



Test Monitoring Center

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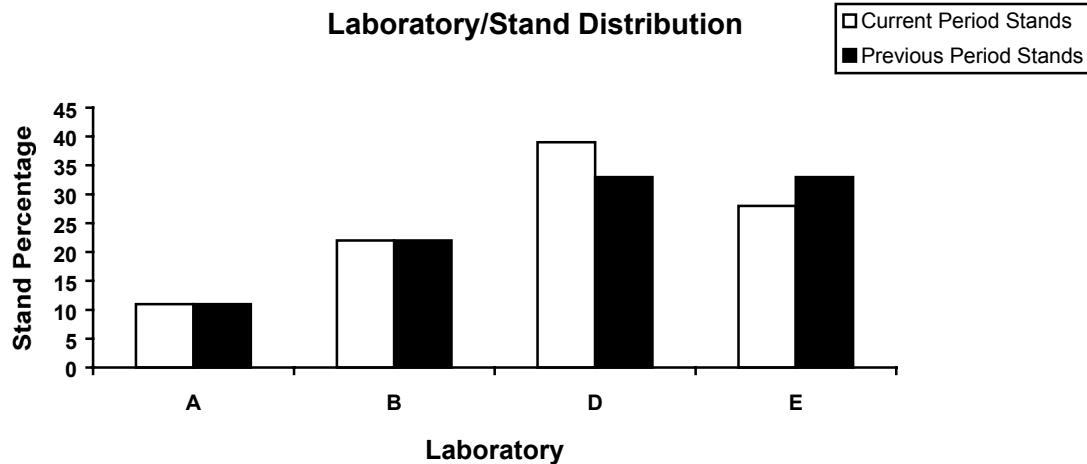
MEMORANDUM: 01-041
DATE: May 2, 2001
TO: Dale Smith, Chairman, L-33 Surveillance Panel
FROM: Donald Lind
SUBJECT: L-33 Reference Test Status from October 1, 2000 through March 31, 2001

The following is a summary of the L-33 reference oil tests that were reported to the Test Monitoring Center during the period October 1, 2000 through March 31, 2001.

Lab and Stand Summary

	Reporting Data	Calibrated as of 3/31/01
Number of Laboratories	4	4
Number of Storage Boxes	18	11

The following chart shows the laboratory/stand distribution:

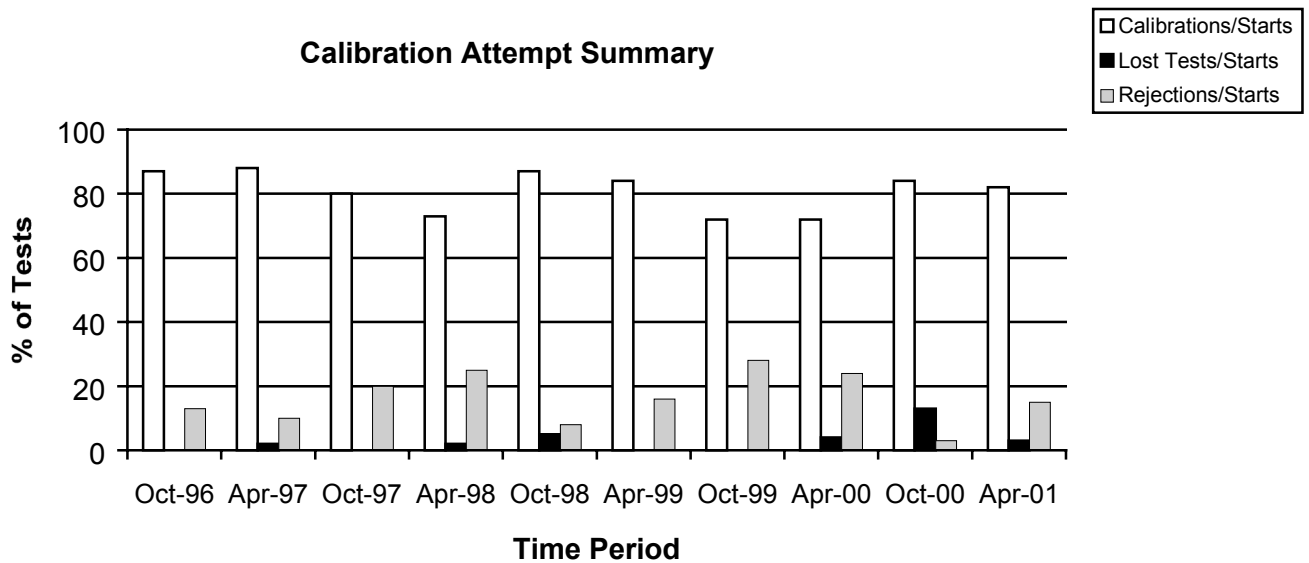


The following summarizes the status of the reference oil tests reported to the TMC:

	TMC Validity Codes	No. of Tests
Operationally and Statistically Acceptable	AC	27
Failed Acceptance Criteria	OC	5
Operationally Invalid (Lab Judgement)	LC	0
Operationally Invalid (Lab / TMC Judgement)	RC	0
Aborted	XC	1
Total		33

There were 15 additional tests conducted for category reference oil approval and evaluation.

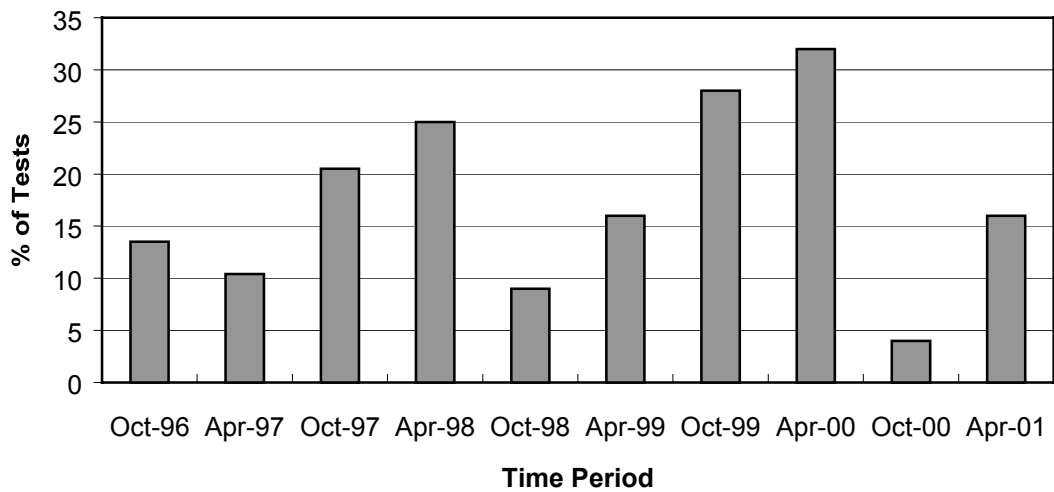
Calibrations per start, lost tests per start and rejection per start rates are summarized below:



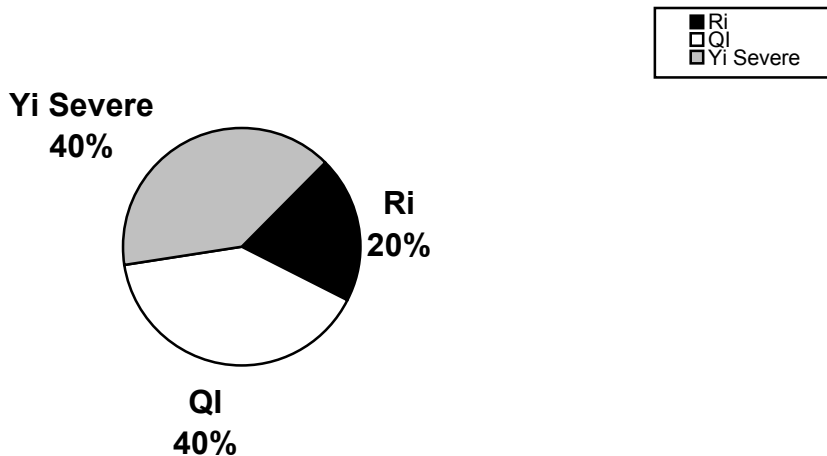
The calibrations per start rate and lost test per start rate have decreased this period with respect to the previous report period. The rejected test per start rate has increased with respect to the previous period. All rates compare well with the historical values.

The percentage of tests failing the acceptance criteria for operationally valid tests has increased this report period compared to the previous report period and history. The percentages of tests failing the acceptance criteria for operationally valid tests are depicted graphically below.

Rejected Operationally Valid Tests

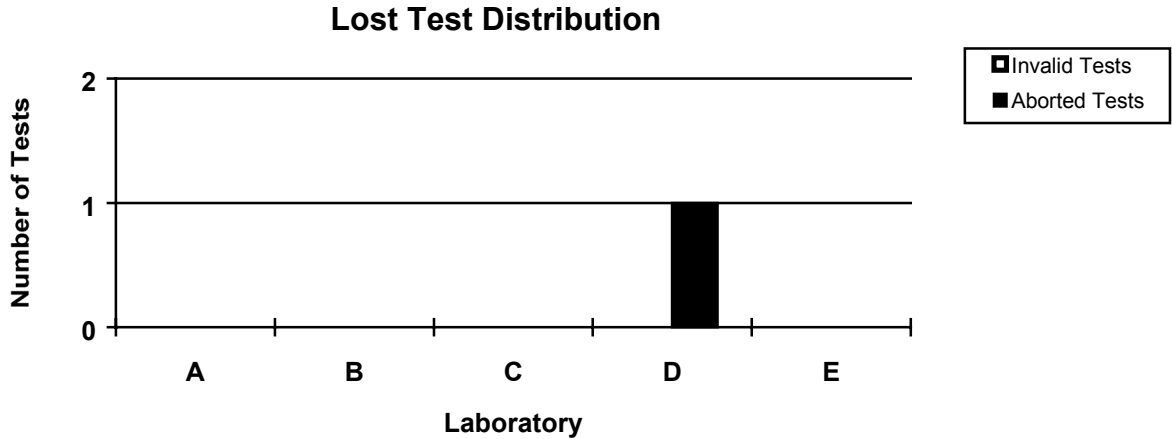


Distribution of LTMS Stand Alarms



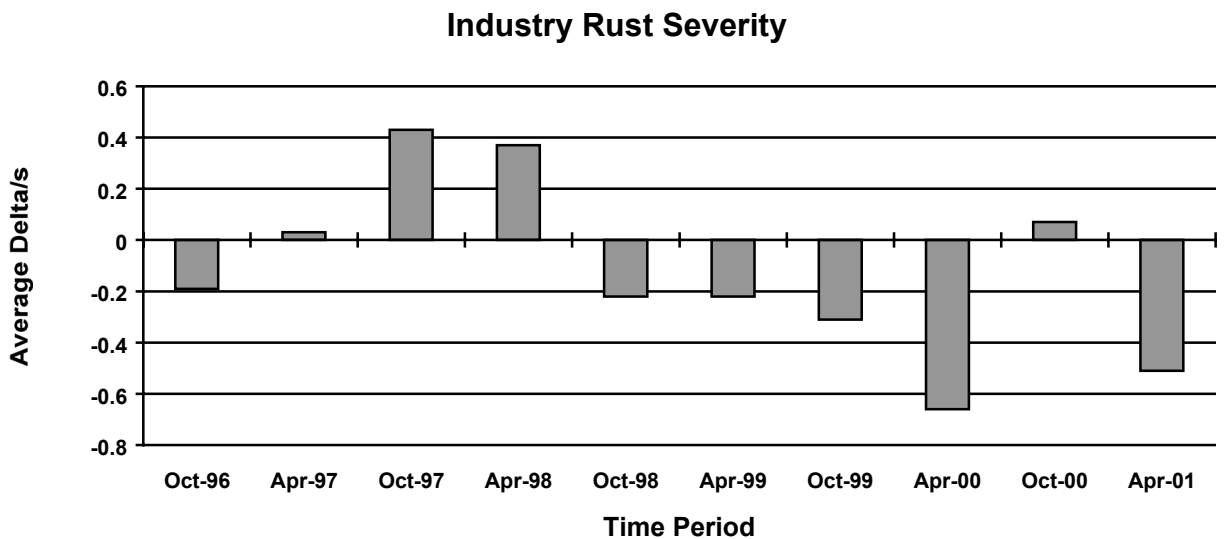
There were five tests that failed the acceptance criteria this report period. Two tests failed rust severe, two tests failed EWMA precision alarm, and one test failed Shewhart precision alarm (Ri).

The laboratory distribution of lost tests is shown below. There was one lost test this report period. A detailed list of reasons for tests declared operationally invalid or aborted are shown in Table 2.

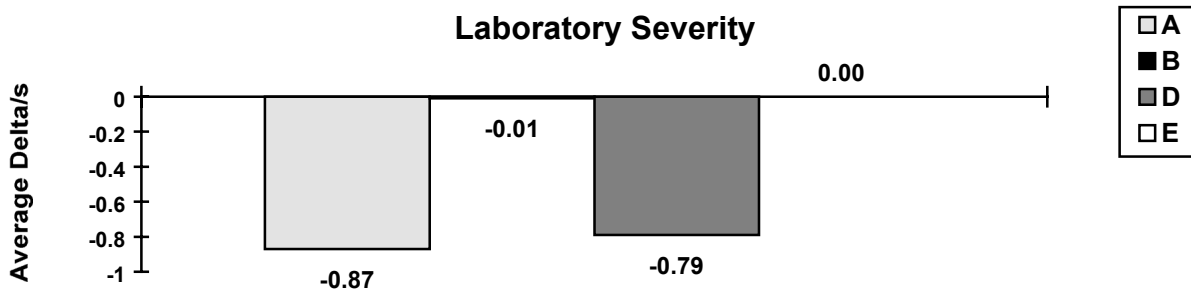


Severity and Precision

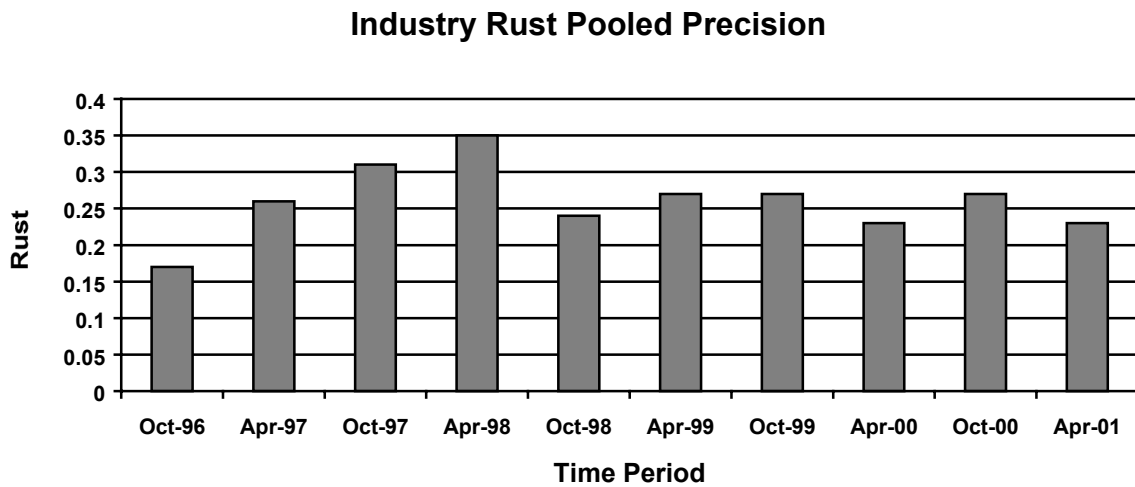
A total of 32 operationally valid test results were reported this period, 27 were conducted on gear batch V99.1 and 5 on gear batch V95.1. The mean Δ/s for this period is -0.51 severe, which equates to 0.12 merits. Severity is severe of target as indicated in the chart below and Figure 1. Comparison with previous periods are shown below:



Shown below is a summary of the average rust Δ/s for all laboratories reporting data this report period.



The industry precision estimate for this report period is 0.23 merits (pooled s). The precision estimate has improved slightly compared to the previous report period, and compares well historically.



Industry Control Charts

Figure 1 is the Industry EWMA severity and precision chart of tests completed through March 31, 2001. There were eight precision EWMA alarms (six warning and two action) and eleven severity EWMA warning alarms triggered this report period. The alarms appear to be caused by four test results that were 2.3 standard deviations severe or greater. All four results were from the same lab (D) and conducted on reference oil 121-1 and 121-2. Figure 2 illustrates the industry control without the four test results. The lab is currently investigating the cause of the severe results.

TMC Lab Visits

There were three TMC lab visits this report period. There were no discrepancies to report.

Information Letters

There were no information letters issued this report period.

Reference Oils

The following is a listing of reference oils with the expected number of tests remaining at the Test Monitoring Center and at the testing laboratories. L-33 reference oils are shipped in quantities of 1 gallon per test.

Reference Oil	Lab A	Lab B	Lab D	Lab E	TMC
121-1	4	1	0	2	0
121-2	10	10	10	13	100
123	15	5	9	11	78
123-1	6	3	2	5	2
151-3	2	3	3	4	*

* 603 Gallons (Multiple test area usage)

Attachments

c: L-33 Surveillance Panel
<ftp://www.tmc.astm.cmri.cmu.edu/docs/gear/l33/semiannualreports/l33-04-2001.pdf>
J. L. Zalar
F. M. Farber

Listing of Tables and Figure Included as Part of This Report to the L-33 Surveillance Panel

Table 1 is the L-33 Industry Timeline

Table 2 is summary of lost tests

Figure 1 is the Industry Control Chart for L-33 Rust

Figure 2 is the Industry Control Chart for L-33 Rust Without the Four Severe Test Results From Lab D

Table 2
Summary of Reasons for Aborted and Operationally Invalid Tests

Reason	Number of Tests
Motoring phase of test was run for five additional hours	1

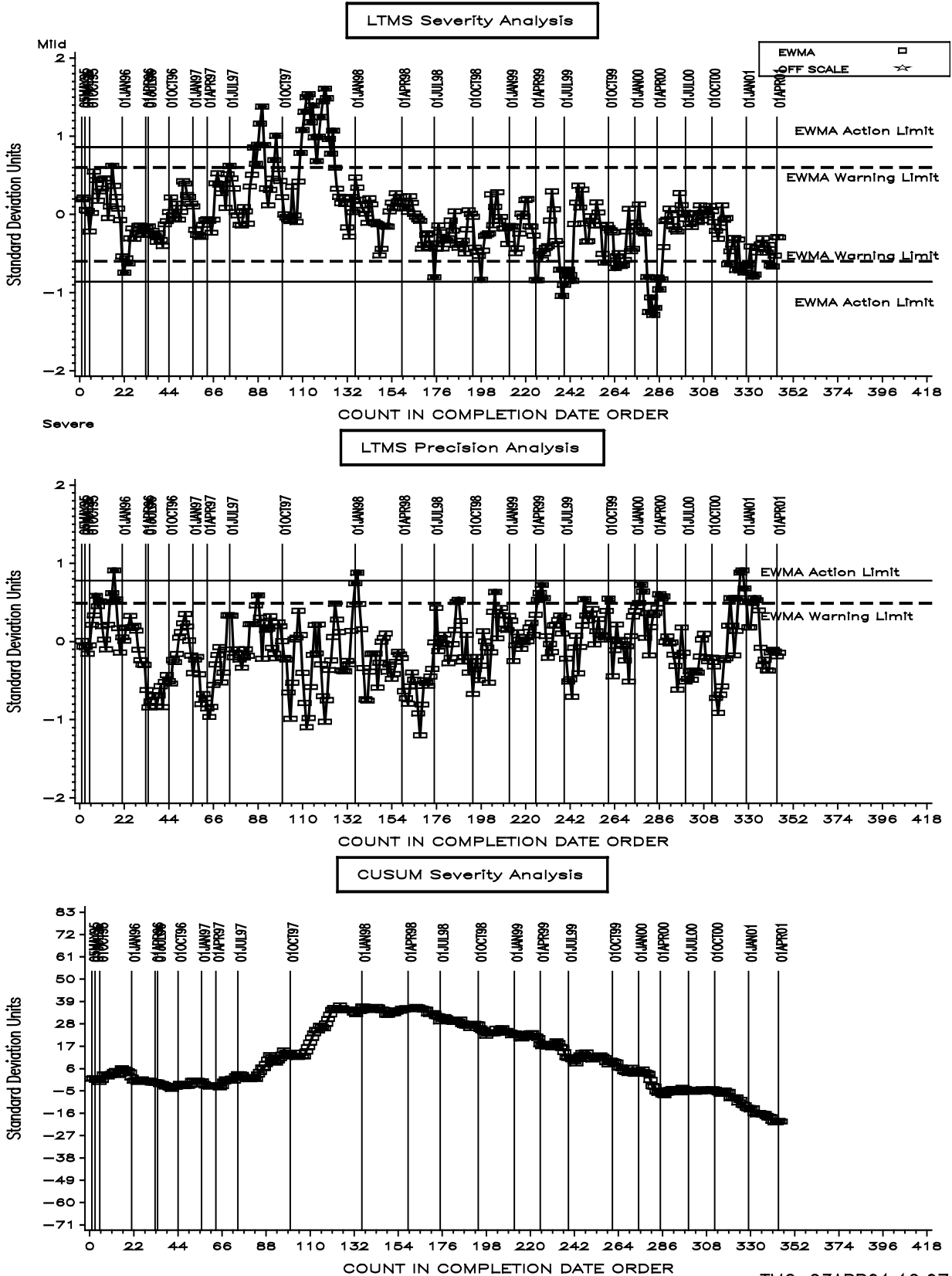
Table 1
L-33 Industry Timeline

Effective Date	Topic	Information Letter Number
19930901	Ultrasonic Parts Cleaning Requirement	1
19930901	Abrasive Blasting w/ AL Oxide Required	1
19930901	Differential Housing Cover Plate Preparation Requirement	1
19930901	Functional Surface Preparation Requirement	1
19930901	Pre-test Inspection for Rust Requirement	1
19930901	Acetone Usage Report Note Requirement	1
19931221	Report Forms and Dictionary Version 19931129	2
19941020	Test Stand Calibration Schedule Change	3
19941020	Report Forms and Dictionary Version 19940909	3
19950820	Revised Definition of Corrosion Rust and Light Rust	4
19950820	Report Forms and Dictionary Version 19950509	4
19960312	Revised Time Limit for Parts Rating	96-1
19960506	Report Forms and Dictionary Version 19960329	96-2
19970602	Rating Scale Revisions	97-1
19970602	Discrimination Oil Test Requirement	97-1
19970602	Area Weighting Factors for Reference Oil Tests	97-1
19970602	Report Forms and Dictionary Version 19970411	97-1
19970602	New TMC Address and Test Reporting Clarifications	97-1
19970602	Discrimination Oil Test Correction	97-2
19970602	Rust Rating Correction	97-2
19970602	Report Forms and Dictionary Version 19970609	97-3
19980303	Report Forms and Dictionary Version 19971218	98-1
19980701	Pinion torque requirements for assembled unit	98-2
19990104	Removal of Discrimination Oil Test Requirement	99-1
19990430	Reference Oil 121-1 Targets 45 Test Update	
20000419	Approval of Teflon Gasket and Water Column for V99.1 Hardware Testing	00-1, Sequence No. 13
20000730	Standardization of Abrasive Blasting Equipment	00-2, Sequence No. 14
20010411	Calibration of Test Stands Suspended Until Severity Trend Issues Resolved	

L-33 INDUSTRY OPERATIONALLY VALID DATA

REFERENCE FINAL RUST CORROSION MERIT RATING

FIGURE 1



L-33 INDUSTRY OPERATIONALLY VALID DATA

REFERENCE FINAL RUST CORROSION MERIT RATING

FIGURE 2

