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Standard Test Method for Measurement of Oil Consumption, Piston Deposits, and Wear in a Heavy-Duty High-Speed Diesel Engine—NTC-400 Procedure¹

This standard is issued under the fixed designation D 5290; 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 evaluates the performance of lubricants intended for use in heavy-duty diesel engines with a maximum rated speed in excess of about 2000 r/min, primarily in terms of oil consumption. Engine wear and piston deposits are also evaluated.

1.2 The values stated either in inch-pound or SI units are to be regarded separately as the standard. Within the text the SI units are shown in parentheses. The values stated in each system are not necessarily exact equivalents; therefore, use either system independently of the other. Combination of values from the two systems may result in non-conformance to specification.

NOTE 1—Because the engine used in this test method is designed to inch-pound units the SI conversions given are exact within normal tolerance. When converting dimensions given in drawings or shop manuals, use 1 in. = 25.40 mm, which is exact.

1.3 *This standard does not purport to address all of the safety problems, 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 precautionary statements are given in Note 2.*

2. Referenced Documents

2.1 ASTM Standards:

- D 86 Test Method for Distillation of Petroleum Products²
- D 93 Test Methods for Flash Point by Pensky-Martens Closed Tester²
- D 97 Test Methods for Pour Point of Petroleum Oils²
- D 129 Test Method for Sulfur in Petroleum Products (General Bomb Method)²
- D 130 Method for Detection of Copper Corrosion from Petroleum Products by the Copper Strip Tarnish Test²
- D 235 Specification for Mineral Spirits (Petroleum Spirits) (Hydrocarbon Dry Cleaning Solvents)²
- D 287 Test Method for API Gravity of Crude Petroleum and Petroleum Products (Hydrometer Method)²

- D 445 Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity)²
- D 482 Test Method for Ash from Petroleum Products²
- D 524 Test Method for Ramsbottom Carbon Residue of Petroleum Products²
- D 613 Test Method for Ignition Quality of Diesel Fuels by the Cetane Method³
- D 664 Test Method for Neutralization Number by Potentiometric Titration²
- D 1266 Test Method for Sulfur in Petroleum Products (Lamp Method)²
- D 1298 Test Method for Density, Relative Density (Specific Gravity), or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method²
- D 1319 Test Method for Hydrocarbon Types in Liquid Petroleum Products by Fluorescent Indicator Adsorption²
- D 1796 Test Method for Determination of Water and Sediment in Fuel Oils by the Centrifuge Method (Laboratory Procedure)²
- D 2425 Test Method for Hydrocarbon Types in Middle Distillates by Mass Spectrometry⁴
- D 2500 Test Method for Cloud Point of Petroleum Oils⁴
- D 2622 Test Method for Sulfur in Petroleum Products (X-Ray Spectrographic Method)⁴
- D 2887 Test Method for Boiling Range Distribution of Petroleum Fractions by Gas Chromatography⁴
- D 3117 Test Method for Wax Appearance Point of Distillate Fuels⁴
- D 3431 Test Method for Trace Nitrogen in Liquid Petroleum Hydrocarbons (Microcoulometric Method)⁴
- D 3524 Test Method for Diesel Fuel Diluent in Used Diesel Engine Oils by Gas Chromatography⁴
- D 3701 Test Method for Hydrogen Content of Aviation Turbine Fuels by Low Resolution Nuclear Magnetic Resonance Spectrometry⁵
- D 4485 Performance Specification for Automotive Engine Oils⁵
- D 4739 Test Method for Base Number Determination by Potentiometric Titration⁵
- D 4863 Test Method for Determination of the Lubricity of Two-Stroke Gasoline Engine Lubricants⁵
- G 40 Terminology Relating to Erosion and Wear⁶

¹ This specification is under the jurisdiction of ASTM Committee D-2 on Petroleum Products and Lubricants and is the direct responsibility of Subcommittee D02.0B on Automotive Lubricants.

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² Annual Book of ASTM Standards, Vol 05.01.

³ Annual Book of ASTM Standards, Vol 05.04.

⁴ Annual Book of ASTM Standards, Vol 05.02.

⁵ Annual Book of ASTM Standards, Vol 05.03.

⁶ Annual Book of ASTM Standards, Vol 03.02.