

CHAPTER 3  
LIFE-LIMITED COMPONENTS

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## CHAPTER 3

## LIFE-LIMITED COMPONENTS

3.000 Life-Limited Components3.001 Introduction

This section lists fatigue life-limited parts and specified overhaul requirements for the R44 helicopter.

3.002 Time-In-Service Records

It is the operator's responsibility to maintain accurate time-in-service records for the airframe, engine, and life-limited components. An hourmeter activated by engine oil pressure is standard equipment on earlier R44 helicopters. Later helicopters are equipped with an hourmeter activated by a combination of oil pressure and up collective; the hourmeter will record time only when engine oil pressure exists and the collective is raised. Either hourmeter is an acceptable means of recording time in service (refer to Section 1.006).

Calendar time in service for the airframe and engine begins on the date of the original RHC-issued Export (or Standard) Certificate of Airworthiness for the helicopter. Calendar time in service for spares without a storage limit (refer to Section 1.490) begins on the date of the RHC-issued Airworthiness Approval Tag (Authorized Release Certificate) issued with the invoice.

When installing a life-limited part or a part with an overhaul requirement, record in the helicopter maintenance record the installation date, part number, part name, serial number, helicopter total time, and time in service accumulated by part since new or since last overhaul, as applicable.

**WARNING**

**Components with mandatory overhaul or retirement intervals whose time-in-service is not reliably documented cannot be considered airworthy and must be removed from service.**

3.003 Fatigue Life-Limited Parts

The Airworthiness Limitations Section lists the mandatory replacement schedule for fatigue life-limited parts.

If a part is fatigue life-limited or has a mandatory overhaul requirement and is interchanged between an R44 and an R66 helicopter, and if the part life-limit or overhaul requirement is different between an R44 and an R66 helicopter, the shorter life-limit or overhaul requirement must be used. If a part is fatigue life-limited or has a mandatory overhaul requirement, and the accumulated cycles and/or time-in-service are known but the helicopter type is unknown, the shorter life-limit or overhaul requirement must be used.

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.

### 3.100 Overhaul Requirements

#### 3.110 Powerplant Overhaul Requirements

The engine must be overhauled in accordance with the engine manufacturer's overhaul recommendations and procedures. Refer to latest revision of Textron Lycoming Service Instructions No. 1009.

#### 3.120 Aircraft Overhaul Requirements

The complete airframe, including rotor systems, drive system, control system, and fuselage, must be overhauled as instructed by Robinson Helicopter Company when any of the following occur:

1. When the helicopter has been operated for 2200 hours since new or since last overhaul.
2. When an inspection of the helicopter indicates extensive subsurface corrosion in the primary structure, drive system or control system.
3. When the helicopter condition has deteriorated so the helicopter can no longer meet the performance, controllability or safety specifications given in the Pilot's Operating Handbook.
4. When the aircraft has been in service for twelve years since new or since last overhaul, regardless of the hours flown.

**WARNING**

**Suspected damaged parts removed from damaged aircraft are not to be reinstalled in any aircraft unless part has been returned to RHC, together with its damage history, for inspection and is found by RHC to be airworthy.**

### 3.200 Type Certificate Data Sheet (TCDS)

The Robinson R44 and R44 II Type Certificate Data Sheet (TCDS) reprinted on the following pages is subject to revision.

Visit the FAA Aircraft Certification Regulatory and Guidance Library online databases for TCDS revision status at: <http://rgl.faa.gov>.



**I. Model R44 (Normal Category Rotorcraft), Approved December 10,1992, (cont'd)**

**Airspeed Limits**

S/Ns below 10000:

V<sub>NE</sub> (never exceed speed) at sea level is 130 KIAS (120 KIAS with fixed floats) for takeoff gross weights of 2200 lbs. or less. V<sub>NE</sub> at sea level is 120 KIAS (110 KIAS with fixed floats) for takeoff gross weights over 2200 lbs.

S/N 30001 and subsequent:

V<sub>NE</sub> (never exceed speed) at sea level is 120 KIAS for all takeoff weights with or without fixed floats.

For all S/Ns:

Power Off (Autorotation) V<sub>NE</sub> at sea level is 100 KIAS.

For reduction of V<sub>NE</sub> with altitude and temperature, see appropriate Rotorcraft Flight Manual.

Airspeed limit at power settings above Maximum Continuous Power is 100 KIAS.

Airspeed limit with inflated pop-out floats is 80 KIAS.

Airspeed limit for any combination of Doors Off is 100 KIAS.

**Center of Gravity (C.G.) Range**

S/Ns below 10000:

Gross Weight (lbs.)	Longitudinal C.G. Range		Lateral C.G. Range		
	Forward (in.)	Aft (in.)	Long. C. G. (in.)	Left (in.)	Right (in.)
1550	92.0	102.5	92.0	-3.0	+3.0
2000	92.0	102.5	100.0	-3.0	+3.0
2200	92.0	100.25	102.5	-1.5	+1.5
2400	93.0	98.0			

Note: Straight line variation between points shown

S/N 30001 and subsequent:

Gross Weight (lbs.)	Longitudinal C.G. Range		Lateral C.G. Range		
	Forward (in.)	Aft (in.)	Long. C. G. (in.)	Left (in.)	Right (in.)
1550	92.0	102.5	92.0	-3.0	+3.0
2000	92.0	102.5	100.0	-3.0	+3.0
2200	93.0	100.25	102.5	-1.5	+1.5

Note: Straight line variation between points shown

**Empty Weight C.G. Limit**

For all S/Ns, Empty weight C.G. must be such that calculated C.G. with 150 lb. pilot and full fuel is at STA 102.5 or forward.

**Maximum Weight**

S/Ns below 10000:

2400 lb.

S/N 30001 and subsequent:

2200 lb.

**I. Model R44 (Normal Category Rotorcraft), Approved December 10,1992, (cont'd)**

Minimum Crew 1 pilot at right side control station

Number of Seats S/Ns below 10000:  
4 (3 for Police and ENG Version)

Seat Locations: Pilot and Forward Passenger at STA 49.5  
Aft Passengers at STA 79.5

S/N 30001 and subsequent:  
2

Seat Locations: STA 49.5

Maximum Baggage 50 pounds of baggage and installed equipment in any baggage compartment. For any seat location, the maximum combined weight of the seat load, baggage, and installed equipment is 300 lbs.

For S/N 30001 and subsequent, maximum load on aft deck is 50 lbs each side, and maximum load in each compartment under aft deck is 50 lb.

Fuel Capacity

Tank	Tanks Without Bladders		Tanks With Bladders		Location (STA)
	Capacity (gal.)	Usable (gal.)	Capacity (gal.)	Usable (gal.)	
Main	31.6	30.6	30.5	29.5	106.0
Auxiliary	18.5	18.3	17.2	17.0	102.0

Oil Capacity

Component	Capacity (qt.)	Location (STA)
Engine	9	110.0
Main Rotor Transmission	2	100.0
Tail Rotor Transmission	0.11	327.0
Hydraulic Reservoir (if installed)	0.65	117.0

Maximum Operating Altitude

Density Altitude Limit 14,000 ft.  
Maximum altitude above ground level is 9000 ft. to allow landing within 5 minutes in case of fire.

Manufacturer's Serial Numbers

0002, 0004 thru 9999 except 1140, 30001 and subsequent.

Certification Basis

14 CFR Part 27, dated February 1, 1965, including Amendments 27-1 through 27-24, Exemption No. 5473 dated July 2, 1992, to §27.955(a)(7) and 27.1305(q), and Exemption No. 6692 dated October 17, 1997 to §27.695.

14 CFR Part 36 Amendment 36-20.

Equivalent Safety Finding:

Number TD10352LA-R/S-1  
14CFR Part 27.1401(d), Anticollision Light System

Special Condition:

No. 27-033-SC Robinson Model R44 and R44 II Helicopters, Installation of HeliSAS Autopilot and Stabilization Augmentation System (AP/SAS).

**I. Model R44 (Normal Category Rotorcraft), Approved December 10,1992, (cont'd)**

Equipment The basic required equipment as prescribed in the applicable airworthiness regulations (see Certification Basis) must be installed in the aircraft for certification. In addition, the following FAA-approved Rotorcraft Flight Manual is required:

S/Ns below 10000:  
R44 Rotorcraft Flight Manual (RTR 461) dated December 10, 1992, or later revision (See NOTES 4, 5, & 6).

S/N 30001 and above:  
R44 Cadet Rotorcraft Flight Manual (RTR 463) dated April 29, 2016, or later revision.

**II. Model R44 II (Normal Category Rotorcraft), Approved October 3, 2002**

The R44 II helicopter includes a fuel injected engine with a 245 hp takeoff rating and a maximum weight of 2500 lb. The Rotorcraft Flight Manual has manufacturer’s document number RTR 462.

Engine One Lycoming IO-540-AE1A5, Type Certificate number 1E4

Fuel 100 LL grade aviation gasoline  
100/130 grade aviation gasoline

Engine Limits Maximum continuous: 205 hp at 2718 rpm (102%)  
Takeoff (5 minute): 245 hp at 2718 rpm (102%)

See Rotorcraft Flight Manual for manifold pressure settings corresponding to horsepower limits.

Rotor Speed Limits

Power Off (Rotor Tach)	Power On (Rotor Tach)
Maximum: 432 rpm (108%)	Maximum: 408 rpm (102%)
Minimum: 360 rpm (90%)	Minimum: 404 rpm (101%)

Airspeed Limits

V<sub>NE</sub> (never exceed speed) at sea level is 130 KIAS (120 KIAS with fixed floats) for takeoff gross weights of 2200 lbs. or less. V<sub>NE</sub> at sea level is 120 KIAS (110 KIAS with fixed floats) for takeoff gross weights over 2200 lbs.

Power Off (Autorotation) V<sub>NE</sub> at sea level is 100 KIAS.

For reduction of V<sub>NE</sub> with altitude and temperature, see Rotorcraft Flight Manual.

Airspeed limit at power settings above Maximum Continuous Power is 100 KIAS.

Airspeed limit with inflated pop-out floats is 80 KIAS.

Airspeed limit for any combination of Doors Off is 100 KIAS.



**II. Model R44 II (Normal Category Rotorcraft), Approved October 3,2002, (cont'd)**

Center of Gravity (C.G.) Range

Gross Weight (lbs.)	Longitudinal C.G. Range		Lateral C.G. Range		
	Forward (in.)	Aft (in.)	Long. C. G. (in.)	Left (in.)	Right (in.)
1600	92.0	102.5	92.0	-3.0	+3.0
2100	92.0	102.5	100.0	-3.0	+3.0
2300	92.0	100.25	102.5	-1.5	+1.5
2500	93.0	98.0			

Note: Straight line variation between points shown

Empty Weight C.G. Limit

Empty weight C.G. must be such that calculated C.G. with 150 lb. pilot and full fuel is at STA 102.5 or forward.

Maximum Weight

2500 lb.  
2400 lb. for intentional water landings with fixed or pop-out floats.

Minimum Crew

1 pilot in forward right seat.

Number of Seats

4 (3 for Police and ENG Versions)  
Seat Locations: Pilot and Forward Passenger at STA 49.5  
Aft Passengers at STA 79.5

Maximum Baggage

50 pounds of baggage and installed equipment in any baggage compartment. For any seat location, the maximum combined weight of the seat load, baggage, and installed equipment is 300 lbs.

Fuel Capacity

Tank	Tanks Without Bladders		Tanks With Bladders		Location (STA)
	Capacity (gal.)	Usable (gal.)	Capacity (gal.)	Usable (gal.)	
Main	31.6	30.6	30.5	29.5	106.0
Auxiliary	18.5	18.3	17.2	17.0	102.0

Oil Capacity

Component	Capacity (qt.)	Location (STA)
Engine	9	110.0
Main Rotor Transmission	2	100.0
Tail Rotor Transmission	0.11	327.0
Hydraulic Reservoir	0.65	117.0

Maximum Operating Altitude

Density Altitude Limit - 14,000 ft.  
Maximum altitude above ground level is 9000 ft. to allow landing within 5 minutes in case of fire.

Manufacturer's Serial Numbers

1140, 10001 thru 29999

Certification Basis

14 CFR Part 27, dated February 1, 1965, including Amendments 27-1 through 27-24, and Exemption No. 6692 dated October 17, 1997 to §27.695.

14 CFR Part 36 Amendment 36-24.

Equivalent Safety Finding:

Number TD10352LA-R/S-1

14CFR Part 27.1401(d), Anticollision Light System

Special Condition:

No. 27-033-SC Robinson Model R44 and R44 II Helicopters, Installation of HeliSAS Autopilot and Stabilization Augmentation System (AP/SAS).

**II. Model R44 II (Normal Category Rotorcraft), Approved October 3, 2002, (cont'd)**

Equipment The basic required equipment as prescribed in the applicable airworthiness regulations (see Certification Basis) must be installed in the aircraft for certification. In addition, the following FAA-approved Rotorcraft Flight Manual is required:

R44 II Rotorcraft Flight Manual (RTR 462) dated October 3, 2002, or later revision (See NOTES 7 & 8).

DATA PERTINENT TO BOTH MODELS

Datum 100 in. forward of main rotor centerline.

Leveling Means Refer to the R44 Maintenance Manual and Instructions for Continued Airworthiness (RTR 460).

Rotor Blade and Control Movements Main Rotor blade angles at 75% radius:

Collective Pitch: 12.5° ±1.0° total travel

Note: Collective low pitch to be established in accordance with the Maintenance Manual and Instructions for Continued Airworthiness (RTR 460) procedures to obtain proper autorotation RPM.

Cyclic Pitch:	Forward	13.50° to 14.25°
	Aft	13.50° to 14.25°
	Left	7.5° to 8.5°
	Right	6.0° to 7.0°

Tail Rotor blade angles at 75% radius:

Collective Pitch:	Full right pedal	15.5° to 16.5°
	Full left pedal	18.5° to 19.0°

Production Basis Production Certificate No. 424WE dated February 11, 1993.

GENERAL NOTES

- NOTE 1. A current weight and balance report, including a list of equipment included in the certificated empty weight, and loading instructions when necessary, must be provided for each aircraft at the time of original airworthiness certification and at all times thereafter, except in the case of operators having an approved weight control system.
- NOTE 2. The following placard must be installed in clear view of the pilot:  
"THIS ROTORCRAFT APPROVED FOR DAY AND NIGHT VFR OPERATIONS"
- For additional placards, see the Rotorcraft Flight Manual. All placards required in the Rotorcraft Flight Manual must be installed in the appropriate locations.
- NOTE 3. Information essential to the proper maintenance of the helicopter, including retirement time of critical components, is contained in the Robinson R44 Maintenance Manual and Instructions For Continued Airworthiness (RTR 460). Retirement times are listed in the "AIRWORTHINESS LIMITATIONS" section.
- NOTE 4. R44 Rotorcraft Flight Manual Supplement 5 dated July 17, 1996, or later revision is required when float landing gear is installed.

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NOTE 5. R44 Rotorcraft Flight Manual Supplement 10 dated June 10, 1999, or later revision is required when emergency (pop-out) floats are installed.

NOTE 6. R44 Rotorcraft Flight Manual with revisions through November 5, 1999, or later revision is required when hydraulically-boosted main rotor flight controls are installed.

NOTE 7. Deleted as of April 29, 2016.

NOTE 8. Deleted as of April 29, 2016.

NOTE 9. Deleted as of February 13, 2015.

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3.300 Airworthiness Limitations

The Airworthiness Limitations section is FAA approved and specifies inspections and other maintenance required under 14 CFR §§ 43.16 and 91.403, unless an alternative program has been FAA approved.

There are two lists for fatigue life-limited parts. The first list (this page) is applicable to all R44 and R44 II helicopters. The second list (following page) provides increased service lives which may be used for the two-seat R44 Cadet configuration (R44 serial numbers 30001 through 39999).

**R44 and R44 II Fatigue Life-Limited Parts**

<u>Part Number</u>	<u>Description</u>	<u>Maximum Service Life</u>
C023-1	Tailcone Assembly, Rev M & Prior	2000 Hours
C016-2, -5, & -7	Main Rotor Blade	2200 Hours or 12 years <sup>1</sup>
C020-1 & -2	Upper Frame	2200 Hours
C029-1, -2, & -3	Tail Rotor Blade	2200 Hours or 12 years <sup>1</sup>
C030-1	Tail Rotor Hub	2200 Hours
C044-1	Horizontal Stabilizer, Rev L & Prior	2200 Hours <sup>2</sup>
C146-1 & -5	Gear Set, Main Gearbox	2200 Hours
C154-1	Main Rotor Hub	2200 Hours <sup>2</sup>
C158-1	Main Rotor Spindle	2200 Hours <sup>2</sup>
C196-1	Tail Rotor Drive Shaft	2200 Hours
C263-1 & -2	Sump, Main Gearbox	2200 Hours
C264-1 & -2	Housing, Main Gearbox	2200 Hours
C545-1	Gear Set, Tail Gearbox	2200 Hours <sup>2</sup>
C647-12	Bearing Set, C017-6 Swashplate	2200 Hours <sup>2</sup>
D062-2	Tail Rotor Hub	2200 Hours
D079-1	Tail Rotor Guard	2200 Hours <sup>2</sup>
G062-2	Tail Rotor Hub	2200 Hours <sup>2</sup>
A756-6	Cyclic Grip	4400 Hours
C023-1	Tailcone Assembly, Rev N & Subsequent	4400 Hours
C023-2, -3, -4, -14, & -15	Tailcone Assembly	4400 Hours
C044-1	Horizontal Stabilizer, Rev M & Subsequent	4400 Hours <sup>2</sup>
C198-1 & -2	Lower Swashplate	4400 Hours
C251-1	Main Rotor Shaft	4400 Hours
C319-3	Cyclic Torque Tube	4400 Hours
C320-1	Cyclic Stick	4400 Hours
C337-1	Jackshaft	4400 Hours
D196-1	Tail Rotor Drive Shaft	4400 Hours <sup>2</sup>

<sup>1</sup> Whichever limit occurs first. Calendar time starts on date of original RHC-issued Airworthiness Approval.

<sup>2</sup> Maximum service life is 2000 hours if part is, or ever has been, installed on an R66 helicopter.

