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VENDOR SERVICE PUBLICATION

TO: All Piper Distributors, Service Distributors, Factory Direct Dealers and Piper Field Service Facilities.

SUBJECT: Teledyne Continental Motors Service Bulletin No. M87-20

PURPOSE: To distribute the attached Teledyne Continental Motors Service Bulletin No. M87-20 to all Piper Distributors, Service Distributors, Factory Direct Dealers and Piper Field Service Facilities.

The attached Teledyne Continental Motors Publication may affect Teledyne Continental Motors equipment installed in Piper airplanes. Refer to the publication for specific details.



service bulletin

M87-20
Supersedes M86-8 Rev. 1

Technical Portions Are
FAA Approved

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SUBJECT: ENGINE OPERATION AFTER CYLINDER REPLACEMENT AND/OR MAJOR OVERHAUL

MODELS

AFFECTED: All Models (Steel, Nitrided or Chrome Cylinders)

Proper operation of the engine following cylinder replacement or major overhaul is extremely important. The following procedures should be followed to insure that adequate lubrication is being provided to newly installed components and that the piston ring seating will occur as soon as possible.

I. Operation After Major Overhaul Utilizing an Engine Test Cell

A. Servicing and Pre-starting Procedures

1. Service the lubricating system with mineral oil (MIL-C-6529 Type II.) of the appropriate grade depending on ambient temperature.
2. Rotate the propeller by hand through several cycles with the spark plugs removed.
3. Pre-oil the lubrication system using an external pre-oiling pressure system.
4. Install the spark plugs and ignition harness.

B. Test Cell Operational Procedures

1. Consult the applicable TCM Overhaul Manual and follow the recommended test cell operational procedures listed.

II. Operation After Major Overhaul or Cylinder Replacement with Engine Installed in the Aircraft.

A. The aircraft can be considered a suitable test stand for running-in overhauled engines contingent on the following conditions:

1. Install engine cowling.
2. Each cylinder must be equipped with a temperature sensing device to monitor the head temperature.
3. The flight propeller may be used contingent on careful observation of cylinder temperatures. Head the aircraft into the wind for this test.
4. Calibration of the aircraft engine instruments must be performed when the aircraft is to be used in lieu of an engine test cell.

(Continued)

B. Service and pre-starting procedures

1. Service the lubricating system with mineral oil (MIL-C-6529 Type II) of the appropriate grade depending on ambient temperature.
2. Rotate the propeller by hand through several cycles with the spark plugs removed.
3. Pre-oil the lubrication system using an external pre-oiling pressure system. NOTE: Pre-oil is not required for cylinder replacement.
4. Install the spark plugs and ignition harness.

C. Engine Starting and Ground Operation

1. Assure that all engine and cylinder baffling is properly installed and in good condition.
2. Start the engine and assure that oil pressure rises to within the specified limits within 30 seconds.
3. Operate the engine at 750 RPM for one minute, gradually increasing toward 1000 RPM in three minutes. Check the magneto circuit for grounding prior to a normal shut-down. Allow the engine to cool adequately and then make a visual inspection for any irregularities.
4. Start the engine again and operate it at 750 RPM gradually increasing to 1500 RPM over a period of four minutes. If the engine is equipped with a controllable pitch propeller, cycle the propeller allowing only a 100 RPM drop. Return to the idle range and make adjustments to the idle mixture and RPM as required on carburetor engines and to the low unmetered fuel pressure, idle RPM and mixture on fuel injected engines. Position the throttle to 1200 RPM to smooth the engine. Then do an idle mixture check. Refer to the appropriate service information for these fuel system adjustments. Run engine up to full power for a period not to exceed 10 seconds. Visually inspect and correct any discrepancies. Check the oil quantity. Cowl the engine in preparation for test flight.

D. Test Flight

1. Ambient air and engine operating temperatures are of major concern during this test flight. Do a normal pre-flight run-up in accordance with the aircraft flight manual. Conduct a normal take-off with full power and monitor the fuel flow, RPM, oil pressure, cylinder head temperatures and oil temperatures. Reduce to climb power in accordance with the flight manual and maintain a shallow climb attitude to gain optimum airspeed and cooling. Rich mixture for all operations except lean for field elevation where applicable and lean to maintain smoothness during climb in accordance with airframe manufacturer's operating instructions.
2. Level flight cruise should be at 75% power with best power or richer mixture for the first hour of operation. The second hour power settings should alternate between 65% and 75% power with the appropriate best power mixture settings. Engine controls or aircraft attitude should be adjusted as required to maintain engine instrumentation within specifications.
3. The descent should be made at low cruise power settings, with careful monitoring of engine pressures and temperatures. Avoid long descents with cruise RPM and manifold pressure below 18" hg.; if necessary decrease the RPM sufficiently to maintain manifold pressure.
4. Any discrepancies detected during test flight or any final adjustments necessary should now be made. The engine can be operated in normal service in accordance with the aircraft flight manual.