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Transport Malta

AIRWORTHINESS DIRECTIVE

ENGINE – ENGINE CYLINDER HEAD – INSPECTION/REPLACEMENT

AD No: **2016-0001**

Issue Date: **07 September 2016**

Effective Date: **07 September 2016**

Type Approval Holder Name:	**Type/Model Designation(s):**
BRP-POWERTRAIN GmbH & Co. KG	Rotax 912 and 914 engines

Related Mandatory Continuing Airworthiness Information Reference:

EASA AD No: 2015-0240, dated 18 December 2015
Rotax SB-912-068UL R1, dated 09 September 2015
Rotax SB-912-049UL R1, dated 09 September 2015

Supersedure

N/A

Related EASA Service Information Bulletin reference:

N/A

Manufacturer(s):

BRP-Powertrain GmbH & Co. KG

Applicability:

All engines of Series 912 UL, 912 ULS and 914 UL are affected, if at least one of the following criteria applies.

Criterion A) Engine Serial number:
Engines with a serial number listed below, which have a new cylinder head installed at the measuring position of the temperature, are affected.
For part number of new cylinder heads, see Table 1.
Rotax 912 UL, from S/N 6 770 937 up to S/N 6 771 612 inclusive
Rotax 912 ULS, from S/N 6 781 410 up to S/N 6 784 428 inclusive
Rotax 914 UL, from S/N 7 682 718 up to S/N 7 683 971 inclusive

NOTE: Identifying of new cylinder heads (Suffix -01): The electrical connection of the temperature sensor is pointing upwards.

Criterion B):
Further all engines which have been equipped with new cylinder heads at the measuring position of the temperature as spare part or during engine repair/general overhaul since March 1st, 2013 are also affected. For part numbers of new cylinder heads see Table 1.

Additional support to criteria A and B:
Part no. of new cylinder heads:

Table 1 - Cylinder Head Part Numbers

Engine Type		
912 UL; 914 UL	**912 ULS**	**Cylinder head position**
Part no. 413235 Part no. 413236	Part no. 413185	2/3
Part no. 413245 Part no. 413246	Part no. 413195	1/4

Note: The installation of these engines was either done by the respective **aeroplane manufacturer** or through modification of the aeroplane by Supplemental Type Certificate.

Justification:

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 inservice during maintenance) may be installed on an aircraft without concurrent modification of that aircraft, instructions for which should be provided by the aircraft manufacturer or design organisation, 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 detected and 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.

TM-CAD has decided to adopt EASA position by issuing a national AD.

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 aircraft manufacturer or design organisation installation) modification of the affected aircraft. This also affects engines that are operated with waterless coolant.

Compliance:

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.

(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) or (2.2) 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-912-068ULR2/SB-914-049ULR2.

(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-912-068ULR2/SB-914-049ULR2.

(3) 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 .

(4) From the effective date of this AD, do not install on any post-mod engine 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.

Reference Publications:

BRP-Powertrain SB-912-068ULR2 and SB-914-049ULR2 (published as a single document), dated 09 September 2015.

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

EASA AD No: 2015-0240, dated 18 December 2015.

Remarks:

1. If requested and appropriately substantiated, TM CAD can approve Alternative Methods of Compliance for this AD.

2. Enquiries regarding this AD should be referred to the Airworthiness Inspectorate, Transport Malta Civil Aviation Directorate. E-mail: civil.aviation@transport.gov.mt.