

Daimler Surveillance Panel Meeting Minutes

October 24, 2019

1:00 PM – 3:00 PM CST

Call Participants:

Lubrizol - Patrick Joyce (Chairman), Cory Brier
Southwest Research Institute – Jose Starling (Secretary), Travis Kostan, Robert Warden
Intertek – Josh Ward
Daimler - Suzanne Neal
Afton – Bob Campbell
Infineum - David Brass, Elisa Santos, Jun Cui
Chevron Oronite – Mark Cooper
TEI – Derek Grosch
TMC – Sean Moyer
Haltermann Solutions – Prasad Tumati

Agenda Items

Review DD13 Scuffing Test New Hardware Reference Results (Batch D Liners, B 2nd Rings)

A summary presentation of the coordinated reference results conducted to bring the new Batch D liners and Batch B second rings was presented (see attached). There was a total of five tests conducted on the new hardware and all were operationally valid. The first two tests conducted on the new batch hardware by Intertek resulted in an hours to scuff of 200 and 146 (conducted on “stand 2”). Intertek conducted another test on the new hardware in a different stand and final results came in at 30 hours to scuff. Intertek mentioned that historically stand 2 for them has been mild and thus prompted the re-run of the hardware on their matrix stand. Intertek mentioned that as of now their stand 2 would not calibrate and that they would pursue further investigation internally to see why that stand has been mild. Lubrizol also conducted two tests on the new batch hardware. The first test was operationally valid and resulted in 31 hours to scuff, however it had a deviation during a portion of the test which may be questionable for this exercise. Lubrizol stated that there was a load cell issue on dyno so torque drifted around during stage one. They conducted a second test without any noted issues and this test also resulted in a final value of 31 hours to scuff.

Determine suitability of new DD13 Scuffing Test Hardware

Discussion took place that the test results on this sequence of references do not look much different than some of the previous reference tests. Bob (Afton) stated that looking at the data 60% of it looked good and 40% of it doesn't and it is difficult to interpret what is going on with the test. In general there was concern about how “digital” the test seemed to be and concern with the various 100 plus hour results that there has been. David Brass asked if reviewing the operational data as was done for previous tests when introducing new hardware could also be conducted on these tests. Patrick mentioned that while we have done that in the past it's not something that is required and hasn't provided much useful information. TMC mentioned that while the operational data has been reviewed in the past it is not deemed necessary for approval of the hardware.

Sean (TMC) mentioned that just looking at the results it seems that the tests either scuff early or runs well past the 100 hour mark. Robert (SwRI) mentioned that perhaps the panel should consider how comfortable they are with 1 in 4 or 1 in 5 tests going long. Based on the LTMS data for reference testing it looks like about 33% of the tests run past the 100 hour mark. Bob (Afton) stated that if the goal is to keep fluids out of the market that have a tendency to scuff, these results may indicate that perhaps 40% of the oils that are supposed to scuff may get to market. Bob also added that the panel should consider insuring the test still discriminates by perhaps the addition of a second reference oil to verify that in fact the test is working as it should. It was discussed that this could potentially be discussed ahead of time for the next set of coordinated references which are expected about a year from now.

Discussion took place on if there was any Oil C remaining and it was stated that there was only a small batch produced and none of it remaining. Sean updated that there is about 250 gallons of Oil C remaining in their inventory. It was mentioned that Oil D was actually preferred to insure the test still discriminates and doesn't scuff. It was added that the group should consider including an oil in future references where the test is able to reach 200 hours without scuffing for test condition verification. It was agreed that it would be ideal to have two reference oils for the test, but practically that may not be possible. It was brought up that perhaps the middle ground would be to have at least one lab test an expected no scuff oil during a coordinated reference event such as when approving new hardware. This would at least provide some indication that the test is still discriminating as it should without needed to have each lab conduct a reference test on each oil.

It was asked how large the batch of rings and liners for this new hardware was. Derek (TEI) stated it was 4,000 liners with about a 30% rejection rate which would leave a little under 3,000 liners for test use. TEI also stated that current batch pistons were a little under a year out from being depleted. About 600 pistons and oil rings remain and about 900 top rings remaining. The new batch hardware for these should ideally be batched together for coordinated references in about a year.

At this point it was asked if anything further was needed to decide whether the new batch hardware should be approved or not and if the data shown today is enough to proceed with a panel decision. Discussion regarding the gap or variation that exists between reference tests continued but concluded that the new hardware is not showing results that are significantly different from the previous hardware. At this point it was agreed that incorporating a second reference oil would be useful but likely not something that will be addressed during this meeting. It was asked if there was any of the Old Batch C hardware remaining. Derek mentioned that they had perhaps 10 to 12 kits with minor hone issues that could possibly be used for testing if needed. Suzanne (Daimler) added that the new batch of liners is from the same manufacturer and made in the same process.

Jose (SwRI) asked if the surface roughness measurements TEI has collected on the new batch liners could be shared with the panel just for comparison purposes with Batch C liners. TEI mentioned that they do not have that data compiled but that they can put it together and share

it. TEI mentioned that overall the surface roughness data from these liners seems to be in a tighter range than previous batch.

Patrick (Lubrizol) stated that these parts do not look much different than the previous hardware based on the presented data set. It was asked again if there is anything else that is needed or that the panel members require to see before deciding on the hardware or if the data was sufficient. **Josh Ward made the motion to approve Batch D liners and batch B second rings for candidate use. Suzanne Neal seconded the motion.** No further discussion on the motion took place and the motion was placed for vote among the panel members on the call. The vote was as follows and **the motion carried.**

*Daimler Approved,
Infineum Approved
Afton Waived
Oronite Waived
SwRI Approved
Intertek Approved
TEI Approved
TMC Waived
Lubrizol Approved
ExxonMobil Abstained.*

Furthering discussion it was discussed that since it appears that there may be a stand based influence that the panel should consider insuring that before any stand can run on the new hardware (Batch D liners) that they should first receive a passing reference test result on the new hardware. This would avoid having stands out there reference on Batch C liners and then just be able to utilize the new Batch D liners without data produced from that particular stand. Essentially this would force the labs to prove that a particular stand can calibrate on the new liners before running candidate tests on them.

After discussion in the panel **Bob Campbell made the motion that an acceptable reference result on Batch D liners needs to be conducted prior to being able to proceed with Batch D liners for candidate test use and that the surveillance panel directs the TMC to adjust the calibration period to yield a no net gain or loss. The no net gain or loss statement does not apply to stands that have gone out on time or runs for their calibration period. Mark Cooper Seconded the motion.** The motioned was opened up for discussion. It was clarified that the intent of the motion is to insure that a stand cannot conduct candidate testing on the new hardware without first providing a passing reference test results on the new hardware. It was also clarified that a donated hardware run would also satisfy the requirement of the motion as long as a passing result on the new hardware was achieved, however a donated run would not acquire an adjustment of the calibration period. No further discussion on the motion took place and the motion was placed for vote among the panel members on the call. The vote was as follows and **the motion carried.**

Daimler: Approved
Infineum: Waives
Afton: Approved
Oronite: Approved
Intertek: Approved
SwRI: Approved
TMC: Approved
TEI: Waives
ExxonMobil: Approved
Lubrizol: Approved

Travis (SwRI) mentioned that it seems from the data in the LTMS that when the top rings went from Batch A to Batch B is when an increase in test variability was observed. Travis brought up the LTMS file and showed that there was a significant difference in results after Batch B top rings were introduced and the test has not been consistent since then. Bob mentioned that we should try to do a data comparison of all batch A rings and B rings run to see if there is a substantial difference in the data. If there is a difference in the measured data then when the new Batch of top rings is ordered we know what to ask for. Travis will be looking at the data and providing a statistical comparison of the data from the top rings in an upcoming meeting.

Next meeting topics will be statistical comparison of batch A and B top rings, the possibility of including a second reference oil and in addition will also discuss alternative fuel supplier inquiry. Josh to schedule a meeting for the smaller DD13 Fuel group to at least get the discussion going prior to the next meeting.

It was asked if we could get a room at ASTM D02 meeting in December and meet face to face. It was mentioned that a room was already booked for this group at ASTM but was only for half an hour on Monday December 9th from 3:30 to 4:00 pm. Patrick will get with the ASTM coordinator and see if they can get additional room/time for this. Suzanne will not be attending ASTM this year.

Next Meeting:

Next meeting tentatively be set for Monday December 9th at ASTM, however Patrick to verify if we can get additional meeting time in the room. Otherwise, a conference call may be set up to meet on a different date. Patrick to follow up with the group.



D8074 New Hardware Reference Test Results

Patrick Joyce

24 October 2019

Results Overview

- Reference test results to-date on new batch hardware:
 - Liners: Batch “D”
 - Second Rings: Batch “B”

LTMSDATE	20190820	TBD	20190908	20190915	TBD
LTMSLAB	G	G	B	G	B
LTMSAPP	2	2	1	1	1
IND	864-1	864-1	864-1	864-1	864-1
HRS2	200	146	31	30	31
LTMS Reported	Yes	No	Yes	Yes	No

Reference Oil	Mean	Standard Deviation
864 (OIL X)	48	26
864-1	48	26

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