
Type Acceptance Report

TAR 3/21B/28

Robinson R44 II

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Executive Summary

New Zealand Type Acceptance has been granted to the R44 II based on validation of FAA Type Certificate number H11NM. There are no special requirements for import. The R44 II is now eligible for the issue of an Airworthiness Certificate in the Standard Category in accordance with CAR §21.177, subject to any outstanding New Zealand operational requirements being met. (See Section 5 of this report for a review of compliance of the basic type design with the operating Rules.)

1. Introduction

This report details the basis on which Type Acceptance Certificate No. 3/21B/28 was granted in the Standard Category in accordance with NZCAR Part 21 Subpart B.

Specifically the report aims to:

- (a) Specify the foreign type certificate and associated airworthiness design standard used for type acceptance of the model(s) in New Zealand; and
- (b) Identify any special conditions for import applicable to any model(s) covered by the Type Acceptance Certificate; and
- (c) Identify any additional requirements which must be complied with prior to the issue of a NZ Airworthiness Certificate or for any subsequent operations.

2. Foreign Type Certificate Details

Type Certificate: H11NM

Issued by: Federal Aviation Administration

Manufacturer: Robinson Helicopter Company

Model: R44 II

Engine: Lycoming IO-540-AE1A5

MCTOW 2500 lb.

Noise Category: FAR Part 36 at Amendment 36-24

The certification basis of the R44 II is FAR Part 27, dated February 1, 1965, including Amendments 27-1 through 27-24. (However RHC advise they elected to comply with the latest amendment of Part 27 for the optional engine installation, except as noted in the Compliance Checklist.) Exemption No.6692 against §27.695 was carried forward from the R44, and has been previously accepted by the CAA.

This is an acceptable certification basis in accordance with NZCAR Part 21B Para §21.41, as FAR 27 is the basic standard for rotorcraft called up under Part 21 Appendix C. There are no non-compliances and no special conditions have been prescribed by the Director under §21.23. (The original R44 was type accepted in NZ under TAR 7/93.)

3. Type Acceptance Certificate

The application for New Zealand type acceptance was from the NZ agent, Skysales Aviation (NZ) Ltd, dated 21 February 2002. The first-of-type example was serial number 10034 registered ZK-HTW. The R44 is a four-place all-metal piston-powered helicopter with single teetering main rotor blade system, conventional tail rotor and skid landing gear.

Type Acceptance Certificate No. 3/21B/28 was granted on 13 March 2003 to the Robinson R44 II based on validation of FAA Type Certificate H11NM, and includes the Lycoming IO-540-AE1A5 Series engine based on FAA Type Certificate 1E4. There are no special requirements for import into New Zealand.

The R44 II is a development of the R44 with a 245 hp takeoff rating injected version of the six-cylinder Lycoming engine, for improved performance at altitude, and a 100 lb. increase in MTOW, primarily to compensate for a higher empty weight. Minor changes include a revised fuel system including electric fuel pump; incidental changes to engine controls and instruments; slightly increased area of main rotor blades (increased chord on the outer 1/3 of the span, to reduce vibration and blade stresses at altitude); strengthening of some main rotor control system components; the addition of aerodynamic (rounded) tip caps to the main and tail rotor blades, for reduced noise; and a 28-volt electrical system to aid starting.

4. Type Data

The type data requirements of NZCAR Part 21B Para §21.43 have been satisfied by supply of the following documents:

(1) Type certificate:

FAA Helicopter Type Certificate No. H11NM – R44 II Approved Oct 10, 2002
FAA TCDS No. H11NM at Revision 3 dated October 10, 2002

TCDS No. 1E4 at Rev.20 dated Nov 14, 2002 – -AE1A5 approved Jan 22, 2002

(2) Airworthiness design requirements: Already held by the CAA

(3) Certification compliance listing:

RHC Report RTR 472 – Substantiation of IO-540 Engine Installation – Rev.E

Exemption No. 6692 from §27.695 – This requires an alternate power operated control system to be available so the helicopter can be flown and landed safely in the event of any single failure. RHC petitioned to use a simple cost-effective hydraulic actuator based on the Bell 206 design, which has a proven reliability history free of any accidents resulting from jamming.

(4) Flight manual: FAA-Approved Robinson R44 II Pilot's Operating Handbook and Rotorcraft Flight Manual – Document RTR 462
CAA Accepted as AIR 2821

(5) Illustrated Parts Catalogue:

Existing IPC will be revised to include the R44 II (Draft Revision supplied)

Engine Parts Catalog IO-540-AE1A5 – Part No. PC-615-13 January 2003

(6) Maintenance manual and service data for aircraft and engine:

Existing MM will be revised to include the R44 II
(Draft copy of Change 9 Feb 2003 supplied)

O, IO-540 Operator's Manual Pub. No. 60297-10 revised to include –AE Series

(7) Agreement from manufacturer to supply updates of data in (4), (5) and (6):

CAA 2171 form from RHC V.P. Engineering dated 20 February 2003.

CAA 2171 form from Lycoming FAA/DER Liaison dated 10 March, 2003

5. Additional New Zealand Requirements

Compliance with the retrospective airworthiness requirements of NZCAR Part 26 is a prerequisite for the grant of a type acceptance certificate.

Civil Aviation Rules Part 26

Subpart B - Additional Airworthiness Requirements

Appendix B - All Aircraft

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
B.1	Marking of Doors and Emergency Exits	<i>To be determined on an individual aircraft basis</i>
B.2	Crew Protection Requirements - CAM 8 Appdx. B # .35	Not Applicable – Agricultural aircraft only

Appendix E - Helicopters

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
E.1	Doors and Exits	FAR §27.783 and FAR §27.807(b)(2) – Simple direct-action levers comply with this requirement
E.2.1	Emergency Exit Marking	FAR §27.807(b)(3) and FAR §27.1557(d)

Compliance with the following additional NZ operating requirements has been reviewed and were found to be covered by either the original certification requirements or the basic build standard of the aircraft, except as noted:

Civil Aviation Rules Part 91

Subpart F - Instrument and Equipment Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
91.505	Shoulder Harness if Aerobatic; >10 pax; Flight Training	FAR §27.785(b) -
91.507	Pax Information Signs - Smoking, safety belts fastened	N/A – Certificated seating capacity less than ten pax. seats
91.509 Min. VFR	(1) ASI FAR §27.1303(a) – Fitted as Standard – See POH Section 7 N/A – No Mach limitations (2) Machmeter FAR §27.1303(b) – Fitted as Standard – See POH Section 7 (3) Altimeter FAR §27.1303(c) – Fitted as Standard – See POH Section 7 (4) Magnetic Compass FAR §27.1303(d) – Fitted as Standard – See POH Section 7 (5) Fuel Contents FAR §27.1305(k) – Fitted as Standard – See POH Section 7 (6) Engine RPM FAR §27.1305(h) – Fitted as Standard – See POH Section 7 (7) Oil Pressure	(8) Coolant Temp N/A – Air-cooled engine (9) Oil Temperature FAR §27.1305(j) – Fitted as Standard – See POH Section 7 (10) Manifold Pressure FAR §27.1305(e) – Fitted as Standard – See POH Section 7 (11) Cylinder Head Temp. FAR §27.1305(b) – Fitted as Standard – See POH Section 7 (12) Flap Position N/A – Helicopter (13) U/c Position N/A – Fixed undercarriage (14) Ammeter/Voltmeter FAR §27.1351(d) – Fitted as Standard – See POH Section 7
91.511 Night	(1) Turn and Slip Turn co-ordinator optional fit (2) Position Lights FAR §27.1385	(3) Anti-collision Lights FAR §27.1401 (4) Instrument Lighting FAR §27.1381

91.513	VFR Communication Equipment	Operational Requirement – Compliance as applicable
91.517	IFR Instruments and Equipment	Not Applicable – The R44 is only approved for VFR flight
91.519	IFR Communication and Navigation Equipment	Not Applicable – The R44 is only approved for VFR flight
91.523	(a) More Than 10 pax - First Aid Kits per Table 7	Not Applicable – Less than 10 passengers
Emrgcy	- Fire Extinguishers per Table 8	Not Applicable – Less than 10 passengers
Eqpmt.	(b) More than 20 pax - Axe readily acceptable to crew	Not Applicable – Less than 20 passengers
	(c) More than 61 pax - Portable Megaphones per Table 9	Not Applicable – Less than 61 passengers
91.529	ELT - TSO C91a after 1/4/97 (or replacement)	To be determined on an individual aircraft basis
91.531	Oxygen Indicators - Volume/Pressure/Delivery	Oxygen System not fitted as standard
91.533	>30 min above FL100 - Supplemental for crew, 10% Pax	Oxygen System not fitted as standard
Unpress.	- Therapeutic for 3% of Pax	(Maximum operating altitude is specified in the Flight
A/c	Above FL100 - Supplemental for all Crew, Pax	Manual as not above 9000 feet AGL, to allow landing within
	- Therapeutic for 1% Pax, 120l PBE for each crew member	5 minutes in case of fire.)
91.541	SSR Transponder and Altitude Reporting Equipment	Operational Requirement – Compliance as applicable
91.543	Altitude Alerting Device - Turbojet or Turbofan	Not Applicable – Not turbo jet or turbofan powered
91.545	Assigned Altitude Indicator	Not Applicable – The R44 is only approved for VFR flight
A.15	ELT Installation Requirements	To be determined on an individual aircraft basis

Civil Aviation Rules Part 135

Subpart F - Instrument and Equipment Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
135.355	Seating and Restraints – Shoulder harness - flight-crew seats	FAR §27.785(b)
135.357	Additional Instruments (Powerplant and Propeller)	FAR §27.1305
135.359	Night Flight Landing light, Passenger compartment	Operational Requirement – Compliance as applicable
135.361	IFR Operations Speed, Altitude, spare bulbs/fuses	Not Applicable – The R44 is only approved for VFR flight
135.363	Emergency Equipment (Part 91.523 (a) and (b))	Operational Requirement – Compliance as applicable
135.367	Cockpit Voice Recorder	Not Applicable – Less than 10 passenger seats
135.369	Flight Data Recorder	Not Applicable – Less than 10 passenger seats
135.371	Additional Attitude Indicator	Not Applicable – Not turbo jet or turbofan powered

Attachments

The following documents form attachments to this report:

- Photographs first-of-type example R44 II s/n 10034 ZK-HTW
- Three-view drawing Robinson Model R44 II “Raven”
- Copy of FAA Type Certificate/ Type Certificate Data Sheet H11NM

Sign off

David Gill
Team Leader Airworthiness

Date: 7 July 2003