
Type Acceptance Report

TAR 11/21B/3 – Revision 1

BELL 429

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Executive Summary

New Zealand Type Acceptance has been granted to the Bell 429 model based on validation of Transport Canada Type Certificate number H-107. There are no special requirements for import.

Applicability is currently limited to the Models and/or serial numbers detailed in Appendix 1, which are now eligible for the issue of an Airworthiness Certificate in the Standard Category in accordance with NZCAR §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.) Additional variants or serial numbers approved under the foreign type certificate can become type accepted after supply of the applicable documentation, in accordance with the provisions of NZCAR §21.43(c).

1. Introduction

This report details the basis on which Type Acceptance Certificate No.11/21B/3 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 in New Zealand; and
- (b) Identify any special conditions for import applicable to any model 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. ICAO Type Certificate Details

Manufacturer:	Bell Helicopter Textron Canada Limited
Type Certificate:	H-107
Issued by:	Transport Canada
Model:	429
MCTOW	7,000 lb 7,500 lb (with increased gross weight modification)
Max. No. of Seats:	8
Noise Standard:	FAR 36 App H (stage 2) and ICAO Annex 16 Volume 1 Chapter 8
Engine:	Pratt & Whitney Canada PW207D1 or D2 Type Certificate: E-23

Issued by: Transport Canada

3. Type Acceptance Details

The application for New Zealand type acceptance was from the type certificate holder, Bell Helicopter Textron Canada Ltd, dated 16 July 2010. As part of the type acceptance exercise the CAA sent a certification team to Bell Helicopters factory at Mirabel for a validation visit.

Type Acceptance Certificate No. 11/21B/3 was granted on 16 November 2010 to the Bell 429 based on validation of Transport Canada Type Certificate H-107. (Type Acceptance of the PW207D1 and D2 engines is covered by separate Type Acceptance certificate 11/21B/11). Specific applicability is limited to the coverage provided by the operating documentation supplied. There are no special requirements for import into New Zealand.

This report was raised to Revision 1 to add an optional modification to increase the gross weight from 7,000 lb to 7500 lb, which required an exemption from Transport Canada AWM 527.1(a), equivalent to FAR 27.1(a). This was reviewed and accepted by the NZ CAA. New Zealand Type Acceptance was granted on 19 March 2012.

The Bell 429 is a twin-turbine-powered eight place helicopter with a conventional four-bladed main rotor and a four bladed stacked tail rotor. There are some similarities to the earlier Bell model 427 but the design of the 429 was sufficiently different to justify a new Type Certificate.

The helicopter is certificated as standard for Category A single-pilot IFR operations using the BasiX-Pro integrated avionics and flight control system. This includes a two-screen EFIS system and dual autopilot/flight control systems providing 3-axis stability and control augmentation with a coupled flight director capability. The tail rotor blades, main rotor blades and main rotor hub are of composite construction, and composites are used extensively in the airframe. The interior features energy attenuating seats, with an open cabin and a flat floor. It has an MSG-3 based approved maintenance program.

NOTE: The Bell 429 is also covered by FAA Type Certificate R00003RD and EASA Type Certificate EASA.IM.R.506. Bell Helicopter advises that the type design is identical for all three type certificates and all use the same flight manual. Bell Helicopter questioned the acceptability of all three type certificates to maximise the applicability of STC approvals for its customers. The CAA prefers to accept one type certificate to avoid complication or confusion, that being the type certificate of the State of Design.

However, as the type designs are identical, in accordance with NZCAR 21.503(a), Supplemental Type Certificates issued by EASA supplemental to EASA Type Certificate IM.R.506 and Supplemental Type Certificates issued by the FAA supplemental to FAA Type Certificate R00003RD, are deemed to be acceptable technical data in New Zealand.

4. NZCAR §21.43 Data Requirements

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

(1) ICAO Type certificate:

Transport Canada Type Certificate H-107 issued June 20, 2009

TC Type Certificate Data Sheet number H-107 at Issue 3 dated January 11, 2012
– Model 429 approved November 19, 2009

(2) Airworthiness design requirements:

(i) *Airworthiness Design Standards:*

The certification basis of the model 429 is:

Transport Canada Airworthiness Manual (AWM) Chapter 527 *Normal Category Rotorcraft* at change 527-6 published June 1, 2005 (equivalent to FAR Part 27 at Amdt 27-40) including Appendix B for IFR and Appendix C for Category A, plus FAR Part 27, Amdt 27-44, effective June 16, 2008 as adopted by reference.

AWM Chapter 527 Appendix C – *Criteria for Category A* specifies certain sections of AWM Chapter 529 – *Transport Category Rotorcraft*. For these specified sections, AWM Chapter 529 at change 529-6 published June 20, 2008 (equivalent to FAR 29 at Amdt 29-45) is applicable, plus FAR 29.1587(a)(7) Amdt 29-51, effective March 31, 2008 as adopted by reference.

The certification basis under FAA Type Certificate R00003RD and EASA Type Certificate IM.R.506 are equivalent.

This is an acceptable certification basis in accordance with NZCAR Part 21B Para §21.41 and Advisory Circular 21-1A, as AWM 527 and 529 are equivalent to FAR Parts 27 and 29, which are the basic standards for Normal and Transport Category helicopters called up under Part 21 Appendix C. There are no non-compliances and no additional special conditions have been prescribed by the Director under §21.23.

(ii) *Special Conditions:*

SCA 2005-06; High Intensity Radiated Fields (HIRF) – Provides additional requirements for the effects of high intensity radiated fields on aircraft fitted with advanced electrical and electronic systems. (Added to FAR 27 at Amdt 43.)

SCA 2005-07; 30-second OEI Power Limits – Limit Override Feature – Provides additional requirements for use of manual override on 30 second OEI limits. (When the override is utilised, the aircraft becomes unserviceable. The engine and gearbox may need to be overhauled.)

(iii) *Equivalent Level of Safety Findings:*

AWM Chapter 527, section 529.903(b) for Category A – Engine or Drive System Cooling Fan Blade Protection – Both cooling fans are driven by the tail-rotor drive shaft and a single failure will cause loss of function of both. This does not meet the Category A requirements. Bell demonstrated that loss of function of both cooling fans did not effect continued safe flight.

AWM Chapter 527, sections 527.307(b)(5), 527.723, 527.725 and 527.727 – Landing Gear Limit Drop Test – The landing gear configuration was changed after the drop testing was completed. Bell substantiated the new configuration by analysis.

AWM 527/529.1545(b)(2) – Airspeed Indicator Markings of V_{NE} (Autorotation) – The power-off autorotation speed is not permanently marked by a red cross-hatched line. The EADI presentation of airspeed includes a red line for the V_{NE} which is continuously calculated for the operating conditions at the time.

(iv) *Exemptions:*

Transport Canada issued an exemption against the definition in AWM 527.1(a) (equivalent to FAR 27.1(a)) to allow a MTOW above the limit of 7000 lb. This was issued on the basis that the Bell 429 is certified as a single-pilot IFR helicopter with dual autopilot system and is approved for Category A operations under FAR Part 29 Appendix C. In addition it has fitted as standard many features which exceed the basic requirements of Part 27. This equipment increases the operational safety but brings an empty weight penalty. Transport Canada concluded it was in the public interest to allow for an increase in MTOW to 7500 lb to restore the load-carrying capacity of the helicopter, subject to the following conditions: It is only applicable when the manufacturer's optional kit 429-706-079 is incorporated; No increase in the number of occupants is permitted; Life-limited components had to be re-assessed for the effects of the weight increase; and specified safety equipment is required to be fitted (CVR/FDR, HTAWS, Rad.Alt., Dual Autopilot and bird repellent device[forward flashing lights]).

(v) *Airworthiness Limitations:*

Chapter 4 of the maintenance manual BHT-429-MM-1.

(3) Aircraft Noise and Engine Emission Standards:

(i) *Environmental Standard:*

The Model 429 has been certificated under AWM 516, *Aircraft Emissions*: Subchapter A for Aircraft Noise (this refers to ICAO Annex 16, Volume 1) and Subchapter B for Prevention of Vented Fuel (this refers to ICAO Annex 16, Vol II, Part II).

Compliance with FAR Part 36, up to and including Amdt 36-28 effective February 3, 2006 has also been shown. Certified as a Stage 2 helicopter under FAR Part 36.

Certified Noise levels for 7,000 lb gross weight are (Flight Manual Para 4.10):

Takeoff 88.9 EPNdB, Flyover 89.6 EPNdB, Approach 91.4 EPNdB

Certified Noise levels for 7,500 lb gross weight are (BHT-429-FMS-1 Para 4.10):

Takeoff 88.2 EPNdB, Flyover 89.6 EPNdB, Approach 91.8 EPNdB

Compliance Listing:

Noise Certification Compliance of the Bell 429 – Report 429-993-007

Noise Certification Compliance of the Bell 429 increased gross weight – Report 429-993-022

(4) Certification Compliance Listing:

Bell Model 429 Certification Plan – Report 429-099-023

Bell Model 429 increased gross weight Certification Plan 429-099-156

- (5) Flight Manual: Transport Canada-approved Rotorcraft Flight Manual for the Bell 429 – Document BHT-429-FM-1 – CAA Accepted as AIR 3169

Flight manual supplement BHT-429-FMS-11 “Increased Internal Gross Weight to 7,500 pounds (3,402kg)”.

- (6) Operating Data for Aircraft:

(i) *Maintenance Manual:*

Bell 429 Maintenance Manual BHT-429-MM-1

Bell 429 Component Maintenance Manual BHT-429-CMM

Bell 429 Component Maintenance Manual – Vendor BHT-429-CMM-V

(ii) *Current service Information:*

Bell 429 Alert Service Bulletins

Bell 429 Technical Bulletins

Bell 429 Information Letters

Bell 429 Operator Safety Notices

(iii) *Illustrated Parts Catalogue:*

Bell 429 Illustrated Parts Catalogue BHT-429-IPB

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

Bell provides on-line document access at their website www.bellhelicopter.net

- (8) Other information:

Bell 429 Initial Maintenance Requirements Report 429-PSE-002

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	Compliance with AWM 527 subpart D, at revision 527-9 dated 1 December 2009, which includes doors, seat dynamic testing and cabin and fuel tank crashworthiness provisions, is considered to provide an Equivalent Level of Safety to these exit requirements.
E.2.1	Emergency Exit Marking	<i>To be determined on an individual aircraft basis</i>

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	Seating and Restraints – Safety belt/Shoulder Harness	FAR § 27.785
91.507	Pax Information Signs – Smoking, safety belts fastened	N/A – Less than 10 passenger seats
91.509 Min. VFR	(1) ASI (2) Machmeter (3) Altimeter (4) Magnetic Compass (5) Fuel Contents (6) Engine RPM (7) Oil Pressure	FAR § 27.1303(a) N/A FAR § 27.1303(b) FAR § 27.1303(c) FAR § 27.1305(d) FAR § 27.1305(k) FAR § 27.1305(h)
91.511 Night	(1) Turn and Slip (2) Position Lights	Std – Slip ball on all DU's Standard fit. MD 1-28-B. (3) Anti-collision Lights (4) Instrument Lighting Standard fit. MD 1-28-B.
91.513	VFR Communication Equipment	IFR compliant equipment fitted as standard – see below.
91.517 IFR	(1) Gyroscopic AH (2) Gyroscopic DI (3) Gyro Power Supply (4) Sensitive Altimeter	Std – EADI – IAM Fig 3-4 Std – EHSI – IAM Fig 3-5 Complies - IFR Certified Std – EADI – IAM Fig 3-4
91.519	IFR Communication and Navigation Equipment	Fitted as standard – FM Para 1-3. MD Para 1-15. Basic fit is two GNS430 and one GTX-330.
91.523 Emrgcy Eqpmt.	(a) More Than 9 pax - First Aid Kits per Table 7 - Fire Extinguishers per Table 8 (b) More than 20 pax - Axe readily accessible to crew (c) More than 61 pax - Portable Megaphones per Table 9	<i>To be determined on an individual aircraft basis.</i> <i>To be determined on an individual aircraft basis.</i> N/A – less than 20 pax. N/A – less than 61 pax.
91.529	ELT - TSO C126 406 MHz after 22/11/2007	<i>To be determined on an individual aircraft basis.</i> (Optional Bell kit BHT-429-II-25 installs an Artex C-406 ELT.)
91.531	Oxygen Indicators - Volume/Pressure/Delivery	<i>To be determined on an individual aircraft basis.</i>
91.533 Unpress. A/c	>30 min above FL100 - Supplemental for crew, 10% Pax - Therapeutic for 3% of Pax Above FL100 - Supplemental for all Crew, Pax - Therapeutic for 1% of Pax - 120I PBE for each crew member	<i>To be determined on an individual aircraft basis.</i> No optional kit available from Bell. Max operating altitude is 20,000 ft.
91.541	SSR Transponder and Altitude Reporting Equipment	GTX-330 fitted as standard. FM Para 1-3. MD Para 1-15.
91.543	Altitude Alerting Device - Turbojet or Turbofan	N/A – Not turbojet or turbofan.

91.545	Assigned Altitude Indicator	Standard fit – EADI – IAM Fig 3-4
A.15	ELT Installation Requirements	<i>To be determined on an individual aircraft basis.</i> (Optional Bell kit BHT-429-II-25 installs an Artex C-406 ELT.)

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
135.357	Additional Instruments (Powerplant and Propeller)	FAR §27.1305
135.359	Night Flight	Landing light, Pax compartment
135.361	IFR Operations	Speed, Alt, spare bulbs/fuses
135.363	Emergency Equipment (Part 91.523 (a) and (b))	<i>To be determined on an individual aircraft basis</i>
135.367	Cockpit Voice Recorder	N/A – Only for 2-crew helicopters with more than 10 pax
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

- * FM = Bell 429 Flight Manual BHT-429-FM-1
 MD = Bell 429 Rotorcraft Manufacturers Data BHT-429-MD-1
 IAM = Bell 429 Integrated Avionics Manual BHT-429-IAM

Attachments

The following documents form attachments to this report:

- Three-view drawing Bell Model 429
- Copy of Transport Canada Type Certificate Data Sheet H-107

Sign off

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 Greg Baum
 Airworthiness Engineer

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 Checked – David Gill
 Team Leader Airworthiness

Appendix 1

List of Type Accepted Variants:

Model:	Applicant:	CAA Work Request:	Date Granted:
429	Bell Helicopter Textron Canada Ltd	11/21B/3	14 December 2010
429 (IGW)	Bell Helicopter Textron Canada Ltd	12/21B/13	19 March 2012