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Committee D02 on PETROLEUM PRODUCTS AND LUBRICANTS

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Minutes of the ASTM Cummins ISM Test Development Task Force Held on February 11th, 2004 in San Antonio, Texas

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Call to order: The meeting of the ISM Test Development Task Force was called to order at 3:30 pm on February 11th at Southwest Research Institute in San Antonio, Texas. This meeting was planned in conjunction with two days of Operations and Hardware Subgroup activities intended to improve standardization of operations of the ISM test. The agenda for this meeting is shown as attachment number 1.

Review of Membership: There were no changes made to the current membership of the ISM Test Development Task Force. The membership list is shown as attachment number 2. The following is a list of those in attendance for this meeting:

Name	Company represented
Andy Broff	Southwest Research Institute
Ron Buck	Test Engineering Inc.
Bill Larch	Lubrizol
Jim Matasic	Lubrizol
Warren Totten	Cummins
Jeff Clark	Test Monitoring Center
Jim Moritz	Perkin Elmer
Jim Wells	Southwest Research Institute
Phil Scinto	Lubrizol

Attendance cont.

Name	Company represented
Jim Gutzwiller	Infineum
Bob Campbell	Ethyl
Riccardo Conti	ExxonMobil
Daryl Baumgartner	Lubrizol

Review of Scope and Objectives: A brief review of the scope and objectives of the ISM Test Development Task Force resulted in some minor changes. A few editorial changes in the scope were suggested by some members. Also the elimination of "push tube scuffing" as a secondary parameter was suggested by the test sponsor. The updated version of the Scope and Objectives can be seen as attachment number 3.

Report from O&H subgroup: Jim Moritz gave an overview of the O&H activities that had taken place over the previous two days. Several differences in stand set ups and controls were noted by the group and steps were taken to communize these items. Below is a list of the actions and plans developed from the O&H group.

1. Battery voltage supply for the ISM should be 12 Volts minimum.
2. The factory supplied intake temperature thermistor will be replaced with a fixed resistance of 1.8 K ohms.
3. During the next operational test runs (described below in item 12) labs will run a fixed timing of (-4.0 degrees) at stage conditions one and (+4.2 degrees) at stage 2 conditions.
4. Intake manifold pressure will be measured in the forward boss of the inlet elbow.
5. Intake manifold temperature will be measured in the intake manifold next to the inlet 30mm from the outside of the manifold in and 16mm forward of the inlet edge. The thermocouple should be inserted 70mm (+/- 2.5mm) from the top surface of the manifold.
6. The intake CO2 measurement will be done with a standard probe in a location next to the factory boost sensor. Locate the probe about 51 mm forward of the boost sensor location. When inserting the probe in the manifold, bottom it out and withdraw it approximately 12mm.
7. Fuel temperature is to be measured at the inlet to the pump (not in the filter housing).
8. The EGR cooler bleed lines are to connect back to the coolant expansion tank and allow for normal flow during test operation.
9. ECM pin connections should be as follows
    a. Pin number 9 – accel pedal posit.
    b. Pin number 23 – Accel pedal rtn.
    c. Pin number 28 – Engine coolant level sig
    d. Pin number 29 32 Engine coolant level rtn
    e. Pin number 37 – SAE J1939 Shld
    f. Pin number 39 – key switch
    g. Pin number 46 – SAE J1939 +
    h. Pin number 47 – SAE J1939 –
    i. Pin numbers 43, 44, and 50 are optional light indicators

10. Verify resistance value between pins 28 and 32
11. Jim Moritz to provide a file that includes additional parameters for monitoring in NGET. This file to include the items listed below.
    a. Boost pressure
    b. Boost pressure absolute
    c. Compressor inlet temperature
    d. EGR orifice temperature
    e. Exhaust pressure sensor
    f. Intake manifold temperature
    g. Oil pressure
    h. Percent load
12. Once labs have standardized on the items noted above, they are to run the engine at Stage 1 conditions with -4.0 timing and no inlet restriction (no restriction meaning no additional restriction above what is normal for the labs piping and filter arrangement). Once the engine is stable at stage 1 conditions the labs are to log operational data and take CO2 readings (intake and exhaust). After completing this operational run the labs are then to continue running in stage 1 conditions with a 3Kpa additional inlet restriction added. Once again allow the engine to stabilize and log operational data and take CO2 readings (intake and exhaust). After completing this operation repeat the entire process running at Stage 2 conditions and +4.2 degree timing.
13. The O&H group will then gather all the operational data from the labs for review to determine to what extent operations have been standardized.

Review of Matrix plan: The original matrix plan called for 4 labs to participate with one stand at each lab. Because one lab is not able to participate at this time, it was felt that a review of the original matrix may be necessary. Phil Scinto indicated that if another lab was willing to run 2 stands then the matrix plan could still be followed. Instead of 4 labs the matrix plan will now focus on 4 stands and proceed accordingly. Everyone was in agreement that this would work well and SwRI offered to provide the additional stand needed. SwRI did note however, that it would take some additional time to ready a second stand and that they probably would not be able to run until mid-March. The current timeline for the initial ISM matrix testing is listed below. This timeline is pending standardization of operations and control schemes within the participating labs.

Start of Matrix --- March 1st.
Phase 1 of Matrix complete by first week in April
Phase 2 of Matrix complete by first week in June.

Recommendations to the Surveillance Panel: A presentation on the status of the ISM test development was presented to the Cummins Surveillance Panel on February 12th. A copy of that presentation is shown as attachment number 4. Items to note are that the Cummins Surveillance Panel has deferred to the ISM Test Development Task Force to decide when the test is ready to start the matrix testing. The Task Force will also resolve standardization issues and keep the Surveillance Panel informed. Once data from the matrix is generated, the Task Force will offer opinion, but leave final decision on discrimination and correlation to the Surveillance Panel.

Adjourn: The ISM Test Development Task Force was adjourned at 5:05pm. The next meeting of the task force will be at the call of the chairman or the Test Developer and will likely coincide with the completion of phase 1 of the test matrix.

These meeting minutes were compiled by Daryl Baumgartner of the Lubrizol Corp. If you have any questions or comments related to them, please feel free to contact him at:

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Cummins ISM Test Development Task Force
Meeting Agenda
3:30 pm February 11th 2004
SwRI San Antonio, TX

1. Call to order — D. Baumgartner
2. Review of membership — D. Baumgartner
3. Review scope and objectives — Task Force
4. Report from O&H subgroup — Jim Moritz
    1. Operational review
    2. Stand set ups
    3. Recommendations
5. Is Test Ready for Matrix start? — Task Force
    1. Establish timing
    2. Review matrix plan
6. Finalize recommendations to S.P. — Task Force
7. Adjourn

ISM Test Development Task Force
Membership and Mailing List

Members:

Name	Company	Contact info	Attendance
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Scope and Objectives

Cummins ISM Test Development Task Force
Revised 2/11/04

Scope:

To develop a lubricant performance test on a Cummins ISM test platform that can discriminate and provide a quality assessment of HD Engine Oils in a similar manner as the current M11 tests. The ISM test development will consider the following parameters for lubricant quality evaluation:

Primary parameters:	**Secondary parameters:**
Crosshead weight loss	Liner Wear
Top ring weight loss	Rocker hat wt. loss
Injector screw scuffing/wt. Loss	bearing wear
Sludge	Intake and exhaust screw
Filter delta P	

In addition, the Task Force will provide guidance and documentation of the test development to the Cummins Surveillance panel. The task force will provide a written procedure for the ISM test and to work within ASTM to insure that the ISM test procedure complies with ASTM standards. Once the test is developed to the satisfaction of the Cummins Surveillance Panel, the Test Development Task Force will be disbanded and the Cummins Surveillance Panel will oversee the ISM test.

Objectives:

1. Draft of test procedure 02/04
2. Finalize matrix plan 02/04
3. Begin matrix testing 03/04
4. Analysis of initial phase of matrix 04/04

ISM Test Development Task Force Report

February 12, 2004

Review of Test Development

- 3 labs are up and running the ISM engine.
- O&H activities are addressing operational differences between labs.
- Several items to be standardized over the next week or two between all participating labs
- Operational data to be reviewed by the task force prior to start of matrix testing. This will be done to insure operational consistency.
- Final control scheme for EGR still TBD
- Timing and soot generation control TBD

Matrix Plan Review

- Matrix plan (9/5/03) remains intact with only one change.
- Instead of 4 labs participating, there will be 4 stands from 3 labs participating.
- Matrix will be run in stages
  - Stage 1 4 tests to show discrimination
  - Stage 2 4 tests to show correlation – run as references
  - Stage 3 additional reference tests that confirm correlation and provide referencing
- Note: 2nd stand at one lab will be coming on line later than the initial 3 stands (should be available by March)

Current timing for the ISM Development and start of Matrix

- Laboratories to standardize items identified this week.
- 2/19/04 operational data generated and reviewed
- 2/20/04 labs to proceed with soot generation runs
- 2/23/04 (week of) review data from soot runs.
  - Establish control scheme for engine EGR control and set soot timing levels for start of test. (planned to be done via conference calls)
- 3/01/04 (week of) planned start of initial matrix runs
- 4/05/04 (week of) initial matrix tests done (4 tests)
  - 4/12/04 (week of) possible meeting to review results and operational data
- 5/31/04 (week of) phase two matrix testing done

Final Items of Note

- The ISM Test Development Task Force plans to make the decision to proceed with the initial matrix testing, once the Task Force is convinced that engine operations have been standardized between labs.
- The ISM Test Development Task Force will keep the Cummins Surveillance Panel informed of our activities and meetings.
- Task Force will provide recommendations on data review, but we will need final S.P. direction on discrimination data and correlation data.

Questions or Comments from the Surveillance Panel