API Lubes Group COAT Updates

DETROIT, SEPTEMBER 12, 2018

JIM MORITZ

COAT – Provisional Licensing

Test halted to improve precision: Reduce variation across labs

Improvements to test setup and density calculations implemented
Repeatability improved, but reduced discrimination resulted

- Reference oil 1, 833, high aeration: further study suggests 833 results moved closer to 832
- Reference oil 2, 832, low aeration: further study suggests 832 results have been consistent

Current activities
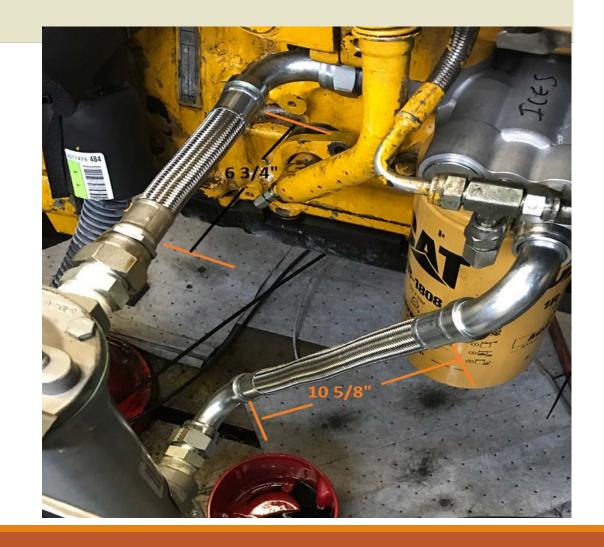
Weekly SP meetings

Scrutiny of data analysis

Deep dive into engine operational parameters

Parts swap among labs

Detailed specifications on other lab components

Detailed review of test lab operation

Improved measurement system calibration procedure

Plans

Continue SP meetings

Continue in-depth analysis of data and test parameters

Finish improved measurement system calibrations

Follow a plan devised by the working group to confirm performance after improvements

Updates will be shared with the Industry as we make progress.

Data Gathering and Timeline

Phase 1: Generate data on the final **2018 MM system/set-up/calibration/aeration calculation method** using reference oil re-blends 833-1 and 832-1 (serves as a mini discrimination, repeatability, reproducibility matrix)

- 6-9 tests and saves original blend reference oil for after confirmation of satisfaction

833 = 4 tests	832 = 5 tests		
	Lab		
Run	**A**	**B**	**G**
1	832-1	833-1	833-1
2	833-1	832-1	832-1
3	832-1	833-1	832-1

Proposed Matrices

Phase 2: Generate data on the final **2018 MM system/set-up/calibration/aeration calculation method** using original reference oils 833 and 832 (serves to tie back to limit setting)

- 9 tests and saves 1-2 tests of original blend reference oil

833 = 4 tests	832 = 5 tests		
	Lab		
Run	**A**	**B**	**G**
1	832-0	833-0	833-0
2	833-0	832-0	832-0
3	832-0	833-0	832-0

Data Gathering and Timeline

Phase 3: Labs calibration and acceptance of reference oil re-blends 833-1 and 832-1

Estimated timeline: 9 weeks to complete from today