



Designation: D 6838 – 02

An American National Standard

Standard Test Method for Cummins M11 High Soot Test¹

This standard is issued under the fixed designation D 6838; 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 is commonly referred to as the Cummins M11 High Soot Test (HST). The test method defines a heavy-duty diesel engine test procedure conducted under high soot conditions to evaluate oil performance with regard to valve train wear, sludge deposits, and oil filter plugging.²

1.2 The values stated in SI units are to be regarded as the standard. The values given in parenthesis 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.* See Annex A1 for general safety precautions.

1.4 Table of Contents:

Subject	Section
Scope	1
Referenced Documents	2
Terminology	3
Summary of Test Method	4
Significance and Use	5
Apparatus	6
Test Engine Configuration	6.1
Test Engine	6.1.1
Oil Heat Exchanger, Adapter Blocks, and Block Off Plate	6.1.2
Oil Pan Modification	6.1.3
Engine Control Module	6.1.4
Air Compressor and Fuel Pump	6.1.5
Test Stand Configuration	6.2
Engine Mounting	6.2.1
Intake Air System	6.2.2
Aftercooler	6.2.3
Exhaust System	6.2.4
Fuel Supply	6.2.5
Coolant System	6.2.6
Pressurized Oil Fill System	6.2.7
External Oil System	6.2.8
Crankcase Aspiration	6.2.9
Blowby Rate	6.2.10
System Time Responses	6.3

Subject	Section
Oil Sample Containers	6.4
Mass Balance	6.5
Engine and Cleaning Fluids	7
Test Oil	7.1
Test Fuel	7.2
Engine Coolant	7.3
Solvent	7.4
Preparation of Apparatus	8
Cleaning of Parts	8.1
Crosshead Cleaning and Measurement	8.1.6
Rod Bearing Cleaning and Measurement	8.1.7
Engine Assembly	8.2
General	8.2.1
Parts Reuse and Replacement	8.2.2
Build-Up Oil	8.2.3
Coolant Thermostat	8.2.4
Oil Thermostat	8.2.5
Fuel Injectors	8.2.6
New Parts	8.2.7
Operational Measurements	8.3
Units and Formats	8.3.1
Instrumentation Calibration	8.3.2
Temperatures	8.3.3
Pressures	8.3.4
Flow Rate	8.3.5
Engine/Stand Calibration and Non-Reference Oil Tests	9
General	9.1
Calibration Configuration	9.2
New Test Stand	9.3
Engine/Stand Calibration Period	9.4
Change of Calibration Configuration	9.5
Stand Modification and Calibration Status	9.6
Test Numbering System	9.7
Reference Oil Test Acceptance	9.8
Unacceptable Reference Oil Test	9.9
Reference Oil Accountability	9.10
Non-Reference Oil Tests	9.11
Test Procedure	10
Engine Installation and Stand Connections	10.1
Coolant System Fill	10.2
Oil Fill for Break-in	10.3
Fuel Samples	10.4
Engine Warm-up	10.5
Engine Break-in	10.6
Shutdown and Maintenance	10.7
200-h Test Procedure	10.8
Oil Fill for Test	10.8.2
Zero-h Oil Sample	10.8.3.1
Operating Conditions	10.8.4
Injection Timing Change	10.8.5
%Soot Validity	10.8.6
Test Timer	10.8.7
Operational Data Acquisition	10.8.8
Oil Purge, Sample and Addition	10.8.9
Full and Drain Weight	10.8.9.2
End of Test (EOT)	10.9

¹ This test method is under the jurisdiction of ASTM Committee D02 on Petroleum Products and Lubricants and is the direct responsibility of Subcommittee D02.0B on Automotive Lubricants.

Current edition approved Nov. 10, 2002. Published February 2003.

² The ASTM Test Monitoring Center (TMC) will update changes in this test method by means of Information Letters. Information letters may be obtained from the ASTM Test Monitoring Center, 6555 Penn Ave., Pittsburgh, PA 15206-4489, Attention: Administrator.