

LAA/AWA/20/10  
29<sup>th</sup> April 2020

## Arplast PV-50 Propeller

### Establishment of Correct Mechanical Fine Pitch Stop Setting

In 2007 the pilot of a Europa aircraft suffered a loss of propeller thrust shortly after take-off. Post incident investigation revealed that the primary cause of the propeller failure was an excessively worn lead screw (the threaded shaft that drives the pitch change mechanism) which had eventually failed. The cause of the excessive wear and the eventual thread failure was determined to be lack of lubrication.

In August 2018, the pilot of a Skystar Kitfox Mk. 7 lost propeller thrust whilst at altitude for similar reasons.

In both the above incidents, though the initial cause of the failure of the propeller mechanism was due to the thread stripping on the lead screw, the reason for the loss of thrust was that the propeller's mechanical fine pitch stop had been incorrectly set.

In the light of this most recent incident LAA/MOD/PROP/08-007, the Airworthiness Information Leaflet published post the 2007 incident, has been raised to Issue 2.

This later issue reaffirms the importance of the 50 hour lead screw inspection/lubrication requirement, and introduces a one-time check to ensure that when the propeller is operating against the mechanical fine pitch stop, the resulting pitch angle is sufficient to hold the engine RPM within manufacturer's limits when at normal climb speed.

LAA/MOD/PROP/08-007 Issue 2 can be downloaded [HERE](#).

The Arplast PV-50 Manual, which is a collation of all the technical material presently available, can be downloaded [HERE](#).

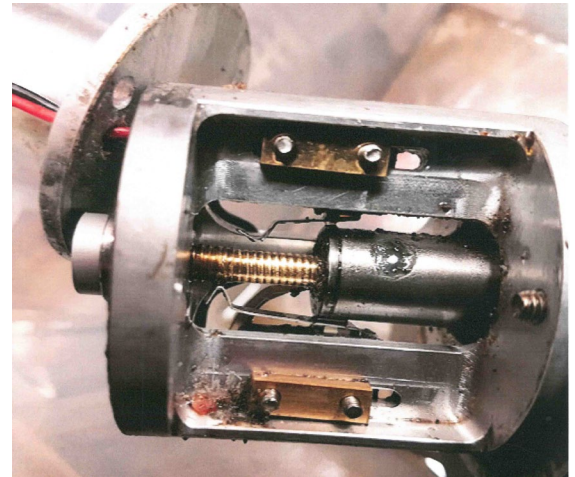


Fig 1. The driving force behind the pitch change mechanism on the Arplast PV-50 propeller is an electric motor driving a threaded lead screw which, in turn, moves a carriage (called a swashplate) which is connected mechanically to the blade's root. The normal range between maximum coarse and minimum fine is determined by the position of two microswitches – the absolute fine position is determined by a mechanical fine pitch stop.

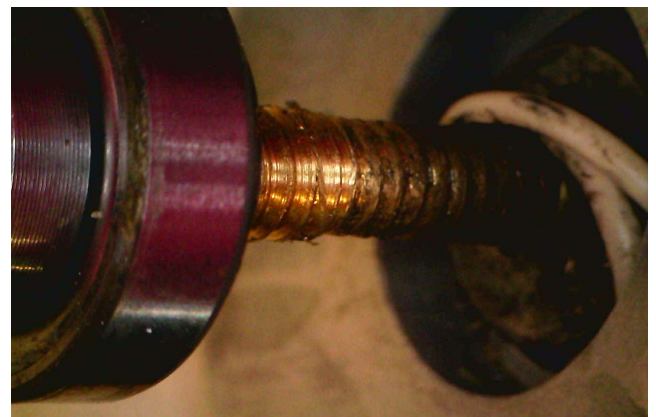


Fig 2. The initiating cause of the two pitch change mechanism failures suffered by LAA members was the mechanical failure of the lead screw; this was considered due to lack of in-service lubrication. It is an LAA requirement that, in the event of a failure of any kind to a propeller pitch change mechanism, the aircraft remains safely flyable. Because, in both incidences, the propeller's fine pitch stops were not correctly set, this wasn't the case and both the aircraft involved were damaged during the subsequent forced landings.