



**Address** 100 Barr Harbor Drive  
PO Box C700  
W. Conshohocken, PA  
19428-2959 | USA

**Phone** 610.832.9500  
**Fax** 610.832.9666  
**Web** www.astm.org

---

### **Committee D02 on PETROLEUM PRODUCTS AND LUBRICANTS**

*Chairman:* KENNETH O. HENDERSON, Cannon Instrument Co., 2139 High Tech Road, State College, PA 16803, (814) 353-8000, Fax: (814) 353-8007, e-mail: kenohenderson@worldnet.att.net  
*First Vice-Chairman:* BEN R. BONAZZA, 3457 WOODVALLEY DRIVE, LAPEER, MI 48446 (810) 664-6769 e-mail: bbonazza@charter.net  
*Second Vice-Chairman:* JANET L. LANE, ExxonMobil Research & Engrg., 600 Billingsport Rd, Paulsboro, NJ 08066-0480 (856) 224-3302, Fax: (856) 224-3616, e-mail: janet.l.lane@exxonmobil.com  
*First Secretary:* RALPH A. CHERRILLO, Shell Global Solutions (US) Inc., Westhollow Tech Ctr., 3333 Highway 6 South, Houston, TX 77082 (281) 544-8789, Fax: (281) 544-8150, e-mail: ralph.cherrillo@shell.com  
*Second Secretary:* MICHAEL A. COLLIER, Petroleum Analyzer Co. LP, PO Box 206, Wilmington, IL 60481, (815) 458-0216, Fax: (815) 458-0217, e-mail: Michael.collier@paclp.com  
*Staff Manager:* DAVID R. BRADLEY, (610) 832-9681, Fax: (610) 832-9668, e-mail: dbradley@astm.org

April 28th, 2016

Reply to:  
Matt Umerley  
The Lubrizol Corporation  
29400 Lakeland Blvd.  
Wickliffe, OH 44092  
(440) 347-4589  
(440) 347-2377 (FAX)  
mtue@lubrizol.com

ASTM D02.B0.03 L-37-1 Surveillance Panel  
Members and Guests:

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

- **November 4th 2015, Surveillance Panel Teleconference**

Please direct any corrections or comments to my attention.

Sincerely,

Matt Umerley, Chairman  
L-37-1 Hardware Taskforce Chairman

**Report of Meeting**  
**L-37-1 Surveillance Panel Meeting**  
***November 4th, 2015 Meeting***

Call to Order – 13:30 EST.

1.0 Approval of Meeting Minutes

- 10/20
- 10/13
- 10/06
- 9/29
- 9/22
- 9/15
- 9/8
- 8/12
- 7/23
  - R. Warden - Motion
  - B. McGlone 2<sup>nd</sup>
  - Unanimous Pass

2.0 Reference Fluids

- Replacement TMC 134 on order

3.0 Open Items

- See M. Dennis quote regarding reduced contact pressure in attached presentation.

4.0 Data Review

5.0 What happens next?

- See presentation.

6.0 Targets/LTMS Discussion

- TMC152-2 and TMC155-1 both have all SPIT results = 9.9, maybe use 'pooled S' rather than 'stdev' when calculating bands

7.0 Final Procedure Review

8.0 Next Steps

- Lubrited Gear Approval
- Housings

## 9.0 New Business

- Nominate M. Umerley as Chairman
- R. Warden 2<sup>nd</sup>
- Pass - Unanimous

## 10.0 Adjournment

Motion to adjourn 15:40

Respectfully Submitted

Matt Umerley

# L-37-1 Surveillance Panel

11/4/2015

# Agenda

- Meeting Minutes Approval
- Reference Fluids
- Data Summary & Review
- Discuss next steps
- Targets / LTMS discussion
- Final Procedure Review
- Next Steps
  - Lubrited
  - Housings
  
- New Business

# Minutes

- Meeting Minutes Posted on TMC Site
  - 10/20
  - 10/13
  - 10/06
  - 9/29
  - 9/22
  - 9/15
  - 9/8
  - 8/12
  - 7/23

# Reference Fluids

- Replacement TMC 134 On Order

# Open Items

- M. Dennis
  - “. I looked at surface and subsurface stresses for the (2) test load conditions; 2359Nm and 1645Nm. For all criteria we have to look at with our FEA software, the stresses are approximately 12% lower at the 1645 load. Criteria consisted of contact stresses, subsurface principle shears (case crushing), and subsurface orthogonal shears (pitting). “



# Data Review

## Standard -----

- 8 x TMC 134 – 1645 Nm
- 8 x TMC 152-2 – 2359 Nm
- 2 x TMC 152-2 – 1645 Nm
- 8 x TMC 155-1 2359 Nm
- 2 x TMC 155-1 1645 Nm

## Canadian -----

- 6 x TMC 152-2 2359 Nm
- 2 x *TMC 152-2 1645 Nm\**

Lab	Oil	Pinion					Ring					Comments	Notes
		Wear	Ripple	Ridge	Spitt	Score	Wear	Ripple	Ridge	Spitt	Score		
D	134	7	8	5	9.9	10	7	9	5	9.9	10	1645 N-m	
D	134	7	7	4	9.9	7	7	10	5	9.9	7	1645 N-m	
B	134	6	7	4	9.5	10	6	10	6	9.9	10	1645 N-m	
B	134	5	7	4	6	10	6	10	6	10	10	1645 N-m	
A	134	5	7	4	8.0	10	5	9	4	9.9	10	1645 N-m	
A	134	6	6	5	9.7	10	6	9	5	9.8	10	1645 N-m	
G	134	6	9	5	9.3	10	8	10	6	9.7	10	1645 N-m	
G	134	7	6	5	9.7	10	7	8	6	9.9	10	1645 N-m	
A	152-2	7	7	10	9.9	10	8	10	10	9.9	10	1 Shut down due to dyno output 100%	*2359 Nm
A	152-2	7	6	9	9.9	10	8	10	10	9.9	10		*2359 Nm
D	152-2	7	10	9	9.9	10	7	10	10	10	10		*2359 Nm
D	152-2	7	10	8	9.9	10	7	10	10	9.9	10		*2359 Nm
B	152-2	9	10	10	9.9	10	9	10	10	9.9	10		*2359 Nm
B	152-2	8	10	10	9.9	10	9	10	10	10	10	Chipping on 2 pinion teeth	*2359 Nm
G	152-2	9	8	9	9.9	10	9	9	9	9.9	10		*2359 Nm
G	152-2	8	10	9	9.9	10	9	10	9	9.9	10		*2359 Nm
B	152-2	8	10	10	9.9	10	9	10	10	9.9	10	1645 N-m	
	152-2											*1645 N-m	
A	155-1	8	9	10	9.9	10	8	10	10	9.9	10		*2359 Nm
D	155-1	7	9	9	9.9	10	8	10	10	9.9	10		*2359 Nm
D	155-1	7	10	10	9.9	10	7	10	10	10	10		*2359 Nm
B	155-1	8	10	10	9.9	10	9	10	10	10	10		*2359 Nm
B	155-1	9	10	10	9.9	10	9	10	10	9.9	10	Chipping on Pinion Teeth	*2359 Nm
G	155-1	8	10	9	9.9	10	9	10	10	9.9	10		*2359 Nm
G	155-1	8	9	9	9.9	10	9	10	10	9.9	10		*2359 Nm
B	155-1	9	10	10	9.9	10	9	10	10	9.9	10	1645 N-m	
A	155-1	7	7	9	9.8	10	8	10	10	9.9	10	*1645 N-m	

# What happens next?

- Approve Procedure & Include Precision Statement
- ASTM Case # - Submit for ballot with Rational Statement
- Post Ballot – Official Procedure DXXXX
  
- Submit for ballot to SAE J2360 & API GL4/5
- Post SAE Ballot – Test now in J2360 Specification
  
- Submit for PRI PD4000 ballot
- Post PRI Ballot – Parts may be submitted to LRI.

# LTMS / Targets

- How do we determine if tests calibrate the stands?
- Scott – LTMS review
- LTMS for all fluids
- Do not chart Failing fluid (TMC 134)
- Include 134 for spitting in precision

Lab	Oil	Pinion					Ring					Comments	Notes
		Wear	Ripple	Ridge	Spitt	Score	Wear	Ripple	Ridge	Spitt	Score		
D	134	7	8	5	9.9	10	7	9	5	9.9	10	1645 N-m	
D	134	7	7	4	9.9	7	7	10	5	9.9	7	1645 N-m	
B	134	6	7	4	9.5	10	6	10	6	9.9	10	1645 N-m	
B	134	5	7	4	6	10	6	10	6	10	10	1645 N-m	
A	134	5	7	4	8.0	10	5	9	4	9.9	10	1645 N-m	
A	134	6	6	5	9.7	10	6	9	5	9.8	10	1645 N-m	
G	134	6	9	5	9.3	10	8	10	6	9.7	10	1645 N-m	
G	134	7	6	5	9.7	10	7	8	6	9.9	10	1645 N-m	
A	152-2	7	7	10	9.9	10	8	10	10	9.9	10	1 Shut down due to dyno output 100%	*2359 Nm
A	152-2	7	6	9	9.9	10	8	10	10	9.9	10		*2359 Nm
D	152-2	7	10	9	9.9	10	7	10	10	10	10		*2359 Nm
D	152-2	7	10	8	9.9	10	7	10	10	9.9	10		*2359 Nm
B	152-2	9	10	10	9.9	10	9	10	10	9.9	10		*2359 Nm
B	152-2	8	10	10	9.9	10	9	10	10	10	10	Chipping on 2 pinion teeth	*2359 Nm
G	152-2	9	8	9	9.9	10	9	9	9	9.9	10		*2359 Nm
G	152-2	8	10	9	9.9	10	9	10	9	9.9	10		*2359 Nm
B	152-2	8	10	10	9.9	10	9	10	10	9.9	10	1645 N-m	
	152-2											*1645 N-m	
A	155-1	8	9	10	9.9	10	8	10	10	9.9	10		*2359 Nm
D	155-1	7	9	9	9.9	10	8	10	10	9.9	10		*2359 Nm
D	155-1	7	10	10	9.9	10	7	10	10	10	10		*2359 Nm
B	155-1	8	10	10	9.9	10	9	10	10	10	10		*2359 Nm
B	155-1	9	10	10	9.9	10	9	10	10	9.9	10	Chipping on Pinion Teeth	*2359 Nm
G	155-1	8	10	9	9.9	10	9	10	10	9.9	10		*2359 Nm
G	155-1	8	9	9	9.9	10	9	10	10	9.9	10		*2359 Nm
B	155-1	9	10	10	9.9	10	9	10	10	9.9	10	1645 N-m	
A	155-1	7	7	9	9.8	10	8	10	10	9.9	10	*1645 N-m	

# Canadian

Lab	Gear Batch	Test Version	Oil	Pinion					Ring					Comments	Notes
				Wear	Ripple	Ridge	Spitt	Score	Wear	Ripple	Ridge	Spitt	Score		
CANADIAN															
A	Non-Lubrited	Canadian	152-2	8	6	9	9.9	10	8	10	9	9.9	10		*2359 Nm
A	Non-Lubrited	Canadian	152-2	8	10	8	9.9	10	8	10	9	9.9	10		*2359 Nm
D	Non-Lubrited	Canadian	152-2	7	9	8	9.9	10	7	10	10	9.9	10		*2359 Nm
D	Non-Lubrited	Canadian	152-2	7	10	8	9.9	10	7	10	8	9.9	10		*2359 Nm
B	Non-Lubrited	Canadian	152-2	7	10	10	9.9	10	9	10	10	10	10	Non-Typical look on Pinion. Similar to sco	*2359 Nm
B	Non-Lubrited	Canadian	152-2	7	10	10	9.9	10	9	10	10	10	10	Non-Typical look on Pinion. Similar to sco	*2359 Nm
G	Non-Lubrited	Canadian	152-2											1645 N-m	
G	Non-Lubrited	Canadian	152-2											1645 N-m	

Lab	Oil	Pinion				
		Wear	Ripple	Ridge	Spitt	Score
D	134	7	8	5	9.9	10
D	134	7	7	4	9.9	7
B	134	6	7	4	9.5	10
B	134	5	7	4	6	10
A	134	5	7	4	8.0	10
A	134	6	6	5	9.7	10
G	134	6	9	5	9.3	10
G	134	7	6	5	9.7	10

A	152-2	7	7	10	9.9	10
A	152-2	7	6	9	9.9	10
D	152-2	7	10	9	9.9	10
D	152-2	7	10	8	9.9	10
B	152-2	9	10	10	9.9	10
B	152-2	8	10	10	9.9	10
G	152-2	9	8	9	9.9	10
G	152-2	8	10	9	9.9	10
B	152-2	8	10	10	9.9	10
	152-2					

A	155-1	8	9	10	9.9	10
D	155-1	7	9	9	9.9	10
D	155-1	7	10	10	9.9	10
B	155-1	8	10	10	9.9	10
B	155-1	9	10	10	9.9	10
G	155-1	8	10	9	9.9	10
G	155-1	8	9	9	9.9	10
B	155-1	9	10	10	9.9	10
A	155-1	7	7	9	9.8	10

New

New

		Pinion			
		Wear	Ripple	Ridge	Spitt
TMC 134	Low	4.662	5.341	3.537	6.552
	High	7.627	8.908	5.446	10

TMC 152-2	Low	6.277	6.153	8.06	9.9
	High	9.277	10	10	9.9

TMC 155-1	Low	6.639	8.693	8.693	9.9
	High	9.36	10	10	9.9

# Precision

- Needs updated with latest runs

L-37-1 Non-Lubrited Standard  
Intermediate Precision (Repeatability) & Reproducibility  
Includes Tests from           to 20150808 and Oils '152-2','155-1'

Obs	_NAME_	DF_IP	DF_R	SIP	IP	SR	R
1	RIDG	12	15	0.432	1.210	0.626	1.753
2	RIPP	12	15	0.791	2.215	1.208	3.382
3	SPIT	12	15	0.000	0.000	0.000	0.000
4	WEAR	12	15	0.484	1.355	0.798	2.234



# Targets

Obs	TVERSION	IND	_NAME_	N	MIN	MAX	MEAN	STD	BANDMIN	BANDMAX
1	Standard	134	RIDG	8	4.0	5.0	4.5000	0.53452	3.53786	5.4621
2	Standard	134	RIPP	8	6.0	9.0	7.1250	0.99103	5.34114	8.9089
3	Standard	134	SPIT	8	6.0	9.9	9.0000	1.35962	6.55268	11.4473
4	Standard	134	WEAR	8	5.0	7.0	6.1250	0.83452	4.62286	7.6271
5	Standard	152-2	RIDG	9	8.0	10.0	9.3333	0.70711	8.06054	10.6061
6	Standard	152-2	RIPP	9	6.0	10.0	9.0000	1.58114	6.15395	11.8460
7	Standard	152-2	SPIT	9	9.9	9.9	9.9000	0.00000	9.90000	9.9000
8	Standard	152-2	WEAR	9	7.0	9.0	7.7778	0.83333	6.27778	9.2778
9	Standard	155-1	RIDG	8	9.0	10.0	9.6250	0.51755	8.69341	10.5566
10	Standard	155-1	RIPP	8	9.0	10.0	9.6250	0.51755	8.69341	10.5566
11	Standard	155-1	SPIT	8	9.9	9.9	9.9000	0.00000	9.90000	9.9000
12	Standard	155-1	WEAR	8	7.0	9.0	8.0000	0.75593	6.63933	9.3607

# Motions

- Approval final procedure version “L-37-1\_Oct 2015\_v1\_10\_30\_15 CPP”
- Approve LTMS / method of referencing
- Approve targets pending final upload of test results by 12/1/15
- Approve Build Document

# Future Steps

- Complete Lubrified Hardware Testing by 1/1/16
  - Run at 1645 Nm
- Continue to investigate alternative housings

# New Business

- ?