



**SUBJ:** Propeller Installations on Experimental Aircraft

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

## **Introduction**

This Special Airworthiness Information Bulletin (SAIB) alerts you, owners, operators, pilots, mechanics, and certificated repair stations of concerns for **potential propeller failures, aircraft damage, and potential loss of aircraft control for certain untested propellers installed on experimental aircraft.**

The FAA is concerned that builders of experimental aircraft and experimental propeller installations do not always consider the consequences of using an untested/ uncertificated propeller and engine combination. One example of an inappropriate propeller installation application is the use of Hartzell ( )8468( )\* series blades installed on Lycoming ( ) ( )-360 series engines. There may be other inappropriate propeller installations. Consult the appropriate propeller manufacturer for installation data to help ensure continued airworthiness.

The FAA acknowledges that the aircraft builder has the ultimate responsibility for the parts/ components used on their experimental aircraft. The builder of the propeller assembly is often a propeller repair station who might be unaware of the consequences of using untested/ uncertificated propeller assemblies on a specific engine. To the extent that the propeller shop may be knowledgeable of such matters, they also share some responsibility in notifying the experimental aircraft builder of the potential consequences of using untested/ uncertificated propeller installations.

## **Background**

There were two accidents resulting from propeller blade failures on experimental aircraft using Hartzell ( )8468( )\* series blades installed on Lycoming ( ) ( )-360 series engines. This blade design uses a thinner airfoil than that used on other Lycoming 360 applications. Also, the accident-related blades incorporated a modification that reduced the blade diameter to less than other approved designs. These differences result in exposure to high vibratory stress loadings that exceed the structural levels allowed for safe operation. In both accidents, the high propeller blade vibratory stress loading is considered a contributing factor in the failures. These accidents show that specific engine and propeller combinations are an important design consideration that requires careful research regardless of the propeller manufacturer.

Builders of experimental aircraft are permitted to use experimental propellers. However, certain propellers, even those with type certificates, might not be suitable for use on certain engines. If combined, there is the potential for an unsafe condition to exist.

Propeller Repair Stations have, on occasion, been reported to assemble an experimental propeller using propeller blades retired from use on certificated aircraft for being undersize in width, thickness, or diameter. Such a propeller enables the builder of an experimental aircraft to reduce costs, but could result in an unsafe application that does not meet any approved or tested engine and propeller combination.

\* There are numerous variations in Hartzell ( )8468( ) series propeller blades such as: F8468A-6R, F8468-2, FC8468-6R, etc.

## **Recommendations**

### **Propeller Repair Stations –**

- If asked to build an experimental propeller, confirm the specific engine model being used and only select a propeller that is known to be vibrationally/ structurally compatible with that engine. As necessary, contact the appropriate propeller manufacturer for assistance in making this selection.
- Advise the customer of the experimental, untested nature of the propeller installation and its potential airworthiness consequences.
- Do not install Hartzell 8468 series blades on a propeller for use on a Lycoming 360 series engine.

### **Experimental Aircraft Builders –**

- Wherever possible, always use an FAA-approved or propeller manufacturer-recommended engine and propeller combination.
- If either an engine or propeller does not meet FAA type design, seek a recommendation from the kit provider (if applicable), the propeller manufacturer, or the engine manufacturer, to obtain the most suitable application possible to avoid an unsafe condition. Builders should make informed decisions concerning their engine and propeller installation combinations.
- Do not use a Hartzell 8468 series blade on a propeller for use on a Lycoming 360 series engine.
- There may be other engine and propeller combinations that result in unsafe installations. Contact the appropriate propeller manufacturer for additional guidance.

### **Experimental Aircraft Owners –**

- If you are unfamiliar with the propeller on your aircraft, perform the research necessary to ensure the propeller/ engine combination meets an approved design. If you do not do the research, consider changing the propeller, or at least become aware of the increased risk and the consequences of a propeller failure.
- If you have an aircraft with a Lycoming 360 series engine, check the propeller to determine if Hartzell 8468 series blades are installed. If they are installed, replace them before further flight.

## **For Further Information Contact**

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