



Test Monitoring Center

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MEMORANDUM: 04-076
DATE: October 1, 2004
TO: Wim Van Dam, Chairman, Mack Surveillance Panel
FROM: Jeff Clark
SUBJECT: T-11 Calibration Testing for the October 2004 ASTM Report Period

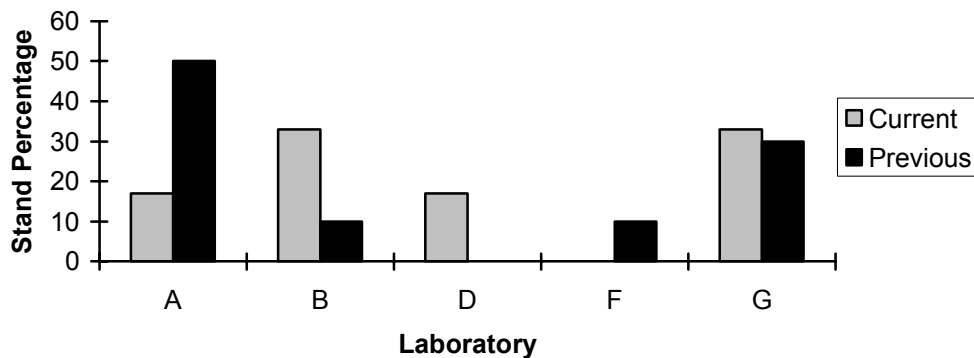
The following is a summary of T-11 reference oil tests completed during the October 2004 ASTM report period, which began on April 1, 2004 and ended on September 30, 2004.

Lab / Stand Distribution:

	Reporting Data	Calibrated as of 9/30/04
Number of Laboratories	4	4
Number of Stands	6	5

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

Laboratory / Stand Distribution

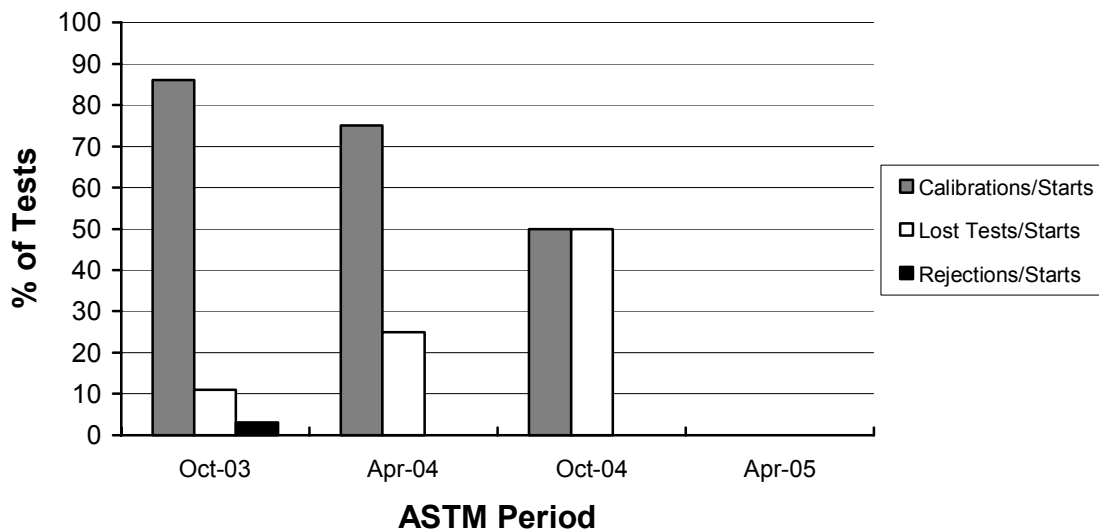


The table below summarizes the status of the reference oil tests reported to the TMC this ASTM report period:

Test Status	TMC Validity Code	Number of T-11 Tests
Acceptable Calibration Test	AC	6
Failed Calibration Test (LTMS Criteria)	OC	0
Operationally Invalid Calibration Test	LC	4
Aborted Calibration Test	XC	2
Total		12

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

Calibration Attempt Summary

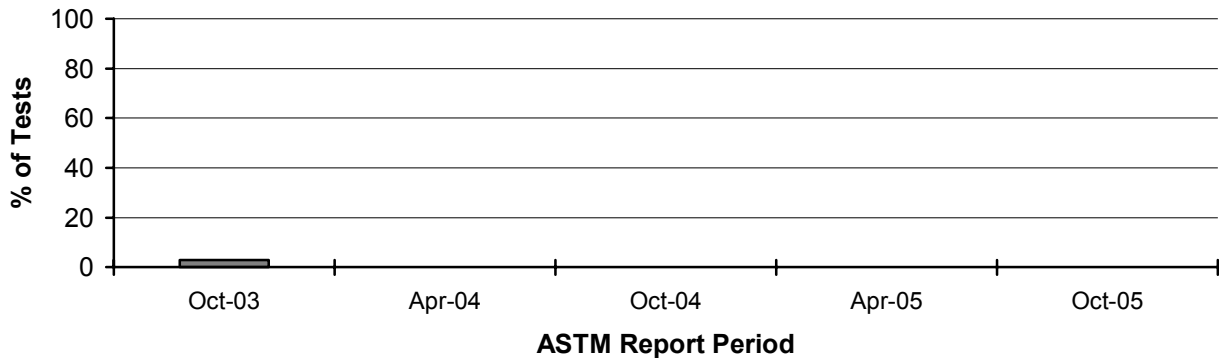


A detailed list of reasons tests failed the acceptance criteria (OC validity) is shown in Table 1. Table 2 lists the operationally invalid tests (LC validity) and Table 3 lists the aborted tests (XC validity).

LTMS Acceptance Criteria / Stand Alarms:

The following figure shows the percentage of operationally valid tests that failed the LTMS acceptance criteria (TMC validity code = OC) for recent ASTM report periods:

Tests Failing LTMS Acceptance Criteria



There were no SOOT LTMS stand alarms for the current period. Please note, the MRV LTMS does not monitor stand alarms. MRV is monitored only for determining laboratory severity adjustments. No LTMS deviations were issued this period. No LTMS deviations have been issued during the history of the T-11.

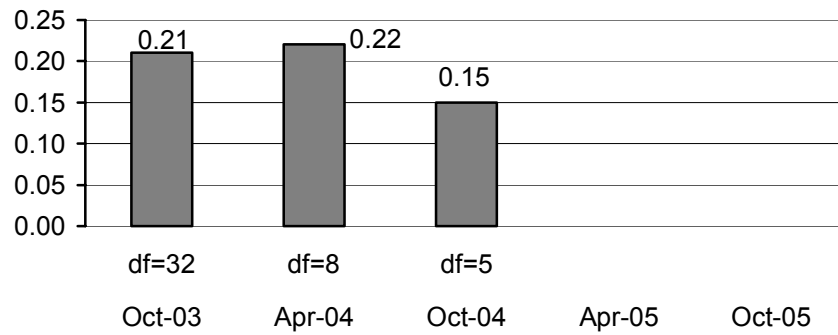
Severity and Precision:

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 within control chart limits. For this period, SOOT is trending an average of 0.56 Δ/s mild, which is approximately 0.12 SOOT %. For a history of SOOT industry alarms, refer to the industry alarm log shown in Table 4.

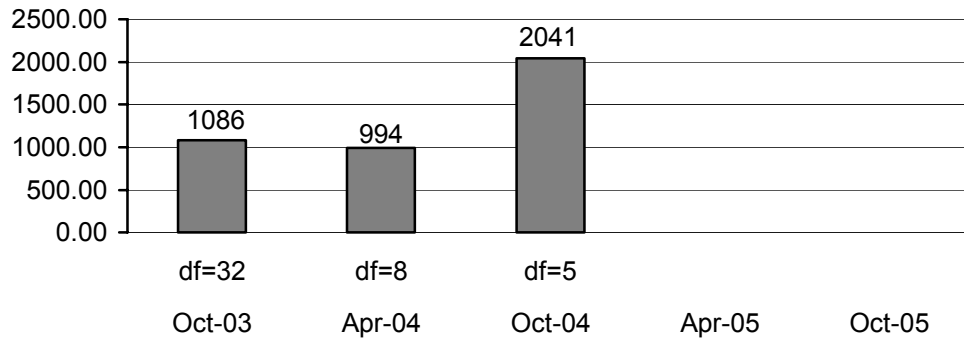
Figure 2 (attached) shows the current industry EWMA severity, EWMA precision, and cusum charts for MRV Viscosity (MRV). MRV is currently in industry action alarms for severity (in the severe direction) and precision. For this period MRV is trending an average of 1.24 Δ/s severe, which is approximately 1360 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 improvement compared to previous periods. Precision for MRV shows significant degradation compared to previous periods.

SOOT Pooled Precision



MRV Viscosity Pooled Precision



Please note, that the degrees of freedom (df) equals $\Sigma(n \text{ observations per oil} - 1)$.

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

Information Letters:

No information letters were issued this ASTM period.

TMC Laboratory Visits:

No TMC laboratory visits were conducted this ASTM period.

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:

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/mem04-076.jac.doc

Attachments

c: J.L. Zalar, TMC
F.M. Farber, TMC
Mack Surveillance Panel
<ftp://ftp.astmtmc.cmu.edu/docs/diesel/mack/semiannualreports/T11-10-2004.pdf>

Distribution: Email

Table 1
Summary of Reasons for Rejected Tests

	No. of Tests
No rejected tests	-

Table 2
Summary of Reasons for Invalid Tests

	No. of Tests
High oil consumption	1
Timing change exceeded 3 degrees	1
Modine intercooler failure	1
Test run without AFR probes	1

Table 3
Summary of Reasons for Aborted Tests

	No. of Tests
High oil consumption	2

FIGURE 1
T-11 INDUSTRY OPERATIONALLY VALID DATA

SOOT AT 12 cSt

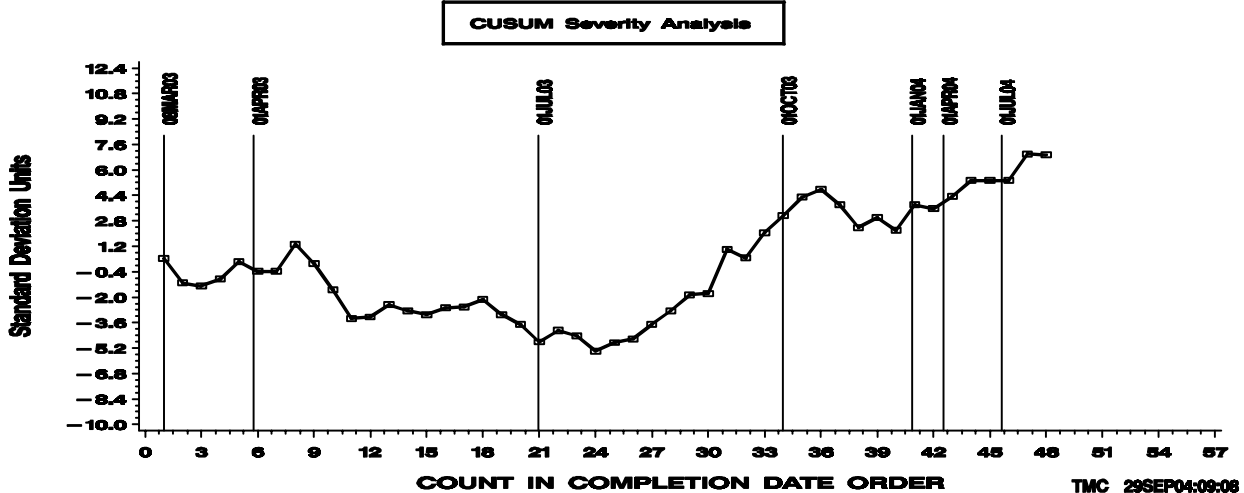
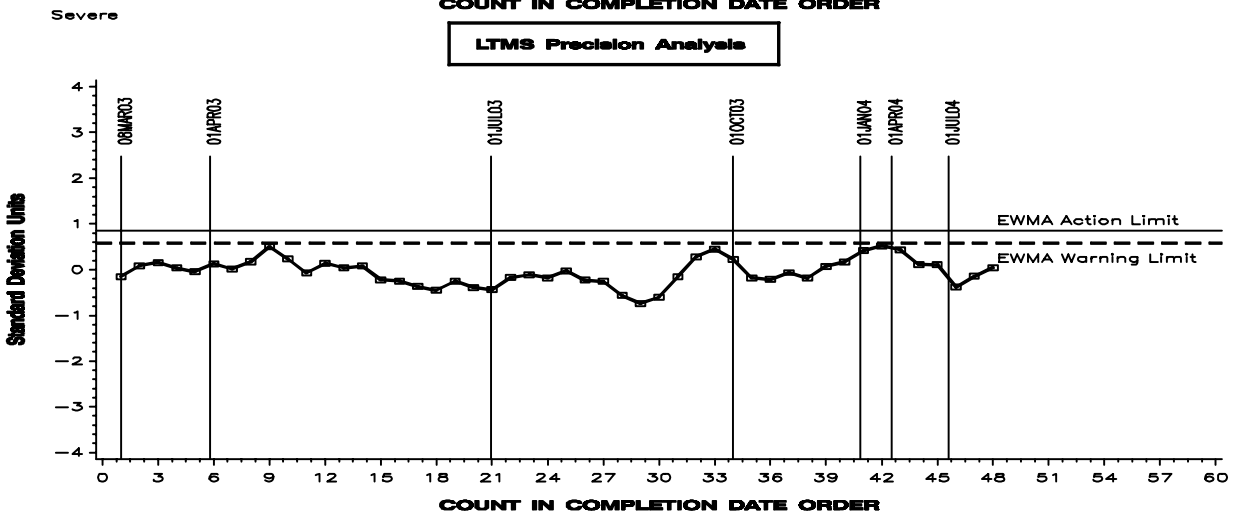
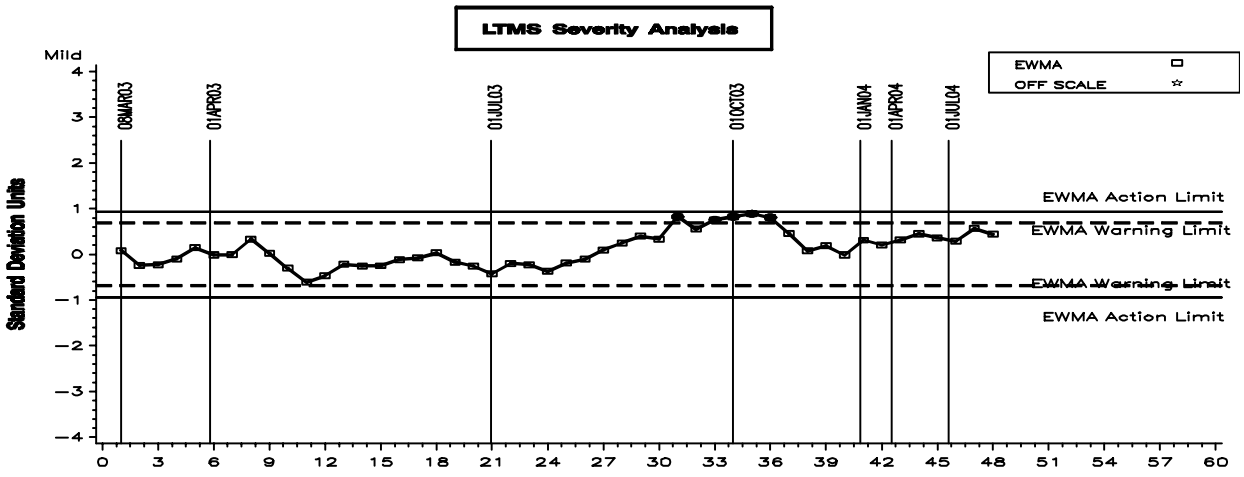


TABLE 4
SOOT AT 12 cSt INDUSTRY ALARM LOG

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.

Updated 10/1/04

FIGURE 2
T-11 INDUSTRY OPERATIONALLY VALID DATA

MRV VISCOSITY

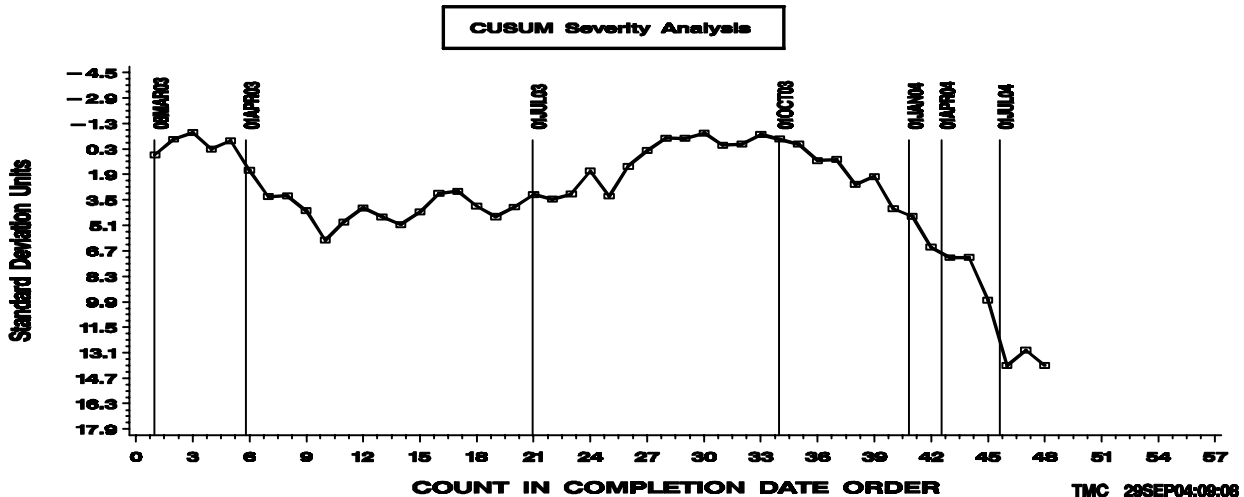
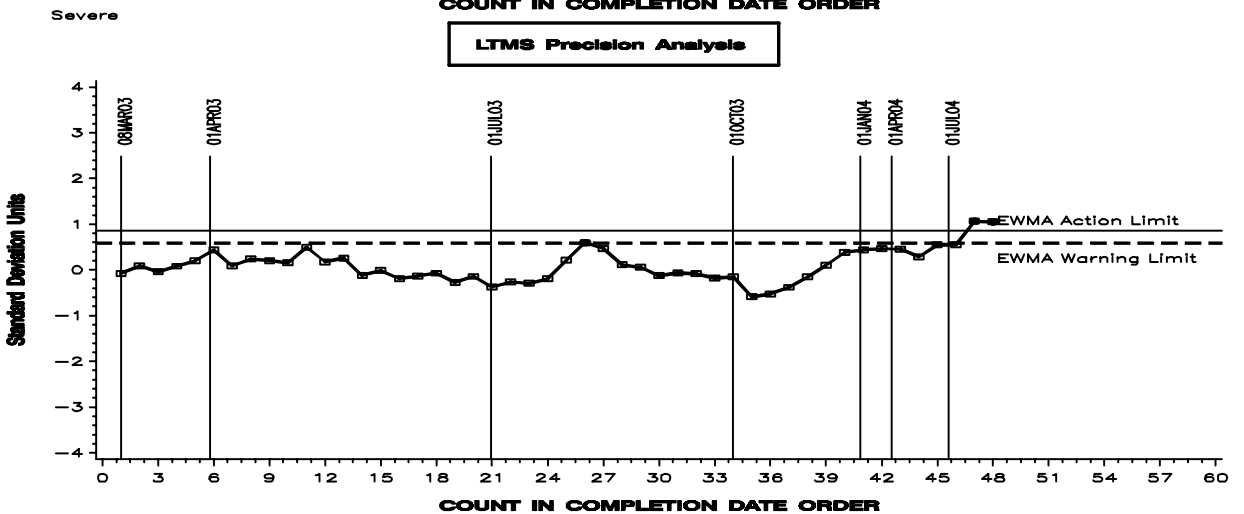
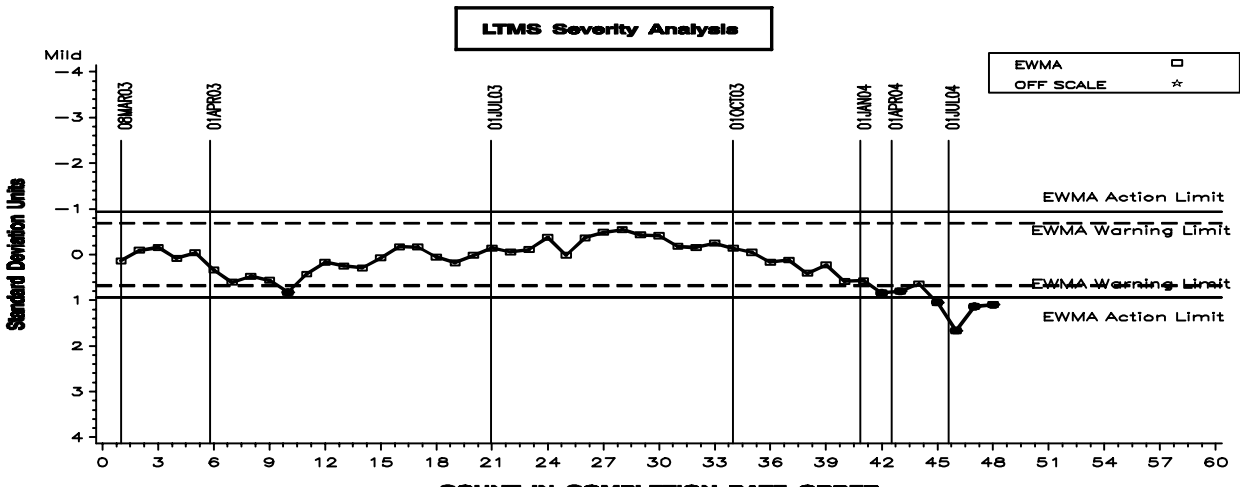


TABLE 5
MRV VISCOSITY INDUSTRY ALARM LOG

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 16, 2004 to Date (Severity, Severe direction; Precision)

The seven most recent tests trigger on-going alarms. No cause yet indicated.

Updated 10/1/04

TABLE 6

T11 Timeline

07:30 Wednesday, September 29, 2004 1

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