

# Continuing Airworthiness Notice – 85-007



## Lycoming O-540 and IO-540 series engines installed on Robinson R44 series helicopters

18 November 2016

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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 followed by a sequential number for the next CAN in that ATA Chapter.

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### Applicability:

Lycoming O-540-F1B5 and IO-540-AE1A5 engines installed on Robinson R44 series helicopters.

### Purpose:

To advise aircraft operators and maintainers of two defect reports received by the CAA of finding failed idler gear posts. Both failures occurred on Lycoming IO-540-AE1A5 engines. The first reported idler gear post failure was found during a 100 hour inspection with metal in the engine oil filter. The second reported idler gear post failure resulted in an in-flight loss of engine power.

### Background:

This Continuing Airworthiness Notice (CAN) is prompted by an accident reported to the CAA of a loss of engine power on a Robinson R44 II, which resulted in the pilot carrying out a successful auto-rotation landing. The magnetos were removed and the idler gear was found loose with gear teeth missing. The rear accessory case was subsequently removed and the attachment studs of the LH idler gear post found failed. The failure resulted in a loss of camshaft and LH magneto drive. Refer to the attached photos for more detail.

Idler gear post fretting is known to occur on Robinson helicopters due to drive train anomalies. Wear and deterioration of the dynamic counterweight rollers/bushes can result in reduced effectiveness of the pendulum damping system and increase the torsional vibration within the engine. An out of balance engine cooling fan can also increase torsional vibration. Inspection of the pendulum damping system on the affected engine revealed that the crankshaft dynamic counterweight rollers and bushes were worn beyond the manufacturer's limits.

### Recommendations:

The CAA recommends that maintainers inspect the idler gear assemblies for damage to the gear teeth at intervals not to exceed 500 hours TIS with magneto removal, or after detection of metal in the engine oil filter, or after experiencing excessive engine vibration.

To inspect the idler gear assemblies, remove both magnetos. With the aid of an inspection mirror and suitable light, or a borescope, inspect the crankshaft idler gear assemblies for damage to the gear teeth. With no cam load on the crankshaft idler gears, inspect the crankshaft idler gear assemblies. There should be no side play or excessive gear backlash.

If there is any indication of damage to the crankshaft idler gear assemblies, excessive gear backlash, damaged gear teeth, or any gear assembly side play, replace all damaged parts, as required and check the balance the engine cooling fan.

### Note:

Initial signs of metal in the engine oil filter require an inspection of the idler gear assemblies, and more frequent balancing of the engine cooling fan during maintenance will reduce the likelihood of fan induced torsional vibration.

### Enquiries:

Enquiries regarding this Continuing Airworthiness Notice should be sent to:

Owen Olls

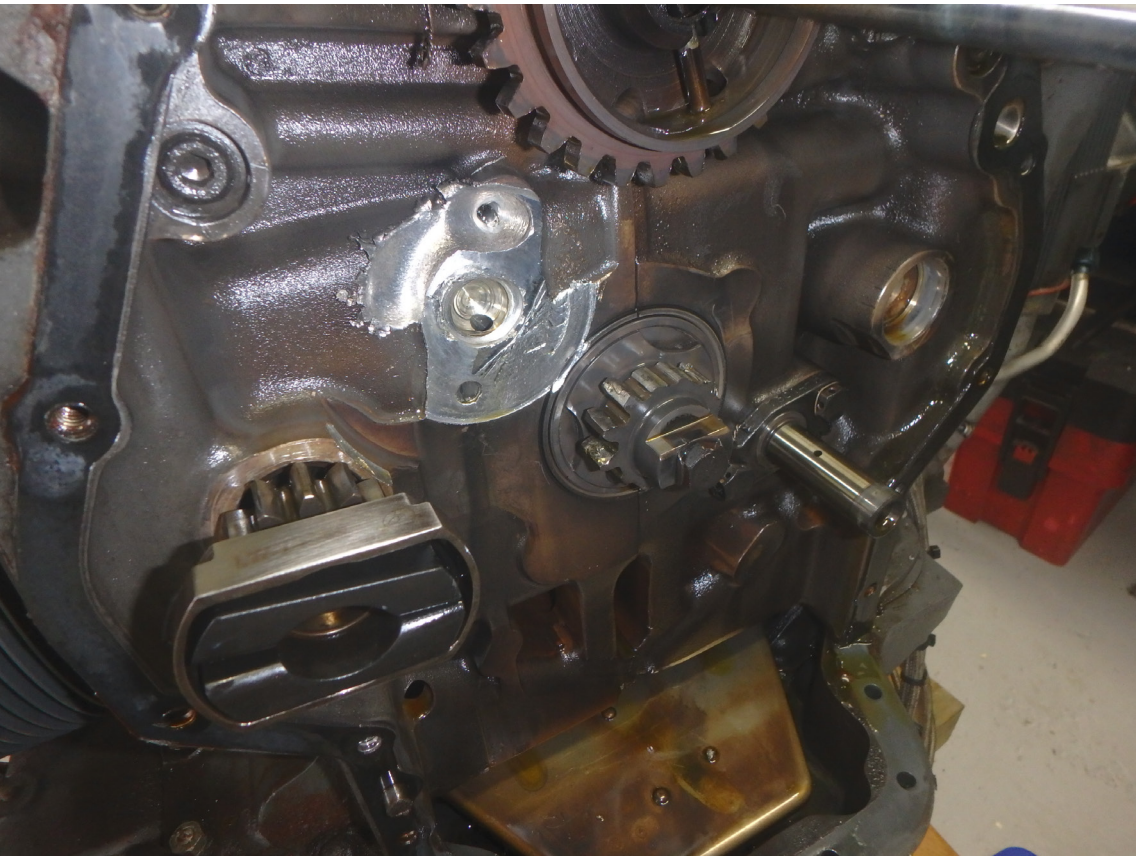
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Failure of LH idler gear resulted in loss of LH magneto and camshaft drive.



Fretting caused by a loose LH idler gear post, due to excessive torsional vibration.