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COMMITTEE D02 ON PETROLEUM PRODUCTS, LIQUID FUELS, AND LUBRICANTS

Issued: Sept. 15, 2016

Reply to: Dan Worcester
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Phone: 210.522.2405
Email: dworcester@swri.org

These are the unapproved minutes of the 09.14.2016 Sequence VI Conference Call.

The meeting was called to order at 9:00 AM Central Time by Greg Miranda.

Agenda

The Agenda is the included as Attachment 1.

1.0 Roll Call

The Attendance list is Attachment 2.

2. Old Business and Update Item Review

2.1 VIE hardware taskforce update

Adrian will continue working with GM on the build kits. The first kits are being delivered. This order was 468 total. An additional 934 engines are in process. 390 will have both left and right cylinder heads, the remainder will need heads saved at the labs and rebuilt. There was an issue with the second set of engines to be delivered from OHT. The first kits did not include several parts. The critical items were the lower intake manifold and upper and lower gaskets, coil packs, temperature sending unit, and fuel injectors. Different labs are using different injectors. Some are using the part number from the procedure [OHT6D-042-1], and some are cleaning and using the injectors that come with the engines. GM confirmed there has not been a change in injectors since 2006. There will be a future motion to define injectors or add the part number for the injectors from the engines. OHT will supply a kit for the additional parts needed for each engine. A partial order is available as some labs have already received these engines.

2.2 VIE Procedure taskforce update

See Attachment 3. There is a list of changes available. The final draft will be sent to Dave for review, then posted on the TMC site. Older versions will be archived.

2.3 VID/VIE equivalency taskforce update

There are concerns of how to correlate VID and VIE results. CLOG would need more VID data to review and compare. There will be further VIE testing. Bill Buscher stated there were about 30 VID tests remaining. IAR will attempt to calibrate three engines that had failed mild. A re-ring with VID rings was discussed. One dependent lab also has some engines that failed mild. Tim Cushing asked what rings would be replaced – the pack or just oil rings. This will be considered. Andy Ritchie asked when the current engines would complete VID tests. For Intertek this would be November, and December for SwRI. Amol Savant indicated he would be willing to have mild engines available for other labs. A decision was made to create a VID test extension task force. IAR will chair this effort, and SwRI, Lubrizol, Ashland, Afton, ExxonMobil, GM and Oronite will participate. Re-work of mild engines will be reviewed.

2.4 Lubrizol update on Seq. VIF supplemental PM work

Lubrizol has completed the conversion to have a VIF stand. This included a TMC lab visit and calibrations. They are running break in and will start the first reference oil next week. The reference oils for the matrix have been selected. Ashland will convert a VIF stand and had questions on reference oil assignments. These would be considered shakedown as was done on the VIE test.

2.5 AOAP/PCEOCP meeting Seq. VIE Update

At the joint AOAP and PCEOCP meeting held in Dearborn, MI on 9/8/16, the PCEOCP unanimously voted and approved the Seq VIE test methodology to be included as an ASTM procedure. AOAP approved the motion for acceptance of the Seq VIE procedure for inclusion as a GF-6 test method to go to E-ballot. Results of this E-Ballot motion are forth coming.

3. New Business

3.1 Procedural Revision: Proposal to change the Seq. VIE & Seq. VIF coolant flow measurement technique (presentation attached) – **Dave Glaenzer**

See Attachment 4. Discussion was on the history of coolant flow in the VIx tests. The VID was run with 100% Dexcool that limited devices that could read flow without damage to the sensor. Amol Savant recommended the manufacturing guidelines be followed for installation.

MOTION: Recommend to the Surveillance Panel the following wording changes for Sections 6.5.6 and 6.5.9.

6.5.6 An orifice plate (differential pressure) (FE-103 in Figs. A5.1–A5.3) **may be used is specified** (see X1.9). Use an orifice flange, 1 ½ NPT. Size the orifice plate to yield a pressure drop of (11.21 ± 0.50) kPa at a flow rate of 80 L/min. There shall be 10diameters upstream and 5 diameters downstream of straight, smooth pipe with no reducers or increasers. Flange size shall be the same size as pipe size. Threaded, slip-on or weld neck styles can be used as long as a consistent pipe diameter is kept throughout the required lengths. An orifice obtained from Flowell (see X1.9) has been found suitable. **As an alternate to using a differential pressure orifice plate to measure coolant flow, the volumetric coolant flow rate may be measured using any venturi or electronic flow meter that has an accuracy of < +/-0.5%.**

6.5.9 Use a Viatran model 274/374, Validyne model DP15 or P55, or Rosemount models 1151 or 3051 differential pressure transducer for reading the coolant flow rate at the orifice plate (FE-103 in Figs.A5.1–A5.3) (see X1.11) **if orifice plate is used for flow measurement.**

Dave Glaenzer, Charlie Leverett second. Yes = 12, No = 0, Waive = 1

The motion passed. The effective date is on or after October 01, 2016.

3.2 At AOAP/PCEOCP meeting in Dearborn, MI 9/8/2016, the Seq. VI SP has been asked to investigate into options that would allow for extending the life of the Seq. VID test methodology A decision was made to create a VID test extension task force. IAR will chair this effort, and SwRI, Lubrizol, Ashland, Afton, ExxonMobil, GM and Oronite will participate. Re-work of mild engines will be reviewed.

4.0 Next Meeting.

The next meeting date considered was in one month on October 19, 2016. Bill Buscher asked if there was interest in a Fall Face to Face set of Surveillance Panel meetings. They could be held in San Antonio. He will send an email.

The meetings adjourned at 10:20 AM.

Sequence VI Surveillance Panel Conference Call Agenda
September 14, 2016 @ 10:00-11:30 EST

Audio Connection

Call-in Number: +1-415-655-0001
Conference Code: 194 320 718

Webex Meeting URL:
https://meetings.webex.com/collabs/#/meetings/detail?uuid=M8VHKQ6PX12H2EA5A0BAP55215-20XT&rnd=29410.575977

1. **Roll Call**

   1.1. *SP Membership changes and additions*

2. **Old Business and Update Item Review**

   2.1. *VIE hardware taskforce update*

   2.2. *VIE Procedure taskforce update*

   2.3. *VID/VIE equivalency taskforce update*

   2.4. *Lubrizol update on Seq. VIF supplemental PM work*

   2.5. *AOAP/PCEOCP meeting Seq. VIE Update*

3. **New Business**

   3.1. *Procedural Revision: Proposal to change the Seq. VIE & Seq. VIF coolant flow measurement technique (presentation attached) –* ***Dave Glaenzer***

   3.2. *At AOAP/PCEOCP meeting in Dearborn, MI 9/8/2016, the Seq. VI SP has been asked to investigate into options that would allow for extending the life of the Seq. VID test methodology*

4. **Next Meeting**

   4.1. *Monthly meetings*
      4.1.1. *October 19, 2016 @ 10:00*

5. **Meeting Adjourned**

ASTM SEQUENCE VI

Name	Email/Phone	Company	Attend
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Jason Bowden **Voting Member**	Phone: (440) 354-7007 jhbowden@ohtech.com	OHT	ATTEND
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David Glaenzer **Voting Member**	Phone: (804) 788-5214 Dave.Glaenzer@aftonchemical.com	Afton	ATTEND
Rich Grundza **Voting Member**	Phone: (412) 365-1034 reg@astmtmc.cmu.edu	TMC	ATTEND
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Kaustav Sinha **Voting Member**	Phone: (713) 432-6642 LFNQ@chevron.com	Chevron Oronite	ATTEND
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Dan Worcester **Voting Member**	Phone: (210) 522-2405 Dan.Worcester@swri.org	SwRI	ATTEND

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ASTM SEQUENCE VI

Name	Email/Phone	Company	Attend

Sequence VIE/VIF Procedure Review

David L. Glaenzer
September 14, 2016

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Surveillance panel requested procedure review

- **Started with June 13, 2016 Draft that Hap Thompson had kept up-to-date with changes made by Surveillance Panel.**
- **Group met via WebEx on August 16 and reviewed changes that had been identified.**
- **Summary sent to group for review with August 24 return date.**
- **No additional changes warranted.**
- **Still awaiting one small piece of information.**

Changes made by Hap Thompson to 06/13/2016 document.

- **Editorial changes to Sections 6.6, 6.6.5.6, 6.6.5.6(1), 6.13.1, 6.13.5.**
- **Part number added to Section 9.4.9**
- **Sections 10.1.1.2 through 10.1.1.8 reworded to reflect current LTMS reference oil calibration practices.**
- **Section 10.1.1.?? Added to detail additional break-in hours needed to reset LTMS following a failed calibration test.**
- **Editorial changes to Table 1, Table 8, Annex 5 figure A5.8, Annex 5 figure A15.9, Annex A6.**
- **Annex 7 table A7.1 Need OHT Part Numbers to Complete**

Another subject

- **Fuel Injectors were discussed.**
- **Procedure calls for OHT injectors**
- **Some labs have used injectors that came with OHT6E-001-1 engines.**

- **Surveillance Panel action probably required.**

Thank You !

- **Thanks to those who provided input and/or participated during our WebEx call and follow-up.**

Adrian Alfonso	Intertek Automotive Research
Charlie Leverett	Retired Good Guy
Cliff Salvensen	ExxonMobil
Dan Worcester	Southwest Research
Greg Miranda	Lubrizol Corporation
Hap Thompson	ASTM Facilitator
Terry Hoffman	Afton Chemical Corporation
Jason Bowden	OH Technologies
Jim Linden	Linden Consulting
Layden Mantle	Valvoline
Nathan Moles	Lubrizol Corporation
Katerina Pecinovsky	Afton Chemical Corporation
Richard Grundza	ASTM Test Monitoring Center
Tim Cushing	General Motors

Sequence VIE/VIF Engine Coolant Flow Measurement

David L. Glaenzer
September 14, 2016

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A Little History

- **The Sequence VIB test called for engine coolant flow (ECF) of 130 L/m.**
- **Sequence VID development started at 60 L/m.**
- **Sequence VID development started with 100% Dexcool® as 100% Dexcool® was being used in scoping a IIIG replacement test using the 3.6L LY7 engine at the same time.**
- **Use of 3.6 L LY7 was eventually abandoned for replacement IIIG use and IIIG test life extended.**
- **100% Dexcool® inadvertently carried forward into VID development work.**

History, part 2

- **At some time prior to Sequence VID Precision Matrix, ECF moved to 80 L/m to better represent actual flow rates at conditions selected for VID.**
- **There was an interest in moving to Vortex or mag flow meters; however the use of 100% Dexcool® prohibited such.**
- **Hence, we continued to measure ECF with fixed orifice plate sized to provide ~45 inches water delta pressure (11.2 kPa).**
- **Viatran or Validyne delta pressure transducers were specified.**

Sequence VIE/VIF

- **Sequence VIE/VIF engine coolant is 50/50 Dexcool®/water at 80 L/m.**
- **Current Wording in VIE Draft**
  - 6.5.6 An orifice plate (differential pressure) (FE-103 in Figs. A5.1–A5.3) is specified (see X1.9). Use an orifice flange, 11/2 NPT. Size the orifice plate to yield a pressure drop of (11.21 ± 0.50) kPa at a flow rate of 80 L/min. There shall be 10 diameters upstream and 5 diameters downstream of straight, smooth pipe with no reducers or increasers. Flange size shall be the same size as pipe size. Threaded, slip-on or weld neck styles can be used as long as a consistent pipe diameter is kept throughout the required lengths. An orifice obtained from Flowell (see X1.9) has been found suitable.
  - 6.5.9 Use a Viatran model 274/374, Validyne model DP15 or P55, or Rosemount models 1151 or 3051 differential pressure transducer for reading the coolant flow rate at the orifice plate (FE-103 in Figs.A5.1–A5.3) (see X1.11)

Sequence VIE/VIF

- **Suggested Change to VIE Draft**
  - 6.5.6 An orifice plate (differential pressure) (FE-103 in Figs. A5.1–A5.3) **may be used ~~is specified~~** (see X1.9). Use an orifice flange, 1 ½ NPT. Size the orifice plate to yield a pressure drop of (11.21 ± 0.50) kPa at a flow rate of 80 L/min. There shall be 10diameters upstream and 5 diameters downstream of straight, smooth pipe with no reducers or increasers. Flange size shall be the same size as pipe size. Threaded, slip-on or weld neck styles can be used as long as a consistent pipe diameter is kept throughout the required lengths. An orifice obtained from Flowell (see X1.9) has been found suitable. **As an alternate to using a differential pressure orifice plate to measure coolant flow, the volumetric coolant flow rate may be measured using any venturi or electronic flow meter that has an accuracy of ≤ +/-0.5%.**
  - 6.5.9 Use a Viatran model 274/374, Validyne model DP15 or P55, or Rosemount models 1151 or 3051 differential pressure transducer for reading the coolant flow rate at the orifice plate (FE-103 in Figs.A5.1–A5.3) (see X1.11) **if orifice plate is used for flow measurement.**

Motion for SP Consideration

- **Afton Chemical Corporation moves:**
  - The Sequence VIE and VIE procedures be modified as detailed on Slide 5.
  - A lab may use an alternate venturi or electronic flow meter on a stand following a successful reference oil calibration test on that stand.
  - Effective date: On or after October 01, 2016.

Afton CHEMICAL

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