The Two FAA Pathways to Approve Use of Unleaded Aviation Fuel

The Federal Aviation Administration (FAA) offers two pathways for unleaded aviation gasoline developers to obtain authorization to offer high-octane unleaded fuels to replace 100 low-lead (100LL).

1 The FAA Fleet Authorization

Description: The Fleet Authorization process allows eligible aircraft and aircraft engines to operate using qualified unleaded aviation gasoline (avgas) in a manner that ensures safety via the Piston Aviation Fuels Initiative (PAFI). This process was developed to meet the provisions of Section 565 of the FAA Reauthorization Act of 2018 (P.L. 115-254).

Procedure: Under PAFI, the FAA uses a combination of testing and analysis methods developed in collaboration with industry to determine if an unleaded avgas qualifies as a replacement for approved leaded avgas. The data obtained through testing will be used to support development of the ASTM production specification for the candidate fuel. FAA will determine the makes and models of type certified and non-type certificated piston aircraft and aircraft engines that can safely operate with the qualified unleaded avgas and will compile them in the Eligible Fleet Authorization Summary Report (EFASR). This will include experimental aircraft. The FAA will also issue a Special Airworthiness Information Bulleting (SAIB) and provide detailed information to accomplish the alteration necessary to enable the use of the fuel. The candidate fuel is then qualified as a replacement fuel for fleet authorization for the eligible portion of the fleet.

Type certificate applicants and holders, along with owners/operators of non-type certificated, piston powered aircraft, may refer to the data and guidance provided in the EFASR and SAIB to determine whether the fuel can be safely used with their aircraft and aircraft engines.

Owners of Special Light Sport Aircraft (SLSA) may also refer to the data and guidance provided in the EFASR and SAIB to meet the requirement specified in 14 CFR §91.327(b)(5). No additional authorization from the manufacturer is required.

Result: Upon successful completion of testing, the FAA will authorize the use of qualified unleaded avgas in aircraft and aircraft engines from the PAFI program under the Fleet Authorization process as set forth in the Summary of the Fleet Authorization Process of the FAA Policy Statement PS-AIR-600-20-01.

Data Access: The PAFI testing data is not proprietary. Therefore, the fleet authorization process provides necessary information directly to owners of aircraft with a special, restricted, or experimental airworthiness certificates, so that they can modify their aircraft appropriately to use the fuel.

Candidate fuels: Under the Fleet Authorization pathway, LyondellBasell and VP Racing are jointly developing UL100E.

For the latest on UL100E's testing status please visit flyEAGLE.org. For more information about VP racing visit VP Racing.

2 Traditional Supplemental Type Certificate (STC)/Approved Model List (AML)

Description: Type Certificate (TC) or Supplemental Type Certificate (STC) processes allow eligible aircraft and aircraft engines to operate using qualified unleaded aviation gasoline (avgas) in a manner that ensures safety via the FAA's traditional certification processes. The FAA approves modifications to an aircraft or aircraft engine's design that are not covered by the original type certificate. This includes changes to add a new fuel to the operating limitations in specific aircraft and aircraft engine models.

Procedure: Under the FAA's traditional STC/AML process, an applicant is responsible for demonstrating that the aircraft and aircraft engines meet all of the applicable regulations and minimum standards under the normal certification process when using the new unleaded fuel. The FAA reviews the compliance data provided by the applicant and issues an approval in the form of an STC.

Aircraft owners must take specific actions to implement changes to the aircraft, typically via Service Bulletins or installation of an STC.

- For aircraft with a standard airworthiness certificate, the alteration is performed by a certificated mechanic or authorized entity and must comply with the TC/STC.
- Owners of Special Light Sport Aircraft (SLSA) can implement the authorization after the SLSA aircraft manufacturer issues an authorization to do so.
- Owners of experimental aircraft must individually determine suitability for each fuel. Those owners may develop their own compatibility or solicit input from the TC/STC holder for data pertinent to their aircraft. Many experimental aircraft have engines and fuel systems in common with aircraft with standard airworthiness certificates.

Result: The applicant can sell the STC to customers enabling them to modify their individual aircraft for use of the fuel specified in the STC. The modification includes a change in the fuel placard and may require additional modifications depending on the STC.

Data Access: The STC data is considered proprietary to the applicant. Therefore, FAA does not provide the STC data directly to owners of aircraft with a special, restricted, or experimental airworthiness certificates. However, the applicant may choose to provide the necessary information to all interested parties.

Candidate fuels: Under the STC pathway, there are two unleaded fuels: G100UL developed by General Aviation Modifications, Inc. (GAMI) and 100R developed by SWIFT Fuels, LLC.

For latest information about the G100UL status, please visit GAMI.com.

For latest information about the 100R status, please visit SwiftFuels.com.