



Standard Specification for Performance of Manual Transmission Gear Lubricants¹

This standard is issued under the fixed designation D 5760; 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.

^{ε1} NOTE—Table 1 was corrected editorially in December 1995.

1. Scope

1.1 This specification lists the test methods and acceptance criteria for determining the acceptability of lubricants used in nonsynchronized heavy duty manual transmission.

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

2. Referenced Documents

2.1 ASTM Standards:

- D 130 Test Method for Detection of Copper Corrosion from Petroleum Products by the Copper Strip Tarnish Test²
- D 892 Test Method for Foaming Characteristics of Lubricating Oils²
- D 5182 Test Method for Evaluating the Scuffing (Scoring) Load Capacity of Oils³
- D 5579 Test Method for Evaluating the Thermal Stability of Manual Transmission Lubricants In a Cyclic Durability Test⁴
- D 5662 Test Method for Determining Automotive Gear Oil Compatibility with Typical Oil Seal Elastomers⁴
- D 5704 Test Method for Evaluation of the Thermal and Oxidative Stability of Lubricants Used for Manual Transmissions and Final Drive Axles⁴

2.2 Federal Standards:⁵

- Federal Standard No. 791C, Method 3430.2 Compatibility Characteristics of Universal Gear Lubricants⁶
- Federal Standard No. 791C, Method 3440.1 Storage Solubility Characteristics of Universal Gear Lubricants⁶

2.3 Military Standard:⁶

- MIL-L-2105D Lubricating Oil, Gear, Multipurpose

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *nonsynchronized transmission, n*—a transmission having no means for synchronizing the speeds of engaging elements. Typical heavy-duty manual transmissions have no such means for gear engagement by the shift lever, but may have such means for pneumatic engagement of auxiliary range gears.

3.1.2 *oil seal compatibility, n*—in lubricants for lubricating manual transmissions and final drive axles, prevention of chemical or thermal degradation of seal elastomers typically observed as hardening, cracking, or excessive swelling in a manner which would result in oil leakage.

3.1.3 *thermal oxidation, n*—in lubricants used for lubricating manual transmissions and final drive axles, deterioration of the lubricant under high-temperature conditions which is observed as viscosity increase of the lubricant, insolubles formation in the lubricant, deposit formation on the parts, or combination thereof.

4. Performance Classification

4.1 *PG-1*—The temporary designation PG-1 has been assigned to identify the category for manual transmissions, apart from API Service Category GL-4. (See Appendix X1 for background information on this category.)

5. Performance Requirements

5.1 PG-1 performance requirements for candidate gear lubricants are provided in Table 1.

6. Number of Tests and Retests

6.1 *Test Method D 5704*—In determining whether an oil meets the required limits the following rules shall apply:

6.1.1 No more than three operationally valid tests are to be conducted for compliance testing.

6.1.2 L-60 data used for PG-1 approval may not be generated prior to Test Monitoring Center (TMC) calibration of the stand for all PG-1 parameters. Stand bias adjustment factors based on reference oil test results will be applied when appropriate.

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.B on Automotive Lubricants.

Current edition approved Aug. 15, 1995. Published October 1995.

² *Annual Book of ASTM Standards*, Vol 05.01.

³ *Annual Book of ASTM Standards*, Vol 05.02.

⁴ *Annual Book of ASTM Standards*, Vol 05.03.

⁵ Information available from Commanding Officer, Army Materials and Mechanics Research Center, Attention: AMXMR-TMS, Watertown, MA 02127.

⁶ Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.