

R44

PAGE	REMARKS (NEW REV)	REMARKS (OLD REV)
1.1	<p>A list of chapters is located in the <i>Introduction</i>. Chapters are separated by tab dividers and chapter contents are listed in the chapter front pages.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p style="text-align: center;"><b>CAUTION</b></p> <p style="text-align: center;"><u>Always</u> read instructions completely <u>before</u> performing a task.</p> </div> <p><u>1.001 RHC Maintenance Manual and Illustrated Parts Catalog Updates</u></p> <p>RHC Maintenance Manuals (MMs) and Illustrated Parts Catalogs (IPCs) are available digitally at <a href="http://www.robinsonheli.com">www.robinsonheli.com</a>, under the Publications tab. Access to these publications does not require an account and is free of charge.</p> <p>Viewing MMs &amp; IPCs online is recommended to ensure use of current data.</p> <p>Viewing MMs &amp; IPCs offline via paper or digital download requires verification that the data is current. Refer to the online MM or IPC Revision Log for the list of current pages.</p> <p>Sign up for free email notification of revisions to MMs &amp; IPCs by sending an email to <a href="mailto:subscriptions@robinsonheli.com">subscriptions@robinsonheli.com</a> with "Subscribe email" in the subject line. Within the email, include name, email address, physical address, and helicopter model(s) of interest.</p> <hr/> <p style="display: flex; justify-content: space-between;"><span>JAN 2021</span><span>Chapter 1 General</span><span>Page 1.1</span></p>	<div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> <p style="text-align: center;"><b>CAUTION</b></p> <p style="text-align: center;"><u>Always</u> read instructions completely <u>before</u> performing a task.</p> </div> <p><u>1.001 R44 Maintenance Manual Revisions</u></p> <p>Before using the R44 Maintenance Manual, verify it consists of current effective pages. The list of effective pages is located in the Revision Log in Chapter 41. When a new manual is purchased, complete and submit the Subscription Order Form available online at <a href="http://www.robinsonheli.com">www.robinsonheli.com</a>. Subscribers receive publication revisions for a two-year period. The revision status for all RHC technical publications is available online at <a href="http://www.robinsonheli.com">www.robinsonheli.com</a>.</p> <hr/> <p style="display: flex; justify-content: space-between;"><span>AUG 2019</span><span>Chapter 1 General</span><span>Page 1.1</span></p>
1.2	<p><u>1.003 Component Maintenance Authorization</u></p> <p>Only appropriately certificated mechanics who have successfully completed both a factory-sponsored maintenance course and component maintenance course, and who possess technical data supplied by RHC, are authorized to perform maintenance specified in the Component Maintenance Manual (CMM). Component maintenance may only be performed at an RHC-authorized Service Center that has required Component Maintenance special tools (ref. R44 SL-67).</p> <p><u>1.004 Maintenance Record</u></p> <p>Blank, digital Airframe Maintenance Record forms are available online at <a href="http://www.robinsonheli.com">www.robinsonheli.com</a>.</p>	<p><u>1.003 R44 Component Maintenance Authorization</u></p> <p>Only appropriately certificated mechanics who have successfully completed both a factory-sponsored maintenance course and component maintenance course, and who possess technical data supplied by RHC, are authorized to perform maintenance specified in the Component Maintenance Manual (CMM). Component maintenance may only be performed at an RHC-authorized Service Center that has required special tools.</p> <p><u>1.004 Maintenance Record</u></p> <p>The Airframe Maintenance Record is available online at <a href="http://www.robinsonheli.com">www.robinsonheli.com</a>.</p>
1.2A	<p><u>1.006 RHC Maintenance Manual and Illustrated Parts Catalog References</u></p>	<p><u>1.006 Maintenance Manual and Illustrated Parts Catalog References</u></p>

1.2B	FORMAT CORRECTION		
1.3	<p>EMU: Engine Monitoring Unit</p> <p>FS: Fuselage Station locations</p> <p>HID: High Intensity Discharge</p> <p>HS: Horizontal Stabilizer Station locations</p> <p>ICA: Instructions for Continued Airworthiness</p> <p>LBL: Left Butt Line Station locations</p> <p>LED: Light Emitting Diode</p> <p>LH: Left-hand</p> <p>LRU: Line-Replaceable Unit</p> <p>MRDS: Main Rotor Drive Shaft</p> <p>MRGB or MGB: Main Rotor Gearbox or Main Gearbox</p> <p>OEM: Original Equipment Manufacturer</p> <p>R44 IPC: R44 Illustrated Parts Catalog</p> <p>R44 MM: R44 Maintenance Manual</p> <p>R44 POH: R44 Pilot's Operating Handbook</p> <p>R44 II POH: R44 II Pilot's Operating Handbook</p> <p>R44 Cadet POH: R44 Cadet Pilot's Operating Handbook</p> <p>RBL: Right Butt Line Station locations</p> <p>RH: Right-hand</p> <p>RHC: Robinson Helicopter Company</p> <p>RS: Rotor Station locations</p> <p>SB: Service Bulletin</p> <p>SDS: Safety Data Sheet</p> <p>SL: Service Letter</p> <p>TBO: Time Between Overhaul</p> <p>TCDS: Type Certificate Data Sheet</p> <p>TRDS: Tail Rotor Drive Shaft</p> <p>TRGB or TGB: Tail Rotor Gearbox or Tail Gearbox</p>		<p>FS: Fuselage Station locations</p> <p>HID: High Intensity Discharge</p> <p>HS: Horizontal Stabilizer Station locations</p> <p>ICA: Instructions for Continued Airworthiness</p> <p>LBL: Left Butt Line Station locations</p> <p>LED: Light Emitting Diode</p> <p>LH: Left-hand</p> <p>LRU: Line-Replaceable Unit</p> <p>MRDS: Main Rotor Drive Shaft</p> <p>MRGB: Main Rotor Gearbox</p> <p>OEM: Original Equipment Manufacturer</p> <p>R44 IPC: R44 Illustrated Parts Catalog</p> <p>R44 MM: R44 Maintenance Manual</p> <p>R44 POH: R44 Pilot's Operating Handbook</p> <p>R44 II POH: R44 II Pilot's Operating Handbook</p> <p>R44 Cadet POH: R44 Cadet Pilot's Operating Handbook</p> <p>RBL: Right Butt Line Station locations</p> <p>RH: Right-hand</p> <p>RHC: Robinson Helicopter Company</p> <p>RS: Rotor Station locations</p> <p>SB: Service Bulletin</p> <p>SL: Service Letter</p> <p>TBO: Time Between Overhaul</p> <p>TCDS: Type Certificate Data Sheet</p> <p>TRDS: Tail Rotor Drive Shaft</p> <p>TRGB: Tail Rotor Gearbox</p> <p>TS: Tailcone Station locations</p>

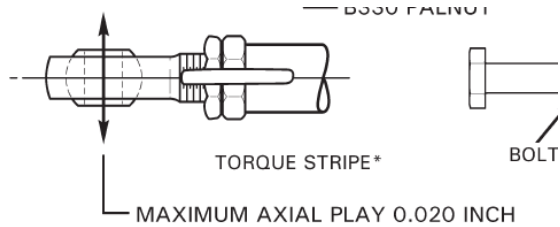
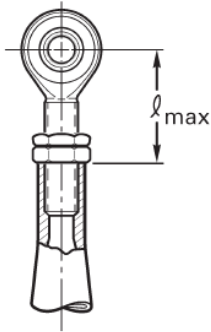




<p>1.36</p>	<p><u>1.490 Storage Limits</u></p> <ol style="list-style-type: none"> <li>1. B283 hoses have a shelf storage life of 5 years. Hose service life is "on condition", with a maximum of 12 years.</li> <li>2. Elastic cords have a shelf storage life of 5 years. Elastic cord service life is "on condition", with a maximum of 12 years. Use invoice or FAA Form 8130 date as start date.</li> <li>3. Store V-belts at less than 85° F (30° C), with relative humidity below 70%. Avoid solvent and oil vapors, atmospheric contaminants, sunlight, and ozone sources (electric motors, arc welding, ionizing air purifiers, etc.). Belt shelf life is 4 years if preceding recommendations are followed. Use invoice date or FAA Form 8130 date as start date.</li> <li>4. Oils and greases have a 5 year shelf life when stored and kept sealed in their original container. Use invoice date or FAA Form 8130 date as start date unless the manufacturer has marked container with manufacture date (in which case use manufacture date as start date).</li> <li>5. Rubber o-rings, seals, and gaskets have a twenty (20) quarter, five (5) year shelf life from the indicated cure date. Fluorocarbon (Viton) and silicon rubber products shall adhere to manufacturer's expiration date(s). Service life is "on condition" with a maximum of 12 years.</li> <li>6. Store uninstalled fuel bladder in original container (if available) at 70°F to 80°F and below 70% humidity. Coat bladder with clean, non-detergent engine mineral oil to prevent rubber from drying out and cracking. Store bladder in relaxed condition free from tension, compression, or other deformation such as creases or folds.</li> </ol>	<p><u>1.490 Storage Limits</u></p> <ol style="list-style-type: none"> <li>1. P/N B283-x hoses have a shelf storage life of 5 years. Hose service life is "on condition", with a maximum of 12 years.</li> <li>2. Elastic cords have a shelf storage life of 5 years. Elastic cord service life is "on condition", with a maximum of 12 years. Use invoice or FAA Form 8130 date as start date.</li> <li>3. Store V-belts at less than 85°F (30°C), with relative humidity below 70%. Avoid solvent and oil vapors, atmospheric contaminants, sunlight, and ozone sources (electric motors, arc welding, ionizing air purifiers, etc.). Belt shelf life is 4 years if preceding recommendations are followed. Use invoice date or FAA Form 8130 date as start date.</li> <li>4. Oils and greases have a 5 year shelf life when stored and kept sealed in their original container. Use invoice date or FAA Form 8130 date as start date unless the manufacturer has marked container with manufacture date (in which case use manufacture date as start date).</li> <li>5. Rubber o-rings, seals, and gaskets have a shelf storage life of 20 quarters (5 years). Service life is "on condition" with a maximum of 12 years. Use cure date on package as start date.</li> <li>6. Store fuel cell (bladder) at temperatures above 45°F and below 75°F.</li> </ol> <p><u>1.500 (Reserved)</u></p>
<p>2.1</p>	<p><u>2.100 General Procedures</u></p> <p>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.</p> <p><u>2.110 Ball and Roller Bearings</u></p> <p>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.</p>	<p><u>2.100 General Procedures</u></p> <p>Unless otherwise specified, the following general procedures apply to R44 inspection. When required, magnetic particle inspection may be performed in accordance with ASTM E 1444 and MIL-STD-1907. Fluorescent penetrant inspection may be performed in accordance with ASTM E 1417 and MIL-STD-1907.</p> <p><u>2.110 Ball and Roller Bearings</u></p> <p>The first indication of bearing failure is usually an increase in bearing noise. Noise will almost always start several hours before bearing failure or any increase in bearing temperature. Listen to drive system during start-up and shutdown. A failing bearing will produce a loud whine, rumble, growl, or siren sound. Upon hearing an unusual noise, thoroughly inspect all bearings before further flight. A failing bearing may have a distorted seal or be exuding a large amount of grease. Do not rely on Telatemps to detect failing bearings as temperature increase may occur only seconds before bearing disintegrates. Refer to § 2.501.</p>

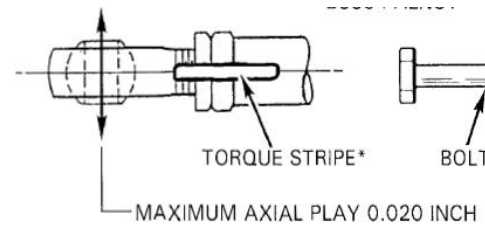
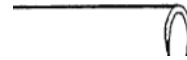
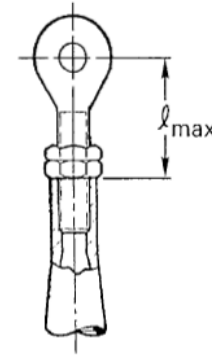
2.2

ROD END	$l_{max}$
A101-4	1.10 in.
D163-1	1.40 in.
D173-1	1.30 in.
F101-4	1.10 in.



\*Typical torque stripe location shown.  
Adjust location as required for maximum visibility during preflight & 100-hr inspection.

ROD END	$l_{max}$
A101-4	1.10 in.
D163-1	1.40 in.
D173-1	1.30 in.



\*Typical torque stripe location shown.  
Adjust location as required for maximum visibility during preflight inspection.

2.3

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 to 1-inch minimum blend radius. Replace push-pull tube if depth exceeds these limits.

2. Replace push-pull tube if tube is dented or flattened more than 5% of its diameter in unswaged area; dents or flattening is not permitted in swaged (tapered and threaded) ends of tubes.

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

Refer to Figures 2-1 & 2-1A.

1. Maximum axial play: 0.020 inch  
Maximum radial play: 0.010 inch
2. Looseness between bearing outer race and rod end housing is not permitted.
3. Rod ends not riveted in place must block passage of 0.020-inch diameter wire through witness hole. Refer to Figure 2-1 for maximum rod end extension when no witness hole is provided.
4. Rod end jam nuts and palnuts must be torqued per § 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 positioned (centered) 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.

**WARNING**

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

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.

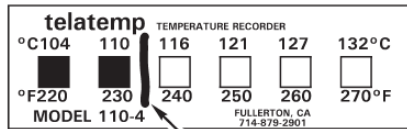
2.6

2.130 Telatemp Indicators

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

NOTE

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



Reference line

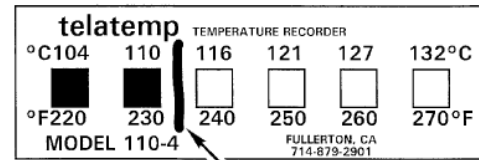
Part Number	Temperature Range
F110-2	60°C / 140°F — 88°C / 190°F
F110-3	82°C / 180°F — 110°C / 230°F
F110-4	104°C / 220°F — 132°C / 270°F

2.140 Torque Stripes

If, during inspection, the remaining torque stripe on a fastener is insufficient to determine joint integrity, then remove accompanying palnut as required and apply specified torque to fastener. If fastener moves, disassemble joint and inspect parts for damage such as fretting, thread deformation, hole elongation, etc.; replace damaged parts. If fastener does not move, install new palnut as required & standard torque per § 1.320. Torque stripe fastener per Figure 2-1.

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.



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



2.11

2.220 Flight Check

1. **Hover:**

- a. All gages green. \_\_\_\_\_
- b. Controllability in left and right pedal turns. \_\_\_\_\_
- c. Hydraulics zero 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. Hydraulics zero cyclic stick forces. \_\_\_\_\_ |
- c. Verify no feedback and collective is balanced. \_\_\_\_\_ |
- d. 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. \_\_\_\_\_
- e. Tail rotor elastic trim cord zeros pedal forces (cord applies left pedal force). \_\_\_\_\_
- f. Turn hydraulics OFF and verify no excessive feedback forces. \_\_\_\_\_ |

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. \_\_\_\_\_

2.37	<p><b>NEW</b></p> <p>SHEAVE ALIGNMENT LEFT: _____ ENGINE HEIGHT: _____  SHEAVE ALIGNMENT RIGHT: _____ CLUTCH ANGLE: _____  TRDS RUNOUT: _____  CHECKLIST COMPLETE:  Mechanic's signature: _____ Date: _____</p>	<p><b>Inspection Procedures and Checklist completed:</b></p> <p>Mechanic's signature: _____ Date: _____</p>
3.1	<p>Listed items must be removed from the helicopter at the specified intervals and permanently retired from service by destroying or damaging each part so it cannot inadvertently be returned to service.</p>	<p>Listed items must be removed from the helicopter at the specified intervals and permanently retired from service by destroying or damaging each part so it cannot inadvertently be returned to service. Fatigue lives are based upon normal flight service, including 6 rotor stop-starts and 10 autorotation entries per hour.</p>
3.2	<p><u>3.200 Type Certificate Data Sheet (TCDS)</u></p> <p>The Robinson R44-series Type Certificate Data Sheet (TCDS) reprinted on the following pages is subject to revision.</p> <p>  Visit the FAA Aircraft Certification Regulatory and Guidance Library to determine TCDS revision status at: <a href="http://rql.faa.gov">http://rql.faa.gov</a>.</p>	<p><u>3.200 Type Certificate Data Sheet (TCDS)</u></p> <p>  The Robinson R44-series Type Certificate Data Sheet (TCDS) reprinted on the following pages is subject to revision.</p> <p>  Visit the FAA Aircraft Certification Regulatory and Guidance Library online databases to determine TCDS revision status at: <a href="http://rql.faa.gov">http://rql.faa.gov</a>.</p>