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

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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

1. 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 meetings 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 Glaenger 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 assess 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 | <i>Nov 2009</i> |
| 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. | <i>On-going</i> |
| 3. Monitor the progress of the comprehensive review of the different LTMS systems utilized by the PCMO test types and their pros and cons. | <i>Nov 2009</i> |
| 4. Task force to study ACW severity shifts and identify potential causes. | <i>On-going</i> |
| Solicit a GF-5 reference oil producing wear results around 50 microns. | <i>Nov 2009</i> |

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

The meeting was adjourned at 11:50 am.

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


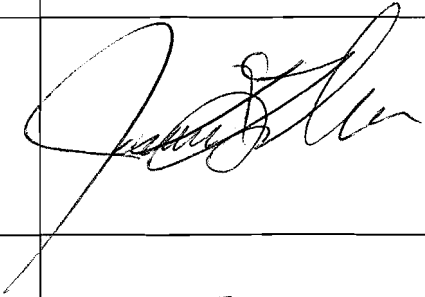

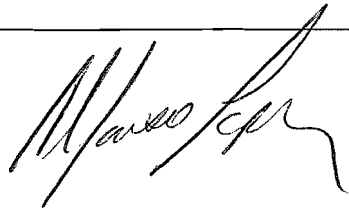

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May 6, 2009

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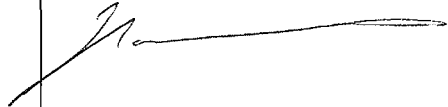
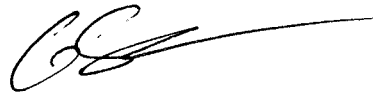
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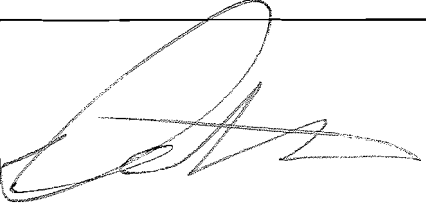

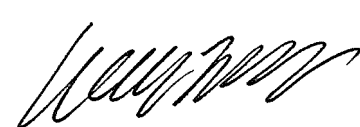
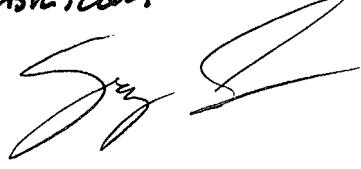
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May 6, 2009

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**PRODUCT
INFORMATION**



T (281) 457-2768

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PRODUCT: KA24E TEST FUEL
Seq. IV & VIII

Batch No.: XB1721GP01 XA2921GP01 VL1821GP05

TMO No.: 800138 800056 21035536

TMC No.:

PRODUCT CODE: HF0008

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

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



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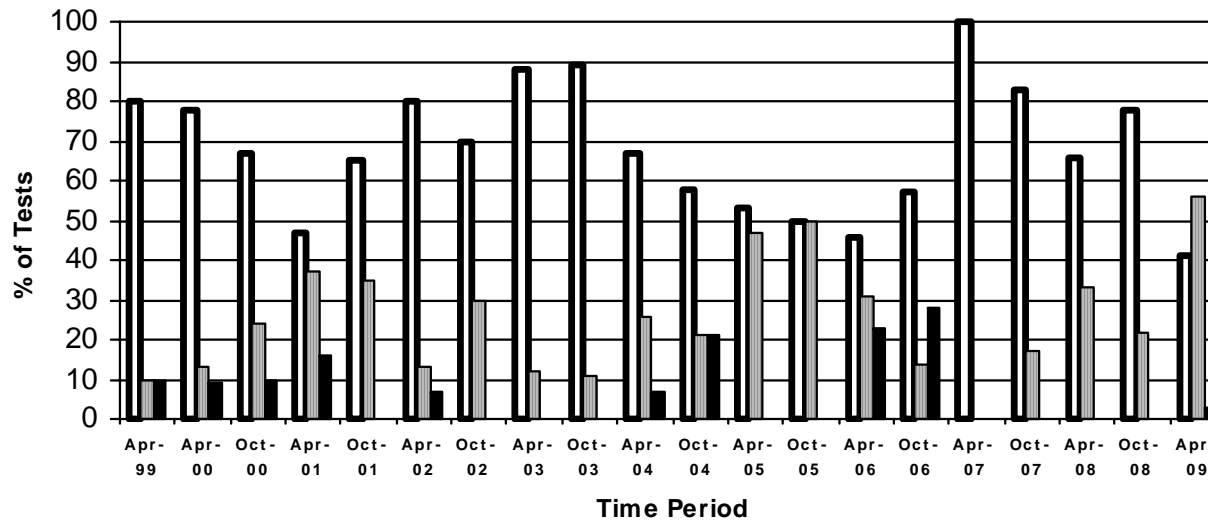
Test Monitoring Center

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

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

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



Test Monitoring Center

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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



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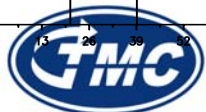
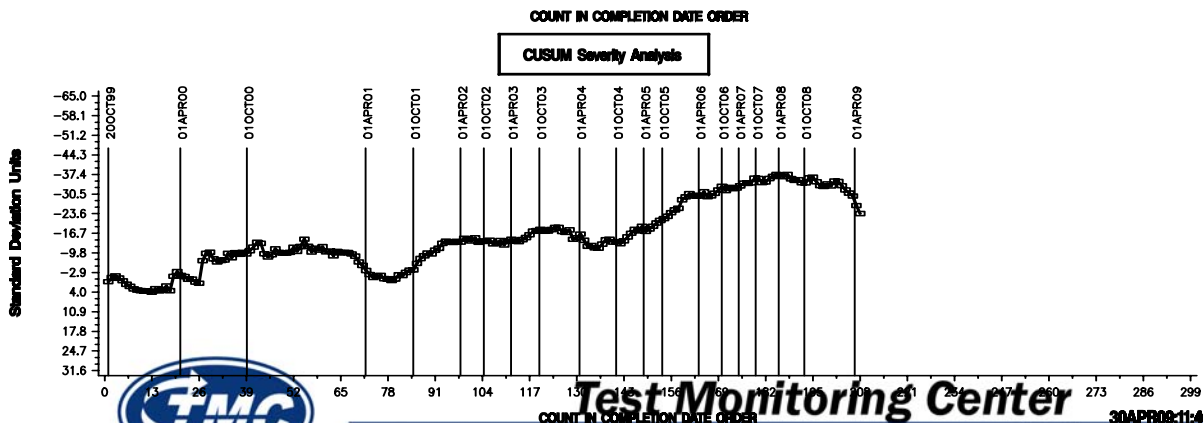
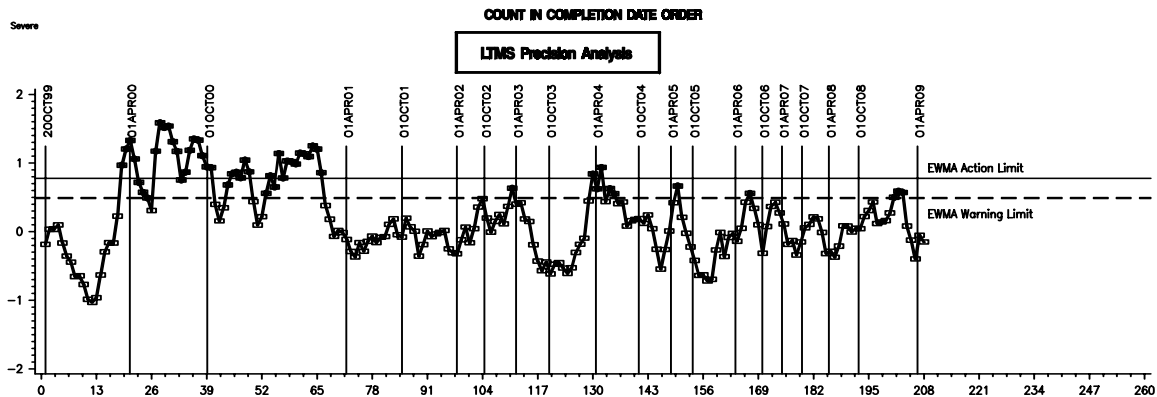
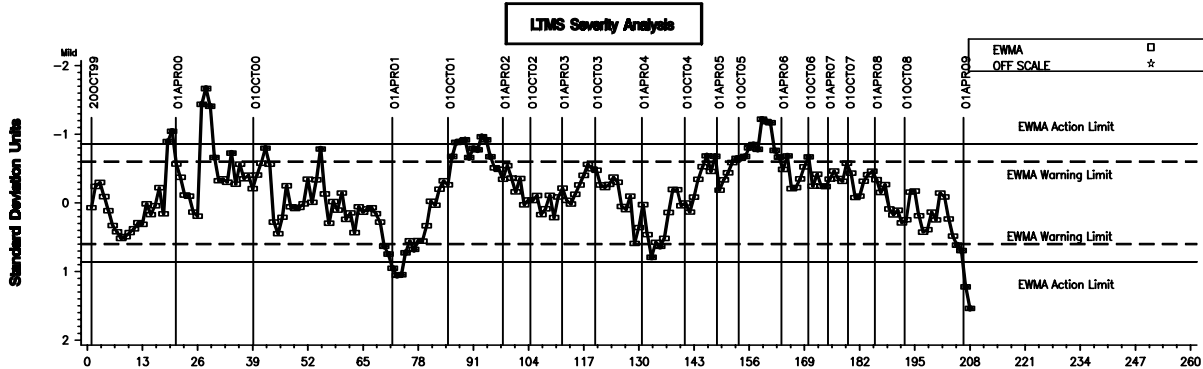
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SEQUENCE IVA INDUSTRY OPERATIONALLY VALID DATA

AVERAGE CAM WEAR



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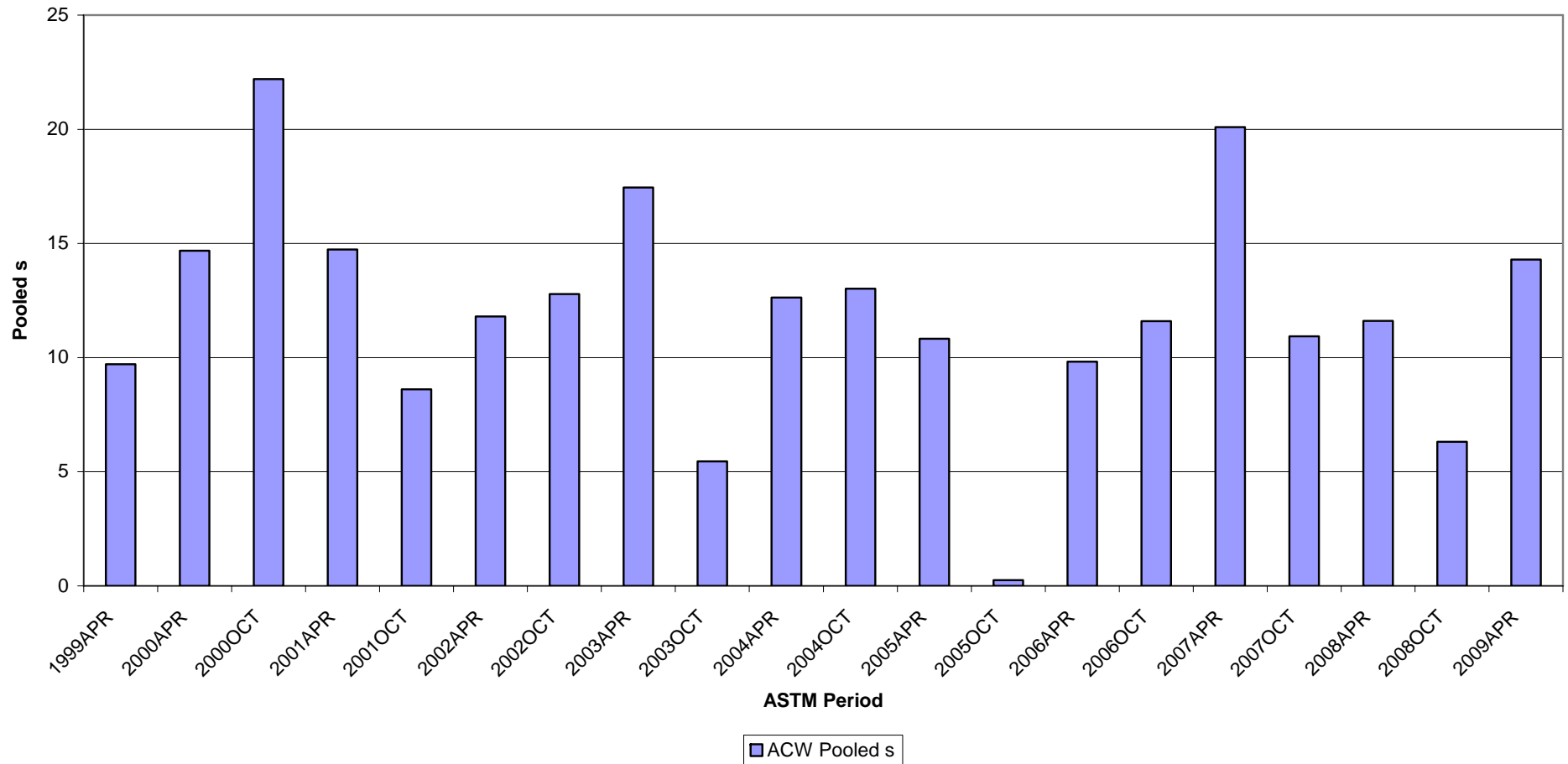
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Test Monitoring Center

30APR02 11:46

<http://astmtmc.cmu.edu>
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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



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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



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.
2. Action Item – SwRI to provide information on their load cell enclosure and blanket heater.
3. Action Item – Severity task force to evaluate the load cell range specification currently included in the Sequence IVA test procedure.
4. 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.
5. Action Item – Sequence IVA SAE paper number to be included in 5/6/09 meeting minutes.
6. 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

7. 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

8. 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

9. 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

10. 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.

11. 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.