



Designation: D909 – 16

Method 6012.6—Federal Test
Method Standard No. 791b



Designation: 119/96

Standard Test Method for Supercharge Rating of Spark-Ignition Aviation Gasoline¹

This standard is issued under the fixed designation D909; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope*

1.1 This laboratory test method covers the quantitative determination of supercharge ratings of spark-ignition aviation gasoline. The sample fuel is tested using a standardized single cylinder, four-stroke cycle, indirect injected, liquid cooled, CFR engine run in accordance with a defined set of operating conditions.

1.2 The supercharge rating is calculated by linear interpolation of the knock limited power of the sample compared to the knock limited power of bracketing reference fuel blends.

1.3 The rating scale covers the range from 85 octane number to Isooctane + 6.0 mL TEL/U.S. gal.

1.4 The values of operating conditions are stated in SI units and are considered standard. The values in parentheses are the historical inch-pound units. The standardized CFR engine measurements and reference fuel concentrations continue to be in historical units.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* Specific precautionary statements are given in **Annex A1**.

2. Referenced Documents

2.1 ASTM Standards:²

D1193 Specification for Reagent Water

D2268 Test Method for Analysis of High-Purity *n*-Heptane and Isooctane by Capillary Gas Chromatography

¹ This test method is under the jurisdiction of ASTM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee D02.01 on Combustion Characteristics.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

D3237 Test Method for Lead in Gasoline by Atomic Absorption Spectroscopy

D3341 Test Method for Lead in Gasoline—Iodine Monochloride Method

D4057 Practice for Manual Sampling of Petroleum and Petroleum Products

D4175 Terminology Relating to Petroleum Products, Liquid Fuels, and Lubricants

D5059 Test Methods for Lead in Gasoline by X-Ray Spectroscopy

E344 Terminology Relating to Thermometry and Hydrometry

E456 Terminology Relating to Quality and Statistics

2.2 CFR Engine Manuals:³

CFR F-4 Form 846 Supercharge Method Aviation Gasoline Rating Unit Installation Manual

CFR F-4 Form 893 Supercharge Method Aviation Gasoline Rating Unit Operation & Maintenance

2.3 Energy Institute Standard:⁴

IP 224/02 Determination of Low Lead Content of Light Petroleum Distillates by Dithizone Extraction and Colorimetric Method

2.4 ASTM Adjuncts:

Rating Data Sheet⁵

Reference Fuel Framework Graphs⁶

3. Terminology

3.1 Definitions:

3.1.1 *accepted reference value, n*—a value that serves as an agreed-upon reference for comparison, and which is derived as: (1) a theoretical or established value, based on scientific principles, or (2) an assigned or certified value, based on

³ Available from CFR Engines, Inc., N8 W22577, Johnson Dr., Pewaukee, WI 53186.

⁴ Available from Energy Institute, 61 New Cavendish St., London, WIG 7AR, U.K.

⁵ Available from ASTM International Headquarters. Order Adjunct No. **ADJD090901**. Original adjunct produced in 1953.

⁶ Available from ASTM International Headquarters. Order Adjunct No. **ADJD090902**. Original adjunct produced in 1953.

*A Summary of Changes section appears at the end of this standard