



**SAIB:** NE-08-20

**Date:** May 14, 2008

**SUBJ:** Propeller Maintenance

*This is information only. Recommendations aren't mandatory.*

## **Introduction**

This Special Airworthiness Information Bulletin (SAIB) alerts owners, operators, pilots, mechanics, and certificated repair facilities of concerns for **possible failures of variable pitch propellers due to inadequate propeller maintenance.**

The FAA is concerned about the continued airworthiness of propellers with regard to maintenance performed on Part 91 of the Code of Federal Regulations (14 CFR part 91) General Aviation aircraft.

Propellers are generally very safe and reliable. Because of this, propeller maintenance may be perceived as not requiring as much scrutiny as engine maintenance. Propeller failures are relatively rare, but when a propeller fails, the consequences are typically more severe than when an engine fails and could result in damage to the engine and mount, and loss of aircraft control.

## **Background**

### *14 CFR Part 91 Requirements*

It is established that *14 CFR* part 135 and *14 CFR* part 121 operators are held to a higher standard of maintenance than *14 CFR* part 91 operators. With regard to propellers, this generally means that for *14 CFR* part 91 operators, compliance with manufacturer's overhaul recommendations is not mandatory. Indeed, it is reported by propeller repair stations that they occasionally see propellers coming in for service that have no evidence of maintenance or overhaul history for as long as twenty years or more.

### *To Overhaul or Not To Overhaul*

The FAA does not mandate compliance with the manufacturer's recommended overhaul intervals for *14 CFR* part 91 operators. However, compliance is recommended.

Service experience has shown that by neglecting propeller maintenance and not performing timely overhauls or repairs can result in a propeller failure. A failure that originates from corrosion is preventable. Seemingly small areas of corrosion can generate stress concentrations which can initiate fatigue cracks.

### *Evident Versus Hidden Conditions*

Propeller blades can and often do sustain considerable wear and damage in service. Propeller blades are often observed to have evidence of nicks, gouges, corrosion, or other surface flaws that should not be ignored and left uncorrected. Operators, mechanics, and aircraft inspectors need to recognize that conditions such as this demand action regardless of the flight time since last overhaul. The propeller manufacturer's Instructions for Continued Airworthiness and FAA Advisory Circular AC 20-37E Aircraft Propeller Maintenance (revised 9/9/05) provide additional information on this subject.

Another concern is reports of painting propeller blades in the field where nicks, gouges, corrosion, or other surface flaws are covered over. A cosmetically attractive paint job can hide a serious structural flaw and cause an airworthiness issue later on.

Controllable pitch propellers have internal components that cannot be inspected without disassembly. Unlike oil/ grease leaks, degradation of grease or seals, etc. that may be evident, internal corrosion problems are often hidden and cannot be evaluated without disassembly and inspection. Hidden defects in highly stressed areas of the hub or other blade retention components can lead to fatigue cracks, blade separation, and loss of airplane control. This is the primary reason why propeller maintenance requirements contain calendar limits.

### *Manufacturer's Overhaul Calendar Limits*

A common complaint from the field is that manufacturer's flight hour limits for overhaul may be reasonable but calendar limits seem too onerous for low utilization, general aviation aircraft.

The extent of exposure and types of corrosive elements can vary greatly. An appropriate time limit for development of corrosion is hard to predict. However, it can be shown that propeller failure events attributed to corrosion typically occur in propellers that are either NOT in compliance with the manufacturer's overhaul calendar limits, have NOT been properly maintained, or have NOT been properly overhauled.

### **Recommendations**

- Follow the propeller manufacturer's maintenance recommendations for calendar time limits as well as specified flight time limits for inspections and overhauls.
- Persons performing annual inspections on 14 CFR part 91 aircraft should be hesitant to sign off annual inspections year after year, if the propeller is beyond the calendar time limit for internal inspection or overhaul, without determining the airworthiness of that propeller in accordance with FAA accepted or approved data.
- Address significant evident damage or corrosion immediately. Do NOT ignore significant evident damage or corrosion until the specified flight hour or calendar time limits are reached. If such conditions are found to exist, timely maintenance is necessary prior to returning the aircraft to service.
- Do NOT perform cosmetic painting of propeller that could hide an underlying surface flaw. Proper rework (including corrosion protection) and inspection must be performed before painting.
- A careful review of the propeller logbook and maintenance records is worthwhile to verify the date and flight hours since the time of last inspection and overhaul. (Purchasers of aircraft have sometimes believed that a propeller was recently overhauled because the propeller has been to a propeller shop in its recent history. However, upon checking, it was determined that the propeller only had a minor repair performed.)
- Owners should become informed and knowledgeable about the companies and personnel that they allow to work on their aircraft propellers.

- To maintain the airworthiness of propellers, it is important that:
  - Maintenance and overhauls are properly performed by trained personnel
  - Maintenance and overhauls are performed in accordance with current approved technical data, (i.e., manufacturers' service documents)
  - Propellers are inspected and serviced at the specified intervals
  - When in service, propellers are operated within design specifications and all limitations for that propeller model installation are observed.

Performing these actions will reduce the opportunities for the propeller to be a causal factor in an accident.

### **For Further Information Contact**

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