OPERATING RECOMMENDATIONS

FOR

TEO-540-C1A ENGINE
IN
TECNAM P2012 TRAVELLER

SSP-124. (03/2024)

Operating Recommendations for TEO-540-C1A Engine in Tecnam P2012 Traveller

Lycoming Part Number: SSP-124

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OPERATING RECOMMENDATIONS
TEO-540-C1A ENGINE

Introduction

The following has been prepared to provide new or current owners of the TECNAM P2012 Traveller with some additional operating recommendations direct from the engine manufacturer, Lycoming Engines. These recommendations do not change the basic specifications or limits in the Aircraft Flight Manual (AFM) or Engine Installation and Operations Manual (IOM). They are intended as a supplement to give owners recommended operating guidelines to obtain good aircraft and engine performance while maintaining a good service experience with the engine. Included with this information package are factory recommendations and tips toward improving the service life of your engine.

The Lycoming TEO-540-C1A Engine is a direct-drive six-cylinder, horizontally opposed, turbocharged, electronically controlled engine. It has electronic fuel injection, electronic ignition, and down exhaust. As standard equipment, this engine has an automotive type starter, an alternator, and two standard AN type accessory drives. The engine has an Electronic Engine Control System (EECS). The EECS continuously monitors and automatically adjusts operating conditions such as ignition timing, fuel injection timing, and fuel mixture. The EECS eliminates the need for magnetos and manual fuel/air mixture control.

Break-In

Operation of the TEO-540-C1A engine must be done with Ashless Dispersant aviation oil only. Recommendations for lubricating oil grade are found in the most current revision of Lycoming Service Instruction 1014. Additional details on break in can be found in the most current revision of Lycoming Service Instruction 1427. Recommendations for cylinder and engine replacements are below.

For field replacement cylinders only:

1. Start the engine and perform a normal preflight run-up in accordance with the Operator's Manual.
2. Take-off at airframe recommended take-off power, while monitoring RPM, fuel flow, oil pressure, oil temperature and cylinder head temperatures.
3. As soon as possible, reduce to climb power specified in the Operator's Manual. Assume a shallow climb angle to a suitable cruise altitude.
4. After establishing cruise altitude and power setting, set an RPM of 2200, modify power lever to attain a displayed power of 70% and continue flight for 2 hours. For the second hour, maintain RPM of 2200 and alternate power lever to attain displayed power between 60% and 70% power per the Operator's Manual.
5. Establishing an RPM of 2575, increase engine power to 93 % indicated taking care not to exceed airframe airspeed limits. Maintain for 30 minutes, provided engine and aircraft are performing within operating specifications.
6. Descend at low cruise power while closely monitoring the engine instruments. Avoid long descents at low manifold pressure. Do not reduce altitude too rapidly or the engine temperature may drop too quickly.
7. After landing and shutdown, check for leaks at fuel and oil fittings and at engine accessory parting surfaces. Compute fuel and oil consumption and compare to the limits found in the Operator's Manual. If the consumption exceeds the figures shown in the manual, determine the cause before releasing the aircraft for service.
8. For the following 50 hours of engine operation or until oil consumption has stabilized, fly the aircraft at cruise settings of 60% to 70% power. Avoid long periods of operation at low power (less than 60%) or prolonged idle. This will ensure that the piston rings expand sufficiently to seat with the cylinder walls during the engine break-in period. The seating of the ring with the cylinder wall will only occur when pressures inside the cylinder are great enough to cause expansion of the piston rings. Pressures in the cylinder only become great enough for break-in when power settings above 60% are used.

For all engine replacements:

1. Fly the aircraft at cruise settings of 60% to 70% power for the first 50 hours of engine operation or until oil consumption has stabilized. Avoid long periods of operation at low power (less than 60%) or prolonged idle. This will ensure that the piston rings expand sufficiently to seat with the cylinder walls during the engine break-in period. The seating of the ring with the cylinder wall will only occur when pressures inside the cylinder are great enough to cause expansion of the piston rings. Pressures in the cylinder only become great enough for break-in when power settings above 60% are used.

Normal Operation

Take-off

The engine power setting for take-off is 2575 RPM, Full Throttle. Monitor the manifold pressure redline on take-off. It is not unusual to experience an over-boost of up to 2 in. MAP with cold oil or on the first take-off of the day. It is recommended to take-off with an oil temperature of 160 ° F or greater. Maintain take-off power until clear of obstacles then set 2400 RPM, and then modify throttle to attain 75% power. Cylinder head temperatures are recommended not to exceed 475°F in climb. For optimum service life, maintain climb cylinder head temperatures below 435°F.

Cruise Settings

Higher operating temperatures and pressures generally increase the wear rate of critical engine parts. Aircraft engines have operating limitations, termed “redlines”, that represent the maximum allowable value for a given parameter. The engine is certified to perform safely at these redline conditions. However, Operating consistently at the maximum allowable engine parameters does not promote optimum service life. There are balances between aircraft and engine performance.

Lycoming recommends that a cruise setting of 60% power be used for typical flight profiles at 2200 RPM. No matter what power setting is used, cylinder head temperatures are recommended not to exceed 435°F in level cruise flight. For optimum service life, maintain cruise cylinder head temperatures below 400°F.

Descent

Plan ahead to make a smooth cylinder head temperature transition between cruise and descent. Start descent early and allow airspeed to increase within aircraft limits, initiating a gradual cooldown. Maintain a minimum 20 inHg of Manifold Pressure during decent. Cylinder head temperature change rate is not to exceed 50°F per minute to avoid rapid shock cooling. Before engine shutdown, operate the engine with throttle at idle stop and with TIT below 1000°F for at least 5 minutes to allow for the turbocharger to cool down.

Cold Weather Operation Tips

- In extremely cold weather (20˚F and colder), engine and/or oil preheating should be utilized to minimize accelerated cold wear rates during the engine warm-up period.
- Avoid rapid acceleration after any cold start-up and make every effort to maintain a constant speed of about 1000 RPM for several minutes during the initial warm-up period.
- Take-off with oil temperatures greater than 160°F to ensure engine oil pressure remains within operation limits during takeoff.
- See the latest revision of Service Instruction No 1585 for information on Oil Cooler Bypass Valve usage in cold weather .

Maintenance

Owners should be familiar with applicable TECNAM and Lycoming service documentation, Service Bulletins and Instructions that apply to the P2012 Traveller and TEO-540-C1A. As with any engine, it is good maintenance practice at each oil and filter change to open the filter element and examine for any quantity of material. See Service Bulletin 480 as it provides details on oil filter inspection.

Remove, examine, clean and reinstall the oil suction screen at each oil change. Spectrographic oil analysis can also be a useful tool in monitoring engine condition. To be effective, the analysis results must be trended over several checks. The same laboratory should be used for all samples. It is critical to take the oil sample in the same manner for each check. The results of the oil analysis should be used together with careful examination of the oil filter and suction screen. Lycoming recommends a 50-hour oil change interval for the TEO-540-C1A engine. Due to differences in operating techniques and engine service life, the operator may find that the oil gets extremely dirty or black prior to scheduled oil change events. In this case, reduce the oil change interval accordingly.

Typical oil consumption for a large turbocharged engine such as the TEO-540-C1A may vary between 3-10 hours per quart depending on the time in service. If oil consumption exceeds 1 quart in 2 hours consistently, maintenance action is required. If the oil is being burned, most likely a top overhaul of the engine is necessary to restore the piston rings and cylinder barrels. Barrel wear and piston ring life is very dependent on the engine operation conditions, cylinder head temperatures and TIT experienced during service life. Cylinder reconditioning or replacement may be necessary before engine TBO is achieved.

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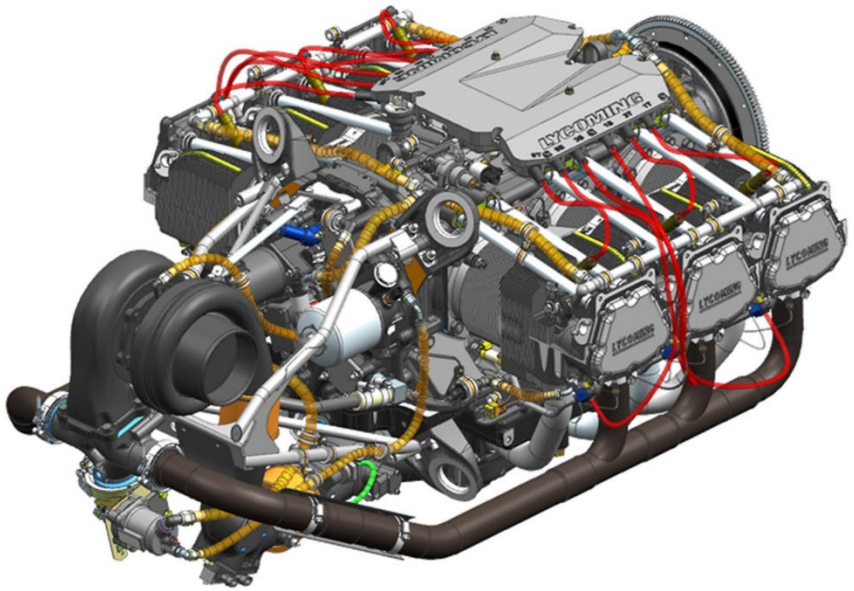

Operating Recommendation Summary:

Take-off at 2575 RPM, Full Throttle

Climb at 2400 RPM, 75% power

Recommended cruise at 60% power, 2200 RPM.

For optimum service life, maintain CHT's in cruise below 400°F.

Regardless of what power setting is used, cruise CHT's are recommended not to exceed 435°F.