Designation: D5500 – 98 (Reapproved 2008)

Standard Test Method for Vehicle Evaluation of Unleaded Automotive Spark-Ignition Engine Fuel for Intake Valve Deposit Formation[1]

This standard is issued under the fixed designation D5500; 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.

1. Scope

1.1 This test method covers a vehicle test procedure for evaluation of intake valve deposit formation of unleaded spark-ignition engine fuels. This test method uses a 1985 model BMW 318i[2] vehicle. Mileage is accumulated following a specified driving schedule on either public road or test track. This test method is adapted from the original BMW of North America/Southwest Research Institute Intake Valve Deposit test and maintains as much commonality as possible with the original test. Chassis dynamometers shall not be used for this test procedure as the BMW NA/SwRI IVD Test was not intended to be applicable to chassis dynamometers and no correlation between road operation and chassis dynamometers has been established.

NOTE 1—If there is any doubt as to the latest edition of Test Method D5500, contact ASTM International.

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

1.3 *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 statements on hazards are given throughout this test method.

2. Referenced Documents

2.1 *ASTM Standards:*[3]

D235 Specification for Mineral Spirits (Petroleum Spirits) (Hydrocarbon Dry Cleaning Solvent)

2.2 *ANSI Standard:*

MC 96.1 American National Standard for Temperature Measurement Thermocouples[4]

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *alternate mileage accumulation (AMA) driving cycle*, *n*—a driving schedule that is based on the U.S. Environmental Protection Agency Durability Driving Schedule, which contains various driving patterns for durability testing of emission control systems.[5]

3.1.2 *base fuel*, *n*—unleaded automotive spark-ignition engine fuel that does not contain a deposit control additive, but may contain antioxidants, corrosion inhibitors, metal deactivators, and oxygenates.

3.1.3 *deposit control additive*, *n*—material added to the base fuel to prevent or remove deposits in the entire engine intake system.

3.1.3.1 *Discussion*—For the purpose of this test method, the performance evaluation of a deposit control additive is limited to the tulip area of intake valves.

3.1.4 *driveability*, *n*—the quality of a vehicle's performance characteristics as perceived by the operator in response to changes in throttle position.

3.1.4.1 *Discussion*—The performance characteristics may include cold starting and warm-up, acceleration, vapor lock, and hot starting.

3.1.5 *intake system*, *n*—components of the engine whose function it is to prepare and deliver an air/fuel mixture to the combustion chamber and includes the throttle, intake manifold hot spot and runners, exhaust gas recirculation (EGR) and positive crankcase ventilation (PCV) ports, cylinder head runners and ports, intake valves, and fuel injectors.

3.1.6 *intake valve deposit*, *n*—material accumulated on the tulip area of the intake valve, generally composed of carbon, other fuel, lubricant, and additive decomposition products, and atmospheric contaminants.

[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.A0.01 on Gasoline and Gasoline-Oxygenate Blends.

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[2] Originally obtained from BMW NA new car dealerships in the United States as a 1985 model year vehicle, the vehicle is currently available through the used vehicle market.

[3] 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.

[4] Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

[5] Code of Federal Regulations, Title 40, Part 86, Appendix IV.

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