



Designation: D5967 – 21

Standard Test Method for Evaluation of Diesel Engine Oils in T-8 Diesel Engine¹

This standard is issued under the fixed designation D5967; 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 reappraisal. A superscript epsilon (ε) indicates an editorial change since the last revision or reappraisal.

1. Scope*

1.1 This test method covers an engine test procedure for evaluating diesel engine oils for performance characteristics, including viscosity increase and soot concentrations (loading).² This test method is commonly referred to as the Mack T-8.

1.2 This test method also provides the procedure for running an extended length T-8 test, which is commonly referred to as the T-8E and an abbreviated length test, which is commonly referred to as T-8A. The procedures for the T-8E and the T-8A are identical to the T-8 with the exception of the items specifically listed in [Annex A8](#) and [Annex A9](#) respectively. Additionally, the procedure modifications listed in [Annex A8](#) and [Annex A9](#) refer to the corresponding section of the T-8 procedure.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.3.1 *Exceptions*—Where there is no direct SI equivalent such as the units for screw threads, National Pipe Threads/diameters, tubing size, sole source equipment suppliers, and oil consumption in grams per kilowatt-hour.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.* See [Annex A6](#) for specific safety precautions.

1.5 A Table of Contents follows:

Scope	1
Referenced Documents	2
Terminology	3
Summary of Test Method	4

¹ This test method is under the jurisdiction of ASTM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee D02.B0.02 on Heavy Duty Engine Oils.

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² The ASTM Test Monitoring Center will update changes in this test method by means of Information Letters. This edition incorporates revisions contained in all information letters through 21-1. Information letters may be obtained from the ASTM Test Monitoring Center, 6555 Penn Avenue, Pittsburgh, PA 15206-4489, Attention: Administrator.

Significance and Use	5
Apparatus	6
General Description	6.1
The Test Engine	6.2
Mack Test Engine	6.2.1
Engine Cooling System	6.2.2
Engine Oil System	6.2.3
Auxiliary Oil System	6.2.4
Crankcase Aspiration	6.2.5
Blowby Meter	6.2.6
Air Supply and Filtration	6.2.7
Fuel Supply	6.2.8
Intake Manifold Temperature Control	6.2.9
Engine Fluids	7
Test Oil	7.1
Test Fuel	7.2
Engine Coolant	7.3
Cleaning Materials	7.4
Preparation of Apparatus at Rebuild	8
Cleaning of Parts	8.1
Valves, Seats, Guides, and Springs	8.2
Cylinder Liner, Piston, and Piston Ring Assembly	8.3
Injectors and Injection Pump	8.4
Assembly Instructions	8.5
Measurements	8.6
Laboratory and Engine Test Stand Calibration/Non-Reference Requirements	9
Calibration Frequency	9.1
Calibration Reference Oils	9.2
Test Numbering	9.3
New Laboratories and New Test Stands	9.4
Calibrated Laboratories and Test Stands	9.5
Calibration Test Acceptance	9.6
Failing Calibration Tests	9.7
Non-Reference Oil Test Requirements	9.8
Procedure	10
Pretest Procedure	10.1
Engine Start-Up	10.2
Engine Shutdown	10.3
Test Cycle	10.4
Oil Addition/Drain	10.5
Oil Samples	10.6
Oil Consumption Calculations	10.7
Fuel Samples	10.8
Periodic Measurements	10.9
Blowby	10.10
Centrifugal Oil Filter Mass Gain	10.11
Oil Filter ΔP Calculation	10.12
Post Test	10.13
Inspection of Fuel and Oil During Test	11
Oil Inspection	11.1
Fuel Inspections	11.2
Oil Consumption	11.3
Report	12
Reporting Test Results	12.1
Deviations from Test Operational Limits	12.2
Electronic Transmission of Test Results	12.3
Plots of Operational Data	12.4

*A Summary of Changes section appears at the end of this standard

Precision and Bias	13
Precision	13.1
Bias	13.2
Keywords	14
Annexes	
Report Forms	Annex A1
Sensor Locations	Annex A2
Kinematic Viscosity At 100 °C For Test Method D5967 Samples	Annex A3
Enhanced Thermal Gravimetric Analysis (TGA) Procedure	Annex A4
Procurement of Test Materials	Annex A5
Safety Precautions	Annex A6
Data Dictionary	Annex A7
T-8E Extended Length Test Requirements	Annex A8
T-8A Abbreviated Length Test Requirements	Annex A9
Mack T-8A, T-8, and T-8E Fuel Requirements	Annex A10

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:³

- D86 Test Method for Distillation of Petroleum Products and Liquid Fuels at Atmospheric Pressure
- D93 Test Methods for Flash Point by Pensky-Martens Closed Cup Tester
- D97 Test Method for Pour Point of Petroleum Products
- D130 Test Method for Corrosiveness to Copper from Petroleum Products by Copper Strip Test
- D235 Specification for Mineral Spirits (Petroleum Spirits) (Hydrocarbon Dry Cleaning Solvent) (Withdrawn 2021)⁴
- D287 Test Method for API Gravity of Crude Petroleum and Petroleum Products (Hydrometer Method)
- D445 Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and Calculation of Dynamic Viscosity)
- D446 Specifications and Operating Instructions for Glass Capillary Kinematic Viscometers
- D482 Test Method for Ash from Petroleum Products
- D524 Test Method for Ramsbottom Carbon Residue of Petroleum Products
- D613 Test Method for Cetane Number of Diesel Fuel Oil
- D664 Test Method for Acid Number of Petroleum Products by Potentiometric Titration
- D976 Test Method for Calculated Cetane Index of Distillate Fuels
- D1319 Test Method for Hydrocarbon Types in Liquid Petroleum Products by Fluorescent Indicator Adsorption
- D2274 Test Method for Oxidation Stability of Distillate Fuel Oil (Accelerated Method)
- D2500 Test Method for Cloud Point of Petroleum Products and Liquid Fuels
- D2622 Test Method for Sulfur in Petroleum Products by

- Wavelength Dispersive X-ray Fluorescence Spectrometry
- D2709 Test Method for Water and Sediment in Middle Distillate Fuels by Centrifuge
- D4052 Test Method for Density, Relative Density, and API Gravity of Liquids by Digital Density Meter
- D4175 Terminology Relating to Petroleum Products, Liquid Fuels, and Lubricants
- D4294 Test Method for Sulfur in Petroleum and Petroleum Products by Energy Dispersive X-ray Fluorescence Spectrometry
- D4485 Specification for Performance of Active API Service Category Engine Oils
- D4737 Test Method for Calculated Cetane Index by Four Variable Equation
- D5185 Test Method for Multielement Determination of Used and Unused Lubricating Oils and Base Oils by Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES)
- D5453 Test Method for Determination of Total Sulfur in Light Hydrocarbons, Spark Ignition Engine Fuel, Diesel Engine Fuel, and Engine Oil by Ultraviolet Fluorescence
- D6278 Test Method for Shear Stability of Polymer Containing Fluids Using a European Diesel Injector Apparatus
- D7422 Test Method for Evaluation of Diesel Engine Oils in T-12 Exhaust Gas Recirculation Diesel Engine
- E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications
- 2.2 SAE Standard:⁵
- SAE J1995 Engine Power Test Code—Spark Ignition and Compression Ignition—Gross Power Rating

3. Terminology

3.1 Definitions:

- 3.1.1 *blind reference oil, n*—a reference oil, the identity of which is unknown by the test facility. **D4175**
- 3.1.2 *blowby, n*—in internal combustion engines, that portion of the combustion products and unburned air/fuel mixture that leaks past piston rings into the engine crankcase during operation.
- 3.1.3 *calibrate, v*—to determine the indication or output of a device (e.g., thermometer, manometer, engine) with respect to that of a standard.
- 3.1.4 *heavy-duty, adj*—in internal combustion engine operation, characterized by average speeds, power output, and internal temperatures that are close to the potential maximums. **D4485**
- 3.1.5 *heavy-duty engine, n*—in internal combustion engine types, one that is designed to allow operation continuously at or close to its peak output.
- 3.1.6 *non-reference oil, n*—any oil other than a reference oil; such as a research formulation, commercial oil, or candidate oil. **D4175**
- 3.1.7 *non-standard test, n*—a test that is not conducted in conformance with the requirements in the standard test

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 The last approved version of this historical standard is referenced on www.astm.org.

⁵ Available from Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096-0001.