TM 55-1520-210-20

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

ORGANIZATIONAL MAINTENANCE MANUAL

ARMY MODEL UH-1D/H HELICOPTER

HEADQUARTERS, DEPARTMENT OF THE ARMY

MAY 1969

WARNING

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, death or an aborted mission.

Starting and operation of the helicopter will be performed only by authorized personnel in accordance with AR95-13.

The helicopter should be electrically grounded when parked. Turn off all power switches before making electrical connections or disconnections. Serious burns and electrical shock can result from contact with exposed electrical wires or connectors.

Before removing any engine ignition system component, ground the leads to dissipate any stored voltage in ingition unit.

The ignition unit contains a very small amount of radioactive material (Cesium-Barium 137) and normally requires no handling precautions. However, severely damaged units that have been broken open must be handled with forceps or gloves and disposed of in accordance with AR 755-380, Disposal of Supplies and Equipment.

Exposure to high concentrations of fire extinguishing agents can cause severe irritation of eyes and nose.

When working on or near an armed helicopter, take all possible precautions to avoid accidental firing of armament. Personnel shall not occupy possible firing pattern. Munitions shall be handled by authorized personnel only.

Cleaning solvents may be flamable and toxic. Use only in well ventilated areas. Avoid inhalation of vapor and skin contact. Do not use solvents near open flame or in areas where very high temperatures prevail.

Lubricating oil used in engine, transmission, and gear boxes may cause a skin rash if prolonged contact is permitted.

When handling fuel, observe precautions and procedures in TM 10-1101.

Battery electrolyte is a strong alkaline solution and is harmful to skin and clothing. Wear protective clothing that is used exclusively for servicing nickel-cadmium batteries. Use a 3 percent solution of boric acid to neutralize any spilled electrolyte. Flush contacted areas thoroughly with water.

TM 55-1520-210-20
C 3

CHANGE
No. 3

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., *7 July 1969*

Organizational Maintenance Manual

ARMY MODEL UH-1D/H HELICOPTER

TM 55-1520-210-20, 7 May 1969, is changed as follows:

1. Remove and insert pages as indicated below.

	Remove pages	Insert pages
Chapter 3, section IV	3-37 thru 3-40	3-37 thru 3-40

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

By Order of the Secretary of the Army:

W. C. WESTMORELAND
General, United States Army,
Chief of Staff.

Official:
KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31 (qty rqr block no.70) requirements for Organizational Maintenance Instructions for UH-1D aircraft.

SECTION IV OVERHAUL AND RETIREMENT SCHEDULE

3-9. SCOPE.

3-10. This section lists units of operating equipment that are to be overhauled or retired 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 TB AVN 23-10.

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.

Retirement Schedule. The operating time or calendar interval specified for removal, condemnation, and disposal of parts in accordance with applicable directives.

Note

Items replaced on a calendar basis (for the purpose of overhaul or retirement) will not be listed on DA Form 2408-16, Component Installation and Removal Record, but will be listed on DA Form 2408-18, Equipment Inspection List, for scheduling purposes.

OVERHAUL AND RETIREMENT SCHEDULE

Model UH-1D/H Helicopter

AREA	OVERHAUL INTERVAL (HOURS)	RETIREMENT INTERVAL (HOURS)	ITEM AND PART NUMBER	
4			**Main Rotor**	
		2500	Main Rotor Blade Assembly	204-011-250-5
	1100		Main Rotor Hub Assembly	204-012-101-3
	1100		Main Rotor Hub Assembly	204-012-101-5
		2200	*Inboard Strap Fitting	204-012-102-1
		2200	*Outboard Strap Fitting	204-012-103-1
		2200	*Strap Pin	204-012-104-1
		2200	*Retention Strap	204-012-112-5
4			**Transmission**	
	1100		Transmission Assembly	205-040-001-1, -5, -11, -17
	1100		Transmission Assembly	204-040-016-1, -3, -5
	50		Mast Assembly	204-040-366-5
		50	*Bearing	204-040-136-5
	1100		Mast Assembly	204-040-366-7
	1500		**** Mast Assembly	204-040-366-9
		1500	*Bearing	204-040-136-7

OVERHAUL AND RETIREMENT SCHEDULE (CONT)

Model UH-1D/H Helicopter

AREA	OVERHAUL INTERVAL (HOURS)	RETIREMENT INTERVAL (HOURS)	ITEM AND PART NUMBER	
5 & 6			**Tail Rotor and Drive System**	
		1100	Blade Assembly	204-011-702-15
		1100	**Hub Assembly, Tail Rotor	204-011-701-11, -13, -19, -29
		1100	*** Hub Assembly, Tail Rotor	204-011-801-5
		1100	Grip Assembly	204-011-706-9
		1100	Grip Assembly	204-011-728-1
		1100	Yoke Assembly	204-010-781-9
		1100	Yoke Assembly	204-011-722-1
	1500		Gear Box, Intermediate	204-040-003-13, -23, -37
	600		Gear Box, Tail Rotor	204-040-012-1
	1100		Gear Box, Tail Rotor	204-040-012-7, -13
4			**Main Rotor Mast Controls**	
	1100		Swashplate and Support Assy.	204-011-400-7, -9
		3300	*Support	204-011-404-5
		3300	Collective Lever	204-011-438-1
	1100		Scissors and Sleeve Assy.	204-011-401-7, -9
4		600	**Rotating Control System Bolts Listed Below: (See figure 3-3.)**	
			Pitch Horn to Pitch Link	(Index No. 4) NAS464-6-26 (Index No. 4) NAS1306-31D
			Pitch Link to Universal	(Index No. 3) NAS1306-27D
			Universal to Mixing Lever	(Index No. 2) NAS464-6-35 (Index No. 2) NAS1306-34D
			Mixing Lever to Tube	(Index No. 1) NAS464-5-27 (Index No. 1) NAS1305-27D

OVERHAUL AND RETIREMENT SCHEDULE (CONT)

Model UH-1D/H Helicopter

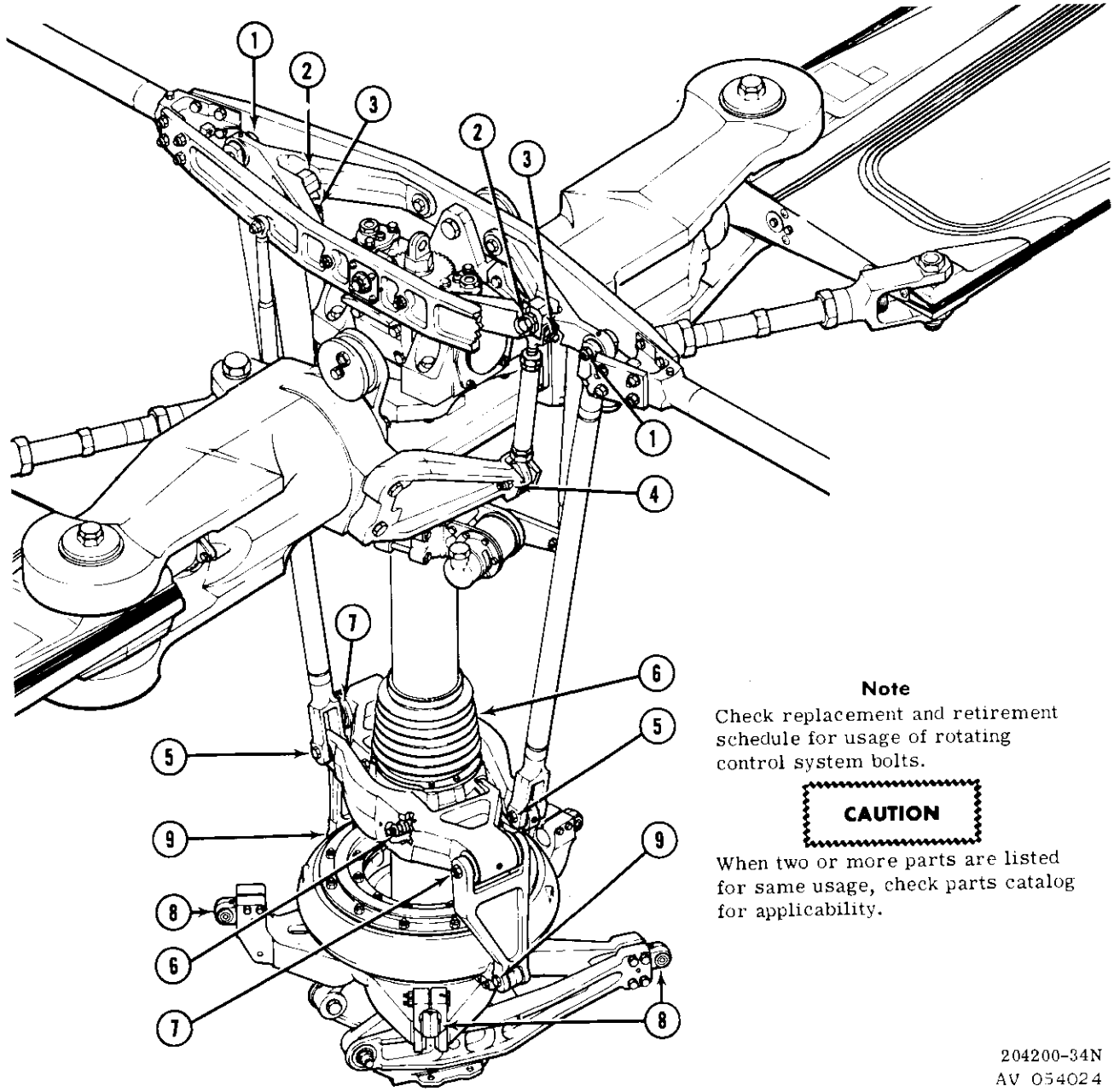
AREA	OVERHAUL INTERVAL (HOURS)	RETIREMENT INTERVAL (HOURS)	ITEM AND PART NUMBER	
			Tube to Scissors	(Index No. 5) NAS464-5-27 (Index No. 5) NAS1305-27D
			Scissors Pivot	(Index No. 6) NAS464-8-90
			Scissors to Drive Link	(Index No. 7) NAS464-8-69
			Drive Link to Swashplate	(Index No. 9) NAS464-5-30 (Index No. 9) NAS1305-30D
			Cyclic Tubes to Swashplate	(Index No. 8) AN175-16
			Collective Tubes to Lever	(Index No. 8) AN175-16
6			**Synchronized Elevator**	
		3000	Elevator Assembly	205-030-856-19, 21
		3000	Elevator Horn Assembly	205-001-914-1
		3000	Elevator Bolt	205-030-476-3
5			**Power Plant**	
	1200		Engine	T53-L-9, -9A, -11, -11B
	1800		Engine	T53-L-11C, -11D
	600		Engine	T53-L-13
	1200		Engine	T53-L-13/L -13A
	1200		Rotor Turbine	1-100-490-01
			1st Stage Gas	1-100-490-02
			Producer Wedged	1-100-490-03 1-100-490-04 1-100-490-06

*Parts will be retired by the maintenance level overhauling the assembled component.

**Bearing set P/N 204-010-704-1 need not be retired if inspection criteria called out in TM 55-1520-210-35, Chapter 8, Section III, is met and bearings are found serviceable.

*** The 801 Hub Yoke does not have to be inspected at every 100 flight hours of operation. The special 100 hour yoke inspection by magnetic partical or ultrasonic N. D. T. does not apply. The 100 hour Tail Rotor Assembly balance requirement does apply.

**** Mast Assemblies P/N 204-040-366-9, installed in transmissions which have not incorporated MWO 55-1529-211-20/21, will have an overhaul interval of "1100 hours."



Note

Check replacement and retirement schedule for usage of rotating control system bolts.

CAUTION

When two or more parts are listed for same usage, check parts catalog for applicability.

204200-34N
AV 054024

1. Bolt, NAS 464-5-27 or NAS 1305-27D
   Mixing Lever to Scissor Tube (2 Places)
2. Bolt, NAS 464-6-35 or NAS 1306-34D
   Universal to Mixing Lever (2 Places)
3. Bolt, NAS 1306-27D
   Pitch Link to Universal (2 Places)
4. Bolt, NAS 464-6-26 or NAS 1306-31D
   Pitch Horn to Pitch Link (2 Places)
5. Bolt, NAS 464-5-27 or NAS 1305-27D
   Scissor Tube to Scissors (2 Places)
6. Bolt, NAS 464-8-90
   Scissors Pivot (2 Places)
7. Bolt, NAS 464-8-69
   Scissors to Drive Link (2 Places)
8. Bolt, AN175-16 (2 Places)
   Cyclic Tubes to Swashplate (3 Places)
   Collective Tube to Collective Lever (1 Place)
9. Bolt, NAS 464-5-30 or NAS 1305-30D
   Drive Link to Swashplate (2 Places)

Figure 3-3. Mast control system bolts

CHANGE
No. 2

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., *13 June 1969*

Organizational Maintenance Manual

ARMY MODEL UH-1D/H HELICOPTER

TM 55-1520-210-20, 7 May 1969, is changed as follows:

1. Remove and insert pages as indicated below.

	Remove pages	Insert pages
Chapter 1, section II	1-19 thru 1-22	1-19 thru 1-22
Chapter 2, section I, II	2-1 and 2-2	2-1 and 2-2
Chapter 3, section IV	3-37 and 3-38	3-37 and 3-38
Chapter 8, section III	8-43 and 8-44	8-43 and 8-44
Chapter 14	14-27 and 14-28	14-27 and 14-28

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

By Order of the Secretary of the Army:

W. C. WESTMORELAND,
General, United States Army,
Chief of Staff.

Official:
KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31 (qty rqr block no. 70) requirements for Organizational Maintenance Instructions for UH-1D aircraft.

in fairing, but fairing must be removed for filling or access to magnetic plug.

Caution

Do NOT interchange filler caps between intermediate and tail rotor gear boxes, since this can cause intermediate gear box to be pumped dry.

1-85. SERVICING - HYDRAULIC RESERVOIR.

1-86. SERVICING - PRESSURIZED HYDRAULIC RESERVOIR. (Serial No. 60-6028 through 64-13901.) The pressurized hydraulic system reservoir (15, figure 1-8) has a graduated-plunger type fluid level indicator rod which can be checked through a window at the front of the pylon structural island in the cabin. Remove access door when necessary to service reservoir with hydraulic fluid (item 4, table 1-2). To fill reservoir with system inoperative, proceed as follows:

a. Press bleed valve on top of indicator rod to relieve any trapped pressure.

Caution

Do not press bleed valve on indicator rod when rotor is turning.

b. Remove filler cap.

Warning

To avoid contamination, do not use previously opened cans of hydraulic fluid. A new, sealed can of fluid must be opened and used.

c. Fill reservoir, keeping fluid level visible in neck by slowly pushing down on indicator rod.

Note

To avoid introducing air into system, fluid level must be kept visible while filling reservoir. If air is introduced, refer to bleeding instructions. (Refer to paragraph 6-26 or 6-27.)

d. Reinstall filler cap.

e. When system is next operated, bleed off any trapped air in reservoir by pressing valve on filler cap.

HYDRAULIC FLUID CAPACITY	U.S. PINTS
System	7.3
Reservoir	1.5
Reservoir Refill	1.0

1-87. DRAINING - PRESSURIZED HYDRAULIC RESERVOIR. (Serial No. 60-6028 through 64-13901.) Hydraulic system reservoir on UH-1D/H can be drained by removing a drain stud from bottom of reservoir piston. On YUH-1D, which has no drain stud, empty reservoir by removing filler cap and pushing piston up to force fluid out into drain scupper.

1-88. SERVICING - GRAVITY FEED HYDRAULIC RESERVOIR. (Serial No. 65-9565 and Subsequent.) Check sight gage of hydraulic reservoir through viewing hole provided on right side of transmission fairing. If fluid level shows in sight gage, reservoir servicing is required. Open transmission fairing for access. Remove cap and fill reservoir to overflow with hydraulic fluid (item 4, table 1-2). Reinstall filler cap. Close transmission fairing.

Warning

To avoid contamination, do not use previously opened cans of hydraulic fluid. A new, sealed can of fluid must be opened and used.

HYDRAULIC FLUID CAPACITY	U.S. PINTS
System	10.0
Reservoir	5.3
Reservoir Refill	2.5

1-89. DRAINING - GRAVITY FEED HYDRAULIC RESERVOIR. (Serial No. 65-9565 and Subsequent.) Drain reservoir by removing plug from port marked DRAIN on lower aft side of reservoir.

1-90. SERVICING - GROUND HANDLING GEAR PUMP.

1-91. Hold pump in an upright position, with oil hole and handle socket at top, and fill with hydraulic fluid (item 4, table 1-2) until fluid comes out filler hole. Check pump for leaks and proper operation. Refer to paragraph 4-295, for pump bleeding procedure.

1-92. SERVICING - GROUND HANDLING GEAR TIRES.

1-93. Each ground handling gear assembly has two 7.00-6, 6-ply rating, Type III aircraft tires to be inflated to 45 psig air pressure.

1-94. SERVICING - BATTERY.

1-95. The battery does not normally require frequent service. Consult maintenance instructions for further information. (Refer to paragraph 12-79.)

1-95A. SERVICING - SMOKE GENERATOR SUBSYSTEM TANK.

1-95B. Refer to paragraph 14-66.

1-96. CLEANING.

1-97. Clean aircraft and components in accordance with procedures contained in TM 55-405-3 unless otherwise specified. Special cleaning procedures will be covered in this manual under individual components.

1-98. PAINTING - TOUCH-UP.

1-99. (Refer to TB-746-93-2.) Special procedures for painting will be covered in this manual under individual component.

1-100. LIST OF CONSUMABLE MATERIALS.

1-101. Refer to Table 1-2.

1-102. TORQUE VALUES.

1-103. Standard torque values are not called out for individual maintenance procedures in this manual. The standard torque table (see Table 1-3) may be used to determine the correct standard torque. In those instances where special torque values are required, the special torque is called out in the assembly instructions for the parts which require the special torque.

1-104. Note 3, on table 1-3, emphasizes the fact that standard torque for a nut may vary depending on the type of bolt. For instance: a 5/16-24 NAS679 nut installed on any of the bolts listed in column 1, should be torqued 100 to 140 inch-pounds. A 5/16-24 NAS679 nut installed on any of the bolts listed in column 2, should be torqued 120 to 145 inch-pounds.

1-105. SPECIAL TOOLS AND EQUIPMENT.

1-106. Special tools and equipment provided for organizational maintenance will be found in TM 55-1520-210-20P.

1-107. RETRIEVAL OF DOWNED AIRCRAFT.

1-108. Retrieving downed aircraft is accomplished as outlined in figures 1-10 through 1-17. The information presented here is typical for all UH-1 helicopters.

TABLE 1-2. LIST OF CONSUMABLE MATERIALS

ITEM NO.	NOMENCLATURE	COLOR NO.	SPECIFICATION
	FUELS AND LUBRICANTS		
1.	Turbine fuel, Aviation, Grades JP-4 and JP-5		MIL-T-5624
2.	Lubricating Oil, Aircraft Turbine Engine, Synthetic base		MIL-L-7808
3.	Lubricating Oil, Aircraft Turbine Engine, Synthetic base		MIL-L-23699
4.	Hydraulic fluid, Petroleum base, Aircraft, Missile and Ordanance		MIL-H-5606
5.	Lubricating Oil, Jet engine (Grade 1010)		MIL-L-6081
6.	Graphite, Lubricating		MIL-G-6711
7.	Grease, Aircraft, Helicopter oscillating bearing		MIL-G-25537
8.	Lubricant, Drive shaft couplings (Tube pack)		204-040-755-3
9.	Corrosion preventive oil, Gas turbine engine, Aircraft, Synthetic base		MIL-C-8188
10.	Grease, Pneumatic system		MIL-G-4343
11.	Hydraulic fluid, Petroleum base, For preservation and testing		MIL-H-6083 (Type II)
12.	Lubricating oil, General purpose, Low Temperature		MIL-L-7870
13.	Petrolatum, Technical		VV-P-236
14.	Grease (Lubriplate)		FSCM 73219
15.	Shortening, Compound and lard		EE-S-321
16.	Castor oil, Technical		JJJ-C-86
17.	Plastilube, Moly No. 3		FSCM 02307
18.	Multi-Fax, EP-2		FSCM 59595
19.	Ease-off 990		FSCM 87889
20.	Molykote Anti-seize Thread Compound		FSCM 94499
	PAINTS, PRIMERS, THINNERS AND MARKING COMPOUNDS		
	NOTE: ALL COLOR NUMBERS TO BE IN ACCORDANCE WITH FED STD 595		
100.	Epoxy primer (Super Koropon)		FSCM 22873
101.	Prussian blue color, Thinned with oil		TT-P-691
102.	Enamel, Aluminum, Heat resistant	XA147	FSCM 77359
103.	Lacquer, Acrylic, Insignia red (Gloss)	11136	MIL-L-81352
104.	Lacquer, Acrylic, Insignia White (Gloss)	17875	MIL-L-81352
105.	Lacquer, Acrylic, Black (Gloss)	17038	MIL-L-81352
106.	Primer coating, Zinc chromate, Low moisture sensitivity		MIL-P-8585
107.	Epoxy, Engine gray A.D. (Components A & B) (P/N E2833)		FSCM 16193
108.	Varnish, Spar, Phenolic, Resin		TT-V-119
	ADHESIVES, CEMENTS AND SEALING COMPOUNDS		
200.	Putty, Zinc chromate, General purpose		MIL-P-8116
201.	Sealing, Locking and retaining compounds, Single component (Grade Q, Grade CV (4-10)		MIL-S-22473
202.	Anti-seize compound, High Temperature (Navy)		MIL-A-907
203.	Molybdenum disulfide, Technical, Lubrication grade		MIL-M-7866
204.	Sealing Compound, Temperature resistant, Integral Fuel tanks and fuel cell cavities, High adhesion		MIL-S-8802
205.	Metal-Set, A-4		MIL-A-8623
206.	Nuocure 28 Catalyst, Nudex Products Co., Heyden Chemical Corp., Elizabeth, N.J.		
207.	Sealing compound, Temperature resistant, Integral fuel tanks and fuel cell cavities, High adhesion		MIL-S-8802 (Type B-2)
208.	Filler, RP-1220		FSCM 02684
209.	Adhesive, 2216 (Scotch-weld)		FSCM 76381
210.	Adhesive, Heat resistant, Airframe structural, Metal to Metal		MMM-A-132
211.	Adhesive, Air-drying, Silicone rubber		MIL-A-25457

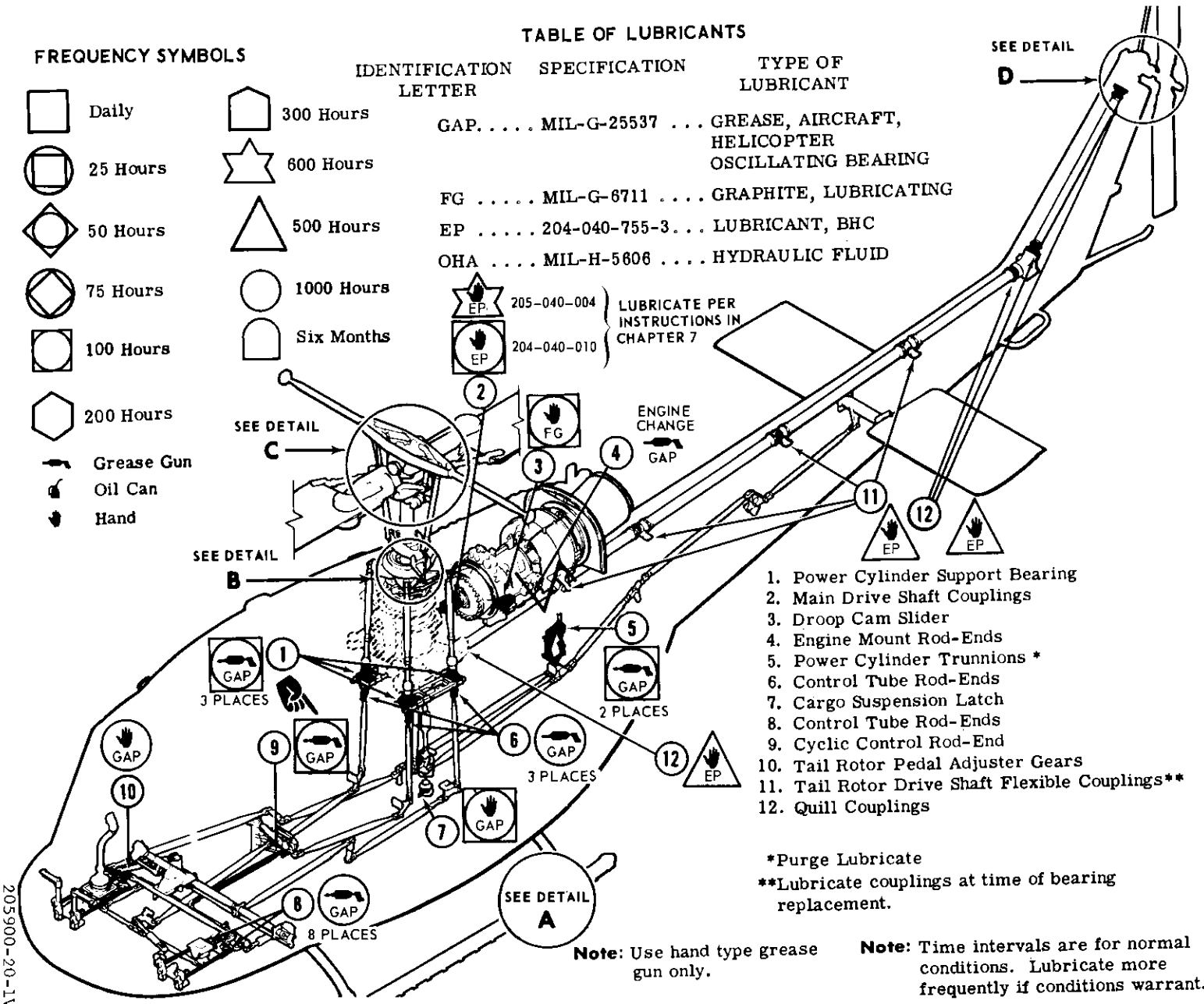


Figure 2-1. Lubrication chart (Sheet 1 of 3)

SECTION IV OVERHAUL AND RETIREMENT SCHEDULE

3-9. SCOPE.

3-10. This section lists units of operating equipment that are to be overhauled or retired 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 TB AVN 23-10.

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.

Retirement Schedule. The operating time or calendar interval specified for removal, condemnation, and disposal of parts in accordance with applicable directives.

Note

Items replaced on a calendar basis (for the purpose of overhaul or retirement) will not be listed on DA Form 2408-16, Component Installation and Removal Record, but will be listed on DA Form 2408-18, Equipment Inspection List, for scheduling purposes.

OVERHAUL AND RETIREMENT SCHEDULE

Model UH-1D/H Helicopter

AREA	OVERHAUL INTERVAL (HOURS)	RETIREMENT INTERVAL (HOURS)	ITEM AND PART NUMBER	
			Main Rotor	
4				
		2500	Main Rotor Blade Assembly	204-011-250-5
	1100		Main Rotor Hub Assembly	204-012-101-3
	1100		Main Rotor Hub Assembly	204-012-101-5
		2200	*Inboard Strap Fitting	204-012-102-1
		2200	*Outboard Strap Fitting	204-012-103-1
		2200	*Strap Pin	204-012-104-1
		2200	*Retention Strap	204-012-112-5
			Transmission	
4				
	1100		Transmission Assembly	205-040-001-1, -5, -11, -17
	1100		Transmission Assembly	204-040-016-1, -3, -5
	50		Mast Assembly	204-040-366-5
		50	*Bearing	204-040-136-5
	1500		Mast Assembly	204-040-366-7, -9
		1100	*Bearing	204-040-136-7

OVERHAUL AND RETIREMENT SCHEDULE (CONT)

Model UH-1D/H Helicopter

AREA	OVERHAUL INTERVAL (HOURS)	RETIREMENT INTERVAL (HOURS)	ITEM AND PART NUMBER	
5 & 6			**Tail Rotor and Drive System**	
		1100	Blade Assembly	204-011-702-15
		1100	**Hub Assembly, Tail Rotor	204-011-701-11, -13, -19, -29
		1100	*** Hub Assembly, Tail Rotor	204-011-801-5
		1100	Grip Assembly	204-011-706-9
		1100	Grip Assembly	204-011-728-1
		1100	Yoke Assembly	204-010-781-9
		1100	Yoke Assembly	204-011-722-1
	1500		Gear Box, Intermediate	204-040-003-13, -23, -37
	600		Gear Box, Tail Rotor	204-040-012-1
	1100		Gear Box, Tail Rotor	204-040-012-7, -13
4			**Main Rotor Mast Controls**	
	1100		Swashplate and Support Assy.	204-011-400-7, -9
		3300	*Support	204-011-404-5
		3300	Collective Lever	204-011-438-1
	1100		Scissors and Sleeve Assy.	204-011-401-7, -9
4		600	**Rotating Control System Bolts Listed Below: (See figure 3-3.)**	
			Pitch Horn to Pitch Link	(Index No. 4) NAS464-6-26 (Index No. 4) NAS1306-31D
			Pitch Link to Universal	(Index No. 3) NAS1306-27D
			Universal to Mixing Lever	(Index No. 2) NAS464-6-35 (Index No. 2) NAS1306-34D
			Mixing Lever to Tube	(Index No. 1) NAS464-5-27 (Index No. 1) NAS1305-27D

Some swaying or flapping action beamwise on tail rotor hub assembly, Part No. 204-011-701-13, (incorporating thrust unit) is allowable. Limits are from the neutral position 1/4 inch beamwise movement up and down, or one inch movement under a 5 pound load, measure at tip. (See figure 8-23.)

j. Check tail rotor for free flapping pitch change action. Check and adjust rigging as necessary. (Refer to paragraph 9-73.)

k. Check for 3.0 (±0.5) inch clearance between tail boom vertical fin and nearest trailing edge of tail rotor at full right pedal position in rigged condition. If necessary, change thickness of shim (12) installed between rotor hub trunnion and static stop for proper clearance. Use bonded laminated shims only.

l. Track tail rotor. (Refer to paragraph 8-79.)

Note

After five hours of operation retorque tail rotor retaining nut (10, figure 8-19). Retorque can be accomplished with slider and crosshead installed, using care that wrench does not contact adjacent parts.

8-84. TAIL ROTOR BLADES.

8-85. Refer to paragraph 8-77 for description.

8-86. CLEANING - TAIL ROTOR BLADES. Wash tail rotor blades with a solution of mild soap and water.

8-87. INSPECTION - TAIL ROTOR BLADES.

Note

Any repair or replacement of tail rotor blades will be performed by Direct Support maintenance level.

a. Nicks and scratches.

(1) Nicks and scratches on the surface of the blade that are 0.008 inch, or less, deep are repairable.

(2) Nicks and notches in the extreme trailing edge of the blade that are 0.050 inch, or less, deep are repairable.

b. Dents which are not in excess of 0.060 inch in depth are acceptable. In cases where a scratch or nick is present in a dent, the depth is measured to the bottom of the scratch or nick and must be repaired.

c. Any crack, in any location, on any blade is cause for blade replacement. Replace tail rotor hub and blade assembly.

d. Voids.

(1) Between the abrasive strip and the inner doubler, along blade centerline, a void with a maximum width of 0.250 inch is acceptable.

(2) At butt end, voids between skin and trailing edge, under doubler rear "fingers" are not acceptable.

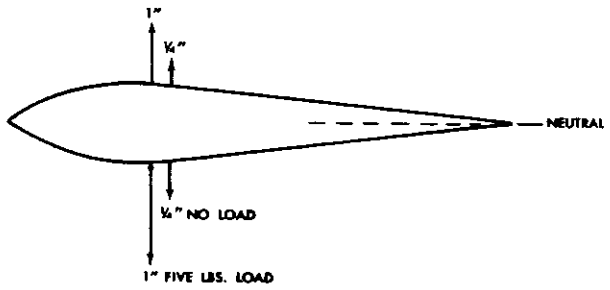
(3) At butt end, voids between skin and inner doubler, under front "fingers" are not acceptable.

(4) At blade tip, between skins and trailing edge, in the outboard 1.00 inch, voids are not acceptable.

(5) In the blade body between the ends of the blade, between the skin and the core, voids not larger than 0.200 inch wide chordwise, by 0.500 inch long spanwise, are acceptable, providing spacing between centers exceeds 2.00 inches.

(6) In the blade body between the ends of the blade, between the skin and the inner doubler, voids not larger than 0.500 inch wide chordwise, by 1.00 inch long are acceptable, providing spacing between centers exceeds 3.00 inches.

(7) In the blade body between the ends of the blade, between the core and the inner doubler, voids not larger than 0.500 inch chordwise, by 1.500 inch spanwise, are acceptable, providing spacing between centers exceeds 3.00 inches.



204011-143
AV 054161

Figure 8-23. Tail rotor hub and blade assembly limits

Note

Any edge void is not acceptable. Replace tail rotor hub and blade assembly.

e. Inspect the tail rotor blades for corrosion in accordance with the following limits:

(1) Skin corrosion areas inboard of station 25.0 not in excess of 0.010 inch in depth are permissable.

(2) Skin corrosion areas outboard of station 25.0 not in excess of 0.015 inch in depth are permissable.

(3) Corrosion areas in the abrasive strip not in ecess of 0.010 inch in depth are permissable.

(4) Corrosion areas in the trailing edge not in excess of 0.015 inch in depth are permissable.

f. Inspect retention bolts for tightness and security.

g. Looseness of either retention bolt hole bushing is cause for blade replacement.

h. If overspeed, sudden stoppage, hard landing or overtorque has occurred, inspect blades. (Refer to Chapter 3.)

i. Bond separation or cracks anywhere on blade is cause for blade replacement.

j. Movement of tip or root weights is cause for blade replacement.

k. Inspect all tail rotor blades, P/N 204-011-702-15, for chordwise cracks in tip cap. Cracks in tip cap are repairable.

l. If one blade of pair has been damaged badly enough that metal has been torn or any bond lines have separated, both blades must be replaced.

8-88. REPAIR OR REPLACEMENT - TAIL ROTOR BLADES.

a. Request assistance of Direct Support maintenance personnel for repair of repairable items, as shown in paragraph 8-87. If assistance is not immediately available, replace tail rotor hub and blade assembly.

b. Replace hub and blade assembly if any blade has voids in excess of limits shown in paragraph 8-87, step d.

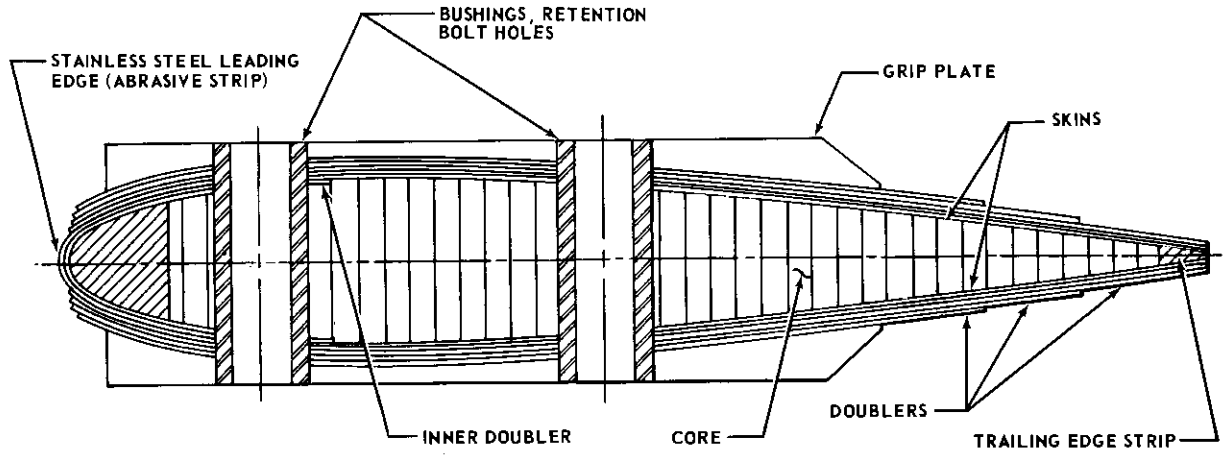


Figure 8-24. Root end view of tail rotor blade

(a) Install union (AN832-20D), with nut (AN-6289-20D) and packing (MS28778-20), in pump port.

(b) Install elbow (AN939-20D) with packing (MS28778-20) on union.

(c) Install coupling half (U6365) with packing (MS28778-20) in elbow.

(2) Install pump and motor under right end of seat, using four bolts (AN106614) and four washers (AN960C516). Do not tighten aft outboard bolt at this time.

(3) Position elbows as shown in figure 14-11 and tighten all pump fittings.

m. Install hose (U6357) (see figure 14-13) and wiring harness (U6443) as follows:

(1) Install connector on wiring harness (U6443) to connector in right side of bulkhead, FS 166.00.

(2) Route wires inboard and forward under two man seat, to pump motor.

(3) Connect wire number P111B4 to terminal on pump motor.

(4) Remove aft outboard pump mounting bolt and secure wire number P112B4 to pump base with pump mounting bolt.

(5) Install union (AN815-20D) in one end of hose (U6357).

(6) Install elbow (AN939-20D) with packing (MS28778-20) on union.

(7) Install coupling half (U6363) with packing (MS28778-20) in elbow.

(8) Install coupling half (U6363) in opposite end of hose.

(9) Connect end of hose with elbow installed in bottom (outlet) port of pump.

(10) Route hose inboard and aft to coupling in bulkhead, FS 166.00. Connect hose to coupling.

(11) Remove one screw from cabin floor aft of pump. Secure hose and wiring harness at screw hose (as shown).

(12) Remove one screw from near inboard end of row of screws approximately 10 inches forward of bulkhead, FS 166.00. Secure hose and wiring harness at screw hole (as shown).

(13) Secure hose and wiring harness approximately midway between aft connector and aft floor attach point (as shown).

(14) Secure hose and wiring harness approximately midway between the two floor attach points (as shown).

n. Install switch (U6374) as follows:

(1) Locate small electrical connector in cabin roof outboard and aft of right overhead console.

(2) Install connector on switch cord, on connector in roof.

(3) Stow switch in spring clip located in cabin roof approximately two inches aft of overhead console.

o. Complete pump inlet hose installation as follows (figure 14-11):

(1) Route hose (U6356) which extends up from center of floor forward of oil tank, outboard to the right along forward edge of tank, to pump. Connect coupling (U6363) on hose, to coupling (U6365) on upper (inlet) pump port.

(2) Secure hose to forward inboard seat leg and DEE ring in tank (as shown).

14-66. SERVICING - SMOKE GENERATOR SUBSYSTEM TANK.

a. Perform the following pre-flight procedures before servicing the tank:

(1) Inspect all supports and tighten if necessary.

(2) Inspect nozzle ring and nozzles for looseness or missing nozzles.

(3) Depress the tank level fog oil circuit breaker in the overhead panel and observe the oil level gage in the cockpit.

b. If the oil level gage indicates less than full, fill oil tank as follows:

Warning

Do not use any alternate fluids in the oil tank. The prescribed fog oil is Type SGF-2 (item 508, table 2-1).

(1) Disconnect the hoses from the inlet and outlet ports on the pump and motor assembly.

(2) Remove the quick disconnect fitting from the dip tube, insert strainer (Part No. U6697) into the flared end of the dip tube and replace the fitting on the tube.

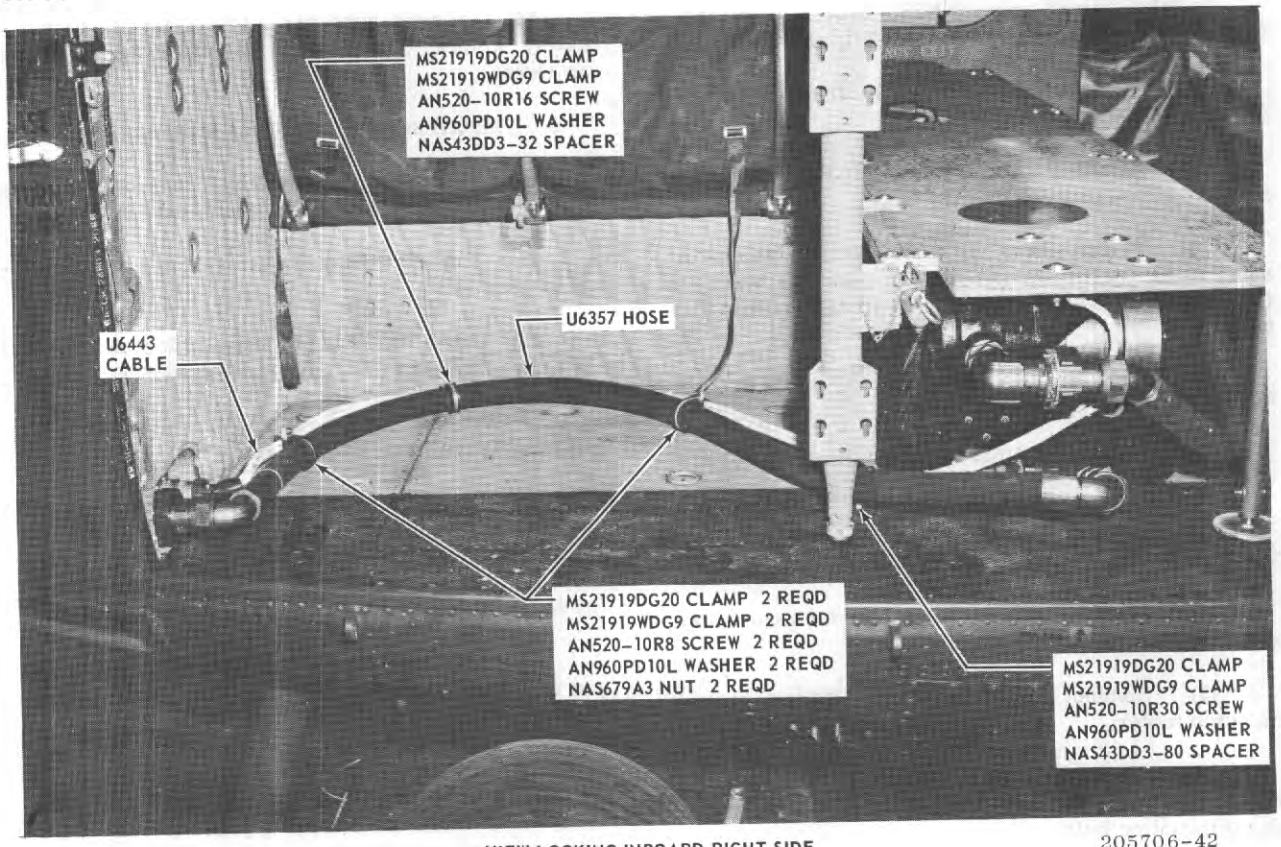


Figure 14-13. Hose and wiring assemblies

(3) Connect one end of the filling hose to the IN (inlet) port of the pump and motor assembly. Connect the other end of this hose to the dip tube, then insert the dip tube into the fog oil shipping drum.

(4) Connect the hose from the oil tank to the OUT (outlet) port of the pump and motor assembly.

Warning

Keep all personnel clear of vent located on the left underside of the helicopter during filling operation. If the oil tank is overfilled, excess fog oil will spill from the vent.

(5) Depress smoke gen pump cont circuit. Depress operating switch push button and observe oil level gage as pump and motor assembly operate. When gage indicates F (full), release push button.

Note

The oil tank holds approximately 50.0 gallons of fog oil.

(6) Open the circuit breakers.

(7) Disconnect filling hose from IN (inlet) port of pump and motor assembly and from fog oil shipping drum.

(8) Disconnect the hose from the OUT (outlet) port of the pump and motor assembly and connect it to the IN (inlet) port.

(9) Connect pump to bulkhead hose assembly to OUT (outlet) port of pump and motor assembly.

c. Perform the following post flight procedures:

(1) Open circuit breakers in overhead panel.

(2) Check oil tank and hose connections for leaks. A grazing 0.50 caliber or larger round may result in a non-self-sealing leak in the oil tank.

TM 55-1520-210-20
C 1

CHANGE
No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., *8 May 1969*

Organizational Maintenance Manual

ARMY MODEL UH-1D/H HELICOPTER

TM 55-1520-210-20, 7 May 1969, is changed as follows:

1. Remove and insert pages as indicated below.

	Remove pages	Insert pages
Chapter 3, section II	3-23 and 3-24	3-23 and 3-24
section IV	3-37 thru 3-40	3-37 thru 3-40

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

By Order of the Secretary of the Army:

W. C. WESTMORELAND,
General, United States Army,
Chief of Staff.

Official:
KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31 (qty rqr block no. 70) requirements for Organizational Maintenance Instructions for UH-1D aircraft.

AIRCRAFT INSPECTION CHECKSHEET	TYPE OF INSP (Daily, Intermediate, etc.) SPECIAL	PAGE NO. 20	NO. OF PAGES 20
AIRCRAFT AND SERIAL NO.	INSPECTION NO.	DATE OF INSPECTION	

AREA NO.	REQUIREMENT EVERY	ITEM	STATUS	RECORDED ON WORKSHEET
6		AFTER INSTALLATION OF TAIL ROTOR. Between five and ten hours of flight, after installation of tail rotor, retorque tail rotor retaining nut. (300 to 400 inch-pounds.)		
6		PRIOR AND AFTER INSTALLATION OF TAIL ROTOR HUB (P/N 204-011-801-5). Lubricate prior to initial installation and immediately after ground run (tracking).		
All Areas		WHEN AVAILABLE INFORMATION INDICATES EXPOSURE TO RADIOACTIVITY. Accomplish the following: (Refer to TM 3-220.) a. Survey helicopter for level of radioactivity. b. Decontaminate helicopter as required.		
All Areas		UPON TRANSFER AND UPON RECEIPT OF A HELICOPTER, UPON EXPIRATION OF TWELVE MONTHS ELAPSED TIME SINCE LAST INVENTORY, AND UPON PLACING HELICOPTER IN STORAGE AND UPON REMOVING FROM STORAGE HELICOPTER NEED NOT BE INVENTORIED WHILE IN STORAGE/INVENTORY HELICOPTER FOR AVAILABILITY OF INVENTORIABLE PROPERTY. REFERENCE TM 38-750.		
All Areas		AFTER INSTALLATION, REMOVAL OR RELOCATION OF EQUIPMENT AND/OR MAJOR MODIFICATION WHICH RESULTS IN AN UNKNOWN CHANGE IN THE BASIC WEIGHT AND BALANCE; AFTER REPORT OF UNSATISFACTORY FLIGHT CHARACTERISTICS. Weigh helicopter and accomplish necessary entries in the Weight and Balance Data (DD Forms 365). (Refer to AR95-16 and TM 55-405-9.)		

SECTION III TEST FLIGHT

3-7. DEFINITION AND GENERAL INFORMATION.

3-8. This section contains test flight inspection requirements peculiar to Army Model UH-1D/H aircraft. Conditions requiring accomplishment of test flight shall be in accordance with TB AVN 23-16 and changes thereto. The requirements herein are established to assure a thorough inspection of the aircraft before flight, during flight, and upon completion of test flight. When a test flight is performed for the purpose of determining if specific equipment or systems are in proper operating condition, requirements not related to such equipment or systems should be disregarded.

The test flight inspection checksheets are presented in a format for local reproduction. Continuation sheets shall be used when necessary for each part.

TEMPERATURE	SEA LEVEL	1000 FT.	2000 FT.	3000 FT.	4000 FT.	5000 FT.
50°F (10°C)	0.0	0.0	0.1	0.2	0.3	0.4
60°F (16°C)	0.0	0.1	0.2	0.3	0.4	0.5
70°F (21°C)	0.2	0.3	0.4	0.5	0.6	0.7
80°F (27°C)	0.4	0.5	0.6	0.7	0.8	0.9
90°F (32°C)	0.5	0.7	0.8	0.9	1.0	1.1
100°F (38°C)	0.7	0.8	0.9	1.0	1.1	1.2

NOTE: All time correction factors are given in seconds and must be added to time attained at standard day conditions

AV 054297

Figure 3-2. Acceleration time correction factors

SECTION IV OVERHAUL AND RETIREMENT SCHEDULE

3-9. SCOPE.

3-10. This section lists units of operating equipment that are to be overhauled or retired 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 TB AVN 23-10.

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.

Retirement Schedule. The operating time or calendar interval specified for removal, condemnation, and disposal of parts in accordance with applicable directives.

Note

Items replaced on a calendar basis (for the purpose of overhaul or retirement) will not be listed on DA Form 2408-16, Component Installation and Removal Record, but will be listed on DA Form 2408-18, Equipment Inspection List, for scheduling purposes.

OVERHAUL AND RETIREMENT SCHEDULE

Model UH-1D/H Helicopter

AREA	OVERHAUL INTERVAL (HOURS)	RETIREMENT INTERVAL (HOURS)	ITEM AND PART NUMBER	
4			**Main Rotor**	
		2500	Main Rotor Blade Assembly	204-011-250-5
	1100		Main Rotor Hub Assembly	204-012-101-3
	1100		Main Rotor Hub Assembly	204-012-101-5
		2500	*Inboard Strap Fitting	204-012-102-1
		2200	*Outboard Strap Fitting	204-012-103-1
		2200	*Strap Pin	204-012-104-1
		2200	*Retention Strap	204-012-112-5
4			**Transmission**	
	1100		Transmission Assembly	205-040-001-1, -5, -11, -17
	1100		Transmission Assembly	204-040-016-1, -3
	50		Mast Assembly	204-040-366-5
		50	*Bearing	204-040-136-5
	1100		Mast Assembly	204-040-366-7, -9
		1100	*Bearing	204-040-136-7

OVERHAUL AND RETIREMENT SCHEDULE (CONT)

Model UH-1D/H Helicopter

AREA	OVERHAUL INTERVAL (HOURS)	RETIREMENT INTERVAL (HOURS)	ITEM AND PART NUMBER	
5 & 6			**Tail Rotor and Drive System**	
		1100	Blade Assembly	204-011-702-15
		1100	**Hub Assembly, Tail Rotor	204-011-701-11, -13, -19, -29
		1100	*** Hub Assembly, Tail Rotor	204-011-801-5
		1100	Grip Assembly	204-011-706-9
		1100	Grip Assembly	204-011-728-1
		1100	Yoke Assembly	204-010-781-9
		1100	Yoke Assembly	204-011-722-1
	1500		Gear Box, Intermediate	204-040-003-13, -23, -37
	600		Gear Box, Tail Rotor	204-040-012-1
	1100		Gear Box, Tail Rotor	204-040-012-7, -13
4			**Main Rotor Mast Controls**	
	1100		Swashplate and Support Assy.	204-011-400-7, -9
		3300	*Support	204-011-404-5
		3300	Collective Lever	204-011-438-1
	1100		Scissors and Sleeve Assy.	204-011-401-7, -9
4		600	**Rotating Control System Bolts Listed Below: (See figure 3-3.)**	
			Pitch Horn to Pitch Link	(Index No. 4) NAS464-6-26 (Index No. 4) NAS1306-31D
			Pitch Link to Universal	(Index No. 3) NAS1306-27D
			Universal to Mixing Lever	(Index No. 2) NAS464-6-35 (Index No. 2) NAS1306-34D
			Mixing Lever to Tube	(Index No. 1) NAS464-5-27 (Index No. 1) NAS1305-27D

OVERHAUL AND RETIREMENT SCHEDULE (CONT)

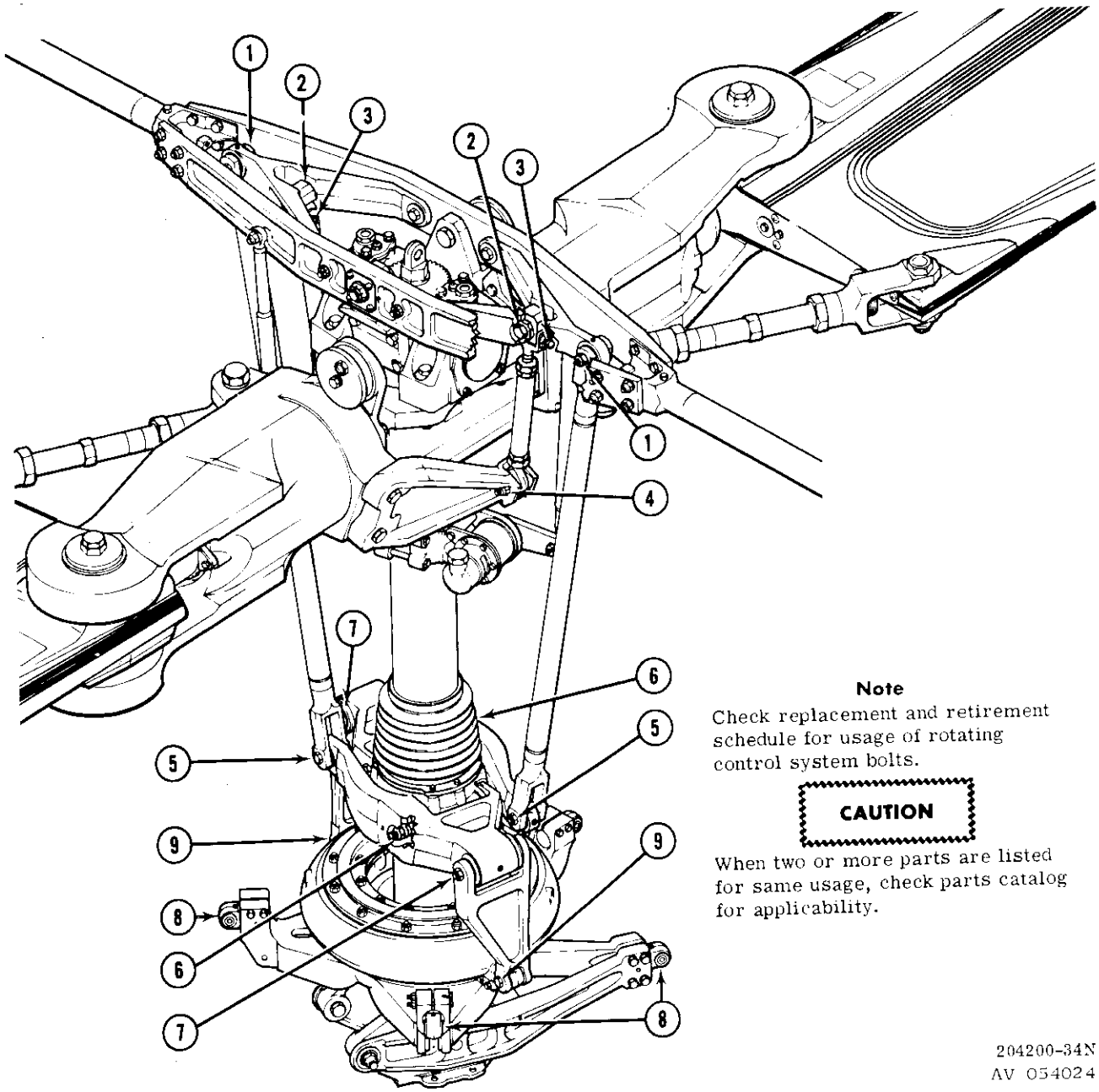
Model UH-1D/H Helicopter

AREA	OVERHAUL INTERVAL (HOURS)	RETIREMENT INTERVAL (HOURS)	ITEM AND PART NUMBER	
			Tube to Scissors	(Index No. 5) NAS464-5-27 (Index No. 5) NAS1305-27D
			Scissors Pivot	(Index No. 6) NAS464-8-90
			Scissors to Drive Link	(Index No. 7) NAS464-8-69
			Drive Link to Swashplate	(Index No. 9) NAS464-5-30 (Index No. 9) NAS1305-30D
			Cyclic Tubes to Swashplate	(Index No. 8) AN175-16
			Collective Tubes to Lever	(Index No. 8) AN175-16
6			**Synchronized Elevator**	
		3000	Elevator Assembly	205-030-856-19, 21
		3000	Elevator Horn Assembly	205-001-914-1
		3000	Elevator Bolt	205-030-476-3
5			**Power Plant**	
	1200		Engine	T53-L-9, -9A, -11, -11B
	1800		Engine	T53-L-11C, -11D
	600		Engine	T53-L-13
	1200		Engine	T53-L-13/L -13A
	1200		Rotor Turbine	1-100-490-01
			1st Stage Gas	1-100-490-02
			Producer Wedged	1-100-490-03 1-100-490-04 1-100-490-06

*Parts will be retired by the maintenance level overhauling the assembled component.

**Bearing set P/N 204-010-704-1 need not be retired if inspection criteria called out in TM 55-1520-210-35, Chapter 8, Section III, is met and bearings are found serviceable.

*** The 801 Hub Yoke does not have to be inspected at every 100 flight hours of operation. The special 100 hour yoke inspection by magnetic partical or ultrasonic N. D. T. does not apply. The 100 hour Tail Rotor Assembly balance requirement does apply.



Note

Check replacement and retirement schedule for usage of rotating control system bolts.

CAUTION

When two or more parts are listed for same usage, check parts catalog for applicability.

204200-34N
AV 054024

1. Bolt, NAS 464-5-27 or NAS 1305-27D
   Mixing Lever to Scissor Tube (2 Places)
2. Bolt, NAS 464-6-35 or NAS 1306-34D
   Universal to Mixing Lever (2 Places)
3. Bolt, NAS 1306-27D
   Pitch Link to Universal (2 Places)
4. Bolt, NAS 464-6-26 or NAS 1306-31D
   Pitch Horn to Pitch Link (2 Places)
5. Bolt, NAS 464-5-27 or NAS 1305-27D
   Scissor Tube to Scissors (2 Places)
6. Bolt, NAS 464-8-90
   Scissors Pivot (2 Places)
7. Bolt, NAS 464-8-69
   Scissors to Drive Link (2 Places)
8. Bolt, AN175-16 (2 Places)
   Cyclic Tubes to Swashplate (3 Places)
   Collective Tube to Collective Lever (1 Place)
9. Bolt, NAS 464-5-30 or NAS 1305-30D
   Drive Link to Swashplate (2 Places)

Figure 3-3. Mast control system bolts

*TM 55-1520-210-20

TECHNICAL MANUAL
No. 55-1520-210-20

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., *7 May 1969*

Organizational Maintenance Manual

ARMY MODEL UH-1D/H HELICOPTER

*This manual supersedes TM 55-1520-210-20, 21 October 1968, including all changes.

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

SECTION I - GENERAL INFORMATION

1-1. SCOPE.

1-2. This manual, issued expressly for organizational maintenance, is the official document for the Army Model YUH-1D, UH-1D and UH-1H helicopters, Serial No. 60-6028 through 60-6034, 62-2106 through 62-2113, 62-12351 through 62-12372, 63-8739 through 63-8859, 63-12956 through 63-13002, 64-13492 through 64-13901, 65-9565 through 65-9767, 65-9770 through 65-10113, 65-10117 through 65-10135, 65-12773 through 65-12776, 65-12847 through 65-12852, 65-12857 through 65-12895, 66-746 through 66-1210, 66-16000 through 66-17144, 66-8574 through 66-8577, 67-17145 through 67-17312, 67-17313 through 67-17859, 67-18411 through 67-18413, 67-18558 through 67-18577, 67-19483 through 67-19504, 67-19514 through 67-19537, 68-15214 through 68-15778 and 68-16050 through 68-16628. The purpose of this manual is to familiarize you with the maintenance functions to be performed at the organizational maintenance level. A Table of Contents for this manual is provided to assist in determining the chapter in the manual in which individual functions are covered. The study and use of this manual will enable a maintenance crew of limited experience to perform the assigned functions with maximum efficiency. This manual provides all essential information for personnel to accomplish Army organizational maintenance on the complete airframe, its components, and systems with functions and related functions of the same general scope and magnitude, as prescribed for organizational maintenance activities in the Maintenance Allocation Chart. (Refer to Appendix B.)

Note

When information applies to a specific helicopter, a code system has been used and is as follows:

D UH-1D equipped with either a T53-L-9, -9A or -11 series engine.

H UH-1H equipped with a T53-L-13 engine.

Note

Do not destroy any pages in this manual unless the data contained therein has been replaced, superseded, or included in the manual by a change or revision.

1-3. DEFINITIONS.

1-4. Notes, cautions, and warnings shall be used to emphasize important and critical instructions and shall be used for the following conditions:

Note

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

Caution

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

Warning

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

1-5. REPORTING OF IMPROVEMENTS.

1-6. Report of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to DA Publications) and forwarded direct to: Commanding General, U. S. Army Aviation Systems Command, ATTN: AMSAV-R-M, P.O. Box 209, St. Louis, Missouri, 63166.

1-7. SUMMARY OF MANUAL CONTENTS.

1-8. CHAPTER 1 - INTRODUCTION. This chapter presents the scope of the manual as well as a summary of the manual contents. It also contains a general description of the entire aircraft, ground handling methods and procedures, servicing instructions, consumable materials, and a list of special tools and equipment and instructions for the retrieval of downed aircraft.

1-9. CHAPTER 2 - LUBRICATION INSTRUCTIONS. This chapter covers the lubrication requirements of the aircraft by inclusion of lubrication instructions and applicable lubrication charts.

1-10. CHAPTER 3 - INSPECTION REQUIREMENTS. This chapter contains complete requirements for special inspections, test flight, overhaul and retirement schedule, and standards of serviceability applicable to the aircraft.

1-11. CHAPTER 4 - AIRCRAFT AND ALIGHTING GEAR. The function of this chapter is to provide all the essential information for maintenance personnel to accomplish organizational maintenance on the complete airframe and alighting gear.

1-12. CHAPTER 5 - POWER PLANT AND RELATED SYSTEMS. The purpose of this chapter is to provide information as a basis for performing maintenance on complete power plant and its related systems.

1-13. CHAPTER 6 - HYDRAULIC AND PNEUMATIC SYSTEMS. This chapter covers each major component of the hydraulic system.

1-14. CHAPTER 7 - POWER TRAIN SYSTEM. This information includes a detailed description of mast, transmission, clutches, drive shafts and tail rotor gear boxes.

1-15. CHAPTER 8 - MAIN AND TAIL ROTOR GROUP. This chapter contains instruction for maintenance of the main and tail rotor hub and blades, and main rotor system.

1-16. CHAPTER 9 - FLIGHT CONTROLS. This chapter covers all moveable and fixed flight control systems.

1-17. CHAPTER 10 - INSTRUMENTS. The purpose of this chapter is to provide maintenance information on flight instruments, navigation instruments, engine and miscellaneous instruments.

1-18. CHAPTER 11 - UTILITY SYSTEMS. Information in this chapter covers the heating and ventilating system.

1-19. CHAPTER 12 - ELECTRICAL SYSTEM. The purpose of this chapter is to provide essential information for maintenance personnel to accomplish maintenance on complete electrical system.

1-20. CHAPTER 13 - WIRING DIAGRAMS. This chapter includes all power load charts and wiring diagrams.

1-21. CHAPTER 14 - AVIONICS, PHOTOGRAPHY AND ARMAMENT. Avionics and photography are not applicable. This chapter provides maintenance instructions for the armament systems.

1-22. CHAPTER 15 - EXTERNAL STORES NON-ARMAMENT. This chapter provides maintenance instructions for all external stores.

1-23. CHAPTER 16 - STORAGE OF AIRCRAFT. This chapter contains a comprehensive procedure for preparing aircraft for flyable, temporary, and limited storage of components, outlining methods and equipment necessary for proper preservation.

1-24. APPENDIX A - REFERENCES. Consists of a list of official publications applicable to organizational maintenance.

1-25. APPENDIX B - MAINTENANCE ALLOCATION CHART. Reflects the maintenance functions to be performed at each echelon.

1-26. APPENDIX C - AIRCRAFT INVENTORY MASTER GUIDE. Provides standard inventory procedures and furnishes the using activities with a master guide to determine the items that are to be inventoried of installed and loose equipment authorized and required by the specific aircraft in performance of its mission.

1-27. APPENDIX D - WEIGHT AND BALANCE. Forms required in the performance of the prescribed maintenance operation of the aircraft, are contained in the aircraft logbook. Assignment of responsibilities and instructions for preparation, and use of logbook forms are outlined in the TM 38-750 (Army Equipment Record Procedures) and TM 55-405-9 (Army Aviation Maintenance Engineering Manual, Weight and Balance).

1-28. APPENDIX E - ILLUSTRATED FIELD MANUFACTURE ITEMS LIST. This appendix includes complete instructions, including bills of material, for field manufacture of all items listed in TM 55-1520-210-35P, Direct Support, General Support, and Depot Maintenance Repair Parts and Special Tool Lists, bearing MF, MH, or MD source code. The part number index lists all items in part number order with a cross-reference to the figure in which the item appears. All materials necessary for manufacture of an item are listed by Federal Stock number, in the bill of material for the item.

1-29. SYSTEMS DESCRIPTION AND DIAGRAMS. This information can be found in procedural paragraph(s) requiring their use or in TM 55-1520-210-10.

1-30. GROUND SUPPORT EQUIPMENT. Ground support equipment required for organizational maintenance is described and illustrated in Section II of this chapter.

1-31. MAINTENANCE DATA. Servicing information and a table of consumable materials used for servicing, lubrication, and other maintenance procedures are contained in Section II of this chapter. A lubrication chart is provided in Chapter 2 Section II.

1-32. EXTERNAL POWER REQUIREMENTS. External power requirements of 650 to 800 amperes, 28.5 volts will be supplied by a suitable auxiliary power unit. A suitable hydraulic test unit, capable of a relief valve setting of 1300 psi, a pressure compensator setting of 1300 psi, and a volume output of 6 gpm, shall be used in testing the hydraulic system.

1-33. ELECTRICAL LOAD DATA.

a. Refer to Chapter 13 for DC and AC electrical load analysis.

b. The DC Electrical Load Analysis Chart is used in determining the generator load demand during flight operation conditions. The amount of power consumed by each electrical unit is shown in addition to the total average amperes for each phase of flight. The EMERGENCY column is for consideration when using the starter-generator 30-volt, 200-ampere system for emergency power.

c. The AC Electrical Load Analysis Chart shows the electrical requirements of the AC units installed. The total load in volt-amperes and the power factor leading or lagging is also shown. Refer to this chart when additional electrical units are installed to determine power availability.

1-34. JET FUEL LIMITATIONS. Jet fuel (item 1, table 1-2) Grade JP-4, is intended for use in jet aircraft under all operating conditions. Experience to date indicates that no undue difficulties will be encountered in starting and operating the helicopter's turbine engine at low temperatures on Grade JP-4. Grade JP-5 fuel may be used as an alternate in the T53-L-11 series/-13 (and T53-L-9A with scoopless combustor) engine. In event low temperature starting difficulties are encountered using JP-5 fuel, refer to cold weather operation procedures in TM 55-1520-210-10.

1-35. HEATER - COMBUSTION. Fuel filter and drain lines should be checked daily for accumulations of ice or water. During low temperature operation below 32°F water vapor in the combustion gases flowing through the drain line may condense and form ice. Water produced during combustion may collect on the fuel nozzles and igniter plug and form ice after the heater has been turned off. This ice may preclude starting the heater without preheating.

1-36. SYNTHETIC BASE OIL. This oil (item 2 or 3, table 1-2) is to be used in preference to petroleum based oil because of its superior temperature characteristics. In addition to a synthetic chemical base, this oil contains oxidation inhibitors and antiwear additives. This oil may cause swelling of O-ring seals that are designed for use in petroleum based oils.

Caution

Synthetic oils, such as MIL-L-7808 and MIL-L-23699, may soften paint or stain clothing upon contact. If synthetic oil is spilled on painted surfaces, those surfaces should be cleaned immediately. Skin should be thoroughly washed after contact and saturated clothing should be removed immediately. Prolonged skin contact with synthetic oil may cause a skin rash. Areas where synthetic oils are used should have adequate ventilation to keep mist and fumes to a minimum.

1-37. DUSTY CONDITIONS. More frequent oil changes are recommended for helicopters operating under unusually dusty conditions. The frequency of oil changes will depend upon the severity of the dust conditions. Failure to change oil more frequently in high dust areas can result in accelerated engine wear.

1-38. CONTAMINATION OF OIL. This oil (item 2 or 3, table 1-2) is a synthetic turbine engine lubricant, and is extremely susceptible to contamination by water. In addition this oil has a limited storage life and must be tested periodically. Due to the susceptibility of this oil to contamination, it is purchased, stored and handled in hermetically sealed containers. These containers, once opened, must be emptied immediately, and must not be retained in opened condition for future use.

1-39. TIRES AND TUBES. Tires and tubes should be stored under normal temperature conditions if at all possible. If it becomes necessary to store tubes at subnormal temperatures, partially inflate them in order to remove creases and folds. Tires and tubes should be warmed before mounting so that normal handling will not flex them to the point of cracking.

1-40. When not actually in use ground handling wheels should be removed from the helicopter and placed in warm storage. If tires should become frozen to the ground, they can be released by heat application or by overinflation. Under no circumstances should the applied heat exceed a temperature of 160°F. The proper procedure should be determined by considering the individual problem. If the tires are to be released by overinflation, the tires may be inflated to one and one-half times normal pressure, provided the following precautions are observed:

a. Careful inspection should be made before inflation for evidence of wheel cracks or breaks in the tires.

b. In order to prevent injury to personnel in case of wheel rim failure, all persons should stand in line with the tire, rather than broadside of the wheel, during inflation.

c. Heat must not be applied to overinflated tires because of its action in further increasing tire pressure.

d. Tire pressure must be reduced to normal immediately after the tires are freed.

Note

When tires are overinflated, as described above immediate action cannot be expected. One-half to one hour may be required before tires are free because of the slow action of the frozen casings in responding to the increased tire pressure.

1-41. MAINTENANCE FORMS. Maintenance forms required in the performance of the prescribed maintenance operation of the aircraft are contained in the aircraft log book. Refer to TM 38-750 and TM 55-405-9.

SECTION II - AIRCRAFT GENERAL

1-42. DESCRIPTION.

1-43. Army helicopter models YUH-1D, UH-1D and UH-1H are single-engine utility types which feature low silhouettes. (See figure 1-1.) Principal dimensions and detailed description will be found in TM 55-1520-210-10.

1-44. Forward fuselage section consists primarily of two longitudinal beams with transverse bulkheads and metal covering. The beams provide supporting structure for cabin, landing gear, fuel cells, transmission, engine, and tail boom. Work platforms are provided around engine and transmission and on top of cabin to afford maintenance personnel easy access to engine and transmission.

1-45. Avionics equipment and electronic equipment are located in left rear compartments and/or nose compartment. The battery is located in the nose or alternate location in the aft fuselage compartment. An external cargo suspension assembly is attached to forward fuselage at a single point, at approximate center of gravity of helicopter, and extends through an opening below transmission.

1-46. Main rotor is a two-blade semi-rigid type employing preconing and underslinging. Tail rotor is a two-blade assembly, delta-mounted for automatic pitch compensation of differential air flow over blades. Main and tail rotor blades are of all-metal construction with honeycomb core.

1-47. Power train consists of a free-turbine power plant, transmission assembly, mast and drive shafts, and two tail rotor gear boxes. Engine assembly is equipped with quick-disconnect couplings to facilitate replacement of individual assemblies or complete engine. Engine and transmission are enclosed by cowling. Tail rotor drive shafts are located along top of tail boom and fin.

1-48. Landing gear is skid type, attached to forward fuselage at four points. Two sets of detachable handling wheels, with hand-operated hydraulic jacks incorporated, are provided for use on ground. Support tubes are provided which allow handling wheels to be left in place during flight as an optional practice.

1-49. Tail boom is a semi-monocoque structure with metal covering, attached to forward section by four bolts. Tail rotor, gear boxes, drive shafts, and synchronized elevator are supported on tail boom. A tail skid is provided on lower aft end to protect tail rotor.

1-50. GROUND HANDLING.

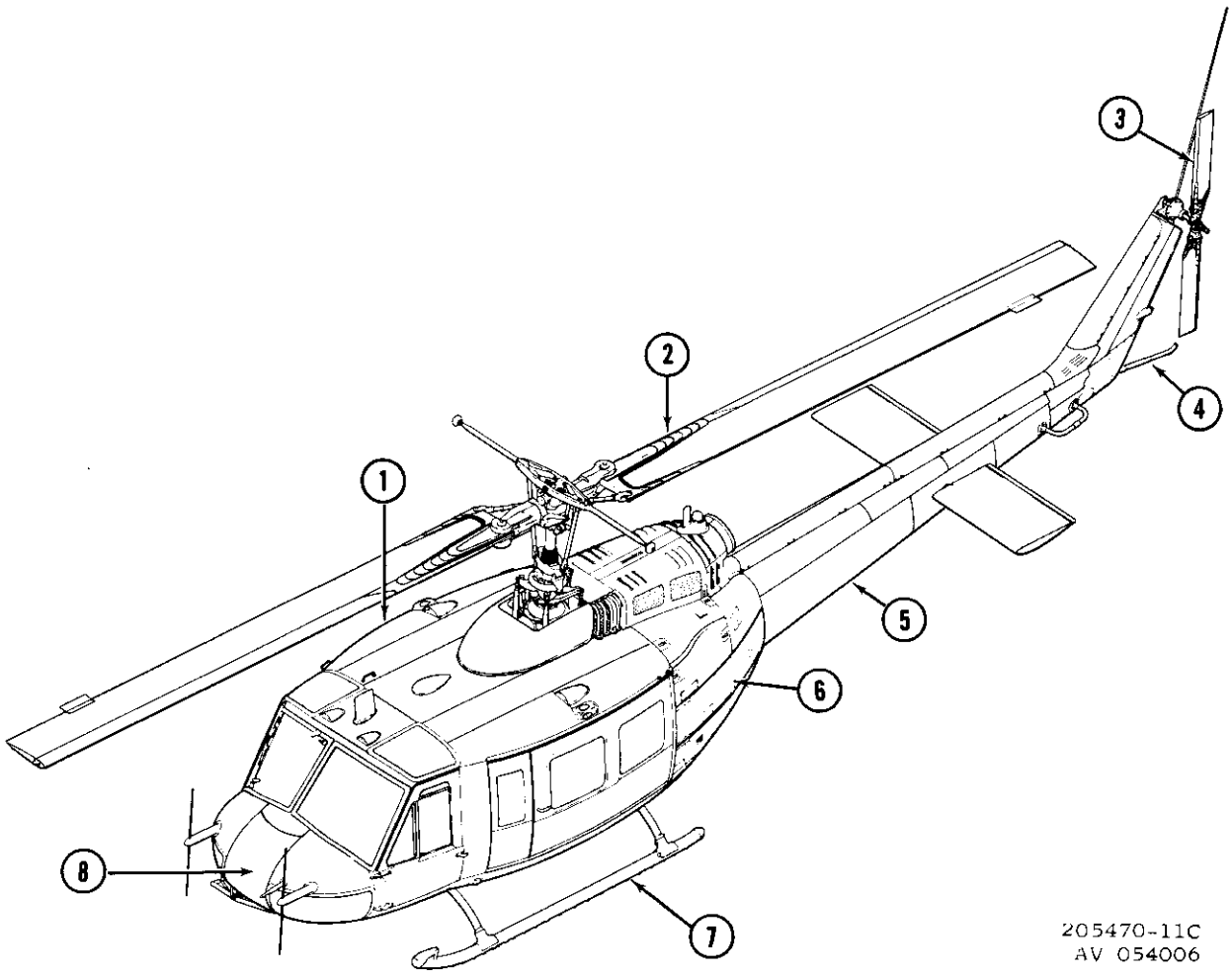
1-51. DESCRIPTION.

1-52. The following paragraphs contain information necessary for hoisting, jacking, mooring, parking, towing, the application of external power, leveling and the attaching of all weather covers.

The following special tool required to hoist helicopter components is listed in Table 1-1.

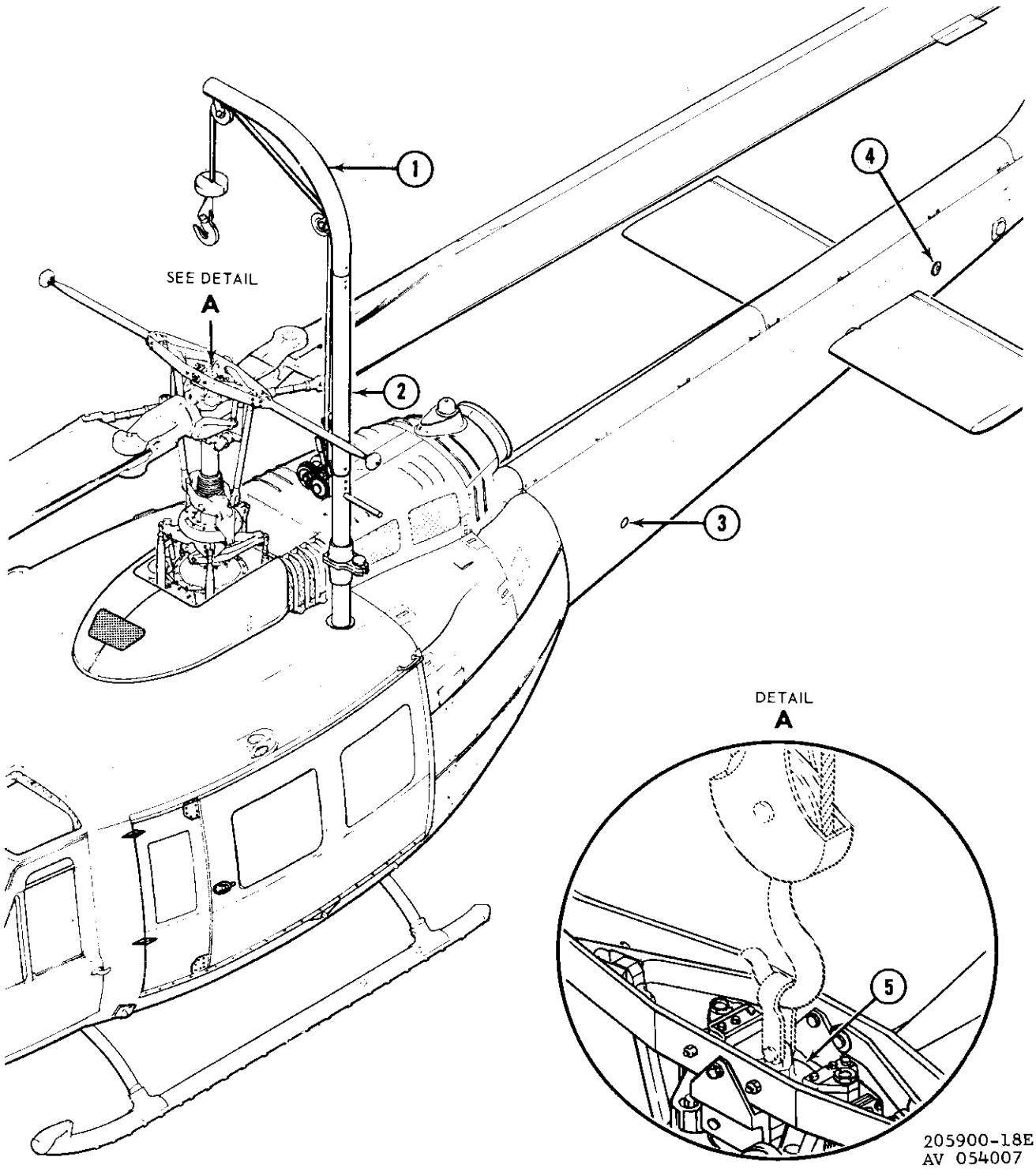
TABLE 1-1. SPECIAL TOOLS

PART NUMBER	NOMENCLATURE
T101452	Maintenance Hoist Assembly



1. Forward Fuselage Section
2. Main Rotor
3. Tail Rotor
4. Tail Skid
5. Tail Boom
6. Radio and Electrical Compartments
7. Landing Gear
8. Radio and Battery Compartment

Figure 1-1. UH-1D helicopter



1. Maintenance Hoist
2. Removable Section
3. Tail Boom Lift Point
4. Stowed Handling Tubes
5. Mast Nut

Figure 1-2. Hoisting diagram

1-53. HOISTING.

a. Hoist the helicopter as follows:

(1) Attach a hoisting clevis or cable to eye provided on retaining nut at top of main rotor mast. (See figure 1-2, Detail A.) Connect a suitable hoist and take up slack.

(2) Station a man at tail skid to steady helicopter when hoisted. If lifting beyond reach from ground, two men and two steadying ropes will be necessary.

(3) Hoist slowly with a steady lifting force.

(4) If transmission has been removed, attach hoist at pylon lift-link and apply same procedure to lift helicopter. (See figure 1-2.)

b. For hoisting or handling tail boom as a separate component, aft end is provided with stowed handling tubes (4, figure 1-2) which can be pulled out into position at each side. Near forward end of boom, a snap plug can be removed at each side to allow insertion of a one-inch diameter pipe or rod through boom structure at reinforced lift point (3).

c. To hoist engine, main rotor, or mast and transmission assemblies from the helicopter, use T101452, maintenance hoist as follows:

Note

The maintenance hoist T101452 is provided to be mounted on airframe for field use to lift engine, main rotor, or mast and transmission assemblies. Maximum operating load of this hoist is 800 pounds. Hoist consists of a support tube equipped with a hand-operated winch, cable, and hook. (See figures 1-2 and 1-3.) Support tube has a hinged joint to fold for storage, a 48-inch section which can be removed to reduce height when required, and a selection of attachment holes for upper pulley to allow centering over unit being removed or installed. Mounting allows hoist to be rotated, with load, to reach over engine and pylon area or outboard from left side of helicopter.

(1) Remove cover at rear left side on cabin roof. Remove soundproofing blanket section in cabin, and plug button in floor fitting directly below.

(2) Lift hoist to position and insert lower support tube down through roof and engage pin at lower end in support fitting in cabin floor. In this procedure, hoist tube can be partially folded at hinge joint, and a man on ground or roof walkway can handle upper support tube in such manner as to assist a man on engine service deck or roof who is lowering hoist into place.

Note

Install hoist with hinge pin outboard and latch bolt and knob inboard. (See figure 1-3.)

(3) Raise upper end of hoist to normal position and secure latchbolt on hinge joint.

(4) Turn hoist to center its hook over component to be lifted. If necessary, change position of upper pulley to another attachment hole of support tube.

Note

Particular attention should be paid to the maintenance hoist, to ascertain that it is assembled correctly. Correct assembly should have the hinge halves of the mating casting, P/N 205-070-929-1, P/N 205-070-929-3 and hinge bolt, P/N AN6-60A on outboard side from closed curve of upper tube (205-782-943) and the latch bolt, P/N 205-070-932-1 and knob, P/N 205-070-933-1 on inboard side. (See figure 1-3.)

1-54. JACKING.

a. Place jacks under two forward jack pad fittings (1, figure 1-4) located just ahead of landing gear forward cross-tube at each side, and under two aft jack pads (3) on fuselage behind landing gear.

Note

YUH-1D has only one rear jack pad, located near center line of fuselage.

b. Raise helicopter evenly. Observe following precautions while helicopter is supported on jacks:

Caution

If helicopter is being placed on jacks preparatory to removing landing gear, take up slack with hoist attached to rotor retaining nut. (See figure 1-2, detail A.)

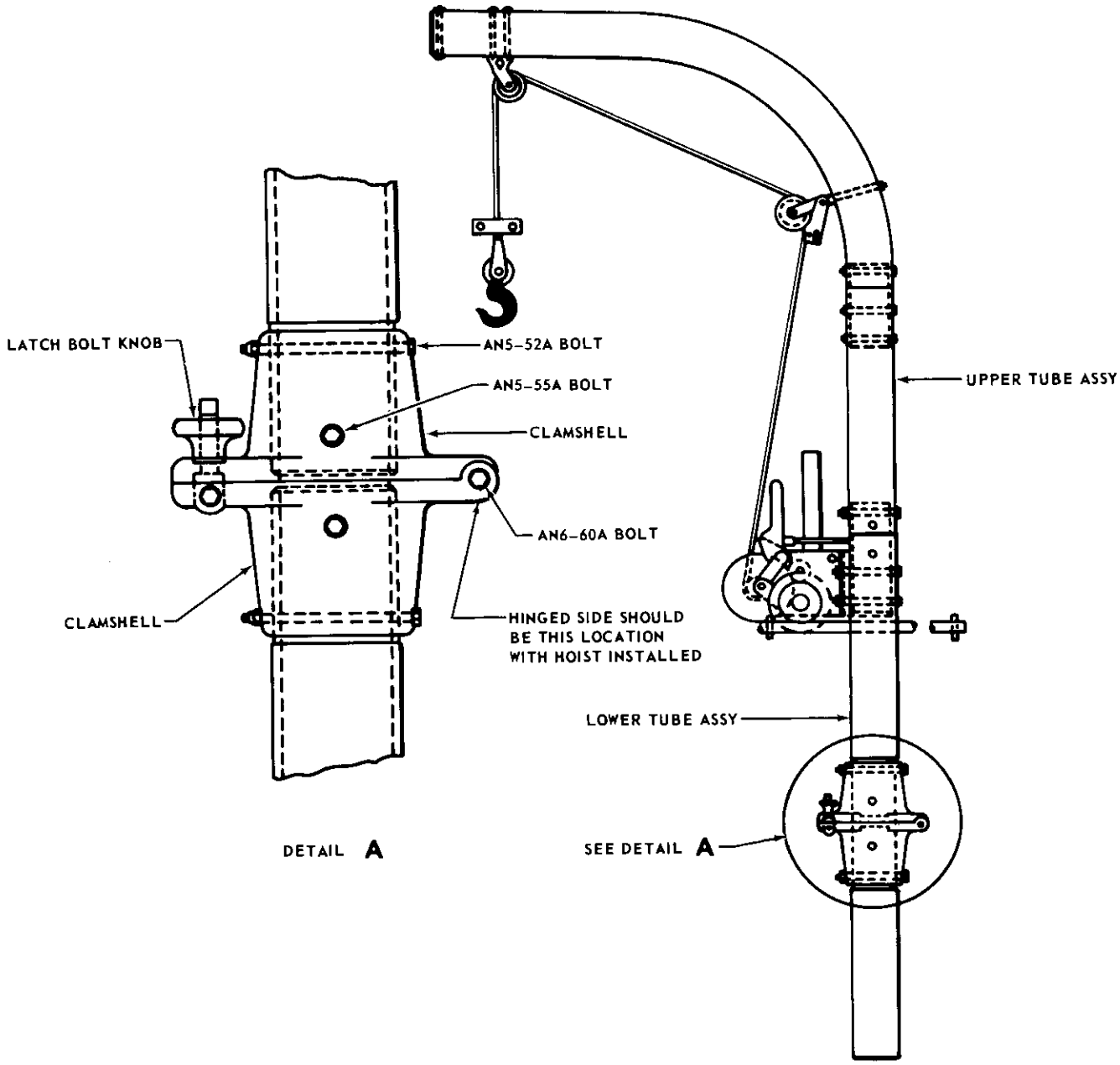


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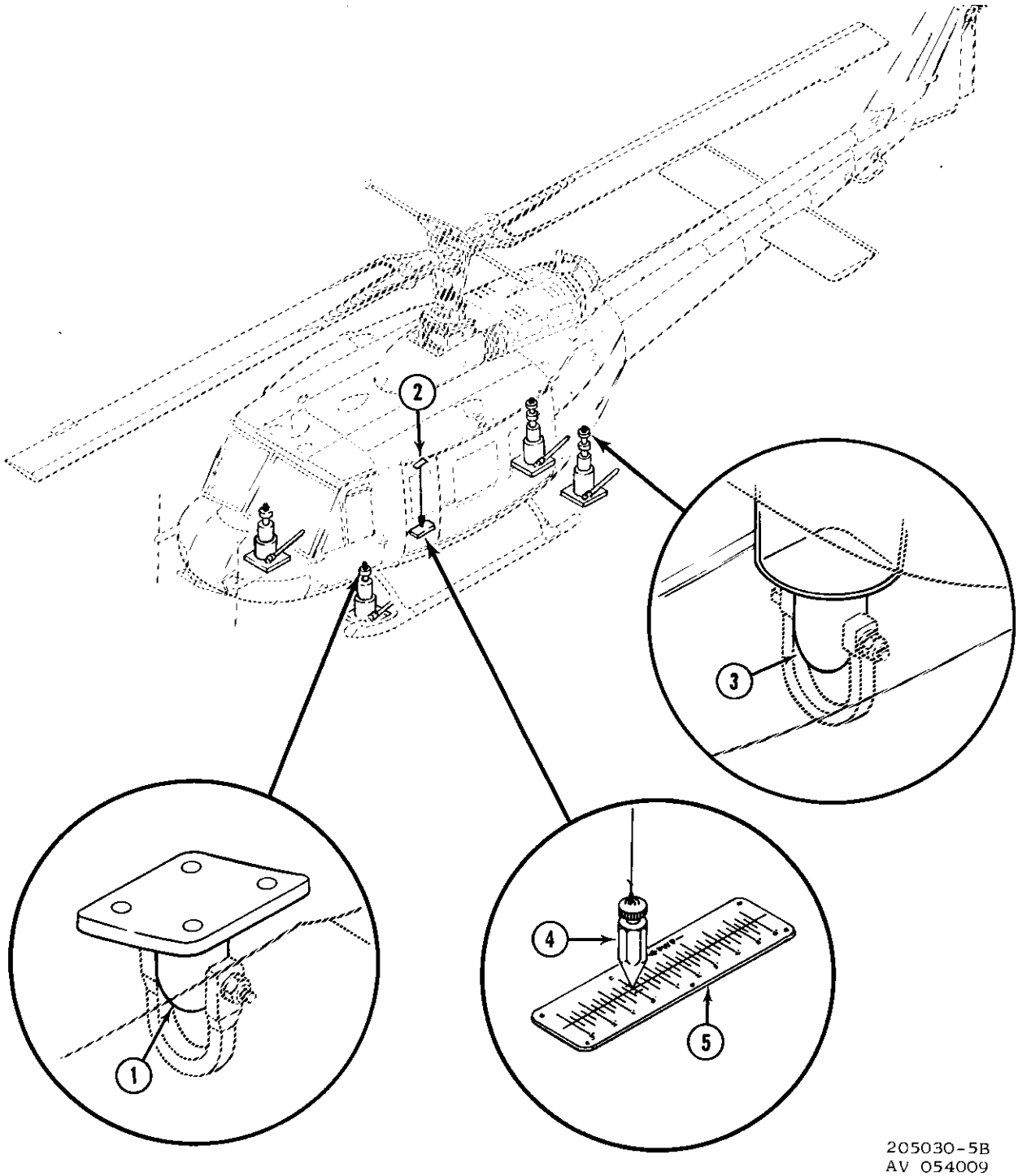
Figure 1-3. T101452 maintenance hoist assembly



1. Forward Jack Pad Fittings
2. Slotted Plate
3. Aft Jack Pads
4. Plumb Bob
5. Leveling Plate

Figure 1-4. Jacking and leveling diagram

(1) Do not climb on or enter helicopter.

(2) All personnel in immediate area shall exercise caution to avoid bumping or otherwise disturbing helicopter while on jacks.

(3) It is recommended that area around helicopter be roped off and signs prominently displayed to warn: CAUTION AIRCRAFT IS ON JACKS.

(4) When aircraft is on jacks in hanger, recommend hanger doors be closed.

1-55. MOORING. Mooring is a process of securing parked helicopter to avoid damage by high winds or turbulent weather. Mooring fittings are provided on jack pad fittings; four on UH-1D/H, three on YUH-1D. Where properly spaced rings are not available, mooring can be accomplished with a standard mooring kit.

a. Park helicopter on unpaved parking area, headed in direction of highest winds forecast.

b. Screw anchor rod (1, figure 1-5) into arrow (3).

c. Slip driving rod (2) over anchor rod and into socket of arrow.

d. Turn cam of driving rod so that prongs of arrow are not spread by driving.

e. If necessary, loosen surface of ground with ground-breaking pin.

f. Position forward rods approximately one foot ahead of each forward mooring fitting (5) and slightly inboard of skid tubes. Position other rods approximately one foot behind each aft mooring fitting (6).

g. Drive each arrow into ground until driving rod handle is approximately three inches above surface.

h. Rotate driving rod handle approximately 90 degrees and give it a sharp blow to spread arrow prongs.

i. Return driving rod to driving position and remove it from anchor rod.

j. Align squared socket of eye assembly (4) with squared end of anchor rod. Fit in place and tighten knurled nut.

k. Set arrow prongs by pulling up on eye assembly.

l. Secure helicopter with quarter-inch cables or one-inch manila rope.

Note

When anchor rods are no longer needed, they may be removed by turning eye assemblies counterclockwise, leaving arrows in ground.

1-56. PARKING. Parking, as used in this manual, is defined as condition in which helicopter will be secured while on the ground. Direction of heading and location of helicopter is normally determined by ease of maintenance and servicing; to allow removal of any one helicopter from parking area; and to permit ready access of mobile fire fighting equipment within area. Maximum velocity of surface winds which can be withstood by helicopter when parked in following manner depends on gross weight of helicopter. Although parking arrangements may vary according to local facilities, the following general procedure should be observed.

a. Double-row lateral parking, with front and rear helicopter of each double row placed tail to tail, should be used where possible.

b. Helicopter should be parked not less than 750 feet from ends of center line of nearest runway, and not less than 250 feet from edge of connecting taxi strips.

c. Width of fire lanes between each double row should be slightly greater than rotor span of parked helicopters. This spacing will facilitate removal of any helicopter from parking area, as well as permitting greater ease of movement for mobile fire fighting equipment within area.

d. Fire lanes having a minimum width of 50 feet should be provided to cross main fire lanes and isolate blocks of 10 helicopters or less.

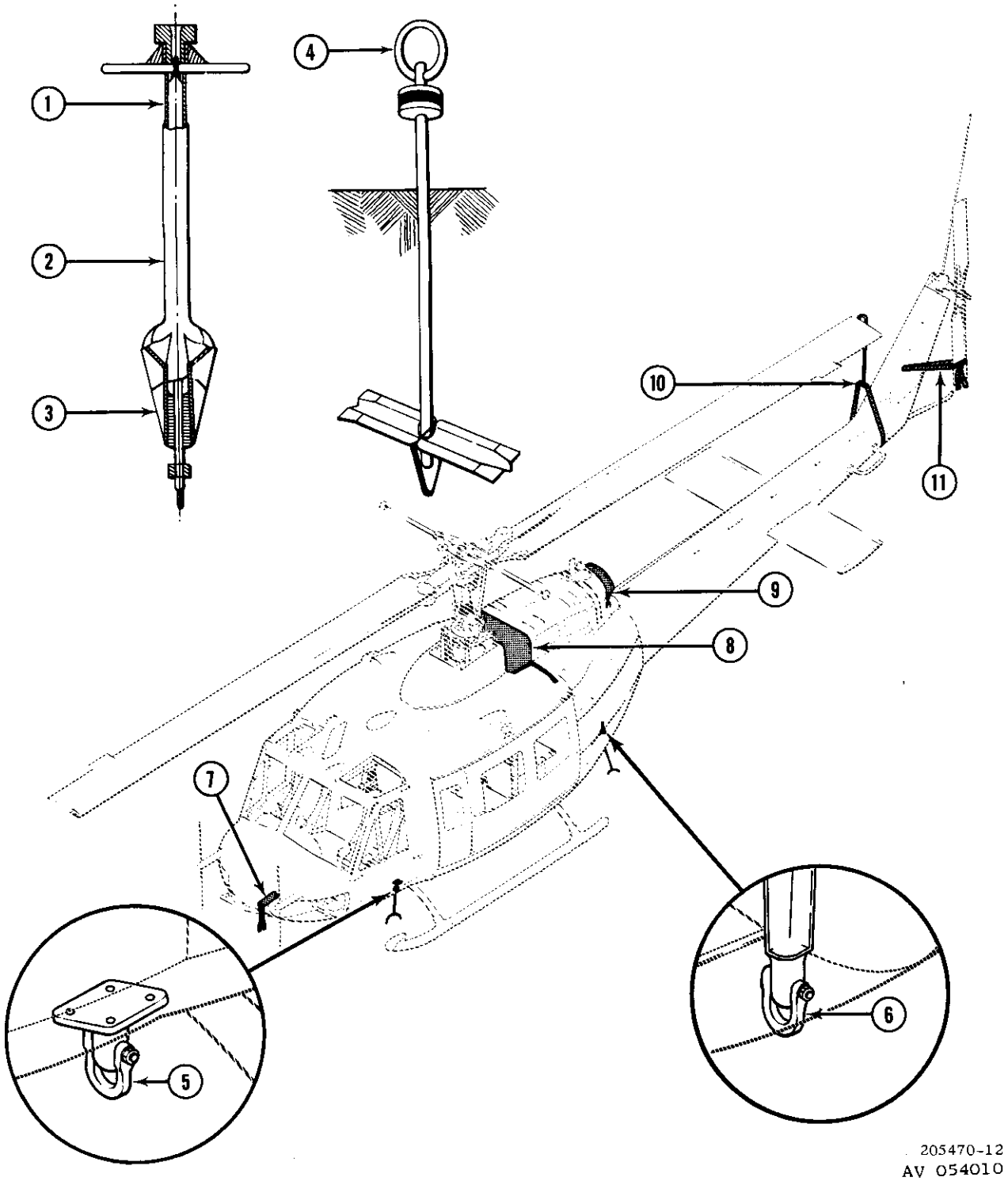
e. Helicopters parked on concrete ramps or aprons should be placed to utilize mooring rings when available.

f. Parked helicopters will be provided with a static ground.

g. Under normal conditions park the helicopter as follows:

(1) Part helicopter on a level surface, whenever possible, so that load will be balanced.

(2) Retract or remove ground handling wheels to allow helicopter to rest on landing skids.



1. Anchor Rod
2. Driving Rod
3. Arrow
4. Eye
5. Forward Mooring Fitting (2)
6. Aft Mooring Fitting (2)
7. Pitot Tube Cover
8. Intake Cover
9. Exhaust Cover
10. Main Rotor Tie Down
11. Tail Rotor Tie Down

Figure 1-5. Parking and mooring diagram

Note

If helicopter is to remain parked more than 14 days, use suitable blocks or shoring to raise skids slightly off supporting surface.

(3) Align main rotor blades fore-and-aft, and tail rotor blades parallel to vertical fin.

(4) Engage hook of main rotor tie-down (10) in hole of fitting on end of rotor blade above tail boom. (If necessary, weighted end of tie-down strap can be tossed over blade to bring it down into reach.) Secure rotor by firmly cross-tying strap of tie-down around tail boom.

(5) Attach tail rotor tie-down strap (11) to tail rotor and secure to loop provided on left side of vertical fin.

(6) Install pitot tube cover (7), engine intake fairing cover (8), and exhaust tailpipe cover (9).

Note

If required and available, install all-weather covers. (Refer to paragraph 1-60.)

(7) Lock flight controls, check that all switches are OFF and external power disconnected, and close all doors, windows, and access plates.

h. Under turbulent weather conditions park the helicopter as follows:

Caution

Structural damage can occur from turbulent weather conditions. Anchoring and mooring should be accomplished when wind is expected to exceed 45 knots per hour. When possible, helicopter should be evacuated to a safe weather area if a tornado, hurricane, or wind condition above 75 knots is expected.

(1) Park helicopter. (Refer to paragraph 1-56.)

(2) Moor helicopter. (Refer to paragraph 1-55.)

(3) Fill fuel tanks to capacity if time permits.

(4) Disconnect battery. Secure all loose equipment. Moor all ground support equipment at safe distance from helicopter.

(5) After high winds have passed, inspect helicopter for damage from flying objects. If in flyable storage or flight status, reconnect battery before ground operation or flight.

1-57. TOWING. Tow rings are provided on forward end of each landing gear skid for attachment of a standard aircraft tow bar. Helicopter is towed on ground handling wheel assemblies mounted on landing skids. (See figure 1-6.)

1-58. APPLICATION OF EXTERNAL POWER. External power receptacle (12, figure 1-8) for 28-volt DC is in lower left side of fuselage, below electrical equipment compartments. Access is through a small door, which is equipped with a limit switch to light EXTERNAL POWER caution panel when door is open and power connected. When applying power from external source, battery switch shall be OFF.

1-59. LEVELING. (See figure 1-4.) Hang a plumb line from slotted plate (2) so that plumb bob (4) just clears leveling plate (5). Adjust jacks under helicopter to align plumb bob exactly over intersection of two lines marked with zero on plate.

1-60. ALL WEATHER COVERS. A set of twelve all weather covers is provided for protection of cabin area and major components. Covers are fastened by cords and snap fasteners, and are to be installed in sequence as illustrated. (See figure 1-7.)

1-61. GROUND HANDLING GEAR. Two ground handling gear assemblies can be quickly attached on fittings of landing skids, and wheels are extended or retracted by means of hand-operated hydraulic pumps located on supporting cradle of each assembly. (See figure 1-6.) Ground handling gear is usually removed before flight, but can be left in place on skids if properly secured in retracted position by means of support rods provided on each side.

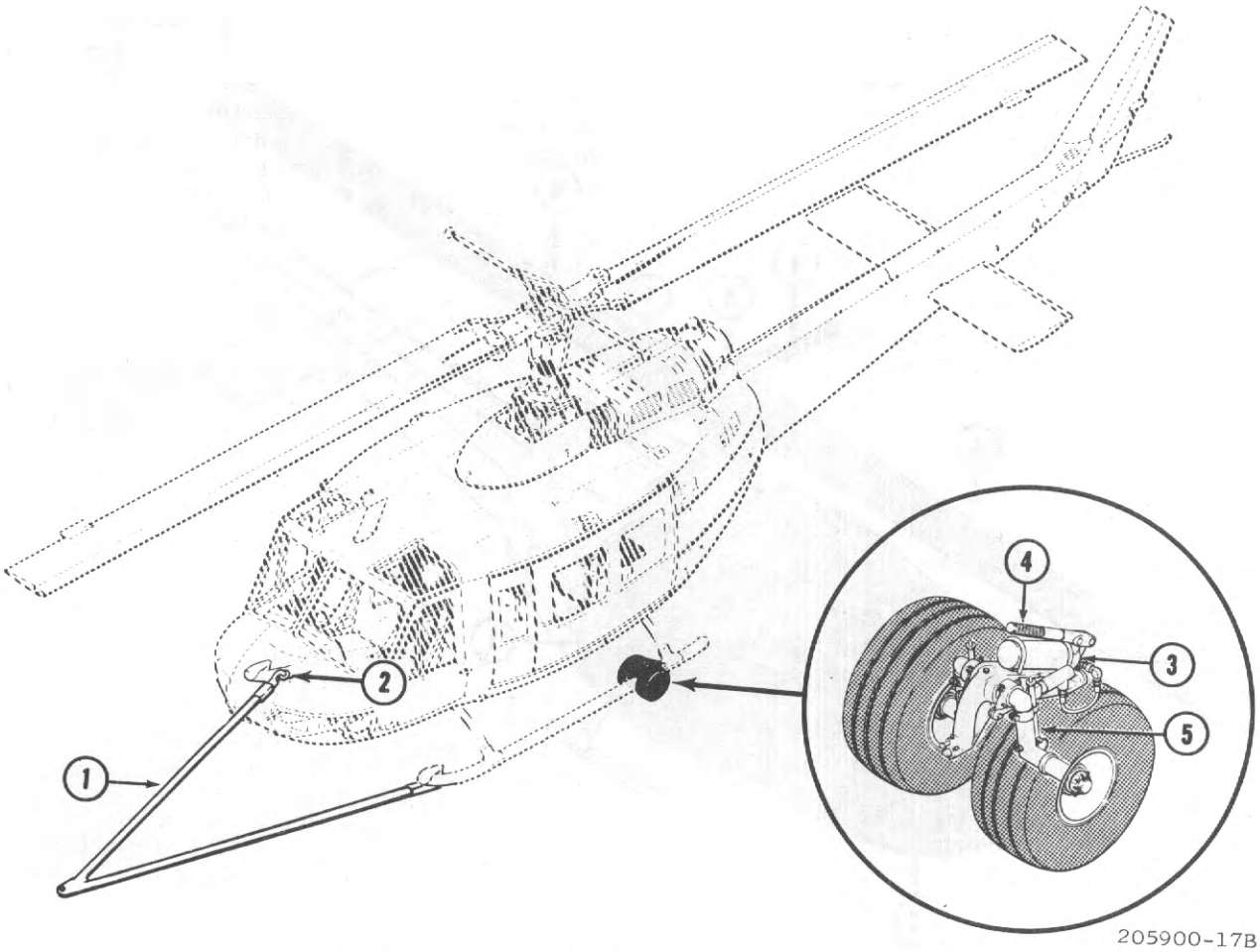
a. Position handling gear assembly over eyebolt fittings on landing skid. Insert fixed pin of cradle in rear fitting, then engage spring-loaded pin in forward fitting.

b. Actuate pump handle to extend wheels and raise landing skid from ground surface.

Note

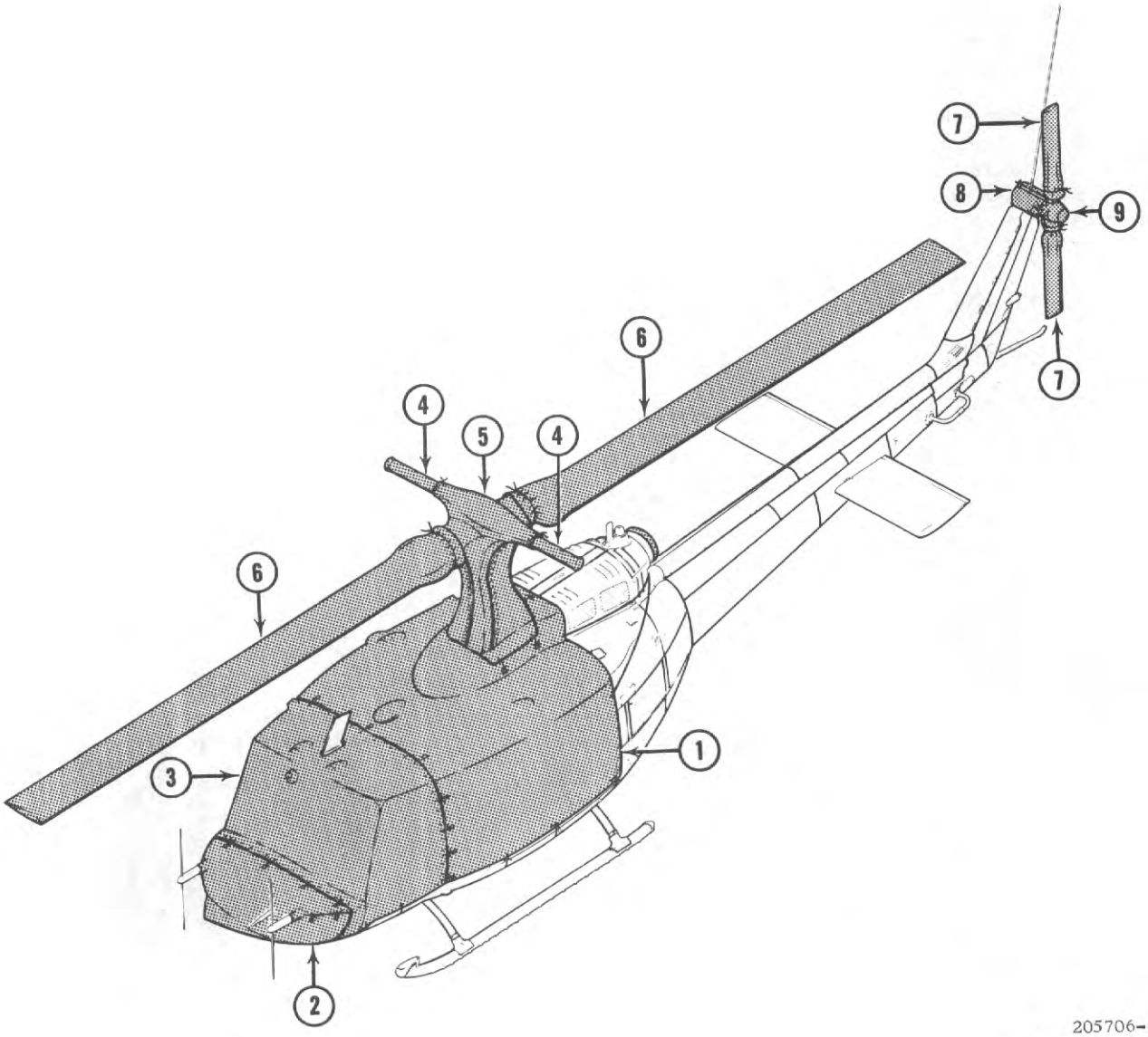
To prevent possible damage to handling wheels the forward portion of the skids should be raised by pulling the tail skid down prior to extending wheels.

c. To retract wheels and lower skid to ground, release hydraulic pressure by turning T-handle of valve on pump.



1. Tow Bar
2. Tow Ring
3. Release Valve
4. Pump Assembly
5. Support Cradle and Axle Assembly

Figure 1-6. Towing provisions diagram



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1. Main Cabin Cover
2. Nose Cover
3. Forward Cabin Cover
4. Stabilizer Bar Cover
5. Pylon Cover
6. Main Rotor Blade Cover
7. Tail Rotor Blade Cover
8. 90° Gear Box Cover
9. Tee Head Cover

Figure 1-7. All weather covers

d. To secure gear in place for flight: With wheels up, detach both support rods from stowing clips and insert ends in two quarter-inch holes provided on upper surface of skid, removing plugs if installed. Interchange rods if necessary for correct fit. Pump wheels down until supports are snug, using caution to avoid excessive strain on parts.

e. To remove handling gear assembly: If support rods are engaged, release hydraulic pressure and raise wheels to detach rods from skid and stow in clips. Press release pin on front of cradle to withdraw support pin from eyebolt. Lift off handling gear assembly.

1-62. SERVICING.

1-63. DESCRIPTION.

1-64. Instructions and information for complete servicing of the helicopter with fuel, oil, hydraulic fluid, and other fluids are provided in paragraphs 1-65 through 1-95. Locations of fillers, sight gages, and drains are shown on Servicing Points Diagram, with indication of how frequently each reservoir should be checked and filled or drained and refilled. (See figure 1-8.) Instructions for use of greases and other lubrication not shown in servicing illustration will be found in Lubrication Chart, Chapter 2.

1-65. SERVICING - FUEL SYSTEM.

1-66. Fuel tank filler (3, figure 1-8) is on right side of fuselage just aft of cargo door. Five cells are interconnected to act as a single tank. Receptacle (2) for static ground is aft of filler on YUH-1D, but is placed lower on UH-1D/H for clearance when cargo door is opened. Service with specified fuel. (See figure 1-8.)

FUEL TANK CAPACITY	U.S. GALLON
Normal Service	220.0
Total Capacity	224.0

Note

When specified fuel is not available, refer to TM 55-1520-210-10 and TB 55-9150-200-25 for information on other fuels and limitations on their use.

Warning

Observe the following precautions in all servicing operations:

(1) Position auxiliary ground power units on the windward side of the helicopter.

(2) Do NOT fuel or defuel during electrical storms.

(3) Do NOT fuel or defuel while ground or aircraft radar sets are operating within 300 feet of the helicopter.

(4) Servicing personnel shall not wear metal taps on their shoes.

(5) Be sure battery switch is in OFF position and external power is disconnected before fueling or defueling the helicopter.

(6) Ground the helicopter at the receptacle located aft of and below the fuel filler cap on the right-hand side of the helicopter.

(7) Fuel truck shall be grounded. (Truck to ground and truck to nozzle.)

(8) Ground the truck filler-nozzle to the helicopter before removing the helicopter fuel tank filler cap. This will equalize static electrical potential.

(9) Do NOT use "SPLASH" filling. Fill the tanks slowly and evenly.

(10) After completion of servicing, wash down and remove any spillover of jet fuel. This fuel does not evaporate as rapidly as gasoline, and constitutes a fire hazard for a much longer time. Cleaning materials or clothing which have become saturated with jet fuel shall be disposed of well away from the aircraft or hangar.

1-67. RECORDING OF ALTERNATE OR EMERGENCY FUEL. If the aircraft is serviced with fuel other than the specified fuel, the type of fuel, quantity and operating time shall be entered in DA Form 2408-13 (Aircraft Inspection and Maintenance Record). This record is for the purpose of scheduling any additional maintenance that may be required. (See figure 1-9.)

1-68. DEFUELING AND DRAIN VALVES.

a. On YUH-1D use defuel valve (18, figure 1-8) connected on cross fuel line between forward cell sumps. Access cover is on underside of cabin just aft of landing light.

b. On UH-1D/H use defuel valve (16) on crossover fitting at aft end of left forward cell. Access cover is on underside of fuselage approximately 12 inches behind left cell sump.

c. To complete drainage of forward cells, use valves (17) on cells.

TYPES OF FUEL AND PERMISSIBLE HOURS OF OPERATION ON EACH BETWEEN SCHEDULED HOT END INSPECTIONS

ENGINE MODEL	SPECIFIED FUEL	ALTERNATE FUEL Type	ALTERNATE FUEL Hours	EMERGENCY FUEL Type	EMERGENCY FUEL Hours
T53-L-9/9A (Scoop type combustor)	JP-4			Gasoline Unleaded	50
				Gasoline Leaded	10
				JP-5 type	10
T53-L-11 Series (9A Scoopless)	JP-4	JP-5	—	Gasoline Unleaded	50
		CITE MIL-F-46005	—	Gasoline Leaded	30
		Diesel Fuel	150		
T53-L-13	JP-4	JP-5	—	Gasoline All Types	10
		CITE	—		

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Figure 1-9. Limitations on use of nonspecified fuels

Note

Each forward cell sump is equipped with a drain valve. On UH-1D/H, each forward cell has a second drain valve for front compartment, ahead of internal baffle.

d. Electric boost pump has a drain valve.

e. To drain main fuel filter (13, figure 1-8) use valve in drain line from filter sump. Access is by opening lower left engine cowl. Drain line discharges through bottom of fuselage just ahead of aft landing gear cross-tube.

1-69. SERVICING - AUXILIARY FUEL SYSTEM. Auxiliary fuel cells, when installed, are at rear of cabin, accessible through cargo doors. Each cell is filled through a filler cap at top front as installed. Observe same precautions as for servicing main fuel system. Each cell will contain 150 U.S. gallons, for a total capacity of 300 U.S. gallons of auxiliary fuel.

1-70. DRAINING - AUXILIARY FUEL. Auxiliary fuel drain valves are located at cabin floor level, outboard of fuel cells. Drain lines discharge under cabin forward and inboard of valves. Observe same fuel handling precautions as for main fuel system.

1-71. SERVICING - ENGINE OIL SYSTEM.

1-72. Engine oil tank (7, figure 1-8) is in engine compartment at right side. Oil level can be checked (through small door marked ACCESS FOR FIRE EXTINGUISHER) by viewing sight gage plugs on tank. Before servicing oil determine whether system contains MIL-L-7808 oil (item 2, table 1-2) or MIL-L-23699 oil (item 3, table 1-2).

in fairing, but fairing must be removed for filling or access to magnetic plug.

Caution

Do NOT interchange filler caps between intermediate and tail rotor gear boxes, since this can cause intermediate gear box to be pumped dry.

1-85. SERVICING - HYDRAULIC RESERVOIR.

1-86. SERVICING - PRESSURIZED HYDRAULIC RESERVOIR. (Serial No. 60-6028 through 64-13901.) The pressurized hydraulic system reservoir (15, figure 1-8) has a graduated-plunger type fluid level indicator rod which can be checked through a window at the front of the pylon structural island in the cabin. Remove access door when necessary to service reservoir with hydraulic fluid (item 4, table 1-2). To fill reservoir with system inoperative, proceed as follows:

a. Press bleed valve on top of indicator rod to relieve any trapped pressure.

Caution

Do not press bleed valve on indicator rod when rotor is turning.

b. Remove filler cap.

Warning

To avoid contamination, do not use previously opened cans of hydraulic fluid. A new, sealed can of fluid must be opened and used.

c. Fill reservoir, keeping fluid level visible in neck by slowly pushing down on indicator rod.

Note

To avoid introducing air into system, fluid level must be kept visible while filling reservoir. If air is introduced, refer to bleeding instructions. (Refer to paragraph 6-26 or 6-27.)

d. Reinstall filler cap.

e. When system is next operated, bleed off any trapped air in reservoir by pressing valve on filler cap.

HYDRAULIC FLUID CAPACITY	U.S. PINTS
System	7.3
Reservoir	1.5
Reservoir Refill	1.0

1-87. DRAINING - PRESSURIZED HYDRAULIC RESERVOIR. (Serial No. 60-6028 through 64-13901.) Hydraulic system reservoir on UH-1D/H can be drained by removing a drain stud from bottom of reservoir piston. On YUH-1D, which has no drain stud, empty reservoir by removing filler cap and pushing piston up to force fluid out into drain scupper.

1-88. SERVICING - GRAVITY FEED HYDRAULIC RESERVOIR. (Serial No. 65-9565 and Subsequent.) Check sight gage of hydraulic reservoir through viewing hole provided on right side of transmission fairing. If fluid level shows in sight gage, reservoir servicing is required. Open transmission fairing for access. Remove cap and fill reservoir to overflow with hydraulic fluid (item 4, table 1-2). Reinstall filler cap. Close transmission fairing.

Warning

To avoid contamination, do not use previously opened cans of hydraulic fluid. A new, sealed can of fluid must be opened and used.

HYDRAULIC FLUID CAPACITY	U.S. PINTS
System	10.0
Reservoir	5.3
Reservoir Refill	2.5

1-89. DRAINING - GRAVITY FEED HYDRAULIC RESERVOIR. (Serial No. 65-9565 and Subsequent.) Drain reservoir by removing plug from port marked DRAIN on lower aft side of reservoir.

1-90. SERVICING - GROUND HANDLING GEAR PUMP.

1-91. Hold pump in an upright position, with oil hole and handle socket at top, and fill with hydraulic fluid (item 4, table 1-2) until fluid comes out filler hole. Check pump for leaks and proper operation. Refer to paragraph 4-295, for pump bleeding procedure.

TABLE 1-2. LIST OF CONSUMABLE MATERIALS

ITEM NO.	NOMENCLATURE	COLOR NO.	SPECIFICATION
	FUELS AND LUBRICANTS		
1.	Turbine fuel, Aviation, Grades JP-4 and JP-5		MIL-T-5624
2.	Lubricating Oil, Aircraft Turbine Engine, Synthetic base		MIL-L-7808
3.	Lubricating Oil, Aircraft Turbine Engine, Synthetic base		MIL-L-23699
4.	Hydraulic fluid, Petroleum base, Aircraft, Missile and Ordanance		MIL-H-5606
5.	Lubricating Oil, Jet engine (Grade 1010)		MIL-L-6081
6.	Graphite, Lubricating		MIL-G-6711
7.	Grease, Aircraft, Helicopter oscillating bearing		MIL-G-25537
8.	Lubricant, Drive shaft couplings (Tube pack)		204-040-755-3
9.	Corrosion preventive oil, Gas turbine engine, Aircraft, Synthetic base		MIL-C-8188
10.	Grease, Pneumatic system		MIL-G-4343
11.	Hydraulic fluid, Petroleum base, For preservation and testing		MIL-H-6083 (Type II)
12.	Lubricating oil, General purpose, Low Temperature		MIL-L-7870
13.	Petrolatum, Technical		VV-P-236
14.	Grease (Lubriplate)		FSCM 73219
15.	Shortening, Compound and lard		EE-S-321
16.	Castor oil, Technical		JJJ-C-86
17.	Plastilube, Moly No. 3		FSCM 02307
18.	Multi-Fax, EP-2		FSCM 59595
19.	Ease-off 990		FSCM 87889
20.	Molykote Anti-seize Thread Compound		FSCM 94499
	PAINTS, PRIMERS, THINNERS AND MARKING COMPOUNDS		
	NOTE: ALL COLOR NUMBERS TO BE IN ACCORDANCE WITH FED STD 595		
100.	Epoxy primer (Super Koropon)		FSCM 22873
101.	Prussian blue color, Thinned with oil		TT-P-691
102.	Enamel, Aluminum, Heat resistant	XA147	FSCM 77359
103.	Lacquer, Acrylic, Insignia red (Gloss)	11136	MIL-L-81352
104.	Lacquer, Acrylic, Insignia White (Gloss)	17875	MIL-L-81352
105.	Lacquer, Acrylic, Black (Gloss)	17038	MIL-L-81352
106.	Primer coating, Zinc chromate, Low moisture sensitivity		MIL-P-8585
107.	Epoxy, Engine gray A.D. (Components A & B) (P/N E2833)		FSCM 16193
108.	Varnish, Spar, Phenolic, Resin		TT-V-119
	ADHESIVES, CEMENTS AND SEALING COMPOUNDS		
200.	Putty, Zinc chromate, General purpose		MIL-P-8116
201.	Sealing, Locking and retaining compounds, Single component (Grade Q, Grade CV (4-10)		MIL-S-22473
202.	Anti-seize compound, High Temperature (Navy)		MIL-A-907
203.	Molybdenum disulfide, Technical, Lubrication grade		MIL-M-7866
204.	Sealing Compound, Temperature resistant, Integral Fuel tanks and fuel cell cavities, High adhesion		MIL-S-8802
205.	Metal-Set, A-4		MIL-A-8623
206.	Nuocure 28 Catalyst, Nudex Products Co., Heyden Chemical Corp., Elizabeth, N.J.		
207.	Sealing compound, Temperature resistant, Integral fuel tanks and fuel cell cavities, High adhesion		MIL-S-8802 (Type B-2)
208.	Filler, RP-1220		FSCM 02684
209.	Adhesive, 2216 (Scotch-weld)		FSCM 76381
210.	Adhesive, Heat resistant, Airframe structural, Metal to Metal		MMM-A-132
211.	Adhesive, Air-drying, Silicone rubber		MIL-A-25457

TABLE 1-2. LIST OF CONSUMABLE MATERIALS (CONT)

ITEM NO.	NOMENCLATURE	COLOR NO.	SPECIFICATION
	FABRICS AND TAPES (Cont)		
508.	Cloth, Abrasive, Aluminum oxide and silicone carbide		P-C-451
509.	Cushioning, Material, Cellulose		PPP-C-843 (Type II)
510.	Cloth, Abrasive, Crocus		P-C-458
511.	Cloth, Fiber Glass, 120 or 127 weave (Volon A finish)		MIL-C-9084

TABLE 1-3. STANDARD TORQUE TABLE

TORQUE VALUES FOR NUT-BOLT COMBINATIONS

	1	2	3
	BOLTS		
	STEEL TENSION	STEEL TENSION	ALUMINUM
	AN3 thru AN20 AN42 thru AN49 AN73 thru AN81 AN173 thru AN186 MS20033 thru MS20046 MS20073 MS20074 AN509 NK9 MS24694 AN525 NK525 MS27039	MS20004 thru MS20024 NAS144 thru NAS158 NAS333 thru NAS340 NAS583 thru NAS590 NAS624 thru NAS644 NAS1303 thru NAS1320 NAS172 NAS174 NAS517	AN3DD thru AN20DD AN173DD thru AN186DD AN509DD AN525D MS27039D MS24694DD
		STEEL SHEAR	
		NAS464	

	NUTS					
	STEEL TENSION	STEEL SHEAR	STEEL TENSION	STEEL SHEAR	ALUMINUM TENSION	ALUMINUM SHEAR
	AN310 AN315 AN363 AN365 NAS1021 MS17825 MS21045 MS20365 MS20500 NAS679	AN320 AN364 NAS1022 MS17826 MS20364	AN310 AN315 AN363 AN365 MS17825 MS20365 MS21045 NAS1021 NAS679	AN320 AN364 NAS1022 MS17826 MS20364	AN365D AN310D NAS1021D	AN320D AN364D NAS1022D

FINE THREAD SERIES

Nut-Bolt Size	Torque Limits inch/lbs.		Torque Limits inch/lbs.		Torque Limits inch/lbs.		Torque Limits inch/lbs.		Torque Limits inch/lbs.		Torque Limits inch/lbs.	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
8 -36	12	15	7	9	-	-	-	-	5	10	3	6
10-32	20	25	12	15	25	30	15	20	10	15	5	10
1/4 -28	50	70	30	40	80	100	50	60	30	45	15	30
5/16-24	100	140	60	85	120	145	70	90	40	65	25	40
3/8 -24	160	190	95	110	200	250	120	150	75	110	45	70
7/16-20	450	500	270	300	520	630	300	400	180	280	110	170
1/2 -20	480	690	290	410	770	950	450	550	280	410	160	260
9/16-18	800	1,000	480	600	1,100	1,300	650	800	380	580	230	360
5/8 -18	1,100	1,300	660	780	1,250	1,550	750	950	550	670	270	420
3/4 -16	2,300	2,500	1,300	1,500	2,650	3,200	1,600	1,900	950	1,250	560	880
7/8 -14	2,500	3,000	1,500	1,800	3,550	4,350	2,100	2,600	1,250	1,900	750	1,200
1 -14	3,700	4,500	2,200	3,300	4,500	5,500	2,700	3,300	1,600	2,400	950	1,500
1 1/8 -12	5,000	7,000	3,000	4,200	6,000	7,300	3,600	4,400	2,100	3,200	1,250	2,000
1 1/4 -12	9,000	11,000	5,400	6,600	11,000	13,400	6,600	8,000	3,900	5,600	2,300	3,650

COARSE THREAD SERIES

8 -32	12	15	7	9	-	-	-	-	-	-	-	-
10-24	20	25	12	15	-	-	-	-	-	-	-	-
1/4 -20	40	50	25	30	-	-	-	-	-	-	-	-
5/16-18	80	90	48	55	-	-	-	-	-	-	-	-
3/8 -16	160	185	95	110	-	-	-	-	-	-	-	-
7/16-14	235	255	140	155	-	-	-	-	-	-	-	-
1/2 -13	400	480	240	290	-	-	-	-	-	-	-	-
9/16-12	500	700	300	420	-	-	-	-	-	-	-	-
5/8 -11	700	900	420	540	-	-	-	-	-	-	-	-
3/4 -10	1,150	1,600	700	950	-	-	-	-	-	-	-	-
7/8 - 9	2,200	3,000	1,300	1,800	-	-	-	-	-	-	-	-
1- 8	3,700	5,000	2,200	3,000	-	-	-	-	-	-	-	-
1 1/8 - 8	5,500	6,500	3,300	4,000	-	-	-	-	-	-	-	-
1 1/4 - 8	6,000	8,000	4,000	5,000	-	-	-	-	-	-	-	-

Note 1: Divide inch-pounds by 12 to convert torque values to foot-pounds.
Note 2: Torque values listed are for turning nuts on stationary bolts.
Note 3: Variation of torque on identical nuts listed in column 1 and column 2 is based on type of bolt.

204900-252
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Note

In this configuration a suitable clevis may be used and attached to the mast nut as shown. It will also be necessary to secure the blades approximately as shown.

CAUTION

Down load at blade tip is limited to 395 pounds. Deflection of blade tip is limited to 53 inches below the flapping axis.

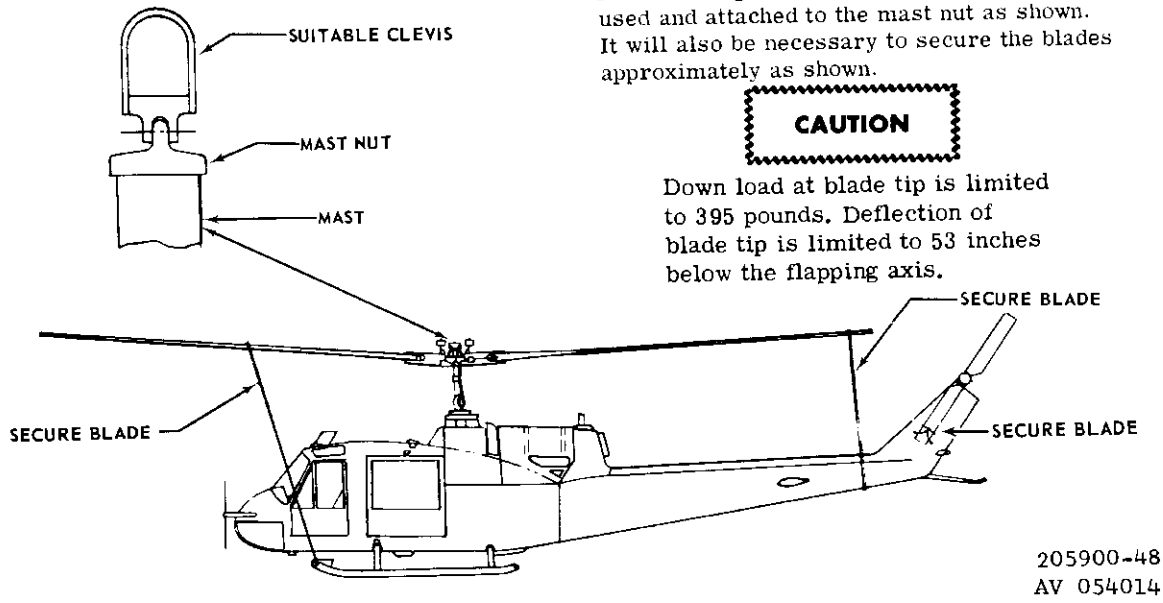

Figure 1-10. UH-1 retrieval with ship and rotor intact

Note

When the rotor has been destroyed but the mast is intact, use a suitable clevis to pick up on the mast nut as shown.

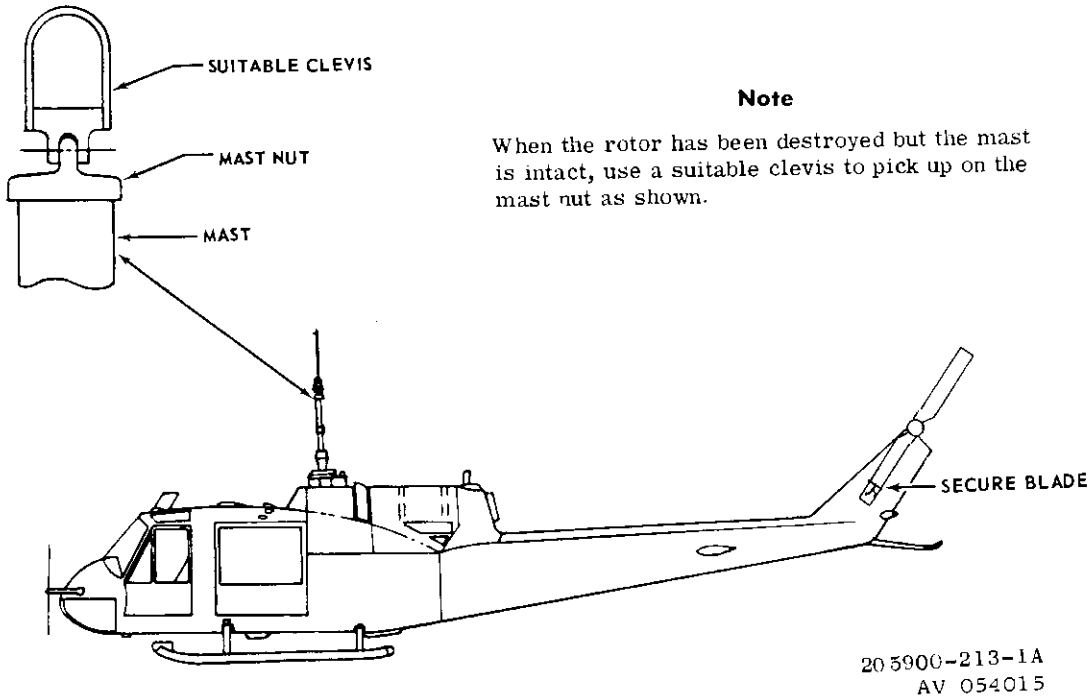

Figure 1-11. UH-1 retrieval with rotor destroyed but mast intact

Note

If the transmission or the transmission base remains intact it is advisable to wrap support cables about the base in a manner similar to that shown in the L/H sketch. If the transmission has been completely destroyed or removed, a support cable and fitting may be attached to the lift link beam as shown in R/H sketch.

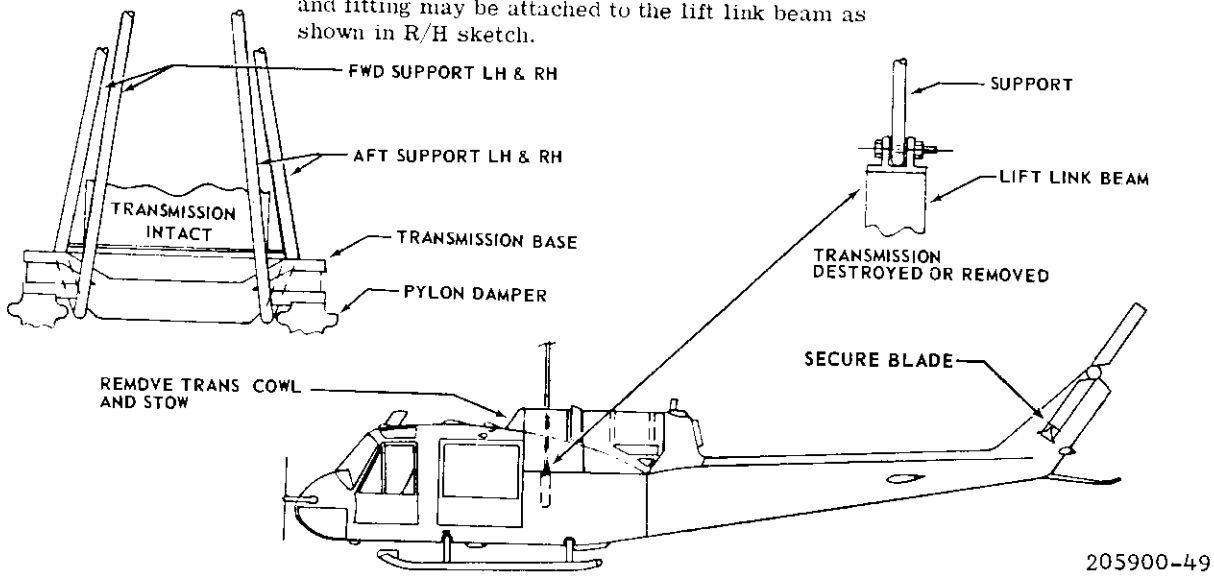

Figure 1-12. UH-1 retrieval with airframe intact but rotor and mast destroyed

Note

It is advisable that in this configuration a support cable and fitting be attached to the lift link beam as shown in sketch below. Remove transmission cowl and stow in cabin.

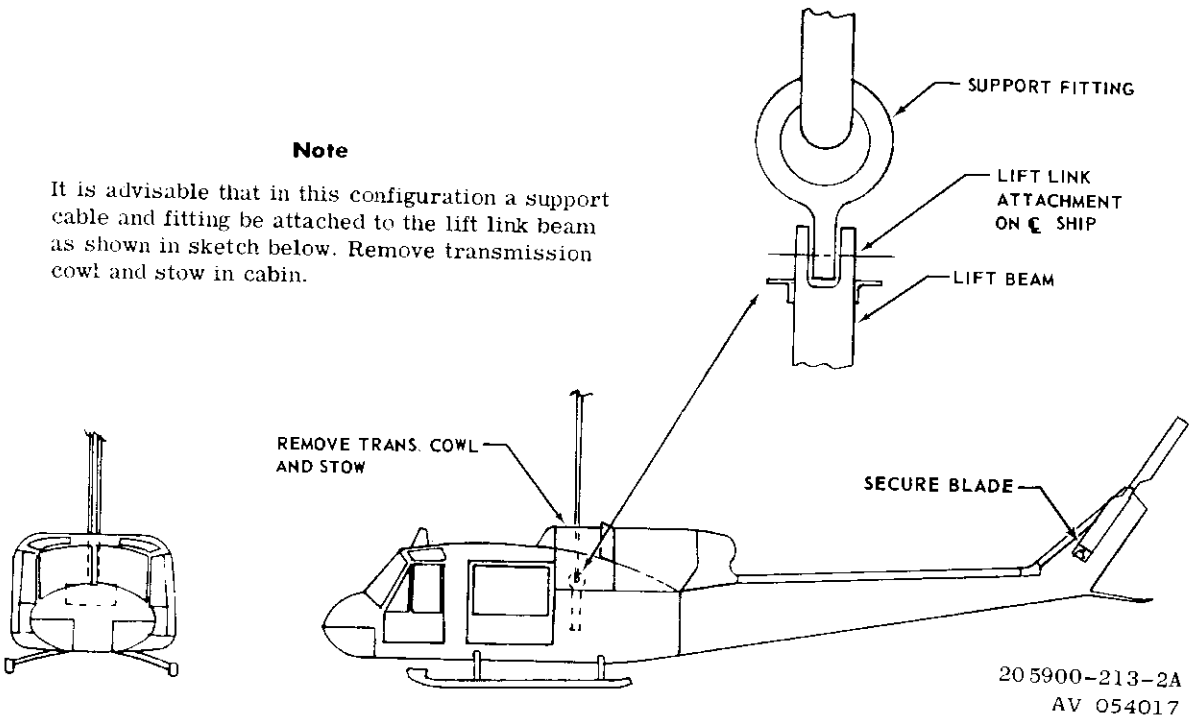

Figure 1-13. UH-1 retrieval with airframe damaged (tail boom and fuselage) with rotor and mast destroyed-preferred method