EASA Safety Information Bulletin

SIB No.: **2009-24**
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Subject: **Lycoming O-235 – Cylinder barrel – Inspection**

Ref. Publication: Lycoming Direct Drive Engine Overhaul Manual P/N 60294-7

Description: This SIB is published to inform all owners and operators of aircraft equipped with Lycoming O-235 engines about possible cylinder cracks leading to engine failures.

34 cases of cylinder barrels circumferential cracks have been experienced on the O-235 French fleet, from November 1995 up to November 2003. The crack induces an oil leak which can become severe enough to stop or seize the engine. In some instances, the crack grows such that the cylinder becomes fully released from its base plate, with immediate engine power loss and destructive failure. The crack originates from a corrosion pit on an external cylinder barrel and grows radially through the barrel, near the cylinder base plate.

For addressing this situation DGAC F mandated repetitive inspections of the affected cylinder barrels. Lycoming Engines has introduced cylinders of improved design. After retrofitting of the French fleet with cylinders of the new design no further occurrences have happened. The adoption of the French AD 1998-225(A) R6 by EASA has been discarded after public consultation (see CRD PAD 05-003).

Cylinders of improved design can be identified as follows:

Engines	Kit	Cylinders
O-235-K2A,-K2B,-K2C,-L2A, -L2C,-M1,-M2	05K23037	16A23033
O-235-F1B,-F2A,-F2B,-G1A, -G2A,-J2A	05K23040	16A23033
O-235-N2A,-N2C,-P1,-P2A,-P2C, -P3C	05K23038	16A23035
O-235-C1,-C1B,-C1C,-C2A,-C2B,-C2C,-E2A,-H2C	05K23039	16A23034

Following a further occurrence in UK and addressing the AAIB UK Safety Recommendation 2007-094 EASA has discussed this issue

with FAA and Lycoming Engines. No problems have been reported in the USA. It is assumed that the corrosion of the cylinders has been caused by improper corrosion prevention during shipment overseas and storage.

Based on the situation described above the following recommendation is made to all owners and operators of aircraft equipped with Lycoming O-235 engines that are not equipped with cylinders of improved design as indentified in the table above:

- Check the cylinder barrels for rust pittings, oil leaks and cracks during the scheduled maintenance

Based on the past experience, the following procedure is recommended:
1. Remove inter-cylinder baffles to improve the method of penetrant inspection of cracks on cylinder barrels.
2. Degrease with ARDROX 9PR551, 9PR5 type or equivalent.
3. Apply white developer ARDROX 9D6F type or equivalent.
4. Perform engine run-up procedure without inter-cylinder baffles.
5. Check :
a) If an oil leakage is confirmed or detected, remove the cylinder and perform a fluorescent penetrant inspection in an approved maintenance shop.
If a crack is found, remove the cylinder from service, replace it and inform the local authority and EASA (for informing EASA use the EASA Form 44 Technical Occurrence Report (see www.easa.europa.eu/ws_prod/g/doc/Contact/Form%2044%20Technical%20Occurrence%20Report%20Form.doc)
If a crack is not found, reassemble the cylinder on the engine in accordance with the engine overhaul manual. The reason of oil leakage must be identified prior to next flight.
b) If no leakage is detected, the engine can be returned to service.
6. Reinstall the inter-cylinder baffles.

The installation of cylinders of improved design is recommended.

Applicability: All aircraft powered by Lycoming O-235 engines, unless cylinders of improved design have been installed

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