
Type Acceptance Report

TAR 16/21B/12 – Revision 1

QUEST KODIAK 100

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
1. INTRODUCTION	1
2. STATE-OF-DESIGN TYPE CERTIFICATE DETAILS	1
3. TYPE ACCEPTANCE DETAILS	2
4. NZCAR §21.43 DATA REQUIREMENTS	3
5. ADDITIONAL NEW ZEALAND REQUIREMENTS	6
ATTACHMENTS	8
APPENDIX 1	8

Executive Summary

New Zealand Type Acceptance has been granted to the Quest Aircraft Kodiak 100 based on validation of FAA Type Certificate no. A00007SE. 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 §21.191, 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).

NOTE: Information in this report is correct as at the date of issue. The report is only updated when an application is received to revise the Type Acceptance Certificate. For details on the current type certificate holder and any specific technical data, refer to the applicable State-of-Design Type Certificate Data Sheet.

1. Introduction

This report details the basis on which Type Acceptance Certificate No. 16/21B/12 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 New Zealand Airworthiness Certificate or for any subsequent operations.

2. State-of-Design Type Certificate Details

TC Holder:	Quest Aircraft Design, LLC
Manufacturer:	Quest Aircraft Company (PC 728NM)
Type Certificate:	A00007SE
Issued by:	Federal Aviation Administration

Model: Kodiak 100

MCTOW 7255 lb. [3291 kg] (s/n 100-0035 and above, or with SN-025)
6750 lb. [3062 kg]

Max. No. of Seats: 10

Noise Standard: FAR Part 36

Engine: Pratt & Whitney Canada PT6A-34
Type Certificate: E-6
Issued by: Transport Canada

Propeller: Hartzell HC-E4N-3P(Y)/D9511FSB
Type Certificate: P10NE
Issued by: Federal Aviation Administration

3. Type Acceptance Details

The application for New Zealand type acceptance was from the type certificate holder, Quest Aircraft Design, dated August 4, 2015. The Kodiak 100 is a high-wing unpressurised single turbine-powered aircraft with fixed undercarriage of conventional configuration and all-metal construction. As part of the validation exercise a team from the CAA Aircraft Certification Unit visited Quest Aircraft at Sandpoint for a technical familiarisation meeting. (See Meeting Notes dated 3rd December 2015.)

Type Acceptance Certificate No. 16/21B/12 was granted on 5 February 2016 to the Quest Kodiak 100 based on validation of FAA Type Certificate A00007SE. Specific applicability is limited to the coverage provided by the operating documentation supplied. There are no special requirements for import into New Zealand. (Revision 1 of this report was issued to correct some minor errors in the original.)

The Kodiak 100 is a brand new design of light utility aircraft optimised for carrying loads into short unimproved airstrips, with good ground clearance and simple field maintenance. Initially the aircraft was approved at a MCTOW of 6750 lb., but this was increased to 7255 lb. from serial number 035 onwards. The increase can be retrofitted by incorporation of Service Notice 025, which references Quest Field Service Instruction FSI-007, Vortex Generator Clip Installation. The maximum landing weight remains 6690 lb., but this can be increased to 7255 lb. when optional large tyres are fitted on all three wheels, as per AFM Supplement AM901-008. The Kodiak was originally fitted with the S-Tec 55X autopilot, but from serial number 130 this changed to the Garmin GFC700 with Electronic Stability Protection. Other factory options available include an external cargo pannier, and the TKS ice protection system.

4. NZCAR §21.43 Data Requirements

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

(1) State-of-Design Type certificate:

FAA Type Certificate Number A00007SE

FAA Type Certificate Data Sheet no. A00007SE Revision 20 dated Jan 14, 2015
– Model Kodiak 100 approved May 31, 2007

(2) Airworthiness design requirements:

(i) *Airworthiness Design Standards:*

The certification basis of the Kodiak 100 is FAR Part 23, as amended by 23-1 through 23-55, plus several paragraphs at a later Amendment date, as noted on the TCDS, plus one special condition for HIRF. This is an acceptable certification basis in accordance with NZCAR Part 21B Para §21.41 and Advisory Circular 21-1A, as FAR 23 is the basic standard for Normal Category Airplanes 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:*

23-207-SC Protection of Electronic Flight Instrument System from the Effects of High Intensity Radiated Fields (HIRF) – This requires qualification of electronic systems and its associated wiring harness that perform critical functions, as installed in the aircraft, to the defined HIRF environment or, as an option to a fixed specified value using laboratory tests.

(iii) *Equivalent Level of Safety Findings:*

Nil

(iv) *Airworthiness Limitations:*

See Chapter 4 – Airworthiness Limitations Section of the Kodiak 100 AMM

(3) Aircraft Noise and Engine Emission Standards:

(i) *Environmental Standard:*

The Kodiak 100 has been certificated under FAR Part 34, including Amendments 34-1 through 34-3, and FAR Part 36, including Amendments 36-1 through 36-26 (original certification), and Amendment 36-28 for the Increased TGW Option.

(ii) *Compliance Listing:*

AeroAcoustics Document AA2138 – FAR Part 36 Appendix G Noise Certification of Quest Aircraft Company Kodiak 100 with Increased Takeoff Gross Weight Option.

AIRCRAFT CONFIGURATION:	POWERPLANT:	GROSS WEIGHT:	NOISE LEVEL:
Kodiak 100 with Cargo Pod	PT6A-34/HC-E4N	7255 lb.	83.3 dB
Kodiak 100 without Cargo Pod	PT6A-34/HC-E4N	7255 lb.	82.5 dB
Kodiak 100 with Cargo Pod	PT6A-34/HC-E4N	6750 lb.	83.5 dB
Kodiak 100 without Cargo Pod	PT6A-34/HC-E4N	6750 lb.	82.3 dB

(4) Certification Compliance Listing:

Quest Report No.: 100-100-000 – Compliance Checklist – Kodiak 100 – Rev. 17

Quest Report No.: 100-251-601 – Appendix B Compliance Checklist – Gross Weight Increase

Quest Report No.: 100-631-002 – Appendix B Compliance Checklist – Garmin Autopilot System

Quest Report No.: 100-290-000 – Jump Modifications – Kodiak 100 – Appendix A Compliance Checklist

(5) Flight Manual: FAA Approved Airplane Flight Manual and Pilot's Operating Handbook – Kodiak 100 Series Aircraft – Document No. AM 901.0
CAA Accepted as AIR 3342

(6) Operating Data for Aircraft:

(i) *Maintenance Manual:*

Kodiak 100 Series Aircraft AMM – Part No. AM 902.0

Kodiak 100 Series Aircraft Wiring Diagram Manual – Part No. AM 903.0

(ii) *Current service Information:*

Service Bulletins, Service Letters and Service Notices are available on the website at <http://questaircraft.com/service-notifications/>

(iii) *Illustrated Parts Catalogue:*

Kodiak 100 Series Aircraft IPC – Part No. AM 906.0

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

CAA 2171 form from Quest Vice President – Operations dated 4 August 2015

(8) Other information:

Kodiak 100 Series Aircraft Installed Equipment List – Part No. AM 905.0

Quest Report No.: 100-820-602 – Electrical Load and Power Source Analysis – Kodiak[®]100 – Revision 5

5. Additional New Zealand Requirements

Compliance with the retrospective airworthiness requirements of NZCAR Part 26 has been assessed as they are a prerequisite for the grant of an airworthiness 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	Partly Fitted as Standard – See compliance statement against FAR §23.783 in Report 100-700-001 – Design Compliance
B.2	Crew Protection Requirements – CAM 8 Appdx. B # .35	Not Applicable – Agricultural Aircraft only

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 §23.785 at Amendment 23-55
91.507	Pax Information Signs – Smoking, safety belts fastened	Not Applicable – 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 §23.1303(a) – * Not Required FAR §23.1303(b) – * FAR §23.1303(c) – KOEL FAR §23.1305(a) – * FAR §23.1305(d)(e) – * FAR §23.1305(b) – *
91.511 Night	(1) Turn and Slip (2) Position Lights	(8) Coolant Temp (9) Oil Temperature (10) Manifold Pressure (11) Cylinder Head Temp. (12) Flap Position (13) U/c Position (14) Ammeter/Voltmeter N/A – Turboprop FAR §23.1305(c) – * N/A – Turboprop N/A – Turboprop FAR §23.699(a)(2) – KOEL Not Applicable FAR §23.1351(d) – *
91.513	VFR Communication Equipment	(3) Anti-collision Lights (4) Instrument Lighting FAR §23.1401 – KOEL FAR §23.1381 – KOEL
91.517 IFR	(1) Gyroscopic AH (2) Gyroscopic DI (3) Gyro Power Supply (4) Sensitive Altimeter	Fitted as standard * (5) OAT (6) Time in hr/min/sec (7) ASI/Heated Pitot (8) Rate of Climb/Descent Fitted as Standard – KOEL Fitted as Standard – * Fitted as Standard – KOEL Fitted as Standard – *
91.519	IFR Communication and Navigation Equipment	Fitted as Standard *
	NOTE: The Kodiak 100 is type certificated for Day and Night VFR and IFR, and Flight Into Known Icing Conditions. KOEL – See Kinds of Operation Equipment List in AFM Section 2 – Limitations * Garmin G1000 Integrated Instrument and Avionics System has dual of: GDC74A Air Data Computers; GRS77 Attitude Heading Reference Systems; GMU44 magnetometers; GIA63W Integrated Avionics Units with VHF Nav/Comm and GPS (TSO-C145a Class 3 installed per AC 20-138A); and GMA1347D audio control panels with integrated Marker Beacon.	
91.523	Emergency Equipment: (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	Not Applicable – Less than 10 passenger seats N/A – NOTE: Kodiak is fitted with 3x Halon FE as standard Not Applicable – Less than 20 passenger seats Not Applicable – Less than 61 passenger seats
91.529	ELT – TSO C126 406 MHz after 22/11/2007	Artex ME406 fitted as standard (C406N std from s/n 174)
91.531	Oxygen Indicators – Volume/Pressure/Delivery	Optional system meets FAR §23.1447/9 (See AFM 7.22)
91.533	Oxygen for Non-pressurised Aircraft: >30 min above FL100 – Supplemental for crew, 10% Pax – Therapeutic for 3% of Pax Above FL100 – Supplemental for all Crew, Passengers – Therapeutic for 1% of Pax; – 120l portable supply for each flt. attendant	Maximum Operating Altitude in AFM is 25,000 ft. The optional oxygen system consists of either a 50 or 115 cubic foot bottle, a regulator/valve assembly with an integral filler port and overpressure protection device, a display/logic controller, and associated lines, fittings and sensors to supply supplemental oxygen throughout the cabin.
91.541	SSR Transponder and Altitude Reporting Equipment	GTx -33 Transponder fitted as standard
91.543	Altitude Alerting Device – Turbojet or Turbofan	Fitted as Standard with either S-Tec or GFC700 Autopilot
91.545	Assigned Altitude Indicator	Not Applicable – Altitude alerting device fitted
A.15	ELT Installation Requirements	Standard factory installation is compliant by inspection

Civil Aviation Rules Part 125

Subpart F – Instrument and Equipment Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
125.53	(b) Aeroplane Airworthiness: (1) SEIFR – Turbine powered, IFR certified, Meets FAR 23 at Amendment 28, or equivalent (2) Engine/propeller combination must have 100,000 hours time-in-service and In Flight Shut Down (IFSD) rate less than 1×10^{-5}	<i>Kodiak 100 Series certification basis under FAA Type Cert. A00007SE is FAR Part 23 including Amendment 23-55. Kodiak 100/PWC PT6A-34 fleet hours are 83,000 hours.</i> <i>NOTE: There has been one Kodiak 100 IFSD to date, due to a single-crystal compressor turbine blade failure. The issue has been addressed (See P&WC Alert S.B. No.A1742R2).</i>
125.355	Seating and Restraints For SE IFR dynamically tested and certificated to comply with standards equivalent to FAR 23 Amendment 36	FAR §23.785 at Amendment 23-55 Dynamically tested seats part of certification basis – See Quest Aircraft Dynamic Seat Test Report 100-220-211
125.357	Additional Instruments (Powerplant and Propeller)	FAR §23.1305
125.359	Night Flight	Fitted as standard
125.361	(a) IFR All Operations – Additional Independent ASI and Altimeter; Spare bulbs and spare fuses (c) SEIFR Emergency Electrical Supply System of sufficient capacity in event of generator failure: (1) extension of landing gear, if appropriate (2) extension of flaps (3) operation of essential IFR systems (4) emergency descent or minimum of one hour (4) SEIFR Equipment (1) Additional independent engine-powered electrical generating system (2) Additional independent attitude indicator (3) IFR-Certified Area Navigation System+ (4) Radio/Radar Altimeter+ (5) Landing Light+ (+powered by emergency bus) (6) Sufficient oxygen for emergency descent (7) Powerplant certificated to FAR Part 33 Amendment 38, and fitted with: (i) Ignition system (automatic or manual) (ii) Magnetic particle detector system, with indicator (iii) Engine control system with FCU fail/malfunction (iv) Engine fire warning system * ² See Report 100-120-611 and AFM Section 3 Emergency Procedures – Fuel Control Unit Malfunctions	Second independent ASI and Altimeter fitted as standard. Spare bulbs and fuses not required. (1) Not applicable. Fixed landing gear. (2) Complies, even under battery power alone. * ¹ (3) Complies, even under battery power alone. * ¹ (4) Quest confirms the Kodiak has sufficient electrical capacity to continue flight for 60 minutes after a single failure of the generator or the alternator. * ¹ * ¹ See Electrical Loads Analysis Report 100-820-602 (1) Standard equipment comprises a 300 Amp Skurka generator and a 40 Amp B & C alternator. (2) Additional attitude indicator fitted as standard. (3) G1000 has dual PBN capable GPS. (4) Not fitted as standard (5) Fitted as standard. (6) Not Applicable – Unpressurised. (7) PT6A-34 certification basis under Transport Canada TC no. E- 6 is CAR 13, including Amendments 13-1 thru 13-4; PT6 ignition system is automatic; Magnetic chip detector in propeller reduction gearbox with G1000 annunciation is optional (See AFM §7-14); Aircraft has an emergency FCU Manual Over-ride *² Not fitted as standard
125.363	Emergency Equipment (Part 91.523 (a) and (b))	Operating Rule – Compliance to be determined by Operator
125.365	Public Address and Crew Member Intercom System	Not Applicable – Less than 10 passenger seats
125.367	Cockpit Voice Recorder – Appendix B.3: TSO C84/C123	Not Applicable – Flight Manual does not require 2 pilots NOTE: Model LDR1000 Voice Data Recorder optional
125.369	Flight Data Recorder – Appendix B.4 requires TSO C124	Not Applicable – Not multi-engine aircraft
125.371	Additional Attitude Indicator	Not Applicable – Not turbojet or turbofan powered
125.373	Weather Radar – Appendix B.6 requires TSO C63	Not Applicable – MCTOW less than 5700 kg. NOTE: WX-500 or GWX-68 are available as options
125.375	Ground Proximity Warning System – App. B.7: TSO C92	Not Applicable – MCTOW less than 5700 kg.
125.377	AEDRS – Required for SE IFR – Meets Appendix B.8	G1000 system in the Kodiak 100 contains both Engine Trend Monitoring and Exceedance systems that comply with DO-160C environmental and DO-178B software conditions. This system is automatically enabled at G1000 power start-up. This complies fully with Appendix B.8 when the SD card is installed for recording. (See Quest statement dated 4.12.2015.)
125.379	Terrain Awareness and Warning System (TAWS) Appendix B.9 requires TSO C151a or b	Not Applicable – MCTOW less than 5700 kg. NOTE: Class B TAWS fitted as standard
125.381	Airborne Collision Avoidance System (ACAS II) Appendix B.10 requires TSO C118/119a or C119b	N/A – MCTOW less than 5700 kg. and less than 19 pax seats NOTE: GTS-800 Traffic Advisory System (TAS) optional

NOTES: 1. A Design Rule reference in the Means of Compliance column indicates the Design Rule was exactly equivalent to the CAR requirement, and compliance is achieved for the basic aircraft type design by certification against the original Design Rule.

2. The CAR Compliance Tables above were correct at the time of issue of the Type Acceptance Report. The Rules may have changed since that date and should be checked individually.

3. Some means of compliance above are specific to a particular model/configuration. Compliance with Part 91/119 operating requirements should be checked in each case, particularly oxygen system capacity and emergency equipment.

Attachments

The following documents form attachments to this report:

Three-view drawing Quest Aircraft Kodiak 100
Copy of FAA Type Certificate Data Sheet Number A00007SE

Sign off

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David Gill
Team Leader Airworthiness

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Checked – Shaun Johnson
Manager Aircraft Certification

Appendix 1

List of Type Accepted Variants:

<i>Model:</i>	<i>Applicant:</i>	<i>CAA Work Request:</i>	<i>Date Granted:</i>
Kodiak 100	Quest Aircraft Design, LLC	16/21B/12	5 February 2016