SURFACE VEHICLE RECOMMENDED PRACTICE

J310™ MAY2020

Issued 1951-09
Revised 2020-05

Superseding J310 JAN2000

(R) Automotive Lubricating Greases

RATIONALE

The SAE J310 Recommended Practice is intended to assist in the selection of grease used for servicing automotive applications. It provides general definitions and recommended test methods for use in determining proper grease selection. This revision updates the references to the current standards and test methods used for automotive service greases.

1. SCOPE

This SAE Recommended Practice was developed by SAE, and the section “Standard Classification and Specification for Service Greases” cooperatively with ASTM and NLGI. It is intended to assist those concerned with the design of automotive components, and with the selection and marketing of greases for the lubrication of certain of those components on passenger cars, trucks, and buses. The information contained herein will be helpful in understanding the terms related to properties, designations, and service applications of automotive greases.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise specified, the latest issue of SAE publications shall apply.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AMS3217/1B Test Slabs, Acrylonitrile Butadiene (NBR-H), Medium-High Acrylonitrile, 65 - 75

AMS3217/2C Test Slabs, Acrylonitrile Butadiene (NBR-L), Low Acrylonitrile, 65 - 75

AMS3217/3C Test Slabs, Chloroprene (CR), 70 - 80

2.1.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM D128 Analysis of Lubricating Grease

ASTM D217 Cone Penetration of Lubricating Grease

ASTM D942 Oxidation Stability of Lubricating Greases by the Oxygen Pressure Vessel Method

ASTM D972 Evaporation Loss of Lubricating Greases and Oils

ASTM D1092 Apparent Viscosity of Lubricating Greases

ASTM D1264 Water Washout Characteristics of Lubricating Greases

ASTM D1403 Cone Penetration of Lubricating Grease Using One-Quarter and One-Half Scale Cone Equipment

ASTM D1404 Test Method for Estimation of Deleterious Particles In Lubricating Grease

ASTM D1478 Low-Temperature Torque of Ball Bearing Greases

ASTM D1742 Oil Separation from Lubricating Grease During Storage

ASTM D1743 Corrosion Preventive Properties of Lubricating Greases

ASTM D1831 Roll Stability of Lubricating Grease

ASTM D2265 Dropping Point of Lubricating Grease Over Wide-Temperature Range

ASTM D2266 Wear Preventive Characteristics of Lubricating Grease (Four-Ball Method)

ASTM D2509 Measurement of Load-Carrying Capacity of Lubricating Grease (Timken Method)

ASTM D2595 Evaporation Loss of Lubricating Greases Over Wide-Temperature Range

ASTM D2596 Measurement of Extreme-Pressure Properties of Lubricating Grease (Four-Ball Method)

ASTM D3336 Test Method for Life of Lubricating Greases in Ball Bearings at Elevated Temperatures

ASTM D3527 Life Performance of Automotive Wheel Bearing Grease

ASTM D3704 Test Method for Wear Preventive Properties of Lubricating Greases Using the (Falex) Block on Ring Test Machine in Oscillating Motion

ASTM D4048 Test Method for Detection of Copper Corrosion from Lubricating Grease

ASTM D4049 Test Method for Determining the Resistance of Lubricating Grease to Water Spray

ASTM D4170 Fretting Wear Protection by Lubricating Greases

ASTM D4289 Compatibility of Lubricating Grease with Elastomers

ASTM D4290 Leakage Tendencies of Automotive Wheel Bearing Grease Under Accelerated Conditions

ASTM D4425 Standard Test Method for Oil Separation from Lubricating Grease by Centrifuging (Koppers Method)

ASTM D4693 Low-Temperature Torque of Greased-Lubricated Wheel Bearings

ASTM D4950 Standard Classification and Specification for Automotive Service Greases

ASTM D5483 Test Method for Oxidation Induction Time of Lubricating Greases by Pressure Differential Scanning Calorimetry

ASTM D5706 Test Method for Determining Extreme Pressure Properties of Lubricating Greases Using a High-Frequency, Linear-Oscillation (SRV) Test Machine

ASTM D5707 Test Method for Measuring Friction and Wear Properties of Lubricating Grease Using a High-Frequency, Linear-Oscillation (SRV) Test Machine

ASTM D5969 Test Method for Corrosion-Preventive Properties of Lubricating Greases in Presence of Dilute Synthetic Sea Water Environments

ASTM D6138 Test Method for Determination of Corrosion Preventive Properties under Dynamic Wet Conditions (Emcor Test)

ASTM D6184 Test Method for Oil Separation from Lubricating Grease (Conical Sieve Method)

ASTM D6185 Practice for Evaluating Compatibility of Binary Mixtures of Lubricating Greases

ASTM MNL-1 Manual on Significant Petroleum Tests (9th Edition)

2.1.3 NLGI Publications

Available from NLGI, 118 N. Conistor Street, Suite B-281, Liberty, MO 64068, USA, www.nlgi.org.

NLGI Recommended Practice for Lubricating Passenger Car Wheel Bearings

NLGI Recommended Practice for Lubricating Passenger Car Ball Joint Front Suspensions

Constant Velocity Joint Greases, Fish, G., NLGI Spokesman, December 1999, Paper #9903

2.1.4 ELGI Publications

Available from the European Lubricating Grease Institute, Hemonylaan 26, 1074 BJ Amsterdam, The Netherlands, www.elgi.org.

The ELGI Rheometry Handbook, Wheately, A.

The ELGI Oil Separation Handbook, Miller, D., 2003

2.1.5 API Publications

Available from API, 200 Massachusetts Avenue NW, Suite 1100, Washington, DC 20001-5571, USA, Tel: 202-682-8000, www.api.org.

API 1509 Appendix E API Base Oil Interchangeability Guidelines for Passenger Car Motor Oils and Diesel Engine Oils

3. DEFINITION OF LUBRICATING GREASE

A lubricating grease is a solid to semi-fluid mixture of a liquid lubricant and a thickening agent. Additives to impart special properties or performance characteristics may be incorporated. The liquid component may be from API base stock groups I through V; the thickener may be a metallic soap or soaps or a nonsoap substance such as an organophilic modified clay, a urea compound, carbon black, or other material or a mixture of thickener types. The viscosity of the fluid, the thickener concentration, and the chemical nature of the thickener can vary widely. The properties of the finished grease are influenced by the manufacturing process as well as by the materials used.