

From: [Salgueiro, Bob](#)
To: ["Alessi, Michael \(michael.l.alessi@exxonmobil.com\)"; Boese, Doyle; "Mark Sutherland"; "Campbell, Bob \(Bob.Campbell@AftonChemical.com\)"; "Conti, Ricardo \(ricardo.conti@exxonmobil.com\)"; Rich Grundza; Gutzwiller, James; "Johnson, Kurt D. \[kurt.johnson@swri.org\]"; "Lanctot, Dan \(dlanctot@tei-net.com\)"; "Matasic, Jim \(james.matasic@lubrizol.com\)"; "McCord, James F. \(jmccord\) \(SwRI\)"; "Moritz, Jim \(Intertek\)"; Sean Moyer; "OMalley, Kevin Kevin \(OMalley@lubrizol.com\)"; Ritchie, Andrew; Santos, Elisa; "Secue, Nick \(Nicholas.Secue@Lubrizol.com\)"; "VanScovoc, Jonathan \(vanscj@cpchem.com\)"; "Warden, Robert W. \(robert.warden@swri.org\)"; Juan Vega Intertek \(juan.vega@intertek.com\); Booth, James E. \(James.Booth@chevron.com\); "Cooper, Mark \(MAWC\)"; Salvesen, Clifford R \(clifford.r.salvesen@exxonmobil.com\); raymond.g.burns@exxonmobil.com; "Mlochte@swri.org"; "DGrosch@tei-net.com"; "Garrett White Intertek"; Christopher.Mileti@Lubrizol.com; Kostan, Travis G. \(travis.kostan@swri.org\); "Jose.starling@swri.org"; "Abaigeal.Ritzenthaler@AftonChemical.com"; Holmes Patrick; Martinez, Jo G. \(jojm\) \(JoMartinez@chevron.com\); Joyce, Patrick; christian.porter@aftonchemical.com; MHauschild@Chevron.com; PSL Services Inc.](#)
Subject: Mack Surveillance Panel Meeting Minutes - Wednesday, January 9, 2019
Date: Wednesday, January 09, 2019 15:15:56
Attachments: [T13 Bearing Roughness Analysis.pdf](#)
[T 13 Bearing Material Changes.pdf](#)
[ltmsT8 proposed requirements 20190109.docx](#)

Everyone,

The following are the unconfirmed minutes of the Mack Surveillance Panel Meeting held on Wednesday January 9, 2019. The meeting was conducted by WebEx. Please feel free to let me know if there are any changes or revisions needed. Thank you.

Participants:

Afton – Christian Porter, Abaigeal Ritzenthaler
ExxonMobil – Shayna Butler, Cliff Salvesen
Haltermann – Prasad Tumati
Infineum – Bob Salgueiro (Secretary), Elisa Santos, Jim Gutzwiller
Intertek – Jim Moritz, Juan Vega
Lubrizol – Kevin O’Malley, Jim Matasic
Oronite – Mark Cooper (Chairman), Jo Martinez
SwRI – Bob Warden, Jim McCord
TEI – Derek Grosch
TMC – Sean Moyer
Volvo – Patrick Holmes

Mack Surveillance Panel Meeting

The Mack Surveillance Panel meeting was called to order at 1:00 PM Eastern, by Mark Cooper, Chairman of the Mack Surveillance Panel.

The agenda topics are listed below, with discussions and actions following.

Agenda Topics in Bold Below, with discussion notes following

• **Volvo T-13 Bearings and Liners**

- Background: The Bearing supplier has changed. 200 sets of Volvo T-13 Connecting Rod Bearings were sent to TEI and ~150 sets were found to have imperfections. Some had a rough fine sand paper like finish on the running face and others had coating that appeared thinner on the running face than others. Images of the imperfections and an analysis by Volvo on the

bearings were provided to the Surveillance Panel and are attached to these meeting minutes for reference. Volvo's analysis showed the protrusions that cause the roughness are below the 2 µm thick tin-flash, and appear to have been caused during the nickel plating process. Examples of the bearings with imperfections were also provided to some labs and input was that neither imperfection would affect the test.

- The Surveillance Panel faced a few challenges: 1) Were the surface imperfections and issue and 2) was the lower Pb content of the bearings an issue? Do we make bearings a non-specified part? Or how do we approve them?
- Volvo is moving away from using Pb in their bearings.
 - T-13 was originally planned to replace the T-12, but we were unable to develop significant measurable wear. Does the Pb contribute to the severity of the T-13?
 - SwRI shared analysis of the Connecting Rod bearings. Latest MAHLE (2019) bearings have 0% content of Pb in them. Last year had about 22% Pb in them. Aftermarket bearings available today do still have Pb in them but their ability to reliably supply was unknown. It was also unclear if the Pb content change was of significance to the T-13.
 - T-13 LTMS Pb shows significant drop off in Pb starting in early 2016 down to single digits.
 - Pb in the Main bearings dropped from 30% down to 4% and was never communicated to the Surveillance Panel.
 - Further Discussion was around effect of Pb on the test. T-13 references have not appeared to not show any drifting over time. There was a comment that it's possible reference oils are not always representative of candidate oil performance.
 - Pb bearing change may ultimately preclude ever being able to use the T-13 to replace the T-12.
- **Volvo will check on the status of the replacement 200 sets of bearing kits (this is about equal to 33 T-13 tests).**
- It was proposed that maybe we can proceed with reference testing on the acceptable bearings TEI has now just to check the impact of Pb free Con Rod bearings. But shortly after, we would still have to re-reference the next batch too.
- TEI reported that of the 200 bearings about 130 had the surface roughness issue. But 50 of the sets were "perfect" 20 either had deep scratches or deep nicks, but would not be acceptable for a test engine. Some had thinner top coating than others, an image was attached comparing the two bearings.
- Feedback has been provided to the supplier about the protrusions in the Ni layer of the bearings, but no response has been received yet. These protrusions could be source points for delamination potentially. The protrusions are only about 20 µm. The worry is if the Sn layer starts to wear, the Ni protrusions could become exposed, potentially accelerating wear.
- Could the surface roughness be indicative of other defects with the bearings, the Surveillance Panel needs MAHLE's input.
- Decision by Surveillance Panel was to **wait for feedback from MAHLE on the bearings to make sure there's no risk of damaging the engine by running these bearings with surface roughness. Patrick will follow up with MAHLE and advise on how soon they can respond to the SP.**
- T-13 Batch A Federal Mogul Liner inventory is very low. TEI has Batch B from MAHLE ~1200 pieces. TEI checked 20 liners and all passed visual inspection. GHG14 liners did already have a small honing change which was just rolled out. **Volvo to check if there was any design**

changes to the liner with the change in supplier. Volvo will check with supplier to understand if there was a manufacturing process change. TEI want to know if to keep some of the Batch A liners or just use them all. It was recommended to TEI to keep at least 1 liner for future analysis if needed. TEI won't sent out anything until the Surveillance Panel advises what to send out.

- **T-13 Humidity Control Calculation - Facilitator related edits to the information letter**
 - Most comments from facilitator was mostly on standardization of some wording and they were reviewed with the Surveillance Panel. Recommended, was the use of Humidity Ratio instead of Moisture Content and a few other editorial changes. There was no objection by members of the Surveillance Panel to proceed with the proposed editorial changes. Dew Point will also continue to be recorded.
- **Mack T-8 LTMS Revisions –** Put together by Kevin O'Malley in 2018
 - The revised LTMS by Kevin O'Malley for the Mack T-8 was distributed Surveillance Panel members for review. The paragraph A. Reference Oil and Parameters, needs to be updated and can be copied from the current LTMS document. LTMS would be switched to a stand based system. There was a lengthy discussion around if you have a stand that is out for a long time does it get treated as a new stand. The Surveillance Panel decided to remove "not" from: Stand for which a lapse in calibration is not greater than two years, as was part of using the reduced K values. The revisions will be sent out to the Surveillance Panel for review and are attached.
- **Other Business**
 - Prasad Tumati of Haltermann introduced himself as their liaison. Haltermann is interested in understanding what tests are needed for qualifying their fuel for the Volvo & Mack Tests. The Surveillance Panel needs to determine how to establish equivalency and get back to Haltermann.
- **Next Meeting**
 - To be scheduled once Volvo hears back from MAHLE.

The Mack Surveillance Panel adjourned at 2:50 PM Eastern.

Respectfully submitted,

Bob Salgueiro

Mack Surveillance Panel Secretary



Please consider the environment before printing this e-mail.

This note and any attachments may contain Infineum confidential or proprietary information. If you are an unintended recipient: (i) place no reliance on the information contained herein; (ii) do not disclose, distribute, or duplicate any information from this note; and (iii) please contact the sender.

--

This message was scanned by ESVA and is believed to be clean.

[Click here to report this message as spam.](#)