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Committee D02 on PETROLEUM PRODUCTS AND LUBRICANTS

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August 17th, 2010

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

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

- **August 11th, 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
SAE Headquarters, Warrendale, PA**

August 11th, 2010

Attendees:

Dana -	Miller (TC)
SwRI -	Koehler
Lubrizol -	Greene, Gropp, Hamilton
Afton -	Koglin, Bell
Intertek-Parc -	Smith
TMC -	Parke, Lind
US Army -	Comfort, Dwornick
Chevron -	Haire (TC), Zakarian
Arvin Meritor -	McGlone, Muransky
ExxonMobil -	Eliot, Kanga
Eaton -	Mosher

Voting Members in **BOLD**

TC = Teleconference

The meeting was called to order at 2:10 pm EDT.

1.0 Approval of Minutes:

- **May 12th, 2010 Surveillance Panel Meeting (Warren, MI)**

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

2.0 Summary of Meeting Discussions

2.1 Hardware Update

The group discussed the recent events in the attempts to obtain a successful batch of Lubrited test hardware. At the last meeting the group decided to proceed with a pilot batch of parts with a new optimized gear design. Subsequent to this request, the manufacturer of the parts requested additional funding to support the new gear redesign. This was to recoup costs related to the additional engineering work required to redesign the gear set. As of this meeting, all labs have reported that PO's have been issued. The manufacturer is to proceed with the build of this hardware ASAP. The manufacturer has reported that it will take approximately 8 to 10 weeks for the gear sets to be produced. They will then need to be retrofitted into housings and tested.

Next the group discussed how to proceed with the initial pilot test matrix and whether to Lubrite all members, ring gear only, etc. The following matrix was decided:

Oil	Conditions	Both ring and pinion Lubrited	Ring gear only Lubrited
152	STD	3	3
	CAN	3	3
155	STD	3	3
134	STD	2	2

Note: The manufacturer is to only proceed with Lubrifying 12 gear sets (both ring and pinion) initially shown above in bold. How the Lubrite coating is applied to the remaining sets will be decided after the data from the initial tests are discussed. The follow motion was proposed:

Motion # 2 → Mr. Smith / 2nd Mr. Koglin - Motion to Lubrite 12 of the pilot build gear sets (both ring and pinion Lubrified). The labs will then run 3 tests on TMC152 STD conditions, 3 tests on TMC152 CAN conditions, 3 tests on TMC155 STD conditions, and 2 tests on TMC134 STD conditions. After these 11 tests are completed, the group will meet to discuss results. The manufacturer is to hold all other gear sets in non-lubricated condition until given direction by the group. The motion passed with a vote of Yes-7, No-0, Abstentions-2.

It also should be understood that these gear sets will be built into the SwRI 2006 axles already waiting at Maumee.

2.2 Review Reference Acceptance Bands

One lab requested that the panel review how reference acceptance bands are established. This was specifically referring to data on the reference acceptance bands for the P4T813 hardware batch. Particularly, on ridging the bands seemed to favor the lower end of the data (after interpretation the bands went from 7 to 9 on one pass oil while the data only had 8's, 9's and 10's. Some questions were discussed such as, is using transformed units the best method for establishing bands and how should we handle decimal bands since the test is only rated at whole numbers from 0 to 10. The discussion continued with the fact that the L-37 rating is very low resolution and these results directly determined whether the reference was acceptable or not.

It was decided that the group should form a task force to investigate (including statisticians). It was also decided to temporarily remove the positive consequences of shewhart alarms for ridging in order to eliminate the unnecessary repeating of reference tests.

Motion # 3 → Mr. Greene / 2nd Mr. Koehler - Motion to form a task force to investigate distribution of reference data and acceptance of references. Also, the consequences of positive shewhart alarms (top of band) are waived for 60 days (effective 8/12) for ridging only on both pass oils. The task force will look to report its findings within 60 days. The motion passed with a vote of Yes-8, No-0, Abstentions-0.

The chairman will form a task force to investigate.

2.3 Lubrified Survey to the Industry

The group had formed a letter to the industry asking if it would be acceptable for the panel to pursue Lubrifying only the ring gear as a possible solution to creating useable Lubrified hardware (see attachment 2). A discussion of the responses was planned but due to time constraints this was not discussed. The responses, however, are attached in Attachment 3 for review.

2.4 Other Agenda Items

Discussing instrument calibration frequency as well as rater workshop data from July was also in the agenda but these items were not discussed due to time constraints. These will be moved to a future meeting.

3.0 Adjournment

Motion by Mr. Smith to Adjourn, Meeting Adjourned at 4:35 pm EDT

Respectfully submitted,

Galen Greene
L-37 Surveillance Panel Chairman

ASTM L-37 Surveillance Panel Membership/Mailing List

Meeting Date: August 11th, 2010

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L-37 Surveillance Panel Members,

The L-37 surveillance panel is continuing to work towards a solution to the Lubrited hardware shortage. Many of you are aware of the several attempts that have been made at changing the manufacturing process to create a batch that matches the severity of historical batches.

One future option that has been proposed is regarding the Lubriting process. Previous hardware batches have had both ring and pinion Lubrited. The panel may look to explore lubriting only one gear as a way to reduced or eliminate the occurrence of the undesired broken teeth and severe pitting/spalling. A previous survey explored how Lubriting is used within the industry and this was discussed at the May 12th, 2010 Surveillance Panel meeting.

The first purpose of this survey is to clearly communicate that the panel may explore only Lubriting the ring gear as it moves forward with another attempt at a successful batch with the manufacturer of the hardware. Secondly, the panel would like to hear feedback on this topic before it is explored. Specifically, we are looking for feedback on whether this path would be considered acceptable.

Please send your feedback/comments to me via email at galen.greene@lubrizol.com by June 21st, 2010. Based on the responses received, we may call a meeting to discuss this topic further.

Thank you,
Galen Greene
L-37 Surveillance Panel Chairman

	Response
1	<p>my response is that this is acceptable.</p> <p>If the questioning were to go further and inquire on a preference as to WHICH of the gears would be phosphated under the above scenario, I would prefer to have the pinion phosphated.</p>
2	<p>I have been doing some OEM visits in Europe and I had the opportunity to ask one more OEM some questions about lubrifying (previous survey that your SP did). Truck Manufacturer A had the following comments:</p> <ul style="list-style-type: none"> -They normally lubrite both pinion & ring for lapped gears -They only lubrite the pinion for ground gears -They cautioned that improper lubrifying can actually lead to more wear than no lubrifying.
3	<p>From the (Company B) perspective, we would have no problem with the proposed change in Lubrifying only ring gears for the axles used in Lubrited L-37 testing. This is because we are not producing any gears with Lubrite process coating on either the pinion or ring gears and would be more interested in the non-coated testing results for our axle lubricants.</p> <p>My experience from the past with Lubrited hypoid gears indicates that the affect of improper Lubrifying has the greatest affect on pinion gears for wear and the potential for pitting/spalling. The combination of high gear surface micro-finish, localized high stress concentration and Lubrite (manganese phosphate) excessive grain size can accelerate gear distress which will show up on the pinion gears first. I assume that taking the Lubrite off of the pinion gear would eliminate its potential affect on gear distress. The only question would be does coating only the ring gear still provide the same reduction in break-in temperatures that coating both parts provides? It might be worth studying this affect as part of the early testing being done to validate the hardware.</p>
4	<p>I don't have any issues with only lubrifying the ring gear.</p>
5	<p>Company C has no problem with this modification to the hardware and feel this will still produce a test which is representative of J2360 hypoid axle performance.</p>
6	<p>Lubrifying only the ring gear seems like mitigating the distress on gears in L-37 test. But, in reality, how many OEMs/gear manufacturers lubrite one gear for the axles? Hopefully the L-37 test represents the actual axle operations as close as possible including the lubrifying condition.</p>
7	<p>I would not have an issue moving forward with just placing the Lubrite coating on the ring gear.</p> <p>In some cases OEM's only Lubrite one component.</p> <p>We will need to follow the validation to make sure everything is OK with this proposed change.</p>
8	<p>Company D approves the option to move forward with lubrifying only the ring gear with the understanding that the reference oils must continue to discriminate in the lubrited test between good vs. bad performing oils.</p>