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Committee D02 on PETROLEUM PRODUCTS AND LUBRICANTS

May 20, 2005

Reply to:
Donald T. Bartlett
The Lubrizol Corporation
29400 Lakeland Blvd.
Wickliffe, OH 44092
(440) 347-2388
(440) 347-2878 (FAX)

ASTM D02.B0.03 L-37 Surveillance Panel
Members and Guests:

Attached for your review and comment are the unconfirmed minutes of the April 6th, 2005 L-37 Surveillance Panel Meeting held at the PRI Headquarters in Warrendale, PA. Please direct any corrections or comments to my attention.

Sincerely,

Donald T Bartlett

Donald T. Bartlett, Chairman
L-37 Surveillance Panel
Attachments

Report of Meeting
L-37 Surveillance Panel
PRI Headquarters, Apollo Room, Warrendale, Pa.
April 6, 2005

Sign-in/Review of Membership: The meeting was called to order at 15:20 p.m. The sign-in sheet is ***Attachment 1***. There were no membership changes to report and included as ***Attachment 2***.

Meeting Agenda: The meeting agenda was reviewed and is included as ***Attachment 3***.

Approval of Meeting Minutes:

Motion 1 ⇒ **Ms. Whitton, Second ⇒ Mr. Koglin** - For the panel to approve the February 2, 2005 Surveillance Panel meeting minutes with the clarification/corrections provided by a SP Member. The motion to approve the minutes as corrected was unanimous.

Chairman's Note: ***Since the February 2, 2005 minutes distributed on February 17, 2005 were approved with corrections, the actual minutes annotate the corrections and are being redistributed to the panel membership. The correction cover letter is dated April 25, 2005.***

Motion 2 ⇒ **Mr. Koglin, Second ⇒ Mr. Smith** - For the panel to approve the March 9, 2005 Surveillance Panel Teleconference call meeting minutes as written. The motion to approve the minutes as written was unanimous.

Summary of Meeting Discussions

2003 L247/T758A Lubrited Matrix -

Attachment 4 is a brief summary of the progress to date. The minutes (attachment 1 and 2) of the March 9, 2005 teleconference call further details continued work comparing Matrix 4 to matrix 2 and 3. The chairman commented that phase 5 testing on TMC 128-1 was in progress and an April teleconference call would be convened to address further action items.

2005 Non-Lubrited Hardware Order -

The chairman reported that the Dana purchase order information needed further documentation and he had been in discussions with Dana representatives for clarification language. The deadline for submitting binding purchase orders is April 15th. One of the Panel members indicated that they were not prepared to commit to an actual number of axles to order today or by April 15th.

Motion 3 ⇒ **Mr. Koehler, Second ⇒ Dale Smith)**: The order date for submitting binding industry purchase orders to be extended to May 1st. The motion carried with none opposed and 1 abstention.

In the interest of time, chairman Bartlett commented that all of the remaining issues included in ***Attachment 5*** would be addressed during an April Panel teleconference call.

Discussion of Test Precision and Reporting -

The Chairman reviewed examples of the current rating report requirements (forms 1 and 2) which are included as ***Attachment 6***. They show the level of reporting precision currently required in the test report. Chairman Bartlett put a proposal on the table for Panel consideration modifying the report precision requirement (forms 1 and 2) that is included as ***Attachment 7.***

Mr. Lind commented that, in his opinion, the Final Merit Result should not be reported as a whole number because one can put in a number less than 1 for a correction factor. He believes that the final number should still be shown to a level of precision of tenths (x.x).

Mr. Sullivan stated that when the Panel approved correction factors, we established the numbers based on the oils historical passing/failing criteria. Hence a final 'corrected' rippling merit result of 7.8 would round to a whole number of 8. We're using a system that doesn't allow much precision, yet, we're using correction factors that bring in a decimal system.

Mr. Gropp expressed the concern that when we start showing the L-37 reported rating values to a tenth, people will start believing that we actually can measure rating to a tenth and that this is clearly not the case or possible.

Mr. Farber stated that if we have a correction factor < 1, then this means that the final value could be reported to the tenth. If the industry accepts that correction factors could only be whole numbers, then he would accept rounding the final L-37 reported result to whole numbers. As an example, a 0.4 correction factor would round down to a value of zero. A 0.6 correction factor would round up to a value of 1.

Mr. Sullivan asked if there is another way to do this. Can we apply a correction factor that is not in the transformed space? What happens when the Panel adopts SA's which are also reported in transformed space?

After more discussion, the following motion was put on the table.

Motion 4 ⇒ **Mr. Farber, Second ⇒ Mr. Smith**: Change the reported level of precision for the original merit results on ring and pinion for wear, rippling, ridging, and scoring to have Original Merit Results be reported to whole numbers. Pitting/Spalling would continue to be reported to tenths because of the current rating scale for pitting/spalling. The Final Merit Results for all distresses would continue to be reported to tenths using Standard Practice E 29. The implementation date is June 2nd. 2005. The motion passed unanimously.

Mr. Sullivan suggested as an action item for the June meeting that the TMC pull the reference data used to develop the initial correction factors and propose new correction factors to help us better understand what happens when you round the final reported values to a whole number. The SP should then make necessary recommended changes to the current correction factors to get the same pass/fail results.

TGC Proposal for Test Precision Reporting Guidelines -

Chairman Bartlett started the discussion by sharing the TGC recommendation in a recent email ballot by Chairman Farnsworth and the information provided by the TMC showing the oils used in the D6121 test method precision statement and the LTMS standard deviation SA. See ***Attachment 8***.

Attachment 9, presented by Mr. Farber, is the TMC recommendation (includes all recommendations impacting all gear tests). Mr. Farber recommended that the SP review this data (reported in transformed unites) in 6 months because there are only 26 chartable tests for non-lubrited at the moment. At present, severity adjustments have not been approved by the panel and are not in force.

Motion 5 ⇒ Mr. Farber, Second ⇒ Mr. Sullivan: The SP is to implement the TMC recommendation for standardizing LTMS SA Standard Deviation and Test Method Precision on April 11th and effective the date of the information letter. This is effective for both lubrited and non-lubrited hardware. The motion passed unanimously.

Chairman's Note: *The chairman received a call on April 27th from Mr. Lind, TMC. Mr. Lind stated that the SAS statistical routine 'Proc GLM' used for calculating the standard deviation for precision and initially reported & approved by the panel on April 6th (referring to Attachment 9) has been found to be incorrect. The SAS routine initially reported data run using lab and oil. It should have been run using stand and oil since the L-37 test is a stand based system.*

For the meeting minutes, clarification, and because the motion # 5 intent was to implement, the chairman decided to attach the correct data (table below) that will be released through information letter 05-2. The corrected data is similar to what was initially approved by the panel. The data will be reviewed by the panel annually, starting January 2006.

Hardware Type	Variable	$S_{i.p.}$
Lubrited	Pinion ridging [A], -ln(10.5 - merit)	0.2612
	Pinion rippling [A], -ln(10.5 - merit)	0.2341
	Pinion wear, merit	0.548
	Pinion pitting/spalling [A], -ln(10.5 - merit)	0.4038
Non-lubrited	Pinion ridging [A], -ln(10.5 - merit)	0.5323
	Pinion rippling [A], -ln(10.5 - merit)	0.3480
	Pinion wear, merit	0.694
	Pinion pitting/spalling [A], -ln(10.5 - merit)	0.4603

Due to time restraints with the scheduled OSCT teleconference meeting, a motion was made by Mr. Smith, second by Mr. Koglin to adjourn the meeting. The meeting was adjourned at 16:04 p.m.

Respectfully submitted,

Donald T Bartlett

Donald T. Bartlett
L-37 Surveillance Panel Chairman

ASTM L-37 Surveillance Panel Membership/Mailing List

Meeting Date: April 6, 2005

Initials*	Name	Voting Status	Company Name & Address	Phone/Email Info
	Akucewich, Ed	Non-Voting	The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, Ohio 44092	Phone: 440-347-2415 Fax: 440-347-9011 E-Mail: esak@lubrizol.com
DTB	Bartlett, Don	Voting/Chair	The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, Ohio 44092	Phone: 440-347-2388 Fax: 440-347-2878 E-Mail: dtb@lubrizol.com
DB	Bell, Don	Non Voting	Afton Chemical 500 Spring Street Richmond, VA 23219	Phone: 804-788-6332 Fax: 804-788-6243 E-Mail: don.bell@aftonchemical.com
	Boschert, Tom	Non Voting	Afton Chemical 2000 Town Center, Suite Southfield, MI 48075	Phone: 248-350-0640 ext. 228 Fax: 248-350-0025 E-Mail:
	Bryson, Tom	Voting	Mack Trucks 13302 Pennsylvania Avenue Hagerstown, Maryland 21740	Phone: 301-790-6744 Fax: 301-790-5605 E-Mail: thomas.bryson@volvo.com
	Buitrago, Juan	Voting	Chevron Oronite Company 100 Chevron Way Richmond, California 94802	Phone: 510-242-1161 Fax: 510-242-3392 E-Mail: jabu@chevrontexaco.com

* Initial to indicate attendance at subject meeting

ASTM L-37 Surveillance Panel Membership/Mailing List

Meeting Date: April 6, 2005

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	Chambers, Harold	Non-Voting	Visteon Corporation 17000 Rotunda Drive, Cube C290 81 Dearborn, MI 48120	Phone: 313-755-4246 Fax: 313-755-5681 E-Mail: hchamber@visteon.com
	De La Fuente, Hector	Non Voting	Southwest Research Institute PO Drawer 28510 San Antono, Texas 78228-0510	Phone: 586-522-5996 Fax: 210-684-7523 E-Mail: hdelafuente@swri.edu
	Dharte, John	Voting	American Axle & Manufacturing 2965 Technology Drive Rochester Hills, MI 48309-3589 78228-0510	Phone: 248-299-6478 Fax: 248-293-6945 E-Mail: Dhartej@aam.com
	Farber, Frank	Non Voting	ASTM Test Monitoring Center 6555 Penn Avenue Pittsburgh, Pennsylvania 15206	Phone: 412-365-1030 Fax: 412-365-1047 E-Mail: fmf@astmtmc.cmu.edu
	Fett, Greg	Non Voting	Dana Corporation P.O. Box 955 Toledo, Ohio 43697	Phone: 419-887- Fax: 419-887-5962 E-Mail: greg.fett@dana.com

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ASTM L-37 Surveillance Panel Membership/Mailing List

Meeting Date: April 6, 2005

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	Follis, Mike	Non Voting	Dana Corporation P.O. Box 955 Toledo, Ohio 43697	Phone: 419-887-3424 Fax: 419-887-5962 E-Mail: mike.follis@dana.com
	Gropp, Jerry	Non Voting	The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, Ohio 44092	Phone: 440-347-1223 Fax: 440-347-1555 E-Mail: jlg@lubrizol.com
	Huron, John	Non Voting	Chevron Oronite Company LLC Suite 210 San Antonio, Texas 78228-1374	Phone: 210-731-5609 Fax: 210 731 5699 E-Mail: HURO@chevrontexaco.com
	Koehler, Brian	Voting	Southwest Research Institute PO Drawer 28510 San Antono, Texas 78228-0510	Phone: 210-522-3588 Fax: 210-684-7523 E-Mail: bkoehler@swri.edu
	Koglin, Cory	Voting	Afton Chemical 500 Spring Street Richmond, VA 23218	Phone: 804-788-5305 Fax: 804-788-6358 E-Mail: Cory_Koglin@aftonchemical.com
	Kozlowski, Ralph	Non Voting	PARC Technical Services, Inc. 100 William Pitt Way Pittsburg, PA 15238	Phone: 412-826-5044 Fax: 412-826-5443 E-Mail:

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ASTM L-37 Surveillance Panel Membership/Mailing List

Meeting Date: April 6, 2005

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	Lind, Don	Voting	ASTM Test Monitoring Center 6555 Penn Avenue Pittsburgh, Pennsylvania 15206	Phone: 412-365-1034 Fax: 412-365-1047 E-Mail: dml@astmtmc.cmu.edu
	Linden, Jim	Voting	GM Research & Development 30500 Mound Rd. MC 480-106-160 Warren, MI 48090	Phone: 586-986-1888 Fax: 586-986-2094 E-Mail: James.L.Linden@GM.com
	Purnell, Keith	Non Voting	Performance Review Institute 161 Thornhill Rd. Warrendale, Pa. 15086-7527	Phone: 724-772-1616 ext 8182 Fax: 724-772-1699 E-Mail: kpurnell@sae.org
	Lochte, Michael	Non Voting	Southwest Research Institute PO Drawer 28510 San Antono, Texas 78228-0510	Phone: 210-522-5430 Fax: 210-684-7523 E-Mail: Mlochte@swri.edu
	Marougy, Thelma	Voting	Eaton Corporation 26201 Northwestern Highway Southfiled, MI 48034	Phone: 248-226-6985 Fax: 248-226-4739 E-Mail: thelmaemarougy@eaton.com

* Initial to indicate attendance at subject meeting

Attachment 1
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ASTM L-37 Surveillance Panel Membership/Mailing List

Meeting Date: April 6, 2005

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	Okamuro, Ken	Voting	Dana Corporation 1293 Glenway Drive Statesville, NC 28677	Phone: 704-878-5642 Fax: 704-878-5735 E-Mail: Ken.Okamuro@dana.com
	Radonich, Peter	Non Voting	The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, Ohio 44092	Phone: 440-347-2184 Fax: 440-347-9011 E-Mail: pdr@lubrizol.com
	Sanchez, Art	Non Voting	Southwest Research Institute PO Drawer 28510 San Antono, Texas 78228-0510	Phone: 210-522-3445 Fax: 210-680-1777 E-Mail: asanchez@swri.edu
	Schenkenbeger, Chris	Non Voting	The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, Ohio 44092	Phone: 440-347-2927 Fax: 440-347-2878 E-Mail: csc@lubrizol.com

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Attachment 1
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Reference L-37

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Meeting Date: April 6, 2005

Initials*	Name	Voting Status	Company Name & Address	Phone/Email Info
	Smith, Dale	Voting	PARC Technical Services, Inc. 100 William Pitt Way Pittsburgh, PA 15238	Phone: 412-826-5051 Fax: 412-826-5443 E-Mail: dsmith@parctech.com
	Sopko, Harry	Non Voting	PARC Technical Services, Inc. 100 William Pitt Way Pittsburg, PA 15238	Phone: 412-826-5165 Fax: 412-826-5443 E-Mail: hsopko@parctech.com
WTS	Sullivan, Bill	Voting	ExxonMobil Chemical Company P. O. Box 3140 Edison, New Jersey 08818	Phone: 732-321-3354 Fax: 732-321-6064 E-Mail:
	Tschirhart, Garland	Non Voting	Southwest Research Institute PO Drawer 28510 San Antono, Texas 78228-0510	Phone: 210-522-3445 Fax: 210-680-1777 E-Mail: gtschirhart@swri.edu
	Vermilyia, Denise	Non Voting	The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, Ohio 44092	Phone: 440-347-4681 Fax: 440-347- E-Mail: drc@lubrizol.com
	Vettel, Paula	Voting	D. A. Stuart Company 4580 Weaver Parkway Warrenville, Illinois 60555	Phone: 630-393-8859 Fax: 630-393-8577 E-Mail: pvettel@dastuart.net

* Initial to indicate attendance at subject meeting

ASTM L-37 Surveillance Panel Membership/Mailing List

Meeting Date: April 6, 2005

Initials*	Name	Voting Status	Company Name & Address	Phone/Email Info
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	Yanchar, Paul	Non Voting	The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, Ohio 44092	Phone: 440-3474468 Fax: 440-347-9011 E-Mail: pjy@lubrizol.com
	Zakarian, Jack	Non Voting	Chevron Products 100 Chevron Way Richmond, CA 94802	Phone: 510-242-3595 Fax: 510-242-3758 E-Mail: jaza@chevron.com
	Zreik, Khaled A.	Voting	AMSTA-TR-D/210 Tank Automotive & Armament 6501 East 11 Mile road Warren, MI 48397-5000	Phone: 586-574-4227 Fax: 586-574-4244 E-Mail: Zreikk@@tacom.army.mil
	Burrow, Robert	Non-Voting	Afton Chemical 500 Spring St. Richmond, VA 23219	Phone 804-788-6862 Fax 804-788-6358 email robert.burrow@aftonchemical.com

* Initial to indicate attendance at subject meeting

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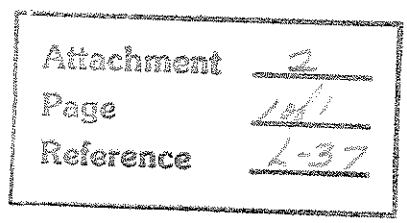
L-37 Surveillance Panel Voting Members

Donald Bartlett	The Lubrizol Corporation (Chairman)
Tom Bryson	Volvo Powertrain Corporation
Juan Buitrago	Chevron Oronite Company
John Dharte	American Axle & Manufacturing
Brian Koehler	Southwest Research Institute
Cory Koglin	Afton Chemical Company
Don Lind	ASTM Test Monitoring Center
Jim Linden	GMR Research and Development
Thelma Marougy	Eaton Corporation
Bruce McGlone	ArvinMeritor Materials Engineering
Ken Okamuro	Dana Corporation
Dale Smith	PARC Technical Services
William Sullivan	ExxonMobil Chemical Company
Paula Vettel	D.A. Stuart Company
Khaled A. Zreik	AMSTA-TR-D/210 US Army Tacom-Tardec



L-37 Surveillance Panel
PRI/ Headquarters, Apollo Room - Warrendale, PA
April 6, 2005

AGENDA

Call to Order/Review Membership

Review Agenda

Approval of Minutes:

- **February 2, 2005 Panel Meeting**
- **March 9, 2005 Teleconference Meeting**

2003 L247/T758A Lubrited Hardware Review and Discussion

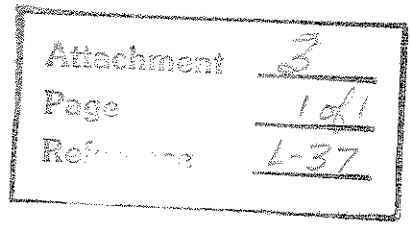
2006 Non-Lubrited Hardware Order

PRI Request for Significant Digit Precision Reporting

TGC Proposal for Test Precision Reporting Guidelines

New Business

Adjournment



2003 L247/T758A Lubrited Hardware Discussion

- Axles ordered January 2003.
- Only 3 labs participated in ordering.
- Glasgow Facility Visit June 18th, 2003 by Hardware TF
- Changes recommended by Dana & approved/accepted by panel:
    - Ring & Pinion will have a new gear geometry development/finite analysis process.
    - Production moved from Statesville NC, to Glasgow KY facility.
    - Different lubriting process.
- Phase 1 and 2 matrix testing completed last quarter 2003 – Variability and something change between Phase 1 and Phase 2.
    - Distress difference due to different pinion production temper. Lower vs. a low temperature temper required to keep pinion at 61-63 HRC.
- Phase Three testing 1st qtr 2004.
    - Anchor batch combined using the two batches – 303 & 426.
    - Statistically, Phase 2 and 3 results were similar.
    - With respect to Rippling, statistical analysis yielded lab differences on both oils.
    - With respect to wear, TMC 151 wear appears severe on new hardware. Remove lab D, there is no difference between new hardware and anchor batch.
    - With respect to Pitting/Spalling, new gear batch is milder than the combined anchor batch.
- Phase 4 testing 1st qtr 2005.
- Phase 5 testing ~~1st~~ 2ND qtr 2005.
- Review and discussion –

Attachment 4
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2005 Non-Lubrited Hardware Order

- **During the March 9, 2005 teleconference call, the panel agreed that:**
  - **Binding PO's should be tendered NLT 4-15-05.**
  - **Next non-Lubrited order is to be placed by April, 2007.**
  - **One pallet of 16 axles to be set aside for hardware approval matrix testing.**
- **Final Axle Order Count:**
  - **Afton -**
  - **Parc -**
  - **SwRI -**
  - **Lubrizol -**
- **Late 2005 is tentative planned hardware receipt.**
- **Approval testing Will Commence1st qtr 2006.**
- **Proposed hardware approval matrix:**
  - Each of the 4 labs will equally participate in a 44-test matrix to evaluate the 2005 non-lubrited hardware batch.
  - 8-tests on TMC 151-3 (standard)
  - 8-tests on TMC LT1-1 (standard) (TMC 152)
  - 8-tests on TMC LT2-1 (standard) (TMC 153)
  - 4-test on TMC 127 (standard)
  - 8-tests on TMC LT1-1 (Canadian) (TMC 152)
  - 8-tests on TMC LT2-1 (Canadian) (TMC 153)
  - TMC will assign each lab one test on TMC 127 and stop to review results (to insure that this oil has performed as expected). Targeted completion date is ????
  - TMC will assign each lab one test on TMC 151 and stop to review results (to insure that this oil has performed as expected). Targeted completion date is ????

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CURRENT

TEST METHOD D6121

L-37

Form 1

Test Result Summary Sheet

Oil Test			
Lab:	Stand:		Stand Run :
Start Date:	Date Completed:	EOT Time:	Test Length:
TMC Oil Code:	Laboratory Oil Code:		Viscosity Grade:
Oil Code:			
Formulation Stand Code:			
Latest Information Letter Test Was Run Under: 05-1			
Test Hardware: NONLUBRITED	Test Version: STANDARD		
Pinion Batch:	Ring Batch:		

Last Reference Oil Calibrating Stand Information - Fill Out For Non-reference Oil Tests Only			
Stand: 191	Stand Run:	TMC Oil Code:	Date Completed:
Pinion Batch:		Ring Batch:	
Test Hardware:		Test Version:	

	Ring Gear Results				
	Wear	Rippling	Ridging	Pitting/Spalling	Scoring
Original Merit Results [C]	8.0	9.0	10.0	10.0	10.0
Transformed Results	8.0000	-0.4055	0.6931	0.6931	10.0000
Correction Factor	0.0000	0.0000	0.0000	0.0000	0.0000
Corrected Transformed Results	8.0000	-0.4055	0.6931	0.6931	10.0000
Severity Adjustment [A]	0.0000	0.0000	0.0000	0.0000	0.0000
Final Transformed Results	8.0000	-0.4055	0.6931	0.6931	10.0000
Final Merit Results	8.0	9.0	10.0	10.0	10.0

	Pinion Gear Results				
	Wear	Rippling	Ridging	Pitting/Spalling	Scoring
Original Merit Results [B,C]	8.0	9.0	10.0	10.0	10.0
Transformed Results	8.0000	-0.4055	0.6931	0.6931	10.0000
Correction Factor	0.0000	0.0000	0.0000	0.0000	0.0000
Corrected Transformed Results	8.0000	-0.4055	0.6931	0.6931	10.0000
Severity Adjustment [A]	0.0000	0.0000	0.0000	0.0000	0.0000
Final Transformed Results	8.0000	-0.4055	0.6931	0.6931	10.0000
Final Merit Results	8.0	9.0	10.0	10.0	10.0

[A] AT THE PRESENT TIME THERE ARE NO SEVERITY ADJUSTMENTS

[B] WITH ANY APPLICABLE EXCLUSIONS APPLIED

[C] IF TOOTH BREAKAGE OCCURS, LEAVE RESULTS BLANK AND REPORT IN COMMENT SECTION

Attachment 6
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CURRENT

TEST METHOD D6121
L-37
Form 2

Gear Tooth Surface Condition

Lab:	Stand:	Stand Run:
Oil Code:		Test Version: STANDARD

Gear Batch Identification		
Test Hardware: NONLUBRITED	Pinion Batch:	Ring Batch:
Match Number: 7L	Assembly Date: 232-04-A	
Pattern Contact Length Rating: 2	Pattern Contact Flank Rating: 0	

Gear Test Phase – After Completion of Pinion and Ring Gear Drive Side Inspection

Rater's Initials:

Gear Condition	Original Ring Rating	Original Pinion Rating
Burnish	Med Brt	Med Brt
Discoloration	8.0	7.0
Corrosion	10.0	10.0
Deposits	10.0	10.0

	Original Ring Rating	Original Pinion Rating	Pinion Rating With Exclusion Applied If Applicable
Wear	8.0	8.0	8.0
Rippling	9.0	9.0	9.0
Ridging	10.0	10.0	10.0
Pitting/Spalling	10.0	10.0	10.0
Scoring	10.0	10.0	10.0

Test Method Defined Rating Exclusion Comments (See Annex A12)

Total Lines of Test Method Exclusions: 1

No Exclusion Applied.

Attachment 6
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PROPOSED

TEST METHOD D6121

L-37

Form 1

Test Result Summary Sheet

Oil Test			
Lab:	Stand:		Stand Run :
Start Date:	Date Completed:	EOT Time:	Test Length:
TMC Oil Code:	Laboratory Oil Code:		Viscosity Grade:
Oil Code:			
Formulation Stand Code:			
Latest Information Letter Test Was Run Under: 05-1			
Test Hardware: NONLUBRITED	Test Version: STANDARD		
Pinion Batch:	Ring Batch:		

Last Reference Oil Calibrating Stand Information - Fill Out For Non-reference Oil Tests Only			
Stand: 191	Stand Run:	TMC Oil Code:	Date Completed:
Pinion Batch:		Ring Batch:	
Test Hardware:		Test Version:	

	Ring Gear Results				
	Wear	Rippling	Ridging	Pitting/Spalling	Scoring
Original Merit Results [C]	8	9	10	10	10
Transformed Results	8.0000	-0.4055	0.6931	0.6931	10.0000
Correction Factor	0.0000	0.0000	0.0000	0.0000	0.0000
Corrected Transformed Results	8.0000	-0.4055	0.6931	0.6931	10.0000
Severity Adjustment [A]	0.0000	0.0000	0.0000	0.0000	0.0000
Final Transformed Results	8.0000	-0.4055	0.6931	0.6931	10.0000
Final Merit Results	8	9	10	10	10

	Pinion Gear Results				
	Wear	Rippling	Ridging	Pitting/Spalling	Scoring
Original Merit Results [B,C]	8	9	10	10	10
Transformed Results	8.0000	-0.4055	0.6931	0.6931	10.0000
Correction Factor	0.0000	0.0000	0.0000	0.0000	0.0000
Corrected Transformed Results	8.0000	-0.4055	0.6931	0.6931	10.0000
Severity Adjustment [A]	0.0000	0.0000	0.0000	0.0000	0.0000
Final Transformed Results	8.0000	-0.4055	0.6931	0.6931	10.0000
Final Merit Results	8	9	10	10	10

[A] AT THE PRESENT TIME THERE ARE NO SEVERITY ADJUSTMENTS

[B] WITH ANY APPLICABLE EXCLUSIONS APPLIED

[C] IF TOOTH BREAKAGE OCCURS, LEAVE RESULTS BLANK AND REPORT IN COMMENT SECTION

Attachment 2
Page 1 of 2
Reference L-37

PROPOSED

TEST METHOD D6121
~~L-37~~
Form 2

Gear Tooth Surface Condition

Lab:	Stand:	Stand Run:
Oil Code:		Test Version: STANDARD

Gear Batch Identification		
Test Hardware: NONLUBRITED	Pinion Batch:	Ring Batch:
Match Number: 7L	Assembly Date: 232-04-A	
Pattern Contact Length Rating: 2	Pattern Contact Flank Rating: 0	

Gear Test Phase – After Completion of Pinion and Ring Gear Drive Side Inspection		
Rater's Initials:		
Gear Condition	**Original Ring Rating**	**Original Pinion Rating**
Burnish	Med Brt	Med Brt
Discoloration	8	7
Corrosion	10	10
Deposits	10	10

	Original Ring Rating	**Original Pinion Rating**	**Pinion Rating With Exclusion Applied If Applicable**
Wear	8	8	8
Rippling	9	9	9
Ridging	10	10	10
Pitting/Spalling	10	10	10
Scoring	10	10	10

Test Method Defined Rating Exclusion Comments (See Annex A12)	
Total Lines of Test Method Exclusions: 1	
No Exclusion Applied.	

Attachment 7
Page 2 of 2
Reference L-37

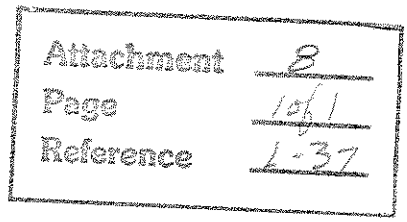
TGC Proposal for Test Precision Reporting Guidelines

As test targets are updated or a need arises to update test method precision statements the TMC will be working with each surveillance panel to identify which reference oils should be used in then Severity Adjustment standard deviation calculation. The recommendation from the TMC is to use reference oil (s) that are as close to the pass limit as possible. In some test areas, only one oil may be used. Other test areas may use multiple oils depending on the available oils and number of pass-fail parameters. As always, it will be the surveillance panel who will ultimately decide the oil (s) selection.

To be consistent on the precision value that is provided to the industry, the TMC will be updating test method reproducibility with the same value that is used for the SA std. Dev. Data to be used for this calculation will be severity adjusted and pooled by oil. The intermediate precision will then be based on the same data set and pooling by oil and lab.

The only time the test method precision values will be change is when the SA std. dev. is updated. And this of course will occur according to the recently accepted LTMS guidelines. As mention above, the surveillance panels can always intervene and make changes as they see fit.

Test Type	Oils used for SA standard Deviation	Oils used for test method Precision Date in the Standard
L-37	N/A	127, 128, 128-1, & 129 All Parameters



Motion 4 ⇒ **Mr. Farber, Second ⇒ Mr. Smith**: Change the reported level of precision for the original merit results on ring and pinion for wear, rippling, ridging, and scoring to have Original Merit Results be reported to whole numbers. Pitting/Spalling would continue to be reported to tenths because of the current rating process for pitting. The Final Merit Results for all distresses would continue to be reported to tenths using Standard Practice E 29. The implementation date is June 2nd. The motion passed unanimously.

Mr. Sullivan suggested as an action item for the June meeting that the TMC pull the reference data used to develop the initial correction factors and propose new correction factors to help us better understand what happens when you round the final reported values to a whole number. The SP should then make necessary recommended changes to the current correction factors to get the same pass/fail results.

TGC Proposal for Test Precision Reporting Guidelines -

Chairman Bartlett started the discussion by sharing the TGC recommendation in an email ballot by Chairman Farnsworth and the information provided by the TMC showing the oils used in the D6121 test method precision statement and the LTMS standard deviation SA. See ***Attachment 8***.

Attachment 9, presented by Mr. Farber, is the TMC recommendation (includes all recommendations impacting all gear tests). Mr. Farber recommended that the SP review this data (reported in transformed unites) in 6 months because there are only 26 chartable tests for non-lubrited at the moment. At present, severity adjustments have not been approved by the panel and are not in force.

Motion 5 ⇒ Mr. Farber, Second ⇒ Mr. Sullivan: The SP is to implement the TMC recommendation for standardizing LTMS SA Standard Deviation and Test Method Precision on April 11th and effective the date of the information letter. This is effective for both lubrited and non-lubrited hardware. The motion passed unanimously.

TGC Test Precision Ballot Review

April 2005

Ballot Issuance

- Technical Guidance Committee Chairman Gordon Farnsworth emailed TGC membership a unanimous consent ballot on 2/3/2005
  - TGC membership : Surveillance Panel Chairs
  - Close date of ballot was March 1, 2005
  - Negatives were received
  - Motion was not implemented

Ballot Subject

- Attached is a proposal from the TMC for "Test Precision Reporting Guidelines". As chairman of the ASTM TGC I will instruct the TMC to adopt this practice on March 1, 2005 unless I receive other input from any TGC member.

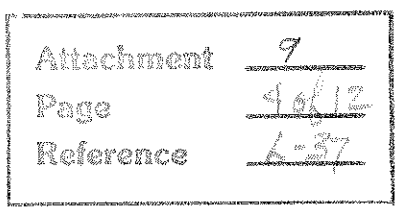
- The ASTM TMC has proposed a standard methodology for calculating and updating the test precision listed in the various Sequence test procedures (see attached). This proposal is complementary to the recently issued LTMS appendix G "Guidelines for developing Reference Oil Targets and Severity Adjustment Deviations - B.01 & B.02 Tests" that the TGC approved via e-mail.

Test Precision Reporting Guidelines

As test targets are updated or a need arises to update test method precision statements the TMC will be working with each surveillance panel to identify which reference oils should be used in the Severity Adjustment standard deviation calculation. The recommendation from the TMC is to use reference oil(s) that are as close to the pass limit as possible. In some test areas, only one oil may be used. Other test areas may use multiple oils depending on the available oils and number of pass fail parameters. As always it will be the surveillance panel who will ultimately decide the oil(s) selection.

To be consistent on the precision value that is provided to the industry, the TMC will be updating test method Intermediate Precision standard deviation with the same value that is used for the SA standard deviation. Data to be used for this calculation will be severity adjusted and pooled by oil and lab. The test method Reproducibility standard deviation will then be based on the same data set and pooled by oil.

The only time the test method precision values will be changed is when the SA std. dev. is updated. And this of course will occur according to the recently accepted LTMS guidelines. As mentioned above, the surveillance panels can always intervene and make changes as they see fit.



Background

- At the December 2004 ASTM meeting D02.B advised that test method precision statements are to be reviewed/updated on an annual basis
- The TMC was aware that inconsistencies existed in how test precision was being reported

Background (continued)

- TMC developed guidelines for updating test method precision values
- TMC forwarded the guidelines to the TGC Chairman for his review
- TGC ballot was subsequently released

Reproducibility

- Reproducibility will be calculated from same data set as Intermediate Precision.

L-37 Recommendation

(Lubrited)

	Test Method	LTMS SA Std. Dev.	Recommendation Test Method & SA
Oils	127, 128, 128-1 and 129	128	151-2,151-3,152 and 153 (22 chartable tests, 3/29/05)
Ridging	0.3836	0.3648	0.2523
Rippling	0.5645	0.2890	0.2331
Wear	1.0181	1.155	0.502
Spitting	0.7124	0.7079	0.3772

Attachment 9
Page 5 of 17
Reference L-37

L-37 Recommendation

(Non-Lubrited)

	Test Method	LTMS SA Std. Dev.	Recommendation Test Method & SA
Oils	127, 128, 128-1 and 129	128	151-2,151-3,152 and 153 (26 chartable tests, 3/29/05)
Ridging	0.4847	0.3560	0.5181
Rippling	0.5303	0.5627	0.3516
Wear	1.0352	0.761	0.620
Spitting	0.4298	0.3105	0.4842

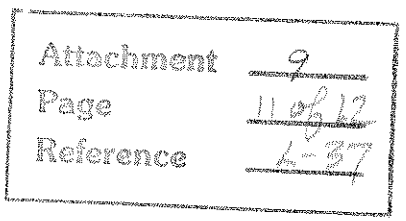
L-60-1 Recommendation

	Test Method	LTMS SA Std. Dev.	Recommendation Test Method & SA
Oils	131-3, 131-4, 143 and 148	See Below	151-2 and reblends (98 chartable tests, 3/29/05)
Viscosity Increase	0.148[1]	0.15 (148)	0.09
Pentane	0.396[1]	0.73 (131)	0.18*
Toluene	0.512[1]	0.75 (131)	0.33*
Carbon/ Varnish	0.360[1]	0.45 (148)	0.39
Sludge	0.255[1]	0.16 (148)	0.16

[1] Precision as of June 30, 1997

L-42 Recommendation

	Test Method	LTMS SA Std. Dev.	Recommendation For Procedure
Oils	No Precision Statement Exists	N/A	115 and reblends (219 chartable tests, 3/29/05)
Scoring		N/A	9.12



L-33-1 Recommendation

	Test Method	LTMS SA Std. Dev.	Recommendation Test Method & SA
Oils	151-3	151-3	151-3 and reblends
Rust	0.25	0.25	0.25 (Done!)