100 Barr Harbor Drive ■ PO Box C700 ■ West Conshohocken, PA 19428-2959
Telephone: 610-832-9500 ■ Fax: 610-832-9555 ■ e-mail: service@astm.org ■ Website: www.astm.org

Committee D02 on PETROLEUM PRODUCTS AND LUBRICANTS

Chairman: W. JAMES BOVER, ExxonMobil Biomedical Sciences Inc, 1545 Route 22 East, PO Box 971, Annandale, NJ 08801-0971, (908) 730-1048, FAX: 908-730-1197, EMail: wjbover@erenj.com
First Vice Chairman: KENNETH O. HENDERSON, Cannon Instrument Co, PO Box 16, State College, PA 16804, (814) 353-8000, Ext: 0265, FAX: 814-353-8007, EMail: kenohenderson@worldnet.att.net
Second Vice Chairman: SALVATORE J. RAND, 221 Flamingo Drive, Fort Myers, FL 33908, (941) 481-4729, FAX: 941-481-4729
Secretary: MICHAEL A. COLLIER, Petroleum Analyzer Co LP, PO Box 206, Wilmington, IL 60481, (815) 458-0216, FAX: 815-458-0217, EMail: macvarlen@aol.com
Assistant Secretary: JANET L. LANE, ExxonMobil Research and Engineering, 600 Billingsport Rd, PO Box 480, Paulsboro, NJ 08066-0480, (856) 224-3302, FAX: 856-224-3616, EMail: janet_l_lane@email.mobil.com
Staff Manager: DAVID R. BRADLEY, (610) 832-9681, EMail: dbradley@astm.org

Originally Issued: December 2, 2005

Reply to: Frank Farber
ASTM Test Monitoring Center
6555 Penn Avenue
Pittsburgh, PA 15206
Phone: 412-365-1030
Fax: 412-365-1047
Email: fmf@astmtmc.cmu.edu

Unapproved Minutes of the November 8, 2005 Sequence III Surveillance Panel Meeting held in San Antonio, TX

The meeting was called to order at 9:00 am by Chairman Bill Nahumck. A membership list was circulated for members & guests to sign in. It's shown in Attachment 1.

Agenda Review

Bill Buscher is Action & Motion recorder.

The Agenda was accepted as shown on Attachment 2.

Sequence III Meeting Minutes
November 8, 2005
San Antonio, TX

Membership Changes

Change Perkin Elmer to Intertek ARL.

Meeting Minute Status

The May 17, 2005 meeting minutes were approved by the surveillance panel without changes or corrections.

Review of Action Items from Last Meeting

Covered in later reports.

IIIF/IIIG TMC Test Status

The complete TMC reports are posted to the TMC website. Rich Grundza gave a verbal summary of the number of calibration tests and general severity.

Sequence IIIG			
Parameter	Δ/s	Average Δ, in Reported Units	Direction
PVIS	-1.402	-48.3 %	Mild
WPD	-0.828	-0.23 Merits	Severe
ALCW	-0.600	-12.8.0μm	Mild

Sequence IIIF			
Parameter	Δ /s	Average Δ, in Reported Units	Direction
PVIS	0.036	0.011	On Target
APV	-0.133	0.32	Severe
WPD	0.378	0.74	Mild
PV60	**-0.623**	0.172	Mild

When Δ/s is in **BOLD RED** the shift is significant!

RSI Report

No RSI attendance. Reports have been previously emailed to panel members and posted to the RSI website.

Sequence III Meeting Minutes
November 8, 2005
San Antonio, TX

Fuel Supplier Report

Bob Rumford presented the latest fuel batch analyzes (Attachment 3). Most of the discussion of this report centered on if there is a fuel life issue in the field now that the fuel is stored longer at the labs. Dow felt that fuel stability is very good and does not appear to be "heavying up". Bob said the fuel is not loaded with cracked stock. As a result, its propensity to remain stable is very good. The panel's concern was that current test severity might be linked to fuel aging. A conference call on 6/16/05 requested more in-depth fuel analysis of laboratory tanks. GM requested this analysis, which has not been completed for this meeting and is shown as Attachment 3A. Southwest Research has received some of the samples back from Dow to complete the analysis, but some lab samples have not been forwarded by Dow. Several labs also sent year old samples to Dow for analysis and have not received any feedback. Intertek ARL just shipped a sample a day ago to Dow for analysis. Bob Rumford will follow-up on this sample. Review of Dow's spreadsheet indicated that some columns may be mislabeled. The recommendation is to redo the analysis with stricter sampling, handling, and analysis guidelines. Charlie Leverett will be the coordinator and direct the previous Fuel Task Force with this task. Duel measurement sites, sampling on both run and storage tanks, above ground versus underground are to be identified for the analysis. Common labeling and bottling are to be detailed. Charlie Leverett will work on developing a scope and objectives this week to get the project started.

IIIG/IIIF CPD Reports

GM Motorsport

GM reported verbally about investigating the effects of packaging of powder metal rods, details of the packaging are proprietary to the supplier.

OHT

Dwight Bowden presented the OHT report.

OHT is currently procuring a quantity of old style rear main housings for the industry.

Ring Issue: An alternative supplier has been obtained for BC6 rings see Attachment 4 for background. Attachment 4A shows the current ring inventory status. Attachment 4B shows the component composition of the ring batches. BC6 rings have no visible tooling marks on the ring face. OHT does not want to introduce BC6 rings without understanding the fuel batch issues and powder metal rod effects. OHT is recommending that a unified engine build be conducted so that the BC6 introduction can be evaluated in a controlled manner. Several members voiced concern that a detailed process needs to be documented with an action plan after a unified engine build matrix.

TMC reviewed PVIS and WPD lab charts for further discussion of lab severity (Attachments 5-5H). Three of the four biggest labs are trending severe on WPD. One of the four labs is currently on target with WPD. All labs are trending mild on PVIS.

Andy Ritchie added that reference oil discrimination on WPD has decreased.

	Since 8/2004		Target
RO 434:	3.68	vs	4.80
RO 435:	3.27	vs	3.59
RO 438:	3.29	vs	3.20

The panel discussed the pros and cons of doing a unified engine build at length.

Sid Clark motioned, seconded by Charlie Leverett, that a uniform engine build and test matrix is to be conducted to introduce the BC6 rings. The intent is to define where the test is using BC6 rings. The O&H Subpanel will develop the design of the experiment for the unified engine build by 11/29/2005. 11/0/1 approved this motion.

O&H Report

Torque Wrench:
The SPS Torque wrench replacement from Ingersoll-Rand (p/n ETW-E180) is reported to be available. Also, OHT has 2 older-style wrenches available for use by the laboratories. Dwight Bowden made the motion to accept the Ingersoll –Rand torque wrench, ETW-E180, for use in Sequence IIIF/G tests. The motion was seconded by Ed Altman. All labs were requested to note the use of the new (ETW-E180) wrench in test reports.

Rater Calibration

Frank Farber discussed the need for adding a requirement to the procedures that ensures a certain level of performance of raters at the CRC workshop. Attachment 6 shows CRC groupings from the Spring 2005 workshop. Attachment 6A shows the motion made by Frank Farber and seconded by Sid Clark. The motioned passed with 9 for, 0 against and 2 waive.

Sequence IIIG Severity Discussion

Phil Scinto presented reference oil standard deviation estimates (Attachment 7).
Recommendations were to: Not change reference oil means.
Refrain from industry correction factors.

No motions were made.

Severity Task Force Report: Pat Lang presented Attachment 8. New powder metal connecting rods will be soaked in new EF-411 at 150°C for 8 hours by both Southwest and Intertek ARL. ICP analysis will be conducted on the new oil and the 8 hour oil sample. Pat Lang will also clean a new powder metal connecting rod in the jet washer, heat it to 150°C and determine if a residue resides on the cleaned connecting rod. Results will be shared with Surveillance Panel members.

GM commented that the labs are consistent on their honing procedure based on recent V_o measurements reviewed by the Severity Task Force.

Status of IIIG Standard

The Sequence IIIG Test Method has been reviewed by Lyle Bowman. Pat Lang is incorporating missed information letters into the document and will forward a revised copy to the surveillance panel for review.

GF-5 Crystal Ball

IIIH engine selection is still on going. Development work should start in 2007. Oxidation and deposits should be the main focus. Wear will not be part of this test.

EF 411 Update

Mark Mosher noted that ExxonMobil is looking into off-loading EF-411 product to another supplier. There are no immediate issues and Mark will keep us informed so that testing will not be interrupted.

Scope & Objectives

See Attachment 9.

New Business Funding for Investigations

Sid Clark presented the concept for the creation of a kitty to support O&H supportive testing. This fund could be managed by TMB/TMC. One concept might be that each test would be surcharged a fee to fund the kitty to address light-duty O&H activity. Chairs from each panel would be part of the committee to oversee the projects that are addressed by the fund resources. GM feels that the industry support of O&H testing activity is in great need of an alternative source for investigating severity and precision issues. Phil Scinto expressed concern that ACC companies would probably fund investigative testing when a problem appeared that warranted testing.

Sequence III Meeting Minutes
November 8, 2005
San Antonio, TX

Adjournment

The meeting was adjourned at 5:00 pm.

Motions and Action Items As Recorded at the Meeting by Bill Buscher

1. Motion – Approval of Minutes for 05/17/05. Approved without changes.
   Charlie Leverett / Pat Lang / Passed unanimously

2. Action Item – Bob Rumford to confirm receipt of fuel samples from PerkinElmer and Ashland for EEE fuel analysis.

3. Action Item – Resample Dow storage tank and all storage/run tanks at each lab for dual analysis performed at both Dow and SwRI. Using the advice of industry fuel experts and established ASTM methods, develop a sampling/shipping/storage procedure that all will follow for these samples. Develop common sample labeling protocol. Analysis will be performed on these samples as well as the 3 old stored fuel samples (2 Afton and 1 Ashland). The objective of this effort will be to identify a difference between samples, especially between the old stored samples and the recent samples, which could be linked to test severity shift. Charlie Leverett will be the coordinator of this effort and direct the previously established test fuel task force.

4. Action Item – Pat Lang to determine timing for analysis of fuel samples on a per sample basis at SwRI.

5. Action Item – Pat Lang and Charlie Leverett will soak new powder metal connecting rods in new EF-411 at 150°C for 8 hours and perform ICP analysis on the new oil and the 8 hour oil sample. Pat Lang will also clean a new powder metal connecting rod in the jet washer, heat it to 150°C and determine if a residue resides on the cleaned connecting rod. Results will be shared with Surveillance Panel members.

6. Motion – Introduce BC-6 piston rings in a unified engine build. The O&H Sub-Panel will develop the design of experiment for the unified engine build and test matrix. O&H Sub-Panel will report back to the Surveillance Panel with the design of experiment on November 29, 2005.
   Sid Clark / Charlie Leverett / 11 For 0 Against 0 Waive

7. Motion – Accept torque wrench ETW-E180 for use in the Sequence IIIF/G test. When this torque wrench is introduced it should be indicated in the comments section of the test report.

   Dwight Bowden / Ed Altman / 10 For 0 Against 1 Waive

8. Action Item – Once the review of the Sequence IIIG Standard has been completed, Pat Lang will send a PDF version, labeled "Draft", to Frank Farber, so that it can be posted on the TMC website for Surveillance Panel members to review.

9. Motion – IIIF/G rater is required to attend CRC Light-Duty Rating Workshop on an annual basis and generate data that meets CRC's definition of Blue, Red or White. If the rater is unable to attend a CRC Light-Duty Rating Workshop for causes beyond his/her control, the rater must attend the next CRC Workshop (which could be a Heavy-Duty Rating Workshop). If the rater does not attend the very next CRC Light-Duty/Heavy-Duty Rating Workshop, the rater is no longer able to rate IIIF/G reference oil or candidate oil tests until attending a CRC Light-Duty Rating Workshop. Effective with the next scheduled Light-Duty Rating Workshop.

   Frank Farber / Sid Clark / 9 For 0 Against 2 Waive

10. Action Item – Bill Nahumck to ask Sub-B chairman to work with TMB to develop a source of funding (i.e. test surcharge) for Light-Duty O&H research activities (i.e. evaluating severity issues, hardware, fuel, etc.).

ASTM SEQUENCE III LIST

November 8, 2005 **San Antonio, Texas**

NAME / ADDRESS	PHONE / FAX / E-MAIL		SIGNATURE
Ed Altman Afton Chemical Corporation P.O. Box 2158 Richmond, VA 23218-2158 USA	804-788-5279 804-788-6358 ed.altman@aftonchemical.com	☑ IIIF SURV PANEL ☑ IIIF MAILING LIST ☑ O&H SUBPANEL ☑ O&H Mailing List	Present
Monica Beyer The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, OH 44092 USA	440-347-2006 440-347-4096 mbey@lubrizol.com	☐ IIIF SURV PANEL ☑ IIIF MAILING LIST ☑ O&H SUBPANEL ☐ O&H Mailing List	Present
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	☐ IIIF SURV PANEL ☑ IIIF MAILING LIST ☐ O&H SUBPANEL ☑ O&H Mailing List	Present
Dwight H. Bowden OH Technologies, Inc. 9300 Progress Parkway P.O. Box 5039 Mentor, OH 44061-5039 USA	440-354-7007 440-354-7080 dhbowden@ohtech.com	☑ IIIF SURV PANEL ☐ IIIF MAILING LIST ☑ O&H SUBPANEL ☐ O&H Mailing List	Present
Donald Bryant The Lubrizol Corporation 28400 Lakeland Boulevard Wickliffe, OH 44092 USA	440-347-2159 440-943-9004 debr@lubrizol.com	☐ IIIF SURV PANEL ☑ IIIF MAILING LIST ☐ O&H SUBPANEL ☑ O&H Mailing List	Present

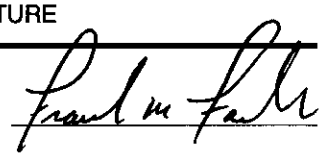
ASTM SEQUENCE III LIST

November 8, 2005 **San Antonio, Texas**

NAME / ADDRESS	PHONE / FAX / E-MAIL		SIGNATURE
Don Burnett ChevronPhillips Chemical Compan Chevron Tower 1301 McKinney Street Suite 2130 Houston, TX 77010-3030 USA	713-289-4859 713-289-4865 burnede@cpchem.com	☐ IIIF SURV PANEL ☑ IIIF MAILING LIST ☐ O&H SUBPANEL ☐ O&H Mailing List	Present
James Carter Haltermann Products 3520 Okemos Rd. Suite #6-176 Okemos, MI USA	517-347-3021 517-347-1024 JECarter@dow.com	☑ IIIF SURV PANEL ☐ IIIF MAILING LIST ☐ O&H SUBPANEL ☐ O&H Mailing List	Present
Timothy L. Caudill Ashland Oil Inc. 22nd & Front Streets Ashland, KY 41101 USA	1960 x5708 606-329-~~5708~~ 606-329-~~3089~~ 2044 tlcaudill@ashland.com	☑ IIIF SURV PANEL ☐ IIIF MAILING LIST ☑ O&H SUBPANEL ☐ O&H Mailing List	Present Timothy L Caudill
Sid Clark GM Powertrain General Motors Corporation MC - 483-730-322 823 Joslyn Rd. Pontiac, MI 48340-2920 USA	248-857-9959 sidney.l.clark@gm.com Test Sponsor Rep	☑ IIIF SURV PANEL ☐ IIIF MAILING LIST ☑ O&H SUBPANEL ☐ O&H Mailing List	Present Sid
Johnny M De La Zerda PerkinElmer Automotive Research, 5404 Bandera Road San Antonio, TX 78238 USA	210-523-4621 210-523-4607 johnny.delazerda@perkinelmer.com	☐ IIIF SURV PANEL ☑ IIIF MAILING LIST ☑ O&H SUBPANEL ☐ O&H Mailing List	Present

ASTM SEQUENCE III LIST

November 8, 2005 **San Antonio, Texas**

NAME / ADDRESS	PHONE / FAX / E-MAIL		SIGNATURE
Frank Farber ASTM Test Monitoring Center 6555 Penn Avenue Pittsburgh, PA 15206 USA	412-365-1030 412-365-1047 fmf@astmtmc.cmu.edu	☐ IIIF SURV PANEL ☑ IIIF MAILING LIST ☐ O&H SUBPANEL ☐ O&H Mailing List	Present 
Gordon R. Farnsworth Infineum RR # 5 Box 211 Montrose, PA 18801 USA	570-934-2776 570-934-0141 gordon.farnsworth@infineum.com	☐ IIIF SURV PANEL ☑ IIIF MAILING LIST ☐ O&H SUBPANEL ☑ O&H Mailing List	Present
Dennis Florkowski DaimlerChrysler 800 Chrysler Road CIMS 482-00-13 Auburn Hills, MI 48236-2757 USA	248-576-7477 248-576-7490 df11@daimlerchrysler.com	☑ IIIF SURV PANEL ☐ IIIF MAILING LIST ☐ O&H SUBPANEL ☐ O&H Mailing List	Present
Joe Franklin PerkinElmer Automotive Research, 5404 Bandera Road San Antonio, TX 78238 USA	210-523-4671 210-523-4607 joe.franklin@perkinelmer.com Sub-Committee D02.B Chair	☐ IIIF SURV PANEL ☑ IIIF MAILING LIST ☐ O&H SUBPANEL ☐ O&H Mailing List	Present
David L. Glaenzer Afton Chemical Corporation 500 Spring Street P.O. Box 2158 Richmond, VA 23218-2158 USA	804-788-5214 804-788-6358 dave.glaenzer@aftonchemical.com	☐ IIIF SURV PANEL ☑ IIIF MAILING LIST ☐ O&H SUBPANEL ☑ O&H Mailing List	Present 

ASTM SEQUENCE III LIST

November 8, 2005 **San Antonio, Texas**

NAME / ADDRESS	PHONE / FAX / E-MAIL		SIGNATURE
Irwin L. Goldblatt Castrol Americas 240 Centennial Avenue Piscataway, NJ 08854-3910 USA	732-980-3606 973-686-4224 irwin.goldblatt@cnacm.com	☐ IIIF SURV PANEL ☑ IIIF MAILING LIST ☐ O&H SUBPANEL ☐ O&H Mailing List	Present
Richard Grundza ASTM Test Monitoring Center 6555 Penn Avenue Pittsburgh, PA 15206 USA	412-365-1031 412-365-1047 reg@astmtmc.cmu.cdu	☑ IIIF SURV PANEL ☐ IIIF MAILING LIST ☑ O&H SUBPANEL ☐ O&H Mailing List	Present
Larry Hamilton The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, OH 44092 USA	440-347-2326 440-347-4096 ldha@lubrizol.com	☐ IIIF SURV PANEL ☐ IIIF MAILING LIST ☑ O&H SUBPANEL ☐ O&H Mailing List	Present
Clayton Knight Test Engineering, Inc. 12718 Cimarron Path San Antonio, TX 78249-3423 USA	210-690-1958 210-690-1959 cknight@tei-net.com	☑ IIIF SURV PANEL ☐ IIIF MAILING LIST ☐ O&H SUBPANEL ☐ O&H Mailing List	Present
Brian Kundinger Kundinger Controls 1771 Harmon Road Auburn Hills, MI 48326 USA	248-391-6100 248-391-6900 bkundinger@kundnger.com	☑ IIIF SURV PANEL ☐ IIIF MAILING LIST ☑ O&H SUBPANEL ☐ O&H Mailing List	Present

ASTM SEQUENCE III LIST

November 8, 2005 **San Antonio, Texas**

NAME / ADDRESS	PHONE / FAX / E-MAIL		SIGNATURE
Patrick Lai Imperial Oil Limited 453 Christina Street Research Department P.O. Box 3022 Sarnia, Ontario N7T7MI CANADA	519-339-5611 519-339-5866 patrick.k.lai@esso.ca	☐ IIIF SURV PANEL ☑ IIIF MAILING LIST ☐ O&H SUBPANEL ☐ O&H Mailing List	Present
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 O&H Subpanel Chairman	☑ IIIF SURV PANEL ☐ IIIF MAILING LIST ☑ O&H SUBPANEL ☐ O&H Mailing List	Present
Charlie Leverett PerkinElmer Automotive Research, 5404 Bandera Road San Antonio, TX 78238 USA	210-647-9422 210-523-4607 charlie.leverett@perkinelmer.com	☑ IIIF SURV PANEL ☐ IIIF MAILING LIST ☑ O&H SUBPANEL ☐ O&H Mailing List	Present
Bill Mahoney Registration Systems, Inc. 4139 Gardendale Suite 205 San Antonio, TX 78229 USA	706 343-1911 b.mahoney@regsysinc.com	☐ IIIF SURV PANEL ☑ IIIF MAILING LIST ☐ O&H SUBPANEL ☐ O&H Mailing List	Present
Josephine G. Martinez Chevron Oronite Company LLC 100 Chevron Way Richmond, CA 94802 USA	510-242-5563 510-242-3173 jogm@chevrontexaco.com	☐ IIIF SURV PANEL ☑ IIIF MAILING LIST ☐ O&H SUBPANEL ☐ O&H Mailing List	Present

ASTM SEQUENCE III LIST

November 8, 2005 **San Antonio, Texas**

NAME / ADDRESS	PHONE / FAX / E-MAIL		SIGNATURE
Chris J. May Imperial Oil Products and Chemcial 453 S. Christina Street P.O. Box 3022 Sarnia, Ontario N7T8C8 CANADA	519-339-2827 chris.j.may@esso.ca	☐ IIIF SURV PANEL ☑ IIIF MAILING LIST ☐ O&H SUBPANEL ☑ O&H Mailing List	Present
Timothy Miranda Castrol Technology Center 240 Centennial Avenue Piscataway, NJ USA BP LUBRICANTS USA 1500 VALLEY ROAD WAYNE, NJ 07470	~~732-980-3634~~ 973-305-3334 973-686-4039 Timothy.Miranda@~~Castrol~~.com Company Name Change @BP.com	☑ IIIF SURV PANEL ☐ IIIF MAILING LIST ☑ O&H SUBPANEL ☐ O&H Mailing List	Present
Mark Mosher ExxonMobil Technology Company Billingsport Road Paulsboro, NJ 08066 USA	856-224-2132 856-224-3628 mark.r.mosher@exxonmobil.com	☑ IIIF SURV PANEL ☐ IIIF MAILING LIST ☑ O&H SUBPANEL ☐ O&H Mailing List	Present
Hannah Murray Toyota Technical Center, USA, Inc. 1588 Woodridge RR #7 Ann Arbor, MI 48105 USA	734-995-3762 734-995-5971 hmurray@ttc-usa.com	☑ IIIF SURV PANEL ☐ IIIF MAILING LIST ☑ O&H SUBPANEL ☐ O&H Mailing List	Present
William M. Nahumck The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, OH 44092 USA	440-347-2596 440-347-4096 wmn@lubrizol.com Surveillance Panel Chair	☑ IIIF SURV PANEL ☐ IIIF MAILING LIST ☑ O&H SUBPANEL ☐ O&H Mailing List	Present

ASTM SEQUENCE III LIST

November 8, 2005 **San Antonio, Texas**

NAME / ADDRESS	PHONE / FAX / E-MAIL		SIGNATURE
Robert Olree GM Powertrain General Motors Corporation MC - 483-730-322 823 Joslyn Rd. Pontiac, MI 48090-9055 USA	248-857-9989 robert.olree@gm.com	☐ IIIF SURV PANEL ☑ IIIF MAILING LIST ☐ O&H SUBPANEL ☑ O&H Mailing List	Present
Michael J. Riley Ford Motor Company 21500 Oakwood Blvd. POEE Building, MD44 Cube DN-159 Dearborn, MI 48121-2053 USA	313-390-3059 313-845-3169 mriley2@ford.com	☑ IIIF SURV PANEL ☐ IIIF MAILING LIST ☑ O&H SUBPANEL ☐ O&H Mailing List	Present
Andrew Ritchie Infineum 1900 East Linden Avenue P.O.Box 735 Linden, NJ 07036 USA	908-474-2097 Andrew.Ritchie@Infineum.com	☑ IIIF SURV PANEL ☐ IIIF MAILING LIST ☑ O&H SUBPANEL ☐ O&H Mailing List	Present AR
Robert H. Rumford Specified Fuels & Chemicals, LLC 1201South Sheldon Road Channelview, TX 77530-0429 USA	281-457-2768 281-457-1469 rhrumford@specified1.com	☐ IIIF SURV PANEL ☑ IIIF MAILING LIST ☐ O&H SUBPANEL ☐ O&H Mailing List	Present
Jim Rutherford Chevron Oronite Company LLC 100 Chevron Way Richmond, CA 94802 USA	510-242-3410 510-242-3173 jaru@chevrontexaco.com	☐ IIIF SURV PANEL ☑ IIIF MAILING LIST ☐ O&H SUBPANEL ☐ O&H Mailing List	Present

ASTM SEQUENCE III LIST

November 8, 2005 **San Antonio, Texas**

NAME / ADDRESS	PHONE / FAX / E-MAIL		SIGNATURE
Philip R. Scinto The Lubrizol Corporation 29400 Lakeland Boulevard Wickliffe, OH 44092 USA	440-347-2161 440-347-9031 prs@lubrizol.com	☐ IIIF SURV PANEL ☑ IIIF MAILING LIST ☐ O&H SUBPANEL ☐ O&H Mailing List	Present
Thomas Smith Valvoline P.O. Box 14000 Lexington, KY 40512-1400 USA	859-357-2766 859-357-7084 trsmith@ashland.com PCEOCP Chair	☐ IIIF SURV PANEL ☑ IIIF MAILING LIST ☐ O&H SUBPANEL ☐ O&H Mailing List	Present
Mark Sutherland Chevron Oronite Company LLC 4502 Centerview Drive Suite 210 San Antonio, TX 78228 USA	210-731-5621 210-731-5699 msut@chevrontexaco.com	☑ IIIF SURV PANEL ☐ IIIF MAILING LIST ☑ O&H SUBPANEL ☐ O&H Mailing List	Present
Ben O. Weber Southwest Research Institute 6220 Culebra Road P.O. Box 28510 San Antonio, TX 78228 USA	210-522-5911 210-684-7530 bweber@swri.edu Sub-Committee D02.B01 Chair	☐ IIIF SURV PANEL ☑ IIIF MAILING LIST ☐ O&H SUBPANEL ☐ O&H Mailing List	Present

SEQUENCE III SURVEILLANCE PANEL MEETING
GUEST LIST
November 8, 2005
San Antonio, Texas

Attachment 1

NAME/ADDRESS	PHONE/FAX/EMAIL	SIGNATURE
William A Buscher III SwRI	210-522-6802 wbuscher@swri.edu	
Guy Stubbs SwRI	210 522 5039 gstubbs@swri.org	
Doyle Boese 1900 E. Linden Ave Linden, NJ 07036	908 474-3176 doyle.boese@infineum.com	

AGENDA

Attachment 2

SEQUENCE III SURVEILLANCE PANEL MEETING

Southwest Research Institute, San Antonio, Texas
November 8, 2005
9:00 AM to 5:00 PM

1. **APPOINTMENT OF RECORDER OF ACTIONS/MOTIONS**
2. **AGENDA REVIEW**
3. **MEMBERSHIP CHANGES**
4. **APPROVAL OF THE MINUTES FROM THE MAY 2005 MEETING**
5. **REVIEW OF ACTION ITEMS FROM THE LAST MEETING**

TMC TEST SEMIANNUAL REPORT HIGHLIGHTS – Rich Grundza
SEQUENCE IIIF – D6984
SEQUENCE IIIG
SEQUENCE IIIGA

RSI SEMIANNUAL REPORT– Bill Mahoney
SEQUENCE IIIF – D6984
SEQUENCE IIIG/IIIGA

SEQUENCE III FUEL SUPPLIER REPORT – Bob Rumford

SEQUENCE III CPD SUPPLIER REPORTS
1. OHT
   Supplier change for piston rings
2. GM MOTORSPORTS

SEQUENCE III O&H REPORTS– Pat Lang
Torque Wrench Update
O&H Activity Review

SEQUENCE IIIG ISSUES
1. **Current Severity concerns**
2. **IIIG Precision Estimates – Phil Scinto**
3. **Setting new reference oil targets**

OLD BUSINESS
1. **Status of IIIG Standard – Ben Weber**

NEW BUSINESS
1. **GF-5 Test Development Status**
2. **Status of EF-411 – Mark Mosher**
3. **Rater Calibration – Frank Farber**
4. **Funding for Investigations – Sid Clark**

REVIEW OF SCOPE & OBJECTIVES – Bill Nahumck
ADJOURNMENT

PRODUCT: **EEE Unleaded Gasoline**

PRODUCT CODE: **HF003**

Batch No.:	TB2821LS10	TH0321LS10	TG1121LS10	TF0321LS10	TE1021LS11
TMO No.:	MTS	MTS	MTS	MTS	MTS
Tank No.:	2014	2012	2014	2014	2012
Analysis Date:	8/16/2005	8/16/2005	7/18/2005	6/10/2005	5/16/2005
Shipment Date:					

TEST	METHOD	UNITS	FED Specs		HALTERMANN Specs			RESULTS	RESULTS	RESULTS	RESULTS	RESULTS
			MIN	MAX	MIN	TARGET	MAX					
Distillation - IBP	ASTM D86	°F	75	95	75		95	84	91	83	87	88
5%		°F						111	118	113	110	115
10%		°F	120	135	120		135	125	131	126	123	128
20%		°F						147	152	144	142	148
30%		°F						172	175	168	163	172
40%		°F						200	202	197	191	200
50%		°F	200	230	200		230	220	222	218	217	220
60%		°F						232	233	229	230	232
70%		°F						243	245	240	243	244
80%		°F						266	268	258	265	268
90%		°F	305	325	305		325	321	322	316	321	322
95%		°F						338	338	335	337	338
Distillation - EP		°F		415			415	398	398	382	396	403
Recovery		vol %				Report		97.4	98.4	97.6	97.7	98.6
Residue		vol %				Report		1.0	1.0	1.0	1.0	1.0
Loss		vol %				Report		1.6	0.6	1.4	1.3	0.4
Gravity	ASTM D4052	°API	58.7	61.2	58.7		61.2	59.0	58.9	59.2	59.3	58.9
Density	ASTM D4052	kg/l			0.734		0.744	0.743	0.743	0.742	0.742	0.743
Reid Vapor Pressure	ASTM D323	psi	8.7	9.2	8.7		9.2	8.9	9.2	9.1	9.2	9.1
Reid Vapor Pressure	ASTM D5191	psi				Report		8.9	9.2	9.1	9.2	9.0
Carbon	ASTM D3343	wt fraction				Report		0.8645	0.8683	0.8672	0.8657	0.8677
Carbon	ASTM E191	wt fraction				Report		0.8597	0.8603	0.8608	0.8611	0.8608
Hydrogen	ASTM E191	wt fraction				Report		0.1360	0.1361	0.1369	0.1360	0.1359
Hydrogen/Carbon ratio	ASTM E191	mole/mole				Report		1.886	1.885	1.895	1.882	1.881
Oxygen	ASTM D4815	wt %					0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Sulfur	ASTM D5453	ppm		1000	3		15	3	3	4	6	7
Lead	ASTM D3237	g/gal		0.05			0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phosphorous	ASTM D3231	g/gal		0.005			0.005	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008
Composition, aromatics	ASTM D1319	vol %		35.0			35.0	27.3	34.5	32.2	32.2	33.2
Composition, olefins	ASTM D1319	vol %		10.0			10.0	0.6	0.7	0.5	0.5	0.3
Composition, saturates	ASTM D1319	vol %				Report		72.1	64.8	67.3	67.3	66.5
Particulate matter	ASTM D5452	mg/l					1	0.6	0.6	0.8	0.6	0.5
Oxidation Stability	ASTM D525	minutes			240			>1000	>1000	>1000	>1000	>1000
Copper Corrosion	ASTM D130						1	1	1	1	1	1
Gum content, washed	ASTM D381	mg/100mls					5	<1	<1	<1	<1	<1
Fuel Economy Numerator/C Density	ASTM E191				2401		2441	2423	2424	2419	2420	2425
C Factor	ASTM E191					Report		1.0012	1.0006	0.9997	1.0002	1.0003
Research Octane Number	ASTM D2699		93.0		96.0			96.5	96.6	96.8	96.9	96.8
Motor Octane Number	ASTM D2700					Report		87.9	87.5	87.8	87.7	88.1
Sensitivity			7.5		7.5			8.6	9.1	9.0	9.2	8.7
Net Heating Value, btu/lb	ASTM D3338	btu/lb				Report		18495	18401	18426	18458	18415
Net Heating Value, btu/lb	ASTM D240	btu/lb				Report		18309	18354	18382	18370	18382
Color	VISUAL	1.75 ptb				Report		Red	Red	Red	Red	Red

APPROVED BY: _____

ANALYST	JCM/MJR	JCM/MJR	JCM/MJR	JM/HD	JM/HD

				PEAR	PEAR	SwRI	SwRI	SwRI	SwRI	SwRI	Afton	Afton	Lubrizol	ExxonMobil
PRODUCT:	**EEE SEQ III**	**Company**	**Markings:**											
	Survey	**Markings:**	**Markings:**											
		Markings:	**Markings:**											TK 215
				TK 64	TK 20	TK 184E	TK 47	TK 48	TK 177	TK 178	SG1921LS11	SI2121LS11	OS#210656	TA1221LS11
PRODUCT CODE:	**HF003**	**Markings:**	**Markings:**											
		Dated:	**Dated:**											
		Date received:	**Date received:**											
		Analysis date:	**Analysis date:**	8/23/2005	8/23/2005	8/23/2005	8/23/2005	8/24/2005	8/24/2005	8/24/2005	10/10/2002	10/10/2005	10/10/2005	11/7/2005

TEST	METHOD	UNITS	SPECIFICATIONS			RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS	RESULTS
			MIN	TARGET	MAX											
Distillation - IBP	ASTM D86	°F	75		95	83	84	88	97	88	83	92	81	87	92	88
5%		°F				113	111	122	131	120	109	120	111	113	117	113
10%		°F	120		135	127	125	136	145	135	123	132	128	126	130	128
20%		°F				179	145	160	166	157	143	151	148	147	151	150
30%		°F				173	167	185	190	182	166	175	172	171	174	174
40%		°F				202	197	209	212	202	195	202	200	200	200	201
50%		°F	210		240	221	219	225	226	223	219	221	221	220	221	221
60%		°F				232	232	235	236	233	232	233	232	235	232	232
70%		°F				245	244	247	248	245	245	245	245	246	244	244
80%		°F				269	266	271	273	269	267	270	268	269	267	265
90%		°F	325		350	323	321	326	325	324	322	324	322	323	322	320
95%		°F				340	338	344	342	342	338	339	340	338	337	338
Distillation - EP		°F	385		415	394	397	407	404	406	395	397	395	394	394	392
Recovery		vol %		Report		97.3	97.3	98.0	98.9	97.6	97.0	98.5	97.1	98.1	98.4	97.0
Residue		vol %			2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Loss		vol %		Report		1.7	1.7	1.0	0.1	1.4	2.0	0.5	1.9	0.9	0.6	2.0
Gravity	ASTM D4052	°API		Report		58.3	59	57.3	56.4	57.4	59.1	59.7	58.9	59.0	58.8	58.9
Specific Gravity	ASTM D4052	-		Report		0.745	0.743	0.749	0.753	0.749	0.742	0.747	0.743	0.743	0.743	0.743
Reid Vapor Pressure	ASTM D5191	psi				8.5	8.7	7.4	6.8	7.5	8.1	8.0	8.9	9.0	8.7	8.9
Sulfur	ASTM D5453	ppm wt			0.02	6	5	4	4	4	6	6	4	2	5	3
Composition, aromatics	ASTM D1319	vol %			35.0	30.7	30.1	31.3	32.9	31.1	29.0	31.4	28.8	28.3	28.0	27.7
Composition, olefins	ASTM D1319	vol %	5.0		10.0	0.9	0.3	0.6	0.5	0.6	0.6	0.7	0.4	0.6	0.6	0.6
Composition, saturates	ASTM D1319	vol %		Report		68.8	69.6	68.1	66.6	68.3	70.4	67.9	70.8	71.1	71.4	71.7
Existent gum, unwashed	ASTM D381	mg/100mls		Report		2	2	9	8	5	1	1	2	1	1	
Existent gum, washed	ASTM D381	mg/100mls			3.0	1	1	3	3	1	<1	<1	<1	<1	<1	
Research Octane Number	ASTM D2699		96.0		98.0											
Motor Octane Number	ASTM D2700			Report												
R+M/2	D2699/2700			Report												
Sensitivity	D2699/2700		7.5													
Net Heat of Combustion	ASTM D240	Btu/lb		Report												

ANALYST

Attachment 4

Date: 02 November 2005

To: William Nahumck, Chairman ASTM Sequence III Surveillance Panel

From: Dwight Bowden, OH Technologies, Inc.

Re: IIIG Rings, Batch Code 5 & Batch Code 6

Cc: Robert Olree, General Motors Corporation
Sid Clark, General Motors Corporation

Attachments: 051102 Update to 050506 Component Composition.xls
051102 IIIG Ring Status.xls

As you may recall, OHT was requested to obtain sorted second rings (BC3, Runs 5 & 6) and replacement second rings (BC3A, Runs 1, 2, 3 & 4) for ring kits following the IIIG Precision Matrix. At that time OHT issued an order for replacement second rings (BC3A) for Runs 5 and 6 in addition to ordering all rings for BC4, Runs 1 thru 6.

The replacement second rings (BC3A) for Runs 5 and 6 were applied to BC5 engine ring sets. However, upon receipt of BC5 second rings for Runs 1 thru 4, it was noted that the rings had the visual "rough" or "thread type" surface.

OHT placed an order to replace these rings and order all components for BC6 engine sets. Among other items, the vendor responded with a quotation that opened the print tolerances for ring gaps. This was deemed unacceptable by OHT and the order was withdrawn. Despite the best efforts of both OHT and General Motors, the vendor was unwilling to alter their quotation.

With General Motors' endorsement, OHT obtained an alternate vendor to manufacture IIIG rings. An order for BC6 rings has been issued and this material will be available in the near future.

OHT is about to deplete engine ring kits assembled using BC4 second rings for Runs 1 thru 4. As a result, there are two options available going forward. The first option is to use material manufactured by the original vendor with second rings that have the rough or thread type visual appearance on the second ring. The second option would be to set aside all material from the original vendor and introduce BC6 engine ring sets manufactured by the alternate vendor.

I request that you distribute this letter with attachments to the Surveillance Panel and place this topic on the agenda for the next meeting.

Attachment 4A

IIIG Piston Ring Status
Date: 11/02/2005

	Engine Sets Batch 4	Engine Sets Batch 5	Engine Sets Batch 5	Engine Sets Batch 6	Engine Sets Total
Run 1	5	0	**100**	200	305
Run 2	21	0	**100**	200	321
Run 3	23	0	**100**	200	323
Run 4	19	0	**100**	200	319
Run 5	0	**163**	0	200	363
Run 6	0	**169**	0	200	369
	68	**332**	**400**	**1200**	**2000**
		NOTE: **Batch 3A Second Rings**	**NOTE:** **"Thread Type" OD Finish on Second Ring**	**NOTE:** **Alternate Vendor Supplied Material**	

Attachment 4B

CENTRAL PARTS DISTRIBUTOR REPORT
OH Technologies, Inc.

Sequence III Surveillance Panel Meeting
SwRi, San Antonio, TX
Nov. 8, 2005

1.) Rejections from 5/10/2005 to 11/4/2005 :

ITEM	DESCRIPTION	REASON REJECTED	QTY	REPLACED (Y/N)	DATE REPLACED
OHT3F-008-6	CAMSHAFT, SPECIAL TEST, IIIF	STAINED	1	YES	7/7/2005
OHT3F-030-2	OIL COOLER	CORROSION	3	YES	7/29/2005
OHT3F-030-2	OIL COOLER	CORROSION	1	YES	8/19/2005

OHT ACTION: MODIFIED POST-PLATING RINSE PROCEDURE

2.) Technical Memos Issued

None

3.) Batch Code Changes

IIIF	Batch Code	Date Introduced
Grade 12 Piston	BC 17	8/19/05
Grade 34 Piston	BC 17	6/29/05
Grade 56 Piston	BC 18	6/29/05
Conn. Bearing	BC 13	6/16/05
Rocker Arm	BC 9	6/29/05

IIIG	Batch Code	Date Introduced
Grade 12 Pistons	BC 18	8/19/05
Grade 34 Pistons	BC 17	4/11/05
Grade 56 Pistons	BC 17	4/29/05
Run 6 Rings	BC 5	5/26/05
Conn. Bearing	BC 13	5/26/05
Rocker Arm	BC 9	8/11/05

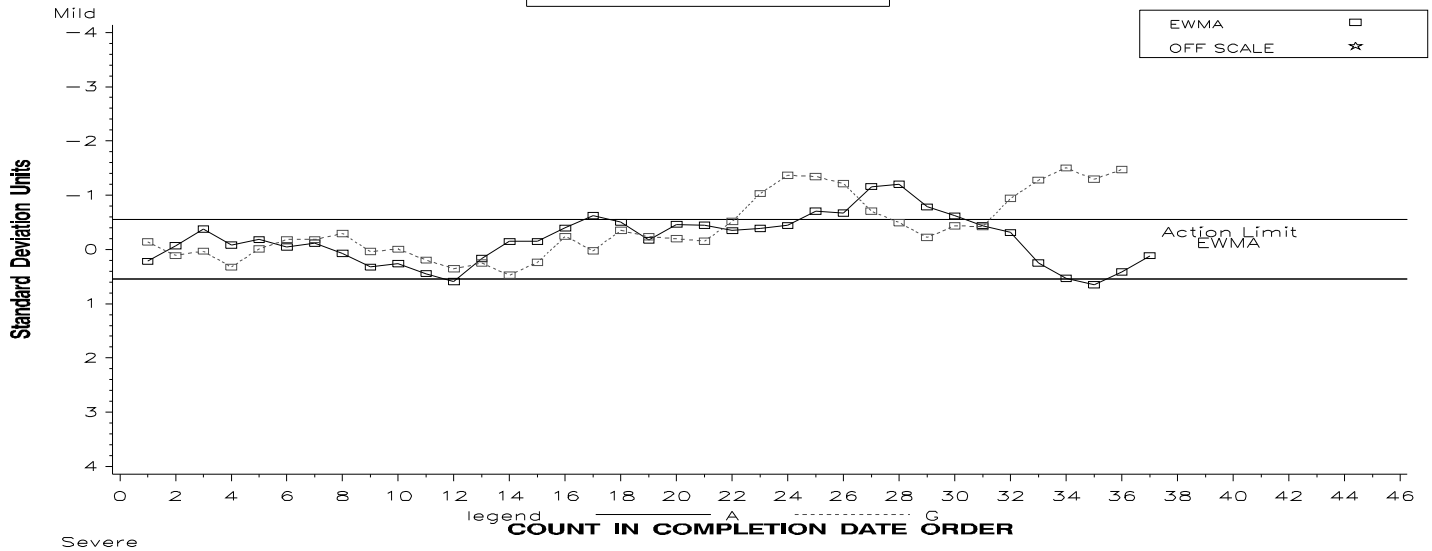
IIIG RING BATCH CODES						
DATE: 10/7/2003						
UPDATED: 03/22/2005						
UPDATED: 11/02/2005						
OHT P/N	**OHT3G-050-RUN1**	**OHT3G-050-RUN2**	**OHT3G-051-RUN3**	**OHT3G-051-RUN4**	**OHT3G-052-RUN5**	**OHT3G-052-RUN6**
RUN	**1**	**2**	**3**	**4**	**5**	**6**
ENGINE SET BATCH CODE	BC3A	BC3A	BC3A	BC3A	BC3	BC3
DESIGNATION						
COMPONENTS						
TOP COMPRESSION	BC3	BC3	BC3	BC3	BC3	BC3
SECOND COMPRESSION	BC3A(REPLACEMENT)	BC3A(REPLACEMENT)	BC3A(REPLACEMENT)	BC3A(REPLACEMENT)	BC3 (SORTED)	BC3 (SORTED)
OIL CONTROL RAILS	BC3	BC3	BC3	BC3	BC3	BC3
EXPANDER	BC3	BC3	BC3	BC3	BC3	BC3
ENGINE SET BATCH CODE	BC4	BC4	BC4	BC4	BC4	BC4
DESIGNATION						
COMPONENTS						
TOP COMPRESSION	BC4	BC4	BC4	BC4	BC4	BC4
SECOND COMPRESSION	BC4	BC4	BC4	BC4	BC4	BC4
OIL CONTROL RAILS	BC4	BC4	BC4	BC4	BC4	BC4
EXPANDER	BC4	BC4	BC4	BC4	BC4	BC4
ENGINE SET BATCH CODE	BC5	BC5	BC5	BC5	BC5	BC5
DESIGNATION						
COMPONENTS						
TOP COMPRESSION	BC5	BC5	BC5	BC5	BC5	BC5
SECOND COMPRESSION	BC5	BC5	BC5	BC5	BC3A (REPLACEMENT)	BC3A (REPLACEMENT)
OIL CONTROL RAILS	BC5	BC5	BC5	BC5	BC5	BC5
EXPANDER	BC5	BC5	BC5	BC5	BC5	BC5
ENGINE SET BATCH CODE	BC6	BC6	BC6	BC6	BC6	BC6
DESIGNATION						
COMPONENTS						
TOP COMPRESSION	BC6	BC6	BC6	BC6	BC6	BC6
SECOND COMPRESSION	BC6	BC6	BC6	BC6	BC6	BC6
OIL CONTROL RAILS	BC6	BC6	BC6	BC6	BC6	BC6
EXPANDER	BC6	BC6	BC6	BC6	BC6	BC6

SEQUENCE IIIG INDUSTRY OPERATIONALLY VALID DATA

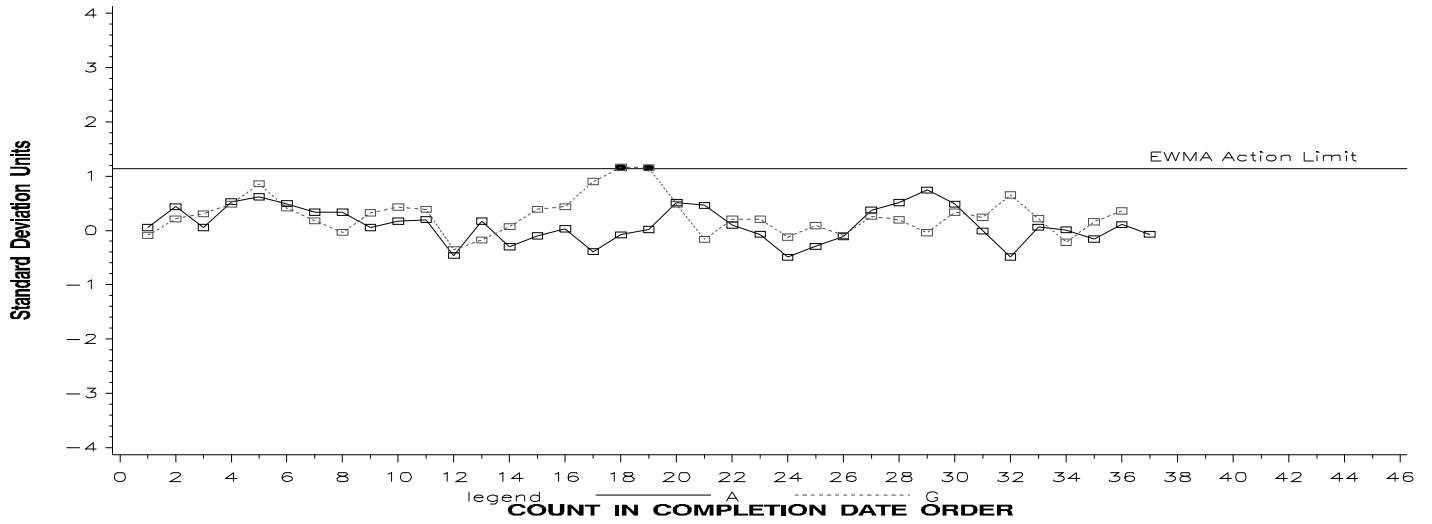
Lab A & G Data

AVERAGE CAM + LIFTER WEAR

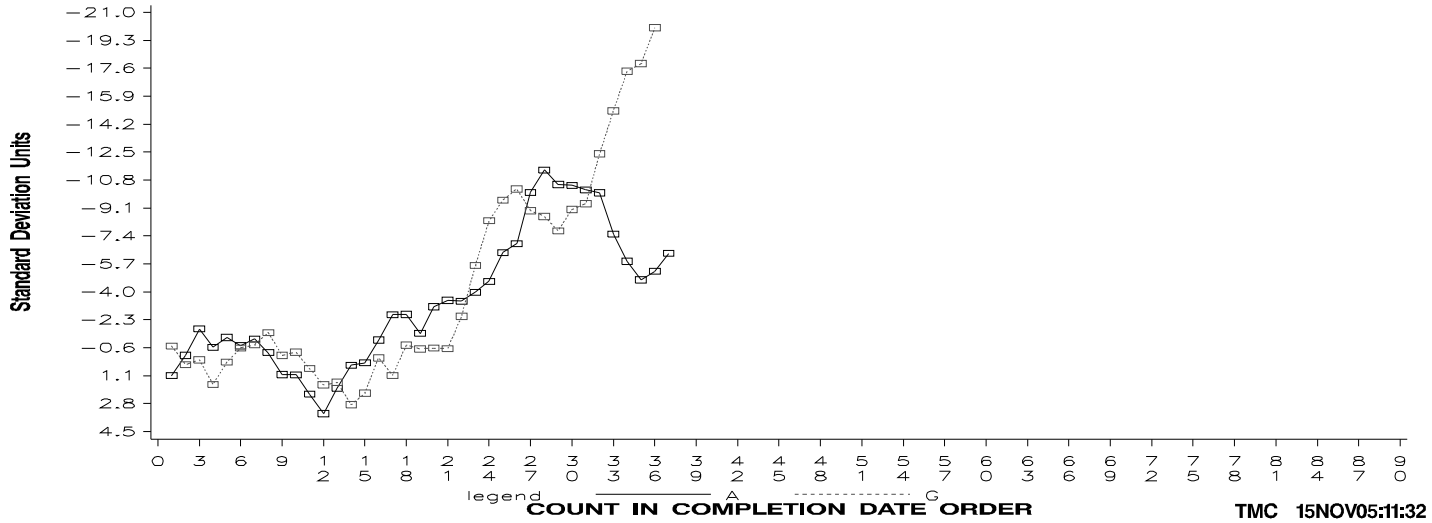
LTMS Severity Analysis



LTMS Precision Analysis



CUSUM Severity Analysis



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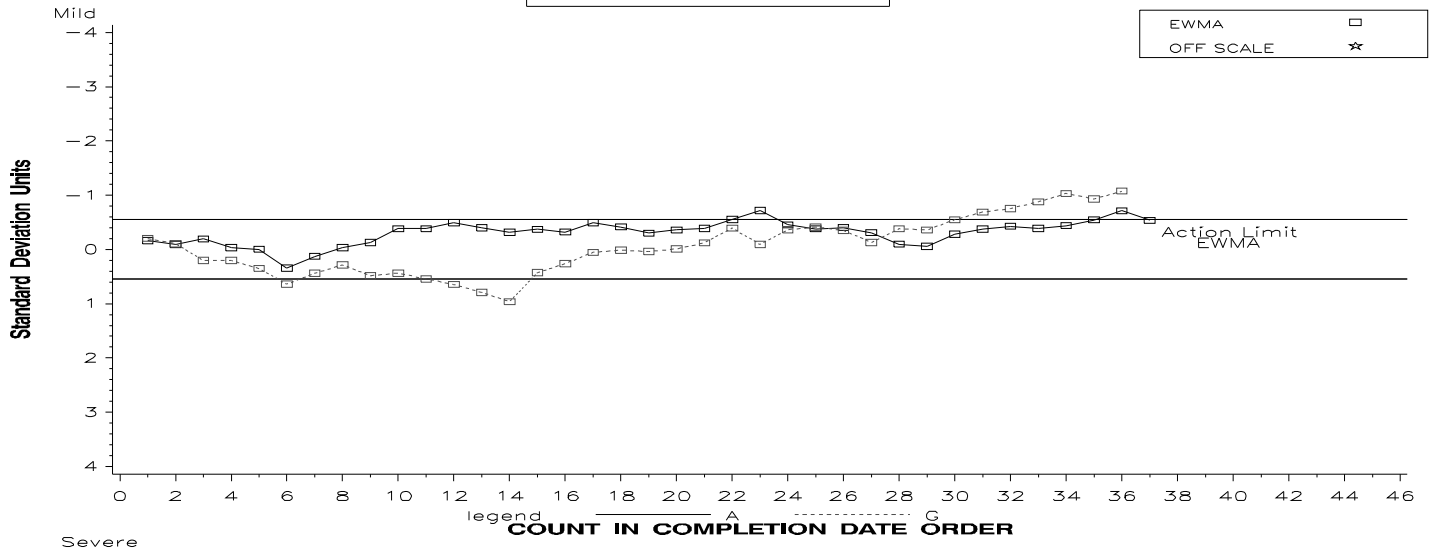
SEQUENCE IIIG INDUSTRY OPERATIONALLY VALID DATA

Lab A & G Data

VISCOSITY INCREASE

LTMS Severity Analysis



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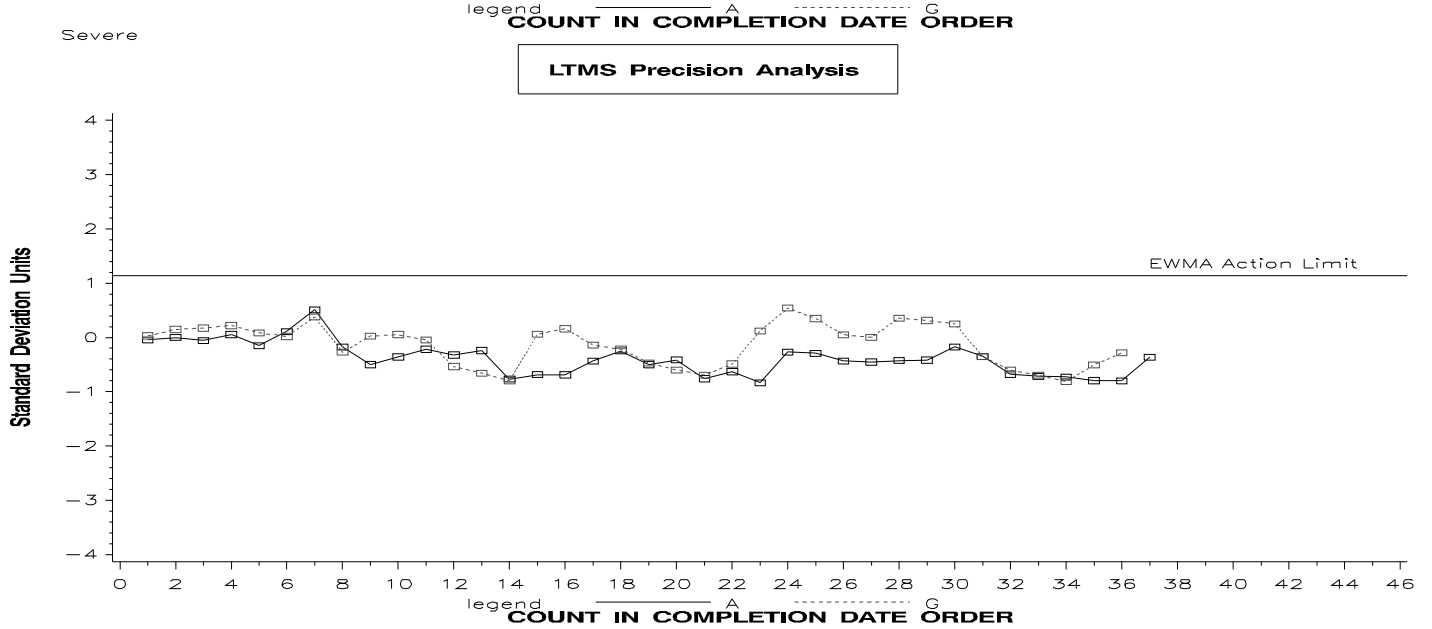

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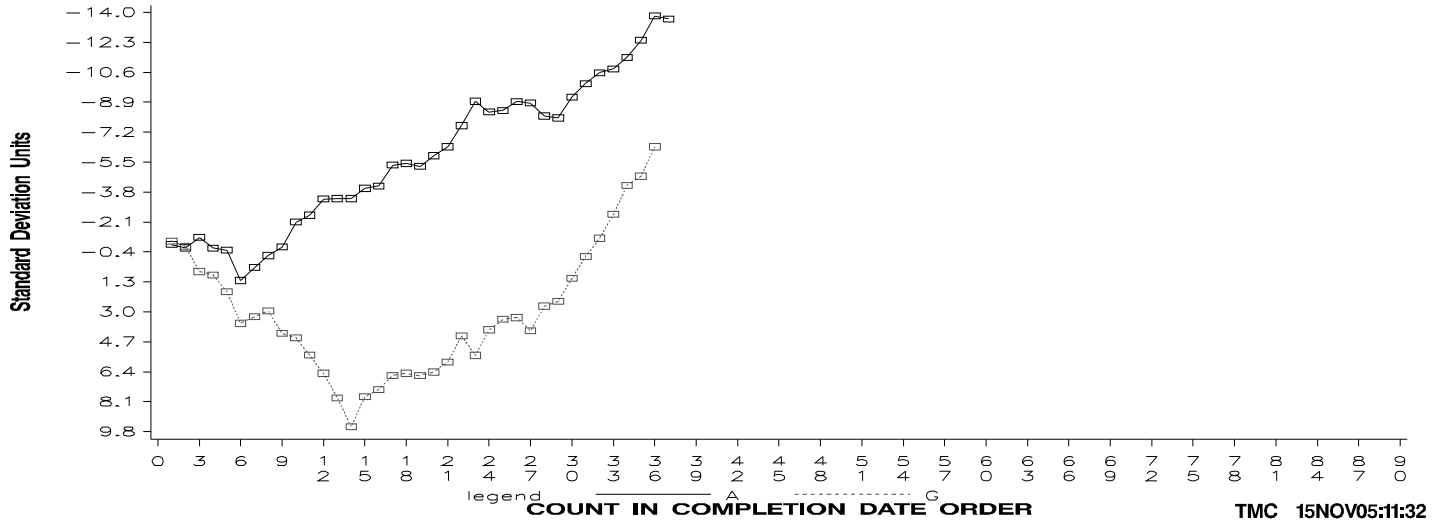

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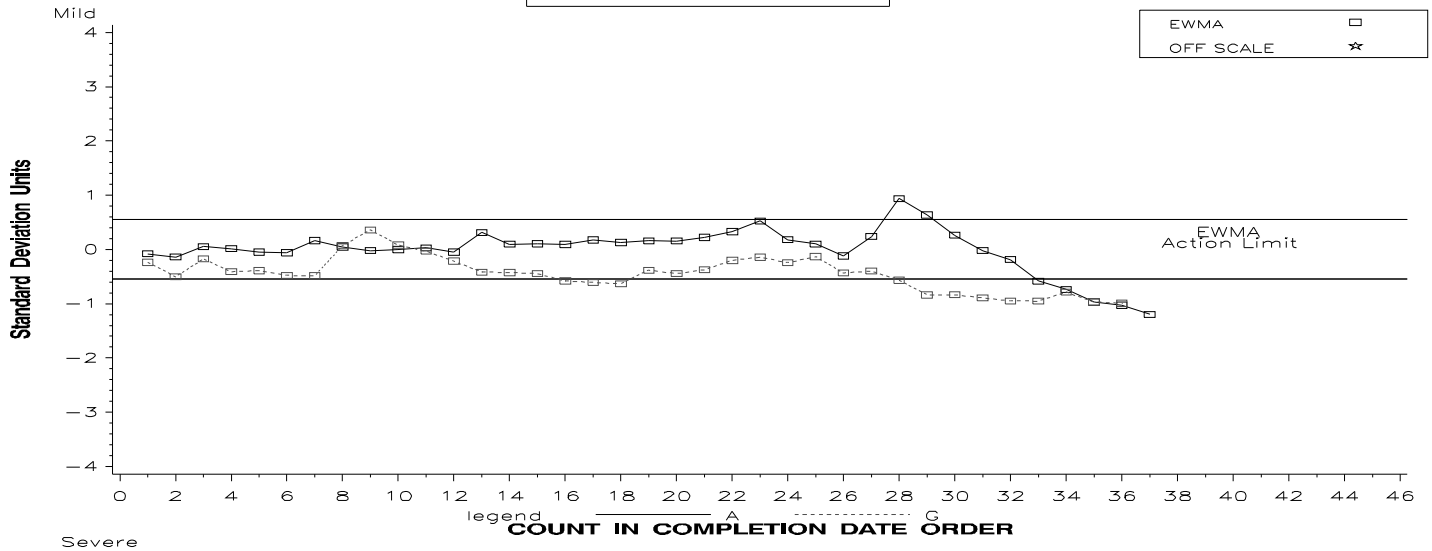
SEQUENCE IIIG INDUSTRY OPERATIONALLY VALID DATA

Lab A & G Data

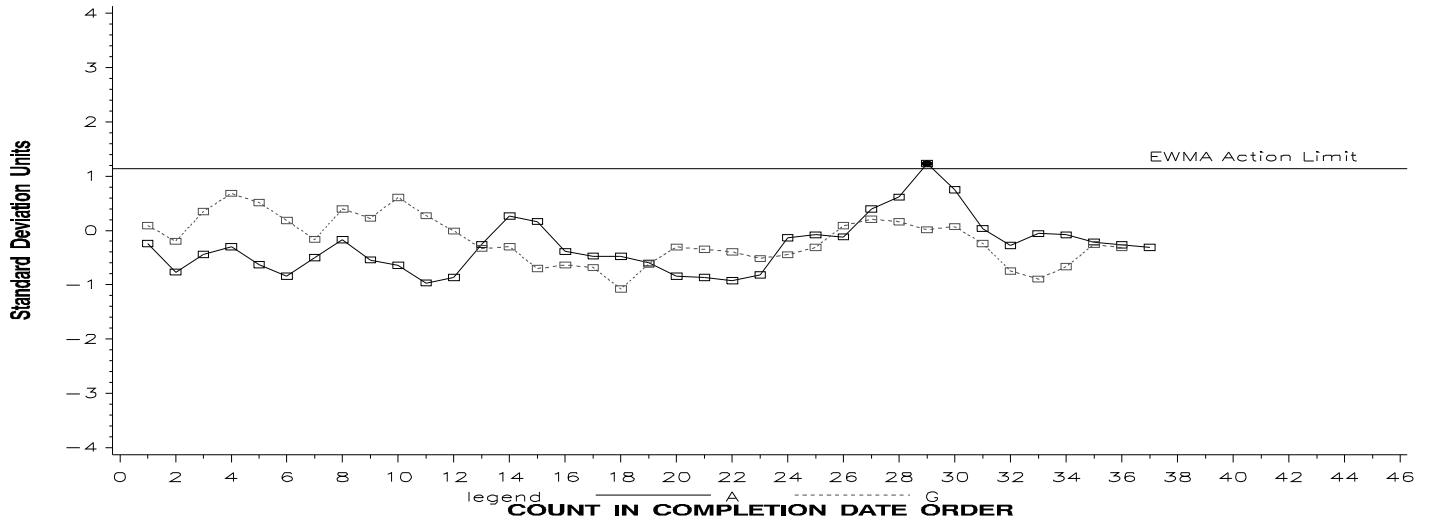
AVERAGE WEIGHTED PISTON DEPOSITS

LTMS Severity Analysis



Severe

LTMS Precision Analysis



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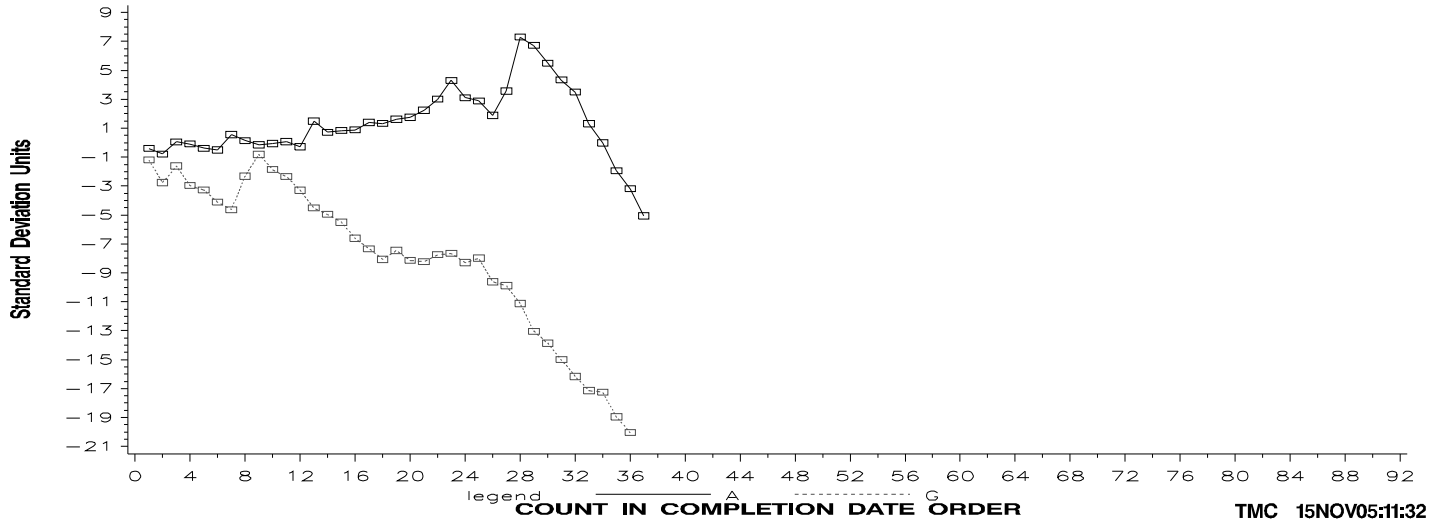

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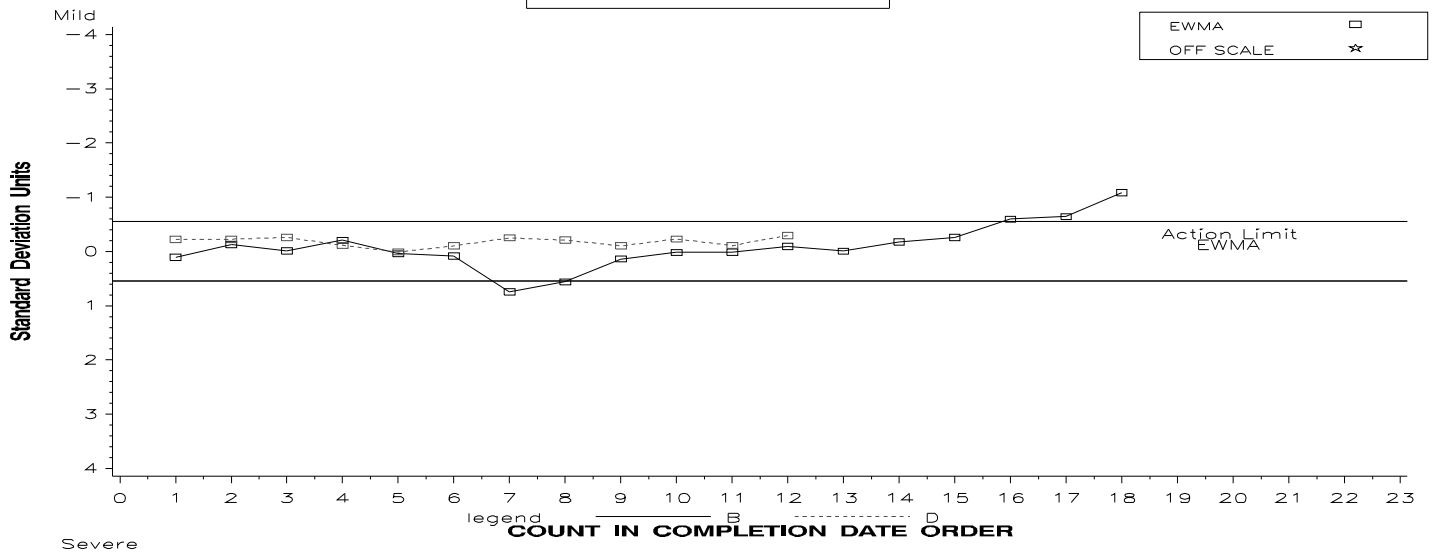
SEQUENCE IIIG INDUSTRY OPERATIONALLY VALID DATA

Lab B & D Data

AVERAGE CAM + LIFTER WEAR

LTMS Severity Analysis



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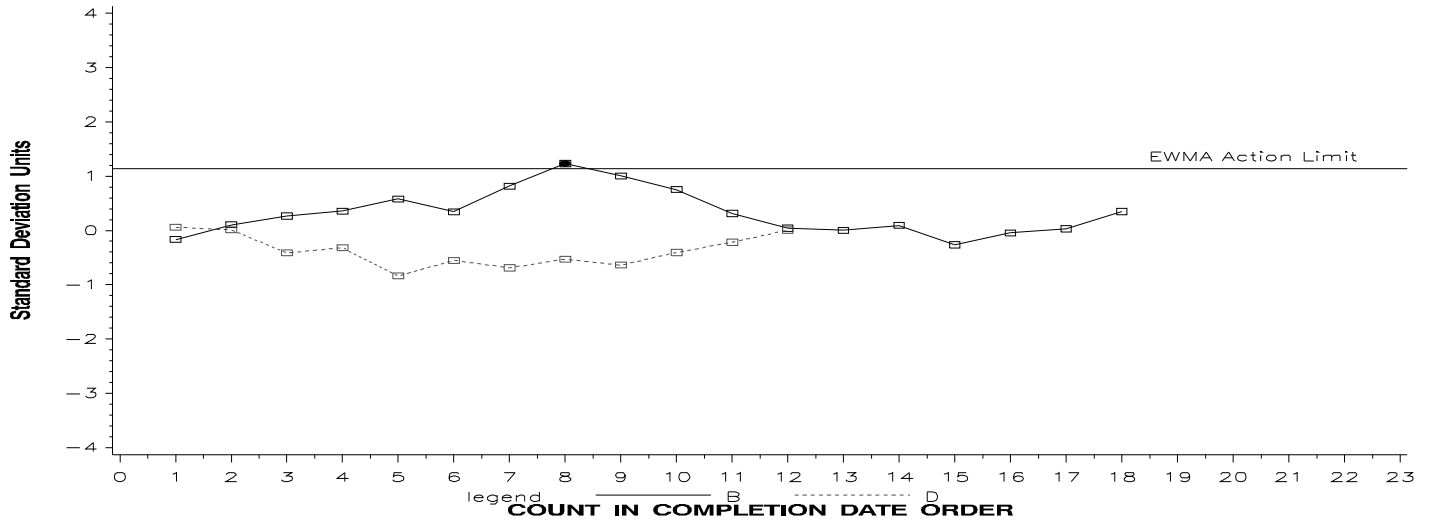

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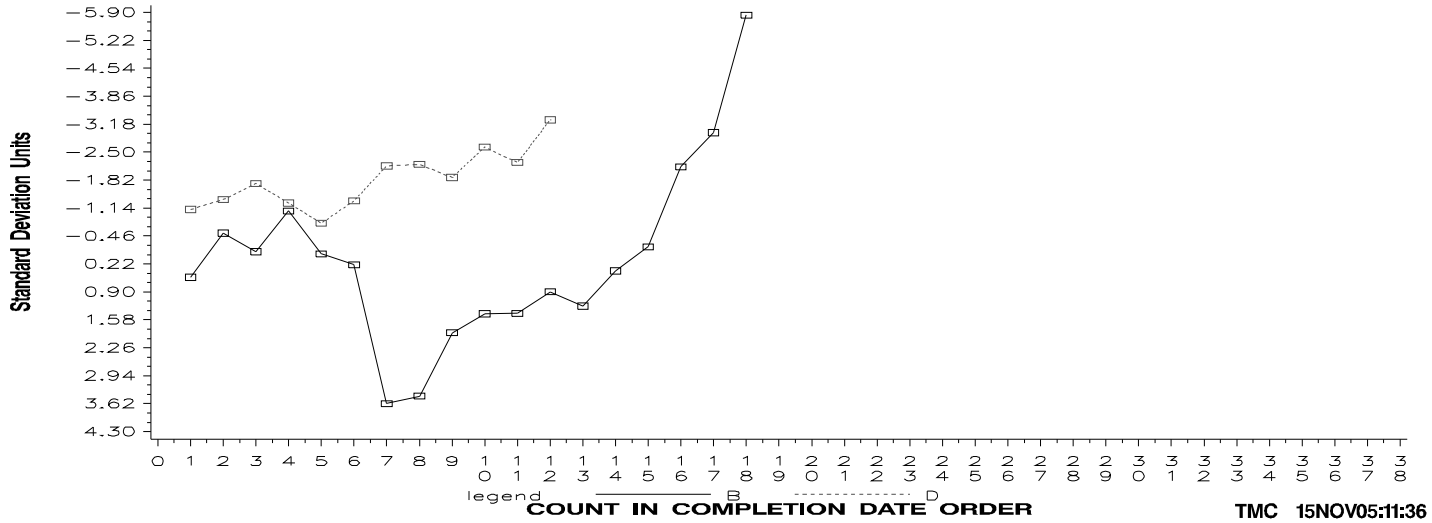

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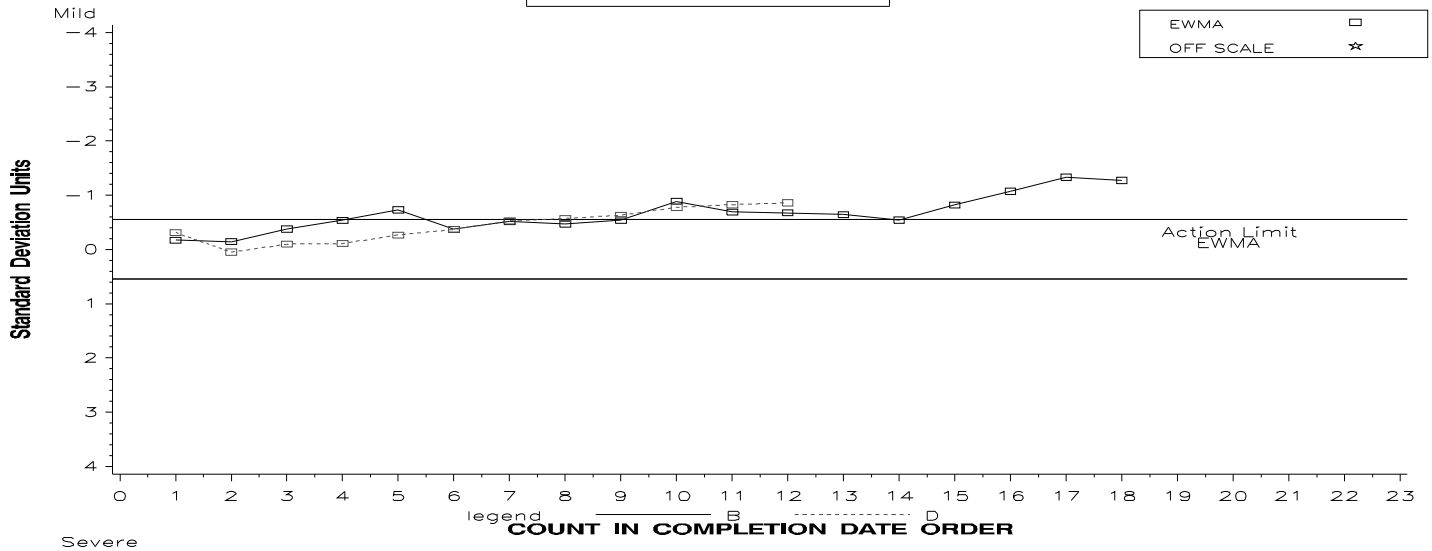
SEQUENCE IIIG INDUSTRY OPERATIONALLY VALID DATA

Lab B & D Data

VISCOSITY INCREASE

LTMS Severity Analysis



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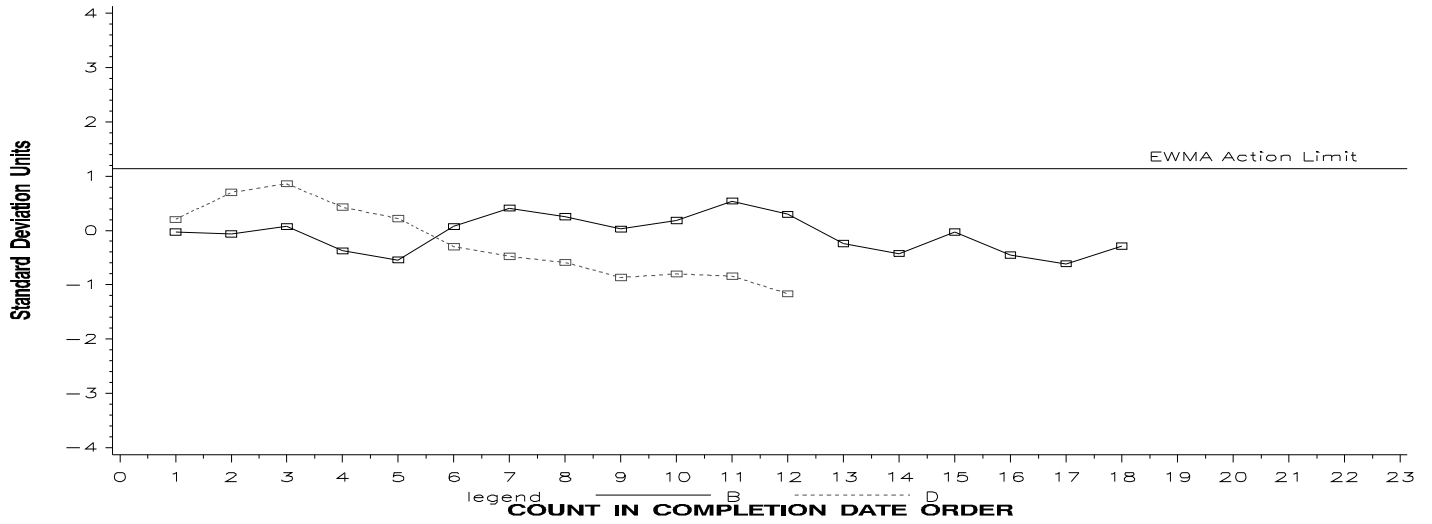

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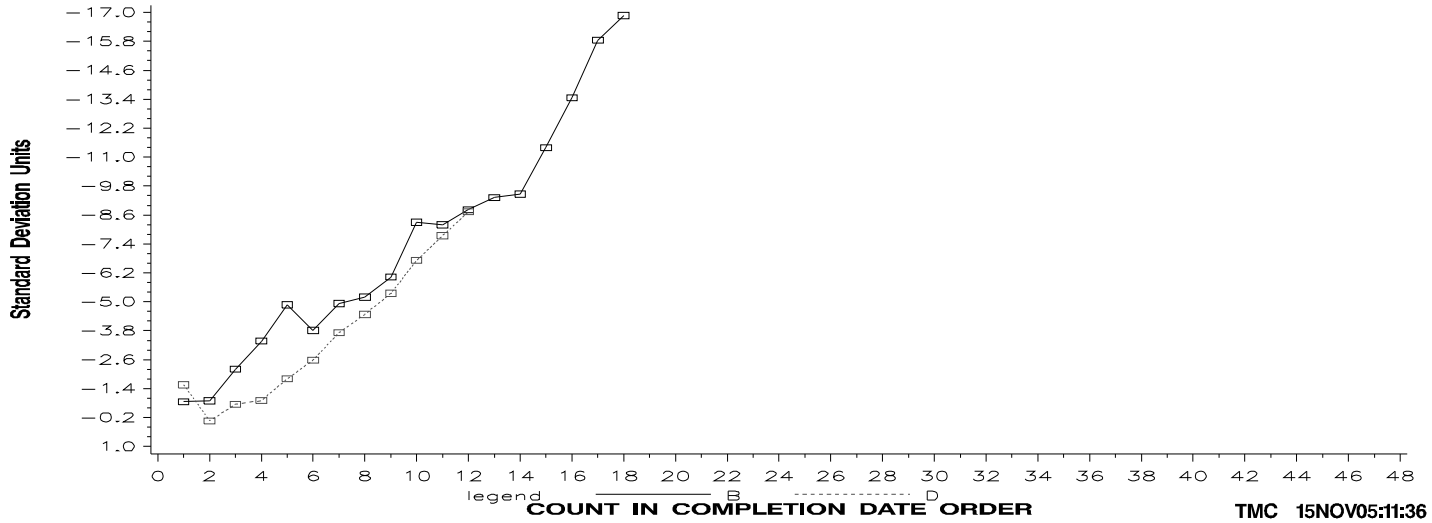

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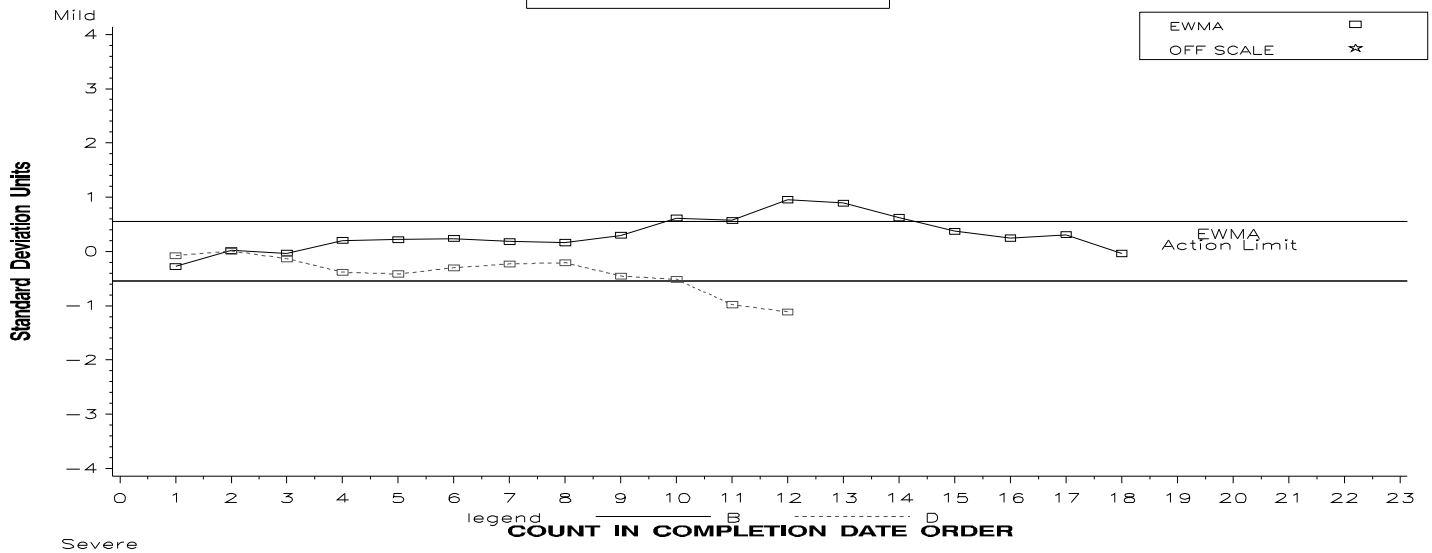
SEQUENCE IIIG INDUSTRY OPERATIONALLY VALID DATA

Lab B & D Data

AVERAGE WEIGHTED PISTON DEPOSITS

LTMS Severity Analysis



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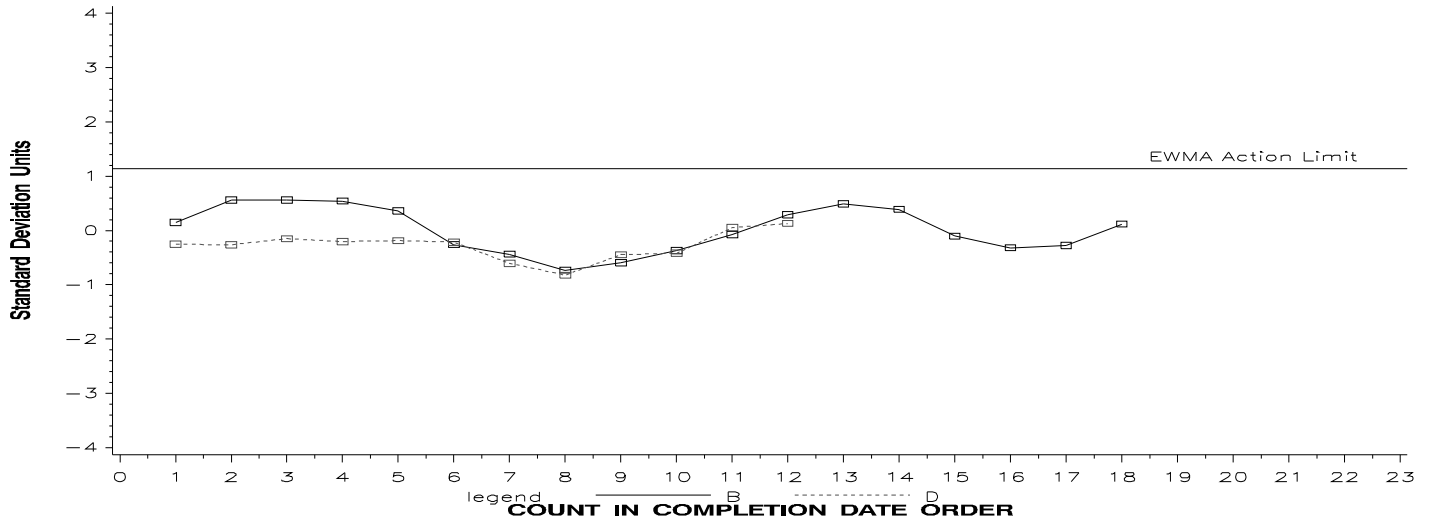

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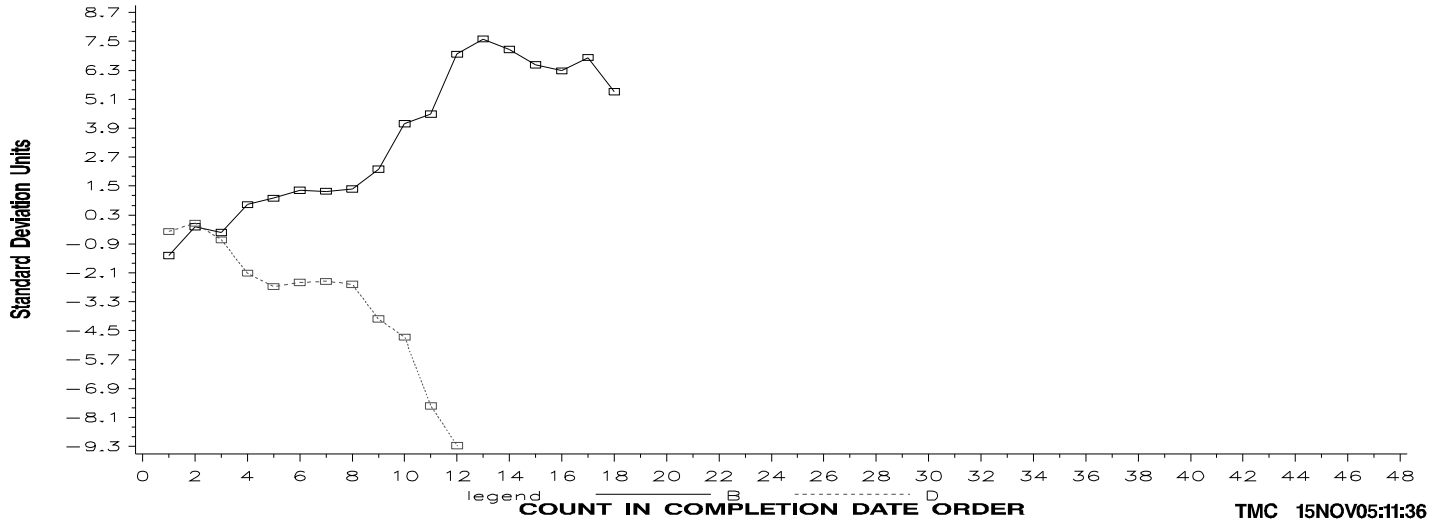

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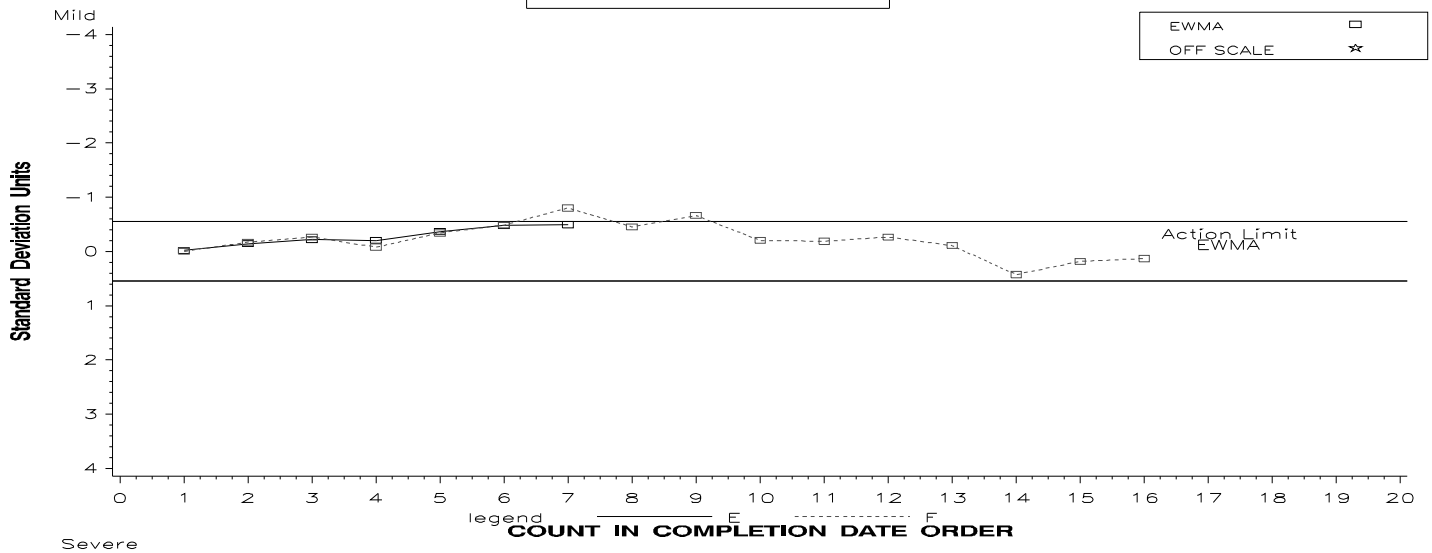
SEQUENCE IIIG INDUSTRY OPERATIONALLY VALID DATA

Lab E & F Data

AVERAGE CAM + LIFTER WEAR

LTMS Severity Analysis



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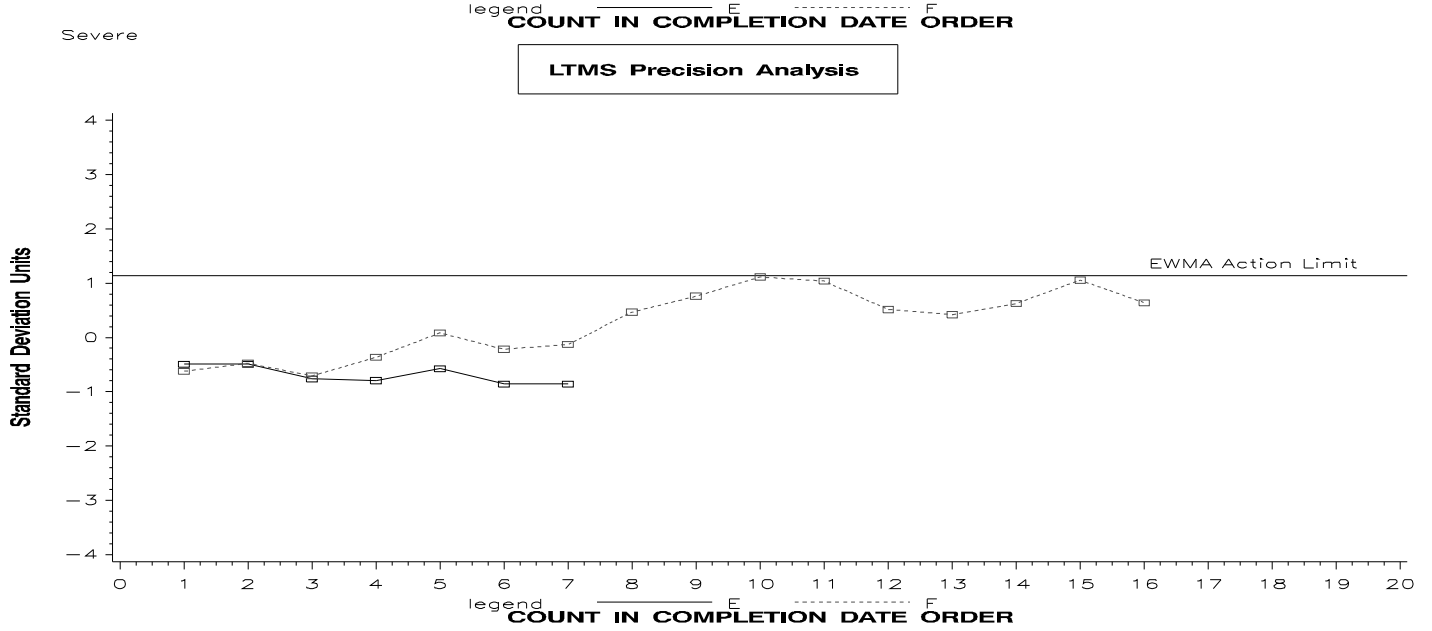

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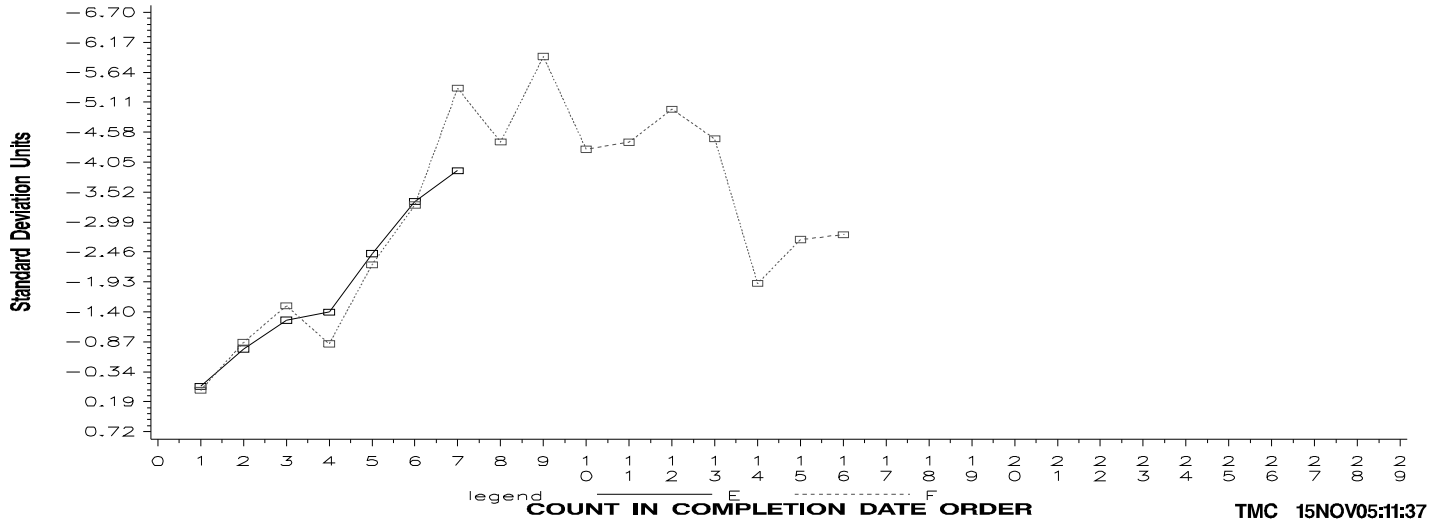

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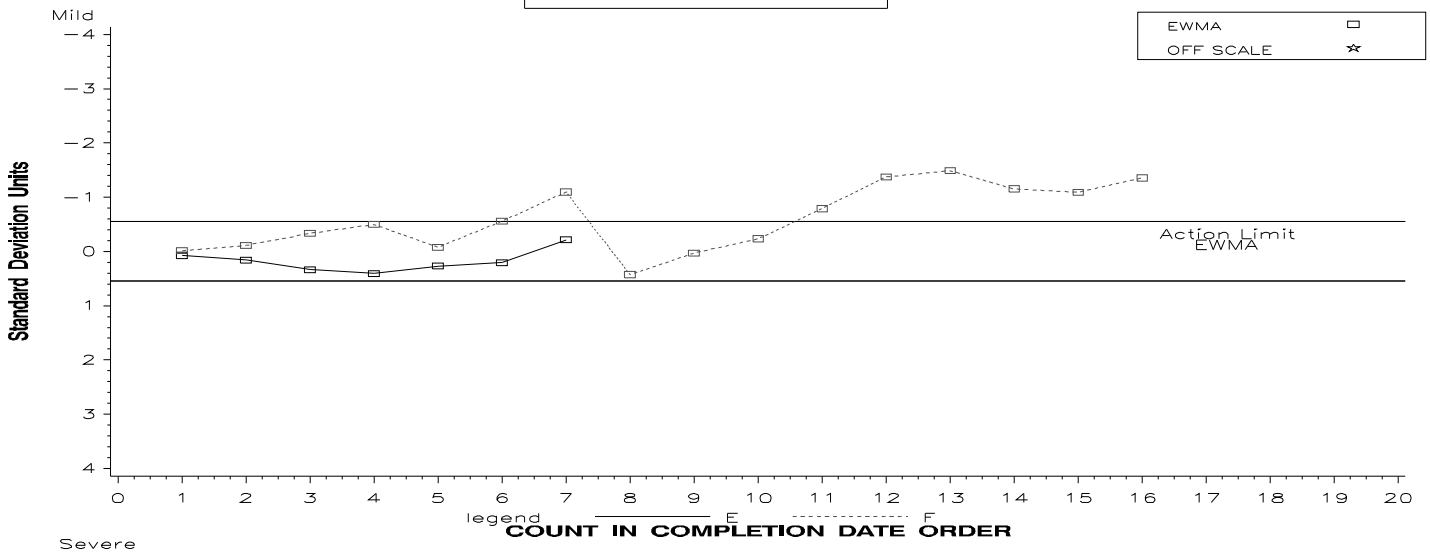
SEQUENCE IIIG INDUSTRY OPERATIONALLY VALID DATA

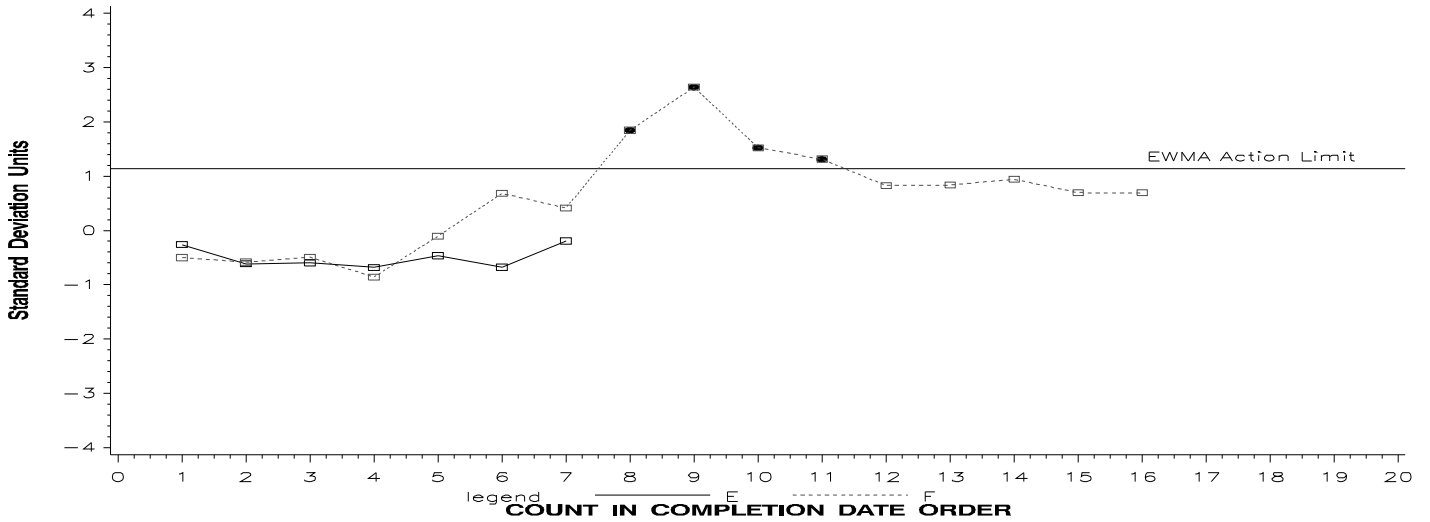
Lab E & F Data

VISCOSITY INCREASE

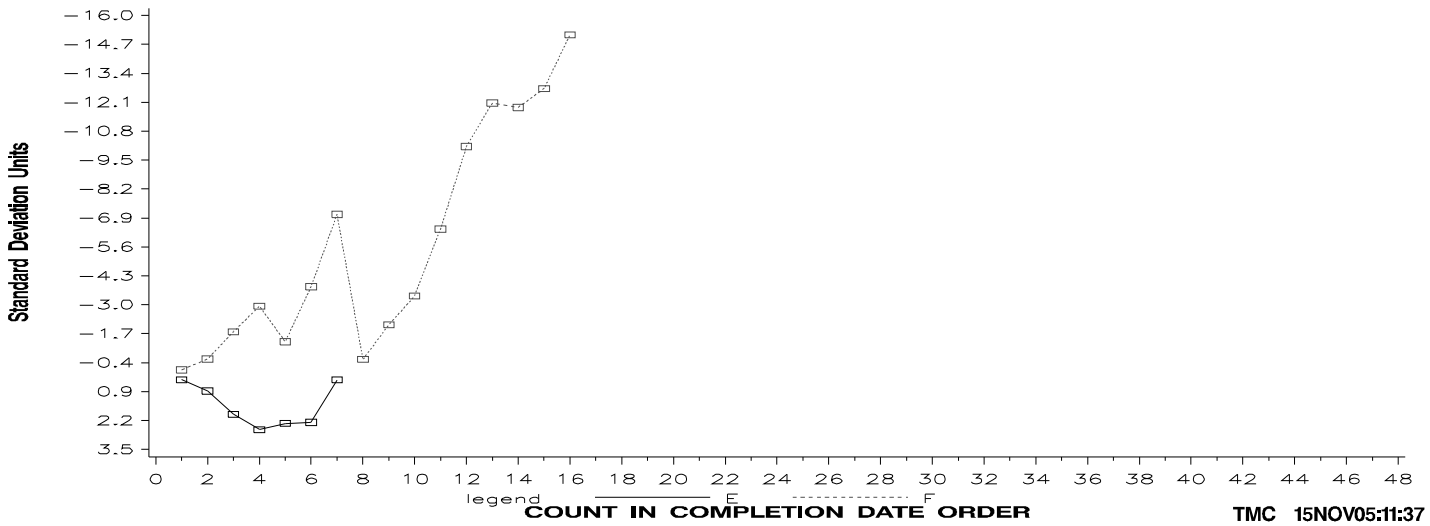
LTMS Severity Analysis



LTMS Precision Analysis



CUSUM Severity Analysis



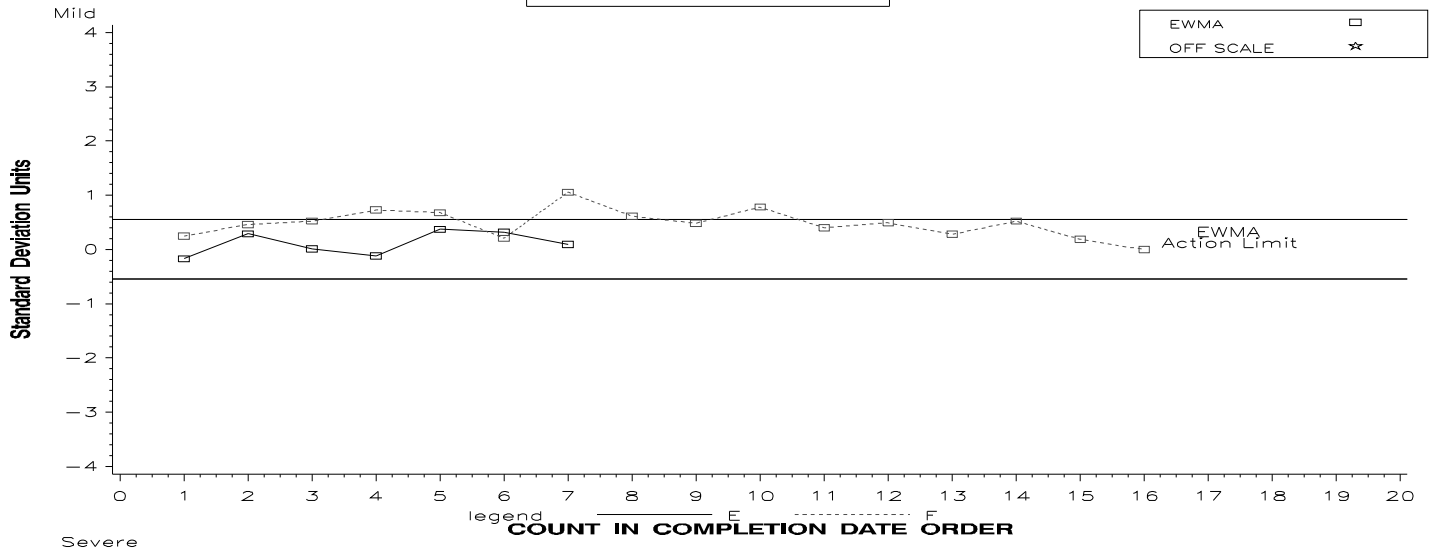
TMC 15NOV05:11:37

SEQUENCE IIIG INDUSTRY OPERATIONALLY VALID DATA

Lab E & F Data

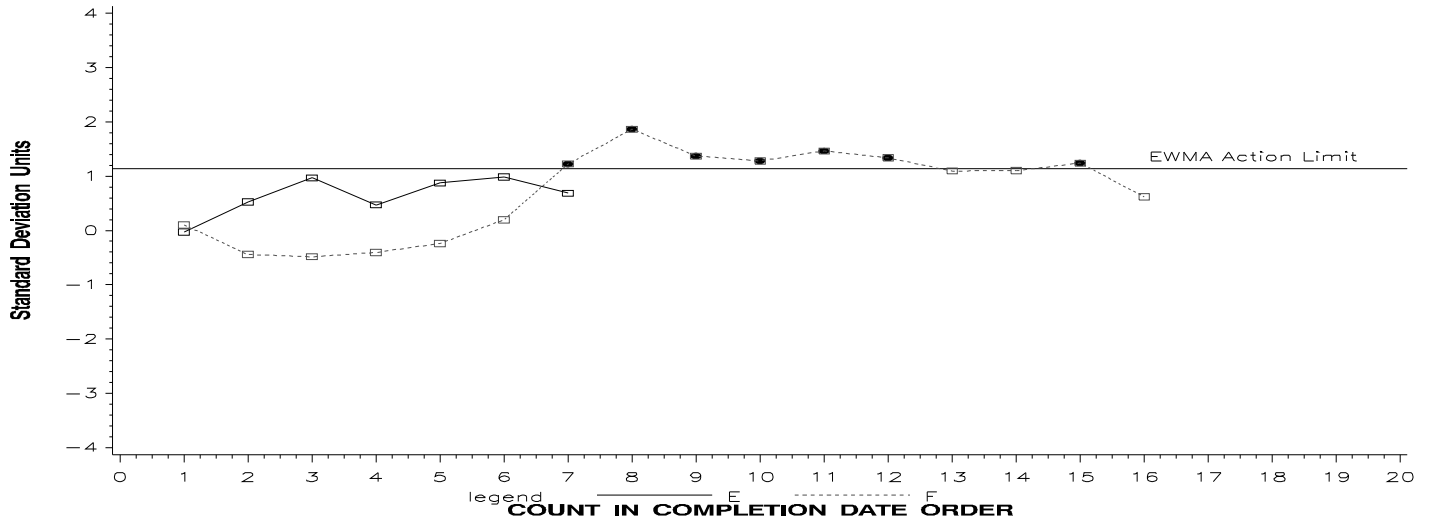
AVERAGE WEIGHTED PISTON DEPOSITS

LTMS Severity Analysis

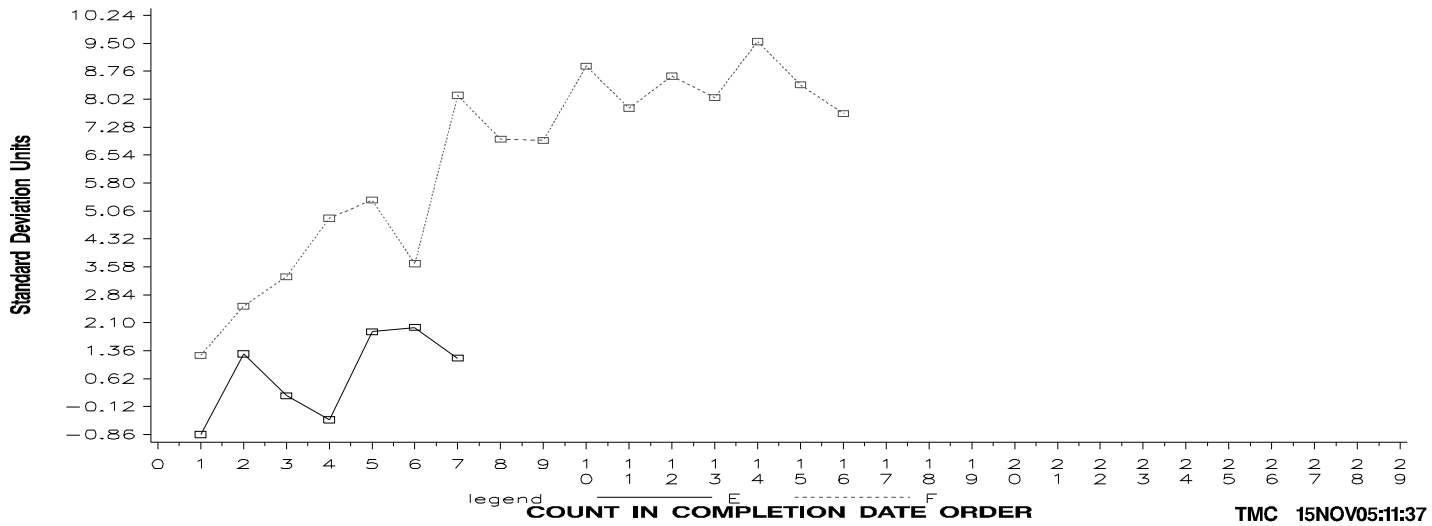


Severe

LTMS Precision Analysis



CUSUM Severity Analysis



TMC 15NOV05:11:37

Rater Calibration

November 2005

April 10-21, 2005

Light Duty Rating Workshop (Sequence III)

	Number of Parts Rated	-1 < yi ≤ 1	-2 < yi ≤ 2	-3 < yi ≤ 3	>3	Yi STD	Group
Castillo, George	14	89.3%	99.1%	99.1%	0.9%	0.66	Blue
Kobrinetz, Jack	13	86.5%	98.1%	100.0%	0.0%	0.66	Blue
Radonich, Pete	14	92.9%	100.0%	100.0%	0.0%	0.57	Blue
Foecking, Brian	14	81.3%	100.0%	100.0%	0.0%	0.74	Red
Hills, Barry	14	80.4%	98.2%	100.0%	0.0%	0.83	Red
Rodriguez, Jesse	14	83.9%	96.4%	99.1%	0.9%	0.78	Red
Yanchar, Paul	14	83.0%	97.3%	99.1%	0.9%	0.78	Red
Adams, Pat	14	71.4%	97.3%	99.1%	0.9%	0.92	White
Avis, Steve	14	70.5%	99.1%	100.0%	0.0%	0.87	White
Cales, Jonathon	14	73.2%	96.4%	98.2%	1.8%	0.98	White
Caproni, David	14	67.0%	91.1%	97.3%	2.7%	1.16	White
Garcia, Orlando	14	76.8%	97.3%	100.0%	0.0%	0.84	White
Lopez, Frank	14	77.7%	99.1%	100.0%	0.0%	0.84	White
Pansza, Mike	14	77.7%	93.8%	100.0%	0.0%	0.91	White
Ramirez, Robert	14	75.0%	95.5%	100.0%	0.0%	0.78	White
Sanchez, Art	14	72.3%	95.5%	99.1%	0.9%	0.99	White
Seiz, Ray	8	70.3%	93.8%	96.9%	3.1%	0.93	White
Tschirhart, Garland	14	74.1%	96.4%	99.1%	0.9%	0.98	White
Guarda, Waldyr	8	54.7%	75.0%	92.2%	7.8%	1.48	Yellow
Lowsky, John	14	55.4%	87.5%	98.2%	1.8%	1.22	Yellow
Pawczuk, Greg	8	62.5%	73.4%	92.2%	7.8%	1.53	Yellow
Viera, Ralph	14	60.7%	92.0%	96.4%	3.6%	1.23	Yellow

	Minimum Number of Parts Rated	Minimum Yi's within 1 STD of mean	Minimum Yi's within 2 STD of mean	Maximum Overall Yi STD	Group Total	
White	6	60%	90%	1.20	11	50%
Red	6	80%	95%	0.85	4	18%
Blue	6	85%	98%	0.75	3	14%
Yellow	-	-	-	-	4	18%

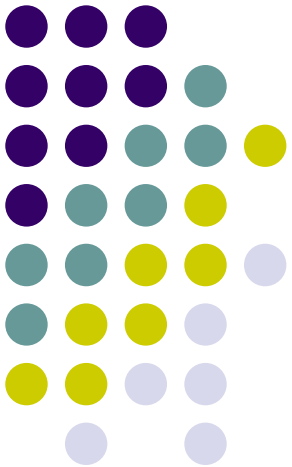
Motion

- Rater is required to attend CRC Light-Duty Rating Workshop on annual basis and generate data that meets CRC's definition of Blue, Red and White.

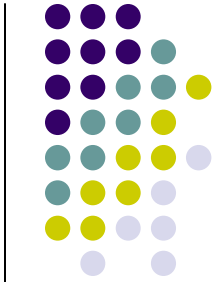
- If rater is unable to a attend CRC Light-Duty Rating Workshop for causes beyond his control the rater must attend the next CRC Workshop (which could be a heavy-duty). If the rater does not attend the very next CRC Heavy-Duty Workshop. The rater is no longer able to rate Sequence IIIG reference oil or candidate tests until attending a CRC Light-Duty Workshop.

IIIG Reference Oil Standard Deviation Estimates

July 2005

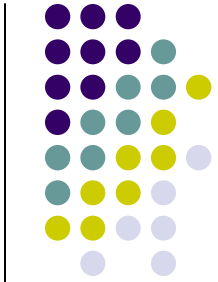


Executive Summary



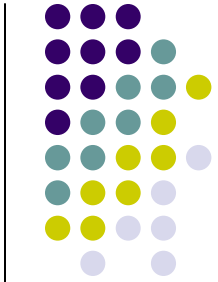
- IIIG Variability
  - Common Cause Variability
  - Special Cause Variability
    - Labs, Honing Technique, Rings, etc.
- Variability Estimates for Severity Adjustments
  - Use Best Estimates of Common Cause Variability
- IIIG Severity
  - Changes Over Time Due to Special Causes
  - Best to Stick with Stake in the Ground Estimates

Summary Table



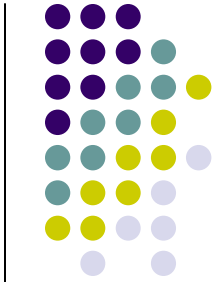
	Ln (Vis)	WPD	Ln (ACLW)
Current Pooled Standard Deviation	**0.2919**	**0.60**	**0.1903**
TMC Proposed Pooled Standard Deviation	**0.4669**	**0.6885**	**0.2407**
Lubrizol Recommended Pooled Standard Deviation	**0.2616**	**0.5618**	**0.2290**

Summary Table



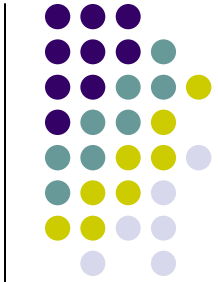
	Ln (Vis)	WPD	Ln (ACLW)
Oil 434			
Current s	**0.3859**	**0.96**	**0.1993**
LZ Estimated s	**0.3878**	**0.59**	**0.2081**
Oil 435			
Current s	**0.3096**	**0.58**	**0.2342**
LZ Estimated s	**0.2413**	**0.42**	**0.2487**
Oil 438			
Current s	**0.1768**	**0.33**	**0.2082**
LZ Estimated s	**0.1343**	**0.38**	**0.2317**

Summary: % Viscosity Increase



- Viscosity Increase is correlated with:
  - Oil, Lab, Fe and Oil Consumption
  - End of Test Fe has changed over time due to
    - Rings: in part
    - New Honing Technique: maybe
    - PM Rods: NO
  - End of Test Oil Consumption has changed over time due to
    - Rings: in part
    - New Honing Technique: maybe
    - PM Rods: NO
- Estimates of Oil Means and Standard Deviations Must Take Special Cause Variability of Labs and Rings into Account

% Viscosity Increase



Analysis of Variance for *LNPVIS, using Adjusted SS for Tests

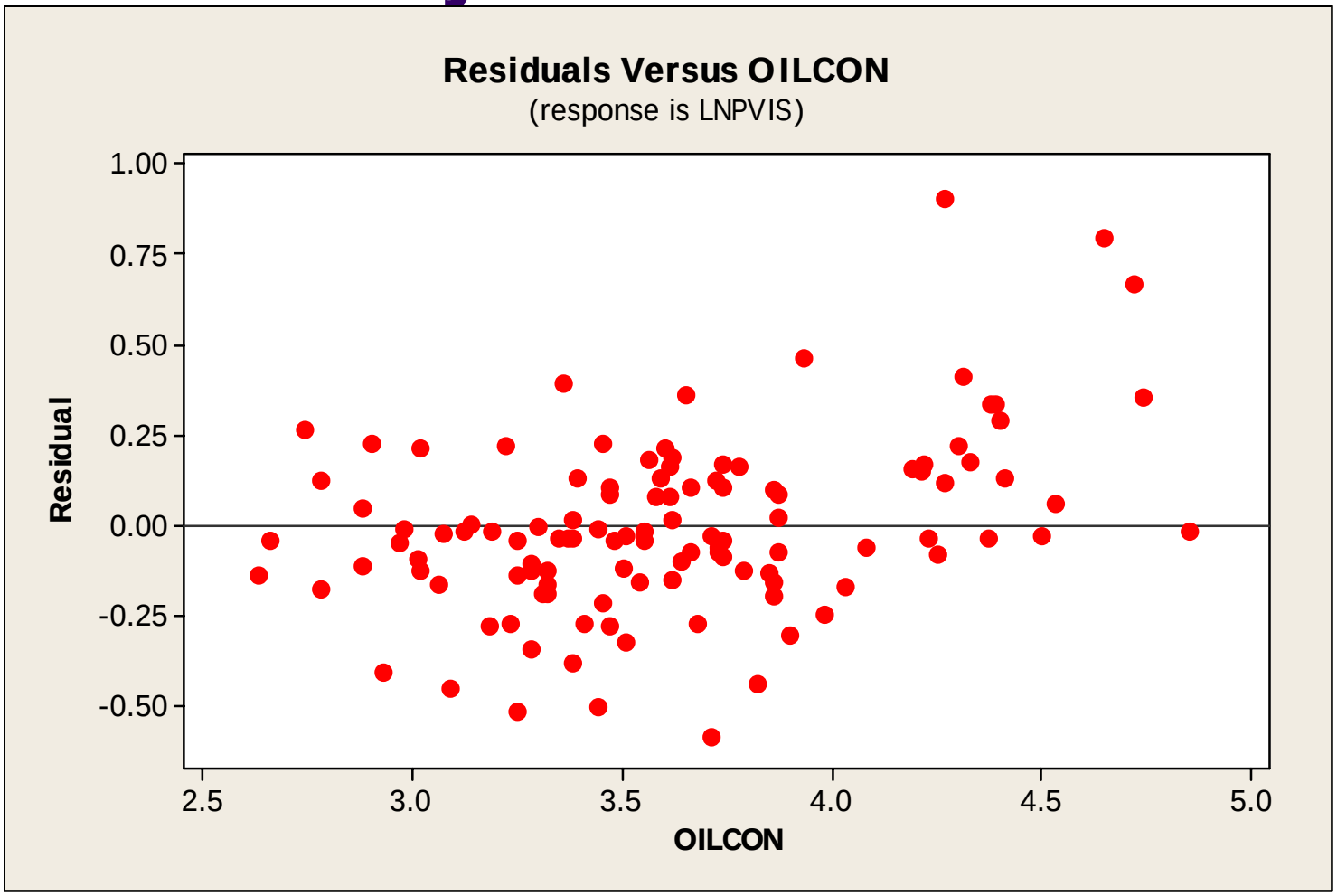
Source	DF	Seq SS	Adj SS	Adj MS	F	P
OIL	2	7.71591	7.63843	3.81922	55.80	0.000
LAB	5	1.53157	1.20088	0.24018	3.51	0.006
PM	1	1.70936	0.02936	0.02936	0.43	0.514
RING	3	1.19220	0.88480	0.29493	4.31	0.007
NEWHONE	1	0.16810	0.19307	0.19307	2.82	0.096
CAMSN	4	0.23518	0.23518	0.05880	0.86	0.492
Error	98	6.70819	6.70819	0.06845		
Total	114	19.26052				

Standard deviation from model: 0.261631 (true within lab standard Deviation should be no larger than this number)

Significant Factors: Oil, Lab, Rings (2, 3, 3A, 4)

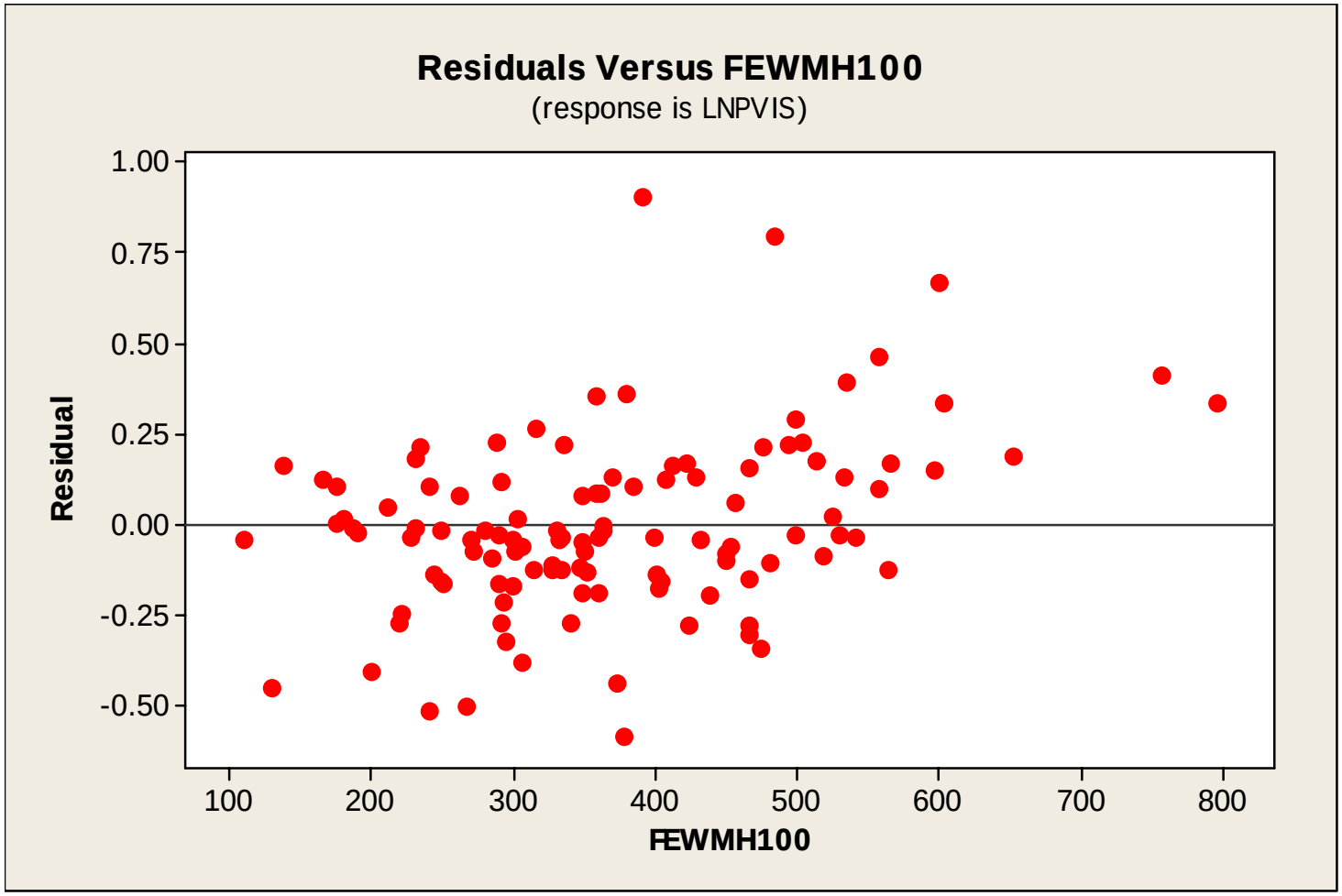
* Outlier Removed

% Viscosity Increase



Increasing pattern in residuals. Viscosity increase is affected by oil consumption. Need to further investigate oil consumption.

% Viscosity Increase

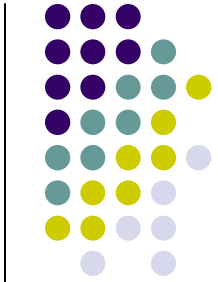


Increasing pattern in residuals. Viscosity increase is affected by EOT Fe. Need to further investigate EOT Fe.

% Viscosity Increase

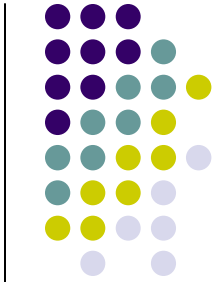
No obvious patterns in residual plot. May have captured variables correlated with time.

Summary: WPD



- WPD severity is correlated with:
  - Oil
  - Lab
  - EOT Fe
  - Ring Batch

WPD



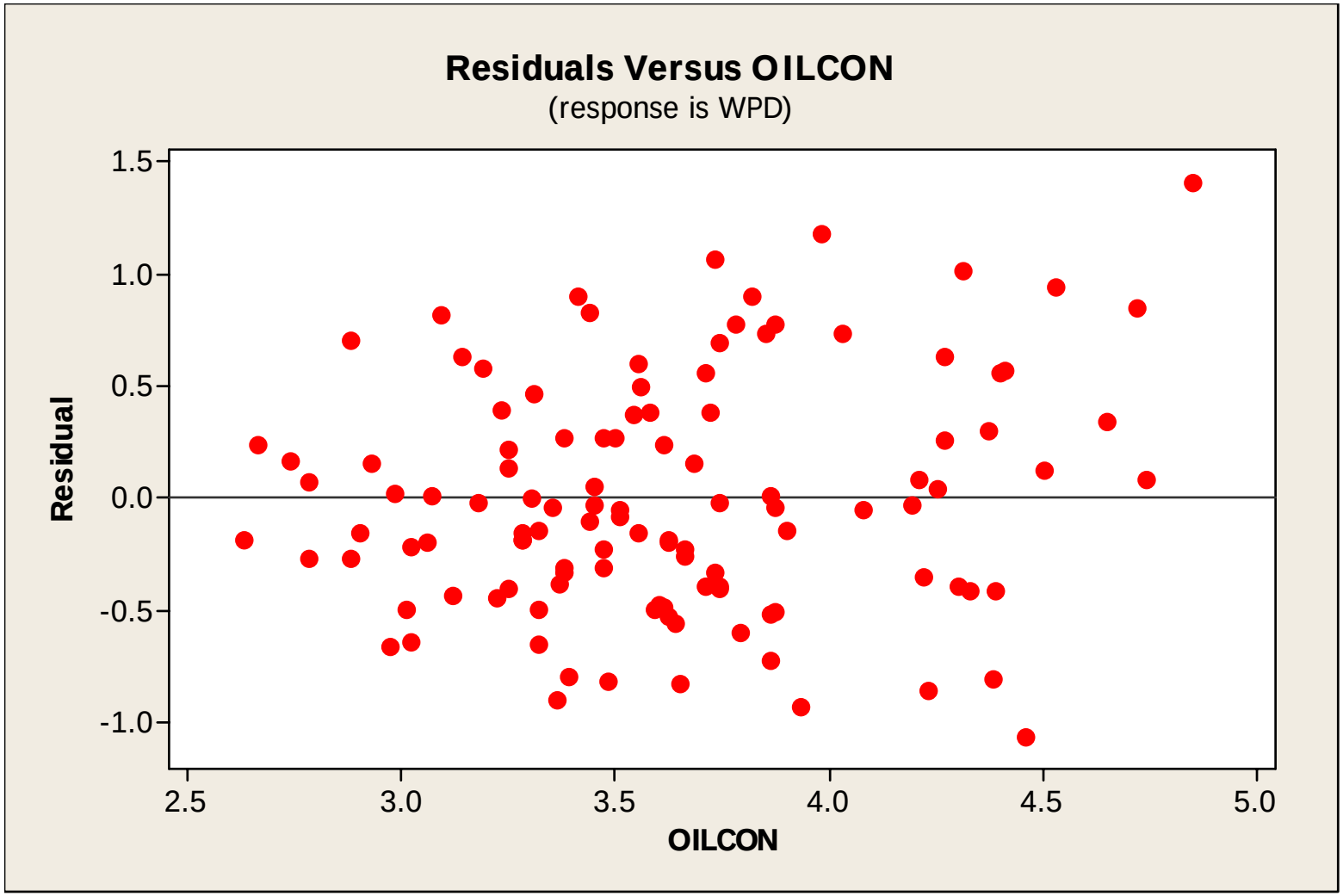
Analysis of Variance for WPD, using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
OIL	2	27.6286	26.6940	13.3470	42.29	0.000
LAB	5	8.1525	9.4754	1.8951	6.00	0.000
PM	1	4.0496	0.4623	0.4623	1.46	0.229
RING	3	8.0164	8.0231	2.6744	8.47	0.000
NEWHONE	1	0.1586	0.0811	0.0811	0.26	0.613
CAMSN	4	2.0865	2.0865	0.5216	1.65	0.167
Error	99	31.2461	31.2461	0.3156		
Total	115	81.3383				

Standard deviation from model: 0.561798 (true within lab standard deviation should be no larger than this number)

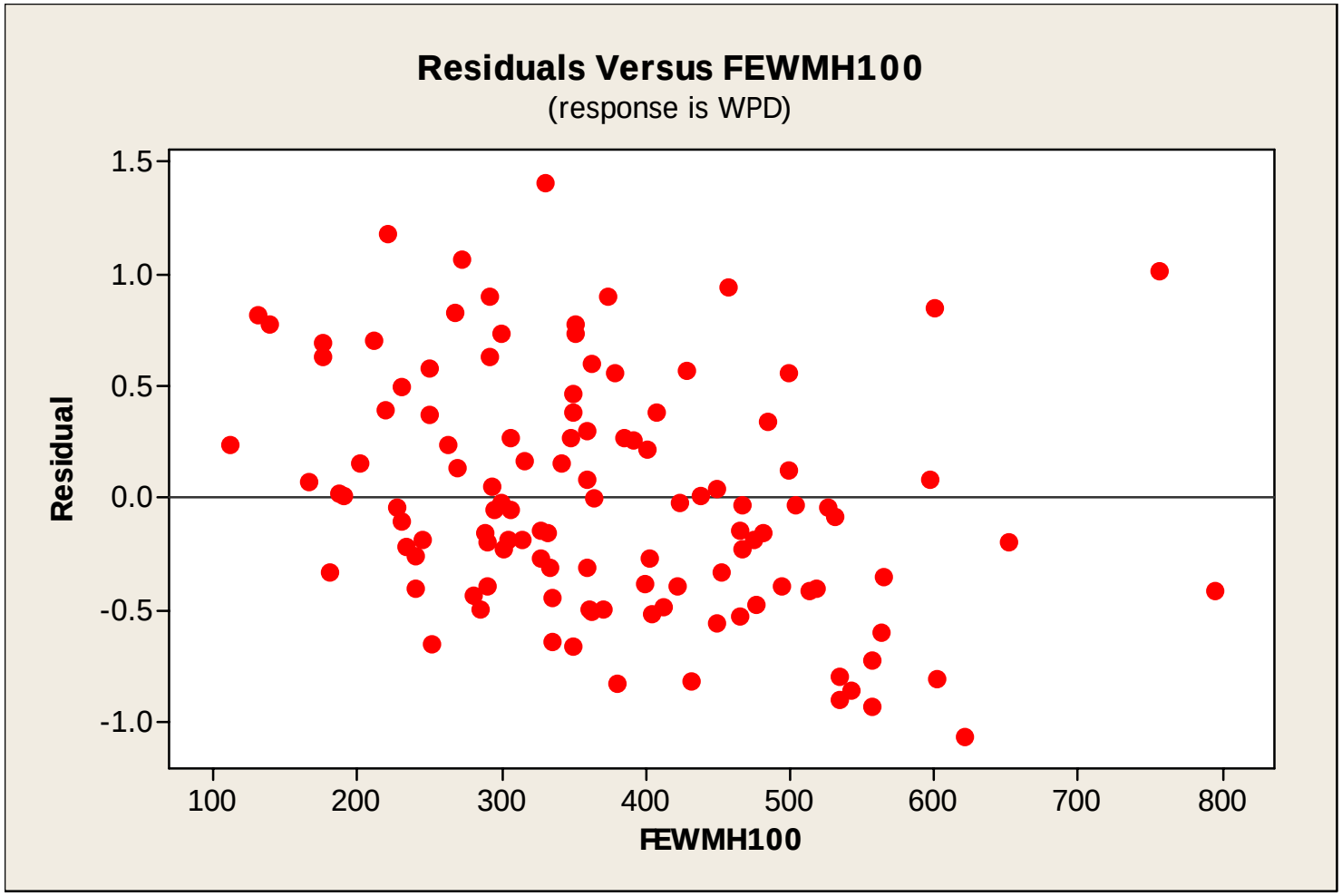
Significant Factors: Oil, Lab, Rings

WPD



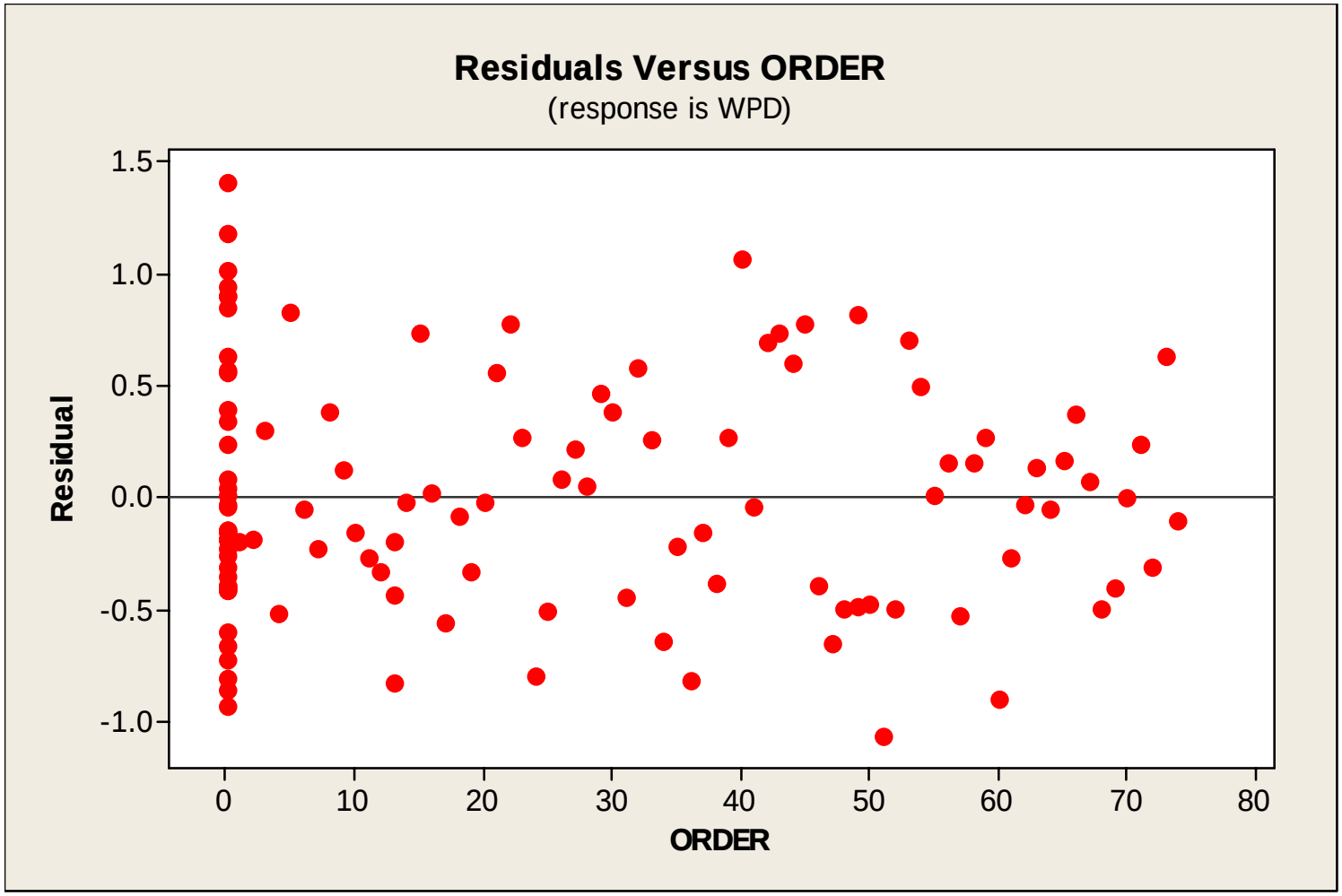
No obvious pattern in residual plot. Oil consumption is not a factor in determining WPD.

WPD



Decreasing pattern in residuals. WPD is related to EOT Fe. Need to further investigate EOT Fe.

WPD



No obvious pattern in residuals. May have captured variables correlated with time.

Summary: ACLW

- ACLW is correlated with:
  - Oil
  - EOT Fe

ACLW

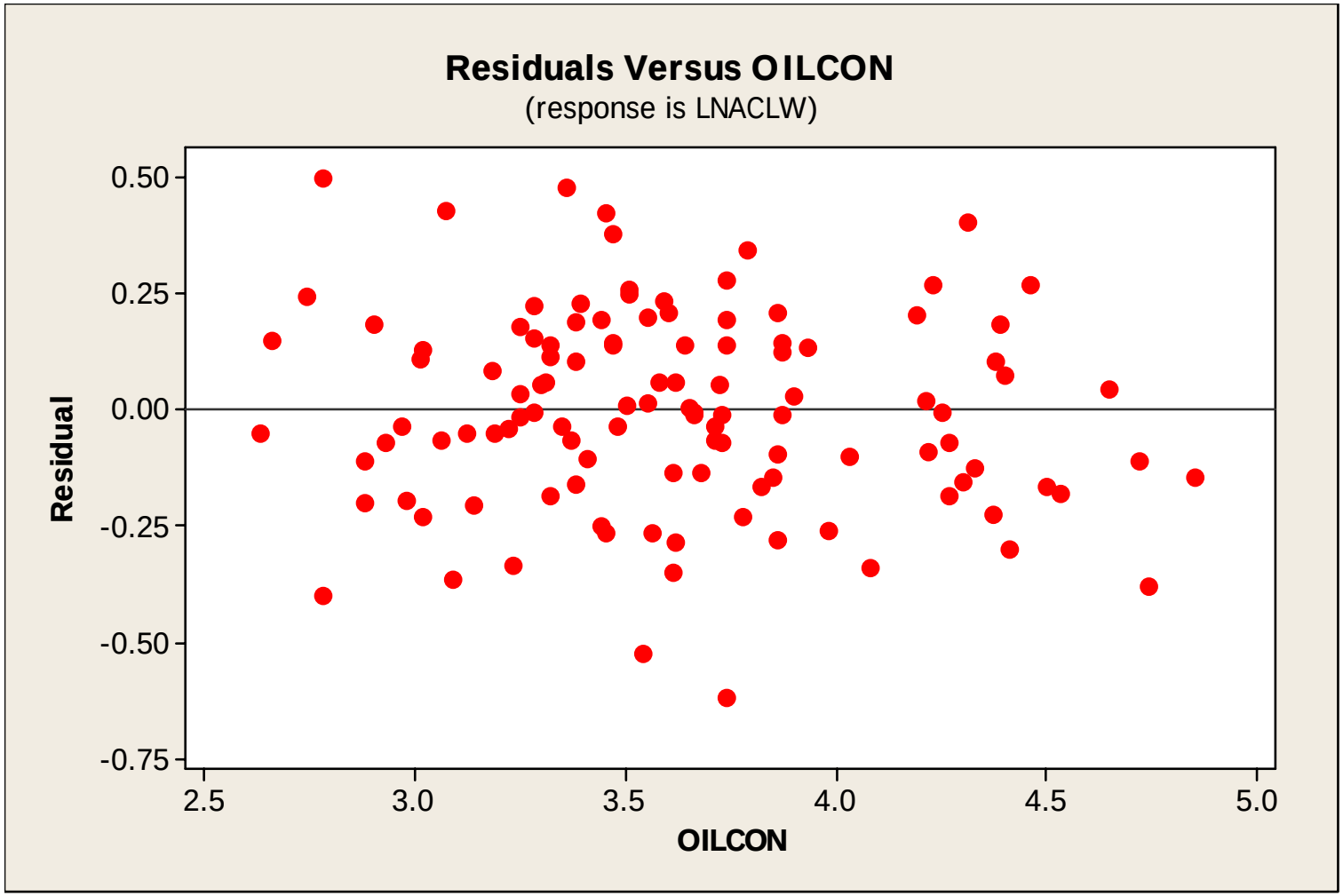
Analysis of Variance for LNACLW, using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
LAB	5	0.13232	0.10872	0.02174	0.41	0.838
OIL	2	9.38977	8.99414	4.49707	85.73	0.000
RING	3	0.36771	0.02384	0.00795	0.15	0.928
PM	1	0.00279	0.00278	0.00278	0.05	0.818
NEWHONE	1	0.05487	0.02453	0.02453	0.47	0.496
CAMSN	4	0.27248	0.27248	0.06812	1.30	0.276
Error	98	5.14057	5.14057	0.05245		
Total	114	15.36051				

Standard deviation from model: 0.229030 (true within lab standard deviation should be no larger than this number)

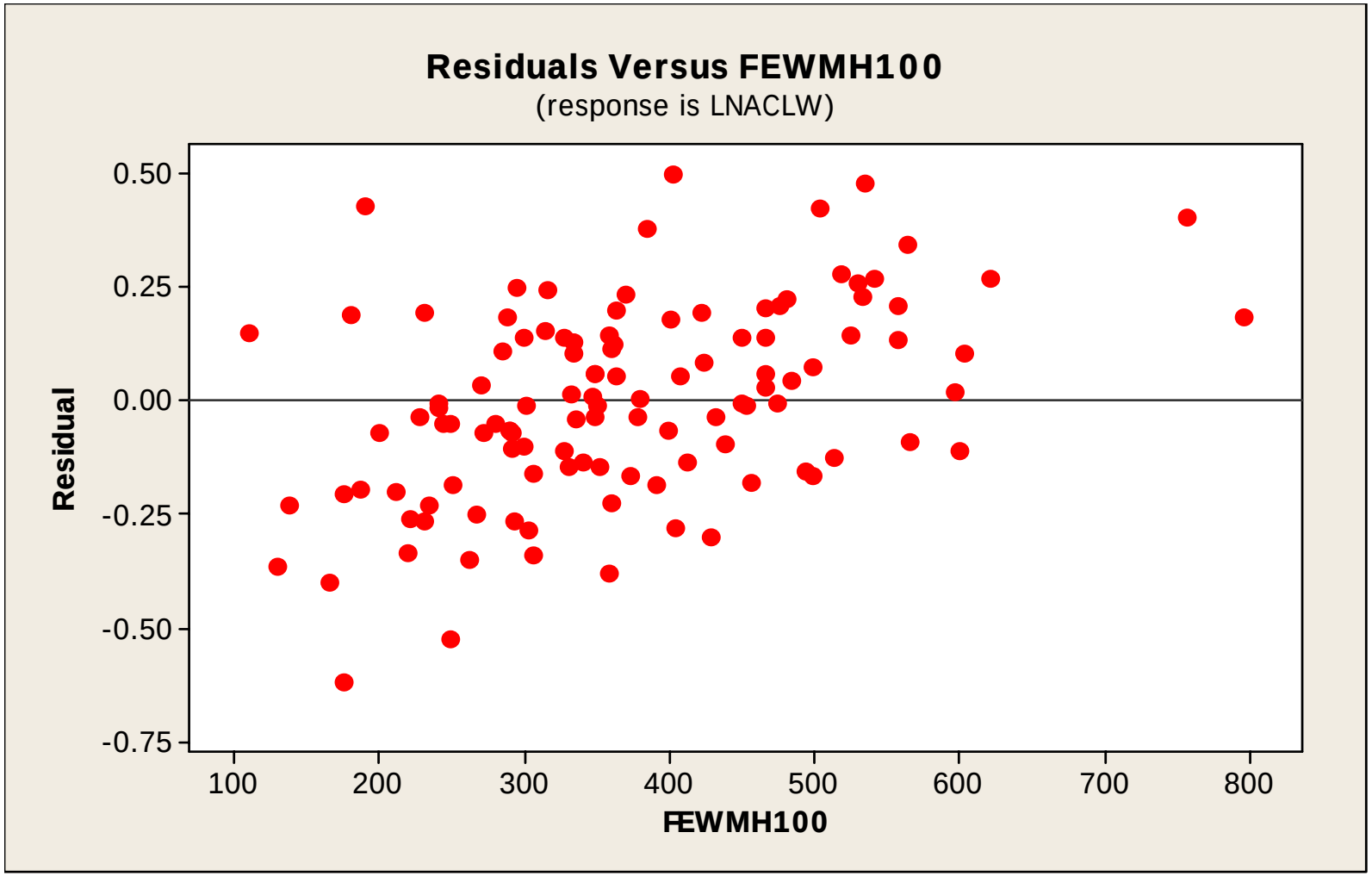
Significant Factors: Oil

ACLW



No obvious pattern in residuals. Ln ACLW is not affected by oil consumption.

ACLW

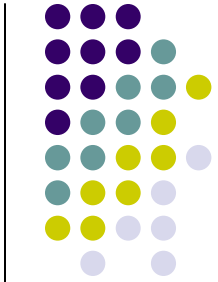


Increasing pattern in residuals. Ln ACLW is correlated with EOT Fe.

ACLW

No obvious pattern in residuals. May have captured variables correlated with time.

% Vis Increase, Oil 434 Only



Analysis of Variance for *LNPVIS, using Adjusted SS for Tests

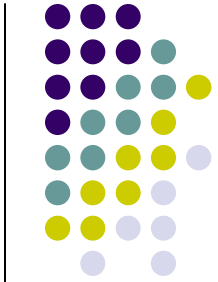
Source	DF	Seq SS	Adj SS	Adj MS	F	P
LAB	5	0.2133	0.3434	0.0687	0.46	0.805
RING	3	1.3188	1.2841	0.4280	2.85	0.057
NEWHONE	1	0.0056	0.0056	0.0056	0.04	0.848
Error	26	3.9100	3.9100	0.1504		
Total	35	5.4478				

Standard deviation from model: 0.387797

Significant Factors: Rings

*Outlier Removed

% Vis Increase, Oil 435 Only



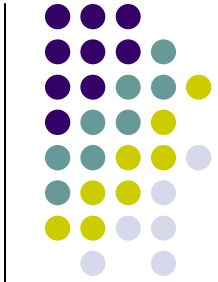
Analysis of Variance for LNPVIS, using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
LAB	5	0.92274	0.41280	0.08256	1.42	0.247
RING	3	1.39336	1.47447	0.49149	8.44	0.000
NEWHONE	1	0.18910	0.18910	0.18910	3.25	0.082
Error	29	1.68803	1.68803	0.05821		
Total	38	4.19323				

Standard deviation from model: 0.241263

Significant factors: Rings

% Vis Increase, Oil 438 Only



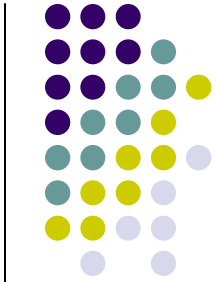
Analysis of Variance for LNPVIS, using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
LAB	5	0.82235	0.65616	0.13123	7.27	0.000
Ring	3	0.53032	0.53795	0.17932	9.93	0.000
NEWHONE	1	0.00945	0.00945	0.00945	0.52	0.475
Error	30	0.54148	0.54148	0.01805		
Total	39	1.90360				

Standard deviation from model: 0.134348

Significant Factors: Labs, Rings

WPD, Oil 434 Only



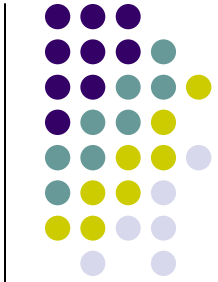
Analysis of Variance for WPD, using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
LAB	5	14.1341	13.4098	2.6820	7.68	0.000
RING	3	9.5495	9.5224	3.1741	9.09	0.000
NEWHONE	1	1.0145	1.0145	1.0145	2.91	0.100
Error	27	9.4234	9.4234	0.3490		
Total	36	34.1214				

Standard deviation from model: 0.590775

Significant Factors: Lab, Rings

WPD, Oil 435 Only



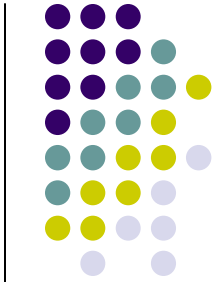
Analysis of Variance for WPD, using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
LAB	5	4.5079	3.3490	0.6698	3.84	0.009
RING	3	1.9703	0.9858	0.3286	1.88	0.154
NEWHONE	1	0.0528	0.0528	0.0528	0.30	0.586
Error	29	5.0574	5.0574	0.1744		
Total	38	11.5883				

Standard deviation from model: 0.417602

Significant factors: Labs

WPD, Oil 438 Only



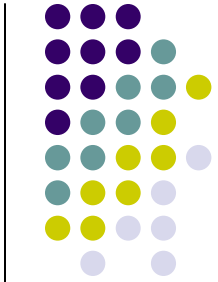
Analysis of Variance for WPD, using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
LAB	5	2.7059	2.5848	0.5170	3.53	0.012
Ring	3	0.8682	0.9021	0.3007	2.06	0.127
NEWHONE	1	0.0374	0.0374	0.0374	0.26	0.617
Error	30	4.3884	4.3884	0.1463		
Total	39	7.9999				

Standard deviation from model: 0.382467

Significant factors: Labs

ACLW, Oil 434 Only



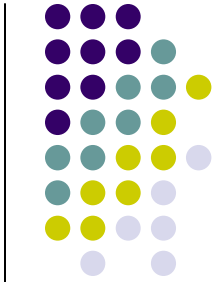
Analysis of Variance for LNACLW, using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
LAB	5	0.06880	0.07152	0.01430	0.33	0.890
RING	3	0.12000	0.17300	0.05767	1.33	0.289
CAMSN	4	0.34236	0.33650	0.08412	1.94	0.138
NEWHONE	1	0.00388	0.00388	0.00388	0.09	0.767
Error	23	0.99647	0.99647	0.04332		
Total	36	1.53151				

Standard deviation from model: 0.208146

No significant factors

ACLW, Oil 435 Only



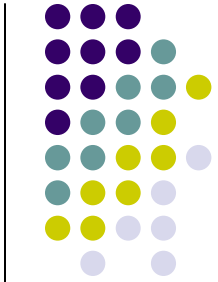
Analysis of Variance for LNACLW, using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
LAB	5	0.27361	0.48407	0.09681	1.57	0.206
RING	3	0.46524	0.39391	0.13130	2.12	0.123
CAMSN	4	0.35741	0.33845	0.08461	1.37	0.273
NEWHONE	1	0.01773	0.01773	0.01773	0.29	0.597
Error	25	1.54632	1.54632	0.06185		
Total	38	2.66031				

Standard deviation from model: 0.248702

No significant factors

ACLW, Oil 438 Only



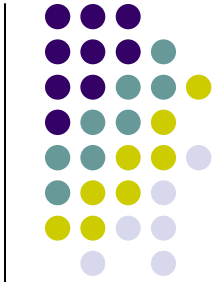
Analysis of Variance for LNACLW, using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
LAB	5	0.06468	0.12710	0.02542	0.47	0.793
Ring	3	0.25813	0.19796	0.06599	1.23	0.319
CAMSN	4	0.20367	0.13410	0.03352	0.62	0.649
NEWHONE	1	0.00088	0.00088	0.00088	0.02	0.899
Error	26	1.39595	1.39595	0.05369		
Total	39	1.92331				

Standard deviation from model: 0.231712

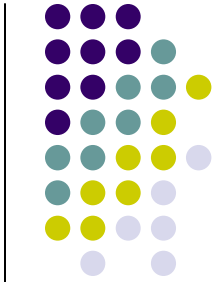
No significant factors.

Summary: Oil Consumption



- There may be a difference among the ring batches and honing techniques
- Lab B produces significantly lower oil consumption
- There is not enough statistical evidence to conclude that PM rods affect oil consumption

Oil Consumption

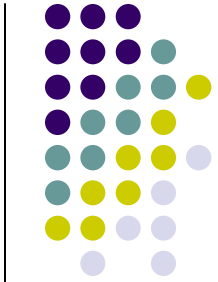


Analysis of Variance for OILCON, using Adjusted SS for Tests

Source	DF	Seq SS	Adj SS	Adj MS	F	P
OIL	2	6.6009	6.3789	3.1895	25.72	0.000
LAB	5	1.8389	2.2149	0.4430	3.57	0.005
RING	3	5.8635	1.5861	0.5287	4.26	0.007
PM	1	0.0059	0.0006	0.0006	0.01	0.943
NEWHONE	1	0.6486	0.4581	0.4581	3.69	0.057
CAMSN	4	0.6150	0.6150	0.1537	1.24	0.299
Error	99	12.2752	12.2752	0.1240		
Total	115	27.8480				

Significant Factors: Oil, Labs, Rings, new honing technique (?)

Recommendation



- Keep Current Estimates of Oil Means
- Due to Continuous Shifts and Changes Over Time and Lab Differences, Refrain from Industry Severity Adjustments
- Adopt LZ Standard Deviation Estimates for Oils and Severity Adjustments

Report of the O&H Subpanel to the Sequence III Surveillance Panel

Presented by

Pat Lang

November 8, 2005

Torque Wrench Replacement

- The replacement torque wrench is now available from Ingersoll-Rand.
- The part number is ETW-E180
- The wrench is capable of performing:
  - Normal torque
  - Torque-plus-angle
  - Torque-to-yield

Torque Wrench (cont'd)

- The list price for the ETW-E180 is $3,950.00.
- The wrenches are not on the shelf today.
- They are quoting 4 to 6 weeks delivery time after order is placed.

Severity Task Force Report

– The O&H Severity Task Force convened for two conference calls: June 16th and July 20th, 2005. The following topics were discussed:

– Reworked Cylinder Heads:

- GM provided a list of serial numbers for the reworked heads; labs looked at candidate data and TMC looked at ref. data. No correlation to test severity (limited number of ref. tests).

Task Force (cont'd)

- New Exhaust Valve:
  - An approx. date for the introduction of the new exhaust valves into SPO was Oct '04. Lot of uncertainty amongst labs on when they ended up in testing. No definitive conclusions yet.
- Powder Metal Rods:
  - Packing oil
  - Bearing clearance
  - Oiling slots

Task Force Cont'd

- Piston Rings:
  - Some measurement work was done by a lab that showed differences in ring tensions, ring weights and oil ring spacer height. OHT and GM investigated and determined that all parameters were within specification.
- Pistons:
  - One lab identified a ring land chamfer difference on one piston batch. No severity trends were observed with this batch.

Task Force Cont'd

- Crankshafts:
  - Cranks have been coming in on the low end of specification.
- Harmonic Balancer
- Engine Block
- Oil Filter
- Engine Operation
- Oil Pressure
  - Slight reduction in oil pressure with PM rods

Task Force Cont'd

- Honing
  - Group agreed that we should do a check on honing.
  - Each lab honed a 4th run or higher block and sent to PE to be checked for surface finish.
  - Focus was on Vo, which can be an indicator of oil consumption.
  - TMC, at a glance, was not able to correlate the differences that were observed to severity.

Task Force Cont'd

- EEE Fuel Analysis:
  - Sid Clark coordinated a conference call to discuss EEE fuel with industry fuel experts.
  - A list of recommended analyses was generated.
  - Haltermann agreed to pay for the standard analyses that are on the COA.
  - Funding is still needed for the additional analyses.
  - Some challenges were encountered with collecting the samples.
  - To date only a couple of samples have been partially analyzed.

Task Force Cont'd

- What's next to keep fuel analysis request moving forward:
  - Determine accurate inventory of samples.
  - Source of funding for additional analyses.
  - Pick a deadline for completion.
- Unified Engine Build:
  - The group entertained the idea of a unified engine build. Current concerns are:
    - Funding
    - Design of experiment (many variables)

New Items

- Rear Main Seal Housing:
  - The rear main seal housing has been changed by GM to accommodate the new style rear seal that we decided not to use. This housing poses a compatibility problem with the old seal. OHT is procuring a quantity of old style housings.

THE ASTM SEQUENCE III SURVEILLANCE PANEL

SCOPE & OBJECTIVES

SCOPE

The Sequence III Surveillance Panel is responsible for the surveillance and continual improvement of the Sequence IIIF and IIIFHD test documented in ASTM Standard D6984-05 as update by the Information Letter System. The Sequence III Surveillance Panel is also responsible for the surveillance and continual improvement of the new Sequence IIIG and IIIGA tests which will be documented as an ASTM Standard DNNNN-XX and updated by the Information Letter System. Data on test precision and laboratory versus field correlation will be solicited and evaluated at least every six (6) months for Sequence III test procedures. The Surveillance Panel is to provide continual improvement of rating techniques, test operation, test monitoring and test validation through communication with the Test Sponsor, ASTM Test Monitoring Center, Operations and Hardware Subpanel, the Central Parts Distributor, fuel supplier, ASTM B0.01 Passenger Car Engine Oil Classification Panel, ASTM Light Duty Rating Task Force, ASTM Committee B0.01, ACC Monitoring Agency and CRC Motor Rating Methods Group. Actions to improve the process will be recommended when appropriate based on input to the Surveillance Panel from one or more of the previously stated groups. Develop updated test procedures when necessary and review the correlation with previous test procedures. This process will provide the best possible Sequence III Type Test Procedure for evaluating automotive lubricant performance with respect to the lubricant's ability to prevent oil thickening, varnish formation, oil consumption and engine wear.

OBJECTIVES		**TARGET DATE**
1.	**Prepare the IIIG Test Method for elevation to ASTM Standard**	**December 2005**
2.	**Issue the IIIG Test Method for ballot to ASTM for approval as a Standard**	**March 2006**
3.	**Develop a Sequence III rater calibration proposal**	**November 2005**
4.	**Complete PVIS and WPD Severity Investigation by the O&H Subpanel**	**May 2006**
5.	**Develop a plan to secure test components for Sequence IIIF/IIIG thru 2010**	**May 2006**

William M. Nahumck, Chairman
Sequence IIIF Surveillance Panel

Updated November 8, 2005
San Antonio, Texas