

POPULAR FLYING ASSOCIATION**Airworthiness Approval Note:** PFA 999-413 Supplement 3**Aircraft Type:** Any LAA Aeroplane listed in Appendix A of this AAN**Foreword**

Following the withdrawal from sale of four-star Mogas as of 1st January 2000, the CAA have raised the issue of Airworthiness Notice 98C, now superseded by CAP 747, Section 2, Part 4, CG 5 to allow the use of unleaded Mogas to BS EN 228 in certain aeroplanes powered by Continental and Lycoming engines, on the basis of a comparison between unleaded Mogas of this specification and that of the US specification ASTM D-439 and D-814 as cleared by STC for use in many aircraft types in the USA.

During the year 2000, the LAA (then PFA) also carried out a trial using BS EN228 95 RON Mogas in a selection of LAA controlled Continental engined aircraft types, accumulating a total of 200 hours flying without apparent problems.

CAA have agreed that in the case of aircraft operated on Permits to Fly issued on LAA recommendation, LAA as a CAA approved organisation may approve individual aircraft/engine combinations for use of unleaded Mogas under CAP 747.

This AAN has been raised to describe the basis of approving aircraft/engine combinations for use with unleaded Mogas and to state the aircraft/engine combinations so approved in a schedule forming Appendix A to this AAN.

Issue 1	Initial issue	24 th April 2001
Issue 2	Several additional airframe/ engine combinations added to list at Appendix A.	30 th June 2001
Issue 3	Several further airframe/engine combinations added at Appendix A.	1 st March 2002
Issue 4	Further airframe/engine combination added, Aeronca 11AC/Cont.A75.	20 th May 2003
Issue 5	Further airframe/engine combination added, Piper J5 /O-200 and Rearwin 175/Continental A75	24 November 2005
Issue 6	Further airframe/engine combination added, Binder Smaragd CP301S/C90-14F	25 th May 2007
Issue 7	Further airframe/engine combination added, Piper J4 /Cont A75, C85, C90 and O-200.	10 September 2007

Issue 8 Amendment to references in CAP 747. 18th November 2010

Issue 9 All airframe/engine combinations 7th July 2011
of Minicab GY20/GY201/201/JB-01/
Cont A65, C85, C90 and O-200 included.

Approved:



Dated: 7th July 2011

For the Light Aircraft Association
CAA Approval DAI/1172/48

DESCRIPTION

Airworthiness Notice 98C was raised in issue on 16th March 2001 to allow the use of unleaded Mogas to specification BS EN 228 in certain single engined aeroplanes powered by Continental and Lycoming engines, subject to each aircraft/engine combination having been approved for the purpose by the CAA. The CAA have agreed that in the case of an aircraft operated on a Permit to Fly issued on LAA recommendation, the LAA as a CAA approved organisation may approve airframe/engine combinations for the use of unleaded fuel under CAP 747.

This AAN is raised to describe the basis on which LAA has approved aircraft/engine combinations for this purpose and to record the aircraft /engine combinations so approved in a schedule attached as Appendix A to this AAN.

BASIS OF APPROVAL

1. Unleaded fuel to specification BS7070 is now becoming obsolete and no investigation of the use of this fuel has taken place. This Airworthiness Approval Note addresses the use of unleaded Mogas to BS EN 228 95 RON only. Unleaded fuel to BS EN 228 covers three octane rating specifications, 91, 95 and 98 RON.
2. The approach taken by the LAA has been to endorse the list of Continental-powered aircraft specified in CAP 747, Section 2, Part 4, General Concession 5, Schedule 2. This group consists of those aircraft/engine combinations previously cleared by CAP 747 for use with four star Mogas, and fitted with Continental engines suitable for use with unleaded fuel. CAA AAN 27742 refers. Additions/changes to this list are described in Appendix A.
3. Acceptance of the engines for use with unleaded Mogas to BS EN228 95 RON is on the basis of equivalence of this fuel with the US ASTM D-439 and D-4814 as cleared for use in the engines concerned by FAA approved STCs SE2029CE, SE634GL, and SE2030CE. CAA AAN 27744 refers. LAA has purchased these STCs from the STC holders and checked that there are no engine modifications required when the engines listed are operated on US unleaded Mogas fuel to ASTM D-439 and D-4814. It has also been checked that there is no significant

guidance operating information contained in the STC material which is not already covered by the LAA guidance document 'Operating Information - Unleaded Mogas' and inspection checklist 'LAA/IC-ULM-CONTINENTAL'.

4. LAA have investigated the implications of the use of unleaded fuel in aircraft by taking advice from an expert in this field, report 'Use of 95 RON Unleaded Mogas in Light Aircraft' dated 26.9.99 refers. This investigates the engine operational implications and highlights those issues relating to the airframe (in particular the fuel system) on which the use of unleaded fuel may have an impact.

In the case of aircraft fitted with engines listed in Appendix A, the recommendations of the LAA report have been addressed by issuing aircraft owners with a checklist, LAA/IC-ULM-CONTINENTAL, to be completed by their LAA inspector, calling for checks that:

- a. The engine / airframe combination is included in Appendix A to this AAN, and a standard carburettor is fitted.
 - b. The fuel system does not appear to contain features known to encourage vapour-lock such as unsecured fuel pipes or convoluted pipe routing.
 - c. The fuel system provides satisfactory means of sampling and draining fuel from each tank.
 - d. The fuel system does not appear to contain rubber or plastic components (including seals, pipes, and fuel tanks) which are likely to be attacked by components of unleaded fuel.
 - e. A placard has been fitted in the cockpit stating the additional limitations applicable and giving guidance for unleaded fuel use.
5. In addition, owners of the aircraft concerned have been instructed to observe all the operating requirements and safety precautions described in the appropriate CAP 747 by issuing them with a document, 'Operating Information - Unleaded Mogas'.

ADDITIONAL LIMITATIONS

In addition to those stated on the Permit to Fly 'Operating Limitations sheet', when operated using unleaded fuel in accordance with CAP 747, in order to reduce the risk of engine failure through fuel vapour-formation the aircraft must be operated in compliance with the following operating limitations, which shall be displayed in the cockpit by means of a clear placard:

Tank fuel temperature not to exceed 20 degrees C

Aircraft not to be operated in excess of 6000 ft altitude.

These additional limitations are imposed on the basis that the same limitations were applied to the use of leaded Four-Star Mogas under CAP 747, and the vapour pressure and hence tendency

to vapour-formation of unleaded Mogas to BS EN 228 is similar to that of leaded Four-Star Mogas. In order that aircraft operating on unleaded Mogas continue the safe operational record which has been accumulated with four-star fuel in LAA aircraft since its introduction by AN 98 and 98A,

in the absence of any further testing or substantiation of relaxed operating limitations it is considered necessary to apply these height and fuel tank temperature limitations as previously applied to four-star fuel.

DOCUMENTATION

LAA Inspectors acting on behalf of the owners of aircraft concerned must identify the aircraft and engine logbooks with the following wording and sign and date the logbooks and checklist accordingly, once they are satisfied that all the requirements of the checklist have been complied with:

'With effect from (date) this (aircraft / engine) may be run on unleaded petrol to BS EN 228, 95 RON 'Premium Unleaded' in accordance with CAP 747'.

The above wording has been agreed by the CAA.

In addition, owners of the aircraft concerned have been instructed to keep records of the unleaded fuel purchases in a manner acceptable to the CAA.

APPROVAL

The aircraft/engine combinations listed in the Schedule attached as Appendix A to this AAN are approved for use with 95 RON 'Premium Unleaded' Mogas fuel to BS EN 228 in accordance with CAP 747 subject, for each individual aircraft, to the satisfactory completion of the inspection checklist LAA/IC-ULM-CONTINENTAL described above.

Date: 18th November 2010

Approved:

For the Light Aircraft Association
CAA Approval Number DAI/1172/48

APPENDIX A

The following engine/airframe combinations may be approved for the use of unleaded Mogas fuel to EN228 95 RON under CAP 747, using the procedures described in this Airworthiness Approval Note.

Continental A50 engine when fitted to the aircraft below:

Porterfield CP50

Continental A65 engine when fitted to the aircraft below:

AERONCA 7AC
AERONCA 11AC
BABY LAKES
BROCHET MB84
DRUINE TURBI
EVANS VP2
JODEL D112
LUSCOMBE 8A
MINICAB GY20, GY201, 201, JB-01
NORD NC854, 854S, 858S
PAZMANY PL4A
PIETENPOL AIRCAMPER
PIPER J2, J3C, L4
PIPER J4A
PIPER PA15, PA17
SHIELD XYLA
TAYLORCRAFT BC12D

Continental A75 engine when fitted to the aircraft below:

AERONCA 7AC
AERONCA 11AC
AUSTER D5/J2
AUSTER D5/JSA
FOKKER E III REPLICA
PIPER J3C, PIPER L4, PIPER J4
REARWIN 175
STITS PLAYBOY

Continental C75 engine when fitted to the aircraft below:

AUSTER 5J2 ARROW
DRUINE TURBI
EAA BIPLANE
MANNING FLANDERS

Continental C85 engine when fitted to the aircraft below

AERONCA L16
AERONCA 7BCM
AERONCA 11AC, 11BC, 11CC
ERONCA 7ACA
CESSNA 120
LUSCOMBE 8E
MIDGET MUSTANG
MINICAB GY20, GY201, 201, JB-01
PIETENPOL AIRCAMPER (gravity fed)
PIPER J2, J3C, J4, L4A
PIPER PA15, PA17
SIPA 91, 901, 902, 903
TAYLORCRAFT BC12D
TAYLOR TITCH

Continental C90 or O-200 when fitted to the aircraft below:

AERONCA 7FC
ANDREASSON BA 4B
AUSTER 5J4/100
BINDER SMARAGD CP301S* (*Placard must be fitted to instrument panel-
'take off, initial climb and landing on
front tank only')

BOLKOW JUNIOR
CASSUTT RACER IIIM
CESSNA 120
COATES SWALESONG
COSMIC WIND
DRUINE CONDOR
FALCONAR F11
FOURNIER RF6B-100
ISAACS SPITFIRE
JODEL D11
JODEL D117
JODEL D119
JODEL D120
JODEL 150
JODEL 1050* (*Placard must be fitted to instrument panel - 'take
off initial climb and landing on front tank only')

JURCA TEMPETE
KITTIWAKE 1
KITTIWAKE 2
LUSCOMBE 8E, 8F
LUTON DUET
MINICAB GY20, GY201, 201, JB-01
MIDGET MUSTANG
MORANE 'N' REPLICAS
NORD NC 854, 854S, 858S
PIEL EMERAUDE* (*Placard must be fitted to instrument panel - 'take
PIEL CP301A* off, initial climb and landing on front tank only')

PIEL CP301B*
PIEL CP301C*
PIETENPOL AIRCAMPER (gravity fed)
PIPER J2, J3C, J4, L4A
PIPER J5
PIPER PA15
PIPER PA17
PIPER L18C
REPLICA PLANS SE5A
REPLICA WAR SEA FURY
REPLICA WAR FW190
ROLLASON BETA
RUTAN VARIEZE
SCINTEX CP1310-C2, -C3
SCINTEX CP1310
SIPA 91, 901, 902, 903
SOPWITH TABLOID
STINSON HW-75
STOLP STARLET
STOLP V STAR
STOREY TSR3
TAYLORCRAFT PLUS D
TAYLORCRAFT F19
TAYLOR TITCH
VOLMER SPORTSMAN
WITTMAN TAILWIND

Changes introduced at issue 2:

Porterfield CP50/Continental A50 added. G-AFZL has successfully participated in the LAA Mogas trials, and is fitted with a simple gravity-fed fuel system. The use of Mogas in the Continental A50 engine is covered by EAA and Petersen STCs in the USA.

Druine Turbi/Continental C75 added. G-APBO has successfully participated in the LAA Mogas trials, and is fitted with a gravity-fed fuel system. The C75 engine is already cleared for Mogas use when installed in other airframes.

Piper PA15/Continental A65 added. G-BRSX has successfully participated in the LAA Mogas trials, and is fitted with a gravity fed fuel system. The A65 was already cleared for Mogas use in the PA17 which has an identical engine installation and fuel system.

Piper PA15/Continental C85 added. The PA15 is fitted with a gravity-fed fuel system. The C85 was already cleared for Mogas use in the Piper PA17, which has an identical engine installation and fuel system.

Aeronca 7FC/Continental C90 added, previously incorrectly included as Aeronca 7FC/Continental A75. Correction of historical clerical error.

Taylorcraft BC12D/Continental C85 added. G-BPPZ has successfully participated in the LAA Mogas trials, and is fitted with a simple gravity-fed fuel system. Airframe already cleared for Mogas when using Continental A65 engine.

Minicab GY20/JB-01 previously read GY30/JB-01, correction of previous clerical error.

Scintex CP1310-C3/Continental C90/O-200 added, to clarify the fact that this was previously considered one of the CP1310 range.

Stinson HW75/Continental C90/O-200 added, aircraft has a simple gravity feed fuel system and is cleared for Mogas use by EAA STC.

Luscombe 8E / Continental C90/O-200 added. Luscombe 8F already cleared for Mogas use when using these engines, 8E model with C90/O-200 has an identical engine and fuel system installation to 8F.

Changes introduced at issue 3:

Pietenpol Aircamper with A65, C85 or C90/O-200 Continental added, aircraft has a simple gravity fed fuel system.

Piper L4 with Continental A75 added. Aircraft has a simple gravity fed fuel system, and is already cleared for Mogas use with other Continental type engines.

Aeronca 11AC and 11BC added with Continental C85 engine. Aircraft has simple gravity-fed fuel system.

Changes introduced at issue 4:

Aeronca 11AC with Continental A75 engine added. Airframe previously cleared with A65 engine fitted, negligible change in A75 installation. Simple gravity fed fuel system fitted.

Changes at issue 5:

Rearwin 175 with Continental A75 engine and Piper J5 with Continental O-200 added. Both have simple gravity fed fuel systems.

Changes at issue 6:

Binder Smaragd CP301S with Continental C90-14F engine added. Fuel system similar to Piel CP301A, CP301B and CP301C.

Changes at issue 7:

Piper J4 with Continental A75, C85, C90 and O-200 engines added. Simple gravity fed fuel system fitted.

Changes at issue 8:

References to Airworthiness Notice AN98C replaced with CAP 747.

Changes at issue 9:

All combinations of Minicab GY20, GY201, 201 and JB-01 with Continental A65, C85, C90 and O-200 engines now cleared. Simple gravity fed fuel system fitted.

NOTES:

1. The approval conferred by this document applies only to aircraft operating on the basis of a Permit to Fly, 'A conditions' or 'B conditions' approval on LAA recommendation.
2. Aircraft/engine combinations as listed above may be approved for use with BS EN 228 'Premium Unleaded' of 95 RON, in accordance with CAP 747, subject to satisfactory inspection and completion of inspection checklist LAA/IC-ULM-CONTINENTAL and annotation of the aircraft and engine logbooks accordingly by the LAA inspector.
3. LAA inspectors are only acceptable for carrying out this task if their LAA approval includes the ability to carry out LAA Permit renewal inspections of the aircraft concerned.

APPROVED:



DATED:

7th July 2011

For the Light Aircraft Association
CAA APPROVAL REFERENCE DAI/1172/48