L-42 Surveillance Panel Meeting Minutes

Southwest Research Institute, San Antonio, TX and Virtual Meeting – Microsoft Teams

February 12, 2025

Attendees: voting members in **bold,** * indicates virtual attendance

N. Ariemma (Lubrizol)
R. Banas (Exxon Mobil)
D. Beck (TMC)
D. Bell (Afton)
T. Bender (Fuchs)
B. Campbell (Afton)
M. Caridi (BASF)
J. Carowick (Cummins)
H. Catania (Cummins)*
A. Comfort (US Army)*
H. De La Fuente (Chevron Oronite)
T. Gibson (Dana)
J. Gingerich (Lubrizol)
A. Goyal (BASF)
D. Horvath (Afton)
A. Jackson (Chevron Oronite)
S. Jetter (Exxon Mobil)
A. Lange (Intertek)
J. Morris (International Motors)*
D. Mosher (BASF)
C. Mueller (SwRI)
T. Muransky (AAM)
M. Portell (Intertek)
M. Sangpeal (Afton/C)
E. Sattler (US Army)*
N. Schaup (LZ)
A. Stone (Afton)*
D. Uy (Shell)
C. Vander Wal (Daimler Truck)
W. Venhoff (TMC)*
R. Warden (Chevron Oronite)
P. Wright (SwRI)
A. Zyski (Afton)

Call to Order

Review of Agenda
The meeting agenda is attached.

Review of Membership
Trevor Gibson will replace Amy Zyski as voting member from Dana.
Steve Jetter will replace Rob Banas as voting member from Exxon Mobil.

A motion was made to approve the above changes to membership.
Motion: A. Goyal
Second: A. Lange
All in favor, no objections, no abstentions.

Approval of Meeting Minutes
Meeting minutes for approval:

- "20241113_SP" → November 13, 2024 – Surveillance Panel Meeting – Plymouth, MI

A motion was made to approve the meeting minutes as presented.
Motion: A. Goyal
Second: T. Muransky
All in favor, no objections, no abstentions.

Action Item Review

One open action item remains from November:

- IAR to investigate installing L-42 axle on their Efficiency T-Rig.

Next Hardware Batch Order

All PO's received by Dana late 2024.

Randy Fitzpatrick from Dana gave this update on 2/5/25: "We have these planned to build in July but we are continuously working with the supply chain to pull in knowing Afton is going to run out around April/May."

Pilot axles will all be sent to Lubrizol for validation testing.

Next-Gen L-42 Test Hardware

A conference call on 2/7/25 was held to discuss the approval plan for Next-Gen hardware from Dana (see attached file for detailed plan).

Afton will test prototype axles on their fired-engine L-42 test stand.

A motion was made to approve the approval plan and to send it to Dana.
Motion: M. Sangpeal
Second: C. Mueller
All in favor, no objections, no abstentions.

Action Item: Afton and Chevron-Oronite will propose a borderline-passing 75W oil for a Canadian L-42 validation run.

L-42-1 Development

SwRI presented more data on their electric L-42 test stand. Increased S2 torque and a more aggressive speed ramp-rate produced increased Scoring severity (see attached file for details).

The committee decided that enough preliminary data has been generated on both test rig types, and they are going to move forward with writing a new ASTM test method and defining test validation plans.

Action Item: M. Sangpeal will set up a meeting with the TMC to begin discussion on writing a new ASTM test method.

Single Reference Test Torque Validity Discussion

Wes Venhoff inquired about S1 and S2 torque level limits for single-try reference tests. Discussion with the committee revealed that there was confusion about torque limits currently in place for the four-test reference sequence. All three Hi Reference Oil tests must have S1 torque within 15% of each other, and S2 torque within 10%. There is currently a check in place at TMC to verify this requirement. The verbiage stating these requirements in D7452 is confusing and unclear.

Action Item: M. Sangpeal will setup a conference call with labs to discuss adding torque limits to single-try reference tests and editing D7452 to clarify torque limit requirements.

Wheel Speed DAQ Discussion

Wes Venhoff inquired about Section 12.1.2 and how labs report wheel speeds. Verbiage in D7452 is confusing and unclear. Test labs were asked to investigate how they calculate and report min, max, and average wheel speed in all sections of the test report. Three different methods were found.

Action Item: M. Sangpeal to set up conference call to discuss editing 12.1.2 to clarify requirements and standardizing speed calculations.

New/Open Issues

A request was made to develop a new high reference oil for L-42 testing. The new oil should produce higher scoring than TMC 117 without the use of any correction factors.

Action Item: TMC will send a request to lubricant suppliers to submit a new reference oil for testing.

Adjournment

A motion was made to adjourn.
Motion: R. Warden
Second: T. Muranski
All in favor, no objections, no abstentions.

Meeting adjourned.

Respectfully submitted,

Matthew A Sangpeal

Matt Sangpeal
L-42 Surveillance Panel Chairman

L-42 Surveillance Panel Meeting

ASTM D7452

Southwest Research Institute

San Antonio, TX

February 12, 2025

10:45 – 11:45 AM CST

Passion for Solutions™

Agenda

- **Call to Order**
- **Agenda**
- **Membership Review & Update**
- **Approval of Meeting Minutes**
  - “20241113 SP” – Intertek PSI, Plymouth, MI
- **Action Item Review**
- **Next Hardware Batch Order Update**
- **Next-Gen L-42 Test Hardware Update**
- **Wheel Speed Discussion**
- **Single Calibration Tests**
- **L-42-1 Development Updates**
- **New Issues**
- **Adjournment**

L-42 SP Voting Members

- **Rob Banas:** **Exxon Mobil Replacement: Steve Jetter**
- **Wes Venhoff:** **TMC**
- **Allen Comfort:** **US Army**
- **Arjun Goyal:** **BASF**
- **Troy Muransky:** **AAM**
- **Jessica Carowick:** **Cummins**
- **Matt Sangpeal:** **Afton Chemical (Chair)**
- **Nick Schaup:** **Lubrizol**
- **Anthony Lange:** **Intertek**
- **Caroline Mueller:** **SwRI**
- **Amy Zyski:** **Dana Replacement: Trevor Gibson**
- **Rebecca Warden:** **Chevron-Oronite**

Motion to Approve voting member changes.

Approval of Meeting Minutes

SP Meeting Minutes

- "20241113 SP" → November 13, 2024 – Surveillance Panel Meeting - Intertek PSI, Plymouth, MI and Virtual Meeting via Microsoft Teams

Motion to Approve Meeting Minutes as they stand.

Action Item Review

- **IAR to donate three axles from MSPLO/P2AD01 batch to SwRI for development efforts.**
  - Status: Complete
- **IAR to investigate installing L-42 axle on their Efficiency T-Rig.**
  - Status: ?
- **Afton to set up call with SP to discuss and identify process for new gear approval.**
  - Status: Complete
- **SwRI to run two additional tests on TMC 117 and TMC 119 with a target peak torque of -250 to -255 ft-lbs in Shock II.**
  - Status: Discussion to follow

Next Hardware Batch Order

- **Orders have been placed with Dana. Quantities by lab:**
  - SwRI: 300
  - IAR: ~~250~~ 325
  - Afton: ~~200~~ 300
  - Lubrizol: ~~100~~ 125
- **PO Status:**
  - All PO's received late 2024
- **Update from Dana:**
  - Randy Fitzpatrick, 2/5/25
    - "We have these planned to build in July but we are continuously working with the supply chain to pull in knowing Afton is going to run out around April/May."

Next-Gen L-42 Hardware Update

- **Dana requested detailed approval plan for prototype axles**
- **Conference Call on 2/7/25 to discuss approval process**
  - See attached Word document

Motion to Approve Next-Gen Hardware approval process.

- **Timing for delivery: Close to next production run**
- **Which lab will run testing?**
- **Which 75W oil will be tested / who will provide?**

Wheel Speed Discussion

- **See TMC slides**

Wheel Speed Discussion

Afton's Method (Cond. 4 example)

- Coast Side:
  - 8 min speed values including Left and Right channels
  - Min, Max, and Avg from those 8 values reported
- Drive Side:
  - 8 max speed values including Left and Right channels
  - Min, Max, and Avg from those 8 values reported

Operational Data					
		Conditioning 2		Conditioning 4	
		Wheel Speed (r/min)	Torques (lbf-ft)	Wheel Speed (r/min)	Torques (lbf-ft)
Drive Side	Maximum	578	137	801	124
	Minimum	577	136	800	117
	Average	578	136	800	120
Coast Side	Maximum	386	-60	678	-64
	Minimum	384	-64	670	-76
	Average	384	-62	674	-70

Other Labs?

Single Calibration Tests

- **See TMC Slides**

L-42-1 Development Updates

- **Action Item from Nov. SP meeting:**
  - SwRI to run two additional tests on TMC 117 and TMC 119 with a target peak torque of -250 to -255 ft-lbs in Shock II.
- **See presentation from SwRI for results**
- **Need to decide on future direction**
  - Current efforts began in 2020

New Issues

?

Motion to Adjourn

Thanks!

L-42 Discussion Topics

12 February 2025

Topics

- Interpretation of Operational Data
  - Wheel Speeds
- Single Calibration Tests
  - Operational Validity Requirement for Shock Series Torques

12. Interpretation of Operational Data

Operational Data				
	Conditioning 1		Conditioning 3	
	Wheel Speed (r/min)	Torques (lbf-ft)	Wheel Speed (r/min)	Torques (lbf-ft)
Maximum	578	66	821	80
Minimum	572	54	809	61
Average	575	60	815	70

Operational Data					
		Conditioning 2		Conditioning 4	
		Wheel Speed (r/min)	Torques (lbf-ft)	Wheel Speed (r/min)	Torques (lbf-ft)
Drive Side	Maximum	574	99	816	125
	Minimum	573	98	815	116
	Average	574	98	815	121
Coast Side	Maximum	393	-54	670	-107
	Minimum	391	-60	665	-152
	Average	392	-57	667	-137

12. Interpretation of Operational Data

12.1.2 *Wheel Speeds:*

12.1.2.1 During Conditioning 1, see Fig. A6.11 location (A) and Conditioning 3, see Fig. A6.12 location (D), the reported wheel speeds shall be the average over the steady-state sequence.

12.1.2.2 Referring to Figs. A6.11 and A6.12, during Conditioning 2 or 4, the value of the maximum and minimum single scan conditioning 2 and 4 wheel speeds are located at (B_1-B_3 and C_1-C_4) and (E_1-E_3 and F_1-F_4) respectively. For both conditioning 2 and 4, independently report the maximum, minimum, and average of the single scan maximum speeds and the maximum, minimum, and average of the single scan minimum speeds by including all peaks and valleys not connected to a steady state operating condition phase.

Figure A6.11

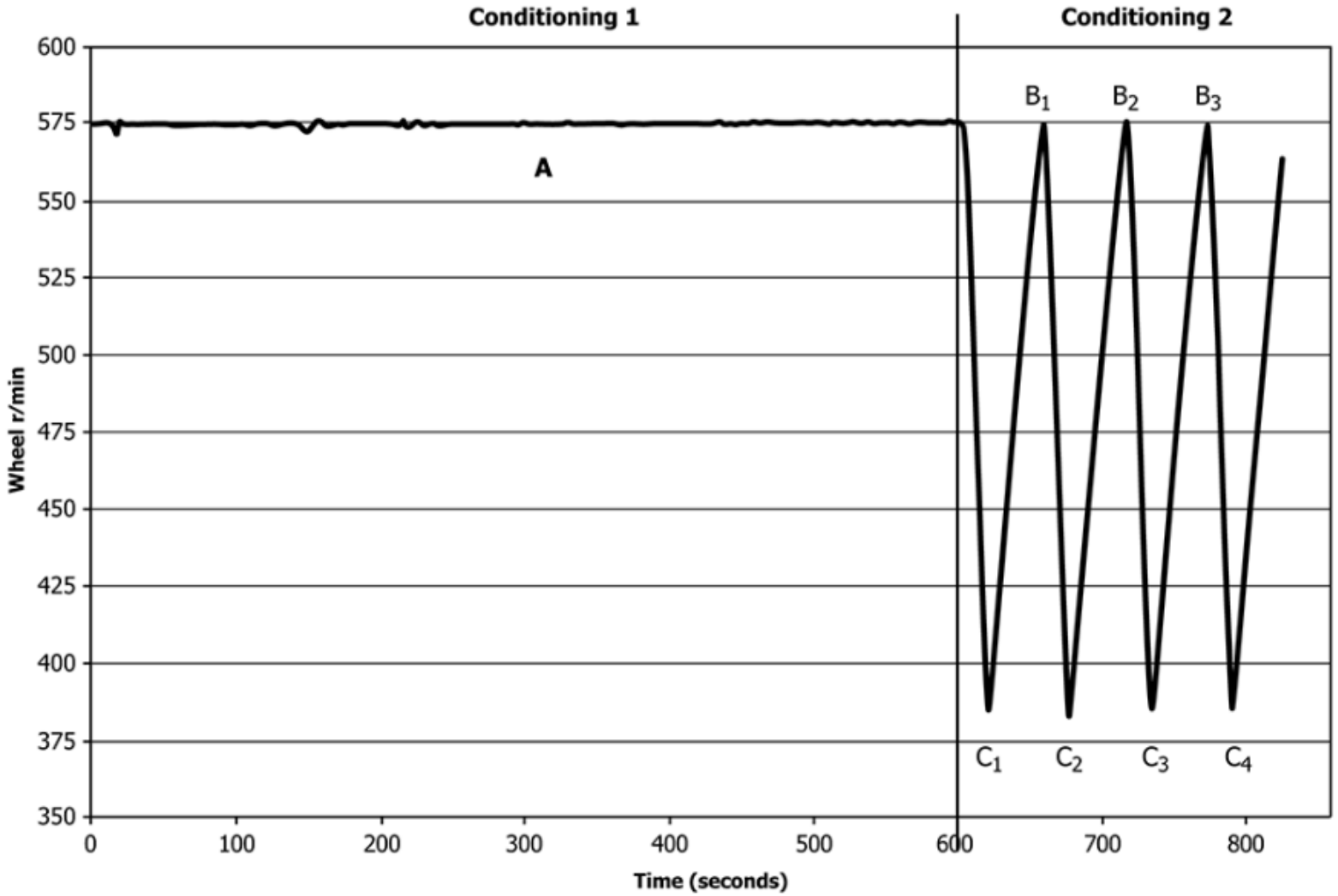

FIG. A6.11 Conditioning 1 & 2—Wheel Speed

Figure A6.12

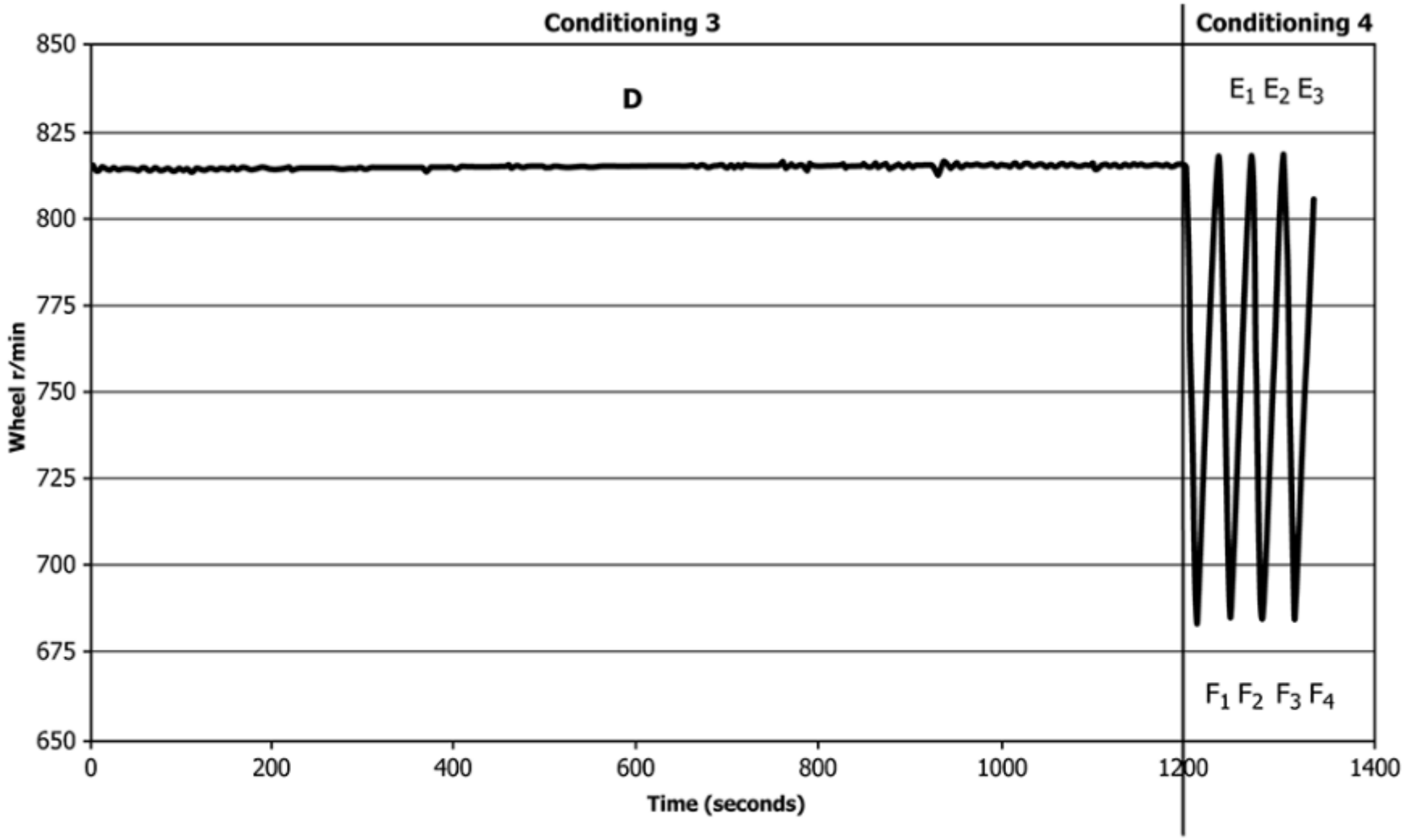

FIG. A6.12 Conditioning 3 & 4—Wheel Speed

12. Interpretation of Operational Data

12.1.2.3 Referring to Fig. A6.13, during Shock Series 1, the value of the maximum and minimum single scan Shock Series 1 wheel speeds are to be found at locations (G_1-G_5) and (H_1-H_4) respectively. Report the maximum, minimum, and average of the single scan maximum speeds and the maximum, minimum, and average of the single scan minimum speeds by including all peaks and valleys not connected to a steady state operating condition phase.

12.1.2.4 Referring to Fig. A6.14, during Shock Series 2, the value of the maximum and minimum single scan Shock Series 2 wheel speeds are to be found at locations (I_1-I_{10}) and (J_1-J_9) respectively. Report the maximum, minimum, and average of the single scan maximum speeds and the maximum, minimum, and average of the single scan minimum speeds by including all peaks and valleys not connected to a steady state operating condition phase.

Figure A6.13

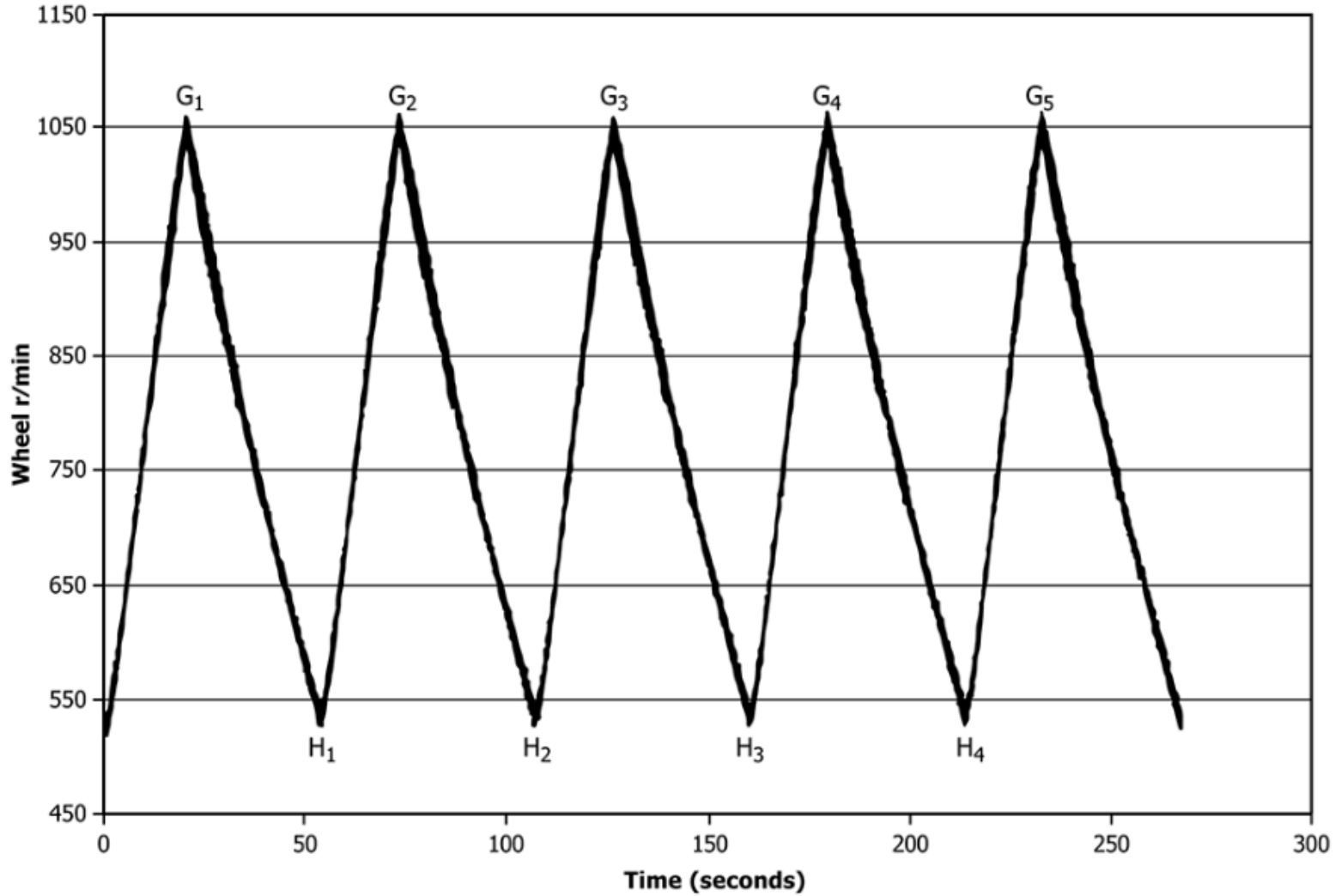

FIG. A6.13 Shock Series One—Wheel Speed (5 Shocks)

Figure A6.12

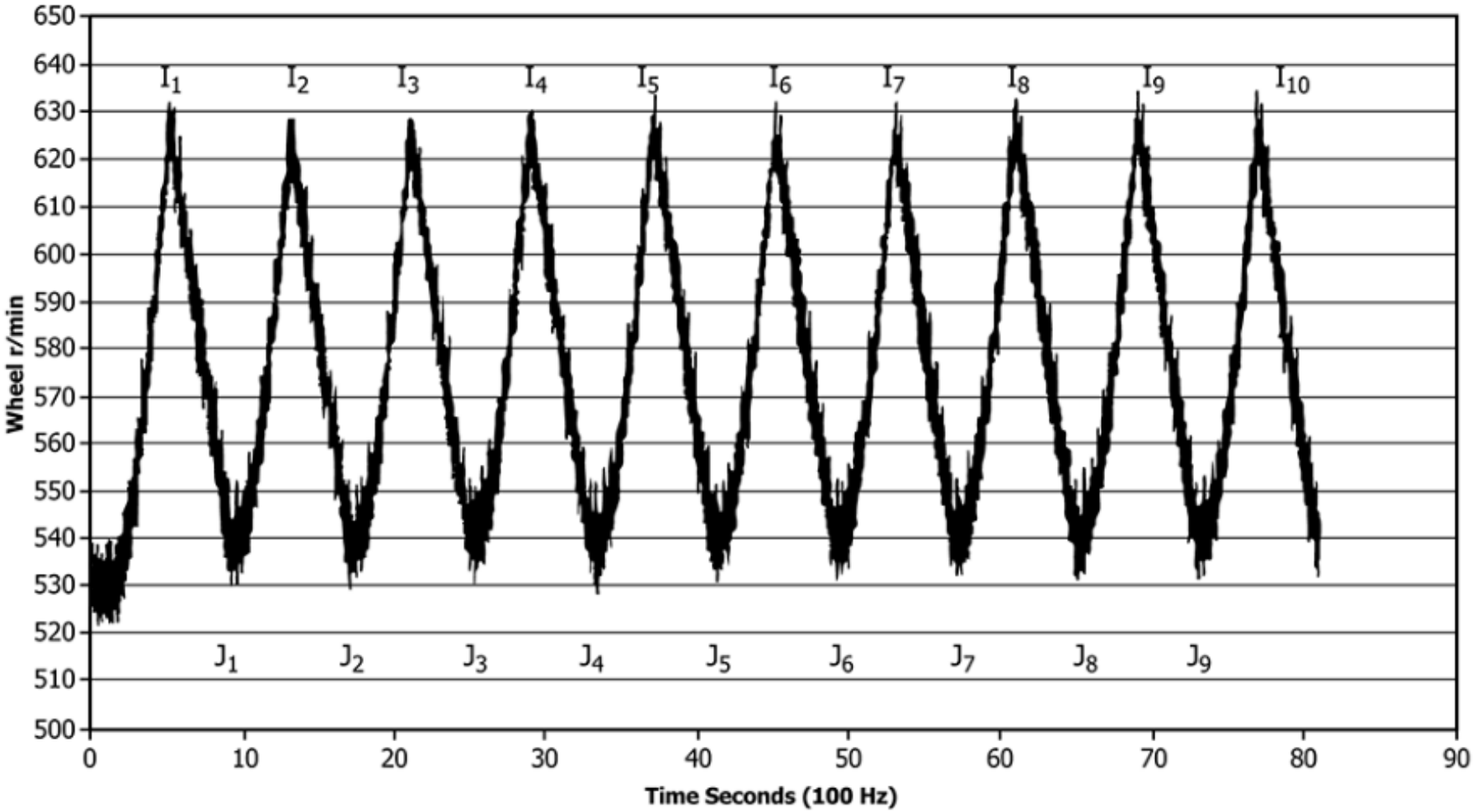

FIG. A6.14 Shock Series Two—Wheel Speed (10 Shocks)

Interpretation of Operational Data

- How are labs calculating wheel speeds for the various stages of the test?

Single Calibration Tests

- In 2016, the SP approved “single test try” calibration tests if certain criteria were met (previously calibrated stand, throttle and torque settings unchanged, same hardware batch, etc.)

- Prior to then, full calibration sequences were required for every stand calibration attempt (3 “pass” oils & 1 discrimination oil)

Form 1 – Test Result Summary

Stand Reference Oil Test History In Chronological Order												
	Test Date Started	Test Date Completed	Stand Run No.	CMIR No.	TMC Oil No.	Drive Side Scoring (%)		Coast Side Scoring (%)			Coast Side Torque (lbf-ft)	
						EOT Pinion	EOT Ring	EOT Pinion	EOT Ring	Shock Series 1 Ring	Shock Series 1 (Average)	Shock Series 2 (Average)
Discrimination [A]	20240813	20240813	0602	184370	119	0	0	52	33	0	-82.9	-351.1
Calibration Sequence Passing Tests Only [B]	20240326	20240326	0584	184372	117	0	0	15	11	0	-84.6	-319.2
	20240813	20240813	0601	184374	117	0	0	15	10	0	-77.8	-313.0
	20250123	20250123	0620	187557	117	0	0	17	12	0	-82.1	-322.4
Passing Reference Oil Test Average								16	11	0	-81.5	-318.2

Test Monitoring Center
https://www.astmtmc.org
A Program of ASTM International

Single Calibration Tests

- Should we have shock series coast side torque operational validity requirements (+/-15% for SS1 & +/-10% for SS2) based on the averages from the previous, 3-test calibration sequence?

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L-42-1 Update
ASTM/LRI #216

SOUTHWEST RESEARCH INSTITUTE®

Caroline Mueller

Feb 12, 2025

Background

- SwRI to tune Shock 2 severity up
  - approximately -250 ft-lbs on shock 2
  - ASTM D7452 torque setpoints and cycle counts
- Three runs:
  - 2x TMC 117, target [14%-32%]
  - 1x TMC 119, target 2x average 117

Newest Results

- Shock 2 peak torque average -240 ft-lbs
  - Faster speed ramps
- Average of **23/15, corrected** for TMC 117
  - Target center is 23% for pinion
- Result of 27/18 for TMC 119
  - Below effective target of 46%
- Conclusion: severity moved in right direction; further work needed for discrimination

Results Recent History

August 2024

- Operational differences from D7452:
  - 10 cycles conditioning 4
  - 15 cycles Shock 2
  - Dyno setpoint of 100 ft-lb Shock 2
  - Shock 2 peak torque (avg) -223 ft lbs
- Results:
  - 117 (Avg): 15/10
  - 119: 34/24

November 2024

- Operational differences from D7452:
  - Shock 2 peak torque (avg) -230s ft lbs
- Results:
  - 117: 16/9
  - 119: 25/12

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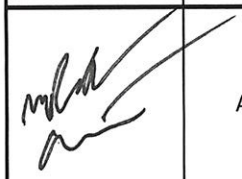
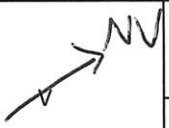
Present	Name	Voting Non-Voting	Company Name Company Address	Contact information	
	Aguirre, Nancy	NV	Intertek Automotive Research	Phone:	
			5404 Bandera Rd. San Antonio, TX 78238	E-mail:	nancy.aguirre@intertek.com
	Ariemma, Nick	NV	The Lubrizol Corporation	Phone:	
			29400 Lakeland Boulevard Wickliffe, OH 44092	E-mail:	Nick.Ariemma@Lubrizol.com
	Banas, Rob	V	ExxonMobil Product Solutions	Phone:	770-833-5920
			535 Thomas Lane Waleska, GA 30183	E-mail:	rob.a.banas@exxonmobil.com
DB	Beck, Dylan		ASTM Test Monitoring Center	Phone:	724-355-1854
			203 Armstrong Drive Freeport, PA 16229	E-mail:	djb@astmtmc.org
DB	Bell, Don	NV	Afton Chemical	Phone:	804-788-6332
			500 Spring St. Richmond, VA 23219	E-mail:	don.bell@aftonchemical.com

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TB	Bender, Tobias	NV	Fuchs Lubricants	Phone:	708-737-1681
			17050 Lathrop Ave Harvey, IL 60426	E-mail:	Tobias. Bender@fuchs.com
	Burgman, Maxim	NV	Fuchs Lubricants	Phone:	248-846-3120
			17050 Lathrop Ave Harvey, IL 60426	E-mail:	maxim.burgman@fuchs.com
BC	Campbell, Bob	NV	Afton Chemical	Phone:	804-788-5340
			500 Spring St. Richmond, VA 23219	E-mail:	Bob.Campbell@aftonchemical.com
MC	Caridi, Margaret	NV	BASF	Phone:	914-785-2336
			500 White Plains Rd Tarrytown, NY 10591	E-mail:	margaret.caridi@basf.com
JFC	Carowick, Jessica	V	~~Cummins-Meritor~~	Phone:	248-872-3055
			2135 W. Maple Rd Troy, MI 48084	E-mail:	jessica.carowick@cummins.com ~~Jessica.LaBond@cummins.com~~

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	Cereghino, Brian	NV	IPAC Inc.	Phone:	
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	Charron, Michael	NV	Southwest Research Institute	Phone:	832-444-2180
			6220 Culebra Rd. San Antonio, TX 78238	E-mail:	michael.charron@swri.org
	Clark, Jeff	NV	ASTM Test Monitoring Center	Phone:	412-365-1032
			203 Armstrong Drive Freeport, PA 16229	E-mail:	jac@astmtmc.org
Virtual	Comfort, Allen	V	US Army DEVCOM	Phone:	586-282-4225
				E-mail:	allen.s.comfort.civ@army.mil

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TG	Gibson, Trevor	V	Dana Incorporated	Phone:	419-386-9783
			3939 Technology Dr Maumee, OH 43537	E-mail:	trevor.gibson@dana.com
JG	Gingerich, Jason	NV	The Lubrizol Corporation	Phone:	440-391-0101
			29400 Lakeland Boulevard Wickliffe, OH 44092	E-mail:	Jason.Gingerich@lubrizol.com
	Goyal, Arjun	V	BASF	Phone:	914-785-2083
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	Haynes, Troy	NV	IPAC Inc.	Phone:	
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	Horvath, Dan	NV	Afton Chemical	Phone:	248-514-2551
			2000 Town Center, Suite 1160 Southfield, MI 48075	E-mail:	dan.horvath@aftonchemical.com
	Jackson, Alexander	NV	Chevron Oronite	Phone:	510-367-7541
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	Joy, Tisha	NV	BASF	Phone:	914-785-2206
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				E-mail:	
	Kostan, Travis	NV	Southwest Research Institute	Phone:	210.522.2407
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	Lange, Anthony	V	Intertek Automotive Research	Phone:	210-634-1103
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	Morris, Jeanelle	NV	Navistar	Phone:	331-332-1661
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	Mosher, Donna	NV	BASF	Phone:	269-217-1715
			100 Park Ave Florham Park, NJ 07932	E-mail:	donna.mosher@basf.com
	Mueller, Caroline	V	Southwest Research Institute	Phone:	210-522-2671
			6220 Culebra Rd. San Antonio, TX 78238	E-mail:	caroline.louis@swri.org
	Muransky, Troy	V	AAM	Phone:	734-564-8406
			1840 Holbrook Ave Detroit, MI 48212	E-mail:	troy.muransky@aam.com
	Neil, Suzanne	NV	Daimler Trucks/Detroit Diesel	Phone:	
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	Portell, Michael	NV	Intertek Automotive Research	Phone:	210-896-8012
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MM	Sangpeal, Matt	V/Chair	Afton Chemical	Phone:	804-788-5364
			500 Spring St. Richmond, VA 23219	E-mail:	matt.sangpeal@aftonchemical.com
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			Warren, MI	E-mail:	eric.r.sattler.civ@army.mil
NS	Schaup, Nick	V	The Lubrizol Corporation	Phone:	616-710-2546
			29400 Lakeland Boulevard Wickliffe, OH 44092	E-mail:	Nick.Schaup@Lubrizol.com
	Schweitzer, Addison	NV	Shell	Phone:	346-549-2481
				E-mail:	Addison.Schweitzer@shell.com
DU	Uy; Dairene	NV	Shell	Phone:	281-544-6781
				E-mail:	dairene.uy@shell.com

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Virtual	Venhoff, Wes	NV → V	ASTM Test Monitoring Center	Phone:	
			203 Armstrong Drive Freeport, PA 16229	E-mail:	wnv@astmtmc.org
RCW	Warden, Rebecca	V	Chevron Oronite	Phone:	830-865-6771
			4502 Centerview, Suite 210 San Antonio, TX 78228	E-mail:	Rebecca.Warden@chevron.com
	Yucebilgic, Fatih	NV	Fuchs Lubricants	Phone:	708-539-0252
			17050 Lathrop Ave Harvey, IL 60426	E-mail:	fatih.yucebilgic@fuchs.com
	Zarins, George	NV	AAM	Phone:	586-854-8810
			1840 Holbrook Detroit, MI	E-mail:	george.zarins@aam.com
	Zreik, Khaled	NV	General Motors	Phone:	248-977-9214
			823 Joslyn Ave Pontiac, MI 84340-2925	E-mail:	khaled.zreik@gm.com

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Present	Name	Voting Non-Voting	Company Name Company Address	Contact information	
	Zyski, Amy	NV V	Afton Chemical	Phone:	313-766-3702
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