



# Test Monitoring Center

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(412) 365-1000

MEMORANDUM: 05-095

DATE: November 14, 2005

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

FROM: Scott Parke

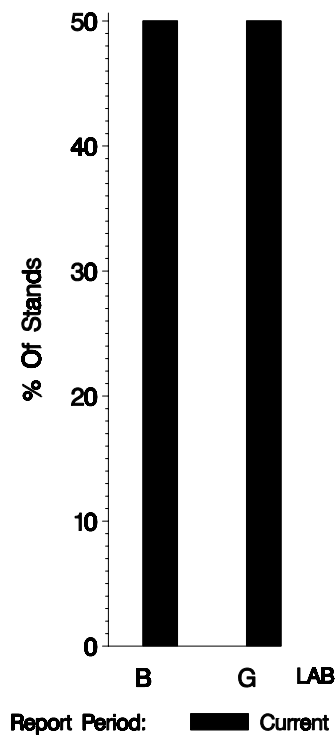
SUBJECT: 1R Testing from April 1, 2005 through September 30, 2005

Three calibration tests were reported to the Test Monitoring Center during the period from April 1, 2005 through September 30, 2005. The data from these tests is shown on page 7. Following is a summary of testing activity this period.

	Reporting Data	Calibrated on 9-30-05
Number of Labs	2	1
Number of Stands	2	1

Stands reporting data this period were distributed as shown below:

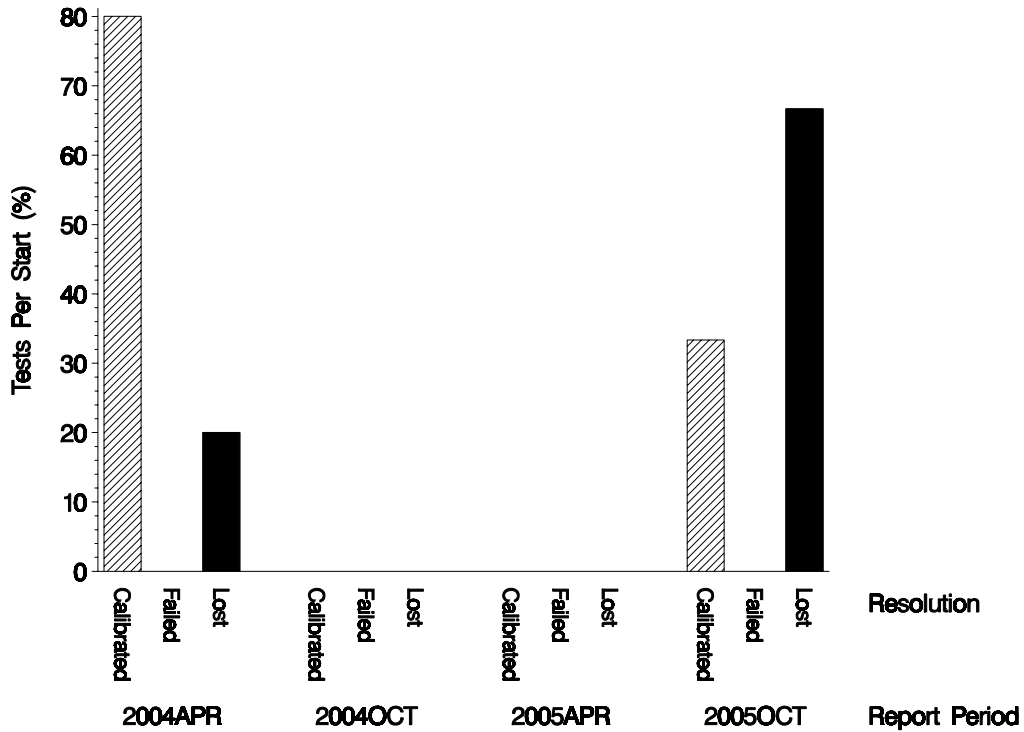
## 1R LABORATORY / STAND DISTRIBUTION



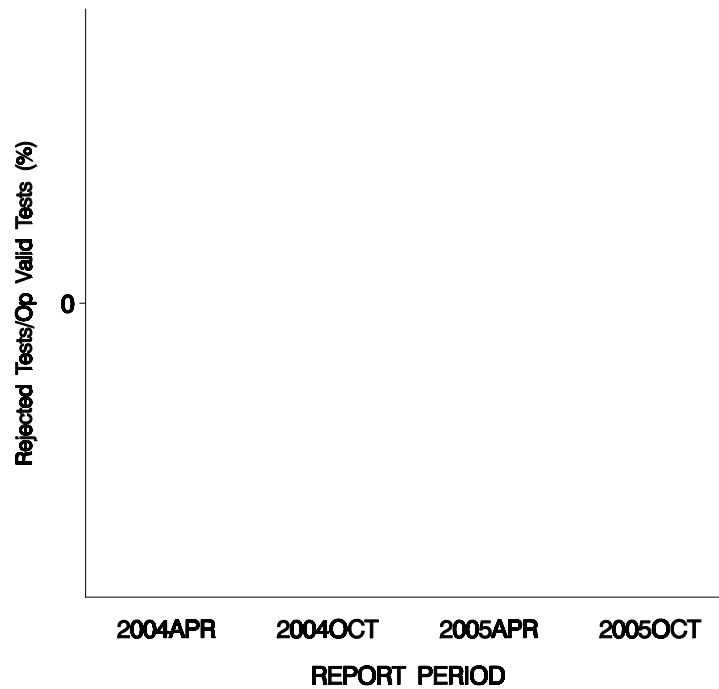
**Test Distribution by Oil and Validity**

			Totals			
		820-2	1005-1	1005-2	Last Period	This Period
Accepted for Calibration	AC	1	0	0	0	1
Rejected Mild	OC	0	0	0	0	0
Rejected Severe	OC	0	0	0	0	0
Rejected for EWMA Precision	OC	0	0	0	0	0
Rejected for Shewhart Precision	OC	0	0	0	0	0
Operationally Invalid (lab)	LC	0	1	0	0	1
Operationally Invalid (lab/TMC)	RC	0	0	0	0	0
Aborted Calibration	XC	1	0	0	0	1
<b>Total</b>		<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>3</b>

**1R CALIBRATION ATTEMPT SUMMARY**



**OPERATIONALLY VALID 1R TESTS  
FAILING ACCEPTANCE CRITERIA**



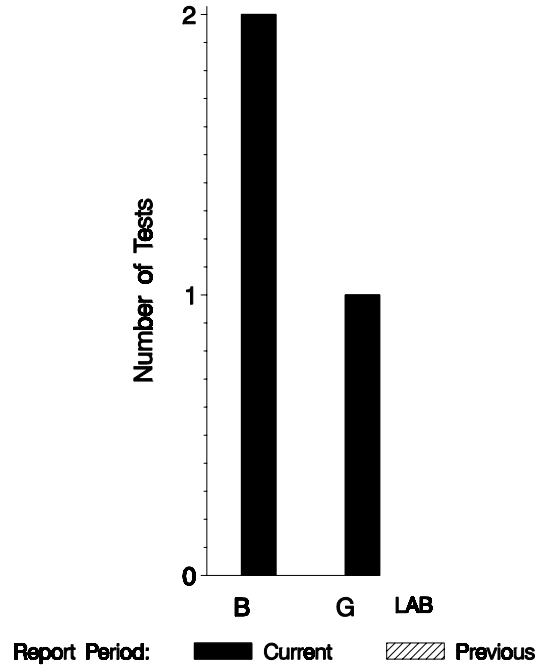
The above chart shows the percentage of failed but operationally valid tests. No tests failed in any of the last four report periods.

No LTMS deviations were written this period (none have ever been written for this test).

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

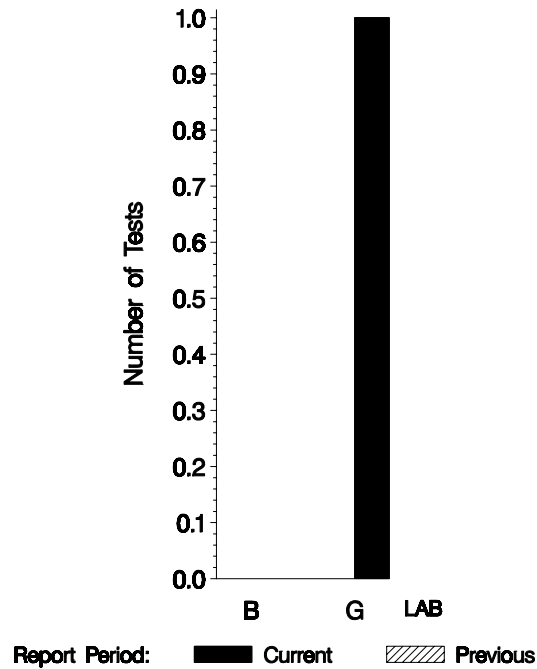
**NUMBER OF 1R TESTS REPORTED  
BY LAB AND REPORT PERIOD**

(All Test Starts – Both Valid & Invalid)

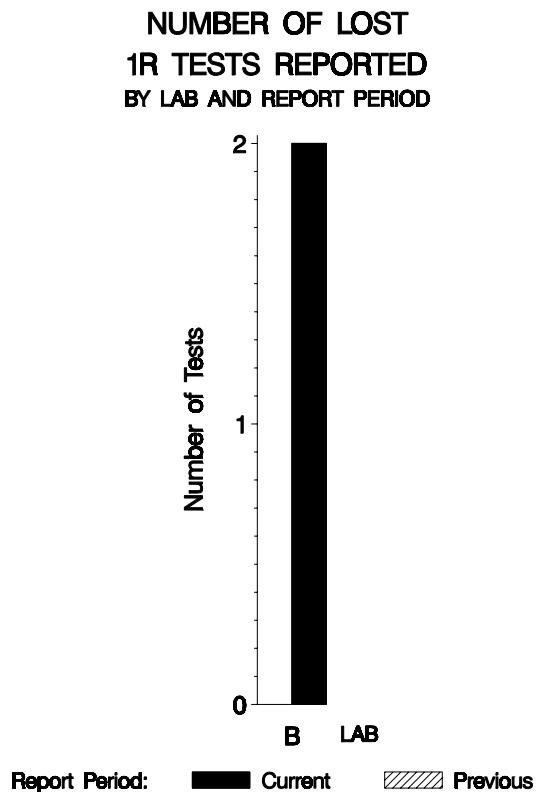


With all operationally invalid tests removed, the distribution looks like this:

**NUMBER OF OPERATIONALLY VALID  
1R TESTS REPORTED  
BY LAB AND REPORT PERIOD**



And the by-lab distribution of lost tests:



Lost Tests per Start by Oil and Lab

Lab	820-2			1005-1			1005-2			Total		
	Lost	Starts	%	Lost	Starts	%	Lost	Starts	%	Lost	Starts	%
B	1	1	100	1	1	100				2	2	100
G	0	1	0							0	1	0
Total	1	2	50	1	1	100				2	3	67

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

Causes for Lost Tests

Lab	Cause	Oil			Validity			Loss Rate		
		820-2	1005-1	1005-2	LC	RC	XC	Lost	Starts	%
B	Post-test inspection of severe test discovered a crack in the cylinder head near the intake guide.		●		●			2	2	100%
	Post-test inspection of test aborted due to high oil consumption revealed that the wrong piston had been installed.	●					●			
	Lost	1	1	0	1	0	1			
	Starts	2	1	0	3	3	3			
	%	50%	100%	0%	33%	0%	33%			

Average Δ/s by Lab						
Lab	n	TGC	WD	TLC	BTOC*	ETOC*
B	1	-1.737	-0.494	-1.792	0.941	0.615
Industry	3	-1.737	-0.494	-1.792	0.941	0.615

\* Transformed

DATA FROM ALL OPERATIONALLY VALID TESTS REPORTED THIS PERIOD:

**LTMS**

DATE	LAB	STAND	OIL	TG	WD	TL	BTOC	ETOC	TGYI	WDYI	TLYI	BTOCYI	ETOCYI
20050614	G	1	820-2	16.25	323.3	4.00	9.9	9.5	-1.737	-0.494	-1.792	0.941	0.615

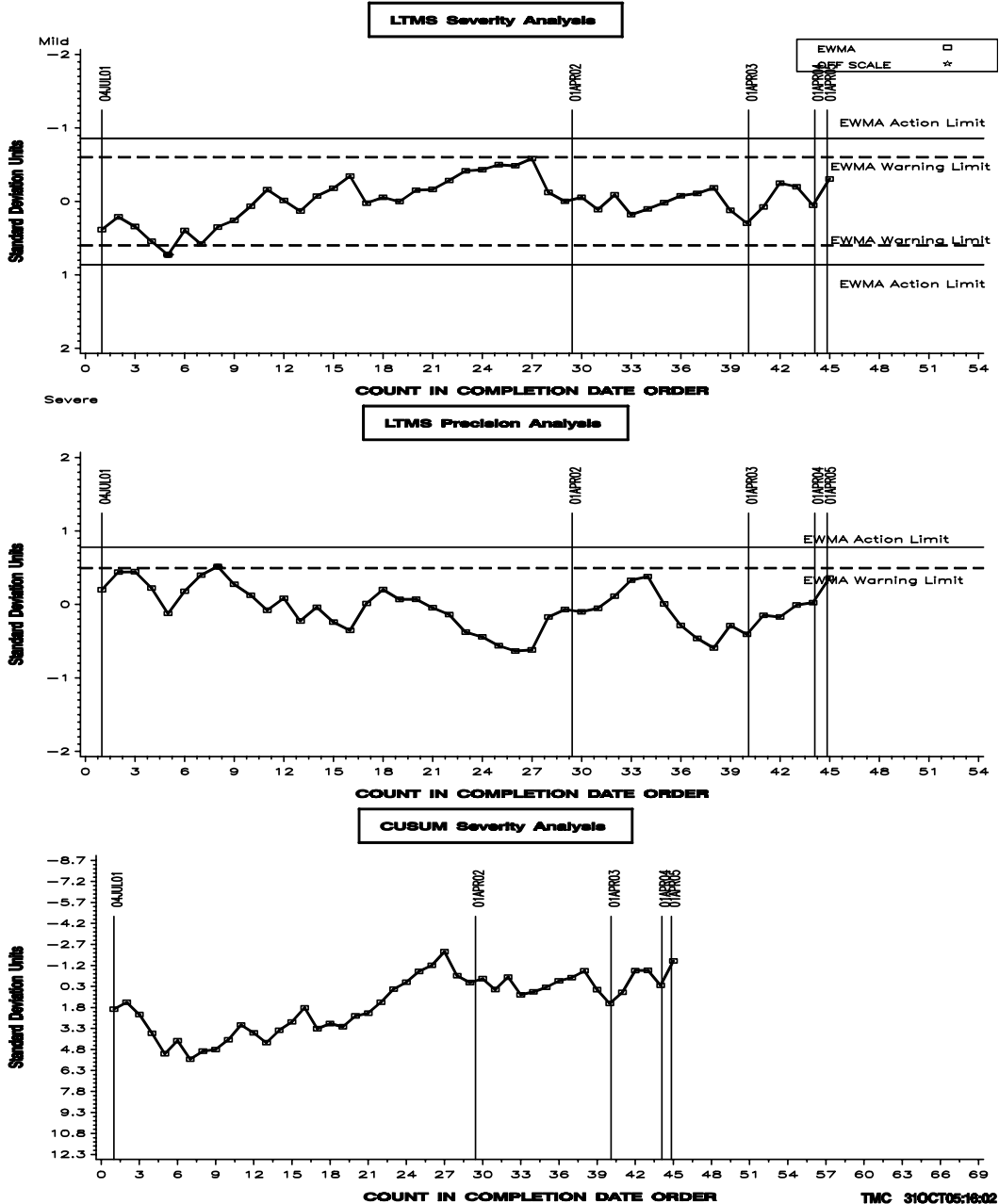
DISCUSSION OF INDUSTRY PERFORMANCE OVER THIS PERIOD

TGC:

The average  $Y_i$  reported this period was -1.737 (see table on previous page). Using the value 9.70 (which is the root mean square error of the matrix data and the value used to generate lab severity adjustments) to compute an average delta yields 16.85 demerits mild. Severity and precision remained within acceptable limits throughout this period.

**CATERPILLAR 1R INDUSTRY OPERATIONALLY VALID DATA**

**FINAL TOP GROOVE CARBON (DEMERITS)**



Shown above is the LTMS/Cusum plot for TGC.

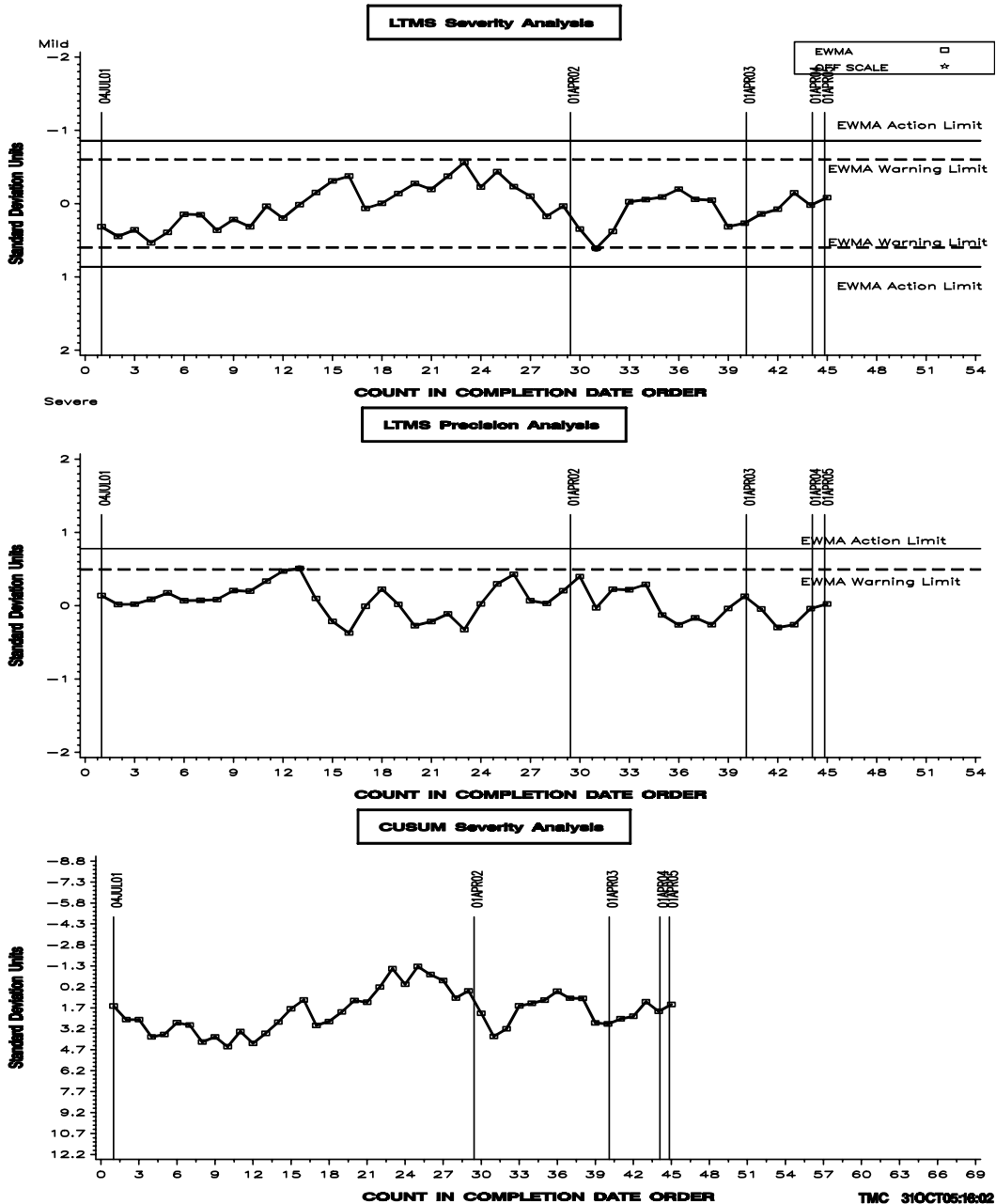


WD:

The average  $Y_i$  reported for WDP this period was -0.494 mild (see table on page 7). Using the value 29.0 (which is the root mean square error of the matrix data and the value used to generate lab severity adjustments) to compute an average delta yields 14.33 demerits mild. Severity and precision remained within acceptable limits. The LTMS/Cusum plot is shown below.

**CATERPILLAR 1R INDUSTRY OPERATIONALLY VALID DATA**

**FINAL WEIGHTED TOTAL DEMERITS (DEMERITS)**

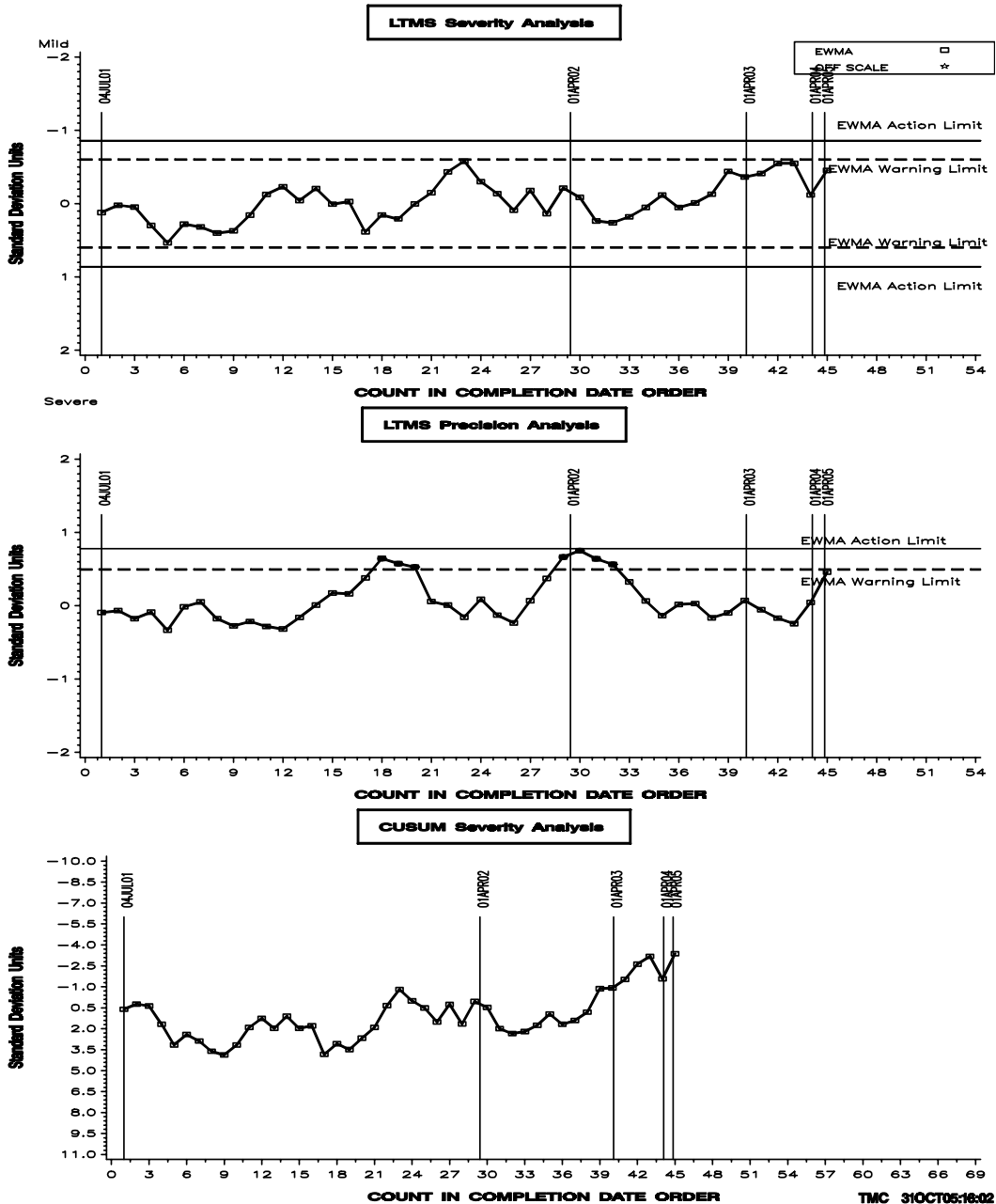


**TLC:**

The average TLC Yi reported this period was -1.792 (see table on page 7). Using the value 7.84 (which is the root mean square error of the matrix data and the value used to generate lab severity adjustments) to compute an average delta yields 14.05 demerits mild. TLC remained within both severity and precision limits. The LTMS/Cusum chart is shown below.

**CATERPILLAR 1R INDUSTRY OPERATIONALLY VALID DATA**

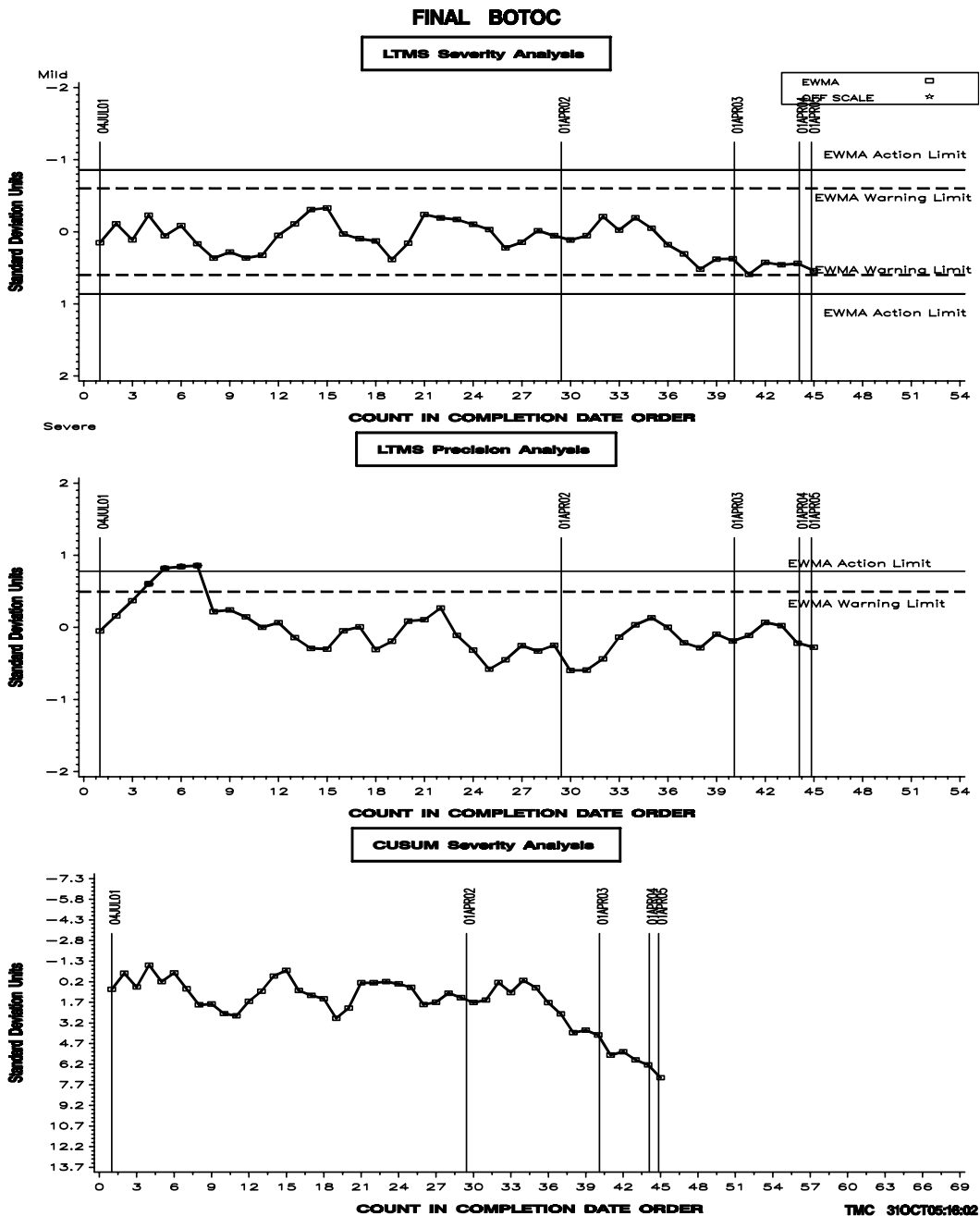
**FINAL TOP LAND CARBON (DEMERITS)**



Beginning of Test Oil Consumption (BTOC):

The average transformed BTOC  $Y_i$  this period was 0.941 (see table on page 7). Using the value 1.32 (which is the root mean square error of the matrix data and the value used to generate lab severity adjustments) to compute an average delta yields 1.24g/h severe. Severity and precision remained within acceptable limits. The LTMS/Cusum plot for BTOC is shown below.

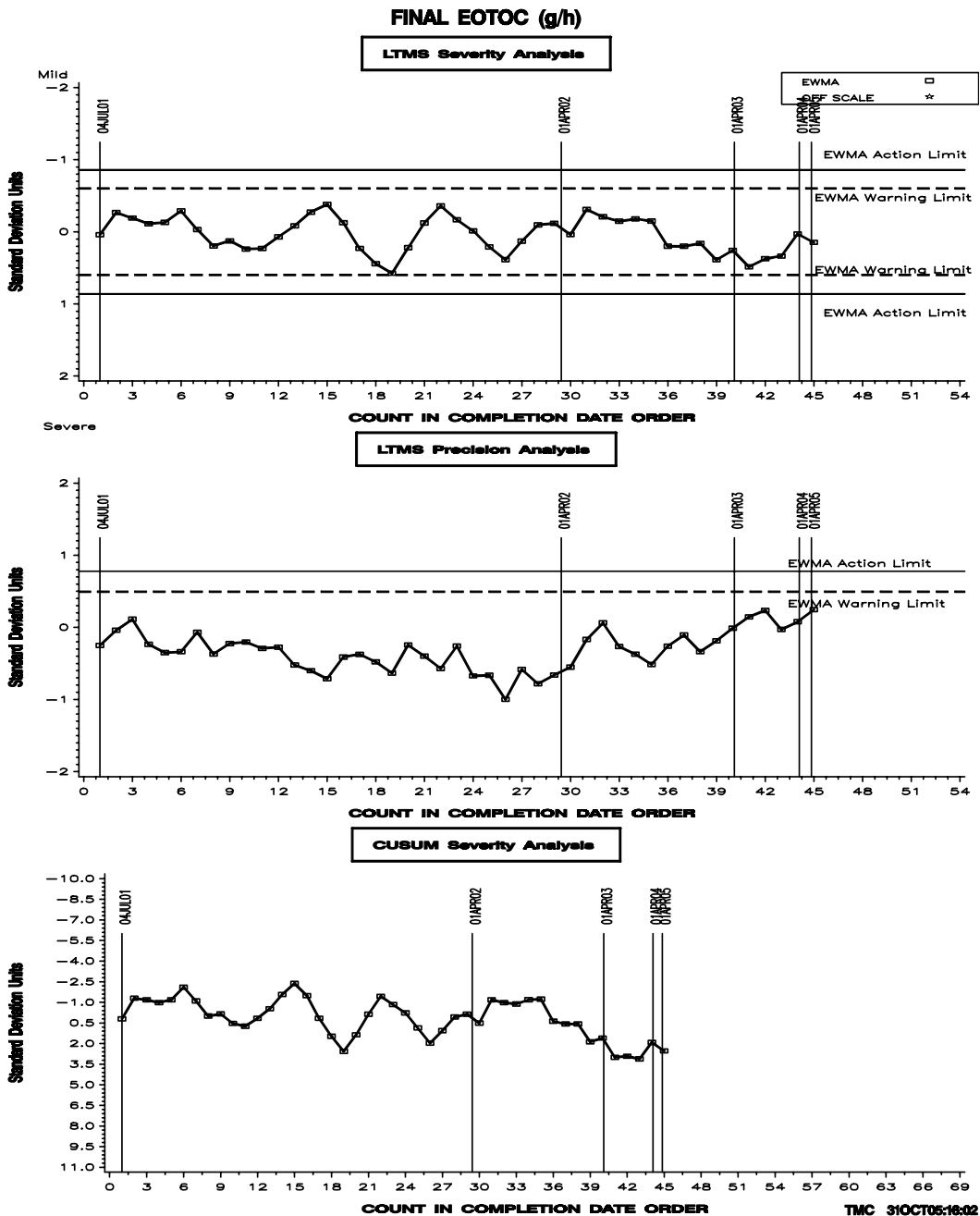
**CATERPILLAR 1R INDUSTRY OPERATIONALLY VALID DATA**



End of Test Oil Consumption (ETOC):

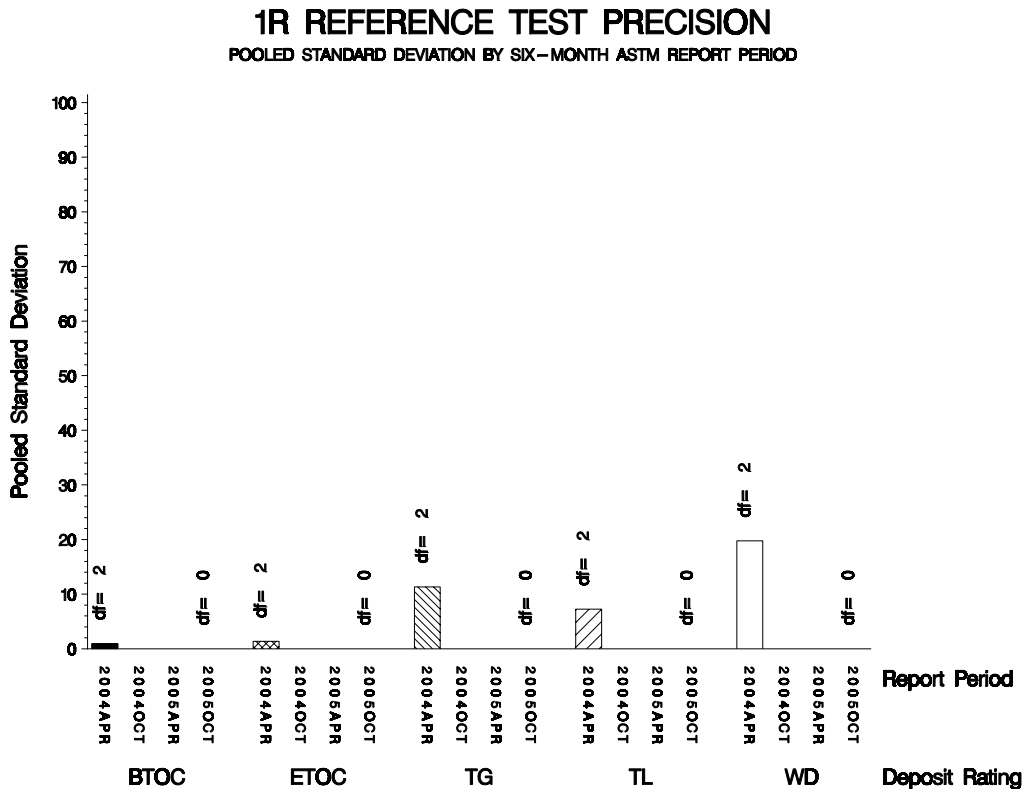
The average transformed ETOC  $Y_i$  this period was 0.615 (see table on page 7) Using the value 1.35 (which is the root mean square error of the matrix data and the value used to generate lab severity adjustments) to compute an average delta yields 0.83g/h severe. Severity and precision remained within acceptable limits throughout this period. The LTMS/Cusum plot for ETOC is shown below.

**CATERPILLAR 1R INDUSTRY OPERATIONALLY VALID DATA**



**POOLED S:**

Shown below is a bar chart comparing the pooled s values for the 1R test parameters over the last four report periods. Where degrees of freedom equal zero, no bars are shown. This will occur where only one test was reported or where multiple tests are reported but all are on different oils (as is the case in this current period). Periods showing no information had no tests reported.



**STATUS OF REFERENCE OIL SUPPLY:**

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

Oil	Cans @ Labs	@ TMC	
		Cans	Gallons
1005-1	11	0	5
1005-2	0	86	1295
820-2	9	20	312
<b>Total</b>	<b>20</b>	<b>106</b>	<b>1612</b>

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

Be aware that this table presumes that all of each of these oils is dedicated to the 1P test area. This is not the case; all of these oils are also used in other diesel test areas.

**TIMELINE OF SIGNIFICANT EVENTS IN THE LIFE OF THE 1P TEST:**

Effective Date	Info Letter	
20010612		START OF FIRST 1R MATRIX TEST
20010902		END OF LAST 1R MATRIX TEST
20011001		BEGIN REGISTERED TESTING
20030101	03-1	FIRST ISSUE OF PROCEDURE DRAFT
20030101	03-1	QUALITY INDEX CALCULATION CONSTANTS FINALIZED
20040212		DD VERSION 20040116 ACC STATEMENT ADDED TO REPORT FORMS
20050321	05-1	SOLVENT SPEC, CAL PERIOD ADJUSTMENT GUIDELINES, PRECISION STMT WORDING

**RATING:**

No 1R re-rates were required during this report period. The table below summarizes the re-rates for this report period:

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

**LAB VISITS:**

No 1R lab visits were completed during this report period.

**INFORMATION LETTERS:**

No information letters were issued during this report period

**FUEL BATCH APPROVAL:**

During this period, no new fuel batches were approved for testing.

**SUMMARY**

- Over the course of this report period, TGC, WD, TLC, BTOC and ETOC all remained within acceptable severity limits.
- Precision for all parameters remained within acceptable limits throughout this report period.

SDP/sdp/astm1005.doc/mem05-094.sdp.doc

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<ftp://ftp.astmtmc.cmu.edu/docs/diesel/scote/semiannualreports/lr-10-2005.pdf>

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