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Committee D02 on PETROLEUM PRODUCTS AND LUBRICANTS

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May 24th, 2010

Reply to:
Galen Greene
The Lubrizol Corporation
29400 Lakeland Blvd.
Wickliffe, OH 44092
(440) 347-2394
(440) 347-2878 (FAX)
ggre@lubrizol.com

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

Attached for your review and comment are the unconfirmed minutes of the:

- **May 12th, 2010 L-37 Surveillance Panel Meeting**

Please direct any corrections or comments to my attention.

Sincerely,

Galen Greene, Chairman
L-37 Surveillance Panel

**Report of Meeting
L-37 Surveillance Panel Meeting
BRTRC Facility, Warren, MI**

May 12th, 2010

Attendees:

| | |
|-----------------|--------------------------------------|
| Dana - | Miller (TC) , Guzikowski (TC) |
| SwRI - | Koehler |
| Lubrizol - | Greene , Graziano, Gropp |
| Afton - | Koglin , Bell, Kearny |
| Intertek-Parc - | Smith |
| TMC - | Parke , Lind |
| AAM - | Dharte |
| US Army - | Comfort , Dwornick |
| Chevron - | Haire (TC) |
| Arvin Meritor | McGlone |
| ExxonMobil | Eliot, Kanga |

Voting Members in **BOLD**

TC = Teleconference

The meeting was called to order at 9:00 am EDT.

1.0 Approval of Minutes:

- **February 3rd, 2010 (Teleconference)**
- **February 10th, 2010 (Warren, MI)**
- **March 29th, 2010 (Teleconference)**
- **April 8th, 2010 (Teleconference)**
- **April 20th, 2010 (Teleconference)**
- **April 27th, 2010 (Teleconference)**
- **May 4th, 2010 (Teleconference)**

Motion # 1 → Mr. Koglin / 2nd Mr. Smith to approve the minutes as presented. Motion for approval was passed with a vote of 8-Yes, 0-No, and 0-Abstentions.

2.0 Summary of Meeting Discussions

2.1 Hardware Discussion

The group reviewed the attached hardware survey results (attachment 1). From the data generated, it appeared that lubrifying only one member would be representative to some applications in the industry. Several members of the panel stated they would support only lubrifying the ring gear. Mr. Miller stated that only lubrifying the ring gear would likely give us a better chance of success because the pinion sees more cycles and it seems to be the largest contributor to the pitting/spalling/broken teeth problem. Overall, Dana would support this activity as they have been lubrifying ring only for quite some time in field applications.

After further discussion, it was decided that the panel should clearly state its intentions to the industry and ask for any concerns or objections before proceeding with any changes to the lubrifying process.

ACTION ITEM 1: The chairman is to draft a letter stating that the panel is interested in exploring changes to the lubrifying process, specifically lubrifying the ring gear only. The letter will ask for any concerns and this will be distributed before any decision needs to be made regarding the manufacture of the new pilot batch.

Next the group discussed the test matrix to run on the pilot batch. Several proposals were discussed at length. These included running combinations of non-lubrited, both members lubrited, as well as ring gear only lubrited. It was decided that the exact matrix did not need to be decided at this meeting.

From discussions of exploring more options for the test, the group discussed upping the pilot batch number from the 24 gear sets that was previously decided.

Motion # 2 → Mr. Koehler / 2nd Mr. Smith - Motion to move forward with the 2009 steel and build 40 gear sets with Dana standard lapping, Dana standard shot peening, and Mr. Miller's redesigned/optimized geometry. Dana is to target a case depth of >0.06" and a pitch core hardness of >40 HRC. Dana should process enough material to have 40 usable gear sets. The motion passed with a vote of Yes-8, No-0, Abstentions-0.

Dana representatives mentioned that there may be some outstanding PO issues. Mr. Ramsey will be contacting the chairman to resolve any of these issues. Mr. Koehler mentioned that we need to be sure that all parts are tracked and that the correct PO numbers are billed with the correct pricing, etc.

2.2 Review Status of contact pattern study

Reviewing the status of the contact pattern study was also on the agenda but due to time constraints, it was moved to a later meeting.

3.0 Adjournment

Motion by Mr. Smith to Adjourn, Meeting Adjourned at 11:30 am EDT

Respectfully submitted,

Galen Greene
L-37 Surveillance Panel Chairman

Attachment 1

| Current Usage | Response 1 | | | Response 2 | | | Response 3 | | | Response 4 | | |
|--|--|--------------------|-------------|--|--------------------|-------------|--|--------------------|-------------|--|--------------------|-------------|
| | Passenger Vehicle | Commercial Vehicle | Off Highway | Passenger Vehicle | Commercial Vehicle | Off Highway | Passenger Vehicle | Commercial Vehicle | Off Highway | Passenger Vehicle | Commercial Vehicle | Off Highway |
| Both ring and pinion lubrited | | x | | | | | | 100 | | | X | X |
| Ring lubrited, pinion non-lubrited | | | | | | | 95 | | | | | |
| Ring non-lubrited, pinion lubrited | | | | | | | | | | | | |
| Both ring and pinion non-lubrited | | | | | x | | 5 | | | | | |
| Both ring and pinion ground | | | | | | | | | | | | |
| Volume | Unsure. Likely more than 100K/yr. | | | Unsure. Likely >50K/yr. | | | 2.5 million | | | OHW = approx 6-7K per year | | |
| Continue this way in the future | Y | | | Y | | | N | | | N | | |
| Future Usage | Passenger Vehicle | Commercial Vehicle | Off Highway | Passenger Vehicle | Commercial Vehicle | Off Highway | Passenger Vehicle | Commercial Vehicle | Off Highway | Passenger Vehicle | Commercial Vehicle | Off Highway |
| Both ring and pinion lubrited | | | | | | | | 100 | | | | |
| Ring lubrited, pinion non-lubrited | | | | | | | 75 | | | | ?? | ?? |
| Ring non-lubrited, pinion lubrited | | | | | | | | | | | | |
| Both ring and pinion non-lubrited | | | | | | | 25 | | | | | |
| Both ring and pinion ground | | | | | | | | | | | | |
| Comments | This represents our phosphating activities in the US. Per a recent discussion with Galen, I'm also submitting a survey that reflects phosphating protocols in Europe and Mexico. | | | This represents our std. non-phosphating activities in Europe and Mexico. Per a recent discussion with Galen, there have been two surveys submitted because phosphating protocols are different in the US. | | | The use of low offset hypoid gears allows non-phosphated gears to be used. | | | Note: Change for future indicates a desire from new mfg location to alter to RG only for some models; don't know how many or volumes at this time. | | |

ASTM L-37 Surveillance Panel Membership/Mailing List

Meeting Date: May 12th, 2010

| Initials* | Name | Voting Status | Company Name & Address | Phone/Email Info |
|-----------|------------------------------------|---------------|--|--|
| | NO LONGER WORKS FOR US ARMY | | | |
| | Agusti, Rachel | Non Voting | AMSTA-TR-D/210 Tank Automotive & Armament 6501 East 11 Mile road Warren, MI 48397-5000 | Phone: 586-574-4222 Fax: 586-574-4244 E-Mail: rachel.agusti@us.army.mil |
| | Bartlett, Don | Non Voting | The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, Ohio 44092 | Phone: 440-347-2388 Fax: 440-347-2878 E-Mail: donald.bartlett@lubrizol.com |
| | 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 |
| BD | DWORKIN Breenen, Bridget | Non-Voting | US ARMY RDECOM/TARDEC RDTA-DP/MS110 6501 East 11 Mile road Warren, MI 48397-5000 | Phone: 586-574-4221 Fax: 586-574-4224 E-Mail: bridget.breenen@us-army.mil |
| | 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 |
| A.D. | Comfort, Allen | Voting | US ARMY RDECOM/TARDEC RDTA-PD/MS110 Tank Automotive & Armament 6501 East 11 Mile road Warren, MI 48397-5000 | Phone: 586-282-4225 Fax: 586-282-4244 E-Mail: allen.s.comfort@us.army.mil |
| | Charle, John | Voting | American Axle & Manufacturing 2065 Technology Drive - 1 DUCK DRIVE Reeherster Hills, MI 48399-3589 D STROVITTY MI 48311 | Phone: 248-299-6428 Fax: 248-299-6581 E-Mail: Dcharlej@aam.com |
| | Eliot, Stephen | Non Voting | ExxonMobil Lubricants & Specialties 18486 Lanier Island Sq. Leesburg, Virginia 20176 | Phone: 703-669-9916 Fax: 703-669-9917 E-Mail: stephen.w.eliot@exxonmobil.com |

* Initial to indicate attendance at subject meeting

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| Initials* | Name | Voting Status | Company Name & Address | Phone/Email Info |
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| | 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 |
| | Foeking, Brian | Non Voting | The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, Ohio 44092 | Phone: 440-347-2130 Fax: 440-347-9011 E-Mail: brian.foeking@lubrizol.com |
| | Gao, Hong | Non-Voting | Conoco Phillips 100 s Pine St. Ponca City, OK 74602 | Phone: 580-767-2126 Fax: 580-767-4534 E-Mail: hong.gao@conocophillips.com |
| <i>RG</i> | Graziano, Rick | Non-Voting | The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, Ohio 44092 | Phone: 440-347-2058 Fax: 440-347-2878 E-Mail: rick.graziano@lubrizol.com |
| <i>Gal</i> | Greene, Galen | Voting/Chair | The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, Ohio 44092 | Phone: 440-347-2394 Fax: 440-347-2878 E-Mail: galen.greene@lubrizol.com |
| <i>JGH</i> | Gropp, Jerry | Non Voting | The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, Ohio 44092 | Phone: 440-347-1223 Fax: 440-347-1555 E-Mail: jerrold.gropp@lubrizol.com |
| <i>TC</i> | Guzikowski, Joe | Non Voting | Dana Corporation Maumee, IN | Phone: Fax: E-Mail: joe.guzikowski@dana.com |
| <i>TC</i> | Haire, Mike | Voting | Chevron Global Lubricants 100 Chevron Way, Rm 71-7302 Richmond, California 94802 | Phone: 510-242-2740 Fax: 510-242-3758 E-Mail: mhaire@chevron.com |
| | Higuchi, Sam | Non Voting | Afton Chemical 500 Spring Street Richmond, VA 23218 | Phone: 804-788-5375 Fax: 804-788-6358 E-Mail: samuel.higuchi@aftonchemical.com |

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|--------------------|------------------|--|---|--|
| | 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 |
| | Jackson, Matt | Non Voting | Southwest Research Institute PO Drawer 28510 San Antonio, Texas 78228-0510 | Phone: 210-522-6981 Fax: 210-522-6858 E-Mail: matt.jackson@swri.org |
| <i>PK</i> | Kanga, Percy | Non Voting | ExxonMobil Research & Engineering 600 Billingsport Road Paulsboro, New Jersey 08066 | Phone: 856-224-2094 Fax: 856-224-3613 E-Mail: percy.r.kanga@exxonmobil.com |
| <i>[Signature]</i> | Koehler, Brian | Voting | Southwest Research Institute PO Drawer 28510 San Antonio, Texas 78228-0510 | Phone: 210-522-3588 Fax: 210-684-7523 E-Mail: bkoehler@swri.org |
| <i>C.K.</i> | Koglin, Cory | Voting | Afton Chemical 500 Spring Street Richmond, VA 23219 | Phone: 804-788-5305 Fax: 804-788-6358 E-Mail: CoryKoglin@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: ralph.kozlowski@intertek.com |
| <i>DMY</i> | Lind, Don | Voting <i>Non Voting</i> | ASTM Test Monitoring Center 6555 Penn Avenue Pittsburgh, Pennsylvania 15206 | Phone: 412-365-1034 Fax: 412-365-1047 E-Mail: dml@astmtmc.cmu.edu |
| | Lochte, Michael | Non Voting | Southwest Research Institute PO Drawer 28510 San Antonio, Texas 78228-0510 | Phone: 210-522-5430 Fax: 210-684-7523 E-Mail: Mlochte@swri.org |
| | Marougy, Thelma | Voting | Eaton Corporation 26201 Northwestern Highway Southfield, MI 48034 | Phone: 248-226-6985 Fax: 248-226-2739 E-Mail: thelmaemarougy@eaton.com |

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|---------------|-------------------|---------------|--|--|
| | Martin, Dan | Non Voting | The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, Ohio 44092 | Phone: 440-347-4723 Fax: 440-347-2878 E-Mail: dan.martin@lubrizol.com |
| | McGlone, Bruce | Voting | Meritor Automotive 2135 West Maple Troy, Michigan 48084 | Phone: 248-435-9929 Fax: 248-435-1411 E-Mail: Bruce.McGlone@ArvinMeritor.com |
| BM | Miller, Kenny | Voting | Dana Corporation 1293 Glenway Drive Statesville, NC 28677 | Phone: 704-878-5762 Fax: 704-878-5735 E-Mail: Kenny.miller@dana.com |
| TC | Pappademos, Lou | Non Voting | Dana Corporation Fort Wayne, IN | Phone: Fax: E-Mail: lou.pappademos@dana.com |
| | Prenngaman, Chris | Non Voting | The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, Ohio 44092 | Phone: 440-347-4225 Fax: 440-347-2878 E-Mail: chris.prenngaman@lubrizol.com |
| | Radonich, Peter | Non Voting | The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, Ohio 44092 | Phone: 440-347-2184 Fax: 440-347-9011 E-Mail: peter.radonich@lubrizol.com |
| | Sanchez, Art | Non Voting | Southwest Research Institute PO Drawer 28510 San Antonio, Texas 78228-0510 | Phone: 210-522-3445 Fax: 210-680-1777 E-Mail: asanchez@swri.org |
| | Smith, Dale | Voting | Intertek - PARC Technical Services, Inc. 100 William Pitt Way Pittsburgh, PA 15238 | Phone: 412-423-1120 , ext 403 Fax: 412-826-5443 E-Mail: Dale.Smith@intertek.com |
| | Song, HaiQing | Non Voting | Research Institute of Petroleum Processing No. 18, XueYan Road, PO Box 914-19 Beijing 10083 P.R. China | Phone: 011-86-10-8236-8182 Fax: 011-86-10-6231-1290 E-Mail: songhq@riipp-sinopec.com |

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| Initials* | Name | Voting Status | Company Name & Address | Phone/Email Info |
|-----------|----------------|---------------|---|--|
| | Sullivan, Bill | Non Voting | William T. Sullivan, Inc. 5 Scheiber Drive Brick, NJ 08723 | Phone: 908-930-3512 Fax: 267-220-7750 E-Mail: wtsullivan@comcast.net |
| | Xie, JingChun | Non Voting | Lanzhou Lube Oil R&D Institute No. 369 Yumen Street, XiGu District Lanshou 730060, Gansu Province P. R. China | Phone: 011-86-931-793-3713 Fax: 011-86-139-9319-2560 E-Mail: xiejingchun_rhy@petrochina.com.cn |
| | 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 |
| | Bill KEARNEY | " | AFTON SOUTHFIELD, MI | Phone: Fax: E-Mail: |
| | SCOTT PARKE | VERTUG | ASTM TMC | Phone: 412 365 1036 Fax: SDP@ASTMTMC.COM E-Mail: SDP@ASTMTMC.COM |
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| | | | | Phone: Fax: E-Mail: |

* Initial to indicate attendance at subject meeting



D02.B0.03

L-37 Surveillance Panel Meeting

5/11/10

9:00am – 11:00am

BRTRC Facility

Warren, MI

Galen Greene (The Lubrizol Corporation)



Agenda

- I. Call to Order
- II. Membership Review
- III. Approval of Meeting Minutes
 - i. February 3rd, 2010 (Teleconference)
 - ii. February 10th, 2010 (Warren, MI)
 - iii. March 29th, 2010 (Teleconference)
 - iv. April 8th, 2010 (Teleconference)
 - v. April 20th, 2010 (Teleconference)
 - vi. April 27th, 2010 (Teleconference)
 - vii. May 4th, 2010 (Teleconference)
- IV. Hardware Discussion
 - i. Review Lubrited survey to the industry
 - ii. Discuss how to proceed with Lubriting the 2009 material
 - iii. Create test matrix for next pilot batch of hardware
- V. Review Status of Contact Pattern Study
- VI. New Business
- VII. Adjournment



Membership Review

| | |
|----------------|-------------------------------------|
| Galen Greene | The Lubrizol Corporation (Chairman) |
| Tom Bryson | Volvo Power Train Corporation |
| Allen Comfort | US Army Tacom-Tardec |
| John Dharte | American Axle & Manufacturing |
| Mike Haire | Chevron Global Lubricants |
| Brian Koehler | Southwest Research Institute |
| Cory Koglin | Afton Chemical Company |
| Kenny Miller | Dana Corporation |
| Don Lind | ASTM Test Monitoring Center |
| Thelma Marougy | Eaton Corporation |
| Bruce McGlone | ArvinMeritor Materials Engineering |
| Dale Smith | Intertek-PARC Technical Services |

Total 12 Voting Members



Hardware Discussion

- Industry Lubriting survey
- How do we proceed with Lubriting in the future?
- Proposed test matrix for initial non-lubrited runs on pilot batch 4
 - 24 axles
 - Initial evaluation will be non-lubrited
 - Proposal:
 - 5 runs TMC155
 - 5 runs TMC152
 - 2 runs TMC134

Lubrizonol

| Oil | Axles Shipped |
|--------|---------------|
| TMC155 | 3 |
| TMC152 | |
| TMC134 | |

SwRI

| Oil | Axles Shipped |
|--------|---------------|
| TMC155 | 3 |
| TMC152 | |
| TMC152 | |

Afton

| Oil | Axles Shipped |
|--------|---------------|
| TMC155 | 3 |
| TMC152 | |
| TMC152 | |

Intertek PARC

| Oil | Axles Shipped |
|--------|---------------|
| TMC155 | 3 |
| TMC155 | |
| TMC134 | |

4



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 - iii. Create test matrix for next pilot batch of hardware
- V. **Review Status of Contact Pattern Study**
- VI. **New Business**
- VII. **Adjournment**