

# MACK-Volvo Surveillance Panel Meeting Notes

## 08/28/2023 @ 2:00 PM EST

### Attendees

SwRI: Isaac Leer, Robert Warden, Travis Kostan, Jose Starling  
Oronite: David Lee, Josephine Martinez  
Afton: Amanda Stone, Alex Ebner, Bob Campbell  
Infineum: David Brass (Chairman), Elisa Santos, Todd Dvorak, Jacob Goodale  
Intertek: Garrett White (Secretary), Khaled Elnagi, Andrew Smith  
Lubrizol: Austin Brininger  
CP Chem:  
Haltermann:  
Exxon Mobil: Steve Jetter  
TMC: Sean Moyer  
TEI: Derek Grosch  
Ford:  
Volvo:

### Agenda

1. Volvo T-13 Reference Oil Suggestions
2. Mack T-12 Coordinated Reference Test Status
3. Stats Analysis for the Volvo T-13 Reference Oil 823-1
4. All Other Business

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### *Action Items and Key Points*

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- Data from T-13 tests performed on proposed new reference oils was presented. 2, anonymous suppliers were noted. Questions from this panel meeting will be brought forward in the next NCDT meeting by David Brass.
- Data from the T-12 coordinated references on hardware combination WYZQFEYYB was reviewed. Cylinder liner wear and top ring weight loss were within historical range across all 3 participating labs. One lab reported oil consumption and delta lead results far below historical range. Statisticians group was asked to review this data and provide any recommendations before the next meeting.
- Motion carried to adopt 109.3 as the new IRPH target and maintain the same current standard deviation as reference oil 823 which is 11.1 in the Volvo T-13. Previous references completed on

823-1 will be updated with the new target results. SA's are to be updated to reflect the change. Candidate tests will receive the new SA's upon the effective date of 8/28/2023.

- Motion carried to introduce a mean of 8.139, standard deviation of 0.929 and ICF of 0.857 for square root %KV40 in the Volvo T-13. This change would apply to reference oil 823-1 target and standard deviation and would apply to tests that ran with batch B liners and going forward. The effective date of this change is 8/28/2023.

## Summary of Discussion

### Volvo T-13 Reference Oil Suggestions

- In the last panel meeting, members recommended a new T-13 reference oil for PC-12 due to a change in the limits for the T-13.
- These limit changes include changing IRPH from 125 to 80 abs/cm and %KV40 from 75 to 50%.
- NCDT has agreed to fund an 8-test matrix for the new oil.
- T-13 test results from 2 different suppliers, with 3 different technologies was reviewed.
- Supplier A provided data from 5 oils.
  - Oils 1A and 1B are slight modifications of one another and both are 5W-30 with HTHS within the FA-4 requirements.
  - Oils 1A and 1B produced FTIR results of 80 and 96.4 while KV40 results were 22.8 and 39.8, respectively.
  - 2A, 2B and 2C are also from supplier A, all three are 10W-30 and are above the HTHS max limit for FA-4.
  - The results for 2A, 2B and 2C ranged as follows: FTIR 77.2-87.6, %KV40 24.2-32.2
- Supplier B provided test results from two oils, oil A and oil C.
  - Oil A was a 5W-30 however it did not meet the HTHS requirements for FA-4 and oil B was a 10W-40.
  - The results of oil A were FTIR = 81.0 and %KV40 = 24.6.
  - The results of oil B were FTIR = 79.5 and %KV40 = 26.9.
- David – FTIR tends to lead ahead of the %KV40 increase and shows it in these oils.
- Robert – Staying away from the blended base stock may be good to reduce variability.
- Bob C – What is the long-term outlook of the chemistry and base stocks going forward for these oils? We don't want to pick a base oil or oil with a component that suppliers may not have a few years down the road.
- Elisa – Who chooses the base stock?
- David – The ones listed here are chosen by the supplier, but the final base stocks come through from BOI/VGRA testing.
- David – I will bring forward these questions to our next NCDT meeting for feedback.
- No comments against or for any oil were noted.

### MACK T-12 Coordinated Reference Status

- Elisa Santos presented data from labs A, D and G on the new hardware combination WYZQFEYYB.

- Cylinder liner wear and top ring weight loss across all 3 labs appear to be inline with historical performance. ICF's being used for the current hardware combination appear to be bringing results back to targets.
- 1 lab reported stage 2 average oil consumption far below historical range which also impacted the reported delta lead and delta lead 2 results.
- Bob C – A 48.5 g/hr stage 2 oil consumption hasn't been seen in quite some time.
- David – I know there is no recommendation today for T-12. I would like to ask the statisticians group to review and finalize their recommendations in time for our next meeting.
- Garrett W – Is there any benefit in waiting for the statisticians to review? Everything is well on target and ICF's are taking care of things according to these plots except for the one lab with the low reported oil consumption.
- Bob C – There's still some things we are trying to understand with the low stage 2 OC and lead that we need to review before proceeding.

### **T-13 823-1 Reference Oil Target Discussion**

- Josephine Martinez presented a summary of 823 and 823-1 reference oil results analysis.
- The purpose of this analysis was to determine if the mean performance of 823-1 has changed and is different from 823, including any covariates such as hardware that could have influenced testing.
- Data sets analyzed included all testing from the establishment of current target values in 2015 to present (n=82), tests on 823 only starting from target establishment in 2015 (n=67) and tests on 823 only starting after humidity control introduction, exclusion of lab F and inclusion high data point from lab B. Additional method of analysis included 823-1 results only.
- IRPH severity difference between oil blends 823 and 823-1 is statistically significant when evaluated both with and without consideration of liner batch.
- Recommendation from the statistician's group is to change the IRPH target to 109.3 with the same standard deviation as the current reference oil, 823, which is 11.1, no ICF recommended. Suggest targets and ICF be reviewed after 10 tests are completed.

**Garrett White motions to adopt 109.3 as the new IRPH target and maintain the same current standard deviation as reference oil 823 which is 11.1. Previous references completed on 823-1 will be updated with the new target results. SA's are to be updated to reflect the change. Candidate tests will receive the new SA's upon the effective date which is today (8/28/2023).**

*Austin Brininger - Seconded motion*

Infineum - Yes

Intertek - Yes

SwRI - Yes

Lubrizol - Yes

Oronite - Yes

Afton - Yes

TEI - Yes

TMC - Yes

Exxon – Yes

CP Chem – No answer

Haltermann – No answer

Ford – No answer

Volvo – No answer

Vote count: Yes (9), No (0), Abstain (0), No Answer (4)

***Motion carried***

- Analysis shows evidence that 823 and 823-1 are both off from the mean for %KV40.
- Difference in %KV40 severity between 823-1 reference tests with batch C or D liners when compared to 823 reference tests with batch A liners is statistically significant.
- Statisticians group is recommending two options for %KV40:
  - Option 1: Mean = 7.357, Standard deviation = 0.929 (current) and ICF = 0.347 (additive)
  - Option 2: Mean = 8.139, Standard deviation = 0.929 (current) and ICF = 0.857 (additive)
- Option 1 assumes the new baseline of severity is on all runs on liner batch A. The ICF would apply to liner batches C and D.
- Option 2 adjusts the test for past severity over several changes. The ICF would be applied to reference tests performed on liner batch B and forward.
- Travis – The difference between the 2 options is that there is more of a bias due to the parts. There are more things over the lifetime of the test that have influenced it.
- David Brass – Since the original targets were implemented, we have had roughly 4 data points above the target and the remainder are below.
- Travis – I don't think grouping liner A runs together is suitable. Amid the liner batch A runs the target was suitable before the introduction of humidity control. Once humidity was introduced it shifted results mild.
- Bob C – I agree you can't look at the reference tests on liner batch A as one group.
- David – The SA has been capturing this mild shift, why would we not capture it in the SA going forward?
- Travis – We are capturing the shift with the SA right now. The issue is SAs will work until labs can't calibrate anymore.

**Bob Campbell motions to accept option 2 which is to introduce a mean of 8.139, standard deviation of 0.929 and ICF of 0.857 for square root %KV40. This change would apply to reference oil 823-1 target and standard deviation and would apply to tests that ran with batch B liners and going forward. The effective date of this change would be today (8/28/2023).**

*Robert Warden - Seconded motion*

Exxon - No answer

Afton - Yes

TMC - Yes

Oronite - Yes

TEI - Yes

Lubrizol - Yes

SwRI - Yes

Intertek - Yes

Infineum - Abstain

CP Chem – No answer

Haltermann – No answer

Ford – No answer

Volvo – No answer

Vote count: Yes (7), No (0), Abstain (1) No answer (5)

***Motion carried***

**AOB**

None

**Next Meeting Date/Time**

Next meeting date: Friday, September 8<sup>th</sup> 10:30 AM EST

Meeting adjourned at 4:07 PM EST.