

# Clearing the Air: How Unleaded Aviation Fuel Is Gaining Approval

## Part 2: How Does an Unleaded Fuel Gain Approval Through the FAA Fleet Authorization Process?

This is the second installment in a three-part series explaining how the next generation of unleaded aviation fuels may be authorized for use in specific engines and aircraft. This segment focuses on the FAA's Fleet Authorization process, developed utilizing the Piston Aviation Fuels Initiative (PAFI) along with the use of ASTM standards. [The first installment](#) covered Supplemental Type Certificates (STC) and Approved Model List STCs (AML STCs). The final installment will discuss the critical role of industry consensus standards, such as those from ASTM International, in ensuring the safe and consistent production, distribution, and use of aviation fuels. For more information, visit: <https://flyEAGLE.org/updates/>.

### **Q: What is the FAA Fleet Authorization process, and why is it important to pilots and aircraft owners?**

Pilots and aircraft owners should be aware that the Fleet Authorization process will result in the FAA, through PAFI, authorizing a qualified unleaded fuel for use in aircraft and aircraft engines. 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 will be compiled and published by the FAA in a document called the Eligible Fleet Authorization Summary Report (EFASR). EAGLE highlighted the FAA's Fleet Authorization process in a [recent Fact Sheet](#).

### **Q: How does the Fleet Authorization process work?**

Under the [Fleet Authorization process](#), the FAA collaborates with industry partners to conduct comprehensive testing of candidate unleaded fuels. This includes evaluating the fuel's compatibility with various aircraft materials, engines, operational environments, and supply chain components. This data, along with an approved ASTM production specification, is required for a qualified replacement fuel. Once it is qualified and the EFASR is published, the FAA will issue a Special Airworthiness Information Bulletin (SAIB) which will "identify the qualified fuel, specify the aircraft and engines eligible to use the qualified fuel, and provide references and other information to accomplish the alteration necessary to enable the use of the fuel."

It should also be noted that type certificate applicants and holders, as well as owners/operators of non-type certificated piston-powered aircraft, may refer to the EFASR and SAIB to determine whether the fuel can be safely used with their aircraft and engines. Owners of Special Light Sport Aircraft (SLSA) can also use the information provided to meet the operating limitations specified in 14 CFR §91.327(b)(5).

### **Q: What role does PAFI play in the Fleet Authorization process?**

PAFI, or the Piston Aviation Fuels Initiative, is a collaboration between the FAA, industry stakeholders, and technical experts to identify and evaluate unleaded fuel candidates. Established in 2014, PAFI defines and executes comprehensive testing protocols to ensure that candidate fuels meet necessary safety, performance, and environmental standards.

PAFI is required by the FAA to make fleet-wide authorization decisions, and it generates the technical data required to support the ASTM specification. Then, this data undergoes extensive peer review by aviation and fuel experts involved in avgas production, distribution, storage, dispensing, operation, maintenance, and aircraft usage to ensure the fuel's safety and reliability. The resulting data helps the marketplace determine whether approved fuels are viable not only for aircraft operation but also for long-term production and distribution.

**Q: How does the Fleet Authorization process compare to the STC process?**

While both the Fleet Authorization and STC processes aim to ensure safe fuel use, they differ significantly in scope and application:

**STC Process:** The STC process requires FAA approval for each aircraft and aircraft engine model. In the STC process, fuel developers work directly with the FAA to conduct required testing to collect data proving compatibility, safety, and performance for specific engines and airframes. This data is provided to the FAA for evaluation, determination of means of compliance, and authorization to approve the unleaded fuel for the requested aircraft and engines. Aircraft and engines each require their own STC. Once the fuel is authorized by the FAA, aircraft owners must then purchase the approved STC and work with a certificated mechanic to implement the required modifications.

**Fleet Authorization Process:** As stated above, the FAA, through PAFI, collaborates with industry partners to conduct comprehensive testing of candidate unleaded fuels. This includes evaluating the fuel's compatibility with various aircraft materials, engines, operational environments, and supply chain components. This data, along with an approved ASTM production specification for the unleaded fuel, is required to have a qualified replacement fuel. Once there is a qualified replacement fuel and the EFASR is published, the FAA will issue a SAIB which will "identify the qualified fuel, specify the aircraft and engines eligible to use the qualified fuel, and provide references and other information to accomplish the alteration necessary to enable the use of the fuel." This process may also require engine and other modifications to the aircraft.

**Q: Is there information available regarding the PAFI test plans, including engines, airframes, and materials that will be tested?**

Yes, this information is available at: <https://flyeagle.org/resources/>

Stay tuned for Part 3, where we will explore the role of industry consensus standards, such as those from ASTM International, in ensuring the safe, consistent production, distribution, and use of unleaded aviation fuels.

*Eliminate Aviation Gasoline Lead Emissions (EAGLE) is a comprehensive government-industry initiative involving the aviation and petroleum industries, U.S. government stakeholders, and a wide range of other constituents and interested parties. Together, they are working toward the transition to lead-free aviation fuels for piston-engine aircraft by the end of 2030, without compromising the safety or economic health of the general aviation industry. To learn more, visit: <https://flyEAGLE.org>.*