A Program of ASTM International

Test Monitoring Center

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Sequence VIII Information Letter 14-3
Sequence No. 17
November 11, 2014

TO: Sequence VIII Mailing List

SUBJECT: Standardized wording describing the role of the TMC

At a June 23, 2014 meeting, ASTM Section D02.B0.10 on Standards Acceleration approved standardized wording describing the role of the Test Monitoring Center. Subcommittee B has requested that the TMC incorporate this wording into all test methods through the information letter system.

These changes are effective with the issuance of this letter.

Fred Gerhart
Chairman,
Sequence VIII Surveillance Panel

Frank M. Farber
Director
ASTM Test Monitoring Center

Attachment

c: ftp://ftp.astmtmc.cmu.edu/docs/gas/sequenceviii/procedure_and_ils/il14-3-17.pdf

Distribution: Email

(Revises Test Method D6709-14 as amended by Information Letter 14-1 and 14-2)

The following Table summarizes the renumbering of Annexes.

Current Annex Description	Current Annex Number	New Annex Number
Measurement of Connecting Rod Bearing Clearance and Journal Taper	Annex A1	Annex A5
Measurement of Main Bearing Clearance	Annex A2	Annex A6
The ASTM Test Monitoring Center Calibration Program	Annex A3	Deleted replaced with A1-A4
Measurement of Piston-to-Sleeve Clearance	Annex A4	Annex A7
Control Chart Technique for a Laboratory's Severity Adjustment (SA)	Annex A5	Annex A8
Recommended New Liner Honing Procedure	Annex A6	Annex A9
Sequence VIII Oil Priming Procedure	Annex A7	Annex A10
Alternative Crankcase Breather Configuration	Annex A8	Annex A11
Connecting Rod Bearing Cleaning Procedure	Annex A9	Annex A12
Electronic Ignition Conversion	Annex A10	Annex A13
System Response Procedure	Annex A11	Annex A14
Air-Fuel Ratio Measurement	Annex A12	Annex A15
Lead Decontamination Procedure	Annex A13	Annex A16
Stay-in-Grade Oil Analysis Procedure	Annex A14	Annex A17
Crankshaft Rear Seal Conditioning	Annex A15	Annex A18
Report Forms and Data Dictionary	Annex A16	Annex A19
Test Fuel Specification	Annex A17	Annex A20

Revised introduction section to address additional TMC description items

INTRODUCTION

This test method is written for use by laboratories that utilize the portions of the test method that refer to ASTM Test Monitoring Center (TMC) services (see Annex A1). Laboratories that choose not to use the TMC services may simply disregard these portions.

The TMC provides reference oils, and engineering and statistical services to laboratories that desire to produce test results that are statistically similar to those produced by laboratories previously calibrated by the TMC.

In general, the Test Purchaser decides if a calibrated test stand is to be used. An organization such as the American Chemistry Council require that a laboratory use the TMC services as part of their test registration process. In addition, the American Petroleum Institute requires that a laboratory utilize the TMC services in seeking qualification of oil against its specifications.

Added new note one

Note 1--The advantage of using the TMC services to calibrate test stands is that the test laboratory (and hence the Test Purchaser) has an assurance that the test stand was operating at the proper level of test

severity. It should also be borne in mind that results obtained in a non calibrated test stand may not be the same as those obtained in a test stand participating in the ASTM TMC services process.

3.2.19 *stay-in-grade (stripped viscosity), n*—the viscosity of the test oil after removal of volatile components and solids, according to the procedure shown in Annex A17.

6.2.2.3 When a closed loop automated control system is employed, use a Badger meter research control valve, Model No. 1002-GCN36-SVCSC-LN36,[13,8] (see Note 2) to control the rocker cover air flow. When using a manual control system instead of the automated system, install a Swagelok 3⁄8-in. metering valve, Part No. SS-6L,[14] to control the air flow into the rocker cover.

NOTE 2—The letter prior to the last dash in the model number defines the trim size. Use the trim that gives the best system control.

6.2.2.5 Construct the off-gas breather[14] as shown in Fig. 4 using American Standard Schedule 40, or equivalent, non-galvanized pipe fittings. Apply sealant to the threads during assembly. Install the breather in the breather port of the oil gallery side cover (see Fig.5) of the engine power section. Fig A11.1 shows freeze plug detail in an alternative configuration to that in Fig. 4.

6.2.7 *Ignition System*—An electronic ignition system is required. The required system is illustrated in Figs. A13.1-A13.10. The TMC and the Sequence VIII Surveillance Panel review and approve other electronic ignition system configurations prior to use.

6.3.3.1 *Calibrated Electronic Exhaust Gas Analyzer*—Use sample gases for the calibration. Follow the directions in Annex A15 to determine air-fuel ratio.

7.4 *Test Fuel*—Use Haltermann Products KA24E Test Fuel.[29,8] See Annex A20 for the specification for KA24E Test Fuel. (**Warning—**Flammable. Health hazard.)

9.4 Reconditioning of Power Section After Each Test— Recondition a previously used power section before the start of a new test. Decontaminate power sections previously used with leaded fuel using the procedure shown in Annex A16 before use. Follow the parts replacement and cleaning procedures described in the following sections.

9.4.1 *New Parts*—Use the following new parts:

9.4.1.1 Piston and piston ring assembly,

NOTE 3—A used piston may be reused if it meets the requirements of 6.1.4.1 and the original piston pin is retained.

9.4.5Piston-to-Sleeve—Determine the piston-to-sleeve clearance in accordance with the procedure given in Annex A7.

9.4.6 Crankshaft Rear Seal Surface Conditioning—Control of oil and air leakage at the crankshaft rear seal may be improved if the crankshaft rear seal surface is conditioned prior to each test in accordance with the recommendations of Annex A18.

9.4.7.8 Determine the connecting rod bearing clearance and journal taper according to the procedure given in Annex A5, or an equivalent method approved by the TMC, prior to the initial weighing of the bearing halves. Perform the connecting rod clearances prior to the initial weighing of the bearing halves.

9.4.7.9 Determine the main bearing clearance according to the procedure given in Annex A5 or an equivalent method approved by the TMC. Perform the connecting rod clearance measurements prior to the initial weighing of the bearing halves.

NOTE 4—The ASTM Test Monitoring Center Calibration Program (Annexes A1 – A4) dictates specific procedures which involve coordination with the TMC in order to obtain calibration status of a test power section and a test stand. The information given in the following sections provides a summary of the calibration process required.

Existing section 10.1.1 deleted, renumber existing sections 10.1.2 through 10.1.4 as 10.1.1 through 10.1.3.

11.1.1 Charge the power section with 2840 mL of fresh test oil. Record the date and time that the oil is poured into the engine. These are considered the test start date/time. Prior to starting the engine and any restarts during the 4 h run-in, perform the oil priming procedure in Annex A10.

11.1.3 Operate the power section according to the schedule in Table 1 for 4 h. Maintain the oil gallery temperature no higher than 107.0 °C, the oil gallery pressure at (280 6 10) kPa, and the jacket outlet temperature no higher than 93.5 °C. Record data at least hourly using a form of the type shown in Fig. X2.1.

11.1.6 Charge the power section with 1660 mL of fresh test oil. Prior to starting the engine and any restarts during the 0.5 h flush, perform the oil priming procedure in Annex A10.

11.1.7 Flush the power section under the following operating conditions for 0.5 h: (3150 6 25) r/min, (3.73 6 0.15) kW, spark advance (35 6 1)° before top dead center (BTDC), maximum oil gallery temperature 107.0 °C, maximum water jacket outlet temperature 93.5 °C, and oil gallery pressure (280 6 10) kPa. Do not energize the oil heater during this period. Record the operational data prior to shutdown using forms of the type shown in Figs. X2.1 and X2.2.

11.2.2 *Warm-up Schedule*—Charge the power section with 1660 mL of fresh test oil. Prior to starting the engine and any restart during the test of 40 h, perform the oil priming procedure in Annex A10. Start the engine and bring engine speed up to 3150 r/min. Follow the schedule in Table 3. When restarting the power section after any unscheduled or emergency shut downs, start the warm-up at the oil gallery temperature recorded when the engine is restarted and adjust the heater wattage or temperature set point, in accordance with Table 3. For example, if the oil gallery temperature when the engine is restarted is 123.9 °C, set the warm-up condition at 1900 W or 132.2 °C for 10 min as shown in Table 3. The warm-up shall proceed from this point and continue with the required steps in Table 3.

11.3 *Air-Fuel Ratio and Spark Advance*—Record and adjust, if necessary, the air-fuel ratio and spark advance at (1, 10, 20 and 30) h. This is the minimum requirement. Additional readings are permitted. When determining the air-fuel ratio using the exhaust gas analysis measured by the calibrated electronic method, utilize Table A15.1.

11.7.1 Record, using the data log sheet shown in X2.2,the following data hourly:

NOTE 5—T_i is assumed to be no less than the recorded-data-acquisition frequency unless supplemental readings are documented.

12.1.2 Determine the viscosity stability of a multiviscosity-graded oil by measuring the stripped viscosity of a sample of used oil taken at 10 h. See Annex A17 for the specified measurement method.

12.2 *Test Bearing Weight Loss Determination*—Record, in milligrams, the weights of the top and bottom connecting rod test bearing halves within 4 h of conclusion of the test. If this determination is delayed longer than 4 h, the test is invalid. Clean each test bearing half, as described in Annex A12, before weighing. Determine the weight loss of the bearing to the nearest 0.1 mg by subtracting from the initial weights recorded prior to power section run-in.

12.2.1 If applicable adjust the total bearing weight loss, according to the procedure in Annex A8. Record the severity adjustments (SA) in the test report (see Annex A19).

13.2 Use Forms 1, 2, 4, 5, 6, 7, and 8 (see Annex A19) for initial transmission of reference oil test results to the TMC.

ANNEXES
(Mandatory Information)

A1.1 *Nature and Functions of the ASTM Test Monitoring Center (TMC)*—The TMC is a non-profit organization located in Pittsburgh, Pennsylvania and is staffed to: administer engineering studies; conduct laboratory inspections; perform statistical analyses of reference oil test data; blend, store, and ship reference oils; and provide the associated administrative functions to maintain the referencing calibration program for various lubricant tests as directed by ASTM Subcommittee D02.B0 and the ASTM Executive

Committee. The TMC coordinates its activities with the test sponsors, the test developers, the surveillance panels, and the testing laboratories. Contact TMC through the TMC Director at:

ASTM Test Monitoring Center
6555 Penn Avenue
Pittsburgh, PA 15206-4489
www.astmtmc.cmu.edu

A1.2 *Rules of Operation of the ASTM TMC*—The TMC operates in accordance with the ASTM Charter, the ASTM Bylaws, the Regulations Governing ASTM Technical Committees, the Bylaws Governing ASTM Committee D02, and the Rules and Regulations Governing the ASTM Test Monitoring System.

A1.3 *Management of the ASTM TMC*—The management of the Test Monitoring System is vested in the Executive Committee elected by Subcommittee D02.B0. The Executive Committee selects the TMC Director who is responsible for directing the activities of the TMC.

A1.4 *Operating Income of the ASTM TMC*—The TMC operating income is obtained from fees levied on the reference oils supplied and on the calibration tests conducted. Fee schedules are established by the Executive Committee and reviewed by Subcommittee D02.B0.

A2. ASTM TEST MONITORING CENTER: CALIBRATION PROCEDURES

A2.1 *Reference Oils*—These oils are formulated or selected to represent specific chemical, or performance levels, or both. They are usually supplied directly to a testing laboratory under code numbers to ensure that the laboratory is not influenced by prior knowledge of acceptable results in assessing test results. The TMC determines the specific reference oil the laboratory shall test.

A2.1.1 *Reference Oil Data Reporting* – Test laboratories that receive reference oils for stand calibration shall submit data to the TMC on every sample of reference oil they receive. If a shipment contains any missing or damaged samples, the laboratory shall notify the TMC immediately.

A2.2 *Calibration Testing:*

A2.2.1 Full-scale calibration testing shall be conducted at regular intervals. These full-scale tests are conducted using coded reference oils supplied by the TMC. It is a laboratory's responsibility to keep the on-site reference oil inventory at or above the minimum level specified by the TMC test engineers.

A2.2.2 *Test Stands Used for Non-Standard Tests*—If a non-standard test is conducted on a previously calibrated test stand, the laboratory shall conduct a reference oil test on that stand to demonstrate that it continues to be calibrated, prior to running standard tests.

A2.3 *Reference Oil Storage*—Store reference oils under cover in locations where the ambient temperature is between -10 °C and +50 °C.

A2.4 *Analysis of Reference Oil*—Unless specifically authorized by the TMC, do not analyze TMC reference oils, either physically or chemically. Do not resell ASTM reference oils or supply them to other laboratories without the approval of the TMC. The reference oils are supplied only for the intended purpose of obtaining calibration under the ASTM Test Monitoring System. Any unauthorized use is strictly forbidden. The testing laboratory tacitly agrees to use the TMC reference oils exclusively in accordance with the TMC's published Policies for Use and Analysis of ASTM Reference Oils, and to run and report the reference oil test results according to TMC guidelines. Additional policies for the use and analysis of ASTM Reference Oils are available from the TMC.

A2.5 *Conducting a Reference Oil Test*—When laboratory personnel are ready to run a reference calibration test, they shall request an oil code via the TMC website.

A2.6 *Reporting Reference Oil Test Results*—Upon completion of the reference oil test, the test laboratory transmits the data electronically to the TMC, as described in Section 13. The TMC reviews the data and contacts the laboratory engineer to report the laboratory's calibration status. All reference oil test results, whether aborted, invalidated, or successfully completed, shall be reported to the TMC.

A2.6.1 All deviations from the specified test method shall be reported.

A3. ASTM TEST MONITORING CENTER: MAINTENANCE ACTIVITIES

A3.1 *Special Reference Oil Tests*—To ensure continuous severity and precision monitoring, calibration tests are conducted periodically throughout the year. Occasionally, the majority or even all of the industry's test stands will conduct calibration tests at roughly the same 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.

A3.2 *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 status is left pending for an excessive length of time. 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. To ensure accurate stand, or laboratory, or both severity assessments, conduct non-reference oil tests the same as reference oil tests.

A3.3 *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.

A3.4 *Intervals Between Reference Oil Tests*—Under special circumstances, such as extended downtime caused by industry-wide parts or fuel shortages, the TMC may extend the intervals between reference oil tests.

A3.5 *Introducing New Reference Oils*—Reference oils produce various results. When new reference oils are selected, participating laboratories will be requested to conduct their share of tests to enable the TMC to recommend industry test targets. ASTM surveillance panels require a minimum number of tests to establish the industry test targets for new reference oils.

A3.6 *TMC Information Letters*—Occasionally it is necessary to revise the test method, and notify the test laboratories of the change, prior to consideration of the revision by Subcommittee D02.B0. In such a case, the TMC issues an Information Letter. Information Letters are balloted semi-annually by Subcommittee D02.B0, and subsequently by D02. By this means, the Society due process procedures are applied to these Information Letters.

A3.6.1 *Issuing Authority*—The authority to issue an Information Letter differs according to its nature. In the case of an Information Letter concerning a part number change which does not affect test results, the TMC is authorized to issue such a letter. Long-term studies by the surveillance panel to improve the test procedure through improved operation and hardware control may result in the issuance of an Information Letter. If obvious procedural items affecting test results need immediate attention, the test sponsor and the TMC issue an Information Letter and present the background and data supporting that action to the surveillance panel for approval prior to the semiannual Subcommittee D02.B0 meeting.

A3.7 *TMC Memoranda*—In addition to the Information Letters, supplementary memoranda are issued. These are developed by the TMC and distributed to the appropriate surveillance panel and participating laboratories. They convey such information as batch approvals for test parts or materials, clarification of

the test procedure, notes and suggestions of the collection and analysis of special data that the TMC may request, or for any other pertinent matters having no direct effect on the test performance, results, or precision and bias.

A4. ASTM TEST MONITORING CENTER: RELATED INFORMATION

A4.1 *New Laboratories*—Laboratories wishing to become part of the ASTM Test Monitoring System will be requested to conduct reference oil tests to ensure that the laboratory is using the proper testing techniques. Information concerning fees, laboratory inspection, reagents, testing practices, appropriate committee membership, and rater training can be obtained by contacting the TMC Director.

A4.2 *Information Letters: COTCO Approval*—Authority for the issuance of Information Letters was given by the committee on Technical Committee Operations in 1984, as follows: "COTCO recognizes that D02 has a unique and complex situation. The use of Information Letters is approved providing each letter contains a disclaimer to the affect that such has not obtained ASTM consensus. These Information Letters should be moved to such consensus as rapidly as possible."

A4.3 *Precision Data*—The TMC determines the precision of test methods by analyzing results of calibration tests conducted on reference oils. Precision data are updated regularly. Current precision data can be obtained from the TMC

CURRENT ANNEXES A1 AND A2 HAVE BEEN RENUMBERED A5 AND A6. CURRENT ANNEXES A4 THROUGH A17 HAVE BEEN RENUMBERED AS A7 THROUGH A20. REVISE NUMBERING ACCORDINGLY.

DELETE CURRENT APPENDIX X1 AND RENUMBER APPENDICES X2 and X3 AS X1 AND X2. REVISE NUMBERING ACCORDINGLY.