Avoid engine stress ROTAX 912

SERVICE BULLETIN

Office of Airworthiness release
Date:
Name: B. Kölmel
Signature: B. Kölmel 2023.07.17

Verification Engineer
I hereby declare that the technical content of this document is correct and can be used to fulfil the obligations of the type design holder per 21.A.265(h)
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Amendments

Issue	Reason	Date
A	Initial issue	17.07.2023

Avoid engine stress ROTAX 912

Multiple occurrences of (partial) loss of power were analysed. Common cause, or at least contributing factor, identified is engine mismanagement resulting in unnecessary engine thermal stress. Emphasis on AFM procedures, including stronger wording in AFM, is deemed necessary.

STANDARD

0 General

0.1 ATA Code

ATA 72 ENGINE – Operation

0.2 Effectivity

All BRM Aero B23 models with ROTAX 912 engine

- TCDS: EASA.A.642

1 Planning information

1.1 Reason

Several occurrences of (partial) loss of power and premature engine failures were reported on Bristell B23 aircraft equipped with ROTAX 912 engine.

1.2 Safety Intent

The safety intent is to prevent the unsafe condition.

The continued operation of the engine with non-adequate procedures/power settings can lead to premature engine failure.

For detail explanation see section 4 Appendix.

1.3 Configuration Description N/A

1.4 Compliance

If criteria in Section 0 is met

Service bulletin must be accomplished

☐ ☐ This SB could be made mandatory by an EASA AD.

☐ ☐ This SB is mandatory as per EASA AD no. xyxyx

☒ Service bulletin recommended to be accomplished to prevent significant operational disruptions

☐ Service bulletin to introduce improvements

☐ Service bulletin for convenience or option

Compliance time is until the next scheduled maintenance

1.5 Approval statement

The technical content of this document is approved under the authority of the DOA ref. EASA. 21J.411.

1.6 Concurrent publications

ADxC-73-001-AFM to be updated to issue B3 dated 12.06.2023

ADxC-73-070-AFM to be updated to issue A2 dated 17.07.2023

1.7 Manpower

Approx. 0.25 hour is required to accomplish this SB.

1.8 Weight and Balance N/A

1.9 Electrical load data N/A

1.10 Software modification N/A

1.11 Referenced documentation

OM-912 (PN 899700) Operators manual for ROTAX engine Type 912 Series, Edition 4 rev. 1 March 6th 2023

1.12 Other publications effected N/A

2 Material information

2.1 Material- cost – availability N/A

2.2 Company support information

BRM AERO, s.r.o.
Address: Letecká 255 686 04 Kunovice Czech Republic
Phone: + 420 773 984 338
E-mail 1: info@brmaero.com
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2.3 Material requirements per aircraft N/A

2.4 Rework parts N/A

2.5 Special tooling N/A

3 Accomplishment/Instructions

1) Update ADxC-73-001-AFM / 070-AFM as applicable to the revision designated in this SB.
2) Make a log book entry and add note to aircraft CAW documentation that this Service bulletin has been incorporated.

4 Appendix

Explanation:

High engine thermal loading is best seen observing the EGT. EGT reaction to changed condition is swift, while oil temp or cylinder head (coolant) temp lag due to thermal inertia of the engine.

1.) High EGT is associated with combination of high RPM and moderate manifold pressure
2.) High EGT is also associated with use of carburettor heat

The intuitive assumption is that both conditions reduce the amount of air in relation to the amount of fuel. But the carburettor supply of fuel is also affected. The amount of fuel is driven by the pressure differential over the venturi which is a function of RPM and manifold. In essence both conditions lead to leaner mixture and higher engine temperature in consequence.

In addition, when using carburettor heat the overall higher temperature of the carburettor can lead to higher vapor pressure in the floating chamber which also leads to leaner mixture.

Therefore:

- Usage of carburettor heat does stress the engine and should be avoided when unnecessary. ROTAX engines are associated with a relatively low rate of carburettor icing events.
- When transition from climb to cruise is made, first the RPM should be reduced – NOT the manifold pressure.
- In low power conditions such as descent, the propeller should not be set to high speed.
- In approach the change to high RPM as preparation for a potential go-around should only be done in short final.

This is contrary to most more traditional aircraft engines operating at much lower engine speeds.

Deviation from recommended power settings in AFM (and in ROTAX operation manual) can lead to high engine stress with subsequent premature failure.