Sequence IVB Sub-Groups | MINUTES

REVISION DATE: 7/2/2018 10:21:00 AM

Relevant Test:	Sequence IVB
Note Taker:	Chris Mileti
Meeting Date:	06-26-2018
Comments:	This was a back-to-back conference call with the two Sequence IVB Sub-Groups: ***IVB Procedure Review Sub-Group*** and ***IVB Precision/Operations Sub-Group***.

1. REVIEW OF ACTION ITEMS (BOTH SUB-GROUPS):

1.1. ACC Request for Data on Camshaft Lobe Failures (TMC):

1.1.1. On June 26th, Rich Grundza sent an email to the five Sequence IVB laboratories requesting information on camshaft lobe failures.

1.1.1.1. This email was in response to a formal request made by the ACC for this information.

1.1.2. This request covers all testing run since the Precision Matrix.

1.1.3. The ACC would like data for both candidate and reference oils.

1.1.4. The TMC would also like each lab to supply the total number of tests that they have run (even though this level of detail was not in the original ACC request).

1.1.5. Grundza does not have any information as to why the ACC has requested this information.

1.1.6. Lubrizol will add this to the action item list.

1.2. Update Procedure with Instructions for Camshaft Lobe Failures:

1.2.1. Intertek previously reported that this action item was almost complete.

1.2.2. Coker will need to get an update on this action item from Buscher, but he anticipates that a draft procedure will be available sometime next week.

1.3. OHT to Design/Supply a Timing Chain Wedge:

1.3.1. ***Note:*** OHT did not call into the meeting until after this action item was discussed.

1.3.2. Intertek, Southwest and Lubrizol are already using wedges that are based on their respective Sequence IVA tools.

1.3.3. Intertek noted that even though the existing labs already have timing chain wedges, it may be useful for OHT to have one available for new labs.

1.3.4. Toyota has no preference as to whether this tool is supplied by OHT.

1.3.5. Lubrizol will contact OHT to discuss having this action item removed.

1.3.6. Intertek suggested adding a drawing to the procedure for a generic timing chain wedge if one is not offered by OHT.

1.4. Compare Lifter Wear vs. Lifter Position:

1.4.1. Lubrizol noted that the Statistics Group has already performed this analysis for some Sequence IVB data.

1.4.2. Lubrizol will follow-up with the Statistics Group to confirm that all the Precision Matrix data was included in the statistical analysis.

1.4.3. Intertek supports having the Statistics Group analyze this further because certain lifter positions are more severe than others.
1.4.4. Lubrizol noted that this action item is closely aligned with the action item to follow-up with the Statistics Group on lifter weighting and outlier screening.

1.5. Blowby Heat Exchanger Baffle:

1.5.1. There is an action item to decide whether Intertek's blowby baffle should be added to the test procedure.
1.5.2. Lubrizol and Southwest both believe that the baffle should be included in an appendix as an optional stand upgrade.
1.5.3. *Comments from Intertek:*
1.5.3.1. This baffle was the only way that they could adequately control the blowby gas temperature on IAR165.
1.5.3.2. It prevented hot air from a neighboring Sequence III stand from blowing over the heat exchanger.
1.5.4. *Comments from Toyota:*
1.5.4.1. They are comfortable with this baffle being an optional upgrade to the Golden Stand.
1.5.4.2. However, the procedure needs to provide guidance as to when the baffle should be used.
1.5.5. Intertek will provide drawings for the baffle that can be included in the test procedure.

1.6. Finalize Sequence IVB Report Form:

1.6.1. Bill Buscher will need to provide an update on this action item when he becomes available.
1.6.2. Intertek and the TMC did exchange some mark-ups of the current report format.
1.6.3. *Comments from TMC:*
1.6.3.1. The TMC wants a final draft of the report form to be reviewed by the Surveillance Panel before any decisions or actions are made.
1.6.3.2. Some parameters may need to be moved around.
1.6.3.3. Other parameters, such as compression checks, may be removed.
1.6.3.4. Form 4 may need to be modified to accommodate iron as a pass/fail parameter.
1.6.3.5. One or two additional parameters and QI's may also be added.

1.7. Confirm that All Laboratories are Reading the Same OBD-II Parameters:

1.7.1. *Comments from Lubrizol:*
1.7.1.1. The original three laboratories tried to audit their OBD-II parameters earlier in test development.
1.7.1.2. However, this was obviously unsuccessful because lab-to-lab differences in OBD-II parameters have still been identified during operational data reviews.
1.7.1.3. Lubrizol has at least one OBD-II parameter that is not being inputted correctly (or is mislabeled).
1.7.2. *Comments from Intertek:*
1.7.2.1. They agree that an audit of the OBD-II parameters is needed.
1.7.2.2. In fact, they have recently reprogrammed some of their OBD-II channels.
1.7.3. *Snap-On Scanners:*
1.7.3.1. Toyota asked for an update from the laboratories on the use of Snap-On scanners.
1.7.3.2. Lubrizol and Intertek confirmed that they do have Snap-On scanners.
1.7.3.3. However, the utility of these scanners is limited by the fact that they can only download segments of data.

1.7.3.4. As a result, all five laboratories import the OBD-II data directly into their data acquisition systems via a CAN-Bus system.

1.7.4. Lubrizol will lead another OBD-II audit that includes all five laboratories.

1.8. Re-Evaluate QI's for All Controlled Parameters:

1.8.1. Lubrizol will contact the Statistics Group to discuss reevaluating all the QI calculations.

1.8.2. The original QI calculations were established before the Precision Matrix data was available.

1.9. Compile All Notes from January 2018 Sequence IVB Engine Build Workshop:

1.9.1. Lubrizol has already compiled its notes from this workshop.

1.9.2. Southwest and Afton will check to see if their attendees to this workshop have any notes that can be provided to Lubrizol.

1.9.3. Intertek will provide Lubrizol with the handouts from the workshop.

1.10. Create Engine "Health" Checklist to Inspect Hardware Between Tests:

1.10.1. Lubrizol confirmed that this action item is specific to the engine and not the test stand.

1.10.1.1. The goal is to identify any excessive wear or damage to the engine that could impact iron generation.

1.10.2. *Comments from Intertek:*

1.10.2.1. They borescope engines to check for excessive wear.

1.10.2.2. The borescope that they use has the capability to collect sideways images.

1.10.2.3. It is used to check for staining or pitting.

1.10.3. Lubrizol asked the labs to provide any feedback that they may have regarding their engine inspection process.

1.11. IVB Test Report and Lobe Failures:

1.11.1. The sub-groups have an action item to determine if a IVB test report should identify when a candidate test follows a test that experienced a camshaft lobe failure or excessive iron.

1.11.2. *Comments from the TMC:*

1.11.2.1. The TMC recommended that this action be handled by the full Surveillance Panel (and not one of the sub-groups).

1.11.2.2. Some customers may not want information such as this published on test reports.

1.11.2.3. In the meantime, this information can be captured in the comments section of the report.

1.11.3. *Comments from Toyota:*

1.11.3.1. All five laboratories will need provide feedback regarding whether 400ppm is an appropriate threshold to describe a "high wear" test.

1.11.3.2. *Are all the oil marketers and additive companies comfortable having this data on test reports?*

1.11.4. Lubrizol will update this action item so that it is discussed during the next face-to-face Surveillance Panel meeting.

1.12. Review Iron Data/Curves for All Engines Used Since Precision Matrix:

1.12.1. There is an action item to develop cumulative iron curves for all engines used since the start of the Precision Matrix.

1.12.2. Southwest has one customer that did not agree to share their data.

1.12.2.1. Southwest has provided Buscher with data that they were authorized to share.

1.12.3. Intertek also had one customer that did not agree to share data.

1.12.3.1. Coker will follow-up with Buscher on this issue and report back to the sub-groups.

1.12.4. Lubrizol and Afton have both agreed to provide data for the tests that they have conducted in their respective labs.
1.12.5. Exxon has not yet reported back to the sub-group about their willingness to supply data from their lab.
1.12.5.1. The TMC will follow-up with Exxon regarding this issue.

1.13. Definition of an "Engine":

1.13.1. *Comments from Lubrizol:*
1.13.1.1. The statisticians have requested some clarity on what defines an "engine".
1.13.1.2. This definition will be needed before they analyze the iron data that is currently being collected.
1.13.1.3. This issue was recently brought to the forefront by Intertek's decision to put an older cylinder head on a newer engine block.

1.13.2. *Comments from Toyota:*
1.13.2.1. Engine nomenclature should be based on the engine block if this group is concerned about excessive oil consumption resulting from cylinder bore wear.

1.13.3. *Comments from OHT:*
1.13.3.1. There are currently different levels of "rebuilding" after camshaft lobe failures.
1.13.3.1.1. In some cases, the engine is flushed prior to the next test.
1.13.3.1.2. In other cases, the bearings are replaced.
1.13.3.2. The sub-group needs to establish some consistency regarding this work.

1.13.4. *Comments from the TMC:*
1.13.4.1. They agree that the sub-group needs to establish a formal method to address lobe failures.
1.13.4.2. *Sequence VI:*
1.13.4.2.1. The Sequence VI test follows the engine.
1.13.4.2.2. In the past, laboratories purchased completely assembled engines.
1.13.4.2.3. Now, laboratories purchase short blocks that were set-aside by GM for warranty work.
1.13.4.2.4. The labs are responsible for installing the cylinder heads.

1.13.5. *Follow-Up Comments from Lubrizol:*
1.13.5.1. Any data provided to the statisticians (regarding engine life) must explicitly identify milestones such as cylinder head changes and camshaft lobe failures.

Action Items	Person responsible	Completion Date

Follow-up Notes/Updates	Initials	Date Added

Attendees	Organization	Contact Information