# ROBINSON HELICOPTER COMPANY

## R66 MAINTENANCE MANUAL
## AND INSTRUCTIONS FOR CONTINUED AIRWORTHINESS
## RTR 660 VOLUME I

Production Certificate Number 424WE
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### OFFICE HOURS

Monday through Friday, 7:30 a.m. to 4:30 p.m., Pacific Time.
Lunch hour is 11:30 a.m. to 12:30 p.m.

### HOLIDAYS

Please visit https://robinsonheli.com for a list of holidays and company shutdowns.

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### PUBLICATIONS

Viewing RHC Maintenance Manuals (MMs) and Illustrated Parts Catalogs (IPCs) online at https://robinsonheli.com is recommended to ensure use of current data. Viewing MMs and IPCs offline via paper or digital download requires verification that the data is current. Refer to the online MM or IPC Revision Log for the list of current pages.

## SUBSCRIPTION ORDER AND RENEWAL FORMS

Subscription order and renewal forms are located at https://robinsonheli.com.

## WARRANTY INFORMATION

Helicopter and parts warranty information is located at https://robinsonheli.com.

1-80 Assembly Instructions for R66 Helicopter Crated for Export (continued)

28. Depreserve the engine after storage per RR300 Series Operation and Maintenance Manual (OMM). Install starter-generator cooling hose. Install engine cowling per § 53-21.
29. Install tail rotor dynamic balance equipment per § 18-21.
30. Perform run-up per § 5-42 steps 2 thru 16.
31. Perform tail rotor dynamic balance per § 18-20.
32. Remove tail rotor dynamic balance equipment. Install main rotor balance equipment per § 18-11.

**CAUTION**

Mast fairing, cowlings, and panels must be installed for flight.

33. Perform hover checks per § 5-43 step 1. DO NOT proceed into forward flight.
34. Track and balance main rotor per § 18-12.
35. While climbing at maximum continuous torque, 60 KIAS:
    a. Evaluate vibration level and controllability.
    b. Perform momentary 30° left yaw to check for adequate directional control.
36. Level flight at typical cruise altitude (deviate as required for weather and terrain), maximum continuous torque:
    a. Evaluate longitudinal and lateral cyclic control forces.
    b. Evaluate collective control forces.
37. Evaluate vibration level at maximum continuous torque and straight-and-level flight.
38. During autorotation at 50 KIAS and 90% rotor RPM, perform momentary 30° right yaw to check for adequate directional control.
39. Check all instruments, gages, and avionics for proper operation.

| **TABLE 1 SCHEDULED MAINTENANCE, DEFAULT*****<br>Consult latest revision of listed publications for specific applicability. | First 100 Hours* | 100 Hours** | 200 Hours** | 300 Hours** | 400 Hours** | 600 Hours** | 1000 Hours** | 2000 Hours** | 12 Months** | 24 Months** | 5 Years** | 6 Years** | 12 Years** | 15 Years** | 3000 Cycles** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Replace main gearbox oil filter per § 12-12. | ● | | | | | ● | | | | | | | | | |
| Perform 100-hour / annual inspection per § 5-45. | | ● | | | | | | | ● | | | | | | |
| Perform main rotor blade tip maintenance per § 62-60. | | ● | | | | | | | | | | | | | |
| As required by RR300 Series Operation and Maintenance Manual (OMM), perform maintenance and inspection. | | | ● | | ● | | | ● | ● | | | | | | ● |
| Service inlet barrier filter per § 71-21. | | | | ● | | | | | ● | | | | | | |
| Replace both 9v back-up batteries under LH front seat (ships with Lithium-ion main battery only). | | | | | | | | | ● | | | | | | |
| Replace main gearbox oil per § 12-11. | | | | | | ● | | | | | | | | | |
| Drain and flush tail rotor gearbox per § 12-23. | | | | | | ● | | | | | | | | | |
| Replace hydraulic filter per § 12-32. | | | | | | ● | | | | | | | | | |
| Clean gearbox chip detectors per § 12-13 & 12-22. | | | | | | ● | | | ● | | | | | | |
| Lubricate swashplate bearings per § 12-90. | | | | | | | ● | | | | | ● | | | |
| Perform 2000-hour/12-year inspection per § 5-50. | | | | | | | | ● | | | | | ● | | |
| Perform main gearbox internal visual inspection per § 5-74. | | | | | | | | | ● | | | | | | |
| Perform pop-out float leak check per § 32-64 Part A. | | | | | | | | | ● | | | | | | |
| Replace cockpit camera battery per § 96-120 Part C. | | | | | | | | | ● | | | | | | |
| Test and inspect transponder per 14 CFR § 91.413. (U.S.-registered helicopters only). | | | | | | | | | | ● | | | | | |
| Perform pop-out float inflation check per § 32-64 Part B. | | | | | | | | | | | ● | | | | |
| Perform pop-out float pressure cylinder hydrostatic test (per U.S. DOT-SP 10915). | | | | | | | | | | | ● | | | | |
| Pop-out float pressure cylinder maximum life. | | | | | | | | | | | | | | ● | |

* One-time maintenance after new or overhauled main rotor gearbox is installed.

** Recurring inspection.

*** Helicopters on a Part 91 Approved Inspection Program (AIP), a Part 135 Approved Aircraft Inspection Program (AAIP), or an equivalent foreign-approved inspection program, must refer to & comply with that program. Refer to current revisions of FAA Advisory Circulars 91-90 & 135-10.

1-92 Additional Component Maintenance (continued)

**B. 2000 HOURS (continued)**

| Part Number | Description | Action |
|---|---|---|
| C649-4 | Oil Cooler (main rotor gearbox oil) | Replace with new, or overhaul oil cooler. |
| C947-3 | Flex Plate Assembly (tail rotor driveline) | Replace with new. |
| D082-1 | Tube Assembly (tail rotor guard mount) | Magnetic particle inspect or replace with new. |
| D211-3 | Hydraulic Reservoir Assembly | Replace with new or overhaul exchange reservoir assembly. |
| D212-5 | Hydraulic Servo Assembly | Replace with new or overhaul exchange servo assembly. |
| D212-6 | Hydraulic Servo Assembly | Replace with new or overhaul exchange servo assembly. |
| D224-3 and -4 | Tail Rotor Drive Shaft (D196-1) Assembly | Refer to § 4-30. Replace with new D224-4 tail rotor drive shaft assembly, if required. |
| D333-13 | Fitting (PTG) | Replace with new. |
| D500-2 | Hydraulic Pump Assembly | Replace with new or overhaul exchange pump assembly. |
| D500-3 | Main Rotor Gearbox Oil Pump Assembly | Replace with new or overhaul exchange pump assembly. |
| D918-1 | Elastic Cord – Longitudinal (cyclic pivot) | Replace with new. |
| D918-2 | Elastic Cord – Lateral (cyclic pivot) | Replace with new. |
| D918-3 | Elastic Cord – (collective) | Replace with new. |
| D930-2 | Spring – Safety (FCU throttle input) | Replace with new. |
| F006-1, -6 | Main Rotor Gearbox Assembly | Refer to § 4-30. Replace with new or overhaul exchange F006-1 or F006-6 gearbox assembly, as required. |
| F018-1 | Clutch Assembly | Replace with new or overhaul exchange clutch assembly. |
| F101-4 | Rod End, Elastomeric | Replace with new. |
| F170-1, -2 | Fitting (engine gearbox vent) | Replace with new F170-2 fitting. |
| F173-1 | Strut (exhaust weldment support) | Replace with new. |
| F453-5 | Retainer (at firewall seal) | Replace with new. |
| F579-1 | Engine Air Bellmouth | Replace with new. |
| F597-1 | Seal – Firewall | Replace with new. |
| F642-6, -7 | Engine Shaft Weldment | Replace with new F642-7 weldment. |
| F649-1 | Oil Cooler (engine oil) | Replace with new, or overhaul oil cooler. |
| F651-2 | Element – Main Gearbox Filter | Replace with new. |
| F651-3 | Seal Kit – Main Gearbox Filter | Replace with new. |
| F771-1 | Filter – Engine Air Intake (foam, standard) | Replace with new. |
| F771-4 | Filter – Starter-Generator (cooling air) | Replace with new. |

1-92 Additional Component Maintenance (continued)

**B. 2000 HOURS (continued)**

| Part Number | Description | Action |
|---|---|---|
| F771-7 | Filter – G918-1 Box Assembly | Replace with new. |
| F792-1 or -2 | Dual Tachometer | Replace with new. |
| G732-2 | Cap (with C130-62 spacer) | Replace with G732-3 cap. |
| A880-908 or AN815-8D | Union – Engine Oil Outlet (replaces CV26-77 check valve on helicopter S/N 0222 and prior) | Replace with new. |
| A880-908 or AN815-8D | Union – Oil Tank Vent (at engine) | Replace with new. |
| A880-910 or AN815-10D | Union – Engine Oil Inlet | Replace with new. |
| MS16562-4 | Spring Pin (at D333-13 fitting on PTG lever) | Replace with new. |
| MS29512-10 | Packing (left rollover valve) | Replace with new. |
| NAS1149E0363R | Washer (at A462-4 fittings) | Replace with new. |
| NAS557-32A | Grommet – Firewall (engine drive shaft weldment) | Replace with new. |
| NAS6604-67 | Bolt (clutch assembly) | Replace with new. |

# CHAPTER 5

# INSPECTIONS

## CHAPTER 5

## INSPECTIONS (Continued)

# CHAPTER 5

# INSPECTIONS

## 5-10 Introduction

The R66 helicopter must be inspected periodically to verify it is in airworthy condition; refer to Table 1.

> NOTE
>
> Helicopters on a Part 91 Approved Inspection Program (AIP), a Part 135 Approved Aircraft Inspection Program (AAIP), or an equivalent foreign-approved inspection program, must refer to & comply with that program. Refer to current revisions of FAA Advisory Circulars 91-90 & 135-10.

Fluid leaks, discoloration, dents, scratches, nicks, cracks, galling, chafing, fretting, and corrosion all warrant further investigation. Unairworthy items must be replaced or repaired as allowed by Robinson Helicopter Company. This section contains procedures for performing the required periodic airframe inspections.

> NOTE
>
> Unless directed by Service Bulletin, parts which were not listed as requiring replacement during previous compliance with a 12-year or 2000-hour Inspection may remain in service until next 12-year or 2000-hour Inspection (whichever occurs first).

## 5-20 [Reserved]

## 5-30 General Procedures

Unless otherwise specified, the following general procedures apply to R66 inspection. When required, magnetic particle inspection may be performed in accordance with ASTM E 1444 and MIL-STD-1907. Fluorescent penetrant inspection may be performed in accordance with ASTM E 1417 and MIL-STD-1907.

### 5-31 Ball and Roller Bearings

The first indication of bearing failure is usually an increase in bearing noise. Noise will almost always start several hours prior to bearing failure. Listen to drive system during start-up and shutdown. A failing bearing will produce a loud whine, rumble, growl, or siren sound. Upon hearing an unusual noise, thoroughly inspect all bearings before further flight.

A failing bearing may have a distorted seal or be exuding a large amount of grease. Monitor bearings for increase in temperature, but do not rely on Telatemps to detect failing bearings as temperature increase may occur only seconds before bearing disintegrates.

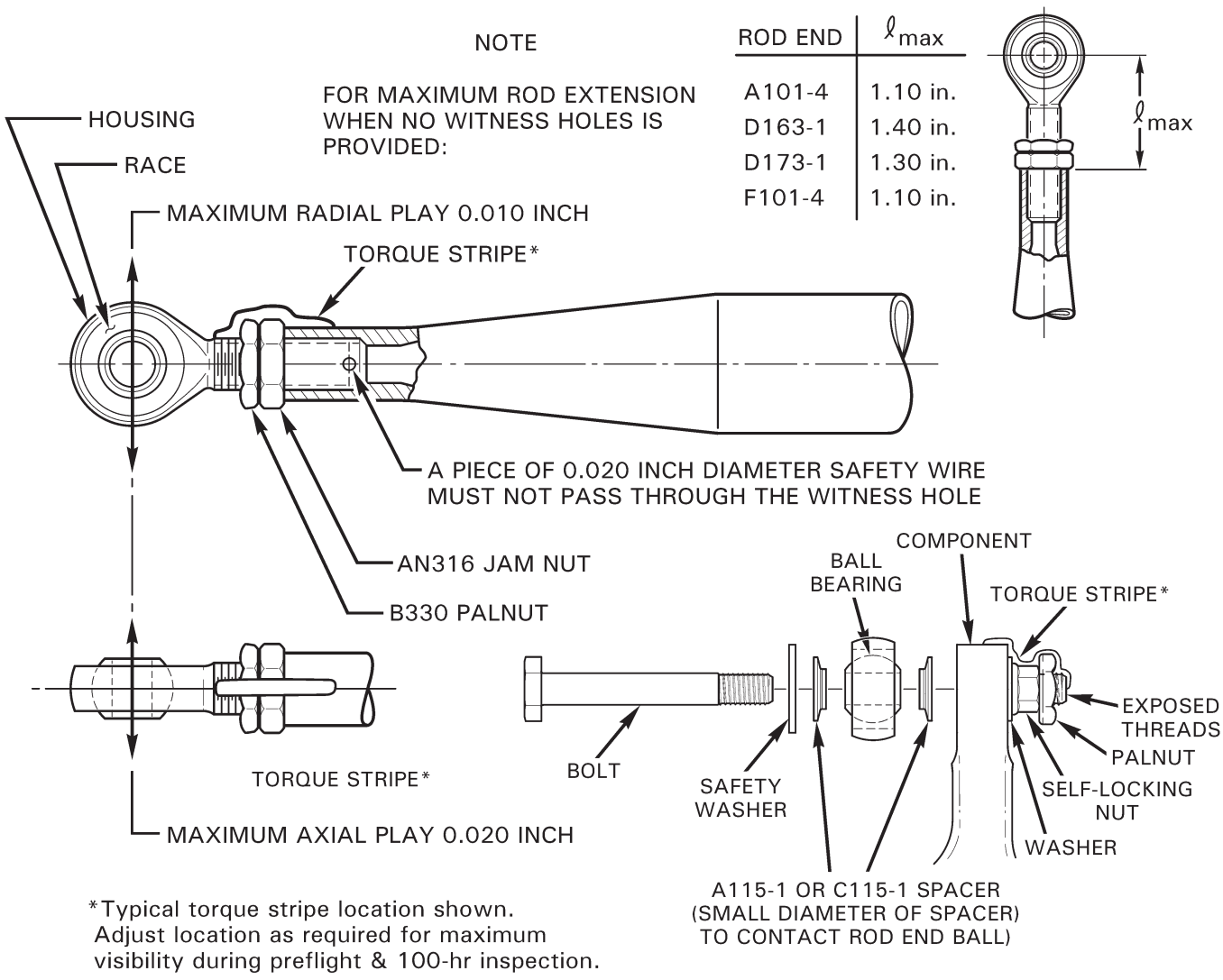
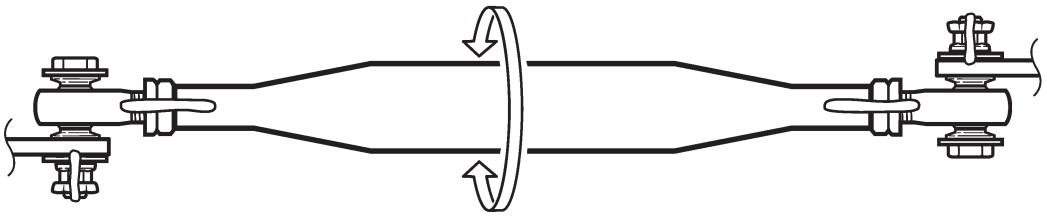



FIGURE 5-1 ROD END AND SPHERICAL BEARING PLAY LIMITS AND TORQUE STRIPE APPLICATION



Position rod ends for maximum rotation

FIGURE 5-2 ROD END CENTERING

## 5-45 100-Hour / Annual Maintenance and Inspection

RHC recommends retaining a copy of the most recently performed 100-hour / annual checklist with the aircraft's maintenance records to meet the requirement of 14 CFR § 91.417 (b)(1).

R66 Serial No.: _____ Technician Name: _____

Registration No.: _____

Collective-Activated (Time In Service) Hourmeter Indication: _____ Technician Certificate Number: _____

Helicopter Total Time In Service: _____

_____ **Operation Checks:**
Perform ground and flight checks per § 5-40.

**A. Preparation**

_____ **Cleaning (required by 14 CFR Part 43, Appendix D, paragraph (a)):**
Before cleaning, identify leak/debris type & source, and note if more investigation is required. Clean main and tail rotor blades, hubs, and airframe exterior with a mild soap (pH between 7 & 9) and water solution per Chapter 20.

**CAUTION**

Do not spray main rotor hub, tail rotor gearbox vent, hydraulic reservoir vent, swashplate area, or bearing seals with high-pressure water or solvent as water or solvent may cause corrosion or breakdown of lubricants. See RR300 Series Operation and Maintenance Manual (OMM) for engine cleaning instructions and precautions.

_____ **Access and Inspection Panels:**
Refer to R66 Illustrated Parts Catalog Chapter 6 for access and inspection panel locations. Remove or open necessary panels, doors, covers, fairings, and cowlings in accordance with 14 CFR Part 43, Appendix D, paragraph (a).

NOTE

If radio antennas are installed on removed panels, disconnect antenna lead and corresponding ground wire. Pull respective radio circuit breaker and tag circuit breaker with "Antenna Removed."

**CAUTION**

Instrument console removal (§ 95-50) is not required for scheduled inspections. Sufficient access for inspection is gained by removing the chin inspection panel, as well as removal of installed avionics, as required (refer to Chapter 97).

5-45 100-Hour / Annual Inspection (continued)

**B. Inspection**

CABIN FORWARD FOOTWELLS

_____ **Tail Rotor Pedal Bearing Blocks:**
Remove pedal bearing block covers as required. Examine accessible portion with inspection light and mirror. Inspect condition. Check for looseness or play in pedal bearings. Maximum allowable play is 0.080 inch axially and 0.030 inch radially. Verify bearing block security.

_____ **Adjustable Tail Rotor Pedals:**
Inspect condition. Verify no cracks in welds. Verify locking pins engage holes to secure adjustable pedals. Verify proper operating clearance. Verify no evidence of contact between outboard portion of lateral (torque) tube of RH pedal and under-floor longitudinal stiffener. Verify smooth actuation.

_____ **Co-Pilot Removable Tail Rotor Pedals:**
Inspect condition. Verify no cracks in welds. Verify locking pins engage holes to secure removable pedals. Verify proper operating clearance and smooth actuation.

_____ **Cabin Heater Diffusers:**
Inspect condition. Verify marking legibility. Verify no significant nicks, scratches or dents, or cracks in welds. Verify security.

_____ **Fire Extinguisher and Mount:**
Inspect condition. Inspect fire extinguisher per manufacturer's instructions. Verify no loss of charge or obstructions in extinguisher nozzle. Verify security.

_____ **Map Holders:**
Inspect condition. Verify no defects, tears, or material deterioration. Remove foreign objects and verify security.

_____ **License Holder:**
Inspect condition. Verify no defects, cracks in plastic, or material deterioration. Verify security.

_____ **Cabin Chin and Floor:**
Inspect condition. Verify equipment security. Retrieve and discard trapped debris.

CONSOLE

_____ **Console Assembly:**
Inspect condition. Verify no significant nicks, scratches or dents; verify no cracks, corrosion, or loose rivets in lower console assembly. Verify hinge security.

_____ **HID Landing Lights:**
Inspect condition. Verify proper installation and security of wiring and equipment.

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5-45 100-Hour / Annual Inspection (continued)

MAIN ROTOR GEARBOX COMPARTMENT

_____ **Cowling Doors:**
Inspect condition. Verify proper operation of fasteners.

_____ **Antenna Wiring & Connectors:**
Inspect condition. Verify no loose, chafed, frayed, or broken wires. Verify no damaged connectors. Verify neatness, proper routing and installation, and security. Check grommets for proper installation.

_____ **Placards:**
Verify placard legibility, proper installation, and security. Refer to Chapter 11.

_____ **Fuel Tank:**
Examine accessible portion with inspection light and mirror. Inspect condition of exterior and verify no leakage. Check bladder interior for foreign objects or debris. Verify security.

_____ **Fuel Gage Sender & Wiring:**
Inspect condition. Verify no loose, chafed, or broken, wires or terminals. Verify proper installation and security of sender and wiring.

_____ **Low-Fuel Switch Assembly Warning:**
Turn battery switch on. With a clean wooden dowel, gently depress low-fuel sender float in fuel bladder and verify LOW FUEL warning segment illuminates after approximate 1-second delay. Turn battery switch off.

_____ **Fuel Cap:**
Inspect condition. Verify no damage or deterioration of gasket. Install cap and verify proper locking function. Verify security.

_____ **Fuel Tank Rollover Vents:**
Inspect condition. Inspect Tygon® tube for defects, tears, or material deterioration. Verify proper safety wire installation and security. Verify 0.25 inch minimum clearance between cable assembly and vent assembly Tygon® tube; adjust cable as required. Verify no obstructions in vents.

_____ **Fuel Tank Sump Drain:**
Inspect condition. Verify drain valve opens easily, drains fuel freely, springs closed, and seals completely. Inspect drain tube and clamp for defects, tears, or material deterioration. Clear fuel from drain tube and install clamp.

_____ **Fuel Valve:**
Inspect condition. Verify cable and component security. Verify proper installation and (smooth) operation of valve.

5-45 100-Hour / Annual Inspection (continued)

MAIN ROTOR GEARBOX COMPARTMENT (continued)

_____ **Cabin Bulkhead:**

Inspect condition. Verify no deformation, buckling, wrinkling, nicks, scratches, dents, cracks, corrosion, fretting, or loose rivets. Verify no leakage from fuel tanks. Verify security.

_____ **Main Rotor Gearbox:**

Inspect condition. Verify no damage, material deterioration, or deformation of gearbox mounts. Verify no leakage at mast tube-to-gearbox attachment. Inspect mast tube for cracks. With ship on level ground, verify correct oil level and cleanliness through sight gage and adjust or flush as required. Verify security of Hall Effect senders and yoke magnets. Inspect oil lines for leakage, chafing, or obvious damage. Inspect oil pump mounting and fittings for leaking or obvious damage. Inspect gearbox oil filter for leakage or for tripped bypass indicator. Verify oil system proper installation and security.

NOTE

At 600 hours time in service or annually, whichever occurs first, remove chip detector and clean detector's magnetic probe and adjacent metal body using a toothbrush and approved solvent per § 12-13 Part B. Service gearbox, change oil and filter, and clean chip detector at intervals recommended in § 1-90.

_____ **Rotor Brake:**

Inspect condition. Verify integrity of brake pads and 0.030 inch minimum pad thickness. Verify brake pads are clear of engine shaft with brake released. Inspect micro switches for cracks. Verify no loose, chafed, or broken wires or terminals. Verify security. Inspect both pulleys (one at end of lever, one next to fuel tank) for cracks. Verify no frayed strands or binding of rotor brake activating cable. Verify proper routing and installation, security, and operation of brake and brake micro switch.

_____ **Hydraulic Servo Support Frame:**

Inspect condition. Inspect rod ends per § 5-33. Use an inspection light and mirror to inspect all parts of each weld. Verify no cracks or corrosion in servo support. Verify proper installation and security.

_____ **Jackshaft:**

Inspect condition. Verify no cracks or corrosion in welded assembly. Inspect jackshaft to vertical push-pull tube attachment. Inspect jackshaft aft support frame attachment and forward attachment rod end per § 5-33. Inspect C343-8 tube and rod ends linking jackshaft to aft servo. Verify security and proper operating clearance.

5-45 100-Hour / Annual Inspection (continued)

MAIN ROTOR GEARBOX COMPARTMENT (continued)

_____ **Main Rotor Push-Pull Tubes:**

Examine accessible portion with inspection light and mirror. Inspect condition per § 5-32. Verify no nicks, scratches, chafing, dents, cracks or corrosion. Inspect rod end bearings per Section 5-33; verify rod ends are centered and palnut and jam nut are tight. Check witness holes for proper thread engagement. Verify proper installation, security, and operating clearance.

_____ **Tail Rotor Push-Pull Tube & Forward Bellcrank:**

Examine accessible portion with inspection light and mirror. Inspect condition per § 5-32. Verify no nicks, scratches, chafing, dents, cracks, or corrosion. Inspect rod end bearings per § 5-33; verify rod ends are centered and palnut and jam nut are tight. Check witness holes for proper thread engagement. Inspect bellcrank and bellcrank sheet metal mounting for nicks, scratches, dents, cracks, or corrosion. Inspect spherical bearings per § 5-33. Verify proper installation, security, and operating clearance.

_____ **Hydraulic Reservoir:**

Inspect condition. Verify no significant leakage. Replace filter and packing at intervals specified in § 1-90. Drain and flush hydraulic system per § 12-33 if oil has turned dark or emits bad odor. Add fluid as required. Verify security.

**CAUTION**

Cleanliness of hydraulic fluid is vital to proper system operation. Service hydraulic system with clean fluid from sealed containers. Verify funnels, tubing, and other service tooling is free of contaminants.

_____ **Hydraulic Servos:**

Inspect condition. Inspect rod ends per § 5-33. Verify approximately 0.040 inch total free play at servo valve input. Hydraulic fluid seepage is permissible (“seepage” is evidence of fluids without flow, drips, or runs) provided fluid does not contaminate MRGB rubber mounts. Clean servo input rod end/clevis area with no-residue, nonalcoholic solvent as required. Verify no obvious defects and security of scissors at upper clevis of servos. Verify proper installation and clearance from surrounding structure through full control travel.

**CAUTION**

Use LPS PreSolve to clean hydraulic parts. Do not use alcohol.

5-45 100-Hour / Annual Inspection (continued)

MAIN ROTOR GEARBOX COMPARTMENT (continued)

_____ **Hydraulic-Servo Absorbent Pad (Recent Servos Only):**
If installed, examine white absorbent pad(s); replace pad if damaged. If pad is discolored, remove pad from tray, then use a roller to squeeze out absorbed fluid, or replace pad. Clean tray & install pad.

_____ **Hydraulic Hoses, Lines, & Fittings:**
Inspect condition. Verify no leakage, chafing, or obvious damage to hydraulic lines. Verify integrity of connections. Verify fluid line clearance to installed equipment and surrounding structure and sufficient fluid hose slack available through full control travel. Verify proper installation and security.

_____ **Hydraulic Pump:**
Inspect condition. Inspect Telatemp per § 5-35. Verify no significant leakage. Verify proper installation and security.

_____ **Upper Steel Tube Frame:**
Inspect condition. Verify no nicks, scratches, dents, cracks, or corrosion. Verify no chafing where wires, hoses, or clamps attach to frame. Examine each weld for cracks with an inspection light and mirror.

**CAUTION**

Upper steel tube frame is fatigue loaded and therefore susceptible to fatigue cracks. Inspect all joints thoroughly.

_____ **F908-1 (Tail Rotor Drive) Yoke Assembly:**
Inspect condition. Verify no cracks, corrosion, or fretting. Verify proper installation, security, and operating clearance. Verify security of magnets.

_____ **G779-1 Pulley (Air Conditioning; if installed):**
Inspect condition. Verify no cracks, corrosion, or fretting. Verify no nicks or sharp edges in fins that could damage v-belt. Verify proper installation, security, and operating clearance.

_____ **V-Belt (Air Conditioning; if installed):**
Inspect condition. Replace belt if exhibiting frayed edges, excessive cracking, heat damage, or rubber deterioration. Verify 4.5–5.5 lb of force applied mid-span deflects belt 0.16-inch; adjust as required per § 21-21.

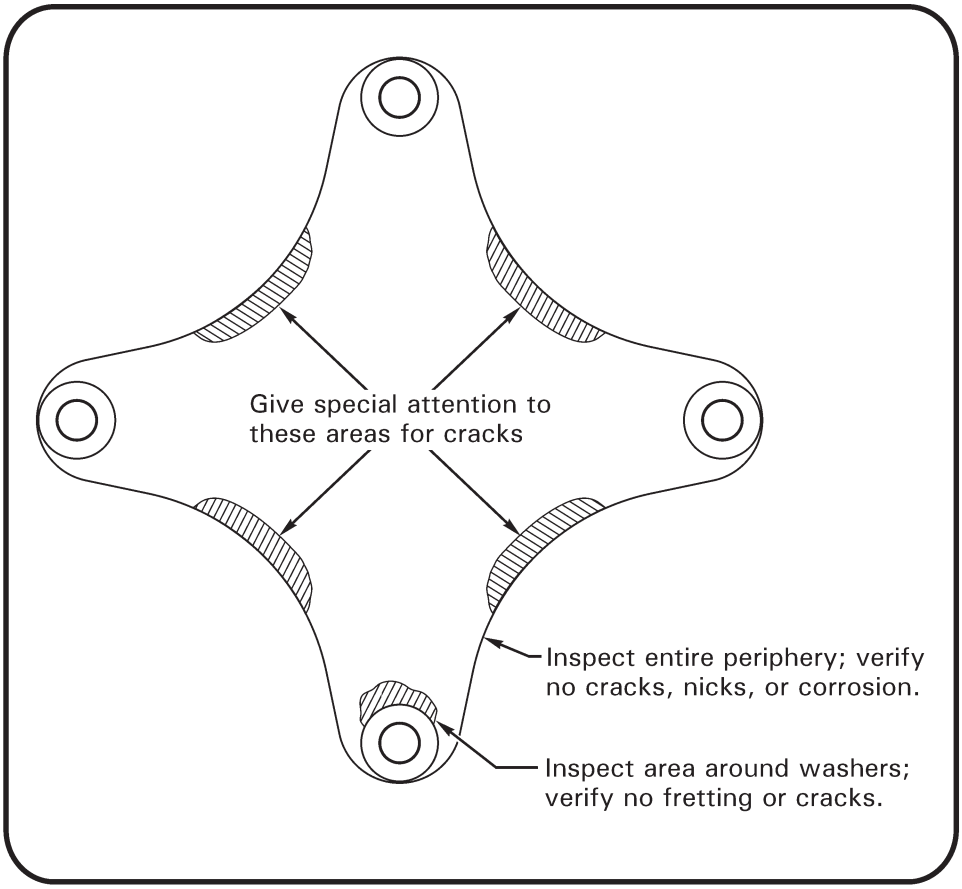



FIGURE 5-4A FLEX PLATE INSPECTION

5-45 100-Hour / Annual Inspection (continued)

MAIN ROTOR GEARBOX COMPARTMENT (continued)

_____ **Compressor Assembly (Air Conditioning; if installed):**
Inspect condition, including integrity of belt-tension slotted plate. Verify security of mounting. Verify no loose, chafed, frayed, or broken wires. Verify proper installation and security of pressure switches, snubber, and refrigerant lines.

_____ **Refrigerant Hose Assemblies (Air Conditioning; if installed):**
Verify security, no damage, and clearance to adjacent structure. Verify dust caps installed on service fittings where lines mount to compressor.

_____ **F196-1 (Tail Rotor Drive) Fan Shaft:**
Inspect condition. Verify no shaft corrosion. Remove any light surface corrosion and apply wax or suitable corrosion inhibitor. Verify no cracks, corrosion, or fretting in fore and aft weldment. Verify proper installation, security, and operating clearance.

5-45 100-Hour / Annual Inspection (continued)

ENGINE (continued)

_____ **Firewalls:**

Inspect condition. Verify no deformation, buckling, wrinkling, cracks, corrosion, fretting, or loose rivets. Pay particular attention to structural attachment points. Inspect condition of engine-to-firewall seal. Verify no open holes.

**WARNING**

**Open holes in engine-to-firewall seals are potential fire leak paths.**

_____ **Engine Mounts:**

Inspect condition. Verify no cracks or corrosion in engine mount weldment. Verify safety wire and security of mounting bolts.

_____ **Lower Steel Tube Frame:**

Inspect condition. Verify no nicks, scratches, dents, cracks, or corrosion. Verify no chafing where wires, hoses, or clamps attach to frame. Examine each weld for cracks with an inspection light and mirror.

_____ **Condenser and Fan Assemblies (Air Conditioning; if installed):**

Inspect condition. Verify security of fans, box assembly, condenser, and firewall supports. Verify security of desiccant cap.

_____ **Refrigerant Line Assemblies (Air Conditioning; if installed):**

Inspect condition. Verify security, no damage, and clearance to adjacent structure.

_____ **Wiring:**

Inspect condition. Verify no loose, chafed, or broken wires or terminals. Check for heat or fluid damage. Verify neatness, proper routing and installation, and security.

_____ **Fasteners & Torque Stripes:**

Inspect condition. Verify proper installation and security of fasteners. Renew deteriorated torque stripes per Figure 5-1.

_____ **Close & Secure:**

Verify foreign objects are removed. Verify equipment security. Verify cleanliness of interior and of cover or cowling. Install/close inspection covers or cowlings removed in preceding steps. Verify security.

5-45 100-Hour / Annual Inspection (continued)

TAILCONE & STABILIZERS

_____ **Inspection Plugs:**
Inspect condition. Verify proper operation of fasteners.

_____ **Tail Rotor Drive Shaft Assembly:**
Examine accessible portion through inspection holes with inspection light and mirror. Verify no cracks, corrosion, or fretting in fore and aft weldment. Verify no evidence of drive shaft contact with tailcone bays. Verify no bowing, bends, dents, cracks, or corrosion. Perform tail rotor drive shaft runout per § 65-21. Verify proper installation, security, and operating clearance.

**CAUTION**

Bowing, bends, dents, cracks, or corrosion are cause for immediate replacement of tail rotor drive shaft.

_____ **Tail Rotor Push-Pull Tube & Forward Bellcrank:**
Examine accessible portion through inspection holes with inspection light and mirror. Inspect condition per § 5-32. Verify no nicks, scratches, chafing, dents, cracks, or corrosion. Inspect rod end bearings per § 5-33; verify rod ends are centered and palnut and jam nut are tight. Check witness holes for proper thread engagement. Inspect bellcrank and bellcrank mount for nicks, scratches, dents, cracks, or corrosion. Inspect spherical bearings per § 5-33. Verify proper installation, security, and operating clearance. Verify tail rotor guard mounting screw shanks clear push-pull tube.

_____ **Tail Rotor Drive Shaft Hanger Bearing & Hanger:**
Inspect condition. Inspect bearing for obvious damage. Verify integrity of bearing seals. Verify bearing's inner race-to-drive shaft torque stripe is intact and no evidence of bearing slippage on shaft. Verify no bends, cracks, corrosion, or obvious damage to hanger and hanger mount to tailcone bulkhead. Verify proper installation, security, and smooth operation.

_____ **Tail Rotor Drive Shaft Damper Assembly:**
Inspect condition. Inspect bearing for obvious damage. Verify integrity of bearing seals. Inspect bearing housing for cracks or corrosion. Verify bearing's inner race-to-drive shaft torque stripe is intact and no evidence of bearing slippage. Verify no bends, cracks, corrosion or obvious damage to friction arms and (Teflon) bearings. Verify proper installation, security, and smooth operation.

_____ **Tailcone Interior:**
Inspect condition. Verify no nicks, scratches, dents, cracks, corrosion, fretting or loose rivets. Verify no cracks where damper assembly mounts to tailcone. Verify no excessive wear in bulkhead bushings from push-pull tubes. Retrieve and discard trapped debris.

5-45 100-Hour / Annual Inspection (continued)

TAILCONE & STABILIZERS (continued)

_____ **Tailcone Exterior:**
Inspect condition. Refer to § 53-41. Inspect tailcone exterior for nicks, scratches, dents, cracks, corrosion, fretting or loose rivets. Verify no obstructions in drain hole at forward edge of each bay (except forward bay).

_____ **F050-2 Horizontal Stabilizer (if installed):**
Inspect condition. Verify no nicks, scratches, dents, cracks, corrosion, fretting, or loose rivets. Verify security.

_____ **Empennage:**
Inspect condition. Verify no nicks, scratches, dents, cracks, corrosion, fretting, or loose rivets on skins or near attachment points. Check tail rotor skid for evidence of tail rotor or tail rotor skid strike. Refer to § 5-61 for tail rotor skid strike inspection criteria. Verify no obstructions in lower vertical stabilizer and skid drain holes. Verify proper installation and security.

_____ **Aft Navigation Light:**
Inspect condition. Verify no cracks where aft navigation light mounts to empennage. Verify lens cleanliness, clarity, and security. Verify proper operation.

_____ **Antennas:**
Inspect condition. Verify no cracks where antennas mount to tailcone. Verify security.

_____ **Anti-Collision Light:**
Inspect condition. Verify no cracks where anti-collision light mounts to tailcone. Verify lens cleanliness, clarity, and security. Verify proper operation.

_____ **Tail Rotor Visual Warning Guard:**
Inspect condition. Verify no cracks where guard mounts to tailcone. Inspect guard welds for cracks or corrosion. Verify security.

_____ **Wiring:**
Inspect condition. Verify no loose, chafed, or broken wires or terminals. Verify neatness, proper routing and installation, and security.

_____ **Fasteners & Torque Stripes:**
Inspect condition. Verify proper installation and security of fasteners. Renew deteriorated torque stripes per Figure 5-1.

_____ **Close & Secure:**
Verify foreign objects are removed. Verify equipment security. Verify cleanliness of interior and of inspection plugs. Install plugs removed in preceding steps. Verify security.

5-45 100-Hour / Annual Inspection (continued)

TAIL ROTOR & TAIL ROTOR GEARBOX

| NOTE |
| --- |
| Verify proper hardware installation securing plastic inspection cover. Longer screws could contact aft flex coupling and yoke. |

_____ **Plastic Inspection Cover:**
Clean cover and inspect condition. Replace as required.

_____ **C947-3 (Tail Rotor Drive) Plate Assembly, Aft:**
Refer to Figure 5-4A. Inspect condition. Verify no distortion, nicks, scratches, cracks, corrosion, and fretting. If fretting is detected, contact RHC Technical Support. Verify bonded washers are installed on both sides of each flex plate ear. Verify proper installation, security, and operating clearance.

_____ **Tail Rotor Gearbox Input Yoke:**
Inspect condition. Verify no cracks, corrosion, or fretting. Inspect weld for cracks or corrosion. Verify proper installation, security, and operating clearance.

_____ **Tail Rotor Gearbox:**
Inspect condition. Verify gearbox-to-tailcone mounting security. Verify no leakage at input or output seals, chip detector, vent plug-filler assembly, or sight gage. With ship on level ground, verify correct oil level and oil cleanliness through sight gage and adjust or flush as required. Inspect Telatemp per § 5-35. Inspect output shaft for nicks, scratches, dents, cracks, or corrosion. Verify proper installation of safety wire (if installed). Gearbox S/Ns 9684 & prior: using 10X magnification, visually inspect four curved surfaces on input cartridge per Figure 5-4B; if cracking is detected, remove gearbox from service and perform C148 Bulkhead Inspection per § 5-75.

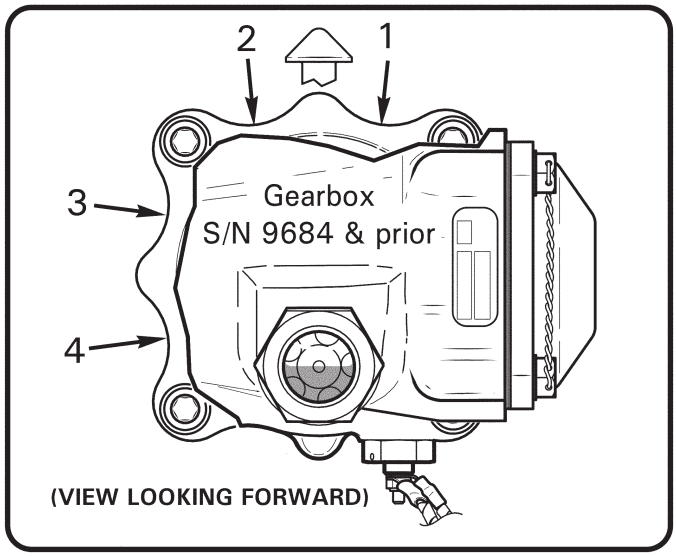



FIGURE 5-4B TRGB INPUT CARTRIDGE INSPECTION

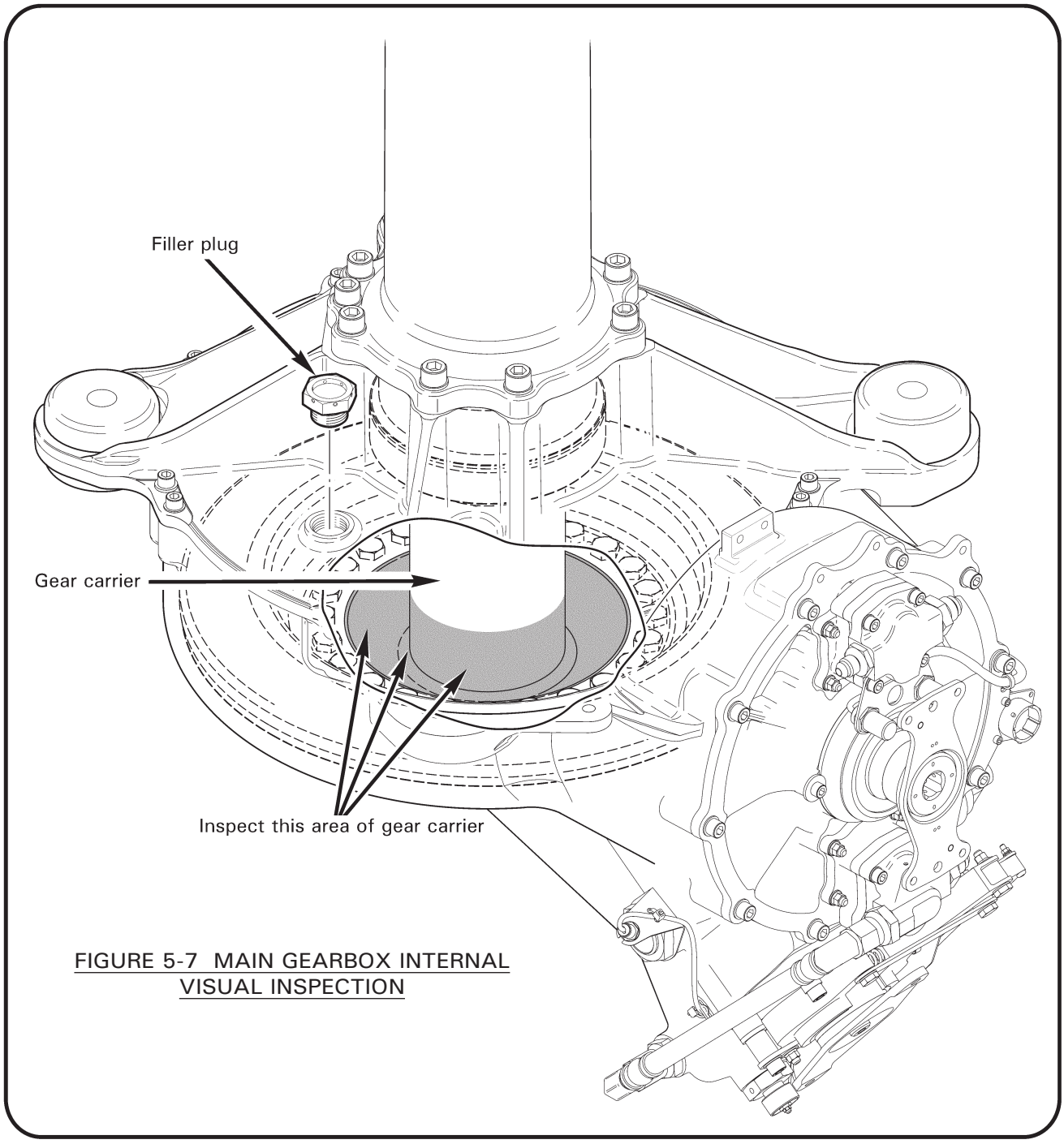



FIGURE 5-7 MAIN GEARBOX INTERNAL VISUAL INSPECTION

## 5-74 Main Rotor Gearbox Internal Visual Inspection

1. Refer to Figure 5-7. Gain access to and remove main gearbox filler plug.
2. Via filler plug hole and using borescope, miniature camera, or smartphone camera with flash, visually inspect specified area of gear carrier. Rotate gearbox by hand-turning main or tail rotor as required to view entire circumference.
3. If no corrosion or paint bubbling is evident, install filler plug & special torque per § 20-33.
4. If corrosion or paint bubbling is detected, contact RHC Technical Support.

## 5-75 C148 Bulkhead Inspection

For damage to an installed C042-1 upper vertical stabilizer, C043-1 lower vertical stabilizer, and/or C044 horizontal stabilizer that results in denting, tearing, or cracking of stabilizer metal, or if a tail skid strike or tail gearbox breakage has occurred, perform the following:

1. On associated tailcone's C148 bulkhead, strip paint from cross-hatched surfaces shown in Figure 5-8 using § 20-71 approved materials.
2. Perform fluorescent penetrant inspection (FPI) per § 20-42 of stripped surfaces. Replace tailcone if crack is indicated.
3. Conversion coat bare aluminum per § 20-51, as required. Epoxy prime (chromated-epoxy primer preferred) & topcoat stripped surfaces per § 20-60.

| NOTE |
| --- |
| Do not apply primer or topcoat to tail rotor gearbox attachment surfaces. |

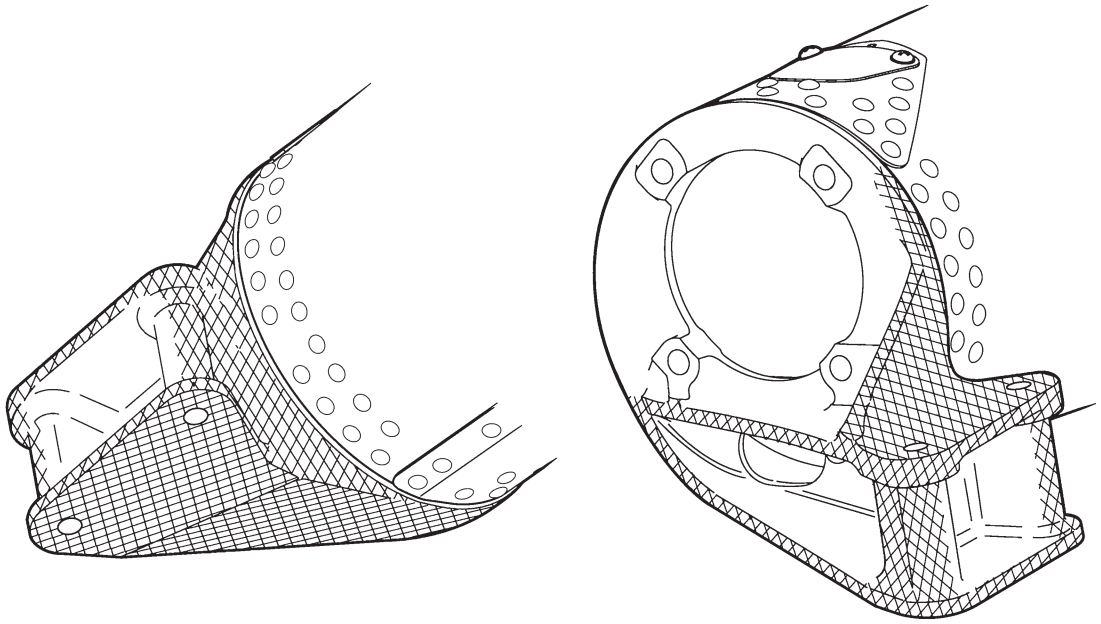


FIGURE 5-8 PENETRANT INSPECT CROSS-HATCHED SURFACES OF C148 BULKHEAD

## 8-22 Weighing Procedure and Calculations

NOTE

- Arm is the distance in inches from datum.
- Datum is located 100 inches forward of main rotor centerline.
- CG (arm) is determined by dividing total moment by total weight.

1. Refer to § 8-20. Prepare helicopter for weighing per § 8-21.
2. Refer to Figure 8-3. Place a jack and one 1000-lb capacity (minimum) scale under each (landing gear) aft strut assembly jack lug/tab and under the ground handling ball.
3. Zero scales, or record tare weight (items between scale and weighing point such as adapter, jack, stand, sandbags, etc.) at each scale.
4. Level helicopter for weight and balance per §§ 8-10 and 8-11. Remove spirit level. If removed, carefully replace F463-1 aft tunnel cover, unsecured, on top of keel panels.
5. Calculate net weights:

| Weighing Point | Scale Indication | | Tare Weight | | Net Weight |
|---|---|---|---|---|---|
| Forward: | _____ | – | _____ | = | _____ lb |
| Left: | _____ | – | _____ | = | _____ lb |
| Right: | _____ | – | _____ | = | _____ lb |

8-22 Weighing Procedure and Calculations (continued)

6. Calculate weight and CG per the following table. Adjust ballast per steps 6b thru 6e, as required, until calculated CG is between 101.50 and 102.50 per step 6a. For Police or ENG versions, also refer to § 90-90 or § 92-285, respectively.

| NOTE |
|---|
| Calculated CG forward of 101.5 inches with maximum empennage ballast installed is permissible. |

| Item | Weight (lb) | | Longitudinal CG (arm, inches) | | Moment (in.-lb) |
|---|---|---|---|---|---|
| Forward Net: | _____ | x | 32.67 | = | _____ |
| Left Net: | _____ | x | 127.35 | = | _____ |
| Right Net: | _____ | x | 127.35 | = | _____ |
| Pilot (right forward seat; add): | 160.00 | x | 49.00 | = | 7840.00 |
| Unusable fuel (add): | 6.70 | x | 110.40 | = | 739.68 |
| **Calculated weight and CG:** | _____ | | _____ | | _____ |

a. If Calculated CG is between 101.50 and 102.50, (additional) ballast is not required. Proceed to step 7.

b. If Calculated CG is less than 101.50 and nose ballast is not installed, install empennage ballast per § 8-32. Reweigh helicopter and calculate new weight and CG per the previous steps.

c. If Calculated CG is less than 101.50 and nose ballast is installed, determine (minimum) nose ballast to remove:

$$\frac{(102.50 - \text{Calculated CG}) \times \text{Calculated weight}}{97.35} = \_\_\_\_\_ \text{ lb}$$

Round down to nearest 0.25 lb. Remove nose ballast per § 8-31. Reweigh helicopter and calculate new weight and CG per the previous steps.

d. If Calculated CG is greater than 102.50 and empennage ballast is installed, remove empennage ballast per § 8-32. Reweigh helicopter and calculate new weight and CG per the previous steps.

e. If Calculated CG is greater than 102.50 and empennage ballast is not installed, determine (minimum) additional nose ballast required:

$$\frac{(\text{Calculated CG} - 102.50) \times \text{Calculated weight}}{97.35} = \_\_\_\_\_ \text{ lb}$$

Round up to nearest 0.25 lb. Install nose ballast per § 8-31. Reweigh helicopter and calculate new weight and CG per the previous steps.

8-22 Weighing Procedure and Calculations (continued)

7. Lower helicopter per § 7-10. Secure aft tunnel cover.

8. Calculate basic empty weight and longitudinal CG:

| Item | Weight (lb) | | Longitudinal CG (arm, inches) | | Moment (in.-lb) |
|---|---|---|---|---|---|
| Forward Net: | _____ | x | 32.67 | = | _____ |
| Left Net: | _____ | x | 127.35 | = | _____ |
| Right Net: | _____ | x | 127.35 | = | _____ |
| Unusable fuel (add): | 6.70 | x | 110.40 | = | 739.68 |
| **Basic empty weight and longitudinal CG:** | _____ | | _____ | | _____ |

9. Calculate basic empty weight and lateral CG:

| Item | Weight (lb) | | Lateral CG (arm, inches) | | Moment (in.-lb) |
|---|---|---|---|---|---|
| Forward Net: | _____ | x | 4.13 | = | _____ |
| Left Net: | _____ | x | – 16.73 | = | _____ |
| Right Net: | _____ | x | 16.73 | = | _____ |
| Unusable fuel (add): | 6.70 | x | – 20.70 | = | – 138.69 |
| **Basic empty weight and lateral CG:** | _____ | | _____ | | _____ |

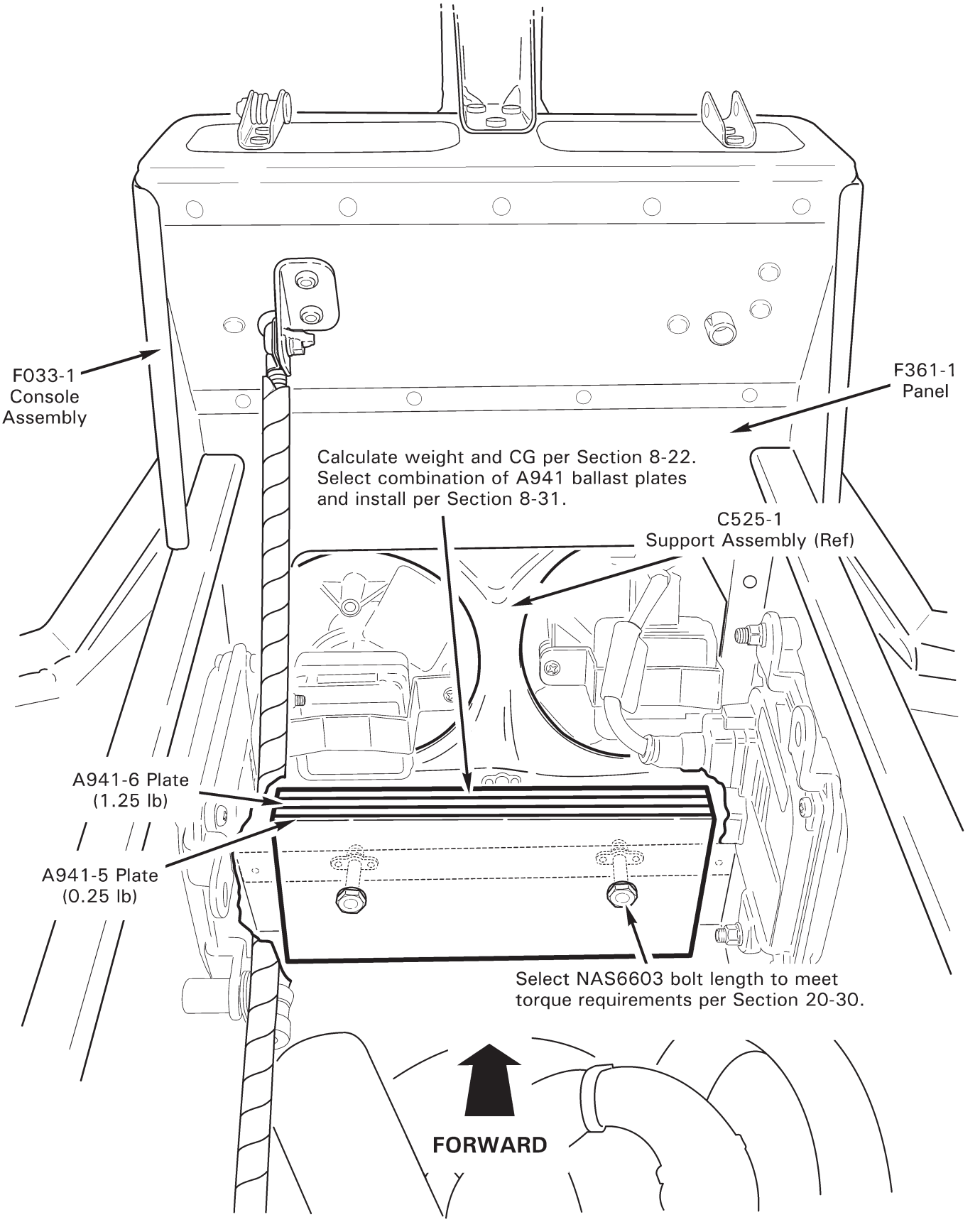



FIGURE 8-4 NOSE BALLAST
(View inside lower console assembly with upper console hinged aft)

## 12-50 Main Rotor Blades

**WARNING**

**Refer to appropriate Material Safety Data Sheet (MSDS) and take necessary safety precautions when working in proximity to hazardous materials.**

## 12-51 Pitch Bearing Housing

NOTE

MT147-1 Main rotor blade spindle air bleed tool includes supply container, hose assemblies, and bleed fittings.

### A. Servicing

1. Remove main rotor blades per § 62-10.
2. Refer to Figure 12-5. Place a suitable drain container below main rotor blade spindle assembly. Remove two B289-2 bolts and drain fluid.
3. Install MT147-1 bleed tool fittings into ports. Attach drain hose assembly to (top) bleed fitting, secure with two wraps 0.032-inch diameter lockwire, and safety tight. Position drain hose into drain container.
4. Place supply container with sufficient A257-4 fluid approximately 3 feet above spindle. Route fill hose assembly into drain container and open brass valve. Open supply container plastic valve and purge air from hose. Close valves.
5. Connect brass valve to (bottom) bleed fitting by tightening brass compression sleeve.
6. Open valves and fill spindle housing until no air bubbles are visible in drain hose assembly. Massage spindle boot, “pitch” blade up & down, and raise blade tip up & down to remove trapped air.
7. Remove drain hose assembly and (top) bleed fitting, and install B289-2 bolt. Roll the blade over. After five minutes, inspect the boot for leaks. If no leaks are found, close valves, remove fill hose assembly brass valve and (bottom) bleed fitting, and install other bolt.
8. Torque B289-2 bolts per § 20-33 and torque stripe per Figure 5-1.
9. Repeat steps for opposite blade.

## 12-60 Engine Oil Servicing

### A. Draining Fluid

1. Remove engine cowling per § 53-21.
2. Place a suitable drain container below B289-2 bolt in bend of F723-1 line assembly, and below AS5169D04 (drain) fitting in F649-1 oil cooler assembly.
3. Remove line assembly bolt and oil cooler assembly (drain) fitting and drain oil.
4. Service the engine oil system per RR300 Series Operation and Maintenance Manual (OMM).

### B. Adding Fluid

> NOTE
>
> Do not contaminate engine oil. Service engine oil system with clean fluid from sealed containers, using clean tools.

> NOTE
>
> When servicing airframe oil tank, full oil quantity is six quarts; minimum quantity for takeoff is four quarts.
>
> Six quart indication is top of knurled section of dipstick. Four quart indication is bottom of knurled section of dipstick or center of oil tank sight gage.
>
> If shut down for more than 15 minutes, some oil may drain from oil tank to engine giving a false low oil quantity indication. If oil level appears low, turn igniter switch OFF and have a qualified person motor engine with starter for 30 seconds then re-check oil quantity.

1. Install B289-2 bolt in bend of F723-1 line assembly and special torque per § 20-33.
2. Install AS5169D04 (drain) fitting in F649-1 oil cooler assembly and special torque per § 20-33.
3. Install engine cowling per § 53-21.
4. Open access door, remove dipstick, and service airframe oil tank using approved turbine engine oil per R66 Pilot's Operating Handbook (POH) Section 8.
5. Install dipstick and close access door.
6. Perform engine test per RR300 Series Operation and Maintenance Manual (OMM) as required.

# CHAPTER 29

# HYDRAULICS

## 29-00 Description

**WARNING**

**Except as instructed in this manual, service on the hydraulic system is limited to component removal and replacement.**

**CAUTION**

Cleanliness of hydraulic fluid is vital to proper system operation. Use only clean fluid from sealed containers and avoid contamination from dirty funnels, tubing, etc. Use LPS PreSolve to clean hydraulic parts. Do not use alcohol.

NOTE

Recent hydraulic servos include an absorbent pad. Any combination of servos with or without an absorbent pad is approved.

Hydraulically boosted main rotor flight controls eliminate cyclic and collective feedback forces. The hydraulic system consists of a pump, three servos, a reservoir, and interconnecting lines. Normal operating pressure is 450 to 500 psi. The pump is mounted on and driven by the main rotor gearbox. A servo is connected to each of the three push-pull tubes that support the main rotor swashplate. The reservoir is mounted to the aft end of the main rotor gearbox and includes a filter, pressure relief valve, and pilot-controlled pressure shut-off valve.

A sight glass for pre-flight fluid level checks is incorporated in the reservoir and accessible via a left side cowl door. A vented filler cap is located on top of the reservoir.

The pressure shut-off valve is solenoid-actuated and controlled by the hydraulic switch on the pilot's cyclic. The switch should be left on during helicopter shutdown and start up except during the hydraulic system check.

Electrical power is required to turn off hydraulics. Pulling HYD circuit breaker will NOT turn off hydraulics but will disable hydraulic switch.

## 29-10 Hydraulic Pump

### A. Removal

1. Remove tailcone cowling per § 53-23.

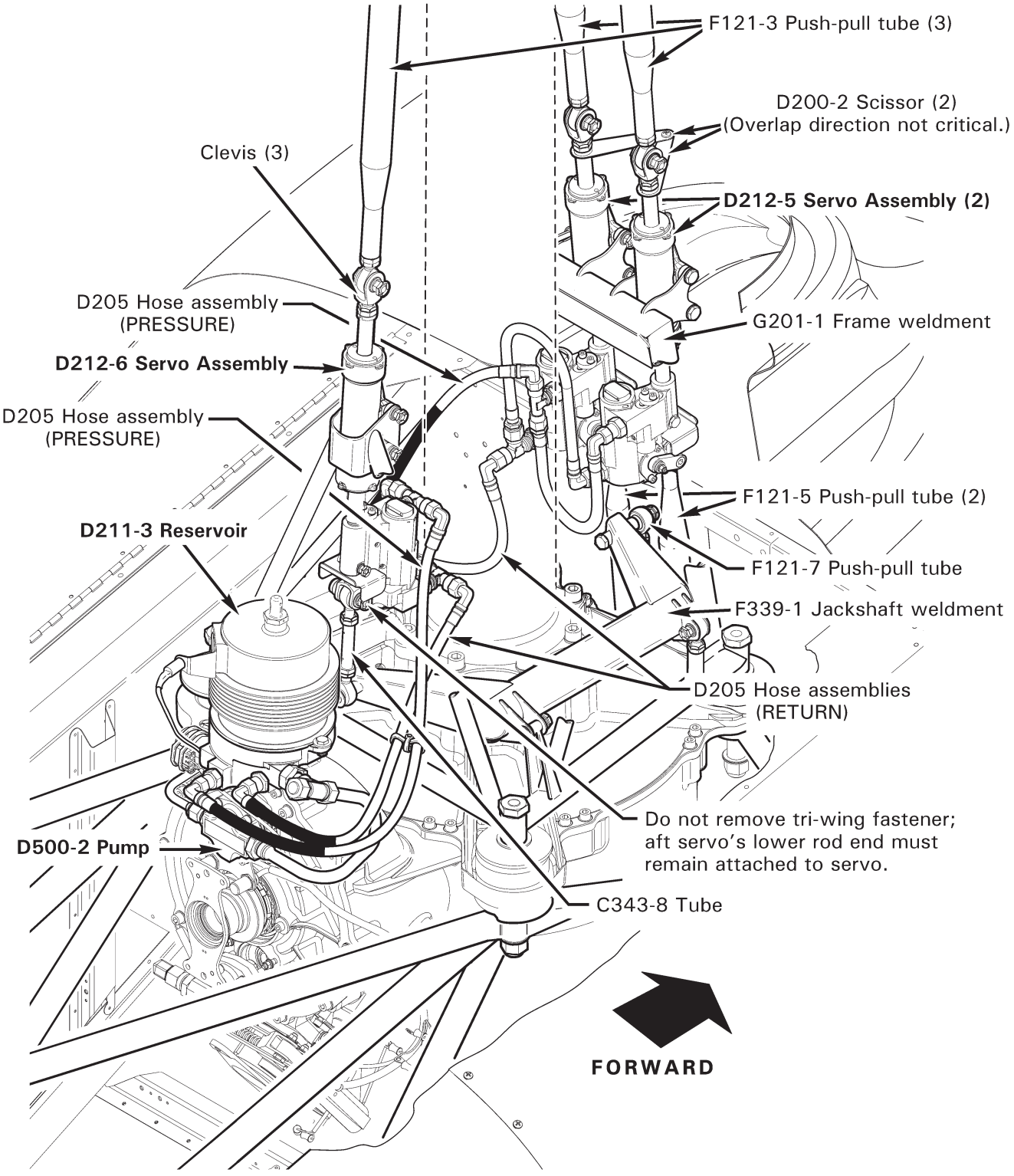



FIGURE 29-1 HYDRAULIC FLIGHT CONTROL SYSTEM

29-10 Hydraulic Pump (continued)

**A. Removal (continued)**

2. For helicopters with air conditioning:

   a. Loosen hardware securing G777-1 compressor assembly to G781-1 arm weldment.

   **CAUTION**

   Do not use refrigerant hose assemblies or fittings to rotate compressor. Do not rotate compressor further than necessary, to avoid damaging system wiring and refrigerant hoses or fittings.

   b. Rotate compressor down and inboard as required to disengage B173-5 v-belt from pulleys.

   c. Remove hardware securing G779-1 pulley to F908-1 yoke assembly and slide pulley aft (do not scuff paint on tail rotor drive fan shaft).

3. Remove hydraulic reservoir filler-vent and temporarily install an air-tight plug.

4. Refer to Figure 12-4. Remove F902 suction line assembly and protect exposed line and fitting openings.

5. Remove F902 pressure line assembly and protect exposed line and fitting openings.

6. Remove aft jam nut from both MR rpm senders and remove both senders from bracket attached to hydraulic pump. Temporarily secure senders away from drive train to prevent damage.

7. Remove four self-locking nuts and washers securing pump to gearbox and remove pump and o-ring. Discard o-ring. Protect pump opening on gearbox.

**B. Installation**

1. Prelubricate new o-ring with gearbox oil and install on pump mounting flange. With pump bracket pointing down, install pump on gearbox and secure. Special torque nuts per § 20-33.

2. Install both MR rpm senders in pump bracket. Adjust clearance between both senders and both yoke magnets to 0.040/0.020 inch and hand-tighten sender jam nuts.

3. Refer to Figure 12-4. Install F902 pressure line assembly & special torque per § 20-33.

4. Install F902 suction line assembly and special torque per § 20-33.

5. Remove temporary air-tight plug from reservoir and adjust fluid level as required. Install filler-vent and special torque per § 20-33.

6. Torque stripe jam nuts and B-nuts.

7. Bleed hydraulic system per § 12-34.

8. Install a 110-4 Telatemp on aft surface of pump.

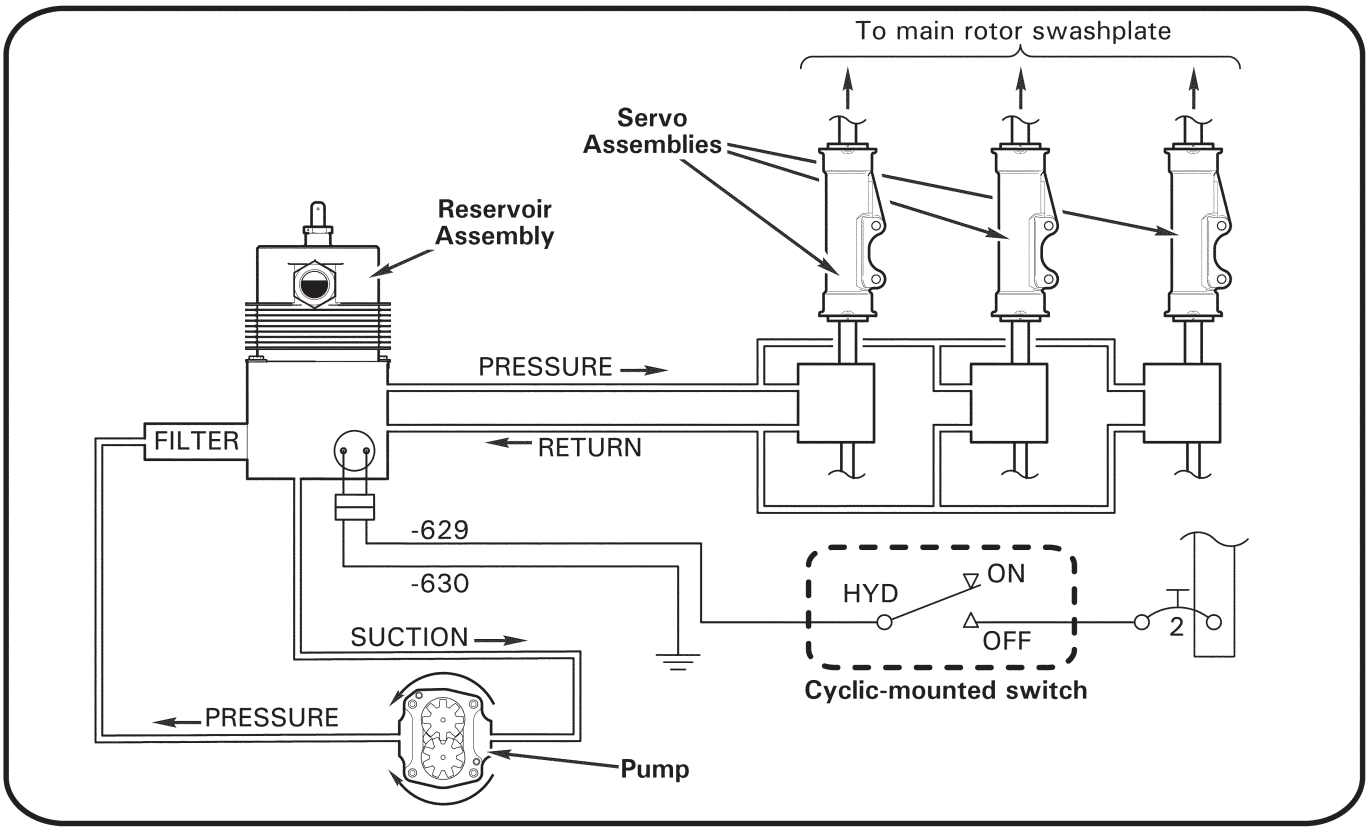



FIGURE 29-2 HYDRAULIC SYSTEM SCHEMATIC

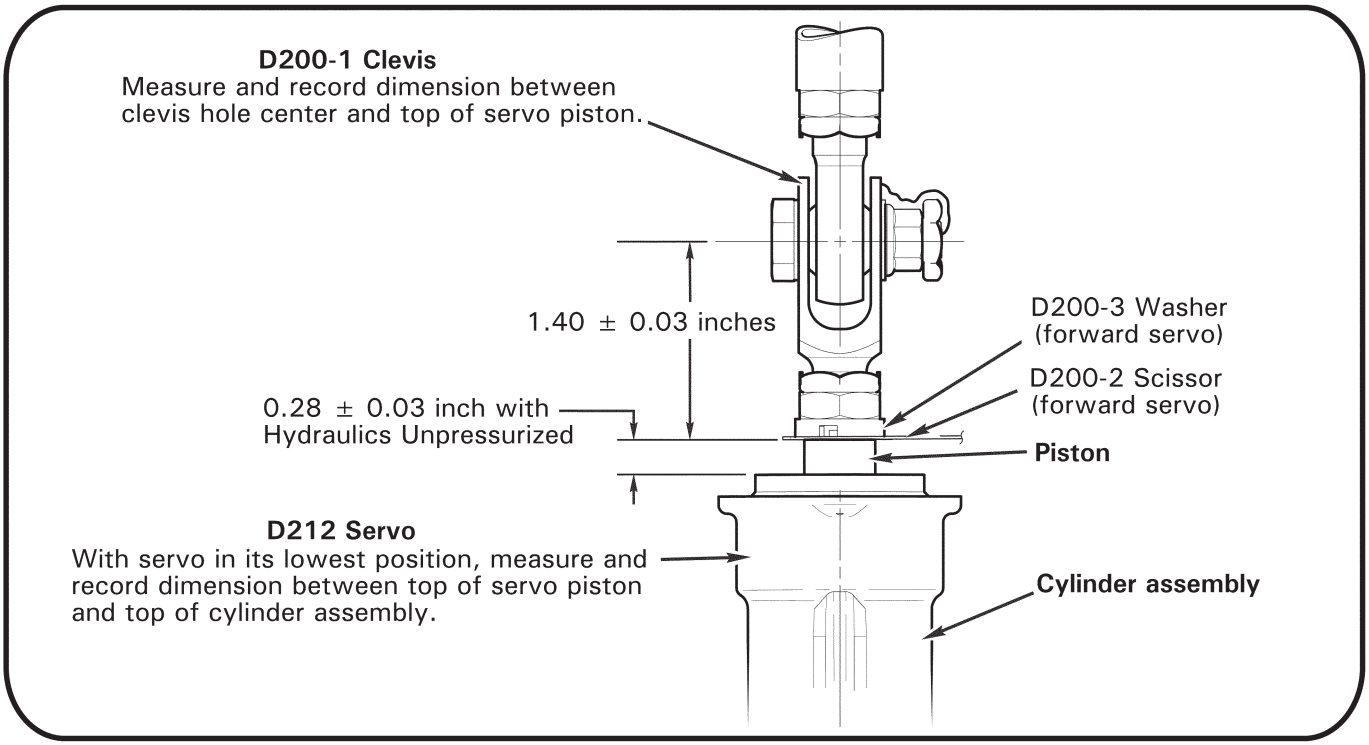



FIGURE 29-3 HYDRAULIC SERVO RIGGING

29-10 Hydraulic Pump (continued)

**B. Installation (continued)**

9. For helicopters with air conditioning:
   a. Position G779-1 pulley on F908-1 yoke assembly. Install hardware, standard torque nuts per § 20-32, and torque stripe per Figure 5-1.
   b. Route B173-5 v-belt onto pulleys. Rotate compressor up and outboard to tension belt, then tighten hardware securing compressor to weldment. Adjust belt until 4.5-5.5 lb of force applied mid-span deflect belt 0.16-inch. Standard torque bolts per § 20-32 and torque stripe per Figure 5-1.
10. Install tailcone cowling per § 53-23.

29-20 Hydraulic Reservoir

**A. Removal**

1. Temporarily install a "DO NOT MOVE FLIGHT CONTROLS" sign in cockpit.
2. Remove tailcone cowling per § 53-23.
3. Place a one-liter container beneath suction tee fitting on reservoir. Remove cap from tee fitting and allow reservoir fluid to drain into container. Reinstall cap and special torque per § 20-33.
4. Remove suction and pressure lines, and disconnect and cap servo supply and return hoses, from reservoir. Protect line and fitting openings.
5. Disconnect pump bypass solenoid and sight gage LED electrical connectors.
6. Remove three screws securing reservoir to gearbox and remove reservoir.
7. Note alignment of tee fittings and sight gage LED. Transfer LED and line and hose fittings from removed reservoir to replacement reservoir.

**B. Installation**

1. Note alignment of tee fittings and sight gage LED on removed reservoir. Transfer LED and line and hose fittings from removed reservoir to replacement reservoir. Special torque fittings per § 20-33.
2. Install reservoir on gearbox and secure with three screws.
3. Install pressure and suction lines, repositioning tee fittings as required, and special torque per § 20-33.
4. Connect servo supply and return hoses to reservoir. Position hose elbows to minimize preload and special torque per § 20-33.
5. Connect pump bypass solenoid and sight gage LED electrical connectors and ty-rap wires as required.
6. Fill reservoir with A257-15 hydraulic fluid and special torque filler vent per § 20-33.
7. Bleed hydraulic system per § 12-34.
8. Install tailcone cowling per § 53-23.

## 29-30 Hydraulic Servos

### A. Servo Removal

**CAUTION**

Do not pressurize hydraulic system while any hydraulic system component is disconnected or removed.

1. Remove mast fairing per § 53-22. Remove tailcone cowling per § 53-23.
2. Refer to Figures 29-1 and 29-3. Perform the following measurements on all D212 hydraulic servo assemblies to be removed:
   a. Measure and record dimension between D200-1 clevis hole center & top of servo piston.
   b. Apply cyclic and collective frictions. With collective full down and hydraulics unpressurized, position cyclic stick so piston in servo to be removed is in its lowest position. Measure and record dimension between top of servo piston and top of cylinder assembly.
3. Remove hardware securing servo clevis to F121-3 push-pull tube's lower rod end.
4. a. Forward Servo: Remove hardware securing servo to F121-5 push-pull tube's upper rod end. Remove hardware joining D200-2 scissors.
   b. Aft Servo: Remove hardware securing C343-8 tube's lower rod end to F339-1 jackshaft weldment.
5. Disconnect D205 hose assemblies from servo unions and tees. Cap and plug fittings.
6. Remove hardware securing servo to G201-1 frame weldment and remove servo.
7. Aft Servo: Measure and record center-to-center dimension between aft servo's lower rod end and C343-8 tube's lower rod end. Loosen palnut and nut securing C343-8 tube to aft servo's lower rod end and remove tube.

**CAUTION**

Do not remove tri-wing fastener; aft servo's lower rod end must remain attached to servo.

**CAUTION**

Dimension between clevis hole center and top of servo piston must be 1.40 ± 0.03 inches; dimension between top of servo piston and top of cylinder assembly must be 0.28 ± 0.03 inch; dimension between C343-8 tube's rod ends must be 4.00 ± 0.03 inches. If dimension(s) are not within required range, perform main rotor rigging per § 18-40 after servo installation.

8. Remove clevis, scissor, D200-3 washer, unions, and tee fittings from servo, as applicable.
9. Actuate servo piston by hand and drain as much hydraulic fluid from servo as possible. Plug servo ports.

# CHAPTER 53

# FUSELAGE

## 53-00 Description

The R66 is a five-place, single main rotor, single engine helicopter constructed primarily of metal and equipped with skid type landing gear.

The primary fuselage structure is welded steel tubing and riveted aluminum sheet. The tailcone is a monocoque structure in which aluminum skins carry most primary loads. Fiberglass and thermoplastics are used in secondary cabin structure and in various ducts and fairings.

Several cowl doors provide access to the drive system, engine, engine oil tank, fuel filler cap, and fuel sump drain. A right-side door provides access to the main baggage compartment. Removable panels and cowlings allow additional access to controls and other components for maintenance.

The instrument console hinges up and aft for instrument and avionics access. The battery is installed behind an access panel under the left front seat, or in the main baggage compartment, depending on aircraft configuration.

The engine is located aft of the main baggage compartment. The engine compartment is isolated from the rest of the airframe by stainless steel firewalls in front of and above the engine.

## 53-10 Cabin Assembly

The cabin assembly is a non-field-replaceable assembly.

### 53-11 Repair

1. Vertical firewall replacement must be performed by an appropriately rated Repair Station using a calibrated jig. Firewall repairs may be accomplished in accordance with U.S. FAA Advisory Circular 43.13-1B Section 4-59. Firewall material is 0.016 inch, type 301, one-quarter hard corrosion-resistant (CRES) steel.
2. Keel panel replacement must be performed by an appropriately rated Repair Station using a calibrated jig. Keel panel repairs may be accomplished in accordance with U.S. FAA Advisory Circular 43.13-1B Sections 4-58 and 4-59. Keel panel material is 0.025 inch, 2024-T3 clad aluminum sheet.
3. To preserve crashworthiness, seat assembly maintenance is limited to replacement only.

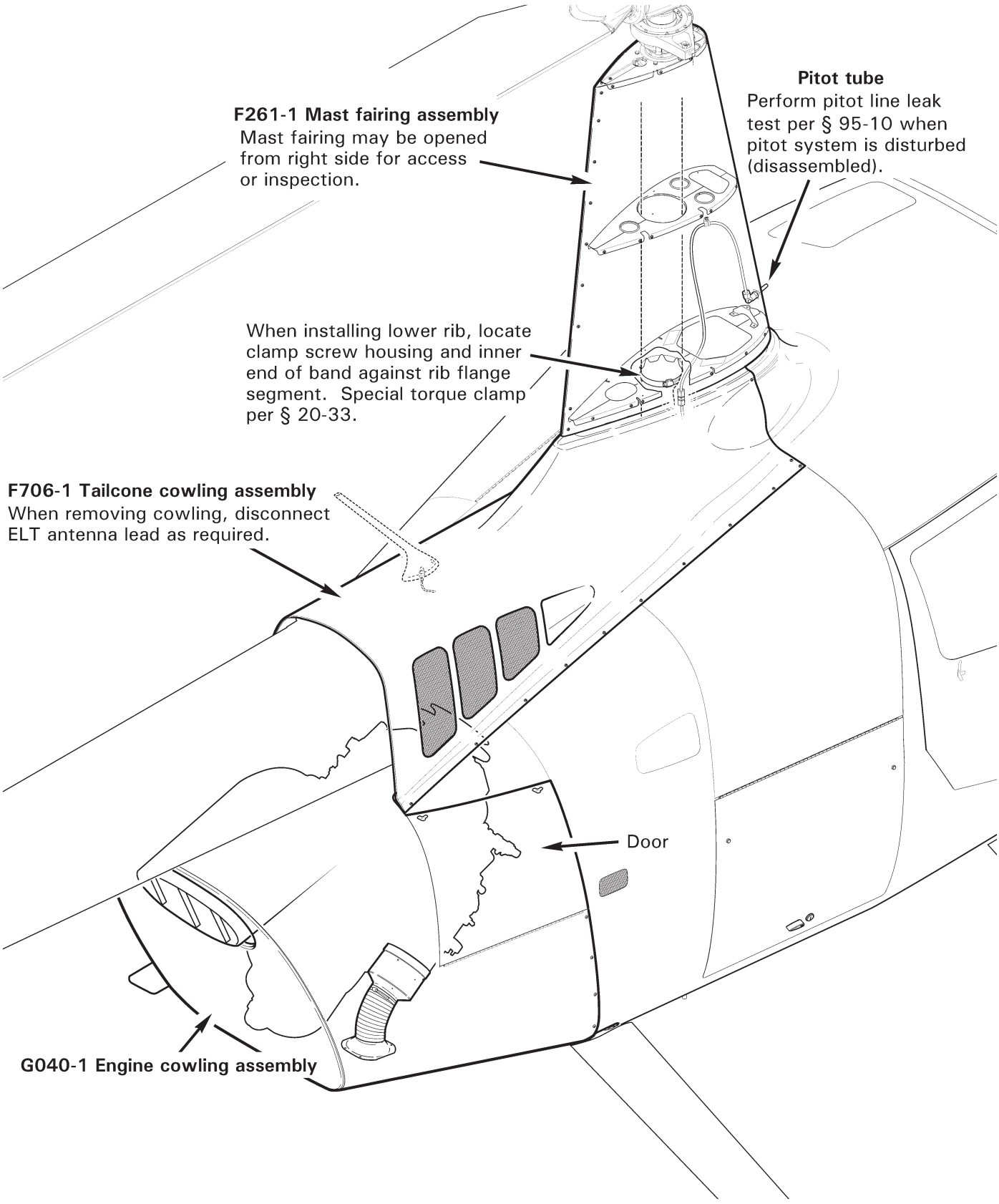



FIGURE 53-1 FAIRING, COWLINGS, AND PANELS

53-40 Tailcone Assembly

**CAUTION**

If tailcone has an F955-1 or -6 bracket, then F050-2 horizontal stabilizer must be installed.

C044-1 or -2 horizontal stabilizer may not be installed on a tailcone that has an F955-1 or -6 bracket.

F044-1 vertical stabilizers mount assembly may only be installed on a tailcone that has an F955-1 or -6 bracket.

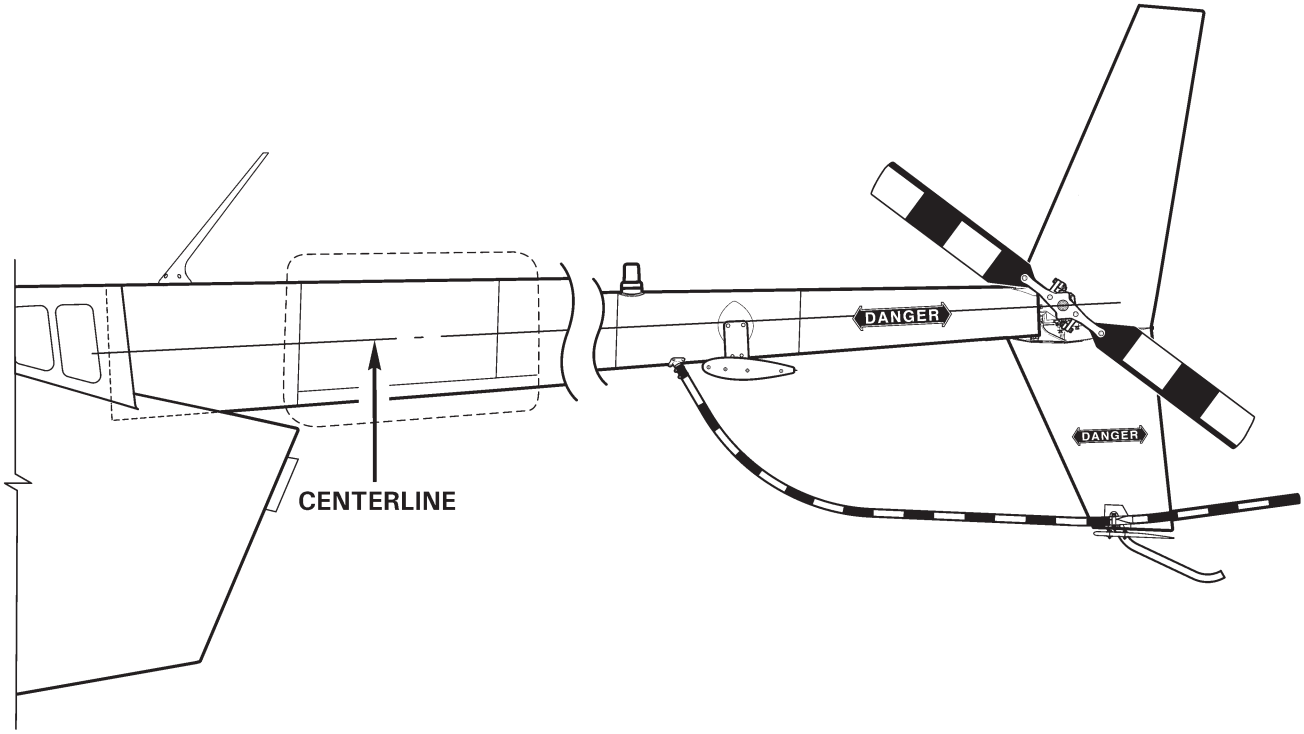
As applicable, C050-2 or G950-2 stabilizer must always be installed.

**A. Removal**

1. Remove tailcone cowling assembly per § 53-23. Remove engine cowling assembly per § 53-21.
2. Refer to Figure 53-4. Cut and discard ty-raps as required and disconnect tailcone wiring at connectors. Disconnect two antenna cables inside tailcone forward bay, and cables at forward bulkhead, as required.
3. Remove hardware securing D224 tail rotor drive shaft yoke to C947-3 (intermediate) plate assembly, noting hardware removed.
4. Remove hardware securing C121-17 push-pull tube to A331-4 bellcrank assembly.
5. Remove hardware securing C023 tailcone assembly to frames and remove tailcone.
6. Cut and discard ty-raps as required and remove F237-1 tailcone attachment frame, as required.

**B. Installation**

1. Refer to Figure 53-4. Install F237-1 tailcone attachment frame, if not previously accomplished. Verify correct damper assembly orientation per Figure 65-3.
2. Position C023 tailcone assembly on F020-1 upper frame assembly; do not pinch wiring between tailcone bulkhead and frames. Install hardware securing tailcone to frames, standard torque bolts per § 20-32, and torque stripe per Figure 5-1.
3. Install hardware securing D224 tail rotor drive shaft yoke to C947-3 (intermediate) plate assembly. Shim tail rotor driveline per § 65-30. Standard torque bolts per § 20-32, and torque stripe per Figure 5-1.
4. Install hardware securing C121-17 push-pull tube to A331-4 bellcrank assembly. Standard torque bolt per § 20-32, and torque stripe per Figure 5-1.
5. Perform tail rotor drive shaft runout per § 65-21.



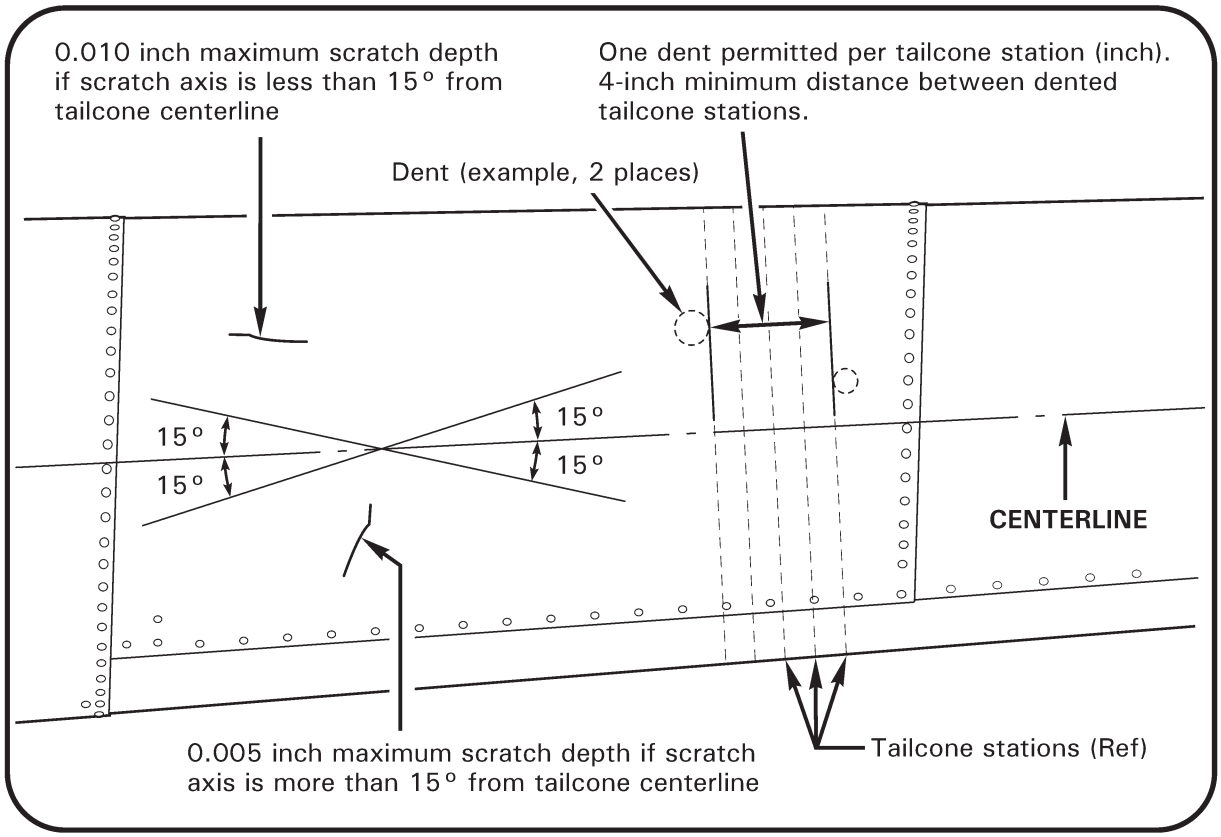




FIGURE 53-5 TAILCONE INSPECTION AND REPAIR

## 53-60 F050-2 Horizontal Stabilizer Assembly

**CAUTION**

If tailcone has an F955-1 or -6 bracket, then F050-2 horizontal stabilizer must be installed.

**CAUTION**

Support F050-2 horizontal stabilizer assembly during removal or installation when upper bolts are removed. F955-1 or -6 bracket is riveted to bottom of tailcone assembly.

### A. Removal

1. Refer to Figure 53-6. Remove hardware securing F050-2 horizontal stabilizer assembly to F955-1 or -6 bracket.
2. Supporting stabilizer, remove hardware securing stabilizer to tailcone assembly and remove stabilizer.
3. As required, install MT023-2 stabilizer bracket supports using removed hardware (recommended when stabilizer is removed).

### B. Installation

1. If installed, remove hardware securing MT023-2 stabilizer bracket supports to F955-1 or -6 bracket & tailcone assembly and remove supports.
2. Supporting F050-2 horizontal stabilizer assembly, install hardware securing stabilizer to tailcone and bracket. Special torque bolts per § 20-33 and torque stripe per Figure 5-1.

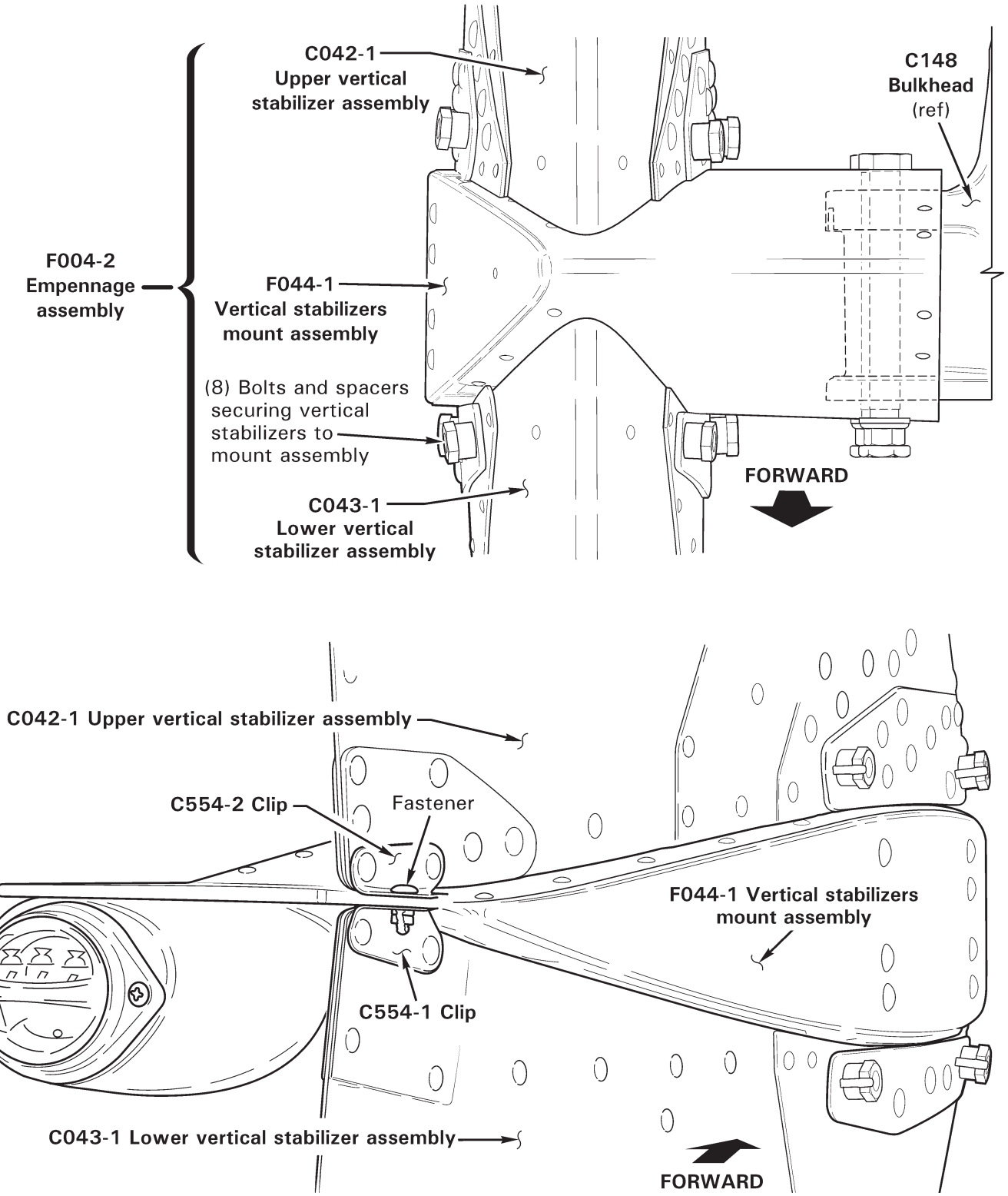



FIGURE 53-7 F004-2 EMPENNAGE ASSEMBLY

53-70 Empennage Assembly

**CAUTION**

If tailcone has an F955-1 or -6 bracket, then F050-2 horizontal stabilizer must be installed.

C044-1 or -2 horizontal stabilizer may not be installed on a tailcone that has an F955-1 or -6 bracket.

F044-1 vertical stabilizers mount assembly may only be installed on a tailcone that has an F955-1 or -6 bracket.

As applicable, C050-2 or G950-2 stabilizer must always be installed.

**A. Removal**

1. Remove tail rotor guard assembly per § 53-50.
2. Remove hardware securing forward MS21919WDG3 clamp to F044-1 vertical stabilizers mount assembly (or C044-1 or -2 horizontal stabilizer, if installed). Cut and discard ty-raps securing position light and gearbox chip detector wires and connectors together. Disconnect position light at connectors.
3. Refer to Figure 53-7 or 53-7A. Supporting empennage assembly, remove hardware securing empennage to C148 bulkhead, and remove empennage.

**B. Installation**

1. Refer to Figure 53-7 or 53-7A. Position empennage assembly on C148 bulkhead.
   a. **If D301 (empennage ballast; ref § 8-32) weights <u>will not</u> be installed:** Install (2) NAS6606-47 (or -48) bolts & associated hardware securing empennage to C148 bulkhead. Use as many NAS1149F0663P washers under nut as required to meet § 20-30 Part E.5. Standard torque bolts and palnuts per § 20-32 and torque stripe per Figure 5-1.
   b. **If D301 (empennage ballast; ref § 8-32) weights <u>will</u> be installed:** Install (2) NAS6606-78 bolts & associated hardware securing empennage to C148 bulkhead. Use (1) or (2) NAS1149F0663P washers under nut as required to meet § 20-30 Part E.5; 1–4 threads may be exposed beyond primary nut. Standard torque bolts and palnuts per § 20-32 and torque stripe per Figure 5-1.
2. Connect position light wire connectors. Secure wires and install hardware securing forward MS21919WDG3 clamp to F044-1 vertical stabilizers mount assembly (or C044-1 or -2 horizontal stabilizer, if installed). Install MS3367-4-9 or -5-9 ty-raps as required to secure wires and connectors together. Cinch ty-raps until snug without over-tightening, and trim tips flush with heads.
3. Test and verify correct function of position and TR chip light circuits.
4. Install tail rotor guard assembly per § 53-50.

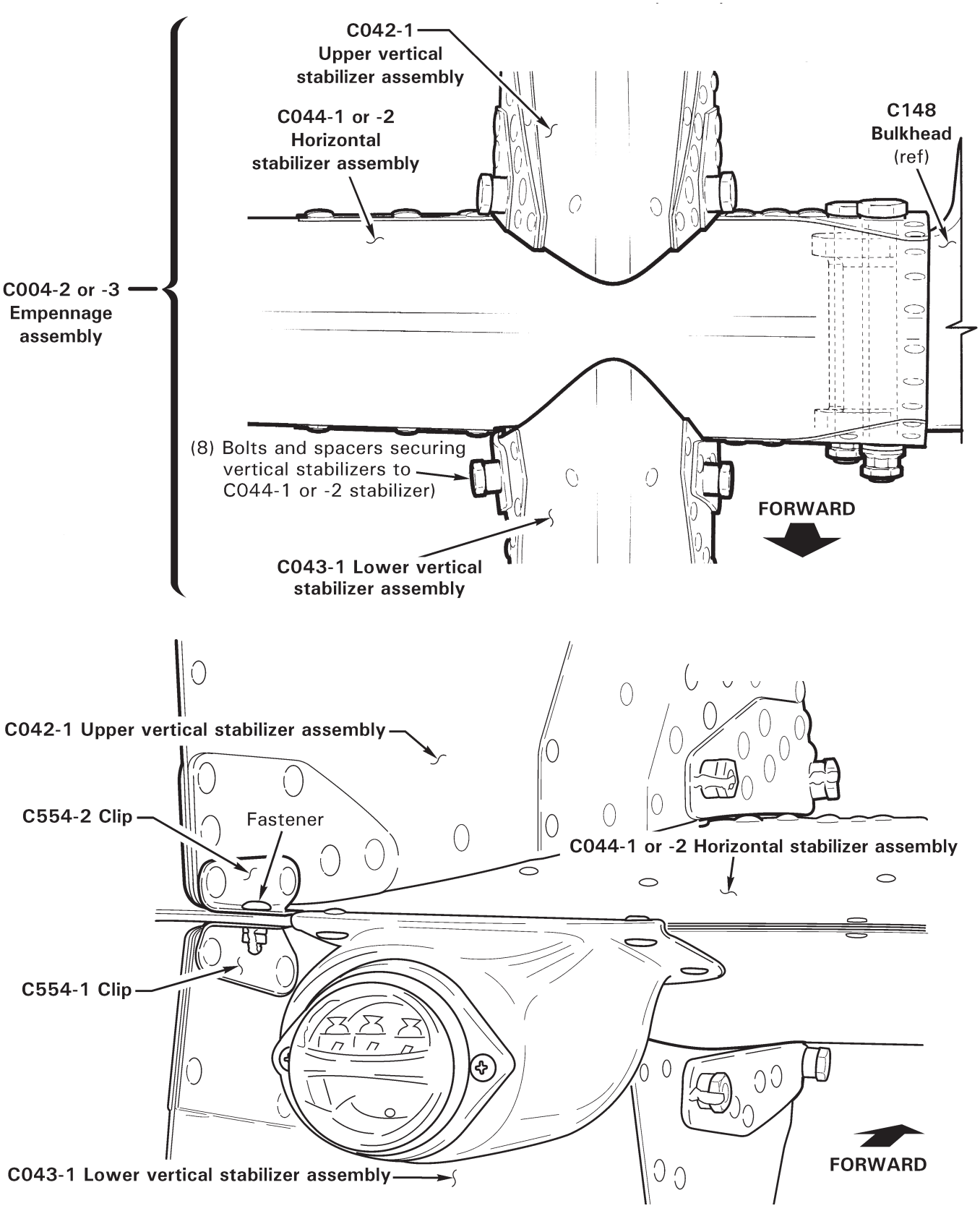



FIGURE 53-7A C004-2 OR C004-3 EMPENNAGE ASSEMBLY

## 53-73 F044-1 Vertical Stabilizers Mount Assembly

### A. Removal

1. Remove C042-1 & C043-1 vertical stabilizer assemblies per §§ 53-71 & 53-72.
2. Remove hardware securing forward clamp to F044-1 vertical stabilizers mount assembly. Cut and discard ty-raps securing position light and gearbox chip detector wires and connectors together. Disconnect position light at connectors.
3. Support the mount assembly, remove hardware securing mount to C148 bulkhead and remove mount.

### B. Installation

**CAUTION**

F044-1 vertical stabilizers mount assembly may only be installed on a tailcone that has an F955-1 or -6 bracket.

1. Position F044-1 vertical stabilizers mount assembly on C148 bulkhead.
   a. **If D301 (empennage ballast; ref § 8-32) weights will not be installed:** Install (2) NAS6606-47 (or -48) bolts & associated hardware securing empennage to C148 bulkhead. Use as many NAS1149F0663P washers under nut as required to meet § 20-30 Part E.5. Standard torque bolts and palnuts per § 20-32 and torque stripe per Figure 5-1.
   b. **If D301 (empennage ballast; ref § 8-32) weights will be installed:** Install (2) NAS6606-78 bolts & associated hardware securing empennage to C148 bulkhead. Use (1) or (2) NAS1149F0663P washers under nut as required to meet § 20-30 Part E.5; 1–4 threads may be exposed beyond primary nut. Standard torque bolts and palnuts per § 20-32 and torque stripe per Figure 5-1.
2. Install C042-1 & C043-1 vertical stabilizer assemblies per §§ 53-71 & 53-72.
3. If mount assembly was replaced, match drill C554-1 & -2 clips 0.144-inch diameter hole through mount. Deburr hole and install fastener.
4. Connect position light at connectors. Install hardware securing forward clamp to mount assembly. Install MS3367-4-9 or -5-9 ty-raps as required to secure position light and gearbox chip detector wires and connectors together. Cinch ty-raps until snug without over-tightening, and trim tips flush with heads.
5. Test and verify correct function of position and TR chip light circuits.

## 53-74 C044-1 or -2 Horizontal Stabilizer Assembly

### A. Removal

1. Remove C042-1 & C043-1 vertical stabilizer assemblies per §§ 53-71 & 53-72.
2. Remove hardware securing forward clamp to C044-1 or -2 horizontal stabilizer assembly. Cut and discard ty-raps securing position light and gearbox chip detector wires and connectors together. Disconnect position light at connectors.
3. Support the stabilizer, remove hardware securing stabilizer to C148 bulkhead and remove stabilizer.

### B. Installation

**CAUTION**

C044-1 or -2 horizontal stabilizer may not be installed on a tailcone that has an F955-1 or -6 bracket.

1. Position C044-1 or -2 horizontal stabilizer assembly on C148 bulkhead.
   a. **If D301 (empennage ballast; ref § 8-32) weights will not be installed:** Install (2) NAS6606-47 (or -48) bolts & associated hardware securing empennage to C148 bulkhead. Use as many NAS1149F0663P washers under nut as required to meet § 20-30 Part E.5. Standard torque bolts and palnuts per § 20-32 and torque stripe per Figure 5-1.
   b. **If D301 (empennage ballast; ref § 8-32) weights will be installed:** Install (2) NAS6606-78 bolts & associated hardware securing empennage to C148 bulkhead. Use (1) or (2) NAS1149F0663P washers under nut as required to meet § 20-30 Part E.5; 1–4 threads may be exposed beyond primary nut. Standard torque bolts and palnuts per § 20-32 and torque stripe per Figure 5-1.
2. Install C042-1 & C043-1 vertical stabilizer assemblies per §§ 53-71 & 53-72.
3. If horizontal stabilizer was replaced, match drill C554-1 & -2 clips 0.144-inch diameter hole through horizontal stabilizer. Deburr hole and install fastener.
4. Connect position light at connectors. Install hardware securing forward clamp to horizontal stabilizer. Install MS3367-4-9 or -5-9 ty-raps as required to secure position light and gearbox chip detector wires and connectors together. Cinch ty-raps until snug without over-tightening, and trim tips flush with heads.
5. Test and verify correct function of position and TR chip light circuits.

# CHAPTER 62

# MAIN ROTOR

Intentionally Blank

## 62-50 Repair of Main Rotor Blades

**WARNING**

**Unauthorized repairs to rotor blades have caused fatal crashes.**

**CAUTION**

Do NOT use power tools, chemical paint strippers, or chemical corrosion removers to repair main rotor blades.

NOTE

Refer to § 20-70 for approved materials.

1. Measure damage per § 62-40.
2. Polish out blade damage using 220 grit or finer wet-or-dry aluminum-oxide abrasive paper, and finish with 320 grit or finer wet-or-dry abrasive paper. Hand-sand in spanwise direction.
3. A fine-toothed file may be used along the spar and trailing edge, provided the area is finished with 320 grit or finer wet-or-dry abrasive paper. Hand-sand or file in spanwise direction.
4. Remove only the material necessary to reach the bottom of the damage, and to blend the reworked area to the radius or dimension required. Visually inspect and verify all damage is removed.
5. Measure reworked area and verify material removed and/or new chord dimension is permissible per § 62-40.
6. Seal and fill per § 62-51, as required. Paint per § 62-52, as required.
7. Track and balance main rotor per Chapter 18, as required.

## 62-51 Sealing, Filling, and Fairing

1. Clean area needing sealing, filling, and fairing with a lint-free cloth dampened with an approved solvent (ref § 20-70).
2. a. Apply B270-27 adhesive to seal all exposed bond joints except at tip of blade and 4–6 inches of outboard end of skin/spar joint; remove excess adhesive.

   b. Apply B270-1 sealant to seal tip of blade and 4–6 inches of outboard end of skin/spar joint; remove excess sealant. Cure for 2–3 hours at 125° ± 25° or air dry for 72 hours minimum.
3. Using 240 grit or finer wet-or-dry aluminum-oxide abrasive paper, hand-sand cured adhesive in spanwise direction to a smooth, aerodynamic finish, congruent with the blade airfoil. Do not remove metal.
4. Hand-sand surrounding painted surface until 25% primer remains. Keep bare metal to a minimum.

## 62-52 Painting

Refer to § 20-70 for approved materials. Refer to paint manufacturer's recommendations.

**CAUTION**

If force-drying paint, do not exceed 175°F surface temperature on blade; monitor blade temperature with IR thermometer and verify by temporarily installing F110-2 Telatemp on blade skin.

1. Remove main rotor blade tip cover(s) as required. Clean the blade(s).
2. Feather edge of paint bordering bare metal by hand-sanding spanwise with 220-grit or finer wet-or-dry aluminum-oxide abrasive paper. Do not remove metal.
3. Clean bare metal to be painted with a lint-free cloth dampened with an approved solvent (ref § 20-70).
4. Refer to Figure 62-21. Mask blade(s) as required, and protect helicopter to prevent overspray contamination.
5. Prime bare metal, including bare metal under tip cover(s) as required, with at least two coats approved primer (chromate primer preferred; refer to § 20-75). Scuff first coat of primer with 320-grit abrasive paper (or very fine Scotch-Brite), and wipe down with a lint-free cloth dampened with an approved solvent (ref § 20-70) prior to applying second coat.

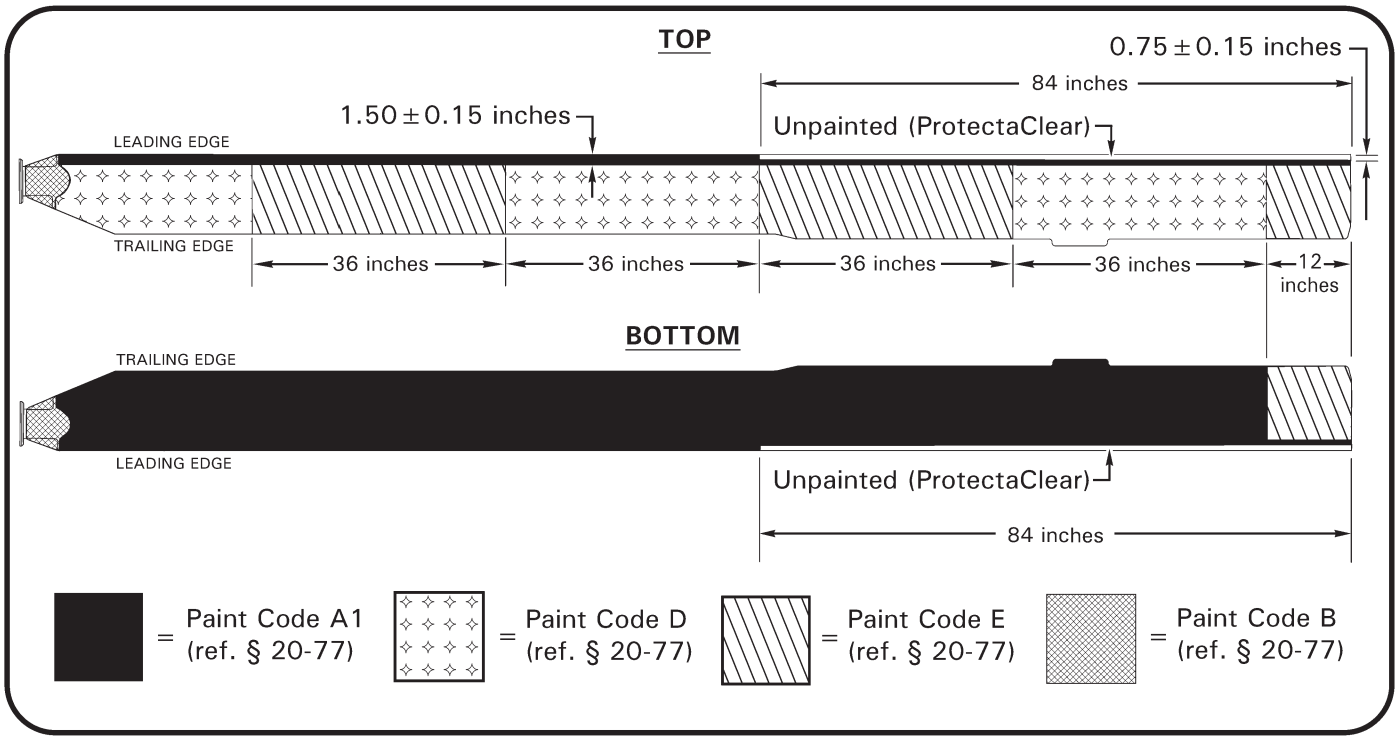



FIGURE 62-21 MAIN ROTOR BLADE PAINT SCHEME

62-52 Painting (continued)

> NOTE
>
> Best results are achieved if primer is allowed to air-dry for 12 hours prior to top coat application.

6. Refer to Figure 62-21. Apply dark gray, flat black, white, and/or yellow polyurethane enamel, as required, to primed area in accordance with paint manufacturer's recommendations.

> NOTE
>
> Allow Imron paint to cure at least 72 hours before flying in erosive conditions (such as drizzle, rain, or dust).

7. Remove masking materials.
8. Using 320-grit or finer aluminum-oxide abrasive paper, carefully break leading edges (upper & lower) of paint spanwise.
9. Install screws, wet with A257-9 anti-seize, securing tip covers. Special torque screws per § 20-33; ensure cover edges are flush with blade profile.

62-53 Leading Edge Care

**A. Unpainted Outboard Leading Edge**

1. Remove any oxidation from unpainted leading edges using maroon-colored Scotch-Brite™ pad (3M General Purpose Hand Pad 7447).
2. Clean surface to be coated using mild soap and water (acetone may be used as necessary; do not use MEK or alcohol). Water-rinse immediately and allow to dry.
3. Wearing a nitrile glove, apply a coat of ProtectaClear using lint-free cloth and allow to dry (approximately one hour).
4. A second coat of ProtectaClear may be applied per step 3 for additional protection.

**B. Painted Leading Edge**

Refer to Figure 62-21. Repaint leading edge per § 62-52 as required. Outboard leading edge may be refinished per Part C.

62-53 Leading Edge Care (continued)

**C. Leading Edge Refinishing**

**CAUTION**

Do NOT use power tools or chemical paint strippers to remove blade paint.

NOTE

Earlier blades with painted outboard leading edge may be refinished per Part C for improved appearance and protection against erosion.

1. Remove main rotor blade tip cover(s). Clean the blade(s).
2. Using a felt-tip marker, draw a straight line on blade's top and bottom surfaces: 0.80-inch aft of leading edge, from blade-tip to 84 inches inboard of blade-tip.
3. Support blade while sanding to avoid pushing blade down. Hand-sand blade spanwise to remove paint without removing metal, forward & outboard of marked lines using 220-grit or finer wet-or-dry aluminum-oxide abrasive paper, and feather paint edges.
4. Clean feathered-paint edges and surfaces of blade requiring touch-up with a lint-free cloth dampened with an approved solvent (ref § 20-70).
5. Refer to Figure 62-21. Using 3M vinyl tape (or equivalent), apply masking to blade(s) along 0.75-inch dimension and aft of feathered paint. Protect blade(s) and helicopter from overspray contamination.
6. Wipe area to be painted using PreKote wipes (or equivalent adhesion promoter) and allow to air dry.
7. Apply light coat of approved primer (chromate primer preferred; refer to § 20-75) to feathered-paint.
8. Apply black paint (ref § 20-77), as required.
9. Remove masking materials.
10. Using 320-grit or finer aluminum-oxide abrasive paper, feather leading edge of black paint spanwise without exposing primer.
11. Wipe bare metal leading edge using PreKote wipes (or equivalent adhesion promoter) and allow to air dry.
12. Wearing nitrile glove, apply a coat of ProtectaClear using lint-free cloth and allow to dry (approximately one hour).
13. A second coat of ProtectaClear may be applied per step 12 for additional protection.
14. Install screws, wet with A257-9 anti-seize, securing tip covers. Special torque screws per § 20-33; ensure cover edges are flush with blade profile.

## 62-60 Main Rotor Blade Tip Maintenance

After removing rounded tip covers, use 10X magnification when visually inspecting blade tip to verify no loose or blistered paint, white-powder corrosion products, or pitting of skins aft of skin-to-spar bond lines (upper & lower). If bare metal (other than spar leading edge) or corrosion is detected, proceed as follows:

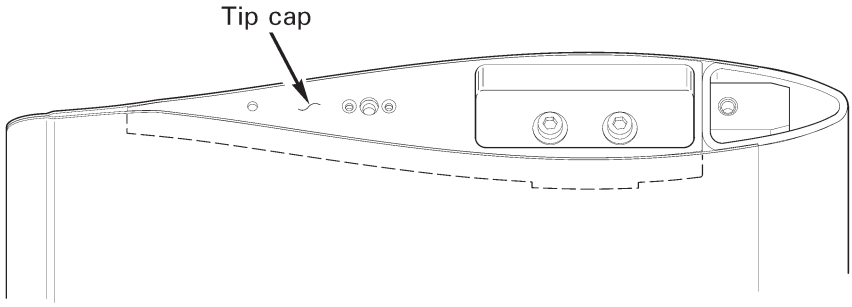
**WARNING**

**Review appropriate Safety Data Sheet (SDS) when working in proximity to hazardous materials. Specific recommendations for use of personal protective equipment are located in the SDS.**

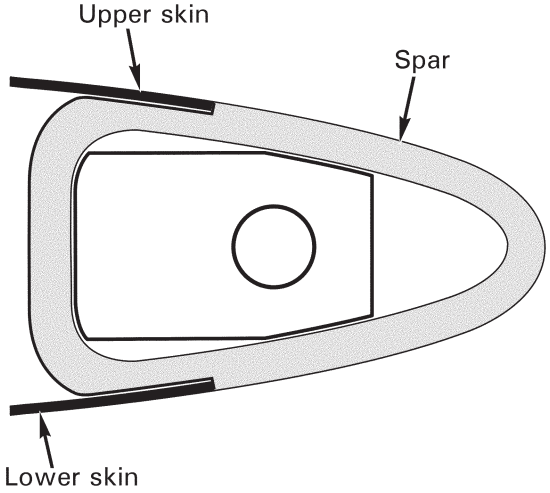
**CAUTION**

Do NOT use power tools or chemical paint strippers to remove blade paint.

1. Remove any corrosion and loose paint on tip cap and outboard edges of blade skins by hand-sanding vertical surface in a chordwise direction; use a hard, flat block with 220-grit aluminum-oxide abrasive paper, then finish sand with 320-grit aluminum-oxide abrasive paper. Remove only material necessary to eliminate corrosion.




2. Remove any corrosion and loose paint from skins on upper or lower surface of blade, aft of skin-to-spar bond joint, by hand-sanding in a spanwise direction using 220-grit aluminum-oxide abrasive paper and minimum 0.1 inch blend radius; finish sand with 320-grit aluminum-oxide abrasive paper. Remove only material necessary to eliminate corrosion.



62-60 Main Rotor Blade Tip Maintenance (continued)

3. Clean bare metal area with lint-free cloth dampened with an approved solvent (ref § 20-70) and allow to dry.
4. Seal exposed bond joints, including bond joints on vertical surfaces, with smooth layer of B270-1 sealant (poly-sulfide, refer to § 20-79) and allow to cure.
5. Prime remaining exposed metal with two coats of epoxy primer (chromated epoxy preferred).
6. Apply yellow paint topcoat within 2 – 48 hours of primer application. For best performance, allow paint to cure 48 hours before flight.
7. Install screws, wet with A257-9 anti-seize, securing tip covers. Special torque screws per § 20-33; ensure cover edges are flush with blade profile.

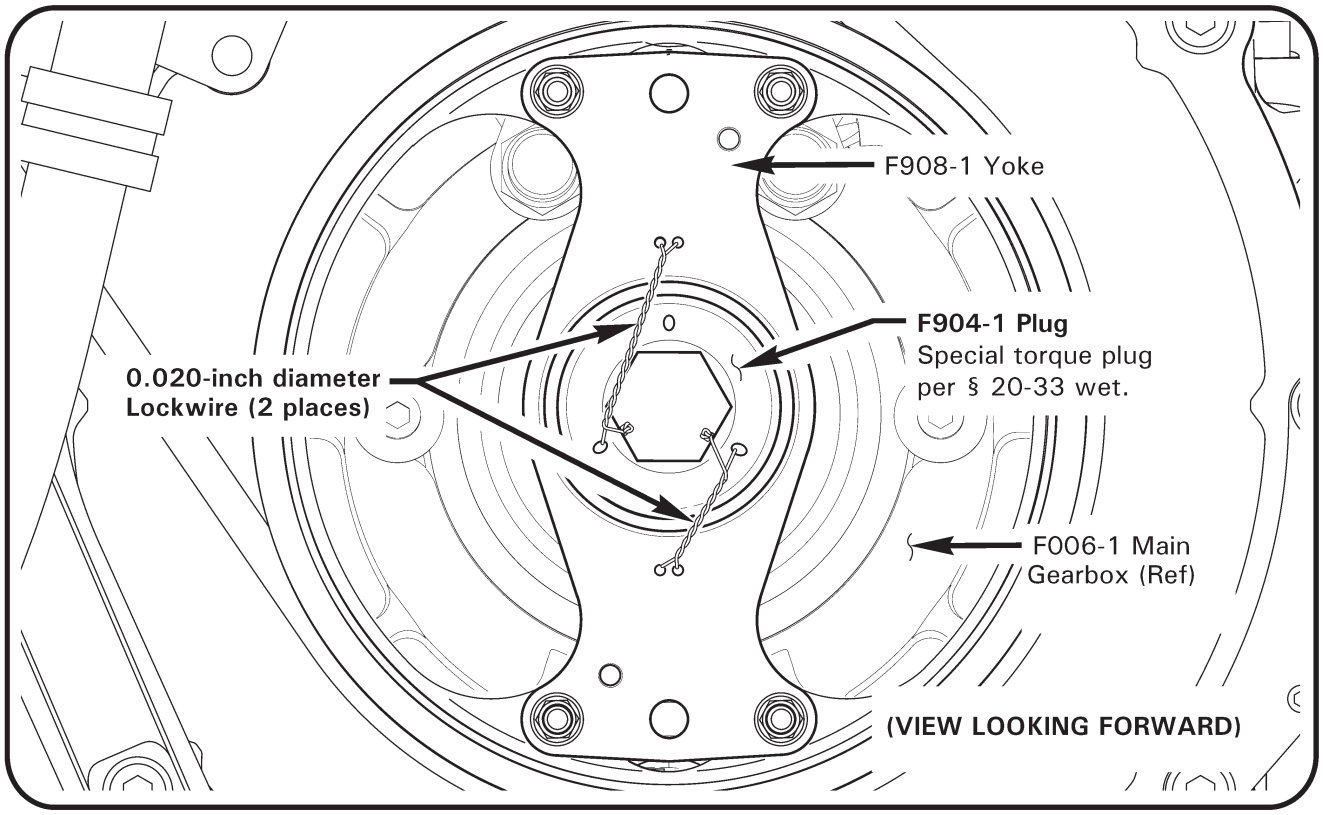



FIGURE 63-2 F908-1 YOKE ASSEMBLY INSTALLATION

63-21 Yoke and Seal Replacement (continued)

**B. (Tail Rotor Drive) F908-1 Yoke Assembly and Seal Installation (continued)**

6. In two places, install 0.020-inch diameter lockwire and safety plug to yoke with pigtails inside recess of plug as shown.
7. Install forward C947-3 flex plate assembly, using hardware removed (replace palnuts). Standard torque hardware per MM § 20-32 and torque stripe per MM Figure 5-1. Ensure safety wire is not contacting flex plate.
8. Install and shim intermediate C947-3 flex plate assembly per MM § 65-30.
9. Install hardware securing aft F305-5 inlet to scroll assembly. Verify 0.10 inch minimum gap between fanwheel assembly and inlet.
10. Install tailcone cowling assembly per § 53-23.
11. Set hall effect sender-to-magnet gap per § 63-40.

63-21 Yoke and Seal Replacement (continued)

**C. (Engine-Driven) F910-1 Yoke Assembly and Seal Removal**

1. Remove tailcone cowling assembly per § 53-23. Remove engine cowling assembly per § 53-21.
2. Drain main gearbox oil per § 12-11.
3. Refer to Figure 63-1. Remove hardware securing A947-2 (forward) plate assembly to F910-1 yoke assembly, and A947-2 (aft) plate assembly to F642 shaft weldment, noting hardware removed. Support weldment to allow clearance for yoke removal.
4. Place a wood block between firewall and yoke flange (to prevent yoke from rotating) or engage rotor brake. Remove nut and washer securing yoke to pinion, then remove yoke.
5. Remove rotor brake per § 63-30.
6. Remove F255 cover with C966 seal, but do not remove shims between cover and pinion bearing. Remove & discard F266-2 spacer, and A215-025 & A215-152 O-rings.
7. Press old seal from cover.

**D. (Engine-Driven) F910-1 Yoke Assembly and Seal Installation**

**CAUTION**

Do not remove exposed shims next to the pinion bearing. Shims control bearing preload and gear backlash.

1. Refer to Figure 63-1. Lubricate new A215-025 O-ring with A257-22 oil and install on pinion shaft.
2. Clean and dry F255 cover. Lubricate inner lip of new C966-10 seal, then place on cover with open face of seal pointing away from cover's counterbore.
3. Lubricate radiused protrusion of MT642-4 seal pressing tool and fully insert into seal. Using arbor press, maintain pressing tool squareness to cover and press seal into cover until fully seated.
4. Lubricate new A215-152 O-ring and install on cover. To protect new seal, lightly lubricate exterior of new F266-2 spacer and gently insert spacer halfway into seal. Install combined cover & spacer over pinion shaft until cover contacts gearbox housing.
5. Install rotor brake per § 63-30.
6. Service main gearbox per § 12-11.

# CHAPTER 64

# TAIL ROTOR

## 64-00 Description

The R66 tail rotor assembly is a conventional, two-bladed teetering rotor system.

Tail rotor blades are constructed of a wrap-around aluminum skin, bonded to aluminum honeycomb and a forged aluminum root fitting. Self-lubricating spherical bearings in the root fitting allow blades to change pitch.

Tail rotor blades are assembled to the hub with a fixed precone angle.

The tail rotor aluminum hub mounts to the gearbox output shaft by teeter hinge. Elastomeric bearings in the hub allow the rotor to teeter. The tail rotor hub teetering stop is a urethane bumper, attached to the output shaft.

## 64-10 Tail Rotor Assembly

### A. Removal

1. Refer to Figure 64-1. Tag each pitch link with corresponding blade serial number. Disconnect pitch links from tail rotor blades; keep associated hardware with each link.

> NOTE
>
> Tail rotor pitch link-to-blade attachment bolts may be different lengths and/or have different washers installed under nut for dynamic balancing.

2. Remove nut and A141-14 washer securing C119-2 bumper to tail rotor gearbox output shaft.
3. Mark hub with teeter hinge bolt orientation for reinstallation. Remove teeter hinge bolt, then slide tail rotor assembly and bumper off of shaft.

> NOTE
>
> Protect tail rotor assembly from damage when maintenance is performed on workbench.

4. If removing tail rotor due to gearbox breakage, then perform C148 bulkhead inspection per § 5-75.

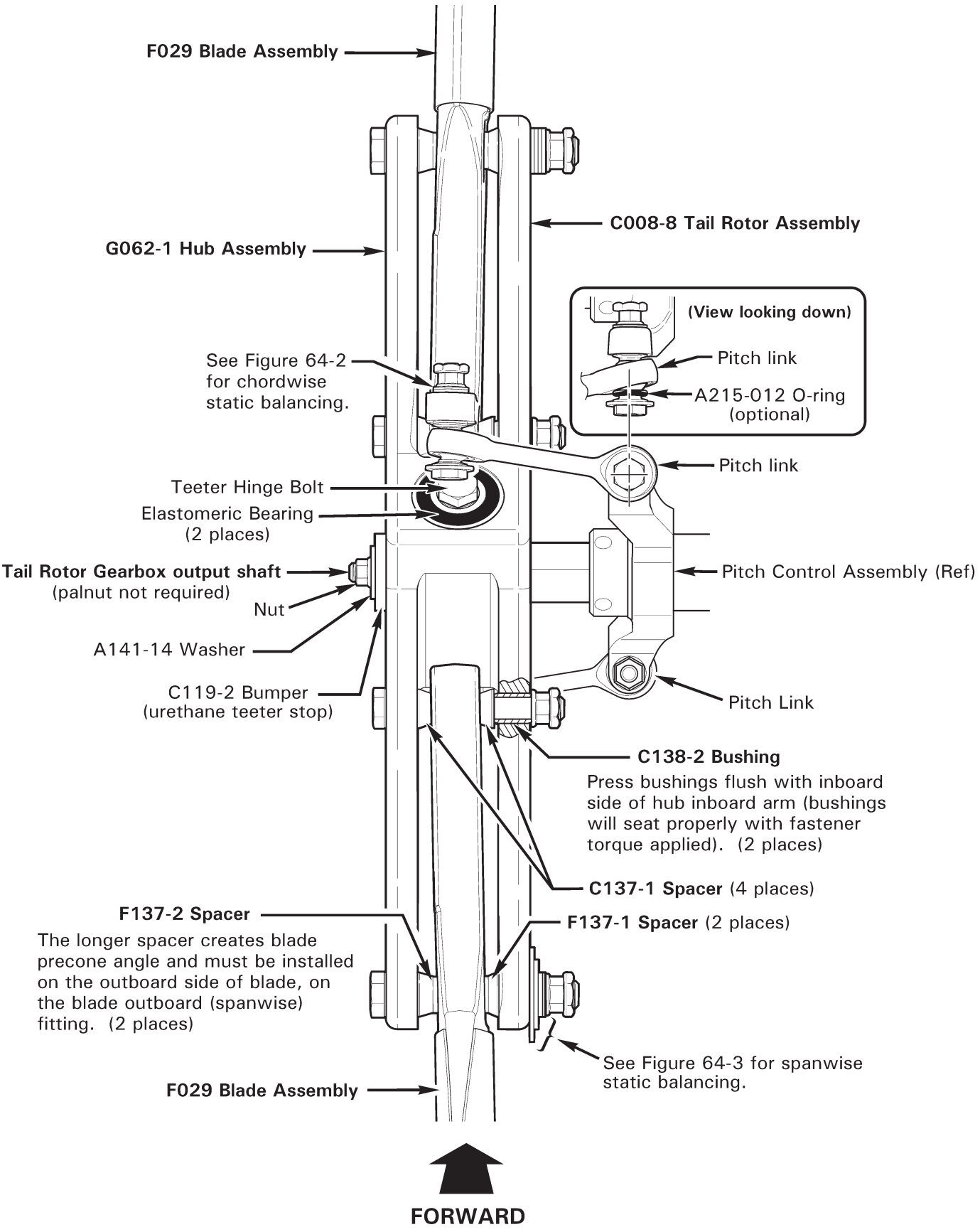



FIGURE 64-1 TAIL ROTOR INSTALLATION

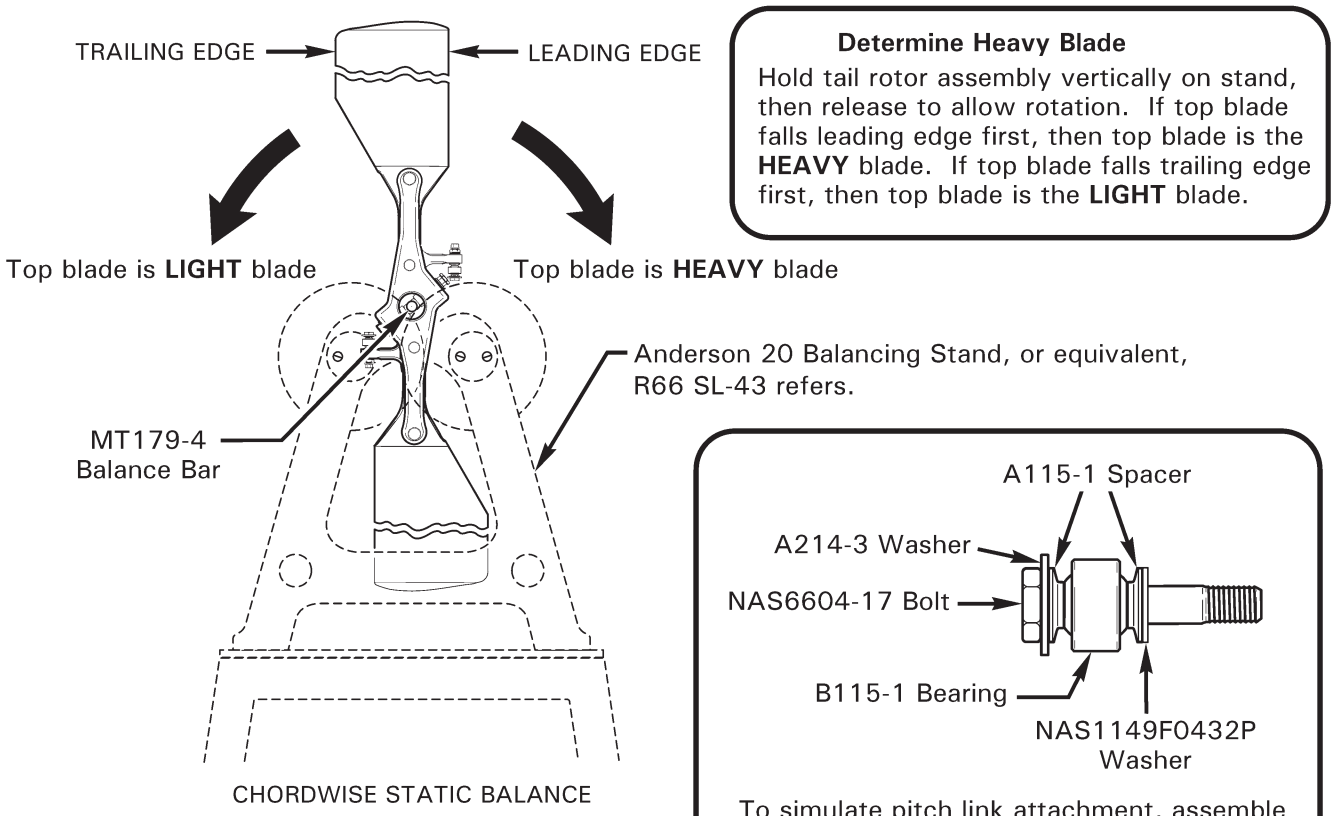
64-10 Tail Rotor Assembly (continued)

**B. Installation**

**CAUTION**

Perform static balance per § 64-11 if balancing hardware information is unknown, if blade(s) or hub bearing(s) were replaced, of if any rework has changed mass of rotor assembly.

1. Inspect elastomeric bearings per § 5-34.
2. Clean tail rotor gearbox output shaft and elastomeric bearing spacer clamping surfaces with lint-free cloth dampened with acetone.
3. Refer to Figure 64-1. Position tail rotor assembly on tail rotor gearbox output shaft, matching tail rotor blades to corresponding pitch links. Verify tail rotor is installed for clockwise rotation when viewed from left side of aircraft.
4. Install teeter hinge bolt and hardware; tighten nut until elastomeric bearing metal spacers contact output shaft, but do not torque. Verify blades cone toward tail rotor gearbox.
5. Remove tags. Install hardware securing tail rotor blades to pitch links as removed, or as determined by static balancing. Standard torque nuts & palnuts per § 20-32, and torque stripe per Figure 5-1.
6. Fabricate a tracking aid using 1x12-inch aluminum sheet; make a 90º bend 2 inches from one end. With tail rotor horizontal, tape tracking aid to tailcone near blade tip.
7. Rotate tail rotor drive shaft and mark tracking aid where each blade tip drain hole passes. Adjust (teeter) tail rotor until both blade tips pass the same point within 0.125 inch. Special torque teeter hinge bolt per § 20-33. Recheck track. Repeat step until blades are tracked.
8. Install palnut on teeter hinge bolt, standard torque per § 20-32, and torque stripe per Figure 5-1. Remove tracking aid.
9. Teeter tail rotor hub back and forth. Verify teeter hinge bolt, bearing metal spacers, washers, and nuts remain stationary when tail rotor is teetered.
10. Install C119-2 bumper, A141-14 washer, and nut. Special torque nut per § 20-33 and torque stripe per Figure 5-1.
11. Dynamically balance tail rotor per § 18-20.




**Determine Heavy Blade**

Hold tail rotor assembly vertically on stand, then release to allow rotation. If top blade falls leading edge first, then top blade is the **HEAVY** blade. If top blade falls trailing edge first, then top blade is the **LIGHT** blade.




To simulate pitch link attachment, assemble hardware as shown and install one each in both blade pitch horns.

**NAS1149F0432P/F0463P, NAS1149D0432J/D0463J, A141-14, or A214-3 Washers**

Select a combination of washers as required (one minimum) to balance tail rotor assembly chordwise.

**NAS6604-17 thru -22 Bolt**

Select bolt length to balance tail rotor assembly chordwise, and to meet thread engagement requirements per § 20-30.

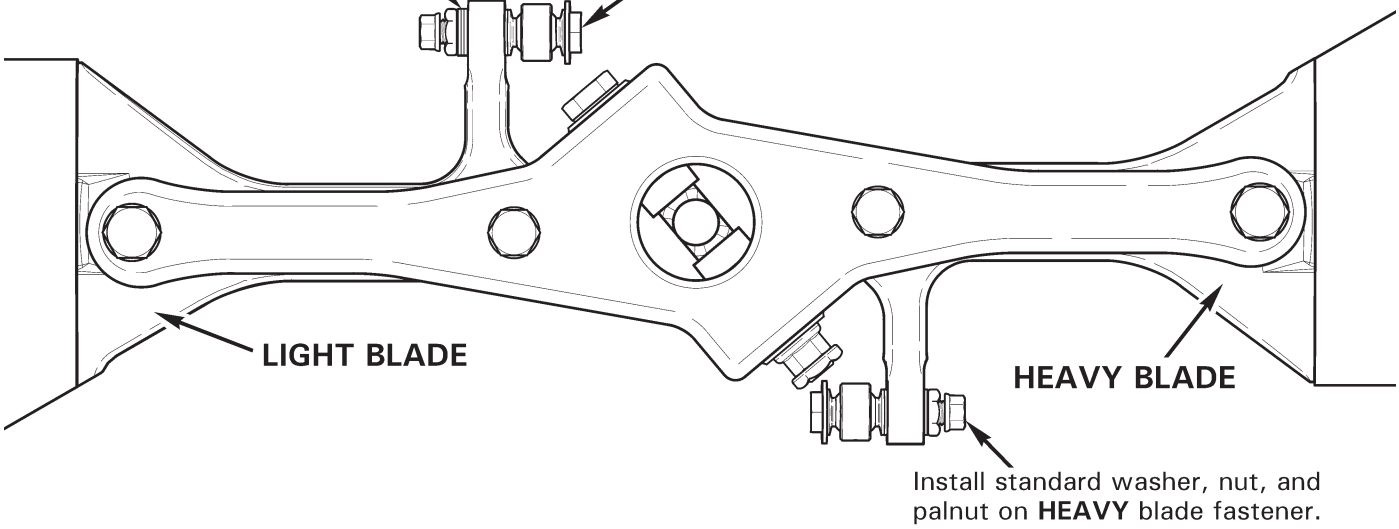



FIGURE 64-2 CHORDWISE STATIC BALANCE

96-120 Cockpit Camera (continued)

> NOTE
>
> Flash drives used with the camera must meet the criteria described in the Cockpit Camera User Guide in order to function reliably.

Complete instructions are provided in the Cockpit Camera User Guide on the Robinson website https://robinsonheli.com. The guide also provides camera lens cleaning instructions, additional playback suggestions, instructions for visualizing GPS data, setting user preferences, updating camera software, and video post-processing and troubleshooting tips. User options include on screen display of time & date and/or GPS position, time zone and daylight saving time status, and units for on screen display of GPS altitude.

**A. Removal**

1. Turn battery & camera switches off.
2. **Remove F039-2 camera assembly per the following:**
   a. Remove (3) screws securing camera assembly to cabin.
   b. Cut & discard ty-raps securing wiring. Disconnect wiring at connectors. Disconnect F714-2 antenna assembly from camera assembly and remove camera assembly from helicopter.
3. **Remove F039-3 camera assembly per the following:**
   a. Remove MS27039C0807 screw securing G796-2 duct assembly and slide duct forward to release from cabin. Cut & discard ty-raps as required and disconnect electrical wiring at connectors. Remove duct from helicopter.
   b. Remove A701-1 tape securing F714-3 antenna assembly wire to duct assembly. Temporarily mark antenna location using felt-tip marker. Using a plastic razor blade, detach antenna from duct assembly.
   c. Disconnect RV-BATT-LIPO500 battery from RV-10251C extension harness.
   d. Remove (4) screws and associated hardware securing camera assembly to duct assembly and remove camera assembly.

**B. Installation**

1. **Install F039-2 camera assembly per the following:**
   a. Connect camera assembly wiring at connectors and lock connectors using MS3367-4-9 ty-rap. Cinch ty-rap until snug without over-tightening and trim tip flush with head. Connect F714-2 antenna assembly to camera assembly.
   b. Position camera assembly and install (3) screws securing camera to cabin.
2. **Install F039-3 camera assembly per the following:**
   a. Install (4) screws and associated hardware securing camera assembly to G796-2 duct assembly.

96-120 Cockpit Camera (continued)

**B. Installation (continued)**

2. b. Clean mating surfaces of duct assembly and F714-3 antenna assembly using alcohol wipe. Secure antenna to duct assembly using A701-7 tape where marked during removal. Install strip of A701-1 tape securing antenna wire.

   c. Connect RV-BATT-LIPO500 battery to RV-10251C extension harness or install new battery per Part C.

   d. Position duct assembly in helicopter and connect electrical wiring at connectors. Lock connectors and secure wiring using MS3367-4-9 ty-raps, as required. Cinch ty-raps until snug without over-tightening and trim tips flush with heads. Align duct assembly, slide aft, and secure using MS27039C0807 screw.

3. Refer to cockpit camera user guide online at https://robinsonheli.com. Verify camera functions and video image is approximately level.

4. To adjust video image loosen (2) NAS1352-04-4 screws securing lens. Rotate lens clockwise to rotate video image counterclockwise or rotate lens counterclockwise to rotate video image clockwise. Tighten screws. Repeat steps 3 and 4 as required.

**C. Battery Replacement**

1. Remove camera assembly per Part A.

| NOTE |
| --- |
| Batteries secured to G796-2 duct assembly may be replaced without removing F039-3 camera assembly from duct assembly. |

2. Gently separate RV-BATT-LIPO500 battery connector from circuit board or disconnect at RV-10251C extension harness.

| NOTE |
| --- |
| Do not remove circuit board to access battery. If battery is internally installed in F039-3 camera assembly, gently unplug battery connector at circuit board and stow wire. Also order RV-10251C extension harness to relocate new battery. |

3. Pull tab on 1024A38 tape to release battery. If battery is secured using A701-7 tape, use a plastic razor blade to separate battery from F039-2 camera assembly housing or G796-2 duct assembly. Remove old tape and clean mating surfaces using an alcohol wipe.

4. Install new battery using 1024A38 tape and carefully connect camera battery to circuit board or RV-10251C extension harness.

5. Install camera assembly per Part B.

99-20 Illustrations and Tasks (continued)

Refer to Figure 99-4.

| Item | Part Number | Description |
|---|---|---|
| 1 | MT525-7 | Main Rotor Blade Rigging Fixture |
| 2 | MT525-9 | Tail Rotor Blade Rigging Fixture |
| 3 | MT526-8 | Bender Assembly – Trim Tab, Main Rotor Blade (aluminum) |
| 4 | MT527-1 | Helicopter Lifting Fixture |
| 5 | MT548-8 | Fitting (engine hoist adapter) |

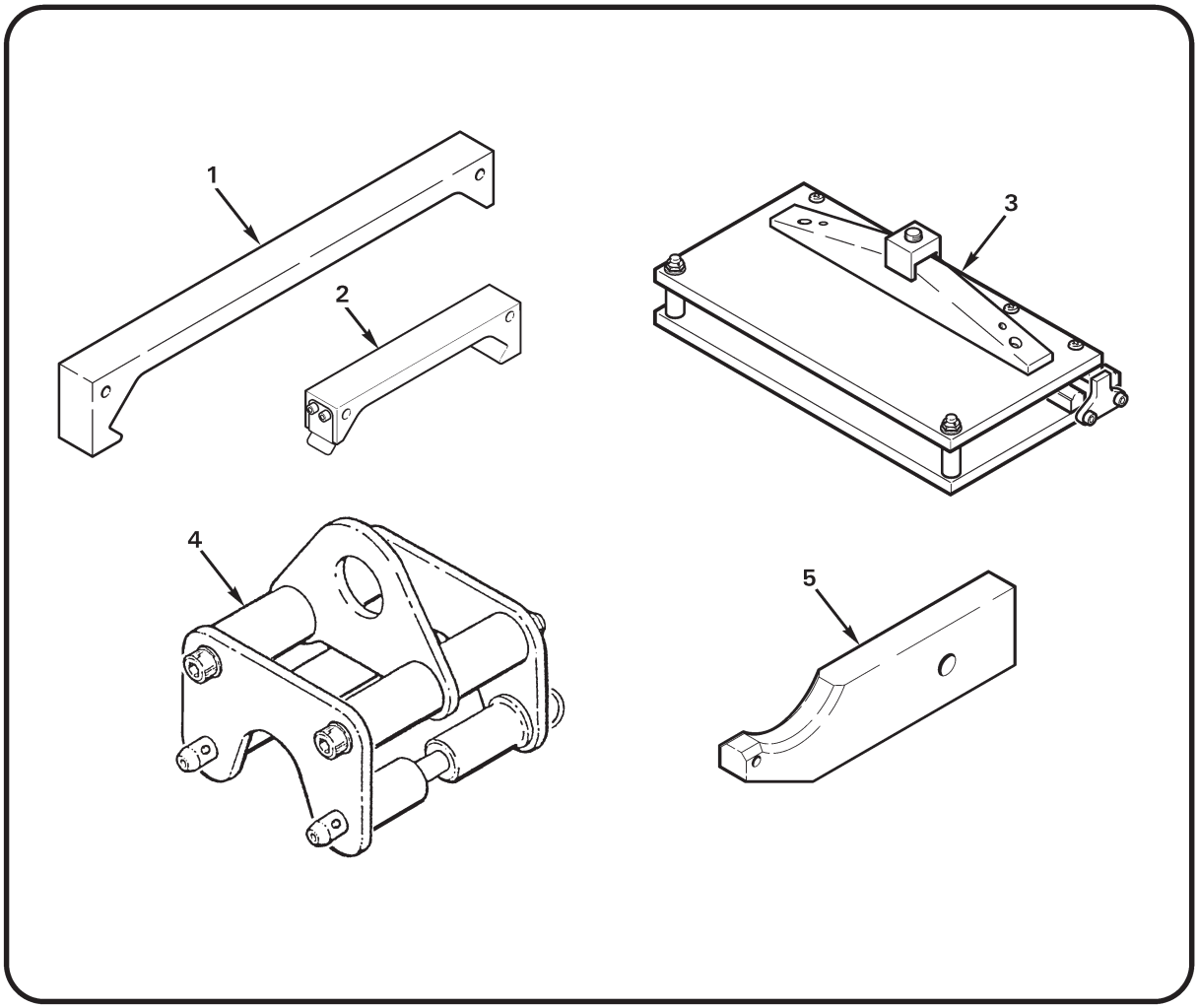



FIGURE 99-4 SPECIAL TOOLS

99-20 Illustrations and Tasks (continued)

Refer to Figure 99-5.

| Item | Part Number | Description |
|---|---|---|
| 1 | MT549-1 | Spacer – Spindle Boot (set of 2) |
| 2 | MT549-2 | Plate – Spindle Boot |
| 3 | MT556-11 | Kit Tools – Tail Rotor Hub Bearing Replacement |
| 4 | MT569-2 | Guide Assembly – Drill (main rotor hub nut) |
| 5 | MT640-2 | Open-End Crowfoot Wrench (N1 Plug) |
| 6 | MT642-4 | Pressing Tool – Seal (MGB Input Shaft Seal) |
| 7 | MT643-1 | Support Weldment – Main Rotor Hub Bearing Installation |
| 8 | MT759-1 | Blocks – Cyclic Rigging (see Figure 18-7A) |
| | MT759-2 | Blocks – Cyclic Rigging (see Figure 18-7A) |

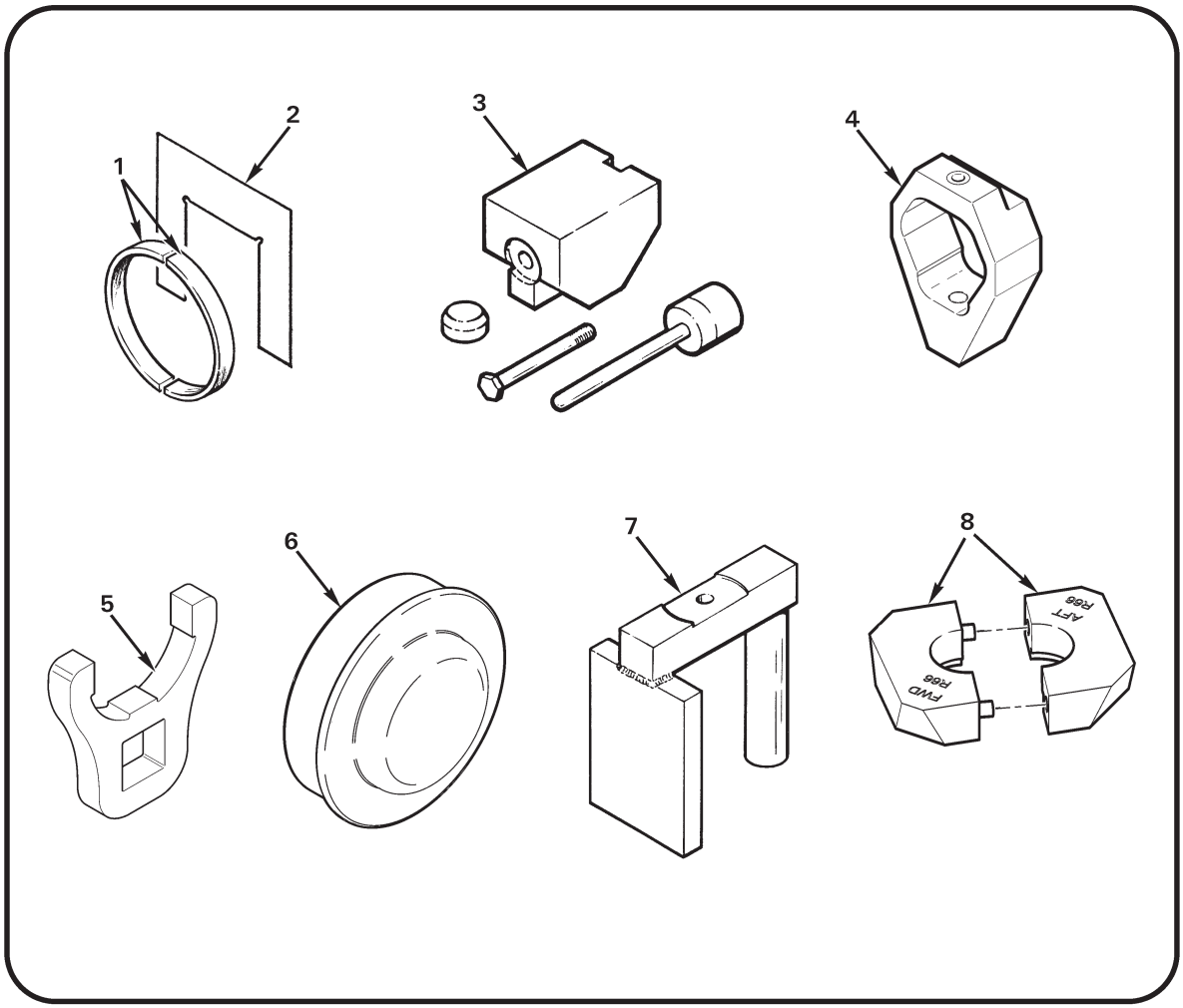



FIGURE 99-5 SPECIAL TOOLS

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| 99.4 | JUL 2023 |
| 99.5 | MAR 2025 |
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| 99.7 | JUL 2023 |
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| 99.9 | JUL 2023 |
| 99.10 | JUL 2023 |
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| 100.ii | MAY 2021 |
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