

APPROVED PERSON PANEL

COVID19 ENGINE PROTOCOL PANEL

This advisory protocol is drafted to assist in preserving aircraft health during the COVID 19 lockdown and is drafted for recommendation as follows:

Subject: COVID-19 engine preservation protocol
Applicability: **Toyota**
Engine group: Group 3: in-line piston engines
Issue date: 24 May 2020
Expiry date: end of COVID-19 lockdown for aircraft
Compliance: recommendation

Introduction

This information is intended to assist the aircraft/engine owner, operator, approved person, AME, or builder to achieve correct operating conditions for the engine and consequently optimum performance and reliability. This information is to be used in addition to the technical information contained in the Operator's Manual, Maintenance Manual and/or Repair Manual.

Background

During unusual circumstances, such as this COVID19 pandemic, owners, pilots or operators might not have prepared their aircraft for costly medium to long term storage. No practical procedure will completely prevent corrosion on installed aircraft engines, their systems or propellers. Corrosion is influenced by geographical location, usage and environmental factors. Aircraft owners and operators should evaluate the conditions in which they operate and take precautionary measures as required.

Experience has shown that active corrosion and electrolysis can be found on cylinder walls of inoperative engines for periods as brief as two days where aircraft are stored at sea level, or in high temperatures and/or humid conditions. Should an owner/operator of an aircraft feel that this might be applicable to them they may apply on a case by case basis. Working engines on the other hand will have acquired a varnish on the cylinder walls that tends to protect them from corrosion. The same for the cam shaft and main bearings. Aircraft operated in high humidity regions like coastal areas, rivers and lakes have a greater need for more frequent engine, propeller and systems preservation actions than those operated in arid regions. Operators/owners should use their discretion in this regard.

Recommendations

If the engine is not going to be used for an extended period of time then certain measures have to be taken to protect engines against heat, direct sunlight, corrosion and formation of residue.

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Procedures

1. Parking:
Whenever the engine is not active or being maintained it is strongly recommended that the following points are covered to prevent contamination and pest ingress:
Engine air inlet
Exhaust outlet.

If the engine is not fitted in an airframe then the following must also be sealed:

Inlets to carburettor and fuel pump
Engine crankcase vent

2. Flyable storage:
This is defined as a maximum of 30 days non-operational storage.
Ensure that the engine has been stopped by turning off the fuel valve, thereby not leaving any fuel in the carburettor bowl.
Leave a wooden propeller in the horizontal position to ensure even distribution of liquids in the wood.

It is recommended that the engines be brought up to operating temperatures at least once in a 30-day cycle. This includes cylinder head, oil and water temperatures. This can only be achieved when operating the engine at high power settings for extended periods. It is recommended to fly the aircraft for a period exceeding 30 min to achieve normal operating temperatures. This does not include warmup and taxi time but actual flight time at high cruise power settings.

Store under cover, away from direct sunlight

Ensure openings are covered as per parking above.

3. Avionics systems are susceptible to moisture damage and more so in humid environments, it is recommended that these be switched on for at least 15 to 20 minutes once in two weeks in humid conditions and once in 30 days in more arid conditions. This should be sufficient to ensure enough heat generated to evaporate any moisture buildup which could affect performance. It is best this be achieved in-flight as it would ensure sufficient battery charge and therefore extend battery life.

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4. Electrical variable pitch and constant speed propellers need to be cycled through their entire range of travel at least three times to ensure lubrication of internal thrust bearings. It is best to do this whilst engine is running to ensure electrical brushes remain free and lubrication is spread evenly. It is recommended to do this at least once every 30 days.
5. Drain coolant on liquid cooled engines to prevent damage by freezing during the cold months.
6. Returning engine to service from flyable storage is accomplished by performing a thorough pre-flight inspection. Ensure all protective covers are removed. Fill in coolant and vent the cooling system if it was removed.

WARNING:

Do not store MOGAS or fuels containing alcohol for longer than 30 days.
Ensure that the Master and Ignition Switches are OFF before turning the motor.