Sequence III Surveillance Panel Meeting

Teleconference
Tuesday February 13, 2018 10:00 – 12:00 EST
WebEx sent separately

Agenda

As the host, I have not in the past and will not in the future record any ASTM meeting and there are no "authorized persons" that may record an ASTM meeting. As a reminder to everyone the recording of ASTM meetings is prohibited.

1.0) Attendance

Dave Passmore, Addison Schweitzer, Domingo Carreon, Doyle Boese, Jason Bowden, Jerry Brys, Josephine Martinez, Sid Clark, Jerry Brys, Joseph Gleason, George Szappanos, Robert Stockwell, Travis Kostan, Dan Lanctot, Andy Ritchie, Elisa Santos, Scott Stapp, Tim Cushing, Ankit Chaudhry, Pat Lang, Ed Altman, Todd Dvorak, Ron Romano, and Lisa Dingwell

2.0) Chairman Comments

No additional comments

3.0) Approval of minutes

3.1) Minutes from 1/23/2018 Meeting

Minutes approved

4.0) IIIH Action Items

4.1) Review Batch 5 data and discuss the path forward, data looked good until the last data point, BOI/VGRA group will have a teleconference to discuss if the test is ready next week. How many additional results can be expected this week? Do we want to offer a recommendation? - **All**

IAR has completed one BC5 reference that is scheduled to be reported this week and two additional data points running this week for referencing the BOI/VGRA stands, SwRI has one additional BC5 data point scheduled to be reported for the BOI/VGRA matrix, Afton reported a BC5 test result this week, Valvoline is planning to start a BC5 reference this week, and Lubrizol is scheduled to start a BC5 reference within the next week or two. There is more reference data on BC5 hardware expected in the coming weeks. Todd Dvorak suggested that we proceed forward as is and let the Severity adjustments bring the data back to target. Rich questioned if additional data would be valuable to determine the Surveillance Panel's recommendation to the BOI/VGRA group. There is a push to complete the BOI/VGRA in a timely manner, however if stands are calibrating for the matrix, we need to proceed as is. Todd stated that a correction factor is not viable at this time due to the lack of available data. Going forward with the current severity adjustments is the most reasonable option to complete the BOI/VGRA in a timely manner.

4.2) Sequence IIIF, proposed 70-hour test to support API SJ & SL (I proposed 2x tests on 433 and 1006 to start, and added that additional data on actual SJ and SL oils would improve the correlation – **Stockwell**

ACC was very concerned with the correlation numbers for the IIIF/IIIH correlation. There is some concern that an SJ oil would likely not even complete a standard 90-hour IIIH test based on the correlation limits. Robert proposed running on an actual SJ or SL oil for better correlation data. Four total data points (two 70-hour tests on TMC RO 433 and 1006) were proposed in order to generate additional correlation IIIF/IIIH data. At this

time, the expectation is that these data points would be generated at the independent test labs. Todd Dvorak stated that ideally these data points would be generated on a maximum of two stands. One issue with the 70-hour IIIH test is how would the labs calibrate the test. The current outlook is to calibrate during a 90-hour test according to Robert. Bob Campbell was concerned on how severity adjustments would be utilized and/or calculated by calibrating with a 90-hour test. The 70-hour IIIH test to support API SJ and SL will be added to the agenda for the next call. There was a proposal to run a 90-hour test with disassembly and rating at 70-hours. Establish a test procedure on teardown, rating, and re-running

ACTION ITEM:

Addison Schweitzer to review procedure for teardown, rating, re-assembly and running

4.3) IIIF another possible option – **Schweitzer**

Lubrizol is running IIIF's, IAR has two dual calibrated IIIF stands and is running IIIF's. Addison Schweitzer made a motion to allow IAR to use TMC RO 433-2 to evaluate the use of IIIF/G engine blocks that have cylinder sleeves installed and honed out to a first run as a potential alternate. After some discussion, the motion was tabled. Robert proposed that the Surveillance Panel evaluate the 70-hour IIIF/IIIH correlation matrix data and keep this option as an alternate.

5.0) <u>Old Business</u>

IIIH Test labs to update build manual

Addison proposed forming a Task Force to update the IIIH Build Manual. Any member of the Sequence III SP that wishes to join the IIIH Build Manual Task Force to contact Addison. Ed Altman suggested that a build workshop would be desired once the Task Force concludes.

IIIHA MRV Calculation

MOTION: Addison Schweitzer made the following motion to edit section X1.5.2.1 of the IIIHA test procedure:

X1.5.2.1 Non-reference Oils:

…

XX.X.X.X The Special Case of the MRV Viscosity Being >400,000 cP−If the MRV viscosity is >400,000 cP, record 400,000 cP on Form 4 and use this value to calculate the MRV viscosity.

Note X−The maximum MRV viscosity that will be considered for this method is 400,000 cP so this value replaces any value that is ≥400,000 cP.

XX.X.X.X Complete the calculations on Form 4 for MRV viscosity using a severity adjustment (SA) of zero.

XX.X.X.X Comment on Form 11 (Test Comments) that a severity adjustment of zero was used for the MRV viscosity because the MRV viscosity was ≥400,000 cP.

XX.X.X.X If the application of severity adjustments or correction factors result in a final MRV viscosity of ≥400,000 cP report the results as 400,000 cP. Include a comment in the Test Comments section of the test report that the maximum reportable MRV viscosity for the IIIHA test is 400,000 cP and the final MRV viscosity result was adjusted to 400,000 cP.

Seconded by Ed Altman

14 For

None Against

2 Waive

MOTION:

Amol Savant made the following motion to edit section X1.5.2.6 of the IIIHA test procedure:

X1.5.2.6 Regardless of the CCS result obtained, perform all reference MRV tests at -30°C

Seconded by Pat Lang

14 For
None Against
2 Waive

MOTION: Ed Altman made the motion that Table 1 Control-System/Engine-Interface Components Powertrain Control Module (PCM) needs to be revised from Chrysler Dealer to IMTS.

Seconded by Rich Grundza

13 For
None Against
2 Waive

6.0) New Business

7.0) Review / Update Scope and Objectives

8.0) Next Meeting

Tuesday March 6th 9:00 – 11:00 AM CDT

9.0) Meeting Adjourned

ASTM Sequence III Surveillance Panel (22 Voting members) date: 2-13-2018

	Name/Address	motion # 2	1		Phone/Fax/Email		
						Signature Robert Stockwell	
✓	Jorge Agudelo				jorge.agudelo@bp.com	Voting Member	Present
✓	Ed Altman	Y	Y	Y	ed.altman@aftonchemical.com	Voting Member	Present
	Jeff Betz				jeff.betz@fcagroup.com	Voting Member	Present
✓	Jason Bowden	W	Y	Y	jhbowden@ohtech.com	Voting Member	Present
	Ian Elliott me	Y	Y	Y	IanElliott@chevron.com	Voting Member	Present
✓	Richard Grundza	Y	W	W	reg@astmtmc.cmu.edu	Voting Member	Present
✓	Jeff Hsu, PE	Y	Y	Y	j.hsu@shell.com	Voting Member	Present
	Teri Kowalski				teri.kowalski@toyota.com	Voting Member	Present
✓	Dan Lanctot	W	W	W	dlanctot@tei-net.com	Voting Member	Present
✓	Patrick Lang caller 3		Y	Y	plang@swri.org	Voting Member	Present
✓	Dave Passmore caller 2	Y	Y	Y	dpassmore@imtsind.com	Voting Member	Present
–	Michael Raney Tem	Y	Y	Y	michael.p.raney@gm.com	Voting Member	Present
✓	Andrew Ritchie caller 6	Y	Y	Y	andrew.ritchie@infineum.com	Voting Member	Present
✓	Ron Romano	Y	Y	Y	rromano@ford.com	Voting Member	Present
	Cliff Salvesen				clifford.r.salvesen@exxonmobil.com	Voting Member	Present
✓	Amol Savant	Y	Y	Y	acsavant@valvoline.com	Voting Member	Present
✓	Addison Schweitzer	Y	Y	Y	addison.schweitzer@intertek.com	Voting Member	Present
	Greg Shank				greg.shank@volvo.com	Voting Member	Present
✓	Scott Stap	Y	Y	Y	scott.stap@tgidirect.com	Voting Member	Present
✓	George Szappanos	Y	Y	Y	george.szappanos@lubrizol.com	Voting Member	Present
✓	Haiying Tang	Y	Y	Y	HT146@chrysler.com	Voting Member	Present
	Prasad Tumati				ptumati@jhaltermann.com	Voting Member	Present
		13-0-2 ECM Low Temp	14-0-2 Ref MRV at -30°C		Max MRV 40,000	14-0-2	

3 callers who I did not identify.

ASTM Sequence III Surveillance Panel (22 Voting members) date:

Name/Address	Phone/Fax/Email		Signature
Martin Heimrich	martin.heimrich@swri.org	N-V Member	Present_____
Jason Holmes	jason.holmes@basf.com	N-V Member	Present_____
Eric Johnson	eric.r.johnson@gm.com	N-V Member	Present_____
✓ Travis Kostan	travis.kostan@swri.org	N-V Member	Present_____
Walter Lerche	walt.lerche@gm.com	N-V Member	Present_____
Charlie Leverett	charlie.leverett@yahoo.com	N-V Member	Present_____
Jim Linden	lindenjim@jlindenconsulting.com	N-V Member	Present_____
Scott Lindholm	scott.lindholm@shell.com	N-V Member	Present_____
Michael Lochte	Michael.lochte@swri.org	N-V Member	Present_____
✓ Jo Martinez	JoMartinez@chevron.com	N-V Member	Present_____
James Matasic	james.matasic@lubrizol.com	N-V Member	Present_____
Mike McMillan	mmcmillan123@comcast.net	N-V Member	Present_____
Kevin O'Malley	kevin.omalley@lubrizol.com	N-V Member	Present_____
Mark Overaker	mhoveraker@jhaltermann.com	N-V Member	Present_____
Christian Porter	christian.porter@aftonchemical.com	N-V Member	Present_____
Phil Rabbat	phil.rabbat@basf.com	N-V Member	Present_____
Scott Rajala	srajala@ilacorp.com	N-V Member	Present_____
Bob Salgueiro	bob.salgueiro@infineum.net	N-V Member	Present_____
✓ Elisa Santos	elisa.santos@infineum.com	N-V Member	Present_____
Hirano Satoshi	satoshi_hirano_aa@mail.toyota.co.jp	N-V Member	Present_____
Philip R. Scinto	prs@lubrizol.com	N-V Member	Present_____
Thomas Smith	trsmith@valvoline.com	N-V Member	Present_____
✓ Robert Stockwell	robert.stockwell@chevron.com	N-V Member	Present_____
Chris Taylor	chris.taylor@vpracingfuels.com	N-V Member	Present_____
Ben Weber	bweber1@sat.rr.com	N-V Member	Present_____
Angela Willis	angela.p.willis@gm.com	N-V Member	Present_____

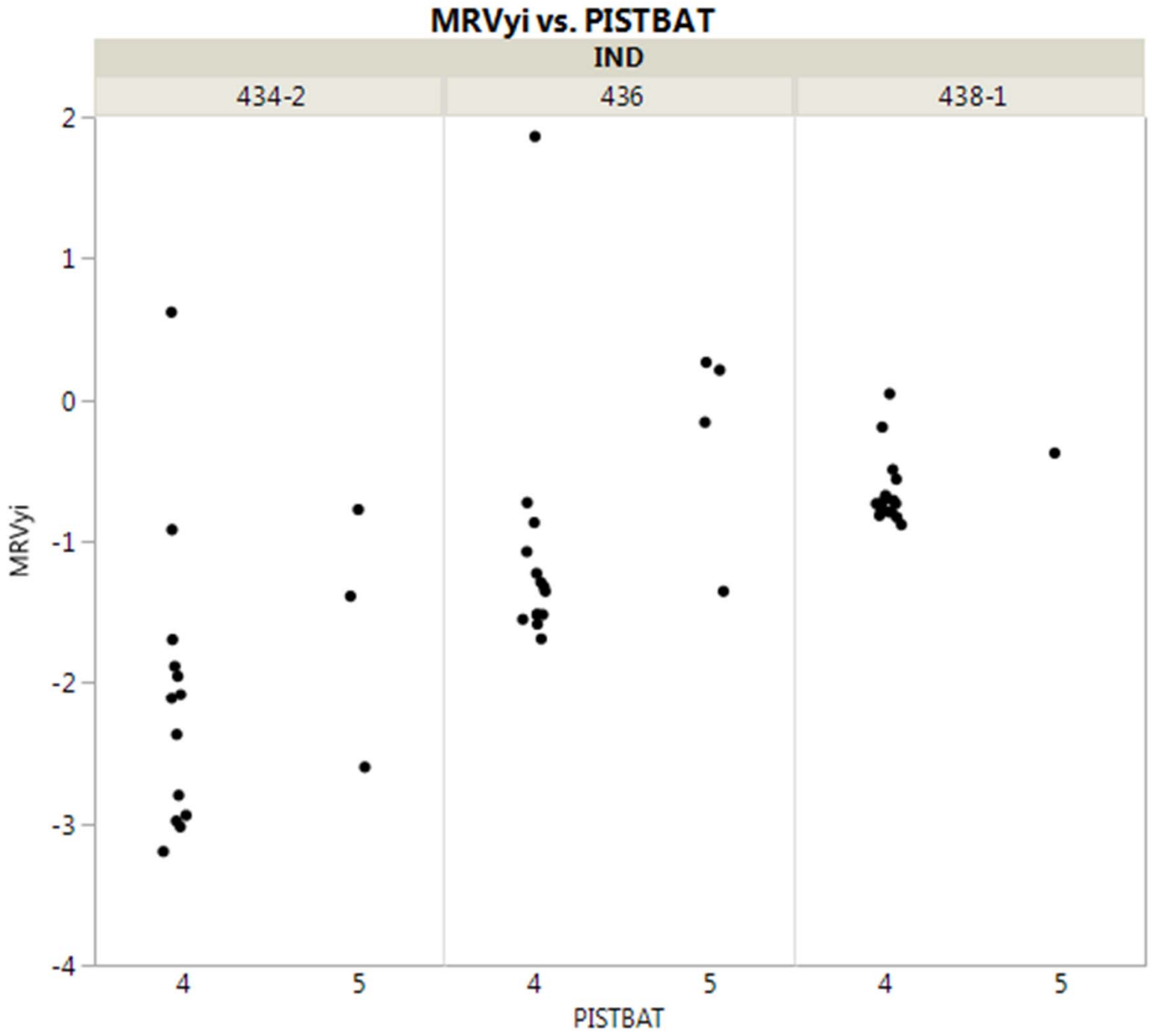
Updated 20170905, 20180105 added Domingo, 20180122 removed Terry Bates, 20180130 removed Bob Olree, 20180212 removed Rutherford

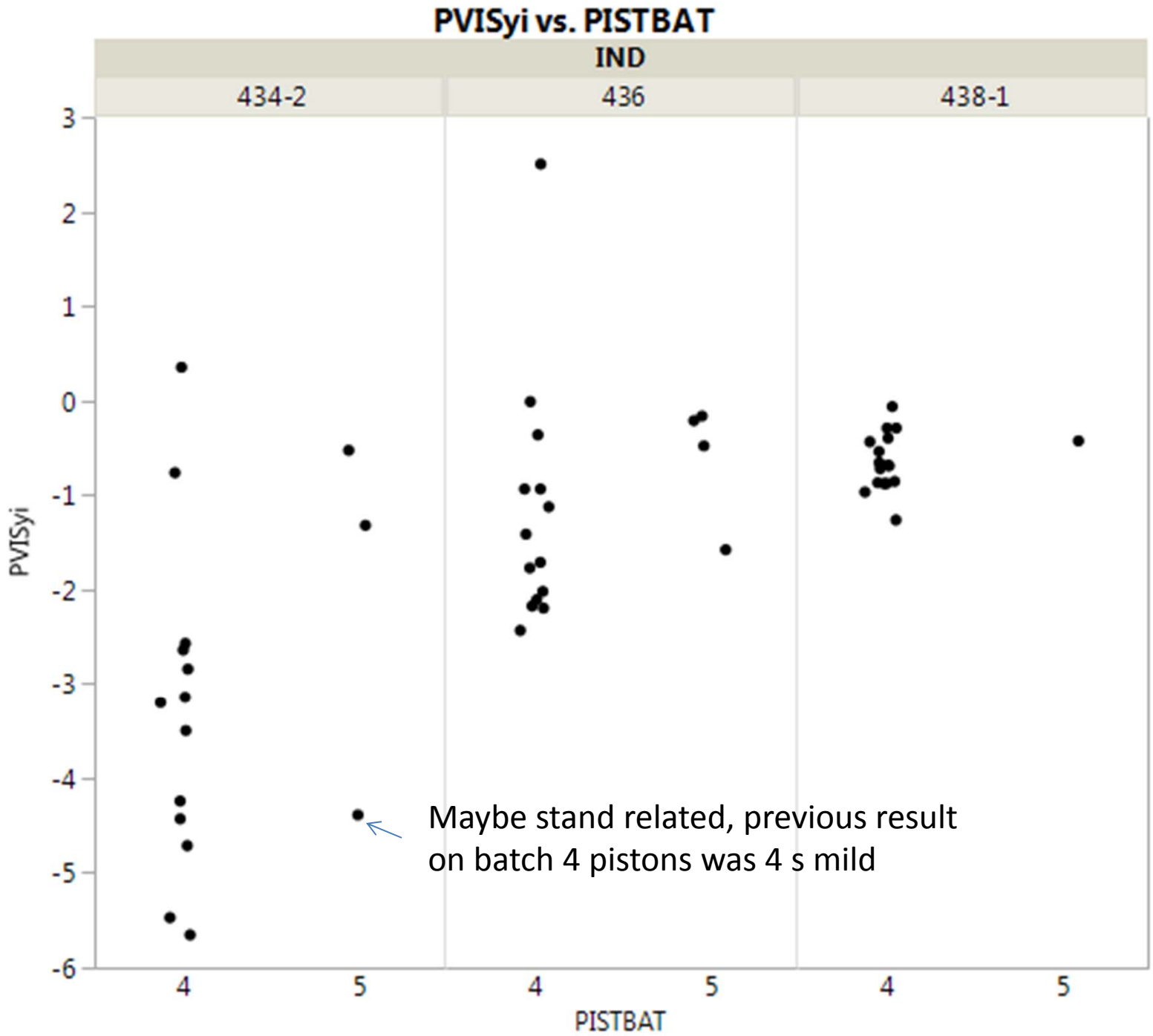
 + Joe LZ 1/27/17

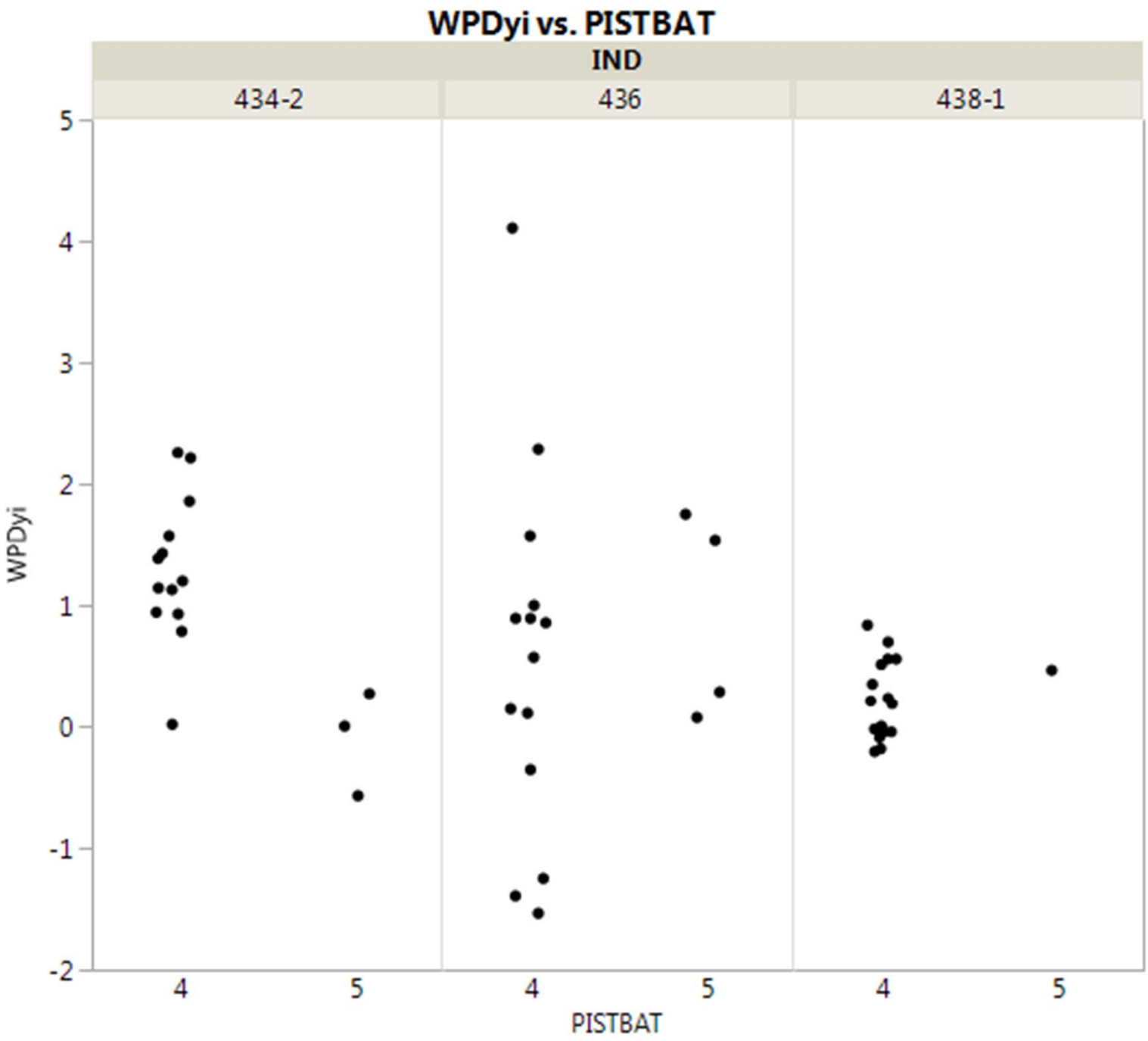
ASTM Sequence III Surveillance Panel (22 Voting members) date:

Name/Address	Phone/Fax/Email		Signature
Ricardo Affinito	affinito@chevron.com	N-V Member	Present_____
Art Andrews	arthur.t.andrews@exxonmobil.com	N-V Member	Present_____
Robert Bacchi	robert.bacchi@basf.com	N-V Member	Present_____
✓ Doyle Boese	doyle.boese@infineum.com	N-V Member	Present_____
Adam Bowden	adbowden@ohtech.com	N-V Member	Present_____
Dwight H. Bowden	dhbowden@ohtech.com	N-V Member	Present_____
Matt Bowden	mjbowden@ohtech.com	N-V Member	Present_____
✓ Jerome A. Brys	jerome.brys@lubrizol.com	N-V Member	Present_____
Jessica Buchanan	jessica.buchanan@lubrizol.com	N-V Member	Present_____
Bill Buscher III	william.buscher@intertek.com	N-V Member	Present_____
Bob Campbell	bob.campbell@aftonchemical.com	N-V Member	Present_____
Domingo Carreon	domingo.carreon@intertek.com	N-V Member	Present_____
Jim Carter	jcarter@gageproducts.com	N-V Member	Present_____
Chris Castanien	chris.castanien@nesteoil.com	N-V Member	Present_____
Timothy L. Caudill	tlcaudill@ashland.com	N-V Member	Present_____
Martin Chadwick	martin.chadwick@intertek.com	N-V Member	Present_____
✓ Ankit Chaudhry	ankit.chaudhry@swri.org	N-V Member	Present_____
Jeff Clark	jac@astmtmc.cmu.edu	N-V Member	Present_____
✓ Sid Clark	sidney.clark@swri.org	N-V Member	Present_____
✓ Tim Cushing called 9	timothy.cushing@gm.com	N-V Member	Present_____
Phil Davies	daviesjp@bp.com	N-V Member	Present_____
✓ Lisa Dingwell	Lisa.Dingwell@AftonChemical.com	N-V Member	Present_____
✓ Todd Dvorak	todd.dvorak@aftonchemical.com	N-V Member	Present_____
Frank Farber	fmf@astmtmc.cmu.edu	N-V Member	Present_____
Joe Franklin	joe.franklin@intertek.com	N-V Member	Present_____
Gordon Farnsworth	gordon.farnsworth@infineum.com	N-V Member	Present_____
Rolfe Hartley	rolfehartley@gmail.com	N-V Member	Present_____
Karin E. Haumann	karin.haumann@shell.com	N-V Member	Present_____

Batch 4 and 5 MRV, PVIS and WPDyi


MRVyi vs. PISTBAT
IND
434-2
436
438-1
MRVyi
2
1
0
-1
-2
-3
-4
4
5
4
5
4
5
PISTBAT


PVISyi vs. PISTBAT
IND
434-2
436
438-1
PVISyi
3
2
1
0
-1
-2
-3
-4
-5
-6
4
5
4
5
4
5
PISTBAT
Maybe stand related, previous result
on batch 4 pistons was 4 s mild


WPDyi vs. PISTBAT
IND
434-2
436
438-1
WPDyi
5
4
3
2
1
0
-1
-2
4
5
4
5
4
5
PISTBAT

IIIH BC5 Pistons (n=8)

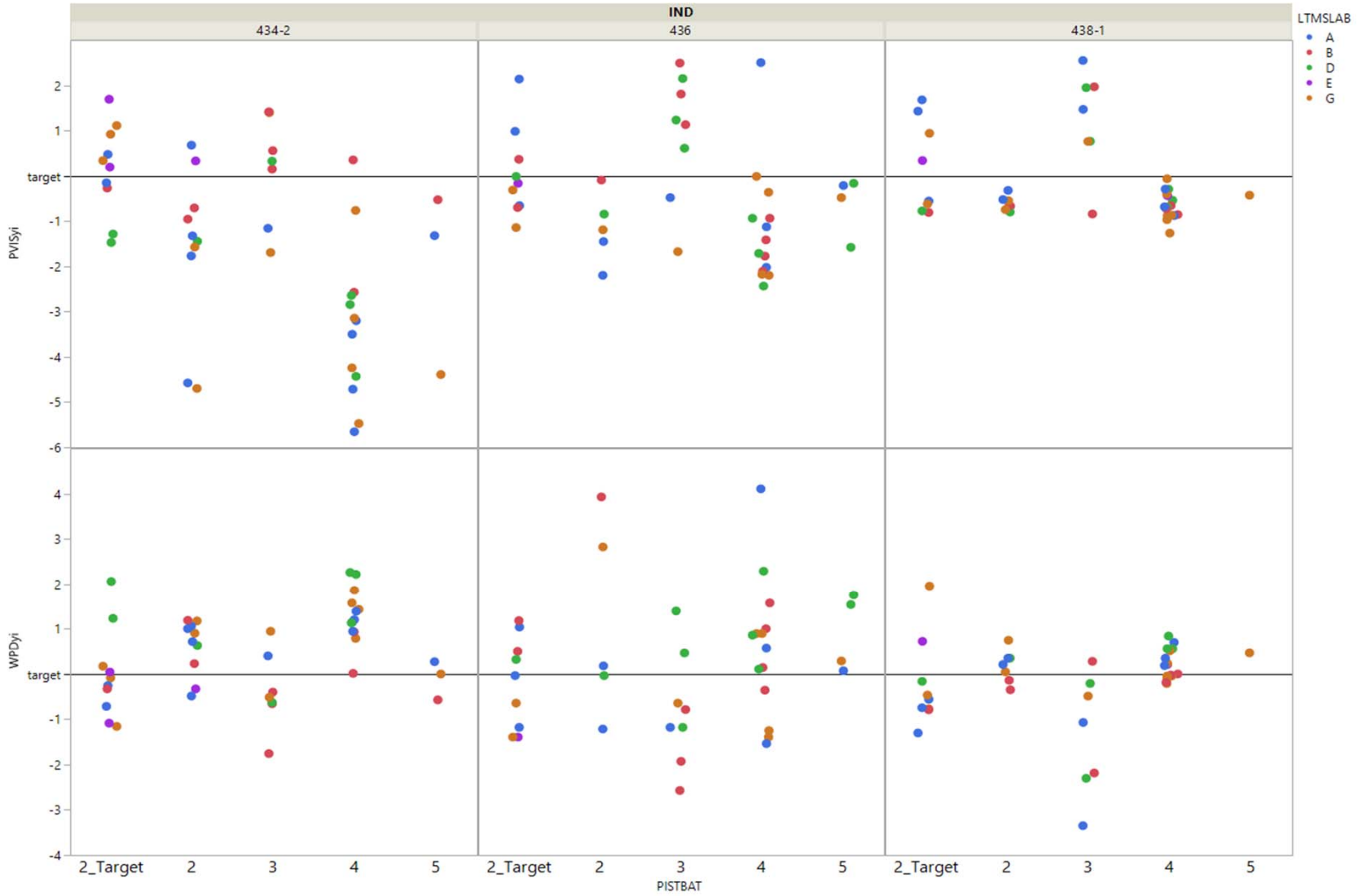
Feb. 13, 2018

IND	PVIS_OR	TESTKEY	WPD_OR	LTMSDATE	LTMSLAB	LTMSAPP	PVISyi	WPDyi
436	26.46	128437-IIIH	5.12	20171210	D	2	-0.1649	1.75
436	16.06	131176-IIIH	4.54	20171216	G	1	-0.4807	0.2857
434-2	63.42	128423-IIIH	4.35	20171218	A	3	-1.3217	0.2714
434-2	89.27	126201-IIIH	3.76	20180113	B	1	-0.5269	-0.5714
438-1	23.73	131178-IIIH	3.69	20180122	G	1	-0.4276	0.4651
436	26.05	127166-IIIH	4.65	20180131	A	4	-0.2134	0.0714
436	17	131179-IIIH	5.06	20180205	D	1	-1.5796	1.5357
434-2	16.89	131738-IIIH	4.16	20180206	G	3	-4.3893	0

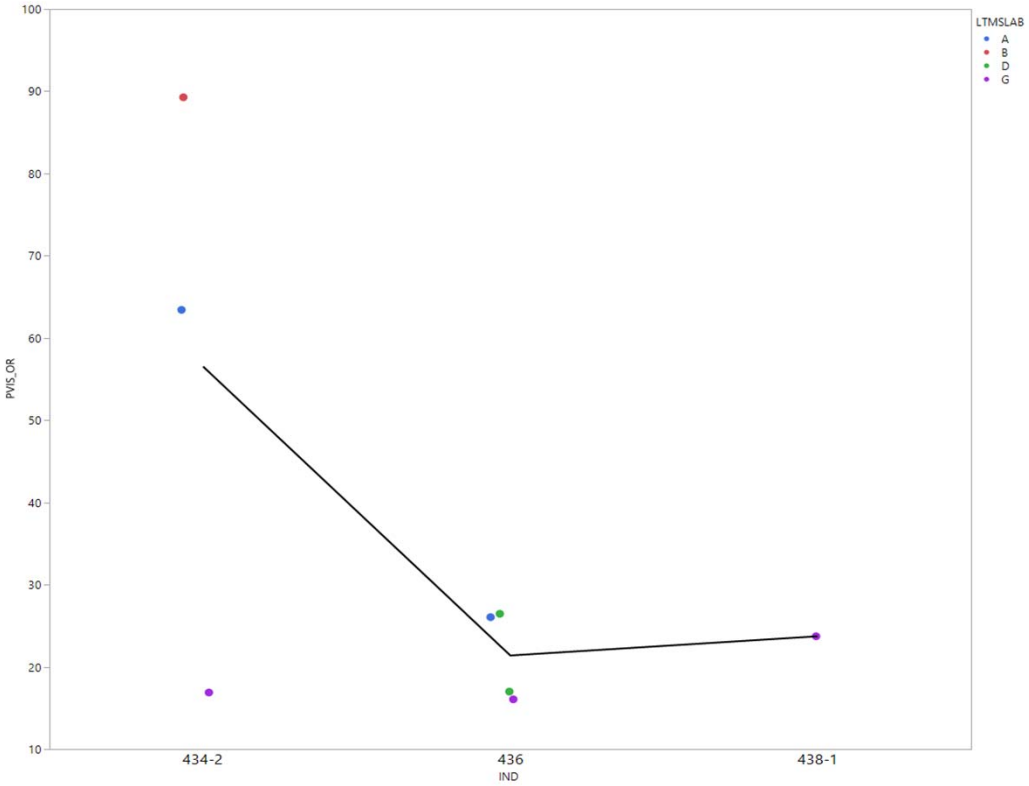
BC5 runs are generally on the mild side.

PVIS

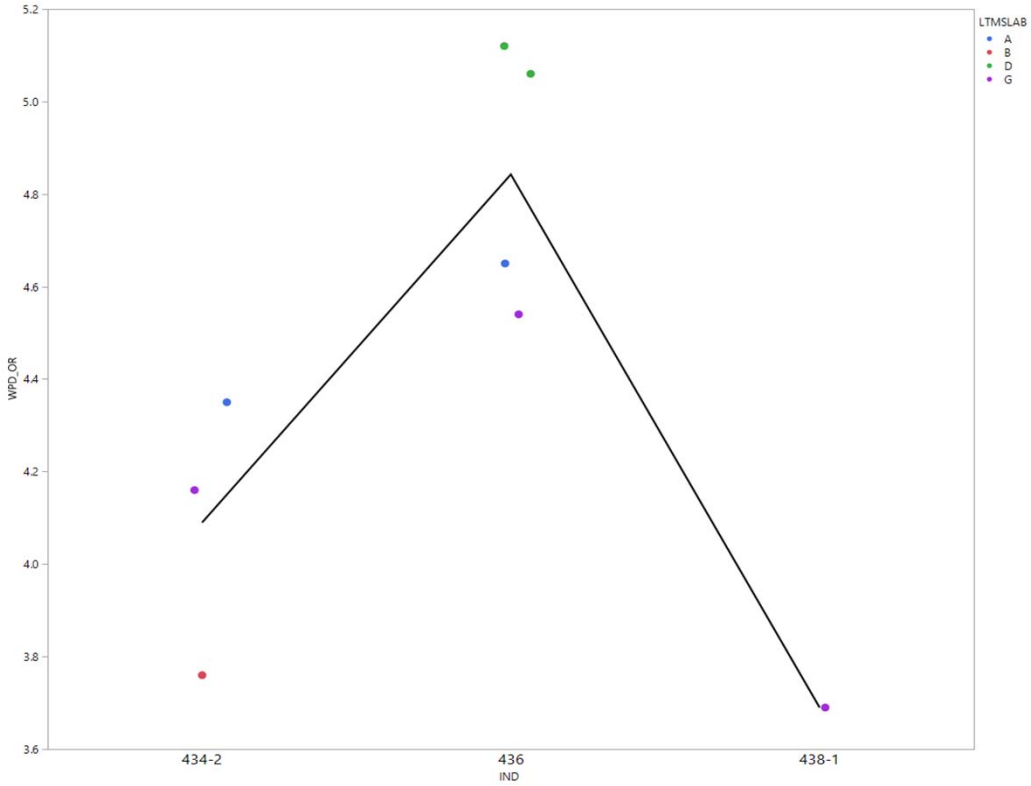
WPD



PVIS



WPD



BC5	LnPVIS		PVIS		WPD	
Oil	BC5 Avg	Target	BC5 Avg	Target	BC5 Avg	Target
434-2 (n=3)	3.8227	4.7191	45.7	112.1	4.09	4.16
436 (n=4)	3.0363	3.3289	20.8	27.9	4.84	4.63
438-1 (n=1)	3.1667	3.9754	23.7	53.3	3.69	3.66

It appears that BC5 oil ranking is similar to Target oil ranking.

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SEQ. IIIHA

Reporting Final MRV Results

X1. SEQUENCE IIIHA TEST PROCEDURE

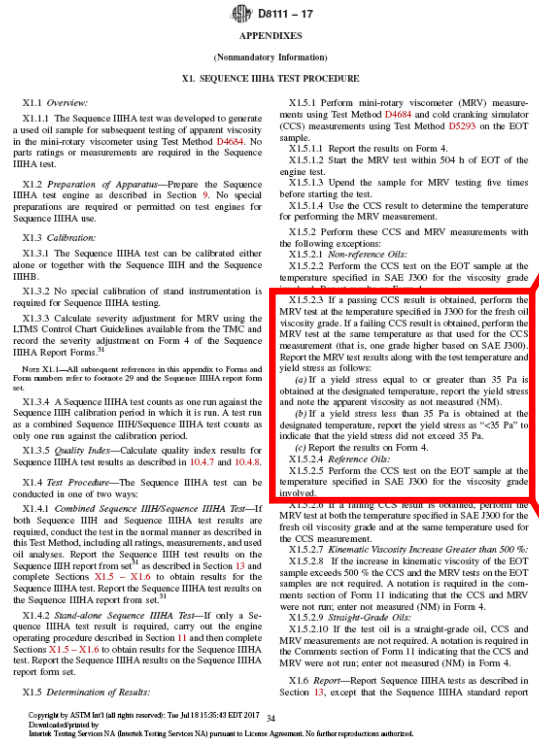
The current IIIHA Test Procedure in unclear about how to report the final MRV viscosity when the original units or final original unit result (after being severity adjusted) is >400,000 cP.

Section X1.5.2.3 (a) currently states:

> *"If a yield stress equal to or greater than 35 Pa is obtained at the designated temperature, report the yield stress and note the apparent viscosity as not measured (NM)"*

This statement is a carryover from the IIIGA test procedure and further definition may be required in the IIIHA test procedure due to the existence of severity adjustments. The severity adjustment for MRV is calculated using the LTMS Control Chart Guidelines on final numerical MRV viscosity results from calibration tests.

PROPOSED REVISION TO X1. SEQUENCE IIIHA TEST PROCEDURE



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APPENDIXES

(Nonmandatory Information)

X1. SEQUENCE IIIHA TEST PROCEDURE

X1.1 *Overview:*

X1.1.1 The Sequence IIIHA test was developed to generate a used oil sample for subsequent testing of apparent viscosity in the mini-rotary viscometer using Test Method D4684. No parts ratings or measurements are required in the Sequence IIIHA test.

X1.2 *Preparation of Apparatus*—Prepare the Sequence IIIHA test engine as described in Section 9. No special preparations are required or permitted on test engines for Sequence IIIHA use.

X1.3 *Calibration:*

X1.3.1 The Sequence IIIHA test can be calibrated either alone or together with the Sequence IIIH and the Sequence IIIHB.

X1.3.2 No special calibration of stand instrumentation is required for Sequence IIIHA testing.

X1.3.3 Calculate severity adjustment for MRV using the LTMS Control Chart Guidelines available from the TMC and record the severity adjustment on Form 4 of the Sequence IIIHA Report Forms.[31]

NOTE X1.1—All subsequent references in this appendix to Forms and Form numbers refer to footnote 29 and the Sequence IIIHA report form set.

X1.3.4 A Sequence IIIHA test counts as one run against the Sequence IIIH calibration period in which it is run. A test run as a combined Sequence IIIH/Sequence IIIHA test counts as only one run against the calibration period.

X1.3.5 *Quality Index*—Calculate quality index results for Sequence IIIHA test results as described in 10.4.7 and 10.4.8.

X1.4 *Test Procedure*—The Sequence IIIHA test can be conducted in one of two ways:

X1.4.1 *Combined Sequence IIIH/Sequence IIIHA Test*—If both Sequence IIIH and Sequence IIIHA test results are required, conduct the test in the normal manner as described in this Test Method, including all ratings, measurements, and used oil analyses. Report the Sequence IIIH test results on the Sequence IIIH report from set[31] as described in Section 13 and complete Sections X1.5 – X1.6 to obtain results for the Sequence IIIHA test. Report the Sequence IIIHA test results on the Sequence IIIHA report from set.[31]

X1.4.2 *Stand-alone Sequence IIIHA Test*—If only a Sequence IIIHA test result is required, carry out the engine operating procedure described in Section 11 and then complete Sections X1.5 – X1.6 to obtain results for the Sequence IIIHA test. Report the Sequence IIIHA results on the Sequence IIIHA report form set.

X1.5 *Determination of Results:*

X1.5.1 Perform mini-rotary viscometer (MRV) measurements using Test Method D4684 and cold cranking simulator (CCS) measurements using Test Method D5293 on the EOT sample.

X1.5.1.1 Report the results on Form 4.

X1.5.1.2 Start the MRV test within 504 h of EOT of the engine test.

X1.5.1.3 Upend the sample for MRV testing five times before starting the test.

X1.5.1.4 Use the CCS result to determine the temperature for performing the MRV measurement.

X1.5.2 Perform these CCS and MRV measurements with the following exceptions:

X1.5.2.1 *Non-reference Oils:*

X1.5.2.2 Perform the CCS test on the EOT sample at the temperature specified in SAE J300 for the viscosity grade involved.

X1.5.2.3 If a passing CCS result is obtained, perform the MRV test at the temperature specified in J300 for the fresh oil viscosity grade. If a failing CCS result is obtained, perform the MRV test at the same temperature as that used for the CCS measurement (that is, one grade higher based on SAE J300). Report the MRV test results along with the test temperature and yield stress as follows:

(a) If a yield stress equal to or greater than 35 Pa is obtained at the designated temperature, report the yield stress and note the apparent viscosity as not measured (NM).

(b) If a yield stress less than 35 Pa is obtained at the designated temperature, report the yield stress as "<35 Pa" to indicate that the yield stress did not exceed 35 Pa.

(c) Report the results on Form 4.

X1.5.2.4 *Reference Oils:*

X1.5.2.5 Perform the CCS test on the EOT sample at the temperature specified in SAE J300 for the viscosity grade involved.

X1.5.2.6 If a failing CCS result is obtained, perform the MRV test at both the temperature specified in SAE J300 for the fresh oil viscosity grade and at the same temperature used for the CCS measurement.

X1.5.2.7 *Kinematic Viscosity Increase Greater than 500 %:*

X1.5.2.8 If the increase in kinematic viscosity of the EOT sample exceeds 500 % the CCS and the MRV tests on the EOT samples are not required. A notation is required in the comments section of Form 11 indicating that the CCS and MRV were not run; enter not measured (NM) in Form 4.

X1.5.2.9 *Straight-Grade Oils:*

X1.5.2.10 If the test oil is a straight-grade oil, CCS and MRV measurements are not required. A notation is required in the Comments section of Form 11 indicating that the CCS and MRV were not run; enter not measured (NM) in Form 4.

X1.6 *Report*—Report Sequence IIIHA tests as described in Section 13, except that the Sequence IIIHA standard report

X1.5.2.3 If a passing CCS result is obtained, perform the MRV test at the temperature specified in J300 for the fresh oil viscosity grade. If a failing CCS result is obtained, perform the MRV test at the same temperature as that used for the CCS measurement (that is, one grade higher based on SAE J300). Report the MRV test results along with the test temperature and yield stress as follows:

~~*(a)* If a yield stress equal to or greater than 35 Pa is obtained at the designated temperature, report the yield stress and note the apparent viscosity as not measured (NM).~~

(b) If a yield stress less than 35 Pa is obtained at the designated temperature, report the yield stress as "<35 Pa" to indicate that the yield stress did not exceed 35 Pa.

(c) Report the results on Form 4.

X1.5.2.4 *Reference Oils:*

X1.5.2.5 Perform the CCS test on the EOT sample at the temperature specified in SAE J300 for the viscosity grade involved.

X1.5.2.6 If a failing CCS result is obtained, perform the MRV test at both the temperature specified in SAE J300 for the fresh oil viscosity grade and at the same temperature used for the CCS measurement.

PROPOSED REVISION TO X1. SEQUENCE IIIHA TEST PROCEDURE

"*X1.5.2.1 Non-reference Oils:*

…

XX.X.X.X The Special Case of the MRV Viscosity Being >400,000 cP−If the MRV viscosity is >400,000 cP, record 400,000 cP on Form 4 and use this value to calculate the MRV viscosity.

Note X−The maximum MRV viscosity that will be considered for this method is 400,000 cP so this value replaces any value that is ≥400,000 cP.

XX.X.X.X Complete the calculations on Form 4 for MRV viscosity using a severity adjustment (SA) of zero.

XX.X.X.X Comment on Form 11 (Test Comments) that a severity adjustment of zero was used for the MRV viscosity because the MRV viscosity was ≥400,000 cP.

XX.X.X.X If the application of severity adjustments or correction factors result in a final MRV viscosity of ≥400,000 cP report the results as 400,000 cP. Include a comment in the Test Comments section of the test report that the maximum reportable MRV viscosity for the IIIHA test is 400,000 cP and the final MRV viscosity result was adjusted to 400,000 cP."

Addison J. Schweitzer

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intertek.com/automotive/lubricants-fuel-systems/

Total Quality. Assured.