

**Sequence VH Surveillance Panel Call
September 5, 2024, Webex**

Roll Call:

Afton: B. Maddock, B. Campbell, A. Stone
Ford: M. Deegan
GM T. Cushing, B. Cosgrove
Haltermann: W. Hairston, E. Hennessy, I. Mathur
IMTS: S. Clarke
Infineum: J. Anthony, T. Dvorak, A. Ritchie (Chair)
Intertek: A. Lopez
Lubrizol: T. Catanese
Oronite: R. Affinito, J. Martinez
Shell: J. Hsu, S. Demel
SwRI: D. Engstrom, T. Kostan, P. Lang
TMC: R. Grundza
TEI: D. Lanctot

Chair's Comments

- Meeting minutes from 8/22 are posted.
- Chair Ritchie started the meeting and outlined the agenda items:
 - 1) Fuel Inventory & New Batch Status
 - 2) O&H Update
 - 3) Old Business
 - 4) New Business

Fuel Inventory & New Batch Status

- Fuel batch N-000010 has -XX appended to track RVP adjustments.
 - The nomenclature changed when the fuel was moved from the original tank to the 4 rail cars.
 - -16 to -19 are rail cars after the last tank RVP adjustment, -15.
 - Future rail car RVP adjustments nomenclature has not been decided.
- Rail cars batches are going to have to be combined in the deliveries.
- IAR tanks go down to about 10% before filling and try to keep deliveries separate.
- There are 82,500 gallons of fuel remaining in rail cars.
- The contract and proposed fuel readiness timeline will be distributed to the SP before the next meeting.
- The next fuel batch will be available 30-45 days after signing the contract.
- Chair requested a presentation from Haltermann describing Fuel Batch N's CofA's, RVP history, and the current status.
- AO discussion about whether AO is being consumed early and if more or less should be added to the fuel.
 - Is AO being consumed in a vented trailer during delivery?
 - Haltermann proposes studying AO consumption because they haven't seen the consumption in the storage tanks.

- Can 10 ppm of AO components be dependably measured?
 - The GC used for AO measurement detection limit is near 100 ppm, making it hard to reliably measure AO concentration.
- Should the AO be added at a higher level to preserve the fuel?
- Would another 10 ppm of AO make the test mild?
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- Lochte is trying to form a technical fuel task force made up of fuel additive experts.
 - The committee has not yet formed.
 - This is intended to be a technical group separate from the contract committee.

O&H Update

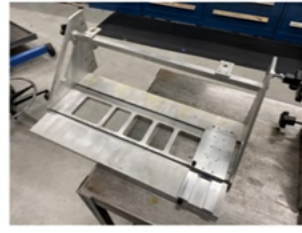
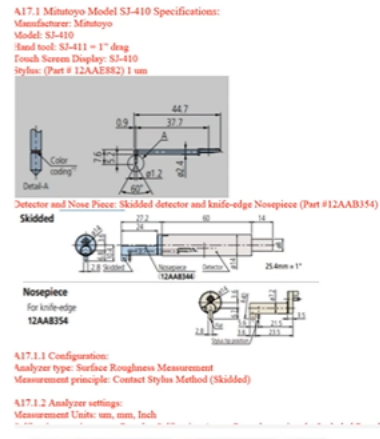
Engine Build Update

- Finalizing method to ensure the cylinder bore surface finish is measured identically.
- The IIIH and GMOD use different a stylus to measure hone finish, but this stylus is more appropriate for the VH.
- Infineum asked if the surface finish should be included in LTMS data.
- IAR just started storing RA surface finish now that it is using the same equipment and O&H will collect and review the data starting with next fuel batch so as not to confound the results.

Motion to standardize surface finish stylus, Mitutoyo SJ-410, shown below.

VH Build Workshop

- **Motion (Maddock / Grundza):** Labs have agreed to standardize on a Surface finish analyzer as well as stylus and mounting bracket to facilitate measurement. Details are as follows:
- (6) Perform surface finish measurements using a Mitutoyo SJ-410 Surface Analyzer with 1 μm stylus . Use a modified GMOD mounting bracket to properly align the measuring device. Take surface measurements approximately 30mm from the top of the cylinder wall (headgasket mating surface). Details for analyzer set up and mounting are shown in Appendix A17.



- The motion was passed last week with unanimous consent.
- No objections.
- The motion passed.

VH Build Workshop

- **Motion:** Labs have agreed to standardize on fuel rail temperature measurement and begin reporting non-controlled values on Form 6.

- Add to Section 9: *Fuel Rail temperature* —Insert the thermocouple into the center of a tee or cross fitting and locate it within 600 mm from the OEM fuel rail connection.

- This motion is effective 10/31/2024 to allow labs time to comply and report packages to be updated.

Sequence VII
Form 6
Operational Summary

Laboratory:	Stand:	Stand Runs:	Total Runs on Stand:
Oidcode:			
Formulation Stand Code:			

Parameter	Units	QI Threshold	EOT QI	Target			Average			Samples	BOD	Over/Under Range
				Stage 1	Stage 2	Stage 3	Stage 1	Stage 2	Stage 3			
Speed	r/min	0.000		1200	2900	700						
Manifold Abs Press	kPa	0.000		69	66	Record						
Engine Oil, In	°C	0.000		68	100	45						
Engine Coolant, Out	°C	0.000		57	85	45						
Engine Coolant Flow	L/min	0.000		48	Record	Record						
Engine Coolant Pressure	kPa	0.000		70	70	70						
RAC Coolant, In	°C	0.000		29	85	29						
RAC Flow	L/min	0.000		15	15	15						
Intake Air	°C	0.000		30	30	30						
Intake Air Pressure	kPa	0.000		0.05	0.05	0.05						
Intake Air Humidity	g/kg	0.000		11.4	11.4	11.4						
Exhaust Backpressure	kPa	0.000		104	107	Record						
Parameter	Units	Specifications										
Fuel Flow	kg/h			Record	Record	Record						
Flowby	L/min			Record	60-70							
Power	kW			Record	Record	1.3 ± 0.2						
Fuel Rail	°C			Record	Record	Record						
Exhaust Gas												
Lambda, Left Bank	AFR			1.0	1.0	0.75						
Lambda, Right Bank	AFR			1.0	1.0	0.75						

Fuel Rail Temperature Measurement

- Standardizing the fuel rail temperature measurement location and instrumentation has been agreed upon by the labs.
 - Afton was the only lab not measuring the same as other labs and will comply by November 1, 2024.
- **Motion by Afton:**
 - Recording Stage 1 & 2 as a non-controlled parameter.
 - The thermocouple used for fuel temperature shall be placed within 600 mm of the OEM fuel rail connection.
 - Motion seconded by Grundza.
 - No objections.
 - No waives.
 - Hearing nothing, it is deemed unanimous consent and will be included in a letter and will be distributed September 2024 and will be effective November 1st.

Hardware

- Ford Component Sales (FCS) Order

- TEI awaiting feedback from Ford to complete purchase of overstock pistons
- Once overstock are purchased and distributed, additional FCS order will be placed for the remaining quantity of pistons required by the labs

Size	Quantity
0.125	272
0.250	272
0.375	272
0.500	400

- Camshafts

- Ford submitted RFQ to OHT & IMTS

Pistons

- TEI has ordered pistons from Ford and pistons will be shipped the week of September 9, 2024.
- O&H will discuss ring suppliers for the new pistons.

Camshaft Order Status

- Ford Romeo camshaft forgings are depleted.
- Ford submitted an RFQ for camshafts to OHT & IMTS.
- IMTS will submit 2 sets of camshafts for testing & approval.

Discussion of Using Camshafts More than 4 Tests

- IAR is running low on camshafts and proposes re-using the camshafts more than 4 times as long as the surface measurements meet specs.
 - IAR changes the chain sprockets for each test due to visible wear.
- IAR thinks we should wait until we get new fuel before changing the language to use camshafts more than 4 times.
 - The procedure in 7.3 says a camshaft may be used up to four times as long as camshaft is within spec.
 - Afton proposes as changing the procedure from “up to 4” to “at lab’s discretion” and the lab will accept the risk of a failed test due to camshaft failure.
 - Ford agrees with using the camshafts for more than 4 tests if they are serviceable.
 - Ford believes the test report should include a note if the camshafts have been used more than 4 times.
 - IAR I noted that a lab is using the camshafts 5 tests.
 - IAR has been throwing camshafts away after 4 tests.
 - Afton has found that camshafts after 4 tests some camshafts are still within spec.
 - IAR has found that the bearing journals sometimes wear depending on the oil, but the lobes typically do not have visible wear.
 - IAR has enough camshafts to make it to the end of the year.
 - Afton has been sharing camshafts and Lubrizol is willing share camshafts with IAR until a new camshaft shipment arrives.

- Afton motions to change the procedure from “camshafts may be used for up to 4 tests” to “the number of tests camshafts may be used is left to the lab’s discretion.”
 - IAR seconds the motion.
 - Objection to allow the SP members to consider it and allow Ford to participate.

Operational Data Analysis

- Op Data Analysis – N-000010-1 Fuel Approval vs Precision Matrix

- Data was submitted on-time
- [astmtmc.org/ftp/refdata/gas/VH/data/Precision matrix op data/VH Operational Data review of Fuel matrix Data.pdf](http://astmtmc.org/ftp/refdata/gas/VH/data/Precision%20matrix%20op%20data/VH%20Operational%20Data%20review%20of%20Fuel%20matrix%20Data.pdf)
- Analysis requires some fine tuning, TMC to coordinate with stats
 - Identify any differences in ramp strategy within a lab from PM to N-10-1 matrix
 - Analyze fuel rail temperature and identify if there’s correlation to test severity
 - If so, what temperature could be suggested as a controlled setpoint?
 - Evaluate 1009 op data against 931. While not identical oils, they’re close enough for this analysis
 - Do any of the unreported values correlate to severity?

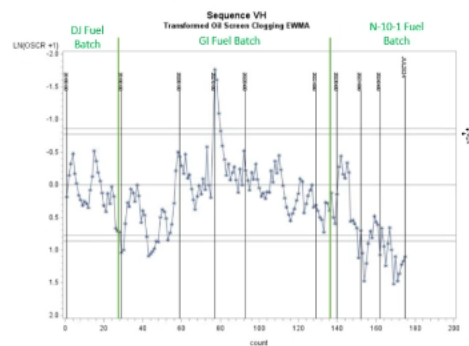
TESTKEY	LTMSLAB	IND
166515-VH	A	931
169622-VH	G	1011-1
172588-VH	G	931
172259-VH	D	1011-1
172583-VH	A	1011-1
172589-VH	G	931
172587-VH	G	940
172582-VH	A	940
172584-VH	A	1011-1
166686-VH	D	931
171799-VH	D	931
172585-VH	A	1011-1
175648-VH	A	931
175637-VH	G	1011-1
175640-VH	G	931
169623-VH	G	1011-1
175643-VH	G	940

- O&H met to review the statistical analysis and agreed that more work needs to be done to get meaningful information before making recommendations.
- TMC proposes meeting with Todd Dvorak in the next meeting to discuss what they would like to get out of the data.

Oil Screen Clogging

- Oil Screen Clogging (OSCR)

- Rating group met virtually on 8/13
 - All raters define clogging and debris identically
 - All raters use the same methodology to evaluate percent clogging
 - Takeaway: Raters believe they’re rating precisely but rater workshop tells a different story
- Rating group to conduct OSCR Round Robin (n=20)



- Bob Campbell to conduct a round robin by sending out 20 oil screens.
 - Bob Campbell left the meeting before this was discussed.
- Seth Demel proposed that experienced raters vs. new raters may be rating parts differently.

Old Business: None

New Business: None

The meeting ended at 10:30 am EDT.

