MANDATORY SERVICE BULLETIN

CATEGORY 1

MSB18-08B

Subject Matter of This Document may be Incorporated, in Whole or in Part, in an FAA Issued Airworthiness Directive

Supersedes SB18-08A
TECHNICAL PORTIONS
FAA APPROVED

SUBJECT: Inspection and Maintenance Modification of Cylinder Assemblies

PURPOSE: To inspect and remove casting material build-up on the radius edge of identified cross-flow cylinder heads.

COMPLIANCE: If under 500 hours in service, perform radius blend inspection and modification no later than the next scheduled 100-Hour/Annual inspection. If 500 hours or greater, perform radius blend modification at the next maintenance event (not to exceed 50 hours).

MODELS AFFECTED: New and rebuilt Continental Aerospace Technologies GTSIO-520-C, D, H, K, L, M, N; IO-550-G, N, P, R; IOF-550-N, P, R; TSIO-520-BE; TSIO-550-A, B, C, E, G, K, N and TSIOF-550-D, J, K, P aviation gasoline (AvGas) engines originally manufactured, rebuilt, or modified with a cross-flow cylinder replacement on or after 01 NOV 2014.

I. GENERAL INFORMATION

Several field reports indicate the potential for fracture initiation on engines (exceeding 500 hours of operation) at the radius edge of identified cylinder heads produced on or after 01 NOV 2014 (see Figure 2). The affected cylinder casting can be identified by the "filled" top fin flange area above the exhaust port as shown in Figure 1.

Table 1. Affected Cylinder Assemblies, Part Numbers[1]

658538	658540	658542	658591	658595	658613	658624
658539	658541	658590	658594	658603	658623	658630

1. Base part number may be followed with a **suffix** (i.e. 658613**A1**)

II. SCOPE

This service document is issued to provide inspection criteria and perform corrective action on affected cylinder assemblies. Affected cylinder head castings have a distinguishing feature (see Figure 1) from unaffected. Affected new and rebuilt engines with serial number 1036883 and later were inspected and corrected at the factory to comply with this Service Document. Additionally, all cylinder heads stamped with the letter **"S"** (regardless of serial number) meet full compliance and do not require additional inspection, see Figure 3.

New or rebuilt engines obtained prior to 01 NOV 2014 are not affected by this Service Document. Additionally, cylinder assemblies obtained prior to 01 NOV 2014 or stamped with serial number **AC18KB277** or later (reference Figure 1 and Figure 9) are not affected by this Service Document.

> NOTE: Refer to the engine log book for documentation of prior compliance; if prior compliance is recorded and the letter "S" has been metal stamped (1/4") on either the cylinder head exhaust ear or face of the intake pushrod boss, the cylinder assembly is in full compliance with this Service Document (MSB18-08B).

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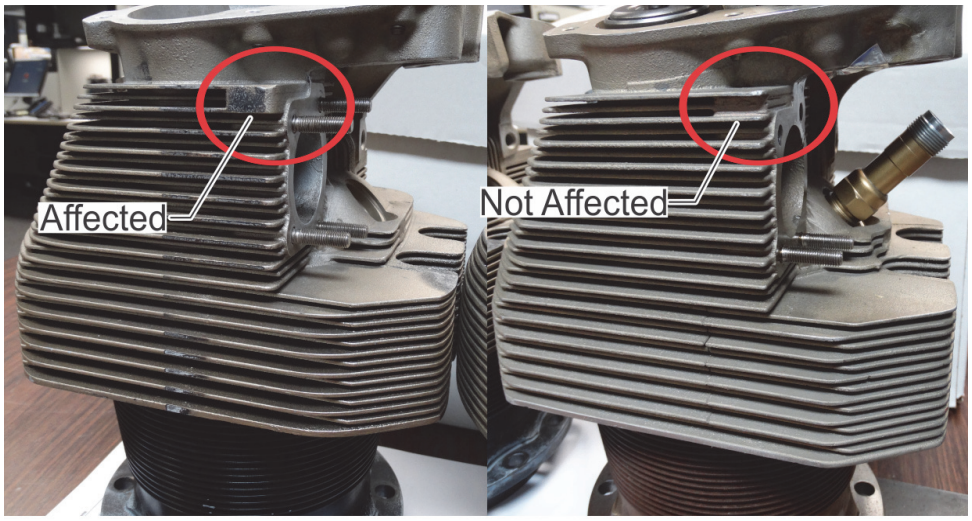
On affected cylinder assemblies with 500 hours or more total time in operation, perform the radius edge inspection and modification at the next maintenance event (not to exceed 50 hours).



Identified Cylinder Assemblies, Replaced After 01 Nov 2014

Figure 1. Affected Cross Flow Cylinders, Top Fin Flange typical

III. ACTION REQUIRED

Perform the following cylinder head inspection and modification on affected Continental engine models. Remove engine cowling and any airframe supplied parts or components as necessary to facilitate access to the cylinder heads.

> *CAUTION: Refer to the applicable manufacturer's maintenance manuals or service instructions to gain access to the engine. In addition, any preflight or in-flight operational checks require use of the appropriate AFM or POH.*

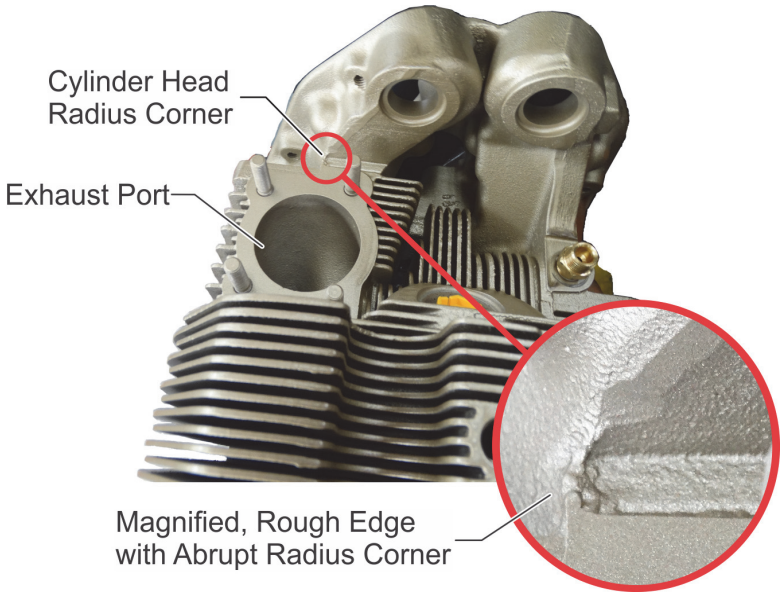


Figure 2. Abrupt Radius Edge with Flash Material Build-up, typical

1. The cylinder head meets compliance with Service Document (MSB18-08) if:
   a. Serial number AC-18KB277 or later (reference Figure 9), *or if*
   b. The letter "S" is metal stamped on either the cylinder head exhaust ear or on the exposed face of the intake pushrod boss, (reference Figure 3)**,** *and if*
   c. The radius corner inspection and modifications were completed in accordance with this Service Document (reference Figure 4).

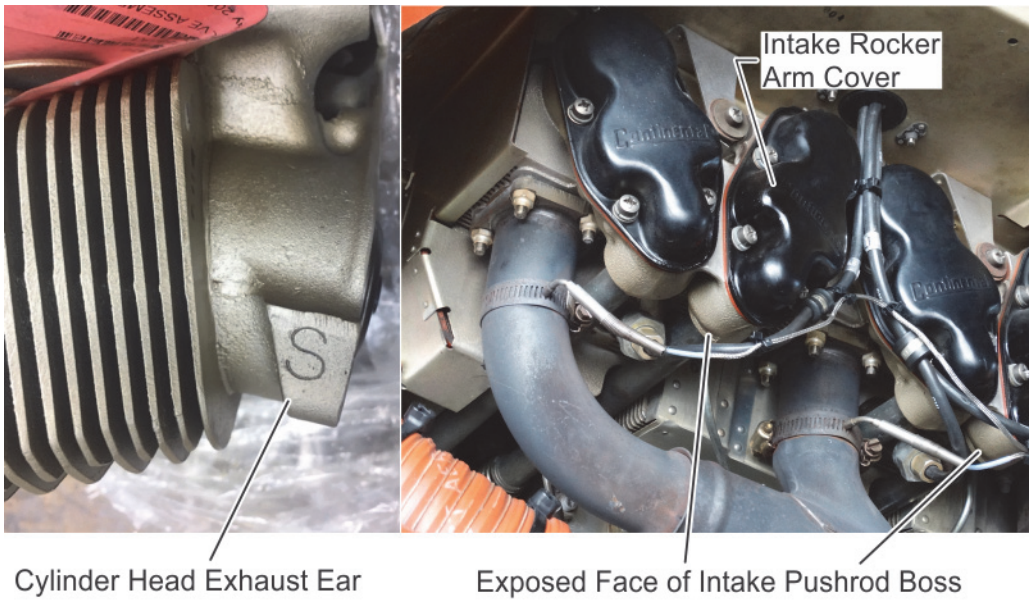


Figure 3. Cylinder Head Indicates Prior Compliance, Stamped with Letter "S"

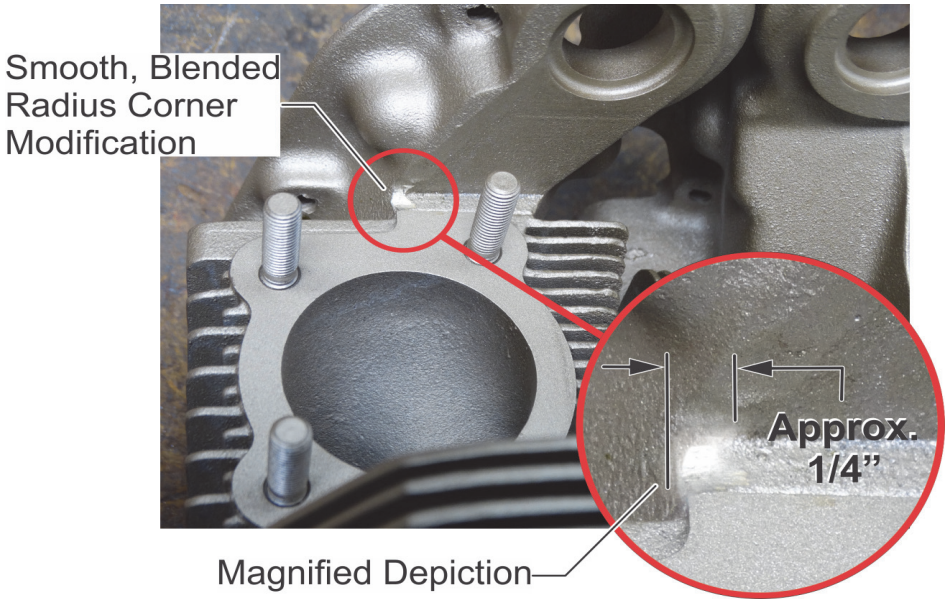


Figure 4. Smooth Radius Corner after Radius Blend Modification

2. If the cylinder head exhaust ear is not stamped with the letter "S" or is obscured by baffling, inspect the radius corner angle below the exhaust port (see Figure 5) for any casting flash build-up or sharp radius edges. The radius corner should be tapered and blended smooth (reference Figure 4).

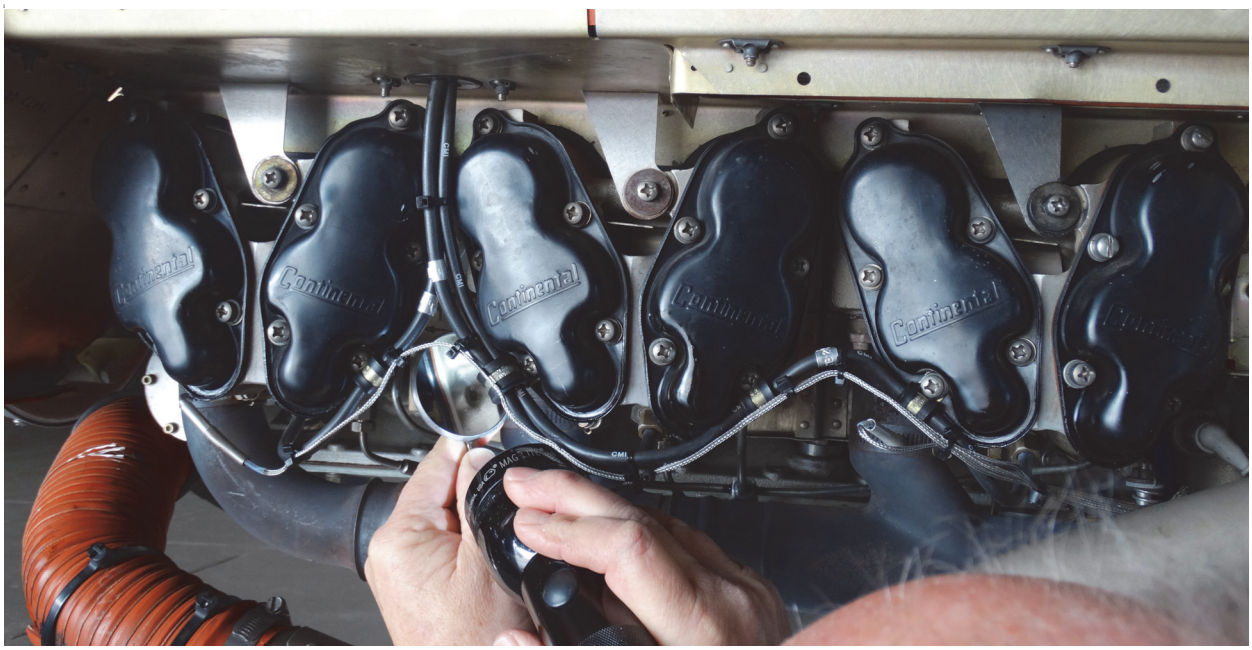


Figure 5. Cylinder Head Inspection Area, typical aircraft installation

3. Perform a "Non-Destructive Visual Inspection" according to the latest instructions in M-0, Standard Practice Maintenance Manual, Chapter 11, on the cylinder head radius corner (all possible angles). All cracks require attention, regardless of size or location. If a fissure, crack or physical damage is identified, replace the cylinder. Contact Continental Customer Service (Section V on page 6) to order replacement parts.

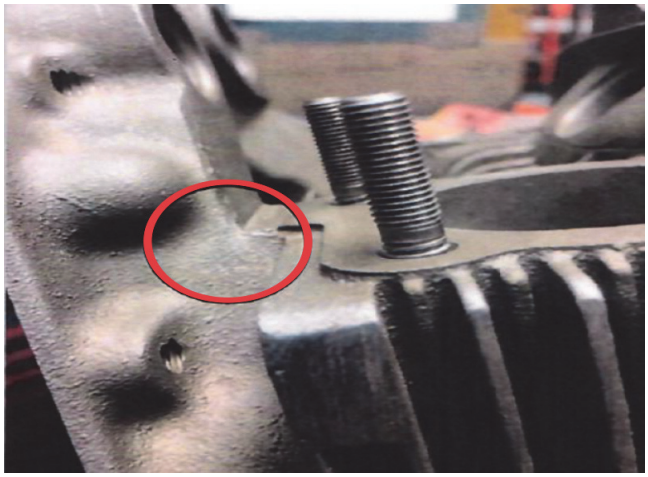


Figure 6. Cylinder Head Radius Corner, side view

CAUTION: Wear eye protection to avoid injury from flying debris.

4. Begin removing built-up flash material using a pencil grinder or 1/4" round metal file held approximately at a 30 degree angle (i.e. Nickolson Bastard Cut file, see Figure 7).

   Carefully, vary your filing motion until a smooth, blended "tapered" radius edge is achieved at the radius corner. Remove ONLY enough material from the cylinder head to achieve dimensional specification, see Figure 4. The finished radius blend should not exceed 0.20" depth of the material removed.

Figure 7. Round Nickolson Bastard Cut File or equivalent, 1/4" diameter

5. Inspect the cylinder head surface and remove all nicks, burrs, sharp angles or edges using a de-burring tool and Scotch-Brite© (ultra fine or equivalent). Evenly shape, taper, and smooth all interfering surfaces where material was removed (see Figure 4).

   CAUTION: When utilizing compressed air, wear OSHA approved protective eye wear. Never exceed 30 psi when using compressed gases for cleaning purposes (OSHA 1910.242(b)).

6. Metal stamp the letter "S" (1/4" stamp) on the face of the intake pushrod boss (reference Figure 3) to indicate part compliance.
7. Use compressed air and a clean dry rag to remove residual material.

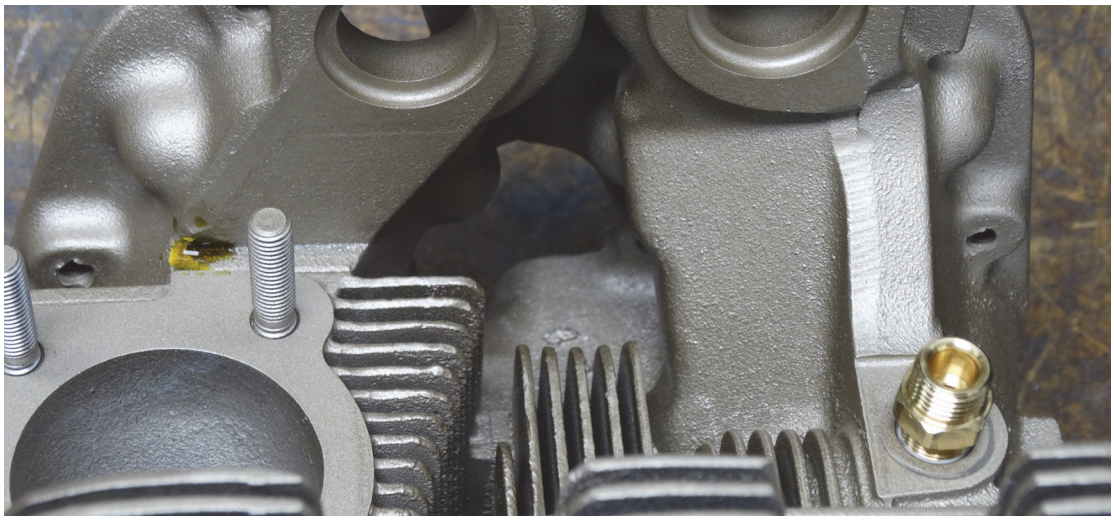


Figure 8. Cylinder Head, Alodine Application

8. Use an alodine touch up pen (Alodine® 1132™ Touch-N-Prep® Coating, Henkel Corporation) or equivalent (as specified by MIL-DTL-81706B, (PIN M817061A6D)) to apply alodine to machined areas or any other areas of exposed metal, as instructed by the engine's primary Instructions for Continued Airworthiness (ICA).
9. Create a logbook entry detailing the compliance action taken in accordance with this Service Document (MSB18-08B). The logbook entry must record all cylinder head serial numbers and include a complete listing of parts used in this installation.
10. If any equipment was removed to gain access, continue with engine assembly according to the primary Instructions for Continued Airworthiness (ICA).

IV. SERIAL NUMBER IDENTIFICATION

The cylinder serial number is stamped on the bottom fin of the cylinder head. Cylinder head assembly serial numbers incorporate a manufacturing date and may be identified as follows (reference Figure 9).

Serial numbers begin with the letters **AC** to denote the Cylinder Class: followed by a two digit "Year" and single digit "Month" (the letters A through L represent the months Jan. through Dec.).

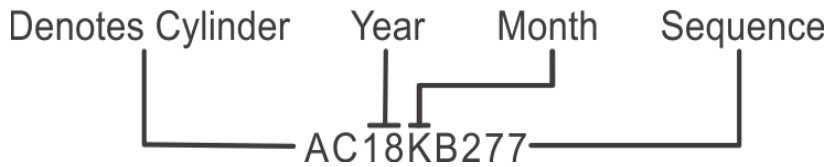


Figure 9. Cylinder Head, Serial Number Identification

V. WARRANTY

The actions required to comply with this Service Document are covered, up to the Eligible Allowance provided for reimbursement, as shown below. Standard warranty practices apply. Visit the Continental web site at www.continental.aero to obtain copies of Continental Warranty Policies.

Complete and eMail a copy of the linked Compliance Form, along with a copy of the work invoice and a copy of the repair agency's W-9, immediately upon completion for reimbursement. Continental reserves the right to request copies of invoices and maintenance records to verify warranty applicability.

Allowances/Reimbursements

	Eligible Allowances for Reimbursement (not installed in aircraft)	Labor Hours[1]
1	Blend radius corner and alodine affected cylinder assembly (as required, according to this Service Document MSB18-08B)	0.15 per cylinder

1. at published shop rate

	Eligible Allowances for Reimbursement (installed in aircraft)	Labor Hours[1]
1	Inspection to identify affected cylinder assemblies, per engine	0.50 per engine
2	Blend radius corner and alodine affected cylinder assembly (as required, according to this Service Document MSB18-08B)	0.25 per cylinder

1. at published shop rate

Contact Continental Technical Services at one of the numbers listed below if you have any questions concerning the technical content of this Service Document.

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