Australian Government
Civil Aviation Safety Authority

AIRWORTHINESS BULLETIN

Piper Seneca PA-34-200 Propeller Damper

AWB 61-010 **Issue** : 1
Date : 19 April 2013

1. Applicability

Piper Seneca PA-34-200 aeroplanes.

2. Purpose

Alert pilots, operators and maintainers to the potential hazard of an in-flight propeller blade loss or crankshaft failure due to incorrect spinner attachment screw length and ignoring the vibration damper overhaul requirements.

3. Background

Certain Piper Seneca PA-34-200 series aircraft were Type Certificated with an engine vibration propeller damper assembly because during certification it was found that a potentially destructive harmonic vibration became apparent at 2200 to 2400 RPM.

The spring-loaded friction damper is an FAA requirement to remove the 2200 to 2400 RPM operational limitation. The dynamic damper an integral part of the propeller-to-engine assembly, being part of the spinner bulk head attachment plate, bolted on the rear of the propeller. See Figure 1.

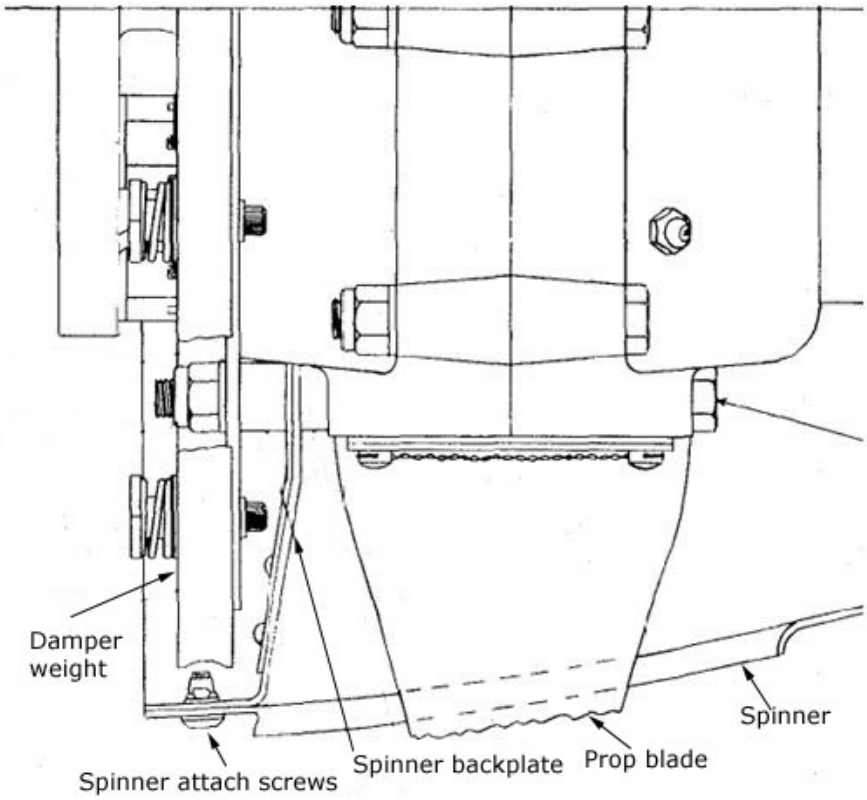

Fig. 1. Propeller and vibration damper assembly. Note the location of the spinner attachment screws and how close the ends of the spinner attachment screws are to the damper weight.

In order for the vibration damper to be effective, the outer weight of the damper must have a certain rate of constant radial motion in response to vibration.

Propeller overhaul facilities continue to report two problems:

1. Screw-end marks on the outer face of the damper assembly. These marks are due to the ends of spinner attachment screws contacting the weight. If the spinner attachment screws are too long they contact the outer face of the damper weight and restrict or stop damper movement.

   Restricting damper motion will affect the vibration attenuation function of the damper assembly resulting in increased engine/propeller vibrations and possible propeller/engine fatigue damage. It is also possible that overlong screws could lock the damper to one side of the propeller hub thus amplifying the propeller vibration level.

2. When the propeller is removed for overhaul, the damper assembly is frequently removed with the backplate and not sent for overhaul at the same time as the propeller. AD/PROP/1 requires propellers to be overhauled in accordance with the manufacturer's requirements and Hartzell specify that the damper has the same time between overhaul (TBO) as the propeller.

   Since the damper is a friction device, it will wear and if the damper is not overhauled at the specified TBO, then it will not function as intended and allow increased engine/propeller vibrations and result in engine/propeller fatigue damage. All Hartzell propeller damper assemblies are to be overhauled at 2400 hours of operation or 72 calendar months, whichever occurs first.

4. References

- Hartzell Propeller Maintenance Manual - Damper Installation
  Page 778 Rev.4 May/99 Fig 753
- Hartzell Service Letter (SL) HC-SL-61-61 Y
- AD/PROP/1
- FAA TCDS A7SO Revision 18. (Piper PA-34-200).

5. Recommendation

CASA strongly recommends that all personnel involved with engine and propeller maintenance on this aircraft type should ensure that:

1. There is adequate clearance between the spinner attachment screw ends and the damper assembly. The correct attachment screws to hold the spinner in place when a propeller damper is fitted are MS35207-263 pan head type, Piper P/N 411 532.

2. The damper assembly is overhauled at the same interval as the propeller.

6. 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

or in writing, to:

Airworthiness & Engineering Branch
Civil Aviation Safety Authority
GPO Box 2005, Canberra, ACT, 2601