

**HEAVY-DUTY ENGINE OIL CLASSIFICATION PANEL**  
OF  
ASTM D02.B0.02  
June 28, 2016  
Hyatt Regency Bellevue – Bellevue, WA

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**ACTION ITEMS**

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**MINUTES**

- 1.0 Call to order
  - 1.1 The Heavy Duty Engine Oil Classification Panel (HDEOCP) was called to order by Chairman Shawn Whitacre at 3::30 pm on Tuesday June 28, 2016, in the Auditorium of the Hyatt Regency Bellevue, Bellevue, WA.
  - 1.2 There were 12 members present and 47 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 from the December 2015 were issued too late to be approved.
- 4.0 Membership
  - 4.1 There were no membership changes. The membership list was shown (**Attachment 3**). Abdul Cassim of John Deere attended for Ken Chao.
- 5.0 Anti-trust statement
  - 5.1 The ASTM anti-trust statement was read and presented (**Attachment 3**).
- 6.0 Availability of existing tests
  - 6.1 Mark Cooper gave his semiannual availability of existing engine tests presentation (**Attachment 4**). Some mention on development of ISX replacement test. CLOG activity working on Sequence IIIF/G to IIHH correlation.
- 7.0 T-13 update
  - 7.1 Greg Shank gave an update on the latest activity (**Attachment 5**). He included a short mention of the Surveillance Panel decision to control inlet air humidity for a precision improvement. Tests are being conducted with controlled inlet air humidity now. The ASTM

test method ballot has one negative which will be discussed at Subcommittee B. If it resolved, and it should be, then the edits for D4485 can be implemented in an August 2016 ballot.

#### 8.0 CAT Update

- 8.1 Hind Abi-Akar provided an update on the COAT (**Attachment 6**). The test method number is D8047. The Surveillance Panel is working with the Micromotion brand flow density meter supplier to improve the measurement. There are plans to develop a correlation between the COAT and EOAT. Hind reiterated her call for candidate data between the 2 tests to help with the correlation. The data can be sent to the TMC.

#### 9.0 DD13 Update

- 9.1 Suzanne Neal gave an update on the DD13 test (**Attachment 7**). The test method ballot has been approved through Subcommittee B and will be on a D02 ballot in August. There are referenced stands available.

#### 10.0 Update on availability of 1006

- 10.1 Dennis Gaal gave a presentation for Mike Birke (**Attachment 8**). Reference oil 1006-2 is in short supply (about 2500 gallons) and cannot be re-blended. There is about an 18 month supply of this oil. It is also used as Service Fluid 105. The Seals SP is seeking support from the HDEOCP to determine the needs for seal approval testing. The issue for the HDEOCP is that the seals test limit for candidate oils is that it has better performance than the reference oil, not a hard limit. The HDEOCP needs to deal with the limit method or get an oil with a similar performance level. Chairman Whitacre suggested forming a task force to look at this. If the replacement oil is brand new, then it will need to be introduced by the first quarter of 2017. TMC to provide 1006-2 seals reference oil data. Mike Alessi will lead the effort on this task. Let Mike know if you want to participate.

#### 11.0 Next meetings

- 11.1 The next meeting will be at the call of the chairman or December ASTM.

#### 12.0 The meeting was adjourned at 2:20 pm.

**AGENDA**  
**D02.B0.02.1**  
**Heavy-Duty Engine Oil Classification Panel**  
**Tuesday, June 28, 2016 1:30pm PDT**  
**Hyatt Regency - Auditorium**  
**Bellevue, Washington, USA**

- 1) Call to Order**
- 2) Minutes** – Approval of Minutes from December 8, 2015 Meeting in Austin, Texas, USA
- 3) Membership**
  - a) Review current panel membership
- 4) Existing tests/categories**
  - a) Review of status of carry-over engine tests that support API CK-4, FA-4 and legacy categories (Mark Cooper, Chevron Oronite)
  - b) Mack/Volvo Surveillance Panel Update (Greg Shank, Volvo)
  - c) CAT Oil Aeration Test Update (Hind Abi-Akar, CAT)
  - d) DD13 Scuffing Test Update (Suzanne Neal, DTNA)
- 5) Old Business**
  - a) Supply of reference oil for D7216 (Dennis Gaal, E-M)
- 6) New Business**
- 7) HDEOCP Adjournment (transition to DEOAP)**

## HDEOCP Attendance: June 28, 2016

| LastName  | FirstName    | MiddleName | Company                             | Business Phone  | E-mail Address                     |
|-----------|--------------|------------|-------------------------------------|-----------------|------------------------------------|
| Abdul     | Cassim       |            | John Deere                          | 319-292-5242    | cassimabdul@johndeere.com          |
| Abi-Akar  | Hind         |            | Caterpillar Inc.                    | 309-578-9553    | abi-akar_hind@cat.com              |
| Alessi    | Michael      | L.         | ExxonMobil R&E                      | 856-224-2309    | michael.l.alessi@exxonmobil.com    |
| Andersen  | Jason        |            | PACCAR Technical Center             | 360-757-5324    | jason.andersen@paccar.com          |
| Arcy      | Dan          |            | Shell Global Solutions              | 281-544-6586    | dan.arcy@shell.com                 |
| Bennett   | Elizabeth    |            | ExxonMobil                          | 703-937-7719    | elizabeth.m.bennett@exxonmobil.com |
| Bloomfeld | Michael      |            | ExxonMobil                          | 856-224-2865    | michael.l.blumfeld@exxonmobil.com  |
| Booth     | James        |            | Chevron Oronite                     | 510-778-4712    | james.booth@chevron.com            |
| Carter    | James        | E.         | Gage Products                       | 517-896-1150    | jcarter@gageproducts.com           |
| Denton    | Vicky        |            | Fuels & Lubes Asia                  |                 | editor@fuelsandlubes.com           |
| Denton    | Ryan         |            | Cummins Inc.                        | 812-377-1543    | ryan.denton@cummins.com            |
| Dougherty | Rick         |            | ExxonMobil Research and Engineering |                 | richard.dougherty@exxonmobil.com   |
| Evans     | Joan         |            | Infineum                            | 908-474-6510    | joan.evans@infineum.com            |
| Evans     | Gail         |            | The Lubrizol Corporation            |                 | gail.evans@lubrizol.com            |
| Farber    | Frank        | M.         | ASTM - TMC                          | 412-365-1030    | fmf@astmtmc.cmu.edu                |
| Franklin  | Joe          |            | Intertek Automotive Research        | 210-523-4671    | joe.franklin@intertek.com          |
| Frederick | Josh         |            | Valvoline                           | 859-357-2248    | jrfrederick@ashland.com            |
| Fuesser   | Hans-Juergen |            | Daimler                             | 49-731-505-2176 | hans-juergen.fuesser@daimler.com   |

## HDEOCP Attendance: June 28, 2016

| LastName  | FirstName | MiddleName | Company                                 | Business Phone | E-mail Address                  |
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| Gerrity   | Shawn     |            | Idemitsu Lubricants America Corporation | 310-563-1930   | sgerrity@ILACorp.com            |
| Goldmints | Isabella  |            | Infineum                                | 908-474-2629   | isabella.goldmints@infineum.com |
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| Humphrey  | Brian     |            | PetroCanada                             | 440-537-2851   | brhumphrey@suncor.com           |
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| Koglin    | Cory      |            | Afton Chemical Corporation              | 248-350-0640   | cory.koglin@aftonchemical.com   |
| Kozub     | Daniel    |            | Detroit Diesel Corp.                    | 313-592-7589   | daniel.kozub@daimler.com        |
| Kunselman | Michael   |            | Center for Quality Assurance            | 248-234-3697   | mkunselman@centerforqa.com      |
| Kuntschik | Larry     |            | ILMA                                    | 281-693-2410   | lfkuntschik@aol.com             |
| Linden    | Jim       |            | Total Lubricants, USA                   | 248-321-5343   | lindenjim@jlindenconsulting.com |
| Lochte    | Michael   |            | Southwest Research Institute            | 210-522-5430   | mlochte@swri.org                |
| Loomis    | Ron       |            | The Lubrizol Corporation                | 440-347-4046   | rol@lubrizol.com                |
| Marley    | Bruce     |            | Biosynthetic Technologies               | 949-390-5921   | BruceM@biosynthetic.com         |
| Martinez  | Jo        | G.         | Chevron Oronite                         | 510-242-5563   | jogm@chevron.com                |

## HDEOCP Attendance: June 28, 2016

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| Matasic    | Jim       |            | The Lubrizol Corporation       | 440-347-2487   | james.matasic@lubrizol.com       |
| McMillan   | Michael   | L.         | MLM Consulting, Inc.           | 586-677-9198   | mmcmillan123@comcast.net         |
| Mills      | Justin    |            | Evonik Oil Additives USA, Inc. | 215-706-5816   | justin.mills@evonik.com          |
| Miranda    | Greg      |            | The Lubrizol Corporation       | 440-347-8516   | greg.miranda@lubrizol.com        |
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| Neal       | Suzanne   |            | Detroit Diesel Corp.           | 313-592-7130   | suzanne.neal@daimler.com         |
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| Passmore   | Dave      |            | IMTS                           | 810-588-9591   | dpassmore@imtsind.com            |
| Purificati | Darryl    |            | Petro-Canada Lubricants Inc.   | 519-304-2351   | dpurificati@suncor.com           |
| Rajala     | Scott     |            | Idemitsu Lubricants            | 248-455-1460   | srajala@ilacorp.com              |
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| Romano     | Ron       |            | Ford Motor Co.                 | 313-845-4068   | rromano@ford.com                 |
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| Shank      | Greg      | L.         | Volvo Groups Technology        | 301-790-5817   | greg.shank@volvo.com             |
| Sheehan    | Michael   | P.         | ExxonMobil Chemical Company    | 281-834-2080   | michael.p.sheehan@exxonmobil.com |

## HDEOCP Attendance: June 28, 2016

| LastName  | FirstName | MiddleName | Company                    | Business Phone | E-mail Address               |
|-----------|-----------|------------|----------------------------|----------------|------------------------------|
| Stockwell | Robert    | T.         | Chevron Oronite            | 210-232-3188   | robert.stockwell@chevron.com |
| Thompson  | E.A.      | Hap        | Global PPL Standards Assc. | 904-287-9596   | hapjthom@aol.com             |
| Tomaro    | Joe       |            | The Lubrizol Corporation   | 440-347-1564   | joseph.tomaro@lubrizol.com   |
| Whitacre  | Shawn     |            | Chevron Lubricants         | 510-242-3557   | shawnwhitacre@chevron.com    |
| Wong      | Lawrence  |            | Chevron Base Oils          | 510-242-1444   | lwong@chevron.com            |

# D02.B0.02.1 HDEOCP

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**Shawn Whitacre**

**Chairman**

**Heavy-Duty Engine Oil Classification Panel**

*June 28, 2016*

*Bellevue, WA*







# Antitrust Statement

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- **For a complete list of standards see**  
<http://www.astm.org/COMMIT/SUBCOMMIT/D02B0.htm>



# ASTM-HDEOCP Membership

| Oil and Additive Companies |                                      | OEMs |                                    |
|----------------------------|--------------------------------------|------|------------------------------------|
| 1                          | Shawn Whitacre - Chevron             | 1    | Greg Shank – Volvo Power Train     |
| 2                          | Mike Alessi- ExxonMobil              | 2    | Ryan Denton - Cummins Inc.         |
| 3                          | Dan Arcy - Shell                     | 3    | Mesfin Belay - Detroit Diesel      |
| 4                          | Corey Taylor - BP Castrol            | 4    | Hind Abi-Akar - Caterpillar Inc.   |
| 5                          | Josh Frederick - Valvoline           | 5    | Heather DeBaun – Navistar          |
| 6                          | Galen Greene - BASF                  | 6    | Ken Chao - John Deere*             |
| 7                          | David Gray - Evonik                  | 7    | Eric Johnson- GM Powertrain        |
| 8                          | Michael McLaughlin - Afton           | 8    | Jason Andersen- Paccar             |
| 9                          | Robert Stockwell - Oronite           | 9    | Ron Romano - Ford                  |
| 10                         | Gail Evans - Lubrizol                |      |                                    |
| 11                         | Robert Salgueiro - Infineum U.S.A.   |      | *Represented today by Abdul Cassim |
| 12                         | David Taber - Phillips 66 Lubricants |      |                                    |
| 13                         | Rodney Walker, Safety-Kleen          |      |                                    |



# In Memoriam

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**“Pat” Glen Paul Fetterman Jr.**

**1947-2016**

## Availability of API CH-4 through CJ-4 Tests for PC-11

| Test          | Hardware / Test Issues  | Availability Through 2020 | Notes   |
|---------------|---|---------------------------|---|
| Cat 1K/1N     | Auxiliary components  | Likely                    | 1980's vintage engine. Ongoing resolution of issues with auxiliary stand and miscellaneous components.  |
| Cat 1P/1R     | Crankshaft  | Likely                    | 1990's vintage engine. Crankshaft supplier has been identified by Caterpillar.  |
| Cat C13       | New liners – references anticipated Oct 2016                              | Likely                    | Engine block, injectors, turbos only available through reman. New liner material, processing but same specs. Validation, including engine testing by Caterpillar. |
| Cummins ISM   | Upcoming references on new batch crossheads / new batch injector pushrods | Likely                    | ISM engine now produced outside the US. Injector pushrods now 'critical part'. Cummins is looking at backwards-compatible development using ISX.                  |
| Cummins ISB   | No current issues   | Likely                    | 17 engine long blocks at CPD. Large batch of pushrods on order. Several year supply of camshafts at CPD.  |
| Mack T-11     | Oil Consumption   | Likely                    | Engine production ended 2006. Finite / decreasing number of new engine blocks. Engine build life issues with oil consumption.                                     |
| Mack T-12     | Oil Consumption, head gasket  | Likely                    | Engine production ended 2006. Finite / decreasing number of new engine blocks. OC improvement from reduced tolerance liners and piston crowns.                    |
| RFWT          | No current issues   | Likely                    | Long term supply of test parts at CPD. 6.5 L engine no longer in production at AM General, but available through supply network. Injection pump available.        |
| Seq IIIF/IIIG | Hardware depletion Dec 2016   | No                        | Hardware depletion projected Dec 2016. API CLOG TF working on IIIF / IIIH correlation. Discussions in SP about IIIG / IIIH correlation.                           |
| EOAT          | Using last known hardware   | No                        | EOAT oversight transferred to Cat Surveillance Panel. Cat SP requested data for correlation with COAT.  |

June 28, 2016

## Availability of API CH-4 through CJ-4 Tests for PC-11

| Test      | Hardware Issues                              | Availability Through 2020 | Notes   |
|-----------|--|---------------------------|---|
| Cat 1K/1N | Auxiliary components                         | Likely                    | 1980's vintage engine. Ongoing resolution of issues with auxiliary stand and miscellaneous components.  |
| Cat 1P/1R | Crankshaft                                   | Likely                    | 1990's vintage engine. Crankshaft supplier has been identified by Caterpillar.  |
| Cat C13   | New liners – references anticipated Oct 2016 | Likely                    | <p>Engine block, injectors, turbos only available through reman.</p> <p>New liners – updates to material, production, and surface characterization, in part to align with current production liners. Produced to same specs as original C-13 test liners.</p> <p>Proveout testing by Caterpillar.</p> |

June 28, 2016

## Availability of API CH-4 through CJ-4 Tests for PC-11

| Test        | Hardware Issues   | Availability Through 2020 | Notes   |
|-------------|---|---------------------------|---|
| Cummins ISM | Upcoming references on new batch crossheads / new batch injector pushrods | Likely                    | ISM engine produced outside the US.<br>Injector pushrods now 'critical part'.<br>Cummins is looking at backwards-compatible development using ISX platform. |
| Cummins ISB | No current issues   | Likely                    | 17 engine long blocks at CPD.<br>Large batch of pushrods on order.<br>Several year supply of camshafts at CPD.  |

## Availability of API CH-4 through CJ-4 Tests for PC-11

| Test      | Hardware Issues              | Availability Through 2020 | Notes  |
|-----------|------------------------------|---------------------------|--|
| Mack T-11 | Oil Consumption              | Likely                    | <p>Engine production ended 2006. Finite number of engine blocks.</p> <p>Engine build life issues with oil consumption.</p>   |
| Mack T-12 | Oil Consumption, head gasket | Likely                    | <p>Engine production ended 2006.</p> <p>Finite / decreasing number of new engine blocks.</p> <p>Some OC improvement from reduced tolerance liners and piston crowns.</p> |

## Availability of API CH-4 through CJ-4 Tests for PC-11

| Test            | Hardware Issues             | Availability Through 2020 | Notes   |
|-----------------|-----------------------------|---------------------------|---|
| RFWT            | Engine configuration        | Likely                    | <p>Long term supply of test parts at CPD.</p> <p>6.5 L engine no longer in production at AM General, but available through supply network.</p> <p>Injection pump still available.</p> |
| Seq III F/III G | Hardware depletion Dec 2016 | No                        | <p>Hardware depletion projected Dec 2016.</p> <p>API CLOG TF working on III F / III H correlation.</p> <p>Discussions in SP about III G / III H correlation.</p>                      |
| EOAT            | Using last known hardware   | No                        | EOAT oversight transferred to Cat Surveillance Panel. Cat SP requested data for correlation with COAT.  |



# **VOLVO**

## **T13 Mack Surveillance Panel Update**

June 28 2017

# T13 Update

- Face to Face Meeting @ SWRI 5/4/16 – Teleconferences 6/1/16 – 6/9/16
- T-13 Humidity Discussions
- Test data was presented by ExxonMobil & Lubrizol that showed severity differences on controlled versus non controlled humidity
- Panel decided to control humidity on T13 test.
- A 16C dew point was discussed since that is Passenger Car tests target.
- A target a moisture content of 11.4 g/kg was agreed upon - Dew point of 16.1C = 11.4g/kg moisture content
- Qi limit of +/-1 g/kg for moisture content was approved
- Reference testing with humidity control has begun

# T13 ASTM Test Procedure

- One Negative Ballot
  - FTIR Method Questioned
  - Trying to resolve at Wednesday B meeting

# Caterpillar Oil Aeration Test

Hind Abi-Akar

Heavy-Duty Engine Oil Classification Panel Meeting

Bellevue, Washington, June 28, 2015



11/28/2016

## COAT Test Updates

- Test procedure is approved: ASTM D8047
- Test available at three labs, two independent and one dependent
  - One test stand at each
  - Testing and referencing are ongoing
- Face to face meeting in May, SWRI.
- Surveillance panel is in communication with Micromotion supplier
  - Potential for continuous improvement
  - Option for frequent verification of the MM
  - SP is discussing options and will continue working with the supplier.
- Plans to work on correlation between COAT and EOAT

# DAIMLER

DD 13 Scuffing Test Update  
ASTM D02 - June 28th, 2016  
Suzanne Neal

## Daimler Trucks



# DD 13 Scuffing Test Update

| Topic                  | Update  |
|------------------------|---|
| Ballot                 | <p>May/June 2016 → Sub Committee B</p> <ul style="list-style-type: none"><li>• 23 Affirmative</li><li>• 0 Negatives</li><li>• 16 Abstain</li><li>• 84.76 % Ballot Returns</li></ul> <p>August 2016 → Ballot will go to the Main D02 Committee</p> |
| Stand Referencing      | Labs are currently working to reference new stands.   |
| New Hardware Reference | Labs are currently referencing stands on new hardware.  |
| Next Meeting           | Phone Conference: July 11 <sup>th</sup> , 2016 11:00 AM – 1:00 PM   |

# Update from Elastomers SP to HDEOCP on EOEC Reference Oil (Oil 1006)

June 28, 2016  
Bellevue, WA



# Background

- Oil 1006 is an industry (API SJ) reference oil which is severe for seals performance
- Oil 1006 has multiple purposes:
  - The only reference oil for EOEC and LDEOC testing
    - Testing used to set some limits for HD specifications
  - A reference oil for the Seq IV, Seq V, and Seq VIII tests
  - Sold as Service Fluid 105 to outside parties for seals evaluation
- Inventory of Oil 1006-1 was depleted at TMC earlier this year with the second batch, Oil 1006-2, introduced as the replacement in EOEC/LDEOC testing
  - RR tests indicate current limits should be acceptable with 1006-2
- Supplier has stated that additional volume of Oil 1006 cannot be produced, so Oil 1006-2 is the last batch of Oil 1006

## Replacement for 1006-2

- Current inventory of Oil 1006-2 is about 2500 gallons
- Lifetime for Oil 1006-2 is conservatively estimated at 18 months (YE 2017)
  - Lifetime is shorter than calculated in B01 semiannual report as report does not account for sales of SF 105
- Timeline is driven by the multiple usages of Oil 1006 as well the amount of testing needed to develop statistics for a new reference oil
  - A minimum of 10 tests/elastomer are necessary for baseline statistics with more tests likely needed to account for lab to lab differences currently seen in the test monitoring

# Request for Support in Reference Oil Development

- Elastomers SP is requesting support from HDEOCP in developing a new EOEC reference oil
  - particularly if limits will remain based on EOEC monitoring
- Critical decision from HDEOCP is how specifications will be adjusted with the depletion of Oil 1006
  - Potential scenarios are development of a new reference oil with similar performance as Oil 1006 or development of hard limits
- Depending on this decision, the Elastomers SP may look to the HDEOCP to take the lead in the reference oil development

## (Back-Up) Request for Reference Oil Candidates

- The Elastomers SP is requesting candidate submissions from HDEOCP
- Considerations for new reference oil candidate:
  - Similar performance as Oil 1006 favored, but not a requirement
  - Supply of roughly 6 drums of oil per year for at least five years
  - Current/future HD technology
    - Potential for use of new reference oils from HD engine tests
- Potential suppliers should contact Mike Birke (Elastomers SP chair) or TMC