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Nov. 2nd, 2012

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ASTM D02.B0.03 L-42 Surveillance Panel
Members and Guests:

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

Aug. 8th, 2012 Surveillance Panel Meeting (PRI Headquarters – Warrendale, PA)

Please direct any corrections or comments to my attention.

Very Respectfully,

Thomas Gottwald, Chairman
L-42 Surveillance Panel

L-42 Surveillance Panel Meeting Minutes

PRI Headquarters

Warrendale, PA

Aug. 8, 2012

Attendees: voting members in **bold**

B. Koehler (SwRI)	A. Athey (Volvo)	P. Kanga (XOM)	R. Banas (XOM)
D. Smith (Intertek)	D. Bell (Afton)	T. Boschert (Afton)	M. Umerly (LZ)
S. Parke (TMC)	J. Gropp (LZ)	W. Venhoff (LZ)	R. Thorpe (SwRI)
T. Gottwald (Afton/C)	K. Hobson (Afton)	A. Trader (Intertek)	G. Greene (BASF)
J. Dharte (AAM)	L. Hamilton (LZ)	J. Clark (TMC)	H. Chambers (Linamar)

Call to Order

The meeting PowerPoint presentation is attached.

Review of Membership

The sign-in sheet is attached and up-to-date.

Review of Agenda

The meeting agenda is attached (slide 2 of attached PowerPoint presentation).

Approval of Meeting Minutes

Meeting minutes from the May 9, 2012 L-42 Surveillance Panel meeting, held at Automation Alley in Troy, MI.

Motion by Mr. Dharte, second by Mr. Koehler, to approve the meeting minutes as presented. Pass 7/0/0.

Reference Oil 116-1 Availability

Mr. Parke, presenting for the TMC, stated that the current inventory of L-42 passing reference fluid, oil 116-1, is down to 44.5 gal (excluding fluid currently at labs): 89 tests worth of fluid. The TMC had contacted the supplier and found that the current supplier is no longer able to provide a reblend. The TMC expressed a need to come up with a solution in finding a new supplier.

The Surveillance Panel determined that any offered oils must meet the specs of the 116-1 oil and that this performance must be well documented. Mr. Gropp asked if there was any way to come up with

hard pass/fail criteria for the oil. The lab engineers said that these limits are too dependent on hardware (batch to batch), so the answer is no. Mr. Gropp then expressed that the next step would be to look in to a correction factor/average to equalize hardware variation factors. The Panel determined that the quickest solution would be to start with the oil suppliers.

PRIORITY Action: The TMC is to request suppliers to look back to see if they have a comparable 116-1 fluid and to contact Frank Farber at the TMC with any possible solutions.

L-42 Rating

Mr. Parke presented that the L-42 Raters requested more helpful templates for rating. At the rating workshop held at Afton's Richmond, VA facility the week of July 30, 2012, Lubrizol proposed new templates which expanded on the current template areas (these are found on pages 5 and 6 of the attached PowerPoint). A ballot conducted by the TMC on Aug. 6, 2012 garnered unanimous approval from the Raters. Mr. Dharte had no problems with the proposed templates and called them reasonable.

Concern was raised that a date should be included on the templates to prevent duplication. Mr. Chambers mentioned that it would be good to have an ID on the templates for traceability. The TMC noted the need to be careful in adding writing to the templates because the Raters had asked for more "white space" on the templates during the workshop. It was noted that the 20mm witness line was also added to the templates to prevent duplication. Mr. Chambers agreed and stated that the unique thickness of the template material would also further protect the integrity of the templates. It was determined that this will be policed in audits and that no extra writing should be included on the templates. This adheres to the Raters' wishes to maintain clarity of the rating areas.

Motion by Mr. Smith, second by Mr. Koehler, to release the new templates as presented by the TMC for ASTM production and industry use as soon as they are available. Pass 7/0/0.

ACTION: The TMC will get the newly approved templates to ASTM. The TMC will put out an information letter pertaining to the use of the templates as soon as they are available from ASTM. [NOTE: Templates will hopefully be available by the Feb. 2013 Surveillance Panel meetings.]

Hardware Update

Review of Pilot Matrix Status (slide 8 of attached PowerPoint presentation)

As reported in the May Surveillance Panel meeting, the initial runs revealed drive-side scoring. After sharing the initial results with Dana, the labs sent their remaining axles back to Dana's Ft. Wayne facility to have the gears relapped. The relapped axles were evenly redistributed amongst the labs (4 axles each).

A matrix was determined for axles containing the relapped gears:

- 1 axle on the previous pilot batch axle settings

- 2 pass tests (TMC oil 116-1)
- 1 discrimination test (TMC oil 113)

Review of Pilot Matrix Results (slide 9 of attached PowerPoint presentation)

The relapped axles ran more favorably than the initial pilot batch, however two of the three participating labs reported still seeing some degree of drive-side scoring.

A decision was made by the hardware task group to release the industry batch order for production, with the condition that a drive-side scoring waiver be submitted to the LRI Committee, as well as further lab fine tuning to determine a confidence of $\leq 10\%$ drive-side scoring on pass/candidate oils before approving the batch for industry use.

The Industry batch order was released for production with Dana on July 6, 2012.

Moving Forward (slide 10 of attached PowerPoint presentation)

As per an Aug. 8, 2012 update from Tim Hammer at Dana Dry Ridge, Ft. Wayne is scheduled to have the gear order completed by Sept. 24th. Based on this timing Dry Ridge expects to complete the remainder of the order (743 axles) by Oct. 22nd.

ACTION: Mr. Gottwald to confirm that all other components are in Dry Ridge and to communicate to Ft. Wayne and reiterate the urgency of this order.

Discussions concerning the approval matrix started. A minimum of each lab making all four reference runs is necessary, however fine tuning to adjust for drive-side scoring may require more approval tests.

Drive-side Scoring

Following an action item from the L-42 Surveillance Panel meeting on May 9, 2012, a memo describing the drive-side scoring problems and relapping of the pilot batch was issued to Harold Chambers on June 29, 2012 (pages 11 to 19 of the attached PowerPoint). Mr. Chambers responded with the following comments and requested photo examples of the results in question:

If it is less than 10% I might consider using these [results] as long as the candidate oils had less scoring than the drive side and the scoring does not exceed 10% [referencing gears run on the passing reference oil].

Of course you do not have a reference guide template for percent area of scoring on the drive side of the tooth so the gear rating panel would need to develop one at least for the 10% max area.

There was some discussion, but no true results, as to why labs were finding drive-side scoring variation lab to lab. Mr. Chambers concluded that there may have been a shift in micro-finish with this batch and that it could be a good lesson learned for future industry orders. He also noted that it may be a good idea to have some gears checked for micro-finish. Mr. Koehler commented that this will most likely be the last batch order from Dana.

The TMC asked if the current rating templates could be used because the requested waiver will only be for the batch in question. Mr. Dharte agreed because this should be a onetime occurrence. Mr. Chambers agreed that this would be OK; however, the Surveillance Panel must establish/designate a limit template to ensure that candidates do not exceed it. The Panel agreed that templates will need to be redeveloped for the Next Generation L-42 test.

ACTION: Bring scored parts to the Nov. Surveillance Panel meeting.

ACTION: Determine go/no-go limit at the Nov. meeting.

New/Open Issues

There is concern to start discussions for a Next Generation L-42 test, because the current L-42 hardware order with Dana may last less than two years. This topic will be on the agenda for the Surveillance Panel meeting in Troy, MI in Nov.

Adjournment

Motion to adjourn, Mr. Smith. Second, Mr. Dharte. Motion passed 7/0/0.

Respectfully submitted,



Thomas Gottwald

L-42 Surveillance Panel Chairman



L-42 Surveillance Panel Meeting

PRI Headquarters
Warrendale, PA
August 8, 2012
10am-12pm EDT

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Agenda

- ▲ Call to Order
- ▲ Membership/Agenda Review
- ▲ Approval of Meeting Minutes
- ▲ Availability of Reference Oil 116-1 (TMC)
- ▲ Rating (TMC)
- ▲ Hardware Update
 - ▲ Pilot Matrix Results
 - ▲ Batch Plan Moving Forward
- ▲ Drive-side Scoring
- ▲ New/Open Issues
- ▲ Adjournment



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Approval of Meeting Minutes

SP Meeting Minutes

- ▶ May 9, 2012 – Troy, MI
- ▶ Posted to TMC website on May 17, 2012
 - File name “20120509_sp.pdf”



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Reference Oil 116-1 Availability (TMC has the floor)

 **New blend needed?**

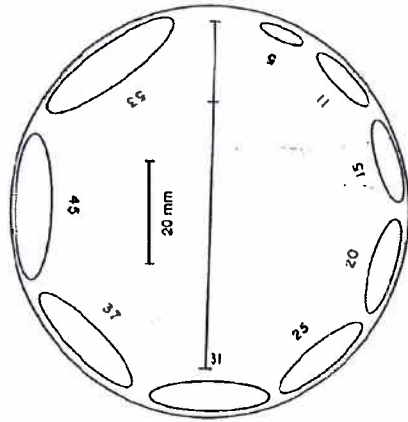


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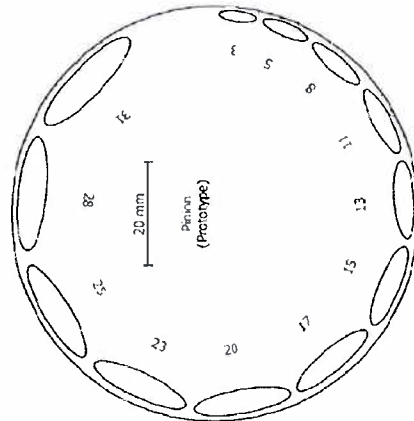
L-42 Rating (TMC has the floor)

L-42 Rating Template Comparison (Pinion)

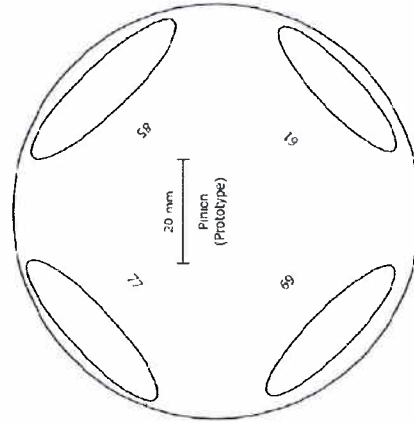
Not Actual Size
For layout comparison only
Not acceptable for rating



Current



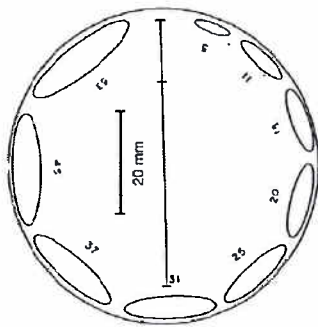
Proposed (set of 3)



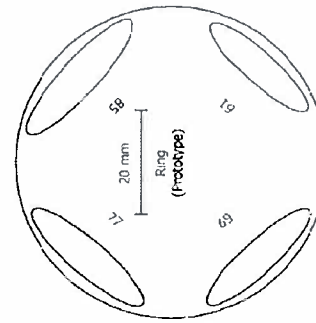
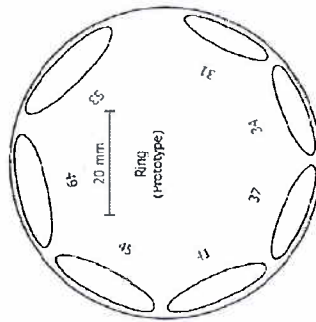
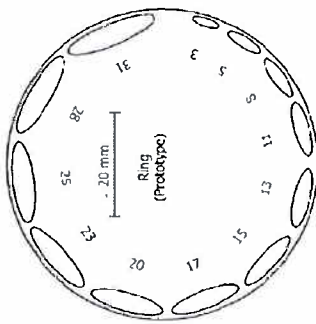
L-42 Rating (TMC has the floor)

L-42 Rating Template Comparison (Ring)

Not Actual Size
 For layout comparison only
 Not acceptable for rating



Current



Proposed (set of 3)

L-42 Rating (TMC has the floor)

- ▶ **Ballot conducted by TMC on Aug. 6, 2012**
- ▶ **Approved by raters from:**
 - ▶ Afton (2)
 - ▶ Lubrizol (3)
 - ▶ Southwest Research Institute (1)
 - ▶ Intertek (1)
- ▶ **Unanimous approval!**



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Hardware Update

Pilot Matrix Status

- ▶ As reported in May SP meeting, initial runs revealed drive-side scoring
- ▶ Remaining axles sent back to Dana for relapping
 - 4 – Lubrizol
 - 4 – SwRI
 - 6 – Afton
- ▶ Labs received axles back from Dana
 - 4 axles each after redistribution
 - 2 Afton axles to be resolved upon completion of industry batch

Hardware Update

Pilot Matrix Results

- ▶ Labs ran 1 relapped axle on previous pilot batch axle settings
- ▶ Labs ran 2 pass tests (TMC oil 116-1)
- ▶ Labs ran 1 discrimination test (TMC oil 113)
- ▶ Relapped axles ran more favorably and initial pilot batch, however 2 labs still experiencing drive-side scoring
 - Seen on both pass and discrimination oils

 **Decision made by the hardware task group to release industry batch order for production, with condition that a drive-side scoring waiver be submitted to the LRI Committee, as well as further lab fine tuning to determine confidence of $\leq 10\%$ drive-side scoring on pass/candidate oils before approving batch for industry use.***

- ▶ Industry batch order released with Dana on July 6, 2012

*Drive-side scoring to be addressed shortly in meeting



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Hardware Update

Moving Forward

- ▶ Dana update (from Tim Hammer on Aug. 8, 2012)
- ▶ Fort Wayne will have gear order completed by Sept. 24th
- ▶ Based on this timing, Dry Ridge able to complete remaining order (743 axles) by Oct. 22nd

Drive-side Scoring

Action Item from LRI Committee meeting on May 9, 2012

- ▶ Put together a short memo or presentation which describes the problem and formalizes the request, and give this to Wendy for distribution to the Committee

L-42 Chair contacted Harold Chambers for drive-side scoring input on June 29, 2012

Background (Letter to Harold Chambers - Linamar)

- ▶ Reported at the LRI meeting in May,
- ▶ L-42 Task Group having trouble getting the new batch of hardware to perform to historical expectations.
- ▶ Labs (Afton, LZ, and SwRI) ran a series of pilot tests.
- ▶ First round
 - ▶ LZ and SwRI experienced drive-side scoring at various points in the test
 - ▶ Afton was unable to run at that time
 - ▶ Contact pattern on this batch slightly different than the previous industry order
 - ▶ Remaining 12 pilot axles sent back to Dana, re-lapped
- ▶ **The axles are performing better, however data from some of the tests (2 passing runs and 1 discrimination run) are still showing results with drive-side scoring.**

Background (Letter to Harold Chambers - Linamar)

Second round

- ▶ Axles are performing better
- ▶ Data from some of the tests (2 passing runs and 1 discrimination run) are still showing results with drive-side scoring

Response from Harold Chambers

- ▶ How much scoring on the drive side of the gears with the passing reference oil? If it is less than 10% I might consider using these as long as the candidate oils had less scoring than the drive side and the scoring does not exceed 10 %.
- ▶ Of course you do not have a reference guide template for percent area of scoring on the drive side of the tooth so the gear rating panel would need to develop one at least for the 10% max area.
- ▶ If you would, send me some photo examples of the scoring.

Photos of Drive-side Scoring Shared with Harold and Reviewers



L-42 High Speed Shock Axle

Oil Code:	CMIR-83452	EOT Date:	20120618
Run Number:	03A-0082		

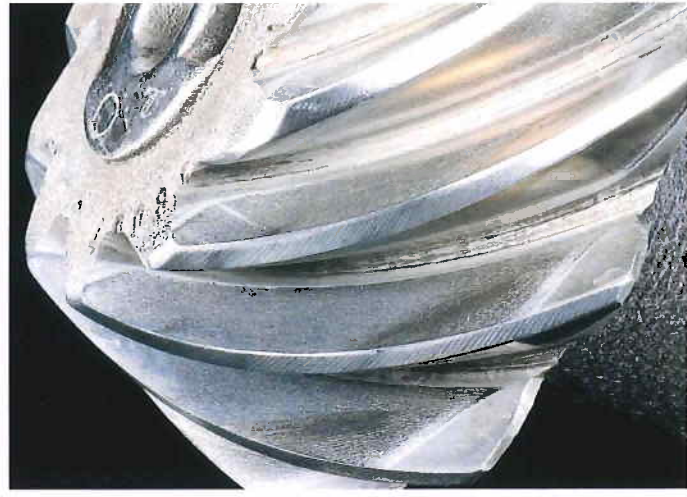
Drive Side Pinion



L-42 High Speed Shock Axle

Oil Code:	83453	EOT Date:	20120620
Run Number:	03A-0083		

Drive Side Pinion



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L-42 High Speed Shock Axle

Oil Code:	83454	EOT Date:	20120621
Run Number:	03A-0084		

Drive Side Pinion



L-42 High Speed Shock Axle

Oil Code:	CMIR-83452	EOT Date:	20120618
Run Number:	03A-0082		

Drive Side Ring Gear



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L-42 High Speed Shock Axle

Oil Code:	83453	EOT Date:	20120620
Run Number:	03A-0083		

Drive Side Ring Gear



L-42 High Speed Shock Axle

Oil Code:	83454	EOT Date:	20120621
Run Number:	03A-0084		

Drive Side Ring Gear



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New/Open Issues

 Anything?



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Thanks!



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L-42 Surveillance Panel Membership/Attendance
PRI Headquarters - Warrendale, PA
August 8, 2012

Initials	Name	Voting Non-Voting	Company Name Company Address	Phone:	Contact information
AA	Allison Athey	V	Volvo Powertrain 13302 Pennsylvania Ave. Hagerstown, MD 21740	E-mail: allison.athey@volvo.com	301-573-5684
	Brian Koehler	V	Southwest Research Institute P.O. Drawer 28510 San Antonio, TX 78228-0510	E-mail: Bkoehler@swri.org	210-522-3588
	Dale Smith	V	Intertek Automotive Research	Phone: E-mail: dale.smith@intertek.com	412-855-6854
	Scott Parke	V	ASTM Test Monitoring Center 6555 Penn Ave Pittsburg, PA 15206	Phone: E-mail: sdp@astmtmc.cmu.edu	412-365-1036
	Thomas Gottwald	V/Chair	Afton Chemical 500 Spring St. Richmond, VA 23219	Phone: E-mail: thomas.gottwald@aftonchemical.com	804-788-5230
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**L-42 Surveillance Panel Membership/Attendance
PRI Headquarters - Warrendale, PA
August 8, 2012**

Initials	Name	Voting Non-Voting	Company Name Company Address	Contact information
<i>JG</i>	Jerry Gropp	NV	The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, OH 44092	Phone: 440-347-1223 E-mail: jerry.gropp@lubrizol.com
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<i>LH</i>	Larry Hamilton	V	The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, OH 44092	Phone: 440-347-2326 E-mail: larry.hamilton@lubrizol.com
<i>P.R. K</i>	Percy Kanga	NV	ExxonMobil Research & Engineering 600 Billingsport Rd. Paulsboro, NJ 08066	Phone: 856-224-2094 E-mail: percyr.kanga@exxonmobil.com
	Sam Higuchi	NV	Afton Chemical 500 Spring St. Richmond, VA 23219	Phone: 804-788-5375 E-mail: samuel.higuchi@aftonchemical.com
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L-42 Surveillance Panel Membership/Attendance
 PRI Headquarters - Warrendale, PA
 August 8, 2012

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	Troy Muransky	NV (ALT)	Meritor	Phone: 248-435-1409 E-mail: troy.muransky@meritor.com
	Cheryl O'Brien	NV (ALT)	General Motors 823 Joslyn Ave Pontiac, MI 48340-2925	Phone: 248-343-7347 E-mail: cheryl.obrien@gm.com
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L-42 Surveillance Panel Membership/Attendance
 PRI Headquarters - Warrendale, PA
 August 8, 2012

Initials	Name	Voting Non-Voting	Company Name Company Address	Phone: E-mail:	Contact information
Bob	Bob Banas	NV	ExxonMobil Fuels, Lubricants + Specialties 114 Arcadia Park Dr. Canton, GA 30114	678-493-3930 rob.a.banas@exxonmobil.com	
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RT	Ryan Thorpe	NV	SWRI	210 522 6409	
CKG	Galen Green	V?	BASF	973-823-245-5809 galen@green@BASF.com	
Called In TB	Harold Chambers	NV	Linamar Driveline Systems Traveler's Tower I 2655 Evergreen Rd Ste 900 Southfield, MI 48076	248-358-6038 harold_chambers@linamar.com	
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