



Standard Test Method for Evaluation of Automotive Engine Oils in the CRC L-38 Spark-Ignition Engine¹

This standard is issued under the fixed designation D 5119; 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.

INTRODUCTION

The test method described in this standard can be used by any properly equipped laboratory without the assistance of anyone not associated with that laboratory. However, the ASTM Test Monitoring Center (TMC)² offers a very valuable service to a test laboratory; the Center provides reference oils and an assessment of the test results obtained on those oils by the laboratory (see Appendix X1). By this means, the laboratory will know whether their use of the test method gives results statistically similar to those obtained by other laboratories. Furthermore, various agencies require that a laboratory utilize the TMC services in seeking qualification of oils against specifications. For example, the U.S. Army imposes such a requirement, in connection with several Army lubricant specifications.

Accordingly, this test method is written for use by laboratories that utilize the TMC services. Laboratories that choose not to use those services may simply ignore those portions of the test method that refer to the TMC. This test method may be modified by means of Information Letters issued by the TMC. In addition, the TMC may issue supplementary memoranda related to the test method (see Annex A4).

1. Scope

1.1 This engine oil test method covers the evaluation of automotive engine oils (SAE³ grades 5W 10W, 20, 30, 40, and 50, and multiviscosity grades) intended for use in either spark-ignition gasoline engines, or in diesel engines. The test procedure is conducted using a carbureted, spark-ignition Cooperative Lubrication Research (CLR) Oil Test Engine (referred to as the L-38 engine in this test method). An oil is evaluated for protection against engine and oil deterioration under high-temperature, heavy-duty service conditions. The test method can also be used to evaluate the viscosity stability of multiviscosity-graded oils.

1.2 The two measures of engine deterioration used in this test method are (1) weight loss of copper-lead bearings used in the test power section, and (2) varnish and sludge deposits on power section parts.

1.3 The two measures of oil deterioration used in this test method are (1) the change in the acid number of the oil, and (2) the change in the viscosity of the oil during the test period.

1.4 Correlation of test results with those obtained in automotive service has not been established. Furthermore, the results obtained in this test method are not necessarily indicative of results that will be obtained in a full-scale automotive spark-ignition or compression-ignition engine, or in an engine operated under conditions different from those of the test method. The test can be used to compare one oil with another.

¹ This test method is under the jurisdiction of ASTM Committee D02 on Petroleum Products and Lubricants and is the direct responsibility of Subcommittee D02.B0.01 on Passenger Car Engine Oils.

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The procedure, originally developed by the Coordinating Research Council, was published as Federal Test Method 3405.2, Oxidation of Crankcase Lubricating Oils (CLR Engine), 1972. In 1980, it was published as *ASTM STP 509A*, Part IV Labeco L-38 Test Method.

² ASTM Test Monitoring Center, 6555 Penn Ave., Pittsburgh, PA 15206-4489. This edition includes all Information Letters through No. 31.

³ Available from Society of Automotive Engineers (SAE), 400 Commonwealth Dr., Warrendale, PA 15096-0001.

NOTE 1—Companion test methods used to evaluate engine oil performance for specification requirements include the following current versions of single-cylinder and multicylinder engine tests:

*ASTM STP 509A, Single Cylinder Engine Tests for Evaluating the Performance of Crankcase Lubricants*⁴

Part I, Caterpillar 1G2 Test Method

Part II, Caterpillar 1H2 Test Method

*ASTM STP 315H, Multicylinder Test Sequences for Evaluating Engine Oils*⁴

⁴ Available from ASTM International Headquarters.