

GC No. 7 Use of Unleaded Aviation Gasoline (Avgas) UL 91 in Annex I Aircraft

I Applicability

- 1.1 This Concession is applicable only to aircraft defined in Annex I of Regulation (EU) 2018/1139 (as amended), known as 'Annex I aircraft' or 'non-EASA aircraft'. For EASA-regulated aircraft, reference should be made to EASA CS-STAN, Subpart B, CS-SC202.

NOTE: Owners of aircraft under the airworthiness administration of the LAA may use LAA Airworthiness Approval Notice LAA-999-413 supplement 5 (or later) as an approval to use UL 91, subject to the conditions stated therein.

2 Introduction

- 2.1 Because of the difficulties experienced in obtaining Aviation Gasoline (Avgas), particularly in small quantities, and the ready availability of Motor Gasoline (Mogas), CAA was asked to consider permitting the use of Mogas in general aviation aircraft. This was granted under the auspices of Generic Concessions (GCs) 2, 3, 4 and 5, published in CAP 747 (previously Airworthiness Notices 98, 98A, 98B and 98C), which allow microlights and certain light aircraft to use Mogas, subject to the conditions therein.
- 2.2 Since the publication of these documents, the composition and properties of some Mogas fuels has changed and it is becoming increasingly difficult to obtain Mogas that does not contain any alcohol. With the exception of microlights, the use of Mogas containing alcohol is generally prohibited in aircraft.
- 2.3 This Generic Concession, by means of the attached Exemption against Article 33 of the Air Navigation Order 2016 (as amended), permits the use of a new unleaded aviation fuel, UL 91 Avgas, in Annex I aircraft, subject to the conditions stated in this Concession.

3 General

- 3.1 Unleaded Avgas UL 91 is a type of unleaded aviation fuel with similar properties to those of Avgas 100LL but without the addition of Tetraethyl Lead (TEL). The octane rating of UL 91 is broadly equivalent to BS EN228:2004 unleaded Mogas but this fuel does not contain octane boosting additives such as ethanol or ETBE, which are commonly included in Mogas.
- 3.2 The absence of Mogas additives in UL 91 eliminates material compatibility issues associated with the presence of ethanol in fuel and its effect on certain components. Additionally, aircraft operating with unleaded Avgas are not required to observe the maximum altitude and fuel temperature restrictions placed upon aircraft operating with Mogas.
- 3.3 As an aviation fuel, the production and delivery of UL 91 is subject to stringent quality control procedures in order to protect the fuel from contamination and to maintain its quality and traceability. Additionally, the Air Navigation Order (ANO) places obligations on the managers of aviation fuel installations at aerodromes and personnel carrying out refuelling to apply procedures to maintain the quality of the fuel.
- 3.4 It should be noted that although the CAA is satisfied that the qualifying aircraft/engines may be operated with adequate safety on UL 91, subject to the conditions stated in this Concession, the CAA takes no responsibility for infringement of the manufacturer's

warranty, accelerated deterioration of the engine or airframe components, or any other long term deleterious effects.

4 Conditions for using UL 91

- 4.1 UL 91 meets the requirements of ASTM D7547 therefore where an aircraft is already approved for operation with Avgas 100LL (according to ASTM D910, Def Stan 91-90, Mil-G-5572, GOST1012-72 or equivalent), additional approval for the use of unleaded Avgas UL 91 is required only for the engine.
- 4.2 Approval is given either by means of the manufacture confirming the acceptability of UL 91 for a particular engine type or variant or by evidence that the use of UL 91 will not be detrimental to the safe operation of the engine.
- 4.3 On the issue date of this Concession, two manufactures are known to have confirmed acceptance of UL 91 for certain products. The latest versions of the Service Instructions listed below identify which engines are approved by these manufacturers. Approval of other engines and by other manufacturers may be under review by the engine type certificate holders but has not yet been granted.
- Rotax Service Instruction SI-912-016/SI-914-019, latest revision.
 - Lycoming Service Instruction No. 1070R or later revision.
- 4.4 Engines and aircraft types approved to use unleaded Mogas RON 95 (MON 85) in accordance with Standard EN228:2008 are deemed as suitable for operation with UL 91 and are exempted from the requirements to gain approval to use this fuel in accordance with the Exemption given in Appendix 1 to this Concession.
- 4.5 Engines and aircraft types approved to use 80/87 Avgas and which do not require TEL for engine lubrication are also suitable for operation with UL 91 and are exempted from the requirements to gain approval to use this fuel in accordance with the Exemption given in Appendix 1 to this Concession.
- 4.6 If none of the above is applicable then approval to use UL 91 should be requested from the engine manufacturer in the first instance. Where the engine manufacturer no longer exists, or the engine type is no longer supported, application for approval should be made to the CAA. In order to gain approval to use UL 91, it will be necessary to demonstrate its suitability for the particular engine/airframe combination and to provide evidence that the absence of tetraethyl lead will not be detrimental to the safe operation of the engine.

5 Precautions

- 5.1 The use of UL 91 in engines that have not been approved for the use of this fuel may cause extensive damage or lead to in flight failure, due to the lower Motor Octane Number (MON) of the fuel, compared to Avgas 100LL.
- NOTE:** UL 91 is not equivalent to 91/96 Avgas.
- 5.2 Before using unleaded Avgas UL 91, it is necessary to take the following actions:
- a) Check the latest instructions of the engine type certificate holder to verify if the engine installed on their aeroplane is approved for use of unleaded Avgas UL 91;
 - b) Verify that the engine has not been modified or altered in a way that invalidates approval to use UL 91;

- c) Install on each fuel cap a label from the fuel supplier or make your own placard identifying that unleaded Avgas UL 91 is acceptable fuel for the aeroplane.

6 Reference Publications

6.1 Standards and Specifications:

- ASTM D7547 "Standard Specification for Unleaded Aviation Gasoline".
- ASTM D910 "Standard Specification for Aviation Gasoline".
- Defence Standard 91-90.
- EN 228:2008 "Automotive fuels – Unleaded petrol – Requirements and test methods".

6.2 Related Service Information of Engine Type Certificate Holders:

- Rotax Service Instruction SI-912-016/SI-914-019, latest revision.
- Lycoming Service Instruction No. 1070R or later revision.

6.3 Later revisions of these publications may be available.

Appendix I to GC No. 7 – Air Navigation Order 2009 Exemption

Superseded by [ORS4 No 1525](#)