

**Report of Meeting
ASTM SECTION B0.03
Automotive Gear Lubricants and Fluids
PRI Headquarters
Warrendale, PA
June 21, 2006**

CALL TO ORDER

Mr. Sullivan, Chairman, called the meeting to order at 4:20 pm.

AGENDA

The agenda is shown as Attachment 1. No additional items were added. The attendance list is shown as Attachment 2.

OPENING COMMENTS

The chairman appreciated all the hard work that was done by the L-42 surveillance panel over the last 6 months.

MEMBERSHIP

Add Mr. Salvatore Rea of Infineum USA to the membership list. The complete membership list is included as part of Attachment 2.

APPROVAL OF MINUTES

Minutes of the November 2005 meeting was approved with no changes.

REVIEW SCOPE AND OBJECTIVES

The sections scope and objectives were reviewed. No changes were made. Attachment 3 shows the current scope and objectives.

SURVEILLANCE PANEL REPORTS

L-33-1

Mr. Smith presented the panel report.

The ASTM D-7038 has been relatively stable. There has been a severity issue with the referencing of the stands. The issue was that the reference oil TMC-123 had gone slightly mild and the TMC-151 had gone slightly severe. The alarms that were triggered cleared on the next reference. The TMC reviewed oil targets and the appropriate time and adjusted to levels in accordance with the committee requirements. The Committee approved the use of a new reference passing oil TMC-155. Hardware remains in good supply for the immediate future. Now hardware is on order at this time.

The report was accepted without changes.

L-37

Mr. Bartlett presented the panel report. The report is shown as Attachment 4. The report was accepted without changes.

L-42

Mr. Koglin presented the panel report. The report is shown as Attachment 5. The report was accepted without changes.

L-60-1

Mr. Schenkenberger presented the panel report. The report is shown as Attachment 6. The report was accepted without changes.

Cyclic Durability

Mr. De La Fuente presented the report in place of Mr. Koehler. The report is shown as Attachment 7. The report was accepted without changes.

Oil Seal Compatibility

Mr. Bell presented the panel report. The panel has been active in the last 6 months. The panel has been doing the following:

- 1) Completed Revisions to the Standard.
 - a. New calibration procedure implemented.
 - b. New elastomer batch approval process has been developed.
 - c. New spacer design completed.
- 2) New batch of elastomer has been approved.
- 3) The panel is gathering data on Nitrile reference oil to generate statistics.
- 4) New procedure for referencing elastomers to reduce the amount used each test has been implemented.

The report was accepted without changes.

TASK FORCE REPORTS

Test Rating

Mr. De La Fuente presented the task force report for Mr. Sanchez. The report is shown as Attachment 8. The report was accepted without changes.

PM-2

Mr. Akucewich presented the task force report.

The task force met once in the last 6 months. The tests for the specifications have been identified. Limits have been identified on all but 3 tests. Reference oils are needed to determine the limits on the remaining test and move the specification forward. The task force has decided to approach SAE TC-3 for help in identifying and obtaining reference oils for specification development.

The report was accepted without changes.

GL-5

Mr. Sullivan presented the task force report for Mr. Buitrago. The report is shown as Attachment 9. The report was accepted without changes.

GEAR OIL CLASSIFICATION PANEL

Mr. McGlone presented the panel report.

The G.O.C.P. has met once since the last report to B.03. Current action items are:

- 1) Participation in the progress of L-42 procedure to L42-1 to an ASTM Procedure.
- 2) Participation in the progress of the PM-2 performance specification, including proposed tests and limits. ASTM and CEC test procedures are proposed herein.

No new gear oil requests have been received. The report was accepted without changes.

OLD BUSINESS

PM-1 Status

Mr. Sullivan indicated that this specification is no longer active and will be discontinued. No interest has been shown by industry.

Non-Monitored ASTM Tests

The section discussed the issue of TMC monitored tests using non-monitored ASTM tests in their procedures. The lack of oversight on these tests can cause problems with the monitored test. Members had concerns about this and asked what can be done to insure that these non-monitored tests stay in control. Mr. Sullivan will talk to the Test Monitoring Board (TMB) and ASTM Section B at the June 2006 meetings concerning this issue.

NEW BUSINESS

No new business was discussed.

NEXT MEETING DATE/LOCATION

The next B0.03 section will take place at the November 2006 LRI meetings in Warrendale, PA.

REPORT TO B03/SAE

Mr. Sullivan's report to the B meeting at ASTM week in June 2006 is included as Attachment 10.

ADJOURNMENT

The meeting was adjourned at 5:07 p.m.

Sincerely,

A handwritten signature in black ink, reading "Edward S. Akucewich". The signature is written in a cursive style with a long, sweeping tail.

Edward S. Akucewich, Secretary
ASTM Section B0.03 Gear Lubricants and Fluids

**ASTM SECTION B0.03
AUTOMOTIVE GEAR LUBRICANTS AND FLUIDS
PRI, Warrendale, PA
June 21, 2006**

- 1 Membership
- 2 Approve Minutes
- 3 Review Scope and Objectives
- 4 Surveillance Panel Reports
 - 4.1 L-33-1
 - 4.2 L-37
 - 4.3 L-42
 - 4.4 L-60-1
 - 4.5 Cyclic Durability
 - 4.6 Oil Seal Compatibility
- 5 Task Force Reports
 - 5.1 Test Rater
 - 5.2 PM-2
 - 5.3 GL-5
- 6 Gear Oil Classification Panel Report
- 7 Old Business
- 8 New Business
- 9 Next Meeting Date/Location
- 10 Report to B03/SAE

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BO.03 SECTION MEETING

Sign-in Sheet

JUNE 21, 2006

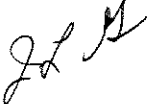
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ASTM SECTION B0.03 GEAR LUBRICANTS AND FLUIDS

SCOPE

This section is responsible for the promotion of knowledge of, and specifications, test methods and terminology for automotive gear lubricants and fluids. This includes gear lubricants used in rear drive axles, power dividers, and fluids used in manual and automatic transmissions of wheeled or track laying vehicles such as passenger cars, recreation vehicles, taxicabs, trailers, trucks, buses, tractors, construction and farm vehicles.

FUNCTIONS:

- Keep existing performance tests operational, at historic severity and precision levels.
- Ensure that performance test parts and reference oils are available in adequate supply and of a consistent quality.
- Develop and maintain performance tests for gear lubricant and transmission fluid categories.
- Maintain surveillance of test procedures under Section jurisdiction
- Work to improve test precision and correlation with field service.
- Maintain active liaison with related organizations, CEC, SAE.

Amendment	<u>3</u>
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L-37 Report to D02.B0.03

PRI/ Headquarters, Apollo Room - Warrendale, PA

June 21, 2006



Donald T. Bartlett, L-37 SP Chairman

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Meetings

- Since the November, 2005 B0.03 meeting:
 - Two Hardware TF Trips:
 - Ft Wayne, IN - November 2005
 - Lugoff, SC – December 2005
 - Two Surveillance Panel meetings
 - Two Teleconference Panel meetings

Attachment 4

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Reference

Information Letters Issued

- IL 06-1 – Correction Factor for Lubrited L247/T758A Batch for Canadian Test Version Only
 - Pinion Ridging Transformed CF = 0.5878
Corrects Original Ridging Distress of 6 to an 8 with respect to the pass/fail line
 - Pitting/Spalling Transformed CF = 0.7340
Corrects Original Pitting/Spalling Distress from an 8 to a 9.3 with respect to the pass/fail line

2003 L247/T758A Lubrited Hardware

- ✓ Hardware currently approved for Standard testing with no Correction Factors
- ✓ Hardware currently approved for Canadian testing with Correction Factors for Ridging and Pitting/Spalling

Attachment 4

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Reference _____

2005 V1L417/P4L792 Non-Lubrited Hardware

- ✓ 44-Test Hardware matrix completed in April, 2006

- ✓ Hardware currently approved for Standard testing with no Correction Factors

- ✓ Hardware currently approved for Canadian testing with No Correction Factors

2006 Lubrited Hardware Order

- ✓ Binding PO's were issued May 30th, 2006.

- ✓ Total Gears Ordered: 1086

- ✓ Will be made with 8620 primary steel. The panel will be advised if the primary steel cannot be obtained

- o Laboratory Hardware TF visits planed for Ft. Wayne and Lugoff, facilities

- o October time frame for production/assembly/delivery

Attachment	<u>4</u>
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Other Actions

- ✓ Approved TMC 155 as replacement oil for TMC 151.
- o Looking to Additive Companies for TMC 127 replacement oil. (Fail Oil)
- o Looking for response from the Gear Oil Rating TF:
 - For rating pinions and rings – The difference between the vast population of raters is that a rating for any distress should not be more than 1
 - The reproducibility of the number across the industry should be no worse than what it is where a lab has more than one rater

Thank You

- ✓ Laboratories – For hardware Task Force extra work & commitment and donated testing \$\$\$
- ✓ TMC - statistical and technical support
- ✓ Dana Corporation - for support and commitment to system processes to provide quality/consistent hardware
- ✓ Gear Oil Rating Task Force - for commitment to improve the rating processes variability & consistency
- ✓ Panel - for patience, direction, and support

Attachment	4
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L42 B03 Update

June 2006

Information Letters

- Information letter 06-1
 - Alternative power train allowed for L42 test
- Information letter 06-2
 - Adopted the L42-1 task force procedure dated Feb 27, 2006.
 - Revised L42 procedure (STP 512A) allowing one common power train (superseded IL 06-1)

Attachment	<u>5</u>
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L42-1 TF update

- L42-1
 - Labs completed 32 test matrix April 2006 using torque targets for shock series
 - Torque vs score results were unexpected
- Task force implementing suggested changes by SP
- Task force looking at Conditioning 2&4 variation

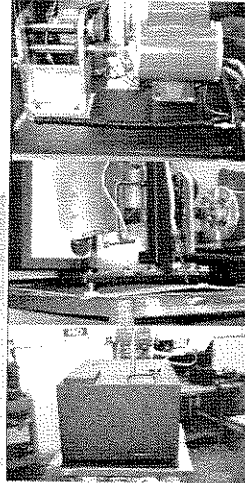
Hardware update

- Hardware low in industry
- Labs placed PO's July 2005
 - Hardware manufactured in Feb-Mar 2006
 - Dana-Lugoff discovered pattern issues when assembling gearsets
 - ~30% Carrier dimensions out of spec
 - Gearset geometry makes driveside pattern sensitive to adjustments
 - Dana actively pursuing new carriers and manufacturing new rings/pinions of update driveside design (less sensitivity to scoring/adjustments)
 - Dana's target to complete 1000 set order September 2006

Attachment	<u>5</u>
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ASTM L-60-1 S.P. Report to D02.B0.03

6/21/06
Chris Schenkenberger



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L-60-1 Surveillance Panel Activity

- One Task Force Meeting
- One Surveillance Panel Meeting
- No information letters issued in 2006.

Attachment 6

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Reference

L-60-1 Surveillance Panel Activity

- As a result of increased test standardization, Task Force activity has slowed as severity has leveled off.
- The final action for severity investigation involved the test rig drawings.
 - Stand apparatus drawings were never updated when D5704 transitioned from L-60 to L-60-1 during early 1990s.
 - Surveillance panel hoped that thorough investigation of stands would reveal cause/causes.

Task Force Meeting Summary for 6/20/06

- Task Force meeting held yesterday (6/20/06) to collectively review findings from TMC lab visits.
- The task force classified the findings into a three categories:
 1. Items outside of tolerances and judged to be non-critical
 2. Items being outside of tolerances and assumed to be non-critical while acknowledging that data doesn't exist to prove this hypothesis.
 3. Items being outside of tolerances and labs making changes to conform.

Attachment 6

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Reference _____

Task Force Meeting Summary for 6/20/06

- Task force believes focus needs to be placed on critical areas of performance.
 - Examples include location of gears inside of gear case assembly and thermocouple locations.
- Proposal is to have a secondary set of “performance” drawings to define critical areas of performance required for stand calibration.
- Current drawings would be for manufacturing of new/replacement parts.
 - Task Force defined an action plan that would be completed by end of year.
 - Steps include defining performance specs, completing drawings, building critical templates, and getting SP approval for issuing to D5704.

Outcomes of 6/21/06 Surveillance Panel Meeting

- Critical performance drawings will be included as an annex to D5704.
- Section 6.2 of the will be revised to define the difference and implications of the critical performance drawings and the manufacturing drawings.
- The Task Force has the action item of completing deliverables by the November 2006 Surveillance Panel meeting.

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L-60-1 Surveillance Panel Activity

- Hardware
 - Labs Working Off of the Same November 2000 Hardware Batch
- Reference Fluids
 - TMC 148-1 and TMC 151-2 Being Assigned at 50/50 Ratio

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Mack HTCT S.P. Presentation to Section B0.03

- By: Brian Koehler; S.P. Chairman
- June 21st, 2006
- PRI, Warrendale, PA

TEST STATUS, page 1

- 2 labs with a total of 2 stands
- Three references were run this last period, all passed
- One lab visit made, no findings
- New style hardware is available
- All stands on conf. 2 hardware

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TEST STATUS, page 2

- Industry delta/s is -0.79 severe
 - Severity may relate to using only Conf. 2 hardware
 - Chairman/ TMC to Study Further
- 1 S.P. Meeting Held
 - 2-7-06, PRI
 - Substituted TMC 155 oil for 151-3
 - First test was acceptable

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ASTM Rating Task Force Report

June 16, 2006

By: Arthur Sanchez
ASTM Rating Task Force Leader

The ASTM Calibration Workshop was held in Richmond, VA January 10,11, & 12, 2006 hosted by Afton Chemical. The next Calibration Workshop is scheduled for July 25,26 & 27 in Cleveland, OH. Hosted by Lubrizol Corporation.

L-42 Scoring/Bright burnish: This issue is tabled until a decision by the Surveillance Panel can be made.

CRC L-37 Photo Rating Aid: Hardware examples for possible replacement of current distress photos have not been collected. This issue was tabled for review at the July workshop in Cleveland.

Rating Wear on RTMS L-37 Pinions: Rating Task Force group wants to change the current method of rating wear on a single marked tooth of an RTMS L-37 pinion, when spalling is present near the wear step. Raters are instructed to rate one marked pinion tooth for all distress. The spalling makes it difficult to see and feel the true wear step.

The L-37 LTMS pinions with spalls covering the wear step will be re-rated at the workshop in Cleveland July 25,2006. Don Lind will choose a separate tooth to be rated for wear only.

L-37 Wear rating in the 6 to 8 rating range: Since we adopted the new wear definition, which states that raters should confirm the presence of a wear step both visually and tactilely, the wear ratings have not been as consistent.

Afton volunteered to provide for review, a new photo of 6 wear. Afton will ask the LRI board and LZ to loan the unused pinion rating boards to accommodate this photo project.

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Other suggestions are to possibly modify the Light (7) and Light/medium (6) wear definitions.

Examples:

Light (7) - Absence of tool marks at the heel or toe which may or may not include the presence of a barely discernible wear step.

Light/Medium (6) – Presence of a discernible wear step.

These examples for (6) and (7) wear will be discussed at the July workshop.

L-33 Cover Template: During review of L-33 data, an observation was made of the template installation on the cover. It was discovered by placing the template in two different directions, rust could be covered or not covered by the template. The Template has a bevel on one side and is sharper on the other side.

L-33 cover templates from all four labs were sent to PARC for marking and clear identification as to the exact position of installation for rating.

All cover templates were returned to there respective labs and are currently in use.

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ASTM GL-5 Task Force - June 28th, 2006 Report

Juan A. Buitrago

ASTM GL-5 task Force

Status

- Since the last report, November 2005, the task force has not held a meeting or a conference call
- Last November, the Task Force approved the final draft of the revised GL-5 specification

Next Step

- This draft needs to be balloted and approved by Subcommittee B

Thank You!

Attachment 9

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Reference

ASTM SECTION D02.B0.03

Status Report to Subcommittee

June, 2006

OVERVIEW

Existing Procedures and Standards

- *All tests under Section B03 are available.*
- *All outstanding hardware are approved and where the need defined, relevant correction factors have been applied.*

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OVERVIEW

New Category Development

PM-2: Performance test table developed. Task Force now actively meeting. Task Force now preparing letter to SAE to address Category pass/fail limits

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SECTION TASK FORCES

- **Gear Oil Classification Panel**

- *No new activity.*

- **Test Rating Task Force**

- *Task Force actively working with with the L-42 SP and the LRI to handle burnishing issue*

- **GL-5 Task Force**

- *Draft category standard now ready to pass to subcommittee for ballot this summer.*

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CURRENT STANDARD MAINTENANCE

SAE J2360, API GL-5, D 5760

Surveillance Panel Activity

- **L-33-1:** *All outstanding gear batches are available for use, with appropriate correction factors, where appropriate. Current supply of hardware is 2+ years. Panel will begin looking at alternate hardware options, focusing on the Dana Model 44 (L-42) in 2007.*
- **L-37:** *The SP has placed it's next order for lubrited gears from the supplier .*
 - *All existing gear batches are currently approved and have correction factors where appropriate.*
 - *Currently, only one independent lab has lubrited gears available for testing.*

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CURRENT STANDARD MAINTAINENCE

SAE J2360, API GL-5, D 5760

Surveillance Panel Activity

- **L-42:** *The Panel is still working on the hardware standardization process for the draft. Focus is on procedure details*
All current labs now have the new stand configuration. An initial matrix of tests has been carried out using the new "L-42-1" cofiguration. The Surveillance panel has approved the use of the new engine/ data hardware for use in the current L-42 test.
- **L-60-1:** *Recent updates to C/V rating procedure have improved precision.*

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CURRENT STANDARD MAINTAINENCE

SAE J2360, API GL-5, D5760

Surveillance Panel Activity

- **Cyclic Durability:** All industry stands are now calibrated using Configuration # 2 hardware.
- **Seal Immersion:** Panel is now testing a new reference oil (aggressive) for Nitrile seals. The panel has voted to cut in ½ the amount of reference testing to more efficiently use each elastomer batch

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NEW STANDARD DEVELOPMENT

- **PM-2** (Commercial Synchronized Manual Transmission Oil Applications)

Task Force Activity

- Defined test list with partial list of limits, Task Force now active.
- Task Force is working on a communication to the SAE to ask for help setting "European Centric test pass/fail limits.
- Task Force is also discussing how ASTM will handle CEC tests within our Standards.

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Activities Directed at Ballots

- L-42 Stands have been upgraded to the new configuration. Draft Standard still being authored.
- PM-2 TF will survey European OEM's for proposed limits on CEC methods.
- GL-5 TF has written and reviewed a draft category Standard rather than rewrite STP 512A. Draft ready to pass to staff for ballot

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Next Section Meeting

November, 2006 in Pittsburgh.

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