TEXTRON Lycoming

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SERVICE INSTRUCTION

DATE: April 18, 1997

Service Instruction No. 1241C
(Supersedes Service Instruction No. 1241B)
Engineering Aspects are
FAA Approved

SUBJECT: Pre-Oiling Engines Prior to Initial Start

MODELS AFFECTED: All Textron Lycoming engines.

TIME OF COMPLIANCE: Prior to initial start after engine change, overhaul, oil cooler replacement or draining or any prolonged period of inactivity.

To avoid possible high speed bearing failure resulting from lack of lubrication during initial starts all aircraft engines should be pre-oiled prior to first start. Engines need not be pre-oiled after an oil change or whenever the oil lines have been disconnected. However, on dry sump engines after an oil change or whenever the oil lines have been disconnected it will be necessary to disconnect the oil inlet connection at the oil pump and drain a sufficient amount of oil from the tank to be certain there are no obstructions or air in the inlet line to the oil pump. The following procedure is intended to apply to wet sump and dry sump engines.

1. Fill the oil tank or sump to the proper level. In all turbocharged engines use only ashless dispersant oil conforming to specification MIL-L-22851 or SAEJ1899.

2. External oil tanks and turbocharged engines.

   (a) On engines with external oil tanks, disconnect the oil inlet connection at the oil pump and drain a sufficient amount of oil to eliminate any possible obstructions or air in the inlet passage. Reinstall oil inlet connections to the oil pump.

   (b) On turbocharged engines, disconnect the inlet lines at the turbocharger and the front lines to the exhaust valve guide oiler, if applicable. Also disconnect the engine air duct from the compressor housing inlet. Fill the turbocharger oil inlet port with clean engine oil and manually turn the compressor wheel several revolutions in both directions to coat all journal and bearing surfaces with oil. Reconnect the air duct.

3. For wet sump engines, except TIO-541-E series, fill the cooler with oil.

4. Remove one spark plug from each cylinder of the engine.

5. Place the mixture control in idle cut-off and the fuel selector or shut off in the "off" position. If the engine is not equipped with idle cut-off, open throttle to full open position and put fuel and ignition switches in "off" position.

6. Turn engine with starter (or external power source, if available) until oil is visible at the end of the oil lines disconnected in steps 2 and 3. Reconnect the oil lines. Turn engine with starter (or external power source, if available) until a minimum pressure of 20 lbs. is indicated on the oil pressure gage.

NOTE

If oil pressure is not attained after cranking for 10-15 seconds, allow starter to cool.

7. Energize starter for 2 or more 10-15 seconds periods.

CAUTION

DO NOT ENERGIZE STARTER FOR PERIODS OF OVER 10–15 SECONDS. ALLOW TO COOL AFTER EACH ENERGIZING.

Lack of pressure build–up or rapid drop–off of pressure is an indication of the presence of air in the line and the engine is not being pre–oiled. To remedy this, repeat steps 2 and 3 and continue until oil pressure is indicated.

8. The line disconnected in step 2 may be reconnected after the oil pressure is attained and the oil is flowing from the disconnected lines.

9. Turn the engine with the starter for approximately 10 seconds to check for continued oil pressure.

10. Reinstall spark plugs and proceed with normal starting procedure which should not be later than three hours after pre–oiling.

11. When engine is started it should be run for about three minutes at approximately 1000 RPM for fixed wing applications, and idle RPM on helicopters before increasing power for other ground operations or take–off power.

CAUTION

ON TURBOCHARGED ENGINES MAINTAIN LOW SPEED OPERATION UNTIL PRESSURE HAS STABILIZED. OVERBOOST CAN OCCUR IF ABNORMAL OIL PRESSURES ARE PRESENT IN THE TURBOCHARGER CONTROL SYSTEM; DUE TO OIL BELOW MINIMUM OPERATION TEMPERATURE.

APPROVED TURBO COMPONENTS, INC.

400 SERIES TURBOCHARGERS
INSTALLATION INSTRUCTIONS

CAUTION: Failure to follow these instructions can result in premature turbocharger failure and warranty denial.

I. GENERAL

A. When installing a replacement turbocharger, be careful there is no foreign material in the air cleaner and the ducting to the compressor inlet or in the exhaust manifold. Even small or soft objects will cause extensive damage to the turbocharger wheels.

B. Take care to avoid getting dirt or debris into the turbocharger openings.

C. New and replacement turbochargers may have bolts missing or deliberately left loose to facilitate installation. (A bolt kit may be required. See airframe and/or Engine Manufacturer's Pertinent Overhaul Manual for specific instructions.) If the turbocharger bolts are all tight, all lock tabs bent up and compressor and turbine housings are correctly aligned proceed to Step IV. Otherwise, proceed to Step II.

II. REALIGNMENT OF END HOUSINGS

A. Loosen the compressor (aluminum) and turbine housing (cast iron) bolts and/or V-band nut(s) the minimum required permit the housings to rotate on the center housing. Excessive loosening of the housings will allow contact and possible wheel damage. Bolts should not have to be loosened more that 1 1/2 turns.

B. Temporarily secure the turbocharger to the engine exhaust manifold outlet flange with two bolts.

C. Rotate the center housing so that the oil inlet and outlet pads will mate with the engine lines. The oil outlet (largest hole) must be at the bottom with the center line of the hole not more than 35° from vertical. Snugly tighten at least two bolts or the V-band, as applicable, to lock the center housing to the turbine housing.

D. Rotate the compressor housing until it lines up with the intake manifold or intercooler ducting. Snugly tighten at least two bolts or V-band to lock the housing in place.

E. Remove turbocharger from engine and tighten all bolts and/or V-band nuts. Tighten bolts alternately from side to side to prevent cocking of the housings. Turn V-band nuts slowly as the torque setting is neared, tapping band slightly with a soft mallet, to allow the band to fully set. Refer to torque values specified in the applicable Manual.

III. BEND LOCKTABS

Bend lockplate tabs up against a flat on each bolt head (if not already bent) on bolted housing models. Bend in a direction which will tend to tighten not loosen the bolt. V-band nuts are self-locking.

IV. INSTALLATION AND PRE-OILING OF TURBOCHARGERS

A. Remove old gasket from exhaust manifold mounting flange, inspect flange for erosion and flatness and install a new gasket, if used.

B. Inspect oil drain and supply lines for kinking, clogging, restrictions and other signs of deterioration.

C. Install turbocharger on engine using all new gaskets and "O" rings (when needed). but do not connect the compressor inlet and oil supply line. Tighten the nuts or bolts attaching the turbocharger to the exhaust manifold to the torque valves given in the shop manual. Use of a high temperature lubricant on these threads is recommended.

D. Fill the oil inlet hole with clean engine oil and spin the compressor wheel several times to coat the bearings with oil. Refill the oil inlet hole and connect the oil supply line.

E. If the compressor wheel cannot be freely spun by hand or if there is any indication of rubbing or scaping, determine the reason before starting the engine. One cause of wheel rubbing is a cocked compressor or turbine housing. TO4 and TO4B turbochargers may have a slight drag before running in, which is a normal condition. Connect the pipe or hose from the outlet of the air filter to the compressor inlet.

F. Check lubricant level in engine crankcase.

G. Prime the oil filter if it was changed.

V. START ENGINE

A. Before attempting to start the engine, crank the engine with the fuel off for 10 to 15 seconds or until the instruments show an oil pressure buildup.

B. Start the engine and allow it to run at idle speed for 3 to 4 minutes before accelerating.

C. Check for oil leaks.

VI. OPERATIONAL TEST

A. Perform per Kelly Aerospace Service Bulletin No. 23.