
Type Acceptance Report

TAR 98/12 – Revision 2

STEMME S 10 Series

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Executive Summary

New Zealand Type Acceptance has been granted to the Stemme S 10 Series based on validation of EASA Type Certificate number A.054. 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 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 latest applicable ICAO Type Certificate Data Sheet.

1. Introduction

This report details the basis on which Type Acceptance Certificate No. 98/12 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 NZ Airworthiness Certificate or for any subsequent operations.

2. ICAO Type Certificate Details

Type Certificate Holder: Stemme GmbH & Co. KG

Manufacturer: Stemme AG

Type Certificate: A.054

Issued by: European Aviation Safety Agency

Model(s): S 10, S 10-V, S 10-VT

MCTOW 850 kg [1874 lb.]

Max. No. of Seats: 2

Noise Standard: ICAO Annex 16 Volume 1

Engine: Limbach L2400 EB1.AD (S 10, S 10-V)

Type Certificate: E.084

Issued by: European Aviation Safety Agency

Rotax 914F2/S1 (S 10-VT)

Type Certificate: 5006

Issued by: Luftfahrt-Bundesamt

NOTE: The engine in the Stemme S10-VT is based on the Rotax 914 F2, which is type certificated under EASA.E.122, but with a modified arrangement of some accessories (induction and exhaust system including turbocharger, engine mounts etc.) to adapt the systems to specific aircraft installation requirements. With these changes the engine model becomes Rotax 914 F2/S1. The engine/propeller “package” is type certificated by the LBA.

Propeller: Stemme 10AP-N (S 10)

Type Certificate: 32.100/1

Issued by: Luftfahrt-Bundesamt

Stemme 10AP-F (S 10-V)

Type Certificate: 32.100/4

Issued by: Luftfahrt-Bundesamt

Stemme 10AP-V (S 10-V)

Type Certificate: 32.100/2

Issued by: Luftfahrt-Bundesamt

Stemme 11AP-V (S 10-VT)

Type Certificate: 32.100/3

Issued by: Luftfahrt-Bundesamt

3. Type Acceptance Details

The application for New Zealand type acceptance of the Stemme S10 was from the importer Mr D M Craill, dated 8 January 1998. The first-of-type example S10 was serial number 10-41, registered ZK-GDC. The S10 is a self-launching two-seat side-by-side all composite construction powered glider, with the engine mounted in the centre fuselage connected by a shaft system to a folding centrifugally-deployed propeller in the nose.

Type Acceptance Certificate No. 98/12 was granted on 23 February 1998 to the Stemme Model S 10 based on validation of LBA Type Certificate 846, and includes the Limbach L2400 Series engine based on validation of LBA Type Certificate 4607. There are no special requirements for import into New Zealand.

This report was raised to Issue 1 under CAA Work Request 4/21B/4 to include the Model S 10-VT. The application was from the NZ agent, HPCA Ltd, dated 20 August 2003. The first-of-type variant was serial number 11-082 registered ZK-GTR. Type acceptance was granted to the S 10-VT on 17 October 2003, and included the Rotax 914F Series engine based on validation of Austrian CAA type certificate number TW10-ACG.

Revision 2 was issued to include the S 10-V variant, after application from the importer Mr D M Craill dated 8 September 2015. The first-of-type variant was serial number 14-039M registered ZK-GSI. Type Acceptance was granted on 17 November 2015.

The Stemme S10 Series uses an ingenious arrangement to deploy and drive the propeller. The engine is mounted in the fuselage in a central steel tubing frame near the centre of gravity. Engine power is transmitted via a propeller shaft made of composites and a helical spur gear to the variable pitch propeller in the fuselage nose. During soaring, the propeller is folded and covered by a movable nose cone. Propeller pitch change from take-off into cruise position is accomplished by electrically heated expansion elements, and from cruise back to take-off position by spring force. The development prototype flew in 1986.

The S10-V is the same as the original S 10 with the option of an electrically actuated variable pitch propeller. Conversion can be accomplished in accordance with Service Bulletin A31-10-010, as part of which a new dataplate and aircraft serial number will be issued. The S10-VT variant uses a turbocharged Rotax engine, different variable pitch propeller and installation of a redesigned transmission system with new frontal spur gear.

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) ICAO Type certificate:

EASA Type Certificate Number A.054

EASA Type Certificate Data Sheet no. A.054 at Issue 01 dated 16 September 2005
– Model S 10 approved 31 December 1990
– Model S 10-V approved 16 September 1994
– Model S 10-VT approved 15 August 1997

EASA Type Certificate Data Sheet no. E.084 at Issue 01 dated 4 August 2006
– Model 2400 EB approved 12 June 1985

EASA Type Certificate Data Sheet no. E.122 at Issue 05 dated 14 April 2015
– Model 914F2 approved 15 May 1966

Luftfahrt-Bundesamt Datenblatt Nr 5006 – Propeller-Antrieb S10-VT – Ausgabe 1
– Date of approval: 14 August 1997

Supersedes:

LBA Musterzulassungsschein Nr.846 issued for Stemme S 10 Series
LBA TCDS Nr. 846 – Type: Stemme S10-VT at Change 8 dated 19.06.2002

LBA TCDS Type Certificate Data Sheet Nr. 4607

Austro Control TC Nr.TW10-ACG – Rotax 914 F2, F3, F4 issued 15 May 1996

(2) Airworthiness design requirements:

(i) *Airworthiness Design Standards:*

The certification basis of the S10 is JAR-22 effective on June 27, 1989 (Change 4 of the English Original Issue). Elect to comply conditions included the Preliminary Standards for Structural Substantiation of Sailplane and Powered Sailplane Components Consisting of Glass or Carbon Fibre Reinforced Plastics, Issue Jan. 1981, the Preliminary Standards for the Substantiation of the Electrical System of Powered Sailplanes, Issue Feb. 1, 1990, the Standards for the Substantiation of the Electrical System of Powered Sailplanes, Issue September 15, 1992, and the Preliminary Standards for the Substantiation of Indirect Drive Shafts in Power Plants of Powered Sailplanes (JAR 22) (with modifications for S10) dated 05.08.1988, plus JAR 22.375 from Amendment 22/90/1 for winglets. The same certification basis was used for the S10-V and S10-VT, except that the structural Supplementary Requirement for composites was updated to Issue July 1991, and a new NPA 22E-XX (Proposed Amendment to JAR-22 for Variable-Pitch Propellers) Issue March 25, 1993 was imposed.

This is an acceptable certification basis in accordance with NZCAR Part 21B paragraph §21.41 and Advisory Circular 21-1A, because JAR-22 is the basic standard for Sailplanes and Powered Sailplanes. There are no non-compliances and no additional special conditions have been prescribed by the Director under §21.23.

The certification basis of the Limbach L2400EB engine is JAR 22 Subpart H at Amendment 2 dated 13 September 1982. The certification basis of the Rotax 914F2 engine is JAR-E Change 9, dated 21 October 1994. These are both an acceptable standard for aircraft engines used in powered sailplanes, as detailed in Advisory Circular 21-1A.

(ii) *Special Conditions:*

Nil

(iii) *Equivalent Level of Safety Findings:*

Nil

(iv) *Airworthiness Limitations:*

See AMM Section 4 Airworthiness Limitations Section

(3) Aircraft Noise and Engine Emission Standards:

(i) *Environmental Standard:*

German LSL, equivalent to ICAO Annex 16, Volume 1, Chapter 10.4a or b.

(ii) *Compliance Listing:*

Test Report: Noise Measurements S10-VT – Doc.No. A22-11-0-9701

EASA Type Certificate Data Sheet for Noise TCDSN No. EASA.A.054 – Issue 4

VARIANT:	ENGINE:	PROPELLER:	MCTOW:	TAKEOFF NOISE LEVEL:
Stemme S 10	L2400 EB1.AD	10AP-N	850 kg	65.4 dB(A)
Stemme S 10-V	L2400 EB1.AD	10AP-F	850 kg	66.8 dB(A)
Stemme S 10-V	L2400 EB1.AD	10AP-V	850 kg	75.6 dB(A)
Stemme S 10-VT	Rotax 914S1/F2	11AP-V	850 kg	69.7 dB(A)

(4) Certification Compliance Listing:

Compliance Checklist (Listing of Single Proofs) Type: Stemme S10 Change 12

Type Design Documents Master List, doc # A08-10-000, amendment index 02.a

Compliance Checklist – New Model Stemme S10-VT – Project No. 11-0

Document number A05-11-0 at Amendment 03.a LBA-Approved 11.08.1997

Compliance Checklist – S10 with Variable Pitch Propeller – Project No. 10-039

Document number A05-10-039 at Am.-Index 03.c dated Dec 16, 1994

(5) Flight Manual:

LBA-Approved Flight Manual for the powered sailplane STEMME S 10a –

Document No. A40-10-011 – CAA Accepted as AIR 2608

LBA-Approved Flight Manual for the powered sailplane STEMME S10-VT –

Document No. A40-11-111 – CAA Accepted as AIR 2843

LBA-Approved Flight Manual for the powered sailplane STEMME S10-V –

Document No. A40-10-111 – CAA Accepted as AIR 3326

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

(i) *Maintenance Manual:*

Maintenance Manual for the STEMME S 10 – Document No. A40-10-021
Maintenance Manual for the STEMME S10-V – Document No. A40-10-121
Maintenance Manual for the STEMME S10-VT – Document No. A40-11-122
Small Repairs of Composite Material Parts – S10 and TSA-M – A35-10SMRE
Maintenance Instructions – Propeller 10AP-F for model S10-V – A35-10-067E

Limbach L2400 Operating and Maintenance Manual

Maintenance Manual (Heavy) for ROTAX 912 and 914 Series – P/N 899603
Maintenance Manual (Line) for ROTAX 914 Series – P/N 899608

(ii) *Current service Information:*

Service Bulletins applicable to the Model S 10 series
List of Service Informations Stemme S 10 – Document No. A91-10-00

Limbach Flugmotoren Effective Technical Bulletins

Rotax Service Bulletins and Alert Service Bulletins
SB-914-000 Publication Index for Rotax Aircraft Engines

(iii) *Illustrated Parts Catalogue:*

IPC Stemme Models S10, S10-V, S-10VT – Document No. A44-10-00

Limbach L1700, L2000, L2400 Ersatzteilkatalog

IPC Rotax 912 A/F/S/UL/ULS/ULSFR and 914 F/UL – P/N 899472

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

Letter from Stemme Airworthiness Department dated 21 January 1998
CAA Form 2171 from Stemme Head of Airworthiness Department dated 23.09.03
Stemme publications available on their website: www.stemme.info/service/

Letter from Limbach Flugmotoren dated 22.01.98
Limbach publications available on their website:
<http://www.limflug.de/en/support/downloads>

Rotax publications available on their website:
www.flyrotax.com/services/technical-documentation.html

(8) Other information:

Limbach L1700, L2000, and L2400 Series Installation Manual

Rotax Installation Manual 914 Series – P/N 897817
Rotax Operators Manual 914 Series – P/N 899645

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.

CAR 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:

CAR Part 91 – Subpart F – Instrument and Equipment Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
91.505	Seating and Restraints – Shoulder Harness required if certified for aerobatics; >10 pax; Flight Training	JAR 22.1307 – 2x four-element straps is required minimum equipment – See TCDS Section III paragraph 11
91.507	Pax Information Signs – Smoking, safety belts fastened	Not Applicable – Less than ten passenger seats
91.509	Minimum Instruments and Equipment	Not Applicable to powered gliders
91.511	Night VFR Instruments and Equipment	Not Applicable – Certificated for Day VFR flight only
91.513	VFR Communication Equipment	<i>Operational requirement – compliance as applicable</i>
91.517	IFR Instruments and Equipment	Not Applicable – Certificated for Day VFR flight only
91.519	IFR Communication and Navigation Equipment	Not Applicable – Certificated for Day VFR flight only
91.523	Emergency Equipment	Not Applicable – Superseded by §104.101(5)
91.529	ELT – TSO C91a after 1/4/97 (or replacement)	<i>To be determined on an individual aircraft basis</i>
91.531	Oxygen Indicators – Volume/Pressure/Delivery	Not fitted as standard
91.533	Oxygen for Unpressurized Aircraft	Not fitted as standard
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	Not Applicable – Certificated for Day VFR flight only
A.15	ELT Installation Requirements	<i>To be determined on an individual aircraft basis</i>

CAR Part 104 – Subpart C – Equipment and Maintenance Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
104.101	(1) Airspeed Indicator (2) Altimeter (Adjustable for barometric pressure) (3) Magnetic Compass (4) Safety Harness for each seat (5) A First Aid Kit (6) For powered gliders – (i) Fuel gauge for each main fuel tank (ii) Oil Pressure Gauge or warning device (iii) A tachometer or engine governor light (1) For IMC – (i) A variometer (ii) Turn & Slip/Artificial Horizon (iii) Radio transceiver	Required as Minimum Equipment – See TCDS Section 11 Required as Minimum Equipment – See TCDS Section 11 Required as Minimum Equipment – See TCDS Section 11 Required as Minimum Equipment – See TCDS Section 11 <i>Operational requirement – compliance as applicable</i> Required as Minimum Equipment – See TCDS Section 11 Required as Minimum Equipment – See TCDS Section 11 Required as Minimum Equipment – See TCDS Section 11 } N/A – The S 10 Series is not approved for cloud flying

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 Stemme S10 s/n 10-41 ZK-GDC
- Photographs first-of-type example Stemme S10-VT s/n 11-082 ZK-GTR
- Three-view drawing Stemme Model S10
- Copy of EASA Type Certificate Data Sheet Number A.054

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>
S 10	D M Craill	98/21B/12	23 February 1998
S 10-VT	P Rold	4/21B/4	17 October 2003
S 10-V	D M Craill	16/21B/10	17 November 2015