A Program of ASTM International

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1P Information Letter No. 13-1
Sequence No. 9
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ASTM consensus has not yet been obtained on this information letter. An appropriate ASTM ballot will be issued in order to achieve such consensus.

TO: Single Cylinder Diesel Mailing List

SUBJECT: Corrected References for Rating Manuals and Workshop

As approved by the unanimous email ballot, the references to rating manuals and workshops have been updated to reflect the current nomenclature. Section 2.4 has been added and Sections 7.2, 7.3, 9.10.2, 10.15, 11.7.2.1, 11.7.3, A13.1, A13.2, A13.3.1 and A13.4.3.1 have been updated to reference the ASTM Deposit Rating Manual 20 and ASTM Heavy Duty Rating Workshop and are attached.

The attached changes to Test Method D6681 are effective with the issue date of this letter.

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Attachment

c: ftp://ftp.astmtmc.cmu.edu/docs/diesel/scote/procedure_and_ils/1p/il13-01.pdf

Distribution: Email

(Revises Test Method D6681-10a as amended by Information Letter 12-01)

2.4 OtherASTM Documents[5]
ASTM Deposit Rating Manual 20 (Formerly CRC Manual 20)

7.2 *Diesel Piston Rating Booth*, as described by ASTM Deposit Rating Manual 20.[18]
7.3 *Diesel Piston Rating Lamp*, as described by ASTM Deposit Rating Manual 20.

9.10.2 Measure the ring side clearances and ring end gaps for all three rings (see Fig. A10.2 and Table A10.1). Keystone ring side clearance measurements require the ring to be confined in a dedicated slotted liner (see Appendix X1) or a ring gage[9,13] 137.16 mm in diameter. Measure the side clearances using four feeler gages of equal width and thickness of 0.01 mm at intervals of 90° around the piston. Measure the rectangular ring side clearance this way as well. Measure the minimum side clearance as specified in ASTM Deposit Rating Manual 20.

10.15 *Calibration of Piston Deposit Raters*—Each calendar year, each facility shall send at least one Heavy Duty Diesel Piston Rater to the ASTM Heavy Duty Rating Workshop held every Fall. Each rater shall rate a minimum of six diesel pistons. If this schedule is not suitable to a particular rater or test laboratory, then make alternative arrangements as soon as possible to have the rater calibrated.

11.7.2.1 Process and measure the piston deposits according to the Modified Diesel Piston Rating Method described in ASTM Deposit Rating Manual 20 modified by the directions listed in Annex A13. Rate only two levels of carbon (heavy and light) on the second groove and all lands, and only one level of carbon (light) for the under-crown and cooling groove. Use a combined varnish rating method for the third groove, third land, fourth land, under-crown, and cooling groove (see Annex A13). An example rating worksheet is shown in Appendix X1.

11.7.3 *Referee Ratings*—The referee laboratory rates the entire piston. Wrap all pistons to be referee-rated in paper with ASTM desiccant chips. Then place them in plastic and seal before shipping to the referee laboratory. Report referee ratings to the TMC within ten days of EOT for calibration tests. Referee-rate piston deposits for all non-reference tests reviewed by Caterpillar.

A13. PISTON AND LINER RATING MODIFICATIONS

A13.1 The 1P piston deposits are accessed using the Modified Diesel Piston Rating Method described in ASTM Deposit Rating Manual 20. Three levels of carbon (heavy, medium, and light) are rated for grooves one and three. Only two levels of carbon (heavy and light) are rated for the second groove and all lands, and only one level of carbon (light) is rated for the cooling gallery and under-crown. The carbon deposit factors are 1.00 for heavy, 0.5 for medium, and 0.25 for light carbon. The varnish merit values range from 1.0 to 10 using the ASTM Rust/Varnish Rating Scale where 10 is clean and 1.0 is maximum intensity. The merit varnish values are converted to demerit values resulting in deposit factors that range from 0 for clean to 9.0 for maximum intensity. The merit varnish values are converted to demerit values using Eq. A13.1:

$$\text{Demerit Varnish Zonal Rating} = \text{Area } \% \times (10 - \text{Merit Rating}) \quad \text{(A13.1)}$$

A13.2 The rating location factors were chosen to yield separation between low and high calibration oils. All required rating equipment, such as the rating booth and particular lamp used, are described in ASTM Deposit Rating Manual 20.

A13.3.1 Rate the piston as is normally done according to the Modified Diesel Piston Rating Method described in ASTM Deposit Rating Manual 20.

A13.4.3.1 *Rating Environment*—Rate liners in the ASTM rating booth with the same light as specified to rate pistons or a two-bulb fluorescent desk lamp.

[18] For STOCK# TMCMNL20, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org.