



# Test Monitoring Center

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MEMORANDUM: 04-020

DATE: April 7, 2004

TO: Robert Stockwell, Chairman, Roller Follower Wear Test Surveillance Panel

FROM: Jeff Clark

SUBJECT: Roller Follower Wear Reference Testing for the April 2004 ASTM Report Period

The following is a summary of Roller Follower Wear reference oil tests that were completed during the April 2004 ASTM period which began October 1, 2003 and ended March 31, 2004. It should be noted that since August 1997, all data has been generated at one laboratory.

The following table 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	RC	0
Aborted	XC	0
Total		1

### Severity and Precision:

Figure 1 (attached) shows the current industry severity and precision EWMA control charts and the industry cusum chart for average follower wear (AFW). AFW is currently within the industry severity and precision limits.

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 in the following table.

**AFW Pooled Precision By Year**

Parameter	1995	1996	1997	1998	2002
df	9	9	12	2	2
AFW	0.02	0.05	0.03	0.01	0.01

Due to low test activity, precision estimates are not available for 1999 through 2001, and no estimate is available for 2003. Precision for 1998 and 2002 show improvement versus historical levels. This apparent improvement may be due to all data since August 1997 being generated at only one laboratory. Note, the degrees of freedom (df) equals  $\Sigma(\text{no. obs. per oil} - 1)$ .

Reference Oils and Hardware:

The table below shows the current AFW test targets.

Parameter	Reference Oil	N	Mean (mils)	S
AFW	1004-2	10	0.33	0.05
	1004-3	-	0.33	0.05
	1005	-	0.20	0.06
	1005-1	5	0.20	0.05

Oils 1004-3 and 1005-1 have been distributed for reference testing. The first five tests for oil 1004-3 will be judged against the targets for oils 1004-2. To date one test has been completed on oil 1004-3. New targets for oil 1004-3 will be generated once five tests have been completed.

To date, ten tests have been completed on oil 1005-1. However, the data for these tests produces a standard deviation of less than 0.01 mils. This data was generated at only one laboratory and may be artificially precise, especially compared to historical levels. The TMC is requesting that the Surveillance Panel address this situation prior to the implementation of new test targets for oil 1005-1. Until action is taken, the five test targets for oil 1005-1 will be used to determine calibration status.

Information Letters:

No information letters were issued this report period.

Laboratory Visits:

One TMC laboratory visit was conducted this ASTM period. One deficiency was noted. The 30-second stabilization period was not being applied to each step of the cyclic portion of the new engine break-in.

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Additional Information:

The RFWT industry database, LTMS plots, industry alarm log, and timeline may all be accessed from the TMC home page at [www.astmtmc.cmu.edu](http://www.astmtmc.cmu.edu).

JAC/jac/mem04-020.jac.doc

Attachments

c: J.L. Zalar, TMC  
F.M. Farber, TMC  
Roller Follower Wear Test Surveillance Panel  
<ftp://ftp.astmtmc.cmu.edu/docs/diesel/rfwt/semiannualreports/rfwt-04-2004.pdf>

Distribution: Email

# Figure 1

## RFWT INDUSTRY OPERATIONALLY VALID DATA

Average Follower Wear – Mils

