
Type Acceptance Report

TAR 19/21B/22

CESSNA 188 Series

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Executive Summary

New Zealand Type Acceptance has been granted to the Cessna Model 188 Series based on validation of FAA Type Certificate number A9CE. There are no special requirements for import.

All models listed under the FAA type certificate have been type accepted in New Zealand, which are now eligible for the issue of an Airworthiness Certificate in the Standard or Restricted 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.)

NOTE: The information in this report was correct as at the date of issue. The report is generally 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 latest revision of the State-of-Design Type Certificate Data Sheet referenced herein.

1. Introduction

This report details the basis on which Type Acceptance Certificate No. 19/21B/22 was granted in the Restricted Category for the Model T188C and the Standard Category for all other models 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: A9CE
Issued by: Federal Aviation Administration

Production Approval: Delegation Option Manufacturer No. CE-1
FAA PC No.4

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

- (i) **Models:** 188, 188A, 188B
- MCTOW: 1497 kg [3300 lb.] – Normal Category
1723 kg [3800 lb.] – Restricted Category
- Max. No. of Seats: 1
- Noise Standard: Not Applicable
- Engine:** Continental O-470-R – Models 188, 188B
Continental O-470-S – Models 188A, 188B
Type Certificate: FAA E-273
- Propeller:** McCauley 1A200/AOM
Type Certificate: FAA P-874
McCauley 2A34C50/90A-2 or 2A34C66/90AT-2
Type Certificate: FAA P3EA
McCauley 2A34C201/90DA-2 or 2A34C203/90DCA-2
Type Certificate: FAA P3EA
- (ii) **Models:** A188, A188A, A188B
- MCTOW: 1497 kg [3300 lb.] – Normal Category
1814 kg [4000 lb.] – Restricted Category
1905 kg [4200 lb.] – Restricted Category (s/n 18801375T on)
- Max. No. of Seats: 1
- Noise Standard: Not Applicable
- Engine:** Continental IO-520-D
Type Certificate: E5CE

Propeller: McCauley D2A34C58, D2A34C58-0 or F2A34C58 / 90AT-4/8
McCauley D2A34C98 or D2A34C98-0 / 90AT-4 or 90AT-8
Type Certificate: FAA P3EA
McCauley D3A32C90 or D3A32C90-N / 82NC-2 – A188B
Type Certificate: FAA P21EA
McCauley B2A34C205/90DHA-4 – Model A188B
Type Certificate: FAA P3EA
McCauley D3A32C408/82NDA-2
Type Certificate: FAA P47GL

(iii) **Model:** T188C

MCTOW: 1497 kg [3300 lb.]
1995 kg [4400 lb.] – CAM 8 Restricted Category

Max. No. of Seats: 1

Noise Standard: Not Applicable

Engine: Continental TSIO-520-T
Type Certificate: FAA E8CE

Propeller: McCauley D3A34C402/90DFA-10
Type Certificate: FAA P47GL

- Notes: 1. Refer to FAA TCDS A9CE for specific applicability of engine and propeller combinations to individual aircraft models.
2. Refer to Advisory Circular 21-1 Appendix 2 for the New Zealand type acceptance status of any engines and propellers listed above.

3. Application Details and Background Information

The Cessna 188 Series was originally accepted into New Zealand under the provisions of NZCAR B.9, and grandfathered under CAR Part 21 Appendix A(c). This only covered those variants and model years for which examples had been imported. The type certificate holder subsequently applied for type acceptance of all the other variants and model years of the 188 Series not previously included, on the basis of provision of access to all technical publications. The Cessna Model 188 is a single-seat single-piston-engine low-wing all-metal aircraft with fixed undercarriage intended for agricultural operations with a hopper located forward of the cockpit.

Type Acceptance Certificate Number 19/21B/22 was granted on 10 September 2019 to the Cessna 188 Series based on validation of FAA Type Certificate number A9CE. Specific applicability is limited to the coverage provided by the operating documentation supplied. There are no special requirements for import into New Zealand.

Cessna's Model 188 Agwagon was an all-new agricultural aircraft design of conventional configuration, with a braced low wing and a fibreglass hopper in front of the pilot. It was designed using the results of extensive research and consultation with agricultural aircraft operators conducted in the early 1960s. There were initially two versions in 1966, the 230 hp Model 188 "Agwagon 230" and the 300 hp Model A188 "Agwagon 300". The Agwagon could be equipped with either a small hopper (26.7 cu. ft.) or a large hopper (37.4 cu. ft.). Aircraft with a fuselage strengthened for the larger hopper are identified with a serial number with a T suffix, and were marketed as the "AgTruck". There were bi-annual improvements, with the Agwagon "A" being introduced in 1968, and the Models 188A/A188A Agwagon "B" in 1970. The definitive Models 188B/A188B Agwagon "C" were developed in 1972. The final version of the Series was the turbocharged T188C Ag Husky, which was introduced in 1979.

The first example of the Cessna Model A188 in New Zealand was serial number 188-0024 registered ZK-CON in September 1966. The first A188A Agwagon B was serial number 188-0670 registered ZK-CXO in June 1970, while the first A188B Agwagon C was serial number 188-01066 registered ZK-DHX in February 1973. (There have been no examples of the Model 188 Agwagon 230 imported into New Zealand). The first T188C Ag Husky was serial number 188-03845T registered ZK-ETR in November 1981.

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 A9CE

FAA Type Certificate Data Sheet number A9CE at Revision 28 dated July 29, 2015

- Models 188 and A188 approved February 14, 1966
- Models 188A and A188A approved September 26, 1969
- Models 188B and A188B approved December 20, 1971
- Model T188C (Restricted Category) approved September 8, 1978

(2) Airworthiness design requirements:

(i) *Airworthiness Design Standards:*

The certification basis of the Cessna A/188/A/B Series in the Normal Category is FAR Part 23 effective February 1, 1965, plus effective S/N 18803297 and up (1979 Model on), FAR §23.1559 (Operating Limitations Placard) effective March 1, 1978.

The certification basis of the Cessna T188C in the Restricted Category is FAR Part 21 dated February 1, 1965, and FAR Part 23 dated February 1, 1965, with exception to paragraph §23.221 (Spinning) in accordance with the provisions of §21.25(a)(1), plus FAR §23.1559 effective March 1, 1978.

This is an acceptable certification basis in accordance with NZCAR Part 21B Para §21.41, because FAR Part 23 is the basic standard for Normal Category Airplanes called up under NZCAR Part 21 Appendix C. In addition the spinning dispensation for agricultural operations is accepted in New Zealand in the Restricted Category. There are no non-compliances and no additional special conditions have been prescribed by the Director under §21.23.

(ii) *Special Conditions:*

Nil

(iii) *Equivalent Level of Safety Findings:*

1979 Models on:

FAR 23.1545 Airspeed Indicator; FAR 23.1583(a)(1) 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.

(iv) *Airworthiness Limitations:*

Nil

(3) Aircraft Noise and Engine Emission Standards:

(i) *Environmental Standard:*

Under §36.1(a)(2) 1979 and on Cessna 188 Series have not been shown to meet the noise requirements of FAR Part 36, because they were designed for “agricultural aircraft operations” or for “dispensing fire fighting materials”. Accordingly they are limited to those special purposes of FAR §21.15(b)(1) agricultural and §21.25(b)(2) fire-fighting, unless compliance with noise requirements is shown.

(4) Certification Compliance Listing:

- S-188-0: Basic Data (Cessna Model 188)
- S-188-1: Wing Analysis; S-188-2: Fuselage Analysis;
- S-188-3: Horizontal Tail Analysis; S-188-4: Vertical Tail Analysis;
- S-188-5: Aileron Analysis; S-188-6: Flap Analysis;
- S-188-7: Landing Gear Analysis; S-188-9: Control System Analysis
- S-188-11-1: Wing Test Proposal
- S-188-11-2: Wing Test Results
- S-188-12-1/2: Fuselage Test Proposal and results
- S-188-15-1/2: Aileron Test Proposal and Results
- S-188-17-1/2: Landing Gear Test Proposal and Results
- S-188-19-1/2: Control System Test Proposal and Results
- S-188-22-1/2: Fuel Cell and Hopper Test Proposal and Results
- S-188-21-1/2: Cabin Accommodations Test Proposal and Results
- S-188-26-2: Ground Vibration Test Results and Simplified Flutter Survey
- S-188-33: Substantiation, Critical Loads and Structural Materials Summary (188)
- S-188B-33: Substantiation, Critical Loads and Structural Materials Summary
- CES-1133: Finish Specification for Model 188 AgWagon

- F-A188-1: Certification of Cessna AgWagon Flight Characteristics at 3600 Pounds Gross Weight (Model A188)
- S-A188-34: Investigation of 3600 lb. Flight G.W. for Model A188 (Australian)
- S-A188B(T)-33: Substantiation, Critical Loads and Structural Summary
- S-188B(T)-33: Substantiation, Critical Loads and Structural Summary
- S-188B-35(72): Fatigue Analysis (Model 188B)
- DM 188A-0: Original Certification of the 1970 Model 188A
- DM 188B-0: Certification of the Model 188B, plus:
 - Addendum 1: Certification of the 1973 Model Changes
 - Addendum 2: Certification of the 1974 Model Changes
 - Addendum 4: Certification of the 1975 Model Changes

- DM-A188B-0: Original Certification of the Model A188B, plus:
 - Add. 2: Certification of 1973 Model Changes on AGpickup, AGwagon, AGtruck
 - Addendum 4: 1974 Model Changes - Addendum 5: 1975 Model Changes
 - Addendum 6: 1976 Model Changes - Addendum 7: 1977 Model Changes
 - Addendum 8: 1978 Model Changes - Addendum 9: 1979 Model Changes
 - Addendum 10: 1980 Model Changes - Addendum 11: 1981 Model Changes
 - Addendum 12: 1982 Model Changes - Addendum 15: 1983 Model Changes

- DM-T188C-0: Original Certification of the Model T188C AG Husky, plus:
 - Addendum 1: Certification of 1980 Model Changes to Model T188C AG Husky
 - Addendum 2: Certification of the 1981 Model Changes
 - Addendum 3: Rational Analysis Certification of 1982 Model T188C AG Husky
 - Addendum 6: Certification of the 1983 Model Changes
- S-T188C-33: Substantiation, Critical Loads, and Structure Materials Summary
- S-T188C-34: Investigation of 3,600 lb. Flight G.W. for Model T188C
- F-T188C-4: Analysis of the Model T188C at 3600 lbs with respect to FAR 23 Normal Category Flight Requirements *[Produced at the request of NZ MoT]*

(5) Flight Manual:

AIR Number:	Cessna Publication:	Title:
AIR 3113	D392-13	Model 188/188A (1966-1967) Owner's Manual
AIR 3903	D726-13	Model 188/188A (1968-1969) Owner's Manual
AIR 3112	D764-13	Model 188A/A188A (1970-1971) Owner's Manual
AIR 3904	D961-13	Model 188B/A188B (1972-1973) Owner's Manual
AIR 3905	D1023-13	Model 188B/A188B (1974) Owner's Manual
AIR 3101	D1043-13	Model 188B/A188B (1975) Owner's Manual
AIR 3906	D1064-13	Model A188B (1976) Owner's Manual
AIR 3111	D1089-13	Model A188B (1977) Owner's Manual
AIR 3907	D1117-13	Model A188B (1978) Owner's Manual
AIR 3908	D1145-13	Model A188B (1979) Owner's Manual
AIR 3909	D1180-13	Model A188B (1980) Information Manual
AIR 3910	D1201-13	Model A188B (1981) Information Manual
AIR 3911	D1220-13	Model A188B (1982) Information Manual
AIR 3912	D1238-13	Model A188B (1983) Information Manual
AIR 2780	D1146-13	Model T188C (1979) Owner's Manual
AIR 2781	D1181-13	Model T188C (1980) Information Manual
AIR 3913	D1202-13	Model T188C (1981) Information Manual
AIR 3914	D1221-13	Model T188C (1982) Information Manual
AIR 3915	D1239-13	Model T188C (1983) Information Manual

NOTE: The Owner's/Information Manual has been specified in New Zealand instead of the Flight Manual, because it contains the FM, plus it includes performance data. This is considered essential for agricultural operations using Part 137 Appendix B.

(6) Operating Data for Aircraft:

(i) *Maintenance Manual:*

Cessna 188 Series (1966-1984) Service Manual – Publication D2054-13

(ii) *Current service Information:*

Service Bulletins

(iii) *Illustrated Parts Catalogue:*

Cessna 188 Series (1966-1975) Parts Catalog – Publication P545-12

Cessna 188 Series (1976-1984) Parts Catalog – Publication P694-12

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

Cessna publications are now available through the Textron IView 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	<i>To be determined on an individual aircraft basis</i>
B.2	Crew Protection Requirements – CAM 8 Appendix. B # .35	Equivalent provisions to CAM 8 Appendix B Section .35 Protection are contained in FAR 23, paragraphs §23.561 Emergency Landing Conditions General; §23.785(h) Seats, berths, litters, safety belts and shoulder harnesses; §23.787 Baggage Compartments; and §23.831 Ventilation;

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
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) N/A – No Mach limitations FAR §23.1303(b) FAR §23.1303(c) FAR §23.1305(a) FAR §23.1305(d) FAR §23.1305(b)
		(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 – Air cooled engine fitted FAR §23.1305(c) FAR §23.1305(h) FAR §23.1305(f) FAR §23.699 N/A – Fixed Undercarriage FAR §23.1351
91.511	Night VFR Instruments and Equipment	<i>Operational requirement – Compliance as applicable</i>
91.513	VFR Communication Equipment	<i>Operational requirement – Compliance as applicable</i>
91.517	IFR Instruments and Equipment	<i>Operational requirement – Compliance as applicable</i>
91.519	IFR Communication and Navigation Equipment	<i>Operational requirement – Compliance as applicable</i>
	NOTES: The 188 Series is equipped for Day and Night VFR operations (See FM and Equipment List)	
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	<i>Operational Requirement – Compliance as applicable</i> <i>Operational Requirement – Compliance as applicable</i> 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	<i>Operational requirement – Compliance as applicable</i>
91.531	Oxygen Indicators – Volume/Pressure/Delivery	<i>Operational requirement – Compliance as applicable</i>
91.533	Oxygen for non-Pressurised Aircraft:	Not fitted as standard (Maximum Altitude T188C 14,000 ft.)
91.541	SSR Transponder and Altitude Reporting Equipment	<i>Operational requirement – Compliance as applicable</i>
91.543	Altitude Alerting Device – Turbojet or Turbofan	Not Applicable – Not turbo jet or turbofan powered
91.545	Assigned Altitude Indicator	<i>Operational requirement – Compliance as applicable</i>
A.15	ELT Installation Requirements	<i>To be determined on an individual aircraft basis</i>

Civil Aviation Rules Part 137

Subpart F – Instrument and Equipment Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
137.255	Seating and Restraints – Shoulder harness required	Seatbelts with shoulder harness are fitted as standard. (See Owner's Manual Section II and IPC Figures 65/66.) Inertial reel is available as optional equipment.
137.257	Additional Instruments – Slip indicator required	<i>To be determined on an individual aircraft basis</i>
137.259	Additional equipment	See Appendix D compliance statements below
	Appendix B – Overload Weight Determination	FAR 23 Normal Category Design load factor is 3.8 – Maximum Recommended Weight Increase per CAR Part 137 Appendix B Fig.2 is 131% → For MCTOW of 3300 lb, Agricultural Operating Weight = 4323 lb. NOTE: TCDS A9CE states the 188 Series has demonstrated satisfactory operation at higher weights in accordance with FAA AC 20-33B and CAM 8 (equivalent to CAR 137 Appendix B), as follows: 188 Series – 3800 lb. A188 Series – 4000 lb. or 4200 lb. (Serials 678T, 18801375T [1974 Ag-Truck] and on) T188C Series – 4400 lb.

Appendix D – Instruments and Equipment Airworthiness Design Standards		
D.1	Seating and Restraints – Ult. Fwd. inertia load – 12g	Cessna Report S-188-21-1 states seat occupant load per NAS 809 and Cessna policy was 9g x 1.33 fitting factor. Report S-188-21-2 states static load test passed at up to 115% design load.
D.2	Hopper permitted maximum load	<i>To be determined on an individual aircraft basis</i>
D.3	Hoppers and spray tanks – 12g fwd/1.5 rear/1.0 sideways	See Cessna Report S-188-22-2
D.4	Hopper upper level contents – Indication, density allowance	Hopper has viewing port visible in the cockpit
D.5	Jettison gear – 80% of maximum load in 5 seconds – simple to operate, single action required	<i>Operational Requirement – Compliance as applicable</i>
D.6	Markings/Placards – hopper or tank maximum loadings – representative jettison times – pax location, flt limitations	<i>To be determined on an individual aircraft basis</i>

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.

3. Some means of compliance above are specific to a particular model/configuration. Compliance with Part 91/137 operating requirements should be checked in each case.

Attachments

The following documents form attachments to this report:

Three-view drawing Cessna Model 188 AgWagon
Copy of FAA Type Certificate Data Sheet Number A9CE

Sign off

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David Gill
Team Leader Airworthiness

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Checked – Lino Miguel
Airworthiness Engineer

Appendix 1

List of Type Accepted Variants:

<i>Model:</i>	<i>Applicant:</i>	<i>CAA Work Request:</i>	<i>Date Granted:</i>
A188, A188B	AC 21-1.2/NZCAR Part 21 Appendix A(c)		
188, 188A, 188B	Textron Aviation Inc	19/21B/22	10 September 2019
A188A, T188C	Textron Aviation Inc	19/21B/22	10 September 2019