



Test Monitoring Center

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

MEMORANDUM: 05-033

DATE: May 27, 2005

TO: James McCord,
Chairman, Single Cylinder Diesel Surveillance Panel

FROM: Scott Parke

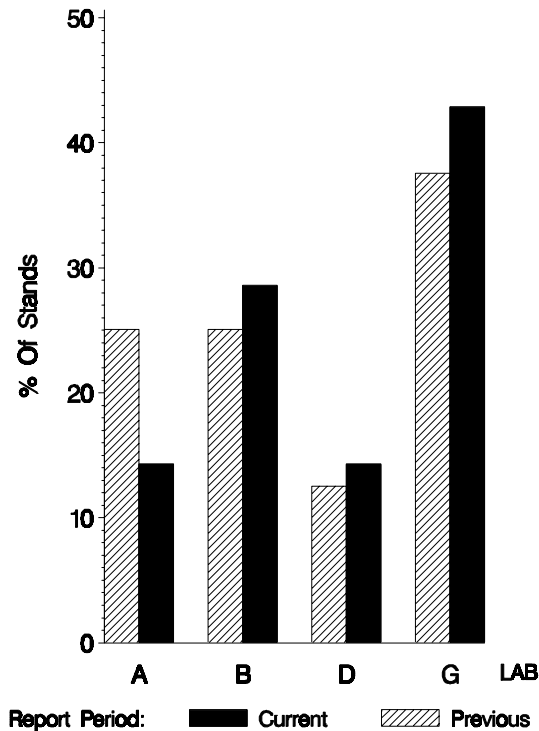
SUBJECT: 1M-PC Testing from October 1, 2004 through March 31, 2005

Nine calibration tests were reported to the Test Monitoring Center during the period from October 1, 2004 through March 31, 2005. The data from the operationally valid tests is shown on page 6. Following is a summary of testing activity this period.

	Reporting Data	Calibrated on 3-31-05
Number of Labs	4	4
Number of Stands	7	6

Stands reporting data this period were distributed as shown below:

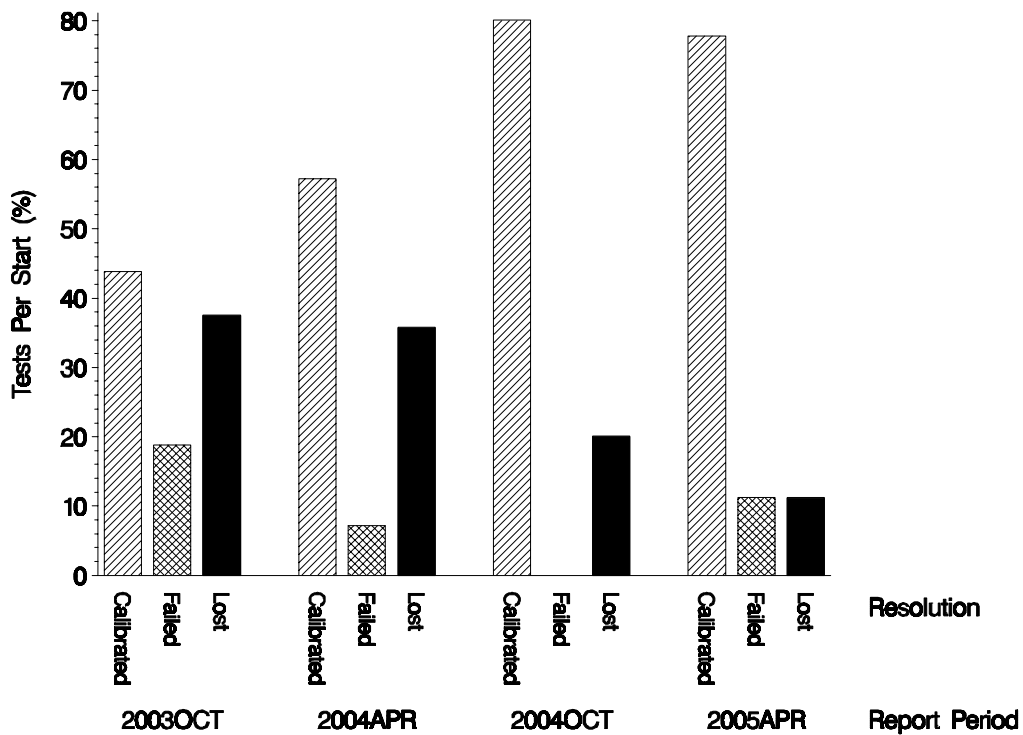
1M-PC LABORATORY / STAND DISTRIBUTION



Test Distribution by Oil and Validity

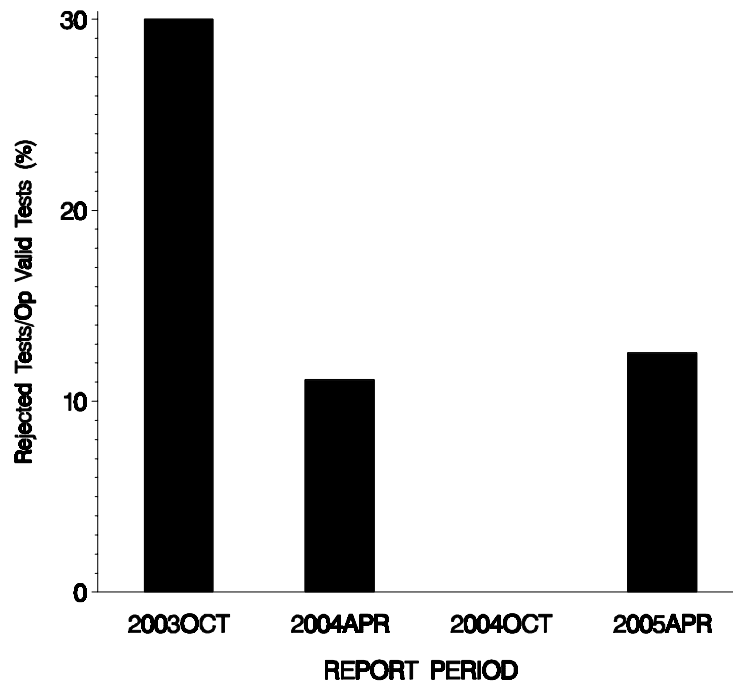
			Totals			
			873-1	873-2	Last Period	This Period
Accepted for Calibration	AC	0	7		8	7
Rejected Mild	OC	0	0		0	0
Rejected Severe	OC	0	1		0	1
Rejected for EWMA Precision	OC	0	0		0	0
Rejected for Shewhart Precision	OC	0	0		0	0
Operationally Invalid (lab)	LC	0	0		0	0
Operationally Invalid (lab/TMC)	RC	0	0		0	0
Aborted Calibration	XC	0	1		2	1
Total			0	9	10	9

1M-PC CALIBRATION ATTEMPT SUMMARY



The test-per-start ratio for calibrated, failed, and lost tests is shown above.

**OPERATIONALLY VALID 1M-PC TESTS
FAILING ACCEPTANCE CRITERIA**

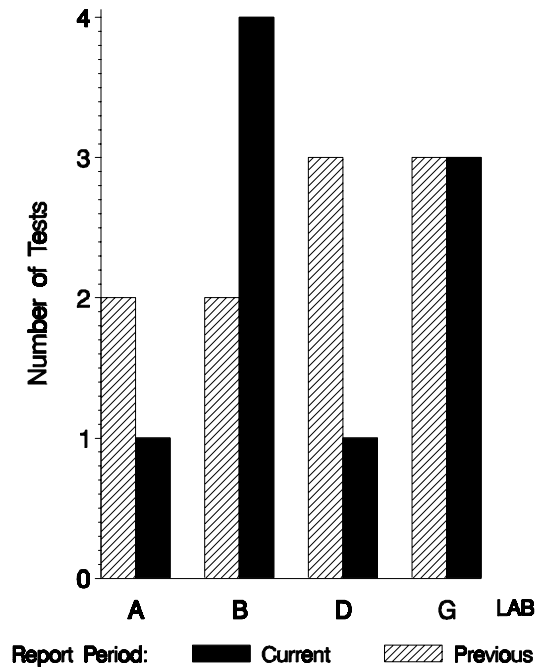


No LTMS deviations were written this period. A total of two deviations have been written over the life of this test. One test failed this period; it produced severe TGF. 1Y3995 cylinder liners have tended to produce severe TGF.

By lab, the tests run this report period were distributed as shown below:

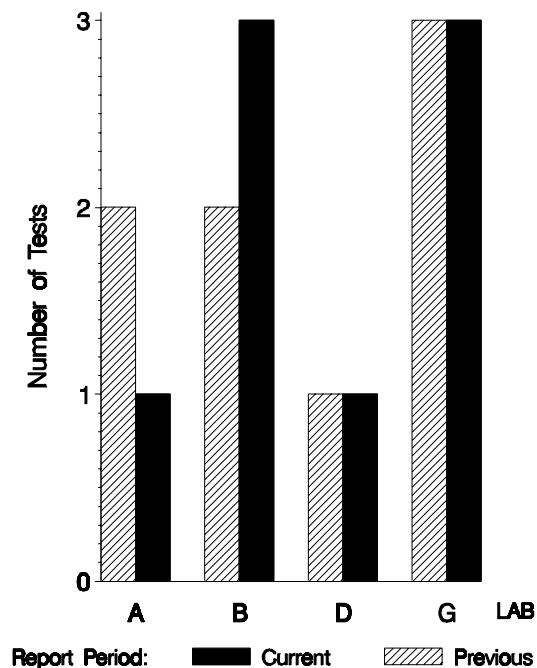
**NUMBER OF 1M-PC TESTS REPORTED
BY LAB AND REPORT PERIOD**

(All Test Starts - Both Valid & Invalid)

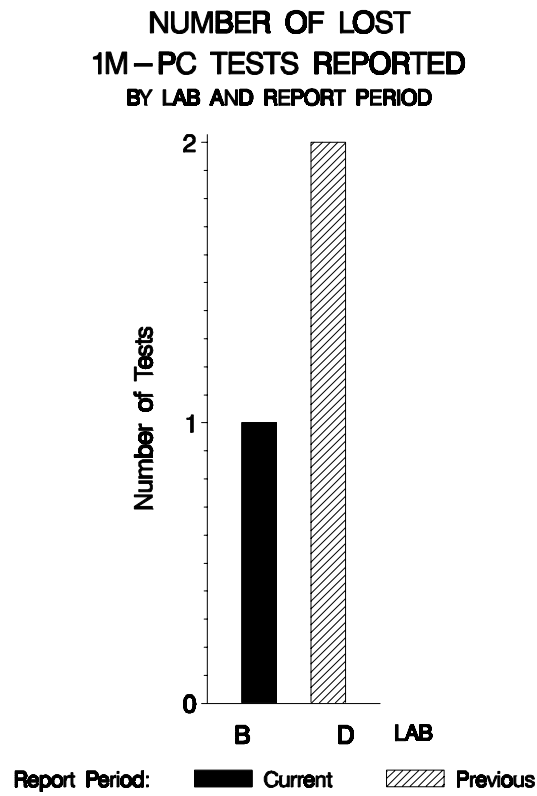


With all operationally invalid tests removed, the distribution looks like this:

**NUMBER OF OPERATIONALLY VALID
1M-PC TESTS REPORTED
BY LAB AND REPORT PERIOD**



And the by-lab distribution of lost tests:



Lost Tests per Start by Oil and Lab:

Lab	873-1			873-2			Total		
	Lost	Starts	%	Lost	Starts	%	Lost	Starts	%
A				0	1	0	0	1	0
B				1	4	25	1	4	25
D				0	1	0	0	1	0
G				0	3	0	0	3	0
Total				1	9	11	1	9	11

Lost tests are those that were either aborted, rejected by lab, or operationally invalid.

Causes for Lost Tests:

Lab	Cause	Oil		Validity			Loss Rate		
		873-1	873-2	LC	RC	XC	Lost	Starts	%
B	Exhaust cam lobe failure @64h.		●			●	1	4	25%
	Lost	0	1	0	0	1			
	Starts	0	9	9	9	9			
	%	0%	11%	0%	0%	11%			

Average Δ/s by Lab			
Lab	n	TGF	WTD
A	1	0.745	1.788
B	3	1.139	0.896
D	1	1.429	-0.475
G	3	0.745	-0.755
Industry	8	0.978	0.217

DATA FROM ALL OPERATIONALLY VALID TESTS REPORTED THIS PERIOD:

LTMS

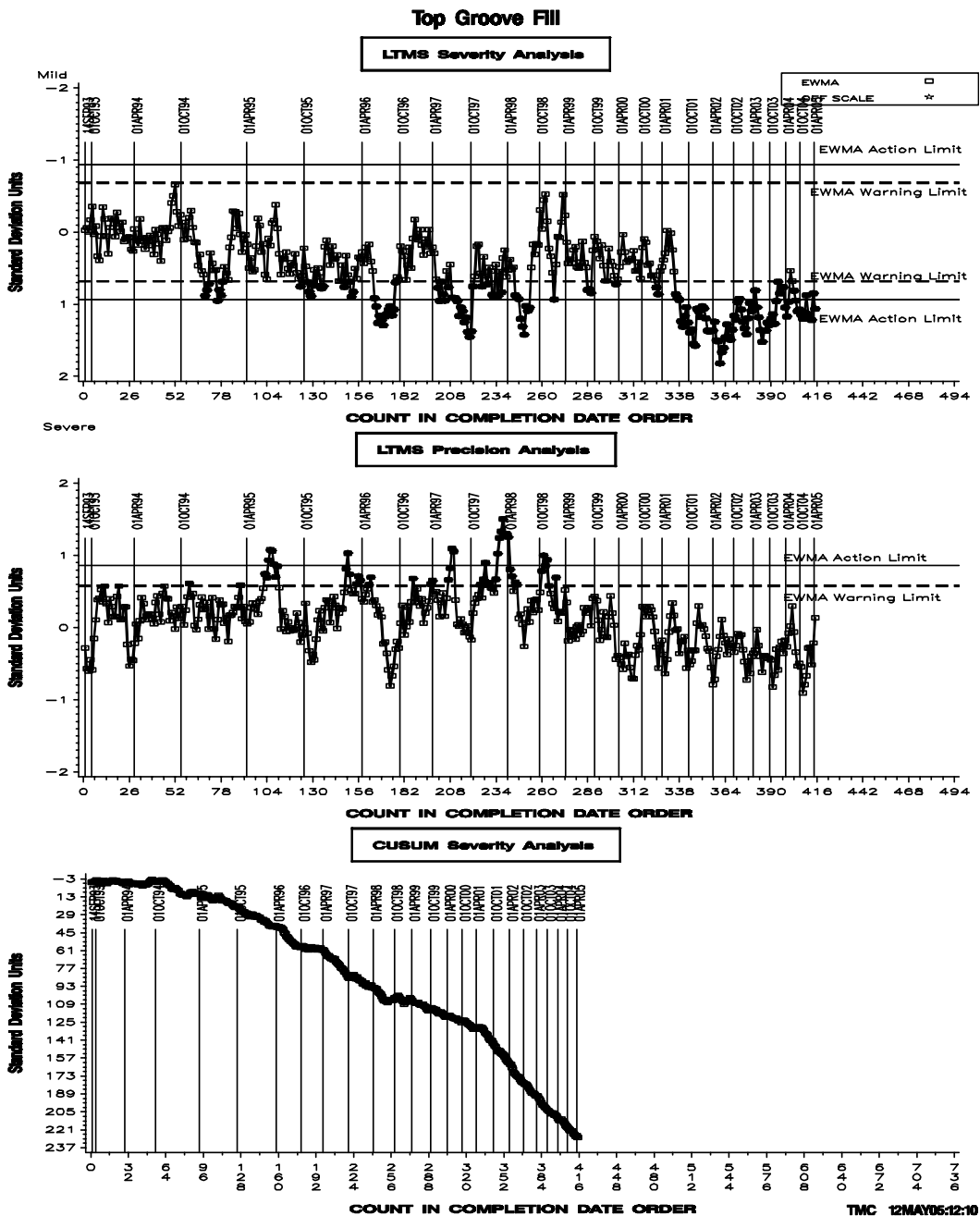
DATE	LAB	STAND	OIL	TG	WD	TGYI	WDYI
20041115	G	8A	873-2	64	199.3	1.429	-0.657
20041117	D	2	873-2	64	208.5	1.429	-0.475
20041208	A	9	873-2	53	322.8	0.745	1.788
20050124	B	7	873-2	40	279.0	-0.062	0.921
20050222	B	8A	873-2	76	238.6	2.174	0.121
20050309	G	13A	873-2	64	188.8	1.429	-0.865
20050321	B	8A	873-2	62	315.7	1.304	1.648
20050322	G	10A	873-2	31	195.0	-0.621	-0.743

DISCUSSION OF INDUSTRY PERFORMANCE OVER THIS PERIOD

TGF:

TGF over this period was again severe and continues to exceed the EWMA action limit. Industry average TGF Y_i was 0.978 (see table on previous page). Using 873-1's test target standard deviation of 16.1 to compute an average Δ yields 16% TGF. In its most recent meeting the Single Cylinder Diesel Surveillance Panel conceded that 1Y3995 cylinder liners introduced in May of 2001 appear to have caused a severity shift. The stock of these liners is nearly depleted. A new liner is in the process of being introduced.

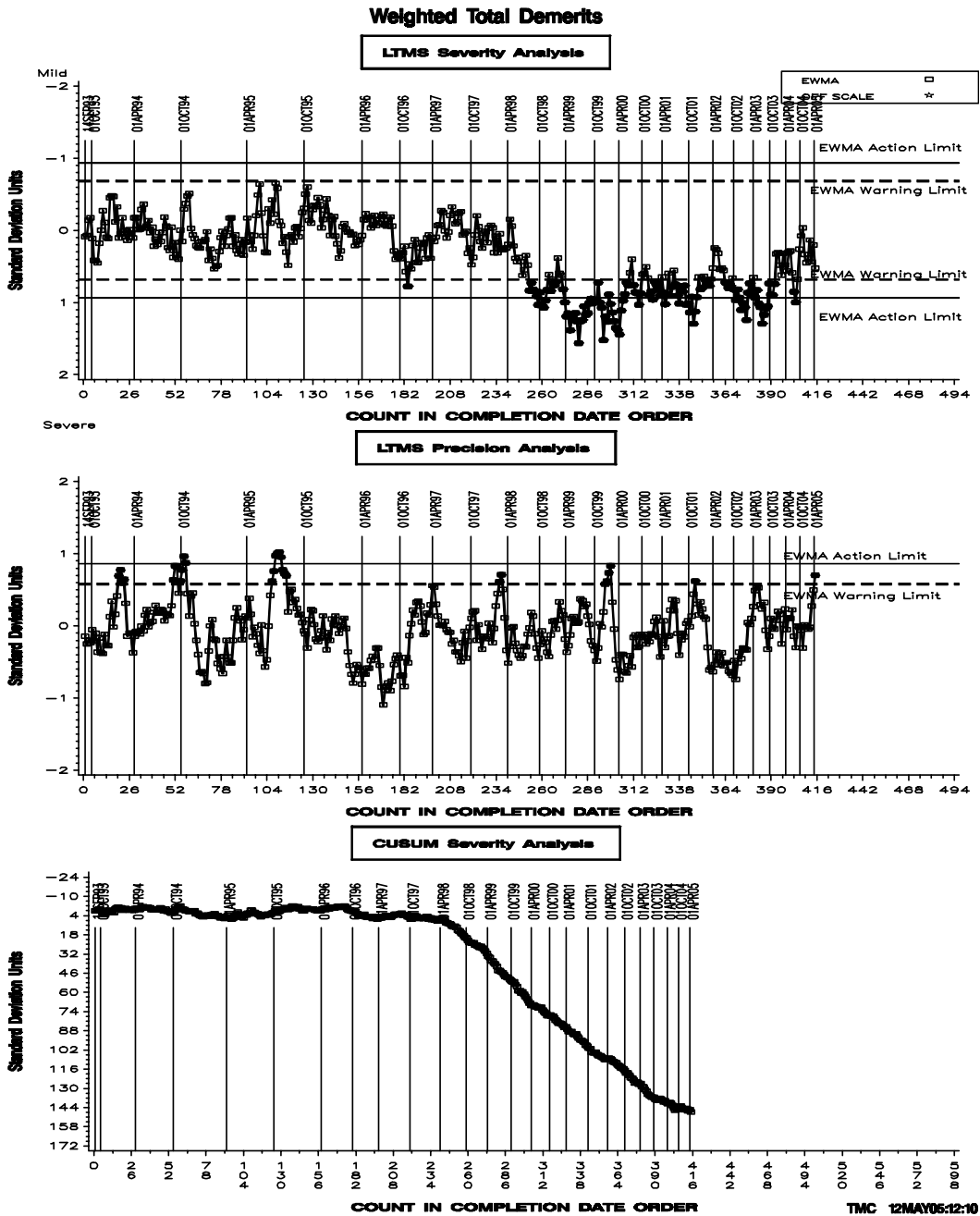
CATERPILLAR 1M-PC INDUSTRY OPERATIONALLY VALID DATA



WTD:

As it has since April '98, WTD also continues to be severe (though less so than in prior periods). Industry average WTD Yi was 0.217 (equivalent to 11.0 demerits severe when multiplied by 873-1's standard deviation of 50.5). Precision remained within acceptable limits this period.

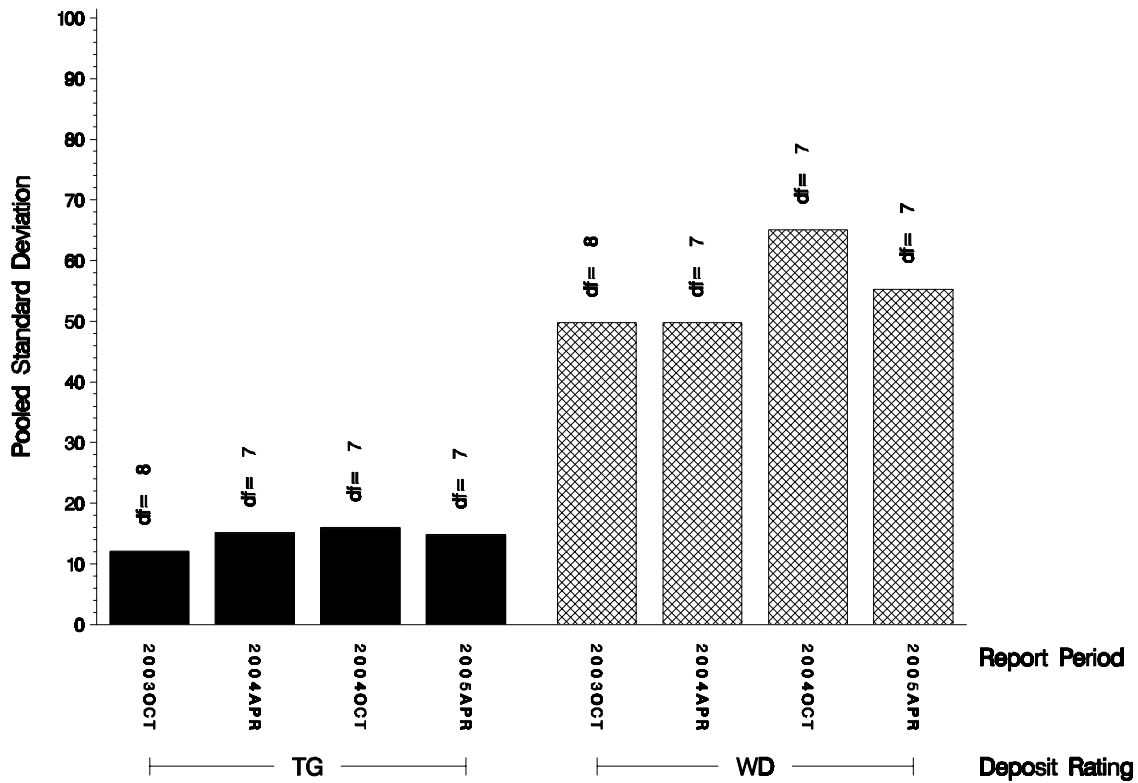
CATERPILLAR 1M – PC INDUSTRY OPERATIONALLY VALID DATA



POOLED S:

Shown below is a bar chart comparing the pooled s values for the 1M-PC test parameters over the last four report periods. Precision for both parameters, as measured by pooled s, is comparable to previous periods.

1M – PC REFERENCE TEST PRECISION
POOLED STANDARD DEVIATION BY SIX-MONTH ASTM REPORT PERIOD



STATUS OF REFERENCE OIL SUPPLY:

At the end of this report period, the testing oil supply stood as outlined in the table below:

Oil	Cans @ Labs	@ TMC	
		Cans	Gallons
873-1	3	2	25
873-2	13	83	833
Total	16	85	858

* Future reblends of any oils marked with an asterisk are not obtainable by TMC.

TIMELINE OF SIGNIFICANT EVENTS IN THE LIFE OF THE 1M-PC TEST:

Effective Date	Info Letter	
19940419		FIRST USE OF 873-1
19940927		FIRST EXHAUST BARREL TEST
19941031		LAST USE OF 873
19941225		LAST NON-EXHAUST BARREL TEST
19950401		LTMS INTRODUCTION
19950728	95-1	REWRITTEN PROCEDURE ISSUED ALONG WITH INFORMATION LETTER 95-1
19950728	95-1	LINER WEAR STEP MEASUREMENT TECHNIQUE CHANGED TO CONFORM TO 1K/1N
19950728	95-1	REMOVAL OF MAXIMUM ALLOWABLE LSC SPECIFICATION
19950728	95-1	ADOPTION OF THE STANDARDIZED TEST REPORT COVER SHEET
19950728	95-1	EXHAUST BACKPRESSURE SPECIFICATION CHANGED TO ABSOLUTE PRESSURE
19950728	95-1	EXHAUST TEMPERATURE SPECIFICATION LOWERED
19950926	95-1	IMPLEMENTATION OF DATA DICTIONARY AND REPORT FORMS (VERSION=19950607)
19960315	96-1	FUEL FLOW MEASUREMENT DEVICE SPECIFICATION CLARIFIED
19960315	96-1	HUMIDITY CALIBRATION SCHEDULING REQUIREMENT CHANGED
19960315	96-1	EDITORIAL CHANGES
19960414	96-1	FORMS CHANGES
19980209	98-1	REVISED WARRANTY PROCEDURE & FORMS
19980209	98-1	FUEL SUPPLIER NAME CHANGE
19980209	98-1	COOLANT ADDITIVE NAME CHANGE(PENCOOL 2000)
19980209	98-1	TMC FAX NUMBER CHANGE
19980430	98-2	ADD FUEL, LTMS, AND OTHER 1K/1N-TYPE FORMS & EXAMPLES TO TEST REPORT
19980824	98-3	ADD RATING WORKSHEET (FORM 4A) TO TEST REPORT
19981109	98-4	ADD AREAS FOR CLEAN TO RATING SHEETS 5 & 5A
19981109	98-5	CORRECTION TYPO IN 98-2 TO FUEL AND COOLANT SUPPLIER NAMES
19990419	99-1	UPDATED INTAKE AIR FILTER REQUIREMENTS
19990419	99-1	RE-CALIBRATION REQUIREMENTS WHEN CRANK IS REMOVED
19990419	99-1	VISUAL INSPECTION OF INTAKE AIR BARRELS
19990419	99-1	COOLANT SYSTEM FLUSHING REQUIREMENTS
19990419	99-1	TEST STAND INSTRUMENTATION CALIBRATION REQUIREMENTS
19990419	99-1	USE OF MOBIL EF-411 AS BUILD-UP/FLUSHING OIL
19990419	99-1	TIME ZONE FOR USE IN EOT REPORTING
19990419	99-1	FUEL INJECTION PUMP REPLACEMENT
19990419	99-1	EDITORIAL
20010508		FIRST 1Y3995 LINER TEST
20020428		FIRST 873-2 TEST
20031121	03-1	1M-PC DATA DICTIONARY AND REPORT FORMS (VERSION=20031022) SEPARATED FROM THE STANDARD
20050321		FIRST 5H5657 PRODUCTION LINER TEST
20050321	05-1	EDITORIAL (SOLVENT SPEC, PRECISION STMT, CAL FREQ ADJUSTMENT)

RATING:

One referee re-rate was requested this report period. After review of all ratings, the lab both changed its own rating and used the second referee rating for the final test report.

Rating Re-rate Summary

Total number of re-rates requested	<u>1</u>
Number of tests where lab rating was changed	1
Number of tests where referee rating was changed	1
Number of tests where no changes were made	0

LAB VISITS:

No 1M-PC lab visits were completed during this period.

INFORMATION LETTERS:

Information Letter 05-1 was issued during this report period. It contained several editorial revisions made at the request of ASTM Subcommittee D02.B and ASTM Section D02.B0.09.

FUEL BATCH APPROVAL:

During this period, the following fuel batches were approved for testing: SK0521LS02 and SK1821LS11.

SUMMARY

- Over the course of this report period, TGF and WTD both continued to be severe. The surveillance panel has concluded that the shift in TGF severity can be attributed to the use of 1Y3995 liners. No corrective action has been taken.

- Precision for both TGF and WTD remained within limits throughout the period.

SDP/sdp/astm0405.doc/mem05-033.sdp.doc

c: J. L. Zalar

F. M. Farber

Abdul Cassim, Caterpillar

Chuck Dutart, Caterpillar

Single Cylinder Diesel Surveillance Panel

<ftp://ftp.astmtmc.cmu.edu/docs/diesel/scote/semiannualreports/1mpc-04-2005.pdf>

Distribution: email