

**SERVICE INFORMATION LETTER**

**SIL012**

Contains Useful Information Pertaining to Your Aircraft Engine

**SUBJECT:** Break-in Instructions for Engine Overhaul or PMA Cylinder Replacement

**PURPOSE:** To clarify engine break-in instructions after PMA cylinder installation and engine run-in.

**COMPLIANCE:** During engine assembly, repair, overhaul, or PMA cylinder replacement.

**MODELS**

**AFFECTED:** Continental Motors, Inc., (CMI) cylinders manufactured under PMA

**I. GENERAL INFORMATION**

This Service Document provides the following information:

1. Precautions
2. Run-In vs. Break-In
3. Break-In Procedures
4. Cylinder Replacement

**II. PRECAUTIONS**

**WARNING**

**Ensure the propeller arc is clear of personnel and obstructions before starting the engine. DO NOT stand or place equipment within the arc of the propeller.**

*CAUTION: Refer to OEM Cylinder “Removal and Installation” instructions in the primary ICA for the applicable engine. Instructions in the primary ICA are applicable except for the cylinder bore, piston fit, and ring gap dimensions provided for NiC3™ cylinders listed in the latest revision of Service Information Letter, SIL001, “Replacement PMA Cylinder Assemblies for Angle Valve Cylinder Lycoming® Engines”, SIL007, “Replacement PMA Cylinder Assemblies for Parallel Valve Cylinder Lycoming® Engines”, SIL004, “Piston Ring Set Applications, Fitting Instructions and Reference”, and SIL002, “Cylinder Bore Honing Instructions”.*

*CAUTION: High power ground operation resulting in cylinder and oil temperatures exceeding normal operating limits can be detrimental to cylinders, pistons, valves, and rings.*

*CAUTION: Reference the engine manufacturer’s instructions for engine oil and fuel specifications, oil change intervals, and lubrication requirements.*

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### III. RUN-IN vs. BREAK-IN

Engine overhaul shops typically run-in all engines for a period of one to two hours prior to release for installation in the airframe. *However*, run-in was never intended to be a complete break-in. The objective of the run-in is to:

1. Verify the engine meets rated power specification
2. Correct any oil, fuel, or induction leaks
3. Check and adjust engine fuel system
4. Check and adjust engine oil pressure

**After run-in**, the engine is released to the installer who provides the airframe, baffling, fuel settings, and all aircraft interface considerations. **Break-in** is not complete until the engine oil consumption has stabilized and many hours of operation have elapsed.

### IV. BREAK-IN PROCEDURES

We recommend these procedures to break-in a new, overhauled, or repaired engine:

NOTE: The following break-in procedures apply for through-hardened steel and Nickel+Carbide™ cylinder bores.

NOTE: Use 50-weight, aviation grade mineral oil for engine break-in.

#### **(First 25 Hours, or until engine oil consumption stabilizes)**

1. Ensure all precautions contained in Section II, "PRECAUTIONS" have been observed.
2. Ensure the engine has been run-in according to the engine manufacturer's instructions with no outstanding discrepancies.
3. Follow the engine manufacturer's instructions for engine break-in listed in the primary ICA.

### V. CYLINDER REPLACEMENT

1. Cylinder repairs must be performed by personnel authorized to perform the repairs by the FAA, or equivalent airworthiness authority.
2. All replacement parts must be approved by the FAA and have traceability to their origin. Do not reuse rings removed from the piston.
3. If the removed cylinder(s) is reinstalled, determine the type of cylinder bore surface and follow the appropriate requirements described below:
  - a. Through-hardened steel cylinders - hone the cylinder barrel finish to the bore. New rings must be fitted to the pistons.
  - b. NiC3™ cylinders - hone the cylinder barrel finish to the bores using procedures contained in the latest revision of Service Document - SIL002, "*Cylinder Bore Honing Instructions.*"

#### **WARNING**

**DO NOT install chrome, chromium plated, or bimetallic faced rings, under any circumstances, in chrome (Channelchromium® or Cermichrome®) or Nickel Carbide (NiC3™) cylinder bores.**

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4. The cylinder bore and the ring materials must be compatible. Any orange paint on the outside of the cylinder is a good visual clue that the bore has been chrome plated. See the latest revision of Service Instruction SIL004, “*Piston Ring Sets Applications, Fitting Instructions and Reference.*”

5. Verify proper ring fit and gap according to the instructions in SIL004, “*Piston Ring Sets Applications, Fitting Instructions and Reference.*”

*CAUTION: Cleanliness is imperative. Debris from applying the ring finish, gapping piston rings, grinding seats, reaming guides, as well as airborne contamination, can cause severe damage to the engine.*

6. Lubricate bores, pistons, and rings with a properly formulated assembly lubricant.

7. Install cylinder(s) according to the engine manufacturer’s instructions. Always use the most current version of the referenced Lycoming® aircraft engines ICA.

*CAUTION: Do not use any oil containing anti-scuffing additives during break-in.*

*CAUTION: Do not break-in replacement cylinders with oils containing synthetic components. Synthetic oils will interfere with the ring and bore mating process which we want to occur as quickly as possible.*

8. Service the engine with new engine oil filter and 50-weight oil aviation grade mineral oil to complete break-in.

- a. Monitor oil consumption frequently during the break-in period. Service the oil level, as needed, to keep the oil level above minimum operating level.
- b. Replace the engine oil and filter at 25-Hour intervals until engine oil consumption stabilizes.

**VI. INSTRUCTIONS FOR CONTINUED AIRWORTHINESS (ICA), REFERENCES**

Table 1 is provided to serve as a reference to all service and maintenance personnel engaged in the repair and overhaul of Lycoming® aircraft engines. The documents referenced in Table 1 are subject to revision or supersedure. Always use the most current version of the referenced ICA.

**Table 1. Reference ICAs**

ICA	Lycoming® Reference ICAs <sup>1</sup>
60294-7	Lycoming® Direct Drive Engine Overhaul Manual
60294-5	Lycoming® Reduction Gear Drive Engine Overhaul Manual

1. Any copyright associated with the referenced ICAs is not connected to, affiliated with, sponsored by, or endorsed by Continental Motors or any of their related or affiliate companies.

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