
Type Acceptance Report

TAR 5/21B/1 – Revision 4

Maule Series

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Executive Summary

New Zealand Type Acceptance has been granted to the Maule Series based on validation of FAA Type Certificate number 3A23. 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: 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. 5/21B/1 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 also notes the status of all models included under the State-of-Design type certificate which have been granted type acceptance in New Zealand. Models covered by the type acceptance certificate issued under Part 21B are listed in Section 2 of this report. Models which were certificated prior to that under NZCAR Section B.9 and are type accepted under the transitional arrangements of Part 21 Appendix A(c) are listed in Appendix 1.

2. Aircraft Certification Details

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

Original Company: Maule Aircraft Corporation
TC Holder: Maule Aerospace Technology, Inc. (from June 18, 1982)
Manufacturer: Maule Air, Inc.
Type Certificate: 3A23
Issued by: Federal Aviation Administration
Production Approval: FAA PC No.11SO issued May 3, 1984 – See TCDS Note 7

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

(i) **Model:** M-6-235
MCTOW: 2500 lb. [1134 kg] (landplane and skiplane)
2750 lb. [1247 kg] (floatplane)
Max. No. of Seats: 4 (5 optional from serial no. 7474C and up)
Noise Standard: FAR Part 36
Engine*: Lycoming O-540-J1A5D, -J3A5, or -B4B5
FAA Type Certificate: E295
Lycoming IO-540-W1A5 or -W1A5D
FAA Type Certificate: 1E4
Propeller*: Hartzell HC-C2YR-1BF/F8468A-6R or -3R or /F8477D-6
FAA Type Certificate: P-920
Hartzell HC-C3YR-1RF/F7693(F)-()
FAA Type Certificate: P25EA
McCauley B3D32C414-C/G-82NDA-2 or -4
FAA Type Certificate: P58GL
McCauley B2D37C224-B/G-90RA-9
FAA Type Certificate: P7EA

* See TCDS Note 14 for applicability and limitations

(ii) **Models:** MX-7-180A, MXT-7-180A
MCTOW: 2400 lb. [1089 kg]
No. of Seats: 4
Noise Standard: FAR Part 36
Engine: Lycoming O-360-C1F or O-360-C4F
FAA Type Certificate: E-286
Propeller: Sensenich 76EM8S5-0-56 or 76EM8S8-0-56
FAA Type Certificate: P4EA

(iii) **Models:** MXT-7-180, MX-7-180B
MCTOW: 2500 lb. [1134 kg]
Max. No. of Seats: 4 (5 optional)
Noise Standard: FAR Part 36
Engine: Lycoming O-360-C1F
FAA Type Certificate: E-286
Propeller: Hartzell HC-C2YR-1BF/7666A
FAA Type Certificate: P-920
McCauley B3D32C414-C/G-82NDA-8
FAA Type Certificate: P58GL

(iv) **Model:** M-9-235
MCTOW: 2800 lb. [1270 kg]
Max. No. of Seats: 5
Noise Standard: FAR Part 36
Engine: Lycoming IO-540-W1A5
FAA Type Certificate: 1E4
Propeller: McCauley B3D32C414-[]/[]-82NDA-2
FAA Type Certificate: P58GL

3. Application Details and Background Information

The application for New Zealand type acceptance of the Model MX-7-180B was from the importer Mr Ian Wright, dated 5 June 2004. The first-of-type example was serial number 22001C, registered ZK-TDS. The Maule is a single-engine welded-steel-tube fuselage strut-braced high-wing four or five-seat light aircraft with STOL characteristics.

Type Acceptance Certificate No. 5/21B/1 was granted on 19th August 2004 to the Maule Model MX-7-180B based on validation of FAA Type Certificate 3A23. There are no special requirements for import into New Zealand.

This report was raised to Revision 1 to include the M-6-235 variant, under Work Request number 6/21B/4. The application was from the importer, H A and J L Robinson, dated 20th July 2005. The first-of-type example was serial number 7465C, registered ZK-MTP. Type acceptance of the Model M-6-235 was granted on 24 November 2005.

This report was raised to Revision 2 to include two new variants: the MXT-7-180 under Work Request number 7/21B/22. The application was from the aircraft manufacturer dated 21 November 2006 and the first-of-type example was serial number 14120C registered ZK-JQY; and the MX-7-180A under Work Request 7/21B/24. The application was from the importer Mr Shane Anderson dated 12 December 2006 and the first-of-type example was serial number 20052C registered ZK-MUL.

Revision 3 of this report adds the latest M-9-235 Model. The application was from the importer dated 7 August 2015 and the first-of-type example was serial number 36001C registered ZK-VRF. (The M-9 is aerodynamically identical to the M-7 Series, except for reinforcements to the wing, landing gear, and fuselage attachment points, to permit operations at higher gross weight.) Type Acceptance was granted on 26 October 2015.

Revision 4 was issued to include the MXT-7-180A Model, which is a nosewheel landing gear version of the MX-7-180A. The first-of-type example was serial number 21025C to be registered as ZK-RLT. Type Acceptance was granted on 5 February 2018.

Originally a homebuilt aircraft the first Maule production version was the 145 hp Model M-4. Although there are 48 variants of the Maule on the type certificate, all are essentially the same basic aircraft with different powerplants and detail variations in flaps, ailerons, wingspan, fuel tanks, fuselage and tail surfaces, depending on the installed power, number of seats and maximum takeoff weight. Versions are also available with the Allison 250 turbine engine and a nosewheel undercarriage.

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) State-of-Design Type certificate:

FAA Type Certificate Number 3A23 issued August 10, 1961

FAA Type Certificate Data Sheet No. 3A23 at Revision 31 dated April 9, 2012

- Model M-6-235 approved June 25, 1981
- Model MXT-7-180 approved November 9, 1990
- Models MX-7-180A and MXT-7-180A approved June 3, 1993
- Model MX-7-180B approved July 12, 1993
- Model M-9-235 approved April 9, 2012

(2) Airworthiness design requirements:

(i) *Airworthiness Design Standards:*

The certification basis of the Maule Series is Part 3, Civil Air Regulations, effective May 15, 1956 as amended by 3-1 through 3-5 and 3.705 as amended by 3-7, plus Part 23.955 in lieu of CAR 3.435 for specified models. This is an acceptable certification basis in accordance with NZCAR Part 21B Paragraph §21.41 and Advisory Circular 21-1B, because 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.

(ii) *Special Conditions:*

For some specific models the FAA established Special Certification Rules, which was the use or substitution of later Amendment date FAR 23 individual paragraphs. See the TCDS for affected models and details of the updated sections.

(iii) *Equivalent Level of Safety Findings:*

Nil

(iv) *Airworthiness Limitations:*

Nil

(3) Aircraft Noise and Engine Emission Standards:

(i) *Environmental Standard:*

The Maule Series has been certificated for noise under FAR Part 36. For models approved between 1976 and 2002, per §36.2 (prior to Amendment 36-24) the Part 36 amendment in effect on the approval date of each model was used. After 2002, per §36.2 the Part 36 amendment in effect on the date of application was used. The applicable dates are located in the first line in each model's section on the TCDS. Some of these derivative models were able to show no acoustical change from a previously approved model.

(ii) *Compliance Listing:*

Draft Appendix F – Aircraft Noise Data for U.S. Certification Propeller Driven Small Airplanes (FAR Part 36, Appendix F):

Model M6-235 at 2500 lb MAUW 2400 RPM 81” dia – Noise Level = 71.3 Cdb(A)

Models MX-7-180A and MXT-7-180A at 2400 lb MAUW 2700 RPM 78”
propeller diameter – Noise Level = 76.2 dB(A)

Models MX7-180B and MXT-7-180 at 2500 lb MAUW 2700 RPM 76” propeller
diameter – Noise Level = 70.9 Mdb(A); 71.7 Cdb(A)

Model M-9-235 Noise Level per FAR 36 Appendix G = 79.6 dB(A)

(4) Certification compliance listing:

Maule Aerospace Technology Inc. Report 140:
Model M-6-235 Compliance Checklist

Maule Aerospace Technology Inc. Report 143:
Model MXT-7-180 Compliance Checklist

Maule Aerospace Technology Inc. Report 174:
Model MX-7-160/180A/180B Compliance Checklist

Maule Aerospace Technology Inc. Report 175:
Model MXT-7-160/180A Compliance Checklist

Maule Aerospace Technology Inc. Report 199 – Certification Plan for Maule
Model M-9-235 Airplanes – FAA Project No. AT5400AT-A – Rev.G

(5) Flight manual: FAA Approved Airplane Flight Manual for Maule MX-7-180B
CAA Accepted as AIR 2872

FAA Approved Airplane Flight Manual for Maule M-6-235
(s/n 7247C-7465C) – CAA Accepted as AIR 2926

FAA Approved Airplane Flight Manual for Maule M-6-235
(s/n 7466C, 7468C-7473C) – CAA Accepted as AIR 2927

FAA Approved Airplane Flight Manual for Maule M-6-235
(s/n 7474C and up) – CAA Accepted as AIR 2928

(Maule operate a system whereby the same manual is used at
different revision dates for separate serial number ranges.)

FAA Approved Airplane Flight Manual for Maule MXT-7-180
CAA Accepted as AIR 2988

FAA Approved Airplane Flight Manual for Maule MX-7-180A
CAA Accepted as AIR 2989

FAA Approved Airplane Flight Manual for Maule M-9-235
CAA Accepted as AIR 3340

FAA Approved Airplane Flight Manual for Maule MXT-7-180A
CAA Accepted as AIR 3661

(6) Operating Data for Aircraft, Engine and Propeller:

(i) *Maintenance Manual:*

Maintenance Manual for Maule MX-7-180B Star Rocket
Maintenance Manual for Maule M-6-235 Super Rocket
Maintenance Manual for Maule MXT-7-180 Star Rocket Trigear
Maintenance Manual for Maule MX-7-160 and MX-7-180A Sportplane
Maintenance Manual for Maule MXT-7-160/180A Sportplane Trigear
Maintenance Manual and Instructions for Continued Airworthiness for Maule
M-9-235 – P/N TLC-M-9-235

(ii) *Current service Information:*

Service Bulletins and Service Letters

(iii) *Illustrated Parts Catalogue:*

Parts Catalog (covers all models)

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

CAA 2171 from Engineering Manager, Shirley Maule, dated 2 August 2004
(All Maule publications are available free-of-charge on their website)

AFM, MM, Revisions, SB and SL can be downloaded at www.mauleairinc.com/

(8) Other information:

Maule – Required Equipment List (R.E.L.) at Rev.77 dated 5 June 2017
Maule – Optional Equipment List (O.E.L.) at Rev.84 dated 24 September 2014

5. New Zealand Operational Rule Compliance

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

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	Seat belt/3-Point Harness Fitted as Std – See R.E.L. #25
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) – Fitted as Standard – See R.E.L. #15 N/A – No mach number limitations (2) Machmeter CAR §3.655(a)(2) – Fitted as Standard – See R.E.L. #14 (3) Altimeter CAR §3.655(a)(3) – Fitted as Standard – See R.E.L. #13 (4) Magnetic Compass CAR §3.655(b)(1)(i) – Fitted as Std in Maule Cluster Gauge (5) Fuel Contents CAR §3.655(b)(1)(v) Fitted as Standard – See R.E.L. #20 (6) Engine RPM	(7) Oil Pressure CAR §3.655(b)(1)(ii) Fitted as Std in Maule Cluster Gauge (8) Coolant Temp N/A – Air cooled engine (9) Oil Temperature CAR §3.655(b)(1)(iii) Fitted as Std in Maule Cluster Gauge (10) Manifold Pressure CAR §3.655(b)(2)(iii) Fitted as Std – See R.E.L. #17 (11) Cylinder Head Temp. CAR §3.655(b)(2)(i) Fitted as Std in Maule Cluster Gauge (12) Flap Position Notched lever (13) U/c Position N/A – Fixed undercarriage (14) Ammeter/Voltmeter CAR §3.687 – Ammeter in Maule Cluster Gauge
91.511 Night	(1) Turn and Slip Optional Fit – See O.E.L. #5C (2) Position Lights Fitted as Std – See R.E.L.#28	(3) Anti-collision Lights Optional Fit – See O.E.L. #1 (4) Instrument Lighting Fitted as Std – See R.E.L.#11
91.513	VFR Communication Equipment	See O.E.L. #2A/B/C for standard radio equipment options
91.517 IFR	(1) Gyroscopic AH Optional Fit – See O.E.L. #4B (2) Gyroscopic DI Optional Fit – See O.E.L. #4A (3) Gyro Power Supply Optional Fit – See O.E.L. #3D (4) Sensitive Altimeter Fitted as Standard	(5) OAT Optional Fit – See O.E.L. #6C (6) Time in hr/min/sec Optional Fit – See O.E.L. #6B (7) ASI/Heated Pitot Optional Fit – See O.E.L. #7A (8) Rate of Climb/Descent Optional Fit – See O.E.L. #5B
91.519	IFR Communication and Navigation Equipment	See O.E.L. #2 for standard navigation equipment options
91.523	Emergency Equipment: (a) More Than 10 pax – First Aid Kits per Table 7 – Fire Extinguishers per Table 8 (b) More than 20 pax – Axe readily acceptable to crew (c) More than 61 pax – Portable Megaphones per Table 9	<i>To be determined on an individual aircraft basis if used on Air Transport operations</i> Not Applicable – Less than 20 passenger seats Not Applicable – Less than 61 passenger seats
91.529	ELT – TSO C91a after 1/4/97 (or replacement)	ELT Fitted as Standard – See R.E.L. #30
91.531	Oxygen Indicators – Volume/Pressure/Delivery	Oxygen system not fitted as standard
91.533	Oxygen for Non-Pressurized 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, 20l PBE for each crew member	<i>Operating Rule – Compliance to be determined by operator</i> Portable and Long Range Portable Oxygen Systems are available as optional equipment – See O.E.L. #7K/L
91.541	SSR Transponder and Altitude Reporting Equipment	See O.E.L. #2K for transponder options
91.543	Altitude Alerting Device – Turbojet or Turbofan	Not Applicable – Not turbo jet or turbofan powered
91.545	Assigned Altitude Indicator	<i>Operating Rule – Compliance to be determined by operator</i>
A.15	ELT Installation Requirements	<i>To be determined on an individual aircraft basis</i>

Civil Aviation Rules Part 135

Subpart F – Instrument and Equipment Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
135.355	Seating/Restraints – Shoulder harness for flight-crew seats	3-Point diagonal harness fitted as standard for all seats
135.357	Additional Instruments (Powerplant and Propeller)	Has all instruments required under FAR §23.1305
135.359	Night Flight	<i>Operating Rule – Compliance to be determined by operator</i>
	Landing light, Pax compartment	
135.361	IFR Operations	<i>Operating Rule – Compliance to be determined by operator</i>
	Speed, Alt, spare bulbs/fuses	
135.363	Emergency Equipment (Part 91.523 (a) and (b))	<i>Operating Rule – Compliance to be determined by operator</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

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:

Photographs first-of-type example MX-7-180B serial no. 22001C ZK-TDS
 Three-view drawing Maule Model MX-7-180B “Star Rocket”
 Photographs first-of-type example M-6-235 serial no. 7465C ZK-MTP
 Three-view drawing Maule Model M-6-235 “Super Rocket”
 Photographs first-of-type example MXT-7-180 serial no. 14120C ZK-JQY
 Maule Drawing 1550F – Maule MXT-7-160/180 Plan and Elevation
 Copy of FAA Type Certificate and Data Sheet Number 3A23

Sign off

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 David Gill
 Team Leader Airworthiness

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 Checked – Greg Baum
 Airworthiness Engineer

Appendix 1

List of Type Accepted Variants:

<i>Model:</i>	<i>Applicant:</i>	<i>CAA Work Request:</i>	<i>Date Granted:</i>
M-4-210C		AC 21-1.2/NZCAR Part 21 Appendix A(c)	
M-5-180C, M-5-210C, M-5-235C		AC 21-1.2/NZCAR Part 21 Appendix A(c)	
MX-7-180B	I G Wright	5/21B/1	11 August 2004
M-6-235	H A and J L Robinson	6/21B/4	24 November 2005
MXT-7-180	Maule Aerospace Technology Inc.	7/21B/22	21 December 2006
MX-7-180A	S P Anderson	7/21B/24	12 January 2007
M-9-235	E Aharoni	16/21B/5	26 October 2015
MXT-7-180A	A Rossaak	18/21B/27	5 February 2018