

ASTM Test Monitoring System Executive Committee Meeting
June 26, 2017
Sheraton Boston Hotel
Boston, MA

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Call to Order

ASTM D02.B0.08, the Test Monitoring System Executive Committee, met on Monday, June 26, 2017 at 5:00 p.m. in the Sheraton Boston - Boston, MA. Six voting members and several other attendees were present. Attendance list is Attachment A.

Committee Voting Members

Bob Campbell, Present
Jason Anderson, Present
Eric Johnson, Not Present
Ron Loomis, Present
Doyle Boese, Present
Mike Alessi, Not Present
Jason Bowden, Present
Suzanne Neal, Not Present, Proxy Given to Greg Shank
Greg Shank, Present

The agenda is shown as Attachment B.

Meeting Minutes

The December 5, 2016, May 1, 2017 and May 25, 2017 meeting minutes were approved as posted.

Membership

The membership was reviewed. No changes were made.

The current members and their terms are shown on the next page.

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Greg Shank						U	U						
Jason Anderson				U	U	U	U						
Mike Alessi						P	P						
Suzanne Neal					U	U							
Eric Johnson			U	U	U	U							
Bob Campbell				P	P	P	P						
Ron Loomis					P	P							
Doyle Boese			P	P	P	P							
Jason Bowden	G	G	G	G	G	G							



Eligibility; P=Producer, U=User, G=General Interest

Technical Guidance Committee (TGC) Report – Pat Lang

Pat's report is shown as Attachment C. Pat's report also included a report from the Fuel Task Force – Attachment D.

Test Monitoring Center (TMC) Report – Frank Farber

Frank's report is shown as Attachment E. James Booth requested that the Regulations Governing the ASTM Test Monitoring System revision include task forces as well as surveillance panels. The committee agreed to include this change. The committee discussed B06 - Two Cycle testing and member activity and decided to recommend to Subcommittee B to withdraw test methods under B06 due to no activity, shortage of parts and un-usable reference oils.

There were no old or new business items.

The meeting ended at approximately 6:00 pm.

Respectfully submitted,

Frank M. Farber, Secretary
ASTM Test Monitoring System Executive Committee

Attachments
FMF/fmf

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Attachment A
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Voting Members

NAME	COMPANY AND ADDRESS	PHONE NUMBER E-MAIL ADDRESS FAX NUMBER	PRESENT
Bob Campbell Chairman	Afton Chemical Corporation 500 Spring Street P.O. Box 2158 Richmond, VA 23218-2158	Phone: (804) 788-5236 e-mail: bob.campbell@aftonchemical.com FAX: (804) 788-5340	<i>ACC</i>
Mike Alessi	ExxonMobil Paulsboro Technology Center 600 Billingsport Road Paulsboro, NJ 08066-0480	Phone: (856) 224-2309 e-mail: michael.l.alessi@exxonmobil.com FAX: (856) 224-	
Jason Anderson	PACCAR	Phone: e-mail: Jason.Andersen@PACCAR.com	<i>JAA</i>
Doyle Boese	Infineum USA, L.P. 1900 East Linden Avenue Linden, NJ 07036-0536	Phone: (908) 474-3176 e-mail: doyle.boese@infineum.com FAX: (908) 474- 2617 2637	<i>DWB</i>
Jason Bowden	OH Technologies 9300 Progress Parkway P. O. Box 5039 Mentor, OH 44061-5039	Phone: (440) 354-7007 e-mail: jhbowden@ohotech.com FAX: (440) 354-7080	<i>JAB</i>
Eric Johnson	General Motors	Phone: 248-705-1086 e-mail: eric.r.johnson@gm.com FAX:	
Ron Loomis	The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, OH 44092	Phone: (440) 347-4046 e-mail: Ron.Loomis@lubrizol.com FAX: (440) 347-1555	<i>RLZ</i>
Suzanne Neal	Daimler/Detroit Diesel Corporation 13400 Outer Drive, West Detroit, MI 48239	Phone: (313) 592-7130 e-mail: Suzanne.neal@daimler.com FAX: (313)592-7104	
Greg Shank	Volvo Powertrain 13302 Pennsylvania Avenue Hagerstown, MD 21742-2693	Phone: (301) 790-5817 e-mail: greg.shank@volvo.com FAX: (301)790-5815	<i>On back</i>

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Non-Voting Members

NAME	COMPANY AND ADDRESS	PHONE NUMBER E-MAIL ADDRESS FAX NUMBER	PRESENT
Don Bell OSCT	Afton Chemical Corporation 500 Spring Street PO Box 2158 Richmond, VA 23218-2158	Phone: (804) 788-6332 e-mail: don.bell@aftonchemical.com FAX: (804) 788-6243	
Mike Birke LDEOC/EOEC Chairman	Southwest Research Institute 6620 Culebra Road San Antonio, TX 78228-0510	Phone: (210) 522-5310 e-mail: mbirke@swri.org FAX: (210) 522-5907	
William Buscher, III Sequence IVA & B01 Chairman	Intertek 5404 Bandera Road San Antonio, TX 78238	Phone: (210) 240-8099 e-mail: william.buscher@intertek.com FAX: (210) 684-7523	WAB
Tim Brooke ASTM International	ASTM 100 Barr Harbor Drive West Conshohocken, PA 19428	Phone: (610) 832-9729 e-mail: tbrooke@astm.org FAX: (610) 832-	TBB
G. E. Callis Two-Stoke Cycle	Spectrum Corporation 1523 SE Prestwick Lane Port St. Lucie, FL 34952-6038	Phone: (561) 337-5060 e-mail: ecallis@spectrumcorporation.com FAX: (561) 337-5061	
Angelina Chan TEOST, TEOST-MHT Chairperson	The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, OH 44092-2298	Phone: (440) 347- e-mail: Angelina.Chan@lubrizol.com FAX: (440) 347-8061	
Mark Cooper T-8/T-8E, T-11, T-12, T- 13 Chairman	Chevron Oronite Company, LLC 4502 Centerview Drive, Suite 210 San Antonio, TX 78228	Phone: (210) 731-5606 e-mail: mawc@chevrontexaco.com FAX: (210) 731-5699	
Mark Devlin Gelation Index Chairman	Afton Chemical Corporation 500 Spring Street, P.O. Box 2158 Richmond, VA 23218-2158	Phone: (804) 788-6322 e-mail: mark.devlin@aftonchemical.com FAX: (804) 788-6388	
Frank Farber TMC Director	ASTM Test Monitoring Center 6555 Penn Avenue Pittsburgh, PA 15206-4489	Phone: (412) 365-1030 e-mail: fmf@astmtmc.cmu.edu FAX: (412) 365-1030	fmf
Joe Franklin Subcommittee B Chairman	Intertek Automotive Research 5404 Bandera Road San Antonio, TX 78238-1933	Phone: (210) 523-4671 e-mail: joe.franklin@intertek.com FAX: (210) 681-8300	JF
Pat Lang Sequence VIII TGC Chairman	Southwest Research Institute 6220 Culebra Road San Antonio, TX 78228-0510	Phone: (210) 522-2820 e-mail: plang@swri.org FAX: (210) 684-7523	P.L.
Robert Stockwell Sequence III F/III G/III H Chairman	Chevron Oronite 4502 Centerview Drive Suite 210 San Antonio, TX 78228	Phone: (210) 232-3188 e-mail: robert.stockwell@chevron.com FAX:	
John Glaser Intertek	Intertek Automotive Research 5404 Bandera Road San Antonio, TX 78238-1933	Phone: (210) 647-9459 e-mail: john.glaser@intertek.com FAX: (210) 684-6074	
Eric Donovan L-42	Afton Chemical Corporation 500 Spring Street P.O. Box 2158 Richmond, VA 23218-2158	Phone: (804) 788- e-mail: eric.donovan@aftonchemical.com FAX: (804) 788-6358	
Jim Gutzwiller Scote/C13 Chairman	Infineum USA, L.P. 4335 West Piedras Drive, Suite 101 San Antonio, TX 78228	Phone: (210) 732-8132 x13 e-mail: james.gutzwiller@infineum.com FAX: (210) 732-8480	

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NAME	COMPANY AND ADDRESS	PHONE NUMBER E-MAIL ADDRESS FAX NUMBER	PRESENT
Brad Bubonic L-60-1 Chairman	The Lubrizol Corporation 29400 Lakeland Blvd. Wickliffe, OH 44092-2298	Phone: (440) 347- e-mail: brad.bubonic@lubrizol.com FAX: (440) 347-4096	
Ryan Johnson EOAT	Southwest Research Institute 6220 Culebra Road San Antonio, TX 78228-0510	Phone: (210) 522-2892 e-mail: ryan.johnson@swri.org FAX: (210) 684-7530	
Brian Koehler HTCT Chairman	Southwest Research Institute 6220 Culebra Road San Antonio, TX 78228-0510	Phone: (210) 522-3588 e-mail: bkoehler@swri.edu FAX: (210) 680-1777	
Greg Miranda Sequence VID/VIE	The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, OH 44092-2298	Phone: (440) 347- e-mail: Greg.Miranda@Lubrizol.com FAX: (440) 347-	
Stefan Von Lukawiecki D5800, D6417 Chairman	Safety-Kleen Canada, Inc. 300 Woolwich Street South Breslau, Ontario N0B 1M0 CANADA	Phone: (519) 648-2291 e-mail: svonluka@safety-kleen.com FAX: (519) 648-2033	
Yong-Li McFarland EOFT, EOWT Chairperson	Southwest Research Institute 6620 Culebra Road San Antonio, TX 78228-0510	Phone: (210) 522- e-mail: yongli.mcfarland@swri.org FAX: (210) 522-5907	✓
Angelina Chan TEOST, TEOST-MHT	The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, OH 44092-2298	Phone: (440) 347-8174 e-mail: smm@lubrizol.com FAX: (440) 347-8061	
Jim Moritz ISB & ISM Chairman	Intertek Automotive Research 5404 Bandera Road San Antonio, TX 78238-1933	Phone: (210) 523-4601 e-mail: jim.moritz@intertek.com FAX: (210) 523-4607	
Leonard Orzech BRT Chairman	Intertek Automotive Research 5404 Bandera Road San Antonio, TX 78238-1933	Phone: (210) 523-4680 e-mail: leonard.orzech@intertek.com FAX: (210) 523-4694	
Wes Venhoff L-37, B03 Chairman	The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, OH 44092-2298	Phone: (440) 347- e-mail: Wes.Venhoff@Lubrizol.com FAX: (440) 347-	
Gil Reinhard CBT, HTCBT	Intertek Automotive Research 5404 Bandera Road San Antonio, TX 78238-1933	Phone: (210) 523-4674 e-mail: gil.reinhard@intertek.com FAX: (210) 681-8300	
Andrew Ritchie VG Chairman	Infineum USA, L.P. 1900 East Linden Avenue Linden, NJ 07036-0536	Phone: (908) 474-2097 e-mail: andrew.ritchie@infineum.com FAX: (908) 474-3637	AR
Angela Trader L-33-1 Chairperson	Intertek Automotive 5404 Bandera Road San Antonio, TX 78238-1993	Phone: (210) 264-5911 e-mail: angela.trader@intertek.com FAX: (210)	

Visitors

NAME	COMPANY AND ADDRESS	PHONE NUMBER E-MAIL ADDRESS FAX NUMBER	PRESENT
Michael Lochte	SWRI	MLOCHTE@SWRI.ORG	✓
MIKE McMILLAN	MLM CONSULTING, INC	MMCMILLAN123@COMCAST.NET	✓
GREG RALEY	MOTIVA	gregory.rale@motiva.com	✓
Lizbeth Cisneros	Motiva	Lizbeth.cisneros@motiva.com	✓
Dave Duncan	Lubrizol	dadun@lubrizol.com	✓
Matt Bowden	OHT	MJBowden@OHTECH.com	✓
JAMES BOOTH	ORONITE	JAMES.BOOTH@ORONITE.COM	✓
GREG SHANK	VOLVO/MACK	greg.shank@volvo.com	✓
Proxy for Suzanne Neal	DDC		
ROBERT STACKWELL	ORONITE	ROBERT.STACKWELL@CHEVRON.COM	✓
DON SMOLENSKI	EVONIK	donald.smolenski@evonik.com	✓
Steve Marty	SWRI	smarty@swri.org	✓
MIKE VAN HECKE	SWRI	mvanhecke@swri.org	✓

Richard Grundza ASTM TMC reg@astm.tmc.cmu.edu ✓
 Jim Matasic LZ jmat@lubrizol.com ✓
 Pat Joyce LZ pajy@lubrizol.com
 MIKE KUNSELMAN CQA 4 mkunselman@CenterforQA.com ✓

**ASTM Test Monitoring System
Executive Committee Meeting
Monday – June 26, 2017**

5:00 - 6:30 PM

Sheraton Boston; Boston, MA

AGENDA

- 1. Call to Order**
- 2. Approval of Minutes - December 5, 2016
May 1, 2017
May 25, 2017**
- 3. Membership**
- 4. Receive, Accept and Take Action on Reports
- Technical Guidance Committee – Pat Lang
- Test Monitoring Center – Frank Farber**
- 5. New Business**
- 6. Old Business**
- 7. Next Meeting – Monday, December 4, 2017
Houston, TX**
- 8. Adjournment**

Technical Guidance Committee Report

Prepared by: Patrick Lang

June 26, 2017

Boston, MA

TGC Meetings Conducted This Reporting Period

- The TGC conducted a meeting on December 7, 2016 at Lake Buena Vista, Florida during ASTM meeting week.
- A conference call/WebEx was conducted on June 13, 2017.

Accomplishments this Reporting Period

- During the June 13, 2017 TGC Conference call, the group approved the document entitled “ASTM Sub Committee B Test Availability Guidelines”.
 - Document states that a test is available for ASTM TMC purposes as long as one lab (dependent or independent) is able to run the test.
 - TMC has a link to this document on the TMC Website.
 - Document includes the notification process that will be used in the event that a test is unavailable and a distribution list that includes the email addresses for the key stake holders that should be notified in the event of a test availability concern.

ASTM Sub Committee B Test Availability Guidelines

BACKGROUND

The ASTM Technical Guidance Committee has approved the following guidelines to assist surveillance panels in the notification of when a specific test may be available or unavailable for testing purposes. The intent is that all stake holders are informed in a timely manner of any possible continuation/disruption in test availability.

GUIDELINES

Each surveillance panel is responsible for ensuring adequate supplies of acceptable test components, fuel, or any other item necessary to conduct a test. If a condition arises that would prevent a laboratory from procuring materials to conduct a registered or reference oil test, the surveillance panel chairman should be notified immediately. The surveillance panel is to then meet and discuss possible redistribution of the resource, alternative suppliers, etc. to help resolve the procurement issue. If no resolution is found the surveillance panel chairman is to inform at a minimum the stake holders shown below under the heading notification list. It is hoped in situations when a test is facing a shortage of material(s) that immediate notification can focus industry expertise on finding suitable replacements and or develop/initiate protocol to handle approval of oils. In the case of sole-source/critical parts, it is advisable that the surveillance panels establish an equivalency testing protocol in anticipation of the event that material can no longer be procured. If material procurement conditions change enabling a registered or reference oil test to be run the surveillance panel chairman is to also immediately notify stake holders.

For ASTM Test Monitoring System purposes a test is deemed available as long as one calibrated laboratory (independent or dependent) is able to run tests.

Notification List

Organization	Position
ASTM	D02.B0 Chairman
	Test Monitoring System Executive Committee Chairman
	Test Monitoring Center Director
	PCEOCP Chairman
	HDEOCP Chairman
	D02.B0.01 Chairman
	D02.B0.02 Chairman
	D02.B0.03 Chairman
	D02.B0.07 Chairman
	Membership of Effected Surveillance Panel
	ACC
MAAG Chairman	
API	EOLCS Manager
	EOLCS Chairman
Auto Alliance	
JAMA	
EMA	EMA Staff
API	AOAP Chairman
API	DEOAP Chairman
ACC-MA	Manager

Notification

From the TMC website (<http://www.astmtmc.cmu.edu/TestStatusNotification.aspx>) a notification email can be generated with the current notification member emails. Surveillance Panel Chairs will need to append a letter describing the situation using the current D02 letterhead (a link is on the TMC notification page) and a notification comment to the body of the email prior to sending.

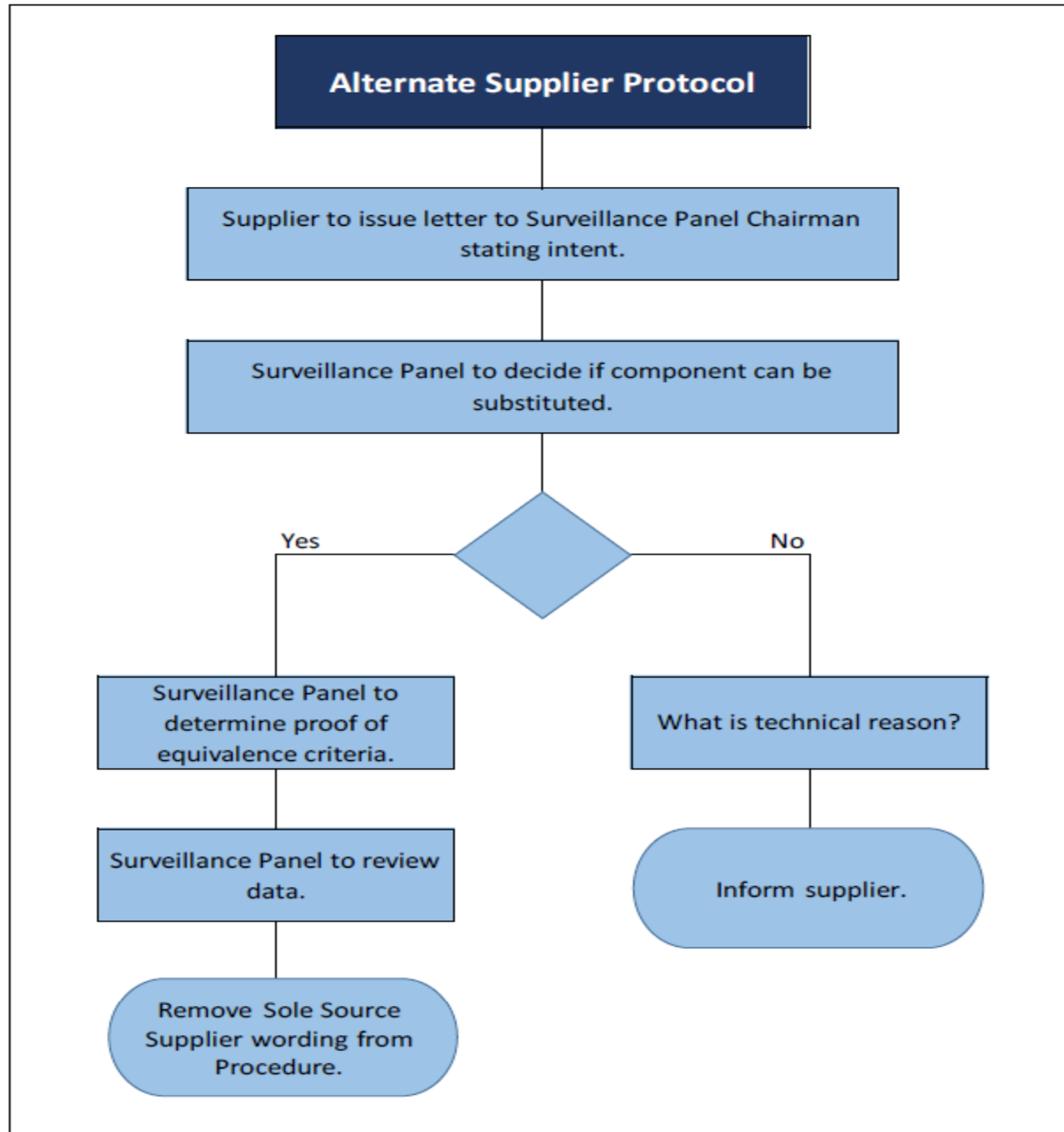
Material Substitution/Alternate Supplier Protocol

- Extensive review of the “Facts for Members” document as it relates to replacement of non-generic equipment/alternate suppliers.
 - Document encourages the development of test methods based on generic equipment.
 - Also encourages a clear process for later incorporation of additional equipment if it becomes available and is shown to be equivalent.
 - Refers to standard ASTM Methods for establishing precision and bias to determine equivalency.
 - Document does not offer any testing methodology for the determination of equivalency.

Material Substitution/Alternate Supplier Protocol (cont'd)

- The LCTWG sent request to TGC on December 5, 2016 requesting that a search for historic examples of non-generic parts introductions be summarized with the goal of extracting some general guidelines/best practices that could be used for replacement of non-generic equipment.
- SwRI compiled a document with several examples and distributed it by email on March 22, 2017 to the TGC membership group for review.
- Lengthy discussion during the June 13th conference call on feasibility of creating some generic wording on the how to introduce non-generic equipment from an alternate supplier.

Table 1



Material Substitution/Alternate Supplier Protocol (cont'd)

- The panel agreed that it would be difficult to come up with wording that would cover all scenarios.
- The compromise would be to establish some “boiler plate” wording that could potentially be put in all test procedures that would essentially guide a potential supplier through the process.
- Action: TGC Chairman to come up with initial draft of wording and distribute to the group for review.

Rating Task Force

- Bob Campbell of Afton has accepted the chairmanship of the Rating Task Force (Thanks to Bob and Afton!)
- Two conference calls were held:
 - May 25, 2017: initial call to discuss membership and objective of the task force. Some proposed objectives discussed:
 - Maintain standardization between raters and labs
 - Address rating issues relative to new test types for GF-6
 - Support Surveillance Panel needs
 - Conduct pre and post workshop discussions to ensure needs are met and work towards continuous improvement
 - Maintain rating methods in conjunction with ASTM

Rating Task Force (cont'd)

- June 9th a second conference call was held.
Some highlights:
 - Revisit the minimum number of target raters required for establishment of rating targets at the start of each workshop.
 - Attempt to carry a piston across workshops to compare current ratings with past.
 - Motion made to use 0.10 as the minimum standard deviation (previously 0.05) for the upcoming HD workshop (passed unanimously).
 - Include DD13 rating as part of the HD workshop.

Fuel Task Force

- Jim Matasic of Lubrizol is the Fuels Task Force Chairman.
- Several conference calls were held during this reporting period.
- Jim will present a separate report.

Scope and Objectives

The Technical Guidance Committee is a standing committee under the ASTM Test Monitoring System Executive Committee. The TGC shall consist of the chairmen of the surveillance panels of monitored tests, a representative of each of the test developers/sponsor who are responsible for the test procedures and the Director. The Technical Guidance Committee will advise the Director in technical matters concerning test procedures.

This will involve working with the surveillance panels, test developers, critical parts suppliers, fuel suppliers and testing laboratories across all testing types to improve the repeatability and reproducibility of the test procedures. The TGC will provide guidance for future test developments. Additionally, the TGC chairman will liaise with the ACC PAPTG Chair.

Objectives:

- 1) Develop guidelines for issues that are potentially common to all HD/PC engine, gear and bench testing.
- 2) Work with the Rating Committee to provide guidance for issues related to visual deposit ratings.
- 3) Provide guidance on best practices for critical component identification within test procedures.
- 4) Continue to refine the “Guide for Test Development” document as new categories are developed.

What's Next

- Next meeting scheduled for June 28th from 1:00 to 3:00 PM here in Boston.
 - Main topic of discussion will be to come up with a proposal for the wording that could be used in ASTM test procedures that will identify the approval process of non-generic equipment from alternate suppliers.



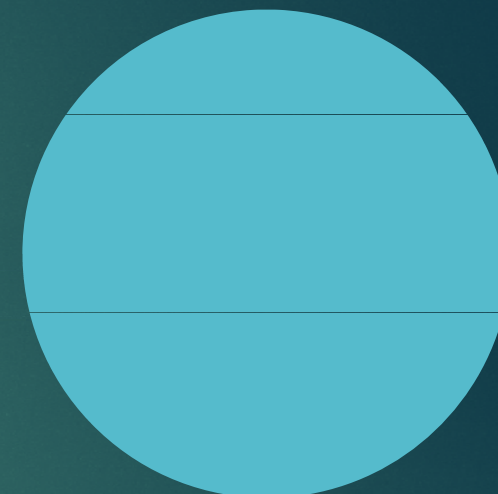
TGC – Fuels Task Force

TGC UPDATE

06-25-2017

Current Membership

Member	Company
Jim Matasic - Chair	Lubrizol
Bob Campbell	Afton
Mark Cooper	Chevron Oronite
Mark Sutherland	TEI
Frank Farber	TMC
Pat Lang	SwRI
Mark Overaker	Haltermann
Jim Moritz	IAR
Bill Buscher	IAR
Al Lopez	IAR
Mike Lochte	SwRI
Jim Linden	
Mike Madalian	Infineum
Nancy Somers	GM
Tim Cushing	GM
Jason Bowden	OHT
Chris Taylor	VP
Greg Miranda	LZ
Patrick Joyce	LZ
Matt Bowden	OHT
Rebecca Monroe	GM
Svetlana Kroll	SwRI
Jonathan VanScoyoc	CPChem
Marissa Macagnone	BASF
Jim Carter	Gage



January 31, 2017 Teleconference

- ▶ Task Force Reviewed Scope and Objectives
 - ▶ Current versions on next two slides
- ▶ Action Items
 - ▶ Mark Overaker to work with other fuel suppliers and TMC to develop a statement around IP
 - ▶ TGC to work with Mark Overaker, Rich Grundza, and Frank Farber to understand what we do today for fuel batches
 - ▶ TGC Fuels Task Force to work on recommendation for fuel batch handling going forward
 - ▶ TGC Fuels Task Force needs to create outline of standards for severity, batches, timing, etc that can be used by surveillance panels
 - ▶ Chris Taylor, Mark Overaker, Mark Cooper, and Mike Lochte to look at CofA's (using PC-9 as a start)

TGC Fuels Task Force - Scope

The scope of this task force is to create a document including best practices for HD and PC test fuel monitoring, handling, storage, and supply. The task force also needs to establish mechanisms for single and multiple source supply.

TGC Fuels Task Force - Objectives

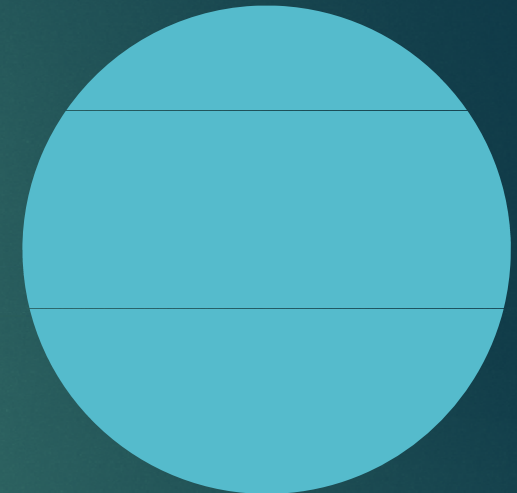
1. Maintain a data depository for all test fuel data, located in the TMC website. This should include test fuel formulation details (similar to reference oils) and create a procedure to indicate when significant changes occur in a test fuel formulation.
2. Develop test fuel monitoring plans, include what to analyze (what are key parameters) and how to determine what properties of the test fuel affect the parameters the lubricant test is evaluating. Define what a "batch" is.
3. Establish best practices for test fuel transporting, handling, and storage at the suppliers and laboratories.
4. Develop robust back up plans to account for lack of supply, natural disasters, raw material shortages, etc. From original supplier or alternative suppliers.
5. Include test fuel as critical parameter and test fuel suppliers as partners at the start of test development. Start out with multiple supply scenarios in new procedures.
6. Look to reduce the amount of industry test fuels and reduce storage complexity for labs.
7. Develop alternative supplier standards for test fuel across lubricant testing procedures.

March 22, 2017 Teleconference

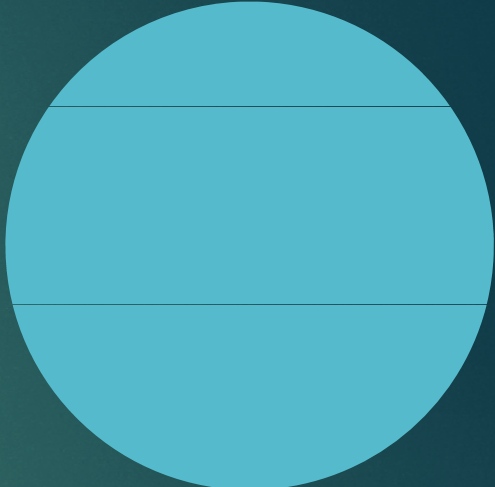
- ▶ Jim Matasic reviewed open action items from 1-31-17 teleconference
- ▶ A review of notes from Mark Overaker based on his 1-31-17 action items
- ▶ Mike Lochte reviewed fuel analysis and his action items from 1-31-17
 - ▶ Jim Moritz brought up question regarding IP on this analysis
- ▶ Action Items
 - ▶ Haltermann, VP, Chevron Phillips to review Mike Lochte's analysis and be prepared to discuss any concerns with it being public information moving forward
 - ▶ Entire Task Force to review Mark and Mike's info and be prepared to discuss further at the next meeting

May 23, 2017 Teleconference

- ▶ Mark Overaker presented on COA's for PC Fuels/EEE (presentation in Appendix 1)
 - ▶ Add D5769 (Aromatics)
 - ▶ Add D6750 (Olefins)
 - ▶ Include ranges for aromatics C6 C10+
 - ▶ Report to TMC
 - ▶ Evaluate data
 - ▶ Labs/suppliers would run analysis on new batch of fuel and load data to TMC
 - ▶ Data available like LTMS info
 - ▶ Starting point for future specs, etc
- ▶ BASF
 - ▶ LCTWG Letter (Appendix 2)
- ▶ Action Items
 - ▶ TMC to create a report form for suppliers to upload data
 - ▶ Standardized form for all fuels
 - ▶ Need to get EEE supplier in Europe onboard as well
 - ▶ TGC Fuels Task Force attendance
 - ▶ Mike Lochte will conduct poll of fuel suppliers whether they are willing to publicly share this data



Appendix 1



Fuel C of A's

THE NEED TO ENHANCE ANALYTICAL REPORTING

PREPARED BY:

MARK OVERAKER, HALTERMANN SOLUTIONS™

MIKE LOCHTE, SWRI

Fuel CofA's

- Action Items from TGC Fuels Task Force
 - Can panels determine what should be listed (on CofA)?
 - What, if any, are the drivers affecting test variability?
 - Is there a method to determine if fuel effects are present?
 - Need to go beyond what is currently on the C of A's
 - Current CofA's measure physical properties of the fuel
 - Current CofA's are limited with respect to fuel composition
 - Several routes to produce fuels that satisfy the specifications, but specifications do not define "how" the fuel should look.....

Fuel CofA's

- Current look is at Physical Properties
 - Limited view of the actual fuel composition
 - Reporting focused on “historically” accepted values
 - Difficult to ascertain meaningful “changes” in fuel that:
 - May affect test results
 - Shifts in severity
 - Increased test variability
 - Not consistent with other measurement activities

Fuel CofA's

Partial CofA for EEE Lube

TEST	METHOD	UNITS	HALTERMANN Specs			RESULTS	RESULTS	RESULTS
			MIN	TARGET	MAX			
Distillation - IBP	ASTM D86 ²	°C	23.9		35.0	31.6	31.3	32.3
5%		°C				41.7	46.8	45.6
10%		°C	48.9		57.2	49.8	53.2	52.4
20%		°C				61.6	63.3	62.1
30%		°C				74.1	75.8	73.6
40%		°C				90.8	91.7	89.3
50%		°C	93.3		110.0	103.5	104.3	103.3
60%		°C				110.0	111.5	110.7
70%		°C				115.9	117.6	116.6
80%		°C				126.1	128.5	126.8
90%		°C	151.7		162.8	156.2	161.2	159.5
95%		°C				170.5	177.6	172.7
Distillation - EP		°C			212.8	205.1	202.3	202.9
Recovery		vol %		Report		96.1	97.5	97.4
Residue		vol %		Report		1.1	1.1	1.3
Loss		vol %		Report		2.8	1.4	1.3
Gravity @ 60°F/60°F	ASTM D4052 ¹	°API	58.7		61.2	59.22	59.1	58.9
Density @ 15° C	ASTM D4052 ¹	kg/l	0.734		0.744	0.7417	0.742	0.743
Reid Vapor Pressure	ASTM D5191 ¹	kPa	60.1		63.4	62.3	63.4	60.6
Composition, aromatics	ASTM D1319 ²	vol %	26.0		32.5	30.2	31.7	29.3
Composition, olefins	ASTM D1319 ²	vol %			10.0	0.4	0.9	3.0
Composition, saturates	ASTM D1319 ²	vol %		Report		69.4	67.3	67.7
Research Octane Number	ASTM D2699 ²		96.0			96.2	97.2	97.9
Motor Octane Number	ASTM D2700 ²			Report		88.4	88.9	89.3
Sensitivity	D2699/2700 ²		7.5			7.8	8.3	8.6
Net Heating Value, btu/lb	ASTM D3338 ²	btu/lb		Report		18450	18438	18464
Net Heating Value, btu/lb	ASTM D240 ²	btu/lb		Report		18332	18475	18532

Fuel CofA's

- What new approach should we consider?
 - Compositional view important
 - Aromatics and olefins – best place to start
 - Current method, D1319, limited in scope
 - *ASTM D1319 - Standard Test Method for Hydrocarbon Types in Liquid Petroleum Products by Fluorescent Indicator Adsorption*
 - Reports total saturates, olefins, and aromatics
 - Does not quantify carbon length – only family/functional group

Fuel CofA's

- So how do we enhance compositional view?
 - Gather data for evaluating aromatic composition using:
 - *ASTM D6729 - Standard Test Method for Determination of Individual Components in Spark Ignition Engine Fuels by 100 Meter Capillary High Resolution Gas Chromatography*
 - *ASTM D5580 - Standard Test Method for Determination of Benzene, Toluene, Ethylbenzene, p/m-Xylene, o-Xylene, C9 and Heavier Aromatics, and Total Aromatics in Finished Gasoline by Gas Chromatography*
 - *ASTM D5769 - Standard Test Method for Determination of Benzene, Toluene, and Total Aromatics in Finished Gasolines by Gas Chromatography/Mass Spectrometry*

Fuel CofA's

- Focus on accuracy - aromatics first
- Using EEE Lube as the fuel, we
 - Ran DHA's , ASTM D6729 on three batches of fuel
 - Results obtained from two Labs on the three batches of EEE
 - PONA data from DHA questionable. Results not consistent with fuel recipe.
 - Aromatics over reported in all cases
 - Overall average total aromatics 37.19%
 - Expected range 32.5 – 34.5

Tank 111
D6729 PONA results

Functional Group	Expected % range from formula	D6729 Lab A	D6729 Lab B	Average
Iso-P	51 - 53	47.31	51	49.16
Normal-P	8 - 10	9.44	9.1	9.27
Napthenes	3 - 5	1.89	2.27	2.08
Olefins	<1	0.17	0.01	0.09
Aromatics	32.5 - 34.5	39.1	35.44	37.27
Unidentified		2.11	2.18	2.15
Total		100.02	100.00	100.01

Tank 122
D6729 PONA results

Functional Group	Expected % range from formula	D6729 Lab A	D6729 Lab B	Average
Iso-P	51 - 53	49.8	52.35	51.08
Normal-P	8 - 10	6.9	6.41	6.66
Napthenes	3 - 5	3.38	3.48	3.43
Olefins	<1	0.13	0	0.07
Aromatics	32.5 - 34.5	38.23	35.77	37.00
Unidentified		1.55	2	1.78
Total		99.99	100.01	100.00

Tank 133
D6729 PONA results

Functional Group	Expected % range from formula	D6729 Lab A	D6729 Lab B	Average
Iso-P	51 - 53	46.43	49.60	48.02
Normal-P	8 - 10	9.14	8.90	9.02
Napthenes	3 - 5	3.60	3.80	3.70
Olefins	<1	0.12	0.02	0.07
Aromatics	32.5 - 34.5	39.00	35.60	37.30
Unidentified		1.70	2.02	1.86
Total		99.99	99.94	99.97

Average Overall Total Aromatic Content
37.19%
Expected Total Aromatic Content
32.5 – 34.5%

Fuel CofA's

- Focus on accuracy - aromatics first
 - ASTM D5580 - Standard Test Method for Determination of Benzene, Toluene, Ethylbenzene, p/m-Xylene, o-Xylene, C9 and Heavier Aromatics, and Total Aromatics in Finished Gasoline by Gas Chromatography
 - Results obtained from three Labs on the batches of EEE fuel
 - Analytical data inconsistent with fuel recipe.

C6 aromatics (benzene)	<1
C7 aromatics (toluene)	20.0 - 21.5
C8 aromatics	.5 - 1.0
C9 aromatics	8.5 - 10.0
C10+ aromatics	2.0 - 3.0
Total Aromatics	32.5 - 34.5

- Overall average 33.7% Total Aromatics, BUT
- No C10+ aromatics reported.....

Tank 111
D5580 GC results

Tank 122
D5580 GC results

Tank 133
D5580 GC results

Aromatic Content % vol	Expected % range from formula	Lab A	Lab B	Lab C	Average	Aromatic Content % vol	Expected % range from formula	Lab A	Lab B	Lab C	Average	Aromatic Content % vol	Expected % range from formula	Lab A	Lab B	Lab C	Average
C6 aromatics (benzene)	<1	0.06	0.04	<0.1	0.05	C6 aromatics (benzene)	<1	0.03	0.01	<0.1	0.02	C6 aromatics (benzene)	<1	0.07	0.04	<0.1	0.06
C7 aromatics (toluene)	20.0 - 21.5	18.48	20.81	20.96	20.08	C7 aromatics (toluene)	20.0 - 21.5	21.2	21.36	21.79	21.45	C7 aromatics (toluene)	20.0 - 21.5	20.52	20.95	21.01	20.83
C8 aromatics	.5 - 1.0	0.82	0.84	0.86	0.84	C8 aromatics	.5 - 1.5	0.83	0.77	0.78	0.79	C8 aromatics	.5 - 1.5	1.0	0.96	0.96	0.97
C9 aromatics	8.5 - 10.0	10.96	10.88	12.13	11.32	C9 aromatics	8.5 - 10.0	12.7	11.42	12.67	12.26	C9 aromatics	8.5 - 10.0	12.28	11.10	12.26	11.88
C10+ aromatics	2.0 - 3.0					C10+ aromatics	2.0 - 3.0					C10+ aromatics	2.0 - 3.0				
Total Aromatics	32.5 - 34.5	30.32	32.57	34.02	33.30	Total Aromatics	32.5 - 34.5	34.76	33.56	35.29	34.54	Total Aromatics	32.5 - 34.5	33.87	33.05	34.28	33.73

Average Overall Total Aromatic Content
33.37%
Expected Total Aromatic Content
32.5 - 34.5%

Fuel CofA's

- Focus on accuracy - aromatics first
 - Ran ASTM D5769, Standard Test Method for Determination of Benzene, Toluene, and Total Aromatics in Finished Gasolines by Gas Chromatography/Mass Spectrometry, on three batches of fuel
 - Results obtained from three Labs on the EEE fuel
 - Analytical data consistent with fuel recipe.

C6 aromatics (benzene)	<1
C7 aromatics (toluene)	20.0 - 21.5
C8 aromatics	.5 - 1.0
C9 aromatics	8.5 - 10.0
C10+ aromatics	2.0 - 3.0
Total Aromatics	32.5 - 34.5

- Overall average 33.22 % Total Aromatics
- A more complete look at the fuel's aromatic composition....

Tank 111
D5769 Mass Spec results

Tank 122
D5769 Mass Spec results

Tank 133
D5769 Mass Spec results

Aromatic Content % vol	Expected % range from formula	Lab A	Lab B	Lab C	Average	Aromatic Content % vol	Expected % range from formula	Lab A	Lab B	Lab C	Average	Aromatic Content % vol	Expected % range from formula	Lab A	Lab B	Lab C	Average
C6 aromatics (benzene)	<1	0.08	0.07	<0.1	0.08	C6 aromatics (benzene)	<1	0.05	0.03	<0.1	0.04	C6 aromatics (benzene)	<1	0.08	0.07	<0.1	0.08
C7 aromatics (toluene)	20.0 - 21.5	21.41	19.59	20.76	20.59	C7 aromatics (toluene)	20.0 - 21.5	21.87	20.27	21.33	21.16	C7 aromatics (toluene)	20.0 - 21.5	21.21	19.81	20.98	20.67
C8 aromatics	.5 - 1.0	0.81	0.79	0.86	0.82	C8 aromatics	.5 - 1.5	0.74	0.71	0.59	0.68	C8 aromatics	.5 - 1.5	0.90	0.90	0.74	0.85
C9 aromatics	8.5 - 10.0	9.13	9.26	9.43	9.27	C9 aromatics	8.5 - 10.0	8.95	9.04	9.18	9.06	C9 aromatics	8.5 - 10.0	9.19	9.56	9.61	9.45
C10+ aromatics	2.0 - 3.0	2.02	1.98	2.16	2.05	C10+ aromatics	2.0 - 3.0	2.67	2.57	2.83	2.69	C10+ aromatics	2.0 - 3.0	2.10	2.05	2.23	2.13
Total Aromatics	32.5 - 34.5	33.45	31.69	33.17	32.77	Total Aromatics	32.5 - 34.5	34.28	32.62	34.12	33.67	Total Aromatics	32.5 - 34.5	33.48	32.39	33.79	33.22

Average Overall Total Aromatic Content

32.99%

Expected Total Aromatic Content

32.5 - 34.5%

Method Comparison -Total Aromatics and Carbon Numbers.....

Tank 111
Method comparison

Aromatic % vol	Average D6729	Average D5580	Average D5769
C6 aromatics (benzene)	0.06	0.05	0.08
C7 aromatics (toluene)	23.24	20.08	20.59
C8 aromatics	0.86	0.84	0.82
C9 aromatics	9.53	11.32	9.27
C10+ aromatics	3.01		2.05
Total Aromatics	36.70	33.30	32.77

Tank 122
Method comparison

Aromatic % vol	Average D6729	Average D5580	Average D5769
C6 aromatics (benzene)	0.03	0.02	0.04
C7 aromatics (toluene)	23.23	21.45	21.16
C8 aromatics	0.77	0.79	0.68
C9 aromatics	9.18	12.26	9.06
C10+ aromatics	3.23		2.69
Total Aromatics	36.43	34.54	33.67

Tank 133
Method comparison

Aromatic % vol	Average D6729	Average D5580	Average D5769	Expected Range
C6 aromatics (benzene)	0.06	0.06	0.08	<1
C7 aromatics (toluene)	23.11	20.83	20.67	20.0 - 21.5
C8 aromatics	0.96	0.97	0.85	.5 - 1.0
C9 aromatics	9.63	11.88	9.45	8.5 - 10.0
C10+ aromatics	2.94		2.13	2.0 - 3.0
Total Aromatics	36.70	33.73	33.22	32.5 - 34.5

C6 aromatics (benzene)	<1
C7 aromatics (toluene)	20.0 - 21.5
C8 aromatics	.5 - 1.0
C9 aromatics	8.5 - 10.0
C10+ aromatics	2.0 - 3.0
Total Aromatics	32.5 - 34.5

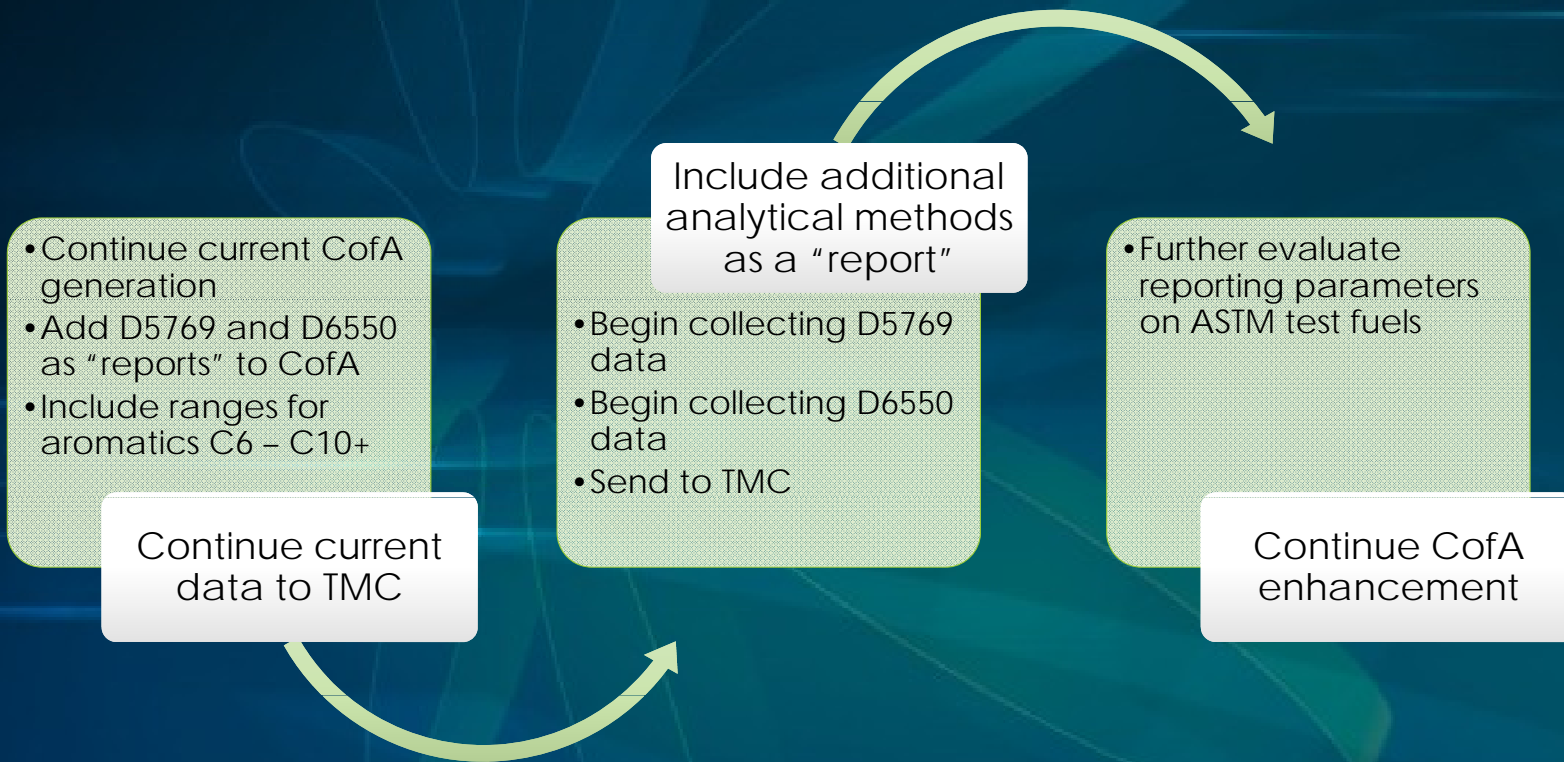
Fuel CofA's Total Aromatics.....

- ASTM D5769 reports aromatics most accurately
 - Mass spec technology
 - Reports thru C10+
 - More consistent reporting of C6 – C10+ and total aromatics.
- ASTM D5580 limited reporting.
 - Ends at C9's.....
- ASTM D6729 DHA
 - Least accurate for reporting toluene and total aromatic concentration.
 - Coelution issues – report based on retention times

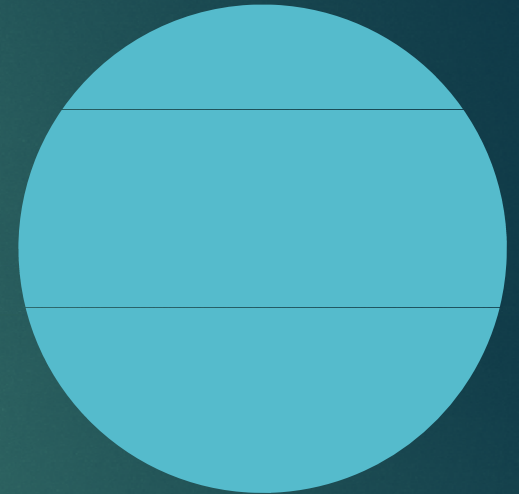
Fuel CofA's Olefin Concentration.....

- ASTM D6550 Standard Test Method for Determination of Olefin Content of Gasolines by Supercritical-Fluid Chromatography
 - Will result in a more accurate total olefin report
 - EEE Lube is a low olefin fuel (expect <1 %)
 - All 6 (3 results from 2 Labs) results less than 1%

Fuel CofA's



Appendix 2





Sent via email
December 5, 2016

To: Joe Franklin: ASTM D02.B0 Automotive Lubricants Chair (joe.franklin@intertek.com)
Steven Kennedy: ASTM D02.B0.08 Test Monitoring Center Executive Committee Chair (steven.kennedy@exxonmobil.com)
Patrick Lang: ASTM Technical Guidance Committee Chair (patrick.lang@swri.org)

RE: Equivalent / Replacement of Non-Generic Equipment

The Lubricant Category Testing Work Group (LCTWG), working at the behest of ACC PAPTG, continues to engage industry stakeholders on how ASTM tests procedures address material substitution and procurement of materials. LCTWG remains interested in both a materials procurement process and the ongoing management thereof. The content of this letter pertains to the use of non-generic equipment (apparatus, solvents or other materials) used in the practice of ASTM automotive lubricant engine test methods.

LCTWG fully supports ASTM International's policy "...to encourage the development of test methods based on generic equipment"¹. Although there may be an opportunity for more robust discussion regarding the use of generic and non-generic equipment/materials within lubricant engine test development Task Forces, LCTWG recognizes circumstances exist in which non-generic equipment / material is required.

Facts For Members² Attachment 4, Section 7 details the procedure for listing of equivalent / replacement equipment, however it does not describe a "testing mechanism" which is mentioned in 3.1.4, and 4.1.2. Section 7 informs steps post-testing, but does not offer any guidance on the testing itself. Industry stakeholders (especially surveillance panels and suppliers interested in supporting ASTM test methods) would benefit from equivalency testing guidelines to clarify protocols and ensure consistency (under technically similar circumstances).

LCTWG proposes that surveillance panels review and summarize historical meeting minutes (from the past 5 years or whatever is permissible under your retention policy) detailing testing conducted to replace non-generic equipment/materials with those from a different supplier. From this exercise, it is believed technical guidelines can be drawn up, based on consensus best practices, for replacement apparatus, parts (e.g. ring, liners, bearings, valve-train), reference oils, and fuel.

We look forward to comments from the committees you chair.

Regards,

¹ Section 15/ Regulations Governing ASTM International Technical Committees, March 2010, and Sections F3 and F4, Form and Style for ASTM International Standards, March 2010

² Facts For Members ASTM International Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants, December 2014



Equivalent / Replacement of Non-Generic Equipment
December 5, 2016
Page 2

James Booth
James Booth
ACC LCTWG Chair, PAPTG vice-Chair

Doug Anderson
Doug Anderson
ACC PAPTG Manager



Test Monitoring Center Report

- ▶ June 26, 2017
 - ▶ Boston, MA

2017 Matrix Programs

- *IVB – 2017 Ongoing – Paused*
- *VH – 2017 Finished*
- *IIIF/IIIH Matrix Finished*
- *VID/VIE Matrix Ongoing*
- *GF-6 BOI/VGRA Matrices Late 2017*

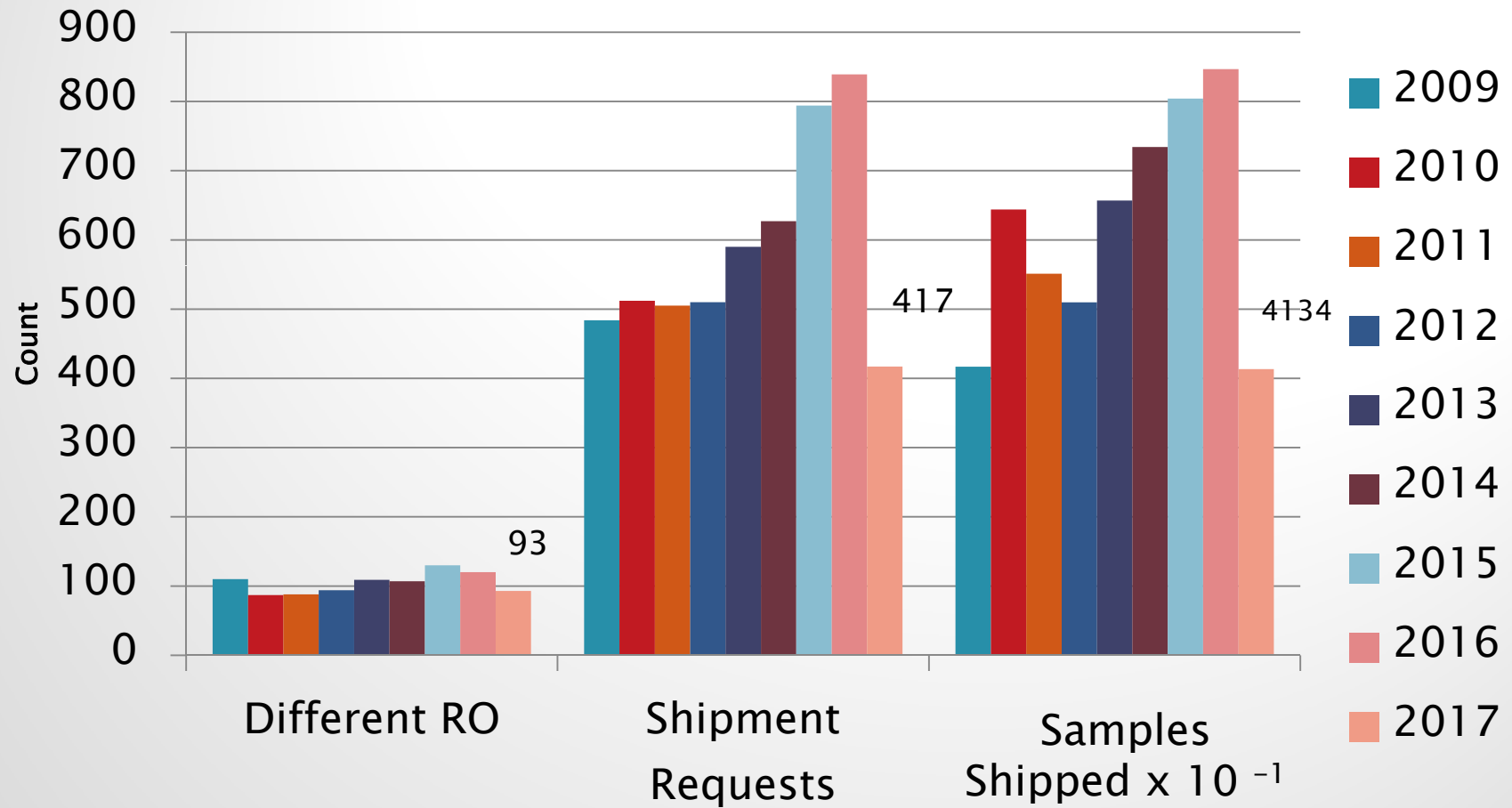
17 Information Letters Passed Sub B Ballot

Test Area	No.	Issued	Subject
ISM	16-3	20161027	New IAS Mass Loss Correction Factor
DD13	16-1	20161202	DD13 Clarification on Hours to Scuff
L-33-1	16-3	20161220	Editorial revisions to wording adopted for introduction of American Axle K2XX hardware
VIE	17-1	20170131	<ol style="list-style-type: none"> 1. Stand for Engine Break-in 2. Changes to Calibration Frequencies in Table 7
VIE	17-2	20170301	Correction to Calibration Period
T-12	17-1	20170307	VXYPD Hardware Correction Factors Update
IIIH	17-1	20170322	<ol style="list-style-type: none"> 1. Use of Fans on Exhaust Manifolds 2. Correction to Figure A3.1 Blowby Canister Mounting 3. Insulating of Blowby System
OSCT	17-1	20170411	<ol style="list-style-type: none"> 1. Cutting of pre-test elongation specimens 2. Standardization of separation washer size 3. Standardization of hanger hole size 4. Standardization of specimen marking method 5. Standardization of location for specimen hardness measurement 6. Clarification on post-test cooling period prior to result measurement 7. Computation of test result averages and standard deviations
EOEC	17-1	20170412	New Reference Oil Light Duty Polyacrylate Elastomer Correction Factor for Volume Change
COAT	17-1	20170414	Test Number Change
IIIF	17-1	20170426	Re-Use of Rocker Arm OHT3F-058-1
IIIG	17-1	20170426	Re-Use of Rocker Arm OHT3F-058-1
EOEC	17-2	20170427	Light Duty Polyacrylate Elastomer Correction Factor for Volume Change ACM1-20
IIIH	17-2	20170501	Calibration Periods and Test Numbering
IIIF	17-2	20170511	Honing Machine Calibration Frequency
IIIG	17-2	20170511	Honing Machine Calibration Frequency
CBT	17-1	20170518	Removal of Evaporation Weight Loss Measurement

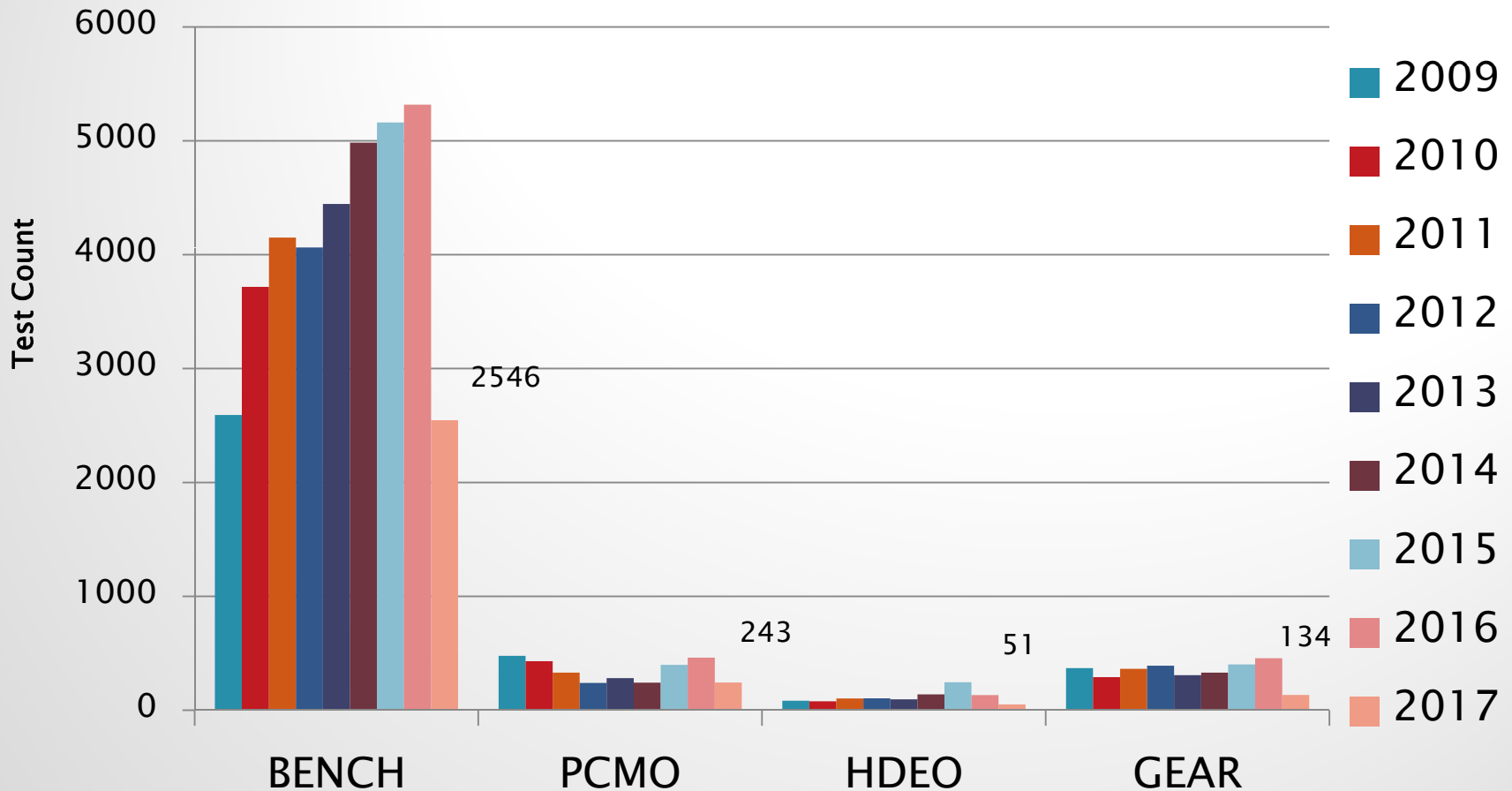
Reference Oil Procurement

Type	Oil Code	Quantity (drums)
Sequence IVB	1012	40
Service Fluid 105	SFPILOT	2
C13	831-4	32
TEOST	75-1	1
OSCT	171 (160 Replacement)	1
VG	1009-1	19

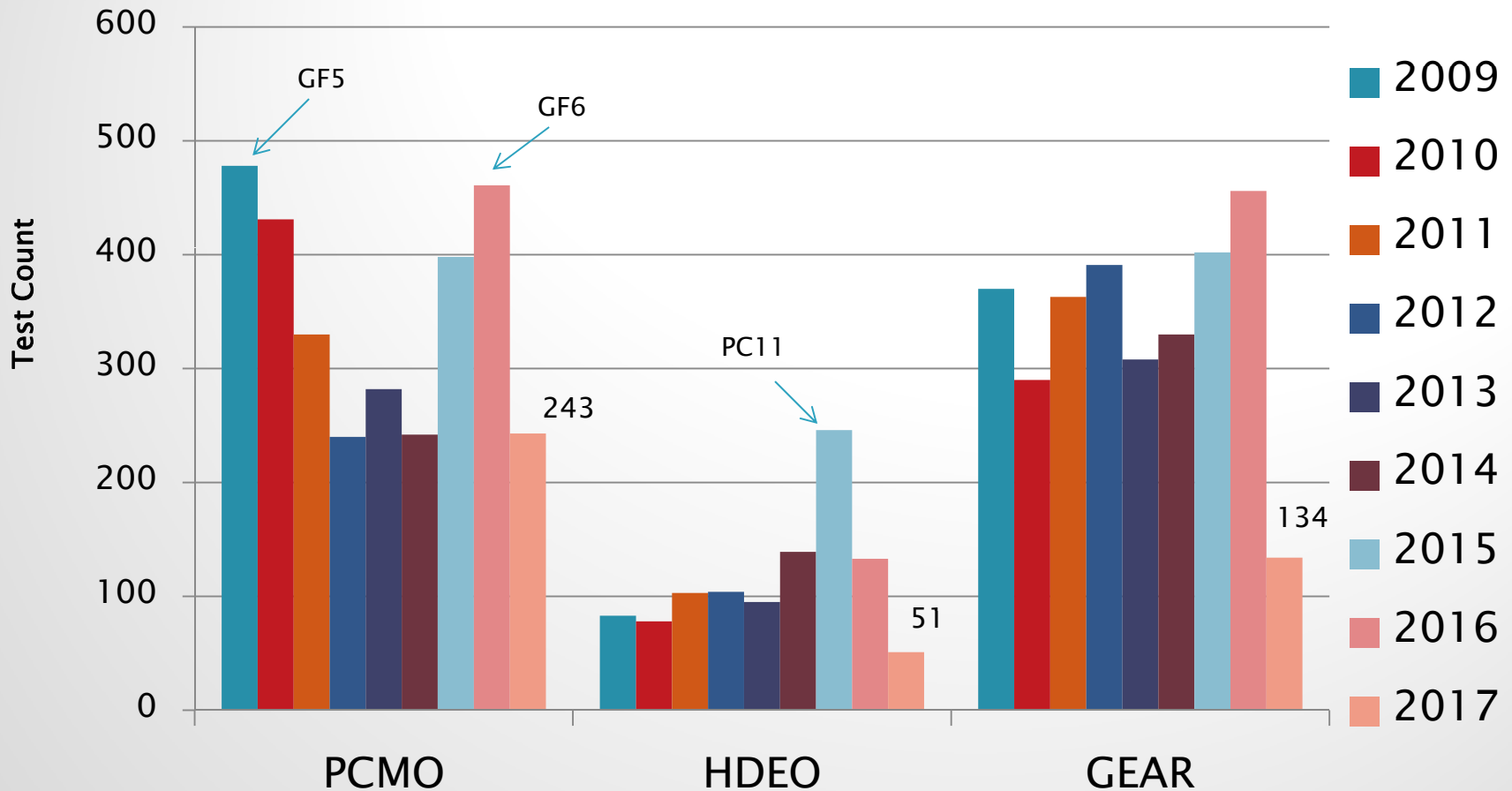
Reference Oil Shipment Overview



Reference Test Activity



Reference Test Activity



1006-2 Status

- ▶ TMC Inventory of 1006-2 is at 1800 gallons
 - It can not be re-blended (Group I basestock not available)
- ▶ 1.0-year usage
 - SF105 238 gallons
 - Specified in ASTM D471 & GM Standards
 - EOEC/LDEOC 264 gallons
 - IVA/VG/VIII 60 gallons
 - Total 562 gallons
- ▶ Estimated Life >24 months

1006 Replacement Task Force

- ▶ LDEOEC and HDEOEC scoping of RO 1006 clones – Completed
- ▶ Best clone selected
- ▶ Blend a drum or two for more extensive evaluation
 - Update ASTM classification and surveillance panels to develop further test plans and acceptance
 - Update SAE and OEM / Elastomer stakeholders
- ▶ Clone @ TMC 44 gallons

Workshop Group Formation

- ▶ Bob Campbell has graciously volunteered to be chairman.
- ▶ First call had favorable participation from raters and engineering representatives.

Regulations Revision Ballot

▶ REGULATIONS GOVERNING THE ASTM TEST MONITORING SYSTEM

Under Director's responsibilities

- *6.3.12 On approval of surveillance panels, facilitate, develop and oversee contracts desired by the industry to source test fuels and parts.*

Two Cycle Oils TCII & TCIII

- ▶ Reference oils 604-1 and 605 are showing degradation/dropout
- ▶ TCII: 604-1 received in 1989
- ▶ TCIII: 605 -1 received in 1992

- ▶ TCII D4863 Lubricity
- ▶ TCIII D4858 Pre-ignition