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COMMITTEE D02 ON PETROLEUM PRODUCTS, LIQUID FUELS, AND LUBRICANTS

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Originally Issued: August 3, 2021

Reply to: Richard Grundza
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Unapproved Minutes of the July 29, 2021
Sequence IV Surveillance Panel Conference Call.

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The meeting was called to order by Chairman Buscher at 7:00 AM Central Time.

A copy of the agenda is included as attachment 1.

A list of attendees is included as attachment 2.

The panel discussed list of action items from the previous meeting (see attachment 3). All of the action items from the previous meeting had been addressed.

The panel discussed the expected life of the current IVA test. There are approximately 70-80 tests left and labs project to be out of hardware by the end of 2022. The panel discussed options for extending the life

of the IVA test (See attachment 4). Parts are still available from online sources and auto parts stores but Nissan indicated additional hardware will not be made available from them. Several members indicated that engines need to be rebuilt and it was suggested that perhaps a central parts distributor could take on obtaining cams, followers and other such parts. Discussions with Nissan and Toyota representative indicated that it was unlikely that the Iva would continue to be used in JASO specifications. The group discussed whether the IVA can be replaced with the IVB in some of the older categories. The panel chair agreed to contact the CLOG group to further investigate this possibility. The chair also agreed to distribute the Sequence Iva SAE paper to the panel. A final question of the availability of reference oil 1006-2 was made and it was determined there was about two hundred gallons left, which is roughly forth tests.

The panel discussed an ACC PAPTAG request to review and evaluate lobe failures on candidate tests. This item had been discussed and reviewed during a previous meeting and a letter was sent to ACC PAPTAG regarding lobe wear (See attachment 5) The panel reviewed a presentation by the TMC regarding lobe failures noted in the reference system (see attachment 6). The TMC indicated the last lobe failure noted was a BOI/VGRA Test in March of 2019. No instances of lobe failure have been identified with reference oils since. The chair indicated that one lab is investigating some observations on lobe wear and has informed the chair and test sponsor of their on-going investigations. The panel will be updated when these investigations have been completed.

The panel discussed two procedure changes/updates. The first change is the reference to oil 1006-2 as the break-in oil. The panel agreed to begin using oil SL107 during a previous meeting. The TMC informed the panel that 3 of the 4 labs had successfully reference engines broke in with this oil and a fourth lab is in process of referencing. The panel also entertained a change in the instrumentation calibration frequency to change calibrations from every six month to prior to a reference oil test. The panel agreed to issue an information letter to address both of these items.

The panel discussed the introduction of a reblend of reference oil 1011. The panel agreed to introduce this oil, 1011-1, using the current 1011 targets. The TMC will keep the panel apprised of the progress and any issues arising from the introduction of this oil.

Scope and objectives review was deferred for another meeting, which is planned to be held in about two months to address the status of the IVA test.

The meeting was adjourned at 8:35 AM CST.

Attachment 7 includes the motion and action items recorded during this meeting.

Sequence IV Surveillance Panel

Conference Call

July 29, 2021




7:00 a.m. - 9:00 a.m.

A G E N D A

1. Chairman comments.
2. Attendance.
3. Membership changes.
4. Approval of minutes for November 19, 2020
5. November 19, 2020 action item review.
6. Sequence IVA end of life / availability.
7. Sequence IV Surveillance Panel response to ACC PAPTG letter.
8. Sequence IVB procedural modification to replace ASTM REO 1006-2 with ASTM REO SL-107 for the initial break-in / aging oil.
9. Sequence IVB procedural modification to align full stand instrument calibration period to reference calibration period.
10. Introduction of ASTM REO 1011-1 into Sequence IVB.
11. Review scope & objectives
12. Old business.
13. New business.
14. Motion and action item review.
15. Next meeting.
16. Adjourn.

**MEMBERSHIP
SEQUENCE IV SURVEILLANCE PANEL**

July 29, 2021

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SEQUENCE IV SURVEILLANCE PANEL**

July 29, 2021

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July 29, 2021

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SEQUENCE IV SURVEILLANCE PANEL**

July 29, 2021

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**NON-MEMBER MAILING LIST
SEQUENCE IV SURVEILLANCE PANEL**

July 29, 2021

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Sequence IV Surveillance Panel
November 19, 2020
1:30PM – 3:30PM
Conference Call

Motions and Action Items

As Recorded at the Meeting by Bill Buscher

1. Motion – The Sequence IV Surveillance Panel approves the TGC Fuels Task Force recommendation for a revised KA24E Green test fuel specification as written.
Rich Grundza / William Buscher / Passed 16 – 0 – 1
Completed.
2. Motion – The Sequence IV Surveillance Panel approves the TGC Fuels Task Force recommendation to remove the KA24E Green test fuel specification from the Sequence IVA (ASTM D6891) and the Sequence IVB (ASTM D8350) test procedures, and to post the fuel specification on the ASTM TMC website.
William Buscher / Teri Kowalski / Passed 16 – 0 – 1
Completed. Test procedures have been updated.
3. Action Item – SwRI and Intertek to further investigate lifter differences that SwRI has visually observed. SwRI and Intertek to measure surface finish on a sampling of new lifters from Lifter Batches A, B, C and D. Lifter sides will be measured.
Completed. To be discussed today.
4. Action Item – ASTM TMC to conduct a correlation of lifter ID to lifter wear and lobe failures for reference oils and test users to conduct a correlation of lifter ID to lifter wear and lobe failures for candidate oils.
Completed. To be discussed today.
5. Action Item – Sequence IV Surveillance Panel chair to draft a response to ACC PAPTG and distribute to the surveillance panel members for feedback, prior to sending to the ACC PAPTG.
Completed. Set to the ACC PAPTG on 1/12/2021.
6. Motion – The Sequence IV Surveillance Panel approves changes to the Sequence IVB Golden Test stand, which include using a laboratory’s commonly used bulkhead fitting, in place of the Golden Stand bulkhead fitting for the pressure lines and modifying the Golden Stand driveline guard to allow for the use of hinges and pins.
Ben Maddock / Andrew Stevens / Passed Unanimously 17 – 0 – 0
Completed.

Sequence IVA

End of Life / Availability

July 29, 2021

Sequence IVA Current Hardware Inventory

| Current Inventory as of 6/21/2021 | |
|--|--|
| Laboratory | Remaining Sequence IVA Runs |
| Intertek | 19 |
| SwRI | 55 |
| Total | 74 |

Sequence IVA End of Life Projection

| Usage | | |
|---|--------|-----------|
| Year | Actual | Projected |
| 2019 | 52 | |
| 2020 | 51 | |
| 2021 | 23 | 28 |
| 2022 | | 51 |
| Projected Amount Needed through 2022 | | 77 |
| Current Inventory | | 74 |
| Balance | | -3 |

- Intertek projected to run out of Sequence IVA hardware in January 2022
- SwRI is projected to run out of Sequence IVA hardware in December of 2022
- Essentially, if activity remains stable, we will run out of IVA hardware in December 2022

Sequence IVA Future Availability

- Is there a way to extend the life of the Sequence IVA test to support the API legacy categories?
 - Can we acquire more critical hardware through Nissan or through the after-market industry?
 - Sequence IV Surveillance Panel chair has previously approached Nissan about additional availability of critical Sequence IVA hardware, primarily the camshaft, rocker arms and rocker shafts, and Nissan's response was that this hardware was no longer available from Nissan
- Is there a replacement test available for the Sequence IVA test?
 - Could the Sequence IVB be accepted as a replacement test for the Sequence IVA?
 - What work would need to be done to deem the Sequence IVB acceptable as a replacement for the Sequence IVA?
 - A PCEOCP member, possible someone from API or ACC indicated that an acceptable replacement test does not have to be proven equivalent or correlate to the test that it is replacing

Status of ACC PAPTG Request to Sequence IV Surveillance Panel

Request to investigate increase in camshaft lobe failures during
candidate Sequence IVB tests

January 12, 2021

Surveillance Panel Observations

- Observed significant differences in lobe failures between candidate and reference tests
 - Lobe Failure Rate = 12.89% for candidate tests (29 of 225 tests)
 - Lobe Failure Rate = 2.54% for reference tests (5 of 197 tests)
 - 3 REO 300 (5W-30) tests
 - 1 REO 1011 (0W-16) test
 - 1 BOI/VGRA (5W-30) test
- Observed that lobe failures have only occurred at independent labs
- Observed lobe failure rate has increased in the past year
- One lab has observed visual differences between lifter batches
 - Could lifter batch impact lobe failures?

Surveillance Panel Member Comments

- Surveillance Panels typically do not address candidate oil issues, if they are not similarly occurring with reference oils
- Not much action that the Sequence IV Surveillance Panel can take with regards to this ACC PAPTG request
- Appears that the introduction of LSPI compliant oils has increased lobe failure rate
 - Formulation change associated with API SN+, API SP and ILSAC GF-6 candidate oils could be a factor

Surveillance Panel Action Items

- SwRI and Intertek to further investigate lifter differences that SwRI has visually observed. SwRI and Intertek to measure surface finish on a sampling of new lifters from Lifter Batches A, B, C and D. Lifter sides will be measured.
- ASTM TMC to conduct a correlation of lifter ID to lifter wear and lobe failures for reference oils and test users to conduct a correlation of lifter ID to lifter wear and lobe failures for candidate oils

Timeline

- 11/3/2020 – ACC PAPTG sent request to Sequence IV Surveillance Panel chair
- 11/4/2020 – Sequence IV Surveillance Panel chair contacted ACC PAPTG manager, ASTM TMC and Sequence IVB test sponsor (Toyota) to discuss ACC PAPTG request
- 11/5/2020 – Sequence IV Surveillance Panel chair sent ACC PAPTG request to Sequence IV Surveillance Panel and scheduled Surveillance Panel meeting to discuss
- 11/19/2020 – Sequence IV Surveillance Panel meeting conducted to discuss and address ACC PAPTG request



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Attachment 6

Test Monitoring Center

<http://astmtmc.cmu.edu>

IVB Lobe Wear

All Reference data reported through 11/17/20

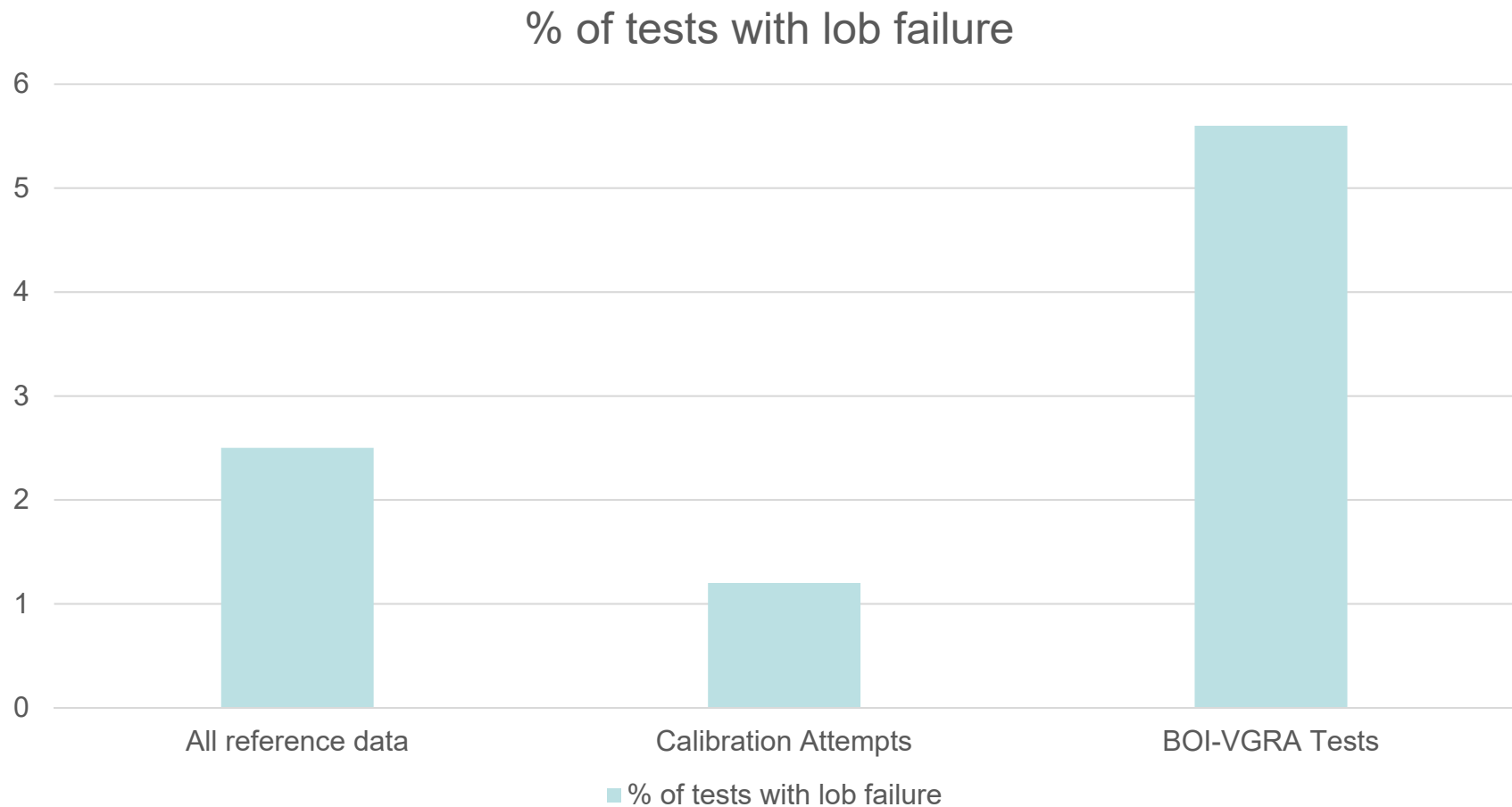
Summary of Review

- All data (prove out, development, matrix, BOI-VGRA and subsequent reference data) reviewed for occurrence of lobe failure
- Five occurrences noted in reference data with some 197 results.
- Most recent occurrence was a BOI-VGRA oil result on March 17, 2019.

Rates of Lobe Failure

- All data (prove out, development, matrix, BOI-VGRA and subsequent reference data) shows 5 lobe failures in 197 results
- Tests for calibration purposes showed a single lobe failure in 84 calibration attempts.
- One BOI-VGRA oil result exhibited lobe failure out of the eighteen BOI-VGRA tests run.
- Breakdown by oil indicates three tests on RO 300, one test on 1011 and one on a BOI-VGRA oil.
- Four of the five lobe failures occurred on 5W-30 oils and one occurred with a 0W-16 oil.

Rates based on Type of Test



Timeline of Lobe Failures

| Date | Purpose | Oil | Vis Grade |
|------------|---|---------|-----------|
| 9/15/2016 | Prove out for Matrix 1 | 300 | 5W-30 |
| 3/23/2017 | 2 nd test on stand, 1 st matrix | 1011 | 0W-16 |
| 11/17/2017 | Matrix test | 300 | 5W-30 |
| 6/16/2018 | 1 st calibration attempt on a new stand | 300 | 5W-30 |
| 3/17/2019 | BOI-VGRA test | IVB17-1 | 5W-30 |



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Motions and Action Items

As Recorded at the Meeting by Bill Buscher

1. Action Item – The Sequence IV Surveillance Panel chair to contact the CLOG chair to obtain an update on the CLOG response and potential request to the Sequence IV Surveillance Panel for addressing Sequence IVA end of life / availability.
2. Action Item – The Sequence IV Surveillance Panel chair to distribute the Sequence IVA SAE paper number to surveillance panel members.
3. Motion – The Sequence IV Surveillance Panel approves revision to the Sequence IVB test procedure (D8350) to replace ASTM REO 1006-2 with ASTM REO SL-107 for the initial break-in / aging oil. Effective 7/29/2021.
William Buscher / Andrew Stevens / Passed Unanimously 16 – 0 – 0
4. Motion – The Sequence IV Surveillance Panel approves revision to the Sequence IVB test procedure (D8350) to align full stand instrument calibration period to reference calibration period (procedure to read the same as the Sequence VH test procedure). Effective 7/29/2021.
William Buscher / Khaled Rais / Passed Unanimously 16 – 0 – 0