



SAIB: HQ-16-05R1

Date: August 30, 2016

SUBJ: Fuel– Grade UL94 Unleaded Aviation Gasoline

This is information only. Recommendations aren't mandatory.

Introduction

This revised Special Airworthiness Information Bulletin (SAIB) advises aircraft operators, fixed base operators, FAA repair stations, Flight Standards District Offices, and Foreign Civil Aviation Authorities, that **Grade UL94 aviation gasoline** (avgas), that meets the American Society for Testing and Materials (ASTM) International fuel specification D7547, is acceptable for use on:

1. Aircraft and engines certificated for operation with Grade UL94 avgas that meets ASTM International fuel specification D7592. Specification D7547 Grade UL94 avgas meets the same performance requirements as specification D7592 Grade UL94 avgas.
2. Aircraft and engines certificated for operation with Grade UL91 avgas that meets ASTM International fuel specification D7547. Specification D7547 Grade UL94 avgas meets or exceeds all of the performance requirements of Grade UL91 avgas, which is also specified in D7547.
3. Aircraft and engines certificated for operation with Grade 80¹ avgas. Specification D7547 Grade UL94 avgas meets or exceeds all of the performance requirements of Grade 80 avgas that was utilized to certify the existing aircraft and engines approved for that fuel.

This revision adds additional information to the Introduction, Background, and Recommendations paragraphs.

Background

The FAA collaborates with ASTM International to develop fuel specifications that applicants may designate as operating limitations for their approved products. These aviation fuel operating limitations may be listed in the product's Type Certificate Data Sheet (TCDS), installation manual, service instructions, or as limitations associated with a Supplemental Type Certificate (STC).

ASTM International specification D7547 was originally issued with only Grade UL91 avgas. This specification was recently revised to add Grade UL94 avgas. The properties of Grade UL94 avgas in specification D7547 are identical to those in specification D7592. Therefore, specification D7547 Grade UL94 avgas meets the operating limitations of aircraft and engines approved to operate with Grade UL94 avgas that meets specification D7592.

Grade UL94 avgas is identical to Grade UL91 avgas except that the minimum motor octane number (MON) for Grade UL94 avgas is higher than the minimum MON specified for Grade UL91 avgas. A minimum MON of 91 is specified for Grade UL91 avgas and a minimum MON of 94 is specified for

¹ Operating limitations may specify grade 80 avgas in various forms including "grade 80/87", "80 minimum", "80/87", "80", or "80 octane fuel or lower grades".

Grade UL94 avgas. The minimum MON of Grade UL94 avgas exceeds the minimum MON requirement of Grade UL91 avgas and therefore Grade UL94 avgas meets the operating limitations of aircraft and engines approved to operate with Grade UL91 avgas.

The FAA collaborated with industry on the ASTM International task force that evaluated data supporting the incorporation of Grade UL94 avgas into specification D7547. We determined that specification D7547 Grade UL94 avgas is identical to specification D7592 Grade UL94 avgas. We also determined that Grade UL94 avgas meets or exceeds all of the performance requirements of Grade UL91 and will perform identically in aircraft and engines approved to operate with Grade UL91 avgas.

Both Grade UL94 avgas and UL91 avgas meet the requirements of the operating limitations of aircraft and engines approved to operate with Grade 80 avgas. The key performance properties of Grade 80 avgas as specified in ASTM International standard D910 are identical to or are exceeded by those specified in ASTM D7547 for UL91 and UL94. A minimum MON of 80 is specified for Grade 80 avgas and a minimum MONs of 94 and 91 are specified for Grades UL94 and UL91 avgas, respectively. Because the minimum MONs of Grades UL94 and UL91 avgas exceed the minimum MON requirement of Grade 80 avgas, Grades UL94 and UL91 avgas meet the operating limitations of aircraft and engines approved to operate with Grade 80 avgas.

These limitations are summarized in Table 1.

Table 1

Fuel Grade	ASTM International Specification	Acceptable for use in Aircraft/Engine Approved for UL91?	Acceptable for use in Aircraft/Engine Approved for UL91 and UL94?	Acceptable for use in Aircraft/Engine Approved for UL94, but not UL91?	Acceptable for use in Aircraft/Engine Approved for Grade 80?
UL91	D7547	Yes	Yes	No	Yes
UL94	D7547	Yes	Yes	Yes	Yes
UL94	D7592	Yes	Yes	Yes	Yes

Recommendations

Since Grade UL94 avgas that meets ASTM International specification D7547 is identical to Grade UL94 avgas that meets ASTM International specification D7592; and Grade UL94 avgas meets or exceeds the performance requirements of Grade UL91 avgas that meets specification D7547, and Grades UL94 and UL91 avgas meet the requirements of the operating limitations of aircraft and engines approved to operate with Grade 80 avgas, the following recommendations apply:

1. Grade UL94 avgas that meets specification D7547 is acceptable to use on those aircraft and engines that are approved to operate with Grade UL94 avgas that meets specification D7592, Grade UL91 avgas that meets specification D7547, or Grade 80 avgas.
2. Aircraft flight manuals, pilot operating instructions, TCDS, or STC limitations that specify Grade UL94 avgas that meets specification D7592, Grade UL91 avgas that meets specification D7547, or Grade 80 as operating limitations are acceptable for use with Grade UL94 avgas that meets specification D7547.

3. Grade UL94 avgas that meets specification D7547 is acceptable for use on aircraft equipped with placards that specify Grade UL94 avgas that meets specification D7592, Grade UL91 avgas that meets specification D7547, or Grade 80 avgas.
4. Operating, maintenance, or other service documents for aircraft and engines that are approved to operate with Grade UL94 avgas that meets specification D7592, Grade UL91 avgas that meets specification D7547, or Grade 80 avgas, are acceptable for use with Grade UL94 avgas that meets specification D7547.
5. There are no additional or revised maintenance actions, inspections, or service requirements necessary when operating with Grade UL94 avgas that meets specification D7547 on aircraft and engines that are approved to operate with Grade UL94 avgas that meets specification D7592, Grade UL91 avgas that meets specification D7547, or Grade 80 avgas.

For Further Information Contact

Mark Rumizen, AIR-20, 12 New England Executive Park, Burlington, MA 01803; phone: 781-238-7113; fax: 781-238-7199; email: mark.rumizen@faa.gov.