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: June 3, 2009

Reply to:

Richard Grundza
ASTM Test Monitoring Center
6555 Penn Avenue
Pittsburgh, PA 15206
Phone: 412-365-1031
Fax: 412-365-1047
Email: reg@astmtmc.cmu.edu

Unapproved Minutes of the May 6, 2009 Sequence III Surveillance Panel Meeting held in Warren, MI

The meeting was called to order at 9:00 am by Chairman Bill Buscher.

Agenda Review
Pat Lang is Action & Motion recorder.

The Agenda was accepted as shown on attachment 1.

Membership Changes

There were no membership changes noted. A sign in sheet listing all attendees is included as attachment 2.

Meeting Minute Status

The November 12, 2008 meeting minutes were approved by the surveillance panel.

Review of Action Items from Last Meeting

The status of motions and action items from the previous meeting were reviewed as follows

Sequence IVA Surveillance Panel
November 12, 2008
10:00AM – 12:00PM
GM Technical Center
Warren, MI

Motions and Action Items
As Recorded at the Meeting by Pat Lang

1. Action Item – Chairman to request that the LTMS task force chairman, Dan Worcester, schedule a meeting in January 2009 to conduct a comprehensive review of the different LTMS systems utilized by the PCMO test types and their pros and cons.
   Done. LTMS task force meeting held on 1/28/09 and on 1/29/09.

2. Action Item – Will look for some assistance from ILSAC chair to acquire additional reference oils meeting the Surveillance Panel's objectives.
   Open.

3. Action Item – Chairman to conduct a metrology and engine build workshop at Southwest Research Institute on January 6 and 7, 2009.
   Done. Workshops held on 1/6/09 and 1/7/09.

4. Action Item - Under guidance of the TGC, create a test fuel task force to include TMC, fuel supplier, and SP chairmen. This group will investigate best practices/methods for determining if the test fuel is changing.
   Done. TGC meeting held on 1/27/09.

5. Action Item – TMC to issue a survey to test labs to determine the quantity of all Nissan parts on hand and how many parts have been ordered in the 2008 solicitation. Survey to including cam and rocker arm batch codes and corresponding quantities, and information on which cam batches have been

proven out. Also include an estimate of how many tests labs need for GF-5. Completion date of December 1, 2008.
Done. To be reviewed at today's meeting.

6. Action Item – Chairman to contact Nissan North America (NNA) to determine the availability of parts for the current and future orders (single cam batches, all lab orders to be filled 100%, etc.), and to obtain details on what the camshaft and rocker arm batches identify (a date for casting/machining/packaging, one or more manufacturing plants, etc.).
Done. NNA contacted on 4/29/09 with questions from 11/12/08 surveillance panel meeting, 1/8/09 severity task force meeting and 3/26/09 severity task force conference call. Currently waiting for NNA's response.

7. Motion – Form a Sequence IVA ACW severity task force to investigate mild severity trends observed at one or more laboratories. Al Lopez to be the chairman of the task force.

   Al Lopez / Dwight Bowden / Passed Unanimously
   Done. Severity task force conducted conference calls on 11/20/08 and 3/26/09 and a face-to-face meeting on 1/8/09 in San Antonio, TX. Report to be presented at today's meeting.

8. Motion – All Sequence IVA tests run to completion should report all data, no matter what the reported validity is. Descriptive comments to be included for all reported invalid tests.

Al Lopez / Rich Grundza / Passed Unanimously
Done.

9. Motion – Change section 6.3.1.4 of the Sequence IVA test procedure to include references to DACA II on how to process bad quality data.

   Rich Grundza / Bill Buscher / Passed Unanimously
Done. TMC issued Sequence IVA Information Letter 08-1 on 11/20/08.

Fuel Supplier Report

Jim Carter of Haltermann gave the fuel suppliers report. A copy of Jim's report is included as attachment 3. Jim was asked to comment on batch sizes and storage. Batches are blended as needed. Southwest has about 24000 gallons in storage on site, Intertek has 2000 – 3000 gallons on site, which they expect to last 6 months. An action item was assigned to the Chairman to contact Todd Dvorak to see if he would be available to perform similar analysis on KA24E Green fuel data as he did on EEE fuel data.

Test Monitoring Center Report

A copy of the Test Monitoring Center Report is available at the TMC website. Rich also provided an updated report, which is included as attachment 4. There were comments about the current severe alarm. Rich explained that the most recent results have all been from one lab and that lab has an SA of about 19 µm.

ACC Monitoring Agency Report

A copy of the report is available at the ACC Monitoring Agency website. No update was provided

Hardware Report

Bill Buscher presented a hardware update, which is included as attachment 5. Industry is running a mixture of 2007 and 2008 hardware. The oil cooler and items from the stand kit are no longer available. Bill said there will be a solicitation in 2009 and that this may be the last one, so labs should consider what parts they will need through GF-5 and purchase then. Bill discussed his contacts with Nissan over the past six months. Scott Gehring has been replaced by Stephen Fields. Bill's presentation, included as attachment 5, lists 16 questions regarding hardware presented to Stephen. Rich Grundza presented the results of the industry parts survey. A copy of the survey is included as attachment 6. Based on the experience of GF-3 and 4, it appears that there is currently enough hardware available. Bill discussed parts which have become unavailable. Oil coolers are no longer available, as well as distributors and the throttle body. Distributors can be refurbished by replacing the cap and rotor. Throttle bodies may be scoured from salvage yards. The mass air flow sensor is still available.

Test Severity

Al Lopez of Intertek summarized the activities of his task force. A copy of Al's report is included as attachment 7. He was able to successfully reference his lab after the industry conducted a number of meeting to address lab differences. The key item identified was driveline stiffness. This was confirmed by activities at Southwest Research. Southwest had encountered mild results on two stands. These stands had different driveline couplings than the other three stands and when switched to match the rest of the lab, initial indications are that these stands are more severe now. Other labs were asked to discuss their history. Dave Glaenzer of Afton commented that Afton had encountered difficulty referencing and had discontinued IVA testing. Afton had used a damped driveline but was unsure about the various changes, as they had a number of different driveline rebuilders, and couldn't be sure about stiffness changes. The group will continue to try and asses the differences in driveline stiffness. Bill Buscher also mentioned that the size of the adapter plate can also affect wear. Bill mentioned that much the effects on wear can be gleaned from the SAE paper on the test development. Bill did not have the paper number available at the meeting, but committed to have it included in the meeting minutes. That SAE paper number is 2000-01-1820. The panel reviewed the recommendations from the Severity Task Force. The panel agreed to drop the measurement of valve spring free length and squareness and to require vacuum check on the assembled cylinder head. The panel agreed to increase the number of runs on cylinder head and block to 16 and 32, respectively. The panel approved the elimination of the number of runs the distributor and oil cooler can be used and added the distributor cap and rotor part numbers to the procedure. The panel also agreed to add front cover flow, rocker cover inlet and outlet temperature as record only parameters and to control coolant pressure to 70±5 kPa. The panel discussed adding the 1/8' valve to the pcv system, but tabled that issue for refinement and potential eballot. The panel agreed to continue not using 1009 for calibration attempts. A cam has been selected for a measurement round robin and will be circulated to participating labs shortly.

Scope and Objectives

The panel reviewed the current scope and objectives and revised accordingly. Revised scope and objectives are below.

ASTM Sequence IVA Surveillance Panel

Scope and Objectives

Scope

The Sequence IVA Surveillance Panel is responsible for the surveillance and continued improvement of the Sequence IVA test documented in Test Method D 6891 as updated by the Information Letter system. Data on test precision and laboratory versus field correlation will be solicited and evaluated at least every six months. Improvements in wear measurement technique, test operation, test monitoring and test validation will be accomplished through continual communication with the Test Sponsor and Parts Distributor, ASTM Test Monitoring Center, ASTM Committee D02.B0.01 and the ASTM Passenger Car Engine Oil Classification Panel. Actions to improve the process will be recommended when deemed appropriate based on input from the proceeding. The Panel will review development and correlation of updated test procedures with previous test procedures. This process will provide a suitable test procedure for evaluating an automotive lubricant's effect on controlling cam lobe wear for overhead valvetrain equipped engines with sliding cam followers.

Objectives	**Target Date**
1. Conduct 2009 round robin	*Nov 2009*
2. Ensure a secure supply of Nissan KA24E hardware is available to accommodate testing through GF-5, anticipating the need for additional parts solicitations from Nissan.	*On-going*
3. Monitor the progress of the comprehensive review of the different LTMS systems utilized by the PCMO test types and their pros and cons.	*Nov 2009*
4. Task force to study ACW severity shifts and identify potential causes.	*On-going*
Solicit a GF-5 reference oil producing wear results around 50 microns.	*Nov 2009*

William A. Buscher III, Chairman
Sequence IVA Surveillance Panel

Updated: May 2009

A listing of the action items from this meeting are included as attachment 8.

The meeting was adjourned at 11:50 am.

Attachment 1

Sequence IVA Surveillance Panel

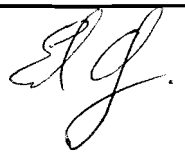
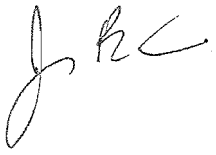
Warren, MI
GM Technical Center
May 6, 2009
9:00 a.m. - 12:00 p.m.

A G E N D A

1.	Chairman comments	
2.	Attendance sign-in sheet distribution	
3.	Membership changes	
4.	Motion and Action recorders	
5.	Approval of minutes for 11/12/2008	All
6.	Review action items from last meeting	Buscher
7.	Fuel supplier report – KA24E Green Fuel	Carter
8.	TMC report	Grundza
9.	ACC report	Farber
10.	Test hardware report	Buscher
11.	Severity task force report	Lopez
12.	Round table discussion on recent referencing trends	All
13.	Review Scope & Objectives	All
14.	Old business	
15.	New business	
16.	Next meeting	
17.	Adjourn	

MEMBERSHIP
ASTM IVA SURVEILLANCE PANEL

May 6, 2009

NAME	COMPANY-ADDRESS-PHONE-FAX-EMAIL	SIGNATURE
Altman, Ed	Afton Chemical Corporation 500 Spring Street P.O. Box 2158 Richmond, VA 23217-2158 Phone No.: 804-788-5279 Fax No.: 804-788-6358 Email: ed.altman@aftonchemical.com	
Bowden, Dwight	OH Technologies, Inc. 9300 Progress Parkway P.O. Box 5039 Mentor, OH 44061-5039 Phone No.: 440-354-7007 Fax No.: 440-354-7080 Email: dhbowden@ohtech.com	
Brys, Jerome	Lubrizol Corporation 29400 Lakeland Blvd. Wickliffe, OH 44092 Phone No.: 440-347-2631 / 440-943-1200 Fax No.: 440-943-9013 Email: jabs@lubrizol.com	
Buscher III, Bill	Southwest Research Institute 6220 Culebra Road P.O. Drawer 28510 San Antonio, TX 78228-0510 Phone No.: 210-522-6802 or 210-240-8990 cell Fax No.: 210-684-7523 Email: william.buscher@swri.org	
Buscher, Jr., Bill	Buscher Consulting Services P.O. Box 112 Hopewell Jct., NY 12533 Phone No.: 914-897-8069 Fax No.: 914-897-8069 Email: buschwa@aol.com	
Carter, James	Haltermann Products 2296 Hulett Okemos, MI 48864 Phone No.: 517-347-3021 Fax No.: 517-347-1024 Email: jecarter@dow.com JHALTERMANN.COM	
Caudill, Timothy	Ashland Inc. 22nd & Front Streets Ashland, KY 41114 Phone No.: 606-329-1960 x5708 Fax No.: 606-329-2044 Email: tlcaudill@ashland.com	
Glaenzer, Dave	Afton Chemical Corporation 500 Spring Street P.O. Box 2158 Richmond, VA 23217-2158 Phone No.: 804-788-5214 Fax No.: 804-788-6358 Email: dave.glaenzer@aftonchemical.com	

MEMBERSHIP
ASTM IVA SURVEILLANCE PANEL

May 6, 2009

NAME	COMPANY-ADDRESS-PHONE-FAX-EMAIL	SIGNATURE
Grundza, Rich	ASTM Test Monitoring Center 6555 Penn Avenue Pittsburgh, PA 15206 Phone No.: 412-365-1031 Fax No.: 412-365-1047 Email: reg@astmtmc.cmu.edu	
Knight, Clayton	Test Engineering, Inc. 12718 Cimarron Path San Antonio, TX 78249 Phone No.: 210-862-5987 cell Fax No.: 210-690-1959 Email: cknight@tei-net.com	
Linden, James	GM ~~Powertrain~~ R&D Mail Code ~~483-730-322~~ 480-106-160 ~~823 Joslyn~~ Rd. 30500 MOUND RD ~~Pontiac, MI 48340-2920~~ WARREN, MI 48090 Phone No.: 586-986-1888 Fax No.: ~~248-857-4425~~ 586-986-9063 Email: james.l.linden@gm.com	
Liu, Eric	Southwest Research Institute 6220 Culebra Road P.O. Drawer 28510 San Antonio, TX 78228-0510 Phone No.: 210-522-5937 or 210-416-9024 cell Fax No.: 210-684-7523 Email: eric.liu@swri.org	
Lopez, Al	Intertek Automotive Research 5404 Bandera Road San Antonio, TX 78238-1993 Phone No.: 210-862-7935 Fax No.: 210-523-4607 Email: al.lopez@intertek.com	
Miranda, Timothy	BP Castrol 1500 Valley Road Wayne, NJ 07470 Phone No.: 973-305-3334 Fax No.: 973-686-4039 Email: timothy.miranda@bp.com	
Mosher, Mark	ExxonMobil Research & Engineering Co. 600 Billingsport Road P.O. Box 480 Paulsboro, NJ 08066-0480 Phone No.: 856-224-2132 Fax No.: 856-224-3628 Email: mark.r.mosher@exxonmobil.com	
Mabuchi, Yutaka	Nissan Motor Co., Ltd. Email: y-mabuchi@mail.nissan.co.jp	

MEMBERSHIP
ASTM IVA SURVEILLANCE PANEL

June 7, 2006

NAME	COMPANY-ADDRESS-PHONE-FAX-EMAIL	SIGNATURE
Romano, Ron	Ford Motor Company Email: rromano@ford.com	
Ritchie, Andrew	Infineum USA L.P. 1900 E. Linden Avenue Linden, NJ 07036-0536 Phone No.: 908-474-2097 Fax No.: 908-474-3637 Email: andrew.ritchie@infineum.com	
Seman, Greg	Lubrizol Corporation 29400 Lakeland Blvd. Wickliffe, OH 44092 Phone No.: 440-347-2153 Fax No.: 440-347-4096 Email: greg.seman@lubrizol.com	
Sutherland, Mark	Chevron Oronite Company LLC 4502 Centerview Dr., #210 San Antonio, TX 78228 Phone No.: 210-867-8357 cell Fax No.: 210-731-5699 Email: msut@chevron.com	
Szappanos, Geo.	Lubrizol Phone No.: Fax No.: Email:	
	Phone No.: Fax No.: Email:	
	Phone No.: Fax No.: Email:	
	Phone No.: Fax No.: Email:	

NON-MEMBER MAILING LIST
ASTM IVA SURVEILLANCE PANEL

May 6, 2009

NAME	COMPANY-ADDRESS-PHONE-FAX-EMAIL	SIGNATURE
Ayutsede, Jonathan	Infineum USA L.P. 1900 E. Linden Avenue Linden, NJ 07036-0536 Phone No.: 908-474-2916 Fax No.: 908-474-3637 Email: jonathan.ayutsede@infineum.com	
Boese, Doyle	Infineum USA L.P. 1900 E. Linden Avenue Linden, NJ 07036-0536 Phone No.: 908-474-3176 Fax No.: 908-474-3637 Email: doyle.boese@infineum.com	
Bowden, Adam	OH Technologies, Inc. 9300 Progress Parkway P.O. Box 5039 Mentor, OH 44061-5039 Phone No.: 440-354-7007 Fax No.: 440-354-7080 Email: adbowden@ohtech.com	
Bowden, Jason	OH Technologies, Inc. 9300 Progress Parkway P.O. Box 5039 Mentor, OH 44061-5039 Phone No.: 440-354-7007 Fax No.: 440-354-7080 Email: jhbowden@ohtech.com	
Bryant, Don	Lubrizol Corporation 29400 Lakeland Blvd. Wickliffe, OH 44092 Phone No.: 440-943-1200 Fax No.: 440-943-9013 Email:	
Carlson, Jon	Lubrizol Corporation 14602 Huebner, Suite 116-PMB 198 San Antonio, TX 78230 Phone No.: 210-391-8838 cell Fax No.: 210-522-0391 Email: jomc@lubrizol.com	
Clark, Sid	GM Powertrain Mail Code 483-730-322 823 Joslyn Rd. Pontiac, MI 48340-2920 Phone No.: 248-857-9959 Fax No.: 248-857-4425 Email: sidney.l.clark@gm.com	
Farber, Frank	ASTM Test Monitoring Center 6555 Penn Avenue Pittsburgh, PA 15206 Phone No.: 412-365-1030 Fax No.: 412-365-1047 Email: fmf@astmtmc.cmu.edu	

NON-MEMBER MAILING LIST
ASTM IVA SURVEILLANCE PANEL

May 6, 2009

NAME	COMPANY-ADDRESS-PHONE-FAX-EMAIL	SIGNATURE
Farnsworth, Gordon	Infineum USA L.P. 1900 E. Linden Avenue Linden, NJ 07036-0536 Phone No.: 570-934-2776 Fax No.: 908-474-3637 Email: gordon.farnsworth@infineum.com	
Ferner, Mark	Pennzoil / Quaker State Company 1520 Lake Front Circle The Woodlands, TX 77380 Phone No.: 713-363-8190 Fax No.: 713-363-8002 Email:	
Galbraith, Robert	Imperial Oil Limited 453 Christina St. South P.O. Box 3002 Sarnia, Ontar, Canada N7T8C8 Phone No.: Fax No.: Email: rob.galbraith@iol.sprint.com	
Hsu, Jeffery	Pennzoil / Quaker State Company 1520 Lake Front Circle (77380) P.O. Box 7569 The Woodlands, TX 77387 Phone No.: 281-363-8177 Fax No.: 281-363-8002 Email: JefferyHsu@PZLQS.com	
Ishikawa, Masa	Infineum USA L.P. 1900 East Linden Avenue Linden, NJ 07036 Phone No.: 908-474-2384 Fax No.: 908-474-3597 Email: masa.ishikawa@infineum.com	
Kelly, Jack	Lubrizol Corporation 29400 Lakeland Blvd. Wickliffe, OH 44092 Phone No.: 216-943-1200 Fax No.: Email: jack@lubrizol.com	
Lang, Patrick	Southwest Research Institute 6220 Culebra Road P.O. Drawer 28510 San Antonio, TX 78228-0510 Phone No.: 210-522-2820 or 210-240-9461 cell Fax No.: 210-684-7523 Email: patrick.lang@swri.org	
Martinez, Jo	Chevron Oronite Company LLC 100 Chevron Way, 60-1211 P.O. Box 1627 Richmond, CA 94802-0627 Phone No.: 510-242-5563 Fax No.: 510-242-1930 Email: jogm@chevrontexaco.com	

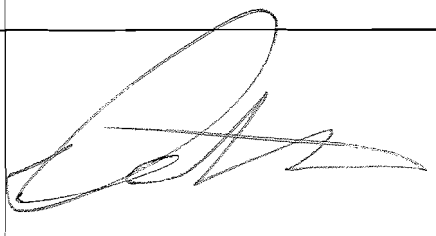
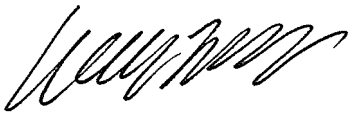
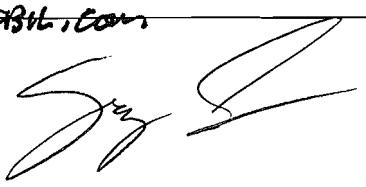
NON-MEMBER MAILING LIST
ASTM IVA SURVEILLANCE PANEL

May 6, 2009

NAME	COMPANY-ADDRESS-PHONE-FAX-EMAIL	SIGNATURE
Olree, Robert	GM Powertrain Mail Code 483-730-322 823 Joslyn Rd. Pontiac, MI 48340-2920 Phone No.: 248-857- Fax No.: 248-857-4425 Email: robert.olree@gm.com	
Roby, Stephen	Chevron Oronite Company LLC 100 Chevron Way P.O. Box 1627 Richmond, CA 94802-0627 Phone No.: 510-242-1273 Fax No.: 510-242-3173 Email: hrby@chevrontexaco.com	
Rutherford, Jim	Chevron Oronite Company LLC 100 Chevron Way, 60-1211 P.O. Box 1627 Richmond, CA 94802-0627 Phone No.: 510-242-3410 Fax No.: 510-242-1930 Email: jaru@chevrontexaco.com	
Scinto, Phil	Lubrizol Corporation 29400 Lakeland Blvd. Mail Drop 152-A Wickliffe, OH 44092 Phone No.: 440-347-2161 Fax No.: 440-347-9031 Email: prs@lubrizol.com	
Simkins, Russell	Conoco Inc. 1000 South Pine, 6617RW P.O. Box 1267 Ponca City, OK 74602-1267 Phone No.: 580-767-6758 Fax No.: 580-767-4534 Email: russell.e.simkins@usa.conoco.com	
Sutherland, Robert	Shell Global Solutions 3333 Highway 6 South Houston, TX 77082 Phone No.: 281-544-8620 Fax No.: 281-544-8150 Email: r.sutherland@shell.com	
Thompson, Hap	Phone No.: 908-287-9596 Fax No.: Email: Hapjthom@aol.com	
Weber, Ben	Southwest Research Institute 6220 Culebra Road P.O. Drawer 28510 San Antonio, TX 78228-0510 Phone No.: 210-522-5911 Fax No.: 210-684-7523 Email: benjamin.weber@swri.org	

NON-MEMBER MAILING LIST
ASTM IVA SURVEILLANCE PANEL

May 6, 2009

NAME	COMPANY-ADDRESS-PHONE-FAX-EMAIL	SIGNATURE
Zalar, John	ASTM Test Monitoring Center 6555 Penn Avenue Pittsburgh, PA 15206 Phone No.: 412-365-1005 Fax No.: 412-365-1047 Email: jlz@astmtmc.cmu.edu	
Zaweski, Ed	BP Amoco Oil 150 W. Warrenville Rd. Mail Code C-6 Naperville, IL 60563 Phone No.: 630-420-5026 Fax No.: 630-420-4866 Email: ed_f_zaweski@amoco.com	
WORCESTER, DAN	SwRI Phone No.: Fax No.: Email: :	
Kirkwood, Reham	SWRI Phone No.: Fax No.: Email: :	
MAXWELL, BILL L.	EXXONMOBIL RESEARCH & ENGINEERING Co. 600 BILLINGSPORT ROAD PAULSBORO, NJ [redacted] 08066-0480 Phone No.: 856-224-5220 Fax No.: 856-224-3613 Email: BILL.L.MAXWELL@EXXONMOBIL.COM	
Seman, Greg	Lubrizol 29400 Lakeland Blvd Wickliffe, OH 44092 Phone No.: 440.347.2157 Fax No.: Email: GLSEM@lubrizol.com	
GOLDBLATT, IRWIN	BP Lubricants 1500 Valley Road WAYNE, NJ 07470 Phone No.: 973-686-3306 Fax No.: Email: irwin.goldblatt@bp.com	IJG
	Phone No.: Fax No.: Email: :	

NON-MEMBER MAILING LIST
ASTM IVA SURVEILLANCE PANEL

May 6, 2009

NAME	COMPANY-ADDRESS-PHONE-FAX-EMAIL	SIGNATURE
Jo Martinez	Oronite Phone No.: Fax No.: Email:	On Phone
Chris Castanien	Lubrizol Phone No.: Fax No.: Email:	↓
Tim Miranda	BP/Castrol Phone No.: Fax No.: Email:	↓
	Phone No.: Fax No.: Email:	
	Phone No.: Fax No.: Email:	
	Phone No.: Fax No.: Email:	
	Phone No.: Fax No.: Email:	
	Phone No.: Fax No.: Email:	

PRODUCT INFORMATION

Haltermann PRODUCTS

T (281) 457-2768 F (281) 457-1469

PRODUCT: **KA24E TEST FUEL**
Seq. IV & VIII

PRODUCT CODE: **HF0008**

Batch No.:	XB1721GP01	XA2921GP01	VL1821GP05
TMO No.:	800138	800056	21035536
TMC No.:			
Tank No.:	52	52	Gage T90
Analysis Date:	2/26/2009	2/6/2009	1/9/2008

TEST	METHOD	UNITS	SPECIFICATIONS			RESULTS	RESULTS	RESULTS
			MIN	TARGET	MAX			
Distillation - IBP	ASTM D86	°F	75		95	88	81	86
5%		°F				114	110	113
10%		°F	120		135	126	123	125
20%		°F				147	146	146
30%		°F				172	172	172
40%		°F				202	200	202
50%		°F	200		230	221	220	221
60%		°F				230	229	231
70%		°F				239	239	240
80%		°F				255	256	255
90%		°F	300		325	316	316	313
95%		°F				342	348	344
Distillation - EP		°F	385		415	389	399	392
Recovery		vol %		Report		98.2	97.9	97.3
Residue		vol %		Report		1.1	1.1	1.2
Loss		vol %		Report		0.7	1.0	1.5
Gravity	ASTM D4052	°API	58.7		61.2	60.0	59.9	59.6
Density	ASTM D4052	kg/l	0.734		0.744	0.739	0.739	0.740

Reid Vapor Pressure	ASTM D5191	psi	8.8		9.2	8.9	9.2	8.9
Carbon	ASTM E191	wt fraction	0.8580		0.867	0.8622	0.8611	0.8614
Sulfur	ASTM D4294	wt %	0.01		0.04	0.011	0.014	0.0125
Lead	ASTM D3237	g/gal			0.05	0.013	<0.001	<0.01
Oxygen	ASTM D4815	wt %			0.05	<0.01	<0.01	<0.05
Composition, aromatics	ASTM D1319	vol %			35.0	33.9	30.4	29.3
Composition, olefins	ASTM D1319	vol %	5.0		10.0	10.0	5.8	5.8
Composition, saturates	ASTM D1319	vol %		Report		56.1	63.8	65.0
Oxidation Stability	ASTM D525	minutes	1440			>1440	>1440	>1440
Copper Corrosion	ASTM D130				1	1a	1a	1a
Gum content, washed	ASTM D381	mg/100ml			5	<0.5	<0.5	<0.5
Research Octane Number	ASTM D2699		96.0		97.5	97.2	97.1	96.2
Motor Octane Number	ASTM D2700			Report		87.9	87.7	87.2
R+M/2	D2699/2700			Report		92.6	92.4	91.7
Sensitivity	D2699/2700		7.5			9.3	9.4	9.0
Net Heat of Combustion	ASTM D240	btu/lb		Report		18318	18340	18246
Color	Visual			Green		Green	Green	Green

Attachment 4

Sequence IVA Update

May 6, 2009

A Program of ASTM International

Test Monitoring Center

Carnegie Mellon University
6555 Penn Avenue, Pittsburgh, PA 15206, USA

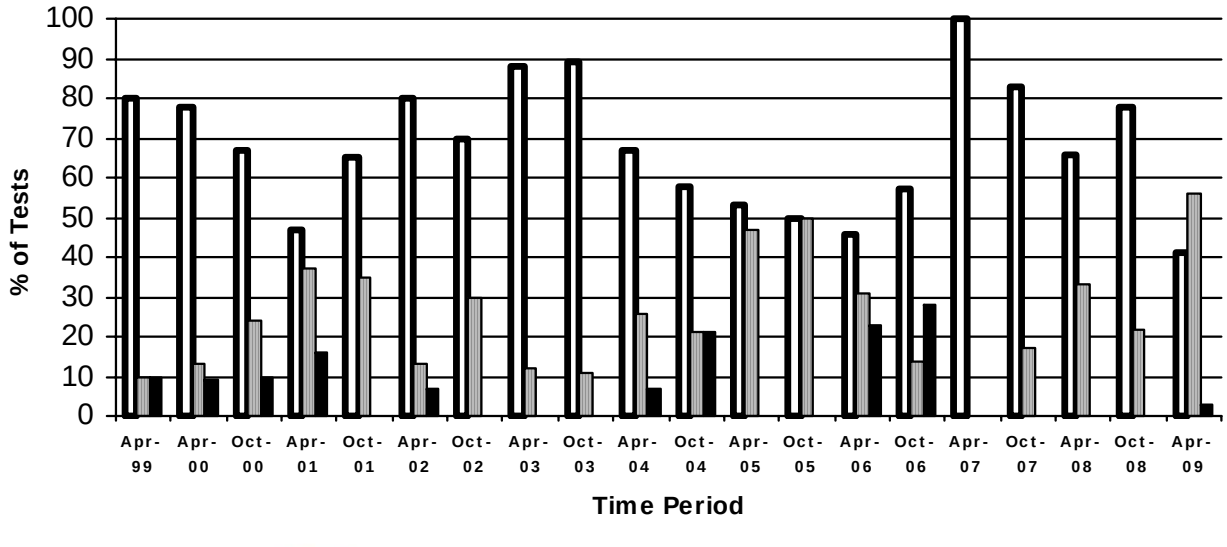
http://astmtmc.cmu.edu
412-365-1000

Sequence IVA Update

- Six stands at three labs calibrated as of today
- Calibration per start has decreased, lost and rejected test rates increased.
- Industry currently in severity action alarm

Calibration Start Outcomes	TMC Validity Codes	No. of Tests
Operationally and Statistically Acceptable	AC	13
Operationally Valid, Statistically Unacceptable	OC	1
Operationally Invalid, Laboratory Judgement	LC	11
Operationally Invalid, Laboratory and TMC Judgement	RC	1
Stand Abandoned	MC	3
Aborted	XC	2
Total		31

Calibration Attempt Summary

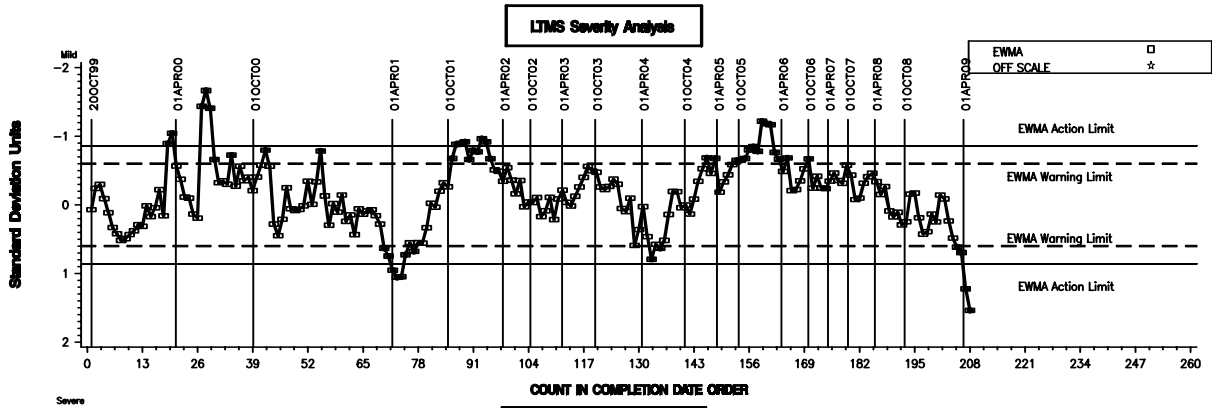


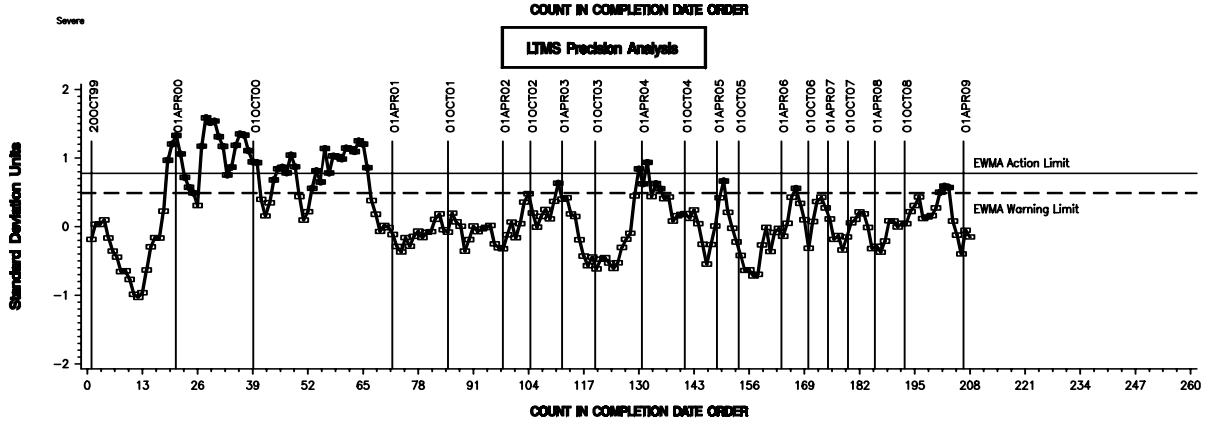
Industry Severity Summary			
Parameter	Average Δ/s	Pooled standard deviation (degrees of freedom)	Average Δ, in micrometers
ACW	0.336	14.30 (df=13)	4.80 μm

ACW Results, by Laboratory	
Laboratory	Average Δ/s
A	0.352
B1	0.039
C	N/A
F	1.378

SEQUENCE IVA INDUSTRY OPERATIONALLY VALID DATA

AVERAGE CAM WEAR





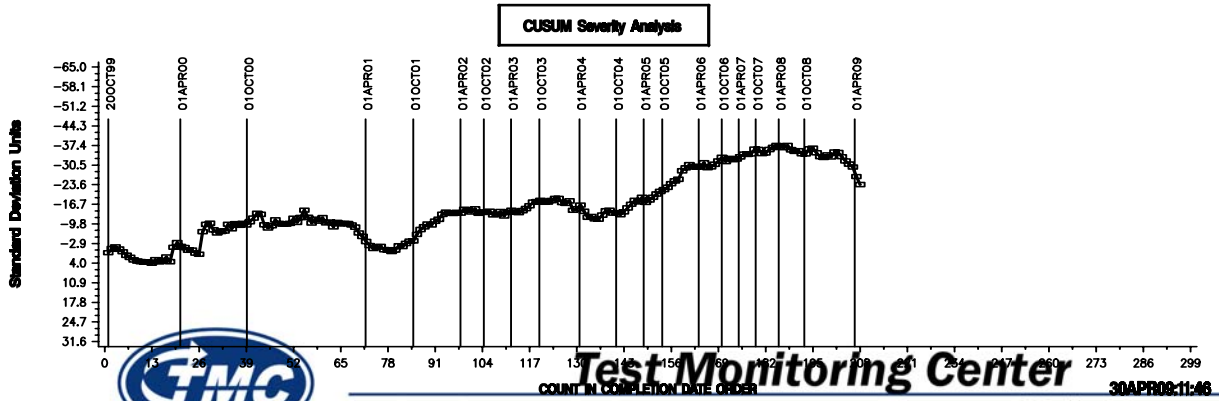
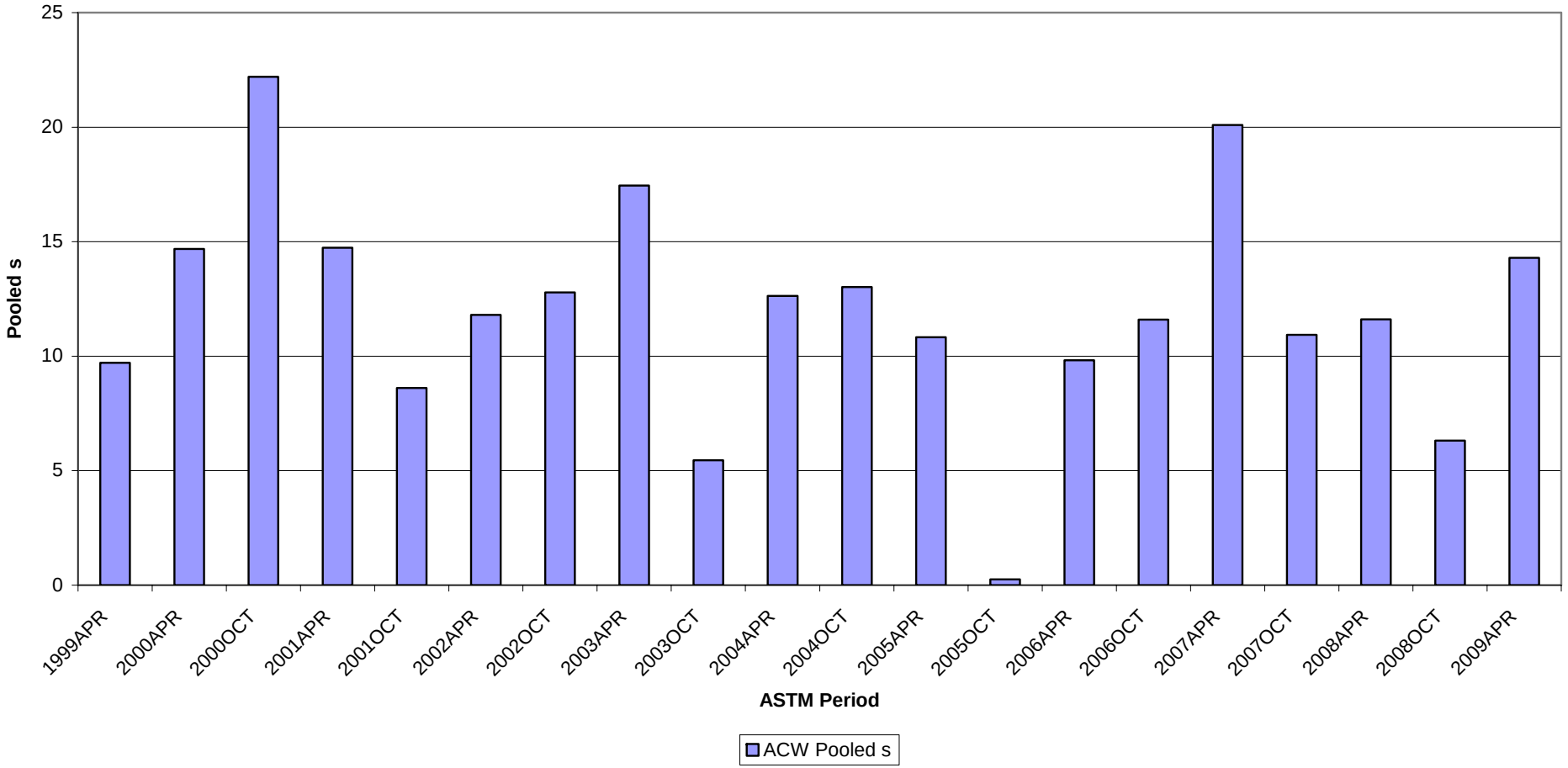


Figure 3 - Sequence IVA Reference Oil Data
Average Camshaft Wear



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Other issues

- One information letter issued

  CLARIFIED CALCULATIONS FOR QI WHEN MISSING OR BAD QUALITY DATA ARE ENCOUNTERED and CORRECTED TYPOGRAPHICAL ERROR

Attachment 5

Test Hardware Report

- Hardware Status:
  - No shortage of test hardware.
  - Industry currently using mixture of 2007 and 2008 test kits.
  - 2008 Nissan parts order was submitted in September 2008. Waiting for parts to be delivered.
    - Oil Cooler no longer available.
    - Some Test Stand Kit components no longer available.
    - Large order(s) placed by two labs.

Test Hardware Report

- Hardware Status Cont'd:
  - Another (final?) Nissan parts solicitation expected sometime in 2009.
  - TMC conducted an industry hardware survey.
    - To be reviewed at today's meeting.
  - **Nissan North America contact has once changed, from Scott Gehring to Stephen Fields.**

Test Hardware Report

- Questions to Nissan:
  - Confirm the status of the parts ordered in the 2008 hardware order.
    - xxx
  - Will all lab orders be filled 100% for the 2008 hardware order?
    - xxx
  - Confirm if there will be a 2009 hardware order solicitation and when it will be issued to the labs.
    - xxx

Test Hardware Report

- Questions to Nissan Cont'd:
  - Confirm if any additional hardware order solicitations will be issued beyond 2009.
    - xxx
  - If there will be additional hardware order solicitations, confirm if the same parts will be offered as in the 2008 hardware order, or are some of these parts now discontinued.
    - xxx

Test Hardware Report

- Questions to Nissan Cont'd:
  - Since the availability of the test stand kits have been limited for a while now, is it possibly to get lists of what parts, and there part numbers, were in those kits, and which of these parts might still be available through the Nissan local dealership parts department network?
    - xxx

Test Hardware Report

- Questions to Nissan Cont'd:
  - For the 2007 hardware order, multiple camshaft batches (070917A, 080317, 080418, 080610 and 080730) were supplied, which was a departure from what ASTM had previously requested of Nissan, and from what Nissan had supplied the labs in the 2001, 2002, 2003, 2004 and 2005 hardware orders (all single camshaft batch orders). Will there be a single camshaft batch or multiple camshaft batches supplied for the 2008 hardware order?
    - xxx

Test Hardware Report

- Questions to Nissan Cont'd:
  - For the 2007 hardware order, there is a mix of different rocker arm batches (070508, 130608, 200608, 300608). The rocker arm batch varies within test kits with the same camshaft batch and also between test kits where the camshaft batch varies. Will there be a single rocker arm batch or multiple rocker arm batches supplied for the 2008 hardware order?
    - xxx

Test Hardware Report

- Questions to Nissan Cont'd:
  - Can you tell us what the camshaft and rocker arm batch numbers identify (a date for casting/ machining/packaging, one or more manufacturing plants, etc.)?
    - xxx
  - What does a change in the casting number (3, 51H, 11, 12, 48G)on the rocker arm mean?
    - xxx

Test Hardware Report

- Questions to Nissan Cont'd:
  - Nissan informed us that the hardware that has been supplied to the labs starting with the 2007 hardware order, has switched from production parts to service parts. Can you tell us what this means?
    - xxx

Test Hardware Report

- Questions to Nissan Cont'd:
  - At some point in history the camshaft part number changed from 13020-40F01 to A3020-40F01 for the camshaft provided in the test kit. What does this change from a "1" to an "A" in the part number mean?
    - xxx
  - Are all cylinder heads manufactured at the same location?
    - xxx

Test Hardware Report

- Questions to Nissan Cont'd:
  - Are there casting numbers on the cylinder head and cylinder blocks? If so, what do they mean?
    - xxx
  - Has there been any changes over the life of the Sequence IVA test (1996 – Present) in the supplier or design specification of the Nissan oil filter supplied in the test kit?
    - xxx

Test Hardware Report

- Questions to Nissan Cont'd:
  - Does Nissan sell a diagnostic scanner that would link to the ECM that the Sequence IVA test uses that will monitor detailed ECM data? We have a Snap-On scanner that links to the ECM, but it only provides very limited data.
    - xxx

Total Estimated runs 1196

Batch	Cams	Rocker arms	Proven (y or n)	Heads	Rocker Shaft, IN	Rocker Shaft, EX	Plugs	Oil Filters	Distributors	Oil Coolers	Engines
080418	**42**	**504**	**Y**		**42**	**42**	**168**	**126**			
080610	**51**	**612**	**N**		**51**	**51**	**204**	**153**			
080730	**47**	**564**	**N**		**47**	**47**	**188**	**141**	**11**	**27**	18
2007	**264**		**N**	**14**					**4**	**5**	7
021015A	**2**		**y**	**20**	**138**	**138**	**8***	**9***	**9**	**8**	
30724	**50**		**y**								
070917A	**86**		**n**								
80610	**40**	**480**	**n**	**4**	**45**	**45**	**180**	**135**	**2**	**16**	

3) Parts on Order (2008 Solicitation)

Cams	**360**	135
Rockers	**4320**	1620
Heads	**18**	7
Rocker shafts	**720**	
Plugs	**1440**	
Oil Filters	**1080**	
Oil Coolers	**0**	3
Distributors	**27**	0
Engines	**15**	7

Other labs (0)

* From Dealer

Attachment 7

Sequence IVA Task Force

Surveillance Panel Report

May 6, 2009

Task Force Objectives

- Solve the mild severity shift seen at several labs.

- Observe technical details of solution and make recommendations to the Surveillance Panel.

January Meeting Summary

- The Task Force met in San Antonio January 09.
  - SWRI was the only calibrated lab
  - Lab visit to SWRI for build and metrology workshops
  - Met at Intertek for brainstorming session and review of findings from lab visit
  - Planned engine exchange experiment
  - 1009 oil assignment suspension

Major Findings

- There is no standard on driveline stiffness. Labs are running both damped and undamped systems
- SWRI has adopted a method of measuring blowby with an aspirated cart with unique pcv plumbing (1/8 in needle valve)
- Engine harness vintage (OHT vs Lab fab)
- The engine exchange experiment revealed that hardware was not the problem

Intertek Results

- Both Intertek stands produced wear after applying the methods seen at SWRI
  - Damped Vulcan coupling
  - OHT Engine Harness
  - New PCV plumbing including the 1/8 in needle valve between the intake and PCV valve
- Experimentation Continued
  - shakedown with old harness (produced wear)
  - shakedown with old pcv plumbing (produced wear)
- Both stands calibrated and experimentation stopped

Status and Recommendations

- 3 Labs are calibrated
- The solution at Intertek seems to be in the driveline stiffness but that has yet to be proven
- Other lab input

Action Items / Motions

1. Remove the requirement to conduct valve spring free length and squareness and to require vacuum checks of the cylinder head after assembly
2. Begin to monitor fresh air flow to the front cover
3. Begin to monitor RAC in and out temperature
4. Advise industry to monitor long blocks for Mexico castings
5. SWRI to provide schematic and equipment list to calculate injector pulse width
6. Pressurize the cooling system to 100 kpa, in a manner similar to the VG and VIB
7. Configure the PCV system similar to SWRI with the isolation valve and measure blowby using the IIIG cart

Sequence IVA Surveillance Panel
May 6, 2009
9:00AM – 12:00PM
GM Technical Center
Warren, MI

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

1. Action Item – SwRI to provide information (schematic and equipment list) on how they monitor injector pulse width and ignition timing.

1. Action Item – SwRI to provide information on their load cell enclosure and blanket heater.

2. Action Item – Severity task force to evaluate the load cell range specification currently included in the Sequence IVA test procedure.

3. Action Item – Labs to start conducting ICP analysis on the Flush 1 and Flush 2 oil samples, for all reference tests, and report in comment section of test report. Evaluate data at next surveillance panel meeting.

4. Action Item –Sequence IVA SAE paper number to be included in 5/6/09 meeting minutes.

5. Motion – Modify Sequence IVA test procedure to remove the requirement to conduct valve spring free length and squareness measurements and to require vacuum checks of the cylinder head after assembly. Effective 5/6/09.

Bill Buscher / Al Lopez / Passed Unanimously

6. Motion – Considering that the oil cooler assembly (p/n 21305-03E00) and distributor assembly (p/n 22100-40F00RE) are no longer available from Nissan, modify Sequence IVA test procedure to eliminate the number of allowed runs criteria on these two parts and to allow for replacement of distributor caps (p/n 22162-40F00) and rotors (p/n 22157-21E01). Effective 5/6/09.

Bill Buscher / Greg Seman / Passed Unanimously

7. Motion – Modify Sequence IVA test procedure to add record only measurements for fresh air flow rate to the front cover, rocker cover coolant in temperature, rocker cover coolant out temperature, and to add coolant system pressure measurement and control to

70±5kPa (in a manner similar to the Sequence VG and VIB). Modify test report forms and data dictionary accordingly. Implement by 8/1/09.

Al Lopez / Bill Buscher / Passed 10-0-1

8. Motion – Modify Sequence IVA test procedure to allow for 32 (from 20) runs per engine assembly and 16 (from 10) runs per cylinder head assembly. Effective 5/6/09.

Bill Buscher / Al Lopez / Passed 8-0-3

9. Motion – Modify Sequence IVA test procedure to require the 1/8" needle valve (as per SwRI's set-up) in the PVC system and to allow for both blowby measurement methods, using either the Sequence III or Sequence V blowby cart (a previous motion that never made it into the test procedure). Test procedure to indicate that the valve position is to be wide open for all test conditions except when a blowby measurement is being taken.

Tabled for refinement, and will Eballot by 6/1/09.

10. Action Item – Chairman to contact Todd Dvorak to see if he would be available to perform similar analysis on KA24E Green fuel data as he did on EEE fuel data.