



Test Monitoring Center

6555 Penn Avenue
Pittsburgh, PA 15206-4489
(412) 365-1000

Sequence IVA Information Letter No. 06-1

Sequence No. 15

February 16, 2006

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: 1. Changes to Camshaft Wear Measurement Technique
2. Editorial Changes

1. The Sequence IVA Surveillance Panel approved a number of changes in the technique for measuring cam wear based on recommendations from the Sequence IVA Metrology Workshop. Sections 11.5.3.5 and 11.5.3.11 have been revised and are attached.
2. A typographical error was noted in Section 12.1. In addition, a number of sentences were reworded to be in conformance with ASTM Form and Style. For better clarity and flow, Section 12.1 has been divided into Sections 12.1 and 12.1.1 through 12.1.5. These revised sections are attached.

The attached changes to Test Method D 6891 are effective February 14, 2006.

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/ivail06-1-15.pdf

Distribution: Electronic Mail

11.5.3.5 If two unworn edges are present, level the trace by the two-point method (electronic leveling).

11.5.3.11 When leveling by the no form method, mechanically level the camshaft on the ATC side of the cam lobe for the ATC traces and the BTC side of the cam lobe for the BTC traces. Run the ATC and BTC leveling traces at a point closest to TDC where two unworn edges are present, or where at least 30% of the lobe exhibits no wear. Use the leveling trace closest to TDC for the TDC trace.

12.1 *Camshaft Lobe Wear*—Use a surface roughness meter (profilometer) to measure the change in profiles across the worn cam lobe. Each lobe usually has an unworn edge at the front of the lobe, and at the rear of the lobe. Use these unworn edges to define a two-point reference line, and measure a maximum depth of wear.

12.1.1 For each lobe, make seven profilometer traces, scribing across the lobe. The seven locations on each lobe are: at the nose, which is 0 (zero)° cam lobe, $\pm 4^\circ$; $\pm 10^\circ$; $\pm 14^\circ$. Locate the nose by reading the highest profilometer position (to within 0.5 μm) on the unworn cam lobe surface.

12.1.2 Affix a 360° wheel with a minimum of 25 cm diameter or an optical angle encoder to the front of the camshaft. Resolution of the degree wheel is 1° or better. After locating the lobe nose, determine the degree wheel zero reference mark. When viewed from the engine front, the camshaft normally rotates clockwise. When viewing the camshaft front, the plus direction is before cam nose top center. The minus direction is after the cam nose top center. Use this same sign convention for profilometer measurements.

12.1.3 The maximum deviation (Wt) of the worn nose profile (phase-correct filtered waviness profile) from a deduced unworn profile (reference line) is the wear value for that cam lobe location. (Report individual wear measurements to a resolution of one half of 1 μm , or better, in the range of 0 to 30 μm wear, and to a resolution of 1 μm , or better, in a wear range greater than 30 μm wear.)

12.1.4 For an individual lobe, the wear is a mathematical summation of the Wt values for the seven defined locations on each lobe. Record these measurements on the appropriate report form.

12.1.5 Average (equal weighting) the lobe wear values for the twelve lobes of the camshaft to determine the single test result (average cam wear, ACW) (reported to 1/100 of a μm). Adjust for laboratory severity as shown in TMC Memorandum 94-200. Record this severity-adjusted result as Average Cam Wear Final (ACWFNL) on the appropriate test report form. ACWFNL is the primary result from this test method.