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

MEMORANDUM: 05-084

DATE: November 7, 2005

TO: Wim Van Dam, Chairman, Mack Surveillance Panel

FROM: Jeff Clark

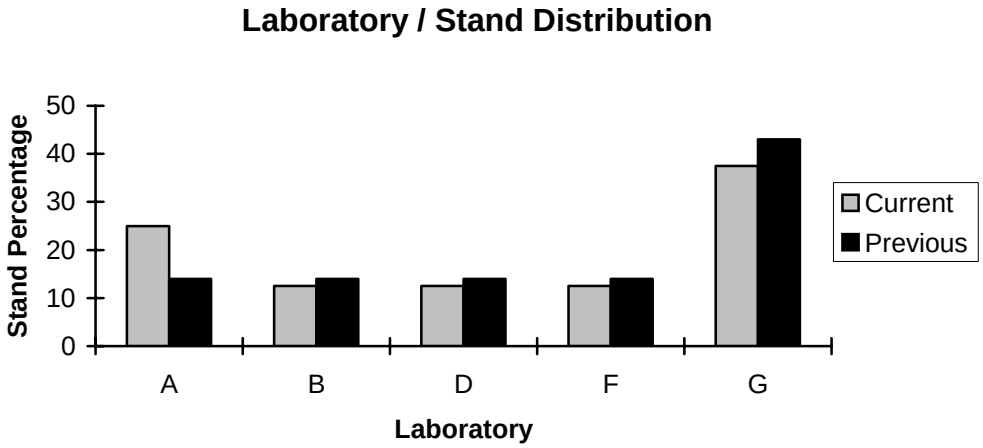
SUBJECT: T-11 Calibration Testing for the October 2005 ASTM Report Period

The following is a summary of T-11 reference oil tests completed during the October 2005 ASTM report period, which began on April 1, 2005 and ended on September 30, 2005.

Lab / Stand Distribution:

	Reporting Data	Calibrated as of 9/30/05
Number of Laboratories	5	4
Number of Stands	8	6

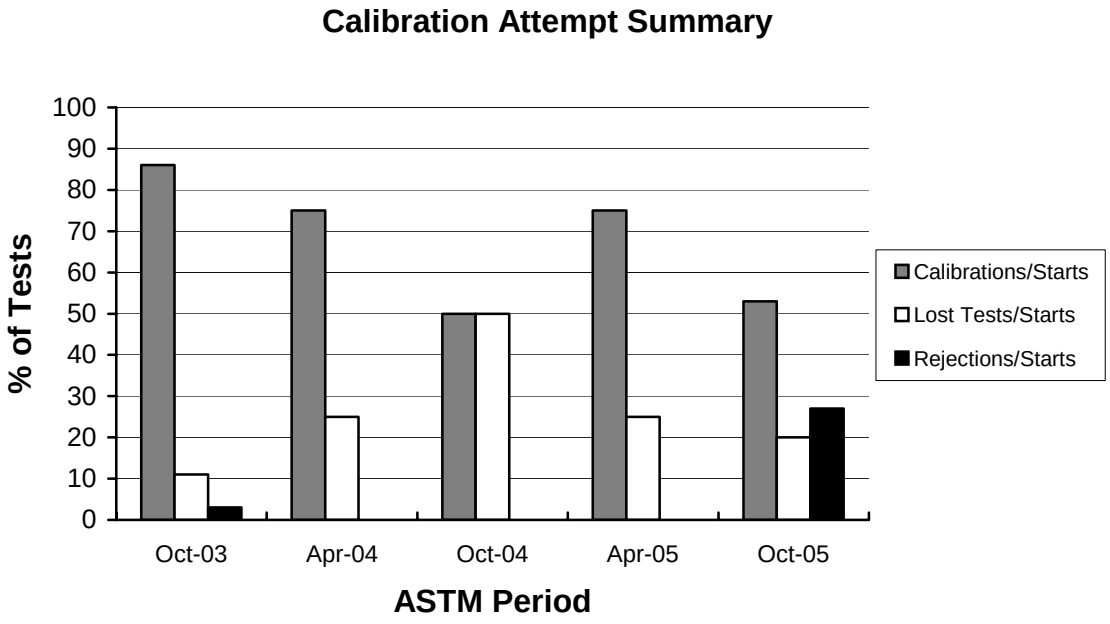
The figure below shows the T-11 laboratory / stand distribution for tests completed the current and previous report periods:



The table below summarizes the status of the reference oil tests reported to the TMC this ASTM report period:

Test Status	TMC Validity Code	Number of Tests
Acceptable Calibration Test	AC	8
Failed Calibration Test (LTMS Criteria)	OC	4
Operationally Invalid Calibration Test	LC	2
Aborted Calibration Test	XC	1
Donated Test	AG	1
Total		16

Calibrations per start, lost tests per start and rejections per start rates are summarized in the figure below:



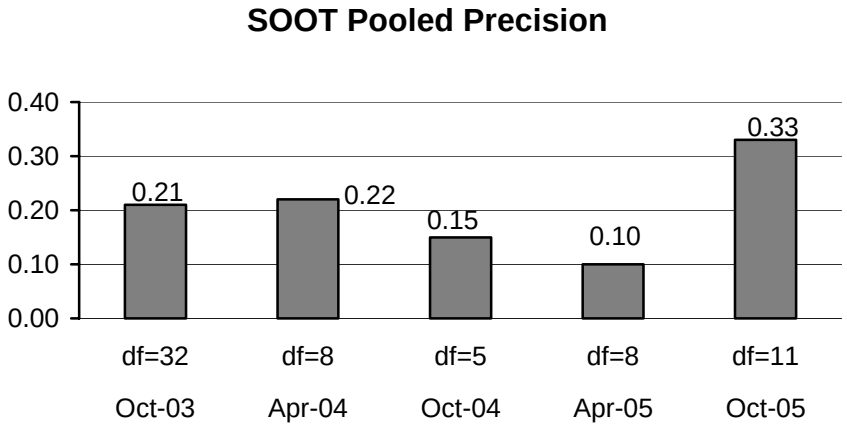
A detailed list of reasons tests failed the acceptance criteria (OC validity) is shown in Table 1. Table 2 lists the operationally invalid tests (LC validity) and Table 3 lists the aborted tests (XC validity).

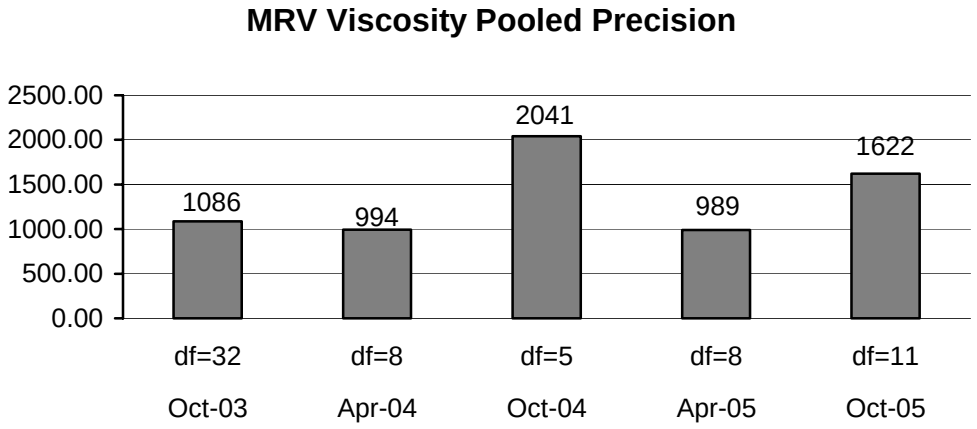
Severity and Precision:

Figure 1 (attached) shows the current industry EWMA severity, EWMA precision, and cusum charts for Soot at 12 cSt Viscosity Increase (SOOT). SOOT is currently in an industry warning alarm in the mild direction. For this period, SOOT is trending an average of 0.51 Δ/s mild, which is approximately 0.11 SOOT %. For a history of SOOT industry alarms, refer to the industry alarm log shown in Table 4.

Figure 2 (attached) shows the current industry EWMA severity, EWMA precision, and cusum charts for MRV Viscosity (MRV). MRV is currently in industry action alarm for severity (in the severe direction). For this period MRV is trending an average of 0.66 Δ/s severe, which is approximately 724 cP. For a history of MRV industry alarms, refer to the industry alarm log shown in Table 5.

Precision, as estimated by the pooled standard deviation, is shown in the following figures. For comparison purposes, the TMC will continue to report precision by ASTM period. Precision for SOOT shows degradation compared to previous periods. Precision for MRV is within historical levels, though it has degraded in comparison to the previous period.





Please note, that the degrees of freedom (df) equals Σ(n observations per oil - 1).

Reference Oils:

The current reference oil test targets are shown below:

Oil	N	Parameter	Mean (cSt)	s
820-2	32	SOOT	5.78	0.21
		MRV	14969	1097

Hardware:

The change to the part number 349GC3107 top rings has resulted in correction factors for both SOOT (-0.39 %) and MRV (+1274 cP). The surveillance panel will review these correction factors as more data becomes available.

Information Letters:

No information letters were issued this ASTM period.

TMC Laboratory Visits:

No TMC laboratory visits were conducted this ASTM period.

LTMS Deviations

No LTMS deviations were issued this period. No LTMS deviations have been issued during the history of the T-11.

Quality Index:

No Quality Index deviations were issued this ASTM period. For the history of the T-11, no Quality Index deviations have been issued.

Additional Information:

The T-11 test procedure is now available as ASTM D 7156.

Table 6 contains the T-11 Timeline which details changes to the test since its inception.

The T-11 database can be accessed on the TMC's homepage. If you have any questions on how to access this information, contact the TMC.

JAC/jac/mem05-084.jac.doc
Attachments

c: J.L. Zalar, TMC
F.M. Farber, TMC
Mack Surveillance Panel
ftp://ftp.astmtmc.cmu.edu/docs/diesel/mack/semiannualreports/T11-10-2005.pdf

Distribution: Email

Table 1
Summary of Reasons for Rejected Tests

	No. of Tests
Soot as 12cSt Viscosity Increase, Mild	4

Table 2
Summary of Reasons for Invalid Tests

	No. of Tests
Lab performed forced oil consumption drains	1
Missed 96 hour soot window	1

Table 3
Summary of Reasons for Aborted Tests

	No. of Tests
High oil consumption	1

FIGURE 1
T−11 INDUSTRY OPERATIONALLY VALID DATA

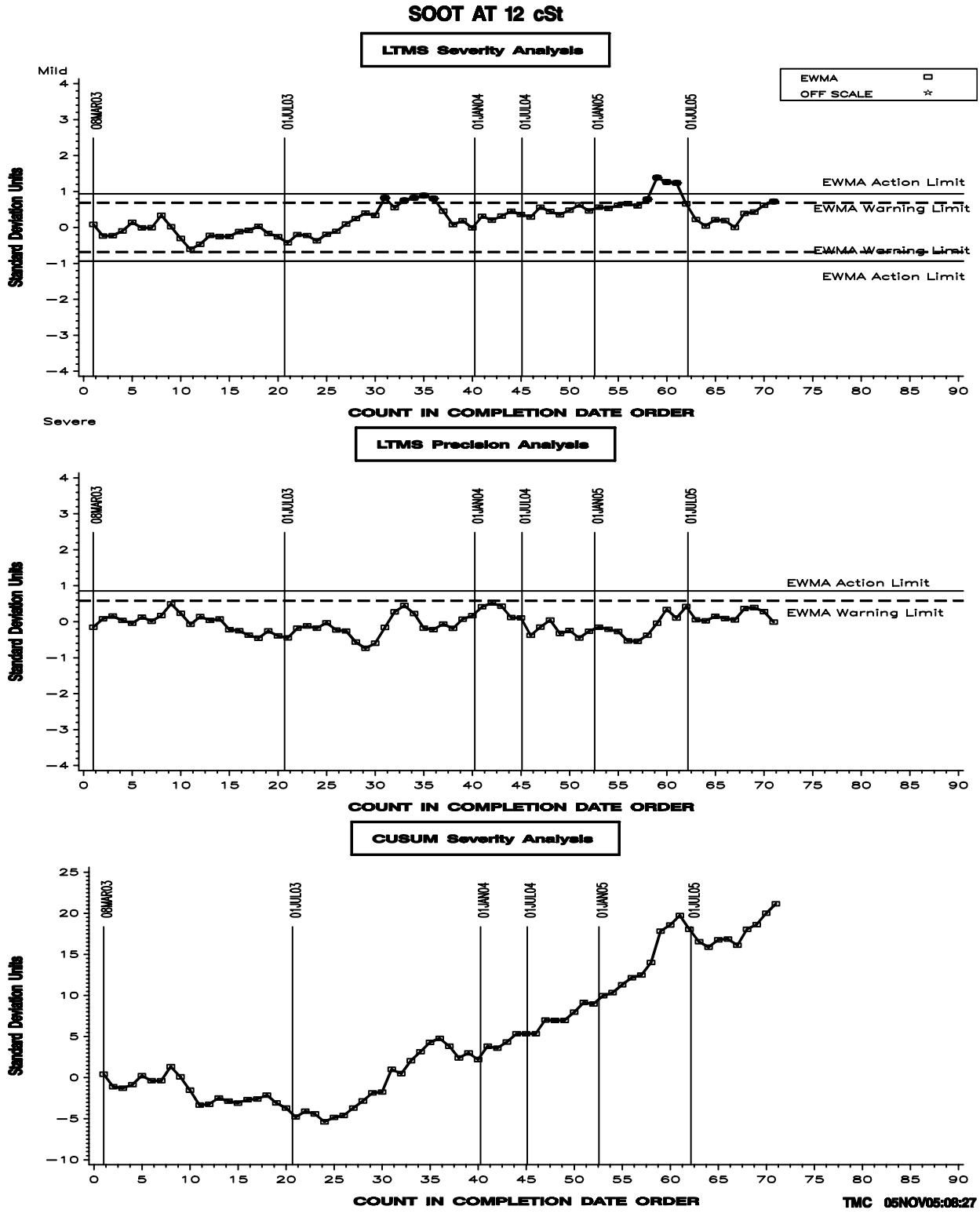


TABLE 4
SOOT AT 12 cSt INDUSTRY ALARM LOG

April 26, 2003 to April 29, 2003 (Precision)

A one-test excursion occurs. No industry related problem.

August 11, 2003 to November 3, 2003 (Severity, Mild direction)

Five of six tests trigger an industry warning alarm. No cause was apparent and the alarm cleared without any action being taken by the surveillance panel.

April 19, 2005 to August 22, 2005 (Severity, Mild direction)

This trend appeared to be the continuation of a long-term mild trend. The surveillance panel investigation found an increase in oil consumption had occurred in the same time frame. A series of tests were run using new top ring hardware (T-12 top rings) and the oil consumption problem was abated. However, a shift in SOOT results occurred with the implementation of the new hardware. An industry-wide correction factor of –0.39% was adopted for tests run with T-12 top rings. The alarm cleared on August 22, 2005. The surveillance panel will continue to evaluate the correction factor as more data becomes available.

October 26, 2005 to Date (Severity, Mild direction)

A one-test excursion occurs. No indication yet if this is an industry related problem.

Updated 11/7/05

FIGURE 2
T-11 INDUSTRY OPERATIONALLY VALID DATA

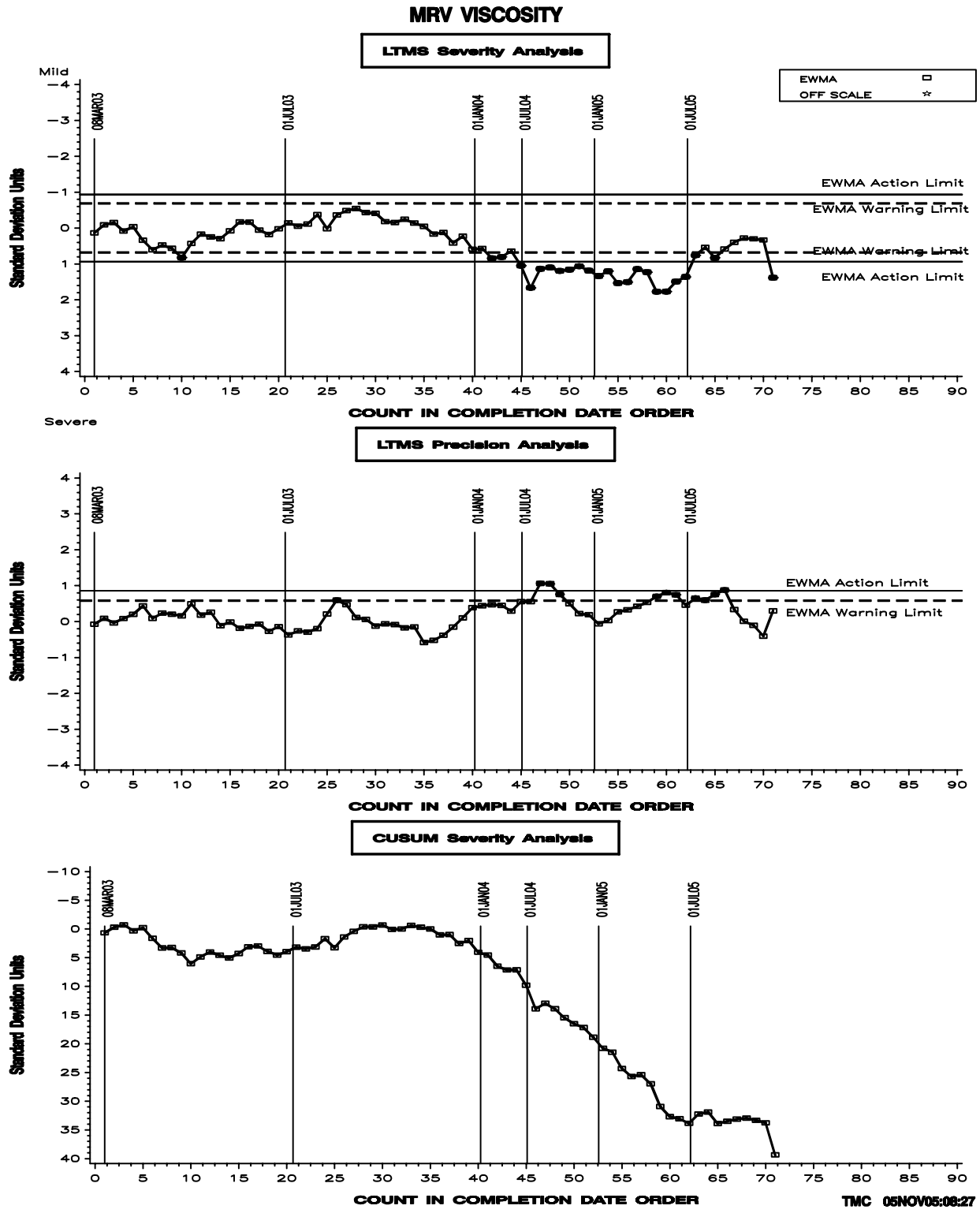


TABLE 5
MRV VISCOSITY INDUSTRY ALARM LOG

April 26, 2003 to April 29, 2003 (Severity, Severe direction)

A one-test excursion occurs. No industry related problem.

July 19, 2003 to July 21, 2003 (Precision)

A one-test excursion occurs. No industry related problem.

March 12, 2004 to August 22, 2005 (Severity, Severe direction; Precision)

This trend appeared to be the continuation of a long-term severe trend. The surveillance panel investigation found an increase in oil consumption had occurred in the same time frame. A series of tests were run using new top ring hardware (T-12 top rings) and the oil consumption problem was abated. However, a shift in MRV results occurred with the implementation of the new hardware. An industry-wide correction factor of 1274 cP was adopted for tests run with T-12 top rings. The alarm cleared on August 22, 2005. The surveillance panel will continue to evaluate the correction factor as more data becomes available.

October 26, 2005 to Date (Severity, Severe direction)

A one-test excursion occurs. No indication yet if this is an industry related problem.

Updated 11/7/05

TABLE 6

Obs	effective_date	info_letter_number	event
1	20030221		Draft 1 of test procedure issued
2	20030303		Oil sump configuration specified
3	20030313		Draft 2 of test procedure issued
4	20030422		Oil sample location specified as the pre-oil filter pressure port
5	20030709		Draft 3 of test procedure issued
6	20030714		Calibration period set to six months or six tests (1512 test hours)
7	20030717		Draft 4 of test procedure issued
8	20030821		Oil consumption limit of 65 g/hr maximum, using 25-h to EOT regression slope
9	20030821		LTMS implemented
10	20030905		Third soot window moved from EOT to 228 hours
11	20030918		Draft 5 of test procedure issued
12	20030923		Report Forms and Data Dictionary Version 20030819
13	20031205		Report Forms and Data Dictionary Version 20031029
14	20040415		Intake Manifold Pressure specification set to 140 kPa minimum.
15	20040504		Draft 6 of test procedure issued
16	20041215		USE OF DYED FUEL ACCEPTED
17	20050511		GB3133 VALVE GUIDES INTRODUCED
18	20050528		349GC3107 TOP RINGS INTRODUCED (T-12 RINGS)
19	20050603		Test procedure available as ASTM D 7156
20	20050803		349GC3107 TOP RINGS APPROVED FOR ALL TESTS
21	20050914		Correction factors adopted for SOOT (-0.39) and MRV (+1274) for all tests run with 349GC3107 top rings