



BELL 212 Pilot Training Manual

Chapter 14

SERVICING

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Chapter 14
Servicing



INTRODUCTION

To properly handle the helicopter on the ground, you must know what provisions are made on the helicopter, the equipment used and how to use it.

General

This discussion will concern hoisting, jacking, leveling, parking, mooring, towing and the ground handling wheels.

The servicing and lubrication requirements for the helicopter will also be discussed.

Hoisting

The entire helicopter can be lifted by attaching a hoisting clevis (Clevis, Part Number 204-011-178-001) to the eye of the

main rotor retaining nut, and use a suitable hoist that is capable of lifting the entire weight of the helicopter.

A man should be stationed at the tailskid to steady the helicopter during hoisting operation. If lifting beyond the reach from ground, use a rope to steady the helicopter.

Jacking

The 212 has four jacking points on the lower fuselage, two just forward of the landing gear forward cross tube, at station 61.69, and two

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aft of the 211.58. The forward jack pads attach to the lower main beam transverse bulkhead members of the forward fuselage and the two aft points are attached to the left and right upper main beam assemblies.

Standard aircraft jacks of sufficient weight capability should be used.

Leveling

A leveling plate is located on the cabin floor, just inside the left passenger/cargo door, at station 117.50.

The plate is graduated in 1/4 degrees and provides for both longitudinal and lateral leveling capabilities. A slot in the door frame directly above the leveling plate provides for suspending a plumb bob and line for leveling.

Parking and Mooring

The helicopter should be parked on a level surface whenever possible, to balance the load.

The ground handling wheels should be retracted or removed to allow the helicopter to rest on the skid tubes.

The main rotor blades should be aligned fore and aft, and the aft blade secured with the tiedown strap to the tail boom.

The tail rotor blade should be secured to the side of the vertical fin with the tiedown strap.

Install all covers and tighten the friction locks for the flight controls, if winds of 20-45 knots are expected.

For parking in winds in excess of 45 knots, the helicopter should be moored for safety, if it must be parked in the open.

On paved ramps, with suitable spaced tiedown fittings in the ramp, tie the helicopter down, and headed into the direction from which the highest winds are expected. Use

the mooring fittings on each jack pad to secure the helicopter.

On unimproved parking areas, a mooring kit with anchors and anchor rods or deadman anchors can be used to secure the helicopter.

Towing, and Ground Handling Wheels

Two ground handling wheel assemblies are provided for quick mounting on the landing gear skid tubes to allow for moving of the helicopter.

The ground handling wheels are positioned over the eyebolt fittings in the landing gear skid tubes. The wheels are then attached to fittings on the skids and are extended and retracted by means of hand-operated hydraulic pumps located on the supporting cradle of each wheel assembly.

CAUTION: Ensure that the pins are properly and completely engaged, prior to actuating the hydraulic pump to extend the wheels.

Station a man at the tailskid to balance or stabilize the helicopter. Actuate the pumps to extend both wheel assemblies simultaneously, raising the skids from the ground. Both wheel assemblies should be extended or retracted simultaneously to prevent possible damage to the wheel assemblies.

Towing is accomplished by using the two tow rings provided at the forward inboard side of the skid tubes. A standard aircraft tow bar can be used.

The helicopter is towed using the ground handling wheel assemblies and a man stationed at the tailskid.

Towing the helicopter on the ground, on unprepared surfaces, or rough areas in excess of 8000# gross weight will cause

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permanent set in the aft cross tubes. In an emergency, the helicopter can be towed up to 11,200# gross weight, by securing skid tubes together to prevent spreading of cross tubes.

OPERATION

1. Install strap on aft cross tube of landing gear part number and gross weight as follows: (Figure 14-3)
2. Tie down main rotor blades
3. Install ground handling wheels as follows:

Part Number	Type	Gross Wt.
205-050-400-27	Standard	>8000
205-050-400-71	Standard	>8000
205-050-400-101	High Skid	>9000

Table 14-1 Gear Strap Requirement

Caution: Do not use ground-handling gear, 212-050-200, when helicopter gross weight is in excess of 9500 lbs. Damage to ground handling gear may result.

Installation with fixed pins directed forward or fixed pins aft is as needed to keep the aircraft in Balance. If required, you may ballast the helicopter forward or in baggage compartment to achieve a neutral C.G. relative to the ground handling wheels.

- A. Position ground handling wheels over the skid tube and align attaching fixed pins with eyebolts on tube. (Figure 14-2)
- B. Station a person at tailskid to keep helicopter level during ground handling or towing.

- C. Extend wheels on both skid tubes at same time to raise skid tubes for ground clearance.
- D. Disconnect ground wire from helicopter.
- E. Tow or handle helicopter slowly. Move helicopter on wheels using tailskid to maintain balance.

Caution: Do not leave helicopter unattended with ground handling wheels in extended position.

4. Remove ground-handling wheels as follows:
 - A. Lower skid tubes to the ground by retracting the ground handling wheels on each skid tube at same time.
 - B. Remove fixed pins from eyebolts and remove wheels from skid tubes.
 - C. Connect ground wire to helicopter.

Servicing

The current Model 212 Flight Manual contains the complete servicing instructions for the helicopter. The Flight Manual should be reviewed to include fuels, oils, hydraulic fluids and lubricants applicable to the model. The servicing points are shown on (Fig 14-5)

Servicing of the various components and system will be covered in detail under the particular component in the "R.O.N. (Remain Over Night) Without a "mechanic" class given by maintenance, Pilots should be aware of the types of oils and fluids that are used in the aircraft. They should also be aware that the mixing of oils is allowed only in very specific instances. Inadvertent mixing of oils requires that the system be drained and flushed. Again, you can consult the rotorcraft flight manual for specifics on servicing the engines, transmissions and hydraulic systems.

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Caution: Stained or discolored sight gage glasses may give false indication of oil and fluid quantity. If false indication is suspected, shake helicopter by the tailskid and observe oil or fluid movement. Have any sight gage glass that does not provide adequately clear indication of oil and fluid level, replaced.

Lubrication locations may be seen in the diagrams in (Figure 14-5) through (Figure 14-8).

All five interconnected cells of the main fuel system are serviced through a single filler located on the right side of the helicopter. A grounding jack is provided near the filler. Sump drains are located in the bottom of right and left fuel cells beneath the cabin floor. System defuel valves are accessible through the bottom skin behind the aft cabin bulkhead. A system filter is located ahead of each of the two engine power sections. The filters are connected to the caution panel for indication of impending bypass conditions.

WARNING: fueling and defueling on the part of all personnel. The fuels used are extremely flammable and easily ignited. Fuel vapors can be ignited by static or friction sparks, hot exhaust pipes, lighted cigarette, electrical devices and similar ignition sources. Personnel should not be aboard helicopter during fueling or defueling procedures (Consult the Operations Manual fueling chapter in regards to fueling with personnel on board). When helicopter fuel comes into contact with skin a solvent action occurs which removes natural fats and oil that may expose skin to infectious dermatoses. Extensive vapor inhalation may cause serious illness. Accidental swallowing of fuels will result in internal injury and possibly death. Personnel subjected to splashed or sprayed fuel should remove contaminated clothing as soon as possible and wash down and shower with large amounts of water. Do not remove clothing near potential ignition sources.

1. Do not perform fueling when high winds are considered hazardous or when electrical storms are within a three mile radius of fueling or defueling operations
2. Fuel transfer personnel shall not wear static producing clothing such as nylon, rayon, or wool. Before starting actual fuel operations, all persons working at the helicopter should dissipate static potential by gripping the static ground line with bare hand (consideration given to excessive cold). Shoes with taps or protruding nails should not be worn.
3. Do not perform fueling or defueling operations near drainage ditches or low places where combustible vapors could accumulate.
4. Do not perform fueling or defueling operations in a hangar.
5. During fueling or defueling, helicopter shall be positioned at least 50 feet away from any building or smoking area.
6. The helicopter shall be positioned at least 500 feet from any radar system.
7. Do not perform fueling or defueling operations when other aircraft are operating within 100 feet of refueling area.
8. Position the servicing unit as far from the helicopter as hose will permit, and in a position so it may be driven or towed away from the area in event of an emergency. Set parking brake.
9. Ground fuel/defuel vehicle and helicopter as outlined in the Operations Manual fueling chapter.
10. Do not return drained fuel to a storage area unless it is passed through a filter/separator as it is drained from the helicopter.

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11. If the quality of the fuel is questionable, it should be stored, sampled, and tested before use, downgraded, or disposed of as tests indicate appropriate.



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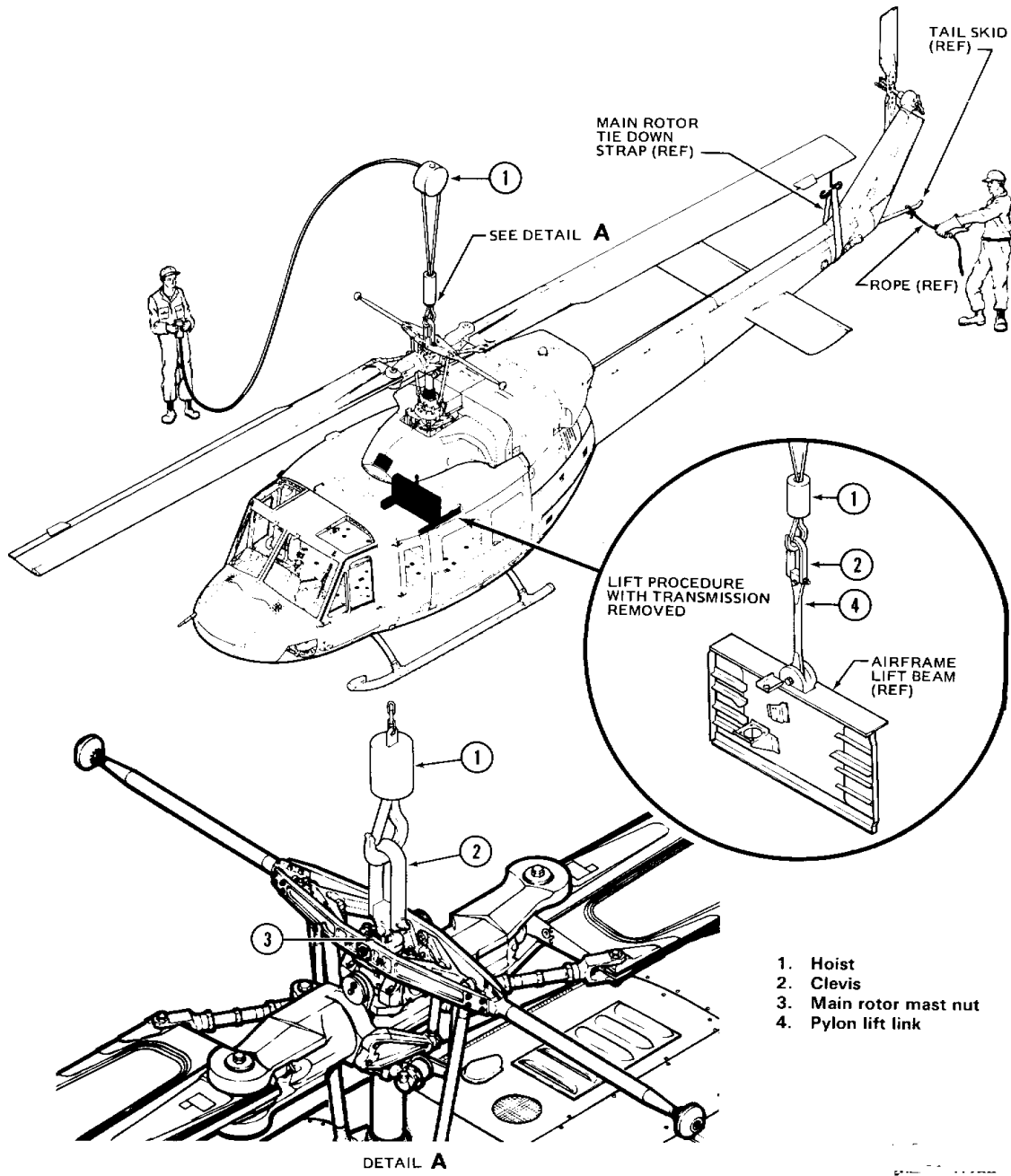
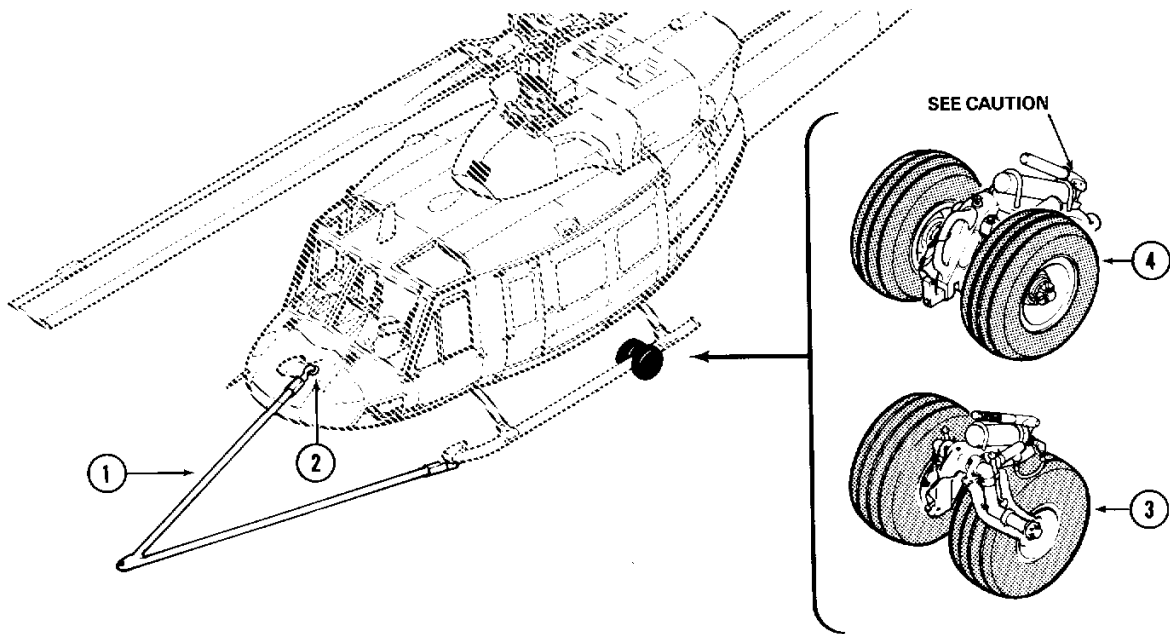


FIGURE 14-1 HOISTING COMPLETE HELICOPTER



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- 1. Tow bar
- 2. Tow ring
- 3. Ground handling wheel assembly 204-050-200
- 4. Ground handling wheel assembly 212-050-200
— heavy gross weight

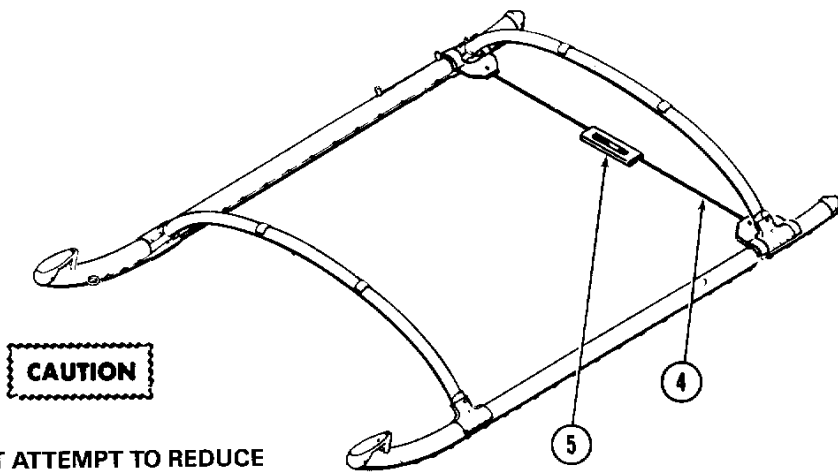
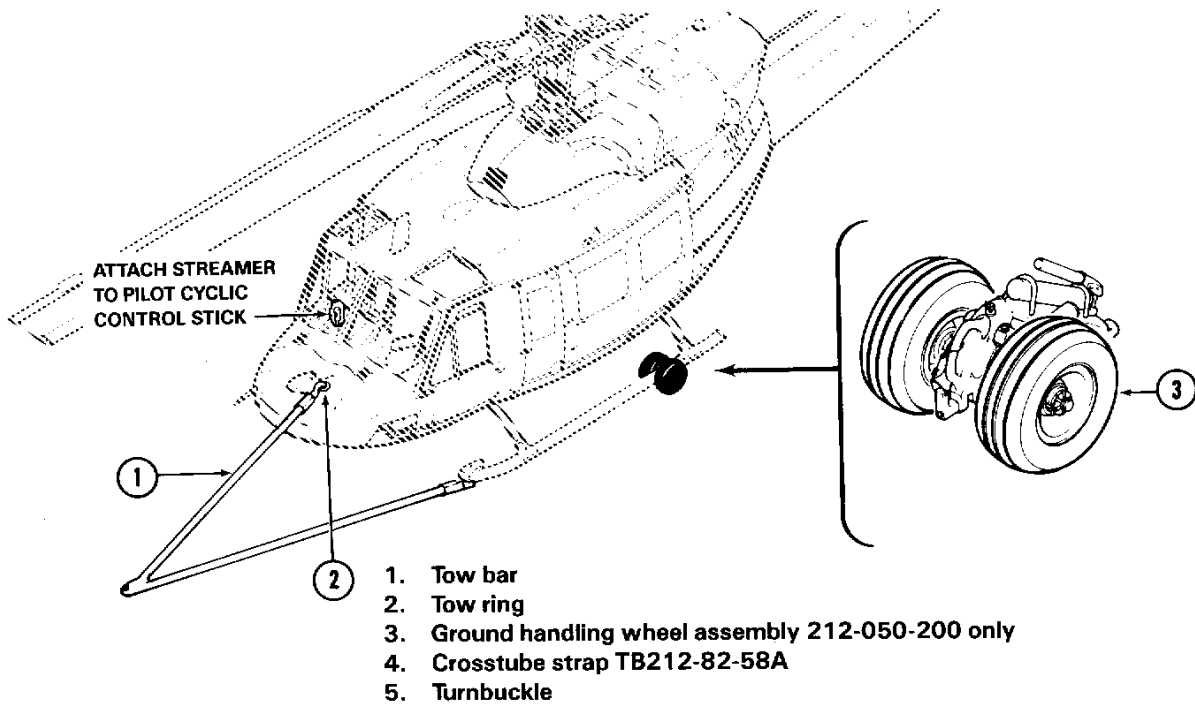
CAUTION

USE ONLY 212-050-200 GROUND HANDLING
WHEEL FOR TOWING WEIGHTS GREATER
THEN 8,000 POUNDS.

FIGURE 14-2 TOWING HELICOPTER



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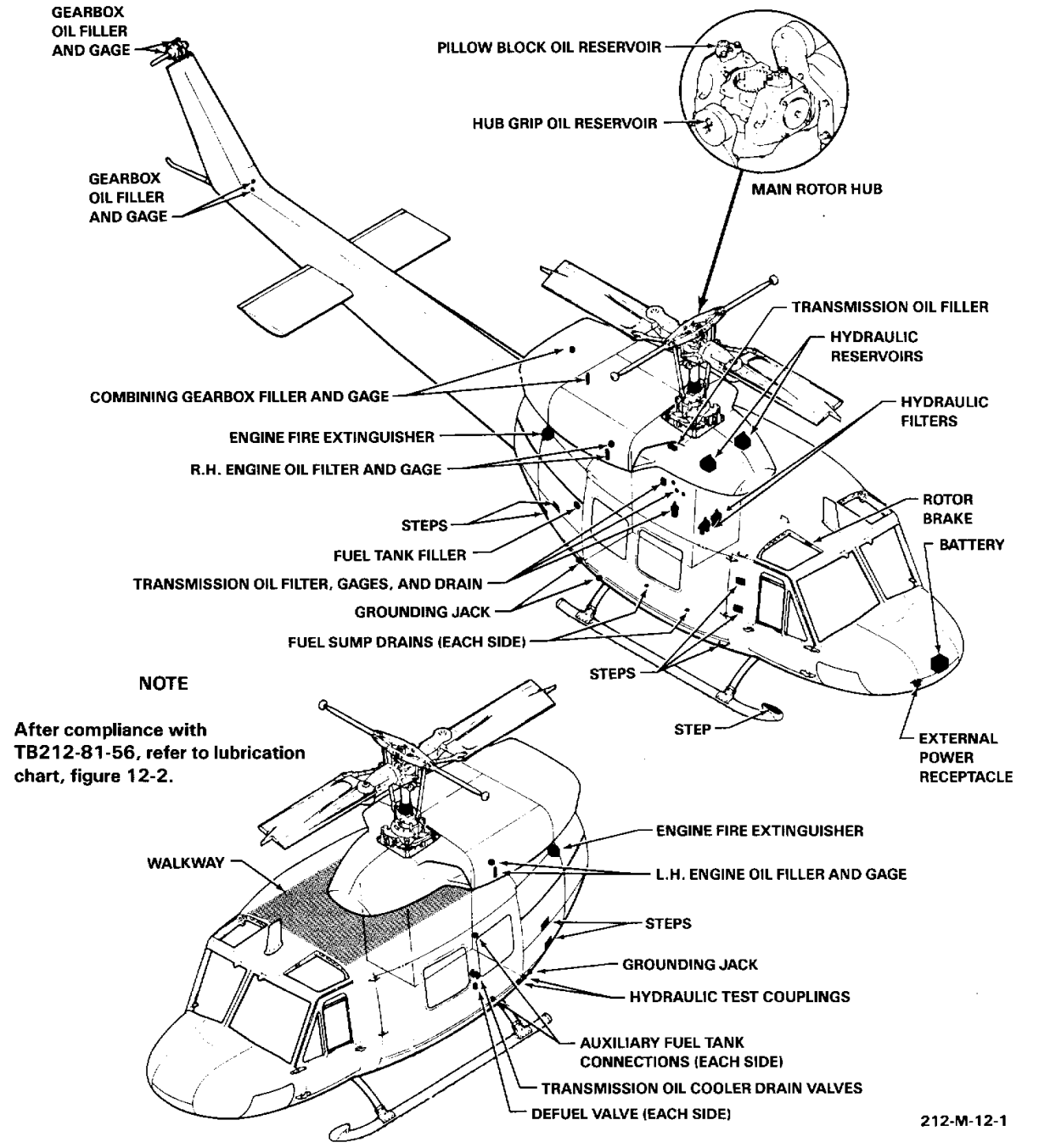


DO NOT ATTEMPT TO REDUCE NATURAL GEAR SPREAD WHILE LOADED. SNUG UP TURNBUCKLE (5) WITH WEIGHT ON SKID TUBES.

FIGURE 14-3 CROSSSTUBE STRAP INSTALLATION



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212-M-12-1

FIGURE 14-4 SERVICING POINTS



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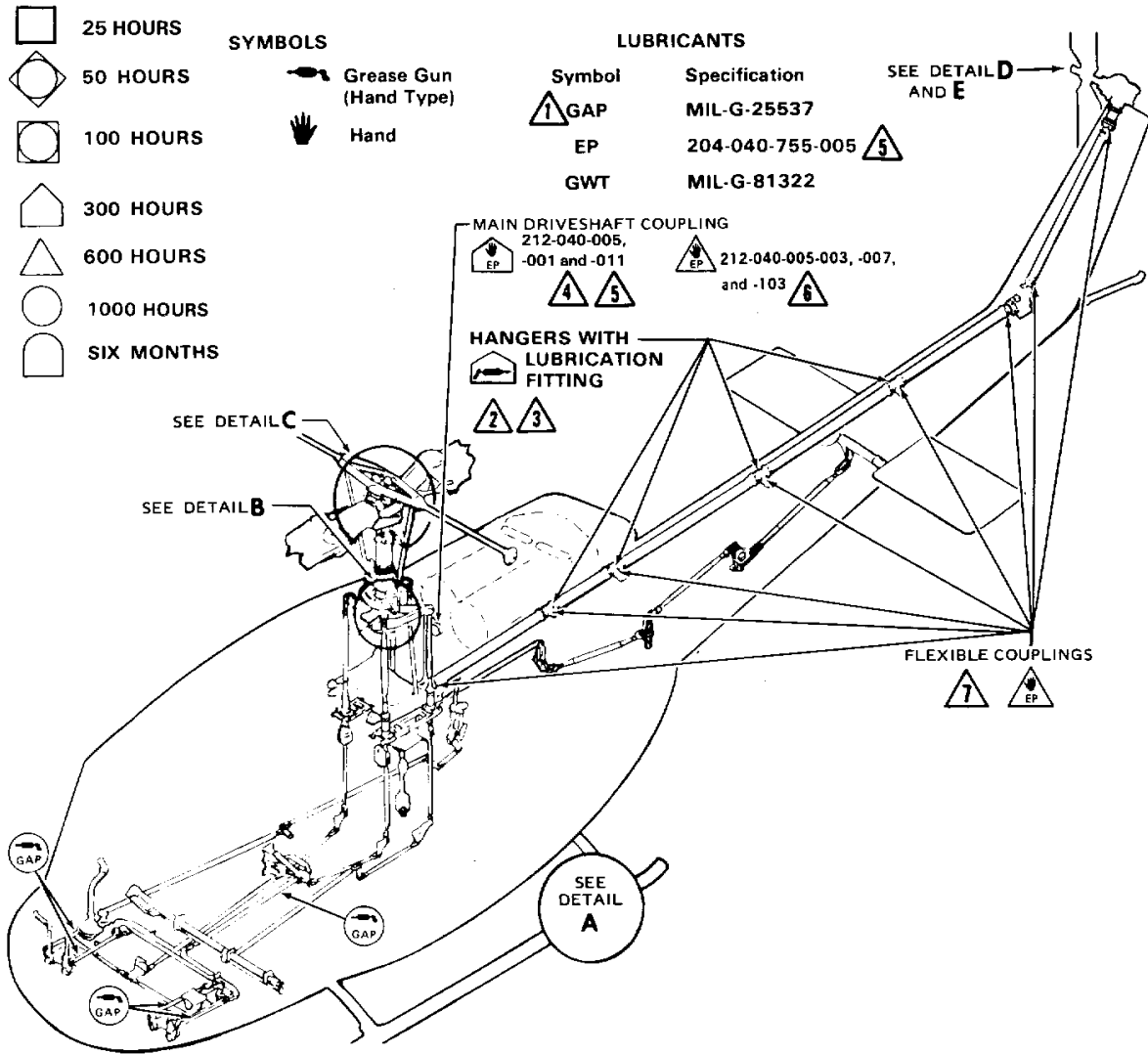


FIGURE 14-5 LUBRICATION CHART 1 OF 4



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1. Axle pivot point
2. Actuating cylinder trunnions △ 9
3. Wheel bearings
4. Pin assembly
5. Securing pin
6. Collective sleeve bearing
7. Scissor bearings
8. Swashplate bearings
9. Collective lever trunnion △ 9
10. Outer control plate trunnions △ 9
11. Control plate trunnions △ 9
12. Scissors pivot cover plate △ 8
13. Collective sleeve splines △ 8
14. Scissors pivot needle bearing (P/N 212-010-407 Scissors) △ 8
15. Crosshead bearing △ 10
16. Antitorque control lever
17. Pitch change link universal
18. Stabilizer centerframe bearing } △ 8
19. Mixing lever bearings
20. Trunnion bearing △ 12

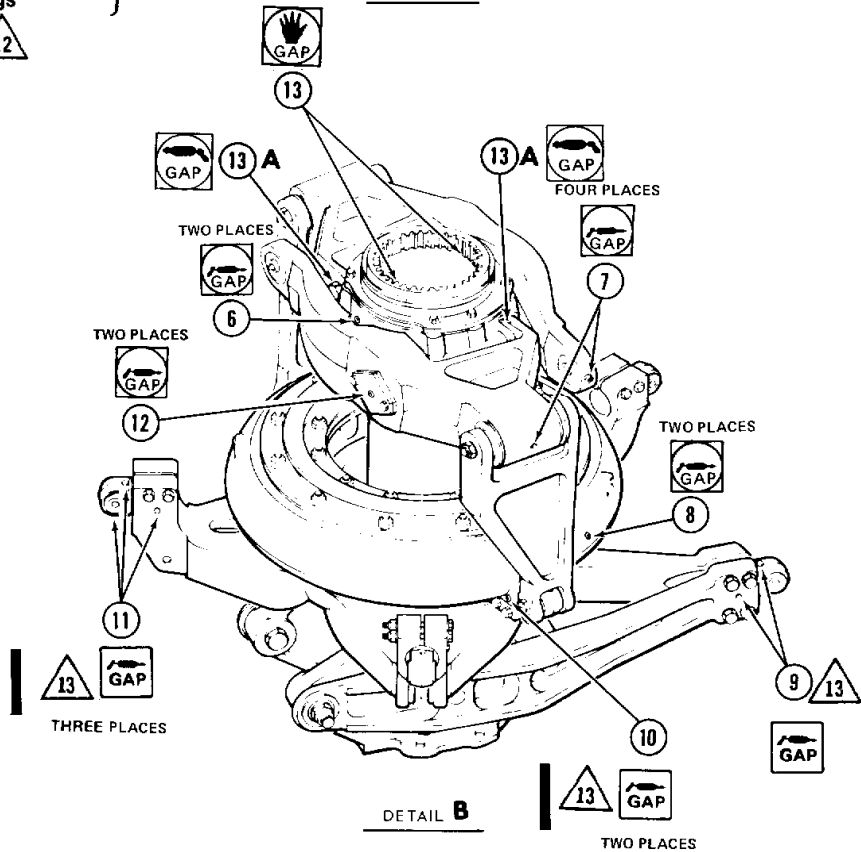
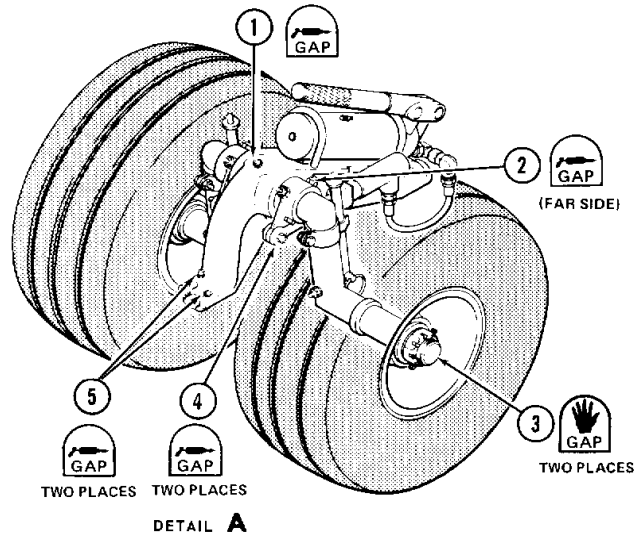


Figure 12-2. Lubrication chart (sheet 2)

FIGURE 14-6 LUBRICATION CHART 2 OF 4



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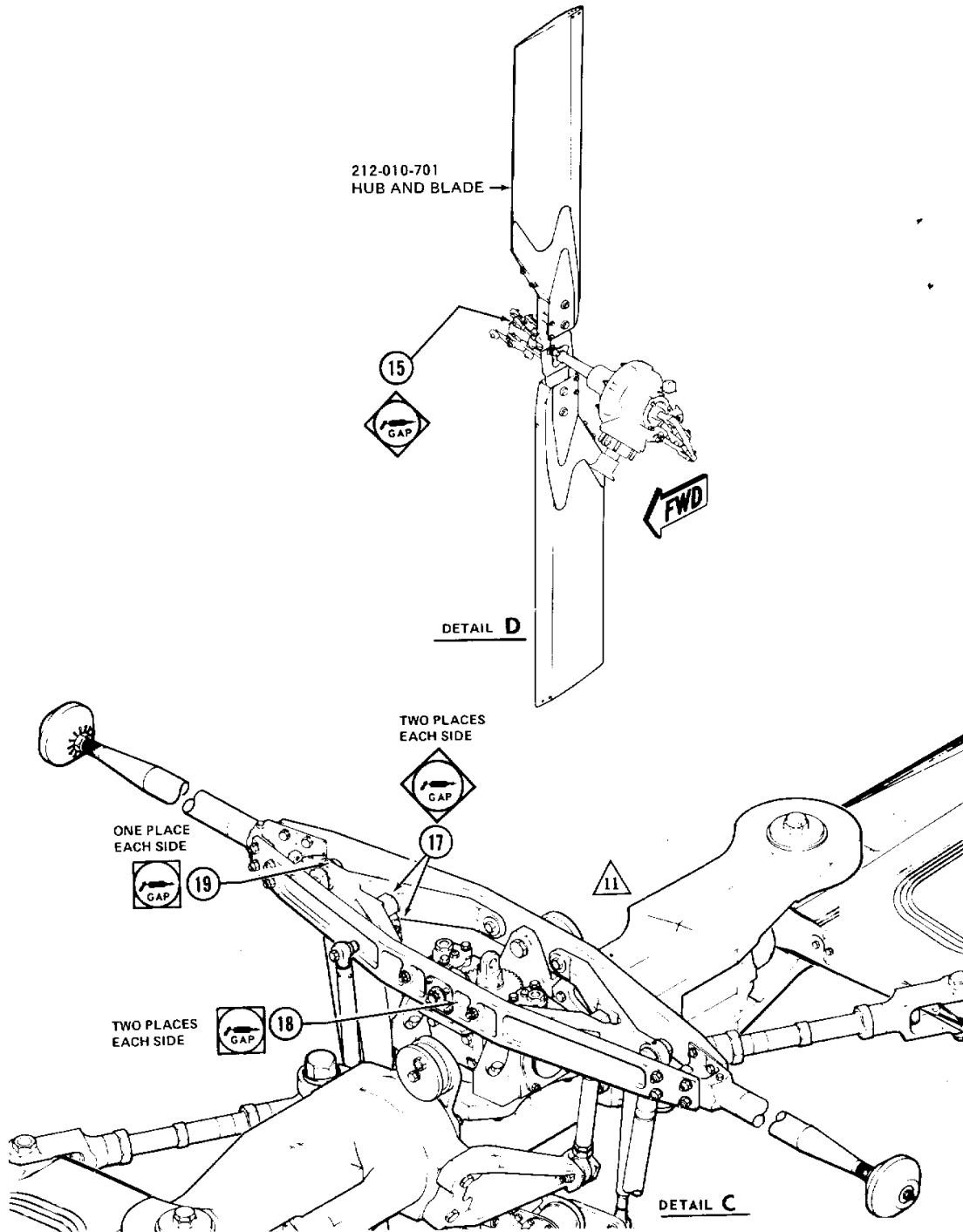
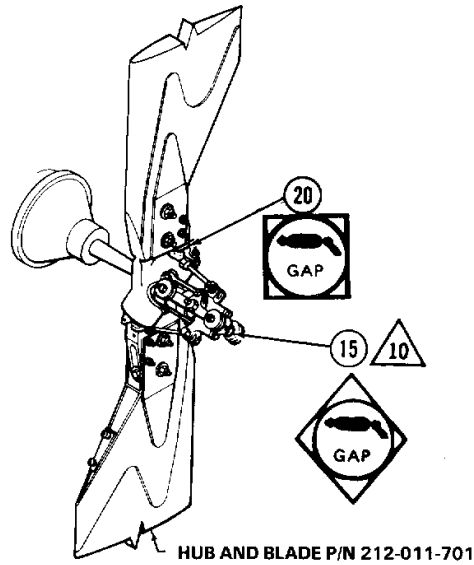


FIGURE 14-7 LUBRICATION CHART 3 OF 4



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DETAIL E
NOTES

- | | |
|--|---|
| <p>1 MIL-G-81322 grease is recommended for use in all applications which previously used MIL-G-25537 grease; however, intermixing of grease is prohibited. When changing from one grease to the other, purge until previous grease is depleted. Exercise same care when switching brands of grease as when switching types of grease.</p> <p>2 Lubricate hanger bearing by slowly pumping grease into fitting until grease may be seen around bearing seal. Use caution because excessive pump pressure may push seal from bearing.</p> <p>3 Lubricate tail rotor hanger bearing with Mobil 28 conforming to MIL-G-81322 grease.</p> <p>4 Lubricate couplings on P/N 212-040-005-011 main driveshaft every 300 hours or 3 months; whichever occurs first.</p> <p>5 Grease, 204-040-755-5, has a shelf storage life of 4 years whether stored in original container or in a component. If a component is not put in service prior to expiration of the 4 year shelf life of the grease, component shall be relubricated prior to installation on a helicopter. After initial operation of component on the helicopter, refer to lubrication chart for lubrication intervals.</p> | <p>6 Lubricate couplings on P/N 212-040-005-003, -007, and -103 main driveshaft every 600 hours or 6 months; whichever occurs first.</p> <p>7 Lubricate tail rotor driveshaft couplings every 600 hours or six months; whichever occurs first.</p> <p>8 Lubricate more frequently if conditions warrant.</p> <p>9 Purge lubricate.</p> <p>10 Do not overlubricate crosshead bearing. Two shots of grease each 50 hours of operation is considered adequate.</p> <p>11 If T.B. 212-81-56 has been complied with, purge lubricate main rotor grips and trunnions with MIL-G-81322 each 50 hours of operation. Refer to T.B. 212-81-56 for lubrication instructions.</p> <p>12 Lubricate until grease passes seal.</p> <p>13 Every 4th 25 (100 hours) rotate bearing 180° and purge lubricate (Chapter 5).</p> |
|--|---|

212-M-12-2-4

FIGURE 14-8 LUBRICATION CHART 4 OF 4

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