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Docket Management System
U.S. Department of Transportation
Room PL-401
400 Seventh Street, SW
Washington, DC 20590-0001

Re: Docket No. FAA-2005-21331; Directorate Identifier 2005-NE-07-AD; Notice of proposed rulemaking (NPRM); Engine Components Incorporated (ECi) Reciprocating Engine Connecting Rods

The Aircraft Owners and Pilots Association (AOPA), representing over 407,000 members, requests that the Federal Aviation Administration (FAA) withdraw its proposed airworthiness directive (AD) for certain Lycoming 360- and 540-series engines with ECi connecting rods installed because the agency fails to show that an unsafe condition exists.

Engine failure due to excessive variation in circularity of the journal bores limited to single event

The FAA is proposing this AD entirely on reports of excessive variation in circularity of the journal bores stemming from a single connecting rod failure event. AOPA reviewed the data provided by ECi, test results, accident reports, and other correspondence, and the only reports of connecting rod variation we found are those pertaining to this one engine failure where unrelated oil starvation, possibly from oil blockage, may have caused or contributed to the failure. We are not aware of any other reports of engine failure or damaged connecting rods attributable to variation in circularity of the journal bores.

There have been no reports of scalloping outside FAA-approved limits

There is no evidence that scalloping within the Parts Manufacturing Approval (PMA) approved limits affects the proper functioning of the connecting rods. Evidence of the connecting rods functioning properly with slight scalloping was shown during a Lycoming engine (S/N L24157-36A) prop strike investigation, and in the ECi test of the connecting rods witnessed by FAA inspector James Fote.

The FAA approved the connecting rods with a rod bore tolerance of .0005 inches. All indications are that the waviness or scalloping was within the FAA approved limits and within tolerances typically found at an overhaul facility. There have been no reports of scalloping outside of these FAA-approved limits.

Scalloping marks may result from normal engine wear and unlikely to be an unsafe condition

AOPA examined photos of a Lycoming engine (S/N L24157-36A) that shows scalloping on a Lycoming engine connecting rod. It appears from the data, that Central Cylinder Service overhauled the connecting rod and returned it to service according to the applicable repair and overhaul procedures. These photos indicate that the scalloping marks may be a normal part of engine wear and unlikely to be an unsafe condition. The Lycoming connecting rods had reached 1618 hours SMOH, and were operating properly.

The suspect connecting rods have been installed in general aviation reciprocating engines for a number of years with thousands of hours and hundreds of thousands to millions of cycles without any reported failures other than the incident aircraft. It would appear that if the waviness or scalloping were an unsafe condition and caused oil starvation, reports of this cause would have been reported before and/or after the one connecting rod failure identified in the NPRM.

FAA is creating new airworthiness standards that affect all reciprocating engines

The FAA's concern that scalloping and waviness (even within limitations) creates an unsafe condition has implications for all reciprocating engine connecting rod bores. This concern raises new questions about the validity of and need for changing certification limitations established in federal airworthiness standards. For this reason it is imperative that the FAA make available its test results to the public and conduct a study that includes industry participation before creating any new "de facto" certification standards through an AD that would adversely affect the entire general aviation community.

If the data truly justifies airworthiness action, then it would be more appropriate for the FAA to follow the normal rulemaking process related to airworthiness standards rather than imposing new certification limitations through an AD. Doing so would allow for any new requirements to be imposed only on products certificated after the effective date of the rule instead of being retroactive to a fleet of aircraft where no unsafe condition has been established.

Inappropriate to use automobile standards in aircraft applications

AOPA opposes the FAA's use of non-aircraft Society of Automotive Engineers (SAE) standards to indicate that there is an unsafe condition and non-compliant product. AOPA disagrees that automobile engine limitations are appropriate for air-cooled aircraft reciprocating engines. A study of the differences between air-cooled and water-cooled engines should be undertaken before a decision is made as to the validity of the non-aircraft SAE standards in an aircraft application. This should take place as a normal part of the rulemaking process.

FAA bypasses airworthiness concern process – foregoes valuable input

ECi was negotiating a test plan with the FAA that would help to establish whether there was a systemic problem with the connecting rods or whether the accident aircraft was an isolated case. The fact the FAA continued to develop and issue the NPRM without continuing to finalize and complete the test program is problematic from a trust and integrity standpoint. The FAA has blindsided AOPA, ECi and the general aviation community in spite of an agreement to utilize the airworthiness concern process to gather all of the general aviation community input before making a decision as to whether an AD is warranted.

Had the FAA used the airworthiness concern process, they would have been able to obtain the kind of data needed to make an informed decision regarding the proper disposition of the potential safety issue.

Summary

Given the disagreement between the aviation industry and the FAA as to the impact on the scalloping or waviness in the connecting rod bore, and the fact there have been no further reports of accidents or incidents relating to the connecting rods, AOPA recommends that the FAA withdraw this NPRM and undertake a study that includes industry participation (OEM, PMA, Suppliers, etc.) to determine the impact of the scalloping of the connecting rod bore. This study will allow for the participation of all the pertinent parties to assist in objectively finding a solution to the issue. In the interim the FAA should consider an alternative solution like a Special Airworthiness Information Bulletin (SAIB) to inspect the connecting rods at overhaul and replace or repair to a defined standard, if heavy scalloping is noted.

Sincerely,

Luis M. Gutierrez
Director, Regulatory and Certification Policy

cc: Francis Favara, Acting Manager, FAA Engine and Propeller Directorate
David Downey, Manager, FAA Rotorcraft Directorate