

## **1. Applicability**

All operators and maintainers of aircraft fitted with Jabiru 2200 / 3300 series engines.

## **2. Purpose**

This AWB discusses the safety issues and proposes inspections related to the loosening of the propeller attachment bolts, which may result in separation of propeller from the engine and / or loss of power.

## **3. Background**

There have been reported incidents on Jabiru engines and propellers in New Zealand caused by loosening of the propeller attachment bolts. This AWB discusses the mechanics of such failures, recommends inspections and seeks input on inspection findings.

Indications suggest the failure mode to be loss of mounting bolt torque.

The main means of getting the engine torque to the propeller is the friction between the crankshaft propeller flange and the propeller hub face. There are two ways to lose that friction; (a) over-torquing and (b) under-torquing of the mounting bolts.

Wooden propeller maintenance requires routine re-torquing of the propeller bolts and re-torquing should be done to the value and at the intervals specified by the manufacturer.

Over-torquing of the propeller bolts may result in crushing the wood.

Under-torquing on the other hand may result in propeller movement relative to the crankshaft and vibrations, eventuating in broken bolts, a broken hub or even a scorched hub. Once wood starts to heat up, it would contract further, making a loose fit even looser.

Accordingly, maintenance of proper pre-load through periodic inspection of the attaching bolts and re-torquing of the bolts to the optimum value at the specified intervals can never be over-emphasized.

CASA Airworthiness Directive (AD) AD/PFP/1 mandates periodic inspection of wooden propellers for condition and tightness of securing bolts and nuts. Jabiru service manuals contain specific information and reference data.

Jabiru Service Bulletin (JSB) 009-1 provides instructions on how to upgrade propeller mounting system using Belleville washers.

Belleville washers (also known as cupped spring washers) are designed to maintain required pre-load / torque on the propeller bolts while accommodating seasonal changes and weather variations.

## 4. Recommendation

- a) Ensure your aircraft is installed with an engine / propeller combination approved by Jabiru. If in doubt, CASA recommends contacting Jabiru Aircraft for technical advice.
- b) Unless already accomplished, CASA recommends compliance with Jabiru JSB 009-1 and JSB 014-1.
- c) If your Jabiru engine is fitted with Jabiru propeller, inspect propeller for security of attachment in accordance with AD/PFP/1 and Jabiru instructions for continued airworthiness (ICA).
- d) If your Jabiru engine is fitted with fixed pitch wooden propeller other than the Jabiru; inspect for security of attachment in accordance with AD/PFP/1 and in accordance with propeller manufacturer's ICA.
- e) If your Jabiru engine is fitted with any other propeller type; inspect for security of attachment in accordance with applicable CASA Directives and in accordance with applicable ICAs.

*Note: ICA issued by the OEM may include owner's manuals, handbooks, maintenance manuals and the updates to these documents as contained in service bulletins, letters, instructions, notices etc.*

- f) In accordance with Civil Aviation Regulations, reporting of a defect in the course of complying with an AD is mandatory. CASA recommends online lodgement of Service Difficulty Reports using SDR system available on CASA website <http://www.casa.gov.au/airworth/sdr/index.htm>

## 5. Enquiries

Enquiries with regard to the content of this Airworthiness Bulletin should be made via the direct link e-mail address: [AirworthinessBulletin@casa.gov.au](mailto:AirworthinessBulletin@casa.gov.au)

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