



## **BMAA Inspectorate Notice: CAA MPD 2017-001**

**Dated:** 24/02/2017

**Reference:** CAA MPD 2017-001

**Title:** Engine Cylinder Head – Inspection/Replacement/Reidentification

**Applicability:** Rotax 912UL, 912ULS, 914UL

**Effective date:** 11 February 2017

This Mandatory Permit Directive relates to a Rotax bulletin issued in 2013. ***The CAA recognises compliance with MPD 2017-001 can be via the simplified requirements of BMAA Service Bulletin 2612 (link below):***

BMAA SB2612

[http://bmaa.org/files/oa\\_sb\\_2612.pdf](http://bmaa.org/files/oa_sb_2612.pdf)

CAA MPD 2017-001

<http://publicapps.caa.co.uk/docs/33/2017-001.pdf>

*Alternatively, a copy of both can be found to follow this notice.*

**Ensure that logbook entries mention both BMAA SB2612 & MPD 2017-001.**

Kind regards,  
Rob

***Rob Mott***

*Chief Inspector*

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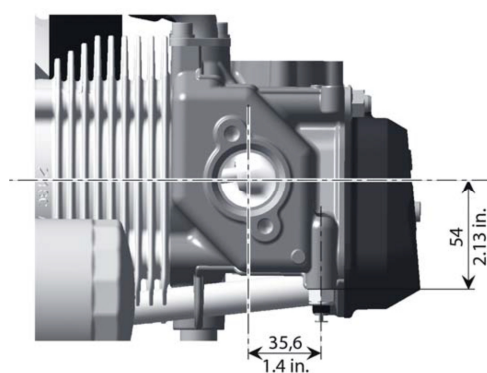
**Reference:** BMAA Service Bulletin 2612 issue 1  
**Title:** Rotax 912-series cylinder head temperature measurement  
**Applicability:** All BMAA aircraft with Rotax 912-series engine  
**Author:** Ben Syson, BMAA  
**Effective date:** 1 August 2016  
**Classification:** Recommended Service Bulletin

**1 Introduction**

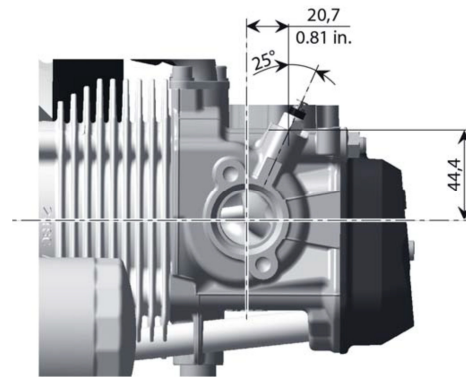
In 2013 Rotax changed the detailed design of the cylinder head on their 912-series engines (including the 912 / 912UL and 912S / 912ULS). The temperature measurement point, which used to measure cylinder-head temperature (CHT), now measures coolant temperature, which has a lower maximum temperature.

**2 Details**

The drawings below show the old type head, which measures CHT, and the new type head, which measures coolant temperature. The new type head can be retrofitted to older engines (but is not suitable for use with waterless coolant, such as Evans’).



**CHT measurement (old)**



**Coolant temperature measurement (new)**

Rotax has decided that if an engine has a new type head fitted to it, the engine type designator should have ‘-01’ appended to. This is to help identify these engines in future documents. The photo to the right shows an amended type plate for a certified 912S engine.



**3 Action**

**If your aircraft has a CHT gauge** (or displays CHT on an EFIS or EMS)...

- Check the cylinder head whose temperature it is measuring. If it is the new type of cylinder head:
  - Change the marking of the gauge to show that it is measuring COOLANT temperature, not CHT;
  - Change the maximum temperature limit on the gauge to the maximum coolant temperature of 120°C;
  - Ensure any engine limitation placard displays the maximum coolant temperature.

**If your engine has the new type of cylinder head...**

Append ‘-01’ to the engine type in the front of the engine logbook (if it does not have it already). For example a ‘912UL2’ becomes a ‘912UL2-01’. Also amend the type plate fitted to the engine (similarly to the photo above), although this can be delayed until the next time the engine is removed.

**Record compliance with this Service Bulletin in the engine logbook** (even if no action was required).

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## **Appendix 1 - Notes**

- It is recommended that this Service Bulletin is complied with as soon as practicable. It is anticipated that the UK CAA will mandate this Service Bulletin with a Mandatory Permit Directive (MPD), in which case the timescale specified in the MPD must be complied with.
- All BMAA aircraft have a list of required instruments that must be fitted, which is contained in the TADS / HADS for the type. BMAA aircraft powered by a Rotax 912-series engine are required to display either CHT or coolant temperature. Therefore changing from measuring CHT to measuring coolant will not invalidate the instrument fit. Simply deleting a CHT gauge will invalidate the instrument fit unless coolant is independently monitored.
- If the aircraft displays CHT on an EFIS (Electronic Flight Information System) or EMS (Engine Monitoring System) the minimum requirement is that the temperature limit is lowered to the coolant temperature limit. If possible, the CHT display should be changed to a coolant display.
- To measure coolant temperature, a Rotax 912-series engines with the old style (CHT measuring) cylinder head required an additional temperature sensor located somewhere in the cooling system. What such a sensor will indicate in case of a loss of coolant - 'high', 'low', or 'normal' temperature - depends very much on the sensor's location. The new cylinder head is more reliable in that it will normally give a 'high' temperature reading in case of coolant loss.
- More significant changes (than those described in Section 3) to the instrument fit require assessment, and potentially approval, by the BMAA Technical Office.

## **Appendix 2 - Further information**

Rotax docs: SB-912-066 & SB-912-066UL; SB-912-068 & SB-912-068UL; SI-912-016

Note: The technical content of this document is approved by the BMAA, UK CAA organisation approval ref. DAI/8909/84.



# MANDATORY PERMIT DIRECTIVE

**Number: 2017-001**

Issue date: 8 February 2017

In accordance with Article 41(1) of The Air Navigation Order 2016, as amended, the following action required by this Mandatory Permit Directive (MPD) is mandatory for applicable aircraft registered in the United Kingdom operating on a UK CAA Permit to Fly.

**Type Approval Holder's Name:**

BRP Powertrain GmbH & Co KG

**Type/Model Designation(s):**

Rotax 912UL, 912ULS, 914UL

**Title:**

Engine Cylinder Head – Inspection/Replacement, Engine Re-identification

**Manufacturer:**

BRP Powertrain GmbH & Co. KG

**Applicability:**

Rotax 912UL, 912ULS, 914UL

**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 the aircraft instructions 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 identifying 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. EASA issued AD 2015-0240 for certified engines, this MPD covers uncertified engine variants.

**Effective Date:**

11 February 2017

**Compliance/Action:**

Required as indicated, unless accomplished previously:

At the next aircraft annual inspection after the effective date of this MPD, accomplish the actions as required by paragraphs 1) and 2) of this MPD:

- 1) Inspect the engine to determine whether a cylinder head, having a part number (P/N) as listed in Table 1 of this MPD, 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 MPD, a “pre-mod” engine is an engine with a cylinder head P/N installed which is not included in Table 1 of this MPD. A “post-mod” engine is an engine with a cylinder head P/N installed which is included in Table 1.

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

Table 1 - Cylinder head part nos.

912UL, 914UL	413235 or 413236 on cylinder head position 2/3
912ULS	413185 on cylinder head position 2/3

Table 2 - Known affected engines

912UL	6 770 937 to 6 771 612 inclusive
912ULS	6 781 410 to 6 784 428 inclusive
914UL	7 682 718 to 7 683 971 inclusive

- 2) If, during the inspection as required by paragraph (1) of this MPD, a cylinder head is found installed on position 2 or 3, having a P/N listed in Table 1 of this MPD, accomplish the actions specified in paragraphs (2.1), (2.2) and (2.3) of this MPD, as applicable.

2.1) For an engine having cylinder heads with P/N listed in Table 1 of this MPD, installed on both positions 2 and 3, annotate the log book to indicate the new “-01” engine designation and amend the engine data plate in accordance with SB 912-068UL R2/SB914-049UL R2 at next engine removal.

	<p>2.2) For an engine having one cylinder head, with P/N listed in Table 1 of this MPD, installed on a single position (2 or 3 as appropriate) replace the cylinder head installed on the unchanged position with a cylinder head having a P/N listed in Table 1 of this AD, and concurrently annotate the log book to indicate the new "-01" engine designation and amend the engine data plate in accordance with SB 912-068UL R2/SB914-049UL R2 at next engine removal.</p> <p>2.3) For an affected engine installed on an aircraft, contact the aircraft manufacturer for approved modification instructions to change the cylinder temperature limits to those associated with the engine configuration (if such instructions have not already been issued) and accomplish those instructions accordingly.</p> <p>3) 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 MPD for that aircraft, provided this is accomplished by using aircraft modification instructions from the applicable manufacturer (see Note 3 of this MPD). British Microlight Aircraft Association (BMAA) Service Bulletin 2612, Light Aircraft Association (LAA) Airworthiness Information Leaflet MOD/ENG/ROTAX/001 and RotorSport UK Ltd Service Bulletin No. 094, as applicable, are acceptable aircraft modification instructions for the purposes of this paragraph.</p> <p>Note 3: For the purpose of this MPD, a modification to limit the CHT indication to 120°C includes an assessment by the applicable manufacturer that the CHT does not exceed 120°C when the aircraft is operated within its approved envelope.</p> <p>4) From the effective date of this MPD, it is permissible to install on a fitted pre-mod engine (see Note 1 of this MPD) cylinder heads having a P/N listed in Table 1 of this MPD, provided such action is authorised by the applicable manufacturer of the aircraft on which the engine is installed, that these cylinder heads are installed on both positions 2 and 3 and, concurrently with that installation, the log book is annotated to indicate the correct engine designation and the engine data plate is amended in accordance with SB 912-068UL R2/SB914-049UL R2 at next engine removal.</p> <p>5) From the effective date of this MPD, it is permissible to install on an aircraft a post-mod engine (see Note 1 above) provided that this is accomplished by using an appropriate aircraft level modification.</p>
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	<p>6) From the effective date of this MPD, do not install on any post-mod engine a cylinder head, having a P/N not listed in table 1 of this MPD in any position as indicated in table 1 of this MPD unless that installation is accomplished in accordance with approved instructions provided by BRP-Powertrain.</p> <p>7) From the effective date of this MPD, prior to installation of any 912UL, 912ULS or 914UL series engine on an aircraft, ensure that the engine and airframe installation either complies with this MPD or the MPD is determined to be not applicable. Prior to installation of any 912UL, 912ULS or 914UL on an aircraft ensure the correct engine designation is shown on the data plate. A post mod engine is to be marked on the data plate in accordance with SB 912-068 R1/ SB-914-049 R1.</p>
<p><b>ENSURE COMPLIANCE WITH THIS MPD IS RECORDED IN THE AIRCRAFT LOGBOOK</b></p>	
<p><b>Reference Publications:</b></p>	<p>SB 912-068UL R2/SB 914-049UL R2 dated 9 September 2015 (single document) plus referenced SB 912-068 R1/SB 914-049 R1. Later revisions of these documents may be used to show compliance with this MPD.</p>
<p><b>Remarks:</b></p>	<p>1) This MPD was posted on 23 November 2016 as PMPD 16-03 for consultation until 7 December 2016. Responses from two commenters were received and this MPD has taken into account most of the points raised.</p> <p>2) If requested and appropriately substantiated, the CAA may accept Alternative Methods of Compliance to this MPD. Application for an Alternative Method of Compliance (AMOC) must be made to the CAA and, if agreed, the CAA will issue a written acceptance that confirms the AMOC meets the necessary compliance requirements.</p> <p>3) Enquiries regarding this Mandatory Permit Directive should be referred to: GA Unit, Civil Aviation Authority, Safety and Airspace Regulation Group, Aviation House, Gatwick Airport South, West Sussex RH6 0YR.</p> <p>Tel: +44 (0)1293 573988 E-mail: ga@caa.co.uk</p>