

MEMORANDUM: 00-44

DATE: April 10, 2000

TO: Jim Wells, Chairman, Engine Oil Aeration Test Surveillance Panel

FROM: Jeff Clark

SUBJECT: Engine Oil Aeration Reference Testing for the April 2000 ASTM Report Period

The following is a summary of Engine Oil Aeration reference oil tests that were completed during the April 2000 ASTM period, which began October 1, 1999 and ended March 31, 2000. It should be noted that for the history of the EOAT, all data has been generated at one laboratory.

The following summarizes the status of the reference oil tests completed this ASTM report period:

Test Description	TMC Validity Code	Number of Tests
Operationally and Statistically Acceptable	AC	1
Failed Acceptance Criteria	OC	0
Operationally Invalid	LC	0
Aborted	XC	1
Total		2

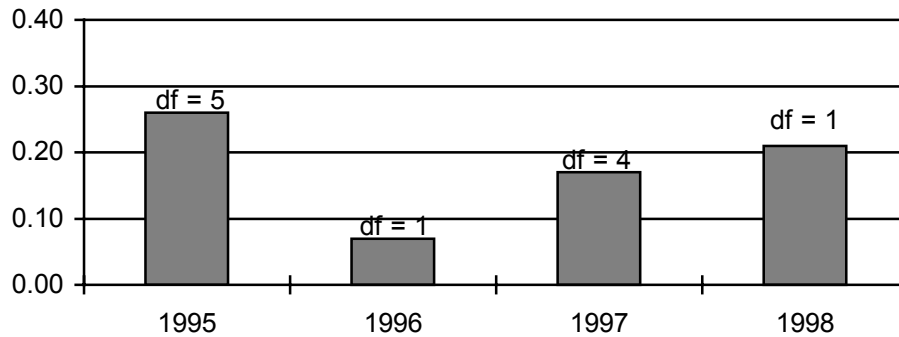
The aborted test was due to a failed fuel injector.

Severity and Precision:

Figure 1 (attached) shows the current industry severity and precision EWMA control charts and the industry cusum chart for average engine oil aeration (AEOA). AEOA is currently within the industry severity and precision limits. For a history of AEOA industry alarms, refer to the industry alarm log shown in Table 1.

Since testing frequency is low, an estimate of precision by ASTM period will not be presented. Instead, the TMC will provide yearly pooled (across all reference oils) standard deviation as an estimate of test precision as shown on the following chart.

Pooled Precision by Year



Precision estimates for 1999 and 2000 are not available due to low test volume. The 1998 precision estimate for AEOA appears to be within historical levels. However, it should be noted that the small degrees of freedom for every year dating back to 1995 makes it difficult to draw any meaningful comparison of precision. Note, the degrees of freedom (df) equals $\Sigma(\text{no. obs. per oil} - 1)$.

Reference Oils and Hardware:

The table below shows the current AEOA test targets.

Parameter	Reference Oil	n	Mean (%)	S
AEOA	1004-2	13	9.46	0.25
	1004-3	-	9.46	0.25
	1005	2	7.80	0.25
	1005-1	-	7.80	0.25

The current test targets for oil 1004-3 and 1005-1 are based on oils 1004-2 and 1005 respectively. These targets will be updated at five tests. To date, two tests each have been run on oils 1004-3 and 1005-1.

Information Letters:

No information letters were issued during the April 2000 ASTM period.

Additional Information:

Table 2 (attached) contains the AEOA Timeline which details changes to the Engine Oil Aeration Test since 1995.

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Additional Information (cont.):

The EOAT database, the industry LTMS plots, industry alarm log, and the EOAT Timeline may all be accessed from the TMC home page at www.tmc.astm.cmri.cmu.edu.

JAC/jac/mem00-044.jac.doc

Attachments

c: J.L. Zalar, TMC

F.M. Farber, TMC

Engine Oil Aeration Test Surveillance Panel

FIGURE 1
 EOAT INDUSTRY OPERATIONALLY VALID DATA
 ENGINE OIL AERATION

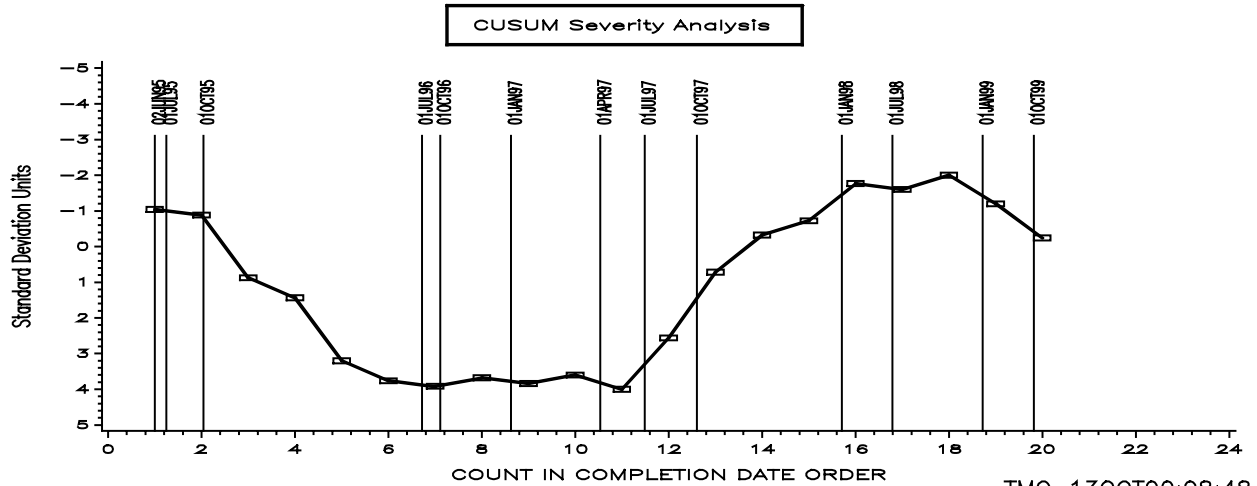
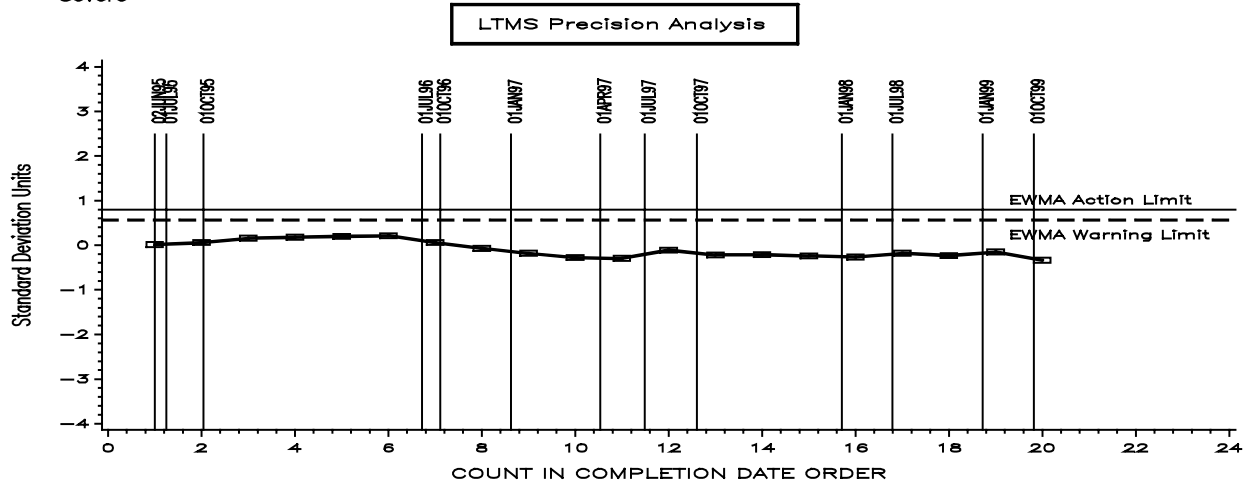
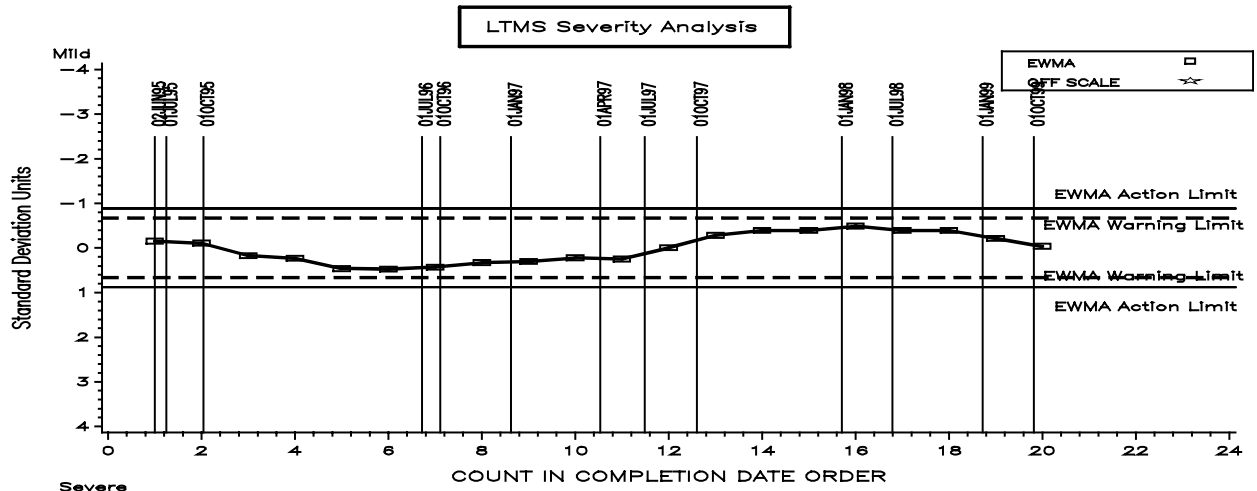


TABLE 1
ENGINE OIL AERATION INDUSTRY ALARM LOG

No industry alarms have occurred.

Updated 10/13/00

TABLE 2
Engine Oil Aeration Test Timeline

Date	Info. Letter	Topic
19950602,	,	OIL 1004-2 INTRODUCED.
19970510,	,	OIL 1005 INTRODUCED.
19971025,	,	OIL 1004-3 INTRODUCED.
19980812,	,	OIL 1005-1 INTRODUCED.
19990101,	,	TMC BEGINS MONITORING TEST. LTMS USED FOR DETERMINING TEST STAND CALIBRATION.
19990621,	,	CALIBRATION PERIOD SET AS 1 YEAR FROM REFERENCE EOT, OR 30 TESTS.
19991101,	99-1	DATA DICTIONARY AND REPORT FORMS VERSION 19990803.