



Test Monitoring Center

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APPROVED BY ASTM D02.B December 6, 2000
(DATE)

Sequence IIF Information Letter 00-3
Sequence No. 3
December 21, 2000

TO: Sequence IIF Mailing List
SUBJECT: Non-reference Oil Test Interpretability Criteria

This Information Letter implements action items approved by the Sequence IIF Surveillance Panel. This Information Letter addresses specific parts and procedures pertaining to quality, consistency, performance, and accountability of test parts as part of the ongoing effort by the panel to ensure continual process improvement of the Sequence IIF test. Updated replacement pages of the Sequence IIF Test Procedure Draft are attached.

Non-reference Oil Test Interpretability Criteria

At the September 27, 2000 meeting of the Sequence IIF Surveillance Panel, the panel approved a motion to add non-reference oil test interpretability criteria based upon oil consumption and stated Noack volatility. For oils with a stated Noack volatility that is nominally 15% or less, the test results are considered non-interpretable for purposes of MTAC if oil consumption exceeds 5.2L. For oils with stated Noack volatility that exceeds 15%, the test results are considered non-interpretable for the purposes of MTAC if oil consumption exceeds 6.5L. This change is effective December 6, 2000.

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Attachments

c: ftp://tmc.astm.cmri.cmu.edu/docs/gas/sequenceiii/procedure_and_ils/IL00-3.pdf

Sequence IIIF
Test Procedure

Draft Number 3b
Updated with IL 00-2
Updated with IL 00-3

December 6, 2000

2. Referenced Documents

2.1 ASTM Standards:

- D 16 Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products³
- D 86 Test Method for Distillation of Petroleum Products
- D 130 Test Method for Detection of Copper Corrosion from Petroleum Products by the Copper Strip Tarnish Test
- D 156 Test Method for Saybolt Color of Petroleum Products (Saybolt Chronometer Method)
- D 235 Specification for Mineral Spirits (Petroleum Spirits) (Hydrocarbon Dry Cleaning Solvent)
- D 287 Test Method for API Gravity of Crude Petroleum and Petroleum Products (Hydrometer Method)⁴
- D 323 Test Method for Vapor Pressure of Petroleum Products (Reid Method)
- D 381 Test Method for Existent Gum in Fuels by Jet Evaporation
- D 445 Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity)
- D 525 Test Method for Oxidation Stability of Gasoline (Induction Period Method)
- D 1266 Test Method for Sulfur in Petroleum Products (Lamp Method)
- D 2422 Classification of Industrial Fluid Lubricants by Viscosity System
- D 2699 Test Method for Knock Characteristics of Motor Fuels by the Research Method
- D 2700 Test Method for Knock Characteristics of Motor and Aviation Fuels by the Motor Method
- D 2982 Test Methods for Detecting Glycol-Base Antifreeze in Used Lubricating Oils
- D 3237 Test Method for Lead in Gasoline by Atomic Absorption Spectrometry
- D 4175 Terminology Relating to Petroleum, Petroleum Products, and Lubricants
- D 4485 Specification for Performance of Engine Oils
- D 4684 Standard Test Method for Determination of Yield Stress and Apparent Viscosity of Engine Oils at Low Temperature
- D 5119 Test Method for Evaluation of Automotive Engine Oils in the CRC L-38 Spark-Ignition Engine
- D 5302 Test Method for Evaluation of Automotive Engine Oils for Inhibition of Deposit Formation and Wear in a Spark-Ignition Internal Combustion Engine Fueled with Gasoline and Operated Under Low-Temperature, Light-Duty Conditions
- D5293 Test Method for Apparent Viscosity of Engine Oils Between -5 and 30°C Using Cold-Cranking Simulator
- D5800 Standard Test Method for Evaporation Loss of Lubricating Oils by Noack Method
- E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

- E 270 Definitions of Terms Relating Liquid Penetrant Examination
- E 344 Terminology Relating to Thermometry and Hydrometry
- E 380 Practice for Use of the International System of Units (SI)
(The Modernized Metric System)
- G 40 Terminology Relating to Wear and Erosion

2.2 Military Specification:

MIL-L-2104, Lubricating Oil, Internal Combustion Engine, Tactical Service

2.3 SAE Standards:

J183, Engine Oil Performance and Engine Service Classification
(Other Than "Energy-Conserving")

J304, Engine Oil Tests

2.4 Sequence Testing Documents:

Sequence IIIF Engine Assembly Manual

Data Acquisition and Control Automation II Task Force Report

ASTM Test Monitoring Center, System Time Response Measurement Guidelines, 5/27/99

13.15 Oil Consumption Computation-Compute the oil consumption for the test as follows:

13.15.1 Annex A10

13.15.2 Determine the total fresh oil added to the engine during the initial oil leveling run and 10-h test periods in Step 8 of Annex A10. Enter the total in the end-of-test total column on Annex A10.

13.15.3 Determine the total amount of oil discarded during the 80-h test periods in Step 11 of Annex A10. Enter the total in the end-of-test total column on Annex A10.

13.15.4 Determine the computed oil level in milliliters at the end of the test, Step 13 in Annex A10. Enter the number in the end-of-test total column on Annex A10.

13.15.5 Add the values determined in 13.15.2 and 13.15.4, and subtract the value determined in 13.15.3. Enter the remainder, which is the amount of oil consumed in the test, in the blank for Step 14 on Fig. X4.4.

13.15.6 For non-reference oils, evaluate the oil consumption result based upon the following guidelines:

13.15.6.1 For oils with a stated Noack volatility that is nominally 15% or less, the test results are considered non-interpretable for purposes of MTAC if oil consumption exceeds 5.2L.

13.15.6.2 For oils with stated Noack volatility that exceeds 15%, the test results are considered non-interpretable for purposes of MTAC if oil consumption exceeds 6.5L.

13.15.6.3 The Noack Volatility result is not required to start a test. The Test Purchaser only has to declare if the oil is either 'above 15%' or '15% or less' Noack Volatility. If the Test Purchaser later determines that the Noack Volatility is other than originally stated, the Test Purchaser shall notify the Test Laboratory so that the interpretability of the test results can be corrected, if necessary.

13.16 Photographs of Test Parts-Take color photographs of the test parts for inclusion in the test report, as follows:

13.16.1 Photograph pistons after all ratings have been completed.

13.16.2 Do not coat the pistons with build-up oil (for preservation) before the photographs are taken. Do not re-install piston rings.

13.16.3 Photograph all six piston thrust sides in one shot. No piston labels required. (see 13.16.13)

13.16.4 Photograph all six piston anti-thrust sides in one shot. No piston labels required. (see 13.16.13)

13.16.11 Size the final piston photographs for inclusion in the test report so that the overall piston height is not less than 5 cm (2 in.), but small enough that three photographs can be mounted in a column on the 28-cm (11-in.) dimension of a 22 by 28-cm (8 1/2 by 11 in.) sheet of paper.

13.16.12 Assemble the photographs on two pages, with the thrust side photographs on one page, and the anti-thrust photographs on the other page.

13.16.13 Mount the photographs on each of the two pages with the reciprocating axes of the pistons parallel to the 28-cm (11-in.) dimension of the page. Arrange the photographs in two vertical columns of three each, with the No. 1 piston in the upper left corner of the page, No. 2 piston in the upper right corner, No. 3 piston in the center of the left column, etc.

13.17 Retention of Representative Test Parts-Retain for at least 6 months, all pistons, camshaft, and lifters.

13.18 Severity Adjustments-Calculate severity adjustments (SA) for results of non-reference engine oil tests. Use the control chart technique, described in Annex A5, for determining the laboratory bias for % viscosity increase, piston skirt varnish, and weighted piston deposits. Enter the adjustments on Form 4, Test Result Summary, in standardized report form set (See Annex A6).

13.19 Determination of Operational Validity-Determine and document the operational validity of every Sequence IIIF test conducted, according to the following:

13.19.1 Complete the report forms to substantiate that the test stand, engine build-up, installation of the engine on the test stand, and the test operation conformed to the procedures specified in this test method.

13.19.2 Inspect the test records for instances of downtime (excluding the initial oil level run of the test), and record any such instances on Form 13, Downtime & Outlier Report Form, in standardized report form set (See Annex A6). Enter the total downtime on Form 13, Downtime & Outlier Report Form, in standardized report form set (See Annex A6). If the total downtime exceeds 24 h, note on Form 1, in standardized report form set (See Annex A6) that the test is invalid.

13.19.3 Sequence IIIF tests must average higher than 23 l/m (0.812 cu.ft./m) blowby rate for hours 1 through 26 in order to be considered a valid engine build.

13.19.4 If the end of test quality index value is below 0.000, conduct an engineering review of the test operations. The engineering review will be conducted by the test laboratory, and, for reference oil tests, the Test Monitoring Center. If needed, additional industry experts may be consulted. Document the results of the engineering review.