

Not Flying Much? **Beat the Rust**

Piston engines function best when flown regularly, but how to keep them in good condition if you don't get into the air so often?

A piston engine flown infrequently is prone to corrosion and contamination, both of which can reduce its service life.

Engine manufacturer Lycoming even add 200 hours to the TBO of some of their engines if they're flown at least 40 hours a month.

Neville Williamson, Chief Engineer at Dunedin's Flightline Aviation, knows first-hand the benefits of regular use.

"We've found that aeroplanes left sitting around develop defects, while aeroplanes used every day don't. There's nothing like actually flying the aircraft – that's what they're designed to do."

Manufacturers generally recommend that a preservation regime be implemented for engines expected to sit unused for longer than 30 days.

Engine Temperature

Regular flight brings an engine up to operating temperature, which will vaporise and eliminate the condensation that causes corrosion.

"The oil temperature really needs to get into the green to boil off the moisture," Neville says.

When mixed with the by-products of combustion, moisture can also form acidic compounds which etch the metal and increase the chances of corrosion.

The corrosion itself then becomes an abrasive, which further worsens the problem.

Oil and Preservatives

Oil changes are typically specified by engine manufacturers in both an hour time limit, and a calendar time limit.

Changing the oil means removing contaminants conducive to corrosion. So, if an aircraft is flown infrequently, it's vital that the calendar time limit isn't ignored.

For longer time frames, sending an engine through a corrosion inhibition process can

prove far more cost-effective than having to fix the corrosion at a later date.

"People who aren't going to use their aircraft over an extended period, for example leaving it in the hangar over winter, should be getting their engine inhibited," suggests Neville.

Engine Ground Runs

An engine ground run should not be considered an alternative to regular flight, and can in fact encourage corrosion.

A ground run will heat and cool the engine, a process creating condensation, but the heat itself won't be enough to vaporise the moisture.

"Ground running won't usually get the oil and cylinder head temperatures up high enough to make a difference," says Neville.

"Doing so once a month can do more damage than good, because it only drives moisture from the pores of the material to the surface."

Other Considerations

Pulling an engine through by hand helps guard against rings sticking, but it also potentially exacerbates problems.

Pulling the engine through can wipe oil away from the cylinder walls, cam, and followers. That results in additional wear at the next engine start, leaving the engine more vulnerable to corrosion.

Aside from the inherent problems of corrosion, dry seals can also break down over time, magnetos could suffer, and moisture may build up around impulse couplings.

Attempting to start an engine with a battery that's known to be flat is also discouraged. A failed start can result in fuel washing away the protective coating of oil, leaving an engine more prone to corrosion. It is much better to park the aircraft until the battery can be changed.

For the long-term health of your aircraft engine, there is simply no substitute for regular flight. Contact your engine manufacturer or engineer for further advice. ■

