

HEAVY-DUTY ENGINE OIL CLASSIFICATION PANEL
OF
ASTM D02.B0.02
December 10, 2013
Marriot Tampa Waterside Hotel – Tampa, FL

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ACTION ITEMS

MINUTES

- 1.0 Call to order
 - 1.1 The Heavy Duty Engine Oil Classification Panel (HDEOCP) was called to order by Chairman Jim McGeehan at 1:30 p.m. on Tuesday, December 10, 2013, in Salon A/B of the Marriot Tampa Waterside Hotel, Tampa, FL.
 - 1.2 There were 17 members present and 60 guests present. The attendance list is included as **Attachment 2**.
- 2.0 Agenda
 - 2.1 The agenda circulated prior (included as **Attachment 1**) was not changed.
- 3.0 Minutes
 - 3.1 The minutes for the June 25, 2013 meeting were approved as issued.
- 4.0 Membership
 - 4.1 There were 3 membership changes. Galen Green replaces Scott Harold from BASF. Thom Smith replaces Vic Kersey of Ashland. David Gray replaces Steve Herzog and the company name changes to Evonik.
- 5.0 Results of Exit Criteria Ballots
 - 5.1 PC-11B HT/HS Viscosity limit: 2.9-3.2 cP: There were 3 negatives to this ballot with comments. **Attachment 3**. SAE J-300 states that 2.9 is a critical limit and is for fresh oil; the ACEA limit of 2.9 is non-critical and after-shear. A suggestion was made to review the capability of the HTHS test method to compare the range of limits. The method reproducibility is 0.13. EMA proposes limits of 2.9-3.2 as non-critical for fresh oil. Discussion on whether the SAE J-300 specs apply to the PC-11 limits. A limit of after shear would not apply to SAE J-300 since that is for new oil. The PC-11 spec would not have to list a floor for HTHS since the lowest viscosity grade allowed will be a 30 weight which is bound to SAE J-300. Chairman McGeehan suggested a task force to discuss the details which will include both new oil and after shear. Steve Kennedy will chair the task force.
 - 5.2 Shear stability SAE XW-40 (except SAE 0W-40) 12.8 cSt@100 degrees C after 90 cycles Kurt Orbahn (KO) shear. All other viscosities in grade: There were 2 negatives to this ballot

with comments. **Attachment 3.** Comments dealt with the exclusion of the 0W-40 and that the proposal doesn't address the original request.

- 5.3 Propose PC-11 A&B adopt Mack T-11 API CJ-4 limit but remove 6.7% soot kinematic viscosity requirement. There were 11 negatives and 7 affirmatives. **Attachment 5.** If the proposal was for PC-11B only, more would consider it. PC-11A must stay backward compatible. This may be brought up for PC-11B only at the next NCDT meeting.
- 6.0 Old Business
 - 6.1 Chairman McGeehan reminded the group that there is on outstanding item for limits from carry-over tests to settle.
- 7.0 The meeting was adjourned at 2:15 pm.

Tentative Agenda
ASTM SECTION D.02.BO.02
HEAVY-DUTY ENGINE OIL CLASSIFICATION PANELS

Marriott Tampa Waterside Hotel
Tampa, FL
December 10th , 2013

1:30-2:00 pm
(API NCDT meeting will follow at 2:00-5:00 pm)

Chairman/ Secretary: **Jim Mc Geehan/Jim Moritz**

Purpose: **Review results of “Exit-Criteria” ballots**

Desired Outcomes: **Preparing for PC-11**

TOPIC	PROCESS	WHO	TIME
Agenda Review	<ul style="list-style-type: none"> • Desired Outcomes & Agenda 	Group	1:00-1:10
Membership	<ul style="list-style-type: none"> • Changes: Additions 	Group	1:10-1:15
Results of Exit-Criteria ballots	<ul style="list-style-type: none"> • PC-11B HT/HS Viscosity limit: 2.9-3.2 cP • Propose PC-11 A&B adopt Mack T-11 API CJ-4 limit but remove 6.7% soot kinematic viscosity requirement. • Shear stability SAE XW-40 (except SAE 0W-40) 12.8 cSt@100 degrees C after 90 cycles Kurt Orbahn (KO) shear. All other viscosities in grade. 	Jim McGeehan	1:15-2:00
NCDT meeting	<ul style="list-style-type: none"> • NCDT agenda 	Dennis Bachelder Dan Arcy	2:00-5:00

HDEOCP Attendance: December 10, 2013

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HDEOCP Attendance: December 10, 2013

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Report

James McGeehan
Chairman
Heavy-Duty Engine Oil Classification Panel

December 10th 2013





ASTM-HDEOCP Membership

	Oil and Additive Companies	OEMs
1	Jim A. McGeehan – Chevron	Greg Shank – Volvo Power Train
2	Steve Kennedy - ExxonMobil	Dan Nyman - Cummins Inc.
3	Dan Arcy - Shell	Mesfin Belay - Detroit Diesel
4	Corey Taylor - BP Castrol	Hind Abi-Akar - Caterpillar Inc.
5	Ying Yang - Ashland	Heather DeBaun - International
6	Scott Harold - BASF	Ken Chao - John Deere
7	Steven Herzog - RohMax	Robert Stockwell - GM Powertrain
8	Jason Lagona - Afton	Jason Andersen- Paccar
9	Jerry Wang - Oronite	
10	Gail Evans - Lubrizol	
11	Pat Fetterman - Infineum U.S.A.	
12	David Taber,-ConocoPhillips	

PC-11B HT/HS Viscosity Limit: 2.9 to 3.2 cP



Company	Representative	Affirmative	Negative	Comments
John Deere	Kenneth Chao	X		
Navistar	Heather DeBaun	X		
Daimler	Mesfin Belay	X		
Cummins	Dan Nyman	X		
Paccar	Jason Andersen	X		
Volvo	Greg Shank	X		Comments
Caterpillar	Hind Abi-Akar	X		
Lubrizol	Gail Evans	X		Comments
Oronite	Jerry Wang		X	
Afton	Jason Lagona	X		
Infineum	Bob Salgueiro	X		
Evonik	Steve Herzog	X		
Shell	Dan Arcy	X		
Exxon Mobil	Steven Kennedy	X		
Chevron	Jim McGeehan		X	Comments
BP Lubricants	Corey Taylor	X		
GM	Robert Stockwell	X		
Valvoline	Thom Smith		X	Comments



PC-11B HT/HS Viscosity Limit: 2.9 to 3.2 cP

EMA at the NCDT meeting requested that PC-11 should be aligned with the future ACEA HD fuel economy category (F -sequence 2016). This ballot does not align with the ACEA specification. At the AAA Heavy Duty meeting on November 7th the new HTHS limits were announced:

SAE XW-30 maximum HTHS will be 3.2 and minimum 2.9 HTHS after shear PC-11 proposed in 3.2-2.9 cP (no shear) for fresh oil.

The HTHS 2.9 cP minimum is a critical limit in SAE J-300. Because it is a critical specification it must be greater than 2.96 cP for release. If 3.2 is a critical limit, the release specification must be less than 3.14 cP. This allows only 0.18 cP range. If the specification is to be aligned with ACEA the 2.9 cP should be after 90 cycle shear and meet a minimum of 2.96 cP for release. The 3.2 limit should be defined as a non-critical limit.

Chevron recommends staying with the range of 2.9 cP after shear (as critical limit) and 3.2 cP as non-critical limit for the best product consistency. This will be aligned with ACEA and OEM specifications.

Jim McGeehan, Chevron

Sample of the negative comments

Conformance to HTHS min Specification

According to ASTM D3244

ASTM D3244 A2.3 Critical Specification

Reproducibility R established by HTHS test method

Assume D4683 for this analysis

- R (old) = 3.58% of mean
- R (new) = 0.03207 (HTHS + 1.2137)

P = 0.05 (95% confidence level - recommended)

P = 0.025 (97.5% confidence level - high level of assurance)

D = 1.645 (95% CL)

D = 1.960 (97.5% CL)

Acceptance Limit (AL) = $S + (0.255 * R * D)$

- where S = specification limit

S	R	AL
2.9	0.1319	2.96
3.2	0.1415	3.14
3.3	0.1448	3.24

SAE Grade	HTHS min	Reproducibility			Confidence Level	Assigned Test Value (Critical)	
		Current	New	D		Current R	New R
40 - 60	3.7	0.1325	0.1576	1.645	95	3.76	3.77
40 - 60	3.7	0.1325	0.1576	1.96	97.5	3.77	3.78
40	3.5	0.1253	0.1512	1.645	95	3.55	3.56
40	3.5	0.1253	0.1512	1.96	97.5	3.56	3.58
30	2.9	0.1038	0.1319	1.645	95	2.94	2.96
30	2.9	0.1038	0.1319	1.96	97.5	2.95	2.97
20	2.6	0.0931	0.1223	1.645	95	2.64	2.65
20	2.6	0.0931	0.1223	1.96	97.5	2.65	2.66
16	2.3	0.0823	0.1127	1.645	95	2.33	2.35
16	2.3	0.0823	0.1127	1.96	97.5	2.34	2.36
"12"	2.0	0.0716	0.1031	1.645	95	2.03	2.04
"12"	2.0	0.0716	0.1031	1.96	97.5	2.04	2.05
"8"	1.7	0.0609	0.0934	1.645	95	1.73	1.74
"8"	1.7	0.0609	0.0934	1.96	97.5	1.73	1.75
"4"	1.5	0.0537	0.0870	1.645	95	1.52	1.54
"4"	1.5	0.0537	0.0870	1.96	97.5	1.53	1.54
"4"	1.4	0.0501	0.0838	1.645	95	1.42	1.44
"4"	1.4	0.0501	0.0838	1.96	97.5	1.43	1.44

Note 1: current HTHS method does not apply to HTHS < 2.5 mPa·s

Note 2: new HTHS method does not apply to HTHS < 1.5 mPa·s

PC-11B HT/HS Viscosity Limit: 2.9 to 3.2 cP



A previous ballot has established the range to be 2.9~3.3. The primary justification for narrowing the range is to be consistent with proposed ACEA specification. However, the latest proposed ACEA HD specification as disclosed in the AAA HD meeting in November specifies 2.9~3.3 "after shear" while the proposal in PC-11 refers to fresh oil. This ballot does not achieve consistency with ACEA therefore does not provide any benefit to further limit the blending flexibility. The original ballot result should be maintained.

Jerry Wang, Chevron Oronite

Sample of the negative comments

PC-11B HT/HS Viscosity Limit: 2.9 to 3.2 cP



There has been no technical reason as to why 3.2 should be uses as the upper limit as opposed to the 3.3cP originally propoased.

Thom Smith, Valvoline

Sample of the negative comments

Shear Stability SAE XW-40 (Except SAE 0W-40) 12.8 cSt @ 100c After 90 Cycles Kurt Orbahn (KO) Shear All Other Viscosities Stay in Grade



Company	Representative	Affirmative	Negative	Comments
John Deere	Kenneth Chao	X		
Navistar	Heather DeBaun	X		
Daimler	Mesfin Belay	X		
Cummins	Dan Nyman	X		
Paccar	Jason Andersen	X		Comments
Volvo	Greg Shank	X		
Caterpillar	Hind Abi-Akar	X		
Lubrizol	Gail Evans		X	Comments
Oronite	Jerry Wang		X	
Afton	Jason Lagona	X		
Infineum	Bob Salgueiro	X		Comments
Evonik	Steve Herzog	X		
Shell	Dan Arcy	X		
Exxon Mobil	Steven Kennedy	X		
Chevron	Jim McGeehan	X		Comments
BP Lubricants	Corey Taylor	X		
GM	Robert Stockwell	---		Waiving
Valvoline	Thom Smith	X		



Shear Stability SAE XW-40 (Except SAE 0W-40) 12.8 cSt @ 100c After 90 Cycles Kurt Orbahn (KO) Shear All Other Viscosities Stay in Grade

Lubrizol supports keeping 90 cycle Kurt Orbahn as the shear test for PC-11. We also agree with adding 12.8 cSt restriction to 15W-40 viscosity grades, because this is the viscosity grade cited by EMA as having issues in the field. We not, however, understand the arbitrary exemption for 0W-40 grades and for SAE 30 multigrades. The VM levels in 5W-40 and 10W-40 can be equal or higher than 0W-40 grades and 10W-30 oils are much more prevalent than 5W-30 or 10W-40 grades. Consequently, we support adding a KV-stay-in grade cushion to 15W-40 oils only and maintaining SAE J300 as the stay in grade requirement for all other PC-11 multigrades.

Gail Evans, Lubrizol

Sample of the negative comments



Shear Stability SAE XW-40 (Except SAE 0W-40) 12.8 cSt @ 100c After 90 Cycles Kurt Orbahn (KO) Shear All Other Viscosities Stay in Grade

The original request was to increase shear stability. This proposed increase in KV does not address that technical need to improve VM or finished oil shear stability.

The concern over customer's confusion over UOA results should be addressed through consumer education rather than through specification.

The field test conducted by the task force also found mostly fuel dilution without direct indication of a shear stability problem.

While more passes in the KO method didn't show correlation with the field test, they did show additional shear. Either the current J300 KV minimum be maintained or one of the KO method with more passes should be adopted.

Jerry Wang, Chevron Oronite

Sample of the negative comments



Propose PC-11 A & B Adopt Mack T-11 API CJ-4 Limit But Remove 6.7% Soot Kinematic Viscosity (KV) Requirement

Company	Representative	Affirmative	Negative	Comments
John Deere	Kenneth Chao	X		
Navistar	Heather DeBaun	X		
Daimler	Mesfin Belay		X	Comments
Cummins	Dan Nyman		X	Comments
Paccar	Jason Andersen	X		Comments
Volvo	Greg Shank		X	Comments
Caterpillar	Hind Abi-Akar		X	Comments
Lubrizol	Gail Evans		X	Comments
Oronite	Jerry Wang	X		
Afton	Jason Lagona		X	Comments
Infineum	Bob Salgueiro		X	Comments
Evonik	Steve Herzog		X	
Shell	Dan Arcy		X	Comments
Exxon Mobil	Steven Kennedy		X	Comments
Chevron	Jim McGeehan	X		
BP Lubricants	Corey Taylor	X		
GM	Robert Stockwell	X		
Valvoline	Thom Smith		X	Comments