



## Test Monitoring Center

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High Temperature Cyclic Durability Information Letter 05-2  
Sequence No. 13  
May 4, 2005

***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: High Temperature Cyclic Durability Mailing List

SUBJECT: 1. Surveillance Panel Use of Donated Reference Oil Test Programs  
2. Guidelines for Shortening or Lengthening Reference Oil Calibration Periods  
3. Updated Test Precision  
4. Rounding Test Results Using ASTM E 29  
5. Piston, High Low Range Shift Outside Diameter Specification  
6. Company Name Change

1. On November 8, 2004, ASTM Subcommittee D02.B approved a recommendation from the Test Monitoring Board to revise test methods monitored by the Test Monitoring Center regarding surveillance panel use of donated reference oil test programs. This revision provides consistent language for the procedures and clarification to the end users. A new Section 10.6 of Test Method D5579 is attached.

2. On November 8, 2004, ASTM Subcommittee D02.B approved a recommendation from the Test Monitoring Board to revise test methods monitored by the Test Monitoring Center regarding the shortening or lengthening of reference oil calibration periods. This revision provides consistent language for the procedures and clarification to the end users. New Sections 10.3.1, 10.3.1.1, 10.3.1.2, 10.3.1.3, and 10.3.1.4 of Test Method D5579 are attached.

3. At the April 6, 2005 HTCT Surveillance Panel meeting, the panel approved a motion to update the reference oil test precision data. A revised Table 4 of Test Method D5579 is attached. The old Section 14.1 and footnote 8 has been deleted. New Sections 14.1, 14.1.1, 14.1.2, 14.1.2.1, 14.1.3, 14.1.3.1, and a new Note 3 of Test Method D5579 are attached.

4. At the April 6, 2005 HTCT Surveillance Panel meeting, the panel approved a motion to use ASTM E 29 for all test result rounding. A revised Section 2.1 and a new Section 12.4 of Test Method D5579 are attached.

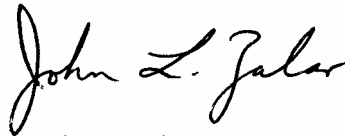
5. At the April 6, 2005 HTCT Surveillance Panel meeting, the panel approved a motion to add the outside diameter specification for the high low range shift piston to Test Method D5579. A new footnote 8 has been added to Table 3.

6. Mack Trucks, Inc. has been changed to Volvo Powertrain, North America. A revised footnote 6 of D 5579 is attached.

These changes are effective the date of this information letter.



Brian Koehler  
Chairman  
HTCT Surveillance Panel



John L. Zalar  
Administrator  
ASTM Test Monitoring Center

Attachment

c: [ftp://ftp.astmtmc.cmu.edu/docs/gear/htct/procedure\\_and\\_ils/il05-2.pdf](ftp://ftp.astmtmc.cmu.edu/docs/gear/htct/procedure_and_ils/il05-2.pdf)

Distribution: Email

(Revises Test Method D 5579-04 as amended by Information Letters 04-1 through 05-1)

## 2.1 *ASTM Standards:*<sup>3</sup>

D 235 Specification for Mineral Spirits (Petroleum Spirits) (Hydrocarbon Dry Cleaning Solvent)

E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

10.3.1 Reference oil test frequency may be adjusted due to the following reasons:

10.3.1.1 *Procedural Deviations* – On occasions when a laboratory becomes aware of a significant deviation from the test method, such as might arise during an in-house review or a TMC inspection, the laboratory and the TMC shall agree on an appropriate course of action to remedy the deviation. This action may include the shortening of existing reference oil calibration periods.

10.3.1.2 *Parts and Fuel Shortages* – Under special circumstances, such as industry-wide parts or fuel shortages, the surveillance panel may direct the TMC to extend the time intervals between reference oil tests. These extensions shall not exceed one regular calibration period.

10.3.1.3 *Reference Oil Test Data Flow* – To ensure continuous severity and precision monitoring, calibration tests are conducted periodically throughout the year. There may be occasions when laboratories conduct a large portion of calibration tests in a short period of time. This could result in an unacceptably large time frame when very few calibration tests are conducted. The TMC can shorten or extend calibration periods as needed to provide a consistent flow of reference oil test data. Adjustments to calibration periods are made such that laboratories incur no net loss (or gain) in calibration status.

10.3.1.4 *Special Use of the Reference Oil Calibration System* – The surveillance panel has the option to use the reference oil system to evaluate changes that have potential impact on test severity and precision. This option is only taken when a program of donated tests is not feasible. The surveillance panel and the TMC shall develop a detailed plan for the test program. This plan requires all reference oil tests in the program to be completed as close to the same time as possible, so that no laboratory/stand calibration is left in an excessively long pending status. In order to maintain the integrity of the reference oil monitoring system, each reference oil test is conducted so as to be interpretable for stand calibration. To facilitate the required test scheduling, the surveillance panel may direct the TMC to lengthen and shorten reference oil calibration periods within laboratories such that the laboratories incur no net loss (or gain) in calibration status.

10.6 *Donated Reference Oil Test Programs* – The Surveillance Panel is charged with maintaining effective reference oil test severity and precision monitoring. During times of new parts introductions, new or re-blended reference oil additions, and procedural revisions, it may be necessary to evaluate the possible effects on severity and precision levels. The surveillance panel may choose to conduct a program of donated reference oil tests in those laboratories participating in the monitoring system, in order to quantify the effect of a particular change on severity and precision. Typically, the surveillance panel requests its panel members to volunteer enough reference oil test results to create a robust data set. Broad laboratory participation is needed to provide a representative sampling of the industry. To ensure the quality of the data obtained, donated tests are conducted on calibrated test stands. The surveillance panel shall arrange an appropriate number of donated tests and ensure completion of the test program in a timely manner.

(Revises Test Method D 5579-04 as amended by Information Letters 04-1 through 05-1)

12.4 Round test results according to Practice E 29.

**Delete Old Sections 14.1, 14.2, 14.3, and 14.4.**

**Renumber Section 14.5 to 14.2**

14.1 *Test Precision-Reference Oils:*

14.1.1 Test precision is established on the basis of operationally valid reference oil test results monitored by the TMC. The data are reviewed annually by the HTCT Surveillance Panel. Contact the ASTM TMC for current industry data.

14.1.2 *Intermediate Precision Conditions*-Conditions where test results are obtained with the same test method using the same oil, with changing conditions such as operators, measuring equipment, test stands, test engines and time.

Note 3-Intermediate precision is the appropriate term for this test method rather than repeatability, which defines more rigorous within-laboratory conditions.

14.1.2.1 *Intermediate Precision Limit (i.p.)*—The difference between two results obtained under intermediate precision conditions that would, in the long run, in the normal and correct conduct of the test method, exceed the values shown in Table 1 in only one case in twenty. When only a single test result is available, the Intermediate Precision Limit can be used to calculate a range (test result  $\pm$  Intermediate Precision Limit) outside of which a second test result would be expected to fall about one time in twenty.

14.1.3 *Reproducibility Conditions*-Conditions where test results are obtained with the same test method using the same test oil in different laboratories with different operators using different equipment.

14.1.3.1 *Reproducibility Limit (R)*—The difference between two results obtained under reproducibility conditions that would, in the long run, in the normal and correct conduct of the test method, exceed the values shown in Table 1 in only one case in twenty. When only a single test result is available, the Reproducibility Limit can be used to calculate a range (test result  $\pm$  Reproducibility Limit) outside of which a second test result would be expected to fall about one time in twenty.

**TABLE 3 Part Numbers for Approved Configurations**

Part description	Test Hardware Configuration	
	Configuration 1	Configuration 2
Synchronizer clutch assembly	320KB450C	320KB459A
Synchronizer pin (3 each)	301KC240B	301KC33
Synchronizer pin (3 each)	301KC241B	301KC34
Synchronizer pin (3 each)	48AX17	301KC35
Synchronizer pre-load spring (3 each)	107KD244	107KD247
High range mainshaft gear	751KB489	751KB4123
Low range mainshaft hub	84KC42	84KC47
Compound mainshaft, rear	601KC429	601KC432
Bearing, compound mainshaft	None required	46AX538
Thrust washers, mainshaft (2 each)	223KD316A	None required
Snap ring (2 each)	97AX151 or 97AX171	97AX151 or 97AX171
Snap ring (2 each)	97AX267	97AX267
Shift rail	591KC3154A	591KC3154A
O-ring, low range shift piston	56AX560	56AX560
Piston, high low range shift <sup>A</sup>	336KC318	336KC318
Cylinder housing, hi-lo shift piston	55KC46A	55KC46A
O-ring, compound shift piston	None required	None required
O-ring, range high low shift piston	56AX588	56AX588
Countershaft gear, front	757KB3322	757KB3322
	757KB4108	757KB4108
Countershaft gear, rear	757KB4106	757KB4106
	757KB440A	
Range shift valve	216KD123	216KD42

<sup>A</sup> The piston, high low range shift, has an outside diameter of 3.740 to 3.738 in.(95.00 to 94.95 mm).

### Delete Footnote 8

**Table 4 Reference Oil Precision <sup>A</sup>**

Variable	Intermediate Precision		Reproducibility	
	S <sub>i.p.</sub> <sup>B</sup>	i.p. <sup>C</sup>	S <sub>R</sub> <sup>B</sup>	R <sup>C</sup>
Cycles to Fail	9131	25567	9131	25567

<sup>A</sup> These statistics are based on results obtained on TMC Reference Oils 151-2 and 151-3 with Configuration 2 hardware over the period January 25, 1999 through March 19, 2005

<sup>B</sup> S = standard deviation

<sup>C</sup> This value is obtained by multiplying the standard deviation by 2.8

<sup>6</sup> Available from Volvo Powertrain, North America 13302 Pennsylvania Ave, Hagerstown, MD 21742