



Standard Test Method for Evaluation of the Load Carrying Capacity of Lubricants Under Conditions of Low Speed and High Torque Used for Final Hypoid Drive Axles¹

This standard is issued under the fixed designation D 6121; 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 L-37 test.² This test method covers a test procedure for evaluating the load-carrying, wear, and extreme pressure properties of a gear lubricant in a hypoid axle under conditions of low-speed, high-torque operation.

1.2 The values stated in inch-pound units are to be regarded as the standard. The SI values given in parentheses are provided for informational purposes 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.* Specific hazard information is given in Sections 4, 7, and 8.

2. Referenced Documents

2.1 ASTM Standards:

D 235 Specification for Mineral Spirits (Petroleum Spirits) (Hydrocarbon Dry Cleaning Solvent)³

2.2 Military Specification:⁴

MIL-PRF-2105E Lubricating Oil, Gear, Multipurpose

2.3 AGMA National Standard:⁵

Nomenclature of Gear Tooth Failure Modes

2.4 SAE Standard:

SAE J308 Information Report on Axle and Manual Transmission Lubricants⁶

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *abrasive wear, n—on ring and pinion gears*, removal of material from the operating surface of the gear caused by lapping of mating surfaces by fine particles suspended in lubricant, fuel, or air or imbedded in a surface (CRC Rating Manual No. 18).⁷

3.1.2 *adhesive wear, n—on ring and pinion gears*, removal of material from the operating surface of the gear caused by shearing of junctions formed between operating surfaces in direct metal-to-metal contact; sheared-off particles either remain affixed to the harder of the mating surfaces or act as wear particles between the surfaces (CRC Rating Manual No. 18).

3.1.3 *burnish, n—on ring and pinion gears*, an alteration of the original manufactured surface to a dull or brightly polished condition (CRC Rating Manual No. 17).⁷

3.1.4 *corrosion, n—in final drive axles*, a general alteration of the finished surfaces of bearings or gears by discoloration, accompanied by roughening not attributable to mechanical action (CRC Rating Manual No. 17).

3.1.5 *deposits, n—in final drive axles*, material of pasty, gummy, or brittle nature adhering to or collecting around any of the working parts (CRC Rating Manual No. 17).

3.1.6 *discoloration, n—on ring and pinion gears*, any alteration in the normal color of finished steel surfaces (CRC Rating Manual No. 17).

3.1.7 *pitting, n—on ring and pinion gears*, small irregular cavities in the tooth surface, resulting from the breaking out of small areas of surface metal (CRC Rating Manual No. 17).

3.1.8 *ridging, n—on ring and pinion gears*, an alteration of the tooth surface to give a series of parallel raised and polished ridges running diagonally in the direction of sliding motion, either partially or completely across the tooth surfaces of gears (CRC Rating Manual No. 17).

3.1.9 *rippling, n—on ring and pinion gears*, an alteration of the tooth surface to give an appearance of a more or less regular pattern resembling ripples on water or fish scales (CRC Rating Manual No. 17).

3.1.10 *scoring, n—on ring and pinion gears*, the rapid removal of metal from the tooth surfaces caused by the tearing

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² Until the next revision of this test method, the ASTM Test Monitoring Center (TMC) will update changes in this test method by means of Information Letters. This edition includes all Information Letters through No. 99-3. Information Letters may be obtained from the ASTM Test Monitoring Center, 6555 Penn Ave, Pittsburgh, PA 15206, Attn: Administrator. The TMC is also the source of reference oils.

³ *Annual Book of ASTM Standards*, Vol 06.04.

⁴ Standardization Documents Order Desk, Bldg 4, Section D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, Attn: NPODS.

⁵ American Gear Manufacturers Assn., 1500 King St., Suite 201, Alexandria, VA 22314.

⁶ Available from Society of Automotive Engineers, 400 Commonwealth Dr., Warrendale, PA 15096-0001.

⁷ Available from Coordinating Research Council (CRC), 219 Perimeter Ctr. Pkwy., Atlanta, GA 30346.