



CODE BULLETIN C-49

American Chemistry Council Product Approval Code of Practice December 2010 Edition

To: Practitioners of the American Chemistry Council
Product Approval Code of Practice Interested Parties

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Effective

Date: April 25, 2016

Re: Appendix F Revision- Defining MTEP for the Caterpillar engine Oil Aeration Test (COAT), Mack T-12, and Volvo T-13
Product Approval Code of Practice – December 2010 Edition

The American Chemistry Council's (ACC) Product Approval Protocol Task Group (PAPTG) reached consensus to revise Appendix F for the purpose of defining Multiple Test Evaluation Procedures (MTEP) for the Caterpillar engine Oil Aeration Test (COAT), Mack T-12, and Volvo T-13 engine tests. Existing text and proposed edits to Appendix F are provided below.

Existing Text on Page F-6 through F-7

Mack T-8E	TLM TLM	Viscosity Increase at 3.8% soot (cSt) Relative Viscosity at 4.8% soot (unitless number)
Mack T-11	TLM	TGA % Soot @ 4.0 cSt increase @ 100° C TGA % Soot @ 12.0 cSt increase @ 100° C TGA % Soot @ 15.0 cSt increase @ 100° C

Notes:

- 1) Units for parameters in italics are transformed. See next section for specific transformations.
- 2) The majority of retained tests must not have ring sticking (hot stuck).
- 3) The majority of retained tests must not have compression ring sticking (hot stuck).
- 4) None of the retained tests may have piston ring sticking.
- 5) If three or more operationally valid tests have been run, the majority of these tests must not have scuffing. Any scuffed tests are considered non-interpretable, and no data from these tests are to be used in MTEP calculations.



- 6) Two methods of calculating WTD are used, one for API Category CF and a different one for API Category CF-2. Both methods use MTAC for handling test results.
- 7) None of the retained tests may have piston, ring or liner scuffing.
- 8) The parameters used in calculating the Merit Rating value are shown.

List of Transformations of Rated Parameters

<u>Test</u>	<u>Parameter</u>	<u>Transformation</u>
Sequence IIIF	Viscosity, % Increase	1/square root of the % increase at 80 hours
Sequence IIIFHD	Viscosity, % Increase	LN (PVISH060)
Sequence IIIG	Viscosity, % Increase Avg. cam plus lifter wear	LN (PVISH100) LN (ACLW)
Sequence VG	Oil Screen Clogging	LN (oil screen clogging +1)
Caterpillar 1K	Top Land Heavy Carbon	LN (TLHC + 1)
Caterpillar 1N	Top Land Heavy Carbon	LN (TLHC + 1)
Caterpillar 1P	Average Oil Consumption Final Oil Consumption	LN (AOC) LN (FOC)
Caterpillar C13	Delta Oil Consumption (g/h) Second Ring Top Carbon	Square root (Delta OC) LN(R2TC)
Mack T-12	Delta Pb @ EOT Delta Pb 250 to 300 hours Oil Consumption	LN (DPbEOT) LN (DPb250300) LN (OC)
Cummins ISM	Oil Filter Pressure Delta	LN (OFDP)

Proposed Text on Page F-6 through F-7

Mack T-12	Delta Pb @ EOT Delta Pb 250 to 300 hours Oil Consumption	LN (DPbEOT) LN (DPb250300) LN (OC)
Mack T-12 (note 9)	TLM	Liner Wear, µm Top Ring Mass Loss, mg Lead Content at EOT, mg/kg
Mack T-12 (note 10)	MRS	Cylinder Liner Wear, µm Top Ring Mass Loss, mg Delta Lead, Final, mg/kg



		Delta Lead (250-300h), mg/kg Oil Consumption, g/h
Mack T-12 (note 11)	MTAC (note 12)	Top Ring Mass Loss, mg Cylinder Liner Wear, μm
Volvo T-13	TLM	IR Peak at EOT, Abs., cm^{-1} Kinematic Viscosity Increase at 40°C, %
COAT	MTAC (note 12)	Average Aeration, 40h to 50h, %

Notes:

- 1) Units for parameters in italics are transformed. See next section for specific transformations.
- 2) The majority of retained tests must not have ring sticking (hot stuck).
- 3) The majority of retained tests must not have compression ring sticking (hot stuck).
- 4) None of the retained tests may have piston ring sticking.
- 5) If three or more operationally valid tests have been run, the majority of these tests must not have scuffing. Any scuffed tests are considered non-interpretable, and no data from these tests are to be used in MTEP calculations.
- 6) Two methods of calculating WTD are used, one for API Category CF and a different one for API Category CF-2. Both methods use MTAC for handling test results.
- 7) None of the retained tests may have piston, ring or liner scuffing.
- 8) The parameters used in calculating the Merit Rating value are shown.
- 9) This TLM applies to Mack T-12 used in API Category CH-4.
- 10) This MRS applies to Mack T-12 used in API Category CI-4 and CJ-4.
- 11) This MTAC applies to Mack T-12 used in API Category CK-4 and FA-4.
- 12) The MTAC provision to discard any valid test result is not applicable (See Appendix F, pg. F-3, Three or More Tests, Number 2).

List of Transformations of Rated Parameters

<u>Test</u>	<u>Parameter</u>	<u>Transformation</u>
Sequence IIIF	Viscosity, % Increase	1/square root of the % increase at 80 hours
Sequence IIIFHD	Viscosity, % Increase	LN (PVISH060)
Sequence IIIG	Viscosity, % Increase Avg. cam plus lifter wear	LN (PVISH100) LN (ACLW)
Sequence VG	Oil Screen Clogging	LN (oil screen clogging +1)
Caterpillar 1K	Top Land Heavy Carbon	LN (TLHC + 1)
Caterpillar 1N	Top Land Heavy Carbon	LN (TLHC + 1)
Caterpillar 1P	Average Oil Consumption Final Oil Consumption	LN (AOC) LN (FOC)
Caterpillar C13	Delta Oil Consumption (g/h) Second Ring Top Carbon	Square root (Delta OC) LN(R2TC)



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Mack T-12	Delta Pb @ EOT Delta Pb 250 to 300 hours Oil Consumption	LN (DPbEOT) LN (DPb250300) LN (OC)
Cummins ISM	Oil Filter Pressure Delta	LN (OFDP)
Volvo T-13	Kinematic Viscosity Increase at 40°C	Square root (KV40)

The Code is available online at <http://www.americanchemistry.com/paptg>. Comments to this Code Bulletin (C-49) should be sent to the PAPTG Manager [W.D. \(Doug\) Anderson](#) prior to April 25, 2016.

