



FIXED WING BREAK-IN

Tips

A. PREPARATION FOR TEST WITH ENGINE INSTALLED IN AIRCRAFT

NOTE – Refer to the latest revision of Lycoming Service Instruction No. 1014 for the recommended oil to be used for engine break-in on Lycoming engine models. In most cases, turbocharged engines are to use ashless dispersant oil for break-in. Non-turbocharged engines are to use aviation grade mineral oil for break-in. Follow Service Instruction No. 1014 to use the correct oil for break-in.

Do the engine pre-oil in accordance with latest revision of Lycoming Service Instruction No. 1241.

Calibrate the cylinder head temperature gage, oil temperature gage, oil pressure gage, manifold pressure gage, and tachometer before the ground operational test.

Install all airframe baffles and cowling.

For optimum cooling during the ground operational test, use a test club. If the test club is not available, use the regular flight propeller, however, monitor the cylinder head temperature closely

CAUTION – Make sure that all vent and breather lines are installed correctly and are securely in place in accordance with the airframe maintenance manual.

B. GROUND TEST

NOTE – Before the ground operational test, the oil cooler system must not have any air locks.

NOTE – If any malfunction occurs, stop the engine and let it cool. Identify and correct the cause before continuation of the ground operational test.

If the engine had failed before overhaul, it is possible that the oil cooler, propeller and governor could have been contaminated. During overhaul, these parts were either to be replaced or cleaned and examined by an approved repair facility.

Before the start of the ground operational test, examine the oil cooler, propeller, and governor for metal contamination. These parts must be clean and free of contamination before the ground operational test can begin.

Put the aircraft in a position facing the wind.

Start the engine, and look at the oil pressure gage. If sufficient oil pressure indication is not shown within 30 seconds, stop the engine. Identify and correct the cause.

If oil pressure is sufficient, operate the engine at 1000 RPM until the oil temperature is stable or is at 140°F (60° C). After warm-up, the oil pressure is not to be less than the minimum specified pressure in the applicable Lycoming Operator's Manual.

Increase the engine speed to 1500 RPM and operate at that speed for 15 minutes.

Make sure the cylinder head temperature, oil temperature and oil pressure is within the specified limits in the Lycoming Operator's Manual.

- a. Start the engine again and monitor oil pressure
- b. Increase engine speed to 1500 RPM for 5 minutes

If the engine has magnetos, measure the magneto drop-off as described in the latest revision of Lycoming Service Instruction No. 1132.

Do a cycle of the propeller pitch and a feathering check as applicable as per the airframe manufacturer's recommendations.

Operate the engine to a full-static aircraft recommended power for up to 10 seconds. After the engine operates at full power, slowly decrease the RPM to idle and let the engine stabilize.

Do a check of the idle mixture adjustment before engine shutdown

Examine the engine for oil, fuel, and hydraulic fluid leaks. Identify and correct the cause of any leaks.

Remove the oil suction screen and the oil pressure screen or oil filter to look for any blockage or contamination. If no blockage or contamination is found, a flight test can be done. If blockage or contamination is found, change the oil. Remove the blockage and contamination. Refer to the latest revision of Service Bulletin No. 480 for instructions

NOTE – Extended ground operation can cause excessively high cylinder and/or oil temperatures.

C. FLIGHT TEST

WARNING – Replace engine test clubs with approved flight propellers before the flight test.

Start the engine, and do a preflight run-up in accordance with the applicable manufacturer's Pilot's Operator's Handbook (POH).

Do a full power take-off in accordance with the POH.

Monitor engine RPM, fuel flow, oil pressure, oil temperature and cylinder head temperature during takeoff.

As soon as possible, decrease the engine speed to climb power in accordance with the POH.

Do a shallow climb angle to a suitable cruise altitude.

Adjust the mixture per the POH.

At cruise altitude, decrease power to approximately 75% and continue flight for 2 hours. For the second hour, do power settings alternating between 65% and 75% power as per the applicable POH.

NOTE – For correct piston ring seating, in a top overhauled engine or a newly overhauled engine, operate the aircraft at 65% to 75% cruise power until oil consumption is stable. For a normally aspirated (non-turbocharged) engine, it will be necessary to operate at cruise power at the lower altitudes. Density altitude in excess of 8,000 feet (2438 m) will prevent the engine from reaching sufficient cruise power for an acceptable break-in; 5,000 feet (1524 m) is recommended.

If oil consumption is not stable, look for oil leaks. Identify and correct the cause of the leak(s).

If the engine and aircraft are operating to correct specifications per the Lycoming Operator's Manual, increase engine power to the maximum airframer recommendations and hold for 30 minutes.

CAUTION – For engines that have dynamic counterweight assemblies, do not operate at low manifold pressure during high engine speeds under 15 in. HG and rapid changes in engine speeds. These conditions can cause damage to the counterweights, rollers or bushings, and cause detuning.

Decrease altitude at low cruise power and closely monitor the engine instruments. Do not do long descents at low manifold pressure. Do not decrease altitude too rapidly. The engine temperature could decrease too quickly.

CAUTION – Do not do closed throttle descents. Closed throttle operation during descents will cause ring flutter which can cause damage to the cylinders and rings.

After landing and shutdown, examine the engine for oil, fuel, and hydraulic fluid leaks. Identify and correct the cause of any leaks.

Calculate fuel and oil consumption and compare the limits given in the applicable Lycoming Operator's Manual. If the oil consumption value is above the limits in the manual, identify and correct the cause. Do this flight test again, up to and including this step before releasing the aircraft for service.

Remove the oil suction screen and the oil pressure screen or oil filter to look for any blockage or contamination. If no blockage or contamination is found, a flight test can be

done. If blockage or contamination is found, change the oil. Remove the blockage and contamination. Refer to the latest revision of Service Bulletin No. 480 for instructions. Record compliance with the Service Instruction in the logbook. Correct any problems before releasing the engine back into service.

Product Support Network

Wherever you are in the world, you have access to exceptional expertise and knowledge about Lycoming engines. Get the most comprehensive customer service and support in the general aviation industry.

[LEARN MORE](#)

RELATED PUBLICATION

Service Instruction No. 1014

For more information on correct engine break-in, please refer to these service instructions.

[VIEW PUBLICATION](#)