

**CONTINENTAL MOTORS® AIRCRAFT ENGINE
CRITICAL SERVICE BULLETIN**
Compliance Necessary to Maintain Safety

CSB95-4A
Supersedes CSB95-4
TECHNICAL PORTIONS
FAA APPROVED

SUBJECT: INTAKE VALVE GUIDE SEAL P/N 646678 INSPECTION

PURPOSE: Continental Motors (CM) has received reports and investigated instances of intake valve guide seal damage on cylinder assemblies supplied from September 1, 1994 through April 30, 1995. This bulletin provides inspection procedures to determine if seal replacement on these cylinder assemblies is required.

COMPLIANCE: Prior to further engine operation.

1. For cylinders that have accumulated more than 50 hours of operation - accomplish the instructions set forth in section "A. INSPECTION INSTRUCTIONS".
2. For cylinders that have accumulated 50 hours of operation or less - accomplish the instructions set forth in section "B. INSPECTION INSTRUCTIONS".

**MODELS
AFFECTED:**

All IO-240, IO-360, TSIO-360 and LTSIO-360 model engines and cylinders listed below:


1. The following engines must be inspected as set forth in this service bulletin.

NEW ENGINES

MODEL	SERIAL NUMBER
IO-240-A	806055 thru 806064, 806076, 806077, 806100, 806102 thru 806106, 806109 thru 806111.
IO-360-ES	357024 thru 357029, 357035 thru 357037.
TSIO-360-FB	318019.
TSIO-360-KB	320229, 320233 thru 320235, 320239, 320242 thru 320250, 320254 thru 320268, 320273 thru 320275, 320292 thru 320295.
LTSIO-360-KB	319232, 319235 thru 319237, 319241, 319244 thru 319253, 319256 thru 319258, 319260 thru 319274, 319276, 319297 thru 319299, 319322, 319323.

REBUILT ENGINES

MODEL	SERIAL NUMBER
IO-360-A	020134-R.
IO-360-C	060635-R, 060636-R, 060638-R, 060639-R.
IO-360-CB	236518-R.
IO-360-D	062983-R thru 062990-R.
IO-360-DB	239789-R thru 239799-R.
IO-360-G	244580-R thru 244582-R.
IO-360-GB	236687-R thru 236690-R.
IO-360-H	226563-R thru 226565-R, 226567-R, 226568-R.

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REBUILT ENGINES (cont'd)

MODEL	SERIAL NUMBER
IO-360-HB	265186-R thru 265188-R.
IO-360-J	238725-R.
IO-360-K	240131-R, 240132-R, 240134-R.
IO-360-KB	288581-R thru 288584-R, 288586-R thru 288606-R, 288608-R.
TSIO-360-A	197110-R.
TSIO-360-AB	237614-R.
TSIO-360-C	283542-R, 283543-R.
TSIO-360-CB	236213-R thru 236220-R, 236222-R thru 236224-R.
TSIO-360-E	225145-R.
TSIO-360-EB	265938-R, 265942-R thru 265944-R, 265946-R thru 265975-R, 265977-R thru 265984-R, 265986-R thru 265989-R, 265991-R.
TSIO-360-F	232814-R thru 232818-R.
TSIO-360-FB	281183-R, 281190-R, 281193-R thru 281197-R, 281199-R, 299501-R thru 299523-R, 299525-R thru 299528-R, 299531-R thru 299533-R.
TSIO-360-KB	268195-R thru 268202-R, 268204-R thru 268207-R, 268209-R, 268210-R.
TSIO-360-LB	247257-R, 247259-R, 247260-R, 247262-R, 247267-R thru 247271-R, 247273-R thru 247275-R, 247277-R, 247279-R thru 247281-R.
TSIO-360-MB	279245-R thru 279247-R, 279249-R, 279250-R, 279252-R thru 279254-R.
LTSIO-360-EB	266480-R, 266482-R, 266486-R, 266487-R, 266489-R thru 266495-R, 266497-R thru 266499-R, 807251-R thru 807254-R, 807256-R thru 807280-R, 807282-R thru 807284-R.
LTSIO-360-KB	268431-R, 268433-R, 268434-R, 268436-R, 268437-R, 268440-R thru 268445-R, 268447-R, 268449-R.

2. Cylinder assembly part numbers 649484CE-A1, 649484CE-A4, 649484CE-A5, 653450A1, 653450A2, 653450A4, 653450A5, 653450A7, 653450TC-A2, 653450TC-A3, 653450TC-A5, 653451A1, 653451A2, 653451A3 and 653451TC-A3 supplied by CM from September 1, 1994 through April 30, 1995.
3. Any IO-240, IO-360, TSIO-360 and LTSIO-360 model engine, regardless of date of manufacture or total time in service, that exhibits seal material in the oil suction screen, oil screen, filter or oil sump must be inspected in accordance with the instructions set forth in section "B. INSPECTION INSTRUCTIONS".


CAUTION

Some early production cylinders contain intake valve guides that have an installed height of .885 - .905 inch above the valve spring retainer. Intake guide seals CANNOT be installed on cylinders containing these guides.

Intake guide seals can only be installed on intake guides that have a measured installed height of .695 to .715 inch above the valve spring retainer.

WARNING

FAILURE TO INSPECT FOR AND REPLACE DAMAGED INTAKE VALVE GUIDE SEALS CAN RESULT IN A PARTIAL OR TOTAL LOSS OF OIL

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PRESSURE AND SUBSEQUENT LOSS OF POWER AND/OR ENGINE FAILURE.

- A. INSPECTION INSTRUCTIONS (Cylinders that have accumulated more than 50-hours of operation)

WARNING

MAKE CERTAIN THAT THE AIRCRAFT MASTER AND MAGNETO SWITCH IS IN THE "OFF" POSITION AND THE MAGNETOS ARE GROUNDED PRIOR TO ACCOMPLISHING THE FOLLOWING INSTRUCTIONS.

1. Remove aircraft cowling, baffling and components in accordance with the airframe manufacturer's instructions to facilitate the removal of the oil suction screen and oil screen or filter.
2. Drain oil into a clean container and strain oil through a suitable filter and inspect for contamination. Remove the oil suction screen located on the lower left portion of the accessory case and the oil screen or filter located on the lower right portion of the accessory case. Inspect screens and filters for intake valve guide seal material. This would be evident by the existence of dark green rubber and/or small coil spring material.

WARNING


THE PRESENCE OF ANY MATERIAL OTHER THAN NORMAL AMOUNTS OF COMBUSTION BY-PRODUCTS AND WEAR MATERIALS REQUIRES INVESTIGATION TO DETERMINE ITS ORIGIN. ACCOMPLISH ANY NECESSARY REPAIRS PRIOR TO FURTHER ENGINE OPERATION.

3. If no material is present, clean and install oil suction screen and oil screen. Install new oil filter where used. Torque oil suction screen to 200-210 inch pounds. Torque the oil screen to 500-520 inch pounds. Torque oil filter to 192-216 inch pounds. Install oil drain plug and torque to 190-210 inch pounds. Safety wire oil suction screen, oil screen or filter and oil drain plug using approved methods as indicated in the latest revision of M-0, Standard Practice Maintenance Manual. Replenish engine oil with the appropriate grade and quantity. No further action is required.
 4. If seal material is present, proceed to section "C. SEAL REMOVAL AND INSTALLATION INSTRUCTIONS".
- B. INSPECTION INSTRUCTIONS (Cylinders that have accumulated 50-hours of operation or less)

WARNING

MAKE CERTAIN THAT THE AIRCRAFT MASTER AND MAGNETO SWITCH IS IN THE "OFF" POSITION AND THE MAGNETOS ARE GROUNDED PRIOR TO ACCOMPLISHING THE FOLLOWING INSTRUCTIONS.

1. Remove aircraft cowling, baffling and components in accordance with the airframe manufacturer's instructions to facilitate the removal of the intake rocker cover. Remove the top spark plug leads and spark plugs.
2. Remove intake rocker cover and gasket. Discard gasket. Rotate the propeller until the intake valve is on its seat. Disengage tab washers and remove rocker shaft nuts, tab

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washers and retainers. Discard tab washers. Remove intake rocker arm, thrust washer and shaft assembly.

3. Proceed to section "C" and accomplish steps 4 and 5 only.
4. Inspect the intake valve guide seal for damage to the seal lip and/or missing spring. Figure 1 shows an intact and properly seated intake guide seal. Repeat inspection on all cylinders.
5. If seal springs are intact and the seals do not exhibit any damage, make certain that the seal is completely seated on the valve guide by tapping the seal using a plastic mallet and installation tool. Figure 2 provides proper dimensions to produce an installation tool. Proceed to section "C", step 7 and reinstall the intake parts as instructed.
6. If seal springs are not intact or the seal is damaged, remove and inspect the oil suction screen and oil screen or oil filter. Drain engine oil. Proceed to section "C" and accomplish steps 6, 7, 8, 9 and 10.


C. SEAL REMOVAL AND INSTALLATION INSTRUCTIONS

1. Remove aircraft cowling, baffling and components in accordance with the airframe manufacturer's instructions to facilitate the removal of the intake rocker covers. Remove the top spark plug leads and spark plugs.
2. Remove intake rocker cover and gasket. Discard gasket. Rotate the propeller until the intake valve is on its seat.
3. Disengage tab washers and remove rocker shaft nuts, tab washers and retainers. Discard tab washers. Remove intake rocker arm, thrust washer and shaft assembly.

WARNING

USE EXTREME CAUTION IN THE AREA OF THE PROPELLER WHILE PERFORMING THE FOLLOWING STEP. VERIFY THAT THE PISTON IS POSITIONED AT THE BOTTOM OF THE INTAKE STROKE PRIOR TO CONNECTING AIR PRESSURE SOURCE.

4. Rotate propeller until the piston is at the bottom of the intake stroke. Install deferential compression tester adapter in the top spark plug location. Connect a regulated air pressure source to the adapter and apply 80 to 100 PSI.
5. Install valve spring compressor (Kent Moore (Borroughs) P/N 3602 or equivalent) on the cylinder with rocker shaft P/N 648002 and nuts P/N 646605. Compress the valve springs and remove the valve keepers with a magnet. Slowly relieve spring compression and remove roto coil, inner and outer valve springs and spring compressor.
6. Remove the seal from the guide and valve stem. Coat new seal P/N 646678 and intake valve guide with clean 50 weight aircraft engine oil. Install seal over valve stem and into position on the valve guide by hand. Using the installation tool and a plastic mallet, see Figure 2, tap the seal onto the guide until seal is completely seated. Make certain that the seal is firmly seated on the guide. See Figure 1.
7. Install valve spring compressor on rocker shaft. Install inner P/N 625957 and outer P/N 625958 valve springs with coils in opposite directions into position in the valve spring


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retainer P/N 24026. Install roto coil P/N 631654 on valve springs and compress only deep enough to allow the installation of the valve keepers. Install two valve keepers P/N 627731 into position between the roto coil and valve stem and slowly relieve spring compression. Remove spring compressor, nuts and rocker shaft. Disconnect air source and remove adapter from spark plug port.

8. Install intake rocker arm assembly P/N 639648, thrust washers P/N 653189 and retainers P/N 631996 onto rocker shaft P/N 648002 and position the assembly on the intake studs. Install new tab washers P/N 501867 and nuts P/N 646605. Turn propeller to position the piston at the top of the compression stroke. Torque nuts to 110-120 inch pounds. Bend washer tabs into position against nut flats. Install rocker cover with new gasket P/N 653195 and torque attaching hardware beginning with the two lower screws first to 55-65 inch pounds. Repeat the previous steps (2, 3, 4, 5, 6, 7 and 8) on each cylinder.
9. Install oil suction screen, oil screen or oil filter, oil drain plug and replenish oil as indicated in section "A", step 3. Install spark plugs and torque to 300-360 inch pounds. Install spark plug leads and torque 5/8-24 leads to 90-95 inch pounds and 3/4-20 leads to 110-120 inch pounds. Reinstall baffling and components that were removed in accordance with the airframe manufacturer's instructions.
10. Make a log book entry as to compliance with this service bulletin.

WARRANTY

CM will reimburse the cost of the parts and labor to perform the inspection and (if necessary) the replacement of intake guide seals through December 15, 1995. After this date warranty coverage will be subject to the terms and conditions of the Gold Medallion Warranty Policy. Warranty claims must be filed with an authorized CM Distributor.

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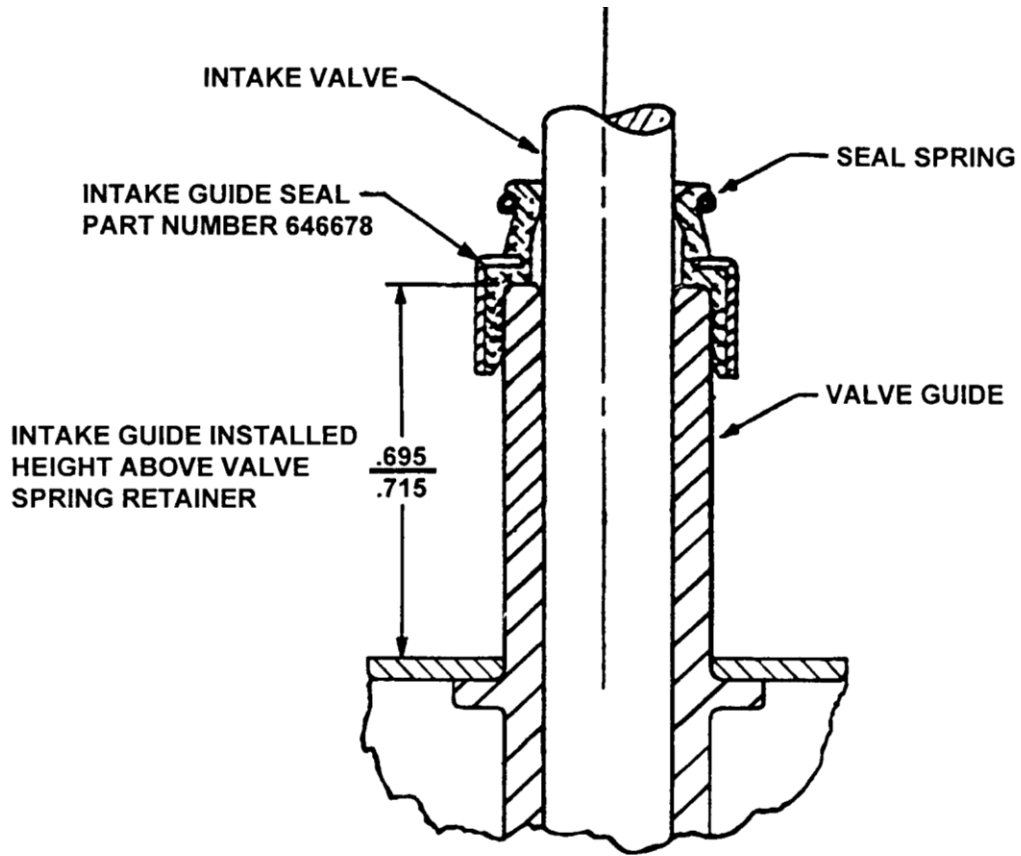


FIGURE 1.

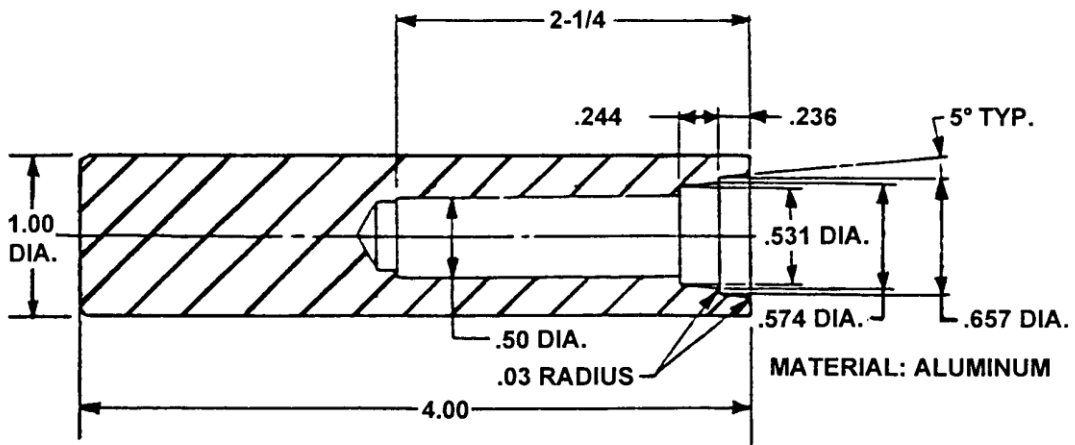



FIGURE 2. INTAKE GUIDE SEAL INSTALLATION TOOL

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