

Sequence III Surveillance Panel
Meeting Minutes
January 09, 2015
14:00 EST

1.0) Attendance (Attachment 1)

- 1.1) Requests for voting membership:
Jeff Betz, Chrysler Mopar Parts
Jeff Shu, Shell

Both requests were granted.

2.0) Approval of minutes

The October 21, 2014 minutes, held in San Antonio, TX, were approved as issued.

3.0) Action Item Review

- 3.1) Test Longevity Report to PCEOCP December, 2014 (Attachment 2) **Glaenzer**

Approximately 700 - 750 runs may be available for life of test(s); estimate of mid-2016 run out of parts.

- 3.2) Statistician Review of Sequence IIIF RO 433-1 PVIS Targets (Attachment 3) **Martinez**

The stats group does not support a change in targets at this time.

4.0) Old Business

- 4.1) Introduction of Size 7 & 8 pistons/rings into Sequence IIIF test **Brys**

This was previously done for the IIIG. Motion from Leverett, Szappanos second:

Allow Labs to conduct IIIF tests on run 7 & 8 kit hardware once they have had one acceptable IIIF reference run within their lab; effective 1/15/15.

The motion was approved with no objections and three waives. The TMC will revise the build manual and/or issue an information letter as necessary.

OHT asked for an estimate of quantity required. Dave Glaenzer will survey the labs.

5.0) New Business

5.1) Use of Stellite (S) seated heads beyond second use for IIIF and IIIG **Leverett**

In another effort to extend test life, the following motion was made (Leverett, Altman)

Allow the reuse of cylinder heads (24502260S) with hardened valve seat material in Seq. IIIF and IIIG as long as:

- **Valve recession does not exceed 0.005" from the original measurement.**
- **Measure valve guide clearances at top and bottom of guides meet clearance of 0.0015 to 0.0032 inch.**

In order to document where cylinder heads have been reused, laboratories are to append the run number, i.e. "2" for the second run with the heads, "3" for the third run with the heads, etc. to the cylinder head part numbers; effective 1/12/15.

The motion passed 16-0-3.

5.2) Sequence IIIH Task Force report of readiness for Matrix Testing **Haumann**

Karin Haumann presented (Attachment 4). The TF has voted to approve the test for matrix testing with a caveat regarding final resolution on the oil temperature control point (refer to slide 8 of the presentation). Karin fielded several questions regarding the data and various tests, as well as suggested tweaks to the presentation. It was noted that this presentation is an abbreviated version of the one being sent to AOAP.

Action Item: Karin to make revisions and distribute the updated report.

Action Item: Haiying Tang of Chrysler to forward relevant and approved for release reference oil volatility data to the surveillance panel.

5.3) Sequence III Surveillance Panel vote on IIIH readiness for Matrix Testing

The same motion approved by the IIIH TF motion was made by Jeff Shu and seconded by Kastav Sinha:

"The Seq. III SP support the IIIH test being included in the precision matrix pending final resolution of the oil temperature control point issue, and will recommend such to the AOAP and PCEOCP".

After significant and lengthy discussion, this motion carried 8-1-10.

Shortly after passage of the previous motion, the follow motion was made (Mosher, Altman):

Prior to final matrix readiness approval, the surveillance panel will meet on or before February 5, 2015 to evaluate the resolution of the oil temperature control issue.

This motion carried 17-0-2. It was noted that both motions should be presented to the AOAP and PCEOCP.

The meeting adjourned at 4:00 pm.

Name/Address	Phone/Fax/Email		Signature
Ed Altman Afton Chemical Corporation 500 Spring Street Richmond, VA 23219 USA	804-788-5279 804-788-6358 ed.altman@aftonchemical.com	Voting Member	Present ✓ A N A
Jason Bowden OH Technologies, Inc. 9300 Progress Parkway P.O. Box 5039 Mentor, OH 44061-5039 USA	440-354-7007 440-354-7080 jhbowden@ohtech.com	Voting Member	Present ✓ W W A
Timothy L. Caudill Ashland Oil Inc. 22 nd & Front Streets Ashland, KY 41101 USA	606-329-1960 x5708 606-329-2044 tlcaudill@ashland.com	Voting Member	Present ✓ A W A
Richard Grundza ASTM Test Monitoring Center 6555 Penn Avenue Pittsburgh, PA 15206 USA	412-365-1031 412-365-1047 reg@astmtmc.cmu.edu	Voting Member	Present ✓ A W A
Tracey King Haltermann Solutions MI USA	947-517-4107 tking@jhaltermann.com	Voting Member	Present ✓ W A A
Teri Kowalski Toyota Motor North America, Inc. 1555 Woodridge Ann Arbor, MI 48105 USA	734-995-4032 734-995-9049 teri.kowalski@tema.toyota.com	Voting Member	Present ✓ W A
Patrick Lang Southwest Research Institute 6220 Culebra Road P.O. Box 28510 San Antonio, TX 78228 USA	210-522-2820 210-684-7523 plang@swri.edu	Voting Member	Present ✓ A A W Cylinder Head Vote Include in Matrix S.P. meet by Feb 5

ASTM Sequence III Surveillance Panel (20 Voting members)

date:

Name/Address	Phone/Fax/Email	Voting Member	Signature
Charlie Leverett Intertek Automotive Research 5404 Bandera Road San Antonio, TX 78238 USA	210-647-9422 210-523-4607 charlie.leverett@intertek.com	Voting Member	Present ✓
A W A			
Bruce Matthews GM Powertrain Mail Code 483-730-472 823 Jocyn Avenue Pontiac, MI 48340 USA	248-830-9197 248-857-4441 bruce.matthews@gm.com Test Sponsor Representative	Voting Member	Present ✓
A W A			
Timothy Miranda BP Castrol Lubricants USA 1500 Valley Road Wayne, NJ 07470 USA	973-305-3334 973-686-4039 Timothy.Miranda@bp.com	Voting Member	Present ✓
A A A			
Mark Mosher ExxonMobil Technology Co. Billingsport Road Paulsboro, NJ 08066 USA	856-224-2132 856-224-3628 mark.r.mosher@exxonmobil.com	Voting Member	Present ✓
A A A			
Andrew Ritchie Infineum 1900 East Linden Avenue P.O. Box 735 Linden, NJ 07036 USA	908-474-2097 908-474-3637 Andrew.Ritchie@Infineum.com	Voting Member	Present ✓
A W A			
Ron Romano Ford Motor Company Diagnostic Service Center II Room 410. 1800 Fairlane Drive Allen Park, MI 48101 USA	313-845-4068 313-32-38042 rromano@ford.com	Voting Member	Present
Greg Shank Volvo	301-790-5817 greg.shank@volvo.com	Voting Member	Present
<i>Carl. Head Vote</i> <i>Incl. in Matrix</i> <i>S.P. meet by Feb 5</i> 2/31/14			

Name/Address	Phone/Fax/Email		Signature
Kaustav Sinha, Ph.D. Chevron Oronite Co., LLC 4800 Fournace Place Bellaire, TX 77401 USA	713-432-6642 713-432-3330 LFNQ@chevron.com	Voting Member	Present ✓ A A A
Thomas Smith Valvoline P.O. Box 14000 Lexington, KY 40512-1400 USA	859-357-2766 859-357-7084 trsmith@ashland.com PCEOCP Chair	Voting Member	Present ✓ A W A
Scott Stap Chevrolet Performance	scott.stap@tgidirect.com	Voting Member	Present ✓ A W A
Mark Sutherland Test Engineering, Inc. 12718 Cimarron Path San Antonio, TX 78249-3423 USA	210-867-8357 mrsutherland@tei-net.com	Voting Member	Present ✓ W W W <i>Represented by Dan Lanctot</i>
George Szappanos The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, OH 44092 USA	440-347-2352 440-347-4096 greg.seman@lubrizol.com	Voting Member	Present ✓ A W A
Haiying Tang Chrysler LLC	248-512-0593 ht146@chrysler.com	Voting Member	Present ✓ A A A
<i>Jeff Betz Chrysler Mopar Parts</i>		<i>Voting</i>	<i>Present ✓ A A A</i>
<i>Jeff Hsu, PE Shell</i>		<i>Voting</i>	<i>Present ✓ A A A</i>
		<i>A N W</i>	
	<i>Cylinder Head Vote</i>	<i>16-0-3</i>	
	<i>S.P. support IIIH in MATRIX Vote</i>	<i>8-1-10</i>	
	<i>S.P. to meet by Feb 5 to review oil temp control</i>	<i>Vote 17-0-2</i>	
Page 3 of 8 3			<i>Cyl. Head Vote Include in MATRIX St meet by Feb 5 10/31/14</i>

ASTM Sequence III Test Activity and Performance

ATTACHMENT 2

David L. Glaenzer
Sequence III Surveillance Panel Chairman
December, 2014

Sequence IIIF & IIIG Capacity

Sequence IIIF

5 Stands

4 Labs

Sequence IIIG

13 Stands

5 Labs

One lab has chosen to discontinue IIIG testing

Sequence IIIF & IIIG Oils

Sequence IIIF

RO 433-2 Active Reference Oil

Sequence IIIG

RO 434-1 Active Reference Oil

RO 434-2 Re-blend to be tested

RO 435-2 Active Reference Oil

RO 438 Active Reference Oil

Sequence III Meetings

- Teleconference

- September 05, 2014
 - Approved use of run 7 & 8 pistons/rings for IIIG testing
 - Reviewed RO 433-2 (IIIF) PVIS targets
 - Reviewed ASTM Sequence IIIH Task Force activities

- Face to Face Meeting

- October 21, 2014
 - Meeting of ASTM Sequence IIIH Task Force
 - Reviewed RO 433-2 (IIIF) PVIS targets; insufficient new data
 - Reviewed ASTM Sequence IIIH Task Force activities

Seq IIIF Severity & Precision

- Hours to 275%
 - Severity in control
 - Precision in control
- Average Piston Varnish
 - In Mild action alarm; long-term trend since 2006
 - Precision in control
- PVIS 60
 - In Severe action alarm
 - Precision in control

Sequence IIIG Severity & Precision

- PVIS (percent viscosity increase)
 - Severity in control
 - Precision at warning alarm
- ACLW (average cam plus lifter wear)
 - Severity in Mild warning alarm (long term trend)
 - Precision in Mild warning alarm (long term trend)
- WPD (weighted piston deposits)
 - Severity at Severe action (long term trend)
 - Precision in control
- MRV
 - Severity and Precision in control
- Phosphorus Retention
 - Severity and Precision in control

Sequence IIIF / IIIG

Availability of Key Test Components

- **12593374 Connecting Rods (new)**
 - **787** runs available; re-furbishing possible
Labs have saved used rods should re-work become necessary
- **24502168 Crankshaft (unused)**
 - **546** runs available based on 6 runs per crankshaft
May need to look at extending use beyond 6 runs per unit

Sequence IIIF / IIIG

Availability of Key Test Components (cont.)

- **24502286 Cylinder Case (Block)**
 - **717** runs available based on 8 runs per block
Size 7 & 8 pistons and rings approved for IIIG (not IIIF)
Surveillance Panel may consider use of Size 7 & 8 in IIIF
- **24502260S Cylinder Heads (w/Stellite seats)**
 - **750** runs available based on one re-use
SP will consider additional use if necessary
214 pieces #24502260 heads available (need seats installed)

Sequence IIIF / IIIG

Availability of Key Test Components (cont.)

Extended use of engine blocks is underway for IIIG test.
Third use of Stellite seat heads will be considered.

It is anticipated testing will diminish after 2014 as new tests become available.

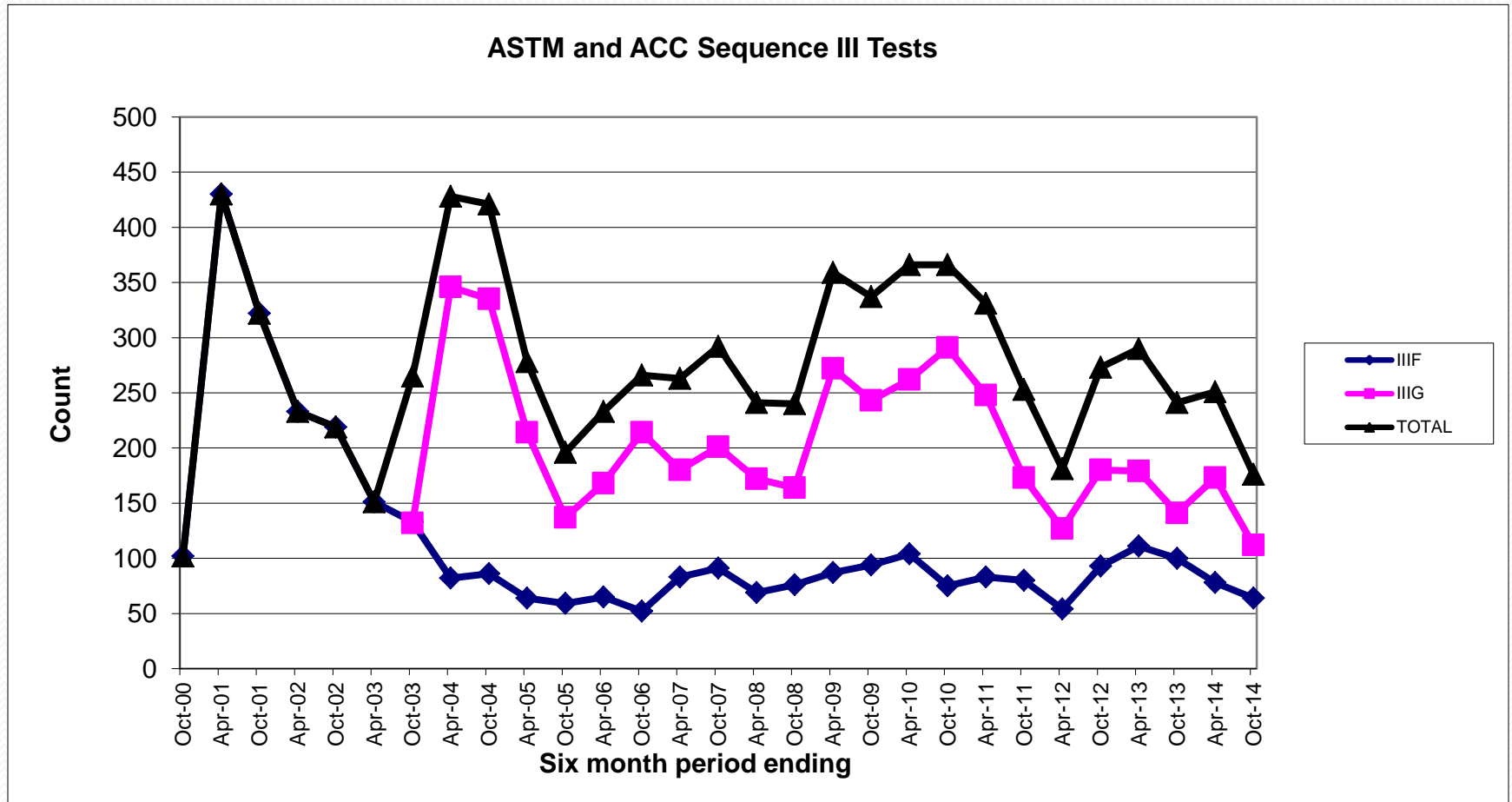
Average number of ACC & ASTM tests has been 248 tests per 6 month period (three years).

Most recent six month period was 176 tests.

Chairman's Estimates

2015	450 tests
2016	250 tests

Sequence IIIF / IIIG Activity



ATTACHMENT 3

Sequence IIF RO 433-2 Review

Data Analyst Group

12/10/2014

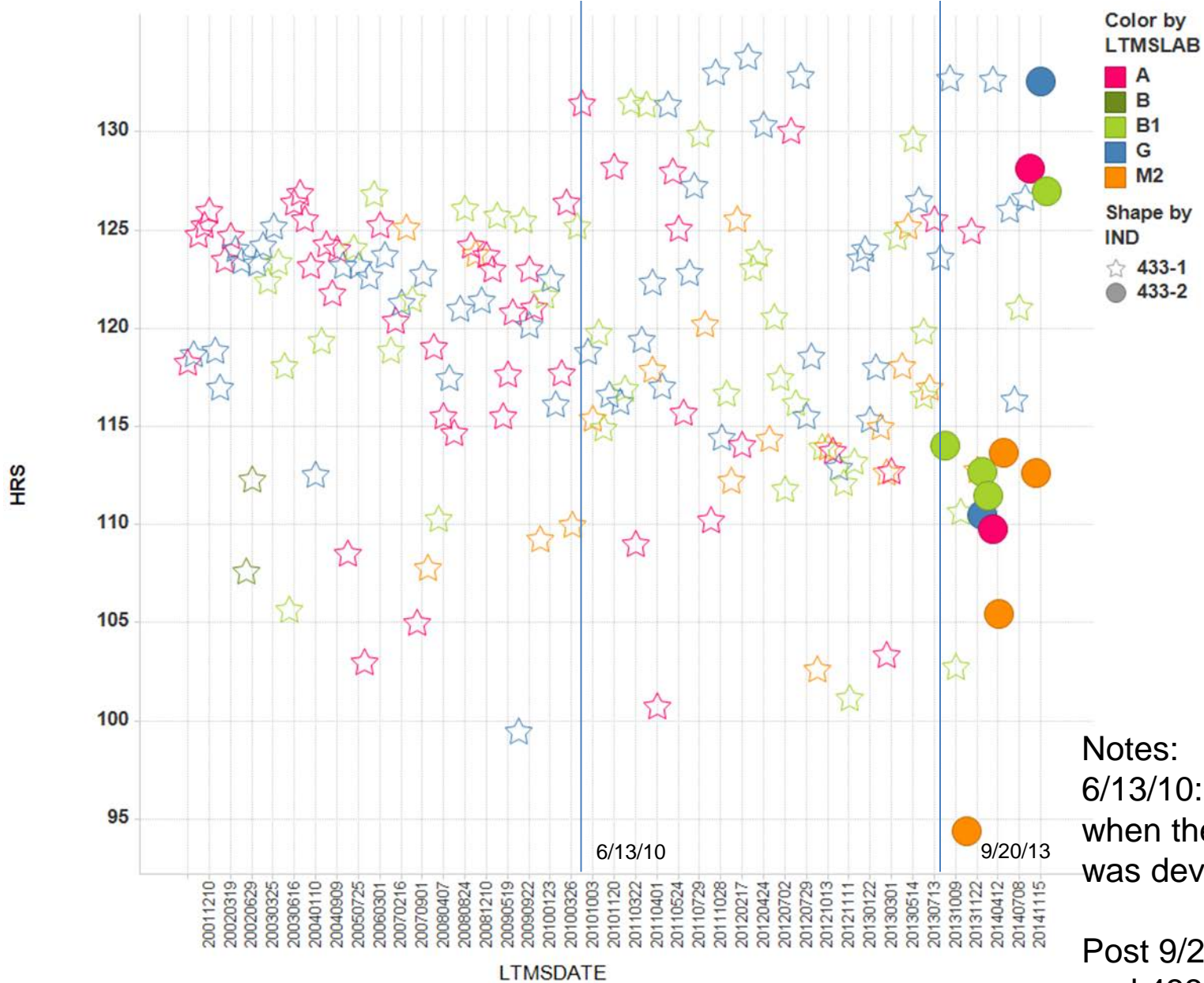
Data Analyst Group Participation

- Participants:
 - Janet Buckingham, SWRI
 - Martin Chadwick, IAR
 - Todd Dvorak, Afton
 - Rich Grundza, TMC
 - Jo Martinez, Chevron Oronite
 - Kevin O'Malley, Lubrizol

Background and Recommendation

- The Sequence III SP has requested the Data Analyst Group review 433-2 as the result of a TMC review on reference oils.
 - Specifically, the group was asked to assess whether 433-2 reference oil targets need to be updated.
- The data set reviewed was the IIF LTMS data file where CHARTHRS = Y and the last reported result was 20141118 (n=168).
- As 433-1 and 433-2 were both tested beginning 20130924, a smaller data set beginning at that time was also reviewed.
- **The Data Analyst Group does not support a change in the reference oil targets for 433-2.**

Hours Over Time

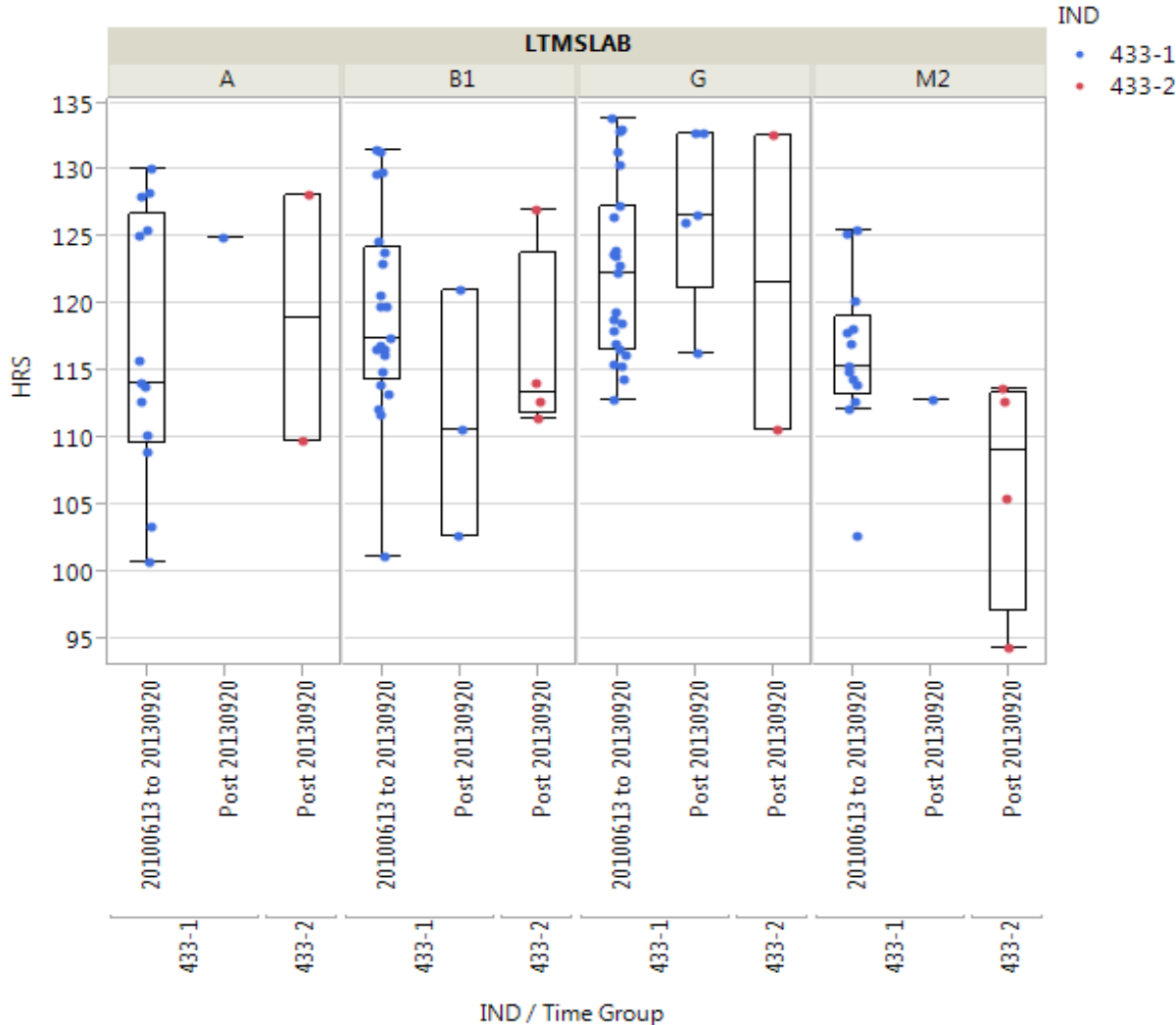


Notes:
 6/13/10: The cutoff used when the HRS calculation was developed

Post 9/20/13: Both 433-1 and 433-2 were tested

Comparison of 433-1 HOURS (6/13/10 to 9/20/13) to 433-2 HOURS

- Labs A & B1: 433-2 HRS are within the range of 433-1 HRS
- Lab G: 1 433-2 result is lower than observed range of 433-1 HRS
- Lab M2: 1 of the 4 433-2 HRS is lower than the observed range of 433-1 HRS

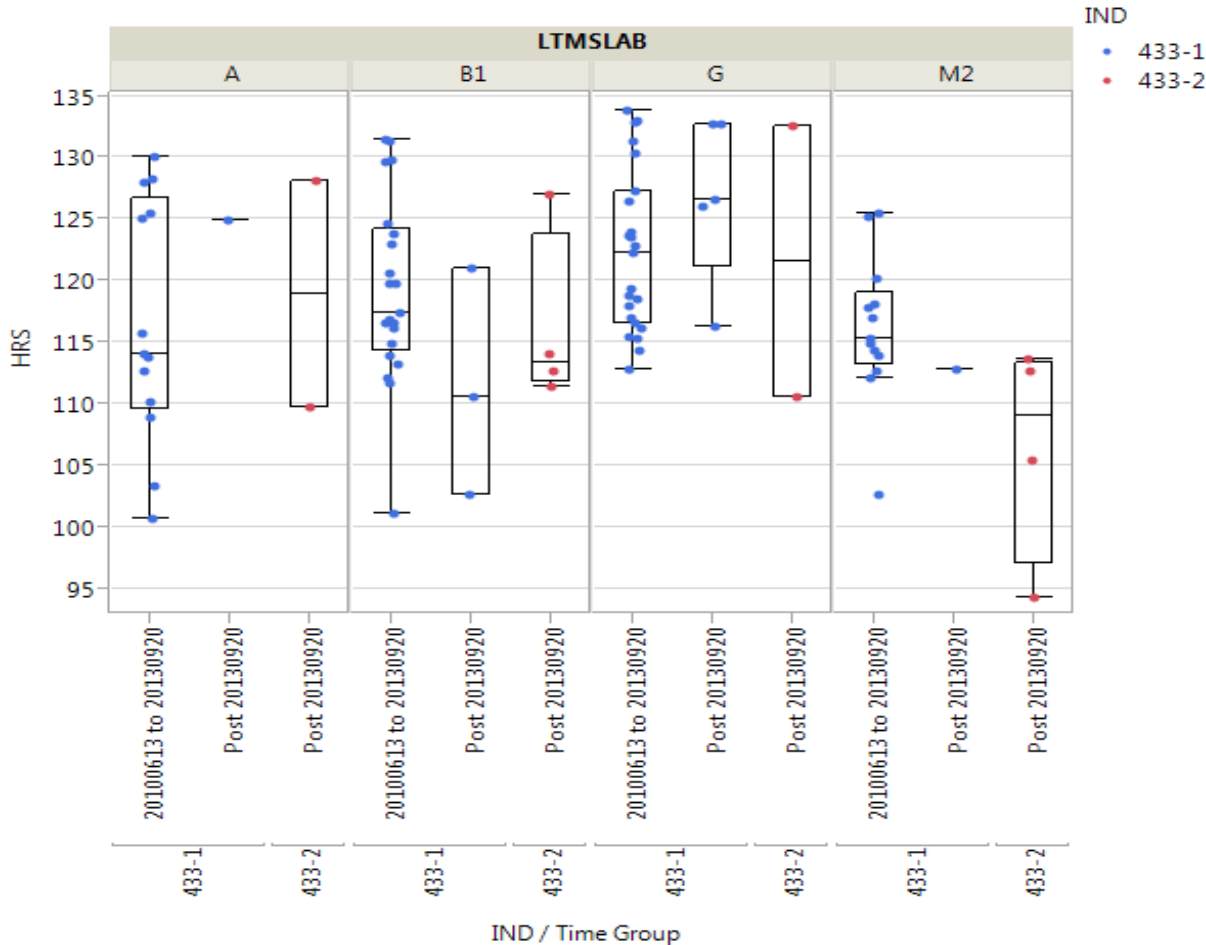


Notes:
6/13/10: The cutoff used when the HRS calculation was developed

Post 9/20/13: Both 433-1 and 433-2 were tested

Comparison of 433-2 HOURS to 433-1 HOURS Post 9/20/13

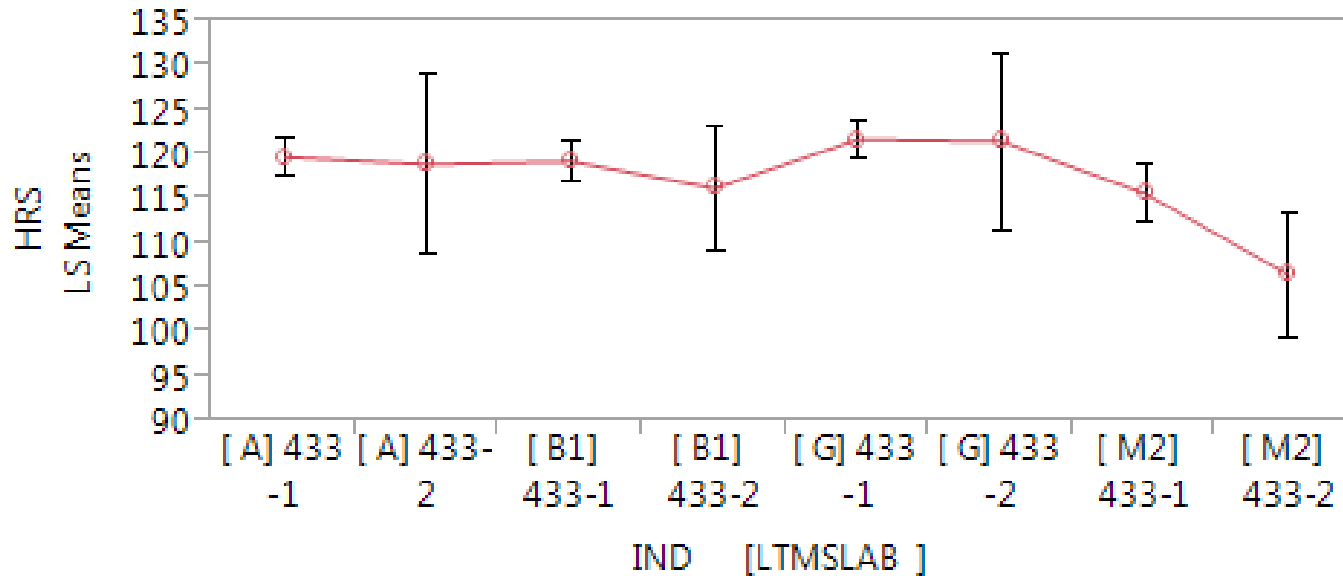
- Lab A: 433-2 HRS comparable to 433-1 HRS
- Lab B1: 3 of the 4 433-2 results are comparable to 433-1 HRS;
1 result higher than the 3 433-1 results
- Lab G: 1 433-2 HRS comparable to 433-1 HRS; 1 433-2 HRS lower than 433-1
- Lab M2: 2 of the 4 433-2 HRS appear lower than the 433-1 HRS



Notes:
6/13/10: The cutoff used when the HRS calculation was developed

Post 9/20/13: Both 433-1 and 433-2 were tested ⁶

Though not statistically significant, 433-2 LSMeans are consistently lower than 433-1 within labs (n=166*)



Least Squares Means Table			
Level	Least Sq Mean	Lower 95%	Upper 95%
[A] 433-1	119.79457	117.70564	121.88349
[A] 433-2	118.96500	108.94685	128.98315
[B1] 433-1	119.30410	117.03544	121.57277
[B1] 433-2	116.28750	109.20360	123.37140
[G] 433-1	121.79040	119.78677	123.79403
[G] 433-2	121.55500	111.53685	131.57315
[M2] 433-1	115.69737	112.44705	118.94769
[M2] 433-2	106.51750	99.43360	113.60140

* Less 2 tests from Lab B



ATTACHMENT 4

Chrysler Oxidation and Deposit Engine Test Development for GF-6

Task Force Update to Surveillance Panel
January 8, 2015



Oronite



Prove-Out Matrix

- All labs are using the final hardware and hone procedure
- The results are repeated and correlated between the labs.

Prove out Matrix								
	SwRI		IAR		Lubrizol		Afton	
	pVis, %	WPD	pVis, %	WPD	pVis, %	WPD	pVis, %	WPD
REO2	78.5	4.76	121.6**	3.63	71.1	4.52	45.9	4.38
REO2	54.8	4.72	46.4	5.15	44.6	4.82		
REO2	49.1*	4.98						
434-1	143.7	4.27	90.5	4.76	754.7***	3.8	264.3	4.46
434-1	146.8*	4.61			184*	3.84		
REO3	21.2	6.8						

*New Oil Thermocouple Location

**Test was conducted using lab cut rings and exhibited high blowby

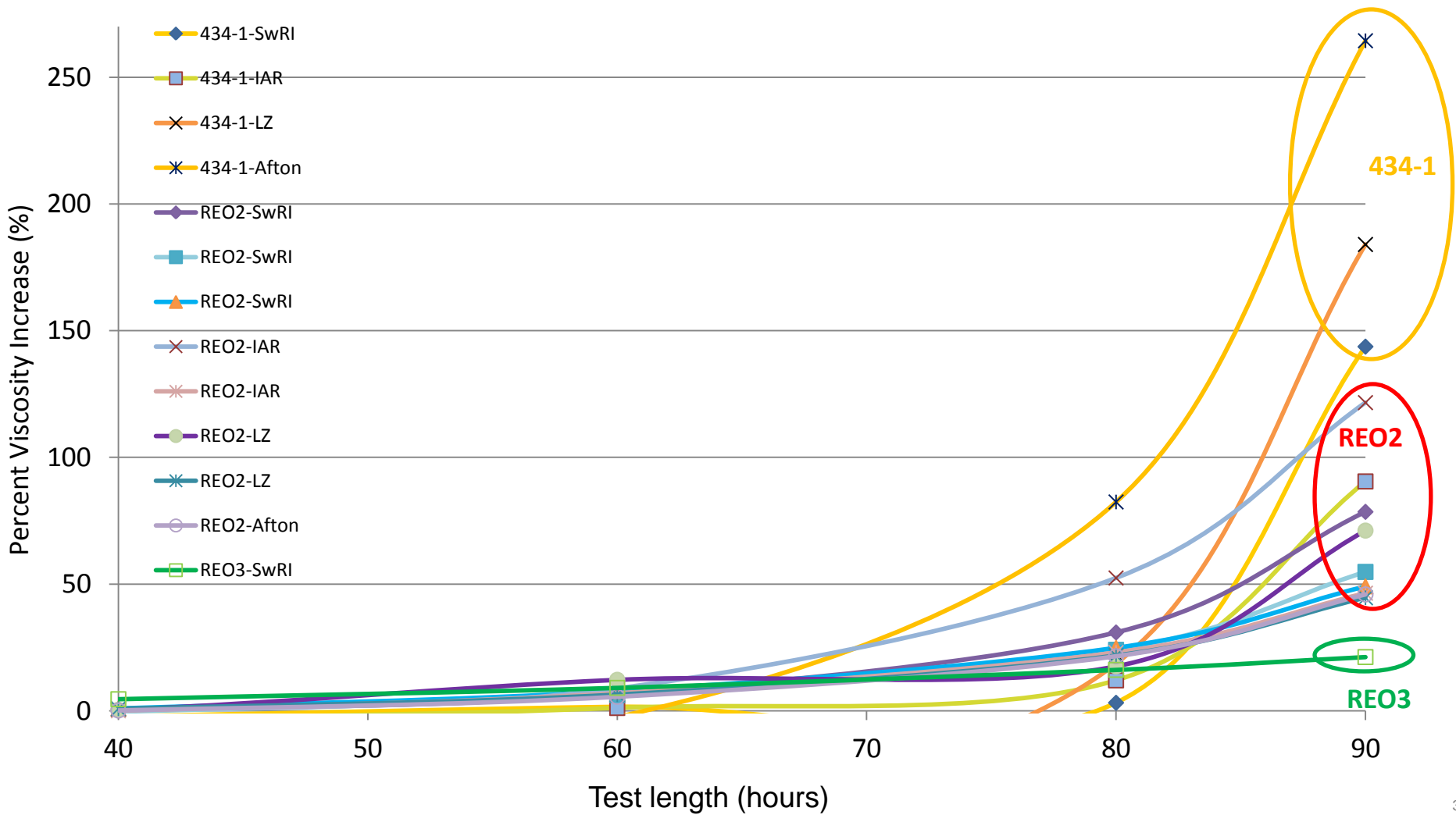
***Anomaly in engine cooling strategy during oil level was identified

Repeatability and discrimination on PVIS



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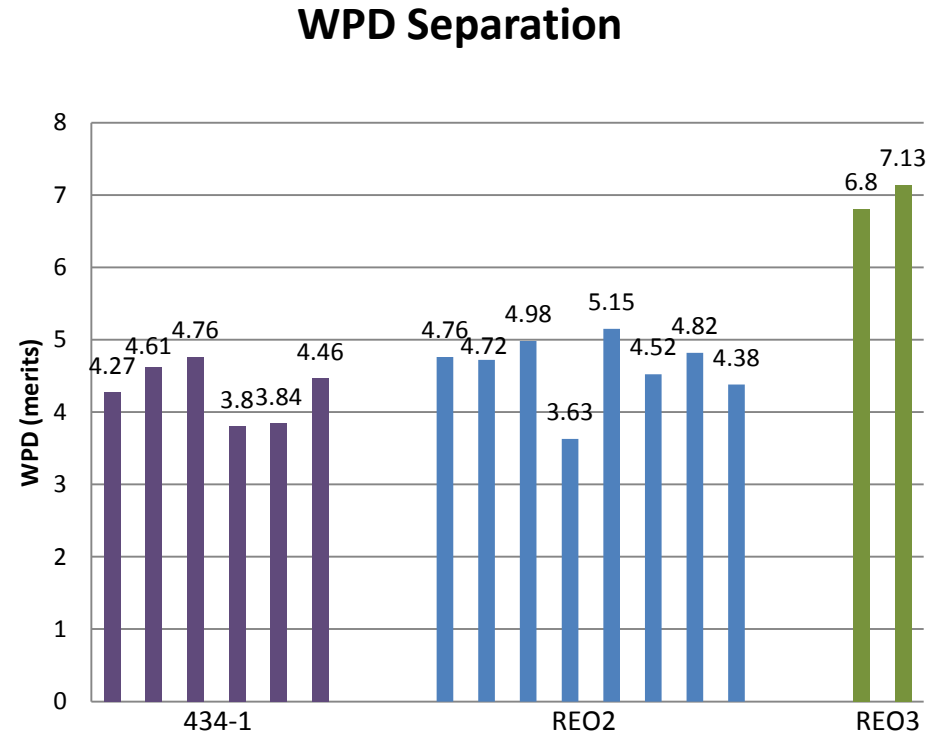
▪ TMC reference oils and two Vegas field test oils were run in duplicate with final procedure and final hardware



Discrimination on WPD

- TMC reference oils and two Vegas field test oils were run with final procedure and final hardware
- WPD results demonstrated discrimination on WPD with the separation of REO3 from TMC reference oil 434-1 and REO2

Oil	pVis, %	WPD
434-1-SwRI	143.7	4.27
434-1- SwRI	146.8	4.61
434-1-IAR	90.5	4.76
434-1-LZ	754.7	3.8
434-1-LZ	184	3.84
434-1-Afton	264.4	4.46
435-SwRI	38.6	4.84
438-SwRI	113.9	3.91
REO2-SwRI	78.5	4.76
REO2-SwRI	54.8	4.72
REO2-SwRI	49.1	4.98
REO2-IAR	121.6	3.63
REO2-IAR	46.4	5.15
REO2-LZ	71.1	4.52
REO2-LZ	44.6	4.82
REO2-Afton	45.9	4.38
REO3-SwRI	21.2	6.80



Development Data



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Development Data on Final Hardware

Oil	PVIS (%)	WPD (merits)
TMC 434-1 SwRI	143.7	4.27
TMC 434-1 SwRI	146.8	4.61
TMC 434-1 IAR	90.5	4.76
TMC 434-1 Afton	264.3	4.46
TMC 434-1 LZ	754.7	3.8
TMC 434-1 LZ	184.0	3.84
REO2 SwRI	78.5	4.76
REO2 SwRI	54.8	4.72
REO2 SwRI	49.1	4.98
REO2 IAR	121.6	3.63
REO2 IAR	46.4	5.15
REO2 Lubrizol	71.1	4.52
REO2 Lubrizol	44.6	4.82
REO2 Afton	45.9	4.38
REO3 SwRI	21.2	6.80
REO3 SwRI	17.9	7.13*

*100
hour

Test Status Summary

- Test Development is complete and all work has been transferred to the Task Force

Status	Criteria	Remark
Yes	Stand to stand repeatability	Demonstrated
Yes	Discrimination	Demonstrated
Yes	0W-16 viable	Demonstrated
Yes	Field Correlation	REO 2/3
Yes	Procedure and final hardware available and released	90 hours, 6 oz oil addition every 20 hours
Yes	Long term engine supply and readiness	3800 engines to last through 2022, other parts through CPD
Yes	Lab to lab reproducibility and prove-out matrix	2 independent labs and 2-3 dependent labs

Summary



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- The Chrysler test results show repeatability, reproducibility, and discrimination on PVIS and WPD.
- The Chrysler test meets the test development objectives.
- The AOAP has voted unanimously that the test is 'fit for purpose' at the November 2014 meeting.
- The Task Force voted on January 6 in support of the test being included in the precision matrix pending final resolution of the oil temperature control point, and will recommend such to the AOAP and PCEOCP on January 15.
- Six stands are ready for Matrix in two independent labs and two dependent labs.

- A change was recently made to lower the oil gallery thermocouple into the engine block in an attempt to obtain the most consistent oil temperature reading.
- Prove-out testing was done with this change to verify that the change had a negligible effect on the test.
- During the prove-out testing two labs were able to provide satisfactory data on 3 tests, however 2 labs experienced oil leaking at the new location
- The Task Force is conducting testing now to verify the viability of an alternate oil temperature control point.



Thank You!