

Continuing Airworthiness Notice – 85-005



Lycoming Crankshaft Propeller Flanges with Lightening Holes

15 December 2009

Issued by the Civil Aviation Authority of New Zealand in the interests of aviation safety. A Continuing Airworthiness Notice (CAN) is intended to alert, educate, and make recommendations to the aviation community. A CAN contains non-regulatory information and guidance that does not meet the criteria for an Airworthiness Directive (AD). The inspections and practices described in this CAN must still be carried out in accordance with the applicable NZCAR Parts 21, 43 and 91. CAN numbering is by ATA Chapter and a serial number for the next CAN in that ATA Chapter.

The contents of this notice are ADVISORY ONLY and are NOT MANDATORY.

Applicability:

All Lycoming engines with crankshafts with a propeller flange with lightening holes.

Purpose:

This Continued Airworthiness Notice (CAN) advises operators/maintainers of Lycoming engines fitted with crankshafts with a propeller flange with lightening holes to inspect the propeller flange for corrosion. Undetected corrosion of the propeller flange can cause corrosion initiated fatigue cracks which can result in failure of the propeller flange and loss of the propeller.

Background:

This CAN is prompted by an in-flight failure of a crankshaft with a propeller flange with lightening holes fitted to a 540 series Lycoming engine on a BN 2A MK III-1 Britten-Norman Trislander, operated in New Zealand. The failure was due to a fatigue crack on the rear face of the propeller flange. Investigation revealed several fatigue cracks propagating from corrosion pits within the lightening holes of the propeller flange.

A review of the manufacturer's ICA's* revealed there are several inspection requirements for Lycoming engines fitted with crankshafts with a propeller flange that has lightening holes. Inspection requirements include Lycoming MSB 465C mandated by AD DCA/LYC/176A, Lycoming SB No. 482 mandated by AD DCA/LYC/205, which was issued after a New Zealand occurrence, and Lycoming SB No. 300B

In SL No. L202B Lycoming advises operators/maintainers of aircraft fitted with Lycoming 320, 360 and 540 series engines comply with the inspection requirements in Lycoming MSB 465C. Lycoming advises that certain conditions such as aerobatic manoeuvres, propeller operating RPM, propeller configuration and aircraft dynamic response can induce excess stress in the crankshaft propeller flange which can result in cracks on the rear face of the propeller flange. Crack growth of this type was evident in most of the fractured flange webs from the failed crankshaft.

Recommendation:

The CAA recommends operators/maintainers of Lycoming engines review the requirements in the above mentioned Lycoming ICAs, for applicability to their engine/propeller/airframe combination and the nature of their operations. The rear face of crankshaft flanges with lightening holes should be inspected for damage, cracks and corrosion every time the propeller is removed, or any other opportunity. The instructions in SB 465C may be used for these inspections. If any corrosion is found the corrosion should be removed in accordance with an acceptable procedure and a magnetic particle inspection accomplished. If the crankshaft propeller flange has not been inspected in accordance with SB 465C or a similar inspection at the last propeller removal or propeller overhaul or maintenance inspection, then the CAA recommends an initial inspection per SB 465C at the next aircraft maintenance inspection, and thereafter every time the propeller is removed, replaced or overhauled.

Enquiries:

Enquiries with regard to the content of this Continued Airworthiness Notice should be sent to:

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*ICAs: Instructions for Continued Airworthiness, a term which includes Service Bulletins, Service Letters, Service Instructions and maintenance publications by which the manufacturers may provide instructions necessary to ensure airworthiness.