EASA Safety Information Bulletin

SIB No.: **2011-09**
Issued: **17 May 2011**

Subject: **Pilot Response to Propeller Overspeed in Piston Engine Aeroplanes**

Ref. Publications: Federal Aviation Administration (FAA) Special Airworthiness Information Bulletin (SAIB) CE-10-21 dated 17 March 2010.

Applicability: All piston engine aeroplanes equipped with variable pitch propellers.

Description: The FAA published the above-referenced advisory document (which is attached as pages 2 and 3 of this bulletin) to inform operators, pilots and manufacturers of concerns for an optimum response to a propeller overspeed in piston engine aeroplanes with variable pitch propellers.

After reviewing the available information, EASA support the recommended actions contained in FAA SAIB CE-10-21.

Since this is a 'generic' subject that addresses all piston engine aeroplanes equipped with variable pitch propellers, i.e. not only those of US origin, the SAIB cannot be considered as a 'State of Design' advisory. For that reason, EASA have decided to explicitly apply these recommendations to all piston engine aeroplanes equipped with variable pitch propellers.

This SIB is published to ensure that all owners, operators and pilots of piston engine aeroplanes (if equipped with variable pitch propellers) registered in European Union Member States or associated countries, are made aware of these recommendations.

Contact: For further information contact the Airworthiness Directives, Safety Management & Research Section, Certification Directorate, EASA. E-mail: ADs@easa.europa.eu.

FAA
Aviation Safety

SPECIAL AIRWORTHINESS INFORMATION BULLETIN

SAIB: CE-10-21
SUBJ: Propellers/Propulsers; Propeller Overspeed in Piston Engine Aircraft **Date:** March 17, 2010
This is information only. Recommendations aren't mandatory.

Introduction

This Special Airworthiness Information Bulletin (SAIB) alerts operators, pilots, and aircraft manufacturers of concerns for an optimum response to a propeller overspeed in piston engine aircraft with variable pitch propellers.

At this time, the airworthiness concern is not an unsafe condition that would warrant airworthiness directive (AD) action under Title 14 of the Code of Federal Aviation Regulations (14 CFR) part 39.

Background

Recently, a single-engine aircraft experienced a propeller overspeed during cruise flight at 7,000 ft. altitude. The pilot reported that the application of throttle resulted in a propeller overspeed with no appreciable thrust. The pilot attempted to glide to a nearby airport and established the "best glide" speed of 110 knots (as published in the Pilot's Operating Handbook). The pilot was unable to reach the airport and was forced to conduct an off field landing.

It was determined that the propeller experienced a failure that caused the blade pitch change mechanism to move to the low pitch stop position. This caused the propeller to operate as a fixed pitch propeller such that it changes RPM with changes in power and airspeed. The low pitch setting allows for maximum power during take off but can result in a propeller overspeed at a higher airspeed.

A performance evaluation of the flight condition was performed for the particular aircraft model involved in this incident. This evaluation indicated that an airspeed lower than the best glide speed would have resulted in increased thrust and enabled the pilot to maintain level flight.

There are numerous variables in aircraft, engines, and propellers, which affect aircraft performance. For some aircraft models, the published best glide speed may not be low enough to generate adequate thrust for a given propeller installation in this situation (propeller blades at low pitch stop position).

The graph below shows thrust versus airspeed for a typical propeller model set at a 12-degree blade angle and maintaining 2,700 revolutions per minute (RPM). From the graph, note that at over 118 knots this propeller is incapable of generating a positive thrust and airspeed has to be lower than 95 knots to generate enough thrust to overcome the aircraft drag, i.e. maintain level flight. While different propeller models have different thrust characteristics and different aircraft have different drag characteristics, the concept remains the same – the lower the airspeed the more thrust there is available at a given RPM.

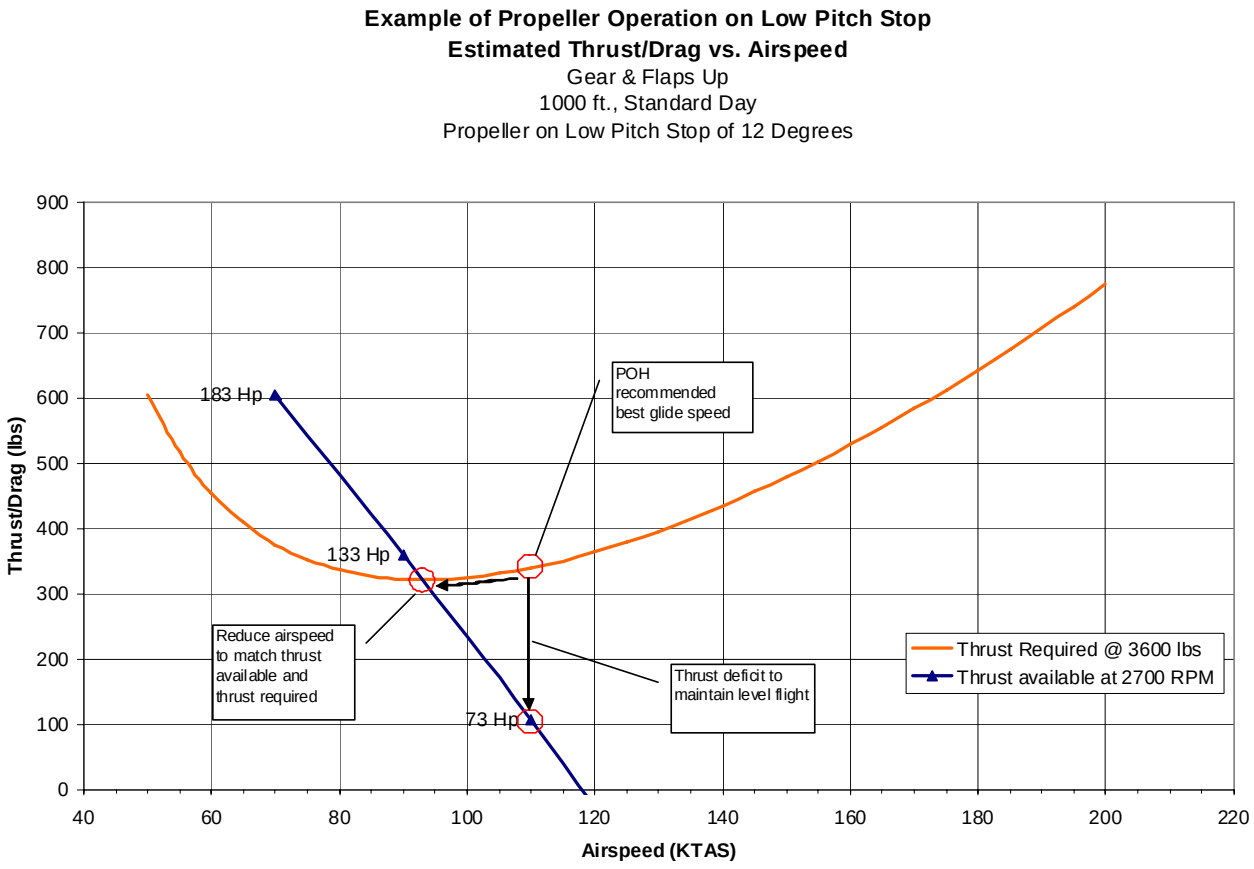
A review of pilot's operating handbooks from several aircraft manufacturers showed they did not include emergency procedures for a propeller overspeed. In cases where overspeed procedures were published, the procedure said to simply reduce throttle. More appropriately, the procedures should

advise the pilot to control a propeller overspeed by throttle reduction and a reduction in airspeed as much as practical with an adequate margin above stall speed such that level flight can be maintained.

Recommendations

Pilots

The operators of aircraft with variable pitch propellers should be aware that in certain instances of propeller overspeed, the airspeed necessary to maintain level flight may be different than the speed associated with engine-out best glide speed. The appropriate emergency procedures should be followed to mitigate the emergency situation in the event of a propeller overspeed; however, pilots should be aware that some reduction in airspeed may result in the ability for continued safe flight and landing. The determination of an airspeed that is more suitable than engine-out best glide speed should only be conducted at a safe altitude when the pilot has time to determine an alternative course of action other than landing immediately.



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