

ASTM Sequence IVB Task Force Conference Call

Thursday, April 30, 2015

11:00pm Japan time and 10:00am Eastern / 9:00am Central / 7:00am Pacific U.S. time

Written By: **William A. Buscher III**

Attendees:

- See attached attendance list:



IVB Task Force
Conference Call Atter

Action Items:

- At their next conference call, the Sequence IVB test development team will discuss what mix of engines will be utilized in the ASTM precision matrix? All new engines, as originally intended or a mix of engines that have accumulated different levels of run hours.
- Bill Buscher will add the lifter wear measurement round robin to the Sequence IVB test development update slides.

Review status of the Sequence IVB preparations for precision matrix:

- See attached presentation:



IVB Update to ASTM
Task Force 20150430

- Question was asked concerning what has been decided with regards to what engines will be used in the precision matrix.
 - Will a mix of engines that have accumulated different levels of run hours be included in the precision matrix?
 - Has the test development team received statistical input on what mix of engines to use in the precision matrix?
 - Toyota and I indicated that the current plan is to start with new engines on all matrix stands.
 - It was agreed to generate an action item for the test development team to discuss this item at their next conference call.
- Question was asked on what will be the expected life of the test engines.
 - The initial plan is to use the engine short block assembly for 12 tests and the cylinder head assembly and timing chain components for 6 tests.
- Follow-up question was asked if test hours limits should be specified for the test engines.
 - A break-in and aging schedule = 101.5 hours, not including start-up, shut-down and resume run time.
 - A full-length test schedule = 202.0 hours, not including start-up, shut-down and resume run time.
 - Based on these hours, total engine hours = 2,627.0 hours and total cylinder head hours = 1313.5 hours.

- This could be a topic to address at a later date, most likely sometime after the conclusion of the precision matrix.
- Question was asked if a lifter wear measurement round-robin has been conducted or is planned.
 - Yes, a lifter wear measurement round-robin has been planned and is about to start, using the lifter set for Lubrizol's 2nd prove-out test.
 - The round robin will include:
 - All 3 matrix labs.
 - PDI and Keyence measurements.
 - Pre-test and post-test measurements.
 - In addition, previously a round robin was conducted between SwRI and Intertek for PDI lifter wear measurements and heel-to-toe camshaft lobe wear measurements.
 - Pseudo Keyence round robins have been performed between SwRI and Intertek and between Intertek and Lubrizol on select numbers of lifters.
- There were no additional questions or concerns about the status of the Sequence IVB test development or preparations for the precision matrix.

Review of the initial drafts of the Sequence IVB test development database and the prove-out data analysis:

- See attached presentation:



Sequence IVB
Prove-out Data Analy

- There were no questions or concerns about the Sequence IVB test development database or the prove-out data analysis.

Review of the status of the Sequence IVB test procedure and engine assembly manual:

- The task force was informed that a test procedure review team has been formed under the test development team, which includes all precision matrix labs.
- The task force was informed that the following has been drafted and reviewed during multiple conference calls and that revisions are currently in process based on the review and feedback presented.
 - Engine Assembly Manual:
 - New Engine Preparation
 - Camshaft and Lifter Installation
 - Cylinder Head Replacement
 - Golden Stand Manual:
 - Illustrated Bill of Materials
 - Test Procedure:
 - Summary of Test Method
 - Break-in and Aging Procedure
 - Engine Operation Procedure
 - Pre and Post-test Measurements Procedure
 - Equipment Calibration and Maintenance
- This wasn't mentioned during the conference call, but the test procedure review team has also conducted a comparison of the IVA and IVB test procedures.

- Drafts of these Sequence IVB manuals and procedure are expected to be distributed publically sometime in May 2015.

Question and Answer session:

- Question was asked concerning what difference viscosity grades were tested throughout test development.
 - The following list of oil was provided:
 - 0W-16, 2 oils, REO3 and Tech 1.
 - 0W-20, 1 oil, SD/SE oil.
 - 5W-20, 1 oil, REO3.
 - 5W-20, 2 oils, ASTM REO 1006-2 and ASM REO 300.
- There were no additional questions from the task force members.
- Task force chair asked the task force members if there was anything missing for any of the members, in order for the members to be able to vote on the task force supporting the inclusion of the Sequence IVB in the ASTM precision matrix, pending the completion of the third matrix lab's prove-out tests.
 - No one indicated anything was missing in order to vote on this motion.

Next Conference Call:

- Thursday, May 7, 2015, at 11:00pm Japan time and 10:00am Eastern / 9:00am Central / 7:00am Pacific U.S. time.
- A motion will be presented to the task force to vote on the task force supporting the inclusion of the Sequence IVB in the ASTM precision matrix, pending the completion of the third matrix lab's prove-out tests.