

CHAPTER 2
INSPECTION

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CHAPTER 2

INSPECTION

2.000 Introduction

The R22 helicopter must be inspected periodically to verify it is in airworthy condition. Required inspection intervals are maximum 100 hours time in service or 12 calendar months (annually), whichever occurs first; the inspection interval may be extended up to 10 hours, without accumulation, if allowed by local regulations. 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.

2.100 General Procedures

Unless otherwise specified, the following general procedures apply to R22 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.

2.110 Ball and Roller Bearings

The first indication of bearing failure is usually an increase in bearing noise. Noise will almost always start several hours before bearing failure or any increase in bearing temperature. 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. Do not rely on Telatemps to detect failing bearings as temperature increase may occur only seconds before bearing disintegrates. Refer to § 22-40.

The failure of either actuator bearing in flight could cause loss of power to the rotor system and could result in a serious accident. The actuator upper ball bearing is on the clutch shaft aft of the upper sheave; the actuator lower roller bearing is on the fanshaft aft of the lower sheave. Just before complete failure of an actuator bearing, the clutch light may flicker constantly (on and off in less than one second). This should not be confused with its normal on-off re-tensioning in flight (on for 1-8 seconds then off). Flight should not be resumed until cause of the flickering clutch light has been determined.

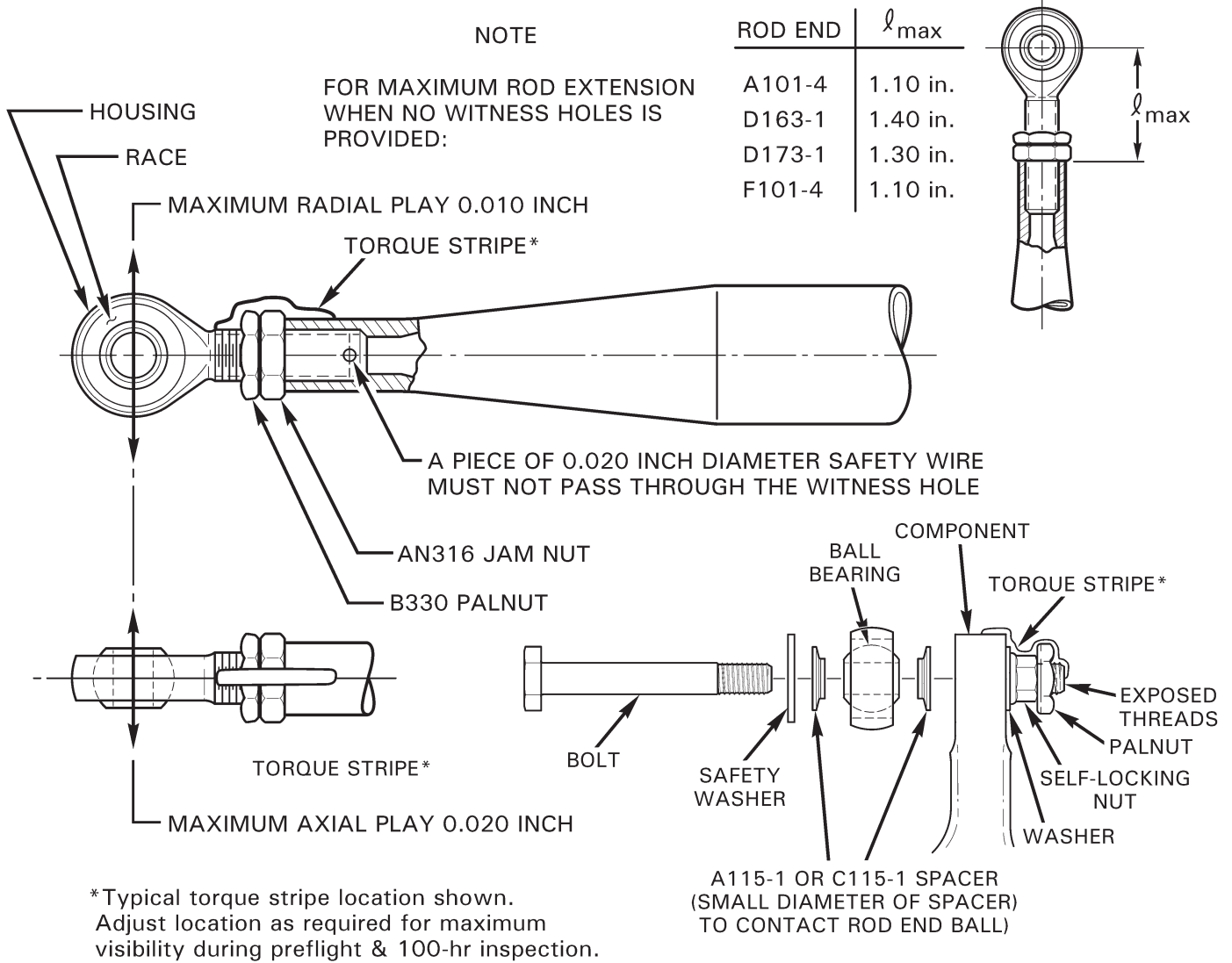


FIGURE 2-1 ROD END AND SPHERICAL BEARING PLAY LIMITS AND TORQUE STRIPE APPLICATION

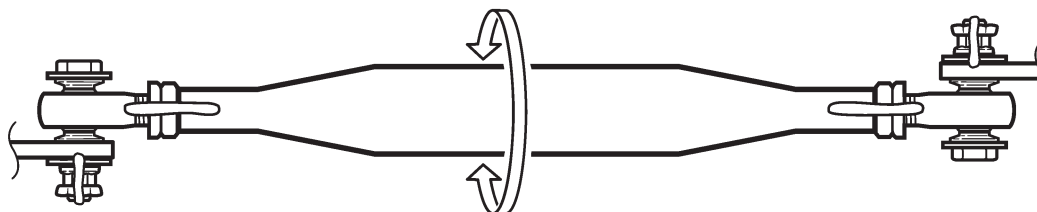


FIGURE 2-1A ROD END CENTERING
(Position rod ends for maximum rotation)

2.120 Push-Pull Tubes, Rod Ends, and Spherical Bearings

2.121 Push-Pull Tubes

Nicks, cuts, or scratches in tube not more than 0.010 inch deep and not more than 1/4 of tube circumference may be polished out in lengthwise direction using 320-grit or finer wet-or-dry abrasive paper and 1-inch minimum blend radius. If depth exceeds these limits, tube must be replaced.

If tube is dented or flattened more than 5 percent of its diameter, it must be replaced.

2.122 Rod Ends and Spherical Bearings

Refer to Figure 2-1.

1. Maximum axial play: 0.020 inch
Maximum radial play: 0.010 inch
2. Looseness between bearing outer race and rod end housing is not permitted.
3. Rod ends not riveted in place must block passage of 0.020 inch diameter wire through witness hole, if provided.
4. Rod end jam nuts and palnuts must be torqued per § 23-32 and torque striped, per Figure 2-1, at the most visible position for pre-flight inspection. Torque stripe must extend across nuts to both rod end shank and push-pull tube (or pitch link barrel, yoke, support, strut, etc.). Torque stripes are subject to deterioration and must be periodically renewed.
5. Rod ends must be centered, i.e., rod ends should be positioned to allow as much movement as possible without binding.

WARNING

Assembly of flight controls is critical and requires inspection by a qualified person. If a second person is not available, the installer must take a 5-minute break prior to inspecting flight control connections he has assembled.

CAUTION

Teflon-lined bearings must not be lubricated or solvent cleaned.

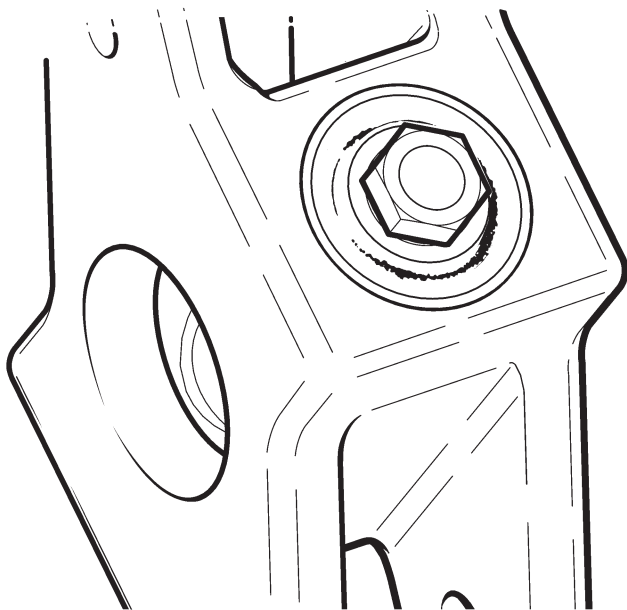


FIGURE 2-2A
ELASTOMER FATIGUE

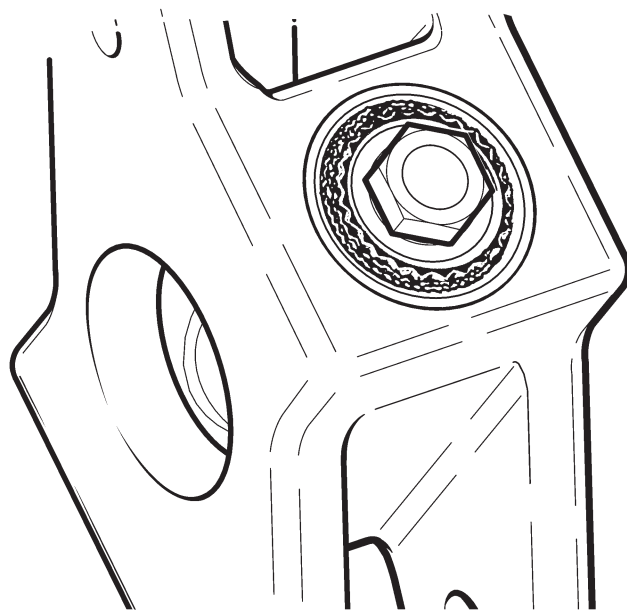


FIGURE 2-2B
ELASTOMER OIL CONTAMINATION

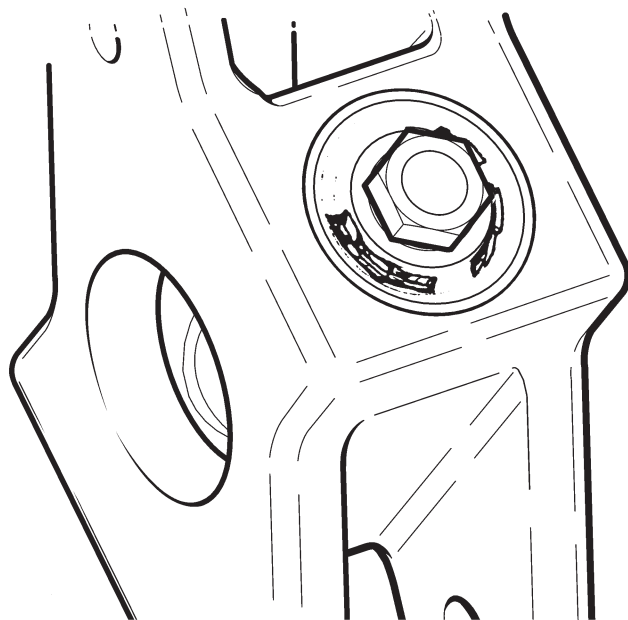


FIGURE 2-2C
ELASTOMER OVERLOAD

2.125 Elastomeric Bearings

Elastomeric bearings are used in the A062-1 tail rotor hub. Fatigue, oil contamination, or overload can degrade the elastomer.

Small surface cracks (fatigue cracks) and elastomer dust or “eraser crumbs” (see Figure 2-2A) are normal and are not causes for replacement. As cracks grow, enough elastomer will be lost to cause reduced stiffness and increased vibration. If deep (greater than 0.10 inch) cracks are present over more than 25% of elastomer face, replace bearing.

Avoid exposure to oil, grease, hydraulic fluid, cleaning solvent, and rust-preventative fluids. Immediately wash off any such contaminants with detergent and water. Contaminated bearings exhibit swelling, wavy edges, or debonding (see Figure 2-2B) and must be replaced.

Overload occurs when elastomer’s tensile strength or rubber-to-metal bond strength is exceeded. This can occur when normal loads are applied to a bearing weakened by fatigue or oil contamination. Overload is indicated by large extrusions from and large clean cracks in elastomer as shown in Figure 2-2C.

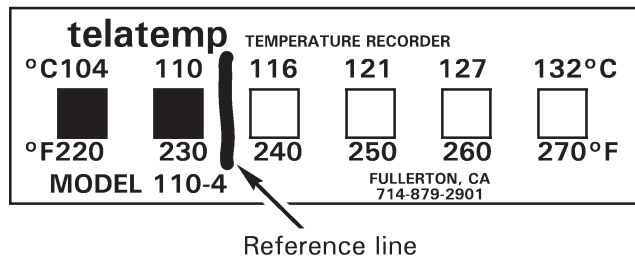
Elastomer may also separate (debond) from metal bushings. If separation occurs over more than 25% of bonded area, replace bearing.

2.130 Telatemp Indicators

Self-adhesive Telatemp indicators record changes in operating temperatures of bearings and gearboxes. To use a Telatemp, draw a reference line between the highest temperature square which has darkened during normal operation and the next undarkened square. During every check thereafter, determine if an additional square has blackened. If an indicated temperature increase cannot be accounted for by a change in operating conditions, carefully examine the component before further flight.

NOTE

Telatemps can indicate erroneously if contaminated by a petroleum product, typically appearing as white, unactivated square(s) between darkened squares at each end; replace any Telatemp indicating as such and clean area with acetone prior to installing.



Part Number	Temperature Range
F110-2	60°C / 140°F — 88°C / 190°F
F110-4	104°C / 220°F — 132°C / 270°F

Usage

- F110-4 on A006-1 Main Rotor Gearbox
- F110-2 on A184-3 Upper Actuator Bearing (just aft of upper sheave)
- F110-2 on A181-4 Lower Actuator Bearing (just aft of lower sheave)
- F110-2 on A021-1 or B021-1 Tail Rotor Gearbox

2.140 Torque Stripes

If, during inspection, the remaining torque stripe on a fastener is insufficient to determine joint integrity, then remove accompanying palnut as required and apply specified torque to fastener. If fastener moves, disassemble joint and inspect parts for damage such as fretting, thread deformation, hole elongation, etc.; replace damaged parts. If fastener does not move, install new palnut as required & standard torque per § 23-32. Torque stripe fastener per Figure 2-1.

2.200 Ground and Flight Check for 100-Hour/Annual Inspection

Complete the following checklists in conjunction with a 100-hour or annual inspection. Note and correct any discrepancies.

2.205 Ground Check

1. **Throttle Control:** Check for freedom of rotation with collective full down and full up. _____
2. **Throttle Overtravel Spring:** Check by twisting throttle past idle position to override stop. Release throttle and ensure it returns immediately to normal idle position. _____
3. **Mixture Control:** Check for smoothness of operation with no binding. Check press-to-unlock button for proper function. Verify 0.03 to 0.10 inch spring-back at full rich position. _____
4. **Carburetor Heat Control:** Check for smoothness of operation with no binding. Verify 0.03 to 0.10 inch spring-back at full off position. _____
5. **Cyclic Control:** Check freedom through full travel with friction and right trim off. Verify friction knob rotates 1/8 to 1 turn clockwise before adding friction. Check full travel with friction and right trim on. Verify 10 pounds maximum friction measured laterally at grip with right trim off, friction on, and MR blade pitch links fore and aft. _____
6. **Collective Control:** Check freedom through full travel with friction off. Check freedom through full travel with friction on; friction should be 12 to 20 pounds measured at grip. _____
7. **Carb Heat Assist (if installed):** With collective down and full carb heat, raise collective full up and verify carb heat off. Lower collective full down and verify carb heat full on. With collective friction off, push carb heat off and verify collective stays down. _____
8. **Tail Rotor Pedals:** Check for smooth operation with no binding. _____
9. **Removable Controls:** Verify security of attached fasteners. _____
10. **Lighting and Instruments:** Turn MASTER switch on and verify –
 - a. Carbon Monoxide caution light blinks twice _____
 - b. Carb Air Temp approximately same as Outside Air Temp _____
 - c. ALT caution light on _____
 - d. OIL pressure warning light on _____
 - e. Fuel quantity gages – indication of fuel level _____
 - f. Navigation and panel lights – check function _____
 - g. Strobe light – check function _____

2.205 Ground Check (continued)

10. Lighting and Instruments: Turn MASTER switch on and verify – (continued)

- h. Landing lights – check function
(clutch switch must be Engaged to check landing lights) _____
- i. Map light – check function _____
- j. Ammeter – shows discharge _____
- k. Oil temperature gage – slight needle deflection with engine cold _____
- l. Cylinder head temp gage – slight needle deflection with engine cold _____
- m. MR CHIP light – on when sender shorted or test switch depressed _____
- n. MR TEMP light – on when sender shorted or test switch depressed _____
- o. TR CHIP light – on when sender shorted or test switch depressed _____
- p. LOW FUEL light – on after approximately 1 second delay when low fuel sender in tank is depressed or when test switch depressed _____

2.210 Run Up

1. Perform preflight inspection per POH. _____
2. Turn MASTER switch on. Apply rotor brake and verify BRAKE light on. With brake applied, verify starter does not activate when key is turned to START position. _____
3. Start engine and run up using POH checklist, except leave cyclic and collective frictions on and governor off before proceeding. After engaging clutch switch, verify blades turn within 5 seconds and CLUTCH light extinguishes within 100 seconds. _____
4. Ammeter indicates charge, ALT light off. _____
5. Both magnetos ground (momentarily off) at 60% RPM. _____
6. Select alternator and battery switches off and verify-
 - a. Engine and rotor tachometers operate. _____
 - b. All warning/caution lights extinguished, indicating proper function of tachometer bus isolation diode. _____
7. No unusual bearing noise when varying RPM through operating range. Mechanic to listen near V-belt drive for symptoms of failing bearing as described in Section 2.110. _____
8. Set RPM at 75%, governor on, Increase to 85%, release throttle and verify governor increases RPM to 104% \pm 1.5%. Increase RPM to 106%, release throttle, and verify governor decreases RPM to 104% \pm 1.5%. _____
9. Engine and rotor tachometer needles within 1% of each other at 104% RPM. _____
10. Verify alternator voltage as follows: _____
13.4 to 13.9 vdc for A942-3 alternator control unit
13.0 to 13.7 vdc for A942-1 or -2 alternator control unit _____
11. Heater operates properly (if installed). _____
12. Tachometer needles do not jump more than 2% when transmitting on 118.00, 125.00, and 136.975 MHz with governor on. _____
13. Raise collective control 0.5 inch at grip and slowly decrease RPM. Verify low rotor RPM warning horn and light activate at 97 to 96% RPM and remain on as RPM is decreased to idle. _____
14. Idle RPM with engine warm, clutch engaged, throttle closed: 53 to 57%. _____
15. Idle mixture with engine warm, clutch disengaged, throttle closed: 2 to 4% RPM rise as mixture is pulled slowly to idle cut-off. Adjust idle mixture screw as required. If unable to obtain rise, set idle mixture screw to nominal position of 1½ turns out from full-in then adjust as required for smooth idle. _____

2.220 Flight Check

1. Hover:

- a. All gages green _____
- b. Controllability in left and right pedal turns _____
- c. Vibration levels _____

2. Level flight: Approximately 3000 feet density altitude (if possible), maximum continuous power, governor on, right trim on, frictions off.

- a. Vibration levels _____
- b. Longitudinal cyclic trim - cyclic does not creep forward or aft _____
- c. Lateral cyclic trim - cyclic does not creep left or right _____
- d. Collective spring - collective does not creep up or down _____
- e. Tail rotor pedal position - 0.0 to 0.5 inch left _____

2.300 AIRFRAME PREPARATION FOR 100-HOUR/ANNUAL INSPECTION

The airframe must be thoroughly cleaned prior to inspection in accordance with U.S. FAR 43, Appendix D, paragraph (a). Cleaning should include a wipe down of main and tail rotor blades, hubs, and airframe exterior with a mild soap and water solution. Refer to R22 POH Section 8 for cleaning instruction. Note any fluid leakage before cleaning.

CAUTION

Do not spray magnetos, main rotor hub, tail rotor gearbox vent, or swashplate area with high pressure water as water may enter and cause corrosion and breakdown of lubricants.

2.400 100-HOUR/ANNUAL AIRFRAME INSPECTION

Perform 100 hour or annual airframe inspections per Section 2.410. RHC recommends keeping a copy of the most recently performed checklist with the aircraft's maintenance records.

2.410 Inspection Procedures and Checklist

R22 Serial No.:	_____	Technician name:	_____
Registration No.:	_____	Technician	_____
Hourmeter Indication:	_____	Certificate number:	_____
Aircraft Total Time:	_____		

Numbers in parentheses indicate access location per Figures 2-3A and 2-3B.

1. Remove Landing Light Retainer (1A)

NOTE

Do not remove pedal bearing block cover plates (1B) unless function check of pedals indicates a problem with bearing blocks.

- Landing Light Retainer and Support:** Inspect condition. Verify support security. _____
- Tail Rotor Pedal Bearing Blocks:** Use an inspection light and mirror to inspect bearing blocks. Maximum allowable play is 0.050 inch axially and 0.020 inch radially. Verify security. _____
- Tail Rotor Pedal Bearing Blocks Sheet Metal Supports:** Use an inspection light and mirror to verify no cracks or fretting in bearing block vertical sheet metal supports. _____
- Tail Rotor Pedals:** Inspect condition. Verify no cracks. Verify security and operating clearance. _____
- Push-Pull Tubes:** Inspect condition. Verify no cracks at ends. Inspect rod ends per Section 2.120. Verify security and operating clearance. _____
- Sheet Metal Structure:** Inspect condition. Verify no corrosion. No cracks. _____
- Battery Box (if installed in nose):** Inspect drain attachment to battery box. Verify no electrolyte leakage. _____
- Chin Area:** Verify no loose equipment or debris. _____
- Wiring:** Inspect condition. Verify no loose, broken, or chafed wires. Verify neatness and security. _____
- Fasteners & Torque Stripes:** Inspect condition and verify security of all fasteners. Renew deteriorated torque stripes per Figure 2-1. _____

2.410 Inspection Procedures and Checklist (cont'd)

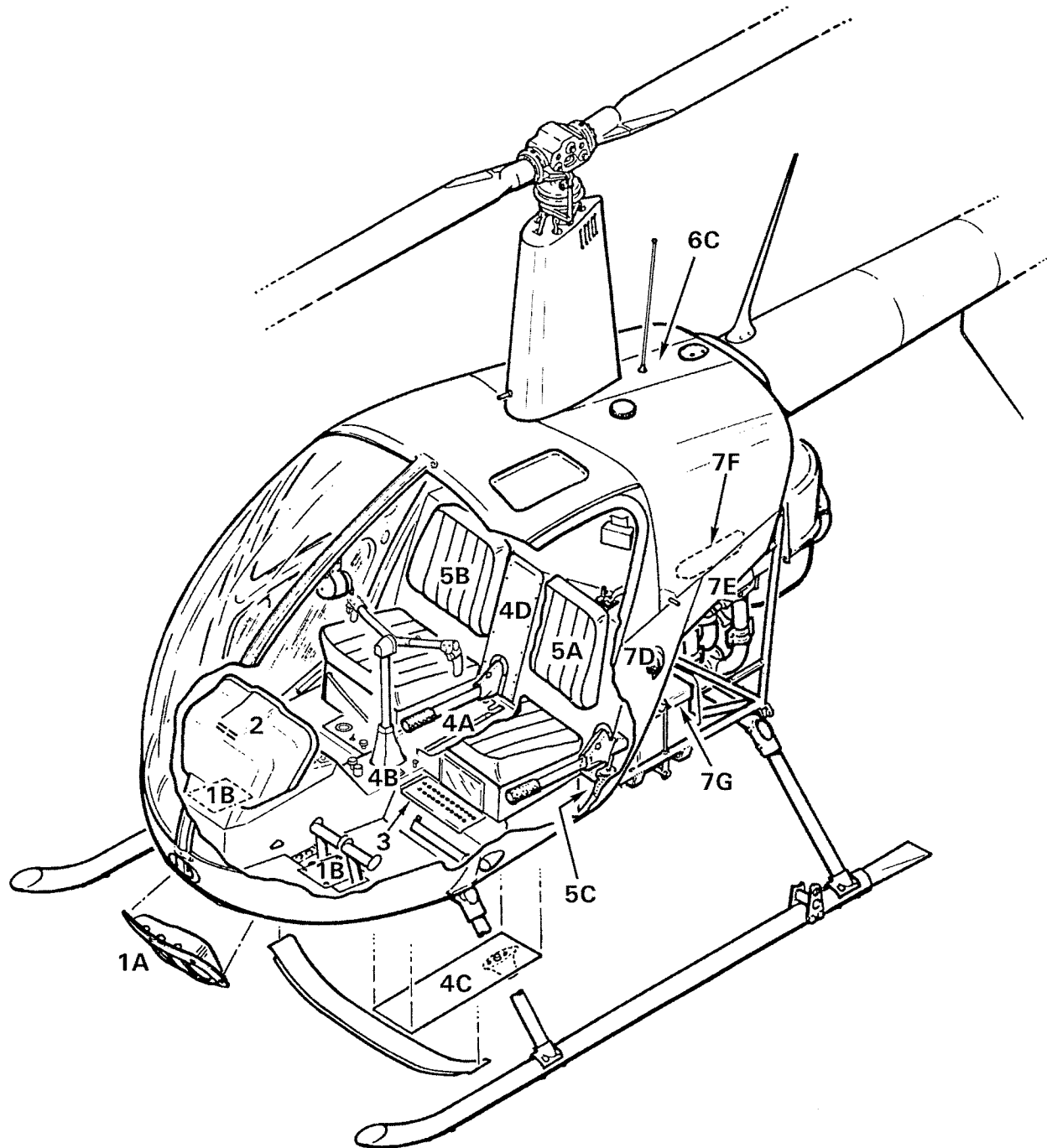


FIGURE 2-3A ACCESS COVERS AND INSPECTION PANELS

2.410 Inspection Procedures and Checklist (continued)

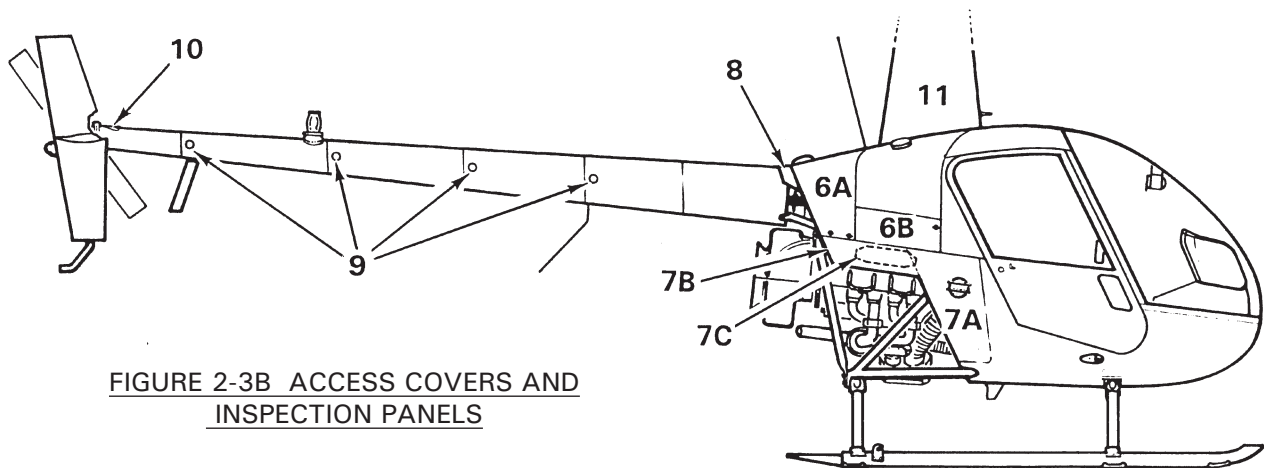


FIGURE 2-3B ACCESS COVERS AND INSPECTION PANELS

2. Remove or open upper console assembly per § 13-70:

CAUTION

Instrument console removal (§ 13-70) is not required for scheduled inspections. Sufficient access for inspection is gained by removing the landing light retainer and/or removal of installed avionics, as required (refer to Chapter 34).

Upper Console Assembly: Inspect condition. Verify hinge security. _____

Instruments and Instrument connections: Inspect condition. Verify security. _____

Strobe Power Supply and Wiring (alternate locations – atop horizontal firewall or behind right seat back): Inspect condition. Verify no cracks in mounting area. Verify security. _____

B255-1 Bracket (10-hole instrument console only): Inspect condition of grommet and bracket contacting brace assembly between windshields. _____

Tail Rotor Push-Pull Tubes: Inspect condition of visible portions. Verify operating clearance. _____

Battery and Box (if installed in nose): Inspect condition. Check battery cell fluid level and specific gravity (non-sealed battery only). Verify security of connections. Verify no corrosion in surrounding structure. _____

Radio Tray(s): Inspect condition. Verify security. Verify no loose or poor wire connections. _____

Fasteners & Torque Stripes: Inspect condition and verify security of all fasteners. Renew deteriorated torque stripes per Figure 2-1.

Wiring: Inspect condition. Verify neatness, security, and no chafing. _____

2.410 Inspection Procedures and Checklist (continued)

3. Open Circuit Breaker Panel (3)

WARNING
Ensure electrical system remains off while circuit breaker panel is open.

Wiring: Inspect condition. Verify neatness, security, and no chafing. _____

Connections: Inspect condition. Verify security and no corrosion. _____

Circuit Breakers: Inspect condition. Verify security. Check airworthiness directive applicability. Verify red button (collar) on CLUTCH circuit breaker button. _____

Copper Bus Bars: Inspect condition. Verify no corrosion. Verify bus bars are not bent and will not contact surrounding structure. _____

Circuit Breaker Box Interior: Inspect condition. Verify cleanliness. _____

Close and Secure: Circuit breaker panel. _____

4. Remove Horizontal Cover (4A), Cyclic Box Cover (4B), Belly Panel (4C) and Vertical Panel (4D)

To remove cyclic box cover, unscrew trim adjustment knob, remove spring pin in cyclic friction knob, and, on ships equipped with carburetor heat assist, unscrew carburetor heat knob.

Covers: Inspect condition. Verify placard legibility. _____

Cyclic Box Assembly: Inspect condition. Verify no cracks, loose rivets, or corrosion. Verify security. _____

Cyclic Stick Assembly: Inspect condition. Verify no cracks in weld areas. Verify security and operating clearance. Verify no more than 0.015 inch wear in plates at bottom of stick from A121-1 push-pull tube's forward rod end housing. _____

Cyclic Pivot (forward end of torque tube): Inspect condition. Inspect bearings per § 2.120. Verify security and operating clearance. _____

Cyclic Right Trim: Rotate main rotor blades until pitch links are located fore and aft. Grip cyclic and activate right trim. Trim should produce a right cyclic stick force. Move cyclic stick fully left and verify right trim spring coils do not bind. Verify security and operating clearance. _____

2.410 Inspection Procedures and Checklist (cont'd)

4. Remove Horizontal Cover (4A), Cyclic Box Cover (4B), Belly Panel (4C) and Vertical Panel (4D) (cont'd)

Cyclic Friction: Inspect condition. Inspect rod ends per Section 2.120. _____

Cyclic Horizontal Push-Pull Tube: Inspect condition. Verify no cracks around reinforcement blocks at tube ends. Verify security and operating clearance. _____

Tail Rotor Horizontal Push-Pull Tubes: Inspect condition. Verify no cracks at ends. Inspect rod ends per Section 2.120. Verify security and operating clearance. _____

Tail Rotor Push-Pull tube Lower Bellcrank: Inspect condition. Verify security and operating clearance. _____

Mixture Cable: Verify security. _____

Carburetor Heat Cable: Verify security. _____

Carburetor Heat Assist Bellcrank (if installed): Inspect condition. Verify security and operating clearance. _____

Carburetor Heat Assist Push-Pull Tube (if installed): Inspect condition. Verify no cracks at ends. Inspect rod ends per Section 2.120. Verify security and operating clearance. _____

Pitot and Static Lines and Drains: Inspect condition. Verify no cracking, chafing, or kinking. Remove drain plugs from tee fittings in each line and drain any water. Install drain plugs. _____

Elastic Trim Cord: Remove trim cord assembly and stretch it. While stretched, check cord for voids which may indicate broken strands. Slide both hooks back and verify security of locking rings. Install cord. Verify operating clearance. _____

Fasteners & Torque Stripes: Inspect condition and verify security of all fasteners. Renew deteriorated torque stripes per Figure 2-1. _____

<p>NOTE</p> <p>Elastic trim cord is not required if cyclic does not need forward trim in cruise flight.</p>
--

2.410 Inspection Procedures and Checklist (cont'd)

4. Remove Horizontal Cover (4A), Cyclic Box Cover (4B), Belly Panel (4C) and Vertical Panel (4D) (cont'd)

Electrical Wiring: Inspect condition. Verify no loose, broken, or chafed wires. Verify neatness and security. _____

Tail Rotor Vertical Push-Pull Tube: Inspect condition. Verify no cracks at ends. Inspect rod ends per Section 2.120. Verify security and operating clearance. _____

Cyclic Push-Pull Tubes: Inspect condition. Verify no cracks at ends. Inspect rod ends per Section 2.120. Verify security and operating clearance. Contact between A121-3 & -7 push-pull tube lower ends is permitted when cyclic stick is in aft corners of cyclic box. _____

Cyclic Bellcrank: Inspect condition. Verify security and operating clearance. _____

Cyclic Yoke (aft end of torque tube): Inspect condition. Inspect bearings per Section 2.120. Verify security and operating clearance. _____

Cyclic Fork (attaching bellcrank to collective stick): Inspect condition. Inspect rod end per Section 2.120. Verify security. Verify operating clearance. _____

Throttle Overtravel Spring: Inspect condition. Inspect rod ends per Section 2.120. Verify security and operating clearance. Contact between overtravel spring and A121-1 push-pull tube is permitted when cyclic stick is in forward right corner of cyclic box. _____

Collective Friction and Stop Assembly: Inspect condition. Verify no nicks, cuts, or scratches. Move collective up and down and verify no bending or binding. Verify security and operating clearance. _____

Collective Boot: Inspect condition. Verify no tears. Ensure tie string ends are tucked into boot (if installed - current production aircraft use Ty-raps to secure boot around collective stick). _____

Fasteners & Torque Stripes: Inspect condition and verify security of all fasteners. Renew deteriorated torque stripes per Figure 2-1. _____

2.410 Inspection Procedures and Checklist (continued)

5. Remove Seat Backs (5A & 5B) & Collective Spring Guard (5C under left seat)

Seat Backs and Collective Spring Guard: Inspect condition. Verify upholstery security. _____

Upper Frame Assembly: Inspect condition of visible portions. Verify security. _____

Electrical and Antenna Wiring: Inspect condition. Verify security. Verify no chafing. Check grommets for proper installation. _____

Pitot and Static Lines: Inspect condition. Verify no chafing or kinks. _____

Collective Stick Assembly: Inspect condition. Inspect bearings per § 2.120. Verify security and operating clearance. Verify no cracks in welds. Verify security of removable stick (if installed). If applicable, verify A783-1 retainer is secured to collective stick with ty-raps per Figure 2-4. _____

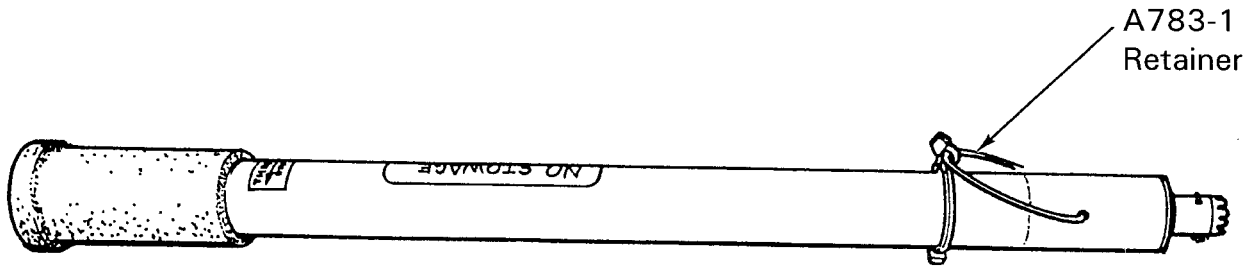


FIGURE 2-4 A783-1 RETAINER SECURITY

Throttle Connecting Rod: Inspect condition. Verify no cracks. Verify security and operating clearance. _____

Governor: Inspect condition. Inspect rod ends per § 2.120. Verify security and operating clearance. Verify sufficient wiring slack with full up collective. _____

Collective Spring: Inspect condition. Inspect rod ends per § 2.120. Verify no binding or roughness during operation. Verify lubrication of guide rods. Verify spring coils do not touch each other when collective is full down. Verify no elongation of lower cap guide rod holes. Verify security and operating clearance. _____

2.410 Inspection Procedures and Checklist (continued)

5. Remove Seat Backs (5A & 5B) & Collective Spring Guard (5C under left seat) (continued)

Firewall Drains: Inspect condition. Verify drains are unobstructed. Verify tubing clamps are not cutting tubing. Verify security. _____

Governor Controller/Engine Monitoring Unit (EMU; later helicopters) and Wiring: Inspect condition. Refer to § 33-137 for EMU description; refer to EMU Technician’s Guide and EMU User Guide online at www.robinsonheli.com for data access. Verify security. _____

Main Fuel Tank Outlet & Fuel Hose: Inspect condition. Verify no leakage. Verify security. Verify smooth operation of fuel valve. _____

Fuel Shut-Off Valve: Inspect condition. Verify no leakage. Verify security. Verify smooth operation of fuel valve. _____

Aux Fuel Tank Fuel Hose: Inspect condition. Verify clearance to structure. Verify no leakage. Verify security. _____

Fasteners & Torque Stripes: Inspect condition and verify security of all fasteners. Renew deteriorated torque stripes per Figure 2-1. _____

6. Open Cowling Door(s) (6A & 6B) & Remove aft Cowling (6C)

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

Electrical Wiring: Inspect condition. Verify no loose, broken, or chafed wires. Verify neatness and security. _____

Actuator Fuse(s) and Holder(s): Inspect condition. Verify no corrosion. Verify correct AGC-1 ½ fuse(s), twist-to-lock function, and security. _____

Antennas and Connections: Inspect condition. Verify security of antenna(s) and antenna connection(s). _____

Emergency Locator Transmitter (ELT; if installed): Inspect condition. Comply with U.S. 14 CFR 91.207 (d), if required. Verify proper installation, security, and clearance from drive train components. Verify D693-4 strap assembly is installed and buckled securely. _____

Pitot Line and Static Vent: Inspect condition. Verify no chafing, kinks, or tight bends. Verify static vent is clean and unobstructed. _____

Fuel Tanks: Inspect condition of visible portion. Verify no leaks. Verify security. Check interior for foreign objects and cracks in baffle. _____

Aux Fuel Tank Fuel Hose: Inspect condition. Verify clearance to structure. Verify no leakage. Verify security. If hose is C595-1 “breakaway” style (later helicopters), visually inspect coupling and verify no leakage, four rivets are installed and secure, and gap is not excessive (0.005 inch max.). _____

Fuel Gage Sender(s) and Wiring: Inspect condition. Verify no fuel leaks. _____

2.410 Inspection Procedures and Checklist (continued)

6. Open Cowling Door(s) (6A & 6B) & Remove Aft Cowling (6C) (continued)

Fuel Tank Sump Drain(s): Inspect condition. Verify drain valve(s) open easily, drain fuel freely, spring closed, and seal completely. _____

Low Fuel Warning: Turn battery on. With a clean wooden dowel, gently depress low fuel sender float in main fuel tank and verify LOW FUEL warning light illuminates after approximately 1 second delay. Turn battery off. _____

Fuel Cap(s): Refer to Figure 2-4A. Verify A689-6 fuel cap is revision J or subsequent if bladder tanks are installed (revision J or subsequent caps may also be used on all-aluminum tanks). Inspect condition. Verify no deterioration of gasket(s). Verify security when closed. Refer to R22 SB-107; verify cap decal is legible and properly installed, and alignment marks on cap and tank align when cap is fully closed. _____

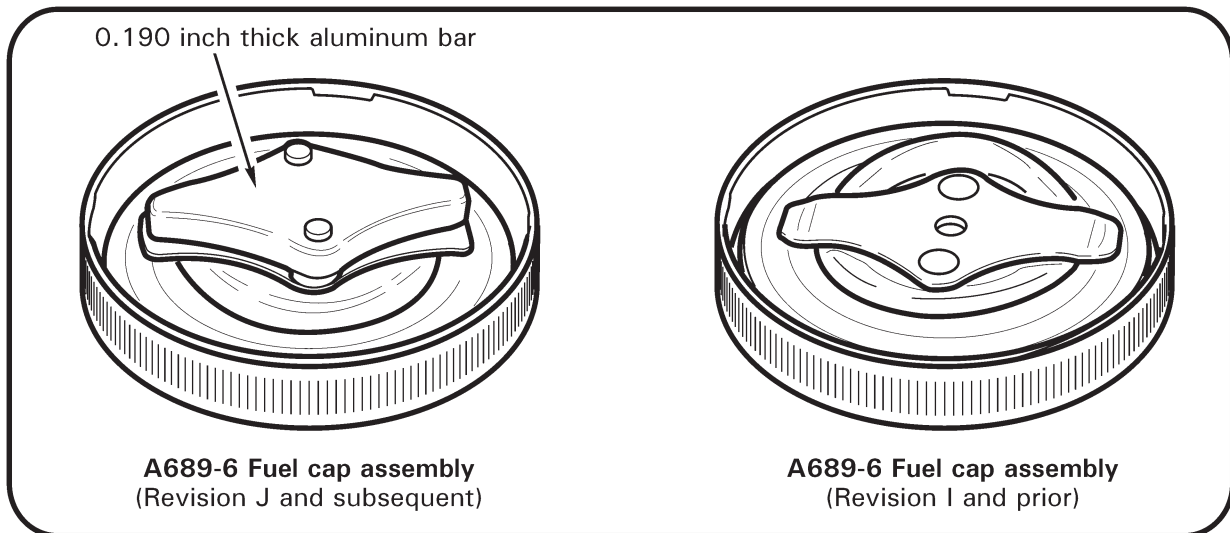


FIGURE 2-4A A689-6 FUEL CAPS

Collective Jackshaft Supports: Inspect condition. Inspect rod ends per § 2.120. Verify no cracks or corrosion. Verify strut ends are sealed. Verify security. _____

Collective Jackshaft: Inspect condition. Verify no cracks or corrosion. If open type, verify no internal corrosion. Verify security. Verify operating clearance. _____

Swashplate Push-Pull Tubes: Inspect condition of visible portions. Verify no cracks at ends. Inspect rod ends per § 2.120. Verify no tears in, or wear through, heat-shrink sleeves on forward push-pull tubes. Verify security and operating clearance. _____

Push-Pull Tube Guides or Rollers: Inspect condition. Verify cleanliness, no wear into metal, and free movement of rollers. Verify security. _____

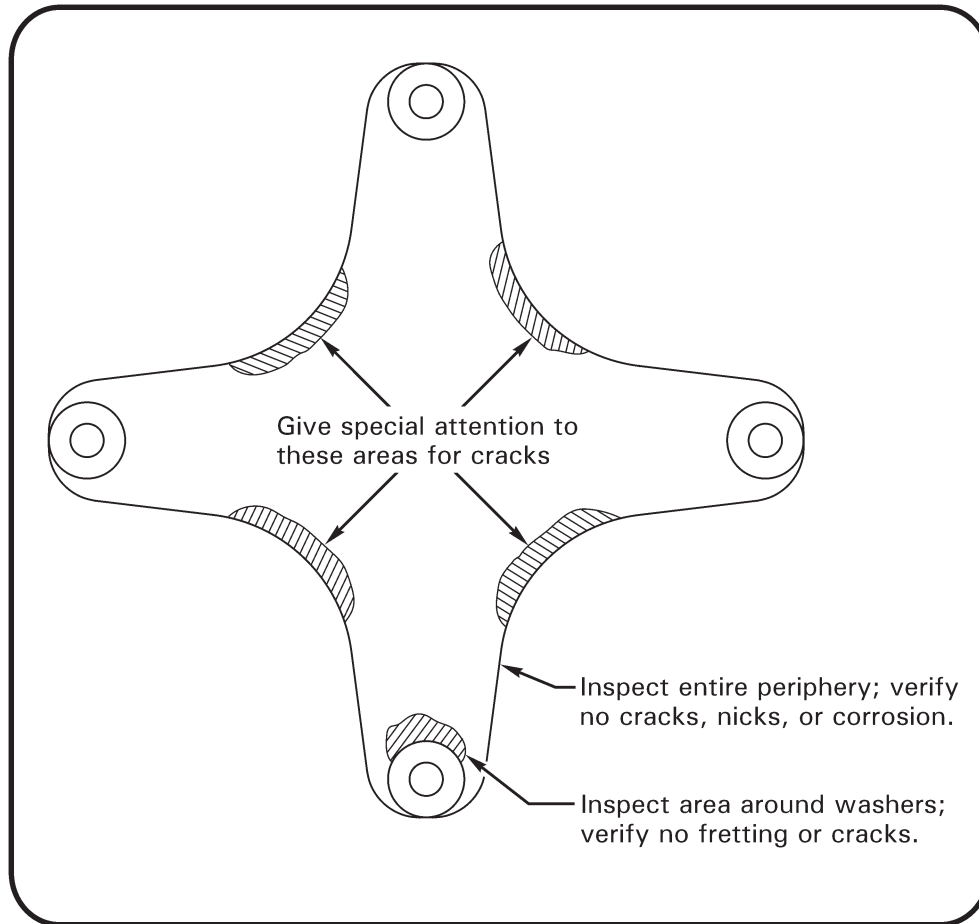


FIGURE 2-4B A947-1 FLEX PLATE INSPECTION

2.410 Inspection Procedures and Checklist (continued)

6. Open Cowling Door(s) (6A & 6B) & Remove Aft Cowling (6C) (continued)

Tail Rotor Push-Pull Tube and Bellcrank (at forward end of A121-15 push-pull tube): Inspect condition. Inspect rod ends per § 2.120. Verify no cracks in tube ends. Verify no cracks at bellcrank sheet metal mounting. Verify security and operating clearance.

Main Rotor Gearbox Cooling Air Duct and Nozzle: Inspect condition. Verify security. Verify no rips, holes, chafing, or obstructions. Inspect condition and verify security of horizontal firewall grommet around duct.

2.410 Inspection Procedures and Checklist (continued)

6. Open Cowling Door(s) (6A & 6B) & Remove Aft Cowling (6C) (continued)

Main Rotor Gearbox: Inspect condition, especially gearbox mounts, static mast tube-to-gearbox attachment, and mast tube lower casting (if applicable). Inspect Telatemp per § 2.130. Verify proper oil level with no leakage. Verify security. Verify security of Hall Effect senders.

NOTE

At 500 hours time in service or annually, whichever occurs first, remove chip detector and clean any varnish accumulation from detector’s magnetic probe and adjacent metal body using a toothbrush and approved solvent per § 22-11. Drain and flush gearbox at intervals not to exceed 500 hours time in service (refer to § 22-13).

Rotor Brake: Inspect condition, including activating cable & pulley and microswitch. Verify integrity of brake pads and 0.030 inch minimum pad thickness. Verify brake pad clearance to input yoke when brake is off. Verify security and operating clearance.

MRGB Input Yoke: Inspect condition. Verify security and operating clearance. Verify security of magnets.

Forward Flex Plate: Refer to Figure 2-4B. Inspect condition. Verify no distortion, nicks, scratches, cracks, corrosion, or 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.

WARNING

A193 flex plates, which do not have bonded washers, are obsolete and must be replaced with A947 flex plates having bonded washers. If a bonded washer separates from an A947 flex plate, flex plate is unairworthy and cannot be repaired. Ensure A947-1 forward flex plate is Rev E or subsequent (identified by letter, “E” or subsequent letter, on two adjacent arms of flex plate).

Clutch Shaft Forward Yoke: Inspect condition. Verify no cracks, corrosion, or fretting. Verify security and operating clearance.

Clutch Assembly: Inspect condition. Verify no oil leakage. Verify no clutch shaft corrosion, especially at shaft-to-A966-1 seal junctures. Remove any light surface corrosion at shaft-to-seal junctures and apply wax or suitable corrosion preventative compound. Verify no cracks in seal retainer plates.

NOTE

Clutch assembly lubricant inspection and servicing (§ 7.214) is recommended every 500 hours time in service.

2.410 Inspection Procedures and Checklist (continued)

6. Open Cowling Door(s) (6A & 6B) & Remove Aft Cowling (6C) (continued)

Upper Sheave: Inspect condition. Verify smoothness of drive belt contact surfaces. Replace any sheave having corrosion, pitting, flaking, roughness, sharp ridges, wear through anodized coating, or blistering of optional metalized coating.

Upper Steel Tube Frame: Inspect condition. Verify no cracks or corrosion. If corrosion is found, inspect and repair per § 2.560. Use an inspection light and mirror to inspect all parts of each weld.

CAUTION

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

Horizontal Firewall: Inspect condition, especially where bolted to steel structure. Verify no cracks, buckling, or wrinkles.

Cabin Aft Bulkhead: Inspect condition. Verify no corrosion, loose rivets, deformation, or cracks.

Fasteners & Torque Stripes: Inspect condition and verify security of all fasteners. Renew deteriorated torque stripes per Figure 2-1.

7. Remove Side Skirts (7A, 7B, 7D, & 7E), Spark Plug Access Covers (7C & 7F), and Battery Box Cover (7G, alternate location under upper console or left seat)

Engine: Refer to Lycoming Operator's Manual (Lycoming P/N 60297-12 or 60297-16, as applicable) Sections 4 and 5 and Lycoming SI 1080 (current revision) for 100-hour or annual inspection and service procedure.

Muffler: Open heater shroud (if installed). Inspect muffler condition. Verify no cracks or ruptures. Pay particular attention to tail pipe and riser attachment areas, welds, clamps, riser flanges and gaskets. Verify no internal obstructions.

Muffler Leak Check: Pressurize muffler with low pressure air and inspect for leakage by applying soapy water to exterior and looking for air bubbles. Verify security.

WARNING

Exhaust system failure can result in carbon monoxide poisoning, partial loss of power, or fire.

Heater Shroud (if installed): Inspect condition. Close and secure shroud and connect hoses.

Engine Cooling Panels: Inspect condition. Pay particular attention to panel attached to oil cooler and panel attached to alternator cooling hose. Verify no cracks or missing or loose fasteners. Verify security.

2.410 Inspection Procedures and Checklist (continued)

7. Remove Side Skirts (7A, 7B, 7D, & 7E), Spark Plug Access Covers (7C & 7F), and Battery Box Cover (7G, alternate location under upper console or left seat) (continued)

Alternator & Pulley: Inspect condition. Verify steel pulley (use magnet); aluminum pulley is not approved. Verify security. _____

Alternator Wiring: Inspect condition. Verify no evidence of arcing. Verify security of output, aux, and field terminal studs. Verify no damage to insulating spacer at output stud. Verify wiring security. _____

Alternator Belt: Inspect condition. Replace belt if there are any cracks, missing teeth or delamination. Check tension per Lycoming Service Instruction 1129 (current revision). Verify proper belt alignment. _____

Emergency Spare Alternator Belt: Remove if installed. _____

Alternator Cooling Hose: Inspect condition. Verify no obstructions or holes. Verify security. _____

Vertical Firewall: Inspect condition. Verify no cracks, buckling, or wrinkles, especially around structural attachment points. _____

Lower Steel Tube Frames: Inspect condition. Verify no corrosion or cracks, especially at welds. If corrosion is found, inspect and repair per § 2.560. Verify proper torque (see § 23-32) and safety wiring of drilled-head bolt at lower left frame-to-cabin-belly attachment. _____

Engine Mounts: Inspect condition. Verify security. Replace rubber mounts exhibiting significant deflection or other than superficial cracks. _____

Throttle Control: Verify carburetor butterfly bellcrank contacts idle rpm adjustment screw with collective full down and throttle grip at idle position. Verify bellcrank contacts full-open stop when throttle is opened with collective half-up. Inspect rod end per § 2.120. Verify operating clearance, especially at vertical firewall. _____

Throttle Correlation Rigging: Check per § 10.150 and adjust as required. _____

Full Throttle Switch Rigging: Check per § 33-60 and adjust as required. _____

Carburetor Mixture Control: Verify carburetor mixture control moves carburetor mixture control arm stop to stop. Inspect condition and verify security of mixture control cable clamp(s) on air box bracket; push and pull cable housing to ensure it does not slip in clamp(s). Inspect condition and verify security of mixture control cable inner wire attachment to carburetor mixture control arm. Ensure freedom of rotation between mixture control arm and inner wire retention fitting (bolt) when arm moves. Verify mixture control safety spring is properly installed (so spring force moves mixture control arm to full-rich position if inner wire breaks). _____

Engine Electrical Wiring, Alternator Control Unit: Inspect condition. Verify no wire chafing. Inspect connections. Verify security and no corrosion. _____

2.410 Inspection Procedures and Checklist (continued)

7. Remove Side Skirts (7A, 7B, 7D, & 7E), Spark Plug Access Covers (7C & 7F), and Battery Box Cover (7G, alternate location under upper console or left seat) (continued)

Oil Lines & Elbows: Inspect condition. Verify clearance and no cracks or abrasions. Wires, ty-raps, and structure must not contact lines. _____

Oil Line Clamps: Inspect condition. Verify no broken clamps. _____

Oil Cooler: Inspect condition. Verify no cracks or leakage. Verify security. Verify airflow path through cooling fins is unobstructed. _____

Gascolator: Inspect condition. With fuel valve in OFF position, remove and clean gascolator bowl and filter screen. Reinstall bowl, turn fuel valve ON. Safety wire retainer after ensuring no leakage. Verify drain valve opens easily, drains fuel freely, springs closed, seals completely, and is torque-stripped per § 23-31. _____

Fuel Hose: Inspect condition, verify security, clearance, no cracks, abrasion or leakage. _____

Carburetor Air Box: Open air box. Inspect condition. Verify free movement of disk in drain valve (not applicable to Mariners). Verify security. If installed, verify free movement and full closure of spring-loaded alternate air door. _____

Carburetor Heat Valve: Verify carburetor heat control fully opens and closes slider valve. Inspect condition and verify security of carburetor heat cable clamp on air box. Inspect condition and verify security of carburetor heat control cable inner wire attachment to slider valve. _____

Air Filter: Clean B771-1 air filter per § 6.435. Close and secure air box. _____

Carburetor Air Inlet Hose: Inspect condition. Verify no obstructions, leakage, or chafing. Verify security. _____

Carburetor Heat Scoop and Hose: Inspect condition. Verify security. Verify no obstructions, leakage, chafing, or scoop cracks. _____

Heater Hoses (if installed): Inspect condition. Verify security and no obstructions, leakage, or chafing. Verify security. _____

Battery, Battery Cables, and Battery Box (alternate locations under upper console or left seat): Inspect condition. Check each battery cell electrolyte for quantity and specific gravity (non-sealed batteries only). As required, perform capacity test or replace battery per manufacturer's instructions. Verify battery cable security and no cracked or corroded terminals. Verify security of, and no obstructions in, battery box drain tube (if installed). _____

Fasteners & Torque Stripes: Inspect condition and verify security of all fasteners. Renew deteriorated torque stripes per Figure 2-1. _____

2.410 Inspection Procedures and Checklist (continued)

8. Remove Tailcone Fairing (8)

Tailcone Fairing: Inspect condition. _____

Upper Steel Tube Frame: Inspect condition. Verify no cracks or corrosion. If corrosion is found, inspect and repair per § 2.560. Use an inspection light & mirror to inspect all parts of each weld. _____

CAUTION

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

Tailcone-to-Upper Frame Attachment: Inspect condition. Verify security. _____

Upper Frame Protective Clamp: Inspect clamp protecting right side upper frame tube from drive belt contact; replace if wear has penetrated clamp. If clamp is not installed, verify no more than 0.0049 inch wear into frame tube due to drive belt rubbing. Protective clamp may be installed per Figure 2-4C on any R22 if desired. _____

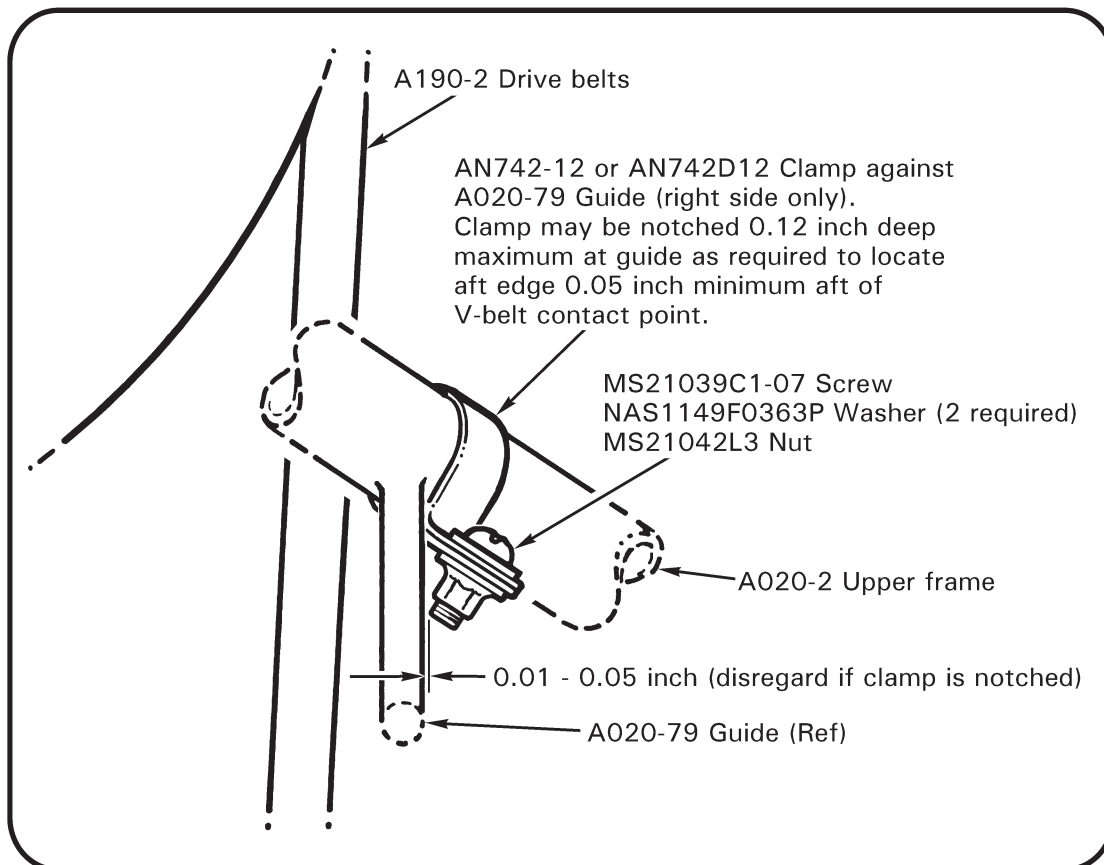


FIGURE 2-4C UPPER FRAME PROTECTIVE CLAMP INSTALLATION
(View looking forward)

2.410 Inspection Procedures and Checklist (continued)

8. Remove Tailcone Fairing (8) (continued)

Actuator Upper Bearing: Inspect condition. Verify no more than 0.060 inch axial play. Verify no fretting between bearing inner race and clutch shaft. Verify bearing inner race has not slipped relative to clutch shaft. Inspect Telatemp per § 2.130. Perform § 22-41 bearing inspection if unexplainable Telatemp increase has occurred.

CAUTION
A184 bearing requires periodic lubrication per § 1.101.

Actuator Upper Bearing Lubrication: Perform as required.

Clutch Lateral Centering Strut Assembly: Inspect condition. Inspect rod ends per § 2.120. Verify security.

Intermediate Flex Plate and Yokes: Refer to Figure 2-4B. Inspect condition. Verify no distortion, nicks, scratches, cracks, corrosion, or 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.

WARNING
A193 flex plates, which do not have bonded washers, are obsolete and must be replaced with A947 flex plates having bonded washers. If a bonded washer separates from an A947 flex plate, flex plate is unairworthy and cannot be repaired.

Tail Rotor Push-Pull Tubes and A331-1 Bellcrank: Inspect condition. Verify no cracks at tube ends. Inspect rod ends per § 2.120. Verify security and operating clearance.

Drive V-Belts: Inspect per § 2.507.

Fanshaft: Inspect condition. Perform 360° visual inspection of exposed fanshaft for cracks. Verify security and safety wiring of attaching bolts.

Actuator Lower Bearing: Inspect condition, verify bearing inner race has not slipped relative to fanshaft. Inspect Telatemps per § 2.130. Perform § 22-42 bearing inspection if unexplainable Telatemp increase has occurred.

CAUTION
A181-4 bearing requires periodic lubrication per § 1.101.

Actuator Lower Bearing Lubrication: Perform as required.

2.410 Inspection Procedures and Checklist (continued)

8. Remove Tailcone Fairing (8) (continued)

Actuator Lower Bearing Lubrication: Perform as required.

Lower Bearing Brackets: Refer to Figure 2-4D. Visually inspect A185 brackets and attaching rivets for evidence of fretting or looseness. If evidence of looseness is found repair per R22 SL-74A. On lower A185 bracket, apply torque seal in a horizontal stripe across both outboard rivets to lower scroll to facilitate future inspections.

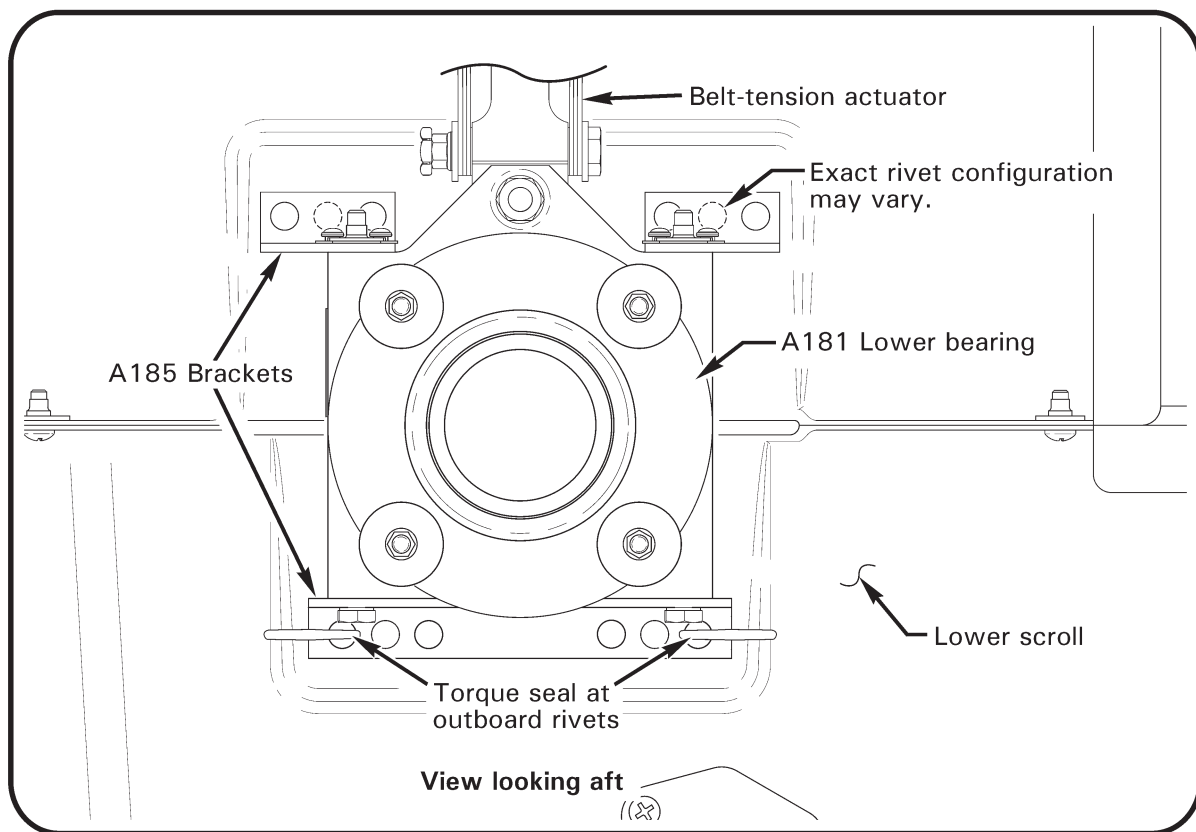


FIGURE 2-4D ACTUATOR LOWER BEARING A185 BRACKETS

Fiberglass Scroll: Inspect condition. Verify no damage to vane assembly in upper right scroll. Verify security. Verify drain hole is unobstructed.

Scroll Metal Inlet Lips & Gap (if installed): Inspect condition. Verify 0.020 to 0.100 inch gap between lips and fanwheel inlet. (Attach holes in lips may be elongated to facilitate gap adjustment.)

Fanwheel Assembly: Inspect condition. Verify no cracks or corrosion. Check leading edge of vanes for damage. Verify alignment of roll pin and slippage marks on fanwheel. If marks and roll pin do not align, remove fanwheel and inspect hub and shaft for damage. Verify security.

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2.410 Inspection Procedures and Checklist (continued)

8. Remove Tailcone Fairing (8) (continued)

Actuator (A051-1): Turn master switch on and engage clutch switch. While actuator is engaging, depress extension limit switch lever and verify gear motor stops; release lever and verify gear motor resumes running. Use an inspection mirror to observe column springs at end of belt-tensioning cycle; springs should snap outward simultaneously. Verify maximum engaged extension limit per Figure 7-15 is not exceeded. Verify security of attachment to A181 and A184 bearings. Verify gear motor security and minimum 0.030 inch clearance to upper frame.

Actuator Spring Switches: Check using either of following two methods, as appropriate:

Method 1 – (actuator electrical harness must be equipped with “Test” plug)

CAUTION

When using MT558-1 plug assembly (see Figure 2-5), if gear motor does not shut off when column springs snap outward then spring switch has failed in closed position; immediately remove MT558-1 to prevent actuator damage.

- a. Disengage actuator. Connect one end of MT558-1 to actuator test plug. Engage actuator and verify gear motor shuts off when column springs snap outward.
- b. Disengage actuator. Connect opposite end of MT558-1 to actuator test plug. Engage actuator and verify gear motor shuts off when column springs snap outward.
- c. MT558-1 pins 1-2 jumper tests the wire 98 spring switch; the pins 2-3 jumper tests the wire 91 spring switch (see Figure 14-4A). If either switch does not function properly, replace switch section per § 7.551 before further flight.

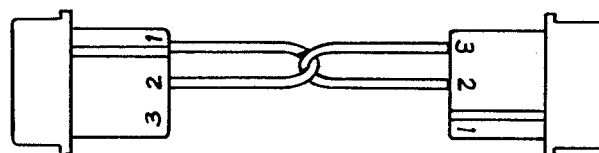


FIGURE 2-5 MT558-1

2.410 Inspection Procedures and Checklist (continued)

8. Remove Tailcone Fairing (8) (continued)

Actuator Spring Switches (continued):

Method 2 – (use if actuator electrical harness is not equipped with “Test” plug)

- a. Refer to Figure 2-5A. Depress column springs on one side of actuator until springs snap inward (use large screwdriver or similar tool with several layers to tape over end to protect actuator). Hold springs inward for at least one second. Actuator motor should not run. If motor starts, allow motor to run approximately two seconds, then release pressure on column springs. Depress column springs again. If motor starts again, opposite spring switch does not function properly. _____
- b. Disengage and re-engage actuator. Repeat step a. on opposite-side column springs. _____
- c. If either switch does not function properly, replace switch per § 7.551 before further flight.

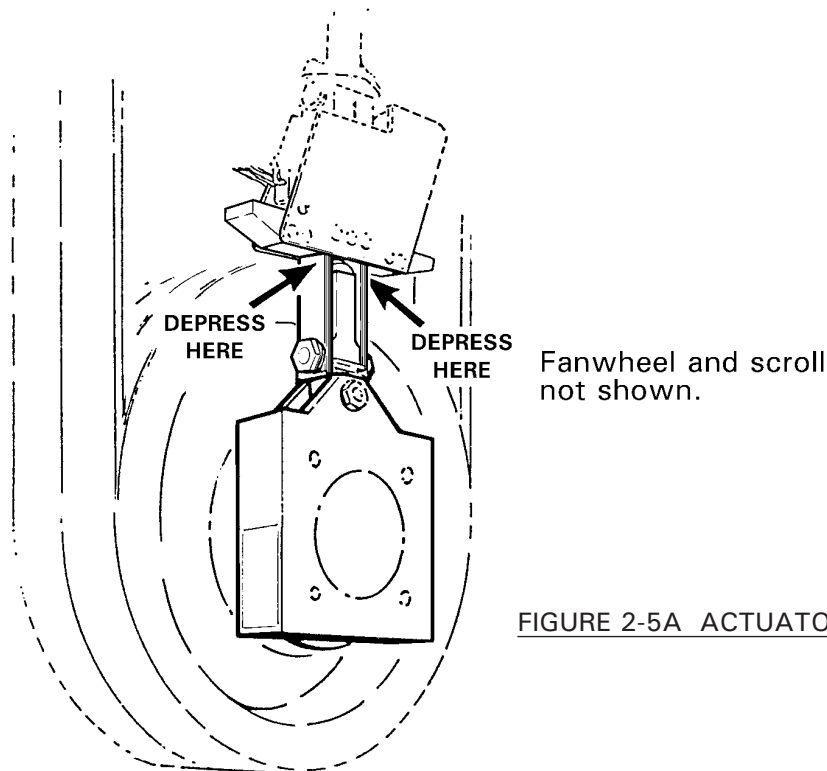


FIGURE 2-5A ACTUATOR FUNCTION TEST

Lower Sheave: Inspect condition. Verify smoothness of drive belt contact surfaces. Remove any surface corrosion and refinish with approved primer (chromate primer preferred; refer to § 23-75). Replace any sheave showing corrosion-pitting or flaking of metalized coating, roughness, or sharp ridges. _____

2.410 Inspection Procedures and Checklist (continued)

8. Remove Tailcone Fairing (8) (continued)

Engine Height: Check per § 6.130 and adjust as required. _____

Clutch Shaft Angle: Check per § 7.240. Replace drive belts as required. _____

Sheave Alignment: Check per § 7.230 and adjust as required. _____

Throttle Correlation Rigging: Check per § 10.150 and adjust as required. _____

Fasteners & Torque Stripes: Inspect condition and verify security of all fasteners. Renew deteriorated torque stripes per Figure 2-1. _____

9. Remove 4 Tailcone Inspection Covers (9) : Verify nutplate self-locking feature when removing.

Inspection Covers: Inspect condition. _____

Tail Rotor Drive Shaft: Inspect condition. Verify no cracks, bends, or contact with inside of tailcone. Refer to Figure 7-12C for corrosion limitations. Check runout per § 7.340. _____

Tail Rotor Push-Pull Tube: Inspect condition. Inspect rod ends per § 2.120. Verify wear does not exceed § 2.120 limits. Verify no cracks in ends. Verify operating clearance. Verify tail rotor guard mounting screw shanks clear push-pull tube. _____

Damper: Inspect condition. Verify security. Verify bearing housing wear is within Figure 2-6 limits. _____

Tailcone Interior: Inspect condition. Verify no loose rivets or corrosion. Verify no excessive wear in tail rotor push-pull tube bushings. Verify no cracks, especially at damper-to-tailcone attachment. _____

Lower, Whip Antenna (if installed): Remove four screws securing antenna mounting plate to tailcone. Verify no cracks or corrosion on mounting plate or tailcone mount. Inspect antenna and wiring condition. Install antenna. Verify security. _____

Upper Antenna(s) (if installed): Inspect antenna and wiring condition. Verify security and no cracks at attachment to tailcone. _____

Tailcone Exterior: Inspect condition. Refer to Figures 2-7A and 2-7B for dent and scratch limits. Verify no cracks, corrosion, fretting between skin joints, or loose rivets. Verify drain hole at forward edge of each bay (except forward) is unobstructed. _____

Tail Rotor Visual Warning Guard: Inspect condition. Verify no cracks or corrosion, especially at tailcone attachment. Verify security. _____

Strobe Light: Inspect condition. Verify cleanliness and security. _____

Fasteners & Torque Stripes: Inspect condition and verify security of all fasteners. Renew deteriorated torque stripes per Figure 2-1. _____

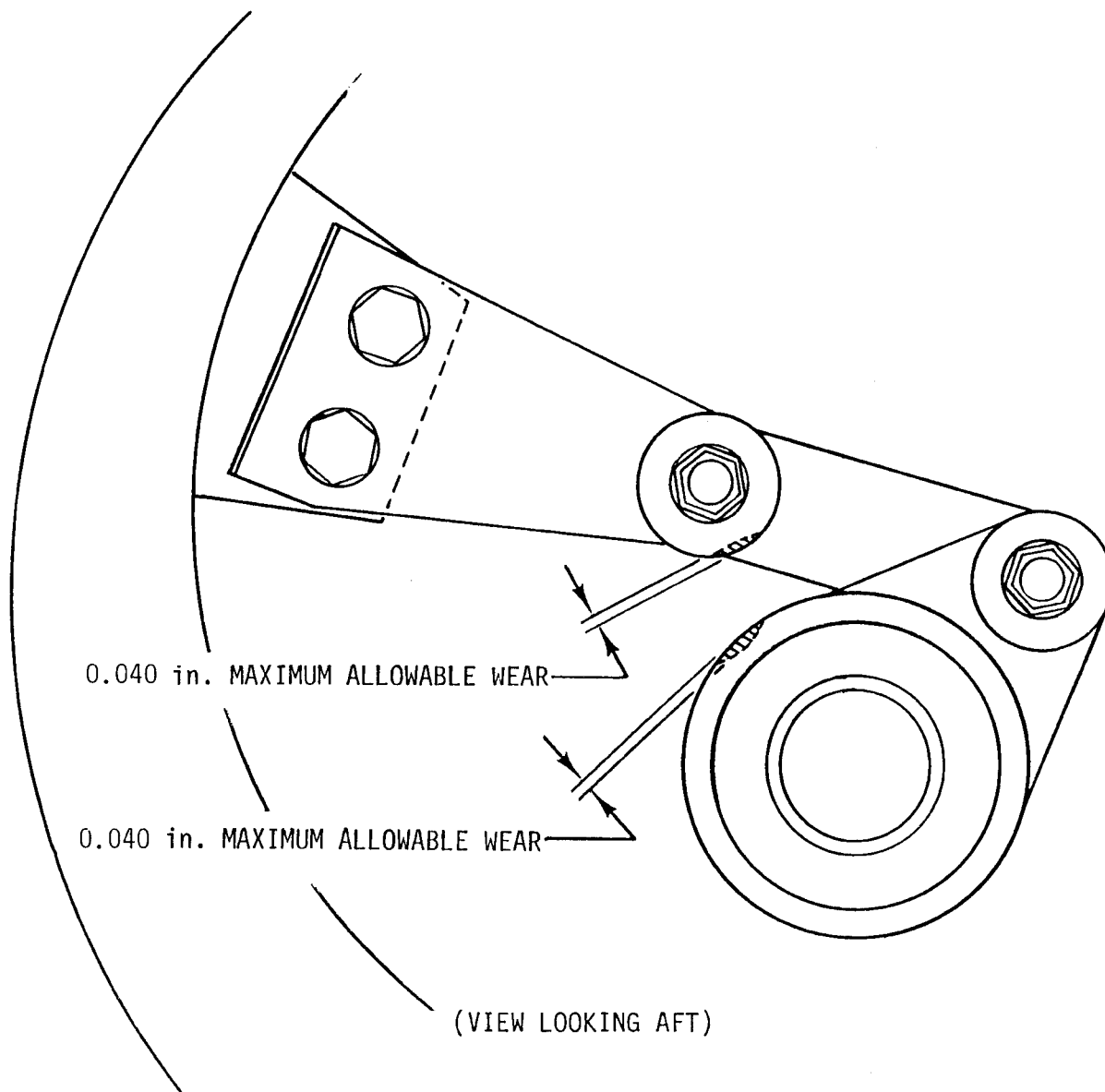


FIGURE 2-6 DAMPER BEARING HOUSING WEAR LIMITS

2.410 Inspection Procedures and Checklist (continued)

9. Remove 4 Tailcone Inspection Covers (9) (continued)

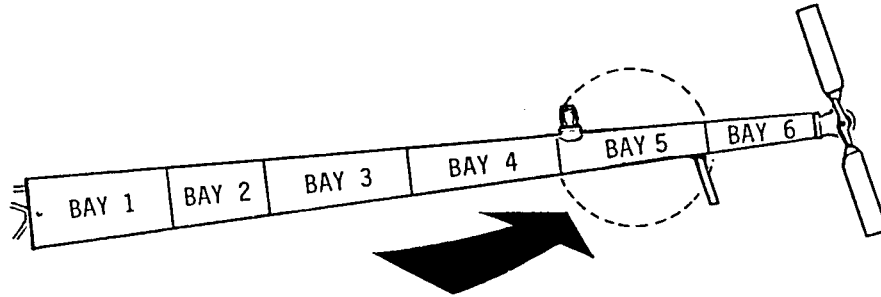


FIGURE 2-7A TAILCONE DENT LIMITS

BAY 5:

- 0.00 to 0.10 inch deep — No repair required provided 4 inches minimum between dented stations.
- 0.10 to 0.25 inch deep — Repair per § 4.314.
- Greater than 0.25 inch deep — Replace bay (requires return to RHC).

ANY OTHER BAY:

Dents with 0.030 inch maximum depth, 1.25 inch maximum diameter, and 0.125 inch minimum bottom radius are acceptable if there is no more than one dent per station with 4 inches minimum between dented stations. Otherwise, replace tailcone or return to RHC for repair.

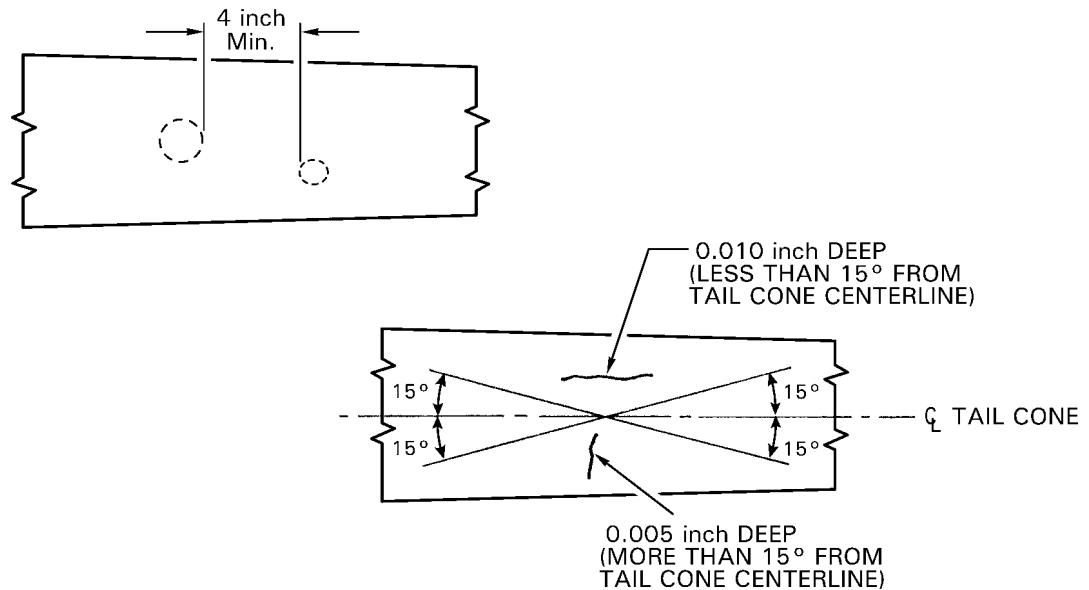


FIGURE 2-7B TAILCONE SCRATCH LIMITS

Allowable scratch depth varies with scratch angle to tailcone centerline as shown. For scratches within these limits, polish out scratches using 320-grit or finer abrasive paper and minimum 0.10 inch blend radius. Polish parallel to tailcone long axis. If scratches exceed limits, replace tailcone or return to RHC for repair.

2.410 Inspection Procedures and Checklist (continued)

10. Remove Plastic Cover (10)

Plastic Cover: Remove and clean. Inspect condition. Replace as required and install. Verify nutplate self-locking feature when installing. _____

Empennage: Inspect condition. Verify security. Verify no cracks or loose fasteners. Verify lower vertical stabilizer and tail skid drain holes are unobstructed. Refer to special inspection section for tail skid strike inspection criteria. _____

Aft Navigation Light: Inspect condition. Verify cleanliness, clear lens, and security. _____

Aft Flex Plate: Refer to Figure 2-4B. Inspect condition. Verify no distortion, nicks, scratches, cracks, corrosion, or 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. _____

WARNING

A193 flex plates, which do not have bonded washers, are obsolete and must be replaced with A947 flex plates having bonded washers. If a bonded washer separates from a A947 flex plate, flex plate is unairworthy and cannot be repaired.

Tail Rotor Gearbox: Inspect condition, including seals. Verify proper oil level and no leakage. Verify security and safety wire integrity. Verify output shaft cleanliness. _____

NOTE

At 500 hours time in service or annually, whichever occurs first, remove chip detector and clean any varnish accumulation from detector's magnetic probe and adjacent metal body using a toothbrush and approved solvent per § 22-21. Drain and flush gearbox at intervals not to exceed 500 hours time in service (refer to § 22-23).

2.410 Inspection Procedures and Checklist (continued)**10. Remove Plastic Cover (10) (continued)**

Tail Rotor Pitch Control Assembly and Aft Bellcrank: Inspect condition. Inspect spherical bearing in underside of pitch control per § 2.120; it is permissible to have a single radial crack in this spherical bearing ball. Verify no excessive looseness on output shaft (0.25 inch maximum rotational play measured at pitch link attaching bolt head). Verify operating clearance and assembly slides freely on output shaft. Verify no leakage at bearing seals. Verify security.

WARNING

A031-1 Rev. J or prior pitch control assemblies require repetitive inspection per R22 Service Bulletin SB-90A every 300 hours or annually, whichever occurs first.

Pitch Links: Inspect condition. Inspect rod ends and spherical bearings per § 2.120. Remove and reinstall pitch links with outboard end inboard and inboard end outboard as required to obtain maximum service life; additionally, an optional A215-012 o-ring may be installed on A115-1 spacer under bolt head at pitch control. Reinstall chordwise weights at respective attachment points for balance purposes. Verify proper installation, security, and operating clearance.

Tail Rotor Blades: Refer to R22 SB-120. Inspect condition. Refer to § 28-30 for damage limits and repair. Verify no buckling. Verify no looseness between feather bearing outer races and root fittings. Inspect bearings per § 2.120. Verify no obstructions in blade tip drain holes. Verify proper installation, security, and pitch change operation.

WARNING

Structural damage may occur if compressed air is applied to blade tip drain holes.

Tail Rotor Hub: Inspect condition. Verify no nicks, scratches, gouges, dents, cracks, or corrosion. Inspect elastomeric teeter hinge bearings per § 2.125. Teeter the rotor hub and verify teeter bearing bolt, spacers, and nuts do not rotate. Verify hub teeters smoothly. Verify proper installation and security of blade bolts.

Fasteners & Torque Stripes: Inspect condition and verify security of all fasteners. Renew deteriorated torque stripes per Figure 2-1.

2.410 Inspection Procedures and Checklist (continued)

11. Open Mast Fairing (11)

Mast Fairing: Inspect condition. Verify no cracks, dents, or corrosion. Verify no yielding or cracking of A665-1 restraint. Yielding can be caused by overtightening screws in restraint nutplates. _____

Upper and Lower Ribs: Inspect condition. Verify security, especially tightness of lower rib clamp. _____

Three Vertical Push-Pull Tubes (Two A121-7 and One A121-5): Inspect condition. Inspect rod ends per § 2.120. Verify no cracks at upper ends. With collective full up and cyclic full aft, verify no wear of A121-7 tubes or sleeves, especially where sleeves rub inside guide assembly. Verify security and operating clearance. _____

Pitot Tube and Line: Inspect condition. Verify no cracking, chafing, or kinking. Ensure drain hole on bottom of elbow behind pitot tube is clear. Verify security. _____

Fuel Tank Vent Metal Lines and Plastic Tubes: Inspect condition. Verify no kinking or obstructions. Verify security. _____

Swashplate Upper Scissors: Inspect condition. Inspect rod ends and spherical bearings per § 2.120. Measure scissors play per Figure 2-8. Observe scissor linkage while having someone raise and lower collective. Verify bolt, journals (or spherical bearing balls and spacers), and arm rotate together at each scissor linkage pivot. Verify operating clearance. _____

Swashplate Lower Scissors: Inspect condition. Inspect rod ends per § 2.120. Verify security. _____

Swashplate Slider Tube: Inspect condition. Verify no cracks at rivet holes or corrosion on base. Verify no damage to, or wear through, anodized tube surface. When viewed under 10X magnification, minute "checkerboarding" of anodized surface is normal. _____

Remove Swashplate Boot Lower Ty-rap: Lift boot from swashplate. Using an inspection mirror, inspect area between main rotor drive shaft and inside of slider tube. Verify no corrosion and no debris. Verify no boot damage. _____

Swashplate: Inspect condition. Verify 0.020 inch maximum radial play between swashplate ball and slider tube. Rotate rotor by hand and verify operating clearance and no rough or dry bearings. _____

Swashplate Shimming: Observe swashplate ball from below and have someone move collective stick slowly up & down. Verify swashplate ball immediately moves with swashplate when swashplate reverses direction. Movement of swashplate without attendant ball movement indicates axial play between ball and swashplate; shim swashplate per § 8.416. _____

Install Swashplate Boot Lower Ty-rap: Verify correct boot position and security and no boot damage. _____

Fasteners & Torque Stripes: Inspect condition and verify security of all fasteners. Renew deteriorated torque stripes per Figure 2-1. _____

2.410 Inspection Procedures and Checklist (continued)

11. Open Mast Faring (11) (continued)

Main Rotor Drive Shaft: Inspect condition of accessible portion. Verify no corrosion.

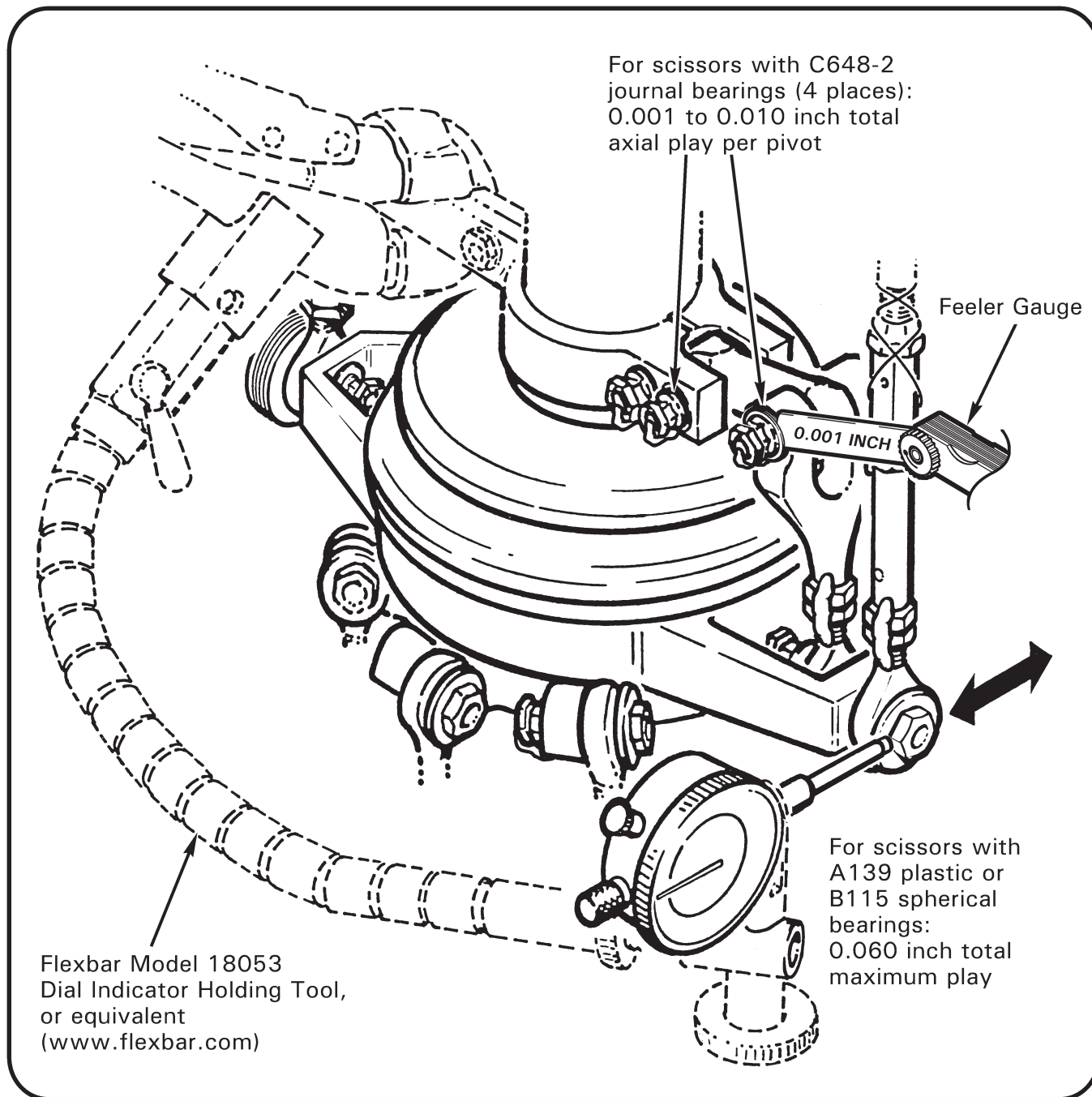


FIGURE 2-8 MEASURING UPPER SWASHPLATE SCISSORS PLAY
(Identify scissors bearing type and measure as shown)

2.410 Inspection Procedures and Checklist (continued)

12. Rotor Hub and Hinge Bolts

Hub: Inspect condition. Verify no nicks, scratches, gouges, or corrosion. If main rotor imbalance is suspected, check teeter and coning hinge friction per § 26-32. Verify no brown or black residue (indicates bearing wear). _____

Hinge Bolts (three): Inspect condition; corrosion is prohibited. Verify cotter pins are in place and secure. Verify bolt heads and nuts are torque striped to thrust washers. _____

Pitch Links and Rod Ends: Inspect condition. Inspect rod ends per § 2.120, including centering. Verify security, including jam nut tightness and proper safety wiring. _____

Fasteners & Torque Stripes: Inspect condition and verify security of all fasteners. Renew deteriorated torque stripes per Figure 2-1. _____

13. Main Rotor Blades

Blade Boots: Inspect condition. Verify no boot damage or oil leakage. Verify proper boot position and security. Verify sufficient clearance from hub assembly through full control travel. _____

Blade Spindles & Root Fittings: Inspect area for damage per § 26-43. Comply with FAA Airworthiness Directive 88-26-01 (current revision) as required (A158-1 spindles only). Verify proper installation and security of visible fasteners. Renew deteriorated torque stripes per Figure 2-1. _____

Main Rotor Blade Tip Maintenance: Perform main rotor blade tip maintenance per § 26-60. _____

Main Rotor Blade Inspection: Inspect skins and doublers for scratches and corrosion per § 26-41. Inspect blades for dents and local deformations per § 26-42 and for voids per § 26-44. As required, wax blades with soft cleaning cloths using carnauba-type wax (such as SC Johnson® Paste Wax). Ensure tip cover and blade tip drain holes are unobstructed. _____

WARNING
Structural damage may occur if compressed air is applied to blade tip drain holes.

2.410 Inspection Procedures and Checklist (continued)

14. Cabin

General: Verify no loose equipment that might interfere with controls. _____

Seat Belts: Inspect condition. Verify no fraying, broken stitching, holes, or rotting. Verify no significant discoloration due to UV damage. Check inertia reels for proper operation. Check buckles for proper operation. Verify security. _____

NOTE
TSO tag not required on factory-installed harnesses.

Windows: Inspect condition. Verify no significant UV damage (yellowing). Minor defects or imperfections that do not impair pilot's visibility are considered acceptable. Acceptable defects include: _____

One nick, no more than 0.010 inch deep and no larger than 0.25 by 0.50 inch per square foot. _____

Scratches no more than 0.010 inch deep and 5 inches long. _____

Any surface defect such as small spots or stains that can be removed with light polishing. _____

For cracks and crazing adjacent to windshield edges refer to § 25-20. _____

Yaw String: Inspect condition. Minimum 3 inches long each side. Verify security. _____

2.410 Inspection Procedures and Checklist (continued)

14. Cabin (continued)

Exterior: Inspect condition. Verify no cracks, corrosion, or damage. Verify no loose rivets. Loose rivets may be indicated by cracked paint and/or black residue around heads. _____

Left and Right Navigation Lights: Inspect condition. Verify red left, green right, lens cleanliness, and security. _____

Doors: Inspect condition. Verify no structural cracks around hinges or door latches. Check door vents for operation. Ensure door hinge pins are secured with cotter pins. Check tightness of hinge mounting screws. Verify proper operation of door latching and locking mechanisms. _____

Fasteners & Torque Stripes: Inspect condition and verify security of all fasteners. Renew deteriorated torque stripes per Figure 2-1. _____

15. Landing Gear

Skid Tubes and Shoes: Inspect condition. Verify no more than 0.5 inch wide flat area on underside of skid tube due to wear. Verify longitudinal scratches are not more than 0.030 inch deep, and circumferential scratches are not more than 0.030 inch deep & are less than 0.50 inch long. Verify drain holes are open (not applicable to float landing gear). Verify security of rain caps. Verify minimum 0.05 inch shoe thickness. _____

Struts and Elbows: Inspect condition. Verify no cracks or corrosion, especially where joined and in weld areas at bottom of struts. Verify security. If helicopter routinely performs running landings, torque check strut-to-skid-tube bolts. _____

Cross Tubes: Inspect condition. Verify minimum tail skid height per § 5.210. Verify no corrosion. Verify security of rain caps. If a rain cap is loose, verify no internal corrosion. Verify no fretting at elbows. _____

Landing Gear Attach Points: Inspect condition. Verify no loose fasteners, cracks, buckling, or fretting. Inspect mounts and verify no loose swages or worn bearings. _____

Floats (if installed): Perform relief valve and bulkhead tests per § 2.580 (2) and (3). Verify proper inflation pressure per R22 POH. Inspect condition. Verify security. _____

Float Skid Tubes (if installed): Remove drain plugs at aft end of skid extensions. With ground handling wheels installed, pull down on tailcone to drain any trapped moisture. Install drain plugs. _____

Fasteners & Torque Stripes: Inspect condition and verify security of all fasteners. Renew deteriorated torque stripes per Figure 2-1. _____

2.410 Inspection Procedures and Checklist (continued)

16. Life-Limited Parts, Additional Limitations, ADs, & SBs

Life-Limited Parts: Refer to helicopter maintenance records and § 3.300. Replace life-limited parts as required. Verify components installed have sufficient time remaining for projected operations. _____

Additional Component Maintenance: Refer to helicopter maintenance records and § 1.102. Replace components scheduled for 12-year service, overhaul, or replacement as required. Replace engine and accessories scheduled for maintenance as required. Verify components installed have sufficient time remaining for projected operations. _____

Airworthiness Directives: Verify applicable airframe, engine, and accessory Airworthiness Directives (ADs) have been performed according to AD compliance procedures. Some aircraft may be affected by ADs that require recurring inspections at less than 100-hour or annual intervals. Recent U.S. Airworthiness Directives are available online at www.faa.gov. _____

Service Bulletins: Verify applicable airframe, engine, and accessory Service Bulletins (SBs) have been complied with according to manufacturers' instructions. Some aircraft may be affected by SBs that require recurring inspections at less than 100-hour or annual intervals. RHC Service Bulletins are available online at www.robinsonheli.com, under the Publications tab. _____

17. Required Documents and Placards

Documents: Check that required documents (Airworthiness Certificate, Registration, applicable Radio Station License, Pilot's Operating Handbook, Equipment List/Weight & Balance Data) are on board, legible, and current. _____

Placards: Verify required placards are properly installed, legible, and current. Refer to Pilot's Operating Handbook Section 2 for placard requirements. _____

18. Inspection and Access Covers

Foreign Objects Removed: Verify all tools, loose hardware, rags, and other foreign objects are removed from helicopter. _____

Covers Closed and Secure: Install/close all inspection and access covers removed in preceding steps. Verify security of all access covers. _____

Mariner Airbox Sealed: Ensure air box cover perimeter is sealed with aluminum tape (Mariner models only). _____

2.410 Inspection Procedures and Checklist (continued)

19. Maintenance Records

Maintenance Records: Verify maintenance records are accurate, legible, and complete. Enter maintenance performed (such as part replacement, equipment adjustments, servicing, and lubrication) and inspection data. Data must include a description of (or reference to data acceptable to the Administrator) the work performed, date, helicopter total time in service, signature, certificate type and certificate number of person approving aircraft for return to service. _____

SHEAVE ALIGNMENT LEFT: _____ **ENGINE HEIGHT:** _____

SHEAVE ALIGNMENT RIGHT: _____ **CLUTCH ANGLE:** _____

TRDS RUNOUT: _____

CHECKLIST COMPLETE:

Mechanic's signature: _____ Date: _____

2.500 Special Inspections

2.501 Clutch Actuator Upper and Lower Bearings Inspection and Lubrication

This section has been moved to § 22-40. |

2.502 A181-4 Actuator Lower Bearing Inspection and Lubrication

This section has been moved to § 22-42. |

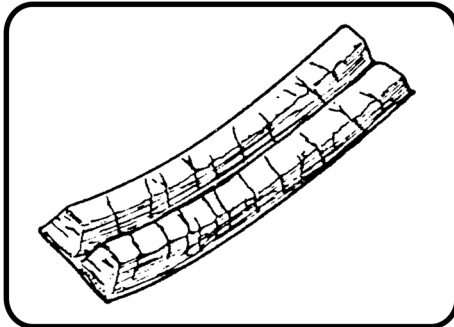
2.503 A184 Actuator Upper Bearing Inspection and Lubrication

This section has been moved to § 22-41. |

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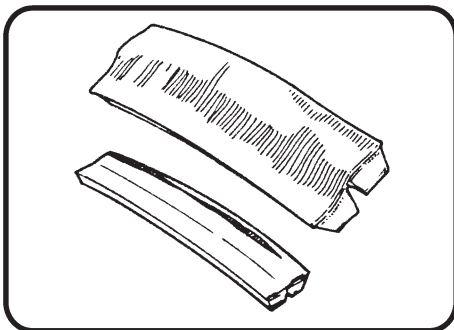
2.507 V-Belt Inspection

The most common V-belt discrepancies and courses of corrective action are given below.



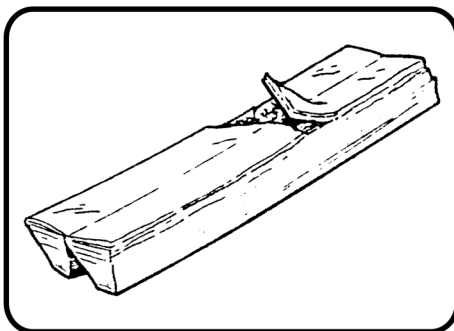
1. Belts Cracking:

CAUSE	REMEDY
Belt is old.	Replace belts per § 7.280.
Belt slipping causing heat buildup and gradual hardening of undercord.	Replace belts per § 7.280. Replace actuator per § 7.500.



2. Top of Tie Band Frayed or Damaged:

CAUSE	REMEDY
Obstruction interfering with normal belt operation.	Remove obstruction, and replace belts per § 7.280.

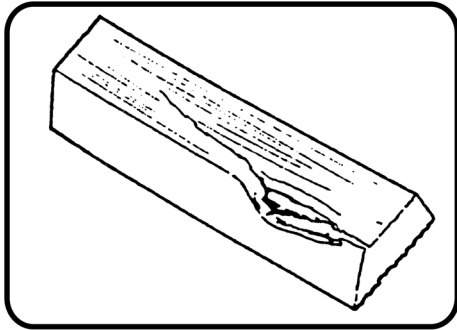


3. Top of Tie Band Blistered or Perforated:

CAUSE	REMEDY
Dirt or sand accumulating between belts and sheave.	Replace belts per § 7.280. Periodically wash inside of replacement belts.
Belts worn out.	Replace belts per § 7.280.

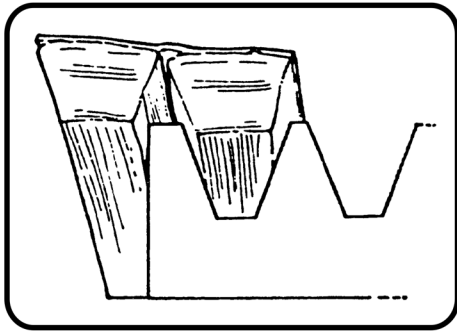
FIGURE 2-10 V-BELT DISCREPANCIES

2.507 V-Belt Inspection (continued)



4. Belt Cut on Inside:

CAUSE	REMEDY
Belt forced over sheave flange during installation without proper slack.	Replace belts per § 7.280.
Foreign material fell into belt drive.	Replace foreign material and replace belts per § 7.280.



5. Belt Riding Outside Sheave Groove:

CAUSE	REMEDY
Belt forced over sheave flange during installation without proper slack.	Replace belts per § 7.280.

FIGURE 2-10A V-BELT DISCREPANCIES

2.508 Lower Sheave V-Belt Wear Pattern Inspection

Observe wear patterns in paint primer in all four lower sheave grooves. The eight wear patterns (both sides of all four grooves) should appear very similar and be consistent around sheave circumference.

If wear pattern is noticeably different from groove to groove, measure width of narrowest and widest wear patterns. See Figure 2-11. If ratio exceeds 3:1, replace V-belts per § 7.280.

CAUTION

RHC does not recommend using A170-1 or -2 Revision N or prior upper sheaves with A493-1 Revision T or later lower sheaves. Such combinations may cause excessive drive belt vibration. Refer to Figure 7-3D.

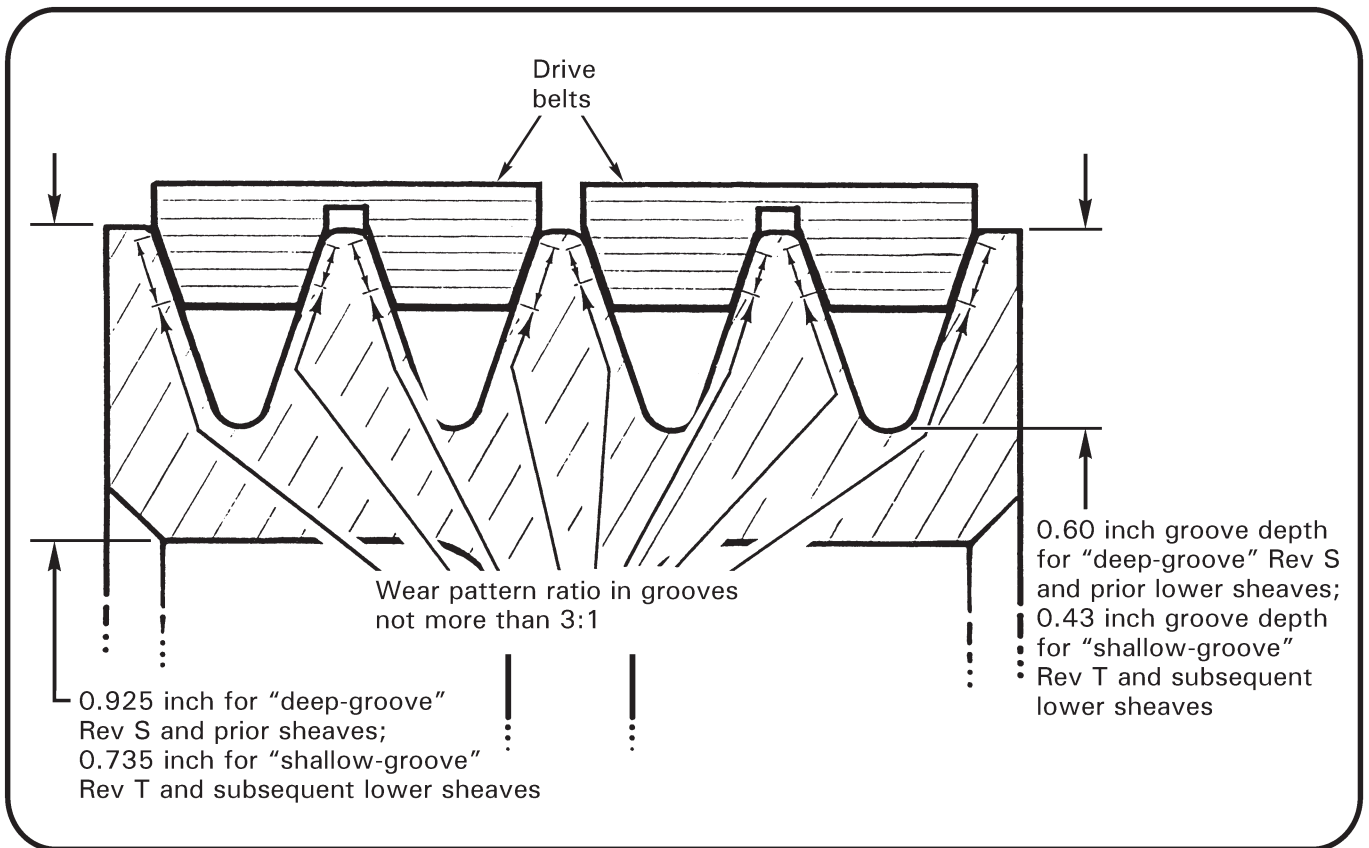


FIGURE 2-11 LOWER SHEAVE V-BELT WEAR PATTERN

2.510 Tail Skid Strike

A. Scuffing or Slight Bending of Tail Skid

1. Visually inspect tail rotor blades. Verify no evidence of solid object or ground contact. If tail rotor damage is found, inspect tail rotor per § 2.520.
2. Visually inspect lower vertical stabilizer. Verify no buckling, cracks, or loose rivets at tail skid and lower vertical to horizontal stabilizer attach points.
3. Visually inspect horizontal stabilizer to tailcone attach points. Verify no buckling, loose rivets, or cracking.
4. Visually inspect tailcone. Verify no damage. Also inspect tailcone-to-upper steel tube frame attach points and verify no buckling or loose attach bolts.

B. Buckling or Breaking of Tail Skid and/or Lower Vertical Stabilizer

1. Perform inspections per § 2.510.A.
2. Inspect tail rotor drive shaft run-out per § 7.340.
3. Remove tailcone and:
 - a. Visually inspect tailcone attach points. Verify any elongated holes are no greater than 0.265 inch across at widest point.
 - b. See Figure 2-12. Using an approved paint stripper (ref. § 23-71), remove paint from and within 2 inches of tailcone attach points on upper frame.
 - c. Fluorescent penetrant inspect (ref. § 23-42) upper steel tube frame at tailcone attach points.
4. Remove stabilizer assembly and:
 - a. Visually inspect horizontal stabilizer. Verify any elongated holes at attach points are no greater than 0.265 inch across at widest point. Verify no loose rivets or buckling.
 - b. Using an approved paint stripper (ref. § 23-71), remove paint from tailcone casting exterior surfaces.
 - c. Fluorescent penetrant inspect (ref. § 23-42) casting.
5. Remove lower vertical stabilizer from horizontal stabilizer and visually inspect. Verify no buckling, cracks, or loose rivets. Buckling or cracks require replacement of stabilizer. Loose rivets may be drilled out and replaced. Verify any elongated holes at attach points on either stabilizer are no greater than 0.200 inch across at widest point.

2.520 Tail Rotor Strike**A. Contact with Small Stone, Tall Grass, or Other Small Object in Free Air**

1. Inspect tail rotor blades per § 28-30.
2. Check tail rotor drive shaft run-out per § 7.340. If run-out exceeds 0.025 inch at any location, shaft must be replaced or repaired.

B. Sudden Stoppage of Tail Rotor due to Ground or Solid Object Contact (Causing Bending or Shearing of Blade(s))

1. Perform inspections per § 2.520.A.
2. Using an approved paint stripper (ref. § 23-71), strip paint surrounding and at least 2 inches from tail rotor drive shaft forward holes and aft weld. Fluorescent penetrant inspect (ref. § 23-42) stripped areas. If cracks are found, drive shaft must be replaced.
3. Visually inspect drive shaft. Verify no deformation, nicks, dents, or scratches. Nicks and scratches may be polished out per § 7.360. Deformation or dents require replacement of drive shaft.
4. Remove tail rotor and tail rotor gearbox and return to RHC for overhaul.
5. Replace aft and intermediate flex plates.
6. Visually verify tail rotor blades have not struck tailcone and empennage.
7. Visually inspect main rotor system. Verify no nicks, dents, or scratches.

2.530 Main Rotor Strike

A. Contact with Small Objects in Free Air

1. Inspect main rotor blades per § 26-40.
2. Verify no buckling or bending of trailing edge.

WARNING

Any main rotor blade buckling or spar bending is considered sudden stoppage and requires compliance with Part B.

B. Sudden stoppage of Main Rotor Due to Ground or Solid Object Contact

1. Check tail rotor drive shaft run-out per § 7.340.
2. Remove following components and return to a RHC authorized overhaul facility for inspection and/or repair.
 - a. A005-2 Main Rotor Blade and Spindle Assemblies
 - b. A005-4 Main Rotor Hub and Bearings
 - c. A017-2 Swashplate Assembly
 - d. A018-1 or -2 Clutch Assembly
 - e. A106 Main Rotor Journals
 - f. A152-1 Thrust Washers
 - g. A907-4 or -5 Yoke
 - h. A908-4 or A006-5 Yoke
3. Replace A947-1 forward flex plate.
4. Return main rotor gearbox to RHC for overhaul.
5. Inspect engine per engine manufacturer's sudden stoppage instructions.

2.540 Rotor/Engine Overspeed**A. Rotor Overspeed Between 110 and 116%****NOTE**

Refer to Part C if a power-on overspeed occurs.

1. Check main rotor and tail rotor dynamic balance. Compare pre-overspeed and post-overspeed balance.

CAUTION

Any change in rotor dynamic balance greater than 0.3 ips requires inspection per Part B.

2. Remove main rotor blades. Drain pitch bearing housings. Remove outer blade boot clamps and fold boots away from pitch horns. Rotate spindles to verify no brinelling of pitch bearings.

NOTE

Bearings have a high preload; slight roughness is normal. If roughness is evident, return blade and spindle assembly to RHC-authorized overhaul facility for repair.

3. Visually inspect main and tail rotor blades.
4. Check tail rotor drive shaft run-out per § 7.340.

2.540 Rotor/Engine Overspeed (continued)

B. Rotor Overspeed at or Above 116%

NOTE
For power-on overspeeds, Part C must also be performed.

1. Perform inspection per Part A steps 2, 3, and 4.
2. Return blades and hub to an RHC-authorized overhaul facility for NOT inspection of spindles and hub.
3. Replace any cracked or bent bolts, thrust washers, and journals. Magnetic particle inspect any parts not replaced.

C. Engine overspeed

Percent engine overspeed is determined from tachometer indication as follows:

$$\% \text{ Engine Overspeed} = \frac{\text{Engine Tach Indication (\%)} \times 2550}{2700} - 100$$

NOTE
104% Engine Tach Indication = 2652 Actual Engine RPM.
Engine is rated at 2700 RPM.

Refer to Lycoming SB 369 (current revision) for engine overspeed inspection requirements.

2.550 Hard Landing

A. Yielding of Cross Tubes Due to Hard Landings Without Side Loads

NOTE

Side loads are indicated by buckling and bending of steel tube frame or sheet metal.

1. Visually inspect steel tube frames. Verify no yielding or cracks. Pay particular attention to lower steel tube frame aft vertical struts.
2. Check tail rotor drive shaft run-out per § 7.340.
3. Visually inspect main rotor blades per § 26-40.
4. Place rotorcraft on level ground and measure from tail skid or bottom of float stabilizer to ground. Aft cross tube must be replaced if dimension is less than:

24 inches for Standard or HP.
34 inches for Alpha, Beta, Beta II, Mariner, or Mariner II measured from tail skid.
37 inches for Mariner or Mariner II, measured from float stabilizer.

Replace forward cross tube if it contacts cross tube cover.
5. Check and adjust upper and lower sheave alignment per § 7.230.

B. Hard Landings That May Impose Side Loads on Landing Gear

NOTE

Side loads are indicated by buckling and bending of steel tube frame or sheet metal.

1. Perform inspection per Part A.
2. Visually inspect fuselage landing gear attach points, vertical firewall, and horizontal firewall. Verify no buckling or cracks. Pay attention to engine mount strut-to-vertical firewall attach points.
3. Remove tailcone per § 4.311.
4. See Figure 2-12. Using an approved paint stripper (ref. § 23-71), remove paint from and within 2 inches of tailcone attach points on upper frame. Fluorescent penetrant inspect (ref. § 23-42) upper steel tube frame at tailcone attach points.
5. Visually inspect tailcone. Verify no buckling or loose rivets.
6. Visually inspect landing gear elbows. Verify no yielding, nicks, or cracks.

2.550 Hard Landing (continued)

B. Hard Landings That May Impose Side Loads on Landing Gear (continued)

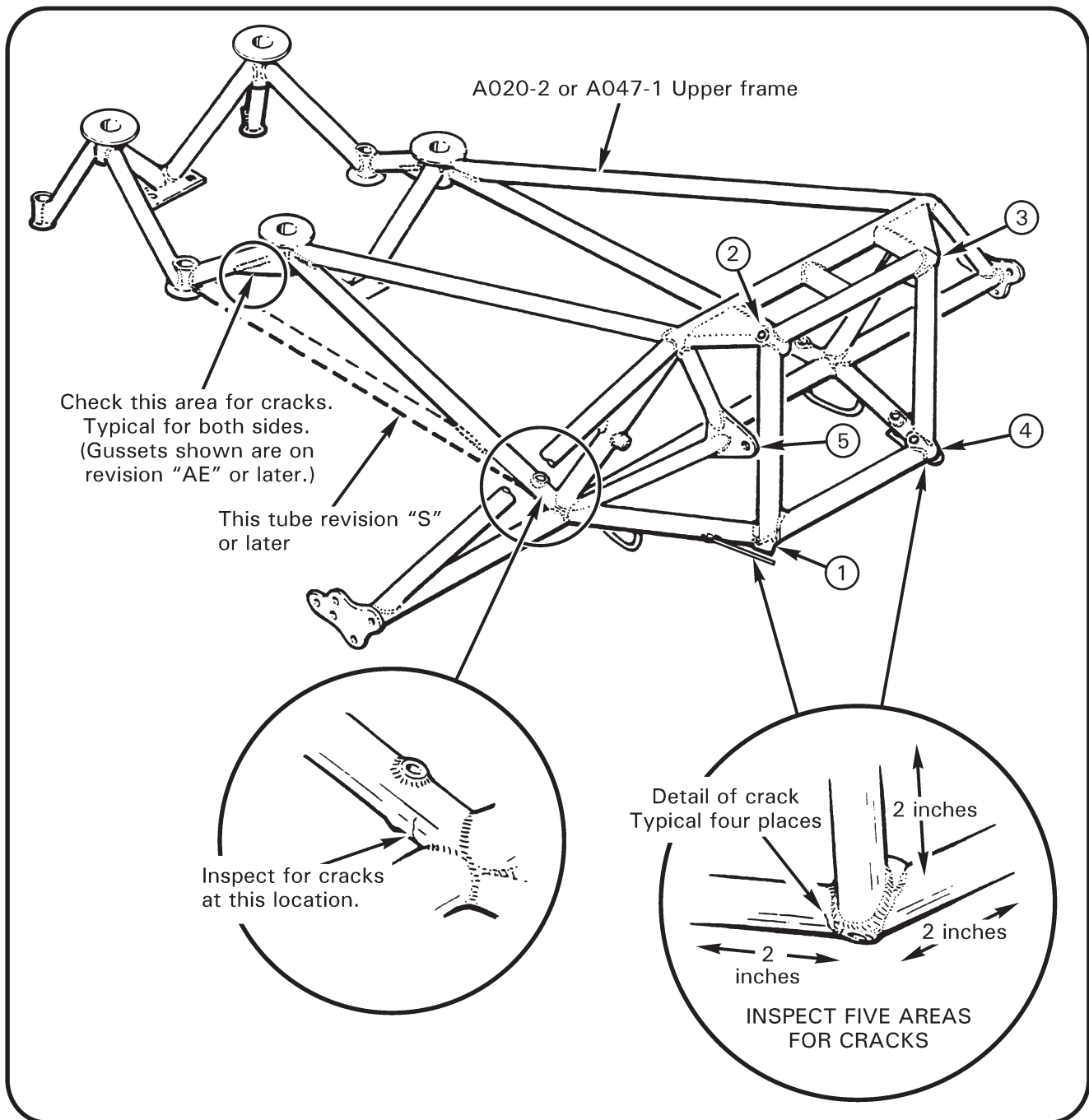


FIGURE 2-12 UPPER FRAME CRACK INSPECTION

2.560 Steel Tube Frame Corrosion

1. For large areas of corrosion, remove frame and strip paint using an approved paint stripper (ref. § 23-71) to determine full extent of corrosion. If corrosion exceeds Figure 2-13 limits, replace frame.
2. Measure and record diameter of frame member at corroded area(s).
3. Polish out corrosion with 320-grit or finer wet-or-dry sandpaper. Measure frame member diameter at polished area(s). Compare with measurement(s) from step 2, and verify polish depth is within Figure 2-13 limits.
4. Clean, prime, and paint frame (see § 23-71). Install frame if removed in step 1.

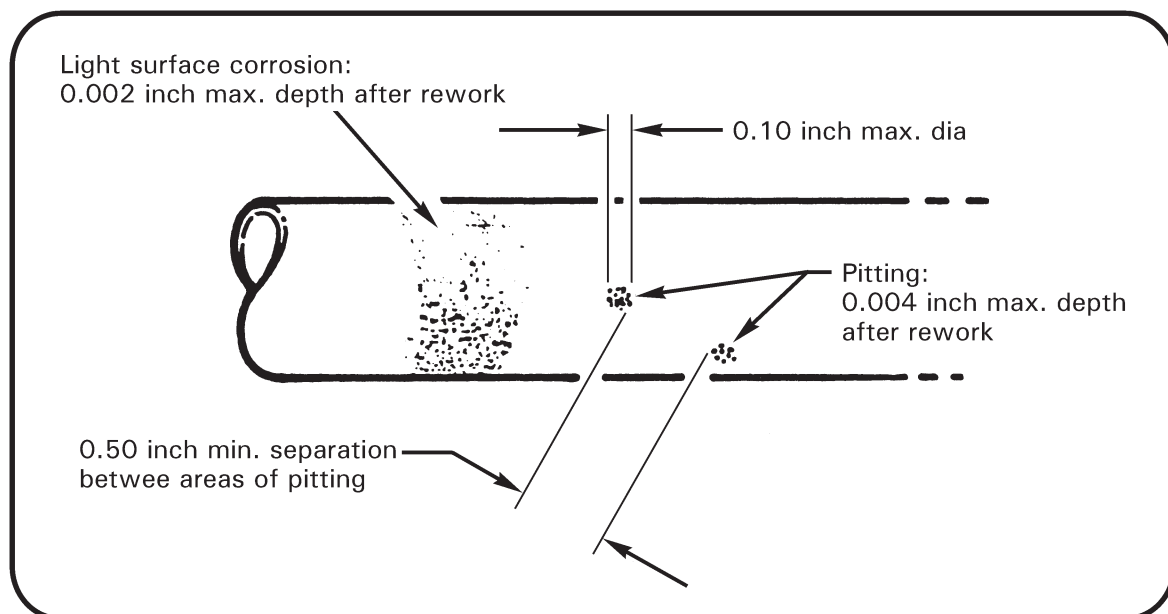


FIGURE 2-13 FRAME CORROSION AND REPAIR LIMITS

2.570 [Deleted]2.580 Float Inspection and Testing

1. Inspection Intervals and Float Replacement

Perform Relief Valve Test and Bulkhead Test during each 100-hour or annual inspection. Floats must be repaired or replaced on condition, or upon failure of Relief Valve or Bulkhead Test.

2. Relief Valve Test

CAUTION

When filling floats, open inflation valve prior to applying air pressure; do not apply air pressure against a closed valve.

CAUTION

Prior to test, inspect float bag uninflated and with each compartment individually inflated to 0.75 to 1.0 psig. Verify no cuts, tears, punctures, abrasion, delamination (blistering), or seam separation.

- a. Use filtered oil-free dry air to inflate float compartments to 5.0 psig. Inflate by using a manifold or inflate chambers individually in 0.5 psig increments.
- b. Fill relief valve apertures with clean water. Slowly increase pressure and observe relief valves; bubbles indicate opening. Record opening pressures, then reduce pressure until bubbles stop, indicating relief valves are closed. Record closing pressures.

CAUTION

Do not exceed 7 psig in float compartments.

- c. Replace any valve not meeting the following criteria:

Opening pressure: 5.5 to 6.5 psig
Closing pressure: 5.5 psig minimum

3. Bulkhead Test

- a. Deflate all float chambers, then inflate forward chamber and second chamber from rear to 3 psig.
- b. Repair or replace floats if pressure in inflated chambers after 1 hour, at constant temperature, is less than 2.75 psig minimum.
- c. Deflate all float chambers, then inflate aft chamber and second chamber from front to 3 psig. Repeat step b.

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2.600 2200-Hour/12-Year Inspection**NOTE**

KI-2202 (for R22-series Helicopter S/N 2570 & prior) and KI-2203 (for R22-series Helicopter S/N 2571 & subsequent) 2200-Hour Inspection Kit contents are available online at www.robinsonheli.com for review.

NOTE

12-Year Inspection is only required for helicopters that have accumulated 12 years in service and less than 2200 hours time in service since new, since last 2200-hour inspection, or since last 12-year inspection.

1. Refer to helicopter maintenance records and § 3.300; replace life-limited parts, or next higher assemblies, as required.
2. Refer to helicopter maintenance records and § 1.102; perform additional component maintenance, as required.
3. Remove engine, engine cooling panels, fanwheel, scroll, air induction system, carburetor heat system, oil lines, and all hoses. Overhaul or inspect, as required, magnetos, alternator, and carburetor per appropriate manufacturer's maintenance publications and service bulletins.
4. Remove horizontal and vertical stabilizers per § 4.320, and replace as required. If replacement is not required, visually inspect stabilizers and verify no cracks, corrosion, loose rivets, dents, or deformation. Fluorescent penetrant inspect any suspect areas per § 23-42. Install stabilizers per § 4.320.
5. Remove landing gear assembly per § 5.100, and replace as required. If replacement is not required, completely disassemble gear and remove paint. Visually inspect parts and verify no cracks, corrosion, or deformation. Magnetic particle and fluorescent penetrant inspect per §§ 23-41 and 23-42. Clean, prime, and paint per § 23-60. Assemble gear if disassembled. Install landing gear assembly per § 5.100.
6. Remove steel tube frames per § 4.200, and replace as required. If replacement is not required, remove paint. Visually inspect frames and verify no cracks or corrosion. Magnetic particle inspect per § 23-41. Clean, prime, and paint per § 23-60. Install frames per § 4.200.
7. Remove cyclic stick per § 8.110. Remove wiring harness. Remove paint via dry media blasting. Visually inspect and verify no cracks or corrosion. Magnetic particle inspect per § 23-41. Clean, prime, and paint per § 23-60. Install wiring harness. Install cyclic stick per § 8.110.

2.600 2200-Hour/12-Year Inspection (continued)

8. Remove A121 push-pull tube assemblies per Chapter 8. Remove paint. Visually inspect and verify no cracks or corrosion. Fluorescent penetrant inspect per § 23-42. Clean, prime, and paint per § 23-60. Install push-pull tubes per Chapter 8.
9. Magnetic particle inspect A650 and F650-3 main gearbox mount fittings and bolt, and A337-1 jackshaft per § 23-41.
10. Inspect airframe wiring condition. Verify no corrosion, insulation deterioration, or other damage. Verify correct wires attached to correct circuit breakers.
11. Remove main and aux tank fuel bladders per § 12.110 and § 12.120. Visually inspect; verify no cracking or delamination of rubber and rubber-to-metal joints. Visually inspect threaded inserts and fittings for damage. Pressurize to 1 psi max and check for leaks with mild soap & water mixture. Visually inspect tank structures for evidence of bladder leakage. Install bladders per § 12.110 and § 12.120.
12. Perform clutch sheave alignment per § 7.230 and intermediate flex plate shimming per § 7.330.
13. Perform main rotor flight control and blade angle rigging per § 10.110 and § 10.120.
14. Perform tail rotor flight control and blade rigging per § 10.130 and § 10.140.
15. Perform 100-hour/annual inspection per § 2.400.
16. Weigh helicopter per § 18-20.

NOTE

Extended low-power operation with new piston rings may prevent proper piston ring seating.

17. Balance tail rotor per § 10.240. Track and balance main rotor per § 10.230. Perform ground check, run up, and flight checks per §§ 2.205, 2.210, and 2.220.
18. Drain and flush main and tail rotor gearboxes per § 22-13 and § 22-23.
19. Make appropriate maintenance record entries. Enter maintenance performed (such as part replacement, equipment adjustments, weighing, servicing, and lubrication) and inspection data. Data must include a description of (or reference to data acceptable to the Administrator) the work performed, date, helicopter total time in service, signature, certificate type and certificate number of person approving aircraft return to service.

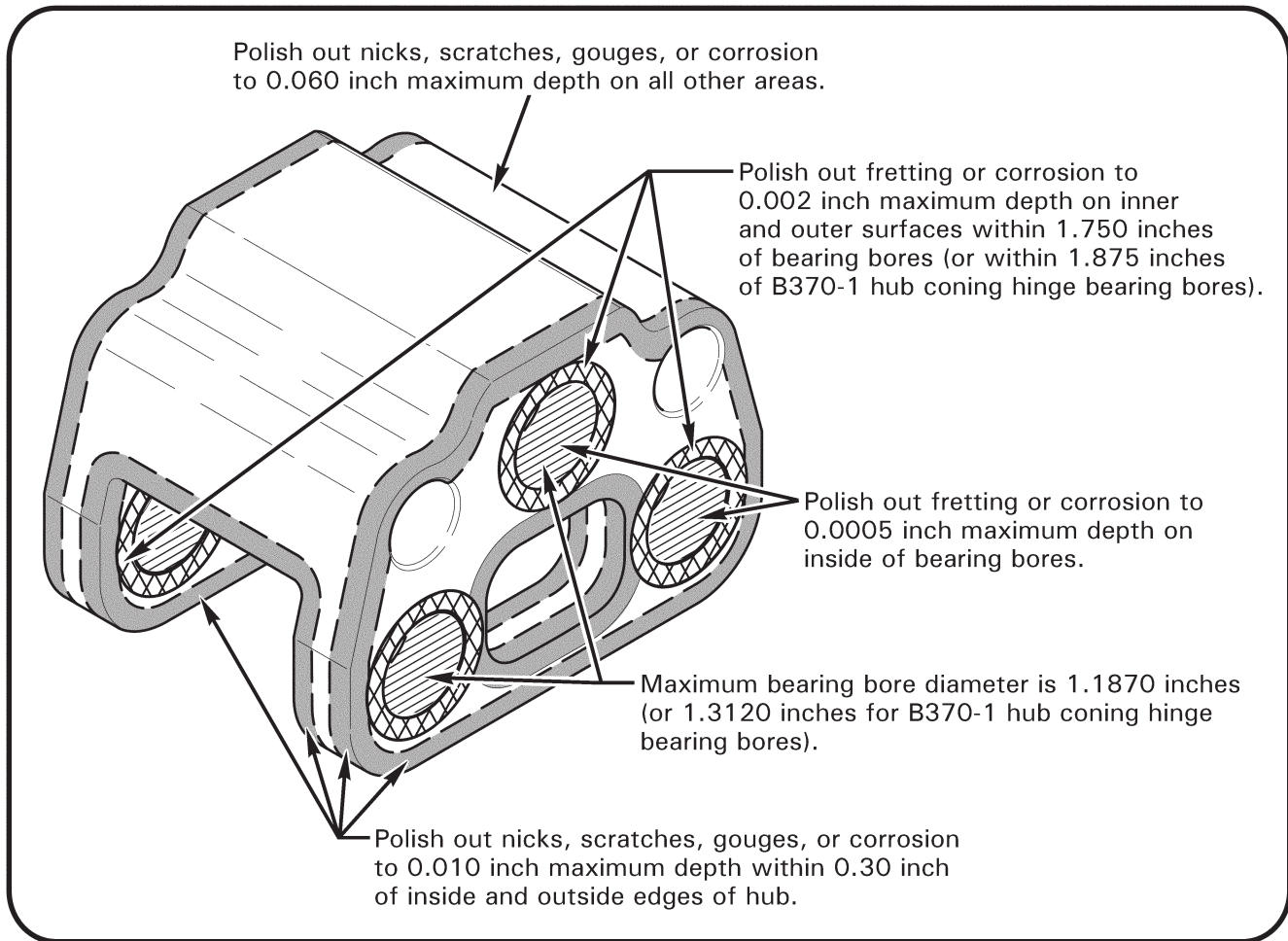


FIGURE 2-17 MAIN ROTOR HUB REPAIR LIMITS

2.610 Main Rotor Hub Inspection and Repair

1. Remove main rotor hub bearings per § 26-21 steps 1 and 2.
2. Remove hub paint by plastic or baking soda media blasting.
3. Refer to Figure 2-17. If required, polish surfaces using 320-grit or finer aluminum-oxide abrasive paper to 0.25 inch minimum blend radius.
 - a. Visually inspect hub bearing bores and verify no scoring, scratches, or other obvious damage. Polish out fretting or corrosion to 0.002 inch maximum depth on inner and outer surfaces within 1.750 inches of bearing bores (or within 1.875 inches of B370-1 hub coning hinge bearing bores). Polish out fretting or corrosion to 0.0005 inch maximum depth on inside of bearing bores; maximum bearing bore diameter is 1.1870 inches (or 1.3120 inches for B370-1 hub coning hinge bearing bores).
 - b. Visually inspect all other areas of hub for obvious damage. Polish out nicks, scratches, gouges, or corrosion to 0.010 inch maximum depth within 0.30 inch of inside and outside edges of hub. Polish out nicks, scratches, gouges, or corrosion to 0.060 inch maximum depth on all other areas.

2.610 Main Rotor Hub Inspection and Repair (continued)

4. Fluorescent penetrant inspect hub per § 23-42.
5. Prime hub per § 23-60.
6. Install bearings per § 26-21 steps 4 and 5.
7. Mask bearings and topcoat hub assembly per § 23-60.
8. When top coat has sufficiently cured, remove masking.

2.620 Tail Rotor Gearbox 12-Year Maintenance

1. If installed, drain and flush B021-1 tail rotor gearbox assembly per § 22-23 steps 1 thru 8.
2. If installed, remove tail rotor gearbox per § 7.410.
3. Remove hardware securing B546-1 yoke to B545 input gear. Visually inspect yoke and replace yoke if damaged. Visually inspect input gear splines; return gearbox to RHC if splines are damaged, including wear steps. Replace input shaft seal per § 7.470 steps 6 thru 17.
4. Remove sight gage and clean glass. Visually inspect gear set; return gearbox to RHC if corrosion or other damage is detected. Install sight gage and special torque gage per § 23-33.
5. Replace output shaft seal per § 7.460 steps 4 thru 9.
6. Install tail rotor gearbox per § 7.420 steps 1 thru 3.
7. Remove filler-plug. Fill gearbox to center of sight gage using correct gearbox oil (refer to § 22-10 Part C). Rotate rotor system by hand for several revolutions and pull down on tail rotor gearbox several times. Check gearbox oil level and adjust as required. Install filler-plug in gearbox and special torque plug per § 23-33.
8. Connect tail light and chip detector wiring to airframe harness at connectors. Turn battery on. Verify tail light illuminates with position lights turned on. Depress push-to-test TR CHIP button and verify TR CHIP caution light illuminates. Turn battery off.
9. Install tail rotor assembly per § 28-10.

2.630 Fanwheel 12-Year Maintenance

1. If installed, remove B174-1 fanwheel assembly per § 6.210.
2. Mark fanwheel assembly parts, including balancing hardware, for identical reassembly.
3. Refer to Figure 2-19. Remove hardware securing A187-4 cone assembly, A186-2 hub, and A178-2 spacer(s) to fanwheel and remove parts, noting relative locations for identical reassembly.
4. Visually inspect all components for obvious damage. Verify no elongation of fastener holes. Replace parts as required.
5. Assemble fanwheel wet with approved primer (chromate primer preferred; refer to § 23-75) between all clamping surfaces; while primer is wet, special torque NAS6603 bolts to 70 in.-lb and NAS6605 bolts to 300 in.-lb.

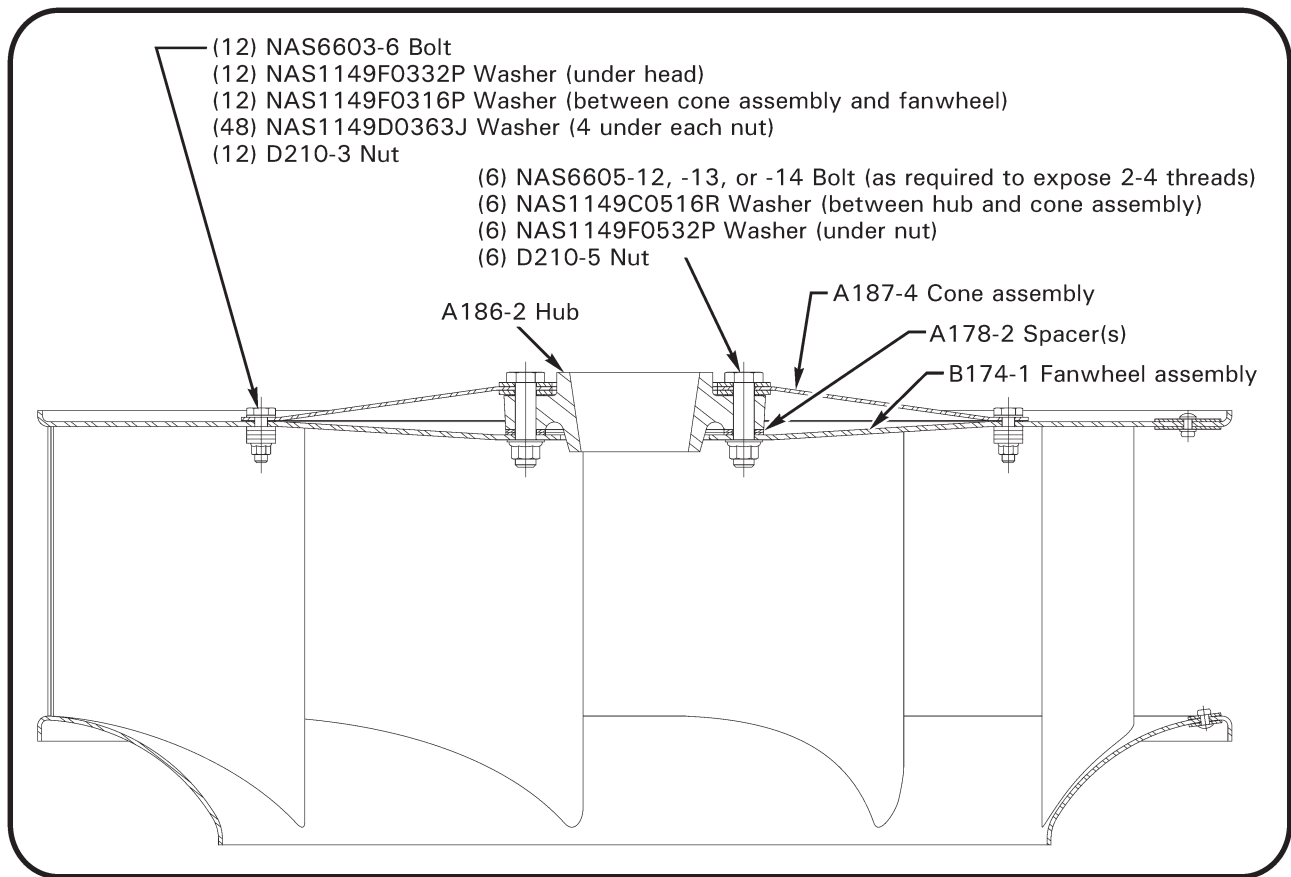


FIGURE 2-19 B174-1 FANWHEEL ASSEMBLY

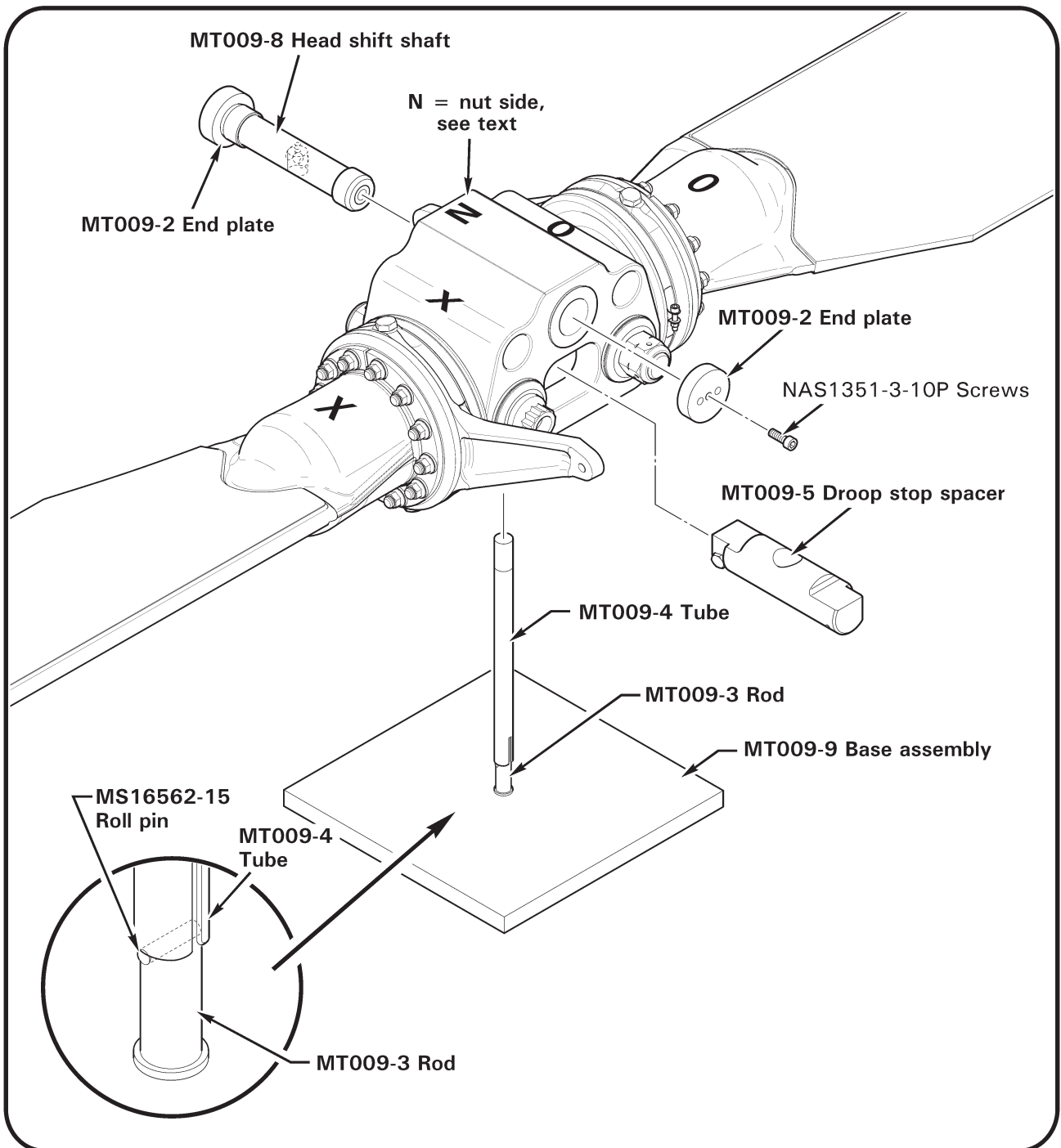


FIGURE 2-20 MT009-10 MAIN ROTOR STATIC BALANCE FIXTURE ASSEMBLY

2.640 Main Rotor Blade Static Balance**CAUTION**

Ensure surfaces contacting blade skins and trailing edges are sufficiently cushioned to prevent blade damage.

1. Refer to Table 26-1. Assemble main rotor blade & spindle assembly to main rotor hub by selecting a combination of A106 coning hinge journals and A117 coning hinge shims (if used) to obtain total axial clearance between 0.002–0.006 inch. Install same length journal (dash number) on leading edge side of both coning hinges.
2. Install nuts (dry); tighten nuts on hinge bolts until journals and thrust washers are firmly seated (snug). Measure gaps between thrust washers and hub bearing faces per Figure 26-8; verify total axial clearance at each hinge is between 0.002–0.006 inch.
3. Refer to Figure 2-20. Install MT009-10 main rotor static balancing fixture assembly in hub as shown. Hoist main rotor assembly and position on MT009-9 base assembly.
4. Refer to Figure 2-21. Verify blade pitch angles are approximately equal with pitch horns adjusted as shown. If blade pitch angles are not equal, then pitch horn(s) are not correctly installed.
5. Place a spirit level chordwise (parallel with teeter and coning hinges) atop main rotor hub. Level by adjusting NAS1351-3-10P screws.

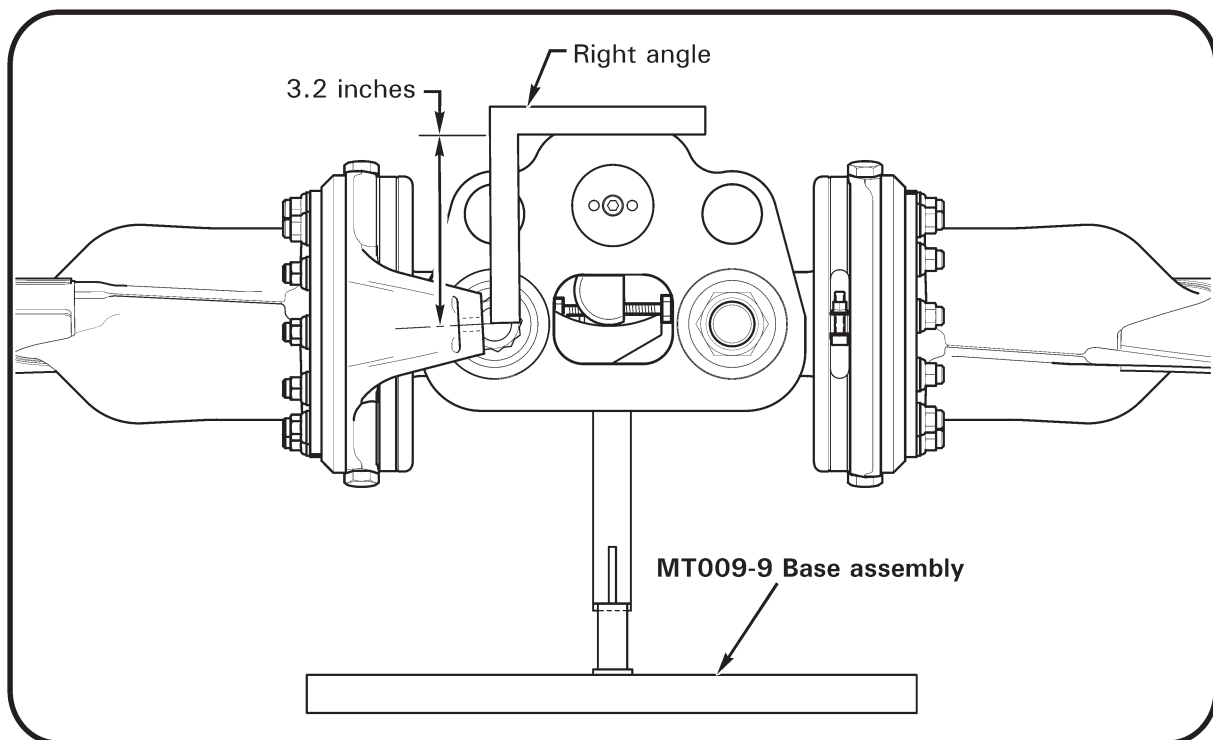


FIGURE 2-21 EQUALIZING BLADE PITCH

2.640 Main Rotor Blade Static Balance (continued)

6. Refer to Figure 2-22. Using a depth micrometer or calipers, measure distance between MT009-2 end plate and MT009-8 shaft thru (either) end plate hole on both sides of main rotor hub. On side of hub with smaller measured distance, mark top of hub with letter "N" to indicate nut-side of teeter hinge bolt.
7. Place a spirit level spanwise (perpendicular to teeter and coning hinges) atop main rotor hub. Place tip cover, tip cover attach screws, and two A722-4 screws as close to blade tip as possible. Level rotor system by adding A298 balance strips, NAS1149F0332P washers, and/or NAS1149F0363P washers as required. Final balance to be within one NAS1149F0332P washer.
8. Apply light coat A257-9 anti-seize to threads and install screws securing tip weights to blade; special torque screws to 40 in.-lb. Apply light coat A257-9 anti-seize to threads and install screws securing tip cover to blade; special torque screws to 40 in.-lb. Recheck spanwise and chordwise balance.
9. Conspicuously mark rotor assembly with colored "X" and "O" on hub, blade roots, and coning bolts (consistent marking on each side of hub) as reference for correct assembly on helicopter. Disassemble main rotor assembly.

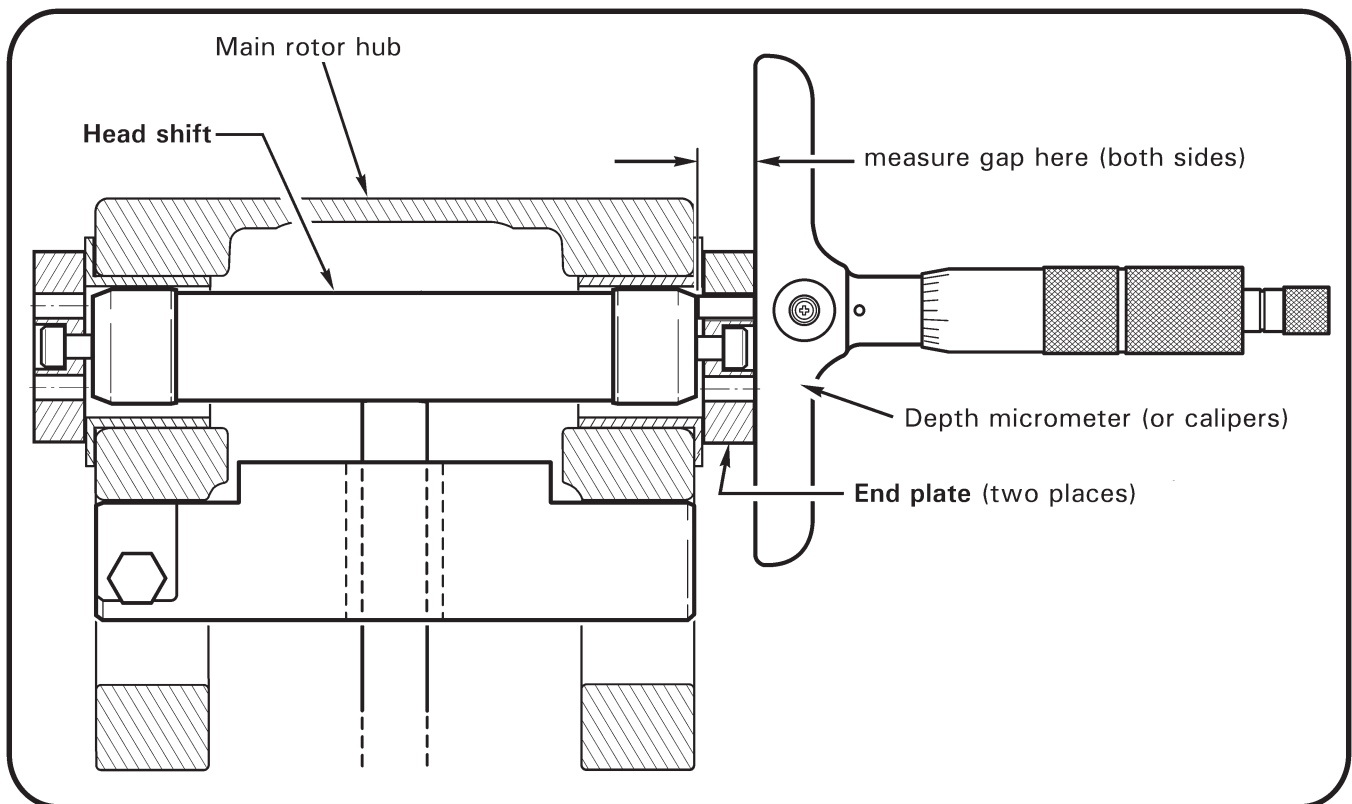


FIGURE 2-22 MEASURING GAP BETWEEN THRUST WASHER AND HUB BEARING

2.650 A258-5 Main Rotor Pitch Link Assembly Inspection

1. Temporarily mark each pitch link and associated swashplate ear with unique color. Record overall lengths of both links.
2. Remove pitch links.
3. Disassemble pitch links, keeping parts from each link separate from the other.
4. Evaluate rod ends per § 2.122 and replace as required.
5. Visually inspect parts with 10X magnification for obvious damage. Replace damaged parts.
6. Visually inspect interior of barrels with borescope for obvious damage. Replace damaged barrels.
7. Assemble pitch links and adjust to recorded lengths. Torque jam nut & adjacent palnut per § 23-32. Special torque self-locking jam nut per § 23-33.
8. Install pitch links to associated swashplate ear and, if installed, main rotor blade. Torque fasteners per § 23-32 and torque stripe per Figure 2-1.

2.700 Additional Special Inspections

2.710 Volcanic Ash Recommendations

Flight in visible volcanic ash conditions ("ash cloud") is detrimental to the helicopter and should be avoided. If helicopter has been operated in visible volcanic ash conditions:

1. Refer to Lycoming SI 1530. Wearing suitable protective equipment, use vacuum cleaner followed by compressed air to remove as much debris as possible. Do not use compressed air near main rotor blade drain holes.
2. Refer to R22 Pilot's Operating Handbook (POH) Section 8. Thoroughly clean, wash, and rinse helicopter, including inner circumference of drive belts.
3. Remove main rotor blade tip covers and clean blade tips.
4. Using 10X magnification, visually inspect any exposed main rotor blade skin-to-spar bond line (adhesive) for gaps (empty space between skin and spar). Blade is unairworthy if any gap, including "pin hole(s)", is detected in the bond line. Refinish blade as required.
5. Inspect condition of drive belt sheaves. Replace any sheave having corrosion pitting, flaking, wear thru metalized or anodized coatings, roughness, or sharp ridges. Replace drive belts if either sheave has sharp ridge(s) on drive belt contact surface.
6. Disconnect alternator drive belt from alternator. Spin alternator pulley by hand and verify rotor bearings and brushes operate smoothly; repair alternator as required if roughness or unusual noise is encountered (volcanic ash can enter via unfiltered cooling air). Inspect alternator and ring gear support pulleys and verify no wear steps; replace alternator belt and pulley(s) if wear steps exist. Perform Lycoming SI 1129 alternator belt tension check and adjust as required.
7. Clean airbox interior and:
 - a. Inspect air filter and clean or replace as required.
 - b. Inspect induction system downstream of air filter (a clean, white glove is beneficial). If volcanic ash is found then:
 - i. Clean induction system, disassembling as required.
 - ii. Disassemble carburetor or fuel injection servo, as applicable, inspect for internal contamination, and overhaul as required.
 - iii. Perform Lycoming SI 1191 Cylinder Compression check.
 - iv. Perform Lycoming SB 388 Procedure to Determine Exhaust Valve and Guide Condition.
 - v. Inspect spark plug condition; service as required.

2.710 Volcanic Ash Recommendations (continued)

8. Remove each magneto's distributor gear inspection plug and inspect visible internal portion for contamination; overhaul magnetos if volcanic ash is found inside (magneto vent plugs are unfiltered).
9. Inspect engine oil condition. Regardless of oil time-in-service if oil smells bad, is opaque (or is not obviously brown), or if particulates are detectable on the dipstick, change engine oil & oil filter, inspect suction screen and old oil filter, and perform Lycoming SI 1191 Cylinder Compression check if not previously accomplished in step 6.

2.720 Lightning Strike

Lightning strikes are extremely rare for helicopters operating in VFR conditions.

If a lightning strike does occur, RHC recommends performing a 100-hour inspection per § 2.400 and following recommendations for aircraft struck by lightning per Lycoming Service Bulletin No. 401.

High voltage that is well conducted through the aircraft structure will dissipate and cause minimal damage. High voltage that is not well conducted through the aircraft structure can result in excessive heat, which can bake, burn, char, or even melt certain materials. Heat damage may or may not be detectable by visual inspection. A component may not exhibit obvious damage, but temperatures above 300° F can alter the strength of some materials and thus affect a component's service life and airworthiness.

Visually inspect main rotor blades, landing gear, drive train, airframe, and flight controls thoroughly for obvious damage such as electrical arcing or burns, pitting, or cracking. Particular attention should be given to rod ends, journals, etc., where the conductive path is most susceptible. If obvious damage is detected in any of the above-mentioned systems, additional components may require replacement. Contact RHC Technical Support with detailed documentation for further guidance prior to approving aircraft for return to service.

2.730 Inspection After Stabilizer Damage

For damage to an installed A042-1 upper vertical stabilizer, A043-1 lower vertical stabilizer, and/or A044-1 horizontal stabilizer that results in denting, tearing, or cracking of stabilizer metal:

1. On associated tailcone's aft casting, strip paint from cross-hatched surfaces shown in Figure 2-23.
2. Fluorescent penetrant inspect (ref. § 23-42) stripped surfaces. Replace tailcone if crack is indicated.
3. Prime & paint stripped surfaces per § 23-60.

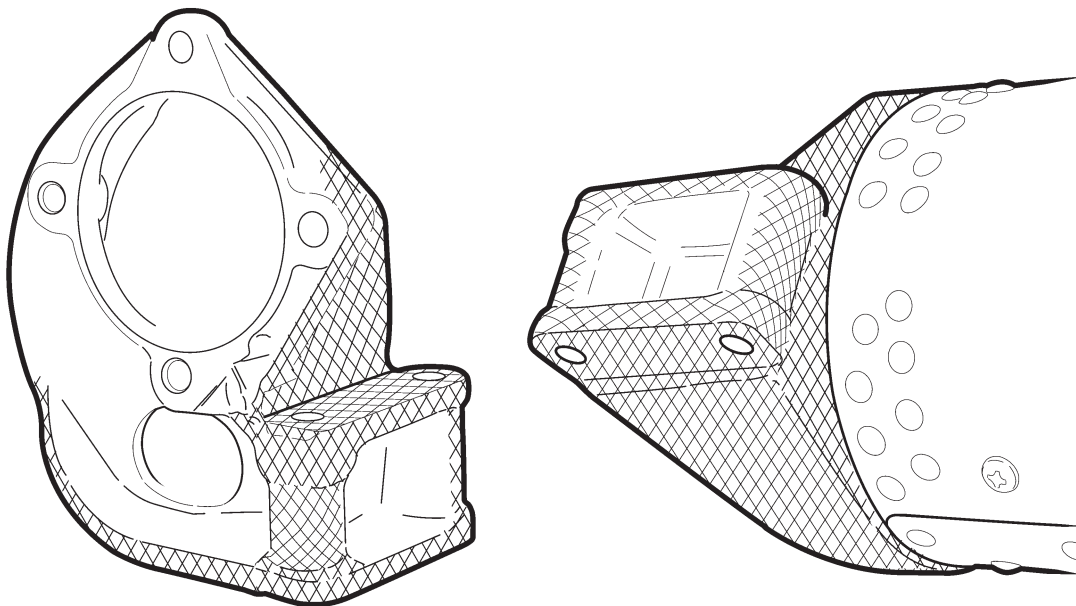


FIGURE 2-23 CROSS-HATCHED SURFACES OF TAILCONE'S AFT CASTING