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Committee D02 on PETROLEUM PRODUCTS AND LUBRICANTS

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March 18th, 2013

Reply to:
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ASTM D02.B0.03 L-37-1 Next Generation Hardware Task Force
Members and Guests:

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

- **February 6th, 2013 Next Generation Hardware Task Force Meeting (Automation Alley, Troy MI)**

Please direct any corrections or comments to my attention.

Sincerely,

Chris Prengaman, Chairman
L-37-1 Hardware Taskforce Chairman

Report of Meeting
L-37-1 Hardware Task Force Meeting
Automation Alley
Troy, MI
February 6th, 2013

Attendees:

Voting Members in **BOLD**

Athey, Allison – Volvo (Teleconference)

Banas, Rob – ExxonMobil

Bell, Don – Afton Chemical

Bubonic, Brad – Lubrizol

Comfort, Allen – US Army RDECOM/TARDEC

Bwornick, Bridget – US Army RDECOM/TARDEC

Gottwald, Thomas – Afton Chemical

Gropp, Jerry – Lubrizol

Guzikowski, Joe – Dana

Hamilton, Larry – Lubrizol

Kearney, Bill – Afton Chemical

Koehler, Brian – Southwest Research Institute

Marougy, Thelma – Eaton

McGlone, Bruce – Meritor

Muransky, Tory – Meritor

Parke, Scott – ASTM TMC

Prengaman, Chris – Lubrizol

Smith, Dale – Intertek Automotive Research

Trader, Angela – Intertek Automotive Research

Umerley, Matt – Lubrizol

Venhoff, Wes – Lubrizol

Zakarian, Jack – Chevron

Zreik, Khaled – General Motors

Koglin, Cory – Afton Chemical

Bryson, Tom – Volvo (Teleconference)

The meeting was called to order at 01:05 pm EST.

1.0 Membership and Agenda Review

2.0 Approval of Meeting Minutes

- **November 7th, 2012 (Automation Alley – Troy, MI)**

Motion # 1 - Motion to approve prior meeting minutes.

1st Dale Smith / 2nd Wes Venhoff Motion was approved unanimously.

3.0 Summary of Meeting Discussions

3.1 Review Latest Data, Next Steps

2 Field oils have been evaluated that had been given poor results earlier at the 11 hour test length – 2 different variations of test conditions: an increase from 950ml to 1450ml sump size, and reduced temperatures at the normal Canadian test temperature (200F compared with the normal temperature of 275F). The increased sump size has given favorable test data (pass based on J2360 L37

specifications). The group discussed a potential next steps would be to potentially lengthen the test to reduce the performance of the of the TMC fail oil.

C. Prengaman – recommendation that we bring AAM engineering into the next teleconference to add some comments and insight on fill volumes.

J. Gropp - maybe a small matrix would be advisable here to look at fill volumes. Clarification was made on the current process of filling the axle.

B. Koehler – brought up thoughts along the lines of oil thickness film during the breakin period – and we've potentially fixed the problem, however the real phenomena is the heat being generated at the gear teeth is what is creating the film thickness. This break-in may need to be tweaked some – potentially a slow linear ramp to ease things in at the beginning. However there is concern that you might make everything look good this way. You can see the “break-in” during the test at the beginning – as the demand for cooling at the beginning is high, then really drops off shortly after that.

B. Bubonic – brought up that maybe we go back to longer duration at higher volume to bring us back to close to what we were in length initially.

J. Gropp – The non-lubrited has a wider spread of data, lubrited has a nice spread (tighter) for ridging and rippling. Lubriting does have a negative effect on spitting.

H. Chambers – feels that yes, this is somewhat expected on the spitting – due to the surface fatigues issues of the etch process.

J. Gropp – feels this test is historically focused on ridging or rippling, and not spitting which is more of a surface geometry / gear design issue.

H. Chambers raised the question of maybe that 1A/1B fluids are exhausting the additive chemistry to quickly – maybe we need to be looking at that?

B. Koehler – if we go back to the 950ml size, at Canadian conditions – full flood water was not enough cooling to maintain that temperature – the aluminum housing was cool to the touch but still was heating up. The greater fill volume may be aiding in this.

W. Venhoff – we will need to discuss with an AAM engineer before deciding next steps. Topics will be: Fill Volume, Break-In Effect, Heat Dissipation.

3.2 Next Hardware Order

Outside labs have 4-5 NL, Afton has ~16 NL and Lubrizol has ~8 NL axles remaining.

W. Venhoff will look into timing for a next order, but the group wants to wait till discussing with AAM to move any further.

C. Prengaman will look to holding a teleconference in the next 2 weeks.

4.0 New Business

C. Koglin - asked what is the plan B? we all hope that this will work, but do we have an alternate plan?

W. Venhoff 1st / D. Smith 2nd – Motion to nominate C. Prengaman as new L-37-1 Hardware Task Force Chairman.

5.0 Adjournment

Motion to adjourn . Motion was approved unanimously by voice vote.

Respectfully Submitted

Chris Prengaman

L-37-1 Task Force Meeting

February 6th, 2013
2:00 pm – 3:00 pm EST
Automation Alley – Troy, MI

Agenda

- 1) Call to order/Agenda review
- 2) Membership review
- 3) Approval of meeting minutes
 - November 7, 2012 (Automation Alley – Troy, MI)
- 4) Review latest data (fill volume/temperature studies)
- 5) Next steps – What do we want to run next?
- 6) Next hardware order
- 7) New business
- 8) Adjournment

Call in number for those not traveling to Troy, MI → **216-706-7052 code 324160**



D02.B0.03

L-37-1 Task Force Meeting

2/6/13
2:00 – 3:00pm
Automation Alley
Troy, MI
Wes Venhoff



D02.B0.03

L-37-1 Task Force Meeting

Agenda

- Call to order/Agenda review
- Membership review
- Approval of meeting minutes
 - November 7, 2012 (Automation Alley – Troy, MI)
- Review latest data (fill volume/temperature studies)
- Next steps – What do we want to run next?
- Next hardware order
- New business
- Adjournment



D02.B0.03

L-37-1 Task Force Meeting

Membership Review

Wes Venhoff	The Lubrizol Corporation (Chairman)
Allen Comfort	US Army RDECOM/TARDEC
John Dharte	American Axle & Manufacturing
Jack Zakarian	Chevron Products
Brian Koehler	Southwest Research Institute
Thomas Gottwald	Afton Chemical Company
Joe Guzikowski	Dana Corporation
Scott Parke	ASTM Test Monitoring Center
Bruce McGlone	Meritor Automotive
Dale Smith	Intertek Automotive Research
Galen Greene	BASF

Total 11 Voting Members

Industry Oil Code (TMC Oil)	Test Version (Standard or Canadian)	Hardware Identification	Lab	Stand	Test Hardware	EOT Date	Pinion Rating					Ring Rating					Free-form Comment
							WEAR	RIDG	RIPP	SPIT	SCOR	WEARR	RIDGR	RIPPR	SPITR	SCORR	
IND	TVERSION	SERIALNO	LTMSLAB	LTMSAPP	TESTHARD	LTMSDATE										COMMENT	
16.5 hour, 1650 lb-ft torque																	
134	STANDARD	GGAD120036- - - -	B		NONLUBRITED	20120413										AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure. Test ran for 11hrs. - all teeth broken, catastrophic failure. Last 5 digits of serial number missing.	
134	STANDARD	GGAD12063093932	A	5	NONLUBRITED	20120414	6	6	8	9.9	10	6	6	10	9.9	10	AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure.
134	STANDARD	GGAD12063092414	B		NONLUBRITED	20120427						5	6	10	9.9	10	AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure. Test ran for 11.25hrs. - all teeth broken, pinion unrateable.
134	STANDARD	GGAD12047090125	D	3	NONLUBRITED	20120515	7	7	7	9.9	10	7	8	9	10	10	AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure. Broken teeth on pinion. Damage to ring. Shut down due to vibration at 15 hrs 37 min (on test).
134	STANDARD	GGAD12063112723	D	3	NONLUBRITED	20120519	7	7	9	9.9	10	7	7	9	9.9	10	AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure.
134	STANDARD	GGAD12063134922	B		NONLUBRITED	20120521	6	4	7	5	10	6	4	10	9.9	10	AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure. High vibration at 8.5hrs. - pinion teeth cracked.
134	STANDARD	GGAD12047081449	D	3	NONLUBRITED	20120524	7	7	10	9.9	10	7	8	10	9.9	10	AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure. Shutdown due to excessive vibration at 5:01 test hours.
134	STANDARD		G		NONLUBRITED	20120822	7	5	9	9.9	10	7	5	9	9.9	10	AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure. Light coast side scoring observed
152-1	STANDARD		B		NONLUBRITED	20121101	7	10	10	9.9	10	7	10	10	9.9	10	Non-lubrited AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure.
152-1	CANADIAN		B		NONLUBRITED	20121103	7	10	10	9.9	10	7	10	10	9.9	10	Non-lubrited AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure.
155	STANDARD	GGAD12047090210	D	3	NONLUBRITED	20120504	7	7	10	10	10	7	7	10	10	10	Non-lubrited AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure. Cracked tooth on ring gear
155	STANDARD	GGAD12063093332	B		NONLUBRITED	20120621	8	9	10	9.9	9	8	9	10	9.9	10	Non-lubrited AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure.
155	STANDARD	GGAD12063092600	A	5	NONLUBRITED	20120721	7	8	10	9.9	10	7	8	10	9.9	10	This is a non-lubrited AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure.
1-A	STANDARD		A	5	NONLUBRITED	20120804	6	6	8	9.9	10	6	7	9	9.9	10	Non-lubrited AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure.
1-A	STANDARD		G		NONLUBRITED	20120830						6	6	8			Non-lubrited AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure. Non-interprettable. Distress - Heavy to Catastrophic. Broken teeth on pinion and ring.
1-B	STANDARD		A	5	NONLUBRITED	20120807	3	6	7	9.9	10	5	6	9	10	10	Non-lubrited AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure.
1-B	STANDARD		G		NONLUBRITED	20120905	5	3	9	9.8	10	6	5	8	9	10	Non-lubrited AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure.
16.5 hour, 1350 lb-ft torque																	
134	STANDARD	GGAD12063093015	A	5	NONLUBRITED	20120830	6	6	8	9.9	10	7	7	10	10	10	AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure. This ran at 1350 lb-ft torque.
134	STANDARD	GGAD12063093135	B		NONLUBRITED	20120830	7	10	9	9.9	10	7	10	10	9.9	10	AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure. This ran at 1350 lb-ft torque.

16.5 hour, 1500 lb-ft torque

134	STANDARD	GGAS22928327218	A	5	NONLUBRITED	20120831	6	5	9	9.9	10	6	6	10	9.9	10	AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure. This ran at 1500 lb-ft torque.
152-1	STANDARD	GGAD12063113036	G		NONLUBRITED	20120827	7	8	9	9.9	10	7	10	9	9.9	10	1500 torque, 16.5 hours. This was supposed to be 134 but we had a mix up during oil assignment and 152-1 was ran instead.

11 hour, 1650 lb-ft torque

134	STANDARD	GGAD12063111151	G		NONLUBRITED	20120912	6	4	8	9.9	10	7	5	9	9.9	10	AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure. This ran at 1650 lb-ft torque for 11 hrs.
134	STANDARD	GGAD12063094027	A	5	NONLUBRITED	20120912	7	5	8	9.9	10	7	6	9	9.9	10	AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure. This ran a special test length of 11 hours.
152-1	STANDARD	GGAD12063112939	G		NONLUBRITED	20120915	8	9	9	9.9	10	8	9	8	9.9	10	AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure. This ran a special test length of 11 hours.
152-1	STANDARD	GGAD12063123814	A	5	NONLUBRITED	20120917	7	7	10	10	10	7	10	10	10	10	AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure. This ran a special test length of 11 hours.
152-1	CANADIAN	GGAD12063112848	G		NONLUBRITED	20120921	7	9	10	9.9	10	7	10	9	9.9	10	1650 torque, 11 hours, Problems controlling to Canadian conditions with current valve setup (3 nozzles @ 100% on)
152-1	CANADIAN	GGAD12063110037	B		NONLUBRITED	20120925	7	10	10	9.9	10	7	10	10	10	10	AAM Zeta axle - Batch 2012. 11 hr test length, 1650 lb-ft torque.
152-1	CANADIAN	GGAD12063113138	G		NONLUBRITED	20121009	7	9	8	9.9	10	8	10	9	9.9	10	1650 torque, 11 hours, Problems controlling to Canadian conditions with current valve setup (3 nozzles @ 100% on)
155	STANDARD	GGAD12063111331	G		NONLUBRITED	20120922	7	8	9	9.9	10	7	9	9	9.9	10	1650 torque, 11 hours
155	STANDARD	GGAD12063094334	B		NONLUBRITED	20120925	7	7	9	9.9	10	7	9	10	9.9	10	AAM Zeta axle - Batch 2012. 11 hr test length, 1650 lb-ft torque.
1-A	STANDARD	GGAD12063092127	A	5	NONLUBRITED	20120926	6	5	5	10	10	7	7	9	10	10	AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure. 11 hrs.
1-A	STANDARD	GGAD12063111115	G		NONLUBRITED	20121006	7	7	8	9.9	10	7	7	8	9.9	10	AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure. 11 hrs.
1-A	STANDARD	GGAD12063091633	G		NONLUBRITED	20121126	7	9	9	9.9	10	7	9	10	9.9	10	1650 torque, 11 hours - 1450 ml fill
1-B	STANDARD	GGAD12063093822	A	5	NONLUBRITED	20120927	6	6	7	9.9	10	6	7	10	10	10	AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure. 11 hrs.
1-B	STANDARD	GGAD12063103742	G		NONLUBRITED	20121005	5	4	9	9.7	10	6	5	9	9.7	10	AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure. 11 hrs.
1-B	STANDARD	N/A	G		NONLUBRITED	20121128	7	10	9	9.9	10	7	10	9	9.9	10	1650 torque, 11 hours - 1450 ml fill
1-A	CANADIAN	GGAD12063093512	A	5	NONLUBRITED	20121130	7	9	9	9.9	10	8	9	9	9.9	10	Ran Lubrizol recommended test conditions except ran oil set points as L-37 Canadian. Used Oil 1-A. Non-lubricated AAM Zeta axle - Batch 2012.
1-B	CANADIAN	GGAD12063093242	A	5	NONLUBRITED	20121214	7	9	9	9.9	10	7	9	9	9.9	10	Ran Lubrizol recommended test conditions except ran oil set points as L-37 Canadian. Used Oil 1-B. Non-lubricated AAM Zeta axle - Batch 2012.

ASTM L-37 Surveillance Panel Membership/Mailing List

Meeting Date: February 6th, 2013

Initials*	Name	Voting Status	Company Name & Address	Phone/Email Info
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* Initial to indicate attendance at subject meeting

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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
<i>[Signature]</i>	McGhone, Bruce	Voting	Meritor Automotive 2135 West Maple Troy, Michigan 48084	Phone: 248-435-9929 Fax: 248-435-9902 E-Mail: Bruce.McGhone@Meritor.com
<i>[Signature]</i>	Muransky, Troy	Non Voting	Meritor Automotive 2135 West Maple Troy, Michigan 48084	Phone: 248-435-1409 Fax: 248-435-6602 E-Mail: troy.muransky@Meritor.com

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	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@ripp-sinopec.com
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Meeting Date: February 6th, 2013

Initials*	Name	Voting Status	Company Name & Address	Phone/Email Info
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* Initial to indicate attendance at subject meeting

ASTM L-37 Surveillance Panel Membership/Mailing List

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