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|  <p><b>QUALIFIED PRODUCTS LISTING</b><br/>161 Thorn Hill Road, Warrendale, PA15086-7527</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p><b>PROGRAM<br/>DOCUMENT</b></p> | <p><b>PD4000</b><br/>Issued: 12-Jun-2027<br/>Revision: 12-Feb-2026</p> | <p><b>Rev. O</b></p> |
| <p align="center"><b>GEAR LUBRICANT REVIEW PROGRAM</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                    |                                                                        |                      |
| <p>This Program Document details who the Lubricant Review Institute (LRI) Committee is, how to become a member, and what procedure is to be followed for Presenters to submit lubricant information, test reports, and test parts to the Review Committee for its evaluation against the requirements of SAE J2360.</p> <p>Information submitted to the Review Committee is submitted for the sole purpose of permitting the Review Committee to carry out its assigned function and is not for dissemination outside the Review Committee. Nothing in this document, however, precludes Committee members from using or discussing such information not designated proprietary under Section "Restrictions on Disclosure of Information Designation as "Proprietary" Submitted to the Committee" in the normal course of their employment.</p> <p>Any questions concerning interpretation of these Procedures should be addressed to the Chairman of the LRI Committee.</p> |                                    |                                                                        |                      |

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### 1.0 REFERENCES

#### 1.1 Applicable Documents

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

#### 1.2 American Society for Testing and Materials (ASTM) Publications

Available from ASTM International at <http://www.astm.org>.

- ASTM D445: Standard Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and Calculation of Dynamic Viscosity)
- ASTM D664: Standard Test Method for Acid Number of Petroleum Products by Potentiometric Titration
- ASTM D892: Standard Test Method for Foaming Characteristics of Lubricating Oils
- ASTM D1552: Standard Test Method for Sulfur in Petroleum Products by High Temperature Combustion and Infrared (IR) Detection or Thermal Conductivity Detection (TCD)
- ASTM D2622M: Standard Test Method for Sulfur in Petroleum Products by Wavelength Dispersive X-ray Fluorescence Spectrometry
- ASTM D4739: Standard Test Method for Base Number Determination by Potentiometric Hydrochloric Acid Titration
- ASTM D5185: Standard Test Method for Multielement Determination of Used and Unused Lubricating Oils and Base Oils by Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES)
- ASTM D5662: Standard Test Method for Determining Automotive Gear Oil Compatibility with Typical Oil Seal Elastomers
- ASTM D5704 (L-60-1): Standard Test Method for Evaluation of the Thermal and Oxidative Stability of Lubricating Oils Used for Manual Transmissions and Final Drive Axles
- ASTM D6304: Standard Test Method for Determination of Water in Petroleum Products, Lubricating Oils, and Additives by Coulometric Karl Fischer Titration
- ASTM D7038 (L-33-1): Standard Test Method for Evaluation of Moisture Corrosion Resistance of Automotive Gear Lubricants
- ASTM D7452 (L-42): Standard Test Method for Evaluation of the Load Carrying Properties of Lubricants Used for Final Drive Axles, Under Conditions of High Speed and Shock Loading
- ASTM D7603: Standard Test Method for Determination of Storage Stability and Compatibility in Automotive Gear Oils
- ASTM D8165 (L-37-1): Standard Test Method for Evaluation of Load-Carrying Capacity of Lubricants Used in Hypoid Final-Drive Axles Operated under Low-Speed and High-Torque Conditions
- ASTM E168: General Techniques of Infrared Quantitative Analysis

#### 1.3 International Automotive Task Force (IATF) Publications

Available from International Automotive Task Force (IATF) at <http://www.iatfglobaloversight.org/iatf-publications/>

- IATF 16949: Quality Management Systems

#### 1.4 International Organization for Standardization (ISO) Publications

Available from International Organization for Standardization at <http://www.iso.org/standards.html>.

- ISO 9001: Quality Management Systems

#### 1.5 Performance Review Institute (PRI) Publications

Available from Performance Review Institute at <http://www.p-r-i.org/gpl/lubricant-review-institute>.

- PD4000 Gear Lubricant Review Program

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### 1.6 SAE International Publications

Available from SAE International at <http://www.sae.org>.

- SAE J2360: Automotive Gear Lubricants for Commercial and Military Use

### 1.7 U.S. Government Publications

Copies of these documents are available online at <http://quicksearch.dla.mil>.

- FED-STD-791F: Testing Method of Lubricants, Liquid Fuels, And Related Products - Method 7504.0: Efficiency of Axle Gear Lubricants
- FED-STD-791F: Testing Method of Lubricants, Liquid Fuels, And Related Products; Method 7506.0 Gear Lubricant Compatibility for Stryker Vehicle Limited Slip Differential Clutches

## 2.0 LUBRICANT REVIEW INSTITUTE (LRI) COMMITTEE

### 2.1 About

The LRI Committee is made up of user members, supplier members, independent lab members, and support members, all with the main purpose of maintaining all associated testing procedures and related documents associated with the qualification of candidates against the requirements outlined within SAE International J2360 and this program document PD4000. Contained within the LRI Committee is the Review Committee, who is responsible for evaluation of all submitted candidates against SAE J2360, and if accepted, may be added to the Qualified Products List (QPL). Both the LRI Committee and Review Committee operate under the supervision of Performance Review Institute (PRI).

### 2.2 LRI Committee Membership

Individuals who have interest in the activities of the LRI Committee can request membership. Requests should be submitted to the Secretary of the LRI, who determines the status of their membership. For membership consideration, a minimum of two (2) LRI Committee meetings, in-person, must be attended within a twelve-month period. Either during, or after the second attended meeting, a vote for membership can take place by the LRI Committee, requiring quorum (>50% of voting members) and a minimum of 70% voting approval. Voting privileges (Voting Member or Alternate Voting Member) may also be granted during the membership vote, if applicable. As a LRI Committee Member, you are expected to:

- Attend a minimum of two meetings (in-person or virtual) per calendar year and maintain active participation.
- Contribute to the work and support of the LRI Committee
- Vote on ballots in a timely manner, if granted voting privileges.

### 2.3 Maintaining Membership

The Secretary of the LRI shall review the LRI Committee roster at least once annually for the purpose of retaining only those who actively contribute to the effectiveness of the committee work. Members not attending the expected minimum of two meetings per calendar year may lose voting privileges and/or membership. At any time, the LRI Committee reserves the right to vote on removal of membership and/or voting privileges. The vote requires quorum and a minimum of 70% voting approval to revoke membership and/or voting privileges. The Secretary of the LRI shall notify any change in their participant classification or voting privileges.

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### 2.4 Point of Contact

All inquiries are to be directed to:

Secretary of the LRI  
Performance Review Institute  
Email: [qpladmin@p-r-i.org](mailto:qpladmin@p-r-i.org)  
Phone: +1 (724) 772-8647

### 2.5 LRI Committee Roles and Responsibilities

The LRI Committee includes a few different types of members with different responsibilities, all detailed below.

#### 2.5.1 User Member

A User Member is considered as someone who is currently employed, affiliated with, or retired from a hardware manufacturer, such as the United States Government, Original Equipment Manufacturer (OEM), or Tier 1 Hardware supplier. However, no one shall be considered as a User Member who is currently employed by, or affiliated with, an organization that primarily refines, produces, processes, or distributes finished lubricants or components contained within finished fluids, such as raw materials, additives, base stocks, other petroleum products.; or employed by an organization that primarily conducts lubricant testing.

#### 2.5.2 Supplier Member

A Supplier Member is considered as someone who is currently employed, affiliated with, or retired from an organization that primarily refines, produces, processes, or distributes finished lubricants or components contained within such as raw materials, additives, base stocks, and other petroleum products.

#### 2.5.3 Independent Lab Member

An Independent Lab Member is considered as someone who is currently employed from an independent laboratory who supports and performs reference and candidate testing for the presenting companies per the SAE J2360 standard. They are also approved to do so by the LRI Committee and the American Society for Testing and Materials (ASTM) Test Monitoring Center (TMC) to perform testing per SAE J2360.

Currently Southwest Research Institute (SwRI) and Intertek Automotive Research (IAR) are the two Independent Lab Members. If other independent laboratories are interested in becoming members, please contact the Secretary of the LRI for more information.

#### 2.5.4 Support Member

A Support member is considered someone who is currently employed, or retired, from an organization assisting the LRI Committee and Review Committee. Currently, the American Society for Testing and Materials (ASTM) Test Monitoring Center (TMC) is a supporting member and serves the LRI and Review Committees by verifying and confirming operational validity for candidate and reference testing data presented to the Review Committee. The ASTM TMC has established a web-based data registration, upload, and review service. This service has the potential to evolve even more to better meet the LRI community's needs, including website, data acquisition, etc.

The Performance Review Institute (PRI) is also a supporting member of the LRI Committee and serves as the administrator with various responsibilities outlined under Secretary of the LRI.

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### 2.5.5 Guest/Visitor

Anyone attending an open meeting, without current membership, or is not requesting membership, will be designated as a guest/visitor and will not be considered or granted voting privileges.

## 2.6 Review Committee

Contained within the LRI Committee is the Review Committee, who is responsible for the evaluation of all submitted programs against SAE J2360, and if programs are accepted, they may be added to the Qualified Products List (QPL) as outlined within this program document. The Review Committee also includes LRI Committee Support Members.

### 2.6.1 Review Committee Member

A Review Committee Member is a User Member who has been voted in by the LRI Committee, based on the individual's qualifications and experience with the performance of gear lubricants, for the purpose of evaluating submitted lubricant information, test reports, and test parts against the requirements of SAE J2360.

### 2.6.2 Review Committee Membership

To be considered for membership, the individual shall:

- Have significant industry experience and technical expertise and must be competent and authoritative in the field of automotive gear hardware and/or automotive gear lubricants.
- Provide a written request (resume or letter of recommendation from their employer) to the LRI Chairman, a minimum of one week prior to the scheduled LRI Meeting.
- Shall sign a Confidentiality Agreement supplied and verified by the Secretary of the LRI prior to admittance into the Review Committee Meeting.
- Attend a minimum of two (2) Review Committee Meetings in-person within a twelve-month period with an experienced Review Committee Member, prior to a vote for membership.
- Must attend a Gear Rater Workshop to learn how to evaluate and rate parts. There is no cost for Review Committee Members to attend the workshop, and the individual will not be considered a calibrated rater.

Either during or after the second in-person meeting attended, a vote for membership can take place by the LRI Committee, requiring a minimum of 70% voting approval under quorum. At any time, the LRI Committee reserves the right to vote on removal of membership from the Review Committee. The vote requires a minimum of 70% voting approval under quorum to revoke membership and/or voting privileges. The Secretary of the LRI shall notify any change in their participant classification or voting privileges.

### 2.6.3 Responsibilities of the Review Committee Members

- Review test parts, test data, and test summaries for each program and recommend acceptance, rejection, re-test, or correction of information supplied without bias toward the presenter.
- Provide recommendations for submitted programs or consultations associated with the required testing or direction in support of requests for requalification, interchange of components, and/or field testing, as appropriate.
- Make recommendations to the LRI Committee for improvements and changes (as necessary) to the overall process, associated documents, and test procedures.
- Make recommendations and vote on ballots. However, if three (3) consecutive ballots for vote are not submitted, notification of voting right removal will be distributed by the Secretary of the LRI. Voting privileges can be reinstated by the Review Committee upon request.

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- Periodic attendance at Gear Rating Workshops is recommended every three years and is at no cost for Review Committee Members to attend. Please contact the Chairman of the LRI or ASTM TMC directly for more information.
- Regular attendance for Open Meetings, Closed Meetings, and Presentations/Consultations especially associated with part review.
- Review Parts remotely if required and provide feedback and recommendations to the Review Committee.

### 2.7 Chairman of the LRI Committee

This individual shall be elected from the current membership of the Review Committee and shall have a preferred minimum of five years of commensurate experience. They shall be elected by a minimum of 70% voting approval under quorum of the LRI Committee. However, they can be removed at any time by a minimum of 70% voting approval under quorum of no-confidence by the LRI Committee. The position's length of term shall be two (2) years with the option for additional terms taken consecutively or non-consecutively. Administratively, the individual shall be responsible to the Secretary of the LRI, who will ensure that the individual operates within the policy constraints of the LRI Committee and Review Committee. The responsibilities of the Chairman include:

- Preside over meetings of the LRI Committee and Review Committee.
- Inform all parties of changes or clarifications in test procedures, hardware, specifications, and administrative matters.
- Provide guidance and interpretation of qualification procedures and test requirements.
- Determine merit of requests for reconsideration regarding Review Committee recommendations and initiate appropriate action.
- Review, confirm, and sign Review Committee recommendations on each program submitted, or delegated to the Vice Chairman or the Secretary of the LRI.
- Review and confirm minutes for LRI Committee Meetings.
- Serve as spokesman for the LRI and Review Committees.
- Provide updates to the SAE Technical Committee 3 (TC-3) as requested.
- Report any problems to Secretary of the LRI.
- Perform other duties as required by the LRI and Review Committees.

### 2.8 Vice Chairman of the LRI Committee

This individual shall be elected from the current membership of the Review Committee. They shall be elected by a minimum of 70% voting approval under quorum of the LRI Committee, occurring on alternating years with the election of the Chairman. However, they can be removed at any time by a minimum of 70% voting approval under quorum of no-confidence by the LRI Committee. The position's length of term shall be two (2) years with the option for additional terms taken consecutively or non-consecutively. The responsibilities of Vice Chairman include:

- To fill in for the Chairman of the LRI in the event of their absence or removal.
- Other duties as assigned by the Chairman of the LRI.
- 

### 2.9 Secretary of the LRI

The LRI Committee and Review Committee shall have a Secretary assigned from PRI Staff and is the administrator for these Committees. The duties of the Secretary of the LRI Committee shall include:

- Schedule, organize, and arrange logistics for LRI and Review Committee meetings including handling of parts, and arrangement of meeting and waiting room facilities.
- Prepare minutes of meetings for confirmation by the Chairman of the LRI or designee.
- Issue minutes and notices associated with LRI and Review Committee activities and meetings.
- Record Review Committee recommendations on each program submitted for review.

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- Prepare reports of each program review and transmit signed copies to the Presenter(s).
- Maintain records of all Review Committee actions, correspondence, fee invoices, etc.
- Invoicing and collection of presentation and report fees.
- Arrange for appropriate legal counsel and report findings and recommendations of legal counsel to the LRI and Review Committees.
- Assure compliance with all prescribed forms and procedures involving review activities.
- Document Control of PD4000 including revisions and balloting.
- Maintain SAE J2360 Qualified Products List (QPL)
- Assume the administrative responsibilities in the event of no Chairman or Vice Chairman, until the positions are filled.
- Does not have any voting privileges on LRI or Review Committee related items.

### 2.10 Guest Reviewer

Anyone attending the closed portions of the meeting and/or considering membership as a Review Committee Member and will be required to sign a Confidentiality Agreement supplied and verified by the Secretary of the LRI prior to admittance. They will not have voting rights until Review Committee membership is granted by vote.

### 2.11 Presenter

A presenter is considered as someone who, on behalf of a company, is requesting a consultation and/or is submitting programs to the Review Committee for its evaluation against the requirements of SAE J2360. A presenter does not have to be an LRI Committee Member but has to properly notify the Secretary of the LRI as described within this document.

### 2.12 Meetings

All meetings are coordinated and scheduled by the Secretary of the LRI. Please contact them for more details. All dates and locations are subject to change so please confirm with the Secretary of the LRI. Virtual meeting links can also be provided by the Secretary of the LRI if needed.

#### 2.12.1 Open LRI Committee Meetings

The LRI Committee conducts a formal, one-day meeting, typically quarterly, but to be held no less than once a year. Tentatively, the meetings are scheduled on Thursday the first full week of the month, during the months of February, May, August, and November. The location of the in-person meetings is typically alternated between a location in the greater Detroit, MI area and at SAE Headquarters in Warrendale, PA respectively. At each meeting, the dates are confirmed for the next meeting and tentative dates are set for one or more meetings thereafter. The annual meeting schedule can be found at <http://www.p-r-i.org/qpl/lubricant-review-institute>.

A detailed agenda will be issued prior to the meeting for all current LRI Committee Members. The Secretary of the LRI shall prepare and distribute minutes for each meeting, typically within two weeks after the meeting. These minutes shall be subject to confirmation at the following meeting, and once confirmed will be published at <http://www.p-r-i.org/qpl/lubricant-review-institute>.

#### 2.12.2 Task Force Meetings

Virtual or in-person task force meetings are coordinated by the designated task force leader and scheduled by the Secretary of the LRI as needed. The task force is typically a result of an item or topic that needs further discussion beyond the Open LRI Committee Meeting. The task force is made up of the leader and group of volunteers and is open to all members as applicable.

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### **2.12.3 Closed Review Committee Meetings**

Closed meetings for the Review Committee only take place as needed and are only open for the Review Committee members to attend. They typically take place prior to or immediately following the Open LRI Committee Meeting but can be scheduled at any time based on need.

### **2.12.4 Consultations and Program Submissions**

The review of consultations and program submission by the Review Committee takes place after the LRI Committee open meetings, and closed meetings if necessary. The order of appearance is determined by consensus amongst the Presenters. All Visitors must wear a Visitors badge where applicable. It is up to the Presenter to notify the Chairman or Secretary of the LRI prior to start of a consultation or program submission if someone is present that is believed to not be approved.

## **2.13 Voting**

### **2.13.1 LRI Committee Voting**

All LRI Committee ballots and motions that are voted on are required to have quorum (>50% of voting members) and pass with a minimum of 70% voting approval. The following applies for all related voting activities:

- One representative from each company can be designated as a Voting member and one representative can be designated as an Alternate Voting member.
- Only a single vote per company is allowed and counted, from either the designated voting or alternative voting member.
- Voting members who are absent without alternate representation from four (4) consecutive LRI Committee meetings may have their voting privileges revoked unless the LRI Chairman determines that other circumstances warrant retention.
- If a ballot is sent out for vote, the ballot end date may be extended to obtain sufficient votes if needed.
- All activities being voted on can be voted as: yes (for), no (against), or an abstention (not voting), unless otherwise specified.
- All "against" votes require a comment and technical explanation.
- Editorial comments may be resolved by the document owner or designee.
- All comments, including those associated with an "against" vote, shall be resolved by either accepting, rejecting, or withdrawing the comment.
- The document owner may resolve technical comments directly with the commenter.
- Technical changes resulting from a comment resolution require an additional confirmation ballot to confirm the changes.
- Unresolved comments can be resolved by voice vote during a meeting.

### **2.13.2 Review Committee Voting**

All Review Committee voting for ballots and motions are required to have quorum (>50% of the Review Committee Members) and must pass with a minimum of 70% voting approval. Only a single vote per company is allowed and counted.

All program submission acceptance is required to have quorum (>50% of the Review Committee Members with at least one Review Committee Member representing each test (Chemicals/Physicals, L-33-1, L37-1, L-42, L-60-1, and Seals)) and must pass with a minimum of 70% voting approval. Additional Military approvals must include the voting from the US Army representative Review Committee member.

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### 3.0 OVERVIEW OF SUBMISSIONS TO THE REVIEW COMMITTEE

All submissions to the Review Committee must follow the process as outlined within this document. This includes consultations, reference oil test submissions, and program submissions. Any questions should be directed to the Chairman of the LRI Committee.

### 3.1 Submission Pricing

A pricing structure has been established by Performance Review Institute (PRI) for the presentations and program submissions to the Review Committee. These fees will be invoiced to the Presenter by the Secretary of the LRI. The fee structure is posted at <http://www.p-r-i.org/resources/qpl/pri-qpl-lubricant-pricing-structure>. At the Review Committee's discretion, fees may be waived.

#### 3.1.1 Fees will be charged for the following:

- Programs – complete, partial, or resubmissions which involve evaluation of test parts or test reports by the Review Committee;
- Programs involving resubmission with additional information but without test parts or test reports;
- Field Trial Reviews;
- Programs requesting consultation (advice) from the Review Committee.

#### 3.1.2 No fees will be charged for the following:

- Presentation of supplemental information for the benefit of the qualifying agency and/or the Review Committee such as improvements in analytical methods, test procedures, etc.

### 3.2 Notification to the Review Committee

A written communication using GL Form 0 to request a submission time slot shall be received by the Secretary of the LRI at least five (5) working days prior to the start of the Review Committee Meeting. Based on available time slots for all presenters, the number of programs and/or presentations may be limited and is on a first-come, first-serve basis.

### 3.3 Submission of Presentations and Documentation

All documentation such as presentations, GL Forms, test reports, operational validity, and appropriate completed RGL forms are required to be electronically uploaded to the ASTM/TMC website <http://www.astmtmc.org/LRITools.aspx> at least five (5) working days prior to the start of the Review Committee Meeting. See the TMC Website Upload Instructions <http://www.p-r-i.org/qpl/lubricant-review-institute>. Files uploaded should be named starting with Program Number.

### 3.4 Submission of Reference Oil Test Parts

All reference oil test parts do not need to be shipped or submitted to the Review Committee, however, must be made available for review within the 40-day correction period upon request by the Review Committee. All parts shall be clearly tagged or labeled with Test Number and Program Number.

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### 3.5 Submission of Program Test Parts

All test parts associated with submitted programs must be submitted to the Review Committee as outlined below. All parts shall be clearly tagged or labeled with Test Number and Program Number. Listed in Table 1 is the number of tests needed per new program.

Table 1: Number of Tests Required for New Product Submission Testing.

| Test Method | Hardware Type <sup>(1)</sup> | Viscosity Grade per SAE J306 <sup>(2)</sup> |         |         |         |         |         |         |         |
|-------------|------------------------------|---------------------------------------------|---------|---------|---------|---------|---------|---------|---------|
|             |                              | 62W -XX                                     | 63W -XX | 64W -XX | 65W -XX | 70W -XX | 75W -XX | 80W -XX | 85W -XX |
| L-60-1      | S                            | 1                                           | 1       | 1       | 1       | 1       | 1       | 1       | 1       |
| L-33-1      | S                            | 1                                           | 1       | 1       | 1       | 1       | 1       | 1       | 1       |
| L-37-1      | S, NC                        | 1                                           | 1       | 1       | 1       | 1       | 1       | 1       | 1       |
|             | S, C                         | 1                                           | 1       | 1       | 1       | 1       | 1       | 1       | 1       |
|             | CN, NC                       | 1                                           | 1       | 1       | 1       | 1       | 1       | N/A     | N/A     |
|             | CN, C                        | 1                                           | 1       | 1       | 1       | 1       | 1       | N/A     | N/A     |
| L-42        | S                            | 1                                           | 1       | 1       | 1       | 1       | 1       | 1       | 1       |
|             | CN                           | 1                                           | 1       | 1       | 1       | 1       | 1       | N/A     | N/A     |
| Seals       | ACM <sup>(3)</sup>           | 1                                           | 1       | 1       | 1       | 1       | 1       | 1       | 1       |
|             | FKM <sup>(4)</sup>           | 1                                           | 1       | 1       | 1       | 1       | 1       | 1       | 1       |

(1) S = Standard; CN = Canadian; NC = Non-Coated; C = Coated

(2) XX signifies the high temperature viscosity grade of the lubricant, and may be left blank or equal to 62, 63, 64, 65, 70, 75, 80, 85, 90, 110, 140, 190, or 250, as indicated in SAE J306

(3) Polyacrylate Copolymer

(4) Fluoroelastomer

The following parts associated with the tests shall be submitted to the Review Committee

- Chemicals & Physical Tests: No parts required for review.
- ASTM D5704 (L-60-1): Both test spur gears.
- ASTM D7038 (L-33-1): All rated parts, completely disassembled.
- ASTM D8165 (L-37-1): Ring Gear and Pinion, disassembled without bearings.
- ASTM D7452 (L-42): Ring Gear and Pinion, disassembled without bearings.
- ASTM D5662 (Seals): No parts required for review.

For Military specific approvals the following additional testing is required:

- ASTM D5704 (L-60-1) Extended: Both test spur gears.
- FED-STD-791F, Method 7504.0 (Axle Efficiency): No parts required for review.
- FED-STD-791F, Method 7506.0 (Limited Slip Compatibility): No parts required for review.

The shipping and receiving of parts shall be coordinated with the Secretary of the LRI at least five (5) working days prior to the start of the Review Committee Meeting. The shipment of parts may be to the meeting location or directly to the Review Committee Member at a provided address, if required.

All parts should be packaged in a manner that prohibits damage or corrosion to the parts, that could result in a rejected program and/or required retest. It is recommended that ASTM D7038 (L-33-1) parts be shipped inside of a sealed 5-gallon (20-Liter) bucket to prevent corrosion propagation after end of test. If required, all parts shipped directly to Review Committee Member(s) must include return shipping labels, written communication to dispose of the parts, or written communication that parts will be picked up following the program review with the Review Committee.

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### 3.6 Submission of Field Trial Parts

All field trial parts shall be coordinated with the Secretary of the LRI at least 90 days prior to the start of the Review Committee Meeting.

### 3.7 Forms

The following forms are to be completed and available to the Review Committee during the candidate presentations, as required for each submission type. All forms can be found at <http://www.p-r-i.org/gpl/lubricant-review-institute>. The forms must be filled out completely. For questions, please contact the Secretary of the LRI.

- GL Form 0: Summary of Reference and Candidate Lubricant Programs
- GL Form 1: Program Submission and Committee Recommendation
- GL Form 2: Gear Lubricant Formulation and Inspection Data
- GL Form 2a: Gear Lubricant Fourier Transform Infrared Data
- GL Form 3: Gear Lubricant Laboratory Performance Results
- GL Form 3a: Gear Lubricant Laboratory Performance Results
- GL Form 3b: Gear Lubricant Military Specific Laboratory Performance Results
- GL Form 4: New Base Stock Consistency Data
- A-1 Affidavit Form #1 for Original Qualification
- A-2 Affidavit Form #2 for Reblending (Original Qualification Holder)
- A-3 Affidavit Form #3 for Reblending (Blending Company)
- A-4 Affidavit Form #4 for Rebranding (Supplier)
- A-5 Affidavit Form #5 for Rebranding (Marketer)

### 3.8 Laboratory Performance Test Requirements

All program related testing must be completed using a production representative process, ideally from the same batch blend.

All program tests must be conducted in a laboratory approved or designated for each particular test. The Review Committee will not consider for review, any tests not conducted on properly referenced and calibrated test equipment. ASTM TMC will review and provide an Operational Review Summary (ORS) to confirm the test was run on a properly referenced stand within the proper operating conditions for the following testing:

- ASTM D5662 (Oil Seal Compatibility)
- ASTM D5704 (L-60-1)
- ASTM D7038 (L-33-1)
- ASTM D7452 (L-42)
- ASTM D8165 (L-37-1)

### 3.9 Test Reports

All test reports submitted to the Review Committee for each test must include the following unless otherwise noted:

- 3.9.1 ASTM D892 (Foam Characteristics)
  - Test report, no photographs required.
- 3.9.2 ASTM D5704 (L-60-1)
  - TMC Operational Review Summary Form (ORS)
  - Test report with one color photograph for each gear.

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- 3.9.3 ASTM D7038 (L-33-1)
  - TMC Operational Review Summary Form (ORS)
  - Test report, no photographs are required but recommended for concerns of corrosion after rating.
- 3.9.4 ASTM D7603 (SS&C)
  - Test report, no photographs required.
- 3.9.5 ASTM D8165 (L-37-1)
  - TMC Operational Review Summary Form (ORS)
  - Lubricant Temperature Chart
  - Test report, no photograph required.
- 3.9.6 ASTM D7452 (L- 42)
  - TMC Operational Review Summary Form (ORS)
  - Lubricant Temperature Chart
  - Test report, no photograph required.
- 3.9.7 ASTM D5662 (Oil Seal Compatibility)
  - TMC Operational Review Summary Form (ORS)
  - Test report, no photograph required.
- 3.9.8 ASTM D5704 (L-60-1) Extended (For military approvals, but can be used in place of the standard test if it still meets the requirements of SAE J2360)
  - TMC Operational Review Summary Form (ORS)
  - Test report with one color photograph required for each gear.

### 3.10 Program Submissions

It is recommended that all presenters have a short presentation to review all programs submitted, which will allow for the Review Committee to ask any questions prior to reviewing documentation and parts. At the time of appearance before the Review Committee, the Presenter shall place before each member of the Review Committee and the Secretary of the LRI all the documentation and test parts relevant to the program.

The documentation shall be prefaced by a completed GL Form 0 that indicates which performance test procedures will be presented with each program. The submitted forms shall be stacked in numerical order in which they are on GL-Form 0, which is also the order in which they will be presented.

The individual program numbers will be automatically generated in Section III on GL Form 0 once the meeting number is inputted and the company name is selected from the dropdown list. If your company isn't listed in the dropdown list, then please contact the Secretary of the LRI to assist with creating the company designation. This company designation can be up to four characters and include numbers and letters only. In addition, such numbering identification shall appear on all sheets of each program including attachments, such as supporting data and/or previously presented programs relating to the presentation, even if handwritten.

When a program extends beyond one meeting, copies of the GL Forms presented at previous meeting(s) and signed by the Secretary, including Committee recommendations, must be resubmitted with each subsequent presentation.

Note: When copies of the GL Forms presented at previous meetings are resubmitted with each subsequent presentation, it is not necessary to include all attachments with each related program. For example, if program 60/AA-1 has related programs 58/AA-2, 57/AA-3 and 55/AA-4, and if program 58/AA-2 also has

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related programs 57/AA-3 and 55/AA-4, and if program 57/AA-3 has related program 55/AA-4, then only one copy of 57/AA-3 and one copy of 55/AA-4 should be attached. They should be attached in descending sequential order, but to minimize the documentation. **DO NOT ATTACH EXTRA COPIES OF THE RELATED PROGRAMS.**

### 3.11 Read Across for Testing

The Review Committee, at its discretion, may allow certain test requirements to be waived based on “read-across” of data obtained from running similar formulations previously tested. All “read-across” will be evaluated on a case-by-case basis and granted only when sound support data and engineering judgment exists. The Review Committee is in no way bound to grant a requested “read-across” when they deem the support is not technically sound.

### 3.12 Waivers for Testing

When the same additive package has been qualified using different base stocks groups in the same viscosity grade or lower, in seven or more programs, a waiver may be granted for the following tests:

- ASTM D7038 (L-33-1)
- ASTM D7452 (L-42)
- ASTM D8165 (L-37-1)

To obtain this waiver, the Presenter shall file a written request to the Review Committee as a separate program tabulating the meeting(s), Program Number(s), Viscosity Grades and Qualification Number(s) (if assigned) of the seven programs using the subject additive package. After the waiver has been granted for the given additive package, a reference to the meeting and program number of the written request shall be included on GL Form 3 and 3a as applicable.

The Review Committee will allow the submission of companion or “sister” programs, which, by definition, is a similar formulation, same main additive package, but at different viscosities. For example: 75W-90 and 75W-140. When submitted together at the same Review Committee Meeting, data for the lower viscosity can be a read-across for the higher viscosity candidate(s) for the following tests:

- ASTM D7038 (L-33-1)
- ASTM D7452 (L-42)
- ASTM D8165 (L-37-1)

### 3.13 Restrictions on Disclosure of Information Designation as “Proprietary” Submitted to the Review Committee

Each Review Committee member, by accepting their appointment to the Review Committee, or such other individual having access to such information by a Presenter’s submission to the Review Committee, agrees to refrain from disclosing information designated as “Proprietary” by the Presenter outside the Review Committee. This obligation of non-disclosure is binding indefinitely on each Review Committee member and such other individual having access, except if that information:

- is available to the public at the time of presentation to the Review Committee;
- became available to the public by other means than the result of unauthorized disclosure by the Review Committee Member;
- was known to the Review Committee Member prior to its disclosure to the Review Committee;
- is required to be disclosed by enforceable legal process;
- is obtained from other sources without knowingly violating the rights of the Presenter.

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### **3.14 Review Committee Decisions & Recommendations**

Following the review of submitted program by the Review Committee, a determination by the Review Committee will be made for the program as “Acceptable,” “Rejected,” or “Pending.” For Rejected and Pending determinations, the Review Committee will also provide recommendations, documented on GL Form 1. At the discretion of the Review Committee, a 40-day correction period may be granted to address the recommendations, if applicable, and will also be documented on GL Form 1. Recommendations may include, but are not limited to, correction of errors in the forms, providing missing testing data or parts, retesting of parts, re-rating of parts by a calibrated rater, at an Independent Lab, and/or the request for additional information.

If the program is determined “Acceptable,” GL Form 1 will be signed by the Secretary of the LRI for official transmittal along with the remaining test summaries and test reports. One copy of the signed GL Form 1 together with copies of GL Forms 2, 2a, 3, 3a, 3b, and 4, where applicable, will also be forwarded to the Presenter.

These completed GL Forms shall not be used for advertising purposes, nor shall there be any implication that SAE and/or PRI has approved or endorses the candidate lubricant. Approval by PRI will only be verifiable once the lubricant formulation appearing on GL Form 1 appears on PRI’s Qualified Products List (QPL).

### **3.15 40-Day Corrections**

If the 40-day correction period is granted by the Review Committee based on their recommendations, an updated program submission must be provided to the Secretary of the LRI within 40 calendar days from the date of the Review Committee meeting for reevaluation. If test part evaluation is required, the presenter must also coordinate with the specific Review Committee Member(s) to ensure the documentation can still be properly submitted within the 40-day correction period. The Review Committee is then required to respond within 20 days if they accept the program. If rejected, the program would then need to be resubmitted as a new program at the next meeting.

If all corrections are accepted, the acceptance will be documented in the GL Form 1. If the submitted corrections are rejected, the Secretary of the LRI will coordinate the communication between the LRI Reviewer and the Presenter to achieve acceptance, but likely will require taking the program to the next meeting unless it can be resolved within the 40-day correction period.

### **3.16 Resubmission of a Program**

Any Presenter submitting a program for review who is dissatisfied with the determination or recommendations of the Review Committee, and/or unable to address such within the 40-day correction period if granted, may submit the program again as a new program for consideration at the next Review Committee meeting.

### **3.17 Reconsideration of Committee Recommendation for a Program**

Any Presenter submitting a program for review who is dissatisfied with the determination or recommendations of the Review Committee, may submit a written request of reconsideration to the Chairman of the LRI within 30 calendar days of the meeting date. The request shall include justification for the request; however, the request will not be considered for missing testing data, missing parts, and/or the request for re-rating. The Chairman shall review such request and if he/she finds that the request has merit, shall submit the request to the Review Committee for consideration at the next Review Committee Meeting. If the determination is reversed and the program is accepted beyond the 40-day correction period, it will need to be resubmitted at the next meeting as a new program, but fees will be waived.

### **3.18 Submittal of Approved Programs for Listing on the PRI/LRI QPL**

Once a program has been accepted by the Review Committee, including field trials unless waived, Presenters can request the program to be listed on the PRI/LRI QPL by completing the following:

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- Submit Affidavit Form 1 with completed and signed LRI Forms 1, 2, 2a, 3, 3a and 3b as appropriate to the Qualifying Activity.
- Payment for QPL listing to be included in submittal based on PRI Submission Pricing.

Qualified products are valid for up to five (5) years to the day from the initiated date of the program's approval by the Review Committee. Presenters will have 182 days (6 months) from that date to request a QPL listing, or the material will require re-submittal to the Review Committee as a new program. Exceptions can be made if the Review Committee is notified in advance with a valid reason for the delay. All affidavits shall be submitted directly to the Secretary of the LRI and are not reviewed by the Review Committee.

A QPL Approval Letter and Production Tolerances will be developed and distributed to the presenter and the military by the Qualifying Activity. The QPL can be found at <http://www.p-r-i.org/qpl/lubricant-review-institute> under Program Documents. A unique identifier "A" at the end of the QPL number (PRI GL ##### A) will be documented on the QPL identifying those products that meet the additional military requirements per SAE J2360.

### 4.0 REQUIREMENTS OF SUBMISSIONS TO REVIEW COMMITTEE

#### 4.1 Base Stocks

An accepted base stock is defined as a base stock that is on the Accepted Base Stock list, confidentially maintained by the Secretary of the LRI Review Committee. The Accepted Base Stock list contains base stocks previously reviewed and accepted within submitted and accepted programs by the Review Committee. Each accepted base stock is specific to each presenting company and manufacturing location. For more information, contact the Secretary of the LRI.

When completing GL Form 1, section III, use the dropdown list under New Base Stock to select "yes" for a new non-accepted base stock, and "no" for a previously accepted base stock currently on the Accepted Base Stock list. If "yes" is selected, a GL Form 4 will need to be filled out for each. A base stock would be defined as a base stock that is not currently on the Accepted Base Stock list specific to the presenting company and manufacturing location. This would include changes to current manufacturing process or location, and/or addition of a new manufacturing location. When there are multiple base stocks used, list each one individually on GL Form 1.

For all New base stocks, physical and chemical properties demonstrating base stock consistency must be submitted using GL Form 4. If the base stock is not manufactured during the four specified months, the available data from the base stock can be presented at the next LRI Committee Meeting. It is at the discretion of the Review Committee if they want to accept the base stock based on the data submitted.

#### 4.2 Consultations

A consultation may be requested from the Review Committee for advice or direction. At a minimum, the following must be submitted:

The Presenter shall be responsible for 6 Paper Copies, 1 for each Review Station of GL Form 0.

#### 4.3 Reference Oil Test Submissions

To have reference test oils submitted, the TMC approved lab shall complete by doing the following:

- GL Form 0: 1 per Meeting
- RGL Form 1: 1 per Reference Oil Test
- RGL Form 2: 1 per Reference Oil Test
- RGL Form 3: 1 Per Reference Oil Test
- RGL Form 4: 1 Per Reference Oil Test

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### 4.4 New Candidate Program Submissions

Every program submittal is tied to a unique chemical formulation and must have their own associated documentation, program number, and submission which would result in a unique QPL number. A unique chemical formulation would be defined as not having interchangeable components unless deemed to be chemically identical by the Review Committee. For example, if a component, even if from different sources, is shown to be chemically identical via Fourier Transform Infrared (FTIR), chemical properties, and physical properties, then it would be considered interchangeable within the unique formulation.

For new program submissions, the Presenter shall be responsible for providing all associated test parts with a paper copy of the specific test report without the ORS to the applicable Review Committee member. In addition, paper copies of each of the following:

- GL Form 0: One form per Meeting
- GL Form 1: One form per Consultation, Candidate Program Submission, or Field Trial Submission (as documented on GL Form 0) to explain the purpose of the presentation or program and to receive official recommendations of the Review Committee
- GL Form 2: One form per Candidate Program Submission or Field Trial Submission
- GL Form 2a: One form per Candidate Program Submission or Field Trial Submission
- GL Form 3: One form per Candidate Program Submission
- GL Form 3a: One form per Candidate Program Submission
- GL Form 4: One form per Candidate Program Submission per new (non-accepted base stock used)
- Waiver as Applicable
- Field Trial Report Form: One form per Field Trial Submission as Applicable

Additionally, for those suppliers intending to sell lubricant products to the U.S. military, in addition to the requirements above, lubricant grades 75W-90 and 75W-140 shall be tested in accordance to FED-STD-791 method 7504.0 (Efficiency of Axle Gear Lubricants), FED-STD-791 method 7506.0 (Gear Lubricant Compatibility for Stryker Vehicle Limited Slip Differential Clutches), and an extended 150 hour version of ASTM D5704 (L-60-1). The Presenter shall be responsible for 6 Paper Copies, 1 for each Review station, of each of the following:

- GL Form 3b: One form per Candidate Program Submission if additional military approval is requested.

### 4.5 Requalification of an Original Qualification

Each qualified product is accepted for up to a period not to exceed five years from the date the QPL number is issued. To be eligible for requalification, the complete requalification process must be completed prior to the QPL expiration date. Note: The testing also cannot be started prior to 12 months from this expiration date.

For requalification program submissions, the Presenter shall be responsible for 6 paper copies, 1 for each Review station, of each of the following:

- GL Form 0: One form per Meeting
- GL Form 1: One form per Program Submission (as documented on GL Form 0) to explain the purpose of the program and to receive official recommendations of the Review Committee
- GL Form 2: One form per Program Submission
- GL Form 2a: One form per Program Submission

GL Forms 2 and 2a must include the requalification test data and original testing data. All requests for requalification must also be accompanied by six (6) copies of signed GL Forms 1, 2, 2a, 3 and 3, and submitted for the original qualification along with the previous recommendations of the Review Committee. The Review Committee reserves the right to request additional testing or information as well. If accepted, an

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additional five (5) years will be added to the expiration date. Requests for requalification which do not meet the above guidelines, will not be considered, unless otherwise approved by the Review Committee.

If a submission for requalification is initiated and the approval is pending a 40-day correction, at the discretion of the Review Committee, a short extension may be granted for a designated period. The Secretary of the LRI will communicate the QPL extension period to the presenter. Note: The Review Committee reserves the right to make allowances as necessary based on the circumstances and expiration date for extension periods to still be considered a requalification.

### **4.6 Reblending Qualification of an Original Qualification**

The Review Committee will allow the reblend of qualified products by a second manufacturer if the original qualification is still active on the QPL. All such reblend requests must be submitted to Secretary of the LRI with the following:

- An active ISO 9000 or ISO/IATF 16949 certificate
- Properly executed Affidavits Form 2 and 3
- Original Qualification GL Forms 1, 2, 2a, 3, 3a, 3b, 4, as applicable.

All affidavits shall be submitted directly to the Qualifying Activity and are not reviewed by the Review Committee. The reblend QPL expiration dates will be the same as the original approval on which they were based.

### **4.7 Rebranding of Qualified Products**

The Review Committee will allow the rebrand of qualified products. All such rebrand requests must be submitted to the Secretary of the LRI with properly executed Affidavit Form 4 and Affidavit Form 5. All affidavits are not reviewed by the Review Committee. The rebrand QPL expiration dates will be the same as the original approval on which they were based.

### **4.8 Changes in Qualified Products**

It is the responsibility of the presenter, or finished fluid manufacturer, to inform the Secretary of the LRI in writing of any potential changes that could impact the qualified product chemical properties, physical properties and/or performance properties as tested per SAE J2360 including, but not limited to changes in material, manufacturer, or manufacturing location for base stocks, and/or additives used within the qualified product as defined below. Before the change is made, approval must be granted by the Secretary of the LRI after receiving approval from the Review Committee.

For non-emergency situations, the change shall be submitted as a new program at the next Review Committee Meeting. For emergency situations such as force majeure, the Chairman of the LRI should be notified so a special Review Committee Meeting can be held for evaluation of the change. The Secretary of the LRI reserves the right to immediately remove the applicable QPL if it is discovered changes were not reported and/or approved. Secretary of the LRI will notify the presenter within five (5) business days of direction by the Review Committee if the accepted program will be removed from the QPL, and the QPL will be updated within this same time frame.

The Review Committee may consider these changes limited to the following components:

- Base Stocks staying within original approved API Groups: I, II, III, and IV
- Pour Point Depressant
- Anti-Foam Additives
- Viscosity Modifier
- Increasing Viscosity of Formulation

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The program submission to the Review Committee needs to include a short presentation describing the change, and completed GL Forms 0, 1, 2, and 2a must be submitted. GL Forms 2 and 2a must include the current and proposed formulation. Additionally, ASTM D5662 (Oil Seal Compatibility) and ASTM D5704 (L-60-1) testing must be completed and GL Form 3a must be submitted with that data. The Review Committee may require additional testing and GL Forms based on the change and impact as recommendations.

### 4.9 Field Test Performance Requirements

#### 4.9.1 Field Trial Consultation and Approval to Proceed

A consultation is required with the Review Committee to review and should be approved prior to the start of a Field Trial to avoid being rejected. After approval, any deviations from those described or proposed during the consultation, or ordered by the Review Committee, are to be discussed prior to the start of such tests. The following information is required to be provided during the consultation for each vehicle:

- Fleet Name, Service Type, and Location of Testing
- Vehicle Type, Make, Model
- Vehicle Class (Heavy Duty Only)
- Engine OEM, Model, Maximum horsepower, and Maximum torque.
- Transmission OEM, Model, and Number of Gears/Speeds
- Axle OEM, Ring Gear Size, and Ratio to Pinion
- Description General Routes with details such as elevation changes and grades.
  - o Expected Mileage / Week
  - o Expected Load – Percentage of Miles Full and Correlated Load in lbs.
  - o Note: Routes with minimal elevation changes and grades may be rejected (Heavy Duty Only).
- Trailer Type, Length, and typical contents (Heavy Duty Only)

Test vehicles must be equipped with new Original Equipment Manufacturer (OEM) components including but not limited to hypoid drive gear differentials and carrier assembly(s), differential bearings and seals, and wheel end bearings and seals. If on-shaft bearings are used, axle shafts must also be new. Main drive gear and pinion must be a hypoid gear. All others will be rejected.

#### 4.9.2 Field Trial Vehicle Requirements

When field tests are conducted, these tests must include heavy duty service and light/moderate duty service per Table 2 below.

Table 2: Vehicle Requirements for Field Trials

| Duty  | Minimum Vehicles               | Service Type                      | Maximum Initial Axle Mileage <sup>(3)</sup> | Minimum Total Mileage <sup>(4)</sup> |
|-------|--------------------------------|-----------------------------------|---------------------------------------------|--------------------------------------|
| Light | Two (2) Light Trucks or Sedans | Mixed city-suburban-expressway    | 100 miles (161 km)                          | 100,000 miles (160,000 km)           |
| Heavy | Three (3) Class 8 Trucks       | Profit Commercial Loaded Trailers | 500 miles (800 km)                          | 200,000 miles (320,000 km)           |

(5) To accommodate the fact that new vehicles may accumulate "destination mileage" as they are moved from the manufacturer to the distributor and/or the field test site, field testing may be conducted using axles that have not exceeded the maximum initial mileage.

(6) Operation on a mileage accumulation dynamometer is not acceptable.

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It is acceptable, prior to test: (1) To clean the housing and wheel hubs; and (2) to fill with candidate oil and run under no-load conditions for no more than 15 minutes or 10 miles (16 km) as a flushing operation. Following this operation, drain and refill with candidate oil and start the field trial test. There is to be no other drain during the test.

Throughout the field trial, oil samples shall be taken from each vehicle, no more than 120 mL per sample, at the mileage interval as described in table 3 and analyzed by the latest revision of referenced test methods. The withdrawn sample volume for heavy duty field trials is not to be replaced with new oil. Any component replacement, seal leakage, seal replacement or other axle maintenance on any of the test vehicles during the test must be reported to the Review Committee.

Table 3: Oil Sampling Testing Requirements at Specified Mileage Intervals.

| Property                                                               | Test Method              | Light Duty Requirement                                                                     | Heavy Duty Requirement                                                                       |
|------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Kinematic Viscosity at 40°C; mm <sup>2</sup> /s <sup>(5)</sup>         | ASTM D445                | Plot Date against mileage at 0, 25,000, 50,000, 75,000, and 100,000 mile sample intervals. | Plot Date against mileage at 0, 50,000, 100,000, 150,000, and 200,000 mile sample intervals. |
| Kinematic Viscosity at 100°C; mm <sup>2</sup> /s <sup>(5)</sup>        | ASTM D445                |                                                                                            |                                                                                              |
| Elemental Analysis: Ba, B, Ca, Cu, Fe, Mg, Mo, P, K, Si, Na, Zn; wt. % | ASTM D4951 or ASTM D5185 |                                                                                            |                                                                                              |
| Sulfur (S); wt. %                                                      | ASTM D1552 or D2622      |                                                                                            |                                                                                              |
| Acid Number; mg KOH/g                                                  | ASTM D664                |                                                                                            |                                                                                              |
| Water; wt. %                                                           | ASTM D6304               |                                                                                            |                                                                                              |

(7) *The Review Committee shall not consider shearing out of viscosity grade as the only justification for rejection.*

At the completion of the specified minimal total mileage, a complete tear-down inspection shall be made on each vehicle's rear axle by experienced rater(s) in ASTM D5704, D7038, D8165 and D7452 test areas as calibrated by ASTM TMC. All ratings should be captured on the rating sheets found in ASTM Manual 21. Photos of all parts are recommended but not required.

All axle components (including seals) from at least two light duty and two heavy duty axles (two drive axles – front only- from tandem axle vehicles or two axles from single drive axle vehicles) shall be presented to the Committee for inspection. In addition, completed rating sheets and all oil sampling data as specified in Table 3, must be submitted to the Review Committee for review. Approval is at the discretion of the Review Committee.