



Standard Test Method for Dynamometer Evaluation of Unleaded Spark-Ignition Engine Fuel for Intake Valve Deposit Formation¹

This standard is issued under the fixed designation D 6201; 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 an engine dynamometer test procedure for evaluation of intake valve deposit formation of unleaded spark-ignition engine fuels. This test uses a Ford Ranger 2.3 L four-cylinder engine. The following details the procedure, hardware, and operations used for this test.

1.2 The ASTM Test Monitoring Center (TMC)² is responsible for engine test stand certification as well as issuance of information letters after test method modifications are approved by Subcommittee D02.A and Committee D02. Users of this test method shall request copies of recent information letters from the TMC to ensure proper conduct of the test method.

1.3 The values stated in SI units are to be regarded as the standard. Approximate inch-pound units are shown in parentheses for information.

1.4 *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 applicability of regulatory limitations prior to use.* Specific precautionary statements are given throughout this test method.

1.5 This test method is arranged as follows:

Subject	Section
Scope	1
Referenced Documents	2
Terminology	3
Summary of Test Method	4
Significance and Use	5
Apparatus	6
Laboratory Facilities	6.1
Test Stand Laboratory Equipment	6.2
Test Engine Hardware	6.3
Special Measurement and Assembly Equipment	6.4
Reagents and Materials	7
Fuel	7.1
Engine Oil and Assembly Lubricant	7.2
Engine Coolant	7.3
Solvents and Cleaners	7.4
Fuel Injector Test Fluid	7.5
Valve Lapping Compound	7.6

Subject	Section
Crushed Walnut Shells	7.7
Desiccant	7.8
Hazards	8
Specific Hazards	8.1
Reference Fuel	9
Reference Base Fuel Batch Approval Process	9.1
Fuel Batch Analyses	9.2
Fuel Batch Shipment and Storage	9.3
Preparation of Apparatus	10
Test Stand Preparation	10.1
Engine Block Preparation	10.2
Preparation of Miscellaneous Engine Components	10.3
Cylinder Head Preparation	10.4
Cylinder Head Assembly	10.5
Cylinder Head Installation	10.6
Final Engine Assembly	10.7
Calibration	11
Test Stand Calibration	11.1
Instrumentation Calibration	11.2
Test Procedure	12
Pretest Procedure	12.1
Engine Operating Procedure	12.2
Periodic Measurements and Functions	12.3
End of Test Procedures	12.4
Determination of Test Results	13
Post-test Intake Valve Weighing Procedure	13.1
Photographs of Parts - General	13.2
Induction System Rating	13.3
Determination of Test Validity - Engine Conformance	13.4
Final Test Report	14
Standard Report	14.1
Data Acquisition Summary Report	14.2
Photographs of Specific Parts	14.3
Precision and Bias	15
Precision	15.1
Bias	15.2
Keywords	16

Annexes	
Detailed Specifications and Photographs of Apparatus	Annex A1
Engine Part Number Listing	Annex A2

2. Referenced Documents

2.1 ASTM Standards:

- D 86 Test Method for Distillation of Petroleum Products³
- D 235 Specification for Mineral Spirits (Petroleum Spirits) (Hydrocarbon Dry Cleaning Solvents)⁴
- D 287 Test Method for API Gravity of Crude Petroleum and Petroleum Products (Hydrometer Method)³
- D 381 Test Method for Existent Gum in Fuels by Jet Evaporation³

¹ This test method is under jurisdiction of ASTM Committee D-2 on Petroleum Products and Lubricants and is the direct responsibility of Subcommittee D02.A on Gasoline.

Current edition approved June 10, 1999. Published August 1999. Originally published as D 6201 – 97. Last previous edition D 6201 – 97.

² ASTM Test Monitoring Center, 6555 Penn Avenue, Pittsburgh, PA 15206-4489.

³ Annual Book of ASTM Standards, Vol. 05.01.

⁴ Annual Book of ASTM Standards, Vol. 06.04.