



Mandatory Service Bulletin

ENGINE COMPONENTS, INC.

M.S.B. No.: 04-1

Page: 1 of 2

Title: MANDATORY CYLINDER INSPECTION

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Technical Portions are FAA DER Approved.

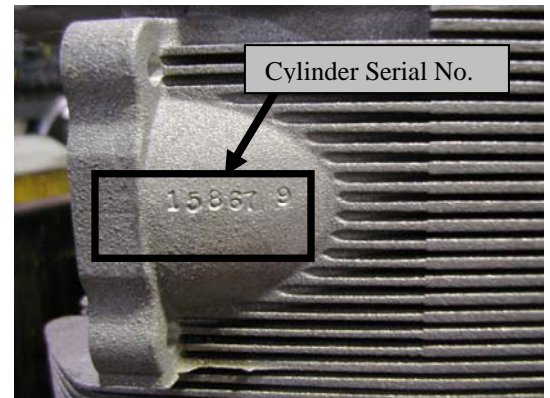
- 1.0 SCOPE AND APPLICATION:** Engine Components, Inc. (ECi) considers this Service Bulletin to be mandatory to ensure continued airworthiness for airplanes that have TCM 520 and 550 cubic inch engines using new cylinders manufactured by ECi during the time frame between September 1, 2002 to May 12, 2003.
- 2.0 INTRODUCTION:** This Mandatory Service Bulletin alerts you, an owner or operator of Teledyne Continental IO-520/TSIO-520 or IO-550 engines and Repair Stations, FBO's and FSDO's to an inspection program for certain cylinder assemblies manufactured by Engine Components, Inc. (ECi), under license from the PMA holder Airmotive Engineering Corporation (AEC), a subsidiary of Engine Components, Inc. This Service Bulletin is limited to new ECi cylinders for the IO/TSIO-520 or IO-550 engines that were produced by ECi during the period September 1, 2002 through May 12, 2003.
- 3.0 BACKGROUND:** ECi has received reports of approximately 40 cracked Parts Manufacturer Approval (PMA) ECi cylinder heads installed on Teledyne Continental IO-520/TSIO-520 or IO-550 engines. The cracks are initiated during engine operation and are located on the cylinder head between the ninth and tenth cylinder head fins from the head/barrel junction, with cracks starting on the exhaust side of the head.

Investigation of the cracked cylinders by ECi has revealed that occasional and sporadic deviations from the approved cylinder head heat treatment procedure took place between Sept. 1, 2002 and May 12, 2003. The heat treatment processing deviation involved a shortening of the time frame for artificial aging (heating) of the cylinder heads after solution heat treatment. This left some of these cylinder heads harder and less ductile than the ECi specifications require.

The metallurgy of the cylinder heads manufactured by ECi is such that natural aging can occur during operation if the cylinders are not completely artificially aged during the fabrication process. However, the number of operating hours required to optimize the ductility has not been quantified. Accordingly, the only way to ensure that cylinder heads manufactured during this time frame are in the proper heat treat condition is to test the cylinders. This requires that the cylinders be removed from the engines and sent to ECi for evaluation. Review of the casting and manufacturing processes, basic metallurgy and dimensional characteristics have not identified any other contributing causes.

- 4.0 IMPLEMENTATION:** Engine Components, Inc. requires that at the next maintenance opportunity, but no longer than 50 operating hours after the date of this bulletin, all owners, operators and repair stations must:

- a. Determine that the engine is an IO/TSIO-520 or IO-550 engine and that the cylinder serial numbers are below 7709. The cylinder serial numbers can be determined by checking the engine overhaul/repair documentation, or by visually verifying the serial numbers stamped on the outside of the intake port boss (Photograph 1). If the cylinder serial number is 7709 or above, this bulletin does not apply.
- b. Remove the rocker box covers from the cylinders and determine if the cylinders are made from ECi casting Part No. AEC65385 as shown in Photograph 2. Verify that the cylinder head marking is identical to Photograph 2, with the part number between the ECi logo and the rocker box flange. Also, the letter "O" will be below the ECi logo as shown.



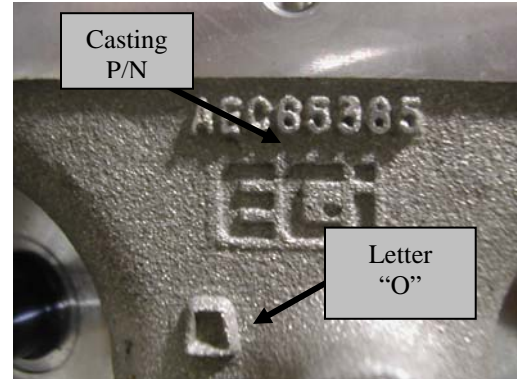
Photograph 1

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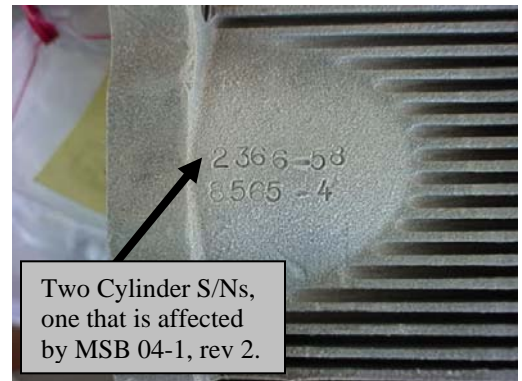
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www.eci2fly.com • sales-service@eci2fly.com • FAA Repair Station #AG2R689K

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- c. Note that some cylinders have two serial numbers. Both numbers may be on the outboard side of the intake port (as shown in Photograph 3), or there may be one at this location and one on the flat area below the intake port side adjacent to the head/barrel junction (see Photograph 4). If either serial number is below 7709 and markings identified in paragraph (b) are present, the cylinder may be affected. If the cylinder is stamped “A” as shown in Photograph 5 below, remove the cylinder and ship to ECi. **NOTE: This only applies if the cylinder has two S/N’s in addition to the letter “A”.** If the cylinder is stamped “B” in the same location, the cylinder is not affected.
- d. If the cylinder is identified as an ECi replacement cylinder with the identification shown, and has only one S/N, which is less than 7709, then view the rocker box flange from the top of the cylinder. Determine if there is the letter “A” or the letter “X” stamped on the rocker box flange as shown in Photograph 5. If the letter “A” or “X” is stamped on the rocker box flange, regardless of the serial number, then no further action is required. Record the inspection in the engine logbooks and return the airplane to service.
- e. If there is no letter “A” or “X” stamped on the cylinder head rocker box flange, then contact ECi Customer Service at 1-800-ECI2FLY (800-324-2359) to obtain a Return Material Authorization (RMA) number. Remove the cylinders and ship to ECi for testing *along with a properly completed Warranty Application*, which is attached to this Service Bulletin. Cylinders should be shipped to ECi at 9503 Middlex, San Antonio, TX. 78217.
- f. ECi will be providing reports of the inspection to the FAA’s Fort Worth Aircraft Certification Office (Mr. Richard Karanian, SW-190, (817-222-5195). However, the customer may contact Mr. Karanian for further discussion if deemed necessary.
- g. Engine Components, Inc. will reimburse owner operators 40 hours per engine at \$48.00 per hour for removal and reinstallation of the cylinders. In the event that not all 6 cylinders require removal, ECi will reimburse 7 hours labor per cylinder removed at \$48.00 per hour. ECi will pay for ground shipment of the cylinders.
- h. Cylinders that do not meet the design requirements will be replaced. Engine Components, Inc. will reinstate the original limited warranty that came with the cylinders to the date ECi ships the cylinders back after the inspection has been completed. Cylinders that have been inspected by ECi will be identified with a letter “B” stamped in the area where “A” is stamped as shown in Photograph 5. Cylinders that are replaced will be marked with the letter “A.”
- i. Any alternative method of compliance to this Service Bulletin must be evaluated by ECi Engineering before accomplishment. Accordingly, contact ECi Customer Service to schedule consultation with ECi engineers. Any alternative method of compliance must also be approved by the FAA-ACO.



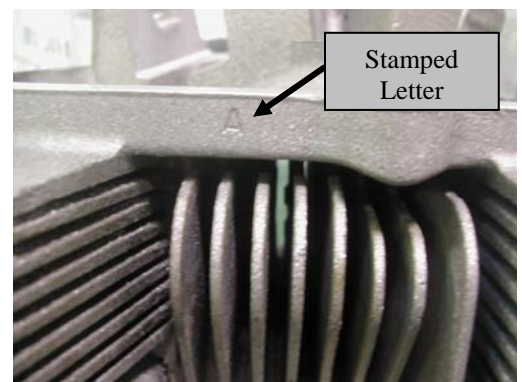
Photograph 2



Photograph 3



Photograph 4



Photograph 5