



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

Phone 610.832.9500
Fax 610.832.9666
Web www.astm.org

Committee D02 on PETROLEUM PRODUCTS AND LUBRICANTS

Chairman: KENNETH O. HENDERSON, Cannon Instrument Co., 2139 High Tech Road, State College, PA 16803, (814) 353-8000, Fax: (814) 353-8007, e-mail: kenohenderson@worldnet.att.net
First Vice-Chairman: BEN R. BONAZZA, TI Group Automotive Systems, Caro Research Center, 326 Green Street, Caro, MI, 48723 (989) 673-8181 ext. 227, Fax: (989) 673-3241, e-mail: bbonazza@us.tiauto.com
Second Vice-Chairman: JANET L. LANE, ExxonMobil Research & Engrg., 600 Billingsport Rd, Paulsboro, NJ 08066-0480 (856) 224-3302, Fax: (856) 224-3616, e-mail: janet.l.lane@exxonmobil.com
First Secretary: RALPH A. CHERRILLO, Shell Global Solutions (US) Inc., Westhollow Tech Ctr., 3333 Highway 6 South, Houston, TX 77082 (281) 544-8789, Fax: (281) 544-8150, e-mail: ralph.cherrillo@shell.com
Second Secretary: MICHAEL A. COLLIER, Petroleum Analyzer Co. LP, PO Box 206, Wilmington, IL 60481, (815) 458-0216, Fax: (815) 458-0217, e-mail: macvarlen@aol.com
Staff Manager: DAVID R. BRADLEY, (610) 832-9681, Fax: (610) 832-9668, e-mail: dbradley@astm.org

Originally Issued: September 28, 2010

Reply to: Jeff Clark
Test Monitoring Center
6555 Penn Avenue
Pittsburgh, PA 15206
412-365-1032
jac@astmtmc.cmu.edu

Unapproved Minutes of the September 22, 2010 Mack Test Surveillance Panel Meeting Paulsboro, NJ

The meeting was called to order at 8:40 am by Chairman Mark Cooper. The agenda is shown as **Attachment 1**. The attendance is show in **Attachment 2**. No membership changes were announced.

Meeting Minutes

The minutes of previous meetings were approved without objection (Clark, Campbell).

T-12 A Test Targets

Jeff Clark updated the panel on the status of the T-12A. The ballot cleared with no negatives and the test now exists. Monitoring is ready to be in place, but in a flurry of excitement at the May meeting, the panel approved test targets for the wrong oil. Jim Rutherford presented a quick analysis for the correct oil (821 and reblends). The presentation is included as

Attachment 3. Based on the presentation, Greg Shank moved (Jim Moritz second) the outlier screened targets (mean = 11736; std. dev. = 331). The motion was approved 9-0-1.

CPD Report

The CPD report was given by Zack Bishop of TEI (**Attachment 4**).

ChevronPhillips PC-9 Plus Fuel Update

Tom Wingfield gave a presentation regarding the status of PC-9 fuel (**Attachment 5**). Tom presented sample (sanitized to protect intellectual property) graphs of fuel properties that changed over time and an executive summary and conclusion of his findings. He noted two things: the fuel will be within the PC-9 spec, and the fuel will be more like the PC-9 fuel of five years ago. Mark Cooper also presented a graph (**Attachment 6**). It was noted that CPC will work with the TMC so that the IP sensitive properties are still kept at the desired level for each fuel batch. Tom also mentioned that fuel for the upcoming T-11 tests should be shipped by end of this week. Jeff will take the action of making sure all surveillance panels that use PC-9 fuel will be informed of the situation.

T-11 Industry Notification

Mark Cooper will notify industry stakeholder organizations of the progress on the T-11.

T-12 Extensions and Notifications

Mark Cooper and Jeff Clark will work on notifying industry organizations about the status of T-12 extensions. Ryan Johnson moved to add 60 days (or until new hardware is accepted) to current extensions (total of 150 days extension available). Jim Matasic second. During discussion, Jim Moritz expressed concern about his lab's situation, adding 60 days was too long a time. He felt shorter extension would add pressure to resolve the situation. Jeff expressed that as a panel we will continue to get into these types of situations if we keep experimenting with live references. The motion carried 7-0-3. Further discussion resulted in asking Jim Rutherford to re-examine the liner wear correction factor to see if it is still accurate.

T-12 Parts Analysis Update

Ken Goshorn and Greg Shank of Mack/Volvo led the discussion and took questions (**Attachment 7**). A long discussion of the ring analysis took place during which we were joined via teleconference by John Lahrman of Mahle. John was asked about differences (and whether or not they might be significant) noted in the traces: crown drop / barrel arc; smoothness; etc. John was asked if they could make more rings. John felt what was just made reflects normal process variation and wasn't sure what would be targeted for a new batch. A long discussion followed. After a lunch break, liner data was shown. Following the presentation, the discussion turned to next steps. Mark Cooper also presented information on T-12 oil consumption (**Attachment 8**). A wide ranging and drawn out discussion occurred, the result of which was the following:

Labs will run a T-12 reference oil test on T Batch hardware according to standard procedure to 150 hours and then stop until the panel makes a decision on potential oil adds needed to make it to end of test. A teleconference will be held on October 4th at 10:30 am to determine test start dates. If labs become aware that their test will start significantly later than early October, they are requested to notify the panel as soon as possible so that the conference call is not wasted time.

Review of T-12 Liner Wear Correction Factor

At the request of the panel, Jim Rutherford presented an updated analysis (**Attachment 9**) of the liner wear correction factor, which was originally set with 5 tests on R batch rings. The analysis raised the question as to whether or not the current correction factor is appropriate. Much discussion occurred and no action was taken on the correction factor; Mark Cooper will request liner data from ACC for further analysis.

The meeting adjourned at 4:10 p.m.

Attachment 1

Mack Surveillance Panel

**Proposed Meeting Agenda
Wednesday September 22, 2010
8:30 a.m. – 4:30 p.m.
Exxon Mobil Technical Center
Paulsboro, New Jersey**

Membership / Attendance	Mark Cooper
Approval of Previous Minutes	Mark Cooper
TMC Report	Jeff Clark
CPD / Parts Supply Update	Zack Bishop
Chevron Phillips PC-9 Plus Fuel Update	Tom Wingfield
T-12 Extension Notification	Mark Cooper
T-12 Parts Analysis Update	Greg Shank / Ken Goshorn
Path Forward with T-12 Parts	Group
T-11 LTMS	Todd Dvorak / Group
T-12 LTMS	Jim Rutherford / Group
Old Business / New Business	Mark Cooper
Next Meeting	Mark Cooper

Attachment 2

**Mack Test SP Meeting Attendance
Paulsboro, NJ
September 22, 2010**

Name	Company
Jim Moritz	Intertek
Jim Gutzwiller	Infineum
Zack Bishop	TEI
Jim Matasic	Lubrizol
Mark Cooper	ChevronOronite
Doyle Boese	Infineum
Tom Wingfield	ChevronPhillips
Chris Castanien	Lubrizol
Jim Rutherford	ChevronOronite
Jeff Clark	TMC
Mike Alessi	ExxonMobil
Greg Shank	Volvo Powertrain
Ken Goshorn	Volvo Powertrain
Ryan Johnson	SwRI
Riccardo Conti	ExxonMobil
Art Andrews	ExxonMobil
Bob Campbell	Afton
Todd Dvorak	Afton
Jim Carter	Haltermann
Andy Ritchie	Infineum

Joined Meeting Via Conference Call

Scott Richards	SwRI
Brad Carter	Intertek
John Larhman	Mahle

Attachment 3



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Mack T-12A Targets

**Presented to Mack Surveillance Panel
September 22, 2010
Jim Rutherford**

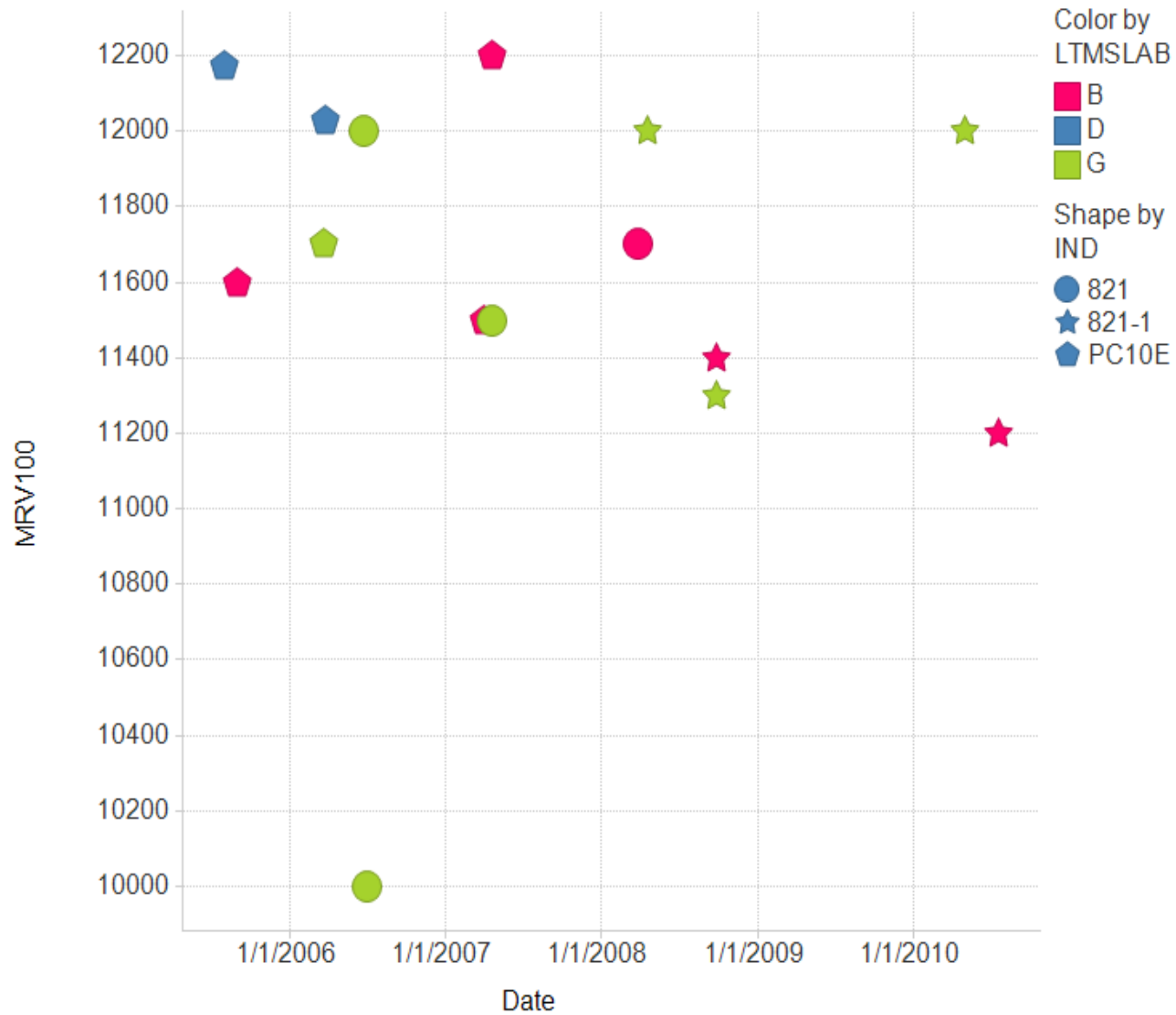
Summary

- Messed up again
- 15 results available with oils PC10E, 821, 821-1 and labs B, D, and G
- Differences among oils and labs were not significant
- One "outlier"?

	n	Target	Standard Deviation
With "outlier"	15	11620	550
Without "outlier"	14	11736	331



All Data

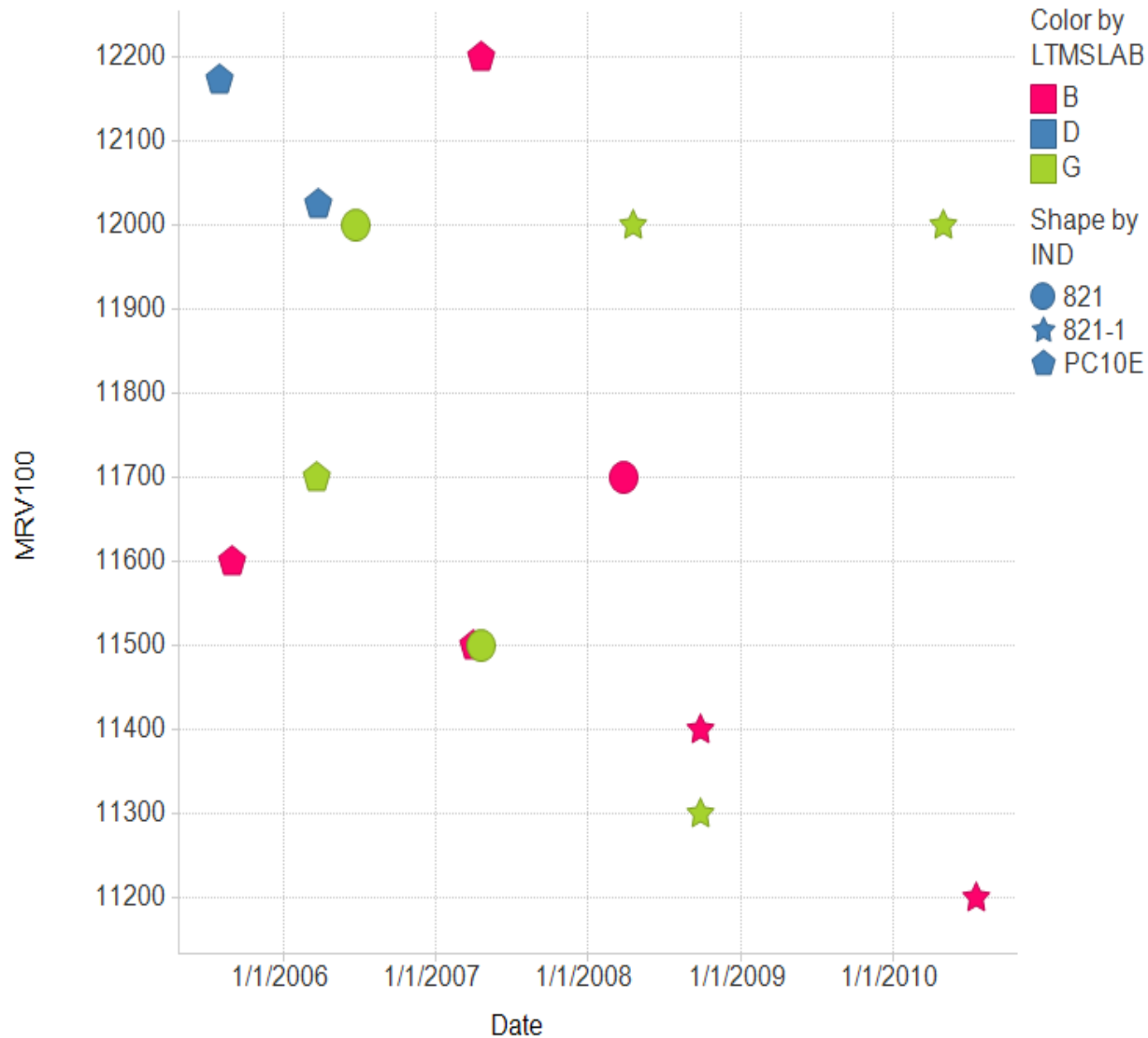


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Without "outlier"



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Analyses

Class	Levels	Values
IND	3	821 821-1 PC10E
LTMSLAB	3	B D G

Model	4	949522	237380	0.72	0.60
Error	10	3284323	328432		
Corrected Total	14	4233845			
R-Square	Coeff Var	Root MSE	MRV100 Mean		
0.22	4.9	573	11620		
Source	DF	Type III SS	Mean Square	F Value	Pr > F
IND	2	386481	193241	0.59	0.57
LTMSLAB	2	167348	83674	0.25	0.78
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	4	499568	124892	1.22	0.37
Error	9	922652	102517		
Corrected Total	13	1422219			
R-Square	Coeff Var	Root MSE	MRV100 Mean		
0.35	2.7	320	11736		
Source	DF	Type III SS	Mean Square	F Value	Pr > F
IND	2	123153	61576	0.60	0.57
LTMSLAB	2	275687	137843	1.34	0.31



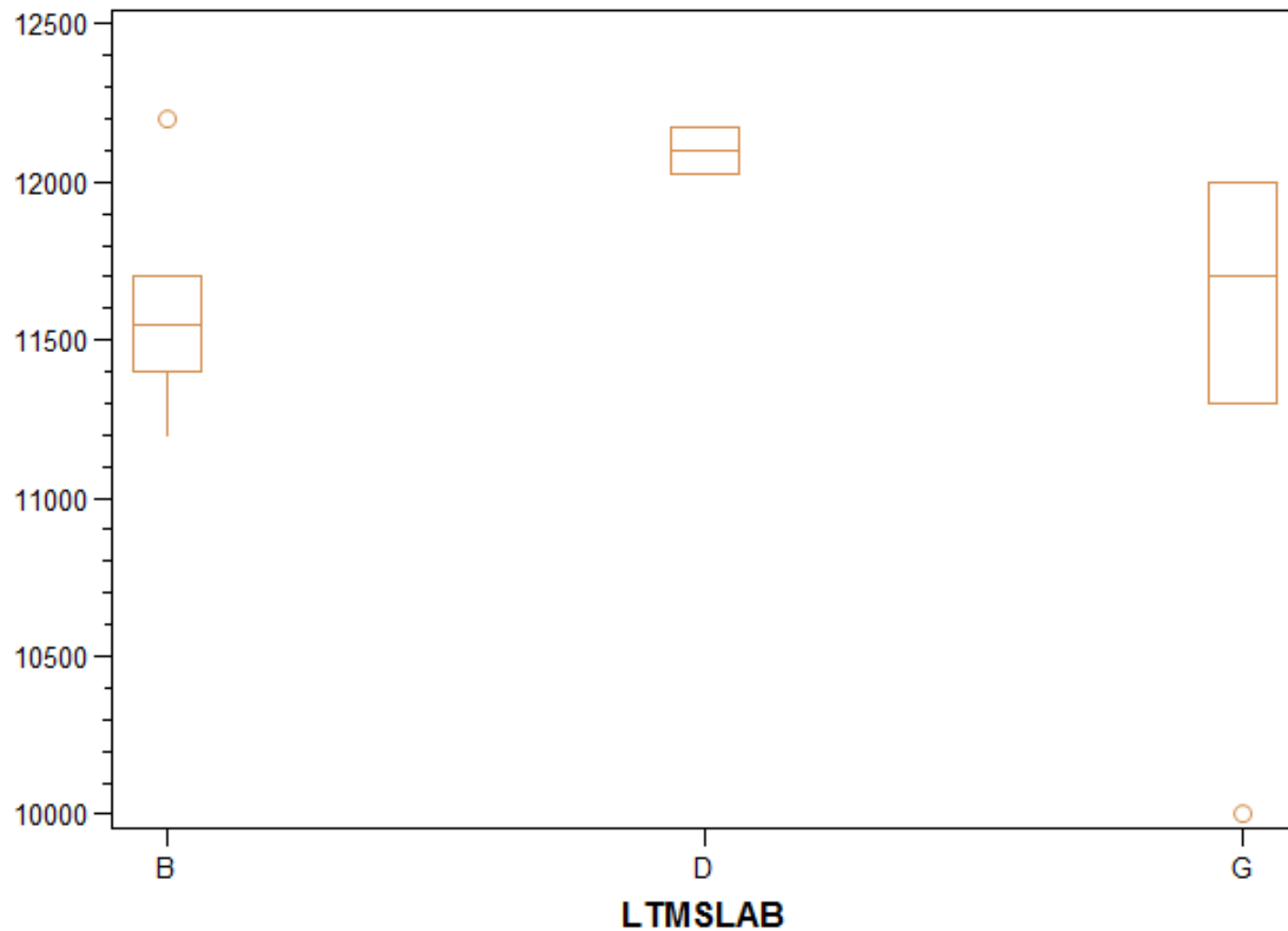
Descriptive Statistics

	Mean	Std Dev	Minimum	Maximum	N	Median
	11620	550	10000	12200	15	11700
LTMSLAB	Mean	Std Dev	Minimum	Maximum	N	Median
B	11600	341	11200	12200	6	11550
D	12100	104	12026	12173	2	12100
G	11500	716	10000	12000	7	11700
	Mean	Std Dev	Minimum	Maximum	N	Median
	11736	331	11200	12200	14	11700
LTMSLAB	Mean	Std Dev	Minimum	Maximum	N	Median
B	11600	341	11200	12200	6	11550
D	12100	104	12026	12173	2	12100
G	11750	302	11300	12000	6	11850



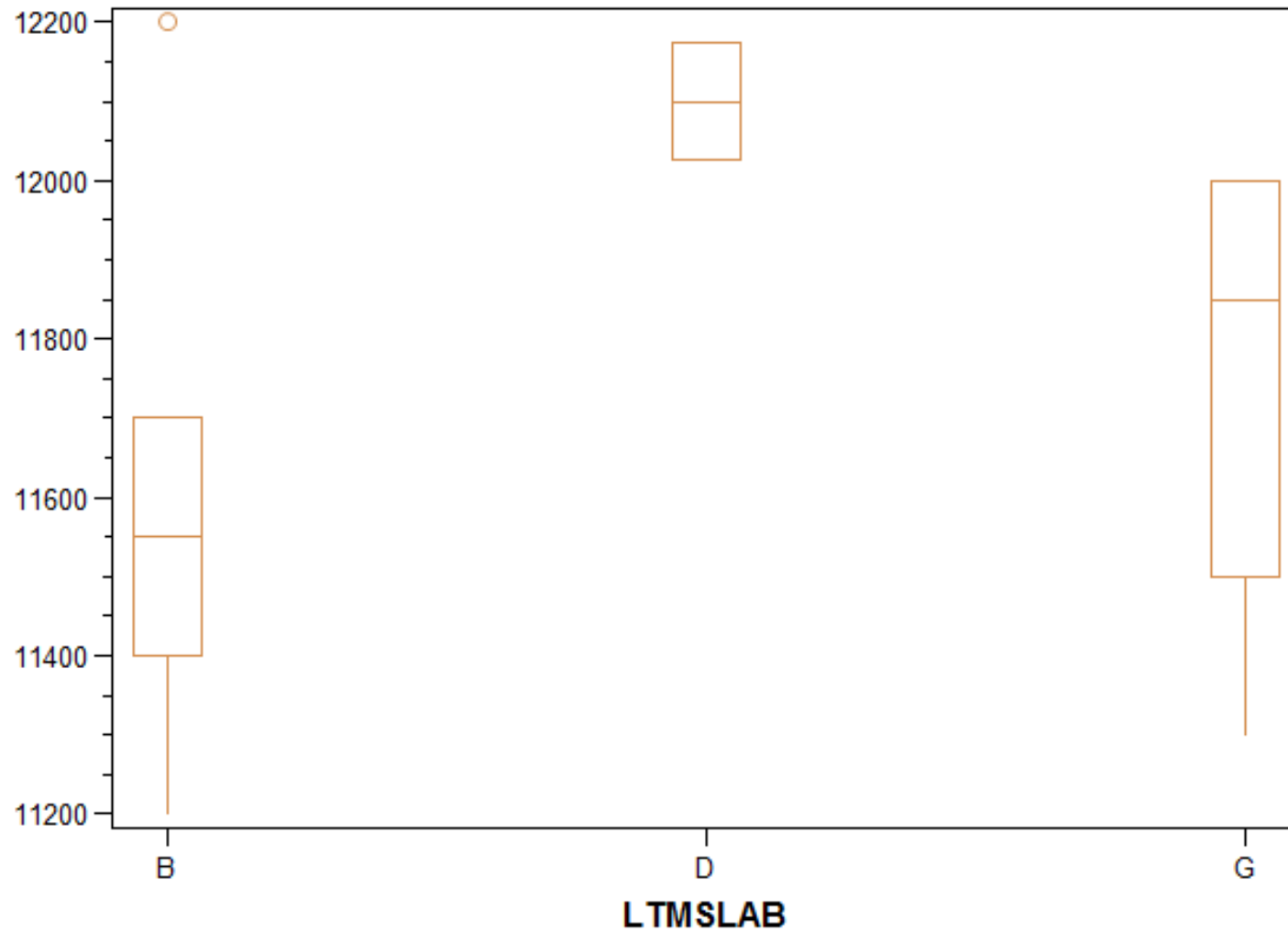
Box and Whisker – All Data

MRV100



Box and Whisker – Without “outlier”

MRV100



Attachment 4



12718 CIMARRON PATH
SAN ANTONIO, TEXAS 78249-3423 USA
VX 210 690 1958 FX 210 690 1959
www.TEI-net.com

CPD Report

Mack Surveillance Panel

September 22, 2010

Mack T-11 / T-12 / T-8

Test Kit Hardware Update

List of Required Test Stand Hardware

Review and Comment



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 SAN ANTONIO, TEXAS 78249-3423 USA
 VX 210 690 1958 FX 210 690 1959
 www.TE-net.com

CPD Report

Mack Surveillance Panel

September 22, 2010

TEI INVENTORY of MACK T-11 PARTS

Part Description	Part Number	Part Availability	
		Current	Future
T-11 Rebuild Kit			
Cylinder Liner	509GC471	4+ year supply	4+ year supply
Piston Crown & Skirt	240GC2264M	4+ year supply	4+ year supply
Top Ring (Blue Stripe with White Dot)	349GC3107 (Batch "S")	4+ year supply	4+ year supply
2nd Ring	349GC3108	4+ year supply	4+ year supply
Oil Ring	350GC343	4+ year supply	4+ year supply
Main Bearings	M1057GCT100	4+ year supply	4+ year supply
Connecting Rod Bearings	M1062GBT100	4+ year supply	4+ year supply



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CPD Report

Mack Surveillance Panel

September 22, 2010

TEI INVENTORY of MACK T-12 PARTS

Part Description	Part Number	Part Availability	
		Current	Future
T-12 Rebuild Kit			
Cylinder Liner	509GC471	4+ year supply	4+ year supply
Piston Crown & Skirt	240GC2264M	4+ year supply	4+ year supply
Top Ring (Blue Stripe)	349GC3107 (Batch "R")	4+ year supply	4+ year supply
2nd Ring	349GC3108	4+ year supply	4+ year supply
Oil Ring	350GC343	4+ year supply	4+ year supply
Main Bearings	M1057GCT100	4+ year supply	4+ year supply
Connecting Rod Bearings	M1062GBT100	4+ year supply	4+ year supply



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CPD Report

Mack Surveillance Panel

September 22, 2010

- TEI received 21 skids of liners from Federal Mogul. Our original order was for 19 skids. The additional 2 skids were part overrun pieces. TEI purchased these for the Industry rather than have them be discarded.
- Sampling of liners from each skid was conducted.
- Visual inspection and surface finish analysis of the liners sampled was better than projected. Only 12% were rejected (slightly below 12 micro-inch finish). The rejects will be preserved for possible future use.



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CPD Report

Mack Surveillance Panel

September 22, 2010

TEI INVENTORY of MACK T-8 PARTS

Part Description	Part Number	Part Availability	
		Current	Future
T-8 Rebuild Kit			
Complete Assembly (Piston, Rings & Liner)	215SB217E (Kusalava Liner)	2 year supply	Next order ~ March 2012

CPD Report

Mack Surveillance Panel

September 22, 2010

Part Description Miscellaneous Items	Part Number	Part Availability	
		Current	Future
EGR Cooler (T-11)	19GBX52	21	Order as required - Supplier is available
EGR Cooler (T-12)	28GB519	0	Order as required - Supplier is available
High Temperature Hose	3101632M	131	Order as required - Supplier is available
Oil Pump Assembly (T-11 and T-12)	315GC465BM	6	No longer available - Rebuild existing pumps ?
Venturi (T-11 and T-12)	762GBX433SS	1	Order as required - Supplier is available
Exhaust Manifold Assembly "front" (T-11)	M10104GC5164MFR	1	Order as required - Supplier is available
Exhaust Manifold Assembly "rear" (T-11)	M10104GC5164MRR	0	Order as required - Supplier is available
Intake Manifold Assembly (T-11)	M10105GCX4332/5212	1	Order as required - Supplier is available
Turbo small (T-11)	631GC5145M3	21	Availability unknown - will the 21 suffice? Usage ~ 4/year
Turbo large (T-11)	3801847R	0	Order as required - Supplier is available
Turbo (T-12)	631GC5176CM7	0	Order as required - Supplier is available
Fuel Injector Line (T-11)	HL69-151	18	Order as required - Supplier is available
Fuel Injector Line (T-11)	HL69-152	17	Order as required - Supplier is available

CPD Report

Mack Surveillance Panel

September 22, 2010

Part Description Miscellaneous Items	Part Number	Part Availability	
		Current	Future
Modine Intercooler (T-11)	5424-03928031	1	Order as required - Supplier is available
Modine Intercooler (T-12)	5424-1A166566D	2	Order as required - Supplier is available
Oil Filter Housing (T-11 and T-12)	27GB525M	7	Obsolete part
Full Flow Oil Filter	485GB3226	8	Order as required - Supplier is available
Injection Pump "calibrated" (T-8)	313GC5212P16X	0	Order as required - Supplier is available
Machine Elbow (T-11 and T-12)	454GC5236	0	Order as required - Supplier is available
Camshaft Kit	57GC2209A	4	Order as required - Supplier is available
Lifter Assembly	72GC373A	12	Order as required - Supplier is available
Cylinder Head (T-11)	732GB3494M2	0	Order as required - Supplier is available
Cylinder Head (T-11 and T-12)	732GB3499	0	Order as required - Supplier is available
Cylinder Head (T-11 and T-12)	732GB3499M	1	Order as required - Supplier is available
Injection Nozzle (T-11)	736GB411M2	0	Order as required - Supplier is available
Electronic Actuator	9MS42	0	Order as required - Supplier is available
Short EGR Exhaust Probe (T-11)	TEGR0005	8	Order as required - Supplier is available
Oil Cooler End Caps (T-12)	TEI-T12OCEC	1	Order as required - Supplier is available
Turbo Gasket	TEIEX201064AM	84	Order as required - Supplier is available
Engine Block availability ? None stocked by TEI			

Attachment 5



Chevron Phillips Chemical Co. Specialty Chemicals

Tom Wingfield

Surveillance Panel Meetings

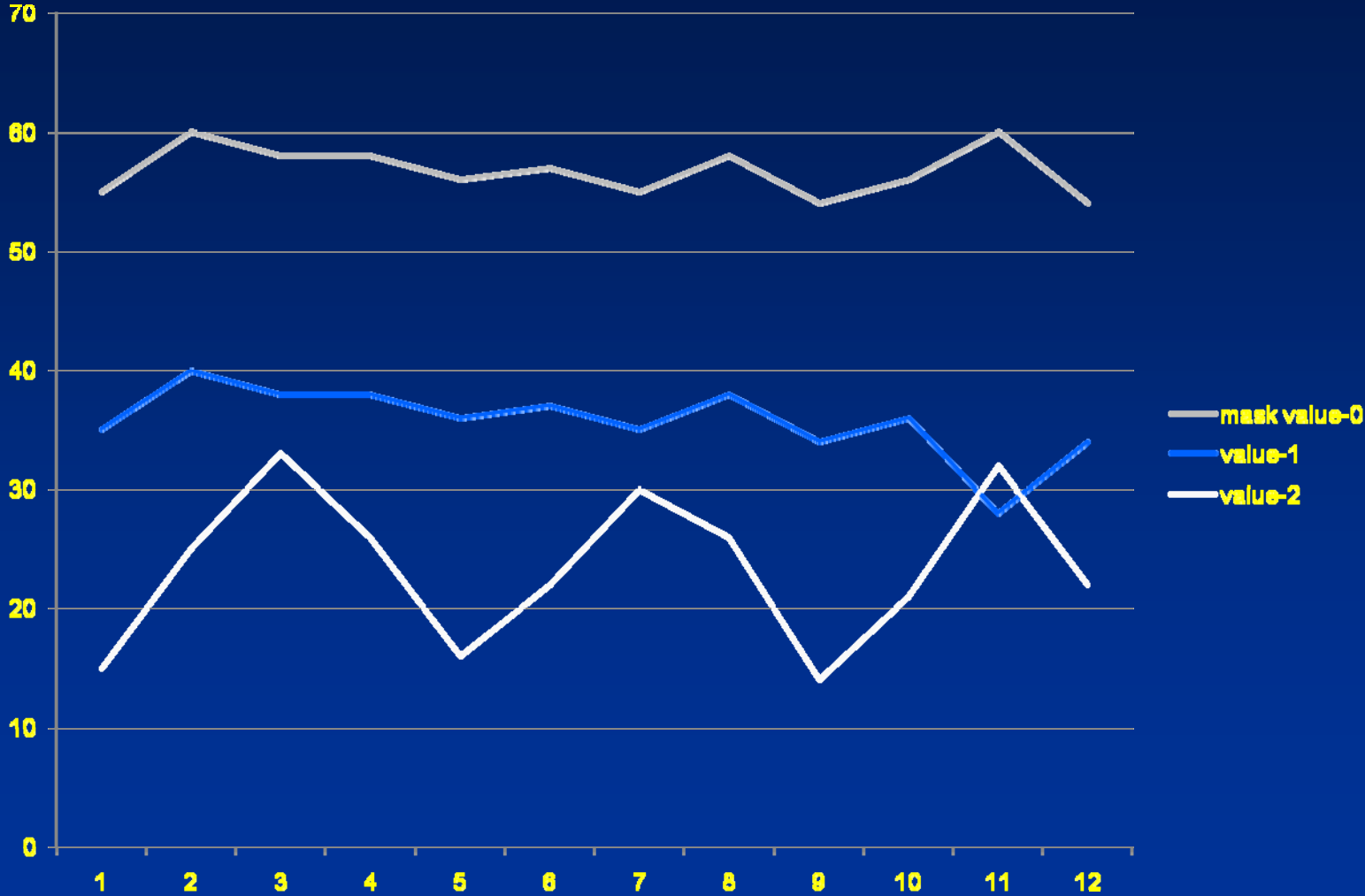
PC-9 Diesel Fuel

Tom Wingfield
Surveillance Panels
Sept 21-23, 2010



EXAMPLE

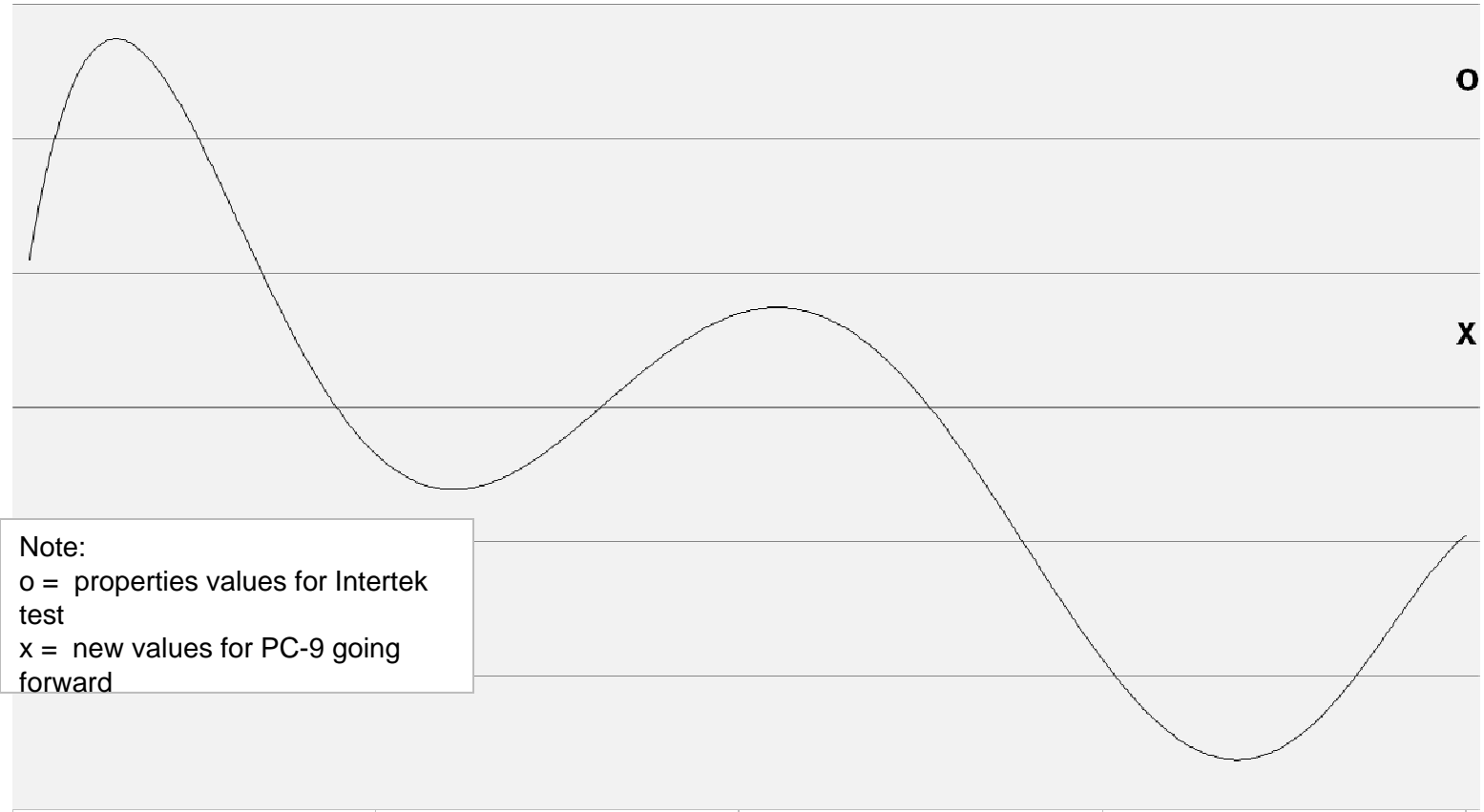
Masking of Properties Trend



Tom Wingfield
Surveillance Panels
Sept 21-23, 2010



PC-9 Diesel – Properties Trend



3/6/2005

7/19/2006

12/1/2007

4/14/2009

8/27/2010

o

x

Tom Wingfield
Surveillance Panels
Sept 21-23, 2010

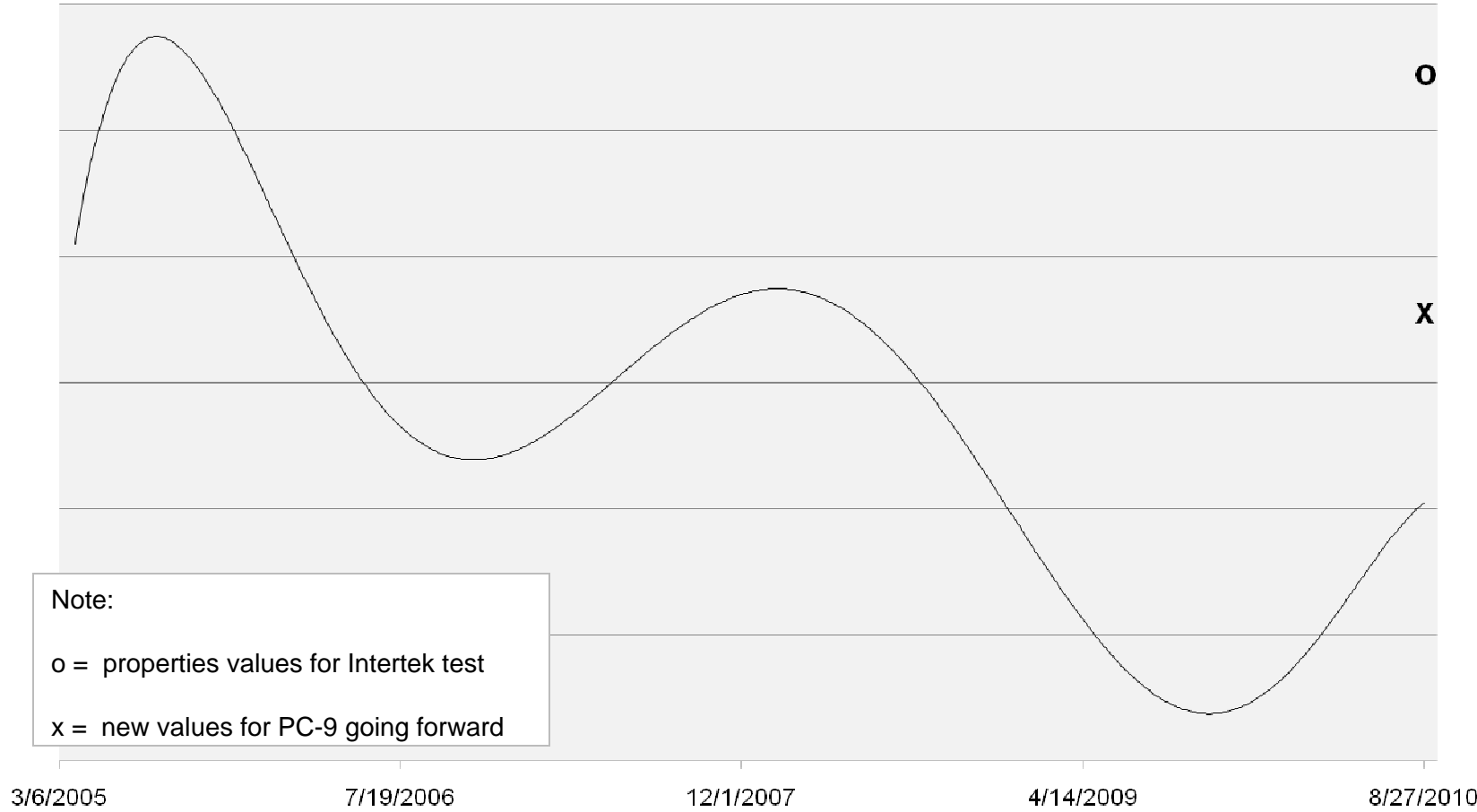


Executive Summary

- For our initial test at Intertek, we turned the knobs to achieve the data point “o”
- With the Intertek test, the primary objective was to assure that the knobs we turned would give a severe result, which it did.
- For the test at Intertek, the resulting PC-9 was *near* specification
- For the PC-9 going forward, we are dialing back the knobs to achieve the data point “x”



PC-9 Diesel – Properties Trend



Tom Wingfield
Surveillance Panels
Sept 21-23, 2010

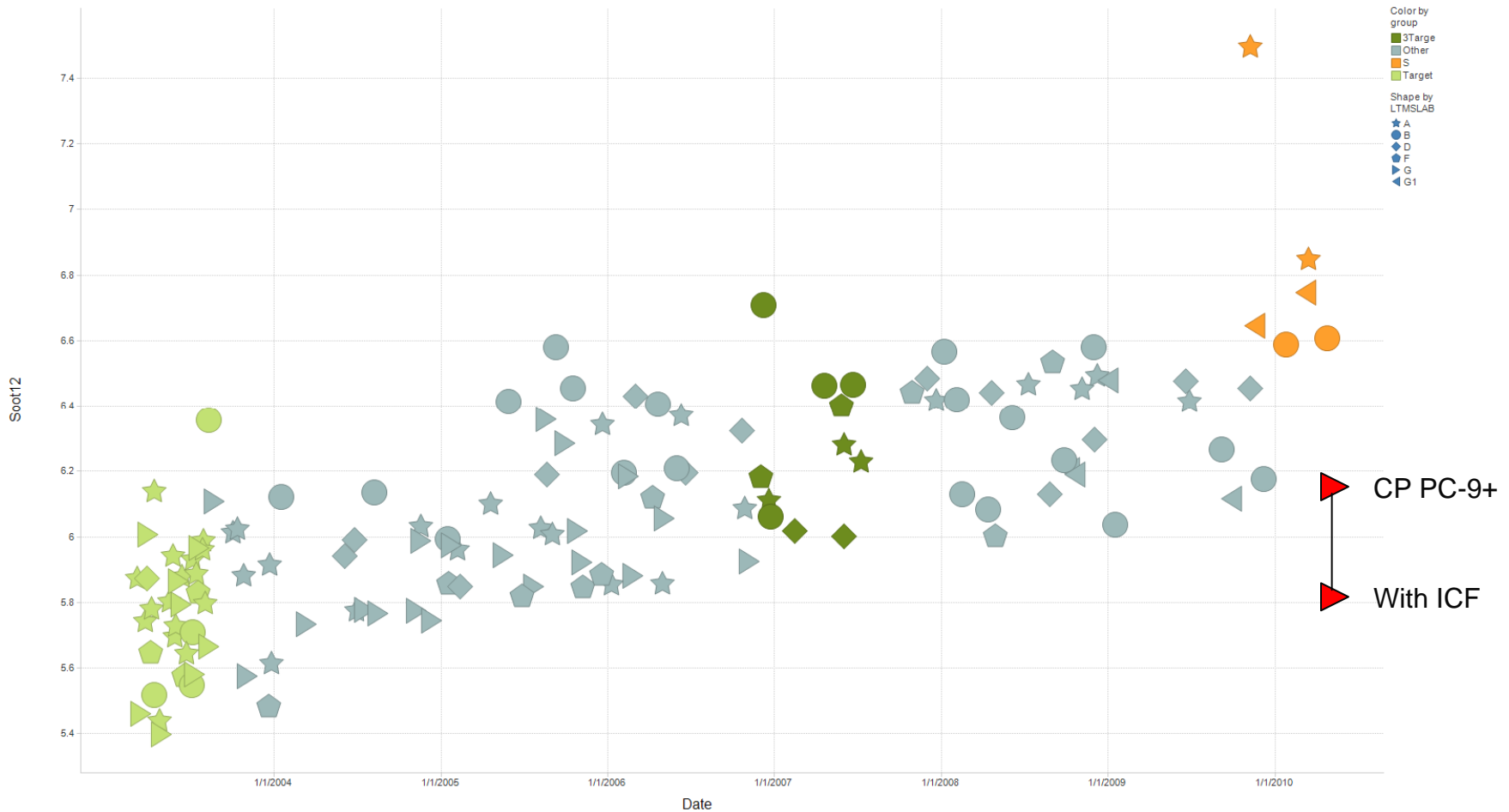


Conclusions

- PC-9 going forward will be on-spec and still achieve the severity desired for the T-11 test
- All of this was necessary because of the changing nature of available refining streams which are tuned to meet the *commercial* fuels market

Attachment 6

T-11 Soot @ 12 cSt versus date by group and lab



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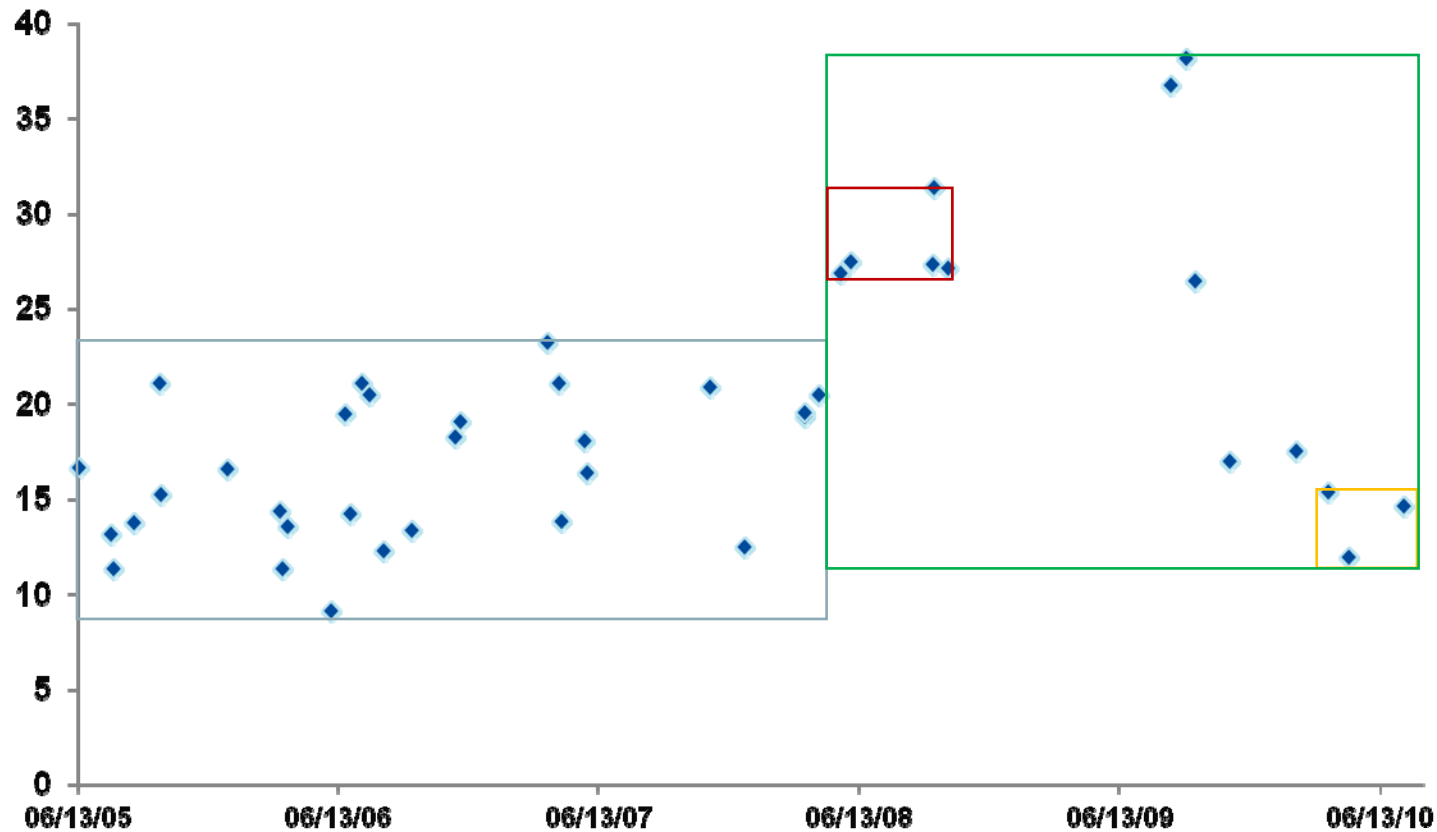
Attachment 7





Click on link to access documents:

<ftp://ftp.astmtmc.cmu.edu/docs/diesel/mack/minutes/2010/Mack.2010-09-22.Meeting/Attachment%207/>

Attachment 8

T-12 Liner Wear – All Labs, All 821



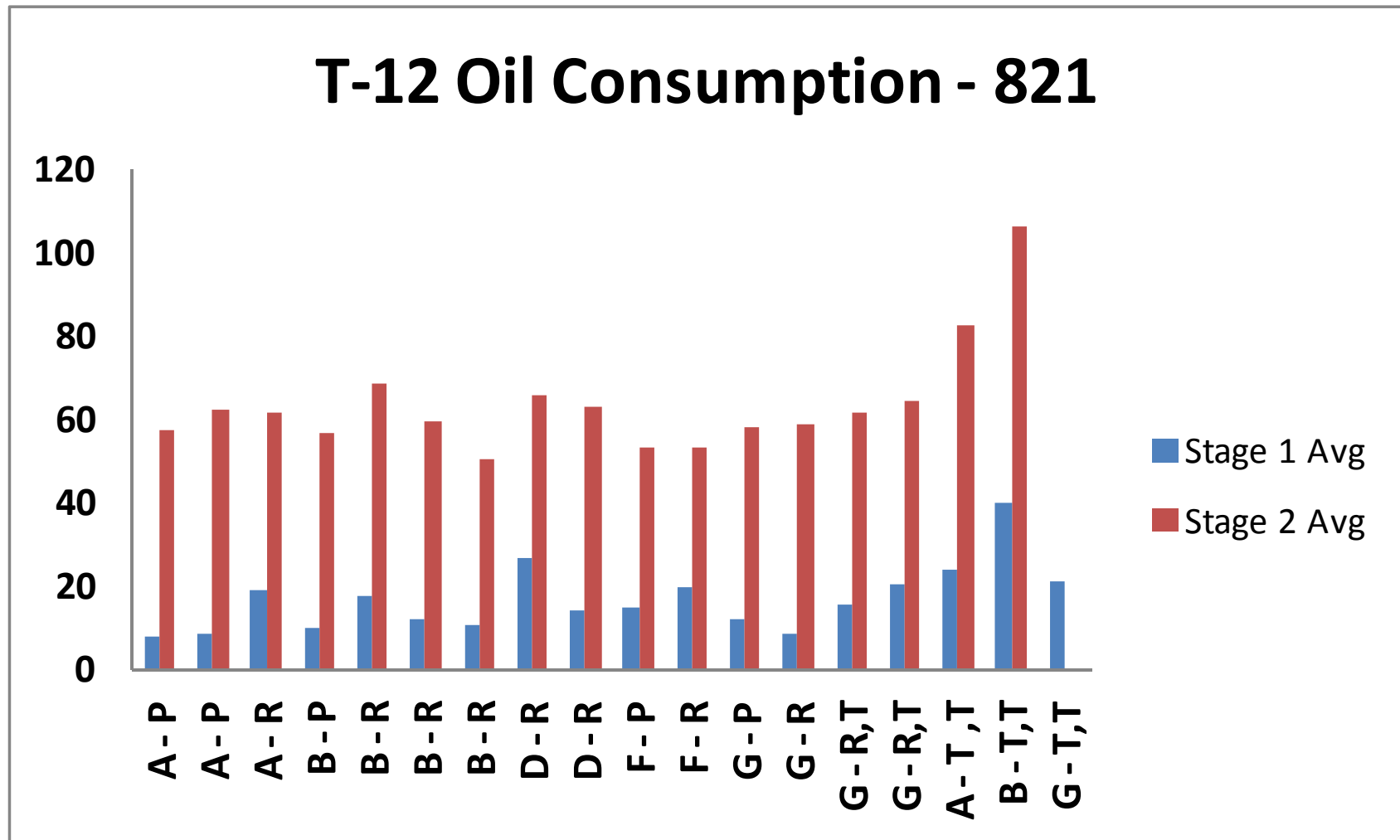
-  multiple ring and liner batches
-  initial R batch ring tests
-  R batch ring tests
-  R batch ring plus new liners

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T-12 Oil Consumption – Oil 821, multiple hardware batches



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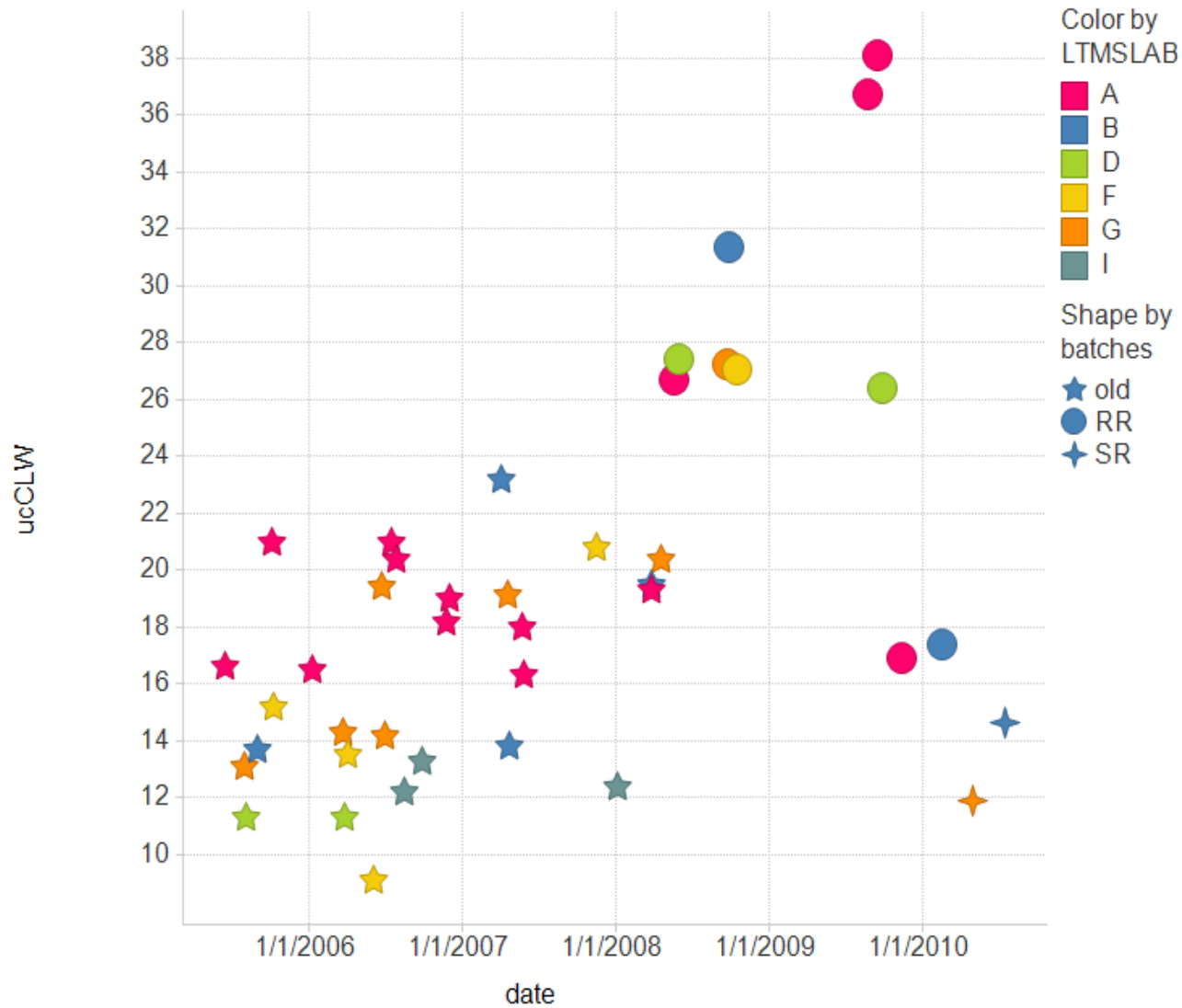
Attachment 9

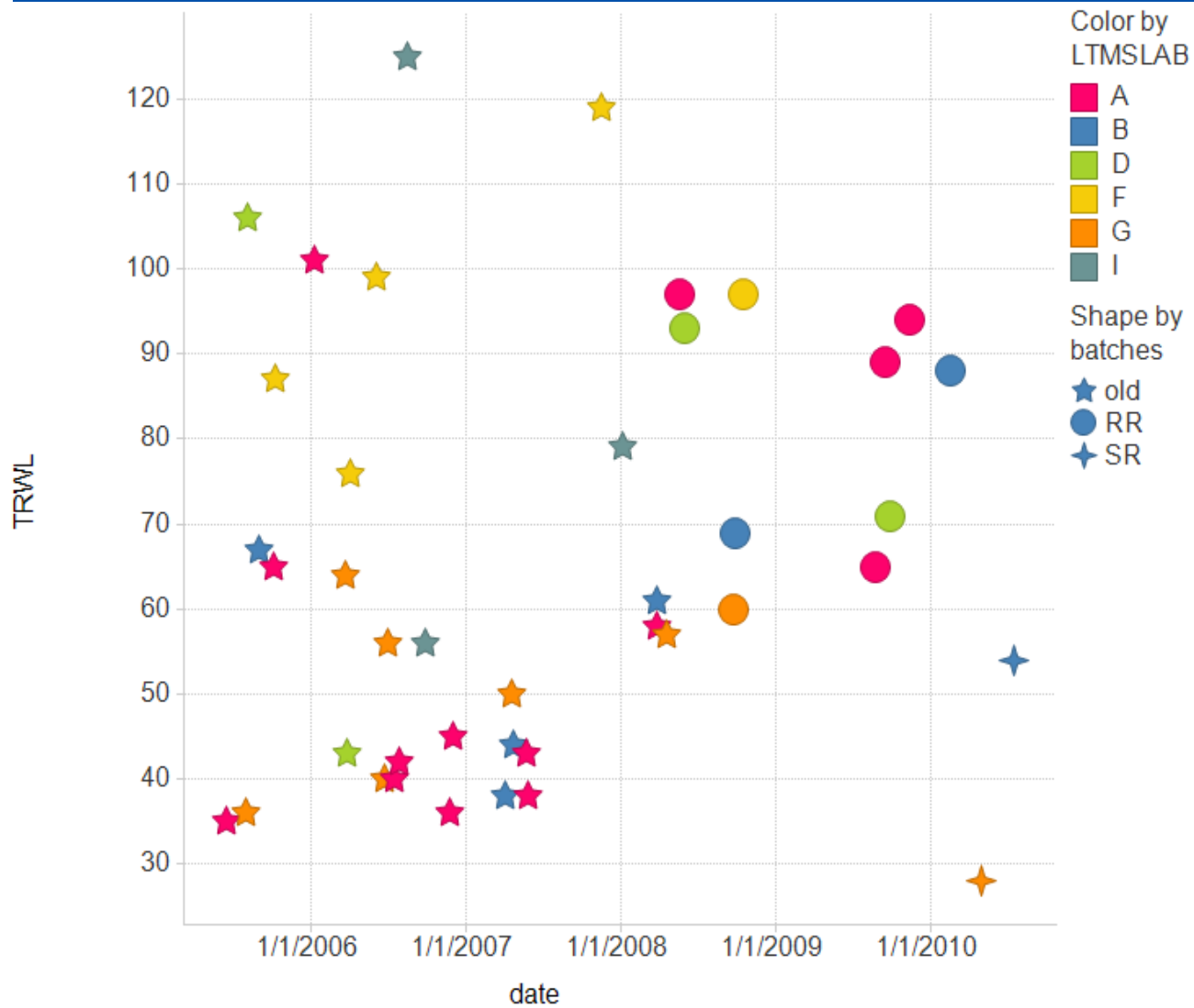


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Mack T-12 Cylinder Liner Wear Industry Correction Factor Review

**Presented to Mack Surveillance Panel
September 22, 2010
Jim Rutherford**





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