

HEAVY-DUTY ENGINE OIL CLASSIFICATION PANEL
OF
ASTM D02.B0.02
September 26, 2001
Marriott Rivercenter Hotel of San Antonio, TX

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ACTION ITEMS

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| 1. Issue round three of exit ballots. | Jim McGeehan |
| 2. Complete tiered limits for 1R and M-11 EGR | Statisticians |
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MINUTES

- 1.0 Call to Order
 - 1.1 The meeting was called to order by Chairman Jim McGeehan at 9:45 a.m. on September 26, 2001, in Salon M of the Marriott Rivercenter Hotel of San Antonio, Texas. A moment of silence was observed in remembrance of the September 11th terrorist victims and their families. There were 14 members present or represented and approximately 30 guests present, one by teleconference. The attendance list is shown as Attachment 2.
- 2.0 Agenda
 - 2.1 The published agenda (Attachment 1) was reviewed. It was suggested and agreed upon that the IR oxidation discussion be moved to be part of the T-10 discussion.
- 3.0 Previous Meeting Minutes
 - 3.1 The minutes of the August 15, 2001 meeting were approved as distributed and posted on the TMC website.
- 4.0 Membership
 - 4.1 There were no changes in membership. See Attachment 2 for the list of members.
- 5.0 PC-9 Matrix Status

- 5.1 John Zalar's report on the 1R matrix status and the PC-9 timeline was presented in absentia (Attachment 3). The 1R matrix has been completed and the statistical analysis is done. Earliest API license date for CI-4 is now estimated to be August 15, 2002.
- 6.0 Caterpillar 1R
- 6.1 Dwayne Tharp presented an update on the 1R status and suggested limits for the single cylinder tests (Attachment 4). Most of the ensuing discussion was concerned with the proposed oil consumption limits for the 1R.
 - 6.2 Phil Scinto, via teleconference, went over his presentation (Attachment 5) of the statistical analysis for the 1R matrix. Afterward, the group asked Phil to analyze the initial oil consumption, final oil consumption and their ratio. Dwayne showed a spreadsheet with the data he had and suggested a maximum ratio of 1.1 (FOC/IOC) or perhaps an increment of between 1.0 and 1.5 g/h over the initial oil consumption. Most of the matrix tests had lower FOC than IOC.
 - 6.3 Dwayne Tharp moved and Steve Kennedy seconded that the 1R test be accepted as part of PC-9. The motion passed with 14 for, 0 against, 0 abstain. There was no 'official' ACC representation present to speak on 1R registration, but speculation was that registration of tests could start on Monday, October 1, 2001.
 - 6.4 Dwayne Tharp moved and Bill Kleiser seconded that the proposed 1R limits for a one test pass, rounded to whole numbers, be accepted. The two and three test pass limits will be determined statistically. The motion passed with 14 for, 0 against, 0 abstain.
 - 6.5 Sometime after lunch, Phil called back with analysis of the matrix oil consumption data. The following information is all in grams per hour except for the ratios. For IOC he found no stand effects, but possible lab and oil effects. The least squared mean of IOC for Oil A was 8.34; for Oil D was 10.15 and for Oil M was 10.40 with a pooled standard deviation of 1.32. Looking at the ratio (IOC/FOC) removed any lab effect, yet still left a possible oil effect. The LSM was 1.09 for Oil A; 0.97 for Oil D and 1.22 for Oil M with a pooled S. Dev. of 0.16. The 95% confidence interval for Oil M would be 1.1 to 1.4. Looking at the differential (IOC-FOC) again removed any lab effect but still showed some weak oil effect. Oil A had an LSM of 0.4; Oil D, -0.25 and Oil M, 1.87 with a pooled S. Dev. of 1.38.
 - 6.6 Dwayne Tharp proposed to exit ballot an oil consumption limit for the 1R of FOC less than or equal to IOC + 1.2 g/h. Steve Kennedy seconded the motion. Bill Kleiser raised concern that the proposed increment is less than the matrix standard deviation. The motion passed with 12 for, 0 against, 1 abstain.

7.0 Lunch

- 7.1 The meeting went into recess around 11:30 a.m. for lunch and restarted at 12:45 p.m. with a review of the round two exit ballot results.

8.0 Exit Ballot Review (See Attachment 6 for a summary)

8.1 M-11 EGR

- 8.11 Lubrizol negative on concern that the TRWL limit of 175 mg is too tight.
- 8.12 ExxonMobil negative on TRWL for the M-11. They feel the T-10 covers the TRWL need. Steve Kennedy presented a slide (Attachment 7) showing M-11 & T-10 matrix results relative to the proposed limits.
- 8.13 Infineum negative on concerns about OFDP and the sludge / viscosity differences between labs.
- 8.14 Chevron negative on concerns with TRWL. Jim McGeehan presented a slide of matrix TRWL results (Attachment 8) and feels the limit should be 190 mg or higher.
- 8.15 Oronite negative on concerns with OFDP and TRWL. Bill Kleiser presented a slide (Attachment 9), showing filter pleats touching and glued that way.
- 8.16 Dave Stehouwer responded for Cummins with a presentation shown as Attachment 10. In addition to the matrix Oil E data, they have internal data which support the need to stay below TRWL of 175 mg. He talked about the tests Fleetguard was performing on a sample of 36 filters pulled from the TEI test filter stock and tests they had run on returned used filters.
- 8.17 Chevron and Lubrizol indicated they would reluctantly agree to a TRWL limit of 175 mg. ExxonMobil would abstain on TRWL if they were the only negative, but they still feel the T-10 and M-11 TRWL are looking at the same thing. Oronite would reconsider after looking at the effect of the adopted outlier criteria for TRWL.
- 8.18 Cummins volunteered to reduce the sludge limit from 8.0 to 7.8 and asked that it be exit balloted. Statistically derived tiered limits for the M-11 are shown in Attachment 11, except for the revised sludge limit at 7.8.

8.2 T-10

- 8.21 Infineum negative on concern that three of the pass / fail parameters (EOT lead, Delta lead 250-300, IR oxidation) are highly correlated and thus increase the chances of failing a test just on random variability. Jai Bansal made a presentation (Attachment 12) which suggests eliminating the Delta lead 250-300 and the IR

oxidation and accepting the Sequence III-F test at SL limits for oxidation protection.

- 8.22 Greg Shank showed the statistical tiered limits for the T-10 (Attachment 11) and then put up a slide (Attachment 13) showing lead level versus time in the test for several oils. One of the oils exhibited a significant increase in lead level between 250 and 300 hours. Because of this type of behavior, he is unwilling to give up the Delta lead 250-300 parameter. He would be willing to give up the IR oxidation parameter for the Sequence III-F at SL limits, for oxidation and oil consumption only in that test. Thus, Greg Shank moved and Jai Bansal seconded that the Sequence III-F be accepted as the oxidation test for CI-4 at SL limits for oxidation and oil consumption only.
- 8.23 Oronite negative over concern for random test failures with the correlated parameters. Bill Kleiser presented a proposed merit system (Attachment 14) they feel would help offset the lack of precision in the test parameters. There was a lot of discussion over the feasibility of implementing a merit system at this late date. Greg Shank agreed to meet with those interested in a merit system, if they could all meet together before the next HDEOCP meeting.
- 8.24 Greg Shank moved to exit ballot the John Zalar tiered limits for the T-10 (Attachment 11). Dave Stehouwer seconded the motion which passed with 14 for, 0 against, 0 abstain.

8.3 1N

- 8.31 Dwayne Tharp stated that based on the data presented to Caterpillar, they would stay with the CG-4 limits for the 1N (See Attachment 4). They would however, accept either the 1N at CG-4 limits or the 1K at CH-4 limits for PC-9.
- 8.32 Rich Lee proposed using the 1K at CH-4 limits as the aluminum piston deposit test for PC-9, with the 1N at CG-4 limits as an acceptable alternative. Lew Williams seconded the motion which passed with 13 for, 0 against, 0 abstain.

8.4 HTHS

- 8.41 3.5, Non-Critical (See Attachment 15 for John Zalar explanation of D-3244 on "Critical" / "Non-Critical" specifications)
- 8.411 Pennzoil-Quaker State negative, but would not hold up the category.
- 8.412 Infineum negative for previously enumerated reasons. They will maintain the negative.
- 8.413 Equilon negative, will maintain that position.
- 8.42 3.3, Critical

- 8.421 Ethyl negative, would abstain.
- 8.422 Valvoline negative, would favor 3.5, non-critical.
- 8.423 Infineum negative, would switch to positive.
- 8.424 Oronite negative
- 8.425 Pennzoil-Quaker State negative, would prefer 3.3, non-critical, but would abstain if this went forward.
- 8.426 Jim McGeehan presented some slides on the blending target effects of the critical / non-critical specifications (Attachment 16).
- 8.427 Greg Shank for EMA commented they feel too much time has been spent on this subject already. Frank Bondarowicz presented Attachment 17 and noted that European oils are already at 3.5 cP, HTHS.
- 8.428 Greg Shank moved and Ken Chao seconded that 3.5 cP, non-critical, be accepted as the PC-9 HTHS limit. The motion passed with 11 for, 1 against, 1 abstain.

8.5 Used Oil Viscosity

- 8.51 Dave Stehouwer used some of the slides from Attachment 18 and then proposed a PC-9 MRV limit of 25,000 cP at -20 C on the T-10 75 hour oil sample, for all viscosity grades. Lew Williams seconded the motion which passed with 13 for, 0 against, 1 abstain.

9.0 Backward Compatibility

- 9.1 Mark Rees presented Lubrizol data (Attachment 19) comparing T-10 versus T-9 results and M-11 EGR versus M-11 HST results. Mark then made a motion that the tests and limits as approved by ASTM D.02.B used to qualify oils for API CI-4 may be used to qualify oils for API CH-4. Dave Stehouwer seconded the motion, which after discussion was tabled because all the CI-4 limits have not yet been defined.

10.0 Elastomers

- 10.1 Tom Boschert presented a report on the status of elastomer compatibility (Attachment 20) and indicated that a surveillance panel had been formed. That panel plans to meet on September 27, 2001. Tom asked for HDEOCP concurrence with the process proposed. Lew Williams seconded the motion which passed via voice vote with no objections.

11.0 "B" Ballot Preparation

- 11.1 Since this meeting was in San Antonio, Tom Franklin retreated from retirement long enough to attend, probably, much to his regret. Being the experienced ballot compiler that he is, he was prevailed upon to undertake putting together the "B" ballot for PC-9. In the event that funding is

needed to help compensate Tom for this effort, the following organizations have committed to help: Chevron, Infineum, Ethyl, EMA, Lubrizol, TEI, Equilon and Ohio Technologies.

12.0 Next Meeting

12.1 The next meeting is scheduled for October 16, 2001 at the Hyatt Regency O'Hare in Rosemont, IL.

13.0 Adjournment

13.1 This meeting was adjourned at 4:45 p.m. on September 26, 2001.

Submitted by:

Jim Wells
Secretary to the HDEOCP