

## **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.

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## 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 ( $\text{CF}_3\text{Br}$ ) is highly volatile but is not easily detected by smell. It is not toxic, but reduces oxygen available for proper breathing.

If liquid  $\text{CF}_3\text{Br}$  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.



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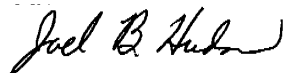
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A/(B blank)  
i and ii  
1-1 and 1-2  
1-5 through 1-8  
1-17 and 1-18  
1-37 and 1-38  
1-43 through 1-46  
1-55 and 1-56  
1-59 and 1-60  
1-85 through 1-90  
1-103 and 1-104  
1-135 and 1-136  
1-159 and 1-160  
1-163 and 1-164  
1-189 through 1-192  
1-201 and 1-202  
1-207 and 1-208  
-----  
1-209 and 1-210  
1-225 through 1-238  
1-241 through 1-246  
1-267 through 1-272  
1-275 and 1-276  
1-317 and 1-318  
-----  
1-331 and 1-332  
1-341 through 1-350  
-----  
1-355 and 1-356  
1-379 and 1-380

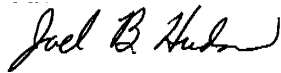
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A and B  
i and ii  
1-1 and 1-2  
1-5 through 1-8  
1-17 and 1-18  
1-37 and 1-38  
1-43 through 1-46  
1-55 and 1-56  
1-59 and 1-60  
1-85 through 1-90  
1-103 and 1-104  
1-135 and 1-136  
1-159 and 1-160  
1-163 and 1-164  
1-189 through 1-192  
1-201 and 1-202  
1-207 and 1-208  
1-208.1 and 1-208.2  
1-209 and 1-210  
1-225 through 1-238  
1-241 through 1-246  
1-267 through 1-272  
1-275 and 1-276  
1-317 and 1-318  
1-318.1 and 1-318.2  
1-331 and 1-332  
1-341 through 1-350  
1-350.1 and 1-350.2  
1-355 and 1-356  
1-379 and 1-380

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## CH-47D HELICOPTER

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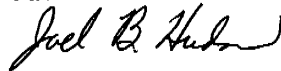
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A/(B blank)  
1-43 and 1-44  
1-55 through 1-57/(1-58 blank)  
1-315 and 1-316  
1-323 and 1-324  
1-343 and 1-344

**Insert pages**

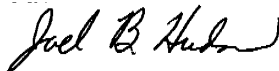
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1-43 and 1-44  
1-55 through 1-57/(1-58 blank)  
1-315 and 1-316  
1-323 and 1-324  
1-343 and 1-344

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Original	19 September 2002	Change 3	30 September 2003
Change 1	4 November 2002	Change 4	20 February 2004
Change 2	1 April 2003		

Page No.	*Change No.	Page No.	*Change No.
Title .....	0	1-105 through 1-134 ....	0
a through g .....	0	1-135 and 1-136 .....	3
h blank .....	0	1-137 through 1-158 ....	0
A and B .....	4	1-159 .....	3
i and ii .....	3	1-160 through 1-163 ....	0
iii through vii .....	0	1-164 .....	3
1-1 .....	3	1-165 through 1-185 ....	0
1-2 through 1-5 .....	0	1-186 blank .....	0
1-6 .....	3	1-187 through 1-189 ....	0
1-7 .....	0	1-190 .....	3
1-8 .....	3	1-191 .....	0
1-9 .....	0	1-192 .....	3
1-10 blank .....	0	1-193 through 1-200 ....	0
1-11 through 1-16 .....	0	1-201 .....	3
1-17 .....	3	1-202 .....	0
1-18 through 1-29 .....	0	1-203 through 1-206 ....	0
1-30 blank .....	0	1-207 and 1-208 .....	3
1-31 through 1-36 .....	0	1-208.1 added .....	3
1-37 .....	3	1-208.2 added .....	3
1-38 .....	0	1-209 .....	0
1-39 through 1-42 .....	0	1-210 .....	3
1-43 .....	1	1-211 through 1-225 ....	0
1-44 through 1-46 .....	3	1-226 and 1-227 .....	3
1-47 through 1-54 .....	0	1-228 and 1-229 .....	0
1-55 .....	1	1-230 .....	3
1-56 .....	3	1-231 .....	0
1-57 .....	1	1-232 .....	3
1-58 blank .....	0	1-233 .....	0
1-59 .....	0	1-234 .....	3
1-60 .....	3	1-235 .....	0
1-61 through 1-85 .....	0	1-236 through 1-238 ....	3
1-86 through 1-90 .....	3	1-239 and 1-240 .....	0
1-91 .....	0	1-241 through 1-243 ....	3
1-92 through 1-102 .....	0	1-244 .....	0
1-103 and 1-104 .....	3	1-245 .....	3

\*Zero in this column indicates an original page.

## List of Effective Pages, continued

Page No.	*Change No.	Page No.	*Change No.
1-246 through 1-267	.... 0	1-331	..... 3
1-268	..... 3	1-332 through 1-341	.... 0
1-269	..... 0	1-342 1and 3-143	..... 3
1-270 through 1-272	.... 3	1-344	..... 4
1-273 and 1-274	..... 0	1-345 through 1-350	.... 3
1-275 and 1-276	..... 3	1-350.1 added	..... 3
1-277 through 1-315	.... 0	1-350.2 added	..... 3
1-316	..... 1	1-355	..... 0
1-317 and 1-318	..... 3	1-356	..... 3
1-318.1 added	..... 3	1-357 through 1-378	.... 0
1-318.2 added	..... 3	1-379	..... 3
1-319 through 1-322	.... 0	1-380 through 1-396	.... 0
1-323 and 1-324	..... 1		
1-325 and 1-326	..... 0		
1-327 through 1-330	.... 2		

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# 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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## TABLE OF CONTENTS

		PAGE NO.
VOLUME	I	
	HOW TO USE THIS MANUAL .....	v
CHAPTER	1 INTRODUCTION AND HELICOPTER GENERAL .....	1-1
Section	I General Information .....	1-1
Section	II Equipment Description and Data .....	1-7
Section	III Maintenance Data .....	1-11
Section	IV Tools and Materials .....	1-31
Section	V Ground Handling .....	1-59
Section	VI Servicing and Lubrication .....	1-187
Section	VII Overhaul and Retirement Schedule .....	1-325
Section	VIII Special Inspection/Maintenance Actions .....	1-337
Section	IX Storage of Aircraft .....	1-359
INDEX	See Volume XI	
VOLUME	II	
CHAPTER	2 AIRFRAME .....	2-1
Section	I General Structural Repair Description and Operation .....	2-1
Section	II General Structural Repairs .....	2-7
Section	III Fuselage .....	2-187
Section	IV Pylon .....	2-953
Section	V General Repair Information Using Adhesives .....	2-1103
Section	VI General Information for Miscellaneous Data .....	2-1145
Section	VII Corrosion Prevention and Control Description and Operation .....	2-1261
INDEX	See Volume XI	

\*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.



VOLUME	III		
CHAPTER	3	ALIGHTING GEAR . . . . .	3-1
Section	I	Landing Gear Description and Operation . . . . .	3-1
Section	II	Landing Gear . . . . .	3-7
Section	III	Brake Description and Operation . . . . .	3-189
Section	IV	Brakes . . . . .	3-193
CHAPTER	4	POWERPLANT . . . . .	4-1
Section	I	Powerplant Description and Operation . . . . .	4-1
Section	II	Powerplant . . . . .	4-11
Section	III	Cooling System . . . . .	4-245
Section	IV	Air Induction System . . . . .	4-275
Section	V	Exhaust System . . . . .	4-341
Section	VI	Oil System . . . . .	4-347
Section	VII	Ignition System . . . . .	4-365
Section	VIII	Power Controls . . . . .	4-371
Section	IX	Engine Compressor Cleaning and Preservation System (With T55-GA-714A ENGINE) . . . . .	4-463
Section	X	FADEC Control System (With T55-GA-714A ENGINE) . . . . .	4-485
INDEX		See Volume XI	
VOLUME	IV		
CHAPTER	5	ROTOR SYSTEM . . . . .	5-1
Section	I	Rotary-Wing Head and Controls Description and Operation . . . . .	5-1
Section	II	Rotary-Wing Head and Controls . . . . .	5-7
Section	III	Rotary-Wing Blades Description and Operation . . . . .	5-269
Section	IV	Rotary-Wing Blades . . . . .	5-273
Section	V	Main Rotor Controls . . . . .	5-565
Section	VI	Deleted (Refer to TM 1-6625-724-13&P for Tracking and Balancing Procedures.)	
INDEX		See Volume XI	
VOLUME	V		
CHAPTER	6	DRIVE SYSTEM . . . . .	6-1
Section	I	Drive System Description and Operation . . . . .	6-1
Section	II	Drive Shafting . . . . .	6-11
Section	III	Forward Rotary-Wing Drive Transmission . . . . .	6-107
Section	IV	Aft Rotary-Wing Drive Shaft . . . . .	6-203
Section	V	Engine Combining Transmission . . . . .	6-247
Section	VI	Aft Rotary-Wing Drive Transmission . . . . .	6-301
Section	VII	Engine Transmission . . . . .	6-375
Section	VIII	Oil Systems . . . . .	6-427
INDEX		See Volume XI	
VOLUME	VI		
CHAPTER	7	HYDRAULIC SYSTEM . . . . .	7-1
Section	I	Flight Control Hydraulic System Description and Theory of Operation . . . . .	7-1
Section	II	Flight Control Hydraulic System . . . . .	7-13
Section	III	Utility Hydraulic System Description and Theory of Operation . . . . .	7-607
Section	IV	Utility Hydraulic System . . . . .	7-625
INDEX		See Volume XI	
VOLUME	VII		
CHAPTER	8	INSTRUMENTS . . . . .	8-1
Section	I	Engine Instruments Description and Operation . . . . .	8-1
Section	II	Engine Instruments . . . . .	8-15

		PAGE NO.
Section	III Flight Instruments Description and Operation . . . . .	8-73
Section	IV Flight Instruments . . . . .	8-79
Section	V Miscellaneous Instruments Description and Operation . . . . .	8-155
Section	VI Miscellaneous Instruments . . . . .	8-165
CHAPTER	9 ELECTRICAL SYSTEMS . . . . .	9-1
Section	I Direct Current (DC) Power Distribution System Description and Theory of Operation . . . . .	9-1
Section	II Direct Current (DC) Power Distribution System . . . . .	9-17
Section	III Alternating Current (AC) Power Distribution System Description and Theory of Operation . . . . .	9-83
Section	IV Alternating Current (AC) Power Distribution System . . . . .	9-99
Section	V Lighting Systems Description and Operation . . . . .	9-167
Section	VI Lighting Systems . . . . .	9-217
Section	VII Miscellaneous Equipment Description and Operation . . . . .	9-489
Section	VIII Miscellaneous Equipment . . . . .	9-497
INDEX	See Volume XI	
VOLUME	VIII	
CHAPTER	10 FUEL SYSTEM . . . . .	10-1
Section	I Fuel System Description and Theory of Operation . . . . .	10-1
Section	II Fuel Tanks . . . . .	10-23
Section	III Fuel Systems . . . . .	10-159
INDEX	See Volume XI	
VOLUME	IX	
CHAPTER	11 FLIGHT CONTROLS SYSTEM . . . . .	11-1
Section	I Flight Controls System Description and Operation . . . . .	11-1
Section	II Flight Controls . . . . .	11-7
Section	III Cockpit Controls . . . . .	11-275
Section	IV Closet Controls . . . . .	11-461
Section	V Mixing Controls . . . . .	11-729
Section	VI Upper Controls . . . . .	11-787
Section	VII Tunnel Controls . . . . .	11-911
Section	VIII Aft Fuselage and Pylon Controls . . . . .	11-949
Section	IX Advanced Flight Control System Description and Operation . . . . .	11-1011
Section	X Advanced Flight Control System . . . . .	11-1019
INDEX	See Volume XI	
VOLUME	X	
CHAPTER	12 UTILITY SYSTEMS . . . . .	12-1
Section	I Windshield and Anti-Icing System Description and Theory of Operation . . . . .	12-1
Section	II Windshield Anti-Icing System . . . . .	12-5
Section	III Fire Detection and Extinguishing Systems Description and Theory of Operation . . . . .	12-19
Section	IV Fire Detection and Extinguishing Systems . . . . .	12-25
Section	V Windshield Wiper System Description and Operation . . . . .	12-81
Section	VI Windshield Wiper System . . . . .	12-83
CHAPTER	13 ENVIRONMENTAL CONTROLS . . . . .	13-1
Section	I Environmental System Description and Theory of Operation . . . . .	13-1
Section	II Environmental System . . . . .	13-9
CHAPTER	14 HOISTS AND WINCHES . . . . .	14-1
Section	I Cargo Handling System Description and Theory of Operation . . . . .	14-1
Section	II Cargo Handling System . . . . .	14-7

		PAGE NO.
CHAPTER	15 AUXILIARY POWER UNIT . . . . .	15-1
Section	I Auxiliary Power Unit Description and Sequence of Operation . . . . .	15-1
Section	II Auxiliary Power Unit . . . . .	15-5
CHAPTER	16 MISSION EQUIPMENT . . . . .	16-1
Section	I Cargo Carrying Hook System Description and Theory of Operation . . . . .	16-1
Section	II Cargo Carrying Hook System . . . . .	16-9
Section	III Paratroop and Cargo Drop Equipment Description and Operation . .	16-211
Section	IV Paratroop and Cargo Drop Equipment . . . . .	16-213
Section	V Flare Dispenser System Description and Theory of Operation . . . . .	16-225
Section	VI Flare Dispenser System . . . . .	16-229
Section	VII Litter Provisions Description and Operation . . . . .	16-251
Section	VIII Litter Provisions . . . . .	16-253
Section	IX Seat Armor Provisions Description . . . . .	16-263
Section	X Seat Armor Provisions . . . . .	16-265
Section	XI Ski Provisions Description . . . . .	16-305
Section	XII Ski Provisions . . . . .	16-307
Section	XIII Head Up Display Description and Operation . . . . .	16-327
Section	XIV Head Up Display . . . . .	16-333
Section	XV Extended Range Fuel System (ERFS II) Description and Operation . . . . .	16-345
Section	XVI Extended Range Fuel System (ERFS II) . . . . .	16-347
Section	XVII Engine Air Particle Separator System (EAPS) Provisions Description and Operations . . . . .	16-353
INDEX	See Volume XI	
VOLUME	XI	
CHAPTER	17 EMERGENCY EQUIPMENT . . . . .	17-1
Section	I Emergency Equipment Description and Operation . . . . .	17-1
Section	II Emergency Equipment . . . . .	17-5
APPENDIX	A References . . . . .	A-1
APPENDIX	B Maintenance Allocation Chart . . . . .	B-1
APPENDIX	C Aircraft Inventory . . . . .	C-1
APPENDIX	D Expendable Supplies and Materials . . . . .	D-1
APPENDIX	E Illustrated Field of Manufactured Items List . . . . .	E-1
APPENDIX	F Wiring Diagrams . . . . .	F-1
APPENDIX	G Weight and Balance . . . . .	G-1
APPENDIX	H Storage of Aircraft . . . . .	H-1
APPENDIX	J Torque Limits . . . . .	J-1
APPENDIX	K Marking Information . . . . .	K-1
GLOSSARY		Glossary-1
INDEX		Index-1

## 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**

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

				EFFECTIVITY
CODE	ECP/MWO NO.	TITLE	PRODUCTION (Serial Number)	RETROFIT
<b>28</b>	ECP D126C1	Accumulator APU/Flight Control Modules	86-1635 and on	Attrition
<b>29</b>	ECP D085C1	Reduced Length Servo-Cylinder Safety Blocks	GSE	MWO 55-1520-240-50-16
<b>30</b>	ECP 712R7	Portable Calculator and Hardware for Vibrex	OBSOLETE	-----
<b>31</b>	ECP D108	Aft Transmission Torque Reactor Improvement	GSE	MWO 55-1730-240-50-1
<b>32</b>	ECP D111	Deletion of KY-28 Secure Voice Control Panel	87-0069 and on	AMCOM MSG.
<b>33</b>	ECP D133	Install New UH60/CH-47D Common APU in CH-47D	86-1650 and on	MWO 55-1520-240-50-21
<b>34</b>	ECP D122	Change Droop Stop Shroud from Installed to Flyaway Equipment	85-24361 and on	N/A
<b>35</b>	ECP D016R1	Single Handle Cargo Hook Release	88-0079 and on	MWO 55-1520-240-50-15
<b>36</b>	ECP D113	Hook Release Button Ring Guard on Cyclic Grip	88-0085 and on	MWO 55-1520-240-50-23
<b>37</b>	ECP D115	Transmission and Engine Chip Burnoff System	89-0139 and on	MWO 55-1520-240-50-24
<b>38</b>	ECP D154R1 (Phase 1)	Installation of Stainless Steel Flight Control Connecting Links	88-0091 and on	MWO 55-1520-240-50-39
<b>39</b>	ECP D069R4	Ramp Extension/Center Skid Pad Modification for Compatibility With HICHS	90-0180 and on	Attrition
<b>40</b>	ECP D121R2	Fine Mesh Inlet Screen	88-0095 and on	Retrofit
<b>41</b>	ECP D105R1	Shotpeen Horizontal Hinge Pins	88-0107 and on	MWO 55-1520-240-55-6
<b>42</b>	ECP D135	Improved Rotor Blade Grounding Strap	88-0103 and on	MWO 55-1520-240-50-32
<b>43</b>	ECP D089	Delete Engine Anti-Ice System	87-0077 and on	MWO 1-1520-240-50-22
<b>44</b>	ECP D101	Engine Oil Pressure Transmitter Vib. Isolation Mounts	90-0180 and on	MWO 55-1520-240-50-17
<b>45</b>	ECP D092R1 (Phase 1)	Elastomeric Lag Damper and Pitch Link Bearings	90-0180 and on	-----
<b>46</b>	ECP D114C2	Drive Scissors Positive Locking Bolts	90-0180 and on	MWO 1-1520-240-50-51
<b>47</b>	ECP D095R1	Airframe Structural Improvements	90-0180 and on	Attrition
<b>48</b>	ECP D173	Combining Transmission Sync Shaft Shielding Baffle	88-0099 and on	MWO 55-1520-240-50-45
<b>49</b>	ECP D131R1	Transmission Drip Pan Material Change	90-0214 and on	Attrition
<b>50</b>	ECP D145R1C1	Bolt/Bushing Assembly Improvements	90-0180 and on	MWO 1-1520-240-50-37
<b>51</b>	ECP D157R1	One Piece Engine Drive Shaft	90-0180 and on	MWO 55-1520-240-50-43
<b>52</b>	ECP D190R1	Improved Clamshell Door Latch	92-0282 and on	MWO 1-1520-240-50-62
<b>53</b>	ECP D164	Incorporation of Dome Light Positive Locking Lever Switch	91-0252 and on	MWO 55-1520-240-50-50
<b>54</b>	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
<b>55</b>	ECP D185R1	Separate Fuel Control Relay Box Ground Connections	90-0202 and on	MWO 1-1520-240-50-58
<b>56</b>	ECP D183	Helicopter Internal Cargo Handling System (HICHS) Ramp Centerline Attachment	81-23381 thru 91-0277	MWO 1-1520-240-50-59
<b>57</b>	ECP D175	Engine Aft Mount Adjustable Link	81-23381 thru 92-0302	MWO 1-1520-240-50-60
<b>58</b>	ECP D145R2	Improved Bolt/Bushing Connection	N/A	MWO 1-1520-240-50-69
<b>59</b>	ECP D198A1	Polyurethane Paint for CH-47D Aircraft	—	Attrition
<b>60</b>	ECP A098	Heads Up Display System (HUD) AN/AVS-7	81-23381 thru 91-0271	MWO 1-1520-240-50-56
<b>61</b>	ECP A0027	Global Positioning System (GPS) AN/ASN-149(V)1	81-23381 thru 92-0302	MWO 1-1520-240-50-68
<b>62</b>	ECP AEEMH-03009	Altitude Voice Warning System Radar Altimeter, AN/APN-209(V)	81-23381 thru 93-0934	MWO 1-1520-240-50-61
<b>63</b>	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
<b>64</b>	ECP D194R1	Stainless Steel Bellcranks in Combining Transmission Area	81-23381 and on	MWO 1-1520-240-50-65
<b>65</b>	ECP D168R1	Cockpit Remote Emergency Ramp Extension System	81-23381 thru 92-0309	MWO 1-1520-240-50-48
<b>66</b>	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
<b>67</b>	ECP D214R1	Aft Position Lights Switch	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-75
<b>68</b>	ECP D216	Pressure Refueling Vacuum Relief Valve	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-81
<b>69</b>	ECP D215	NVG Bezel	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-71
<b>70</b>	ECP D210R1	Easily Replaceable Cabin Escape Hatch	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-76
<b>71</b>	ECP END H030015	Installation of AN/ASN-128B Doppler GPS Navigation System	76-18479 and on	MWO 1-1520-240-50-73
<b>72</b>	ECP D209	Installation of Radar Altimeter in Center Hook Compartment	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-72
<b>73</b>	EJCH007016	ARC-220/KY-100	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-74
<b>74</b>	ECP D218	714/FADEC	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-83
<b>75</b>	ECP D219	Pylon Clamshell Door Latch	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-80
<b>76</b>	ECP D220 (Pending)	Pylon Platform Latch	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-77
<b>77</b>	ECP D221 (Pending)	Improved Engine Cross Shaft Adapters	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-XX
<b>78</b>	ECP D223	Cargo Hatch Handhold	76-18479 and 81-23381 thru 93-00934	MWO 1-1520-240-50-79
<b>79</b>	ECP D225 (Pending)	Cad Bolts	76-18479 and 81-23381 thru 93-00934	Attrition

## EFFECTIVITY

CODE	ECP/MWO NO.	TITLE	PRODUCTION (Serial Number)	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.

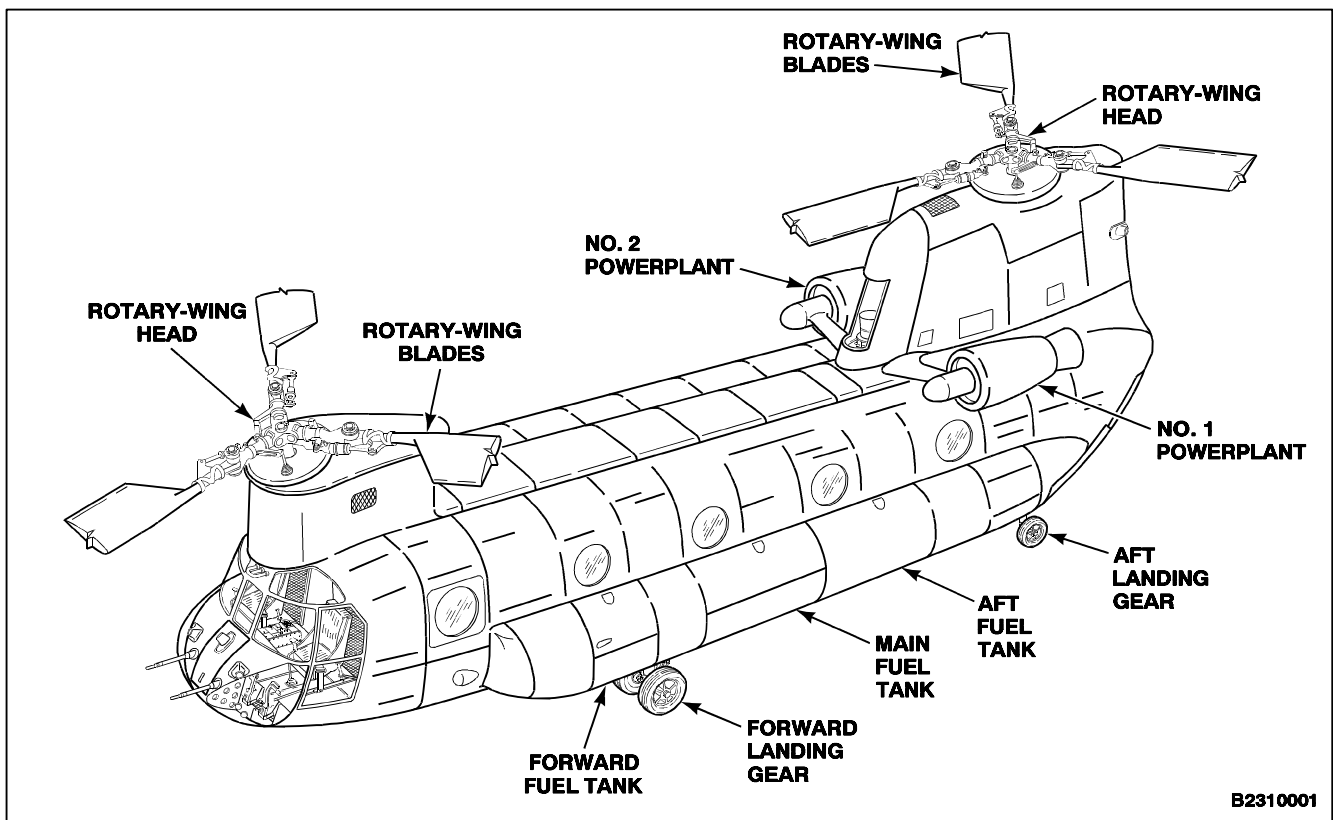
Torque from engines is transmitted to rotary-wing blades through a series of mechanical transmissions. These transmissions are interconnected by a system of synchronizing drive shafts.

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  $360^{\circ}$ . 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.

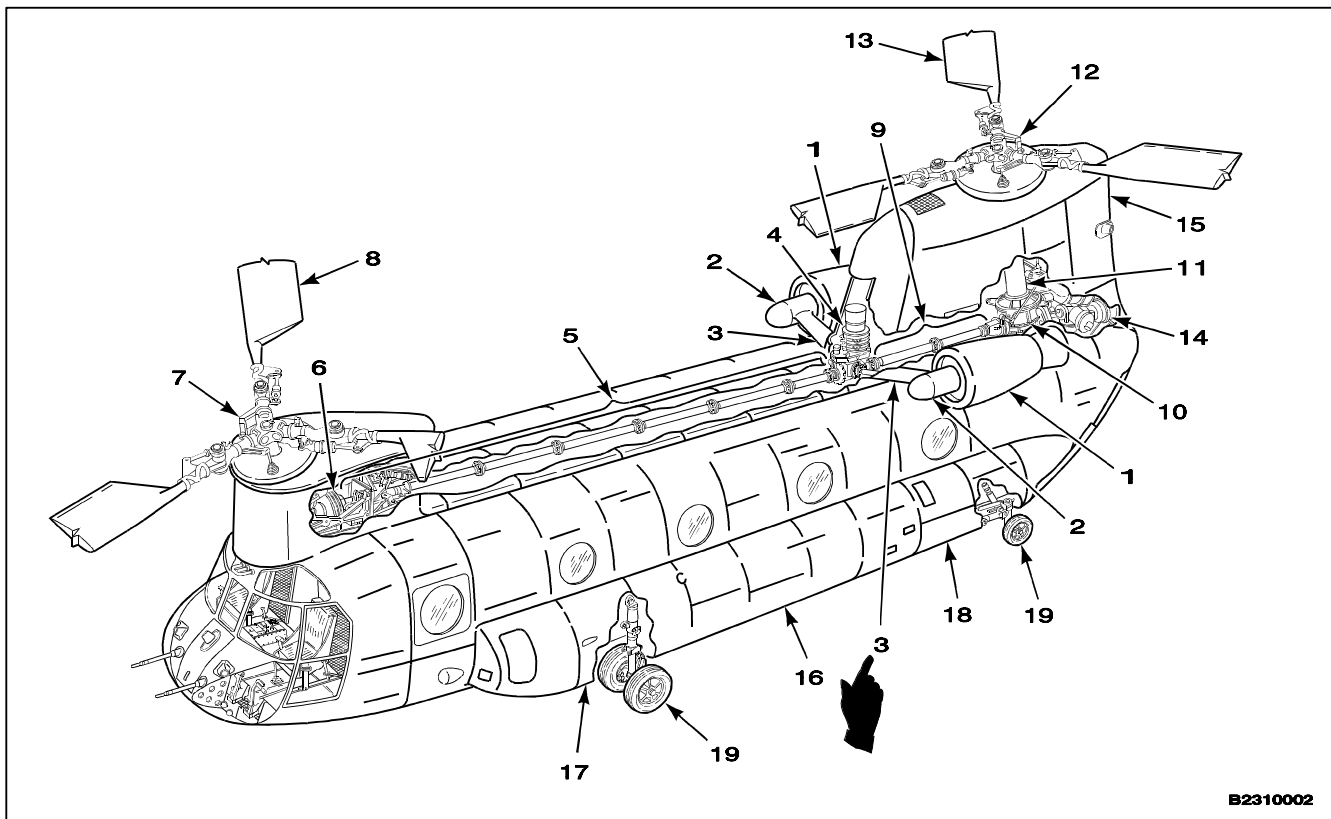
An auxiliary power unit mounted above the cargo ramp area in the aft pylon permits operation of all helicopter systems without the use of a ground power source.

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

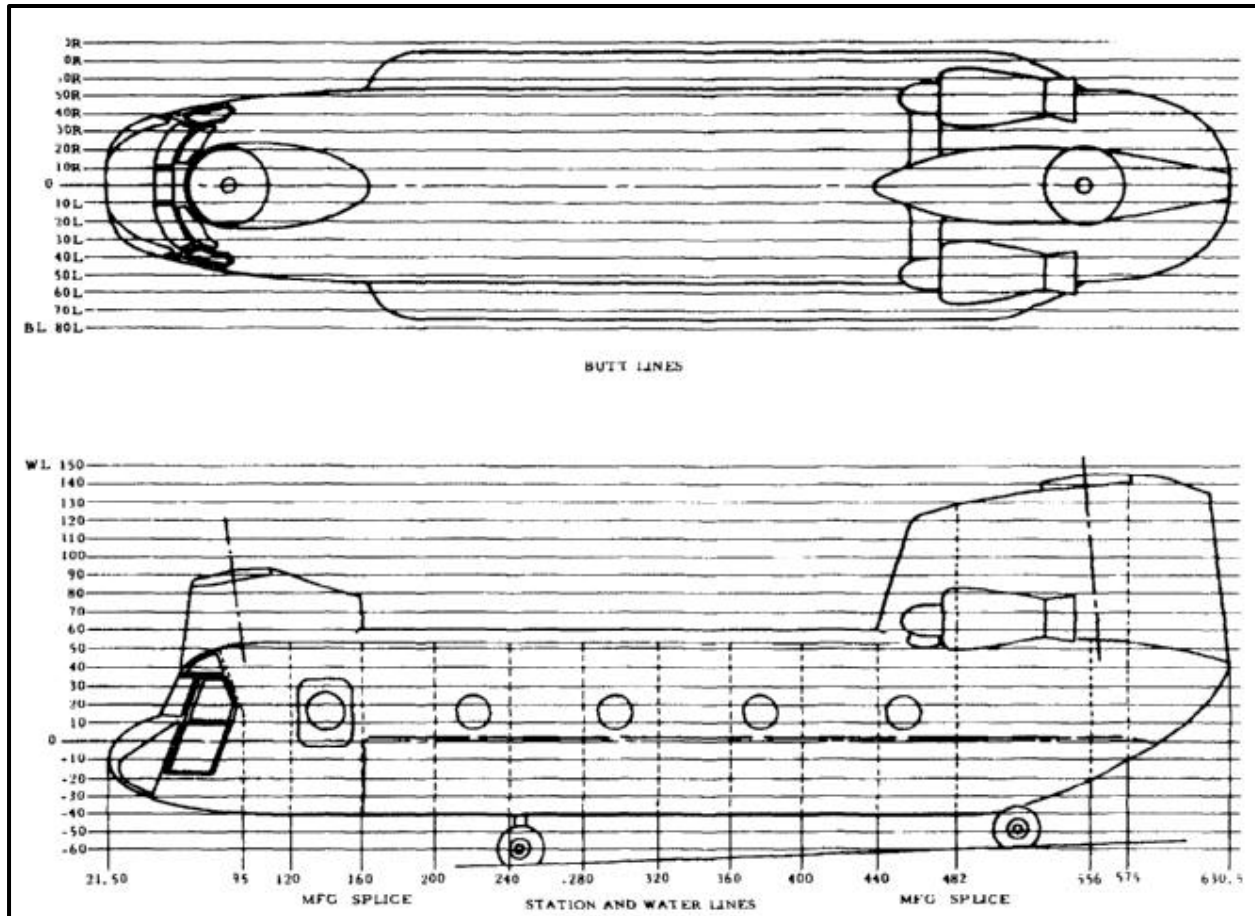
1. Powerplant — Provides power to helicopter.
2. Engine Transmission — Directs power from engine to combining transmission.
3. Engine Drive Shaft — Transmits power from engine transmission to combining transmission.
4. Combining Transmission — Combines power from two engines.
5. Forward Drive Shafting — 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.



B2310002

## 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. Butt line 80.0 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 if corrosion occurs, it 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.

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

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 MS21069 MS21071 MS20365 MS21072 MS21044 MS21073 MS21045 NAS679 MS20500 NAS1021 MS21055 NAS1068 MS21056 BACN10MK MS21059 BACN10JZ MS21060 BACN10FX MS21076 BACN10HY	AN320 AN316 AN315C MS21083 NAS1022 MS51967 MS51968 MS51971	MS17825	MS17826 MS21224	MS21244	AN310 AN315 MS21044	AN320 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  $\pm 10$  percent is used.
2. Torque values are for dry (unlubricated) threads. If 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.



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***

<b>THREAD SIZE</b>	<b>MINIMUM FRICTION TORQUE</b>
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 nuts 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**  
**100 to 750 Inch-Pounds**

**700 to 1600 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<sup>1</sup>

D — Steel or aluminum flared fitting nuts, AN818, AN924, NAS591-593, and NAS594-596: used on steel tube<sup>1</sup>

E — Steel or aluminum flared fitting hose coupling nuts<sup>1</sup>

<sup>1</sup>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

Utility Return Module

APU Start Module

APU Start Accumulator

Utility Cooler Reservoir

Flight Control Cooler Reservoir

Flight Control Power Control Module

Lower Controls Module

ILCA Manifold

APU Motor Pump

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

**TORQUE WRENCHES**

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

**700 to 1600 Inch-Pounds**

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

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

THREAD SIZE	WORKING TORQUE <sup>1</sup>	MAXIMUM TORQUE <sup>1</sup>
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**

<sup>1</sup>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*

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

TUBE SIZE	TUBE FITTING		BULKHEAD HOLE DIA (INCH)		WASHER THICKNESS	TORQUE (INCH-POUND) AN924 NUT	
	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.



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.

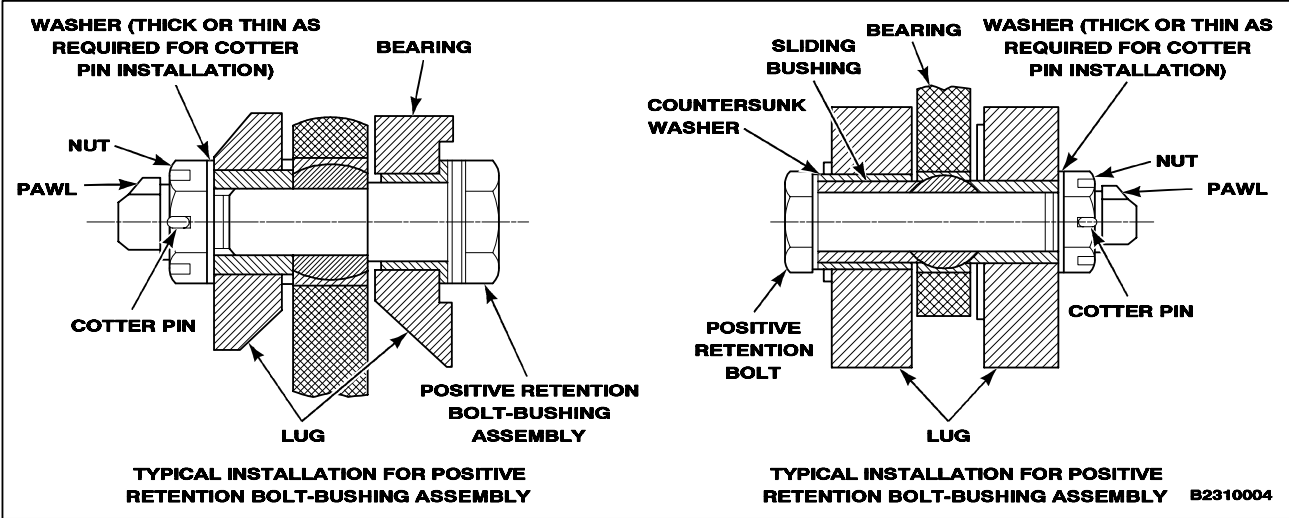
Align bearing, lugs, bolt, and bushing. Install bolt.
- d.

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



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:

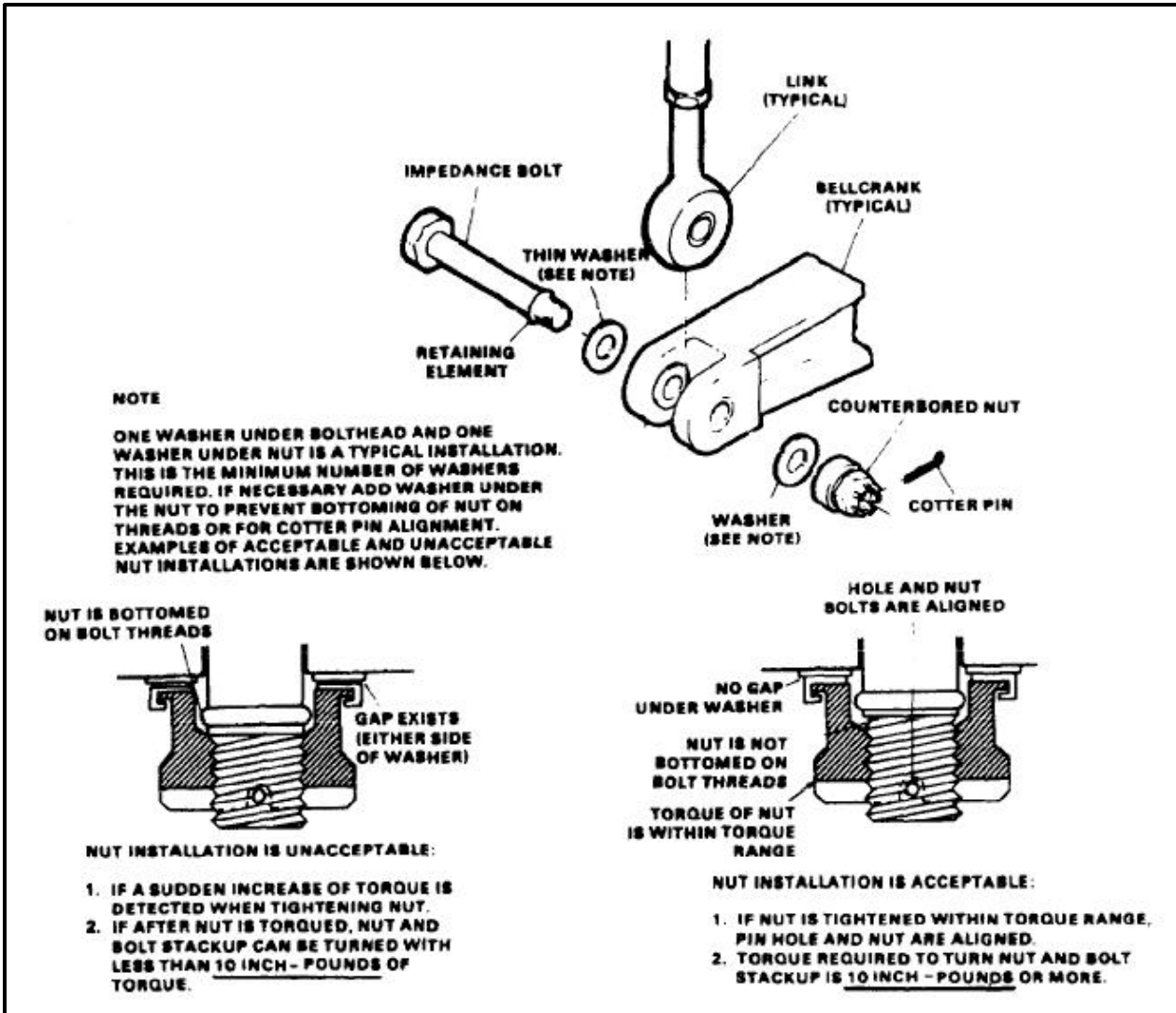
- a. Remove cotter pin and nut.
- b. Push bolt shank in removal direction until retaining element is compressed. Do not hammer on bolt.
- c. Grasp bolthead and pull bolt out of parts.

## 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.



1-14

SELF-RETAINING BOLTS INSTALLATION (Continued)

1-14

- c. Place washer(s) on bolt.
- d. Install nut as follows:



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		

**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:**

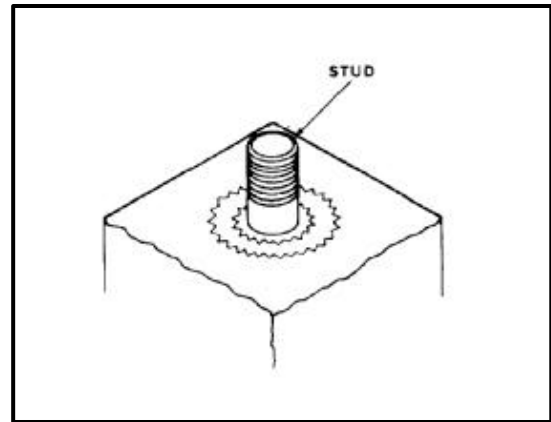
Machinist  
Inspector

**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.

**NOTE**

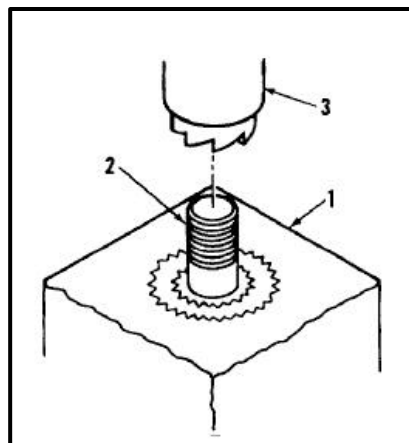
Procedure is same to replace any locked-in stud. Typical stud shown here.

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:**

MS51989-104

MS51989-105

MS51989-106

MS51989-107

MS51992B-504-13

SHF101-9SA(8)A

ST-10045

**Use Tool:**

SM91-16

SM101-18

SM111-20

SM121-22

B1575

SM101-18

SM101-18

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

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.

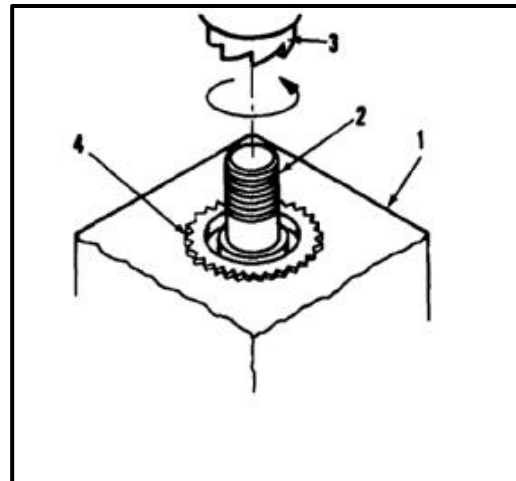
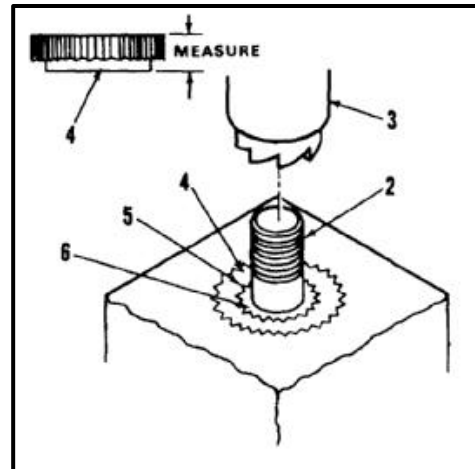
5. Cutaway interlock area (5) between stud flange (6) and lock ring (4) with tool (3). Do not drill deeper than lock ring thickness recorded in step 3. Use several light cuts. Pull back tool between cuts to clear chips and check depth.

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.

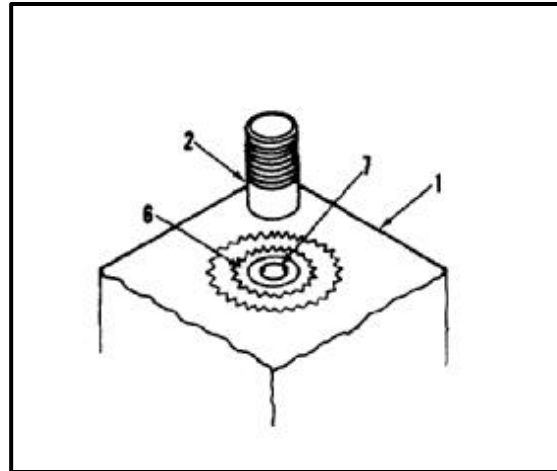
7. Remove tool (3) from drill or drill press.
8. Go to step 15.



**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:**

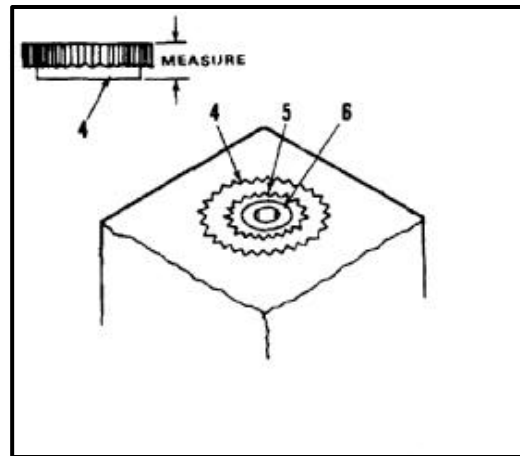
MS51989-104	7 (0.201 Inch)
MS51989-105	F (0.257 Inch)
MS51989-106	5/16 (0.312 Inch)
MS51989-107	U (0.368 Inch)
MS519928-504-13	0.4375 Inch
SHF101-9SA(8)A	F (0.257 Inch)
ST-10045	F (0.257 Inch)

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.

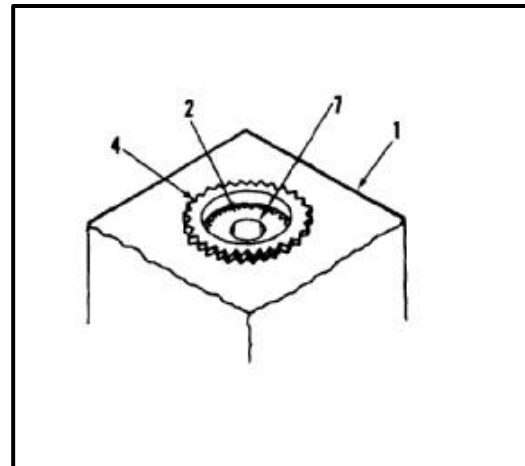


**1-15 REPLACE LOCKED-IN STUD (AVIM) (Continued)****1-15**

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

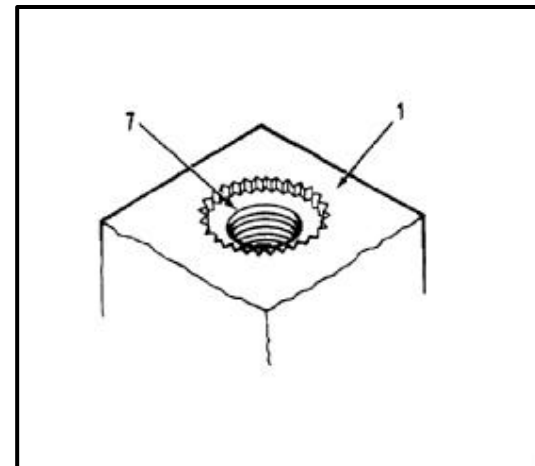
**NOTE**

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**

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.

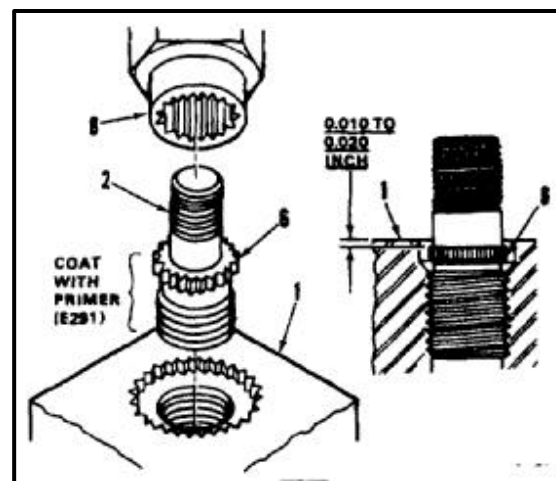


Stud can be damaged if not installed to correct depth.

**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).





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

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

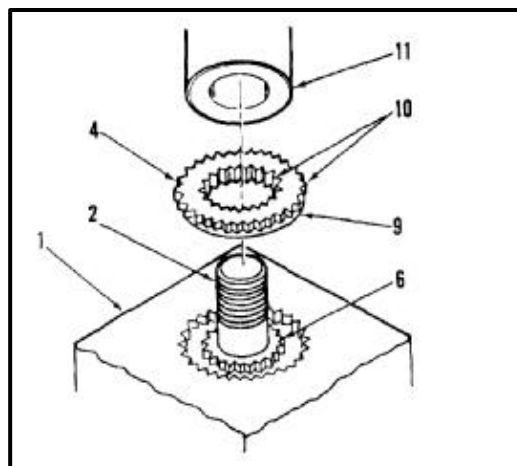
SHF101-9SA(8)A

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:**

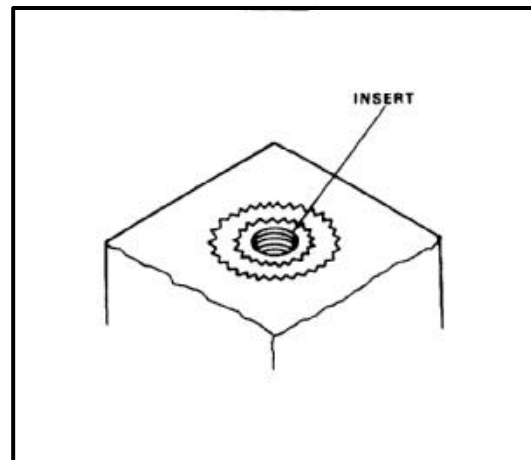
Machinist  
Inspector

**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**

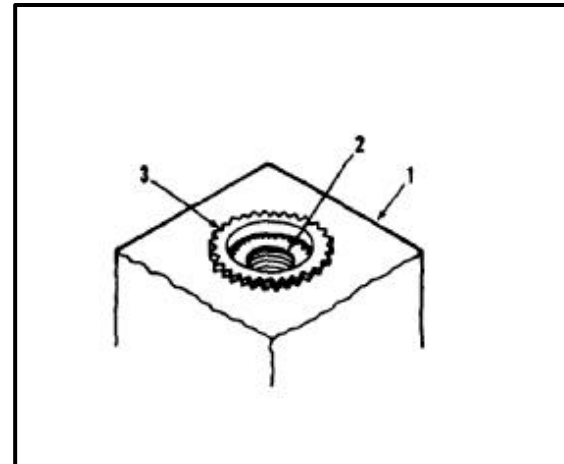
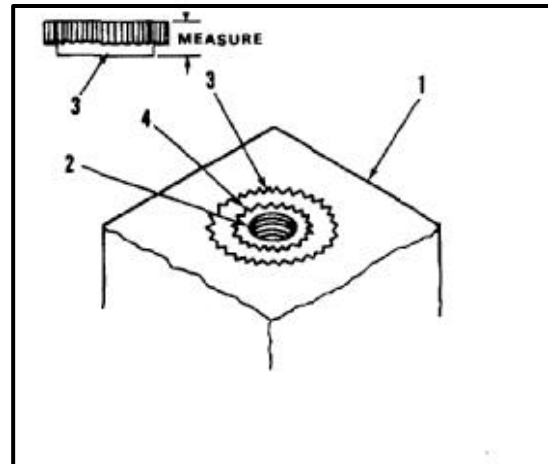
Interlock need not be drilled away to full depth. Three-quarters depth is enough.

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).

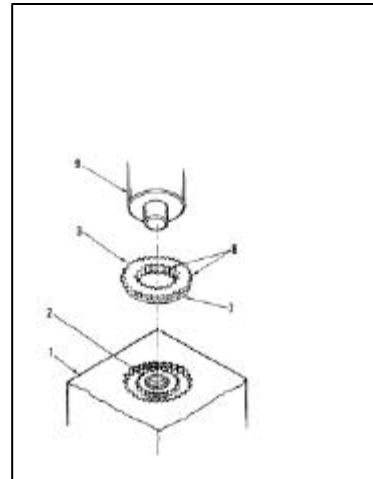
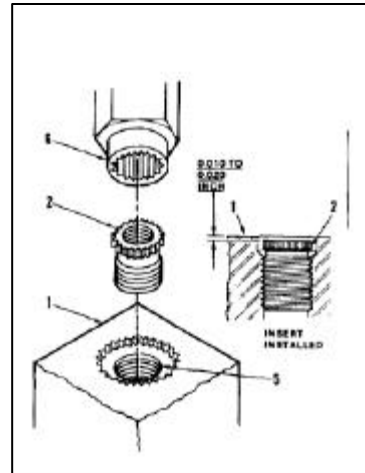
**CAUTION**

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

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

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	145G0002-6	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

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

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 (T39)
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

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

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)

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

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

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 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

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

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

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

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 ONMM3	—	—
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	Perchloroethylene (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

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


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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	Loctite 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 bottle, 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 electroplating	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)	—	—

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

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
<b>NOTE A</b>	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

Change 1

1-57/(1-58 blank)





## **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:**

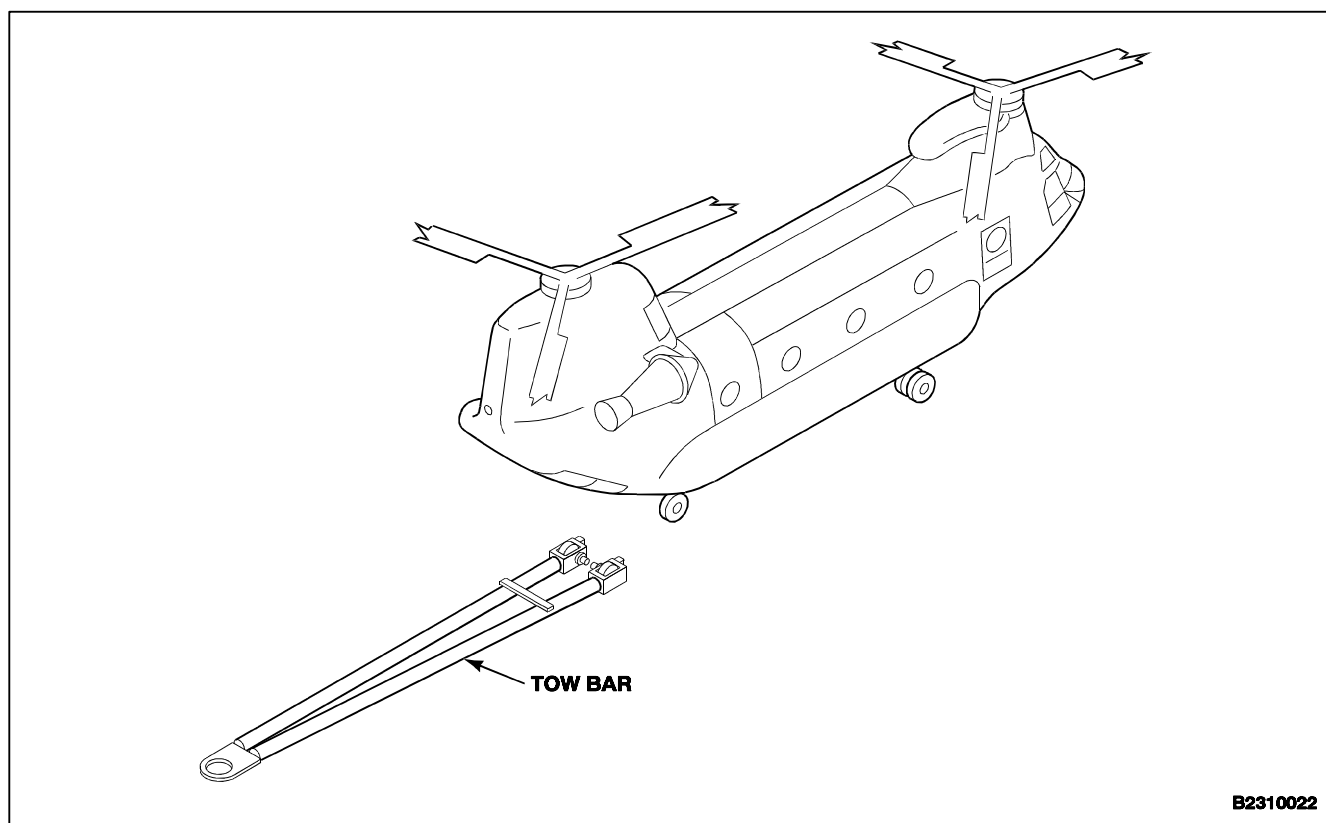
None

**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.

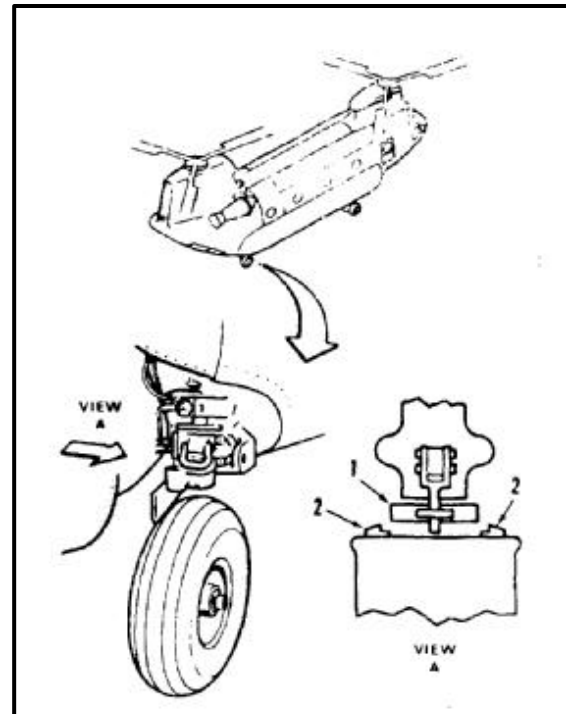
**CAUTION**

Towing with swivel locks engaged will damage landing gear.

**CAUTION**

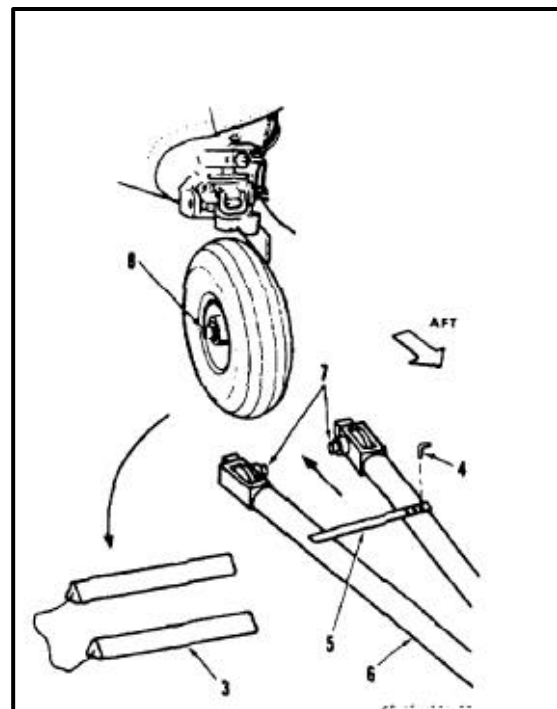
It is not recommended to tow aircraft from the aft left wheel because damage to the aft right landing gear may occur. If you have to tow from the left wheel have a steering bar attached with personnel steering the aft right wheel. Tow helicopter slowly.

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.

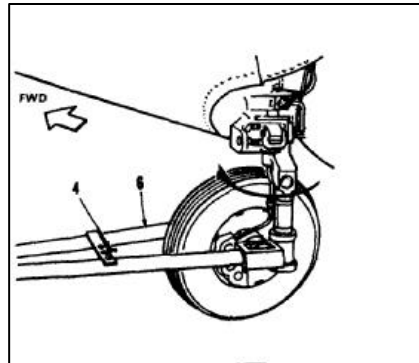
2. Remove chocks (3), if installed, from aft left wheel.
3. Remove pin (4) securing spreader (5) to tow bar (6).
4. Fit tow bar pins (7) into ends of axle (8) of aft left wheel.
5. Secure tow bar (6) to axle (8) by installing pin (4) through one of the holes in spreader (5).



**CAUTION**

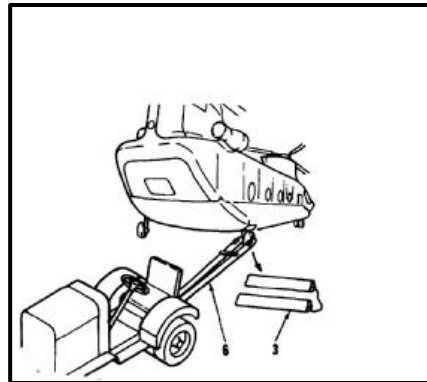
Left wheel and gear can be damaged if wheel is not turned around before towing aft.

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



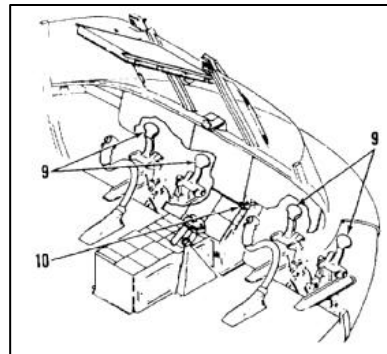
**INSTALL TOW BAR**

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**

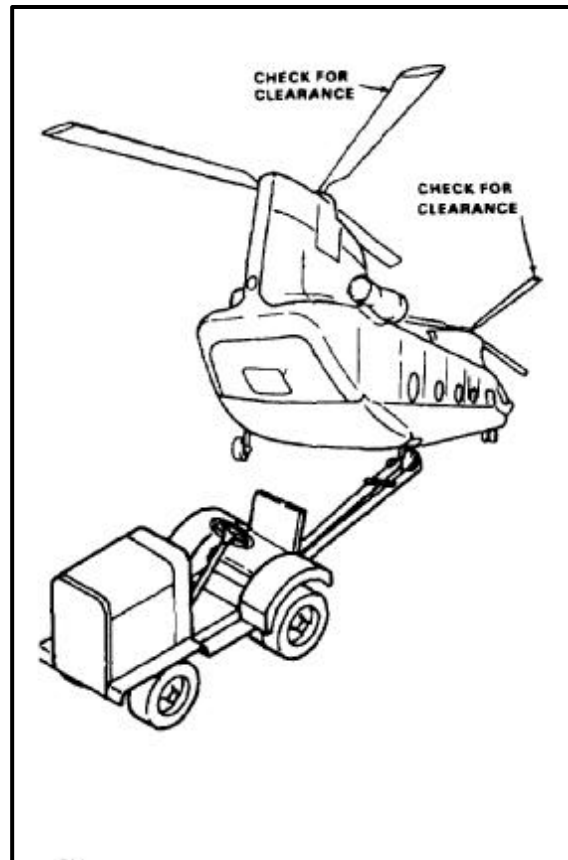
11. Have helper sit in cockpit. Helper will apply brakes if needed during towing.
12. Have helper release parking brakes by pressing on pilot's or copilot's brake pedals (9). Brake handle (10) will release.



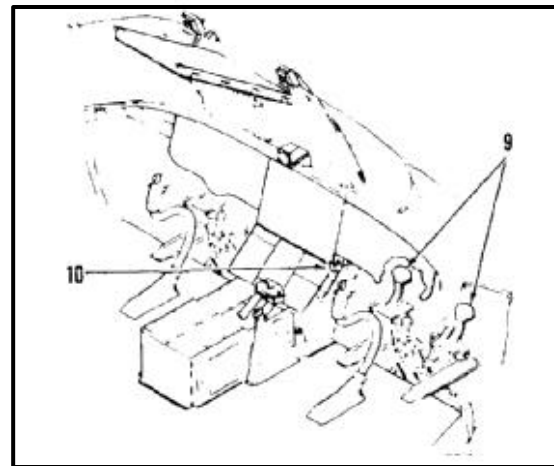
**CAUTION**

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.



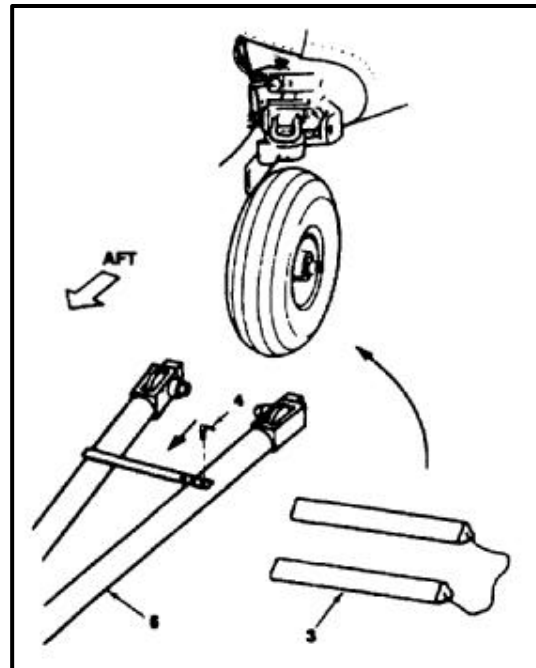
15. When towing is done, have helper set parking brakes by pressing pilot's brake pedals (9) and pulling handle (10).



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

**RETURN WHEEL****NOTE**

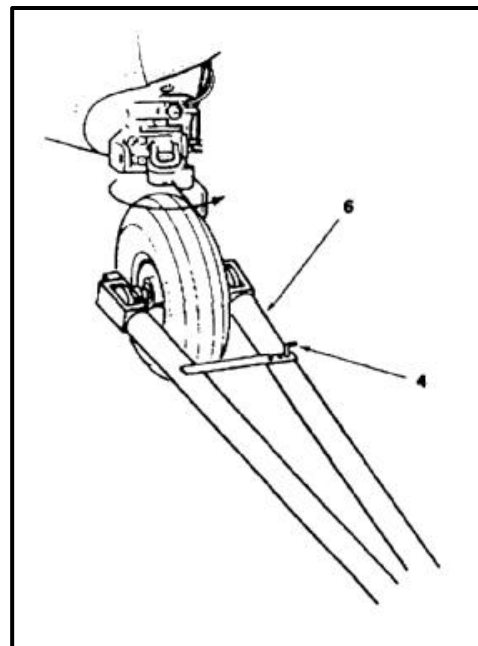
Perform steps 18 thru 20 only if helicopter was towed aft.



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:**

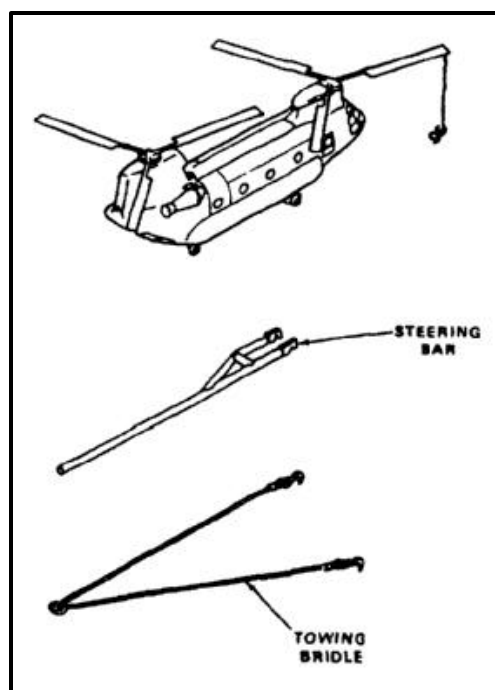
Medium Helicopter Repairer (As Required)

**References:**

Task 1-64

**Equipment Condition:**

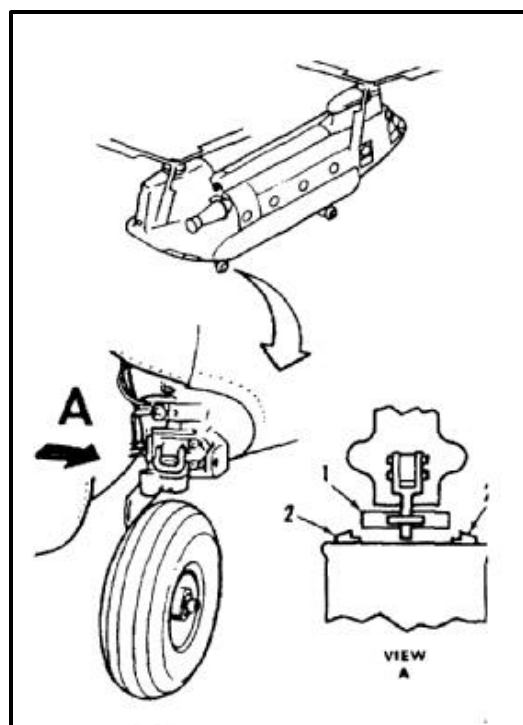
Battery Disconnected (Task 1-39)  
Electrical Power Off  
Hydraulic Power Off  
Utility System APU Start Accumulator Charged to  
3,000 Psi (Task 1-64)  
Emergency Utility Pressure Valve Open (TM  
55-1520-240-T)



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.



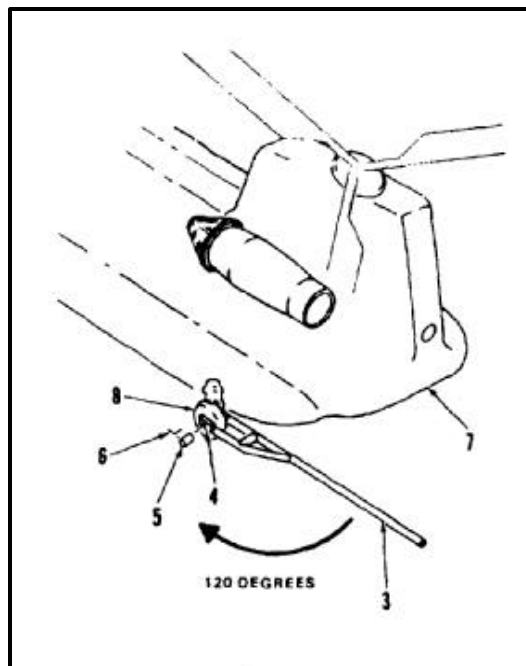


2. Attach steering bar (T75) (3) to left aft landing gear axle (4) as follows:
  - a. Insert steering bar pin (5) in outboard end of axle (4).
  - b. Position steering bar (T75) (3) on axle (4).
  - c. Insert "L" pin (6) in steering bar pin (5).
  - d. Deleted.

**CAUTION**

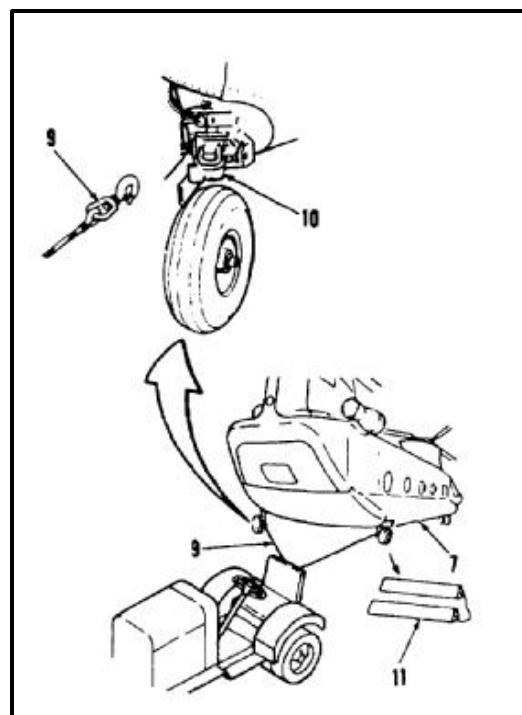
Left wheel and gear can be damaged if wheel is not turned around before towing aft.

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 bridle 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.



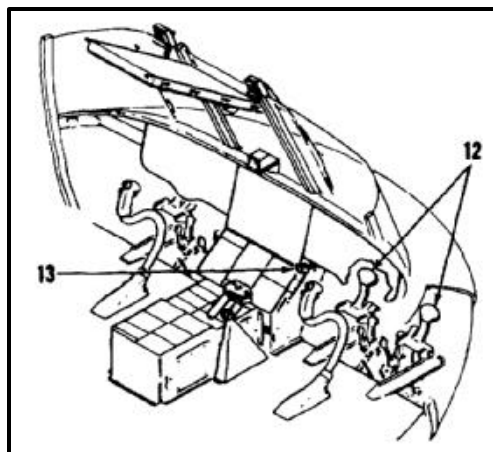
**1-20 ALTERNATE TOWING (Continued)****1-20**

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.



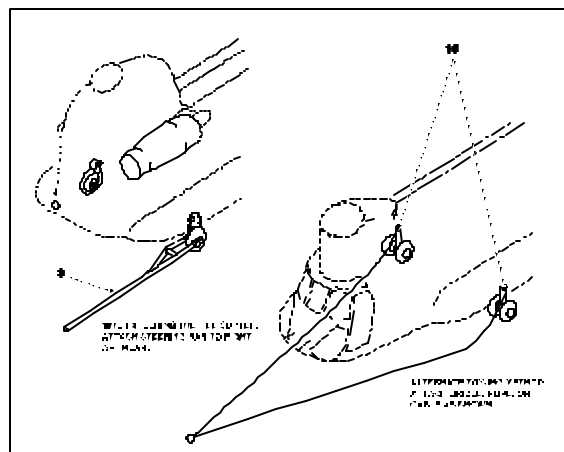
Ensure LEFT aft landing gear is in the trail position (wheel outboard).

- 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).

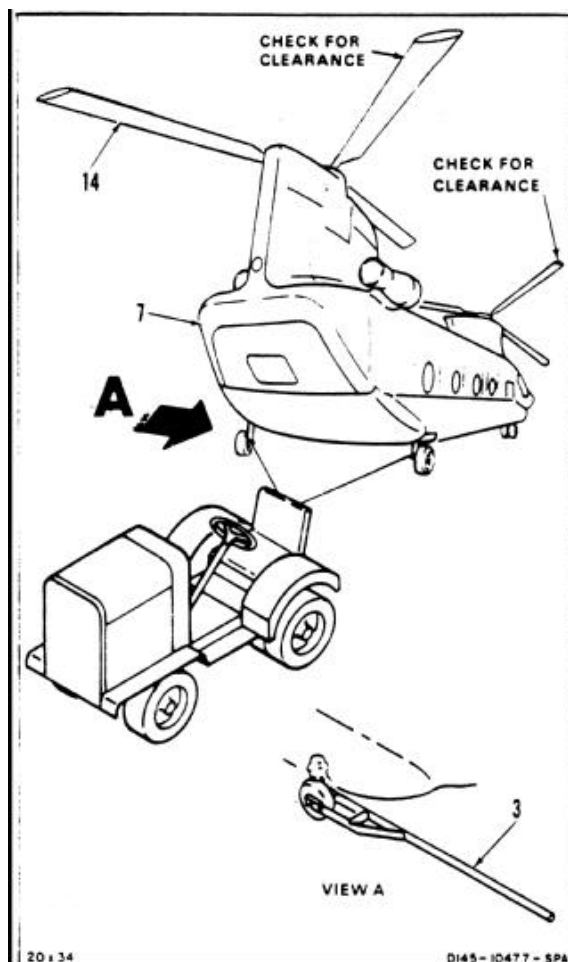
- 10.5. Have helper release parking brakes by pressing on pilot's or copilot's brake pedals (12). Brake handle (13) will release.
- 10.6. Remove chocks.



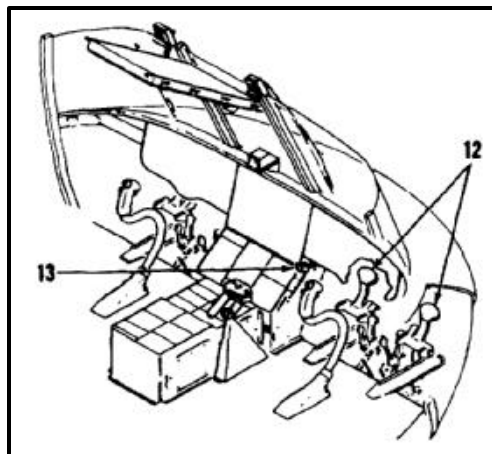
**CAUTION**

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

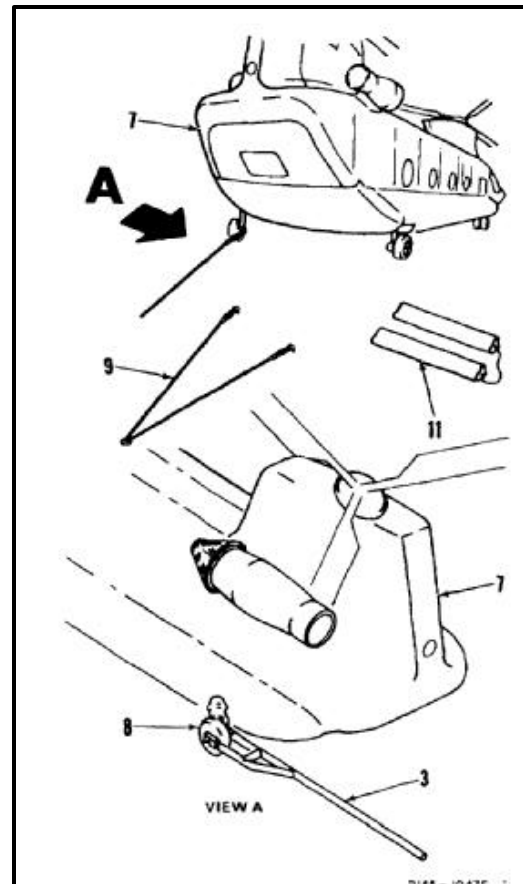
11. Station observers at each side of helicopter (7) to make sure blades (14) have clearance during towing. Turn rotor heads as needed for clearance.
12. Tow helicopter (7) slowly. Avoid sudden starts and stops. Turn blades (14) as needed for blade clearance as observers report.



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

## 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)

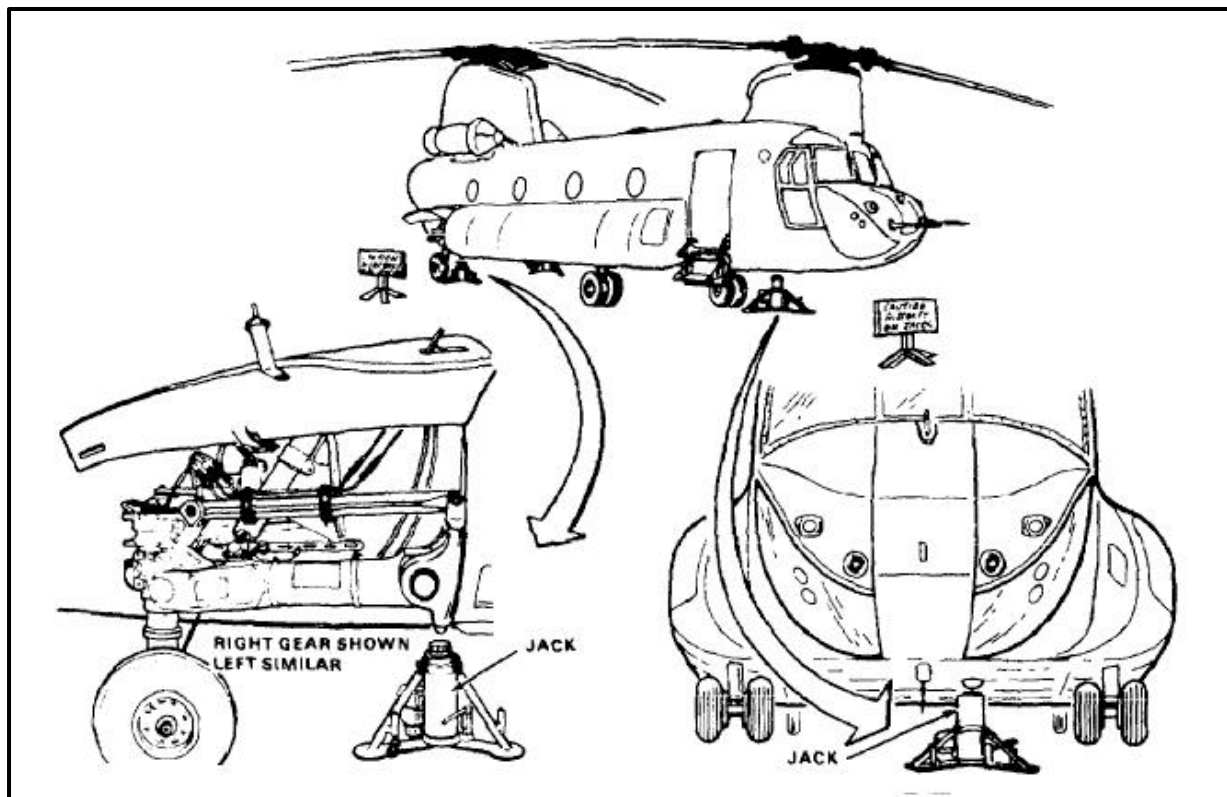
Helicopter Roped Off and Signs Posted to Restrict Access

**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).



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

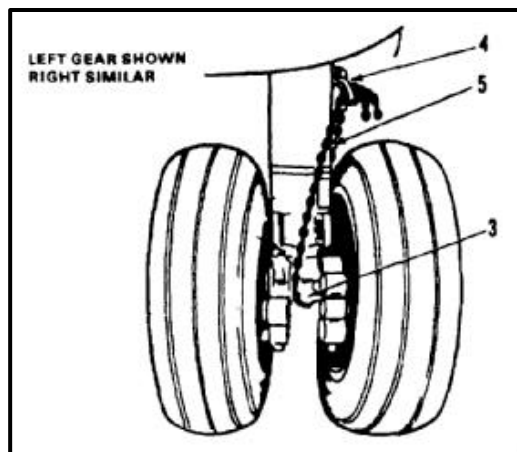
2. Make sure there will be clearance for blades (1) after jacking. Make sure cargo ramp (2) will not hit ground during jacking.



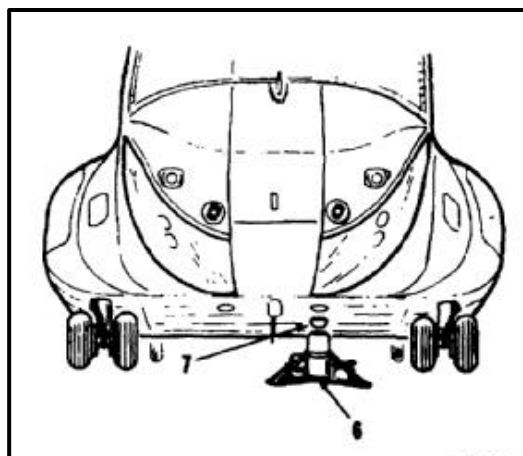
**CAUTION**

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).



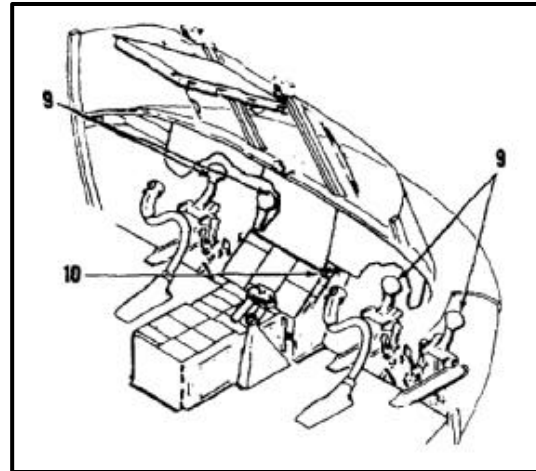
4. Set jack (6) under forward fuselage jack pad (7). Raise jack until it just begins to support some weight.



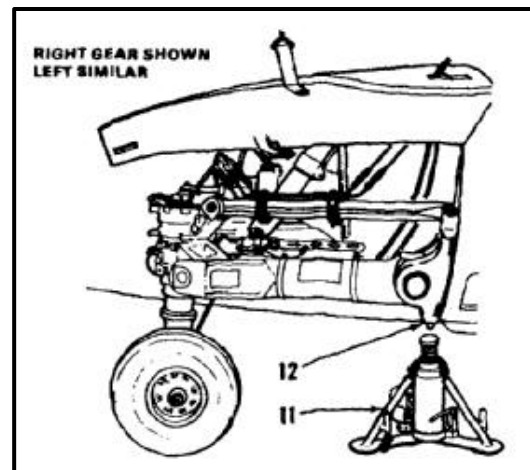
5. Remove chocks (8).



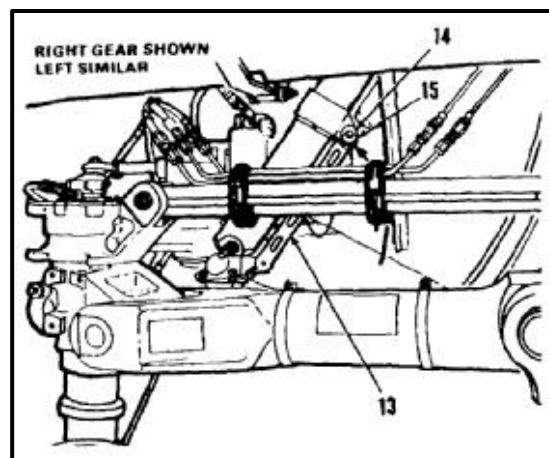
6. Release parking brake by pressing pilot's or copilot's brake pedals (9). Brake handle (10) will release.



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.

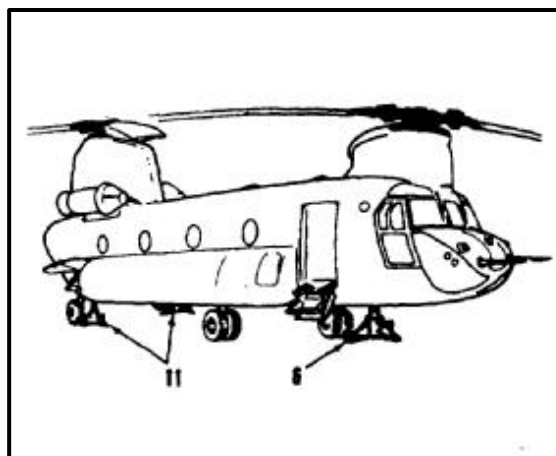




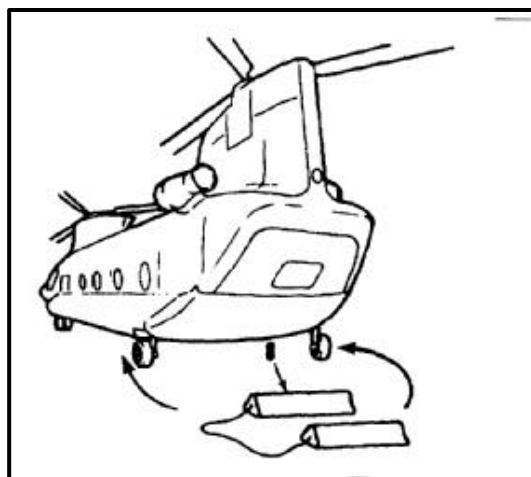
9. Jack helicopter as high as needed. Raise all three jacks evenly, a little at a time.

**LOWER HELICOPTER**

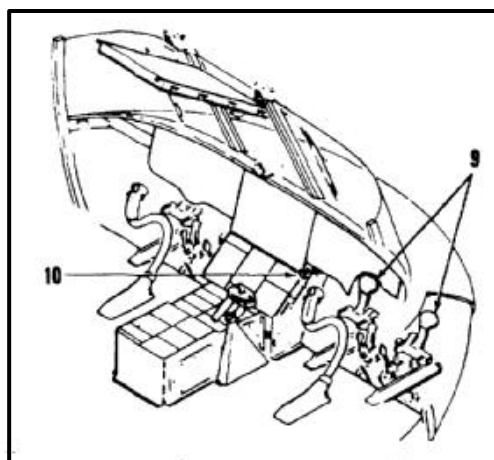
10. Lower all three jacks (6 and 11) evenly, a little at a time until forward wheels are firmly on the ground and aft wheels are touching ground. Do not remove jacks.



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



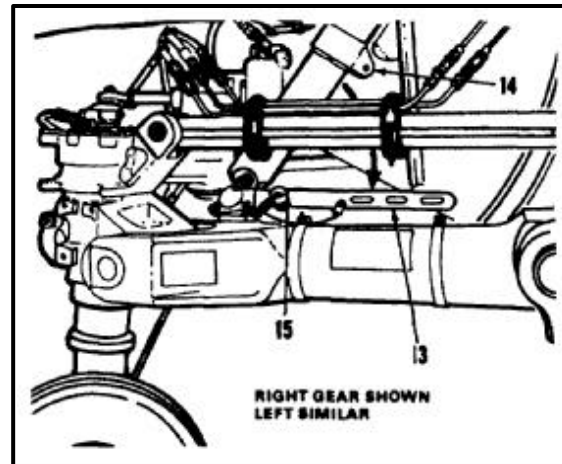
12. Set parking brakes by pressing pilot's brake pedals (9) and pulling handle (10). Release pedal.



**CAUTION**

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

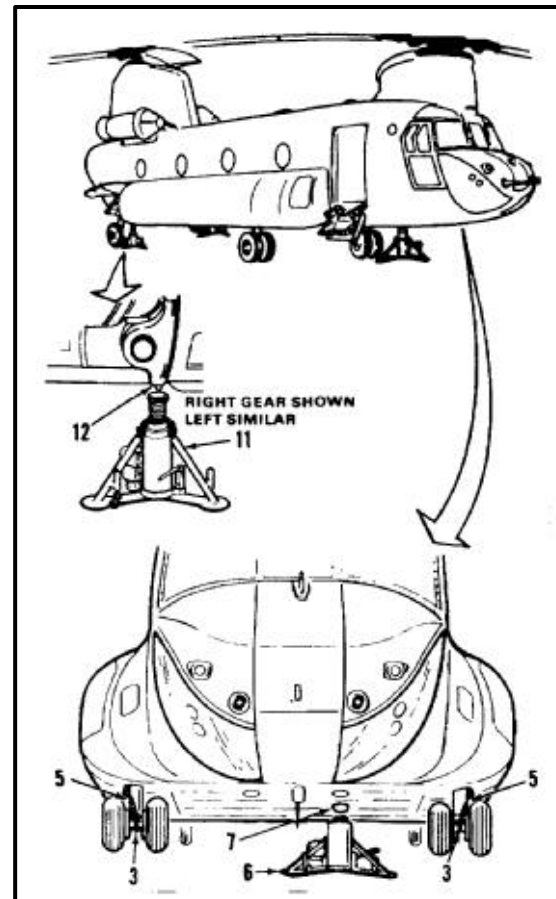
13. Lower aft landing gear until wheel touches ground. Release static lock (13) from lug (14) on each aft landing gear. Secure in stowed position with pin (15).



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

## 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:**

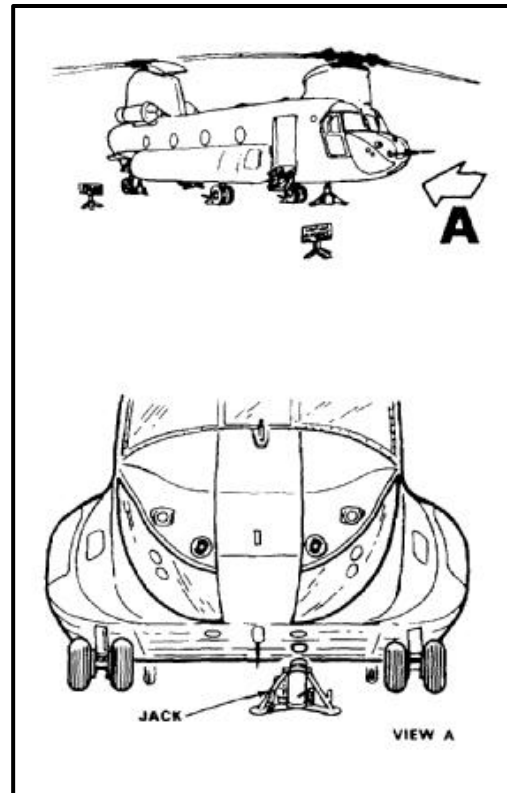
Battery Disconnected (Task 1-39)  
Electrical Power Off  
Hydraulic Power Off  
Fuel Tanks Drained (Task 10-34 or 10-35)  
Helicopter on Hard, Level Surface  
Forward Landing Gear Shock Struts Deflated (Task 1-71)  
Helicopter Roped Off and Signs Posted to Restrict Access

**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.



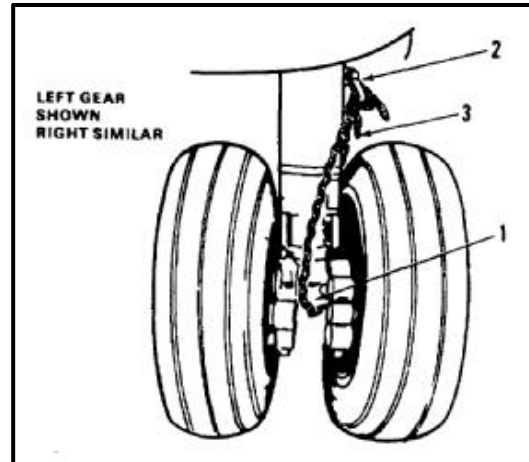
**RAISE HELICOPTER**

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

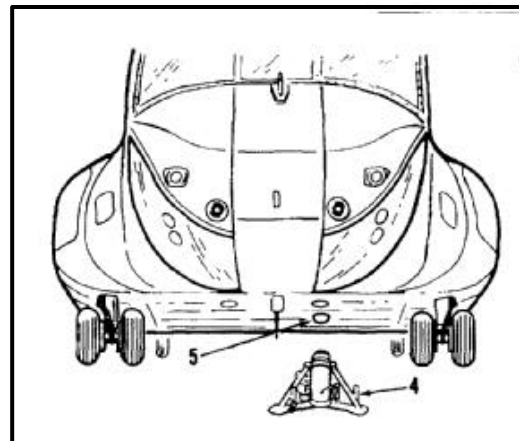


Do not let tiedown chain press against brake tubing. Tubing can be damaged.

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.



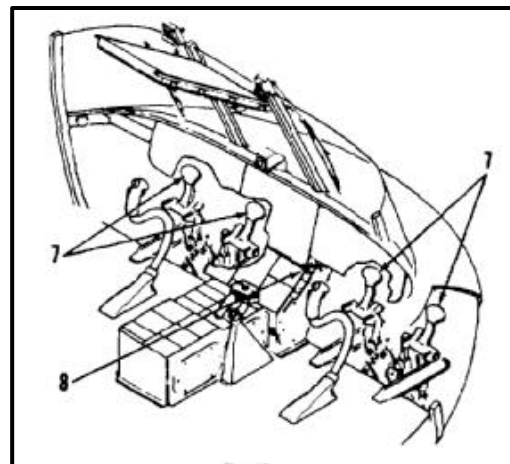
**WARNING**

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

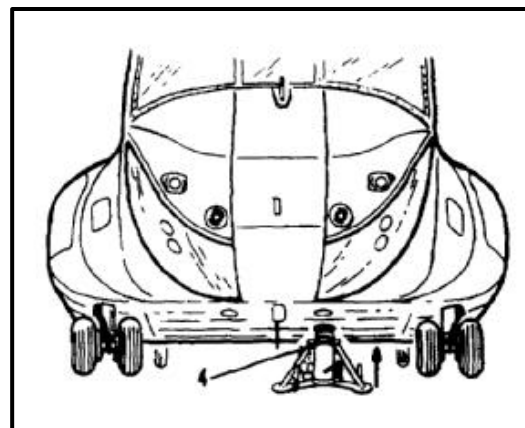
4. Remove chocks (6).



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

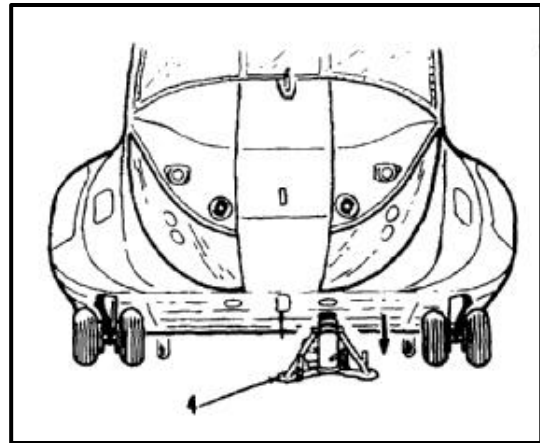


6. Raise jack (4) to lift helicopter as high as needed.



**LOWER HELICOPTER**

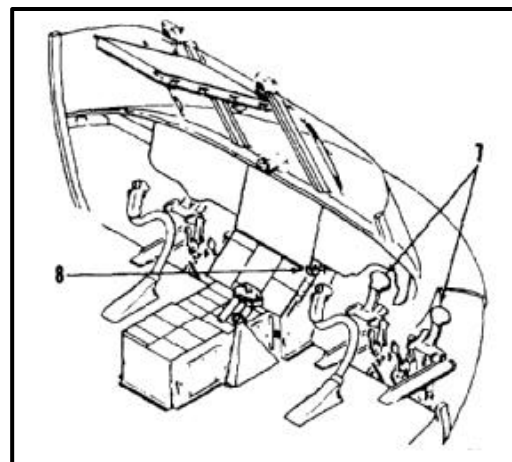
7. Lower jack (4) until forward landing gear wheels are firmly on the ground. Do not remove jack.



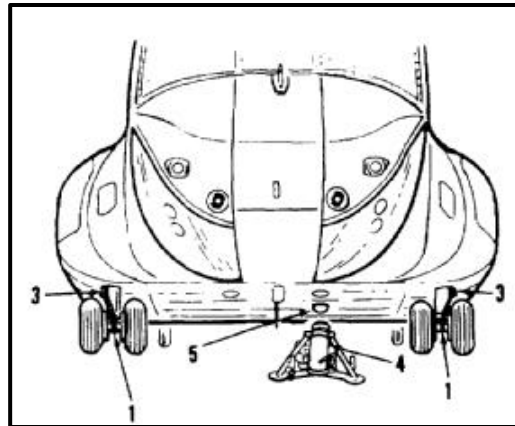
8. Place chocks (6) at either aft wheel.



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**

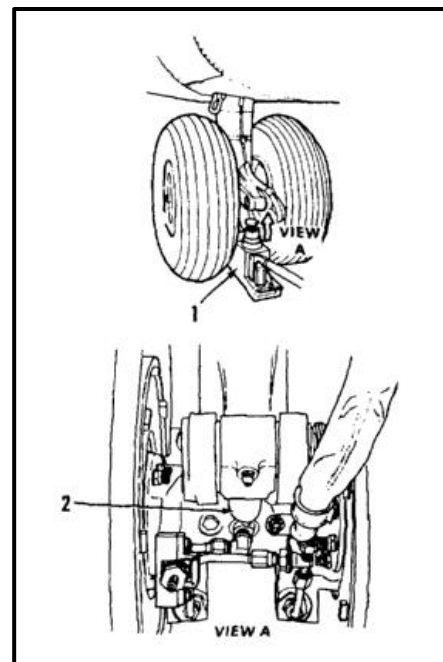
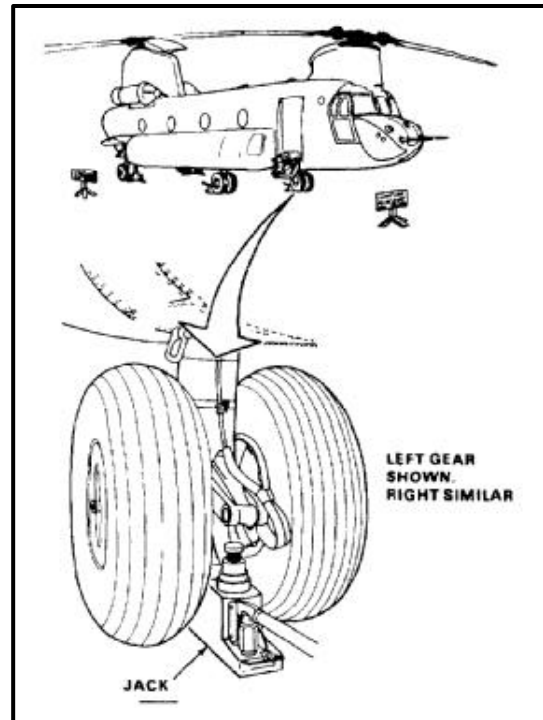
1. Set jack (1) under jack pad (2).
2. Jack as high as needed. If jacking both sides, raise both jacks evenly, a little at a time.

**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



## 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**

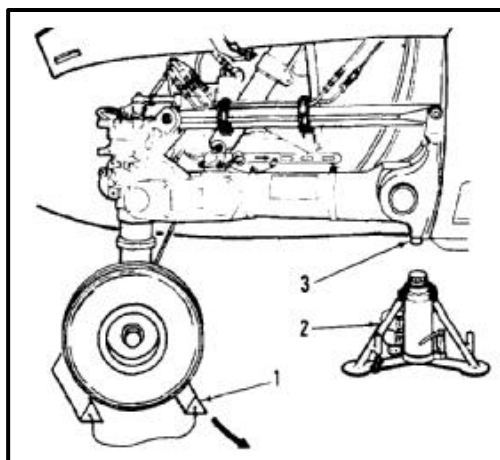
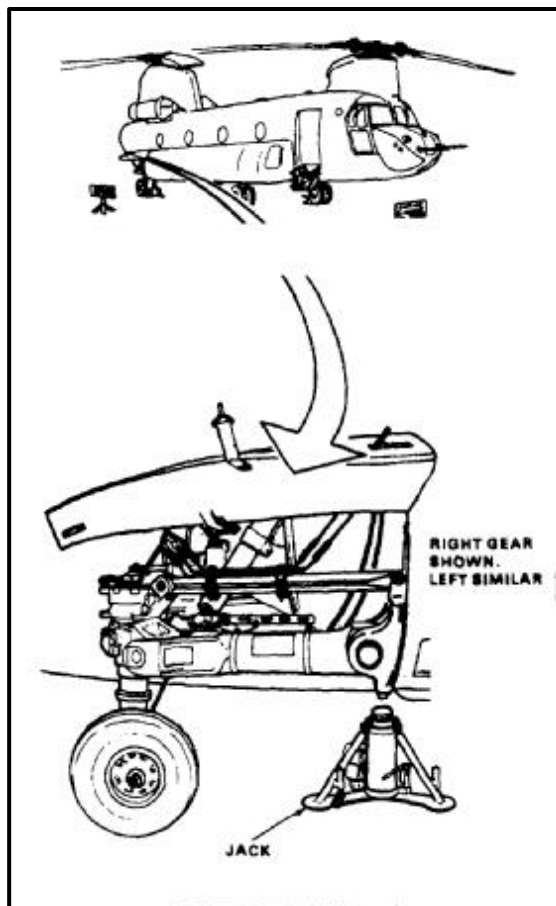
Jacking on soft or uneven surface or in winds or gusts over **20 knots** can cause helicopter to fall. Personal injury and damage to equipment can result.

**NOTE**

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

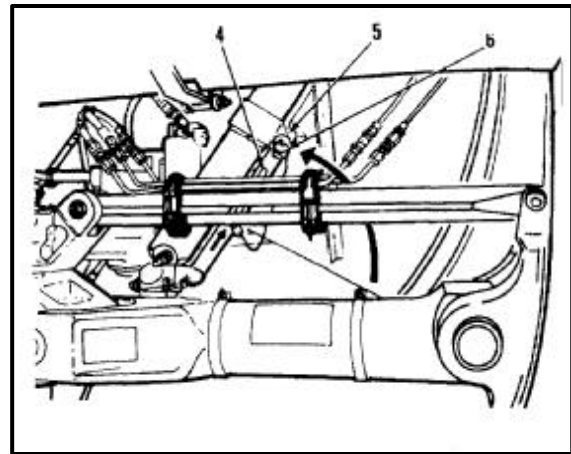
**RAISE HELICOPTER**

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



**1-24 JACK AFT END OF HELICOPTER (Continued)****1-24**

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.

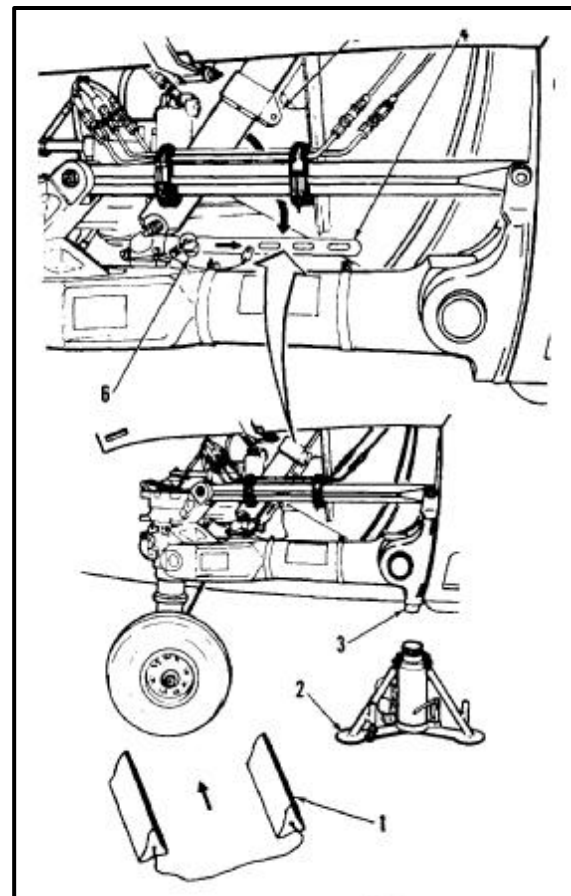


Landing gear can be damaged if static lock is not released and stowed before lowering helicopter.

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

## INITIAL SETUP

**Applicable Configurations:**

All

**Tools:**

None

**Materials:**

None

**Personnel Required:**

Medium Helicopter Repairer

**References:**

Task 2-2

**Equipment Condition:**

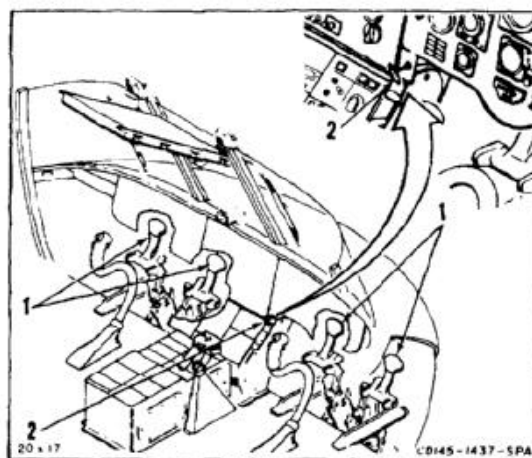
Battery Disconnected (Task 1-39)

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.

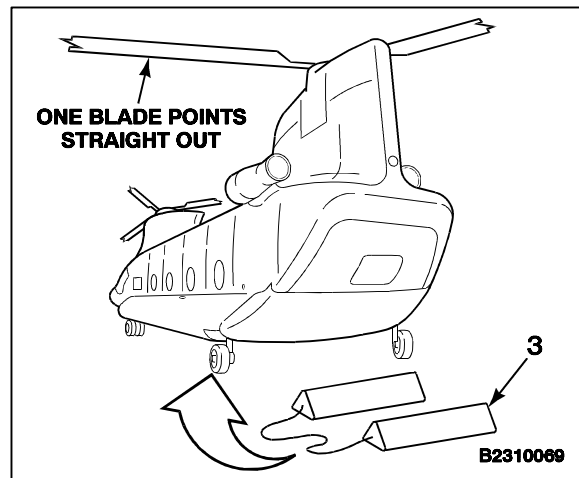
**WARNING**

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  $90^\circ$  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**

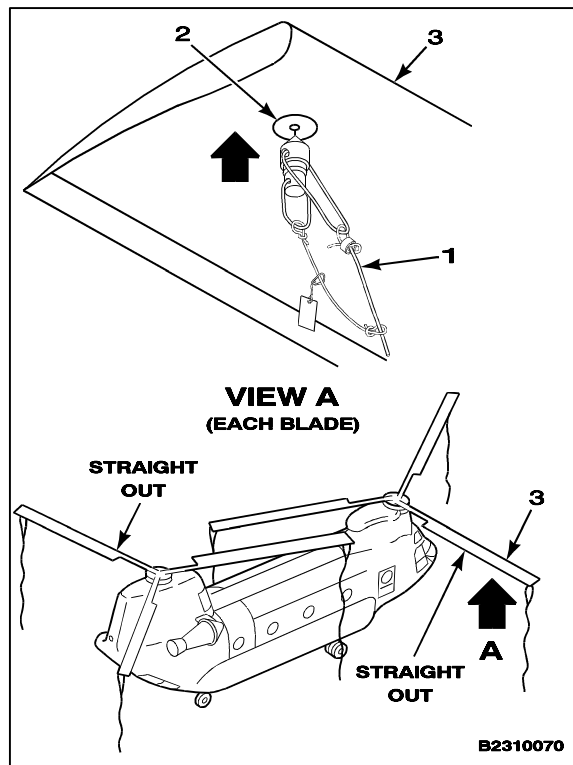
In winds of **39 to 65 knots**, tiedown blades and fuselage to prevent damage. In winds over **65 knots**, evacuate helicopter or store in hangar. If evacuation or storage is not possible, remove blades and tie fuselage down. The leeward side of a large building is the best tiedown location.

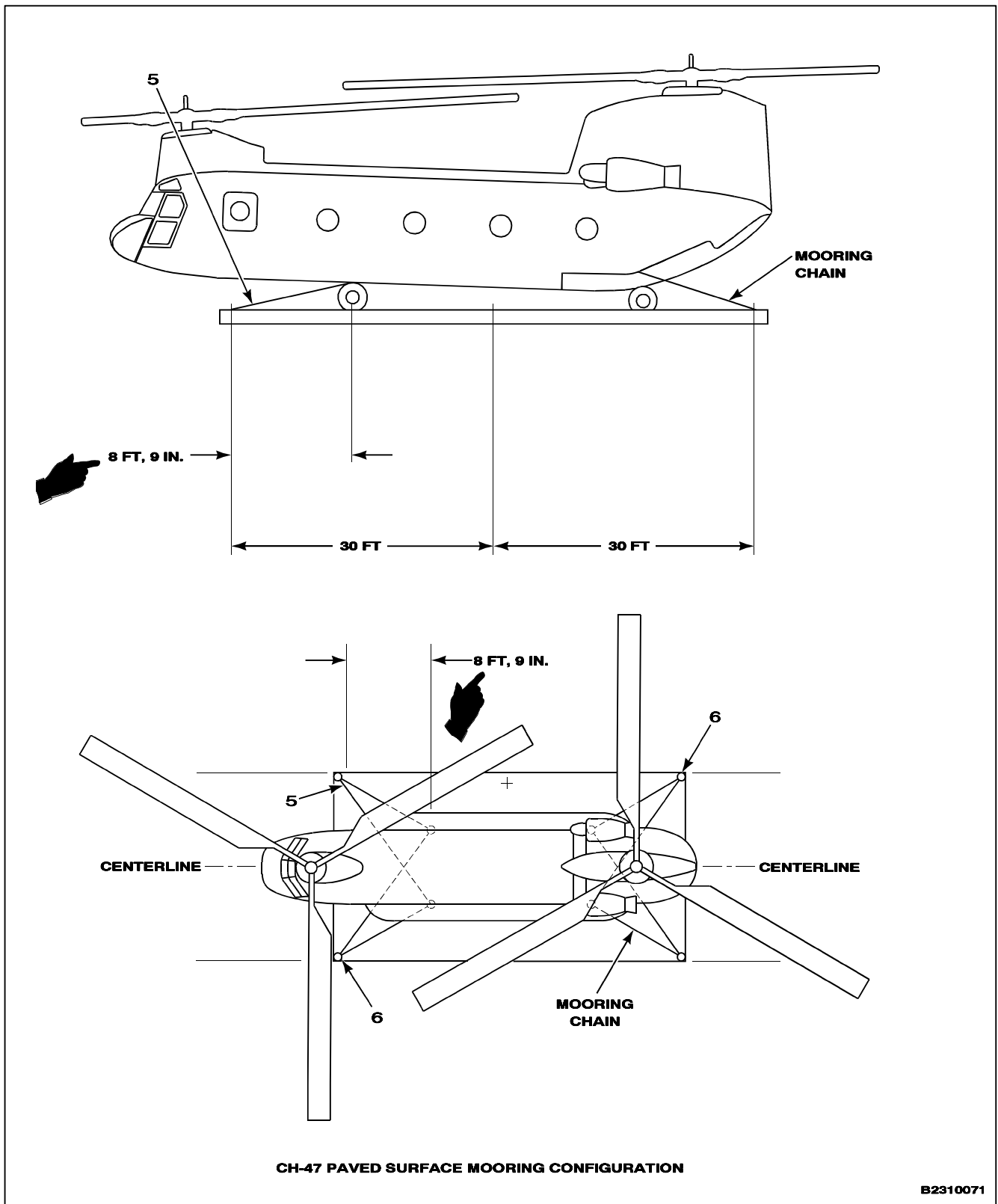
**NOTE**

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

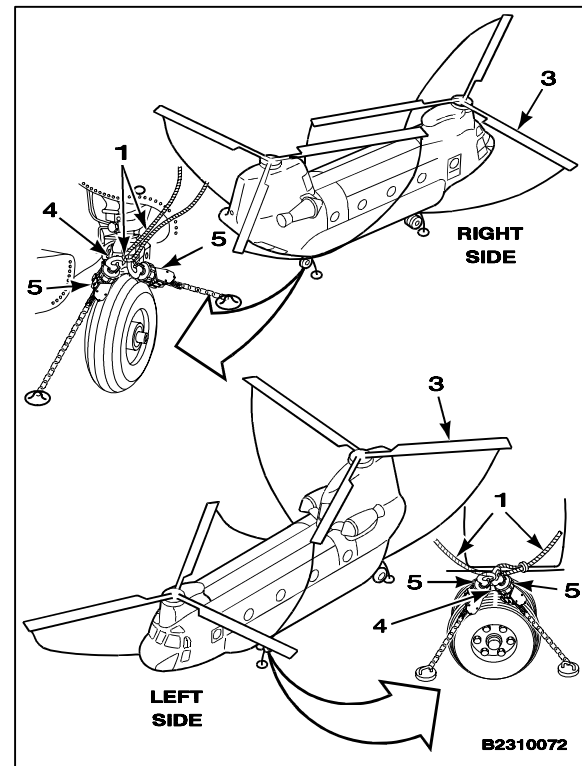
**TIEDOWN AND MOORING**

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.





2. Pull blades (3) around so that one forward blade and one aft blade point straight out  $90^{\circ}$  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:**

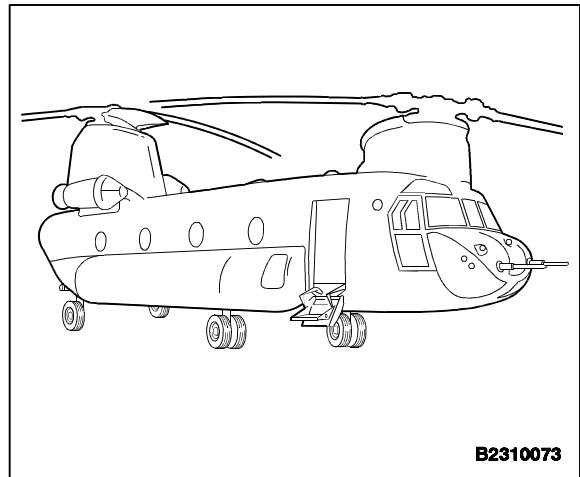
Task 1-32  
 TM 1-1500-250-23

**Equipment Condition:**

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

**General Safety Instructions:****WARNING**

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



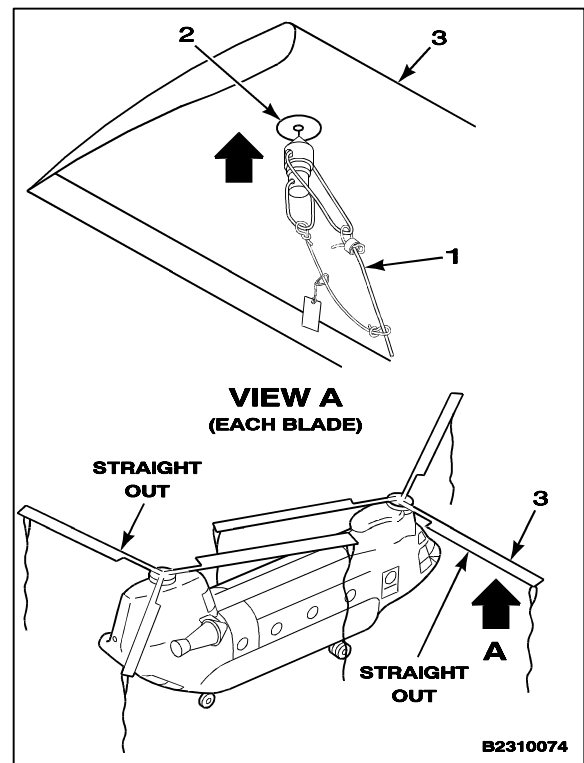
In winds of **39 to 65 knots**, tiedown blades and fuselage to prevent damage. In winds over **65 knots**, evacuate helicopter or store in hangar. If evacuation or storage is not possible, remove blades and tie fuselage down. The leeward side of a large building is the best tiedown location.

**NOTE**

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

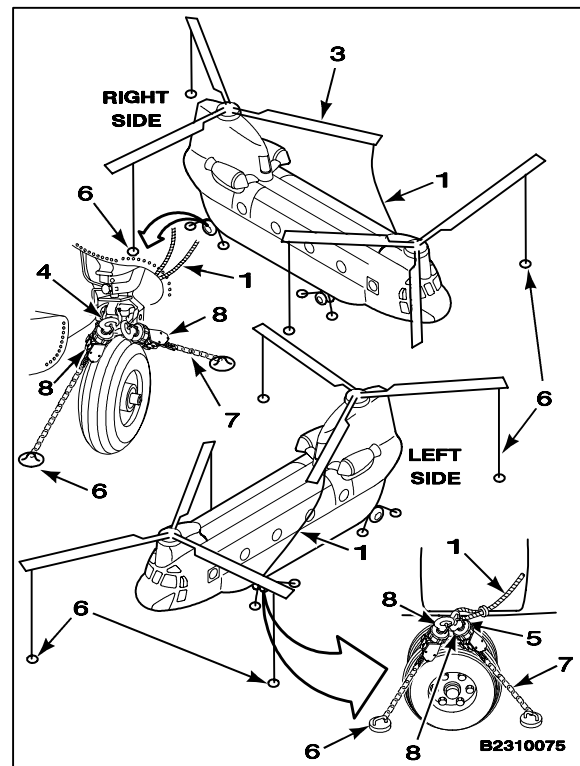
**MOOR**

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.





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:***

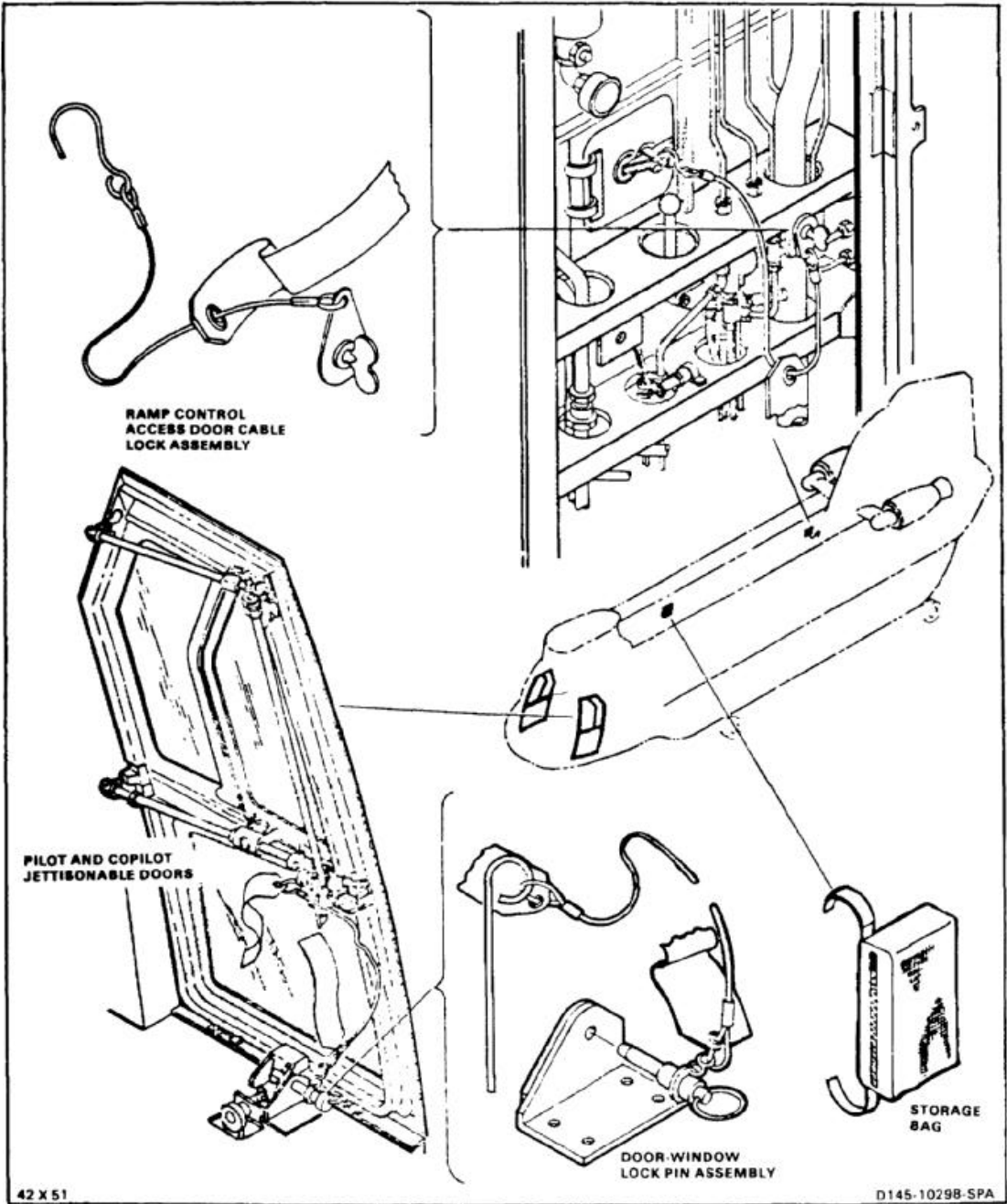
Battery Disconnected (Task 1-39)

Helicopter Parked (Task 1-25)

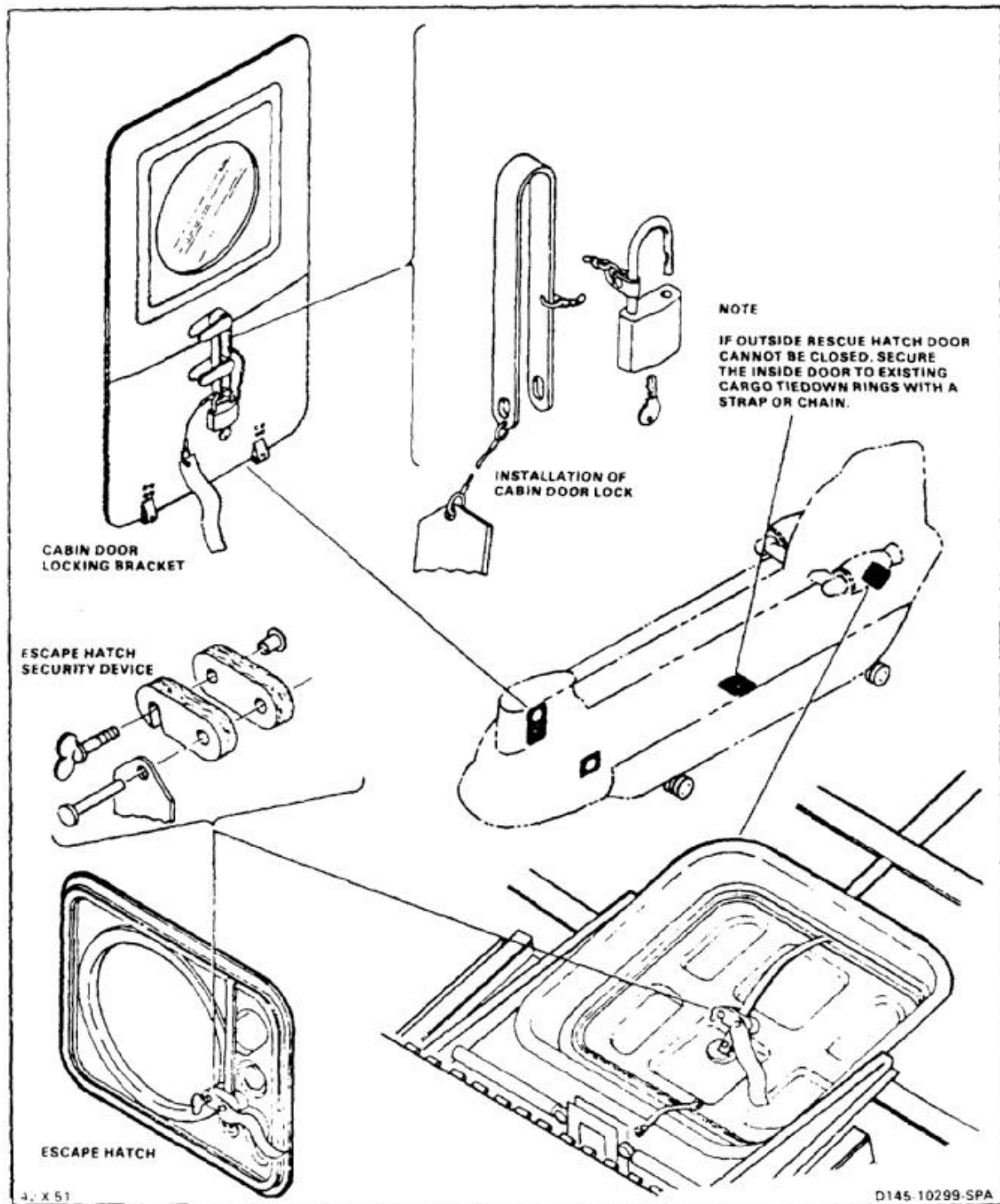
**NOTE**

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

**INITIAL SETUP****Applicable Configurations:**

All

**Tools:**Red Cloth Strips  
Grounding Cable**Materials:**

As Required

**Personnel Required:**

Medium Helicopter Repairer

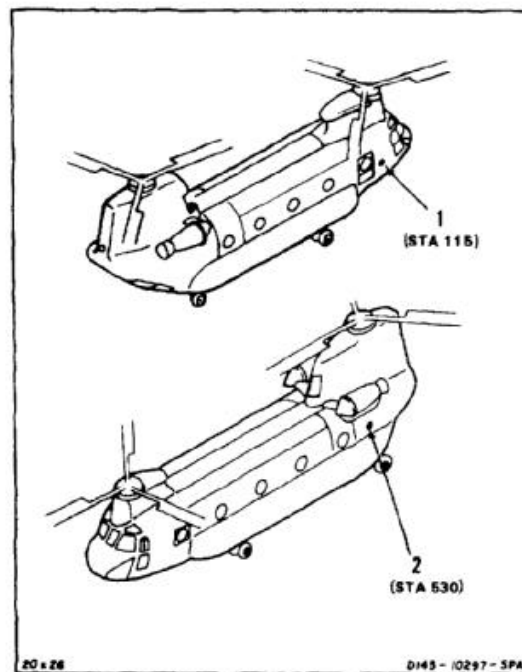
**Equipment Condition:**Battery Disconnected (Task 1-39)  
Helicopter Parked (Task 1-25)**General Safety Instructions:****WARNING**

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

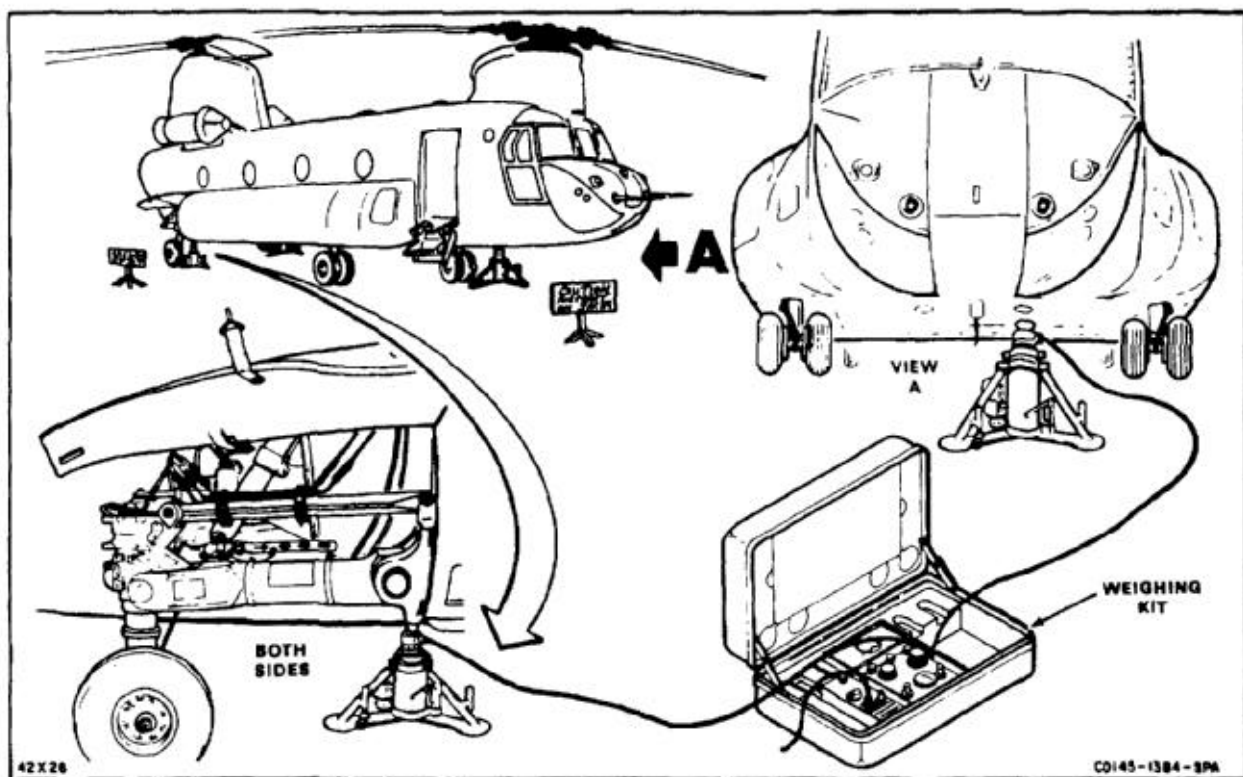
**Equipment Condition:**

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.

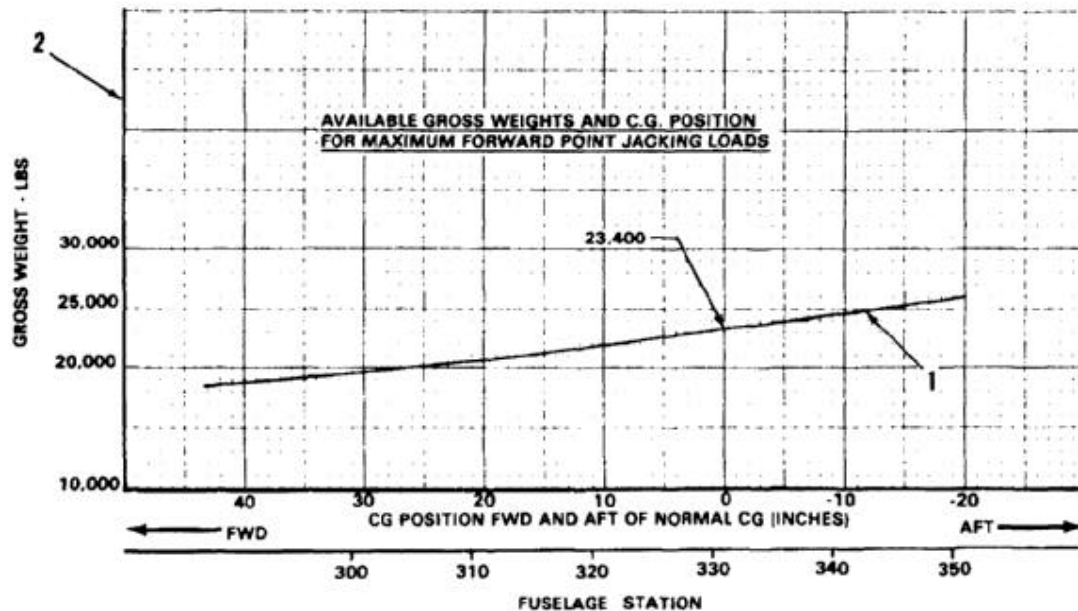
**CAUTION**

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.

**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.

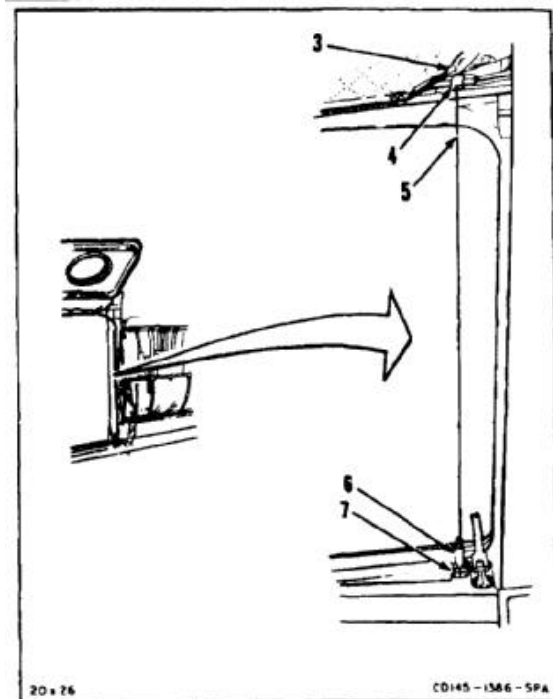


**NOTE**

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

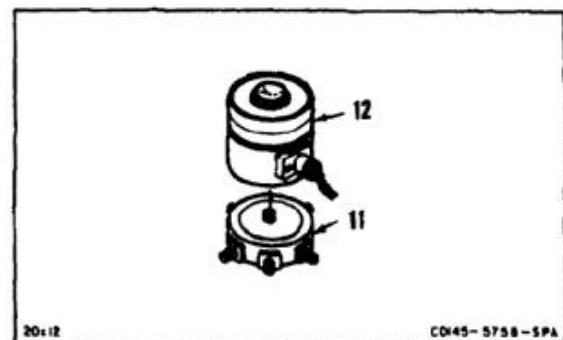
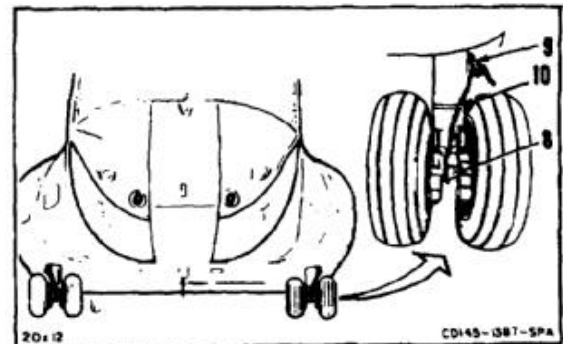
**SECURE PLUMB BOB**

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**

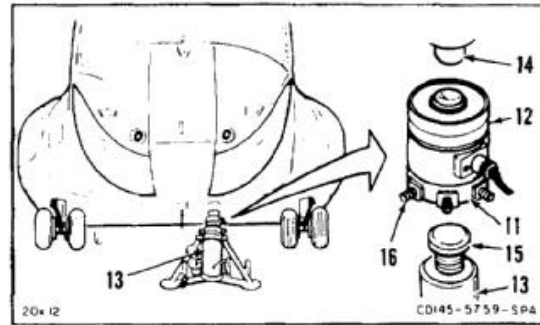
Do not let tiedown cable press against brake tubing. Tubing can be damaged.

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.

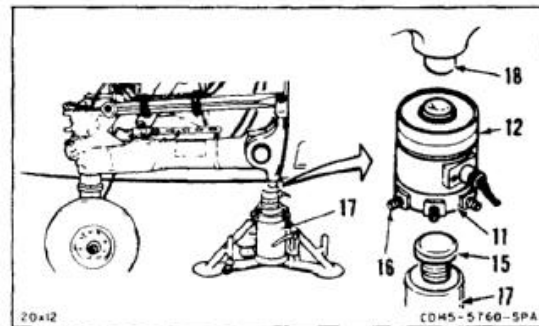




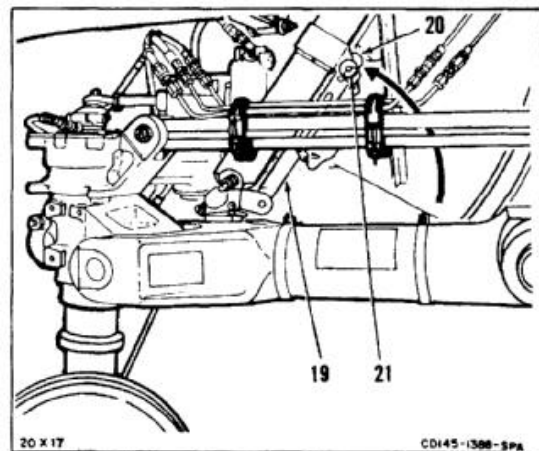
7. Set jack (13) under forward fuselage jack pad (14). Set adapter (11) and cell (12) on jack.
8. Secure adapter (11) to threaded extension (15) with six screws (16). Raise threaded extension by hand to put cell (12) against pad (14).



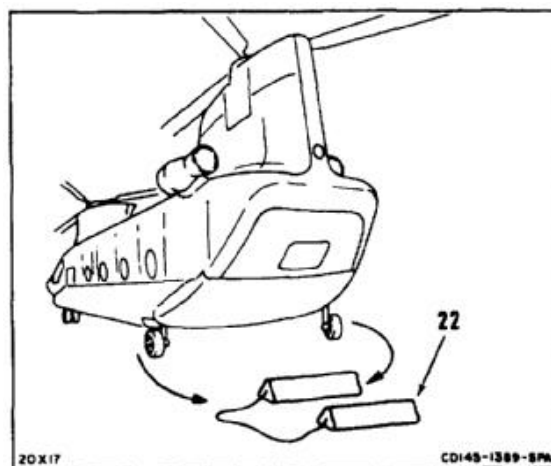
9. Set a jack (17) under each aft fuselage jack pad (18). Set adapter (11) and cell (12) on each jack.
10. Secure adapter (11) to threaded extension (15) with six screws (16). Raise threaded extension by hand to put cell (12) against pad (18).



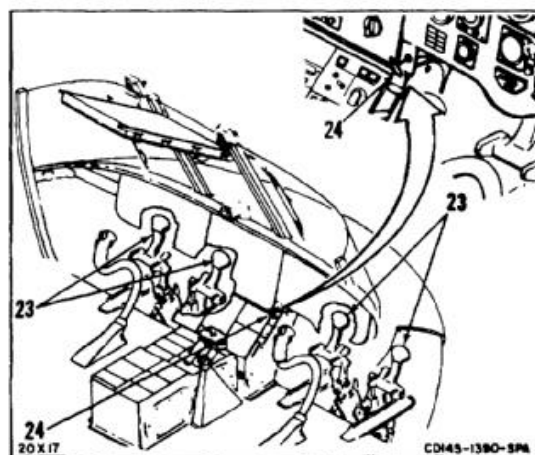
11. Release static lock (19) from stowed position on each aft landing gear. Secure it to lug (20) with pin (21). If needed, jack gear until lock can be secured.



12. Remove chocks (22) from aft wheel.

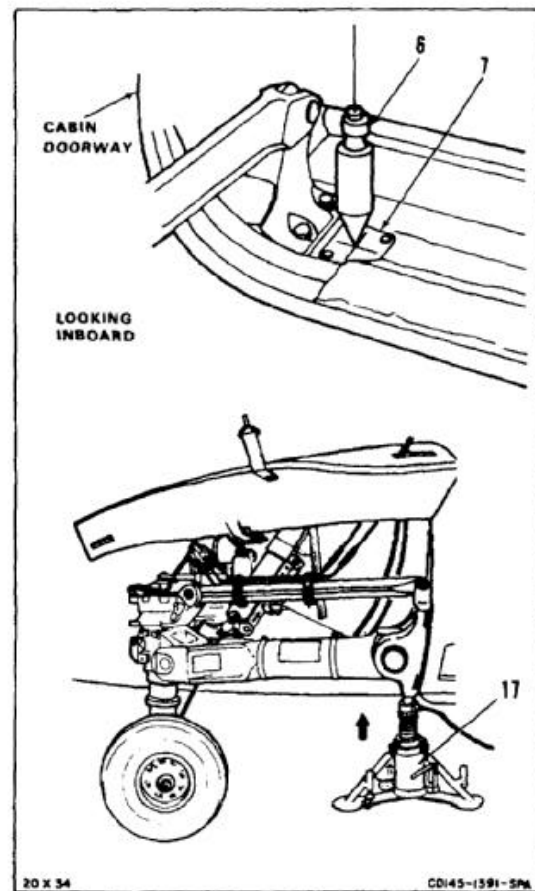


13. Release parking brakes by pressing pilot's or copilot's brake pedals (23). Brake handle (24) will release.



**WEIGH HELICOPTER**

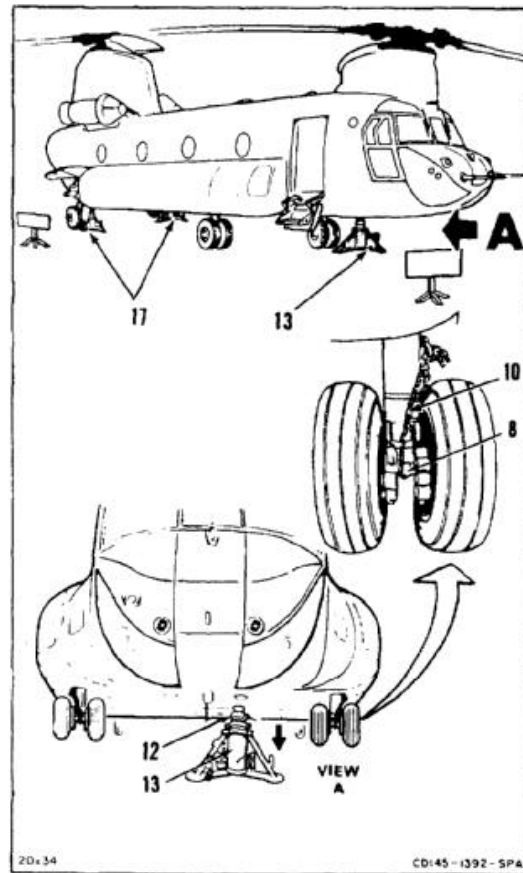
14. Have helper stand outside the cabin doorway to watch plumb bob (6) and plate (7).
15. Raise both aft jacks (17) together **1 inch** at a time. Raise them until helicopter is level. Helicopter is level when point of plumb bob (6) is directly over cross point of guide lines on plate (7).
16. Record weight supported by each load cell. Refer to instructions in weighing kit.



**LOWER HELICOPTER****CAUTION**

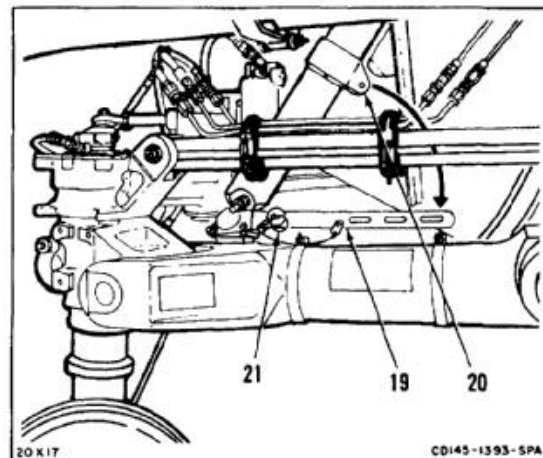
Do not lower aft jacks first. Damage to structure can result.

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.

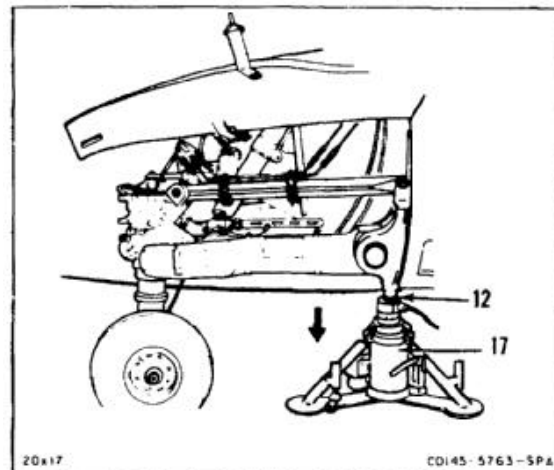
**CAUTION**

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

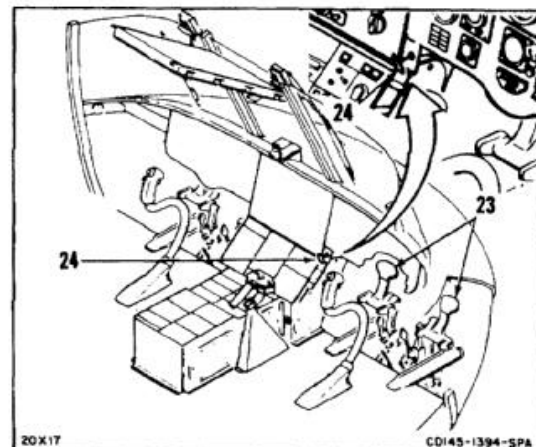
19. Lower both aft landing gear evenly until wheels touch ground. Release static gear lock (19) from lug (20) on each gear. Secure in stowed position with pin (21).



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.



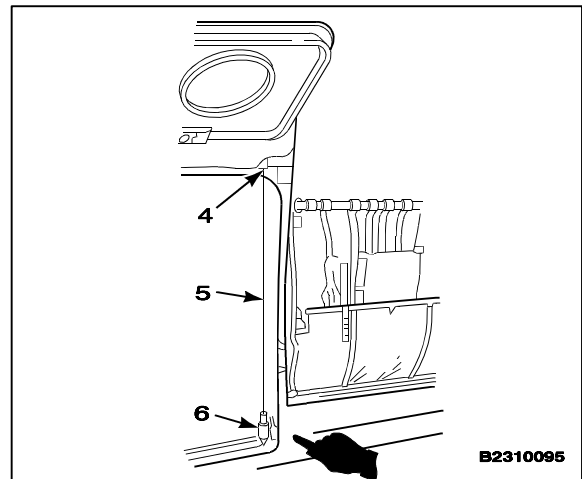
21. Set parking brakes by pressing pilot's brake pedals (23) and pulling handle (24). Release pedal.



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

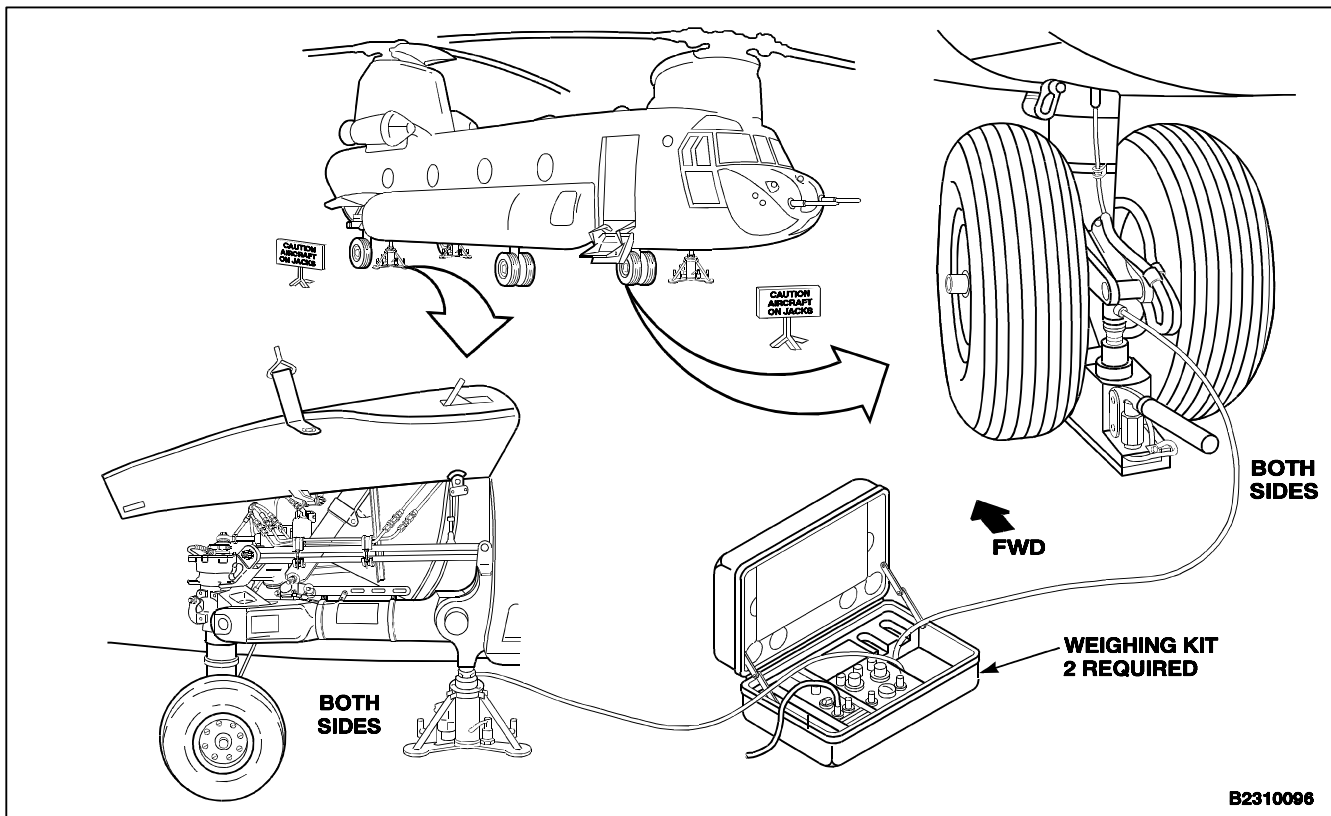
**Equipment Condition:**

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.

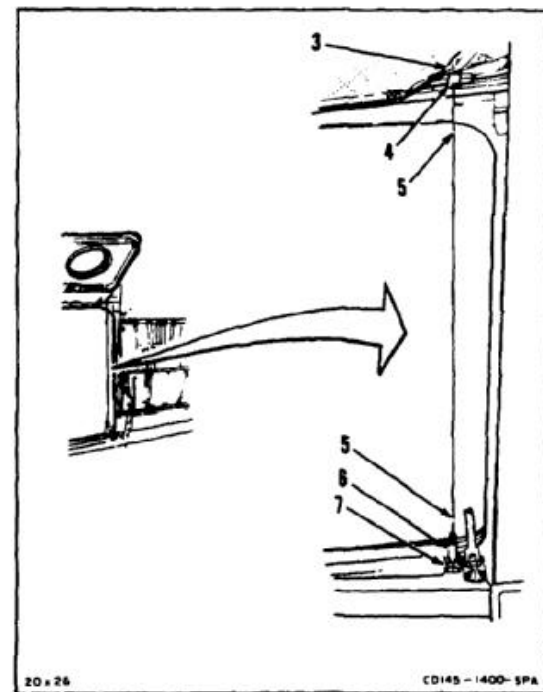
1. Make sure there will be clearance for blades (1) after jacking. Make sure cargo ramp (2) is closed.

**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**

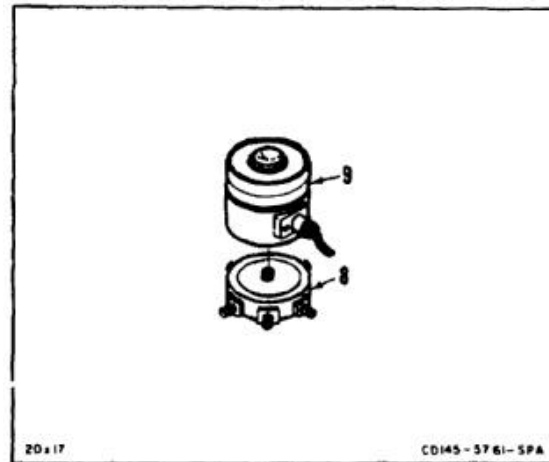
Refer to TM 55-1500-342-23 for additional information on helicopter weighing.



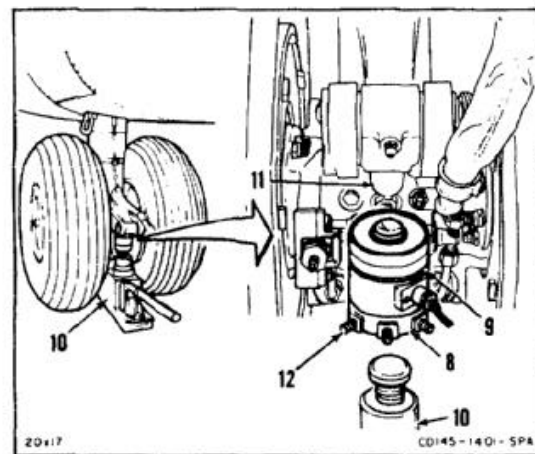


**POSITION JACKS**

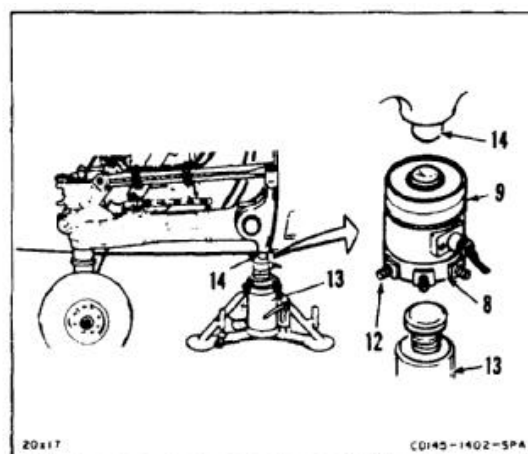
4. Install an adapter (8) on each of four weighing cells (9). Adapters and cells are part of weighing kit.



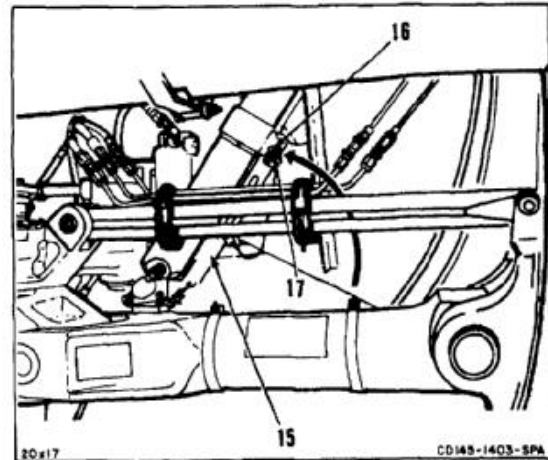
5. Set a jack A5 (10) under each forward landing gear jack pad (11). Set adapter (8) and cell (9) on each jack.
6. Secure adapter (8) to threaded extension of jack (10) with six screws (12). Raise extension by hand to put cell (9) against pad (11).



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).



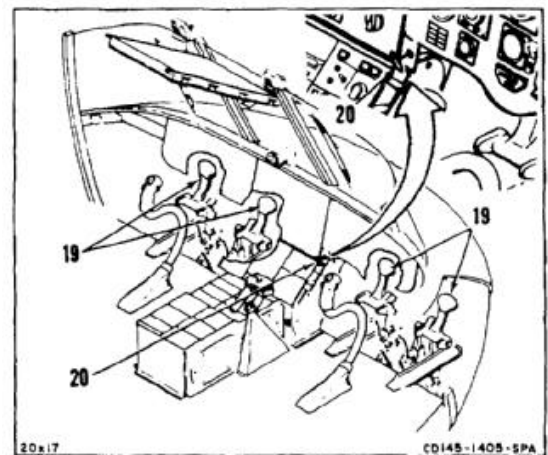
9. Release static lock (15) on each aft landing gear from stowed position. Secure it to lug (16) with pin (17). If needed, jack gear until lock can be secured.



10. Remove chocks (18) from wheels.

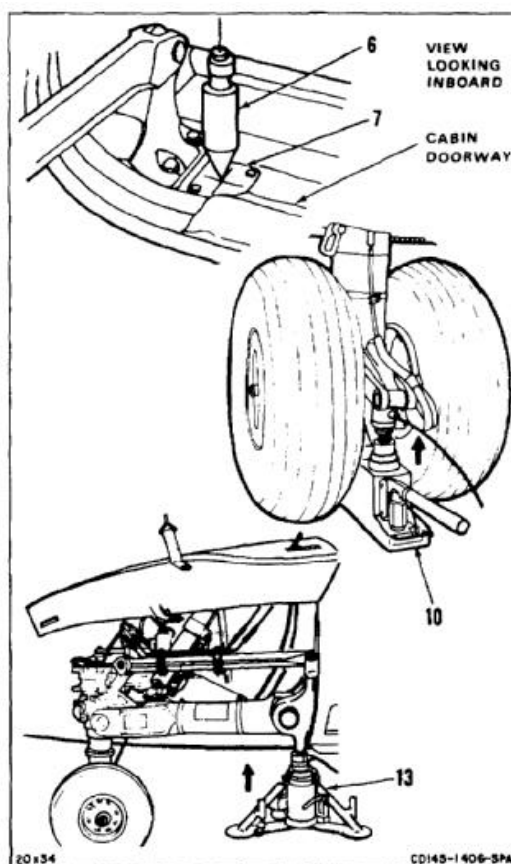


11. Release parking brakes by pressing pilot's or copilot's brake pedals (19). Brake handle (20) will release.



**WEIGH HELICOPTER**

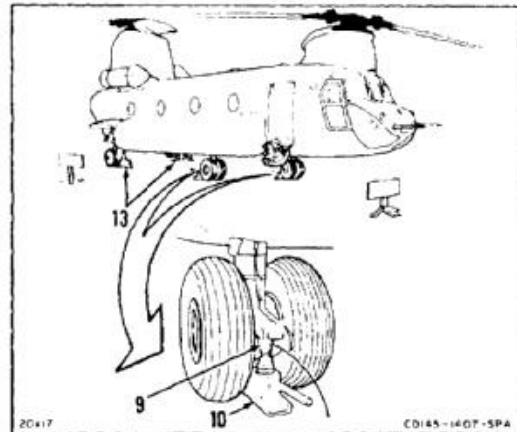
12. Have a helper stand outside cabin doorway to watch plumb bob (6) and plate (7).
13. Raise both forward jacks (10) and both aft jacks (13) together. Raise them **1 inch** at a time, until all tires are off the ground.
14. Raise each jack (10 and 13) as needed to level helicopter. Helicopter is level 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**

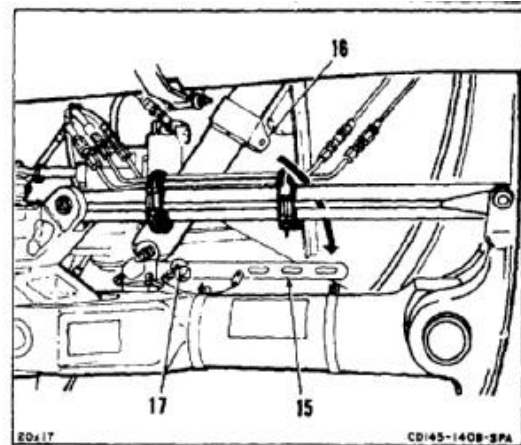
Do not lower aft jacks first. Damage to structure can result.

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.

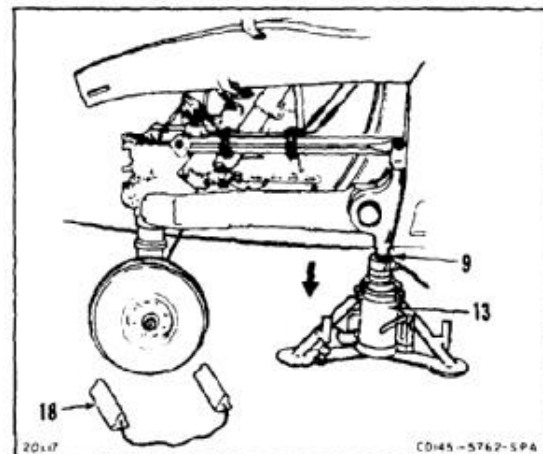
**CAUTION**

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

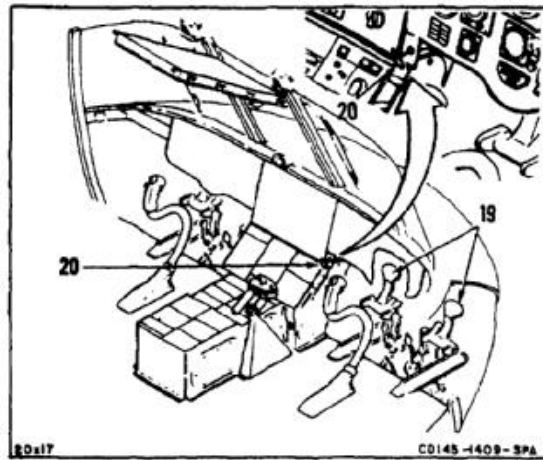
17. Lower both aft landing gear evenly until wheels touch ground. Release static lock (15) from lug (16) on each gear. Secure in stowed position with pin (17).



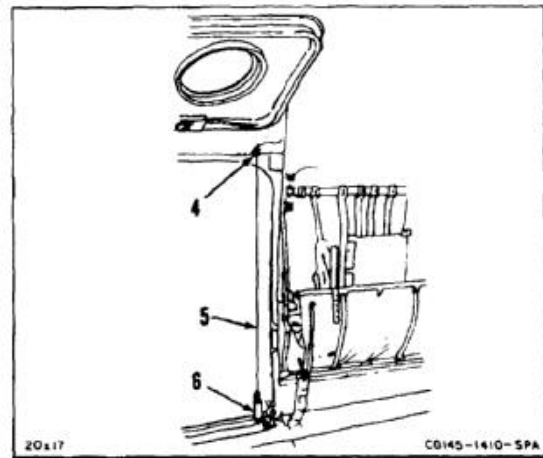
18. Lower both aft jacks (13) evenly. Lower them **1 inch** at a time, until cells (9) are clear of pads. Move jacks and cells away from helicopters.
19. Place chocks (18) at either aft wheel.



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:**

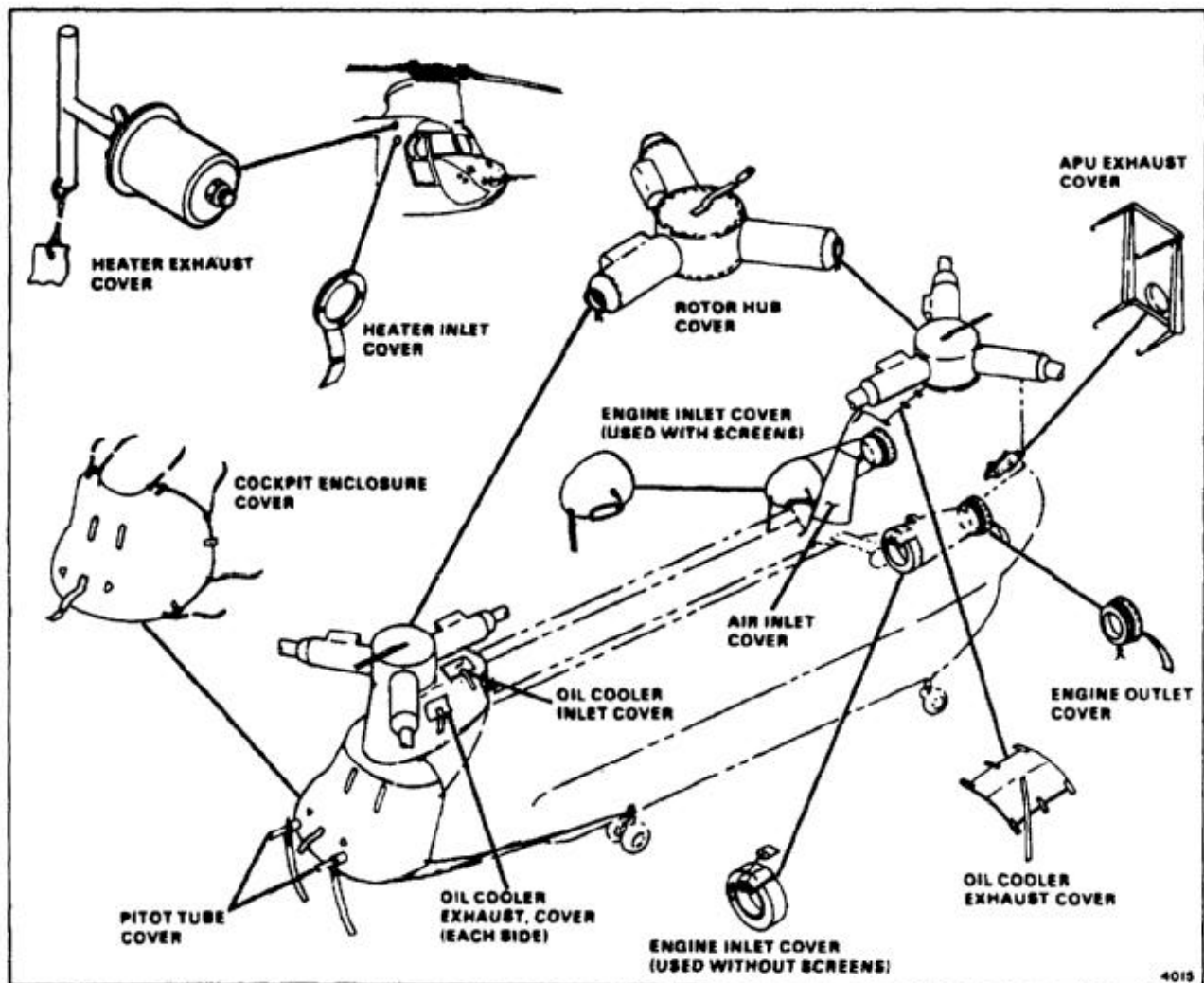
None

**Personnel Required:**

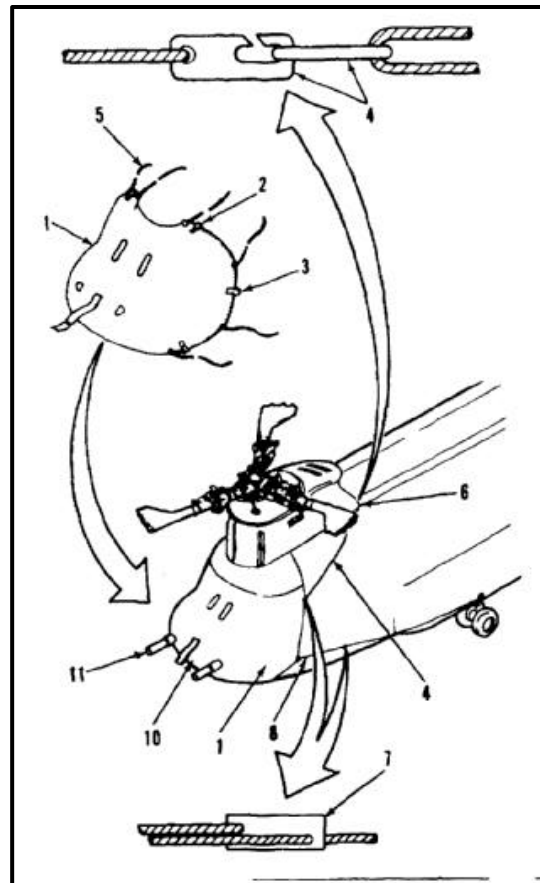
Medium Helicopter Repairer (2)

**Equipment Condition:**

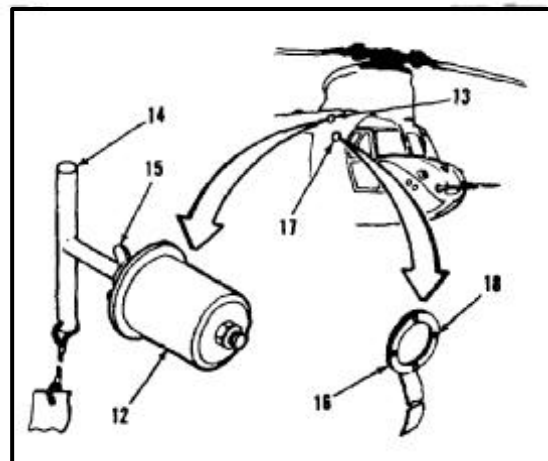
As Required



1. 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).

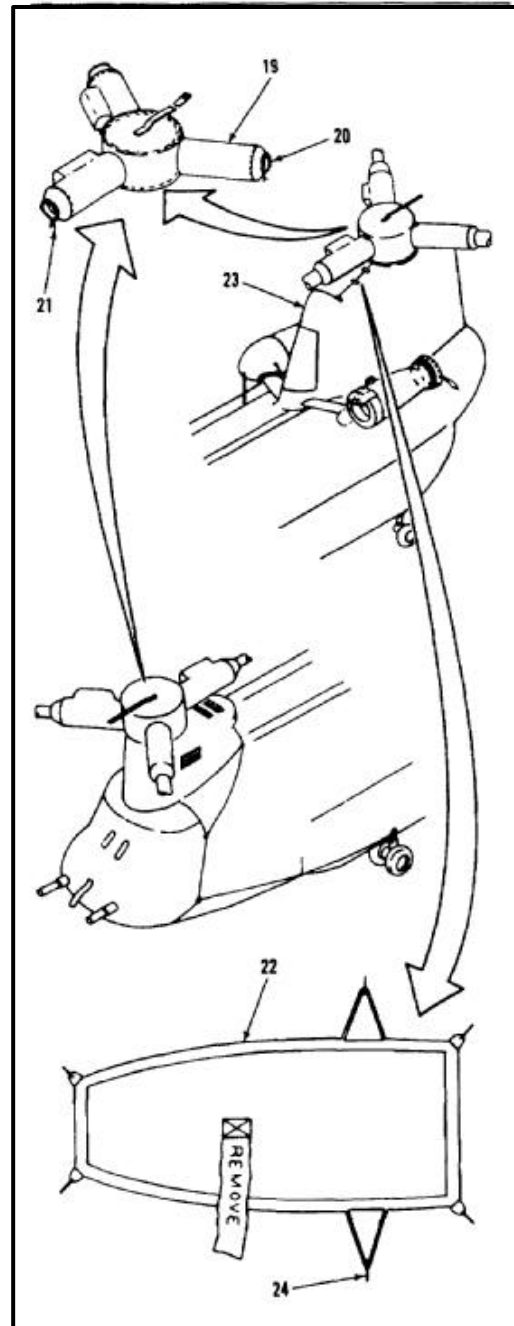


4. Position forward and aft rotary-wing head covers (T58) (19) on helicopter. Close slide fasteners (20). Tie draw cords (21).

**NOTE**

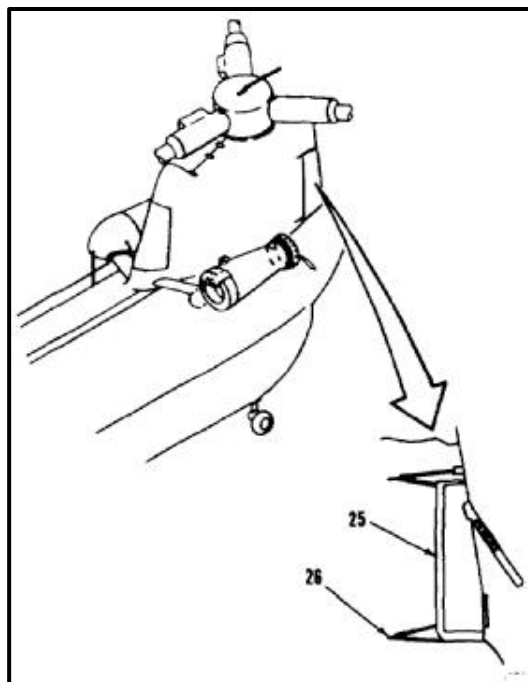
Arms of covers may be installed on arms of rotary-wing head in any position.

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

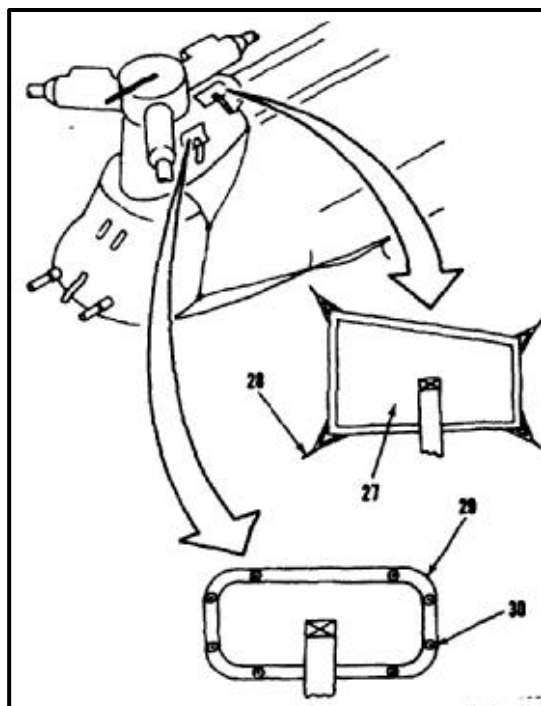




6. Install APU exhaust cover (T61) (25). Secure cover. Use four hooks (26).

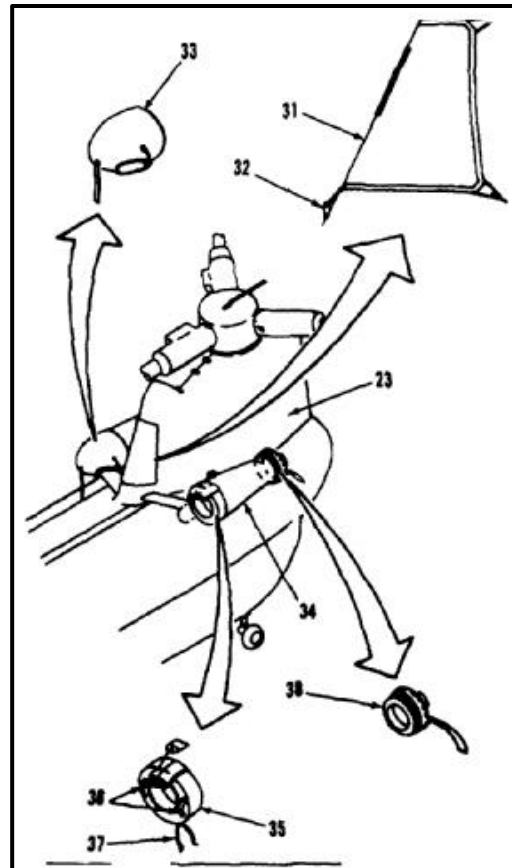


7. Install oil cooler inlet cover (T66) (27). Secure cover. Use four hooks (28).
8. Install oil cooler exhaust covers (T67 and T68) (29). Secure covers. Use eight snap fasteners (30).



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

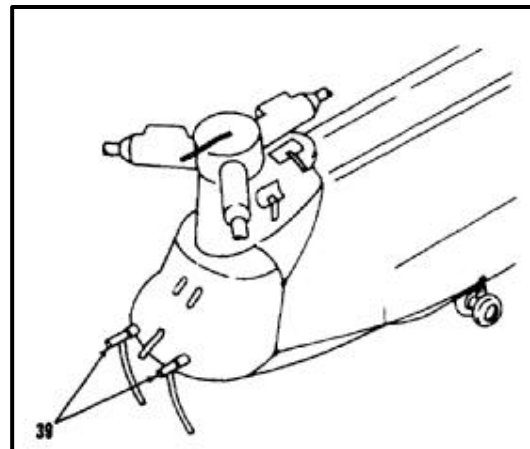
9. Install air inlet cover (T76) (31) on pylon (23). Secure cover. Use five hooks (32).
10. Install engine inlet covers (33) or (35) as follows:
  - a. Install covers (T131) (33) if helicopter has inlet screens. Position cover over inlet of engine (34).
  - b. Install covers (T132) (35) if helicopter 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:**

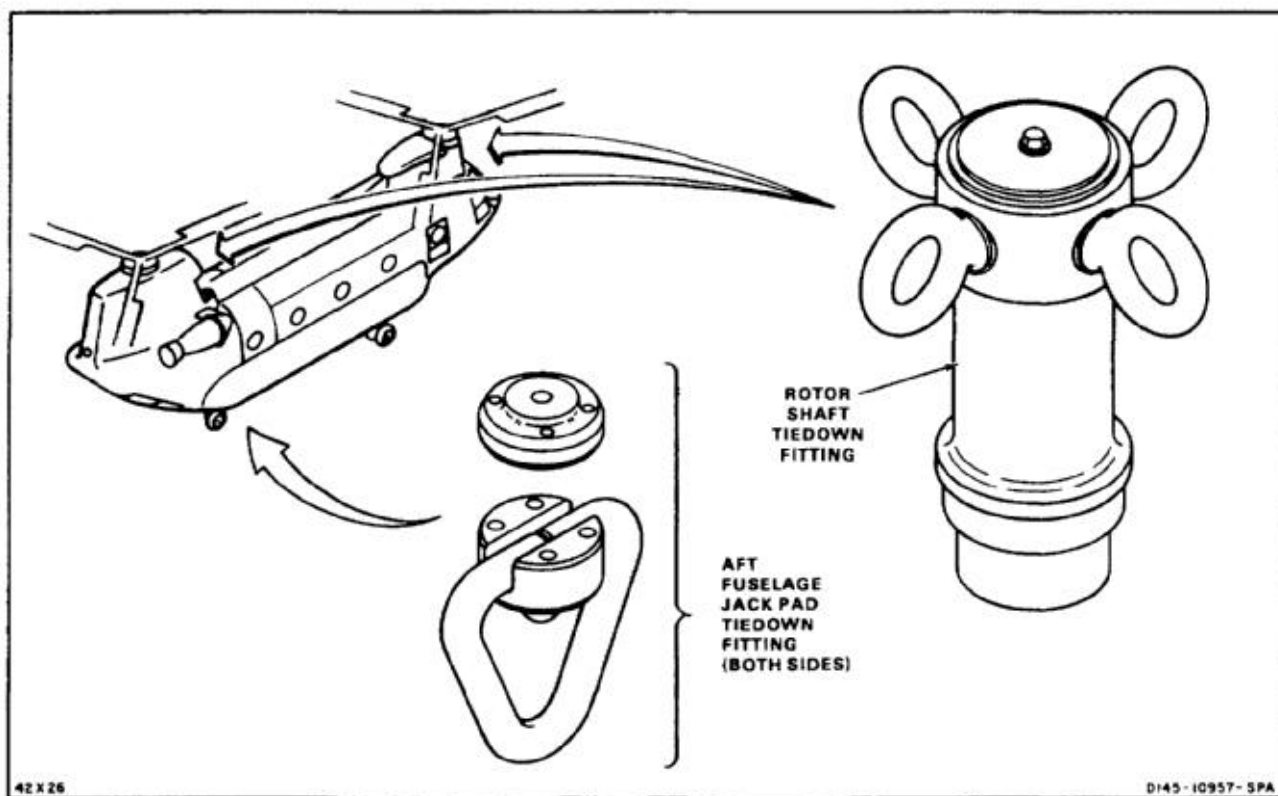
None

**Personnel Required:**

Medium Helicopter Repairer  
Inspector

**Equipment Condition:**

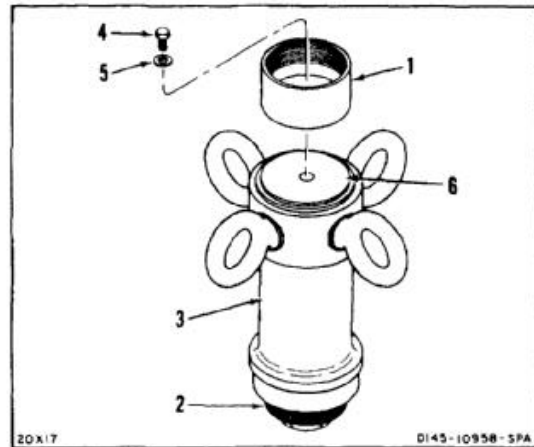
Battery Disconnected (Task 1-39)  
Electrical Power Off  
Forward Transmission Fairing Work Platforms Open  
(Task 2-2)  
Aft Pylon Work Platforms Open (Task 2-2)



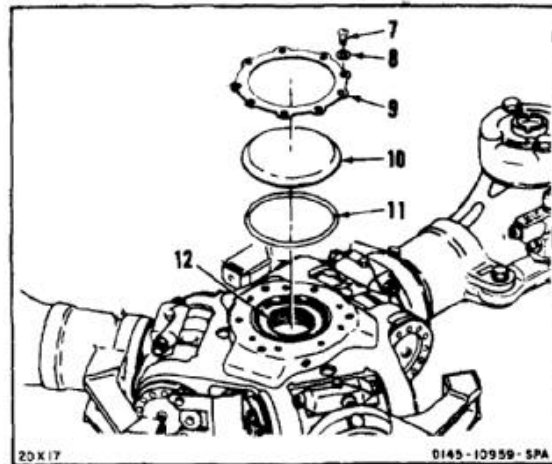
**INSTALL ROTOR SHAFT FITTINGS****NOTE**

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

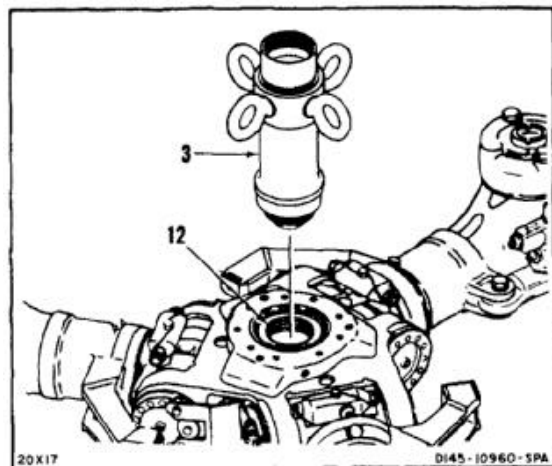
1. Remove cover (1) from threads (2) at bottom of fitting (3).
2. Remove bolt (4) and washer (5) from top of fitting (3).
3. Install cover (1) on plate (6) at top of fitting (3). Install bolt (4) and washer (5).



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



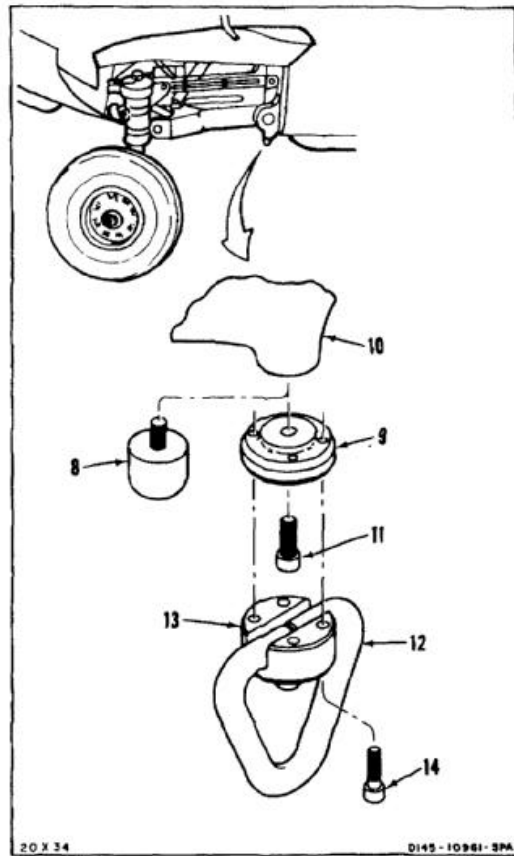
5. Install fitting (3) in rotor shaft (12).

**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:**

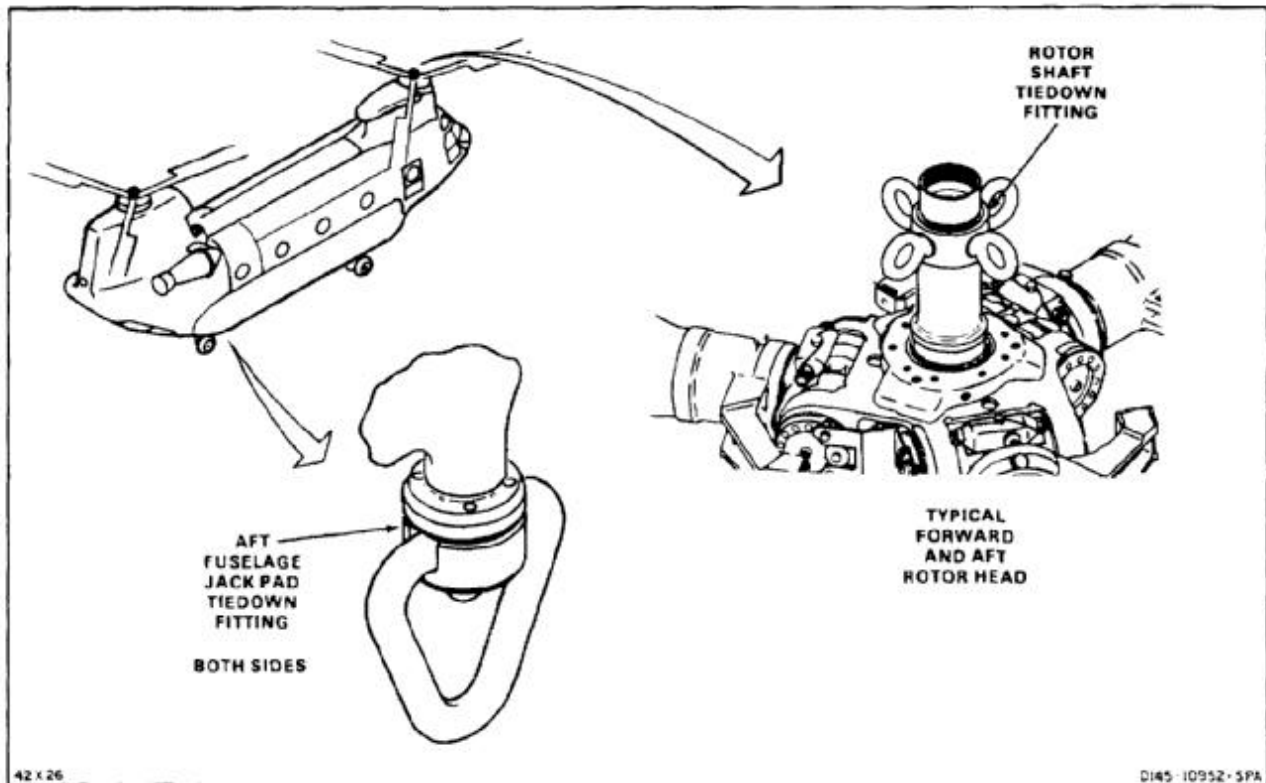
None

**Personnel Required:**

Medium Helicopter Repairer  
 Inspector

**Equipment Condition:**

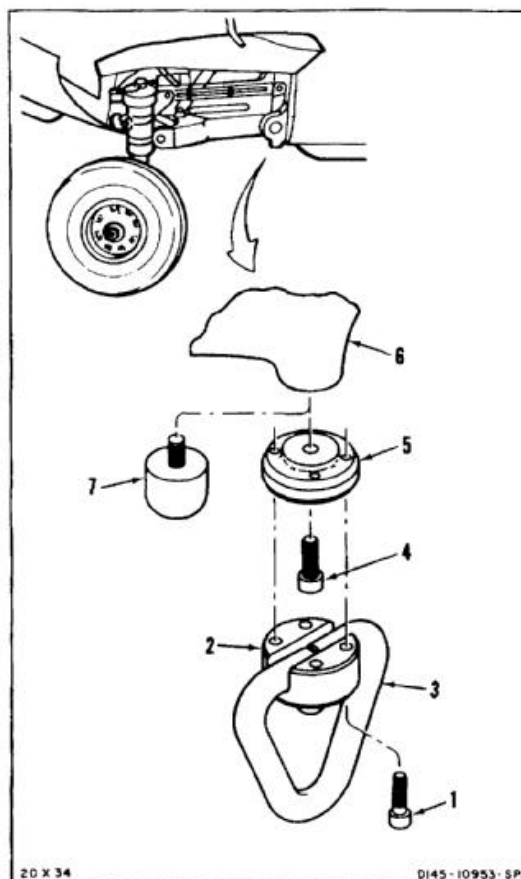
Battery Disconnected (Task 1-39)  
 Electrical Power Off  
 Forward Transmission Fairing Work Platforms Open  
 (Task 2-2)  
 Aft Pylon Work Platforms Open (Task 2-2)



**REMOVE JACK PAD FITTINGS****NOTE**

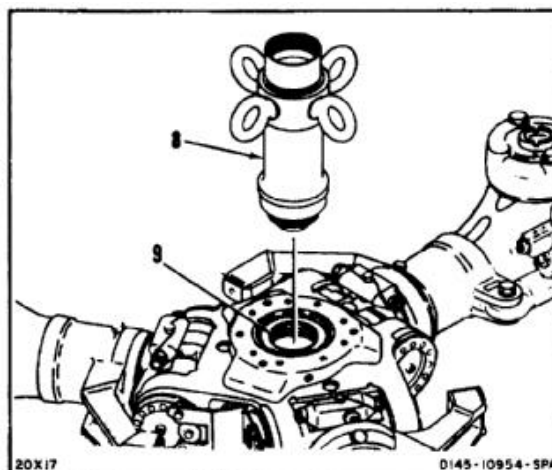
Remove fitting from left or right aft fuselage jack pad base in same way. Right side shown.

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**

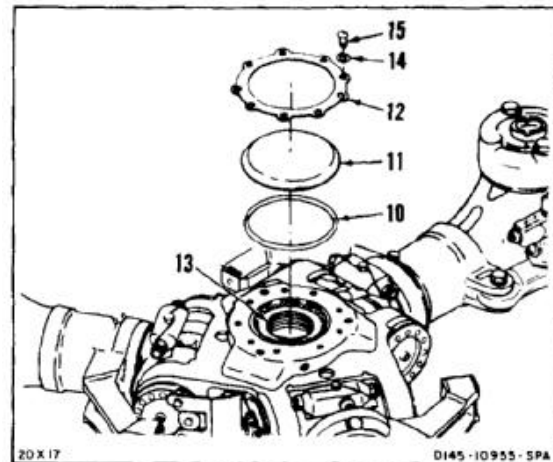
Remove fitting from forward or aft rotor shaft in same way.

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

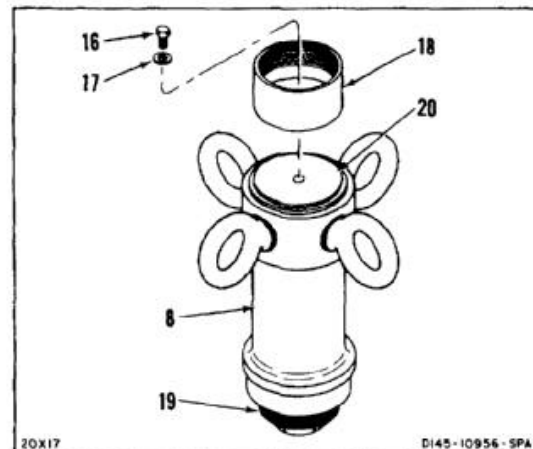


**1-34 REMOVE TRANSPORTATION TIEDOWN KIT (Continued)****1-34**

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**



## 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)

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

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**

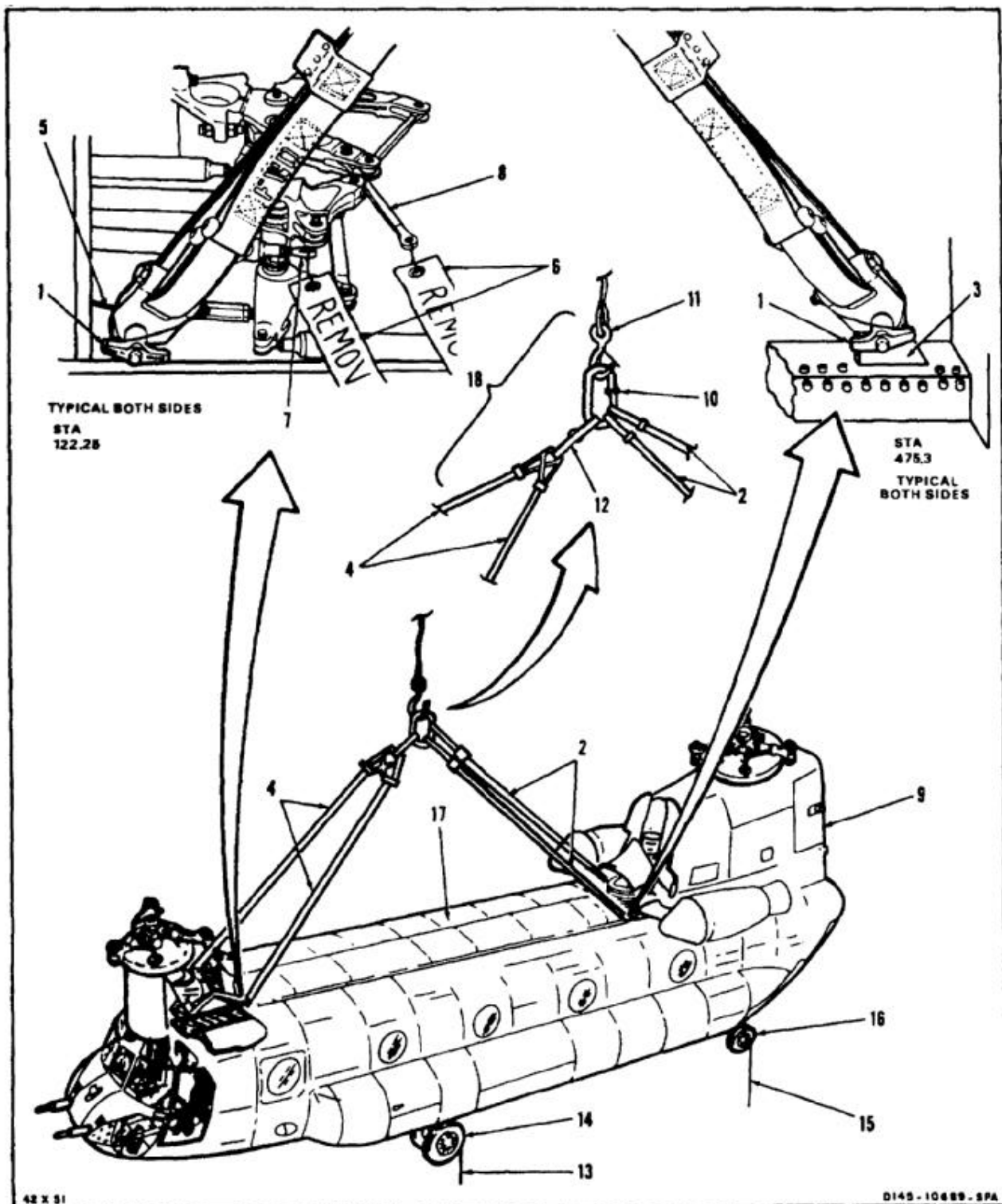
Personnel must be clear of area under helicopter during hoisting.

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).



END OF TASK

1-124

**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:**

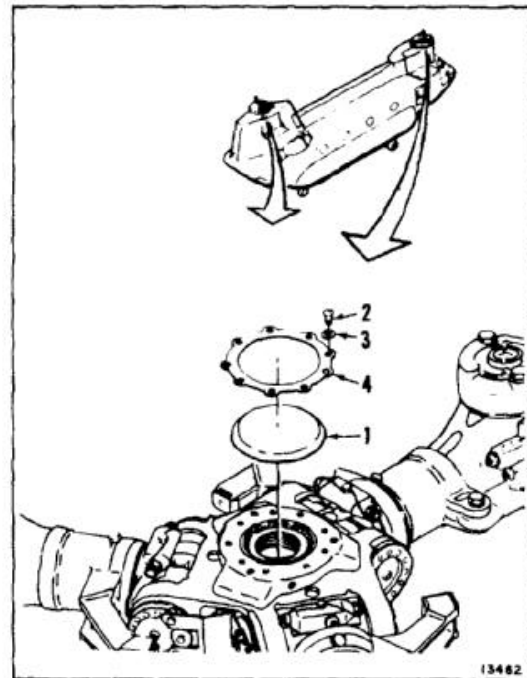
None

**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**

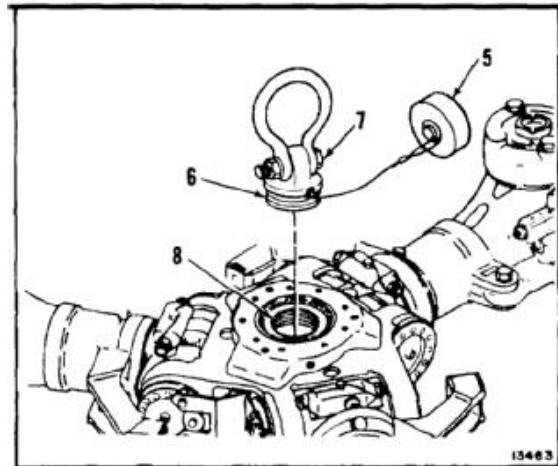
Procedure is same to install ring on forward or aft rotor head. Forward head shown.

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).

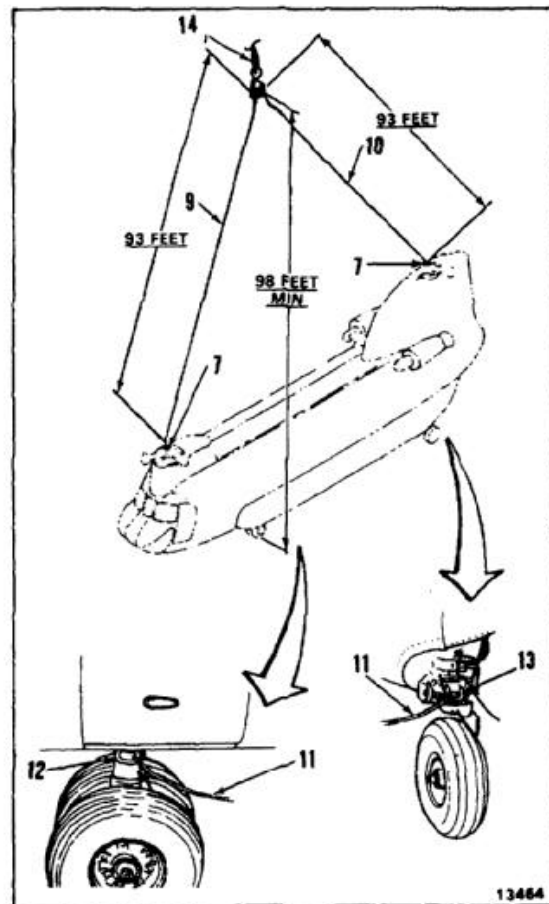
**INSPECT****HOIST HELICOPTER**

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.

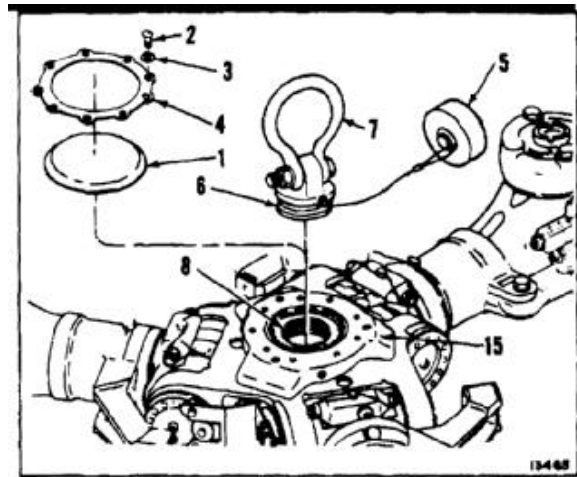
4. Attach guide lines (11) to shackles (12 and 13) at forward and aft landing gear. Have helpers hold lines.
5. Attach cables (9 and 10) to hoist (14). Slowly take up cable slack with hoist.
6. Slowly raise helicopter from ground. Hold it steady with guide lines (11).
7. Move helicopter slowly to desired 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

## 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)

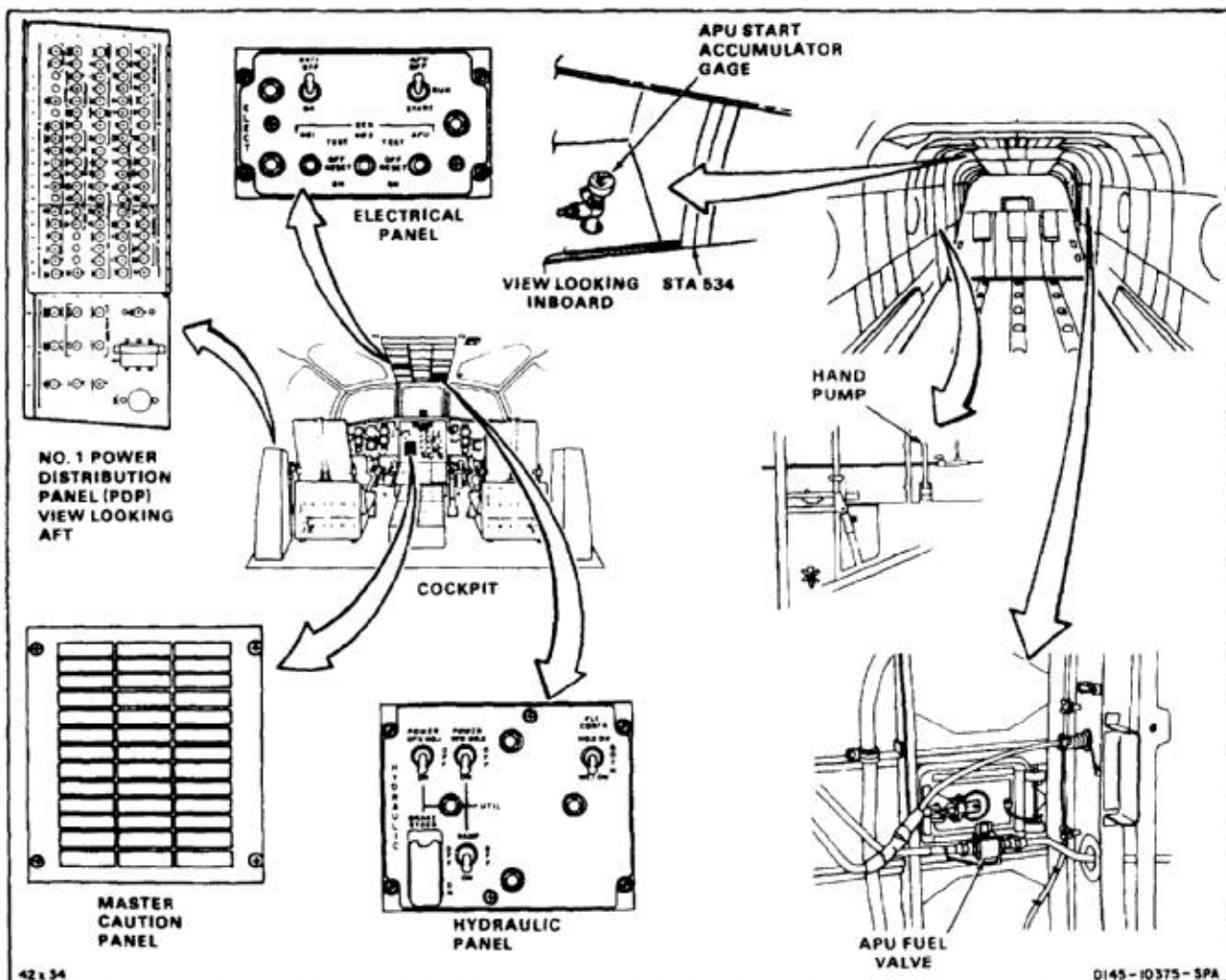
**WARNING**

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

**CAUTION**

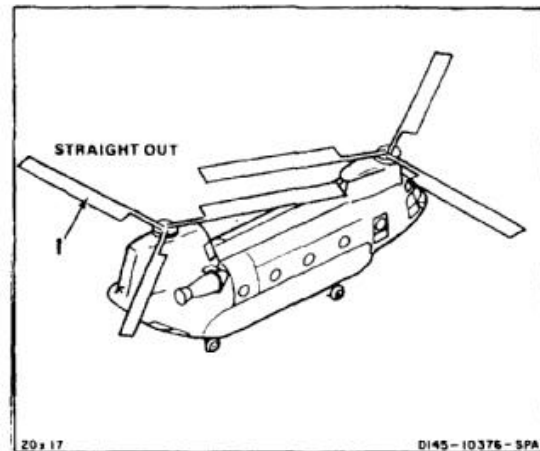
Service life of gyroscopes can be reduced under power. Open the following circuit breakers when applying power, unless noted:

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



**START APU**

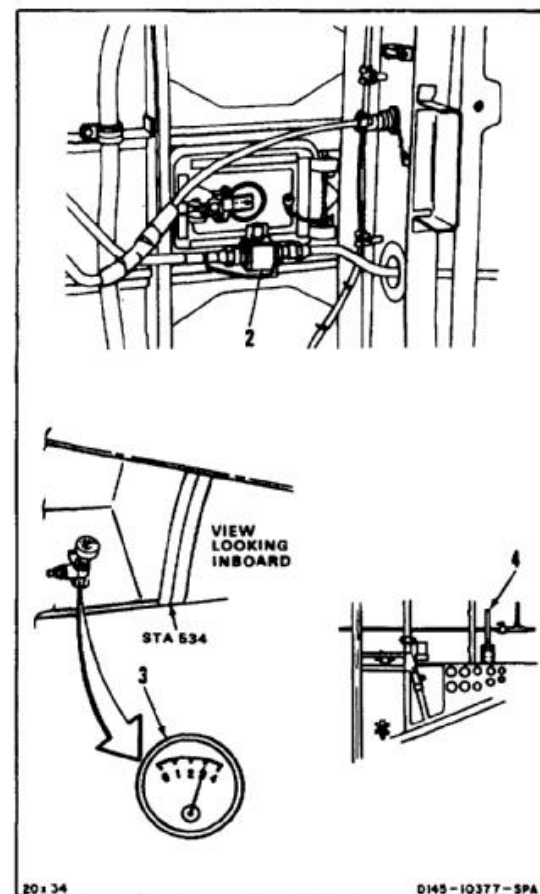
1. Pull rotor blades (1) around so that one aft or forward blade points straight out **90°** from fuselage.



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.

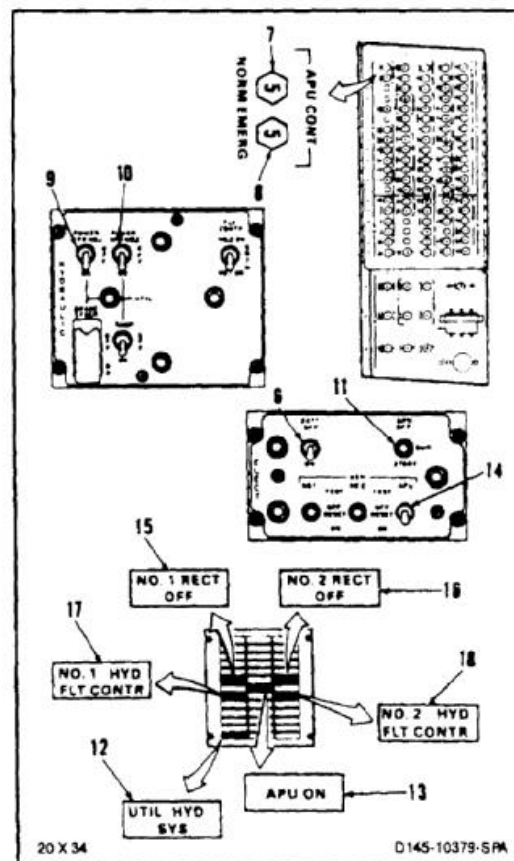




4. Have helper stand behind helicopter to watch for fire at APU exhaust (5) during start.

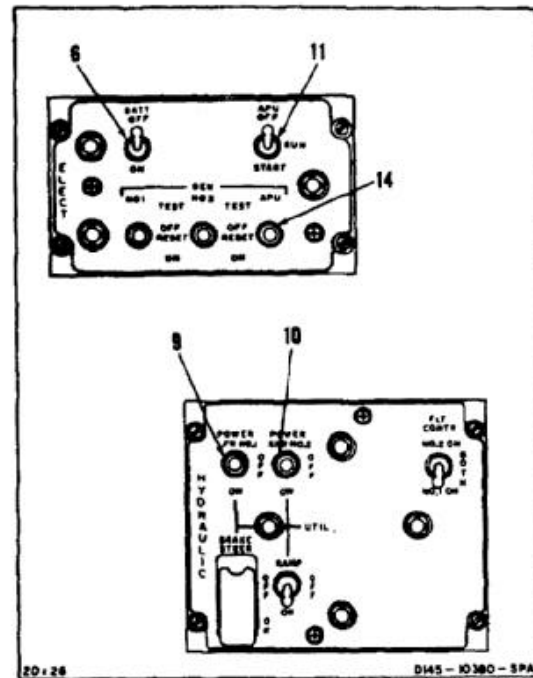


5. Check that APU CONT NORM and EMERG circuit breakers (7 and 8) are closed.
6. Check that POWER XFR NO. 1 and POWER XFR NO. 2 switches (9 and 10) are at OFF.
7. Set BATT SWITCH (6) to ON.
8. Set APU switch (11) to RUN for **3 to 5 seconds**, then to START for at least **2 seconds**. Release switch to 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

## 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:**

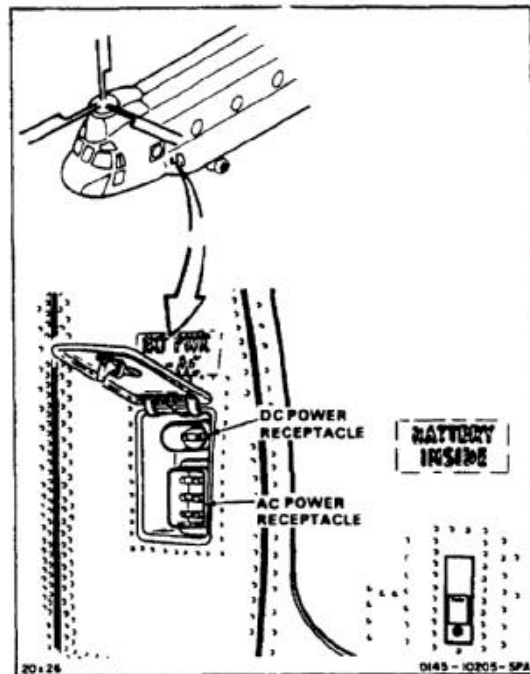
Aircraft Electrician

**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)



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.)

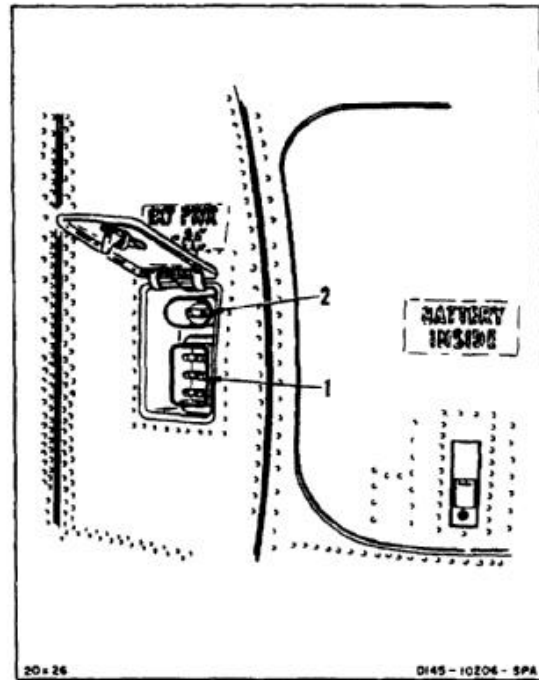
**NOTE**

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

## 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:**

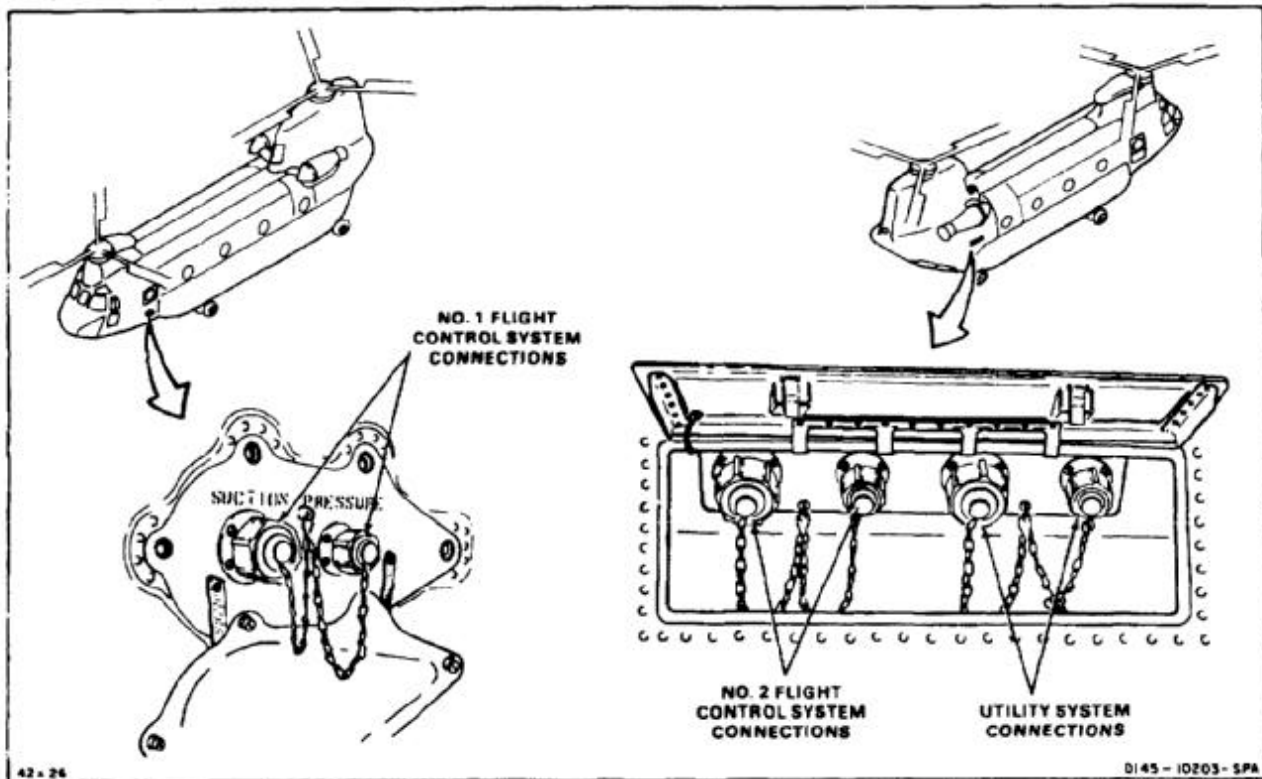
Battery Disconnected (Task 1-39)  
Electrical Power Off  
Ground Test Connection Access Cover Removed for  
No. 1 Flight Control Hydraulic System and Panel  
Open for No. 2 Flight Control and Utility Hydraulic  
Systems as Needed (Task 2-2)

**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**

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**

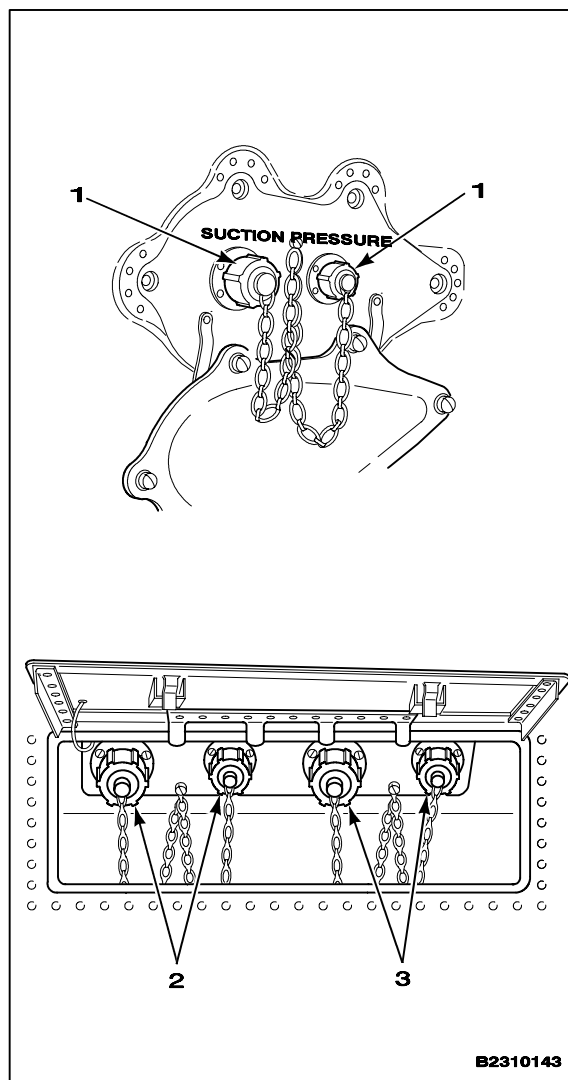
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**DISCONNECT POWER**

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

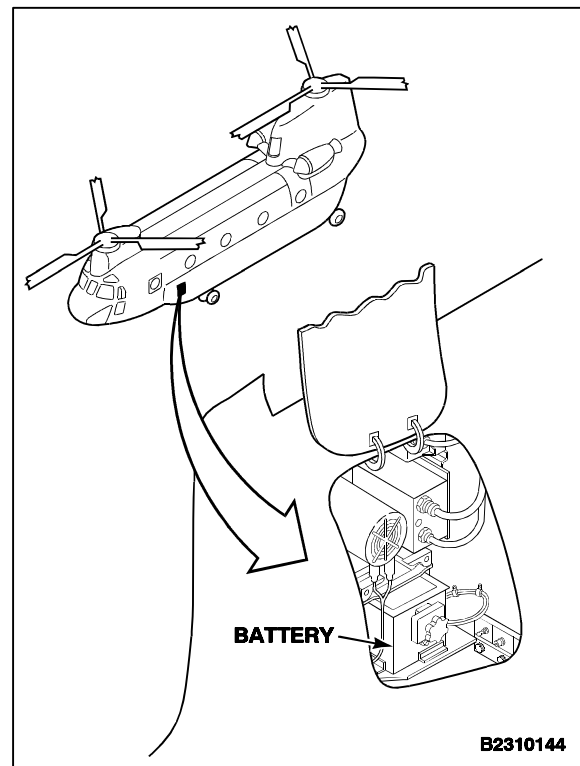
**Personnel Required:**

CH-47 Helicopter Repairer

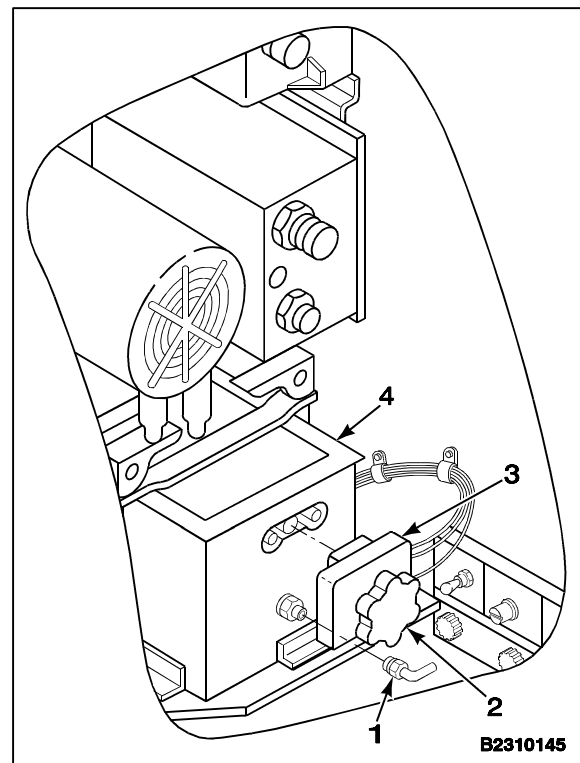
**Equipment Condition:**

Electrical Power Off

Electrical Equipment Access Door Open (Task 2-2)

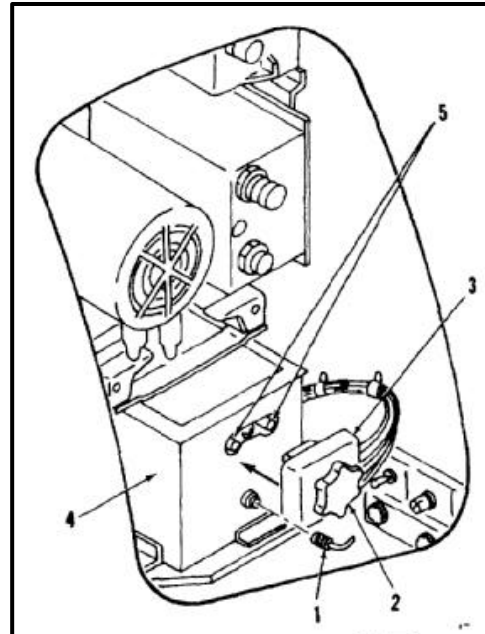
**DISCONNECT**

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



## 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:**

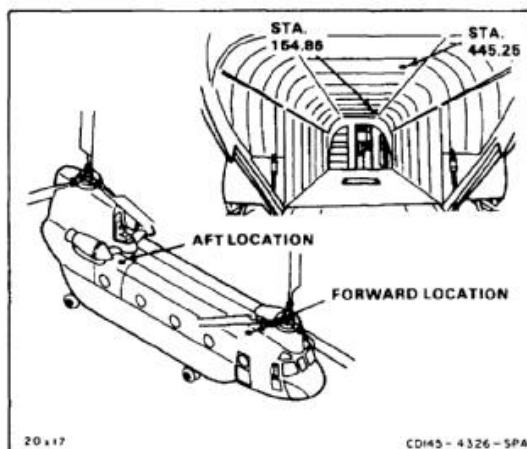
Medium Helicopter Repairer (5)  
Inspector

**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:**

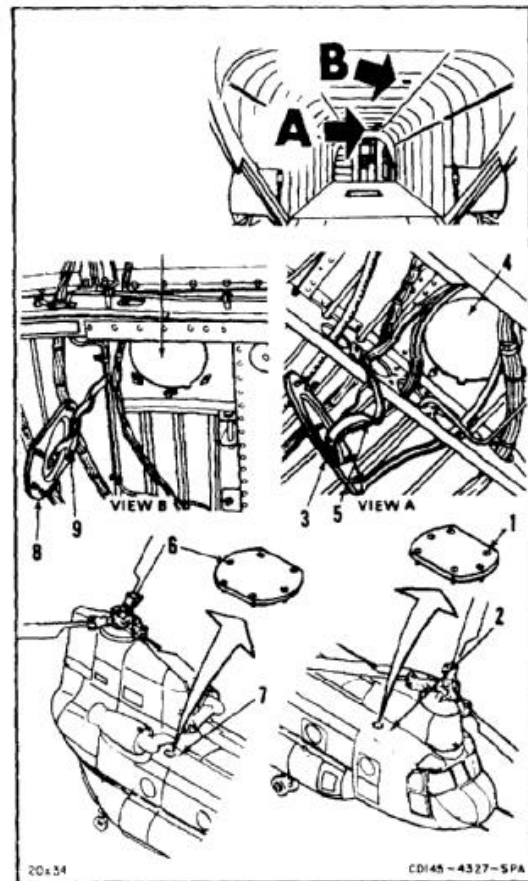
TM 55-1520-240-23P



**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).

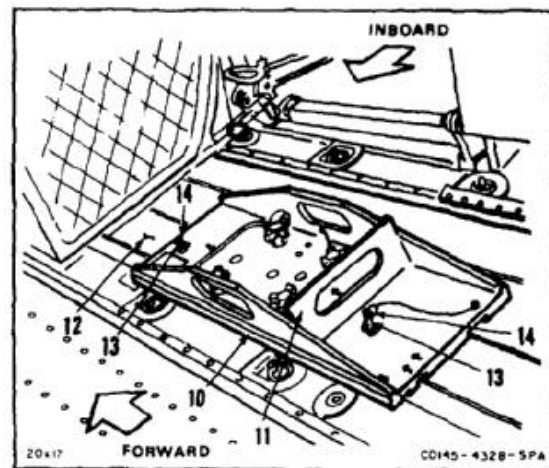


3. Position base plate (10) on cabin floor at sta. 154.86 for forward installation. Position base plate at station 445.25 for aft installation. Position plate so that support (11) is facing aft.

**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**

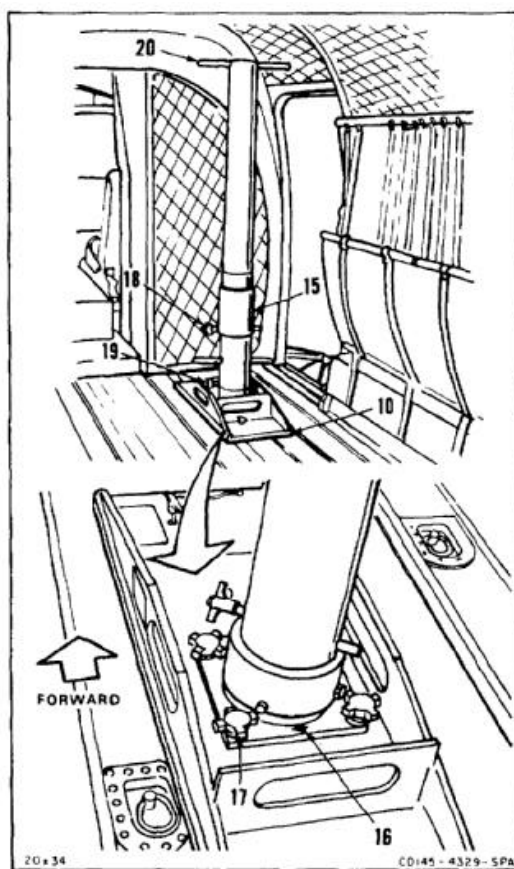
Upper and lower tubes make up cabin upright.

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

**WARNING**

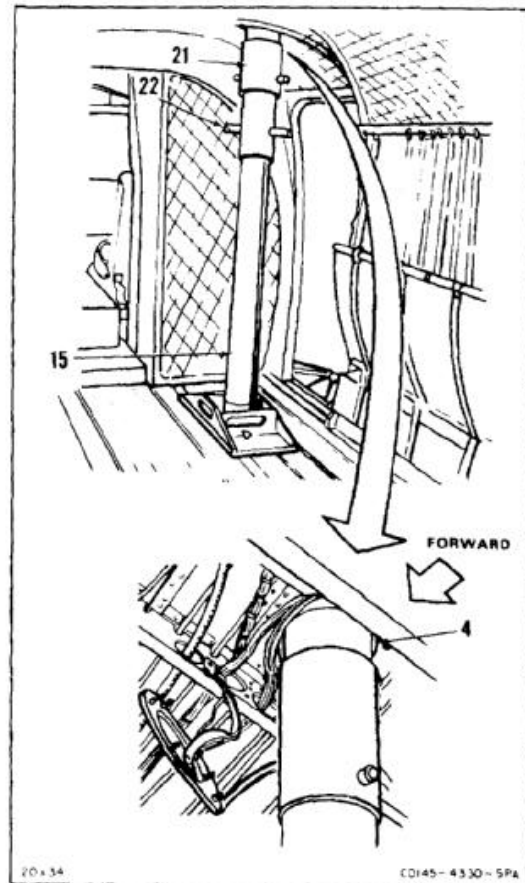
Do not align holes in cabin upright with fingers. Injury can occur. Use hand knobs.

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).

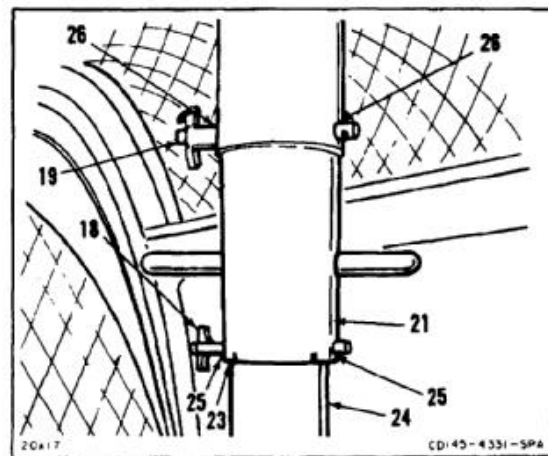


**1-40 INSTALL HOISTING UNIT (Continued)****1-40**

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).

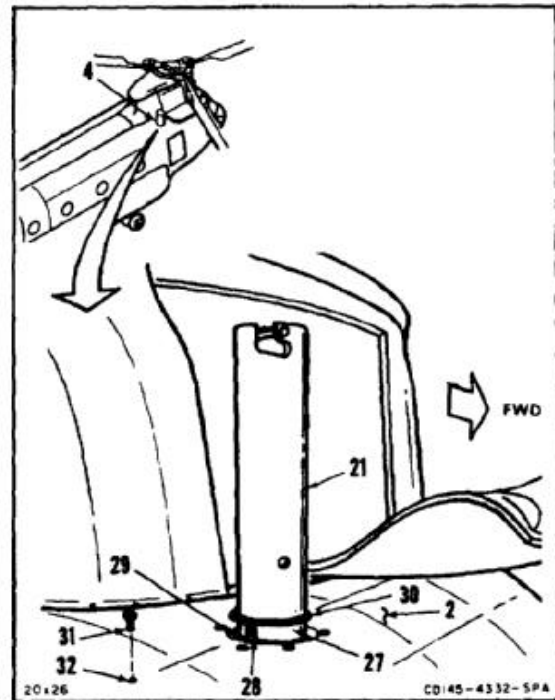


15. Position sleeve (27) over upper tube (21). Align guide bars (28) on sleeve with slots (29) in hole (4). Push sleeve in hole until lip (30) is against fuselage (2).

**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.

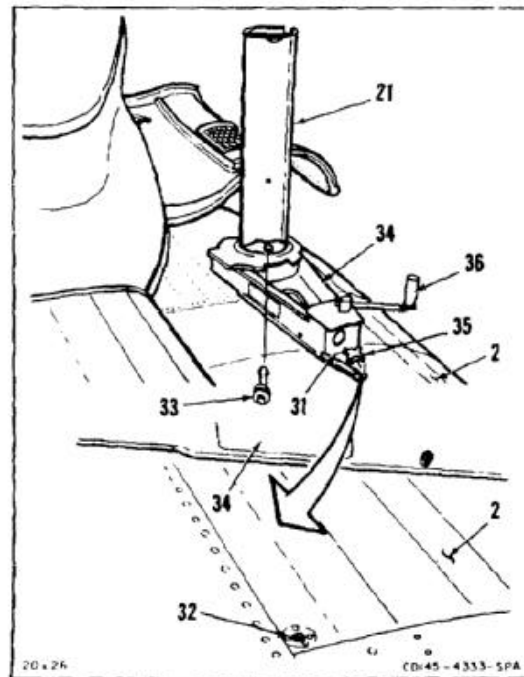


17. Remove quick-release pin (33) from azimuth control (34).
18. Position control (34) over tube (21) and lower control to fuselage (2).
19. Install quick-release pin (33) through control (34) and tube (21).
20. Position aft end of control (34) over threaded hole (32). Install captive screw (35) in hole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

**CAUTION**

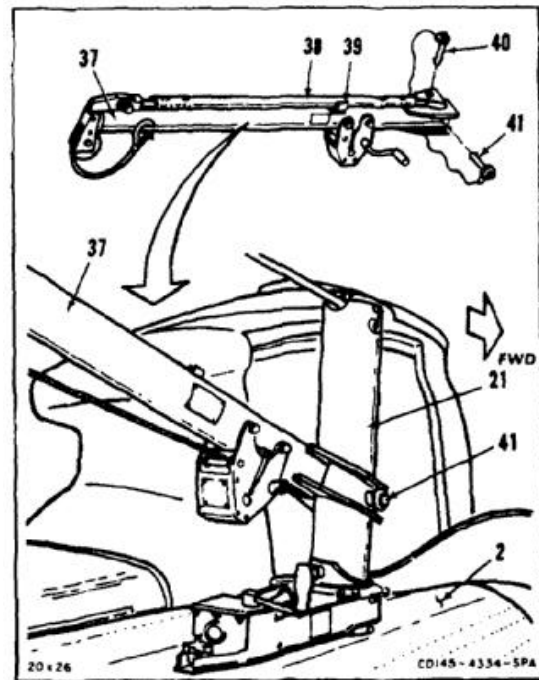
Upper tube must be returned to original position to ensure secure mast and boom installation. If tube is not in original position, mast and boom can slip out. Damage to equipment will result.

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

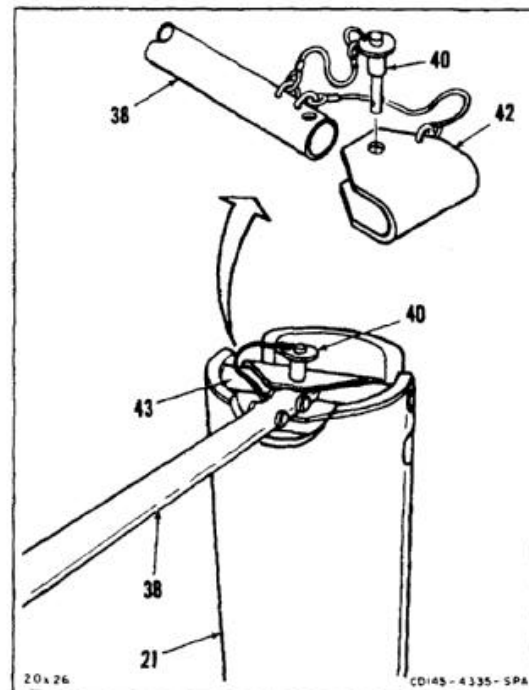


**1-40 INSTALL HOISTING UNIT (Continued)****1-40**

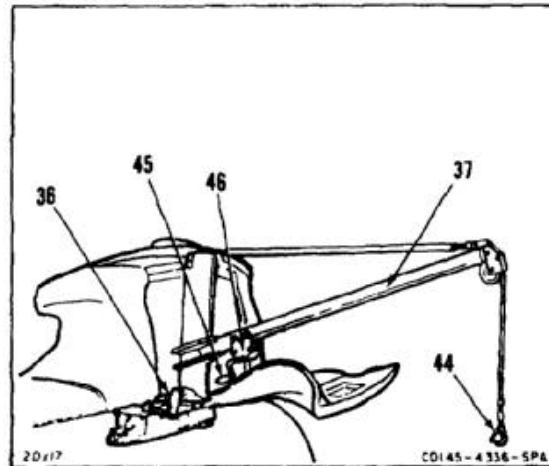
23. Have two helpers place jib boom (37) on top of fuselage (2).
24. Remove jib boom support tube (38) from bracket (39) on boom (37). Remove quick-release pin (40).
25. Remove quick-release pin (41).
26. Position boom (37) over upper tube (21). Align holes in boom and upper tube. Install quick-release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



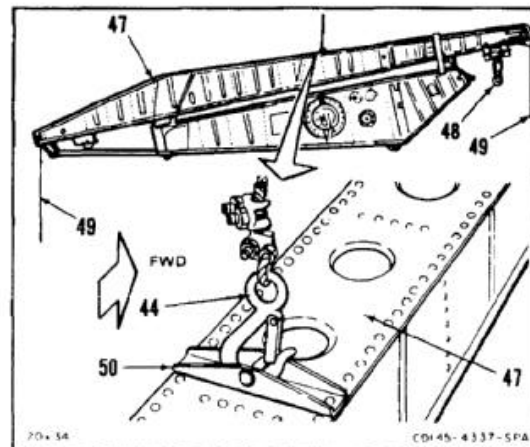
27. Remove strap (42) from support tube (38).
28. Position support tube (38) on top of upper tube (21). Position strap (42) over tube (43) in upper tube (21).
29. Install pin (40).



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).



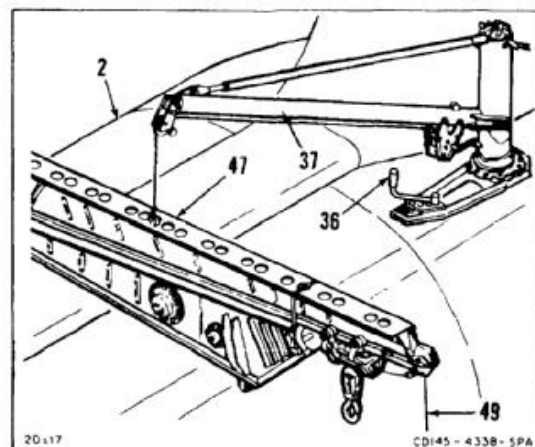
33. Have helpers position mast and boom (47) on ground beside helicopter under jib boom with trolley and hook (48) forward.
34. Attach rope guide lines (49) to both ends of mast and boom (47).
35. Attach jib boom hook (44) to bracket (50) on mast and boom (47). If hook does not fit, use a nylon or wire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



### CAUTION

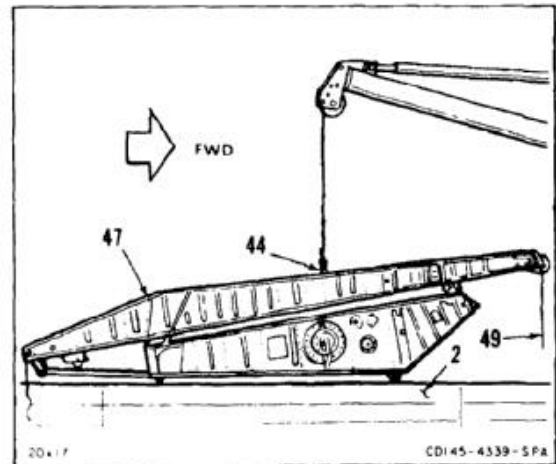
Raise mast and boom slowly and carefully to prevent damage which otherwise might result from mast and boom hitting helicopter.

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).

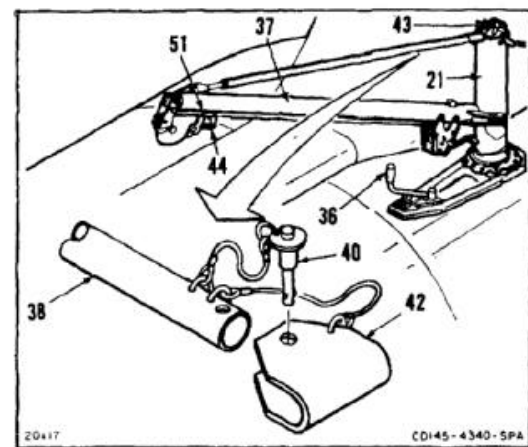


**1-40 INSTALL HOISTING UNIT (Continued)****1-40**

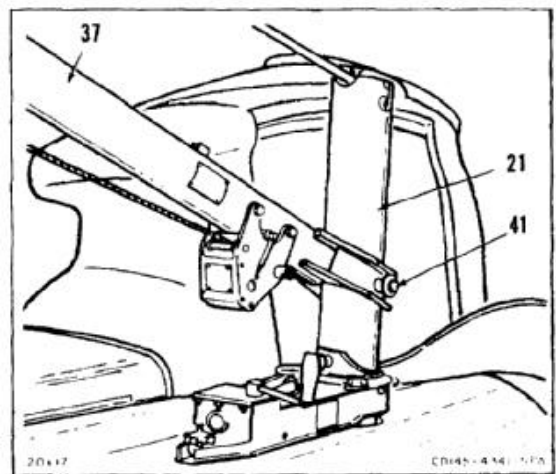
- 38. Lower hook (44). Set mast and boom (47) on fuselage (2).
- 39. Remove guide lines (49). Remove hook (44).



- 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).

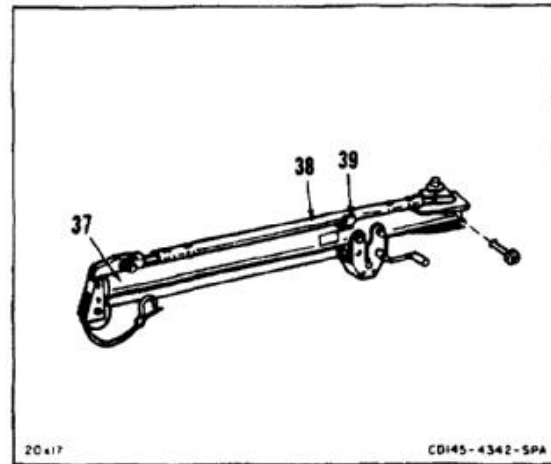


- 45. Have helpers support jib boom (37).
- 46. Remove pin (41) from jib boom (37) and upper tube (21).
- 47. Raise and remove boom (37) from tube (21).

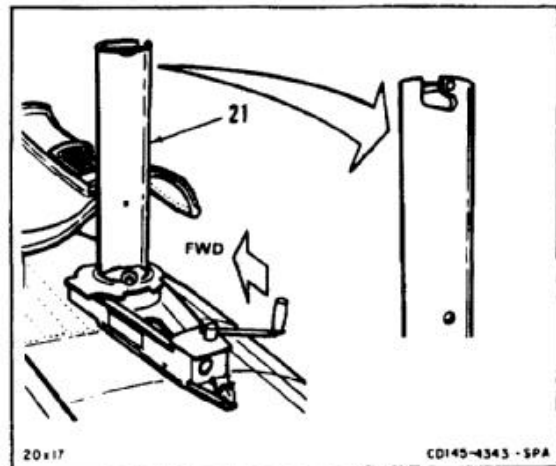




48. Stow support tube (38) in bracket (39) and set boom (37) on workstand, away from work area.



49. Rotate upper tube (21) 180°.



### NOTE

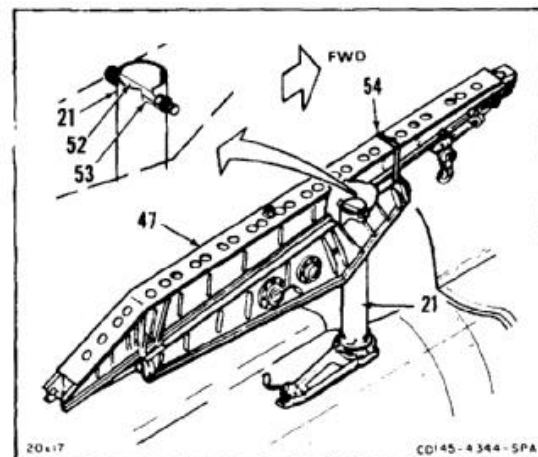
Mast and boom can support itself in horizontal position on upper tube.

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).



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

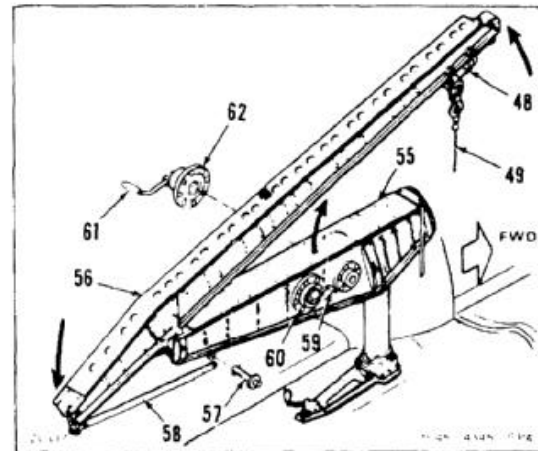
53. Unstow trolley and hook (48). Attach guideline (49) to trolley and hook.
54. Remove quick-release pin (57) from tension rod (58) and mast (55).
55. Remove handle (59) from stowed position. Install handle on hook winch (60). Remove handle (61) from stowed position. Install handles on trolley winch (62).

**CAUTION**

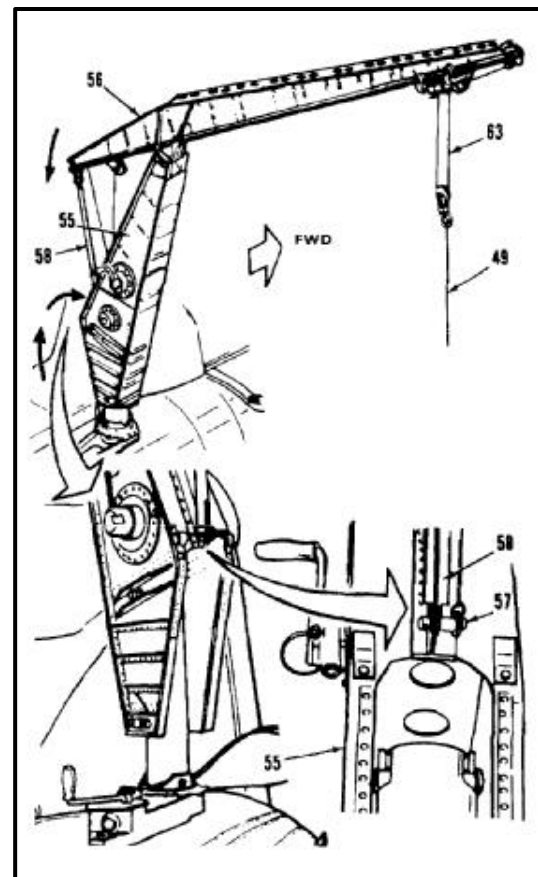
Cable will tangle if slack is not taken up when mast and boom are raised.

**NOTE**

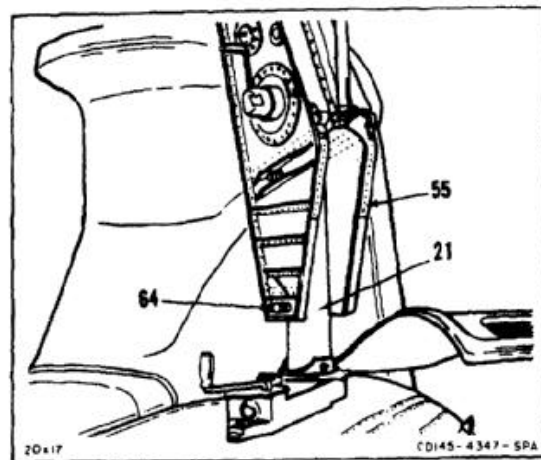
Up and down directions are shown on winches.



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).



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:**

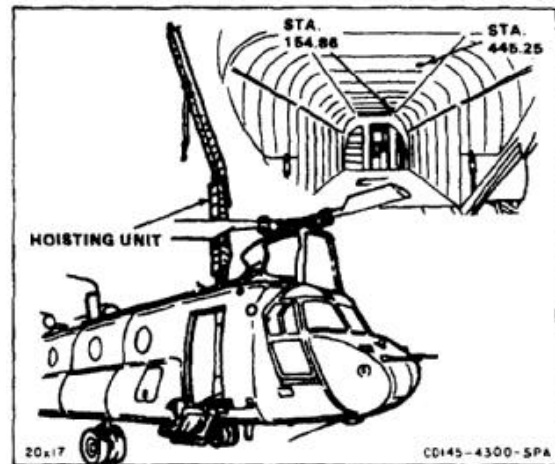
Aircraft Mechanic's Tool Kit, NSN 5180-00-323-4692  
Workstand

**Materials:**

Rope Guidelines (2)

**Personnel Required:**

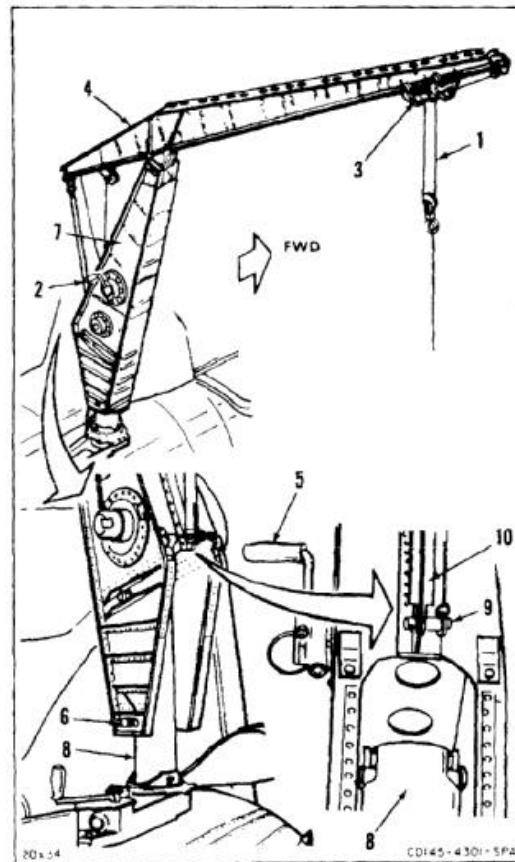
Medium Helicopter Repairer (5)  
Inspector

**NOTE**

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

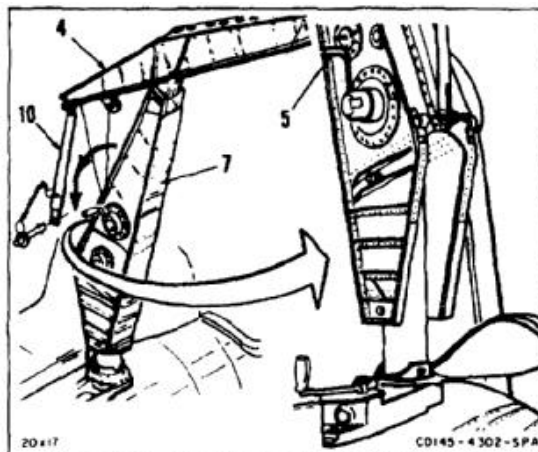
Cable will tangle if slack is not taken up when mast and boom are raised.

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).

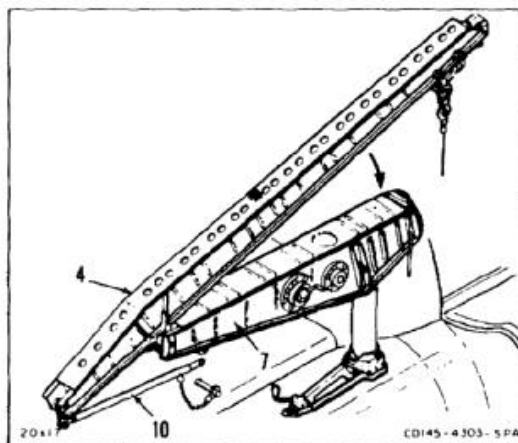


5. Lower boom (4) and mast (7) as follows:

- 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).



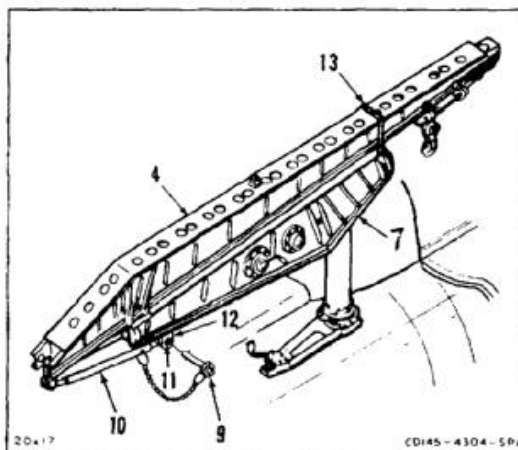
- c. Have helper holding rod (10), support and guide boom (4) until boom is lowered.
- d. Lower mast (7) and boom (4) into folded position.



#### NOTE

Upper tube can support mast and boom in folded position.

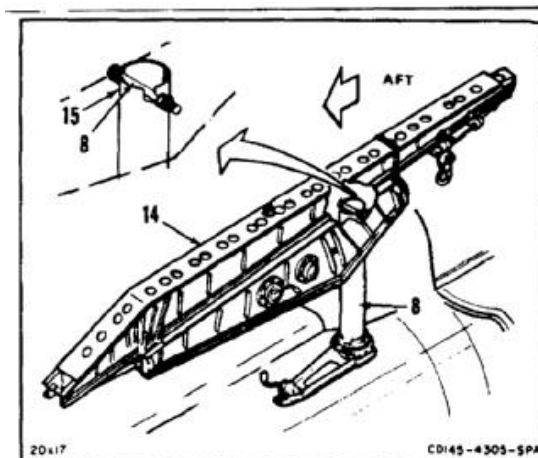
6. Align holes (11) in rod (10) and bracket (12).
7. Install pin (9) through rod (10) and bracket (12).
8. Install strap (13) to secure mast (7) and boom (4).



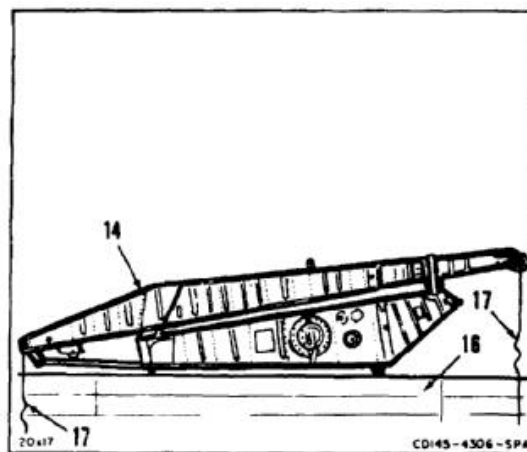
**1-41 REMOVE HOISTING UNIT (Continued)**

1-41

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).

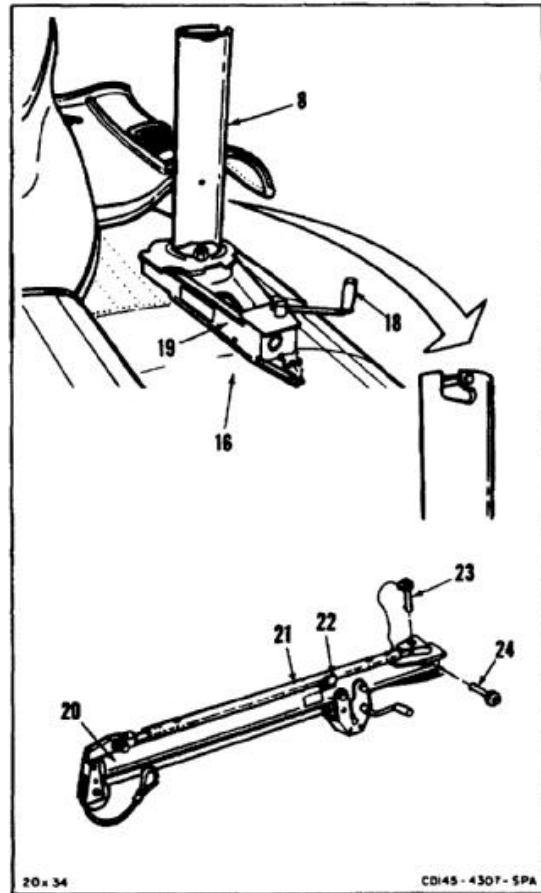


11. Set mast and boom (14) on top of fuselage (16).
12. Attach guidelines (17) to both ends of mast and boom (14).

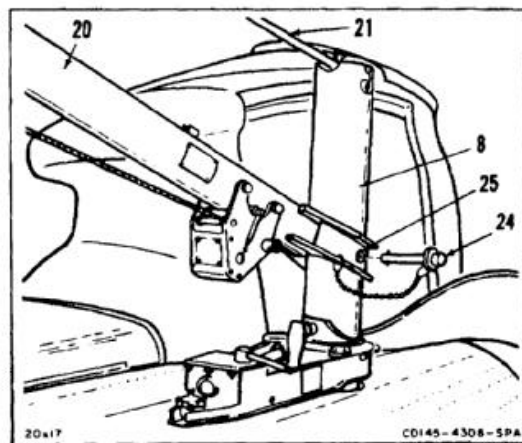


**1-41 REMOVE HOISTING UNIT (Continued)****1-41**

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).



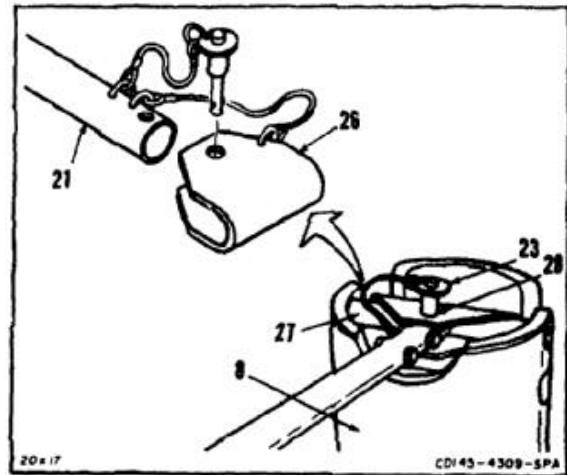
17. Have helpers position boom (20) over top of upper tube (8). Position support tube (21) on top of upper tube.
18. Align holes in boom (20) and upper tube (8). Install pin (24) through holes (25).



**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).

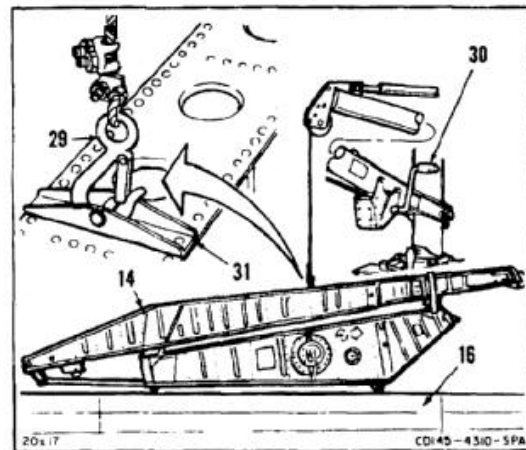


22. Have helpers position mast and boom (14) under jib boom hook (29).
23. Lower hook (29) by turning jib boom winch handle (30) in DOWN direction.
24. Attach hook (29) to bracket (31).

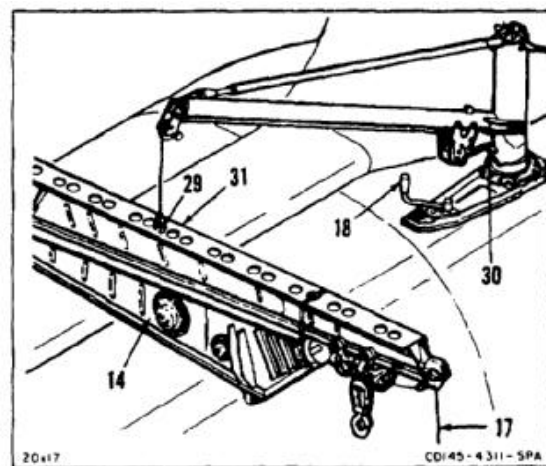


Helpers must guide mast and boom while it is lowered from fuselage to prevent it from hitting helicopter.

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



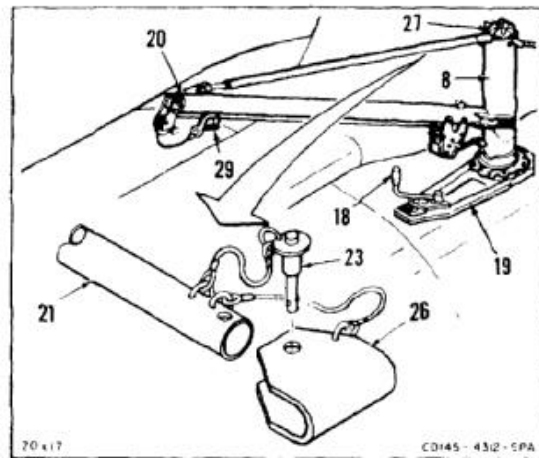
26. Have helpers steady mast and boom (14) with guidelines (17).
27. Position mast and boom (14) over right side of helicopter by turning azimuth control handle (18).
28. Lower mast and boom (14) to ground by turning winch handle (30) in DOWN direction.
29. Remove hook (29) from bracket (31) and rewind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



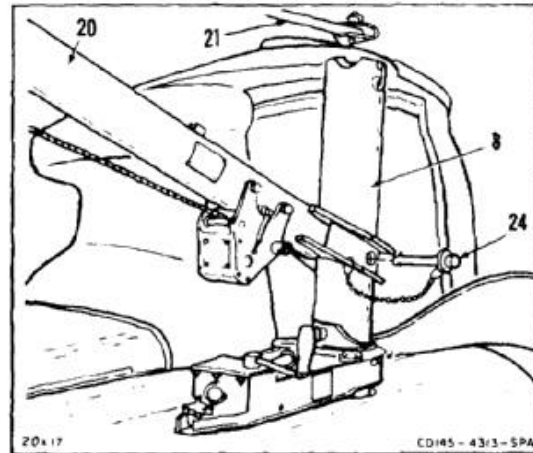


**1-41 REMOVE HOISTING UNIT (Continued)****1-41**

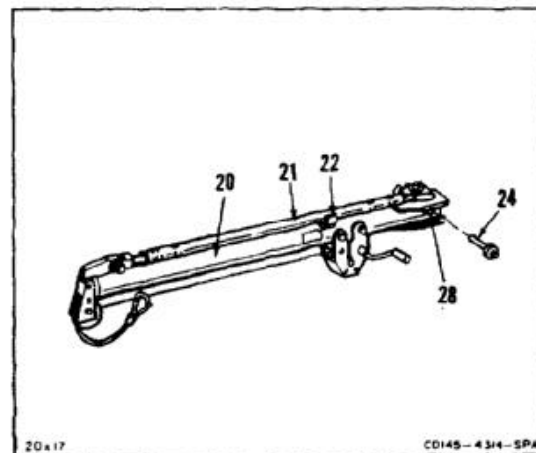
30. Rotate boom to original position over azimuth control (19) by turning control handle (18).
31. Place hook (29) in stowed position on boom (20).
32. Remove pin (23), support tube (21) and strap (26) from tube (27) in upper tube (8).
33. Install pin (23) in holes in strap (26) and tube (21). Position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

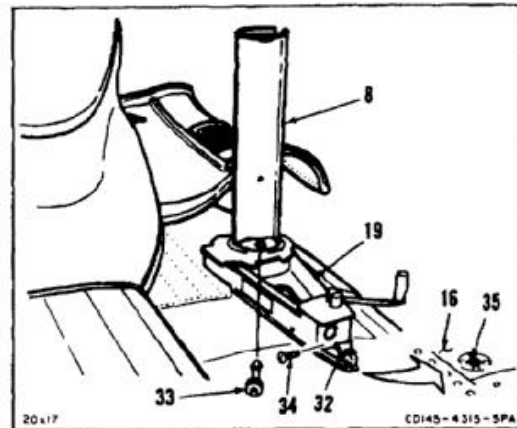


37. Stow support tube (21) in bracket (22).
38. Stow pin (24) in hole (28) in boom (20).

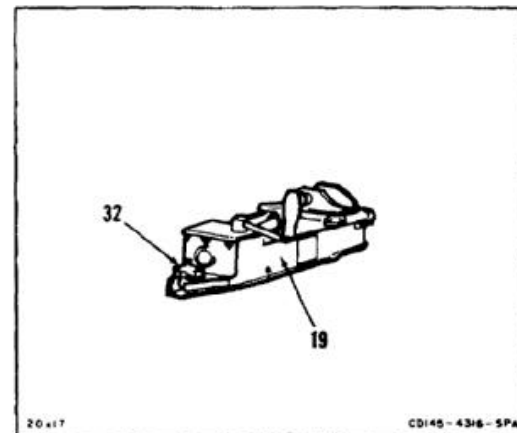


**1-41 REMOVE HOISTING UNIT (Continued)****1-41**

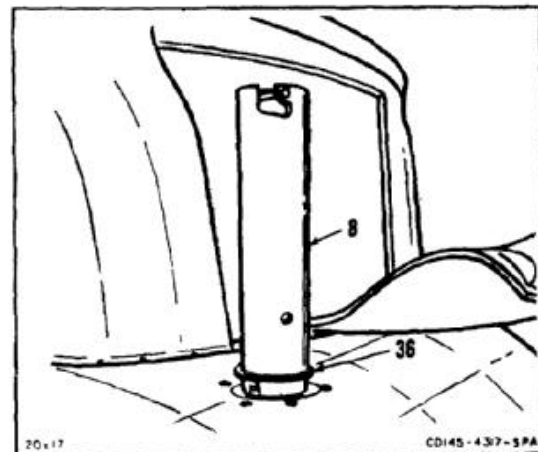
39. Remove captive screw (32).
40. Remove pin (33) from azimuth control (19) and upper tube (8).
41. Remove azimuth control (19) by lifting it from upper tube (8). Remove screw (34) stowed in azimuth control.
42. Install screw (34) in hole (35) in top of fuselage (16).
43. Install pin (33) in azimuth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



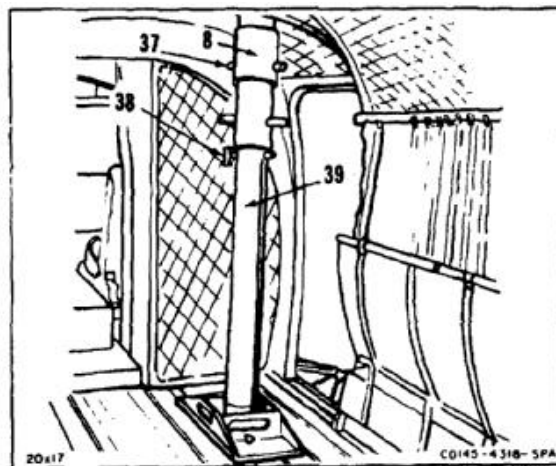
44. Stow captive screw (32) on azimuth control (19).



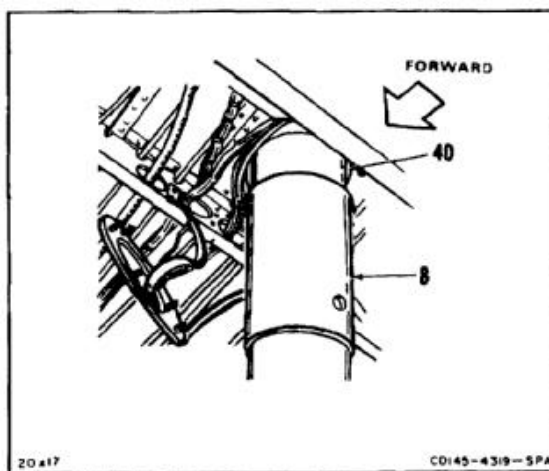
45. Remove sleeve (36) from upper tube (8).



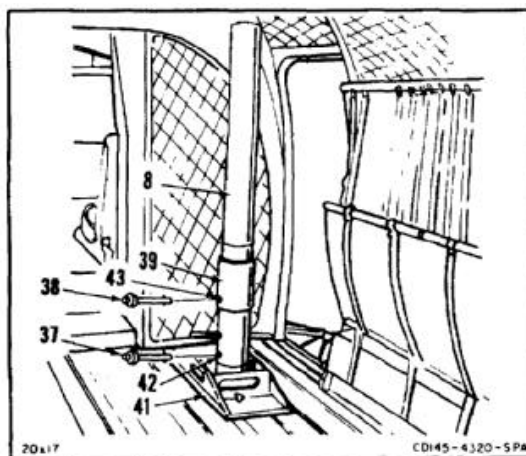
46. Have two helpers support upper tube (8).
47. Remove pins (37 and 38).
48. Have other two helpers lower upper tube (8) over lower tube (39).



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).



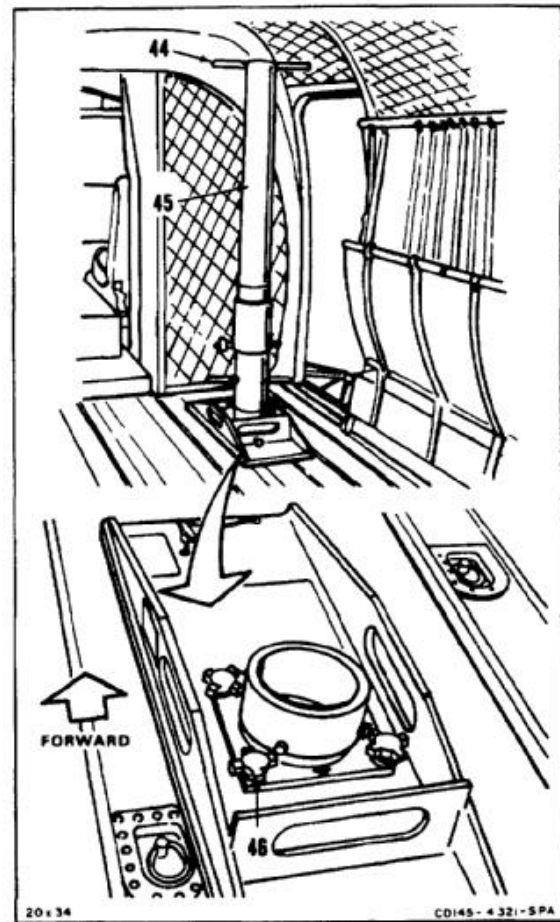
## 1-41 REMOVE HOISTING UNIT (Continued)

1-41

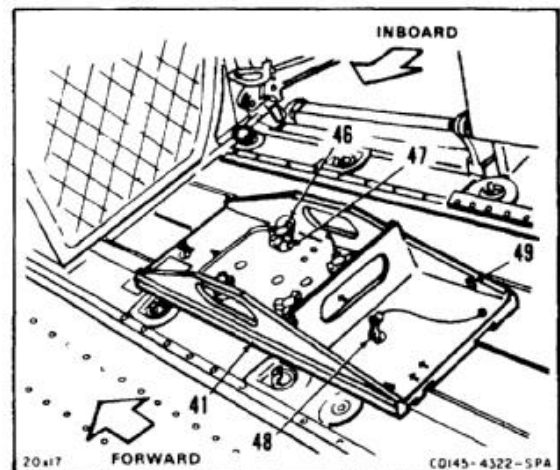
**NOTE**

Upper and lower tubes make up cabin upright.

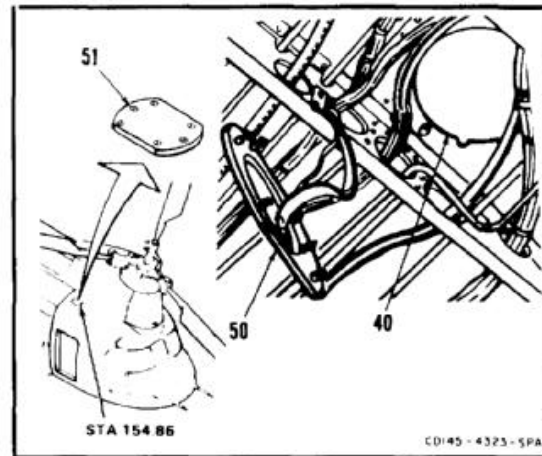
54. Install handle (44) in cabin upright (45).
55. Have two helpers support upright (45).
56. Remove four hand knobs (46).
57. Have four helpers remove upright (45).



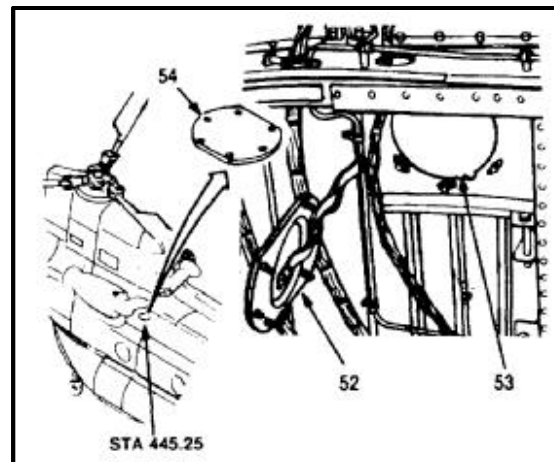
58. Stow knobs (46) in holes (47).
59. Remove quick-release pins (48) and stow in holes (49).
60. Remove base plate (41).



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

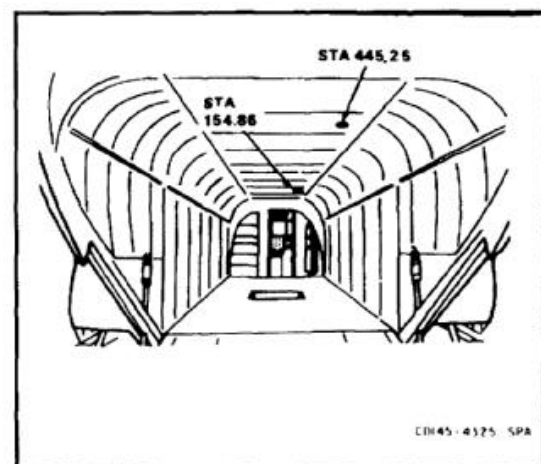


62. At aft location, pull access cover (52) up through hole (53). Position cover (52) at sta. 445.25 and tighten six fasteners (54).



#### **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

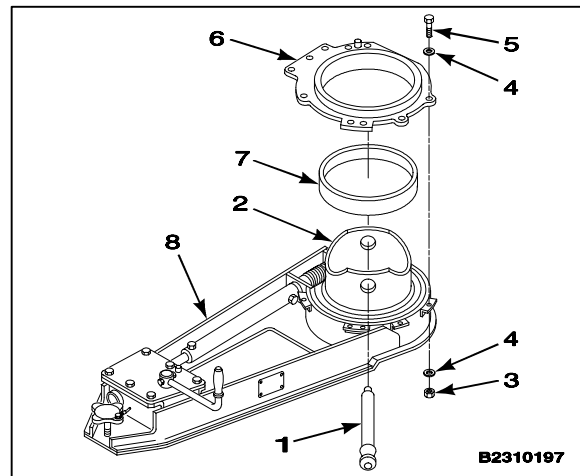
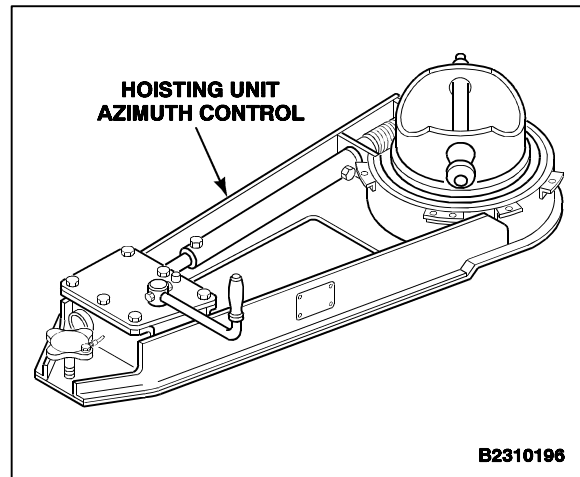
**Personnel Required:**

CH-47 Helicopter Repairer

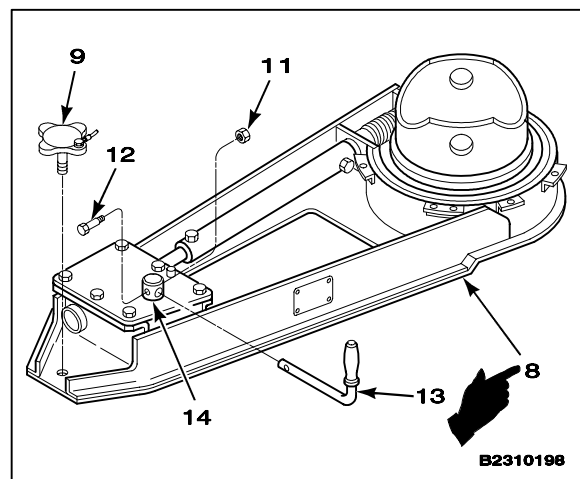
**Equipment Condition:**

Off Helicopter Task

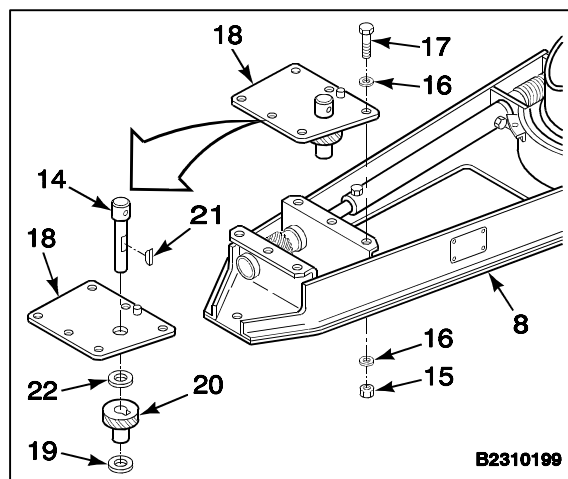
1. Remove quick-release pin (1) from worm gear (2).
2. Remove 9 nuts (3), 18 washers (4), 9 bolts (5), worm gear cap (6) and spacer (7) from azimuth drive housing (8).



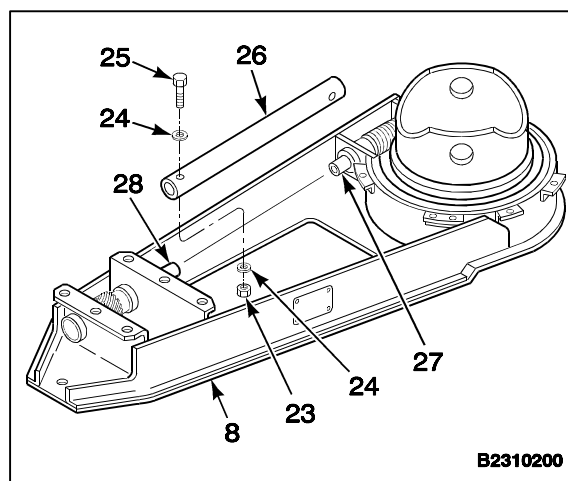
3. Remove captive screw (9) from housing (8).
4. Remove nut (11), bolt (12), and handle (13) from pinion shaft (14).



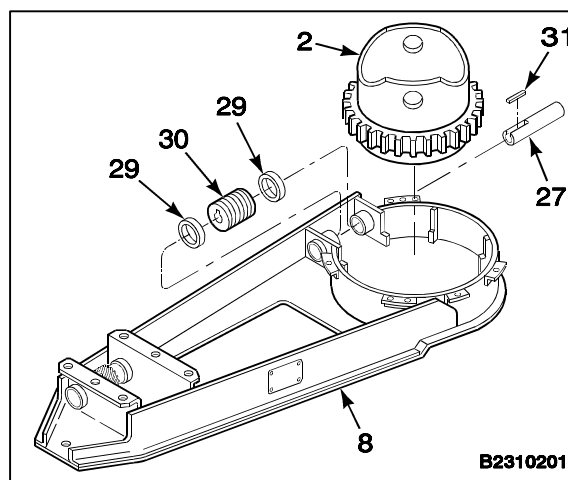
5. Remove 6 nuts (15), 12 washers (16), 6 bolts (17) and helical gear cap (18) from azimuth drive housing (8).
6. Remove thrust washer (19), helical gear (20), key (21), and thrust washer (22) from pinion shaft (14).
7. Remove pinion shaft (14) from helical gear cap (18).



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).

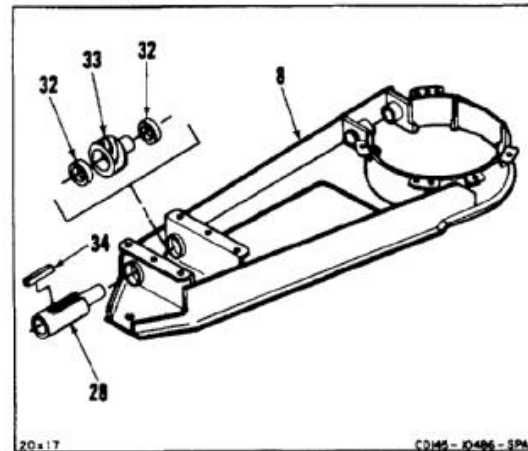


11. Push azimuth drive shaft (27) from housing (8). Use drift. Remove azimuth drive shaft, two bearings (29), worm (30), and key (31) from housing (8).
12. Remove worm gear (2).



**1-42 DISASSEMBLE HOISTING UNIT AZIMUTH CONTROL (Continued)****1-42**

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



## 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:**

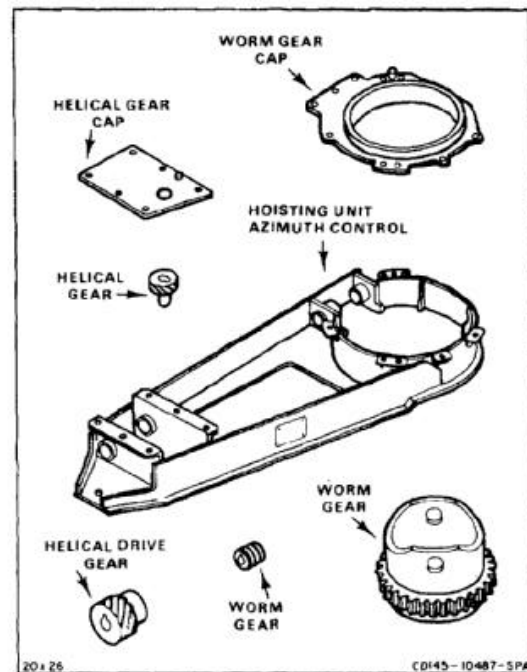
Grease (E190)

**Personnel Required:**

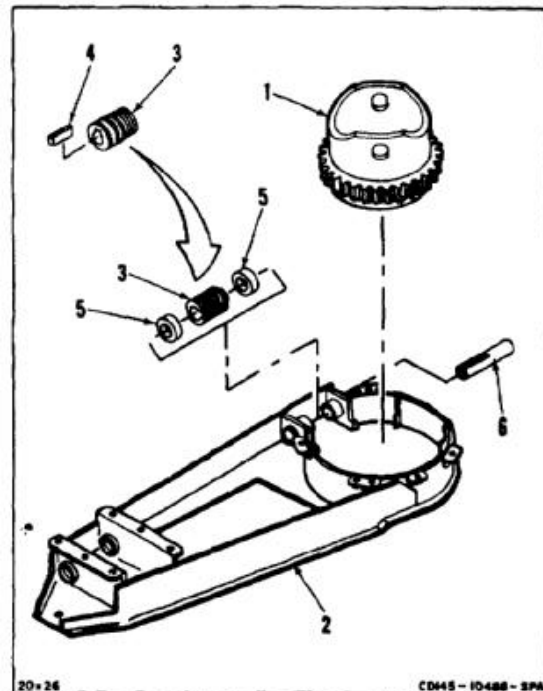
Medium Helicopter Repairer  
 Inspector

**References:**

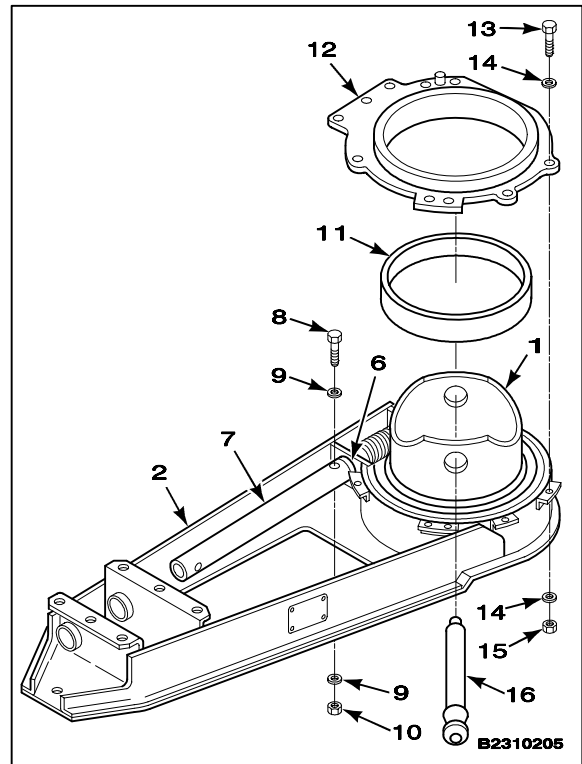
TM 55-1520-240-23P



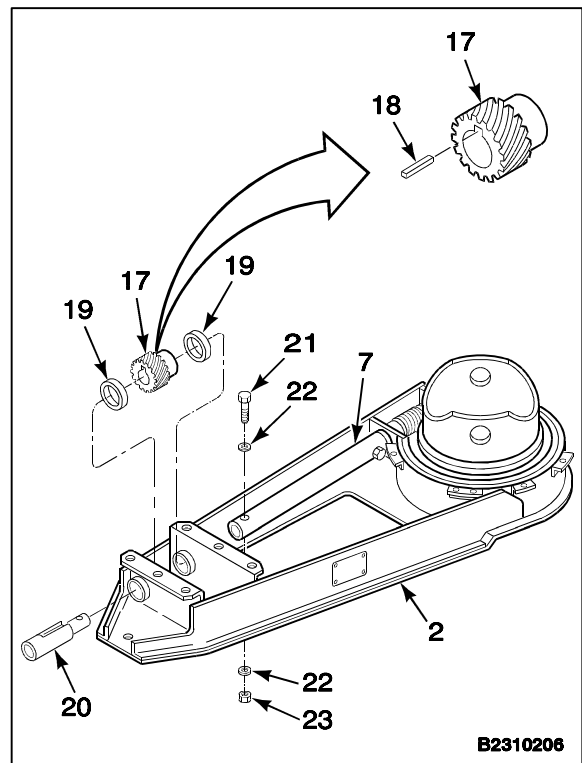
1. Apply coat of grease (E190) to worm gear (1).
2. Install worm gear (1) in azimuth drive housing (2).
3. Apply coat of grease (E190) to worm gear (3).
4. Install key (4) in groove in worm gear (3).
5. Position worm gear (3) and two bearings (5) in housing (2). Slide azimuth drive shaft (6) into housing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



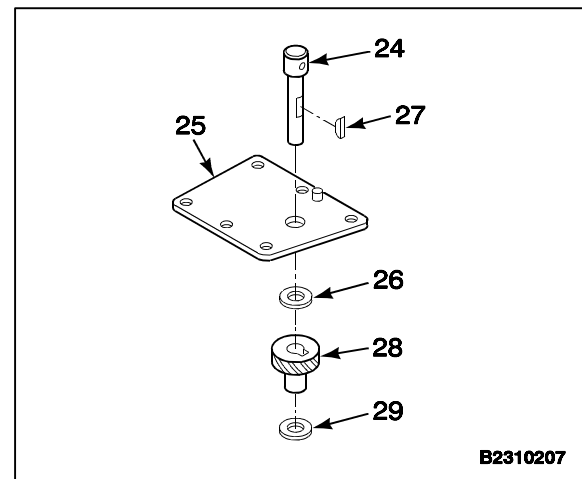
7. Slide shaft connector (7) on shaft (6). Align holes in shaft connector and shaft. Install bolt (8) two washers (9) and nut (10).
8. Install spacer (11), worm gear cap (12), 9 bolts (13), 18 washers (14), and 9 nuts (15) on housing (2).
9. Install quick-release pin (16) in worm gear (1).



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).



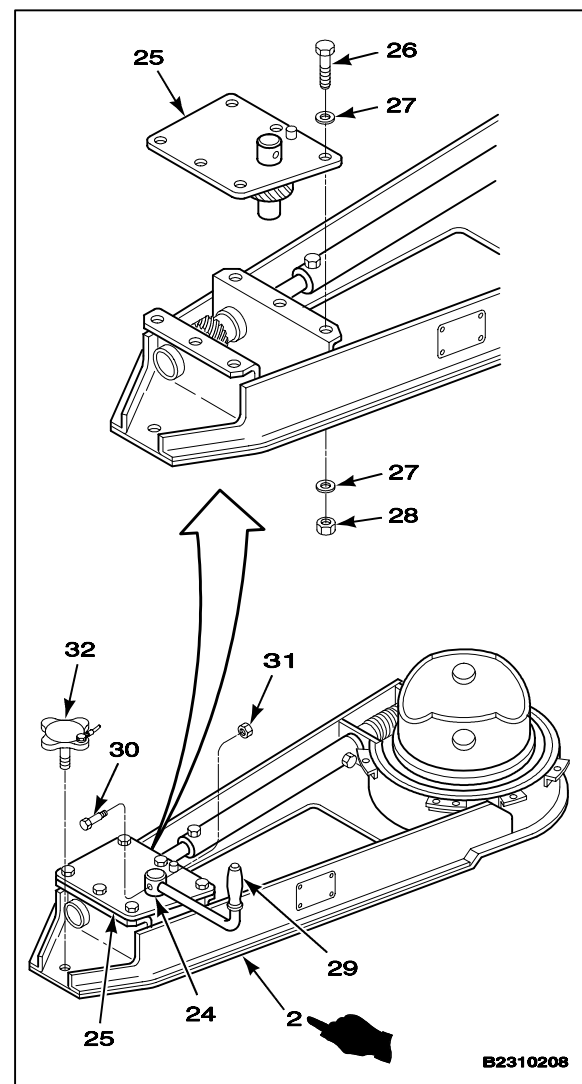
14. Install pinion shaft (24) in helical gear cap (25).
15. Install thrust washer (26), key (27), helical gear (28), and thrust washer (29) on pinion shaft (24).



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:**

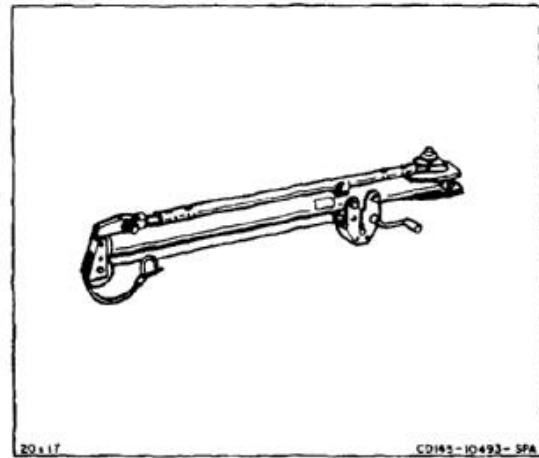
None

**Personnel Required:**

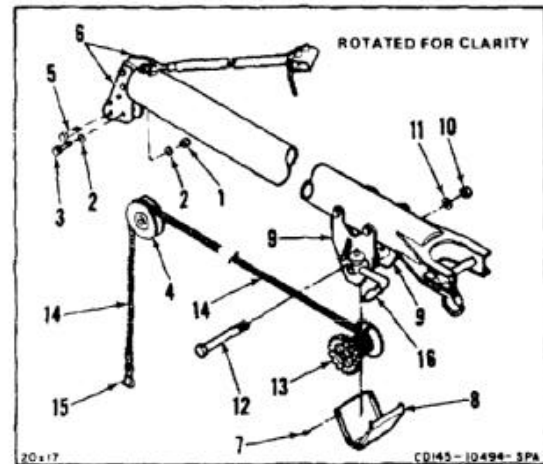
Medium Helicopter Repairer

**Equipment Condition:**

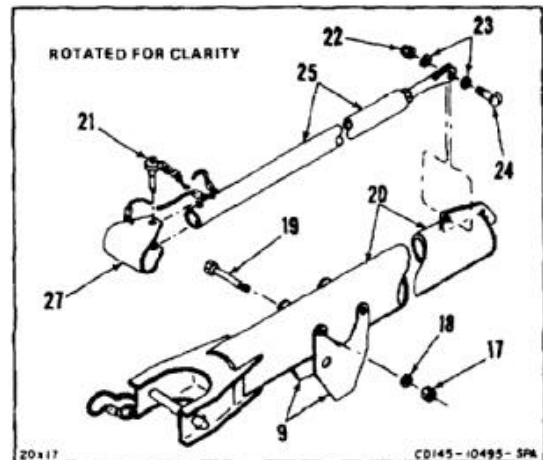
Off Helicopter Task



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**

## INITIAL SETUP

**Applicable Configurations:**

All

**Tools:**

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

**Materials:**

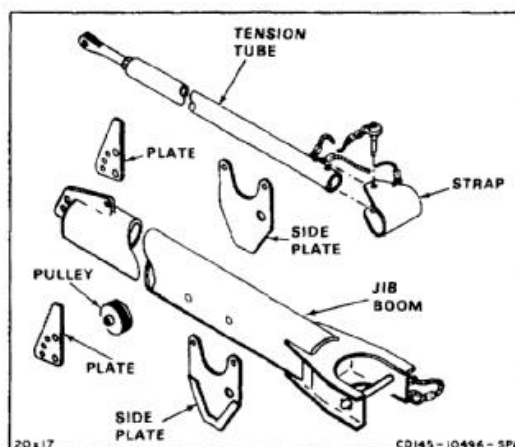
None

**Personnel Required:**Medium Helicopter Repairer  
Inspector**References:**

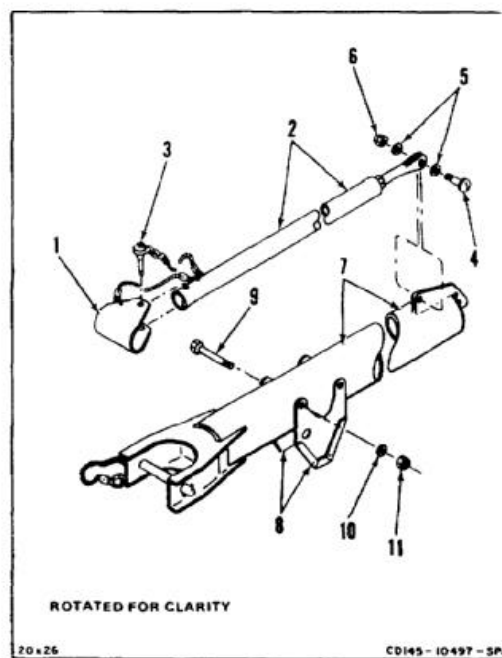
TM 55-1520-240-23P

**Equipment Condition:**

Off Helicopter Task

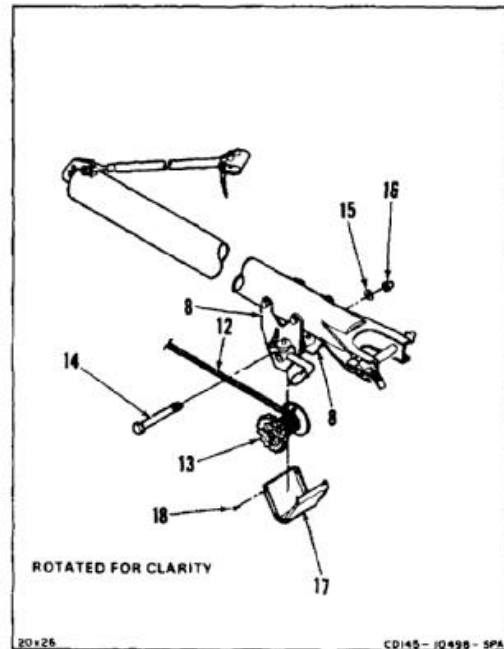


1. Install strap (1) on tension tube (2). Align holes in strap and tube, and install quick-release pin (3).
2. Install bolt (4), washers (5), and nut (6) in tension tube (2) and jib boom (7).
3. Align holes in boom (7) and winch side plates (8). Install two bolts (9), washers (10) and nuts (11) in boom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



**1-45 ASSEMBLE HOISTING UNIT JIB BOOM (Continued)****1-45**

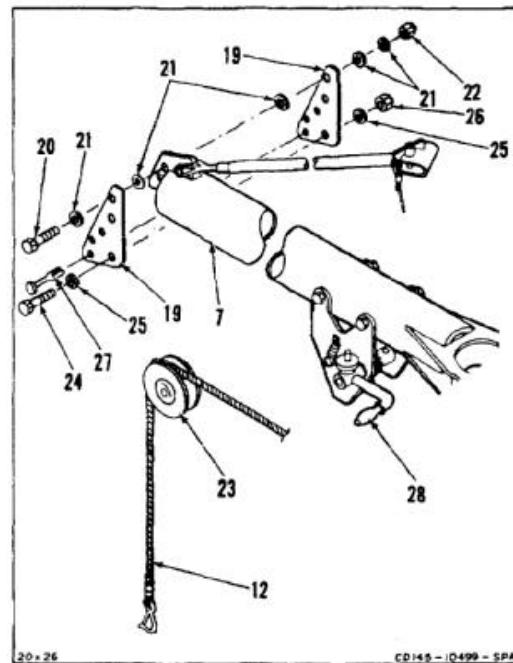
4. Install rope in spur gear drum (13). Tie knot in rope to prevent it from dropping out of drum.
5. Position spur gear drum (13) between plates (8). Install bolt (14) through plates and drum. Install washer (15) and nut (16) on bolt.
6. Position cover (17) on bottom of plates (8). Install 10 screws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

## 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:**

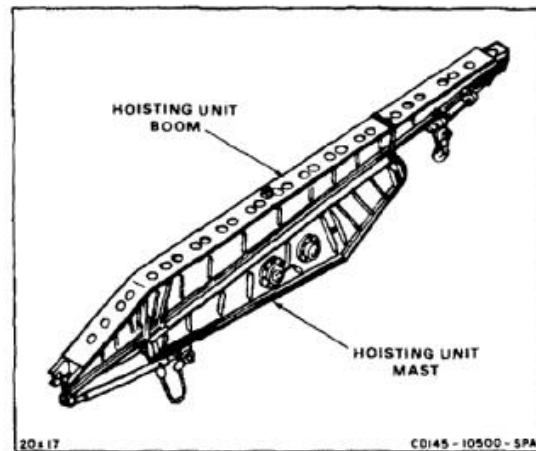
None

**Personnel Required:**

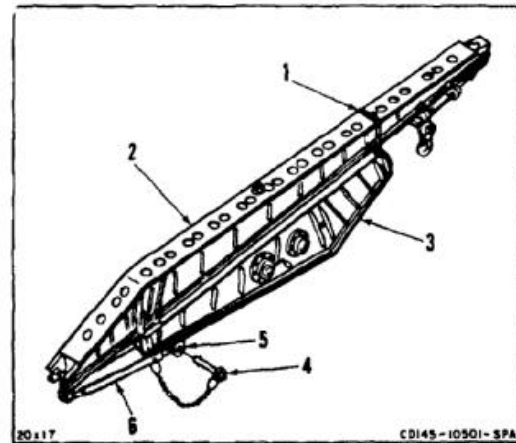
Medium Helicopter Repairer (2)

**Equipment Condition:**

Off Helicopter Task



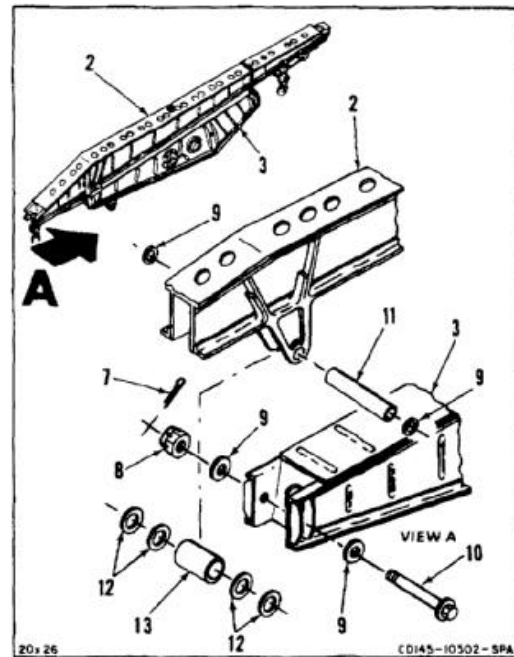
1. Remove strap (1) securing boom (2) to mast (3).
2. Remove quick-release pin (4) from bracket (5).  
Remove tension rod (6) from bracket.



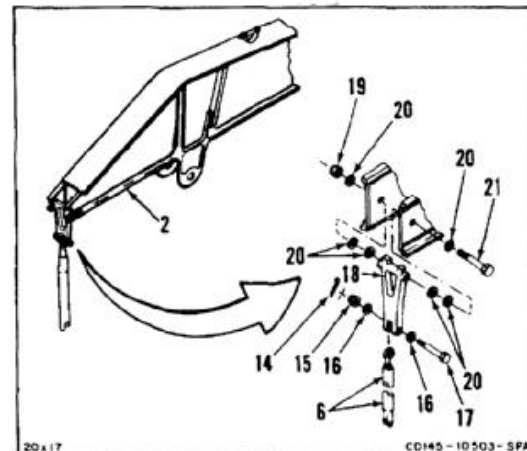
## 1-46 DISASSEMBLE HOISTING UNIT BOOM (Continued)

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).

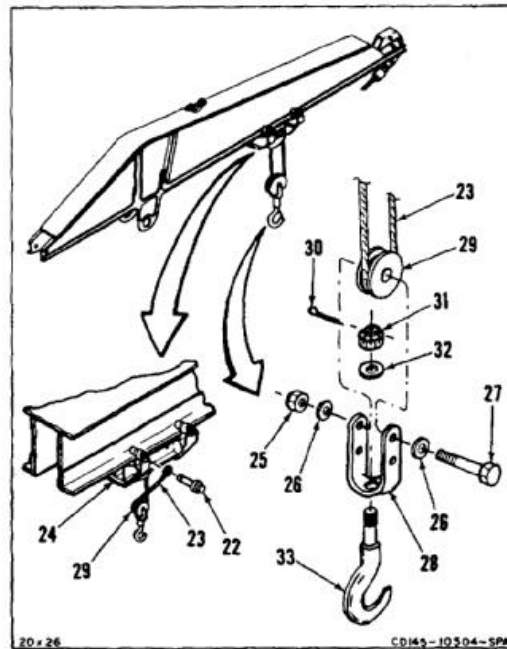


5. Remove cotter pin (14), nut (15), two washers (16), bolt (17), and tension rod (6) from link (18).
6. Remove nut (19), six washers (20), bolt (21) and link (18) from boom (2).

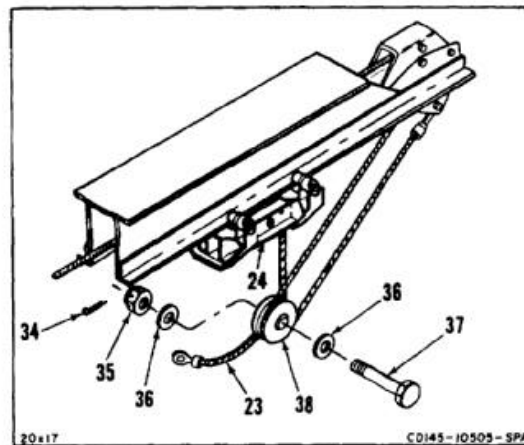




7. Remove quick-disconnect (22) and cable (23) from trolley (24).
8. Remove nut (25), two washers (26), bolt (27), and hook strap (28) from hook pulley (29). Remove cable (23) from hook pulley.
9. Remove cotter pin (30), nut (31), washer (32), and hook (33) from hook strap (28).

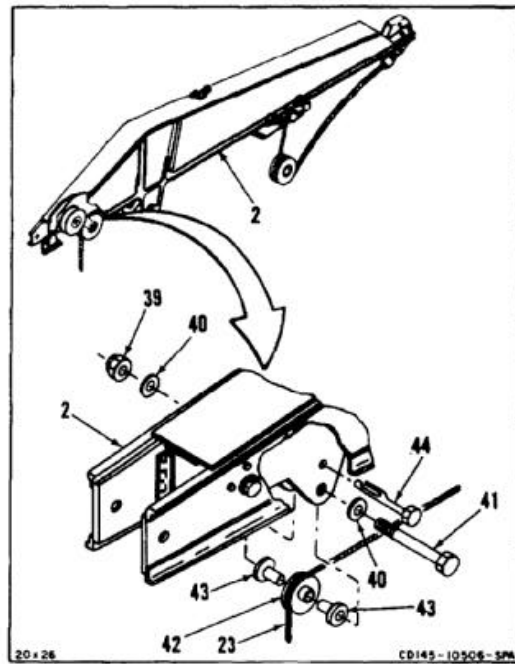


10. Remove cotter pin (34), nut (35), two washers (36), bolt (37), and trolley pulley (38) from trolley (24). Remove cable (23) from pulley.

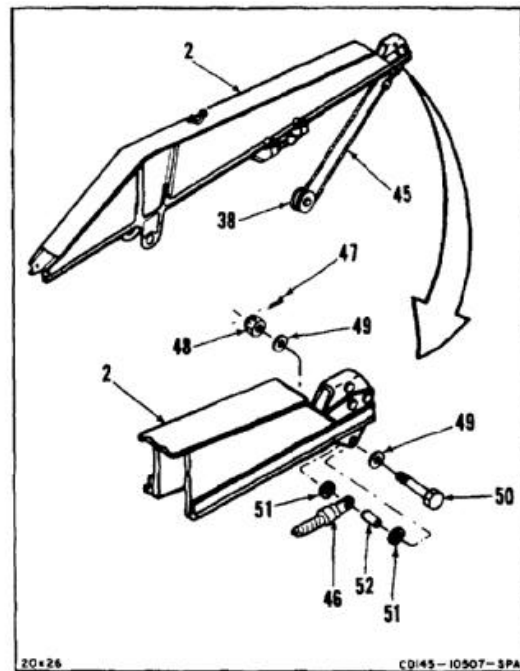


**1-46 DISASSEMBLE HOISTING UNIT BOOM (Continued)****1-46**

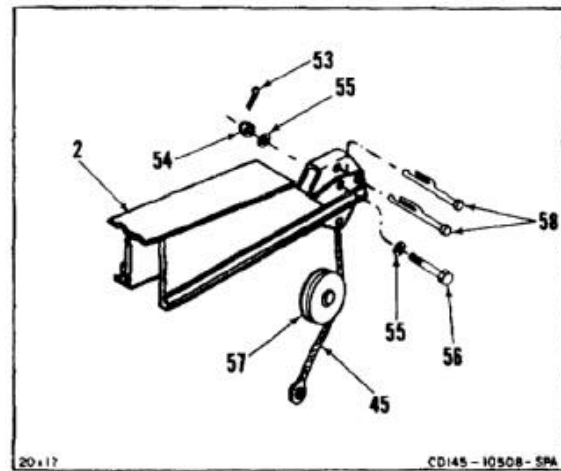
11. Remove nut (39), two washers (40), and bolt (41) from boom (2).
12. Remove pulley (42) and two bushings (43) from boom (2). Use bushing removal tool. Remove cable (23) from pulley.
13. Remove spring pin (44) from boom (2).



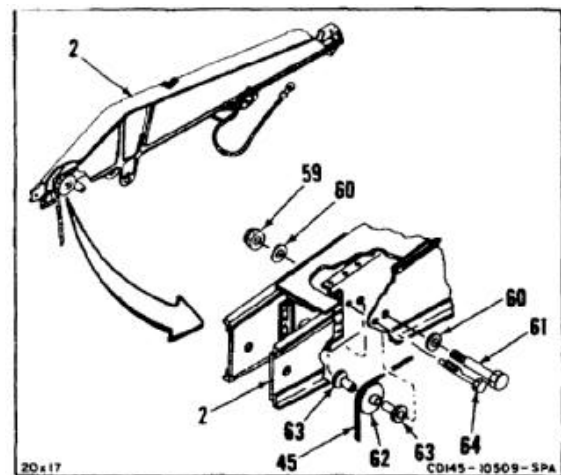
14. Release cable (45) at cable lock (46). Remove cable from trolley pulley (38).
15. Remove cotter pin (47), nut (48), two washers (49), and bolt (50). Remove cable lock (46), two washers (51), and bushing (52) from boom (2).



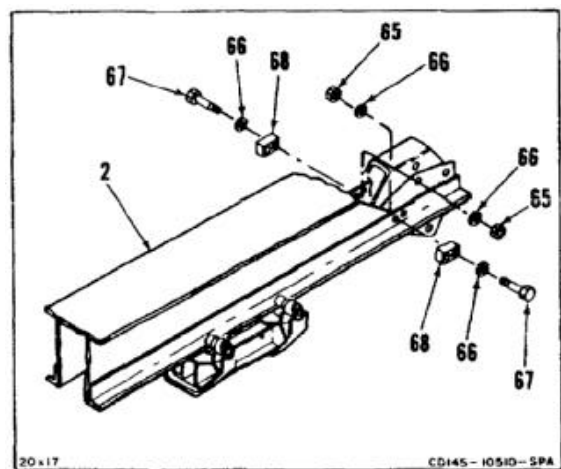
16. Remove cotter pin (53), nut (54), two washers (55), bolt (56), and boom pulley (57). Remove cable (45) from pulley.
17. Remove two spring pins (58) from boom (2).



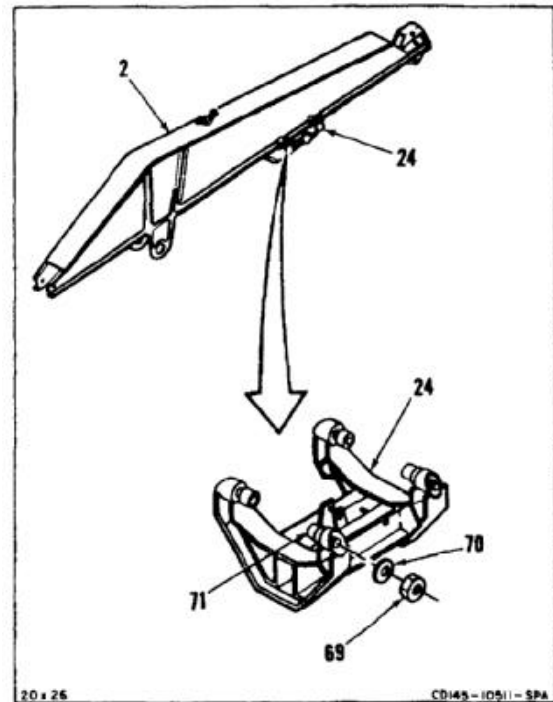
18. Remove nut (59), two washers (60), and bolt (61).
19. Remove pulley (62) and two bushings (63) from boom (2). Use bushing removal tool. Remove cable (45) from pulley.
20. Remove spring pin (64) from boom (2).
21. Remove cable (45) from boom (2).



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

## INITIAL SETUP

**Applicable Configurations:**

All

**Tools:**

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

**Materials:**

None

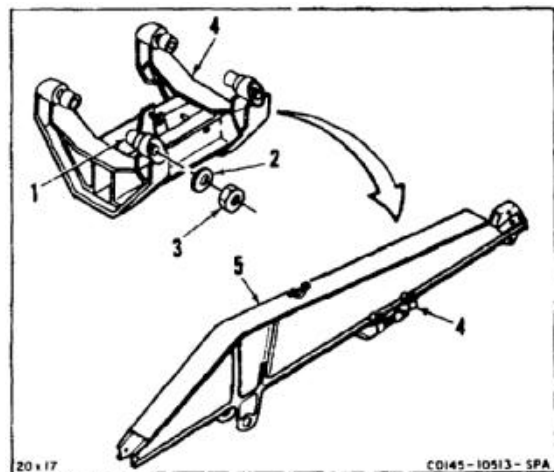
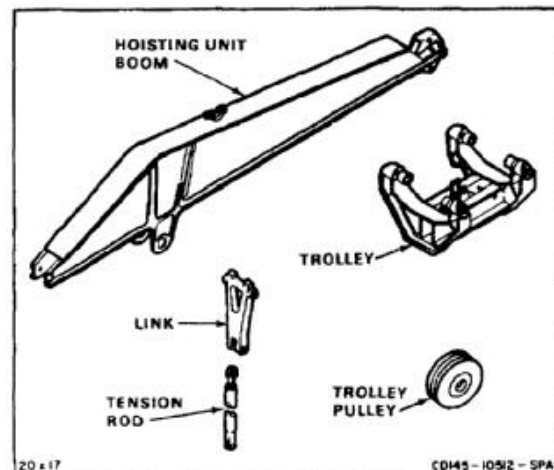
**Parts:**

Cotter Pins

**Personnel Required:**Medium Helicopter Repairer (2)  
Inspector**References:**

TM 55-1520-240-23P

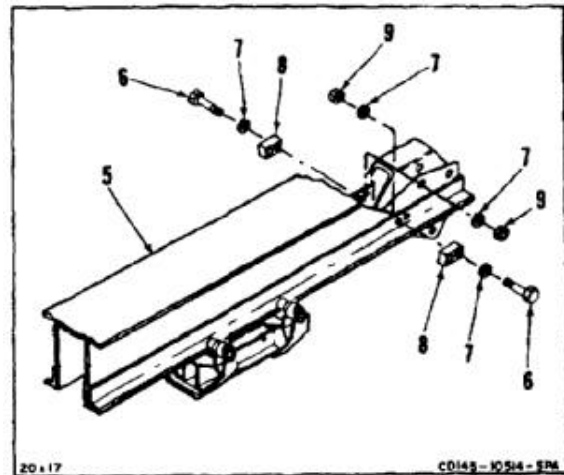
1. Install four cam followers (1), washers (2), and nuts (3) on trolley (4).
2. Install trolley (4) on boom (5).



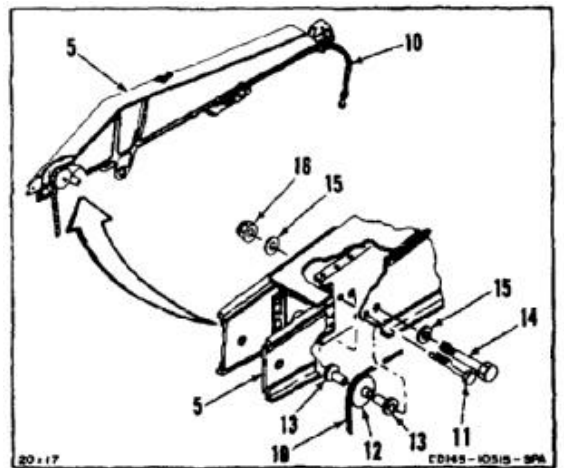
## 1-47 ASSEMBLE HOISTING UNIT BOOM (Continued)

1-47

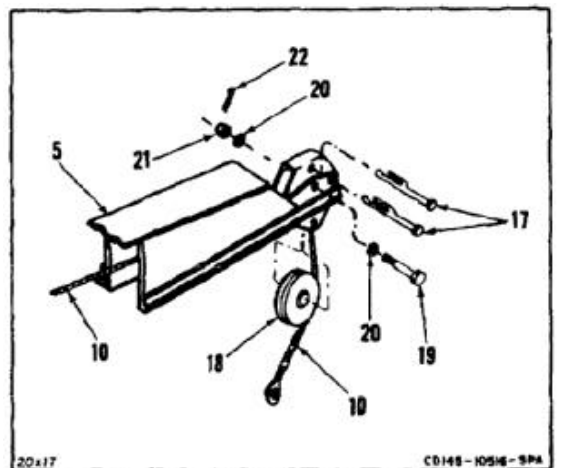
3. Install four bolts (6), eight washers (7), two stops (8), and four nuts (9) on boom (5).



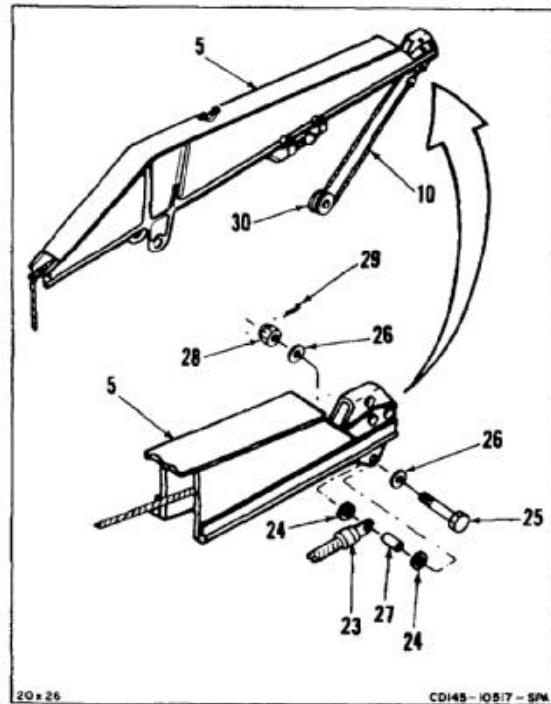
4. Thread end of cable (10) through boom (5).  
 5. Install spring pin (11) in boom (5).  
 6. Install cable (10) in groove of pulley (12).  
 7. Position pulley (12) and two bushings (13) in boom (5). Install bolt (14), two washers (15), and nut (16).



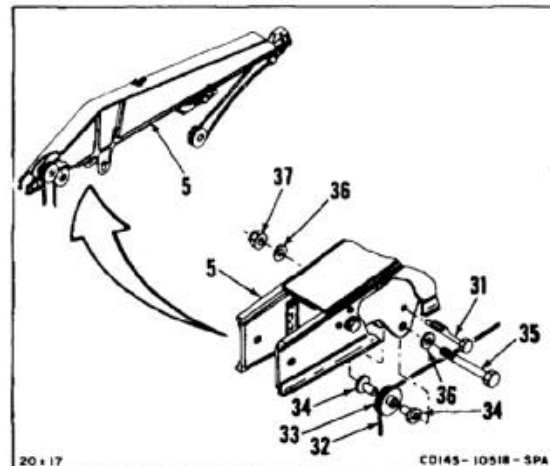
8. Install two spring pins (17) in boom (5).  
 9. Install cable (10) in groove of boom pulley (18).  
 10. Position boom pulley (18) in boom (5). Install bolt (19), two washers (20), nut (21), and cotter pin (22).



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).



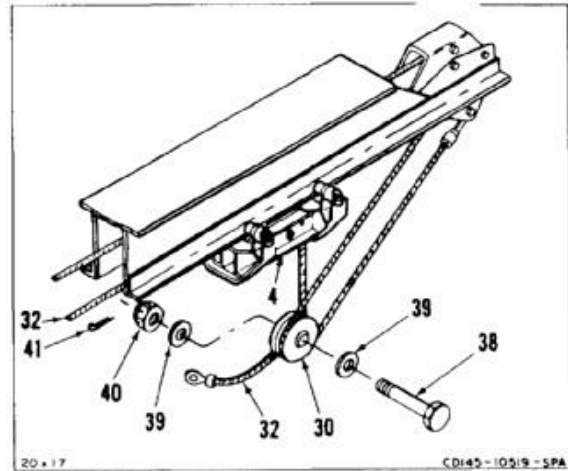
14. Install spring pin (31) in boom (5).
15. Install cable (32) in groove in pulley (33).
16. Position pulley (33) and two bushings (34) in boom (5). Install bolt (35), two washers (36), and nut (37).



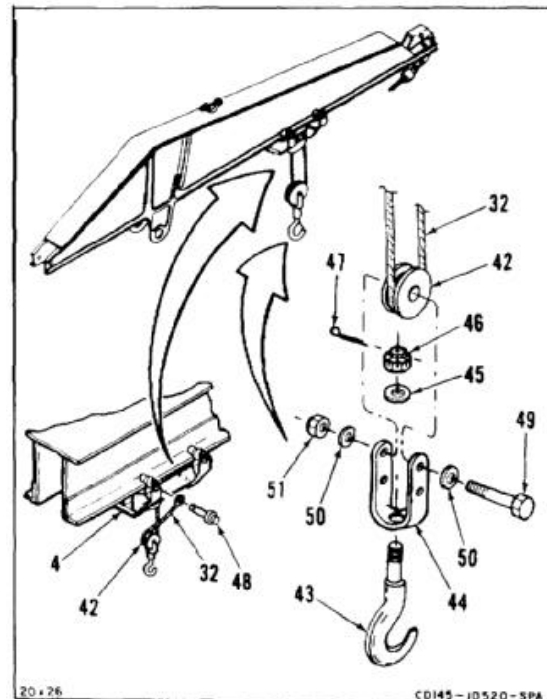
## 1-47 ASSEMBLE HOISTING UNIT BOOM (Continued)

1-47

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).

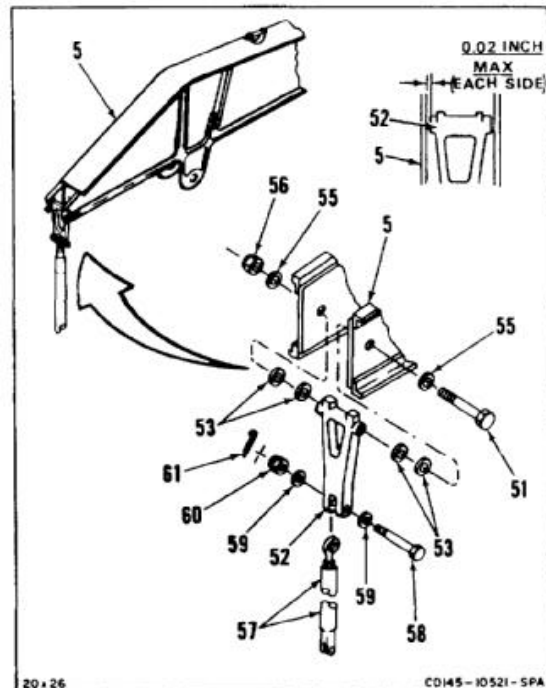


19. Route cable (32) around hook pulley (42).
20. Push hook (43) into hook strap (44). Install washer (45), nut (46), and cotter pin (47).
21. Align hole in end of cable (32) and trolley (4). Install quick-release pin (48).
22. Align hole in hook strap (44) and hook pulley (42). Install bolt (49), two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

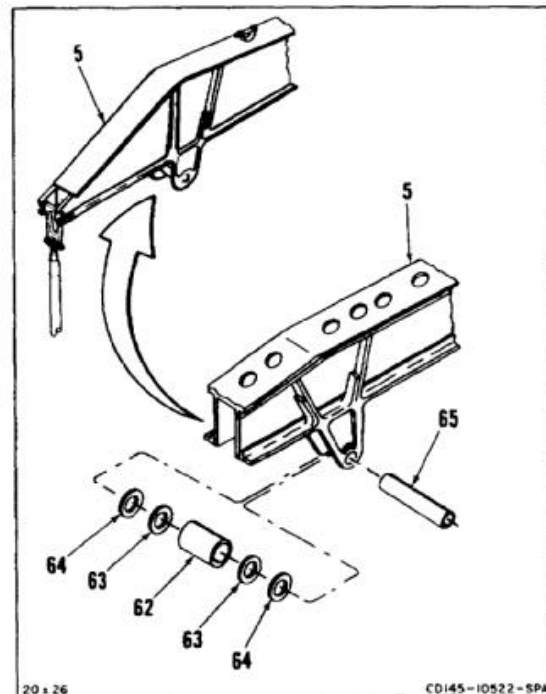




23. Position link (52) in boom (5). Check that gap between link and boom is less than **0.02 inch**. If gap is more than **0.02 inch**, install a maximum of two washers (53) on each side of link to close gap.
24. Install bolt (54), two washers (55), and nut (56).
25. Align holes in link (52) and tension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

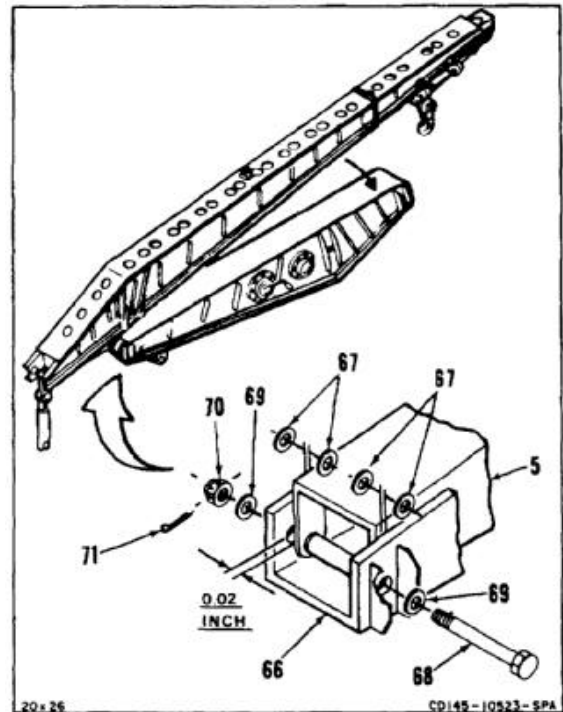


26. Position spacer (62) and two washers (63) in boom (5). Check that gap between washers and boom is less than **0.02 inch**. If gap is more than **0.02 inch**, install washers (64) as needed to close gap.
27. Install spacer (65).



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

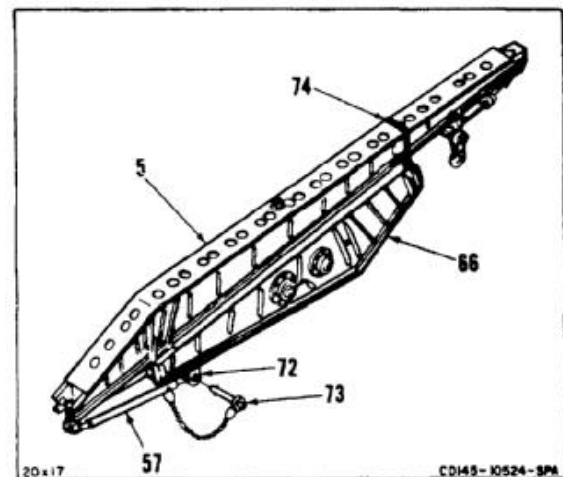
28. Position boom (5) in mast (66). Check that gap between boom and mast is less than **0.02 inch**. If gap is more than **0.02 inch**, install a maximum of two washers (67) on each side of boom to close gap.
29. Install bolt (68), two washers (69), nut (70), and cotter pin (71).



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

## INITIAL SETUP

**Applicable Configurations:**

All

**Tools:**

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

**Materials:**

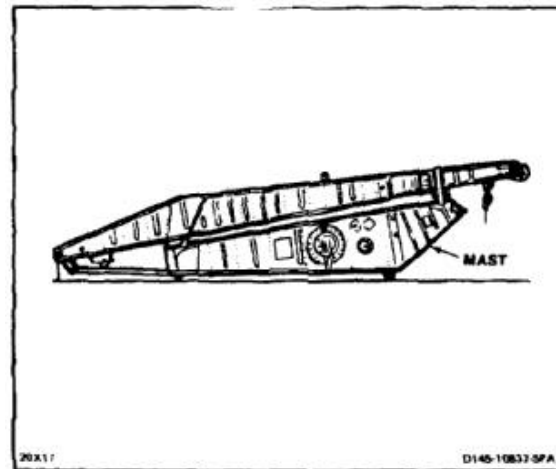
None

**Personnel Required:**

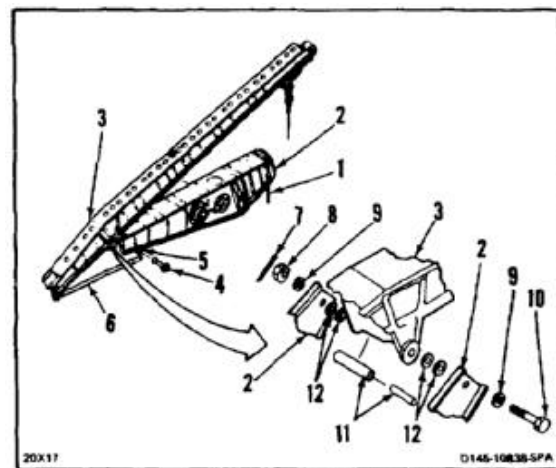
Medium Helicopter Repairer (2)

**Equipment Condition:**

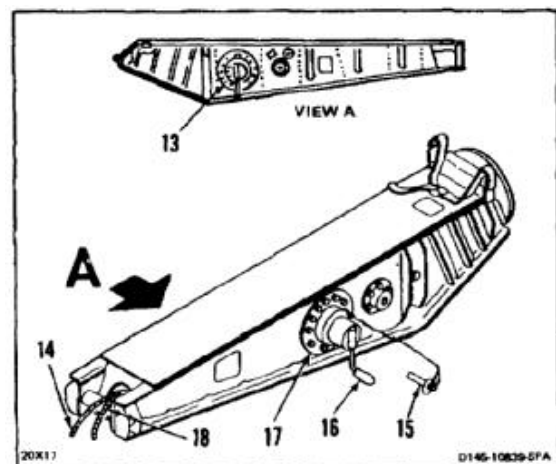
Off Helicopter Task



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).

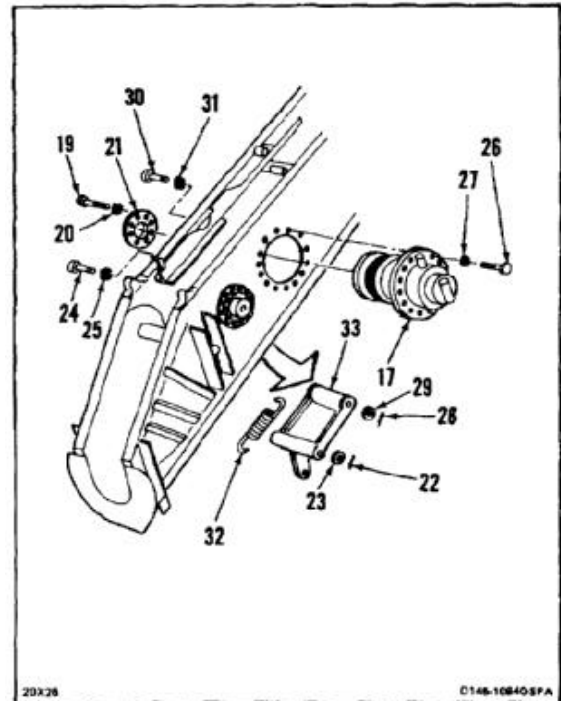


6. Turn trolley winch (13) counterclockwise to unwind trolley cable (14).
7. Remove quick-release pin (15) and handle (16) from hook winch (17). Pull cable (18) from hook winch (17).

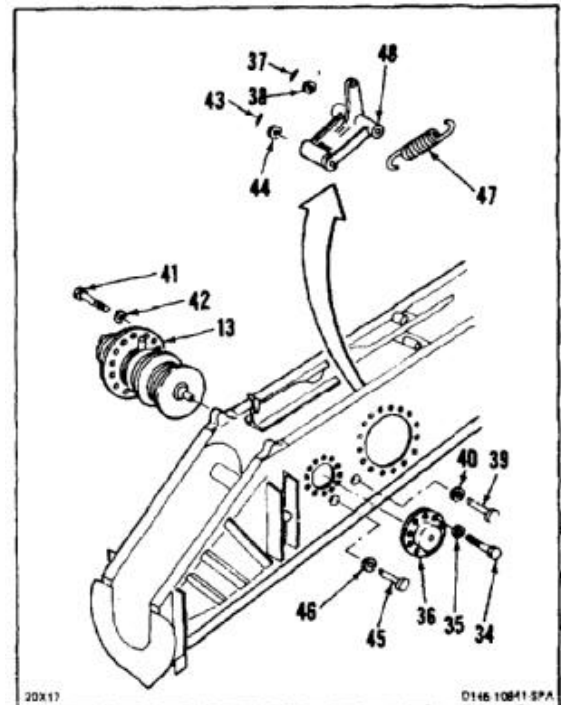


**1-48 DISASSEMBLE HOISTING UNIT MAST (Continued)****1-48**

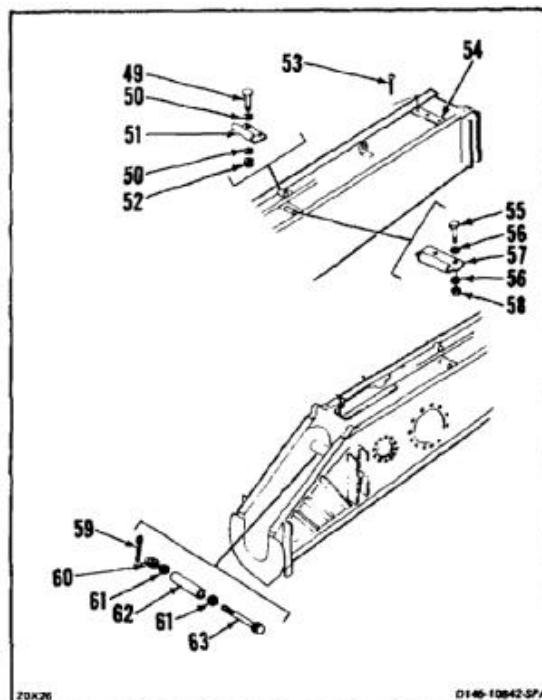
8. Remove six bolts (19) and washers (20) from hook winch hub (21).
9. Remove cotter pin (22) and washer (23) from clevis pin (24).
10. Remove clevis pin (24) and washer (25).
11. Remove 20 bolts (26) and washers (27) from hook winch (17). Remove hook winch.
12. Remove cotter pin (28) and washer (29) 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:**

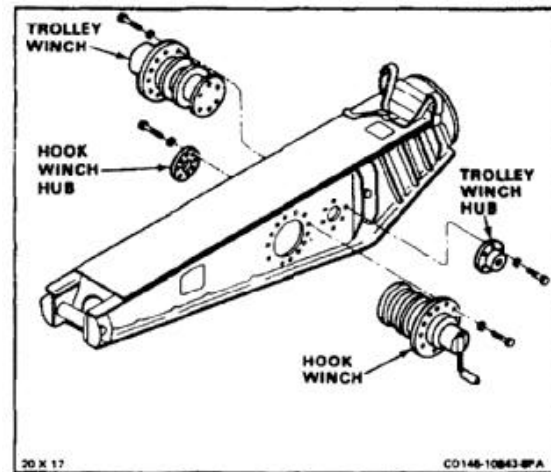
None

**Parts:**

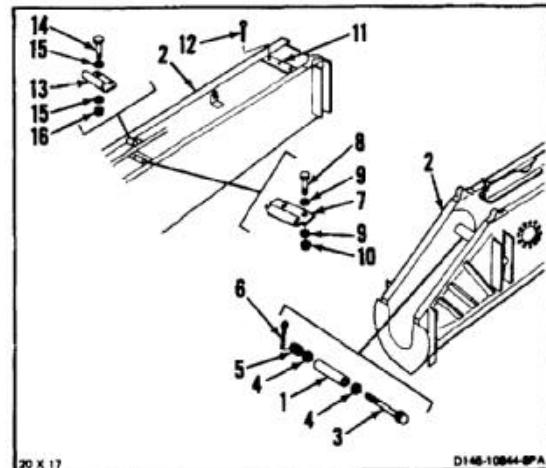
Cotter Pins

**Personnel Required:**Medium Helicopter Repairer (2)  
Inspector**References:**

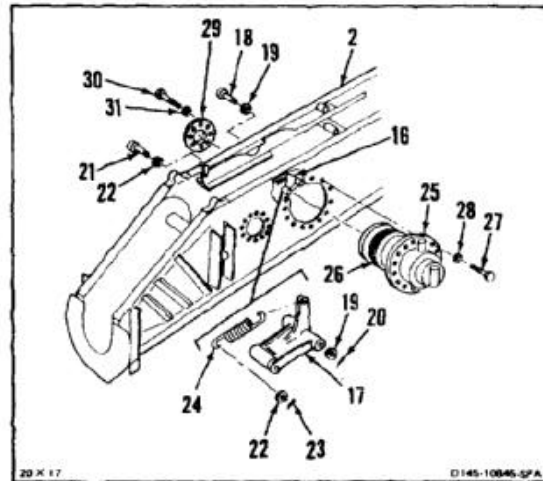
TM 55-1520-240-23P



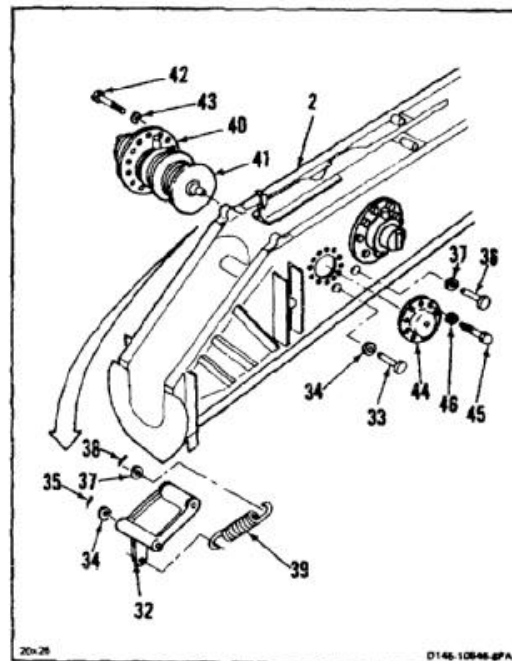
1. Position spacer (1) in mast (2). Install bolt (3), washers (4), nut (5), and cotter pin (6).
2. Position rubbing strip (7) on mast (2). Install two bolts (8), four washers (9), and two nuts (10).
3. Position rubbing strip (11). Install four screws (12).
4. Position rubbing strip (13) on mast (2).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



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).

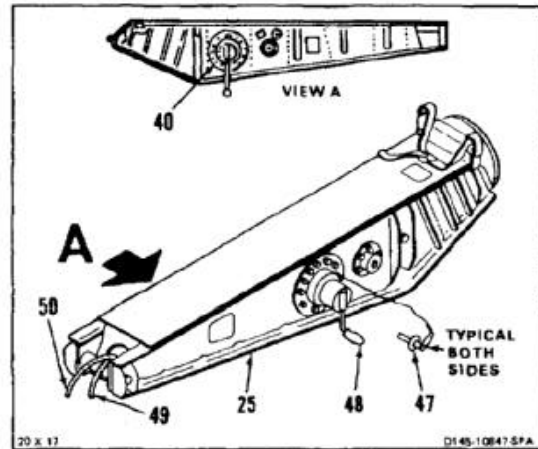


10. Position tension bracket (32) on mast (2). Install clevis pin (33) in mast (2) through bracket (32). Install washers (34) and cotter pin (35) on clevis pin (33).
11. Install clevis pin (36) in mast (2). Install washers (37) and cotter pin (38) on clevis pin (36).
12. Install tension spring (39) on 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).

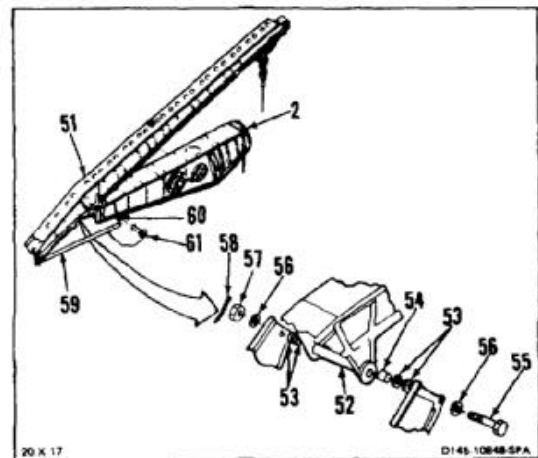


**1-49 ASSEMBLE HOISTING UNIT MAST (Continued)****1-49**

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.



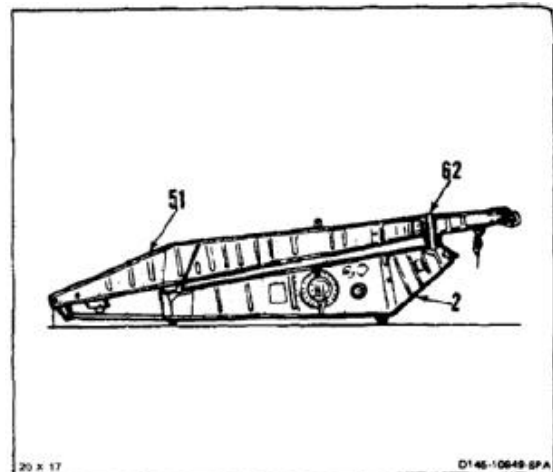
17. Position mast (2) on boom (51). Install spacer (52), four washers (53), and spacer (54).
18. Install bolt (55), two washers (56), nut (57), and cotter pin (58).
19. Install tension rod (59) on bracket (60).
20. Install quick-release pin (61) on bracket (60) and tension rod (59).



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

**INSPECT****FOLLOW-ON MAINTENANCE:**

None



END OF TASK



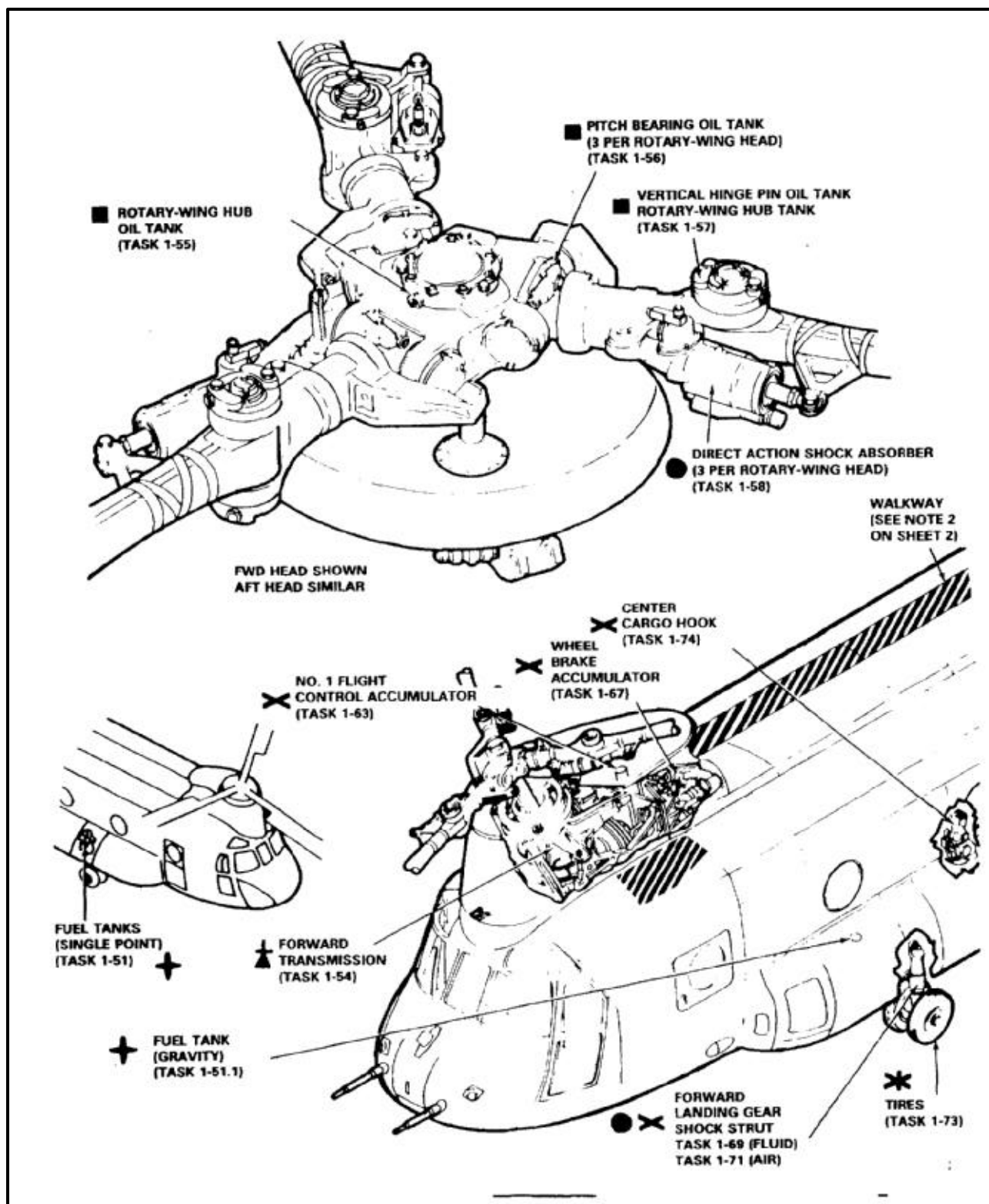


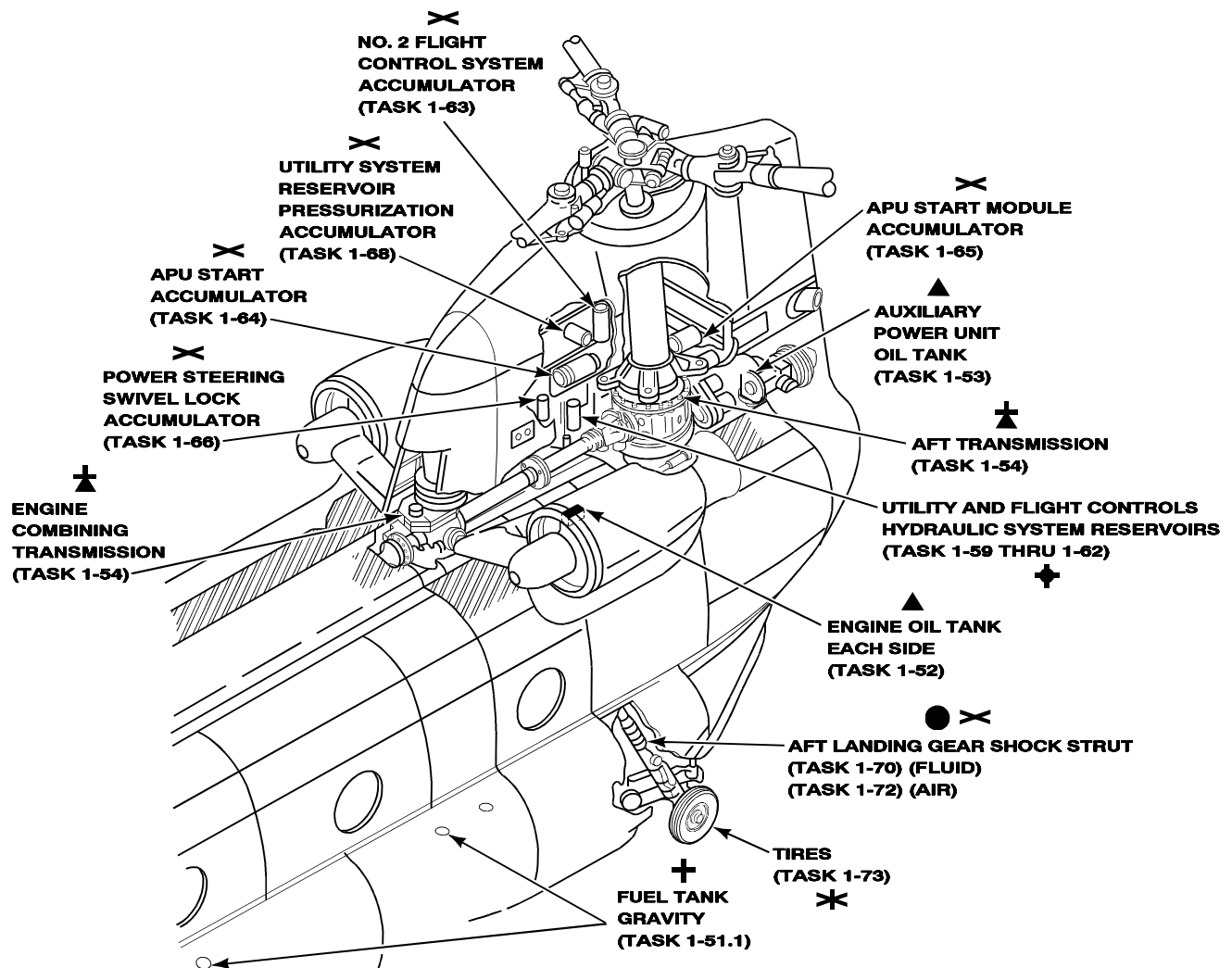
## **SECTION VI**

### **SERVICING AND LUBRICATION**

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.



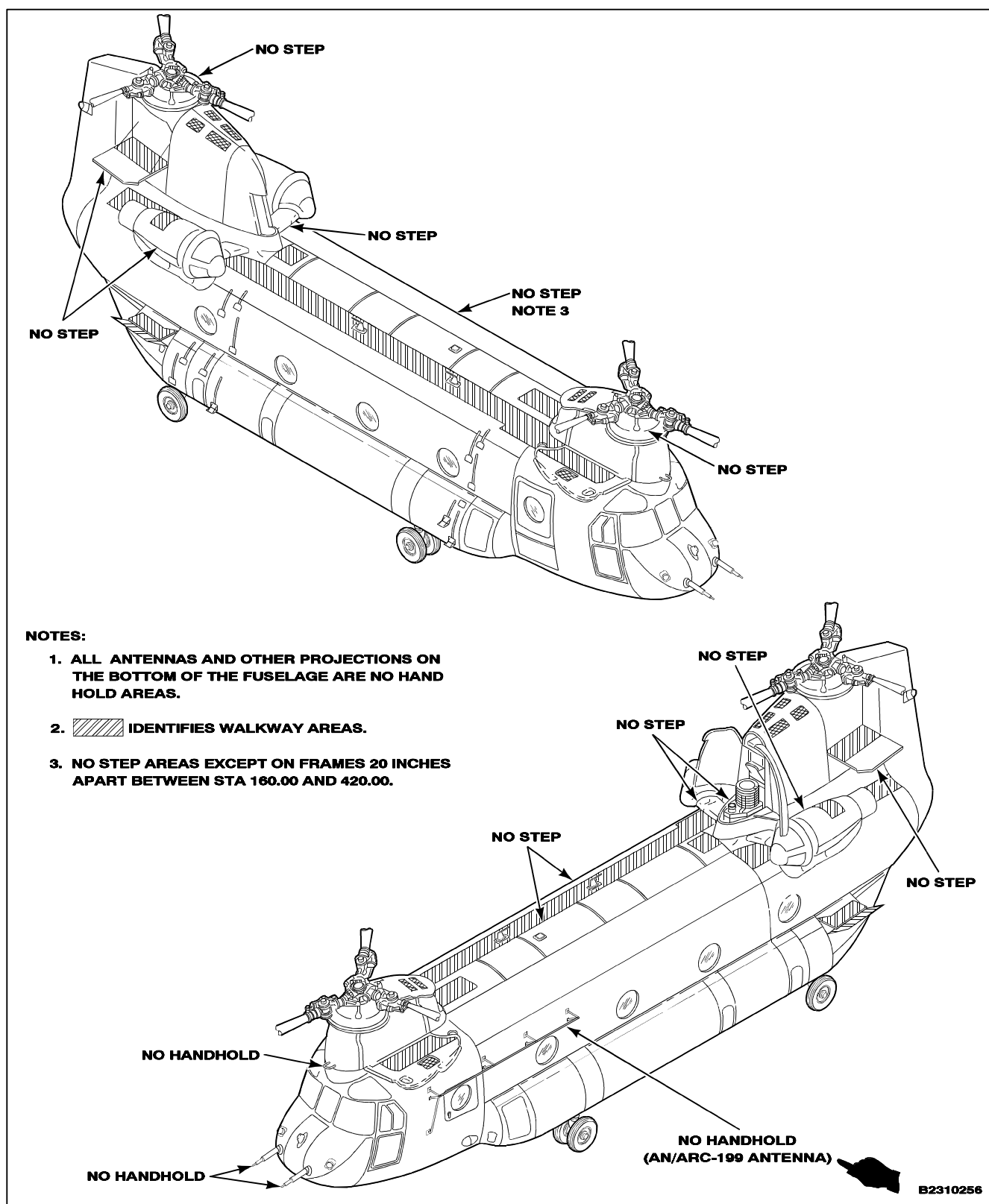


## NOTES:

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



**1-50 GENERAL SERVICING INFORMATION (Continued)****1-50**

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

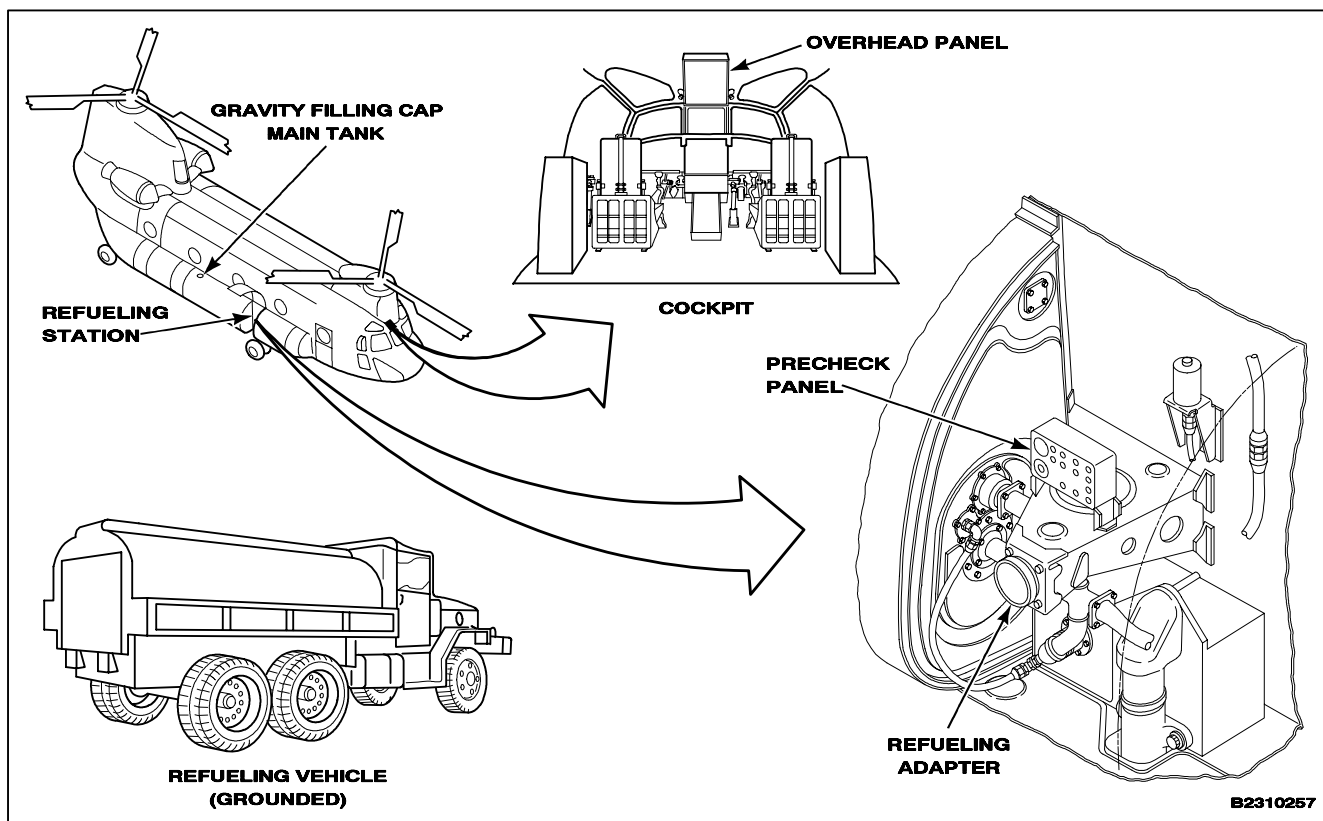
**General Safety Instructions:****WARNING**

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.





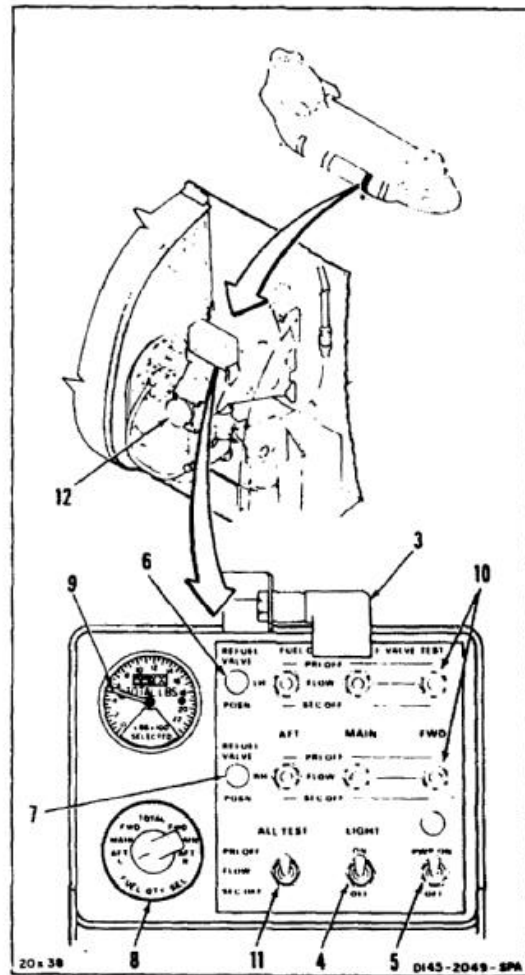


2. If panel light (3) at refueling station is required, set LIGHTswitch (4) to ON.
3. Set PWR switch (5) to PWR ON. LH REFUEL VALVE POSN light (6) and RH REFUEL VALVE POSN light (7) shall come on and go off.

**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).



## 1-51 SINGLE POINT REFUELING (Continued)

1-51

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**

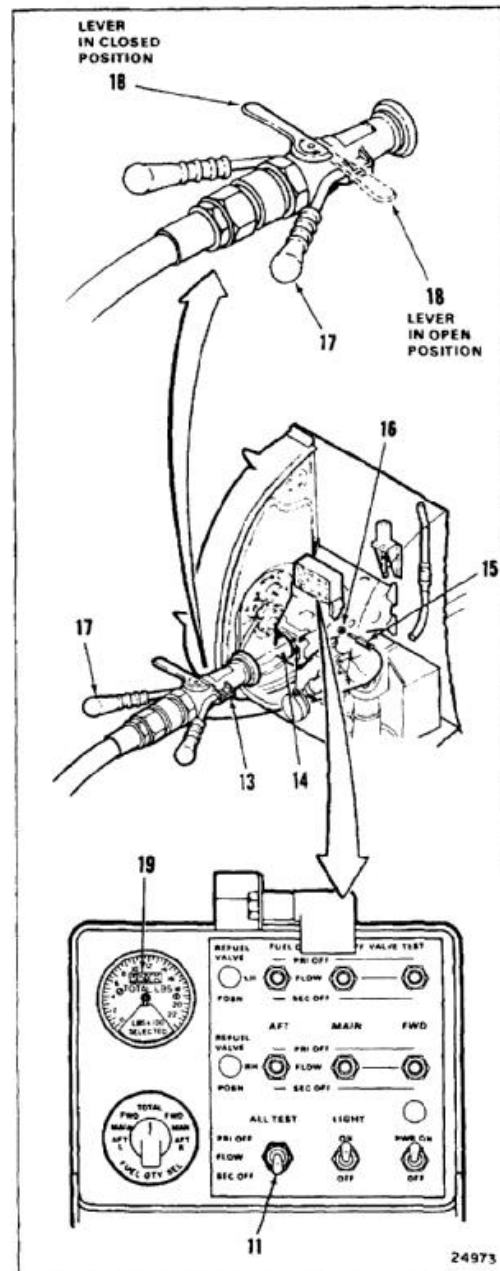
Damage to fuel system could result if refueling hose pressure exceeds **55 psi**.

**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.





If either the PRI OFF or SEC OFF float switch shutoff for any tank is inoperative, do not pressure refuel the helicopter, 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.

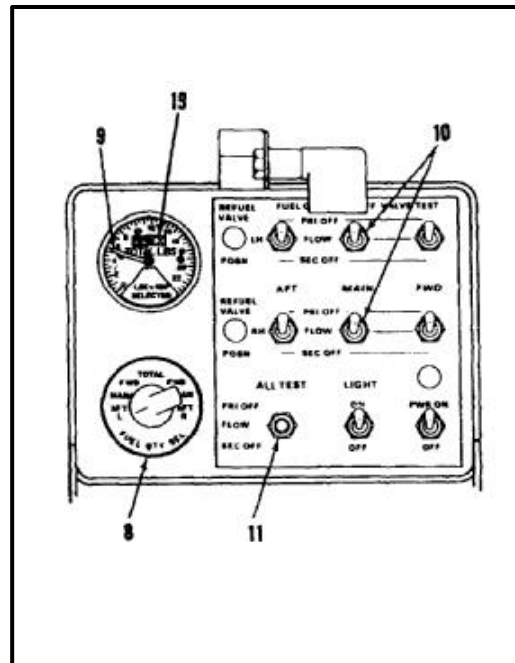
16. Watch totalizer (19). Totalizer shall indicate about **7000 pounds**. When totalizer stops, go to step 25.

#### 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

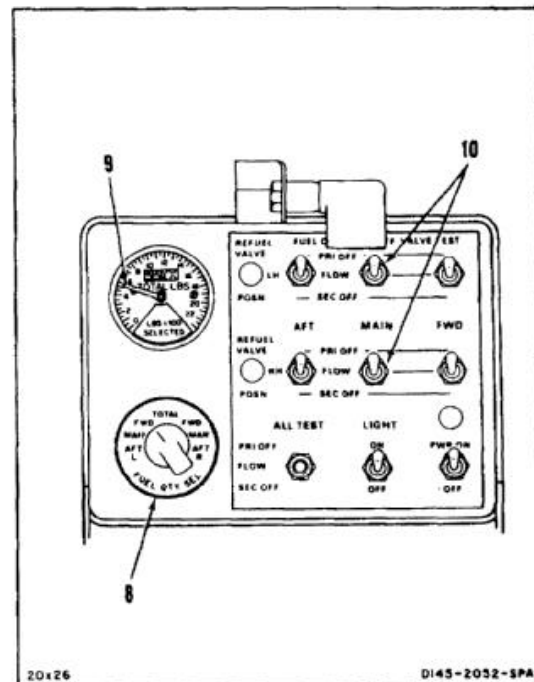
17. Set six FUEL CELL SHUTOFF VALVE TEST switches (10) to PRI OFF.
18. Set ALL TEST switch (11) to FLOW.
19. To add fuel to left aft fuel tank.
  - a. Set FUEL QTY SEL switch (8) to L AFT.



- 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.

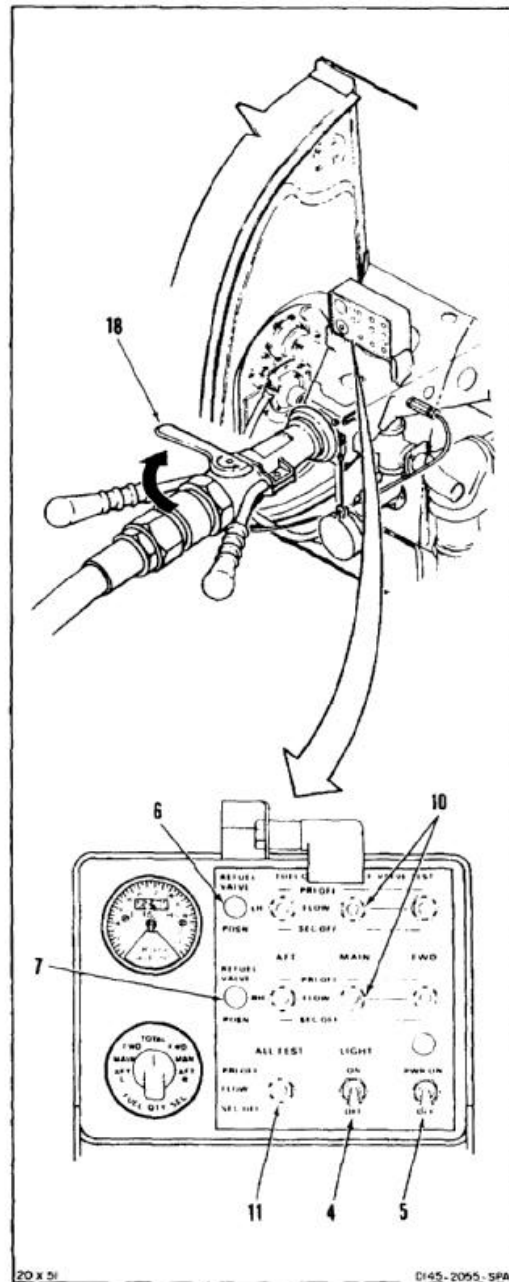
**1-51 SINGLE POINT REFUELING (Continued)****1-51**

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.



**SHUTDOWN**

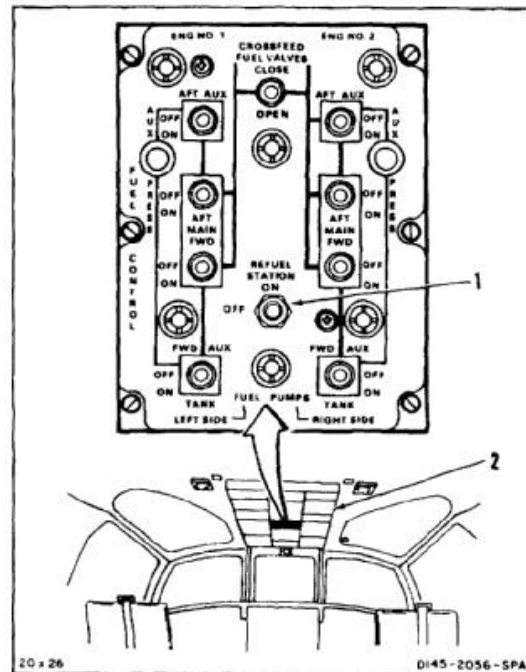
25. Set flow control lever (18) clockwise to closed position.
26. Set power switch (5) to OFF. VALVE POSN lights (6 and 7) shall come on and go off.
27. Set six FUEL CELL SHUTOFF VALVE switches (10) to FLOW.
28. Set ALL TEST switch (11) to FLOW.
29. Set LIGHT switch (4) to OFF.



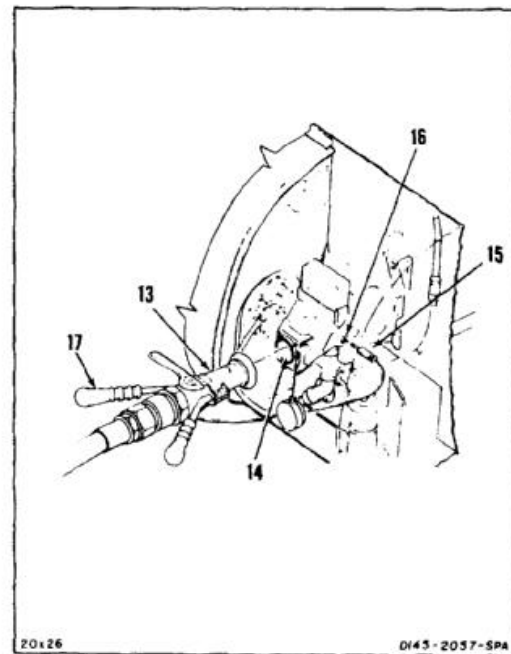
30. Inside cockpit, set REFUEL STATION switch (1) to OFF on overhead panel (2).

**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).

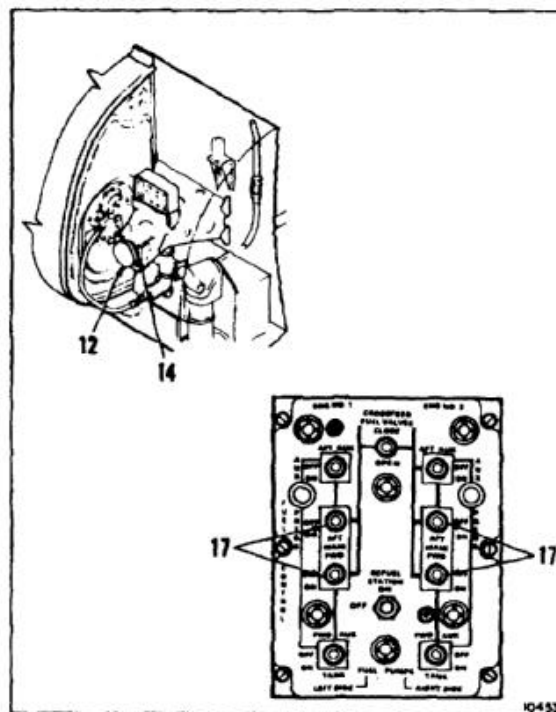


33. Install cap (12) on adapter (14).



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:
- Apply ac power to the helicopter (Task 1-37).
  - Operate any of the main tank boost pumps for about **two minutes**. Use switches (17).
  - 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**

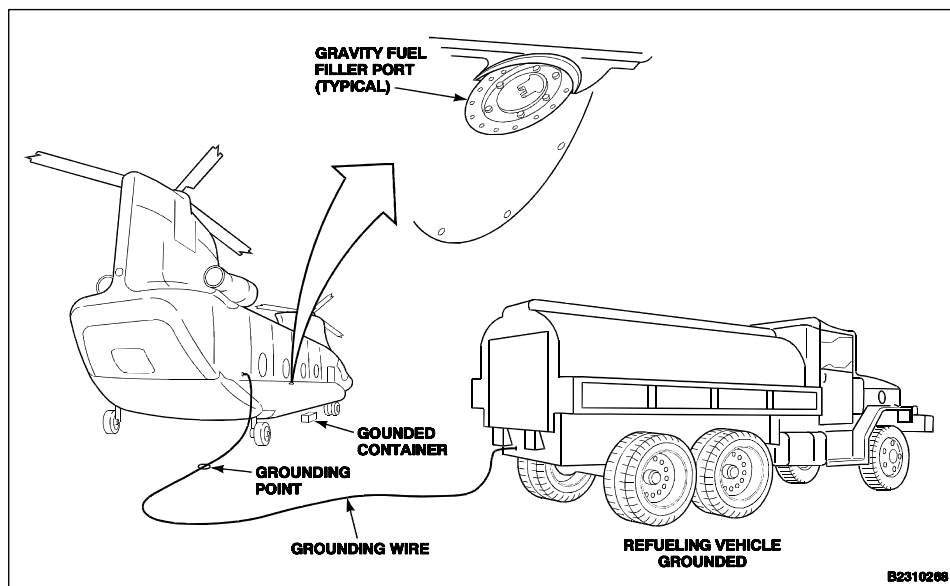
Proper electrical grounding is essential to prevent damage to equipment and injury to personnel.

**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**

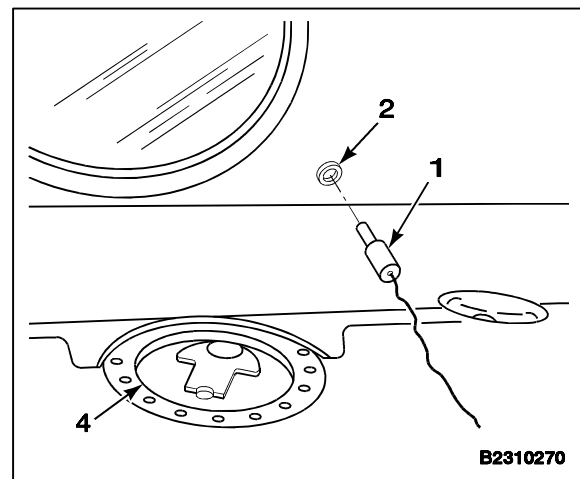
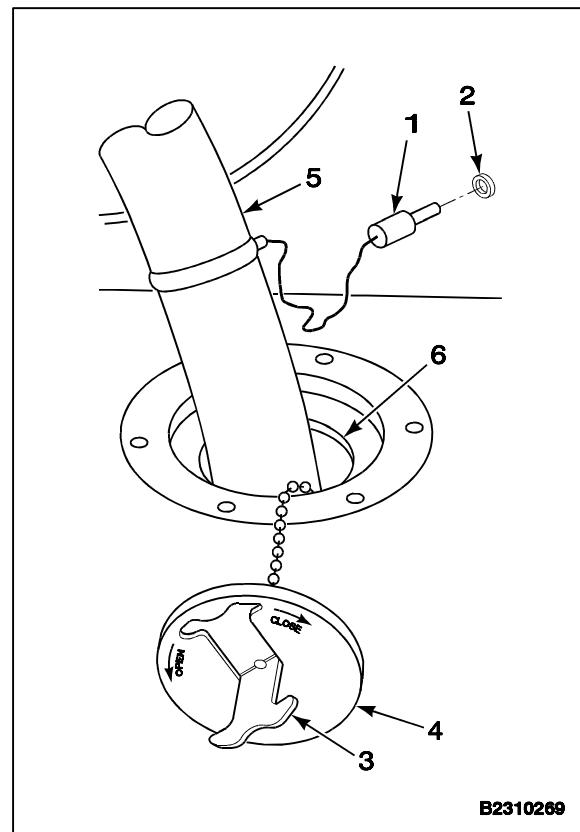
If checking fuel level inside the tank, use an explosion-proof flashlight. Other flashlights could cause a spark that ignites fumes. Injury to personnel can result.

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 -25°)  
Lubricating Oil, Aircraft Turbine Engine (E254)  
(Temperature Below -25°)  
Gloves (E186)

**Personnel Required:**

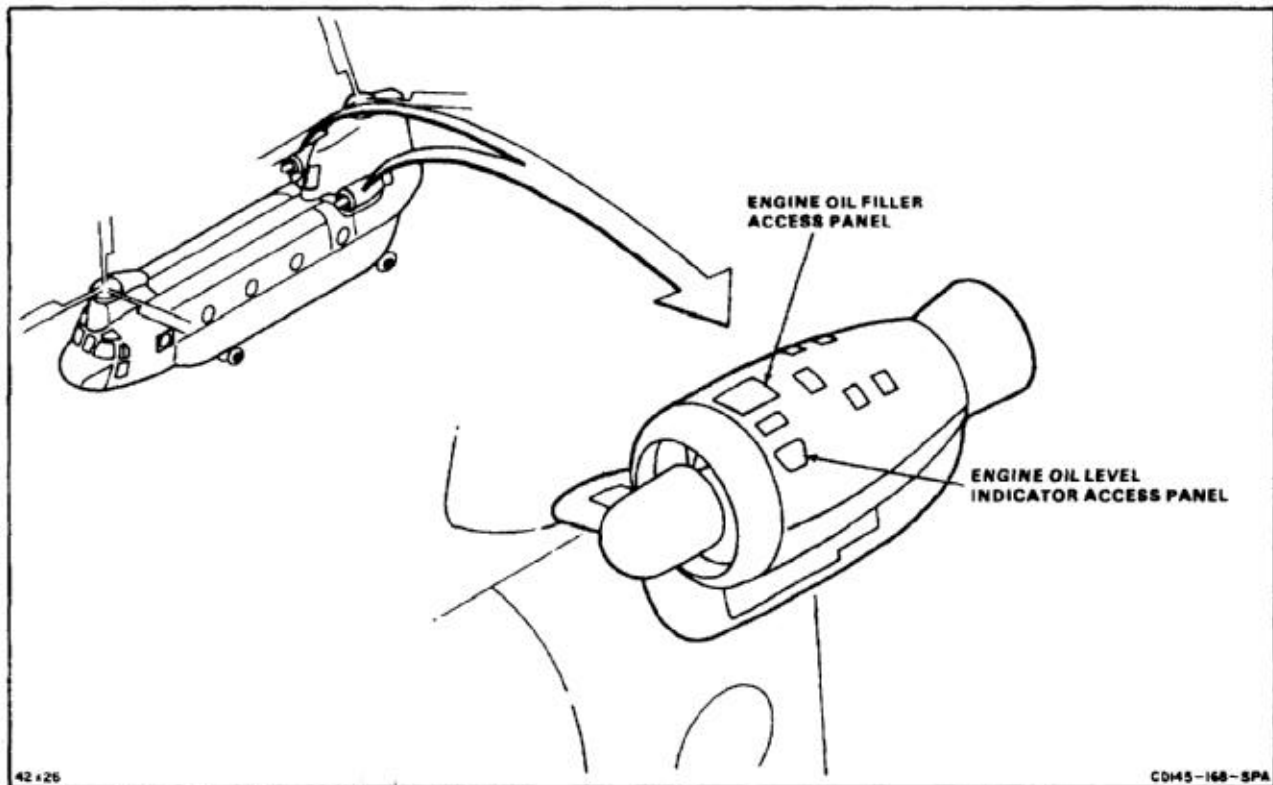
Medium Helicopter Repairer

**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 **-25°F (-32°C)**. Oil (E254) must be used for temperature below **-25°F (-32°C)**. 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.

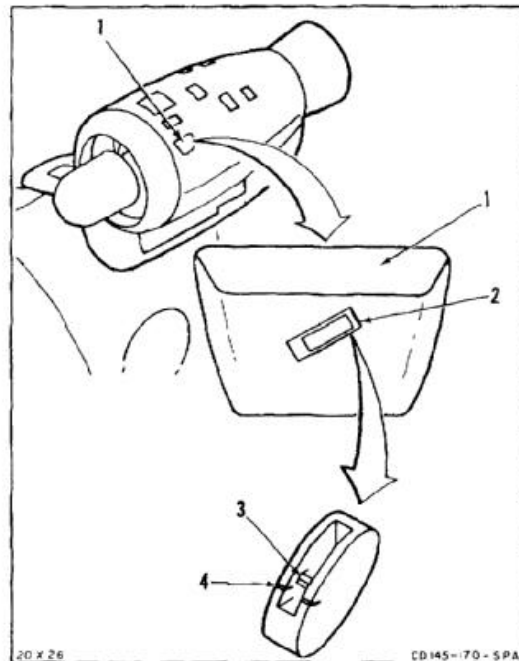
If engine has not been operated within **24 hours**, cooler oil can cause an incorrect oil level reading. For correct reading, check oil after engine operation.

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).

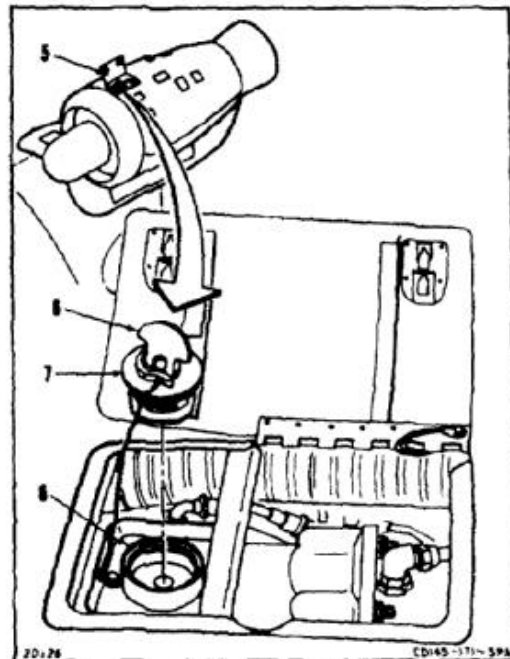
**WARNING**

Oil (E253 or E254) is a skin irritant. If oil gets on skin, wash thoroughly. If oil soaks into clothes, change clothes immediately.

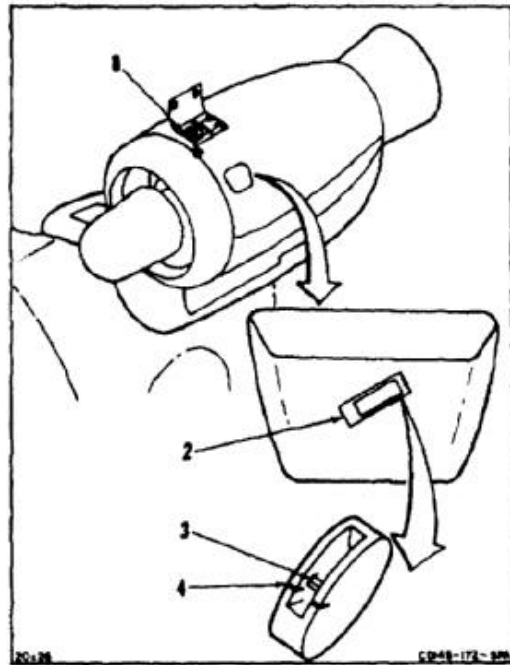
Oil (E253 or E254) gives off fumes that can cause injury to personnel. Use oil in a well-ventilated area.

**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).



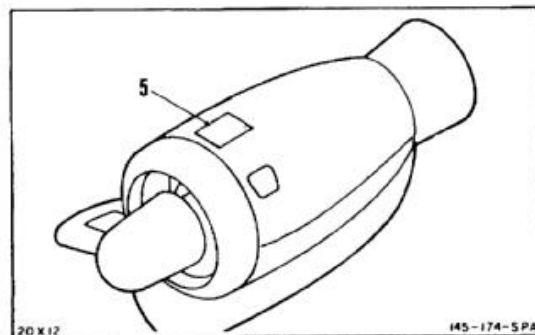
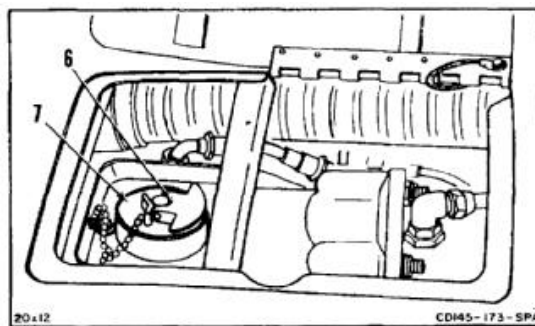
**CAUTION**

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)

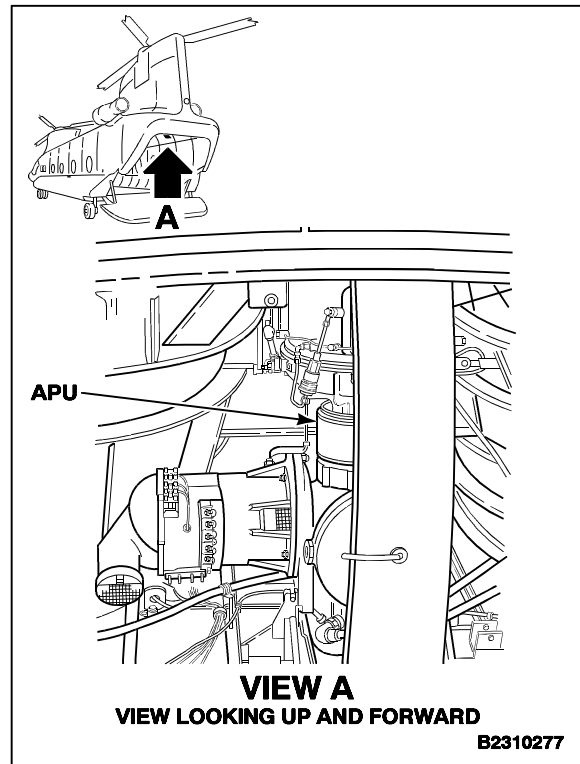
**General Safety Instructions:****WARNING**

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.

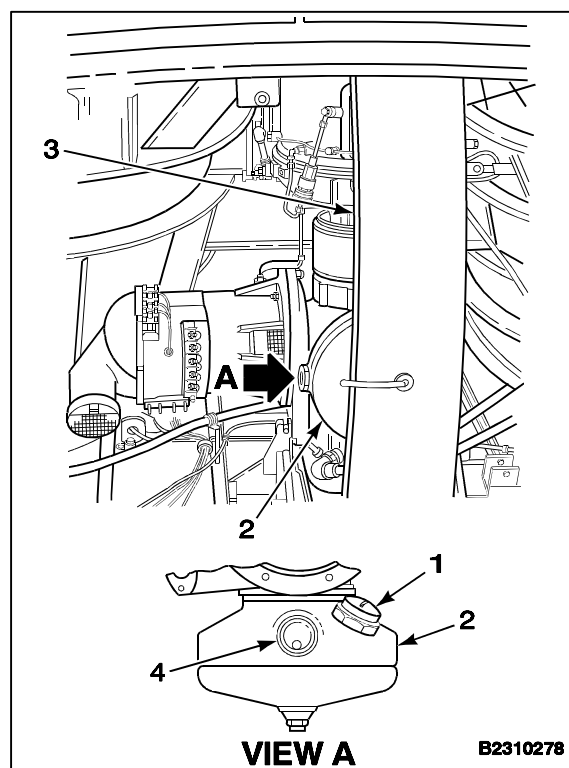
1. Remove filler cap (1) from top of tank (2) above left side of drip pan (3).

**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  $-25^{\circ}\text{F}$  ( $-32^{\circ}\text{C}$ ). Oil (E254) must be used for temperatures below  $-25^{\circ}\text{F}$  ( $-32^{\circ}\text{C}$ ). 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

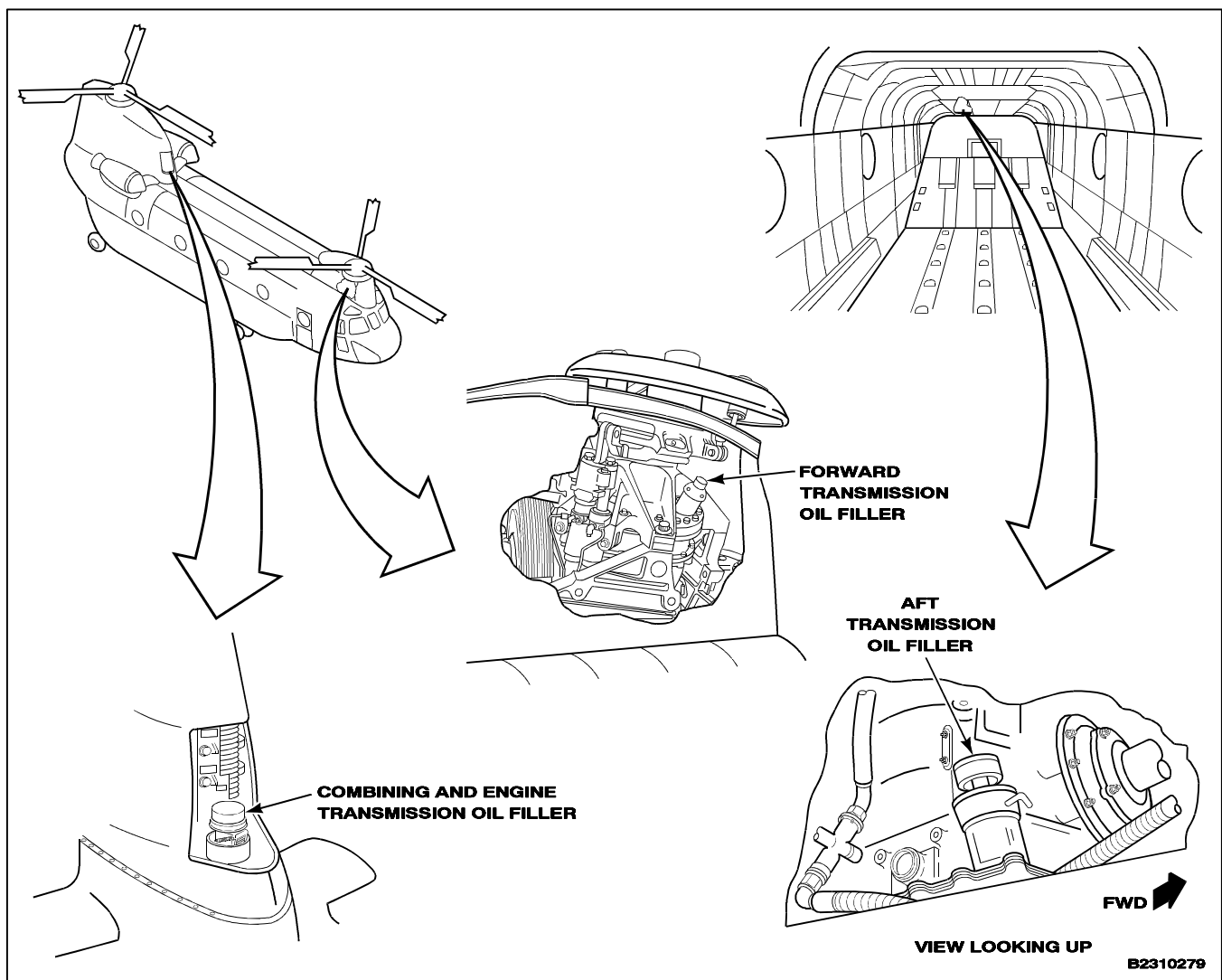
**Equipment Condition:**

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.





**SERVICE FORWARD TRANSMISSION**

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.

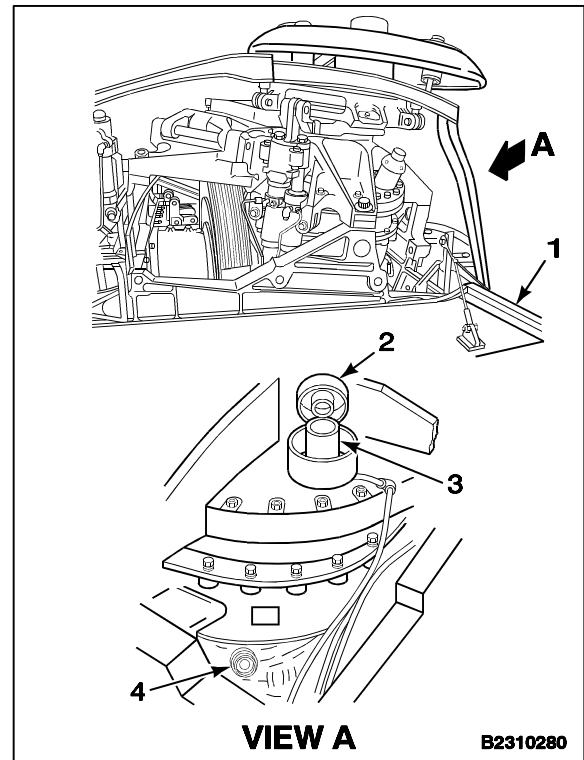
**NOTE**

If transmission has been operated within the past **30 minutes**, wait **30 minutes** prior to servicing transmission.

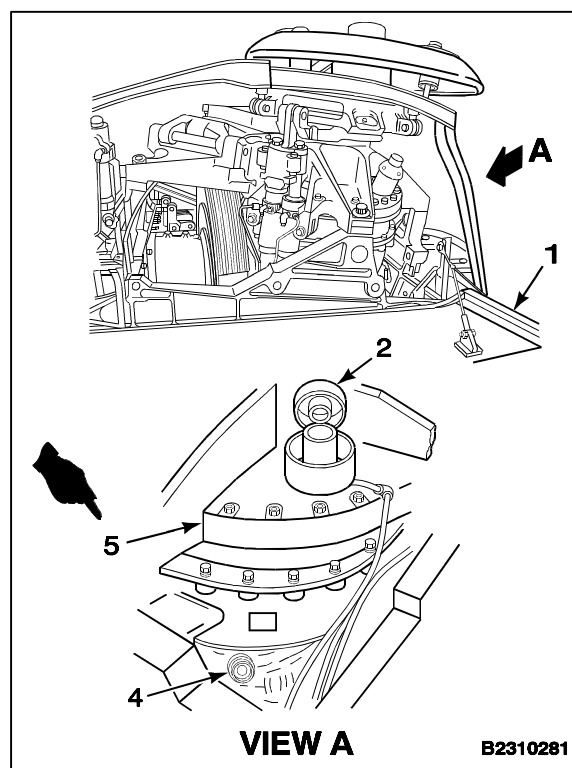
**NOTE**

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 **-25°F (-32°C)**. 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.

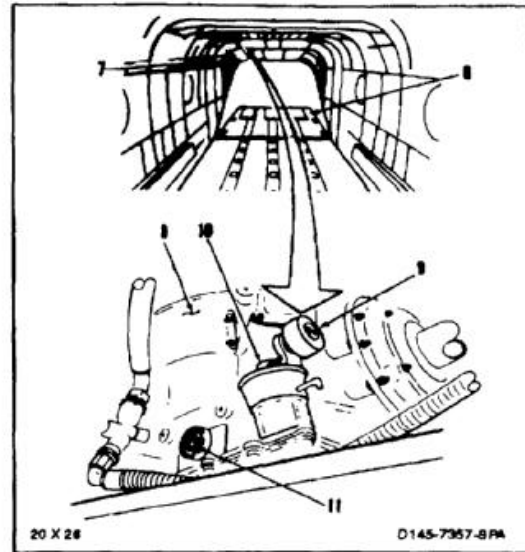
**NOTE**

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**

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 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**

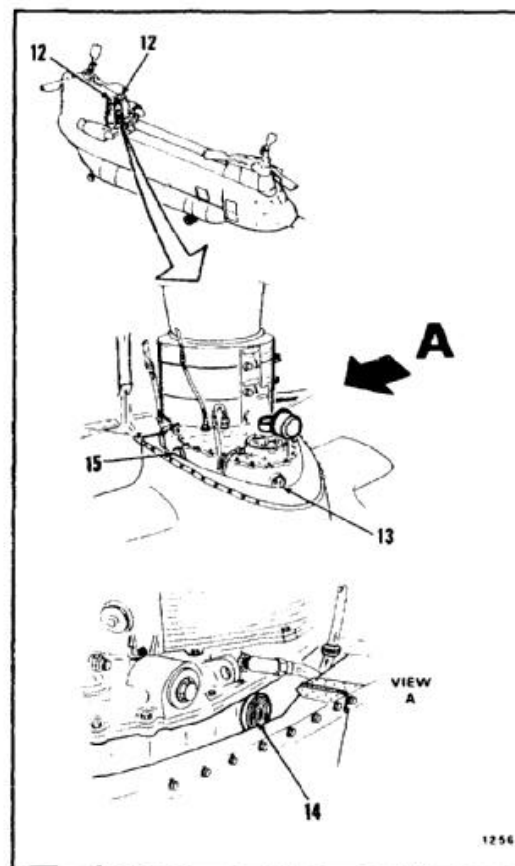
Restencil all transmissions as required to correctly identify lubrication oil to be used after servicing.

17. Open aft pylon access doors (12) (Task 2-2).

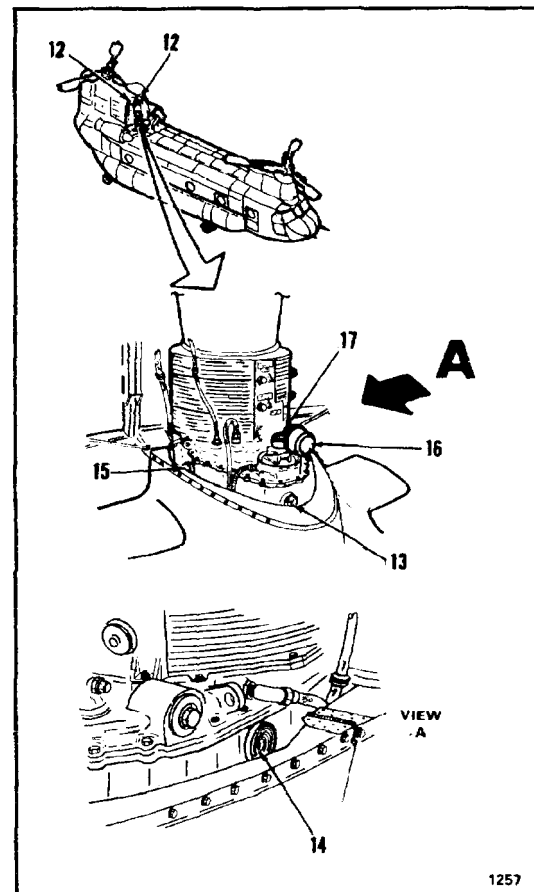
**NOTE**

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

## 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:**

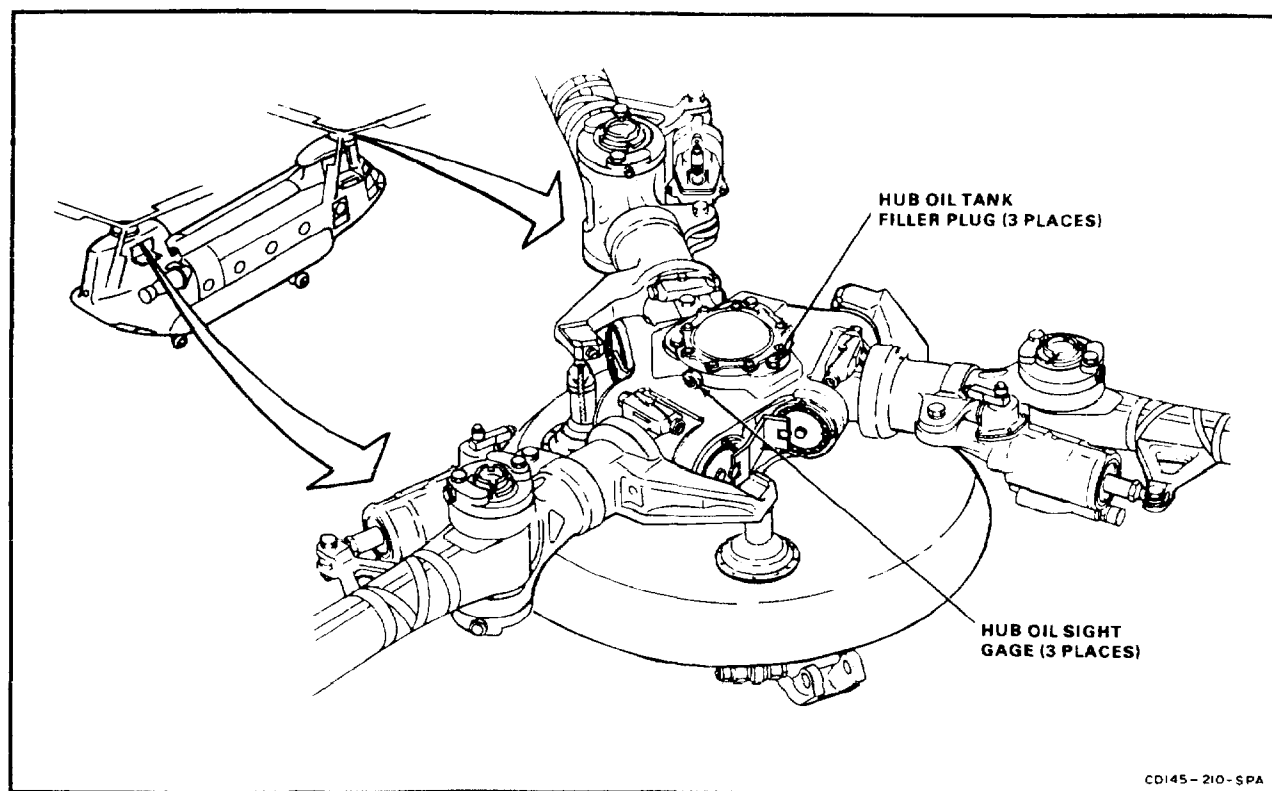
Task 1-26  
 Task 1-39  
 Task 2-2  
 TM 55-1520-240-23P

**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.





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  $-25^{\circ}\text{F}$  ( $-32^{\circ}\text{C}$ ).

#### 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  $90^{\circ}$  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

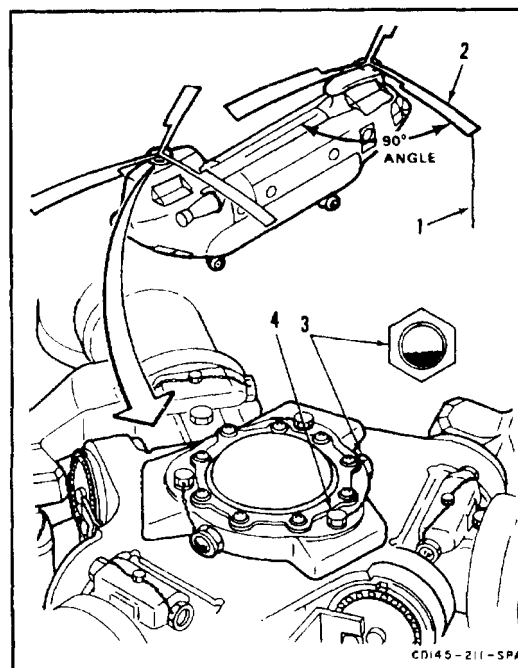
If oil level in sight gage drops from full (half-way) mark to bottom of glass in **two hours** of operation, leakage is too great. Check for source of leakage. Repair as required.

2. Check oil level in sight gage (3) next to the blade that is positioned at  $90^{\circ}$  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**

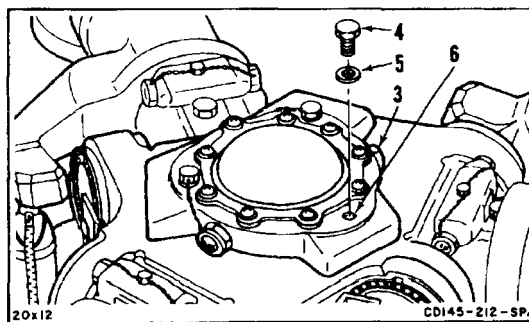
Oil (E254 or E254.1) is a skin irritant. If oil gets on skin, wash thoroughly. If oil spills on clothes, change clothes immediately.

Oil gives off fumes that can cause injury to personnel. Use oil (E254 or E254.1) in a well-ventilated area.

**CAUTION**

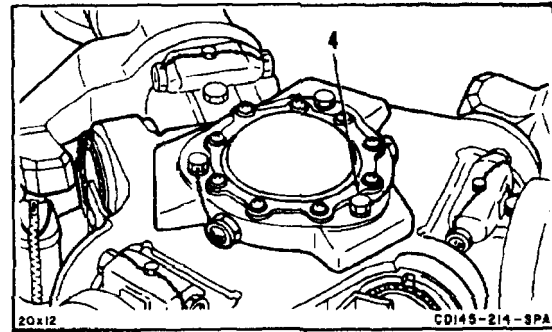
Oil (E254 or E254.1) can soften paint. If oil drips on painted surface of helicopter, wipe up immediately with clean cloths.

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**.

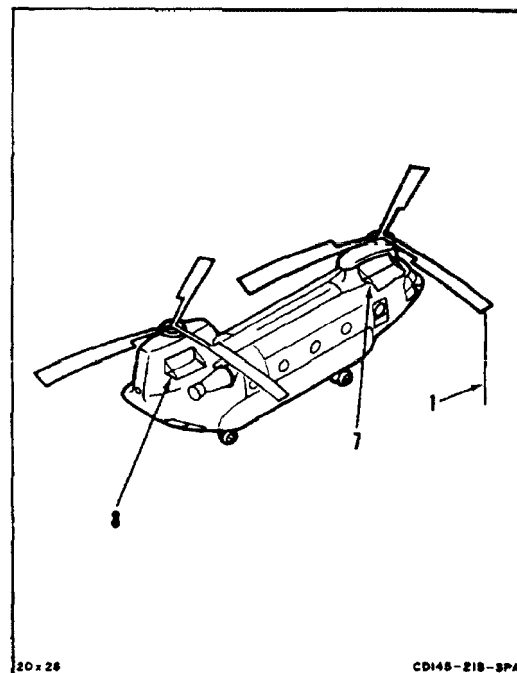


7. Lockwire filler plug (4). Use lockwire (E231).

**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

## 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:**

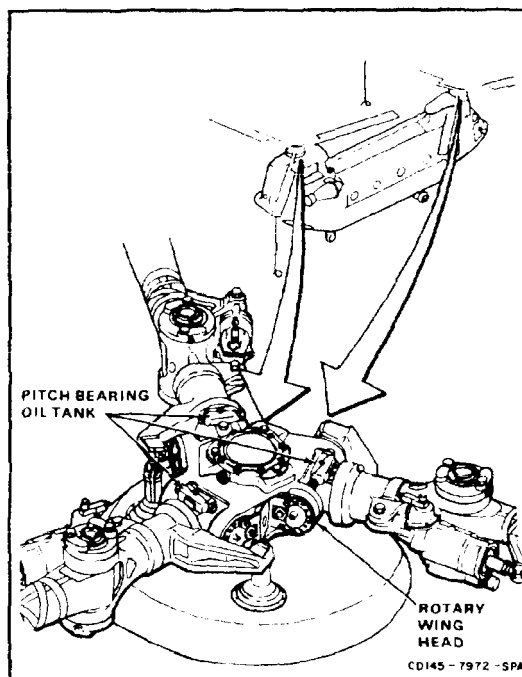
Medium Helicopter Repairer  
Inspector

**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)



**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)**.

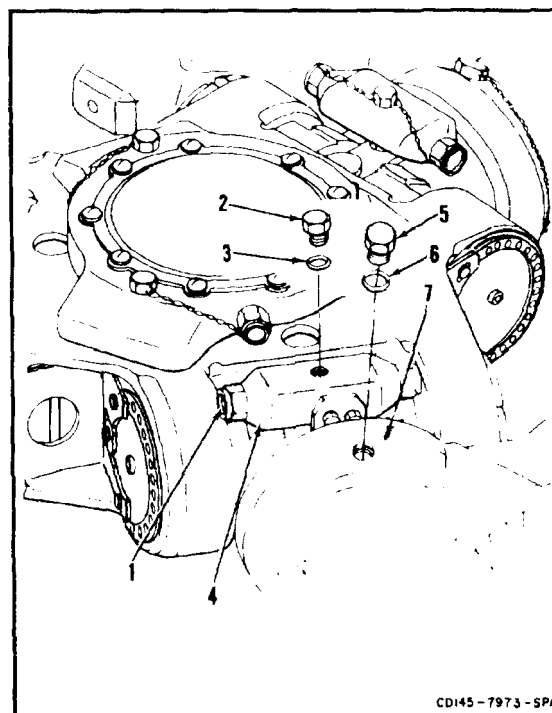
**NOTE**

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.

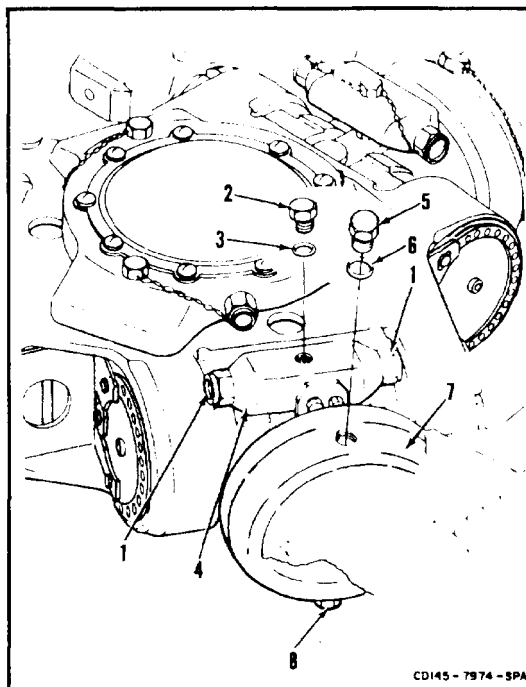
Blade must be over tunnel.

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).



CDI45-7973-SPA

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**.

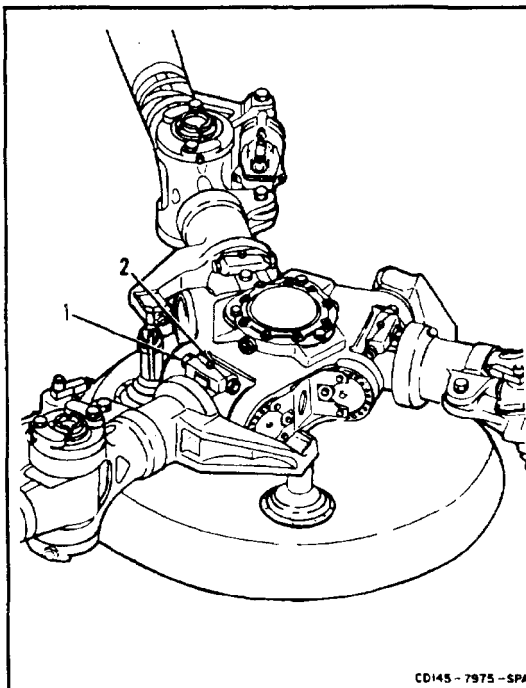


8. Lockwire plug (2) to two sight indicators (1). Use lockwire (E231).

### **INSPECT**

### **FOLLOW-ON MAINTENANCE:**

Close work platforms (Task 2-2).



END OF TASK

**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:**

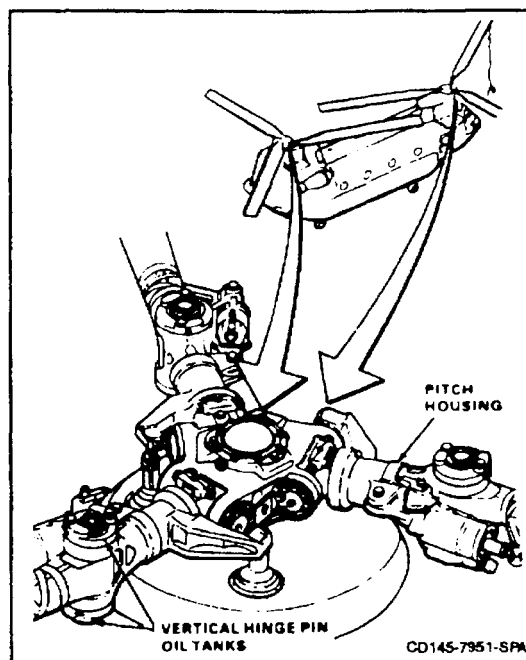
Battery Disconnected (Task 1-39)  
 Electrical Power Off  
 Hydraulic Power Off  
 Tiedown Lines On One Forward and One Aft  
 Rotary-Wing Blade Tied Down (Task 1-26)  
 Forward or Pylon Work Platform Open (Task 2-2)

**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.



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  $-25^{\circ}\text{F}$  ( $-32^{\circ}\text{C}$ ).

#### 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).

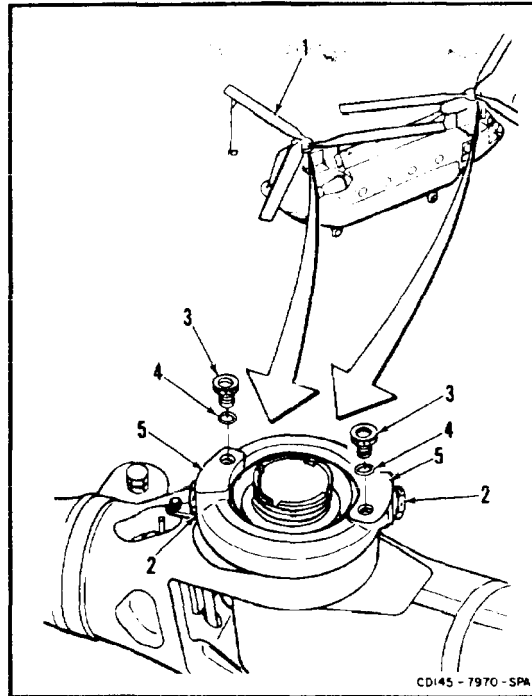
#### WARNING

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**.

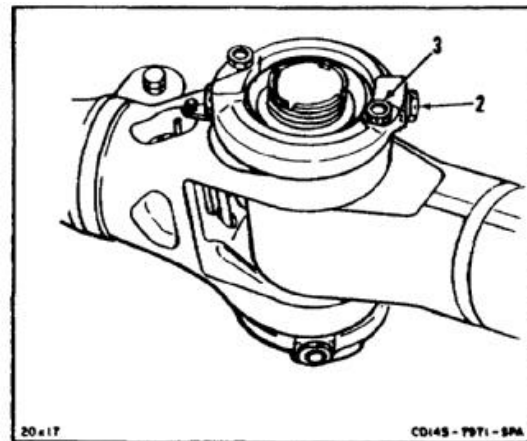


6. Lockwire plugs (3) to sight indicators (2). Use lockwire (E231).

**INSPECT**

**FOLLOW-ON MAINTENANCE:**

- Close work platforms (Task 2-2).  
Remove tiedown lines from blades (Task 1-26).



END OF TASK



## 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:**

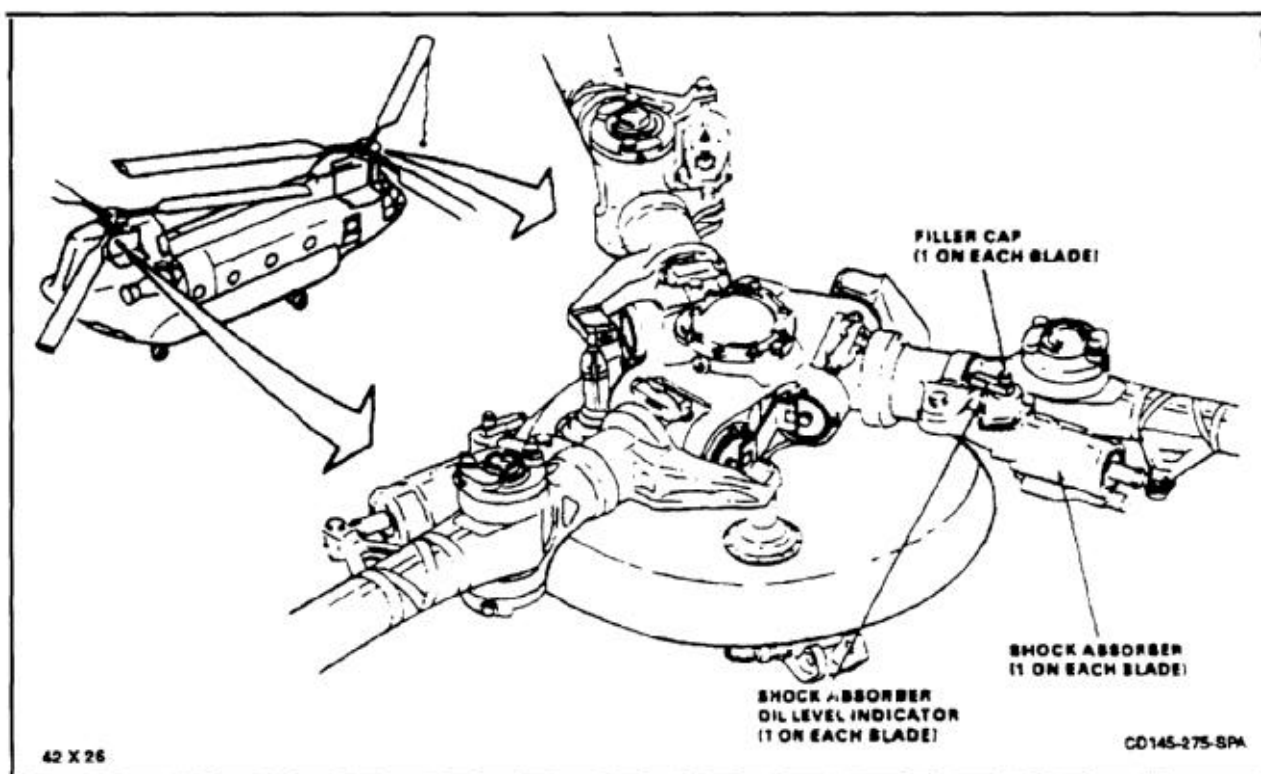
Medium Helicopter Repairer  
Inspector

**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  $90^\circ$  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.

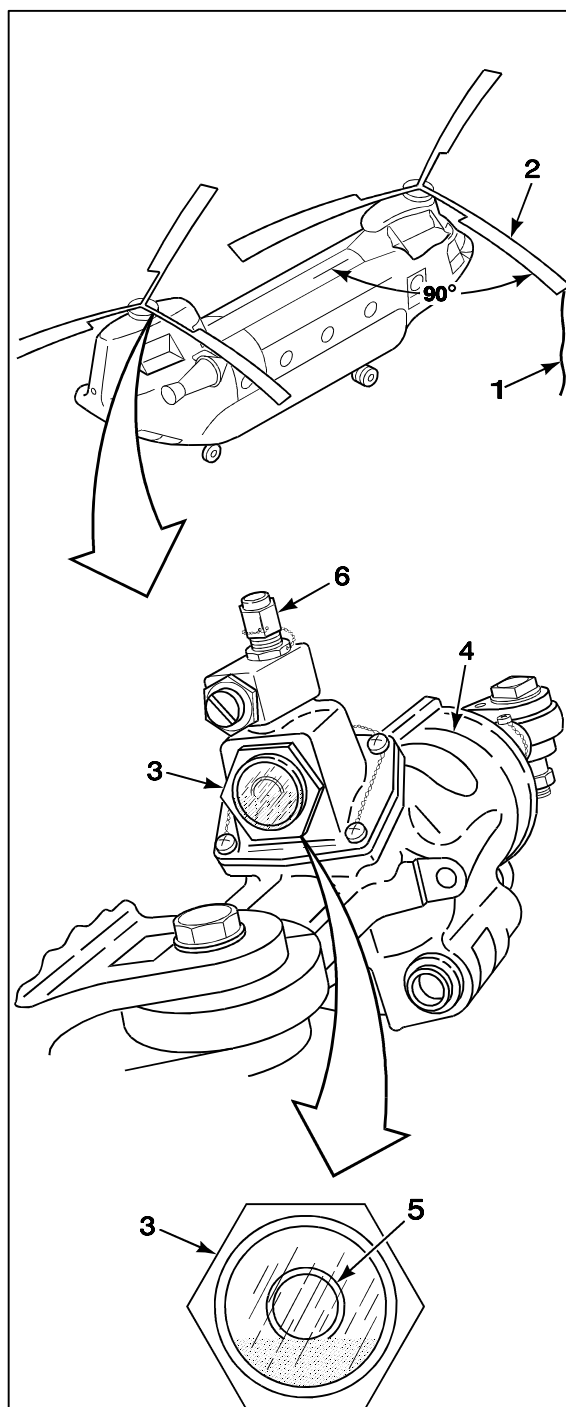
**NOTE**

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).

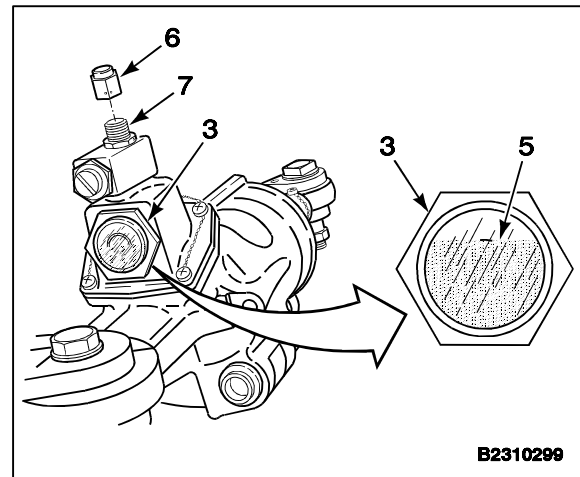
**WARNING**

Hydraulic fluid (E197) is a skin irritant. If fluid gets on skin, wash immediately with soap and water.

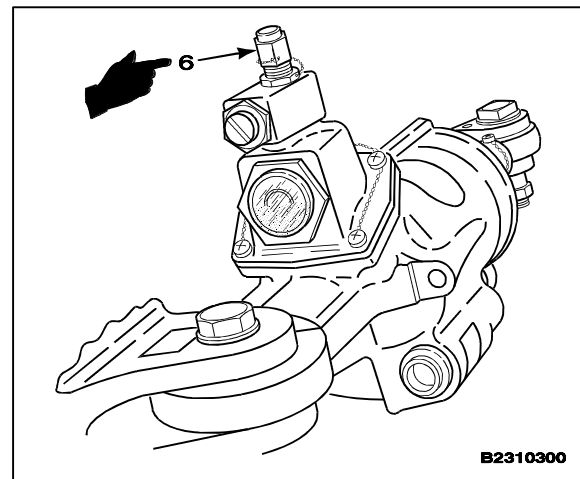


B2310298

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:**

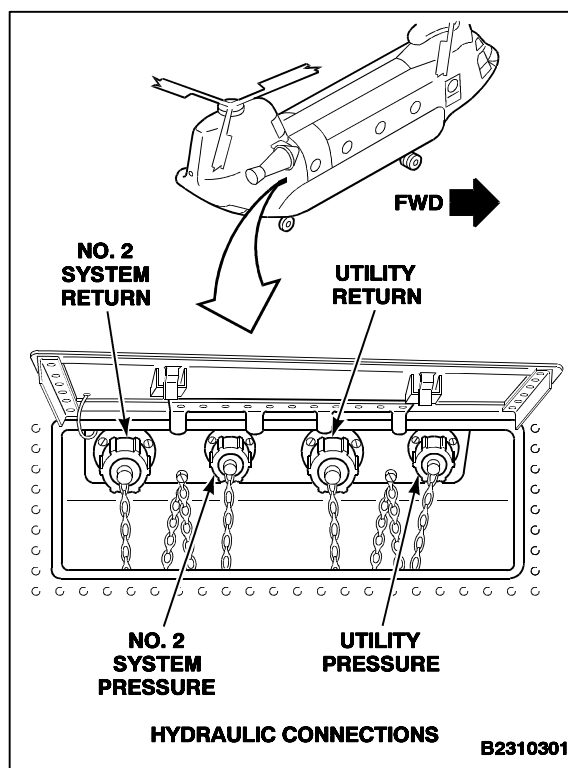
CH-47 Helicopter Repairer  
 Aircraft Pneudraulics Repairer

**References:**

TM 1-1520-240-10  
 TM 55-1730-229-12  
 TM 55-4920-335-14  
 TM 55-4920-373-14&P

**Equipment Condition:**

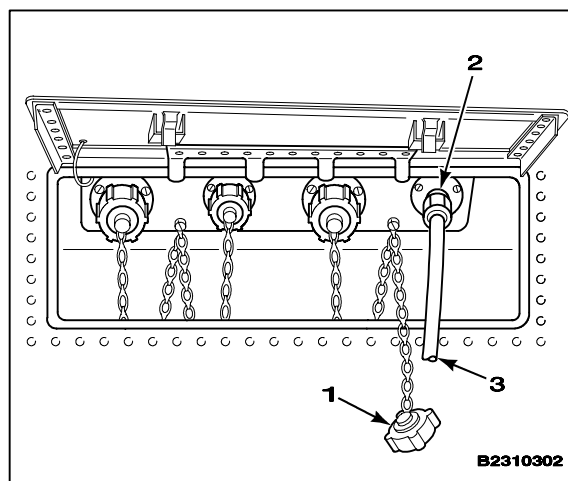
Battery Connected (Task 1-39)  
 Electrical Power Off  
 Hydraulic Power Off  
 Hydraulic Connection Access Panel Open (Task 2-2)  
 Cargo Ramp Fully Up or Full Down (TM 55-1520-240-T)  
 Utility Hydraulic System Depressurized (Task 7-135.1)

**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.



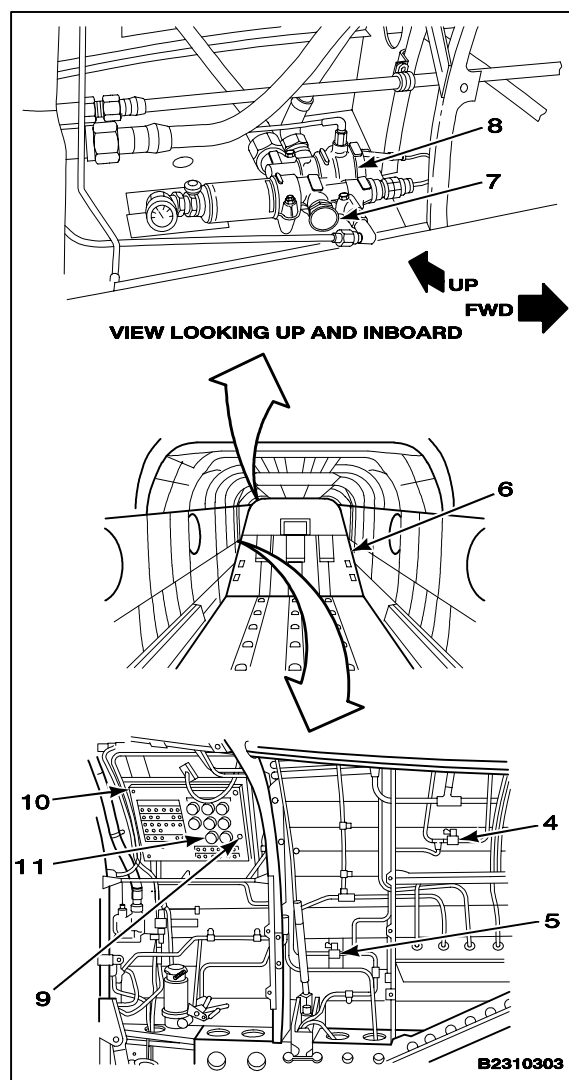
1. Remove dust cover (1) from utility system pressure connection (2).
2. Connect test stand pressure line (3) to utility pressure connection (2).

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.

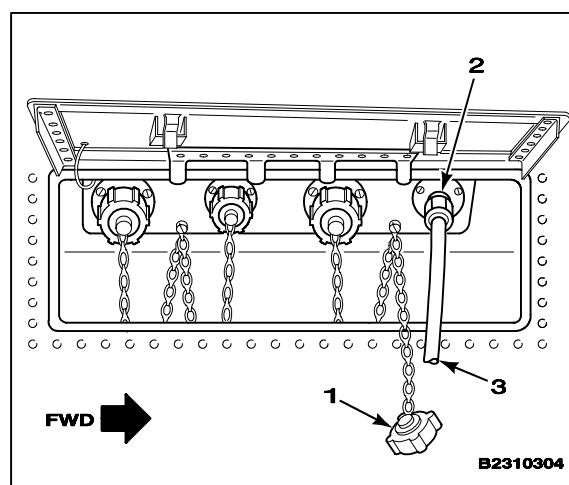
**NOTE**

Be sure to read correct scale on gauge according to whether ramp is fully up or fully down.

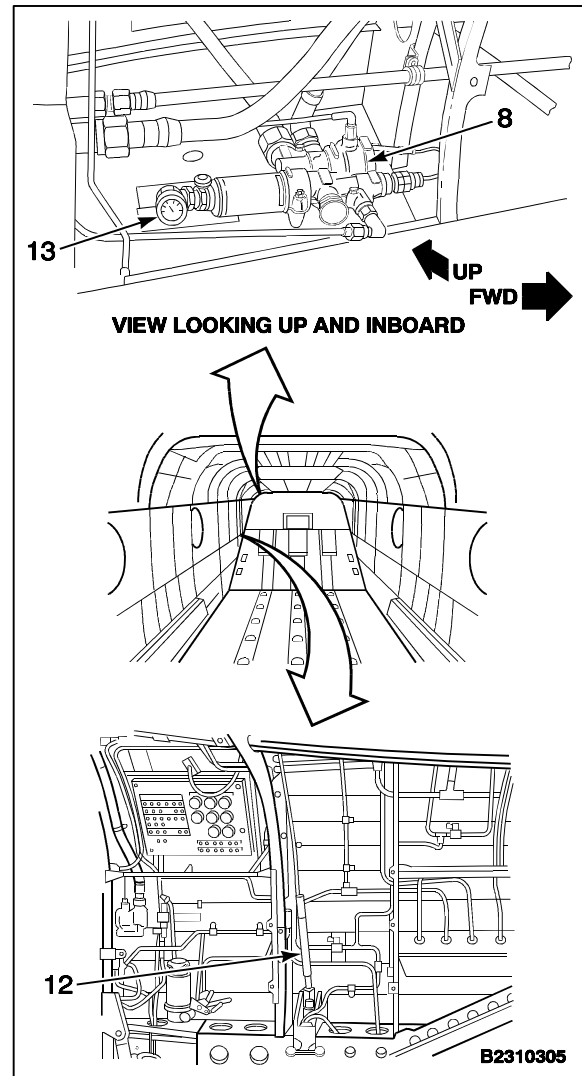
7. Press and hold LEVEL CHECK button (9) on MAINTENANCE PANEL (10). Read reservoir fluid level on gauge (11).
8. Have helper operate test stand. Set test stand flow limits to minimum flow position. Turn on test stand. Set stand pressure between **500 and 1000 psi** (TM 55-4920-335-14 or TM 55-4920-373-14&P).
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  $-25^{\circ}\text{F}$  ( $-32^{\circ}\text{C}$ ), charge accumulator to **3000 psi**. If temperature is below  $-25^{\circ}\text{F}$  ( $-32^{\circ}\text{C}$ ), 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)

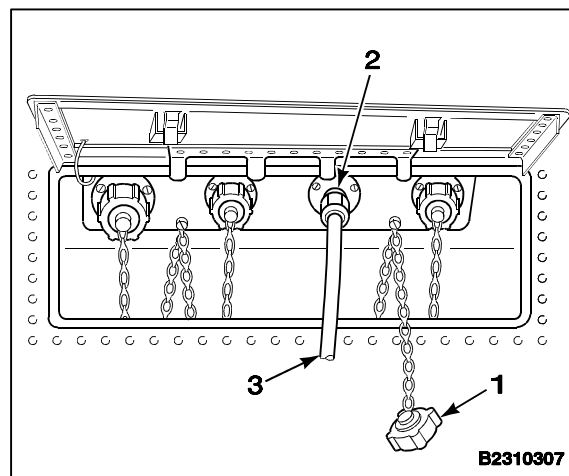
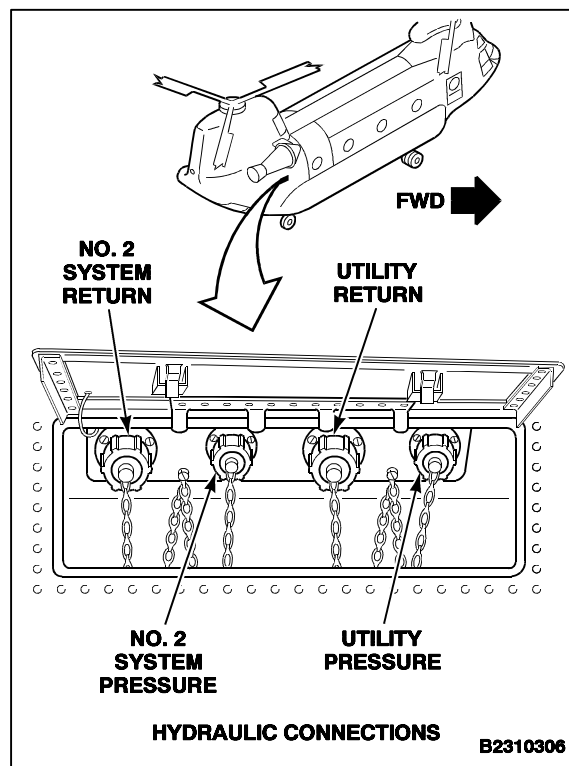
**General Safety Instructions:****WARNING**

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).

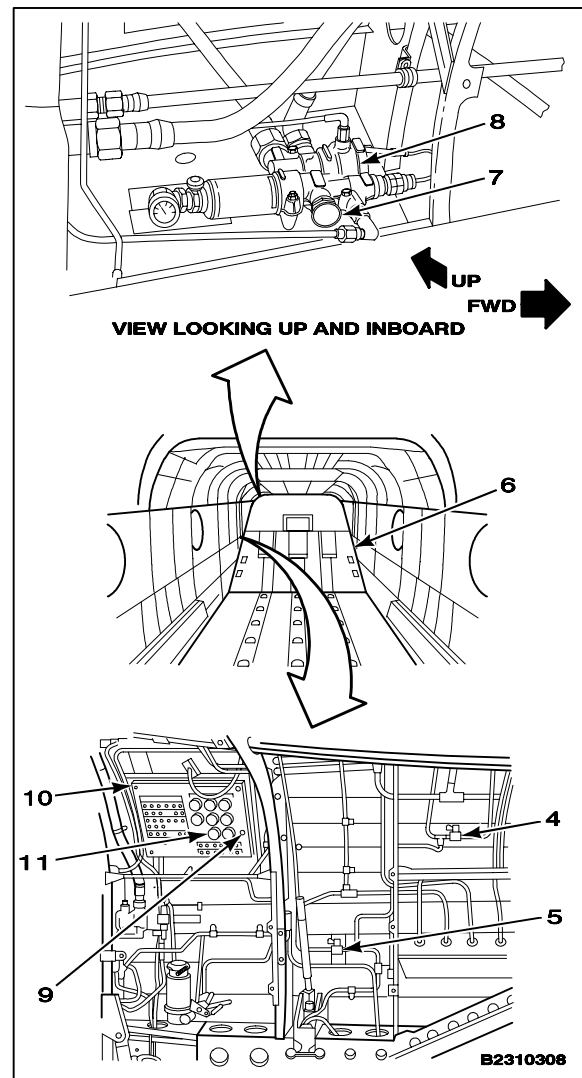


3. Make sure UTILITY RESERVOIR DEPRESSURIZE valve (4) and EMERG UTIL PRESS valve (5) are set to NORMAL.
4. Press and hold depressurization valve (7) on APU start module (8) until accumulators deplete to precharge.
5. Release valve (7).
6. Turn valve (4) to OPEN.

**NOTE**

Be sure to read correct scale on gauge according to whether ramp is fully up or fully down.

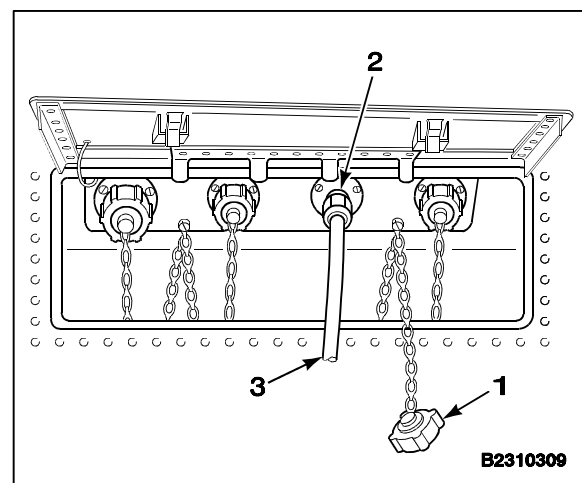
7. Press and hold LEVEL CHECK button (9) on MAINTENANCE PANEL (10). Read reservoir fluid level on gauge (11).
8. Have helper operate test stand. Turn on test stand (TM 55-4920-335-14 or TM 55-4920-373-14&P).
9. Have helper press and hold valve (7). Press button (9) and read gauge (11).
10. When gauge (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

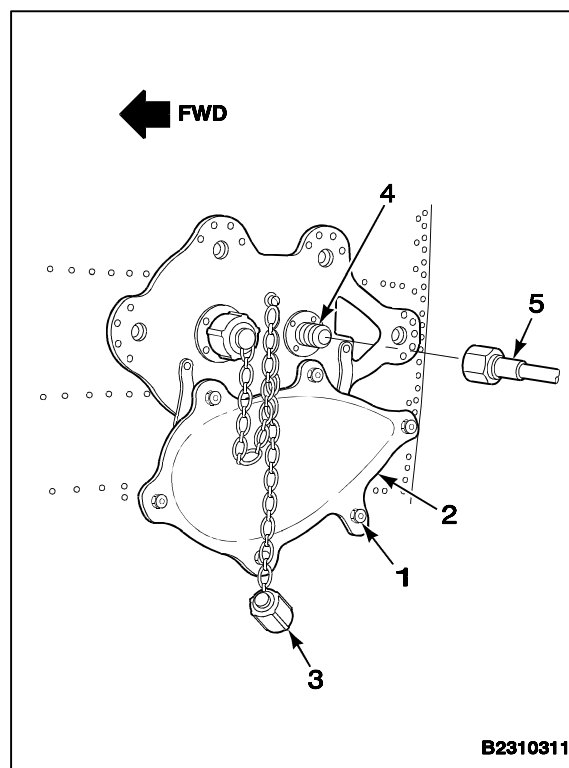
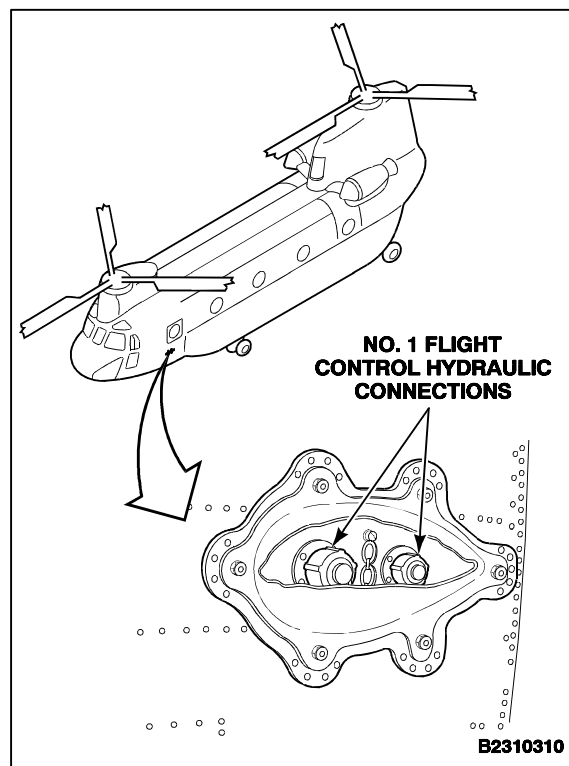
**General Safety Instructions:****WARNING**

Make sure all connections are tight before operating hydraulic test stand. High-pressure fluid from test stand can injure personnel.

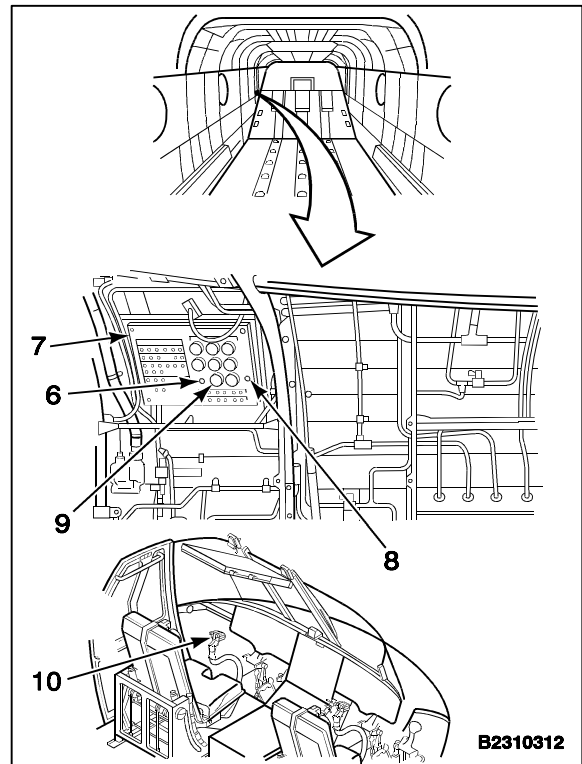
**WARNING**

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).



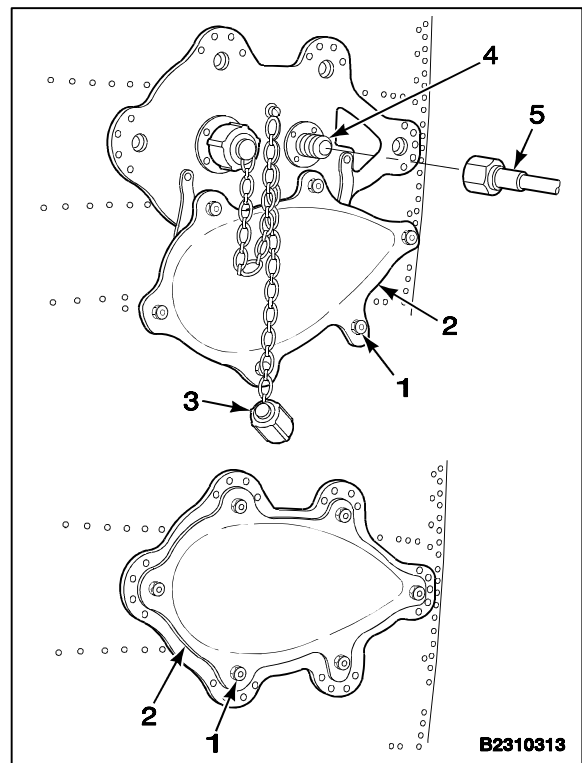
4. Set FLT CONT switch (6) on MAINTENANCE PANEL (7) to No. 1.
5. Press and hold LEVEL CHECK button (8). Read reservoir fluid level on gauge (9).
6. Have helper operate test stand. Set test stand pressure between **1500 and 2000 psi**.
7. Observe gauge (9) while helper cycles cockpit control stick (10).
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&amp;P

**Equipment Condition:**

Battery Connected (Task 1-39)

Hydraulic Power Off

Electrical Power Off

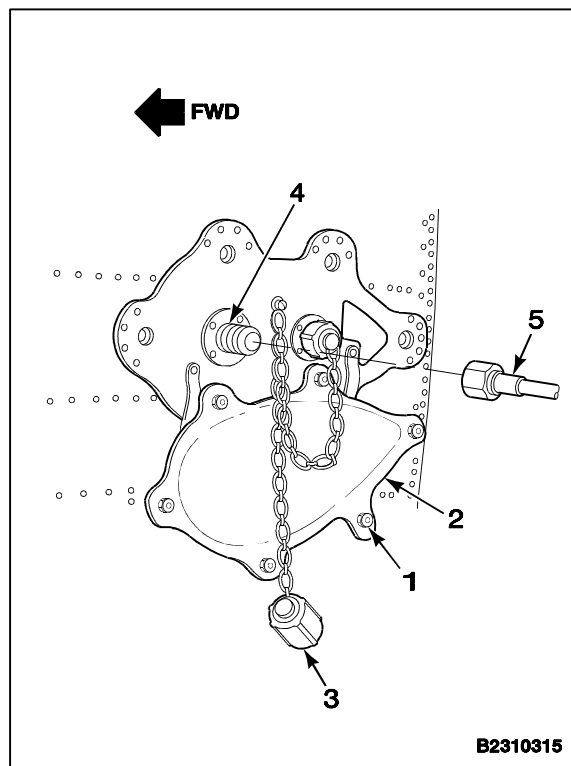
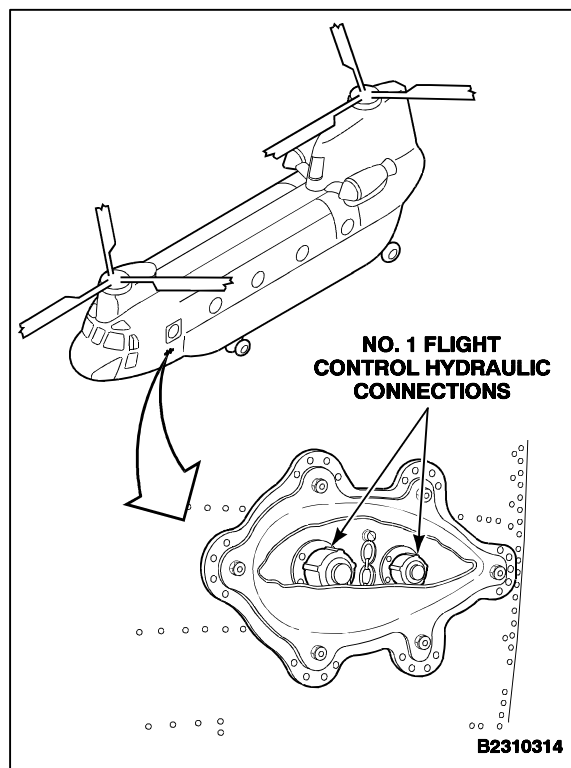
**General Safety Instructions:****WARNING**

Make sure all connections are tight before operating hydraulic test stand. High-pressure fluid from test stand can injure personnel.

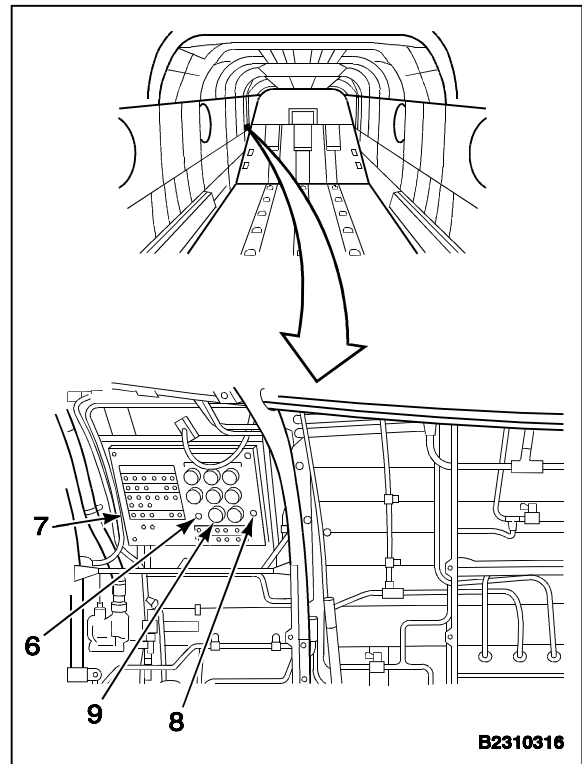
**WARNING**

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).



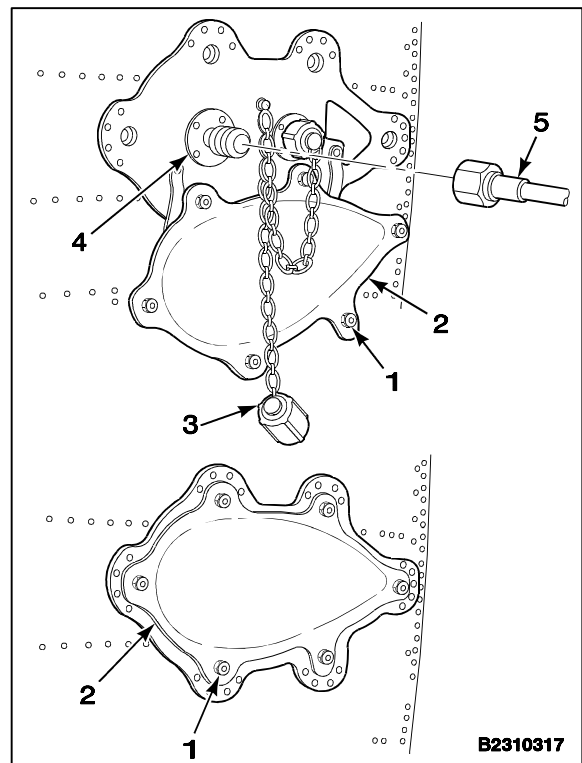
4. Set FLT CONT switch (6) on MAINTENANCE PANEL (7) to No. 1.
5. Press and hold LEVEL CHECK button (8). Read reservoir fluid level on gauge (9).
6. Have helper operate test stand. Set test stand to reservoir (TM 55-4920-335-14 or TM 55-4920-373-14&P).
7. When gauge (9) indicates EMPTY, shut down test 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)

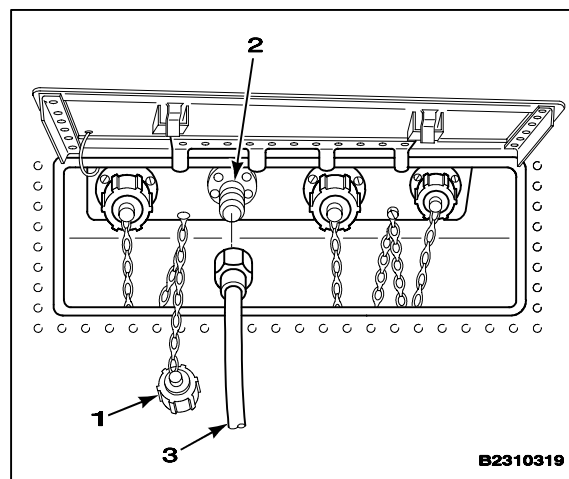
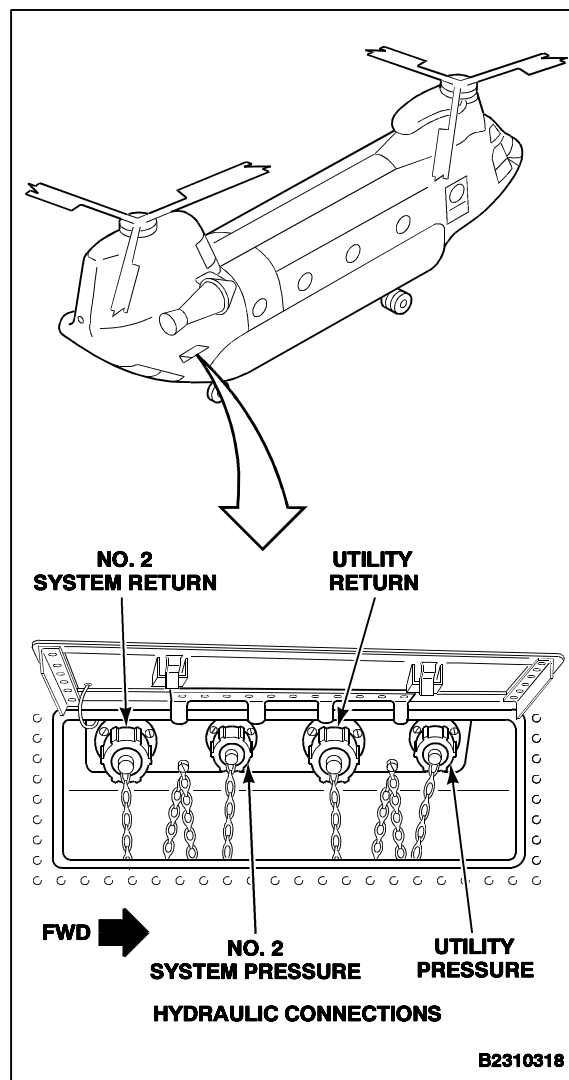
**General Safety Instructions:****WARNING**

Make sure all connections are tight before operating hydraulic test stand. High-pressure fluid from test stand can injure personnel.

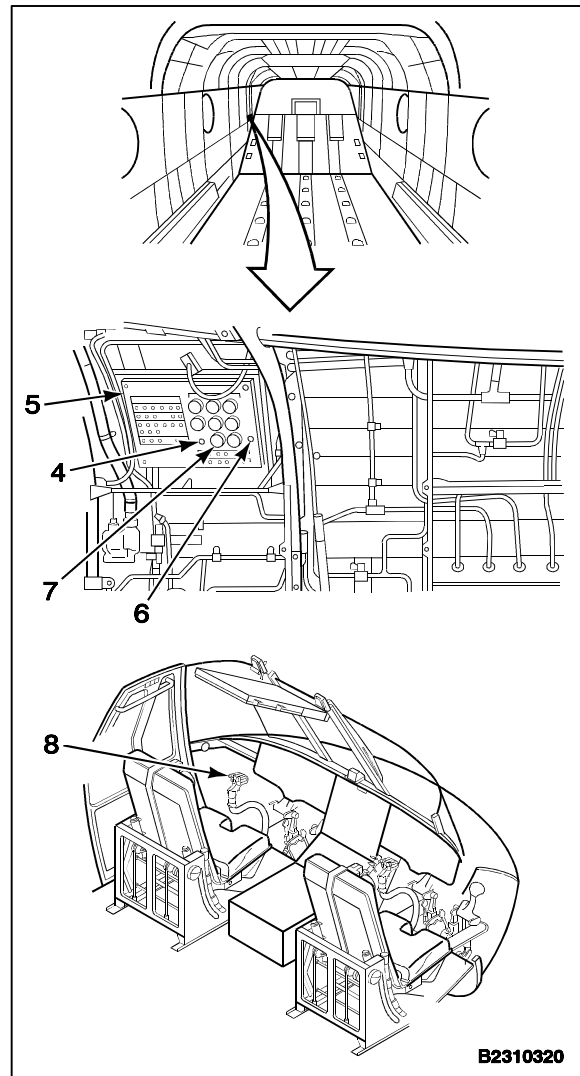
**WARNING**

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).



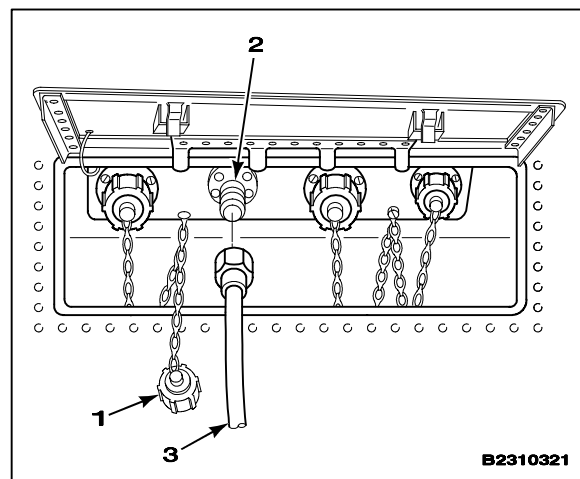
3. Set FLT CONT switch (4) on MAINTENANCE PANEL (5) to NO. 2.
4. Press and hold LEVEL CHECK button (6). Read reservoir fluid level on gauge (7).
5. Have helper operate test stand. Set test stand pressure between **1500 and 2000 psi** (TM 55-4920-373-14&P and TM 55-1730-229-12).
6. Observe gauge (7) while 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)

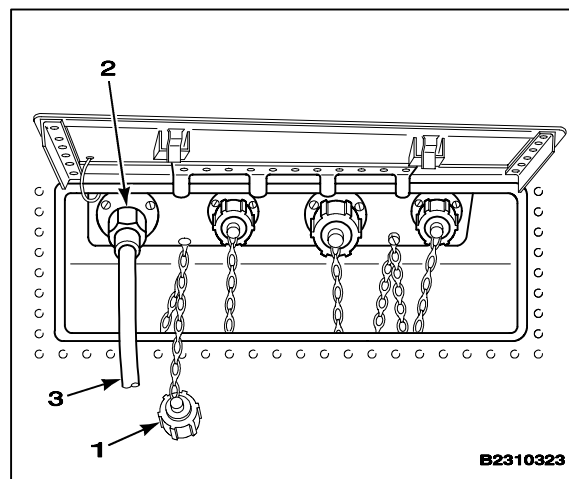
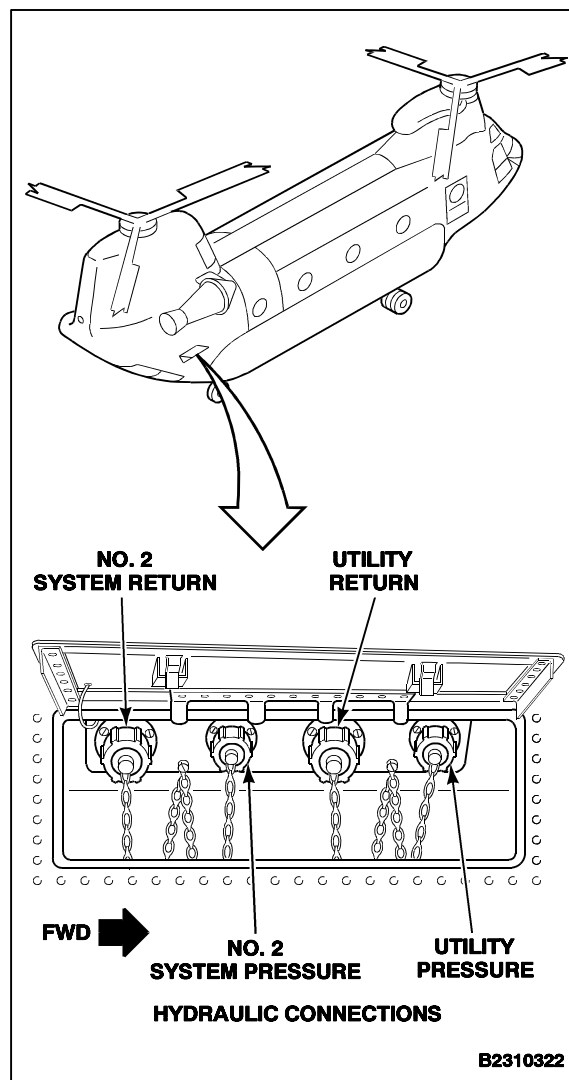
**General Safety Instructions:****WARNING**

Make sure all connections are tight before operating hydraulic test stand. High-pressure fluid from test stand can injure personnel.

**WARNING**

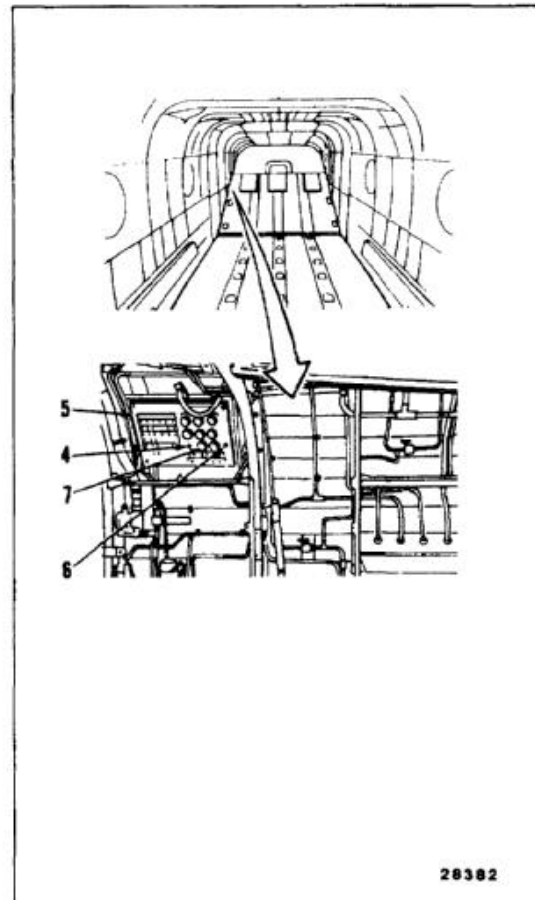
Hydraulic fluid (E199) is toxic. It can irritate skin and cause burns. Avoid inhaling. Use only with adequate ventilation. Avoid contact with skin, eyes, or clothing. In case of contact, immediately flush skin or eyes for at least **15 minutes**. Get medical attention for eyes.

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).

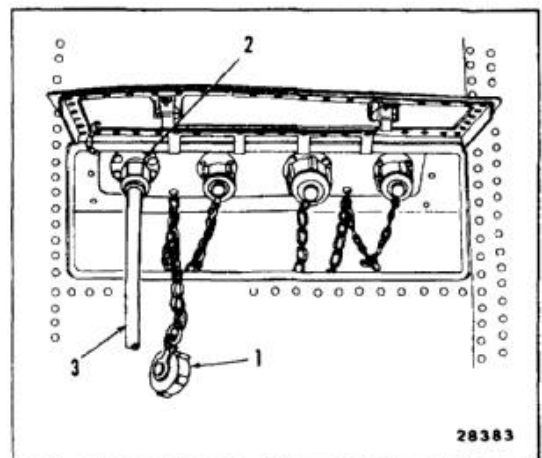


**1-61.1 POWER DRAIN NO. 2 FLIGHT CONTROL HYDRAULIC SYSTEM RESERVOIR (Continued) 1-61.1**

- 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



## INITIAL SETUP

**Applicable Configurations:**

All

**Tools:**

None

**Materials:**

Hydraulic Fluid (E199)  
Cloths (E120)

**Personnel Required:**

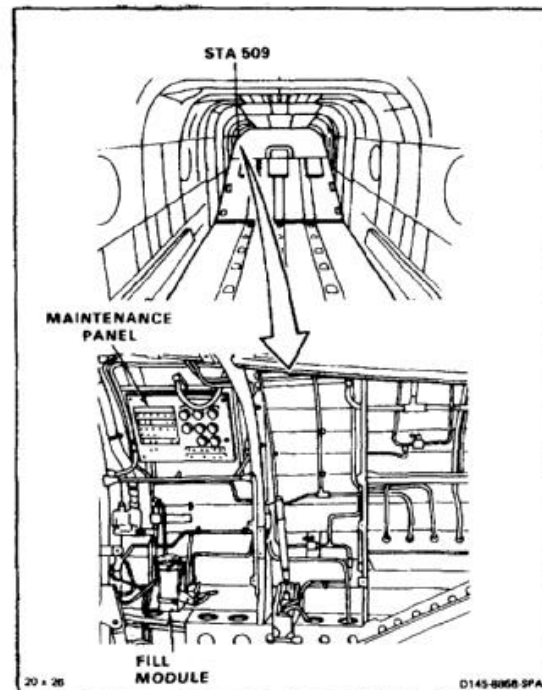
Medium Helicopter Repairer

**References:**

TM 55-1520-240-T

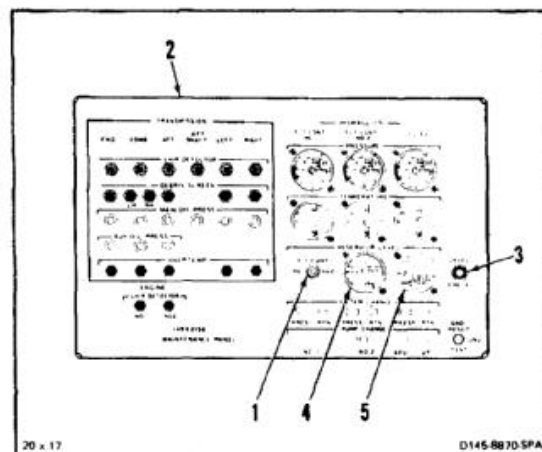
**Equipment Condition:**

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.

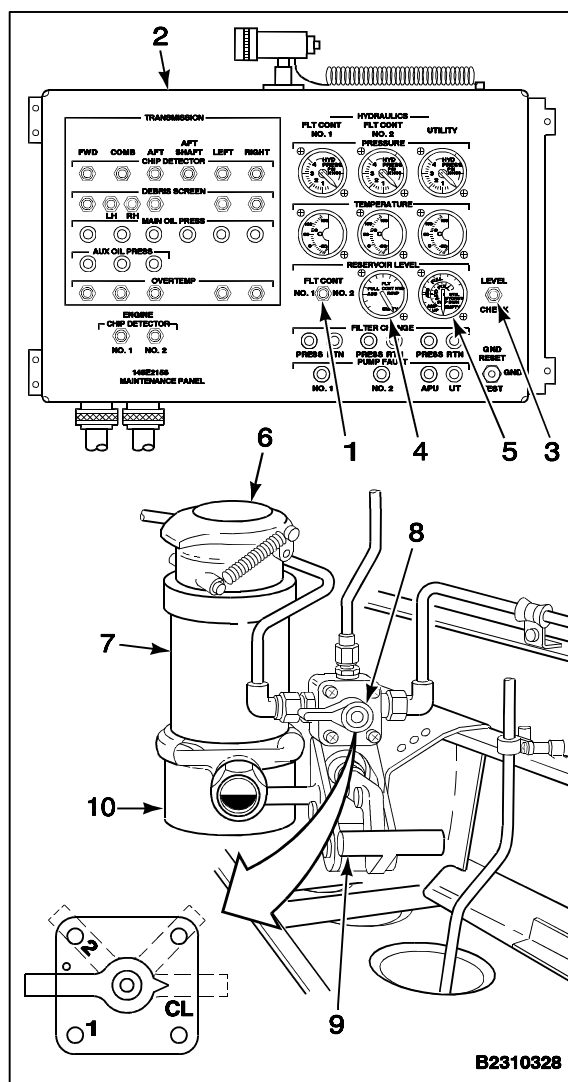
1. In aft cabin, set FLT CONT switch (1) on MAINTENANCE PANEL (2) to No. 1.
2. Press and hold LEVEL CHECK button (3). Read No. 1 flight control system reservoir fluid level on gage (4). Read utility system reservoir fluid level on gage (5).
3. Set switch (1) to No. 2. Read No. 2 flight control system 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.



B2310328

**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:**

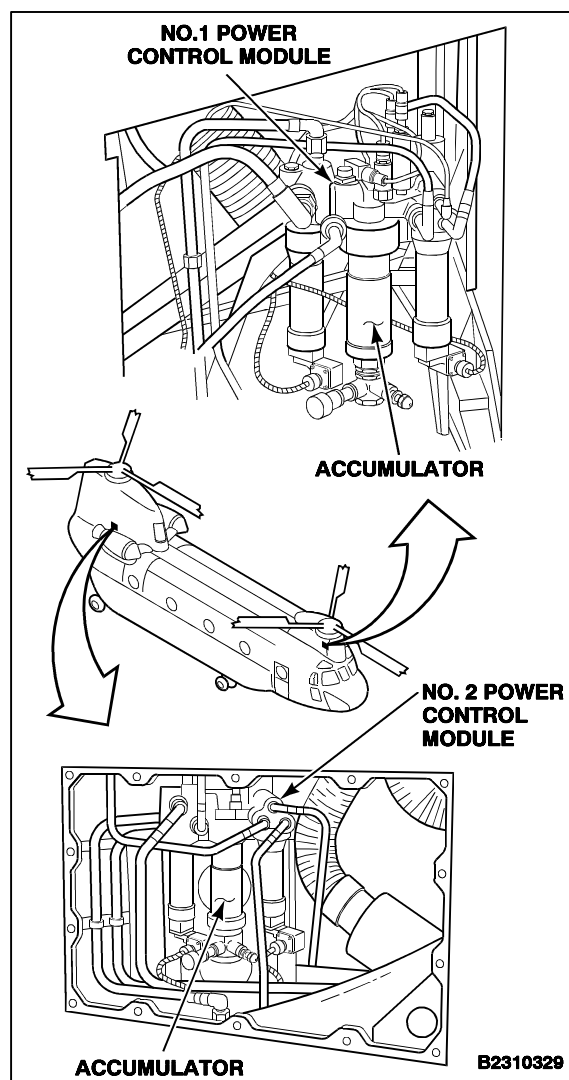
None

**Personnel Required:**

CH-47 Helicopter Repairer  
 Inspector

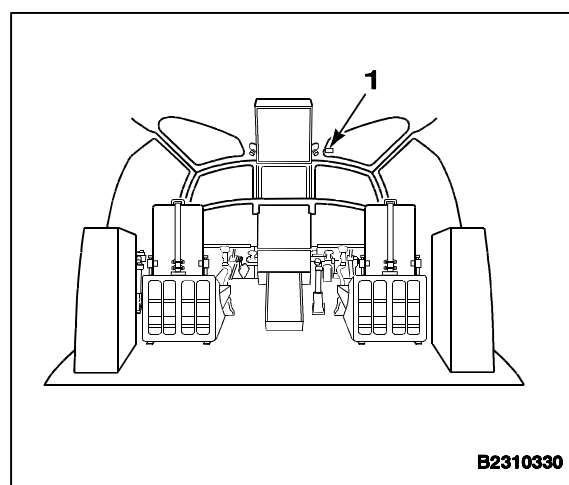
**Equipment Condition:**

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**

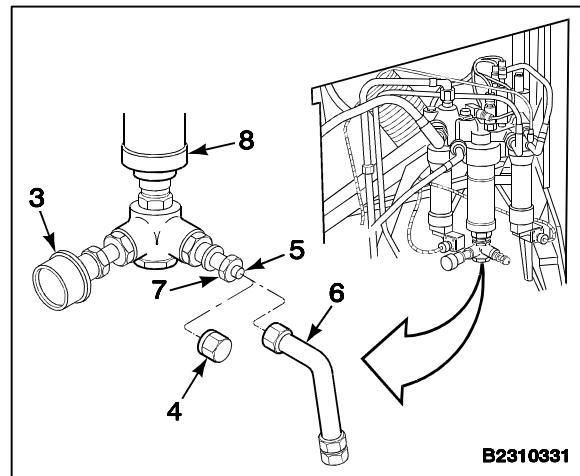
When depressurizing the accumulator, high pressure air will be released from the accumulator charging valve. Ensure body parts are well clear of high pressure air or injury will result.

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.



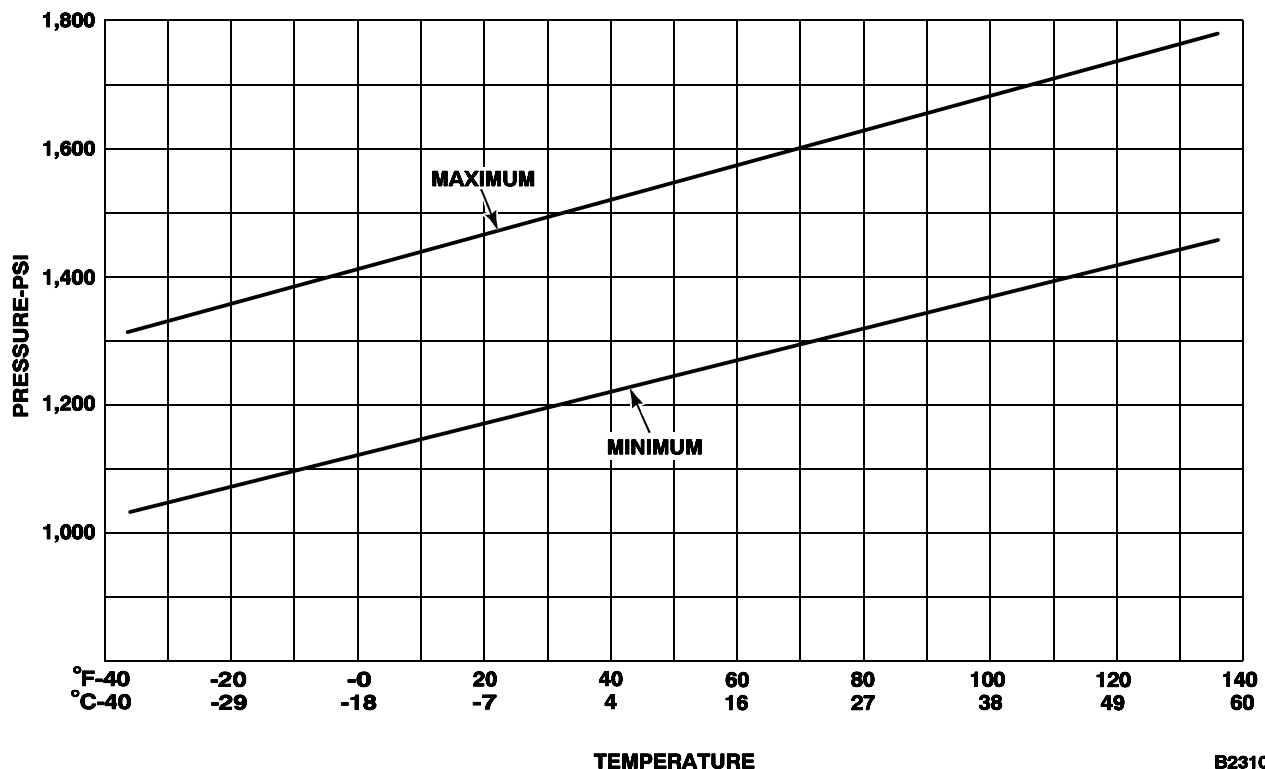
Depressurize accumulator slowly. Fast depressurization will result in internal damage to accumulator.

6. Turn valve outer nut (7) completely counterclockwise to open valve.



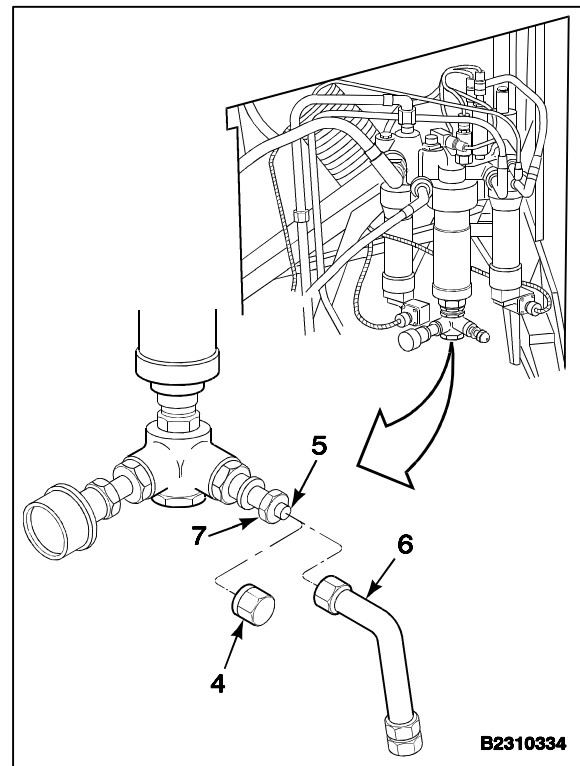
B2310331

7. Charge accumulator (8) with dry air or nitrogen to pressure indicated in chart. Read pressure on gauge (3).



B2310332

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:**

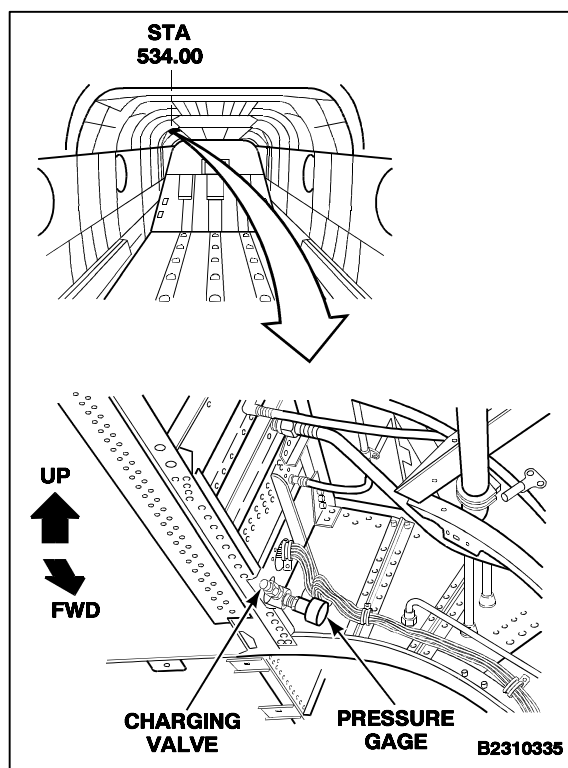
None

**Personnel Required:**

CH-47 Helicopter Repairer  
 Inspector

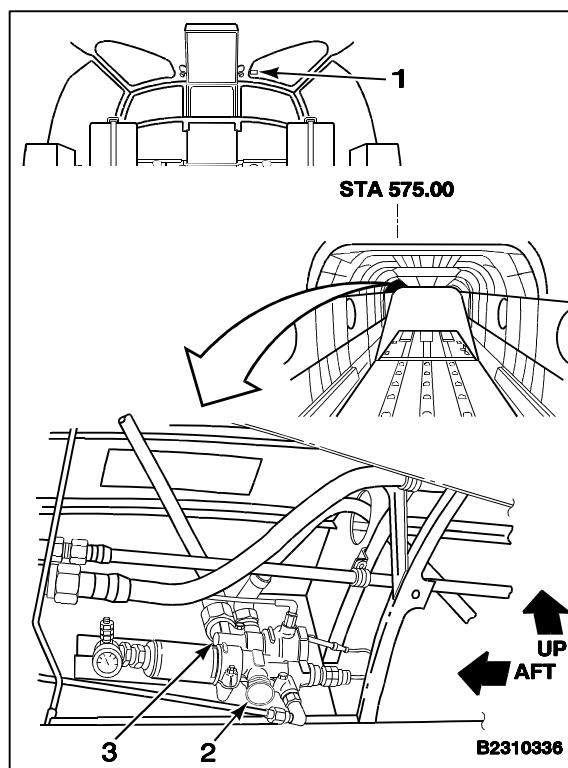
**Equipment Condition:**

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**

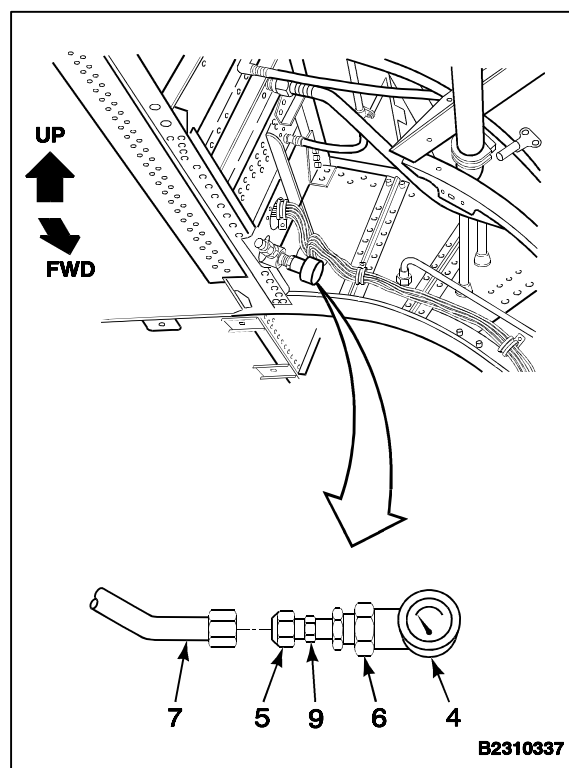
When depressurizing the accumulator, high pressure air will be released from the accumulator charging valve. Ensure body parts are well clear of high pressure air or injury will result.

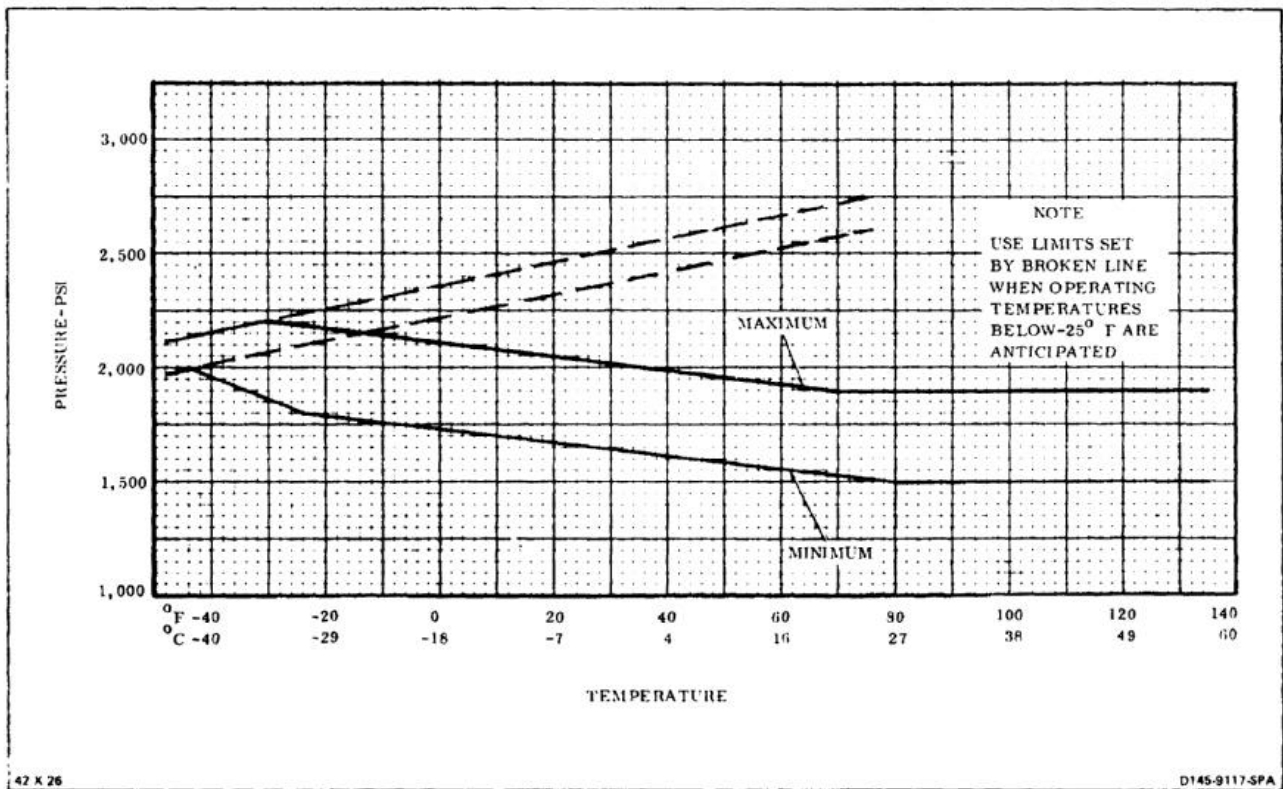
5. Remove cap (5). To depressurize system accumulator, go to and complete step 6 and stop. To service system accumulator, connect chuck (7) from air source to valve (6) before going to step 6 and on.

**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).







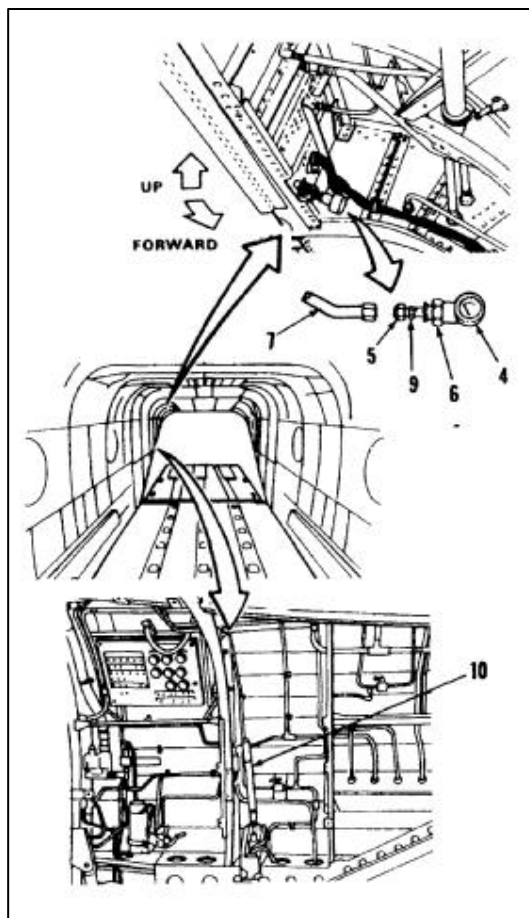
9. Shut off air source. Remove chuck (7).
10. Torque nut (9) to **60 inch-pounds**.
11. Install cap (5) on valve (6).

**INSPECT**

12. Charge accumulator. Use hand pump (10). Read pressure on accumulator gage (4). If temperature is above **25°F (-4°C)**, charge accumulator to **3000 psi**. If temperature is below **25°F (-4°C)**, 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  
 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:**

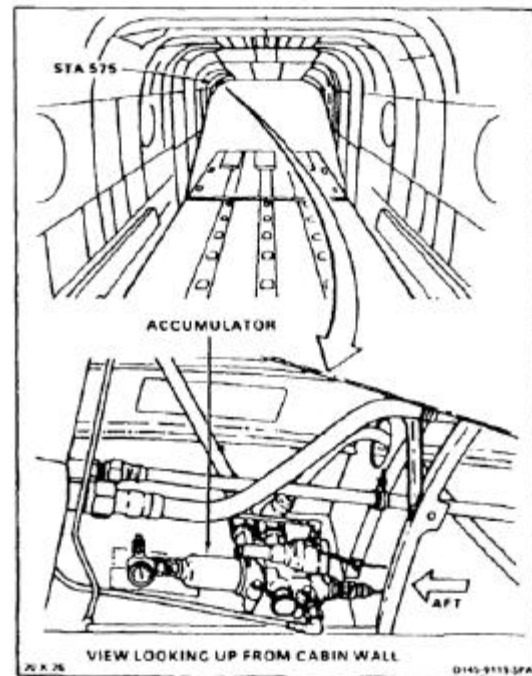
Lockwire (E231)

**Personnel Required:**

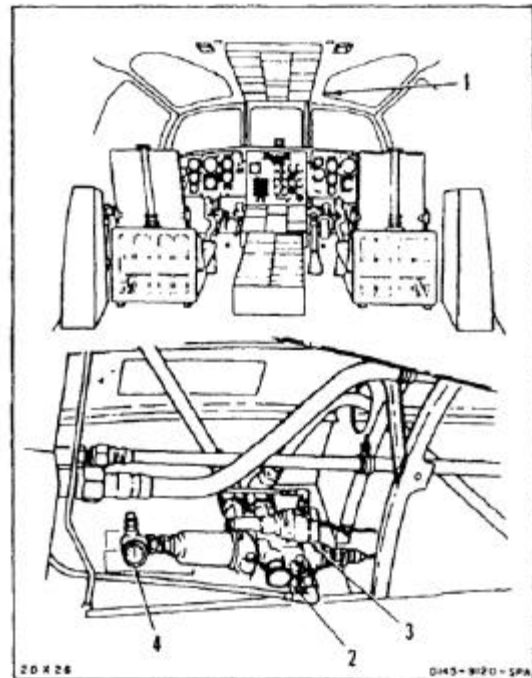
Medium Helicopter Repairer  
 Inspector

**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)



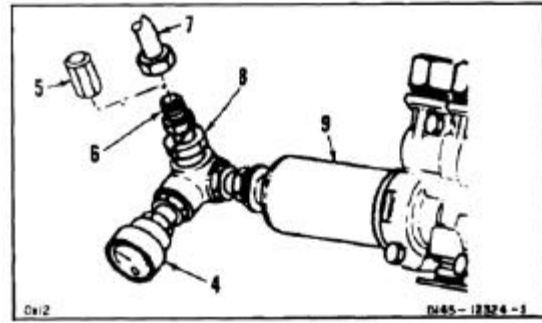
1. Measure and record outside air temperature. Use fat gage (1) in cockpit.
2. Press depressurization valve (2) on APU start module (3). Hold valve until sound of depressurizing has stopped.
3. Read accumulator gage (4).



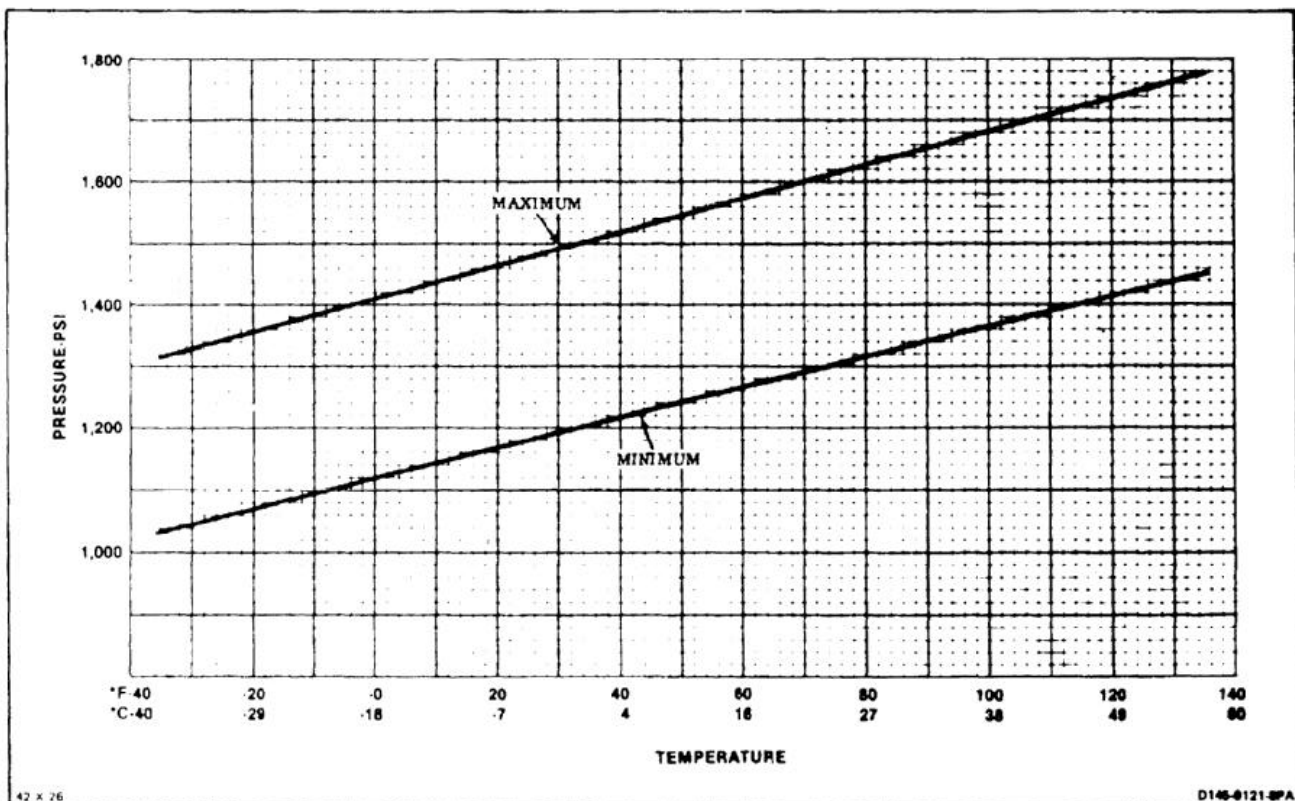
4. If pressure indicated on gage (4) is within maximum and minimum limits shown in chart, go to step 12. If pressure is not within limits, go to step 5.

**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).



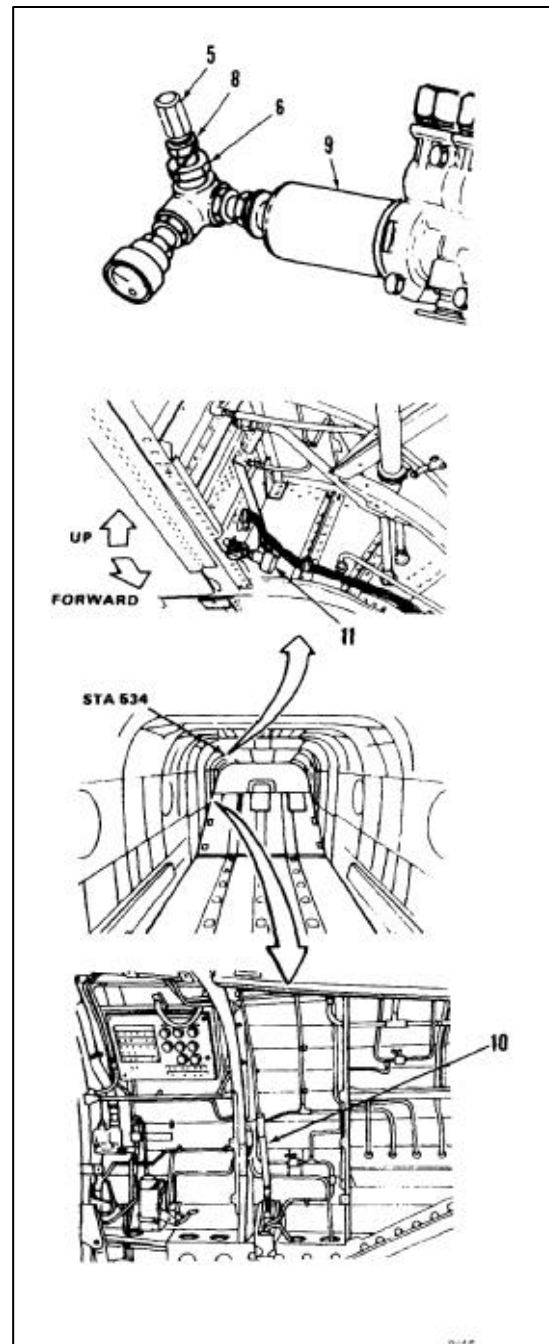
11. Torque nut (8) to **60 inch-pounds**. Install lockwire (E231).
12. Install cap (5) on valve (6).

**INSPECT**

13. Charge accumulator (9). Use hand pump (10). Read pressure on accumulator gage (11). If temperature is above **-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 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:**

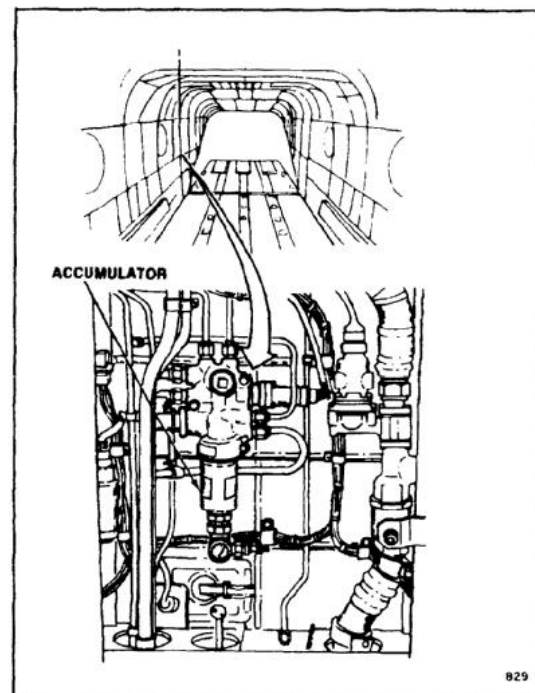
None

**Personnel Required:**

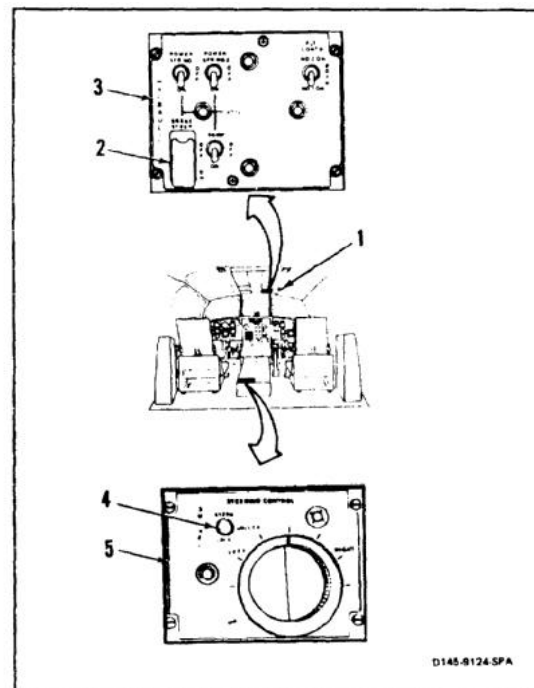
Medium Helicopter Repairer  
 Inspector

**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.



**1-66 SERVICE UTILITY SYSTEM POWER STEERING/SWIVEL LOCK  
ACCUMULATOR (Continued)**

1-66

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**

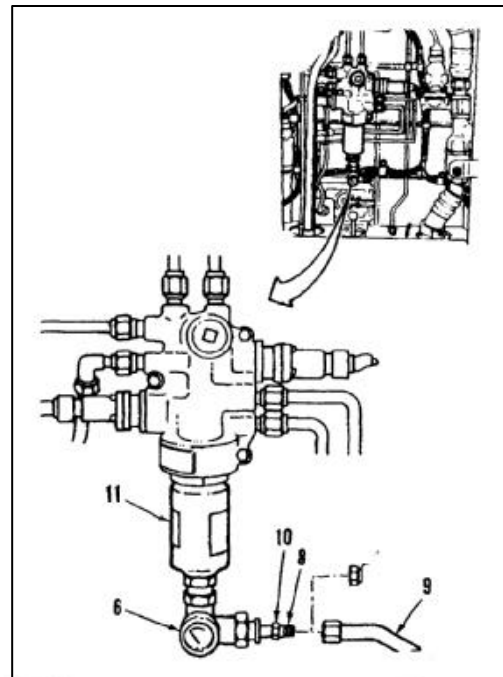
When depressurizing the accumulator, high pressure air will be released from the accumulator charging valve. Ensure body parts are well clear of high pressure air or injury will result.

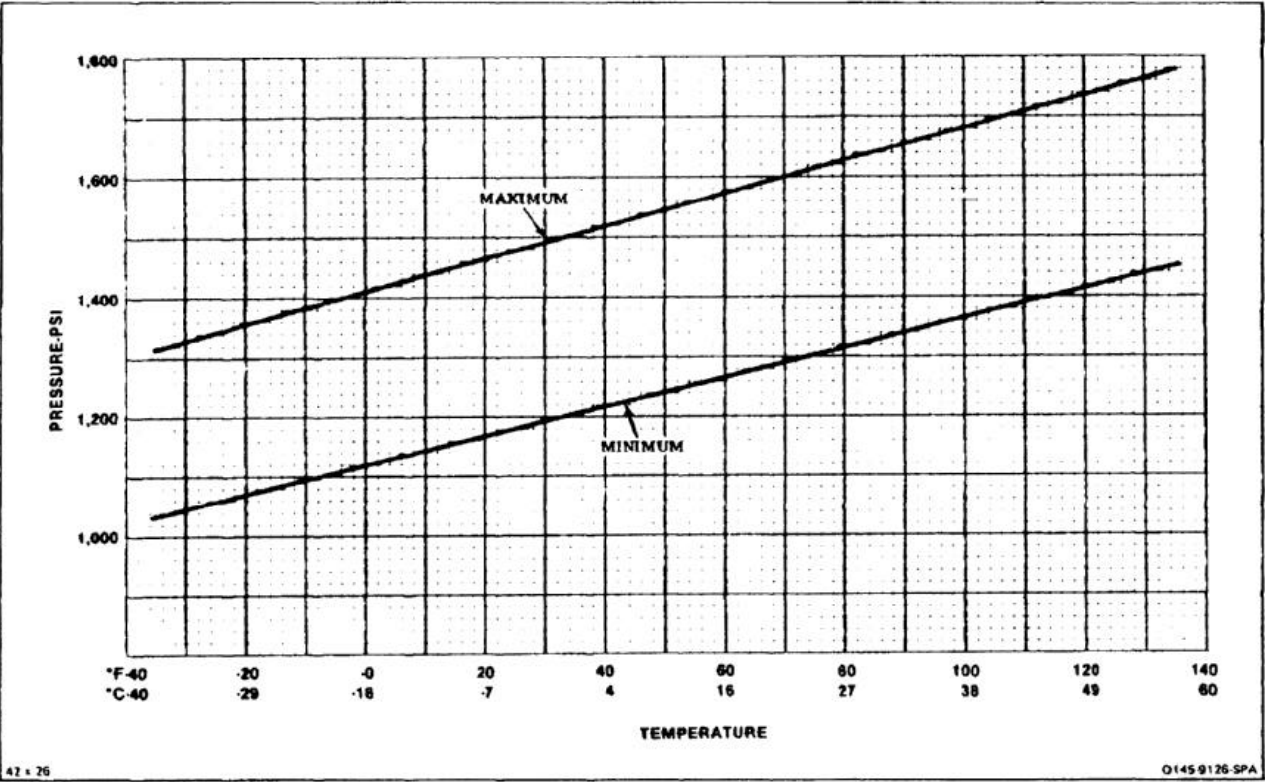
7. Remove cap (7). To depressurize system accumulator, go to and complete step 8 and stop. To service system accumulator connect chuck (9) from air source to valve (8) before going to step 8 and on.

**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).

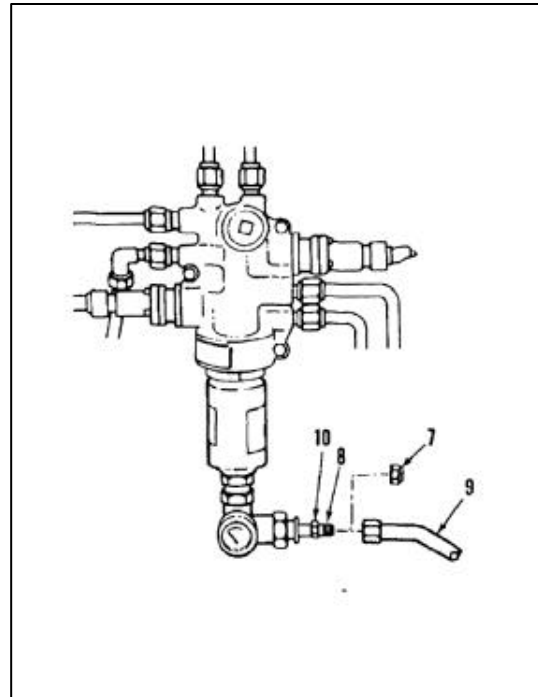




**1-66 SERVICE UTILITY SYSTEM POWER STEERING/SWIVEL LOCK  
ACCUMULATOR (Continued)**

1-66

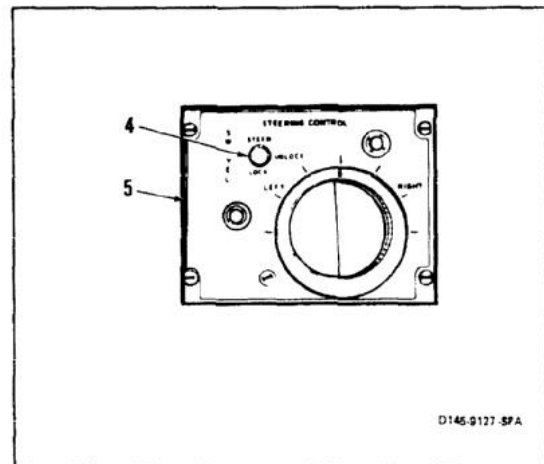
10. Tighten nut (10).
11. Shut off air source. Remove chuck (9).
12. Torque nut (10) to **60 inch-pounds**.
13. Install cap (7) on valve (8).

**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



## 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

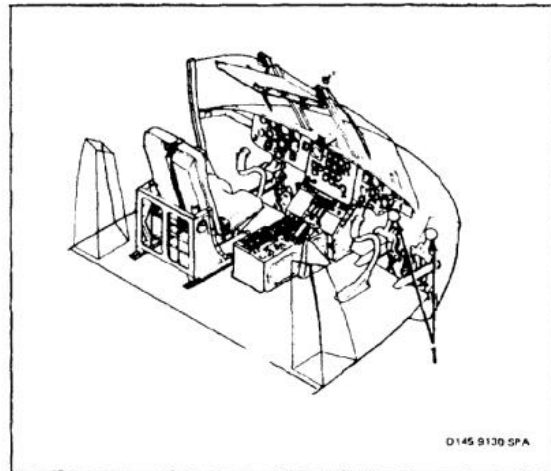
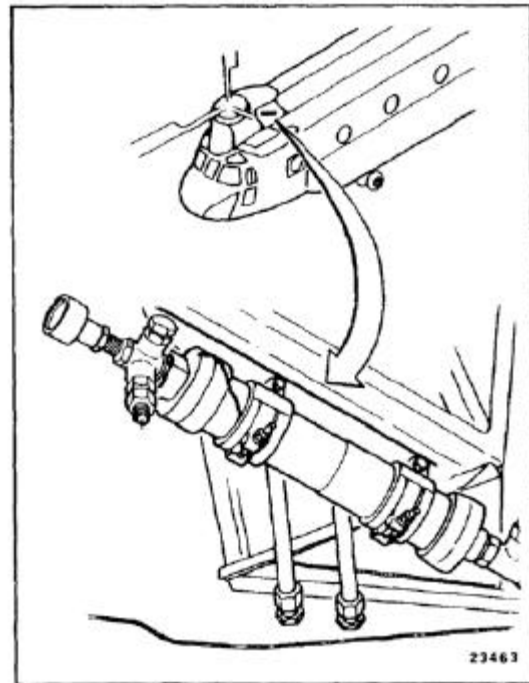
**Personnel Required:**

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.

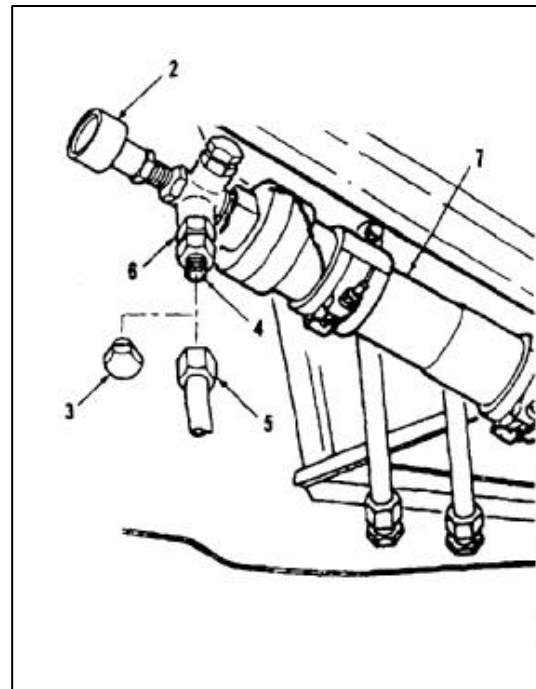
5. Hold body of valve (4) with wrench. Turn valve outer nut completely counterclockwise to open valve.
6. Charge accumulator (7) with dry air or nitrogen to **700 psi**.
7. Tighten outer nut of valve (4). Torque to **60 inch-pounds**.
8. Lockwire nut (6). Use lockwire (E231).

**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

## 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:**

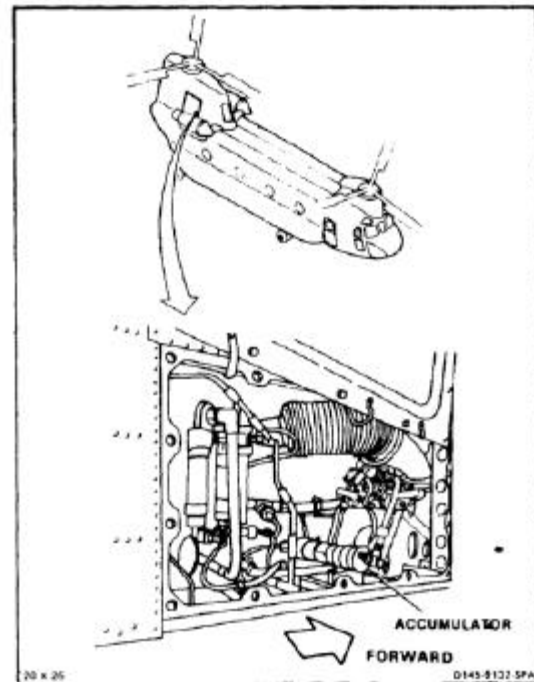
Lockwire (E231)

**Personnel Required:**

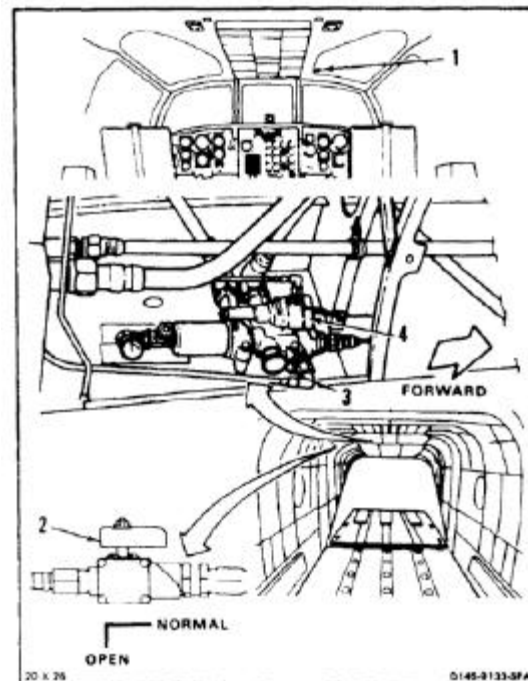
Medium Helicopter Repairer  
 Inspector

**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.



# 1-68 SERVICE UTILITY SYSTEM RESERVOIR PRESSURIZATION ACCUMULATOR (Continued)

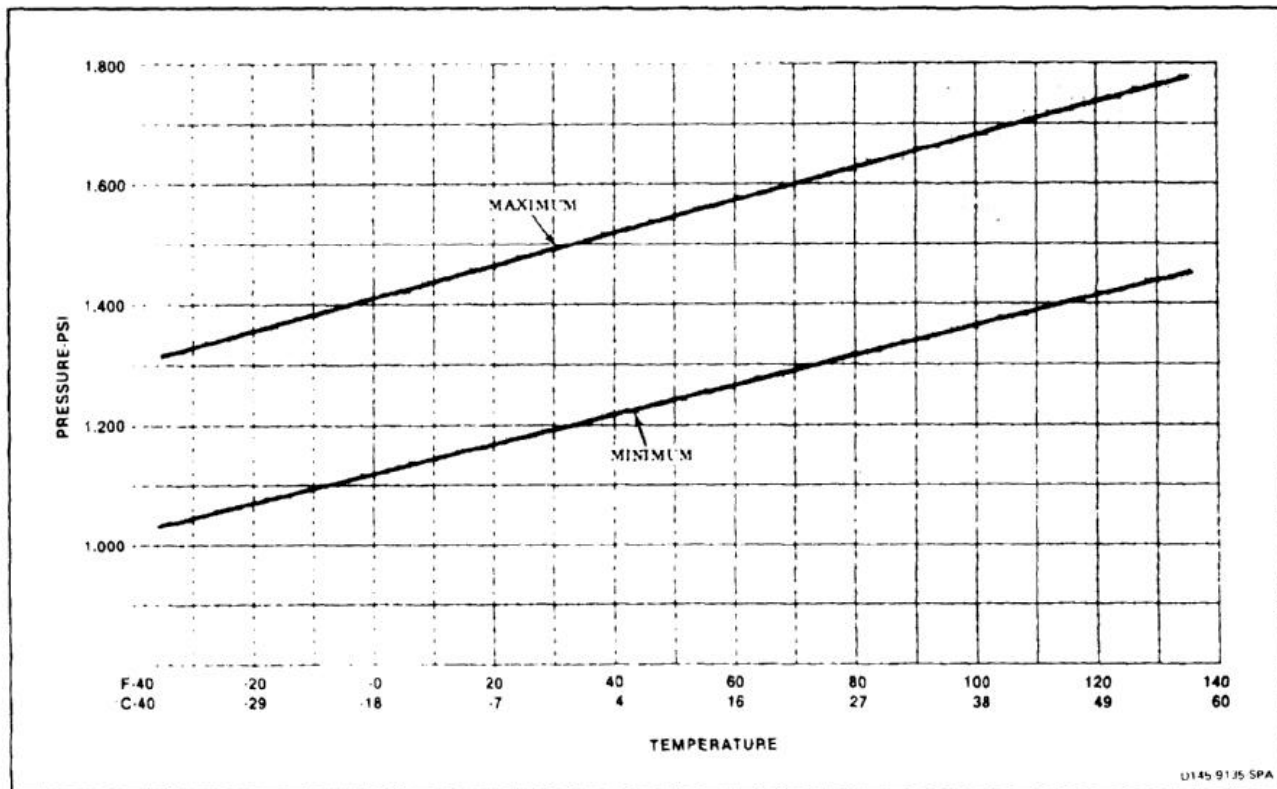
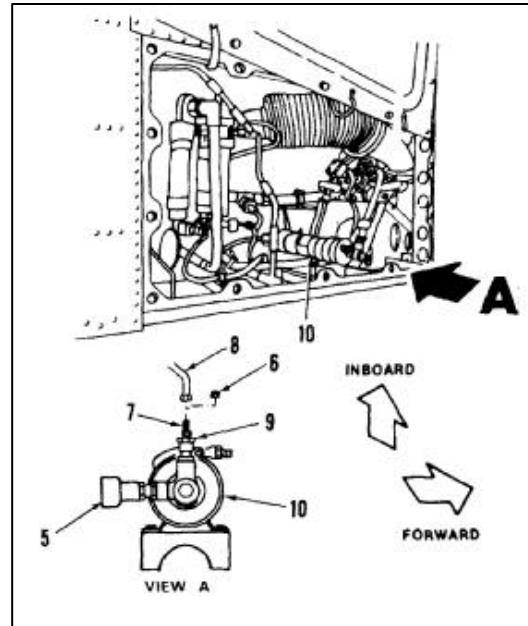
1-68

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

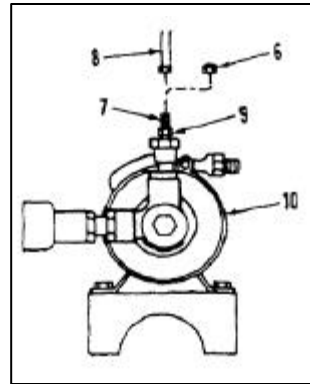
High pressure air trapped under valve cap can be a hazard. If cap is not removed slowly, air can pop it off and cause injury.

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).



**1-68 SERVICE UTILITY SYSTEM RESERVOIR PRESSURIZATION  
ACCUMULATOR (Continued)****1-68**

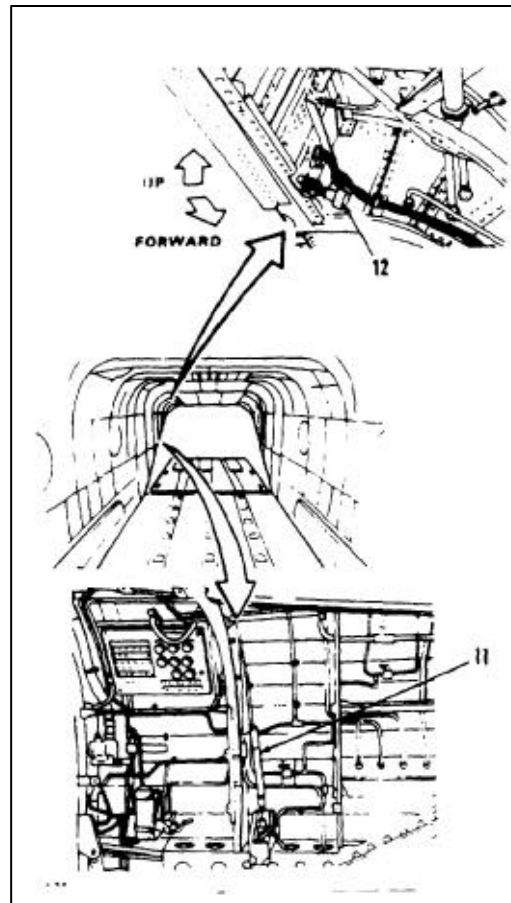
12. Shut off air source. Remove chuck (8).
13. Torque nut (9) to **60 inch-pounds**. Install lockwire (E231).
14. Install cap (6) on valve (7).

**INSPECT**

15. Charge accumulators. Use hand pump (11). Read pressure on APU start accumulator gage (12). If temperature is above **-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 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:**

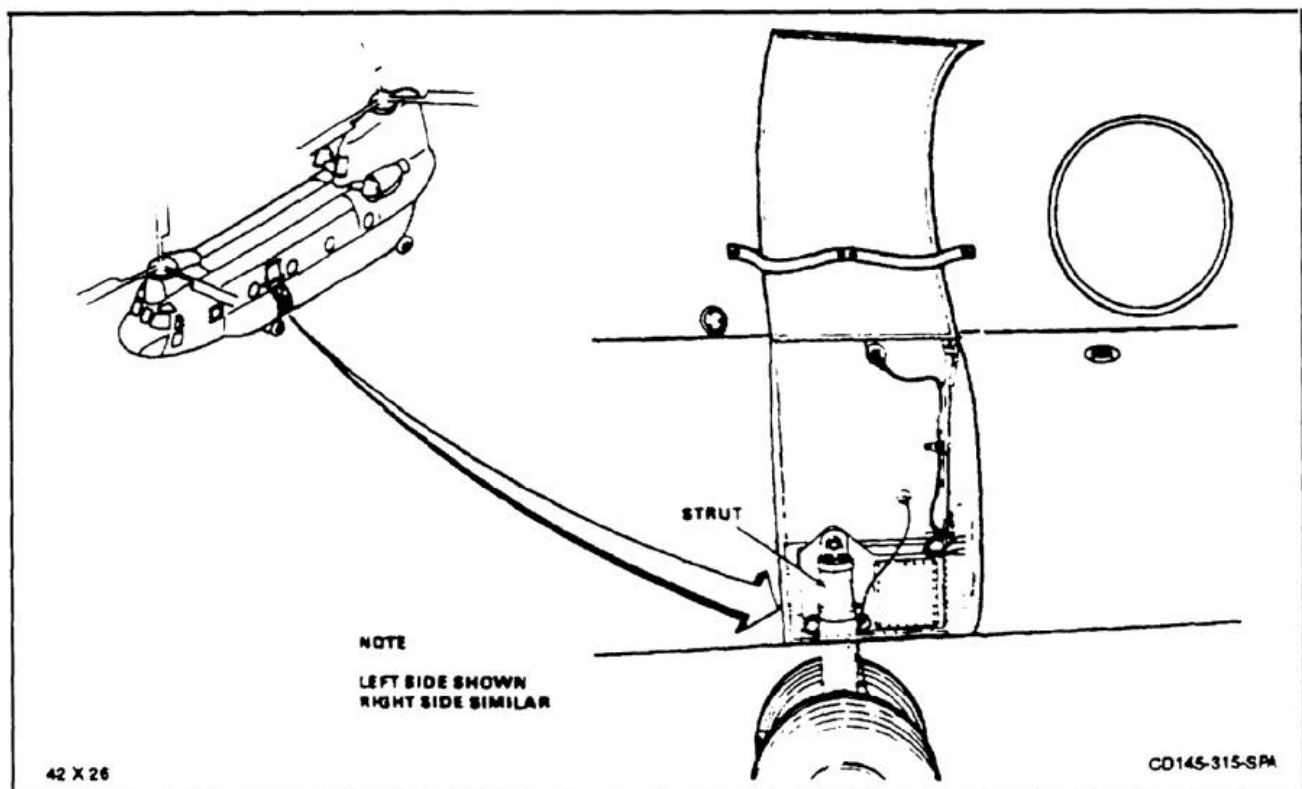
Medium Helicopter Repair (2)  
 Inspector

**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.

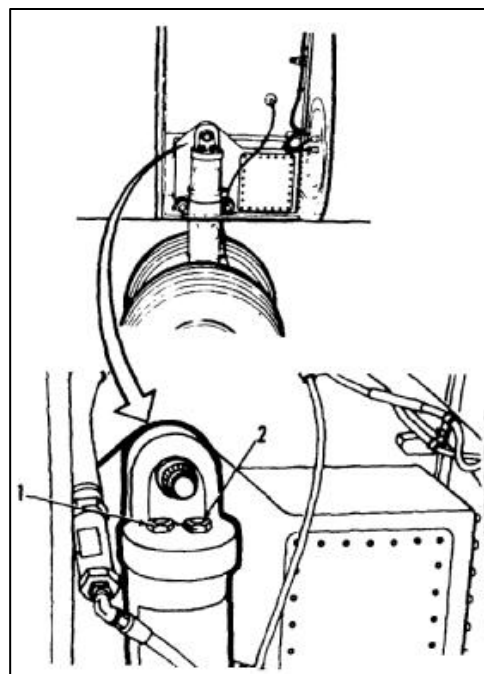
1. Remove lockwire from two filler plugs (1 and 2).

**WARNING**

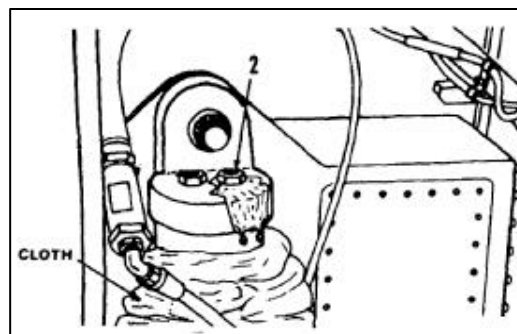
Strut fluid may be under pressure. Loosen plug slowly to allow any pressurized fluid out safely. Otherwise, personal injury can result. If hit by fluid, flush skin with water. Get medical attention for eyes.

**NOTE**

Placing cloths around strut before loosening plugs will absorb released fluid.

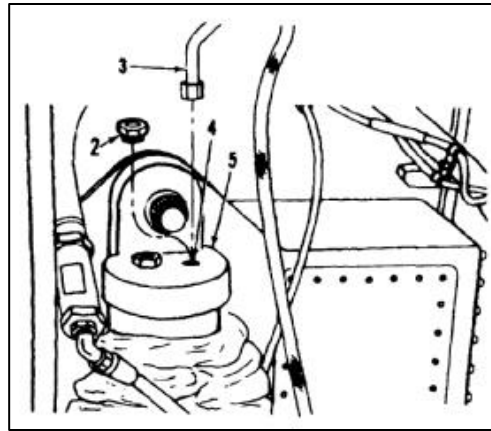


2. Loosen plug (2) slowly. Wait for pressure to bleed off.

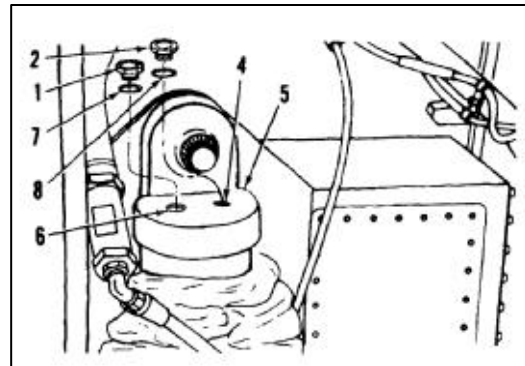


**1-69 SERVICE FORWARD LANDING GEAR SHOCK STRUT (FLUID) (Continued)****1-69**

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**.

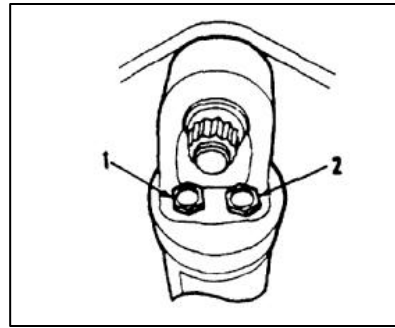


4. Remove forward plug (1).
5. Hand-fill strut (5) with hydraulic fluid (E197) through aft port (4). Fill until bubble-free fluid begins to flow from forward port (6).
6. Coat new packing (7) with hydraulic fluid (E197). Install packing on plug (1). Install plug in forward port (6).
7. Continue to fill 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).

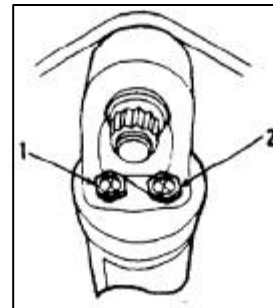




10. Torque plugs (1 and 2) to **250 inch-pounds**. Use **1 inch** crowfoot attachment.



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:**

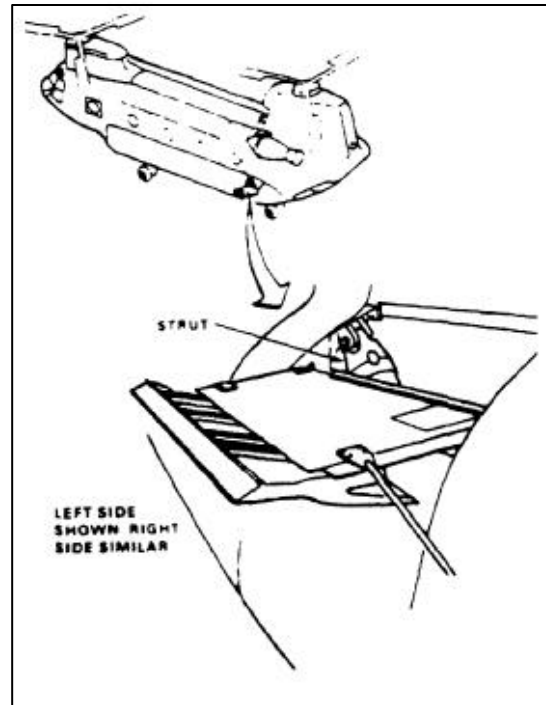
Medium Helicopter Repairer (2)  
 Inspector

**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).

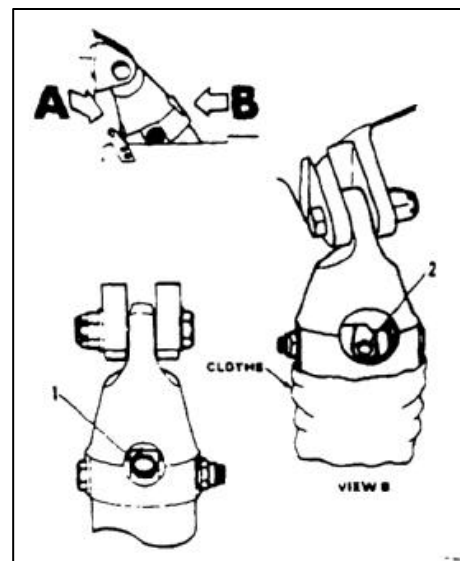
**WARNING**

Strut fluid may be under pressure. Loosen plug slowly to allow any pressurized fluid out safely. Otherwise, personal injury can result. If hit by fluid, flush side with water. Get medical attention for eyes.

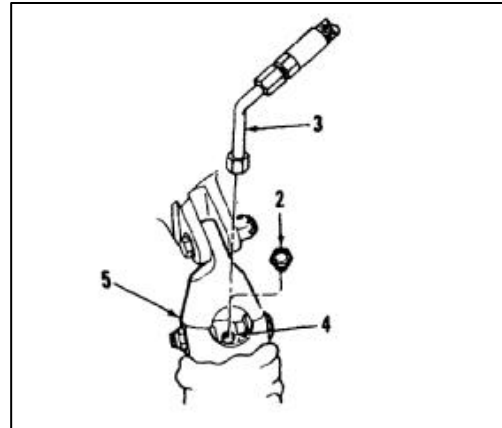
**NOTE**

Placing cloths around strut before loosening plug will absorb released fluid.

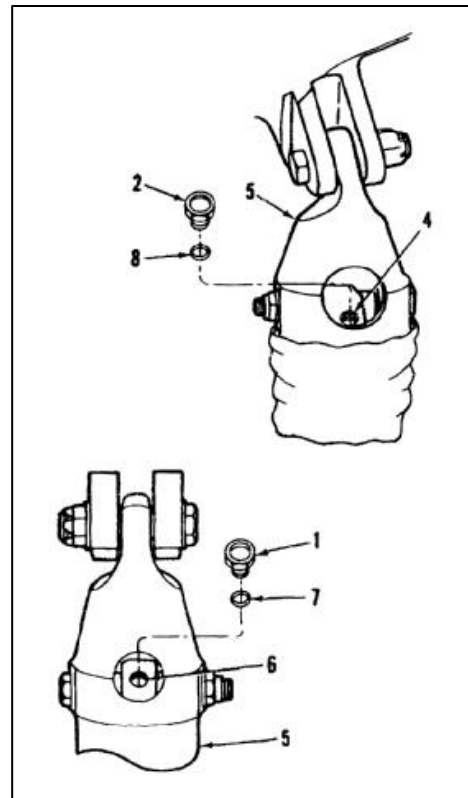
2. Loosen aft (upper) plug (2) slowly. Wait for pressure to bleed off.



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).

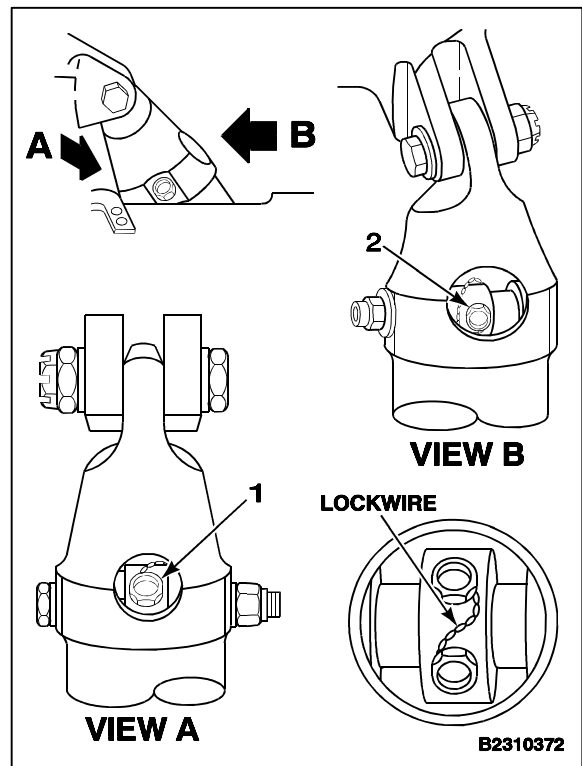


10. Torque plugs (1 and 2) to **250 inch-pounds**.
11. Secure plugs (1 and 2) together with lockwire (E231).

**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:**

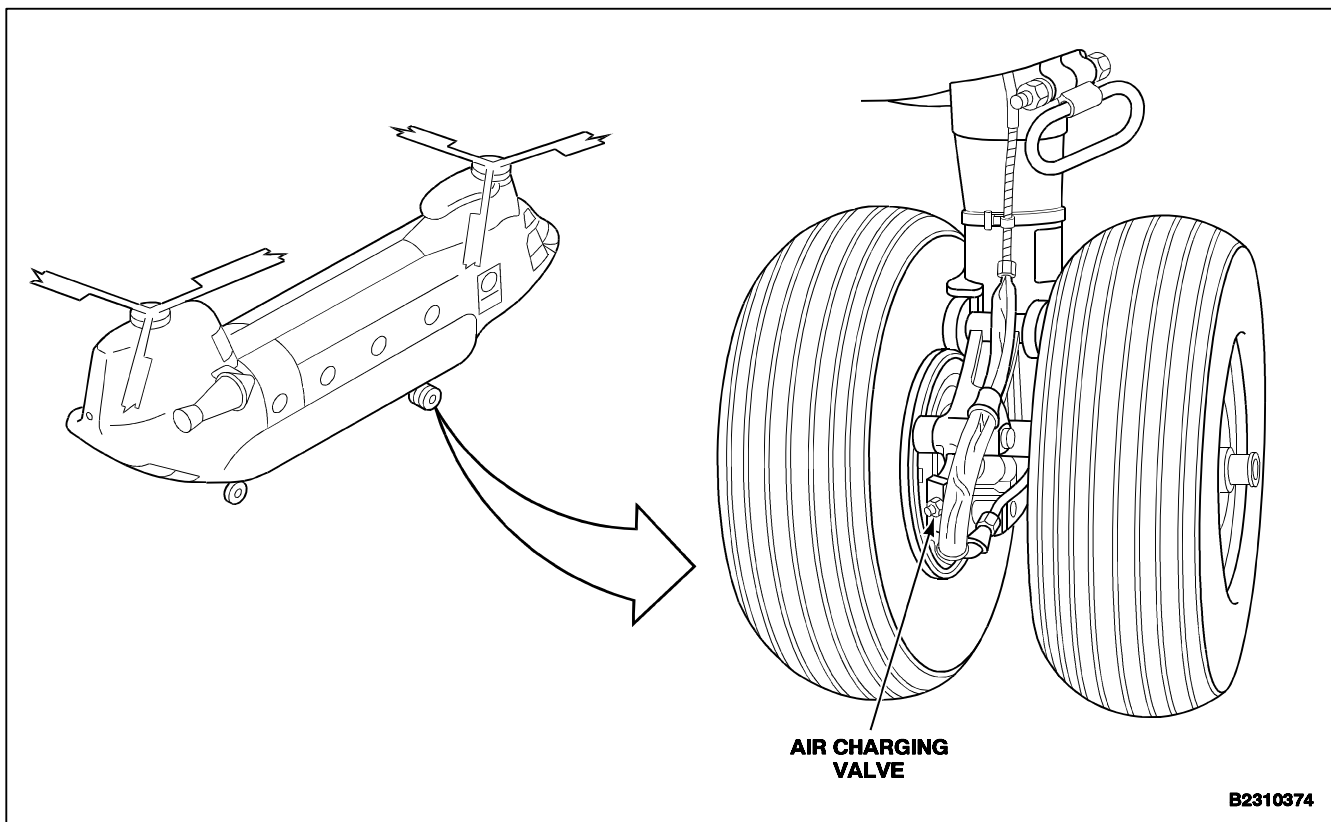
CH-47 Helicopter Repairer (2)  
Inspector

**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.

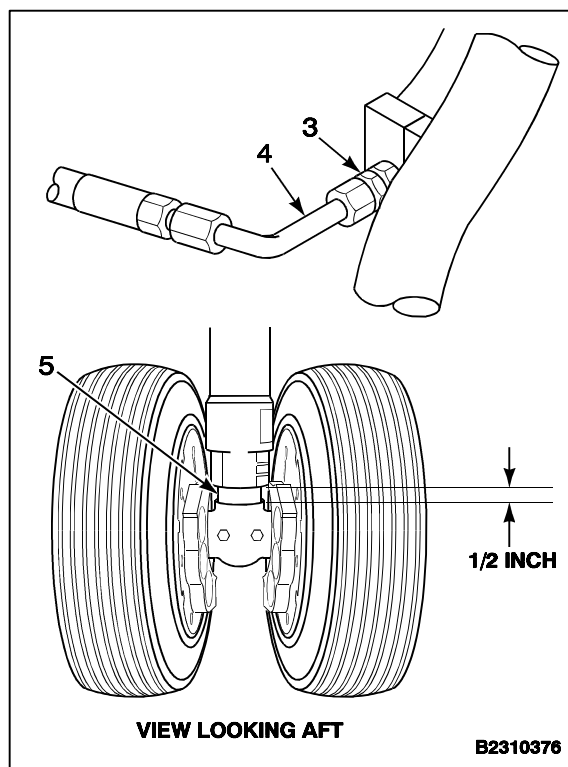
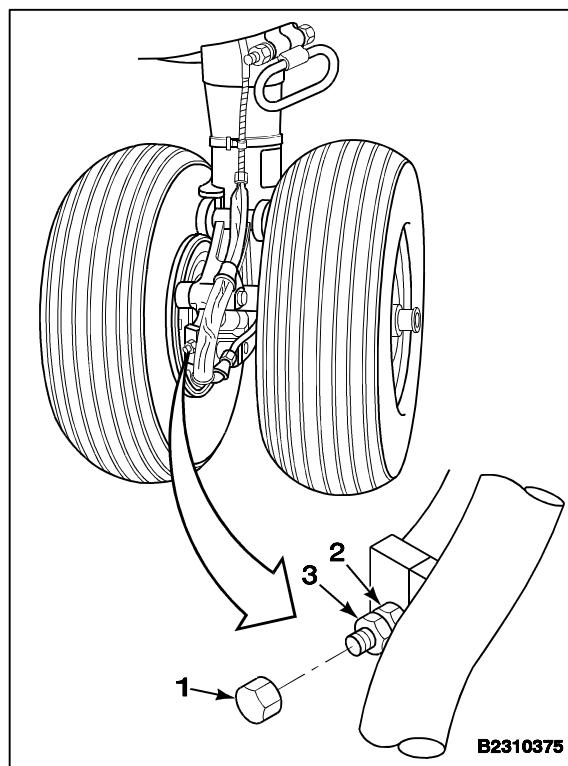
**NOTE**

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.

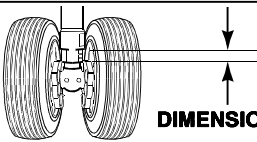
**NOTE**

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)

B2310377

**NOTE**

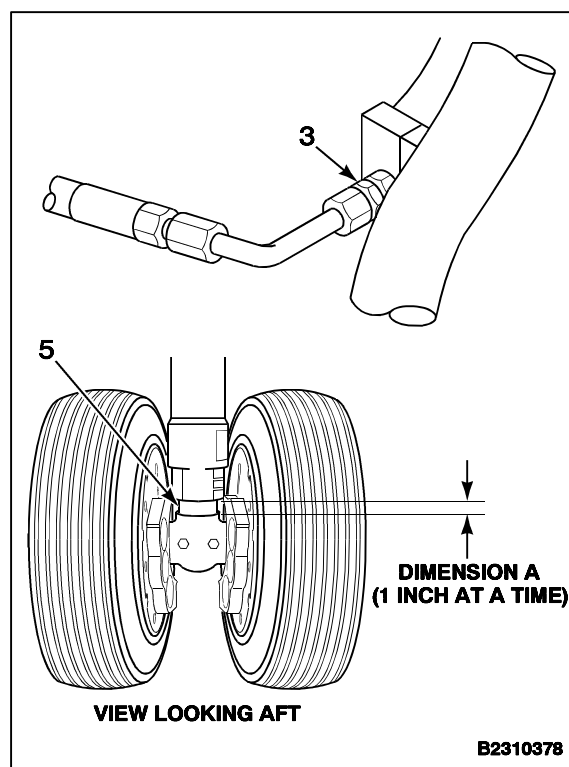
Turn outer valve nut (3) left to add air.  
Turn nut right to shut off air.

Step 14 requires going back and forth between landing gear. If two air sources are available, service both struts at same time.

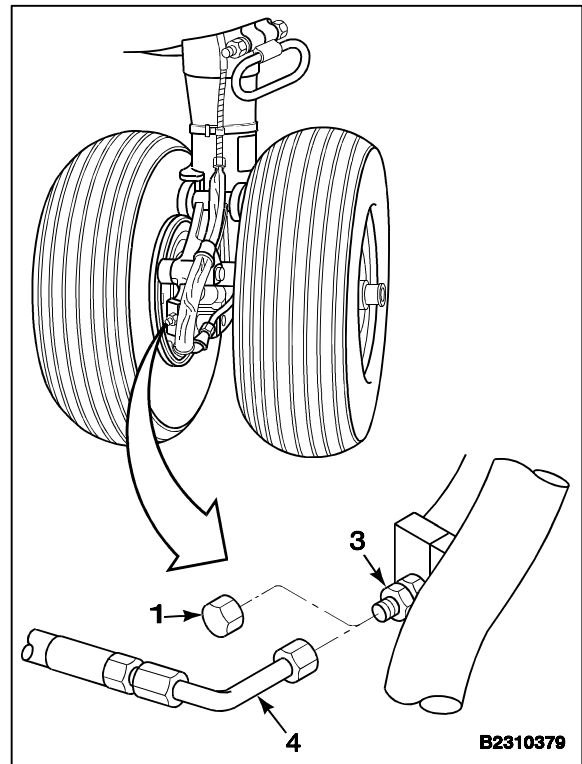
14. Add as much air as needed to each strut (5) in turn to increase extension of strut about **1 inch** at a time. Stop when each strut extension equals required DIMENSION A.

**NOTE**

The minimum ground clearance is **19.2 inches**. This measurement is taken from under the aircraft at ramp hinge.



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:**

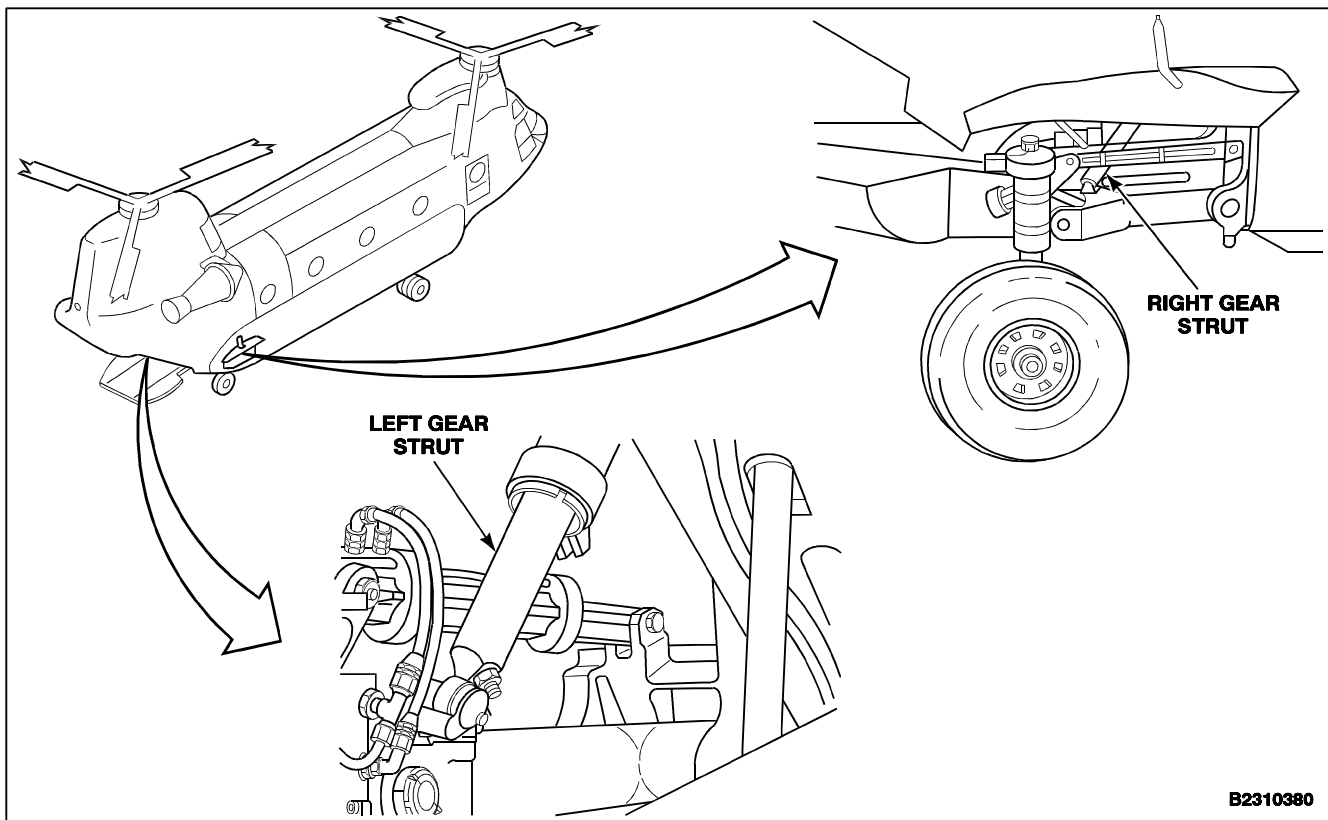
CH-47 Helicopter Repairer (2)  
 Inspector

**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.



B2310380

**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.

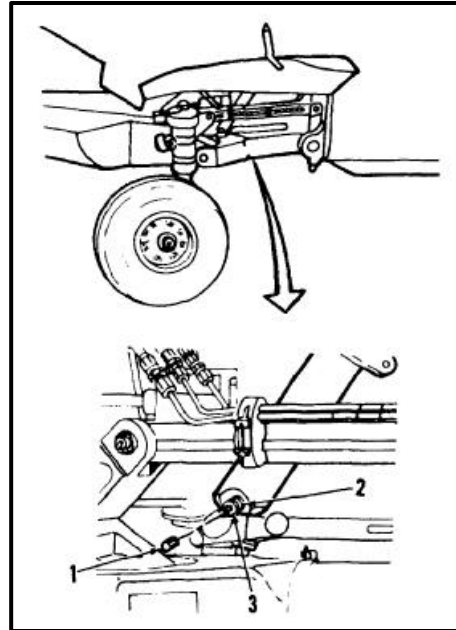
**NOTE**

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.

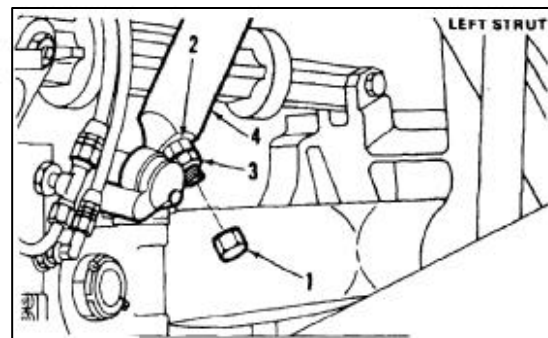
**NOTE**

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**

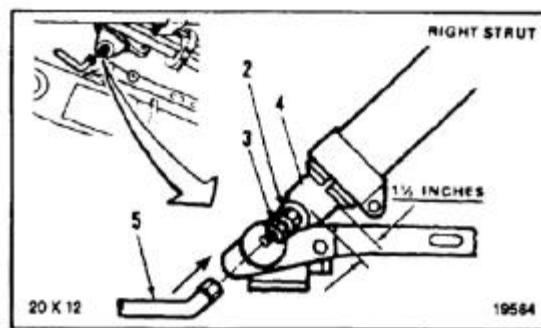
A completely deflated strut will still have **1 inch** of piston showing.



**INFLATE STRUTS****NOTE**

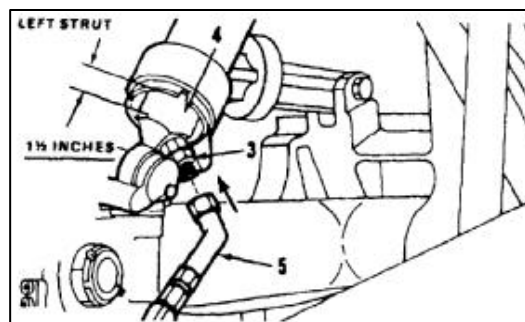
Service both struts at same time if two compressors are available.

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.

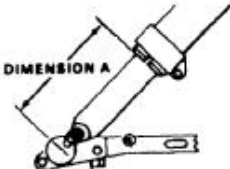
6. Shut off air by turning outer valve nut (3) to right. Disconnect chuck (5).
7. Repeat steps 4 thru 6 for left strut.
8. Deflate right strut (steps 1 and 2).
9. Inflate right strut again to **1-1/2 inch**. (Repeat steps 4 thru 6; then go to step 10.)
10. Note recorded pressure needed to inflate left 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.



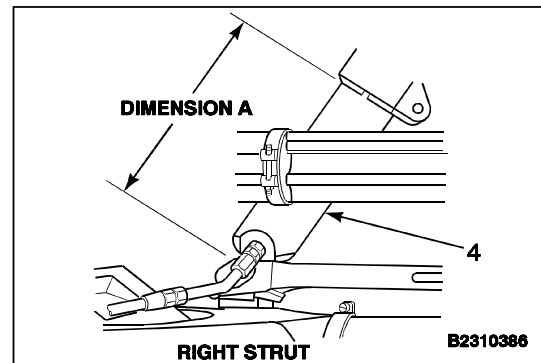
AIR PRESSURE AT 1-1/2 INCHES (PSIG)	NOMINAL PRESSURE	DIMENSION A (INCHES)
1,725 - 1,800	1,750	5
1,548 - 1,598	1,573	5-1/2
1,405 - 1,455	1,430	6
1,285 - 1,335	1,310	6-1/2
1,183 - 1,233	1,208	7
1,098 - 1,148	1,111	7-1/2
1,020 - 1,070	1,045	8
954 - 1,004	979	8-1/2
896 - 946		9
844 - 894		9-1/2
805 - 855		10
775 - 825		10-1/2
735 - 785		11
700 - 750		11-1/2
645 - 685		12 (FULLY EXTENDED)

**NOTE**

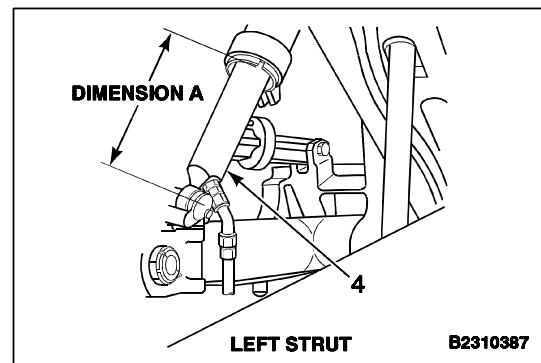
Turn outer valve nut left to add air.  
Turn nut right to shut off air.

Step 12 requires going back and forth between landing gear. If two air sources are available, service both struts at same time.

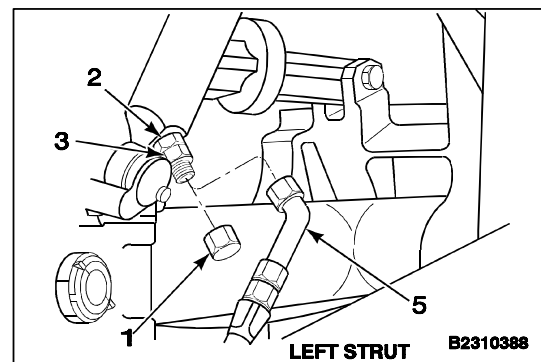
12. Add as much air as needed to each strut in turn to increase extension of piston (4) about **1 inch** at a time. Stop when each extension equals required DIMENSION A.

**NOTE**

The minimum ground clearance is **19.2 inches**. This measurement is taken from under the aircraft at ramp hinge.



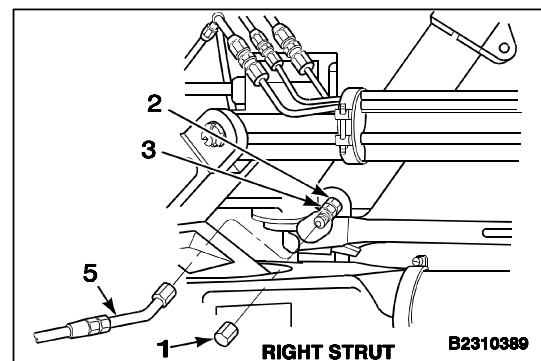
13. Hold body of valve (2) on left strut with wrench. Torque outer valve nut (3) to **60 inch-pounds**.
14. Shut off air at air source. Remove air chuck (5) if installed. Install valve cap (1).



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:**

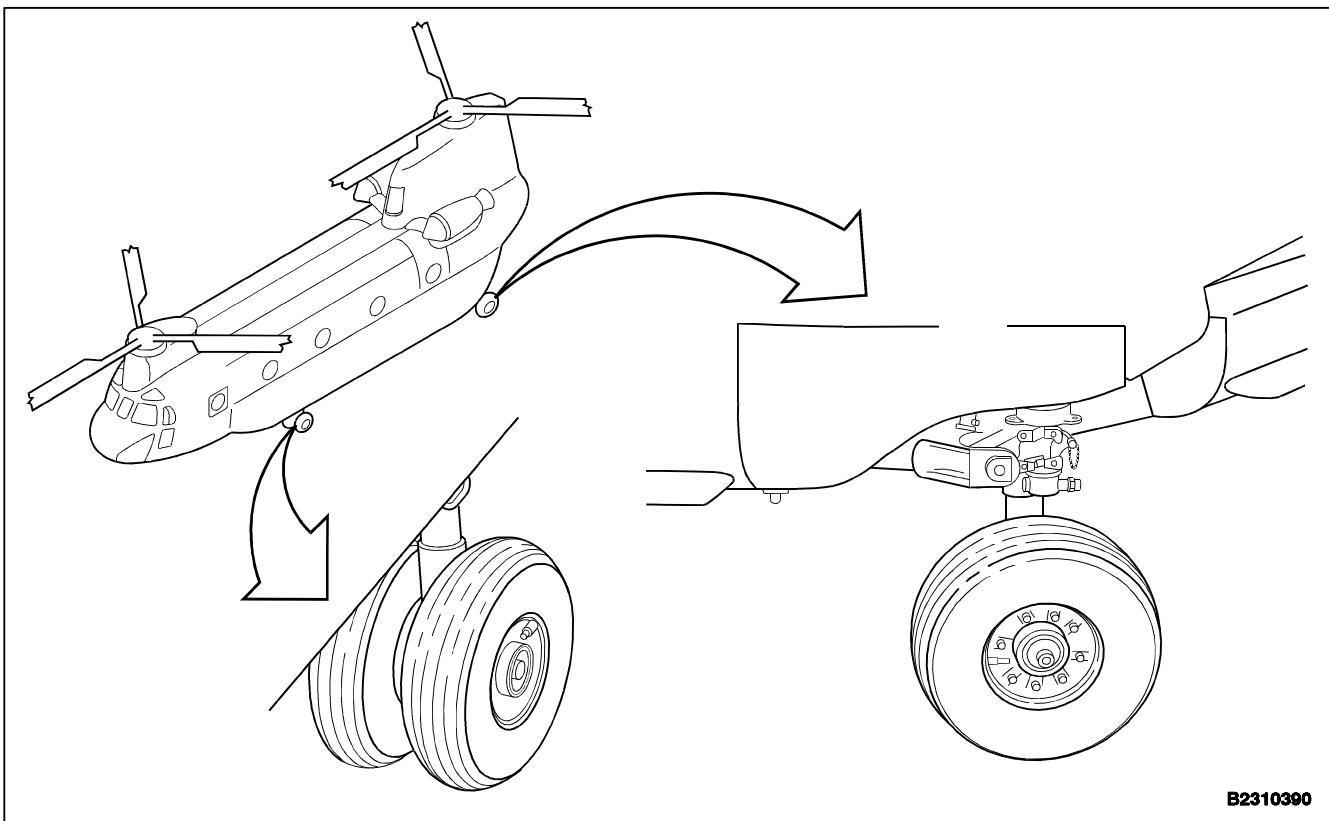
CH-47 Helicopter Repairer

**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.

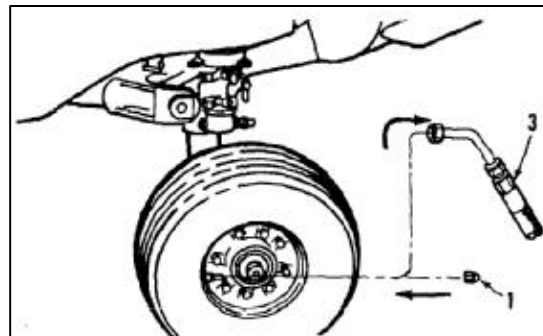
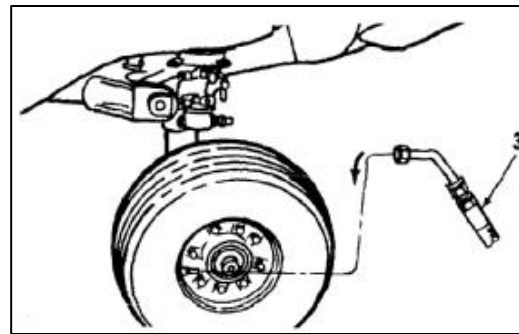
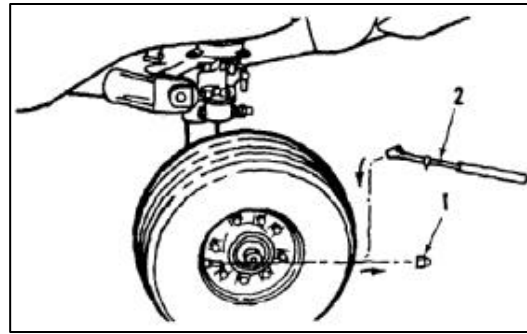
**NOTE**

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

## 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:**

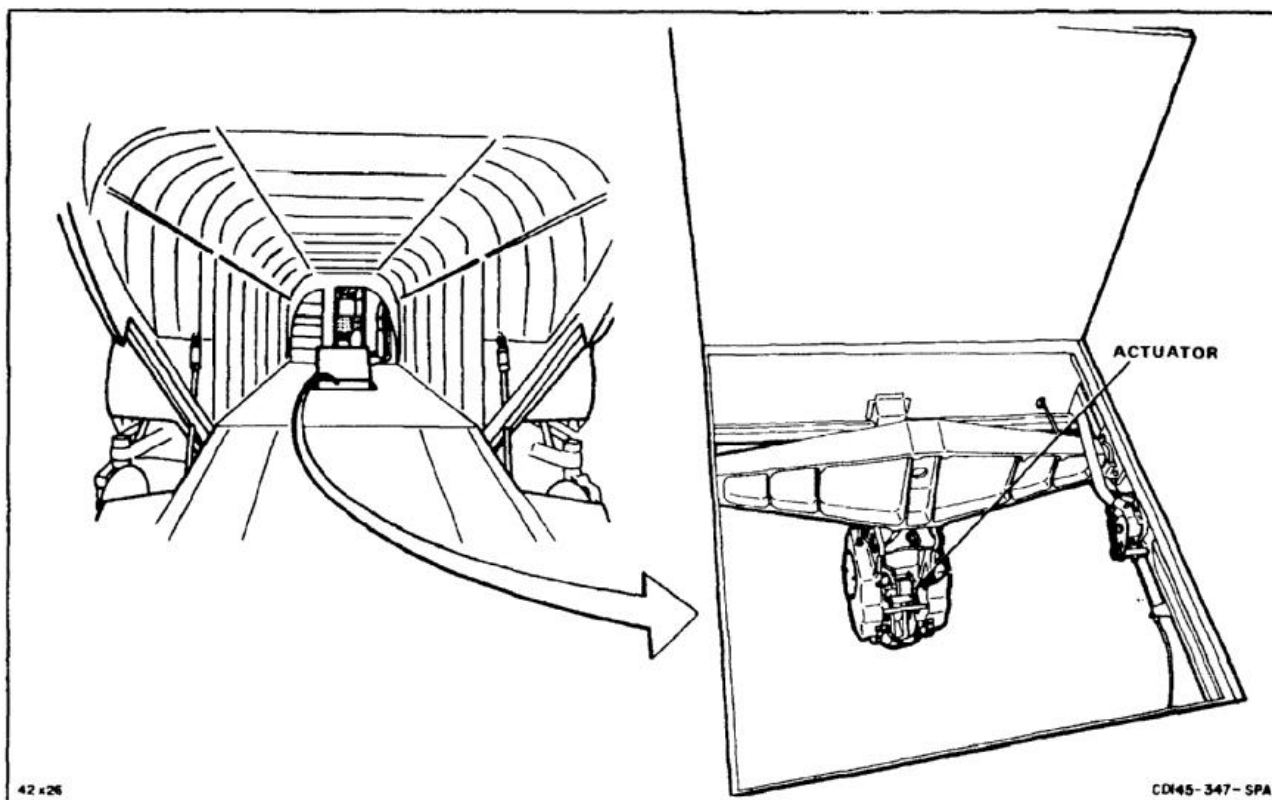
Medium Helicopter Repairer (2)

**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**

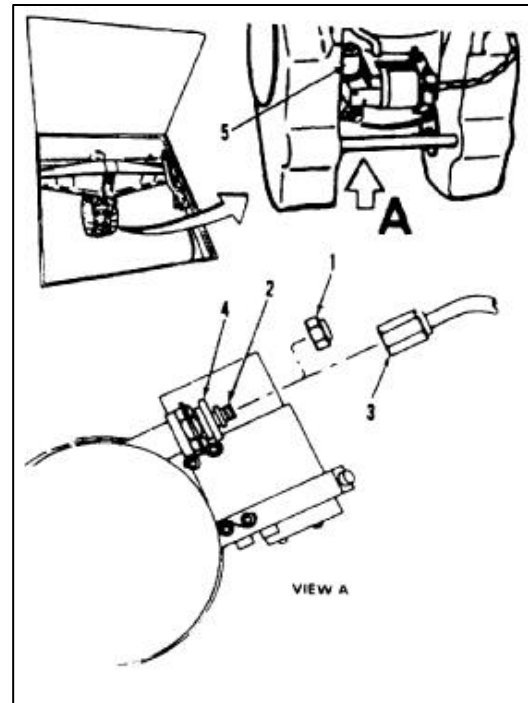
High pressure air trapped under valve cap can be a hazard. If cap is not removed slowly, air can pop it off and cause injury.

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



**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:**

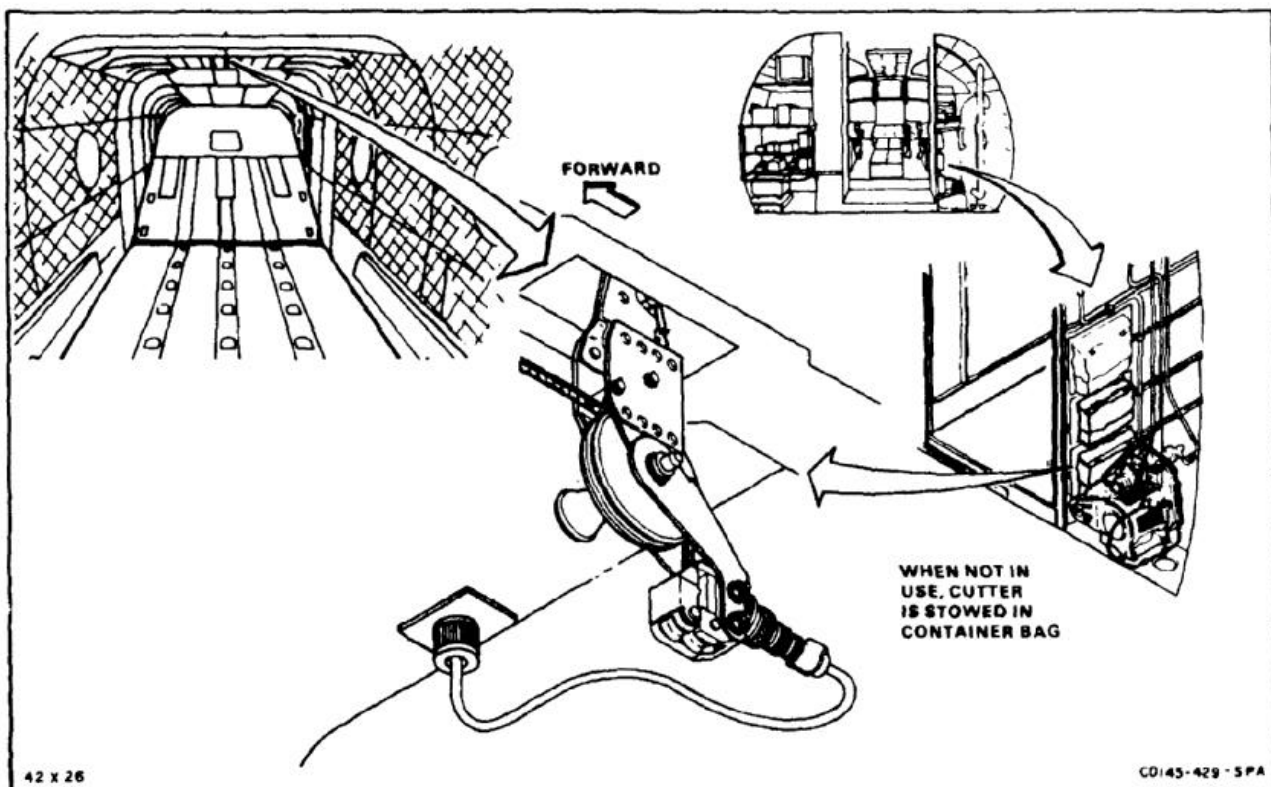
Battery Disconnected (Task 1-39)  
 Electrical Power Off

**General Safety Instructions:****WARNING**

Do not service or handle with power on. The cartridge could fire. Severe personal injury could result.

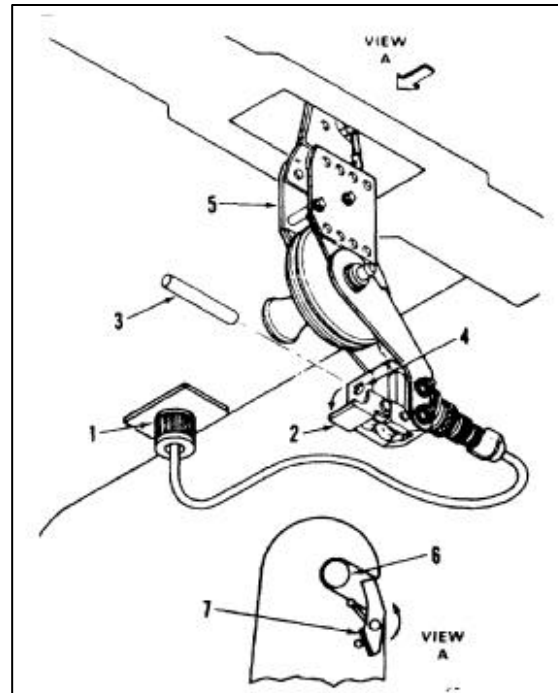
**NOTE**

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.



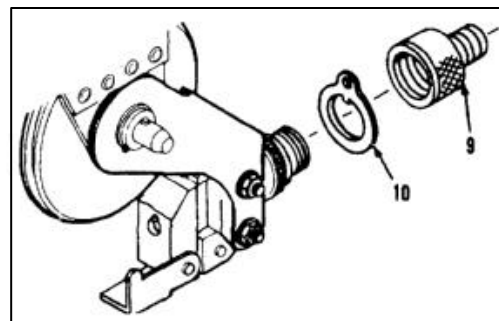
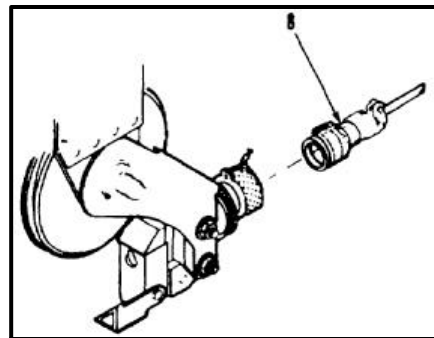
**CUTTER RELEASE FIRED CARTRIDGE**

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.

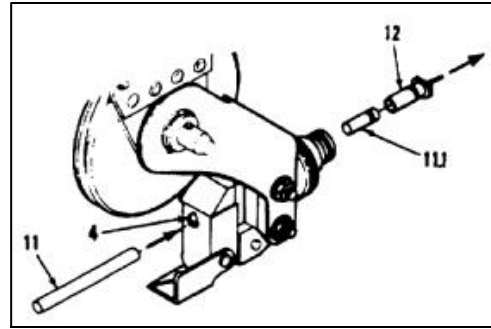
4. Remove lockwire from electrical connector (8). Remove connector.
5. Remove adapter (9). Remove key washer (10).



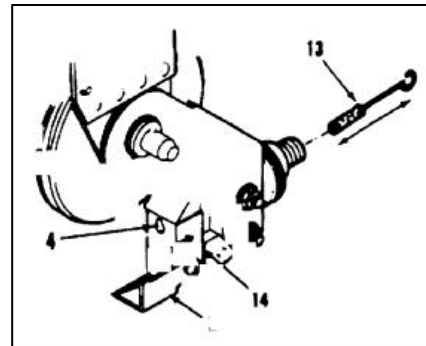
6. Insert a long driftpin (11) in chamber (4). Tap driftpin to drive out punch (11.1) and cartridge (12).



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

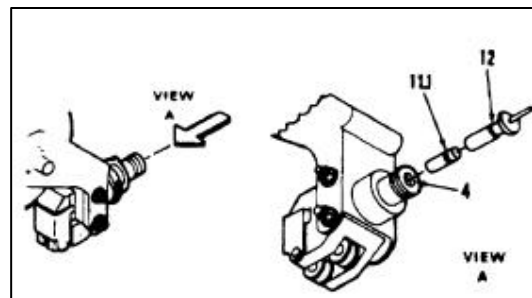
#### WARNING

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.

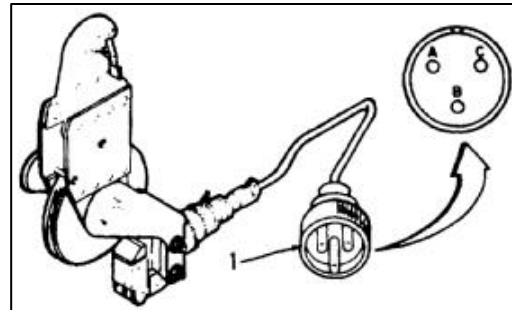
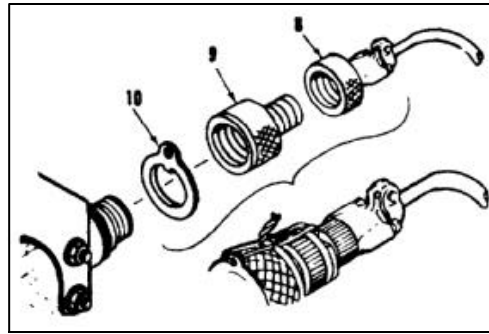
#### NOTE

The cartridge first number, installation date, and required date of removal shall be recorded on DA Form 2408-18 for maintenance planning.



**1-75 SERVICE HOIST CABLE CUTTER (Continued)****1-75**

10. Install key washer (10). Install adapter (9).
11. Connect electrical connector (8). Secure it to washer (10) with lockwire (E231).

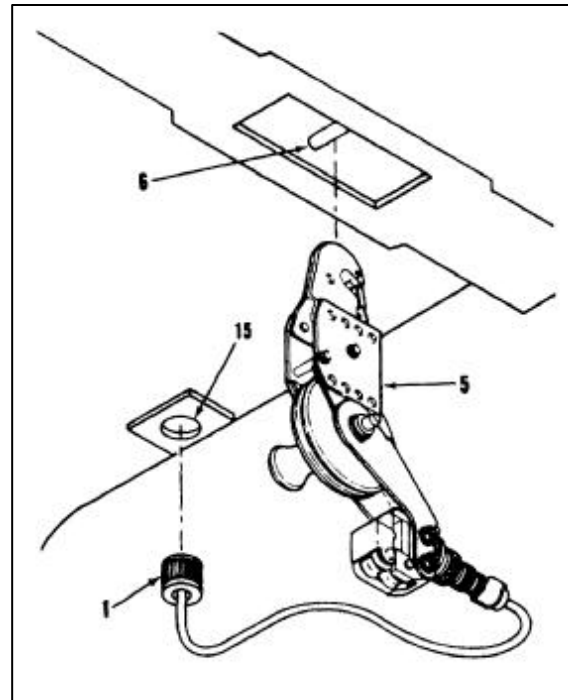
**INSPECT****CUTTER INSTALLATION****NOTE**

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

## 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:**

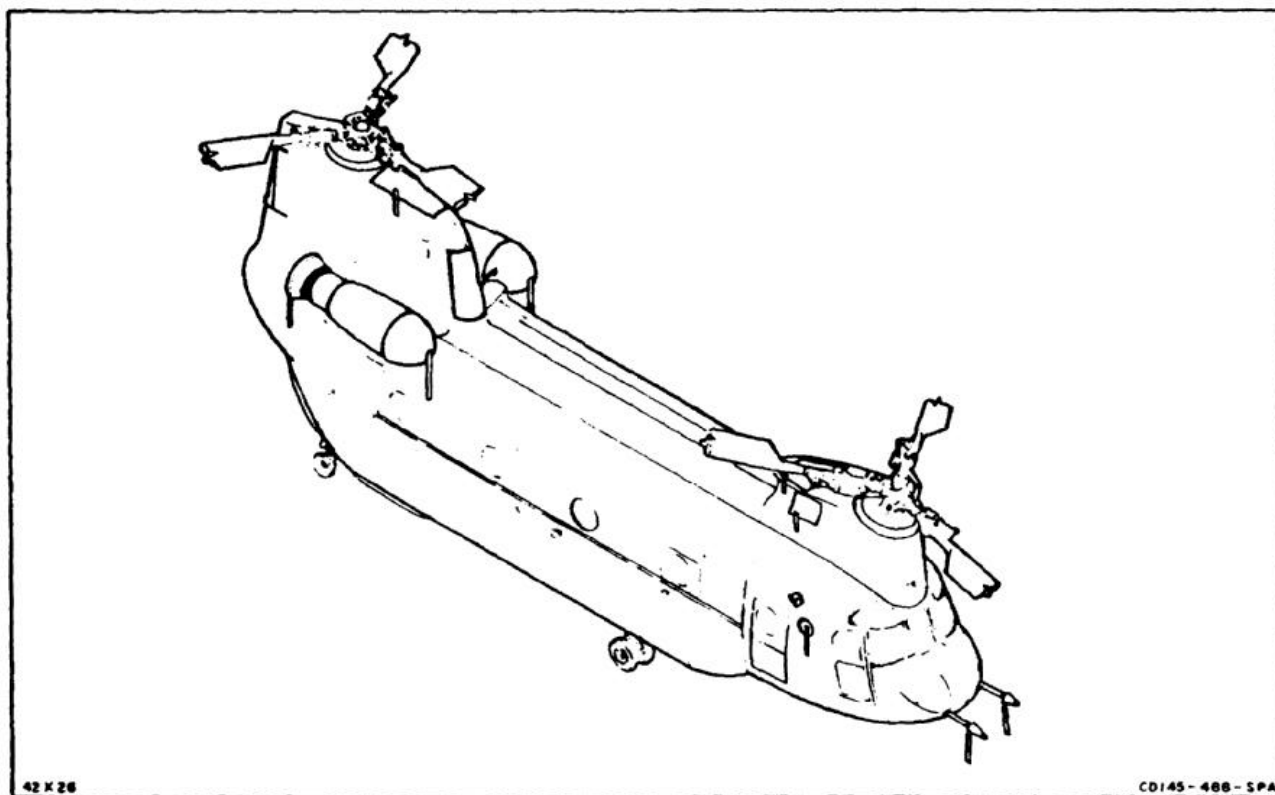
Medium Helicopter Repairer

**References:**

TM 55-1500-344-24

**Equipment Condition:**

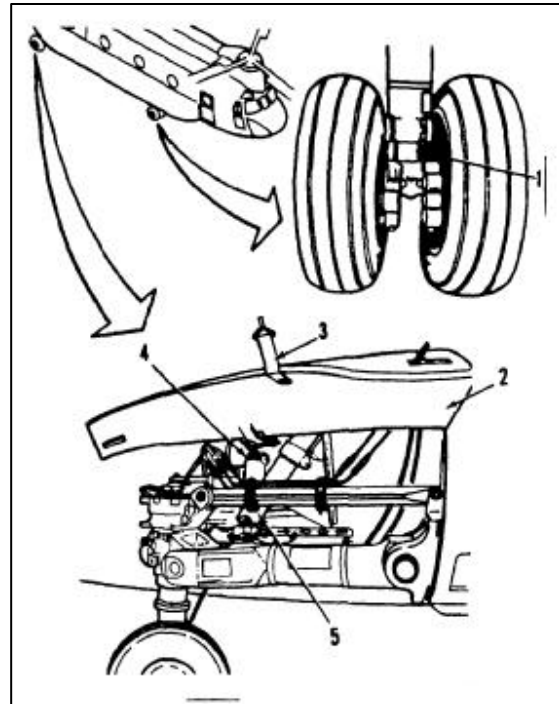
Battery Disconnected (Task 1-39)  
Drain Plugs Open (Task 2-214)  
Protective Covers Installed on Following Areas (Task 1-32):  
APU Exhaust  
Engine Exhaust (2)  
Engine Inlet (2)  
Heater Exhaust  
Heater Inlet  
Oil Cooler Exhaust (2)  
Oil Cooler Inlet (2)  
Pitot Tube (2)  
Pylon Air Inlet



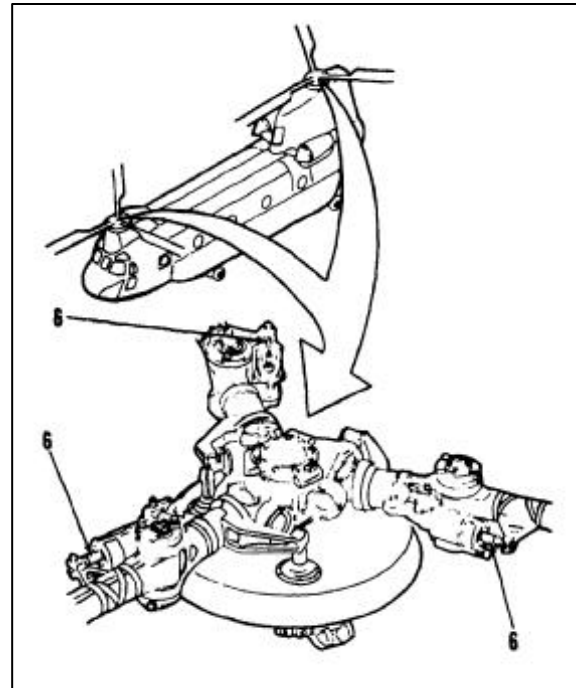
**PREPARE HELICOPTER****NOTE**

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**

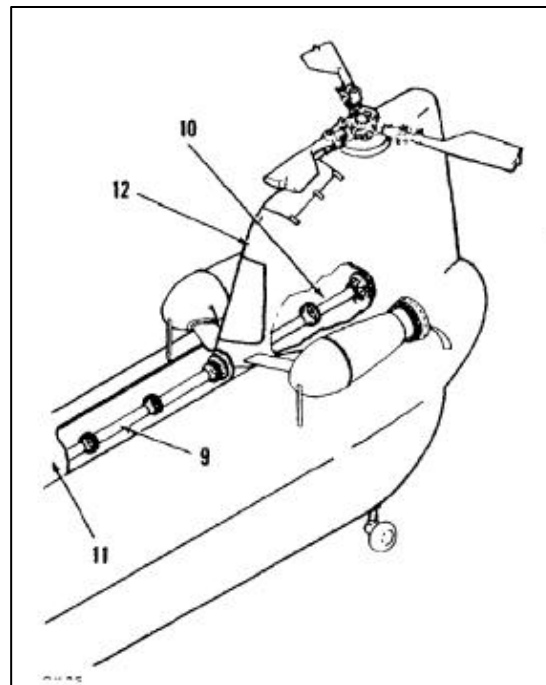
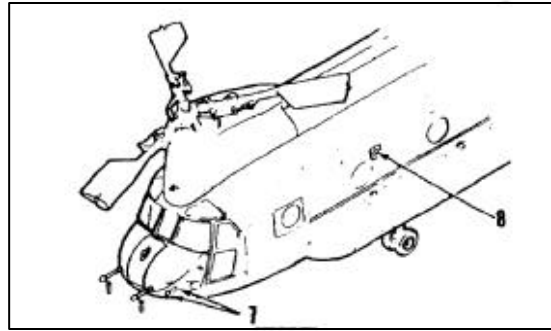
Cleaning solution can damage paint and make clear plexiglass hazy if left on too long. Rinse with clear water before solution dries.

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**

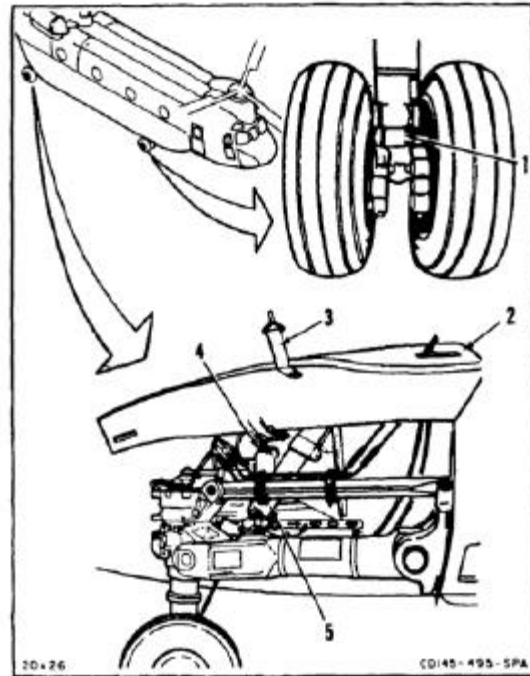
If solution is not rinsed off completely, it can damage paint and plexiglass.

10. Rinse solution from cleaned surface. Water heated to **120° to 140°F (50° to 60°C)** 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.

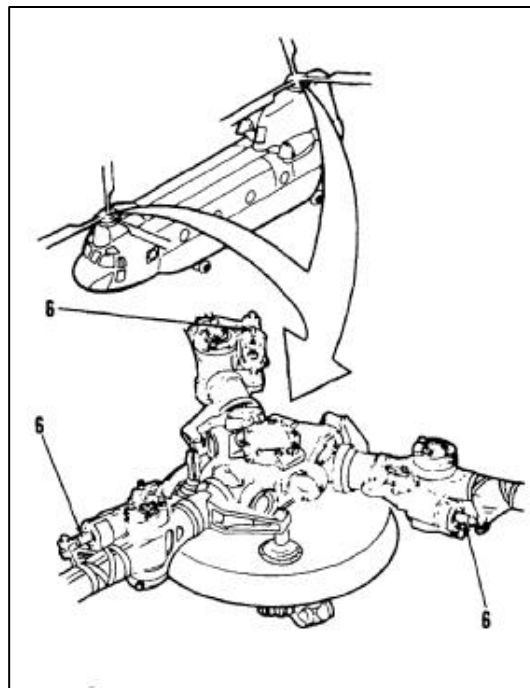


**REMOVE PROTECTIVE COVERINGS**

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).

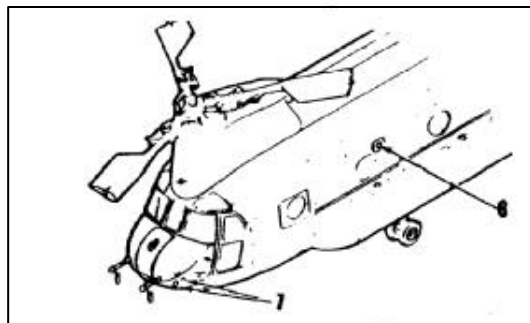


17. Remove covering from six blade shock absorber pistons (6). Wipe pistons with cloth (E120) dipped in hydraulic fluid (E197 or E199).





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

## INITIAL SETUP

**General Safety Instructions:****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

**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

**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:**

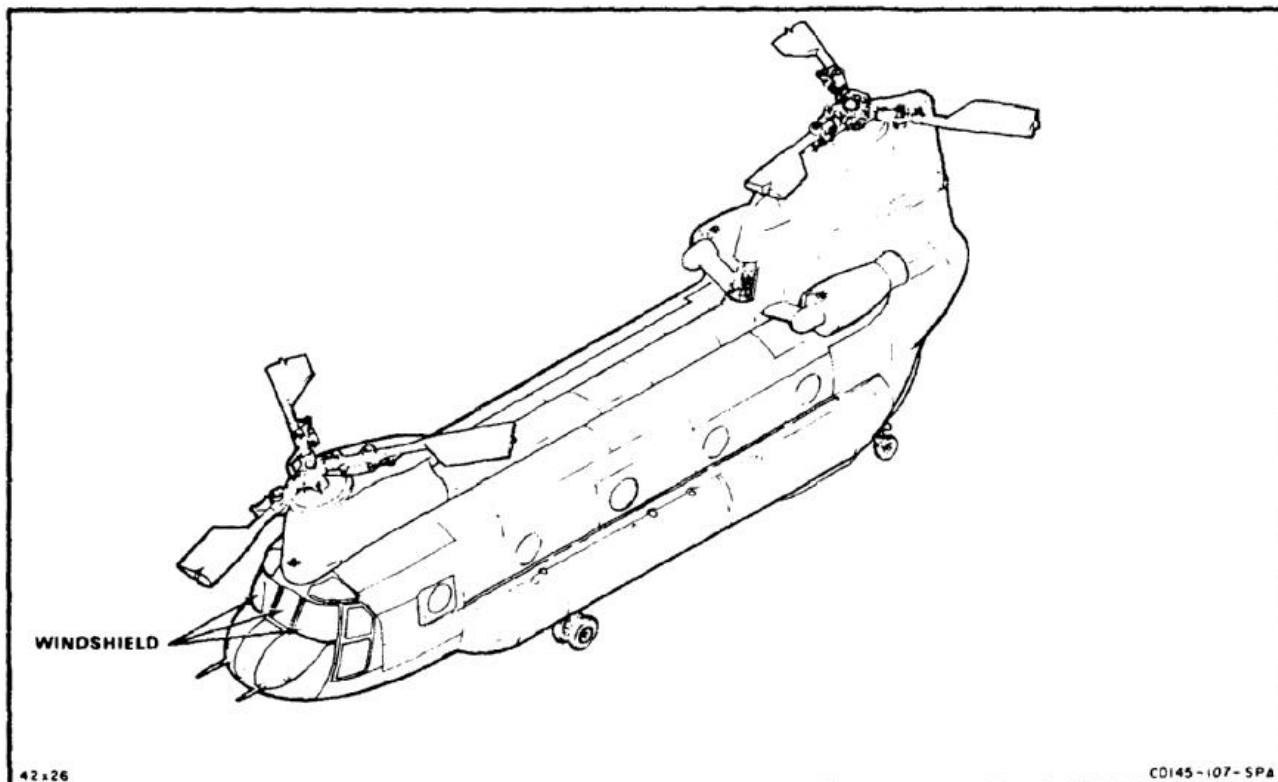
Medium Helicopter Repairer

**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.

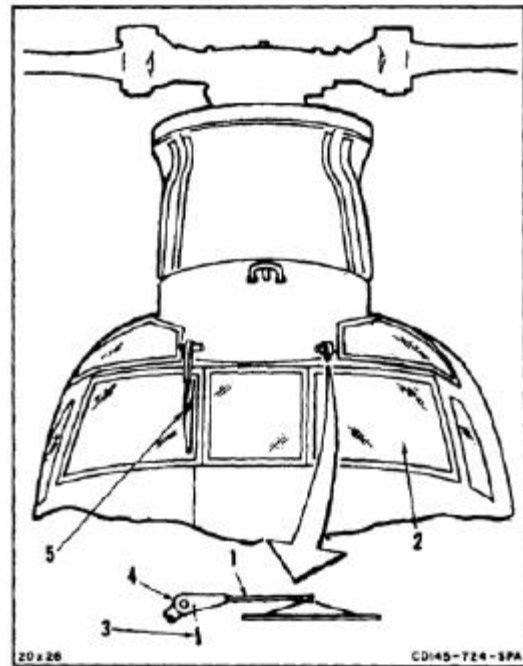


**CLEAN OUTSIDE SURFACE**

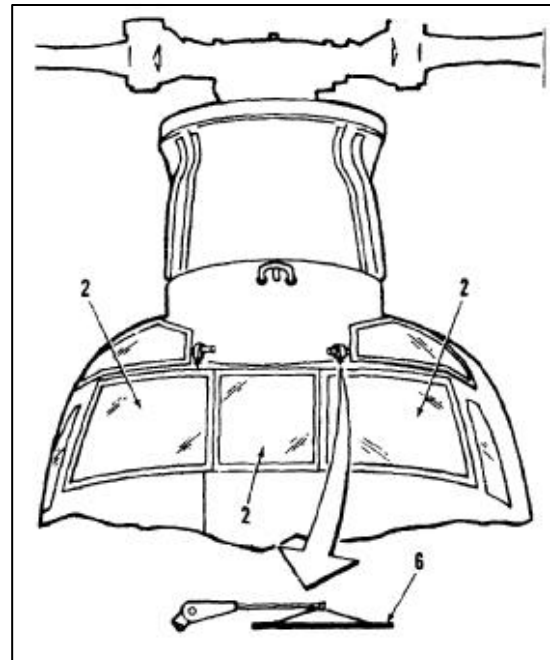
1. Raise and hold wiper arm (1) away from surface of windshield (2).
2. Put cotter pin (3) through hole in wiper arm (1) near hub (4).
3. Perform steps 1 and 2 for other wiper arm (5).
4. Flush outside of windshield (2) with clean running water to remove loose dirt.



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.



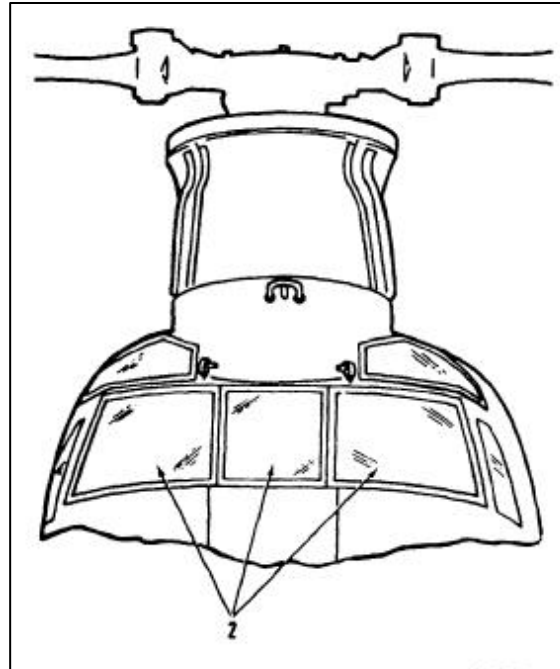
**CAUTION**

Do not use anything except naphtha (E245) or cleaner (E116) to wipe oil and grease off windshield (2). Surface will be damaged.

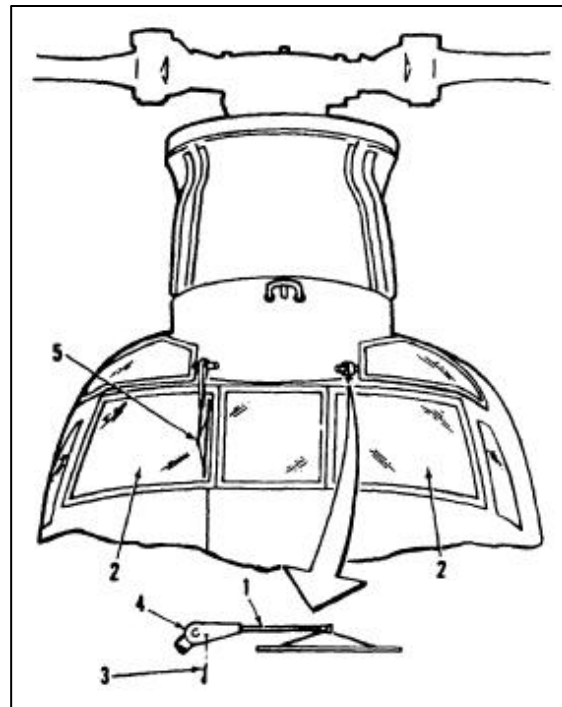
10. Wipe off all oil and grease from outside of windshield (2). Use clean cloth (E120) damp with naphtha (E245) or cleaner (E116). Wear gloves (E186).
11. Wipe off outside surface of windshield (2). Use clean cloth (E128) damp with water.
12. Put glass cleaner (E115) on outside surface of windshield (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).



**1-77.1 CLEAN WINDSHIELD (Continued)****1-77.1****CLEAN INSIDE SURFACE****CAUTION**

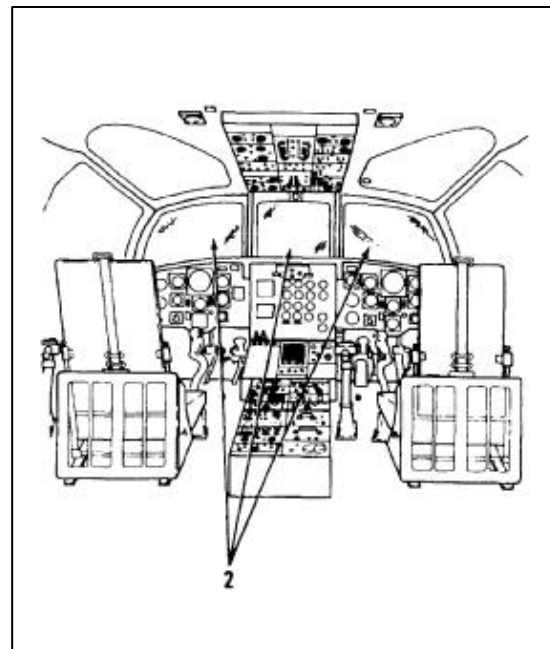
Do not use anything except naphtha (E245) or cleaner (E116) to clean windshield (2). Surface will be damaged.

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

**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

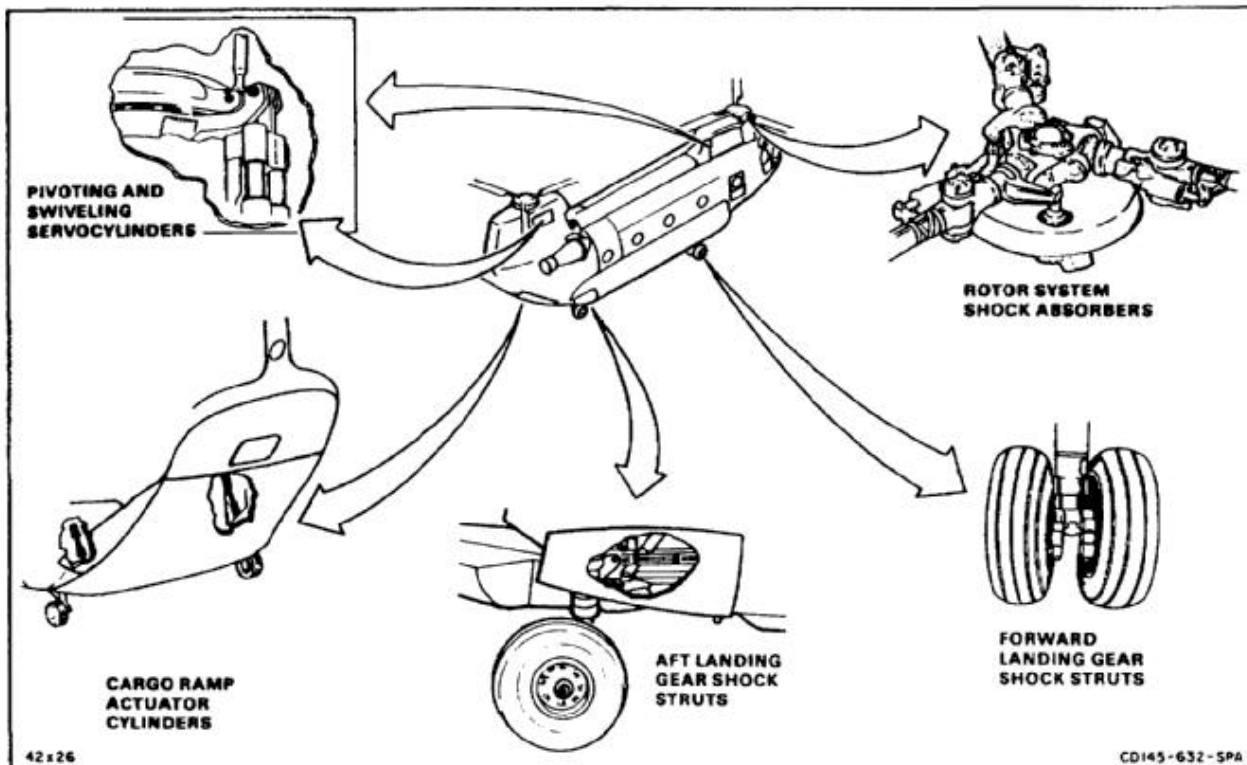
Hydraulic Power Off

**General Safety Instructions:****CAUTION**

Hydraulic fluid can damage rubber.  
Do not let fluid get on seals or rubber parts.

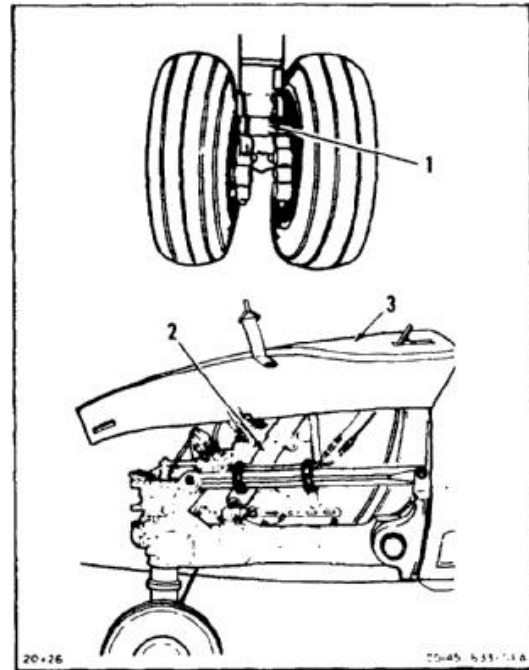
**CAUTION**

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**

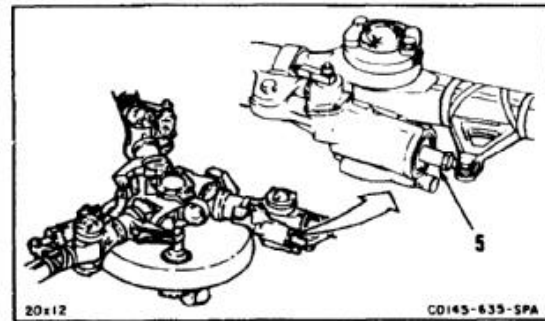
1. Gain access to forward pistons (1) from front of each gear. Gain access to aft gear (2) by opening access panel (3) (Task 2-2).
2. Cover tires with barrier material (E80) to protect from hydraulic fluid.
3. Dip a clean cloth (E120) in hydraulic fluid (E197 or E199). Wipe piston (1 or 2) with wet cloth 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).





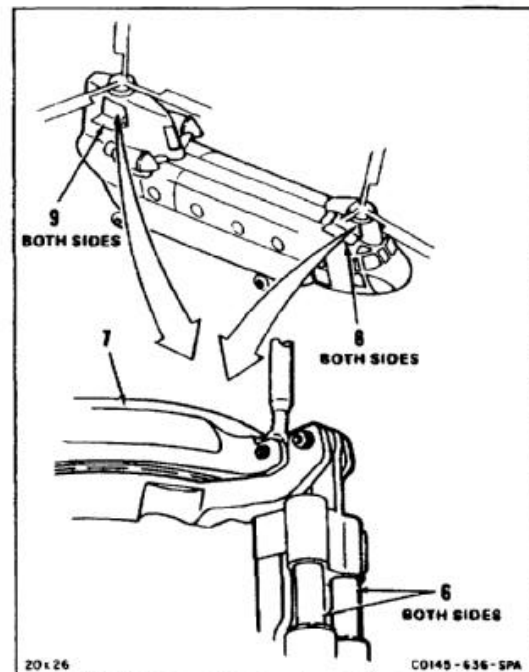
**CLEAN ROTOR SYSTEM SHOCK ABSORBER PISTONS**

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.

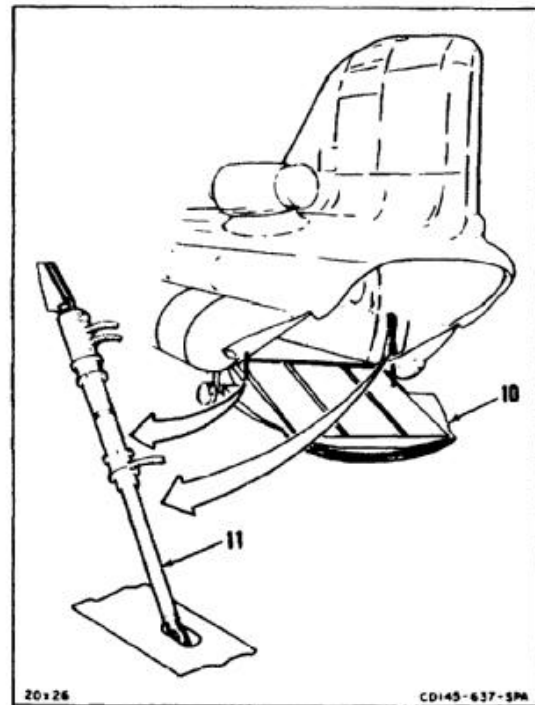
9. Gain access to servocylinder pistons (6) on swashplate (7) of forward rotor by opening forward work platforms (8) (Task 2-2). Gain access to aft pistons by opening pylon work platforms (9) (Task 2-2).
10. Dip a clean cloth (E120) in hydraulic fluid (E197 or E199). Wipe pistons (6) with wet cloth to 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

## 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

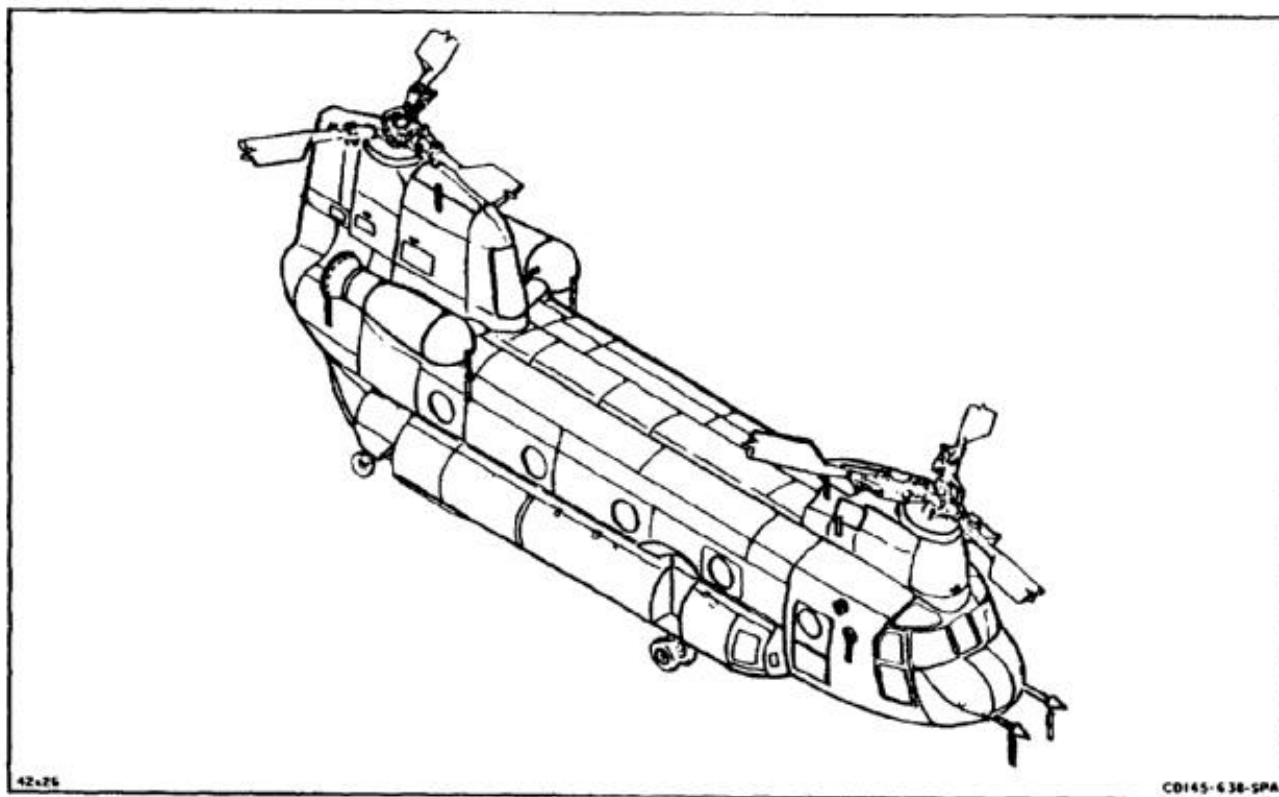
**References:**

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

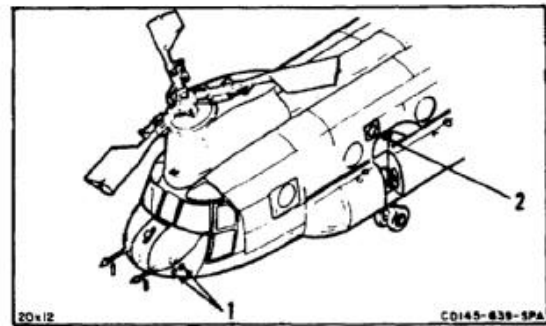
**Equipment Conditions:**

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)

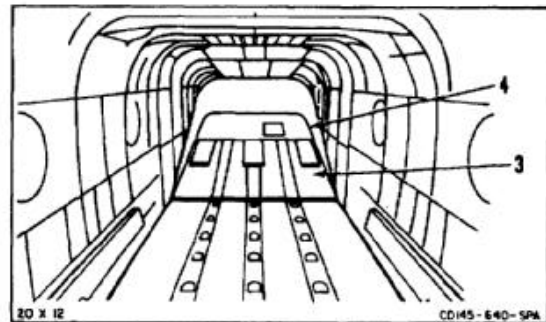


**1-79 CLEAN AFTER SALT WATER LANDING OR IMMERSION (Continued)****1-79**

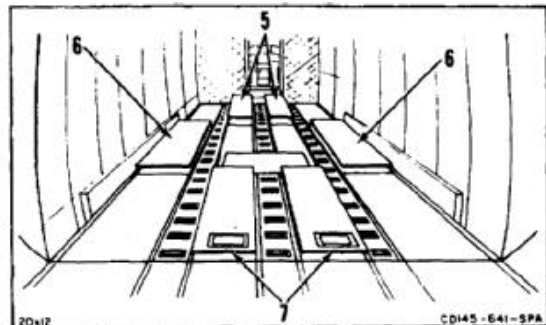
1. Cover sideslip ports (1) on both sides of nose. Cover static ports (2) on both sides of fuselage. Use barrier material (E80) and masking tape (E388).
2. Rinse all areas exposed to salt water or spray. Use fresh water.



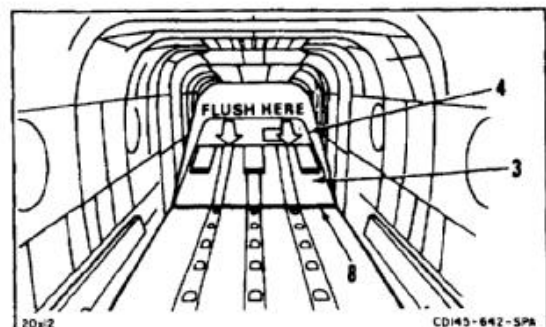
3. Open cargo ramp (3) halfway (TM 55-1520-240-T). Leave door (4) extended.



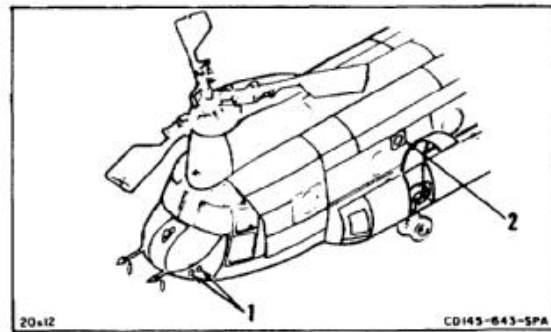
4. Remove following cabin floor panels (Task 2-204):  
 Forward inboard (5)  
 Center outboard (6)  
 Aft inboard (7)



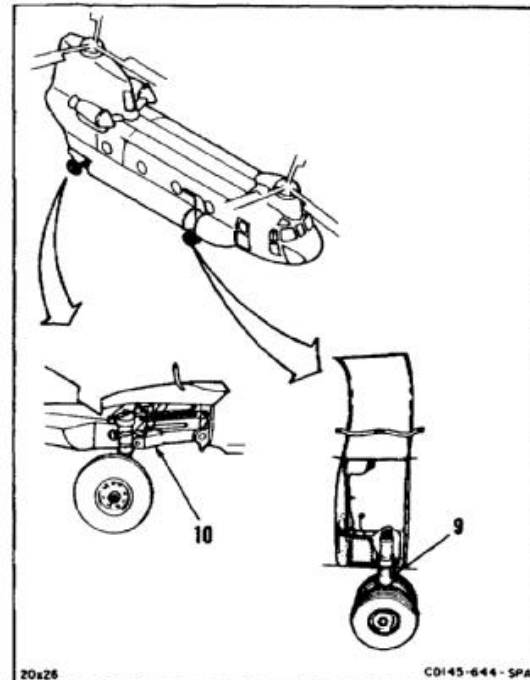
5. Flush underfloor areas with fresh water.
6. Flush between cargo ramp (3) and door (4) with fresh water. Flush ramp hinge fittings (8).



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).

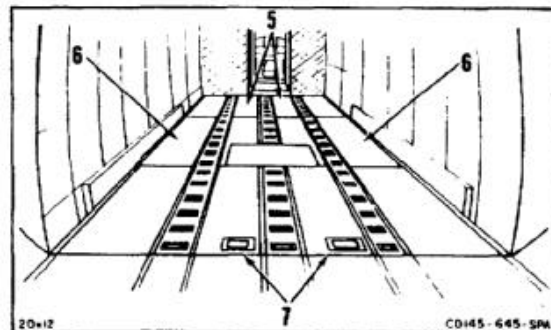


#### NOTE

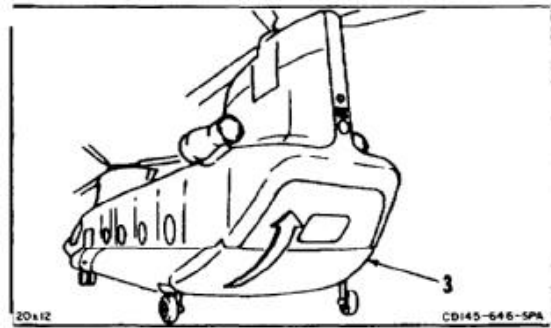
Check that underfloor areas have drained and dried before installing floor panels.

#### INSPECT

12. Install floor panels (5, 6, and 7) removed in step 4 (Task 2-207).



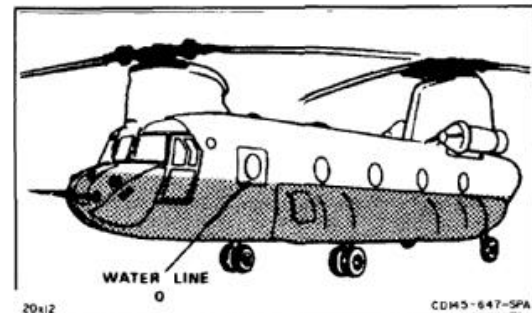
13. Close cargo ramp (3) (TM 55-1520-240-T).



**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

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 <b>1 to 3 minutes</b> . 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



## INITIAL SETUP

**Applicable Configurations:**

All

**Tools:**

Goggles

**Materials:**

Perchloroethylene (E272)

Gloves (E186)

**Personnel Required:**

Medium Helicopter Repairer

**References:**

Task 1-80

**Equipment Conditions:**

Off Helicopter Task

**General Safety Instructions:****WARNING**

Perchloroethylene (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 perchloroethylene (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:

**1-82 CLEAN AND TREAT MAGNESIUM ALLOY PARTS (AVIM) (Continued)****1-82**

- (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 **180° to 210°F (82° to 99°C) 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 **165° to 210°F (74° to 99°C) for 10 to 15 minutes**. Rinse parts thoroughly with cold water. If necessary, the chromic acid solution may be maintained at **70°F (21°C)**, however, longer immersion times may be necessary.
- (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 **200° to 220°F (93° to 104°C)**, for approximately **30 minutes**.
- (7) Rinse parts thoroughly. Dip them in hot water to let them dry faster.

**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.

**1-82 CLEAN AND TREAT MAGNESIUM ALLOY PARTS (AVIM) (Continued)****1-82****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

## 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 **175° to 185°F (70.5° to 85°C)** to dissolve crystals.
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 **160° to 210 °F (71° to 99°C)** 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 **150° to 170°F (66° to 77°C)** for this period.
  - e. Remove part from solution, rinse thoroughly with water. Dry with clean, dry filtered hot air. Do not exceed **140°F (60°C)**.
  - 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**.

**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.

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

## INITIAL SETUP

**Applicable Configurations:**

All

**Tools:**

None

**Materials:**

None



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.

**Personnel Required:**

Medium Helicopter Repairer

**References:**

TM 1-1500-204-23

TM 55-410

Refer to TM 1-1500-204-23 and TM 55-410 for hot weather maintenance procedures.

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

## INITIAL SETUP

**Applicable Configurations:**

All

**Tools:**

Brush  
Compressed Air Source

**Materials:**

Cloth (E120)  
Solvent (E161)  
Gloves (E186)

**Personnel Required:**

Medium Helicopter Repairer

**Equipment Conditions:**

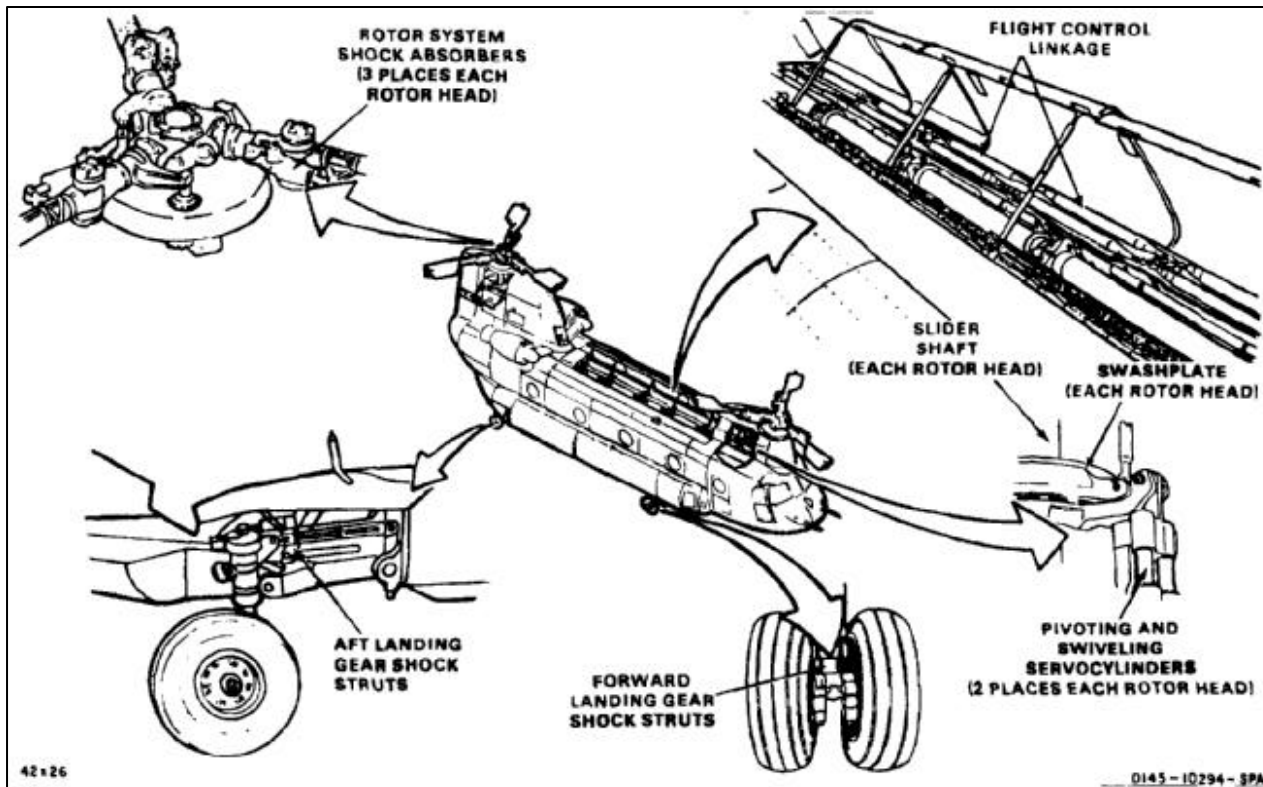
Battery Disconnected (Task 1-39)  
Electrical Power Off  
Forward Transmission Fairing Work Platforms Open  
(Task 2-2)  
Aft Pylon Work Platforms Open (Task 2-2)  
Drive Shaft Tunnel Access Covers Open (Task 2-2)  
Aft Landing Gear Access Panels Open (Task 2-2)

**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.







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

## 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 **0°F (-18°C)**. Dangerous ground and flight reactions can result.

**NOTE**

Vent valve may be open or closed at temperatures between **0°F (-18°C)** and **30°F (-1°C)**.

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 **150°F (66°C)**.

Ambient Temp	Fluid (E74)	Water
30°F(-0°C)	20%	80%
20°F(-7°C)	30%	70%
10°F(-12°C)	40%	60%
0°F(-18°C)	45%	55%
-10°F(-23°C)	50%	50%
-20°F(-29°C)	55%	45%
-30°F(-35°C)	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**

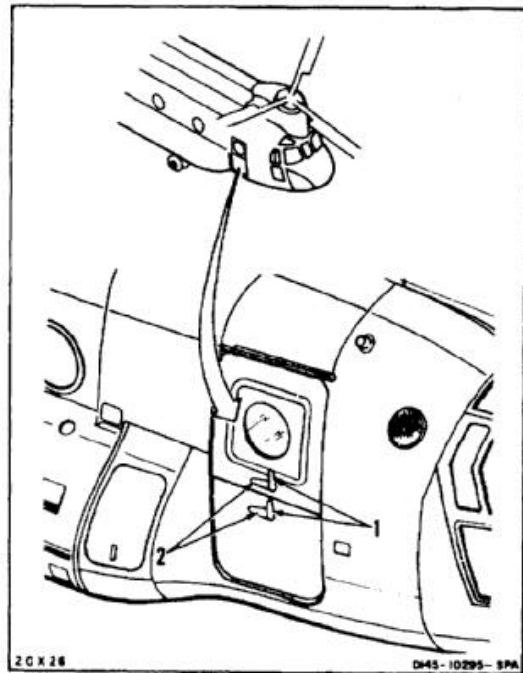
Dry cleaning solvent (E162) is combustible and toxic. It can irritate skin and cause burns. Use only with adequate ventilation, away from open flame. In case of contact, immediately flush skin or eyes with water for at least **15 minutes**. Get medical attention for eyes.

- 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.

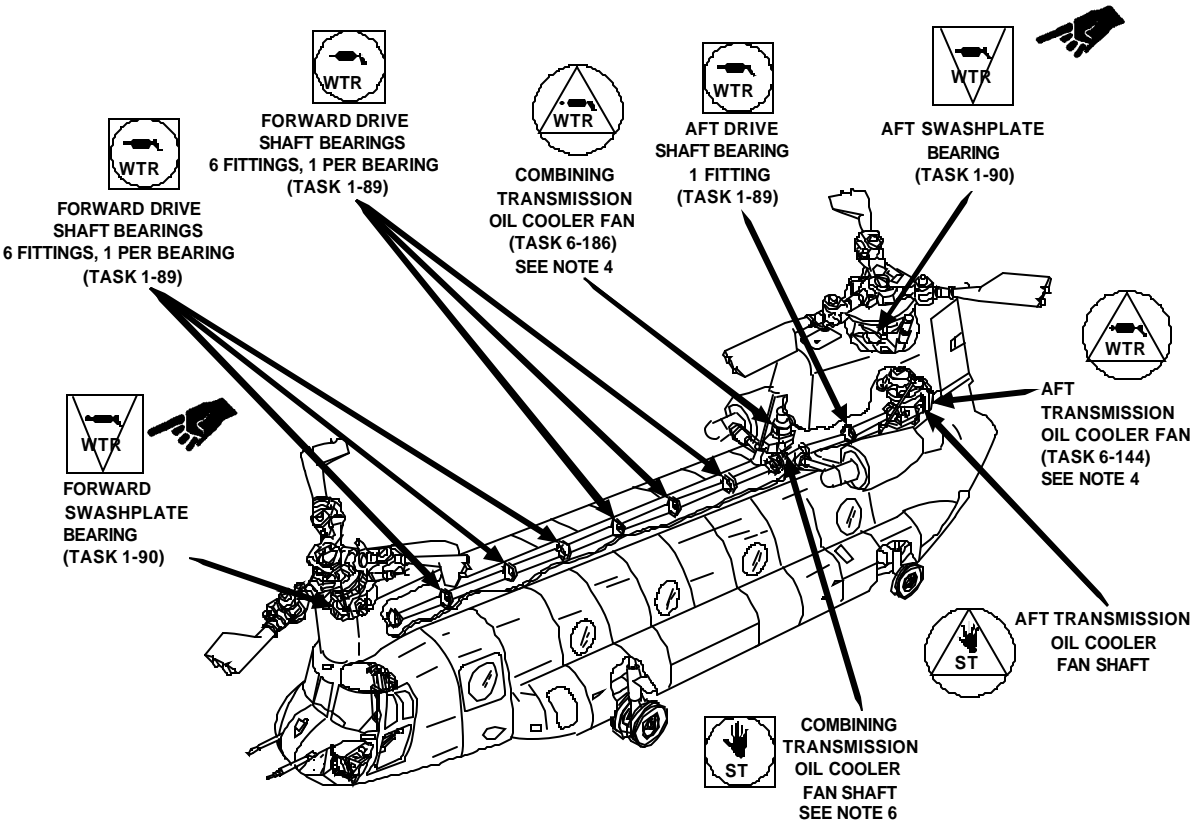
- d. Renew coating when latches and handle release mechanisms become difficult to operator.
9. Clean transparent plastic when temperature is below **32°F (0°C)**. Use cleaning and polishing compound (E118 or E282) (Task 2-40).

**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

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.

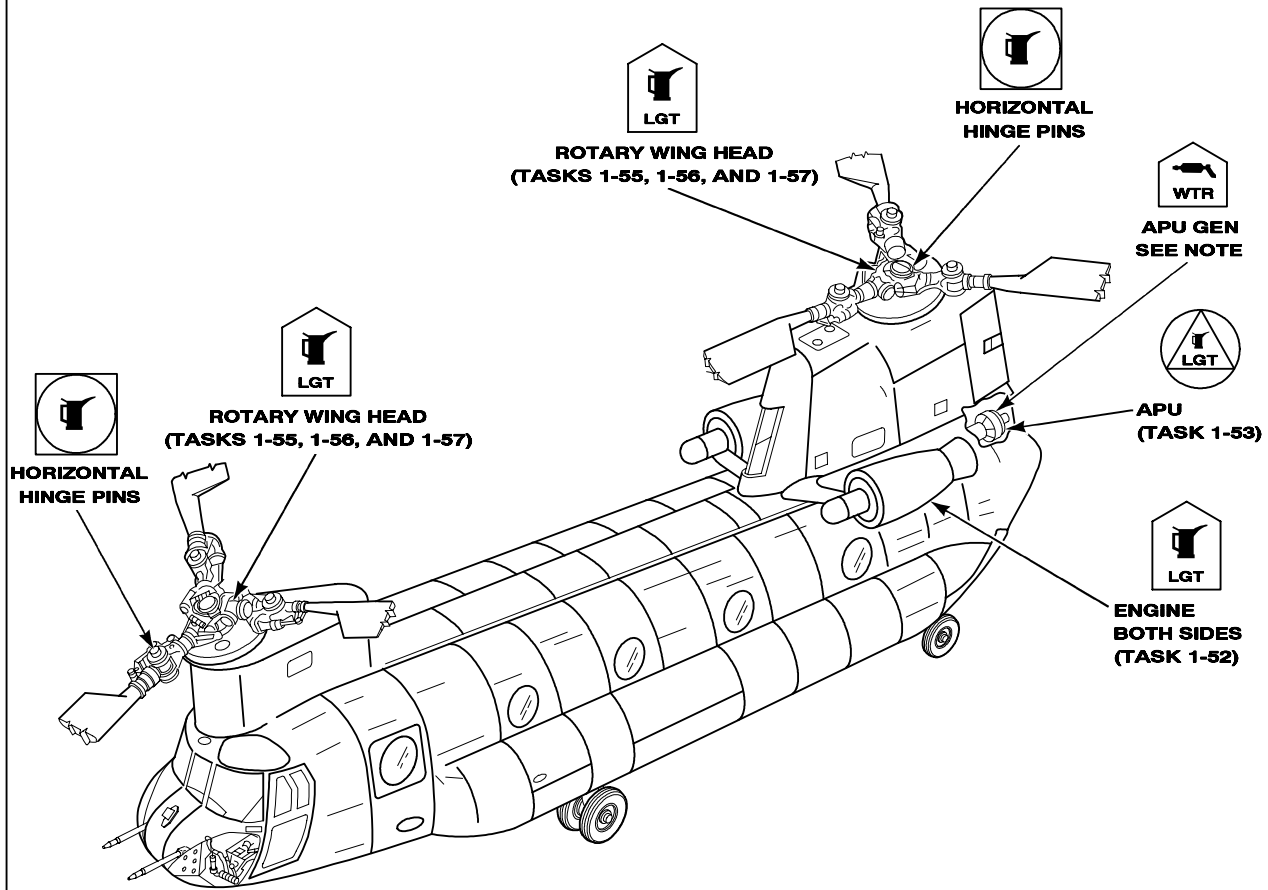
3. LUBRICATION INTERVAL SHOWN IS FOR AVERAGE CONDITIONS. MORE FREQUENT LUBRICATION MAY BE NECESSARY UNDER EXTREMELY DUSTY CONDITIONS.
4. DO NO OVERGREASE THE FAN ASSEMBLY. DO NOT BLOCK THE VENT FITTING WHILE APPLYING GREASE.

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			SYMBOLS		FREQUENCY	METHOD OF APPLICATION	
IDENTIFICATION LETTER	SPECIFICATION	TYPE OF LUBRICANT					
WTR	MIL-G-81322 (E190)	GREASE, AIRCRAFT GENERAL PURPOSE, WIDE TEMPERATURE RANGE			100 HOURS		GREASE GUN
ST	(E190.1)	GREASE, SYN-TECH			200 HOURS		HAND
					50 HOURS		

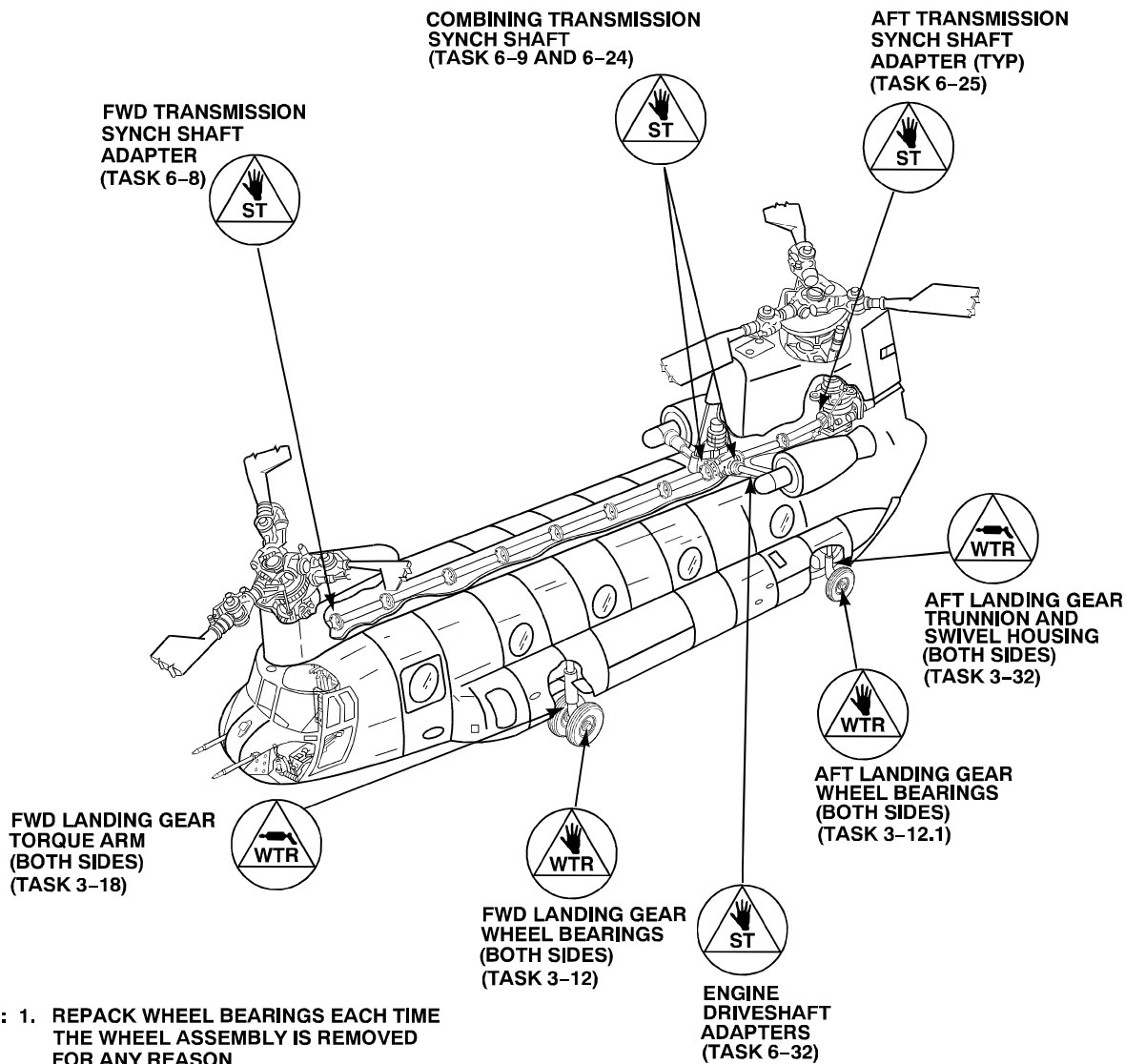
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**NOTE: APPLIES TO LEGEND GENERATOR (AGH942-1) ONLY.**

TABLE OF LUBRICANTS			SYMBOLS	FREQUENCY	METHOD OF APPLICATION
IDENTIFICATION LETTER	SPECIFICATION	TYPE OF LUBRICANT		200 HOURS	 OIL CAN
LGT	MIL-L-7808 (E254) OR MIL-L-23699 (E253) (REFER TO SERVICING INSTRUCTIONS FOR USAGE LIMITATIONS)	LUBRICATING OIL AIRCRAFT TURBINE ENGINE SYNTHETIC BASE		400 HOURS	 GREASE GUN
WTR	MIL-G-81322 (E190)	GREASE AIRCRAFT GENERAL PURPOSE WIDE TEMPERATURE RANGE		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			SYMBOLS	FREQUENCY	METHOD OF APPLICATION
IDENTIFICATION LETTER	SPECIFICATION	TYPE OF LUBRICANT		200 HOURS	GREASE GUN
ST	(E190.1)	GREASE, SYN-TECH			HAND
WTR	MIL-G-81322 (E190)	GREASE, AIRCRAFT GENERAL PURPOSE, WIDE TEMPERATURE RANGE			

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)

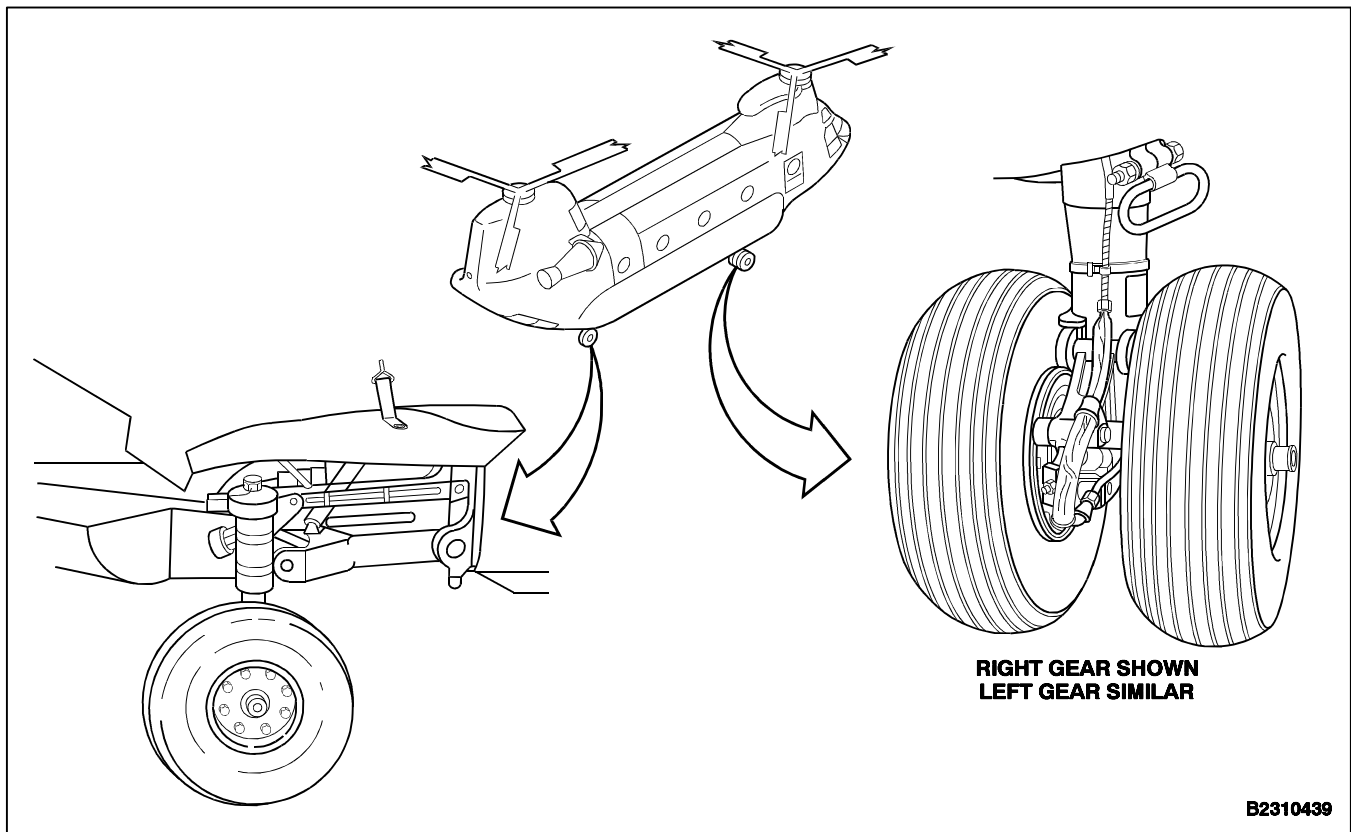
***Personnel Required:***

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)



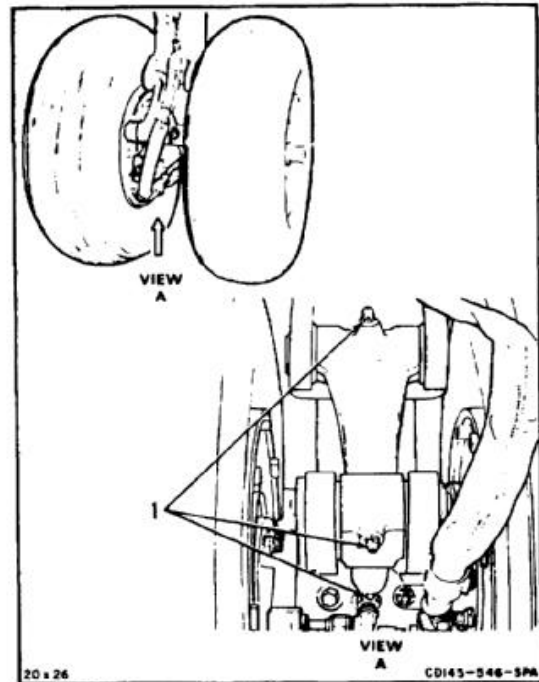


**NOTE**

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).



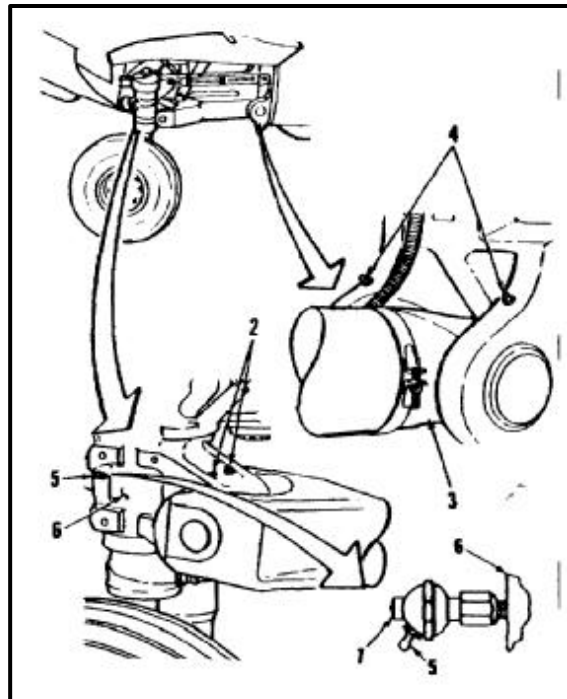
**LUBRICATE AFT GEAR**

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.



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

**INITIAL SETUP****Applicable Configurations:**

All

**Tools:**

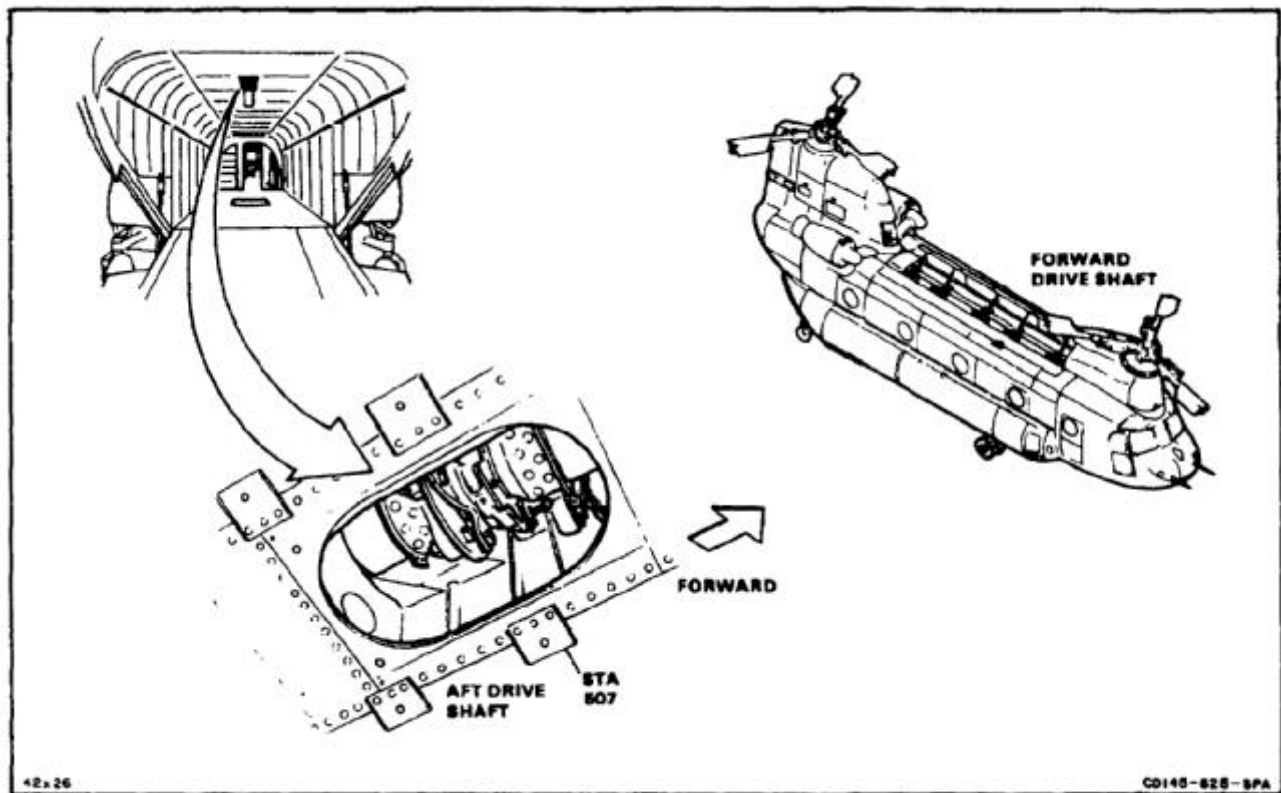
Hand Lubricating Gun

**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.



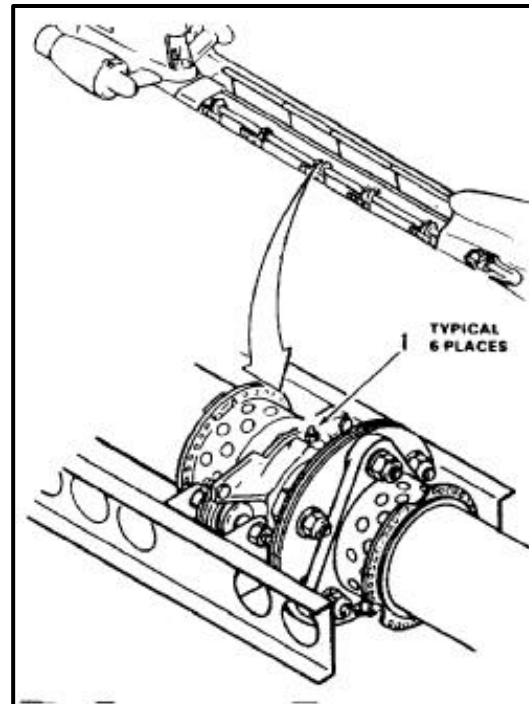
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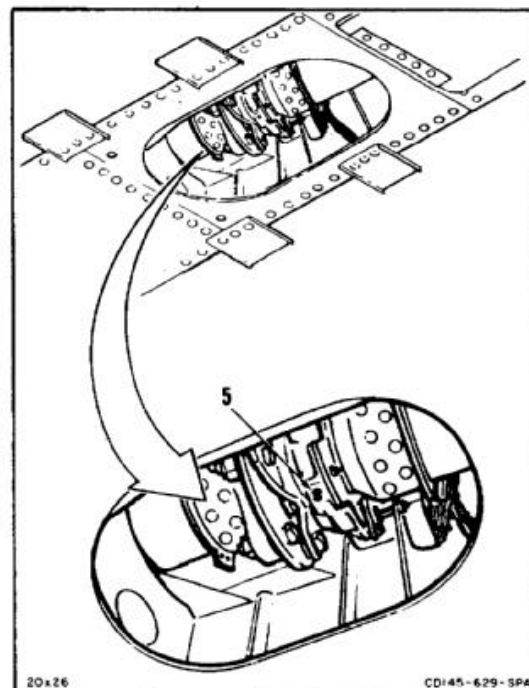
**LUBRICATE FORWARD SHAFT BEARINGS****NOTE**

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:**

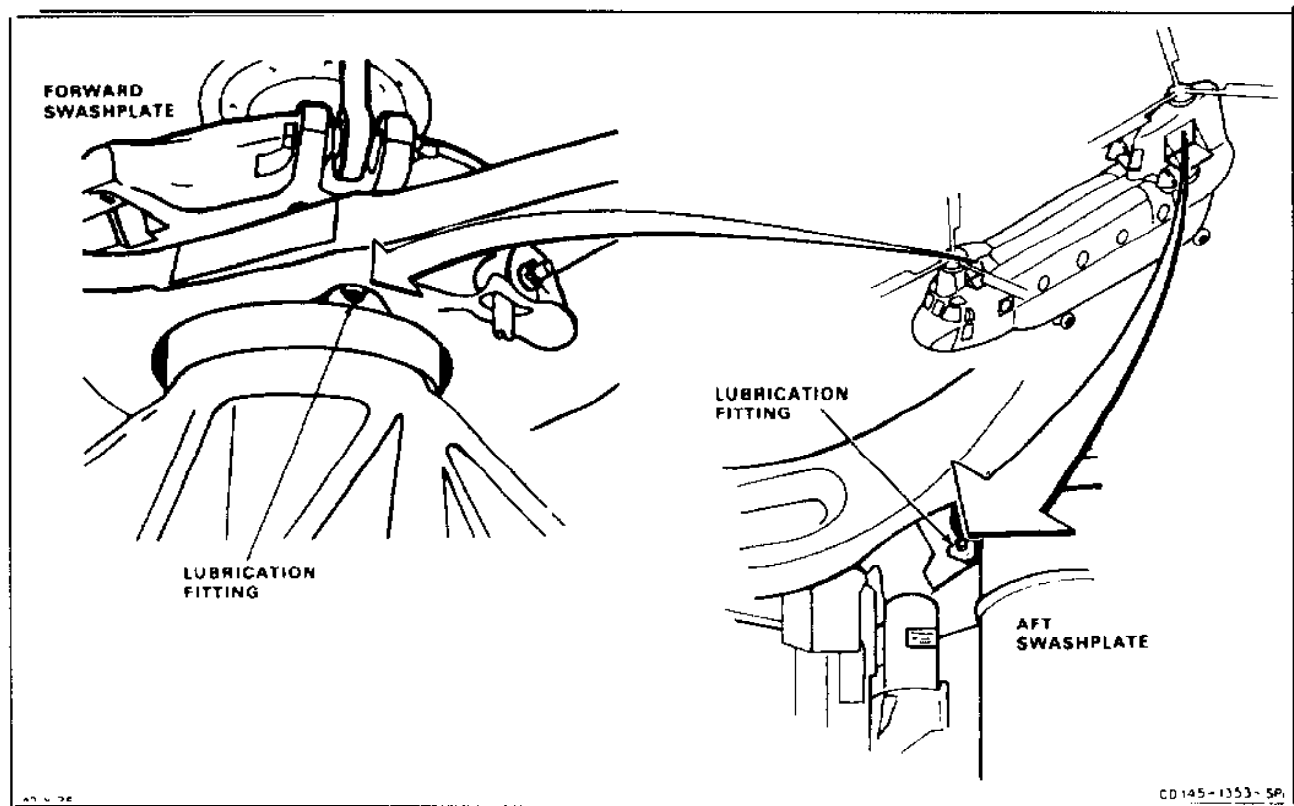
Medium Helicopter Repairer (2)

**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.

- Using a clean lint free cloth (E134.1) dampened 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.

- 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**

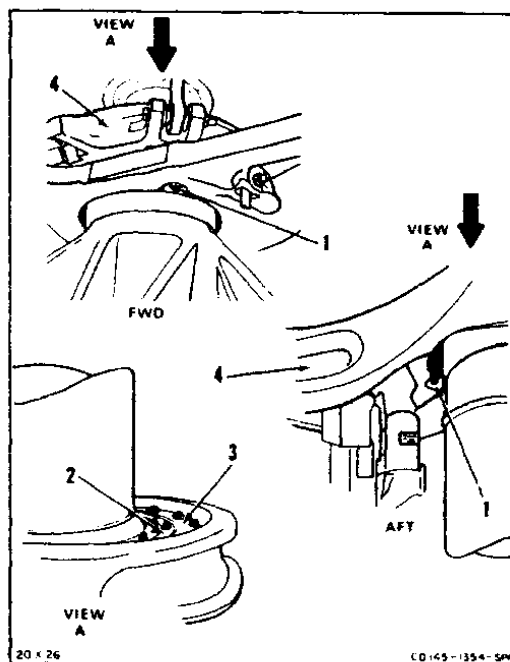
A minimum of **16 ounces** of grease must be used to adequately purge grease from the swashplate.

- Pump until clean grease appears all the way around the line between stationary seal (2) and rotating seal (3).
- Wipe grease from fitting (1) and between seals (2 and 3).
- 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 is 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.

**1-91 OVERHAUL AND RETIREMENT SCHEDULE (Continued)****1-91*****CH-47D Components with Fatigue Lives Less Than 10,000 Hours***

<b>COMPONENTS</b>	<b>PART NO.</b>	<b>RETIREMENT SCHEDULE HOURS</b>
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	114RS214-1	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)

*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

**1-91 OVERHAUL AND RETIREMENT SCHEDULE (Continued)****1-91**

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)
Aft Transmission	145D1300-9	On Condition (Note E)
	145D2300-2	On Condition (Note D)
	145D2300-3	On Condition

**1-91 OVERHAUL AND RETIREMENT SCHEDULE (Continued)****1-91**

COMPONENT	PART NO.	TBO — HOURS
Combining Transmission	145D2300-4	On Condition
	145D2300-5	On Condition
	145D2300-6	On Condition
	145D2300-7	On Condition
	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
Combining Transmission Cooling Fan Drive Shaft	145D5300-13	On Condition
	145D5319-3	On Condition
	145D5319-5	On Condition
Engine Transmission	145D5319-7	On Condition
	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)
Servocylinder, Swiveling	145H6600-20	On Condition (Note G, Note H)
	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**

<b>Component</b>	<b>Serial Number</b>	<b>Removal Time (Max Allowable Flt Hrs-CH-47D)</b>
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**

<b>Component</b>	<b>Serial Number</b>	<b>Removal Time (Max Allowable FIt Hrs-CH-47D)</b>
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**

<b>Component</b>	<b>Serial Number</b>	<b>Removal Time (Max Allowable Flt Hrs-CH-47D)</b>
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**

<b>Component</b>	<b>Serial Number</b>	<b>Removal Time (Max Allowable FIt Hrs-CH-47D)</b>
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

*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.

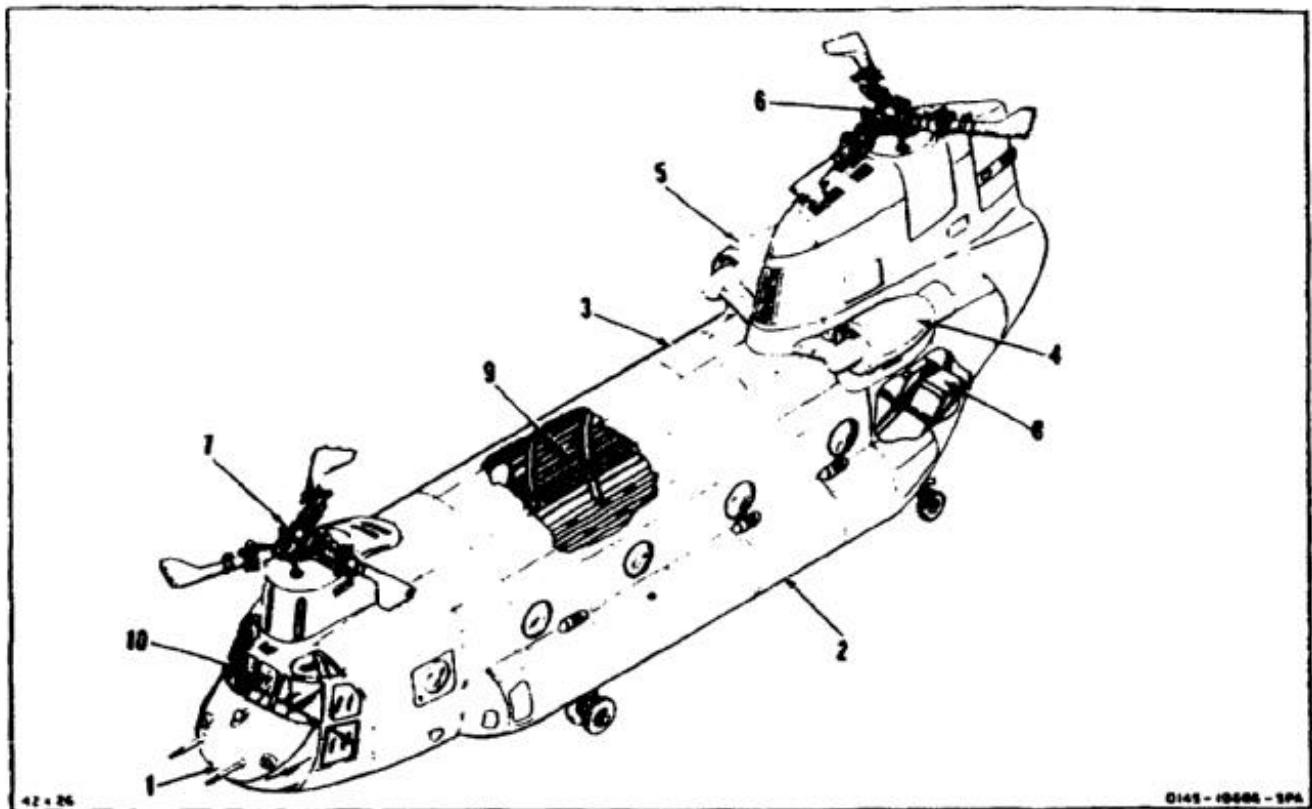
**FOLLOW-ON MAINTENANCE:**

None

END OF TASK

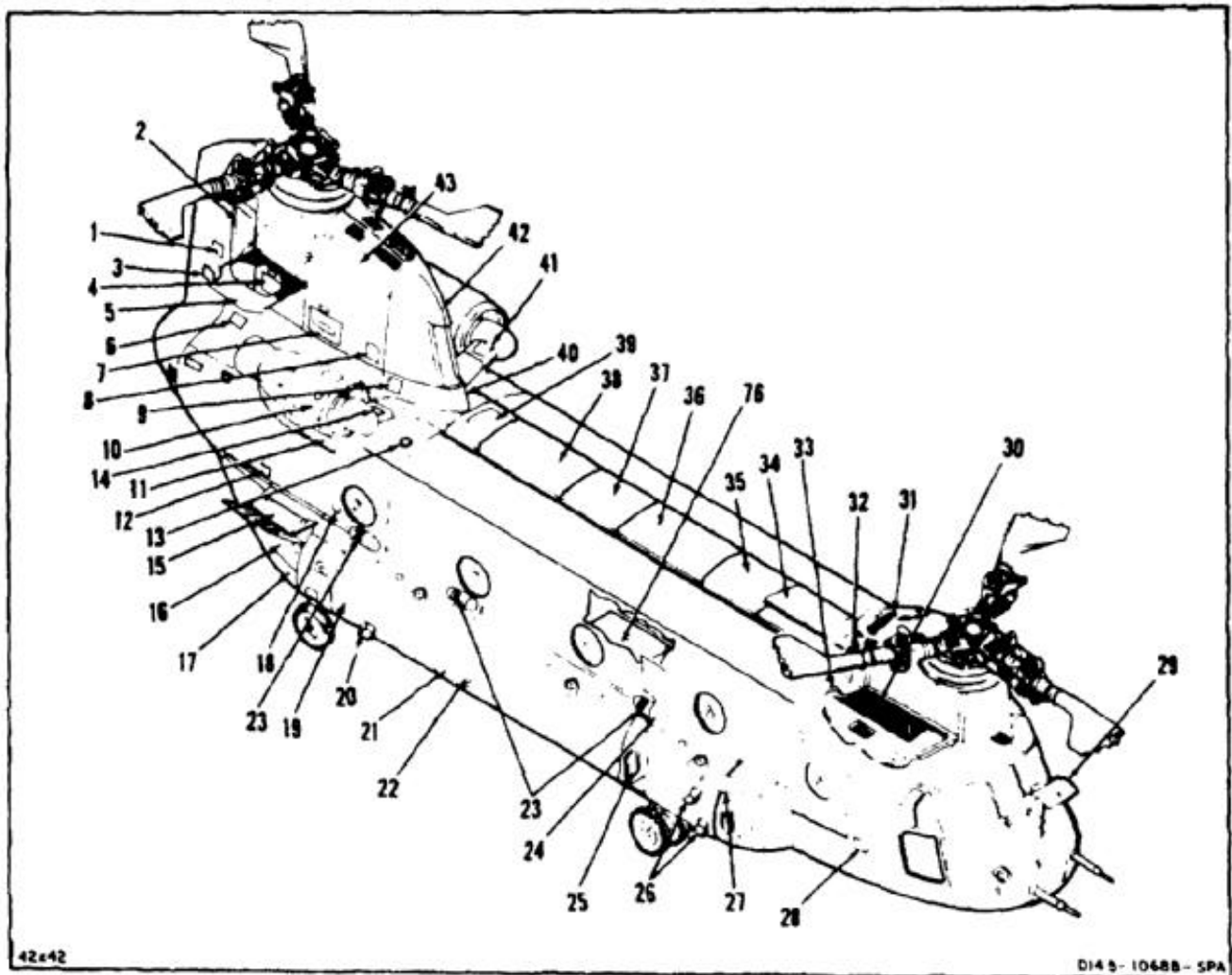
## **SECTION VIII**

### **SPECIAL INSPECTION/MAINTENANCE ACTIONS**

**Inspection Area Diagram****Inspection Area Diagram**

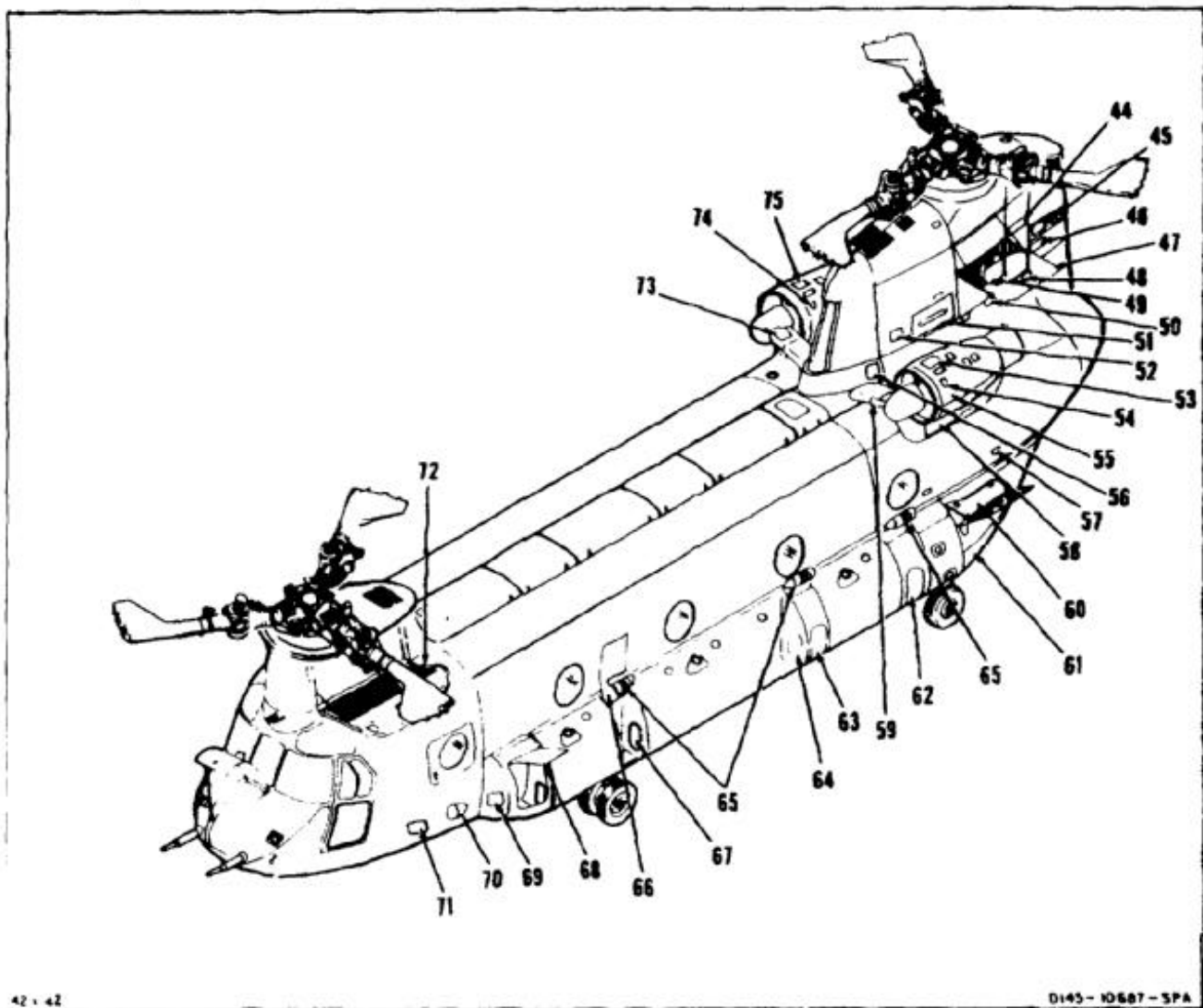
Area No. 1	Nose	External fuselage from sta. 120 RH to sta. 120 LH, excluding area No. 7, but including those internal areas visible or accessible from outside.
Area No. 2	Left Fuselage	External fuselage from sta. 120 LH aft to sta. 630.5, including bottom of fuselage, but excluding areas No. 6 and 7.
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, cowlings, fairings and engine driveshaft.
Area No. 5	No. 2 Engine	Right hand engine installation including transmission, cowlings, 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                  | 23. Fuel tank vent access panels                               |
| 2. Upper pylon access panel                           | 24. Forward landing gear access panel                          |
| 3. Pylon removal access panel                         | 25. Main tank forward fuel boost pump access panel             |
| 4. Aft transmission access cover                      | 26. Fuselage foldout steps                                     |
| 5. Work platform                                      | 27. Electrical compartment access door                         |
| 6. Generator access door                              | 28. Interphone jack access door                                |
| 7. Access cover                                       | 29. Nose compartment access door                               |
| 8. Hydraulic module inspection access cover           | 30. Work platform  |
| 9. Combining transmission access door                 | 31. Forward transmission fairing hydraulic module access door  |
| 10. Engine upper cover                                | 32. Forward transmission fairing hydraulic module access cover |
| 11. Lower access door                                 | 33. Maintenance crane installation access panel                |
| 12. Aft hydraulic service panel                       | 34. Cabin crown access tunnel cover                            |
| 13. Maintenance crane installation access panel       | 35. Tunnel access cover  |
| 14. Lower hinged access panel                         | 36. Tunnel access cover  |
| 15. Work platform                                     | 37. Tunnel access cover  |
| 16. Aft landing gear fairing                          | 38. Tunnel access cover  |
| 17. Aft landing gear access panel                     | 39. Aft crown tunnel access cover                              |
| 18. Aft interphone jack and ramp control access panel | 40. Pylon leading edge lower hinged fairing                    |
| 19. Aft pod access panel                              | 41. Upper hinged access panel                                  |
| 20. Fuselage foldout step                             | 42. Aft pylon leading edge hinged fairing                      |
| 21. Center pod access panel                           | 43. Aft pylon forward hinged crown fairing                     |
| 22. Main tank aft fuel boost pump access panel        |  |



Access Doors, Covers, and Panels (Sheet 1 of 2)

- |     |   |     |  |
|-----|---|-----|--|
| 44. | Access panel                              | 61. | Aft landing gear access panel                  |
| 45. | Radar warning antenna access door         | 62. | Aft pod access panel                           |
| 46. | Pylon removal access panel                | 63. | Center access panel                            |
| 47. | Work platform                             | 64. | Main tank aft fuel boost pump access panel     |
| 48. | Utility hydraulic pump access panel       | 65. | Fuel tank vent access panels                   |
| 49. | Aft transmission access panel             | 66. | Forward landing gear access panel              |
| 50. | Aft transmission oil filler access door   | 67. | Main tank forward fuel boost pump access panel |
| 51. | Access cover                              | 68. | Electrical compartment access door             |
| 52. | Hydraulic module inspection access cover  | 69. | External power receptacles access door         |
| 53. | Engine oil filler access door             | 70. | Hydraulic ground test access cover             |
| 54. | Engine oil quantity indicator access door | 71. | Antenna coupler access panel                   |
| 55. | Engine upper cover                        | 72. | Work platform                                  |
| 56. | Combining transmission access door        | 73. | Upper hinged access panel                      |
| 57. | APU emergency fluid shutoff access panel  | 74. | Engine oil quantity indicator access door      |
| 58. | Lower access door                         | 75. | Engine oil filler access door                  |
| 59. | Lower hinged access panel                 | 76. | Rescue hatch lower door                        |
| 60. | Work platform                             |     |  |



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.
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.

**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.



**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 <b>10 FLIGHT HOURS</b> . IF DURING TORQUE CHECK RETORQUING IS REQUIRED, THE TORQUE CHECK WILL BE REPEATED AFTER SUBSEQUENT FLIGHT, BUT NOT TO EXCEED <b>10 FLIGHT HOURS</b> .
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 DAMPNES 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.	
		NOTE 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.	
		NOTE 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.)
		<b>NOTE</b> IF AFTER COMPLETING THE <b>25, 50, AND 100 HOUR</b> 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).
		<b>NOTE</b> AFTER COMPLIANCE WITH MWO 1-1520-240-50-60, <b>50 HOUR</b> INSPECTION REQUIREMENTS IS CHANGED TO <b>200 HOURS</b> OR NEAREST PHASE.
19.	300 HOURS AND EVERY 100 HOURS THEREAFTER	PERFORM EDDY CURRENT INSPECTION OF HUB SPLINES OR FLUORESCENT PENETRANT INSPECT A <b>ONE INCH</b> WIDE ANNULAR STRIP AROUND THE SPLINE HOLE ON THE BOTTOM SURFACE OF THE HUB OF THE FOLLOWING ROTOR WING HEADS:  FORWARD HEAD 145R2003-1 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 <b>180°</b> AND REINSTALL THEM. INSPECT AND ROTATE SERVICEABLE VERTICAL PIN BEARING <b>180°</b> 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 <b>14 CONSECUTIVE CALENDAR DAYS</b> :	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:	<p>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).</p> <p>b. Lower cockpit enclosures for cracks.</p> <p>c. Landing searchlights and lower anticollision light for cracked lenses. Open drain plug in lower anticollision light. Check for trapped fluid. Close drain plug.</p> <p>d. Underside antennas and cargo hooks for damage and security.</p> <p>e. Forward and aft cargo hooks. Remove drain plugs from solenoid covers. Check for water inside cover.</p> <p>f. Ramp hinge cover for damage.</p> <p>g. Drain pitot static and AFCS yaw sensing systems.</p> <p>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.)</p> <p>i. Wheel bearings (removed) for condition. Clean and lubricate the wheel bearings not later than <b>3 days</b> after the initial water landing (Task 3-33).</p>

**1-92 INSPECTION (Continued)****1-92**

REF. NO.	AREA NO.	FREQUENCY	INSPECTION REQUIREMENTS
6.	ALL	WHEN SALT WATER LANDINGS HAVE BEEN PERFORMED AFTER THE LAST FLIGHT OF THE DAY:	<ul style="list-style-type: none"> <li>a. Perform conditional inspection No. 5.</li> <li>b. Wash aircraft (Task 1-76).</li> <li>c. Clean engines. Refer to TM 55-2840-254-23.</li> <li>d. Clean APU compressor. Refer to TM 55-2835-205-23.</li> </ul>
7.	1, 10	WHEN A LANDING IN MUD OR SWAMPY TERRAIN IS MADE OR DIFFICULT STARTING OR TORCHING OF THE CABIN HEATER OCCURS:	<ul style="list-style-type: none"> <li>Inspect and clean cabin heater drain line (Task 13-9).</li> </ul>
8.	ALL	WHEN THE AIRCRAFT IS STRUCK BY LIGHTNING:	<ul style="list-style-type: none"> <li>Perform lightning strike inspection (Task 2-5).</li> </ul>
9.	2, 3, 7	WHEN AN AIRCRAFT HAS BEEN WASHED OR SUBJECTED TO HEAVY RAIN:	<ul style="list-style-type: none"> <li>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).</li> <li>b. Open drain plug in lower anti-collision light. Check for fluid.</li> <li>c. Check synchronizing drive shafting for water. Clear water drains as required.</li> </ul>
10.	2, 3	WHEN A LANDING GEAR WHEEL ASSEMBLY HAS BEEN REMOVED:	<ul style="list-style-type: none"> <li>Remove, clean, inspect, and repack landing gear wheel bearings (TM 1-1500-204-23 and TM 55-1500-322-24).</li> </ul>
11.	2, 3	WHEN LANDING GEAR WHEELS HAVE BEEN SUBMERGED IN WATER OR MUD:	<ul style="list-style-type: none"> <li>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.)</li> <li>b. Wheel bearings (removed) for condition. Clean and lubricate the wheel bearings not later than <b>3 days</b> after the wheels were submerged (Task 3-33).</li> </ul>
12.	2, 3	WHEN FUEL VENTS OVERBOARD OR UNEVEN TANK DEPLETION RATE OCCURS FROM AN AUXILIARY FUEL TANK DURING NORMAL OPERATION:	<ul style="list-style-type: none"> <li>a. Determine if fuel boost pump is functional and is delivering at least <b>22 psi</b> pressure.</li> <li>b. Check for loose connections in affected fuel cell manifold.</li> <li>c. Perform pressure refueling precheck.</li> <li>d. Inspect tank outlet check valve (breakaway valve) is closed in affected tank.</li> </ul>

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 <b>2 inch</b> 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).

**1-92 INSPECTION (Continued)****1-92**

<b>REF. NO.</b>	<b>AREA NO.</b>	<b>FREQUENCY</b>	<b>INSPECTION REQUIREMENTS</b>
16.	2, 7	WHENEVER SKIS ARE INSTALLED:	<p>a. Daily — Axial shaft attaching points, trailing wheel and attaching points, and springs actuator attaching points for security.</p> <p>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).</p>
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 <b>2 QUARTS</b> 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:	<p>a. Compute to find if actual overspeed occurred (Task 4-7).</p> <p>b. If overspeed occurred, perform an overspeed inspection. Refer to TM 55-2840-254-23.</p>
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:	<p>a. Forward airframe support engine mount lugs (visually) for cracks, nicks, scratches, and elongated holes.</p> <p style="text-align: center;"><b>NOTE</b></p> <p>The inspections in paragraph b and paragraph c are required at engine removal only. Do not remove engines just to perform these inspections.</p> <p>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 <b>600 hours</b> of aircraft operation.)</p> <p>c. Inspect engine drag link IAW Task 4-41. (Not required if it has been performed in the last <b>600 hours</b> of aircraft operation.)</p>
24.1	4,5	WHEN A -714 SERIES ENGINE IS REMOVED FOR REPLACEMENT/OVERHAUL:	<p>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.</p>
24.2.	4, 5	ANYTIME AN ENGINE IS INSTALLED:	<p>a. On aircraft with T55-GA-714A engines only. Perform Aviation Vibration Analyzer (AVA) check IAW TM 1-2840-265-23 and AVA procedures.</p> <p>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.</p> <p>c. Retorque forward engine mount bolts after first flight. First flight not to exceed <b>4 flight hours</b>.</p>
25.	4, 5	WHEN THE ENGINE OIL FILTER BUTTON IS EXTENDED:	<p>Replace filter element and perform with Task 1-99, TM 55-2840-254-23-1.</p>
26.	4, 5	WHEN EMERGENCY POWER REACHES <b>30 MINUTES</b> CUMULATIVE TIME:	<p>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.</p> <p>b. Record cumulative engine emergency power minutes, time since last hot end inspection, and total engine operating hours on DA Form 2408-15.</p>
27.	4, 5, 10	WHEN THE ENGINE OR TIMER/EMERGENCY POWER PANEL IS REMOVED OR INSTALLED:	<p>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.</p> <p>b. Reset the black and white indicator flag using switch in nose compartment while helicopter is on ground.</p>

**1-92 INSPECTION (Continued)****1-92**

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 <b>2 PERCENT</b> 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 <b>30 INCH-POUNDS</b> 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 <sub>2</sub> IS APPLIED TO THE ENGINE:	<p>a. If CO<sub>2</sub> 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<sub>2</sub> for cracks.</p> <p>b. If CO<sub>2</sub> is applied into the tailpipe or other engine areas while the engine is hot or rotating, inspect the area subjected to CO<sub>2</sub> for cracks.</p>
38.	4, 5, 6, 7, 8	WHEN STEADY STATE TORQUE LIMITS HAVE BEEN EXCEEDED FOR <b>10 SECONDS</b> OR MORE:	<p>a. Replace any engine transmission if <b>150 percent</b> torque is exceeded on that transmission.</p>

**1-92 INSPECTION (Continued)****1-92**

REF. NO.	AREA NO.	FREQUENCY	INSPECTION REQUIREMENTS
			<p>b. Replace the combining transmission if <b>150 percent</b> torque is exceeded on either engine or <b>260 percent</b> total torque from both engines is exceeded.</p> <p>c. Inspect engine if <b>154 percent</b> torque is exceeded on that engine. Refer to TM 55-2840-254-23.</p> <p>d. Replace the forward and aft transmissions if <b>260 percent</b> total torque from both engines is exceeded.</p>
39.	4, 5, 6, 7, 8	WHEN TRANSIENT (NEVER EXCEED) TORQUE LIMITS HAVE BEEN EXCEEDED:	<p>a. Replace any engine transmission if <b>154 percent</b> torque is exceeded on that transmission.</p> <p>b. Replace the combining transmission if <b>154 percent</b> torque is exceeded on either engine.</p> <p>c. Inspect any engine if <b>154 percent</b> torque is exceeded on that engine. Refer to TM 55-2840-254-23.</p> <p>d. Replace the forward and aft transmissions if <b>300 percent</b> total torque from both engines is exceeded.</p>
40.	6	AT INSPECTION PHASE NEAREST <b>300 HOURS</b> OF AIRCRAFT OPERATION SINCE INITIAL OR SUBSEQUENT AFT PYLON INSTALLATION:	<p>Retorque bolts NAS628 and nuts in the aft pylon-to-airframe splice (backed off and retightened) to specified torque.</p>
41.	4, 5, 6, 7, 8, 10	WHEN THE TRANSMISSION OIL TEMPERATURE EXCEEDS <b>140°C</b> OR THE #1 OR #2 ENGINE XMSN HOT INDICATOR LIGHTS:	<p>a. Functionally check the affected oil temperature indicating system. Refer to TM 55-1520-240-T.</p> <p>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.)</p> <p>c. Determine the cause of overheating.</p>
42.	6, 7	WHEN ANY MAJOR HYDRAULIC SYSTEM MAINTENANCE ACTION HAS BEEN PERFORMED THAT REQUIRED A SIGNIFICANT REPLACEMENT OR EXCHANGE OF FLUID:	<p>Perform a hydraulic fluid contamination check (Task 7-8.1).</p>
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:	<p>Perform an oil system contamination inspection (Tasks 6-112, 6-140, 6-170, 6-198).</p>

**1-92 INSPECTION (Continued)****1-92**

REF. NO.	AREA NO.	FREQUENCY	INSPECTION REQUIREMENTS
44.	6, 7, 8, 10	WHEN A TRANSMISSION OR AFT ROTARY WING SHAFT IS INACTIVE FOR <b>30 DAYS</b> , OR TRANSMISSION OIL COOLER IS REPLACED OR INACTIVE FOR <b>30 DAYS</b> :	<p>a. Perform a <b>30 minute</b> ground run at normal rotor rpm.</p> <p>b. After ground run and prior to first flight, inspect applicable filter(s) for extended indicator buttons.</p> <p>c. After first flight, inspect applicable filter(s) for extended indicator buttons.</p>
44.1	6, 7, 8, 10	WHEN A TRANSMISSION OR AFT ROTARY WING SHAFT IS REPLACED (DOES NOT INCLUDE CONTROLLED EXCHANGE):	<p>a. Perform a <b>30 minute</b> ground run at normal rotor rpm.</p> <p>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).</p> <p>c. After first flight, inspect applicable filter(s) for extended indicator button.</p>
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:	<p>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).</p>
46.	6	WHEN AN AFT TRANSMISSION HAS BEEN REPLACED DUE TO METAL CONTAMINATION:	<p>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).</p>
47.	6, 7, 8, 10	WHEN THE TRANSMISSION FILTER BYPASS BUTTON IS EXTENDED:	<p>Replace filter element. Check in accordance with Tasks 6-108, 6-136, 6-166, and 6-194.</p>
48.	6, 7, 8, 10	WHEN AN ENGINE TRANSMISSION IS REMOVED:	<p>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).</p>
48.1.	6	PRIOR TO ENGINE TRANSMISSION BEING INSTALLED:	<p>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.</p>
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:	<p>a. If filter shows signs of being bypassed or if the filter warning indicator is extended, inspect inlet screen for contamination.</p> <p>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).</p>

**1-92 INSPECTION (Continued)****1-92**

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 <b>25 HOURS</b> 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:	<p>a. Inspect all six rotary wing blades as follows:</p> <ul style="list-style-type: none"> <li>(1) Blade leading edge for dents, buckles, tears, and unbonding.</li> <li>(2) Blade upper and lower surfaces for dents, delaminations, buckles, wrinkles, and tears.</li> <li>(3) Blade spar roots for distortion and delamination.</li> <li>(4) Blade trailing edges for cracks, delaminations, and distortion.</li> <li>(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.</li> <li>(6) Shock absorber attachment brackets and filament windings for cracks, delaminations, and distortion.</li> </ul> <p>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.</p> <p>c. If inspection of blades and shock absorbers reveals damage or if a sudden RPM reduction in the power train occurs, inspect the following:</p> <ul style="list-style-type: none"> <li>(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.</li> <li>(2) If there is no buckling, proceed to step (4).</li> <li>(3) If buckling is found and power train components have been removed, proceed to step (7).</li> <li>(4) Power train shafting, adapters, and plate assemblies for cracks and security of attachment.</li> <li>(5) Bearing housing shock mounts for freedom of fore-and-aft movement on support bushings, torn or unbonded rubber, and security.</li> <li>(6) Drive system for freedom of rotation.</li> <li>(7) Transmission and drive shafting supports for distortion, cracks, and security. Adjacent structure for damage.</li> </ul>

**1-92 INSPECTION (Continued)****1-92**

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 <b>115 PERCENT</b> :	<p>a. Replace the forward and aft rotary wing heads, including vertical hinge pins. Identify heads as overspeeding. Return to depot.</p> <p>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.</p>
55.1.	6, 7	WHEN ROTOR RPM EXCEEDS <b>111 PERCENT</b> , BUT DOES NOT EXCEED <b>115 PERCENT</b> 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 ASSEMBLIES:	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:	<p>a. Tang washer and lock-ring for proper installation and security (Task 5-9).</p> <p>b. Retaining nut for specific torque (Task 5-9.1).</p>
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:	<p>a. With forward actuator retracted, inspect forward rotor heal and droop stops for damage.</p> <p>b. With aft actuator retracted, replace the aft rotary wing driveshaft only if gross weight exceeds <b>40,000 pounds</b> (Tasks 6-56 or 6-57 and 6-62 or 6-63).</p>
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.

**1-92 INSPECTION (Continued)****1-92**

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:	<p>a. Droop stops, pitch links, rotor blades and rotary-wing howls for distortion and visible damage (Task 5-63.3).</p> <p>b. Damage to droop stops, pitch links, or rotary-wing head requires replacement of only the affected blades (Task 5-63.3).</p> <p>c. Identify the removed blades as having experienced excessive flapping.</p>
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 <b>3-micron</b> filter (Tasks 7-9 thru 7-15 or 7-315 thru 7-326).
65.	8	AFTER <b>50 HOURS</b> OF HELICOPTER OPERATION FOLLOWING APU INSTALLATION:	APU mounting bolts for specified torque ( <b>75-85 inch-pounds</b> ).
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 <b>6 hours</b> 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 <b>200 MILES</b> OF VOLCANIC ACTIVITY:  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:	<p>PRIOR TO INSTALLATION, INSPECT FORWARD TRANSMISSION MAIN LUBRICATION PUMP FOR THE FOLLOWING SERIAL NUMBERS:</p> <p>V534, V535, V539, V541, V545 V557, V561, V564, V566, V569, V574, V575, V577 THROUGH V581, AND V589 THROUGH V598.</p> <p>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.</p>
77.	4, 5	ANYTIME THE ENGINE AIR INLET SCREENS ARE REMOVED:	<p>CHECK BOND LINE OF THE SILICONE RUBBER PAD ON STRAP ASSEMBLIES 114P8079-2 AND -3 FOR LOOSENESS.</p>
78.	6, 10	PRIOR TO INSTALLATION OF A FORWARD OR AFT TRANSMISSION.	<p>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.</p>
79.	9	PRIOR TO USING THE WINCH FOR RESCUE OPERATIONS:	<p>PERFORM INSPECTION OF WINCH IAW TM 55-1520-240-23, TASK 14-2.</p>
80.	6, 7	PRIOR TO INSTALLATION OF A HORIZONTAL HINGE PIN ASSEMBLY:	<p>PERFORM VISUAL INSPECTION OF THE HORIZONTAL HINGE PIN TASK 5-45.</p>

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

## INITIAL SETUP

**Applicable Configurations:**

All

**Tools:**

As Required  
Thermometer -20 to +110° 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 **57°C (135°F)**, 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

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.



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**1-97      PREPARE HELICOPTER FOR FLYABLE STORAGE — GENERAL  
PROCEDURES    (Continued)**


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**1-97****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 **-40°F (-40°C)**. Remove battery from helicopter and store if temperature is below **-40°F (-40°C)**. (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).



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

## 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 55-1520-240-10).

**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 depressured 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, dampers, 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

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**1-100     INSPECT HELICOPTER AFTER SERVICING FROM FLYABLE STORAGE**

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**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

## 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).

**1-102 PREPARE HELICOPTER FOR SHORT TERM STORAGE (Continued)****1-102**

- 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).



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).



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 **-40°C (-40°F)** 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.

**1-102 PREPARE HELICOPTER FOR SHORT TERM STORAGE (Continued)****1-102**

- 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).

**1-102 PREPARE HELICOPTER FOR SHORT TERM STORAGE (Continued)****1-102**

- 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.



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.



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.



Deleted.

- s. Check that aft transmission is serviced with oil (E254) (Task 1-54).



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

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**1-105 INSPECT HELICOPTER BEFORE INTERMEDIATE STORAGE**

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**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.

**1-106 PREPARE HELICOPTER FOR INTERMEDIATE STORAGE (Continued)****1-106**

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.

**1-107 SERVICE HELICOPTER AFTER INTERMEDIATE STORAGE (Continued)****1-107****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.)
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 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****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.

**WARNING**

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.

**CAUTION**

To prevent damage to fuel cell, remove all sharp object from pockets. Remove shoes or wear covers over shoes.

**1-107 SERVICE HELICOPTER AFTER INTERMEDIATE STORAGE (Continued)****1-107**

- 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

**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.

## 1-109 AIRCRAFT INVENTORY MASTER GUIDE (Continued)

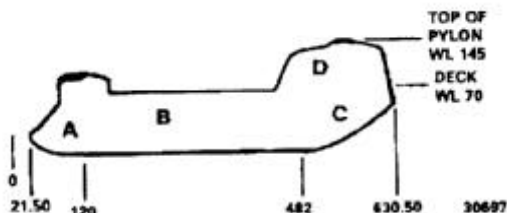
1-109

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	<b>NOTE</b> 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 <sub>3</sub> Br	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 <sub>3</sub> Br	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

## 1-109 AIRCRAFT INVENTORY MASTER GUIDE (Continued)

1-109

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 <sub>3</sub> Br	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

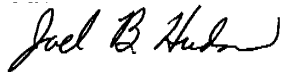


ITEM NOMENCLATURE	CH-47D				LOCATION OR REMARKS
	H	J	K	L	
Transmitter Remote Compass with Compensator CN-405( )/ASN	1				Romp Area Left Side sta 575
Troop Warning Signal					Left Side of Bulkhead sta 535
SECTION D — ENGINE AND AFT PYLON					
Fire Extinguisher System Bottles 114PS203-3	2				Overhead sta 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:



**JOEL B. HUDSON**

Administrative Assistant to the  
Secretary of the Army  
0220705

**ERIC K. SHINSEKI**  
General, United States Army  
Chief of Staff

**DISTRIBUTION:**

To be distributed in accordance with 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: "Whoever" <whoever@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.



<b>RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS</b> 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 <b>8/30/02</b>
TO: (Forward to proponent of publication or form)(Include ZIP Code) Commander, U.S. Army Aviation and Missile Command ATTN: AMSAM-MMC-MA-NP Redstone Arsenal, AL 35898						FROM: (Activity and location)(Include ZIP Code) MSG, Jane Q. Doe 1234 Any Street Nowhere Town, AL 34565	
<b>PART 1 - ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS</b>							
PUBLICATION/FORM NUMBER <b>TM 9-1005-433-24</b>						DATE <b>16 Sep 2002</b>	TITLE 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.	
<div style="transform: rotate(-45deg); font-size: 100px; opacity: 0.5;">EXAMPLE</div>							
* Reference to line numbers within the paragraph or subparagraph.							
TYPED NAME, GRADE OR TITLE <b>MSG, Jane Q. Doe, SFC</b>				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION <b>788-1234</b>		SIGNATURE	

<b>TO:</b> (Forward direct to addressee listed in publication) Commander, U.S. Army Aviation and Missile Command ATTN: AMSAM-MMC-MA-NP Redstone Arsenal, AL 35898				<b>FROM:</b> (Activity and location) (Include ZIP Code) MSG, Jane Q. Doe 1234 Any Street Nowhere Town, AL 34565				<b>DATE</b> 8/30/02	
<b>PART II - REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS</b>									
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	
<b>PART III - REMARKS</b> (Any general remarks, requests for corrections, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)									
<div style="text-align: center; font-size: 100px; transform: rotate(-45deg); opacity: 0.5;">           EXAMPLE         </div>									
TYPED NAME, GRADE OR TITLE MSG, Jane Q. Doe, SFC				TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION 788-1234			SIGNATURE		

<b>RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS</b> 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) Commander, U.S. Army Aviation and Missile Command ATTN: AMSAM-MMC-MA-NP Redstone Arsenal, AL 35898						FROM: (Activity and location)(Include ZIP Code)	
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## 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 decigrams = .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 milliliters = .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

<i>To change</i>	<i>To</i>	<i>Multiply by</i>	<i>To change</i>	<i>To</i>	<i>Multiply by</i>
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)

<b>F</b>	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	<b>C</b>
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