Safety Regulation Group
Safety Information and Data Department

Follow-up Action on Occurrence Report

ACCIDENT TO GROB G115E TUTOR, G-BYXJ, 4NM SW OF SALISBURY ON 29 JUNE 2004
(PROPELLER BLADES SEPARATED FROM THE HUB DURING AN AEROBATIC MANOEUVRE)

CAA FACTOR NUMBER	:	F17/2005
FACTOR PUBLICATION DATE	:	11 May 2005
OPERATOR	:	Military
CAA OCCURRENCE NUMBER	:	2004/04248
AAIB REPORT	:	Bulletin 4/2005

SYNOPSIS

(From AAIB Report)

The aircraft was completing an aerobatic manoeuvre when one of the propeller blades separated from the hub. Despite severe vibration, the pilot was able to shut down the engine quickly and perform a successful forced landing in a field. There were no injuries to either crew member.

The investigation determined that the No 1 propeller blade had detached due to a high-cycle fatigue failure of the blade socket in the aluminium alloy hub. The pattern of cracking suggested that the failure may have been vibration related. It was also established that the propeller blade-retaining nut preload decreases rapidly in the first few hours of propeller operation, raising concerns that the reduction in blade retention stiffness could increase the blade's propensity to vibrate, thereby increasing the stresses in the hub. A safety recommendation concerning the need for further vibration testing to be carried out in order to fully understand the mechanism of the failure was made on 1 December 2004. Two further safety recommendations have also been made concerned with the continued airworthiness of the propeller and focusing on propeller blade retaining nut maintenance procedures and the non-destructive testing of propeller blade sockets to detect fatigue cracks.

FOLLOW UP ACTION

The three Safety Recommendations, made by the AAIB following their investigation, are reproduced below, together with the CAA's responses.

Recommendation 2004-102

The aircraft manufacturer, GROB-WERKE Aerospace Division, should perform testing of the HO-V343K-V/183GY propeller on the engine/airframe combination of the Grob G115E, in order to establish the vibration characteristics of the propeller and the resultant stresses in the propeller blades and hub. This testing should also examine the effects of a loss in preload of the blade retaining nut.

CAA Response

This Recommendation is not addressed to the CAA.

CAA Status - Closed

Recommendation 2005-02

It is recommended that Hoffmann Propeller GmbH & Co KG introduce suitable maintenance procedures, or a suitable technical solution, for the type HO-V343K-V/183GY propeller on the Grob G115E, to ensure that the preload of the propeller blade retaining nut is maintained at an acceptable level.

CAA Response

This Recommendation is not addressed to the CAA. However, the CAA will monitor and review the actions of the Type Certificate Holder and Original Equipment Manufacturer in response to the Recommendation.

CAA Status - Closed

Recommendation 2005-03

It is recommended that Hoffmann Propeller GmbH & Co KG introduce adequate, high confidence level, non-destructive test (NDT) procedures, that will detect cracks in the threads of the type HO-V343K-V/183GY propeller blade sockets during overhaul and whilst in operational service on Grob G 115E aircraft.

CAA Response

This Recommendation is not addressed to the CAA. However, the CAA will monitor and review the actions of the Type Certificate Holder and Original Equipment Manufacturer in response to the Recommendation.

CAA Status - Closed