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Committee D02 on PETROLEUM PRODUCTS AND LUBRICANTS

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August 7th, 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:

- **July 31st , 2013 Next Generation Hardware Task Force Meeting; Teleconference.**

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 Next Generation Hardware Task Force Meeting
Teleconference
July 31st, 2013

Attendees:

Voting Members in **BOLD**

Marsh, Greg – AAM

Gottwald, Thomas – Afton

Boschert, Tom - Afton

Guzikowski, Joe - Dana

Trader, Angela – Intertek

Smith, Dale - Intertek

Pregaman, Chris – Lubrizol

Umerley, Matt – Lubrizol

Gropp, Jerry – Lubrizol

Bubonic, Brad – Lubrizol

McGlone, Bruce – Meritor

Koehler, Brian – Southwest Research Institute

Parke, Scott – TMC

Comfort, Allen – US Army

The meeting was called to order at 10:00 am EST.

1.0 Agenda Review

The agenda was reviewed

2.0 Review & Discuss Test Progress

The spreadsheet of data was distributed to the group and the data was reviewed.

C. Pregaman shared that Lubrizol ran the 1-B fluid, but had an invalid run due to axle sump temperature. Based on the data reviewed, it may be possible the pinion bearings spun on the shaft causing a spike in sump temperature. Lubrizol will attempt to rerun the 1-B fluid if enough oil remains.

B. Koehler shared that the 1-B run was running. During the first half of the test phase, the stand encountered a vibration shutdown. The stand was held, and axle inspected in stand. The cause of the shutdown was unknown and test restarted. There was some evidence of ridging on the gears visible during the inspection. The test rig uses 0.01 seconds of filtering on the high speed torque data.

D. Smith expects to be running soon. They have encountered a number of issues going back in to L-37-1 test mode.

T. Gottwald requested the labs discuss data further in person prior to the surveillance panel meeting in Pittsburgh. C. Pregaman requested the labs and any additional interested party meet at 8AM prior to the start of the planned meetings for the day.

3.0 New Business

No new business

4.0 Adjournment

Motion to adjourn .

Respectfully Submitted

Chris Prengaman

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	WEAR	RIDG	RIPP	SPIT	SCOR	WEARR	RIDGR	RIPPR	SPITR	SCORR	COMMENT
16.5 hour, 1650 lb-ft torque, Highly Modified Break-In																	
134	STANDARD		D		NONLUBRITED		7	6	9	9.9	10	7	7	10	10	10	Highly Modified Break-In Run
134	STANDARD	GGAD12047085304	D		NONLUBRITED	20130514	6	6	9	9.9	10	7	7	10	10	10	Highly Modified Break-In Run
134	STANDARD	GGAD12063092213	A		NONLUBRITED	20130716	6	3	7	9.9	10	6	7	10	10	10	Non-lubricated AAM Zeta axle - Batch 2012. Conducted per SwRI highly modified break-in. 950 ml oil charge. Standard temp. Matrix test.
134	STANDARD		B		NONLUBRITED	20130720											Test stopped at 7.8 hours due to broken teeth.
134	STANDARD		G														
1-B	STANDARD	GGAD12047074125	D		NONLUBRITED	20130612	4	4	8	9.9	10	5	5	9	9.9	10	Highly Modified Break-In Run Test stopped at 6 hours due to vibration.
1-B	STANDARD	GGAD12047092818	D		NONLUBRITED	20130620	4	4	8	9.9	10	5	5	9	9.9	10	Highly Modified Break-In Run Test stopped at 5:25 due to vibration
1-B	STANDARD	GGAD12063113	B		NONLUBRITED	20130730	6	5	6	10	10	7	6	10	10	10	Invalid Test
1-B	STANDARD		G														
1-B	STANDARD		A														
155	STANDARD	GGAD12047080902	D		NONLUBRITED	20130627	7	9	10	10	10	7	10	10	10	10	Highly Modified Break-In Run
155	STANDARD	No tag on axle	A		NONLUBRITED	20130720	7	8	9	9.9	10	8	9	9	9.9	10	Non-lubricated AAM Zeta axle - Batch 2012. Conducted per SwRI highly modified break-in. 950 ml oil charge. Standard temp. Matrix test.
155	STANDARD	GGAD12063112	B		NONLUBRITED	20130731	7	10	10	9.9	10	8	10	10	9.9	10	
155	STANDARD		G														
1-B	STANDARD		A		NONLUBRITED	20130403	7	9	9	10	10	8	10	10	10	10	Highly Modified Break-In Run (11 hours)

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	WEAR	RIDG	RIPP	SPIT	SCOR	WEARR	RIDGR	RIPPR	SPITR	SCORR	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-interpretable. 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.

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							WEAR	RIDG	RIPP	SPIT	SCOR	WEARR	RIDGR	RIPPR	SPITR	SCORR	
IND	TVERSION	SERIALNO	LTMSLAB	LTMSAPP	TESTHARD	LTMSDATE	WEAR	RIDG	RIPP	SPIT	SCOR	WEARR	RIDGR	RIPPR	SPITR	SCORR	COMMENT
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 11hrs.
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	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	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	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.

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							IND	TVERSION	SERIALNO	LTMSLAB	LTMSAPP	TESTHARD	LTMSDATE	WEAR	RIDG	RIPP	
11 hour, 1650 lb-ft torque, Overfilled (1450ml)																	
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	N/A	G		NONLUBRITED	20121128	7	10	9	9.9	10	7	10	9	9.9	10	1650 torque, 11 hours - 1450 ml fill
134	STANDARD	N/A	G		NONLUBRITED	20121206	7	8	8	9.9	10	7	10	9	9.9	10	1650 torque, 11 hours - 1450 ml fill
11 hour, 1650 lb-ft torque, Highly Modified Break-In																	
1-B	STANDARD		A		NONLUBRITED	20130403	7	9	9	10	10	8	10	10	10	10	Highly Modified Break-In Run
134	STANDARD	GGAD12063112	B		NONLUBRITED	20130411	6	5	10	9.9	10	7	6	10	9.9	10	Highly Modified Break-In Run

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	WEAR	RIDG	RIPP	SPIT	SCOR	WEARR	RIDGR	RIPPR	SPITR	SCORR	COMMENT
16.5 hour, 1650 lb-ft torque																	
134	STANDARD	GGAD12063130725	D	3	LUBRITED	20120505	7	6	9	9.9	10	7	7	10	10	10	AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure. 7 spat on inner cone of head bearing.
134	STANDARD	GGAD12063122708	A	5	LUBRITED	20120720	6	5	10	10	10	6	6	10	10	10	AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure.
134	STANDARD		G		LUBRITED	20120804	6	5	9	9.9	10	7	6	8	9.9	10	AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure.
155	STANDARD	GGAD12063132945	B		LUBRITED	20120406	7	7	9	9.9	10	7	8	10	9.9	10	AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure.
155	STANDARD	GGAD12063124110	A	5	LUBRITED	20120425	7	8	9	9.9	10	8	9	10	9.9	10	AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure.
155	STANDARD	GGAD12063140809	D	3	LUBRITED	20120517	7	7	10	9.9	10	7	8	10	10	10	AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure.
155	STANDARD	GGAD120631- - - -	D	3	LUBRITED	20120518	7	8	10	9.9	10	7	8	10	9.9	10	AAM Zeta axle - Batch 2012. Conducted per Lubrizol proposed procedure. Last 5 digits of serial number missing.