Type Acceptance Report

TAR 96/03 – Revision 1

CESSNA 310 Series

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Executive Summary

New Zealand Type Acceptance has been granted to the Cessna Model 310 Series based on validation of FAA Type Certificate no.3A10. There are no special requirements for import.

All models listed under the FAA type certificate have been type accepted in New Zealand, except for two models: 310E – Cessna advise only one prototype of this model was produced, and all production aircraft were delivered to the military. 310J-1 – This was a one-off aircraft produced to compete for a military contract.

1. Introduction

This report details the basis on which Type Acceptance Certificate No. 96/03 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.

The report covers all models included on the State-of-Design type certificate which have been granted type acceptance in New Zealand. Appendix 1 details which models have been type accepted in accordance with the provisions of CAR Part 21B and which were certificated prior to that under NZCAR Section B.9 and are now type accepted under the transitional arrangements of Part 21 Appendix A(c).

2. Aircraft Certification Details

(a) State-of-Design Type and Production Certificates:

Manufacturer:	Cessna Aircraft Company
Type Certificate Holder:	Textron Aviation Inc. (since July 29, 2015)
Type Certificate:	3A10
Issued by:	Federal Aviation Administration
Production Approval:	Delegation Option Manufacturer No. CE-1 (Model 310) FAA PC No.4 (Models 310A through 310E) FAA PC No.312 (Models 310F through 310R)

(b) Models Covered by the Part 21B Type Acceptance Certificate:

(i) Models: 310, 310A, 310B, 310C, 310D, 310F, 310G, 310H, E310H

MCTOW: 4600 lb. (2086 kg) – Model 310
4830 lb. (2191 kg) – Models 310A, 310C, 310D, 310F
4700 lb. (2132 kg) – Model 310B
4990 lb. (2263 kg) – Model 310G, E310H
5100 lb. (2313 kg) – Model 310H

Noise Standard: Not Applicable

Engine: Continental O-470-B or -M (Model 310 thru 310B)
Type Certificate: E-269
Issued by: Federal Aviation Administration

Continental IO-470-D (Model 310C thru 310H)
Type Certificate: 3E1
Issued by: Federal Aviation Administration

Propeller: Hartzell HC-82XF-2 or HC-A2XF-2 (Models 310 thru 310H)
Type Certificate: P-878
Issued by: Federal Aviation Administration

McCauley D2AF36C48 (Models 310C thru 310H)
Type Certificate: P-911
Issued by: Federal Aviation Administration

(ii) Models: 310I, 310J, E310J, 310K, 310L, 310N, 310P, 310Q

MCTOW: 4990 lb. (2263 kg) – Model E310J
5100 lb. (2313 kg) – Models 310I, 310J
5200 lb. (2359 kg) – Models 310K, 310L, 310N, 310P
5300 lb. (2404 kg) – Model 310Q

Noise Standard: Not Applicable

Engine: Continental IO-470-U, -V or -VO
Type Certificate: 3E1
Issued by: Federal Aviation Administration

Propeller: McCauley D2AF34C52, C65, C71, C81 (Models 310I thru 310Q)
Type Certificate: P5EA
Issued by: Federal Aviation Administration

McCauley D3AF32C80, C87 (Models 310K thru 310Q)
Type Certificate: P22EA
Issued by: Federal Aviation Administration

(iii) Models: T310P, T310Q, T310R

MCTOW: 5400 lb. (2450 kg) – Model T310P
5500 lb. (2495 kg) – Model T310Q, T310R

Noise Standard: Not Applicable (T310P, T310Q)
FAR 36 (T310R)

Engine: Continental TSIO-520-B or -BB
Type Certificate: E8CE
Issued by: Federal Aviation Administration

Propeller: McCauley D2AF34C71/84JF-3
Type Certificate: P5EA
Issued by: Federal Aviation Administration

McCauley 3AF32C87/82NC-4
Type Certificate: P22EA
Issued by: Federal Aviation Administration

(iv) Model: 310R

MCTOW: 5500 lb. (2495 kg)

Max. Seats: 5 (All models)

Noise Standard: FAR 36

Engine: Continental IO-520-M or -MB
Type Certificate: E8CE
Issued by: Federal Aviation Administration

Propeller: McCauley 3AF32C87/82NC-5
Type Certificate: P22EA
Issued by: Federal Aviation Administration

3AF32C504/82NEA-5
Type Certificate: P57GL
Issued by: Federal Aviation Administration

NOTE: See Advisory Circular AC21-1 Appendix 2 for the New Zealand type acceptance status of engines and propellers listed above.

3. Application Details and Background Information

The application for New Zealand type acceptance of the Cessna 310B was from the importer, Dennis Thompson International Limited, by 24021/02 dated 18 March 1996. The first-of-type example was serial number 35738, registered ZK-JGJ. The Cessna 310 is a twin-engined low-wing all-metal unpressurised five-seat light aircraft.

Type Acceptance Certificate No. 96/03 was granted on 13 June 1996 to the Cessna 310B based on validation of FAA Type Certificate 3A10. Specific applicability is limited to the coverage provided by the operating documentation supplied. There are no special requirements for import into New Zealand.

The application for New Zealand type acceptance of the Cessna 310P was from the importer, Photo Survey Ltd, dated 6 September 2002. The first-of-type example was serial number 310P0199 registered ZK-DTM. Type Acceptance was granted on 1 October 2002.

Revision 1 to this report combined the previous two 310B and 310P reports, and added all the other variants of the 310 Series not previously included. This was at the request of the type certificate holder, who has provided access to all technical publications.

The 310 was Cessna's first post-WW2 twin-engined production aircraft, and the first with a tricycle undercarriage configuration, deliveries commencing late in 1954. Equipped with 240 hp pressure-carburetted engines in slimline nacelles, the 310 uniquely carried all its fuel in tuna shaped wingtip tanks. The compact dimensions were sized to fit in a standard T-hangar. The 310B is structurally identical to the original 310 model, but has O-470-M engines, redesigned instrument panel and MTOW increased from 4600 to 4700 lb. (The 310A was the first model used by the USAF as the U-27A [later redesignated U-3A]) The first major upgrade was the 310C of 1959, being fitted with more powerful fuel-injected 260 hp engines. There were incremental improvements over the years, along with a gradual increase in MAUW. The swept vertical fin was introduced to the 310D of 1960, and an extra cabin window was added in the 310F. The 310G introduced new canted fuel tanks, and the 310I had the first baggage compartment engine nacelles. The 310K replaced the rear two windows on each side with a single unit and the 310L had a one-piece front windscreen. The 310P was a development of the previous 310N with some 14 minor modifications. The major ones were the incorporation of the 411 type nose gear, removal of the three-inch propeller extension (per Model 320), revised static ports (for similarity with the turbocharged version), revised flap gearbox (with pre-select system) and installation of a ventral fin. The 310P model year also introduced a turbocharged version using the larger 285 hp engine. The 310Q model had a redesigned rear cabin with a higher ceiling and skylight window. The final production models were the 310R and T310R which had the nose and luggage locker lengthened by 32 inches.

The first 310 in New Zealand was ZK-BSY in July 1957, followed by 310B ZK-REX. 310G ZK-CFG was registered in 1963 and 310L ZK-DLP. There have been three 310Q aircraft ZK-DRK, ZK-KIM and ZK-OIL. There has been one 310R model ZK-ETM.

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, or were already held by the CAA:

(1) State-of-Design Type certificate:

FAA Type Certificate Number 3A10

FAA Type Certificate Data Sheet number 3A10 at Revision 63 dated July 29, 2015
- Model 310 approved March 22, 1954
- Model 310A approved April 9, 1957
- Model 310B approved May 23, 1957
- Model 310C approved October 22, 1958
- Model 310D approved July 8, 1959
- Model 310F approved July 25, 1960
- Model 310G approved October 2, 1961
- Model 310H approved July 19, 1962
- Model E310H approved January 17, 1963
- Model 310I approved December 20, 1963
- Model 310J approved September 3, 1964
- Model E310J approved March 15, 1965
- Model 310K approved October 20, 1965
- Model 310L approved September 20, 1966
- Model 310N approved August 22, 1967
- Models 310P and T310P approved August 30, 1968
- Models 310Q and T310Q approved August 20, 1969
- Models 310R and T310R approved August 15, 1974

(2) Airworthiness design requirements:

(i) Airworthiness Design Standards:

(ii) The certification basis of the Models 310 through 310F is CAR 3 dated November 1, 1949 as amended by 3-1 through 3-10. For the Models 310G through 310P this was amended to include Sections 3.109, 3.111, 3.112, 3.115, 3.118 and 3.120 of CAR 3 dated May 15, 1956, as amended by 3-2 and 3-5. For the Model 310Q the additional paragraphs were as amended by 32-, 3-5 and 3-8. For the Model 310R some additional paragraphs of FAR Part 23 dated February 1, 1965 were added, at the amendment dates for individual paragraphs as detailed on the TCDS. This is an acceptable certification basis in accordance with NZCAR Part 21B Para §21.41 and Advisory Circular 21-1A, as CAR 3 is the predecessor of FAR 23, which 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.

(iii) Special Conditions:

Nil

(iv) Equivalent Level of Safety Findings:

Model 310R S/N 310R0501 through 310R2140:

CAR 3.757 Airspeed Indicator; CAR 3.778(a) Operating Limitations – The use of indicated instead of calibrated airspeed was accepted provided the approved calibration data presented in the POH is available to the pilot. ASI calibration data must be predicated on flight test.

(v) Airworthiness Limitations:
Nil

(3) Aircraft Noise and Engine Emission Standards:

(i) Environmental Standard:
The Models 310R/T310R S/N 310R1801 through 310R2140 have been certificated for noise under FAR Part 36, including Amendments 36-1 through 36-10.

(ii) Compliance Listing:
Advisory Circular 36-1H
ISA-Corrected A-weighted sound levels for flyovers per Part 36 Appendix F, for a MTOW of 5500 lb and a MLW of 5400 lb at 2700 RPM:

Model 310R (TCM IO-520-M/McCauley 3AF32C87/82NC-5.5) – 79.1 dBA

Model T310R (TCM TSIO-520-BB/McCauley 3AF32C87/82NC-4) – 77.7 dBA

(4) Certification Compliance Listing:

Cessna Report 1500: Basic Data (Model 310)
Cessna Report 15009: Basic Data (Model 310A)
Cessna Report 1501: Wing Analysis (Model 310)
Cessna Report 1502: Fuselage Analysis (Model 310)
Cessna Report 1503: Horizontal Tail Analysis (Model 310)
Cessna Report 1507: Landing Gear Analysis (Model 310)
Cessna Report 1504: Vertical Tail Analysis (Model 310)
Cessna Report 1512-2: Fuselage Static Test Results
Cessna Report 1521-2: Fuel Tank Static and Pressure Test Results
Cessna Report 1517-2: Results - Landing Gear Drop Test

Cessna Report 1500 – Model 310B – Basic Data Rev.E dated 20 March 1957

Cessna Report 15031: Basic Data (Model 310D)
Type Inspection Report: Cessna 310D

Cessna Report 15100: Basic Data (Model 310E)
Type Inspection Report DM-310F-0: Model 310F
Cessna Report 15032: Basic Data & Substantiation (Model 310F)

DM 310G-0: Flight Test Report for the Cessna Model 310G
Cessna Report S-310G-0: Basic Data & Substantiation (Model 310G)

DM 310H-0: Flight Test Report for the Cessna 310H
DM 310H-8: Flight Test Report for the Cessna E310H
Cessna Report S-310H-0: Basic Data and Substantiation

DM310i-0: Flight Test Report for the Cessna 310I
Cessna Report S-310i-0: Basic Substantiation Data:

Delegation Option Manufacturer Report 310P-0 – Basic TIR – 3 July 1968
Cessna Report S-310P-110 – Structures Data Summary – January 13, 1969

Cessna Report S-310R/T310R-110 – Structures Data Summary

(5) Flight Manual:

AIR Number:	*Cessna Publication:*	*Title:*
AIR 3388	D731-13	Model 310 (1955 -1956) Owner's Manual
AIR 2558	P139A-13	Model 310B (1957-1958) Owner's Manual
AIR 3380	P172-13	Model 310C (1959) Owner's Manual
AIR 3390	P199-13	Model 310D (1960) Owner's Manual
AIR 3391	P233-13	Model 310F (1961) Owner's Manual
AIR 3392	D132-13	Model 310G (1962) Owner's Manual
AIR 3393	D163-13	Model 310H (1963) Owner's Manual
AIR 3394	D848-13	Model 310I (1964) Owner's Manual
AIR 3395	D850-13	Model 310J (1965) Owner's Manual
AIR 3396	D374-13	Model 310K (1966) Owner's Manual
AIR 201	D436-13	Model 310L (1967) Owner's Manual
AIR 3397	D560-13	Model 310N (1968) Owner's Manual
AIR 2957	D657-13	Model 310P (1969) Owner's Manual
AIR 3398	D922-13	Model 310Q (1970-1972) Owner's Manual
AIR 2480	D983-13	Model 310Q (1973) Owner's Manual
AIR 3399	D1562-13	Model 310Q (1974) Owner's Manual
AIR 2106	D1518-13	Model 310R (1975) Owner's Manual
AIR 3402	D1528-13	Model 310R (1976) Pilot's Operating Handbook
AIR 3403	D1541-13	Model 310R (1977) Pilot's Operating Handbook
AIR 3404	D1552-13	Model 310R (1978) Pilot's Operating Handbook
AIR 3405	D1565-13PH	Model 310R (1979) Pilot's Operating Handbook
AIR 3406	D1575-13PH	Model 310R (1980) Pilot's Operating Handbook
AIR 3407	D1588-13PH	Model 310R (1981) Pilot's Operating Handbook

(6) Operating Data for Aircraft:

(i) Maintenance Manual:

Cessna 310F-310K (1961-1966) Service Manual – Publication D455-13
Cessna 310L-310N (1967-1968) Service Manual – Publication D526-13
Cessna 310-310D (1955-1960) Service Manual – Publication P150-13
Cessna 310R/T310R (1975-1981) Service Manual – Publication D2514-13
Cessna 310P-310Q (1969-1974) Service Manual – Publication D872-13

(ii) Current service Information:

Service Bulletins

(iii) Illustrated Parts Catalogue:

Cessna 310-310D (1955-1960) Parts Catalog – Publication P251-12
Cessna 310F-310K (1961-1966) Parts Catalog – Publication P329-12
Cessna 310L/310N (1967-1968) Parts Catalog – Publication P447-12
Cessna 310P/310Q (1969-1974) Parts Catalog – Publication P497-12
Cessna 310R (1975-1981) Parts Catalog – Publication P533-12

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

Cessna publications are now available through the Textron 1View website at https://ww2.txtav.com or for some older manuals at http://techpubs.cessna.com/

5. New Zealand Operational Rule Compliance

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	***To be determined on an individual aircraft basis***
B.2	Crew Protection Requirements – CAM 8 Appdx. B # .35	Not Applicable – Agricultural Aircraft only

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		***Operational requirement – Compliance as applicable***	
91.507	Pax Information Signs – Smoking, safety belts fastened		Not Applicable – Less than 10 passenger seats	
91.509 Min. VFR	(1) ASI	CAR §3.655(a)(1)	(8) Coolant Temp	N/A – Air cooled engine
	(2) Machmeter	N/A	(9) Oil Temperature	CAR §3.655(b)(1)(iii)
	(3) Altimeter	CAR §3.655(a)(2)	(10) Manifold Pressure	CAR §3.655(b)(2)(iii)
	(4) Magnetic Compass	CAR §3.655(a)(3)	(11) Cylinder Head Temp.	CAR §3.655(b)(2)(i)
	(5) Fuel Contents	CAR §3.655(b)(1)(i)	(12) Flap Position	Combined selector/indicator
	(6) Engine RPM	CAR §3.655(b)(1)(v)	(13) U/c Position	Position Lights fitted as standard
	(7) Oil Pressure	CAR §3.655(b)(1)(ii)	(14) Ammeter/Voltmeter	CAR §3.687
91.511	Night VFR Instruments and Equipment		***Operational requirement – Compliance as applicable***	
91.513	VFR Communication Equipment		***Operational requirement – Compliance as applicable***	
91.517	IFR Instruments and Equipment		***Operational requirement – Compliance as applicable***	
91.519	IFR Communication and Navigation Equipment		***Operational requirement – Compliance as applicable***	
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		 ***Operational Requirement – Compliance as applicable*** ***Operational Requirement – Compliance as applicable*** 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		***Operational requirement – Compliance as applicable***	
91.531	Oxygen Indicators – Volume/Pressure/Delivery		***Operational requirement – Compliance as applicable***	
91.533	Oxygen for non-Pressurised Aircraft:		***Operational requirement – Compliance as applicable***	
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		***Operational requirement – Compliance as applicable***	
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		***Operational requirement – Compliance as applicable***
135.357	Additional Instruments (Powerplant and Propeller)		Has all instruments required by FAR §23.1305
135.359	Night Flight	Landing light, Pax compartment	***Operational requirement – Compliance as applicable***
135.361	IFR Operations	Speed, Alt, spare bulbs/fuses	***Operational requirement – Compliance as applicable***
135.363	Emergency Equipment (Part 91.523 (a) and (b))		***Operational requirement – Compliance as applicable***
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

NOTES: 1. A Design Rule reference in the Means of Compliance column indicates the Design Rule was directly 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.

Attachments

The following documents form attachments to this report:

Three-view drawing Cessna Model 310
Copy of FAA Type Certificate Data Sheet Number 3A10

Sign off

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David Gill	Checked – Gaetano Settineri
Team Leader Airworthiness	Airworthiness Engineer

Appendix 1

List of Type Accepted Variants:

Model:	*Applicant:*	*CAA Work Request:*	*Date Granted:*
310L, 310Q, 310R	AC 21-1.2/NZCAR Part 21 Appendix A(c)		
310B	Dennis Thompson International Ltd.	96/21B/20	13 June 1996
310P	Photo Survey Limited	3/21B/7	1 October 2002
All other 310 Models	Textron Aviation Inc.	18/21B/3	24 August 2017