



Test Monitoring Center

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Sequence VG Information Letter 05-1
Sequence No. 22

June 1, 2005

ASTM consensus has not been obtained on this information letter. An appropriate ASTM ballot will be issued in order to achieve such consensus.

TO: Sequence VG Mailing List

SUBJECT: 1. Elimination of Additional Measurements
2. Clarification of Oil Screen Clogging Ratings
3. Updated Precision Statement
4. Limits on Lost Operational Data
5. Editorial Changes Relating to Hazard Statements

1. At the May 19, 2005 Sequence VG Surveillance Panel Meeting, the panel agreed to eliminate additional measurements detailed in Section 13.7 of Test Method D 6593. As a result, this section has been removed from the method.
2. Also, at the May 19, 2005 meeting, the panel agreed to a clarification to the rating of oil screen clogging. The previous wording could be interpreted as rating the percentage of the oil screen clogged by both sludge and debris. The intention is to rate the percentage of screen clogging by sludge and debris and report them as separate parameters. Section 13.4.1.3 has been revised to require rating of clogging of the oil screen by sludge and debris separately.
3. The panel agreed to update the test method precision statement. Table 8 has been revised accordingly.
4. The panel agreed to include a requirement regarding loss of test operational data on controlled parameters. For a test to be considered operationally valid, no more than two hours of lost operational data shall occur on controlled parameters. Section 14.8 has been revised to include this requirement.

5. A number of editorial changes were noted in Annex A1 regarding the use of hazardous chemicals. Additionally, Ethyl Acetate and n-pentane appear in Annex A1, but are not listed in Section 7.7.1, Solvents and Cleaners Required, which states no substitutes for Sections 7.7.1 through 7.7.5 are allowed. Sections A1.3.4 and A1.3.8 have been deleted. Section 7.6.2.2 lists aliphatic naptha, which is incorrect. Section 7.6.2.2 has been revised to list degreasing solvent as the proper cleaner. Sections 7.7.1 through 7.7.5 have been revised to correct these hazard statements.

The attached revised sections are effective May 19, 2005



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Attachment

c: ftp://ftp.astmtmc.cmu.edu/docs/gas/sequencev/procedure_and_ils/vgil05-1-22.pdf

Distribution: Email

(Revises Test Method D6593-04a, as amended by Information Letters 04-2, 04-3 and 04-4)

7.6.2.2 Clean the butterfly and bore of the throttle body with degreasing solvent (7.7.1) and air-dry before each test. Do not disassemble the throttle body as this will cause excessive wear on the components. The idle air screw can be removed for the cleaning process. Fully close the idle air screw during test operation.

7.7.1 *Degreasing Solvent*, any solvent meeting Specification D 235, Type II, Class C for Aromatic Content (0-2% vol), Flash Point (142°F/61°C, min) and Color may be used. Obtain a Certificate of Analysis for each batch of solvent from the supplier. **Warning.** Combustible. Health Hazard.

7.7.2 *Organic Solvent*, Penmul L460.^{1,2} **Warning.** Combustible. Health Hazard.

7.7.3 *Dearsol 134 Acidic Cleaner*^{11, 3} *with Inhibitor*, RAC cooling jacket internal cleaner. **Warning.** Caustic. Health Hazard.

7.7.4 *Cooling System Cleaner*, Dupont or equivalent, for cleaning cooling system components external to the engine. **Warning.** Caustic. Health Hazard.

7.7.5 *Parts Cleaning Soap*, NAT-50⁴ or PDN-50¹⁴ have been found to be acceptable. **Warning.** Health Hazard.

13.4.1.3 Determine the percentage of the total screen opening that is obstructed with debris. Determine the percentage of the total screen opening that is obstructed with sludge. Transform the oil screen sludge results by taking the natural log (ln) of the oil screen sludge rating plus one; that is, ln (oil screen clogging+one). Round the transformed value to four decimal places. Report both the transformed and original result on the appropriate form(s). Where laboratory bias is determined to be significant, adjust the results for severity in accordance with the Lubricant Test Monitoring System⁵. Round this adjusted result to four decimal places and convert to original units by subtracting one from the antilog (e^x) of the adjusted result in transformed units. Record this value as the final result in original units on the appropriate form(s). Label as sludge all matter present on the oil screen that is not immediately recognizable as debris. Label all matter of indeterminate composition as sludge.

13.7 *Deleted*

TABLE 8 Reference Oil Statistics ^A

Variable	Intermediate Precision		Reproducibility	
	S _{i.p.}	i.p. ^B	S _R	R ^B
Average engine sludge	0.45	1.26	0.46	1.29
Rocker cover sludge	0.25	0.70	0.27	0.76
Average engine varnish	0.10	0.28	0.10	0.28
Oil screen clogging, sludge ^C	0.793	2.220	0.819	2.293
Average piston varnish	0.20	0.56	0.20	0.56

^A These statistics are based on results obtained on Test Monitoring Center Reference Oils 1006, 1006–2, 1007, and 1009 over the period from Sept. 16, 1998 through Nov. 5, 2004.

^B This value is obtained by multiplying the standard deviation by 2.8.

^C This parameter is transformed using $\ln(\text{result}+1)$. When comparing two test results on this parameter, first apply this transformation to each test result. Compare the absolute difference between the transformed results with the appropriate (intermediate precision or reproducibility) precision limit.

14.8 *Quality Index*—Requirements for quality index are listed in Annex A2. If the end of test quality index value is below 0.000 for reference oil tests, review the test operations with the TMC. The TMC will issue a letter to the laboratory and the test purchaser on its opinion. The laboratory will document its comments regarding end of test quality index values less than 0.000 for non-reference oil tests. The laboratory or test purchaser may request TMC review of test operations for non-reference oil tests. The TMC will issue a letter to document its opinion. If a test has greater than 2h without recorded operational data on any controlled parameter, the test is operationally invalid.

A1. SAFETY PRECAUTIONS

A1.1 General Information:

A1.1.1 The operation of this procedure *can* expose personnel to hazardous materials, operations, and equipment. Personnel who are involved in the design, installation, and operation should be thoroughly trained and experienced. Personnel should be provided with safety glasses, hearing protection, and proper tools. All loose clothing should be removed or secured.

A1.1.2 The laboratory facilities should be inspected and approved by the laboratory's safety department. All laboratory areas should be kept clean and free of oil and fuel spills. The laboratory should also be kept free of tripping hazards. Containers of fuel and oil should not be allowed to accumulate excessively. A fixed fire protection system and adequate fire extinguishers should be available in all parts of the laboratory. Emergency showers should be provided throughout the laboratory.

A1.1.3 The test stands should be equipped with a fuel shut-off valve that is designed to automatically interrupt the fuel supply when the engine is not running. The engine should also be automatically shutdown if any of the following events occur: dynamometer loses field current, engine over speed, exhaust system fails, room ventilation fails, or the fire protection system activates. Guards should be installed around all external rotating parts and hot surfaces. All fuel lines, oil lines, steam lines, process water lines, and electrical wiring should be properly routed, protected, and kept in good working order.

A1.1.4 This test method can expose personnel to physical hazards and various hazardous chemicals to prepare parts for the test. These chemicals and a summary of specific precautions concerning each chemical are listed below. Emergency showers and eye-rinse facilities should be provided in parts preparation areas.

A1.2 Physical Hazards:

- A1.2.1 Electrical shock.
- A1.2.2 High-speed rotating equipment.
- A1.2.3 High-temperature surfaces.
- A1.2.4 Noise.

A1.3 Hazardous Chemicals and Materials:

A1.3.1 Degreasing Solvent (meeting Specification D 235, Type II, Class C requirements) (See 7.7.1):

A1.3.1.1 Before opening the container, relieve pressure. Keep the container tightly closed when not in use.

A1.3.1.2 Store at moderate temperatures and keep away from heat, sparks, open flame, oxidizing agents, acids, and bases.

A1.3.1.3 Use dry chemical, foam, or CO₂ as extinguishing media.

A1.3.1.4 Use safety glasses and impervious gloves when handling.

A1.3.1.5 Use cartridge or air-line respirators in enclosed areas.

A1.3.1.6 Use only if adequate ventilation is available.

A1.3.1.7 Avoid contact with eyes, skin, and clothing.

A1.3.2 Cooling System Cleanser, (DuPont formulation or equivalent):

A1.3.2.1 Store at moderate temperatures. Keep container closed until use.

A1.3.2.2 Use safety glasses and impervious gloves when handling.

A1.3.2.3 Use respiratory protection in absence of proper environmental control.

A1.3.2.4 Use only if adequate ventilation is available.

A1.3.2.5 Avoid contact with eyes, skin, and clothing.

A1.3.3 Acidic Cleaner with Inhibitor (Dearsol 134):

A1.3.3.1 Store at moderate temperatures. Keep container closed until use.

A1.3.3.2 Use safety glasses and impervious gloves when handling.

A1.3.3.3 Use respiratory protection in absence of proper environmental control. Use only if adequate ventilation is available.

A1.3.3.4 Avoid contact with eyes, skin, and clothing.

A1.3.4 Unleaded Gasoline (Haltermann VG Fuel): **Warning.** Flammable. Health Hazard

A1.3.4.1 Before opening the container, relieve pressure. Keep the container tightly closed when not in use.

A1.3.4.2 Store at moderate temperatures and keep away from heat, sparks, open flame, and oxidizing agents.

A1.3.4.3 Use dry chemical, foam, or CO₂ as extinguishing media.

A1.3.4.4 Use safety glasses and impervious gloves when handling.

A1.3.4.5 Use respiratory hydrocarbon vapor canister in enclosed areas.

A1.3.4.6 Use only if adequate ventilation is available.

A1.3.4.7 Avoid contact with eyes, skin, and clothing.

A1.3.5 New and Used Oil Samples:

A1.3.5.1 Store at moderate temperatures and keep away from extreme heat, sparks, open flame, and oxidizing agents.

A1.3.5.2 Use dry chemical, foam, or CO₂ as extinguishing media.

A1.3.5.3 Use safety glasses and impervious gloves when handling.

A1.3.5.4 Avoid contact with eyes, skin, and clothing.

A1.3.5.5 *Used Oil Samples Only* **Warning.** Health Hazard.—Since used oils contain compounds that were not originally present in the new oil, follow the most stringent Material Safety Data Sheets guidelines for all components present. *In addition to other precautions, note that continuous contact with used motor oils has caused skin cancer in laboratory mice.*

A1.3.6 Organic Solvent (Penmul):

A1.3.6.1 Before opening the container, relieve pressure. Keep the container tightly closed when not in use.

A1.3.6.2 Store at moderate temperatures and keep away from heat, sparks, open flame, and strong oxidizing agents.

A1.3.6.3 Use dry chemical, foam, or CO₂ as extinguishing media.

A1.3.6.4 Use safety glasses and impervious gloves when handling.

A1.3.6.5 Use respiratory hydrocarbon vapor canister in enclosed area.

A1.3.6.6 Use only if adequate ventilation is available.

A1.3.6.7 Avoid contact with eyes, skin, and clothing.