

CHAPTER 2  
INSPECTION

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## CHAPTER 2

## INSPECTION

2.000 Introduction

The R44 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. Preventive maintenance is required between scheduled inspections. 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

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. Unless otherwise specified, the following general procedures apply to R44 inspection.

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 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 Section 2.501 for bearing inspection and lubrication.

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 roller 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 retensioning in flight (on for 1-8 seconds then off). Flight should not be resumed until cause of the flickering clutch light has been determined.

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

### 2.121 Push-Pull Tubes

1. 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. Replace tube if depth exceeds these limits.
2. If tube is dented or flattened more than 5 percent of its diameter, it must be replaced.

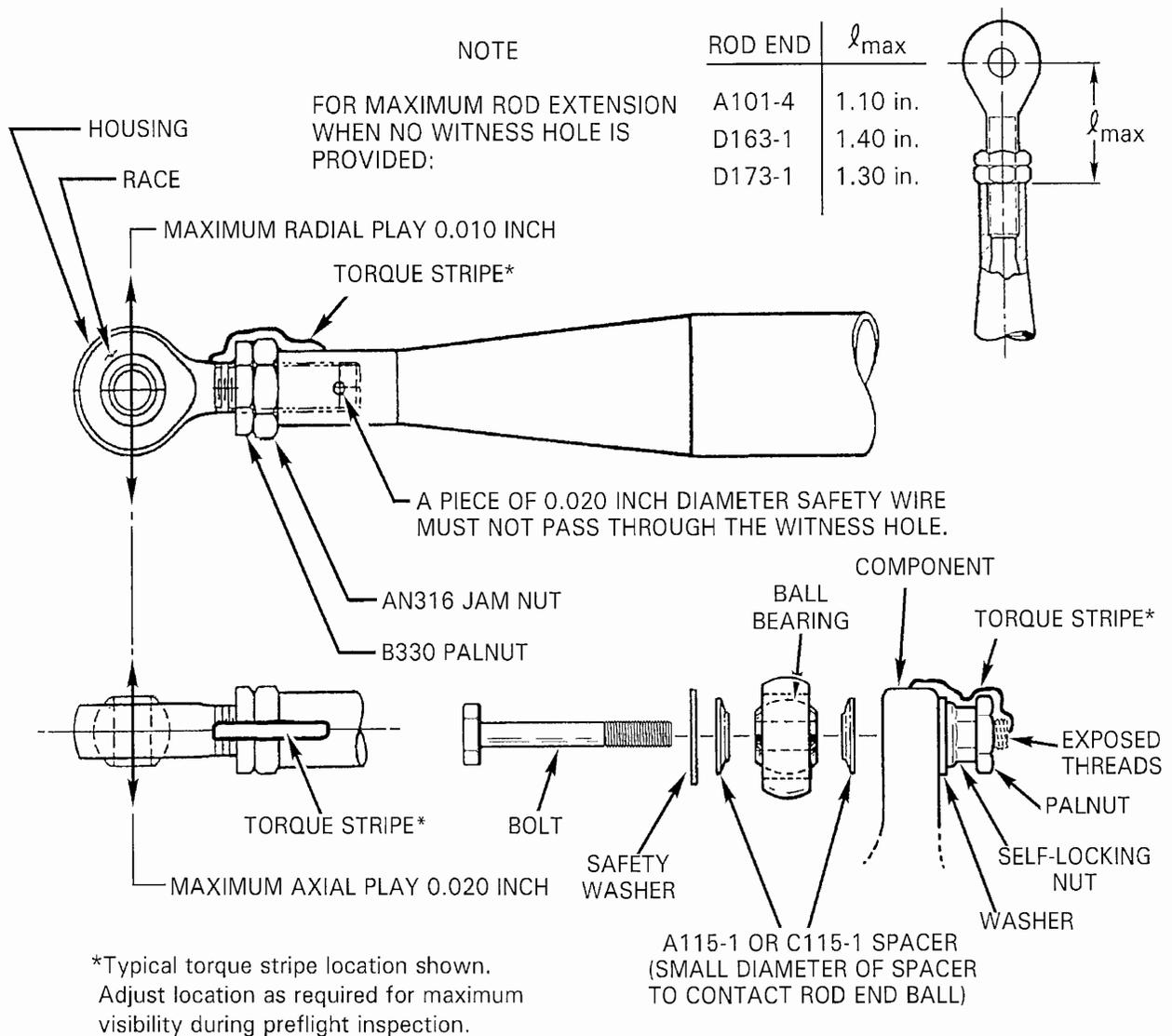
### 2.122 Rod Ends and Spherical Bearings (see Figure 2-1)

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 the witness hole, if provided.
4. Rod end jam nuts and palnuts must be torqued per Section 1.320 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. Refer to Figure 2-1A. Rod ends must be centered, or positioned, to allow as much push-pull tube or link rotational movement as possible without binding.

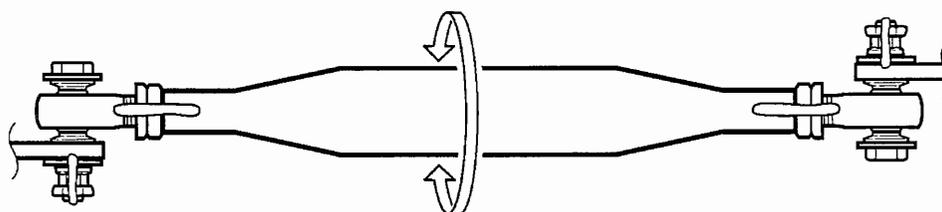
**CAUTION**

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

2.122 Rod Ends and Spherical Bearings (cont'd)



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



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

### 2.125 Elastomeric Bearings

Elastomeric bearings are used in the D062-1 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.

2.125 Elastomeric Bearings (cont'd)

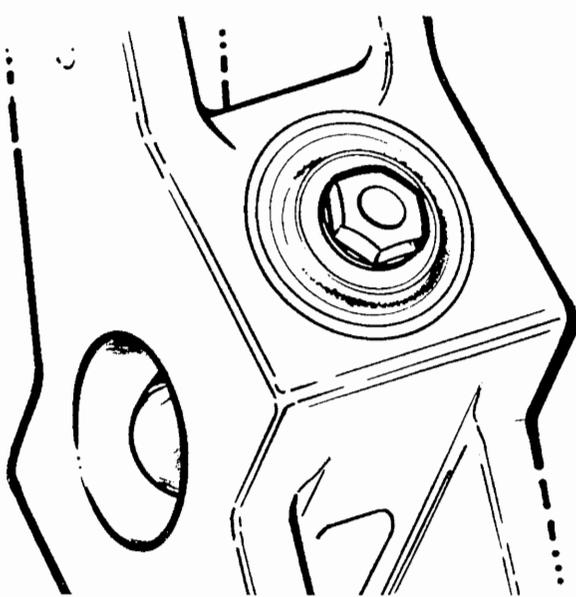


Figure 2-2A - Elastomer Fatigue

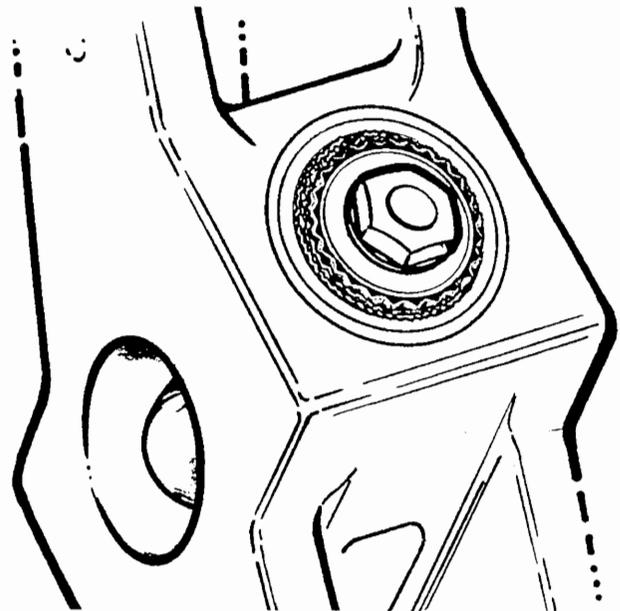


Figure 2-2B - Elastomer Oil Contamination

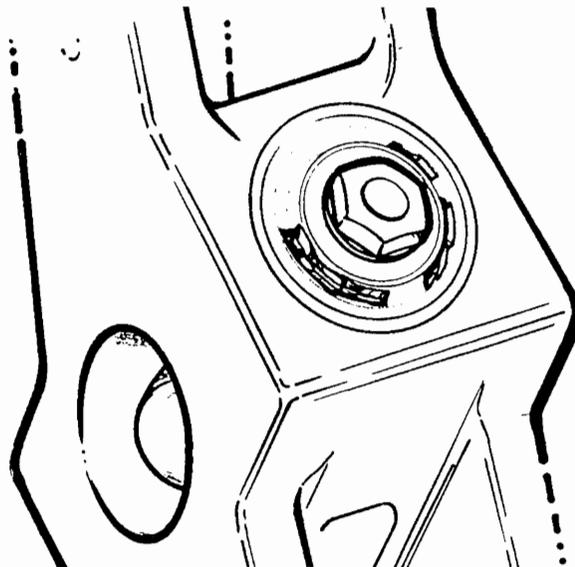
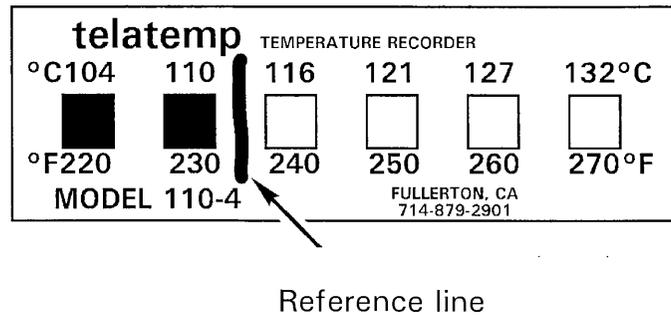


Figure 2-2C - Elastomer Overload

2.130 Telatemp Indicators

Self-adhesive Telatemp indicators record increases in operating temperatures of bearings, gearboxes, etc. To use Telatemp, draw a reference line between the highest temperature square which has darkened during normal operation and the next undarkened square. See Figure 2-3. During every check thereafter, determine if an additional block has blackened. If an indicated temperature increase cannot be accounted for by a change in operating conditions, subject component should be carefully examined before further flight.



**FIGURE 2-3 TELATEMP WITH DRAWN REFERENCE LINE**

Telatemp	Component
110-4	Main Rotor Gearbox
110-2 or 110-3	Upper Actuator Bearing (just aft of upper sheave)
110-2	Tail Rotor Gearbox
110-4	Hydraulic Pump (if installed)

Telatemp P/Ns & Temperature Ranges:

110-2	60 degrees C/140 degrees F - 88 degrees C/190 degrees F
110-3	82 degrees C/180 degrees F - 110 degrees C/230 degrees F
110-4	104 degrees C/220 degrees F - 132 degrees C/270 degrees F

2.200 GROUND AND FLIGHT CHECK FOR 100-HOUR/ANNUAL INSPECTION

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

2.205 Ground Check (Aircraft not running)

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 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 (O-540 only):** Check for smoothness of operation with no binding. Verify 0.03 to 0.10 inch spring-back at full off position. \_\_\_\_\_
5. **Cyclic Control:** With trim motors (if installed) in neutral position, verify freedom thru full travel with friction off. Verify friction knob rotates 1/8-to-1 full turn before adding friction. For hydraulic controls: Verify approximately one-half inch total longitudinal and one inch total lateral freeplay before encountering resistance. Verify normal hydraulic resistance with no binding or abnormal feel throughout control travel. \_\_\_\_\_
6. **Collective Control:** Verify freedom through full travel with friction off and on. For non-hydraulic aircraft, verify friction knob moves 0.3-0.6 inch before adding friction. For hydraulic controls: Verify approximately one-half inch total freeplay before encountering resistance. With carb heat assist (if installed) locked and friction lever fully off, verify C334 friction (between rear seats) within freeplay range is 4-5 pounds average measured at grip. With friction lever fully on, verify 18-22 pounds measured at grip. Verify normal hydraulic resistance with no binding or abnormal feel throughout control travel. \_\_\_\_\_
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 attach fasteners. \_\_\_\_\_

2.205 Ground Check (cont'd)

**10. Lighting and Instruments: (Master Switch on)**

- a. CARBON MONOXIDE warning light flashes twice (if installed). \_\_\_\_\_
- b. Carb Air Temp approximately same as Outside Air Temp. \_\_\_\_\_
- c. ALT warning light on. \_\_\_\_\_
- d. OIL pressure warning light on. \_\_\_\_\_
- e. AUX FUEL PUMP warning light on (IO-540 only). \_\_\_\_\_
- f. Fuel quantity gages - indication of fuel level. \_\_\_\_\_
- g. Navigation and panel lights - check function. \_\_\_\_\_
- h. Strobe light - check function. \_\_\_\_\_
- i. Landing lights - check function (clutch switch must be engaged to check landing lights). \_\_\_\_\_
- j. Map light - check function. \_\_\_\_\_
- k. Ammeter - shows discharge. \_\_\_\_\_
- l. Oil temperature gage - slight needle deflection with engine cold. \_\_\_\_\_
- m. Cylinder head temp gage - slight needle deflection with engine cold. \_\_\_\_\_
- n. MR TEMP light - on when sender shorted or test switch depressed. \_\_\_\_\_
- o. MR CHIP light - on when sender shorted or test switch depressed. \_\_\_\_\_
- p. ENGINE FIRE light - on when sender shorted or test switch depressed. \_\_\_\_\_
- q. TR CHIP light - on when sender shorted or test switch depressed. \_\_\_\_\_
- r. LOW FUEL light - on (slight delay is normal) when low fuel sender in tank is depressed with clean, non-sparking rod or when test switch depressed. \_\_\_\_\_
- s. FUEL FILTER light - on when test switch depressed (IO-540 only). \_\_\_\_\_

11. Verify aircraft checklist laminated card is current revision (refer to Section 1.002). \_\_\_\_\_

2.210 Run Up

- 1. Perform POH Section 4 "Preflight" checklist. \_\_\_\_\_
- 2. Perform "Before Starting Engine" checklist. \_\_\_\_\_
- 3. IO-540 engine: Verify AUX FUEL PUMP light extinguishes during prime and illuminates after priming. Verify fuel drains from sniffle valve. \_\_\_\_\_

**NOTE**

Significant prime may be required before fuel drains from sniffle valve. Wait for valve to stop draining before starting engine. Engine will be hard starting/flooded while valve is draining.

- 4. Perform "Starting Engine and Run-Up" checklist. If less than 15 minutes has elapsed since Step 3, use minimum or no prime. \_\_\_\_\_
- 5. Check clutch engagement time – maximum 70 seconds. \_\_\_\_\_
- 6. Ammeter indicates charge, ALT light off. \_\_\_\_\_
- 7. Both magnetos ground (off momentarily) at 60% RPM. \_\_\_\_\_
- 8. Tachometer operates with alternator and battery switches off. \_\_\_\_\_
- 9. No unusual bearing noise when varying RPM through operating range (mechanic to listen near V-belt drive). Refer to Section 2.110 and 2.501 thru 2.503. \_\_\_\_\_
- 10. Set RPM at 75%, governor on. Increase to 85%, release throttle, and verify governor increases RPM to 101 to 102%. Increase RPM to 104%, release throttle, and verify governor decreases RPM to 101 to 102%. \_\_\_\_\_
- 11. Engine and rotor tach needles within 1% of each other at 102% RPM. \_\_\_\_\_
- 12. Verify alternator voltage as follows: \_\_\_\_\_
  - 13.4 to 13.9 vdc for A942-3 alternator control unit
  - 27.75 to 29.25 vdc for A942-4 alternator control unit
- 13. Heater operates properly. \_\_\_\_\_
- 14. Tachometer needles do not jump more than 2% when transmitting on 118.00, 125.00 , and 136.975 MHz with governor on. \_\_\_\_\_
- 15. 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. \_\_\_\_\_

2.210 Run Up (cont'd)

16. Idle RPM with engine warm, clutch engaged, throttle closed-

O-540 engine: 53% - 57% \_\_\_\_\_

IO-540 engine: 58% - 62% \_\_\_\_\_

17. Idle mixture with engine warm, clutch engaged, throttle closed. \_\_\_\_\_

O-540 engine: 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 1 ½ turns out from fully in then adjust as required for smooth idle. \_\_\_\_\_

IO-540 engine: Adjust idle mixture per Section 6.495, Step 23. \_\_\_\_\_

18. Check hydraulic system (if installed) operation. Using cyclic-mounted hydraulics switch, turn hydraulics OFF. Using small longitudinal cyclic inputs, there should be approximately one-half inch of freeplay before encountering stiffness and feedback. Turn hydraulics ON. Controls should be free with no feedback or uncommanded motion ("motoring"). Complete flight check with hydraulics on. \_\_\_\_\_

19. Air Conditioning: Verify system blows cold air on both low and high settings. Verify no EMI/RFI with other instruments and systems. After a flight with air conditioning on, verify water drains from drain tube in ship's belly (may be little or no water in very dry conditions). \_\_\_\_\_

2.220 Flight Check

1. Hover:

- a. All gages green. \_\_\_\_\_
- b. Controllability in left and right pedal turns. \_\_\_\_\_
- c. Cyclic electric trim (or hydraulics) zeros cyclic stick forces. \_\_\_\_\_
- d. Vibration levels satisfactory. \_\_\_\_\_

2. Level flight: Typical cruise altitude (if possible, deviate as required for weather and regulations), maximum continuous power, governor on.

- a. Vibration levels satisfactory. \_\_\_\_\_
- b. Cyclic electric trim (or hydraulics) zeros cyclic stick forces. \_\_\_\_\_
- c. Collective trim spring (electric trim system only) zeros collective forces. For hydraulic controls: Verify no feedback and collective is balanced. \_\_\_\_\_
- d. Fixed collective friction adequate to prevent "bounce" but not excessive (electric trim system only). \_\_\_\_\_
- e. Tail rotor pedal position when yaw string is centered: 0.25 to 0.75 inch right for adjustable pedals, within 0.25 inch of neutral for non-adjustable pedals. \_\_\_\_\_
- f. Tail rotor elastic trim cord zeros pedal forces (cord applies left pedal force). \_\_\_\_\_
- g. For hydraulic controls: Turn hydraulics OFF and verify no excessive feedback forces. \_\_\_\_\_

3. Autorotate at 100 KIAS with station 99 or greater CG. Verify electric trim (or hydraulics) zeros cyclic stick forces. \_\_\_\_\_

2.230 Shutdown

- 1. Verify rotor brake functions and ROTOR BRAKE light illuminates. \_\_\_\_\_
- 2. Complete shutdown per POH checklist. \_\_\_\_\_

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2.300 AIRFRAME PREPARATION FOR 100HR/ANNUAL INSPECTION

Thoroughly clean airframe prior to inspection. Wipe down main and tail rotor blades, hubs, and airframe exterior with a mild soap and water solution.

**CAUTION**

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

2.400 100HR/ANNUAL AIRFRAME INSPECTION

**NOTE**

Numbers in parentheses indicate location as illustrated in Figures 2-4 and 2-4A.

**CAUTION**

If pop-out floats are installed, ensure safety on pilot's red inflation lever is in LOCKED position when working on helicopter.

**WARNING**

Pop-out float pressure cylinder contents are under extreme pressure. If pop-out floats are installed, install locking pin in pressure cylinder valve (see Figure 5-6) when working in forward left baggage compartment, during cylinder removal or installation, and when working on floats or inflation hoses. Remove locking pin when work is completed. Avoid excessive heat (> 200 degrees F) as thermal relief valve will activate.

Perform 100 hour or Annual inspection per Section 2.410.

2.410 Inspection Procedures and Checklist

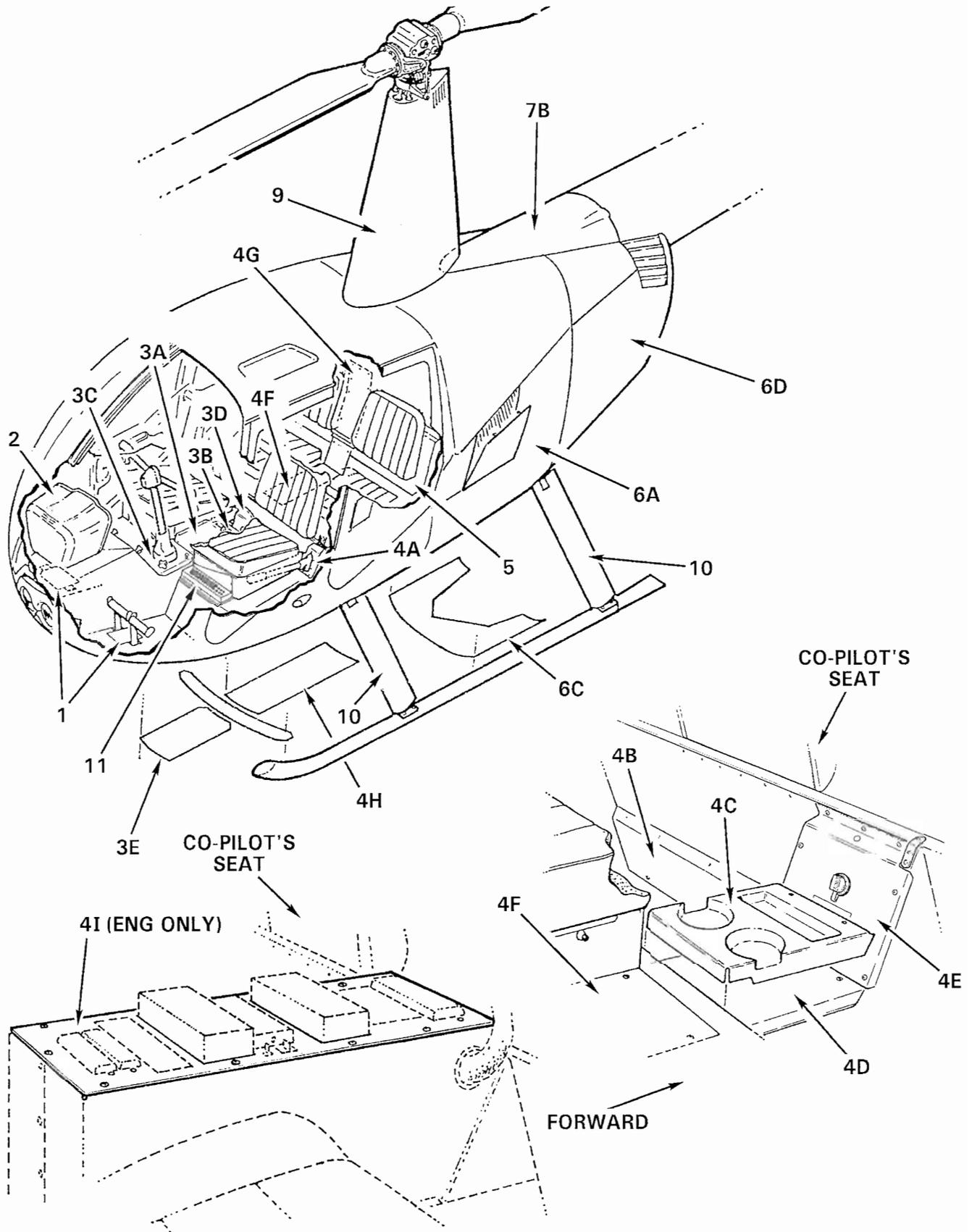
R44 Serial No.:	_____	Technician name:	_____
Registration No.:	_____	Technician	
Hourmeter Indication:	_____	Certificate number:	_____
Aircraft Total Time:	_____		

**1. Tail Rotor Pedal Bearing Blocks**

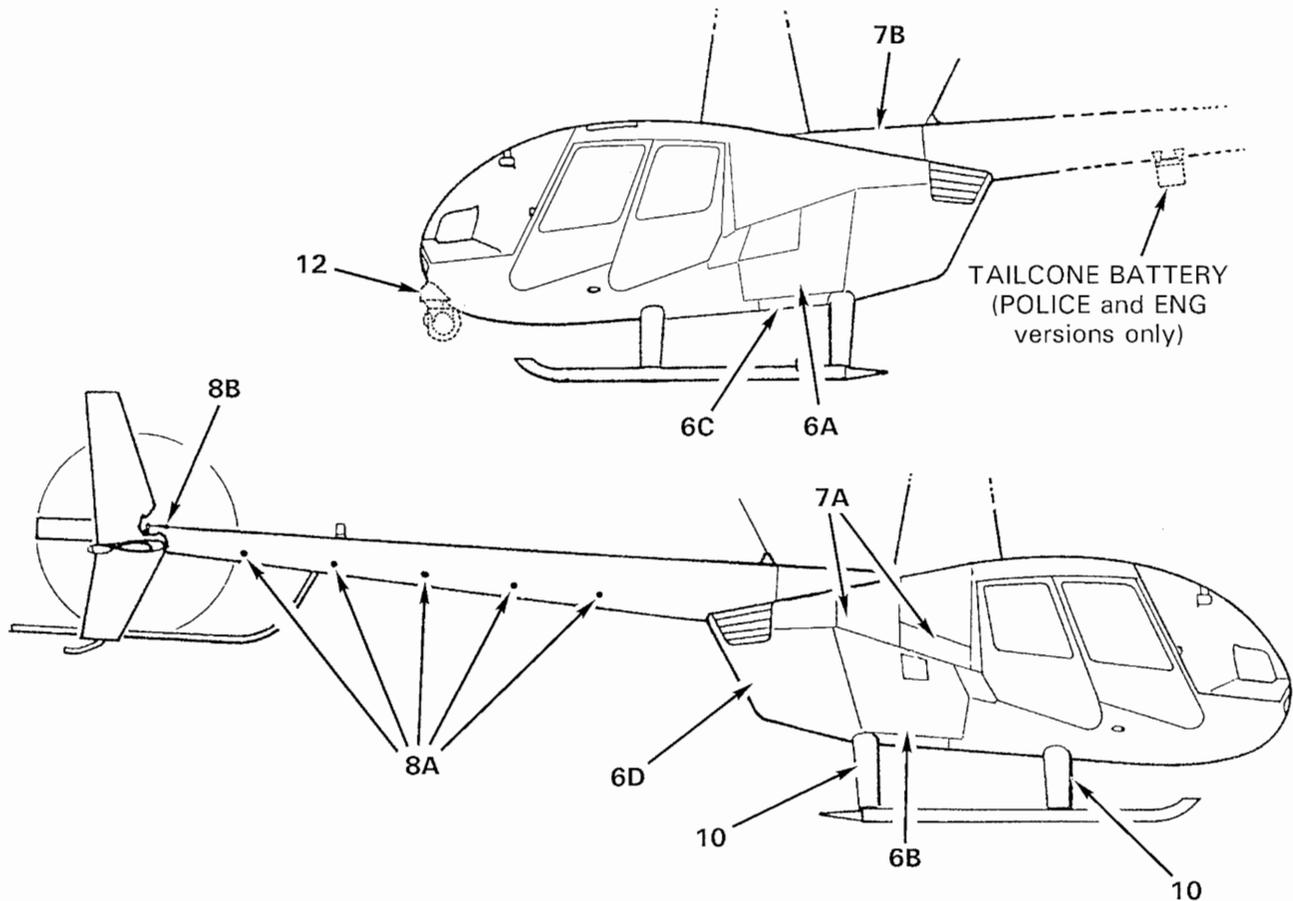
**NOTE**

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

To remove cover plates (1) peel back carpeting and remove screws holding plates. Use an inspection light and mirror to inspect bearing blocks. Inspect for condition and looseness or play. Maximum allowable play is 0.080 inch axially and 0.030 inch radially. Inspect all weld areas in pedal controls.



**FIGURE 2-4 ACCESS AND INSPECTION PANELS**



**FIGURE 2-4A ACCESS AND INSPECTION PANELS**

<u>NUMBER</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>NUMBER</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>
1	B189-4	Deflector (LH)	4I	D383-1	Face (ENG only)
	A412-2 and B189-2	Cover and Deflector (RH)	5	C003-10	Seat Back Assy (RH)
2	B050	Console Assy		C003-11	Seat Back Assy (LH)
3A	C445-1	Cover Assy	6A	C337-1	Cowling Assy (LH)
3B	C445-3	Cover	6B	C378-1	Cowling Assy (RH)
3C	C444-1	Cover	6C	D041-1	Cowling Assy - Belly
3D	C398-1	Cover Assy	6D	D040-1	Aft Cowling Assy
3E	C794-1	Panel	7A	D042-4	Door Assy
4A	C680-1	Cover Assy		D042-4	Door Assy
4B	C461-1	Cover	7B	C706-1	Tailcone Cowling Assy
4C	C464-1	Tray	8A	A231-1	Plug Assy
4D	C463-1	Cover	8B	A558-2	Cover
4E	C054-1	Cover Assy	9	C261-1	Mast Fairing Assy
4F	C474-2	Cover	10	C082-2	Fairing Assy (FWD, RH)
4G	C474-1	Cover		C082-3	Fairing Assy (FWD, LH)
4H	C794-2	Panel (without scoop)		C082-4	Fairing Assy (AFT, RH)
	C794-3	Panel Assy (with scoop)		C082-5	Fairing Assy (AFT, RH)
4H	C794-2	Panel (without scoop)	11	C045	Circuit Breaker Panel
	C794-3	Panel Assy (with scoop)	12	D412-1	Fairing (Inframetrics Camera)
			(Police ships)	or D347-1	Fairing (FSI Camera)

2.410 Inspection Procedures and Checklist (cont'd)

**2. Upper Console (2)**

Console (2), is opened by removing one screw on each side. With console open, inspect the following:

**Pitot-Static System:** Check pitot and static lines for cracking, chafing, pinching or kinking. Check all connections for security. \_\_\_\_\_

**Flight and Engine Gages:** Check all gauges for security. Inspect wiring and connections on all gages. \_\_\_\_\_

**Radio Tray(s):** Check condition and security. \_\_\_\_\_

**Tail Rotor Controls:** Check accessible portions of TR pedal assemblies for defects. Verify operating clearance. \_\_\_\_\_

**3. Remove Forward Tunnel Covers (3A & 3B), Cyclic Stop Cover (3C), Inboard Collective Cover (3D), and Forward Belly Panel (3E)** \_\_\_\_\_

**NOTE**

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

**Cyclic Box Assembly:** Inspect cyclic box assembly for defects. Check cyclic stop sheet metal assembly for cracks and other defects (deterioration, distortion, loose rivets, corrosion). \_\_\_\_\_

**Cyclic Stick Assembly:** Inspect cyclic stick assembly for defects. Inspect welds for cracks. \_\_\_\_\_

**CAUTION  
(manual controls)**

Do not disturb clear silicone coating protecting strain gages, or attached wiring. Any damage to strain gages or wiring will disable trim system.

**Cyclic Trim (manual controls):** Turn master and cyclic trim switches on. Move cyclic laterally stop to stop and longitudinally stop to stop and check operation of trim motors. Check trim motors, springs and elastic cords for clearance from all wire bundles and fuselage structure during movement and at travel limits. \_\_\_\_\_

**Cyclic Lateral Trim Actuator (manual controls):** Turn master and cyclic trim switches on. Push and hold cyclic stick against right stop until motor stops then turn trim off. Move cyclic stick to left stop to compress spring. Inspect exposed portion of shaft for wear and galling. Do not grease rod on Rev H and subsequent C056-1 spring assemblies, bearing is self-lubricating. Inspect C130-13 urethane spacer (stop). Check security of attachment to cyclic pivot. \_\_\_\_\_

**Cyclic Longitudinal Trim Actuator (manual controls):** Inspect C130-13 urethane spacer (stop). Check security of attachment to cyclic stick. \_\_\_\_\_

2.410 Inspection Procedures and Checklist (cont'd)

**3. Remove Forward Tunnel Covers (3A & 3B), Cyclic Stop Cover (3C), Inboard Collective Cover (3D) and Forward Belly Panel (3E) (cont'd)**

**Cyclic Friction:** Check for excessive play or looseness in links and rod ends connected to cyclic stick. Verify no excessive flaring at either end of C130-2 spacer. \_\_\_\_\_

**Cyclic Push-Pull Tube and Torque Tube:** Inspect C319 torque tube paying special attention to area around blocks and end of torque tube for cracks. Inspect C121-1 push-pull tube rod end palnut and jam nut for tightness. Check witness holes on push-pull tubes. Check rod ends and bearings for excessive play and looseness. Check accessible portions of cyclic push-pull tube and torque tube for defects, including scratches. Pay particular attention to top of torque tube immediately below C348-1 anchor assembly. Inspect all nuts and bolts in cyclic controls for rotation and looseness. \_\_\_\_\_

**Tail Rotor Push-Pull Tube:** Inspect accessible portions of C121-9 tail rotor push-pull tube. Look for defects such as cracks, bends, scratches, or chafing. Check rod ends for excessive play and looseness. \_\_\_\_\_

**Collective Friction and Stop:** Inspect collective stop condition; no nicks, cuts or scratches are allowed. Check collective friction lever for security and operation. Move collective up and down and verify no bending or binding of stop. Verify collective boot's lace cannot entangle stop. \_\_\_\_\_

**Throttle Overtravel Spring:** Inspect operation of overtravel spring while operating throttle. It should move freely without any binding or jerkiness. Check play in upper and lower rod ends. Check rod ends for binding. \_\_\_\_\_

**Wiring Harness:** Inspect for chafing and clearance from controls. \_\_\_\_\_

**Pitot and Static Lines:** Inspect pitot and static lines for security and any evidence of cracking, chafing, pinching or kinking from sharp bends. Open drains and check for moisture; close drains. \_\_\_\_\_

**Elastic Trim Cord(s):** With cyclic forward-right, feel forward elastic trim cord(s) for voids which may indicate broken strands. \_\_\_\_\_

**Heater Hose:** Check heater hose for collapsed areas and chafing. \_\_\_\_\_

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

**4. Remove Outboard Collective Cover (4A), Collective Torque Tube Cover (4B), Tray (4C), Mid Tunnel Covers (4D & 4E), Aft Tunnel Covers (4F & 4G), Aft Belly Cover Panel (4H), and Rear Console (4I, ENG ships only)**

**NOTE**

If radio antenna is installed on removed panel, disconnect antenna lead and corresponding ground wire. Pull respective radio circuit breaker and tag circuit breaker with "antenna removed".

2.410 Inspection Procedures and Checklist (cont'd)

- 4. **Remove Outboard Collective Cover (4A), Collective Torque Tube Cover (4B), Tray (4C), Mid Tunnel Covers (4D & 4E), Aft Tunnel Covers (4F & 4G), Aft Belly Cover Panel (4H), and Rear Console (4I, ENG ships only) (cont'd)**

**Collective Stick:** Inspect condition of collective stick. Inspect all welds for cracks. Inspect C328-1 connecting rod assembly giving special attention to points of attachment. Inspect governor motor and governor motor arm for looseness or binding. Inspect collective-activated micro switch for cracks or loose wires.

**Collective Stick Torque Tube:** Verify no corrosion pitting. Apply a corrosion-preventative compound such as LPS 2, ACF-50, or Corrosion-X to any unpainted, phosphate-coated area while avoiding contaminating governor friction clutch (a foam-type applicator works well). Ensure interior of open-end "box" structures at inboard attach point and at A205 fork connection are also treated.

**Aft End of Cyclic Torque Tube and Yoke Assembly:** Inspect torque tube and yoke, paying special attention to area around blocks and end of torque tube for cracks. Check play in bellcrank bearings per Section 2.120. Inspect swaged bearing for movement in yoke.

**Aft End of Cyclic Push-Pull Tube (C121-1) and Lower Ends of Vertical Push-Pull Tubes (C121-7):** Inspect push-pull tubes for cracks. Check rod end jam nuts and palnuts for tightness and rod ends for play. Check rod end bearings for looseness. Inspect fork assembly areas. Check bearings for looseness. Check between bearings and swage for evidence of fretting.

**Aft End of (C121-19) Tail Rotor Push-Pull Tube and Lower Bearing:** Check witness hole. Check lower bellcrank bearing for play. Inspect all welds on support assembly for lower bellcrank and inspect surrounding sheet metal area for cracks.

**Collective Push-Pull Tube (C121-19):** Check for binding or nicks. Check witness holes. Check jam nuts and palnut for tightness and rod end for play.

**Collective Friction Assembly:** Check jam nuts and palnuts for tightness and rod ends for play. Inspect all welds on bellcrank support assembly and inspect surrounding sheet metal for cracks and corrosion.

**Collective Spring Assembly (Manual Controls Only):** Move collective up and down and verify no binding or cracking. Spring coils must not touch when collective is full down. Verify jam nut and palnut tightness. Verify rod ends play within limits. Verify guide rods are greased. If required by Section 1.101, service assembly per Section 8.221.

**Fuel Valve and Fuel Line:** Inspect fuel line for damage and valve fittings for leakage (leakage is indicated by a blue or green residue, depending on fuel used, or odor of fuel). Verify no chafing of fuel lines.

**Fuel Valve-to-Knob Torque Tube:** Inspect condition. Verify attaching security.

2.410 Inspection Procedures and Checklist (cont'd)

**5. Remove Aft Seat Back Assemblies (5)**

**Wiring:** Check wiring for security and proper installation. \_\_\_\_\_

**Pitot and Static Lines:** Check for security, chafing, and kinks. \_\_\_\_\_

**Air Conditioning Refrigerant Lines (if installed):** Verify security and no damage. \_\_\_\_\_

**Evaporator Drain Tubes and Valve (if installed):** Verify tubes are unobstructed. Place a container under sediment-tube protruding from bottom of tee-fitting into right-aft baggage compartment. Remove plug from sediment tube and allow any accumulated moisture and debris to drain. Reinstall plug. Simultaneously squeeze drain tube and sediment tube near tee-fitting and verify check-valve ball moves up momentarily. \_\_\_\_\_

**Strobe Power Supply & Alternator Control Unit:** Inspect strobe power supply and alternator control unit wiring. Inspect mounting panels for cracks. \_\_\_\_\_

**Blind Encoder & Governor Controller:** Inspect blind encoder and governor controller wiring. Inspect mounting panels for cracks. \_\_\_\_\_

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

**6. Remove Engine Aft (6D), Belly (6C), and both side (6A & 6B) Cowlings**

**Vertical Firewall:** Inspect vertical firewall condition, especially around structural attachment points, verify no cracks, buckling or wrinkles. \_\_\_\_\_

**Fuse(s) and Fuse Holder(s) (if installed on vertical firewall):** Verify security and no corrosion. Verify correct fuses: -66 wire requires AGC-3 fuse, -1601/-1602 wires require AGC-5 fuse. If installed, -1226 wire requires AGC-3 fuse. \_\_\_\_\_

**Wiring:** Verify security, proper installation, and no deterioration. \_\_\_\_\_

**Electric Fuel Pump (IO-540 only):** Verify security, proper installation, unobstructed drain tube, and no leakage. \_\_\_\_\_

**Fuel Line & Hose(s):** Inspect condition. Verify security, proper installation, no leakage, & (IO-540 only) good condition of spirap insulation on fuel line between firewall & gascolator. \_\_\_\_\_

**Lower Steel Tube Frames:** Thoroughly inspect lower steel tube structure for corrosion and inspect all welds for cracks. Ensure frames are not chafed by wires, hoses, clamps, etc. \_\_\_\_\_

**Engine Cooling Panels:** Inspect cooling panels for cracks and missing fasteners. \_\_\_\_\_

**Oil Cooler(s):** Inspect oil cooler(s) and fittings for damage, leaks, cleanliness, and security. Check oil cooler mounting area(s) for cracks. \_\_\_\_\_

2.410 Inspection Procedures and Checklist (cont'd)

**6. Remove Engine Aft (6D), Belly (6C), and both side (6A & 6B) Cowlings (cont'd)**

**Oil Lines:** Inspect entire length of all oil lines and verify no cracks, abrasion, or broken clamps. Verify clearance; wires, ty-raps, and structure must not contact lines. \_\_\_\_\_

**Gascolator:** With fuel valve OFF, remove and clean gascolator bowl and filter screen. Verify no deterioration of gasket. If gascolator bowl is secured by threaded collar and ring, lightly lube threads and ring with A257-6 grease. Reassemble and turn fuel valve ON. Safety wire after ensuring no leaks occur. Verify drain valve is secure and torque-stripped. \_\_\_\_\_

**Mixture Control:** Verify mixture control moves mixture control arm stop to stop. Inspect condition and verify security of mixture control cable clamps on bracket; push and pull cable housing to ensure it does not slip in clamps. Inspect condition and verify security of mixture control cable inner wire attachment to 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 holds mixture control arm at full-rich position if inner wire breaks). \_\_\_\_\_

**Air Box & Alternate Air Door:** Ensure carburetor heat slider valve (if applicable) moves fully from stop to stop. Replace air filter (lubricating IO-540 air filter rubber with A257-8 rubber lubricant will facilitate sealing). Check air box for condition and security. Verify spring-loaded alternate air door opens without binding and closes completely. \_\_\_\_\_

**Engine Air Inlet Hose:** Verify correct installation & security. Verify no rips, holes, or collapsed areas. Ensure hose is not chafing frame. \_\_\_\_\_

**Carburetor Heat Scoop and Hose (O-540 engines only):** Inspect for condition and security. \_\_\_\_\_

**Heater Hose:** Inspect for condition and security. \_\_\_\_\_

**Battery and Battery Box (alternate locations under upper console or under left, front seat):** Check cable terminals for cracks. Check each cell electrolyte for quantity and specific gravity if equipped with non-sealed battery. As required, perform capacity test per manufacturer's instructions or replace battery. Verify security and no obstructions in drain tube. \_\_\_\_\_

**7. Open Cowling Doors (7A), Remove Tailcone Cowling (7B) & Mast Fairing (9)**

**Cowling Door:** Inspect hinges and latches for condition and security. \_\_\_\_\_

**Tailcone cowling:** Verify no cracks, air inlet obstructions, or loose rivets. \_\_\_\_\_

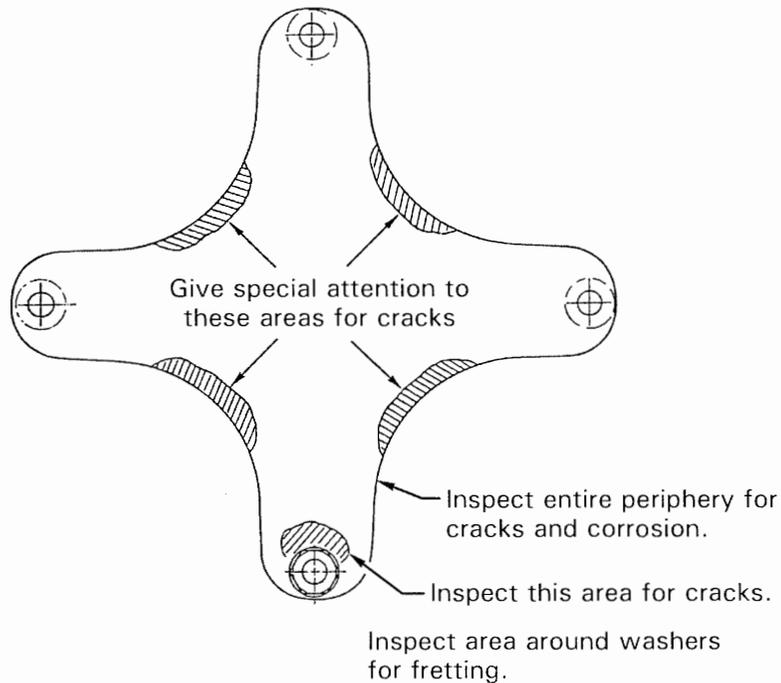
**Electrical and Antenna Wires:** Inspect condition. Verify security and no chafing, kinks or tight bends. \_\_\_\_\_

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

2.410 Inspection Procedures and Checklist (cont'd)

**7. Open Cowling Doors (7A), Remove Tailcone Cowling (7B) & Mast Fairing (9)**  
(cont'd)

**Forward Flex Plate:** Inspect condition, particularly edges. Verify security. Verify bonded washers are securely bonded to both sides of each flex plate arm. Verify operating clearance.



**FIGURE 2-5 FLEX PLATE INSPECTION**

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

**Rotor Brake:** Inspect condition, including activating cable & pulleys 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.

**Jackshaft:** Inspect entire welded assembly for cracks and corrosion. Inspect jackshaft supporting strut and tube weldments for security, cracks and corrosion.

**Main Rotor Push-Pull Tubes:** Inspect condition of viewable portions. Verify no cracks at ends. Inspect rod ends per Section 2.120. Verify no tears in sleeves (manual controls only). Verify security and operating clearances.

**Main Rotor Push-Pull Tube Rollers & Bushings: (manual controls only):** Inspect condition. Verify cleanliness, no wear into metal, and free movement of rollers.

2.410 Inspection Procedures and Checklist (cont'd)

**7. Open Cowling Doors (7A), Remove Tailcone Cowling (7B) & Mast Fairing (9)**  
(cont'd)

**Tail Rotor Push-Pull Tube and Upper Bellcrank:** Inspect C121-15 push-pull tube, especially at ends, for cracks. Check jam nut for tightness and rod end for looseness. Inspect bellcrank and mounting for cracks or other defects.

**Main Rotor Gearbox Cooling Hoses:** Inspect both ends for security. Inspect for rips, holes, and chafing.

**Main Rotor Gearbox:** Inspect main rotor gearbox, especially around gearbox mounts, cap mounting lugs, and mast tube for cracks. Verify no contamination and no deterioration of rubber mounts. Verify security of Hall Effect senders. Check Telatemp for overtemp indications.

**Main Rotor Gearbox Oil:** With ship on level ground, verify correct oil level and cleanliness using sight gage. If required by Section 1.101, drain and flush gearbox per Section 1.120.

**Main Rotor Gearbox Chip Detector:** If required by Section 1.101, clean chip detector per Section 1.115.

**Upper Steel Tube Frame:** Use an inspection light and mirror to inspect each weld, verify no cracks or corrosion.

**CAUTION**

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

**Horizontal Firewall:** Inspect upper and lower surfaces of horizontal firewall, especially where bolted to steel structure, for cracks, buckling, or wrinkles. Inspect firewall under fuel tank for leakage (fuel residue).

**Fuel Tanks:** Inspect condition of visible portion. Verify no leaks. Verify security.

**Auxiliary Fuel Tank Fuel Line:** Inspect condition. Verify clearance to structure. Verify no leakage. Verify security.

**Fuel Return Lines & Pressure Relief Valve (IO-540 only):** Inspect condition. Verify no leakage. Verify security.

**Fuel Gage Senders & Wiring:** Inspect condition. Verify no leaks.

**Fuel Tank Vents:** Check vent tube connections for security.

**Fuel Tank Sump Drains:** Verify both drain valves open easily, drain fuel freely, spring closed, and seal completely. Verify D663-1 shut-off clamp on aux tank drain tube seals completely, and inspect clamp and tube for damage and deterioration.

**Low Fuel Warning:** Turn MASTER switch on. With a clean wooden dowel, gently depress low-fuel sender float in main fuel tank and verify LOW FUEL warning light illuminates. Turn MASTER switch off.

2.410 Inspection Procedures and Checklist (cont'd)

**7. Open Cowling Doors (7A), Remove Tailcone Cowling (7B) & Mast Fairing (9)**  
(cont'd)

**Fuel Caps:** Inspect condition, to include gasket. Verify security when closed. Verify alignment marks on cap and tank align when cap is fully closed.

**Nuts and Bolts:** Inspect all nuts and bolts in this area for movement and looseness.

**Cabin Bulkhead & Forward Hydraulic Servo Mounts:** Inspect bulkhead and servo mounts (if installed) for corrosion, loose rivets, deformation and cracks.

**Clutch Assembly:** Inspect ends of drive shaft and seals on sheave for oil leakage. Inspect shaft for corrosion, especially at shaft-to-seal junctures. Remove any light surface corrosion at shaft-to-seal junctures, and apply a suitable corrosion-inhibitor.

**Upper Sheave:** Inspect sheave grooves. Replace any sheave showing corrosion pitting or flaking of metalized or anodized coatings, wear through anodized coatings, roughness, or sharp ridges.

**Drive V-Belts (see Section 2.507):** Inspect V-belts. Verify no breakage, deterioration of rubber, cuts, fraying, oil, grease, or foreign objects.

**Actuator Fuses & Holders:** Inspect condition. Verify no corrosion. Verify correct fuses (14-volt systems require AGC-3 fuses while 28-volt systems require AGC-1½ fuses). Verify twist-to-lock function and security.

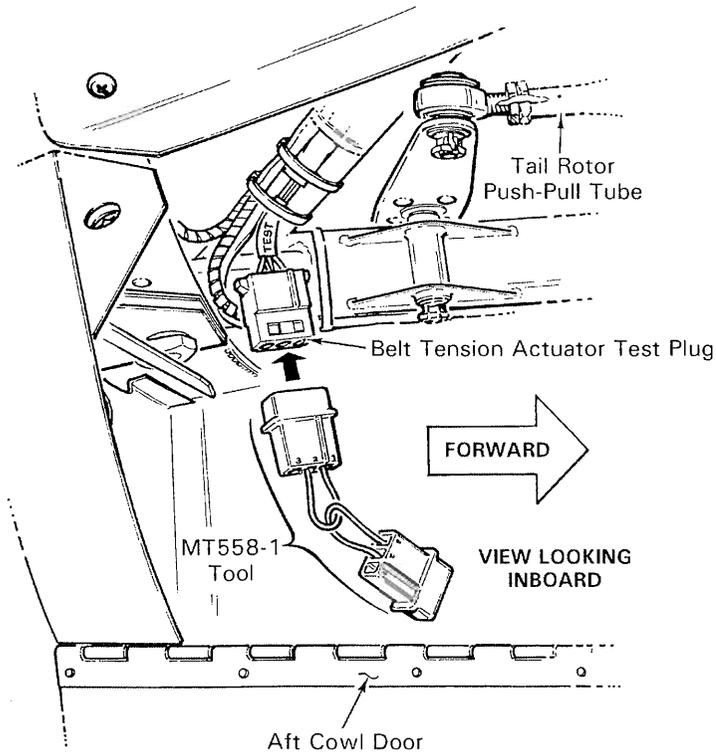
**Actuator Upper Bearing and Strut:** Inspect seals on both sides of bearing for damage. Inspect strut, including both rod ends, and check witness holes. Check for fretting between bearing inner races and clutch shaft. Bearing inner races should be torque striped to clutch shaft. If stripes are broken or misaligned, shaft is unairworthy. Check bearing Telatemp. Perform bearing inspection per Section 2.503 if Telatemp indication has increased without corresponding increase in ambient temperature.

**Actuator Lower Bearing:** Inspect as much of bearing as can be seen. Inspect fiberglass scroll area at bearing attachment brackets for signs of cracking. Check bearing seals for evidence of deterioration. Inspect lower bearing brackets for looseness or wear. Inspect bearing per Section 2.502 if discrepancies are found

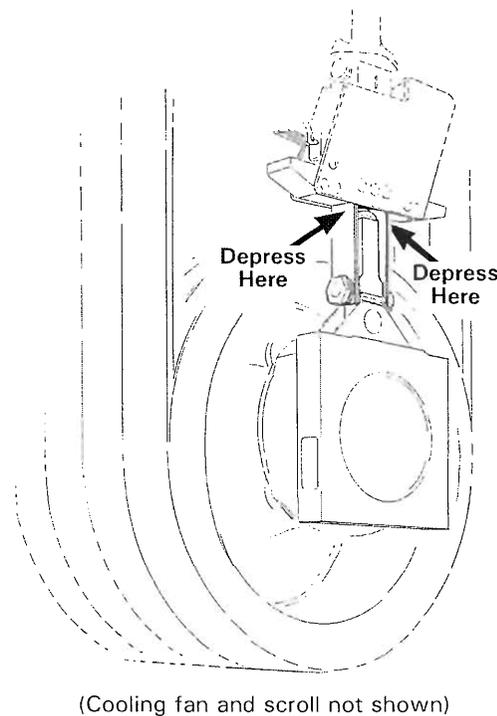
**Intermediate Flex Plate and Forward End of Tail Rotor Drive Shaft (see Figure 2-5):** Inspect flex plate for cracks and fretting. Inspect yoke-to-drive shaft weld for cracks (steel shafts).

**Tailcone Attachment:** Thoroughly inspect all welds in this area for cracks, corrosion, and security of attaching fasteners. Inspect tailcone mounting area for cracks.

2.410 Inspection Procedures and Checklist (cont'd)



**FIGURE 2-6 MT558-1 TOOL INSTALLATION**



**FIGURE 2-6A ACTUATOR SWITCH TEST**

2.410 Inspection Procedures and Checklist (cont'd)

**7. Open Cowling Doors (7A), Remove Tailcone Cowling (7B) & Mast Fairing (9)**  
(cont'd)

**Actuator (C051):** Verify clearance to structure and drive train when fully disengaged. Turn master switch on and engage clutch switch. While actuator is engaging, depress extension limit switch lever (see Figure 7-15) and verify gearmotor stops; release lever and verify gearmotor resumes running. Verify integrity of activating cable for extension limit switch. 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 clearance to structure and drive train when fully engaged. Verify down-limit stop screw jam nut is tight. \_\_\_\_\_

Check actuator for failed-closed spring switch using either of the following two methods: \_\_\_\_\_

**Method 1** - (actuator electrical harness must be equipped with "Test" plug per Figure 2-6)

- a. With MASTER switch on and actuator fully engaged, connect one end of MT558-1 tool to actuator test plug and verify gearmotor remains off. \_\_\_\_\_

<p><b>CAUTION</b></p> <p>If gearmotor activates when installing MT558-1 tool then a spring switch has failed in closed position; immediately remove MT558-1 to prevent actuator damage.</p>
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- b. Disconnect MT558-1 tool, connect opposite end to actuator test plug, and verify gearmotor remains off. \_\_\_\_\_
- c. Disengage clutch and turn MASTER switch off. \_\_\_\_\_
- d. MT558-1 pins 1-2 jumper tests wire 98 spring switch; pins 2-3 jumper tests wire 91 spring switch (see Figure 14-1D). Replace any malfunctioning switch per Section 7.551 before further flight. \_\_\_\_\_

**Method 2** - (actuator electrical harness without "Test" plug)

- a. Refer to Figure 2-6A. With MASTER switch on and actuator fully engaged, depress column springs on one side of actuator until springs snap inward (use large screwdriver or similar tool with several layers of 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 and hold 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. Replace any non-functioning switch per Section 7.551 before further flight. \_\_\_\_\_

2.410 Inspection Procedures and Checklist (cont'd)

**7. Open Cowling Doors (7A), Remove Tailcone Cowling (7B) & Mast Fairing (9)**  
(cont'd)

**Lower Drive Sheave:** Inspect lower sheave. Replace any sheave showing corrosion pitting or flaking of metalized coating, wear grooves, roughness, or sharp ridges.

**Sheave Alignment:** Verify sheave alignment per Section 7.230. Adjust as required.

**Hydraulic Reservoir:** Inspect condition. Verify security and no significant leakage. If required by Section 1.101, replace filter per Section 1.170. Drain and flush hydraulic system per Section 1.180 if oil has turned dark or emits bad odor. Add fluid as required.

**CAUTION**

Cleanliness of hydraulic fluid is vital to proper system operation. Use only clean fluid from sealed containers and avoid contamination from dirty funnels, tubing, etc.

**Hydraulic Reservoir Cooling Hose:** Inspect condition. Verify hose is secure and is directed at center of reservoir cooling fins.

**Hydraulic Pump:** Inspect condition. Pump temperature indication should not exceed gearbox temperature indication. Verify security and no significant leakage.

**Forward Hydraulic Servos:** Inspect condition. Inspect rod ends per Section 2.120. Verify security and no significant leakage. Verify servo input rod end/clevis area is clean; cleanse area with no-residue, non-alcoholic solvent as required. Verify approximately 0.040 inch total freeplay at servo valve input. Verify valve clearance to surrounding structure while flight controls are moved through full range of travel. Inspect condition and verify security of scissors at upper clevis of servos.

**CAUTION**

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

**Aft Hydraulic Servo:** Inspect condition. Inspect rod ends per Section 2.120. Verify security and no significant leakage.. Verify servo input rod end/clevis area is clean; cleanse area with no-residue, non-alcoholic solvent as required. Verify approximately 0.040 inch total freeplay at servo valve input. Verify valve clearance to surrounding structure while flight controls are moved through full range of travel.

**Aft Hydraulic Servo:** Inspect rod ends per Section 2.120. Inspect attachment to sheet metal, verify no cracks. Verify security.

**Hydraulic Lines & Fittings:** Inspect condition. Verify valve clearance to surrounding structure while flight controls are moved through full range of travel. Verify security and no leakage. Verify minimum 0.25 inch clearance between pump hoses and aux fuel tank.

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

2.410 Inspection Criteria (cont'd)

**8. Remove Tailcone Plugs (8A) & Aft Plastic Cover (8B)**

**NOTE**

Aft plastic cover (8B) is secured with two MS27039C0806 screws on Rev L and subsequent tailcones. On Rev K and prior tailcones ensure screws securing plastic cover are short enough to prevent interference in aft flex plate area.

**Tail Rotor Drive Shaft:** Inspect condition of that section of shaft that can be seen through each hole, looking for obvious defects such as cracks, bends, bows in shaft or corrosion or contact with inside of tailcone. Check runout per Section 7.340. Inspect each end of drive shaft for cracks and corrosion.

**CAUTION**

Bends, bowing, dents, cracks and corrosion are cause for immediate replacement of tail rotor drive shaft.

**Damper:** Inspect tail rotor drive shaft damper (C041-1). Inspect bearing and housing for cracks, corrosion, wear (see Figure 2-8), and bearing seal deterioration. Inspect arms and bearings for cleanliness, cracks, bends and corrosion. Inspect bearing's inner race-to-drive shaft torque stripe.

**Tailcone Exterior:** Inspect tailcone exterior for nicks, scratches, corrosion, fretting between skin joints, loose rivets and dents. Inspect tailcone for cracks in vicinity of antenna mounts and battery (if installed on tailcone).

**Strobe Light:** Inspect lens and strobe light mount for cracks, loose rivets, and security. If split red/clear lens is installed, verify clear half of lens faces aft.

**Antennas:** Inspect all antennas for condition and security.

**Tailcone Battery (if installed):** Inspect tailcone-mounted battery condition and security. Verify no debris between battery box cover and tailcone.

**Tailcone Interior:** Inspect tailcone interior, especially around rivets, for cracks, fretting, and corrosion.

**Tailcone Attachment:** Inspect condition and security of four bolts attaching tailcone to upper frame.

**Empennage:** Inspect entire empennage and attachment points for damage, cracks, and loose fasteners. Check tail skid for evidence of tail strike. If evidence of tail strike is found, refer to special inspection section.

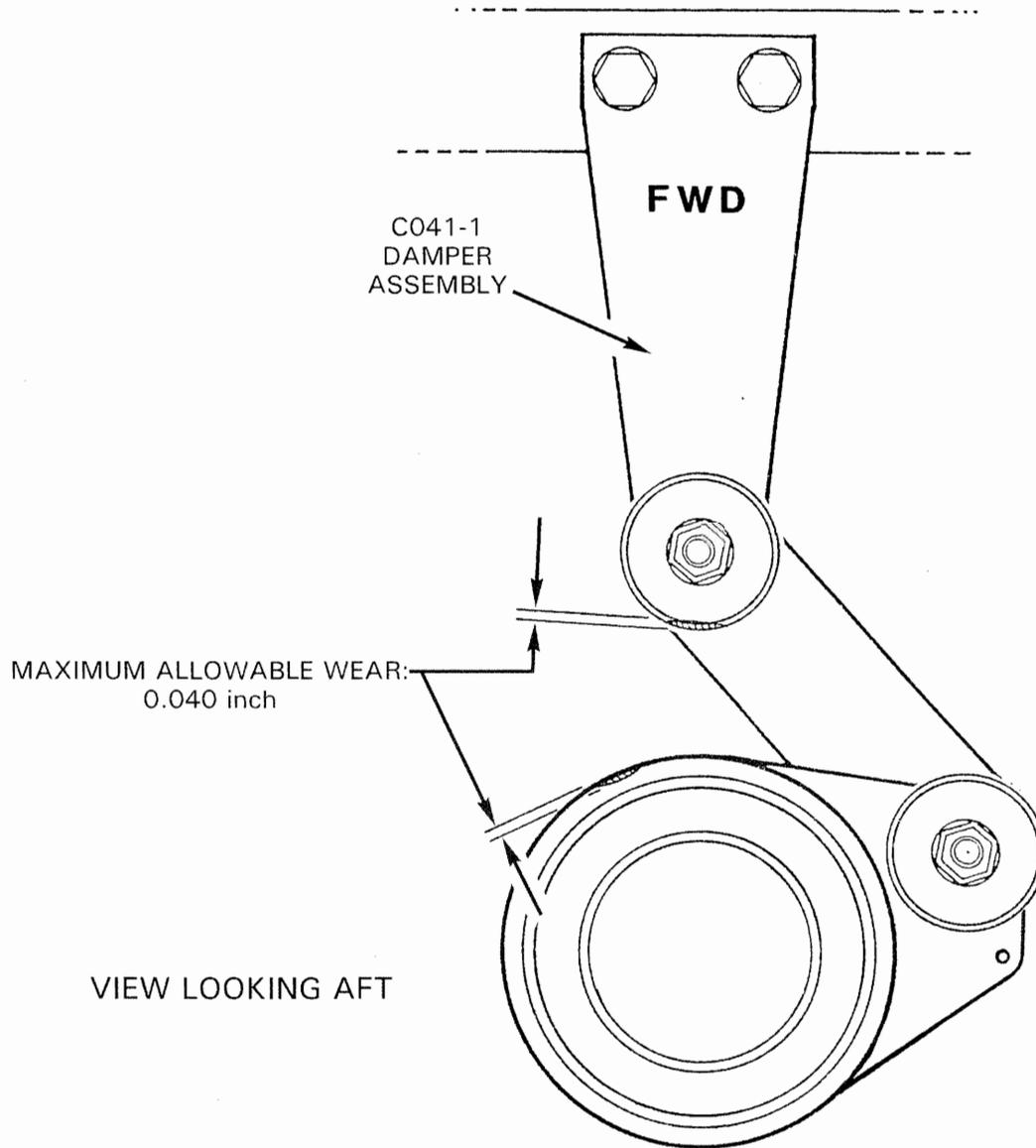
**Float Stabilizer (if installed):** Inspect condition and security.

**Aft Flex Plate (See Figure 2-5):** Inspect flex plate for cracks, fretting, and distortion. If fretting is detected, contact RHC Technical Support. Inspect security of flex plate fasteners.

**Tail Rotor Drive Shaft Aft Yoke:** Using inspection hole, check yoke for cracks, fretting, and corrosion.

**Tail Rotor Guard:** Inspect for security. Check forward mount for cracks around welded area. Inspect area around aft mount for cracking and fretting.

2.410 Inspection Criteria (cont'd)



**FIGURE 2-8 TAIL ROTOR DRIVE SHAFT DAMPER BEARING INSPECTION**

2.410 Inspection Criteria (cont'd)

**9. Tail Rotor Gearbox and Tail Rotor**

**Input Shaft Yoke:** Inspect flange and weld for cracks and corrosion.

**Input Seal:** Inspect for leakage.

**Gearbox:** Inspect general condition. Look for leakage. Check oil quantity and cleanliness through sight gage and adjust or flush as required. Check gearbox-to-tailcone mounting security. Inspect output shaft for nicks, scratches and corrosion. Check safety wire on applicable gearbox bolts. Check Telatemp.

**NOTE**

At 500 hours time-in-service or annually, whichever occurs first, remove chip detector and clean varnish from detector's magnetic probe and adjacent metal body (a toothbrush dampened with solvent works well). Also, drain and flush gearboxes at intervals not to exceed 500 hours time-in-service (ref Section 1.101).

**Pitch Control Assembly and C121-17 Push-Pull Tube:** Check pitch control assembly for free movement throughout its entire range and for looseness on output shaft (0.25 inch maximum rotational play measured at pitch link attach bolt). Inspect bellcrank for cracks and ensure free movement. Pay special attention to spherical bearing atop stud protruding from underside of pitch control; it is permissible to have a single radial crack in the spherical bearing ball. Inspect aft end of C121-17 push-pull tube for cracks and check rod end for excessive looseness (Ref R44 SB 43A).

**Pitch Links:** Check rod ends for excessive looseness. If equipped with one-piece pitch links, disconnect and rotate inboard end outboard as required to obtain maximum service life.

**Tail Rotor Blades:** Inspect blade surfaces for excessive erosion, nicks, scratches, cracks, or corrosion. Check tail rotor blade root fitting bearings for fretting and looseness. Loose bearing outer race in root fitting is unairworthy, requiring replacement of blade. C029-1 blades only: remove tip covers, inspect for debris and corrosion, & reinstall covers.

**Hub Plates and Hub:** Inspect for cracks and corrosion, paying special attention to areas around blade and hub mounting bolts. Ensure teeter hinge bearing outer races move with hub and bearing inner balls and retaining nut and bolt remain stationary when hub is teetered. Hub should move freely on bearings without stiffness or jerkiness. Check teeter hinge bearings for excessive play. For elastomeric bearings inspect per Section 2.125.

**Fasteners and 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)

**10. Open Mast Fairing (9)**

**Mast Fairing:** Inspect condition, especially where stiffeners intersect ribs. \_\_\_\_\_

**Lower Swashplate Scissors:** Inspect condition of scissors. Check rod end and bearing play. Check jam nut. \_\_\_\_\_

**Vertical Push-Pull Tubes:** Inspect for general condition and corrosion. For manual controls, inspect push-pull tube sleeves at rollers and guide. \_\_\_\_\_

**Rod Ends:** Check push-pull tube rod ends per Section 2.120. \_\_\_\_\_

**Plastic Rollers and Guide (manual controls):** Inspect plastic rollers and guide for cleanliness, security, and deterioration. \_\_\_\_\_

**Pitot Tube:** Inspect pitot line and tube, giving special attention to connecting area, for bending, cracking and kinking. Verify pitot tube elbow drain hole is unobstructed. \_\_\_\_\_

**Fuel Tank Vents:** Inspect condition and security of fuel tank vent tube clamps. Ensure pitot line is not chafing fuel vent tubes. Check tube connections. Verify tubes are unobstructed and are not kinked, pinched, or chafing. \_\_\_\_\_

**Mast Fairing Ribs:** Inspect for cracks especially around mast tube attachments. \_\_\_\_\_

**11. Rotor Hub Area**

**Swashplate Lower Scissors:** Inspect condition. Inspect rod ends per Section 2.120. Verify security. \_\_\_\_\_

**Swashplate Upper Scissors:** Inspect condition. Inspect rod ends and spherical bearings per Section 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 Slider Tube:** Inspect condition. Verify no cracks at rivet holes or corrosion on base. Verify no damage to, or wear through, anodized tube surface. \_\_\_\_\_

**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 Section 8.416. \_\_\_\_\_

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

2.410 Inspection Procedures and Checklist (cont'd)

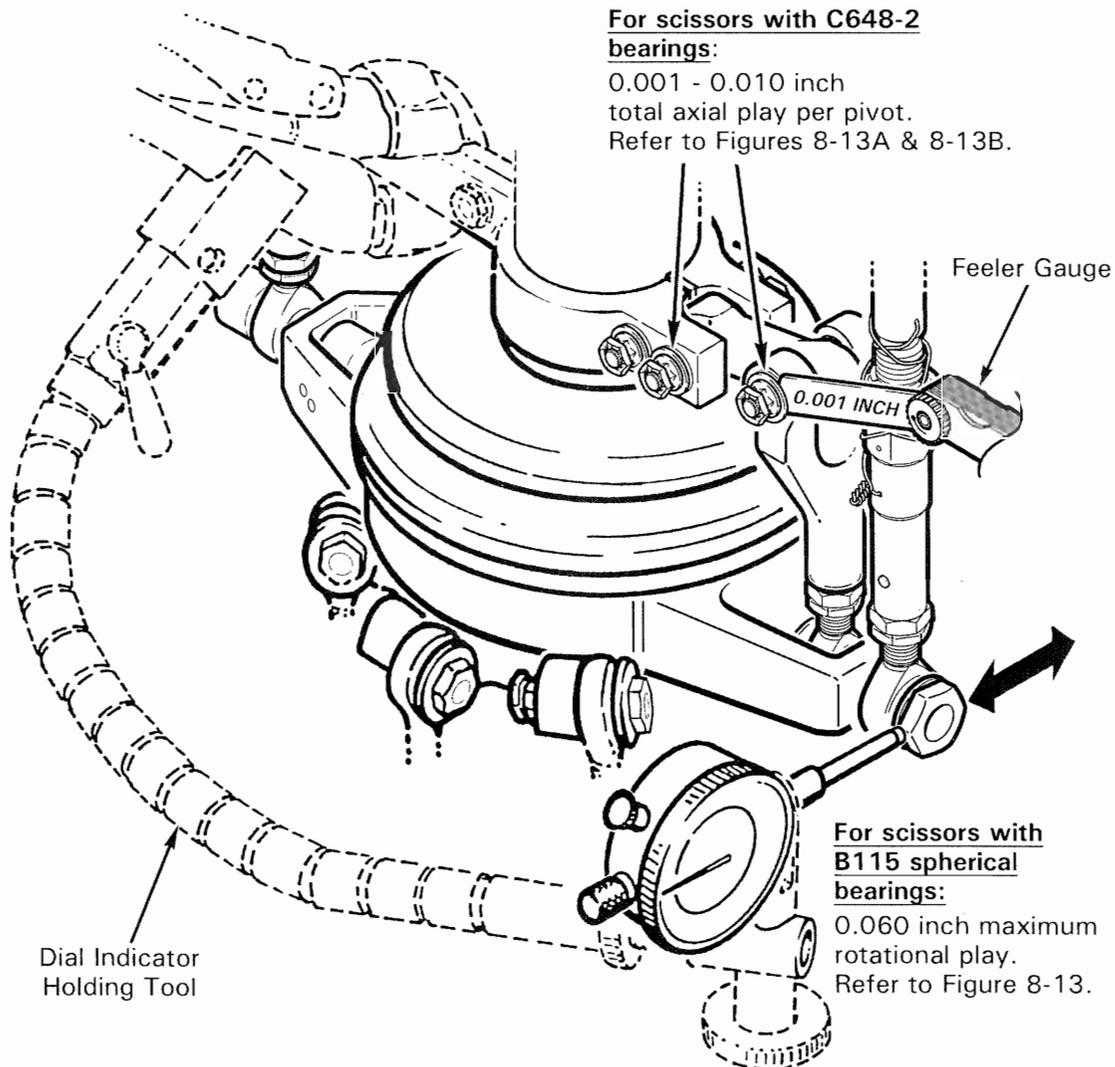
11. Rotor Hub Area (cont'd)

**Hub:** Inspect condition. Verify no nicks, scratches, gouges, or corrosion. If main rotor imbalance is suspected, check teeter and coning hinge friction per Section 9.124 a) 5). Verify no brown or black residue (indicates bearing wear).

**Hinge Bolts:** Inspect condition. 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 Section 2.120, including centering. Verify security, including jamnut tightness and proper safety wiring.

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



**FIGURE 2-9 MEASURING UPPER SWASHPLATE ROTATIONAL PLAY**  
 (Identify scissors bearing type and measure as shown)

2.410 Inspection Procedures and Checklist (cont'd)

**12. Main Rotor Blades** (Refer to Section 9.130 for damage and repair limits)

**CAUTION**

Main rotor blade skins can be dented; exercise care when working on or around blades.

**Spindles:** Inspect visible portion. Verify no corrosion. \_\_\_\_\_

**Boots:** Inspect condition. Verify security and no oil leakage. Verify clearance between boots and main rotor hub at full-up and full-down collective at cyclic travel extremes. \_\_\_\_\_

**Nicks, Scratches, Buckling, and Dents:** Verify no nicks, scratches, or buckling. Verify any dents are within limits. \_\_\_\_\_

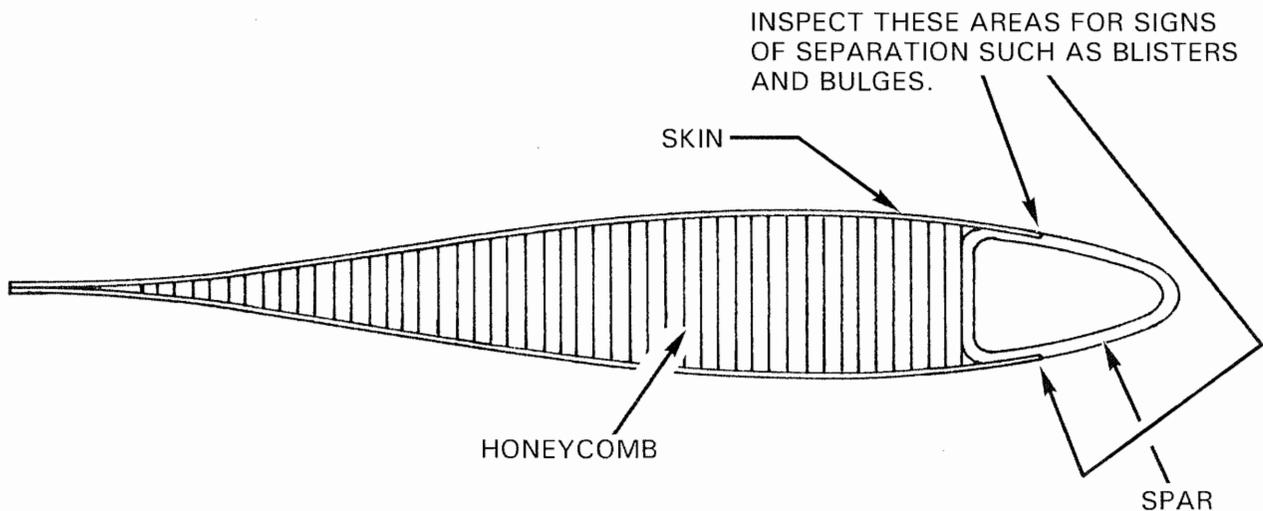
**Adhesive-Bonded Areas:** Refer to Figures 9-9 & 9-9B. Using a 1965-or-later U.S. quarter-dollar coin, tap-test all critical bond areas and verify no dull or hollow sounds. Visually inspect bond areas and verify no separation. Refer to section 9.130.h. for void limits. \_\_\_\_\_

**Skin-to-spar bond line:** Using 5x-10x magnification, visually inspect skin-to-spar bonded areas. Verify no separation and no cracks in paint along skin-to-spar bond line. Refinish any exposed (bare metal) bond line in accordance with R44 Service Letter SL-32. \_\_\_\_\_

**Remove tip covers:** Verify no corrosion or foreign material in blade tips or on tip covers. Refer to Figure 9-9. Using a 1965-or-later U.S. quarter-dollar coin, tap-test skin-to-tip cap bond areas and verify no dull or hollow sounds. Using 5x-10x magnification, visually inspect edge of skin-to-tip cap bonded areas (see Figure 9-9) and verify no separation. Epoxy prime, or prime and paint, any exposed bare metal which may contact installed tip cover. 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.



**FIGURE 2-10 MAIN ROTOR BLADE SKIN-TO-SPAR INSPECTION**

2.410 Inspection Criteria (cont'd)

**12. Main Rotor Blades** (Refer to Section 9.130 for damage and repair limits) (cont'd)

**Install tip covers:** Verify security. \_\_\_\_\_

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

**13. Scroll Area**

**Fanwheel Assembly:** Clean and inspect fanwheel assembly for cracks and corrosion. Check leading edge of vanes for damage. Verify spring pin and fanwheel alignment marks are aligned (see Figure 2-11); remove fanwheel and inspect mating surfaces for damage if misalignment is evident. \_\_\_\_\_

**Fiberglass Scroll:** Inspect fiberglass scroll for cracks and contact marks from fanwheel. Inspect flexible seal around scroll inlet for any rips or damage. Inspect vane assembly in right upper scroll for damage. Verify drain hole is unobstructed. \_\_\_\_\_

**Scroll Metal Inlet Lips & Gap:** Verify 0.030 / 0.090 inch gap between lips and fanwheel inlet (elongate lip attach holes as required to adjust gap). \_\_\_\_\_

**14. Engine**

Refer to Section 1.101. Refer to Lycoming Operator's Manual (P/N 60297-10 sections 4 and 5), Lycoming SI 1080B, and applicable engine component manufacturer's maintenance publications for 100-hour or annual inspection and service procedure. \_\_\_\_\_

**Engine Cooling Panels:** Inspect condition. Pay particular attention to panel(s) mounting oil cooler(s) and panel attached to alternator cooling hose. Verify no cracks or missing or loose fasteners. Verify security. \_\_\_\_\_

**Alternator & Pulley:** Inspect condition. Verify steel pulley (use magnet); aluminum pulley is not approved. Verify security. Verify electrical wiring security. \_\_\_\_\_

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

**Emergency Spare Alternator Belt:** Remove if installed. \_\_\_\_\_

**Alternator Cooling Hose:** Inspect condition. Verify no obstructions or holes. Verify security. \_\_\_\_\_

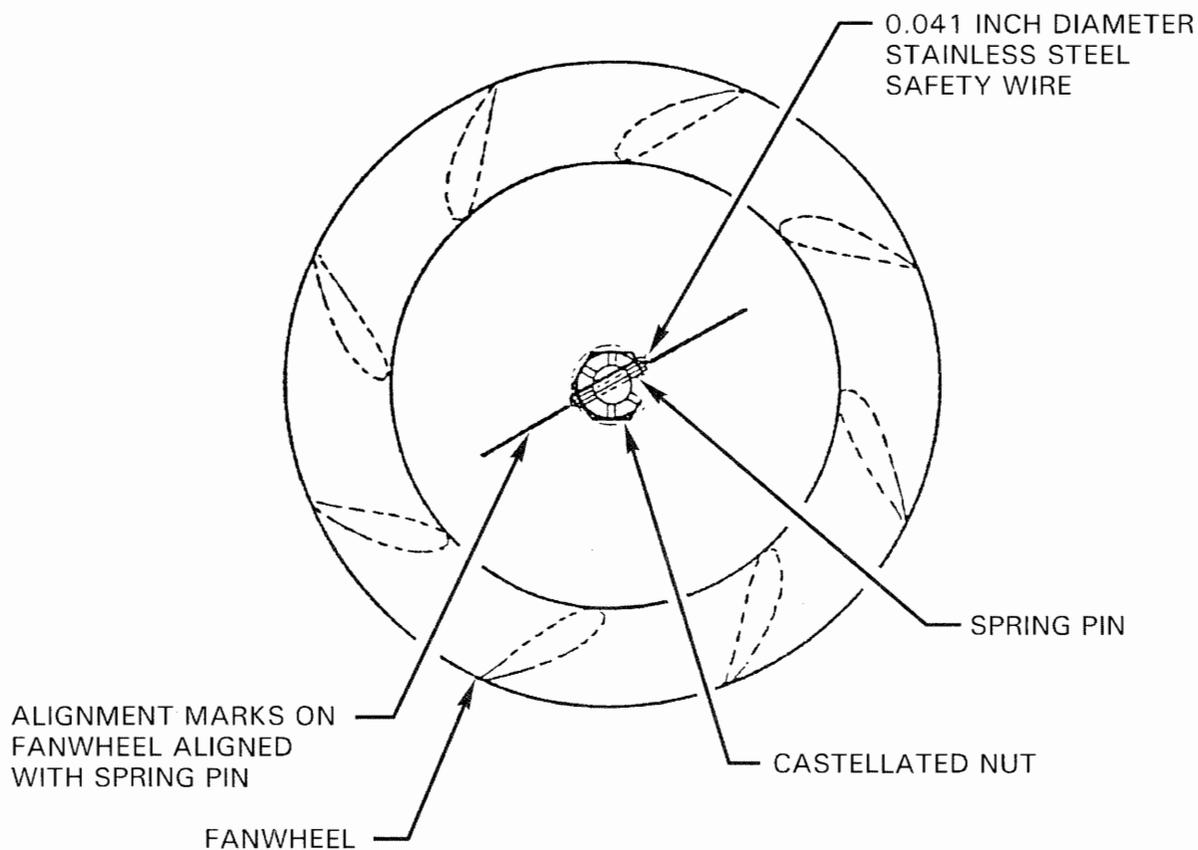
**Air Conditioning Refrigerant Lines (if installed):** Verify security, no damage, and clearance to adjacent structure. Verify dust caps installed on servicing fittings at vertical firewall. \_\_\_\_\_

**Air Conditioning Compressor (if installed):** Verify security. \_\_\_\_\_

**Air Conditioning Compressor Drive Belt (if installed):** Inspect condition. Verify 4.5/5.5 pounds force applied at mid-span of belt causes 0.11/0.17 inch belt deflection; adjust as required. \_\_\_\_\_

**Muffler Elbow & Tailpipe Shields:** Verify no cracks in shields and shield attaching brackets. Verify clamp security. \_\_\_\_\_

2.410 Inspection Criteria (cont'd)



**FIGURE 2-11 FANWHEEL ALIGNMENT MARKS**

2.410 Inspection Procedures and Checklist (cont'd)

**15. Exhaust System**

Remove muffler heater shroud screws, and open shroud. Inspect muffler outer wall for cracks, deformation, and ruptures. Pay particular attention to tailpipe and riser attachment areas, welds, clamps, supports, riser flanges and gaskets. Pressurize muffler with low pressure air and inspect for leakage. Close and secure heater shroud.

**16. Landing Gear**

**Skids and Shoes:** Inspect left and right landing gear skids and skid shoes; minimum allowable shoe thickness is 0.05 inch. Verify drain holes are open (not applicable to float landing gear).

**Struts and Elbows (open fairings if installed):** Inspect for cracks and corrosion, especially at elbow joints. Inspect weld area at bottom of strut for cracks.

**Landing Gear Fairings (if installed):** Inspect for cracks and loose rivets. Verify security.

**Crosstubes:** Inspect, especially at elbow joints, for cracks and corrosion. With helicopter on level ground, measure distance from ground to tail skid. If dimension is less than 30 inches, one or both cross tubes must be replaced (see Section 5).

**Landing Gear Attach Points:** Check forward attach points for loose rivets, cracks, buckling, and fretting. Check bearing mounts for loose swages and worn bearings.

**Utility Floats (if installed):** Inspect for damage. Refer to Pilot's Operating Handbook for proper inflation pressure.

**Pop-out Floats (if installed) Pressure Cylinder & Valve:** Inspect condition. Verify security. Verify pressure gage indicates correct pressure for ambient temperature; refer to placard on cylinder for limits.

**Pop-out Floats (if installed) Inflation Manifold:** Inspect condition. Verify no chafing or pinching of hoses, especially where hoses pass thru structure.

**Pop-out Floats (if installed):** Inspect condition of stowed floats. Verify no holes, cuts, tears, abrasion thru, or unraveling of, float covers. If cover damage is found, inflate and inspect floats. Verify all float cover snaps and hook-and-loop fasteners are properly secured. Verify float-to-skid attachment security.

**NOTE**

Annually apply A257-7 dry-film lubricant (see Section 1.470) to float cover snap mating surfaces. Annually perform Section 5.630 leak check. Every three years, perform Section 5.640 emergency inflation test.

2.410 Inspection Procedures and Checklist (cont'd)

**17. Cabin**

Verify no loose equipment that might foul controls. \_\_\_\_\_

**Static Ports:** Inspect static ports for obstructions. If fixed utility floats are installed, verify air dam installed aft of both static ports. \_\_\_\_\_

**Rear Seat-Bottom Suspension Straps:** Inspect condition and security. \_\_\_\_\_

**Seat Belts and Shoulder Harnesses:** Inspect for fraying and broken stitching. Check inertia reels for proper operation by pulling harness quickly to verify locking function. Check buckles for proper operation. Check belt and reel attach points for security. \_\_\_\_\_

**NOTE**

TSO tag not required on factory installed harnesses.

**Trim Controller (Manual flight controls only) :** Adjust trim controller per Section 14.710. \_\_\_\_\_

**Windows:** Minor damage that does not impair pilot's visibility or indicate impending structural failure is acceptable. For cracks and crazing adjacent to windshield retainer strips, refer to Section 2.580. \_\_\_\_\_

Acceptable damage includes:

- a. One nick, not more than 0.010 inch deep and occupying an area not larger than 0.25 by 0.50 inch per square foot. \_\_\_\_\_
- b. Scratches not more than 0.010 inch deep and 5 inches long. \_\_\_\_\_
- c. Any surface defect such as small spots or stains that can be removed with light polishing. \_\_\_\_\_
- d. Minor polarization faults in small areas of windshield near edges. \_\_\_\_\_

**Skin:** Inspect skin for damage. Inspect for loose rivets, indicated by cracked paint and/or black residue around heads. \_\_\_\_\_

**Doors:** Inspect for cracks around hinges and latches. Check vents for operation. Ensure hinge pins are secured with cotter pins. Check tightness of hinge mounting screws. Verify proper operation of door latching and locking mechanisms. \_\_\_\_\_

**Chin Drains (R44 Clipper):** Verify no obstructions. \_\_\_\_\_

**18. Special Equipment (if installed)**

**Peak Beam Searchlight:** Check for proper operation. Align beams by focusing both lights to smallest spot possible and shining against a wall at least 100 feet away. Verify both spots hit same point within one foot. \_\_\_\_\_

**Nose Gimbal and Monitors:** Turn power on and verify infrared units complete cool down sequence in manufacturer's recommended time. Verify gimbal steers smoothly in azimuth and elevation. Check focus and zoom of infrared/video. Check for clear images on monitors. Verify retractable monitor retracts without interference. \_\_\_\_\_

2.410 Inspection Procedures and Checklist (cont'd)

**18. Special Equipment (if installed)**

**Spectrolab Searchlight:** Verify light starts and cooling fan operates. Verify searchlight steers smoothly in azimuth and elevation. For slaved units, turn on slaving and verify light follows nose gimbal approximately. \_\_\_\_\_

**FM Radios:** Verify radios transmit and receive properly and control head programs radios properly. \_\_\_\_\_

**Video Tape Recorder:** Verify all video tape recorder modes operate properly and remote control correctly controls modes. \_\_\_\_\_

**Overhead Light:** Verify overhead light on/off. \_\_\_\_\_

**Transmit and Intercom Switches:** Verify proper operation of special transmit and intercom switches. \_\_\_\_\_

**Talent Light:** Verify talent light on/off, acceptable friction. \_\_\_\_\_

**Micro Cameras:** Verify all micro cameras are selectable from video switcher and produce focused, upright images on monitors. \_\_\_\_\_

**TV Tuner:** Verify TV tuner receives broadcasts (video clear on monitors, audio clear in headset). \_\_\_\_\_

**Microwave Antenna:** Verify omnidirectional microwave antenna extends/retracts properly. Verify up/down indicator lights function properly. \_\_\_\_\_

**Electromagnetic and Radio Frequency Interference:** With all special equipment turned on, check for EMI/RFI with tach, COM, intercom, compass, or other systems. \_\_\_\_\_

**19. Life-limited Parts, Airworthiness Directives, & Service Bulletins**

**Life-Limited Parts:** Verify S/Ns of installed parts correspond with those listed in maintenance records and all installed parts have adequate service lives remaining. \_\_\_\_\_

**Airworthiness Directives:** Check status of applicable airframe, engine, and accessory Airworthiness Directives, including compliance method. Some aircraft may have Airworthiness Directives which require recurring inspections at less than 100-hour or annual intervals. Recent U.S. Airworthiness Directives may be accessed on the internet at:  
<http://www1.faa.gov/certification/aircraft/> \_\_\_\_\_

**Service Bulletins:** Check status of applicable airframe, engine, and accessory Service Bulletins, including compliance method. Some aircraft may have Service Bulletins, which require recurring inspections at less than 100-hour or annual intervals. Recent RHC Service Bulletins can be accessed via the internet at:  
[www.robinsonheli.com/support.htm](http://www.robinsonheli.com/support.htm) \_\_\_\_\_

**20. 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:** Insure all required placards are installed, legible, and current; refer to Section 2 of Pilot's Operating Handbook for placard requirements. \_\_\_\_\_

2.410 Inspection Procedures and Checklist (cont'd)

**20. Inspection and Access Covers**

**Foreign Objects Removed:** Verify all tools, loose hardware, rags, and other foreign objects are removed from aircraft. \_\_\_\_\_

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

**Clipper I Airbox Sealed:** Ensure air box cover perimeter is sealed with aluminum tape (Clipper I models only). \_\_\_\_\_

**21. Maintenance Records**

**Maintenance Records:** Ensure maintenance records are current and correct. Enter maintenance (such as part replacement, adjustments, oil change, bearing lubrication) and inspection data. Data must include a description of, or reference to, work performed, date, aircraft total time-in-service, signature, and certificate number of person approving return to service. \_\_\_\_\_

## 2.500 SPECIAL INSPECTIONS

### 2.501 Upper and Lower Clutch Actuator Bearings Inspection

The actuator upper bearing is located on the clutch shaft, and the actuator lower bearing is located on the fanshaft. Failure of either actuator bearing in flight could cause loss of power to rotor system and result in a serious accident. Refer to Section 2.110 for general indications of bearing failure. In addition, just before failure of an actuator bearing, the clutch light may flicker (on and off in less than one second) constantly or illuminate for longer than normal in-flight retensioning time of up to 8 seconds, then off). Flight should not be resumed until cause of abnormal clutch light illumination has been determined.

Perform the following bearing inspections whenever an actuator bearing discrepancy is suspected or fanwheel is removed:

### 2.502 C181 Lower Bearing Inspection

1. Remove scroll and fanwheel per Section 6.210.
2. Support clutch drive shaft aft of sheave. Disconnect lower end of belt tension actuator from bearing housing.
3. Rotate bearing housing with finger tips. Verify no roughness, scraping or excessive looseness (0.010 inch maximum axial play). Verify no seal damage and no heat damage. Lubricate bearing per Section 1.140.
4. Carefully inspect inner race bearings on fanshaft. Forward bearing inner race is torque-striped to fanshaft two places 180 degrees apart; cracked or broken torque stripes indicate movement. No movement or fretting is allowed between inner race and fanshaft. Verify no distortion due to bearing outer races rotating in housing. Replace fanshaft & bearing assembly if indications of movement are noted.
5. Reinstall fanwheel per Section 6.220.
6. Check and adjust fanwheel dynamic balance per Section 6.240.

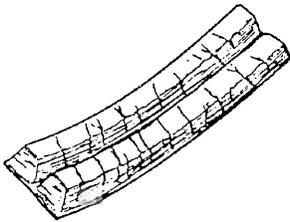
**2.503 C184 Upper Bearing Inspection**

1. Disconnect lateral centering strut from left side of bearing housing.
2. Disconnect bearing housing from actuator. Run actuator to its full disengage position by adjusting actuator down-limit screw upward. Refer to Figure 7-15. Do not allow upper and lower scissors' attaching screw heads to contact each other.
3. Rotate bearing housing and check for sound or feel of any roughness, scraping, or excessive looseness. Verify no seal damage, loss of lubricant or heat damage.
4. Carefully inspect inner races of bearings on clutch shaft. Aft bearing inner race is torque-striped to clutch shaft two places 180 degrees apart; cracked or broken torque stripes indicate movement. Verify no fretting between bearing inner races and shaft. Verify no distortion due to bearing outer race(s) rotating in bearing housing. Remove bearings and inspect bearing and shaft if indications of movement are noted.
5. Connect centering strut and actuator to bearing housing. Adjust actuator down-limit stop screw so there is a delay of less than 5 seconds between clutch engagement and rotor turning during start-up.

2.507 V-Belt Inspection

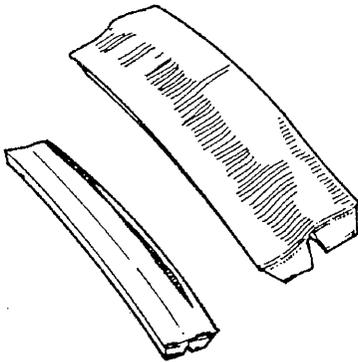
If any of the following conditions are observed, replace V-Belts in a matched set per Section 7.280.

1. Bottom of belts cracking.



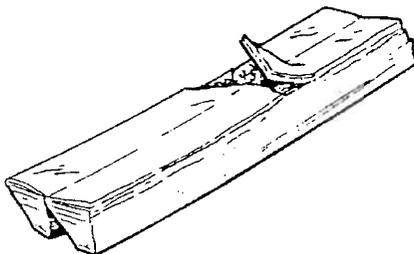
CAUSE	REMEDY
Belt slipping causing heat build-up and gradual hardening of undercord.	Return actuator to RHC for servicing.

2. Top of tie band frayed or damaged.



CAUSE	REMEDY
Surrounding structure interfering with normal operation of belt.	Reposition affected sheave for proper clearance and align sheaves per Section 7.230.
Foreign material contacting belt.	Remove foreign material

3. Top of tie band blistered or perforated.

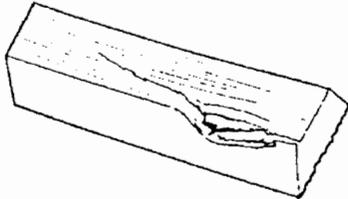


CAUSE	REMEDY
Foreign material accumulating between belts.	Check for and remove foreign material.

FIGURE 2-12 V-BELT DISCREPANCIES

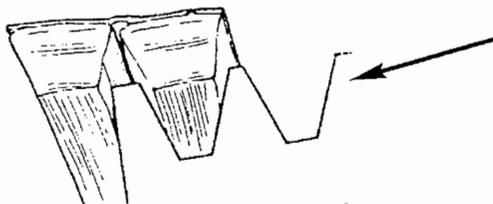
2.507 V-Belt Inspection (cont'd)

4. BELT CUT ON BOTTOM



<u>Cause</u>	<u>Remedy</u>
Belt ran over sheave and came off, or belt forced over sheave flange during installation without proper slack.	Check belt tension per Section 7.283 and upper sheave alignment per Section 7.230.
Foreign material fell into belt drive making belt come off.	Remove foreign material if any. Install new belts properly per Section 7.280

5. BELT RIDING OUTSIDE SHEAVE GROOVE



V-belt has jumped one groove forcing belt out of sheave.

**CAUTION**

If belt condition shown is allowed to run in specified condition, failure would progress as shown below.



<u>Cause</u>	<u>Remedy</u>
One belt separated from tie band	Both belts separated from tie band



<u>Cause</u>	<u>Remedy</u>
Improper belt tension, misalignment of sheaves and/or foreign object struck belt forcing it from its normal path.	Replace V-belts per Section 7.280; align upper sheave per Section 7.230.

FIGURE 2-12A V-BELT DISCREPANCIES

2.508 Lower Sheave V-Belt Wear Pattern Inspection

Observe wear patterns in paint primer in all eight grooves of lower V-belt sheave. Wear patterns on both sides of all eight grooves should appear very similar. Wear patterns which vary in width less than a 3-to-1 ratio groove to groove are acceptable.

If wear pattern is noticeably different from groove to groove, inspect sheave grooves for roughness or excessive wear and replace V-belts per Section 7.280. If wear patterns are all similar and alignment and condition of belts and sheaves are satisfactory, no further action is required.

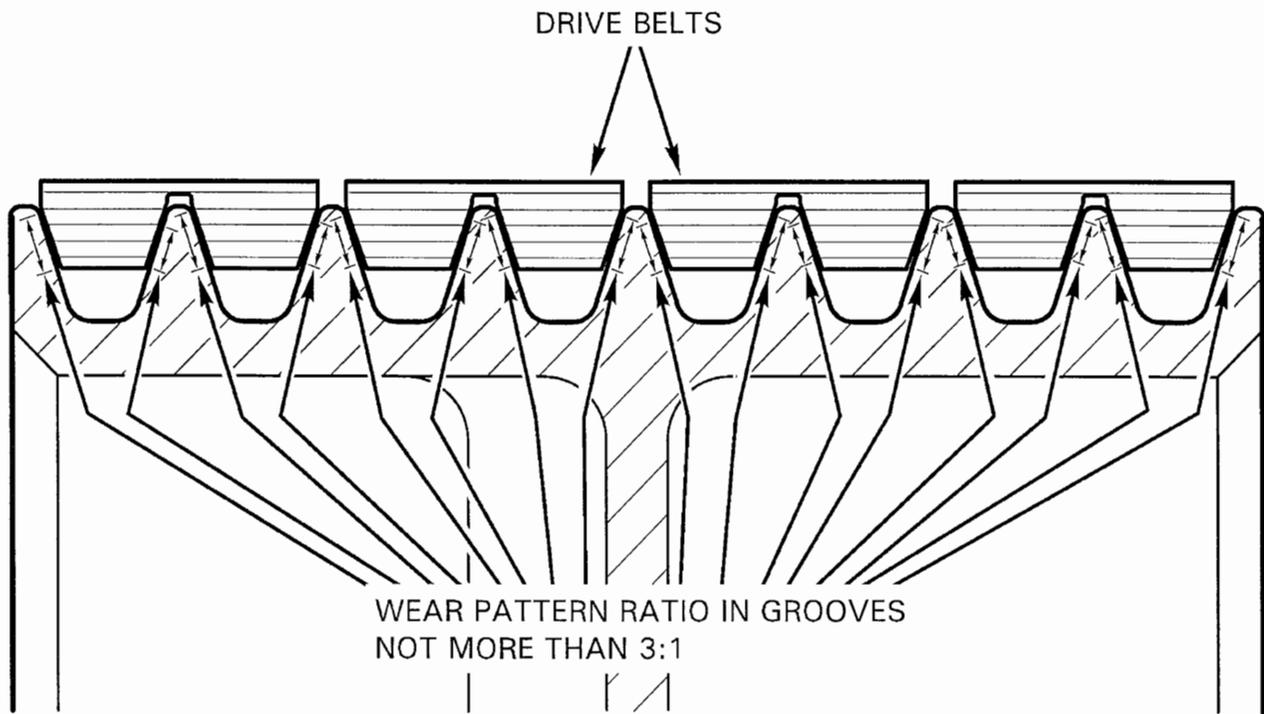


FIGURE 2-13 LOWER SHEAVE V-BELT WEAR PATTERN

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2.510 Tail Skid Strike

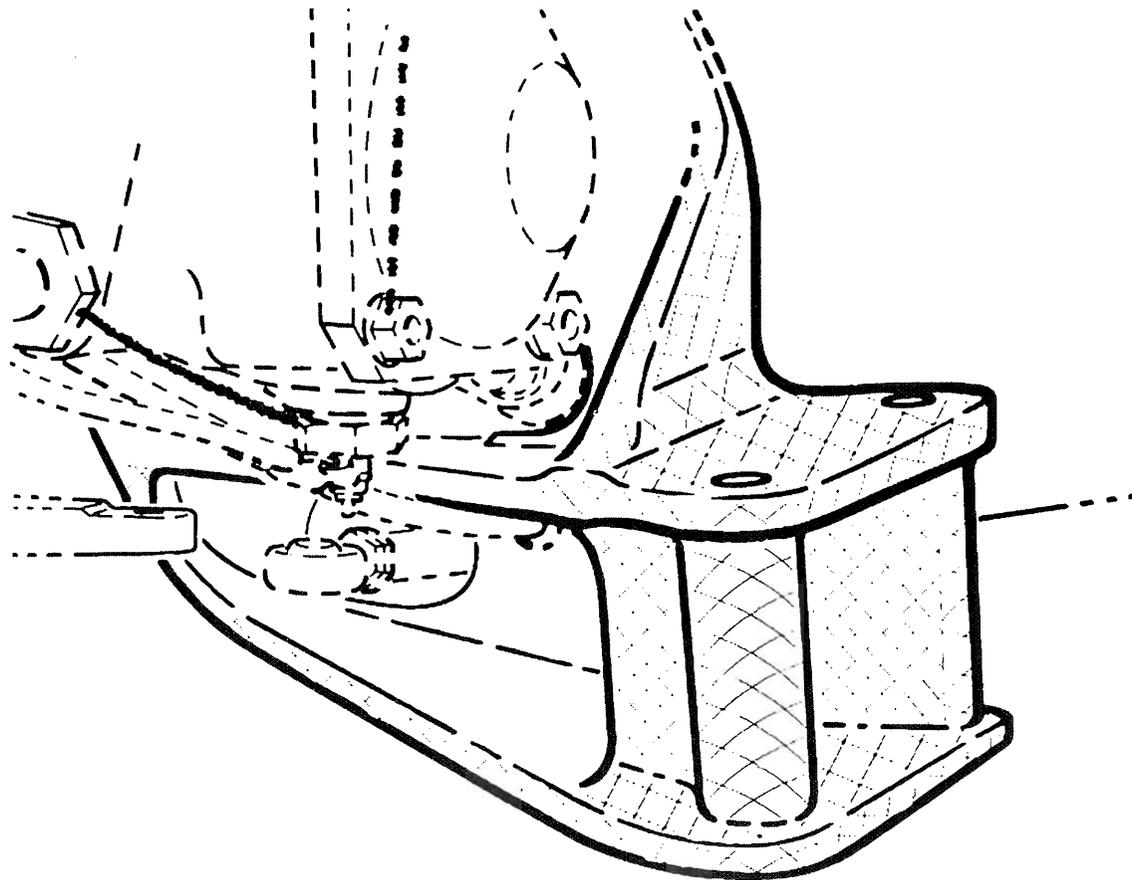
The tail skid strike inspection is listed in two parts, A and B. Part A concerns scuffing of tail skid. Part B is concerned with bending or breaking of tail skid and/or buckling of lower vertical stabilizer.

A. If evidence of scuffing is found on the tail skid, inspect the rotorcraft as follows:

- 1. Visually inspect tail rotor blades for evidence of solid object or ground contact. If tail rotor damage is found, inspect tail rotor per Section 2.520. \_\_\_\_\_
- 2. Visually inspect vertical stabilizer for evidence of buckling, cracks or loose rivets at tail skid and lower vertical to horizontal stabilizer attach points. \_\_\_\_\_
- 3. Visually inspect tail rotor guard for bending or cracking at attach mounts. \_\_\_\_\_
- 4. Visually inspect the horizontal stabilizer to tailcone attach points for evidence of buckling, loose rivets or cracking. \_\_\_\_\_
- 5. Visually inspect tailcone for damage and tailcone to upper steel tube structure attach points for buckling and loose attach bolts. \_\_\_\_\_

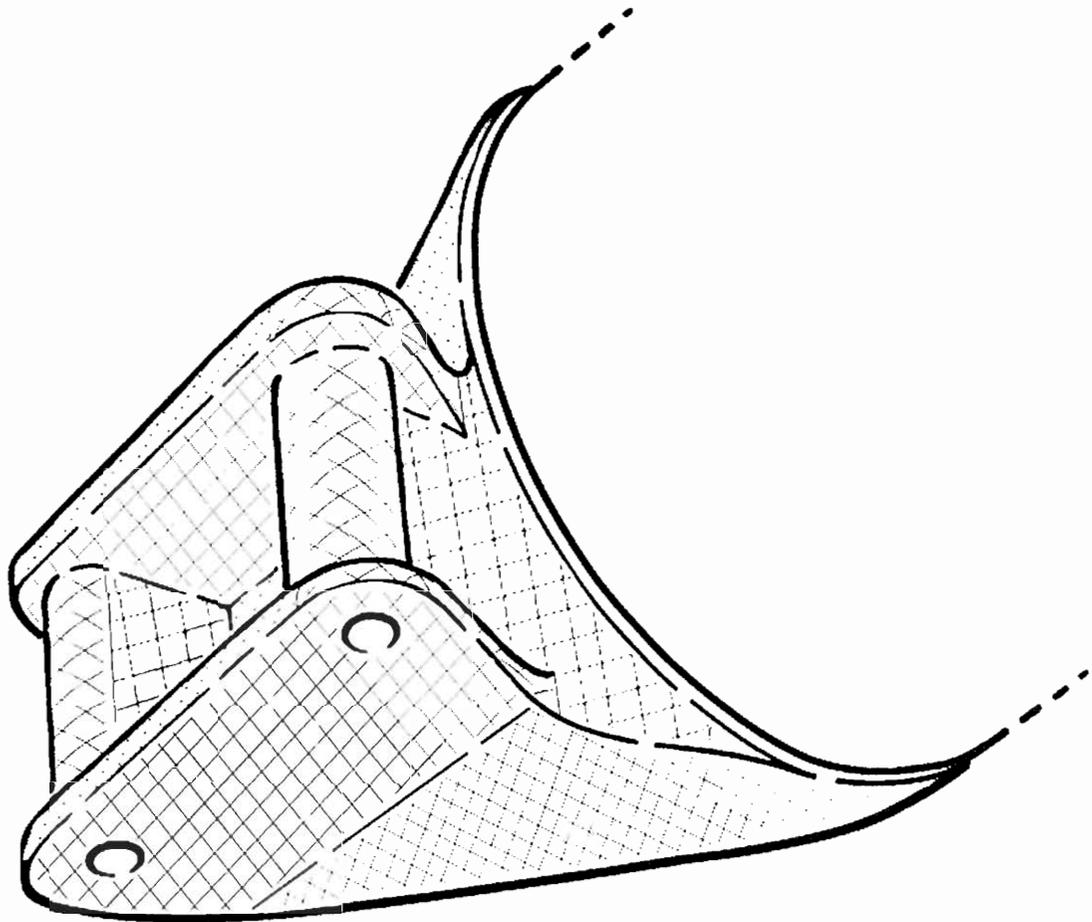
B. For skid bending or breakage, or buckling of lower vertical stabilizer, perform the following inspections in addition to those listed in Step A.

- 1. Inspect tail rotor drive shaft run-out per Section 7.340. \_\_\_\_\_
- 2. Remove tailcone and dye check C020 upper steel tube structure at tailcone attach points per Section 2.560. \_\_\_\_\_
- 3 Visually inspect tailcone attachment points for elongated holes (0.454 inch-diameter maximum.) \_\_\_\_\_
- 4. Remove the stabilizer assembly and dye penetrant inspect the tailcone casting. \_\_\_\_\_
  - a) Remove paint from tailcone casting in areas shown in Figures 2-14 and 2-14A using a suitable paint remover per Section 1.410. \_\_\_\_\_
  - b) Dye penetrant inspect using instructions provided by manufacturer of dye penetrant inspection kit. \_\_\_\_\_



**FIGURE 2-14 TAILCONE CASTING TOP AFT VIEW**

**DYE PENETRANT INSPECT DESIGNATED AREAS AFTER PAINT REMOVAL**



**FIGURE 2-14A TAILCONE CASTING BOTTOM FWD VIEW  
DYE PENETRANT INSPECT DESIGNATED AREAS AFTER PAINT REMOVAL**

2.510 Tail Skid Strike (cont'd)

5. Inspect horizontal stabilizer as follows:

- a) Visually inspect horizontal stabilizer attach points for elongated holes (0.386-inch diameter maximum) loose rivets or buckling. \_\_\_\_\_
- b) Disassemble lower vertical stabilizer from horizontal and visually inspect attach points on vertical and horizontal stabilizers for elongated holes (0.266-inch diameter maximum), buckling, cracks or loose rivets. Buckling and cracks are cause for replacement of the unit. Loose rivets may be drilled out and replaced. \_\_\_\_\_
- c) Remove tail rotor guard. Remove paint from forward and aft attachment points and dye penetrant inspect using instructions provided by manufacturer of dye penetrant inspection kit. Remove guard mount from tailcone by removing four 10-32 screws and dye penetrant inspect same as above step. \_\_\_\_\_

2.520 Tail Rotor Strike

Tail rotor strike inspection is listed in two parts, A and B. Part A concerns damage received by a tail rotor blade due to contact with a small stone, tall grass, or some small object contacting rotor blade in free air. Part B is concerned with sudden stoppage of tail rotor due to ground or solid object contact causing bending or shearing of a tail rotor blade or blades.

A. Inspect per Section 9.220 and complete part B item 1. \_\_\_\_\_

B. If one or both tail rotor blades contact ground or a solid object causing bending or shearing of blades a tail rotor sudden stoppage inspection must be performed. Inspect per following procedure:

- 1) Check tail rotor drive shaft run-out per Section 7.340. If run-out exceeds 0.025 inch at any location the shaft must be replaced or repaired. Strip paint back at least 2 inches from welds at forward end of drive shaft and dye check per instructions supplied by manufacturer of dye check kit. If any evidence of cracks is found, drive shaft must be replaced. \_\_\_\_\_
- 2) Visually inspect drive shaft for evidence of twisting, nicks, dents or scratches. Nicks and scratches may be polished out to a maximum of 0.003 inches deep. Evidence of twisting or dents is cause for replacement of the drive shaft. \_\_\_\_\_
- 3) Remove yoke (C195-5) located at aft end of tail rotor drive shaft. Inspect holes for any elongation. Strip paint and dye check per instructions supplied by manufacturer of dye check kit. \_\_\_\_\_
- 4) Remove tail rotor and tail rotor gearbox and return them to an RHC approved overhaul facility for overhaul and/or repair. \_\_\_\_\_
- 5) Always replace aft and intermediate flex plates after tail strike. \_\_\_\_\_
- 6) Visually inspect tailcone and empennage for evidence of a tail rotor blade strike. \_\_\_\_\_
- 7) Visually inspect main rotor system. \_\_\_\_\_

2.530 Main Rotor Strike

The main rotor strike inspection is listed in two parts A and B. Part A concerns contact of main rotor blades with object in free air such as small stones, brush, small birds, etc. Part B is concerned with sudden stoppage of main rotor due to ground or solid object contact.

- A. If main rotor blade has contacted a small object in free air such as small stones, brush, small birds, etc the main rotor blades should be inspected as follows:
  - 1. Main rotor blades should be inspected for evidence of nicks, scratches, dents, etc. per Section 9.130. \_\_\_\_\_
  - 2. Visually inspect trailing edge of blade for evidence of buckling or bending. This will be most evident near root of blade. \_\_\_\_\_

<p><b>CAUTION</b></p> <p>If evidence of buckling is found on a main rotor blade it will be considered to have sudden stoppage and sudden stoppage inspection must be used to inspect the entire rotorcraft</p>
--

- B. If main rotor blade or blades have contacted ground or a solid object, they must be inspected for sudden stoppage. Sudden stoppage is evident when buckling or bending of the main rotor blades has occurred. Use the following procedure for inspecting rotorcraft after main rotor sudden stoppage has occurred:
  - 1. Check the tail rotor drive shaft run-out Section 7.340. \_\_\_\_\_
  - 2. Remove the following components and return to a Robinson Helicopter Company approved overhaul facility for inspection and/or repair.
    - C005 Main Rotor System \_\_\_\_\_
    - C006 Main Rotor Gearbox \_\_\_\_\_
    - C018 Clutch Assembly \_\_\_\_\_
    - C947-1 Forward Flex Plate \_\_\_\_\_
    - C907 and C908 Yokes \_\_\_\_\_
  - 3. Inspect engine for sudden stoppage per engine manufacturer's instructions. \_\_\_\_\_
  - 4. Dye penetrant inspect upper rotating swashplate for cracks and/or deformation. \_\_\_\_\_

2.540 Rotor/Engine Overspeed

Overspeed inspections are determined by severity of overspeed. Inspection is listed in three parts: A, B, and C. Part A concerns inspection of rotor system due to overspeed between 108% and 114%. Part B is concerned with inspection of rotor system due to overspeeds at or above 114%. Part C is concerned with engine overspeed inspections.

A. For rotor overspeeds between 108 and 114%:

**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 drag 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 Section 7.340.

B. If an overspeed at or above 114% is reported or suspected or if balance changes or pitch bearing roughness is evident, perform following inspections in addition to Part A.

**NOTE**

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

1. Perform inspection per Part A.
2. Check coning hinge bolts for evidence of bending. Replace any bent bolts.
3. Coning hinge bolts, washers, and journals must be magnetic particle inspected. Replace any cracked bolts, journals or washers.

2.540 Rotor/Engine Overspeed (cont'd)

4. Visually inspect hub and dye penetrant inspect any areas suspected of having cracks. Dye penetrant inspections are performed using instructions supplied by manufacturer of penetrant kit.
  5. Reinstall blades and check balance. If a change in balance is evident, rotor system should be returned to an approved RHC overhaul facility for inspection and/or repair.
- C. Determine percent engine overspeed from engine tachometer indication using following formula:

$$\text{Percent engine overspeed} = \frac{\text{Engine tachometer indication} \times 2665}{2800} - 100$$

**NOTE**

102% engine tach indication equals 2718 actual engine RPM.  
The engine is rated at 2800 RPM.

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

2.550 Hard Landing

The hard landing inspection is listed in two parts: A and B. Part A concerns yielding (bending) of the cross tubes due to hard landing such as hovering autorotations or run-on landings that do not apply side loads to the landing gear. Part B is concerned with hard landings that, in addition to yielding of cross tubes, has yielding of steel tube frames or fuselage primary structure.

**NOTE**

Side loads show up in the airframe as buckles and bent steel tube structure.

2.550 Hard Landing (cont'd)

- A. Yielding of cross tube due to hard landing with no side loads:
1. Check tail rotor drive shaft run-out per Section 7.340.
  2. Visually inspect main rotor blades for oil canning of skins and buckling. See Section 9.130 for inspection and repair of main rotor blades.
  3. Check landing gear cross tubes for yielding beyond serviceable limit. Place rotorcraft on level ground, and measure from tip of tail skid to ground. If less than 30 inches, one or both cross tubes must be replaced.
  4. Check and adjust sheave alignment per Section 7.230
  5. Inspect front seat structure for yielding.
  6. Inspect aft seat structure for yielding. Open aft seat bottoms and verify no gap around foam spacer at aft end of seat bottom structure.
- B. If yielding of steel tube frame(s) OR fuselage has occurred, inspect rotorcraft as follows:
1. Perform Part A inspections.
  2. Visually inspect steel tube frames for yielding and cracks. Pay particular attention to aft vertical strut members of lower steel tube structure.

## NOTE

No frame yielding is allowed.

3. Visually inspect fuselage, landing gear attach points, and firewalls for buckling or cracks.

## NOTE

Vertical firewall attach points for engine mount struts are susceptible to cracks due to hard landings.

4. Dye check upper steel tube structure and all welded joints.
5. Visually inspect tailcone for buckling or loose rivets.
6. Visually inspect landing gear skid tube-to-strut attach points for bending and cracks.
7. Hard landings can be accompanied by tail skid strikes, tail rotor strikes, main rotor blade strikes, etc. To inspect for these conditions, refer to the appropriate portion of Section 2.500. Minor sheet metal repairs to cabin are permitted. Any cracks, yielding or buckling in steel tube structure or tailcone are cause for replacement. Major defects may be factory-repaired by replacement of parts and assemblies.

2.560 Penetrant Inspection of C020 Upper Steel Tube Frame

1. Carefully clean all paint, primer, oil, grease, etc from steel tube structure around and adjacent to four tailcone mounts (see Figure 2-15).
2. Apply epoxy paint remover and allow the softening action to complete (temperature affects time required).
3. Remove softened paint by hand using a wire brush. Be sure steel structure is perfectly clean before application of dye penetrant.
4. Carefully check for cracks in and around each weld bead and along each steel supporting tube for at least two inches away from weld beads. Replace any frame exhibiting crack indications.
5. If no cracks are found, clean all inspection materials from steel tubing.
6. Prime with good quality zinc chromate or epoxy primer and allow adequate drying time.
7. Refinish area with gray epoxy top coat or equivalent.

2.561 Corrosion on C020 Upper Steel Tube Frame

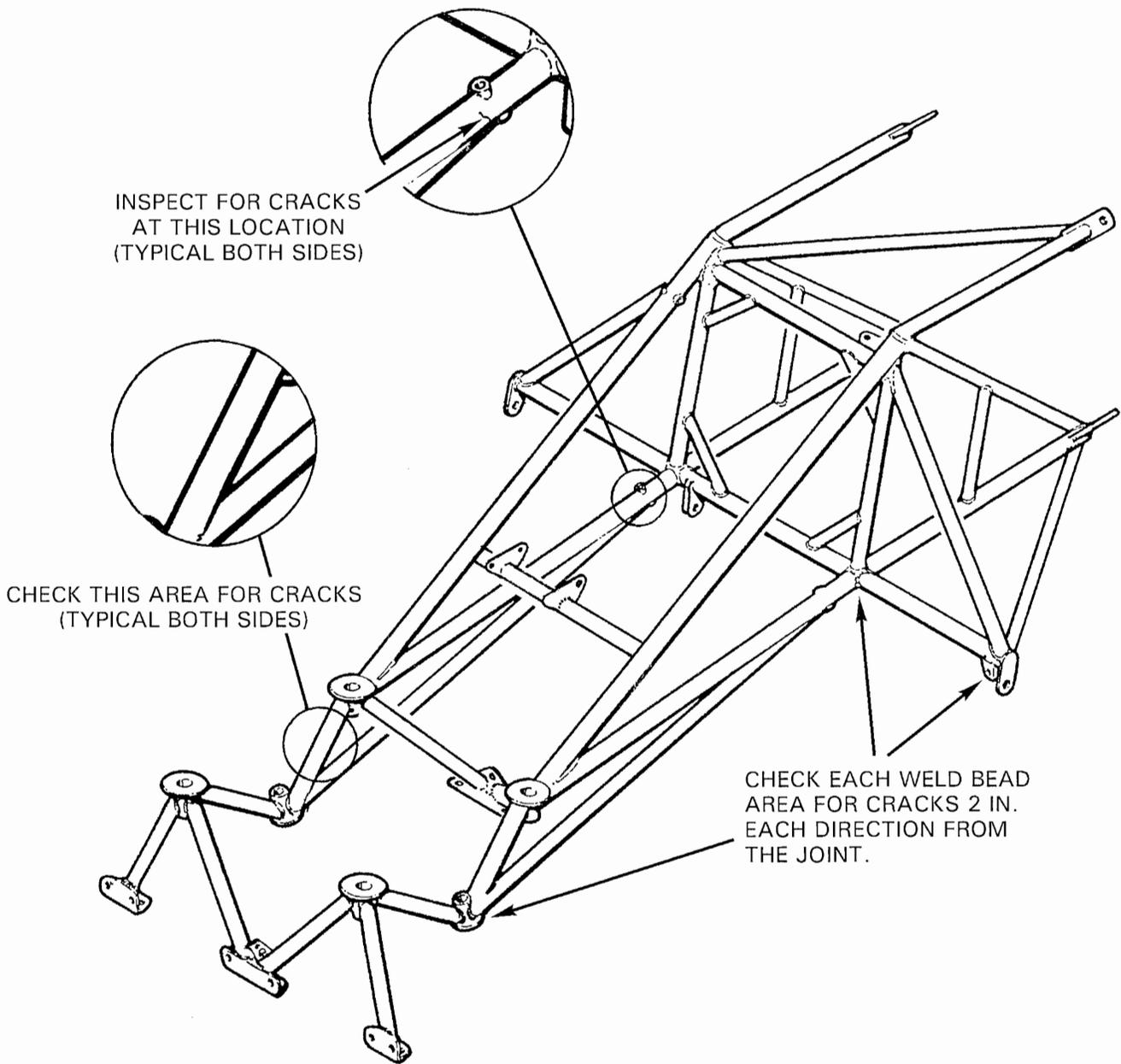
1. Polish out corrosion on steel frame tube members.
  - a. Polish out light surface corrosion on frame members using Scotchbrite or 400 grit wet-or-dry sandpaper subject to dimensional limitations shown in Figure 2-16.
  - b. Polish out corrosion pitting using 320-grit wet-or-dry sandpaper subject to dimensional limitations shown in Figure 2-16.

**NOTE**

For large areas of corrosion, it may be necessary to remove entire upper frame from aircraft and strip off paint to adequately determine extent of damage.

2. Prime bare metal with a good quality zinc chromate or epoxy primer.
3. Refinish area with gray epoxy top coat or equivalent.

2.570 Reserved



**FIGURE 2-15 UPPER FRAME INSPECTION**

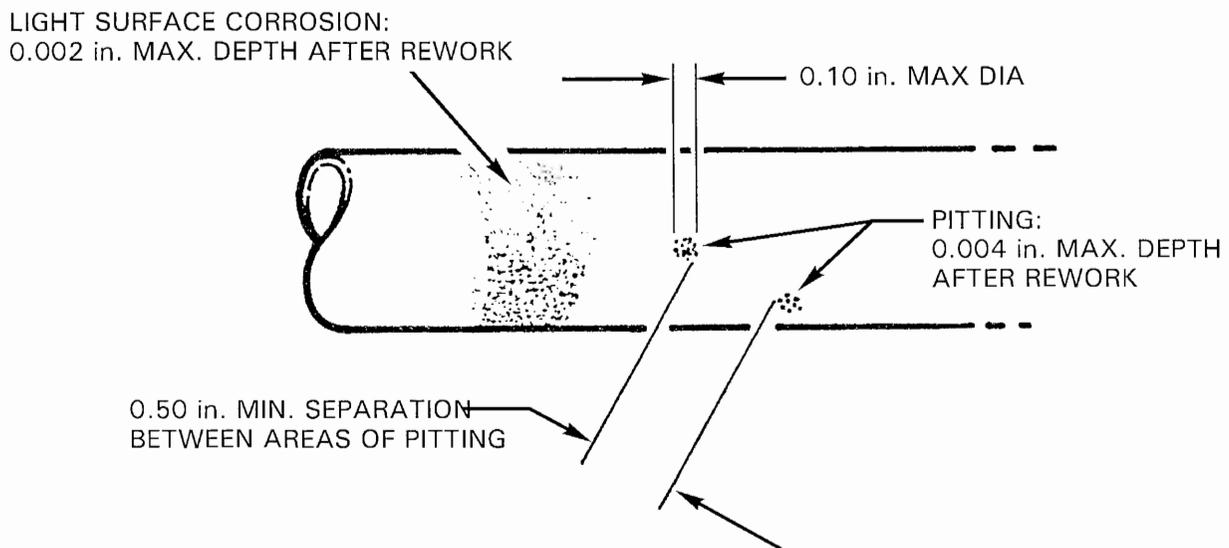


FIGURE 2-16 UPPER FRAME CORROSION REMOVAL LIMITATIONS

2.580 Windshield Inspection

Inspect windshield for cracks and crazing adjacent to retainer strips using the following criteria. If cracks exceed these limits, replace windshields per Section 4.120

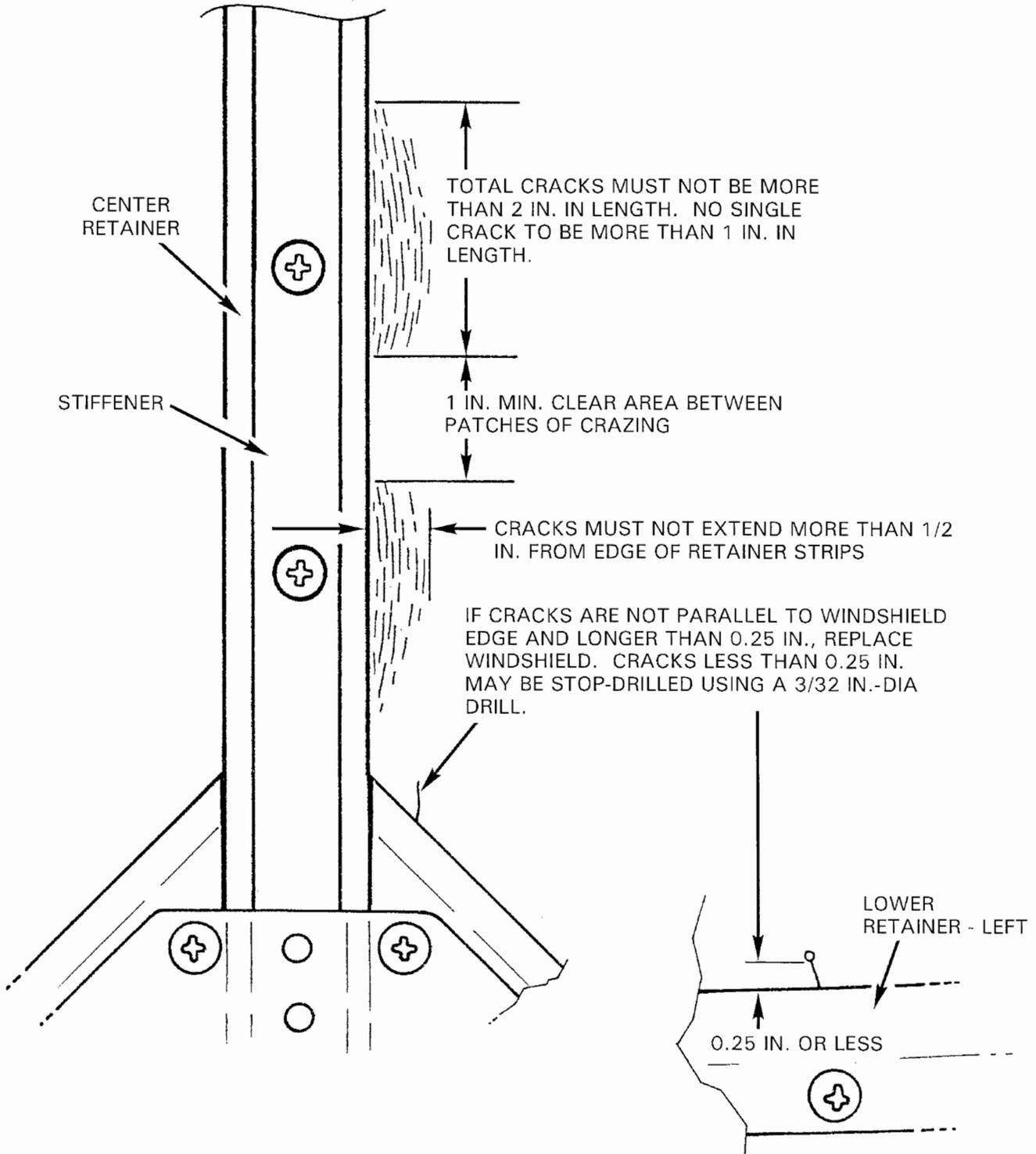


FIGURE 2-17 WINDSHIELD INSPECTION

2.600 12-YEAR INSPECTION AND LIMITED OVERHAUL REQUIREMENTS

If less than 2200 hours time-in-service, but 12 years or more have elapsed since helicopter was new or last overhauled, proceed as follows:

**NOTE**

This Section does not supersede 2200-hour inspection and overhaul requirements contained in Section 3. Section 3 must be complied with based on component service lives regardless of when a 12-year inspection was completed.

2.610 Inspection Procedures

1. Ground check and run up aircraft per Sections 2.205 and 2.210.
2. Remove following components and return to an RHC-authorized component overhaul facility for disassembly & inspection per Section 2.630.

C005-x	Main rotor hub assembly
C005-x	Main rotor blade and spindle assembly
C006-x	Main rotor gearbox and mast assembly
C007-5	Fanshaft and bearing assembly
C008-x	Tail rotor assembly
C017-x	Swashplate assembly
C018-x	Clutch assembly
C021-1	Tail rotor gearbox assembly
C051-x	Belt tension actuator assembly
C792-x	Tachometer
D174-2	Fanwheel assembly
D211-1	Hydraulic Reservoir
D212-1	Hydraulic servo actuators
D278-x	Governor controller assembly

3. Replace following parts with new or overhaul exchange parts:

A120-3	Tail rotor bellcrank
A190-3	V-belts
A785-x	Hoses, air ducts (various dash numbers)
B173-x	Alternator belt
B283-x	Hose assemblies (various dash numbers)
C011-2	Arm assembly
C031-1	Tail rotor pitch control
C041-11	Bearing assembly
C480-1	Swashplate boot
C653-1	Mount
C653-2	Mount
C792-x	Dual Tachometer
D756-x	Bellcrank assembly

4. Remove engine and comply with current revision of Lycoming SI 1009. Flush and pressure test oil cooler. Overhaul or inspect, as required, magnetos, alternator, and carburetor or fuel injection components per appropriate manufacturers' maintenance publications and service bulletins.

2.610 Inspection Procedures (cont'd)

5. Remove horizontal and vertical stabilizers. Visually inspect. Verify no cracks, corrosion, loose rivets, dents, or deformation. Dye penetrant inspect suspect areas.
6. Remove landing gear assembly, disassemble (elbows to remain attached to struts), remove paint, and visually inspect. Verify no cracks, corrosion, or deformation. Magnetic particle and fluorescent penetrant inspect. Clean, prime, and paint using Section 1.400-approved materials.
7. Remove steel tube frames. Remove paint from frames not replaced, and visually inspect. Verify no cracks or corrosion. Magnetic particle inspect. Clean, prime, and paint using Section 1.400-approved materials.
8. Inspect airframe wiring condition. Verify no corrosion, insulation deterioration, or other damage.
9. Inspect and pressure test fuel tanks per Section 12.120.
10. Replace additional parts as required per Airworthiness Limitations.
11. Assemble aircraft. Rig flight controls and rotor systems per Section 10.100.
12. Weigh helicopter and calculate C.G. per Section 1.231. As required, revise Equipment List/Weight & Balance data in Section 6 of helicopter's Pilot's Operating Handbook.
13. Inspect aircraft per Section 2.400.
14. Ground check and run up aircraft per Sections 2.205 and 2.210.

**NOTE**

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

15. Balance fanwheel per Section 6.240.
16. Balance tail rotor per Section 10.240.
17. Track and balance main rotor per Section 10.200.
18. Flight check aircraft per Section 2.220.
19. Drain, flush, and fill gearboxes per Sections 1.120 and 1.130.
20. Fill and bleed hydraulic system (if equipped) per Section 1.190.

2.620 (Reserved)

2.630 Component Inspection Procedures

An RHC-authorized component overhaul facility shall perform noted procedure.

PART NUMBER	DESCRIPTION	NOTES
C005-x	Main rotor hub assembly	Remove bearings. Visually inspect hub. Verify no fretting, corrosion, or obvious damage. Fluorescent penetrant inspect hub. Magnetic particle inspect journals and thrust washers.
C005-x	Main rotor blade & spindle assembly	Replace blades due to possibility of internal corrosion and adhesive deterioration. Replace pitch horn screws, boots, and O-rings. Pitch horn, spindles, and other hardware may be reused after inspection and verifying no damage.
C006-x	Main rotor gearbox and mast assembly	Replace pinion seal and all O-rings (mast tube base, input shaft, end cover, sump, chip detector, chip detector housing, and sight gage). Replace sealed ball bearing atop mast tube. Replace rubber mounts.
C007-5	Fanshaft and bearing assembly	Replace C181-3 bearing assembly with factory new or overhaul exchange part. Inspect fanshaft.
C008-x	Tail rotor assembly	Replace blades due to possibility of internal corrosion and adhesive deterioration. Remove teeter hinge bearings. Inspect hub and hub plates; verify no fretting or corrosion. Fluorescent penetrant inspect hub and hub plates. Replace teeter hinge bearings and blade attach bolts.
C017-x	Swashplate assembly	Clean, inspect, regrease, or replace (as required) swashplate duplex bearings.
C018-x	Clutch assembly	Disassemble, clean, and inspect. Replace all seals, O-rings, and lubricant. Replace C184-2 bearing assembly with factory new or overhaul exchange part.
C051-x	Belt tension actuator assembly	Return to factory for lubrication and calibration check.
D174-2	Fanwheel assembly	Disassemble, clean, inspect. Verify no cracks or corrosion.

2.700 2200-HOUR OVERHAUL REQUIREMENTS

When helicopter has accumulated 2200 hours time-in-service, proceed as follows:

NOTE

Kit R7543 contains the majority of parts required for a 2200-hour overhaul; check [www.robinsonheli.com/public](http://www.robinsonheli.com/public) for current kit contents. Previously replaced airworthy components may remain in service until accumulating 2200 hours or 12 years time-in-service, whichever occurs first, since new or since last overhaul. Refer to Airworthiness Limitations section for additional parts requiring replacement.

2.710 Inspection Procedure

1. Ground check and run up aircraft per Sections 2.205 and 2.210.
2. Replace following parts with new or overhauled exchange parts:

C005-x	Main rotor blade and spindle assembly
C006-x	Main rotor gearboxes and mast assembly
C007-5	Fanshaft and bearing assembly
C008-x	Tail rotor assembly
C017-x	Swashplate assembly
C018-x	Clutch assembly
C021-1	Tail rotor gearbox assembly
C023-x	Tailcone (Rev M & prior)
C031-1	Tail rotor pitch control
C051-x	Actuator assembly
C056-1	Spring assembly
C627-x	4-Point Harness & Buckle assemblies
C628-x	Harness & Buckle assemblies
C792-2	Dual Tachometer
D174-2	Fanwheel assembly
D211-1	Hydraulic reservoir
D212-1	Hydraulic servo actuators
D268-x	Governor Controller

3. On all aircraft, replace following parts with new parts:

A120-3	Tail rotor bellcrank
A190-3	V-Belts
A723-x	Oil lines (various dash numbers)
A780-x	Battery cables
A785-x	Hoses, air ducts (various dash numbers)
A947-2	Flex plate assembly
B173-x	Alternator belt
B283-x	Hose assemblies (various dash numbers)
C121-17	Tail rotor push-pull tube assembly
C169-x	Muffler with risers
C258-1	Main rotor pitch link assemblies
C480-1	Swashplate boot
C918-7	Elastic trim cord (electric trim system only)
C947-1	Flex plate assembly
C947-3	Flex plate assembly
D079-1	Tail rotor guard
D224-1	Tail rotor driveshaft
Various	Engine cooling panels (consult IPC)

2.710 Inspection Procedure (cont'd)

4. Remove engine and overhaul or inspect as required by Lycoming. Flush and pressure test oil cooler. Overhaul or inspect, as required, magnetos, alternator, and carburetor or fuel injection components per appropriate manufacturers' maintenance publications and service bulletins.
5. Remove horizontal and vertical stabilizers. Visually inspect. Verify no cracks, corrosion, loose rivets, dents, or deformation. Dye penetrant inspect suspect areas.
6. Remove landing gear assembly, disassemble, remove paint, and visually inspect. Verify no cracks, corrosion, or deformation. Magnetic particle and fluorescent penetrant inspect. Clean, prime, and paint using Section 1.400 approved materials.
7. Remove steel tube frames. Remove paint from frames not replaced, and visually inspect. Verify no cracks or corrosion. Magnetic particle inspect. Clean, prime, and paint using Section 1.400-approved materials.
8. Inspect airframe wiring condition. Verify no corrosion, insulation deterioration, or other damage.
9. Inspect and pressure test fuel tanks per Section 12.120.
10. Replace additional parts as required per Airworthiness Limitations.
11. Assemble aircraft.
12. Rig flight controls and rotor systems per Section 10.100.
13. Inspect aircraft per Section 2.400.
14. Perform weight and balance per Section 1.230.
15. Ground check and run up aircraft per Sections 2.205 and 2.210.

**NOTE**

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

16. Balance fanwheel per Section 6.240
17. Balance tail rotor per Section 10.240.
18. Track and balance main rotor per Section 10.200.
19. Flight check aircraft per Section 2.220.
20. Drain, flush, and fill gearboxes per Sections 1.120 and 1.130.
21. Fill and bleed hydraulic system (if equipped) per Section 1.190.

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