

SAIB ANE-99-23 SPECIAL AIRWORTHINESS INFORMATION
BULLETIN AIRCRAFT CERTIFICATION SERVICE 800 INDEPENDENCE
AVENUE, S.W.
WASHINGTON, DC 20591

U.S. Department
of Transportation
Federal Aviation
Administration
No. ANE-99-23
June 10, 1999

Published by: FAA, AFS-610, P.O. Box 26460, Oklahoma City, OK 73125
SAIB's are posted on the internet at <http://av-info.faa.gov>

Introduction:

The purpose of this Special Airworthiness Information Bulletin (SAIB) is to alert owners/operators of Piper PA-44-180 and Raytheon (Beech) 76 aircraft of possible hub arm failure. This SAIB is issued for informational purposes only and any recommendation for corrective action is not mandatory.

A recent propeller hub arm failure has prompted an investigation to gather data to help determine whether an airworthiness directive is necessary. Failure of the propeller hub arm results in the loss of a propeller blade which can lead to loss of aircraft control. This is considered an urgent safety issue. All owners/operators are requested to report any occurrence of a cracked propeller hub as soon as possible. This SAIB is applicable to owners/operators of Piper PA-44-180 Seminole and Beech Duchess 76 aircraft with two blade Hartzell Propeller models HC-C2YR-2().

Background:

A Piper PA-44-180 Seminole crashed on April 14, 1999, in Vero Beach, Florida. One of the propeller blades was found to have departed the aircraft in flight due to a hub arm failure. The propeller model is a Hartzell HC-C2YR-2(). Research into the propeller's history has shown that this propeller was involved in a ground strike prior to its last overhaul and that the blades were rejected. The propeller hub was reintroduced into service despite a Hartzell overhaul manual requirement [reference Hartzell Standard Practice Manual 202A] that the hub be removed from service if a blade is retired due to involvement in a ground/foreign object strike. It is important to understand that damage to a hub involved in a ground/foreign object strike may not be easily detected by non-destructive inspection (NDI), but such damage can lead to fatigue cracking and eventually to failure if the hub is returned to service.

Previously, in October 1998, another Hartzell HC-C2YR-2() propeller installed on a Piper PA-44-180 Seminole was found to have cracks in the hub arm. It was reported that this propeller had several loose hub bolts and the low pitch stop had been replaced five times in recent history (possibly related to loose spinner attachment/hub bolts).

The Beech Duchess 76 is another twin-engine trainer similar to the Piper PA-44-180 Seminole. Since three reports of cracked Hartzell hubs have been reported for the Beech Duchess 76, it is being included in this study.

Recommendation:

It is recommended that before every flight, the propeller blades should be inspected for any abnormal signs of grease leaking down the blade. If abnormal grease leakage is found, then the spinner should be removed and the hub inspected in accordance with Hartzell HC-SB-61-227 for signs of cracks in the hub arm.

In addition, it is recommended that all owners/operators check their aircraft and propeller log books for any record of propeller ground impact or foreign object strike events such as gear up landings, snow bank collisions, etc. If any such event is found, then the records should be checked further. This is to verify that if any propeller blades were replaced, then the propeller hub should have been replaced. If the hub was not replaced, then the propeller should be sent to an FAA approved propeller overhaul facility to have the hub replaced. When replacing the hub, it is recommended to use the latest design fillet radius hub (which has the suffix letter "B" at the end of the serial number). The new hub eliminates a critical fillet radius and provides a strengthened hub arm. Please send any reports of cracked hubs, regardless of cause, to the Chicago Aircraft Certification Office (see below). Also, please document your service experience and report it to Hartzell Product Support, so that any other problems can be addressed.

NOTE: See Hartzell Service Letter HC-SL-61-165 (dated 12/7/95) for additional information concerning abnormal grease leakage and vibration; Hartzell Service Bulletin HC-SB-61-227 (dated 5/18/99) for information concerning non-destructive inspection for hub cracks; Hartzell Service Letter HC-SL-61-179 (dated 4/7/97) for part number and installation information concerning use of hubs with current fillet radius design.

To obtain copies of Hartzell Services Letters, write to:

Hartzell Propeller Inc.

Hartzell Product Support

One Propeller Place

Piqua, OH 45356-2634

Telephone: (937) 778-4379

Facsimile: (937) 778-4321

For Further Information, Contact:

FAA, Chicago Aircraft Certification Office, Propulsion Branch, ACE-118C, ATTN:

Tomaso DiPaolo, Aerospace Engineer, 2300 East Devon Avenue, Des Plaines, IL

60018; Telephone: (847) 294-7031; Facsimile: (847) 294-7834; Email:

Tomaso.DiPaolo@faa.gov.