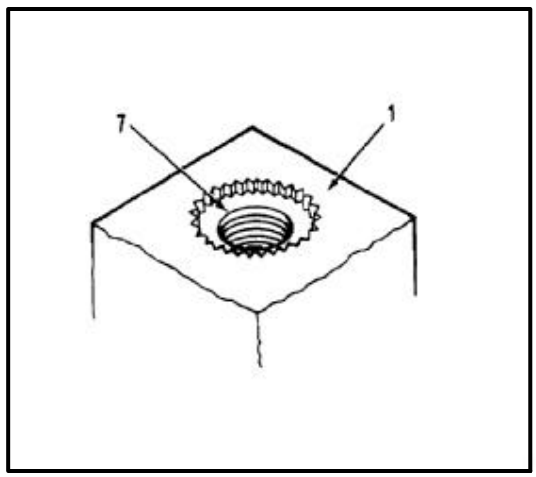
As stud comes out, it will lift out remaining lock ring. If it does not, use punch to collapse and remove remaining ring.

***INSTALL STUD***

CAUTION

When cleaning with compressed air, debris thrown by pressure can injure eyes. Do not use pressure over **30 psi**. Wear eye protection.

15. Clean any debris from hole (7) in housing (1). Use low-pressure compressed air.




CAUTION

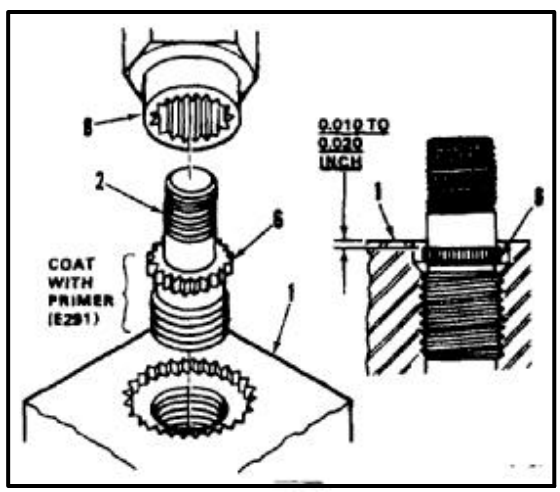
Stud can be damaged if not installed to correct depth.

**NOTE**

Install same size stud as removed.

16. Coat flange (6) and large thread of stud (2) with primer (E292.1). Wear gloves (E184.1).

17. Install stud (2). Use special wrench (8). Make sure top of flange (6) is **0.010 to 0.020 inch** below surface of housing (1).



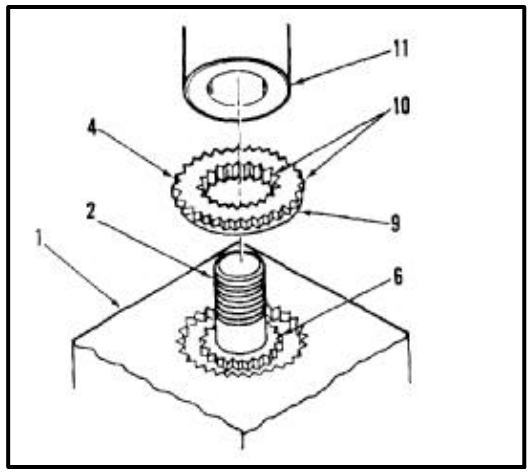
18. Coat lock ring (4) with primer (E292.1). Wear gloves (E184.1).

19. Position lock ring (4) over stud (2), undercut (9) toward housing (1). Align serrations (10) with serrations on housing and flange (6) as much as possible.

20 Drive lock ring (4) around flange (6) and into housing (1). Use special drive tool (11).

| For Stud: | Use Tool: |
|---|---|
| MS51989-104 | S91D-10 |
| MS51989-105 | S101D-12 |
| MS51989-106 | S111D-12 |
| MS51989-107 | S121D-12 |
| MS51992B-504-13 | SF5902-4D |
| SHF101-9SA(8)A | S101D-12 |
| ST-10045 | S101D-12 |

21. Remove any protective covering from area of stud (2) installation.




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 1-16 REPLACE SCREW-THREAD INSERT (AVIM) 1-16

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Machine Shop Set, NSN 4920-00-405-9279
Rosan Tool Kit, NSN 5180-00-778-3789
Source of Low Pressure Compressed Air (30 Psi or Less)
Goggles

***Materials:***

Barrier Material (E80)
Tape (E388)
Epoxy Primer (E292.1)
Gloves (E184.1)

***Parts:***

Lock Ring

***Personnel Required:***

Machinist
Inspector

***References:***

TM 43-0104
TM 55-1520-240-23P

***Equipment Condition:***

Off Helicopter Task

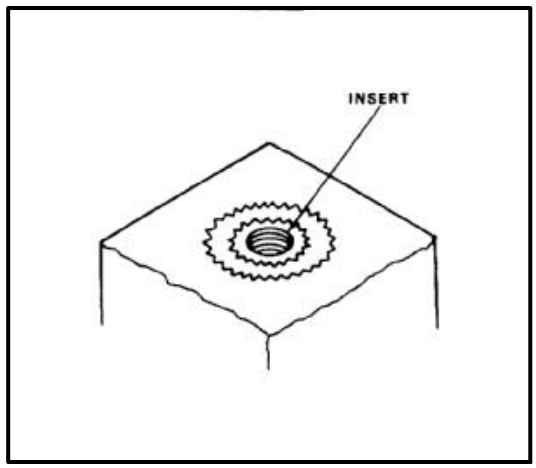
**NOTE**

Task can be done on installed component if insert is accessible.

***General Safety Instructions:***

**WARNING**

Epoxy primer (E292.1) is flammable and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from heat or open flame. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.



**NOTE**

Procedure is same to replace any screw-thread insert. Typical insert shown.

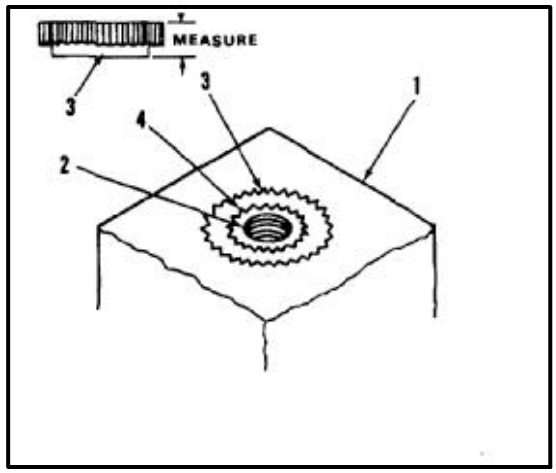
For more information on screw-thread inserts, refer to TM 43-0104.

1. Cover openings in housing (1) in area of insert (2). Use barrier material (E80) and tape (E388).

**NOTE**

Use drill press if possible.

2. Install drill bit in drill or drill press. Use **5/16 inch** drill for inserts MS51991-206 and MS51991-206L. Use **29/64 inch** drill for insert MS51991-208.




3. Measure and record thickness of replacement lock ring (3).

**NOTE**

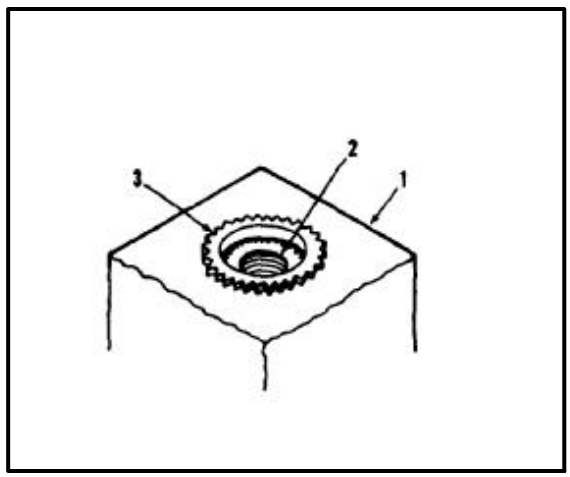
Interlock need not be drilled away to full depth. Three-quarters depth is enough.

4. Cut away interlock area (4) between insert (2) and lock ring (3) by drilling through center of insert. Do not drill deeper than lock ring thickness recorded in step 3. Use several light cuts. Pull back drill between cuts to clear chips and check depth.

**NOTE**

As insert comes out, it will lift out remaining part of lock ring. If it does not, use punch to collapse and remove remaining part of ring.

5. Turn and remove insert (2) and remaining part of lock ring (3) from housing (1). Use screw extractor.



**CAUTION**

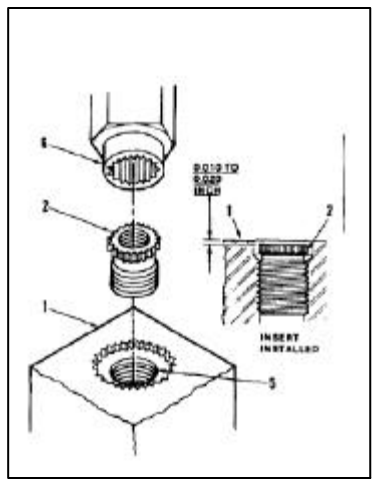
When cleaning with compressed air, debris thrown by pressure can injure eyes. Do not use pressure over **30 psi**. Wear eye protection.

6. Clean debris from hole (5) in housing (1). Use low-pressure compressed air.

**NOTE**

Install same size insert as removed.

7. Coat outside of insert (2) with primer (E292.1). Wear gloves (E184.1).



**CAUTION**

Insert can be damaged if not installed to correct depth.

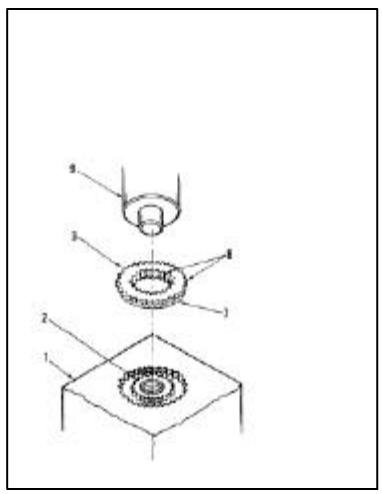
8. Install insert (2) with special wrench (6). Use wrench R1106W for inserts MS51991-206 and MS51991-206L. Use wrench R1108W for insert MS51991-208. Make sure top of insert is **0.010 to 0.020 inch** below surface of housing (1).

9. Coat lock ring (3) with primer (E292.1). Wear gloves (E184.1).

10. Install lock ring (3) around insert (2) undercut (7) toward housing (1). Align serrations (8) with serrations on housing and insert as much as possible.

11. Drive lock ring (3) around insert (2) and into housing (1) with special drive tool (9). Use tool R-206D for inserts MS51991-206 and MS51991-206L. Use tool R208-D for insert MS51991-208.

12. Remove any protective covering from area of insert (2) installation.



***INSPECT***

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

# SECTION IV
# TOOLS AND MATERIALS

## 1-17 SPECIAL TOOLS AND TEST EQUIPMENT 1-17

Special tools, containers, and test equipment are listed below. Each tool or piece of test equipment has an item number assigned for ease of location and reference. When an item number is unknown, locate special tools and test equipment by the alphanumeric arrangement within the table. When an item is referenced in the manual, locate the item by its T designator and item number. T designators are used only with special tools and test equipment. The special tools and test equipment table is found only within this chapter; therefore, the table number is not referenced within the text. A complete listing of all special tools, containers, and test equipment authorized for use to perform maintenance on CH-47D helicopter/accessories is in the helicopter parts manuals.

| ITEM NO. | PART NO. | NOMENCLATURE |
|---|---|---|
| 1 | 145G003-1 | Container, Aft Vertical Shaft |
| 2 | 145GS279-1 | Torque Applicator |
| 3 | 114E5903-1 | Sling Assembly, Engine Transmission |
| 4 | 114E5128-3 | Hoisting Unit |
| 5 | 145G0035-1 | Socket, Horizontal Hinge Pin, Locknut (End Cap) |
| 6 | 114E5803-1 | Pusher, Rotor Head |
| 7 | Model 247000 | OHM Meter, Low Resistance (Biddle) |
| 8 | 114E5809-1 | Puller, Outboard Seal |
| 9 | 114E5813-6 | Puller, Bearing, Rotor Head |
| 10 | 114E5814-7 | Puller, Bearing and Seal, Rotor Hub |
| 11 | 234G0096-1 | Drift, Outboard Seal Installation |
| 12 | 114E5824-4 | Guide Set, Roller Bearing Seals, Rotor Hub |
| 13 | 114E5840-1 | Adapter, Rotor Head Assembly |
| 14 | 114E5852-16 | Sling, Rotor Head Controls |
| 15 | 145E5871-1 | Adapter, Forward Transmission |
| 16 | 114E5872-35 | Adapter, Powerplant |
| 17 | 145E5874-1 | Adapter, Aft Transmission |
| 18 | 114E5878-60 | Adapter, Vertical Shaft Assembly |
| 19 | 114G0020-1 | Adapter, Rotary-Wing Set |
| 20 | 114E5888-1 | Adapter, Combining Transmission |
| 21 | 114G1025-1 | Heater Exhaust Cover |
| 22 | 114E5897-11 | Pin Set, Blade Folding Pitch Lock |
| 23 | PD1220B | Wrench Assembly, Torque |
| 24 | 114E5909-8 | Ring Assembly, Forward Transmission and Aft Vertical Shaft |
| 25 | 114G0039-1 | Tool Set (Easy-Out), Replacement, Tiedown Receiver |
| 26 | LTCT 23980-01 | Portable Cleaning and Preservation Unit |
| 27 | AN/PSM-45A | Digital Multimeter |
| 28 | 145G0037-1 | Reaction Adapter |
| 29 | 145G0141-1 | Socket, Hub Nut |
| 30 | 114E5899-19 | Lifting Device, Rotor Head Assembly |
| 31 | 114E5900-17 | Safety Blocks |

| ITEM NO. | PART NO. | NOMENCLATURE |
|---|---|---|
| 32 | 145E5902-1 | Hoisting Eye, Forward Transmission and Aft Shaft |
| 33 | 145G1471-1 | Guide, Lip Seal, Vertical Hinge Pin |
| 34 | 145E5903-1 | Sling Assembly, Combining Transmission |
| 35 | 145E5911-101 | Sling, Handling, Rotary-Wing Assembly |
| 36 | 145G0024-1 | Container, Combining Transmission |
| 37 | 145G0023-1 | Container, Aft Transmission |
| 38 | 114E5918-8 | Container, Engine Transmission |
| 39 | 145E5941-11 | Rigging Set, Controls |
| 40 | 114E5060-1 | Line Tiedown |
| 41 | 114E5998-1 | Rate Table, Aircraft Displacement (AN/ASM-120 equiv) |
| 42 | 145G5002-1 | Dummy Link Assembly (Dash Actuator), p/o 145E5941-11 (T39) |
| 43 | Deleted | |
| 44 | 145G5004-1 | Rigging Pin A, First Stage Mixing Linkage, p/o 145E5941-11 (T39) |
| 45 | 145G5004-2 | Rigging Pin B, First Stage Mixing Linkage, p/o 145E5941-11 (T39) |
| 46 | 145G5004-3 | Rigging Pin C, First Stage Mixing Linkage, p/o 145E5941-11 (T39) |
| 47 | PD1434 | Reaction Adapter Set, Vertical Hinge Pin |
| 48 | PD1201 | Torque Wrench |
| 49 | 114E51192 | Sling, p/o 114E5124-1 (T85) |
| 50 | 145E5996-1 | Securing Device, Aft Vertical Shaft |
| 51 | 145GO009-1 | AFCS Line Test Set |
| 52 | 145GO008-1 | AFCS Bench Test Set |
| 53 | 145GS278-1 | ILCA Bench Test Set |
| 54 | 114E5855-2 | Sling, Aft Pylon |
| 55 | 114E5856-22 | Skid, Aft Pylon |
| 55.1 | 1730CH47-002 | Outrigger, Aft Pylon Skid |
| 56 | 145G0054-1 | Test Manifold |
| 57 | Deleted | |
| 58 | 114G1023-25 | Rotary-Wing Head Covers Forward and Aft |
| 59 | 114G1024-1 | Heater Inlet Cover |
| 60 | 145G0004-1 | Hydraulic Cooler Exhaust Cover |
| 61 | 145G0005-1 | APU Exhaust Cover |
| 62 | 114GS215-1 | Spark Plug Thimble Gag |
| 63 | 114GS216-1 | Feeler Gage |
| 64 | 114GS225-1 | Spanner Wrench, Viscous Damper |
| 65 | 114G0019-1 | Accessory Kit, Track and Balance (VIBREX) |
| 66 | 145G0001-1 | Oil Cooler Inlet Cover |
| 67 | 145G0002-5 | Oil Cooler Exhaust Cover |

## 1-17 SPECIAL TOOLS AND TEST EQUIPMENT (Continued) 1-17

| ITEM NO. | PART NO. | NOMENCLATURE |
|---|---|---|
| 68 | 145GO002-6 | Oil Cooler Exhaust Cover |
| 69 | 114G0021-1 | Replacement Fixture, Nickel Erosion Cap |
| 70 | 114G0017-1 | Protective Cap, Vertical Pin |
| 71 | 114G1013-1 | Sling Assembly, Aircraft Housing |
| 72 | 114G1014-21 | Rigging Tool, Lead-Lag Damper |
| 73 | 114G1017-70 | Shipping Container, Rotary-Wing Head |
| 74 | 145G0022-1 | Shipping Container, Forward Transmission |
| 75 | 114G1034-46 | Steering Bar, Aft Landing Gear |
| 76 | 145G0003-1 | Air Inlet Cover |
| 77 | 114G1049-14 | Attachment Fittings, Transport Tiedown |
| 78 | 114G1102-11 | Assembly Fixture, Pitch Link |
| 79 | 114G1137-10 | Puller, Vertical Pin, Rotor Head |
| 80 | 114G1323-1 | Engine Outlet Cover |
| 81 | 114E5040-33 | Pitot Tube Cover |
| 82 | Deleted | |
| 83 | Deleted | |
| 84 | 114G1354-1 | Adapter, Handling |
| 85 | 114E5124-1 | Hoist, Aft Transmission |
| 86 | 114G0015-65 | Container, Shipping and Storage, Rotor Blade |
| 87 | 114G1185-1 | Pusher, Horizontal Hinge Pin |
| 88 | BH22231 | Heater Probe |
| 89 | 145G0059-1 | Bracket Locating Fixture |
| 90 | 114G1038-86 | Test Set, Hydraulic System |
| 91 | Deleted | |
| 92 | Deleted | |
| 93 | 145G0140-1 | Adapter, Socket, Forward Transmission Mounting Bolts |
| 94 | 114G1200-1 | Drift, Bearing, Aft Landing Gear |
| 95 | Deleted | |
| 96 | Deleted | |
| 97 | 114G1203-1 | Drift Bearing, Aft Landing Gear |
| 98 | 114G0018-6 | Puller/Pusher Damper Bracket Bushing |
| 99 | Deleted | |
| 100 | 114G1208-1 | Test Set, Viscous Damper |
| 101 | BH112JB-53 | Jetcal Analyzer, Temperature Tester |
| 102 | 114G1236-1 | Puller Assembly, Bearing, Pitch Housing |
| 103 | 145G0006-1 | Protective Cover, Cockpit |
| 104 | BH22101 | Test Harness, Engine PTIT indicator System and Power |

| ITEM NO. | PART NO. | NOMENCLATURE |
|---|---|---|
| 105 | 114G1263-1 | Swaging Tool, Pitch Link |
| 106 | 114G1306-7 | Setting Fixture, Blade Shock Absorber |
| 107 | 114G1322-1 | Container, Blade Lag Shock Absorber |
| 108 | 114G1334-1 | Staking Die, Shock Absorber Mount |
| 109 | 114G1359-1 | Staking Tool, Aft Engine Mount |
| 110 | 114G1373-1 | Fixture, Locating, Sliding Bearing, Rotor Head Controls |
| 111 | BH22223 | Tempcal Probe, Temperature Transmitter Chip Detector |
| 112 | 114G0188-1 | Test Harness, Self-Tuning Dynamic Absorber |
| 113 | 114G1410-1 | Locating and Drill Fixture, Brackets, Sync Shaft |
| 114 | 114G1411-1 | Locating and Drill Fixture, Brackets, Sync Shaft |
| 115 | 145G1414-1 | Test Harness Set, N1 Actuator System |
| 116 | 145G1004-1 | Repair Fixture, Rotor Blade Trailing Edge |
| 117 | 145G0055-1 | Test Block, Flight Control Power Control Module Accumulator |
| 118 | 145G0056-1 | Test Block, PTU Motor Shaft Seal |
| 119 | 145G5310-1 | Yaw Travel Quadrant, p/o 145E5941-11 (T39) |
| 120 | 145G5310-5 | Roll Travel Quadrant, p/o 145E5941-11 (T39) |
| 121 | 145G5310-8 | Pitch Travel Quadrant, p/o 145E5941-11 (T39) |
| 122 | 114E5941-4 | Thrust Rig Pin, p/o 145E5941-11 (T39) |
| 123 | 114E5941-21 | Cockpit Rig Fixture, p/o 145E5941-11 (T39) |
| 124 | 114E5941-26 | Pointer Assembly, p/o 145E5941-11 (T39) |
| 125 | 114E5941-57 | Control Stick Yoke, p/o 145E5941-11 (T39) |
| 126 | 114E5941-73 | Pedal Pointer, p/o 145E5941-11 (T39) |
| 127 | 114E5941-74 | Pedal Rig Pin, p/o 145E5941-11 (T39) |
| 128 | 114E5941-108 | Transfer Belicrank Rig Pin, p/o 145E5941-11 (T39) |
| 129 | Deleted | |
| 130 | 145G5306-1 | Dash Actuator Rigging Tool, p/o 145E5941-11 (T39l |
| 131 | 219G1001-1 | Engine Inlet Cover (Helicopter with Screens) |
| 132 | 114G1206-1 | Engine inlet Cover (Helicopter without Screens) |
| 133 | 114E5941-4 | Pallet Rig Pin, p/o 114E5941-11 (T39) |
| 134 | LTCT14700 | Sling, Engine |
| 135 | 114E5985-9 | Second Stage Rig Pin, p/o 114E5941-11 (T39) |
| 136 | D12102C01-1 | Repair Kit, Hydraulic Tube, p/o D12102C-15-H10 (T172) |
| 137 | D12102C06-06 | Repair Kit, Hydraulic Tube, p/o D12102C-15-H10 (T172) |
| 138 | D12102C09-04 | Repair Kit, Hydraulic Tube, p/o D12102C-15-H10 (T172) |
| 139 | D12025-001 | Power Supply, Hydraulic Tube Repair, p/o D12102C-15-H10 (T172) |
| 140 | KM 13 | Tool Kit, Rosan Adapter |
| 141 | KM 14 | Tool Kit, Rosan Adapter |

| ITEM NO. | PART NO. | NOMENCLATURE |
|---|---|---|
| 142 | KM 18 | Tool Kit, Rosan Adapter |
| 143 | KM 19 | Tool Kit, Rosan Adapter |
| 144 | KM 30 | Tool Kit, Rosan Adapter |
| 145 | KM 31 | Tool Kit, Rosan Adapter |
| 146 | 130-8500800 | Bender Set, Hydraulic Tube |
| 147 | REA048D | Drive Tool, Clinch Nut, Aft Transmission |
| 148 | REA064D | Drive Tool, Clinch Nut, Aft Transmission |
| 149 | RF12LPDE | Removal Tool, Rosan Adapters |
| 150 | RF16LPDE | Removal Tool, Rosan Adapters |
| 151 | RF9812DW | Drive Tool, Rosan Adapters |
| 152 | RF9816DW | Drive Tool, Rosan Adapters |
| 153 | TD428L | Insertion Tool, Cargo Hook |
| 154 | TD1032L | Insertion Tool, Cargo Hook |
| 155 | TKNC06 | Insertion Tool, Cargo Hook |
| 156 | Deleted | |
| 157 | 34-151 | Spanner Wrench-Spring Return Assembly Cargo Hook |
| 158 | 2TE414P0200-8 | Test Set, Fuel Vent Check |
| 159 | 145G0051-1 | Torque Reactor, Fwd Transmission Mounting Bolts |
| 160 | 145G0034-1 | Torque Plate, Aft Transmission |
| 161 | PD1612 | Tee Handle, p/o PD1220 (T23) |
| 162 | 1323TF100-1 | Test Fixture, Accumulator |
| 163 | 114E5924-1 | Sling, Handling, Aft Transmission (alternate, use with T3) |
| 164 | Deleted | |
| 165 | 114E6058-23 | Tackle Block |
| 166 | 1353AS100-1 | Bomb Hoist (NSN 1730-01-161-8623) |
| 167 | 756460/756461 | Seal and Window Retainer Installation Tool (NSN 5120-00-366-5065), p/o Kit CS1154 |
| 168 | 756470/756476 | Seal Filler Installation Tool (NSN 5120-00-075-8307), p/o Kit CS1154 |
| 169 | 114G1425-1 | Roller Staking Kit |
| 170 | MMM8897 | Spray Gun |
| 171 | 145G1019-29 | Trim Tab Fixture |
| 172 | D12102C-15-H10 | Tool Set, Hydraulic Tube |
| 173 | T-1FA13043-007 | Seal Installation Tool, Ramp Control Valve (Cage 26437) |
| 174 | T-1FA13043-007A | Seal Sizing Tool, Ramp Control Valve (Cage 26437) |
| 175 | T-1FA1305592 | Seal Installation Tool, Ramp Control Valve (Cage 26437) |
| 176 | T-1FA1305593 | Seal Sizing Tool, Ramp Control Valve (Cage 26437) |
| 177 | T-1FA1305594 | Seal Sizing Tool, Ramp Control Valve (Cage 26437) |

| ITEM NO. | PART NO. | NOMENCLATURE |
|---|---|---|
| 178 | TF-1FA1304375 | Thermal Relief Valve Test Fixture, Ramp Control Valve (Cage 26437) |
| 179 | TP-1FA1304375 | Plug, Thermal Relief Valve Test, Ramp Control Valve (Cage 26437) |
| 180 | Deleted | |
| 181 | 130-850080 | Tube Bending Set, Acro |
| 182 | 234SK033-3 | Tool Kit, Combining Transmission Support Fitting Replacement |
| 183 | PSD60-1AF | Fuel Quantity Test Set |
| 184 | PSDAF-106 | Fuel Quantity System Test Cable ‘Dual T’ (use with T183) |
| 185 | TTU-27/E | Tester, Tachometer |
| 186 | GECC4-00000-10 | Aircraft Weighing Kit |
| 187 | SK31046-11 | Repair Kit, Lag Damper Bracket Oversized Bushing |
| 188 | 98-160 | EAPS Lifting Device (NSN 2945-01-488-6009) |
| 189 | ACA24913D606A | Extractor, Impeller |
| 190 | ACA24913D608A | Gauge, Blade Erosion |
| 191 | 1479AS200-1 | Towbar, Aircraft |
| 192 | 02314-0023-001 | Wrench, Spanner |
| 193 | | Resistor Box |
| 194 | | Switch, Rotary |
| 195 | | Coupling |

END OF TASK

## 1-18 EXPENDABLE MATERIALS 1-18

Expendable maintenance supplies and materials used in this manual are listed in the table. An item number is assigned to each expendable for ease of location and reference. Wherever they appear in the manual, item numbers are preceded by an E to identify them as expendable. For instance, dry cleaning solvent, type II has the number E162. All expendable numbers in this manual refer to the table in this task. The most current military specification number or national stock number can be found in the current version of the AMDF or FEDLOG.

| ITEM NO. | NOMENCLATURE | MILITARY SPECIFICATION | NSN |
|---|---|---|---|
| 1 | Abrasive cloth, aluminum oxide, grade 600 to 800 | P-C-451 | — |
| 2 | Abrasive pad, Scotch Brite, type A, Minnesota Mining and Mfg Co (or equiv) | — | 7910-00-753-5242 |
| 3 | Abrasive mat, fine grade | MIL-A-9962 | 5350-00-967-5093 |
| 4 | Deleted | | |
| 5 | Abrasive paper, silicone carbide, waterproof 60-grit | P-P-101 | 5350-00-619-9168 |
| 6 | Abrasive paper, silicone carbide, waterproof 80-grit | P-P-101 | 5350-00-619-9167 |
| 7 | Abrasive paper, silicone carbide, waterproof 120-grit | P-P-101 | 5350-00-721-8115 |
| 8 | Abrasive paper, silicone carbide, waterproof 180-grit | P-P-101 | 5350-00-721-8117 |
| 9 | Abrasive paper, silicone carbide, waterproof 240-grit | P-P-101 | 5350-00-224-7207 |
| 10 | Abrasive paper, silicone carbide, waterproof 280-grit | P-P-101 | 5350-00-224-7205 |
| 11 | Abrasive paper, silicone carbide, waterproof 320-grit | P-P-101 | 5350-00-192-5080 |
| 12 | Abrasive paper, silicone carbide, waterproof 360-grit | P-P-101 | 5350-00-224-7202 |
| 13 | Abrasive paper, silicone carbide, waterproof 400-grit | P-P-101 | 5350-00-224-7201 |
| 14 | Abrasive paper, silicone carbide, waterproof 500-grit | P-P-101 | 5350-00-224-7216 |
| 15 | Abrasive paper, silicone carbide, waterproof 600-grit | P-P-101 | 5350-00-224-7215 |
| 16 | Accelerator and cement, 1895C, Goodyear Tire and Rubber Co. (or equiv) | — | 8040-01-028-9866 |
| 17 | Accelerator, 1465C, for 1462C cement, Goodyear Tire and Rubber Co. (or equiv) | — | 2640-00-856-7153 |
| 18 | Accelerator, 611, for 610 filler Resin, Palmer Products Co. Inc. (or equiv) | — | — |
| 19 | Adhesive, 80C29 Goodyear Tire and Rubber Co. (or equiv) | — | 8040-00-518-3455 |
| 20 | Acetone, technical | O-A-51 | 6810-00-184-4796 |
| 21 | Acid, acetic, glacial technical | O-A-76D | 6810-00-275-1215 |
| 22 | Acid, nitric, technical, MS36047 | O-N-350 | 6810-00-237-2918 |
| 23 | Acid, sulfuric, technical | O-S-809 | 6810-00-251-8007 |
| 24 | Activator, Scotchcal A-2, Minnesota Mining and Mfg. Co. (or equiv) | — | 8040-00-028-7098 |
| 25 | Adhesive, air-drying, silicone rubber | MIL-A-25457 | |
| 26 | Adhesive, bonding | MMM-A-121 | 8040-00-273-8716 |
| 27 | Adhesive, EC2216, parts A and B, type 38 | MMM-A-132 | 8040-01-035-2845 |

## 1-18 EXPENDABLE MATERIALS (Continued) 1-18

| ITEM NO. | NOMENCLATURE | MILITARY SPECIFICATION | NSN |
|---|---|---|---|
| 28 | Adhesive, epoxy resin, metal-to-metal structural bonding | MMM-A-134 | 8040-00-900-6295 |
| 29 | Adhesive, S1006, Raychem Corp. (or equiv) | — | 8040-01-127-9256 |
| 30 | Adhesive, polyurethane, EC-3549 B/A (2 parts), Minnesota Mining and Manufacturing Co. (or equiv) | — | 8040-01-016-4726 |
| 31 | Adhesive, Pliobond No 20, Goodyear Tire and Rubber Co. (or equiv) | — | 8040-00-200-9190 |
| 32 | Adhesive, Proseal 590M, Hexcel Corp. | — | |
| 33 | Adhesive consisting of: Component AB, Hysol 4405; and Component CD, Hysol 3538, Hysol Corp. (or equiv) | — | 8040-00-104-9505 |
| 34 | Adhesive consisting of: Component AB, Sa Co 2862 (Component 1); and Component CD, Sa Co 2862 (Component 2), Union Oil Co., Inc. (or equiv) | — | — |
| 35 | Adhesive consisting of: Component AB, XS-1173625A; and Component CD, XS-1173625B, Minnesota Mining and Mfg. Co. (or equiv) | — | — |
| 36 | Adhesive consisting of: Component AB, 183-C-417; and Component CD, 183-C-418, W.P. Fuller Paint Co. (or equiv) | — | — |
| 37 | Adhesive consisting of: Compound AB, 522; and Compound-CD, 542, Technical Research Co. (or equiv) | — | — |
| 38 | Adhesive consisting of: 190-H-1 Resin and 191-B-10 Catalyst, W.P. Fuller and Co. (or equiv) | — | — |
| 39 | Adhesive consisting of: 190-H-1 Resin and 191-C-21 Catalyst, W.P. Fuller and Co. (or equiv) | — | — |
| 40 | Deleted, replaced by (E41) | | |
| 41 | Adhesive EA 9309 NA, Dexter Corp. (Note A) | — | 8040-01-163-3481 |
| 41.1 | Adhesive, EA 934 NA, Hysol Corp. | MMM-A-132 | 8040-00-123-6954 |
| 42 | Adhesive, EC1239B-1/2 and EC1239B-4, Minnesota Mining and Mfg. Co. (or equiv) | MIL-S-8802 | 8030-00-753-5004<br>8030-00-850-0759 |
| 43 | Adhesive, EC-2216, Parts A and B, Minnesota Mining and Materials Mfg. Co. (or equiv) | MMM-A-132 | 8040-00-145-0019 |
| 44 | Adhesive, EC-776, Minnesota Mining and Mfg. Co. (or equiv) | — | 8040-00-664-0439 |
| 45 | Adhesive, EPON VI | MMM-A-134 | 8040-00-200-4390 |
| 46 | Adhesive, EPON VIII | MMM-A-134 | 8040-00-531-8030 |
| 47 | Adhesive, Epocast 50-A, M & T Chemicals, Inc. (or equiv) | — | — |
| 47.1 | Adhesive, EPON 828, Shell Chemical Co. (or equiv) | — | 8030-00-086-1506 |
| 48 | Adhesive, EPON 901, Shell Chemical Co. (or equiv) | — | 8040-00-831-3403 |
| 49 | Adhesive, fuel cell repair | MIL-A-9117B | 8040-00-262-9060 |
| 49.1 | Adhesive, oil resistant fluorosilicone, Q4-2817 Dow Corning (or equiv) | — | — |

**1-18 EXPENDABLE MATERIALS (Continued) 1-18**

| ITEM NO. | NOMENCLATURE | MILITARY SPECIFICATION | NSN |
|---|---|---|---|
| 50 | Adhesive pack, No. 8055-63, Fenwal Laboratories (or equiv) | — | — |
| 50.1 | Adhesive, Permabond 910 | MIL-A-46050 | — |
| 51 | Adhesive, ProSeal 719B-1/2, 719B-2, and 719B-4, Hexcel Co. (or equiv) | — | 8040-01-105-9100 |
| 52 | Adhesive, ProSeal 501, Hexel Co. (or equiv) | — | 8040-00-126-7798 |
| 53 | Adhesive, PR1710, Products Research Corp. (or equiv) | — | 8040-00-142-9721 |
| 54 | Adhesive, PR9021-B-2 and PR9021-B-4, Products Research Co. (or equiv) | — | 8030-01-058-9968 |
| 55 | Adhesive, room temp curing SRC-18 catalyst, General Electric Corp. (or equiv) | — | 8040-01-115-4715 |
| 56 | Adhesive, room temp curing SR529 resin, General Electric Corp. (or equiv) | — | 8040-00-149-0136 |
| 57 | Adhesive, RTV108, General Electric Corp. (or equiv) | MIL-A-46106 | 8040-00-843-0802 |
| 58 | Adhesive, RTV102, General Electric Corp. (or equiv) | MIL-A-46106 | 8040-00-877-9872 |
| 59 | Adhesive, Tereco No. 68, Technical Research Co. (or equiv) | — | — |
| 59.1 | Adhesive, TJE-614, 3-1/2 oz tube, TJ Electronics, Arlington, TX | — | — |
| 60 | Adhesive, Uralane 5716, Parts A and B, Furane Plastics (or equiv) | — | 8040-00-828-4936 |
| 61 | Adhesive, Uralane 8089, Parts A and B, Furane Plastics (or equiv) | — | 8040-00-828-4936 |
| 62 | Adhesive, 6263A, Minnesota Mining and Manufacturing Co. | — | 8040-01-004-6194 |
| 63 | Adhesive | MIL-A-46050 | 8040-01-090-9320 |
| 63.1 | Sealant, Pro Seal 870, type II (or equiv) | MIL-PRF-81733 | 8030-01-361-1814 |
| 63.2 | Adhesive, Repair, Two Part Set 82C18, Goodyear Tire & Rubber Co. | — | 8040-01-129-2559 |
| 63.3 | Adhesive, Barrier, 82C12, Goodyear Tire & Rubber Co. | — | 8040-01-129-2558 |
| 63.4 | Adhesive, 82C16, Goodyear Tire & Rubber Co. | — | — |
| 63.5 | Adhesive, 82C17, Goodyear Tire & Rubber Co. | — | — |
| 64 | Alcohol, isopropyl, commercial grade | TT-1-735 | 6810-00-855-6160 |
| 65 | Alodine 1200 powder, American Chemical Co. (or equiv) | MIL-C-81706 | 8030-00-057-2354 |
| 66 | Aluminum foil | QQ-A-1876 | 9535-00-752-9061 |
| 66.1 | Aluminum plate, 2024-T3 | QQ-A-250/5 | 9535-00-167-2173 |
| 67 | Aluminum plate, 0.375 inch thick | — | — |
| 68 | Aluminum bar, 1 inch square | — | — |
| 69 | Aluminum rod, 2024, 0.25 inch dia. | QQ-A-225/6 | 9530-00-228-9312 |

## 1-18 EXPENDABLE MATERIALS (Continued) 1-18

| ITEM NO. | NOMENCLATURE | MILITARY SPECIFICATION | NSN |
|---|---|---|---|
| 70 | Aluminum sheet, 0.032 inch thick | QQ-A-250 | — |
| 71 | Aluminum sheet, 0.040 inch thick | QQ-A-250 | — |
| 71.1 | Aluminum tubing, 0.250 inch outside diameter, 0.022 inch wall thickness | MIL-T-7081 | 4710-00-993-0482 |
| 71.2 | Aluminum Sheet, 2024-T3, 0.050 inch thick | QQ-A-250/5 | — |
| 72 | Aluminum wool, types II and III | MIL-A-4864 | 5350-00-286-4851 |
| 73 | Ammonium hydroxide, technical | O-A-451 | 6810-00-222-9643 |
| 74 | Anti-icing and deicing-defrosting fluid | MIL-A-8243 | 6850-00-558-1248 |
| 75 | Antiseize compound, molybdenum disulfide-petrolatum | MIL-T-83483 | 8030-00-087-8630 |
| 76 | Antiseize thread compound | MIL-T-22361 | 8030-00-292-1102 |
| 77 | Antiseize and thread sealing compound | MIL-T-5542 | 8030-00-530-5234 |
| 78 | Bag, plastic, 6 inch X 9 inch | A-A-1668 | 8105-00-579-9285 |
| 79 | Bake coating, EV-6174, Bee Chemical Co. (or equiv) | — | — |
| 80 | Barrier material, grade A | MIL-B-121 | 8135-00-753-4661 |
| 81 | Barrier material, water vapor proof, class I | MIL-B-131 | 8135-00-282-0565 |
| 81.1 | Battery, AA Alkaline | — | — |
| 82 | Box, shipping, fiberboard | PPP-B-636 | 8115-00-222-3022 |
| 82.1 | Bottle, Oil Sampling | MIL-B-44054 | 8125-01-082-9697 |
| 83 | Boric acid, ACS | MIL-STD-1218 | 6810-00-264-6535 |
| 83.1 | Brazing alloy, silver | MIL-8-15325 | 3434-01-089-9014 |
| 84 | Brush, cleaning-for bore, chamber and firing pin hole of small arms | MIL-B-20100 | — |
| 85 | Brush, non-metallic, type 3, size 5-3/8 diameter, round | MIL-B-23958 | 7920-00-051-4384 |
| 85.1 | Brush, stencil | H-B-00621 | 7920-00-223-7998 |
| 85.2 | Brush, scrub, pot and pan | H-B-1490-6 | — |
| 86 | Brush, acid swabbing | H-B-643 | 7920-00-514-2417 |
| 87 | Buffing and polishing compound | MIL-B-16909 | 5350-00-240-2213 |
| 88 | Buffing compound, Learock No. 5-30, Lee Mfg. Co. (or equiv) | — | — |
| 89 | Buffing compound, Learock No. 888, Lee Mfg. Co. (or equiv) | — | 5350-00-165-7145 |
| 90 | Calcium fluoride, powder reagent, MS36117 | MIL-STD 1218/1222 | 6810-00-262-8574 |
| 91 | Calcium sulphate, technical grade | — | — |
| 92 | Carbon dioxide, technical, solid (dry ice) | BB-C-104A | 6830-01-011-7848 |
| 93 | Castor oil | JJJ-C-86 | 9150-00-261-7455 |
| 94 | Catalyst B1, for EPON 901, Shell Chemical Co. (or equiv) | — | 8040-00-831-3403 |

## 1-18 EXPENDABLE MATERIALS (Continued) 1-18

| ITEM NO. | NOMENCLATURE | MILITARY SPECIFICATION | NSN |
|---|---|---|---|
| 95 | Catalyst B3, for EPON 903, Shell Chemical Co. (or equiv) | — | — |
| 96 | Catalyst, PS-18, Component B | MIL-A-8576 | 8040-00-266-0215 |
| 97 | Catalyst, PS-30, Component B | — | 8040-01-152-2312 |
| 98 | Cellophane, sheet, commercial grade | L-C-110 | 8135-00-582-5170 |
| 99 | Cement, EC1128, Minnesota Mining and Mfg. Co. (or equiv) | — | 8040-00-917-9932 |
| 100 | Cement, EC826 (or equiv) | MMM-A-1617 | 8040-00-262-9011 |
| 101 | Cement, M6249, US Rubber Co. (or equiv) | — | — |
| 102 | Cement, PS-18 | MIL-A-25055 | 8040-00-266-0815 |
| 103 | Cement, ProSeal 590M, Hexcel Corp. (or equiv) | — | 8030-00-714-3013 |
| 104 | Deleted | | |
| 105 | Cement resin, PS-18, component A | MIL-A-8576 | 8040-00-526-1910 |
| 106 | Cement, Scotch-Grip 1357 | — | 8040-00-262-9005 |
| 107 | Cement, 00063, Goodyear Tire and Rubber Co. (or equiv) | — | — |
| 108 | Cement, 1942C, Goodyear Tire and Rubber Co. (or equiv) | — | — |
| 109 | Cement, 80027, Goodyear Tire and Rubber Co. (or equiv) | — | — |
| 110 | Chalk, marking | SS-C-266 | 7510-00-164-8893 |
| 111 | Chamois leather, sheepskin, oil-tanned | KK-C-300 | 8330-00-823-7545 |
| 112 | Cheesecloth, type 2, class B | CCC-C-440 | 8305-00-267-3015 |
| 113 | Chemical films and chemical films materials for aluminum and aluminum alloys, class 1A | MIL-C-5541 | 8030-00-811-3723 |
| 114 | Chromic acid (chromium trioxide), technical grade | O-C-303 | 6810-00-264-6517 |
| 114.1 | Deleted | | |
| 115 | Cleaner, glass, liquid, type 1, class 1 | P-G-406 | 7930-00-664-6910 |
| 116 | Cleaner, Ultrasene, Atlantic Refining Co. (or equiv) | — | — |
| 117 | Cleaning compound, aircraft surface, alkaline water base | MIL-C-25769 | 6850-00-935-0995 |
| 117.1 | Cleaning compound, aircraft exterior surface, water soluble | MIL-C-87936 | — |
| 118 | Cleaning compound, windshields, Indosil 21, Indosil Co. (or equiv) | P-C-438 | 6850-00-935-0985 |
| 119 | Cleaning compound, aircraft surface | MIL-C-43616 | 6850-01-045-7929 |
| 120 | Cloth, cleaning | CCC-C-46A | 8305-00-753-2967 |
| 121 | Cloth, cotton, airplane | MIL-C-5646 | 8305-00-191-3977 |
| 122 | Cloth, crocus | P-C-458 | 5350-00-221-0872 |
| 123 | Cloth, emery, No. 120 grit, commercial grade | GGG-C-520 | 5350-00-865-5688 |

| ITEM NO. | NOMENCLATURE | MILITARY SPECIFICATION | NSN |
|---|---|---|---|
| 124 | Cloth, emery, No. 180 grit, commercial grade | GGG-C-520 | 5350-00-854-6989 |
| 125 | Cloth, emery, No. 220 grit, commercial grade | GGG-C-520 | 5350-00-174-1000 |
| 126 | Cloth, emery, No. 520 grit, commercial grade | GGG-C-520 | 5350-00-174-0997 |
| 127 | Cloth, emery, No. 600 grit, commercial grade | GGG-C-520 | 5350-00-174-0985 |
| 128 | Cloth, flannel, cotton (or equiv) | CCC-C-458 | 8305-00-222-2460 |
| 129 | Cloth, glass, No. 128 | MIL-C-9084 | 8305-01-007-2670 |
| 130 | Cloth, glass, No. 181 | MIL-C-9084 | 8305-00-530-0109 |
| 131 | Cloth, glass, No. 181-75 | MIL-C-9084 | — |
| 132 | Deleted. Use item 130 | | |
| 132.1 | Cloth, glass, 181-150 | MIL-C-9084 | — |
| 132.2 | Cloth, glass, 181-77 | MIL-C-9084 | — |
| 133 | Cloth, glass finished, for polyester resin laminates | MIL-C-9084B | — |
| 134 | Cloth, Holland, 3-ounce minimum weight per square yard | MIL-C-17564 | 8305-00-286-5050 |
| 134.1 | Cloth, Lint Free | MIL-C-24671 | 4470-01-498-8080 |
| 135 | Cloths | DDD-R-30 | 7930-00-205-1711 |
| 135.1 | Maintenance Kit, rotor, anti-static, Task Research, Inc. | — | 1615-01-180-2624 |
| 135.2 | Coating, anti-static (P/O kit 135.1 NSN 1615-01-180-2624), Task Research, Inc. | — | 1615-01-205-6138 |
| 135.3 | Coating, Base, ALBI107A-15X0100-01 | — | 8010-01-327-5404 |
| 135.4 | Coating, Top, ALBI1144-15X0410-01 (Gray) | — | 8010-01-327-5403 |
| 135.5 | Coating, Anti-static, type III | BMS 10-21 | 8010-01-408-9236 |
| 135.6 | Coating, Top, ALBI144-15X0400-01 (White) | BMS 10-21 | 8010-01-327-5405 |
| 135.7 | Deleted | | |
| 136 | Coating, epoxy, color No. 16081 | MIL-C-22750 | 8010-00-112-0724 |
| 137 | Coating, epoxy, kit color No. 37038 | M22750F-004P-37038 | 8010-01-419-1142 |
| 137.1 | Finish coating | MIL-F-7179 | |
| 138 | Coating, sprayable, strippable, protective | MIL-C-6799 | 8030-00-721-9380 |
| 139 | Core material, aluminum, 2.3-3/8-15N5052 | MIL-C-7438 | — |
| 140 | Core material, aluminum, 3.0-3/8-20N5052 | MIL-C-7438 | — |
| 141 | Core material, aluminum, 3.4-1/4-15N5052 | MIL-C-7438 | 5680-01-283-0092 |
| 142 | Core material, aluminum, 4.3-1/4-20N5052 | MIL-C-7438 | — |
| 143 | Core material, aluminum, 4.3-3/8-50N5052 | MIL-C-7438 | 5680-00-926-4637 |
| 144 | Core material, aluminum, 22.1-1/8-60N5052 | MIL-C-7438 | 5680-00-106-9415 |
| 145 | Core, honeycomb, Nomex, 1/8 inch cell, grade 3.0, full depth, 36 inches long | — | 5680-01-122-8726 |
| 146 | Core, honeycomb, Nomex, 3/16 inch cell, grade 2.0, full depth, 36 inches long | — | 5680-01-084-3900 |

| ITEM NO. | NOMENCLATURE | MILITARY SPECIFICATION | NSN |
|---|---|---|---|
| 147 | Core, honeycomb, Nomex, 1/8 inch cell, grade 3.0, 1/2 X 17 X 36 inches | — | — |
| 148 | Core, honeycomb, Nomex, 3/16 inch cell, grade 2.0 1/2 X 17 X 36 inches | — | — |
| 149 | Core, honeycomb, Nomex, 1/8 inch cell, grade 3.0 1/4 X 17 X 36 inches | — | — |
| 150 | Core, honeycomb, Nomex, 3/16 inch cell, grade 2.0 1/4 X 17 X 36 inches | — | — |
| 150.1 | Core, honeycomb, Nomex, HRH-10-3/16-4.0, Hexcel Corp. (or equiv) | — | 5680-01-303-4041 |
| 150.2 | Core, honeycomb, Nomex, HRH-10/OX-3/16-4.0, Hexcel Corp. (or equiv) | — | 5680-01-303-4042 |
| 150.3 | Core, Honeycomb, Glass HRP 3/16-3.5 Hexcel Corp. (or equiv) | — | — |
| 151 | Cord, glass, class EC-6 | MIL-Y-1140 | 4020-00-530-2757 |
| 152 | Corrosion-preventive compound, type I and III, aircraft engine | MIL-C-6529 | 6850-00-281-2031 |
| 153 | Corrosion-preventive compound, cold application, grade 2 | MIL-C-16173 | 8030-00-244-1297 |
| 154 | Corrosion-preventive compound, hot application, grade 3 | MIL-C-1 1796 | 8030-00-576-8360 |
| 154.1 | Corrosion-preventive compound, WD-40, LPS-2 (or equiv) | — | 8030-00-838-7789 |
| 155 | Corrosion-preventive compound, water displacing, clear, Amiguard, class A, type I, aerosol spray | MIL-C-85054 | 8030-01-044-1596 |
| 155.1 | Corrosion-preventive compound, water displacing, clear, Amiguard, class B, type II, qt container | MIL-C-85054 | 8030-01-045-4780 |
| 155.2 | Corrosion-preventive compound, water displacing, ultra-thin film, type II, class 1, 5 gal | MIL-C-81309 | 8030-00-262-7358 |
| 155.3 | Corrosion-preventive compound, water displacing, ultra-thin film, type II, class 2, 55 gal | MIL-C-81309 | 8030-00-524-9487 |
| 155.4 | Corrosion-preventive compound, water displacing, ultra-thin film, type II, class 2, 16 ounce aerosol spray | MIL-C-81309 | 8030-00-938-1947 |
| 155.5 | Corrosion-preventive compound, water displacing, ultra-thin film, type III, class 2, 16 ounce aerosol spray | MIL-C-81309 | 8030-00-546-8637 |
| 155.6 | Corrosion-preventive compound, solvent cutback, cold application, grade 4, pt | MIL-C-16713 | 8030-00-903-0931 |
| 155.7 | Corrosion-preventive compound, solvent cutback, cold application, grade 4, gal | MIL-C-16173 | 8030-00-062-5866 |
| 155.8 | Corrosion-preventive compound, solvent cutback, cold application, grade 4, 5 gal | MIL-C-16173 | 8030-00-526-1605 |
| 156 | Cotton, Purified, USP | BJJJ-C-561 | 6810-00-201-4000 |
| 157 | Cup, Polyethylene | — | — |
| 158 | Curing agent DTA | O-D-1271 | 6810-00-995-4804 |

| ITEM NO. | NOMENCLATURE | MILITARY SPECIFICATION | NSN |
|---|---|---|---|
| 158.1 | Curing agent polyamide versamid 140, Henkel Corp. (or equiv) | — | 8040-00-105-0826 |
| 159 | Descaling compound, alkaline, hot section jet engine parts | MIL-D-26549 | 6850-00-597-1528 |
| 159.1 | Detergent, general purpose | MIL-D-16791 | 7930-00-527-1237 |
| 160 | Desiccant | MIL-D-3464 | 6850-00-274-5421 |
| 160.1 | Dowel, hardwood, 0.855 inch diameter, 5 inches long | — | — |
| 160.2 | Dowel, hardwood, 1.0 inch diameter, 3 inches long | — | — |
| 160.3 | Dowel, nylon or Delrin, 3/4 inch diameter, 9 inches long, FM1001, Polymer Corp. (or equiv) | — | 9390-00-973-5227 |
| 160.4 | Doubler, nose cap repair (Blade) | — | 1560-01-318-8603 |
| 161 | Dry cleaning solvent, type I | P-D-680 | 6850-00-264-9037 |
| 162 | Dry cleaning solvent, type II | P-D-680 | 6850-00-285-8011 |
| 163 | Ease-Off 990, Texacone Co. (or equiv) | — | 8030-00-778-4277 |
| 164 | Enamel, electrical insulating, Glyptal 1201 | MIL-E-22118 | 5970-00-161-7421 |
| 165 | Enamel, exterior gray | MIL-E-15936 | 8010-00-079-2455 |
| 166 | Epoxy topcoat, gray, parts A & B color No. 16081 gloss, Fed STD 595 | MIL-C-22750 | 8010-01-082-3060 |
| 166.1 | Epoxy topcoat, glossy orange-yellow, No. 13538 | MIL-C-22750 | 8010-01-053-2650 |
| 166.2 | Epoxy topcoat, glossy white, No. 17875 | MIL-C-22750 | 8010-01-141-2459 |
| 166.3 | Epoxy, clear overcoating | MIL-C-22750 | — |
| 166.4 | Epoxy coating, flat gray, No. 36231 | MIL-C-22750 | — |
| 167 | Ethyl alcohol (denatured) | O-E-760 | 6810-00-823-8003 |
| 168 | Fiberglass laminate, 0.018 inch thick (Narmco 5216) | — | — |
| 168.1 | Fiberglass laminate, A02R1753-1 | — | 1615-01-078-4684 |
| 168.2 | Fiberglass Repair Kit | — | 1560-00-169-9222 |
| 169 | Fabreeka, Fabreeka Products Co. (or equiv) | — | — |
| 170 | Fabric, Teflon-impregnated | — | 8305-01-034-3563 |
| 170.1 | Fuel Cell Repair Kit | — | 1560-01-288-2332 |
| 170.2 | Item 170.2 Replaced by 170.1 | — | — |
| 170.3 | Fabric, Organic Fiber (Kevlar) | — | 1680-01-196-8355 |
| 170.4 | Fiberglass Repair Kit | — | 1560-00-169-9222 |
| 171 | Filler, Cabo-Sil, Godfrey L. Cabot Inc. (or equiv) | — | 8010-00-060-3253 |
| 172 | Filler, Corfil 615, Bloomingdale Rubber Co. (or equiv) | — | 8030-00-149-0137 |
| 172.1 | Filler, foam, Isofoam PE2, res PEW | MIL-F-83671 | 9330-00-904-7951 |
| 173 | Filler, EA934 B/A, Hysol Div., Dexter Co. | — | 8040-00-016-8662 |
| 174 | Film, type I (Transparent Barrier Material) | MIL-F-22191 | — |
| 175 | Fingerprint Remover, corrosion-preventive | MIL-C-15074 | 8030-00-252-8301 |

| ITEM NO. | NOMENCLATURE | MILITARY SPECIFICATION | NSN |
|---|---|---|---|
| 176 | Fluid, damping, type DC510, viscosity 500 cstk, Dow-Corning Corp. | — | 9150-01-056-9047 |
| 177 | Fluid, damping, type DC510, viscosity 1,000 cstk, Dow-Corning Corp. | — | 9150-00-024-9623 |
| 178 | Flux, type I, soldering (liquid) | — | 3439-00-250-2635 |
| 178.1 | Flux, welding | — | 3943-00-262-4292 |
| 178.2 | Flux, brazing | — | 3434-01-191-3477 |
| 179 | Foam, G-300, Napco Chemical Co. (or equiv) | — | — |
| 180 | Foam, G-506, Napco Chemical Co. (or equiv) | — | 9330-01-006-5310 |
| 181 | Foam, Polyurethane, sheet, density V-2 | — | 9330-01-008-7428 |
| 182 | Fuel, turbine, grade JP-4, or JP-5 | MIL-T-5624 | 9130-01-256-8613 |
| 182.1 | Fuel, turbine, grade JP-8 | MIL-T-83133 | — |
| 182.2 | Fuel, turbine, grade Jet A or Jet A-1 | ASTM.D 1655-70 | — |
| 183 | Gauze | CCC-G-101 | — |
| 184 | Gauze sponges, surgical, class A, Textile Division, Kendall Co. | — | — |
| 184.1 | Gloves, Chemical and Oil Protective | MIL-G-87066 | — |
| 185 | Gloves, wire handling | MIL-G-43411 | 8415-00-926-1674 |
| 186 | Gloves, anti-contact | MIL-G-10902 | — |
| 186.1 | Gloves | ZZ-G-381 | 8415-00-266-8677 |
| 187 | Gloves, Kevlar | MIL-M-11199 | 8415-01-092-0039 |
| 188 | Glycerol, technical, high gravity | O-G-491 | 6810-00-264-6548 |
| 189 | Grease, aircraft and instrument, gear and helicopter screw | MIL-G-23827 | 9150-00-985-7247 |
| 189.1 | Grease, aircraft | MIL-G-4343 | 9150-00-269-8255 |
| 190 | Grease, acft, gen purpose, wide temp range | MIL-G-81322 | 9150-00-145-0268 |
| 190.1 | Grease, Syn-Tech | — | 9150-00-506-8497 |
| 191 | Hardener, Aroldite 957, Ciba Products Corp. (or equiv) | — | 8040-00-701-9514 |
| 192 | Hardener, Epocast 9816 (P/O Epocast 1835) | — | 8040-00-148-9849 |
| 193 | Hardener, Epoxide 206, Union Carbide Corp. (or equiv) | — | — |
| 194 | Hardener, N, N, dimethylbenzylamine, Eastman Chemical Products, Inc. (or equiv) | — | — |
| 194.1 | Hardener, Versamid 125 | — | 8030-00-893-4224 |
| 195 | Heat sink compound, Dow Corning No. 340 (or equiv) | — | — |
| 196 | Helium, commercial | — | — |
| 196.1 | Hinge, MS2001P8 | — | — |
| 197 | Hydraulic fluid, petroleum base, aircraft | MIL-H-5606 | 9150-00-223-4134 |
| 198 | Deleted | | |

## 1-18 EXPENDABLE MATERIALS (Continued) 1-18

| ITEM NO. | NOMENCLATURE | MILITARY SPECIFICATION | NSN |
|---|---|---|---|
| 199 | Hydraulic fluid, fire-resistant | MIL-H-83282 | 9150-00-149-7431 |
| 200 | Hydrofluoric acid, anhydrous | MIL-H-10925 | — |
| 201 | Hydrofluoric acid, technical | O-H-795 | 6810-00-543-4012 |
| 202 | Inconel sheet, 0.025 inch thick | AMS5599 | — |
| 202.1 | Indicator, humidity | — | 6885-00-833-1223 |
| 203 | Insulation, electrical, synthetic resin composition, non-rigid | MIL-I-631 | 5970-00-556-2710 |
| 204 | Insulation sleeving, electrical, flexible | MIL-I-7444 | 5970-00-051-6514 |
| 205 | Ink, marking, stencil, opaque, for non-porous surface | TT-I-1795 | 7510-00-224-6732 |
| 206 | Jacket (molded shape), neoprene, type BN, class II | MIL-S-6855 | — |
| 207 | Kant fray, Aero Leather Products Co. (or equiv) | — | — |
| 208 | Kerosene | W-K-211 | 9140-00-242-6748 |
| 209 | Kevlar fabric, style 285 or 281 | — | 8305-01-319-6022 |
| 210 | Lacquer, acid-resistant | TT-L-54 | 8010-00-582-5382 |
| 211 | Lacquer, aluminized | MIL-L-19537 | — |
| 212 | Lacquer, outside fuel cell, 1875C, Goodyear Tire and Rubber Co. (or equiv) | — | — |
| 213 | Lacquer, clear | MIL-L-19537 | 8010-00-527-1508 |
| 214 | Lacquer, black, color No. 37038 | TT-L-20 | 8010-00-664-7651 |
| 214.1 | Lacquer, black, low reflective | MIL-L-46159 | — |
| 215 | Lacquer, lusterless black, color No. 37038 | MIL-L-19538 or MIL-L-81352 | 8010-00-527-2884 8010-00-664-7651 |
| 216 | Lacquer, glossy black | MIL-L-19537 | 8010-00-527-2507 |
| 217 | Lacquer, glossy blue | MIL-L-19537 | 8010-00-551-7933 |
| 218 | Lacquer, gray, color No. 36231 | TT-L-20 | 8010-00-515-1568 |
| 219 | Lacquer, light green, color No. 14187 | MIL-L-19537 | 8010-00-527-2483 |
| 219.1 | Lacquer, black, color No. 37038 | MIL-L-19538 | 8010-00-527-2884 |
| 220 | Lacquer, lusterless olive-drab, color No. X34087 | MIL-L-19538 | 8010-00-082-2479 |
| 221 | Lacquer, glossy orange (yellow), color No. 13537 | MIL-L-19538 | 8010-00-527-2496 |
| 222 | Lacquer, glossy, insignia red, color No. 11136 | MIL-L-19538 | 8010-00-551-7934 |
| 223 | Lacquer, glossy white, color No. 17875 | MIL-L-19537 | 8010-00-527-2493 |
| 224 | Lacquer, lusterless white, color No. 27875 | MIL-L-19538 | 8010-00-530-6387 |
| 225 | Lacquer, glossy yellow, color No. 13538 | MIL-L-19537 | 8010-00-527-2496 |
| 225.1 | Lacquer, flat black, color No. 37038 | MIL-L-46159 | 8010-01-211-1106 |
| 225.2 | Lacquer, white, color No. 37875 | MIL-L-19538 | 8010-00-543-2085 |
| 226 | Leak detection compound, type I | MIL-L-25567 | 6850-00-631-1820 |
| 227 | Lockwire | M520995C20 | 9505-00-596-5105 |

## 1-18 EXPENDABLE MATERIALS (Continued) 1-18

| ITEM NO. | NOMENCLATURE | MILITARY SPECIFICATION | NSN |
|---|---|---|---|
| 228 | Lockwire | MS20995CU20 | 9525-01-047-6455 |
| 229 | Lockwire | MS20995NC20 | 9525-00-618-0257 |
| 230 | Lockwire | MS20995C32 | 9505-00-293-4208 |
| 231 | Lockwire | MS20995NC32 | 9525-00-803-3044 |
| 232 | Lockwire | MS20995C40 | — |
| 233 | Lockwire | MS20995NC40 | 9525-00-990-7799 |
| 234 | Lockwire | MS20995NC51 | 9525-00-529-9196 |
| 235 | Lubricant, molybdenum disulfide powder | MIL-M-7866 | 6810-00-264-6715 |
| 236 | Lubricant, penetrating, type I | W-P-216 | 9150-00-261-7899 |
| 237 | Lubricant, solid film, air drying, type I | MIL-L-23398 | 9150-00-754-0064 |
| 238 | Lubricant, solid film | MIL-L-8937 | 9150-00-834-5608 |
| 238.1 | Super O-Lube, Parker Seal Co., silicone damping fluid | W-D-1078A | — |
| 239 | Lubricant, surgical | — | |
| 240 | Lubricant (grease, ball bearing) Lubriplate, Fiske Brothers Refinery Co. (or equiv) | — | 9150-00-076-1574 |
| 241 | Material, cushioning | PPP-3-843 | 8135-00-183-8814 |
| 242 | Metal conditioner and rust remover (phosphoric acid base) | MIL-M-10578 | 6850-00-656-1292 |
| 243 | Methanol (methyl alcohol) | O-M-232 | 6810-00-174-5190 |
| 244 | Methyl-ethyl-ketone | TT-M-261 | 6810-00-281-2785 |
| 245 | Naphtha, aliphatic, type II | TT-N-95 | 6810-00-238-8117 |
| 246 | Naphtha, aromatic | TT-N-97 | 6810-00-223-9067 |
| 247 | Nitrogen, Propellant pressuring agent | MIL-P-27401/BB-N-411 | 9135-00-823-8115 |
| 247.1 | Nitrogen, Aircraft Servicing 0-3000 psi | — | 6830-00-880-1838 |
| 248 | Nitrogen, technical | BB-N-411 | 6830-01-028-9402 |
| 248.1 | Nylon sheet, 0.002 to 0.005 inch thick | — | 9330-00-366-3000 |
| 249 | Oakite, No 24, 36, 61, and M-3, Qakite Products Inc. | P-C-436 | 6850-00-664-7530 |
| 250 | Oil, general purpose, preservative | W-L-800 | 9150-00-231-6689 |
| 251 | Oil, lubricating (Grade 1010) | MIL-L-6081 | 9150-00-231-6676 |
| 252 | Oil, lubricating, aircraft reciprocating engine, grade 1065 | MIL-L-6082 | 9150-01-007-9134 |
| 253 | Oil, lubricating, aircraft turbine engine | MIL-L-23699 | 9150-00-985-7099 |
| 254 | Oil, lubricating, aircraft turbine engine, synthetic base | MIL-L-7808 | 9150-00-782-2627 |
| 254.1 | Oil, lubricating, Aircraft Transmission Systems | DOD-L-85734 | 9150-01-209-2684 |
| 255 | Oil, lubricating, corrosion preventive, synthetic base | MIL-C-8188 | 6850-00-273-2395 |
| 256 | Oil, lubricating, gear, multi-purpose | MIL-L-2105 | 9150-01-035-5392 |
| 257 | Oil, lubricating, instrument | MIL-L-6085 | 9150-00-223-4129 |

## 1-18 EXPENDABLE MATERIALS (Continued) 1-18

| ITEM NO. | NOMENCLATURE | MILITARY SPECIFICATION | NSN |
|---|---|---|---|
| 258 | Oil, lubricating, preservative B.10 type 1, grade 3 | MIL-L-21260 | — |
| 258.1 | Organic fiber fabric (Kevlar) | — | 1680-01-196-8355 |
| 259 | Paint, non-skid, Epolux 100E6AS (or equiv) | — | 8010-00-866-6810 |
| 260 | Paint, 80029, Goodyear Tire and Rubber Co. (or equiv) | — | — |
| 261 | Paint remover | TT-R-248 | 8010-00-515-2258 |
| 261.1 | Paint remover | TT-R-251 type IV, Class B | 8010-00-926-4727 |
| 261.2 | Paint, low reflecting, green, color no. 34031 | MIL-L-46159 | 8010-01-211-1107 |
| 262 | Paint system, fluorescent, removable, daylight, color No. 633 | MIL-P-21600 | 8010-00-082-2421 |
| 262.1 | Paper, printer, EA1500P, Sharp Electronics Corp. (or equiv) | — | — |
| 263 | Paper, wrapping, untreated, Kraft | UU-P-268 | 8135-00-160-7759 |
| 264 | Paper tag | UU-T-81 | 8135-00-292-2345 |
| 265 | Deleted. Use item 307 | | |
| 266 | Deleted. Use item 307 | | |
| 267 | Paste, lapping, grade 388-900A | SS-L-1682 | 5350-00-587-3410 |
| 268 | Patch, inside, FT-136, Goodyear Tire and Rubber Co., P/N 5200-5187-51-94 (Uniroyal) (or equiv) | — | 8305-00-350-5592 |
| 269 | Patch, outside, FT-132, Goodyear Tire and Rubber Co., P/N 5240-5241 (Uniroyal) (or equiv) | — | — |
| 270 | Peel ply, precision fabrics, P/N 51789/52006, Cage 0NMM3 | — | — |
| 270.1 | Pencil, marking | — | 7510-00-465-0994 |
| 271 | Pencil, spiral paper form, wax, glass, and china marking | SS-P-196C | 7510-00-240-1525 |
| 271.1 | Pens, printer, EA-850B, Sharp Electronics Corp. (or equiv) | — | — |
| 272 | Perchlorethylene (tetrachloroethylene) | O-T-236 | 6810-00-819-1128 |
| 273 | Permatex, No. 1372, Permatex Co., Inc. (or equiv) | — | 8030-00-599-7753 |
| 274 | Petrolatum, technical, 2 class V type | W-P-236 | 9150-00-250-0926 |
| 274.1 | Phenolic microballons Bakelite Div. of Union Carbide Co. (or equiv) | — | 9330-00-130-0409 |
| 275 | Phenolic sheet, laminated, type FBM | MIL-P-15035 | 9330-00-585-8678 |
| 276 | Phenolphthalein crystals, commercial grade | O-C-265 | 6810-00-223-7612 |
| 277 | Pigment, iron-blue, dry | TT-P-385 | 8010-00-007-8164 |
| 278 | Plastic, nylon, flexible, molded or extruded | MIL-N-18352 | — |
| 279 | Plastic sheet, weather-resistant | MIL-P-81598 | 9330-00-819-8499 |
| 280 | Plastilube, Moly No. 3, Warren Refining Co. (or equiv) | — | 9150-00-141-4481 |
| 281 | Polish kit, glass RS-69 | — | 1560-00-450-3622 |

## 1-18 EXPENDABLE MATERIALS (Continued) 1-18

| ITEM NO. | NOMENCLATURE | MILITARY SPECIFICATION | NSN |
|---|---|---|---|
| 282 | Polish, plastic | PP-560 | 7930-00-634-5340 |
| 283 | Polyamide, nylon, plastic, rigid, rods and flats | L-P-410 | — |
| 284 | Deleted. Use item 248.1 | | |
| 285 | Polycarbonate sheet, Lexan, General Electric Co. (or equiv) or Merlon, Mobay Chemical Co. (or equiv) 0.0440 and 0.050 inch thick | L-P-393 | — |
| 285.1 | Polyurethane paint, black | MIL-C-46168 | 8010-00-482-5671 |
| 285.2 | Polyurethane paint, green | MIL-C-46168 | 8010-01-141-2420 |
| 285.3 | Polyurethane paint, olive drab | MIL-C-46168 | |
| 285.4 | Polyurethane paint, gray | MIL-C-46168 | |
| 285.5 | Polyurethane paint, white | MIL-C-46168 | |
| 285.6 | Polyurethane paint, yellow | MIL-C-46168 | |
| 286 | Potassium dichromate | O-P-559 | 6810-00-264-6525 |
| 287 | Powder, gypsum buff, commercial grade | — | 8040-00-936-4672 |
| 288 | Primer A-4014, for A-4000 adhesive | MIL-A-25457 | |
| 289 | Deleted | | |
| 290 | Primer coating, vinyl-zinc chromate | MIL-P-15930 | 8010-00-064-0018 |
| 291 | Deleted. Use item 292.1 | | |
| 291.1 | Primer, base 513-707; curing solution 910-787 DeSoto Co. (or equiv) | — | — |
| 292 | Primer, epoxy | MIL-P-23377 | 8010-00-082-2450 |
| 292.1 | Primer, yellow epoxy | MIL-P-85582 | 8010-00-218-0856 |
| 292.2 | Primer, epoxy, waterborne, type I | MIL-P-85582 | — |
| 293 | Primer, epoxy, white | MIL-P-53022 | 8010-00-193-0517 |
| 294 | Primer, fast-drying | MIL-P-7962 | 8010-00-526-2523 |
| 295 | Primer, grade T | MIL-S-22473 | 8030-00-963-0930 |
| 295.1 | Primer, Locquic T | MIL-S-22473 | 8030-00-082-2508 |
| 296 | Primer H, for Uralane 5716 or 8099 (or equiv) | — | 8040-00-104-8225 |
| 297 | Primer J, for Uralane 5716 or 8099 (or equiv) | — | — |
| 298 | Primer, PR1711, Products Research Corp. (or equiv) | — | — |
| 299 | Primer, RTV1200, for 730RTV adhesive, Dow Corning Corp. (or equiv) | — | 8040-00-845-4304 |
| 300 | Primer SS4004 for RTV102 adhesive, General Electric Corp. (or equiv) | — | 8010-00-701-9616 |
| 301 | Primer, wash | MIL-C-15328 | 8030-00-251-2726 |
| 302 | Primer, wash | MIL-C-8514 | 8030-00-015-6104 |
| 303 | Primer, 90-198 Dow Corning Corp. (or equiv) | — | — |
| 304 | Promoter, PS-18, component C | MIL-A-8576 | 8040-00-270-8148 |

## 1-18 EXPENDABLE MATERIALS (Continued) 1-18

| ITEM NO. | NOMENCLATURE | MILITARY SPECIFICATION | NSN |
|---|---|---|---|
| 305 | Protective coating, EC1103, Minnesota Mining and Mfg. Co. (or equiv) | — | 8030-00-264-3886 |
| 306 | Pumice | SS-P-821 | 5350-00-161-9033 |
| 307 | Rain repellant and/or parting agent, Vydax-550, Du Pont, E.I. De Nemours (or equiv) | MIL-W-006882 | 6850-00-139-5297 |
| 308 | Release agent, fluorocarbon dry lube, part S-122, Miller-Stephenson Chemical Co. or Rulon Spray, Connecticut Hard Rubber Co. (or equiv) | — | 8030-01-064-4951 |
| 309 | Repair material, inside, Uniroyal, 5200/5187 (cured) (or equiv) | — | — |
| 310 | Repair material, outside, Uniroyal, 5200 (cured) (or equiv) | — | — |
| 311 | Resin compound, 611 Palmer Products Co., Inc., (or equiv) | — | 8030-00-086-1506 |
| 312 | Resin, Epon 812, Shell Chemical Co. (or equiv) | MMM-A-187 | 8040-01-138-2190 |
| 313 | Resin, paraplex (P-43) (or equiv) | MIL-R-7575 | — |
| 313.1 | Resin, celanese plastic (or equiv) | — | 8030-00-949-6707 |
| 314 | Rod, Inconel No. 62 (or equiv) | — | — |
| 314.1 | Rod, welding | AMS-5756 | — |
| 315 | Rod, Welding, aluminum and aluminum alloys | QQ-R-566 | 3439-00-269-9654 |
| 316 | Rouge, No. 0000 | — | 5350-00-223-5581 |
| 317 | Rubber, cellular, chemically blown, type II Medium, grade A | MIL-R-6130 | 9320-00-618-3180 |
| 318 | Rubber, silicone, Class III, grade 50, color: light to medium gray | ZZ-R-765 | 9390-00-759-2854 |
| 319 | Rubber, sheet, sponge, silicone | AMS3195 | 9320-00-088-1147 |
| 320 | Rubber sheet, silicone | AMS3320L | 9320-01-157-9069 |
| 321 | Rubber sheet, silicone | AMS3345 OR 3346 | 9390-00-289-8702 |
| 322 | Rust inhibitor and preservative, LPS-2 | MIL-C-81309 | 8030-00-838-7789 |
| 323 | Screen 0.040 inch perforated grill, diamond pattern, 0.5 inch wide x 0.75 inch long, Diamond Mfg. Co. (or equiv) | MIL-S-12875 | 9535-00-416-8553 |
| 324 | Screen 0.063 inch, woven wire mesh, 0.187 inch openings, double crimp, type I, class I | RR-W-440 | — |
| 325 | Scrim cloth, HS-32, FMC91775, Hess and Goldsmith (or equiv) | — | 8305-00-443-5601 |
| 326 | Scrim cloth, nylon, EP-15, Travis Mills Corp. (or equiv) | — | 8305-00-178-6825 |
| 327 | Sealant | MIL-S-22473 | — |
| 328 | Sealant, retaining, single component, anaerobic | MIL-S-22473 | — |
| 329 | Sealant, electrical insulating, PR1337, Products Research Co. (or equiv) | — | — |
| 300 | Sealant, gasket, hydrocarbon fluid, water resistant | MIL-S-45180 | 8030-00-252-3391 |

## 1-18 EXPENDABLE MATERIALS (Continued) 1-18

| ITEM NO. | NOMENCLATURE | MILITARY SPECIFICATION | NSN |
|---|---|---|---|
| 331 | Sealant, elastomeric, aircraft structure | MIL-S-7124 | 8030-00-024-9634 |
| 332 | Sealant, integral fuel tanks and fuel cavities, high adhesion, accelerator required | MIL-S-7502/MIL-S-8802 | 8030-00-723-2746 |
| 332.1 | Sealant, 3145 RTV, Dow Corning (or equiv) | MIL-A-46146 | 8040-00-144-9774 |
| 332.2 | Sealant, 162 R1V, Dow Corning (or equiv) | MIL-A-46146 | 8040-01-227-61 53 |
| 333 | Deleted | | |
| 334 | Sealant, EC-801B-A, class A, Minnesota Mining and Mfg. Co. (or equiv) | — | 8030-00-687-8246 |
| 334.1 | Sealant, MMM-08874 | — | — |
| 335 | Sealant, Epoweld 9143, Hardman Inc. | — | — |
| 336 | Sealant, ProSeal 890, Hexcel Corp. (or equiv) | MIL-S-8802 | 8030-00-685-0915 |
| 337 | Sealant, ProSeal 719A-2, Hexcel Corp. (or equiv) | — | — |
| 338 | Sealant, ProSeal 896, Hexcel Corp. (or equiv) | MIL-S-8802 | 8030-00-104-9321 |
| 339 | Sealant, ProSeal 700, Hexcel Corp. (or equiv) | — | 8030-00-723-5345 |
| 340 | Sealant, GE RTV102 or Dow Corning 732 | MIL-A-46106 | 8040-06-877-9872 |
| 340.1 | Sealant, GE RTV103 (or equiv) | — | — |
| 340.2 | Sealant, GE RTV106 (or equiv) | — | 8040-00-941-9984 |
| 340.3 | Sealant, GE FRV1106 (Suitable sub for 730 RTV) | — | — |
| 341 | Sealant, PR1201-Q, Products Research Corp. | — | 8030-00-616-7696 |
| 342 | Sealant, PR9021 A-1, A-2, and A-4, Products Research Corp. (or equiv) | — | — |
| 342.1 | Sealant, type 2, class B-1/2 | MIL-S-8802 | 8030-00-080-1549 |
| 342.2 | Sealing Compound | MIL-S-81733C | 8030-00-008-7198 |
| 342.3 | Sealing Compound, grade O, thread lock, Loctite 262 | MIL-S-46163 | 8030-01-142-9830 |
| 343 | Locktite 404 | — | |
| 344 | Sealant, grade C, Loctite Corp. (or equiv) | MIL-S-22473 | 8030-00-823-7917 |
| 345 | Sealant, grade E, Loctite Corp. (or equiv) | MIL-S-22473 | 8030-00-081-2339 |
| 345.1 | Sealant, Loctite 601 | — | 8030-00-180-6222 |
| 345.2 | Sealant, Loctite No. 635 | MIL-R-46082 | 8030-00-181-7603 |
| 346 | Sealant, Sylgard 186, Dow Corning Co. (or equiv) | — | 5790-00-163-1153 |
| 347 | Sealant (Viscous coating VC-3) Nylock-Detroit Corp., Midland Park, NJ | — | — |
| 348 | Sealant Tape EC1202, Minnesota Mining and Mfg. Co. (or equiv) | — | 9320-00-019-0351 |
| 348.1 | Sealant Tape 1202-T-NS, Minnesota Mining and Mfg. Co. (or equiv) | — | — |
| 349 | Sealer, polysulfide | MIL-S-8802 | 8030-01-048-3772 |
| 349.1 | Sealing and coating compound, corrosion inhibitive, type II, for extrusion application | MIL-S-81733 | — |

## 1-18 EXPENDABLE MATERIALS (Continued) 1-18

| ITEM NO. | NOMENCLATURE | MILITARY SPECIFICATION | NSN |
|---|---|---|---|
| 350 | Sealing compound, EC776SR, topcoat, fuel tank, BUNA-N type | MIL-S-4383B | 8030-00-664-4019 |
| 350.1 | Skin, Light Weight (Blade) | — | 1615-01-078-4634 |
| 351 | Soap, high-foaming (potassium oleate) commercial grade | — | — |
| 352 | Soap, toilet, liquid and paste | P-S-624 | 8520-00-228-0598 |
| 353 | Soap, toilet, white, floating, type I | P-S-620 | 8520-00-531-6484 |
| 354 | Soapstone, powdered or mica, commercial grade | — | 8510-00-817-0295 |
| 355 | Sodium acid fluoride | — | 8510-00-231-3006 |
| 356 | Sodium bicarbonate, technical | O-S-576 | 6810-00-264-6618 |
| 357 | Sodium dichromate (sodium dichromate), technical | O-S-595 | 6810-00-143-2000 |
| 358 | Sodium hydroxide, technical | O-S-598 | 6810-00-270-8177 |
| 359 | Solder, silver | QQ-S-561 | — |
| 360 | Solder, tin alloy, lead-tin alloy, and lead alloy, 50/50, 63/37 | QQ-S-571 | 3439-00-141-8244 |
| 361 | Solution, cadmium alkaline plating, Sifco Metachemical Inc. (Dalic); Marlane Development Corp. (Selectron) (or equiv) | — | — |
| 362 | Solution, cadmium cleaning, Sifco Metachemical Inc. (Dalic); Marlane Development Corp. (Selectron) (or equiv) | — | — |
| 363 | Solution, ruststripper, grade 2, type 2, Oakite Products Inc. (or TT-C-490 equiv) | — | 6850-00-810-1762 |
| 364 | Solution, zinc-cleaning, Dalic, Sifco Metachemical Inc. (or equiv) | — | 6850-01-067-6670 |
| 365 | Solution, zinc-plating, Dalic, Sifco Metachemical Inc. (or equiv) | — | 6850-01-066-5614 |
| 366 | Squeeze boftle, plastic | — | 6640-01-306-5499 |
| 366.1 | Steel Bar, 4130 CRES, 1.5 inch dia | MIL-S-5000 | — |
| 367 | Steel, 4130 | MIL-S-6758 | — |
| 368 | Steel, CRES, type 304 | — | — |
| 368.1 | Steel plate, CRES, type 301 or 304, 1/4 hard or annealed | — | — |
| 369 | Steel plate, 0.50 inch thick | — | — |
| 369.1 | Steel rod, 1/8 inch dia | — | — |
| 370 | Steel, sheet, CRES, 0.040 inch thick, type 301 | MIL-S-5059 | 9515-00-596-1727 |
| 371 | Steel, sheet, 4130, 0.032 inch thick | MIL-S-18729 | 9515-00-640-4146 |
| 372 | Steel, sheet, 4130, 0.060 inch thick | — | — |
| 373 | Steel wool, fine, commercial grade | FF-S-740 | 5350-00-240-2920 |
| 374 | Strap, plastic, line supporting, 0.190 X 6.50 X 0.055 inch | — | — |

## 1-18 EXPENDABLE MATERIALS (Continued) 1-18

| ITEM NO. | NOMENCLATURE | MILITARY SPECIFICATION | NSN |
|---|---|---|---|
| 375 | Strap | MS3367-3-4 | 5975-00-368-8648 |
| 376 | Strap | MS3367-1-6 | 5975-00-935-3942 |
| 377 | Strap | MS3367-4-2 | 5975-00-903-2288 |
| 378 | Strip, gum, 0.020 inch thick, 0.050 inch wide, No. 52904 | — | — |
| 378.1 | Switch, Rotary PA100 | — | 5930-01-216-2252 |
| 379 | Syringe, hypodermic | — | 6515-00-514-2395 |
| 380 | Syringe, hypodermic | MIL-S-36157 | 6915-00-264-7739 |
| 381 | Tape, anti-chafing, Y9265, Minnesota Mining and Mfg. Co. (or equiv) | — | — |
| 382 | Tape, anti-chafing, Permacel 306, 2.0 inches wide | — | 7510-01-009-8023 |
| 383 | Tape, anti-chafing, Y5425, 0.5 inch wide, Minnesota Mining and Mfg. Co. (or equiv) | — | 7510-01-221-3335 |
| 383.1 | Tape, anti-chafing, Y8561, 1.0 inch wide, 3M Co. (or equiv) | — | 9330-01-101-7505 |
| 384 | Tape, conductive, X1170 or X1181, Minnesota Mining and Mfg Co. (or equiv) | — | 7510-00-421-6449 |
| 385 | Tape, plastic, electrical pressure-sensitive, insulating | MIL-I-24391 | 5970-00-419-4291 |
| 385.1 | Tape, pressure-sensitive adhesive plastic, for electrolating | HH-T-0025 | — |
| 386 | Tape, Fabseal, Pittsburgh Plate Glass Co. (or equiv) | — | 7510-00-846-8674 |
| 387 | Tape, glass | MIL-T-4053 | 7510-00-515-0319 |
| 388 | Tape, masking | PPP-T-42 | 7510-00-266-6707 |
| 389 | Tape, Mylar (or equiv) TY-1, 1/2 inch | L-T-100 | 7510-00-721-9756 |
| 390 | Tape, No. 428, type A, Minnesota Mining and Mfg. Co. (or equiv) | — | — |
| 390.1 | Tape, nylon, high temperature, No. 855, Minnesota Mining and Mfg. Co. (or equiv) | — | — |
| 391 | Tape, pressure-sensitive adhesive, aluminum-backed | L-T-80 | 7500-00-720-7516 |
| 392 | Tape, hook, No. 80, slate grey 320 | — | — |
| 393 | Tape, insulation, spiral wrap, 0.006 inch X 1.0 inch | MIL-I-18746 | — |
| 394 | Tape, pressure-sensitive | — | 7510-00-579-8492 |
| 395 | Tape, pressure-sensitive adhesive, waterproof type IV | PPP-T-60 | 7510-00-074-5124 |
| 395.1 | Tape self-vulcanizing silicone | MIL-I-46852B | 5970-00-955-9976 |
| 396 | Tape, vacuum bag sealing, 1 to 2 inches wide, General Sealing or Pressite | — | 8030-00-601-9496 |
| 396.1 | Tape, sealant, EC1202. See item 348. | — | — |
| 397 | Tape, silver reflective, 3870, Minnesota Mining and Mfg. Co (or equiv) | — | — |
| 398 | Tape, Teflon spiral, Tireflex Co., Inc. (or equiv) | — | — |

| ITEM NO. | NOMENCLATURE | MILITARY SPECIFICATION | NSN |
|---|---|---|---|
| 399 | Tape, Teflon, self-adhesive | MIL-I-23594 | 5970-00-848-8683 |
| 400 | Tape, Teflon, glass, Warren Wire Co. (or equiv) | MIL-I-18746 | 5970-00-181-0306 |
| 401 | Tape, Teflon | MIL-T-27730 | 5970-01-212-5820 |
| 402 | Tape, velcro, SA-0140A, Hartwell Corp. (or equiv) | — | 8315-00-926-4931 |
| 402.1 | Tape, velcro (pile) | — | 8315-00-926-4930 |
| 403 | Tape, lacing, type 5, Size 3, Finish C, Stype | — | 4020-00-823-7331 |
| 404 | Tape, yellow | L-T-90 | 7510-00-550-7125 |
| 405 | Tape, red | L-T-90 | 7510-00-550-7126 |
| 406 | Tape, white | L-T-90 | 7510-00-550-7127 |
| 407 | Tape, green | L-T-90 | 7510-00-550-7129 |
| 408 | Tape, blue | L-T-90 | 7510-00-634-3267 |
| 409 | Tape, black | PPP-T-0066A1 | 8135-00-880-7351 |
| 410 | Tarpaulin, weather-resistant | K-P-146E | 8340-00-841-8456 |
| 411 | Tedlarfilm 100 GB30TR, E.I. DuPont, De Nemours (or equiv) | L-P-1040 | — |
| 412 | Teflon sheet | MIL-P-22241 | — |
| 413 | Temperature indicating strips, Model 110-2, 140 to 190°F | — | 6685-01-344-0752 |
| 413.1 | Temperature indicating strips, Model 110-3, 180 to 230°F | — | 6685-01-323-0671 |
| 413.2 | Temperature indicating strips, Model 110-4, 220 to 270°F | — | 6685-01-477-7443 |
| 413.3 | Temperature indicating strips, Model 110-5, 260 to 310°F | — | 6685-01-062-5499 |
| 413.4 | Tetra-Etch, Gore Co. | — | 6850-00-431-8662 |
| 414 | Thinner, dope and lacquer, cellulose nitrate | TT-T-266 | 8010-00-160-5787 |
| 415 | Thinner, lacquer | MIL-T-19544 | 8010-00-160-5789 |
| 416 | Thinner, aliphatic polyurethane coating | MIL-T-81772 | 8010-00-181-8080 |
| 417 | Thinner, logo, R-277, Bee Chemical Co. (or equiv) | — | — |
| 418 | Thinner, paint | TT-T-291 | 8010-00-242-2089 |
| 419 | Thinner, toluene-methyl-isobutyl-ketone | MIL-T-19588 | 6810-00-286-0458 |
| 419.1 | Thinner, ALBI | — | 8010-01-327-5406 |
| 419.2 | Thinner, ALBI | — | 8010-01-327-9982 |
| 420 | Thread, cotton, 4-ply, size 10-3 | V-T-276 | 8310-00-197-7695 |
| 421 | Thread, nylon, tape 1 K, size 1 B, class II, gray | V-T-295 | — |
| 422 | Toluene | JAN-T-171 | — |
| 423 | Toluene, technical | TT-T-548 | 6810-00-281-2002 |
| 424 | Tongue depressor (wood spatula) | LLL-S-007.29 | 6515-00-753-4533 |
| 424.1 | Tongue depressor (wood spatula) | GGD226 | 6515-00-324-5500 |
| 425 | Topcoat, gray polyurethane, isocyanate, part A and part B Pigment-Fed Std 595, table 8, gloss 16081 and 16089 | MIL-C-46168 | — |

| ITEM NO. | NOMENCLATURE | MILITARY SPECIFICATION | NSN |
|---|---|---|---|
| 425.1 | Trailing edge material | — | 1560-01-318-8604 |
| 426 | Trichloroethylene, technical | O-T-634 | 6810-00-184-4800 |
| 427 | Tubing, aluminum, 1/4 inch ID | — | — |
| 427.1 | Tubing, aluminum alloy, 6061-T6, 1/4 X 0.035 inch | MIL-T-7081 | 4710-00-289-2781 |
| 427.2 | Tubing, aluminum alloy, 6061-T6, 3/8 X 0.035 inch | MIL-T-7081 | 4710-00-684-5074 |
| 427.3 | Tubing, aluminum alloy, 6061-T6, 1/2 X 0.035 inch | MIL-T-7081 | 4710-00-142-3010 |
| 427.4 | Tubing, aluminum alloy, 6061-T6, 5/8 X 0.035 inch | MIL-T-7081 | 4710-00-279-0020 |
| 427.5 | Tubing, aluminum alloy, 6061-T6, 3/4 X 0.035 inch | MIL-T-7081 | 4710-00-289-3038 |
| 427.6 | Tubing, aluminum alloy, 6061-T6, 1 X 0.049 inch | MIL-T-7081 | 4710-00-289-2537 |
| 428 | Tubing (extruded shape), synthetic rubber, 9/16 X 0.063 inch | MIL-S-6855 | — |
| 429 | Tubing, aluminum, 1/2 inch diameter | — | — |
| 429.1 | Tubing, CRES, 1/4 X 0.028 inch | MIL-T-6845 | 4710-00-278-3294 |
| 429.2 | Tubing, CR25, 3/8 X 0.028 inch | MIL-T-6845 | 4710-01-148-9345 |
| 429.3 | Tubing, CRES, 1/2 X 0.042 inch | MIL-T-6845 | 4710-00-420-4789 |
| 429.4 | Tubing, CRES, 5/8 X 0.049 inch | MIL-T-6845 | 4710-00-278-3302 |
| 429.5 | Tubing, CRES, 3/4 X 0.049 inch | MIL-T-6845 | 4710-00-443-4773 |
| 430 | Tubing (extruded shape), synthetic rubber, 9/16 X 0.063 inch | MIL-T-6855 | 4720-00-720-0320 |
| 431 | Tubing, electrical insulation, heat shrinkable | MIL-T-47051 | — |
| 432 | Tubing, Teflon, 0.263 inch ID | AMS 3654 | — |
| 433 | Twine, impregnated, lacing and tying | MIL-T-713 | 4720-00-247-1737 |
| 434 | Varnish, electrical-insulating, type AN, grade CB | MIL-I-24092 | 5970-00-296-2129 |
| 435 | Varnish, moisture-and fungus-resistant | MIL-V-173 | 5970-00-285-0271 |
| 436 | Vinegar | Z-V-401 | 8950-00-609-2720 |
| 437 | Vinyl film, KDA 2917, Union Carbide Plastics Co. (or equiv) | — | 8135-00-123-6985 |
| 438 | Walkway material, type I (smooth) black, color No. 37038 | A-A-59166 | 5610-00-641-0429 |
| 439 | Walkway material, type I (smooth) gray, color No. 36231 | A-A-59166 | 5610-00-641-0428 |
| 440 | Walkway material, type II (rough) black, color No. 37038, (Gal) | A-A-59166 | 8010-00-641-0427 |
| 440.1 | Walkway material, type II (rough) black, color No. 37038 (QT) | A-A-59166 | 8010-00-142-6525 |
| 441 | Walkway material, type II (rough) gray, color No. 36231 | A-A-59166 | 5610-00-641-0426 |
| 442 | Wax, aircraft liquid | MIL-W-18723 | 7930-00-267-5588 |
| 443 | Welding rod | AMS5794 | 3439-00-882-7350 |
| 444 | Welding rod | AMS5679 | 3439-00-204-0204 |
| 445 | Welding rod (AWS NO. ERN7W) | — | — |

## 1-18 EXPENDABLE MATERIALS (Continued) 1-18

| ITEM NO. | NOMENCLATURE | MILITARY SPECIFICATION | NSN |
|---|---|---|---|
| 446 | Window tinting compound, Windotint Green, Windotint Corp., Glazetone Green, National Glass Center, Inc. (or equiv) | — | — |
| 447 | Wire, electrical, insulating copper, class 1 | MIL-W-22759 | — |
| 448 | Wire, electrical, 600 volt, aluminum, aircraft | MIL-W-7072 | 6145-00-583-9988 |
| 449 | Wire, electrical, chromel and/or alumel, thermocouple | MIL-W-5846 | — |
| 450 | Wire, electrical, nylon jacket, tin-coated copper conductor, 600 volt, #20 | MIL-W-5086/1 | 6145-00-851-8505 |
| 451 | Wire, electric, PVC-glass-nylon, tin coated copper conductor, 600 volt, #20 | MIL-W-5086/2 | — |
| 452 | Wire, electrical, type B, 105°C, 600 volts, insulated, high temperature | MIL-W-16878/1 | — |
| 452.1 | Wire, non-electrical, | MS20995-022 | 9505-00-293-4208 |
| 453 | Wire mesh, 120 mesh, Metex Corp. | — | 5335-01-306-9677 |
| 453.1 | Wire cloth, 200 mesh, 0.0021 inch dia, 5056 AL alloy | — | 5335-01-306-9678 |
| 454 | Wire rope 0.375 inch diameter | — | — |
| 455 | Xylene | TT-X-916 | 6810-00-584-4070 |
| 456 | Zinlac, Wm. Zinsler Co.(or equiv) | — | — |
| 457 | Gun Blue, instant, formula 44-40 | — | — |
| 458 | Grease, plug valve, grease and oil resistant, type I | MIL-G-6032 | 9150-00-257-5360 |
| 459 | Deleted, see item 192 | — | — |
| 460 | Aluminum sheet, 0.125 inch thick | QQ-A-250 | 9535-00-084-4558 |
| 461 | Silicone grease, Dow Corning No. 7 (or equiv) | MIL-G-46886 | 9150-00-145-0161 |
| 462 | Lacquer, low reflective, black | MIL-L-46159 | 8010-01-042-9438 |
| 463 | Dope, clear | MIL-D-5549 | 8010-00-223-4037 |
| 464 | Powder, solvent, TA 58056, Mine Safety Appliance Co. (or equiv) | MIL-C-372 | 6850-00-224-6658 |
| 465 | Shim | BACS40R13B28F | — |
| 466 | Water Soluble Cleaner | BB3100 | — |
| 467 | Water Soluble Cleaner | TURCO 5884 | — |
| 468 | Bag, Anti-static, plastic; 15 x 18; Minnesota Mining and Mfg. (V17325) | — | 8105-01-353-8808 |
| 469 | Cleaner, pipe | — | 9920-00-292-9946 |
| 470 | Sealant, Type 2, Class B-1/2 | AMS-S-8802 | 8030-00-174-2599 |
| 471 | Solvent, Degreasing, TYPE III | MIL-PRF-680 | 6850-01-474-2317 |
| 472 | Apron, utility | MIL-A-41829 | 8415-00-082-6108 |
| 473 | Goggles, industrial | ANSI Z87.1 | 4220-00-052-3776 |
| **NOTE A** | Adhesive (E41) is preferred for rotor blade repairs. (E41) does not require the use of scrim cloth to prevent squeeze out. (E41) contains beads which prevent it from being squeezed below the thickness of the beads. | | |

END OF TASK

# SECTION V
# GROUND HANDLING

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Aircraft Tow Bar (T191)
Tow Tractor Capable of Towing 45,000 Pounds

***Materials:***

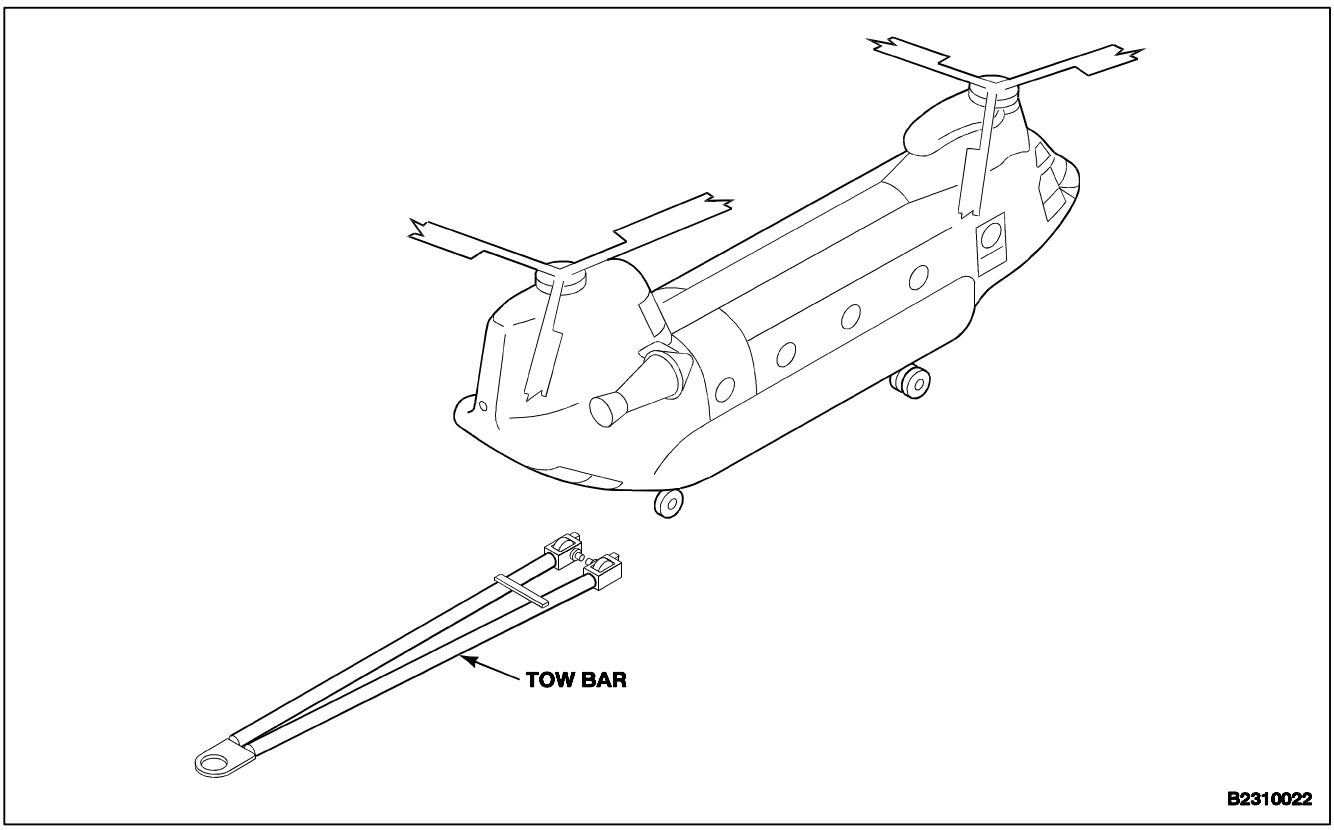
None

***Personnel Required:***

CH-47 Helicopter Repairer (As Required)

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Utility System APU Start Accumulator Charged to 3,000 PSI (Task 1-64)
Aft Wheels in Trailing Position
Emergency Utility Hydraulic Valve Open



CAUTION

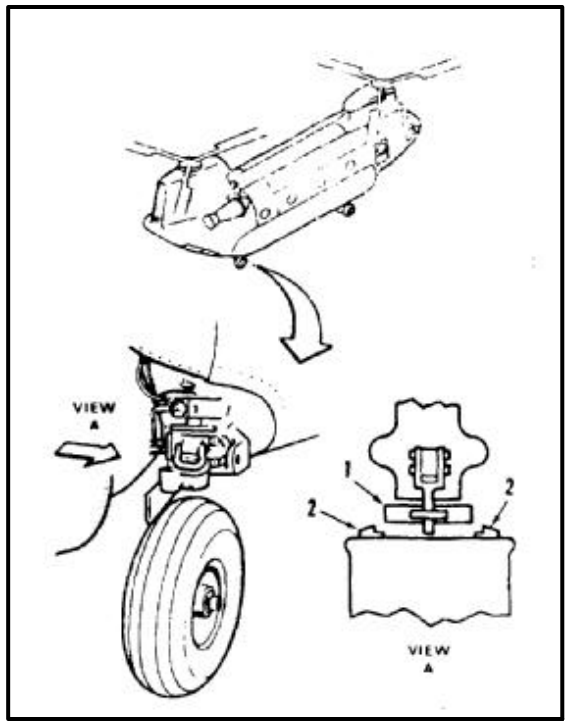
Wait at least **20 minutes** after shutting down or removing electrical power before moving helicopter. Otherwise, vertical gyros can be damaged.

CAUTION

Towing with swivel locks engaged will damage landing gear.

CAUTION

It is not recommended to tow aircraft from the aft left wheel because damage to the aft right landing gear may occur. If you have to tow from the left wheel have a steering bar attached with personnel steering the aft right wheel. Tow helicopter slowly.



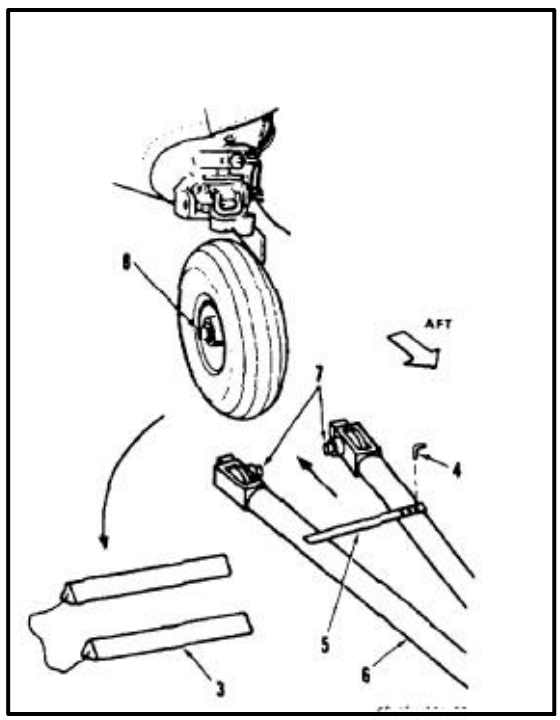

1. Check that swivel lock (1) on each aft landing gear is raised clear of detents (2).

***SWIVEL WHEEL***

**NOTE**

Perform steps 2 thru 7 only if towing aft.

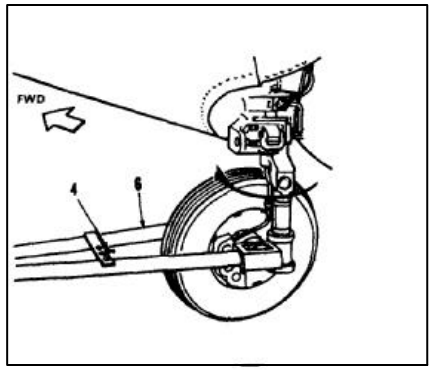
2. Remove chocks (3), if installed, from aft left wheel.
3. Remove pin (4) securing spreader (5) to tow bar (6).
4. Fit tow bar pins (7) into ends of axle (8) of aft left wheel.
5. Secure tow bar (6) to axle (8) by installing pin (4) through one of the holes in spreader (5).



CAUTION

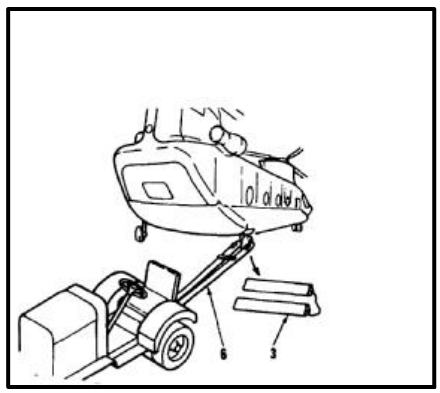
Left wheel and gear can be damaged if wheel is not turned around before towing aft.

6. Use tow bar (6) to swivel the wheel around about **120º**.
7. Remove pin (4). Remove tow bar (6) from wheel.



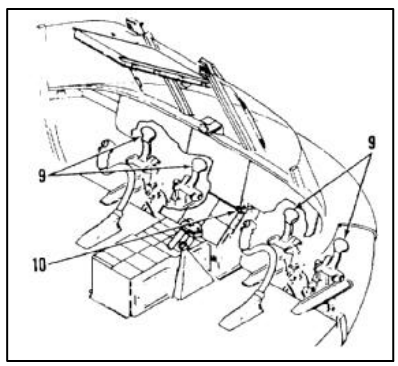

***INSTALL TOW BAR***

8. Remove chocks (3), if installed, from aft right wheel.
9. Install tow bar (6) on aft right wheel (steps 4 and 5).
10. Connect tow bar (6) to towing tractor.




***TOW HELICOPTER***

11. Have helper sit in cockpit. Helper will apply brakes if needed during towing.
12. Have helper release parking brakes by pressing on pilot's or copilot's brake pedals (9). Brake handle (10) will release.

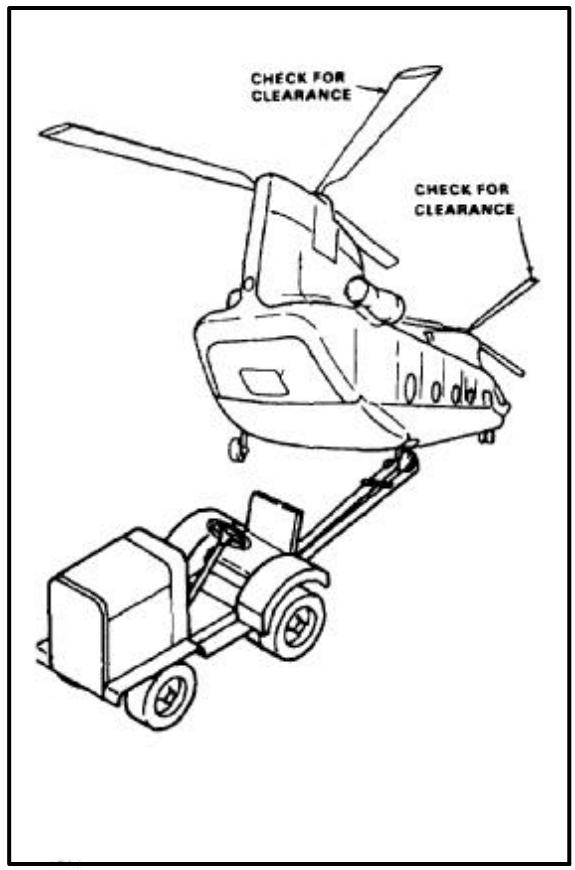


CAUTION

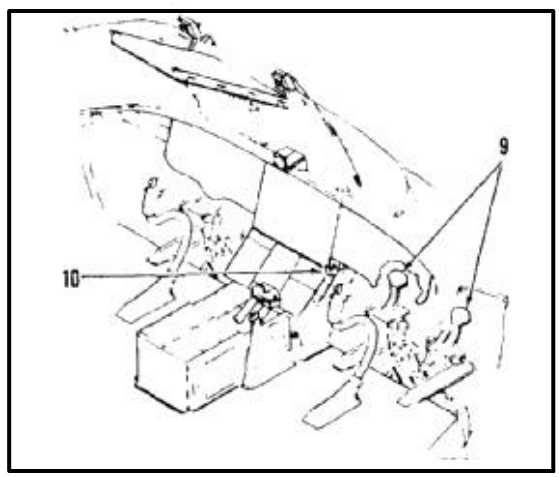
Blades can be damaged if observers do not check for clearance.

13. Station observers at each side of helicopter to make sure blades have clearance during towing. Turn rotor heads as needed for clearance.

14. Tow helicopter slowly. Avoid sudden starts and stops. Turn rotor heads as needed for blade clearance as observers report.




15. When towing is done, have helper set parking brakes by pressing pilot's brake pedals (9) and pulling handle (10).

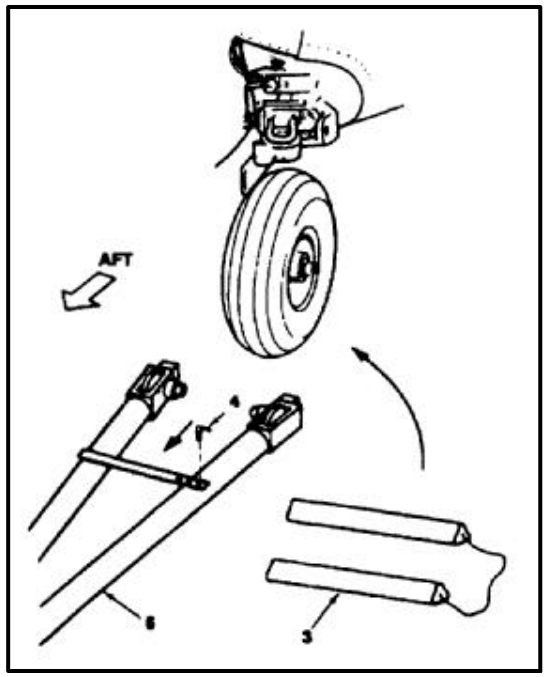


16. Remove pin (4). Remove tow bar (6) from wheel.
17. Install chocks (3).

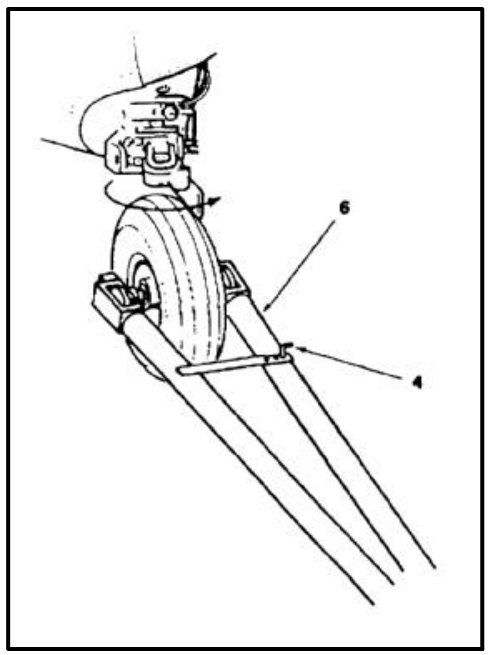
***RETURN WHEEL***

**NOTE**

Peform steps 18 thru 20 only if helicopter was towed aft.




18. Install tow bar (6) on aft left wheel (steps 4 and 5).
19. Use tow bar (6) to turn wheel around to normal position.
20. Remove pin (4). Remove tow bar (6) from wheel.




**FOLLOW-ON MAINTENANCE:**

Park helicopter (Task 1-25).
Check emergency utility hydraulic valve - closed.

END OF TASK

## 1-20 ALTERNATE TOWING 1-20

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Towing Bridle
Steering Bar (T75)
Wheel Chocks
Tow Tractor

***Materials:***

None

***Personnel Required:***

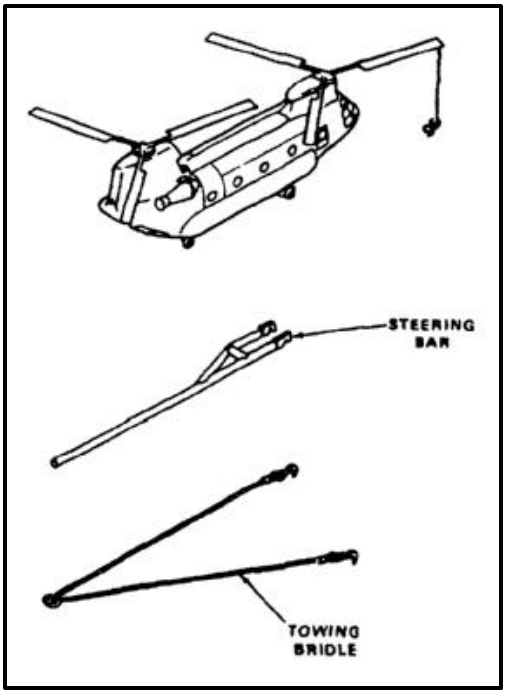
Medium Helicopter Repairer (As Required)

***References:***

Task 1-64

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Utility System APU Start Accumulator Charged to 3,000 Psi (Task 1-64)
Emergency Utility Pressure Valve Open (TM 55-1520-240-T)



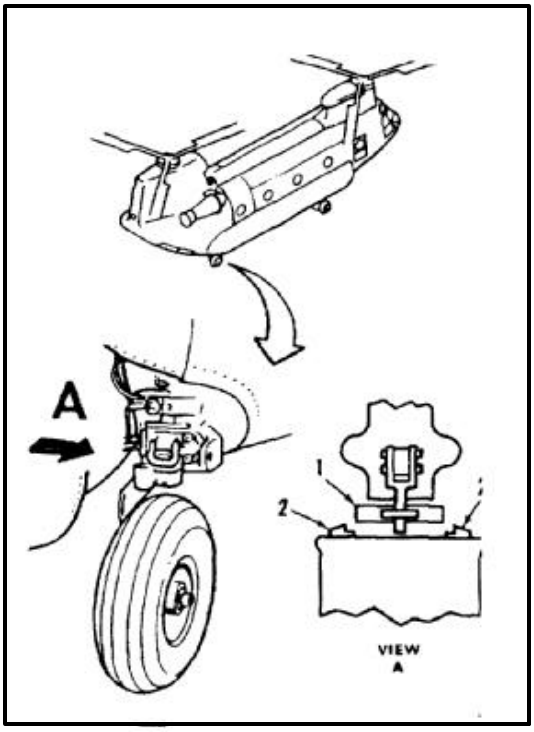

CAUTION

Wait at least **20 minutes** after shutting down or removing electrical power before moving helicopter. Otherwise, vertical gyros can be damaged.

Towing with swivel locks engaged will damage landing gear.

1. Check that swivel lock (1) on each aft landing gear is raised clear of detents (2).

1.1. If helicopter is to be towed forward, go to step 10.



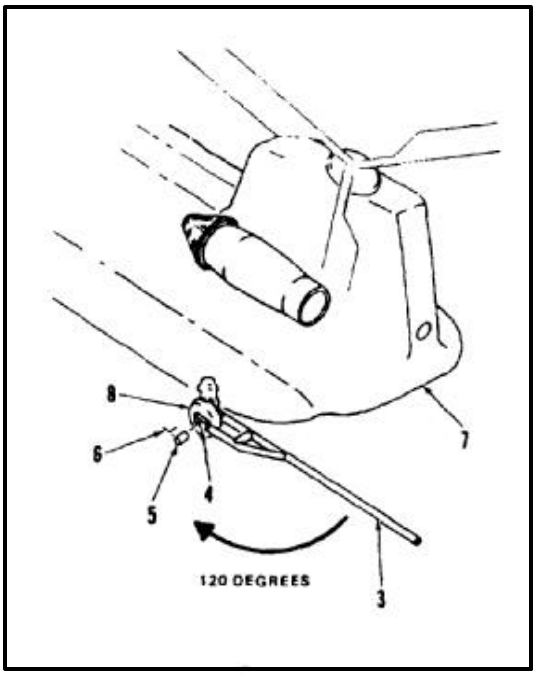
2. Attach steering bar (T75) (3) to left aft landing gear axle (4) as follows:

   a. Insert steering bar pin (5) in outboard end of axle (4).

   b. Position steering bar (T75) (3) on axle (4).

   c. Insert "L" pin (6) in steering bar pin (5).

   d. Deleted.




CAUTION

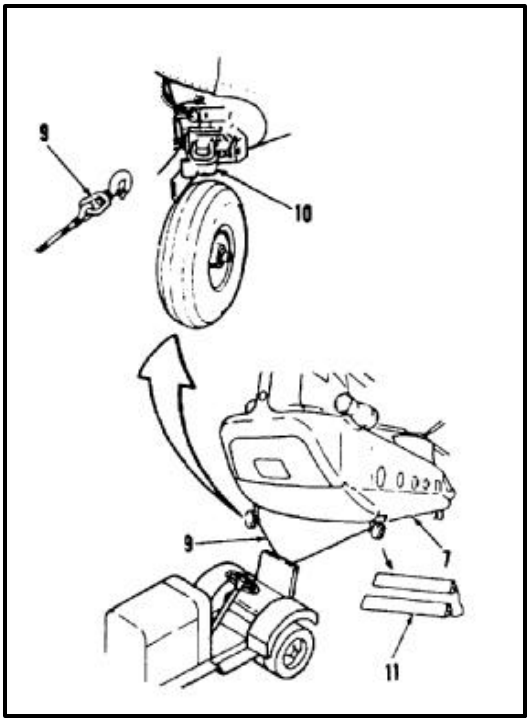
Left wheel and gear can be damaged if wheel is not turned around before towing aft.

3. If helicopter (7) will be towed aft, turn left aft wheel (8) **120°** to one side. Use steering bar (T75) (3).

4. Remove "L" pin (6), steering bar pin (5), and steering bar (T75) (3).

CAUTION

Damage to the aft right landing gear may occur if a steering bar is not attached and used on the aft right wheel when towing bridal is hooked to aft landing gear shackles. Swivel the aft left wheel and tow the helicopter slowly. After towing ensure aft left wheel is returned to proper position.




5. Hook towing bridle (9) onto two aft landing gear shackles (10).

5.1. Attach steering bar (T75) (3) to aft right landing gear.

6. Connect towing bridle (9) to tow tractor. Position tractor just far enough away from helicopter (7) to take up slack in bridle.

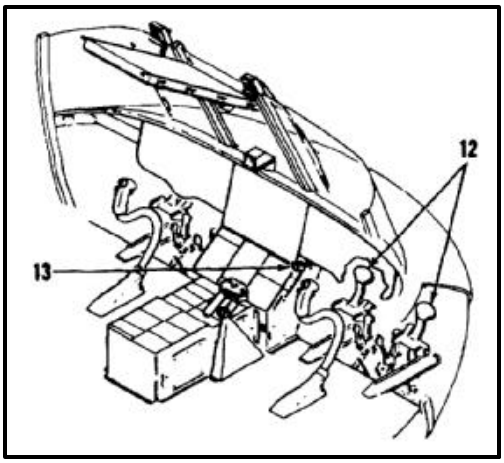
7. Have helper sit in cockpit. Helper will apply brakes if needed during towing.

**NOTE**

If a lot of braking is expected, station someone in the cabin to monitor the APU start accumulator gage (Task 1-64).

8. Remove chocks (11), if installed.

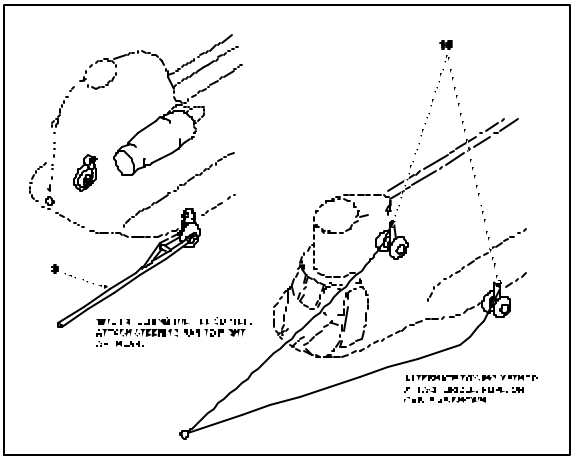
9. Have helper release parking brakes by pressing on pilot's or copilot's brake pedals (12). Brake handle (13) will release.




10. If helicopter will be towed forward, have helpers use steering bar (T75) (3) to steer helicopter.

CAUTION

Ensure LEFT aft landing gear is in the trail position (wheel outboard).



10.1. Attach steering bar (T75) (3) to aft right landing gear.

10.2. Attach towing bridle to forward landing gear shackles (15).

10.3. Connect towing bridle to tow tractor. Make sure tow tractor will have sufficient clearance to prevent contact with blades.

10.4. Have helper sit in cockpit. Helper will apply brakes if needed during towing.

**NOTE**

If a lot of braking is expected, station someone in the cabin to monitor the APU start accumulator gage (Task 1-64).

10.5. Have helper release parking brakes by pressing on pilot's or copilot's brake pedals (12). Brake handle (13) will release.

10.6. Remove chocks.

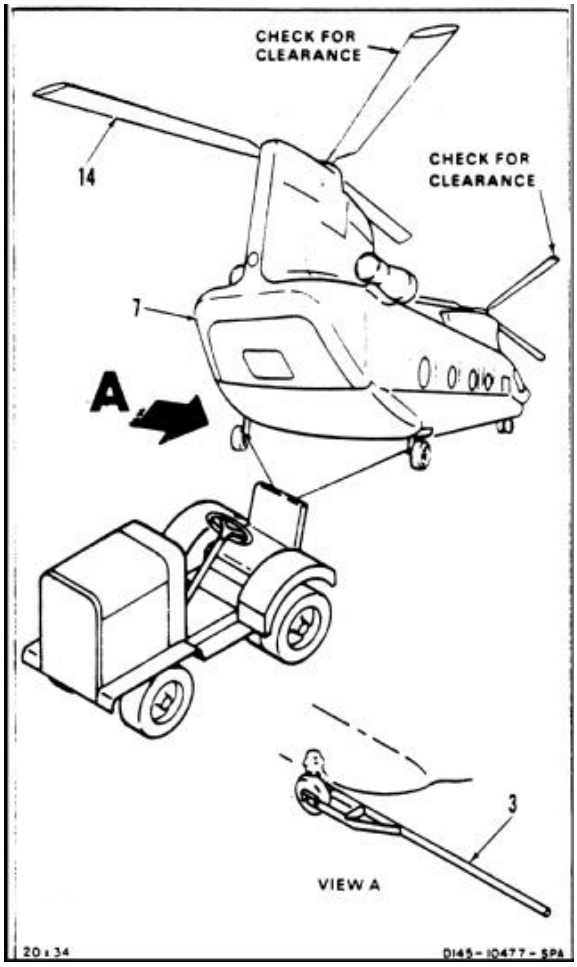
## 1-20 ALTERNATE TOWING (Continued) 1-20

CAUTION

Blades can be damaged if observers do not check for clearance.

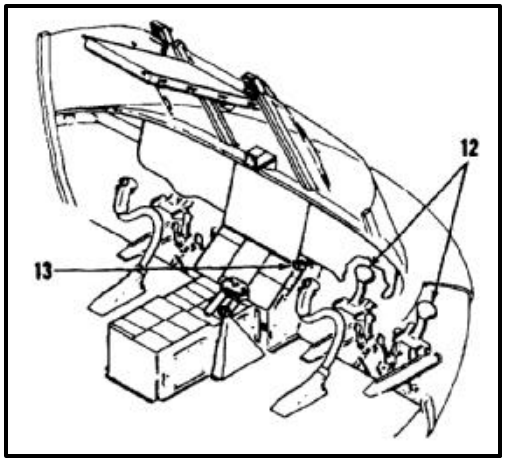
11. Station observers at each side of helicopter (7) to make sure blades (14) have clearance during towing. Turn rotor heads as needed for clearance.

12. Tow helicopter (7) slowly. Avoid sudden starts and stops. Turn blades (14) as needed for blade clearance as observers report.

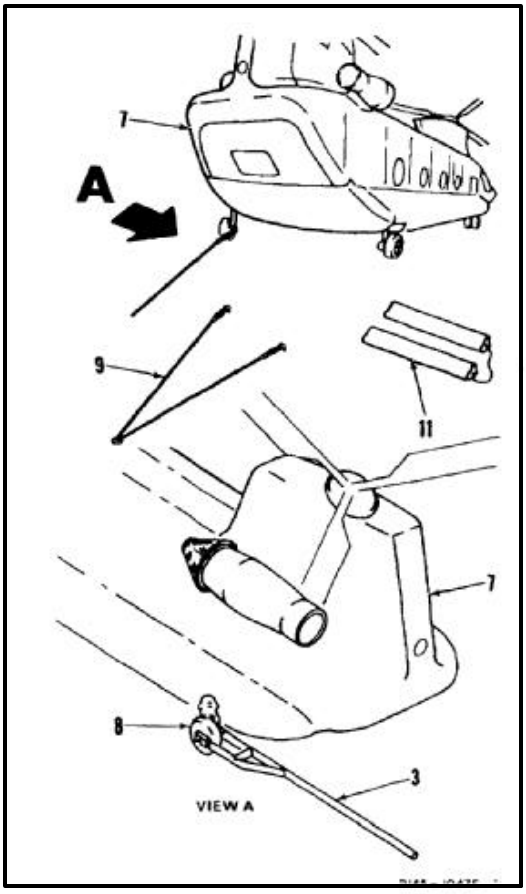



13. When towing is done, have helpers set parking brakes by pressing pilot brake pedals (12) and pulling handle (13).

13.1. Install chocks.



14. Remove towing bridle (9).
15. Remove steering bar (T75) (3) from aft right landing gear.
16. If helicopter (7) was towed aft, return left aft wheel (8) to trailing position. Use steering bar (T75) (3). Follow steps 2 and 3.
17. Deleted.
18. Deleted.




***FOLLOW-ON MAINTENANCE:***

Set emergency utility pressure valve to NORMAL (TM 55-1520-240-T).

END OF TASK

## 1-21 JACK ENTIRE HELICOPTER 1-21

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Jack 1228-31 or Equal
Jack 1214-151 or Equal (2)
Tiedown Chains (2)

***Materials:***

None

***Personnel Required:***

Medium Helicopter Repairer (4)

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Fuel Tanks Drained (Task 10-34 or 10-35)
Helicopter On Hard Level Surface
Both Forward Landing Gear Shock Struts Deflated (Task 1-71)
Both Aft Landing Gear Access Panels Open (Task 2-2)
Helicopter Roped Off and Signs Posted to Restrict Access

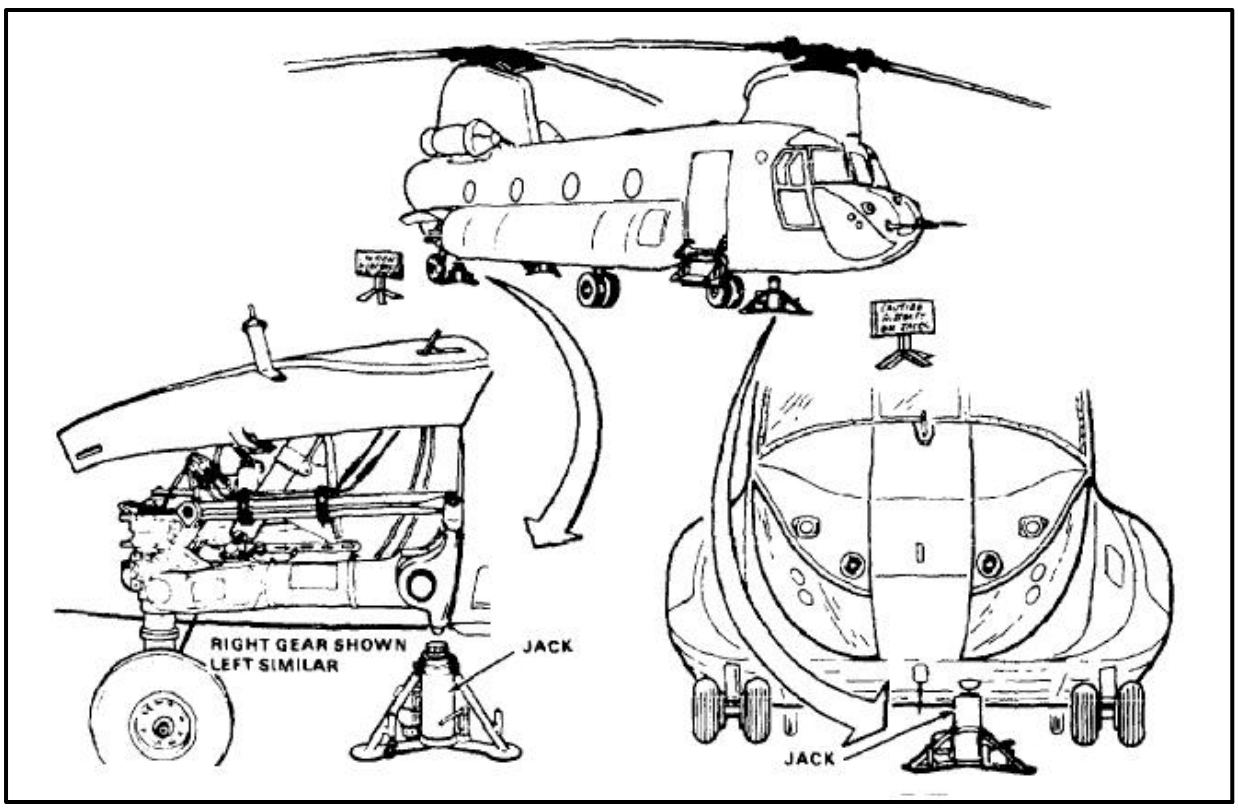
***General Safety Instructions:***

**WARNING**

Jacking on soft or uneven surface, or in winds or gusts over **20 knots** can cause helicopter to fall. Personal injury and damage to equipment can result.

**WARNING**

Jacking when helicopter weight is over limit can damage structure and injure personnel. Do not jack if weight is over limit.



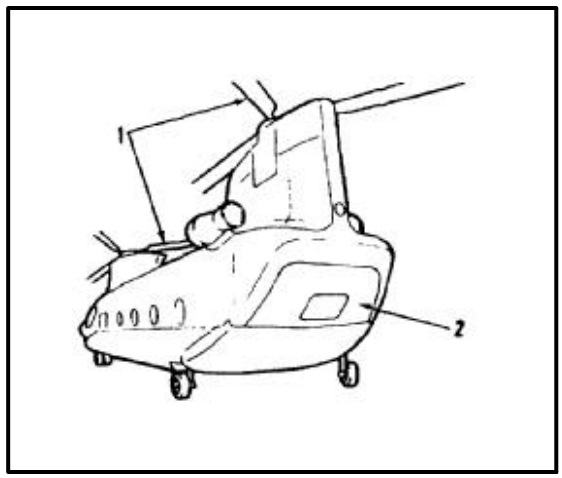
***RAISE HELICOPTER***

1. Check that helicopter gross weight is less than **24,500 pounds** (TM 55-1520-240-10).

CAUTION

Blades or ramp can be damaged if there is not enough clearance.

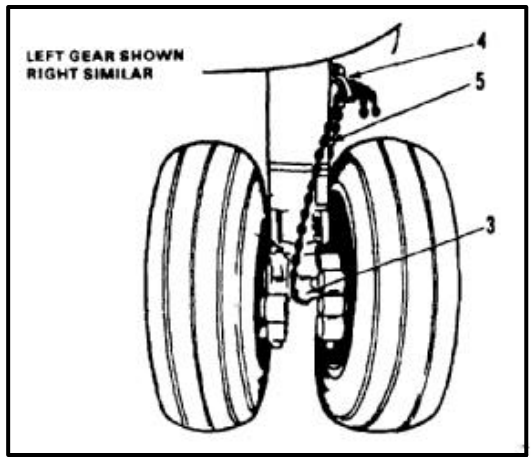
2. Make sure there will be clearance for blades (1) after jacking. Make sure cargo ramp (2) will not hit ground during jacking.



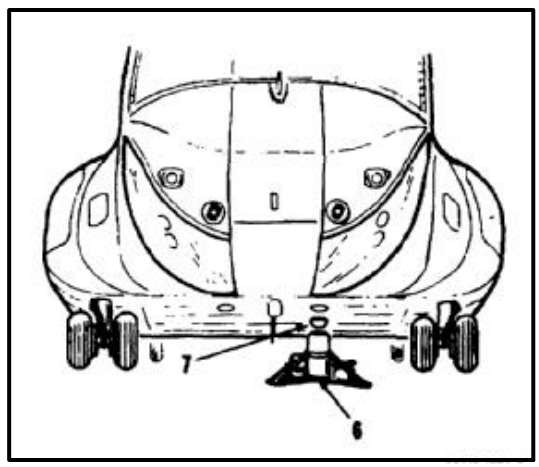
CAUTION

Do not let tiedown chain press against brake tubing. Tubing can be damaged.

3. Secure both forward landing gear shock struts in deflated position. Tie axle housing (3) to towing shackle (4). Use tiedown chain (5).

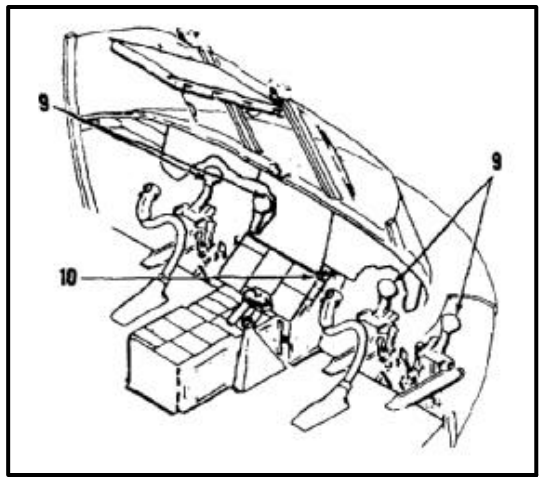



4. Set jack (6) under forward fuselage jack pad (7). Raise jack until it just begins to support some weight.

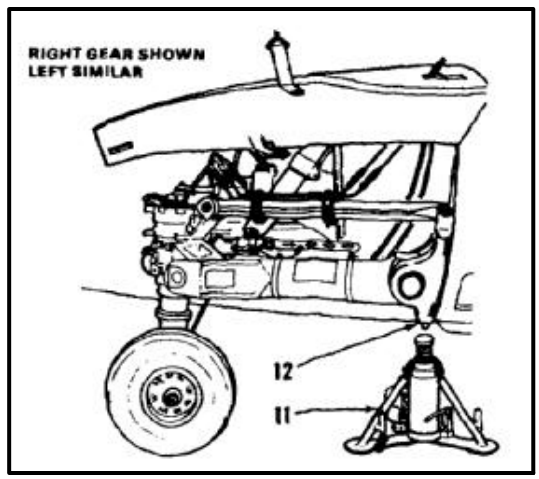



5. Remove chocks (8).

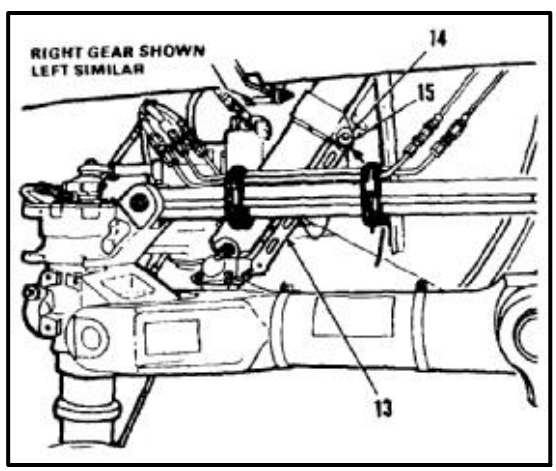
6. Release parking brake by pressing pilot's or copilot's brake pedals (9). Brake handle (10) will release.



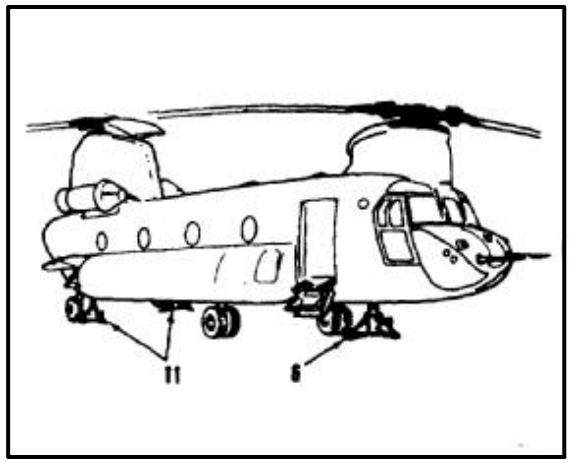

7. Set jack (11) under jack pad (12) at each aft gear. Raise jacks just enough to support some weight.




8. Release static lock (13) from stowed position on each aft landing gear. Secure it to lug (14) with pin (15). If needed, jack gear until lock can be secured.



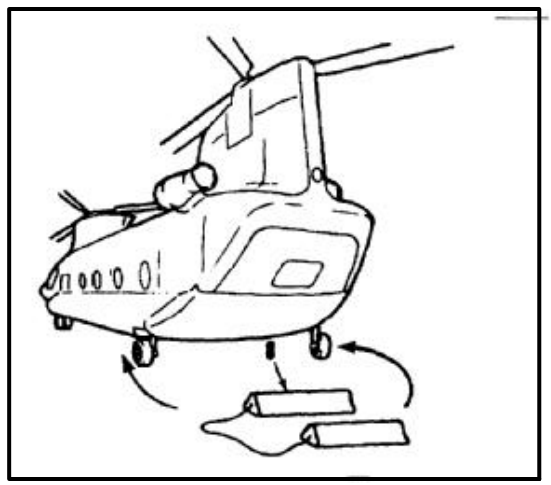
9. Jack helicopter as high as needed. Raise all three jacks evenly, a little at a time.



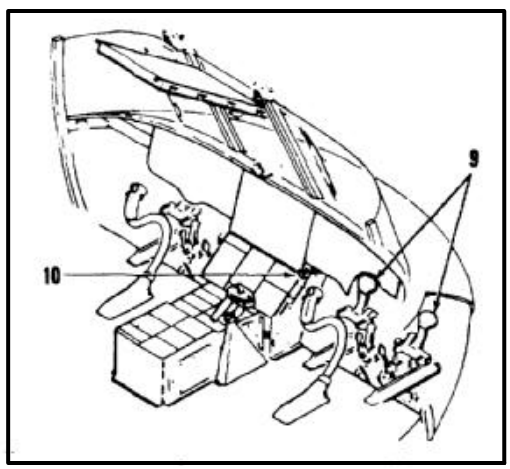

***LOWER HELICOPTER***

10. Lower all three jacks (6 and 11) evenly, a little at a time until forward wheels are firmly on the ground and aft wheels are touching ground. Do not remove jacks.

11. Place chocks (8) at either aft wheel.



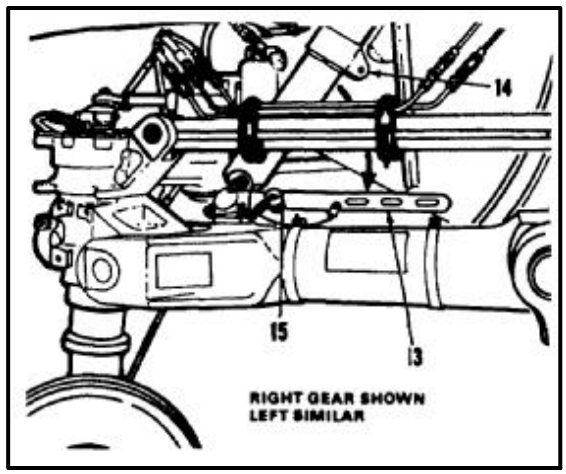

12. Set parking brakes by pressing pilot's brake pedals (9) and pulling handle (10). Release pedal.



CAUTION

Aft landing gear can be damaged if static locks are not released and stowed before lowering all the way.

13. Lower aft landing gear until wheel touches ground. Release static lock (13) from lug (14) on each aft landing gear. Secure in stowed position with pin (15).

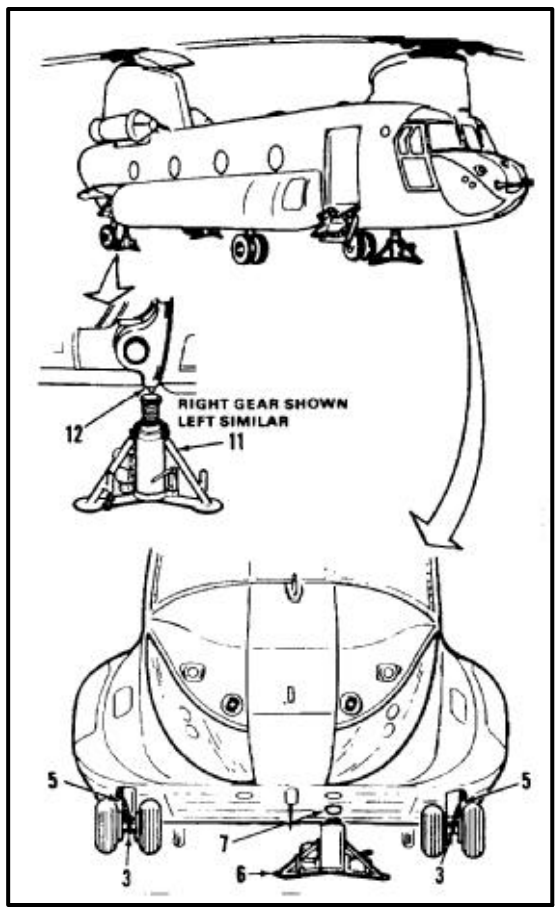



14. Lower all three jacks (6 and 11) evenly until free of pads (7 and 12). Remove jacks.

15. Remove tiedown chains (5) from axle housings (3).

***FOLLOW-ON MAINTENANCE:***

Remove ropes and signs from around helicopter.
Service forward landing gear shock struts with air (Task 1-71).
Service fuel tanks (Task 1-51).




END OF TASK

## 1-22 JACK AT FORWARD FUSELAGE JACK PAD 1-22

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Jack 1228-31 or Equal
Tiedown Chain (2)

***Materials:***

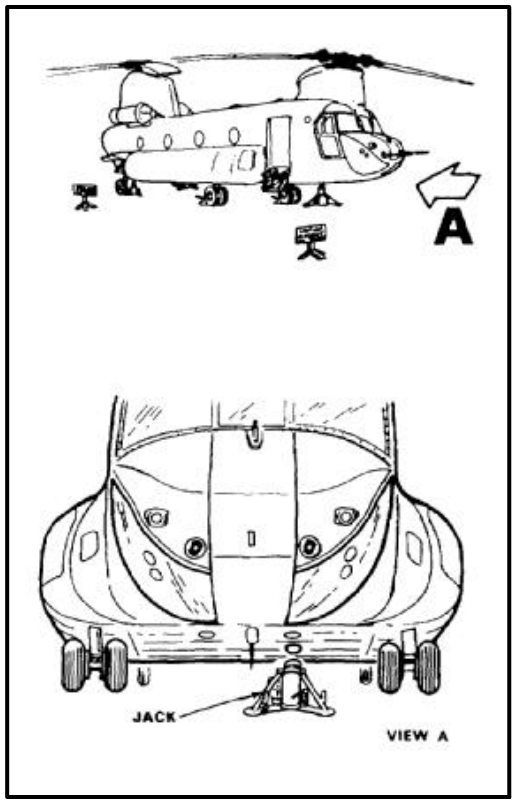
None

***Personnel Required:***

Medium Helicopter Repairer (2)

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Fuel Tanks Drained (Task 10-34 or 10-35)
Helicopter on Hard, Level Surface
Forward Landing Gear Shock Struts Deflated (Task 1-71)
Helicopter Roped Off and Signs Posted to Restrict Access




***General Safety Instructions:***

**WARNING**

Jacking on soft or uneven surface or in winds or gusts over **20 knots** can cause helicopter to fall. Personal injury and damage to equipment can result.

**WARNING**

Jacking when helicopter weight is over limit can damage structure and injure personnel. Do not jack when weight is over limit.

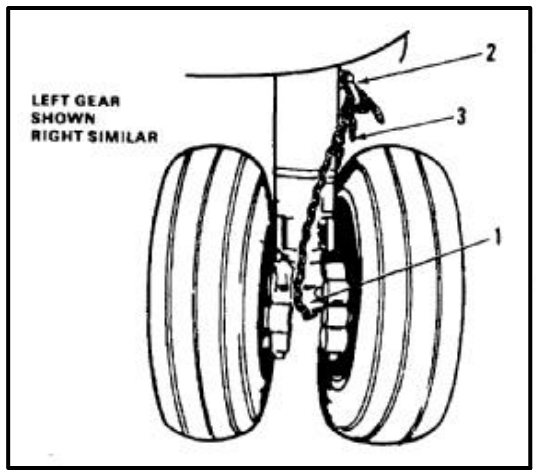
***RAISE HELICOPTER***

1. Check that helicopter gross weight is less than **24,500 pounds** (TM 55-1520-240-10).

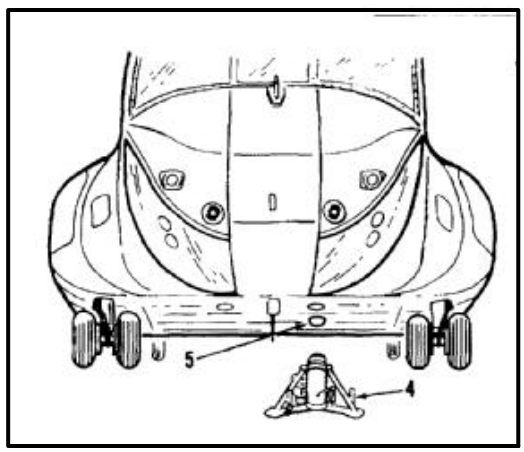
CAUTION

Do not let tiedown chain press against brake tubing. Tubing can be damaged.

2. Secure both forward landing gear shock struts in deflated position. Tie axle housing (1) to towing shackle (2). Use tiedown chain (3).




3. Set jack (4) under jack pad (5). Raise jack until it just begins to support some weight.

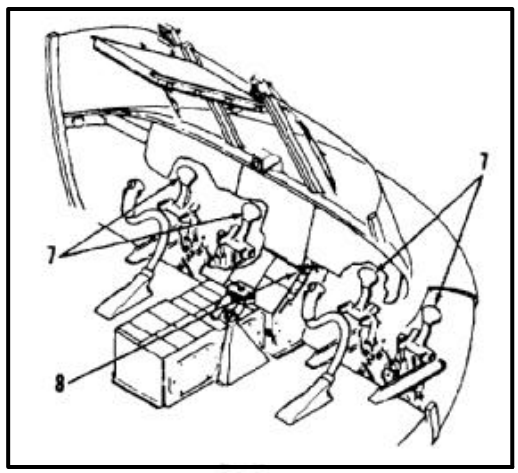


**WARNING**

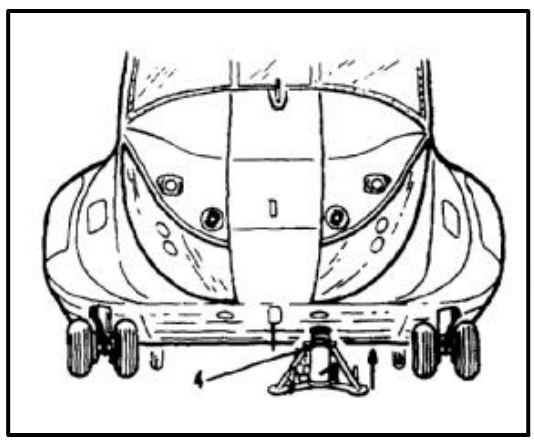
All wheels must be free to move during forward fuselage jacking. If they are not, injury to personnel end damage to structure can result.

4. Remove chocks (6).


5. Release parking brakes by pressing pilot's or copilot's brake pedals (7). Brake handle (8) will release.

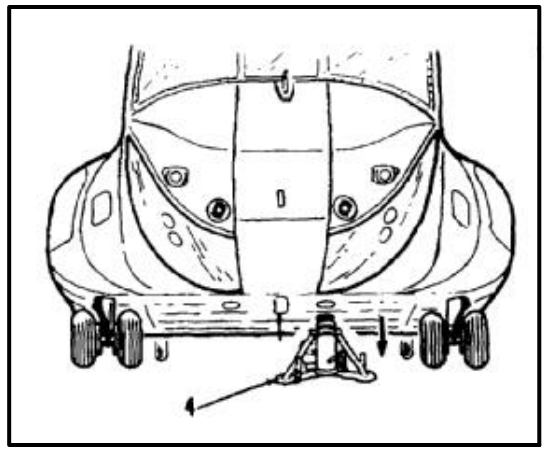



6. Raise jack (4) to lift helicopter as high as needed.

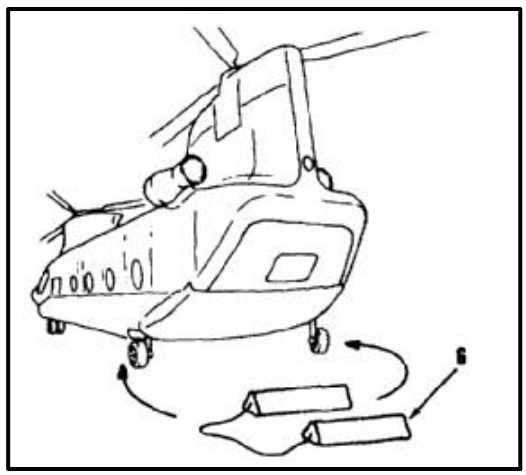


***LOWER HELICOPTER***

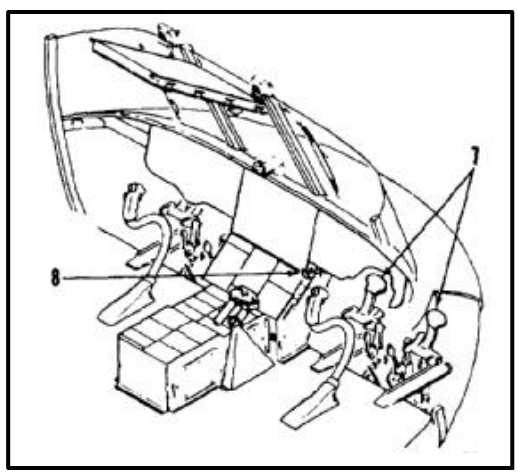
7. Lower jack (4) until forward landing gear wheels are firmly on the ground. Do not remove jack.



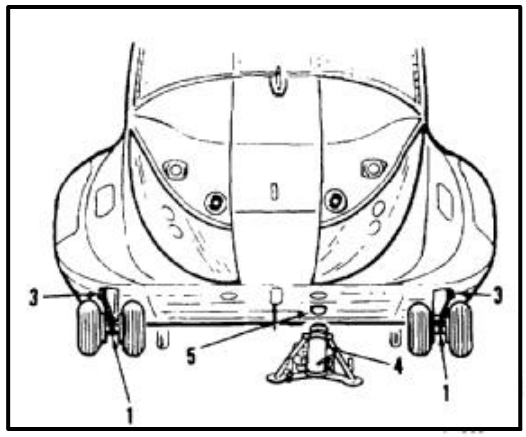

8. Place chocks (6) at either aft wheel.




9. Set parking brakes by pressing pilot's brake pedals (7) and pulling handle (8). Release pedal.



10. Lower jack (4) clear of jack pad (5). Remove jack.
11. Remove tiedown chain (3) from axle housings (1).




***FOLLOW-ON MAINTENANCE:***

Remove ropes and signs from around helicopter.
Service forward landing gear shock struts with air (Task 1-71).
Service fuel tanks (Task 1-51).

END OF TASK

## 1-23 JACK AT FORWARD LANDING GEAR JACK PAD 1-23

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Hydraulic Jack A5 or Equal

***Materials:***

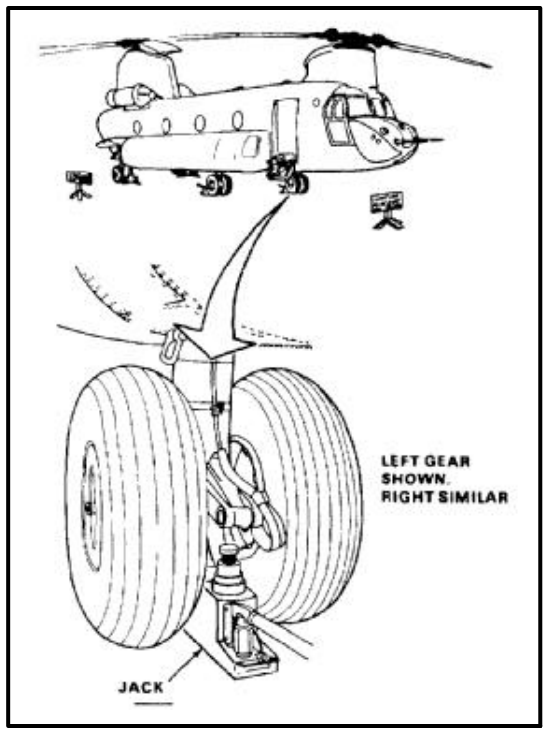
None

***Personnel Required:***

Medium Helicopter Repairer (2)

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Helicopter on Hard Level Surface
Helicopter Roped Off and Signs Posted to Restrict Access



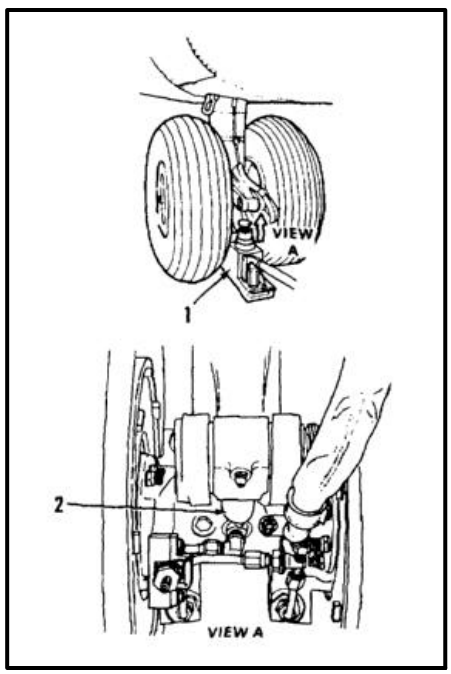

***General Safety Instructions:***

**WARNING**

Jacking on soft or uneven surface, or in winds or gusts over **20 knots**, can cause helicopter to fall. Personal injury and damage to equipment can result.

**NOTE**

Jacking is same at either forward landing gear. Left gear is shown here.




***RAISE HELICOPTER***

1. Set jack (1) under jack pad (2).
2. Jack as high as needed. If jacking both sides, raise both jacks evenly, a little at a time.

***LOWER HELICOPTER***

3. Lower jack (1) slowly and smoothly until free of pad (2). If both sides are jacked, lower both jacks evenly, a little at a time.
4. Remove jack (1) from under pad (2).

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 1-24 JACK AFT END OF HELICOPTER 1-24

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Jack 1214-151 or Equal

***Materials:***

None

***Personnel Required:***

Medium Helicopter Repairer (2)

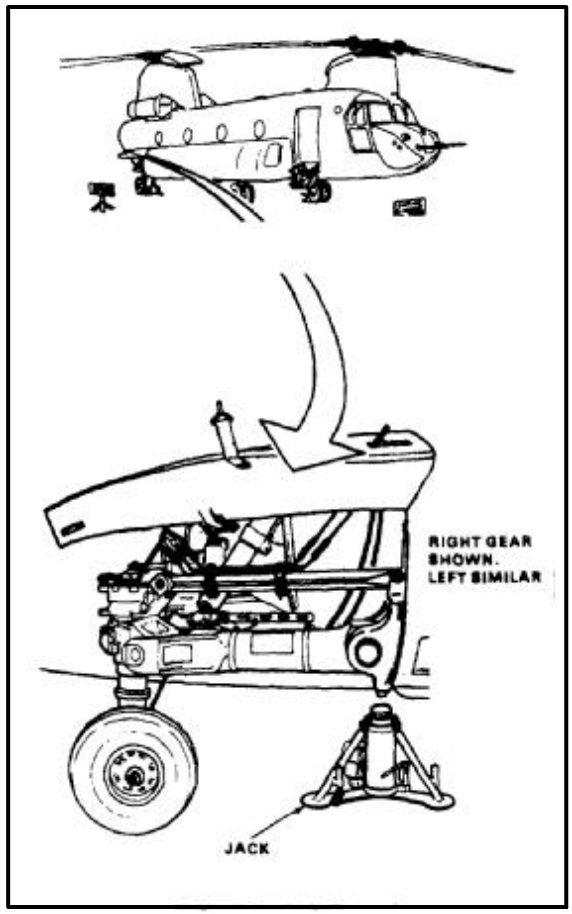
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Both Aft Landing Gear Access Panels Open (Task 2-2)
Helicopter Roped Off and Signs Posted to Restrict Access

***General Safety Instructions:***

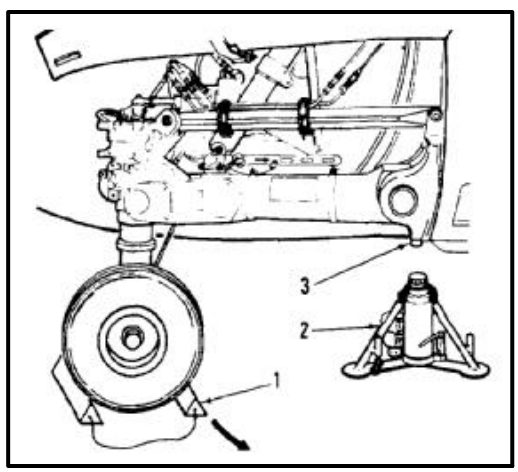
**WARNING**

Jacking on soft or uneven surface or in winds or gusts over **20 knots** can cause helicopter to fall. Personal injury and damage to equipment can result.




**NOTE**

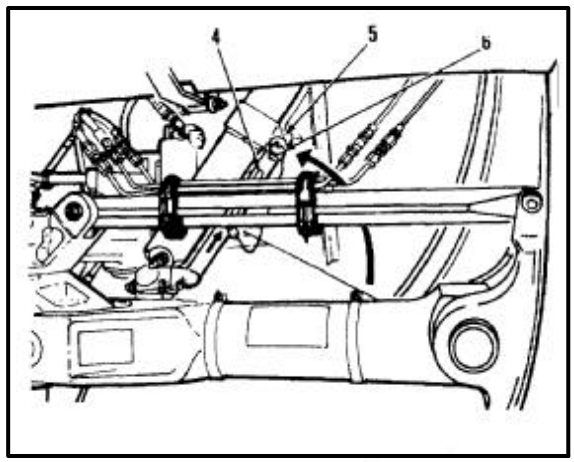
Jack at either aft jack pad in same way. Right pad is shown here.




***RAISE HELICOPTER***

1. Remove chocks (1).
2. Set jack (2) under jack pad (3). Raise jack until it just begins to support some weight.

3. Release static lock (4) from stowed position on side being jacked. Secure to lug (5) with pin (6). If needed, raise jack until lock can be secured.
4. Jack as high as needed. If jacking both sides, raise both jacks evenly, a little at a time.



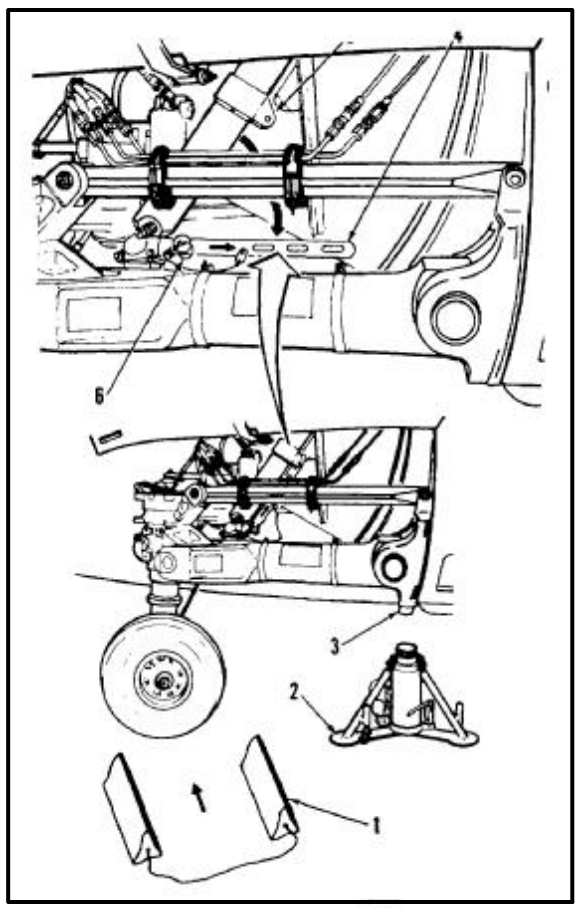

***LOWER HELICOPTER***

5. Lower jack (2) smoothly and slowly until wheel touches ground. If both sides are jacked, lower both sides evenly, a little at a time.
6. Install chocks (1), if removed.

CAUTION

Landing gear can be damaged if static lock is not released and stowed before lowering helicopter.

7. Release static lock (4) from lug (5). Secure in stowed position with pin (6).
8. Lower jack (2) until clear of pad (3).




***FOLLOW-ON MAINTENANCE:***

Close aft landing gear access panels (Task 2-2).

END OF TASK

## 1-25 PARK HELICOPTER 1-25

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

None

***Materials:***

None

***Personnel Required:***

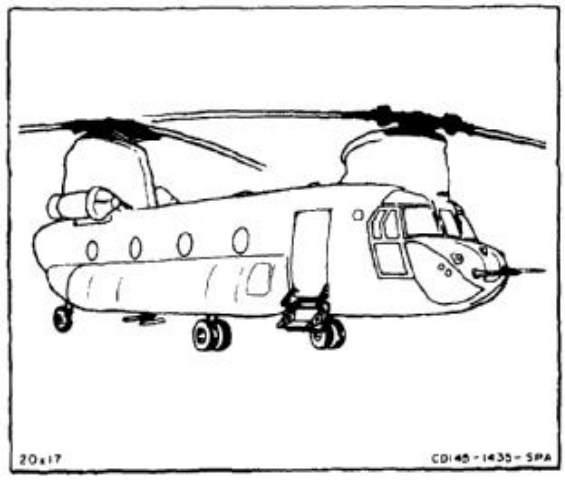
Medium Helicopter Repairer

***References:***

Task 2-2

***Equipment Condition:***

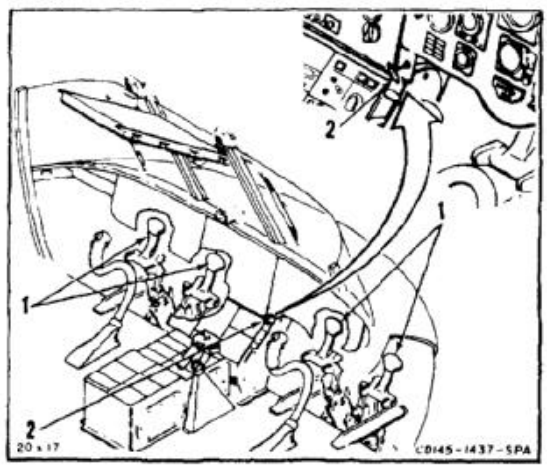
Battery Disconnected (Task 1-39)
Electrical Power Off




**NOTE**

If helicopter will be moored at a hardstand, park it with landing gear next to hardstand fittings.

1. Set parking brakes by pressing pilot's or copilot's brake pedals (1) and pulling handle (2). Release pedals.



2. Place chocks (3) at either aft wheel.

**WARNING**

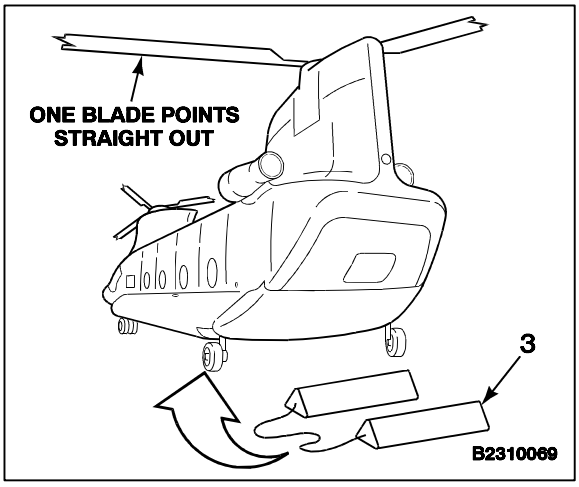
Injury to personnel or damage to equipment can occur if blades move unexpectedly while being turned.

**CAUTION**

If blades are not turned off-centerline, they can hit the fuselage. This can damage fuselage and blade.

3. Turn blades so that one aft blade points straight out **90**° from fuselage centerline.

4. Lock all doors and hatches (Task 2-2).




***FOLLOW-ON MAINTENANCE:***

Moor helicopter, if needed (Task 1-26 or 1-27).

END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Tiedown Line 114E5060-1 (6)
Chain Adjuster, MB-1 (8), NSN 1670-00-212-1149
Chain With Hook for MB-1 (16), NSN 4010-00-516-8405
Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

***Personnel Required:***

CH-47 Helicopter Repairer (2)

***References:***

Task 1-32
TM 1-1500-250-23

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Helicopter Parked (Task 1-25)

***General Safety Instructions:***

**WARNING**

Rotor blades can seriously injure personnel. Make sure area around helicopter is clear of personnel before turning blades.

**NOTE**

The mooring hardware is not considered flyaway equipment. All active mooring pads shall be equipped with this hardware. For additional information refer to TM 1-1500-250-23.

**CAUTION**

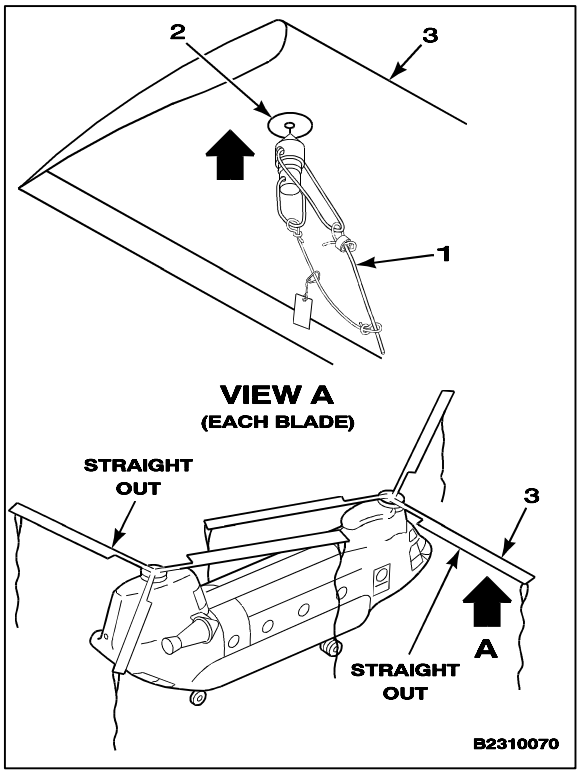
In winds of **39 to 65 knots**, tiedown blades and fuselage to prevent damage. In winds over **65 knots**, evacuate helicopter or store in hangar. If evacuation or storage is not possible, remove blades and tie fuselage down. The leeward side of a large building is the best tiedown location.

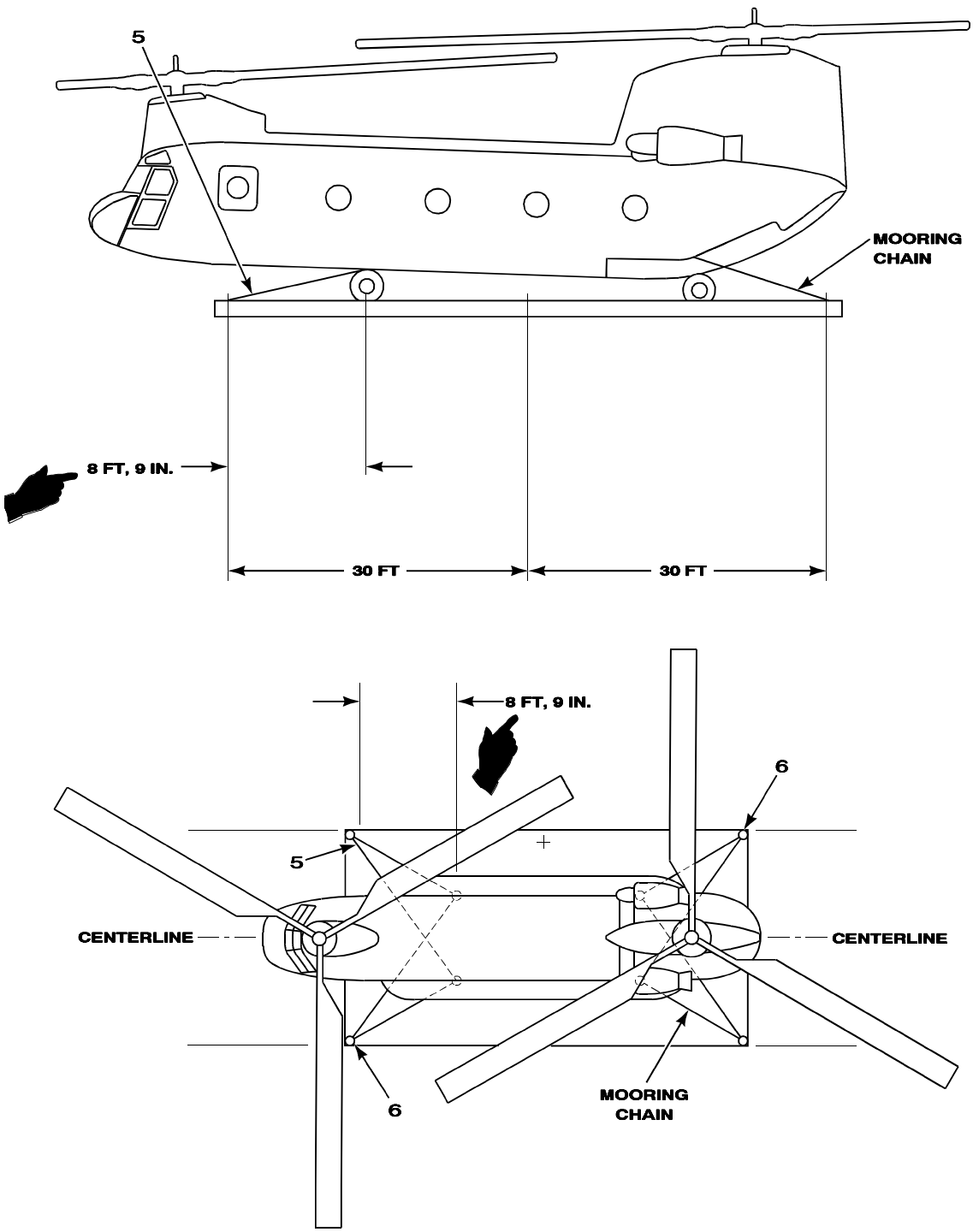
**NOTE**

Tiedown two forward blades in winds under **39 knots**, also when blades will be in rotor wash of other helicopters.

***TIEDOWN AND MOORING***

1. Install tiedown line (1) in fitting (2) of each blade (3). Work from walkway on top of fuselage. Pull blades around with tiedown lines as needed to reach all six blades.

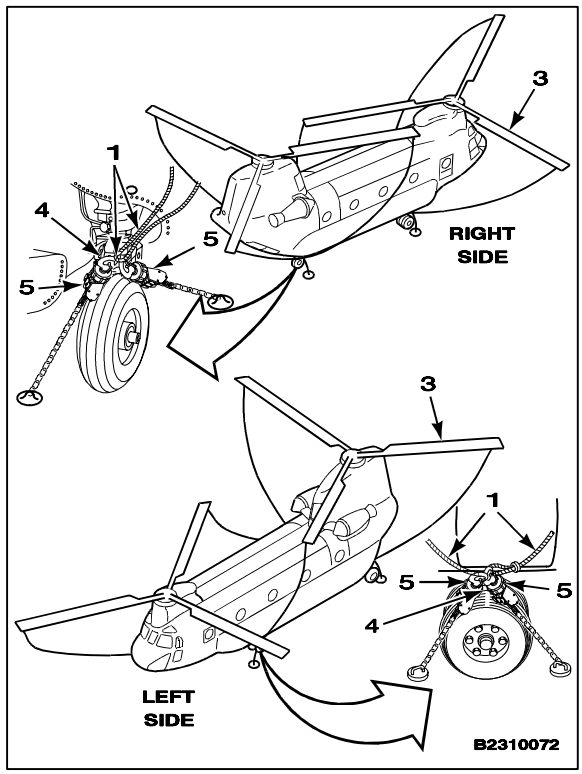





CH-47 PAVED SURFACE MOORING CONFIGURATION

B2310071

2. Pull blades (3) around so that one forward blade and one aft blade point straight out **90**° from fuselage.
3. Position the helicopter on the mooring surface with the longitudinal centerline of the aircraft directly above and parallel to the longitudinal axis of the mooring area.
4. Position the helicopter on the mooring surface so that the mooring shackles (4) located on the main (front) landing gear are **8 feet 9 inches** aft of the pad forward mooring points (6).
5. Secure tiedown line (1) from each blade (3) to towing shackle (4) on nearest forward or aft landing gear.
6. Place the hookends of four chains into the mooring fittings (4) on the forward landing gear struts (TM 1-1500-250-23).
7. Adjust the four chains using the MB-1 chain adjusters (5) provided on the mooring pad. Chains should be adjusted to the point where the slack has been removed.
8. Repeat the procedure for the chains and MB-1 chain adjusters which engage the mooring rings (4) on the aft landing gear, struts, and mooring points (6) (TM 1-1500-250-23).
9. Install protective covers (Task 1-32).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Tiedown Line 114E5060-1 (6)
Mooring Kit AN8015-2
Tiedown Chain (4)
Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

***Personnel Required:***

CH-47 Helicopter Repairer (2)

***References:***

Task 1-32
TM 1-1500-250-23

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Helicopter Parked (Task 1-25)
Mooring Kit Installed

**CAUTION**

In winds of **39 to 65 knots**, tiedown blades and fuselage to prevent damage. In winds over **65 knots**, evacuate helicopter or store in hangar. If evacuation or storage is not possible, remove blades and tie fuselage down. The leeward side of a large building is the best tiedown location.

**NOTE**

Tiedown two forward blades in winds under **39 knots**, also when blades will be in rotor wash of other helicopters.

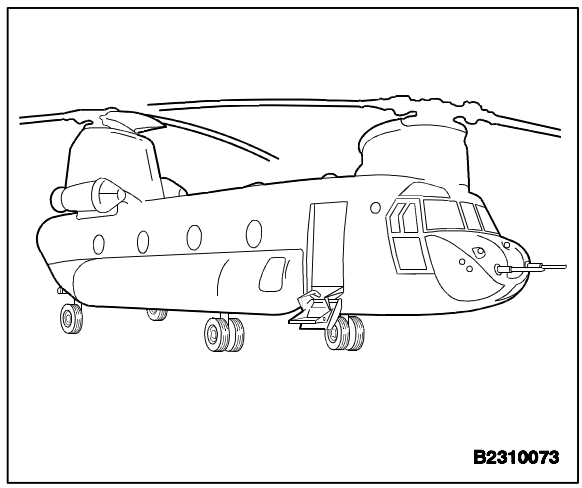
***MOOR***

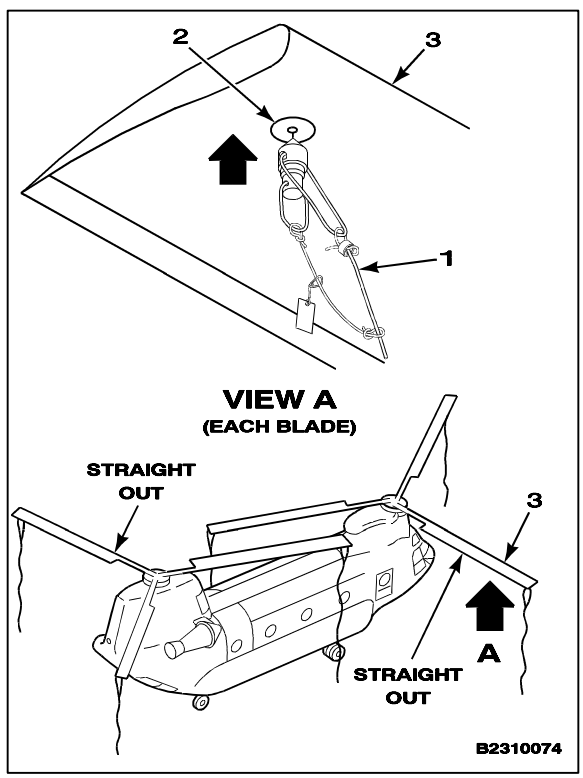
1. Install tiedown line (1) in receiver (2) of each blade (3). Work from walkway on top of fuselage. Pull blades around with tiedown lines as needed to reach all six blades.
2. Pull blades around so that one forward blade and one aft blade point straight out **90°** from fuselage.

***General Safety Instructions:***

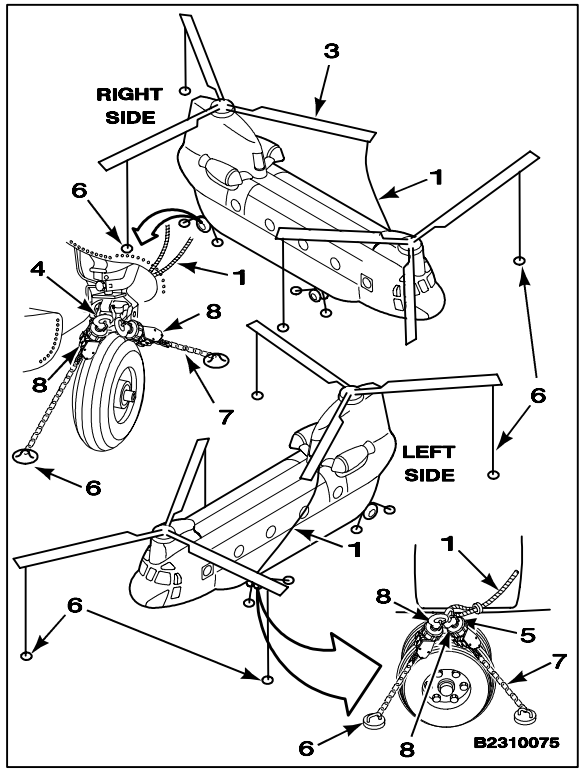
**WARNING**

Rotor blades can seriously injure personnel. Make sure area around helicopter is clear of personnel before turning blades.



3. Tie line (1) from most aft blade of forward head to towing shackle (4) on aft landing gear.
4. Tie line (1) from most forward blade of aft head to shackle (5) on forward landing gear.
5. Tie lines (1) on other four blades (3) to nearest tiedown fittings (6) of mooring kit.
6. Tie each of four shackles (4 or 5) to nearest tiedown fittings (6) of mooring kit. Use tiedown chain (7) with MB-1 chain adjusters (8).
7. Install protective covers (Task 1-32).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 1-28 INSTALL HELICOPTER SECURITY LOCKING DEVICES 1-28

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

None

***Materials:***

None

***Personnel Required:***

Medium Helicopter Repairer

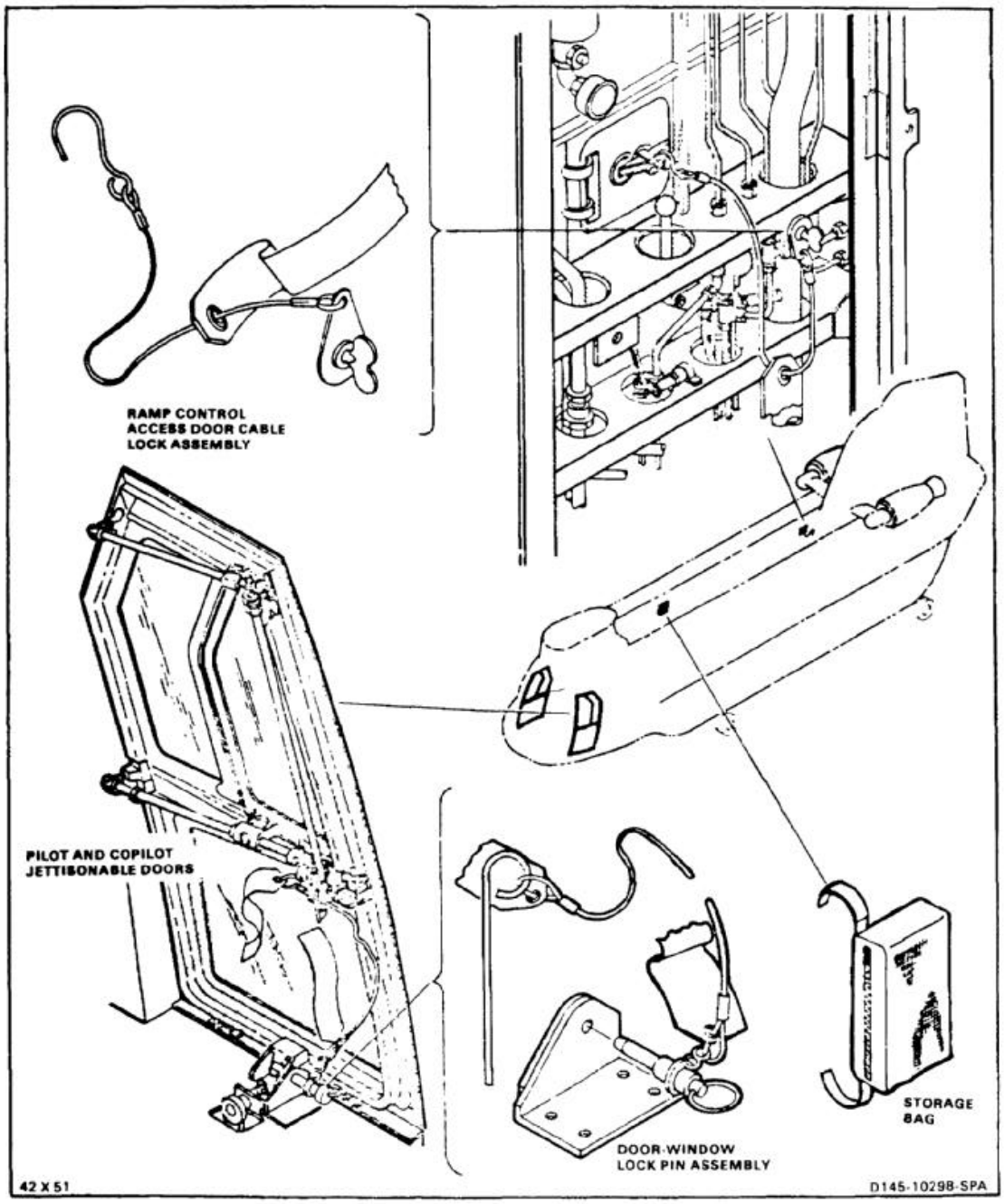
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Helicopter Parked (Task 1-25)

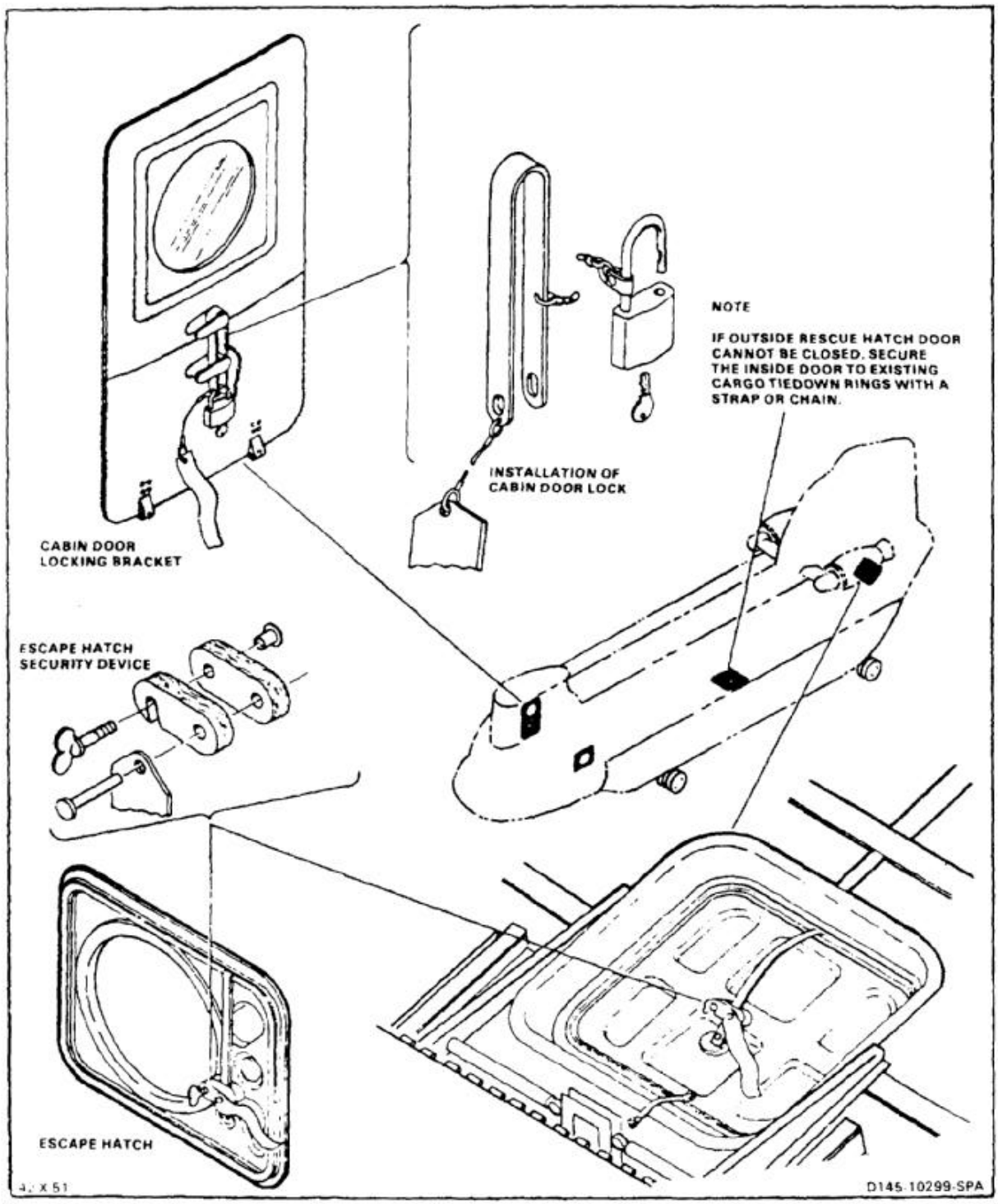
**NOTE**

Helicopter is equipped with door, window, and escape hatch security locking devices to prevent entry by unauthorized persons.

1. Install lock pins through pilot and copilot window latches. Insert quick-release pin through floor bracket and into door latch plate. Check that warning streamers are clearly visible.
2. Secure release straps of forward cabin escape hatches and cargo door escape hatch. Use restraining clamps. Locate clamps as close as possible to release grommet. Check that warning streamers are clearly visible.
3. Check that ramp is in full up position. Install cable hook through ramp controls access door latch. Install fastener at other end of cable to bracket on structure. Check that warning streamer is clearly visible.
4. Close lower rescue hatch door. If door cannot be closed, secure inside door to tiedown ring with cargo strap.
5. Close cabin doors. Install bracket on door handles. Secure bracket with padlock.




*Installation of Helicopter Security Devices (Sheet 1 of 2)*




*Installation of Helicopter Security Devices (Sheet 2 of 2)*

***FOLLOW-ON MAINTENANCE:***

As Required

END OF TASK

## 1-29 STATIC GROUNDING DURING GROUND OPERATION 1-29

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Red Cloth Strips
Grounding Cable

***Materials:***

As Required

***Personnel Required:***

Medium Helicopter Repairer

***Equipment Condition:***

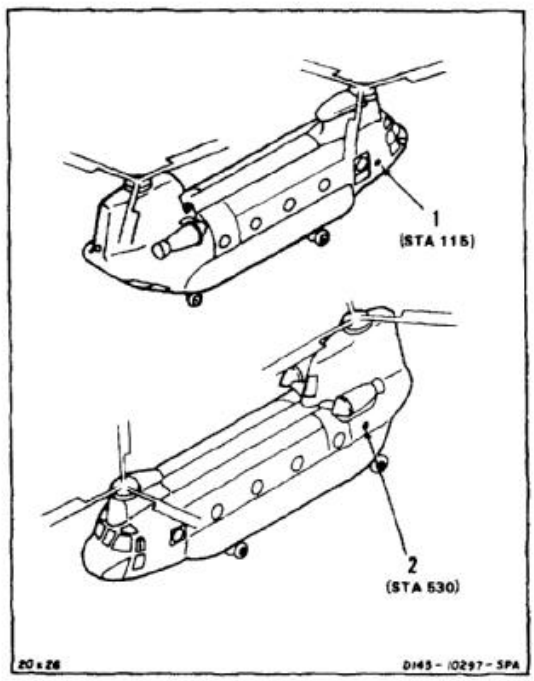
Battery Disconnected (Task 1-39)
Helicopter Parked (Task 1-25)

***General Safety Instructions:***

**WARNING**

Personal injury and damage to equipment can result if helicopter is not electrostatically grounded on flight line, in hangars, or on apron, and helicopters in maintenance or painting.

1. Immediately after helicopter is in position, connect end of grounding cable to grounding jack (1 or 2) on fuselage. Jacks are at sta. 115 rh and sta. 530 lh.
2. Check that cable has no broken strands. Check that clips or plugs are attached securely to grounding points.
3. Attach red cloth strips to cable for personnel safety.
4. Disconnect cable from ground rod first, then from helicopter.




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 1-30 LEVEL AND WEIGH HELICOPTER (3-POINT) (AVIM) 1-30

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Hydraulic Jack 1228-31 or Equal
Hydraulic Jack 1214-151 or Equal (2)
Aircraft Weighing Kit (T186)
Tiedown Chain (2)

***Materials:***

None

***Personnel Required:***

Medium Helicopter Repairer (5)
Inspector

***References:***

TM 55-1500-342-23

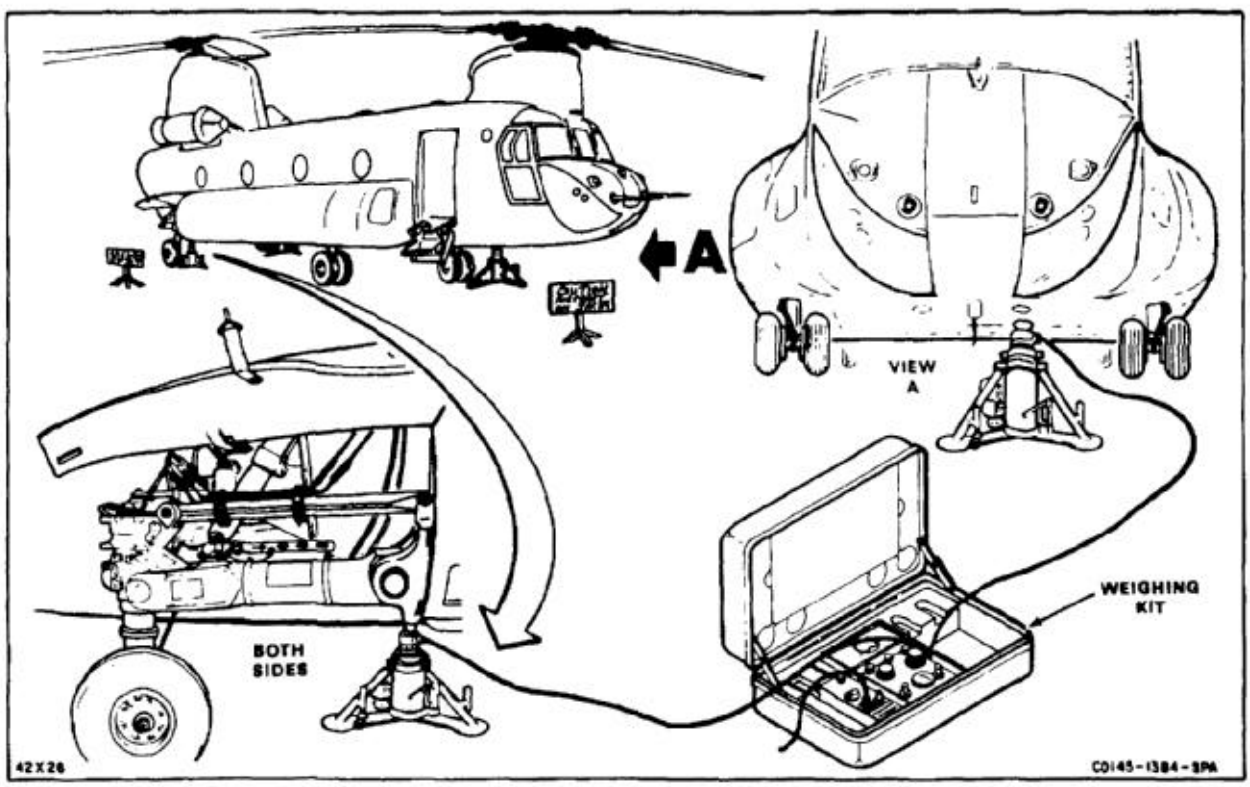
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Fuel Tanks Drained (Task 10-34 or 10-35)
Engine Oil Tanks Serviced to Full (Task 1-52)
All Transmissions Serviced to Full (Task 1-54)
Hydraulic System Reservoir Serviced to Full (Task 1-50 or 1-62)
Helicopter Washed (Task 1-76)
Helicopter Inside Closed Hangar on Level Surface
Helicopter Inventory Complete
Helicopter Roped Off and Signs Posted to Restrict Access
Both Forward Landing Gear Shock Struts Deflated (Task 1-71)
Both Aft Landing Gear Access Panels Open (Task 2-2)
Both Aft Landing Gear Shock Struts Inflated (Task 1-72)
Servocylinder Safety Blocks Installed (Task 11-28)

***General Safety Instructions:***

**WARNING**

Jacking on uneven surface can cause helicopter to fall. Personal injury and damage to equipment can result.



**WARNING**

Jacking when helicopter weight is over limit can damage structure and injure personnel. Do not jack when weight is over limit.

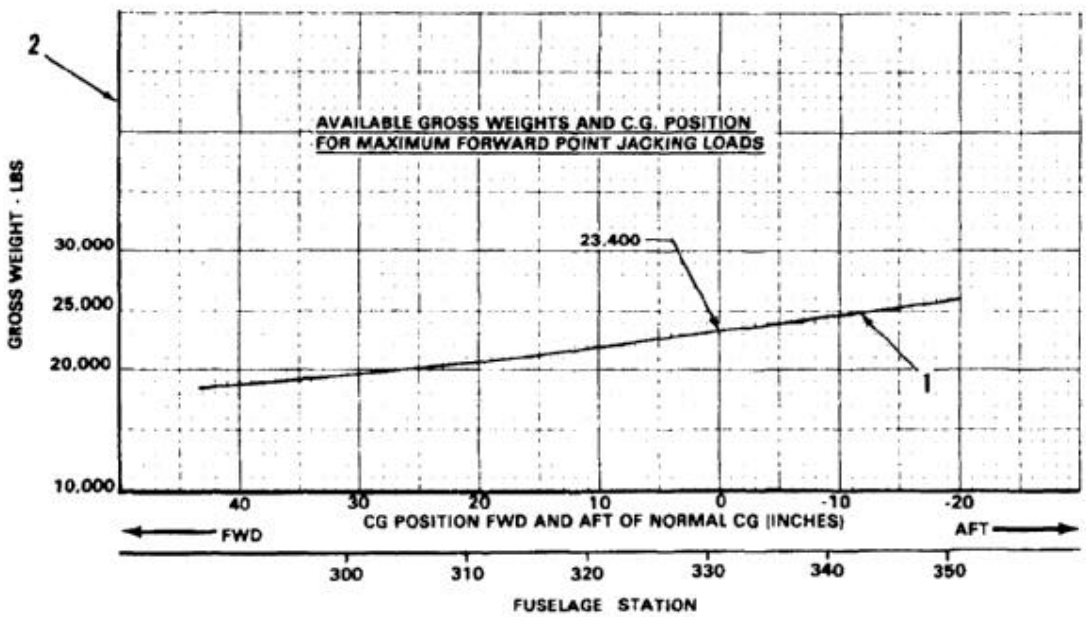
***RAISE HELICOPTER***

1. Determine the estimated gross weight and CG position from the last weighing and information on DD Form 365-3. This data will be necessary in determining the allowable gross weight and CG position for maximum forward point jacking loads from curve (1) on graph (2) below.

**CAUTION**

Blades can be damaged if there is not enough clearance.

2. Make sure there will be clearance for blades after jacking. Make sure cargo ramp is closed.



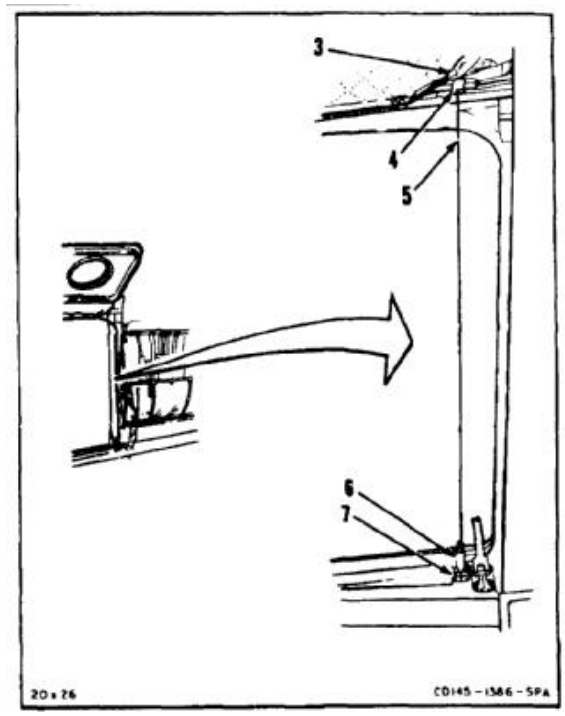
**NOTE**

Refer to TM 55-1500-342-23 for additional information on helicopter weighing.

***SECURE PLUMB BOB***

3. Pull back acoustic blanket (3) above upper aft corner of cabin doorway to expose bracket (4).

4. Tie plumb bob string (5) around bracket (4) so that plumb bob (6) hangs from V-notch point of bracket, slightly above plate (7).

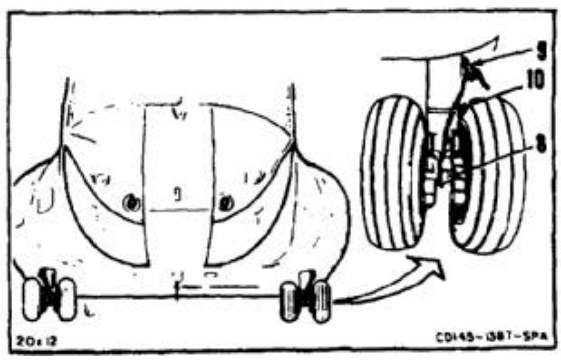



***POSITION JACKS***

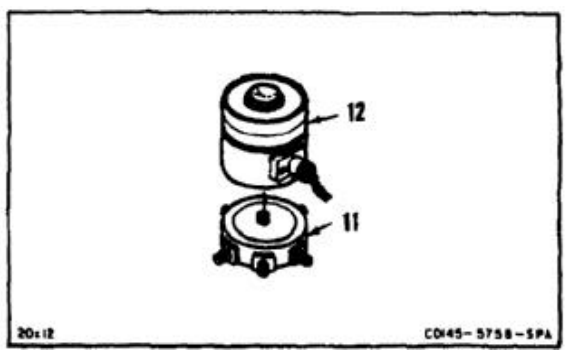
CAUTION

Do not let tiedown cable press against brake tubing. Tubing can be damaged.

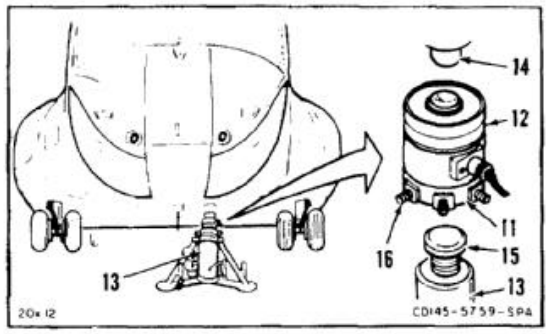
5. Secure both forward landing gear shock struts in deflated position. Tie axle housing (8) to towing shackle (9). Use tiedown chain (10).



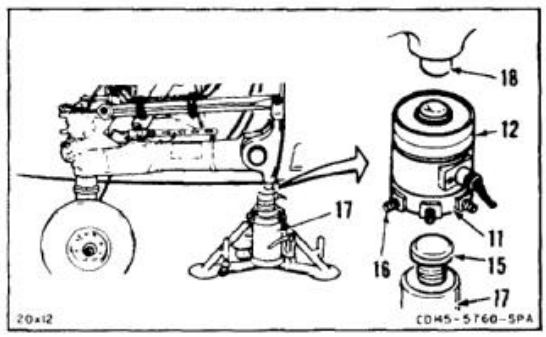

6. Install adapter (11) on each of three weighing cells (12). Adapters and cells are parts of weighing kit.



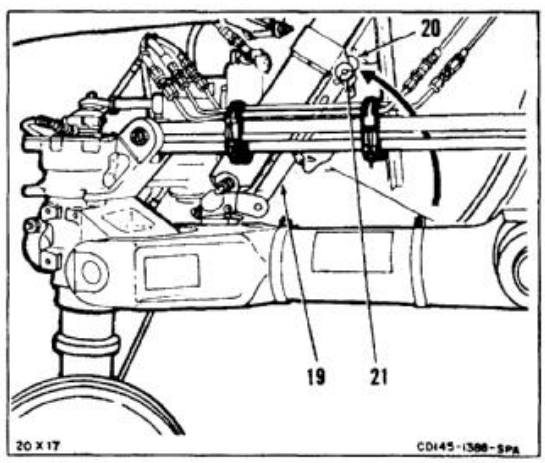
7. Set jack (13) under forward fuselage jack pad (14). Set adapter (11) and cell (12) on jack.
8. Secure adapter (11) to threaded extension (15) with six screws (16). Raise threaded extension by hand to put cell (12) against pad (14).



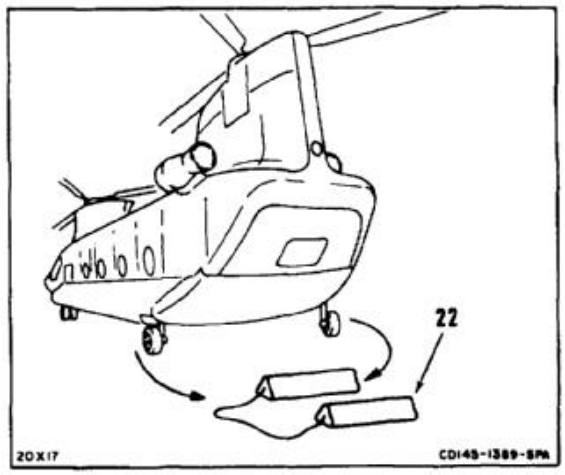

9. Set a jack (17) under each aft fuselage jack pad (18). Set adapter (11) and cell (12) on each jack.
10. Secure adapter (11) to threaded extension (15) with six screws (16). Raise threaded extension by hand to put cell (12) against pad (18).



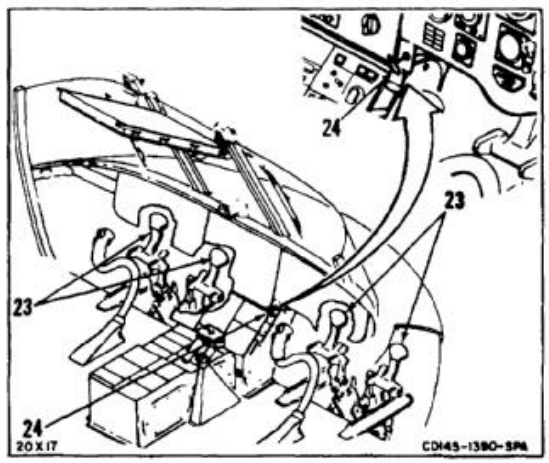

11. Release static lock (19) from stowed position on each aft landing gear. Secure it to lug (20) with pin (21). If needed, jack gear until lock can be secured.



12. Remove chocks (22) from aft wheel.




13. Release parking brakes by pressing pilot's or copilot's brake pedals (23). Brake handle (24) will release.

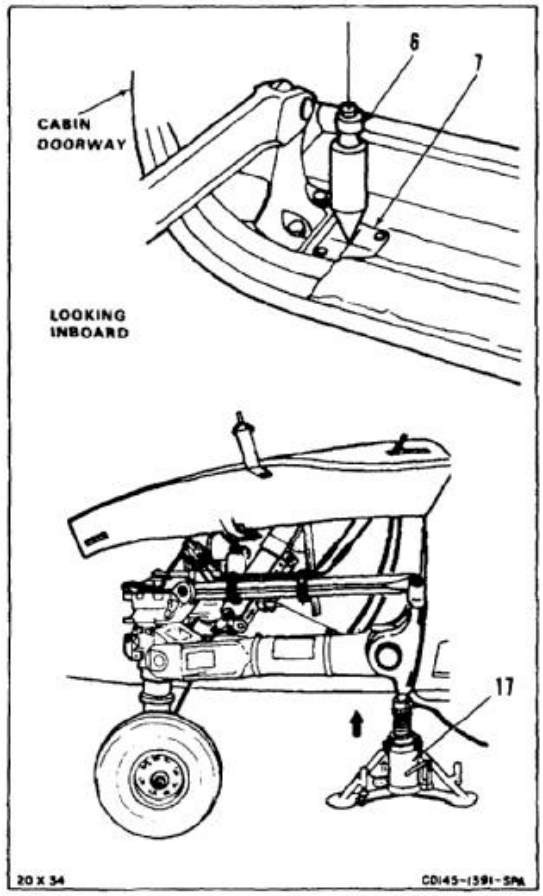


***WEIGH HELICOPTER***

14. Have helper stand outside the cabin doorway to watch plumb bob (6) and plate (7).

15. Raise both aft jacks (17) together **1 inch** at a time. Raise them until helicopter is level. Helicopter is level when point of plumb bob (6) is directly over cross point of guide lines on plate (7).

16. Record weight supported by each load cell. Refer to instructions in weighing kit.



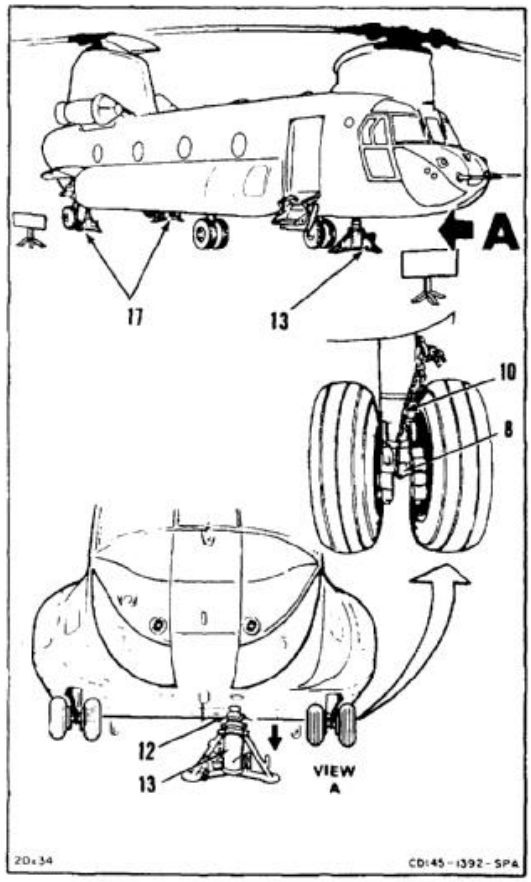
***LOWER HELICOPTER***

CAUTION

Do not lower aft jacks first. Damage to structure can result.

17. Lower all three jacks (13 and 17) together, **1 inch** at a time. Lower them until cell (12) on forward jack is clear of pad. Move jack and cell clear of helicopter.

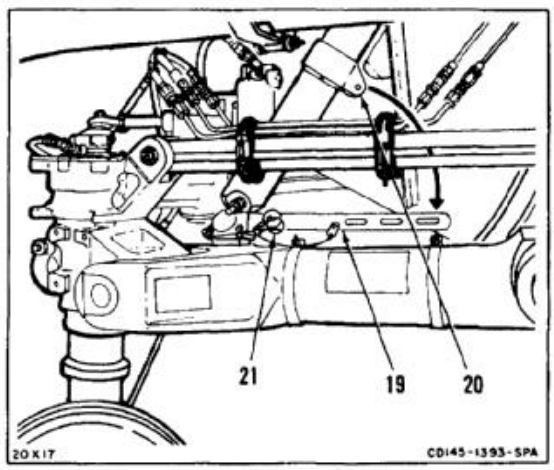
18. Remove tiedown chain (10) from axle housings (8) on each side of helicopter.



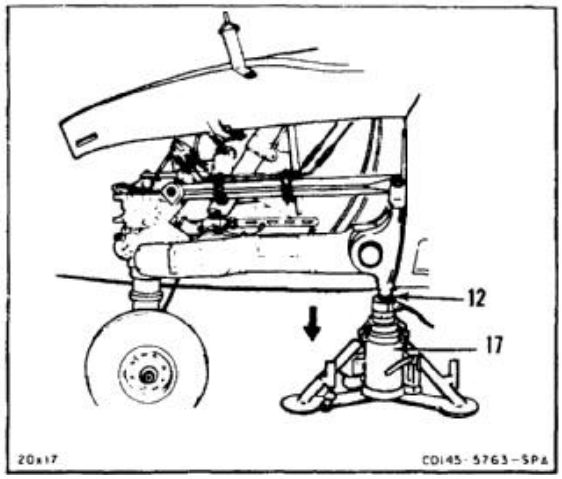

CAUTION

Aft landing gear can be damaged if static locks are not released and stowed before gear are lowered all the way.

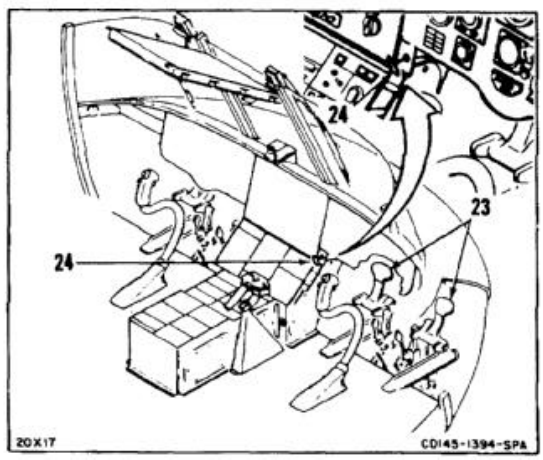
19. Lower both aft landing gear evenly until wheels touch ground. Release static gear lock (19) from lug (20) on each gear. Secure in stowed position with pin (21).



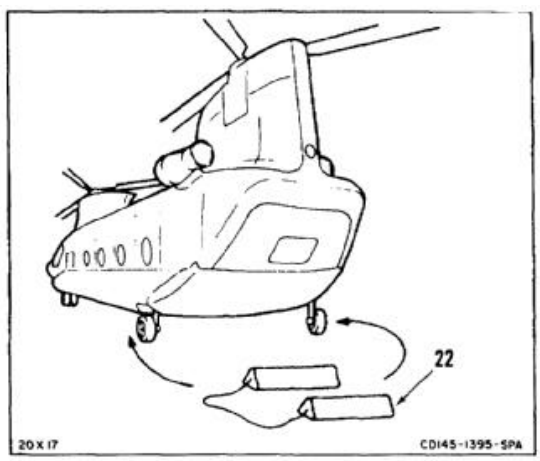
20. Lower both aft jacks (17) evenly, **1 inch** at a time. Lower them until cells (12) are clear of pads. Remove jacks and cells.



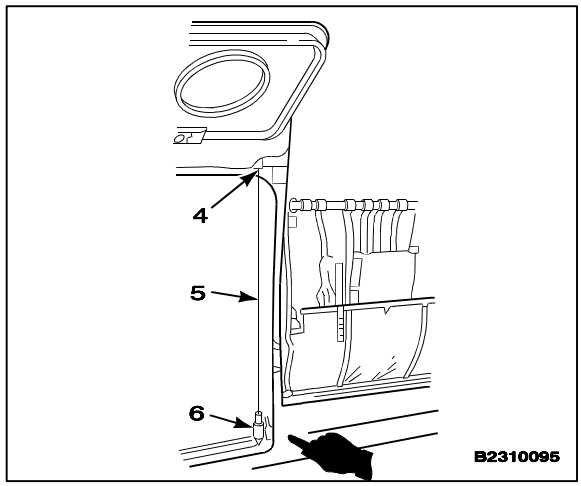

21. Set parking brakes by pressing pilot's brake pedals (23) and pulling handle (24). Release pedal.




22. Place chocks (22) at either aft wheel.



23. Remove plumb bob (6) and string (5) from bracket (4) in cabin doorway.




***FOLLOW-ON MAINTENANCE:***

Remove ropes and signs from around helicopter.
Service forward landing gear shock struts with air (Task 1-71).
Close aft landing gear access panels (Task 2-2).
Remove servocylinder safety blocks (Task 11-29).
Service fuel tanks (Task 1-51).

END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Hydraulic Jack A5 or Equal (2)
Hydraulic Jack 1214-151 or Equal (2)
Aircraft Weighing Kit (2) (T186)
Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

***Materials:***

None

***Personnel Required:***

CH-47 Helicopter Repairer (5)
Inspector

***References:***

TM 55-1500-342-23

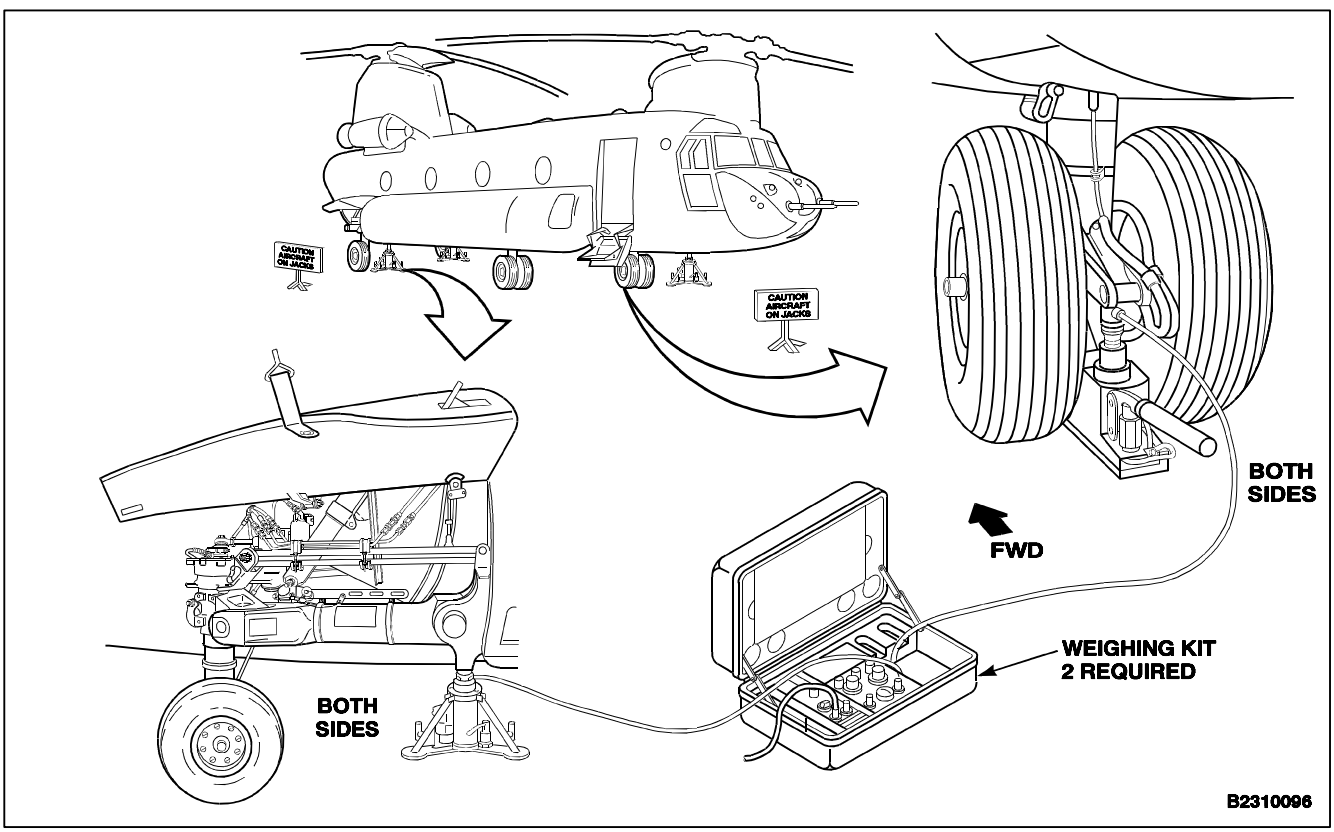
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Gravity Refueling (Task 1-51.1) or Fuel Tanks Drained (Task 10-34 or 10-35)
Engine Oil Tanks Serviced to Full (Task 1-52)
All Transmissions Serviced to Full (Task 1-54)
Hydraulic System Reservoir Serviced to Full (Task 1-59 or 1-62)
Helicopter Washed (Task 1-76)
Helicopter Inside Closed Hanger
Helicopter Inventory Complete
Helicopter on Level Surface With Winds Below 5 Knots
Helicopter Roped Off and Signs Posted to Restrict Access
Both Forward Landing Gear Shock Struts Deflated (Task 1-71)
Both Aft Landing Gear Access Panels Open (Task 2-2)
Both Aft Landing Gear Shock Struts Inflated (Task 1-72)
Servocylinder Safety Blocks Installed (Task 11-28)

***General Safety Instructions:***

**WARNING**

Jacking on uneven surface or in winds or gusts over **20 knots** can cause helicopter to fall. Personal injury and damage to equipment can result.



**WARNING**

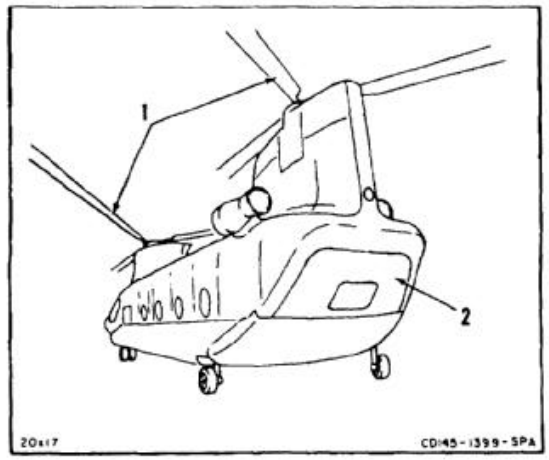
The maximum gross weight for 4-point weighing is **33,000 pounds**. Jacking when helicopter weight is over limit can damage structure and injure personnel. Do not jack when weight is over limit.

**CAUTION**

Blades can be damaged if there is not enough clearance.

**NOTE**

Defueling of the aircraft is not a requirement, to perform this task. That option rests with the operating unit.



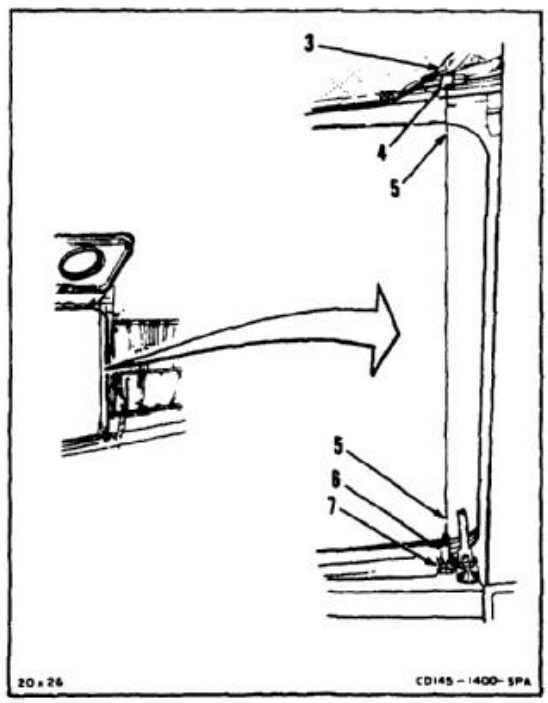

1. Make sure there will be clearance for blades (1) after jacking. Make sure cargo ramp (2) is closed.

***SECURE PLUMB BOB***

2. Pull back insulation (3) above upper aft corner of cabin doorway for access to bracket (4).
3. Tie plumb bob string (5) around bracket (4) so that plumb bob (6) hangs from V-notch of bracket, slightly above (7).

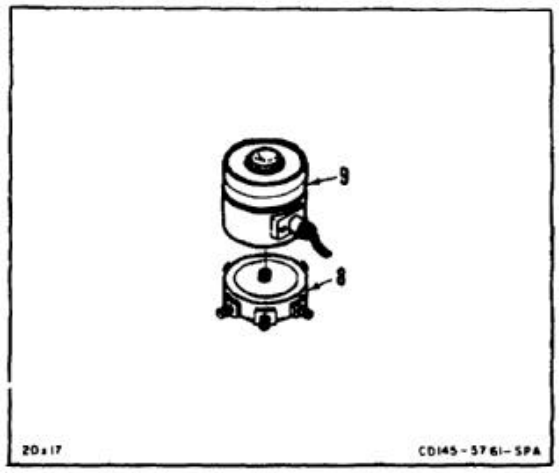
**NOTE**

Refer to TM 55-1500-342-23 for additional information on helicopter weighing.



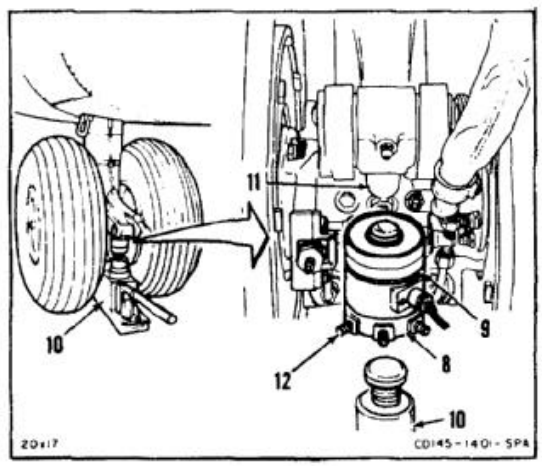
***POSITION JACKS***

4. Install an adapter (8) on each of four weighing cells (9). Adapters and cells are part of weighing kit.



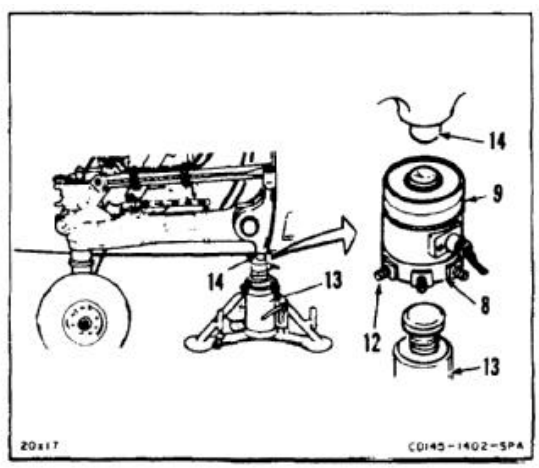

5. Set a jack A5 (10) under each forward landing gear jack pad (11). Set adapter (8) and cell (9) on each jack.

6. Secure adapter (8) to threaded extension of jack (10) with six screws (12). Raise extension by hand to put cell (9) against pad (11).

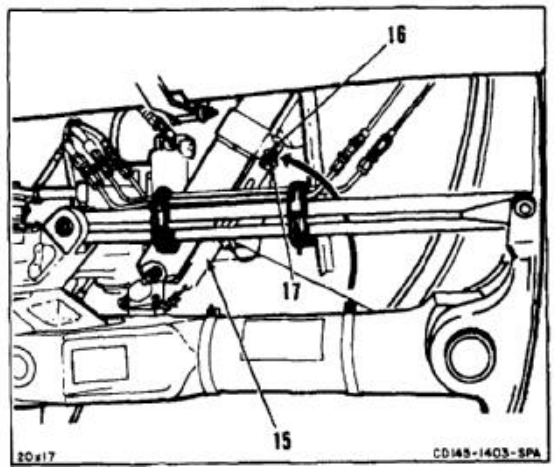



7. Set a jack 1214-151 (13) under each aft fuselage jack pad (14). Set an adapter (8) and cell (9) on each jack. Raise threaded extension on each jack by hand to put cell against pad.

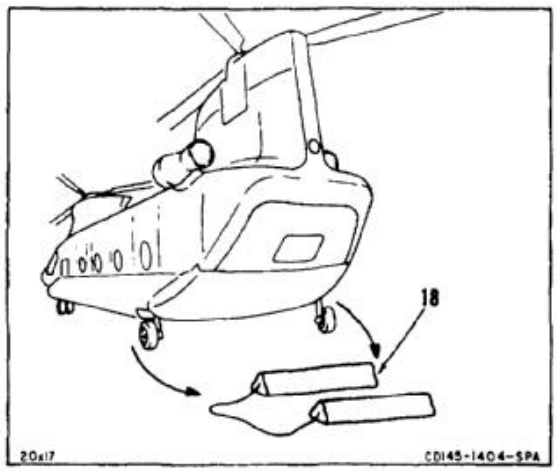
8. Secure adapter (8) to threaded extension of each jack (13) with six screws (12). Raise extension by hand to put cell (9) against pad (14).



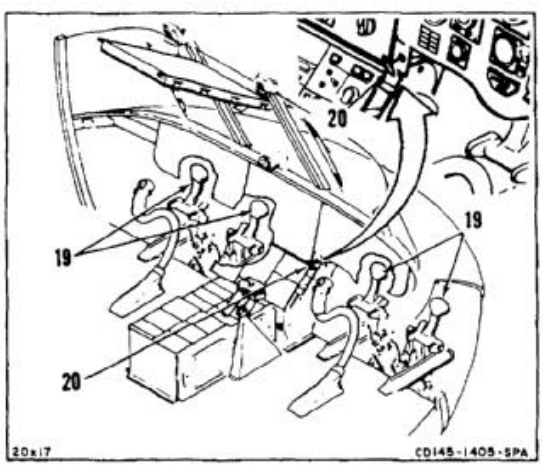
9. Release static lock (15) on each aft landing gear from stowed position. Secure it to lug (16) with pin (17). If needed, jack gear until lock can be secured.




10. Remove chocks (18) from wheels.

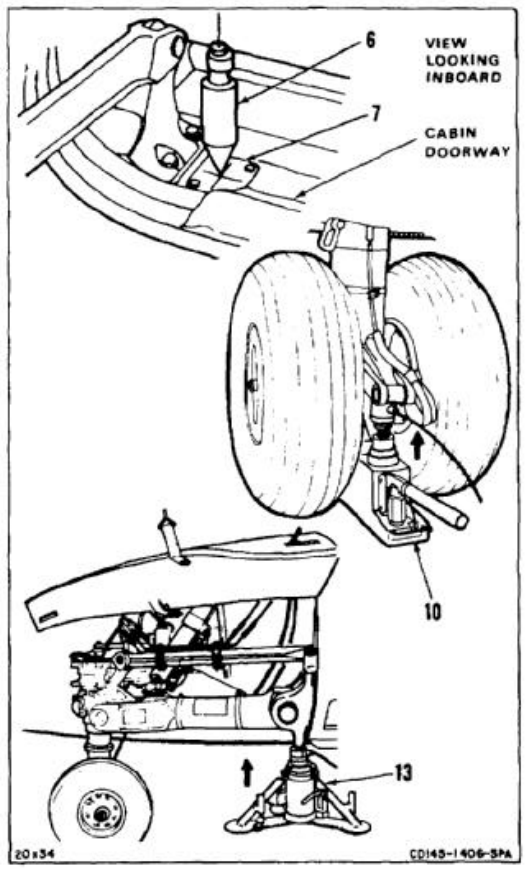



11. Release parking brakes by pressing pilot's or copilot's brake pedals (19). Brake handle (20) will release.



***WEIGH HELICOPTER***

12. Have a helper stand outside cabin doorway to watch plumb bob (6) and plate (7).
13. Raise both forward jacks (10) and both aft jacks (13) together. Raise them **1 inch** at a time, until all tires are off the ground.
14. Raise each jack (10 and 13) as needed to level helicopter. Helicopter is level when point of plumb bob (6) is directly over cross point of lines on plate (7).
15. Record weight supported by each load cell. Refer to instructions in weighing kit.

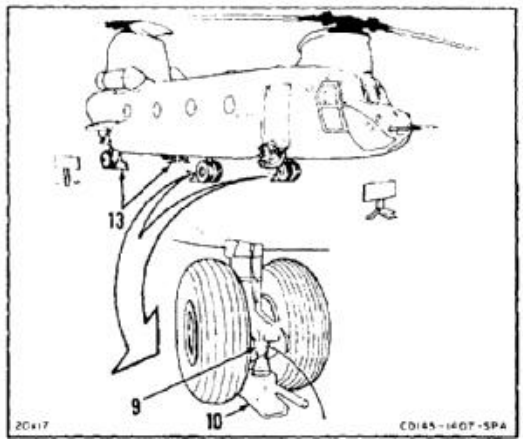


***LOWER HELICOPTER***

CAUTION

Do not lower aft jacks first. Damage to structure can result.

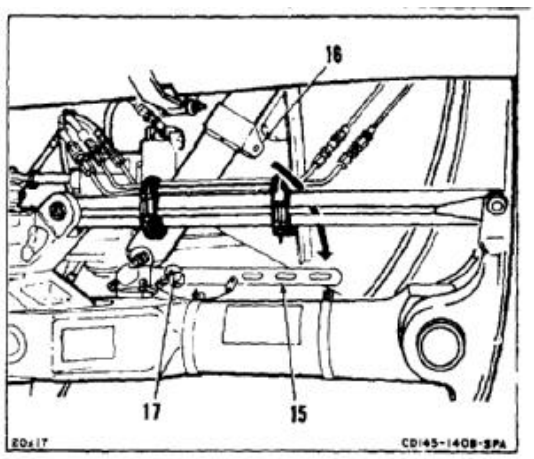
16. Lower all four jacks (10 and 13) together. Lower them **1 inch** at a time, until cells (9) on forward jacks (10) are clear of jacks pads. Remove forward jacks and cells.




CAUTION

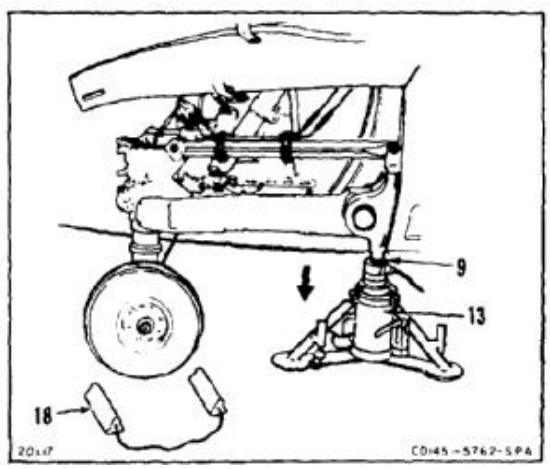
Aft landing gear can be damaged if static locks are not released and stowed before gear are lowered all the way.

17. Lower both aft landing gear evenly until wheels touch ground. Release static lock (15) from lug (16) on each gear. Secure in stowed position with pin (17).

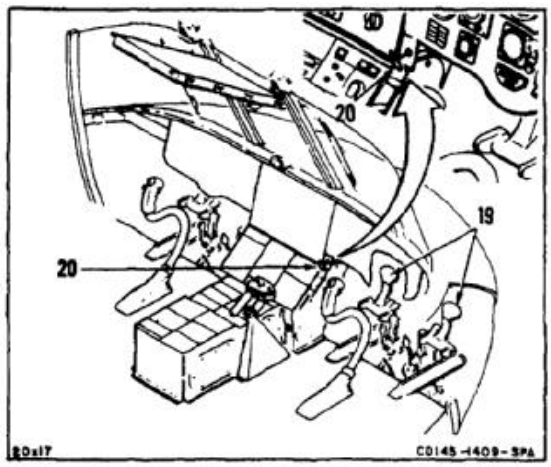



18. Lower both aft jacks (13) evenly. Lower them **1 inch** at a time, until cells (9) are clear of pads. Move jacks and cells away from helicopters.

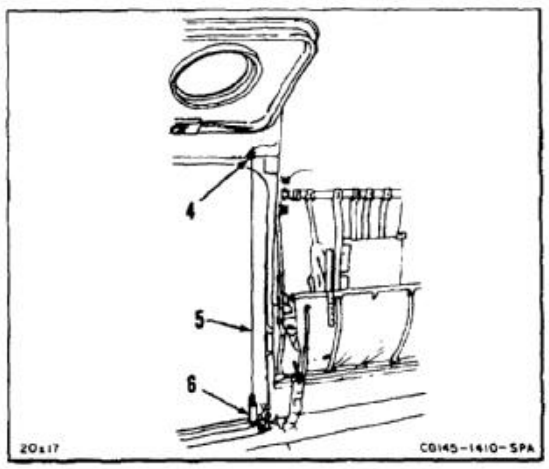
19. Place chocks (18) at either aft wheel.



20. Set parking brakes by pressing pilot's brake pedals (19) and pulling handle (20). Release pedal.




21. Remove plumb bob (6) and string (5) from bracket (4) in cabin doorway.




***FOLLOW-ON MAINTENANCE:***

Remove ropes and signs.
Service forward landing gear shock struts with air (Task 1-71).
Remove servocylinder safety blocks (Task 11-29).
Close aft landing gear access panels (Task 2-2).
Service fuel tanks (Task 1-51).

END OF TASK

## 1-32 INSTALL PROTECTIVE COVERS 1-32

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Cockpit Enclosure Cover (T103)
Heater Exhaust Cover (T21)
Rotary-Wing Head Cover, Forward and Aft (T58)
Heater Inlet Cover (T59)
Hydraulic Cooler Exhaust Cover (T60)
APU Exhaust Cover (T61)
Oil Cooler Inlet Cover (T66)
Oil Cooler Exhaust Cover (T67)
Oil Cooler Exhaust Cover (T68)
Air Inlet Cover (T76)
Engine Inlet Covers (Helicopters with Screens) (T131)
Engine Inlet Covers (Helicopter without Screens) (T132)
Engine Outlet Covers (T80)
Pitot Tube Covers (T81)
Workstand

***Materials:***

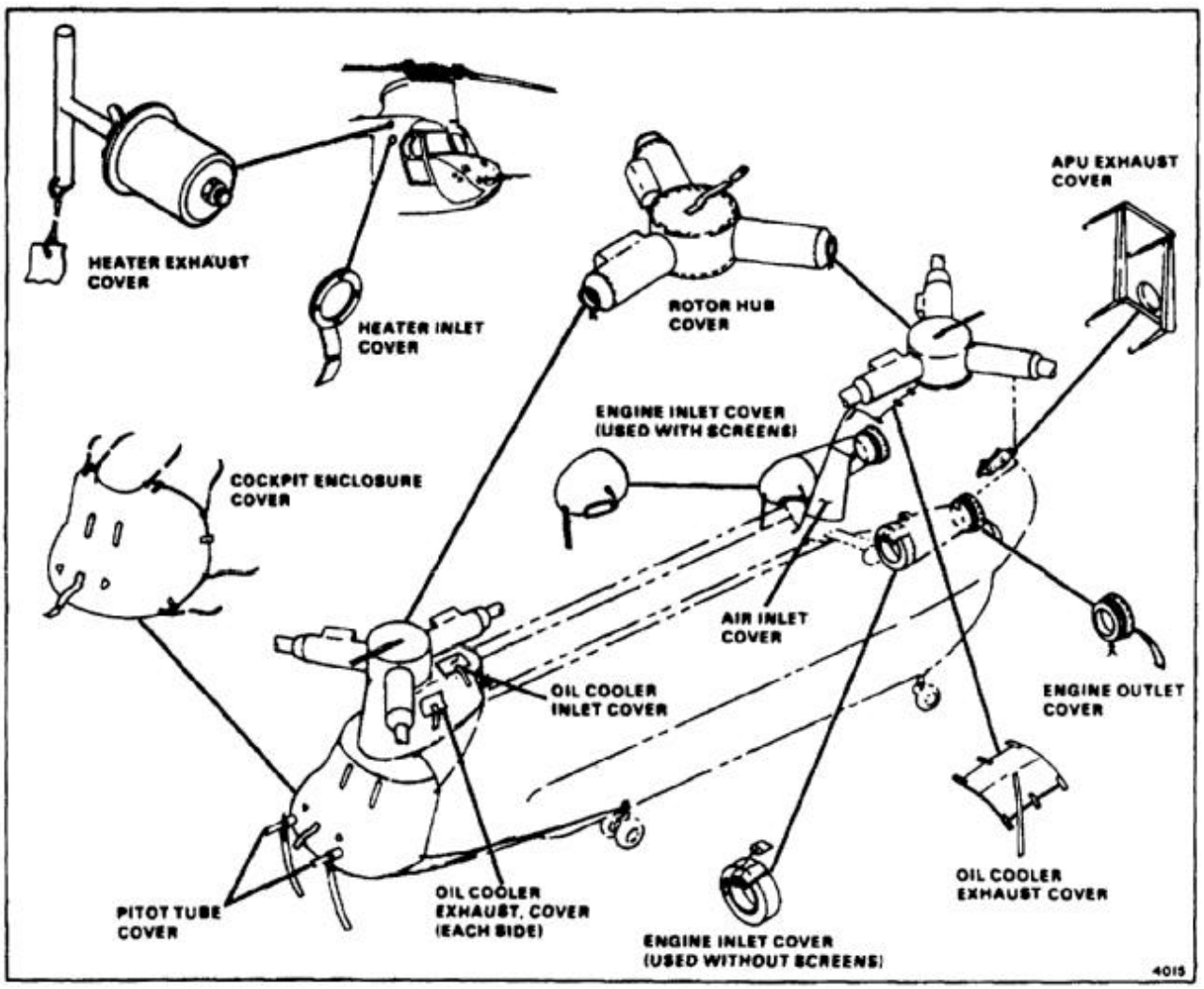
None

***Personnel Required:***

Medium Helicopter Repairer (2)

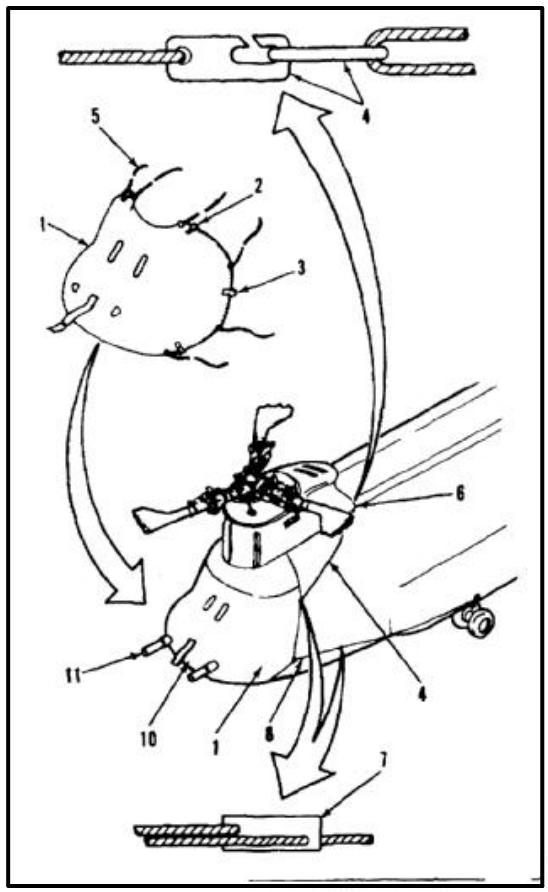
***Equipment Condition:***

As Required

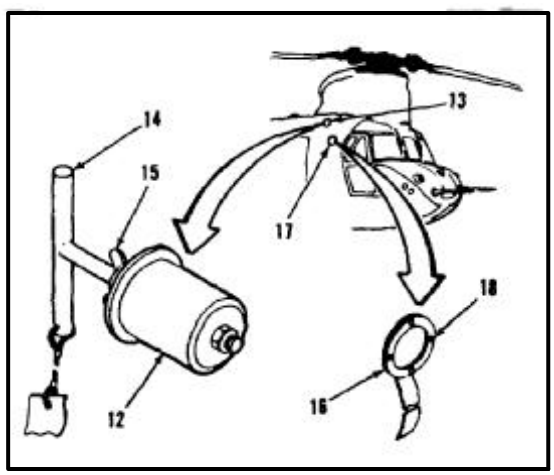


## 1-32 INSTALL PROTECTIVE COVERS (Continued) 1-32

1. Install cockpit enclosure protective cover (T103) (1) as follows:
   a. Position cover (1) on helicopter. Fit cover over raised areas (2). Use tabs (3) to adjust cover position.
   b. Hook fasteners (4) on four top ropes (5) together behind fairing (6). Tighten ropes. Use four sliding fasteners (7).
   c. Hook fasteners (4) on four bottom ropes (8) to landing gear tiedown fittings (9).
   d. Tighten bottom ropes (8). Use sliding fasteners (7).
   e. Secure flap (10) between pitot tubes (11). Use two snap fasteners and hook-and-pile tape.




2. Install heater exhaust protective cover (T21) as follows:
   a. Insert plug (12) into heater exhaust (13).
   b. Prevent handle (14) from turning.
   c. Tighten wing nut (15) to expand plug (12).
3. Position cover (T59) (16) on heater inlet (17). Secure four fasteners (18).

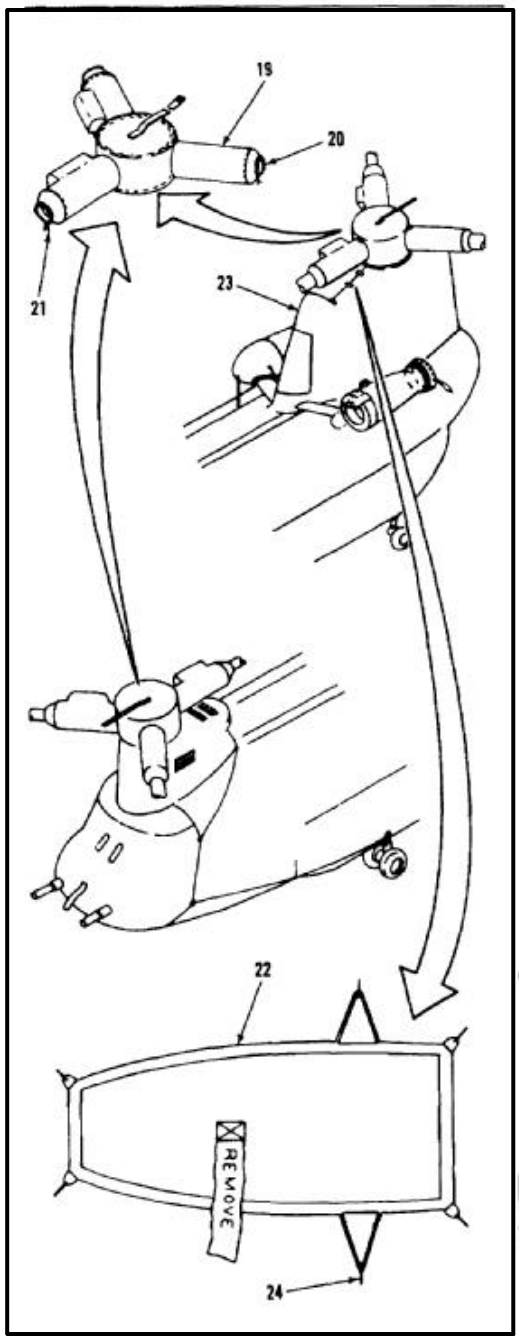


4. Position forward and aft rotary-wing head covers (T58) (19) on helicopter. Close slide fasteners (20). Tie draw cords (21).

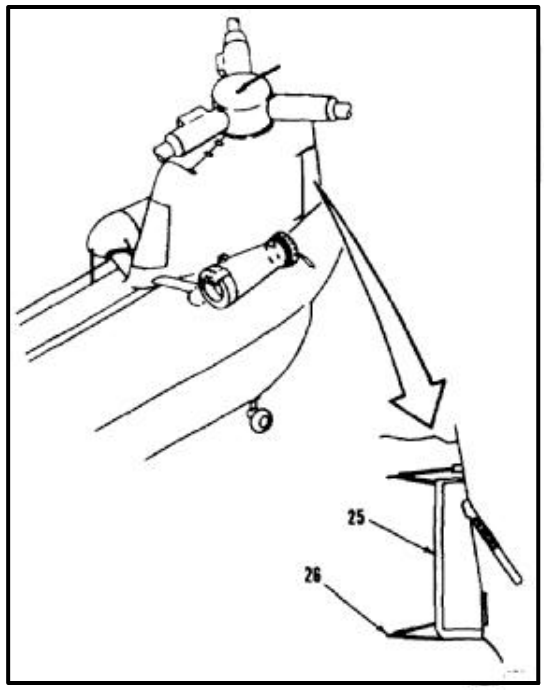
**NOTE**

Arms of covers may be installed on arms of rotary-wing head in any position.

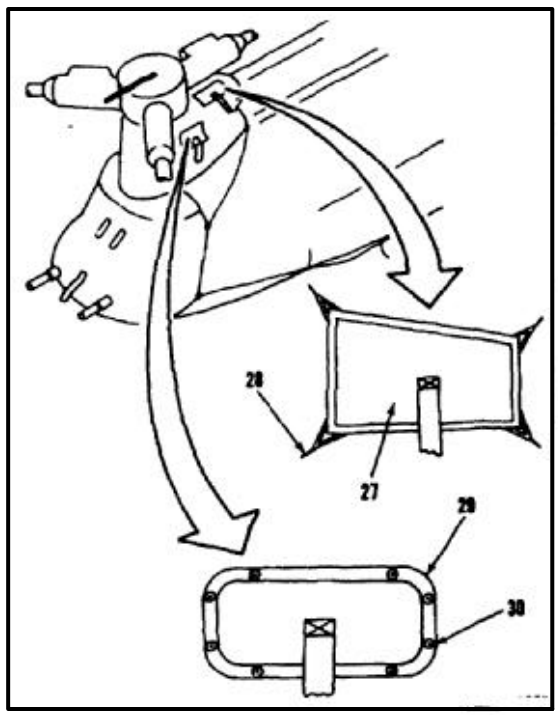
5. Position hydraulic cooler exhaust cover (T60) (22) on pylon (23). Secure cover. Use six hooks (24).



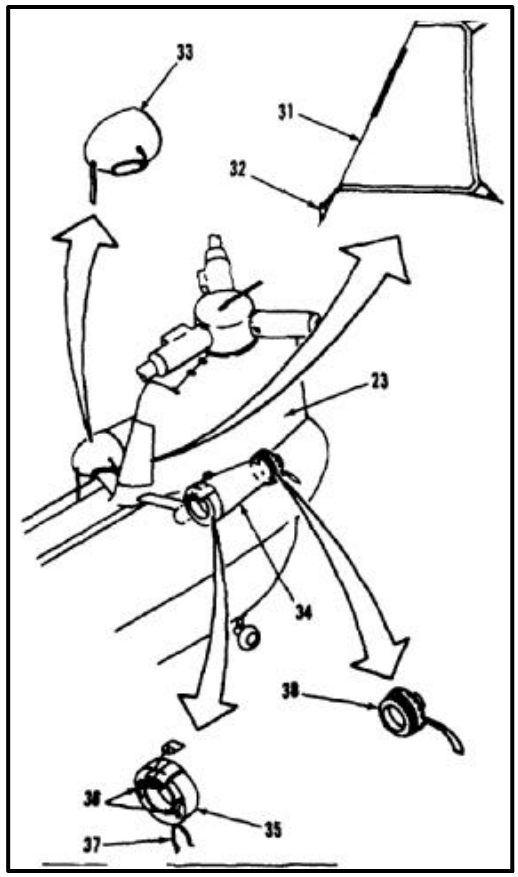
6. Install APU exhaust cover (T61) (25). Secure cover. Use four hooks (26).



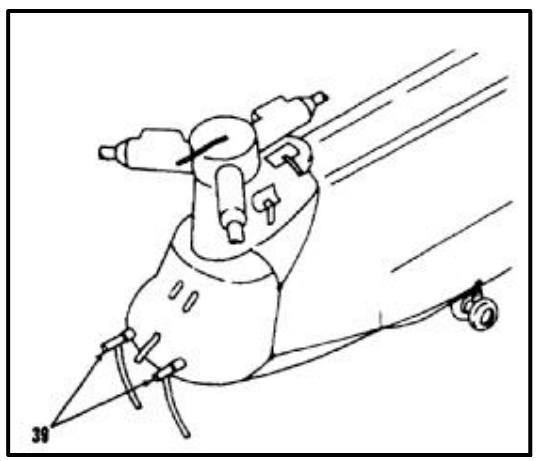

7. Install oil cooler inlet cover (T66) (27). Secure cover. Use four hooks (28).
8. Install oil cooler exhaust covers (T67 and T68) (29). Secure covers. Use eight snap fasteners (30).



9. Install air inlet cover (T76) (31) on pylon (23). Secure cover. Use five hooks (32).
10. Install engine inlet covers (33) or (35) as follows:
    a. Install covers (T131) (33) if helicopter has inlet screens. Position cover over inlet of engine (34).
    b. Install covers (T132) (35) if helicopter does not have inlet screens. Use two handles (36) to position cover over inlet of engine (34). Secure draw cords (38).
11. Install two engine outlet covers (T80) (37).




12. Install two pitot tube covers (T81) (39).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 1-33 INSTALL TRANSPORTATION TIEDOWN KIT 1-33

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Transportation Tiedown Fitting Set (T77)
Spanner Wrench

***Materials:***

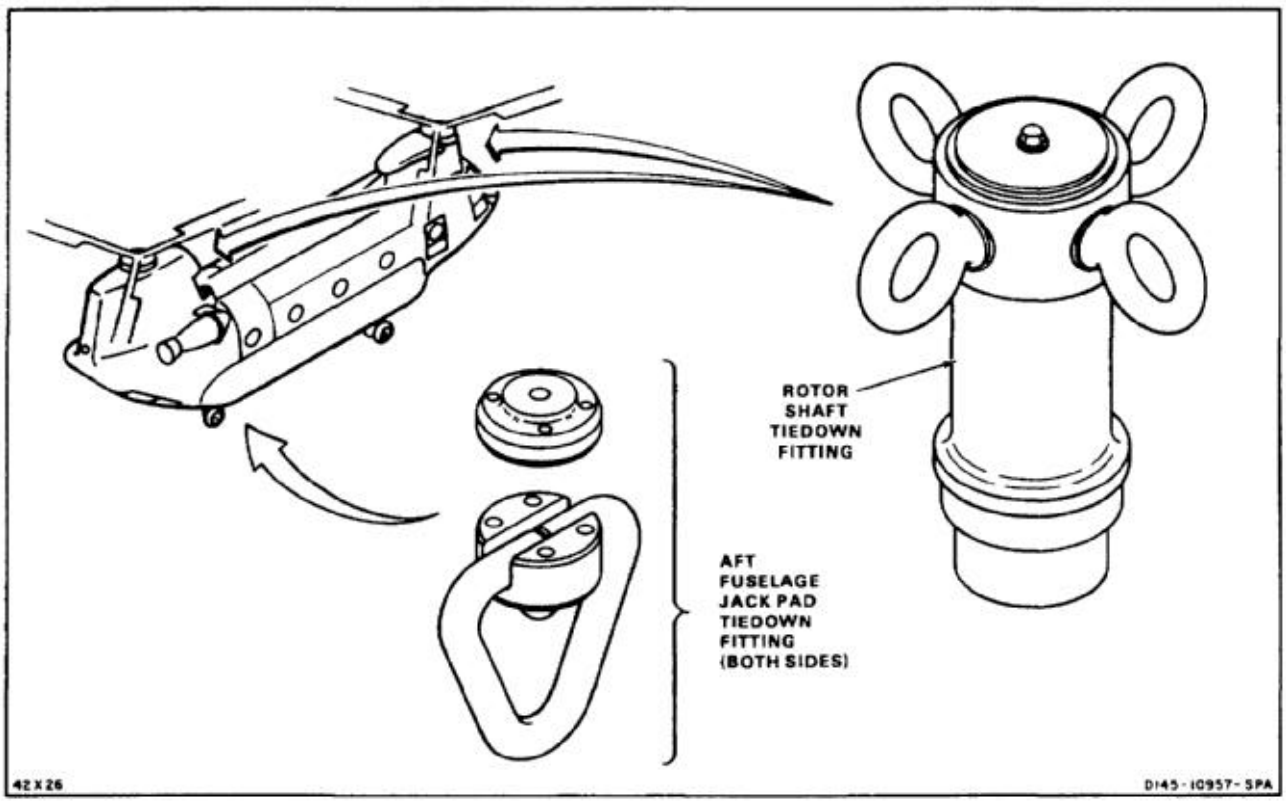
None

***Personnel Required:***

Medium Helicopter Repairer
Inspector

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Forward Transmission Fairing Work Platforms Open (Task 2-2)
Aft Pylon Work Platforms Open (Task 2-2)

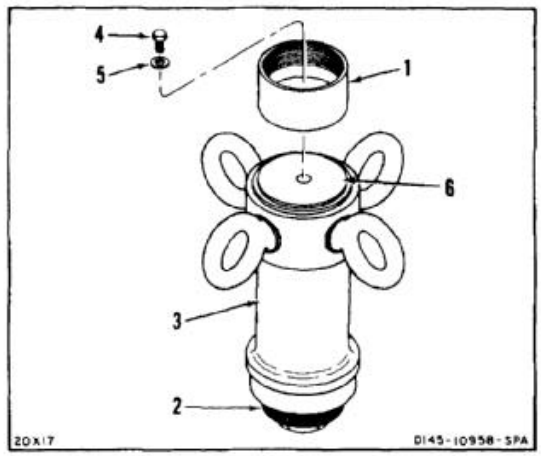


***INSTALL ROTOR SHAFT FITTINGS***

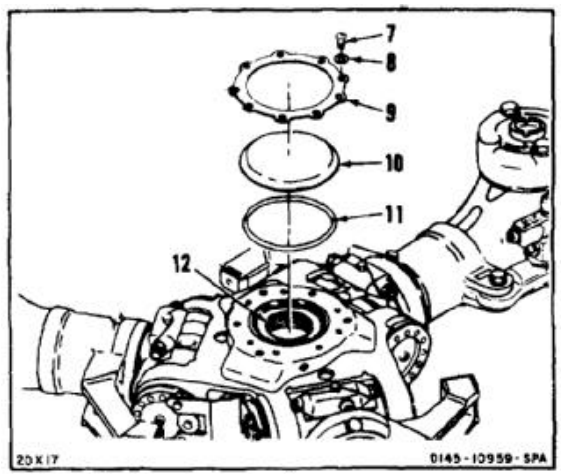
**NOTE**

Install fittings on forward or aft rotor shaft in same way.

1. Remove cover (1) from threads (2) at bottom of fitting (3).
2. Remove bolt (4) and washer (5) from top of fitting (3).
3. Install cover (1) on plate (6) at top of fitting (3). Install bolt (4) and washer (5).

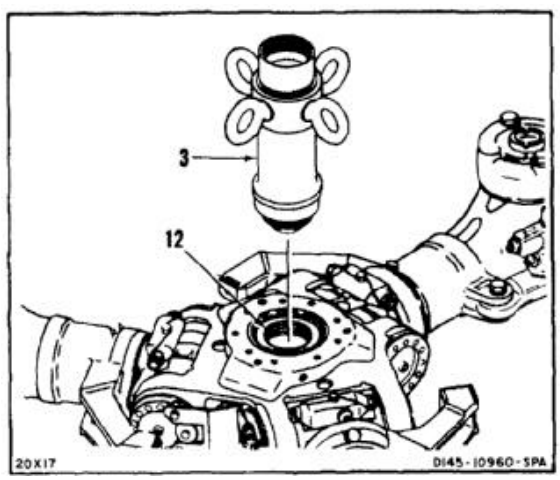



4. Remove nine screws (7) and washers (8) from retainer (9). Remove retainer cover (10) and packing (11) from top of rotor shaft (12).




5. Install fitting (3) in rotor shaft (12).

***INSPECT***

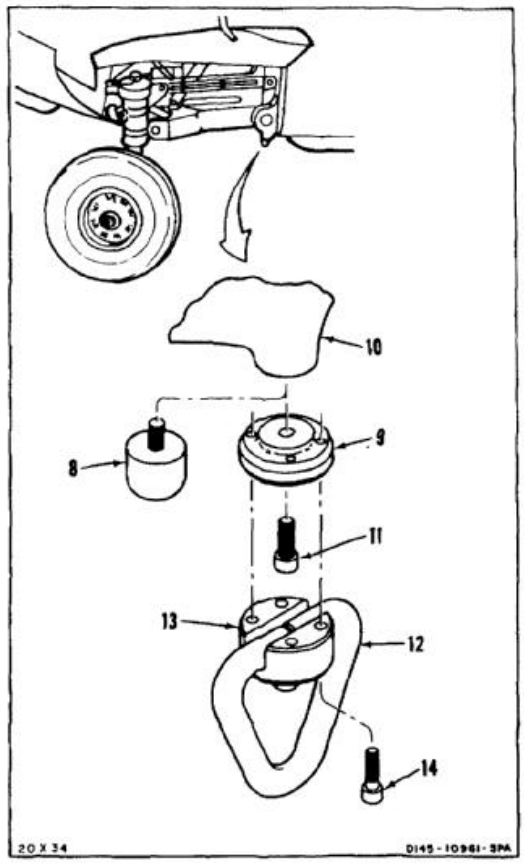


***INSTALL JACK PAD FITTINGS***

**NOTE**

Install fittings on left or right aft fuselage jack pad base in same way. Right side shown.

6. Remove fuselage jack pad (8). Use spanner wrench.
7. Install adapter (9) on jack pad base (10) with bolt (11).
8. Install ring (12) in groove of fitting (13). Install fitting on adapter (9) with four screws (14).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Close forward transmission fairing work platforms (Task 2-2).
Close aft pylon work platforms (Task 2-2).

END OF TASK

## 1-34 REMOVE TRANSPORTATION TIEDOWN KIT 1-34

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Spanner Wrench
Torque Wrench, 5 to 50 Inch-Pounds

***Materials:***

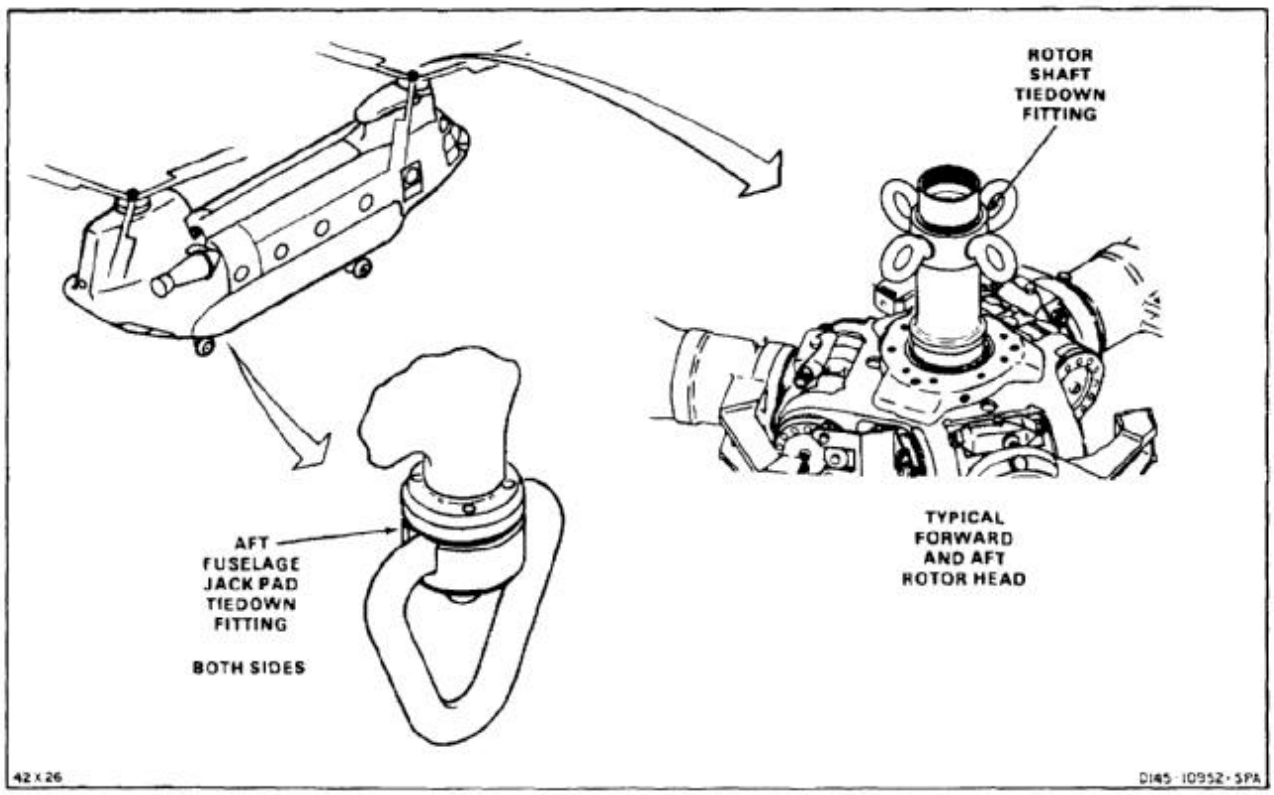
None

***Personnel Required:***

Medium Helicopter Repairer
Inspector

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Forward Transmission Fairing Work Platforms Open (Task 2-2)
Aft Pylon Work Platforms Open (Task 2-2)

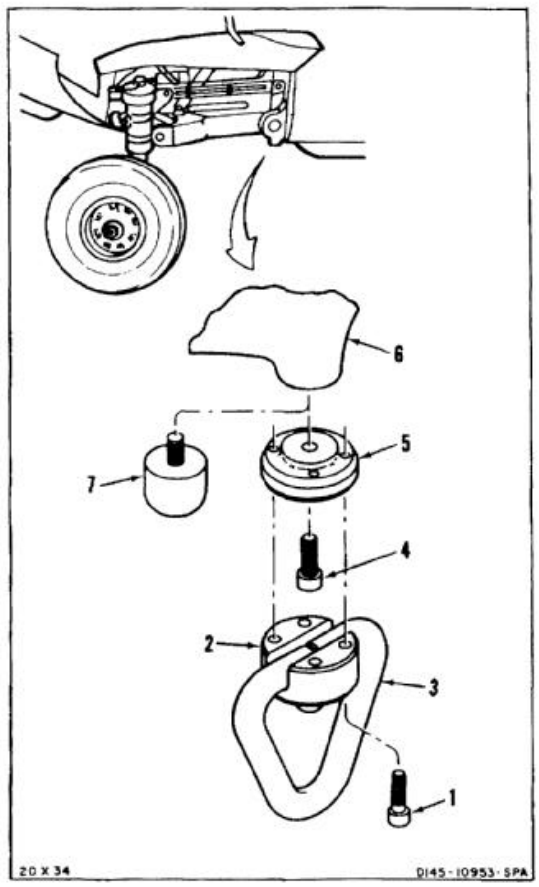


***REMOVE JACK PAD FITTINGS***

**NOTE**

Remove fitting from left or right aft fuselage jack pad base in same way. Right side shown.

1. Remove four bolts (1). Remove fitting (2) and ring (3).
2. Remove bolt (4) and adapter (5).
3. Install fuselage jack pad (6) on jack pad base (7). Use a spanner wrench.



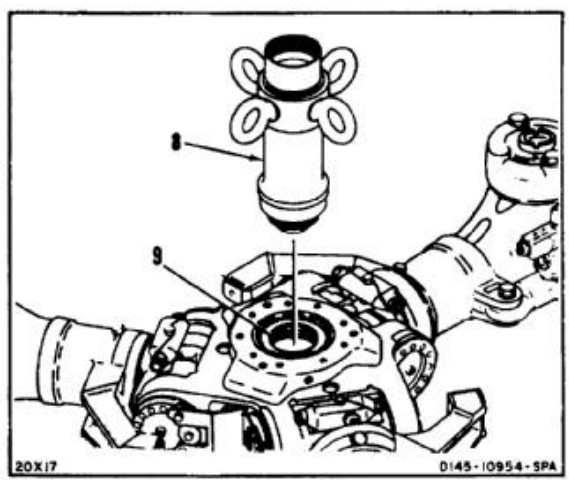

***INSPECT***

***REMOVE ROTOR SHAFT FITTINGS***

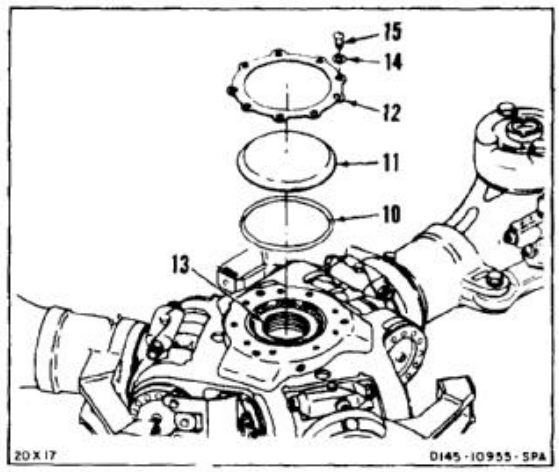
**NOTE**

Remove fitting from forward or aft rotor shaft in same way.

4. Remove fitting (8) from rotor shaft (9).



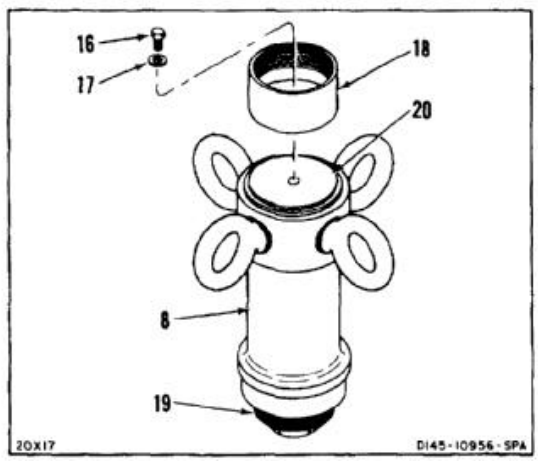
5. Install packing (10), cover (11), and retainer (12) over rotor shaft (13). Install nine washers (14) and screws (15). Torque screws to **20 inch-pounds**.




***INSPECT***

***STORE ROTOR SHAFT FITTINGS***

6. Remove bolt (16) and washer (17). Remove cover (18).
7. Install cover (18) on threads (19) at bottom of fitting (8).
8. Install bolt (16) and washer (17) through plate (20) on top of fitting (8).




***FOLLOW-ON MAINTENANCE:***

Close forward transmission fairing work platforms (Task 2-2).
Close aft pylon work platforms (Task 2-2).

END OF TASK

## 1-35 HOISTING HELICOPTER — 23,900 POUND GROSS WEIGHT 1-35

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Hoist Capacity 24,000 Pounds
Sling (T71)
Warning Streamers (2)
Guide Lines (2)

***Materials:***

Tape (E388)
Lubricant (E237)

***Personnel Required:***

Medium Helicopter Repairer (4)

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Servocylinder Safety Blocks (T31) Installed (Task 11-28)
Rotary-Wing Blades Removed (Task 5-64)
Helicopter Defueled (Task 10-34 or 10-35)
Forward Work Platform Open (Task 2-2)
Pylon Clamshell Doors Open (Task 2-2)
Pylon Leading Edge Fairing Open (Task 2-2)
Aft End of Forward Connecting Link Disconnected (Task 11-194)
Upper Outboard Rigid Link in Second Stage Mix Disconnected (Task 11-190)
Forward Transmission Aft Fairing Removed (Task 2-63)

1. Apply coat of lubricant (E237) on four sling pins (1).
2. Working from aft tunnel position AFT sling legs (2) on lifting lugs (3) at sta. 475.3. Install pins (1) in lugs. Do not twist legs together.

**NOTE**

Sling legs are marked FWD and AFT.

3. Work from forward tunnel, position FWD sling legs (4) of lifting lugs (5) at sta. 122.25. Install pins (1) in lugs. Do not twist legs together.
4. Install warning streamers (6) on links (7 and 8).
5. When lifting helicopter with pylon (9) installed, position loop (10) on hoist hook (11). Go to step 7.
6. When lifting helicopter without pylon (9), position loop (12) on hook (11).

**WARNING**

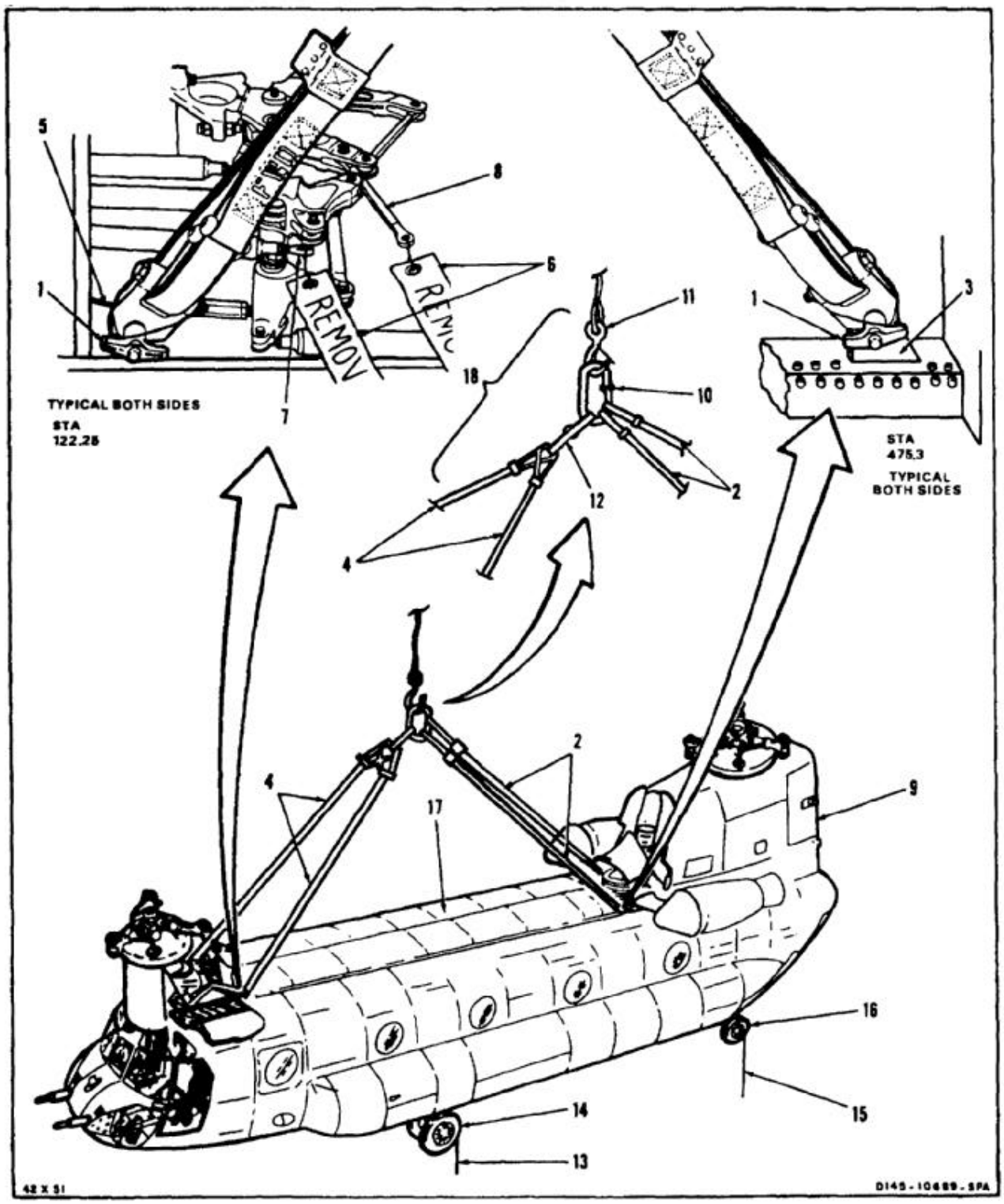
Personnel must be clear of area under helicopter during hoisting.

7. Attach guide line (13) to forward landing gear (14). Have helper hold guide line.
8. Attach guide line (15) to aft landing gear (16). Have helper hold guide line.
9. Slowly take up sling slack with hoist. Be sure legs (2 and 4) are clear of components.
10. Slowly raise helicopter to clear ground. Check helicopter is level and steady. If not level lower helicopter to ground, add ballast load and repeat step 8.
11. Hoist and move helicopter slowly and carefully to desired place. Operate hoist without sudden starts, stops, drops, or sharp turns that could start helicopter swinging.
12. Check area where helicopter will be positioned. Area must be clear of equipment and other objects.
13. Lower helicopter slowly until full weight of helicopter is on wheels, and legs (2 and 4) of sling are slack.
14. Lower hoist hook (11). Remove loop (10 or 12) and lower slowly to drive tunnel (17).
15. Remove four pins (1). Remove sling (T71) (18).
16. Remove two warning streamers (6).

***FOLLOW-ON MAINTENANCE:***

Connect aft end of forward connecting link (Task 11-195).
Connect upper outboard rigid link in second stage mix (Task 11-191).
Close pylon leading edge fairing (Task 2-2).
Close pylon clamshell doors (Task 2-2).
Install rotary-wing blades (Task 5-84).
Remove servocylinder safety blocks (Task 11-29).
Install forward transmission aft fairing (Task 2-68).
Close forward work platform (Task 2-2).

## 1-35 HOISTING HELICOPTER — 23,900 POUND GROSS WEIGHT (Continued) 1-35




END OF TASK

## 1-35.1 HOISTING HELICOPTER — 33,000 POUND GROSS WEIGHT 1-35.1

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Hoist, 33,000 Pounds Capacity
Ring Assembly (T24) (2)
Sling Cable, 93 Feet Long Minimum (2)
Guide Lines (2)
Torque Wrench, 0 to 150 Inch-Pounds

***Materials:***

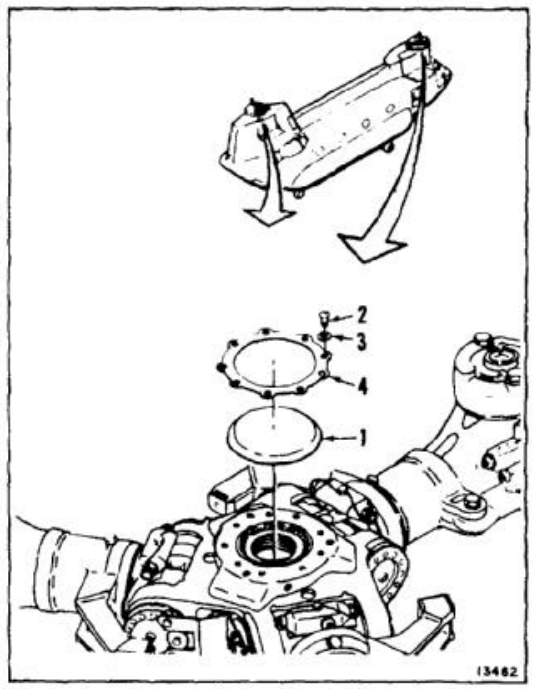
None

***Personnel Required:***

Medium Helicopter Repairer (3)

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Rotary-Wing Blades Removed (Task 5-64)
Helicopter Defueled (Task 10-34 or 10-35)
Forward Work Platform Open (Task 2-2)
Aft Work Platform Open (Task 2-2)




***INSTALL LIFT RING ASSEMBLY***

**NOTE**

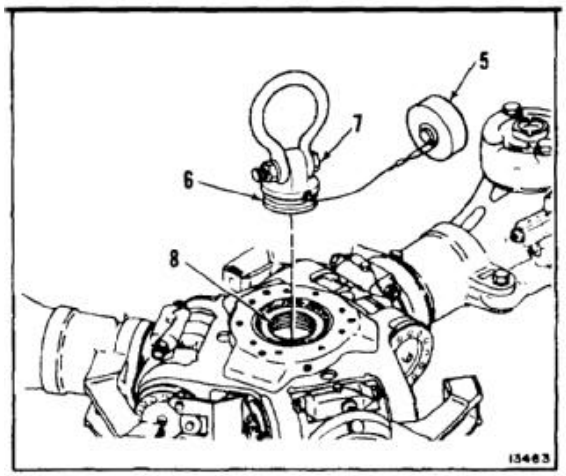
Procedure is same to install ring on forward or aft rotor head. Forward head shown.

1. Remove cover (1) from forward and aft rotor head as follows:
   a. Remove nine screws (2) and washers (3).
   b. Remove retainer (4) and cover (1).

**WARNING**

Make sure ring is fully seated in shaft. Otherwise, injury to personnel or loss of helicopter could result.

2. Remove cover (5) from thread (6) of ring (7). Install ring in rotor shaft (8).




***INSPECT***

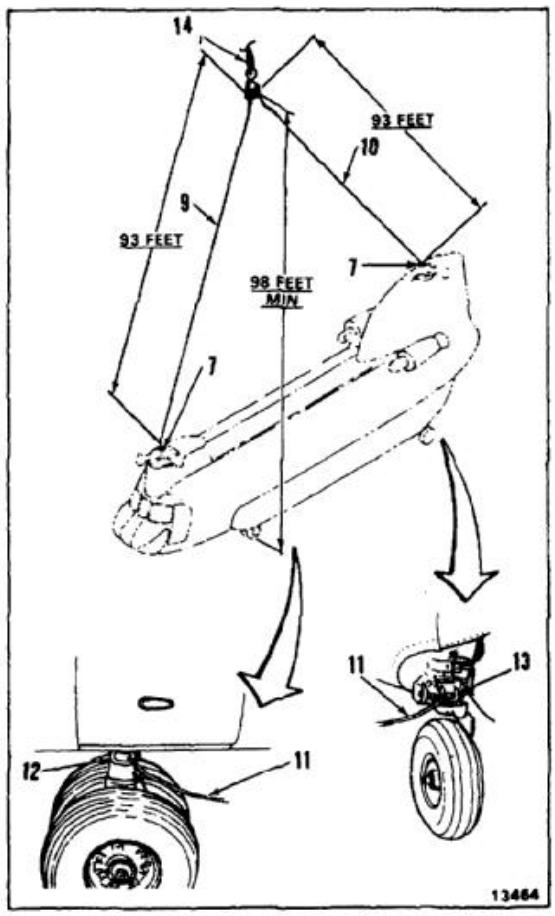
***HOIST HELICOPTER***

3. Attach cable (9) at least **93 feet** long to ring (7) on forward rotor head. Attach cable (10) at least **93 feet** long to ring on aft rotor head.

**WARNING**

Guide lines must be long enough to let personnel keep clear of area under helicopter during hoisting.

4. Attach guide lines (11) to shackles (12 and 13) at forward and aft landing gear. Have helpers hold lines.
5. Attach cables (9 and 10) to hoist (14). Slowly take up cable slack with hoist.
6. Slowly raise helicopter from ground. Hold it steady with guide lines (11).
7. Move helicopter slowly to desired place. Avoid sudden motions that could start it swinging.
8. Check that area where helicopter will be lowered is clear of obstructions.
9. Lower helicopter slowly until all weight is on landing gear and cables (9 and 10) are slack. Remove cables from hoist (14) and rings (7). Remove guide lines (11) from shackles (12 and 13).

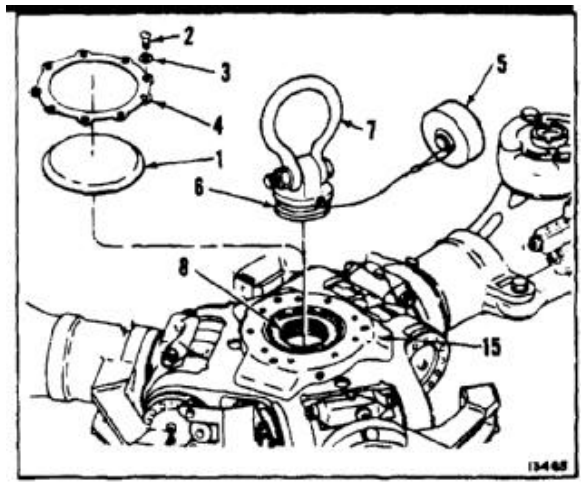


***REMOVE LIFT RING ASSEMBLY***

**NOTE**

Procedure is same to remove ring on forward or aft rotor head. Forward head shown.

10. Screw ring (7) out of rotor shaft (8). Install cover (5) on ring thread (6).
11. Position cover (1) on oil tank (15). Position retainer (4) on cover.
12. Install nine screws (2) and washers (3). Torque screws to **23 inch-pounds**.




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 1-36 APPLY POWER USING APU 1-36

INITIAL SETUP

***Application Configurations:***

All

***Tools:***

Ear Plugs

***Materials:***

None

***Personnel Required:***

Medium Helicopter Repairer (2)

***Equipment Condition:***

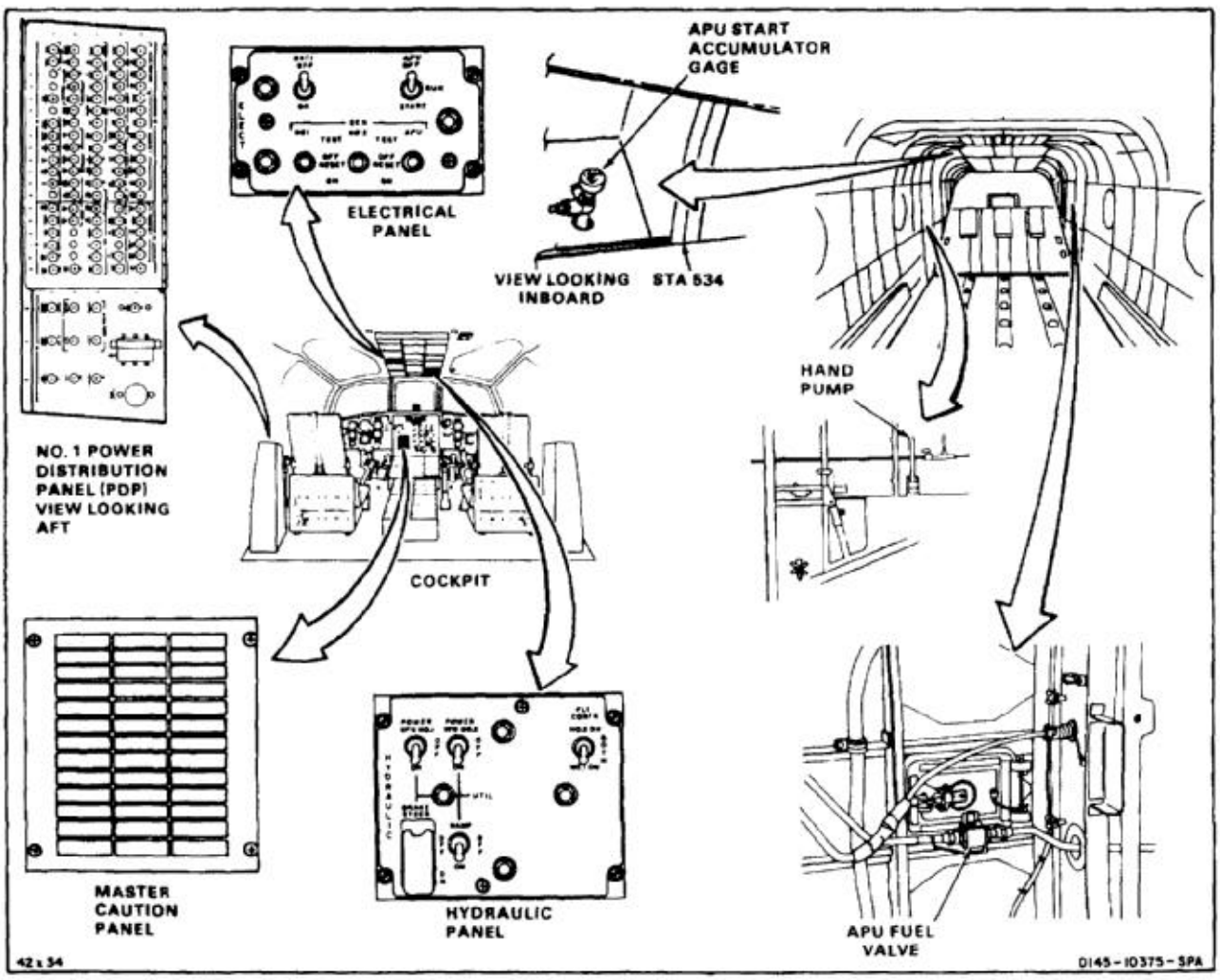
Helicopter Not Positioned Tail into Wind
Battery Connected (Task 1-39)
Battery Switch Off
Hydraulic Power Off
Remove Protective Covers (Task 1-32)

**WARNING**

Wear ear plugs when working around helicopter when APU is running. Otherwise, hearing can be damaged.

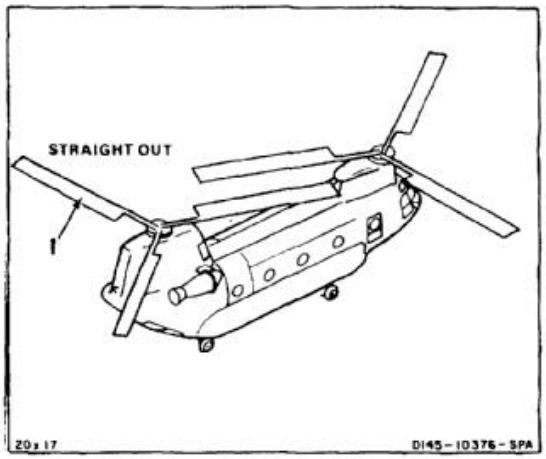
**CAUTION**

Service life of gyroscopes can be reduced under power. Open the following circuit breakers when applying power, unless noted:
PDP NO. 1
COMPASS (2)
COPILOT VGI
AFCS NO. 1
PDP NO. 2
PILOT VGI
AFCS NO. 2



***START APU***

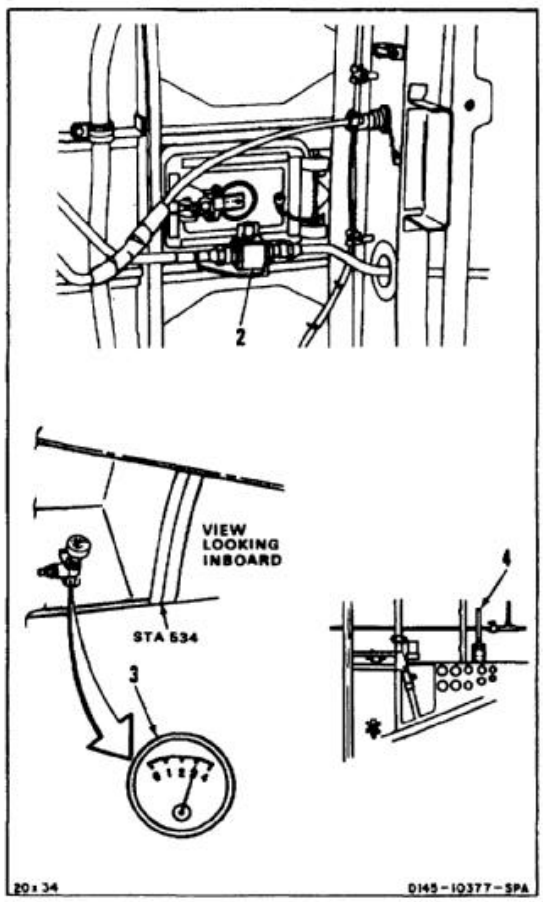
1. Pull rotor blades (1) around so that one aft or forward blade points straight out **90°** from fuselage.




2. Check that APU fuel shutoff valve (2) is OPEN.
3. Check that APU start accumulator gage (3) reads at least **3,000 psi**. If gage reads less, operate hand pump (4) to increase reading to **3,000 psi** or until pressure stabilizes.

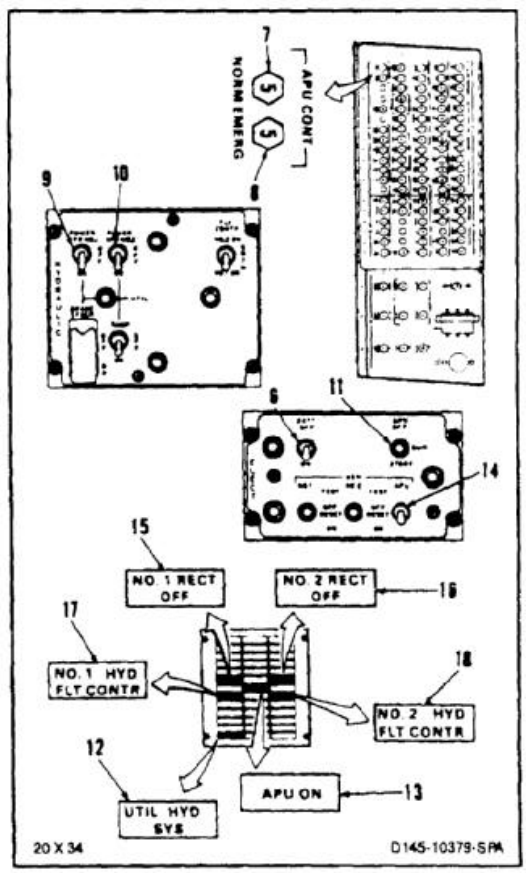
**NOTE**

If pressure stabilizes at less than **3,000 psi** it indicates a bottomed piston in the accumulator. A stabilized pressure of **2,700 psi** or more is enough to start the APU.



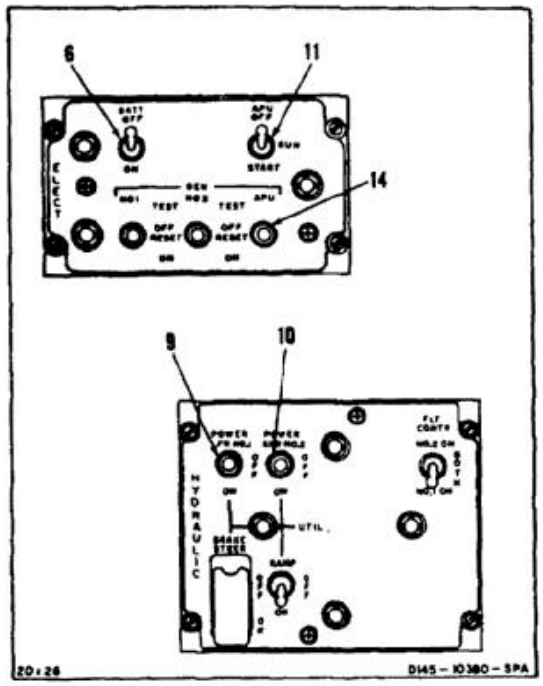
4. Have helper stand behind helicopter to watch for fire at APU exhaust (5) during start.


5. Check that APU CONT NORM and EMERG circuit breakers (7 and 8) are closed.
6. Check that POWER XFR NO. 1 and POWER XFR NO. 2 switches (9 and 10) are at OFF.
7. Set BATT SWITCH (6) to ON.
8. Set APU switch (11) to RUN for **3 to 5 seconds**, then to START for at least **2 seconds**. Release switch to RUN. APU ON capsule (13) shall come on in **10 to 12 seconds**. UTIL HYD SYS capsule (12) should go out within **30 seconds**.
9. Set APU GEN switch (14) to ON. NO. 1 RECT OFF and NO. 2 RECT OFF capsules (15 and 16) shall go out.
10. Set PWR XFR NO. 1 and PWR XFR NO. 2 switches (9 and 10) to ON. NO. 1 HYDR FLT CONTR and NO. 2 HYDR FLT CONTR capsules (17 and 18) shall go out.



***SHUT DOWN APU***

11. Set PWR XFR NO. 1 and PWR XFR NO. 2 switches (9 and 10) to OFF.
12. Set APU GEN switch (14) to OFF.
13. Set APU switch (11) to OFF.
14. Set BATT switch (6) to OFF.




***FOLLOW-ON MAINTENANCE:***

Disconnect battery (Task 1-39).
Install protective covers (Task 1-32).

END OF TASK

## 1-37 APPLY EXTERNAL ELECTRIC POWER 1-37

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Electrical Power Supply, 28 VDC
Electrical Power Supply, 115/200 Volt, 3-Phase, Grounded Neutral, 400-Hz AC
Aviation Ground Power Unit (AGPU)

***Materials:***

None

***Personnel Required:***

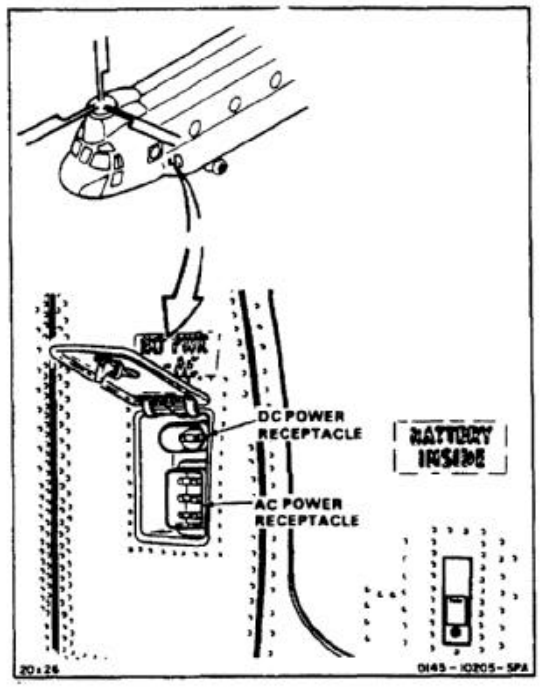
Aircraft Electrician

***References:***

TM 55-1730-229-12
TM 55-1730-229-34

***Equipment Condition:***

Battery Connected (Task 1-39)
External Dc-Ac Power Receptacle Access Door Open (Task 2-2)




**CAUTION**

Service life of gyroscopes can be reduced under power. Open the following circuit breakers when applying power unless noted:

PDP NO. 1
COMPASS (2)
COPILOT VGI
AFCS NO. 1
PDP NO. 2
PILOT VGI
AFCS NO. 2

***CONNECT POWER***

CAUTION

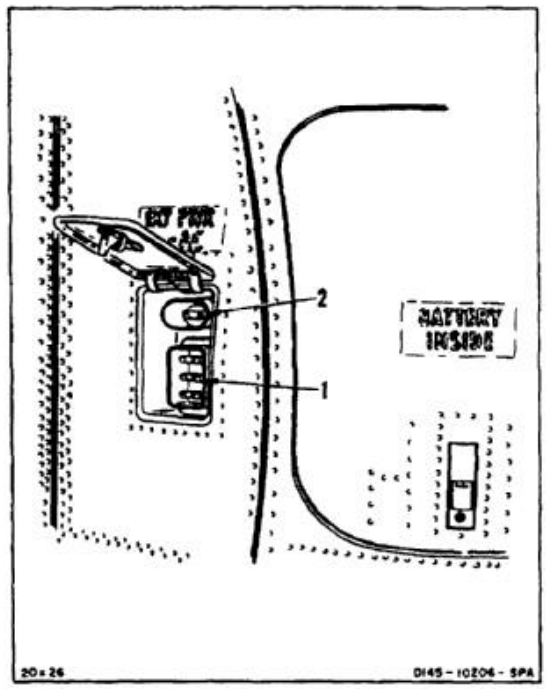
Ensure maintenance personnel are qualified/experienced in operating and connecting external power.

1. Apply ac power by connecting ac power supply cable to receptacle (1) at forward end of left pod. Operate power supply. (Refer to applicable technical manual.)

**NOTE**

Dc power is automatically supplied whenever ac power is applied.

2. Apply only dc power by connecting dc power supply cable to receptacle (2) at forward end of left pod. Operate power supply.




***DISCONNECT POWER***

3. Shut down power supply. (Refer to applicable technical manual.)

4. Disconnect power supply cable from receptacle (1 or 2).

***FOLLOW-ON MAINTENANCE:***

Disconnect battery (Task 1-39).
Close external dc-ac power receptacle door (Task 2-2).

END OF TASK

## 1-38 APPLY EXTERNAL HYDRAULIC POWER 1-38

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Hydraulic Systems Test Stand, Equipped with Three-Micron Filter
Aviation Ground Power Unit (AGPU)

***Materials:***

None

***Personnel Required:***

Aircraft Pneudraulics Repairer

***References:***

TM 55-1730-229-12
TM 55-1730-229-34

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Ground Test Connection Access Cover Removed for No. 1 Flight Control Hydraulic System and Panel Open for No. 2 Flight Control and Utility Hydraulic Systems as Needed (Task 2-2)

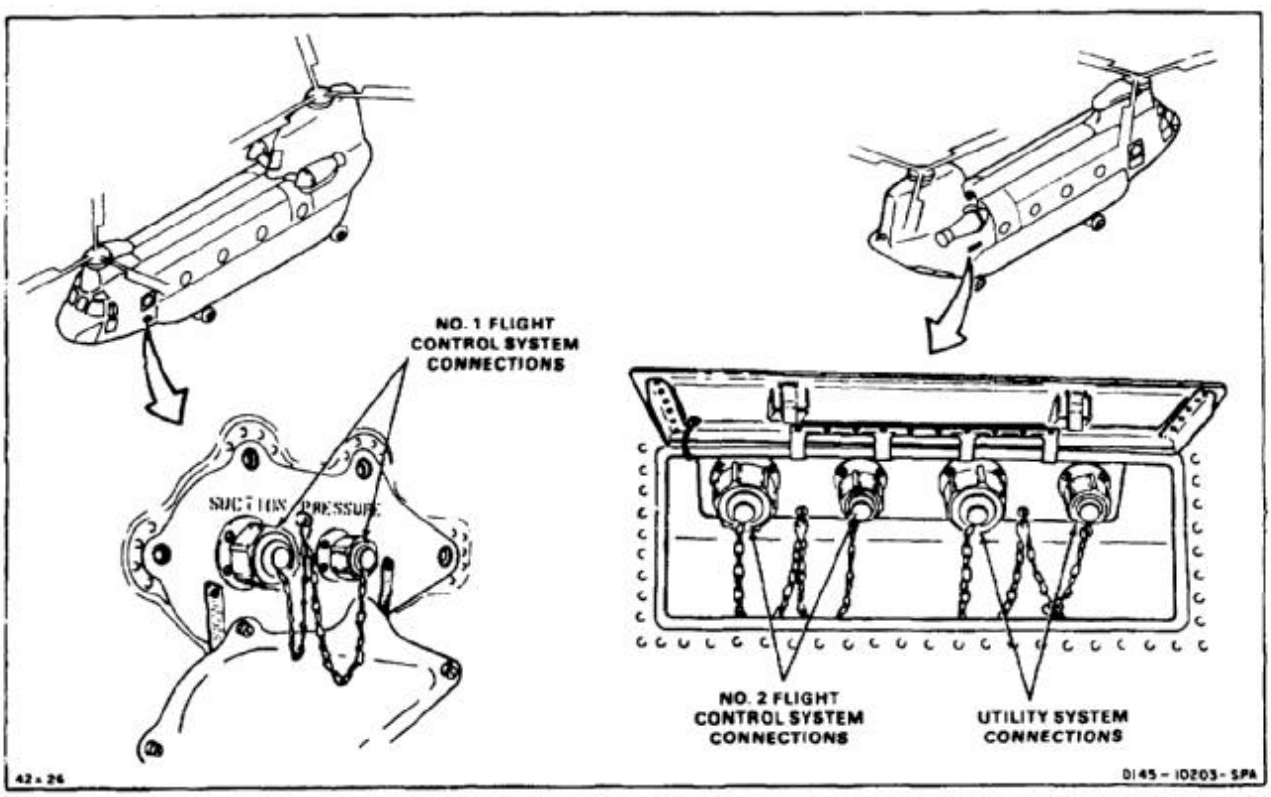
***General Safety Instructions:***

**WARNING**

If applying power to flight controls, keep hands away from controls. Application of hydraulic power will cause controls to move and rotor blades to flap. Injury to personnel can occur.

**CAUTION**

Test stand pressure hose must have coupling nut 3205-8 or 3305-8 installed. Return hose must have coupling nut 3205-12 or 3305-12 installed. Series 3205 are for flared fittings, and 3305 are for flareless fittings (Aeroquip or equivalent). Wrong fittings can damage connections.



***CONNECT POWER***

**CAUTION**

Ensure maintenance personnel are qualified/experienced in operating and connecting external power.

1. Remove caps from proper test connections (1, 2, or 3) on helicopter. Connect pressure and suction hoses to test connections.
2. If applying power to flight control test connections (1 or 2), adjust test stand as follows: (Refer to applicable technical manual.)
   a. Set tank pressurizing valve to **50 psi**.
   b. Set relief valve to **3,750 psi**.
   c. Set volume output to **8 gpm**.
   d. Set pressure compensator to **3,000 psi**.

**NOTE**

If pressurizing both flight control systems at once, use two test stands.

3. If applying power to utility system test connections (3), adjust test stand as follows: (Refer to applicable technical manual.)
   a. Set tank pressurizing valve to **50 psi**.
   b. Set relief valve to **3,750 psi**.
   c. Set volume output to **12 gpm**.
   d. Set pressure compensator to **3,000 psi**. If starting main engines, set compensator to **3,350 psi**.

**NOTE**

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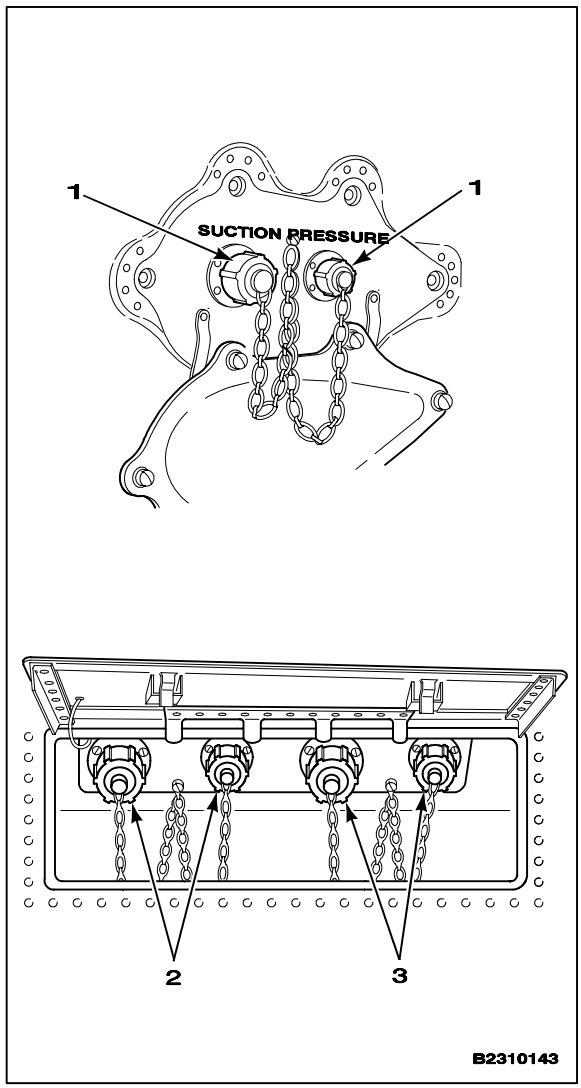



***DISCONNECT POWER***

4. Shut down test stand. (Refer to applicable technical manual.)
5. Disconnect hoses from test connections (1, 2, or 3). Install caps on connections.

***FOLLOW-ON MAINTENANCE:***

Install access cover on No. 1 flight control connections and close panel on No. 2 flight control and utility hydraulic system connections, as needed (Task 2-2).

END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

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

***Materials:***

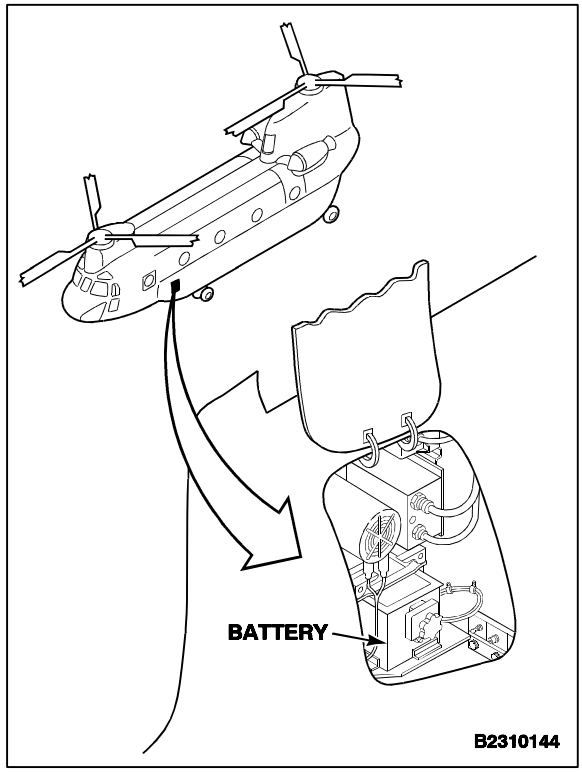
None

***Personnel Required:***

CH-47 Helicopter Repairer

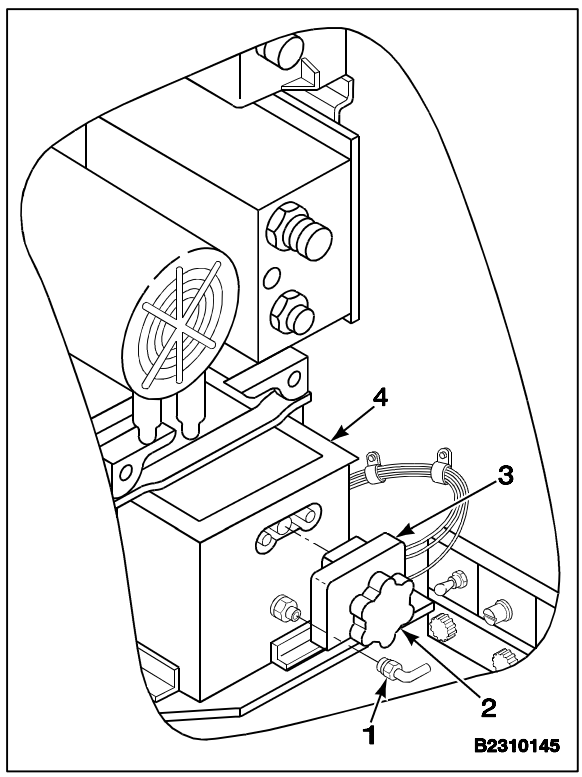
***Equipment Condition:***

Electrical Power Off
Electrical Equipment Access Door Open (Task 2-2)



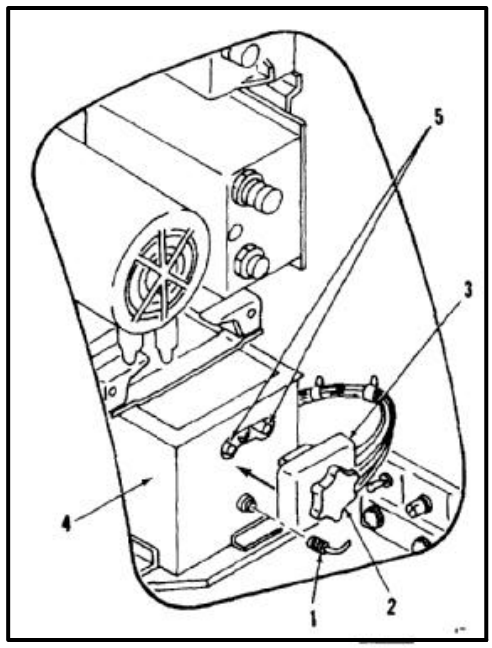

***DISCONNECT***

1. Disconnect battery charger plug (1).
2. Turn knob (2) counterclockwise several turns to release connector (3).
3. Pull connector (3) from battery (4). Place it on shelf in front of battery.



***CONNECT***

4. When battery power is needed, align connector (3) with pins (5). Push connector into battery (4). Secure by turning knob (2) clockwise until tight.
5. Connect battery charger plug (1).




***FOLLOW-ON MAINTENANCE:***

Close electrical equipment access door (Task 2-2).

END OF TASK

## 1-40 INSTALL HOISTING UNIT 1-40

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Hoisting Unit (T4)
Rope Guide Lines (2)
Workstand
Loop, 8 to 12 Inches Diameter, Made of Nylon or Wire Cable, 1/4 Inch Diameter

***Materials:***

None

***Personnel Required:***

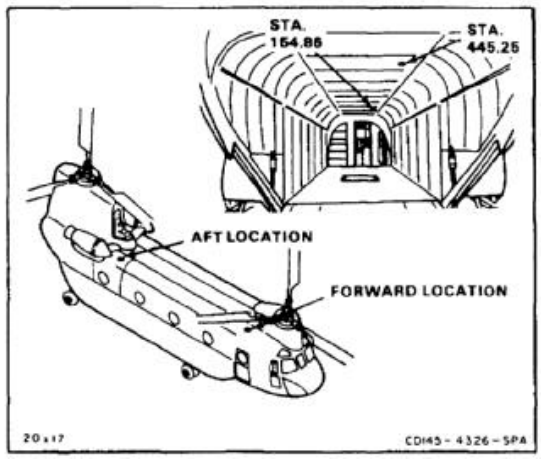
Medium Helicopter Repairer (5)
Inspector

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Troop Seats Stowed (Task 2-233)
Upper Cabin Door Removed For Forward Installation (Task 2-150)
Cabin Acoustic Blanket Removed (Task 2-208)

***References:***

TM 55-1520-240-23P

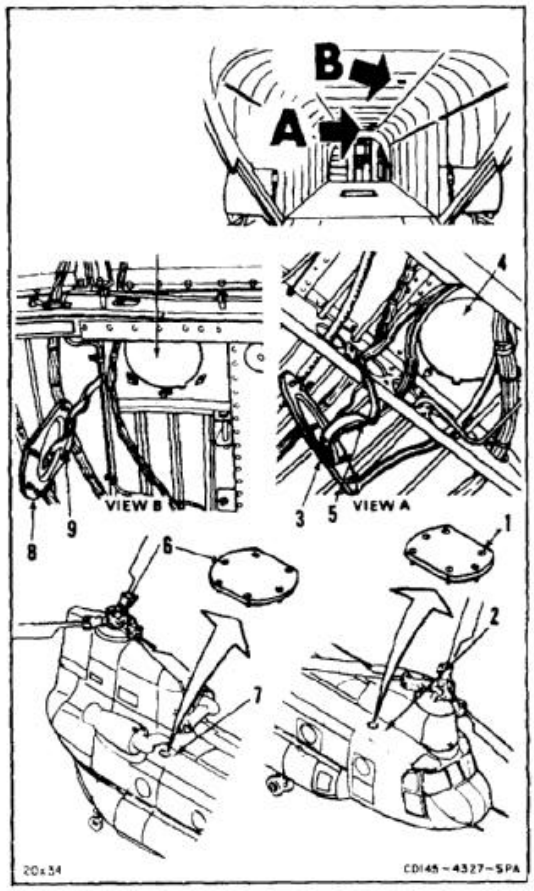


## 1-40 INSTALL HOISTING UNIT (Continued) 1-40

**NOTE**

Procedure is similar for installing hoisting unit in forward and aft positions. Differences are noted in task steps. Forward installation is shown here.

1. For forward installation, release six fasteners (1) on top of fuselage (2). Remove unit access cover (3) from hole (4) and let it hang from attached strap (5).
2. For aft installation, release six fasteners (6) on top of fuselage (7). Remove unit access cover (8) and let it hang from attached strap (9).

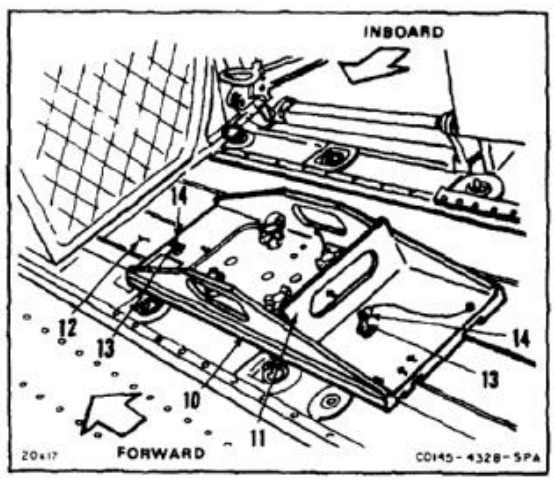



3. Position base plate (10) on cabin floor at sta. 154.86 for forward installation. Position base plate at station 445.25 for aft installation. Position plate so that support (11) is facing aft.

**WARNING**

Crane can fall if quick-release pins NAS1334A2C14 on base plate are not locked in cabin floor. Injury to personnel and damage to equipment can occur.

4. Secure plate (10) to floor (12) by installing two quick-release pins (13). Pull pins without pressing release buttons (14) to make sure pins are locked in floor.



**NOTE**

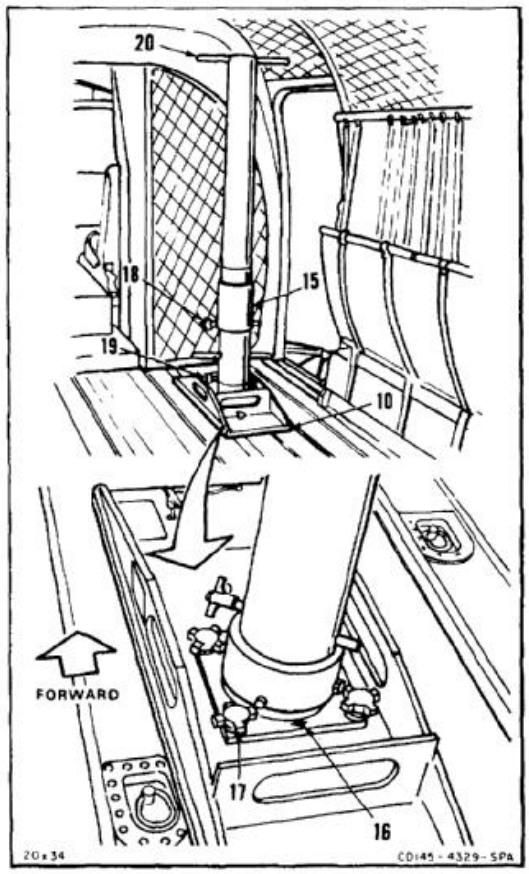
Upper and lower tubes make up cabin upright.

5. Have helpers position cabin upright (15) on base plate (10), arrow (16) pointing aft.

**WARNING**

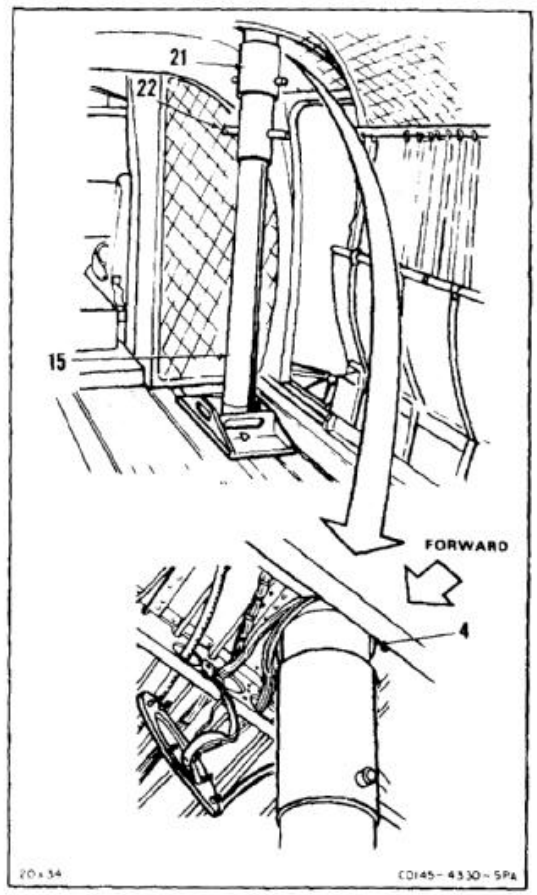
Do not align holes in cabin upright with fingers. Injury can occur. Use hand knobs.

6. Align holes in upright (15) with holes in base plate (10).
7. Install four hand knobs (17) and hand tighten.
8. Remove quick-release pins (18 and 19) from upright (15).
9. Remove handle (20) from upright (15).

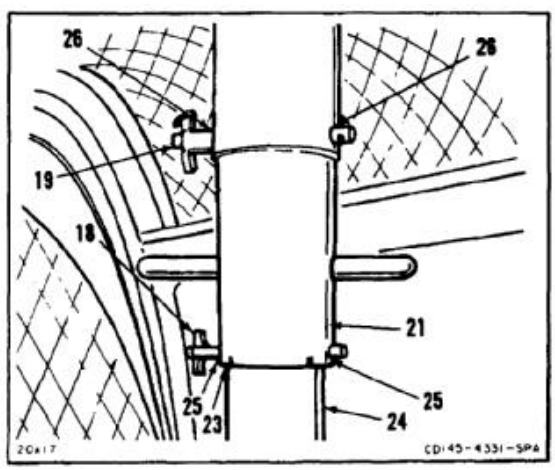


**1-40 INSTALL HOISTING UNIT (Continued) 1-40**

10. Have two helpers raise upper tube (21) of upright (15) through access hole (4) using handle (22). Have other two helpers guide and steady upper tube while raised.




11. Raise tube (21) to the marked (CH-47A) position (23) on lower tube (24).
12. Install pin (18) in lower tube (24) in hole of position (23).
13. Align two slots (25) in upper tube (21) over pin (18). Let slots in tube rest on pin.
14. Install pin (19) through holes (26) of upper tube (21) and lower tube (24).

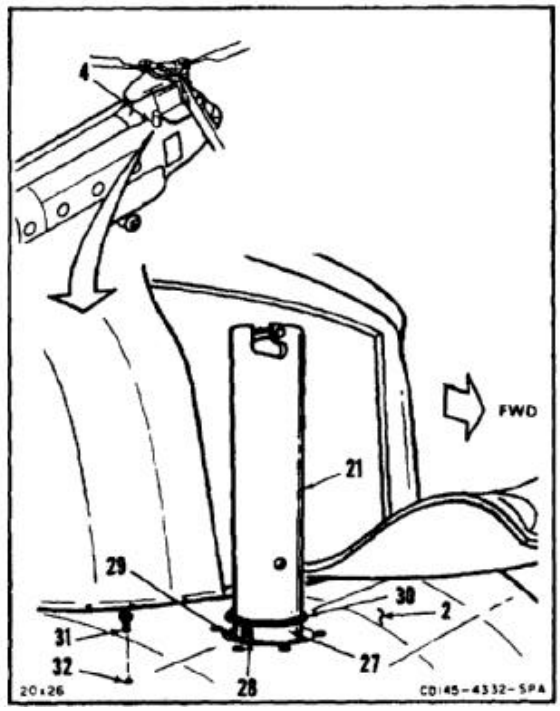


15. Position sleeve (27) over upper tube (21). Align guide bars (28) on sleeve with slots (29) in hole (4). Push sleeve in hole until lip (30) is against fuselage (2).

**NOTE**

Hole is marked sta. 179.7 at forward location. It is marked 419.5 at aft location.

16. Remove screw (31) from hole (32) in fuselage.

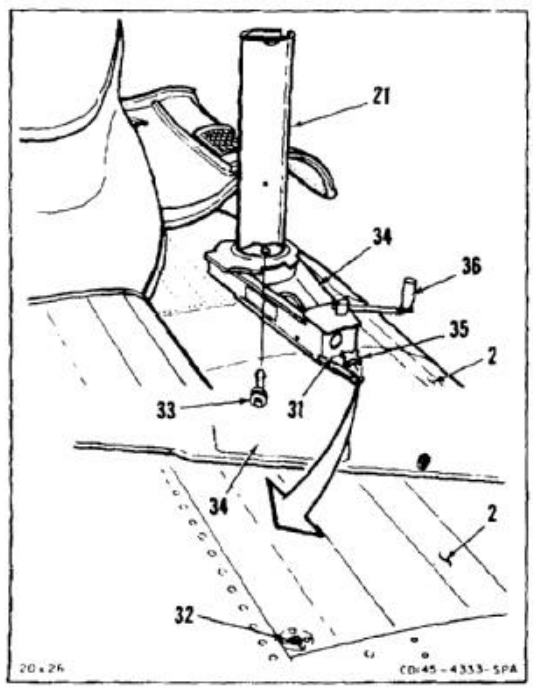



17. Remove quick-release pin (33) from azimuth control (34).
18. Position control (34) over tube (21) and lower control to fuselage (2).
19. Install quick-release pin (33) through control (34) and tube (21).
20. Position aft end of control (34) over threaded hole (32). Install captive screw (35) in hole and hand tighten.
21. Stow screw (32) in stowage place in azimuth control (34).

**CAUTION**

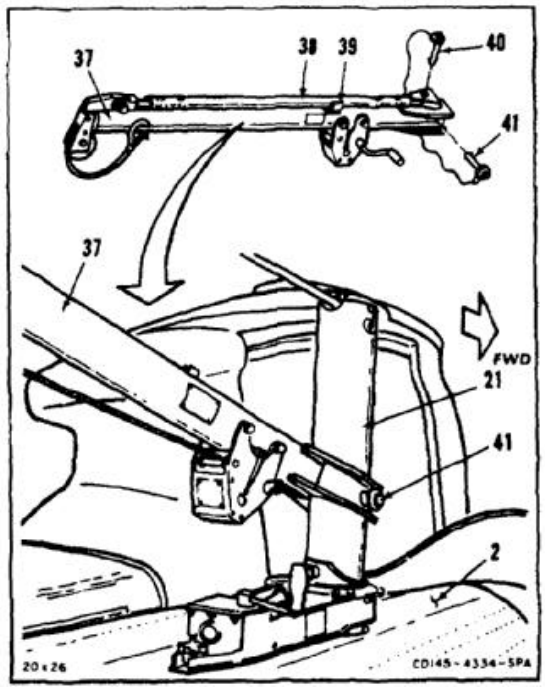
Upper tube must be returned to original position to ensure secure mast and boom installation. If tube is not in original position, mast and boom can slip out. Damage to equipment will result.

22. Rotate upper tube (21) by turning handle (36) on azimuth control (34) clockwise and counterclockwise several times to make sure control is functioning.

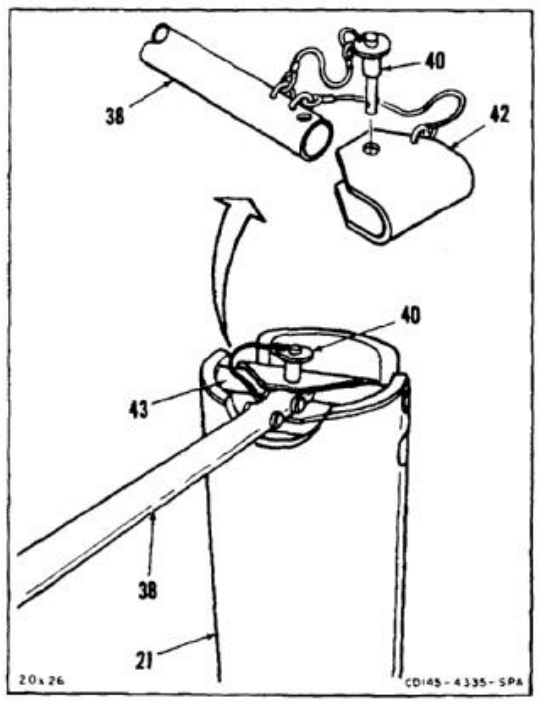


## 1-40 INSTALL HOISTING UNIT (Continued) 1-40

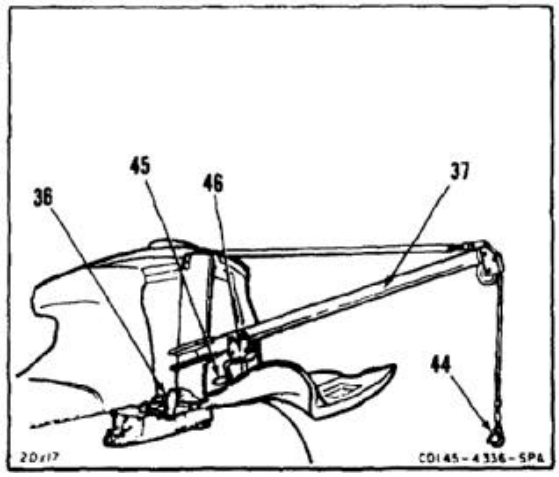
23. Have two helpers place jib boom (37) on top of fuselage (2).
24. Remove jib boom support tube (38) from bracket (39) on boom (37). Remove quick-release pin (40).
25. Remove quick-release pin (41).
26. Position boom (37) over upper tube (21). Align holes in boom and upper tube. Install quick-release pin (41).



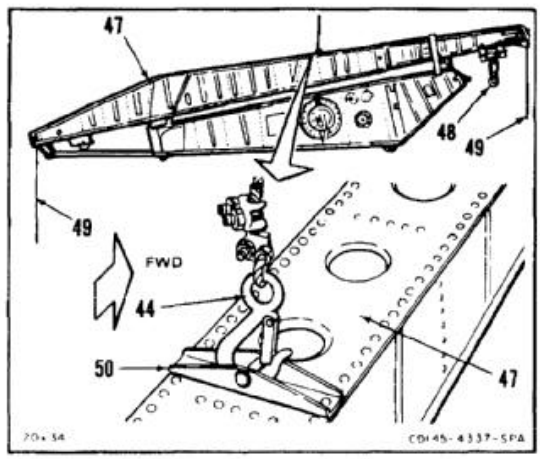

27. Remove strap (42) from support tube (38).
28. Position support tube (38) on top of upper tube (21). Position strap (42) over tube (43) in upper tube (21).
29. Install pin (40).



30. Remove hook (44) from stowed position.
31. Turn azimuth control handle (36) and position jib boom (37) over right side of helicopter.
32. Turn winch handle (45) DOWN and lower hook (44) about **three feet** from ground. Down direction is indicated on winch handle (46).



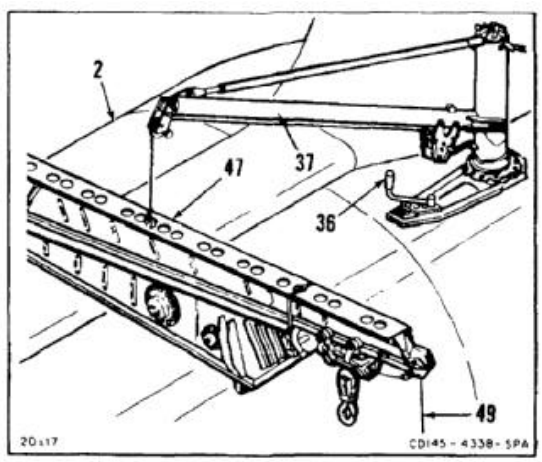

33. Have helpers position mast and boom (47) on ground beside helicopter under jib boom with trolley and hook (48) forward.
34. Attach rope guide lines (49) to both ends of mast and boom (47).
35. Attach jib boom hook (44) to bracket (50) on mast and boom (47). If hook does not fit, use a nylon or wire cable loop between hook and bracket.



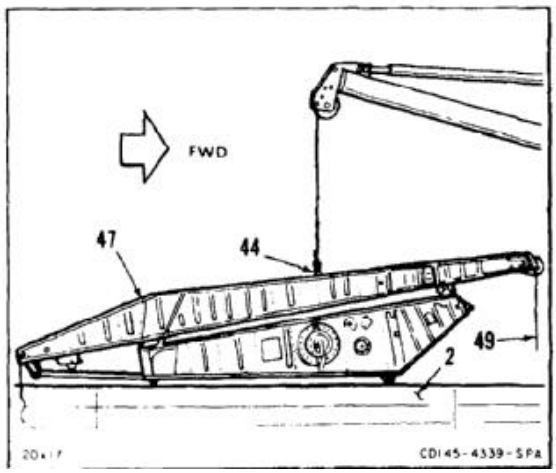

**CAUTION**

Raise mast and boom slowly and carefully to prevent damage which otherwise might result from mast and boom hitting helicopter.

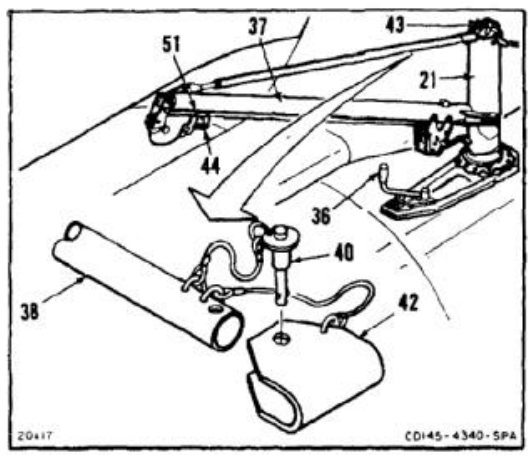
36. Hoist (raise) mast and boom (47) above helicopter. Have two helpers guide mast and boom with guidelines (49).
37. Rotate jib boom (37) with azimuth control handle (36) until mast and boom (47) is positioned directly over center of fuselage (2).



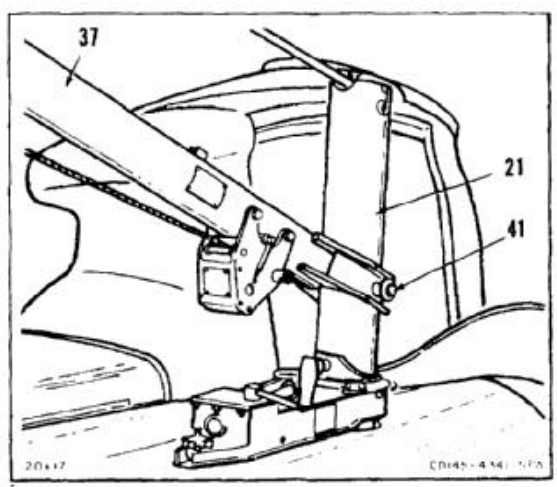
38. Lower hook (44). Set mast and boom (47) on fuselage (2).
39. Remove guide lines (49). Remove hook (44).



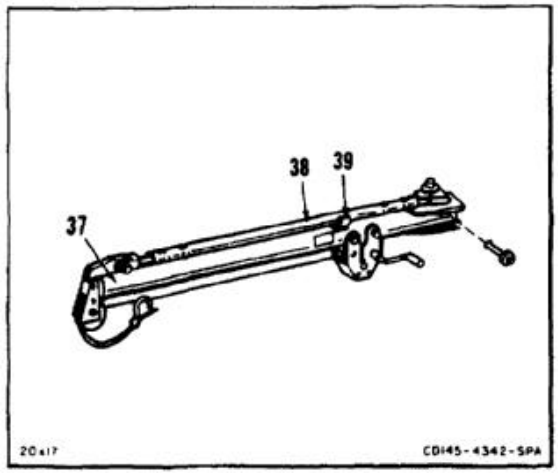

40. Raise hook (44) and place in stowed position (51) on jib boom (37).
41. Remove pin (40), support tube (38) and strap (42) from tube (43) on upper tube (21).
42. Position strap (42) over tube (38).
43. Install pin (40).
44. Rest support tube (38) on tube (21).



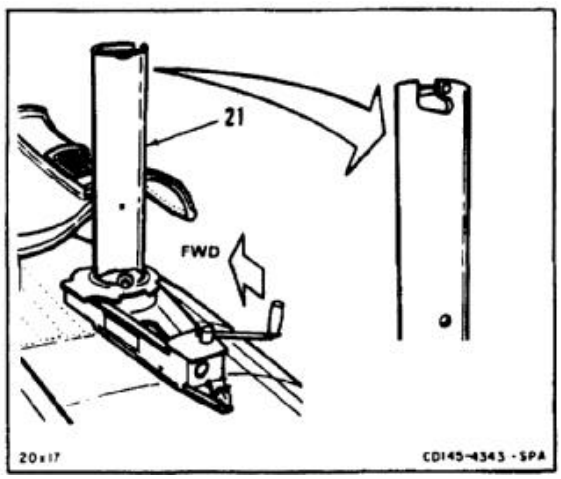

45. Have helpers support jib boom (37).
46. Remove pin (41) from jib boom (37) and upper tube (21).
47. Raise and remove boom (37) from tube (21).



48. Stow support tube (38) in bracket (39) and set boom (37) on workstand, away from work area.




49. Rotate upper tube (21) **180°**.



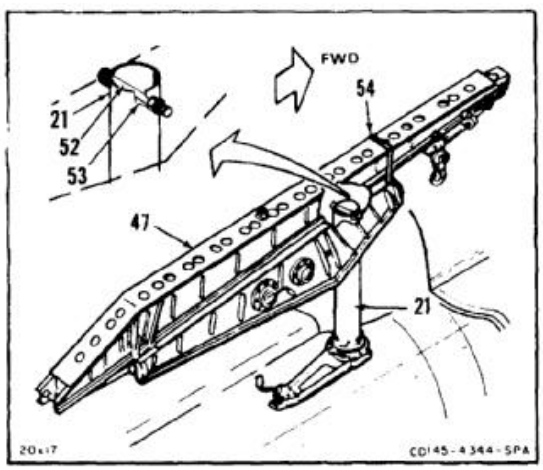

**NOTE**

Mast and boom can support itself in horizontal position on upper tube.

50. Have helpers position mast and boom (47) over upper tube (21).

**WARNING**

Mast and boom will slip out if pivot bolt is not fully seated in upper tube of cabin upright. Injury to personnel and damage to equipment can occur.



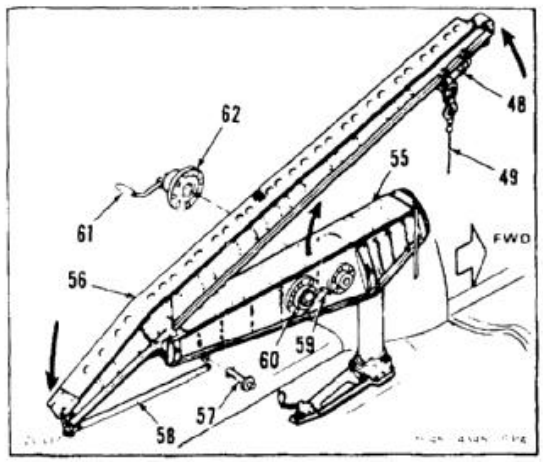

51. Check that pivot bolt (52) is in slot (53) of upper tube (21).

52 Remove strap (54) from mast and boom (47).

53. Unstow trolley and hook (48). Attach guideline (49) to trolley and hook.

54. Remove quick-release pin (57) from tension rod (58) and mast (55).

55. Remove handle (59) from stowed position. Install handle on hook winch (60). Remove handle (61) from stowed position. Install handles on trolley winch (62).




CAUTION

Cable will tangle if slack is not taken up when mast and boom are raised.

**NOTE**

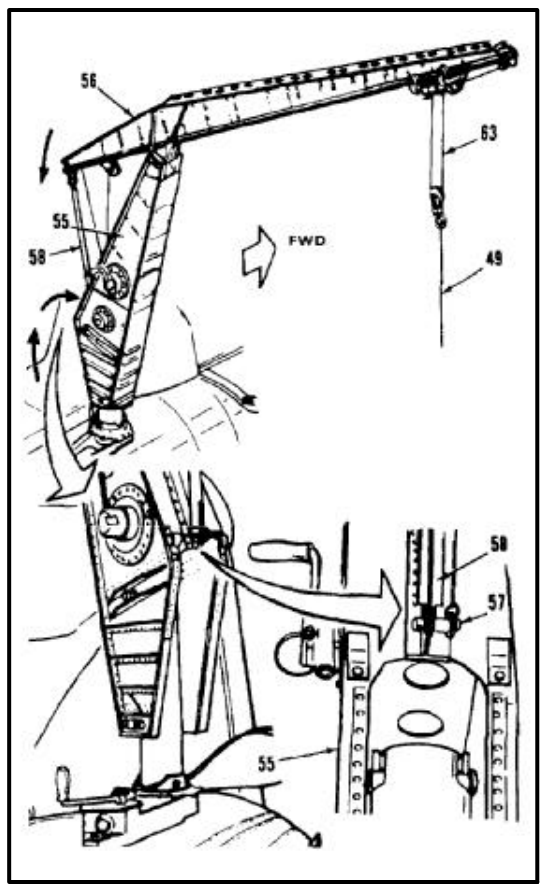
Up and down directions are shown on winches.

56. Have two helpers raise mast (55). At the same time, have one helper pull down on rod (58) to raise boom (56).

57. Have helper pull guideline (49) to take slack from cable (63).

58. Raise mast (55) and boom (56) high enough to align hole in tension rod (58) with bottom hole in mast (55).

59. Install pin (57) into tension rod (58) and mast (55).

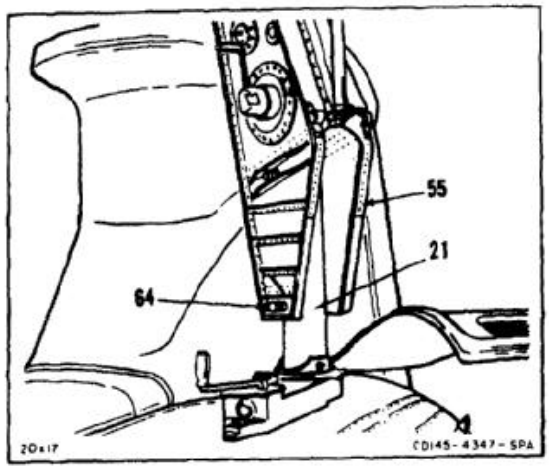


**1-40 INSTALL HOISTING UNIT (Continued) 1-40**

60. Align holes in mast (55) and upper tube (21).

61. Install pin (64) into mast (55) and upper tube (21).

***INSPECT***




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 1-41 REMOVE HOISTING UNIT 1-41

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

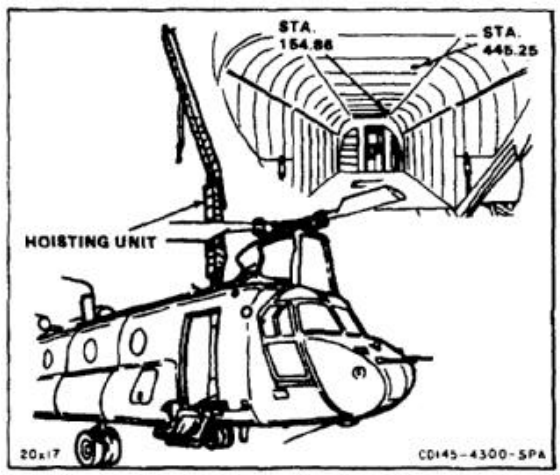
Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Workstand

***Materials:***

Rope Guidelines (2)

***Personnel Required:***

Medium Helicopter Repairer (5)
Inspector

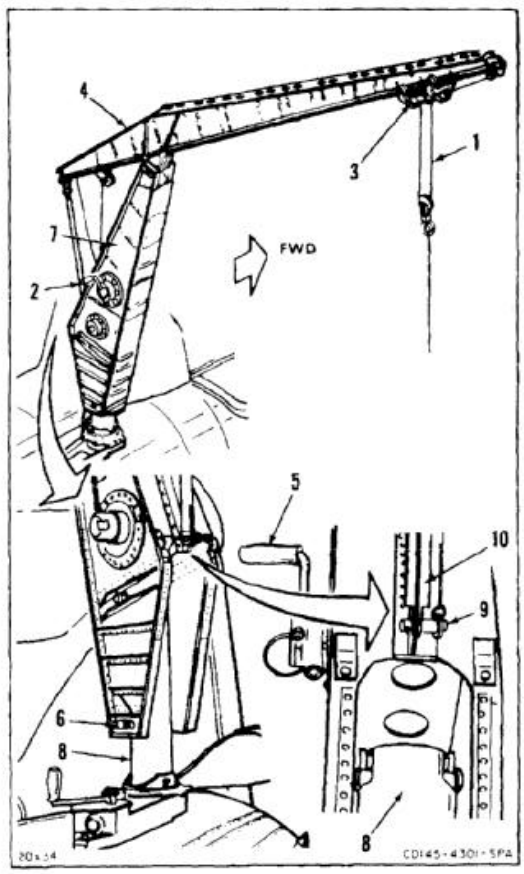



**NOTE**

Procedure is similar for removing unit at forward and aft positions. Differences are noted in task steps. Forward removal is shown here.

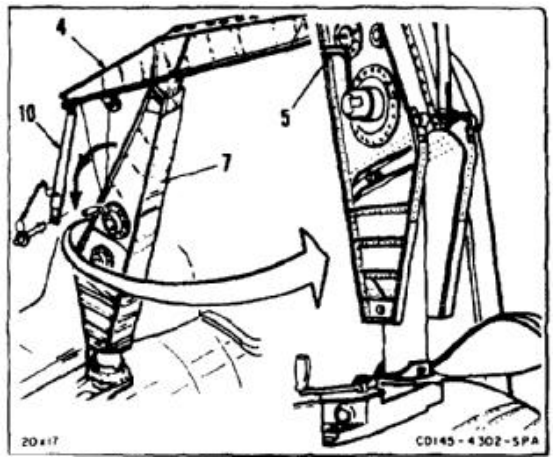
Cable will tangle if slack is not taken up when mast and boom are raised.

1. Take up slack in cable (1) by turning hook winch handle (2) in UP direction.
2. Position trolley (3) at end of boom (4) by turning trolley winch handle (5) in OUT direction.
3. Remove quick-release pin (6) from mast (7) and upper tube (8).
4. Remove quick-release pin (9) from mast (7) and tension rod (10).

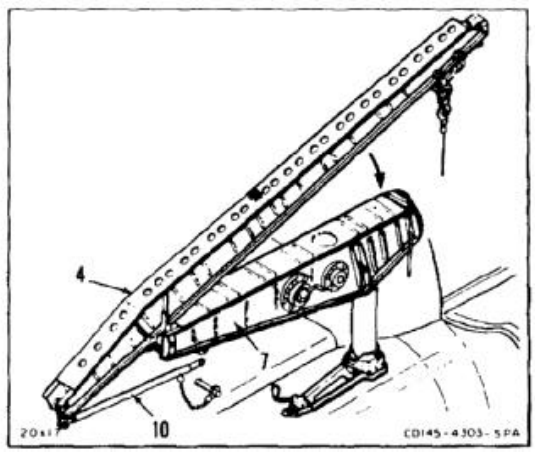


## 1-41 REMOVE HOISTING UNIT (Continued) 1-41

5. Lower boom (4) and mast (7) as follows:
   a. Have one helper support boom (4) by holding rod (10).
   b. Have other helpers lower mast (7) by hand. At same time, turn trolley winch handle (5) to IN direction to lower boom (4).



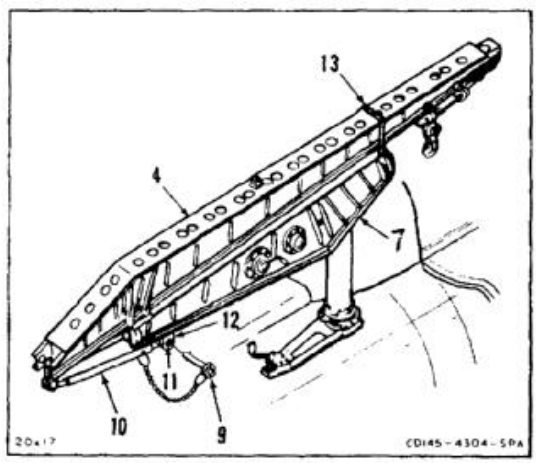

   c. Have helper holding rod (10), support and guide boom (4) until boom is lowered.
   d. Lower mast (7) and boom (4) into folded position.



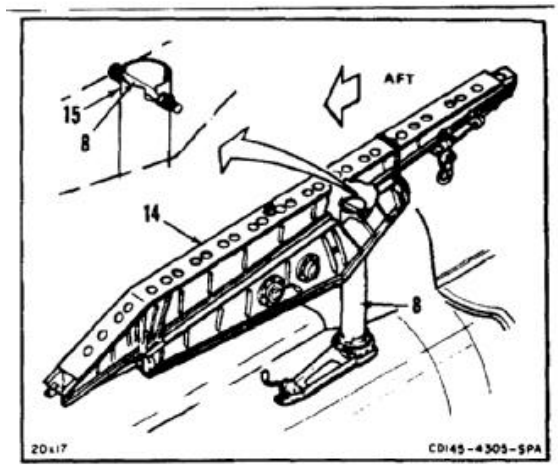

**NOTE**

Upper tube can support mast and boom in folded position.

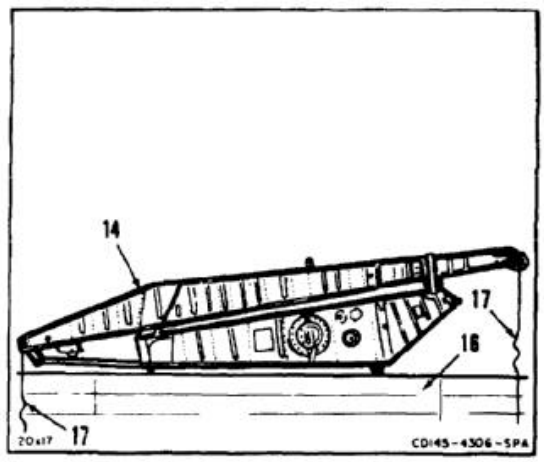
6. Align holes (11) in rod (10) and bracket (12).
7. Install pin (9) through rod (10) and bracket (12).
8. Install strap (13) to secure mast (7) and boom (4).



9. Slide mast and boom (14) aft so that pivot bolt (15) clears slot in cabin upright upper tube (8).
10. With four helpers lift and remove mast and boom (14) from upper tube (8).

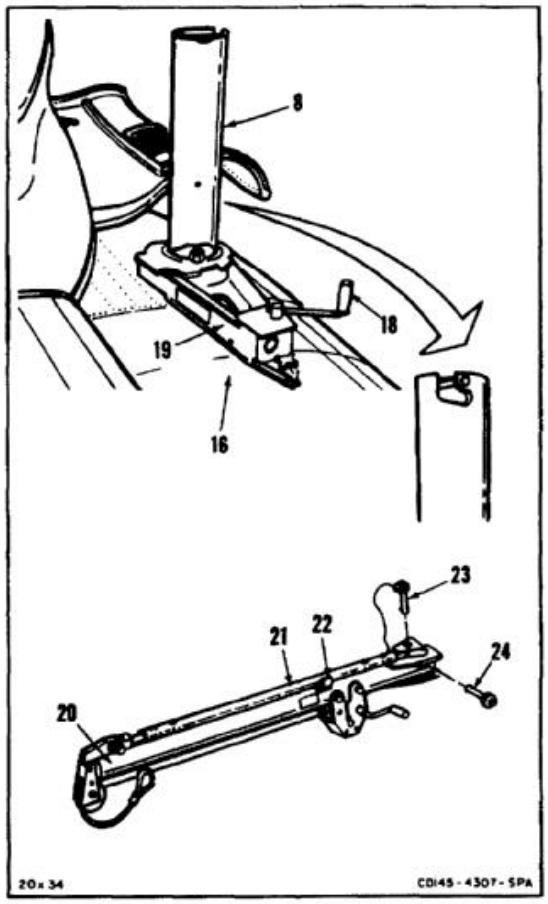



11. Set mast and boom (14) on top of fuselage (16).
12. Attach guidelines (17) to both ends of mast and boom (14).

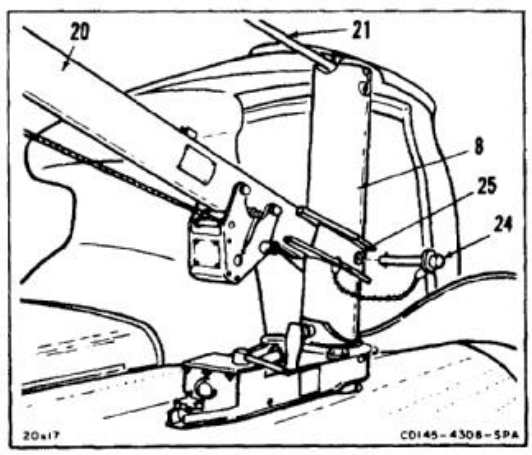


## 1-41 REMOVE HOISTING UNIT (Continued) 1-41

13. Rotate upper tube (8) **180°** by turning handle (18) of azimuth control (19).
14. Have helpers place jib boom (20) on top of fuselage top (16), aft of upper tube (8) for forward location. Place jib boom forward of upper tube for aft location.
15. Remove jib boom support tube (21) from stowed position on bracket (22).
16. Remove quick-release pins (23 and 24).

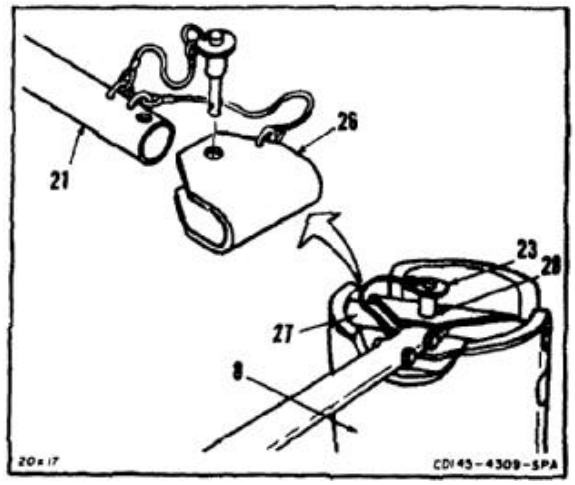



17. Have helpers position boom (20) over top of upper tube (8). Position support tube (21) on top of upper tube.
18. Align holes in boom (20) and upper tube (8). Install pin (24) through holes (25).



## 1-41 REMOVE HOISTING UNIT (Continued) 1-41

19. Remove strap (26) from support tube (21).
20. Position strap (26) over tube (27) in upper tube (8).
21. Position support tube (21) in strap (26). Install pin (23) into holes (28).

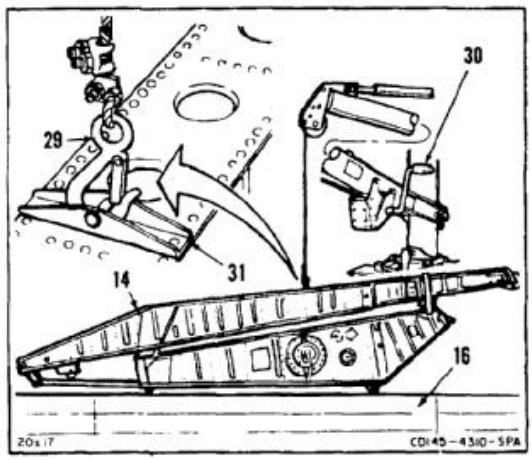



22. Have helpers position mast and boom (14) under jib boom hook (29).
23. Lower hook (29) by turning jib boom winch handle (30) in DOWN direction.
24. Attach hook (29) to bracket (31).

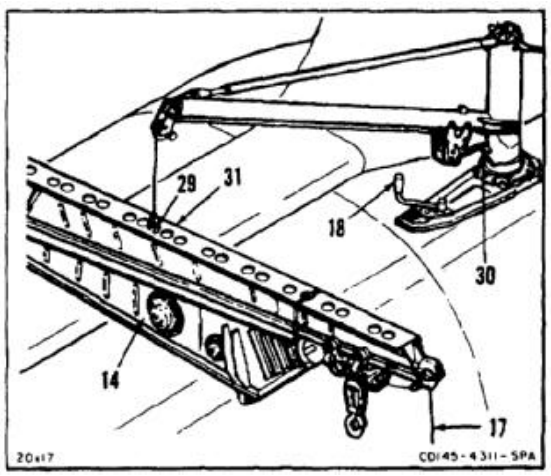
**CAUTION**

Helpers must guide mast and boom while it is lowered from fuselage to prevent it from hitting helicopter.

25. Hoist (raise) mast and boom (14) off fuselage (16).

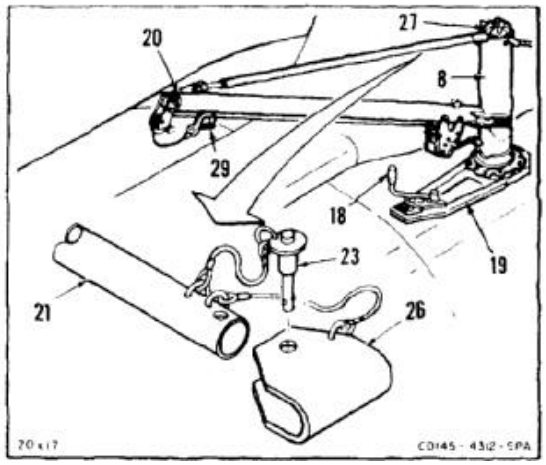



26. Have helpers steady mast and boom (14) with guidelines (17).
27. Position mast and boom (14) over right side of helicopter by turning azimuth control handle (18).
28. Lower mast and boom (14) to ground by turning winch handle (30) in DOWN direction.
29. Remove hook (29) from bracket (31) and rewind by turning winch handle (30) in UP direction. Remove guidelines (17).

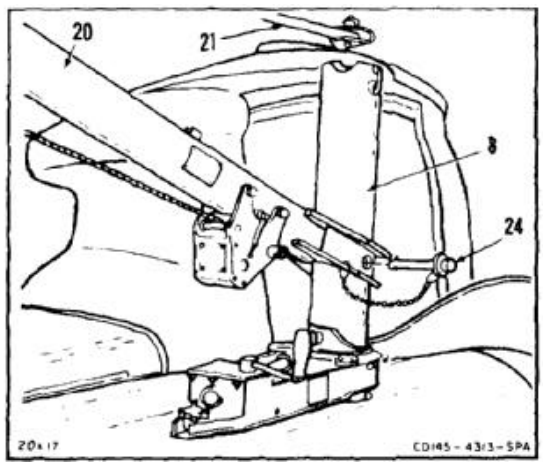


## 1-41 REMOVE HOISTING UNIT (Continued) 1-41

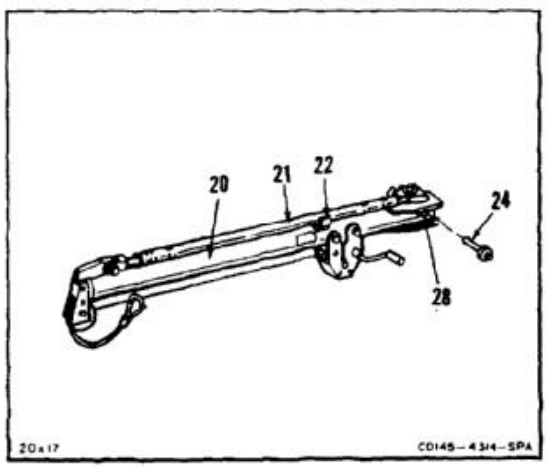
30. Rotate boom to original position over azimuth control (19) by turning control handle (18).
31. Place hook (29) in stowed position on boom (20).
32. Remove pin (23), support tube (21) and strap (26) from tube (27) in upper tube (8).
33. Install pin (23) in holes in strap (26) and tube (21). Position support tube (21) on top of upper tube (8).



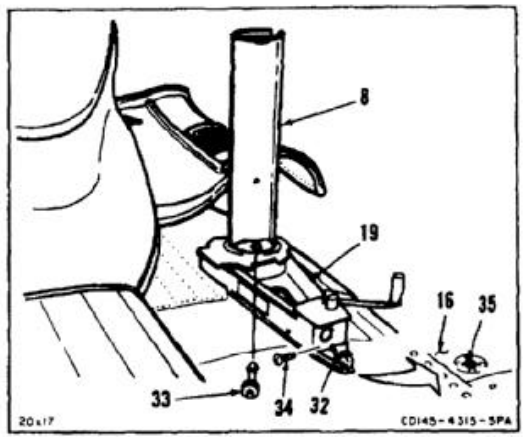

34. Have helpers support jib boom (20).
35. Remove quick-release pin (24) from boom (20) and upper tube (8).
36. Remove boom (20) and support tube (21) from upper tube (8). Place boom (20) on workstand.



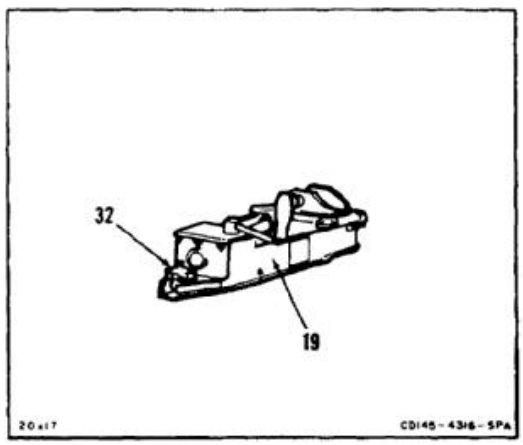

37. Stow support tube (21) in bracket (22).
38. Stow pin (24) in hole (28) in boom (20).



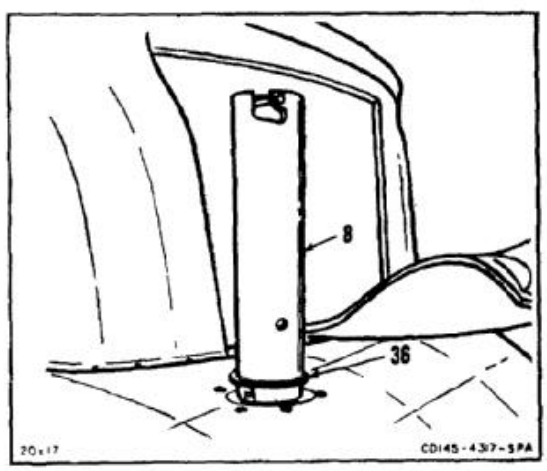
39. Remove captive screw (32).
40. Remove pin (33) from azimuth control (19) and upper tube (8).
41. Remove azimuth control (19) by lifting it from upper tube (8). Remove screw (34) stowed in azimuth control.
42. Install screw (34) in hole (35) in top of fuselage (16).
43. Install pin (33) in azimuth control (19).




44. Stow captive screw (32) on azimuth control (19).

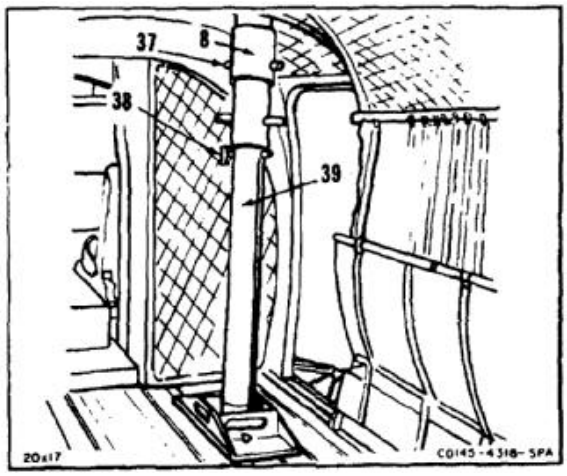



45. Remove sleeve (36) from upper tube (8).

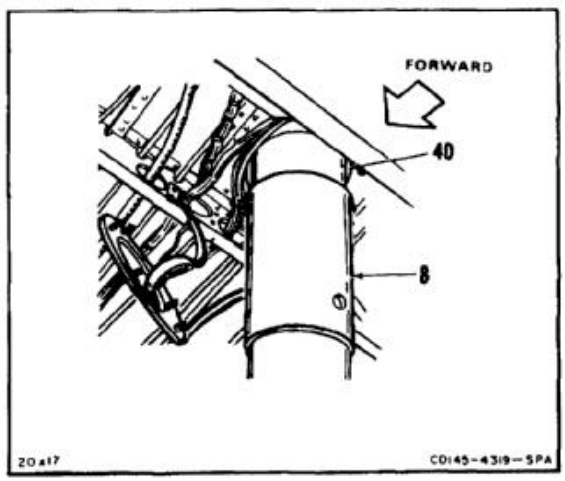


## 1-41 REMOVE HOISTING UNIT (Continued) 1-41

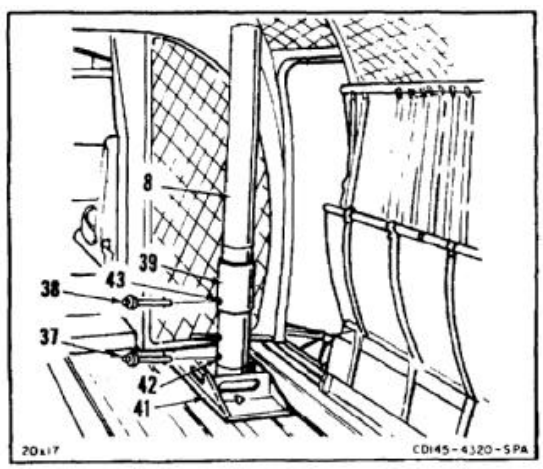
46. Have two helpers support upper tube (8).
47. Remove pins (37 and 38).
48. Have other two helpers lower upper tube (8) over lower tube (39).




49. Have two helpers steady tube (8) down through hole (40).



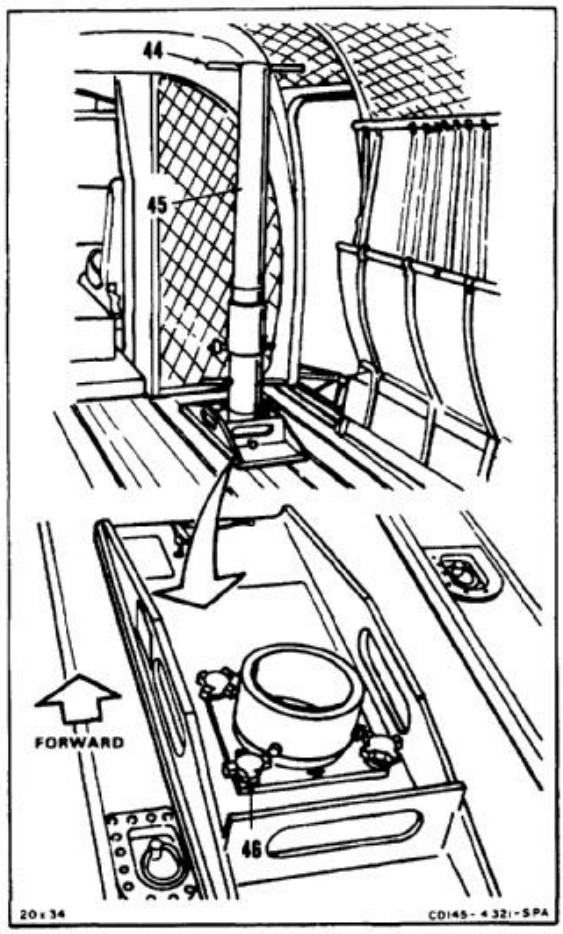

50. Let tube (8) rest on base plate (41).
51. Align holes (42 and 43) in upper and lower tubes (8 and 39).
52. Install pin (37) in hole (42).
53. Install pin (38) in hole (43).



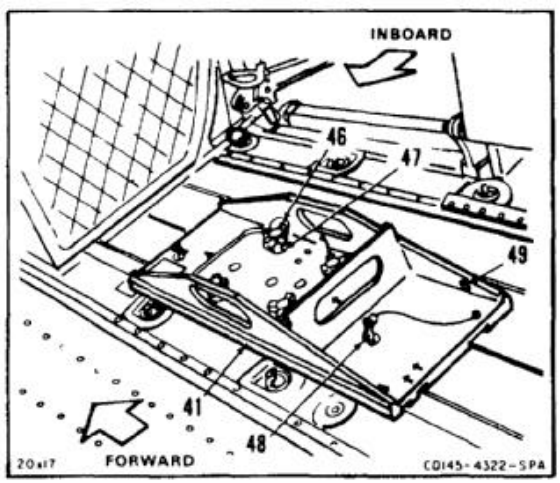
**NOTE**

Upper and lower tubes make up cabin upright.

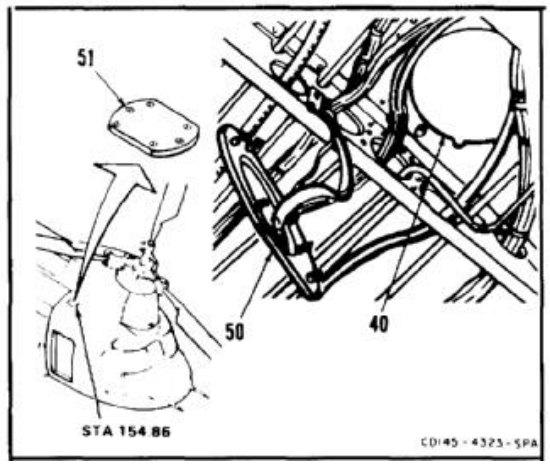
54. Install handle (44) in cabin upright (45).
55. Have two helpers support upright (45).
56. Remove four hand knobs (46).
57. Have four helpers remove upright (45).



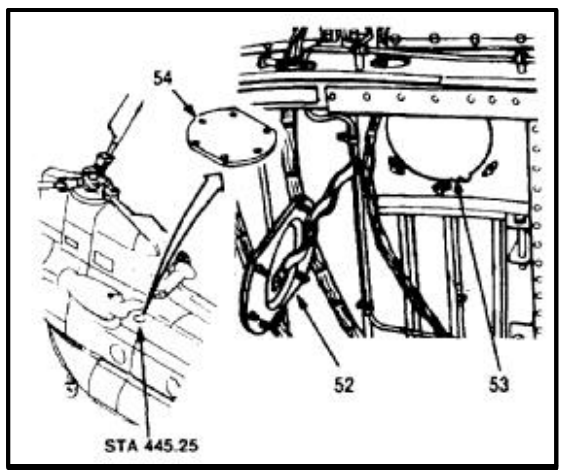

58. Stow knobs (46) in holes (47).
59. Remove quick-release pins (48) and stow in holes (49).
60. Remove base plate (41).



61. At forward location, pull access cover (50) up through hole (40). Position cover at sta. 154.86 and tighten six fasteners (51).

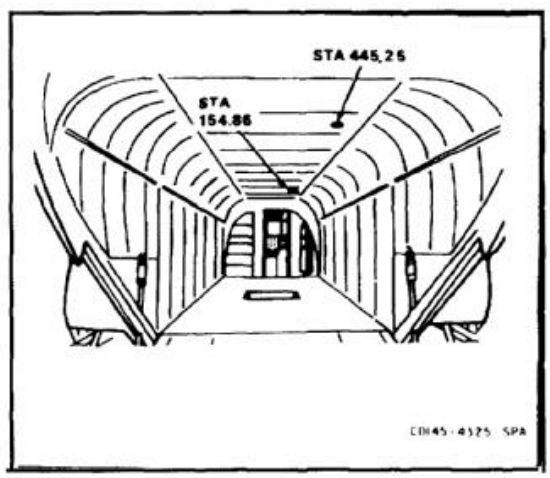



62. At aft location, pull access cover (52) up through hole (53). Position cover (52) at sta. 445.25 and tighten six fasteners (54).




***FOLLOW-ON MAINTENANCE:***

Install upper cabin door (Task 2-158).
Install cabin acoustic blanket (Task 2-210).




END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Aluminum Drift, 1 Inch Diameter X 6 Inches Long

***Materials:***

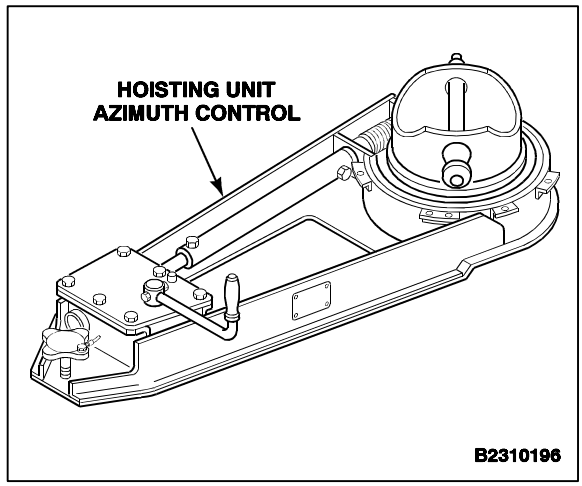
None

***Personnel Required:***

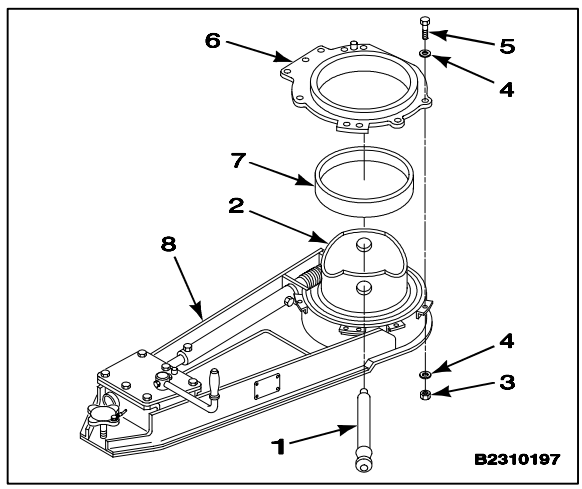
CH-47 Helicopter Repairer

***Equipment Condition:***

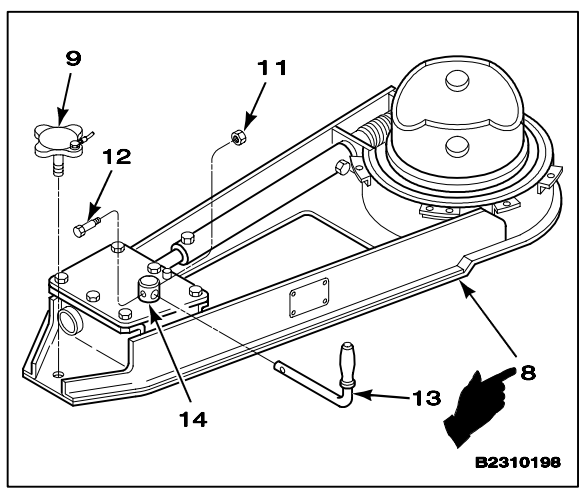
Off Helicopter Task



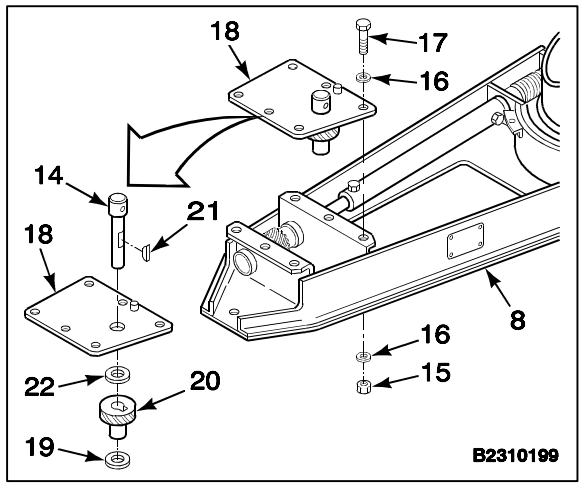

1. Remove quick-release pin (1) from worm gear (2).
2. Remove 9 nuts (3), 18 washers (4), 9 bolts (5), worm gear cap (6) and spacer (7) from azimuth drive housing (8).



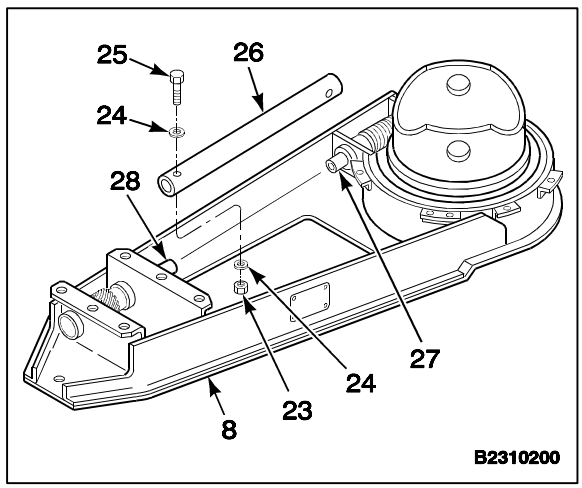

3. Remove captive screw (9) from housing (8).
4. Remove nut (11), bolt (12), and handle (13) from pinion shaft (14).



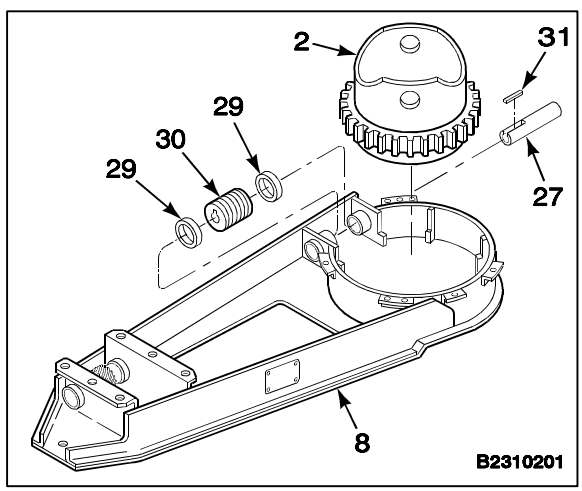
5. Remove 6 nuts (15), 12 washers (16), 6 bolts (17) and helical gear cap (18) from azimuth drive housing (8).
6. Remove thrust washer (19), helical gear (20), key (21), and thrust washer (22) from pinion shaft (14).
7. Remove pinion shaft (14) from helical gear cap (18).



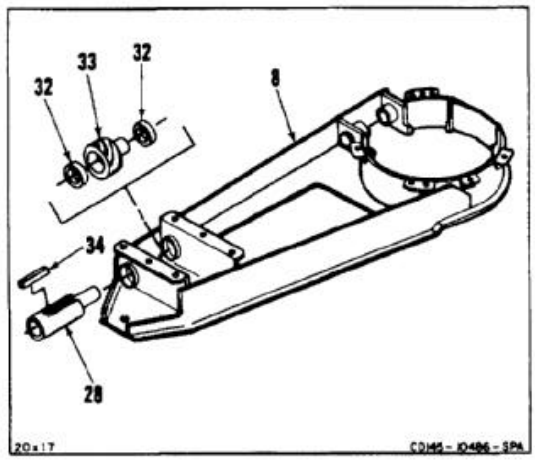

8. Remove nut (23), two washers (24), and bolt (25) from each end of shaft connector (26).
9. Push azimuth drive shaft (27) and pinion drive shaft (28) into housing (8) enough to clear shaft connector (26).
10. Remove shaft connector (26).




11. Push azimuth drive shaft (27) from housing (8). Use drift. Remove azimuth drive shaft, two bearings (29), worm (30), and key (31) from housing (8).
12. Remove worm gear (2).



13. Push pinion drive shaft (28) from housing (8). Use drift. Remove pinion drive shaft, two bearings (32), helical drive gear (33) and key (34) from housing (8).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 1-43 ASSEMBLE HOISTING UNIT AZIMUTH CONTROL 1-43

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Aluminum Drift, 1 Inch Diameter X 6 Inches Long

***Materials:***

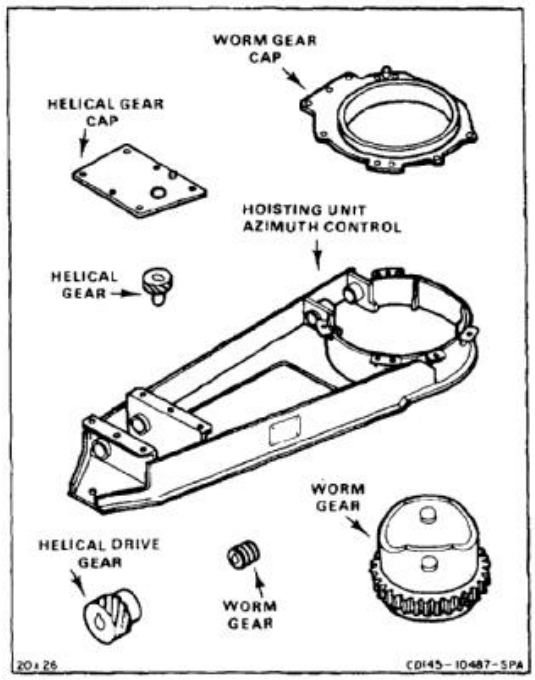
Grease (E190)

***Personnel Required:***

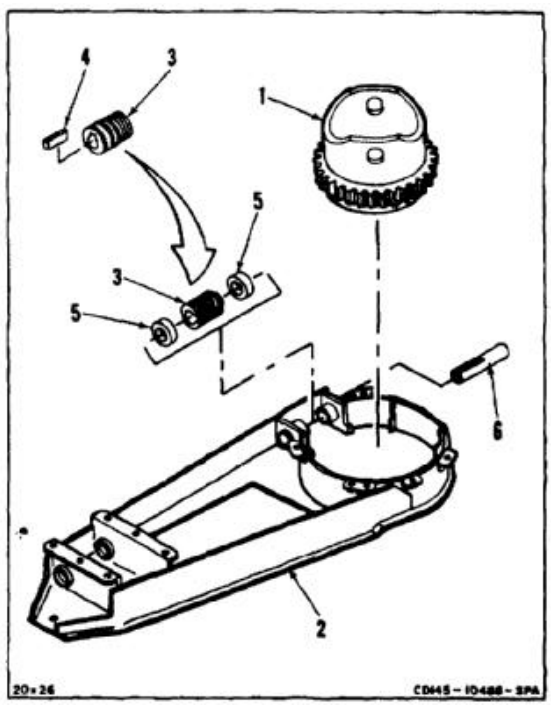
Medium Helicopter Repairer
Inspector

***References:***

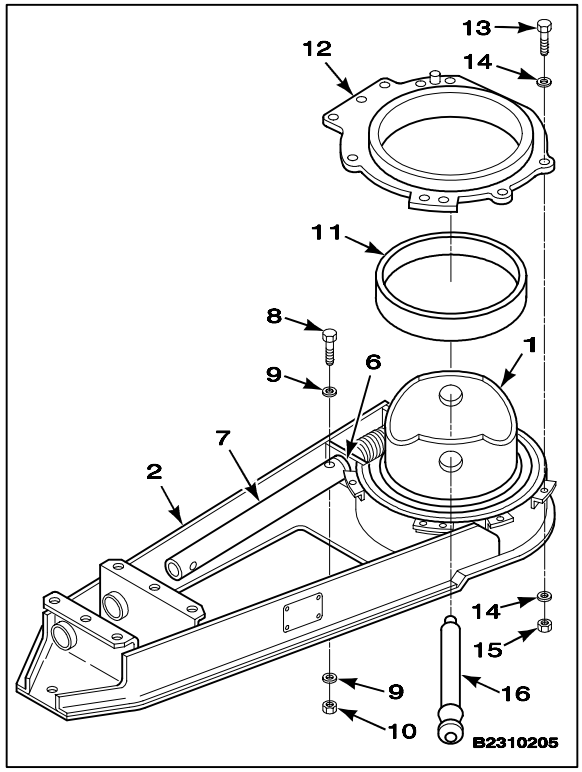
TM 55-1520-240-23P



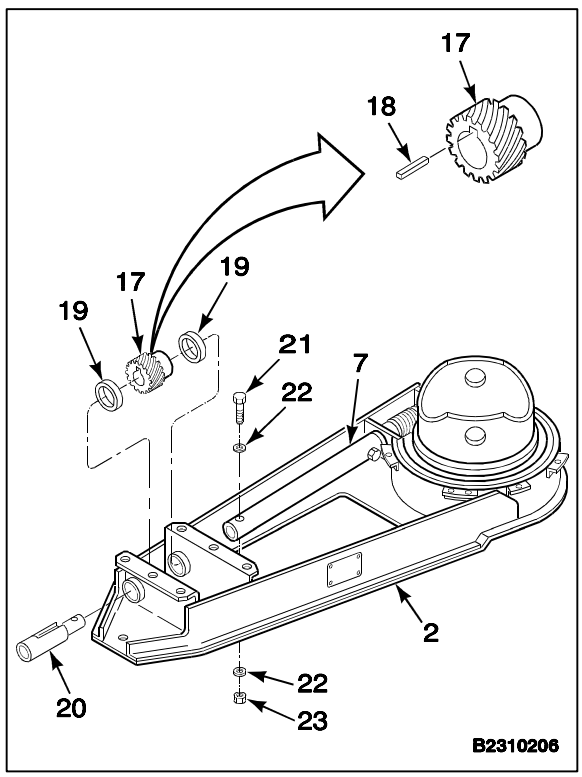

1. Apply coat of grease (E190) to worm gear (1).
2. Install worm gear (1) in azimuth drive housing (2).
3. Apply coat of grease (E190) to worm gear (3).
4. Install key (4) in groove in worm gear (3).
5. Position worm gear (3) and two bearings (5) in housing (2). Slide azimuth drive shaft (6) into housing (2) until slot in shaft engages key (4) in worm.
6. Install shaft (6).



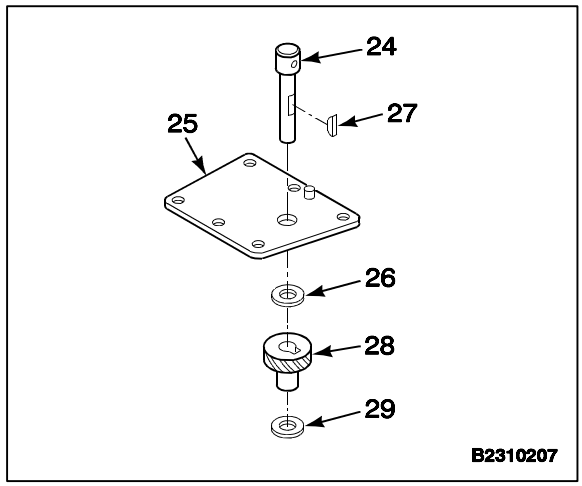
7. Slide shaft connector (7) on shaft (6). Align holes in shaft connector and shaft. Install bolt (8) two washers (9) and nut (10).
8. Install spacer (11), worm gear cap (12), 9 bolts (13), 18 washers (14), and 9 nuts (15) on housing (2).
9. Install quick-release pin (16) in worm gear (1).




10. Apply coat of grease (E190) to helical drive gear (17).
11. Install key (18) in helical drive gear (17).
12. Position helical drive gear (17) and two bearings (19) in housing (2). Slide pinion drive shaft (20) into housing (2) until slot in shaft engages key (18) in gear. Install pinion drive shaft.
13. Align hole in shaft connector (7) and shaft (20). Install bolt (21) two washers (22) and nut (23).



14. Install pinion shaft (24) in helical gear cap (25).
15. Install thrust washer (26), key (27), helical gear (28), and thrust washer (29) on pinion shaft (24).

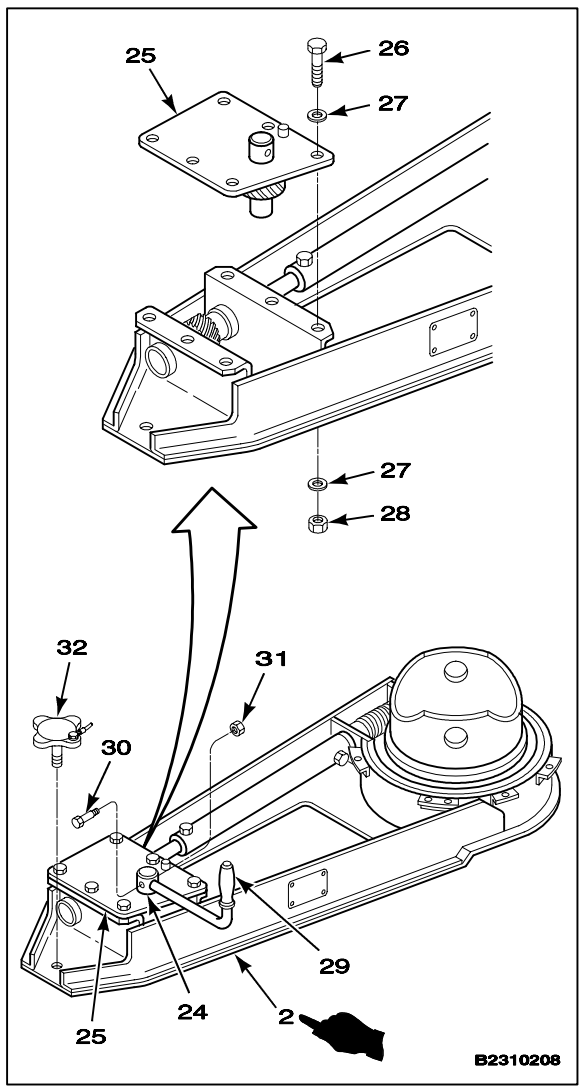



16. Install helical gear cap (25), 6 bolts (26), 12 washers (27), and 6 nuts (28) on housing (2).
17. Position handle (29) in pinion shaft (24). Install bolt (30) and nut (31).
18. Install captive screw (32) in housing (2).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 1-44 DISASSEMBLE HOISTING UNIT JIB BOOM 1-44

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

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

***Materials:***

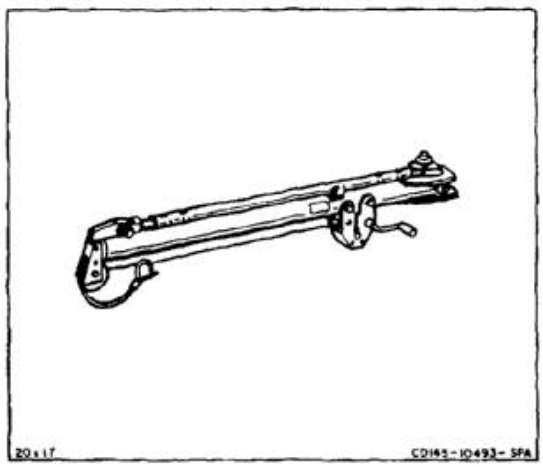
None

***Personnel Required:***

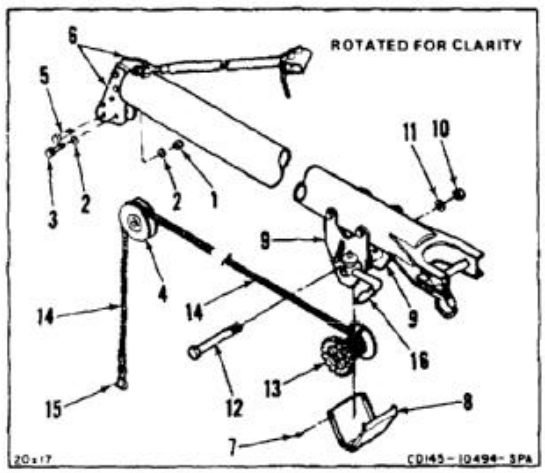
Medium Helicopter Repairer

***Equipment Condition:***

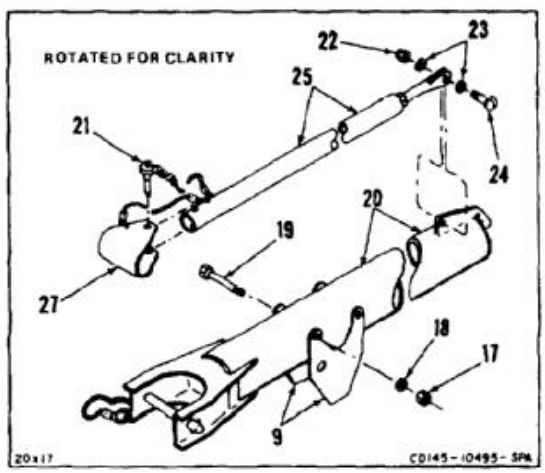
Off Helicopter Task



1. Remove nuts (1), washers (2), bolts (3), pulley (4) and spring pin (5) from plates (6).
2. Remove two plates (6).
3. Remove screws (7), and cover (8) from winch side plates (9).
4. Remove nut (10), washer (11), bolt (12), and spur gear drum (13).
5. Remove knot from nylon rope (14). Remove rope (14) from drum (13) and pulley (4). Remove hook (15).
6. Remove winch handle (16).




7. Remove nut (17), washer (18) and bolt (19) from side plates (9) and jib boom (20).
8. Remove side plates (9).
9. Remove quick-release pin (21).
10. Remove nut (22), washers (23) and bolt (24) from boom (20) and tension tube (25).
11. Remove quick-release pin (21) from tube (25) and strap (27).
12. Remove strap (27).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 1-45 ASSEMBLE HOISTING UNIT JIB BOOM 1-45

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

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

***Materials:***

None

***Personnel Required:***

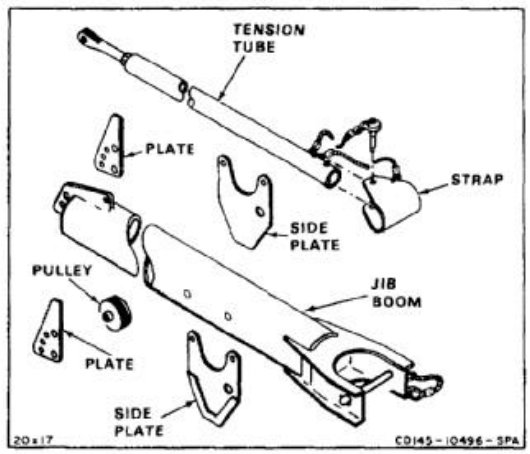
Medium Helicopter Repairer
Inspector

***References:***

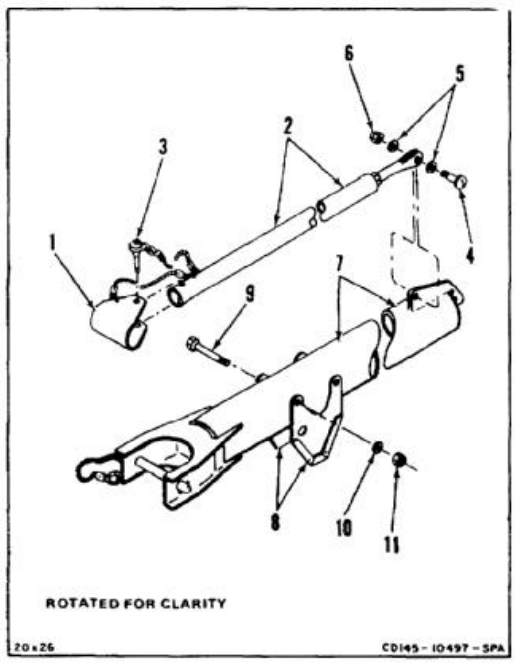
TM 55-1520-240-23P

***Equipment Condition:***

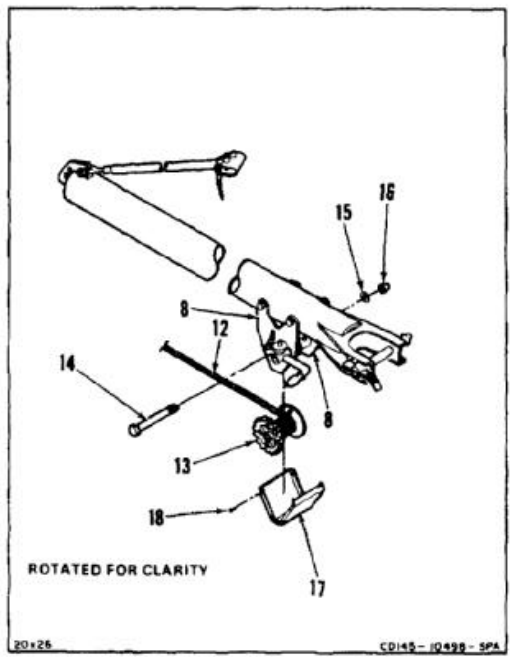
Off Helicopter Task




1. Install strap (1) on tension tube (2). Align holes in strap and tube, and install quick-release pin (3).
2. Install bolt (4), washers (5), and nut (6) in tension tube (2) and jib boom (7).
3. Align holes in boom (7) and winch side plates (8). Install two bolts (9), washers (10) and nuts (11) in boom and plates.



4. Install rope in spur gear drum (13). Tie knot in rope to prevent it from dropping out of drum.
5. Position spur gear drum (13) between plates (8). Install bolt (14) through plates and drum. Install washer (15) and nut (16) on bolt.
6. Position cover (17) on bottom of plates (8). Install 10 screws (18) in cover (17) and plates (8).

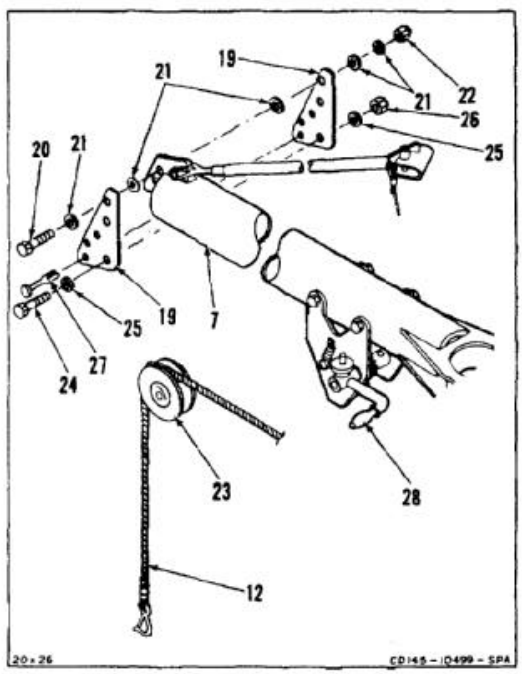



7. Position plates (19) on boom (7). Install top bolt (20), washers (21) and nut (22).
8. Place rope (12) on pulley (23). Position pulley and rope between plates (19) and install four bolts (24), washers (25) and nuts (26).
9. Install spring pin (27) in plates (19).
10. Install handle (28).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

None




END OF TASK

## 1-46 DISASSEMBLE HOISTING UNIT BOOM 1-46

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Bushing Removal Tool, NSN 5120-00-566-2845

***Materials:***

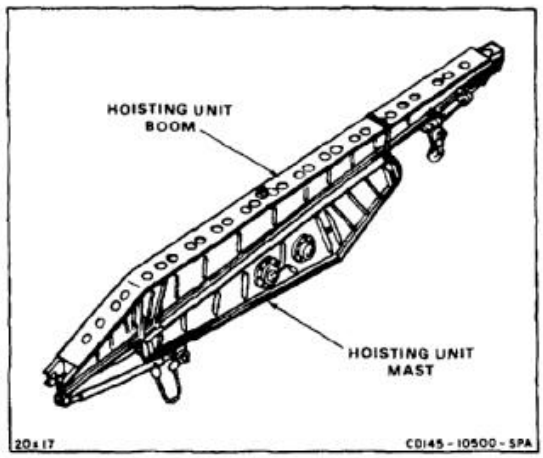
None

***Personnel Required:***

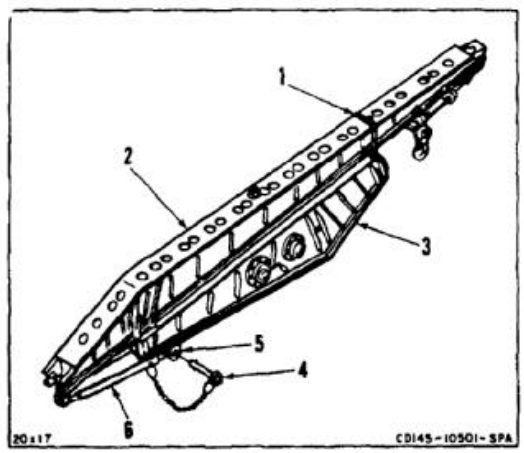
Medium Helicopter Repairer (2)

***Equipment Condition:***

Off Helicopter Task

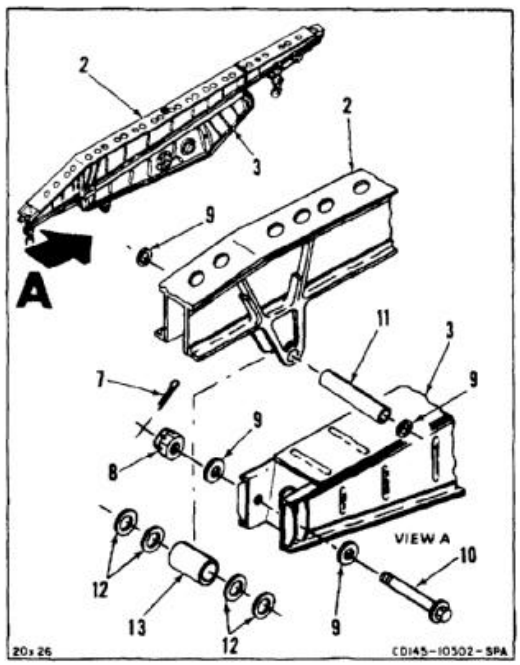



1. Remove strap (1) securing boom (2) to mast (3).
2. Remove quick-release pin (4) from bracket (5). Remove tension rod (6) from bracket.

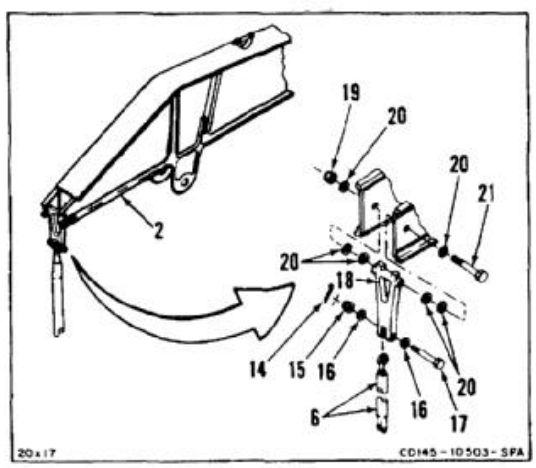


## 1-46 DISASSEMBLE HOISTING UNIT BOOM (Continued) 1-46

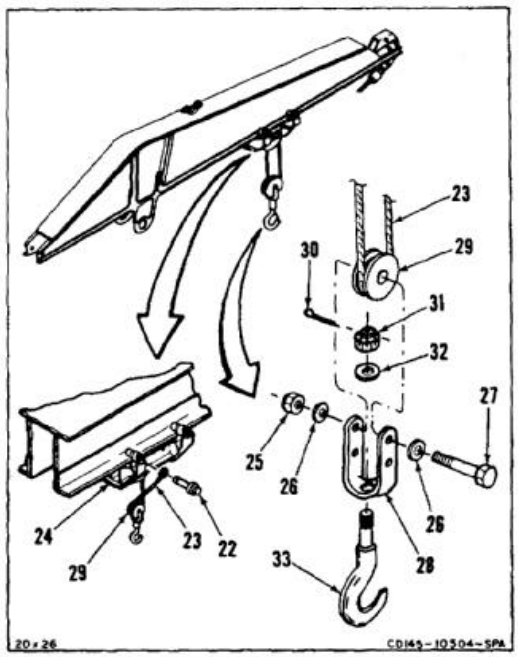
3. Remove cotter pin (7), nut (8), four washers (9) and bolts (10) from boom (2) and mast (3). Separate boom (2) and mast (3).
4. Remove spacer (11), four washers (12), and spacer (13) from boom (2).



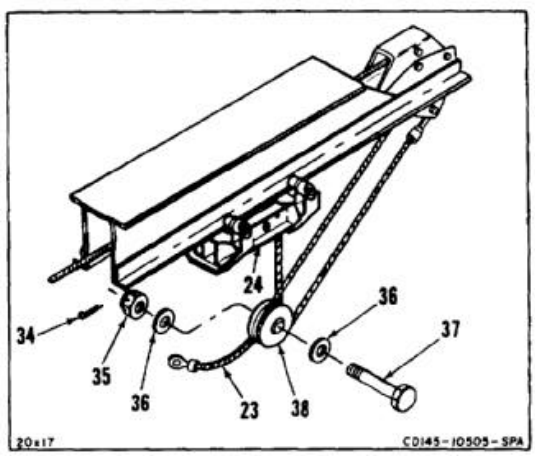

5. Remove cotter pin (14), nut (15), two washers (16), bolt (17), and tension rod (6) from link (18).
6. Remove nut (19), six washers (20), bolt (21) and link (18) from boom (2).



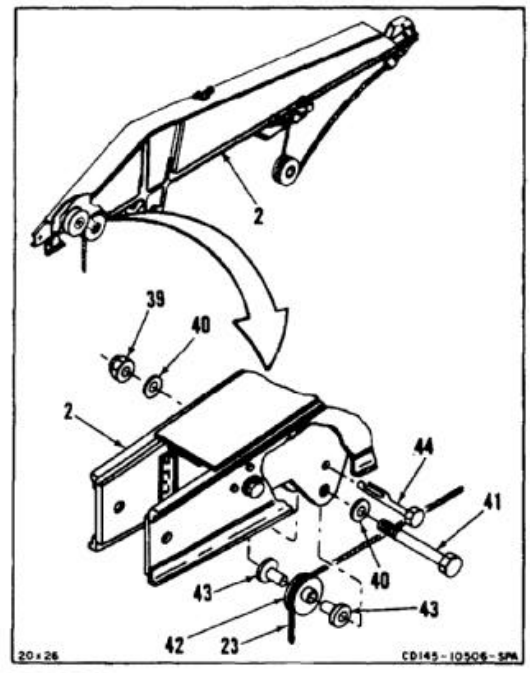
7. Remove quick-disconnect (22) and cable (23) from trolley (24).
8. Remove nut (25), two washers (26), bolt (27), and hook strap (28) from hook pulley (29). Remove cable (23) from hook pulley.
9. Remove cotter pin (30), nut (31), washer (32), and hook (33) from hook strap (28).



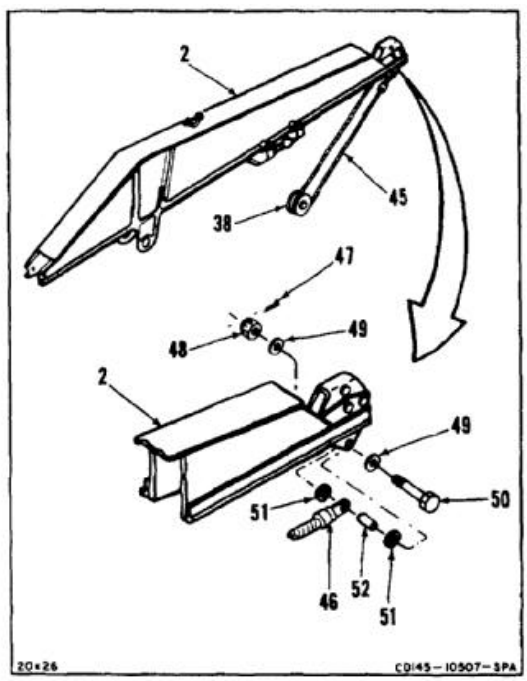

10. Remove cotter pin (34), nut (35), two washers (36), bolt (37), and trolley pulley (38) from trolley (24). Remove cable (23) from pulley.



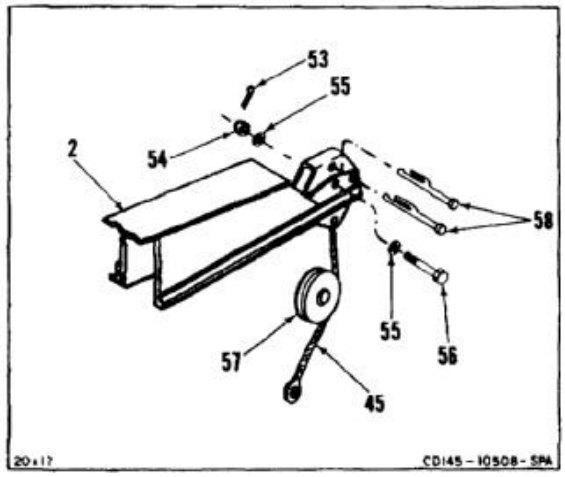
11. Remove nut (39), two washers (40), and bolt (41) from boom (2).
12. Remove pulley (42) and two bushings (43) from boom (2). Use bushing removal tool. Remove cable (23) from pulley.
13. Remove spring pin (44) from boom (2).



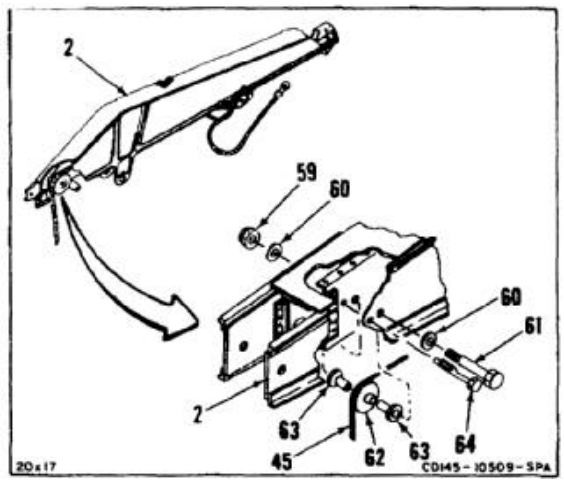

14. Release cable (45) at cable lock (46). Remove cable from trolley pulley (38).
15. Remove cotter pin (47), nut (48), two washers (49), and bolt (50). Remove cable lock (46), two washers (51), and bushing (52) from boom (2).



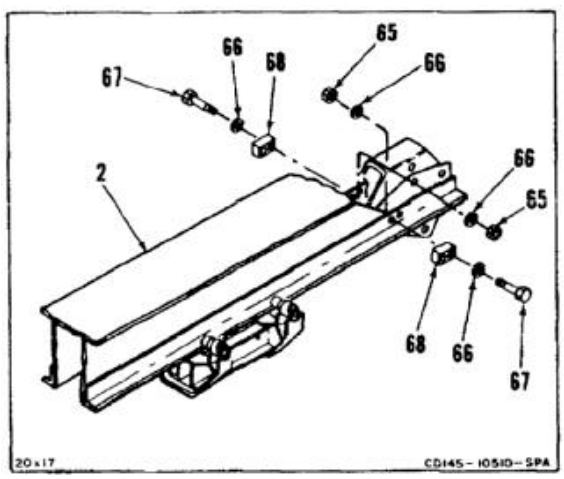
16. Remove cotter pin (53), nut (54), two washers (55), bolt (56), and boom pulley (57). Remove cable (45) from pulley.
17. Remove two spring pins (58) from boom (2).




18. Remove nut (59), two washers (60), and bolt (61).
19. Remove pulley (62) and two bushings (63) from boom (2). Use bushing removal tool. Remove cable (45) from pulley.
20. Remove spring pin (64) from boom (2).
21. Remove cable (45) from boom (2).

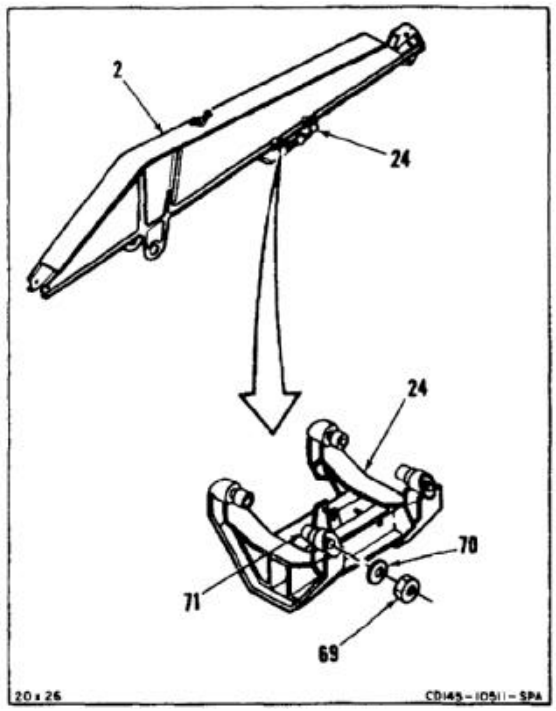



22. Remove four nuts (65), washers (66), bolts (67), and two stops (68) from boom (2).



23. Remove trolley (24) from boom (2).

24. Remove four nuts (69), washers (70), and cam followers (71) from trolley (24).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 1-47 ASSEMBLE HOISTING UNIT BOOM 1-47

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

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

***Materials:***

None

***Parts:***

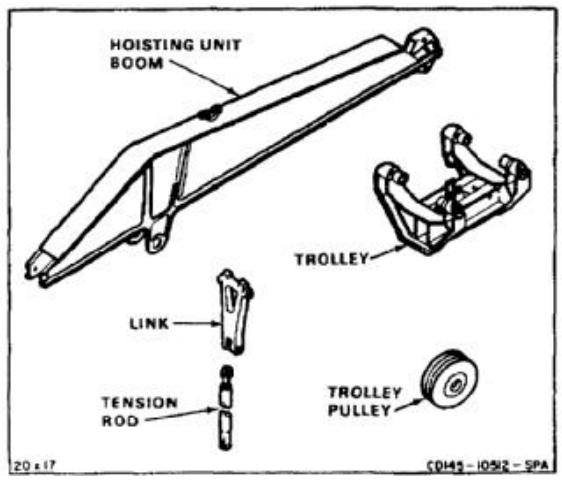
Cotter Pins

***Personnel Required:***

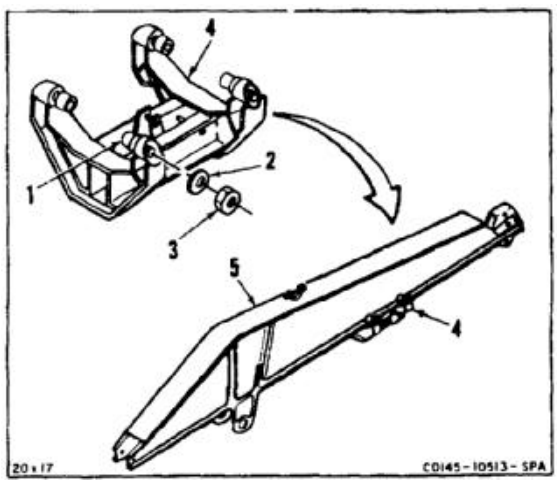
Medium Helicopter Repairer (2)
Inspector

***References:***

TM 55-1520-240-23P

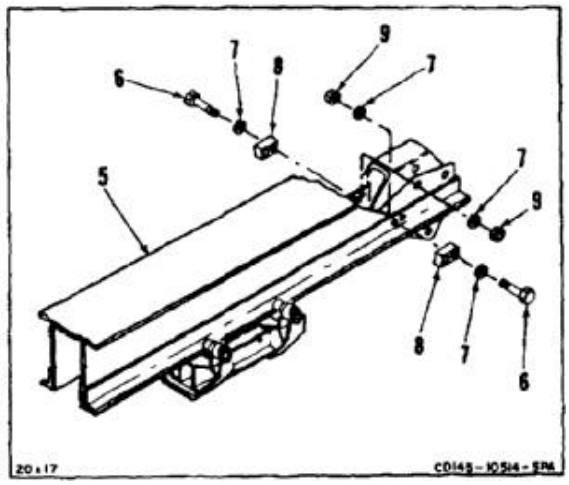



1. Install four cam followers (1), washers (2), and nuts (3) on trolley (4).
2. Install trolley (4) on boom (5).

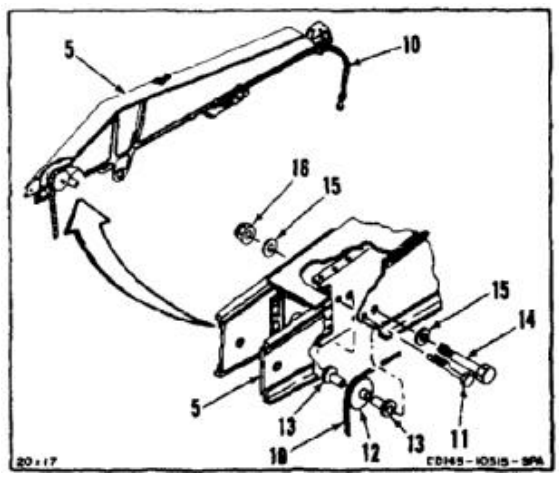


## 1-47 ASSEMBLE HOISTING UNIT BOOM (Continued) 1-47

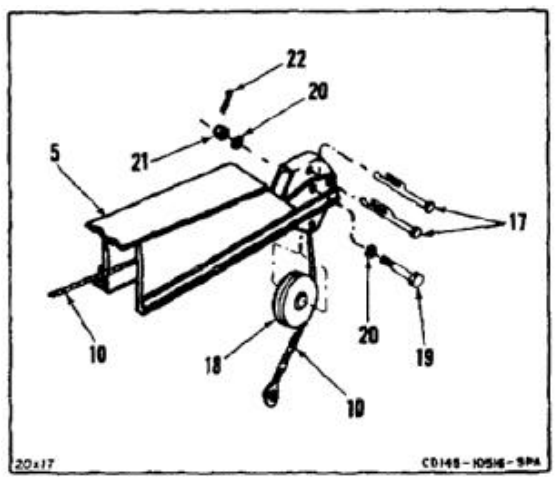
3. Install four bolts (6), eight washers (7), two stops (8), and four nuts (9) on boom (5).




4. Thread end of cable (10) through boom (5).
5. Install spring pin (11) in boom (5).
6. Install cable (10) in groove of pulley (12).
7. Position pulley (12) and two bushings (13) in boom (5). Install bolt (14), two washers (15), and nut (16).

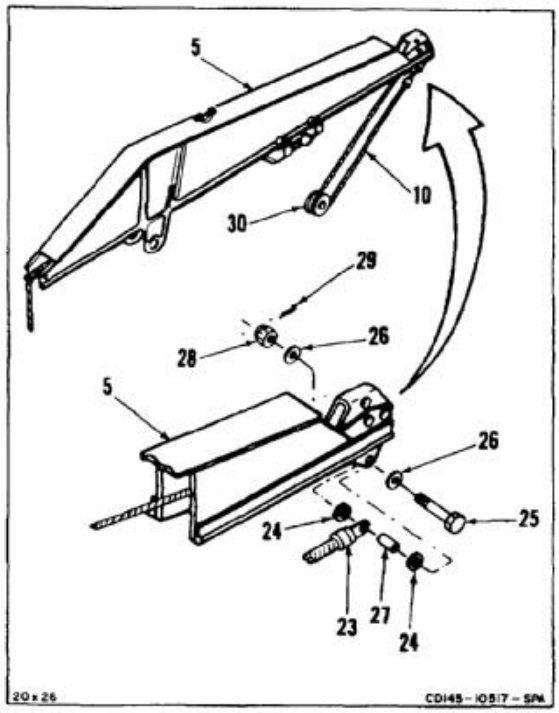



8. Install two spring pins (17) in boom (5).
9. Install cable (10) in groove of boom pulley (18).
10. Position boom pulley (18) in boom (5). Install bolt (19), two washers (20), nut (21), and cotter pin (22).

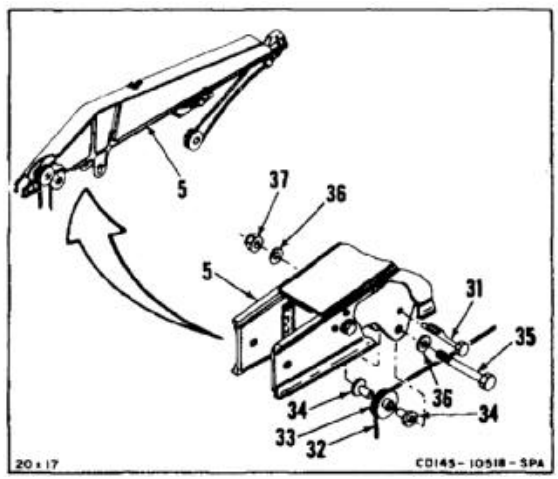


## 1-47 ASSEMBLE HOISTING UNIT BOOM (Continued) 1-47

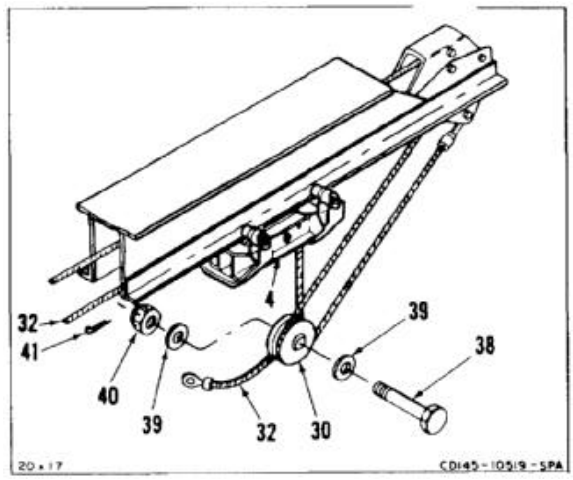
11. Position cable lock (23) and two washers (24) in boom (5).
12. Install bolt (25), two washers (26), bushings (27), nut (28), and cotter pin (29).
13. Route cable (10) over trolley pulley (30). Install end of cable (10) in cable lock (23).



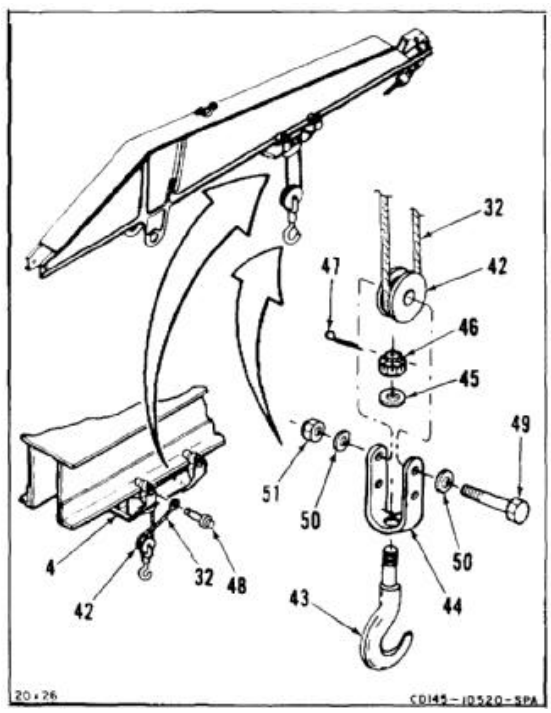

14. Install spring pin (31) in boom (5).
15. Install cable (32) in groove in pulley (33).
16. Position pulley (33) and two bushings (34) in boom (5). Install bolt (35), two washers (36), and nut (37).



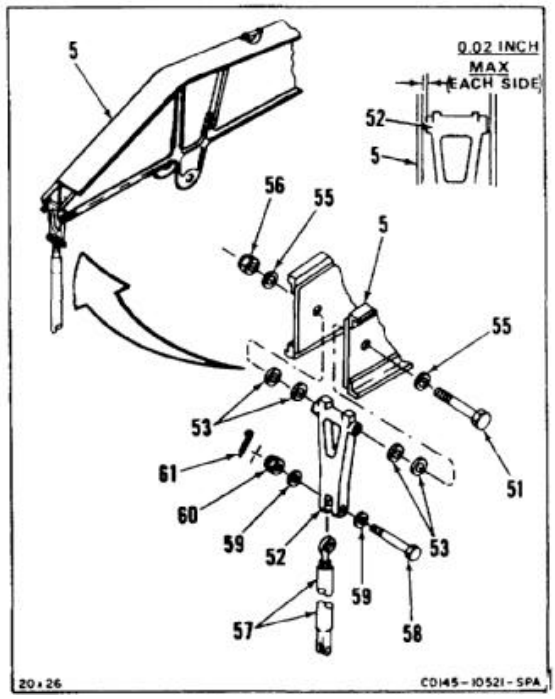
17. Route cable (32) through trolley (4) and over trolley pulley (30).
18. Position trolley pulley (30) in trolley (4). Install bolt (38), two washers (39), nut (40), and cotter pin (41).



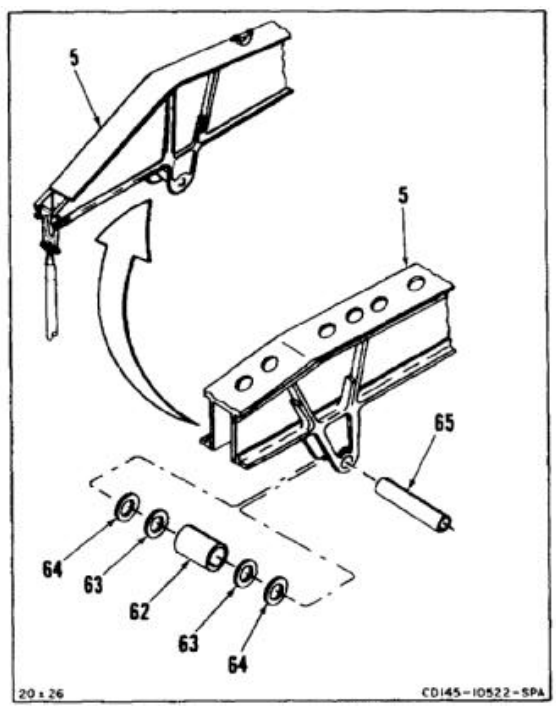

19. Route cable (32) around hook pulley (42).
20. Push hook (43) into hook strap (44). Install washer (45), nut (46), and cotter pin (47).
21. Align hole in end of cable (32) and trolley (4). Install quick-release pin (48).
22. Align hole in hook strap (44) and hook pulley (42). Install bolt (49), two washers (50), and nut (51).



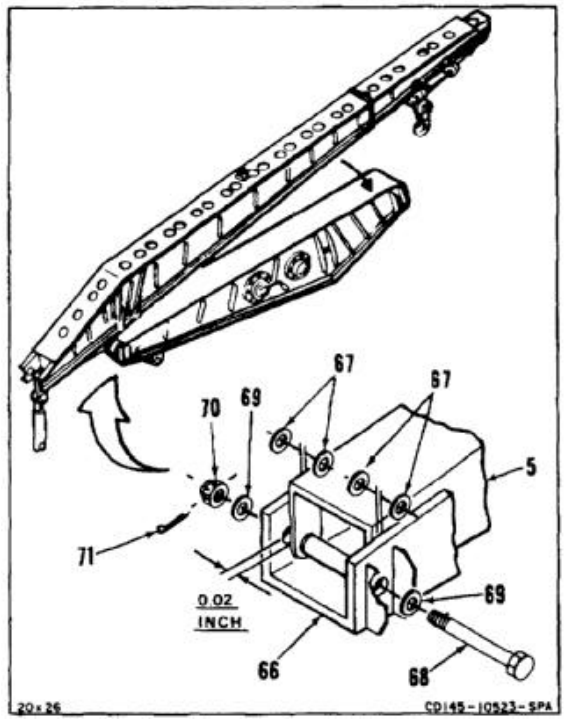
23. Position link (52) in boom (5). Check that gap between link and boom is less than **0.02 inch**. If gap is more than **0.02 inch**, install a maximum of two washers (53) on each side of link to close gap.
24. Install bolt (54), two washers (55), and nut (56).
25. Align holes in link (52) and tension rod (57). Install bolt (58), two washers (59), nut (60), and cotter pin (61).




26. Position spacer (62) and two washers (63) in boom (5). Check that gap between washers and boom is less than **0.02 inch**. If gap is more than **0.02 inch**, install washers (64) as needed to close gap.
27. Install spacer (65).

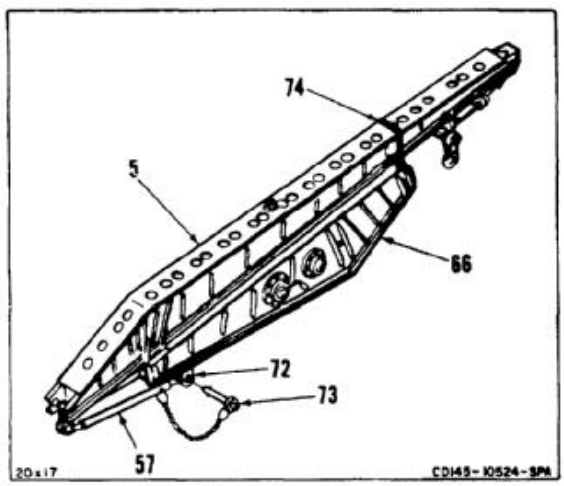


28. Position boom (5) in mast (66). Check that gap between boom and mast is less than **0.02 inch**. If gap is more than **0.02 inch**, install a maximum of two washers (67) on each side of boom to close gap.
29. Install bolt (68), two washers (69), nut (70), and cotter pin (71).




30. Align hole in tension rod (57) and bracket (72) on mast (66). Install quick-release pin (73).
31. Install strap (74) securing boom (5) to mast (66).

***INSPECT***




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 1-48 DISASSEMBLE HOISTING UNIT MAST 1-48

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 6180-00-323-4692

***Materials:***

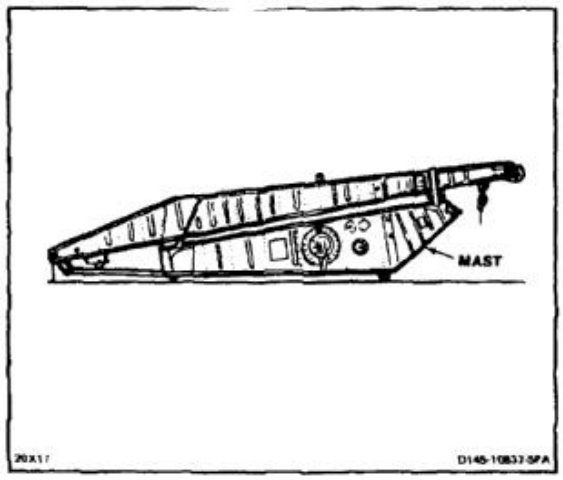
None

***Personnel Required:***

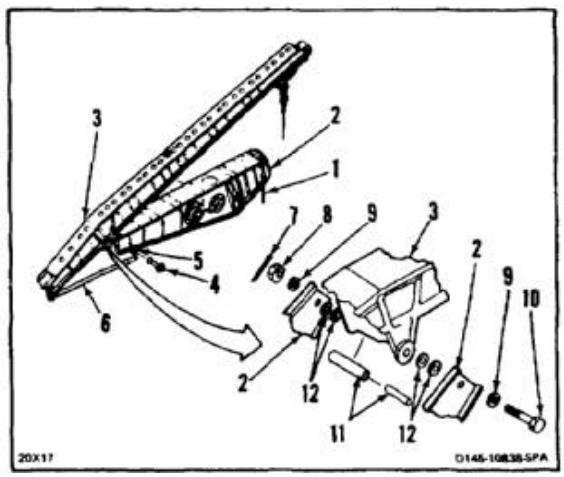
Medium Helicopter Repairer (2)

***Equipment Condition:***

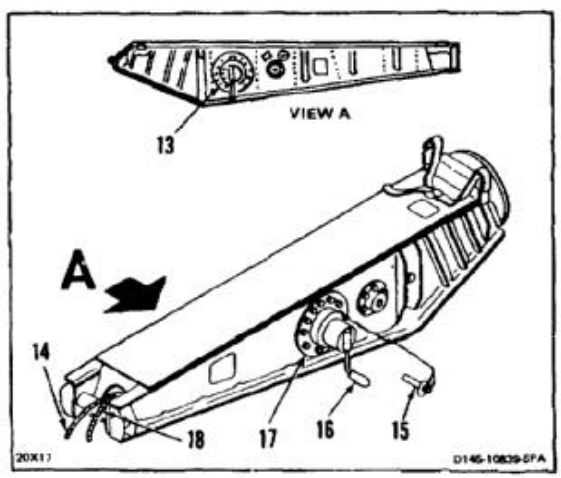
Off Helicopter Task




1. Remove strap (1) securing mast (2) to boom (3).
2. Remove quick release pin (4) from bracket (5). Remove tension rod (6) from bracket (5).
3. Remove cotter pin (7), nut (8), two washers (9), and bolt (10) from mast (2) and boom (3).
4. Separate mast (2) and boom (3).
5. Remove two spacers (11) and four washers (12) from boom (3).

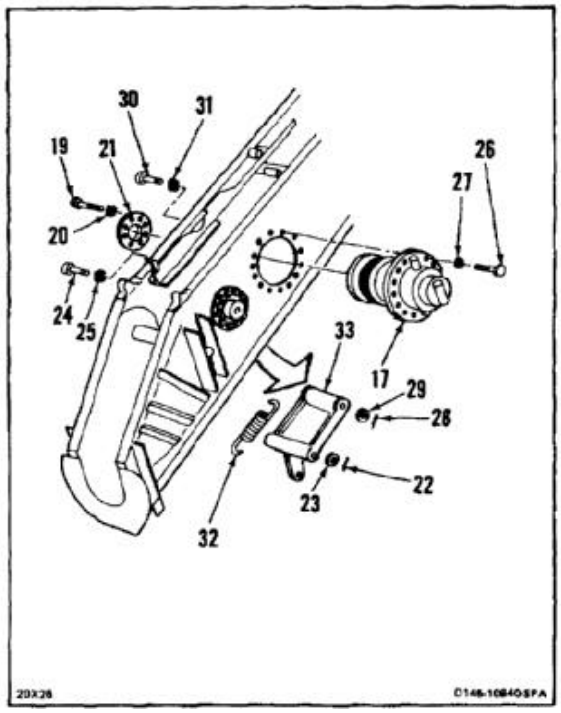



6. Turn trolley winch (13) counterclockwise to unwind trolley cable (14).
7. Remove quick-release pin (15) and handle (16) from hook winch (17). Pull cable (18) from hook winch (17).

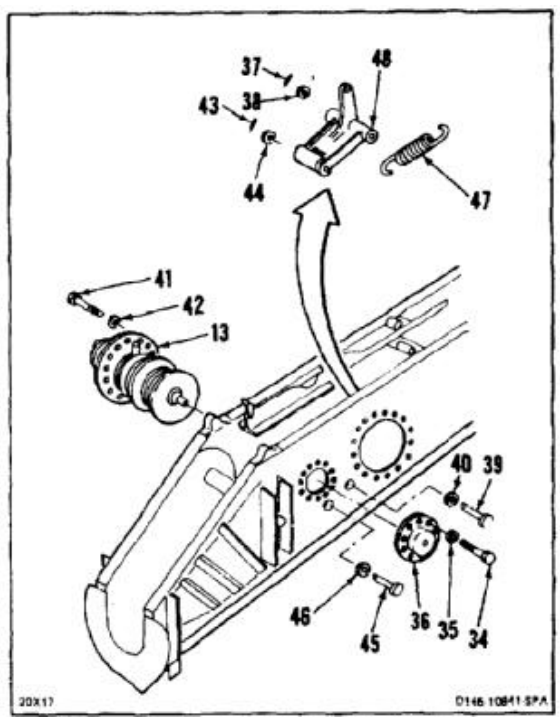


## 1-48 DISASSEMBLE HOISTING UNIT MAST (Continued) 1-48

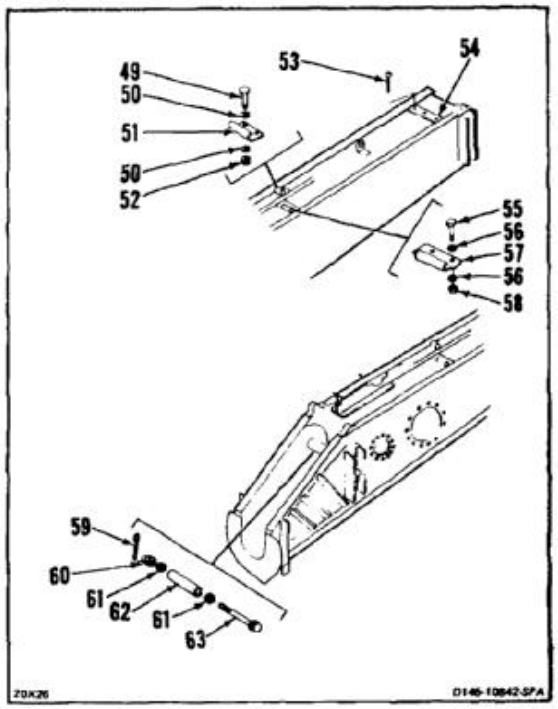
8. Remove six bolts (19) and washers (20) from hook winch hub (21).
9. Remove cotter pin (22) and washer (23) from clevis pin (24).
10. Remove clevis pin (24) and washer (25).
11. Remove 20 bolts (26) and washers (27) from hook winch (17). Remove hook winch.
12. Remove cotter pin (28) and washer (29) from clevis pin (30).
13. Remove clevis pin (30) and washer (31).
14. Remove tension spring (32) and tension bracket (33).




15. Remove six bolts (34) and washers (35) from trolley winch hub (36).
16. Remove cotter pin (37) and washer (38) from clevis pin (39).
17. Remove clevis pin (39) and washer (40).
18. Remove 20 bolts (41) and washers (42) from trolley winch (13). Remove trolley winch.
19. Remove cotter pin (43) and washer (44) from clevis pin (45).
20. Remove clevis pin (45) and washer (46).
21. Remove tension spring (47) and tension bracket (48).



22. Remove bolts (49), washers (50), rubbing strip (51), and nuts (52).
23. Remove four screws (53) and rubbing strip (54).
24. Remove two bolts (55), washers (56), rubbing strip (57), and nut (58).
25. Remove cotter pin (59), nut (60), washers (61), spacer (62), and bolts (63).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 1-49 ASSEMBLE HOISTING UNIT MAST 1-49

INITIAL SETUP

***Tools:***

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

***Materials:***

None

***Parts:***

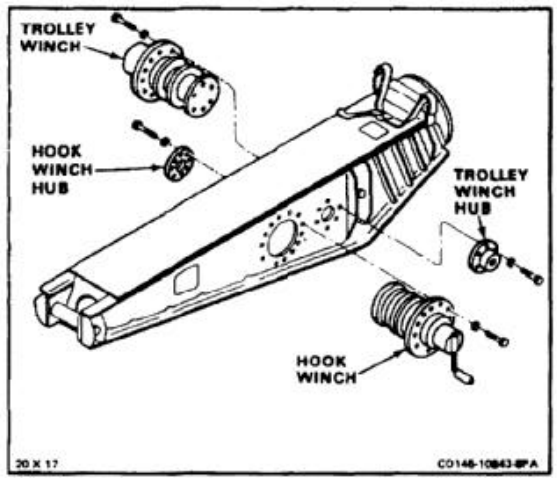
Cotter Pins

***Personnel Required:***

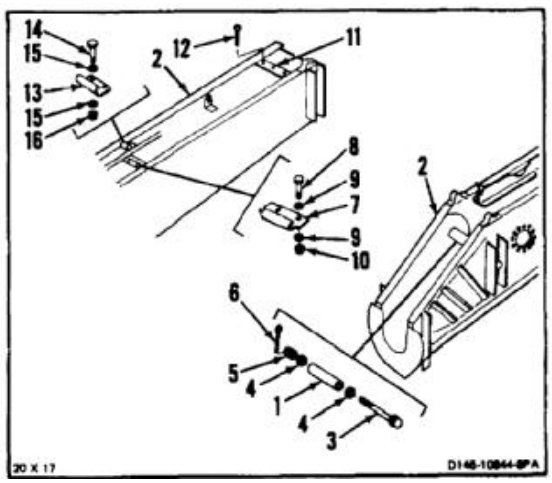
Medium Helicopter Repairer (2)
Inspector

***References:***

TM 55-1520-240-23P

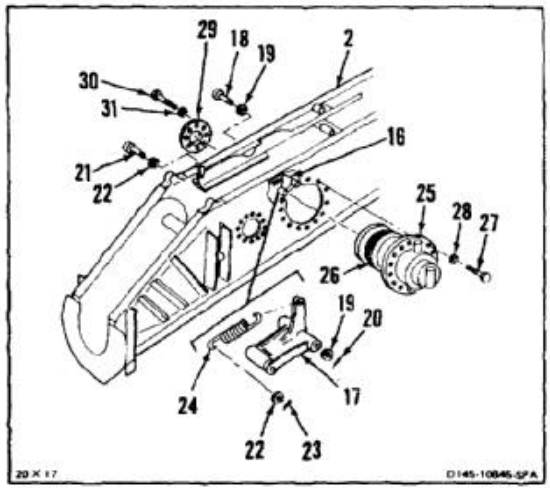



1. Position spacer (1) in mast (2). Install bolt (3), washers (4), nut (5), and cotter pin (6).
2. Position rubbing strip (7) on mast (2). Install two bolts (8), four washers (9), and two nuts (10).
3. Position rubbing strip (11). Install four screws (12).
4. Position rubbing strip (13) on mast (2). Install two bolts (14), four washers (15), and two nuts (16).

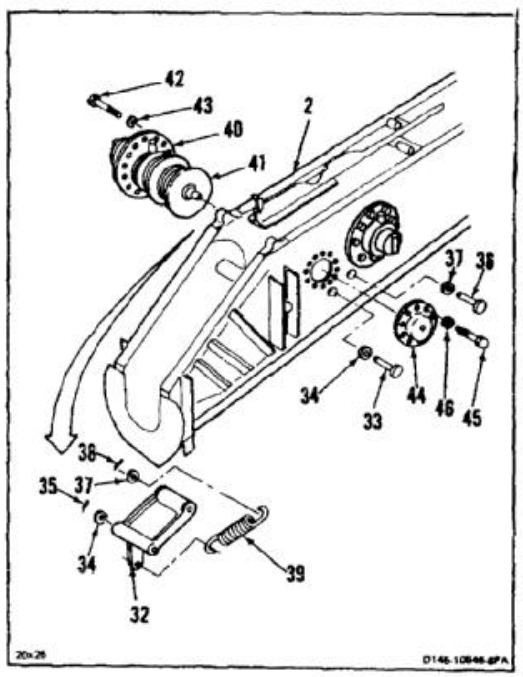


## 1-49 ASSEMBLE HOISTING UNIT MAST (Continued) 1-49

5. Position tension bracket (17) in mast (2). Install clevis pin (18) in mast (2) through bracket (17). Install washers (19) and cotter pin (20).
6. Install clevis pin (21), washers (22), and cotter pin (23) in mast (2).
7. Install tension spring (24) on bracket (17) and clevis pin (21).
8. Position hook winch (25) in mast (2). Make sure tension bracket (17) is against drum (26) of winch (25). Install 20 bolts (27) and washers (28).
9. Position winch hub (29) on mast (2). Install six bolts (30) and washers (31).

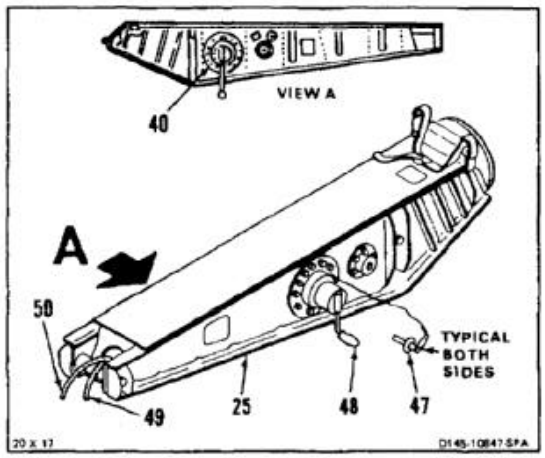



10. Position tension bracket (32) on mast (2). Install clevis pin (33) in mast (2) through bracket (32). Install washers (34) and cotter pin (35) on clevis pin (33).
11. Install clevis pin (36) in mast (2). Install washers (37) and cotter pin (38) on clevis pin (36).
12. Install tension spring (39) on bracket (32) and clevis pin (36).
13. Position trolley winch (40) in mast (2). Make sure tension bracket (32) is against drum (41) of winch (40). Install 20 bolts (42) and washers (43).
14. Position trolley winch hub (44) on mast (2). Install six bolts (45) and washers (46).



15. Install quick-release pin (47) and handle (48) on hook winch (25) and trolley winch (40). Wind cable (49) onto winch (25).

16. Turn trolley winch (40) IN and wind cable (50) on to winch.

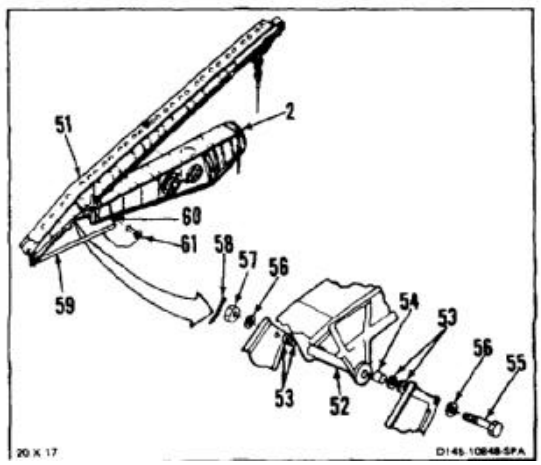



17. Position mast (2) on boom (51). Install spacer (52), four washers (53), and spacer (54).

18. Install bolt (55), two washers (56), nut (57), and cotter pin (58).

19. Install tension rod (59) on bracket (60).

20. Install quick-release pin (61) on bracket (60) and tension rod (59).

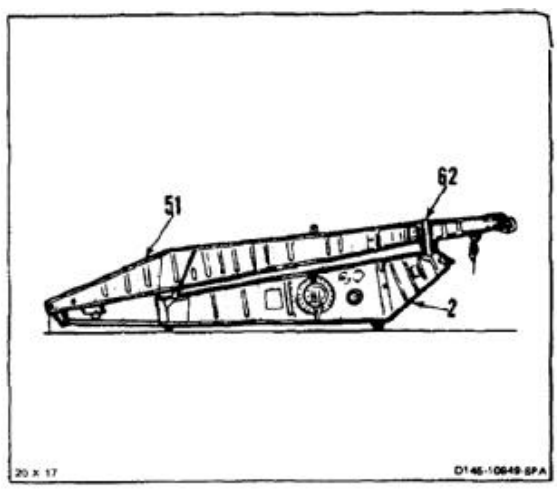



21. Install strap (62) securing mast (2) to boom (51).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

None

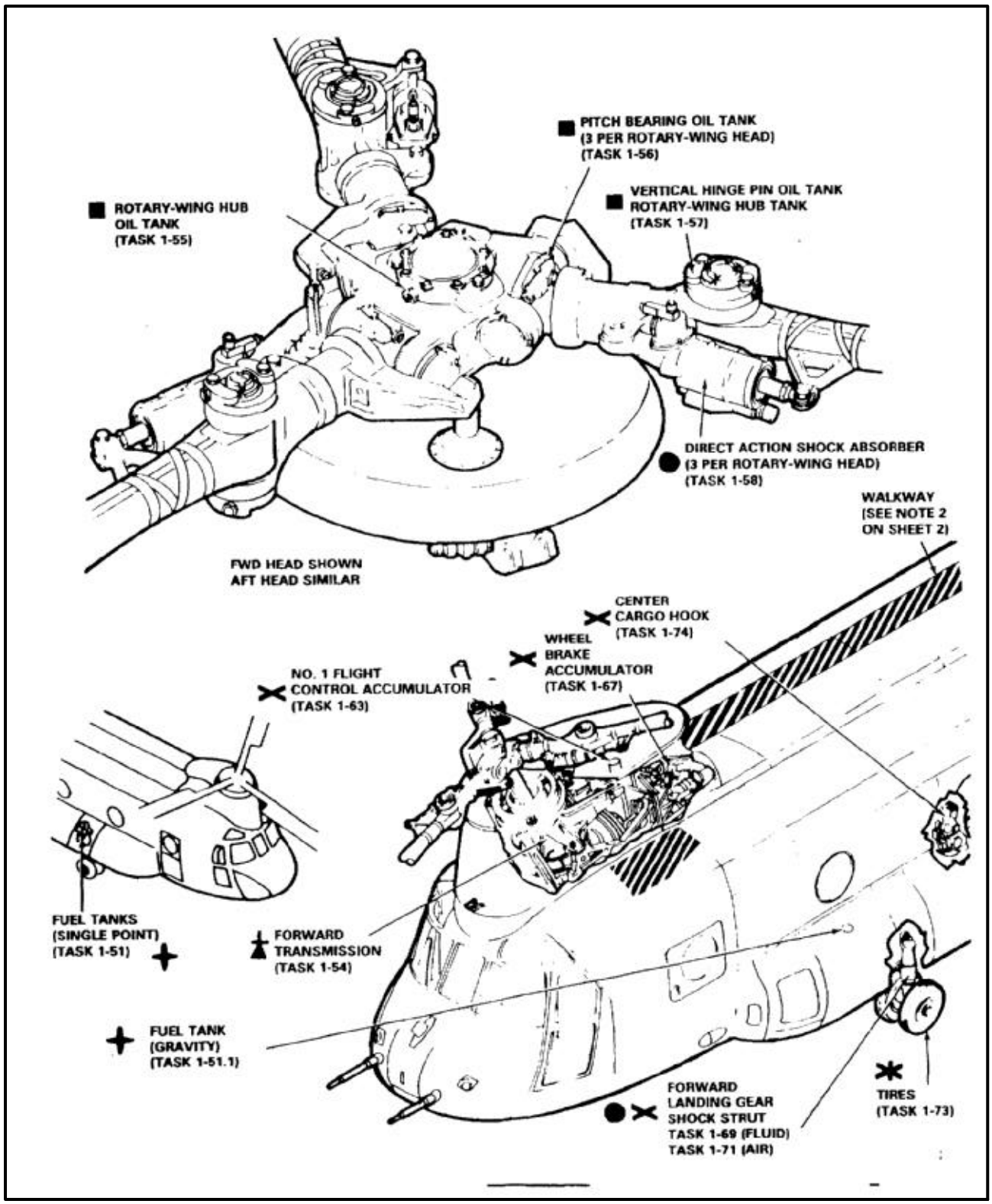


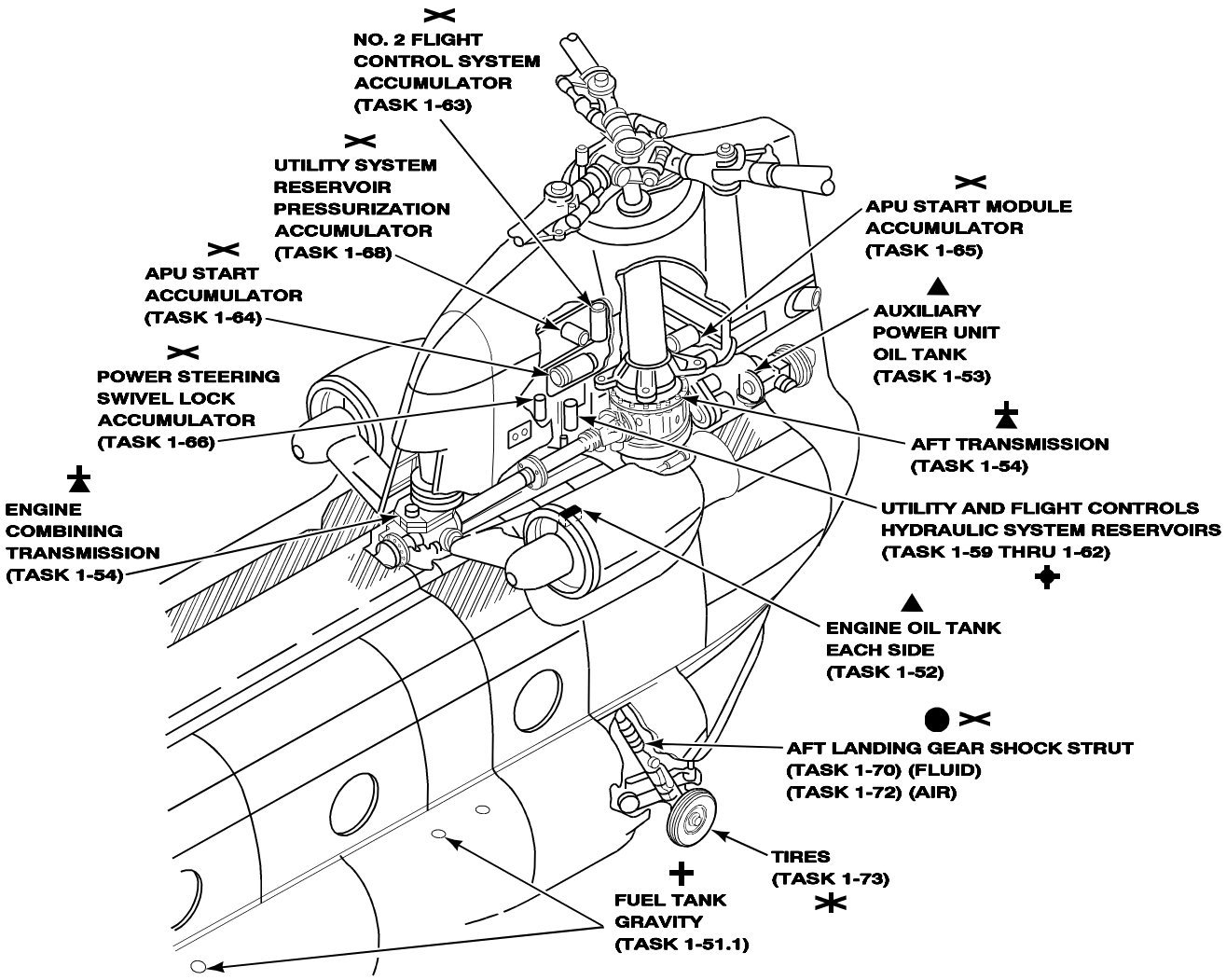

END OF TASK

# SECTION VI
# SERVICING AND LUBRICATION

## 1-50 GENERAL SERVICING INFORMATION 1-50

Sheets 1 and 2 illustrate servicing points on the helicopter, with references to specific tasks. Sheet 3 indicates No Step, Handhold, and Walkway areas. Sheet 4 has a table of servicing materials and unit capacities for systems that require servicing.



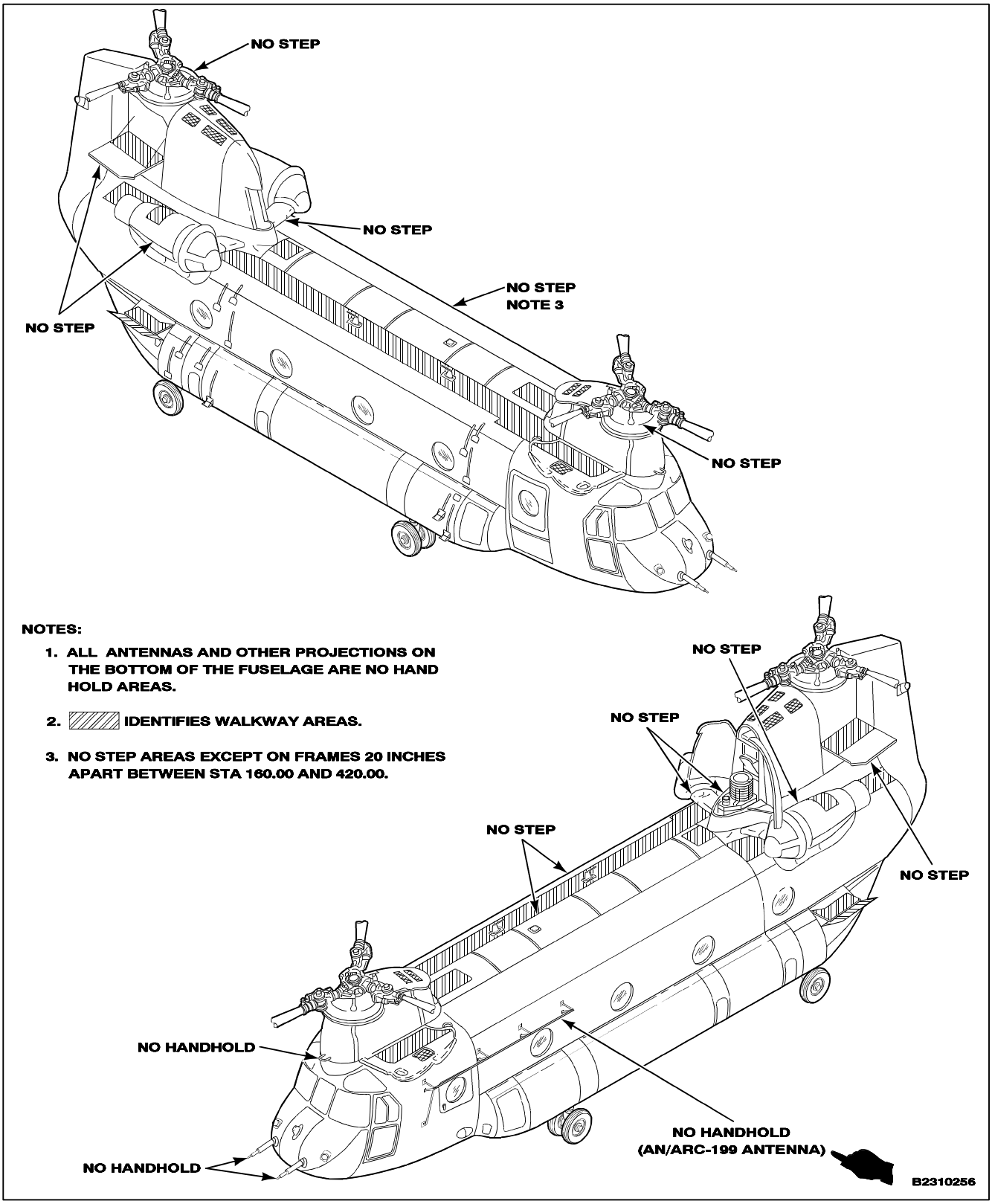



**NOTES:**

1. THERE ARE NO EMERGENCY SERVICING POINTS. SERVICE ONLY AT POINTS ILLUSTRATED.
2. SEE NEXT PAGE FOR NO STEP, NO HAND HOLD, AND WALKWAY AREAS.
3. REFER TO TASK 1-87 FOR LUBRICATION INSTRUCTIONS.
4. SERVICE COMPONENTS WITH NITROGEN AS A PRIME METHOD AND COMPRESSED AIR AS AN ALTERNATE.
5. OIL E254.1 IS THE PREFERRED OIL WHEN TEMPERATURES ARE ABOVE - 25°F, (32° C).
6. OIL E254 MUST BE USED IN TRANSMISSIONS AND ROTARY-WING HEADS AT TEMPERATURES BELOW - 25° F, (32° C).
7. OIL E253 CAN BE USED IN TRANSMISSIONS AND ROTARY-WING HEADS AT TEMPERATURES ABOVE - 25°F, (32°C), IF E254.1 IS NOT AVAILABLE.

| MATERIALS | | |
|---|---|---|
| SYMBOL | NOMENCLATURE | ITEM NO. |
| ▲ | LUBRICATING OIL | E253/E254 |
| + | FUEL, TURBINE ENGINE | E182 |
| ■ | LUBRICATING OIL | E253/E254/E254.1 |
| ✕ | NITROGEN OR AIR | E247.1 |
| ● | HYDRAULIC FLUID | E197 |
| ✦ | HYDRAULIC FLUID | E197/E199 |
| ♦ | GREASE, GENERAL PURPOSE | E190 |
| ✳ | AIR | NONE |
| ‡ | LUBRICATING OIL TRANSMISSION | E253/E254/E254.1 |

B2310255


NO STEP
NO STEP
NO STEP
NOTE 3
NO STEP
NO STEP
NOTES:
1. ALL ANTENNAS AND OTHER PROJECTIONS ON THE BOTTOM OF THE FUSELAGE ARE NO HAND HOLD AREAS.
2. IDENTIFIES WALKWAY AREAS.
3. NO STEP AREAS EXCEPT ON FRAMES 20 INCHES APART BETWEEN STA 160.00 AND 420.00.
NO STEP
NO STEP
NO STEP
NO STEP
NO HANDHOLD
NO HANDHOLD
NO HANDHOLD
(AN/ARC-199 ANTENNA)
B2310256

| UNIT OR SYSTEM | MATERIAL | ITEM | UNIT | CAPACITY | |
|---|---|---|---|---|---|
| | | | | US | IMP |
| Fuel Tank Main | Jet Fuel | E182 | GAL | Left 278<br>Right 274 | 231.5<br>228.1 |
| Fuel Tank Auxiliary, Forward | Jet Fuel | E182 | GAL | Left 122<br>Right 119 | 101.6<br>99.1 |
| Fuel Tank Auxiliary, Aft | Jet Fuel | E182 | GAL | Left 118<br>Right 117 | 96.3<br>97.4 |
| Engine, Each | Lubricating Oil | E253 or E254<br>(Refer to Task 1-52) | GAL | 3.00 | 3.11 |
| APU | Lubricating Oil | E253 or E254<br>(Refer to Task 1-53) | QT | 3.00 | 2.50 |
| Forward Transmission | Lubricating Oil<br>Transmission | E253, E254, or E254.1<br>(Refer to Task 1-54) | QT | 22.0 | 23.0 |
| Aft Transmission | Lubricating Oil<br>Transmission | E253, E254, or E254.1<br>(Refer to Task 1-54) | QT | 32.0 | 25.0 |
| Engine Transmission System (Each) | Lubricating Oil<br>Transmission | E253, E254, or E254.1<br>(Refer to Task 1-54) | QT | 5.0 | 5.8 |
| Combining Transmission System | Lubricating Oil<br>Transmission | E253, E254, or E254.1<br>(Refer to Task 1-54) | QT | 13.5 | 17.5 |
| Pitch-Varying Housing and Oil Tank | Lubricating Oil | E253, E254, or E254.1<br>(Refer to Task 1-56) | QT | 0.37 | 0.30 |
| Rotary-Wing Hub and Oil Tank | Lubricating Oil | E253, E254, or E254.1<br>(Refer to Task 1-55) | QT | 1.00<br>(calculated) | 0.83 |
| Vertical Hinge Pin Bearings and Oil Tank | Lubricating Oil | E253, E254, or E254.1<br>(Refer to Task 1-57) | QT | 0.34 | 0.28 |
| Rotary-Wing Shock Absorber | Hydraulic Fluid | E197<br>(Refer to Task 1-58) | QT | 0.74 | 0.62 |
| Landing Gear Shock Strut Forward | Hydraulic Fluid | E197<br>(Refer to Task 1-69) | QT | 3.20 | 2.65 |
| Landing Gear Shock Strut Aft | Hydraulic Fluid | E197<br>(Refer to Task 1-70) | QT | 1.30 | 1.04 |
| Flight controls Hydraulic Fluid Reservoir, Each | Hydraulic Fluid | E197 or E199<br>(Refer to Task 1-59) | QT | 2.40 | 2.00 |
| Utility Hydraulic Fluid Reservoir (Ramp up) | Hydraulic Fluid | E197 or E199<br>(Refer to Task 1-59) | QT | 5.60 | 4.66 |

**NOTE**

E254.1 is the preferred lubricant in rotor heads and transmissions only. Use E253 only if E254.1 is not available.

Hydraulic System Servicing

1. Use fire-resistant hydraulic fluid MIL-H-83282 (E199) (if installed), to service the utility and flight control hydraulic systems. Its higher flash point provides a greater margin of safety than hydraulic fluid MIL-H-5606 (E197). The two fluids are fully compatible; however, the presence of more than **3 percent** MIL-H-5606 will reduce the fire resistance of MIL-H-83282 proportionately.
2. The viscosity of MIL-H-83282 increases as temperature decreases. Because of this, it should not be used below **–50°F (–46°C)**. If temperature drops below this limit control motions may become stiff and sluggish. If this happens, cycle the controls to agitate the fluid. This along with radiant heat from engines and transmissions, may warm the fluid enough to permit satisfactory operation.
3. If the controls remain sluggish after cycling and warming, drain the system and service with MIL-H-5606.

END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Refueling Vehicle With D1 Nozzle, Parked at Least 10 Feet From Helicopter Rotor Blades, and Grounded
Protective Clothing/Goggles
Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

***Materials:***

Cloth, Cleaning (E120)
Fuel JP-4, or JP-5 (E182), or JP-8 (E182.1) or Jet A/A-1 (E182.2) (As Required)
Gloves (E184.1)

***Personnel Required:***

Petroleum Supply Specialist
CH-47 Helicopter Repairer

***References:***

TM 55-1520-240-T
Task 1-37

***Equipment Condition:***

Helicopter Parked on Level Ground at Least 50 Feet From Hangar or Structure (Task 1-25)
Battery Connected (Task 1-39)
Electrical Power Off
Forward Right Landing Gear Access Panel Open (Task 2-2)
Helicopter Grounded (Task 1-29)
Refueling Vehicle Grounded to Helicopter

***General Safety Instructions:***

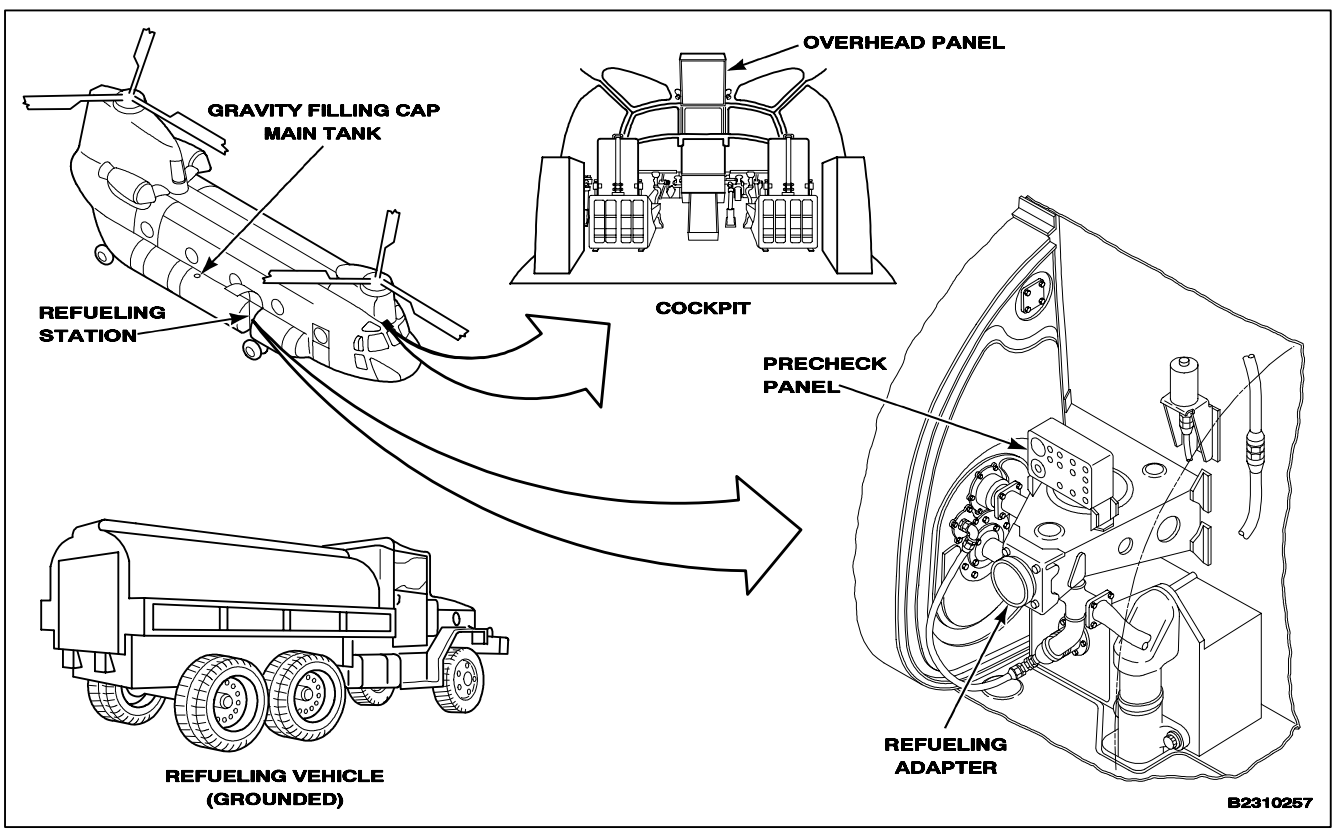
**WARNING**

Proper electrical grounding is essential to prevent damage to equipment and injury to personnel.

All regulations and instructions for handling fuels shall be strictly observed.

Do not remove gravity filling cap from any fuel tank after single point fueling. Fuel spillage could result.

Fuel Jet A-1 shall not be added to tanks containing JP-4 unless it can be assured that Jet A-1 contains conductivity additive in the correct proportions; otherwise, vapor ignition could result. No additive is needed when mixing Jet A-1 with JP-5.

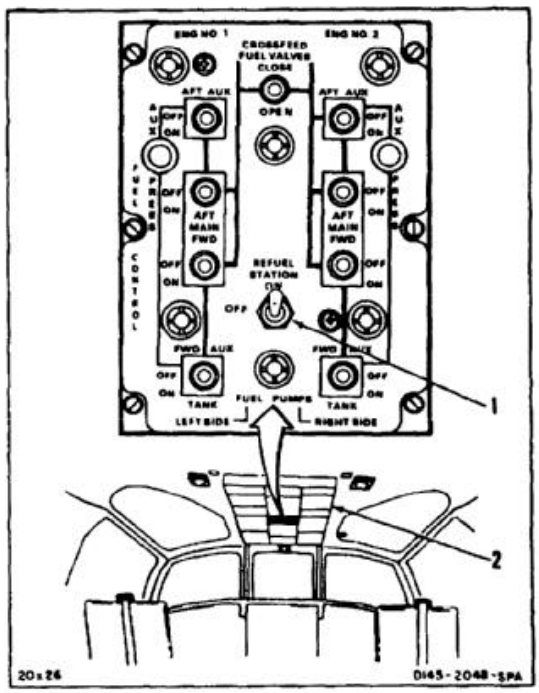


## 1-51 SINGLE POINT REFUELING (Continued) 1-51

**NOTE**

Cockpit fuel level gages will not operate until REFUEL STATION switch is set back to OFF.

1. Inside cockpit, set REFUEL STATION switch (1) to ON on overhead panel (2).

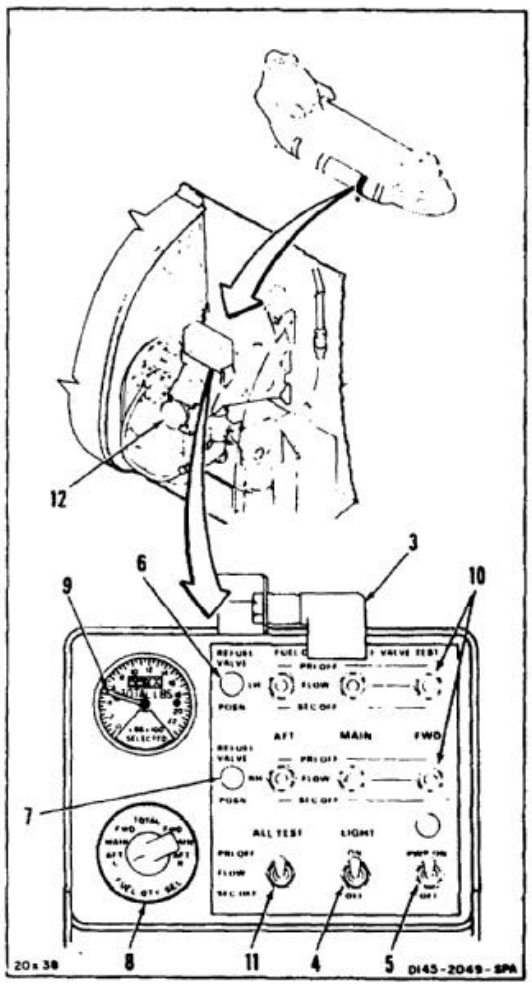


2. If panel light (3) at refueling station is required, set LIGHTswitch (4) to ON.
3. Set PWR switch (5) to PWR ON. LH REFUEL VALVE POSN light (6) and RH REFUEL VALVE POSN light (7) shall come on and go off.

**WARNING**

If refueling panel or system does not function as detailed in this procedure, do not continue. Go to step 25. Troubleshoot system (TM 55-1520-240-T).

4. To check fuel level in any left tank, set FUEL QTY SEL switch (8) to L AFT, L MAIN, or L FWD, as required. Pointer (9) shall indicate fuel level in tank. Pointer shall be steady.
5. To check fuel level in any right tank, set FUEL QTY SEL switch (8) to R FWD, R MAIN, or R AFT, as required. Pointer (9) shall indicate fuel level in tank. Pointer shall be steady.
6. Set FUEL QTY SEL switch (8) to TOTAL.
7. Set six FUEL CELL SHUTOFF VALVE TEST switches (10) to FLOW.
8. Set ALL TEST switch (11) to PRI OFF.
9. Remove cap (12).



10. Position fueling nozzle (13) near fueling adapter (14).

11. Install grounding wire plug (15) on receptacle (16).

12. Install fuel nozzle (13) in adapter (14). Hold grips (17) tightly and rotate grips and nozzle (13) clockwise to lock.

CAUTION

Damage to fuel system could result if refueling hose pressure exceeds **55 psi**.

**NOTE**

If possible, observe the refueling truck gauges for fuel flow indication.

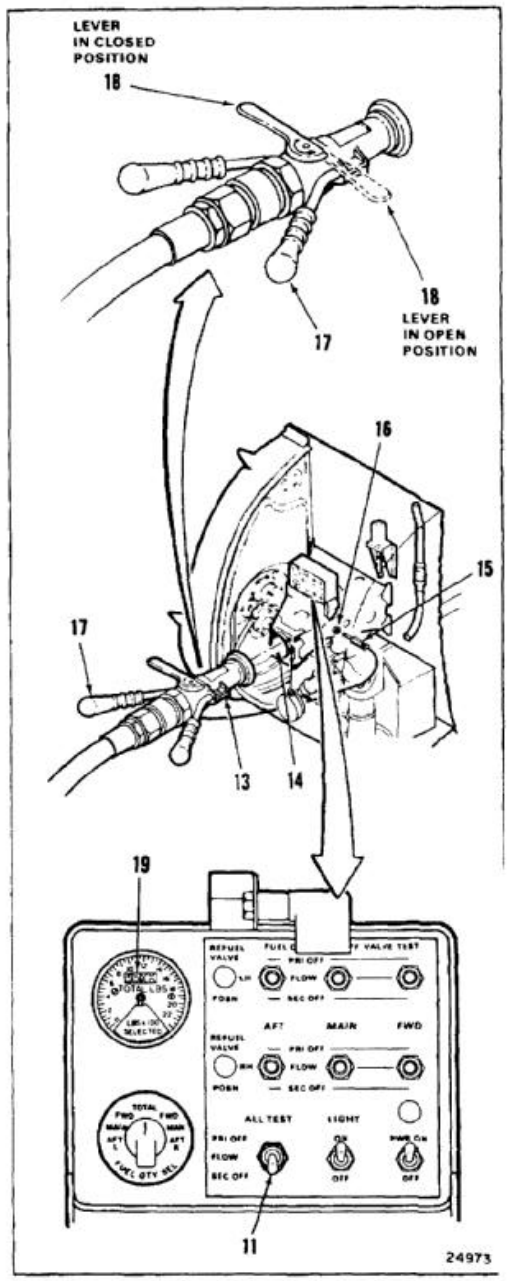
The system is designed to restrict fuel flow to **300 gpm** during pressure refueling at a nozzle pressure of **55 psi**.

13. Swing flow control lever (18) counterclockwise to open position. Fuel will start to flow (as indicated by totalizer (19)) and then stop within **4 seconds**. Valve closing will be indicated by a sudden drop at the fuel truck flowmeter to near zero. However, a small amount of fuel will continue to flow through the open secondary pilot ports. As much as **15 gallons per minute** may flow.

13.1. Reset ALL TEST switch (11) to flow, observe totalizer (19) to verify fuel starts flowing again.

14. Set ALL TEST switch (11) to SEC OFF. Fuel will start to flow (as indicated by totalizer (19)) and then stop within **4 seconds**. A small amount of fuel will continue to flow through the open primary pilot ports.

14.1. If both primary and secondary checks are successful proceed to refuel aircraft.



CAUTION

If either the PRI OFF or SEC OFF float switch shutoff for any tank is inoperative, do not pressure refuel that tank unless the fuel cap is removed to prevent possible fuel cell over pressurization.

If both switches are inoperative, do not pressure refuel the helicopter. Also, if both switches are inoperative for either main tank, the fault must be repaired before flight.

**NOTE**

To fill all fuel tanks, perform steps 15 and 16, then go to step 25.

***TO FILL ALL FUEL TANKS***

15. Set ALL TEST switch (11) to FLOW.

**NOTE**

Tanks are full when totalizer stops.

16. Watch totalizer (19). Totalizer shall indicate about **7000 pounds.** When totalizer stops, go to step 25.

**NOTE**

To add fuel to one or more fuel tanks, perform steps 17 thru 24. Then go to step 25.

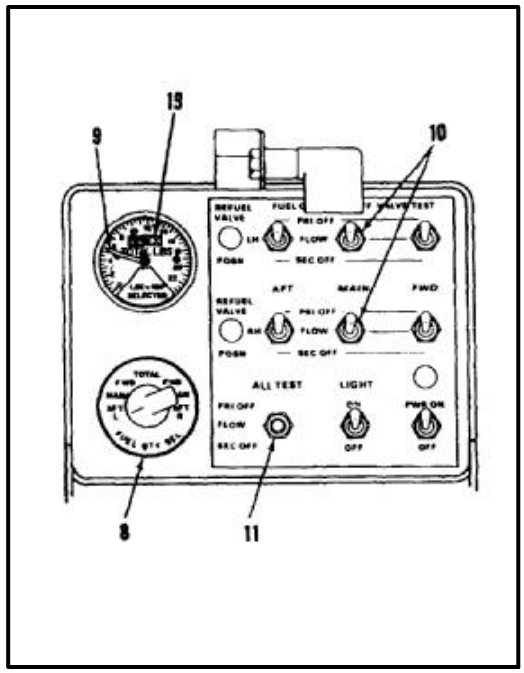
***TO ADD FUEL TO ONE OR MORE FUEL TANKS***

17. Set six FUEL CELL SHUTOFF VALVE TEST switches (10) to PRI OFF.

18. Set ALL TEST switch (11) to FLOW.

19. To add fuel to left aft fuel tank.

    a. Set FUEL QTY SEL switch (8) to L AFT.




    b. Set FUEL CELL SHUTOFF VALVE TEST LH REFUEL AFT switch (10) to FLOW.

    c. Set FUEL CELL SHUTOFF VALVE TEST LH REFUEL AFT switch (10) to PRI OFF when pointer (9) indicates fuel level desired.

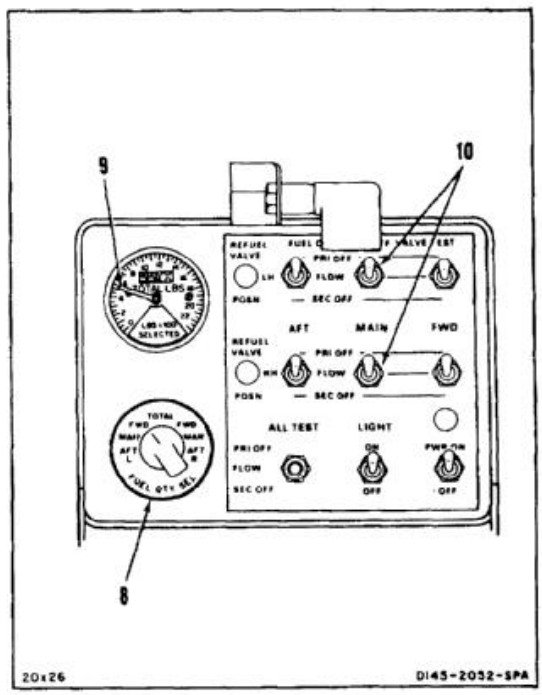
20. To add fuel to left main fuel tank.

    a. Set FUEL QTY SEL switch (8) to L MAIN.

    b. Set FUEL CELL SHUTOFF VALVE TEST LH REFUEL MAIN switch (10) to FLOW.

    c. Set FUEL CELL SHUTOFF VALVE TEST LH REFUEL MAIN switch (10) to PRI OFF when pointer (9) indicates fuel level desired.

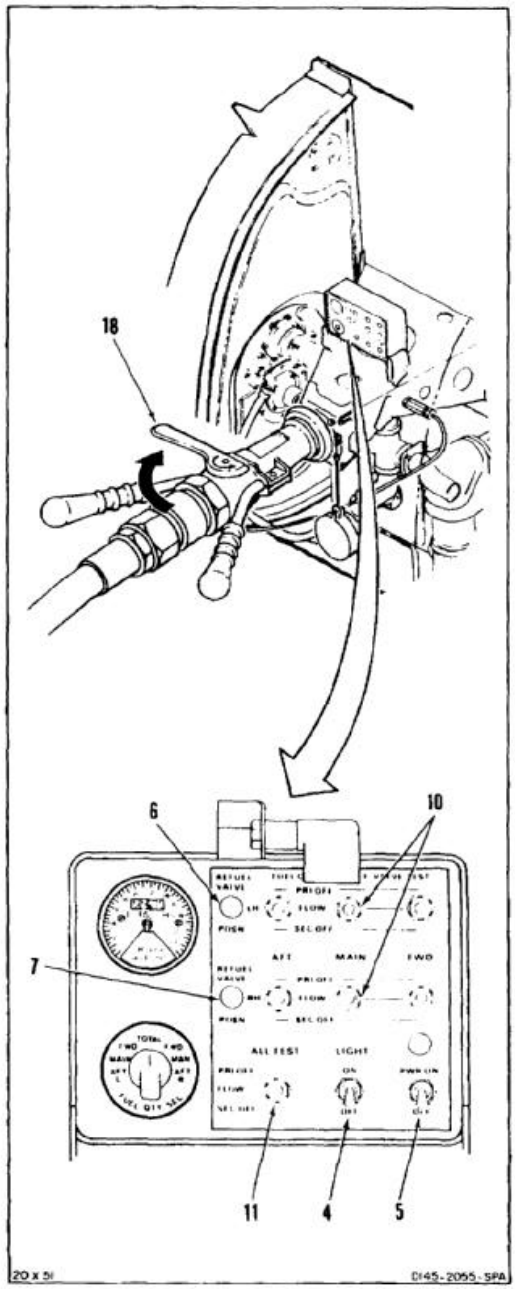
21. To add fuel to left forward fuel tank.
    a. Set FUEL QTY SEL switch (8) to L FWD.
    b. Set FUEL CELL SHUTOFF VALVE TEST LH REFUEL FWD switch (10) to FLOW.
    c. Set FUEL CELL SHUTOFF VALVE TEST LH REFUEL FWD switch (10) to PRI OFF when pointer (9) indicates fuel level desired.
22. To add fuel to aft right fuel tank.
    a. Set FUEL QTY SEL switch (8) to R AFT.
    b. Set FUEL CELL SHUTOFF VALVE TEST RH REFUEL AFT switch (10) to FLOW.
    c. Set FUEL CELL SHUTOFF VALVE TEST RH REFUEL AFT switch (10) to PRI OFF when pointer (9) indicates fuel level desired.
23. To add fuel to right main fuel tank.
    a. Set FUEL QTY SEL switch (8) to R MAIN.
    b. Set FUEL CELL SHUTOFF VALVE TEST RH REFUEL MAIN switch (10) to FLOW.
    c. Set FUEL CELL SHUTOFF VALVE TEST RH REFUEL MAIN switch (10) to PRI OFF when pointer (9) indicates fuel level desired.
24. To add fuel to right forward fuel tank.
    a. Set FUEL QTY SEL switch (8) to R FWD.
    b. Set FUEL CELL SHUTOFF VALVE TEST RH REFUEL FWD switch (10) to FLOW.
    c. Set FUEL CELL SHUTOFF VALVE TEST RH REFUEL FWD switch (10) to PRI OFF when pointer (9) indicates fuel level desired.



## 1-51 SINGLE POINT REFUELING (Continued) 1-51

***SHUTDOWN***

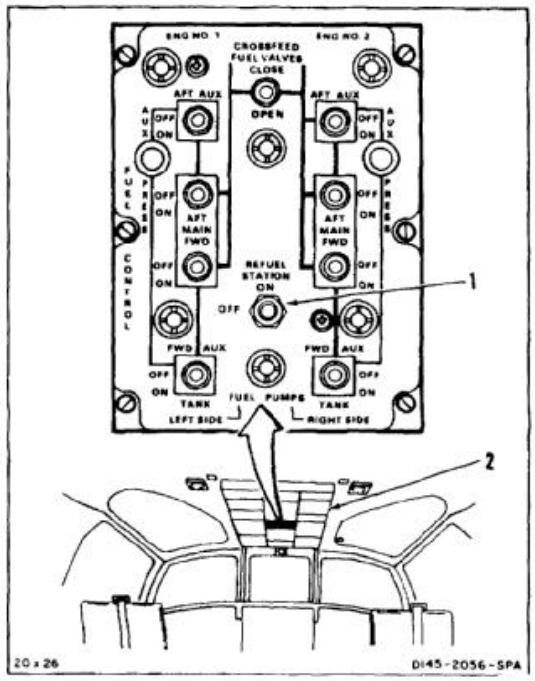
25. Set flow control lever (18) clockwise to closed position.
26. Set power switch (5) to OFF. VALVE POSN lights (6 and 7) shall come on and go off.
27. Set six FUEL CELL SHUTOFF VALVE switches (10) to FLOW.
28. Set ALL TEST switch (11) to FLOW.
29. Set LIGHT switch (4) to OFF.



30. Inside cockpit, set REFUEL STATION switch (1) to OFF on overhead panel (2).

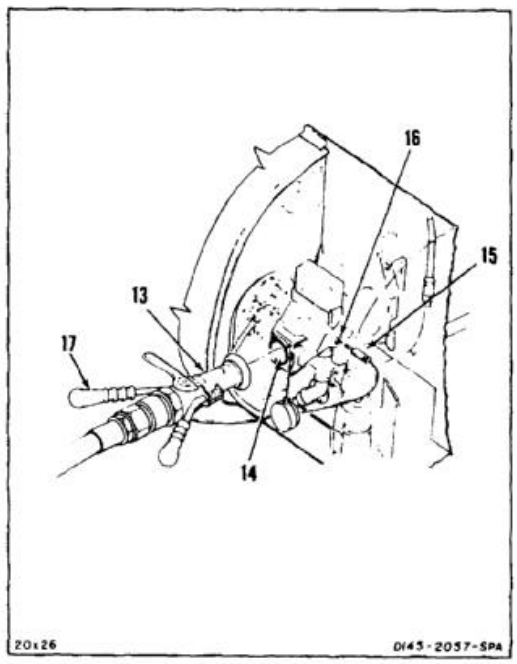
**NOTE**

Cockpit fuel gages will now register fuel tank contents.




31. At refuel station, hold grips (17) tightly and rotate grips and fuel nozzle (13) counterclockwise to unlock. Remove nozzle (13) from adapter (14).

32. Support nozzle (13) and disconnect grounding wire plug (15) from receptacle (16).



33. Install cap (12) on adapter (14).

CAUTION

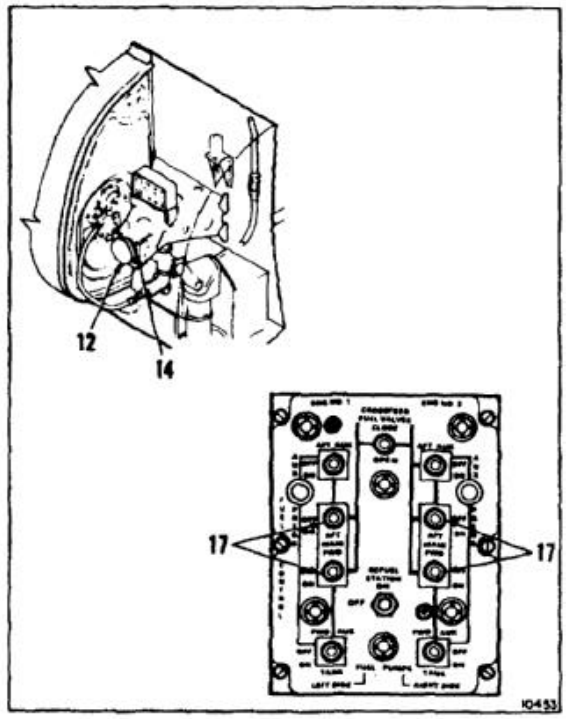
If pressure is not relieved, fuel may seep or spill when refueling is completed.

34. Relieve fuel pressure in the lines by evacuating fuel as follows:

a. Apply ac power to the helicopter (Task 1-37).

b. Operate any of the main tank boost pumps for about **two minutes**. Use switches (17).

c. Remove ac power (Task 1-37).




***FOLLOW-ON MAINTENANCE:***

Close forward right landing gear access panel (Task 2-2).

END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Refueling Vehicle with D1 Nozzel, Parked at Least 10 Feet From Helicopter Rotor Blades, and Grounded
Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

***Materials:***

Fuel JP-4 or JP-5 (E182) or JP-8 (E182.1) or Jet A/A-1 (E182.2) (As Required)
Cloth, Cleaning (E120)
Gloves (E184.1)
Goggles (E473)

***Personnel Required:***

Petroleum Supply Specialist
CH-47 Helicopter Repairer

***Equipment Condition:***

Helicopter Parked on Level Ground at Least 50 Feet From Hangar or Structure (Task 1-25)
Battery Connected (Task 1-39)
Electrical Power Off
Helicopter Grounded (Task 1-29)
Refueling Vehicle Grounded to Helicopter

***General Safety Instructions:***

**WARNING**

JP-4/JP-5/Jet A/A-1 is combustible and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

**WARNING**

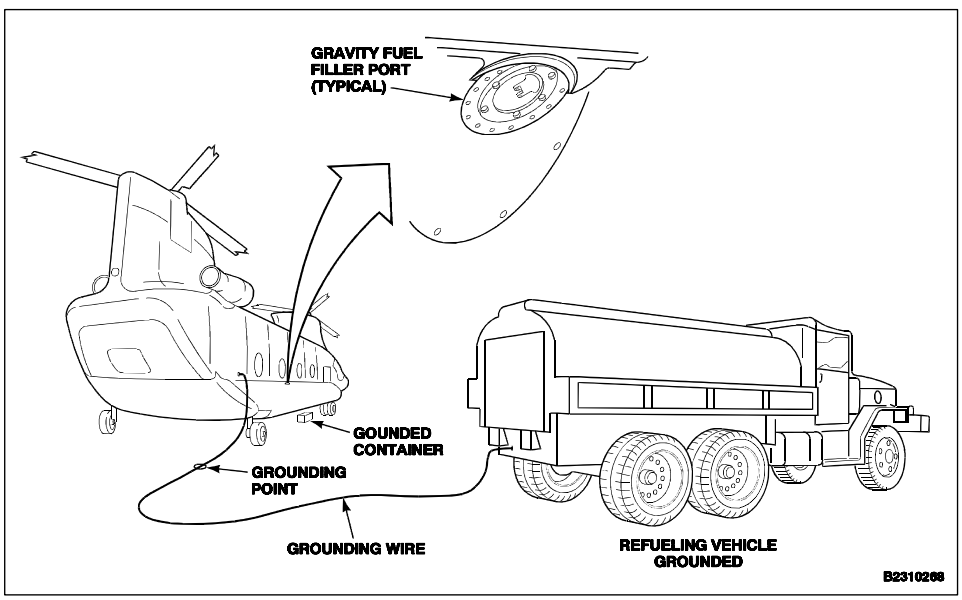
Proper electrical grounding is essential to prevent damage to equipment and injury to personnel.

**WARNING**

All regulations and instructions for handling fuels shall be strictly observed.

**WARNING**

Fuel Jet A-1 shall not be added to tanks containing JP-4 unless it can be assured that Jet A-1 contains conductivity additive in the correct proportions; otherwise, vapor ignition could result. No additive is needed when mixing Jet A-1 with JP-5/JP-8.



**NOTE**

If servicing with engines running, fuel boost pumps shall be left on during servicing.

**NOTE**

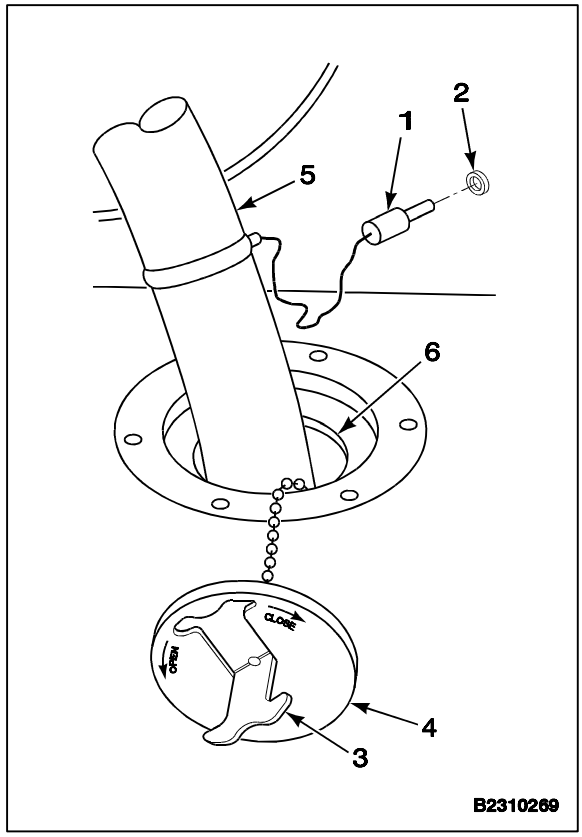
Service main and auxiliary tanks on each side of helicopter in same way. Service main tanks before auxiliary. Left main tank shown here.

1. Connect hose grounding lead (1) to ground socket (2).

**WARNING**

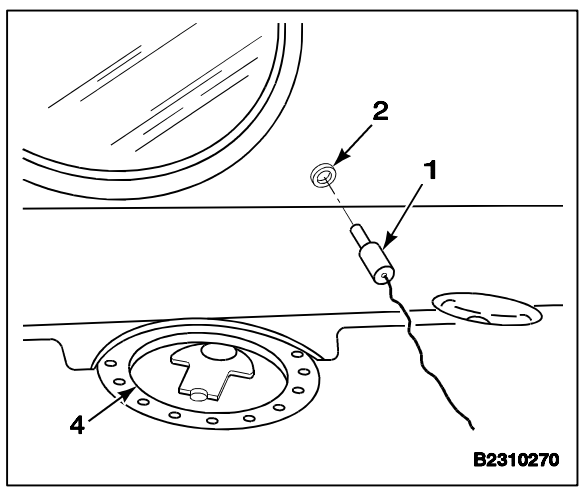
If checking fuel level inside the tank, use an explosion-proof flashlight. Other flashlights could cause a spark that ignites fumes. Injury to personnel can result.

2. Raise filler cap latch (3). Remove cap (4) by rotating it counterclockwise.
3. Insert hose nozzle (5) into filler opening (6). Fill tank to desired level.
4. Remove hose nozzle (5) from opening (6).




5. Install and lock filler cap (4).
6. Disconnect hose grounding lead (1) from ground socket (2).

***INSPECT***




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 1-52 SERVICE ENGINE OIL TANK 1-52

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

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

***Materials:***

Cloths (E120)
Lubricating Oil, Aircraft Turbine Engine (E253)
(Temperature Above –25º)
Lubricating Oil, Aircraft Turbine Engine (E254)
(Temperature Below –25º)
Gloves (E186)

***Personnel Required:***

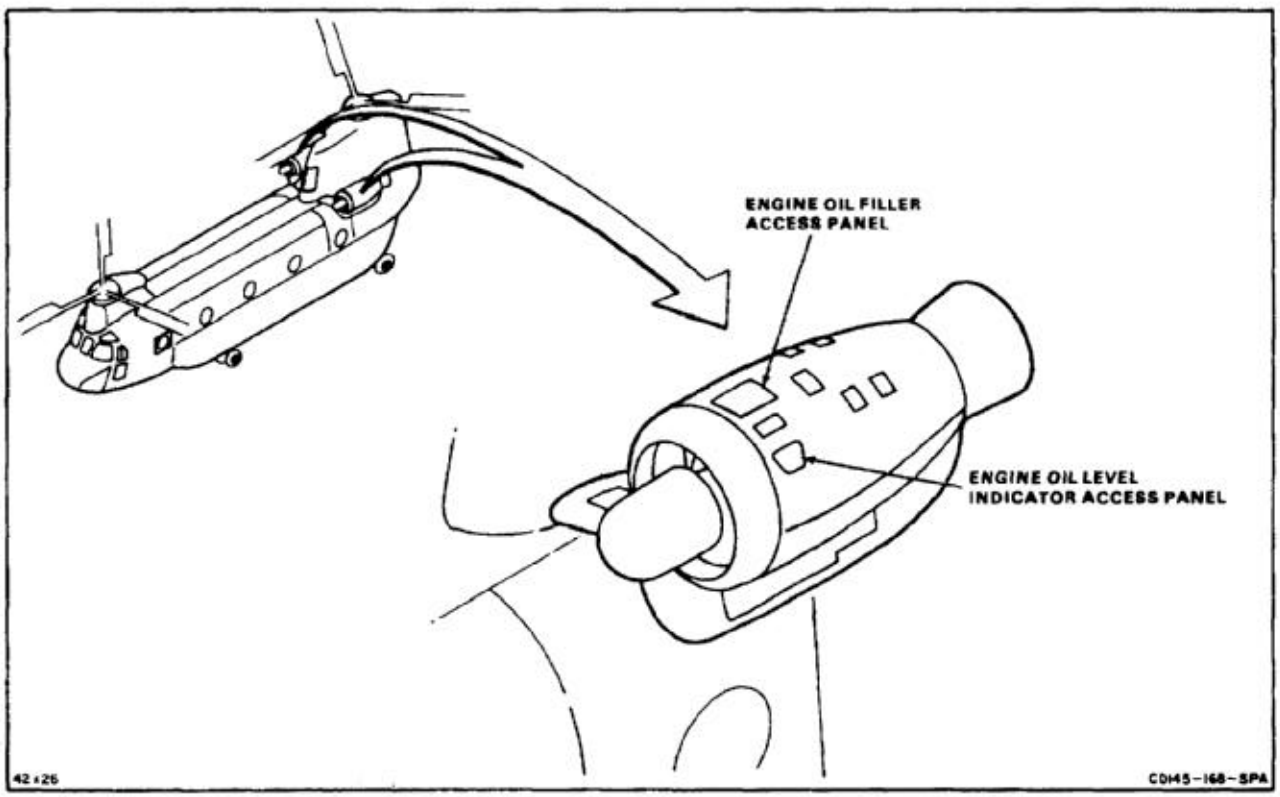
Medium Helicopter Repairer

***References:***

Task 2-2

***Equipment Condition:***

Engine Operated Within Past 24 Hours



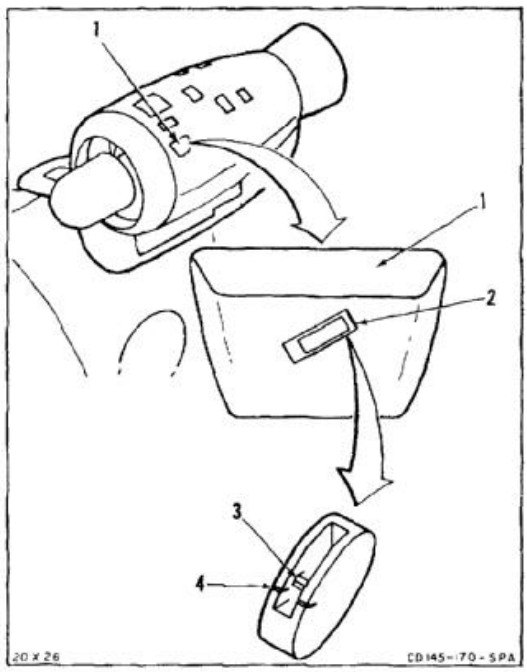
CAUTION

Under normal conditions, engine shall be serviced with only one type of oil (E253 or E254). Oil (E253) is preferred for temperature above **–25ºF (–32ºC)**. Oil (E254) must be used for temperature below **–25ºF (–32ºC)**. In an emergency, if one type of oil is in engine but is not available, the other type may be used. If the two types of oil are mixed, the oil system shall be drained and serviced as soon as possible, but no later than **6 hours**, after engine operation.

**NOTE**

Oil tanks on No. 1 engine and No. 2 engine are serviced in same way.

If engine has not been operated within **24 hours**, cooler oil can cause an incorrect oil level reading. For correct reading, check oil after engine operation.



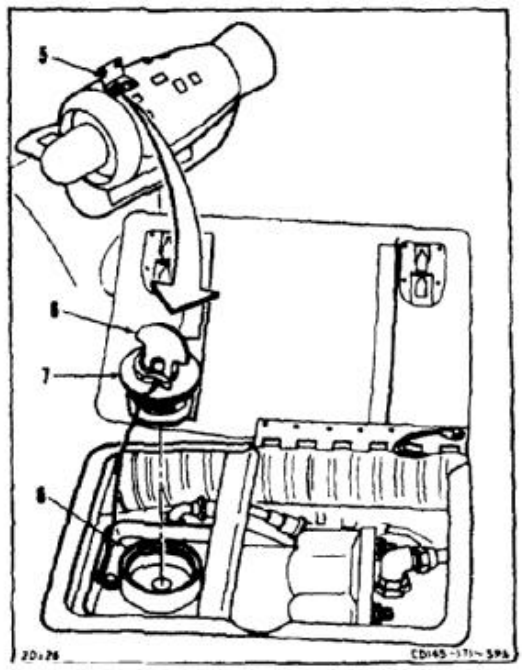

1. Check aircraft log book for type of oil used in engine.
2. Push open engine oil access panel (1).

**NOTE**

Indicator is about **6 inches** below access panel opening.

3. Check oil level on indicator (2). If pointer (3) aligns with white line (4), servicing is not required. If pointer is below white line, go to step 4.

4. Open oil filter access panel (5) (Task 2-2).
5. Lift and twist handle (6) to left.
6. Remove filler cap (7) from tank (8).




**WARNING**

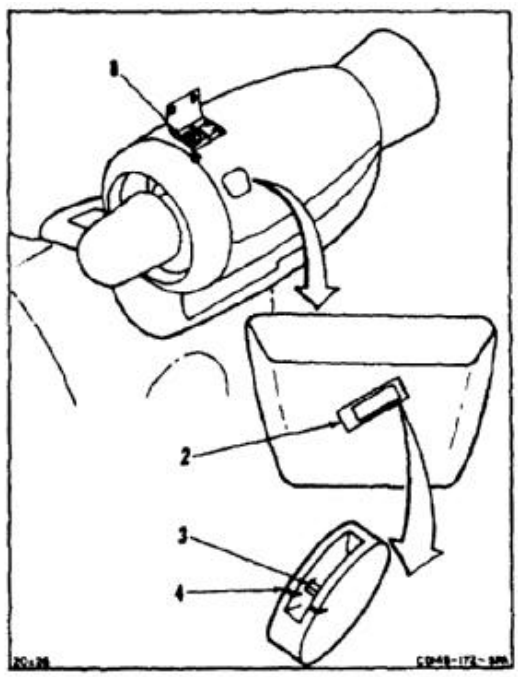
Oil (E253 or E254) is a skin irritant. If oil gets on skin, wash thoroughly. If oil soaks into clothes, change clothes immediately.

Oil (E253 or E254) gives off fumes that can cause injury to personnel. Use oil in a well-ventilated area.

**CAUTION**

Oil (E254) can soften paint. If oil drips on painted surface of helicopter, wipe up immediately with clean cloths.

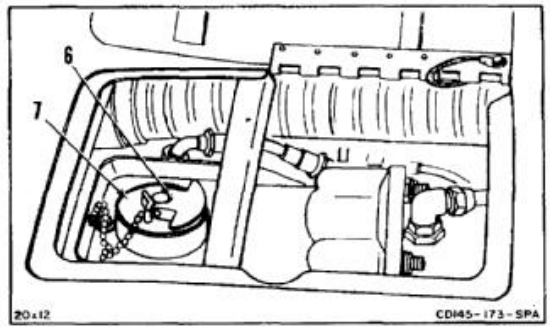
7. Fill oil tank (8) with oil (E253 or E254) until pointer (3) on indicator (2) aligns with white line (4). Wear gloves (E186).



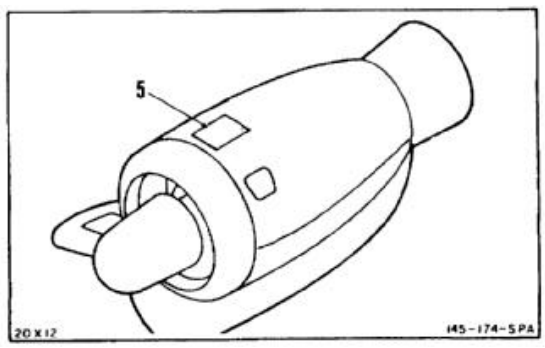
CAUTION

Filler cap must be installed correctly and locked in place on oil tank. If not, cap can come loose during flight and cause loss of engine oil.

8. Install filler cap (7). Turn handle (6) to right and lock flat.




9. Close filler access panel (5) (Task 2-2).




***FOLLOW-ON MAINTENANCE:***

If oil was changed from one type to another, change the stencil on engine cover to show type of oil used (TM 1-1500-204-23).

END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

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

***Materials:***

Oil (E253 or E254)
Gloves (E184.1)
Cloth, Cleaning (E120)
Goggles (E473)

***Personnel Required:***

CH-47 Helicopter Repairer

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Cargo Ramp Open and Level (TM 55-1520-240-T)

***General Safety Instructions:***

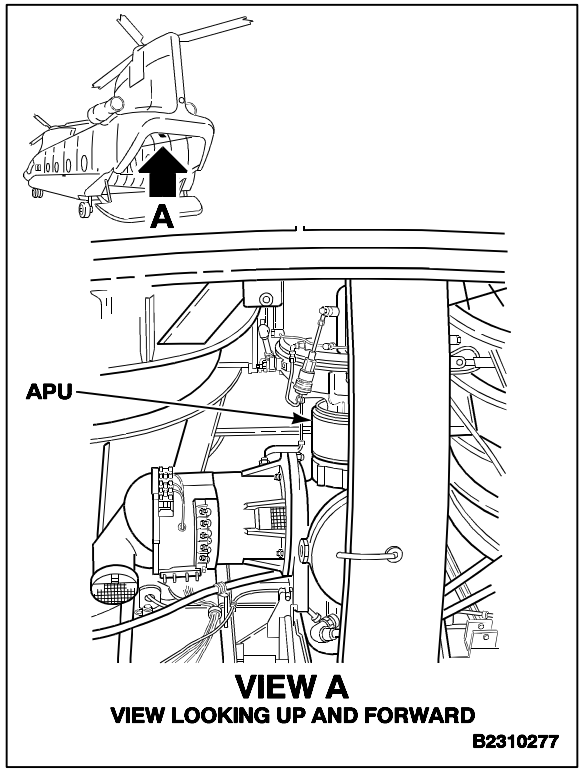
**WARNING**

Oil (E253 or E254) is a skin irritant. If oil gets on skin, wash thoroughly. If oil soaks into clothes, change clothes immediately.

Oil (E253 or E254) gives off fumes that can cause injury to personnel. Use oil in a well-ventilated area.

**CAUTION**

Oil (E254) can soften paint. If oil drips on painted surface of helicopter, wipe up immediately with clean cloth.



**CAUTION**

Do not use drip pan as a handhold. Drip pan may be damaged.

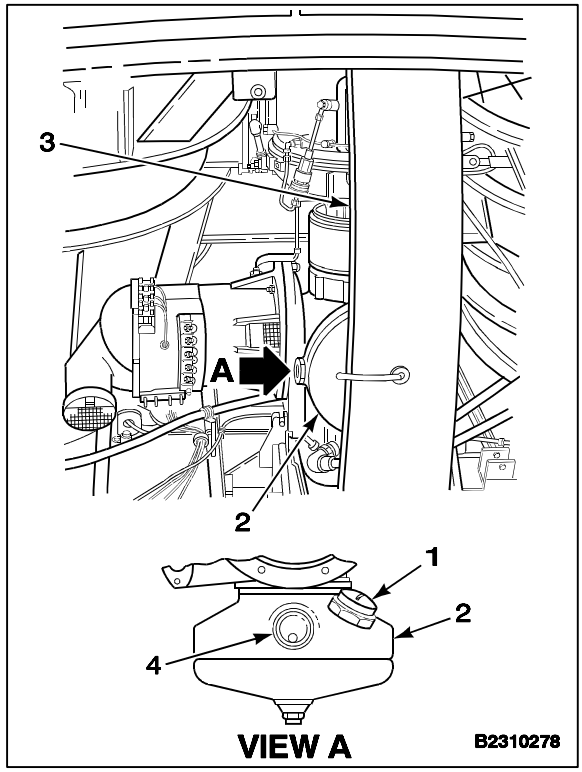
1. Remove filler cap (1) from top of tank (2) above left side of drip pan (3).

**CAUTION**

Do not overfill APU. Damage can result.

Under normal conditions, the APU shall be serviced with only one type of oil (E253 or E254). Oil (E253) is preferred for temperature above **–25°F (–32°C)**. Oil (E254) must be used for temperatures below **–25°F (–32°C)**. In an emergency, if one type of oil is in the APU but is not available, the other type may be used. If the two types of oil are mixed, the oil system shall be drained and serviced as soon as possible, but no later than **6 hours**, after APU operation.

2. Add oil (E253 or E254) to tank (2) to center of sight gauge (4). Use funnel. Wear gloves (E184.1). Wipe up spilled oil using clean cloths (E120). Install cap (1).




***FOLLOW-ON MAINTENANCE:***

Close cargo ramp (TM 55-1520-240-T).

END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

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

***Materials:***

Cloth, Cleaning (E120)
Lubricating Oil (E253, E254, or E254.1)
Gloves (E184.1)
Goggles (E473)

***Personnel Required:***

CH-47 Helicopter Repairer

***References:***

TM 1-1520-240-10
Task 2-2
Task 6-37.1
Task 6-71.1
Task 6-81.1

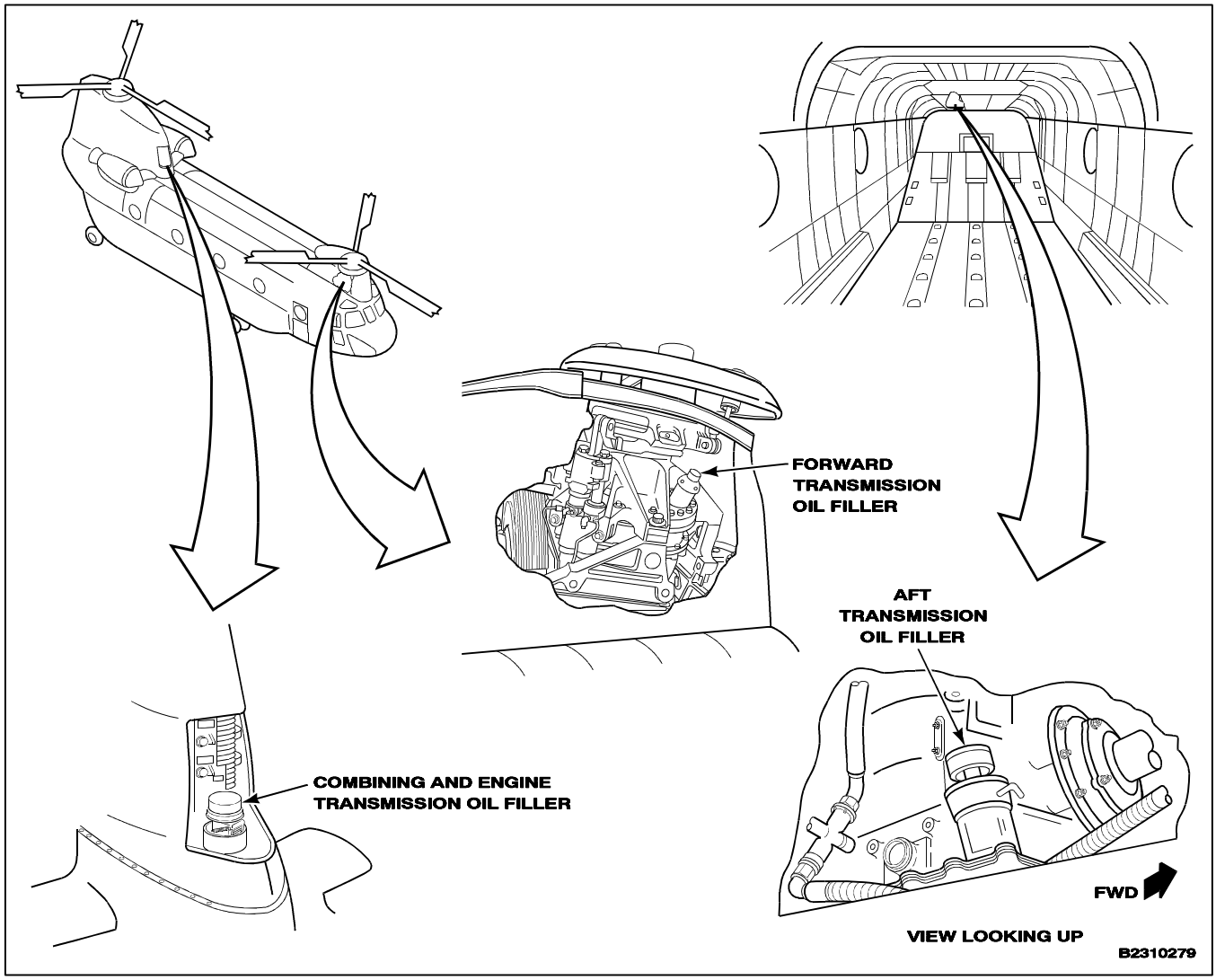
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Helicopter on Level Surface

***General Safety Instructions:***

**WARNING**

Oil (E253, E254.1, or E254) is toxic. They can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.


FORWARD
TRANSMISSION
OIL FILLER
AFT
TRANSMISSION
OIL FILLER
COMBINING AND ENGINE
TRANSMISSION OIL FILLER
FWD
VIEW LOOKING UP
B2310279

***SERVICE FORWARD TRANSMISSION***

**CAUTION**

Under normal conditions, transmission shall be serviced with only one type of oil (E253, E254.1, or E254). Oil (E254) must be used for temperatures below **–25°F (–32°C)**. In an emergency, if one type of oil is in the transmission but not available, the other type may be used. If the two types of oil are mixed, the transmission oil system shall be drained and serviced as soon as possible, but no later than **6 hours**, after transmission operation with mixed oils.

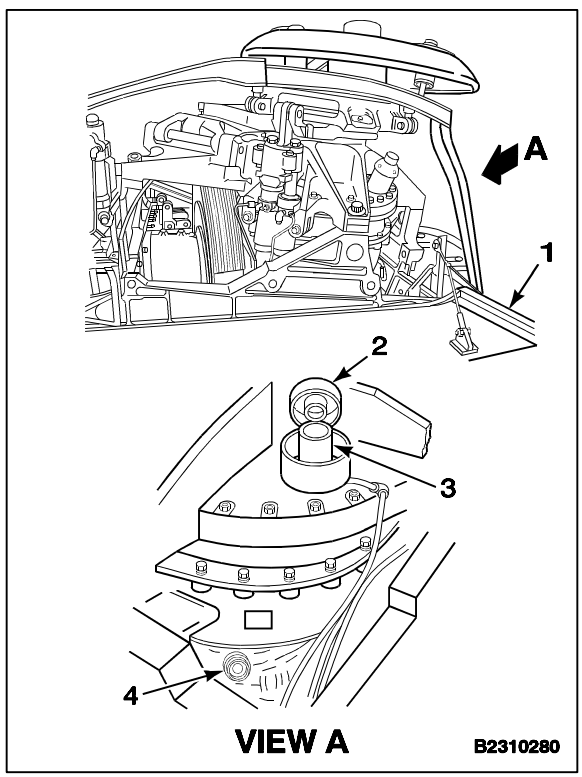
**NOTE**

If transmission has been operated within the past **30 minutes**, wait **30 minutes** prior to servicing transmission.

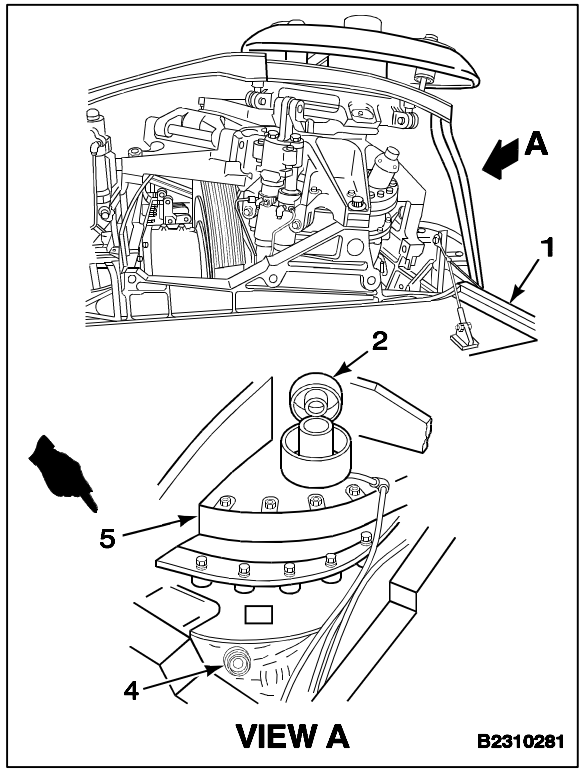
**NOTE**

Restencil all transmissions as required to correctly identify lubrication oil to be used after servicing.

1. Open forward transmission fairing right work platform (1) (Task 2-2).
2. Open oil filler cap (2).
2.1. Inspect filler screen (Task 6-37.1).
3. Add oil (E253, E254.1, or E254) through filler (3) until oil level in sight gauge (4) is at FULL. Use funnel.



4. Close oil filler cap (2).
5. After refilling a drained transmission (5), perform a **5 minute** ground run (TM 1-1520-240-10). Check oil level at sight gauge (4). Repeat steps 2 thru 4 as needed.
6. Close work platform (1) (Task 2-2).
7. Go to Follow-On Maintenance.



***SERVICE AFT TRANSMISSIONS***

8. Lower cargo ramp (6) to level position (Task 2-2).

CAUTION

Under normal conditions, transmission shall be serviced with only one type of oil (E253, E254.1, or E254). Oil (E254) must be used for temperature below –**25ºF (**–**32ºC)**. In an emergency, if one type of oil is in the transmission but is not available, the other type may be used if the two types of oil were mixed, the transmission oil system shall be drained and serviced as soon as possible, but not later than **6 hour**, after transmission operation with mixed oils.

**NOTE**

If transmission has been operated within the past **30 minutes**. Wait **30 minutes** prior to servicing transmission.

**NOTE**

Restencil all transmissions as required to correctly identify lubrication oil to be used after servicing.

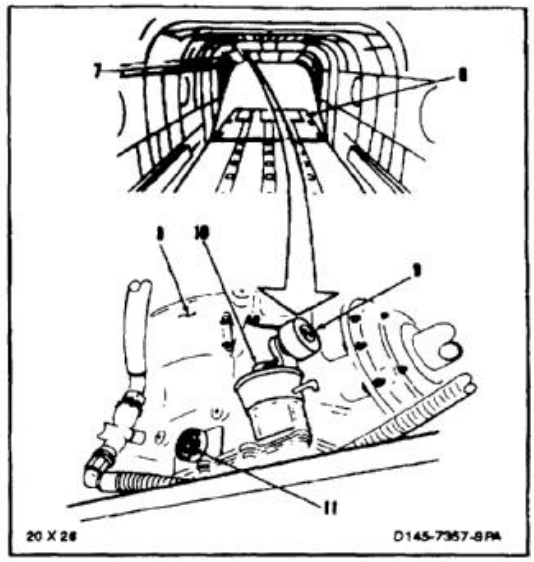
9. Open right baffle (7) under aft transmission (8) (Task 2-2).

10. Open oil filler cap (9).

10.1. Inspect filler screen (Task 6-81.1).

11. Add oil (E253, E254.1, or E254) through filler (10) until oil level at sight gage (11)is at FULL.

12. Close oil filler cap (9).




13. After refilling a drained transmission (8), perform a **5 minute** ground run (TM 55-1520-240-10). Check oil level at sight gage (11). Repeat steps 10 thru 12 as needed.

14. Close right baffle (7) under aft transmission (8) (Task 2-2).

15. Close cargo ramp (6) (Task 2-2).

16. Go to Follow-On Maintenance.

***SERVICE ENGINE AND COMBINING TRANSMISSIONS***

CAUTION

Under normal conditions, transmission shall be serviced with only one type of oil (E253, E254.1, or E254). Oil (E254) must be used for temperatures below –**25ºF (**–**32ºC)**. In an emergency, if one type of oil is in the transmission but is not available, the other type may be used. If the two types of oil are mixed, the transmission oil system shall be drained and serviced as soon as possible, but not later than **6 hours**, after transmission operation with mixed oils.

**NOTE**

If transmission has not been operated during the past **30 minutes**, perform a **5 minute** ground run (TM 55-1520-240-10). (Not applicable if transmission is drained.)

Combining transmission and left and right engine transmissions are serviced at the same time through same oil filler.

**NOTE**

Restencil all transmissions as required to correctly identify lubrication oil to be used after servicing.

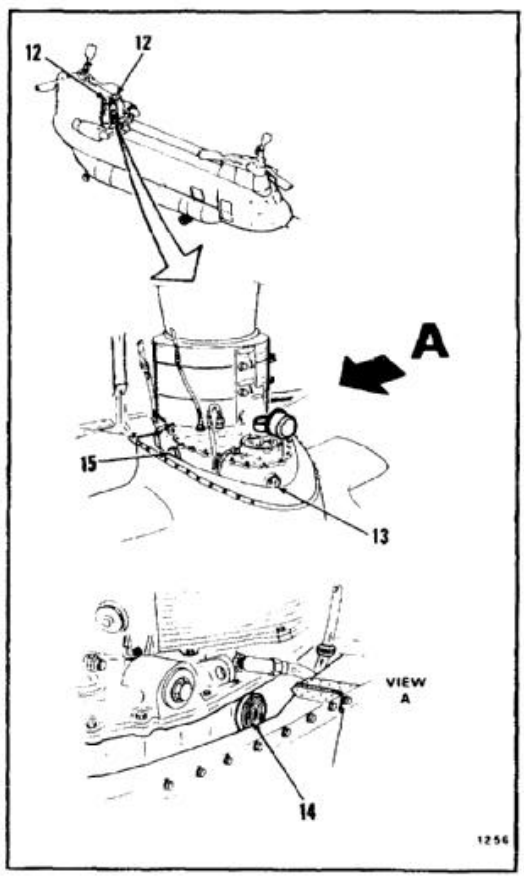
17. Open aft pylon access doors (12) (Task 2-2).

**NOTE**

Combiner oil can drain down from oil reservoir to combiner main housing.

18. Check combiner sight gage (13). If oil appears in gage go to step 24. If oil does not appear go to step 19.

19. Check engine transmission sight gages (14 and 15). If oil appears in gages, perform **5 minute** ground run (TM 55-1520-240-10), and repeat step 18. If oil does not appear, go to step 20.



20. Open oil filler cap (16).

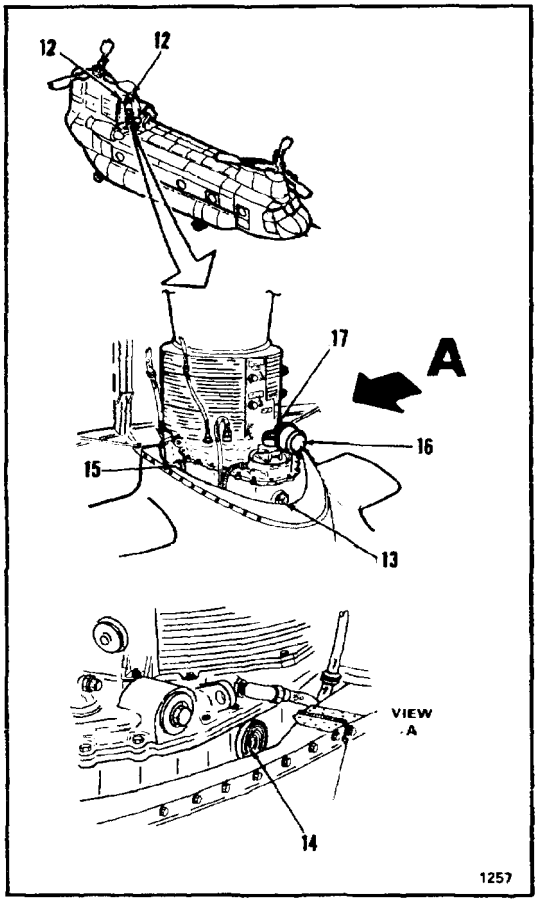
20.1. Inspect filler screen (Task 6-71.1).

21. Add oil (E253, E254.1, or E254) through filler (17) until oil level at sight gage (13) is at FULL. Check that oil is visible in sight gages (14 and 15).

22. Close oil filler cap (16).

23. After refilling a drained transmission, perform a **5 minute** ground run (TM 55-1520-240-10). Check oil level at sight gage (13, 14, and 15). Repeat steps 20 thru 23 if needed.

24. Close aft pylon access doors (12) (Task 2-2).




***FOLLOW-ON MAINTENANCE:***

Restencil all transmissions as required to correctly identify lubrication oil to be used after servicing.

END OF TASK

## 1-55 SERVICE ROTARY-WING HUB OIL TANK 1-55

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Hand Oiler, 4 to 6 Ounce Capacity
Torque Wrench, 30 to 150 Inch-Pounds

***Materials:***

Cloths (E120)
Lockwire (E231)
Lubricating Oil ( E254 or E254.1)
Gloves (E184.1)

***Parts:***

Packings

***Personnel Required:***

Medium Helicopter Repairer
Rotary-Wing Aviator (2)
Inspector

***References:***

Task 1-26
Task 1-39
Task 2-2
TM 55-1520-240-23P

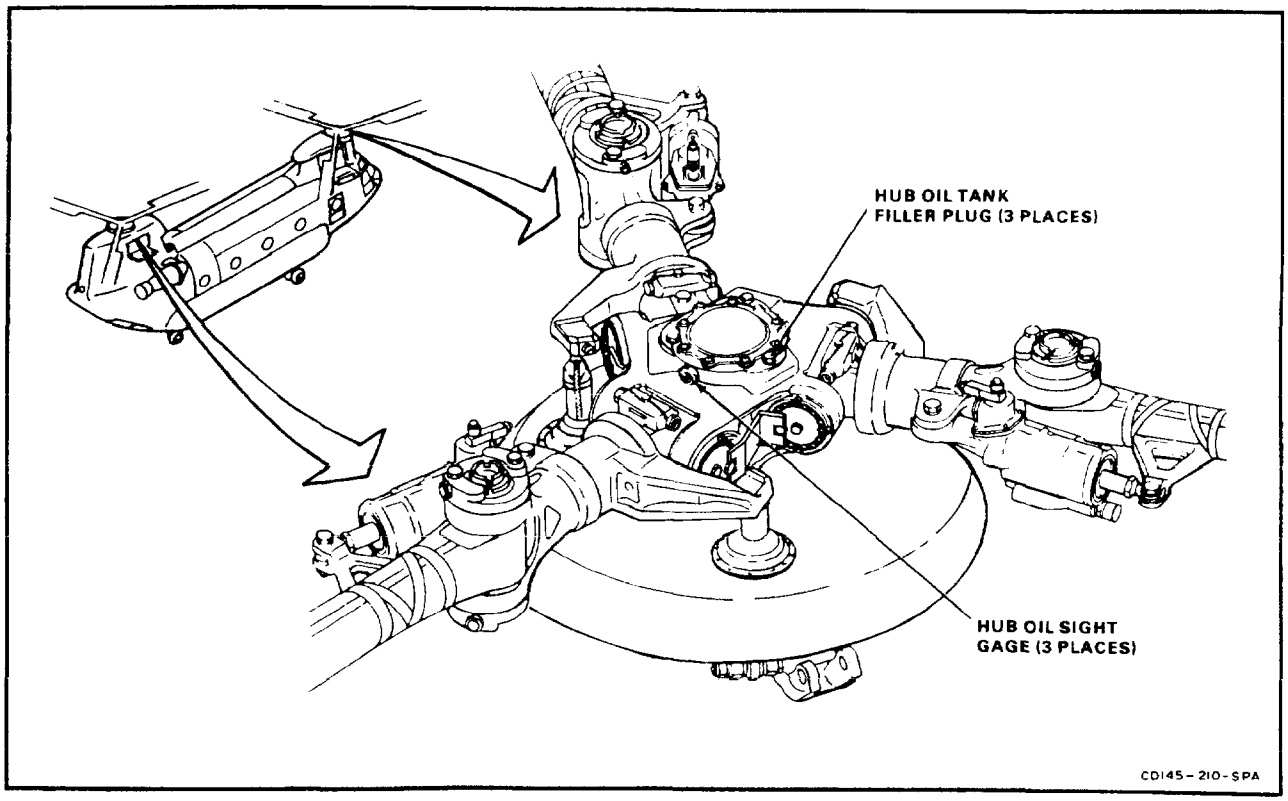
***Equipment Condition:***

Helicopter Parked on Level Ground (Preferred)
Battery Disconnected (Task 1-39)
Electrical Power Off
Tiedown Line Installed on One Forward Blade (Task 1-26)
Aft Pylon Work Platforms Open (Task 2-2)
Forward Transmission Fairing Work Platforms Open (Task 2-2)

***General Safety Instructions:***

**WARNING**

Rotor blades can seriously injure personnel. Make sure area around helicopter is clear of personnel before moving rotor blades.



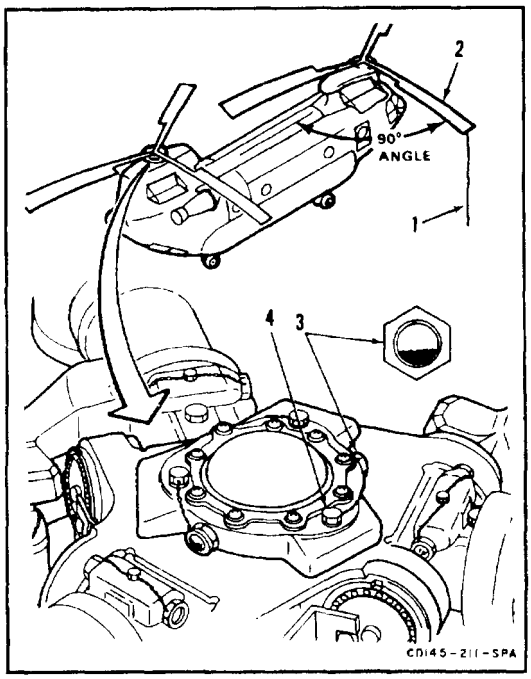
**CAUTION**

Under normal conditions rotary heads shall be serviced with only one type of oil ( E254 or E254.1). Oil (E254) must be used for temperatures below **–25°F (–32°C)**.

**NOTE**

Rotary-wing hub oil tanks on aft and forward rotors are serviced the same way.

Rotor blades must be positioned as shown to get a correct reading of hub oil level.




1. Using tiedown line (1), turn rotor blades (2) so one blade is positioned at a **90°** angle to left or right side of helicopter.

**WARNING**

Prolonged oil leakage can damage finish and create a work hazard by making the fuselage slippery. It can also affect other systems in the helicopter. Therefore, good judgment must be used when determining allowable leakage.

**NOTE**

If oil level in sight gage drops from full (half-way) mark to bottom of glass in **two hours** of operation, leakage is too great. Check for source of leakage. Repair as required.

2. Check oil level in sight gage (3) next to the blade that is positioned at **90°** angle. If oil level is half full or more, servicing is not required. If oil level is less than half full, go to step 3.

**NOTE**

There are three filler plugs for the hub oil tank.

3. Remove lockwire from highest filler plug (4).

4. Remove filler plug (4) and packing (5).

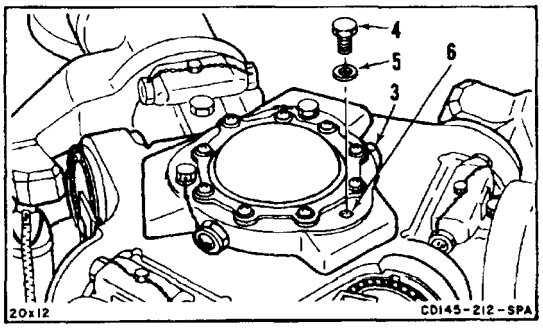
**WARNING**

Oil (E254 or E254.1) is a skin irritant. If oil gets on skin, wash thoroughly. If oil spills on clothes, change clothes immediately.

Oil gives off fumes that can cause injury to personnel. Use oil (E254 or E254.1) in a well-ventilated area.

**CAUTION**

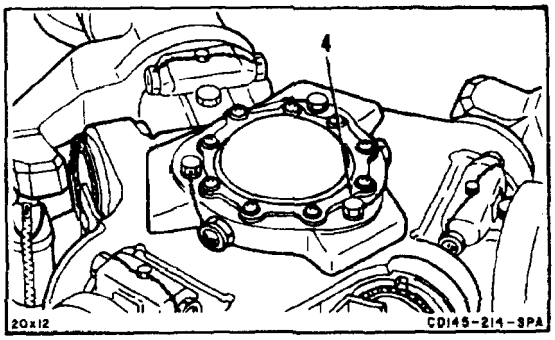
Oil (E254 or E254.1) can soften paint. If oil drips on painted surface of helicopter, wipe up immediately with clean cloths.




5. Add oil (E254 or E254.1) to oil tank (6) until sight gage (3) is half full. Wear gloves (E184.1).

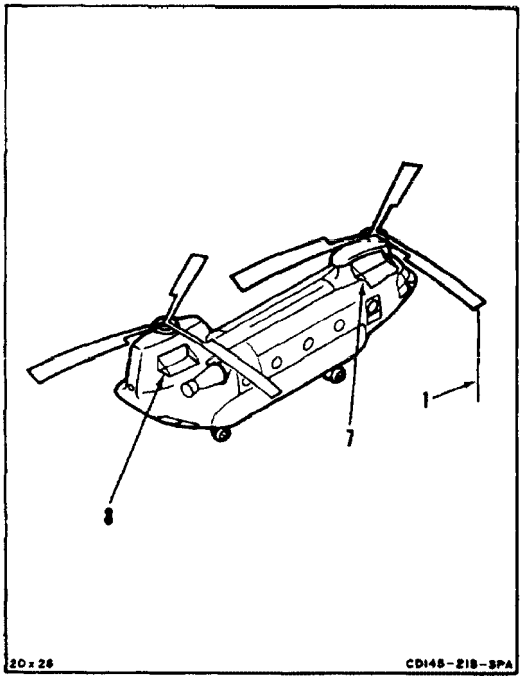
6. Install filler plug (4) and packing (5). Torque to **85 inch-pounds**.

7. Lockwire filler plug (4). Use lockwire (E231).




***INSPECT***

8. If rotary-wing hub oil tank was drained before tank was serviced, continue with steps 9 thru 14. If tank was not drained, go to Follow-On Maintenance.
9. Remove tiedown line (1) (Task 1-26) and close work platforms (7 and 8) (Task 2-2).
10. Connect battery (Task 1-39).
11. Have pilot run engine for **5 minutes**; then shut down engine.
12. Disconnect battery (Task 1-39).
13. Install tiedown line (1) (Task 1-26). Open work platforms (7 and 8) (Task 2-2).
14. Repeat steps 1 and 2.




***FOLLOW-ON MAINTENANCE:***

Remove tiedown line (Task 1-26).
Close work platforms (Task 2-2).

END OF TASK

## 1-56 SERVICE PITCH BEARING OIL TANK 1-56

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Torque Wrench, 5 to 50 Inch-Pounds
Funnel

***Materials:***

Lubricating Oil (E254 or E254.1)
Lockwire (E231)
Cloth (E120)
Gloves (E184.1)

***Parts:***

Packings

***Personnel Required:***

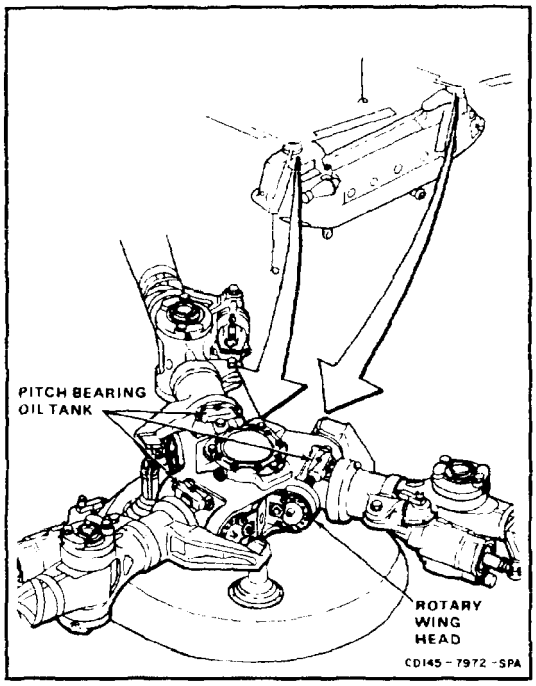
Medium Helicopter Repairer
Inspector

***References:***

TM 55-1520-240-23P

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
One Forward and One Aft Rotary-Wing Blade Tied Down (Task 1-26)
Forward or Pylon Work Platform Open (Task 2-2)



## 1-56 SERVICE PITCH BEARING OIL TANK (Continued) 1-56

**WARNING**

Prolonged oil leakage can damage finish and create a work hazard by making the fuselage slippery. It can also affect other systems in the helicopter. Therefore, good judgment must be used when determining allowable leakage.

Oil (E254 or E254.1) is a skin irritant. If oil gets on skin, wash thoroughly. If oil soaks into clothes, change clothes immediately. Oil gives off fumes that can cause injury to personnel. Use in well-ventilated area.

**CAUTION**

Oil (E254 or E254.1) can soften paint. If oil drips on painted surface of helicopter, wipe up immediately with clean cloths.

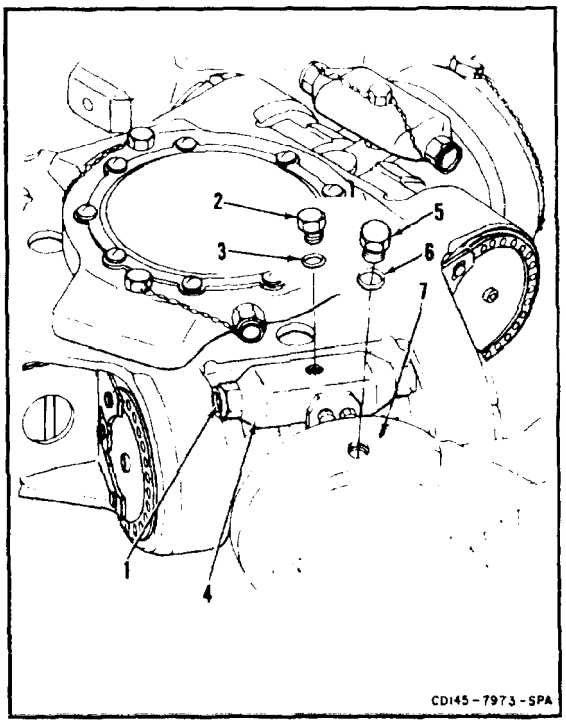
Under normal conditions rotary heads shall be serviced with only one type of oil ( E254 or E254.1). Oil (E254) must be used for temperatures below **–25°F (–32°C)**.

**NOTE**

If oil level in sight gage drops from full (half-way) mark to bottom of glass in **two hours** of operation, leakage is too great. Check for source of leakage. Repair as required.

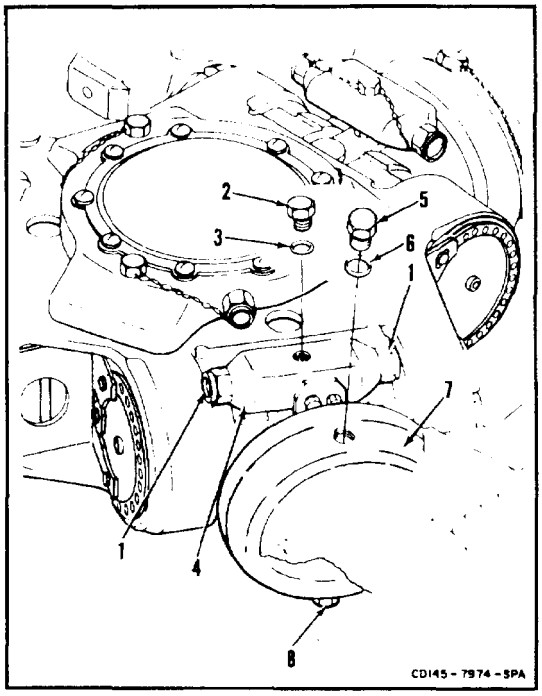
Procedure is same to service any pitch bearing oil tank.

Blade must be over tunnel.




1. Check average oil level in two sight indicators (1).
2. Remove lockwire. Remove plug (2) and packing (3) from tank (4).
3. Remove plug (5) and packing (6) from housing (7).

4. Service pitch bearing oil tank (4) until oil reaches top of housing (7). Use lubricating oil (E254 or E254.1) and funnel. Wear gloves (E184.1).
5. Install packing (6) and plug (5). Torque plug to **24 inch-pounds**. Lockwire plug to lower plug (8). Use lockwire (E231).
6. Continue servicing pitch bearing oil tank (4) until average oil level reaches center of sight indicators (1). Use lubricating oil (E254 or E254.1) and funnel. Wear gloves (E184.1).
7. Install packing (3) and plug (2). Torque plug to **24 inch-pounds**.

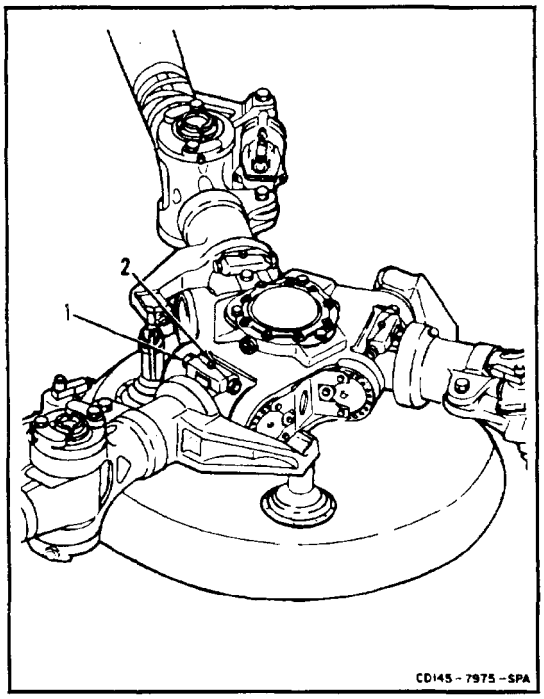



8. Lockwire plug (2) to two sight indicators (1). Use lockwire (E231).

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Close work platforms (Task 2-2).




END OF TASK

## 1-57 SERVICE VERTICAL HINGE PIN OIL TANKS 1-57

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

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

***Materials:***

Lubricating Oil (E254 or E254.1)
Lockwire (E231)
Gloves (E184.1)

***Parts:***

Packings

***Personnel Required:***

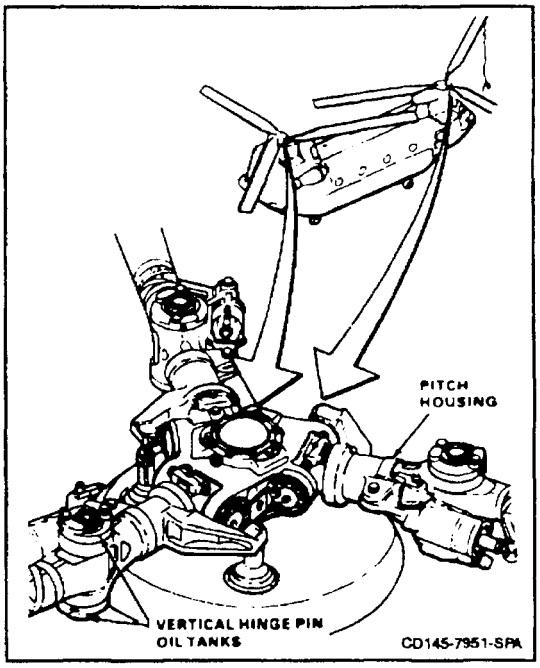
Medium Helicopter Repairer
Inspector

***References:***

TM 55-1520-240-23P

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Tiedown Lines On One Forward and One Aft Rotary-Wing Blade Tied Down (Task 1-26)
Forward or Pylon Work Platform Open (Task 2-2)




**WARNING**

Oil (E254 or E254.1) is a skin irritant. If oil gets on skin, wash thoroughly. If oil soaks into clothes, change clothes immediately. Oil gives off fumes that can cause injury to personnel. Use in well-ventilated area.

**CAUTION**

Oil (E254 or E254.1) can soften paint. If oil drips on painted surface of helicopter, wipe up immediately with clean cloths.

## 1-57 SERVICE VERTICAL HINGE PIN OIL TANKS (Continued) 1-57

**CAUTION**

Under normal conditions rotary heads shall be serviced with only one type of oil (E254 or E254.1). Oil (E254) must be used for temperatures below **–25°F (–32°C)** .

**NOTE**

Procedure is same to service vertical hinge pin oil tanks on any pitch varying housing. Upper and lower tanks are connected by manifold tube and are serviced together.

1. Position blade (1) to level sight indicators (2). Tie down one forward and one aft blade (1).

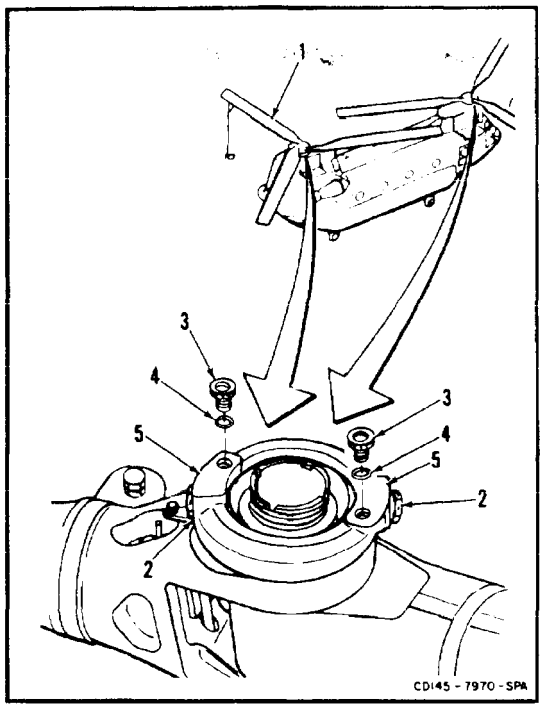
**WARNING**

Prolonged oil leakage can damage finish and create a work hazard by making the fuselage slippery. It can also affect other systems in the helicopter. Therefore, good judgment must be used when determining allowable leakage.

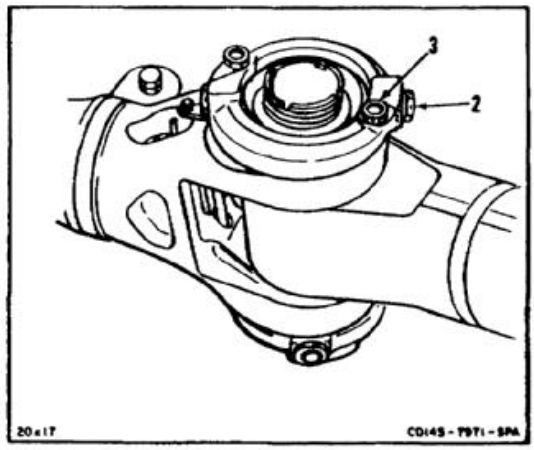
**NOTE**

If oil level in sight gage drops from full (half-way) mark to bottom of glass in **two hours** of operation, leakage is too great. Check for source of leakage. Repair as required.

2. Check oil level in two sight indicators (2).
3. Remove lockwire. Remove two filler/drain plugs (3) and packings (4) from upper tank (5).
4. Service tank (5) until oil reaches center of sight indicators (2). Use lubricating oil (E254 or E254.1) and funnel. Wear gloves (E184.1).
5. Install packings (4) and plugs (3). Torque plugs to **85 inch-pounds**.



6. Lockwire plugs (3) to sight indicators (2). Use lockwire (E231).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Close work platforms (Task 2-2).
Remove tiedown lines from blades (Task 1-26).

END OF TASK

## 1-58 SERVICE ROTARY-WING SHOCK ABSORBER 1-58

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Hand Oiler, 4 to 6 Ounce Capacity

***Materials:***

Hydraulic Fluid (E197)
Lockwire (E231)
Cloths (E120)
Gloves (E186)

***Personnel Required:***

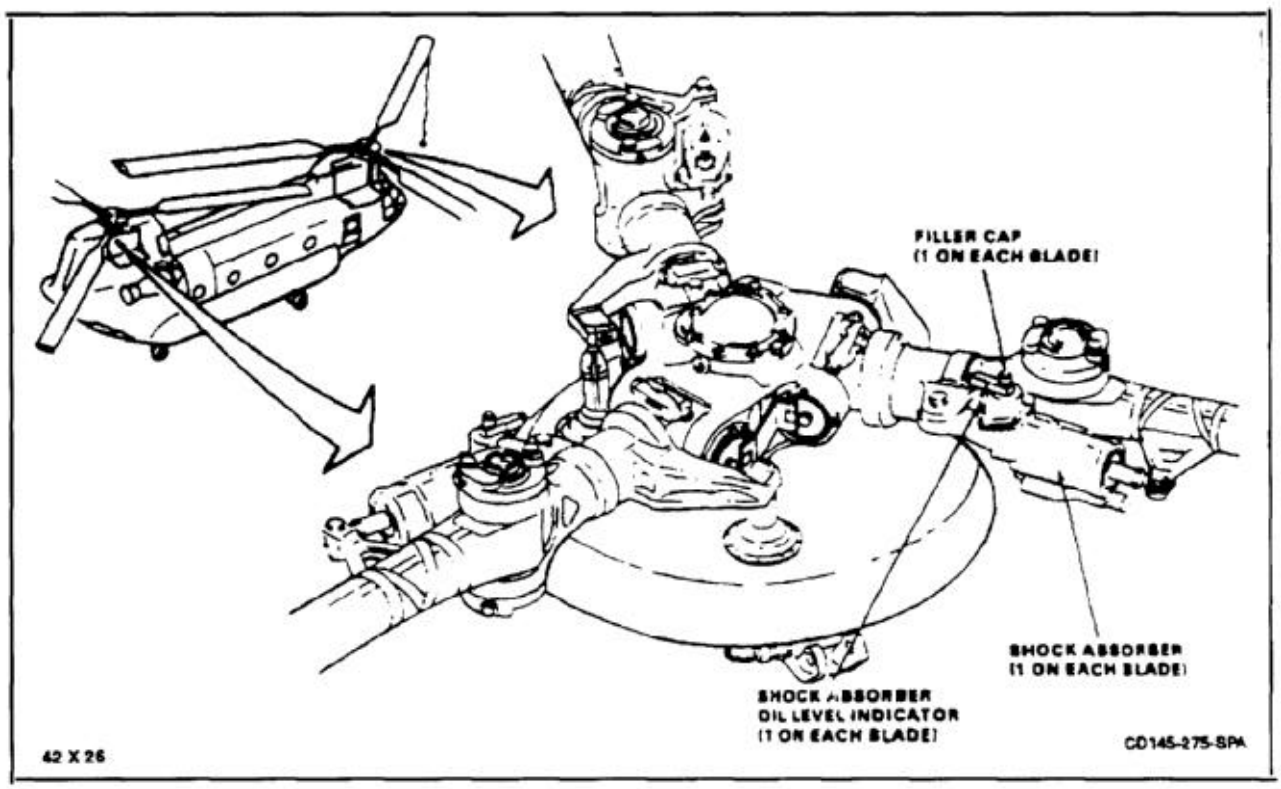
Medium Helicopter Repairer
Inspector

***References:***

Task 5-92

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Tiedown Line Installed on One Forward Blade (Task 1-26)
Aft Pylon Work Platform Open (Task 2-2)
Forward Transmission Fairing Work Platform Open (Task 2-2)



**WARNING**

Moving blades can seriously injure personnel. Make sure area around helicopter is clear of personnel before moving rotor blades.

**NOTE**

Any of the three rotary-wing shock absorbers on the aft and forward rotor heads are serviced the same way.

**NOTE**

Rotor blades must be positioned as shown to get correct reading of shock absorber fluid level.

1. Using tiedown line (1), turn rotor blades (2) so one blade is **90°** to left or right side of helicopter.

**WARNING**

Prolonged oil leakage can damage finish and create a work hazard by making the fuselage slippery. It can also affect other systems in the helicopter. Therefore, good judgment must be used when determining allowable leakage.

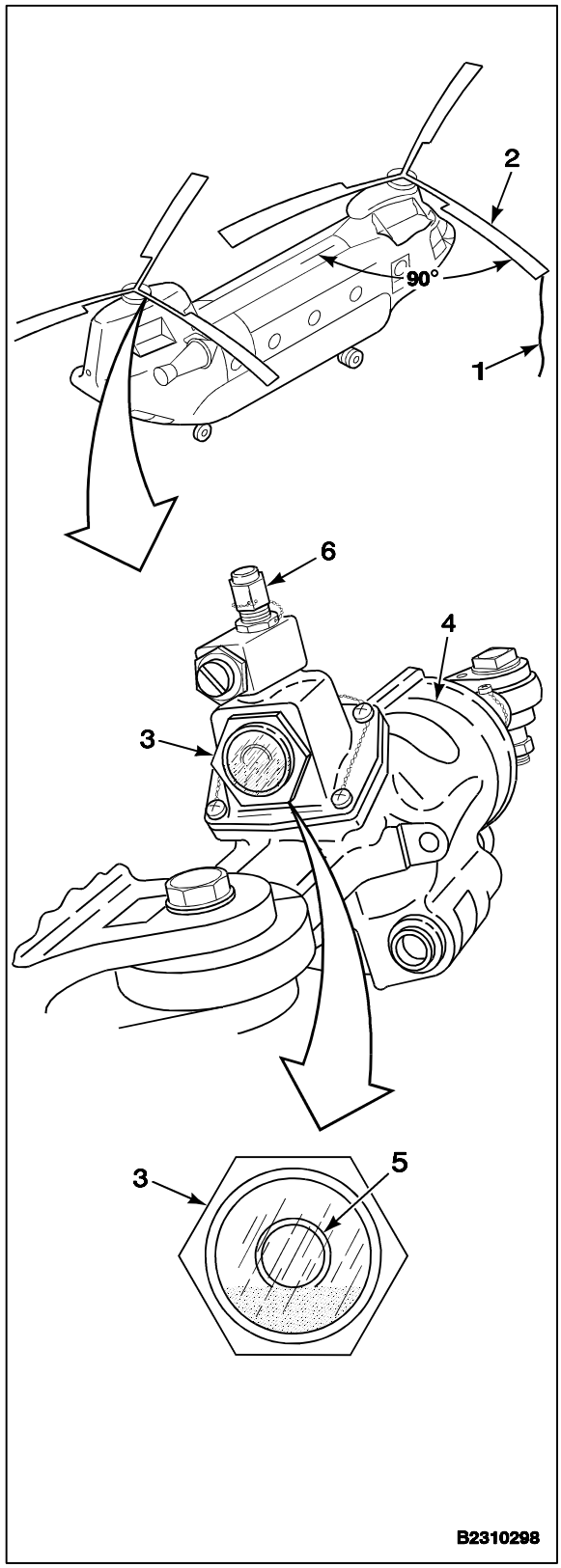
**NOTE**

If oil level in sight gauge drops from full (half-way) mark to bottom of glass in **two hours** of operation, leakage is too great. Check for source of leakage. Repair as required.

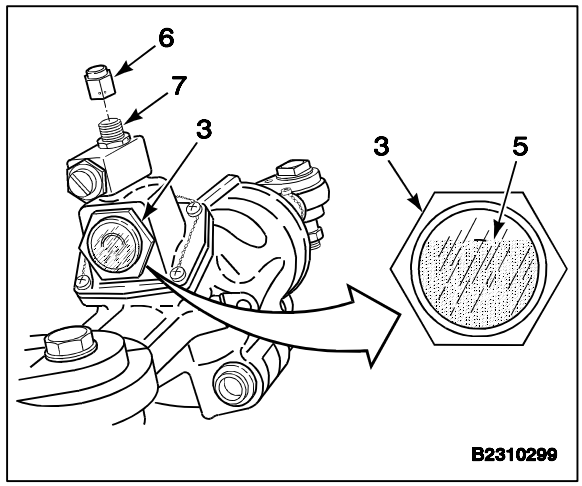
2. Check fluid level on indicator (3) on shock absorber (4) of the positioned blade. If fluid level is within bull's-eye (5), servicing is not required. If fluid level is below bull's-eye, go to step 3.
3. Remove lockwire from cap (6).
4. Remove cap (6).

**WARNING**

Hydraulic fluid (E197) is a skin irritant. If fluid gets on skin, wash immediately with soap and water.

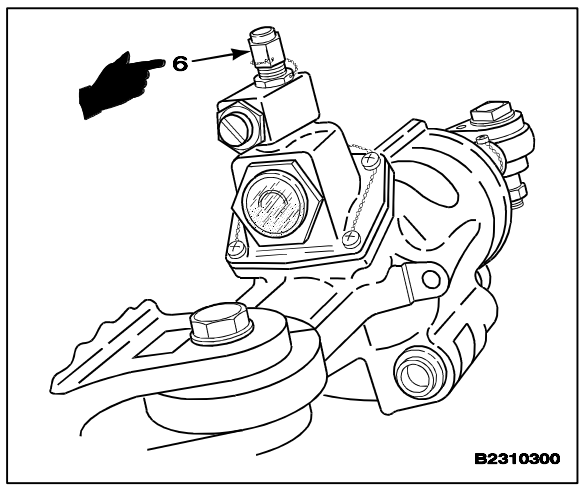


5. Add hydraulic fluid (E197) through filler (7). Wear gloves (E186).
6. Check fluid level in indicator (3) again.
   a. If added fluid remains in indicator, add more fluid (E197) until fluid level is at top of bull's-eye (5).
   b. If added fluid disappears from indicator, add fluid (E187) at filler (7) to top of bull's-eye (5). Then bleed shock absorber (Task 5-92).
7. Install cap (6).




8. Lockwire cap (6). Use lockwire (E231).

***INSPECT***




***FOLLOW-ON MAINTENANCE:***

Remove tiedown line (Task 1-26).
Close work platforms (Task 2-2).

END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Hydraulic Test Stand or AGPU
Thermometer
Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

***Materials:***

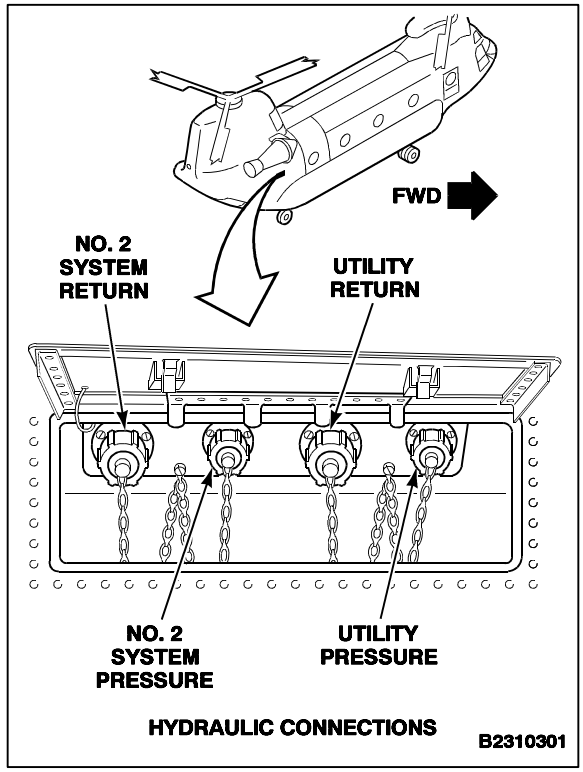
Hydraulic Fluid (E199)
Goggles (E473)

***Personnel Required:***

CH-47 Helicopter Repairer
Aircraft Pneudraulics Repairer

***References:***

TM 1-1520-240-10
TM 55-1730-229-12
TM 55-4920-335-14
TM 55-4920-373-14&P



HYDRAULIC CONNECTIONS

***Equipment Condition:***

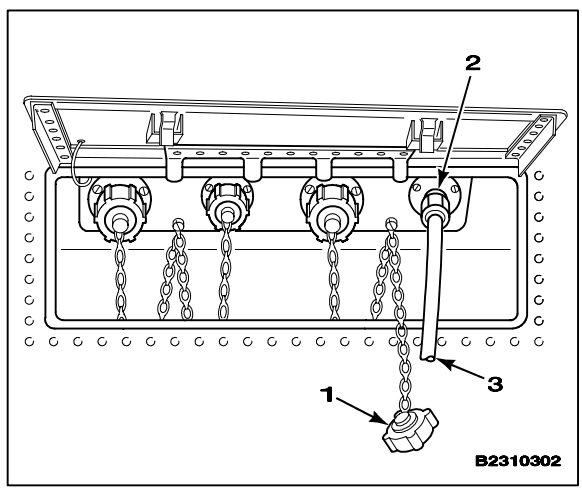
Battery Connected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Hydraulic Connection Access Panel Open (Task 2-2)
Cargo Ramp Fully Up or Full Down (TM 55-1520-240-T)
Utility Hydraulic System Depressurized (Task 7-135.1)

**WARNING**

Make sure all connections are tight before operating hydraulic test stand. High-pressure fluid from test stand can injure personnel.

**WARNING**

Hydraulic fluid (E199) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes for at least **15 minutes**. Get medical attention for eyes.



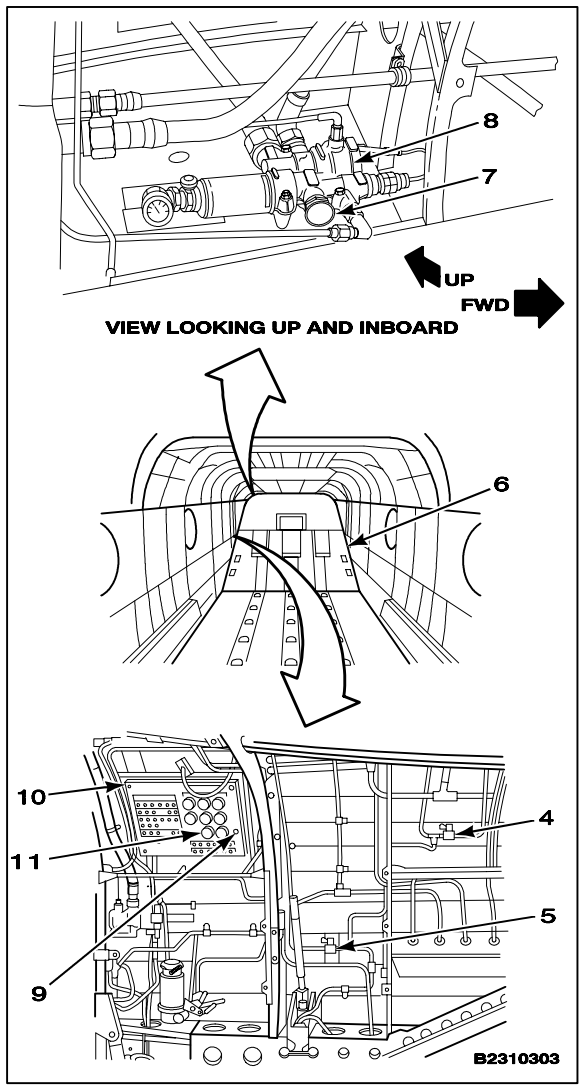

1. Remove dust cover (1) from utility system pressure connection (2).
2. Connect test stand pressure line (3) to utility pressure connection (2).

3. Make sure UTILITY RESERVOIR DEPRESSURIZE valve (4) and EMERG UTIL PRESS valve (5) are set to NORMAL.
4. Press and hold depressurization valve (7) on APU start module (8) until accumulators have discharged completely.
5. Release valve (7).
6. Turn valve (4) to OPEN.

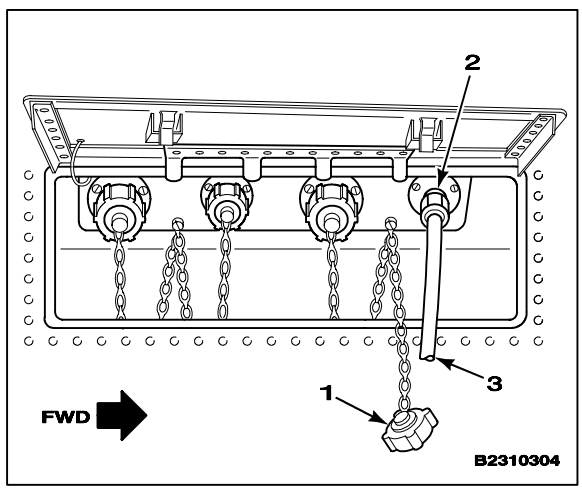
**NOTE**

Be sure to read correct scale on gauge according to whether ramp is fully up or fully down.

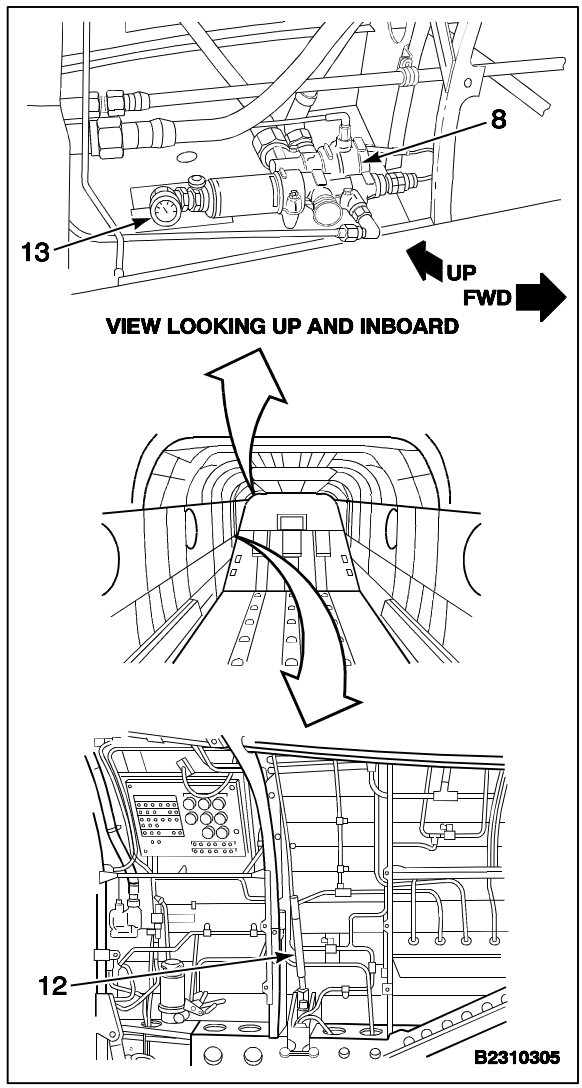
7. Press and hold LEVEL CHECK button (9) on MAINTENANCE PANEL (10). Read reservoir fluid level on gauge (11).
8. Have helper operate test stand. Set test stand flow limits to minimum flow position. Turn on test stand. Set stand pressure between **500 and 1000 psi** (TM 55-4920-335-14 or TM 55-4920-373-14&P).
9. Have helper press and hold valve (7). Press button (9) and read gauge (11).
10. When gauge (11) indicates FULL, release valve (7), and button (9). Turn valve (4) to NORMAL.




11. Shut down test stand.
12. Disconnect test stand pressure line (3) from utility pressure connection (2).
13. Replace dust cover (1) on utility pressure connection.



14. Charge accumulators. Use hand pump (12). Read pressure on accumulator gauge (13) of module (8). If temperature is above –**25°F (–32°C)**, charge accumulator to **3000 psi**. If temperature is below –**25°F (–32°C)**, charge accumulator to **3350 psi** or until pointer of accumulator gauge stops moving, whichever occurs first.




***FOLLOW-ON MAINTENANCE:***

Disconnect battery (Task 1-39).
Close hydraulic connection access panel (Task 2-2).

END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

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

***Materials:***

Goggles (E473)

***Personnel Required:***

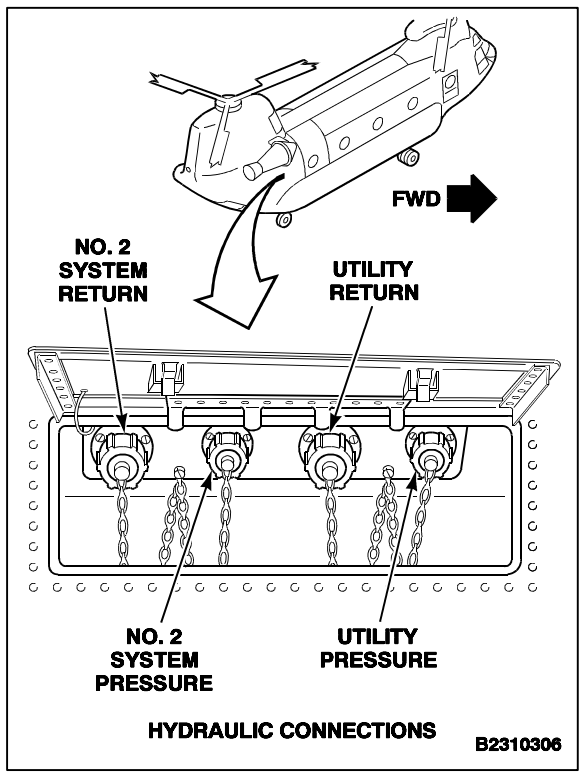
CH-47 Helicopter Repairer
Aircraft Pneudraulics Repairer

***References:***

TM 1-1520-240-10
TM 55-4920-335-14
TM 55-4920-373-14&P

***Equipment Condition:***

Battery Connected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Hydraulic Connection Access Panel Open (Task 2-2)
Cargo Ramp Fully Up or Fully Down (TM 55-1520-240-T)



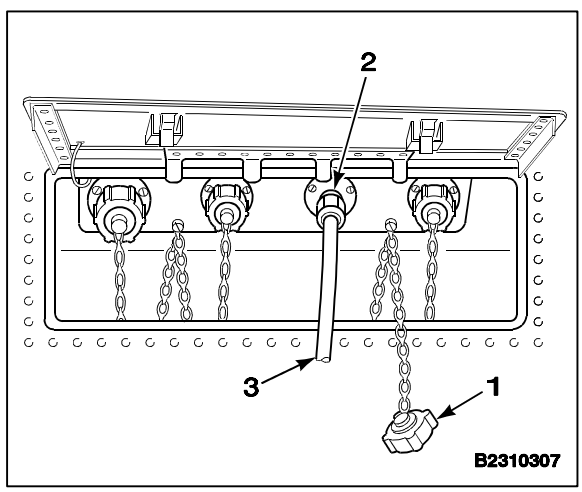

***General Safety Instructions:***

**WARNING**

Make sure all connections are tight before operating hydraulic test stand. High-pressure fluid from test stand can injure personnel.

**WARNING**

Hydraulic fluid (E199) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes for at least **15 minutes**. Get medical attention for eyes.



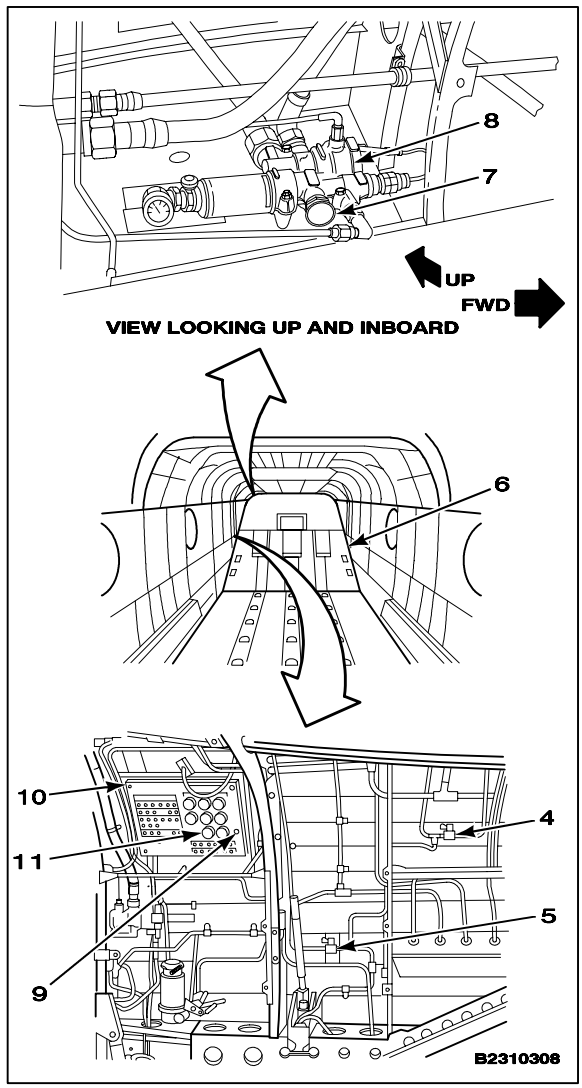

1. Remove dust cover (1) from utility system RETURN connection (2).
2. Connect test stand return line (3) to utility RETURN connection (2).

3. Make sure UTILITY RESERVOIR DEPRESSURIZE valve (4) and EMERG UTIL PRESS valve (5) are set to NORMAL.
4. Press and hold depressurization valve (7) on APU start module (8) until accumulators deplete to precharge.
5. Release valve (7).
6. Turn valve (4) to OPEN.

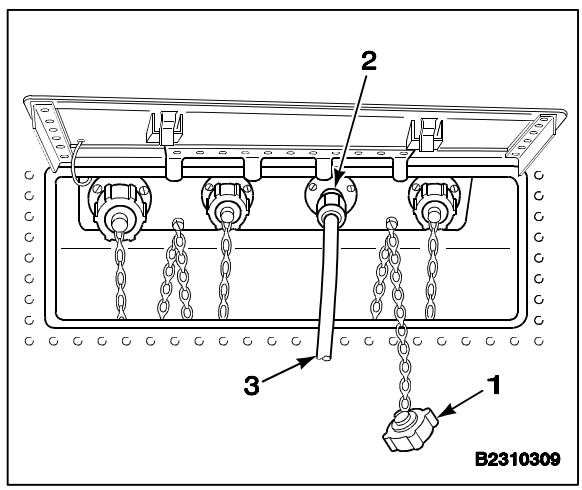
**NOTE**

Be sure to read correct scale on gauge according to whether ramp is fully up or fully down.

7. Press and hold LEVEL CHECK button (9) on MAINTENANCE PANEL (10). Read reservoir fluid level on gauge (11).
8. Have helper operate test stand. Turn on test stand (TM 55-4920-335-14 or TM 55-4920-373-14&P).
9. Have helper press and hold valve (7). Press button (9) and read gauge (11).
10. When gauge (11) indicates EMPTY, release valve (7), and button (9). Turn valve (4) to NORMAL.




11. Shut down test stand.
12. Disconnect test stand return line (3) from utility RETURN connection (2).
13. Replace dust cover (1) on utility RETURN connection.




***FOLLOW-ON MAINTENANCE:***

Disconnect battery (Task 1-39).
Close hydraulic connection access panel (Task 2-2).

END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Hydraulic Test Stand or AGPU
Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

***Materials:***

Hydraulic Fluid (E199)
Goggles (E473)

***Personnel Required:***

CH-47 Helicopter Repairer
Aircraft Pneudraulics Repairer

***References:***

TM 55-1730-229-12
TM 55-4920-335-14
TM 55-4920-373-14&P

***Equipment Condition:***

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

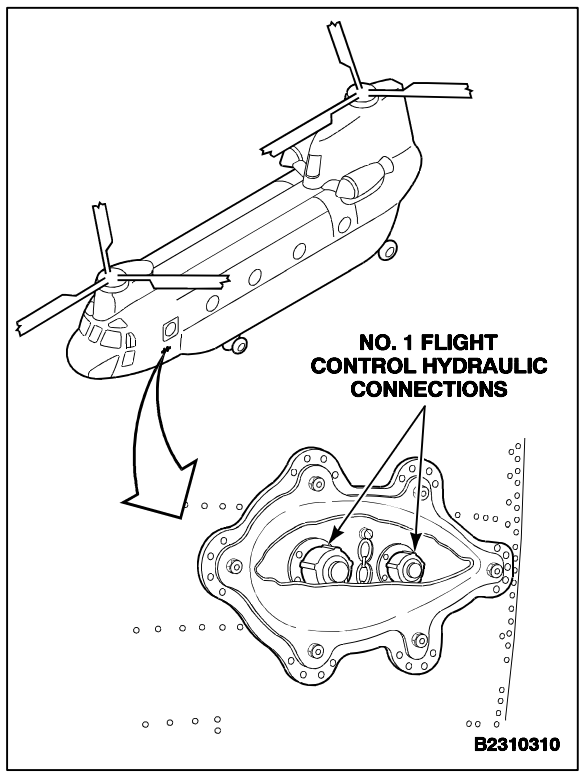
***General Safety Instructions:***

**WARNING**

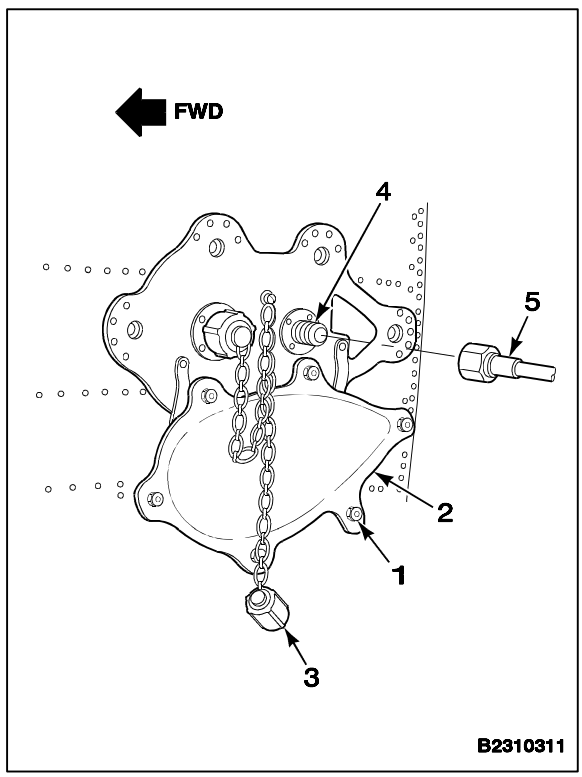
Make sure all connections are tight before operating hydraulic test stand. High-pressure fluid from test stand can injure personnel.

**WARNING**

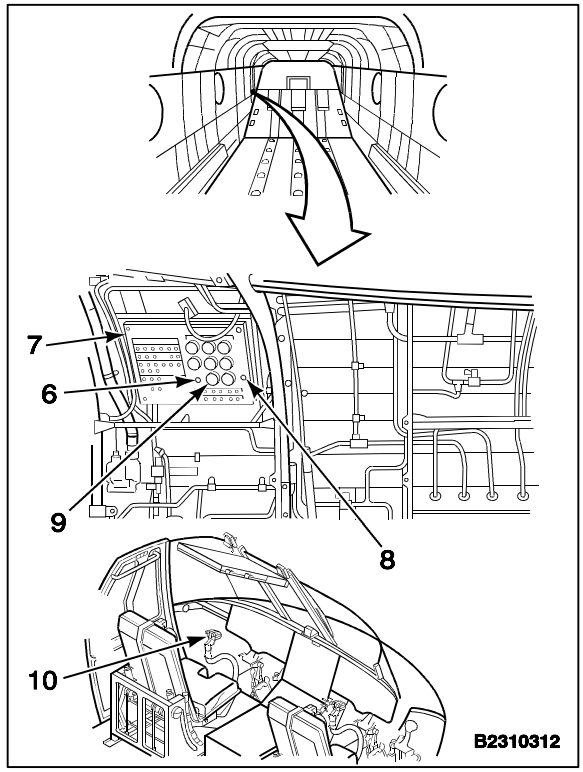
Hydraulic fluid (E199) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes for at least **15 minutes**. Get medical attention for eyes.



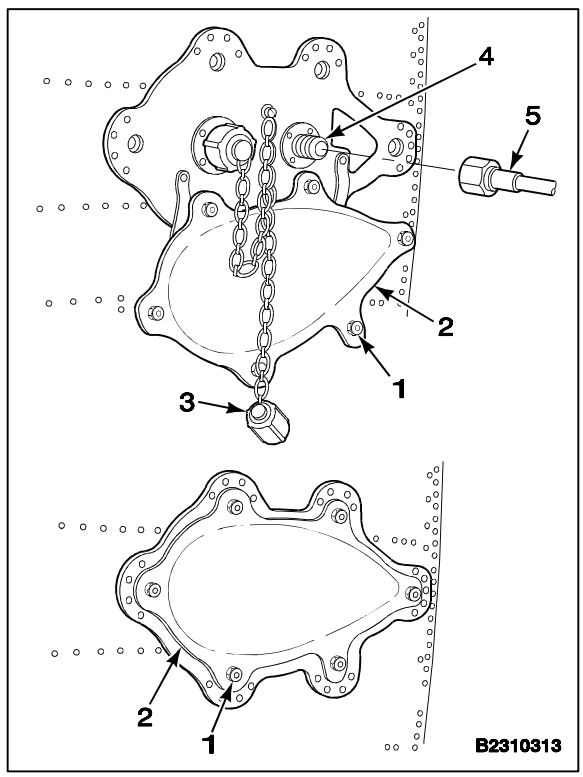

1. Release six fasteners (1) and remove cover (2).
2. Remove dust cover (3) from PRESSURE connection (4).
3. Connect test stand pressure line (5) to PRESSURE connection (4).



4. Set FLT CONT switch (6) on MAINTENANCE PANEL (7) to No. 1.
5. Press and hold LEVEL CHECK button (8). Read reservoir fluid level on gauge (9).
6. Have helper operate test stand. Set test stand pressure between **1500 and 2000 psi**.
7. Observe gauge (9) while helper cycles cockpit control stick (10).
8. When gauge (9) indicates FULL, stop cycling control stick (10) and shutdown test stand. Release button (8).




9. Disconnect test stand pressure line (5) from pressure connection (4).
10. Replace dust cover (3) on PRESSURE connection (4).
11. Install cover (2) and tighten six fasteners (1).




***FOLLOW-ON MAINTENANCE:***

Disconnect battery (Task 1-39).

END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

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

***Materials:***

Goggles (E473)

***Personnel Required:***

CH-47 Helicopter Repairer
Aircraft Pneudraulics Repairer

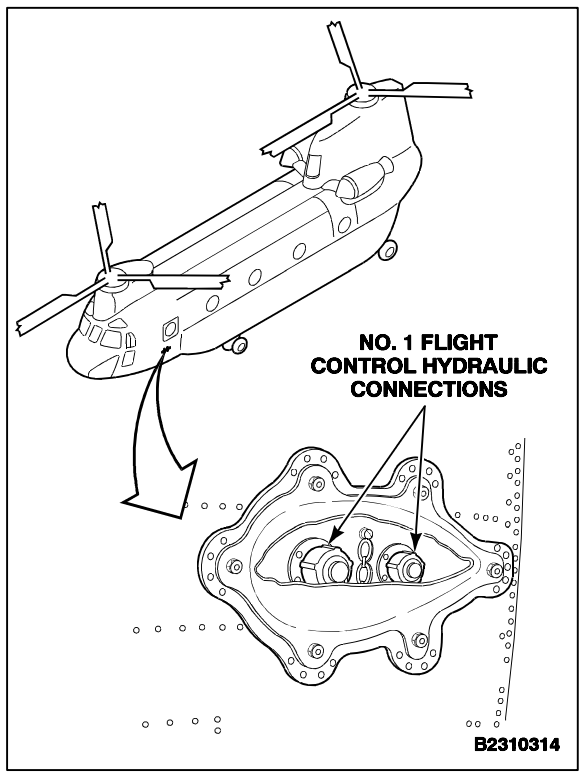
***References:***

TM 55-4920-335-14
TM 55-4920-373-14&P

***Equipment Condition:***

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

***General Safety Instructions:***

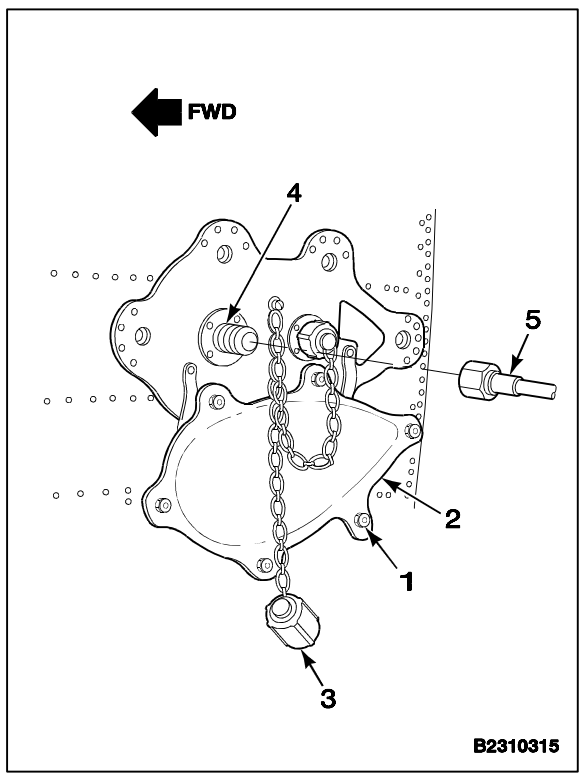



**WARNING**

Make sure all connections are tight before operating hydraulic test stand. High-pressure fluid from test stand can injure personnel.

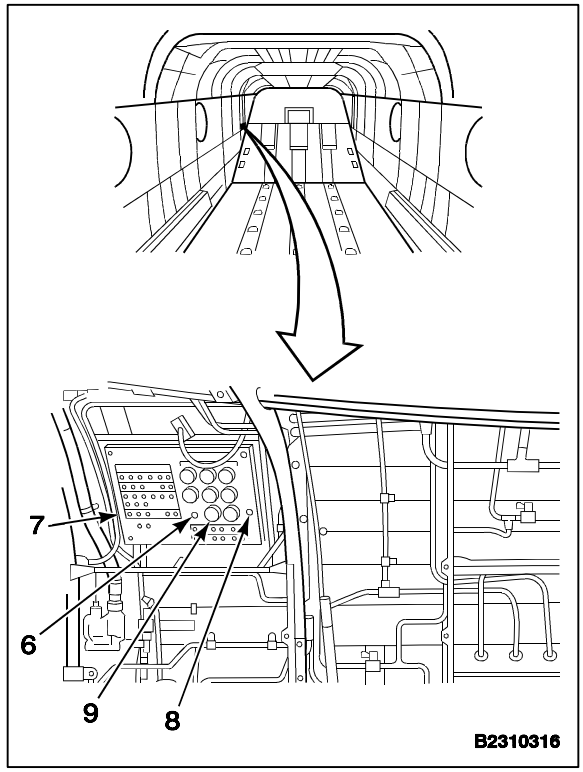
**WARNING**

Hydraulic fluid (E199) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes for at least **15 minutes**. Get medical attention for eyes.

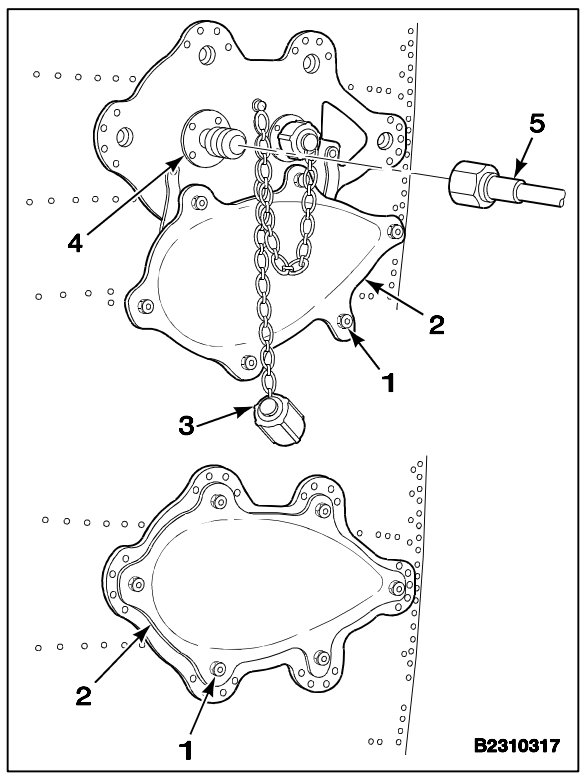



1. Release six fasteners (1) and remove cover (2).
2. Remove dust cover (3) from RETURN connection (4).
3. Connect test stand return line (5) to RETURN connection (4).

4. Set FLT CONT switch (6) on MAINTENANCE PANEL (7) to No. 1.
5. Press and hold LEVEL CHECK button (8). Read reservoir fluid level on gauge (9).
6. Have helper operate test stand. Set test stand to reservoir (TM 55-4920-335-14 or TM 55-4920-373-14&P).
7. When gauge (9) indicates EMPTY, shut down test stand. Release button (8).




8. Disconnect test stand return line (5) from RETURN connection (4).
9. Replace dust cover (3) on RETURN connection (4).
10. Install cover (2) and tighten six fasteners (1).




***FOLLOW-ON MAINTENANCE:***

Disconnect battery (Task 1-39).

END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Hydraulic Test Stand or AGPU
Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692

***Materials:***

Hydraulic Fluid (E199)
Goggles (E473)

***Personnel Required:***

CH-47 Helicopter Repairer
Aircraft Pneudraulics Repairer

***References:***

TM 55-1730-229-12
TM 55-4920-335-14
TM 55-4920-373-14&P

***Equipment Condition:***

Battery Connected (Task 1-39)
Hydraulic Power Off
Electrical Power Off
Hydraulic Connection Access Panel Open (Task 2-2)

***General Safety Instructions:***

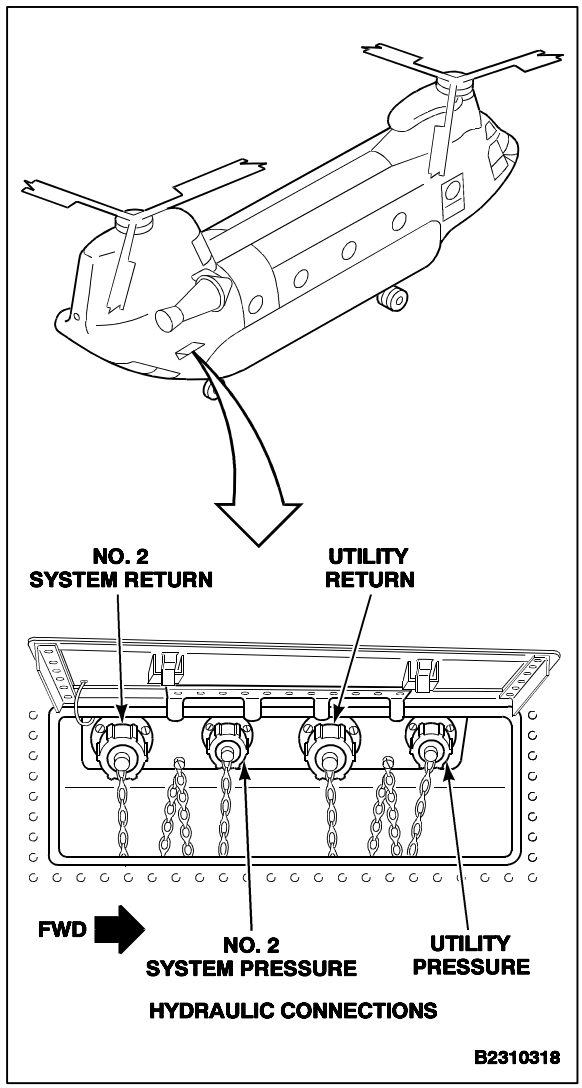
**WARNING**

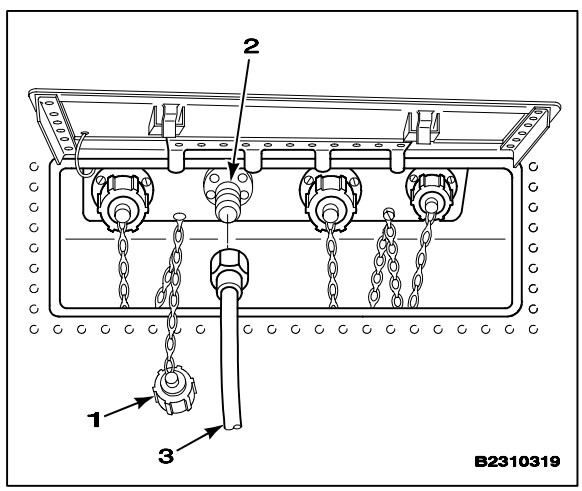
Make sure all connections are tight before operating hydraulic test stand. High-pressure fluid from test stand can injure personnel.

**WARNING**

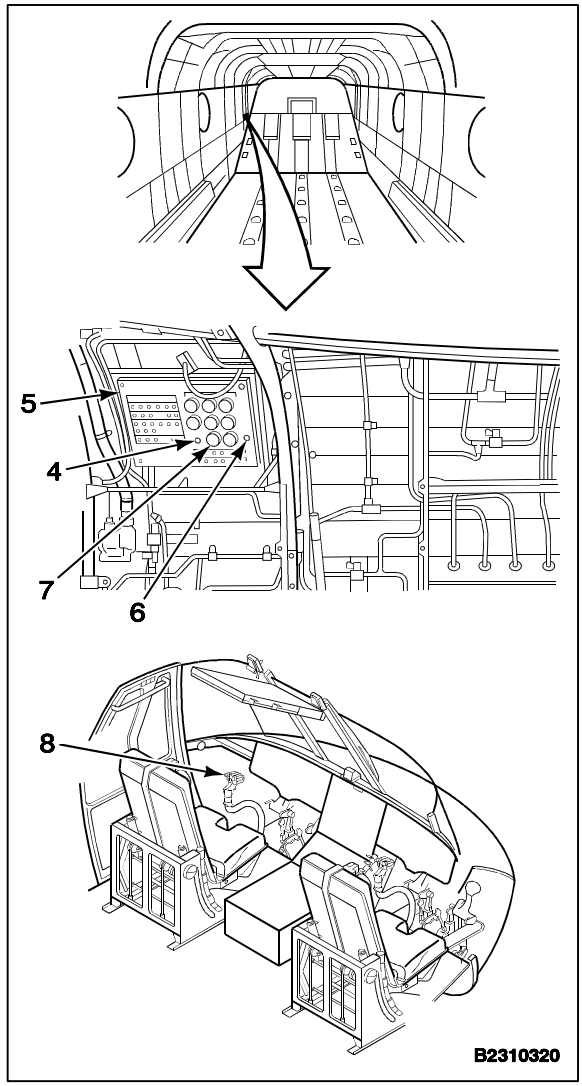
Hydraulic fluid (E199) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes for at least **15 minutes**. Get medical attention for eyes.

1. Remove dust cover (1) from PRESSURE connection (2).
2. Connect test stand pressure line (3) to PRESSURE connection (2) (TM 55-1730-229-12).

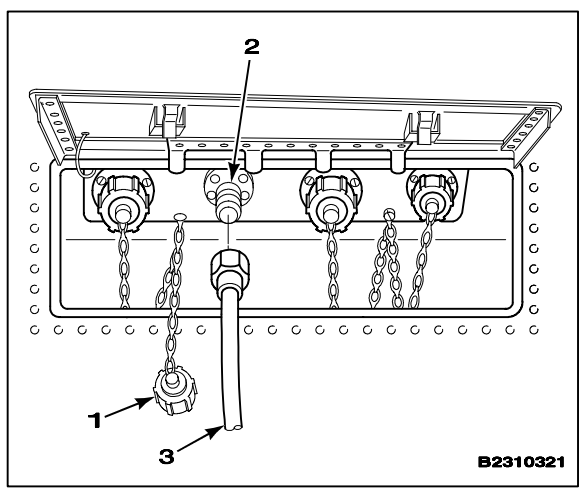


3. Set FLT CONT switch (4) on MAINTENANCE PANEL (5) to NO. 2.
4. Press and hold LEVEL CHECK button (6). Read reservoir fluid level on gauge (7).
5. Have helper operate test stand. Set test stand pressure between **1500 and 2000 psi** (TM 55-4920-373-14&P and TM 55-1730-229-12).
6. Observe gauge (7) while helper cycles cockpit control stick (8).
7. When gauge (7) indicates FULL, stop cycling control stick (8) and shut down test stand. Release button (6).




8. Disconnect test stand pressure line (3) from PRESSURE connection (2).
9. Replace dust cover (1) on PRESSURE connection (2).




***FOLLOW-ON MAINTENANCE:***

Disconnect battery (Task 1-39).
Close hydraulic connection access panel (Task 2-2).

END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

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

***Materials:***

Goggles (E473)

***Personnel Required:***

CH-47 Helicopter Repairer
Aircraft Pneudraulics Repairer

***References:***

TM 55-4920-335-14
TM 55-4920-373-14&P

***Equipment Condition:***

Battery Connected (Task 1-39)
Hydraulic Power Off
Electrical Power Off
Hydraulic Connection Access Panel Open (Task 2-2)

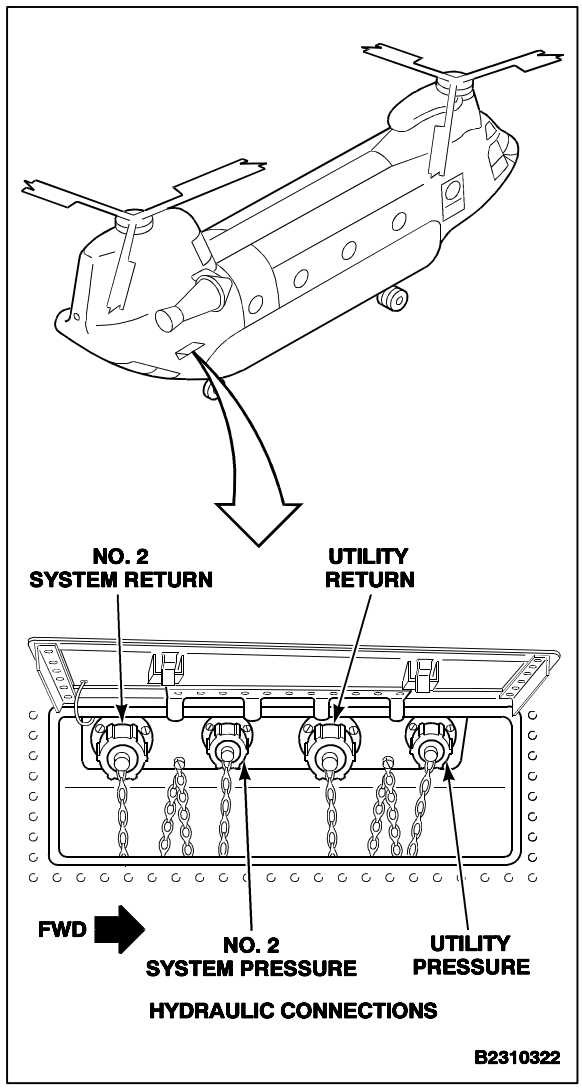
***General Safety Instructions:***

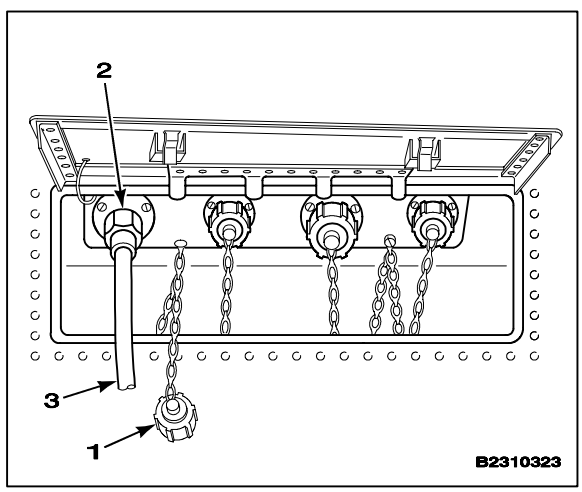
**WARNING**

Make sure all connections are tight before operating hydraulic test stand. High-pressure fluid from test stand can injure personnel.

**WARNING**

Hydraulic fluid (E199) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes for at least **15 minutes**. Get medical attention for eyes.



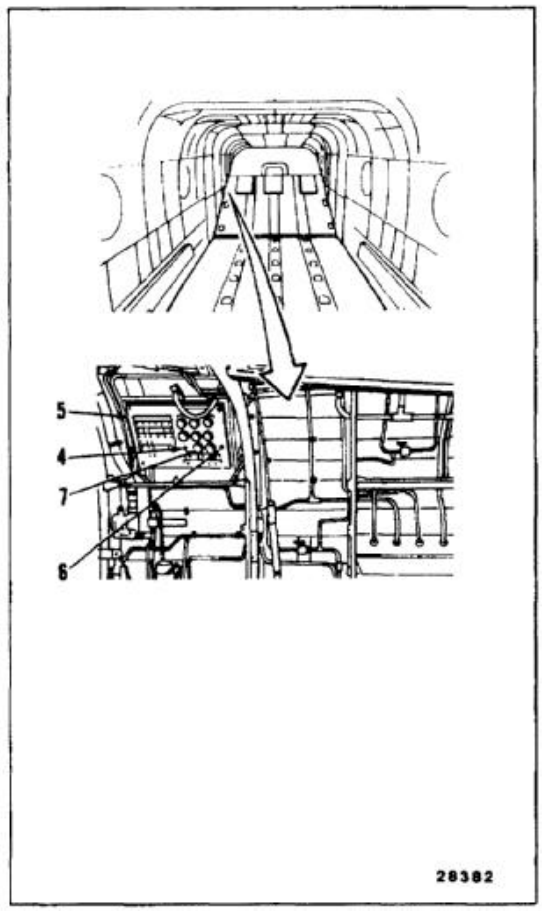

1. Open hydraulic connection access panel (Task 2-2).
2. Remove dust cover (1) from RETURN connection (2).
3. Connect test stand return line (3) to RETURN connection (2).

4 Set FLT CONT switch (4) on MAINTENANCE PANEL (5) to NO. 2.

5. Press and hold LEVEL CHECK button (6). Read reservoir fluid level on gage (7).

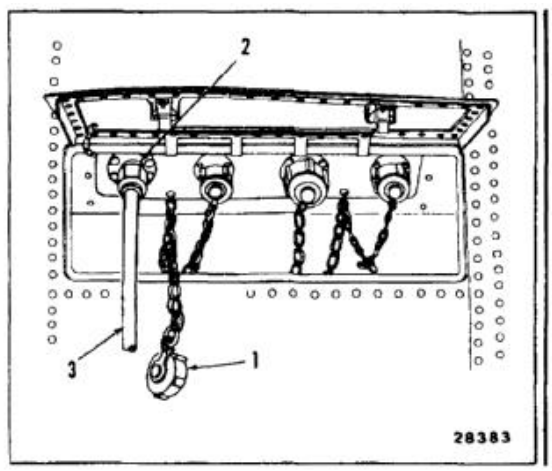
6. Have helper operate test stand. Set test stand to reservoir (TM 55-4920-335-14 or TM 55-4920-373-14&P).

7. When gage (7) indicates EMPTY, shut down test stand. Release button (6).




8. Disconnect test stand return line (3) from RETURN connection (2).

9. Replace dust cover (1) on RETURN connection (2).




***FOLLOW-ON MAINTENANCE:***

Disconnect battery (Task 1-39).
Close hydraulic connection access panel (Task 2-2).

END OF TASK

## 1-62 MANUAL SERVICE HYDRAULIC SYSTEM RESERVOIR 1-62

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

None

***Materials:***

Hydraulic Fluid (E199)
Cloths (E120)

***Personnel Required:***

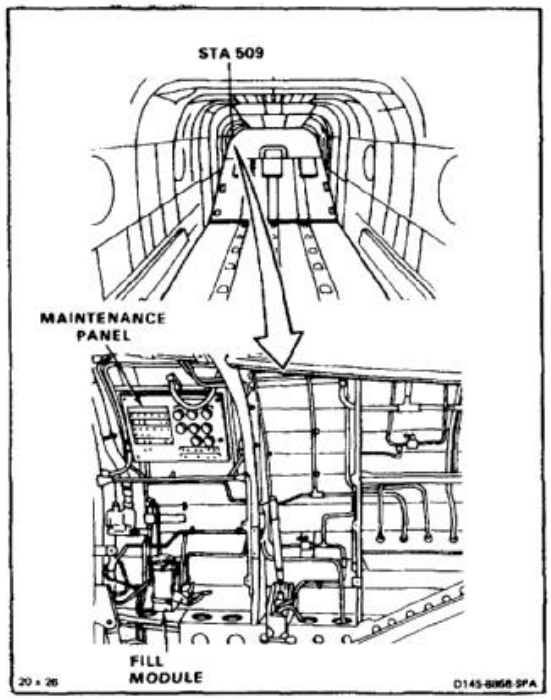
Medium Helicopter Repairer

***References:***

TM 55-1520-240-T

***Equipment Condition:***

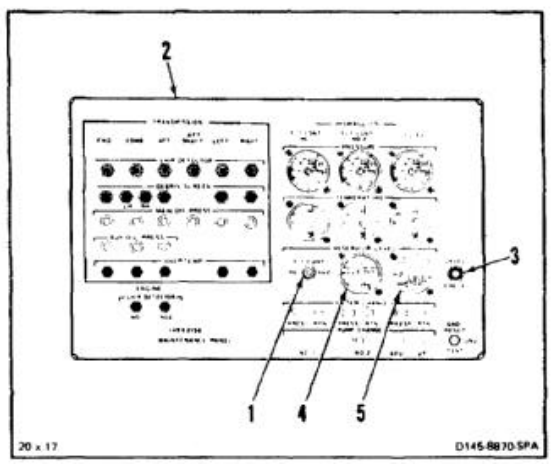
Battery Connected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Cargo Ramp Full Up or Fully Down (TM 55-1520-240-T)




**NOTE**

This procedure applies to utility hydraulic system and both flight control hydraulic systems.

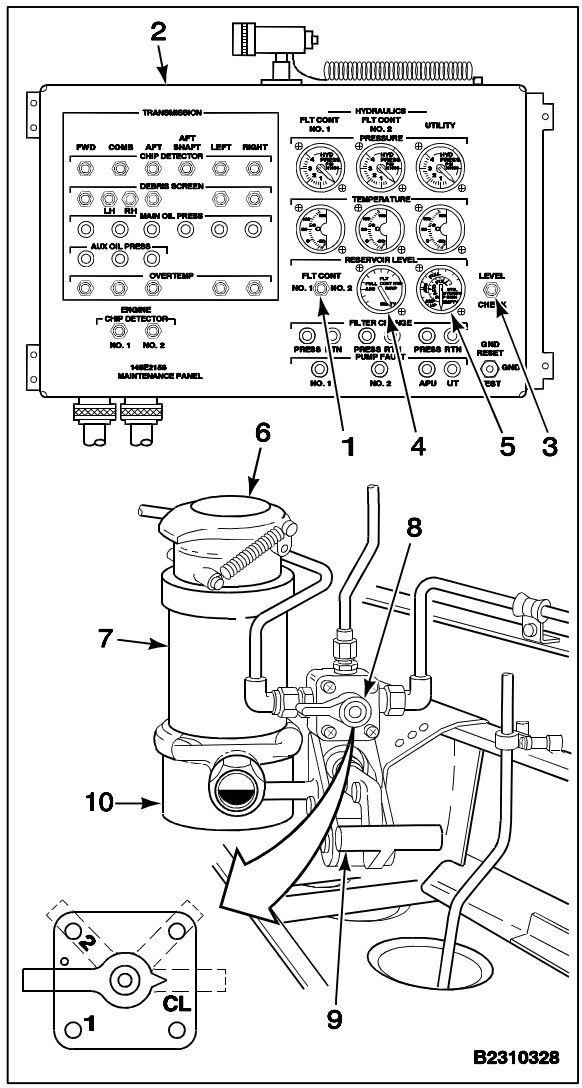
1. In aft cabin, set FLT CONT switch (1) on MAINTENANCE PANEL (2) to No. 1.
2. Press and hold LEVEL CHECK button (3). Read No. 1 flight control system reservoir fluid level on gage (4). Read utility system reservoir fluid level on gage (5).
3. Set switch (1) to No. 2. Read No. 2 flight control system reservoir fluid level on ramp-up scale of gage (4).
4. Release button (3). If all fluid level indications are FULL, go to Follow-On Maintenance.



**WARNING**

Hydraulic fluid (E199) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes for at least **15 minutes**. Get medical attention for eyes.

5. Open cap (6) on fill module (7). Fill with hydraulic fluid (E199).
6. Set selector valve (8) on fill module (7) to system to be filled.
7. Press and hold button (3) on panel (2). Observe fluid level on applicable gauge (4 or 5). Make sure selector switch (1) is set to correct position if filling flight control system. Operate fill module pump (9) until gauge (4 or 5) reads FULL.
8. Observe fluid level gauge (10) while operating pump (9). Keep gauge full of fluid (E199) at all times while pumping.
9. Repeat steps 6 thru 8 for other systems as required.
10. Release button (3) on panel (2).
11. Close cap (6) on fill module (7).
12. Set fill module selector valve (8) to CL.




***FOLLOW-ON MAINTENANCE:***

Disconnect battery (Task 1-39).

END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Source of High-Pressure Compressed Air or Nitrogen, With 0-3000 PSI Air Gauge and Pressure Regulator
Torque Wrench, 30-150 Inch-Pounds

***Materials:***

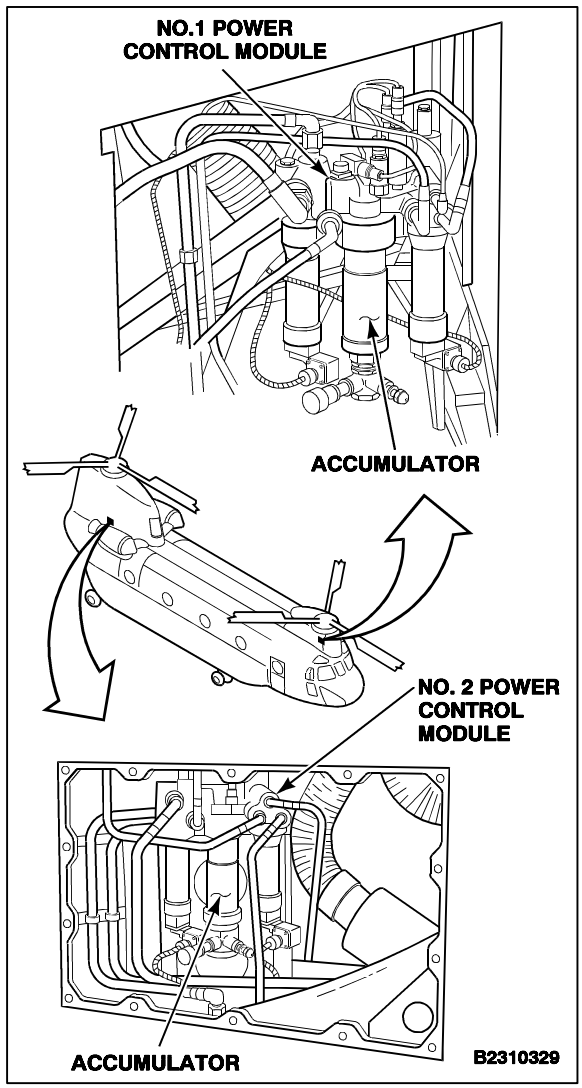
None

***Personnel Required:***

CH-47 Helicopter Repairer
Inspector

***Equipment Condition:***

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

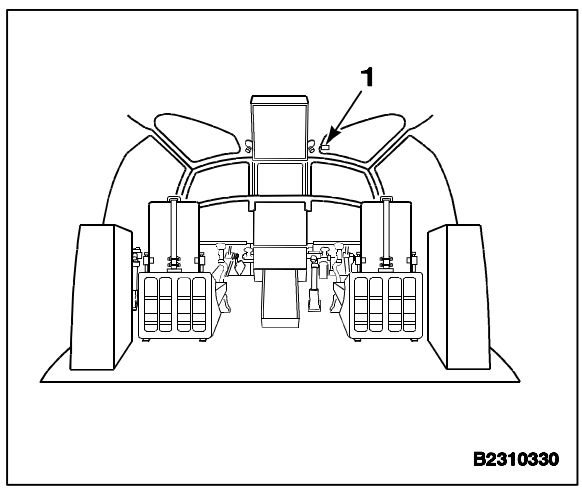



**NOTE**

There are two accumulators, one in No. 1 and one in No. 2 module. Procedure is same for servicing or depressurizing either accumulator.

1. Measure and record outside air temperature. Use fat gauge (1) in cockpit.

2. Deleted.



3. Read accumulator gauge (3). If indicated pressure is within maximum and minimum limits shown in chart, go to Follow-On Maintenance. If pressure is not within limits or you need to depressurize the accumulator, go to step 4.

**WARNING**

High pressure air trapped under valve cap can be a hazard. If cap is not removed slowly, air can pop it off and cause injury.

4. Loosen cap (4) on charging valve (5) **one or two turns**. Allow any trapped air to escape.

**WARNING**

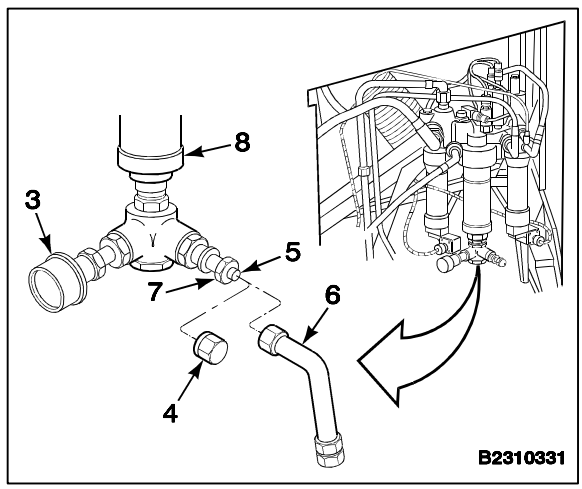
When depressurizing the accumulator, high pressure air will be released from the accumulator charging valve. Ensure body parts are well clear of high pressure air or injury will result.

5. Remove cap (4). To depressurize system accumulator, go to and complete step 6 and stop. To service system accumulator, connect chuck (6) from air source to valve (5) before going to step 6 and on.

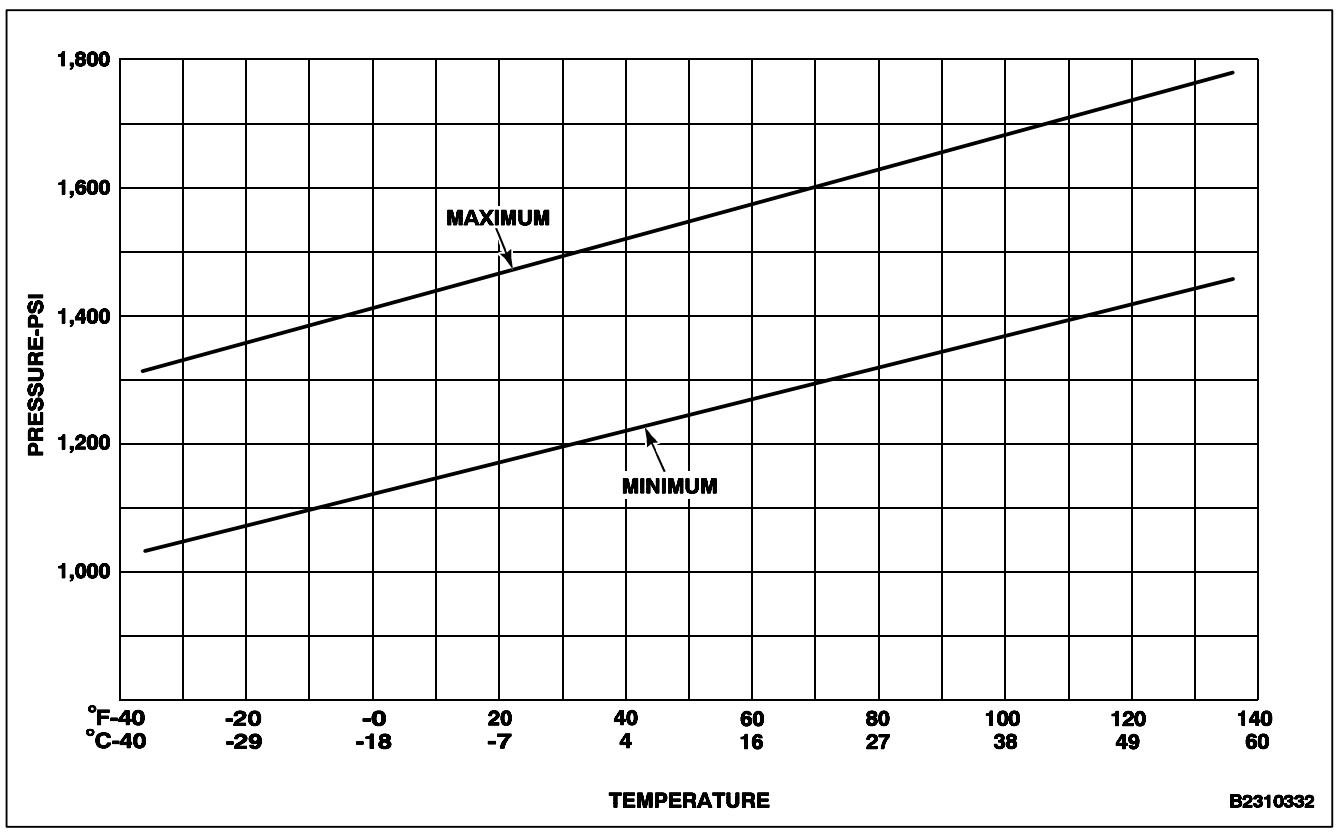
**CAUTION**

Depressurize accumulator slowly. Fast depressurization will result in internal damage to accumulator.

6. Turn valve outer nut (7) completely counterclockwise to open valve.

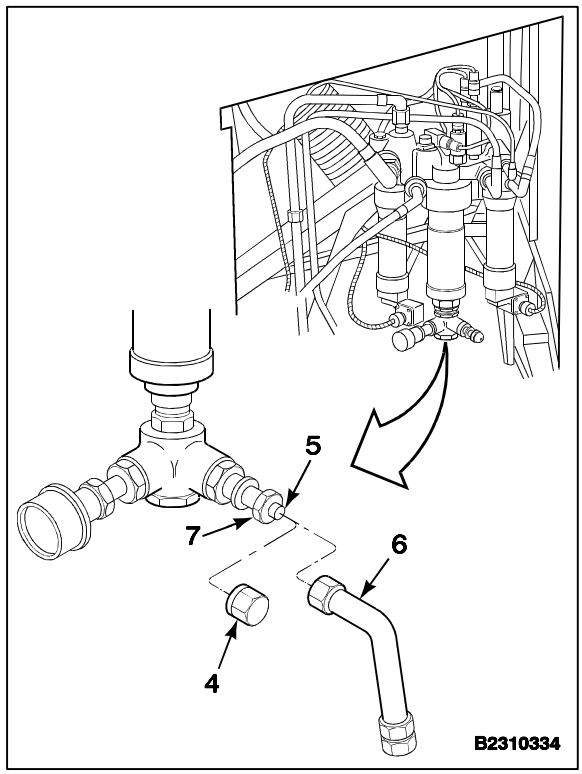



7. Charge accumulator (8) with dry air or nitrogen to pressure indicated in chart. Read pressure on gauge (3).



8. Tighten nut (7).
9. Shut off air source. Remove chuck (6).
10. Torque nut (7) to **60 inch-pounds**.
11. Install cap (4) on valve (5).

***INSPECT***




***FOLLOW-ON MAINTENANCE:***

Close right forward work platform (Task 2-2).
Close right pylon access door (Task 2-2).

END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Source of High-Pressure Compressed Air or Nitrogen, With 0-3000 PSI Air Gauge and Pressure Regulator
Torque Wrench, 30-150 Inch-Pounds

***Materials:***

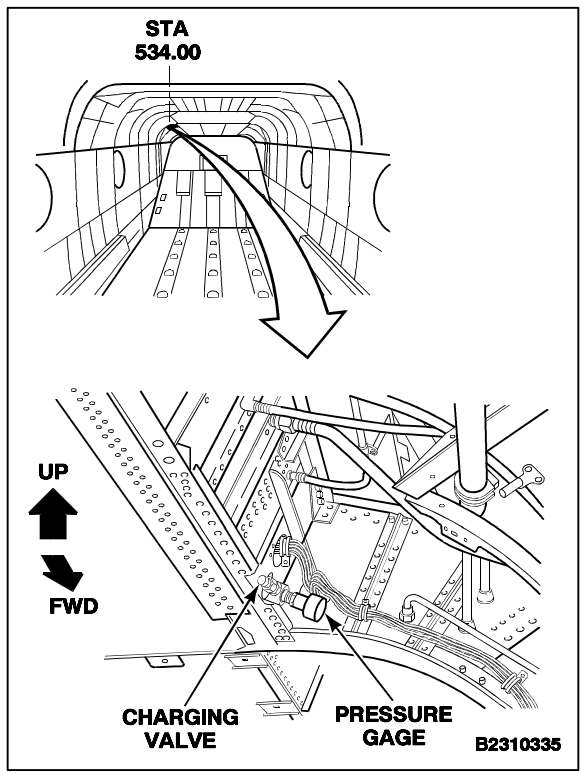
None

***Personnel Required:***

CH-47 Helicopter Repairer
Inspector

***Equipment Condition:***

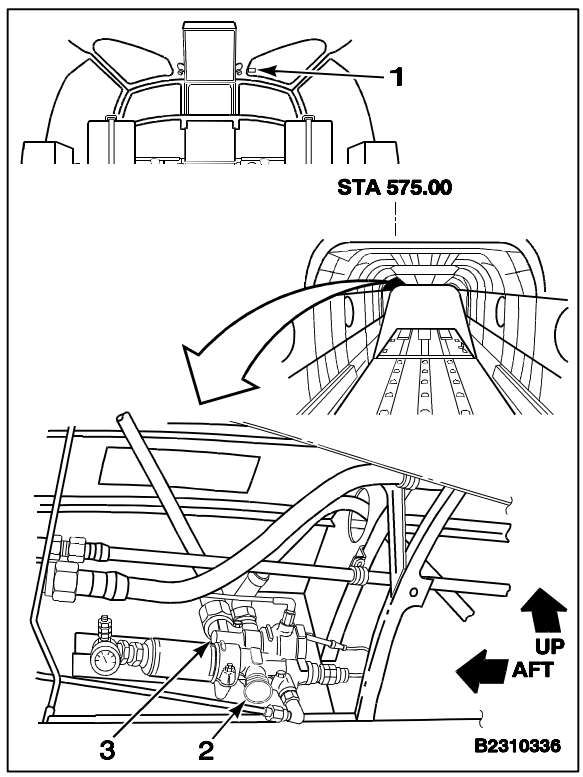
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Emergency Utility Pressure Valve at Normal (TM 55-1520-240-T)
Cargo Ramp Open and Level (TM 55-1520-240-T)




**WARNING**

Prior to checking or servicing APU start accumulator, visually check to ensure pressure gauge vent hole is free of all obstructions. There shall not be anything covering vent hole.

1. Measure and record outside air temperature. Use fat gauge (1) in cockpit.
2. Press depressurization valve (2) on APU start module (3). Hold valve until sound of depressurizing has stopped.



3. Read accumulator gauge (4). If indicated pressure is within maximum and minimum limits shown in chart below, go to step 12. If pressure is not within limits or your need is to depressurize the accumulator, go to step 4.

**WARNING**

High pressure air trapped under valve cap can be a hazard. If cap is not removed slowly, air can pop it off and cause injury.

4. Loosen cap (5) on charging valve (6) **one or two turns**. Allow any trapped air to escape.

**WARNING**

When depressurizing the accumulator, high pressure air will be released from the accumulator charging valve. Ensure body parts are well clear of high pressure air or injury will result.

5. Remove cap (5). To depressurize system accumulator, go to and complete step 6 and stop. To service system accumulator, connect chuck (7) from air source to valve (6) before going to step 6 and on.

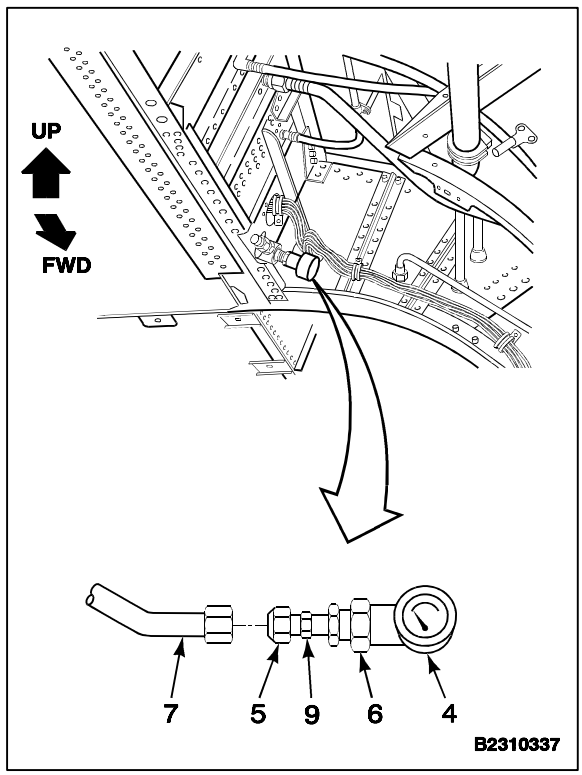
**CAUTION**

Depressurize accumulator slowly. Fast depressurization will result in internal damage to accumulator.

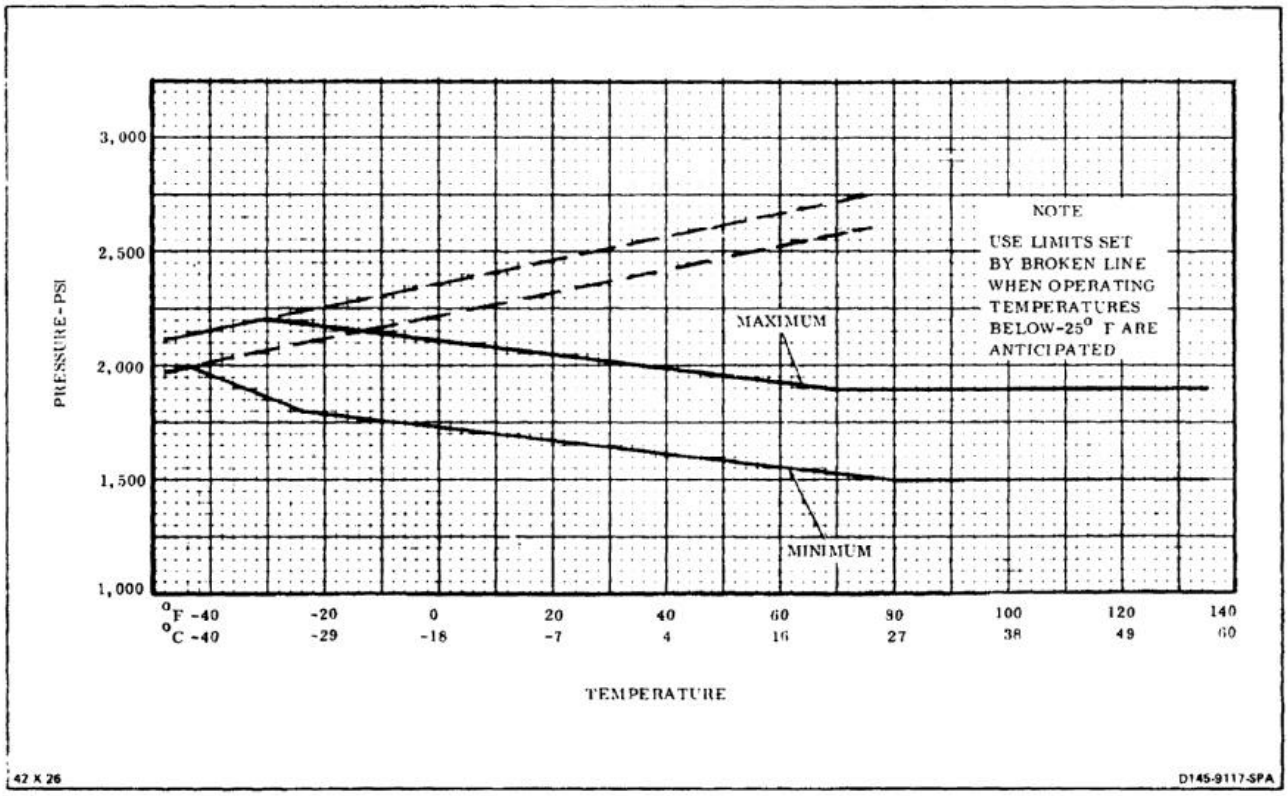
6. Hold body of valve (6) with wrench. Turn valve outer nut (9) to left **one or two turns** to open valve.

7. Charge accumulator with dry air or nitrogen to pressure indicated in the following chart. Read pressure on gauge (4).

8. Tighten nut (9).



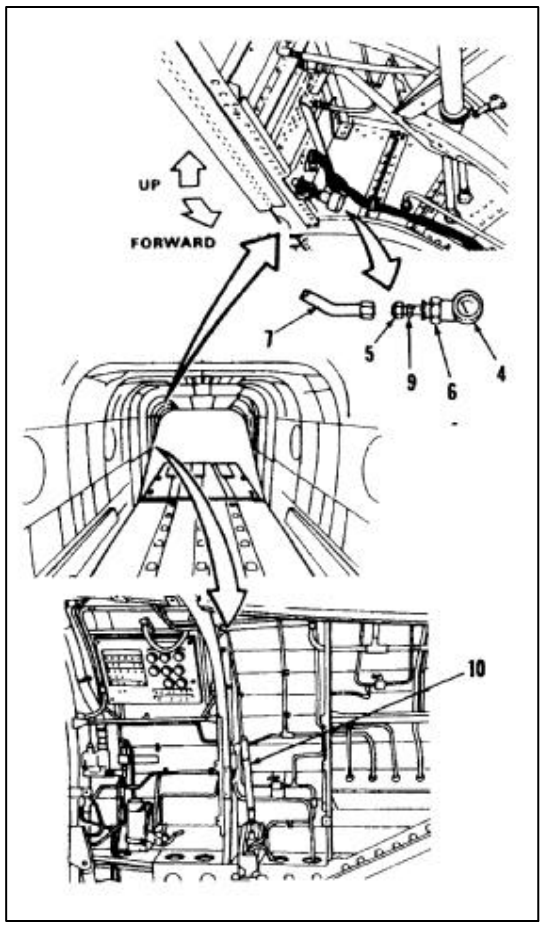
## 1-64 SERVICE UTILITY SYSTEM APU START ACCUMULATOR (Continued) 1-64



9. Shut off air source. Remove chuck (7).
10. Torque nut (9) to **60 inch-pounds**.
11. Install cap (5) on valve (6).

***INSPECT***

12. Charge accumulator. Use hand pump (10). Read pressure on accumulator gage (4). If temperature is above **25ºF (–4ºC)**, charge accumulator to **3000 psi**. If temperature is below **25ºF (–4ºC)**, charge accumulator to **3350 psi** or until pointer of accumulator gage stops moving, whichever occurs first.




***FOLLOW-ON MAINTENANCE:***

Check utility hydraulic reservoir level (Task 1-62).

END OF TASK

## 1-65 SERVICE UTILITY SYSTEM APU START MODULE ACCUMULATOR 1-65

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Source of High-Pressure Compressed Air or Nitrogen with 0-3000 Psi Air Gage and Pressure Regulator
Torque Wrench, 30 to 150 Inch-Pounds

***Materials:***

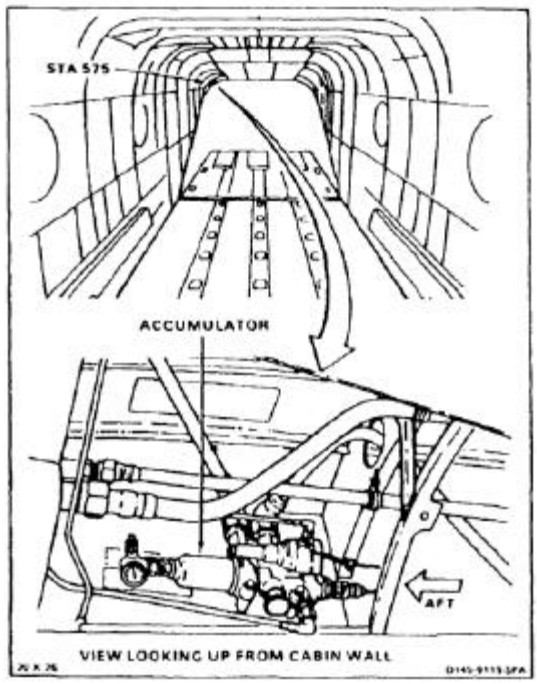
Lockwire (E231)

***Personnel Required:***

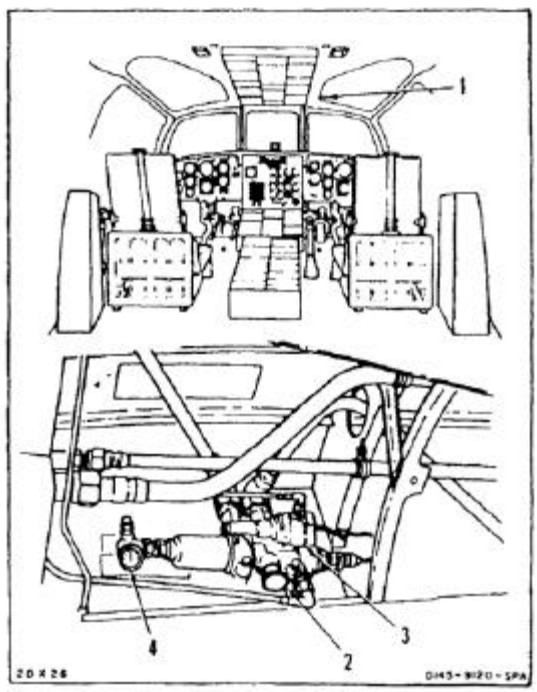
Medium Helicopter Repairer
Inspector

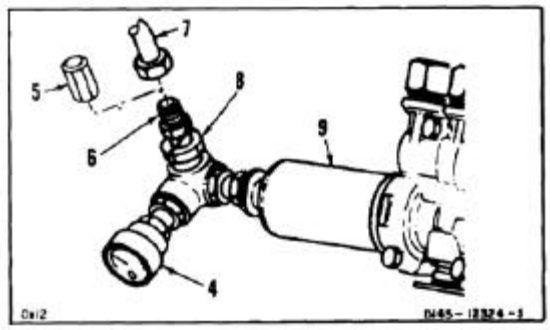
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Emergency Utility Pressure Valve to Open (TM 55-1520-240-T)
Cargo Ramp Open and Level (TM 55-1520-240-T)




1. Measure and record outside air temperature. Use fat gage (1) in cockpit.
2. Press depressurization valve (2) on APU start module (3). Hold valve until sound of depressurizing has stopped.
3. Read accumulator gage (4).



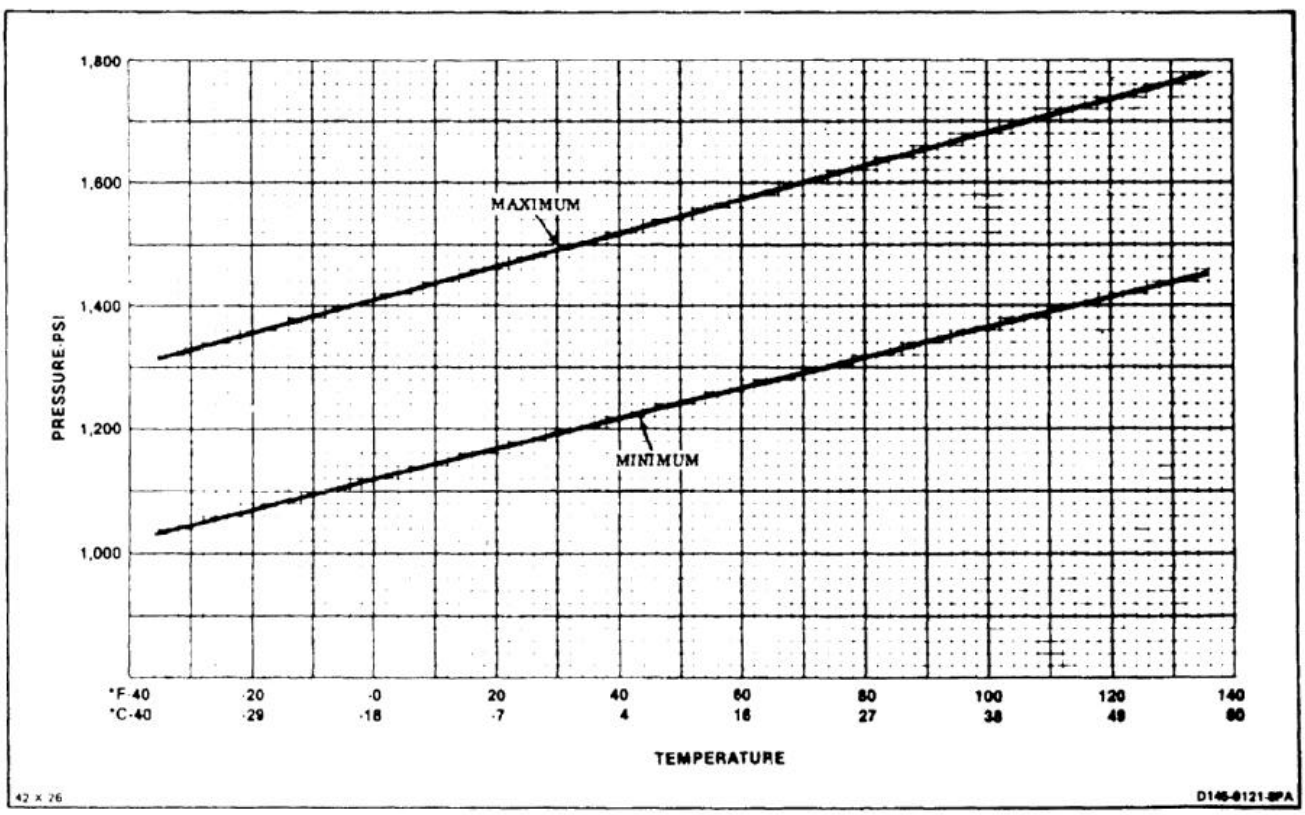



4. If pressure indicated on gage (4) is within maximum and minimum limits shown in chart, go to step 12. If pressure is not within limits, go to step 5.

**WARNING**

High pressure air trapped under valve cap can be a hazard. If cap is not removed slowly, air can pop it off and cause injury.

5. Loosen cap (5) on charging valve (6) **one or two turns**. Let any trapped air escape.
6. Remove cap (5). Connect chuck (7) from air source to valve (6).
7. Remove lockwire from outer nut (8). Hold body of valve (6) with wrench. Turn valve outer nut to left **one or two turns** to open valve.
8. Charge accumulator (9) with dry air or nitrogen to pressure indicated in chart. Read pressure on gage (4).
9. Tighten nut (8).
10. Shut off air source. Remove chuck (7).



11. Torque nut (8) to **60 inch-pounds**. Install lockwire (E231).

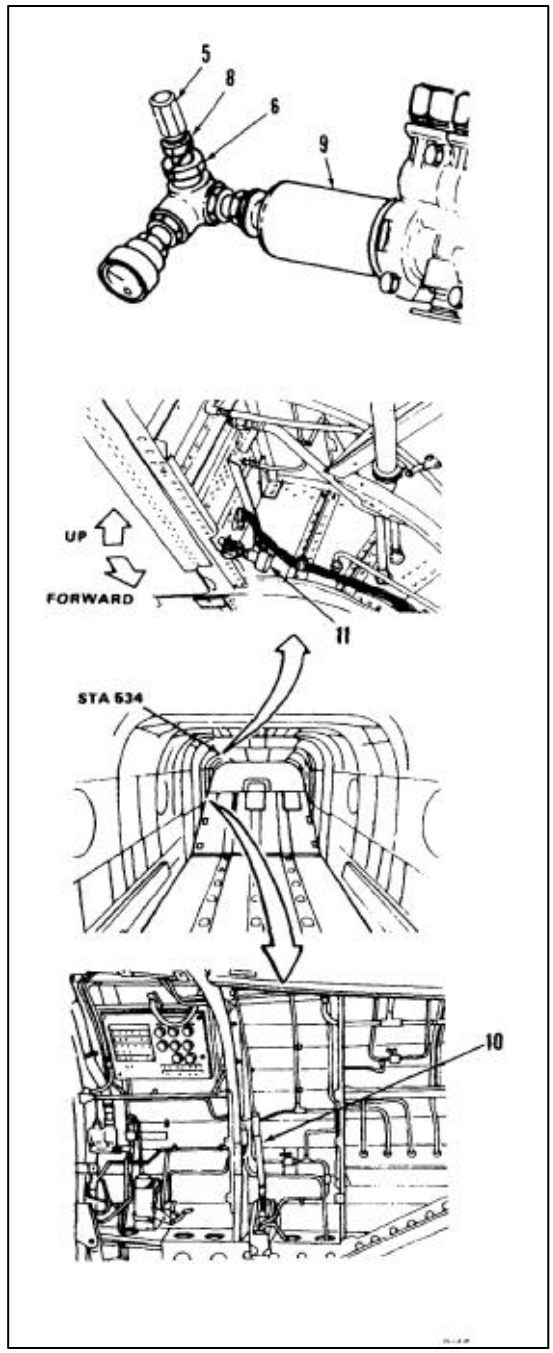
12. Install cap (5) on valve (6).

***INSPECT***

13. Charge accumulator (9). Use hand pump (10). Read pressure on accumulator gage (11). If temperature is above –**25ºF (–32ºC)**, charge accumulator to **3000 psi**. If temperature is below –**25ºF (–32ºC)**, charge accumulator to **3350 psi** or until pointer of accumulator gage stops moving, whichever occurs first.

***FOLLOW-ON MAINTENANCE:***

Check utility hydraulic reservoir level (Task 1-62).




END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Thermometer
Source of High-Pressure Compressed Air or Nitrogen, With 0-3000 Psi Air Gage and Pressure Regulator
Torque Wrench, 30 to 150 Inch-Pounds

***Materials:***

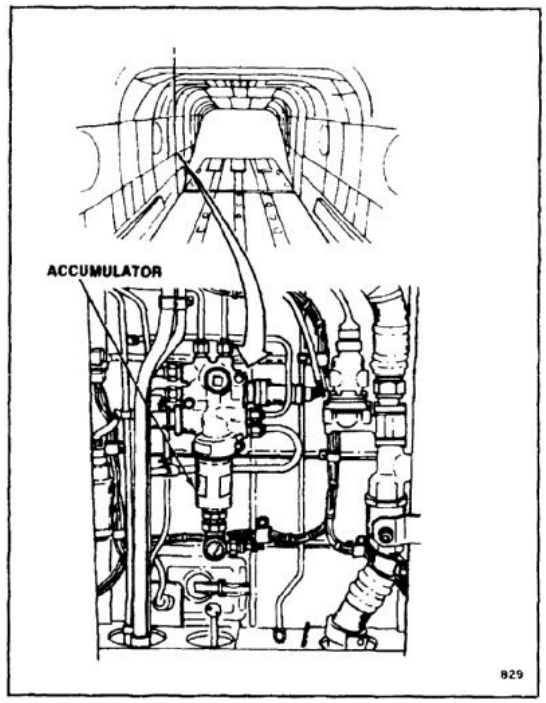
None

***Personnel Required:***

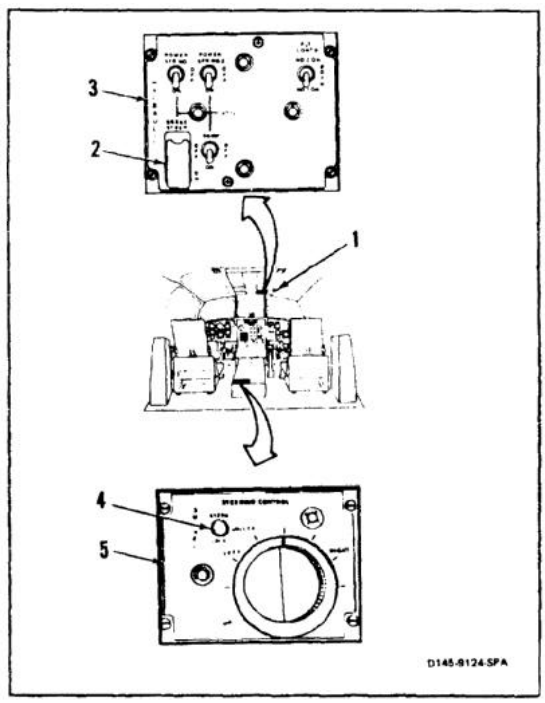
Medium Helicopter Repairer
Inspector

***Equipment Condition:***

Battery Connected (Task 1-39)
Electrical Power On
Hydraulic Power Off
Emergency Utility Pressure Valve Normal (TM 55-1520-240-T)




1. Measure and record outside air temperature. Use fat gage (1) in cockpit.
2. Set BRAKE STEER switch (2) on cockpit HYDRAULIC panel (3) to OFF.
3. Cycle SWIVEL switch (4) on cockpit STEERING CONTROL panel (5) five times between LOCK and UNLOCK positions.
4. Remove electrical power.



5. Read accumulator gage (6) If indicated pressure is within maximum and minimum limits shown on chart below, go to Follow-On Maintenance. If pressure is not within limits or your need is to depressurize the accumulator, go to step 6.

**WARNING**

High pressure air trapped under valve cap can be a hazard. If cap is not removed slowly, air can pop it off and cause injury.

6. Loosen cap (7) on charging valve (8) **one or two turns**. Allow any trapped air to escape.

**WARNING**

When depressurizing the accumulator, high pressure air will be released from the accumulator charging valve. Ensure body parts are well clear of high pressure air or injury will result.

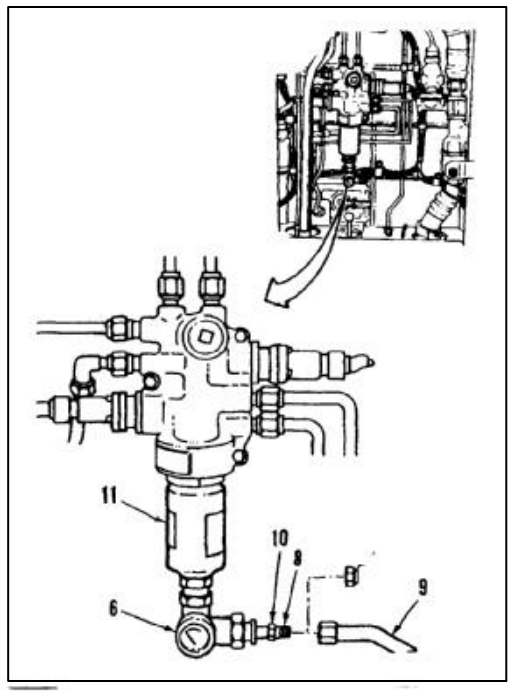
7. Remove cap (7). To depressurize system accumulator, go to and complete step 8 and stop. To service system accumulator connect chuck (9) from air source to valve (8) before going to step 8 and on.

**CAUTION**

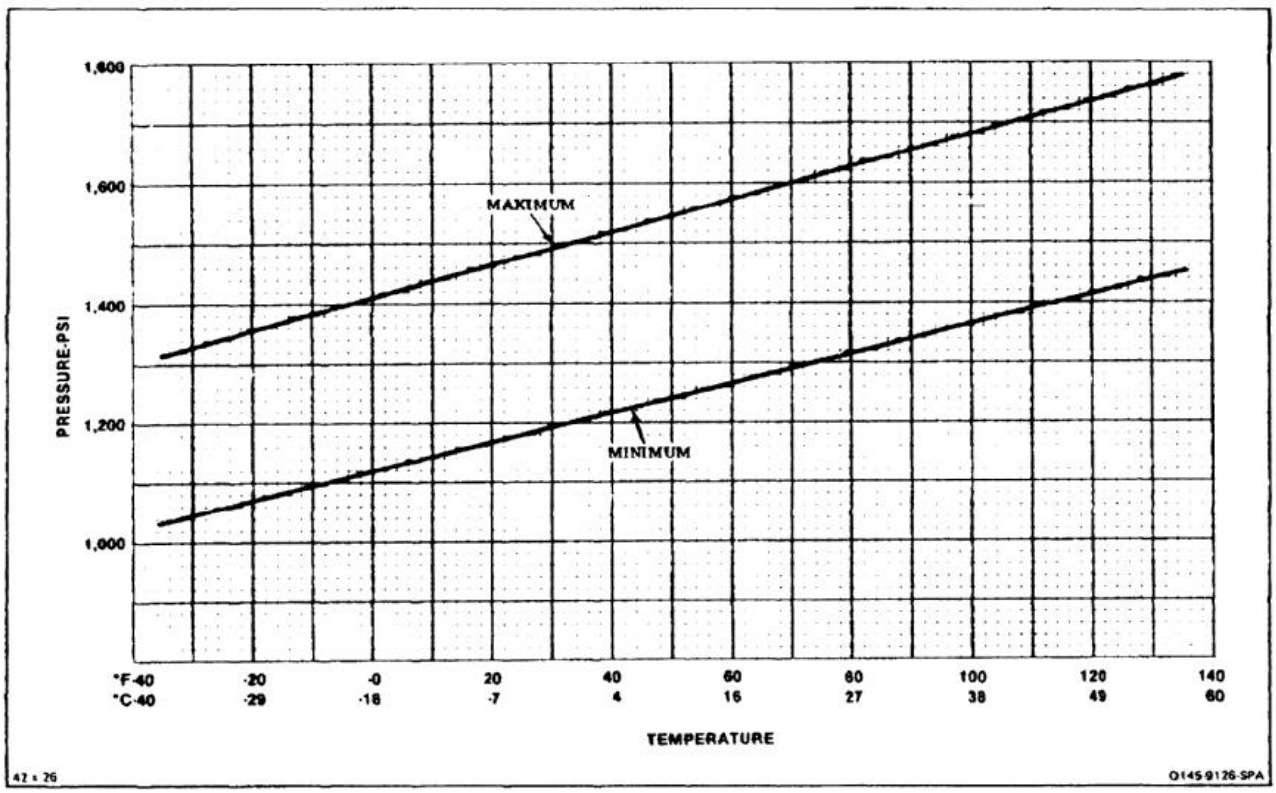
Depressurize accumulator slowly. Fast depressurization will result in internal damage to accumulator.

8. Hold body of valve (8) with wrench. Turn valve outer nut **one or two turns** to open valve.

9. Charge accumulator (11) with dry air or nitrogen to pressure indicated in the following chart. Read pressure on gage (6).

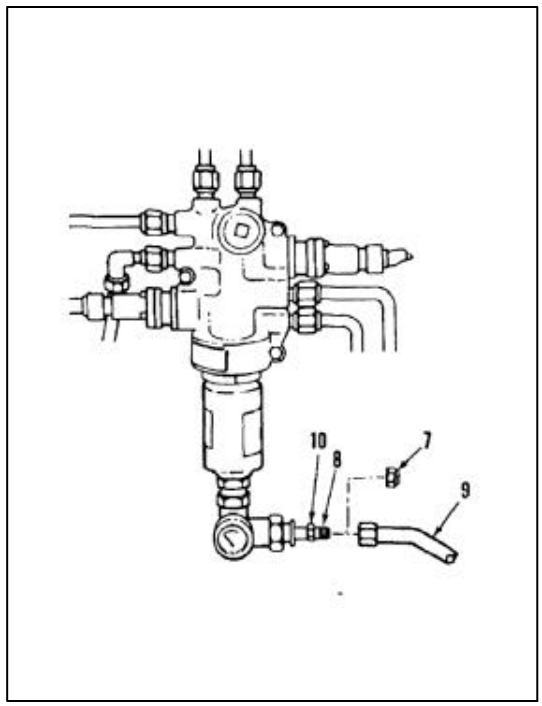


## 1-66 SERVICE UTILITY SYSTEM POWER STEERING/SWIVEL LOCK ACCUMULATOR (Continued) 1-66



10. Tighten nut (10).
11. Shut off air source. Remove chuck (9).
12. Torque nut (10) to **60 inch-pounds**.
13. Install cap (7) on valve (8).

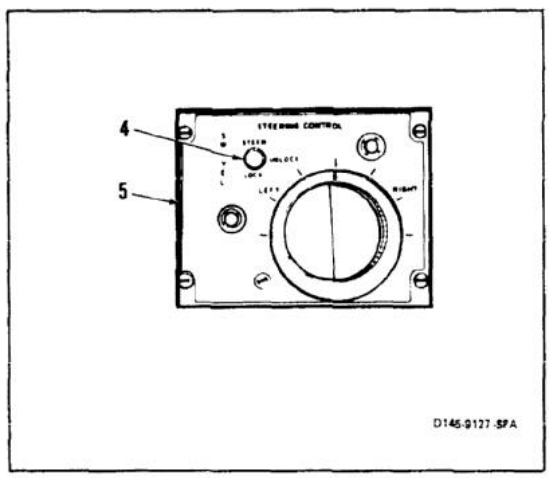
***INSPECT***




14. Set SWIVEL switch (4) on cockpit STEERING CONTROL panel (5) to UNLOCK position.

***FOLLOW-ON MAINTENANCE:***

Disconnect battery (Task 1-39).




END OF TASK

## 1-67 SERVICE UTILITY SYSTEM WHEEL BRAKE ACCUMLATOR 1-67

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Source of High Pressure Compressed Air or Nitrogen, With 0-3000 Psi Air Gage and Pressure Regulator
Torque Wrench, 30 to 150 Inch-Pounds

***Materials:***

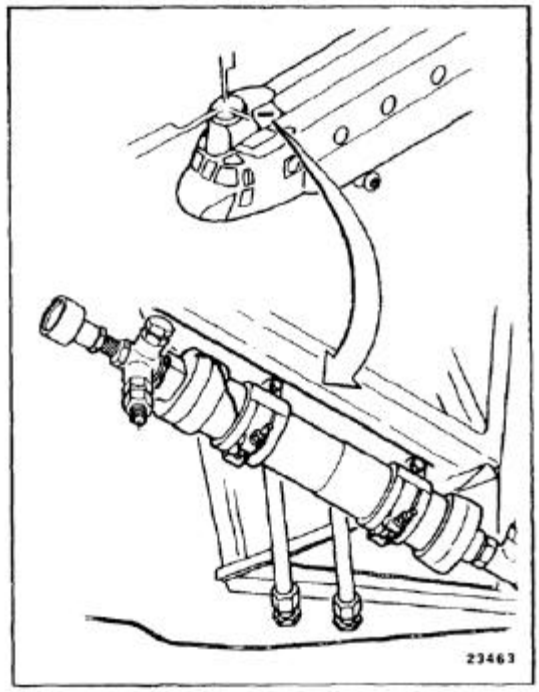
None

***Personnel Required:***

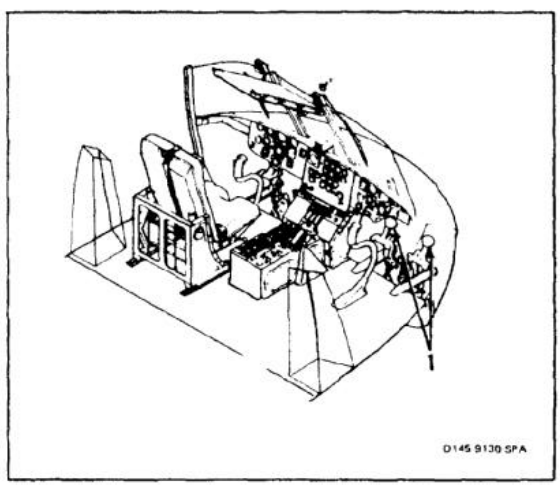
Medium Helicopter Repairer
Inspector

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Forward Fairing Left Work Platform Open (Task 2-2)
Emergency Utility Pressure Valve at Normal (TM 55-1520-240-T)




1. Operate cockpit foot brake pedals (1) ten times to relieve system pressure.



2. Read accumulator gage (2). If indicated pressure is greater than **600 psi** and less than **850 psi**, go to Follow-On Maintenance. If indicated pressure is less than **600 psi** or greater than **850 psi**, go to step 3.

**WARNING**

High pressure air trapped under valve cap can be a hazard. If cap is not removed slowly, air can pop it off and cause injury.

3. Loosen cap (3) on charging valve (4) one or two turns. Allow any trapped air to escape.

**WARNING**

When depressurizing the accumulator, high pressure air will be released from the accumulator charging valve. Ensure body parts are well clear of high pressure air or injury will result.

4. Remove cap (3). To depressurize system accumulator, go to and complete step 5 and stop. To service system accumulator, connect chuck (5) from air source to valve (4) before going to step 5 and on.

**CAUTION**

Depressurize accumulator slowly. Fast depressurization will result in internal damage to the accumulator.

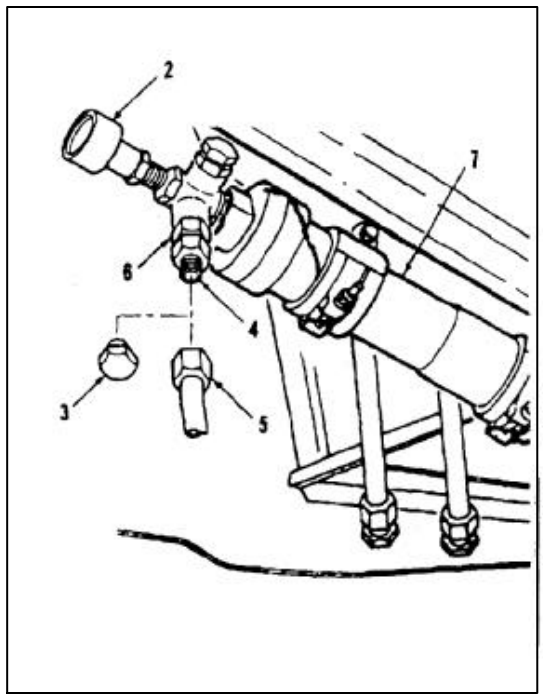
5. Hold body of valve (4) with wrench. Turn valve outer nut completely counterclockwise to open valve.
6. Charge accumulator (7) with dry air or nitrogen to **700 psi**.
7. Tighten outer nut of valve (4). Torque to **60 inch-pounds**.
8. Lockwire nut (6). Use lockwire (E231).

***INSPECT***

9. Shut off air source. Remove chuck (5).
10. Install cap (3) on valve (4).

***FOLLOW-ON MAINTENANCE:***

Close forward fairing left work platform (Task 2-2).




END OF TASK

## 1-68 SERVICE UTILITY SYSTEM RESERVOIR PRESSURIZATION ACCUMULATOR 1-68

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Source of High Pressure Compressed Air or Nitrogen, with 0-3000 Psi Air Gage and Pressure Regulator
Torque Wrench, 30 to 150 Inch Pounds

***Materials:***

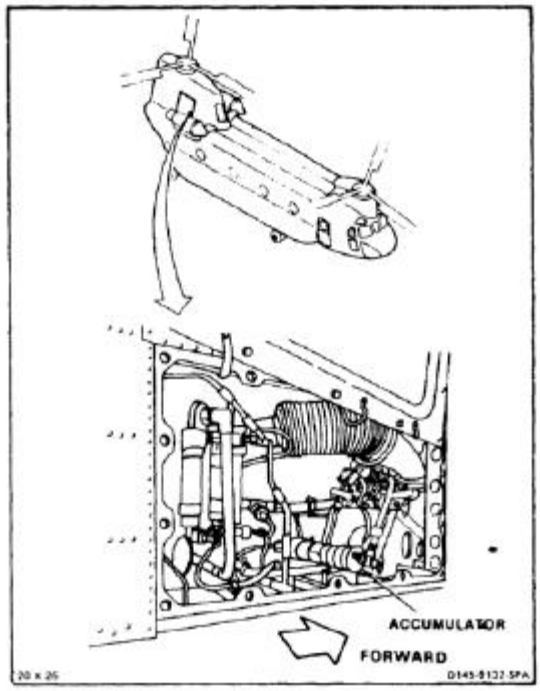
Lockwire (E231)

***Personnel Required:***

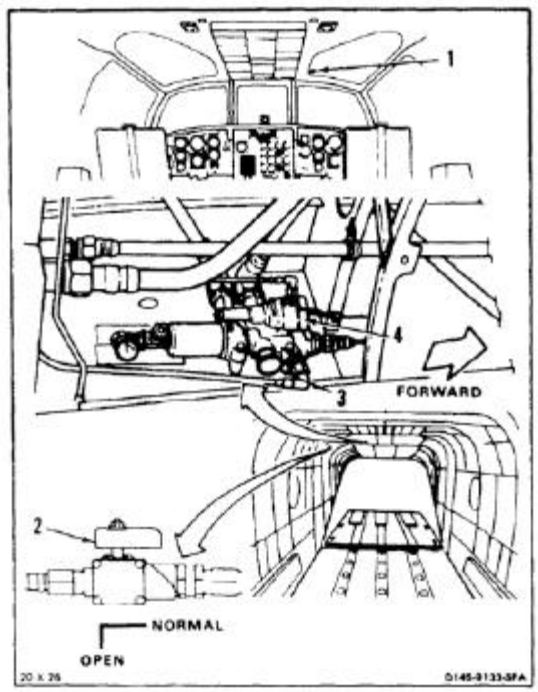
Medium Helicopter Repairer
Inspector

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Pylon Right Access Door Open (Task 2-2)
Cargo Ramp Open and Level (TM 55-1520-240-T)




1. Measure and record outside air temperature. Use fat gage (1) in cockpit.
2. Set UTILITY RESERVOIR DEPRESSURIZE valve (2) to OPEN.
3. Press and hold depressurization valve (3) on APU start module (4) until accumulators have discharged completely.
4. Release valve (3).
5. Set UTILITY RESERVOIR DEPRESSURIZE valve (2) to NORMAL.

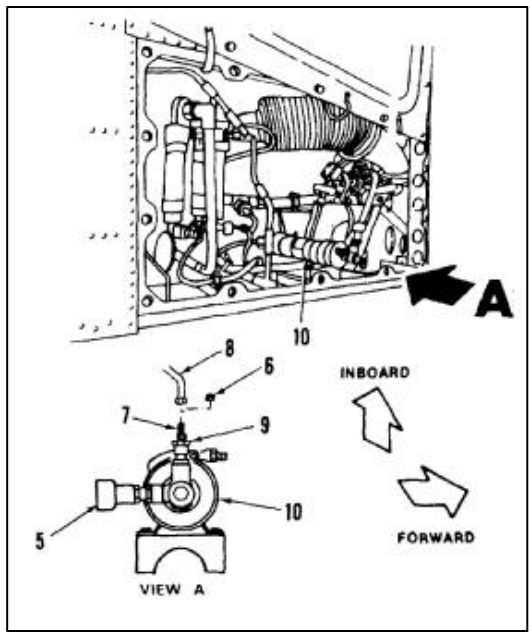


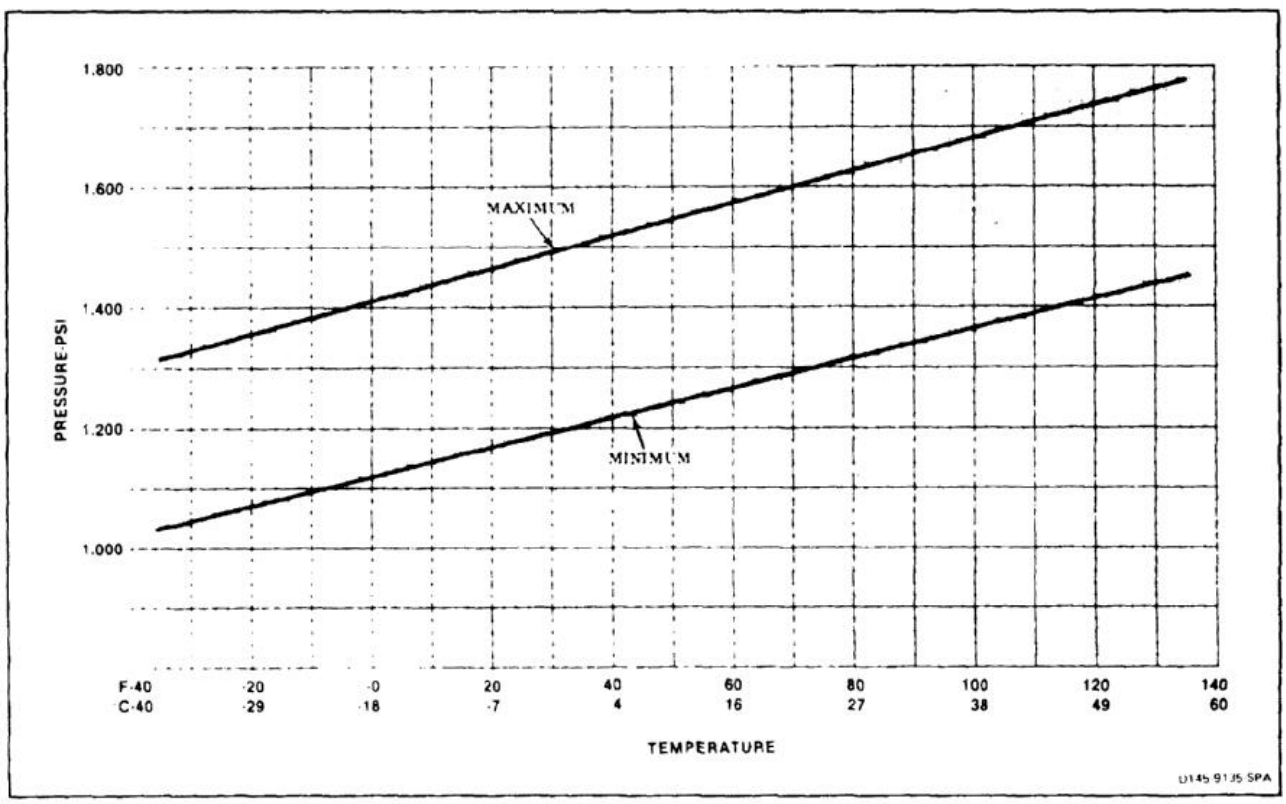
6. Read accumulator gage (5). If indicated pressure is within maximum and minimum limits shown in chart below, go to step 15. If pressure is not within limits, go to step 7.

**WARNING**

High pressure air trapped under valve cap can be a hazard. If cap is not removed slowly, air can pop it off and cause injury.

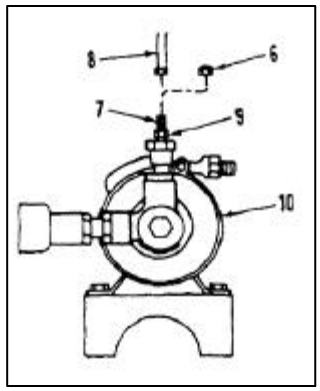
7. Loosen cap (6) on charging valve (7) **one or two turns**. Allow any trapped air to escape.
8. Remove cap (6). Connect chuck (8) from air source to valve (7).
9. Remove lockwire from outer nut (9). Hold body of valve (7) with wrench. Turn outer nut **one or two turns** to open valve.
10. Charge accumulator (10) with dry air or nitrogen to pressure indicated in chart below. Read pressure on gage (5).
11. Tighten nut (9).



12. Shut off air source. Remove chuck (8).
13. Torque nut (9) to **60 inch-pounds**. Install lockwire (E231).
14. Install cap (6) on valve (7).

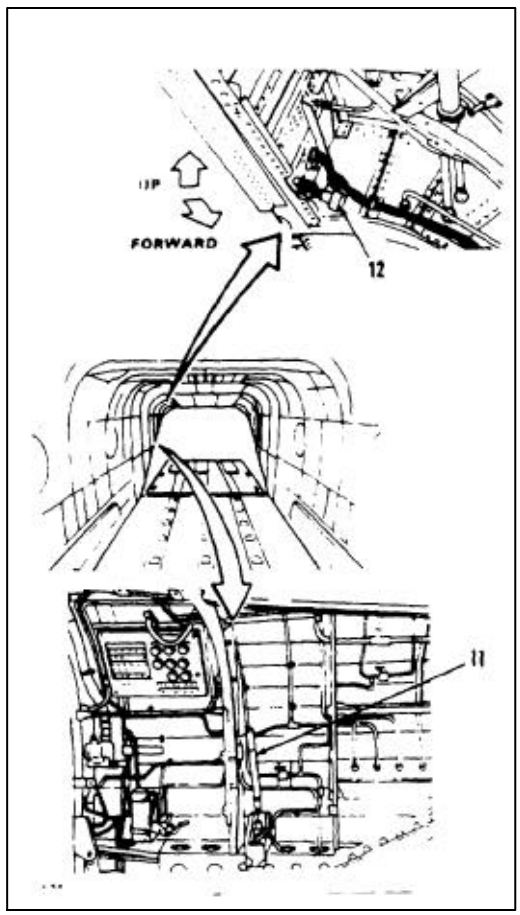
***INSPECT***




15. Charge accumulators. Use hand pump (11). Read pressure on APU start accumulator gage (12). If temperature is above –**25ºF (**–**32ºC)**, charge accumulator to **3000 psi**. If temperature is below –**25ºF (**–**32ºC)** charge accumulator to **3350 psi** or until pointer of accumulator gage stops moving, whichever occurs first.

***FOLLOW-ON MAINTENANCE:***

Close pylon right access door (Task 2-2).
Check utility hydraulic reservoir level (Task 1-62).




END OF TASK

## 1-69 SERVICE FORWARD LANDING GEAR SHOCK STRUT (FLUID) 1-69

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4690
Funnel
Source of Compressed Air
Torque Wrenched, 100 to 750 Inch-Pounds
Crowfoot Attachment, 1 Inch

***Materials:***

Cloths (E120)
Hydraulic Fluid (E197)
Lockwire (E231)
Gloves (E186)

***Parts:***

Packings

***Personnel Required:***

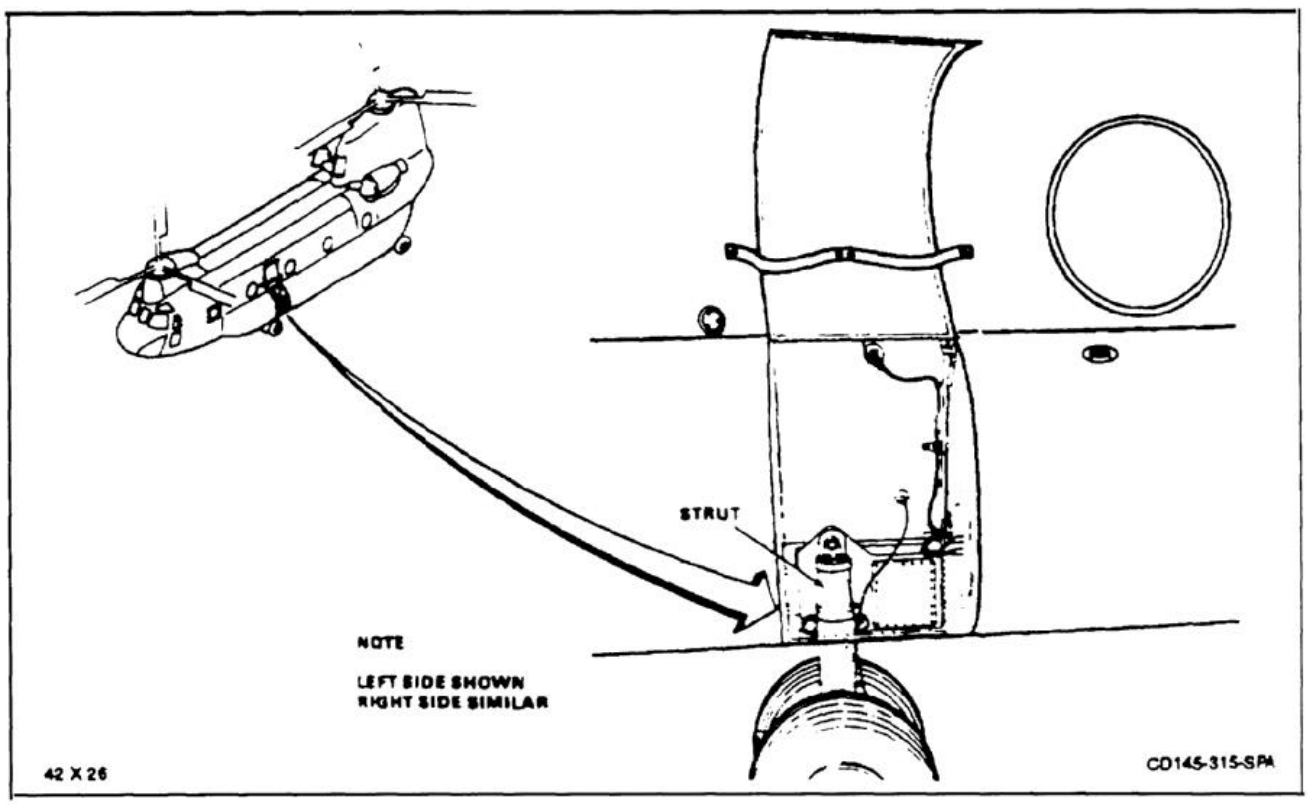
Medium Helicopter Repair (2)
Inspector

***References:***

TM 55-1520-240-23P

***Equipment Condition:***

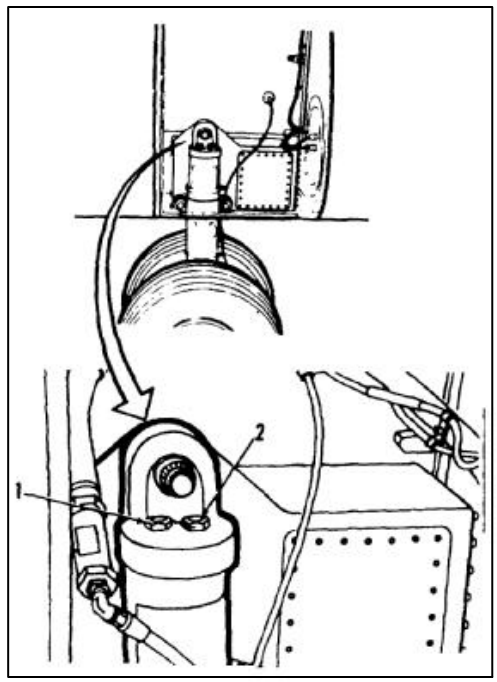
Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Both Forward Gear Access Panels Open (Task 2-2)
Both Forward Landing Gear Shock Struts Deflated (Task 1-71)



**NOTE**

Service left and right shock struts in same way. Left strut is shown here.

1. Remove lockwire from two filler plugs (1 and 2).



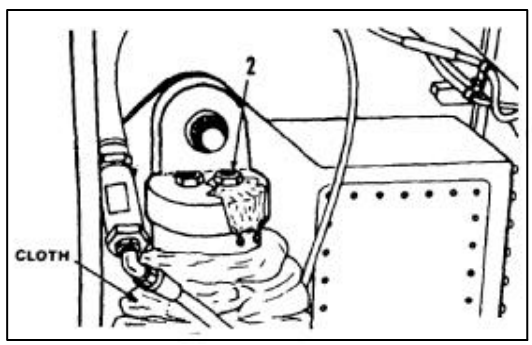

**WARNING**

Strut fluid may be under pressure. Loosen plug slowly to allow any pressurized fluid out safely. Otherwise, personal injury can result. If hit by fluid, flush skin with water. Get medical attention for eyes.

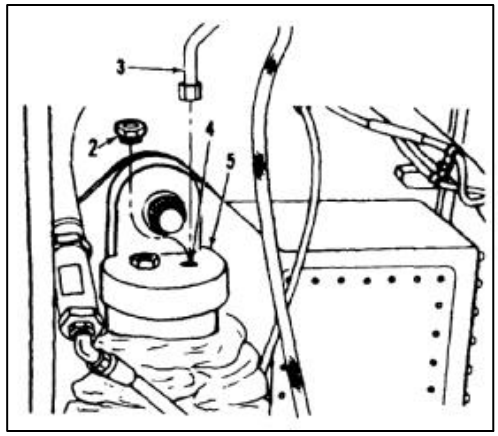
**NOTE**

Placing cloths around strut before loosening plugs will absorb released fluid.

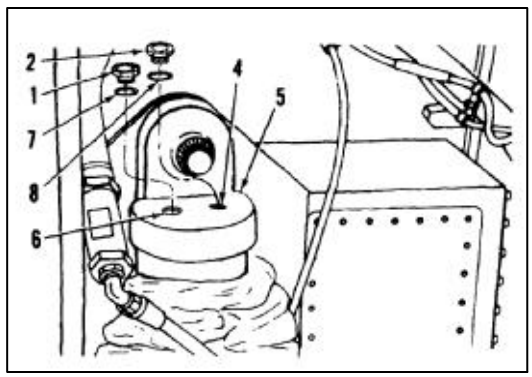
2. Loosen plug (2) slowly. Wait for pressure to bleed off.



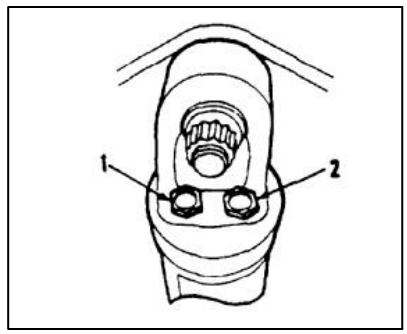
3. Remove aft plug (2). Hold air chuck (3) from source of compressed air over open port (4). Pressurize strut (5) through port at **50 to 100 psi for 5 seconds**.



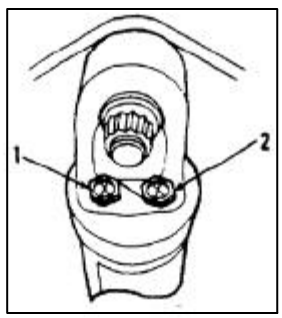

4. Remove forward plug (1).
5. Hand-fill strut (5) with hydraulic fluid (E197) through aft port (4). Fill until bubble-free fluid begins to flow from forward port (6).
6. Coat new packing (7) with hydraulic fluid (E197). Install packing on plug (1). Install plug in forward port (6).
7. Continue to fill strut (5) through aft port (4) until port is filled with bubble-free fluid.
8. Coat new packing (8) with hydraulic fluid (E197). Install packing on plug (2). Install plug in aft port (4).
9. Remove cloths, if used. Clean fluid from strut as needed. Use cloths (E120).



10. Torque plugs (1 and 2) to **250 inch-pounds**. Use **1 inch** crowfoot attachment.




11. Lockwire plugs (1 and 2) together. Use lockwire (E231).




**NOTE**

Task is not finished until both forward struts are serviced in same way.

12. Repeat steps 1 thru 11 for right gear.

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Service both forward landing gear shock struts with air (Task 1-71).
Close both forward landing gear access panels (Task 2-2).

END OF TASK

## 1-70 SERVICING AFT LANDING GEAR SHOCK STRUT (FLUID) 1-70

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Funnel
Source of Compressed Air
Torque Wrench, 100 to 750 Inch-Pounds

***Materials:***

Cloths (E120)
Hydraulic Fluid (E197)
Lockwire (E231)
Gloves (E186)

***Parts:***

Packings

***Personnel Required:***

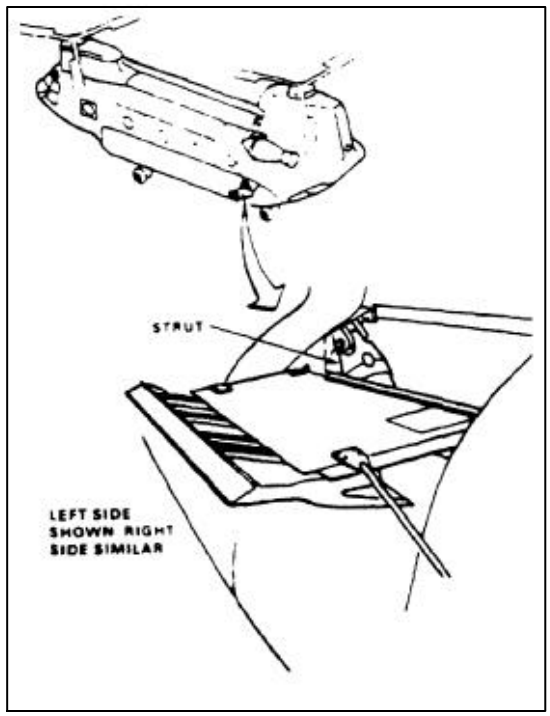
Medium Helicopter Repairer (2)
Inspector

***References:***

TM 55-1520-240-23P

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Both Aft Work Platforms Opened (Task 2-2)
Both Aft Landing Gear Shock Struts Deflated (Task 1-72)




**NOTE**

Service left and right struts in same way. Left strut is shown here.

1. Remove lockwire from two filter plugs (1 and 2).

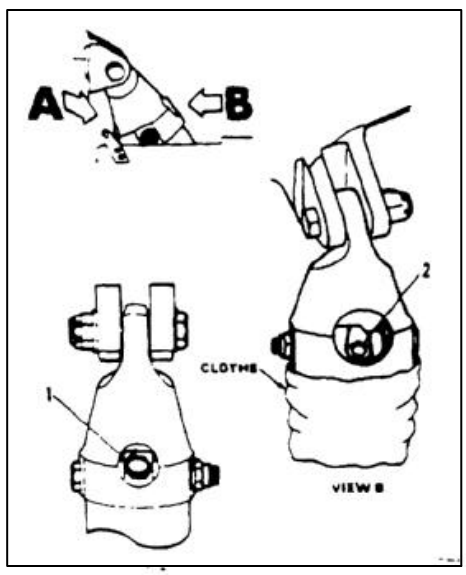
**WARNING**

Strut fluid may be under pressure. Loosen plug slowly to allow any pressurized fluid out safety. Otherwise, personal injury can result. If hit by fluid, flush side with water. Get medical attention for eyes.

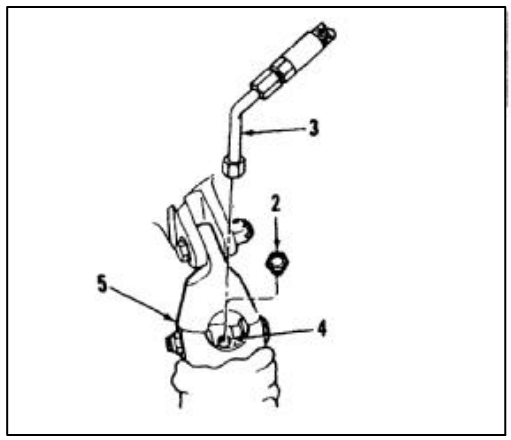
**NOTE**

Placing cloths around strut before loosening plug will absorb released fluid.

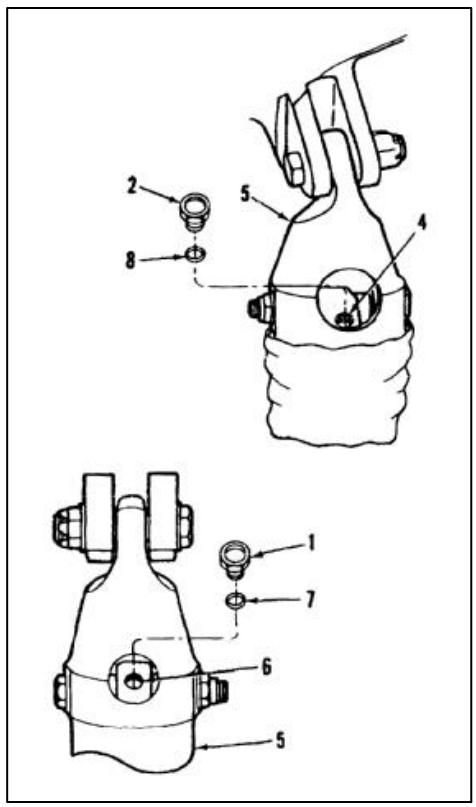
2. Loosen aft (upper) plug (2) slowly. Wait for pressure to bleed off.



3. Remove aft (upper) plug (2). Hold air chuck (3) from source of compressed air over open port (4). Pressurize strut (5) through port at **50 to 100 psi for 5 seconds**.




4. Remove forward (lower) plug (1).
5. Fill strut (5) with hydraulic fluid (E197) through aft port (4). Fill until bubble-free fluid begins to flow from forward port (6).
6. Coat new packing (7) with hydraulic fluid (E197). Install packing on plug (1). Install plug in forward port (6).
7. Continue to fill strut (5) through aft port (4) until port is filled with bubble-free fluid.
8. Coat new packing (8) with hydraulic fluid (E197). Install packing on plug (2). Install plug in aft port (4).
9. Remove cloths, if used. Clean fluid from strut as needed. Use cloths (E120).



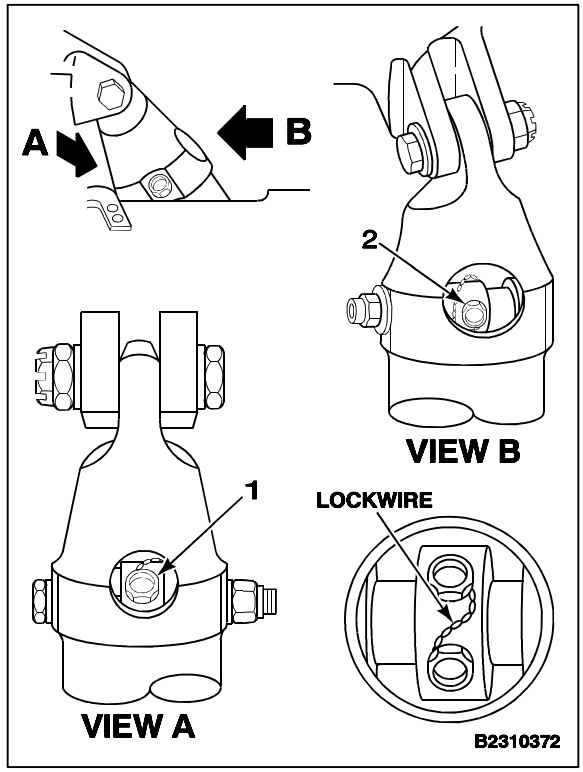
10. Torque plugs (1 and 2) to **250 inch-pounds**.
11. Secure plugs (1 and 2) together with lockwire (E231).

**NOTE**

Task is not done until both aft struts are serviced in same way.

12. Repeat steps 1 thru 11 for aft right strut.

***INSPECT***




***FOLLOW-ON MAINTENANCE:***

Service both aft landing gear shock struts with air (Task 1-72).
Close both aft work platforms (Task 2-2).

END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Source of High-Pressure Compressed Air, With 0-3000 PSI Pressure Gauge and Pressure Regulator
Torque Wrench, 30-150 Inch-Pounds

***Materials:***

None

***Personnel Required:***

CH-47 Helicopter Repairer (2)
Inspector

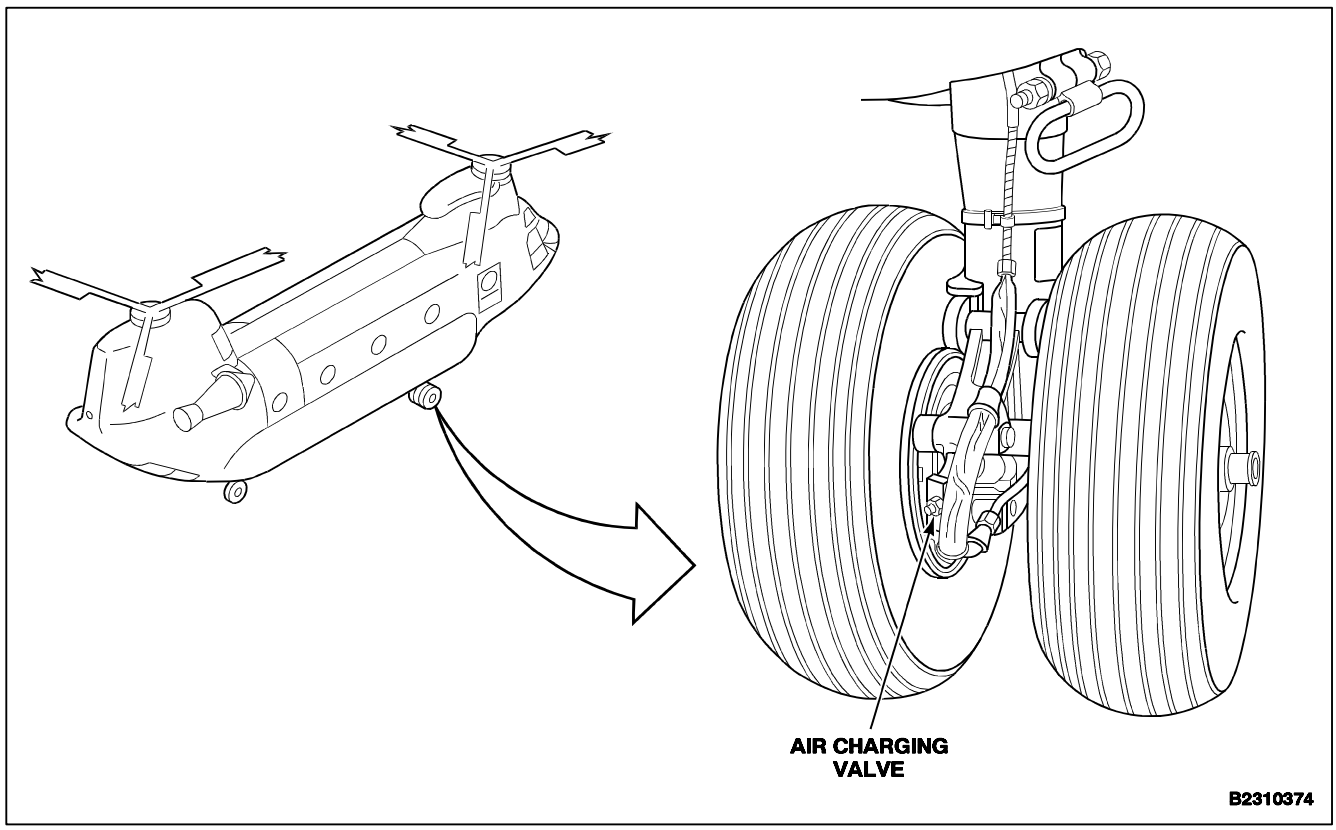
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Shock Strut Serviced With Fluid (Task 1-69)

***General Safety Instructions:***

**WARNING**

Left and right forward landing gear shock struts must be serviced together to prevent uneven strut inflation. Uneven inflation can cause ground resonance.



**NOTE**

Service both struts in same way and at same time. Right strut is shown here.

***DEFLATE STRUT***

**WARNING**

High pressure air trapped under valve cap can be a hazard. If cap is not removed slowly, air can pop it off and cause injury.

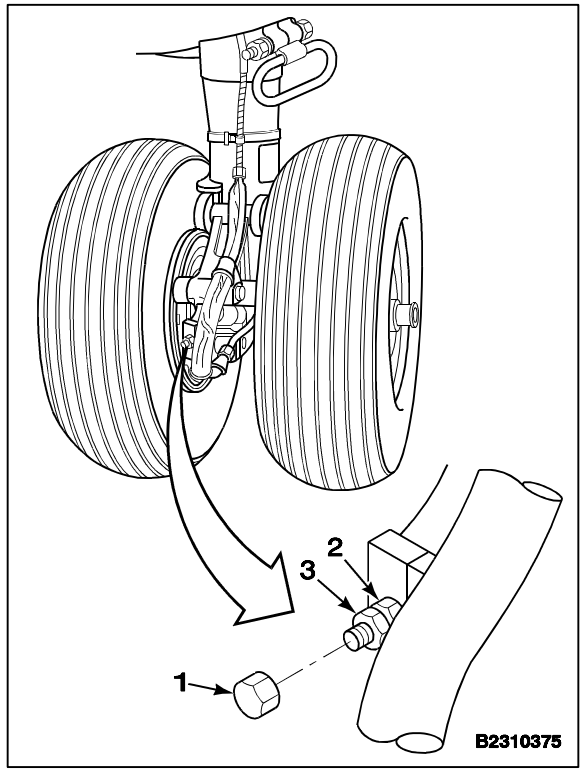
**NOTE**

Steps 1 thru 3 are done on left and right struts at same time. One repairer works on each strut.

1. Loosen cap (1) slowly. Remove it from valve (2).
2. Hold body of valve (2) with wrench. Turn outer valve nut (3) to left **one or two turns** to release air.

**NOTE**

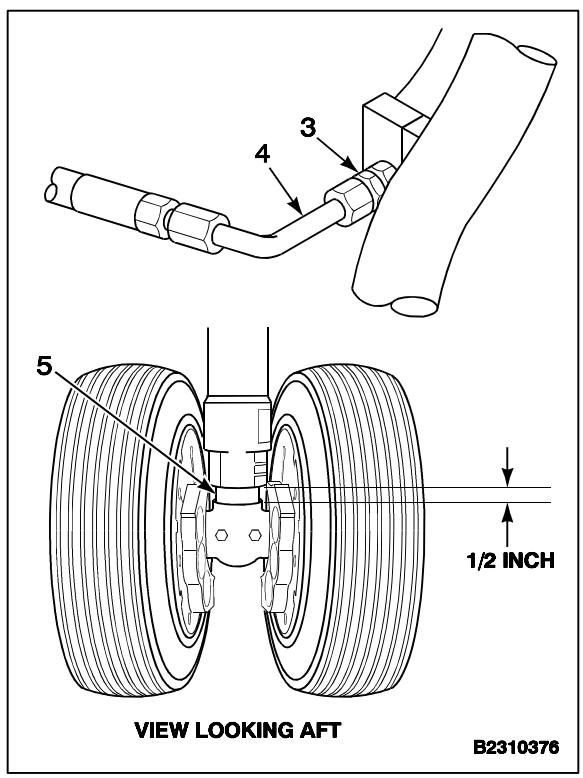
If hydraulic fluid is found in air chamber, replace the strut.




3. Rock helicopter from side to side as air is released. This makes sure strut is deflated.
4. Turn nut (3) fully to right to close valve (2).

***INFLATE STRUT***

5. Connect chuck (4) from air source to valve of one strut.
6. Open valve by turning outer valve nut (3) to left.
7. Add air until **1/2 inch** of shiny surface shows on strut (5). Record air pressure required.
8. Shut off air by turning outer valve nut (3) to right. Disconnect chuck (4).
9. Repeat steps 5 thru 8 for other forward gear.
10. Deflate first strut (steps 1 and 2).
11. Inflate first strut again to **1/2 inch**. (Repeat steps 5 thru 8; then go to step 12.)



12. Note recorded pressure needed to inflate second strut. Note lower of two recorded pressures required to inflate first strut.

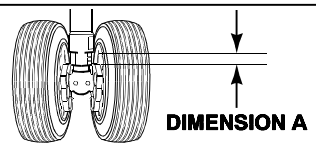
**NOTE**

Chart dimension A for both struts should be same within **1/2 inch**. If off by more, service struts with fluid (Task 1-69).

13. Find noted pressures on chart. If pressures fall between chart blocks, go to closest block. Read chart DIMENSION A next to pressure.

**NOTE**

Only nominal pressure readings are shown on landing gear servicing plate.




| AIR PRESSURE (PSIG) | NOMINAL PRESSURE | DIMENSION A (IN.) |
|---|---|---|
| 2,305-2,355 | 2,330 | 1/2 |
| 1,763-1,813 | 1,788 | 1 |
| 1,425-1,475 | 1,450 | 1 1/2 |
| 1,196-1,245 | 1,221 | 2 |
| 1,025-1,075 | 1,050 | 2 1/2 |
| 897-947 | 919 | 3 |
| 789-848 | 814 | 3 1/2 |
| 685-735 | | 4 |
| 625-675 | | 4 1/2 |
| 595-645 | | 5 |
| 540-590 | | 5 1/2 |
| 511-561 | | 6 |
| 575-525 | | 6 1/2 |
| 450-500 | | 7 |
| 415-465 | | 7 1/2 |
| 385-435 | | 8 |
| 365-415 | | 8 1/2 |
| 350-400 | | 9 |
| 335-385 | | 9 1/2 |
| 315-365 | | 10 |
| 300-350 | | 10 1/2 |
| 274-324 | | 11 (FULLY EXTENDED) |

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**NOTE**

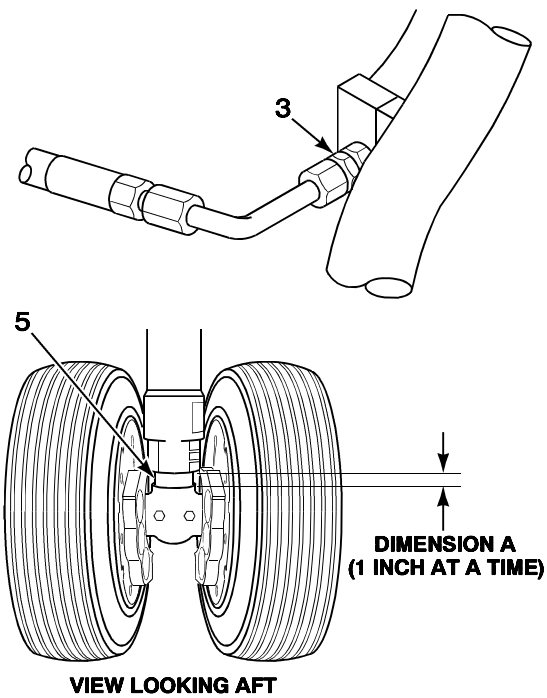
Turn outer valve nut (3) left to add air. Turn nut right to shut off air.

Step 14 requires going back and forth between landing gear. If two air sources are available, service both struts at same time.

14. Add as much air as needed to each strut (5) in turn to increase extension of strut about **1 inch** at a time. Stop when each strut extension equals required DIMENSION A.

**NOTE**

The minimum ground clearance is **19.2 inches**. This measurement is taken from under the aircraft at ramp hinge.

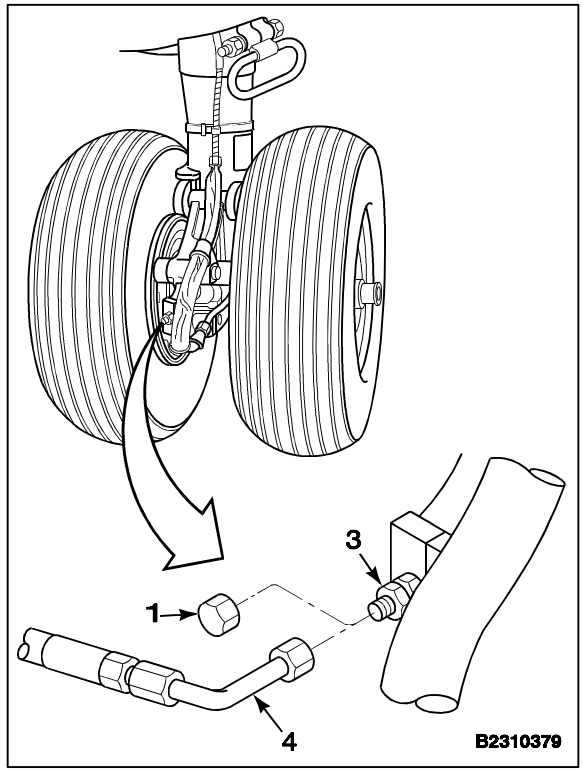



B2310378

15. Tighten outer valve nut (3) on left and right struts when both struts are at DIMENSION A. Hold body of valve with wrench. Torque nut (3) to **60 inch-pounds**.

16. Remove air chuck (4). Install cap (1).

***INSPECT***




***FOLLOW-ON MAINTENANCE:***

Adjust aft landing gear proximity switch (Task 3-56).

END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Source of High-Pressure Compressed Air, With 0-3000 PSI Air Gauge and Pressure Regulator
Torque Wrench, 30-150 Inch-Pounds

***Materials:***

None

***Personnel Required:***

CH-47 Helicopter Repairer (2)
Inspector

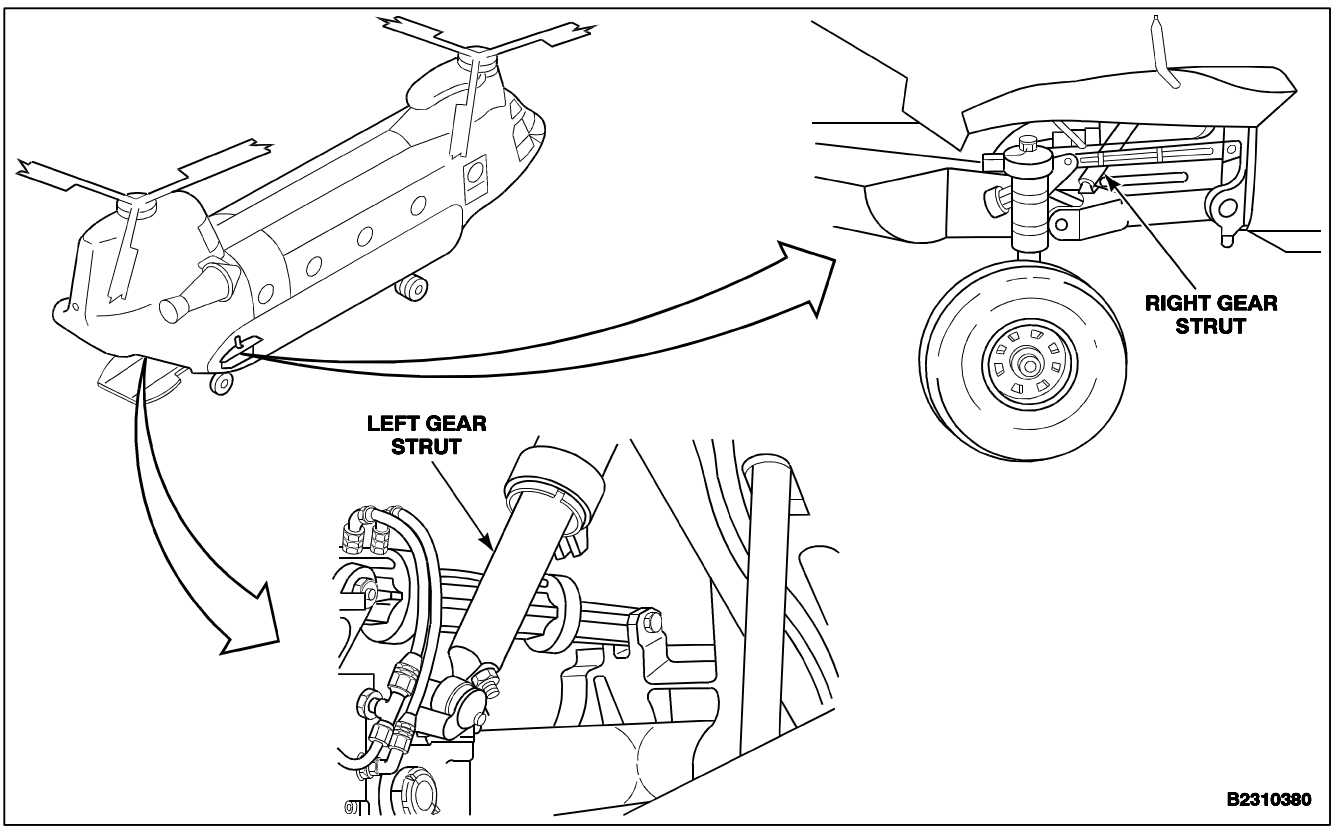
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Cargo Ramp Open Halfway on Level Ground (TM 55-1520-240-T)
Aft Landing Gear Access Panels Open (Task 2-2)
Shock Struts Serviced With Fluid (Task 1-70)

***General Safety Instructions:***

**WARNING**

Left and right aft landing gear shock struts must be serviced together to prevent uneven strut inflation. Uneven inflation can cause ground resonance.



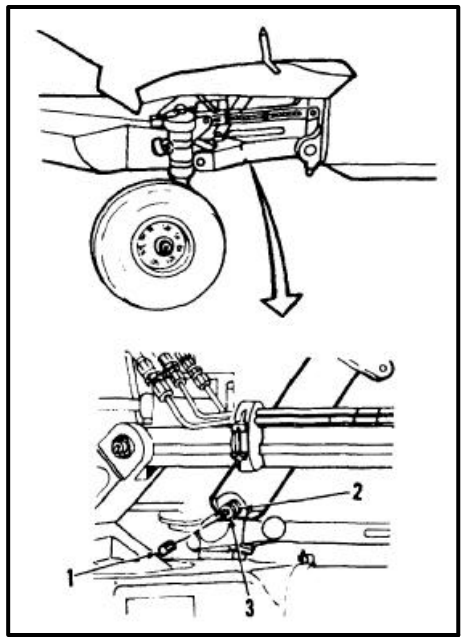
***DEFLATE STRUTS***

**WARNING**

High pressure air trapped under valve cap can be a hazard. If cap is not removed slowly, air can pop it off and cause injury.

**NOTE**

Left and right aft strut must be serviced together. Perform steps 1 thru 3 on each gear at same time. One repairer works on each strut.

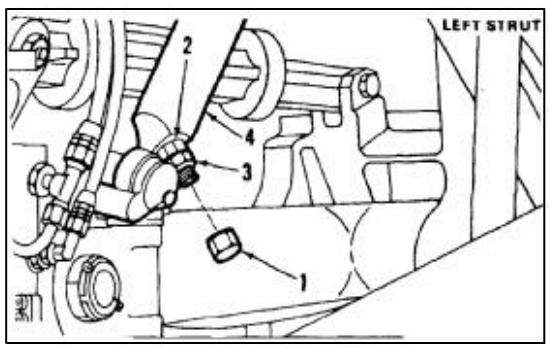



1. Loosen cap (1) slowly. Remove it from valve (2).

**NOTE**

Reach cap on left strut through open ramp.

2. Hold body of valve (2) with wrench. Turn outer valve nut (3) to left **one or two turns** to release air.




**NOTE**

If hydraulic fluid is found in air chamber, replace the strut.

3. Rock helicopter from side to side as air is released. This makes sure piston (4) is fully compressed.

**NOTE**

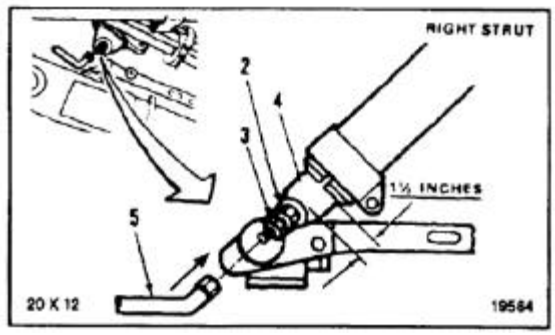
A completely deflated strut will still have **1 inch** of piston showing.

*INFLATE STRUTS*

**NOTE**

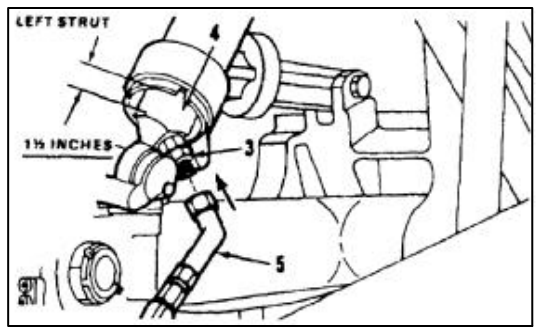
Service both struts at same time if two compressors are available.

4. Connect chuck (5) from air source to valve (2) of right strut.
5. Add air until **1-1/2 inches** of piston (2) shows. Record air pressure needed.




**NOTE**

**1-1/2 inch** of piston, measured from top of machined arc, equals **1/2 inch** strut extension. Measurement to top of arc is for initial extension only.



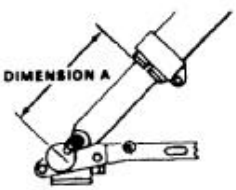

6. Shut off air by turning outer valve nut (3) to right. Disconnect chuck (5).
7. Repeat steps 4 thru 6 for left strut.
8. Deflate right strut (steps 1 and 2).
9. Inflate right strut again to **1-1/2 inch**. (Repeat steps 4 thru 6; then go to step 10.)
10. Note recorded pressure needed to inflate left strut. Note lower of two recorded pressures needed to inflate right strut.

**NOTE**

Only NOMINAL pressure readings are shown on the landing gear servicing plate.

Chart dimension A for both struts is measured from top of exposed portion of strut to center of pin. It should be the same within **1/2 inch**. If difference is more, service struts with fluid (Task 1-70).

11. Find noted pressures on chart. Read chart DIMENSION A next to pressure.



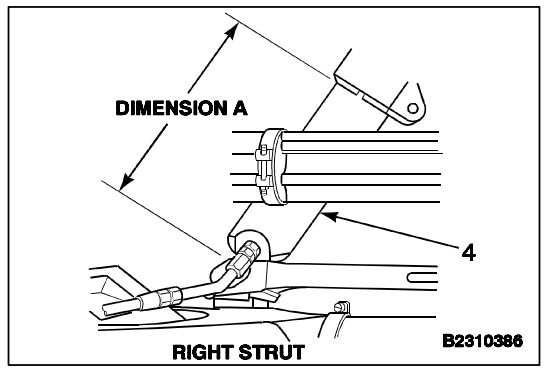

| AIR PRESSURE AT 1-1/2 INCHES (PSIG) | NOMINAL PRESSURE | DIMENSION A (INCHES) |
|---|---|---|
| 1,725 - 1,800 | 1,750 | 5 |
| 1,548 - 1,598 | 1,573 | 5-1/2 |
| 1,405 - 1,455 | 1,430 | 6 |
| 1,285 - 1,335 | 1,310 | 6-1/2 |
| 1,183 - 1,233 | 1,208 | 7 |
| 1,096 - 1,146 | 1,111 | 7-1/2 |
| 1,020 - 1,070 | 1,045 | 8 |
| 954 - 1,004 | 979 | 8-1/2 |
| 896 - 946 | | 9 |
| 844 - 894 | | 9-1/2 |
| 805 - 855 | | 10 |
| 775 - 825 | | 10-1/2 |
| 735 - 785 | | 11 |
| 700 - 750 | | 11-1/2 |
| 645 - 685 | | 12 (FULLY EXTENDED) |

**NOTE**

Turn outer valve nut left to add air. Turn nut right to shut off air.

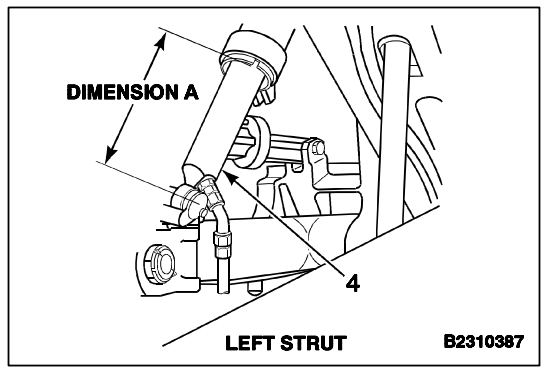
Step 12 requires going back and forth between landing gear. If two air sources are available, service both struts at same time.

12. Add as much air as needed to each strut in turn to increase extension of piston (4) about **1 inch** at a time. Stop when each extension equals required DIMENSION A.



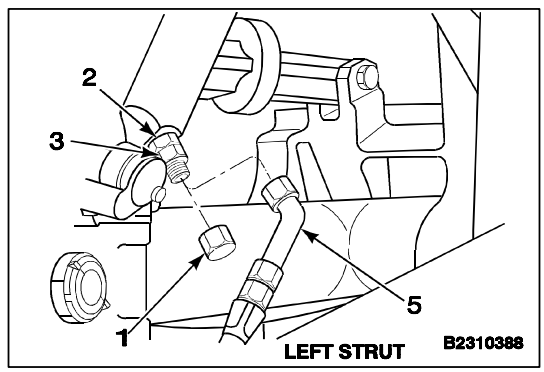

**NOTE**

The minimum ground clearance is **19.2 inches**. This measurement is taken from under the aircraft at ramp hinge.




13. Hold body of valve (2) on left strut with wrench. Torque outer valve nut (3) to **60 inch-pounds**.

14. Shut off air at air source. Remove air chuck (5) if installed. Install valve cap (1).

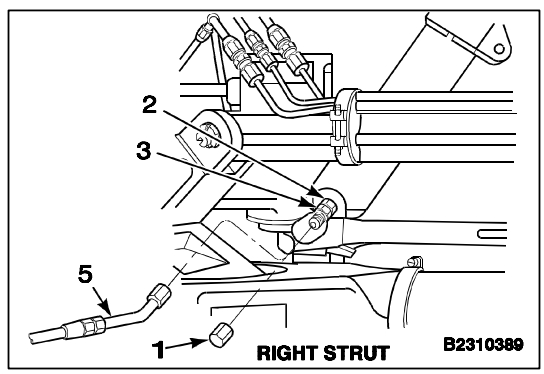



15. Repeat steps 13 and 14 for right strut.

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Adjust proximity switches (Task 3-56).
Close aft landing gear access panels (Task 2-2).
Raise cargo ramp (TM 55-1520-240-T).




END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Inflator Kit, NSN 6685-00-124-4336
Tire Pressure Gauge G6-G-91, Type II
Source of Compressed Air

***Materials:***

None

***Personnel Required:***

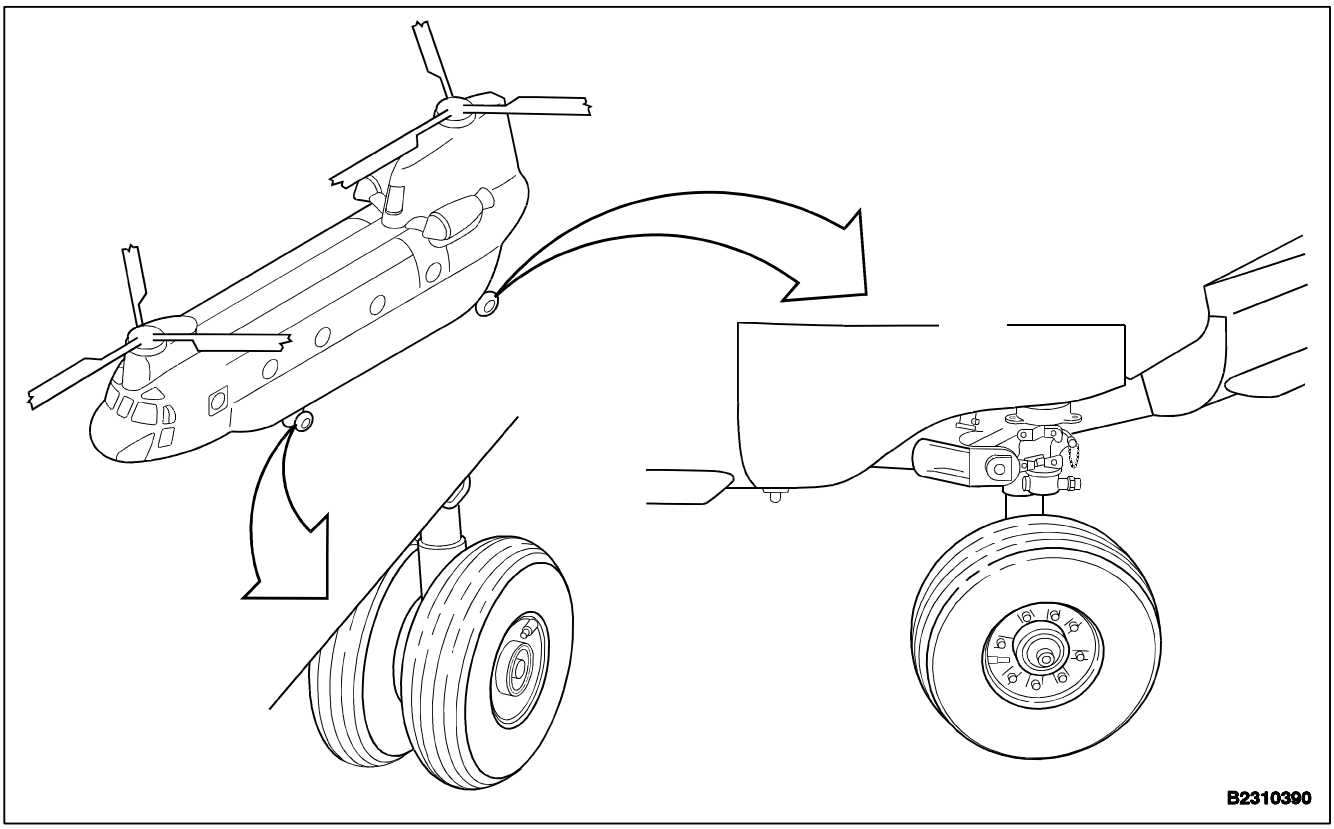
CH-47 Helicopter Repairer

***References:***

TM 55-2620-200-24

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off

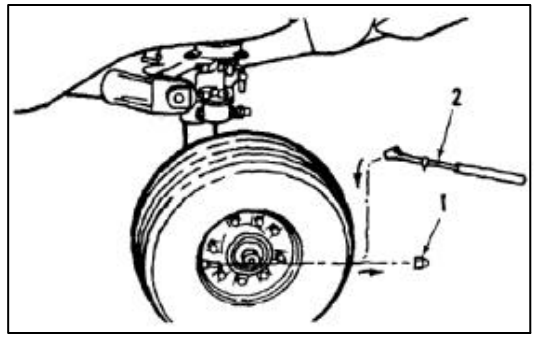


**WARNING**

Never stand facing sidewall of tire being serviced. Stand facing tire tread.

**NOTE**

Service all tires in same way. Aft left tire is shown here.

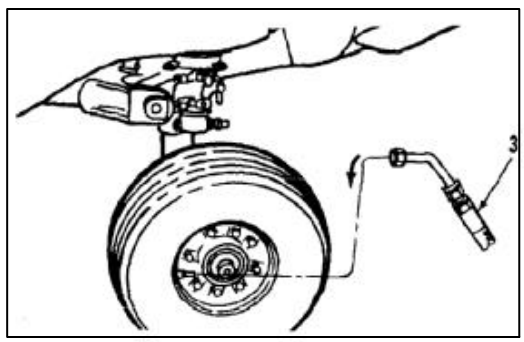



1. Remove valve cap (1).

**NOTE**

A **5°F** change in temperature will affect tire pressure **1 psi**. Check pressure when tires are cool. High temperature increases pressure. A false pressure reading results.

2. Check tire pressure. with gage (2). If pressure is **88 psi**, task ends here.




**WARNING**

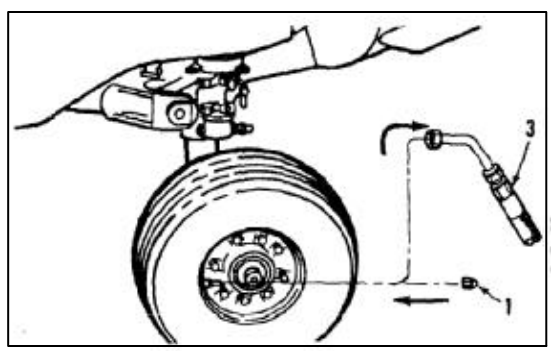
Stand away from tire when inflating. Tires can explode under pressure. Always use remote tire inflator when servicing tires.

**NOTE**

If tire repeatedly loses more than **4 psi in 24 hours**, it is faulty. Repair or replace it (Tasks 3-8 and 3-11).

3. If pressure is less than **88 psi**, connect remote safety chuck (3) of tire inflator. Inflate tire to **88 psi**.

4. Disconnect safety chuck (3). Install cap (1).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 1-74 SERVICE CENTER CARGO HOOK ACTUATOR 1-74

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Source of High-Pressure Compressed Air or Nitrogen (at least 3,000 Psi)
Torque Wrench, 0 to 150 Inch-Pounds

***Materials:***

None

***Personnel Required:***

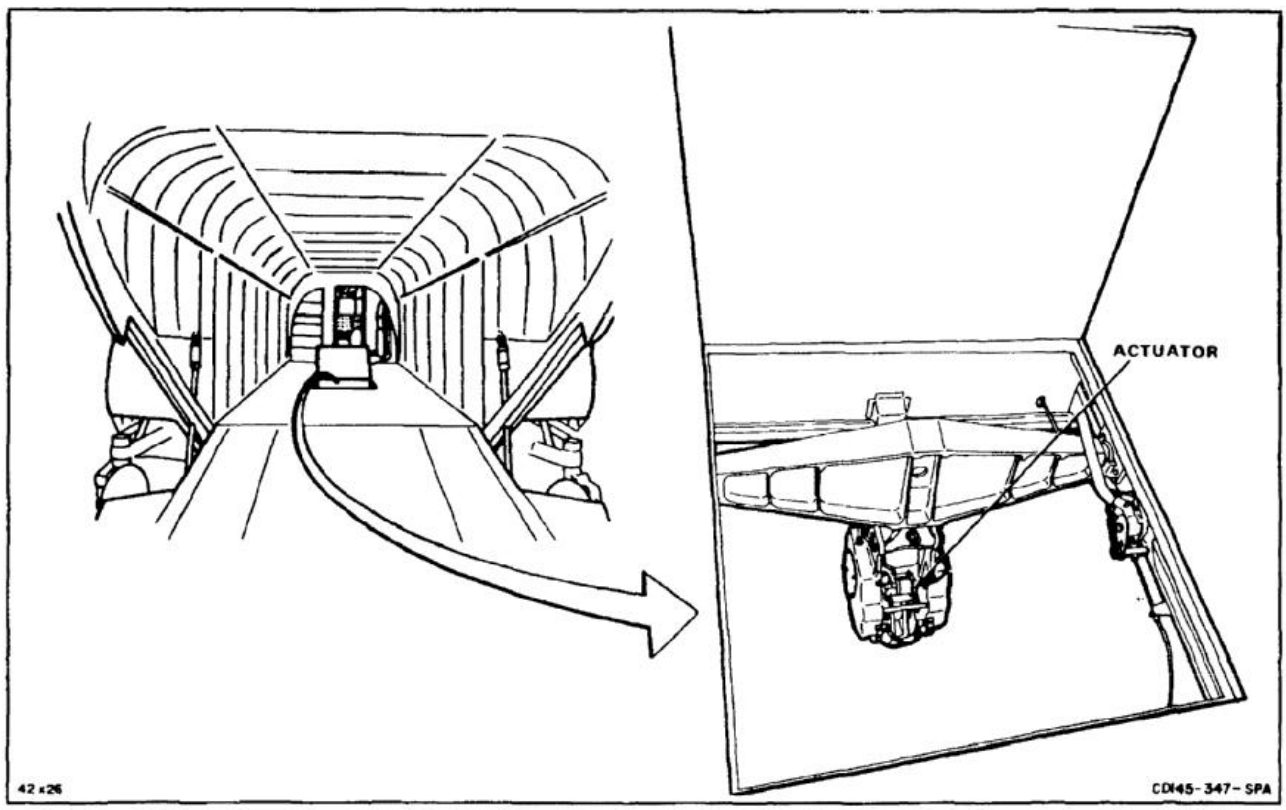
Medium Helicopter Repairer (2)

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Cargo Hook Unstowed (TM 55-1520-240-10)

***References:***

TM 55-1520-240-10



**WARNING**

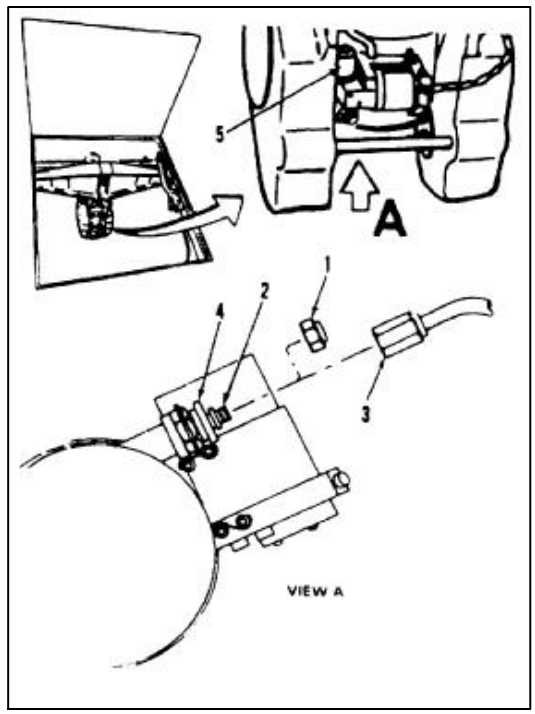
High pressure air trapped under valve cap can be a hazard. If cap is not removed slowly, air can pop it off and cause injury.

1. Loosen valve cap (1) slowly. Remove it from valve (2). Connect chuck (3) from air source to valve.
2. Loosen nut (4) **two turns** with wrench.

**NOTE**

Actuator must be serviced to at least **2,100 psi** or it will not function properly. Do not exceed **2,200 psi**.

3. Have helper operate air source to charge actuator to at least **2,100 psi** as marked on gage (5). Use inspection mirror to read gage.
4. Tighten nut (4) firmly against valve body.
5. Disconnect chuck (3) from valve (2). Continue tightening nut (4) until air leakage stops.
6. Install valve cap (1).
7. If hook will not be used right away, stow it before dosing door (TM 55-1520-240-10).




***INSPECT***

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 1-75 SERVICE HOIST CABLE CUTTER 1-75

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Long Driftpin SK15241-15, 0.365 Inch Dia.
Short Driftpin SK15241-21, 0.365 Inch Dia.
Squib Tester, American Standard Model 115 or Equal

***Materials:***

Cleaning Brush (E84)
Cotton Flannel Cloth (E128)
Lockwire (E231)
Powder Solvent (E464)

***Parts:***

Cartridge (As Required)
Cutter (As Required)

***Personnel Required:***

Medium Helicopter Repairer
Inspector

***References:***

TM 55-1520-240-23P

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off

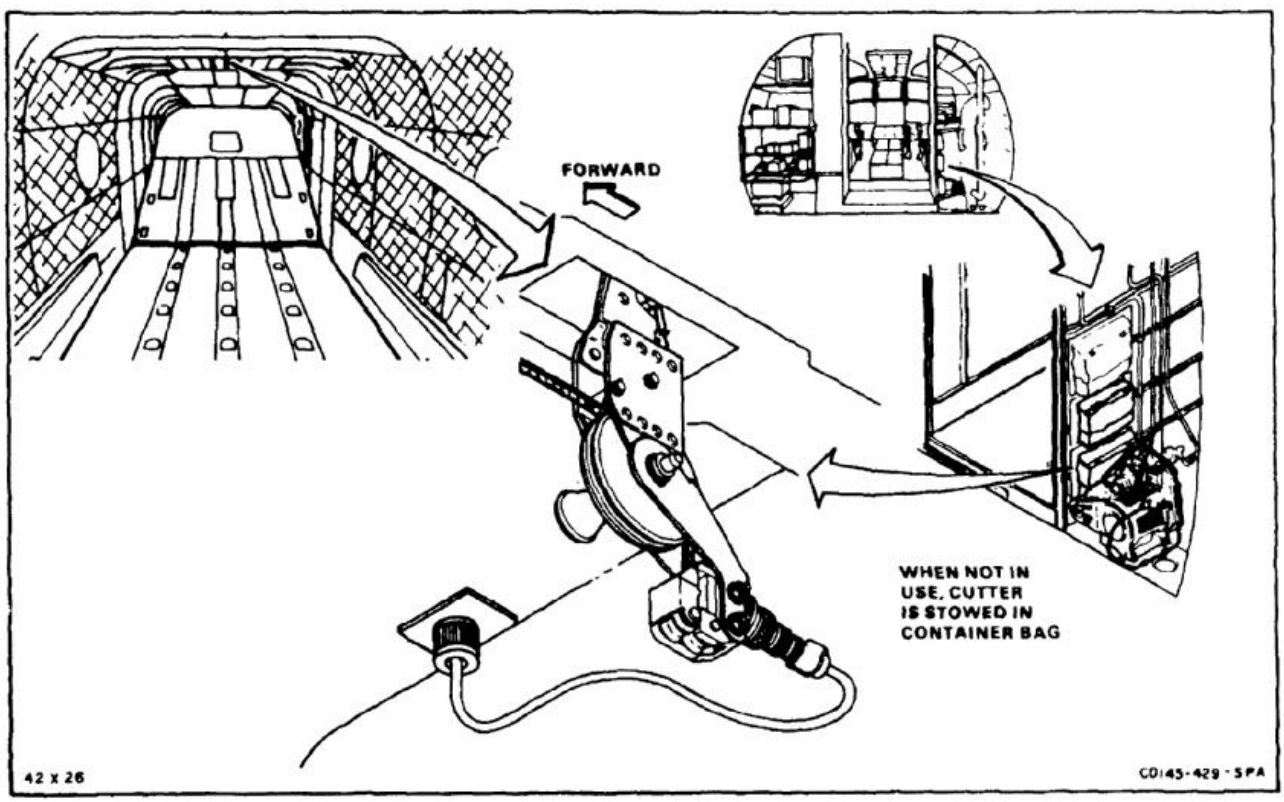
***General Safety Instructions:***

**WARNING**

Do not service or handle with power on. The cartridge could fire. Severe personal injury could result.

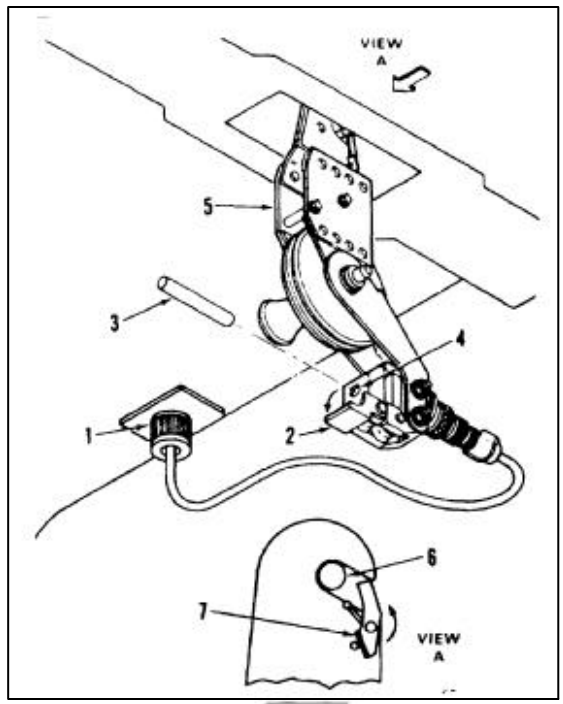
**NOTE**

Dispose of unserviceable live cartridges by placing in the can used to pack the replacement cartridge and returning to the Ammunition Supply Activity. The cartridge should be tagged UNSERVICEABLE with the reason for removal and the date of installation and removal.



***CUTTER RELEASE FIRED CARTRIDGE***

1. Unplug electrical connector (1).
2. Lower guard (2). Insert short driftpin (3) in cartridge chamber (4). Tap driftpin to release fired cutting punch and trapped cable. Remove driftpin.
3. Remove cable block (5) from overhead hook (6) by pressing keeper tab (7) and lifting cable block.

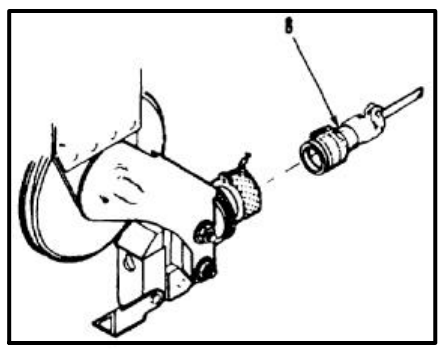



***CARTRIDGE REMOVAL***

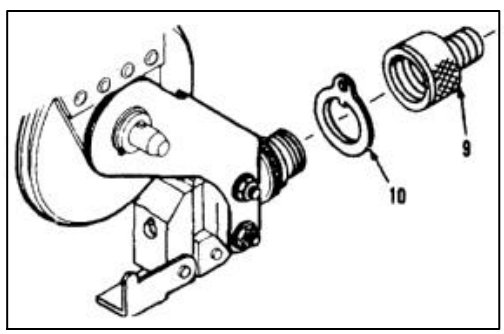
**WARNING**

If not handled properly, an out-of-date cartridge can fire. Personal injury can result.

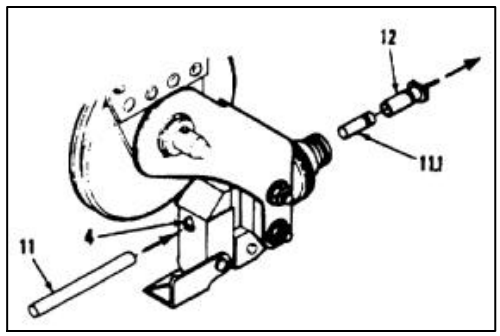
4. Remove lockwire from electrical connector (8). Remove connector.




5. Remove adapter (9). Remove key washer (10).



6. Insert a long driftpin (11) in chamber (4). Tap driftpin to drive out punch (11.1) and cartridge (12).

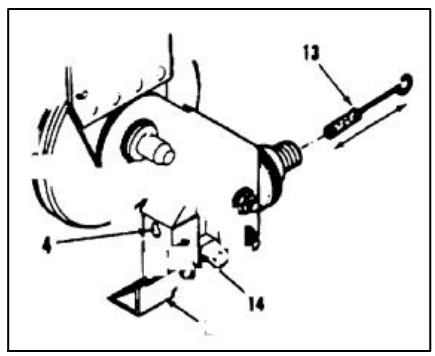



CAUTION

Cutter can be damaged if pieces of cut cable remain in cutter body.

7. Clean chamber (4). Use powder solvent (E464) and bristle brush (E84) (13). Make sure all pieces of cut cable are removed. Close guard (2).

8. Clean cutter (14) with soft cloth (E128). Check for cracks and distortion. Replace damaged cutter.

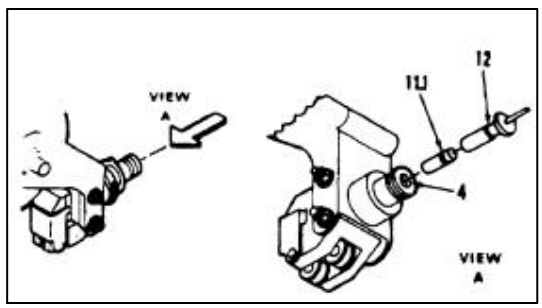



***CARTRIDGE INSTALLATION***

WARNING

A loaded cutter is a hazard. Insert cartridges only if cutter is to be used. Do not insert if cutter will be stowed.

9. Insert punch (11.1) and new cartridge (12) in chamber (4). Align flats in cartridge and cutter.

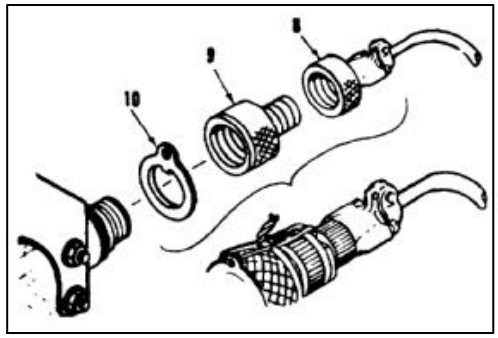


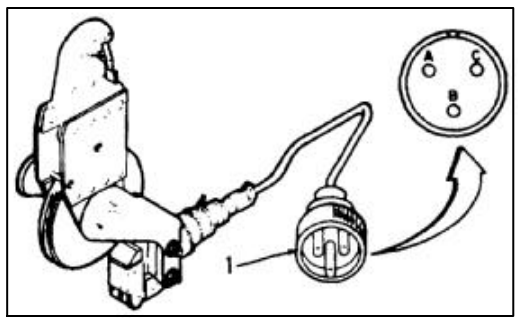

**NOTE**

The cartridge first number, installation date, and required date of removal shall be recorded on DA Form 2408-18 for maintenance planning.

10. Install key washer (10). Install adapter (9).

11. Connect electrical connector (8). Secure it to washer (10) with lockwire (E231).



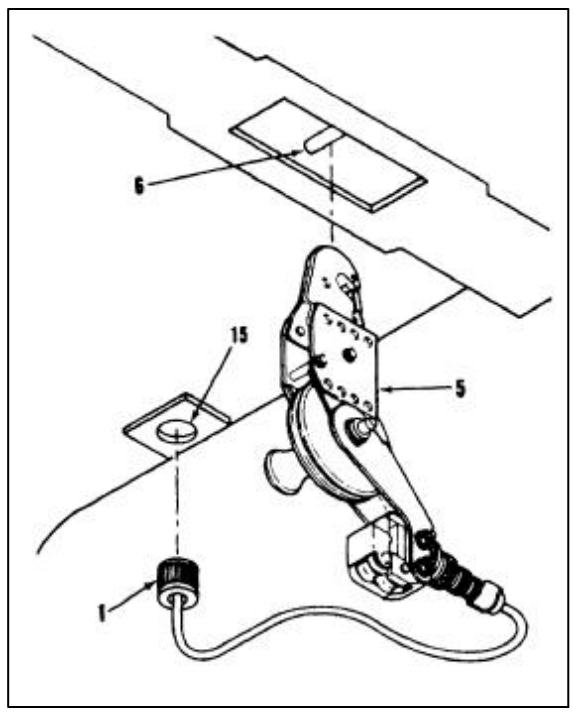

***INSPECT***

***CUTTER INSTALLATION***

**NOTE**

Install cutter only if it is to be used. Stow cutter in container if it will not be used.

12. Hook cable block (5) on overhead hook (6). Plug connector (1) in receptacle (15).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 1-76 CLEAN FUSELAGE EXTERIOR 1-76

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

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

***Materials:***

Barrier Material (E80)
Cleaning Compound (E117)
Hydraulic Fluid (E197 or E199)
Masking Tape (E388)
Nonmetallic Brush (E85)
Cloth (E120)

***Personnel Required:***

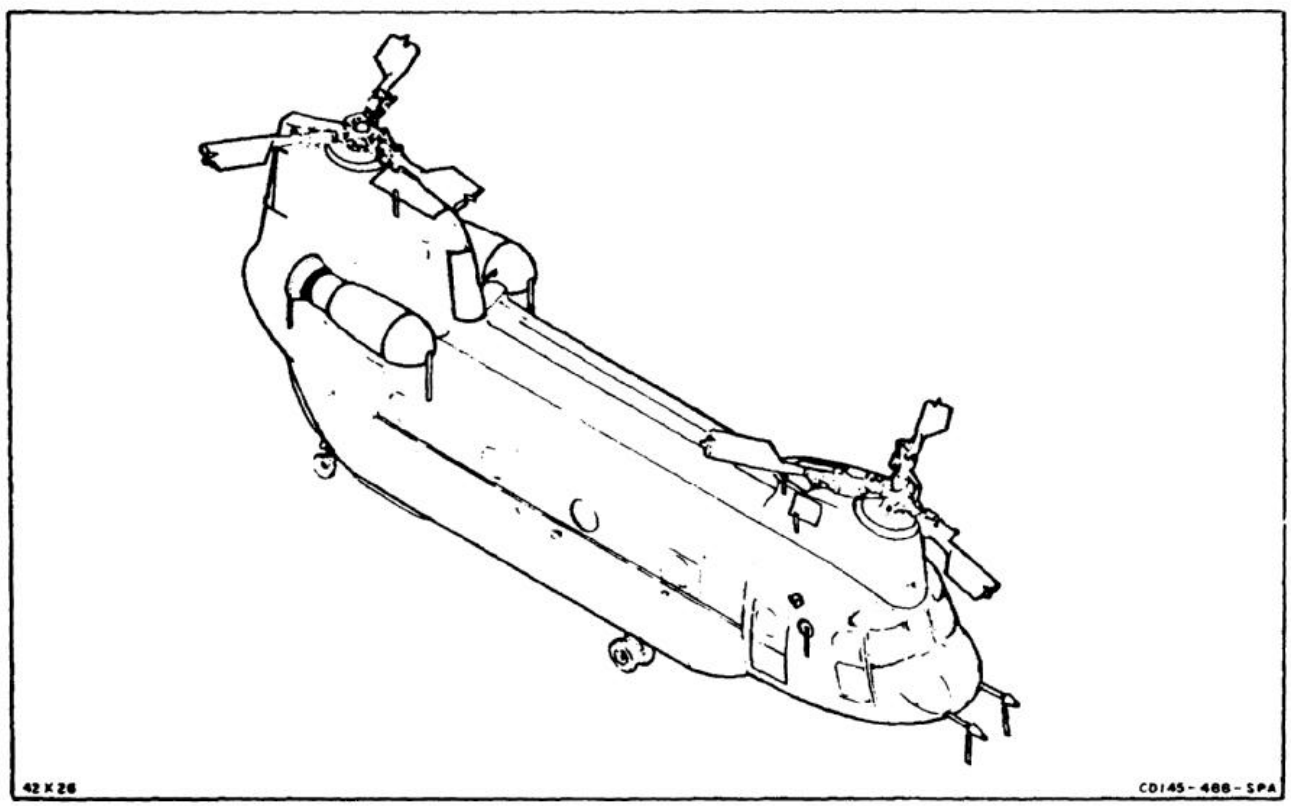
Medium Helicopter Repairer

***References:***

TM 55-1500-344-24

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Drain Plugs Open (Task 2-214)
Protective Covers Installed on Following Areas (Task 1-32):
APU Exhaust
Engine Exhaust (2)
Engine Inlet (2)
Heater Exhaust
Heater Inlet
Oil Cooler Exhaust (2)
Oil Cooler Inlet (2)
Pitot Tube (2)
Pylon Air Inlet

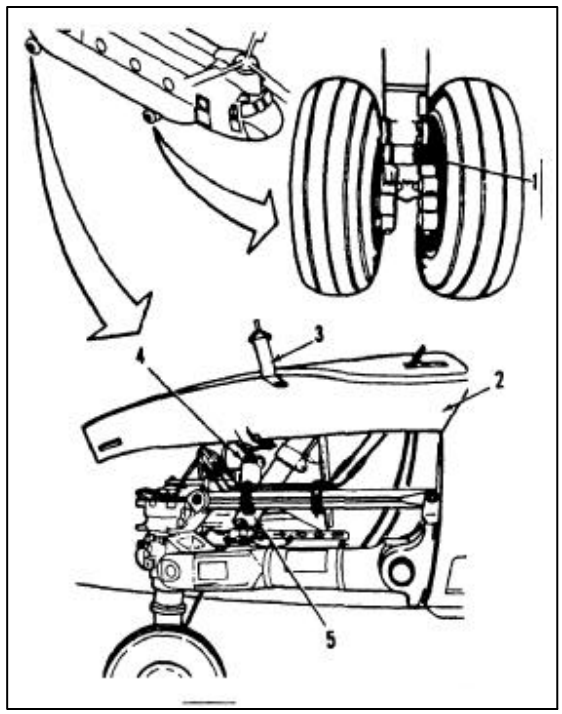


***PREPARE HELICOPTER***

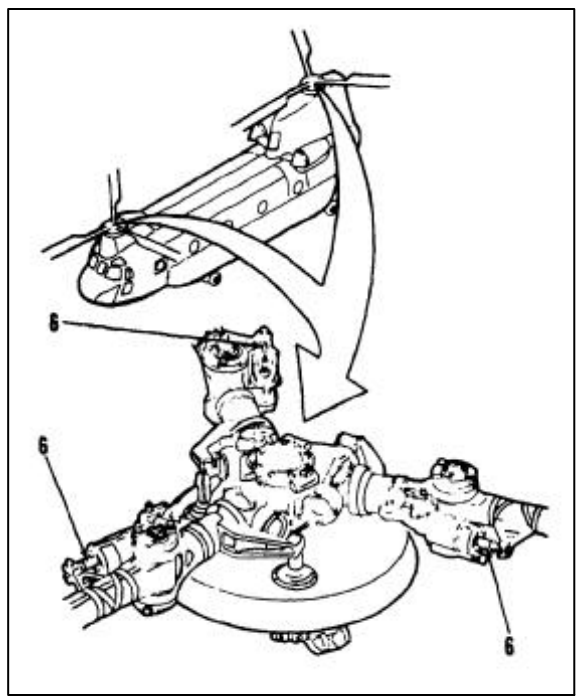
**NOTE**

Parts must be covered to keep them dry.

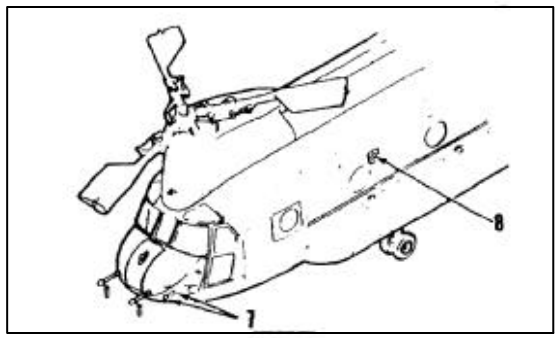
1. Cover shock strut pistons (1) on both forward landing gear. Use barrier material (E80) and tape (E388).
2. Open both aft landing gear access panels (2). Secure with strap (3).
3. Cover power steering electrical connector (4) on right gear. Cover shock strut pistons (5) on both gears. Use barrier material (E80) and tape (E388).
4. Release strap (3). Close panels (2).




5. Cover six blade shock absorber pistons (6) on both rotor heads. Use barrier material (E80) and tape (E388).



6. Cover sideslip ports (7) on both sides of nose. Cover static ports (8) on both sides of fuselage. Use barrier material (E80) and tape (E388).




***CLEAN HELICOPTER***

**NOTE**

TM 55-1500-344-24 contains more information on cleaning Army aircraft.

7. Mix **1 part** cleaning compound (E117) in **5 parts** water. Use **2 or 3 parts** water for very dirty areas.

**NOTE**

The size of the area cleaned depends on how quickly it dries.

8. Apply plenty of solution to small area of fuselage. Use a soft bristle brush (E85).

**CAUTION**

Cleaning solution can damage paint and make clear plexiglass hazy if left on too long. Rinse with clear water before solution dries.

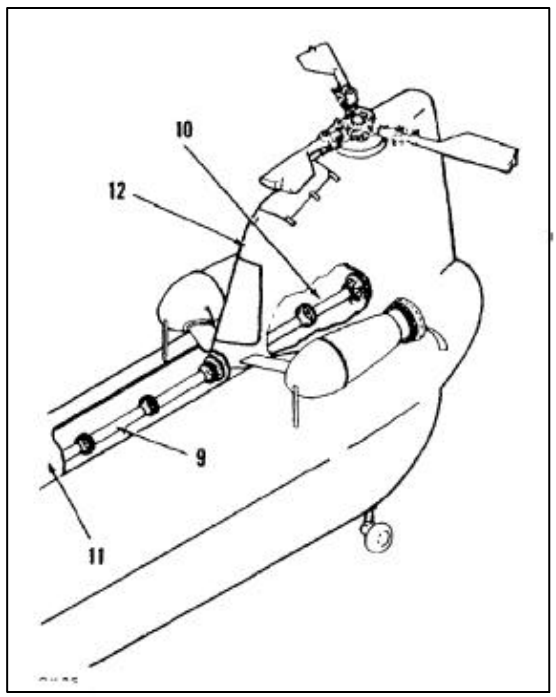
9. Let solution stay on surface for **5 to 10 minutes**. During this time, scrub very dirty areas with soft brush (E85). Do not let solution dry.

**CAUTION**

If solution is not rinsed off completely, it can damage paint and plexiglass.

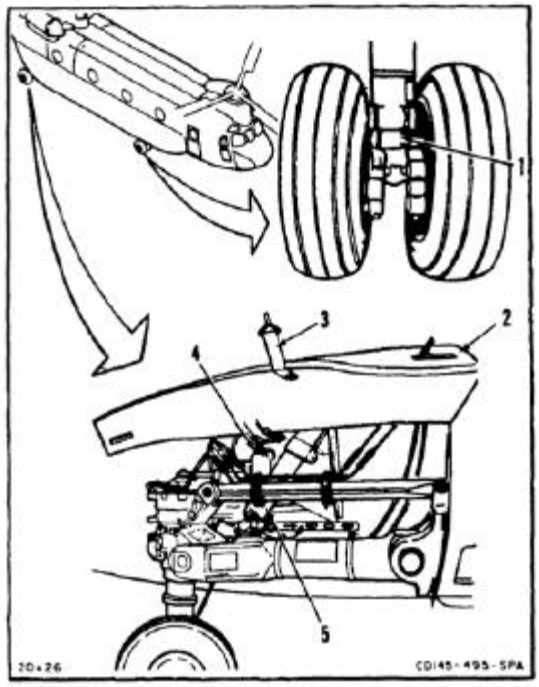
10. Rinse solution from cleaned surface. Water heated to **120º to 140ºF (50º to 60ºC)** is best. Take care to keep water out of forward and aft drive shafts (9 and 10) when rinsing tunnel (11) and pylon (12).

11. Repeat steps 7 thru 10 as needed.

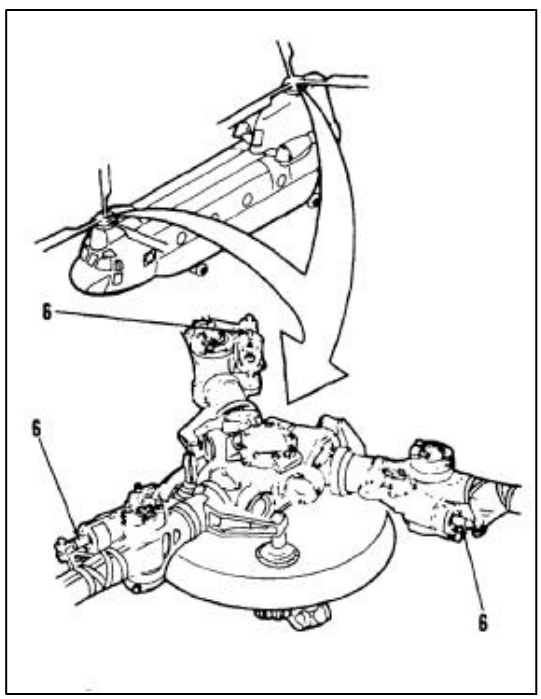


***REMOVE PROTECTIVE COVERINGS***

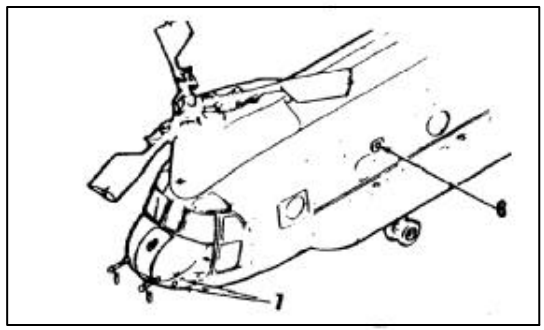
12. Remove covering from each forward landing gear shock strut piston (1). Wipe piston with cloth (E120) dipped in hydraulic fluid (E197 or E199).
13. Open each aft landing gear access panel (2). Secure with strap (3).
14. Remove covering from connector (4) on right gear.
15. Remove covering from shock strut pistons (5). Wipe pistons with cloth (E120) dipped in hydraulic fluid (E197 or E199).
16. Release strap (3). Close panels (2).




17. Remove covering from six blade shock absorber pistons (6). Wipe pistons with cloth (E120) dipped in hydraulic fluid (E197 or E199).



18. Remove covering from sideslip ports (7) on each side of nose. Remove covering from static ports (8) on each side of fuselage.



***FOLLOW-ON MAINTENANCE:***

Close drain plugs (Task 2-215).
Remove protective covers (Task 1-32).

END OF TASK

## 1-77 CLEAN PLASTIC-IMPREGNATED GLASS CLOTH PARTS 1-77

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Maintenance Stand

***Materials:***

Soap (E352)
Naphtha (E245) or Dry Cleaning Solvent (E162)
Cloth (E120)
Flannel Cloth (E128)
Gloves (E186)

***Personnel Required:***

Medium Helicopter Repairer

***General Safety Instructions:***

**WARNING**

Naphtha (E245) and solvent (E162) are combustible and toxic. They can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

**NOTE**

Following steps contain information on routine cleaning where abrasive polishing for removal of scratches is not required.

Naphtha (E245) or solvent (E162) may be substituted for soap and water solution.

1. Prepare mild solution of soap (E352) and water.

**CAUTION**

Do not use dirty or gritty cloths, unapproved cleaning fluids, compounds, solvents, etc., as they can damage the surface.

2. Saturate cloths (E120) with solution and lightly rub surface. Wear gloves (E186) if using naphtha (E245) or solvent (E162).
3. If soap and water solution is used, rinse surfaces with a clean, water-soaked, flannel cloth (E128). Wipe surface dry with clean flannel cloth.

***FOLLOW-ON MAINTENANCE:***

As Required

END OF TASK

## 1-77.1 CLEAN WINDSHIELD 1-77.1

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Workstand

***Materials:***

Chamois (E111)
Cloth, Cleaning (E120)
Cloth, Flannel (E128)
Glass Cleaner (E115)
Naphtha (E245) or Cleaner (E116)
Soap (E352 or E353)
Water Hose
Gloves (E186)

***Parts:***

Cotter Pin, 1/8 Inch Diameter x 2 Inches Long

***Personnel Required:***

Medium Helicopter Repairer

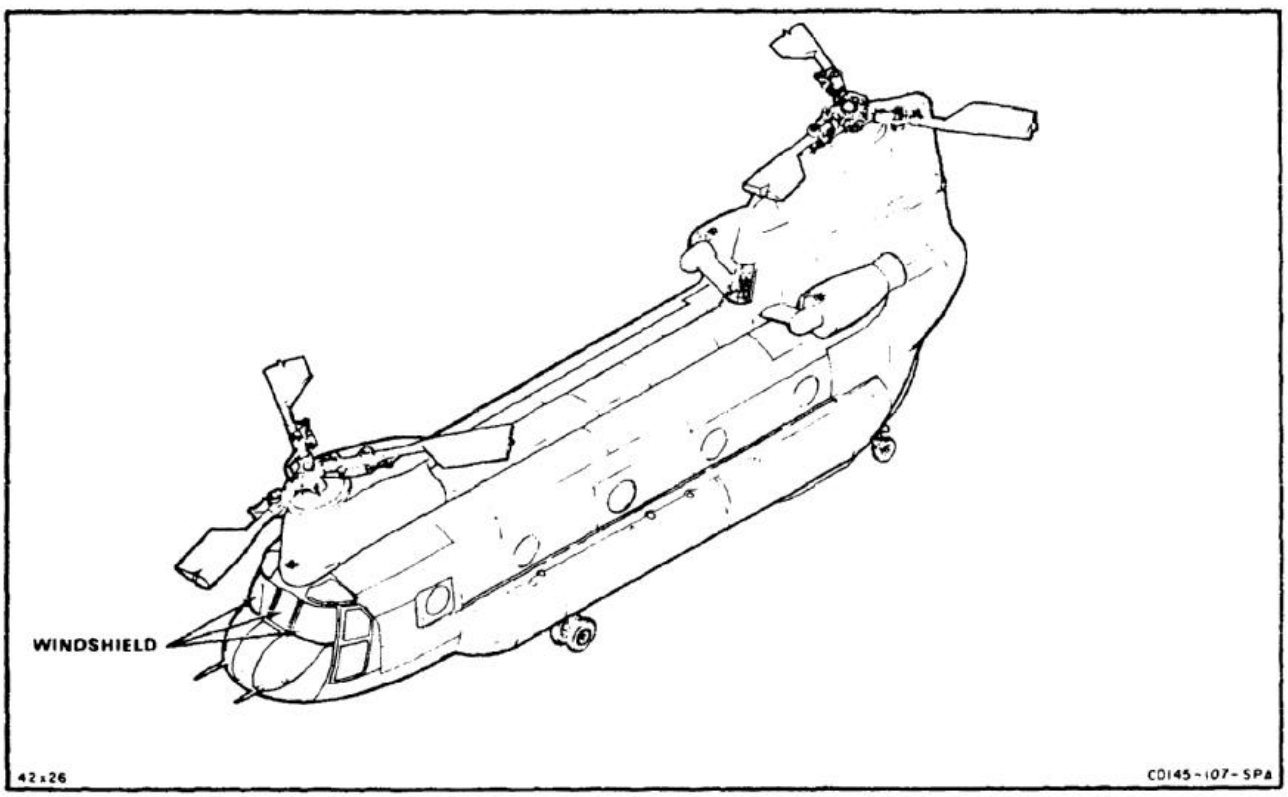
***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Helicopter Parked In Well-Ventilated Area Where Clean Running Water Is Available
Jettisonable Door Sliding Windows Closed

***General Safety Instructions:***

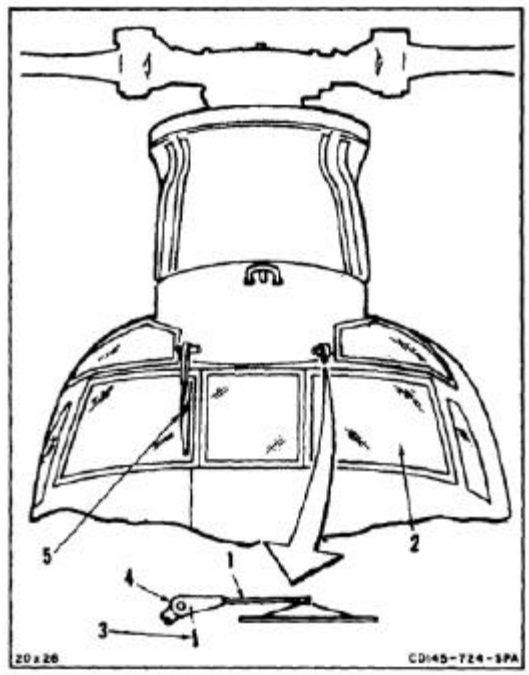
**WARNING**

Naphtha (E245) and cleaner (E116) are flammable and toxic. They can irritate skin and cause burns. Use only in well-ventilated area, away from heat and open flame. In case of contact, immediately flush skin or eyes with plenty of water for at least **15 minutes**. Get medical attention for eyes.



***CLEAN OUTSIDE SURFACE***

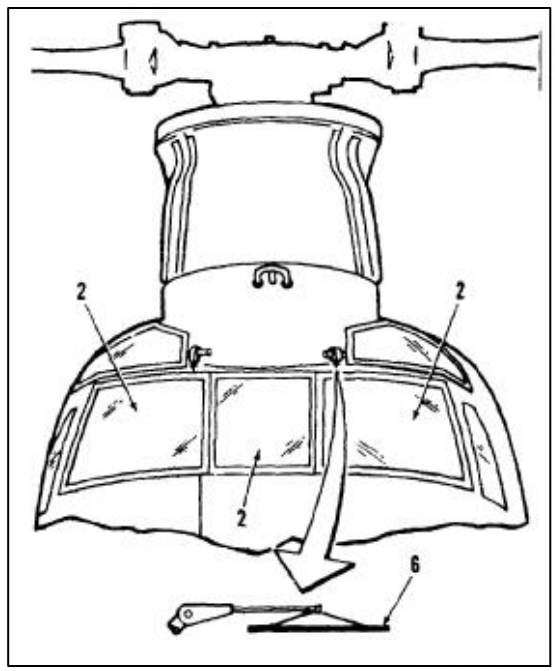
1. Raise and hold wiper arm (1) away from surface of windshield (2).
2. Put cotter pin (3) through hole in wiper arm (1) near hub (4).
3. Perform steps 1 and 2 for other wiper arm (5).
4. Flush outside of windshield (2) with clean running water to remove loose dirt.




**CAUTION**

Do not use chamois to rub off dirt from windshield. Surface of windshield can be damaged. Use chamois only to apply soap and water solution to windshield.

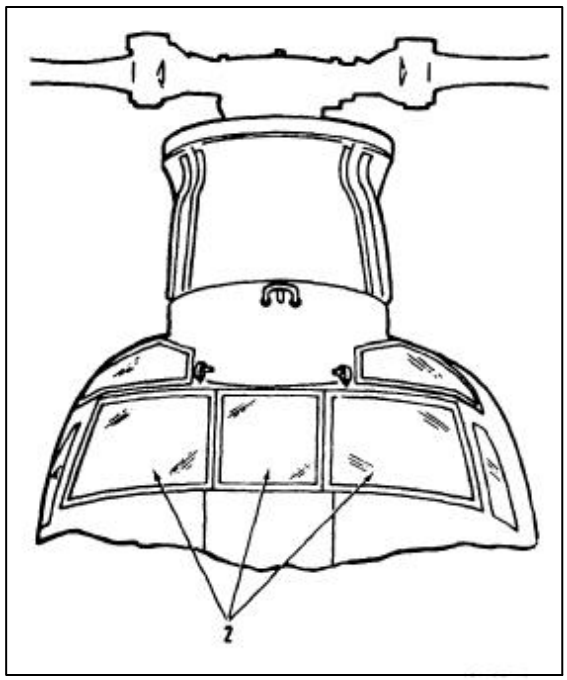
5. Put soap (E352 or E353) and water solution on outside surface of windshield (2), using chamois (E111).
6. Wash outside surface of windshield (2) with soap (E352 or E353) and water solution. Use bare hand to rub off dirt.
7. Rinse outside surface of windshield (2) with clean water until all soap solution and dirt are gone.
8. Let outside surface of windshield (2) dry completely.
9. Wipe off all dirt and foreign material from rubber of blades (6) using clean cloth (E120) damp with water.



CAUTION

Do not use anything except naphtha (E245) or cleaner (E116) to wipe oil and grease off windshield (2). Surface will be damaged.

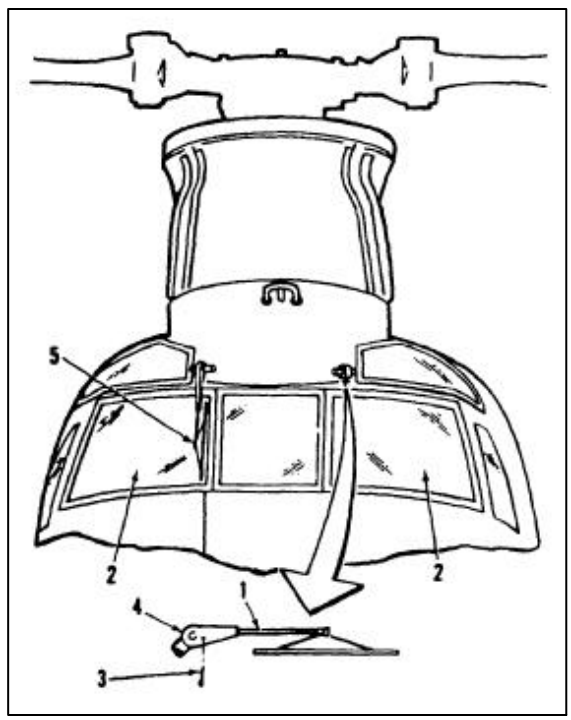
10. Wipe off all oil and grease from outside of windshield (2). Use clean cloth (E120) damp with naphtha (E245) or cleaner (E116). Wear gloves (E186).
11. Wipe off outside surface of windshield (2). Use clean cloth (E128) damp with water.
12. Put glass cleaner (E115) on outside surface of windshield (2) with clean cloth (E120).




CAUTION

Stop polishing surface of windshield (2) as soon as surface is dry. Surface can be damaged. If dry windshield is rubbed with cloth.

13. Polish outside surface of windshield (2) with another clean cloth (E120) until all of outside surface is clear and dry. Stop rubbing as soon as surface of windshield (2) is dry.
14. Hold wiper arm (1) to free cotter pin (3).
15. Remove cotter pin (3) from hole near hub (4).
16. Lower wiper arm (1) against windshield (2).
17. Perform steps 14 thru 16 for other wiper arm (5).



***CLEAN INSIDE SURFACE***

CAUTION

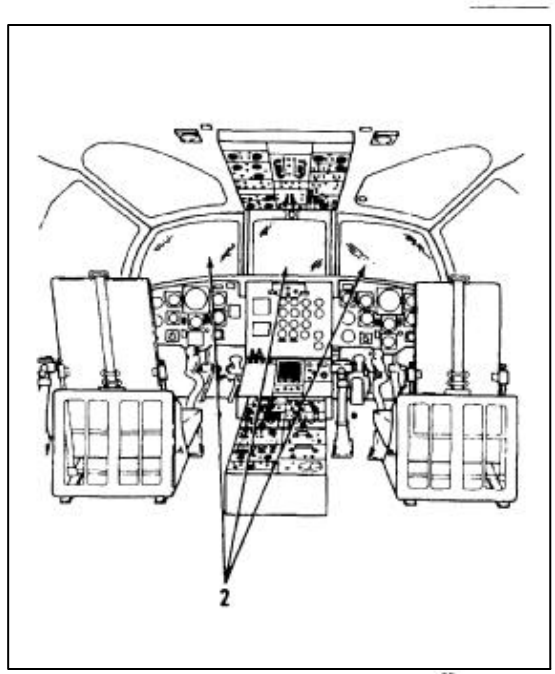
Do not use anything except naphtha (E245) or cleaner (E116) to clean windshield (2). Surface will be damaged.

18. Wipe off all oil, grease, dirt, and other foreign material from inside surface of windshield (2). Use clean cloth (E120) damp with naphtha (E245) or cleaner (E116). Wear gloves (E186).
19. Wipe off inside surface of windshield (2) with clean cloth (E128) damp with water.
20. Put glass cleaner (E115) on inside surface of windshield (2) with clean cloth (E120).

CAUTION

Stop polishing surface of windshield as soon as surface is dry. If windshield is rubbed with cloth when dry, surface will be damaged.

21. Polish inside surface of windshield (2) with another clean cloth (E120) until all of inside surface of windshield is clear and dry. Stop rubbing as soon as surface of windshield is dry.




***FOLLOW-ON MAINTENANCE:***

Inspect windshield (Task 2-41).

END OF TASK

## 1-78 CLEAN HYDRAULIC PISTONS 1-78

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

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

***Materials:***

Barrier Material (E80)
Cloths (E120)
Hydraulic Fluid (E197 or E199)

***Personnel Required:***

Medium Helicopter Repairer

***References:***

Task 2-2
TM 55-1520-240-T

***Equipment Conditions:***

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

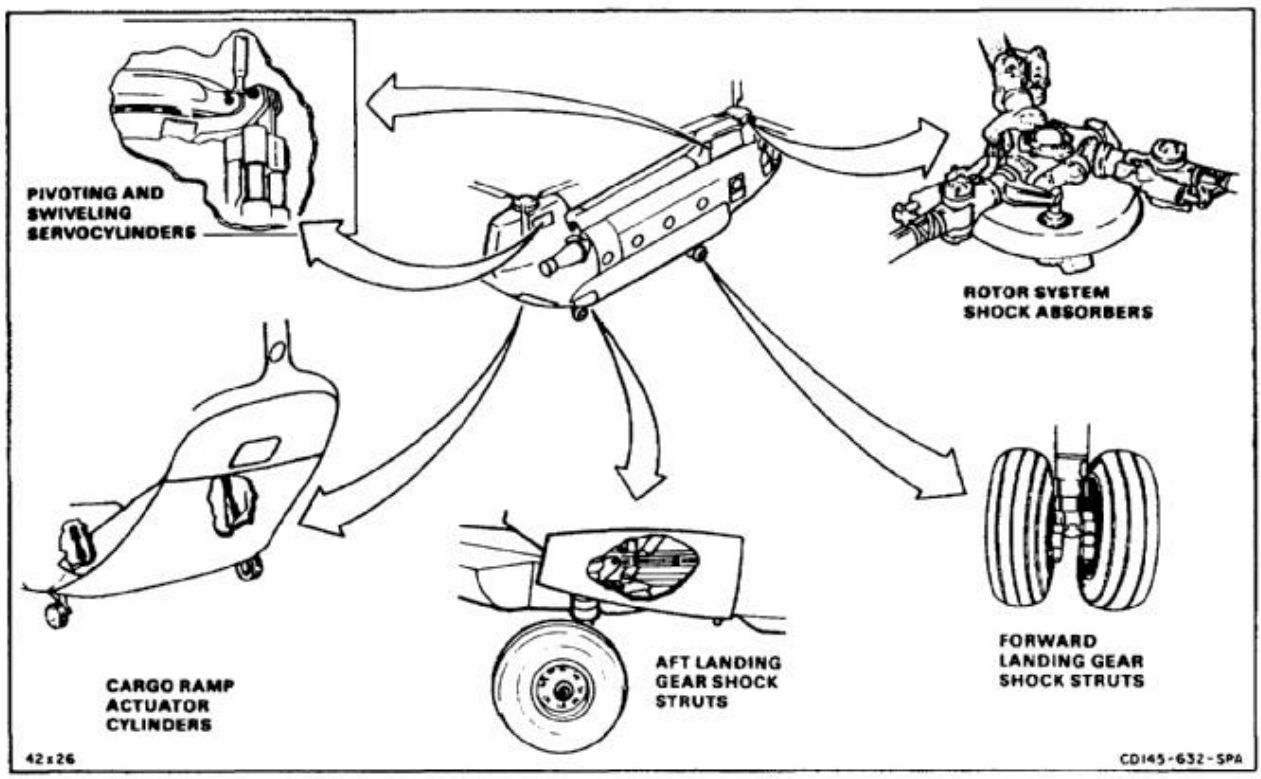
***General Safety Instructions:***

CAUTION

Hydraulic fluid can damage rubber. Do not let fluid get on seals or rubber parts.

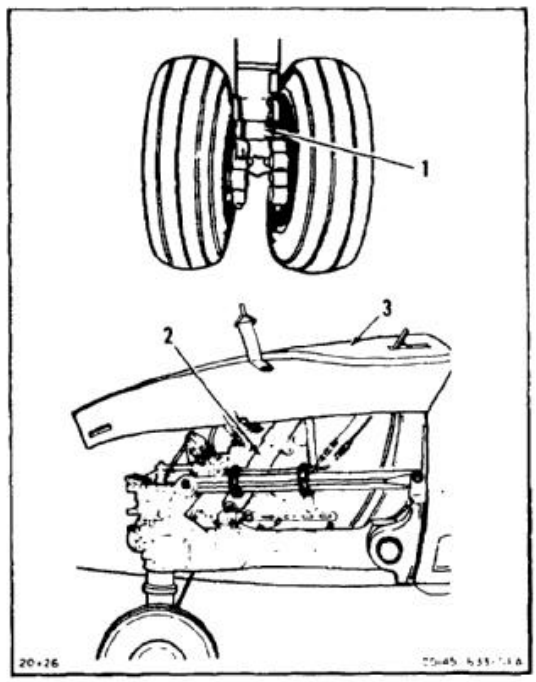
CAUTION

Do not rub pistons. Hard rubbing can cause grit to scratch pistons. Change cloths often to get rid of grit.



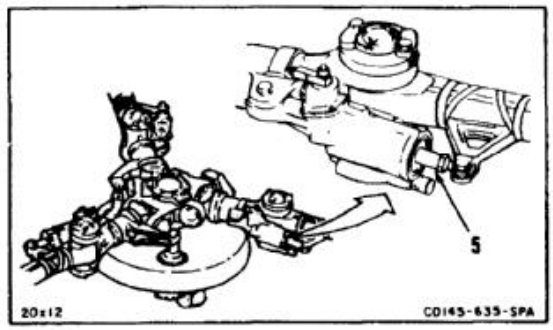
***CLEAN LANDING GEAR SHOCK STRUT PISTONS***

1. Gain access to forward pistons (1) from front of each gear. Gain access to aft gear (2) by opening access panel (3) (Task 2-2).
2. Cover tires with barrier material (E80) to protect from hydraulic fluid.
3. Dip a clean cloth (E120) in hydraulic fluid (E197 or E199). Wipe piston (1 or 2) with wet cloth to flush away grit. Leave a thin film of fluid on pistons.
4. Wipe up any spilled fluid.
5. Remove covers from tires.
6. Close access panel (3) (Task 2-2).



***CLEAN ROTOR SYSTEM SHOCK ABSORBER PISTONS***

7. Dip a clean cloth (E120) in hydraulic fluid (E197 or E199). Wipe pistons (5) with wet cloth to flush away grit. Leave a thin film of fluid on pistons.
8. Wipe up any spilled fluid.

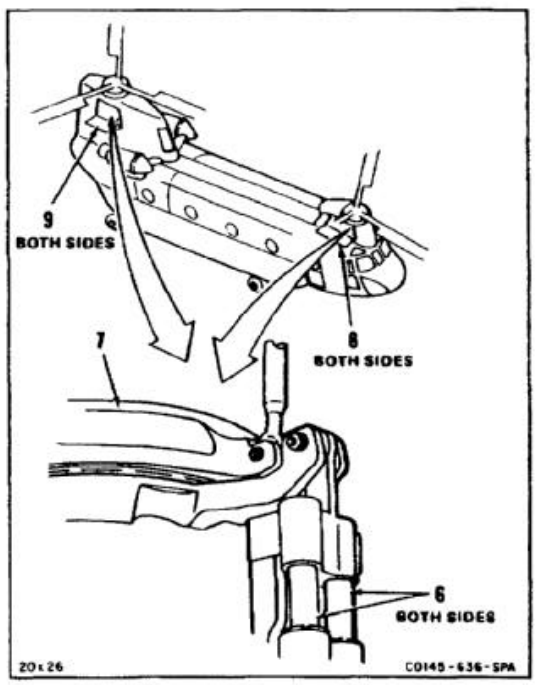



***CLEAN PIVOTING AND SWIVELING SERVOCYLINDER PISTONS***

**NOTE**

There is a servocylinder at each side of each swashplate.

9. Gain access to servocylinder pistons (6) on swashplate (7) of forward rotor by opening forward work platforms (8) (Task 2-2). Gain access to aft pistons by opening pylon work platforms (9) (Task 2-2).
10. Dip a clean cloth (E120) in hydraulic fluid (E197 or E199). Wipe pistons (6) with wet cloth to flush away grit. Leave a thin film of fluid on pistons.
11. Wipe up any spilled fluid.
12. Close forward work platforms (8). Close pylon work platforms (9) (Task 2-2).

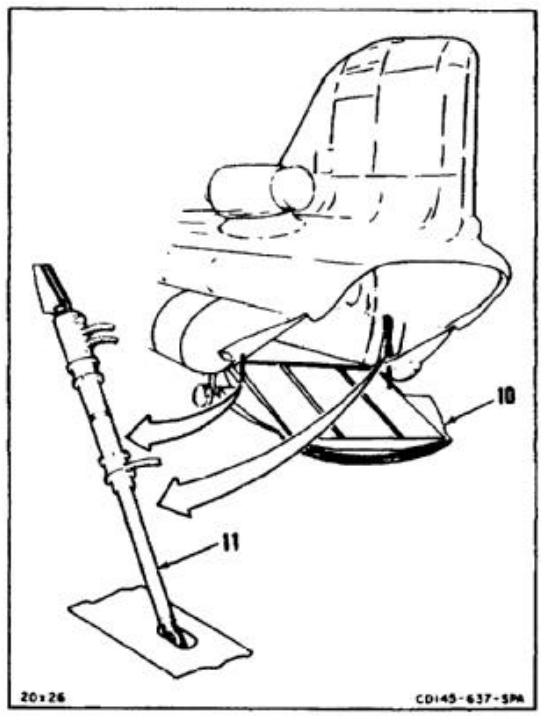


***CLEAN RAMP ACTUATOR CYLINDER PISTONS***

**NOTE**

Ramp must be lowered to expose full length of piston.

13. Lower cargo ramp (10) (TM 55-1520-240-T).
14. Dip a clean cloth (E120) in hydraulic fluid (E197 or E199). Wipe pistons (11) with wet cloth to flush away grit. Leave a thin film of fluid on pistons.
15. Wipe up any spilled fluid.
16. Raise cargo ramp (TM 55-1520-240-T).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 1-79 CLEAN AFTER SALT WATER LANDING OR IMMERSION 1-79

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

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

***Materials:***

Barrier Material (E80)
Corrosion Preventive Compound (E153)
Masking Tape (E388)

***Personnel Required:***

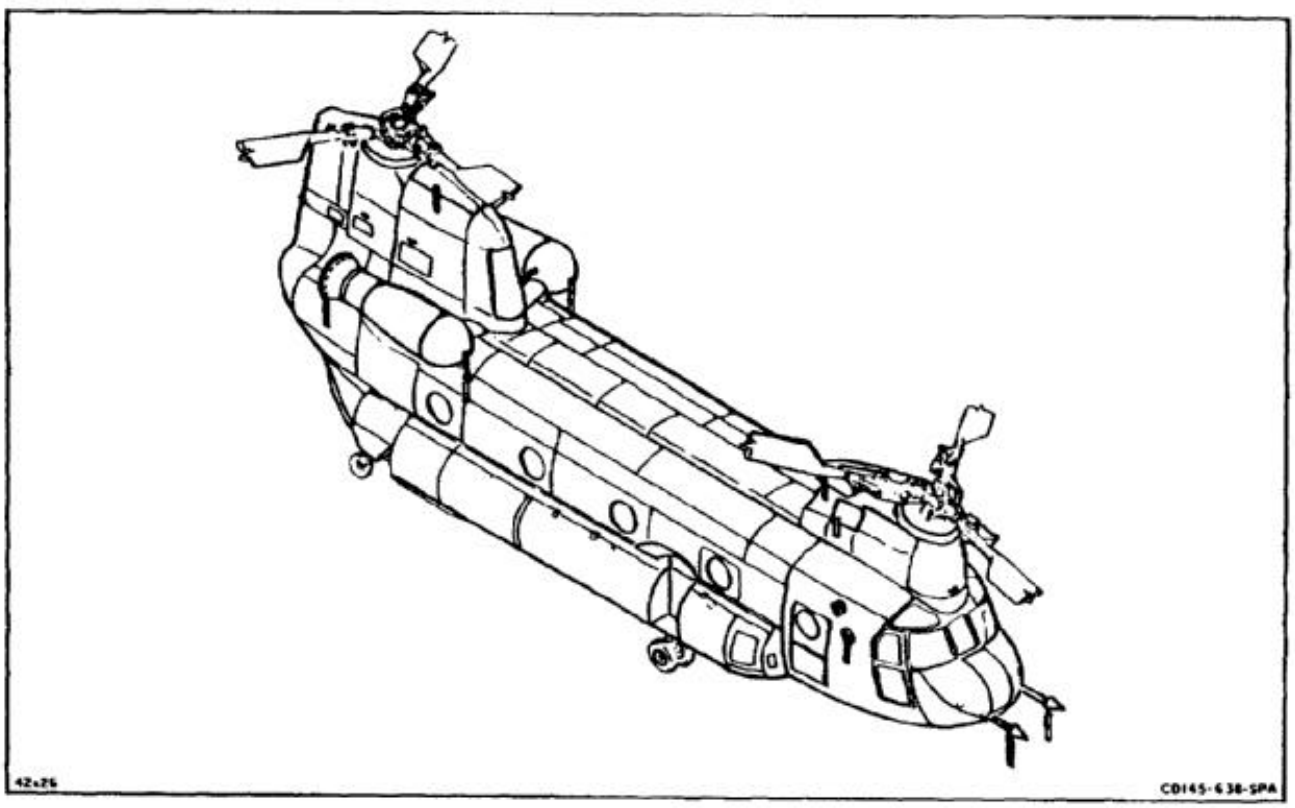
Medium Helicopter Repairer
Inspector

***References:***

TB 746-93-2
TM 55-1520-240-T
Task 1-78
Task 1-88
Task 2-204
Task 2-207
Task 3-7
Task 3-12

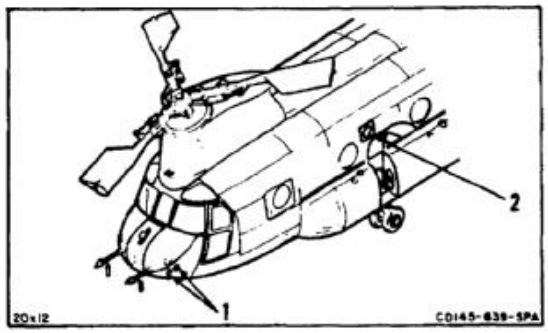
***Equipment Conditions:***

Drain Plugs Open (Task 2-214)
Protective Covers Installed on Following Areas (Task 1-32):
APU Exhaust
Engine Inlet (2)
Heater Exhaust
Heater Inlet
Oil Cooler Exhaust (2)
Oil Cooler Inlet (2)
Pitot Tube (2)
Pylon Air Inlet
Forward and Aft Landing Gear Access Panels Open (Task 2-2)

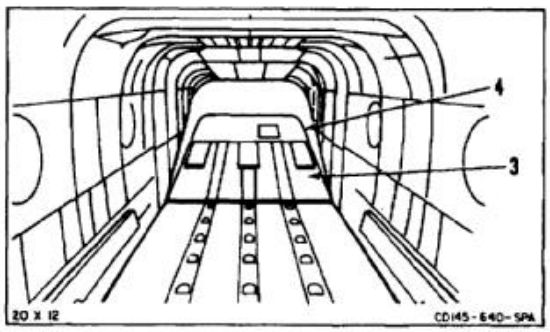


## 1-79 CLEAN AFTER SALT WATER LANDING OR IMMERSION (Continued) 1-79

1. Cover sideslip ports (1) on both sides of nose. Cover static ports (2) on both sides of fuselage. Use barrier material (E80) and masking tape (E388).
2. Rinse all areas exposed to salt water or spray. Use fresh water.

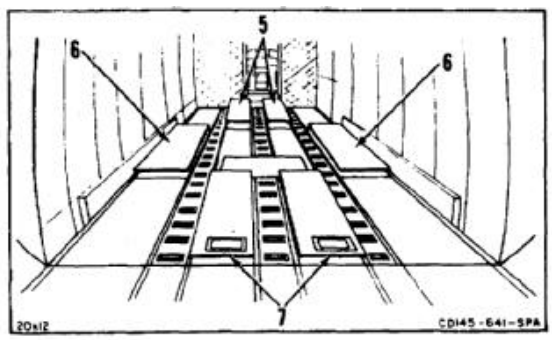



3. Open cargo ramp (3) halfway (TM 55-1520-240-T). Leave door (4) extended.

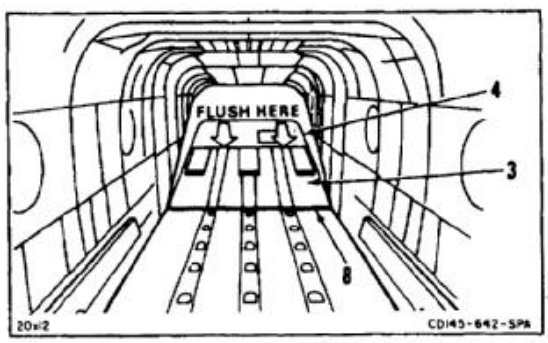



4. Remove following cabin floor panels (Task 2-204):

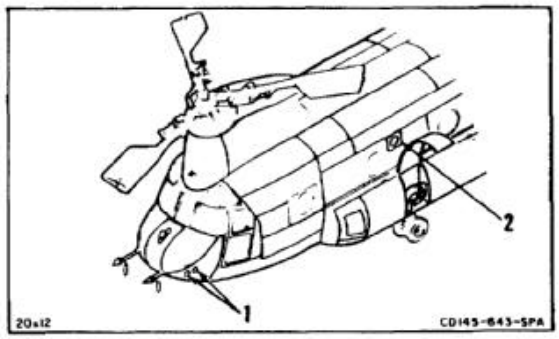
   Forward inboard (5)
   Center outboard (6)
   Aft inboard (7)



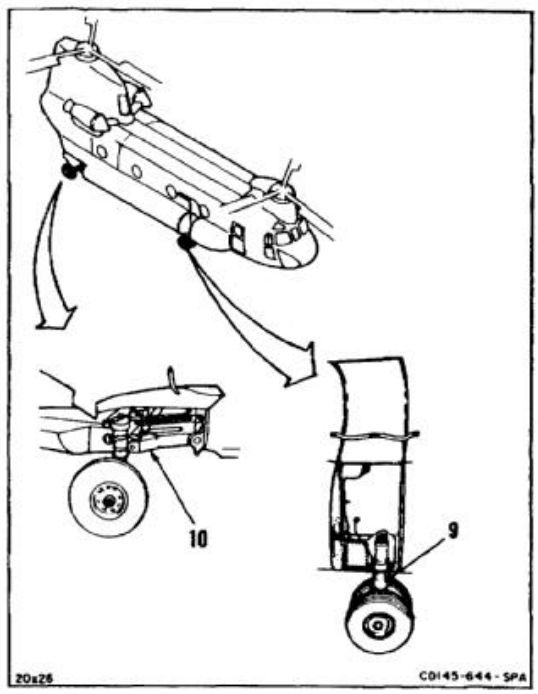

5. Flush underfloor areas with fresh water.
6. Flush between cargo ramp (3) and door (4) with fresh water. Flush ramp hinge fittings (8).



7. Remove covering on sideslip ports (1) and static ports (2) at both sides of helicopter.




8. Look for paint missing on forward landing gear (9), aft landing gear (10) and surrounding structure. Touch up as needed (TB 746-93-2).
9. Clean hydraulic pistons (Task 1-78).
10. Lubricate landing gear (Task 1-88).
11. Lubricate wheel bearings (Tasks 3-7 and 3-12).

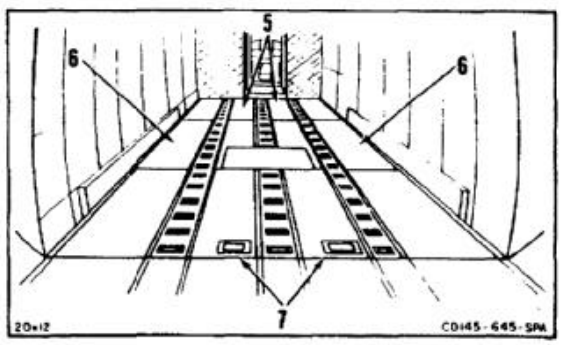



**NOTE**

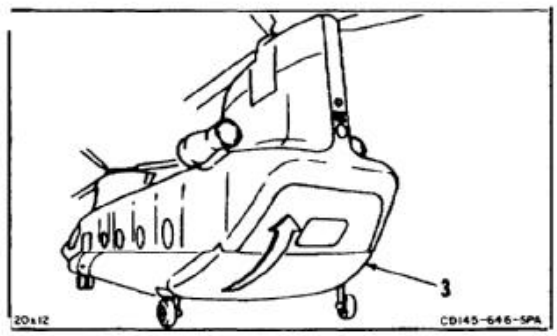
Check that underfloor areas have drained and dried before installing floor panels.

***INSPECT***

12. Install floor panels (5, 6, and 7) removed in step 4 (Task 2-207).



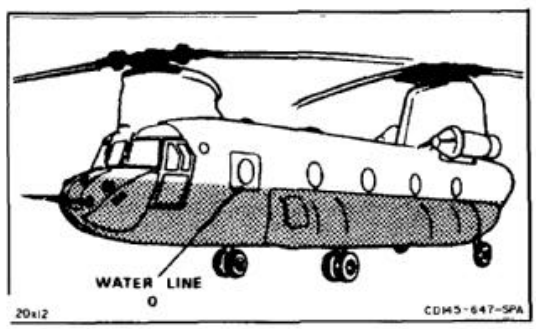
13. Close cargo ramp (3) (TM 55-1520-240-T).




**NOTE**

Perform step 14 only if more salt water landings will be made soon.

14. Coat outside painted surfaces up to water line 0 with exterior surface corrosion preventive compound (E153).




***FOLLOW-ON MAINTENANCE:***

Remove protective covers.
Close drain plugs (Task 2-215).
Close forward and aft landing gear access panels (Task 2-2).

END OF TASK

## 1-80 MATERIALS CLEANING 1-80

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

As Required

***Materials:***

As Required

***Personnel Required:***

Structural Repairer

***References:***

Task 1-76
Task 1-77
Task 1-81
Task 1-82
Task 1-83

1. This task provides general information for cleaning all materials used in the construction of the helicopter.
2. The following table, along with Tasks 1-76, 1-77, 1-81, 1-82, and 1-83, provides recommended cleaning solutions.
3. If the recommended cleaning solutions or compounds are not available, a cleaning procedure using approved materials can be used at the Maintenance Officer's discretion. However, the recommended cleaning procedures should be used as soon as the materials are available.

***Cleaning and Treating Corroded Parts***

| METAL | FORM | CLEANING | TREATMENT |
|---|---|---|---|
| Aluminum unfinished surfaces only | Mild surface pitting, staining, and superficial etching | Apply metal conditioner (E242), type III, with stiff bristle brush. Rinse with fresh water. | Apply brush touchup conversion treatment of alodine 1200 (E65) in accordance with requirements of MIL-C-5541 |
| Aluminum | Heavy surface pitting | Hand rub with aluminum wool (E72) and naphtha (E245). Apply metal conditioner (E242), type III. Rinse with fresh water. | See above |
| Aluminum Alclad unfinished surfaces | Mild or heavy surface pitting, staining, and superficial etching | Apply metal conditioner (E242), type III. Rinse with fresh water. Do not use abrasives. | See above |
| Aluminum | Intergranular corrosion | Remove corroded areas with routing tools. Burnish parts to remove all sharp edges. | See above |
| Aluminum | Stress corrosion (Cracking) | Repair or replace parts in accordance with applicable repair figure. | Not applicable |
| Magnesium | Surface pitting | Small parts (Refer to Task 1-82) | (Refer to Task 1-82) |
| Magnesium | Surface pitting | Large, nonremovable parts — remove corrosion products with a stiff bristle brush | Apply type J chrome-pickle solution or type VI chromic acid solution in accordance with MIL-M-3171 for **1 to 3 minutes**. Wash with fresh water |
| Magnesium | Stress corrosion (Cracking) | Repair or replace parts in accordance with applicable repair figure | Not applicable |
| Steel | Severely rusted | Replace parts | Not applicable |
| Steel | Lightly rusted parts (No deep pitting) | Use steel wool (E373) to remove rust and clean as necessary | Cadmium-plate removable parts in accordance with QQ-P-416. Brush cadmium plate local bare areas in accordance with MIL-STD-865. If post chromate treatment is not applied to cadmium plate, apply one coat of wash primer (E302) in accordance with MIL-C-8507. Then apply primer (E291) or primer (E292) |

***FOLLOW-ON MAINTENANCE:***

As Required

END OF TASK

## 1-81 CLEAN METAL PARTS (AVIM) 1-81

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Goggles

***Materials:***

Perchlorethylene (E272)
Gloves (E186)

***Personnel Required:***

Medium Helicopter Repairer

***References:***

Task 1-80

***Equipment Conditions:***

Off Helicopter Task

***General Safety Instructions:***

**WARNING**

Perchlorethylene (E272) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

1. Clean metal parts with a vapor degreaser such as perchlorethylene (E272). Follow these general procedures when cleaning parts in a vapor degreaser. Wear gloves (E186) and goggles.
2. Lower parts slowly into vapor area.
3. Suspend parts from hooks, racks, or in baskets, so that condensed liquid can drain. When vapor stops condensing on parts, they are ready for removal.
4. Remove parts slowly from the vapor area. If foreign matter remains on parts, hold them briefly above vapor to allow cooling. After parts have been cooled, return them to vapor.
5. Repeat until all foreign matter is removed.

***FOLLOW-ON MAINTENANCE:***

As Required

END OF TASK

## 1-82 CLEAN AND TREAT MAGNESIUM ALLOY PARTS (AVIM) 1-82

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Steel Container, 2 Gallon
Lead-Line 2S Aluminum Container
Lead or Rubber Lined Container
Steel Container
Goggles
Protective Clothing

***Other Tools:***

As Required

***Materials:***

Alkaline Cleaner (E117)
Chromic Acid (E114)
Hydrofluoric Acid (E201)
Sodium Acid Fluoride (E355)
Sodium Dichromate (E357)
Nitric Acid (E22)
Calcium Fluoride (E90)
Cloths (E120)
Naphtha (E245)
Calcium Sulphate (E91)
Gloves (E186)

***Personnel Required:***

Aircraft Structural Repairer

***References:***

Task 1-80
Task 1-81
MIL-M-3171, Type IV
MIL-M-45202, Type 1

***Equipment Conditions:***

Off Helicopter Task

***General Safety Instructions:***

**WARNING**

Do not add water to acids. A violent action will result. Acids should be added to water in small quantities. Wear gloves (E186).

**WARNING**

Chemical materials used in this task are extremely toxic. They can irritate skin and cause burns. Avoid inhaling, use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

1. Galvanic anodize parts containing Dowmetal M, EK30A and EK41A magnesium alloys in accordance with MIL-M-3171, type IV.
2. Anodize parts made from ZK60 magnesium alloy in accordance with MIL-M-45202, type 1. When this treatment is used, do not allow anodic coating to build up excessively.
3. Clean and treat all parts not noted in steps 1 and 2 as follows:
   a. Prepare each of the cleaning and treating solutions as follows:

(1) Mix **6 to 10 ounces** of alkaline cleaner (E117) to water, in a steel container, to make **1 gallon** of alkaline cleaning solution.

(2) Mix **10 to 20 percent**, by weight, of chromic acid (E114) to water in a lead-line or 2S aluminum container, to make a chromic acid solution.

(3) Mix **15 to 25 percent**, by weight, of hydrofluoric acid (E201) to water in a lead or rubber lined container to make a hydrofluoric acid solution.

(4) Mix **4 to 6 percent**, by weight, of sodium acid fluoride (E355) to water in a lead or rubber lined container to make a sodium acid fluoride solution.

(5) Mix **10 to 20 percent**, by weight, of sodium dichromate (E357) and **0.1 to 0.25 percent** by weight of calcium fluoride (E90) to water, in a steel container to make a dichromate solution.

b. Clean and treat parts as follows:

(1) Clean parts with cloths (E120) soaked in naphtha (E245) or equivalent.

(2) Immerse parts in alkaline cleaning solution, maintained at **180º to 210ºF (82º to 99ºC) for 5 to 15 minutes** or until all visible soil is removed.

(3) Rinse parts thoroughly with cold water and inspect for breaks in the water film. If breaks occur, repeat step (2).

(4) Immerse parts in solution of chromic acid (E114), maintained at **165º to 210ºF (74º to 99ºC) for 10 to 15 minutes**. Rinse parts thoroughly with cold water. If necessary, the chromic acid solution may be maintained at **70ºF (21ºC)**, however, longer immersion times may be necessary.

**NOTE**

Newly applied pretreatments can be removed by this procedure. Very old pretreatments may require additional alternate immersion in solutions of alkaline cleaner (E117) and chromic acid (E114) for complete removal of finish.

(5) Immerse parts in solution of hydrofluoric acid (E201). Immerse sheet stock for approximately **30 seconds**. Immerse all other parts for **5 minutes**. If parts contain aluminum inserts, immerse them for **5 to 15 minutes** in solution of sodium acid fluoride (E335) instead of hydrofluoric acid. Rinse all parts thoroughly in cold running water.

(6) Immerse parts in solution of sodium dichromate (E357), maintained at **200º to 220ºF (93º to 104ºC)**, for approximately **30 minutes**.

(7) Rinse parts thoroughly. Dip them in hot water to let them dry faster.

**NOTE**

The dichromate treatment makes magnesium alloys corrosion resistant and serves as a base for paint.

(8) Refinish cleaned and treated parts as soon as possible.

4. Parts requiring touchup only can be chrome-pickle treated as follows:

a. Clean parts with cloths (E120) soaked in naphtha (E245) or equivalent.

b. Prepare one of the following chrome-pickle solutions.

(1) Solution I. Mix **1-1/2 pounds** of sodium dichromate (E357) and **1-1/2 pints** of nitric acid (E22) to a sufficient amount of water to make **1 gallon** of solution. Use polyethylene, stainless steel, glass, or vinyl-lined container.

(2) Solution II. Mix **1-1/3 ounces** of chromic acid (E114) and **1 ounce** of calcium sulphate (E91) to a sufficient amount of water to make **1 gallon** of solution. Use stainless steel, glass, or aluminum container. Apply solution by brushing. Allow solution to remain on surface for **1 to 2 minutes**. Gently wash part with a cloth (E120) soaked with water.

***FOLLOW-ON MAINTENANCE:***

As Required

END OF TASK

## 1-83 CLEAN ALUMINUM AND ALUMINUM ALLOY PARTS (AVIM) 1-83

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Steel Tank
Source of Heat
Goggles
Protective Clothing
Measuring Cup Calibrated in Ounces
Respirator
Other Tools As Required

***Materials:***

Gloves (E186)
Sulfuric Acid (E23)
Sodium Dichromate (E357)
Oakite 61 (E249)
Cloths (E120)
Naphtha (E245)
Barrier Material (E80)

***Personnel Required:***

Aircraft Structural Repairer

***Equipment Conditions:***

Off Helicopter Task

***References:***

Task 1-81

***General Safety Instructions:***

**WARNING**

Do not add water to acids. A violent action will result. Acids shall be added to water in small quantities.

**WARNING**

Sulfuric acid (E23) and sodium dichromate (E357) are extremely toxic. They can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

**NOTE**

This procedure is used when an extremely clean surface is necessary, such as prior to welding, or when bonding large areas of aluminum. Separate solutions must be used for parts to be welded and parts to be bonded.

1. Prepare solution of sulfuric acid (E23) and sodium dichromate (E357) as follows:
   a. Pour cold water into a tank.
   b. Add **40 ounces** of sulfuric acid (E23) to each gallon of water in tank.
   c. Add **4-1/2 ounces** of sodium dichromate (E357) to each gallon of water in tank.
   d. Stir solution until sodium dichromate dissolves.
2. Prepare solution of Oakite No. 61 (E249) as follows:
   a. Add **7 ounces** of Oakite No. 61 (E249) crystals to each gallon of water used. Stir water while adding crystals.
   b. Heat solution to **175º to 185ºF (70.5º to 85ºC)** to dissolve crystals.

**WARNING**

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

3. Before cleaning parts, degrease them with cloths (E120) soaked in naphtha (E245) or equivalent.
4. Clean parts as follows:
   a. Immerse part in solution of Oakite No. 61 (E249) **5 to 10 minutes**. Maintain a solution temperature of **160º to 210 ºF (71º to 99ºC)** for this period.
   b. Remove part from solution. Rinse with water.
   c. Inspect for breaks in water film. If break occurs, repeat degreasing procedure step 3. Then repeat steps 4a, 4b, and 4c.
   d. Immerse parts in solution of sulfuric acid (E23) and sodium dichromate (E357) **10 to 20 minutes**. Maintain solution temperature of **150º to 170ºF (66º to 77ºC)** for this period.
   e. Remove part from solution, rinse thoroughly with water. Dry with clean, dry filtered hot air. Do not exceed **140ºF (60ºC)**.
   f. Handle clean parts with clean gloves. Wrap part with barrier material (E80).
   g. If recleaning is necessary, repeat step 4. However, in step a, immerse part only **2-1/2 to 5 minutes**. Also, in step d, immerse part only **5 to 10 minutes**.

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 1-84 HOT ENVIRONMENT MAINTENANCE 1-84

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

None

***Materials:***

None

***Personnel Required:***

Medium Helicopter Repairer

***References:***

TM 1-1500-204-23
TM 55-410

CAUTION

Sliding windows shall be opened to allow air circulation through helicopter parked in direct sun or where extremely hot climate conditions exist.

**NOTE**

Humidity in closed helicopter can be extremely high, even when outside humidity is low.

Refer to TM 1-1500-204-23 and TM 55-410 for hot weather maintenance procedures.

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 1-85 DUSTY ENVIRONMENT MAINTENANCE 1-85

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Brush
Compressed Air Source

***Materials:***

Cloth (E120)
Solvent (E161)
Gloves (E186)

***Personnel Required:***

Medium Helicopter Repairer

***Equipment Conditions:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Forward Transmission Fairing Work Platforms Open (Task 2-2)
Aft Pylon Work Platforms Open (Task 2-2)
Drive Shaft Tunnel Access Covers Open (Task 2-2)
Aft Landing Gear Access Panels Open (Task 2-2)

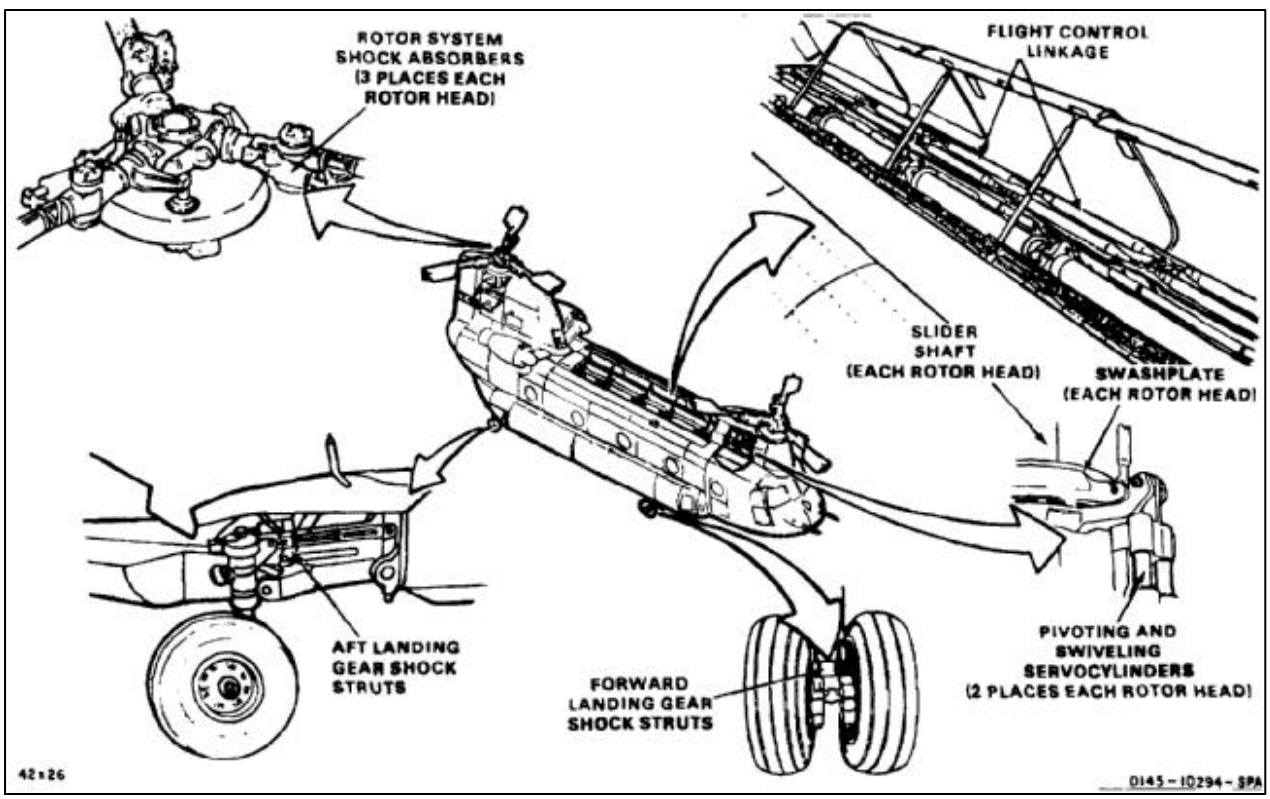
***General Safety Instructions:***

**WARNING**

Dry cleaning solvent (E161) is combustible and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

**WARNING**

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



CAUTION

Do not saturate cloth (E120) with solvent (E161) for removal of solid deposits on flight control components. Contaminants can be washed into bearings resulting in injury to personnel and damage to equipment.

1. Clean flight control linkage in drive shaft tunnel area as required. Use dry brush or low-pressure compressed air. If necessary, use cloth (E120) damp with solvent (E161). Remove dirt, sand, and grit from bellcrank, idler, and connecting link bearing areas. Wear gloves (E186).

2. Clean swashplates in area of slider shaft. Clean upper boost actuator piston. Clean rotary wing shock absorber piston. Clean landing gear shock absorber pistons. Use dry brush or low-pressure compressed air. If necessary, use cloth (E120) damp with solvent (E161). Wear gloves (E186).

***FOLLOW-ON MAINTENANCE:***

Close forward transmission fairing work platforms (Task 2-2).
Close aft pylon work platforms (Task 2-2).
Close drive shaft tunnel access covers (Task 2-2).
Close aft landing gear access panels (Task 2-2).
Install protective covers (1-32).

END OF TASK

## 1-86 COLD ENVIRONMENT MAINTENANCE 1-86

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Zone Heater With Duct

***Materials:***

Cloth (E120)
Hydraulic Fluid (E197)
Release Agent (E308)
Deicing-Defrosting Fluid (E74)
Dry Cleaning Solvent (E162)
Cleaning and Polishing Compound (E118 or E282)

***Personnel Required:***

Medium Helicopter Repairer

***Reference:***

TM 1-1500-204-23
TM 55-410
Task 1-64
Task 1-78
Task 2-2
Task 2-40
Task 4-64
Task 4-76
Task 5-93
Task 9-25

***Equipment Conditions:***

As Required

***General Safety Instructions:***

As Required

**NOTE**

Refer to TM 1-1500-204-23 for cold weather maintenance information.

1. Follow cold weather maintenance procedures for engines as described:
   a. Remove snow and ice from air inlet housings before starting engines.
   b. Remove bypass panels from engine air inlet screens for operation at temperatures below **40°F (4°C)** (Task 4-64).
   c. Open screen access panel (Task 2-2).
   d. Check that compressor rotor turns freely.


Do not use starter to free frozen compressor rotor. Engine damage will result.

**NOTE**

Condensed moisture will freeze engine parts when engine cools to **32°F (0°C)** after shutdown.

   e. Free frozen compressor rotors. Use heater and duct at air inlet housing.
   f. Close engine air inlet screen access panel (Task 2-2).
2. Follow cold weather maintenance practices for battery as described:
   a. If helicopter will be parked overnight at **–40°F (–4°C)** or below, remove battery (Task 9-25). Store battery in warm place.
   b. Keep electrical loads to minimum before starting APU.
3. Wipe exposed shafts of landing gear shock struts daily during cold weather operation (Task 1-78). This prevents accumulation of ice and dirt which damages seals and packings. Use cloth (E120) damp with hydraulic fluid (E197).

WARNING

If closed, vent valves on rotary-wing blade shock absorbers must be open at temperatures below **0ºF (–18ºC)**. Dangerous ground and flight reactions can result.

**NOTE**

Vent valve may be open or closed at temperatures between **0ºF (–18ºC)** and **30ºF (–1ºC)**.

4. Open vent valves on rotary-wing shock absorbers (Task 5-93).
5. Wipe exposed pistons of rotor system shock absorbers and pivoting and swiveling servocylinders (Task 1-78). This prevents accumulation of ice and dirt which damages seals and packings. Use cloth (E120) damp with hydraulic fluid (E197).
6. Follow cold weather maintenance procedures for utility hydraulic system accumulator (Task 1-65).
7. Follow cold weather maintenance procedures for windshields as described:

CAUTION

Do not scrape ice or frost from windshields. Surface will be scratched. Do not use wipers before heating windshield. Scratches or damaged wipers will result.

   a. Soften ice and frost by operating windshield heater before using wipers.

8. Maintain exterior surfaces covered with ice and snow as follows:

CAUTION

Do not chip or scrape ice or frost from any helicopter surface. Surface will be damaged.

   a. Brush all loose snow or frost from helicopter surfaces. Pay special attention to rotor blades.

WARNING

Anti-icing and deicing-defrosting fluid (E74) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

CAUTION

Fluid (E74) must be mixed with water. Strong solutions can damage painted surfaces.

**NOTE**

Fluid (E74) will not damage fiberglass surfaces.

   b. Remove remaining ice. Use anti-icing and deicing defrosting fluid (E74) diluted as shown. Work from upper surfaces downward.

**NOTE**

Fluid (E74) can be heated to **150ºF (66ºC)**.

| Ambient Temp | Fluid (E74) | Water |
|---|---|---|
| 30ºF(–0ºC) | 20% | 80% |
| 20ºF(–7ºC) | 30% | 70% |
| 10ºF(–12ºC) | 40% | 60% |
| 0ºF(–18ºC) | 45% | 55% |
| –10ºF(–23ºC) | 50% | 50% |
| –20ºF(–29ºC) | 55% | 45% |
| –30ºF(–35ºC) | 60% | 40% |

**WARNING**

Release agent (E308) can form toxic vapors if exposed to flame. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

**WARNING**

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

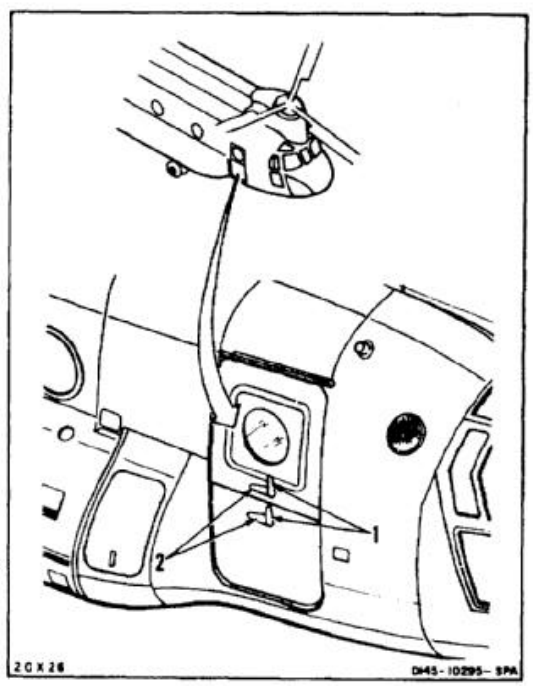
c. Clean surfaces of cabin door handle latch (1) and handle recess (2) in latch body of door. Use cloth (E120) damp with solvent (E162). Apply release agent (E308) to these surfaces.

**NOTE**

Do not lubricate coated surfaces.

d. Renew coating when latches and handle release mechanisms become difficult to operator.

9. Clean transparent plastic when temperature is below **32ºF (0ºC)**. Use cleaning and polishing compound (E118 or E282) (Task 2-40).



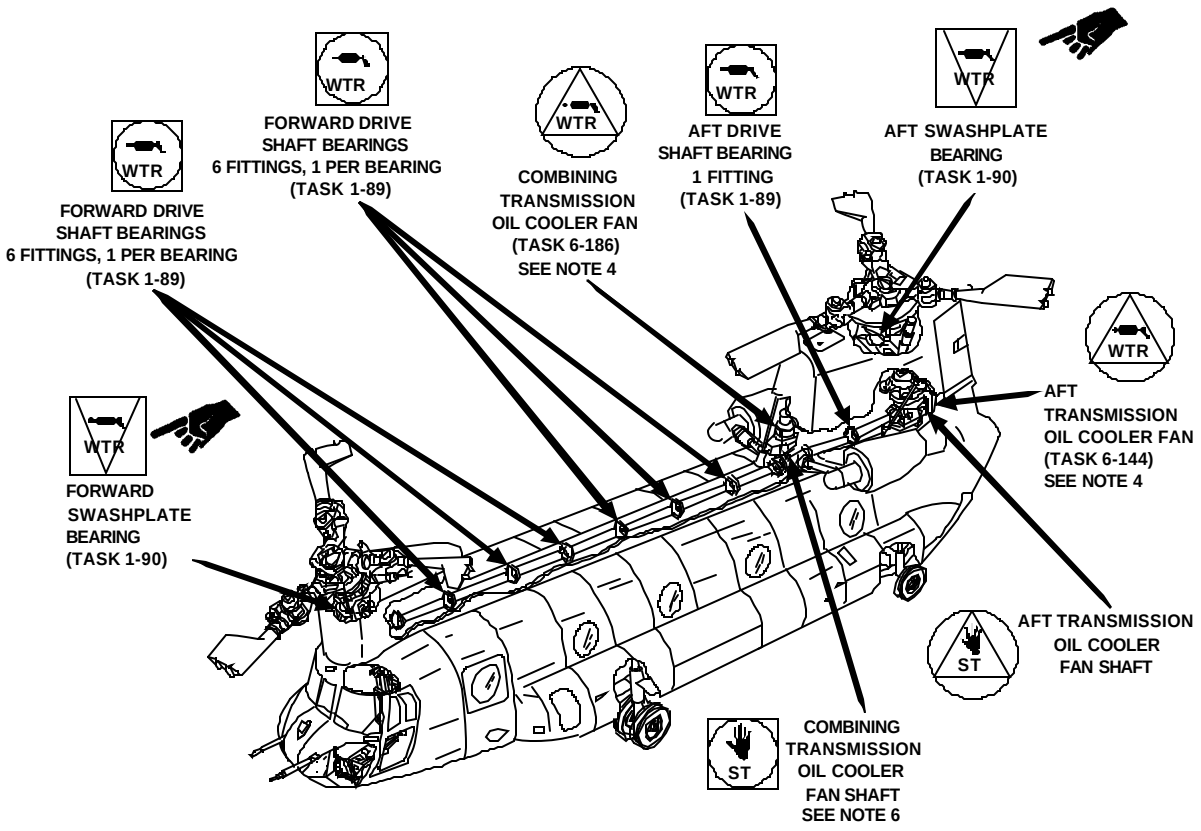

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 1-87 LUBRICATION CHARTS 1-87

Sheet 1 illustrates lubrication points on the helicopter, with reference to specific tasks. Sheet 2 illustrates oil change requirements.




NOTE: 1. REPACK WHEEL BEARINGS EACH TIME THE WHEEL ASSEMBLY IS REMOVED FOR ANY REASON.

2. AFTER A WATER LANDING, NO MORE THAN THREE (3) DAYS SHALL ELAPSE WITHOUT HAVING WHEEL BEARINGS REPACKED.

3. LUBRICATION INTERVAL SHOWN IS FOR AVERAGE CONDITIONS. MORE FREQUENT LUBRICATION MAY BE NECESSARY UNDER EXTREMELY DUSTY CONDITIONS.

4. DO NO OVERGREASE THE FAN ASSEMBLY. DO NOT BLOCK THE VENT FITTING WHILE APPLYING GREASE.

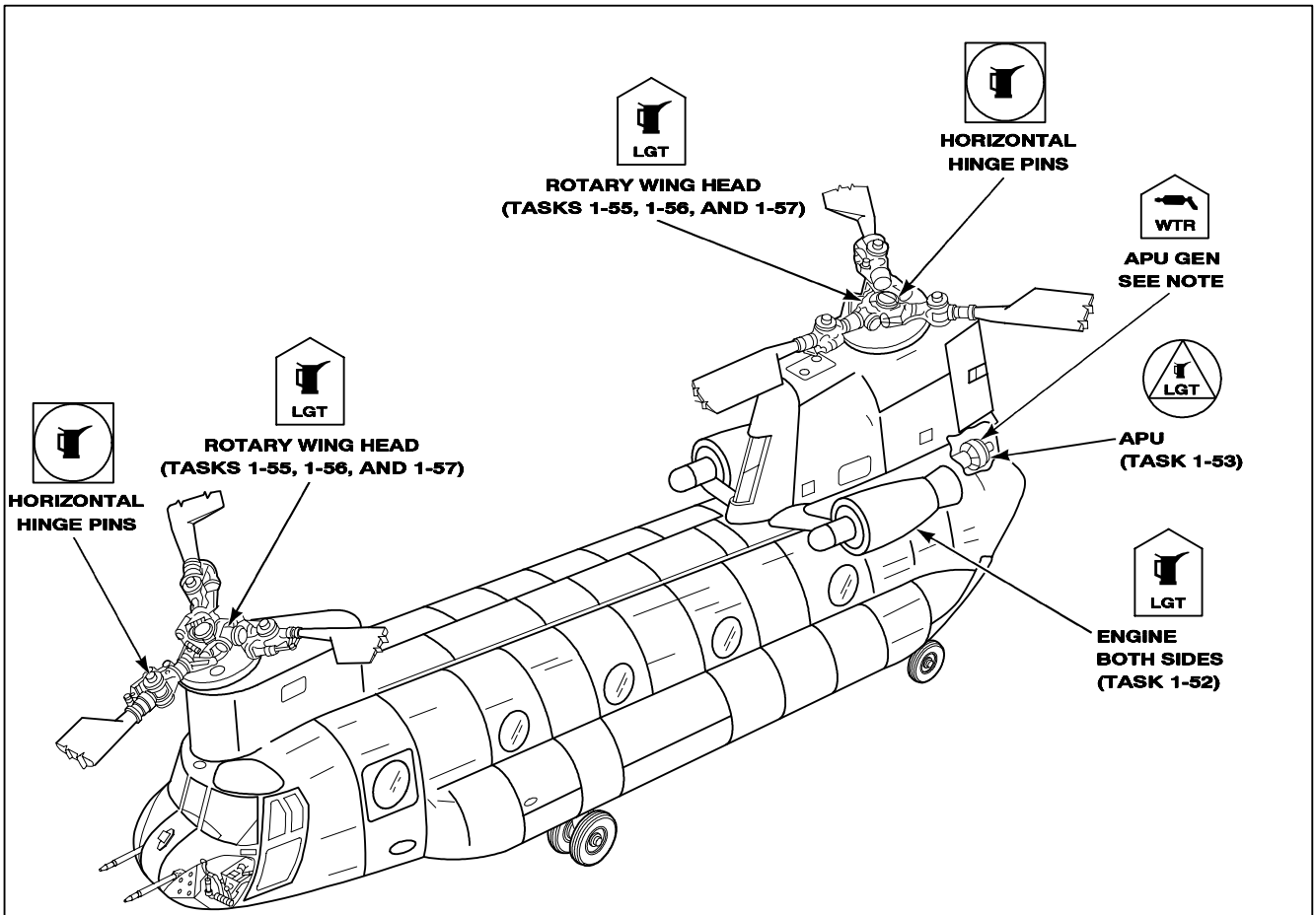
5. WHEEL BEARINGS, FORWARD LANDING GEAR TORQUE LINKS, AFT LANDING GEAR TRUNNION, AND AFT LANDING GEAR SWIVEL HOUSING LUBRICATION ARE CONTAINED IN TM-55-1520-240-PM.

6. REGREASE NOT REQUIRED FOR 145D5319-7 SHAFT.

| TABLE OF LUBRICANTS | | |
|---|---|---|
| IDENTIFICATION LETTER | SPECIFICATION | TYPE OF LUBRICANT |
| WTR | MIL-G-81322 (E190) | GREASE, AIRCRAFT GENERAL PURPOSE, WIDE TEMPERATURE RANGE |
| ST | (E190.1) | GREASE, SYN-TECH |

| SYMBOLS | FREQUENCY | METHOD OF APPLICATION |
|---|---|---|
| | 100 HOURS | GREASE GUN |
| | 200 HOURS | HAND |
| | 50 HOURS | |

B2310437




NOTE: APPLIES TO LEGEND GENERATOR (AGH942-1) ONLY.

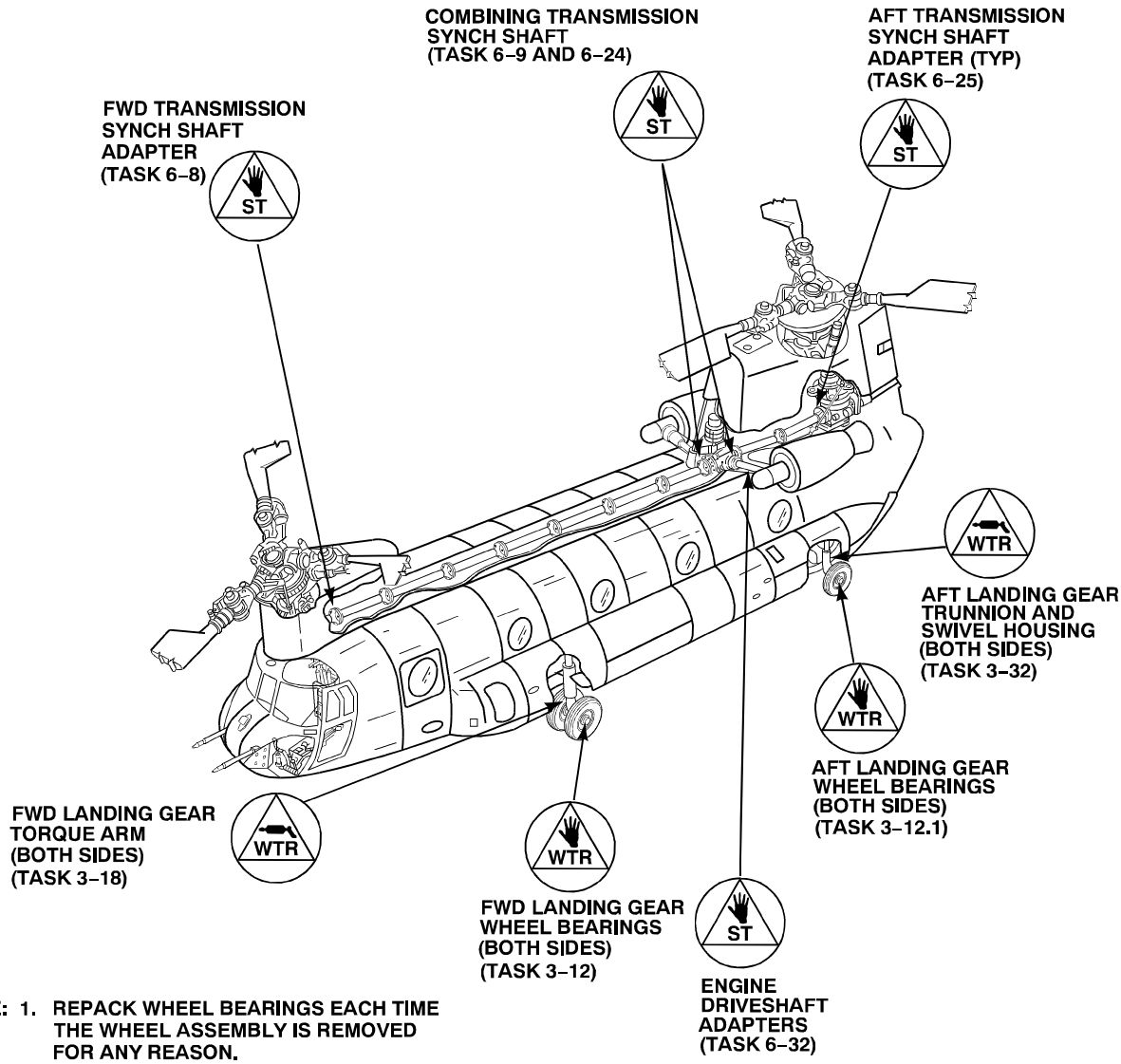
| TABLE OF LUBRICANTS | | |
|---|---|---|
| IDENTIFICATION LETTER | SPECIFICATION | TYPE OF LUBRICANT |
| LGT | MIL-L-7808 (E254) OR MIL-L-23699 (E253) (REFER TO SERVICING INSTRUCTIONS FOR USAGE LIMITATIONS) | LUBRICATING OIL AIRCRAFT TURBINE ENGINE SYNTHETIC BASE |
| WTR | MIL-G-81322 (E190) | GREASE AIRCRAFT GENERAL PURPOSE WIDE TEMPERATURE RANGE |

| SYMBOLS | FREQUENCY | METHOD OF APPLICATION |
|---|---|---|
| △ | 200 HOURS | OIL CAN |
| ⬠ | 400 HOURS | GREASE GUN |
| ○ | 100 HOURS (HORIZONTAL HINGE PINS ONLY) | |

NOTE

ROTARY WING HEAD AND ENGINE OIL CHANGES ARE DONE DURING SPECIFIC INSPECTIONS. REFER TO TM 55-1520-240-PM

B2310438




NOTE: 1. REPACK WHEEL BEARINGS EACH TIME THE WHEEL ASSEMBLY IS REMOVED FOR ANY REASON.

2. AFTER A WATER LANDING, NO MORE THAN THREE (3) DAYS SHALL ELAPSE WITHOUT HAVING WHEEL BEARINGS REPACKED.

SHEET 3 OF 3

| TABLE OF LUBRICANTS | | |
|---|---|---|
| IDENTIFICATION LETTER | SPECIFICATION | TYPE OF LUBRICANT |
| ST | (E190.1) | GREASE, SYN–TECH |
| WTR | MIL–G–81322 (E190) | GREASE, AIRCRAFT GENERAL PURPOSE, WIDE TEMPERATURE RANGE |

| SYMBOLS | FREQUENCY | METHOD OF APPLICATION |
|---|---|---|
| | 200 HOURS | GREASE GUN |
| | | HAND |

B2310459

END OF TASK

## 1-88 LUBRICATE LANDING GEAR 1-88

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Hand Lubricating Gun
Flexible Grease Gun Coupling

***Materials:***

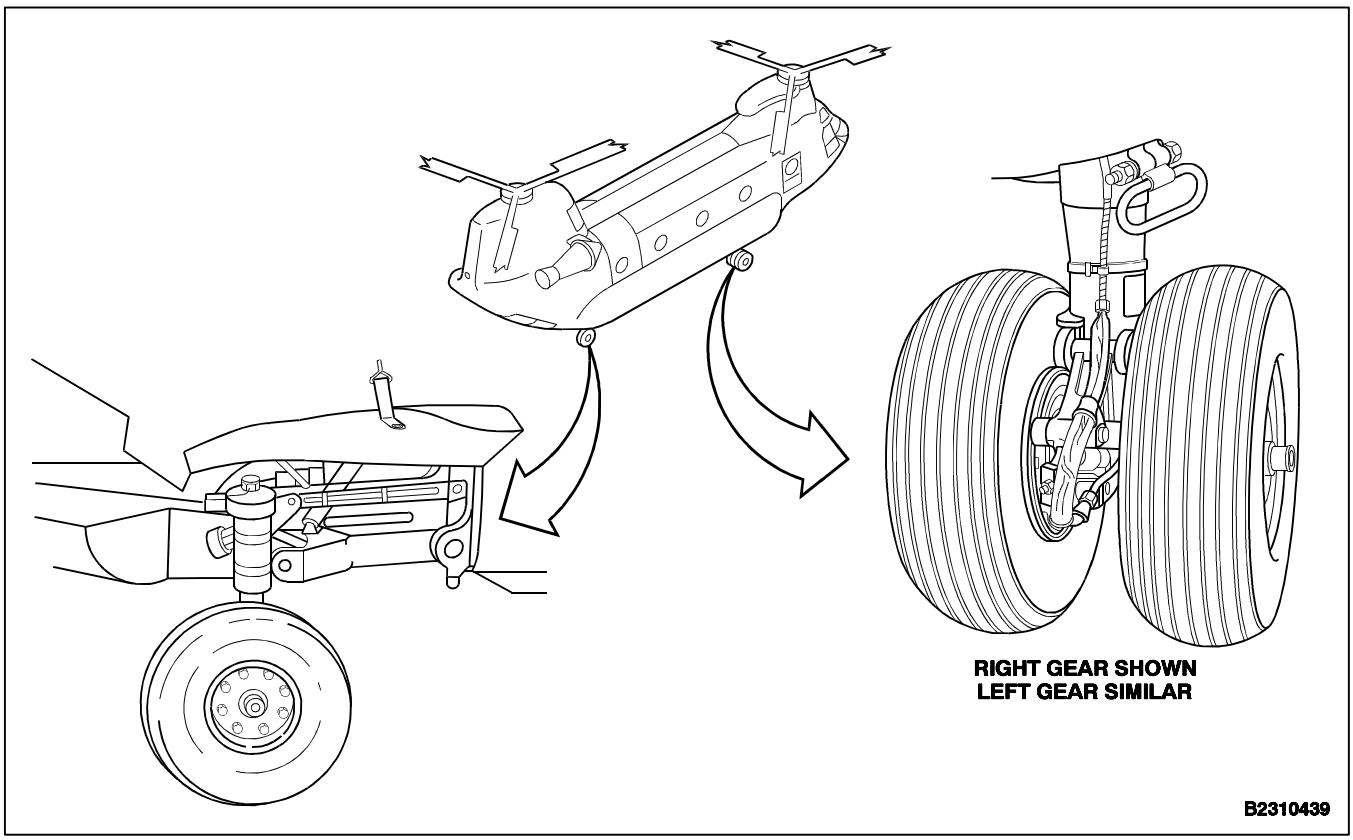
Cloth, Cleaning (E120)
Grease (E190)

***Personnel Required:***

CH-47 Helicopter Repairer

***Equipment Condition:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Hydraulic Power Off
Aft Landing Gear Access Panels Open (Task 2-2)

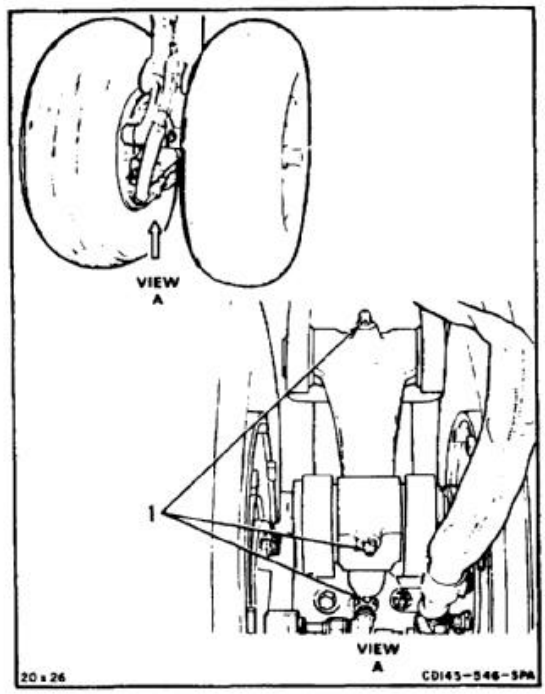

RIGHT GEAR SHOWN
LEFT GEAR SIMILAR
B2310439

**NOTE**

Lubricate left and right gear in same way.

***LUBRICATE FORWARD GEAR***

1. Wipe three fittings (1) at aft end of gear with clean cloth (E120).
2. Apply grease (E190) at each fitting (1) until old grease is forced out and new grease appears.
3. Wipe off old grease with cloth (E120).



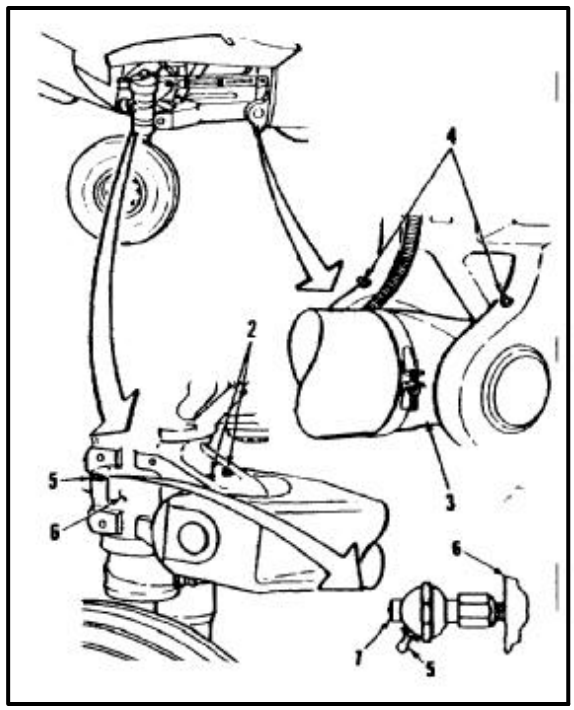
***LUBRICATE AFT GEAR***

4. Wipe fittings clean with clean cloth (E120):
   a. Two fittings (4) at forward end of drag link (3).
   b. Two fittings (2) at aft end of drag link.
   c. Fitting (5) at aft end of swivel housing (6).
5. Apply grease (E190) at fittings (2 and 4) until old grease is forced out and new grease appears.

CAUTION

High pressure at swivel housing fitting can damage gear. If high pressure is needed to force out grease, remove fitting and check for restriction.

6. Apply grease (E190) at swivel housing fitting (5). Use very low pressure. Apply grease until old grease is forced out and new grease appears at relief tip (7).
7. Wipe off old grease with cloth (E120).




***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 1-89 LUBRICATE DRIVE SHAFT BEARINGS 1-89

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Hand Lubricating Gun

***Materials:***

Cloths (E120)
Grease (E190)

***Personnel Required:***

Medium Helicopter Repairer (2)

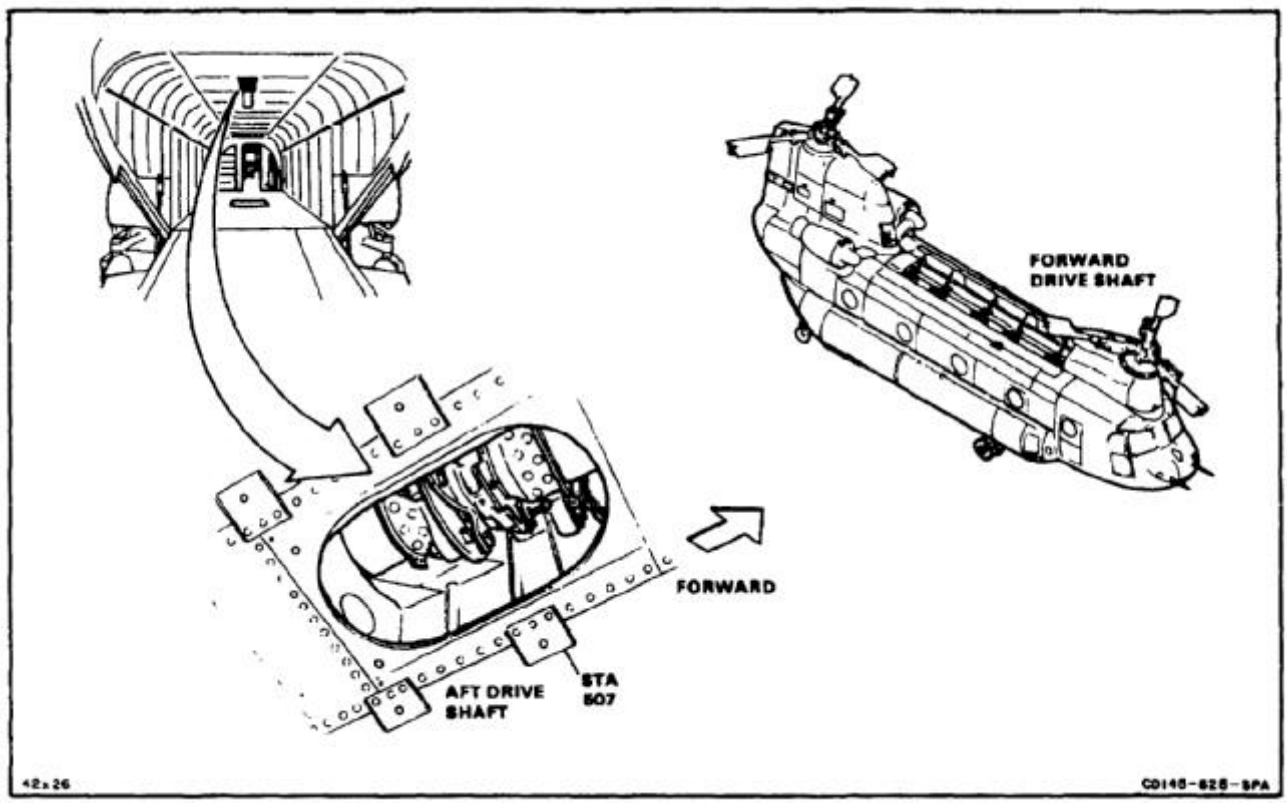
***Equipment Conditions:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Forward Drive Shaft Tunnel
Access Doors Open (Task 2-2)
Aft Drive Shaft Access Panel Open (Task 2-2)
Tiedown Line Installed on One Forward Rotor Blade (Task 1-26)

***General Safety Instructions:***

**WARNING**

Rotary-wing blades can seriously injure personnel. Make sure area around helicopter is clear of personnel before turning blades.

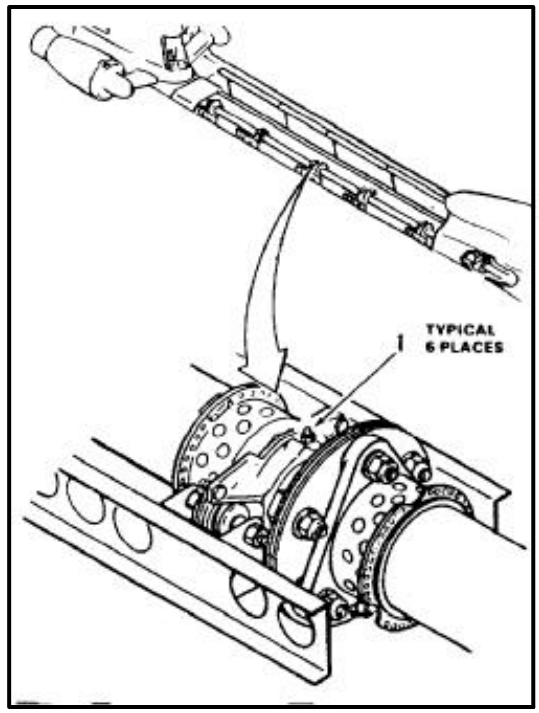


***LUBRICATE FORWARD SHAFT BEARINGS***

**NOTE**

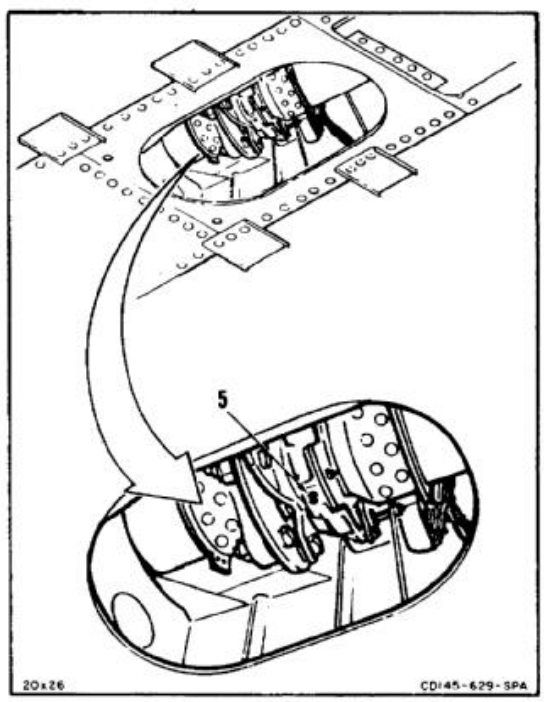
There are six bearings on the forward drive shafting. Lubricate each the same way.

1. Wipe fitting (1) with a clean cloth (E120).
2. Have helper rotate shaft by slowly pulling rotor blades around with tiedown line. As shaft rotates, apply grease (E190) at fitting (1) until old grease is forced out and new grease appears. Use a grease gun.
3. Wipe off old grease with cloths (E120).
4. Repeat steps 1 thru 4 for each fitting (1).




***LUBRICATE AFT SHAFT BEARINGS***

5. Wipe fitting (5) with a clean cloth (E120).
6. Have helper rotate shaft by slowly pulling rotor blades around with tiedown line. As shaft rotates, apply grease (E190) at fitting (5) until old grease is forced out and new grease appears. Use a grease gun.
7. Wipe off old grease with cloths (E120).




***FOLLOW-ON MAINTENANCE:***

Close aft drive shaft access panel (Task 2-2).
Close forward drive shaft tunnel access doors (Task 2-2).

END OF TASK

## 1-90 LUBRICATE SWASHPLATE 1-90

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692
Hand Lubricating Gun
Grease Gun Coupling

***Materials:***

Cloths, Lint Free (E134.1)
Grease (E190)
Cleaning Solvent (E471)

***Personnel Required:***

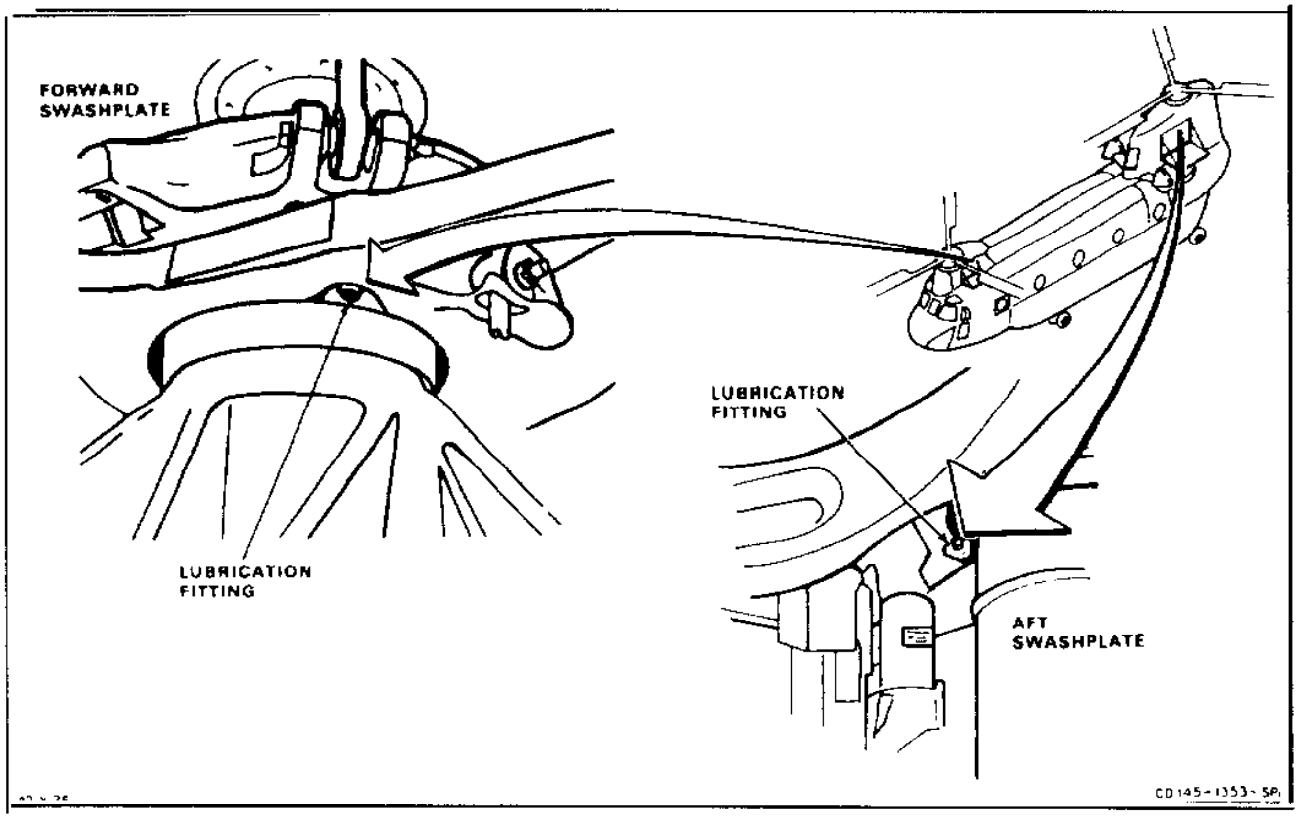
Medium Helicopter Repairer (2)

***References:***

Task 5-115
Task 5-116
Task 5-132
Task 5-133

***Equipment Conditions:***

Battery Disconnected (Task 1-39)
Electrical Power Off
Left Forward Transmission Fairing Open (Task 2-2)
Left Pylon Work Platform Open (Task 2-2)
Tiedown Line Attached to One Forward Blade (Task 1-26)



**NOTE**

Lubricate forward or aft swashplate in the same way.

1. Using a clean lint free cloth (E134.1) dampenend with cleaning solvent (E471), clean the inner ring assembly and the outer ring assembly at the upper seal (2 and 3). Wipe dirt and grease from lubrication fitting (1). Ensure all surface grit, sand, and other foreign materials are removed.

**WARNING**

Rotary-wing blades can seriously injure personnel. Make sure area around helicopter is clear of personnel before turning blades.

**CAUTION**

Pumping grease into swashplate without turning rotating ring can result in bearing damage.

**NOTE**

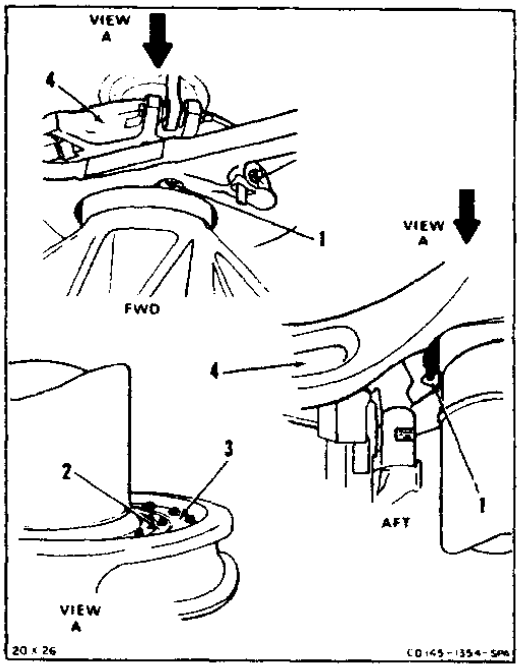
If you cannot pump and turn at the same time, turn ring in **12 equal steps**, **30°** each step. Pump in grease between steps.

2. Have helper rotate ring (4) by pulling blades around with tiedown line. As ring rotates, pump grease (E190) into fitting (1). Use a hand lubricating gun with a flexible coupling.

**NOTE**

A minimum of **16 ounces** of grease must be used to adequately purge grease from the swashplate.

3. Pump until clean grease appears all the way around the line between stationary seal (2) and rotating seal (3).
4. Wipe grease from fitting (1) and between seals (2 and 3).
5. Feel for metal chips in seal grease. If there are chips, replace swashplate (Tasks 5-115 and 5-132 or Tasks 5-116 and 5-133).




***FOLLOW-ON MAINTENANCE:***

Close left forward transmission fairing (Task 2-2).
Close left pylon work platform (Task 2-2).

END OF TASK

# SECTION VII
# OVERHAUL AND RETIREMENT SCHEDULE

## 1-91 OVERHAUL AND RETIREMENT SCHEDULE 1-91

1. This section lists parts or components of the helicopter. These items shall be removed from the helicopter for overhaul or retirement at the period specified. Removal of equipment for overhaul may be accomplished at the inspection nearest the time when overhaul is due unless otherwise specified in TM 1-1500-328-25.

***DEFINITIONS***

a. Overhaul Interval
The maximum authorized operating time or calendar interval of parts prior to removal for overhaul at category of maintenance authorized in accordance with the Maintenance Allocation Chart.

b. Retirement Schedule
The operating time or calendar interval specified for removal, condemnation, and disposal of parts in accordance with applicable directives.

2. List the items replaced on a calendar basis for overhaul or retirement on DA Form 2408-18. Equipment Inspection List, for scheduling purposes.

**NOTE**

Do not list items on DA Form 2408-16, Component Installation and Removal Record for items replaced on a calendar basis.

3. Bolts with an assigned retirement interval.

a. Whenever a bolt with an assigned retirement interval in replaced (not reinstalled) it shall be immediately mutilated and locally scrapped. The replacement bolt shall be a new (zero time) item.

b. Several bolts in the upper rotor controls are assigned a **4,000 hours** aircraft retirement interval. Upon reaching **4,000 hours** aircraft time and every **4,000 aircraft hours** thereafter, the bolts listed in table 1-91 shall be replaced with new life items.

**NOTE**

All Retirement Life Items will have a Demil Code of "L" and will be mutilated in accordance with DOD 4160.21-M-1, DEFENSE DEMILITARIZATION MANUAL.

*CH-47D Components with Fatigue Lives Less Than 10,000 Hours*

| COMPONENTS | PART NO. | RETIREMENT SCHEDULE HOURS |
|---|---|---|
| Rod End Bearing, Aft & Fixed Link | 114CS123-1 | 4000 |
| Upper Vertical Pin Bearing | 114RS214-2 | 2400 (Note A) |
| | 114RS214-6 | 2400 (Note A) |
| Lower Vertical Pin Bearing | 114RS214-l | 2400 (Note A) |
| | 114RS214-5 | 2400 (Note A) |
| Horizontal Pin Leading Bearing | 114RS213-3 | 2400 (Note A) |
| | 114RS225-1 | 2400 (Note A) |
| Horizontal Pin Trailing Bearing | 114RS213-4 | 2400 (Note A) |
| | 114RS226-1 | 2400 (Note A) |
| Pitch Bearing | 114R2130-2 | 2700 |
| Pitch Bearing | 114R2131-1 | 2700 |
| Swashplate Bearing | 114RS308-1 | 1200 |
| Swashplate Bearing | 114RS308-2 | 1200 |
| Aft Pitch Link to Pitch Arm Bolt | 114R3650-13 | 4000 |
| Aft Pitch Link to Swashplate Bolt | 114R3650-15 | 4000 |
| Pitch Link Bolts (Upper) Fwd/Aft | 114R3650-16 | 4000 |
| Pitch Link Bolts (Lower) Fwd/Aft | 114R3650-17 | 4000 |
| Fwd Pivoting and Swiveling Actuator to Swashplate Bolt (Stationary Ring) | 114R3650-3 | 4000 |
| Aft Pivoting and Swiveling Actuator to Swashplate Bolt (Stationary Ring) | 145R3650-1 | 4000 |
| Forward Drive Shaft Assembly | 145D3400-23 | 7285 |
| | 145D3400-24 | 7285 |
| | 145D3400-32 | 7285 |
| | 145D3400-31 | 7285 |
| Aft Drive Shaft | 145D3400-25 | 5783 |
| | 145D3400-26 | 5783 |
| Aft Rotor Shaft | 145D3300-3 | 4030 |
| | 145D3300-5 | 4030 |
| | 145D3300-6 | 4030 |
| Engine Drive Shaft | 145D3500-8 | 4800 |
| | 145D3500-12 | 4800 |
| | 145D3500-15 | 4800 |
| | 145D3504-2 | 6000 (Note H) |
| Adapter Assy Engine Drive Shaft | 145D3500-10 | 7100 |
| | 145D3500-11 | 7100 |
| | 145D3500-13 | 7100 |
| | 145D3500-14 | 7100 |
| | 145D3500-16 | 4581 (Note F) |
| | 145D3500-17 | 4581 (Note G) |
| Bolt, Swiveling Actuator to Lower Attachment (Aft) | BACB30ST8-31 | 4000 |
| Bolt, Pivoting Actuator to Lower Attachment (Aft) | BACB30ST8-31 | 4000 |
| Bolt, Pivoting Actuator to Lower Attachment (Aft) | BACB30ST8-35 | 4000 |
| Aft Pitch Shaft | 114R2088-14 | 1025 (Note B) |
| | 114R2088-16 | 1025 (Note B) |
| | 234R2088-2 | On Condition |
| Forward Pitch Shaft | 114R2088-7 | 1185 (Note B) |
| | 114R2088-15 | 1185 (Note B) |
| | 234R2088-1 | On Condition |
| Forward and Aft Tie-Bar Assembly | 114R2155-1 | 4800 |
| Fwd Xmsn Rotor Shaft | 145D1301-3 | 6761 (Note E) |

## 1-91 OVERHAUL AND RETIREMENT SCHEDULE (Continued) 1-91

### *CH-47D Components with Fatigue Lives Less Than 10,000 Hours*

| COMPONENTS | PART NO. | RETIREMENT SCHEDULE HOURS |
|---|---|---|
| Forward Rotor Hub | 114R2050-17 | 3661 (Note C) |
| | 114R2050-19 | 3661 (Note C) |
| | 114R2050-21 | 3661 (Note C) |
| | 114R2050-23 | 3661 (Note C) |
| | 114R2050-27 | 2887 |
| | 114R2050-29 | 2887 |
| | 114R2050-31 | 2887 |
| | 114R2050-35 | 2887 |
| | 114R2050-37 | 2439 |
| | 114R2050-39 | 2439 |
| | 114R2050-41 | 2439 |
| | 114R2050-43 | 2439 |
| Aft Rotor Head | 114R2050-18 | 3661 (Note C) |
| | 114R2050-20 | 3661 (Note C) |
| | 114R2050-22 | 3661 (Note C) |
| | 114R2050-24 | 3661 (Note C) |
| | 114R2050-28 | 1995 |
| | 114R2050-30 | 1995 |
| | 114R2050-32 | 1995 |
| | 114R2050-36 | 1995 |
| | 114R2050-38 | 1603 |
| | 114R2050-40 | 1603 |
| | 114R2050-42 | 1603 |
| | 114R2050-44 | 1603 |
| Bolt, Horizontal Hinge Pin | 114R2201-1 | 1200 (Note D) |
| Combining Transmission Cooling Fan | 145DS518-5 | 125 |

NOTES

A. To reach full retirement life it is mandatory that bearings be rotated **180° at 1200 hours**. Bearings are to be rotated only once to their unloaded side, regardless of time remaining when bearings were rotated. At no time will "time since new" in block H of rotorhead components/parts, DA Form 2408-16, exceed **2400 hours**.

B. Retirement hours shown are for shafts that have operated only on CH-47D models. Retirement hours for shafts with prior usage on other CH-47 models have been individually calculated and dictate the allowable time for rotor head assemblies listed in Operating Time for Rotor Head Assemblies table.

C. Rotor hubs with unmodified splines require inspection after **300 flight hours** have accrued and reinspection at subsequent intervals of **100 flight hours**.

D. Replace horizontal hinge pin bolt at each **1200 hour** horizontal hinge pin inspection (rotation or replacement).

E. Two separate DA Forms 2408-16 are required, one for forward transmission reporting on condition and one for reporting RC retirement hours for forward transmission rotor shaft.

F. The following serial numbered cross shaft adapter assemblies (P/N 145D3500-16) have a finite life of **3048 hours**. Replace cross shaft adapter assemblies if finite life exceeds **3048**.

| | | | | | |
|---|---|---|---|---|---|
| A-6055 | A-6080 | A-6088 | A-6111 | A-6117 | A-6456 |
| A-6487 | A-6508 | A-6550 | A-6571 | A-6592 | A-6657 |
| A-6664 | A-669 | A-6708 | A-6732 | A-6775 | A-6786 |

G. The following serial numbered cross shaft adapter assemblies (P/N 145D3500-17) have a finite life of **3048 hours**. Replace cross shaft adapter assemblies if finite life exceeds **3048**.

| | | | | | |
|---|---|---|---|---|---|
| A-2705 | A-3049 | A-4001 | A-4370 | A-466 | A-4731 |
| A-4734 | A-6098 | A-6420 | A-6421 | A-6522 | A-6566 |
| A-6607 | A-6611 | A-6614 | A-6631 | A-6688 | A-6692 |

H. The following serial numbered engine drive shafts (P/N 145D3504-2) have a retirement life of **2000 hours**:

| | | | | | |
|---|---|---|---|---|---|
| A-103 | A-107 | A-193 | A-211 | A-230 | A-243 |
| A-262 | A-276 | A-280 | A-287 | A-309 | A-327 |
| A-330 | A-352 | A-385 | A-453 | A-474 | A-501 |
| A-504 | A-506 | A-517 | A-526 | A-536 | A-538 |
| A-571 | A-596 | A-612 | A-617 | A-636 | A-638 |
| A-651 | A-652 | A-675 | A-691 | A-696 | A-704 |
| A-709 | A-731 | A-741 | A-771 | A-778 | A-792 |
| A-799 | A-908 | A-921 | A-960 | A-1200 | A-2343 |
| A-11767BK | | | | | |

### *CH-47D Component Overhaul Interval*

| COMPONENT | PART NO. | TBO — HOURS |
|---|---|---|
| Forward Rotor Head Assembly | 145R2003-1 | (Note A) |
| | 145R2003-3 | 2400 (Note B) |
| | 145R2003-4 | (Note A) |
| | 145R2003-5 | 2400 (Note B) |
| | 145R2003-6 | 2400 (Note B) |
| | 145R2003-9 | 2400 (Note B) |
| | 145R2003-10 | 2400 (Note B) |
| Aft Rotor Head Assembly | 145R2004-2 | (Note A) |
| | 145R2004-6 | 2400 (Note B) |
| | 145R2004-8 | (Note A) |
| | 145R2004-10 | 2400 (Note B) |
| | 145R2004-12 | 2400 (Note B) |
| | 145R2004-18 | 2400 (Note B) |
| | 145R2004-20 | 2400 (Note B) |
| Horizontal Pin | 114R2196-2 | 1200 (Note C) |
| | 114R2197-1 | 1200 (Note C) |
| | 114R2197-5 | 1200 (Note C) |
| | 114R2197-7 | 1200 (Note C) |
| Forward Head Swashplate Assembly | 145R3551-1 | 1200 |
| | 145R3551-5 | 1200 |
| | 145R3551-11 | 1200 |
| | 145R3551-19 | 1200 |
| Aft Head Swashplate Assembly | 145R3551-2 | 1200 |
| | 145R3551-6 | 1200 |
| | 145R3551-12 | 1200 |
| | 145R3551-18 | 1200 |
| Engine, Gas Turbine | 2-001-020-23 | 2400 |
| Fuel Control, Main | 2-161-620-64 | 2400 |
| Engine, Gas Turbine | 2-001-020-39 | 2400 (Note I) |
| Hydro-Mechanical Assembly (HMA) | 2-170-580-02 | 2400 (Note I) |
| Auxiliary Power Unit | 160150-10A | 6000 Cycles (Note J) |
| Forward Transmission | 145D1300-4 | On Condition (Note E) |
| | 145D1300-5 | On Condition (Note E) |
| | 145D1300-6 | On Condition (Note E) |
| | 145D1300-7 | On Condition (Note E) |
| | 145D1300-8 | On Condition (Note E) |
| | 145D1300-9 | On Condition (Note E) |
| Aft Transmission | 145D2300-2 | On Condition (Note D) |
| | 145D2300-3 | On Condition |

## 1-91 OVERHAUL AND RETIREMENT SCHEDULE (Continued) 1-91

| COMPONENT | PART NO. | TBO — HOURS |
|---|---|---|
| | 145D2300-4 | On Condition |
| | 145D2300-5 | On Condition |
| | 145D2300-6 | On Condition |
| | 145D2300-7 | On Condition |
| Combining Transmission | 145D5300-3 | On Condition (Note D) |
| | 145D5300-5 | On Condition |
| | 145D5300-9 | On Condition |
| | 145D5300-10 | On Condition |
| | 145D5300-11 | On Condition |
| | 145D5300-12 | On Condition |
| | 145D5300-13 | On Condition |
| Combining Transmission Cooling Fan Drive Shaft | 145D5319-3 | On Condition |
| | 145D5319-5 | On Condition |
| | 145D5319-7 | On Condition |
| Engine Transmission | 145D6300-2 | On Condition |
| | 145D6300-3 | On Condition |
| | 145D6300-5 | On Condition |
| | 145D6300-6 | On Condition (Note E) |
| | 145D6300-7 | On Condition |
| | 145D6300-8 | On Condition |
| | 145D6300-9 | On Condition |
| | 145D6300-10 | On Condition |
| | 145D6300-11 | On Condition |
| | 145D6300-12 | On Condition |
| | 145D6300-13 | On Condition |
| | 145D6300-14 | On Condition |
| | 145D6300-15 | On Condition |
| Servocylinder, Pivoting | 145H6600-9 | 1200 (Note F, Note G, Note H) |
| | 145H6600-10 | 1200 (Note F, Note G, Note H) |
| | 145H6600-11 | 1200 (Note F, Note G, Note H) |
| | 145H6600-12 | 1200 (Note F, Note G, Note H) |
| | 145H6600-19 | On Condition (Note G, Note H) |
| | 145H6600-20 | On Condition (Note G, Note H) |
| Servocylinder, Swiveling | 145H6700-8 | 1200 (Note F, Note G, Note H) |
| | 145H6700-9 | 1200 (Note F, Note G, Note H) |
| | 145H6700-10 | 1200 (Note F, Note G, Note H) |
| | 145H6700-11 | 1200 (Note F, Note G, Note H) |
| | 145H6700-18 | On Condition (Note G, Note H) |
| | 145H6700-19 | On Condition (Note G, Note H) |

**NOTES**

A. Refer to table beginning on next page.

B. Rotate horizontal pins and horizontal and vertical pin bearings at **1200 hours**.

C. Horizontal Pins:

1. If a pin has been shotpeened, it may be operated an additional **1200 hours** provided it is rotated **180°**. The following pins have been shotpeened by the manufacturer:

    1. A356 thru A367
    2. A380 thru A403
    3. A440 and subsequent with "A" prefix.
    4. YZ1 35 and subsequent with "YZ" prefix 114R2197-7

    Other pins have not been shotpeened unless they have the letters "SP" (shotpeened) etched next to their serial number. All pins with part number 114R2196-6, 114R2197-5 or -6 also have been shotpeened.

2. If a pin has not been shotpeened, it must be replaced at **1200 hours**.

D. Do not use these transmissions if "FO" does not appear following the S/N on the nameplate. This part number transmission is an element of the US Army Flight Safety Parts Surveillance Program which requires the mandatory input of these transmissions samples on a selected basis at **500 hour** intervals.

E. Two separate DA Forms 2408-16, one for forward transmission reporting on condition and one for reporting RC retirement hours for forward transmission rotor shaft.

F. Compute hours from time of installation.

G. Do not use servocylinders if the letter "A" does not appear following the serial number on the metal decal, installed during inspection/replacement of eight (8) actuator screws, per SOF CH-47-93-02 (TB 1-1520-240-20-63). Contact the CH-47 Product Management Office for disposition instructions DSN 693-1440 or commercial 314-263-1440.

H. All overhauled actuators must have a suffix "N" behind the serial number. (Suffix N indicates the actuator has been adjusted in accordance with TB 1-1520-240-20-85; this is not required on new actuators.)

I. The engine, gas turbine and hydro-mechanical unit (HMU) TBO time limits are based on operating hours from the digital engine control unit (DECU) hours not aircraft flight hours. See TM 1-2840-265-23 for instructions on downloading and resetting the DECU.

J. APU TBO based on 6000 events as obtained from event meter attached to APU.

***OPERATING TIME FOR ROTOR HEAD ASSEMBLIES***

| Component | Serial Number | Removal Time (Max Allowable Flt Hrs-CH-47D) |
|---|---|---|
| Forward Rotor Head Assembly 145R2003-1 and -4 | A4-34 | 796 |
| | A4-39 | 807 |
| | A4-50 | 741 |
| | A4-67 | 787 |
| | A4-73 | 782 |
| | A4-88 | 775 |
| | A4-92 | 1185 |
| | A4-104 | 755 |
| | A4-106 | 741 |
| | A4-108 | 1185 |
| | A4-139 | 741 |
| | A4-171 | 741 |
| | A4-217 | 1185 |
| | A4-221 | 741 |
| | A4-229 | 874 |
| | A4-243 | 741 |
| | A4-245 | 781 |
| | A4-255 | 868 |
| | A4-285 | 749 |
| | A4-299 | 762 |
| | A4-301 | 911 |
| | A4-303 | 1185 |
| | A4-312 | 894 |
| | A4-336 | 778 |
| | A4-343 | 837 |
| | A4-374 | 790 |
| | A4-378 | 866 |
| | A4-393 | 815 |
| | A4-407 | 758 |
| | A4-428 | 783 |
| | A4-459 | 846 |
| | A4-465 | 741 |
| | A4-504 | 847 |
| | A4-506 | 741 |
| | A4-516 | 741 |
| | A4-565 | 741 |
| | A4-576 | 741 |

*OPERATING TIME FOR ROTOR HEAD ASSEMBLIES*

| Component | Serial Number | Removal Time (Max Allowable Flt Hrs-CH-47D) |
|---|---|---|
| Forward Rotor Head Assembly 145R2003-1 and -4 | A4-632 | 741 |
| | A4-633 | 1053 |
| | A4-635 | 1108 |
| | A4-644 | 1064 |
| | A4-651 | 741 |
| | A4-662 | 1185 |
| | A4-671 | 741 |
| | A4-681 | 741 |
| | A4-704 | 741 |
| | A4-712 | 1185 |
| | A4-714 | 741 |
| | A4-771 | 741 |
| | A4-785 | 741 |
| | A4-789 | 745 |
| | A4-792 | 1092 |
| | A4-802 | 741 |
| | A4-810 | 741 |
| | A4-830 | 741 |
| | A4-834 | 741 |
| | A4-843 | 741 |
| | A4-852 | 741 |
| | A4-1016 | 741 |
| | A4-1030 | 741 |
| | A4-1087 | 741 |
| | A4-1138 | 741 |
| | A4-1143 | 741 |
| | A4-1160 | 741 |
| | A4-1165 | 743 |
| | A4-1259 | 1175 |
| | A4-1463 | 1185 |
| | A4-1467 | 1185 |
| | A4-1468 | 1185 |
| | A4-1470 | 1185 |
| | A4-1471 | 1185 |
| | A4-1472 | 1185 |

*OPERATING TIME FOR ROTOR HEAD ASSEMBLIES*

| Component | Serial Number | Removal Time (Max Allowable Flt Hrs-CH-47D) |
|---|---|---|
| Aft Rotor Head Assembly 145R2004-2 and -8 | A5-36 | 821 |
| | A5-42 | 647 |
| | A5-45 | 647 |
| | A5-49 | 620 |
| | A5-71 | 647 |
| | A5-105 | 647 |
| | A5-108 | 647 |
| | AS-140 | 647 |
| | A5-183 | 647 |
| | A5-219 | 647 |
| | A5-221 | 647 |
| | A5-248 | 1025 |
| | A5-262 | 647 |
| | A5-276 | 716 |
| | A5-295 | 848 |
| | A5-336 | 530 |
| | A5-343 | 647 |
| | A5-344 | 647 |
| | A5-372 | 712 |
| | A5-382 | 680 |
| | A5-418 | 835 |
| | A5-464 | 1025 |
| | A5-466 | 747 |
| | A5-476 | 840 |
| | A5-479 | 886 |
| | A5-495 | 477 |
| | A5-496 | 900 |
| | A5-497 | 704 |
| | A5-500 | 647 |
| | A5-509 | 647 |
| | A5-515 | 647 |
| | A5-523 | 490 |
| | A5-527 | 859 |
| | A5-571 | 643 |
| | A5-581 | 874 |
| | A5-594 | 647 |

***OPERATING TIME FOR ROTOR HEAD ASSEMBLIES***

| Component | Serial Number | Removal Time (Max Allowable Flt Hrs-CH-47D) |
|---|---|---|
| Aft Rotor Head Assembly 145R2004-2 and-8 | A5-605 | 847 |
| | A5-665 | 689 |
| | A5-695 | 741 |
| | A5-712 | 764 |
| | A5-716 | 813 |
| | A5-741 | 647 |
| | A5-763 | 1025 |
| | A5-771 | 647 |
| | A5-780 | 647 |
| | A5-817 | 853 |
| | A5-834 | 647 |
| | A5-835 | 787 |
| | A5-866 | 843 |
| | A5-867 | 737 |
| | A5-908 | 603 |
| | A5-931 | 800 |
| | A5-936 | 863 |
| | A5-980 | 742 |
| | A5-993 | 791 |
| | A5-1062 | 864 |
| | A5-1065 | 875 |
| | A5-1113 | 758 |
| | A5-1129 | 709 |
| | A5-1146 | 1025 |
| | A5-1156 | 556 |
| | A5-1158 | 611 |
| | A5-1171 | 922 |
| | A5-1179 | 820 |
| | A5-1246 | 647 |
| | A5-1276 | 648 |
| | A5-1515 | 1025 |
| | A5-1519 | 1025 |
| | A5-1520 | 1025 |
| | A5-1522 | 1025 |
| | A5-1523 | 1025 |

**1-91 OVERHAUL AND RETIREMENT SCHEDULE (Continued) 1-91**

***Calendar Overhaul and Removal Schedule***

| COMPONENTS | PART NO. | OVERHAUL INTERVAL | RETIREMENT INTERVAL |
|---|---|---|---|
| Winch Cable Cutter Cartridge | 2518426 | | 1 year* |
| Engine Fire Extinguisher Cartridge | 30903824-1 (Use with 30402103 bottle) | | 6 years**** |
| | 30903824 (Use with 30402103 bottle) | | 5 years** |
| | 895408 (Use with 892868-02 bottle) | | 7 years*** |
| | 899855-1 (Substitute to 895408) | | 7 years*** |
| | **NOTES** | | |
| | TB 9-1300-385 contains the current information for retirement interval and shelf life for these cartridges. If TM 9-1300-385 is not available, use the printed information of this table. | | |
| | Shelf life is computed from the date of manufacture until current date. | | |
| | Service life begins upon opening the sealed cartridge container. | | |
| | Shelf life and service life are not to be added. | | |
| | Early replacement of obsoleted cartridge P/N 13083-5 is not required. Retirement interval remains **42 months**. | | |

* Life not to exceed **8 years** of shelf life or **1 year** of service life, whichever occurs first.

** Life not to exceed **13 years** of shelf life or **5 years** of service life, whichever occurs first.

*** Life not to exceed **8-1/2 years** of shelf life or **7 years** of service life, whichever occurs first.

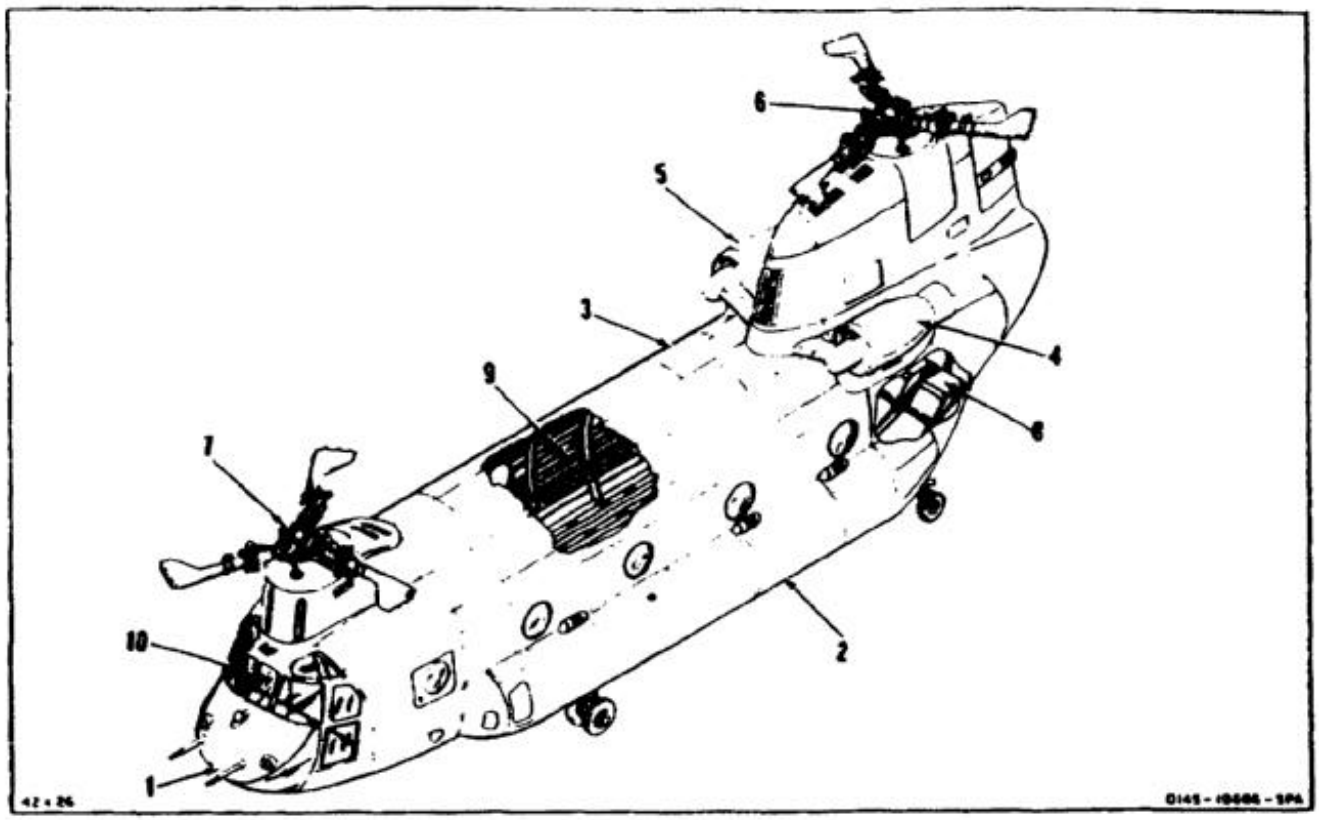
**** Life not to exceed **14 years** of shelf life or **6 years** of service life, whichever occurs first.

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

# SECTION VIII
# SPECIAL INSPECTION/MAINTENANCE ACTIONS

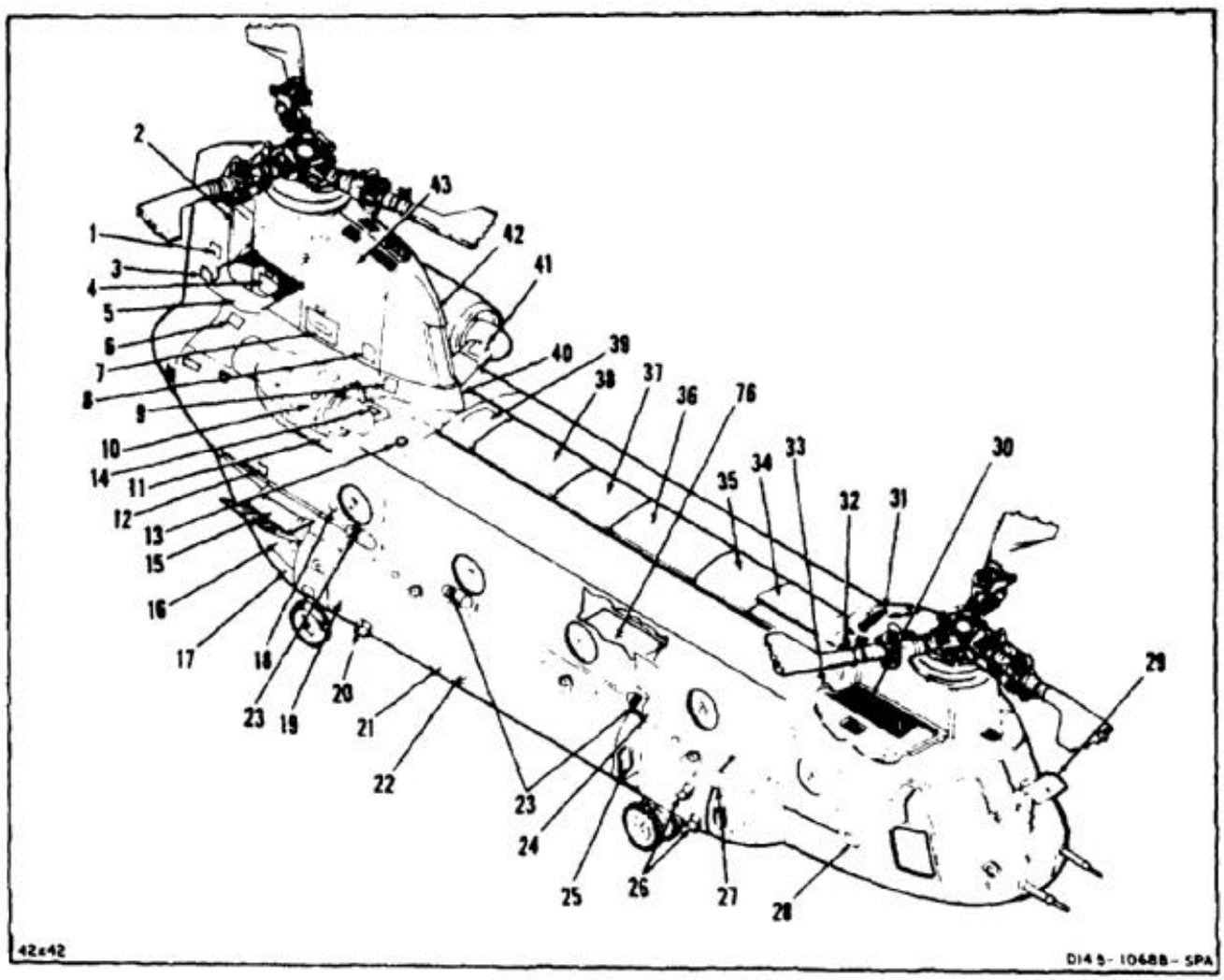



*Inspection Area Diagram*

***Inspection Area Diagram***

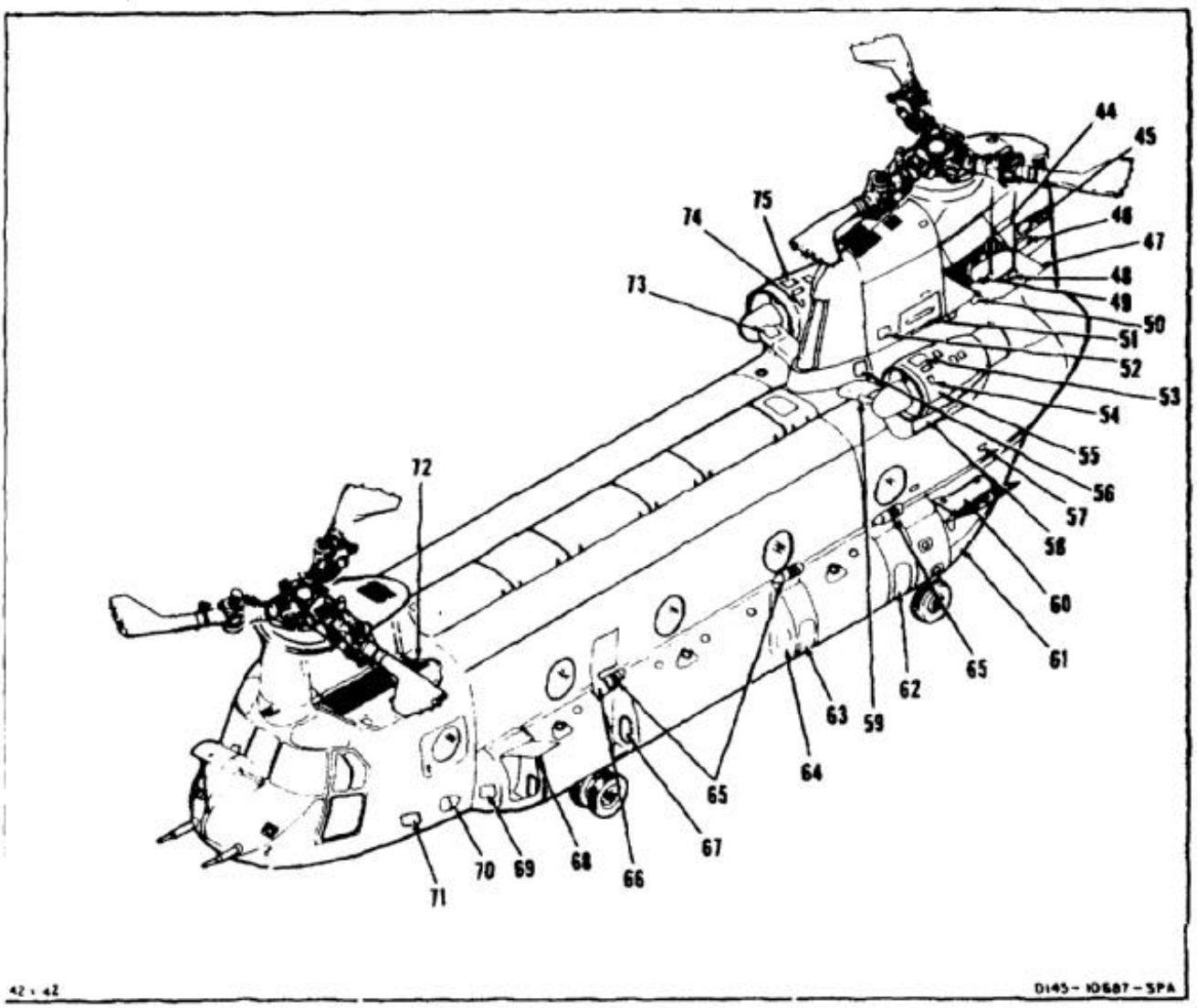
| | | |
|---|---|---|
| Area No. 1 | Nose | External fuselage from sta. 120 RH to sta. 120 LH, excluding area No. 7, but including those internal areas visible or accessible from outside. |
| Area No. 2 | Left Fuselage | External fuselage from sta. 120 LH aft to sta. 630.5, including bottom of fuselage, but excluding areas No. 6 and 7. |
| Area No. 3 | Right Fuselage | External fuselage from sta. 630.5 forward to sta. 120 RH, including bottom of fuselage, but excluding areas No. 6 and 7. |
| Area No. 4 | No. 1 Engine | Left hand engine installation including transmission, cowling, fairings and engine driveshaft. |
| Area No. 5 | No. 2 Engine | Right hand engine installation including transmission, cowling, fairings and engine driveshaft. |
| Area No. 6 | Aft Rotor and Pylon | Internal and external areas of aft pylon from sta. 650.5 forward to sta. 440, excluding areas No. 2 and 3. |
| Area No. 7 | Forward Rotor, Crown and Tunnel | Internal and external areas of upper fuselage from sta. 440 forward to sta. 62, excluding areas No. 1, 2, and 3. |
| Area No. 8 | Ramp | Internal fuselage from sta. 630.5 forward to sta. 482. |
| Area No. 9 | Cabin | Internal fuselage from sta. 482 forward to sta. 120. |
| Area No. 10 | Cockpit | Internal fuselage from sta. 120 forward to sta. 21.5 excluding area No. 1. |

1. Radar warning antenna access door
2. Upper pylon access panel
3. Pylon removal access panel
4. Aft transmission access cover
5. Work platform
6. Generator access door
7. Access cover
8. Hydraulic module inspection access cover
9. Combining transmission access door
10. Engine upper cover
11. Lower access door
12. Aft hydraulic service panel
13. Maintenance crane installation access panel
14. Lower hinged access panel
15. Work platform
16. Aft landing gear fairing
17. Aft landing gear access panel
18. Aft interphone jack and ramp control access panel
19. Aft pod access panel
20. Fuselage foldout step
21. Center pod access panel
22. Main tank aft fuel boost pump access panel
23. Fuel tank vent access panels
24. Forward landing gear access panel
25. Main tank forward fuel boost pump access panel
26. Fuselage foldout steps
27. Electrical compartment access door
28. Interphone jack access door
29. Nose compartment access door
30. Work platform
31. Forward transmission fairing hydraulic module access door
32. Forward transmission fairing hydraulic module access cover
33. Maintenance crane installation access panel
34. Cabin crown access tunnel cover
35. Tunnel access cover
36. Tunnel access cover
37. Tunnel access cover
38. Tunnel access cover
39. Aft crown tunnel access cover
40. Pylon leading edge lower hinged fairing
41. Upper hinged access panel
42. Aft pylon leading edge hinged fairing
43. Aft pylon forward hinged crown fairing




*Access Doors, Covers, and Panels (Sheet 1 of 2)*

44. Access panel
45. Radar warning antenna access door
46. Pylon removal access panel
47. Work platform
48. Utility hydraulic pump access panel
49. Aft transmission access panel
50. Aft transmission oil filler access door
51. Access cover
52. Hydraulic module inspection access cover
53. Engine oil filler access door
54. Engine oil quantitiy indicator access door
55. Engine upper cover
56. Combining transmission access door
57. APU emergency fluid shutoff access panel
58. Lower access door
59. Lower hinged access panel
60. Work platform
61. Aft landing gear access panel
62. Aft pod access panel
63. Center access panel
64. Main tank aft fuel boost pump access panel
65. Fuel tank vent access panels
66. Forward landing gear access panel
67. Main tank forward fuel boost pump access panel
68. Electrical compartment access door
69. External power receptacles access door
70. Hydraulic ground test access cover
71. Antenna coupler access panel
72. Work platform
73. Upper hinged access panel
74. Engine oil quantity indicator access door
75. Engine oil filler access door
76. Rescue hatch lower door




*Access Doors, Covers, and Panels (Sheet 2 of 2)*

***GENERAL INFORMATION***

1. This section contains complete requirements for calendar inspections, operating time special inspections, and conditional inspections which apply to the aircraft. The inspections given in this task shall be carried out at specific periods by Aviation Unit Maintenance (AVUM) activities in addition to the inspection requirements contained in TM 55-1520-240-PM, Phase Maintenance, and TM 55-1520-240-PMD, Preventive Maintenance Daily.

   a. Calendar Inspections are all the inspections based upon elapsed calendar time.

   b. Operating Time Special Inspections are all the inspections and maintenance actions based on aircraft operating time which are not compatible with scheduled inspection intervals.

   c. Conditional Inspections are all the inspections required when the occurrence of a specific incident or set of conditions mandates immediate inspections.

**NOTE**

This manual does not contain specific tasks for each inspection requirement contained in the MAC. Only those inspection tasks which contain measurable criteria (bearing damage) are presented. When no specific inspection task exists, the term "inspect" refers to a general visual inspection to look for security, cracks, leaks, loose or missing hardware, obvious damage, and general condition and serviceability.

2. The inspection requirements indicate which items require inspection, when they are to be inspected, and what to look for during the inspection. The PM and the PMD and the requirements of this task must be carried out to make sure faults are found and corrected before a malfunction or a serious failure results. Inspections are arranged in the order they should be carried out and are divided into groups under headings which locate the area of the aircraft that covers the group.

3. Inspection conditions and skills required are extremely variable and may require changes in the order in which the inspections are carried out; however, it is important that all inspections are covered.

4. This manual may contain inspection requirements applicable to specific equipment not installed in individual aircraft. When the situation is encountered, disregard the requirements which are not applicable.

5. Standards of serviceability to be used in day-to-day inspection and maintenance of the aircraft can be found as fits, tolerances, wear limits, and specifications elsewhere in this manual. Standard of serviceability for transfer of aircraft are contained in TM 55-1500-328-25.

*CALENDAR INSPECTIONS*

| REF. NO. | FREQUENCY | INSPECTION REQUIREMENTS |
|---|---|---|
| 1. | VARIABLE | REFER TO TASK 2-370 FOR INSPECTION INTERVALS BASED UPON ENVIRONMENTAL AREAS (SEVERE, MODERATE, OR MILD). |
| 2. | DELETED | |
| 3. | 6 MONTHS | PORTABLE FIRE EXTINGUISHERS FOR WEIGHT. REFER TO TM 11-1500-204-23. |
| 4. | 6 MONTHS | AIRCRAFT WITH MWO 55-1520-240-50-39 INSTALLED. INSPECT TWO IDLER ARMS AND ONE BELLCRANK LOCATED ADJACENT TO THE COMBINER TRANSMISSION FOR DAMAGE AND DETERIORATION OF ALBI PAINT. REFER TO TASK 11-10.1. IF MWO 1-1520-240-50-65 (STAINLESS STEEL BELLCRANKS) HAS BEEN APPLIED, PAINTING OF THE BELLCRANKS WITH ALBI PAINT IS NOT REQUIRED. |
| 5. | 12 MONTHS | ENGINE FIRE EXTINGUISHER SYSTEM BOTTLES FOR WEIGHT. VISUALLY INSPECT FOR GENERAL CONDITION AND PRESSURE CHARGE. SYSTEM TUBING AND ELECTRICAL CONNECTION FOR CORROSION AND OBVIOUS DAMAGE. CHECK DA FORM 2408-18 AND THE RETIREMENT SCHEDULE FOR REPLACEMENT REQUIREMENTS. |
| 6. | 12 MONTHS | PERFORM AN INVENTORY CHECK. REFER TO DA FORM 2408-17 AND TASK 1-109. |
| 7. | 12 MONTHS | MAGNETIC STANDBY COMPASS FOR CORRECT READING ON ALL CARDINAL HEADINGS. REFER TO TM 1-1500-204-23. |
| 8. | 12 MONTHS | HSI/RMI FOR CORRECT READING ON ALL COORDINATE HEADINGS. REFER TO TM 1-1500-204-23. |
| 8.1. | 24 MONTHS | IF THE AIRCRAFT HAS NOT BEEN THROUGH A PHASE INSPECTION WITHIN THE LAST 24 MONTH PERIOD, INSPECT THE HORIZONTAL HINGE PINS AND BEARINGS PER TM 55-1520-240-23-4, TASK 5-40.1. |
| 9. | 36 MONTHS | WEIGH THE AIRCRAFT AND PERFORM WEIGHT AND BALANCE RECORDS. CHECK AT NEAREST PHASE INSPECTION BUT NOT TO EXCEED 36 MONTHS. REFER TO TM 55-1500-342-23. |

***OPERATING TIME SPECIAL INSPECTION FOR AIRCRAFT ON PM/PMD***

| REF. NO. | FREQUENCY | INSPECTION REQUIREMENTS |
|---|---|---|
| 1. | PRIOR TO FIRST FLIGHT OF EACH DAY | PERFORM ILCA JAM TEST, PHASE 1. REFER TO TM 55-1520-240-23-6, TASK 7-104.1. |
| 1.1. | AFTER EACH ENGINE SHUTDOWN | VISUALLY INSPECT THE FWD AND AFT SWASHPLATE LOWER SEAL USING A FLASHLIGHT OR OTHER SUITABLE LIGHT SOURCE. VISUALLY INSPECT WITH A MIRROR THE AREA BETWEEN THE UNDERSIDE OF THE ROTATING RING AND TOP SIDE OF STATIONARY RING FOR ANY SLINGING OR CLUMPING OR GREASE/DEBRIS (I.E., SEAL, BEARING CAGE, SEAL SPRING, WIRE, OR OTHER MATERIAL). A THIN EVEN BEAD OF GREASE AROUND THE SEALING AREA IS CONSIDERED NORMAL. |
| 1.2. | AFTER FIRST FLIGHT | ANYTIME AN ENGINE DRIVESHAFT, ENGINE DRIVE SHAFT ADAPTER ASSEMBLY, OR ASSOCIATED SELF-LOCKING NUT IS INSTALLED, ALL SELF-LOCKING NUTS SHALL HAVE A TORQUE CHECK PERFORMED IN ACCORDANCE WITH TM 55-1520-240-23, TASK 6-30.2, AFTER FIRST FLIGHT. IF NUT TURNS DURING TORQUE CHECK, REPEAT THE TORQUE CHECK AFTER SUBSEQUENT FLIGHT, BUT NOT TO EXCEED 10 FLIGHT HOURS. ANY NUT THAT FAILS THE SECOND TORQUE CHECK SHALL BE REPLACED WITH A NEW NUT. |
| 2. | AFTER FIRST FLIGHT | AFTER REMOVAL/REINSTALLATION/REPLACEMENT, CHECK TORQUE ON HYDRAULIC PUMP (P/N 145HS100-3) MOUNT BOLTS. FWD AND AFT XMSN. |
| 2.1. | EVERY 5 HEATER HOURS | CLEAN HEATER IGNITERS AND DRAIN LINE. |
| 3. | DELETED | |
| 4. | 10 FLIGHT HOURS | ANYTIME PITCH CHANGE LINK MOUNT BOLTS ARE REINSTALLED OR REPLACED, TORQUE MUST BE CHECKED WITHIN **10 FLIGHT HOURS**. IF DURING TORQUE CHECK RETORQUING IS REQUIRED, THE TORQUE CHECK WILL BE REPEATED AFTER SUBSEQUENT FLIGHT, BUT NOT TO EXCEED **10 FLIGHT HOURS**. |
| 4.1. | 10 FLIGHT HOURS/ 14 DAY BASIS | VISUALLY INSPECT ALL THREE HYDRAULIC PUMPS FOR BROKEN SCREWS ON THE PUMP BODY (NOT THE MOUNTING BOLTS), AND FOR EVIDENCE OF LEAKS. REFER TO TM 55-1520-240-23P-1. |
| 5. | 50 FLIGHT HOURS/MONTHLY | PERFORM AVUM PREVENTIVE MAINTENANCE ON BATTERY. REFER TO TM 11-6140-203-23. |
| 5.1. | 25 FLIGHT HOURS | VISUALLY INSPECT OUTBOARD DRIVE SHAFT LUGS AND ADAPTER LUGS. REFER TO TM 55-1520-240-23-5, TASK 6-30.2 (STEPS 1 AND 2 ONLY). |
| 6. | 25 FLIGHT HOURS (IF INSTALLED) | AIRCRAFT WITH EAPS INSTALLED, SLIDE NO. 1 AND NO. 2 EAPS FORWARD AND VISUALLY INSPECT INSIDE OF EAPS FOR DIRT, OIL, SECURITY OF BYPASS DOOR ACTUATORS AND ELECTRICAL WIRING. VISUALLY INSPECT COMPRESSOR FOR SIGNS OF DAMAGE. LIFT ENGINE COWLINGS AND INSPECT FOR LEAKS AND CHAFING OF FUEL LINES, OIL LINES, ELECTRICAL LINES, AND FIRE DETECTION ELEMENTS. |
| 7. | 25 FLIGHT HOURS | INSPECT ELASTOMERIC, LAG DAMPER AND LOWER PITCH LINK BEARINGS (IF INSTALLED) FOR CONDITION. (DO NOT REMOVE LAG DAMPER BOLTS OR PITCH CHANGE LINK BOLTS TO PERFORM THIS INSPECTION. USE A FLASHLIGHT AND MIRROR IF BLACK RUBBER APPEARS UNBONDED OR NOT VISIBLE, OR IF THERE ARE SIGNS OF OIL DAMPNESS AROUND THE BEARING, THEN REMOVE BOLT/DAMPER.) REFER TO TASKS 5-87.2 AND 5-97.2, TM 55-1520-240-23-4 FOR BEARING INSPECTION CRITERIA ONLY. |
| 7.1. | 25 FLIGHT HOURS | VISUALLY INSPECT UPPER DAMPNER ATTACHING LUG BUSHINGS P/N 145R3116-10 FOR SLIPPING/LOOSENESS. (THIS INSPECTION ONLY REQUIRED IF BUSHING WAS FOUND LOOSE OR SLIPPING DURING INITIAL INSPECTION.) |
| 7.2. | DELETED | |

**1-92 INSPECTION (Continued) 1-92**

| REF. NO. | FREQUENCY | INSPECTION REQUIREMENTS |
|---|---|---|
| 8. | 50 HOURS | VISUALLY INSPECT COMBINER TRANSMISSION SUPPORT FITTINGS P/N 114S3820-1 AND-5 FOR CRACKS.<br>NOTE<br>AIRCRAFT 84-24152 AND SUBSEQUENT WITH COMBINER TRANSMISSION SUPPORT FITTINGS 234S3821-1 AND -2 INSTALLED DO NOT REQUIRE INSPECTION. |
| 8.1 | 50 HOURS (IF INSTALLED) | ENGINE AIR PARTICLE SYSTEM. CHECK BLADES OF SCAVENGE BLOWN IMPELLER FOR WEAR USING BLADE EROSION GAUGE. REFER TO TASK 16-126, TM 55-1520-240-23-10. |
| 9. | 50 HOURS | ENGINE NO. 1 AND ENGINE NO. 2 DUAL CHIP DETECTORS FOR CONTINUITY IF READING IS 400 OHMS OR LESS, REMOVE, INSPECT, AND CLEAN CHIP DETECTOR. IF CHIPS ARE NOTED, PERFORM OIL CONTAMINATION INSPECTION. REFER TO TM 55-2840-254-23. |
| 9.1. | 50 HOURS | PERFORM ENGINE WATER WASH IN ACCORDANCE WITH TM 1-2840-265-23 OR TM 55-2840-254-23. |
| 10. | 50 HOURS | PERFORM VIBRATION TEST ON COMBINING AND AFT TRANSMISSION COOLING FAN ASSEMBLIES (TM 1-6625-724-13&P). |
| 10.1. | 50 FLIGHT HOURS | VISUALLY INSPECT UPPER DAMPNER ATTACHING LUG BUSHINGS P/N 145133116-10 FOR SLIPPING/LOOSENESS. (THIS INSPECTION ONLY REQUIRED IF BUSHING WAS FOUND LOOSE OR SLIPPING DURING INITIAL INSPECTION.) |
| 10.2. | 50 FLIGHT HOURS OR 100 CALENDAR DAYS | TAKE A THREE OUNCE HYDRAULIC OIL SAMPLE FROM THE AIRCRAFT'S NUMBER ONE, NUMBER TWO AND UTILITY HYDRAULIC SYSTEMS (TASK 7-8.1). SEND SAMPLES TO THE UNIT DESIGNATED ARMY OIL ANALYSIS PROGRAM (AOAP) LABORATORY FOR ANALYSIS.<br>NOTE<br>CORRECT HYDRAULIC SAMPLING PROCEDURES ARE PARAMOUNT TO A SUCCESSFUL SAMPLING PROGRAM. THE MAJORITY OF BAD SAMPLES ARE THE RESULT OF IMPROPER SAMPLINGS, INADEQUATE DRAINING AND TAKING OF SAMPLES. |
| 10.3. | 50 FLIGHT HOURS | PERFORM LUBRICATION IAW LUBRICATION CHARTS. |
| 10.4. | DELETED | |
| 10.5. | 50 FLIGHT HOURS | PERFORM DIGITAL ENGINE CONTROL UNIT (DECU) DOWNLOAD. SEE TM 1-2840-265-23 FOR INSTRUCTIONS ON DOWNLOADING AND RESETTING THE DECU. |
| 11. | 100 HOURS | ALL FORWARD AND AFT ROTOR HEADS. CHECK TORQUE ON PITCH LINK BOLTS (TASK 5-99.1). |
| 12. | 100 HOURS | NO. 1 AND NO. 2 ENGINE TRANSMISSION FAIRING (FAIRING REMOVED) FOR CHAFING, CRACKS, DENTS, TWISTING, AND LOOSE OR MISSING HARDWARE. INSPECT ENGINE TRANSMISSION FOR LEAKS, EVIDENCE OF CHAFING, CRACKS, SECURITY OF COMPONENTS AND CORROSION. PAY PARTICULAR ATTENTION TO THE MOUNT FLANGE. INSPECT LUBRICATION HOSES AND FITTINGS FOR LEAKS, CHAFING, DAMAGE, AND PROPER SUPPORT. WIRE BUNDLES AND CONNECTORS FOR SECURITY, DAMAGE, CHAFING AND PROPER SUPPORT AT INSTALLATION, CHECK FOR SECURITY AND INTERFERENCE. |
| 13. | 100 HOURS | RETORQUE FWD AND AFT ROTARY-WING FIXED DROOP STOP RETAINING BOLTS. |
| 14. | 100 HOURS | IF AIRCRAFT IS OPERATED WITH DROOP STOP SHROUDS INSTALLED, INSPECT DROOP STOP BOLTS AND LUGS (TASK 5-53). |
| 15. | 100 HOURS | PERFORM LUBRICATION REQUIREMENTS IAW LUBRICATION CHARTS. |

*OPERATING TIME SPECIAL INSPECTION FOR AIRCRAFT ON PM/PMD*

| REF. NO. | FREQUENCY | INSPECTION REQUIREMENTS |
|---|---|---|
| 16. | 100 HOURS | VISUALLY INSPECT COMBINING TRANSMISSION COOLING FAN ASSY FOR EVIDENCE OF CONTACT BETWEEN THE IMPELLER TIPS AND FAN HOUSING (TIP RUB INSPECTION). DO NOT REMOVE THE FAN FOR THIS INSPECTION. |
| 17. | 100 HOURS/120 DAYS | PERFORM AVIM PREVENTIVE MAINTENANCE ON AIRCRAFT BATTERY. REFER TO TM 11-6140-203-23. |
| 17.1. | 100 FLIGHT HOURS | VISUALLY INSPECT UPPER DAMPNER ATTACHING LUG BUSHINGS P/N 145R3116-10 FOR SLIPPING/LOOSENESS. (THIS INSPECTION ONLY REQUIRED IF BUSHING WAS FOUND LOOSE OR SLIPPING DURING INITIAL INSPECTION.)<br>**NOTE**<br>IF AFTER COMPLETING THE **25, 50, AND 100 HOUR** BUSHING (P/N 145R3116-10) INSPECTIONS AND THE BUSHING HAS NOT SLIPPED OR LOOSENED NO FURTHER INSPECTIONS ARE REQUIRED. |
| 17.2. | 100 FLIGHT HOURS | INSPECT THE COMBINING TRANSMISSION COOLING FAN SHAFT PER TASK 6-182.1. |
| 17.3. | 100 FLIGHT HOURS | CHECK THE COMBINING TRANSMISSION COOLING FAN SHAFT OUTPUT GEAR SPLINE FOR WEAR USING THE SPLINE WEAR (GO-NO-GO) GAUGE, P/N SK33330-018. |
| 17.4. | 100 FLIGHT HOURS | PRIOR TO LUBRICATING FORWARD AND AFT SWASHPLATE ASSEMBLY BEARING, PERFORM VISUAL INSPECTION OF BEARING IAW TASK 5-117.1. |
| 18. | 200 HOURS OF ENGINE OPERATION AND EVERY 50 HOURS THEREAFTER | INSPECT AFT CONNECTING LINK (TASK 4-37).<br>**NOTE**<br>AFTER COMPLIANCE WITH MWO 1-1520-240-50-60, **50 HOUR** INSPECTION REQUIREMENTS IS CHANGED TO **200 HOURS** OR NEAREST PHASE. |
| 19. | 300 HOURS AND EVERY 100 HOURS THEREAFTER | PERFORM EDDY CURRENT INSPECTION OF HUB SPLINES OR FLUORESCENT PENETRANT INSPECT A **ONE INCH** WIDE ANNULAR STRIP AROUND THE SPLINE HOLE ON THE BOTTOM SURFACE OF THE HUB OF THE FOLLOWING ROTOR WING HEADS:<br>FORWARD HEAD 145R2003-1<br>AFT HEAD 145R2004-2 |
| 20. | DELETED | |
| 21. | 1200 HOURS ROTARY-WING HEAD OPERATION SINCE NEW OR OVERHAUL | INSPECT ROTARY-WING HEAD HORIZONTAL HINGE PINS AND BEARINGS FOR SPALLING AND DAMAGE. ROTATE SERVICEABLE PINS AND BEARINGS **180**° AND REINSTALL THEM. INSPECT AND ROTATE SERVICEABLE VERTICAL PIN BEARING **180**° AND REINSTALL ON ALL HEAD ASSEMBLIES EXCEPT FOR HEAD ASSEMBLIES (145R2003-1&4) AND (145R2004-2&8) LISTED IN TASK 1-91. INSPECT ROTARY-WING TIE BAR ASSEMBLIES PER TASK 5-23.1.1. |
| 22. | 1200 HOURS | INSPECT FUEL TANK ASSEMBLIES. REFER TO TM 55-1520-240-23-8, TASK 10-4. |

***CONDITIONAL INSPECTIONS***

| REF. NO. | AREA NO. | FREQUENCY | INSPECTION REQUIREMENTS |
|---|---|---|---|
| 1. | ALL | UPON TRANSFER AND UPON RECEIPT OF AN AIRCRAFT; UPON PLACING AN AIRCRAFT IN STORAGE; AND UPON REMOVAL OF AIRCRAFT FROM STORAGE (AIRCRAFT NEED NOT BE INVENTORIED WHILE IN STORAGE): | Perform an inventory check. Refer to DA Form 2408-17 and Task 1-109. |
| 2. | ALL | PRIOR TO TRANSFER AND IMMEDIATELY UPON ASSIGNMENT OF AIRCRAFT: | Accomplish standard of serviceability requirements. Refer to TM 55-1500-328-25. |
| 3. | ALL | WHEN OVERHAULS, MAJOR MODIFICATIONS, OR MAJOR AIRFRAME REPAIRS ARE ACCOMPLISHED; WHEN ANY SPECIAL EQUIPMENT HAS BEEN ADDED OR REMOVED FROM THE BASIC AIRFRAME; OR WHEN WEIGHT AND BALANCE DATA ARE SUSPECTED TO BE IN ERROR: | Weigh the aircraft and perform a weight and balance records check. Refer to TM 55-1500-342-23. |
| 4. | ALL | WHEN AN AIRCRAFT DOES NOT FLY OR THE ENGINES ARE INOPERABLE FOR **14 CONSECUTIVE CALENDAR DAYS**: | Perform a Daily Inspection in accordance with TM 55-1520-240-PMD and perform an engine ground run. |
| 5. | ALL | WHEN WATER LANDINGS HAVE BEEN PERFORMED, AFTER THE LAST FLIGHT OF THE DAY: | a. Right and left pod compartments, cargo loading ramp, and fuselage bilge for liquids. Open drain valves on underside of fuselage (Task 2-214). Close valves after draining (Task 2-215).<br><br>b. Lower cockpit enclosures for cracks.<br><br>c. Landing searchlights and lower anticollision light for cracked lenses. Open drain plug in lower anticollision light. Check for trapped fluid. Close drain plug.<br><br>d. Underside antennas and cargo hooks for damage and security.<br><br>e. Forward and aft cargo hooks. Remove drain plugs from solenoid covers. Check for water inside cover.<br><br>f. Ramp hinge cover for damage.<br><br>g. Drain pitot static and AFCS yaw sensing systems.<br><br>h. Purge landing gear lubrication fittings with grease. Clean the shock struts. Apply hydraulic fluid to the exposed areas of the shock strut pistons. (Use a clean cloth.)<br><br>i. Wheel bearings (removed) for condition. Clean and lubricate the wheel bearings not later than **3 days** after the initial water landing (Task 3-33). |

| REF. NO. | AREA NO. | FREQUENCY | INSPECTION REQUIREMENTS |
|---|---|---|---|
| 6. | ALL | WHEN SALT WATER LANDINGS HAVE BEEN PERFORMED AFTER THE LAST FLIGHT OF THE DAY: | |
| | | | a. Perform conditional inspection No. 5. |
| | | | b. Wash aircraft (Task 1-76). |
| | | | c. Clean engines. Refer to TM 55-2840-254-23. |
| | | | d. Clean APU compressor. Refer to TM 55-2835-205-23. |
| 7. | 1, 10 | WHEN A LANDING IN MUD OR SWAMPY TERRAIN IS MADE OR DIFFICULT STARTING OR TORCHING OF THE CABIN HEATER OCCURS: | |
| | | | Inspect and clean cabin heater drain line (Task 13-9). |
| 8. | ALL | WHEN THE AIRCRAFT IS STRUCK BY LIGHTNING: | |
| | | | Perform lightning strike inspection (Task 2-5). |
| 9. | 2, 3, 7 | WHEN AN AIRCRAFT HAS BEEN WASHED OR SUBJECTED TO HEAVY RAIN: | |
| | | | a. Right and left pod compartments, cargo loading ramp, and fuselage bilge for liquids. Open drain valves on the underside of fuselage (Task 2-214). Close valves after draining (Task 2-215). |
| | | | b. Open drain plug in lower anti-collision light. Check for fluid. |
| | | | c. Check synchronizing drive shafting for water. Clear water drains as required. |
| 10. | 2, 3 | WHEN A LANDING GEAR WHEEL ASSEMBLY HAS BEEN REMOVED: | |
| | | | Remove, clean, inspect, and repack landing gear wheel bearings (TM 1-1500-204-23 and TM 55-1500-322-24). |
| 11. | 2, 3 | WHEN LANDING GEAR WHEELS HAVE BEEN SUBMERGED IN WATER OR MUD: | |
| | | | a. Purge landing gear lubrication fittings with grease. Clean the shock struts. Apply hydraulic fluid to the exposed areas of the shock strut pistons. (Use a clean cloth.) |
| | | | b. Wheel bearings (removed) for condition. Clean and lubricate the wheel bearings not later than **3 days** after the wheels were submerged (Task 3-33). |
| 12. | 2, 3 | WHEN FUEL VENTS OVERBOARD OR UNEVEN TANK DEPLETION RATE OCCURS FROM AN AUXILIARY FUEL TANK DURING NORMAL OPERATION: | |
| | | | a. Determine if fuel boost pump is functional and is delivering at least **22 psi** pressure. |
| | | | b. Check for loose connections in affected fuel cell manifold. |
| | | | c. Perform pressure refueling precheck. |
| | | | d. Inspect tank outlet check valve (breakaway valve) is closed in affected tank. |

| REF. NO. | AREA NO. | FREQUENCY | INSPECTION REQUIREMENTS |
|---|---|---|---|
| 13. | | IF FUEL VENTS OVERBOARD FROM A MAIN FUEL TANK DURING NORMAL FLIGHT OPERATIONS: | |
| | | | a. Perform pressure refueling precheck. |
| | | | b. Perform pressure check of **2 inch** pressure refueling/auxiliary fuel transfer hose. |
| | | | c. Perform pressure check of vent system for affected tank. |
| 14. | | WHEN AN AIRCRAFT HAS BEEN SUBJECTED TO A HARD LANDING OR WHEN EMERGENCY EXIT LIGHTS (IF INSTALLED) ARE ACTUATED DURING LANDING: | |
| | 2, 3 | | a. Landing gear attachment fittings for misalignment and cracks. Fluorescent inspect in accordance with TM 1-1500-335-23. |
| | 2, 3, 8, 9 | | b. Support frames and skin (internal and external) for distortion. |
| | 6, 7, 8, 9, 10 | | c. Fuselage and transmission support numbers for cracks and distortion. |
| | 4, 5, 8 | | d. No. 1 and No. 2 engine support structure for cracks, distortion, and loose rivets. |
| | 4, 5 | | e. Perform excessive G-Load inspection on engines. Refer to TM 55-2840-254-23. |
| | 4, 5 | | f. Engine mounting pads for cracks and loose bolts. |
| | 8 | | g. APU support structure for cracks, distortion, and loose rivets. |
| | 2, 3 | | h. Wheels for cracks and distortion. Fluorescent inspect in accordance with TM 1-1500-335-23. |
| | 2, 3 | | i. Shock struts for leakage and distortion. |
| | 2, 3 | | j. Fluorescent inspect shock strut mount fittings for cracks. Refer to TM 1-1500-335-23. |
| | 2, 3 | | k. Tires for damage. |
| | 6, 7 | | l. Droop stops and hub for distortion. |
| | 1, 10 | | m. Dynamic absorbers support structure for cracks, distortion, and loose rivets. |
| | 2, 3 | | n. Fuel pod support structure for cracks and distortion. |
| | 2, 3 | | o. Perform inspection on crash resistant fuel system (Task 10-4). |
| 15. | | WHEN HARD LANDING INSPECTION SHOWS MISALIGNMENT OR CRACKS IN LANDING GEAR, OR DISTORTION AND/OR LOOSE OR MISSING RIVETS IN SUPPORTING FRAMES OR SKIN: | |
| | 2, 3 | | a. Wheels (disassembled) for cracks. Fluorescent inspect wheel forgings, welded areas, axles, and attaching bolts in accordance with TM 1-1500-335-23. Wheel bearings for condition. |
| | 4, 5 | | b. No. 1 and No. 2 engine supports for cracks. Fluorescent inspect in accordance with TM 1-1500-335-23. |
| | 8 | | c. Ramp for proper operation and alignment of pins in sockets. |
| | 2, 3 | | d. Fuel cells and components for damage and loose attachment fittings (pod lowered). |

| REF. NO. | AREA NO. | FREQUENCY | INSPECTION REQUIREMENTS |
|---|---|---|---|
| 16. | 2, 7 | WHENEVER SKIS ARE INSTALLED: | a. Daily — Axial shaft attaching points, trailing wheel and attaching points, and springs actuator attaching points for security.<br><br>b. Every 24 Hours — Ski (around wheel well) for cracks and delaminations. Bungee cords and guide lines for condition and security, lubricate 3 fittings per ski with grease (E190). |
| 17. | 4, 5 | WHEN AN ENGINE IS DROPPED DURING HANDLING: | Perform an engine dropped inspection. Refer to TM 55-2840-254-23. |
| 18. | DELETED | | |
| 19. | 4, 5 | WHEN ENGINE OIL CONSUMPTION EXCEEDS **2 QUARTS** PER HOUR: | Perform a hot end inspection and a high oil consumption check at the next inspection phase. Refer to TM 55-2840-254-23. |
| 20. | 4, 5 | WHEN AN ENGINE IS SUBJECTED TO SUDDEN STOPPAGE OR A SUDDEN REDUCTION IN RPM: | Perform an over-torque inspection. Refer to TM 55-2840-254-23. |
| 21. | 4, 5 | WHEN AN ENGINE OVERTEMPERATURE IS EXPERIENCED AS SPECIFIED IN TM 1-1520-240-10. | Perform a hot end inspection. Refer to TM 55-2840-254-23. |
| 22. | 4, 5 | WHEN AN N2 OVERSPEEDS AS SPECIFIED IN TM 1-1520-240-10: | a. Compute to find if actual overspeed occurred (Task 4-7).<br><br>b. If overspeed occurred, perform an overspeed inspection. Refer to TM 55-2840-254-23. |
| 23. | 4, 5 | WHEN AN ENGINE COMPRESSOR STALL (SURGE) IS EXPERIENCED: | Perform compressor stall inspection. Refer to TM 55-2840-254-23. |
| 23.1 | 9 | WHENEVER A DIGITAL ENGINE CONTROL UNIT (DECU) IS REPLACED: | Download and print the old DECU and update the new DECU with the total current engine operating hours and the total current cycles for the 3rd compressor disk, 1st turbine disk, 2nd turbine disk, integral shaft assy (3rd turbine disk), 4th turbine disk, 1st GP sealing plate, and GP spacer. See TM 1-2840-265-23 for instructions on downloading and resetting the DECU. |

| REF. NO. | AREA NO. | FREQUENCY | INSPECTION REQUIREMENTS |
|---|---|---|---|
| 24. | 4, 5 | AT TIME OF ENGINE REMOVAL FOR ANY REASON: | a. Forward airframe support engine mount lugs (visually) for cracks, nicks, scratches, and elongated holes.<br><br>**NOTE**<br>The inspections in paragraph b and paragraph c are required at engine removal only. Do not remove engines just to perform these inspections.<br><br>b. Remove the bolts through the spherical bearings. Remove the slip fit bushings and the spherical bearings (do not remove the press fit bushings). Fluorescent penetrant inspect or eddy current inspect forward airframe support engine mount lugs. Check all parts for wear (Task 4-28). (Not required if it has been performed in the last **600 hours** of aircraft operation.)<br><br>c. Inspect engine drag link IAW Task 4-41. (Not required if it has been performed in the last **600 hours** of aircraft operation.) |
| 24.1 | 4,5 | WHEN A -714 SERIES ENGINE IS REMOVED FOR REPLACEMENT/OVERHAUL: | Download and print the digital engine control unit (DECU) to show the total current engine operating hours and the total current cycles for the 3rd compressor disk, 1st turbine disk, 2nd turbine disk, integral shaft assy (3rd turbine disk), 4th turbine disk, 1st GP sealing plate, and GP spacer. Attach one copy to the DA Form 2410 and one copy to the engine historical records. See TM 1-2840-265-23 for instruction on downloading and resetting the DECU. |
| 24.2. | 4, 5 | ANYTIME AN ENGINE IS INSTALLED: | a. On aircraft with T55-GA-714A engines only. Perform Aviation Vibration Analyzer (AVA) check IAW TM 1-2840-265-23 and AVA procedures.<br><br>b. Update/reset the digital engine control unit (DECU) with the total current engine operating hours and the total current cycles for the 3rd compressor disk, 1st turbine disk, 2nd turbine disk, integral shaft assy (3rd turbine disk), 4th turbine disk, 1st GP sealing plate, and GP spacer. See TM 1-2840-265-23 for instructions on downloading and resetting the DECU.<br><br>c. Retorque forward engine mount bolts after first flight. First flight not to exceed **4 flight hours**. |
| 25. | 4, 5 | WHEN THE ENGINE OIL FILTER BUTTON IS EXTENDED: | Replace filter element and perform with Task 1-99, TM 55-2840-254-23-1. |
| 26. | 4, 5 | WHEN EMERGENCY POWER REACHES **30 MINUTES** CUMULATIVE TIME: | a. Perform engine hot end inspection. Record number of hot end inspections on DA Form 2408-15. Record the computed elapsed time spent in emergency power on DA Form 2408-15.<br><br>b. Record cumulative engine emergency power minutes, time since last hot end inspection, and total engine operating hours on DA Form 2408-15. |
| 27. | 4, 5, 10 | WHEN THE ENGINE OR TIMER/EMERGENCY POWER PANEL IS REMOVED OR INSTALLED: | a. Record the total reading on the digital timer for the installed engine on DA Form 2408-15. Record next hot end inspection due on DA Form 2408-18.<br><br>b. Reset the black and white indicator flag using switch in nose compartment while helicopter is on ground. |

| REF. NO. | AREA NO. | FREQUENCY | INSPECTION REQUIREMENTS |
|---|---|---|---|
| 28. | 4, 5 | WHEN AN ENGINE NEW TO THE AIRCRAFT IS INSTALLED, AFTER REPLACEMENT OF A MAJOR ENGINE COMPONENT (SUCH AS A HOT END), OR AFTER REPLACEMENT OF THE FUEL CONTROL AND AFTER ADJUSTMENT OF **2 PERCENT** OR GREATER OF THE GROUND IDLE SPEED OR ANY ADJUSTMENT TO COMPRESSOR ROTOR MAXIMUM SPEED. | Perform a turbine engine analysis check (TEAC) (Task 4-3). |
| 29. | 4, 5 | WHEN A NEW, OVERHAULED, OR PERMANENT STORAGE ENGINE IS INSTALLED: | Perform activation check run on the engine. Refer to TM 55-2840-254-23. |
| 30. | 4, 5 | WHEN A ROTATING GAS PRODUCER COMPONENT OR POWER TURBINE ASSEMBLY IS REPAIRED OR REPLACED OR IF EXCESSIVE ENGINE VIBRATION IS SUSPECTED: | Perform engine vibration check. Perform (AVA) check IAW TM 1-2840-265-23 and AVA Procedures. Refer to Task 4-14. |
| 31. | 4, 5 6, 7 | WHEN AN ENGINE DRIVE SHAFT OR SYNCHRONIZING DRIVE SHAFT IS INSTALLED: | Torque check the adapter bolts and nuts at each end of the shaft which had not been removed. |
| 32. | 4, 5 | WHEN A CONE ASSEMBLY (TAILPIPE) IS INSTALLED OR REPLACED: | After initial engine ground run, RETORQUE COUPLING NUT TO **30 INCH-POUNDS** ABOVE RUN-ON TORQUE. |
| 33. | 4, 5 | WHEN STARTING OR BEEPING ENGINES, IF LOUD NOISES OR SHOCKS ARE FOLLOWED BY SUDDEN HIGH INCREASES IN ENGINE TORQUE, OR IF A TORQUEMETER IS STATIONARY AT HIGH VALUE AFTER SHUTDOWN: | Do not restart affected engine. Troubleshoot engine in accordance with Chapter 4 and engine transmission in accordance with Chapter 6 of TM 55-1520-240-T. If cause cannot be determined, remove and replace engine and engine transmission. Perform an engine over-torque/sudden engagement inspection in accordance with TM 55-2840-254-23. Remove two electrical generators on aft transmission and inspect shafts for evidence of damage. |
| 34. | 4, 5 | WHEN AN ENGINE HOT END INSPECTION HAS BEEN PERFORMED OR AFTER A HOT END SECTION, POWER TURBINE SHAFT, OR OUTPUT SHAFT HAS BEEN REPLACED: | Confirm that the output shaft and play inspection has been performed. Refer to TM 55-2840-254-23. |
| 35. | 4, 5 | ANYTIME AN ENGINE OPERATING LIMIT HAS BEEN EXCEEDED: | Download the digital engine control unit (DECU) prior to cleaning the limit exceedence. See TM 1-2840-265-23 for instructions on downloading and resetting the DECU. |

| REF. NO. | AREA NO. | FREQUENCY | INSPECTION REQUIREMENTS |
|---|---|---|---|
| 36. | 4, 5 | WHEN STARTING ENGINES, IF EITHER ENGINE FAILS TO ACCELERATE TO FLIGHT SPEED: | |
| | | | Restart suspect engine first, followed by the good engine. If either engine will not engage, always shut down the engine that will not engage first. Troubleshoot in accordance with TM 55-1520-240-T. If it is determined that the engine is not the problem, the engine transmission(s) may have a defective clutch. Replace engine transmissions which failed to engage during the first and second starting sequence. |
| 37. | 4, 5 | WHEN $CO_2$ IS APPLIED TO THE ENGINE: | |
| | | | a. If $CO_2$ is applied into the air inlet while the engine is hot or rotating, perform a hot end inspection. Refer to TM 55-2840-254-23. Inspect the area subjected to $CO_2$ for cracks. |
| | | | b. If $CO_2$ is applied into the tailpipe or other engine areas while the engine is hot or rotating, inspect the area subjected to $CO_2$ for cracks. |
| 38. | 4, 5, 6, 7, 8 | WHEN STEADY STATE TORQUE LIMITS HAVE BEEN EXCEEDED FOR **10 SECONDS** OR MORE: | |
| | | | a. Replace any engine transmission if **150 percent** torque is exceeded on that transmission. |

| REF. NO. | AREA NO. | FREQUENCY | INSPECTION REQUIREMENTS |
|---|---|---|---|
| | | | b. Replace the combining transmission if **150 percent** torque is exceeded on either engine or **260 percent** total torque from both engines is exceeded. |
| | | | c. Inspect engine if **154 percent** torque is exceeded on that engine. Refer to TM 55-2840-254-23. |
| | | | d. Replace the forward and aft transmissions if **260 percent** total torque from both engines is exceeded. |
| 39. | 4, 5, 6, 7, 8 | WHEN TRANSIENT (NEVER EXCEED) TORQUE LIMITS HAVE BEEN EXCEEDED: | |
| | | | a. Replace any engine transmission if **154 percent** torque is exceeded on that transmission. |
| | | | b. Replace the combining transmission if **154 percent** torque is exceeded on either engine. |
| | | | c. Inspect any engine if **154 percent** torque is exceeded on that engine. Refer to TM 55-2840-254-23. |
| | | | d. Replace the forward and aft transmissions if **300 percent** total torque from both engines is exceeded. |
| 40. | 6 | AT INSPECTION PHASE NEAREST **300 HOURS** OF AIRCRAFT OPERATION SINCE INITIAL OR SUBSEQUENT AFT PYLON INSTALLATION: | |
| | | | Retorque bolts NAS628 and nuts in the aft pylon-to-airframe splice (backed off and retightened) to specified torque. |
| 41. | 4, 5, 6, 7, 8, 10 | WHEN THE TRANSMISSION OIL TEMPERATURE EXCEEDS **140ºC** OR THE #1 OR #2 ENGINE XMSN HOT INDICATOR LIGHTS: | |
| | | | a. Functionally check the affected oil temperature indicating system. Refer to TM 55-1520-240-T. |
| | | | b. If the indicating system is satisfactory, replace the transmission (Tasks 6-46, 6-51, 6-72, 6-77, 6-92, 6-97, 6-100, 6-107.) |
| | | | c. Determine the cause of overheating. |
| 42. | 6, 7 | WHEN ANY MAJOR HYDRAULIC SYSTEM MAINTENANCE ACTION HAS BEEN PERFORMED THAT REQUIRED A SIGNIFICANT REPLACEMENT OR EXCHANGE OF FLUID: | |
| | | | Perform a hydraulic fluid contamination check (Task 7-8.1). |
| 42.1. | 6, 7, 8 | WHENEVER A MAJOR HYDRAULIC COMPONENT (FOR EXAMPLE: THE PUMP, CHECK VALVE, ETC.) HAS FAILED, OR WHENEVER THE HYDRAULIC SYSTEM IS SUSPECT OF A FAULT, A SPECIAL HYDRAULIC FLUID SAMPLE MUST BE TAKEN. | |
| 42.2. | 6, 7, 8 | WHENEVER ANY HYDRAULIC FLUID FILTER ELEMENTS ARE REMOVED FROM THE AIRCRAFT DURING PHASE INSPECTION OR FOR NORMAL MAINTENANCE REPLACEMENT, SEND ELEMENTS TO THE UNITS DESIGNATED AOAP LABORATORY FOR ANALYSIS. | |
| 43. | 6, 7, 8, 10 | WHEN A TRANSMISSION LUBRICATION SYSTEM HAS BEEN CONTAMINATED: | |
| | | | Perform an oil system contamination inspection (Tasks 6-112, 6-140, 6-170, 6-198). |

| REF. NO. | AREA NO. | FREQUENCY | INSPECTION REQUIREMENTS |
|---|---|---|---|
| 44. | 6, 7, 8, 10 | WHEN A TRANSMISSION OR AFT ROTARY WING SHAFT IS INACTIVE FOR **30 DAYS**, OR TRANSMISSION OIL COOLER IS REPLACED OR INACTIVE FOR **30 DAYS**: | a. Perform a **30 minute** ground run at normal rotor rpm.<br>b. After ground run and prior to first flight, inspect applicable filter(s) for extended indicator buttons.<br>c. After first flight, inspect applicable filter(s) for extended indicator buttons. |
| 44.1 | 6, 7, 8, 10 | WHEN A TRANSMISSION OR AFT ROTARY WING SHAFT IS REPLACED (DOES NOT INCLUDE CONTROLLED EXCHANGE): | a. Perform a **30 minute** ground run at normal rotor rpm.<br>b. After ground run and prior to first flight, remove and inspect applicable filter(s) and debris screens for contamination (Tasks 6-123, 6-129, 6-133, 6-148, 6-154, 6-157, 6-160, 6-163, 6-164, 6-171, 6-173, 6-174, 6-175, 6-199, 6-201, 6-202 as applicable).<br>c. After first flight, inspect applicable filter(s) for extended indicator button. |
| 45. | 6, 7, 8, 10 | WHEN CONTAMINATION IS FOUND ON A TRANSMISSION OR AFT ROTARY WING DRIVE SHAFT, CHIP DETECTOR, DEBRIS DETECTION SCREEN, MAIN INLET SCREEN, OR AUXILIARY OIL FILTER: | Check the quantity, source, form, and type of material. Determine serviceability or necessity for replacement of component (Tasks 6-108, 6-136, 6-166, and 6-194). |
| 46. | 6 | WHEN AN AFT TRANSMISSION HAS BEEN REPLACED DUE TO METAL CONTAMINATION: | Remove, inspect, and clean aft rotary wing drive shaft filter and chip detector. If the chip detector is contaminated, replace the aft rotary wing drive shaft (Tasks 6-56 or 6-57 and 6-62 or 6-63). |
| 47. | 6, 7, 8, 10 | WHEN THE TRANSMISSION FILTER BYPASS BUTTON IS EXTENDED: | Replace filter element. Check in accordance with Tasks 6-108, 6-136, 6-166, and 6-194. |
| 48. | 6, 7, 8, 10 | WHEN AN ENGINE TRANSMISSION IS REMOVED: | Inspect the quill shaft nylon snubber (Task 6-101). If the snubber is cracked, distorted, or disconnected, from the shaft shoulder, replace with new like item. If the snubber is disintegrated, replace engine transmission (Task 6-107). |
| 48.1. | 6 | PRIOR TO ENGINE TRANSMISSION BEING INSTALLED: | Conduct records check of the engine transmission DA Form 2408-16 to determine the serial numbers of the input pinion spiral bevel gearshift (145D6301) and spiral bevel gearshaft (145D6302) for prefix letter of "P" in the serial number. Engine transmissions with this prefix letter "P" in the serial number of these gear shafts are considered unserviceable. |
| 49. | 6 | WHEN AN ENGINE TRANSMISSION HAS BEEN REMOVED BECAUSE OF A SUSPECTED INTERNAL FAILURE AND THE OIL FILTER OR CHIP DETECTOR SHOW SIGNS OF METAL CONTAMINATION: | a. If filter shows signs of being bypassed or if the filter warning indicator is extended, inspect inlet screen for contamination.<br>b. If inlet screen is contaminated, replace oil cooler and inlet screen and flush hose between cooler and inlet screens. Perform serviceability check (Task 6-108). |

| REF. NO. | AREA NO. | FREQUENCY | INSPECTION REQUIREMENTS |
|---|---|---|---|
| 50. | 6, 7, 8, 10 | WHEN A TRANSMISSION IS SUSPECTED OF EXCESSIVE OIL LEAKAGE: | Perform an oil leak tolerance check (Task 6-109). |
| 51. | DELETED | | |
| 52. | 6, 7, 8, 9 | UPON REACHING **25 HOURS** FOLLOWING INSTALLATION OF A FORWARD, AFT, OR COMBINING TRANSMISSION OR AN AFT ROTARY WING DRIVE SHAFT: | Retorque (back off and retighten) mount nuts to specified torque (Tasks 6-51, 6-62, 6-77 and 6-97). |
| 53. | 6, 7 | PRIOR TO INSTALLATION OF A REPLACEMENT ROTARY WING BLADE: | Insure letter E or F appear on identification plate. |
| 54. | 6, 7 | WHEN A ROTARY WING BLADE HAS MADE CONTACT WITH A FOREIGN OBJECT OR WHEN THE POWER TRAIN HAS BEEN SUBJECTED TO A SUDDEN REDUCTION IN RPM: | a. Inspect all six rotary wing blades as follows:<br>(1) Blade leading edge for dents, buckles, tears, and unbonding.<br>(2) Blade upper and lower surfaces for dents, delaminations, buckles, wrinkles, and tears.<br>(3) Blade spar roots for distortion and delamination.<br>(4) Blade trailing edges for cracks, delaminations, and distortion.<br>(5) Tip cover and rib closure for damage. Remove tip cover and inspect visible portion of blade interior for damage. check tip weight hardware for security and damage.<br>(6) Shock absorber attachment brackets and filament windings for cracks, delaminations, and distortion.<br>b. Inspect blade shock absorber for leakage, distortion, cracks (giving particular attention to threaded area of rod end), and unrestricted travel. Shock absorber attachment brackets on rotary wing head for cracks, distortion, and elongated holes.<br>c. If inspection of blades and shock absorbers reveals damage or if a sudden RPM reduction in the power train occurs, inspect the following:<br>(1) Aft rotor shaft center (aluminum) section and all power train drive shafting for buckling. If buckling is detected, remove all power train transmission and drive shafting.<br>(2) If there is no buckling, proceed to step (4).<br>(3) If buckling is found and power train components have been removed, proceed to step (7).<br>(4) Power train shafting, adapters, and plate assemblies for cracks and security of attachment.<br>(5) Bearing housing shock mounts for freedom of fore-and-aft movement on support bushings, torn or unbonded rubber, and security.<br>(6) Drive system for freedom of rotation.<br>(7) Transmission and drive shafting supports for distortion, cracks, and security. Adjacent structure for damage. |

| REF. NO. | AREA NO. | FREQUENCY | INSPECTION REQUIREMENTS |
|---|---|---|---|
| | | | (8) Rotary wing heads, pitch links, and controls for cracks, nicks, and distortion. |
| | | | (9) Upper dual boost actuators for leakage. Attachment fittings for cracks and security. |
| 55. | 6, 7 | WHEN ROTOR SPEED EXCEEDS **115 PERCENT**: | |
| | | | a. Replace the forward and aft rotary wing heads, including vertical hinge pins. Identify heads as overspeeding. Return to depot. |
| | | | b. Inspect each blade for obvious damage (Task 5-63.1). If any damage is evident, blade is not acceptable for flight. If no damage is evident, blade is acceptable for flight. |
| 55.1. | 6, 7 | WHEN ROTOR RPM EXCEEDS **111 PERCENT**, BUT DOES NOT EXCEED **115 PERCENT** RPM: | |
| | | | Inspect the rotor head tie bar assemblies per Task 5-23.1.1 at the next rotor head removal, but NLT than completion of next phased maintenance. |
| 56. | 6, 7 | WHEN A ROTARY WING BLADE HAS BEEN STRUCK BY LIGHTNING: | |
| | | | Perform lightning strike inspection (Tasks 2-5 and 5-63.2). |
| 57. | 6, 7 | WHEN A ROTARY WING BLADE HAS BEEN FLAPPING DUE TO HIGH WINDS: | |
| | | | Inspect rotor system (Task 5-63.3). |
| 57.1. | 6, 7 | PRIOR TO INSTALLATION OF ROTARY WING HEAD ASSEMBLY P/N 145R2003-9 (FWD) AND/OR P/N 1452004-18 (AFT): | |
| | | | Visually inspect bushings P/N 145R3116-10 for slipping/looseness. |
| 57.2 | 6, 7 | PRIOR TO INSTALLATION OF ROTARY WING HEAD ASSEMBIES: | |
| | | | Rotor hubs with lightening holes only, perform eddy current inspection and inspect the area surrounding the vertical web. |
| 58. | 6, 7 | WHEN A ROTARY WING HEAD IS SUSPECTED OF EXCESSIVE OIL LEAKAGE: | |
| | | | Perform an oil leakage tolerance check (Task 5-5). |
| 59. | 6, 7 | WHEN A ROTARY WING HEAD IS REPLACED OR REINSTALLED AFTER THE FIRST FLIGHT: | |
| | | | a. Tang washer and lock-ring for proper installation and security (Task 5-9). |
| | | | b. Retaining nut for specific torque (Task 5-9.1). |
| 60. | 6, 7 | WHEN THE AIRSPEED LIMITATION, WITH LONGITUDINAL CYCLIC TRIM ACTUATORS RETRACTED AS SPECIFIED IN TM 55-150-240-10, CHAPTER 5, HAS BEEN EXCEEDED: | |
| | | | a. With forward actuator retracted, inspect forward rotor heal and droop stops for damage. |
| | | | b. With aft actuator retracted, replace the aft rotary wing driveshaft only if gross weight exceeds **40,000 pounds** (Tasks 6-56 or 6-57 and 6-62 or 6-63). |
| 61. | 7, 10 | WHEN THE FLIGHT CONTROLS HAVE BEEN MOVED OR THE HYDRAULIC PRESSURE IS REMOVED WHILE RIGGING PINS ARE INSTALLED: | |
| | | | Perform the inspection for damage following movements of flight controls with rigging pins installed (Tasks 11-19 and 11-20). |
| 62. | 6, 7 | WHEN A FORWARD OR AFT LCT ACTUATOR IS REPLACED: | |
| | | | Perform LCT actuator operational check (affected system only). Refer to TM 55-1520-240-T-3, Task 11-3.34.1 for forward and Task 11-3.34.2 for aft. |

| REF. NO. | AREA NO. | FREQUENCY | INSPECTION REQUIREMENTS |
|---|---|---|---|
| 63. | 6, 7 | WHEN THE ROTOR BLADES ARE POUNDING AGAINST THE DROOP STOPS, OR HAVE EXPERIENCED VIOLENT AND HEAVY FLAPPING: | a. Droop stops, pitch links, rotor blades and rotary-wing howls for distortion and visible damage (Task 5-63.3).<br>b. Damage to droop stops, pitch links, or rotary-wing head requires replacement of only the affected blades (Task 5-63.3).<br>c. Identify the removed blades as having experienced excessive flapping. |
| 64. | 8, 10 | WHEN INTERNAL FAILURE (METAL CONTAMINATION) OF A FLIGHT CONTROL OR UTILITY HYDRAULIC PUMP OR MOTOR OCCURS: | Flush the effected system. Use a hydraulic test stand equipped with a **3-micron** filter (Tasks 7-9 thru 7-15 or 7-315 thru 7-326). |
| 65. | 8 | AFTER **50 HOURS** OF HELICOPTER OPERATION FOLLOWING APU INSTALLATION: | APU mounting bolts for specified torque **(75-85 inch-pounds)**. |
| 66. | 10 | WHEN THE COMPASS IS SUSPECTED OF BEING IN ERROR: | Magnetic standby compass indicator for correct reading on all cardinal headings. Refer to TM 1-1500-204-23. |
| 67. | 10 | PRIOR TO INSTALLATION OF FREE AIR TEMPERATURE (FAT) GAUGE: | Each time the FAT gauge is replaced, test the replacement gauge. Refer to TM 1-1500-204-23. |
| 68. | 9 | AFTER EVERY THIRD MANUAL RELEASE OF THE CENTER CARGO HOOK UNDER LOAD: | Remove hook and perform a special inspection (Task 16-3). |
| 69. | 2, 3, 9 | UPON COMPLETION OF FIRST PRESSURE REFUELING: | Inspect for fuel leakage after installation of fuel transfer hose P/N 145PS498-1. |
| 70. | 4, 5 | USE OF EMERGENCY FUEL: | Emergency fuel 100LL (low lead) AVGAS is authorized for use with operation not to exceed **6 hours** cumulative time, after which the engine shall be removed and returned to depot maintenance. All engine operation using emergency fuel shall be recorded on DA Form 2408-13. |
| 71. | 6 | WHENEVER REPLACEMENT AND/OR MAINTENANCE IS DONE ON AFT TRANSMISSION COOLING FAN ASSEMBLY OR FAN DRIVE SHAFT: | Perform Vibration Test. |
| 72. | 6 | WHENEVER REPLACEMENT AND/OR MAINTENANCE IS DONE ON COMBING TRANSMISSION AND/OR DRIVE TRAIN COMPONENTS: | Perform Vibration Test. |
| 73. | 4, 5 | 30 DAYS OR 25 OPERATING HOURS WHICHEVER OCCURS FIRST | WHENEVER AN AIRCRAFT IS OPERATED IN SALT LADEN ENVIRONMENT OR WITHIN **200 MILES** OF VOLCANIC ACTIVITY:<br>Wash engine. Refer to TM 55-2840-254-23. |
| 74. | 6, 7 | PRIOR TO INSTALLATION OF ANY ROTOR HEAD RECEIVED FROM THE SUPPLY SYSTEM: | PERFORM INSPECTION TO ENSURE FLOW OF LUBRICATING OIL TO THE HORIZONTAL HINGE PIN BEARINGS. |
| 75. | 6, 7 | WHENEVER A SWASHPLATE IS INSTALLED: | |

| REF. NO. | AREA NO. | FREQUENCY | INSPECTION REQUIREMENTS |
|---|---|---|---|
| | | | PERFORM SWASHPLATE PULL TEST IN ACCORDANCE WITH TASKS 5-114, 5-114.1, AND 5-115. |
| 76. | 10 | WHENEVER A FORWARD TRANSMISSION IS INSTALLED: | |
| | | | PRIOR TO INSTALLATION, INSPECT FORWARD TRANSMISSION MAIN LUBRICATION PUMP FOR THE FOLLOWING SERIAL NUMBERS: |
| | | | V534, V535, V539, V541, V545 V557, V561, V564, V566, V569, V574, V575, V577 THROUGH V581, AND V589 THROUGH V598. |
| | | | IF THE ABOVE SERIAL NUMBERS ARE FOUND, CONTACT SFAE-AV-CH-L. IF THE ABOVE SERIAL NUMBERS ARE NOT FOUND, RECORD THE SERIAL NUMBER OF THE PUMP IN THE REMARKS BLOCK OF THE FORWARD TRANSMISSION DA FORM 2408-16. IF THE LUBRICATION PUMP HAS A "RW" SUFFIX TO THE PUMP SERIAL NUMBER THE PUMP HAS BEEN REWORKED AND IS ACCEPTABLE FOR USE. |
| 77. | 4, 5 | ANYTIME THE ENGINE AIR INLET SCREENS ARE REMOVED: | |
| | | | CHECK BOND LINE OF THE SILICONE RUBBER PAD ON STRAP ASSEMBLIES 114P8079-2 AND -3 FOR LOOSENESS. |
| 78. | 6, 10 | PRIOR TO INSTALLATION OF A FORWARD OR AFT TRANSMISSION. | |
| | | | CHECK THE FORWARD OR AFT TRANSMISSION SERIAL NUMBERS FOR A "MG", A "MG" AFTER THE SERIAL NUMBER IS REQUIRED ON THE FORWARD AND AFT TRANSMISSIONS FOR NON RESTRICTIVE FLIGHT. |
| 79. | 9 | PRIOR TO USING THE WINCH FOR RESCUE OPERATIONS: | PERFORM INSPECTION OF WINCH IAW TM 55-1520-240-23, TASK 14-2. |
| 80. | 6, 7 | PRIOR TO INSTALLATION OF A HORIZONTAL HINGE PIN ASSEMBLY: | |
| | | | PERFORM VISUAL INSPECTION OF THE HORIZONTAL HINGE PIN TASK 5-45. |

END OF TASK

# SECTION IX
# STORAGE OF AIRCRAFT

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

As Required

***Materials:***

As Required

***Personnel Required:***

As Required

***References:***

TM 43-0105
TM 55-1520-241-5
Tasks 1-96 thru 1-108

**NOTE**

CH-47D helicopters are prepared for shipment as directed in TM 55-1520-241-S.

1. Storage includes corrosion control by preventing moisture from contacting exposed metal surfaces using preservatives.
2. There are two main types of corrosion: direct chemical and electrochemical.
3. Direct chemical corrosion occurs when airborne chemicals erode or etch metal surfaces.
4. Galvanic corrosion occurs between dissimilar metals when moisture is present.
5. Preservation consists of providing clean, moisture-free surfaces, which are protected with a barrier from corrosion conditions.
6. Inspect for corrosion during storage.
7 If wet weather conditions exist, perform the following:
   a. Keep fabrics, rubber, and other materials as dry as possible.
   b. Keep fabric in aircraft clean.
   c. Treat all visible corrosion (TM 43-0105).
   d. If salty air is present, wash aircraft regularly and lubricate moving parts.
   e. Check drain valves are open, covered with screening, and not blocked.
   f. Keep fuel tanks full for flyable and short term storage.
   g. Surrounding conditions must be considered when selecting storage category.

***STORAGE CATEGORIES***

8. Storage categories are as follows:
   a. Flyable storage (no limit) (Tasks 1-96 thru 1-100). Helicopters in flyable storage will have a PMD inspection and runup performed at least once every **14 days**.
   b. Short term storage (from **1 to 45 days**) (Tasks 1-101 thru 1-104).
   c. Intermediate storage (from **46 to 180 days**) (Tasks 1-105 thru 1-108).
   d. Storage of aircraft undergoing maintenance (no time limit). This category of maintenance will include general requirements of storage of aircraft undergoing any maintenance action which causes the aircraft to be inactive for more than **fourteen days**. Due to the wide range of maintenance actions that may create this situation, some storage procedures will not be required and a degree of latitude is given to the local maintenance officer on the storage measures needed for the particular situation. The **fourteen day** limit is a guideline and variances are allowed at the discretion of the Maintenance Officer.

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

As Required

***Materials:***

As Required

***Personnel Required:***

As Required

***References:***

TM 38-230
TM 43-0105
TM 55-1500-344-24
Task 1-19
Task 1-20
Tasks 1-25 thru 1-27
Task 1-76
Task 1-77
Task 1-78
Tasks 1-81 thru 1-83
Task 1-88
Task 1-89
Task 1-99

**NOTE**

Process aircraft and components for storage in accordance with applicable methods described, or included by reference, in this section. Methods include cleaning, drying, preservative application, and use of wrappings or coverings when required. Accomplish preservation in an uninterrupted series of operations. When periods of interruption are necessary, provide temporary protection for partially processed items, as required, to avoid contamination. For components removed from aircraft, preservation and packaging instructions generally are in that section which carries instructions for removing the component. For additional information on preservation methods, refer to TM 38-230. Preservation, Packaging and Packing of Military Supplies and Equipment.

***TOWING***

1. Normal towing (Task 1-19).
2. Alternate towing (Task 1-20).

***CLEANING***

3. Clean interior and exterior (TM 55-1500-344-24 TM 43-0105, Tasks 1-76, 1-77, 1-78, 1-81, 1-82, and 1-83).

***PARKING***

4. Use standard parking procedures (Task 1-25). If aircraft is parked outside, observe fire regulations (TM 43-0105).

***MOORING***

5. Mooring helicopter to hard stand (Task 1-26).
6. Mooring helicopter to mooring kit (Task 1-27).

***LUBRICATION***

7. Lubricate helicopter before storage (Tasks 1-88, 1-89, and 1-90).

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 1-95 STORE AIRCRAFT — GENERAL INSPECTION PROCEDURES 1-95

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

As Required
Thermometer –20 to +110º C

***Materials:***

As Required

***Personnel Required:***

Inspector
As Required

***References:***

DA PAM 738-751
TM 11-1520-240-20
TM 43-0105
Task 1-73

***Equipment Condition:***

As Required

***General Safety Instructions:***

As Required

**NOTE**

General inspection procedures apply to all categories of storage.

1. Check aircraft is ventilated.
2. Check preservation procedures have been performed.
3. Check fuselage, ramp, and pool drain valves are open, operable, covered with screening and free from obstructions.
4. Check covers if installed as follows:
   a. If water is collecting on cover, provide drains.
   b. Replace damaged covers.
   c. Replace deteriorated covers.
5. Measure temperature inside aircraft at **30 minute** intervals during hottest part of day. Use thermometer. If temperature is more than **57ºC (135ºF)**, ventilate the aircraft to prevent condensation. If temperature cannot be reduced, use forced ventilation.
6. Check for corrosion as follows:
   a. Check for moisture collecting areas.
   b. Check painted surfaces for blisters or flaking.
   c. Treat corroded areas (TM 43-0105).

**NOTE**

Perform step 7 after winds more than **35 knots**.

7. Check security and condition of static ground wires, rotor tiedown straps, mooring devices (ropes, cables, rods or eyes), and landing gear tiedown rings. Make frequent checks.


Do not remove or package antennas.

8. Check communication equipment (TM 11-1520-240-20).

9. Check tire pressure. Pressure must be normal during flyable storage. Pressure must be at least **75 percent** of normal during short term and intermediate storage (Task 1-73).


Tires must be rotated every **30 days**. Do not rotate to original position; otherwise sets or flat spots will damage tires.

10. Move aircraft every **30 days**, or jack up aircraft and rotate tires **1/3 turn**.

11. Check hydraulic system for leaks. Repair all leaks.

***LOG BOOK ENTRIES***

12. Enter this data in log book as follows:

    a. Preservation data.

    b. Date aircraft was placed in storage.

    c. Data from Aircraft Inspection and Maintenance Record (DA Form 2408-13).

    d. Data from Historical Record for Aircraft (DA Form 2408-15) (DA PAM 738-751).

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 1-96 INSPECT BEFORE FLYABLE STORAGE 1-96

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

None

***Materials:***

None

***Personnel Required:***

Medium Helicopter Repairer
Inspector

***References:***

DA PAM 738-751
TM 55-1520-240-PMD

1. Maintain helicopter in serviceable condition.
2. Perform **14 Day** Inspection (TM 55-1520-240-PMD).
3. Record date and type of storage on DA Forms 2408-13 and 2408-15 in helicopter log book (DA PAM 738-751).

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 1-97 PREPARE HELICOPTER FOR FLYABLE STORAGE — GENERAL PROCEDURES 1-97

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

As Required

***Materials:***

Hydraulic Fluid (E197)
Barrier Material (E81)
Tape (E388)
Cloth (E120)
Dry Cleaning Solvent (E162)
Cheesecloth (E112)
Gloves (E186)

***Personnel Required:***

Medium Helicopter Repairer (2)
Inspector
Army Rotary-Wing Aviator (2)

***References:***

DA PAM 738-751
TM 11-6140-203-23
TM 55-1520-240-T
TM 55-1520-240-10
Task 1-26 or 1-27
Task 1-32
Task 1-51
Tasks 1-53 thru 1-57
Task 1-59 or 1-62
Tasks 1-64 thru 1-73
Task 1-89
Task 1-90

***Equipment Condition:***

As Required

***General Safety Instructions:***

**WARNING**

Hydraulic fluid (E197) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

**WARNING**

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

***PREPARE DRIVE SYSTEM***

1. Check drive system lubrication and sight gages.
2. Service drive system (Task 1-54 and 1-89).

***AUXILIARY POWER UNIT***

3. Check APU oil level. Service APU, if needed (Task 1-53).
4. Start and operate APU (TM 55-1520-240-T).
5. Shut down APU (TM 55-1520-240-T).
6. Install APU exhaust cover (Task 1-32).
7. Seal APU inlet. Use cover or barrier material (E81) and tape (E388).

***PREPARE ENGINES***

8. Preserve engines as follows:
   a. Keep engines and accessories clean. Observe all precautions.

**WARNING**

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

   b. Clean intake air ducts, plenum chambers, and compressor inlet screens clean and free from foreign materials. Use cloth (E120) damp with solvent (E162) on external parts. Wear gloves (E186).

**NOTE**

Steps c and d may be omitted if engines have been operated recently and are moisture-free.

   c. Have pilot start engines. Perform engine ground runup to circulate engine lubricants throughout engine (TM 55-1520-240-10). Operate engines at **75 percent** rpm. Do not fly helicopter. Check that engine temperature and hydraulic pressures are within normal ranges.
   d. Shut down engines (TM 55-1520-240-10).
   e. Install engine inlet and exhaust protective covers (Task 1-32).
   f. Cover other engine cowling openings. Use barrier material (E81). Secure barrier material with tape (E388).
   g. Record, in aircraft log book on forms DA 2408-13 and DA 2408-15, date engines were placed in flyable storage. (Refer to DA PAM 738-751.)

***PREPARE HYDRAULIC SYSTEMS***

9. Check hydraulic systems for leaks. Repair leaks.
10. Service flight control and utility hydraulic system tanks (Task 1-59 or 1-62). Check that accumulators are pressurized (Tasks 1-64 thru 1-68).
11. Clean exposed areas of hydraulic actuator pistons. Use cloth (E120) soaked in hydraulic preservative fluid (E197). Wipe dry. Use clean cloth. Apply coat of fluid (E197). Wear gloves (E186).

***PREPARE ROTARY-WING BLADES***

12. Tie down blades (Task 1-26).

## 1-97 PREPARE HELICOPTER FOR FLYABLE STORAGE — GENERAL PROCEDURES (Continued) 1-97

***PREPARE ROTOR SYSTEM***

13. Check sight indicators on shock absorbers, vertical hinge pin bearing oil tanks, pitch varying bearing oil tanks, and hub oil tanks. Service if required (Tasks 1-55 and 1-58).
14. Lubricate swashplate (Task 1-90).

***PREPARE FUEL SYSTEM***

15. Drain water from fuel tanks. Fill tanks (Task 1-51). Keep tanks full and free of water through complete storage period.

***PREPARE ELECTRICAL SYSTEM***

16. Check that EMER EXIT LTS switch is set to DISARM.
17. Unplug battery. Wrap plug. Use barrier material (E81). Wrap barrier material, and secure wrapped plug to airframe. Use tape (E388).
18. Keep battery in helicopter if temperature is above **–40ºF (–40ºC)**. Remove battery from helicopter and store if temperature is below **–40°F (–40ºC)**. (Refer to TM 11-6140-203-23).
19. Clean and service battery (TM 11-6140-203-23).

***PREPARE LANDING GEAR***

20. Service tires (Task 1-73).
21. Service shock struts (Tasks 1-69 thru 1-72).
22. Clean exposed polished surfaces of shock strut. Use cloth (E120) soaked with hydraulic fluid (E197). Wipe dry. Apply fluid (E197) to cleaned area of strut. Wear gloves (E186).

CAUTION

Do not allow tape (E38) to contact polished piston.

23. Wrap polished pistons. Use barrier material (E81). Secure barrier material. Use tape (E388).

***PREPARE AIRFRAME***

24. Close doors, windows, and ramp unless ventilation is required.
25. Cover all fuselage openings to prevent entry of water, dust, or other foreign materials. Use protective covers (Task 1-32). Use barrier material (E81) for openings where covers are not provided. Secure barrier material. Use tape (E388).
26. Open drain plugs on underside of fuselage, ramp, and pod sections. Install cheesecloth (E112) over plugs to prevent entry of insects and small vermin. Secure cheesecloth with tape (E388).
27. Moor helicopter (Task 1-26 or 1-27).

***MAKE LOG BOOK ENTRIES***

28. In helicopter log book, on forms DA 2408-13 and DA 2408-15, record data and date placed in flyable storage. (Refer to DA PAM 738-751.)

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

Inspect during storage (Task 1-98).

END OF TASK

## 1-98 INSPECT HELICOPTER DURING FLYABLE STORAGE 1-98

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

As Required

***Materials:***

Rust Inhibitor and Preservative (E322)

***Personnel Required:***

Inspector
Others As Required

***References:***

TM 55-1520-240-PMD
TM 55-1520-240-10
TM 55-2840-254-23
Task 1-32

***Equipment Condition:***

Store Aircraft — General Inspection Procedures (Task 1-951-95)
Inspect Before Flyable Storage (Task 1-96)

1. Perform **14 day** Inspection. (Refer to TM 55-1520-240-PMD.)
2. Remove covers as required (Task 1-32). Start and operate APU once every **14 days** (TM 55-1520-240-10).
3. Remove covers as required (Task 1-32). Start and operate engines, at **100 percent** rpm, once every **14 days**. Do not fly helicopter. Check that engine transmission and hydraulic pressures and temperatures are within normal range (TM 55-1520-240-10).
4. Clean and preserve engine compressor blades every **14 days**. Use rust inhibitor and preservative (E322). (Refer to TM 55-2840-254-23.)
5. Shut down engines and APU (TM 55-520-240-10).

***FOLLOW-ON MAINTENANCE:***

As Required

END OF TASK

## 1-99 SERVICE HELICOPTER AFTER FLYABLE STORAGE 1-99

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

As Required

***Materials:***

Cloths (E120)
Dry Cleaning Solvent (E161)
Hydraulic Fluid (E197)
Gloves (E186)

***Personnel Required:***

Medium Helicopter Repairer
Inspector
Others As Required

***References:***

DA PAM 738-751
TM 11-1520-240-20
TM 11-6140-203-23
TM 55-1520-240-10
Task 1-26 or 1-27
Task 1-39
Tasks 1-51 thru 1-68
Task 1-88
Task 1-89

***Equipment Condition:***

Tiedown Lines Removed (Task 1-26 or 1-27)
Protective Covers Removed (Task 1-32)
Clean Fuselage (Task 1-76)

***General Safety Instructions:***

**WARNING**

Dry cleaning solvent (E161) is combustible and toxic. It can irritate skin and cause burns Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

**CAUTION**

Do not perform system or operational checks until systems or components are depreserved and serviced. Equipment can be damaged.

***PREPARE AIRFRAME***

1. Remove tape and barrier material from fuselage openings. Wipe clean. Use cloth (E120) damp with solvent (E161).
2. Remove cheesecloth screens from drains. Close drain plugs in fuselage, ramp, and pod sections. Remove tape. Use cloth (E120) damp with solvent (E161). Wear gloves (E186).
3. Open doors, windows, and ramp to ventilate helicopter.

4. Record date aircraft was prepared for service on forms DA 2408-13 and 2408-15 in aircraft log book (DA PAM 738-751).

***PREPARE LANDING GEAR***

5. Remove covering.
6. Service tires (Task 1-73).
7. Clean landing gear. Do not clean polished pistons of shock struts. Use cloth (E120) damp with solvent (E161). Wear gloves (E186).
8. Remove tape and barrier material. Clean polished pistons of shock struts. Use cloth (E120) damp with hydraulic fluid (E197). Wipe pistons dry. Apply hydraulic fluid to pistons.
9. Lubricate landing gear (Task 1-88).

***PREPARE ELECTRICAL SYSTEM***

10. Set EMER EXIT LTS switch to DISARM.
11. If removed, install battery (TM 11-1520-240-20). Service battery, if needed (TM 11-6140-203-23).
12. Connect battery (Task 1-39).

***PREPARE FUEL SYSTEM***

13. Drain water from fuel tanks. Fill tanks (Task 1-51).

***PREPARE ROTARY-WING BLADES***

14. Remove tiedown lines from blades (Task 1-26 or 1-27).

***PREPARE ROTOR SYSTEM***

15. Check sight indicators in shock absorbers, vertical hinge pin bearing oil tanks, pitch varying bearing oil tanks, and hub oil tanks. Service if required (Tasks 1-54 thru 1-58).

***PREPARE HYDRAULIC SYSTEMS***

16. Service flight control and utility hydraulic system tanks (Tasks 1-59 thru 1-62). Check that accumulators are pressurized (Tasks 1-63 thru 1-68).
17. Operate flight control and utility hydraulic systems (TM 55-1520-240-10).
18. Check hydraulic systems for leakage (Task 7-7).

***PREPARE DRIVE SYSTEM***

19. Check drive system lubrication.
20. Service drive system (Tasks 1-54 and 1-89).

***PREPARE AUXILIARY POWER UNIT***

21. Remove barrier material and tape from APU inlet.
22. Clean inlet area. Use cloth (E120) damp with solvent (E161).
23. Service APU (Task 1-53).
24. Start and operate APU. Check that APU operates normally (TM 55-1520-240-10).
25. Shut down APU (TM 55-1520-240-10).
26. Record date APU was prepared for service on DA Forms 2408-13 and 2408-15 of aircraft log book (DA PAM 738-751).

***PREPARE ENGINES***

27. Remove barrier material and tape from engine cowls.
28. Clean cowls. Use cloth (E120) damp with solvent (E161). Wear gloves (E186).
29. Remove foreign matter from engine cowls, air intakes, and exhausts.
30. Check that lines, hoses, damps, electrical wires, and components are secured.
31. Service engine oil tanks (Task 1-52).
32. Start engines. Operate engines at GROUND. Check that engine instruments indicate normal conditions (TM 55-1520-240-10).
33. Set ENGINE CONDITION levers to FLIGHT. Operate engines until temperatures are stable.
34. Shut down engines (TM 55-1520-240-10).
35. Record date engine was prepared for service on DA Forms 2408-13 and 2408-15 of aircraft log book.

***INSPECT***

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 1-100 INSPECT HELICOPTER AFTER SERVICING FROM FLYABLE STORAGE 1-100

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

None

***Materials:***

None

***Personnel Required:***

Inspector

***Reference:***

DA PAM 738-751
TM 55-1520-240-PMD
Aircraft Log Book
Task 1-99

***Equipment Condition:***

Service After Flyable Storage (Task 1-99)

1. Check that all removal parts are installed or connected on helicopter. Refer to Aircraft Log Book.
2. Check that Aircraft Log Book has been posted (Task 1-99 and DA PAM 738-751).
3. Perform **14 Day** Inspection (TM 55-1520-240-PMD).

***FOLLOW-ON MAINTENANCE:***

As Required

END OF TASK

## 1-101 INSPECT HELICOPTER BEFORE SHORT TERM STORAGE 1-101

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

None

***Materials:***

None

***Personnel Required:***

Medium Helicopter Repairer
Inspector

***References:***

DA PAM 738-751

1. Check all removed parts are preserved and stored in helicopter.
2. Check all removed or disconnected parts are recorded in aircraft log book on DA Forms 2408-13, -15, -16, and -17 (DA PAM 738-751).
3. Check for leakage of fuel, oil, and hydraulic lines and hoses.

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

## 1-102 PREPARE HELICOPTER FOR SHORT TERM STORAGE 1-102

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

As Required

***Materials:***

Tape (E388)
Oil (E254)
Lubricating Oil (E251)
Cloths (E120)
Dry Cleaning Solvent (E161)
Corrosion Preventive Compound (E153 or E154)
Barrier Material (E81)
Metal Conditioner and Rust Remover (E242
Hydraulic Fluid (E197)
Gloves (E186)
Corrosion Preventive Compound (E465)

***Personnel Required:***

Medium Helicopter Repairer (2)
Inspector

***References:***

DA PAM 738-751
TM 11-6140-203-15-2
TM 55-1500-333-24
TM 55-1520-240-10
TM 55-2835-205-23
TM 55-2840-254-23
Task 1-5
Task 1-26
Task 1-27
Task 1-29
Task 1-32
Tasks 1-37 thru 1-39
Tasks 1-53 thru 1-58
Task 1-59 or 1-62
Task 1-60
Task 1-61
Tasks 1-63 thru 1-70
Tasks 1-76 thru 1-78
Tasks 1-80 thru 1-84
Task 1-88
Task 1-90
Task 1-106
Task 5-2
Task 5-64
Task 5-65
Task 5-87
Task 5-91
Task 17-4

***Equipment Condition:***

As Required

***General Safety Instructions:***

**WARNING**

Lubrication oil (E254) and hydraulic fluid (E197) are toxic. They can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

***DRIVE SYSTEM***

1. Prepare system for storage as follows:
   a. Fill transmissions with oil (E254) (Task 1-54).
   b. Start engines (TM 55-1520-240-10).
   c. Set ENGINE CONDITION levers to FLIGHT, and operate engines until indicated temperatures are steady (TM 55-1520-240-10).
   d. Shut down engines (TM 55-1520-240-10).

**WARNING**

Dry cleaning solvent (E161) is combustible and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

   e. Clean drive system exterior surfaces. Use cloths (E120) and solvent (E161). Wear gloves (E186).

**WARNING**

Corrosion preventive compound (E153 or E154) is flammable and toxic. Avoid inhaling. Use only with adequate ventilation. Keep away from heat, sparks, or open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

   f. Coat exposed (unpainted) surface of drive system. Use compound (E153 or 154). Wear gloves (E186).
   g. Tag ENGINE CONDITION levers and mark on tag TRANSMISSIONS PRESERVED DO NOT OPERATE.

***HYDRAULIC SYSTEM***

2. Prepare system for storage as follows:
   a. Check for leaks.
   b. Repair leaks.
   c. Fill flight control and utility hydraulic system tanks (Tasks 1-59 thru 1-61 or 1-62).
   d. Lower air pressure in accumulators to **250 psi** (Tasks 1-63 thru 1-68).
   e. Seal hydraulic line and tank vents. Use tape (E388).
   f. Clean exposed polished surfaces of actuator pistons. Use cloths soaked in fluid (E197). Wipe surfaces with clean cloth. Apply coat of hydraulic fluid (E197) to surfaces. Use cloths (E120).

***ROTARY-WING BLADES***

3. Prepare rotary-wing blades for storage as follows:
   a. Identify blade with aircraft serial number.
   b. Identify blade with its pitch housing color band.
   c. Remove blades from aircraft (Task 5-64).
   d. Prepare blades for storage (Task 5-65).
   e. Fill shock absorbers (Task 1-58).
   f. Remove absorbers (Task 5-87).
   g. Prepare absorbers for storage (Task 5-91). Store in aircraft.

***ROTARY-WING HEAD***

4. Prepare rotary-wing heads for storage as follows:
   a. Service hub, pitch bearings, and vertical hinge pin bearings oil tanks (Tasks 1-55 thru 1-57).

b. Clean vertical hinge pins, pitch housings. and bearing inner race surfaces. Use cloths (E120) moist with solvent (E161).

c. Wipe vertical hinge pins and bearing inner race surface dry. Use dry cloth (E120).

CAUTION

Do not use metal conditioner and rust remover on vertical hinge pins or bearing inner race surfaces. Damage to surface hardness could result.

d. Remove fretting corrosion from pitch housing. Use metal conditioner and rust remover (E242).

e. Wipe pitch housings dry of solvent or metal conditioner. Use dry cloth (E120).

f. Coat vertical hinge pins and bearing inner race surfaces. Use compound (E154).

g. Install vertical hinge pins in pitch housing (Task 5-2).

h. Install rotor hub protective covers (Task 1-32).

i. If protective covers are not available use barrier (E81), and hold with tape (E388).

j. If rotor hub nut is not installed, cover end of forward or aft transmission drive shaft. Use barrier (E81) and hold with tape (E388).

***ROTARY-WING HEAD CONTROLS***

5. Prepare controls for storage as follows:

a. Lubricate swashplate (Task 1-90).

CAUTION

Do not use corrosion-preventive compounds on rotary-wing head controls. Removal of compounds with solvent will damage dry-type bearings.

b. Clean controls. Use cloth (E120).

***FUEL SYSTEM***

6. Prepare fuel system for storage as follows:

a. If helicopter is stored with fuel in tanks, keep tanks full for duration of storage.

b. If aircraft is stored with tanks drained, perform Task 1-106.

***ELECTRICAL SYSTEM***

7. Prepare electrical system for storage as follows:

a. Set EMER EXIT LTS switch to DISARM.

b. Disconnect battery (Task 1-39).

c. Do not remove battery unless air temperature is –**40ºC (**–**40ºF)** or less. If battery is removed refer to TM 11-6140-203-15-2.

d. Clean battery (TM 11-6140-203-14-2).

e. Wrap battery plug. Use barrier (E81). Secure plug to airframe. Use tape (E388).

f. Remove emergency exit lights (Task 17-4).

***INSTRUMENTS***

**NOTE**

Only pitot-static system requires preparation for storage.

8. Install cover on pitot-static tube (Task 1-32).

***COMMUNICATION EQUIPMENT***

9. Prepare communication equipment for storage as follows:

a. Tag equipment to be removed.

b. Remove, protect, and return classified equipment to appropriate storage facility as directed in applicable directives.

**NOTE**

Do not remove unclassified communication equipment from aircraft unless it needs repair. Repaired equipment must be installed immediately upon delivery from repair.

***LANDING GEAR***

10. Prepare landing gear for storage as follows:

    a. Clean landing gear. Use cloths (E120) and solvent (E161).

    b. Remove dirt, mud, and foreign matter from tires. Use stiff brush and mild soap solution. Rinse with water.

    c. Clean exposed shock strut polished surfaces (Task 1-78).

    d. Deflate shock struts (Tasks 1-69 and 1-70).

    e. Lubricate landing gear (Task 1-88).

    f. Tag shock strut SHOCK STRUT PRESERVED.

    g. If aircraft is not stored on paved surface, install planking or equivalent between tire and ground.

    h. Maintain **75 percent** normal tire pressure during storage.

**NOTE**

Do not permit tire pressure to drop below **15 psi** for aircraft stored on blocks. Inflate tires to **75 percent** of normal tire pressure when pressure drops to **15 psi**.

    i. Install covers on tires.

***AIRFRAME***

11. Prepare airframe for storage as follows:

    a. Clean interior and exterior of aircraft (TM 55-1500-333-24, Tasks 1-76 thru 1-83).

    b. Install ground wire (Task 1-29).

    c. Close doors, windows, and ramp unless ventilation is required.


Make sure scrim (printed) side of barrier material is away from windshield or damage to windshield could occur.

    d. Cover windshields and windows. Use barrier (E81). Hold barrier with tape (E81).

    e. Cover fuselage openings (Task 1-32).

    f. Moor helicopter to hardstand (Task 1-26) or mooring kit (Task 1-27).

***OPERABLE ENGINES***

12. Refer to TM 55-2840-254-23.

***INOPERABLE ENGINES***

13. Preserve each inoperable engine (cannot be motored) as follows:


As a precaution, keep engines and accessories clean. Keep air intake duct, plenum chamber, and compressor inlet screens clean and free of foreign materials. When external cleaning is necessary, use solvent (E161).

**NOTE**

Do not treat engines for corrosion if they have been involved in an accident where engine failure or malfunction is known or suspected to have been a factor. These engines must be held for shipment to an overhaul depot or designated investigation area and should not be treated for corrosion prevention. (Refer to TM 55-2840-254-23.)

    a. Disconnect electrical wires, fuel lines, and drain plugs from the fuel control.

    b. Drain all fuel from pump pressure fittings. pump inlet, pressure tap, fuel inlet port, main and starting fuel outlet ports, and drain port.

    c. Remove and clean fuel strainers and filters. Use solvent (E161).

    d. Install filters and strainers.

    e. Allow fuel to drain from fuel control.

f. Install high pressure caps on all disconnected fuel lines and on open ports and fittings on fuel control, except the fuel inlet port.

g. Install high pressure caps on fuel boost pump open ports and fittings, except the fuel inlet port.

h. Pour lubricating oil (E251) into fuel control inlet port. Cap port.

i. Pour lubricating oil (E251) into fuel control inlet port. Cap port.

j. Spray corrosion preventive compound (E154) in the areas between the inlet housing struts for **30 seconds**. Direct the spray evenly on all compressor blades.

k. Spray **1/2 pint** of lubricating oil (E251) into inlet housing and exhaust diffuser openings. Move spray gun constantly to cover all internal parts.

l. Inspect engine to be sure that visible unplated or unpainted metal surfaces are coated with lubricating oil (E251). Pay particular attention to combustor housing, exhaust diffuser, air diffuser, and internal and external threads.

m. Make sure that parts, assemblies, and accessory components are complete and secure.

n. Seal engine holes or ports. Use protective caps, plugs, barrier material (E81), or tape (E388).

o. Close engine cowl. Seal all louvered openings in cowl. Use barrier material (E81) and tape (E388).

p. Install engine air inlet and exhaust protective covers (Task 1-32).

q. Place a tag on the ENGINE START switch in the cockpit stating: ENGINE PRESERVED, MAINTENANCE REQUIRED, DO NOT OPERATE.

***AUXILIARY POWER UNIT***

14. Prepare APU for storage as follows:

a. Disconnect battery (Task 1-39).

b. Service APU oil sump to full (Task 1-53).

c. Deleted.

d. Disconnect fuel line from fuel filter inlet port. Plug fuel line. Use a high pressure plug.

e. Unplug power supply connector from ignition exciter.

f. Disconnect fuel lines from main fuel manifold and start fuel nozzle.

g. Connect a drain hose to each disconnected line. Place the free ends of the two drain hoses into a **1 quart** container.

h. Check that utility hydraulic system accumulator is charged to **3000 psi** pressure (Task 1-64).

i. Apply dc electrical power to aircraft (Task 1-37).

j. Apply utility hydraulic power to aircraft (Task 1-38).

k. Have helper, in cockpit, hold APU switch to START until all residual fuel has been cleared from the fuel control unit into the **1 quart** container.

l. Have helper set APU switch to OFF.

m. Connect a supply of lubricating oil (E251) to fuel filter inlet port.

n. Have helper in cockpit hold APU switch to START until lubricating oil (E251) flows from drain hoses into **1 quart** container.

o. Have helper set APU switch to OFF.

p. Remove dc electrical power from aircraft.

q. Remove utility hydraulic power from aircraft.

r. Blow residual fuel from start fuel nozzle and main fuel manifold. Use low pressure air.

s. Remove lubricating oil supply from fuel filter inlet port. Install cap on fuel filter inlet port.

t. Remove drain hoses.

u. Connect fuel lines to main fuel manifold and to start fuel nozzle.

v. Connect power supply connector to the igniter exciter.

w. Remove APU oil sump drain plug. Drain lubricating oil (E251) into suitable container.

x. Install drain plug.


Do not apply solvent to cable insulation, rubber, or gasket material. Solvents can cause damage and deterioration to such materials.

y. Clean external metal surfaces of APU. Use a clean cloth (E120) and solvent (E161).

z. Dry clean surfaces of APU. Use a clean cloth (E120) or low pressure compressed air.

aa. Install APU exhaust protective cover (Task 1-32).

ab. Seal APU air inlet. Use barrier material (E81) and tape (E388).

ac. Place a tag on the APU switch stating APU PRESERVED. DO NOT OPERATE.

***LOG BOOK ENTRIES***

15. Enter this data in log book as follows:

a. Preservation data.

b. Date aircraft was placed in storage.

c. Data from Aircraft Inspection and Maintenance Record (DA Form 2408-13).

d. Data from Historical Record for Aircraft (DA Form 2408-15) (DA PAM 738-751).

***FOLLOW-ON MAINTENANCE:***

Inspect helicopter (Task 1-95).

END OF TASK

## 1-103 SERVICE HELICOPTER AFTER SHORT TERM STORAGE 1-103

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

As Required

***Materials:***

Barrier Material (E81)
Cloth (E120)
Hydraulic Fluid (E197)
Cleaning Solvent (E161)
Gloves (E186)
Oil (E254)
Tape (E388)

***Personnel Required:***

Medium Helicopter Repairer
Inspector

***References:***

TM 11-1520-240-20
TM 11-6140-203-14-2
TM 55-1520-240-T
TM 55-2835-205-23
DA PAM 738-751
Task 1-26
Task 1-27
Task 1-29
Task 1-32
Task 1-37
Task 1-39
Task 1-51
Task 1-53
Task 1-54
Task 1-58
Task 1-59
Tasks 1-62 thru 1-68
Tasks 1-71 thru 1-73
Task 1-76
Task 1-77
Task 1-78
Task 1-83
Task 1-88
Task 1-90
Task 1-107
Task 5-4
Task 5-84
Task 5-92
Task 5-93
Task 5-96
Task 6-130
Task 6-131
Task 6-132
Task 6-155
Task 6-156
Task 6-180
Task 6-181
Task 6-209
Task 6-210
Task 6-211
Task 7-8
Task 9-27
Task 10-33

***General Safety Instructions:***

**WARNING**

Dry cleaning solvent (E161) is combustible and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

**CAUTION**

Do not perform system or component operational check until system or component is depreserved and serviced. Equipment can be damaged.

***AIRFRAME***

1. Prepare airframe for service as follows:
   a. Remove moorings and tiedowns (Tasks 1-26 and 1-27).
   b. Remove and stow protective covers (Task 1-32).
   c. Clean fuselage inside and outside surfaces (Tasks 1-76, 1-77, and 1-83).
   d. Open cabin door.
   e. Open cockpit windows.
   f. Open ramp (TM 55-1520-240-T).
   g. Remove screening from fuselage, ramp and pod drains.
   h. Close ramp and pod drain valves.
   i. Remove static ground wire (Task 1-29).

***LANDING GEAR***

2. Prepare landing gear for service as follows:
   a. Remove protective covers as located in (Task 1-32).
   b. Inflate tires (Task 1-73).
   c. Clean forward and aft landing gear. Use cloth (E120) soaked in hydraulic fluid (E197). After cleaning dry with clean cloth and apply coat of fluid.
   d. Lubricate landing gear. (Refer to Task 1-88.)
   e. Inflate shock struts (Tasks 1-71 and 1-72).
   f. Remove PRESERVED tag from shock struts.

***COMMUNICATIONS EQUIPMENT***

3. Prepare communication equipment for service as follows:
   a. Protection and installation of classified equipment must be in accordance with applicable directives.
   b. Remove tags from equipment.

***INSTRUMENTS***

4. Prepare pitot-static system for service as follows:
   a. Remove protective covers as located in Task 1-32.
   b. Remove barrier material from sideslip ports.
   c. Remove tape mark. Use cloth (E120) moist with solvent (E161). Wear gloves (E186).

***ELECTRICAL SYSTEM***

5. Prepare electrical system for service as follows:
   a. Install emergency exit lights (Task 1-78).
   b. If removed, install battery (Task 9-27).
   c. Service battery (TM 11-6140-203-14-2).
   d. Connect battery (Task 1-39).

***FUEL SYSTEM***

6. Prepare fuel system for service as follows:
   a. If stored with fuel tanks drained, refer to Task 1-107.
   b. If stored with fuel in tanks, drain water from tanks. (Refer to Task 10-1 for location of drain valves.)

***ROTARY-WING HEADS***

7. Prepare rotary-wing system heads for service (Task 5-4).

***ROTARY-WING HEAD CONTROLS***


Do not wash flight control components with solvent (E161). Dirt may be carried into bearings.

8. Lubricate swashplates (Task 1-90).
9. Place pitch links in service (Task 5-96).

***ROTARY-WING BLADES***

10. Prepare rotary-wing blades for service as follows:
    a. Place shock absorbers in service (Task 5-93).
    b. Service shock absorbers (Task 1-58).
    c. Install shock absorbers on blades (Task 5-93).
    d. Install blades (Task 5-84).

***HYDRAULIC SYSTEM***

11. Prepare hydraulic system for service as follows:
    a. Clean hydraulic pistons (Task 1-78).
    b. Remove tape from hydraulic tank vents.
    c. Service accumulators (Tasks 1-64 thru 1-68).
    d. Service flight control and utility hydraulic system tanks (Tasks 1-59 and 1-62).
    e. Check hydraulic system for leaks. Repair leaks.

***DRIVE SYSTEM***

12. Prepare drive system for service as follows:
    a. Remove, clean, and inspect filter screens (Tasks 6-130 thru 6-132, 6-155, 6-156, 6-180, 6-181, and 6-209 thru 6-211).
    b. Clean drive system outside surfaces (Task 1-76).
    c. Service transmission oil (Task 1-54).
    d. Remove TRANSMISSION PRESERVED tag from ENGINE CONDITION levers.

***AUXILIARY POWER UNIT***

13. Prepare APU for service as follows:

a. Remove electrical power from aircraft.

b. Remove APU exhaust protective cover, and stow it.

**CAUTION**

Make sure solvent does not enter APU air inlet. The presence of solvent could cause the APU to explode during initial operation.

c. Remove tape (E388) and barrier material (E81) from APU air inlet. Remove tape residue. Use solvent (E161).

d. Service APU oil sump to FULL (Task 1-53).

e. Remove cap from fuel filter inlet port. Remove plug from fuel filter inlet line.

f. Connect fuel filter inlet line to fuel filter inlet port.

g. Disconnect fuel lines from main fuel manifold and start fuel nozzle.

h. Connect drain hoses to each disconnected line. Place free ends of drain hoses into a **1 quart** container.

**CAUTION**

If the following operation is not carried out, the APU will be motored, and ignition might occur.

i. Unplug power supply connector from ignition exciter.

j. Remove APU PRESERVED tag from APU switch.

k. Apply external dc power to aircraft (Task 1-37).

l. Have helper, in cockpit, hold APU switch to START.

m. Observe flow from drain hoses into **1 quart** container.

n. After preserving oil has been purged from system and a steady flow of clear air-free fuel is observed coming from drain hoses, have helper in cockpit set APU switch to OFF.

o. Remove external dc power from aircraft.

p. Remove drain hoses.

q. Connect fuel lines to main fuel manifold and start fuel nozzle.

r. Connect power supply connector to the ignition exciter.

**CAUTION**

Deleted.

s. Check that aft transmission is serviced with oil (E254) (Task 1-54).

**CAUTION**

The APU can be seriously damaged if the intake or exhaust airflow is restricted.

t. Make sure the APU air inlet and exhaust openings are free from obstructions.

u. Make sure turbine fuel drain valve is not restricted. (Refer to TM 55-2835-205-23.)

v. Make sure residual unburned fuel is drained from the turbine section.

w. Apply external dc power to aircraft (Task 1-37).

x. Start and operate APU. (Refer to TM 55-1520-240-T.)

y. Shut down APU. (Refer to TM 55-1520-240-T.)

z. Check APU oil sump level. Service if necessary (Task 1-53).

***ENGINES***

14. Refer to TM 55-2840-254-23.

***LOG BOOK ENTRIES***

15. Enter in aircraft log book date aircraft and component were prepared for service. Use forms DA 2408-13 and 2408-15 (DA PAM 738-751).

***FOLLOW-ON MAINTENANCE:***

None

END OF TASK

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

As Required

***Materials:***

As Required

***Personnel Required:***

Inspector
As Required

***References:***

TM 55-1520-240-PMD
Task 1-103

***Equipment Condition:***

Helicopter Serviced (Task 1-103)

1. Inspect helicopter as follows:
   a. Check all removed components have been installed.
   b. Check entries have been made in aircraft log book (Task 1-103).
   c. Check servicing tasks have been performed (Task 1-103).
   d. Perform pins inspection (TM 55-1520-240-PMD).

***FOLLOW-ON MAINTENANCE:***

As Required

END OF TASK

## 1-105 INSPECT HELICOPTER BEFORE INTERMEDIATE STORAGE 1-105

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

As Required

***Materials:***

As Required

***Personnel Required:***

Inspector

***References:***

DA PAM 738-751
TM 55-1520-240-PMD
Task 1-87
Task 7-7

1. Check that all removed parts are preserved for storage and stowed in helicopter (DA PAM 738-751).
2. Check that removed or disconnected parts are recorded in aircraft log book on DA Forms 2408-13, 2408-15, 2408-16, and 2408-17 (DA PAM 738-751).
3. Check hydraulic system for leakage (Task 7-7).
4. Perform **14 day** Inspection (TM 55-1520-240-PMD).
5. Lubricate helicopter for **100 hour** requirements (Task 1-87).
6. Check that aircraft log book has been posted (DA PAM 738-751).

***FOLLOW-ON MAINTENANCE:***

As Required

END OF TASK

## 1-106 PREPARE HELICOPTER FOR INTERMEDIATE STORAGE 1-106

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Copper Tube, Annealed, 1/4 Inch Diameter, 5 Feet Long
Siphon Pump
Sprayer
Brush
Goggles

***Materials:***

JP-4 Turbine Fuel (E182)
Cloths (E120)
Dry Cleaning Solvent (E161)
Gloves (E184.1)
Tape (E388)
Hydraulic Fluid (E197)
Soap (E352)
Preservative Compound (E153)
Grease (E190)
Epoxy Primer (E292.1)

***Personnel Required:***

Medium Helicopter Repairer
Inspector

***References:***

DA PAM 738-751
TM 11-1520-240-20
TM 55-2840-254-23
Task 1-26
Task 1-29
Task 1-32
Task 1-39
Task 1-71
Task 1-73
Task 1-72
Task 1-76
Task 1-88
Task 1-102
Task 2-343
Task 3-7
Task 3-12
Task 10-2
Task 10-3
Task 10-8
Task 10-18
Task 10-34 or 10-35
Task 12-39
Task 17-4

***General Safety Instructions:***

**WARNING**

Dry cleaning solvent (E161) is combustible and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

***PREPARE DRIVE SYSTEM***

1. Prepare drive system for storage (Task 1-102).

***PREPARE ENGINE***

2. Refer to TM 55-2840-254-23.

***PREPARE AUXILIARY POWER UNIT***

3. Prepare APU for storage (Task 1-102).

***PREPARE HYDRAULIC SYSTEMS***

4. Prepare hydraulic systems for storage (Task 1-102).

***PREPARE ROTARY-WING BLADES***

5. Prepare rotary-wing blades for storage (Task 1-102).

***PREPARE ROTARY-WING SYSTEM HEADS***

6. Prepare rotor system for storage (Task 1-102).

***PREPARE ROTARY-WING SYSTEM HEAD CONTROLS***

7. Prepare rotary-wing system head control for storage (Task 1-102).

***PREPARE FUEL SYSTEM***

8. Defuel helicopter (Task 10-34 or 10-35).
9. Purge each fuel cell (Task 10-2 or 10-3).
10. Clean fuel cell (Task 10-8).

**WARNING**

JP-4 turbine fuel (E182) is combustible and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

**CAUTION**

Spraying must be done using low-pressure air equipment to prevent damage to fuel cells. Ground spray equipment to airframe.

11. Spray inside of cells (Task 10-18). Use about **1 pint** of JP-4 fuel (E182). Use dehumidified air for spraying.
12. Drain fuel and oil mixture left in tank. Wipe up remaining fluid. Use cloths (E120).
13. Install access doors on fuel cells (Task 2-2).
14. Preserve fuel cells (Task 10-18).

***PREPARE ELECTRICAL SYSTEM***

15. Set EMER EXIT LTS switch to DISARM.
16. Disconnect battery (Task 1-39).
17. Clean battery and accessories. (Refer to TM 11-1520-240-20.)
18. Remove battery to shop.
19. Install accessories.
20. Seal battery drain and vent lines. Use tape (E388).
21. Wrap battery plug. Use barrier material (E81). Tape plug to airframe. Use tape (E388).
22. Remove emergency exit lights (Task 17-4).
23. Wrap emergency exit lights. Use barrier material (E81). Store lights in fiberboard box in helicopter.

***PREPARE INSTRUMENTS***

24. Remove two clocks. Tag clocks with statement of condition and return to storage facility.
25. Clean pitot-static system as follows:
    a. Clean pitot tube. Use cloth (E120) damp with solvent (E161). Wear gloves (E184.1).
    b. Install pitot tube covers (Task 1-32).
26. Wipe dust from static and sideslip ports. Use cloth (E120).
27. Seal static and sideslip ports. Use barrier material (E81). Overlay ports by at least **1/4 inch**. Seal edges with tape (E388).

***PREPARE COMMUNICATION EQUIPMENT***

28. Remove classified communication equipment, protect, and store equipment in approved storage facility. (Refer to applicable directives.)

**NOTE**

Unclassified equipment shall not be removed from helicopter unless equipment requires repair.

29. Wrap disconnected connectors. Use barrier material (E81) and tape (E388).
30. Clean antenna masts and related equipment. Use cloth (E120) damp with solvent (E161). Wear gloves (E184.1).

**WARNING**

Corrosion preventive compound (E153) is flammable and toxic. Avoid inhaling. Use only with adequate ventilation. Keep away from heat, sparks, or open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

31. Apply corrosion-preventive compound (E153) to cleaned areas.
32. Remove and treat corroded parts (Task 2-343).

33. Preserve package, and store mechanical items with equipment from which removed.

***LANDING GEAR***

34. Deflate shock struts (Tasks 1-71 and 1-72).
35. Remove hydraulic fluid filler plug.
36. Insert **1/4 inch** annealed copper tube all the way into filler port.

**WARNING**

Hydraulic fluid (E197) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

37. Remove hydraulic fluid. Use siphon pump in tube.
38. Fill struts to port level. Use preservative hydraulic fluid (E197).
39. Install filler plugs.
40. Clean landing gear. Do not clean tires or polished areas of shock struts. Use cloth (E120) damp with solvent (E161). Wear gloves (E184.1).
41. Clean tires. Use stiff brush and soap solution (E352). Rinse with clear water.
42. Clean exposed polished surfaces of shock struts. Use cloth (E120) damp with hydraulic fluid (E197). Dry surfaces. Use cloth (E120). Coat polished surfaces with hydraulic fluid (E197).
43. Remove wheels (Task 3-7).
44. Clean wheels and disk brakes. Use soft brush and solvent (E161). Wear gloves (E184.1) and goggles.
45. Touch up all chipped spots on wheels. Use paint similar to original finish.
46. Coat wheel with preservative compound (E153). Be sure to coat disk brake keys.
47. Lubricate wheel bearings. Use grease (E190).

**WARNING**

Epoxy primer (E292.1) is flammable and toxic. Avoid inhaling. Use only with adequate ventilation, away from heat or open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

48. Apply epoxy primer (E292.1) to brake disks. Wear gloves (E184.1).
49. Install wheels (Task 3-12).
50. Lubricate landing gear (Task 1-88).
51. Secure tag marked SHOCK STRUT PRESERVED.
52. Rest tires on planks if helicopter will not rest on paving or blocks.
53. Service tires to **66 psi** (Task 1-73). Maintain at least **15 psi** pressure throughout storage period.
54. Cover tires. Use covers or barrier material (E81) and tape (E388).

***PREPARE UTILITY ITEMS***

55. Remove condition tag from fire extinguishers. Return extinguishers to storage.
56. Remove condition tags from life rafts, parachutes, AN/CRT-3 radio and other items that can be damaged by climate conditions. Place items in storage.
57. Wrap cargo hooks. Use barrier material (E81) and tape (E388).

***PREPARE AIRFRAME***

58. Clean fuselage (Task 1-76).
59. Open drain valves under fuselage, ramp, and pods. Install cheesecloth (E112) on valves. Secure to fuselage. Use tape (E388).
60. Ground helicopter (Task 1-29).
61. Remove windshield wiper arms and blades (Task 12-39).
62. Store arms and blades in fiberboard box. Tag box and store in helicopter.

63. Close doors, windows, and ramp unless continuous ventilation is required. If ramp actuating cylinders are removed, or if ramp cannot be locked, secure ramp using tiedown straps. Connect ratchet hooks to tiedown rings and loop straps over aft transmission lugs.


Do not position printed side of barrier material against windshields. Windshield can be damaged.

64. Cover windshields and windows. Use barrier material (E81). Use tape (E388) to secure barrier material.

65. Cover fuselage openings. Use protective covers (Task 1-32). Use barrier material (E81) to cover unprotected openings. Use tape (E388) to secure barrier material.

66. Moor helicopter (Task 1-26).

67. Record preservation date and date aircraft was placed in storage on DA Forms 2408-13 and 2408-15 of aircraft log book. (Refer to DA PAM 738-751.)

***FOLLOW-ON MAINTENANCE:***

Inspect helicopter (Task 1-95).

END OF TASK

## 1-107 SERVICE HELICOPTER AFTER INTERMEDIATE STORAGE 1-107

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

Tube, Annealed Copper, 1/4 Inch Diameter
Siphon Pump
Container, 5 Gallons
Protective Clothing
Respirator
Facepiece
Source of Compressed Air

***Materials:***

Dry Cleaning Solvent (E161)
Cloth (E120)
Hydraulic Fluid (E197)
Lockwire (E231)
Grease (E190)
Fuel (E182)
Boric Acid Solution (E83)
Gloves (E186)

***Personnel Required:***

Medium Helicopter Repairer (2)
Inspector

***Reference:***

TM 11-6140-203-15-2
DA PAM 738-751
Task 1-39
Task 1-51
Task 1-59
Task 1-60
Tasks 1-62 thru 1-73
Task 1-76
Task 1-81
Task 1-88
Task 1-103
Task 3-7
Task 3-12
Task 7-7
Task 9-27
Task 10-8
Task 10-36
Task 12-36
Task 12-41
Task 17-7
Task 17-8

***Equipment Condition:***

Helicopter Lubricated — 100 Hour Requirement (Task 1-87)
Tiedown Lines Removed. Location per Task 1-26
Protective Covers Removed. Location per Task 1-32

***General Safety Instructions:***

**WARNING**

Dry cleaning solvent (E161) is combustible and toxic. It can irritate skin and cause burns. Use only with adequate ventilation away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

**WARNING**

Hydraulic fluid (E197) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

***PREPARE AIRFRAME***

1. Remove barrier material and tape from fuselage openings.
2. Clean areas around openings. Use cloth (E120) damp with solvent (E161). Wear gloves (E186).
3. Remove preservation compounds from fuselage surfaces. Use cloth (E120) damp with solvent (E161). Wear gloves (E188).
4. Remove barrier material and tape from window areas.
5. Clean fuselage around windows. Use cloth (E120) damp with solvent (E161). Wear gloves (E186).
6. Clean fuselage (Task 1-76).
7. Open doors, windows, and ramp to ventilate helicopter.
8. Remove screening from all fuselage, ramp, and pod drain valves or plugs.
9. Remove windshield wiper arms and blades from box stowed in helicopter. Inspect and clean blades.
10. Install wiper arms and blades (Task 12-36 and 12-41).
11. Remove static ground wire before moving helicopter.
12. Record data helicopter was prepared for service on DA Forms 2408-13 and 2408-15 of helicopter log books. (Refer to DA PAM 738-751.)

***PREPARE UTILITY ITEMS***

13. Replace or install fire extinguishers, life rafts, parachutes, AN/CRT-3 radio (if applicable) and other items removed from helicopter for storage.
14. Remove tags from utility items installed on helicopter.
15. Remove barrier material from cargo hooks.

***PREPARE LANDING GEAR***

16. Remove covering from tires.
17. Service tires (Task 1-73).
18. Clean landing gear. Do not clean polished pistons of shock struts. Use cloth (E120) damp with solvent (E181). Wear gloves (E186).
19. Remove lockwire from hydraulic fluid filler plugs. Remove plugs.
20. Insert annealed copper tube into shock strut cylinder until it bottoms.
21. Remove hydraulic fluid (E197) from struts. Use siphon pump and tube.
22. Service shock struts with hydraulic fluid (E197) (Tasks 1-69 and 1-70).
23. Remove SHOCK STRUT PRESERVED tag from air valve.
24. Service shock struts with air (Tasks 1-71 and 1-72).
25. Lubricate landing gear (Task 1-88).
26. Clean polished pistons. Use cloth (E120) damp with hydraulic fluid (E197).
27. Remove wheels (Task 3-7).
28. Clean wheels. Use cloth (E120) damp with solvent (E161). Wear gloves (E186).
29. Lubricate bearings. Use grease (E190).
30. Install wheels (Task 3-12).

***PREPARE COMMUNICATION EQUIPMENT***

31. Remove packaged preserved mechanical items stowed in helicopter. Install items on equipment from which removed.
32. Remove corrosion preventive compound from antenna mountings. Use cloth (E120) damp with solvent (E161). Wear gloves (E186).
33. Remove barrier material and tape from connectors.

34. Clean connector areas. Use cloth (E120) damp with solvent (E161). Wear gloves (E186).
35. Remove classified communication equipment from approved storage facility. Install and protect equipment in accordance with applicable directives.
36. Remove tags from communication equipment.

***PREPARE INSTRUMENTS***

37. Remove two clocks from storage. Install in helicopter.
38. Remove tags from clocks.

***PREPARE ELECTRICAL SYSTEM***

39. Remove tape from battery drain and vent lines.
40. Clean drain and vent lines. Use cloth (E120) damp with solvent (E161). Wear gloves (E186).
41. Remove barrier material if installed on battery plug.
42. Service battery sump jar. Use boric acid solution (E83).
43. Install battery in helicopter (Task 9-27).
44. Service battery. (Refer to TM 11-6140-203-14-2.)
45. Connect battery plug (Task 1-39).
46. Install emergency lights (Task 17-8). Charge batteries if needed (Task 17-7).

***PREPARE FUEL SYSTEM***

47. Remove access doors to inspect fuel cells.


To prevent asphyxiation from fuel, oil, and other fumes, wear protective clothing, a respirator, a full facepiece, and rubber gloves. Use an air compressor to continuously pump air into the tank when personnel are in the tank. Ground the air hose to the airframe. Assign a man to monitor the person in the tank in case he is overcome by fumes.


To prevent damage to fuel cell, remove all sharp object from pockets. Remove shoes or wear covers over shoes.

48. Check inside of each fuel cell for fungus. Remove any fungus by cleaning (Task 10-8).
49. Install access doors.
50. Flush airframe fuel system (Task 10-36).
51. Service fuel tanks (Task 1-51).
52. Remove preservation tag from filler cap.

***PREPARE HYDRAULIC SYSTEMS***

53. Clean exposed surfaces of actuators. Use cloth (E120) damp with solvent (E161). Wear gloves (E186).
54. Coat exposed surfaces of actuators. Use hydraulic fluid (E197).
55. Remove tape from hydraulic tank vents.
56. Clean area around tank vents. Use cloth (E120) damp with solvent (E161). Wear gloves (E186).
57. Service hydraulic systems (Tasks 1-59 thru 1-61 or 1-62).
58. Pressurize accumulators (Tasks 1-63 thru 1-68).
59. Check hydraulic system for leakage (Task 7-7).

***PREPARE AUXILIARY POWER UNIT***

60. Prepare APU for service (Task 1-103).

***PREPARE DRIVE SYSTEM***

61. Prepare drive system for service (Task 1-103).

***PREPARE ENGINES***

62. Prepare engines for service (Task 1-103).

***PREPARE ROTARY-WING SYSTEM HEADS***

63. Prepare rotary-wing system heads for service (Task 1-103).

***PREPARE ROTARY-WING SYSTEM HEAD CONTROLS***

64. Prepare rotary-wing system head controls for service (Task 1-103).

***PREPARE ROTARY-WING BLADES***

65. Prepare rotary-wing blades for service (Task 1-103).

***FOLLOW-ON MAINTENANCE:***

As Required

END OF TASK

## 1-108 INSPECT HELICOPTER AFTER SERVICING FROM INTERMEDIATE STORAGE 1-108

INITIAL SETUP

***Applicable Configurations:***

All

***Tools:***

As Required

***Materials:***

As Required

***Personnel Required:***

Inspector

***References:***

TM 55-1520-240-PMD
Task 1-107

***Equipment Condition:***

Helicopter Serviced (Task 1-107)

1. Check that removed parts have been installed and disconnected parts have been connected. Refer to aircraft log book.
2. Check that all procedures in Task 1-107 have been completed.
3. Check that aircraft log book has been properly posted (DA PAM 738-751).
4. Perform **14 day** Inspection. (Refer to TM 55-1520-240-PMD.)

***FOLLOW-ON MAINTENANCE:***

As Required

END OF TASK

This is a list of those items of installed or loose equipment required by and authorized for using organizations to accomplish their primary or alternate mission. This list will serve to standardize present inventory procedures by using the inventory master guide to determine the inventoriable items of installed and loose equipment. Insofar as possible, items of equipment are listed in the sequence of their physical location within the aircraft area.

Aircraft inventory is subject to change as a result of authorized changes and additions or deletions of property for special missions requirements; therefore, the selection of items of inventory from the inventory master guide may or may not provide a complete inventory list. When it is known that the master guide does not provide a complete inventory list, it will be necessary to research authorized changes and local command directives in order to compile an accurate and exact inventory list.

When the compilation of the inventory list is accomplished, this list will be entered on DA Form 2408-17, Aircraft Inventory Record. Refer to DA PAM 738-751 for applicable forms and records.

***SECURITY***

It is desired that aircraft inventory records be unclassified. However, when equipment bearing a security classification or the installation of classified equipment is of a confidential or secret nature, accomplishment of the classification will be in accordance with existing security regulations.

***INVENTORIABLE ITEMS***

The listing is made without regard to the agency, governmental or contractual, furnishing the items.

1. Items listed are as follows:
   a. Those essential to the execution of the designated mission of the aircraft, such as electronic, photographic, armament, special mission instruments, and safety and comfort equipment.
   b. Loose equipment delivered with the aircraft and items subject to pilferage or readily converted to personal use.
   c. Modification kits which are issued or distributed to using organizations for installation and which are not immediately placed in work will be recorded on the affected aircraft DA Form 2408-17 (Aircraft Inventory Record) and identified as loose equipment until the modification is completed.
   d. Equipment required for operation in special environment.
2. Items not listed are as follows:
   a. Nonaccountable items coded as expendable in the applicable stock lists.
   b. Personal issue or furnished on unit allowance or other authority.
   c. Those items or components considered basic or integral parts of the airframe or basic aircraft such as engines, rotary wings, wheels, and standard instruments.
   d. Technical publications, checklists, and aircraft forms.
   e. Items coded CPO (Complete Provisions Only) are not to be inventoried unless the equipment is actually installed.

***PERIODS OF INVENTORY***

Inventoriable items will be checked against the Aircraft Inventory Record (DA Form 2408-17) at the following periods:

1. Upon receipt of the aircraft.
2. Prior to transfer of the aircraft to another organization.
3. Upon placing the aircraft in storage and upon removing it from storage. The aircraft need not be inventoried while in storage.
4. Twelve months elapsed time since the last inventory.
5. Loose equipment shipped under separate cover is inventoried upon transfer by the sending activity and immediately upon receipt by the receiving activity.

***INVENTORY ITEMS LIST***

The following is a list of all CH-47D helicopter inventoriable items.

A — COCKPIT

sta 0 to 120

B — CABIN AREA

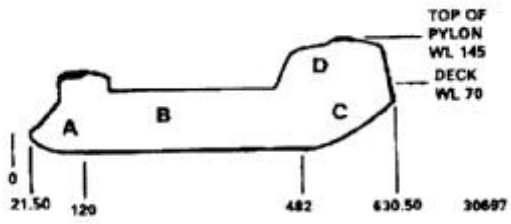
sta 120 to 482

C — RAMP AREA

sta 482 to 630.50

D — ENGINE AND AFT PYLON

sta 440 to 630.50




**Aircraft Series and Configuration by Theater (See Note)**

| ITEM NOMENCLATURE | CH-47D | | | | LOCATION OR REMARKS |
|---|---|---|---|---|---|
| | H | J | K | L | |
| SECTION A — COCKPIT | **NOTE** Letters at top of columns denote theater configuration as follows: H — Conus J — Europe K — Alaska L — Far East | | | | |
| Free Air Temperature Bulb 114E2177 | 1 | | | | Lower Left Corner of Upper Right Cockpit Window |
| Compass, Magnetic Standby, 60-1447 | 1 | | | | Centerline of Nose Enclosure Above Console Glare Shield |
| Compass Correction Card | 1 | | | | To the Side of the Standby Compass |
| Compass Correction Holder | 1 | | | | To the Side of the Standby Compass |
| Interphone Control C-6533 (1/ARC) | 3 | | | | On Center Lower Console |
| Antenna, FM, AS-1703/AR or S65-8282-30 (Section B) | 2 | | | | About sta 146 at the Bottom Centerline of the Fuselage |
| Clock 60-1201 | 2 | | | | Right and Left Side Instrument Panel |
| Digital Chronometer M880A | | | | | |
| Light, Utility, C-4A | 2 | | | | Right and Left Side Cockpit Aft |
| Aircraft Manufacturer's Data Plate BACN12MIVS | 1 | | | | Left Side Cockpit Below Floorline |
| Doppler Navigation System | | | | | |
| 1. RT-1193/ASN-128 | 1 | | | | About sta 106 at BL10.86 Bottom of Fuselage |

## 1-109 AIRCRAFT INVENTORY MASTER GUIDE (Continued) 1-109

| ITEM NOMENCLATURE | CH-47D | | | | LOCATION OR REMARKS |
|---|---|---|---|---|---|
| | H | J | K | L | |
| 2. CV-3338/ASN 128 | 1 | | | | Elect Comp. sta 120 2nd Shelf Down Right Side |
| 3. CP-1252/ASN 128 | 1 | | | | Upper Console, Center |
| Doppler Navigation System | | | | | |
| 1. RT-1193A/ASN-128B | 1 | | | | About sta 106 at BL 10.86 Bottom of Fuselage |
| 2. CV-3338A/ASN-128B | 1 | | | | Elect Comp. sta 120 2nd Shelf Down Right Side |
| 3. CP-1252C/ASN-128B | 1 | | | | Upper Console, Center |
| 4. GPS Antenna | 1 | | | | Tunnel Cover No. 2 |
| Fire Extinguisher FSN 4210-555-8837/$CF_3Br$ | 1 | | | | Aft Right Side of Copilot Seat on Floor |
| First Aid Kit, Aeronautic | 1 | | | | Upper Right Side Cockpit Entrance |
| Belt, Lap Safety, MD-2 Shoulder Harness G-1 | 2 | | | | Pilot and Copilot Seats |
| Cushions, Pilot and Copilot | | | | | |
| 1. Seat 114E4080-18 | 2 | | | | Pilot and Copilot Seats |
| 2. Back 114E4080-17 | 2 | | | | Pilot and Copilot Seats |
| Searchlight, Grimes | 2 | | | | Bottom of Fuselage, Right and Left Sides of the Centerline at about sta 67 |
| Spare Lamp Box | 1 | | | | Aft of Copilot Seat, at Left Side, on the Bulkhead |
| Map and Flight Record Holder 114E4032-20 | 1 | | | | Right Side of Cockpit Entrance |
| UHF Radio AN/ARC-164 | 1 | | | | Console |
| Directional Gyro CN-998( )/ASN-43 | 1 | | | | Electronic Compartment at about sta 120, Left Side, Second Shelf Down |
| Vertical Gyro CN-811( )/ASN or 9000F | 2 | | | | Electronic Compartment at about sta 120, Left Side, Second and Third Shelf Down |
| Attitude Gyro Relay | 1 | | | | Electronic Compartment at about sta 120, Left Side, Second Shelf Down |
| Radio Receiving Set AN/ARN-123 (VOR/ILS) | 1 | | | | Electronic Compartment at about sta 120, Left Side, Second Shelf Down |
| Direction Finder AN/ARN-89 Receiver R-1496/ARN-89 | 1 | | | | Electronic Compartment at about sta 120, Left Side, Third Shelf Down |
| VHF Radio Set AN/ARC-186 | 1 | | | | Console |
| Transponder Set AN/APX-100 (IFF) | 1 | | | | Console |
| Altimeter Set AN/APN-209 | 1 | | | | Pilot's and Copilot's Instrument Panels |
| Troop Commander Seat 114ESO11-3 | 1 | | | | Cockpit Entrance |
| Troop Commander Seat Cushion 114E4088 | 1 | | | | Cockpit Entrance |
| Troop Commander Belt, Safety | 1 | | | | Cockpit Entrance |
| Rescue Hoist Winch | | | | | |
| 1. Winch 114E6040-2 | 1 | | | | Right Side Closet Area at sta 120 |
| 2. Tackle Block 114E0658-23 | 2 | | | | Stored at sta 120, Right Side of Cabin Area |

| ITEM NOMENCLATURE | CH-47D | | | | LOCATION OR REMARKS |
|---|---|---|---|---|---|
| | H | J | K | L | |
| 3. Hook and Cable Assembly 114E6042-15 | 1 | | | | Stored at sta 120, Right Side of Cabin Area |
| 4. Rescue Block 114E6050-39, MA-1 | 1 | | | | Stored at sta 120, Right Side of Cabin Area |
| 5. Hoist Operators Harness | 1 | | | | Stored at sta 120, Right Side of Cabin Area |
| 6. Guard Assembly | 1 | | | | Stored at sta 120, Right Side of Cabin Area |
| 7. Cable Cutter Cartridge | 1 | | | | Loose Equipment |
| Heater | 1 | | | | Right Side Closet Area at sta 120 |
| SECTION B — CABIN AREA | | | | | |
| Door and Exit Locks (Set) | 1 | | | | Right Side of Cabin Area sta 140 |
| Troop Warning Signal (System) | 1 | | | | Left Side of Cabin Area sta 120 |
| Fire Extinguisher FSN 4210-555-8837/$CF_3Br$ | 1 | | | | Left Side of Cabin Area sta 120 |
| Antenna AS-2595/APN-194(V) | 2 | | | | Right and Left Side About sta 150, Bottom of Fuselage |
| AFCS Computer (2) | 2 | | | | Electronic Compartment Left Side, Third Shelf Down |
| Emergency Exit Light | 3 | | | | Right and Left Side Cabin sta 120 and Ramp Area sta 482 |
| Anchor Line Assembly 114E5139 | 1 | | | | Stowed at sta 170, Right Side |
| Interphone Control C-6533( )/ARC | 2 | | | | Overhead Cabin Area sta 170 |
| Foot Switches, Gunner | 2 | | | | sta 170 |
| VHF-UHF Antenna AT-1108( )/ARC | 1 | | | | Bottom Centerline of Fuselage sta 146 |
| Antenna AT-256( )/ARC | 1 | | | | Bottom Fuselage at sta 170 Left Side |
| Antenna ADF AS-2108/ARN-89 (Loop) 114E3082 (Sense) | 1 | | | | Bottom Centerline of Fuselage sta 180 |
| | 1 | | | | Top Fuselage at sta 296 Right Side |
| Antenna AS-1922( )/ARC | 1 | | | | Bottom Fuselage at sta 130 |
| Antenna AT-640/ARN, Marker Beacon | 1 | | | | Bottom Centerline of Fuselage sta 227 |
| Troop Seat (3 Man) | 10 | | | | Cabin Area |
| Troop Seat (1 Man) | 3 | | | | Cabin Area |
| Probe Pole, Cargo Hookup | 1 | | | | Right Side of Cabin Area sta 325 to 390, Stowed |
| Axe, Emergency, Escape 56D6221 | 1 | | | | sta 200 Right Side of Cabin Area Stowed |
| First Aid Kit, Aeronautic | 6 | | | | Cabin Ceiling |
| Belt, Troop Safety, Davis FDC-1650-27MI | 33 | | | | Cabin Area |
| Tiedown Fittings, Outboard 48B7796 (4 each side) (10,000 lb) | 8 | | | | Cabin Area Right and Left Side |
| Battery, 145E2089-1 | 1 | | | | Left Pod sta 190 |
| Winch Control Grip and Cord Assembly | 1 | | | | Stowed on Right Side of Cabin Area sta 330 |

| ITEM NOMENCLATURE | CH-47D | | | | LOCATION OR REMARKS |
|---|---|---|---|---|---|
| | H | J | K | L | |
| Blade Anchor, 114E5060 | 6 | | | | Loose Equipment |
| Crank Assy, Emergency, Ramp and Rescue Hatch | 1 | | | | Stowed at sta 340 on Left Side |
| Cover, Oil Cooler Inlet, 145G0001-1 | 1 | | | | Loose Equipment |
| Cover, Engine Air Outlet, 14G1323-1 | 2 | | | | Loose Equipment |
| Cover, Oil Cooler Exhaust, 145G0002-5 | 1 | | | | Loose Equipment |
| Cover, Pitot Tube, 114E5040-33 | 2 | | | | Loose Equipment |
| Cover, Oil Cooler Exhaust, 145G0002-6 | 1 | | | | Loose Equipment |
| Cover, Cockpit Enclosure, 145G0006-1 | 1 | | | | Loose Equipment |
| Cover, Hydraulic Cool, Exhaust, 145G0004-1 | 1 | | | | Loose Equipment |
| Cover, Rotor Hub, Fwd and Aft, 114G1023-25 | 2 | | | | Loose Equipment |
| Cover, Heater, 114G1024-1 | 1 | | | | Loose Equipment |
| Cover, APU Exhaust, 145G0005-1 | 1 | | | | Loose Equipment |
| Cover, Heater, Exhaust, 114G1025-1 | 1 | | | | Loose Equipment |
| Cover, AW Inlet, 14560003-1 | 1 | | | | Loose Equipment |
| Cover, Engine Inlet (T55-L-712) | 2 | | | | Loose Equipment |
| 219G1001-1 (W/Screens) | | | | | |
| 114E1206-1 (W/O Screens) | | | | | |
| Droop Stop Shroud, 114R2215-1 | 3 | | | | Loose Equipment |
| Droop Stop Base, 114R2215-4 | 3 | | | | Loose Equipment |
| Droop Stop Shield, 114R2215-11 | 3 | | | | Loose Equipment |
| Ramp Extension | | | | | |
| 1560CH-47-4000-1 (3 ea) | 2 | | | | Loose Equipment |
| 1560CH-47-398-1 | 1 | | | | Loose Equipment |
| Tiedown Chains MB-1 | 8 | | | | Loose Equipment |
| Tiedown Straps CGU1/B | 32 | | | | Loose Equipment |
| Signal Data Converter | | | | | Electronic Compartment sta 120, Left Side, at about Second Shelf Down |
| Air Data Transducer | | | | | Electronic Compartment sta 120, Left Side, at about Third Shelf Down |
| Inclinometer | | | | | Electronic Compartment sta 120, Left Side, at about Second Shelf Down |
| Converter Control | | | | | On Canted Console |
| SECTION C — RAMP AREA | | | | | |
| Fire Extinguisher, FSN 4210-55-8837/$CF_3Br$ | 1 | | | | Left Side sta 490 on Frame Aft |
| Static Ground Wire | | | | | Bottom of Left Aft Landing Gear |
| Interphone Control C-6533( )/ARC | | | | | Ramp Area Left Side sta 488 |

| ITEM NOMENCLATURE | CH-47D | | | | LOCATION OR REMARKS |
|---|---|---|---|---|---|
| | H | J | K | L | |
| Transmitter Remote Compass with Compensator CN-405( )/ASN | 1 | | | | Romp Area Left Side sta 575 |
| Troop Warning Signal | | | | | Left Side of Bulkhead sta 535 |
| SECTION D — ENGINE AND AFT PYLON | | | | | |
| Fire Extinguisher System Bottles 114PS203-3 | 2 | | | | Overhead sta 482 and 502 |
| HF Radio Set Control C12436/URC | | | | | Console |
| HF Radio Receiver-Transmitter, RT-1749/URC | 1 | | | | Electronic Compartment at about sta 120, Left Side, Sixth Shelf Down |
| HF Power Amplifier-Coupler, AM-7531/URC | 1 | | | | Electronic Compartment at about sta 120, Left Side, First Shelf Down |
| TSEC-KY-100 Processor | | | | | Electronic Compartment at about sta 120, Left Side, Under Fifth Shelf Down |
| TSEC-KY-100 Control | 1 | | | | Console |

END OF TASK

By Order of the Secretary of the Army:

Official:

**ERIC K. SHINSEKI**
*General, United States Army*
*Chief of Staff*

**JOEL B. HUDSON**
*Administrative Assistant to the*
*Secretary of the Army*
0220705

DISTRIBUTION:
To be distributed in accordance w ith Initial Distribution Number (IDN) 311199, requirements for TM 55-1520-240-23-1.

## *These are the instructions for sending an electronic 2028*

The following format must be used if submitting an electronic 2028. The subject line must be exactly the same and all fields must be included; however only the following fields are mandatory: 1, 3, 4, 5, 6, 7, 8, 9, 10, 13, 15, 16, 17, and 27.

From: "Whomever" <whomever@wherever.army.mil>
To: 2028@redstone.army.mil

Subject: DA Form 2028

1. ***From:*** Joe Smith
2. *Unit:* home
3. ***Address:*** 4300 Park
4. ***City:*** Hometown
5. ***St:*** MO
6. ***Zip:*** 77777
7. ***Date Sent:*** 19−OCT−93
8. ***Pub no:*** 55−2840−229−23
9. ***Pub Title:*** TM
10. ***Publication Date:*** 04−JUL−85
11. *Change Number:* 7
12. *Submitter Rank:* MSG
13. ***Submitter FName:*** Joe
14. *Submitter MName:* T
15. ***Submitter LName:*** Smith
16. ***Submitter Phone:*** 123−123−1234
17. ***Problem:*** **1**
18. *Page:* 2
19. *Paragraph:* 3
20. *Line:* 4
21. *NSN:* 5
22. *Reference:* 6
23. *Figure:* 7
24. *Table:* 8
25. *Item:* 9
26. *Total:* 123
27. ***Text:***

This is the text for the problem below line 27.

| RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS<br>For use of this form, see AR 25–30; the proponent agency is ODISC4. | Use Part II (*reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/ Supply Manuals (SC/SM) | DATE<br>8/30/02 |
|---|---|---|
| TO: (*Forward to proponent of publication or form)(Include ZIP Code)*<br>Commander, U.S. Army Aviation and Missile Command<br>ATTN: AMSAM–MMC–MA–NP<br>Redstone Arsenal, AL 35898 | FROM: (*Activity and location)(Include ZIP Code)*<br>MSG, Jane Q. Doe<br>1234 Any Street<br>Nowhere Town, AL 34565 | |

**PART 1 – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS**

| PUBLICATION/FORM NUMBER | DATE | TITLE |
|---|---|---|
| TM 9–1005–433–24 | 16 Sep 2002 | Organizational, Direct Support, And General Support Maintenance Manual for Machine Gun, .50 Caliber M3P and M3P Machine Gun Electrical Test Set Used On Avenger Air Defense Weapon System |

| ITEM NO. | PAGE NO. | PARA–GRAPH | LINE NO. * | FIGURE NO. | TABLE NO. | RECOMMENDED CHANGES AND REASON |
|---|---|---|---|---|---|---|
| 1 | WP0005 PG 3 | | 2 | | | Test or Corrective Action column should identify a different WP number. |



** Reference to line numbers within the paragraph or subparagraph.*

| TYPED NAME, GRADE OR TITLE | TELEPHONE EXCHANGE/ AUTOVON, PLUS EXTENSION | SIGNATURE |
|---|---|---|
| MSG, Jane Q. Doe, SFC | 788–1234 | |

| **TO:** (*Forward direct to addressee listed in publication)* | **FROM:** (*Activity and location) (Include ZIP Code)* | **DATE** |
|---|---|---|
| Commander, U.S. Army Aviation and Missile Command<br>ATTN: AMSAM–MMC–MA–NP<br>Redstone Arsenal, AL 35898 | MSG, Jane Q. Doe<br>1234 Any Street<br>Nowhere Town, AL 34565 | 8/30/02 |

**PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS**

| PUBLICATION NUMBER | DATE | TITLE |
|---|---|---|
| | | |

| PAGE NO. | COLM NO. | LINE NO. | NATIONAL STOCK NUMBER | REFERENCE NO. | FIGURE NO. | ITEM NO. | TOTAL NO. OF MAJOR ITEMS SUPPORTED | RECOMMENDED ACTION |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |

**PART III – REMARKS** (*Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*



| TYPED NAME, GRADE OR TITLE | TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION | SIGNATURE |
|---|---|---|
| MSG, Jane Q. Doe, SFC | 788–1234 | |

| **RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS**<br>For use of this form, see AR 25–30; the proponent agency is ODISC4. | Use Part II (*reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/ Supply Manuals (SC/SM) | DATE |
|---|---|---|
| TO: (*Forward to proponent of publication or form)(Include ZIP Code)*<br>Commander, U.S. Army Aviation and Missile Command<br>ATTN: AMSAM-MMC-MA-NP<br>Redstone Arsenal, AL 35898 | FROM: (*Activity and location)(Include ZIP Code)* | |

**PART 1 – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS**

| PUBLICATION/FORM NUMBER | DATE | TITLE |
|---|---|---|
| | | |

| ITEM NO. | PAGE NO. | PARA–GRAPH | LINE NO. * | FIGURE NO. | TABLE NO. | RECOMMENDED CHANGES AND REASON |
|---|---|---|---|---|---|---|
| | | | | | | |

** Reference to line numbers within the paragraph or subparagraph.*

| TYPED NAME, GRADE OR TITLE | TELEPHONE EXCHANGE/ AUTOVON, PLUS EXTENSION | SIGNATURE |
|---|---|---|
| | | |

| **TO:** (*Forward direct to addressee listed in publication)*<br>Commander, U.S. Army Aviation and Missile Command<br>ATTN: AMSAM-MMC-MA-NP<br>Redstone Arsenal, AL 35898 | **FROM:** (*Activity and location) (Include ZIP Code)* | **DATE** |
|---|---|---|

**PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS**

| PUBLICATION NUMBER | DATE | TITLE |
|---|---|---|
| | | |

| PAGE NO. | COLM NO. | LINE NO. | NATIONAL STOCK NUMBER | REFERENCE NO. | FIGURE NO. | ITEM NO. | TOTAL NO. OF MAJOR ITEMS SUPPORTED | RECOMMENDED ACTION |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |

**PART III – REMARKS** (*Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

| TYPED NAME, GRADE OR TITLE | TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION | SIGNATURE |
|---|---|---|
| | | |

# The Metric System and Equivalents

### *Linear Measure*

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

### *Weights*

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 decagram = 10 grams = .35 ounce
1 hectogram = 10 decagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

### *Liquid Measure*

1 centiliter = 10 milliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

### *Square Measure*

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

### *Cubic Measure*

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

# Approximate Conversion Factors

| *To change* | *To* | *Multiply by* | *To change* | *To* | *Multiply by* |
|---|---|---|---|---|---|
| inches | centimeters | 2.540 | ounce-inches | Newton-meters | .007062 |
| feet | meters | .305 | centimeters | inches | .394 |
| yards | meters | .914 | meters | feet | 3.280 |
| miles | kilometers | 1.609 | meters | yards | 1.094 |
| square inches | square centimeters | 6.451 | kilometers | miles | .621 |
| square feet | square meters | .093 | square centimeters | square inches | .155 |
| square yards | square meters | .836 | square meters | square feet | 10.764 |
| square miles | square kilometers | 2.590 | square meters | square yards | 1.196 |
| acres | square hectometers | .405 | square kilometers | square miles | .386 |
| cubic feet | cubic meters | .028 | square hectometers | acres | 2.471 |
| cubic yards | cubic meters | .765 | cubic meters | cubic feet | 35.315 |
| fluid ounces | milliliters | 29,573 | cubic meters | cubic yards | 1.308 |
| pints | liters | .473 | milliliters | fluid ounces | .034 |
| quarts | liters | .946 | liters | pints | 2.113 |
| gallons | liters | 3.785 | liters | quarts | 1.057 |
| ounces | grams | 28.349 | liters | gallons | .264 |
| pounds | kilograms | .454 | grams | ounces | .035 |
| short tons | metric tons | .907 | kilograms | pounds | 2.205 |
| pound-feet | Newton-meters | 1.356 | metric tons | short tons | 1.102 |
| pound-inches | Newton-meters | .11296 | | | |

# Temperature (Exact)

| | | | | |
|---|---|---|---|---|
| °F | Fahrenheit temperature | 5/9 (after subtracting 32) | Celsius temperature | °C |

PIN:  053346-000