



**LAA TYPE ACCEPTANCE DATA SHEET
TADS E02
ROTAX 4-STROKE ENGINES**

Issue 1	Initial issue	Dated 04/09/20	JP
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This TADS is intended as a summary of available information about the engine type and should be used during the overhaul, operation and permit revalidation phases to help owners and inspectors. Although it is hoped that this document is as complete a summary as possible, other sources contain more complete information, e.g. the manufacturer's website.

Section 1 contains general information about the engine type and its variants.

Section 2 contains information about the engine type that the LAA considers mandatory and must be complied with.

Section 3 contains advisory information that owners and inspectors should review to help them maintain the engine in an airworthy condition. If due consideration and circumstances suggest that compliance with the requirements in this section can safely be deferred, is not required or not applicable, then this is a permitted judgement call. This section also provides a useful repository for advisory information gathered through defect reports and experience.

Section 1 - Introduction

1.1 UK Distributor

Contact: CFS Aeroproducts Ltd
Address: Harris Road
Warwick
Warwickshire
CV34 5FY
Tel: 024 7630 5873
Email: <http://www.cfsaero.com/rotax/>
Website: rotax@cfsaero.com

Manufacturer contact information:

Address: BRP-Rotax GmbH & Co KG
Rotaxstrasse 1
4623 Günskirchen
Austria
Tel: +43(0) 7246 6010
Website: <https://www.flyrotax.com/home.html>

1.2 Description

Rotax is the brand name for a range of engines designed and produced by the Austrian manufacturer BRP-Rotax GmbH & Co KG. The parent company is Bombardier Recreational Products. Rotax was originally founded in 1920 specialising in the development and manufacturing of innovative drive systems. In the last 50 years, they have developed in excess of 350 engine models. To date, over nine million engines have been manufactured by the company.

Rotax produce a number of different engine types for use in aircraft, in both 2-stroke twin cylinder 'inline' and 4-stroke four-cylinder 'boxer' format. Only part of Rotax's production is aircraft engines, they also make engines for small land and sea-based recreational vehicles as well as engines for various motorcycle manufacturers.



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4-Stroke Engine Models

Model	Capacity and power output	Remarks
912UL	1211 cc 80 hp @ 5800 rpm Max 5800 rpm limited to 5 mins Max continuous 5500 rpm	Non-certified version, dual carburettors, normally aspirated
912A		Certified version to JAR 22, dual carburettors, normally aspirated
912F		Certified version to FAR 33, dual carburettors, normally aspirated
912ULS	1352 cc 100 hp @ 5800 rpm Max 5800 rpm limited to 5 mins Max continuous: 5500 rpm	Non-certified version, dual carburettors, normally aspirated
912S		Certified version to FAR 33, dual carburettors, normally aspirated
914UL	1211 cc 115 hp @ 5800 rpm Max 5800 rpm limited to 5 mins Max continuous: 5500 rpm	Non-certified version, dual carburettors, turbocharged
914F		Certified version to EASA CS-E, dual carburettors, turbocharged
912 iS Sport	1352 cc 100 hp @ 5800 rpm 98 hp @ 5500 rpm Max 5800 rpm limited to 5 mins Max continuous: 5500 rpm	Non-certified version, electronic ignition and fuel injection, normally aspirated
912 iSc Sport		Certified version to EASA CS-E, electronic ignition and fuel injection, normally aspirated
915 iS	1352 cc 141 hp @ 5800 rpm 135 hp @ 5500 rpm Max 5800 rpm limited to 5 mins Max continuous: 5500 rpm	ASTM compliant, electronic ignition and fuel injection, normally aspirated, turbocharged
915 iSc		Certified version to EASA CS-E, electronic ignition and fuel injection, turbocharged

Section 2 Mandatory information for owners, operators and inspectors

At all times, responsibility for the maintenance and airworthiness of an aircraft rests with the owner. A condition stated on a Permit to Fly requires that: *"the aircraft shall be maintained in an airworthy condition"*.

2.1 Lifed Items

LAA Technical Leaflet [TL 2.23 Engine Overhaul Life and Operating 'On Condition'](#) provides a large amount of information on dealing with engine life for engines installed in LAA administered aircraft.

The manufacturer's recommended TBO for the 91x series of engines varies depending on the serial number and modification state of the engine. Further details can be found in the



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Maintenance Manual (Line), Chapter 05-10-00, 'Time Limits' in the [Technical Documentation](#) section of the Rotax website.

The [Technical Documentation](#) section should also be checked for amendments and revisions to the Maintenance Manuals and other technical documentation detailing the manufacturer's recommended time limits for the engine and associated components.

Rotax state in their documentation that whenever a Rotax engine is running, that time should be counted towards the total engine time run. Whilst there is no legal requirement for the engine hours to be recorded in this way (airframe, engine and propeller hours are normally taken as take-off to touch down), failure to comply with the Rotax statement, may cause complications with any warranty claim.

2.2 Operator's manual

Operator's manuals for specific Rotax engines are available for free download from the Rotax website in the [Technical Documentation](#).

2.3 Maintenance Schedule

Regular maintenance is the key to stress free flying. Rotax engines are generally fitted to LAA administered aircraft that are maintained either in accordance with the manufacturer's maintenance schedules, the CAA Light Aircraft Maintenance Schedule (LAMS) [CAP411](#) or the LAA Generic Maintenance Schedule, further details of which can be found in LAA Technical Leaflet [TL 2.19: The LAA Generic Maintenance Schedule](#). The CAA and LAA generic maintenance schedules were originally written around the maintenance requirements of traditional aircraft engines rather than those produced by Rotax.

It is recommended that the applicable maintenance schedule found in the engine type's Rotax Maintenance Manual (Line Maintenance) is consulted when carrying out maintenance on a Rotax engine. Consult the [Technical Documentation](#) section of the Rotax website for the applicable Maintenance Manual (Line Maintenance).

Some aircraft have mandated maintenance requirements and/or schedules which are stated on the aircraft's Operating Limitations document and these must be followed.

More information on maintenance schedules can be found in the [Aircraft Maintenance](#) section of the LAA website.

2.4 Airworthiness Directives

There are various EASA-issued Airworthiness Directives (ADs) in force which do apply to the certified variants of the 91x series of engines. Whilst these mandatory ADs do not apply to the non-certified engines, it would still be prudent to review ADs for applicability even though they are only mandating continuing airworthiness information already produced by the manufacturer.

Note: Airworthiness Directives for Rotax engines are listed on the [EASA Safety Publications Tool](#) under the parent company name of BRP-ROTAX GmbH & Co KG.

2.5 Mandatory Permit Directives

Up until 31 January 2012, when the publication ceased to be amended, [CAP661](#) listed the Mandatory Permit Directives issued by the CAA.



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The CAA now provides links to current MPDs on the [CAA MPD Listing](#) page of their website.

The following Mandatory Permit Directives concerning the Rotax 4-stroke engines have been issued by the CAA:

MPD	Description	Applicability
MPD 2007-003 R2	Fuel pump replacement	By fuel pump p/n
MPD-2011-003-E	Flywheel hub washer (P/N 944072) replacement	912UL, 912ULS, 912ULSFR & 914UL
MPD 2011-009-E R1	Crankshaft inspection	912UL, 912ULS, 912ULSFR & 914UL
MPD 2012-001-E	Oil pump and attachment bolt inspection	912UL, 912ULS & 914UL
MPD 2012-002-E	Fuel pump – pressure side fuel hose replacement	912UL & 912ULS
MPD 2013-003-E Corr	Cylinder head inspection/replacement	912UL, 912ULS & 914UL
MPD 2017-001	Cylinder head – inspection/replacement & engine reidentification	912UL, 912ULS & 914UL
MPD 2017-005-E	Ignition housing sealing plugs inspection	912iS & 912iS Sport
MPD 2018-001	Valve push rod assembly - inspection/replacement	912iS Sport, 912UL, 912ULS & 914UL
MPD 2019-001-E	Exchange of exhaust valves	915iS & 914UL
MPD 2019-006-E	Fuel pump assembly replacement	912i and 915iA (Series)

The [CAA MPD Listing](#) should be checked for revisions or amendments to the above list of MPDs.

The LAA website should be checked for MPDs that are non-type specific in Technical Leaflet [TL 2.22: Non-Type Specific MPDs](#).

2.6 CAA Mandatory Requirements for Airworthiness CAP747 and Civil Aircraft Airworthiness Information and Procedures (CAAIP) CAP562

CAA publications [CAP747](#) and [CAP562](#) contain information that may be relevant to LAA administered aircraft and should be checked for applicability.

In particular, for older engines operating beyond the manufacturer’s recommended life, CAP747 Generic Requirement No 24: ‘Light Aircraft Piston Engine Overhaul Periods’ should be read alongside LAA Technical Leaflet [TL 2.23: Engine Overhaul Life and Operating 'On Condition'](#). Generic Requirements can be found in CAP747: Section 2 ‘Mandatory Information’.

2.7 LAA Required Modifications (including LAA issued AILs, SBs, etc)

Airworthiness Alert	Description	Applicability
AWA 02 Nov 10	Recent Rotax engine thefts	All Rotax



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AWA 11-001	Replacement of flywheel hub washer	912 & 914 Series
LAA/AWA/12/01	Engine oil pump and attachment bolts	912 S2, 912 S3 & 914 F2
LAA/AWA/13/02	Cylinder head inspection/replacement	912 & 914 Series
LAA/AWA/13/07	Checking of the crankshaft journal	912 & 914 Series
LAA/AWA/14/11	Pattern parts warning	912 & 914 Series
LAA/AWA/14/14	Sinking carburettor floats	912 & 914 Series
LAA/AWA/17/03	Engine temperature measurement (supersedes LAA/AWA/17/03)	912 & 914 Series
LAA/AWA/17/04	Checking engine mounting bolts	912 & 914 Series
LAA/AWA/17/07	Positioning of sealing plug in ignition housing	912 iS/iS Sport
LAA/AWA/18/02	Valve pushrod assembly inspection/replacement	912 & 914 Series
LAA/AWA/18/11 R2	Exhaust valve replacement (supersedes LAA/AWA/18/11)	914 Series
LAA/AWA/19/13	Inspection and/or replacement of fuel pump assembly	912 i & 915 i A (Series)
LAA/AWA/19/24	Inspection and/or replacement of fuel pump assembly (supersedes LAA/AWA/19/19 R1/R2)	912 i & 915 i A (Series)

2.8 Additional Engine Operating Limitations to be Placarded or Shown by Instrument Markings

Notes:

- Refer to the engine manufacturer’s latest documentation for the definitive parameter values and recommended instruments.
- Where an instrument is not fitted, the limit need not be displayed.
- Data stated on the aircraft’s Operating Limitations document must be displayed by means of cockpit placards or instrument markings.

Where the engine manufacturer’s operating data shows an operating limitation then a means to monitor that parameter must be installed, except when otherwise agreed with LAA Engineering. It may be acceptable to install temporary instrumentation for the flight test programme.

A more restricted operating limitation may be imposed through an aircraft’s Operating Limitations or Certificate of Clearance which will take precedence over any other limitation, e.g. if a particular propeller is not approved for an engine’s maximum RPM.

Section 3 Advice to owners, operators and inspectors

3.1 General

Rotax provides a lot of [Technical Documentation](#) free of charge on the Rotax website.



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When Conair were involved with Rotax maintenance, they produced a very useful booklet entitled [Looking After Your Rotax 912 Series Engine](#) which provided a wealth of real-world advice and experience of maintaining Rotax 91x series engines.

3.2 Standard Options

There are no Standard Options for 4-stroke Rotax engines at this time.

3.3 Manufacturer's Information (including Service Bulletins, Service Letters, etc)

Rotax provides all of their [Technical Documentation](#) free of charge on the Rotax website. Note that Service Bulletins may be listed as expected under 'Service Bulletins' but also, for the more urgent SBs as Alert Service Bulletins.

Links are included to various documents in these TADS but owners and inspectors should check on the Rotax website for revisions and amendments.

Another good source of information is the [Rotax-owner.com](#) website. There is a facility on this non-factory website for subscribing to continuing airworthiness data that will be emailed free of charge to the subscriber.

In the absence of any over-riding LAA classification, inspections and modifications published in the manufacturer's continuing airworthiness data should be satisfied according to the recommendations therein. It is the owner's responsibility to be aware of and supply such information to their inspector.

3.4 Special Inspection Points

1. Rotax Engine [Installations](#)

A Rotax 4-Stroke Engine Installation Checklist must be completed and forwarded to LAA Engineering with all Rotax powered new-build aircraft paperwork submissions or for an aircraft that is being re-engined. There are currently two checklists available:

- a. Rotax 912UL and 912ULS installations: [LAA/IC ENG ROTAX 912UL\(S\)](#)
- b. Rotax 914 installations: [LAA/IC ENG ROTAX 914](#)

2. Rotax Maintenance

The design and maintenance requirements of the Rotax 91x series of engines is different to what might be termed a 'traditional' aero engine such as a Lycoming or Continental. Owners and inspectors are advised to consider attending one of the LAA Rotax courses.

3. Rotax Operating Fluids

Rotax produce Service Instruction [SI-912-016](#) detailing their recommended operating fluids (oil, fuel and coolant) to be used in the 91x series of engines (other engine variants have different reference numbers for the same Service Letter).

4. Rotax Engine Overhaul

Owners of LAA administered aircraft may elect, at their own discretion, to continue to use an engine beyond the engine manufacturer's recommended Time Before Overhaul (TBO). The extent of the inspection and checks required in order to be reasonably

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satisfied that an engine should be allowed to remain in service beyond the manufacturer's recommended TBO, depends on a number of factors, not least the known history of the engine and its planned usage.

CAA Generic Requirement No 24 in [CAP 747: Mandatory Requirements for Airworthiness](#) covers the subject of Light Aircraft Piston Engine Overhaul Periods. Although this GR is primarily concerned with engines installed in aircraft holding a Certificate of Airworthiness, its inspection requirements do provide useful guidance as to what inspections and checks might be appropriate when considering the operation of an engine beyond the manufacturer's recommended TBO on an LAA administered aircraft.

It is possible to overhaul the Rotax 91x series of engines but the overhaul cost can end up as a fair percentage of the cost of a new engine. Many owners have chosen to sell their engine once it reaches TBO and then purchase a new one.

5. Who Can Overhaul a Rotax?

Work carried out on Rotax engines that is outside permitted 'pilot maintenance' (LAA Technical Leaflet [TL 2.05: Pilot Maintenance](#) refers) must be checked and signed for by a suitably approved LAA inspector. Clearly any major engine work carried out by the owner would fall into this category. To check inspector suitability, refer to the inspector's card and current [LAA Inspector Approval Scheme](#) notes. When engines have been overhauled by a recognised Rotax engine overhaul workshop, then a LAA inspector may accept the engine on this basis, concentrating on checking and signing for the installation of the engine.

6. Rotax Engine Propeller Strikes/Engine Shock Load Inspection

The definition by Rotax of what constitutes a propeller strike is contained in [SL-912-015](#) (other engine variants have different reference numbers for the same Service Letter).

Inspection procedures to be followed following a propeller strike are detailed in the applicable engine Maintenance Manual (Heavy) which can be downloaded from the Rotax website in the [Technical Documentation](#) section.

7. Carburettor Ice Protection

Contrary to popular belief, Rotax 4-stroke engines are not immune to the effects of carburettor icing although the engines rarely suffer from it once the engine has reached normal operating temperature.

Proprietary carburettor ice prevention kits are available for Rotax engines and their installation is recommended. Installation may be carried out without direct reference to LAA Engineering in accordance with LAA Standard Mod [SM10427](#).

8. Carburettor Floats

A lot has been written over recent years regarding problems encountered with the Bing carburettor floats fitted to the 912 and 914 series engines. For whatever reason, some floats have absorbed fuel which obviously can affect the carburettor's operation whilst others have not been affected.

The problem can manifest it in various ways from failure of the engine to start, rough running on the ground and the smell of fuel in the, particularly in the climb.

The Rotax maintenance schedule, which can be found in Section 5.1 of the Rotax Maintenance Manual (Line), calls up an inspection of the floats every 200 hours or



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annually, whichever occurs first. The check is carried out by weighing the floats as a pair and their combined weight should not exceed 7 grams. The exact check procedure is detailed in the Maintenance Manual (Line) section 10.4.1.

Further information can be found in [SB-912-065UL R3](#) and [ASB-912-069UL R1](#) (other engine types are referenced in these SBs). Check Rotax [Technical Documentation](#) for possible later revisions of the SB.

3.4 Operational Issues

1. Stolen Rotax Engines

Rotax publish a list of stolen 4-stroke engines (by serial number) in their Service Letter SL-912-013R15/SL-914-011R15. The current revision of this Service Letter can be found in the [Technical Documentation](#) section of their website.

2. Safety Spot references

The following Safety Spot articles are relevant to Rotax 4-stroke engines:

<i>Light Aviation</i> issue	Subject
(None currently indexed)	

3. Non-Aviation Fuel

Rotax 4-stroke engines in LAA administered aircraft may be cleared for use with unleaded Mogas in accordance with the requirements detailed in the LAA Technical Leaflet [TL 2.26: Procedures for Use of E5 Unleaded Mogas to EN228](#) and [LAA/IC-ULM-Rotax 4-Stroke Inspection Checks](#).

The LAA no longer advises approval for Ethanol-free Mogas due to the majority of Mogas including 5% Ethanol.

3.6 Standard Modifications

The following Standard Modifications have been approved on the type. The Standard Modification leaflet associated with each modification (published on the website) must be followed and an [LAA/MOD 1](#) form completed and return to LAA Engineering in each case (see also LAA Technical Leaflet [TL 3.06: Using an LAA Approved Standard Mod](#)).

Standard Mod no.	Issue	Description
SM10427	1	Carburettor Heater (for Rotax 4-Stroke Engines)
SM12305	1	Soft Start Module
SM12793	2	Permacool 1060 Thermostatic Oil Bypass Valve
SM12808	3	ThermoStasis P6-H-*** Thermostatic Oil Bypass Valve
SM12915	1	Thermostatic coolant Bypass valve
SM12970	1	Schicke GR6 Regulator

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Please report any errors or omissions to LAA Engineering: engineering@laa.uk.com