



Notification of a proposal to issue an Airworthiness Directive

PAD No.: 15-138

Issued: 09 November 2015

Note: This Proposed Airworthiness Directive (PAD) is issued by EASA, acting in accordance with Regulation (EC) 216/2008 on behalf of the European Union, its Member States and of the European third countries that participate in the activities of EASA under Article 66 of that Regulation.

In accordance with the EASA Continuing Airworthiness Procedures, the Executive Director is proposing the issuance of an EASA Airworthiness Directive (AD), applicable to the aeronautical product(s) identified below.
All interested persons may send their comments, referencing the PAD Number above, to the e-mail address specified in the 'Remarks' section, prior to the consultation date indicated.

Design Approval Holder's Name:

BRP-POWERTRAIN GmbH & Co. KG

Type/Model designation(s):

Rotax 912 and 914 engines

Effective Date: [TBD - standard: 14 days after AD issue date]

TCDS Number(s): EASA.E.121 and EASA.E.122

Foreign AD: Not applicable

Supersedure: None

ATA 72 – Engine – Engine Cylinder Head – Inspection / Replacement

Manufacturer(s):

BRP-Powertrain GmbH & Co. KG (previously BRP-Rotax GmbH & Co. KG; Bombardier-Rotax GmbH & Co. KG; Bombardier-Rotax GmbH)

Applicability:

Rotax 912 A1, 912 A2, 912 A3 and 912 A4 engines, up to serial number (s/n) 4 411 086 inclusive, Rotax 912 F2, 912 F3 and 912 F4 engines, up to s/n 4 413 044 inclusive, Rotax 912 S2, 912 S3 and 912 S4 engines, up to s/n 4 924 910 inclusive, and Rotax 914 F2, 914 F3 and 914 F4 engines, up to s/n 4 421 444 inclusive.

These engines are known to be installed on, but not limited to, the types and models aeroplanes as listed in Appendix 1 of this AD. The installation of these engines was either done by the respective aircraft manufacturer or through modification of the aircraft by Supplemental Type Certificate.

Reason:

A design change of the engine cylinder heads was introduced by BRP-Powertrain in March 2013 which modifies the engine/aircraft interfaces by substituting the previous cylinder head temperature (CHT) measurement (limit temperature 135°C/150°C) with a coolant temperature (CT) measurement (limit temperature 120°C).



The design change was communicated on 15 May 2013 by BRP-Powertrain Service Instruction (SI) 912-020R7/914-022R7 (single document) but was not identified by a change of the engine model designation or of the engine P/N, but only through the cylinder head P/N and the position of the temperature sensor.

Consequently, engines with the new cylinder heads (installed during production or replaced in-service during maintenance) may be installed on an aircraft without concurrent modification of that aircraft, instructions for which should be provided by the Type Certificate (TC) holder or Supplemental Type Certificate (STC) holder, as applicable. In this case, the coolant temperature with a maximum engine operating limit of 120°C (valid for engines operated with water diluted glycol coolant) is displayed on a CHT indicator with a typical limit marking (red radial/range) of more than 120°C.

This condition, if not corrected, will prevent the pilot to identify coolant limit exceedances, with subsequent loss of coolant (120°C is the boiling temperature of the coolant), which could lead to engine in-flight shut-down, possibly resulting in a forced landing, with consequent damage to the aircraft and injury to occupants.

BRP-Powertrain published revised [SI-912-020R8/914-022R8](#) to clarify that, on the new cylinder heads, the coolant temperature, instead of the cylinder head temperature in the aluminium, is measured. EASA issued SIB 2014-34 to raise awareness that installation of affected engines and spare parts, without concurrent incorporation of aircraft TC/STC holder approved modifications, and even if unintended and unnoticed by production or maintenance, constitutes an unapproved aircraft modification.

Since EASA published the SIB, further investigation has finally determined that sufficient reason exists to warrant AD action.

For the reason stated above, this AD requires a one-time inspection to determine the actual engine configuration and, depending on findings, engine reidentification and (depending on TC or STC holder installation) modification of the affected aircraft. This also affects engines that are operated with waterless coolant.

Required Action(s) and Compliance Time(s):

Required as indicated, unless accomplished previously:

Within 6 months after the effective date of this AD, accomplish the actions as required by paragraphs (1) and (2) of this AD.

- (1) Inspect the engine to determine whether a cylinder head, having a P/N as listed in Table 1 of this AD, is installed. A review of aircraft- and/or engine maintenance records is acceptable to make the determination as required by this paragraph, provided those records can be relied upon for that purpose.

Note 1: for the purpose of this AD, a “pre-mod engine” is an engine with cylinder head P/N that are not included in Table 1 of this AD.



Note 2: Engines listed in Table 2 of this AD were delivered as post-mod, but were not properly re-identified, and are therefore known to be affected. Other s/n engines may have had a replacement post-mod cylinder head installed in service at any time after 01 March 2013.

Table 1 – Post-mod Cylinder Head P/N and position

Engine	Cylinder Head P/N
912 A, 912 F and 914 F	P/N 413235 or P/N 413236 on cylinder head position 2/3
912 S	P/N 413185 on cylinder head position 2/3

Table 2 – Known Affected Engines

Engine	Serial Number
912 A	S/N 4 410 982 up to S/N 4 411 086 inclusive
912 F	S/N 4 413 020 up to S/N 4 413 044 inclusive
912 S	S/N 4 924 544 up to S/N 4 924 910 inclusive
914 F	S/N 4 421 178 up to S/N 4 421 444 inclusive

Table 3 – Post-mod Engines re-identified during production

Engine	Serial Number
912 A	S/N 4 411 087 and up
912 F	S/N 4 413 045 and up
912 S	S/N 4 924 911 and up
914 F	S/N 4 421 445 and up

- (2) If, during the inspection as required by paragraph (1) of this AD, a cylinder head is found installed on position 2 or 3, having a P/N listed in Table 1 of this AD, accomplish the actions specified in paragraphs (2.1), (2.2) or (2.3) of this AD, as applicable.
- (2.1) For an engine having cylinder heads, with P/N listed in Table 1 of this AD, installed on both positions 2 and 3, change the designation of that engine in accordance with the instructions of BRP-Powertrain SB-912-068/SB-914-049.
- (2.2) For an engine having one cylinder head, with P/N listed in Table 1 of this AD, installed on a single position (2 or 3), replace the cylinder head installed on the unchanged position (3 or 2, as applicable) with a cylinder head having a P/N listed in Table 1 of this AD, and concurrently change the designation of that engine in accordance with the instructions of BRP-Powertrain SB-912-068/SB-914-049.
- (2.3) For an affected engine installed on an aircraft on which only a pre-mod engine (see Note 1 of this AD) is eligible for installation, according to the aircraft TC or STC, as



applicable, contact the design (change) approval holder for approved modification instructions, and accomplish those instructions accordingly. Table 4 of this AD provides a list of approved aircraft modification instructions that are acceptable to comply with this requirement.

Table 4 – Available Aircraft Service Publications

Type / model(s)	SB
Aquila AT01	SB-AT01-029
TECNAM P92, P2002 and P2006T aeroplanes	SB-183-CS
TECNAM P2008 JC aeroplanes	SB-185-CS
Diamond H 36 “Dimona” and HK 36 “Super Dimona” aeroplanes	OSB 36-111
Diamond DV 20 “Katana” aeroplanes	OSB 20-066
Diamond (Canada) DA20-A1 “Katana” aeroplanes	SB Da20-72-04
M&D AVO 68 “Samburo” aeroplanes	TM 808-31
Scheibe SF 25 C and SF 36 R	SI_02-14

- (3) Modification of an aircraft by installing a post-mod engine (see Note 1 of this AD) in accordance with an approved STC is acceptable to comply with the requirements of paragraph (2.3) of this AD for that aircraft.
- (4) Modification of an aircraft to limit the CHT indication to 120°C is an acceptable alternative method to comply with the requirements of paragraph (2.3) of this AD for that aircraft, provided this is accomplished by using approved aircraft modification instructions from the applicable design (change) approval holder (see Note 3 of this AD).

Note 3: For the purpose of this AD, a modification to limit the CHT indication to 120°C includes an assessment by the applicable design (change) approval holder that the CHT does not exceed 120°C when the aircraft is operated within its approved envelope.

- (5) From the effective date of this AD, the use of waterless coolant (with a temperature limitation higher than 120°C) is no longer authorised for post-mod engines. The applicable BRP-Powertrain engine installation manual has been amended accordingly .
- (6) From the effective date of this AD, it is allowed to install on a pre-mod engine (see Note 1 of this AD) cylinder heads having a P/N listed in Table 1 of this AD, provided such action is authorised by the applicable design (change) approval holder of the aircraft on which the engine is (to be) installed, that these cylinder heads are installed on both positions 2 and 3 and, concurrently with that installation, the engine designation is changed in accordance with the instructions of BRP-Powertrain SB-912-068/SB-914-049.
- (7) From the effective date of this AD, it is allowed to install on an aircraft a post-mod engine (see Note 1 of this AD), provided that this is accomplished by using approved aircraft modification instructions from the applicable design (change) approval holder (see Note 3 of this AD).



- (8) From the effective date of this AD, do not install on any post-mod engine (see Note 1 of this AD) a cylinder head, having a P/N not listed in Table 1 of this AD, in any position as indicated in Table 1 of this AD, unless that installation is accomplished in accordance with approved instructions provided by BRP-Powertrain.

Ref. Publications:

BRP Powertrain SB-912-068/SB-914-049, original issue, dated 16 April 2015.

The use of later approved revisions of this document is acceptable for compliance with the requirements of this AD.

Remarks:

1. This Proposed AD will be closed for consultation on 30 November 2015.
2. Enquiries regarding this PAD should be referred to the EASA Safety Information Section, Certification Directorate. E-mail: ADs@easa.europa.eu.
3. For any question concerning the technical content of the requirements in this PAD, please contact: BRP-Powertrain GmbH & Co. KG, Telephone +43 7246 601 0, Fax +43 7246 601 9130, E-mail: airworthiness@brp.com, Website www.rotax-aircraft-engines.com.



Appendix 1 – List of Aeroplanes eligible for installation of Rotax engine(s)

Type Certificate Holder	Type/model
Aero AT SP z.o.o.	AT-3R100
Aeromot-Indústria Mecânico-Metalúrgica	AMT-200 “Super Ximango” and AMT-300 “Turbo Super Ximango”
Aircraft Design and Certification Ltd.	D4 “Fascination”
Aquila Aviation GmbH	Aquila AT01
Cessna Aircraft Company	150 and A150 aeroplanes (and Reims F150 and FA150)
Costruzioni Aeronautiche TECNAM S.r.l.	P92, P2002, P2006T and P2008 JC
Czech Sport Aircraft A.S.	PS-28 “Cruiser”
Diamond Aircraft Industries GmbH	H 36 “Dimona”, HK 36 “Super Dimona” and DV 20 “Katana”
Diamond Aircraft Industries Inc.	DA20-A1 “Katana”
E.I.S. Aircraft GmbH	RF 5 “Sperber”
Evektor spol. s.r.o.	EV-97 VLA, SportStar RTC
Flight - Design	CTLS-ELA
Grob Aircraft AG	G109
Issoire Aviation	APM-20 “Lionceau”
M&D Flugzeugbau GmbH & Co. KG	AVO 68 aeroplanes “Samburo”
Magnaghi Aeronautica S.p.A.	Sky Arrow 650 TC, 650 TCN, 650 TCNS and 710 RG
Korff Luftfahrt	Taifun 17 E II
S.C. Constructii Aeronautice	IAR-46, IS-28M2/GR
Scheibe Aircraft GmbH	SF 25 C, SF 36 R
Skyfox Aviation	CA-25N
Sportavia Puetzer	RF-9 ABS
Stemme AG	S10-VT, ASP S15-1, TSA-M S6

