



Designation: D 4859 – 97

An American National Standard

Standard Specification for Lubricants for Two-Stroke-Cycle Spark-Ignition Gasoline Engines-TC¹

This standard is issued under the fixed designation D 4859; 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 Department of Defense.

1. Scope

1.1 This specification covers lubricants intended for use in two-stroke-cycle spark-ignition gasoline engines, typically other than outboard motors, that are particularly prone to ring sticking, but which are also liable to suffer damage arising from deposit induced preignition, piston scuff, spark plug fouling and piston varnish.

1.2 The values stated in SI units are to be regarded as the standard. The values given in parentheses are for information only.

2. Referenced Documents

2.1 ASTM Standards:

D 445 Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity)²

D 664 Test Method for Acid Number of Petroleum Products by Potentiometric Titration²

D 874 Test Method for Sulfated Ash from Lubricating Oils and Additives²

D 2270 Practice for Calculating Viscosity Index from Kinematic Viscosity at 40° and 100°C²

D 2896 Test Method for Base Number of Petroleum Products by Potentiometric Perchloric Acid Titration²

D 4857 Test Method for Determination of the Ability of Lubricants to Minimize Ring Sticking and Piston Deposits in Two-Stroke-Cycle Gasoline Engines Other Than Outboards³

D 4858 Test Method for Determination of the Tendency of Lubricants to Promote Preignition in Two-Stroke-Cycle Gasoline Engines³

D 4863 Test Method for Determination of Lubricity of Two-Stroke-Cycle Gasoline Engine Lubricants³

2.2 Coordinating European Council (CEC) Standard:

CEC L-19-T-77 The Evaluation of the Lubricity of Two-Stroke Engine Oils⁴

3. Terminology

3.1 Definitions:

3.1.1 *cold sticking—of piston rings*, a condition in which the ring is free in its groove while the engine is running but stuck when the piston is cold, normally indicated by the absence of varnish or other deposits on the outer face of the ring and of signs of blowby on the piston skirt. **D 4857**

3.1.2 *combustion chamber—in reciprocating internal combustion engines*, the volume bounded by the piston crown and any portion of the cylinder walls extending above the piston crown when in the top dead center position, and the inner surface of the cylinder head including any spark plugs and other inserted components. **D 4858**

3.1.3 *hot sticking—of piston rings*, a condition in which the ring is stuck in its groove while the engine is running, normally indicated by varnish or other deposits on the outer face of the ring, by signs of blowby on the piston skirt, or both. **D 4857**

3.1.4 *lubricity*—a qualitative term describing the ability of a lubricant to minimize friction between and damage to surfaces in relative motion under load. **D 4863**

3.1.5 *preignition—in a spark-ignition engine*, ignition of the mixture of fuel and air in the combustion chamber before the passage of the spark. **D 4858**

3.1.6 *scuff, scuffing—in lubrication*, damage caused by instantaneous localized welding between surfaces in relative motion which does not result in immobilization of the parts. **D 4863**

3.1.7 *seizure—in lubrication*, welding between surfaces in relative motion that results in immobilization of the parts. **D 4863**

3.1.8 *spark plug fouling*—deposition of essentially nonconducting material onto the electrodes of a spark plug that may, but will not necessarily, prevent the plug from operating. **D 4857**

3.1.9 *spark plug whiskering, or spark plug bridging*—a deposit of conductive material on the spark plug electrodes

¹ This specification is under the jurisdiction of ASTM Committee D-2 on Petroleum Products and Lubricants and is the direct responsibility of Subcommittee D02.B on Automotive Lubricants.

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² *Annual Book of ASTM Standards*, Vol 05.01.

³ *Annual Book of ASTM Standards*, Vol 05.02.

⁴ Order from the Coordinating European Council, 61 New Cavendish Street, London, W1M 8AR, England.