

**MANDATORY SERVICE BULLETIN****MSB18-08C**

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

**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.

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## 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 3). 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<sup>1</sup>

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. 658613A1)

## II. SCOPE

SB18-08 was issued to provide inspection criteria and perform corrective action on affected cylinder assemblies. Revision A of the service document corrected the format of the unaffected serial numbers. The service document was promoted to a Category 1 (Mandatory Service Bulletin) at Revision B. This revision provides additional clarity and illustrative guidance to successfully complete the field modifications to maintain engine airworthiness.

NOTE: Some steps in the following instructions are identified as Required for Compliance (**RC**). If this service bulletin is mandated by an airworthiness directive (AD), steps identified as **RC** must be accomplished to comply with the AD.

### A. Affected Cylinders

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.

**ISSUED**  
2018/12/10

**REVISED**  
2020/09/21



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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 are not affected by this Service Document. Reference Figure 1 for identifying features of affected and unaffected cylinders. These identification landmarks can positively identify and affected cylinder without reference to part number.

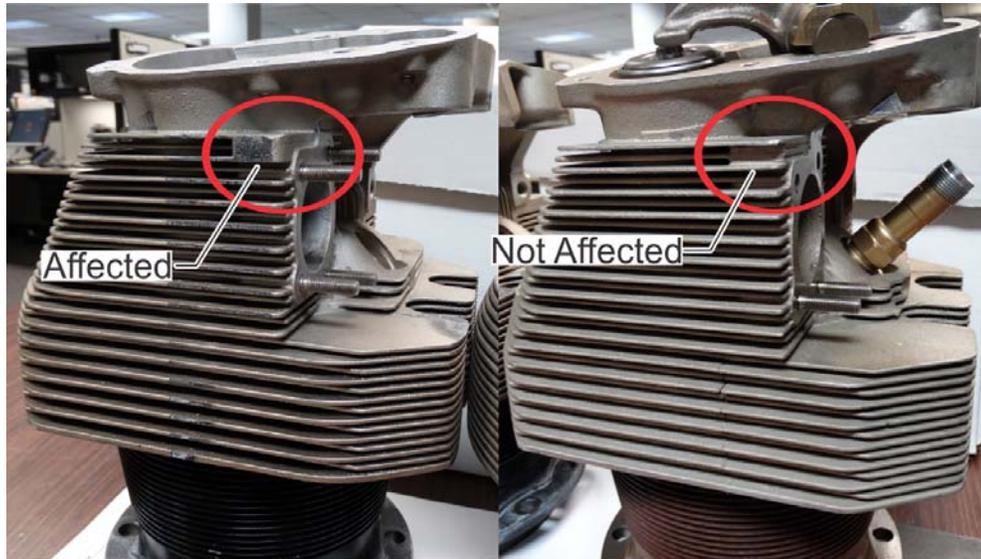


Figure 1. Affected Cross Flow Cylinders, Top Fin Flange typical

### B. Exhibits of Failed Compliance Attempts

Examples in this section illustrate unacceptable attempts to perform the modifications intended to meet the requirements. The preferred tool to accomplish the modification is a short (6" to 8") bastard file; it is very effective for smoothing the affected outside corner and is easier to control in tight spaces than a power tool, such as a die grinder.



*Incomplete Rework with Grinding Marks on Unaffected Area*

*Grinding Marks Evident but Affected Area Untouched*

Figure 2. Examples of Non-Compliance

The photos below are from a cylinder removed for oil seepage at 802 hours. The log book entry for compliance with SB18-08 was 798 hours. The red arrow in the photo points to the hairline fracture already existing in the affected inspection area at the time compliance was recorded.



Rework performed on cracked cylinder



grinding marks through crack - closeup

### 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.*

NOTE: The cylinder depicted in Figure 3 is disassembled for the purpose of clarity only. It is not necessary to remove the baffling or the exhaust system, or disassemble the cylinder to accomplish the modifications detailed in this document.

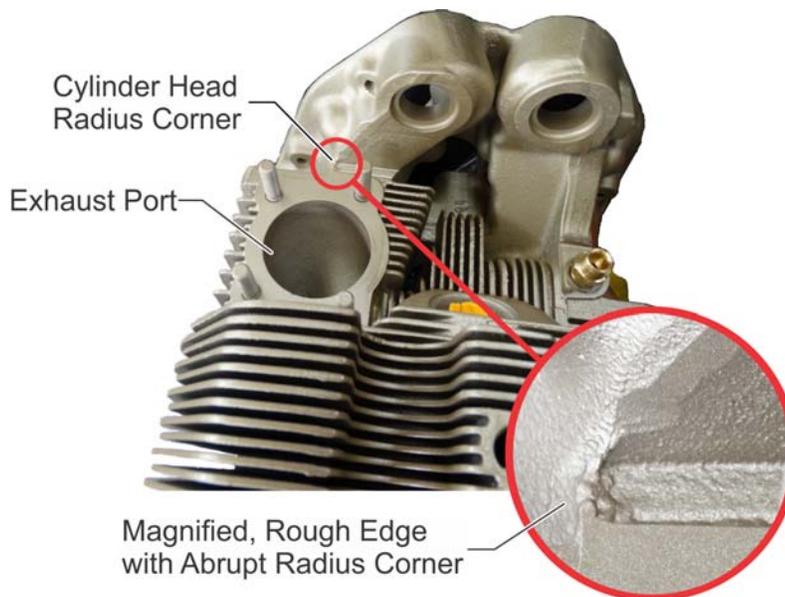


Figure 3. Abrupt Radius Edge with Flash Material Build-up, typical

1. The cylinder head meets compliance with Service Document (MSB18-08) if:
  - a. Serial number AC18KB277 or later (reference Figure 12), *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 4), *and if*
  - c. The radius corner inspection and modifications were completed in accordance with this Service Document (reference Figure 5).



Figure 4. Cylinder Head Indicates Prior Compliance, Stamped with Letter “S”

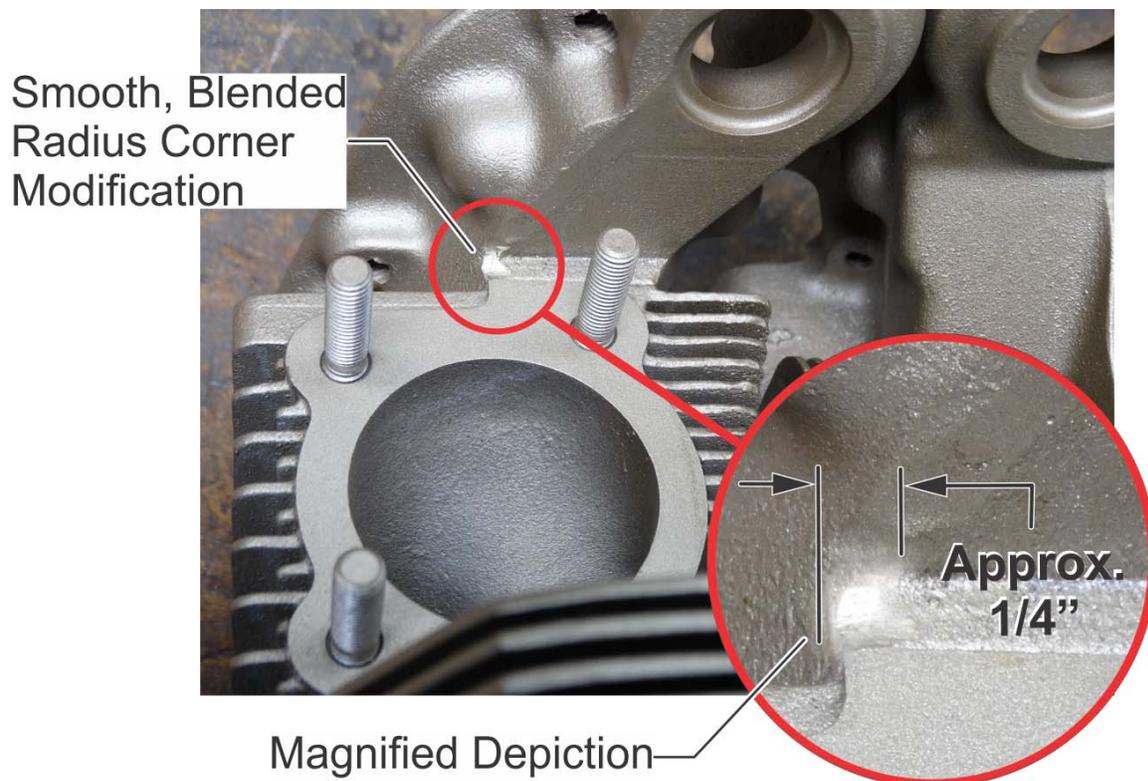


Figure 5. Smooth Radius Corner after Radius Blend Modification

2. **RC** Use an inspection mirror to visually inspect the radius corner angle below the exhaust port (see Figure 6) for any casting flash build-up or sharp radius edges. The radius corner should be tapered and blended smooth (reference Figure 5).



Figure 6. Cylinder Head Inspection Area, typical aircraft installation

3. **RC** Perform a “Non-Destructive Visual Inspection” according to the latest instructions in M-0, Standard Practice Maintenance Manual, Chapter 11, on the area surrounding the cylinder head radius corner (all possible angles). To thoroughly inspect all areas of the cylinder without disassembly, use a magnifying inspection mirror and light source or a borescope with magnification. All cracks require attention, regardless of size or location. If a fissure, crack or physical damage is identified, replace the cylinder.



Figure 7. Cylinder Head Radius Corner, side view

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

4. **RC** Remove built-up flash material using a 1/4” round (rat tail) metal file (i.e. Lima Redonda (Matco Tools Catalog No. MT2219-3) (Figure 8)), or equivalent) held at an approximate 30 degree angle (see Figure 10). The hand file is the preferred method of blending the required radius and is easier to manipulate than a power too, such as a pencil grinder, in tight spaces.



Figure 8. Round Matco Bastard File or equivalent, 1/4” diameter

- a. Carefully, sweep the file around the outside corner to obtain a smooth, blended radius edge.
- b. Remove ONLY enough material from the cylinder head to blend the radius, see Figure 5 and Figure 10. A smooth blend should remove no more than 0.20" material.



*File inserted behind exhaust valve ear, working vertical edge*



*Vertical rework area viewed from front of cylinder*



*File inserted behind intake valve ear, working horizontal edge*



*Horizontal rework area viewed from front of cylinder*



*Hand placement for working horizontal edge*

**Figure 9. Reworking Cylinder Head Corner on Aircraft**

- c. Photographs in Figure 10 are examples of the smoothing operation correctly executed. The exhaust system and the pushrod tubes are removed for clarity only. Engine disassembly is NOT required to comply with the instructions in this service document.



Figure 10. Smoothed Radius Corner after Blending

5. **RC** 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) pad. Evenly shape, taper, and smooth all interfering surfaces where material was removed (see Figure 5).



Figure 11. Deburring with Scotch-Brite™ Pad

*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. Use compressed air and a clean dry rag to remove residual material.
7. 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).
8. Metal stamp the letter "S" (1/4" stamp) on the face of the intake pushrod boss (reference Figure 4) to indicate service document compliance.
9. Create a logbook entry detailing the compliance action taken in accordance with this Service Document (MSB18-08C). 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 12).

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.).

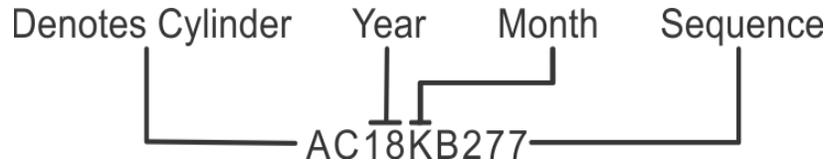


Figure 12. Cylinder Head, Serial Number Identification

#### 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](http://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 ( <u>not installed</u> in aircraft)		Labor Hours <sup>1</sup>
1	Blend radius corner and alodine affected cylinder assembly (as required, according to this Service Document MSB18-08C)	0.15 per cylinder

1. at published shop rate

Eligible Allowances for Reimbursement (installed in aircraft)		Labor Hours <sup>1</sup>
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 MSB18-08C)	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.

1.888.826.5465 Toll Free in the United States  
 +1.251.436.8299 International Callers  
 +1.305.964.0872 En Español

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U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

Aircraft Certification Service  
Compliance & Airworthiness Division

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September 22, 2020

Bryon Denton  
Continental Aerospace Technologies, Inc.  
2039 South Broad Street  
Mobile, Alabama 36615

**In Reply, Reference FAA Correspondence #: 7A0-20-12549-1**

Subject: Alternative Method of Compliance (AMOC) to Airworthiness Directive (AD) 2020-16-11

Dear Mr. Denton:

The Federal Aviation Administration (FAA) has received your proposal dated September 15, 2020, proposing an alternative method of compliance (AMOC) to paragraphs (g)(1), g(1)(i), (g)(2), (g)(2)(i), (h) and (i) of Airworthiness Directive (AD) 2020-16-11. These AD paragraphs reference Continental Aerospace Technologies, Inc. (Continental) Mandatory Service Bulletin (MSB) 18-08B and provide the required actions for the inspection and modification of the cross-flow cylinder assembly, based on engine operating hours, that must be complied with in order to correct the unsafe condition. Continental has published MSB18-08C, which revises MSB18-08B to incorporate additional photos and provide further clarification of the instructions for the required inspection and modification actions.

The Atlanta Aircraft Certification Office Branch approves your AMOC proposal for Continental MSB18-08C be used in place of MSB18-08B to satisfy the requirements of paragraphs (g)(1), g(1)(i), (g)(2), (g)(2)(i), (h) and (i) of AD 2020-16-11.

This AMOC is transferable with the aircraft to another owner/operator. Before using this AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local Flight Standards District Office/Certificate Holding District Office.

The preceding paragraph also applies to any applicable foreign-registered aircraft upon transfer of the aircraft to the U.S. registry if compliance with the AMOC has not been accomplished.

All provisions of AD 2020-16-11 that are not specifically referenced above remain fully applicable and must be complied with accordingly.

The Atlanta Aircraft Certification Office will revoke this AMOC if it is later determined that this AMOC does not provide an acceptable level of safety.

If you have any questions, or need additional information, please contact Mr. Boyce Jones, Aerospace Engineer, by telephone at 1-404-474-5535 or by e-mail at [Boyce.Jones@faa.gov](mailto:Boyce.Jones@faa.gov).

Sincerely,

(for) Christina M. Underwood, Manager  
Atlanta Aircraft Certification Office Branch