

7-2.4. Flight Check and Break-In

New and factory rebuilt Continental engines are adjusted to meet engine specifications in a test cell prior to shipment. A flight check ensures the engine meets operational specifications after installation in the airframe and prior to release for normal service.

Perform an “Engine Operational Check” according to instructions in Section 6-4.7 and a normal preflight, engine start and ground run-up in accordance with the Airplane Flight Manual or Pilot's Operating Handbook (AFM/POH) ***before*** the A&P mechanic can approve the airplane for a Flight Check.

A flight check is required for engines with a standard fuel pump if rated, full power RPM cannot be verified during a ground run-up according to instructions in Section 7-2.4.2 after engine installation, inspection, fuel system repairs, or adjustments. Additionally, engines with an altitude compensating fuel pump require a “Flight Check” according to instructions in Section 7-2.4.2 after a significant change in geographic location from the last operational check (or if the auto-leaning function is suspect) and at twelve month intervals, in conjunction with the Annual/100-hour inspection.

Follow the protocol in Section 7-2.4.1 to complete the recommended break-in period.

7-2.4.1. Engine Break-In

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

The recommended break-in period for Continental engines is 25 hours. Adhere to the following instructions and the Engine Specifications and Operating Limits in the primary Instructions for Continued Airworthiness (Section 1-1.1) applicable to the engine model.

NOTE: Keep flying weight to a minimum to reduce power requirements.

1. For the initial flight after release to service, fast idle (850-1,000 RPM) engine for 3-4 minutes. Shut down and inspect for oil leaks. During ground runs, do not permit cylinder head temperatures to exceed 400°F or oil temperature to exceed 200°F.
2. Conduct a normal engine start, ground run-up and take-off according to the AFM/POH (minimize ground time).
3. Monitor a) engine RPM, b) fuel flow and pressure (if equipped), c) oil pressure and temperature, d) cylinder head temperature (if equipped), e) exhaust gas temperature (if equipped), and f) turbine inlet temperature (if equipped) to verify the engine is operating within the parameters specified in the primary Instructions for Continued Airworthiness (Section 1-1.1).
4. Reduce the engine speed to climb power according to the AFM/POH instructions. Maintain a shallow climb attitude to achieve optimum airspeed and cooling airflow.
5. At cruise altitude:
 - a. Maintain level flight cruise at 75% power with best power or richer mixture for the first hour of operation.
 - b. For the second and subsequent hours of flight, alternate cruise power settings between 65% and 75% power with appropriate best power mixture settings.

NOTE: Best power mixture setting is 100°-150°F (38°-66°C) rich of peak exhaust gas temperature. Adjust engine controls or aircraft attitude to ensure engine instrumentation operates within specifications.

WARNING

Avoid long descents at high engine RPM to prevent undesirable engine cooling. If power must be reduced for long periods, adjust the propeller to minimum governing RPM to obtain desired performance levels. If outside air temperature is extremely cold, it may be desirable to increase drag to maintain engine power without gaining excess airspeed. Do not permit cylinder head temperature to drop below 300°F (149°C).

6. Descend at low cruise power settings. Avoid long descents or descents at cruise power RPM with manifold pressure below 18 in. Hg. If necessary, reduce engine RPM to the lower limit of the specified operating range to maintain sufficient manifold pressure. Carefully monitor engine instrumentation to maintain levels above the minimum specified cylinder head temperature and oil temperature.
7. Correct any discrepancies prior to releasing the aircraft for service.

7-2.4.2. Flight Check

Flight check instructions vary, depending on fuel system configuration, naturally aspirated engines with a carburetor:

- For Continental continuous flow fuel injection systems ***without*** altitude compensating fuel pump, or turbocharged engines regardless of fuel system configuration, follow the Standard Flight Check Instructions in Section 7-2.4.2.1.
- For naturally aspirated engines with Continental continuous flow fuel injection systems ***with*** an altitude compensating fuel pump, follow the Flight Check instructions in Section 7-2.4.2.2.
- For FADEC equipped engines, refer to the flight check in the primary ICA.

7-2.4.2.1. Standard Flight Check Instructions

NOTE: The accuracy of tachometer and fuel flow indicating device (if equipped) is critical to the outcome of the flight check. Verify tachometer and flow meter accuracy according to the aircraft manufacturer's instructions prior to performing the flight check.

1. Conduct a normal engine start, ground run-up and take-off according to the AFM/POH.
2. Monitor a) engine RPM, b) fuel flow and pressure (if equipped), c) oil pressure and temperature, d) cylinder head temperature (if equipped), e) exhaust gas temperature (if equipped), and f) turbine inlet temperature (if equipped) to verify the engine is operating within the parameters specified in the AFM/POH.
3. If the engine fails to reach the rated, full throttle RPM during ground operations, ascend to cruise altitude (>2000 feet above field elevation) and verify the engine achieves full throttle, full rich rated RPM at cruise altitude and operates within the