Type Acceptance Report

TAR 22/21B/12

BRP-ROTAX 912/915 SERIES

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Executive Summary

New Zealand Type Acceptance has been granted to the BRP-Rotax 912-915 engine Series based on validation of Type Certificate number EASA.E.121. There are no special requirements for import.

Applicability is limited to the Models and/or serial numbers detailed in Section 2, which are now eligible for installation on a NZ-registered aircraft. 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 State-of-Design Type Certificate Data Sheet.

1. Introduction

This report details the basis on which Type Acceptance Certificate No. 22/21B/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.

The report notes the status of all models included under the State-of-Design type certificate which have been granted type acceptance in New Zealand, which are listed in Section 2. The history of the Rotax 912/915 Series model type acceptance in New Zealand under type certificate EASA.E.121 is listed in Appendix 1. This includes models type accepted as part of the aircraft under Part 21B prior to Amendment 6.

2. Product Certification Details

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

Manufacturer: BRP-Rotax GmbH & Co. KG

BRP-Powertrain GmbH & Co KG (until June 16, 2016)

BRP-Rotax GmbH & Co. KG (until February 3, 2009)

Bombardier-Rotax GmbH & Co KG (until June 16, 2004)

Type Certificate: EASA.E.121
Issued by: European Aviation Safety Agency

Production Approval: EASA.21G.

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

(i) **Models:** 912 A1, 912 A2, 912 A3, 912 A4
912 F2, 912 F3, 912 F4

Noise Standard: Not Applicable

Power Rating: 58 kW (77.8 bhp) Maximum Continuous
59.6 kW (80 bhp) Maximum Take-off

(ii) **Models:** 912 S2, 912 S3, 912 S4

Noise Standard: Not Applicable

Power Rating: 69 kW (92.5 bhp) Maximum Continuous
73.5 kW (98.5 bhp) Maximum Take-off

(iii) **Models:** 912 iSc2 Sport, 912 iSc3 Sport

Noise Standard: Not Applicable

Power Rating: 72 kW (96.5 bhp) Maximum Continuous
73.5 kW (98.5 bhp) Maximum Take-off

(iv) **Models:** 915 iSc2 A, 915 iSc3 A
915 iSc2 C24, 915 iSc3 C24

Noise Standard: Not Applicable

Power Rating: 99 kW (132.7 bhp) Maximum Continuous
104 kW (139.5 bhp) Maximum Take-off

3. Application Details and Background Information

There have been examples of the Rotax 912 engine in New Zealand prior to Part 21B at Amendment 6, when there was no provision for separate type acceptance of products, and engines and propellers were included as part of an aircraft validation. The 912 A2 was originally type accepted as part of the Tecnam P92J aircraft. The first application for separate type acceptance was for the 912 iSc and 915 iSc Series, from the manufacturer dated 26 January 2022.

The Rotax 912 Series engine is a 4-stroke, 4-cylinder horizontally-opposed, pushrod-actuated overhead-valve spark ignition engine, with the propeller drive via integrated reduction gear. It features liquid-cooled cylinder heads, ram-air-cooled cylinders, two constant depression carburettors, and a dry-sump forced lubrication system.

Type Acceptance Certificate Number 22/21B/12 was granted on 16 March 2022 to the Rotax 912/915 Series based on validation of Type Certificate number EASA.E.121. Specific applicability is limited to the coverage provided by the operating documentation supplied. There are no special requirements for import into New Zealand.

The Rotax 912 Series was developed as an all-new four-stroke engine to replace the companies popular two-stroke range. It is unusual for aircraft engines, being a high revving engine with an integral reduction gearbox. The Rotax 912 Series has become the dominant engine in the ultralight and LSA market, although most examples in service are not type certificated versions. The 912 comes in two basic versions, the 1.2 litre capacity 912 A/F rated at 80 shp (blue cam cover) and the 1.35 litre capacity 912 S rated at 100 shp (black cam cover). The numbers after the model suffix indicate provision for different PCD size and type of propeller to be fitted. (Fixed pitch, constant-speed or additional drive and adapter for hydraulic governor.)

The 912 i Series is a fuel-injected development of the 912 S Series, controlled by a dual channel Full Authority Digital Engine Control (FADEC) system for ignition and injection. The 915 i Series engines were further developments from the 912 i, with power being increased by the fitting of a turbocharger controlled by waste gate adjustment and a new gearbox. The latest 915 iSc C24 versions indicate the engine now has 24 Volt generation capability.

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:

EASA Type Certificate Number EASA.E.121

Type Certificate Data Sheet no. EASA.E.121 at Issue 15 dated 4 October 2021
- Models 912 A1 and 912 A2 approved 25 September 1989
- Model 912 A3 approved 23 April 1993
- Models 912 F2, 912 F3 and 912 F4 approved 22 December 1994
- Model 912 A4 approved 02 August 1996
- Models 912 S2, 912 S3 and 912 S4 approved 27 November 1998
- Models 912 iSc2 Sport and 912 iSc3 Sport approved 17 June 2014
- Model 915 iSc3 A approved 14 December 2017
- Model 915 iSc2 A approved 11 October 2019
- Models 915 iSc2 C24 and 915 iSc3 C24 approved 01 September 2021

(2) Airworthiness design requirements:

(i) Airworthiness Design Standards:
The certification basis of the Rotax 912 A Series is JAR 22 Appendix H, Airworthiness Requirements for Engines of Powered Sailplanes, Amendment 1 of May 18, 1981.

For the Rotax 912 F Series the certification basis was upgraded to FAR Part 33 Amendment 15, plus elect to comply with FAA NPRM Doc. # 24922, Notice number 92-14.

The certification basis of the Rotax 912 iSc Sport Series was changed to CS-E, Amendment 3 (December 23, 2010). For the 915 iSc Series this was updated to Amendment 4 (March 12, 2015).

This is an acceptable certification basis in accordance with NZCAR Part 21B paragraph §21.41 and Advisory Circular 21-1A. JAR-22 is an accepted design standard for powered sailplanes and VLA aircraft, while CS-E is the EASA equivalent of FAR 33, which is the basic standard for engines 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:
Rotax 912 F series and S series:
SC1 HIRF Requirement according RTCA DO 160 C; The engine ignition- and starter system and associated components, considered separately and in relation to other systems, must be designed and installed so that each system required for safe operation is not adversely affected when the engine is exposed to the HIRF environment defined in RTCA DO 160C.

SC2 External Alternator; In the absence of specific requirements for an external alternator Aerospace Standard AS8020 has been determined as the applicable design standard.

(iii) Equivalent Level of Safety Findings:

Rotax 912 F series and S series:

Propeller Governor: Instead of FAR 35.42 as stated in FAR 33.19(b), the blade pitch control system was tested according to JAR-E 180 which was accepted as an equivalent level of safety for certification. JAR-E180(B)(1)(ii) was applied for the operational flight test of the hydraulic governor. The tested configuration (engine, governor and propeller) worked without any problem, and no vibration tendency or leakage have been experienced.

(iv) Deviations:

Rotax 912 F series:

Temporary exemption to paragraph 33.15 until 1.7.1995 had been granted.

(v) Airworthiness Limitations:

The EASA approved Airworthiness Limitations Section of the Instructions for Continued Airworthiness is published in the applicable "Maintenance Manual Line" document (MML), chapter 04-00-00 "Airworthiness Limitations".

The recommended Time Between Overhaul (TBO) is published in the MML (refer to chapter V. “Operating and Service Instructions”). TBO extensions will be published by corresponding Service Bulletins.

(3) Engine Emission Standards:

(i) Environmental Standard:

Not Applicable to piston engines.

(ii) Compliance Listing:

Not Applicable

(4) Certification Compliance Listing:

Certification of Rotax 912 to Jar 22 Compliance Check List – Dated 1991 09 09

Certification Compliance Report – Rotax 912 A4 Engine to JAR-22, Appendix H

Compliance List – Rotax 912 F2, F3, F4 – FAR 33-15 – Issue 1, Corrected

Compliance List – Rotax 912 S2/S3/S4 – FAR 33-15 – Issue II

Doc. Nr.: 912iSc lssC MoC0010 – Means of Compliance 912 iSc2 Sport/912 iSc3 Sport – Requirement (CS-E, Amendment 3, 23. December 2010) – Rev.02

Doc. No.: 00003-MOC00010 – Means of Compliance – CS-E Amendment 4 / 12.03.2015 – Initial Certification Rotax 915 iSc A

Doc. No.: 00004-MOC00010 – Means of Compliance – CS-E Amendment 4 / 12.03.2015 – Initial Certification Rotax 915 iSc2 A

Doc. No.: 00007_MOC00010 – Means of Compliance – CS-E Amendment 4 / 12.03.2015 – Initial certification of Rotax 915 iSc C24 (Derivative)

(5) Flight Manual: Not Applicable

(6) Operating Data for Engine:

(i) Maintenance Manual:

MML-912 – Maintenance Manual Line Rotax Type 912 Series (P/N 899196)
MMH-912/914 – Maintenance Manual Heavy 912/914 Series (P/N 899603)
OHM-912/914 – Overhaul Manual Type 912 and 914 Series (P/N 898701)
OHMA-912 – Appendix to Overhaul Manual 912/914 Series (P/N 897797)

MML-912i – Maintenance Manual Line Rotax Type 912 i Series (P/N 898751)
MMH-912i – Maintenance Manual Heavy Type 912 i Series (P/N 898743)
OHM-912i – Overhaul Manual Rotax Type 912 i Series (P/N 898707)
OHMA-912i – Appendix to Overhaul Manual Type 912 i Series (P/N 898744)

MMH-915iA/C24 – Maintenance Manual Heavy Type 915 iA/C24 (P/N 898861)
MML-915iA/C24 – Maintenance Manual Line Type 915 iA/C24 (P/N 898863)
OHM-915iA/C24 – Overhaul Manual Type 915 iA/C24 Series (P/N 898853)
OHMA-915iA/C24 – Appendix to Overhaul Manual 915 iA/C24 (P/N 898882)

(ii) Current service Information:

Service Bulletins, Service Instructions and Service Letters

(iii) Illustrated Parts Catalogue:

IPC-912/914 – Model 912 A/F/S series (P/N 899473)

IPC-912 i – Model 912 iSc Sport Series (P/N 899477)

IPC-915 i A – Model 915 iSc A series (P/N 898891)

IPC-915 i C24 – Model 915 iSc C24 series (P/N 898895)

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

CAA 2171 from Head of the Office of Airworthiness dated 26 January 2022

Publications are available on the Rotax website at
https://www.flyrotax.com/p/service/technical-documentation

(8) Other information:

OM-912 – Operators Manual Rotax Engine Type 912 Series (P/N 899700)

IM-912 – Installation Manual Rotax Engine Type 912 Series (P/N 898644)

OM-912i – Operators Manual Rotax Type 912 i Series (P/N 898741)

IM-912i – Installation Manual Rotax Engine Type 912 i Series (P/N 898648)

OM-915iA/C24 – Operators Manual Type 915 iA/C24 Series (P/N/ 898851)

IM-915 i A / C24 – Installation Manual Type 915 iA/C24 Series (P/N 898871)

Attachments

The following documents form attachments to this report:

Copy of Type Certificate Data Sheet Number EASA.E.121

Sign off

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David Gill
Team Leader Aircraft Inspection

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Checked – Gaetano Settineri
Team Leader Product Certification

Appendix 1

List of Type Accepted Variants:

Model:	*Applicant:*	*CAA Work Request:*	*Date Granted:*
912 A2	Tecnam Limited	97/21B/16	23 October 1997
912 S2	Giovanni Nustrini	3/21B/15	14 February 2003
912 S3	Costruzioni Aero. Tecnam S.r.l.	10/21B/25	17 June 2010 (Prov.)
912 iSc Series	BRP-Rotax GmbH & Co KG	22/21B/12	16 March 2022
915 iSc Series	BRP-Rotax GmbH & Co KG	22/21B/12	16 March 2022