

## CAT Aeration Test Task Force meeting August 12, 2014

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

| Participant | Name  | Email  |             |
|-------------|---|--|-------------|
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| 20          | Greg Shank  | greg.shank@volvo.com   | Volvo       |

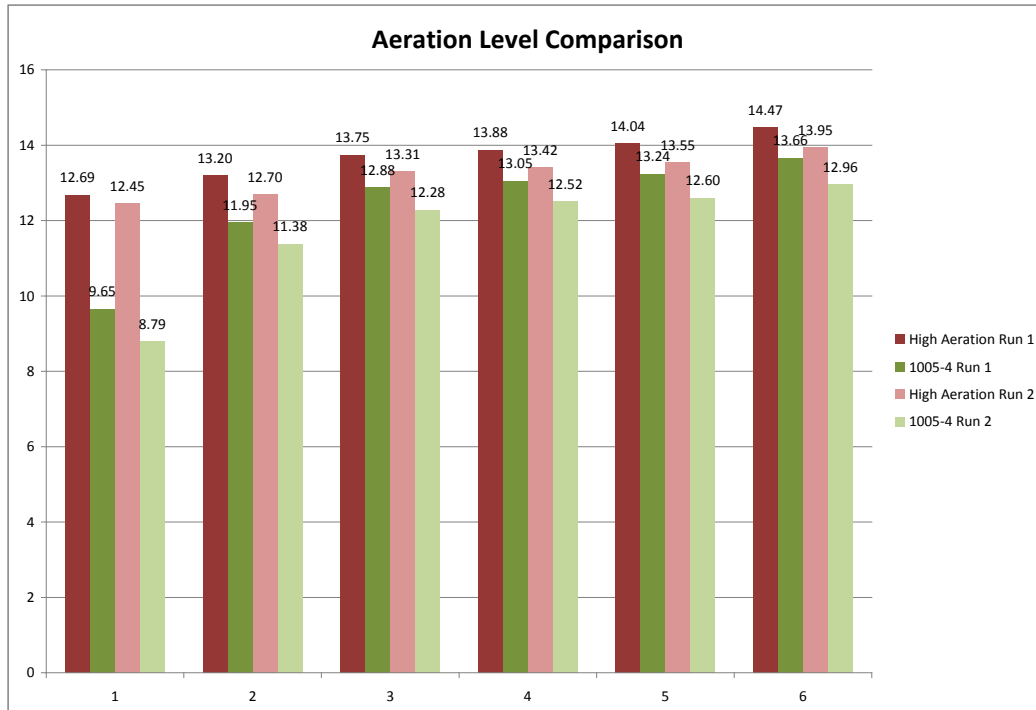
### Agenda:

- 1) Review test status:
  - a) SWRI
  - b) Intertek
  - c) Lubrizol
- 2) Review and update test plan
- 3) Discuss data to be shared at NCDT meeting
- 4) Plan of next tests

## Test Status:

### 1- SWRI

SWRI Shared the results of 4 tests run in the following sequence: HA, 1005, HA and 1005 (Results were emailed to the team.) The results show the Si impact on aeration and show that Si is still increasing although within ~2 ppms. The repeatability of each of the two oils as an average of data from 30 to 50 hours was 0.46% for the HA oil and 0.53% for the 1005 oil. SWRI will run a repeat of the 1005 oil to establish the impact of Si assuming that the level may be unchanging at this stage of the engine life.



It is not clear if the discrimination between HA and 1005 is significant. Additionally, it is not clear whether the change in discrimination is due to the new test parameters or due to the oil formulations themselves.

The discrimination was higher in the past engine procedure. The influence of the changes in the engine test procedure on discrimination is not clear yet.

New discrimination oil will be used. The new oil is a PC-11A technology, 15W-40 and is formulated to be of low aeration.

### 2- Intertek

Intertek is running the HA oil and the data will be ready tomorrow. 1005 will follow and the data will be done by Friday – after the NCDT meeting.

### 3 – Lubrizol

Lubrizol is running the 1005 oil at this time. Lubrizol is also working to resolve the density measurement issues. Suggestions to control this test parameter included P control, micromotion temperature controls, flow conditions, etc.

Refer to the data files were sent from all labs to the TF members

The matrix designed to show repeatability and reproducibility:

| Lab   | Test 0      | Test 1 | Test 2 | Test 3 | Test 4 | Test 5 |
|-------|-------------|--------|--------|--------|--------|--------|
| Lab 1 | LZ oil (OS) | HA     | 1005   | HA     | 1005   | HA     |
| Lab 2 | LZ oil (OS) | HA     | 1005   | HA     | 1005   | HA     |
| Lab 3 | LZ oil (OS) | 1005   | HA     | 1005   | HA     | 1005   |

Where Test 0 was the shakedown test; tests 1- 3 are the key preliminary tests; Tests 4 and 5 are to be conducted if needed.

**Actions:**

SWRI have conducted the four tests. The fifth test will be a repeat of 1005. The new discrimination oil will follow.

Intertek and Lubrizol will continue testing per the matrix above.

Martin will update the procedure with the new test parameters.

A presentation will be developed for the NCDT meeting with the data that is available up to noon of Thursday (day of the meeting). Hind will share the presentation with the Task Force prior to the meeting.

Repeatability: 4 tests at SWRI

Reproducibility: OS oil data (considering some differences in Si), and the three 1005 runs at three labs (1005 will end Friday at Intertek)

The Task Force recommendation will be to ask for more time to finalize the discrimination tests. MOA verbiage may need to be modified to accommodate this delay.

Due to the short duration of the test, it is still expected that the test will still be ready and tested in the Matrix per the current timeline.

Caterpillar will distribute the discrimination oil to the three labs. The oils will be sent this week.