



MEMORANDUM: 19-047
DATE: November 26, 2019
TO: Matthew Sangpeal, Chairman, L-42 Surveillance Panel
FROM: Dylan Beck *DJB B. ego*
SUBJECT: L-42 Reference Oil Testing from April 1, 2019 through September 30, 2019

Attached is a summary of reference oil testing activity this period.

DJB/djb/mem19-047.djb.doc

cc: Frank Farber

Jeff Clark

L-42 Surveillance Panel

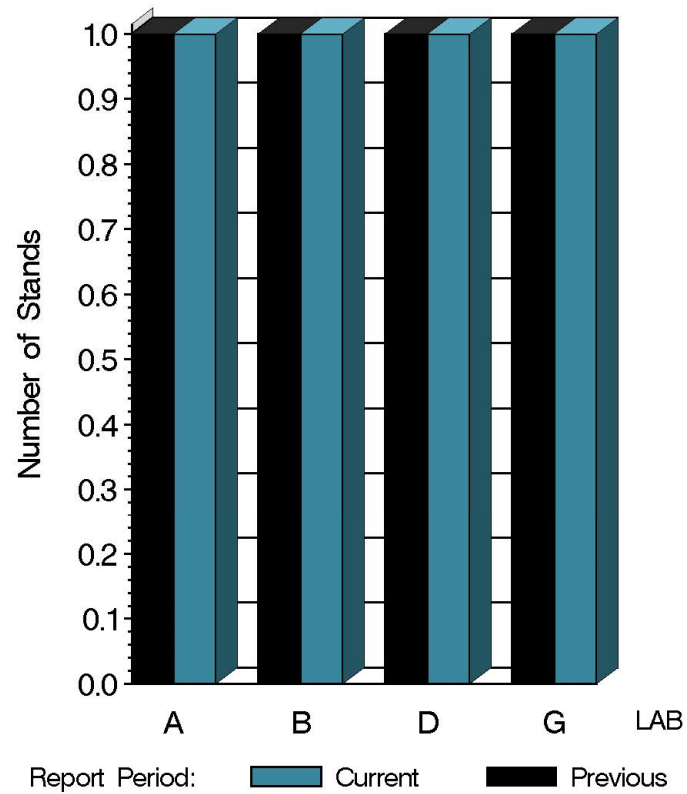
<http://www.astmtmc.cmu.edu/ftp/docs/gear/l42/semiannualreports/l42-10-2019.pdf>

Distribution: email

L-42 (D7452)

| | Reporting Data | Calibrated on 9-30-19 |
|------------------|----------------|-----------------------|
| Number of Labs | 4 | 4 |
| Number of Stands | 4 | 4 |

BY-LAB STAND DISTRIBUTION



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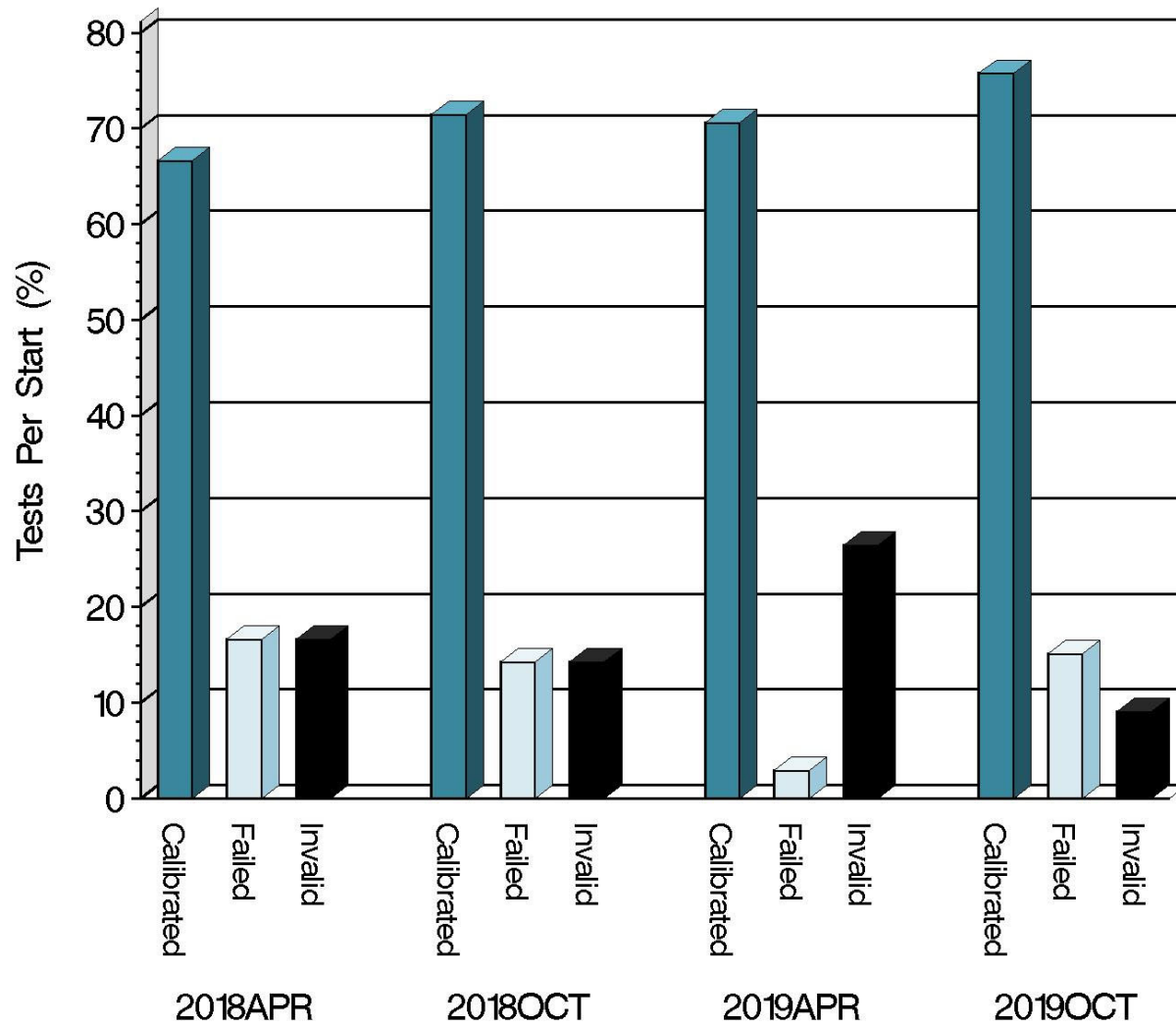
L-42 (D7452)

Test Distribution by Oil and Validity

| | | | | | Totals | |
|------------------------------|----|-----------|-----------|----------|-------------|-------------|
| | | 113 | 117 | 119 | Last Period | This Period |
| Accepted for calibration | AC | 0 | 25 | 0 | 24 | 25 |
| Rejected (Mild) | OC | 0 | 0 | 0 | 0 | 0 |
| Rejected (Severe) | OC | 0 | 5 | 0 | 1 | 5 |
| Rejected (Precision) | OC | 0 | 0 | 0 | 0 | 0 |
| Accepted discrimination | AS | 8 | 0 | 0 | 7 | 8 |
| Unacceptable Information run | MI | 0 | 0 | 1 | 0 | 1 |
| Invalidated discrimination | LS | 2 | 0 | 0 | 6 | 2 |
| Invalidated calibration | LC | 0 | 1 | 0 | 9 | 1 |
| Aborted | XC | 0 | 2 | 0 | 0 | 2 |
| Acceptable information run | NI | 0 | 6 | 5 | 1 | 11 |
| Total | | 10 | 39 | 6 | 48 | 55 |

L-42 (D7452)

CALIBRATION ATTEMPT SUMMARY



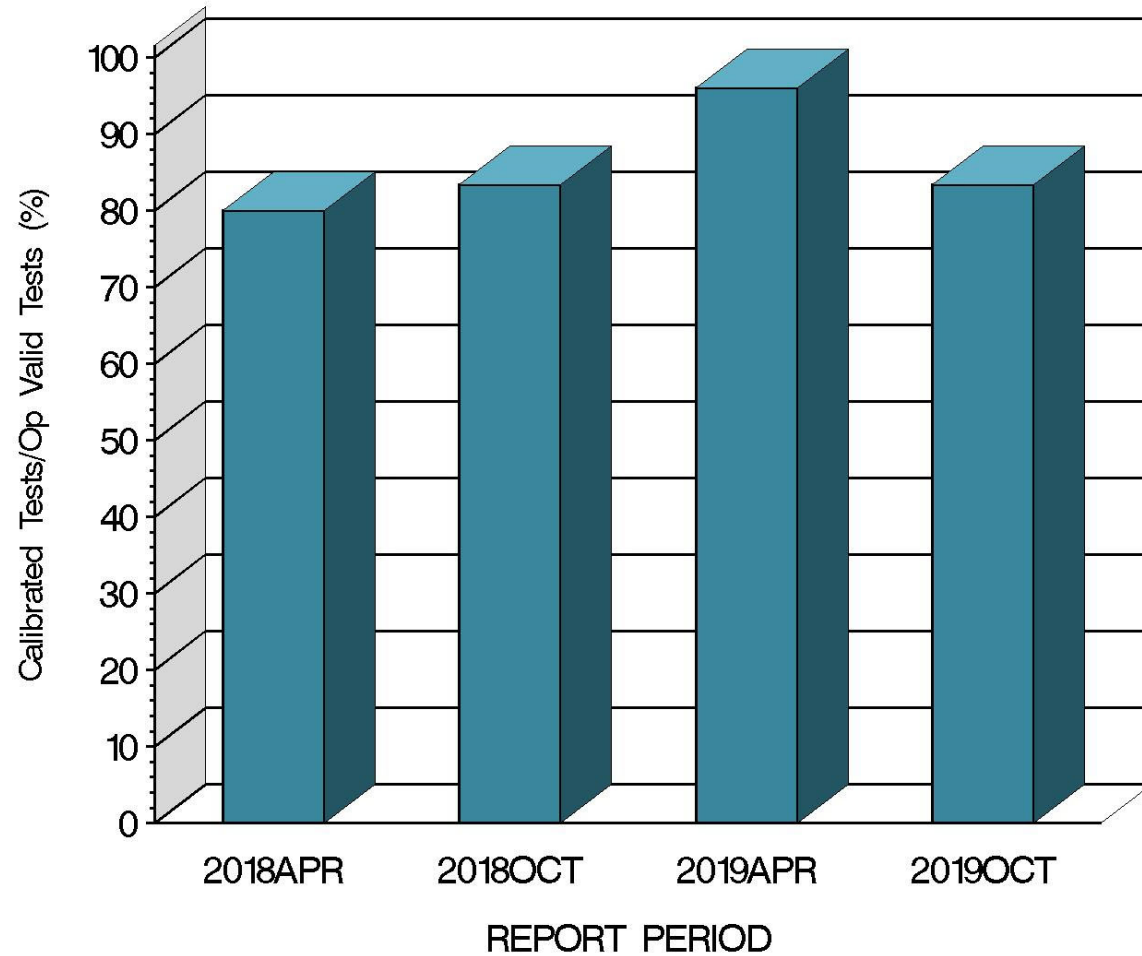
Resolution

Report Period

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OPERATIONALLY VALID TESTS
MEETING ACCEPTANCE CRITERIA



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L-42 (D7452)

CAUSES FOR LOST TESTS

| | | Oil | | Validity | | | | Loss Rate | | |
|--------|---|-----|-----|----------|------|------|----|-----------|--------|-----|
| Lab | Cause | 113 | 117 | LS | LC | XC | XI | Lost | Starts | % |
| B | SS2 Torque not within 10% of other test in reference series | ● | | ● | | | | 2 | 6 | 33% |
| | Mechanical failure resulted in missing data | | ● | | ● | | | 1 | 10 | 10% |
| A | Emergency shutdown | | ● | | | ● | | 1 | 4 | 25% |
| G | Torque meter error | | ● | | | ● | | 1 | 4 | 25% |
| Lost | | 2 | 3 | 2 | 1 | 2 | 0 | | | |
| Starts | | 10 | 39 | 55 | 55 | 55 | 55 | | | |
| % | | 20% | 26% | 3.6% | 1.8% | 3.6% | 0% | | | |

L-42 (D7452)

| | | | Coast Side Pinion Scoring | | |
|-----|-----------------|----|---------------------------|-----------|--------------------|
| Oil | Gear Batch | N | Mean | Std. Dev. | Average Δ/s |
| 117 | C1L446/P8AD132 | 15 | 37.0 | 26.63 | 2.55 |
| 117 | C1L925/P8AD078X | 15 | 21.8 | 3.88 | -0.22 |

| | | Pooled Standard Deviation | | | |
|-----|--------------------------------------|---------------------------|---------------------------|-------------------------|--|
| Lab | Coast Side Pinion Scoring Δ/s | df | Coast Side Pinion Scoring | Coast Side Ring Scoring | Shock Series I Coast Side Ring Scoring |
| A | 0.36 | 2 | 2.00 | 2.00 | 0.00 |
| B | -0.43 | 8 | 4.27 | 2.51 | 0.00 |
| D | 2.82 | 14 | 26.63 | 16.78 | 15.86 |
| G | -0.18 | 2 | 2.65 | 1.00 | 0.00 |

L-42 (D7452)

SUMMARY OF SEVERITY & PRECISION

Severity

Severity exceeded the action limit this period but has since returned within limits.

Precision

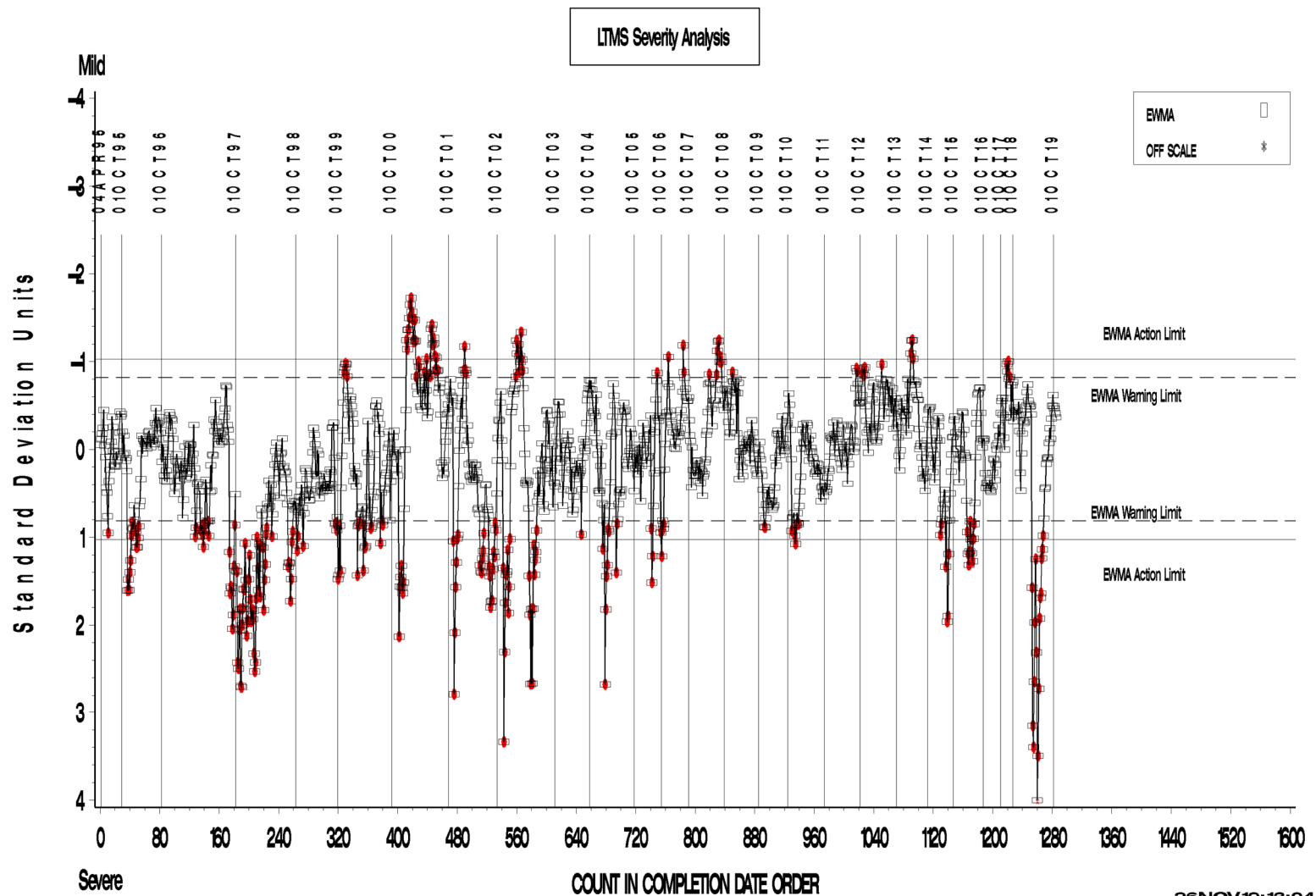
Precision exceeded the action limit this period but has since returned within limits.

Industry control charts follow.

L-42 (D7452)

L-42 INDUSTRY OPERATIONALLY VALID DATA

FINAL EOT PINION SCORING COAST SIDE



Test Monitoring Center

<http://astmtmc.cmu.edu>



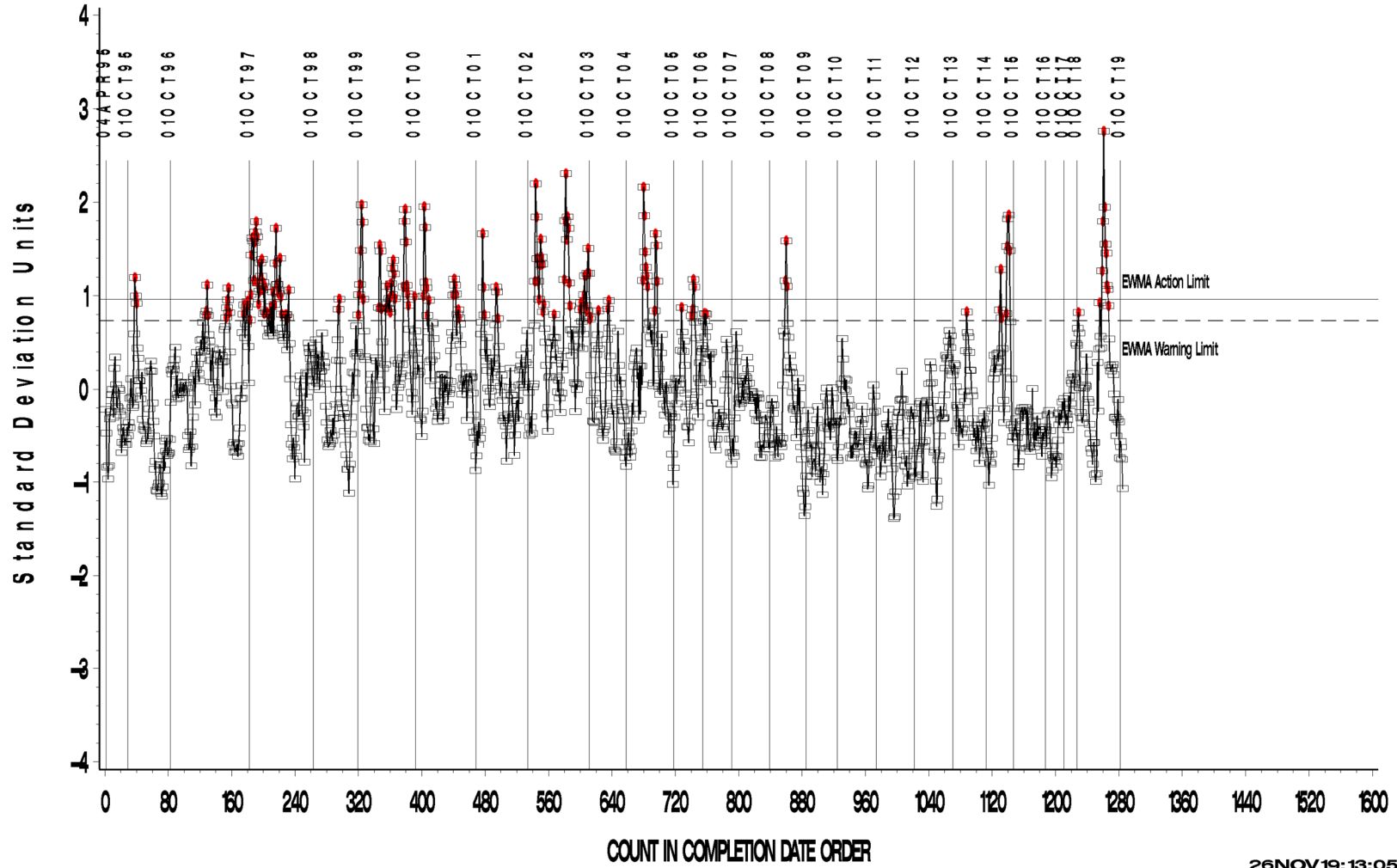
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L-42 (D7452)

L-42 INDUSTRY OPERATIONALLY VALID DATA

FINAL EOT PINION SCORING COAST SIDE

LTMS Precision Analysis



26 NOV 19: 13:05

Test Monitoring Center

<http://astmtmc.cmu.edu>



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L-42 (D7452)

L-42 INDUSTRY OPERATIONALLY VALID DATA

FINAL EOT PINION SCORING COAST SIDE

CUSUM Severity Analysis



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TIMELINE ADDITIONS

| Effective Date | Information Letter | Event |
|---|--------------------|-------|
| No information letters issued during this period. | | |

L-42 (D7452)

LAB VISITS

No L-42 lab visits were conducted during this period.

INFORMATION LETTERS

No information letters issued during this period.

L-42 (D7452)

STATUS OF REFERENCE OIL SUPPLY

| Oil | Cans @ Labs | @ TMC | |
|-------|-------------|-------|---------|
| | | Cans | Gallons |
| 113 | 14 | 65 | 32.7 |
| 116-1 | 0 | 0 | 0.0 |
| 117 | 32 | 684 | 342.0 |
| 119 | 5 | 108 | 54.0 |
| Total | 51 | 857 | 428.7 |

At surveillance panel direction, the TMC has procured oil 117 as a replacement oil for 116-1. This is a J2360 oil which produces somewhat milder scoring. The oil has been implemented for use as the new “pass” oil with a correction factor +6% for the pinion scoring result and +4% for the ring scoring result.

119 oil is currently being evaluated as a replacement oil to 113 discrimination oil. 119 has not yet been approved by the surveillance panel.