

NON-CERTIFIED AND CLONED LYCOMING ENGINES

1. Introduction

A growing number of non-certified engines, based on the Lycoming engine series, are being installed in LAA aircraft. Having the ability to produce a full set of PMA (Parts Manufacturer Approved) parts for specific Lycoming engines, engine component manufacturers such as Superior and Engine Components, Inc. (ECI) also produce their own 'clones' of those engines, which are sold in kit form. LAA Engineering has accepted certain versions of these 'clone' engines, subject to them being assembled by an LAA approved organisation, currently being:

- Aero Sport Power Inc. of Canada
- CFS Aeroproducts Ltd
- Deltair Airmotive Ltd
- Nicholson McLaren Aviation
- Norvic Aero Engines Ltd, formerly Jade Air plc
- Superformance Engineering Ltd
- Swiftair Maintenance Ltd

2. Lycoming OEM Experimental Engines

Lycoming produces a series of non-certified engines that are built in the same way as their certified engines, except those that are fuel injected use the non-certified Airflow Performance or Precision Airmotive fuel systems. These engines, known as OEM Experimental Engines, are available only through kit aircraft manufacturers and engine assembly companies that are approved by Lycoming. Although Lycoming prefix the part numbers of these engines with the letter 'Y', Vans Aircraft has used the letter 'X' to the designation prefix of the non-certified Lycoming engines that they supply. LAA Engineering has accepted the Lycoming non-certified YO-320, YIO-320, YO-360, YIO-360, YO-540 and YIO-540 engines on the basis that they are made using components identical to their certified counterparts and, in the case of the fuel injected engines, an LAA approved fuel injection system. The Lycoming Thunderbolt series of engines is not included in this general acceptance, being of a configuration that does not have a certified equivalent.

3. Superior 'XP' engines

The Superior engines are identified with an 'XP' prefix. Superior has its own system of engine designation that requires a de-code sheet to interpret it.

LAA accepted Superior 'XP' engines are listed below.

XP-O-320-A1AC2
XP-O-320-A1AHD2
XP-O-320-A1C2
XP-O-320-B1A2
XP-IO-320-A1A2
XP-IO-320-A1AC3
XP-IO-320-A3A2
XP-IO-320-A3AD2
XP-IO-320-A3AD3
XP-IO-320-B1AC2
XP-IO-320-B1AD2
XP-IO-320-B1XC2

XP-O-360-A1A2
XP-O-360-B1A2
XP-IO-360-A1A
XP-IO-360-A1A2
XP-IO-360-B1A2
XP-IO-360-B1AA2
XP-IO-360-B1AC2
XP-IO-360-B1AD2
XP-IO-360-B1AD3
XP-IO-360-B1B2
XP-IO-360-B1BA3
XP-IO-360-B1C2
XP-IO-360-B1CA2
XP-IO-360-B1HC2
XP-IO-360-B1HD2
XP-IO-360-B1LD2
XP-IO-360-B2CA2

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Engine Components Inc. 'EXP' engines

The ECI Titan engines, as they are described, have the prefix 'EXP'. ECI also has its own system of engine designation that requires a de-code sheet to interpret it. The LAA accepted ECI 'EXP' engines are shown below.

Titan EXP-O-320-A1B1N
Titan EXP-O-360-D1A1N
Titan EXP-IOX-340S-A1H2N
Titan EXP-DIOX-370-A4L2T

Note: Various other models of Superior and ECI engines may have features that are not acceptable to LAA Engineering, such as dual non-certified electronic ignition systems.

4. Electronic Ignition Systems

In normal circumstances, unless the electronic ignition system installed on the engine is Type Certified, only one magneto may be substituted with an electronic ignition system, although a small number of LAA aircraft have been permitted to be so modified and are being monitored by LAA Engineering. Where a non-certified electronic ignition system is installed, each installation will require individual LAA acceptance. Makes and models of electronic ignition systems currently installed on LAA aircraft engines are the:

- **Unison** 'Limited Authority Spark Advance Regulator' (LASAR)
- **ElectroAir** 'Direct Ignition System' (DIS)
- **Light Speed Engineering** 'Plasma II' and 'Plasma III' 'Capacitor Discharge Ignition' (CDI)
- **E-Mag Ignitions** 'E-Mag' and 'P-Mag'.

The vibration characteristics of metal propellers can be affected by ignition timing; Sensenich, for example, specifically states that the vibration approval of their metal propellers does not extend to the use of non-standard ignition timing while Hartzell has carried out a very limited amount of testing on some of their later blade designs. Using a simple wooden propeller avoids this problem as wood propellers are not prone to resonance problems.

5. Service Bulletins and Airworthiness Directives

Manufacturers of cloned Lycoming engines may produce their own Service Bulletins when necessary, however owners must also be aware that Lycoming Service Bulletins and AD's may also affect their engine or components within it and act accordingly. Normally an AD or SB identifies the engine or range of engines to which they apply by reference to the model designation. In the case of cloned Lycoming engines, its Lycoming engine equivalent will need to be identified to verify applicability. Lycoming Service Bulletins, etc. can be viewed on their web site at www.lycoming.textron.com.

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