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Sequence IVA Information Letter No. 02-3
Sequence No. 9

May 30, 2002

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 IVA Mailing List

SUBJECT: Oil Sample Tap Location Change
Stand Calibration Requirement Revisions
Instrumentation Calibration Requirement Revisions
Editorial Corrections

This information letter implements action items approved by the Sequence IVA 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 IVA test.

Oil Sample Tap Location Change

At the May 14, 2002, meeting of the Sequence IVA Surveillance Panel, the panel approved a motion to change the location from which oil samples are drawn from the engine. The motion specified that the valve, which is currently located in the oil filter block, be removed and replaced with a valve located in place of the oil drain plug in the oil pan. This change is required to be in place for all tests started on or after June 1, 2002. The relevant sections of Draft 6 of the Sequence IVA Test Procedure have been revised and are attached.

Stand Calibration Requirement Revisions

At the May 14, 2002, meeting of the Sequence IVA Surveillance Panel, the panel approved a motion to revise the stand calibration requirements to eliminate the requirement that a reference oil test be conducted every time the test engine is replaced. The calibration period is now defined as 15 non-reference oil tests or six months. New engines or cylinder heads may be installed as needed and do not affect stand calibration status. The life of a test engine or cylinder head did not change; i.e. a new engine is still required every 16 tests and a new cylinder head is still required every eight tests. These changes are effective on May 14, 2002. The relevant sections of Draft 6 of the Sequence IVA Test Procedure have been revised and are attached.

Instrumentation Calibration Requirement Revisions

At the May 14, 2002, meeting of the Sequence IVA Surveillance Panel, the panel approved a motion to eliminate the calibration requirements for Oil Gallery Temperature, Coolant Out Temperature, and Intake Air Temperature after the eighth test conducted on a calibrated test stand. The instrumentation used for these three measurements shall still be calibrated prior to each reference oil test sequence. This change is effective on May 14, 2002. The relevant sections of Draft 6 of the Sequence IVA Test Procedure have been revised and are attached.

Editorial Corrections

In addition to the changes approved by the Sequence IVA Surveillance Panel, several editorial changes were made to correct errors in the document. These changes are listed below:

- Section 6.3.11.5 incorrectly listed the Oil Gallery Temperature as the oil temperature control point. This reference was removed.
- Section 6.4.4 was divided into several subsections (6.4.4.1 and 6.4.4.2), which were kept below Section 6.4.4, and one subsection (6.4.3.1) that was put under Section 6.4.3. The first two were merely editorial clean-ups and the last was moved to put it under the correct section on *Parts to be Replaced.*
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Since these changes are editorial in nature, no action by the Sequence IVA Surveillance Panel was required.

William A. Buscher III
Chairman
Sequence IVA Surveillance Panel

John Zalar
Administrator
ASTM Test Monitoring Center

Attachment

c: ftp://ftp.astmtmc.cmu.edu/documents/gas/sequenceiv/procedures_and_ils/ivail02-3-9.pdf

Distribution: Email

6.3.11.5 Engine Oil Gallery Temperature
Precisely weld a thermocouple fitting to the oil filter block, see Fig. 5. A 3.2-mm diameter thermocouple, or equivalent is recommended. Position the sensor tip in the center of the oil passageway. Do not use the engine oil gallery temperature for oil temperature control.

6.3.12.3 Engine Oil Pressure
Sense the engine oil pressure at the production location on the oil filter block (see Fig. 5). Route the sensing line to a tee fitting, allowing ports to a pressure transducer and an analog pressure gauge.

6.4.3.1 Replace the spark plugs for each test, just prior to the oil flush (see 9.8.2). Gap the spark plug at 0.99-mm (0.03-in.).

6.4.4 Reusable Engine Parts
Replace the engine short-block and oil cooler every 16 tests, and the cylinder head every eighth test. If the engine demonstrates deterioration (excessive blowby, oil consumption or fuel dilution; poor compression, low oil pressure, clearances beyond service limits, stripped fasteners, etc.) prior to this expected life, replace the test engine and follow the break-in procedure for a new test engine prior to resuming non-reference oil testing. No more than 16 tests shall be conducted on a short-block or the oil cooler, and no more than eight tests shall be conducted on a cylinder head.

6.4.4.1 Replace the PCV valve, fuel filters, rocker cover gaskets, and air filter element after eight tests (when a new test engine or a new cylinder head is installed). Replace the ignition distributor when a new test engine is installed.

6.4.4.2 Reuse the jacketed rocker arm cover, oil pan, oil cooler, flywheel, intake and exhaust manifolds, throttle body, modified dummy water pump, spark plug wires, fuel injection system components, and engine sensors, as long as they continue to function properly.

9.6.3.10 Once the camshaft is installed, pour new test oil over the rocker arms, rocker shafts and camshaft. Excess oil will drain through the open oil pan drain valve.

9.7.2.19 After installation, pour new test oil over the rocker arms, rocker shafts and camshaft. Excess oil will drain through the open oil pan drain valve.

10. Test Stand Calibration and Maintenance
Verify the calibration status of the test laboratory and test engine with reference oils, which are supplied by the TMC. Conduct reference oil tests for stand calibration after every 15 non-reference oil tests or every six months, whichever occurs first, to verify that proper severity level and precision are being achieved. A prerequisite to the conduct of reference oil calibration tests is the proper processing of computer acquired operational data, ensuring accuracy of measurements, and test stand preventative maintenance.

10.2 *Instrumentation Calibration*
Perform a thorough re-calibration adjustment of all instrumentation and transducers, including computer channels, prior to conducting a reference oil test. Perform a calibration check for critical parameters after the 8th test of a calibration period. These critical parameters are:

{Current Sections 10.2.1, 10.2.2, and 10.2.3 were deleted; Section 10.2.4 becomes Section 10.2.1, shown below}

10.2.1 Dynamometer torque

10.2.9 Temperature Measurement Calibration

Calibrate the temperature measurement instrumentation prior to every reference oil test sequence. The temperature measurement system accuracy shall be within ± 0.5°C of the laboratory calibration standard. The calibration standard shall be traceable to national standards.

11.1.3.2 Open the oil drain valve in the oil pan and pre-fill the cavities of the cylinder head under the camshaft with break-in oil REO 926-2. Close the oil drain valve once completed

11.2.1.3 Open the oil drain valve in the oil pan and pre-fill the cavities of the cylinder head under the camshaft with new test oil. Close the oil drain valve once completed.

11.3.4 Oil Additions and Used Oil Sampling
During the 100-h test, do not add oil. New oil makeup is not allowed if oil leaks occur. Take a 10 mL oil sample of the new oil, used oil at 25 h, used oil at 50 h, and used oil at 75 h. Remove used oil samples from the oil drain valve, located in the oil pan sump, during the transient portion of Stage II (near end of cycle 25, 50, and 75). Remove a 120 mL purge sample from the engine prior to drawing the oil sample. This purge sample is to be returned to the engine via the cover fill cap using a clean filler pipe equipped with an isolation valve to prevent oil *spit back* due to positive crankcase pressure. After the oil consumption has been calculated at the end of 100 h, remove a 100 mL sample of used oil for chemical analyses of the 100 h test oil. Take the 100 mL sample during the final engine oil drain at the end of the test (100 h). No purge sample is required for this final oil sample.