



**LAA TYPE ACCEPTANCE DATA SHEET  
TADS E05  
CONTINENTAL ENGINES**

Issue 1	Initial issue	Dated 05/03/19	JP
Issue 2	Inclusion of JPM 79001006 and 79001007 oil filter adapters as Standard Options.	Dated 18/05/21	AD
Issue 3	Inclusion of TAF-L oil filter adapter and Real Gaskets pushrod tube conversion kits as Standard Options.	Dated 17/09/21	JV

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

There are no designated UK based contacts for Continental Motors although the following two companies are factory authorised distributors for factory engines and parts.

#### 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](mailto:sales@airpart.co.uk)  
Website: <https://www.airpart.co.uk/>

#### Multiflight Ltd

Address: South Side Aviation Centre  
Leeds Bradford Airport  
Leeds  
West Yorkshire, LA19 7UG

Tel: 0113 328 7100  
Email: <https://www.multiflight.com/contact-multiflight/>  
Website: <https://www.multiflight.com/aircraft-parts/continental-motors-aircraft-parts/>

#### Manufacturer contact information:

Address: Continental Motors, Inc  
2039 S Broad Street  
Mobile  
Alabama, AL 36615



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USA

Tel: 001 251 436 8292  
Website: <http://continentalmotors.aero/>

1.2 Description

As with other aircraft engine manufacturers, Continental was originally an engine builder for the automotive world and branched into developing aircraft engines in the very early days of aviation.

The company has been based in Alabama since the 1960s and has gone through various iterations of its name over the years, including Continental Motors Company, Continental Aircraft Engine Company and Teledyne Continental Motors. In 2011 TCM was sold to Aviation Industry Corporation of China (AVIC) – a Chinese state-owned company and was renamed Continental Motors, Inc.

Rolls-Royce produced various Continental engines under licence, including the 100 hp O-200 and 145 hp O-300 models. Continental supplied their engines to the Americas, American Pacific area and Japan, giving Rolls-Royce the marketing rights to the rest of the world. Rolls-Royce also developed their own model, the 130 hp O-240 engine from an initial design by Continental. Rolls-Royce transferred ownership of the Type Certificate to Teledyne Continental Motors in 1983.

More recently, Continental Motors has included some diesel engines in their line-up. Some have been developed in-house, whilst others are as a result of the parent company buying out Thielert Aircraft Engines GmbH in 2013.

*Engine Model Designation*

Originally, the engine model code denoted the power output of the engine in horsepower but the current basic Continental Motors 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>
A-40	40	4	
A-50	50	4	
A-65	65	4	
A-75	75	4	
C-75	75	4	
A-80	80	4	
C-85	85	4	
C-90	90	4	
Tiara O-270	180	4	
C-115	115	6	
C-125	125	6	
C-140	125	6	Higher rpm version of the C-125
C-145	145	6	
C-175	175	6	Geared version of the C-145
E165	165	6	



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E185	185	6	
O-200	100	4	
E225	225	6	
O-240	130	4	Rolls-Royce developed engine
IO-240	125	4	Continental developed engine
O-300	145	6	Modernised C-145
GO-300	175	6	Geared version of the O-300
IO-346	165	4	
IO-360	210	6	
Tiara O-405	285-320	6	
O-470	230	6	
O-520	320	6	
O-526	270-310	6	
Tiara O-540	380-450	8	
IO-550	280-360	6	

Continental has used various codes throughout their engine variant to denote a specific variant. The current model designator code such as the TSIO-360-B1B can be broken down into three sections:

1. Prefix: TSIO
2. Displacement: 360
3. Suffix: B1B

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

<i>Prefix</i>	<i>Description</i>
G	Geared
TS	Turbo supercharged
I	Fuel injected
O	Horizontally opposed
L	L at the beginning of the prefix: Left-turning (counter clockwise viewed from the rear)
L	L at the end of the prefix: liquid cooled
F	FADEC equipped (Full Authority Digital Electronic Control)
D	Diesel

The engine code suffix identifies further details of the engine's configuration and subsequent changes to a particular engine model.

<i>Suffix</i>	<i>Description</i>
First digit	Engine model. Note: some models may be multi-digit
Second digit	Specification number (ie accessory configuration)
Third digit	Shipping designation (type of packaging)



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### 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.

Continental Motors publishes the recommended Time Before Overhaul (TBO) limits for their engines in Chapter 6-3 of the [M-0 Standard Practice Maintenance Manual](#).

Note: Continental Motors moved many of their continuing airworthiness data (Service Bulletins, Service Letters, Service Instructions etc) into the M-0 Standard Practices Maintenance Manual in 2016. Current editions of this manual are only available by purchasing through [Aircraft Technical Publications](#) (ATP). Links in this TADS to the M-0 manual are to an earlier, non-revised edition. Revisions to M-0 are listed in the [Maintenance Manuals](#) part of the Support section of the Continental website and it may be possible to source the revisions online from third parties, with the normal caveats for internet sourced material.

#### 2.2 Operator's manual

Operator's manuals are available for purchase from Continental Motors via [Aircraft Technical Publications](#). Continental Motors produce a [Current Publication Listing](#) which provides part numbers for the various manuals.

A 1944 edition of the A50, A65, A75 and A80 [Operation, Maintenance, Overhaul Instructions and Parts List](#) is available for reading online at [Avialogs](#).

Note: Manuals may also be sourced online from third parties with the normal caveats for internet sourced material. LAA Engineering has examples of various manuals for reference purposes.

#### 2.3 Maintenance Schedule

Regular maintenance is the key to stress free flying. Continental 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 Continental Engine Installation & Operations Manual or Maintenance Manual, in addition to the mandatory maintenance actions specified by Airworthiness Directives.

Continental Motors provide a listing of [Maintenance Manuals](#) in the Support section of their website. Maintenance manuals are available for purchase from Continental Motors via [Aircraft Technical Publications](#).

The following manuals may be of some use. Please note these are for reference purposes only as they are not amended copies:



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1. [Operation, Maintenance, Overhaul Instructions and Parts List](#)
2. [Continental O-200, C75, C85, C90 Overhaul Manual X-30010 \(1984\)](#)
3. [Rolls Royce O-240 Overhaul Manual X30092 \(1979\)](#)

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 Continental engines, being manufactured in the USA, is the FAA.

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

For the Continental engines produced by Rolls Royce, some relevant ADs are listed in CAA Publication [CAP747](#) but may also have ADs listed on the [FAA Airworthiness Directives](#) website as Continental took over as the Type Certificate Holder in 1983.

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 usually 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. It would take enormous amounts of space in SPARS to produce ADs in full. ADs may well refer to a Continental Motors Service Bulletin or another form of continuing airworthiness data. See Section 3.2 of this TADS for further information regarding SBs etc. If in doubt, please contact LAA Engineering 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 Continental Motors engine ADs may therefore be listed under one of the following Type Certificate Holders' names:

1. Continental Motors
2. Continental Motors, Inc
3. Continental
4. Teledyne Continental Motors

Various third-party accessories are fitted to Continental 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.

2.5 Mandatory Permit Directives (CAP 661)

<a href="#">MPD 1995-01</a>	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

Continental Motors [M-0 Standard Practice Maintenance Manual](#) includes a lot of useful information regarding the maintenance and operation of Continental engines.

For information on parts, there is free access to the [Illustrated Parts Catalogs](#) in the Support section of the Continental Motors website. This is an 'online' service (i.e. not available for download) and is specific to particular engine variants.

Note: Manuals may also be sourced online from third parties with the normal caveats for internet sourced material. LAA Engineering to have examples of various manuals for reference purposes.

### 3.2 Manufacturer's/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



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cases an email request should be made to LAA Engineering in the first instance), subject to an 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. JPM Aviation Part no. 79001003: Spin-on oil filter adapter (straight) with Champion CH48108 or C138 or Blue Print ADT32109 oil filter, fitted to Continental C75, C85, C90, O-200/PC60 and O-240 (model types -12, -14 and -16) engines (reference LAA Mod 13917)
2. JPM Aviation Part no. 79001002: Spin-on oil filter adapter with body oriented at 90° for clearance with close firewalls, with oil temperature probe installed in end of spool and with Blue Print ADT32109 oil filter, fitted to Continental A65, A75, C75-8, C85-8 and C90-8 engines (reference LAA MOD 14602)
3. JPM Aviation Part no. 79001006: Spin-on oil filter adapter similar to 79001002 but with body oriented at 60° for clearance with engine mounting frame and with Blue Print ADT32109 oil filter, fitted to Continental A65, C75-8, C85-8 and C90-8 engines (reference LAA MOD 14961)
4. JPM Aviation Part no. 79001007: Spin-on oil filter adapter similar to 79001002 with body oriented at 90° but body lengthened to accommodate oil temperature probe and with Blue Print ADT32109 oil filter, fitted to Continental A65, A75, C75-8, C85-8 and C90-8 engines (reference LAA MOD 15541).
5. F&M Enterprises T.A.F.-L Spin-on oil filter adapter per FAA STC SE7559SW with either Champion CH48108 or Tempest AA48108-2 oil filter as permitted by FAA PMA No. PQ1206CE Supplement No. 90. fitted to Continental C75-12 Series, C85-12 Series, C90 Series and O-200 Series engines.
6. Real Gaskets pushrods conversion kit (pushrod seal kit) per FAA-PMA RG200PR for Continental A-65, A-75, C-75/85/90/125/145, O-200, O-300 and GO-300 series engines.

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

Continental Motors provide access to some of their technical information and continuing airworthiness in the [Maintenance Manuals](#) part of the Support section of their website.

Some Service Bulletins have been incorporated into the [M-0 Standard Practice Maintenance Manual](#) but others are available in the [Service Bulletin](#) area of the Support section of their website.

Another potential source of useful information is the Type Certificate Data Sheet. For Continental 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.

Note: Rolls-Royce transferred ownership of the Type Certificate to Teledyne Continental Motors in 1983.

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. Differences between A65 & A75 engines

Engines are identical in general construction with differences in power rating of the engine, maximum RPM, compression ratio, piston rings, exhaust valves, piston pin diameter and connecting rods. Parts are generally not interchangeable with C series.

## 2. Continental Ground Power Unit Conversions

There are a small number of Continental PC60 GPU that have been converted to aircraft engines status in LAA aircraft. The nearest similar aircraft engine is the Continental C-90 and although strictly speaking ADs do not apply to the PC60, it is recommended that C-90 ADs be complied with where appropriate.

All GPU conversions are to be considered 'experimental' and examples will vary greatly. Further information on GPU engine conversion is available from the LAA Engineering HQ.

## 3. 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.

## 4. Crankshaft Corrosion

CAA AD 006-07-94 used to apply to all Continental engines and required repetitive internal inspection of crankshafts for corrosion. However, in 1996 the CAA revised the AD and cancelled its applicability in respect of Continental engines. Therefore, there is now no mandatory requirement to internally inspect crankshafts on Continental engines except, as was previously the case, at engine overhaul. It might nevertheless prove worthwhile to remove the core plug and clean out build-ups of sludge from time to time, re-protecting afterwards with 3M776 when appropriate (as was recommended by Yorkshire Light Aircraft – now Multiflight). LAA Engineering suggests that the advice of a suitable engine overhauler be sought in the event of corrosion being discovered in the future.

## 5. A65 crankshaft Corrosion

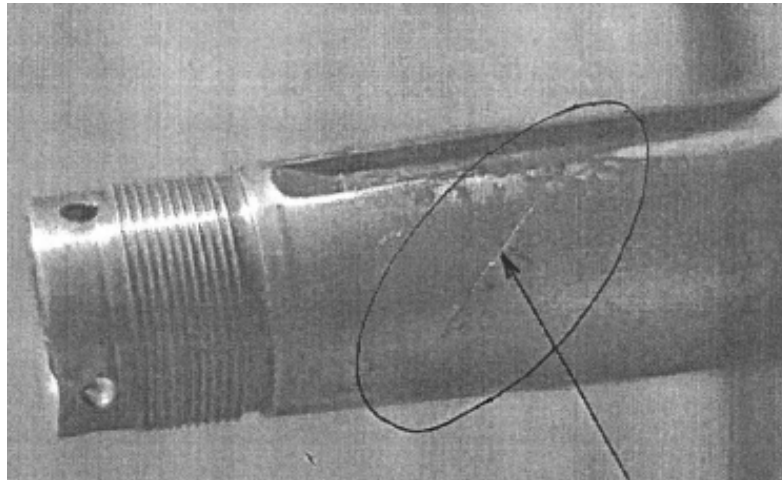
The following report was submitted by the owner of an LAA Piper J3 Cub to LAA Engineering in 2002. The report is included here for the educational benefit of all LAA owners and inspectors.

An oil leak that started about nine months earlier as a fine mist on the windshield, has been traced to a cracked crankshaft. It started as spots of dirty oil, which after about 5 to 10 minutes turned into a clean oily mist which was sprayed onto the windshield by the propeller. This only started to emerge at 1900 rpm and above and other than the oil leak there were no symptoms to anything more serious. First diagnosis was a worn front oil seal but after three new seals and many months of checking for all other possible leaks, it was still getting progressively worse. On the final flight, the dirty oil did not really turn to clear, so I returned to the airfield.

On selecting carb heat and 1500 rpm whilst overhead the airfield, moderate to severe vibration was felt. Power was then eased back until the vibration ceased at 2000 rpm. The landing was made closing the throttle completely on short finals and there was a lumpy type of vibration when taxiing at low rpm. On shutdown, lateral movement was apparent in the crankshaft but when the engine was left to cool, there was no discernible movement.

The engine was removed, dismantled and the crankshaft magnaflux tested. This revealed a spiral crack which seemed to have started from the keyway and migrated aft to the oil splash ring and forward to just short of the boss retaining nut.





### 3.5 Operational Issues

#### 1. *Safety Spot* reference

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

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

#### 2. Information regarding the recommended operation of Continental engines can be found in Chapter 7 of [M-0 Standard Practice Maintenance Manual](#). Troubleshooting engine problems can be found in Chapter 8 of the manual.

#### 3. Fuel Types

Advice on operating LAA administered aircraft fitted with Continental 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](#). Continental engines are not currently approved for operating with [E5 MOGAS](#).

Continental also provides information on Engine Fuel Requirements in Chapter 7-2.2 of [M-0 Standard Practice Maintenance Manual](#).

### 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](mailto:engineering@laa.uk.com)