



LAA TYPE ACCEPTANCE DATA SHEET
TADS E04
LYCOMING ENGINES

Issue 1	Initial issue	Dated 27/02/19	JP
Revision A	Add to Standard Options and Section 3.6	Dated 25/02/22	JP

This TADS is intended as a summary of available information about the engine type and should be used during the overhaul, operation and permit revalidation phases to help owners and inspectors. Although it is hoped that this document is as complete a summary as possible, other sources contain more complete information, e.g. the manufacturer's website.

Section 1 contains general information about the engine type and its variants.

Section 2 contains information about the engine type that the LAA considers mandatory and must be complied with.

Section 3 contains advisory information that owners and inspectors should review to help them maintain the engine in an airworthy condition. If due consideration and circumstances suggest that compliance with the requirements in this section can safely be deferred, is not required or not applicable, then this is a permitted judgement call. This section also provides a useful repository for advisory information gathered through defect reports and experience.

Section 1 - Introduction

1.1 UK contact

Airpart Supply Ltd

Address: Unit 3
The Gateway Centre
Coronation Road
Cressex Business Park
High Wycombe
Buckinghamshire
SL7 3DR

Tel: 01494 450366
Email: sales@airpart.co.uk
Website: <https://www.airpart.co.uk/>

Manufacturer contact information:

Address: Lycoming Engines
652 Oliver Street
Williamsport, PA 17701
USA

Tel: 001 570 323 6181
Website: <https://www.lycoming.com/>

1.2 Description

Lycoming Engines is a major American manufacturer of aircraft engines. The factory is in Williamsport, Pennsylvania and Lycoming produces a line of horizontally opposed, air-cooled, four, six and eight-cylinder engines. In addition, Lycoming produces aerobatic and helicopter piston engines. Lycoming is an operating division of AVCO Corporation, itself a subsidiary of Textron. Textron purchased the company in 1985.

In addition to the standard certified engines, Lycoming also produces non-certified (deemed 'experimental' in the USA) engines both in standard specification and as the 'performance'



LAA TYPE ACCEPTANCE DATA SHEET
TADS E04
LYCOMING ENGINES

Thunderbolt engines. These engines are mostly equivalent to certified types but may have non-certified components installed such as fuel injection systems. Lycoming uses a 'Y' prefix for non-certified engines although some companies may change this. For instance, Van's Aircraft Inc uses an 'X' prefix on non-certified Lycoming factory engines that they supply for their aircraft.

Engine Model Designation

Lycoming uses a code throughout their engine variant numbers based on the engine's configuration. For example, an AEIO-360-A1B6D engine model's code can be broken down into three sections:

- 1. Prefix: AEIO
- 2. Displacement: 360
- 3. Suffix: A1B6D

The current basic Lycoming engine models are identified primarily by their displacement in cubic inches as follows:

<i>Model Series</i>	<i>Power (HP)</i>	<i>No of Cylinders</i>	<i>Remarks</i>
145	55-75	4	Certified
233	115	4	Non-certified
235	<125	4	Certified
290	127-140	4	Certified
320	150-160	4	Certified
360	145-210	4	Certified
390	210	4	Certified
435	190-260	6	Certified
480	270-340	6	Certified
540	235-360	6	Certified
580	315	6	Certified
720	400	8	Certified

The engine code prefix identifies some of an engine's major configuration details:

<i>Prefix</i>	<i>Description</i>
A	Aerobatic (dry sump)
AE	Aerobatic (wet sump with inverted oil system)
E	Electronic
G	Geared
H	Horizontal helicopter
I	Fuel injected
L	Left hand rotation crankshaft (counter clockwise viewed from the rear)
M	Drone
O	Horizontally opposed cylinders
R	Radial type engine
S	Supercharged

T	Turbocharged
V	Vertical plane crankshaft. Usually implies 'H'.
Y	Non-certified engine

The engine code suffix identifies further details of the engine's configuration and subsequent changes to a particular engine model. Engines only utilise relevant suffix numbers so some engines may have a two-digit suffix, whilst others have more. For instance, an engine without a counter-balanced crankshaft will not have the fourth digit and only engines fitted with a (single drive) dual magneto will have the D' as the fifth digit.

<i>Suffix</i>	<i>Description</i>
First digit	Power section and rating
Second digit	Nose section
Third digit	Accessory section
Fourth digit	Counterweight application
Fifth digit	Dual magneto

A list of the differences between various Lycoming engine model variants can be found in [Lycoming SSP-110-1](#).

Non-Certified and Cloned Lycoming Engines

A number of manufacturers produce non-certified engines based on Lycoming designs and these are termed 'cloned' Lycoming engines by LAA Engineering. Further information on these engines can be found in LAA Technical Leaflet [TL 3.15: Non-Certified and Cloned Lycoming Engines](#).

Section 2 Mandatory information for owners, operators and inspectors

At all times, responsibility for the maintenance and airworthiness of an aircraft rests with the owner. A condition stated on a Permit to Fly requires that: *"the aircraft shall be maintained in an airworthy condition"*.

2.1 Lifed Items

LAA Technical Leaflet [TL 2.23 Engine Overhaul Life and Operating 'On Condition'](#) provides a large amount of information on dealing with engine life for LAA administered aircraft.

Lycoming publishes the recommended Time Before Overhaul (TBO) limits for their engines in [Service Instruction SI 1009BC](#).

[Lycoming Technical Publications](#) should be monitored for revisions to engine TBO and other lifed items.

2.2 Operator's manual

Operator's manuals are available for free download from [Lycoming Technical Publications](#).

2.3 Maintenance Schedule

Regular maintenance is the key to stress free flying. Lycoming engines are generally fitted to LAA administered aircraft that are maintained either in accordance with the CAA Light Aircraft Maintenance Schedule (LAMS) [CAP411](#) or the LAA Generic Maintenance Schedule, further details of which can be found in LAA Technical Leaflet [TL 2.19](#). These maintenance schedules were originally written around the maintenance requirements of traditional aircraft engines, such as Lycoming and Continental. Some aircraft have mandated maintenance requirements and/or schedules which are stated on the aircraft's Operating Limitations document and must be followed.

Where there is no mandatory schedule specified, the generic schedule should be customised to include any specific maintenance activities described in the relevant Lycoming Engine Installation & Operations Manual or Maintenance Manual, in addition to the mandatory maintenance actions specified by Airworthiness Directives.

Lycoming engine Installation & Operator's Manuals (which include Lycoming's recommended maintenance schedules) are available for (free) download from [Lycoming Technical Publications](#).

More information on maintenance schedules can be found in the [Aircraft Maintenance](#) section of the LAA website.

2.4 Airworthiness Directives

Airworthiness Directives (ADs) should be complied with on LAA administered aircraft. The primary source for Airworthiness Directives concerning Lycoming engines, being manufactured in the USA, is the FAA.

Due to the large number of different Lycoming models found in LAA administered aircraft, the ADs are not individually listed in this TADS. Current FAA Airworthiness Directives for individual Lycoming engine models can be found on the [FAA Airworthiness Directives](#) website.

In most cases ADs identify the engine or range of engines to which they apply by reference to the basic model designation, prefix and suffix codes and are often also serial number specific. Therefore, an AD appearing against an engine model type may or may not apply to a particular example of that model. The full text of the AD must be consulted in order to determine whether the engine is included or excluded by reason of prefix, suffix or serial number. ADs may well refer to a Lycoming Service Bulletin or another form of continuing airworthiness data. See Section 3.3 of this TADS for further information regarding SBs etc. If in doubt, please contact LAA Engineering or a Lycoming service centre for assistance.

Note: the ADs may be listed under a number of names depending on the Type Certificate Holder's name at the time the engine was manufactured or who may have taken over the Type Certificate at some later date.

Specific Lycoming engine ADs may therefore be listed under one of the following Type Certificate Holders' names:

1. Lycoming Engines
2. Textron Lycoming, AVCO Corporation

Various third-party accessories are fitted to Lycoming engines in the form of carburettors, fuel injection systems, magnetos and starter motors, etc, and whilst most applicable Airworthiness Directives will be listed under the engine model on the FAA AD listings, it would be prudent to check under the accessory manufacturer's name as well.



**LAA TYPE ACCEPTANCE DATA SHEET
TADS E04
LYCOMING ENGINES**

2.5 Mandatory Permit Directives (CAP 661)

MPD 1995-01	Compliance with ADs	Continued compliance with all ADs and other mandatory requirements applicable when an aircraft was on a C of A.
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Also check the LAA website for MPDs that are non-type specific ([TL2.22](#)).

2.6 CAA Mandatory Requirements For Airworthiness CAP 747 and Civil Aircraft Airworthiness Information and Procedures (CAAIP) CAP 562

CAA publications [CAP747](#) and [CAP562](#) contain information that may be relevant to LAA administered aircraft and should be checked for applicability.

In particular, for older engines operating beyond the manufacturer's recommended life, Generic Requirement No 24: 'Light Aircraft Piston Engine Overhaul Periods' should be read alongside LAA Technical Leaflet [TL 2.23: Engine Overhaul Life and Operating 'On Condition'](#). Generic Requirements can be found in CAP747: Section 2 'Mandatory Information'.

2.7 LAA Required Modifications (including LAA issued AILs, SBs, etc)

None currently issued.

2.8 Additional engine operating limitations to be placarded or shown by instrument markings

Notes:

- Refer to the engine manufacturer's latest documentation for the definitive parameter values and recommended instruments.
- Where an instrument is not fitted, the limit need not be displayed.
- Data stated on the aircraft's Operating Limitations document must be displayed by means of cockpit placards or instrument markings.

Where the engine manufacturer's operating data shows an operating limitation then a means to monitor that parameter must be installed, except when otherwise agreed with LAA Engineering. It may be acceptable to install temporary instrumentation for the flight test programme.

A more restricted operating limitation may be imposed through an aircraft's Operating Limitations or Certificate of Clearance which will take precedence over any other limitation, e.g. if a particular propeller is not approved for an engine's maximum RPM.

Section 3 Advice to owners, operators and inspectors

3.1 General

Lycoming produced a publication called the [Lycoming Flyer Key Reprints](#) which contains a lot of useful information regarding both the operation and maintenance of Lycoming engines.

3.2 Standard Options

The following options may be installed without reference to LAA Engineering (except for aircraft that previously held a Certificate of Airworthiness or aircraft with more than 2 seats, in which cases an email request should be made to LAA Engineering in the first instance), subject to an



LAA TYPE ACCEPTANCE DATA SHEET TADS E04 LYCOMING ENGINES

LAA inspector checking the installation against the relevant installation instructions and is compatible with the airframe/engine installation. The inspector must sign a PMR statement in the engine and/or airframe logbook prior to flight with the option fitted.

1. Christen 801 inverted oil system (reference LAA Mod 14930)
2. Raven inverted oil system (reference LAA Mod 12884)
3. 'Half' Raven inverted oil system (installation of air/oil separator without the oil check valve) (reference LAA Mod 12884)
4. [B&C VAC-2/4 Inverted Oil Pickup](#) vacuum pad adaptor. For further installation details, refer to B&C VAC-2 documentation (use reference 'TADS E04 Section 3.2').

3.3 Manufacturer's Information (including Service Bulletins, Service Letters, etc)

Lycoming provides a vast amount of technical and continuing airworthiness information in the [Lycoming Technical Publications](#) section of their website. Lycoming produces an index of Service Bulletins, Service Instructions and Service Letters in [SSP-112-8](#). See also section 3.1 ([Lycoming Flyer Key Reprints](#)).

Another potential source of useful information is the Type Certificate Data Sheet. For Lycoming engines, the TCDS for a particular engine can be found on the [FAA TCDS](#) website. As with the Airworthiness Directives, the TCDS may be listed under one of the various company names of the Type Certificate Holder, not necessarily the obvious one.

In the absence of any over-riding LAA classification, inspections and modifications published in the manufacturer's continuing airworthiness data should be satisfied according to the recommendations therein. It is the owner's responsibility to be aware of and supply such information to their Inspector.

3.4 Special Inspection Points

1. Lycoming Ground Power Unit Conversions

There are a few Lycoming GPU conversions in LAA administered aircraft, designated the O-290-G. Strictly speaking Airworthiness Directives do not apply to GPU conversions but it is recommended that O-290 ADs be complied with where considered appropriate. Further technical information is available from the LAA, on request, to owners and inspectors of O-290-G engines.

2. Modified and Unidentified Engines

A small number of LAA aircraft, more often amateur built types, have engines installed which have in some way been modified and/or for which the correct and full model designation is unclear. Owners and Inspectors will need to establish the basic model type and proceed to use their best judgement to determine which Airworthiness Directives should apply.

3. Electronic ignition systems

Electronic ignition systems generally affect the timing of the engine and can result in changing the vibration characteristics of the engine, which can induce premature fatigue failure in propellers. For this reason, changes to electronic ignition on Lycoming engines must be applied for by submitting a mod application so that propeller compatibility can be checked, except where the system is installed at initial build/import of the aircraft in which case it will be assessed as part of that process. Makes and models previously approved on the LAA fleet include the Unison LASAR, ElectroAir DIS, Light Speed Plasma II and Plasma III, and E-Mag Ignitions E-Mag and P-Mag units.

3.5 Operational Issues

1. *Safety Spot* references

The following *Safety Spot* articles are relevant to Lycoming engines:

<i>Light Aviation</i> issue	<i>Subject</i>
(None currently indexed)	

2. Sources of Operational Information

Refer to the applicable Lycoming engine Operator's Manuals available in the [Lycoming Technical Publications](#) section of the Lycoming website and also the [Lycoming Flyer Key Reprints](#) publication provides a lot of good operational information which is based on the engine manufacturer's experience rather than old wives' tales.

3. Fuel Types

Advice on operating LAA administered aircraft fitted with Lycoming engines on 'non-standard' fuels is available from the LAA website in the Aircraft & Technical [Operating & Maintaining Aircraft](#). Fuel types covered are [Total Avgas UL91](#) and [Ethanol-free MOGAS](#). Lycoming engines are not currently approved for operating with [E5 MOGAS](#).

Lycoming list their recommended fuel types in [Service Instruction SI 1070](#), Check the [Lycoming Technical Publications](#) section of the Lycoming website for the latest revision of SI 1070.

3.6 Standard Modifications

The following Standard Modifications have been approved on the type. The Standard Modification leaflet associated with each modification (published on the website) must be followed and an [LAA/MOD1](#) form completed and return to LAA Engineering in each case (see also [TL 3.06](#)).

<i>Standard Mod no.</i>	<i>Issue</i>	<i>Description</i>
n/a	n/a	None issued at this time

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Please report any errors or omissions to LAA Engineering: engineering@laa.uk.com