

CAT Aeration Test Task Force meeting August 5, 2014

Attendees: Names Highlighted in **Yellow** attended the meeting

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Agenda:

- 1) Brief Lab Status Update:
 - a) SWRI
 - b) Intertek
 - c) Lubrizol
- 2) Review LZ & Intertek shakedown test results.
- 3) Review SWRI test#2 & #3?
- 4) Operational Parameter Discussion (Test Conditions) - follow-up?
- 5) Timeline
- 6) General Discussion

Lab Status:

1- SWRI

SWRI is currently running the repeat of HA oil at 22hrs and should finish up tomorrow. The first attempt at the HA repeat (test#3) had to be invalidated due to improper crankcase pressure control. There was a leak at fill cap. SWRI has added extra alarms to alert the operator that there is an issue with the test so the issue can be addressed.

2- Intertek

Tim has finished the micro-motion check out with the 2nd flush and he just started the LZ shake-down test. There are approximately 3hrs on the test and things are going well. The next tests should go quicker since there was a lot of setup time in the new test cell.

3 – Lubrizol

Greg Miranda was checking out the micro-motion issues before leaving on vacation. Chris Mileti is taking over while Greg is out of the office for the next two weeks.

We need to share the configuration files with each of the labs since there still appears to be some confusion about the micro-motion setup. The transmitters from the micro-motion are different? Intertek and SWRI have the same transmitter the 9739 transmitter with 9 wires. Lubrizol has the 2700 transmitter with four wires. It appears the 9739 transmitter is no longer available.

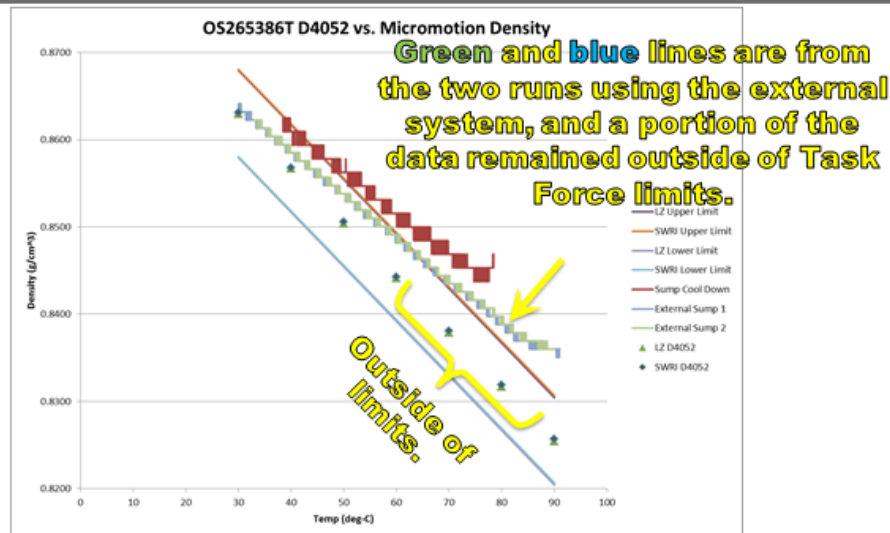
Action: The labs will share the configuration files with each other. We need to be consistent in the damping constants.

Action: over plot the D4052 data from the different labs. Martin will take on this action item.

LZ shake down testing

- LZ shared a presentation with the Task Force.
- LZ is continuing to check out the micro-motion and compare it to the D4052 curve.
- The micro-motion was pulled off and calibrated with nitrogen and water. It checked out extremely close (0.03%) to the water published values.
- The density slopes are the same between Lubrizol, Intertek & SWRI when the pump output is held constant (pressure floats higher as the oil cools).
- Unfortunately, the curve appears to be shifted up at LZ
- The micro-motion has a finer resolution with the density after the span was adjusted to read between 0 - 2 g/cc instead of 0 - 5g/cc.
- Chris is comparing the configuration files and will adjust the pressure to 150kpa.
- Task force agreed that LZ can go forward with the shakedown with the LZ test oil. LZ can adjust the damping on the fly.
- The Task Force agreed that LZ can continue on to test#1 oil after the shakedown test.

Micro Motion Density Measurement: 2nd Check (Results)

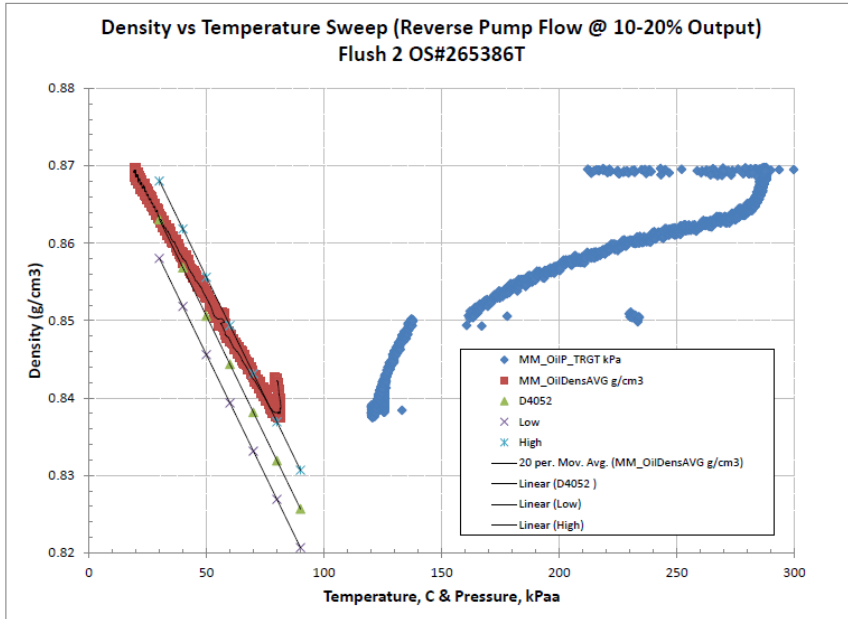


SUMMARY: The two results from the external system repeated each other perfectly and matched the slope of the initial measurement.

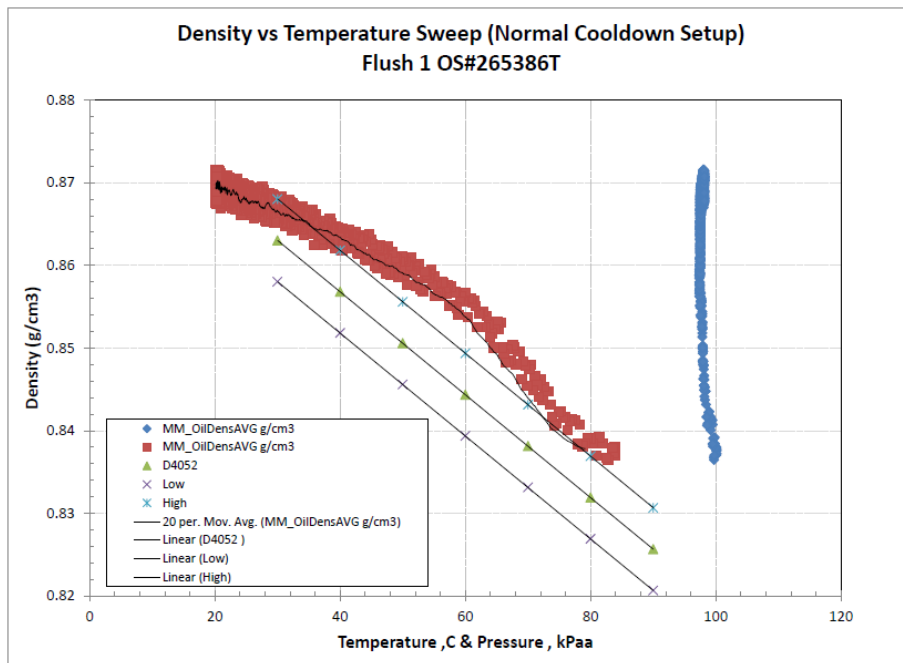
Intertek testing update

- The density slopes are the same between Lubrizol, Intertek & SWRI
- Tim has completed the check-out of the micro-motion and he has shared the following plots which compare the micro-motion to the D4052 results

Plot of density and pressure with flow through the micro-motion.

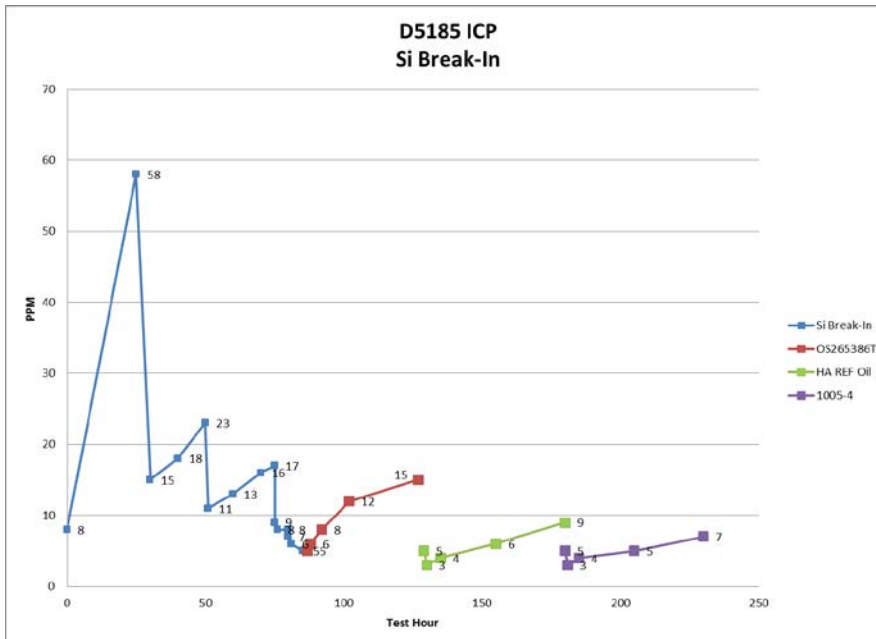
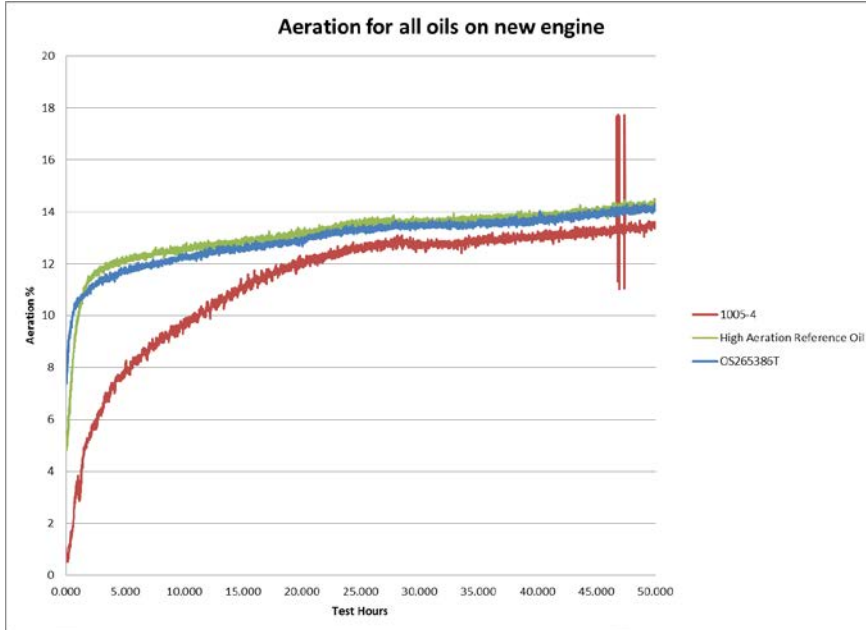


Plot with no flow through micro-motion (blue points are pressure).

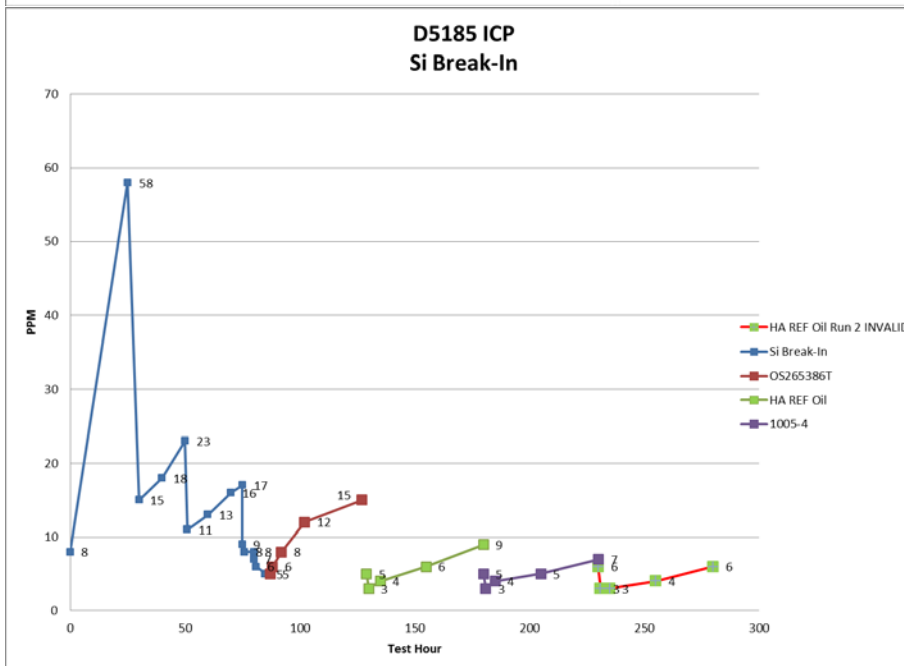
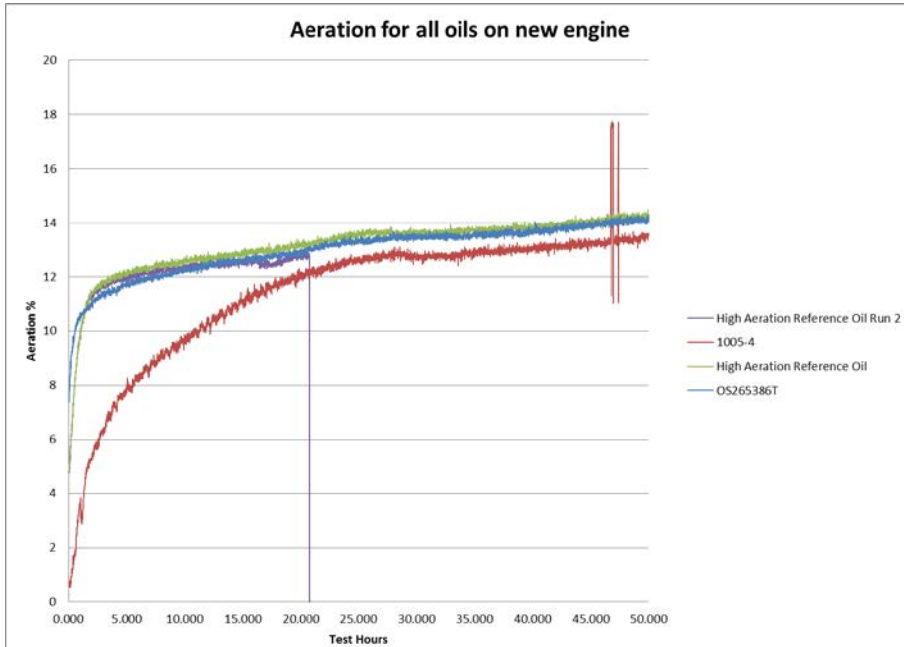


SWRI testing update

- SWRI has completed test#2 with the 1005 oil. It is running about 0.8% lower than the HA oil. There was an odd spike in the data at 46hrs. Martin investigated it and did not find any operational problems during this time. He has not seen this type of behavior before and he will keep an eye out for it in future tests.



- The HA test#3 is currently running. The first attempt had to be voided since the crankcase pressure wasn't properly controlled. The test is currently at ~20hrs.
- The Si levels on the HA run that was aborted were lower than the first HA run. This could explain the slightly lower aeration observed with the HA test#3.



Timeline:

- Intertek should complete the shakedown run by Thursday. Tim should be able to start the HA oil by Friday for the weekend. If all goes well could start the 1005 Monday with completion on Wednesday.
- We may not have all the data by the NCDT meeting next Thursday. The task force discussed proposing an NCDT conference call around the 18th of August to make the final decision on the C13 aeration test for the matrix testing? This time coincides with the ACC meeting and allows this trade group to take a decision on the approval of the test. The MOA may need some modification to accommodate the delay and PC-11 test matrix may need to be discussed for the timeline.
- Martin should be able to get two more runs in before the NCDT meeting next week.
Agreed to run 1005 next and then the LZ oil to show the effect of Si drop.
- Agreed to continue on with the prove out matrix.
 Lab#1 = SWRI
 Lab#2 = Intertek
 Lab#3 = Lubrizol

STOP: STOP:
 Review results Review results
 & decided if & decided if
 more testing more testing
 desired desired

	Test 1	Test 2	Test 3	Test 4	Test 5
Lab 1	HA	1005	HA	1005	HA
Lab 2	HA	1005	HA	1005	HA
Lab 3	1005	HA	1005	HA	1005

General Discussion:

- We are planning to meet August 12th. The meeting will need to be early in the day since many people will be traveling to Detroit. Mark will cancel the Friday the 8th meeting. Data review on the 11th for a quick review.
- The task force discussed sharing the information to be presented at the NCDT meeting prior to the meeting.