



A Program of ASTM International

Test Monitoring Center

203 Armstrong Drive, Freeport, PA 16229, USA

www.astmtmc.org
412-365-1000

MEMORANDUM: 22-010
DATE: June 14, 2022
TO: Robert Slocum, Chairman, L-37-1 Surveillance Panel
FROM: Dylan Beck *Dylan Beck*
SUBJECT: L-37-1 Testing from October 1, 2021 through March 31, 2022

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

DJB/djb/mem22-010.djb.doc

cc: Frank Farber
Jeff Clark

L-37 Surveillance Panel

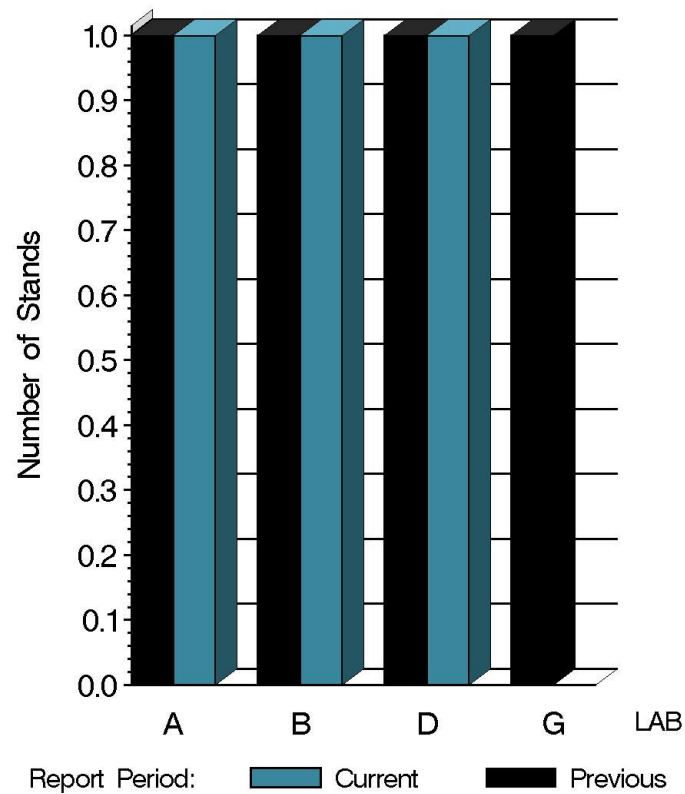
<https://www.astmtmc.org/ftp/docs/gear/1371/semiannualreports/1371-04-2022.pdf>

Distribution: email

L-37-1 (D8165)

| | Reporting Data | Calibrated on 3-31-22 |
|------------------|----------------|-----------------------|
| Number of Labs | 4 | 4 |
| Number of Stands | 4 | 4 |

BY-LAB STAND
DISTRIBUTION



11:08:54 26APR2022



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L-37-1 (D8165)

Test Distribution by Oil and Validity

| | | | | | Totals | |
|--------------------------|----|---------------|----------|----------|-------------|-------------|
| | | | | | Last Period | This Period |
| | | 134/ 134-1 | 152-2 | 155-1 | | |
| Accepted for calibration | AC | 0 | 2 | 3 | 8 | 5 |
| Rejected (Mild) | OC | 0 | 0 | 0 | 0 | 0 |
| Rejected (Severe) | OC | 0 | 0 | 0 | 2 | 0 |
| Rejected (Precision) | OC | 0 | 0 | 0 | 0 | 0 |
| Aborted run | XC | 0 | 0 | 0 | 1 | 0 |
| Acceptable info run | NI | 0 | 0 | 0 | 0 | 0 |
| Total | | 0 | 2 | 3 | 11 | 5 |

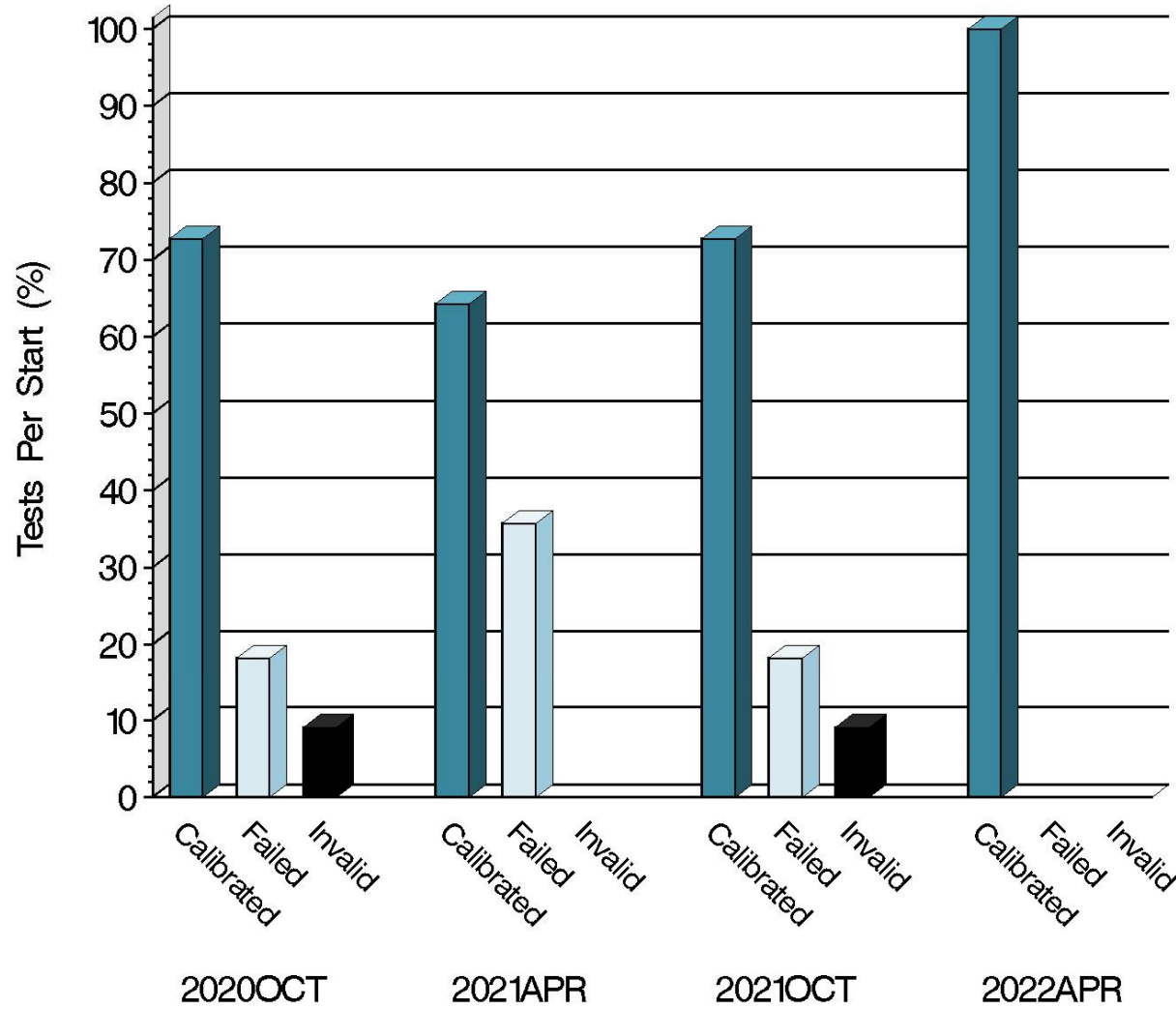
L-37-1 (D8165)

Calibration Attempt Detail

| | Gear Batch | Acceptable | Aborted | Failed | Total |
|------------|-------------------|-------------------|----------------|---------------|--------------|
| Uncoated | 04-2014 | 3 | 0 | 0 | 3 |
| MnP Coated | 06-2018 | 0 | 0 | 0 | 0 |
| | 12-2019 | 2 | 0 | 0 | 2 |
| | 01-2020 | 0 | 0 | 0 | 0 |
| | Total | 5 | 0 | 0 | 5 |

L-37-1 (D8165)

CALIBRATION ATTEMPT SUMMARY



Resolution

Report Period

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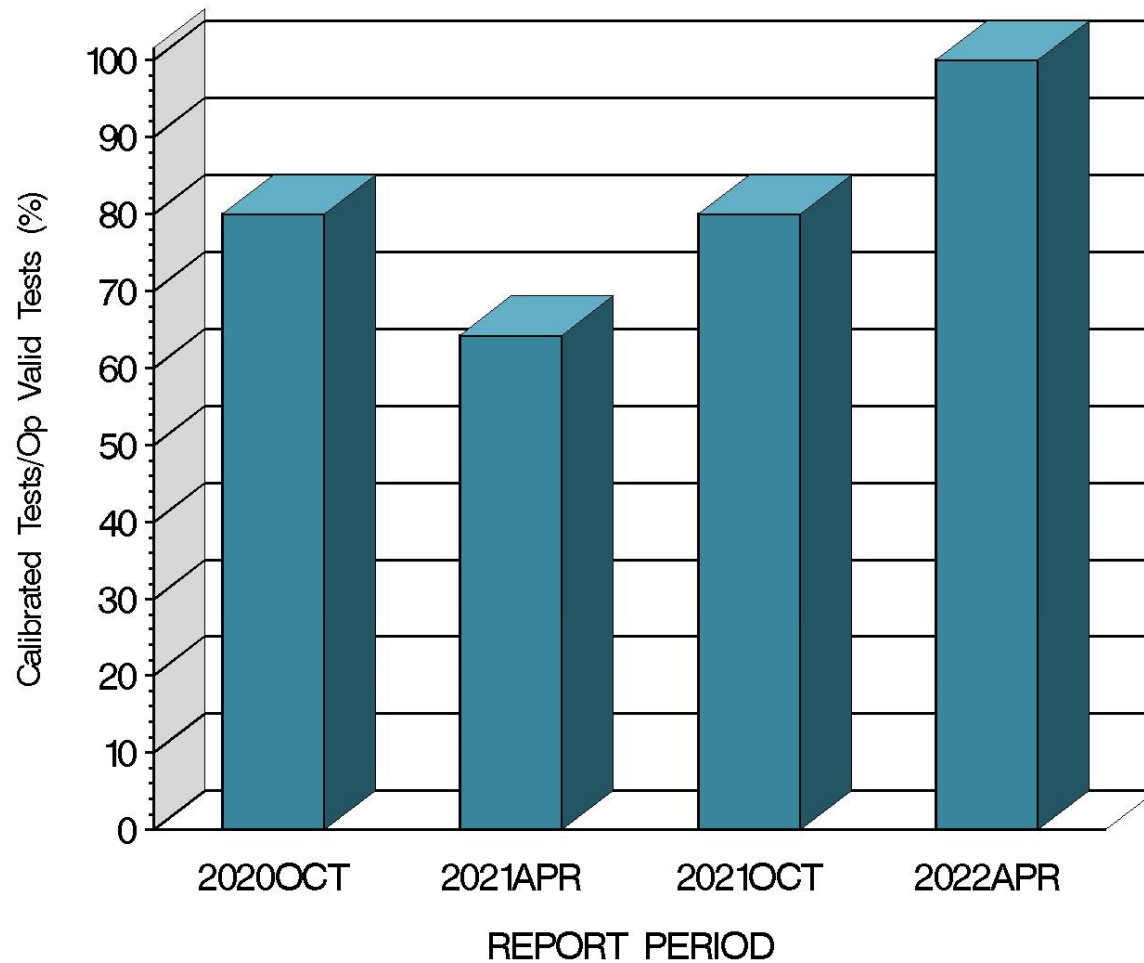
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L-37-1 (D8165)

OPERATIONALLY VALID TESTS
MEETING ACCEPTANCE CRITERIA



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L-37-1 (D8165)

CAUSES FOR LOST TESTS

| Lab | Cause | Oil | | | | Validity | | | Loss Rate | | |
|-----|--------------------------|-------|-------|-------|-------|----------|----|----|-----------|--------|----|
| | | 134-1 | 152-2 | 155-1 | 155-2 | XC | LC | XI | Lost | Starts | % |
| | No lost test this period | | | | | | | | 0 | 5 | 0% |
| | Lost | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| | Starts | 0 | 0 | 0 | 0 | 5 | 5 | 5 | | | |
| | % | 0% | 0% | 0% | 0% | 0% | 0% | 0% | | | |

L-37-1 (D8165)

GEAR BATCH SEVERITY

| MNP COATED HARDWARE | | | | | | |
|---------------------|------------|---|------------|-------|--------------------|--|
| Parameter | Gear Batch | N | Δ/s | s^A | Overall Δ/s | Overall Shift (in Merits) ^B |
| RIDG | 04-2014 | 3 | -0.367 | 1.002 | -0.367 | -0.524 |
| RIPP | 04-2014 | 3 | 0.409 | 1.000 | 0.409 | 0.195 |
| SPIT | 04-2014 | 3 | 0.333 | 0.000 | 0.333 | 0.193 |
| WEAR | 04-2014 | 3 | -1.042 | 0.718 | -1.042 | -0.541 |

| UNCOATED HARDWARE | | | | | | |
|-------------------|------------|---|------------|-------|--------------------|--|
| Parameter | Gear Batch | N | Δ/s | s^A | Overall Δ/s | Overall Shift (in Merits) ^B |
| RIDG | 12-2019 | 2 | 0.000 | 1.414 | 0.000 | 0.000 |
| RIPP | 12-2019 | 2 | 0.364 | 0.000 | 0.364 | 0.203 |
| SPIT | 12-2019 | 2 | . | . | . | . |
| WEAR | 12-2019 | 2 | 0.714 | 0.000 | 0.714 | 0.509 |

^A As computed using SA standard deviation published in the LTMS document.

L-37-1 (D8165)

LAB SEVERITY

| MNP COATED HARDWARE AVERAGE Δ/s | | | | | | |
|--|-----|---|--------|--------|-------|--------|
| Gear Batch | Lab | N | RIDG | RIPP | SPIT | WEAR |
| 04-2014 | A | 1 | -0.300 | 0.429 | . | -1.125 |
| | B | 1 | 0.600 | 1.400 | 0.333 | -0.286 |
| | D | 1 | -1.400 | -0.600 | 0.333 | -1.714 |

| UNCOATED HARDWARE AVERAGE Δ/s | | | | | | |
|--------------------------------------|-----|---|--------|-------|------|-------|
| Gear Batch | Lab | N | RIDG | RIPP | SPIT | WEAR |
| 12-2019 | B | 1 | 1.000 | 0.364 | . | 0.714 |
| | D | 1 | -1.000 | 0.363 | . | 0.714 |

L-37-1 (D8165)

SUMMARY OF SEVERITY & PRECISION

Severity

Uncoated– All parameters remained within the limits this period.

MnP Coated – Wear exceeded the action limit with one test this period and is currently exceeding the warning limit with the most recent test. All other parameters remained within the limits this period.

L-37-1 (D8165)

SUMMARY OF SEVERITY & PRECISION (cont.)

Precision

Uncoated – All parameters remained within the precision limit this period.

MnP Coated – All parameters remained within the precision limit this period.

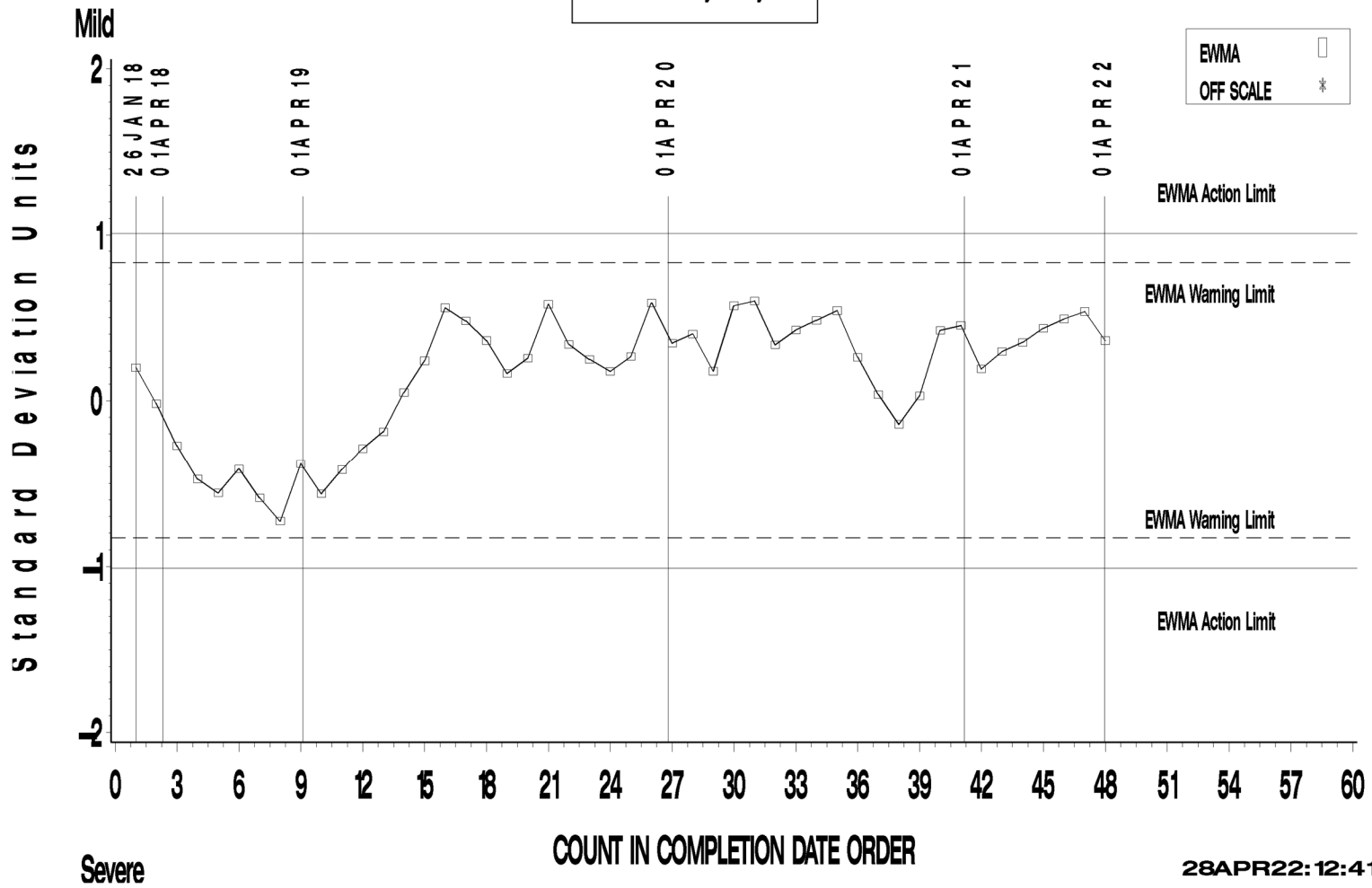
Industry control charts follow.

L-37-1 (D8165)

L-37-1 NONLUBRITED INDUSTRY OPERATIONALLY VALID

FINAL PINION GEAR WEAR

LTMS Severity Analysis



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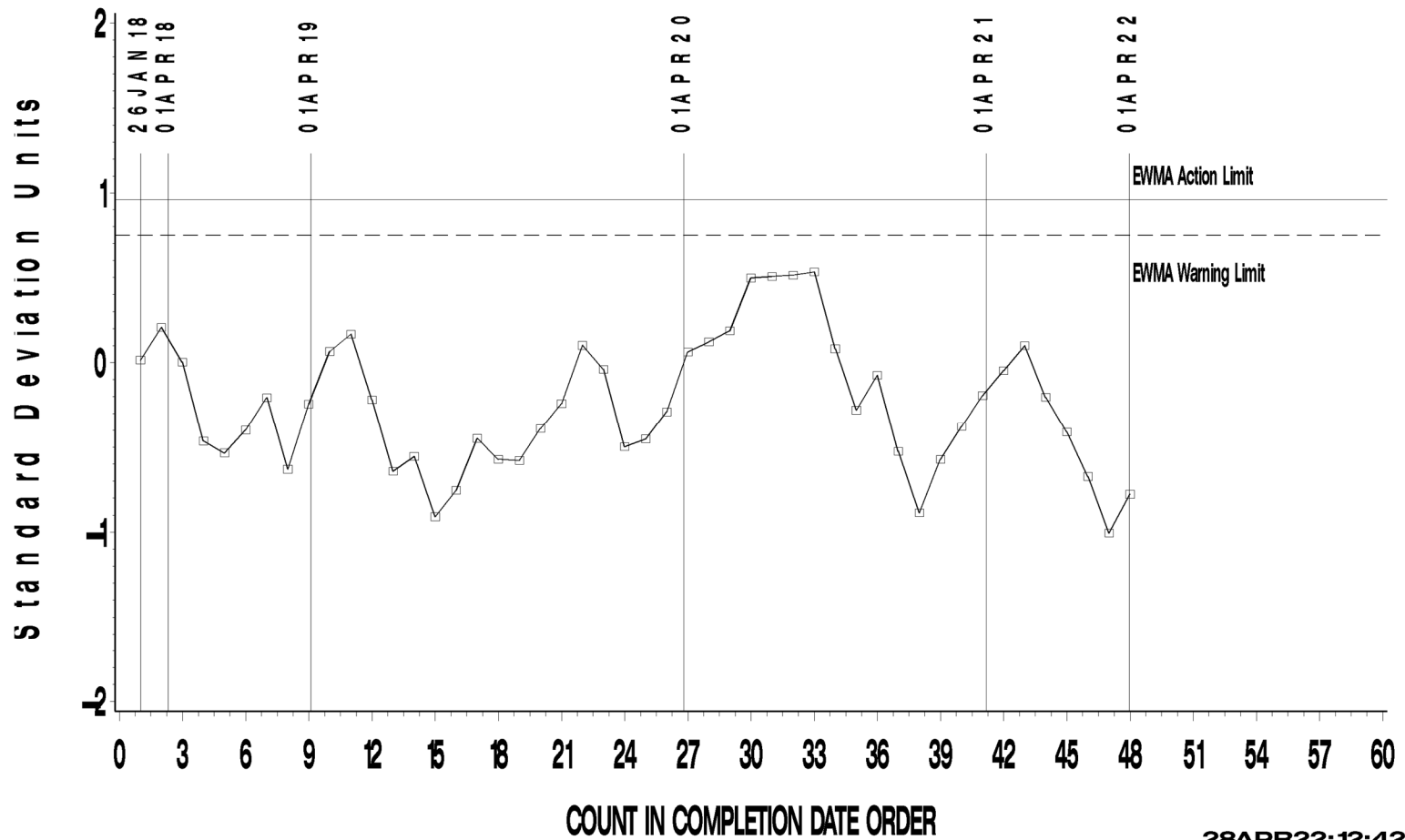
28APR22: 12:41

L-37-1 (D8165)

L-37-1 NONLUBRICATED INDUSTRY OPERATIONALLY VALID

FINAL PINION GEAR WEAR

LTMS Precision Analysis



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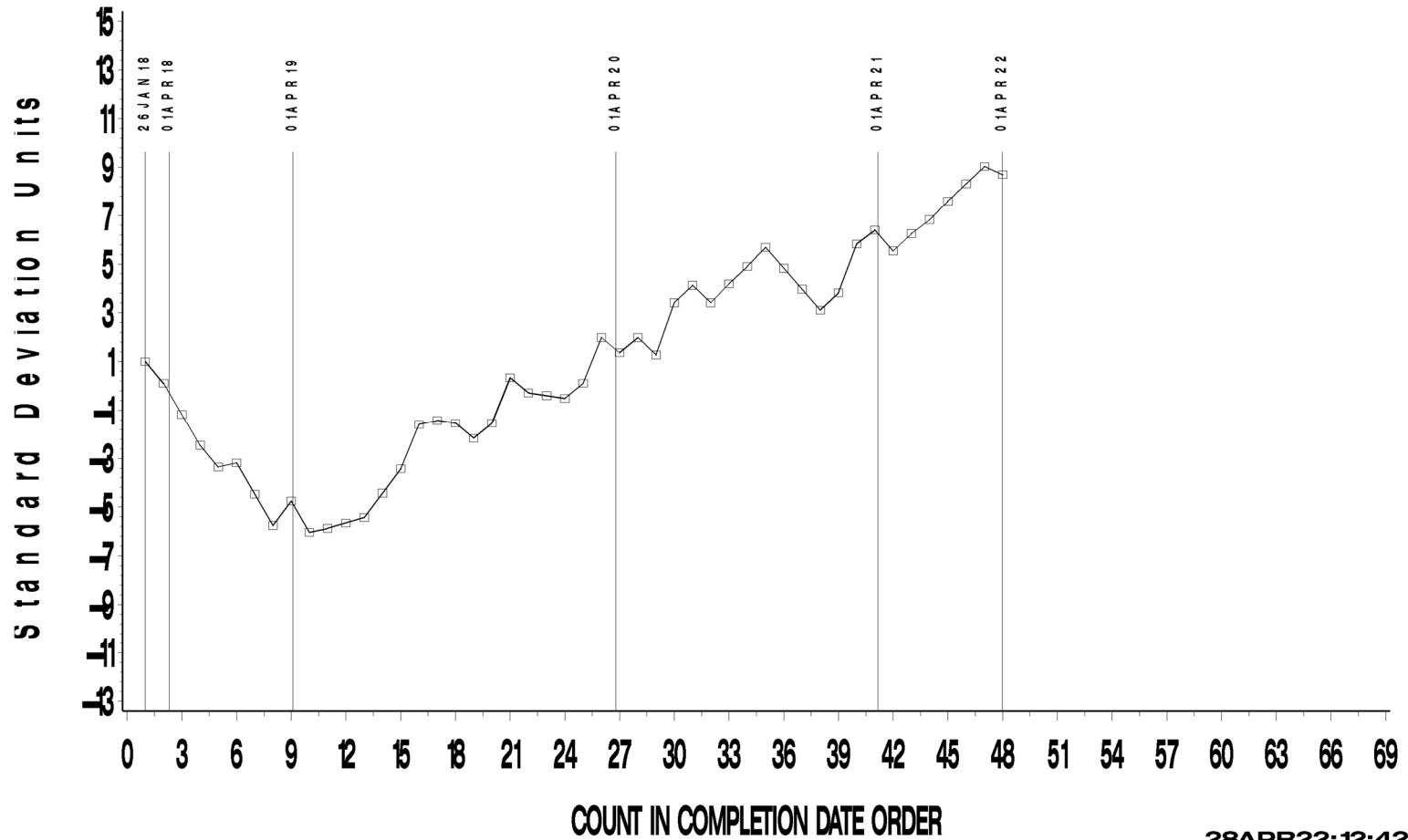
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L-37-1 (D8165)

L-37-1 NONLUBRITED INDUSTRY OPERATIONALLY VALID

FINAL PINION GEAR WEAR

CUSUM Severity Analysis



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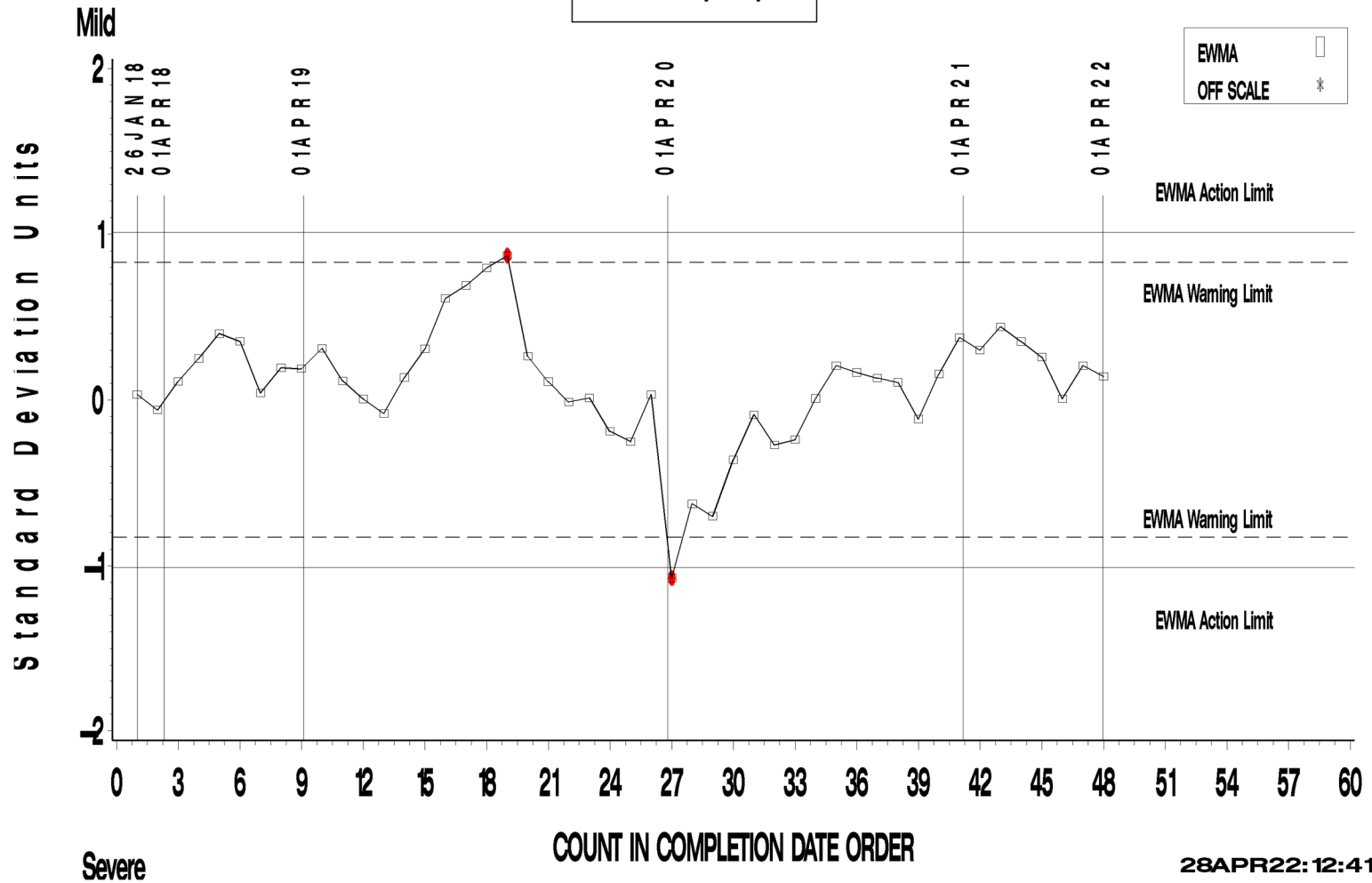
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L-37-1 (D8165)

L-37-1 NONLUBRITED INDUSTRY OPERATIONALLY VALID

FINAL PINION GEAR RIDGING

LTMS Severity Analysis



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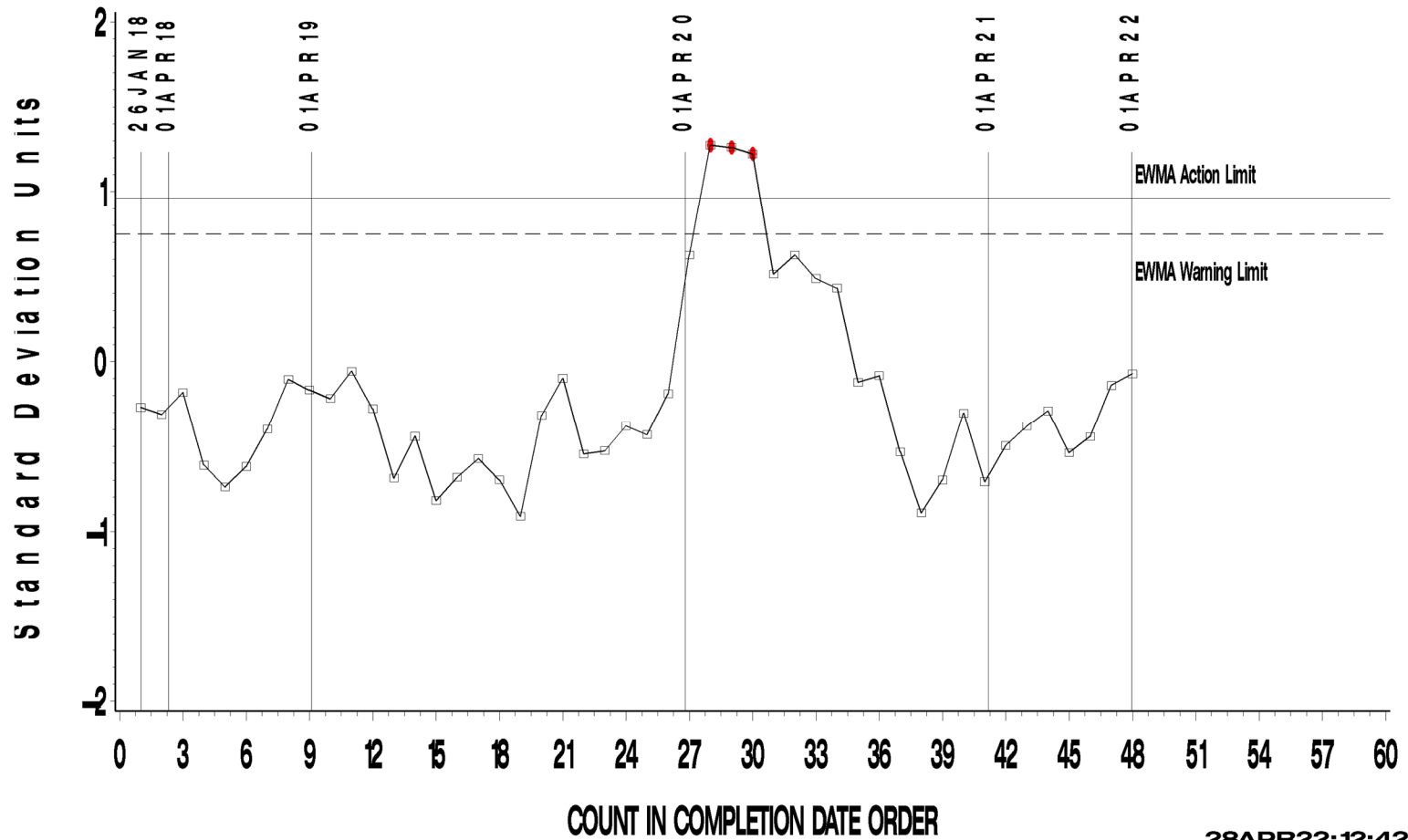
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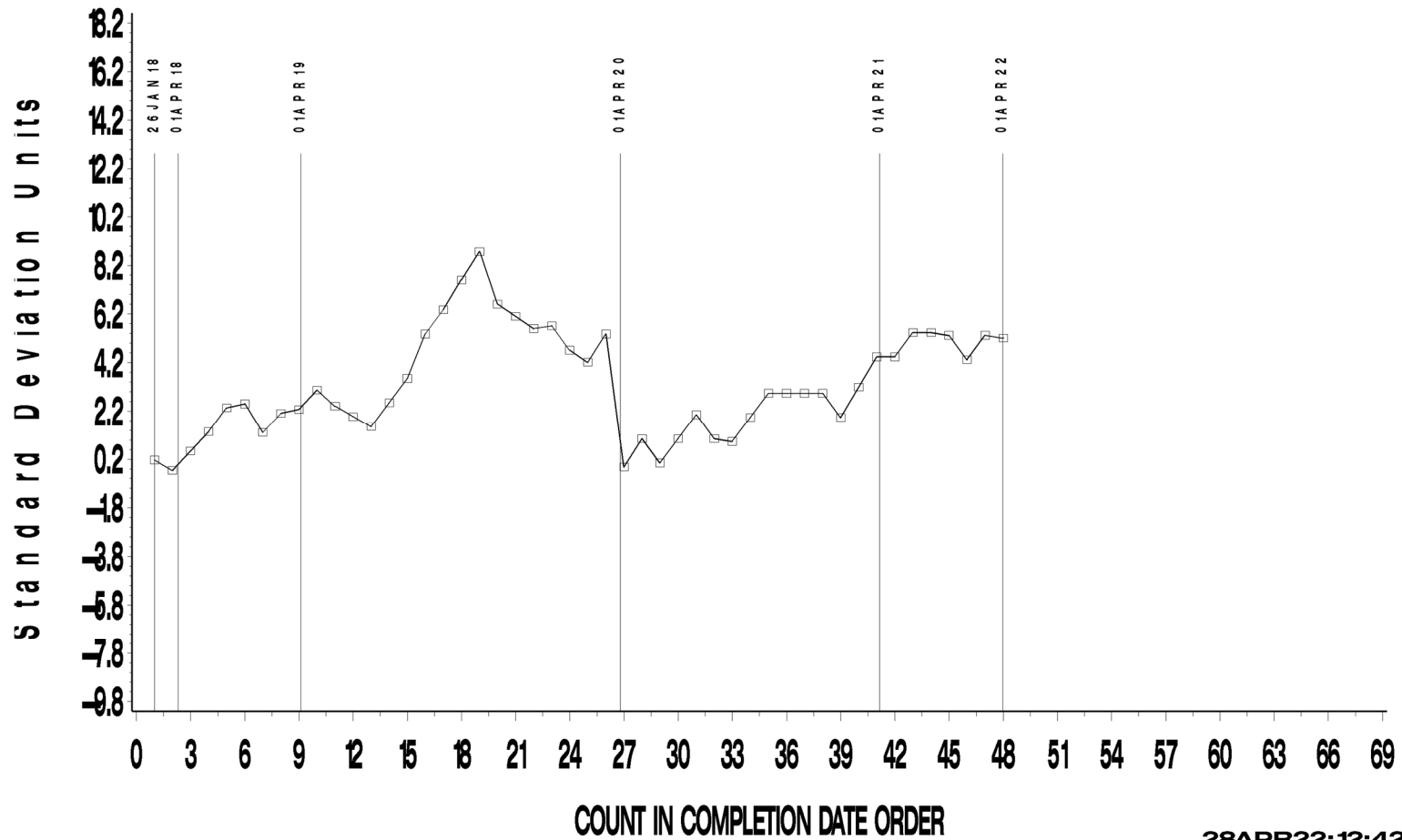
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FINAL PINION GEAR RIDGING

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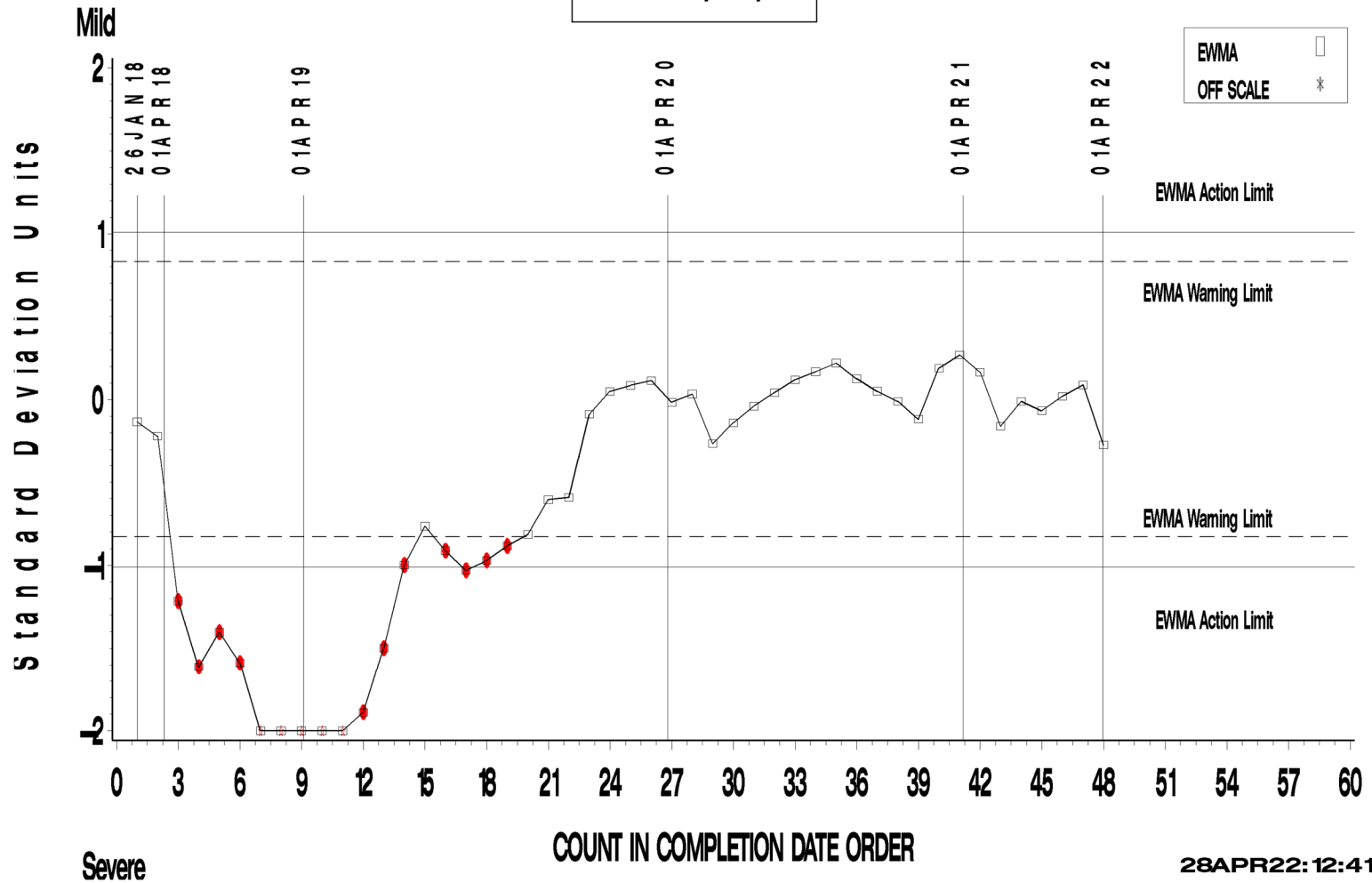
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LTMS Severity Analysis



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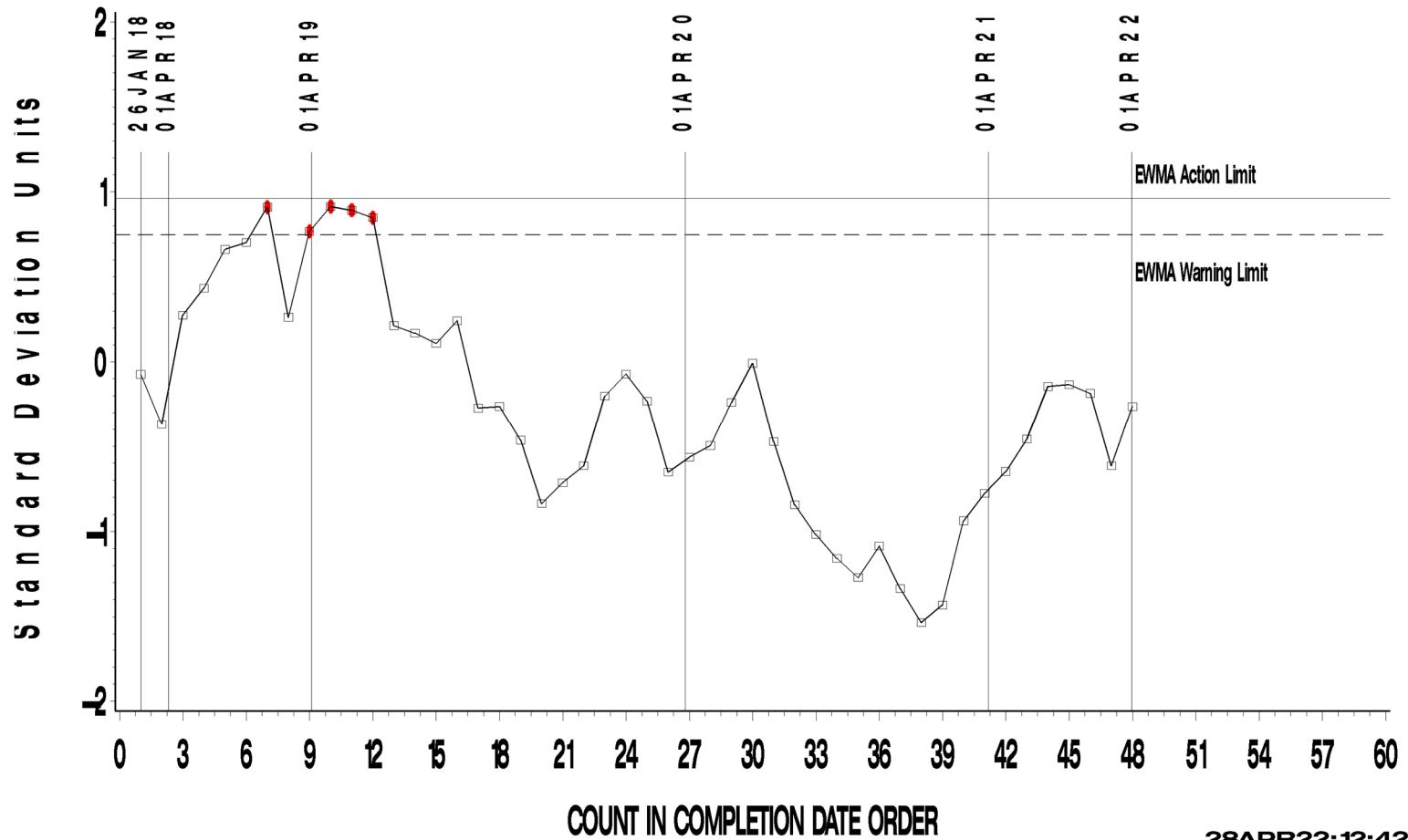
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L-37-1 (D8165)

L-37-1 NONLUBRITED INDUSTRY OPERATIONALLY VALID

FINAL PINION GEAR RIPPLING

LTMS Precision Analysis



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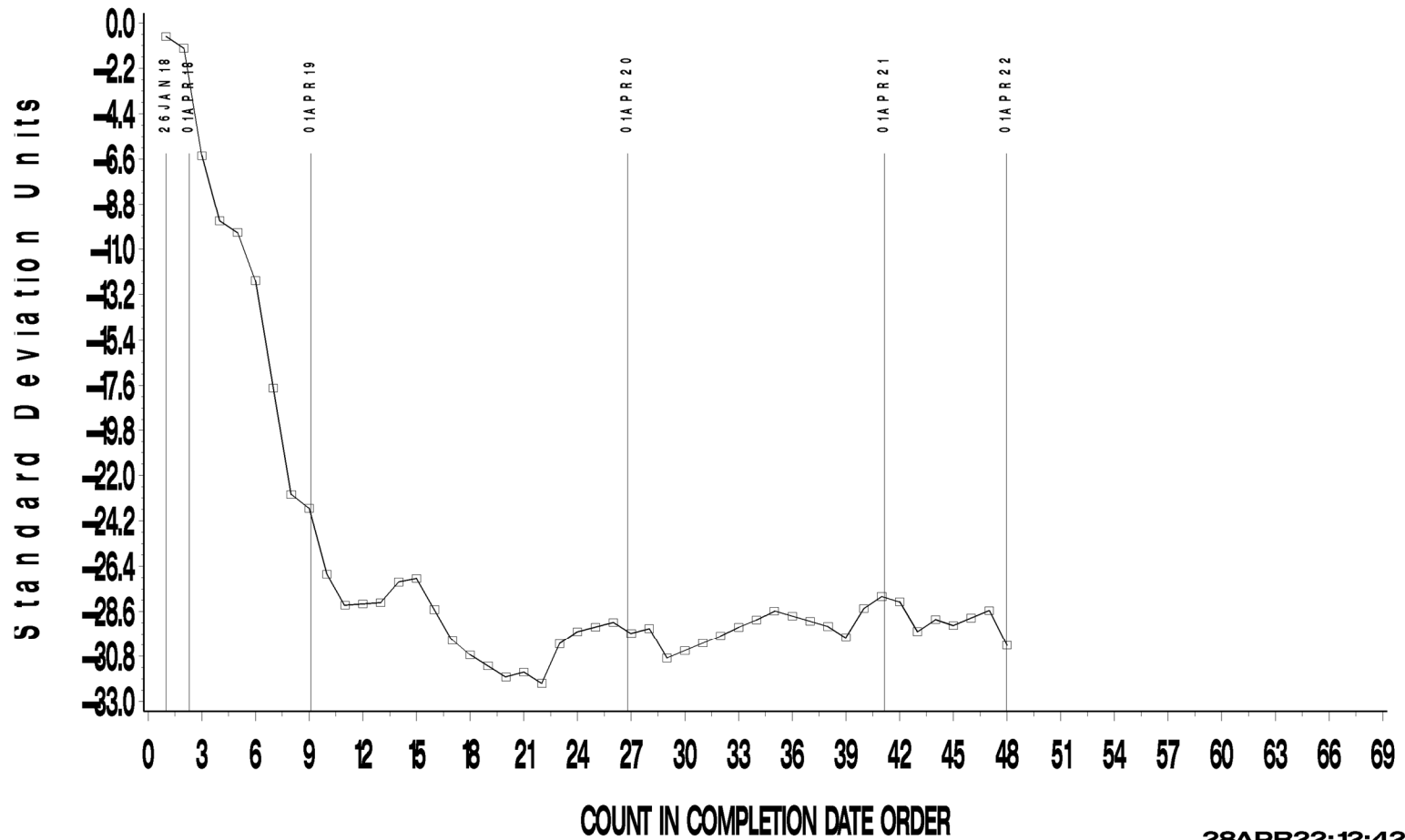
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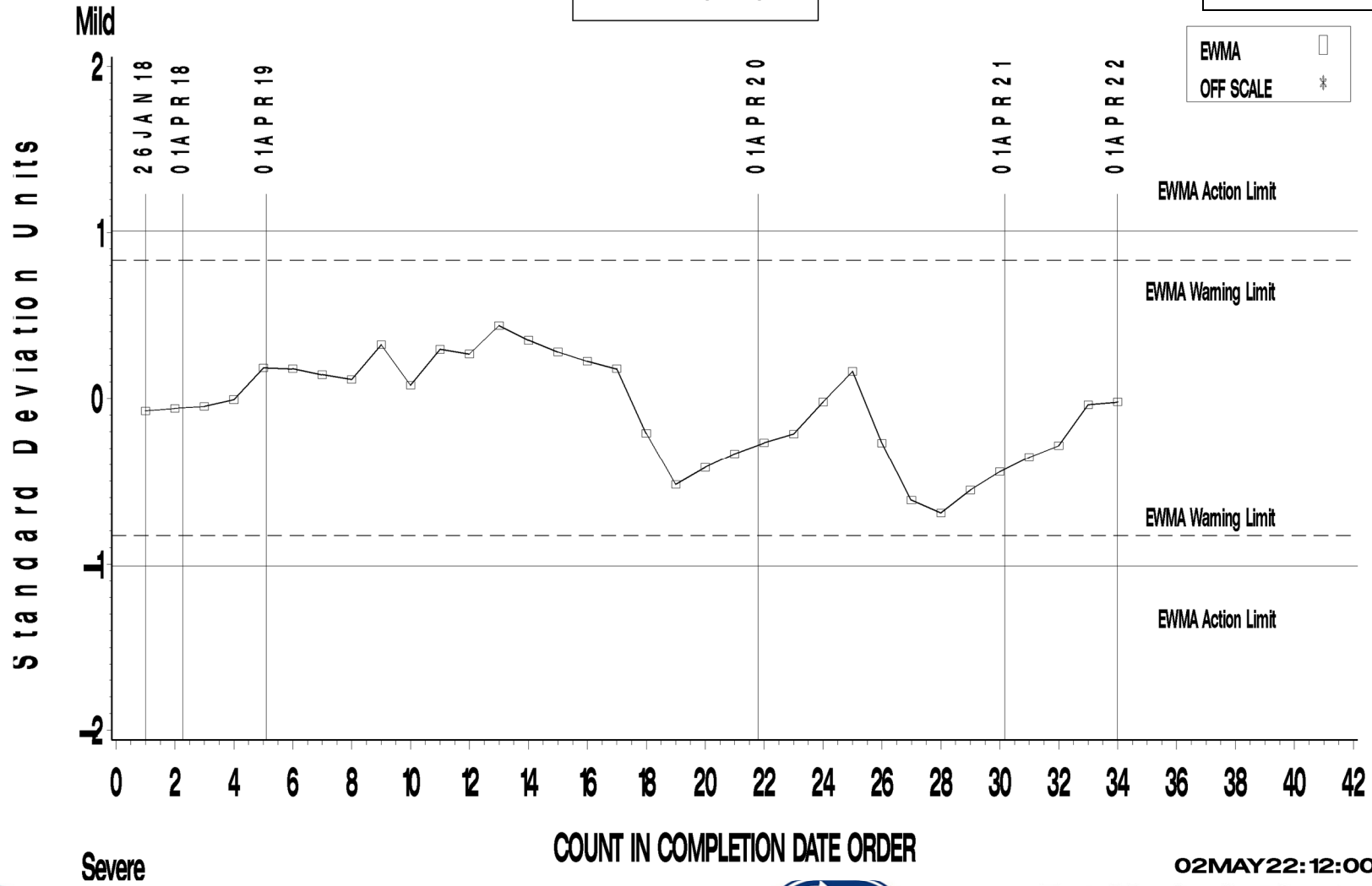
L-37-1 (D8165)

L-37-1 NONLUBRITED INDUSTRY OPERATIONALLY VALID

FINAL PINION GEAR PITTING/SPALLING

LTMS Severity Analysis

Results for 155-1 reference oil were not included in this SPIT charts based on the current targets leading to undefined calculations. Two 152-2 results (129856, and 138440) were also omitted.



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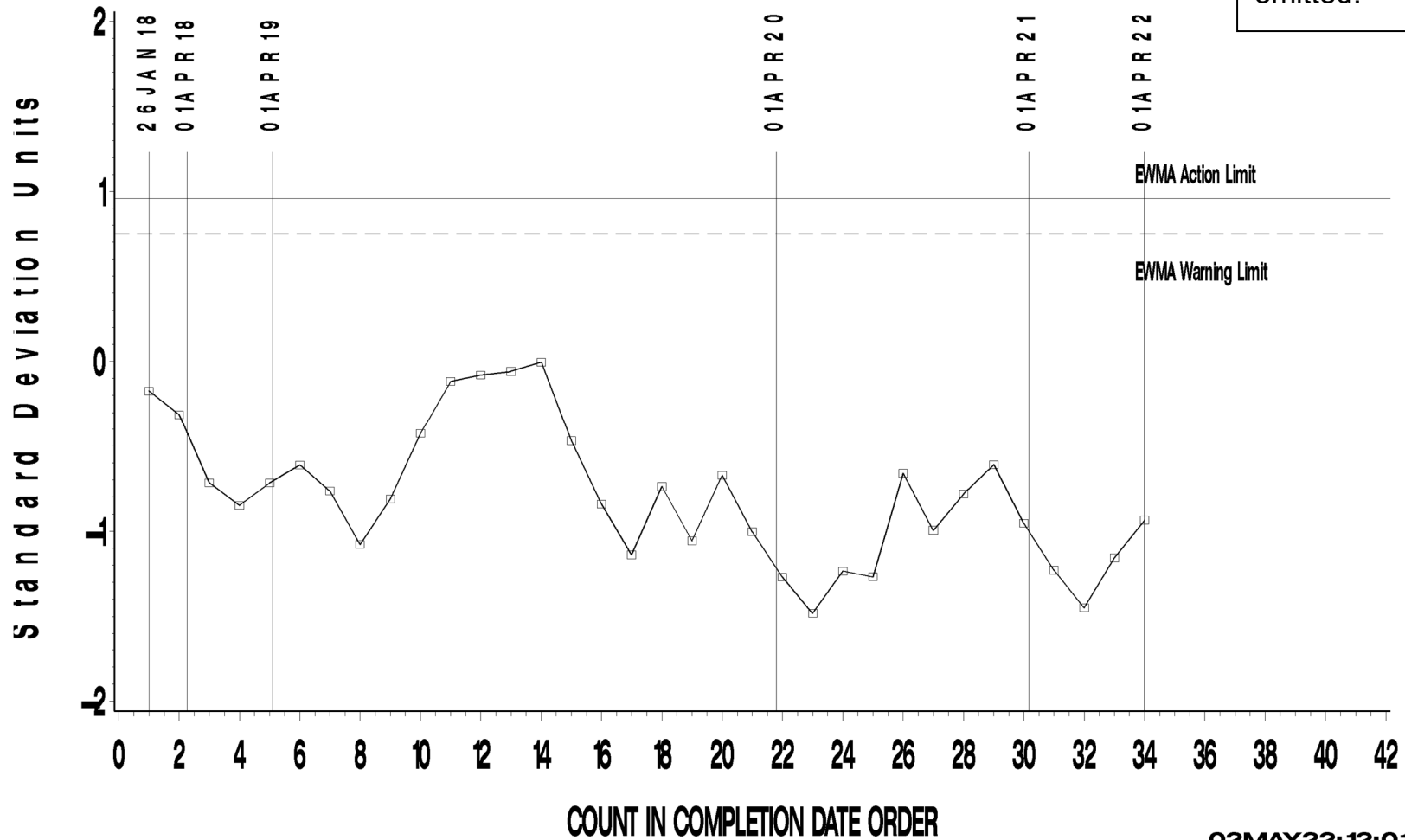
L-37-1 (D8165)

L-37-1 NONLUBRICATED INDUSTRY OPERATIONALLY VALID

FINAL PINION GEAR PITTING/SPALLING

LTMS Precision Analysis

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02MAY22: 12:01
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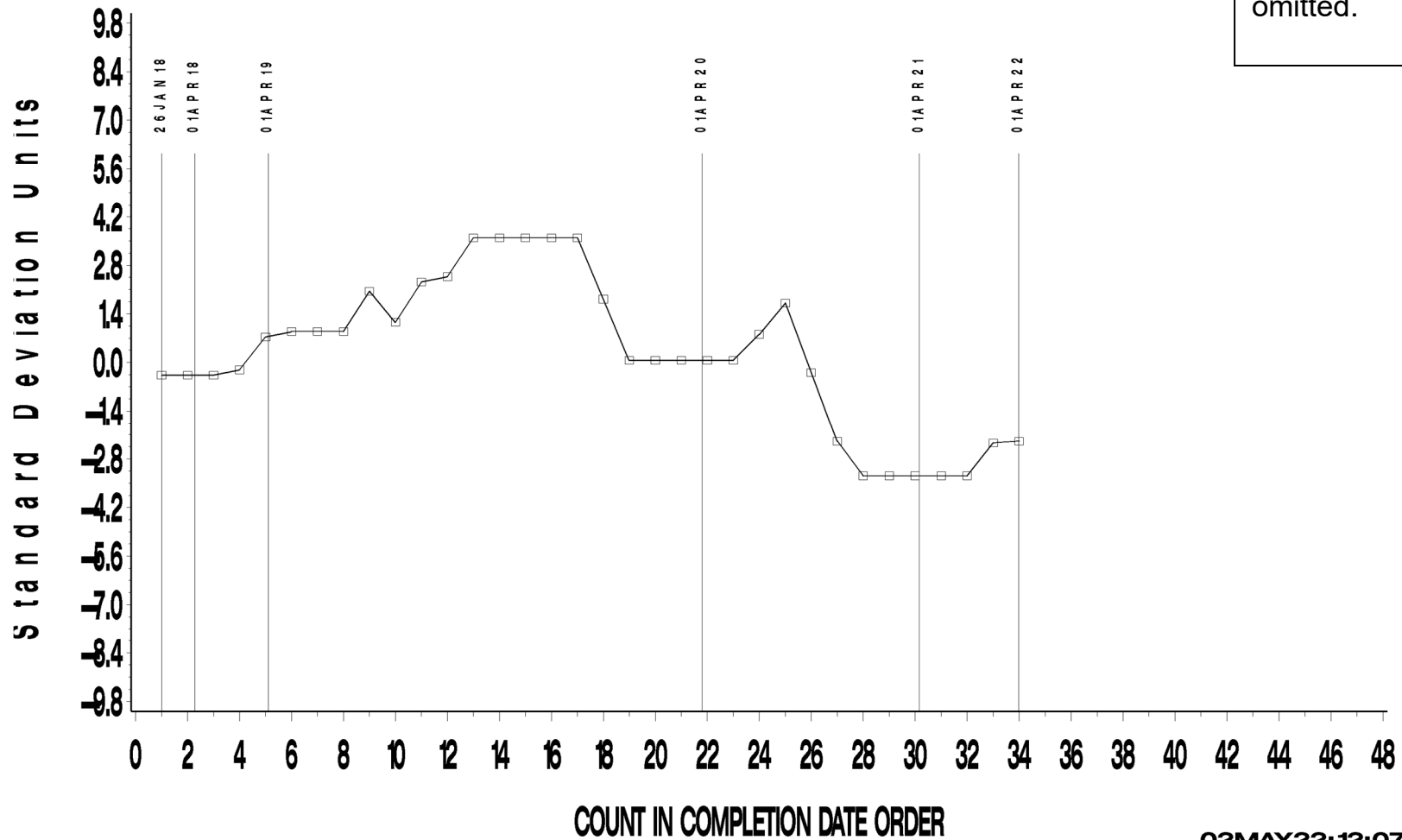
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L-37-1 (D8165)

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FINAL PINION GEAR PITTING/SPALLING

CUSUM Severity Analysis



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02MAY22: 12:07
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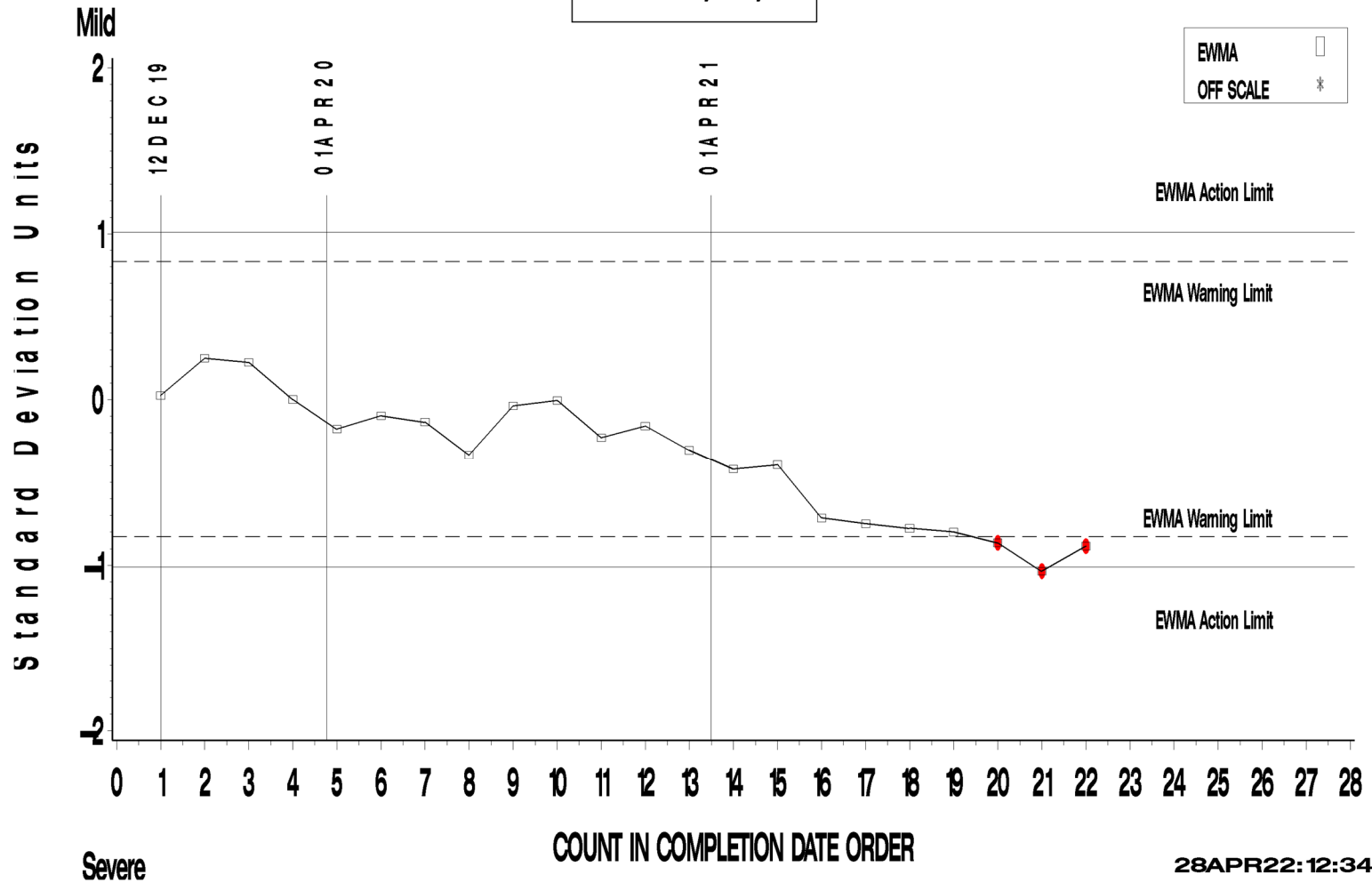
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L-37-1 (D8165)

L-37-1 LUBRITED INDUSTRY OPERATIONALLY VALID

FINAL PINION GEAR WEAR

LTMS Severity Analysis

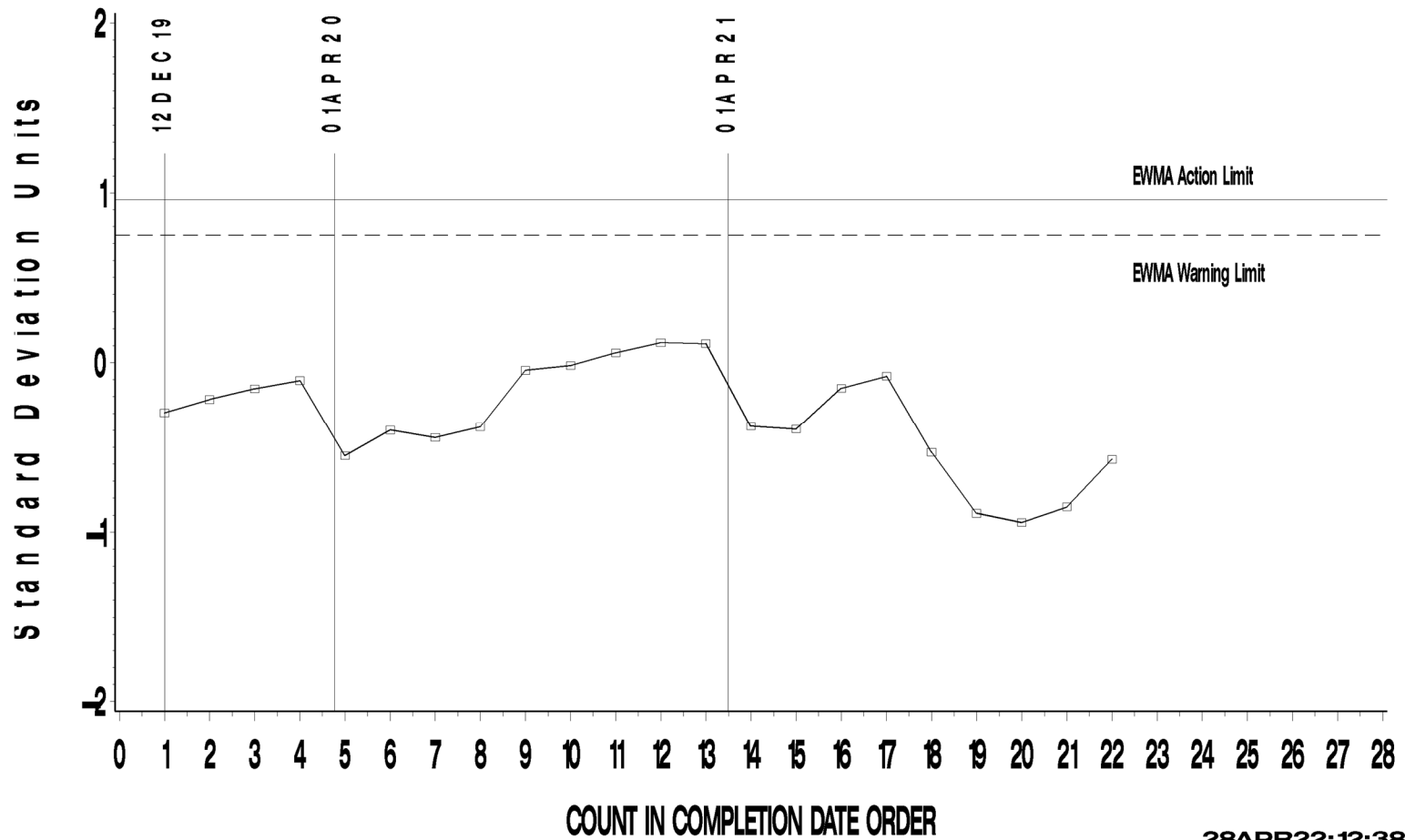


L-37-1 (D8165)

L-37-1 LUBRITED INDUSTRY OPERATIONALLY VALID

FINAL PINION GEAR WEAR

LTMS Precision Analysis



28APR22:12:38



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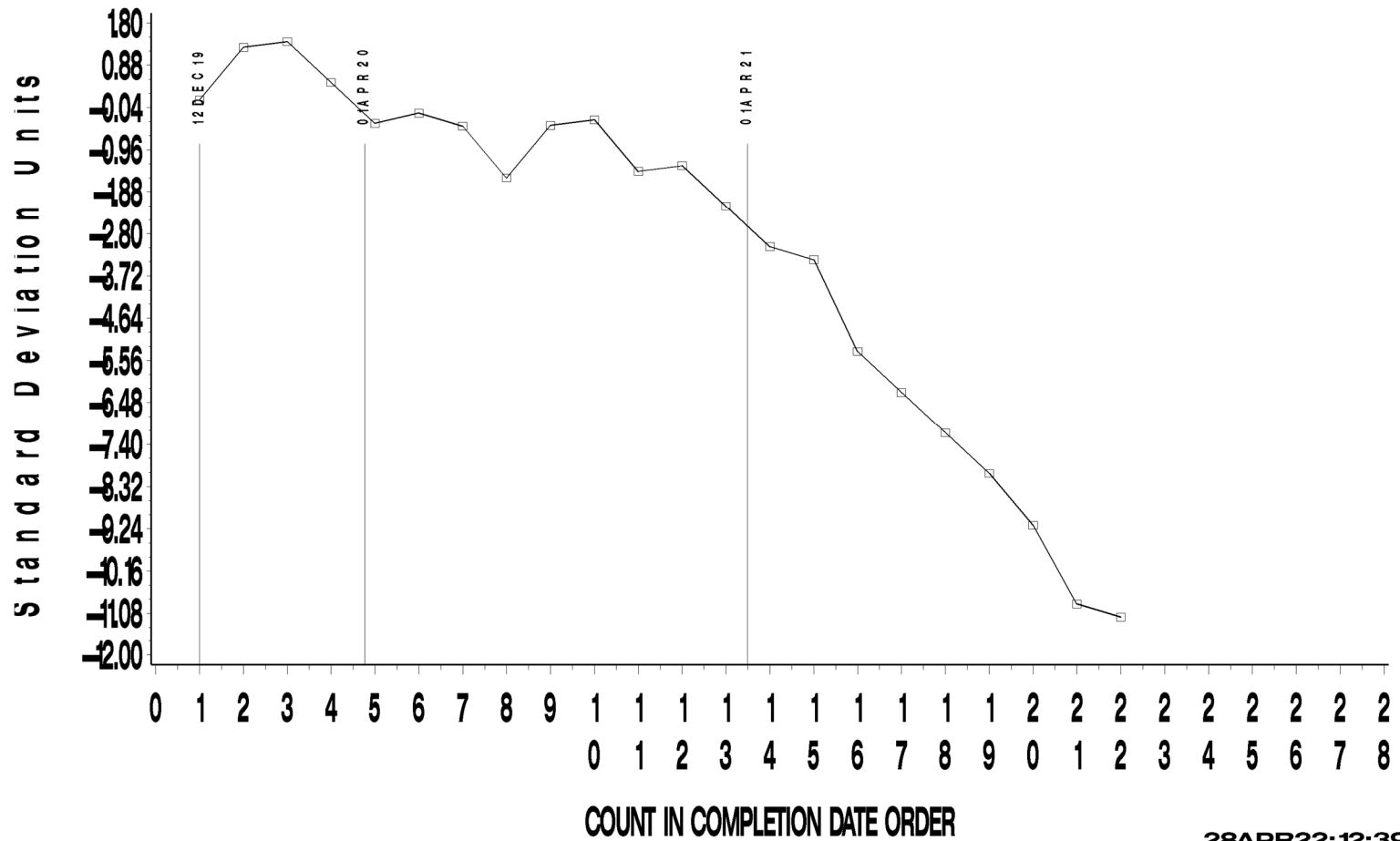
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L-37-1 (D8165)

L-37-1 LUBRITED INDUSTRY OPERATIONALLY VALID

FINAL PINION GEAR WEAR

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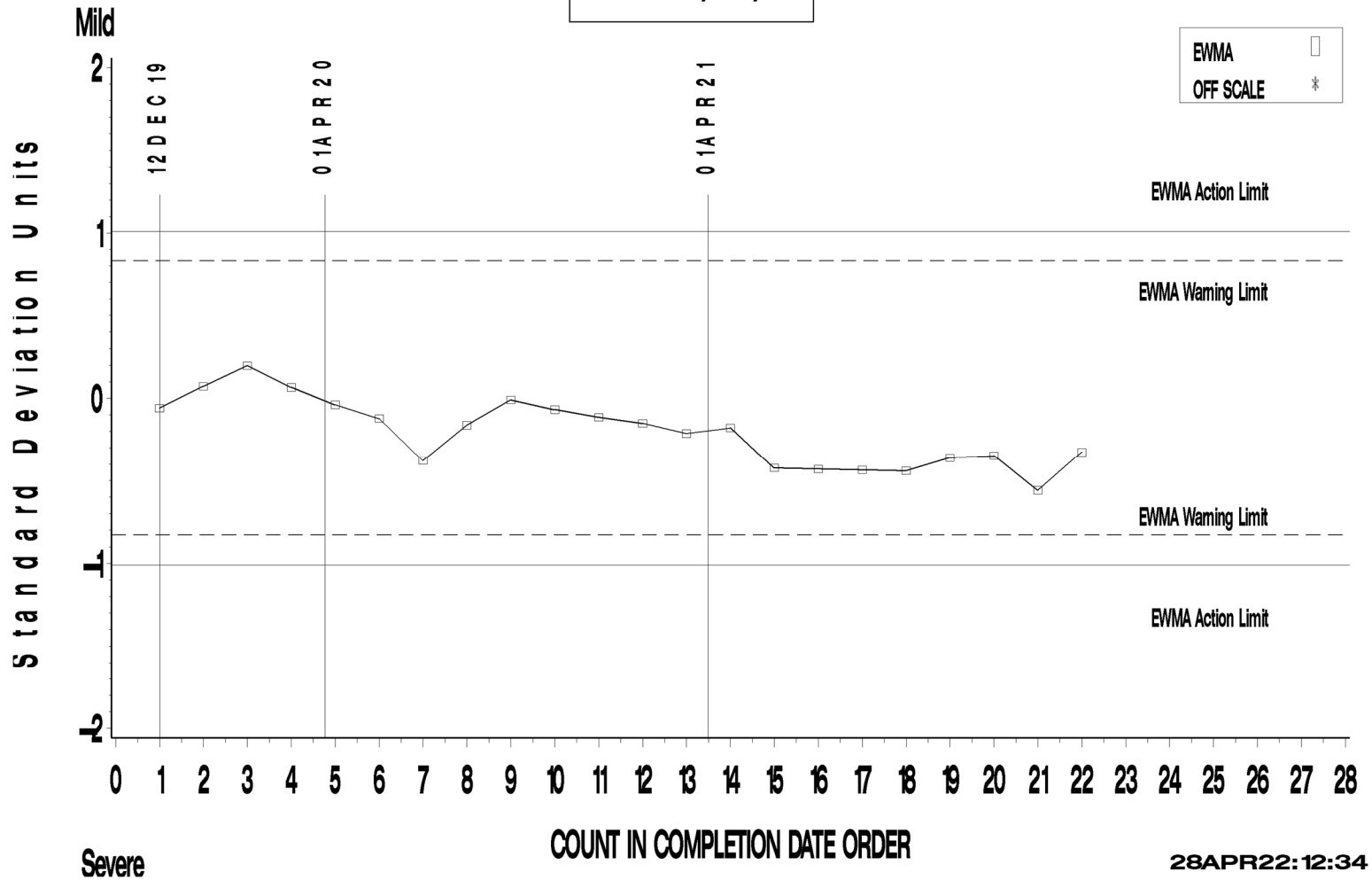
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L-37-1 (D8165)

L-37-1 LUBRITED INDUSTRY OPERATIONALLY VALID

FINAL PINION GEAR RIDGING

LTMS Severity Analysis

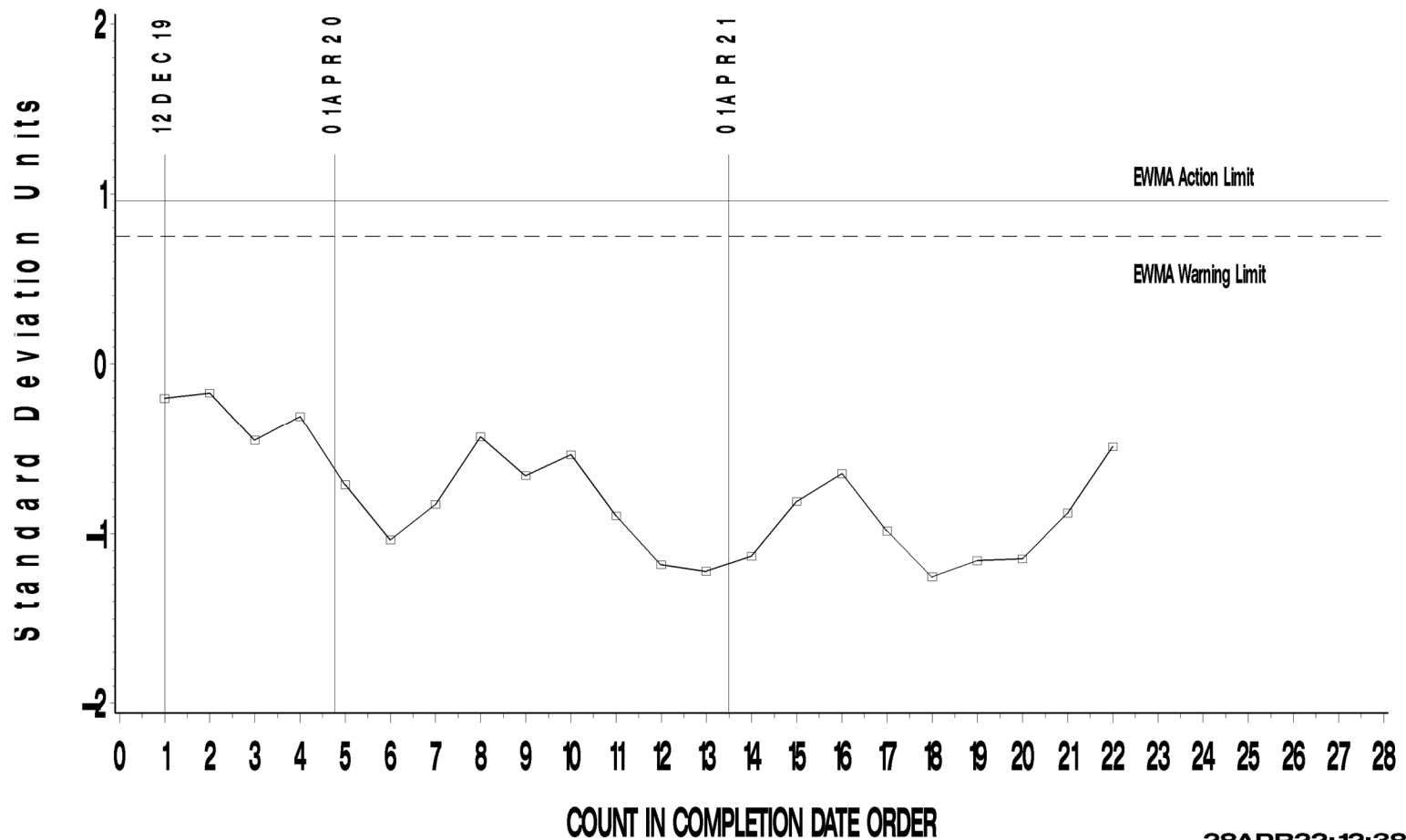


L-37-1 (D8165)

L-37-1 LUBRITED INDUSTRY OPERATIONALLY VALID

FINAL PINION GEAR RIDGING

LTMS Precision Analysis



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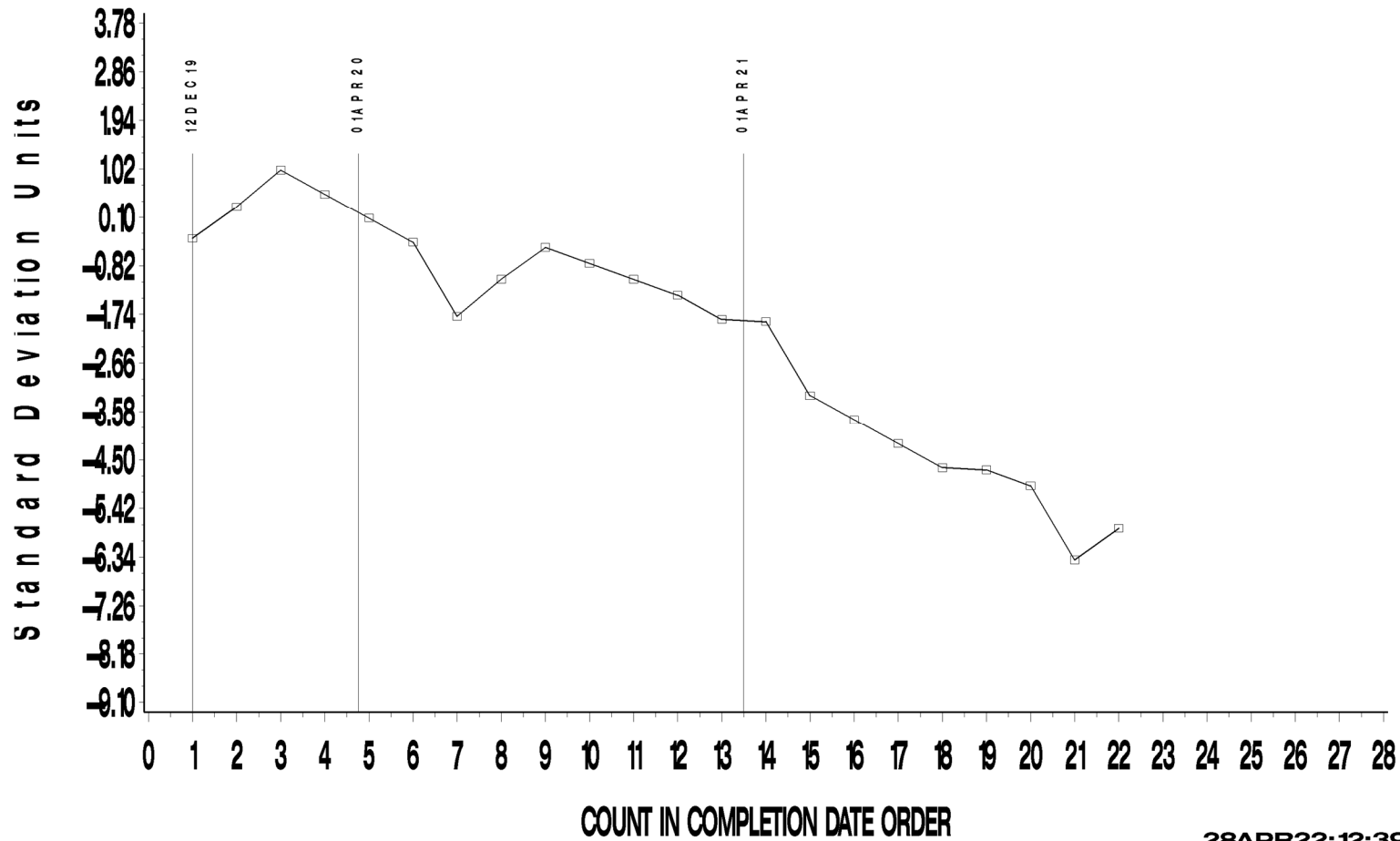
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L-37-1 (D8165)

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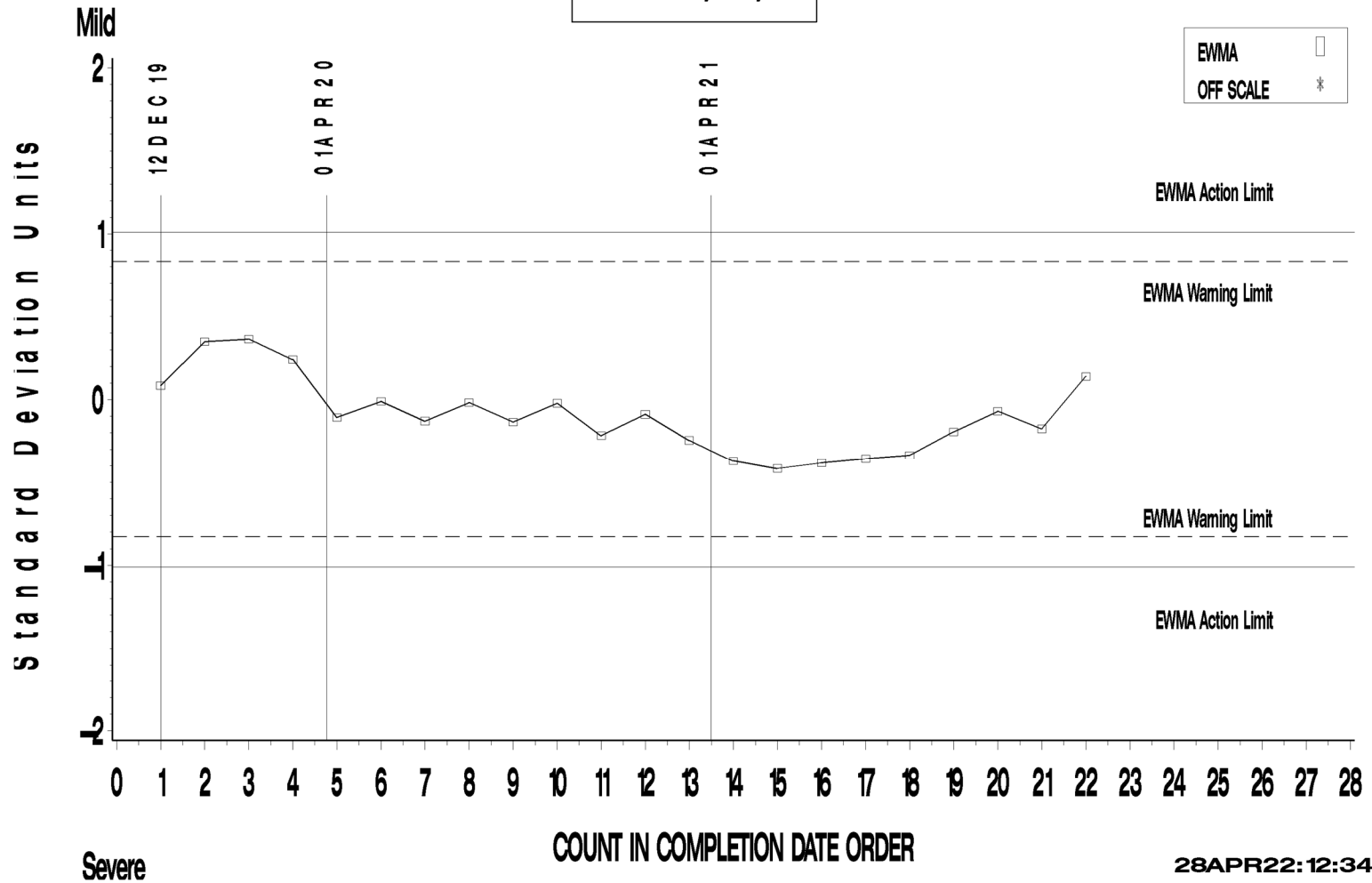
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L-37-1 (D8165)

L-37-1 LUBRITED INDUSTRY OPERATIONALLY VALID

FINAL PINION GEAR RIPPLING

LTMS Severity Analysis



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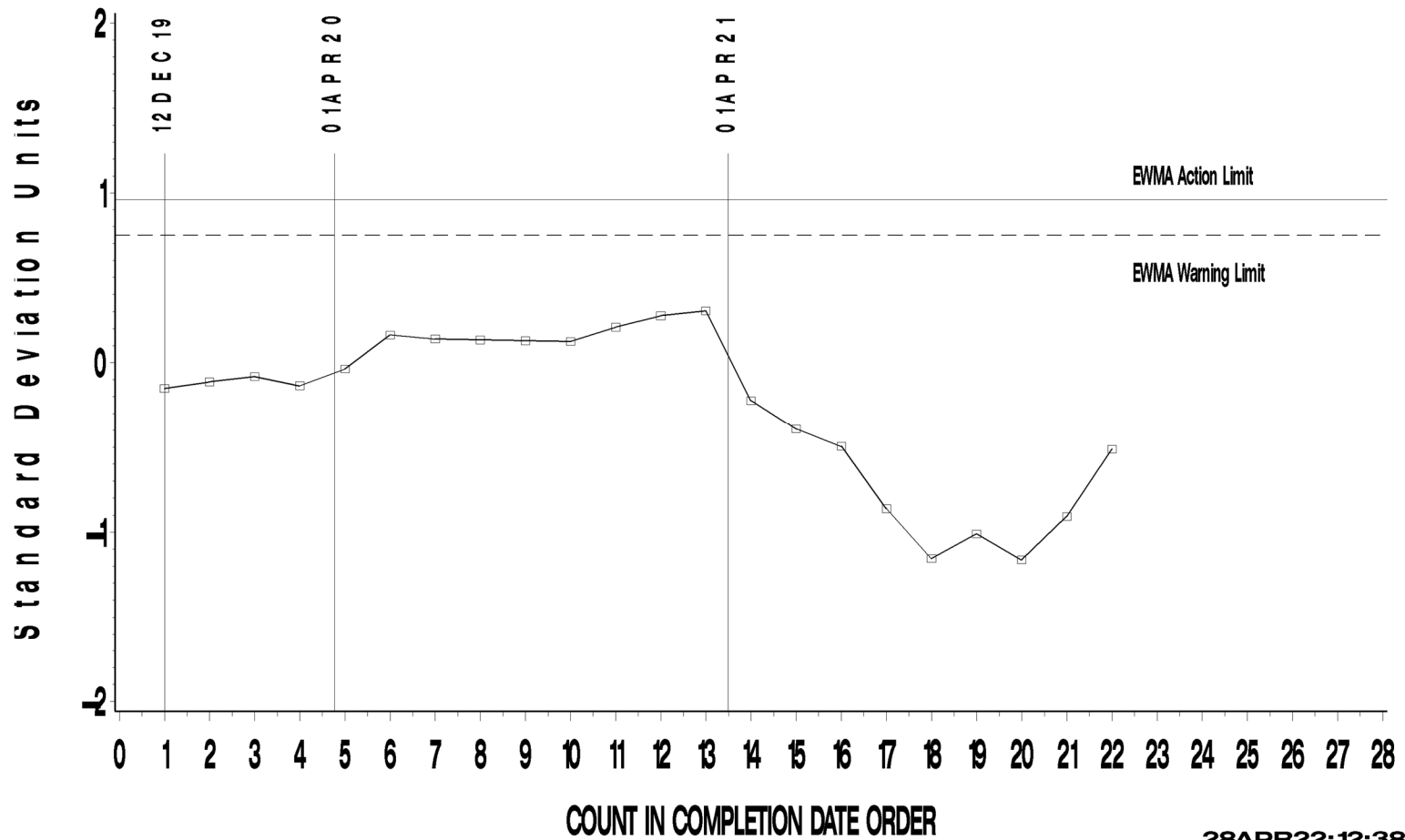
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LTMS Precision Analysis



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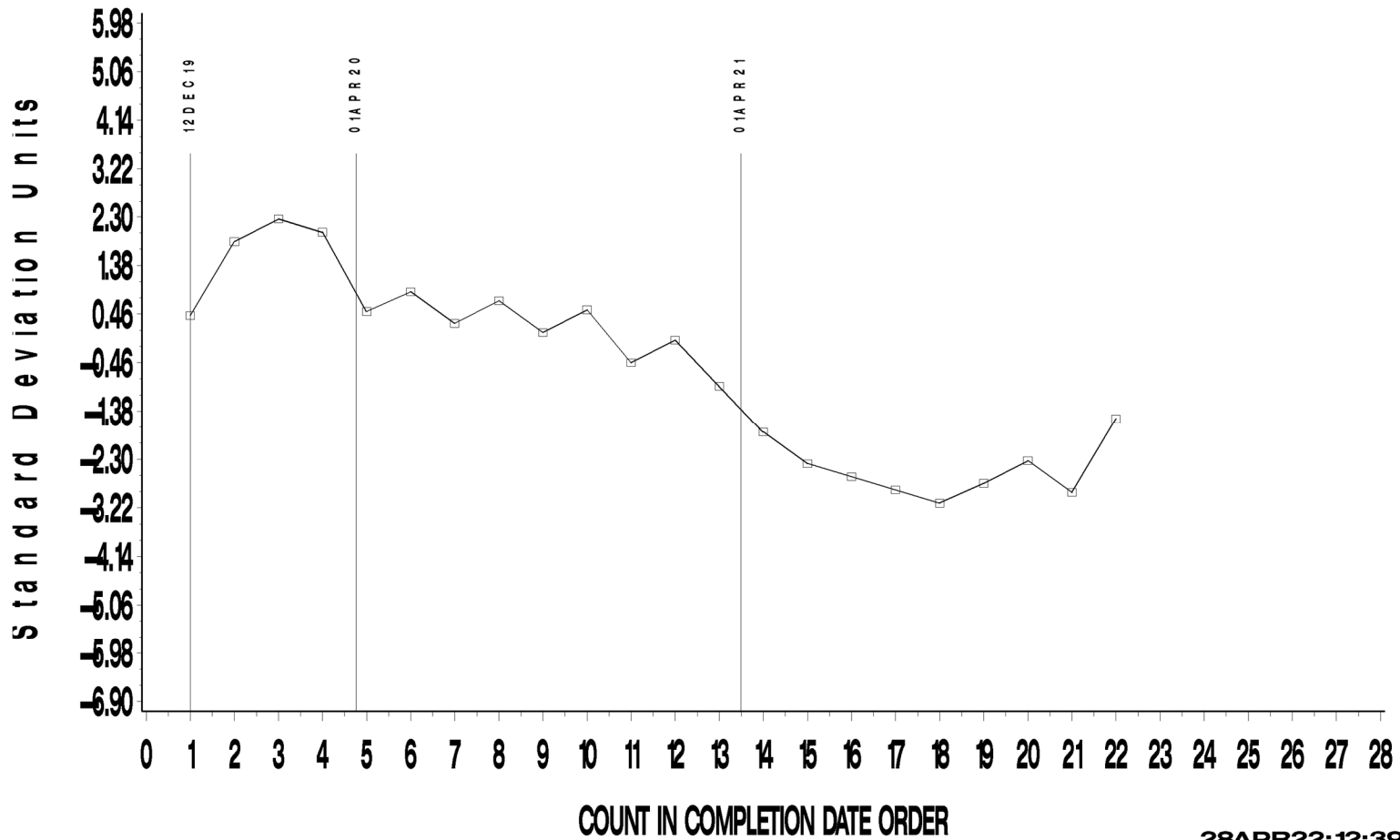
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L-37-1 LUBRITED INDUSTRY OPERATIONALLY VALID

FINAL PINION GEAR RIBBLING

CUSUM Severity Analysis



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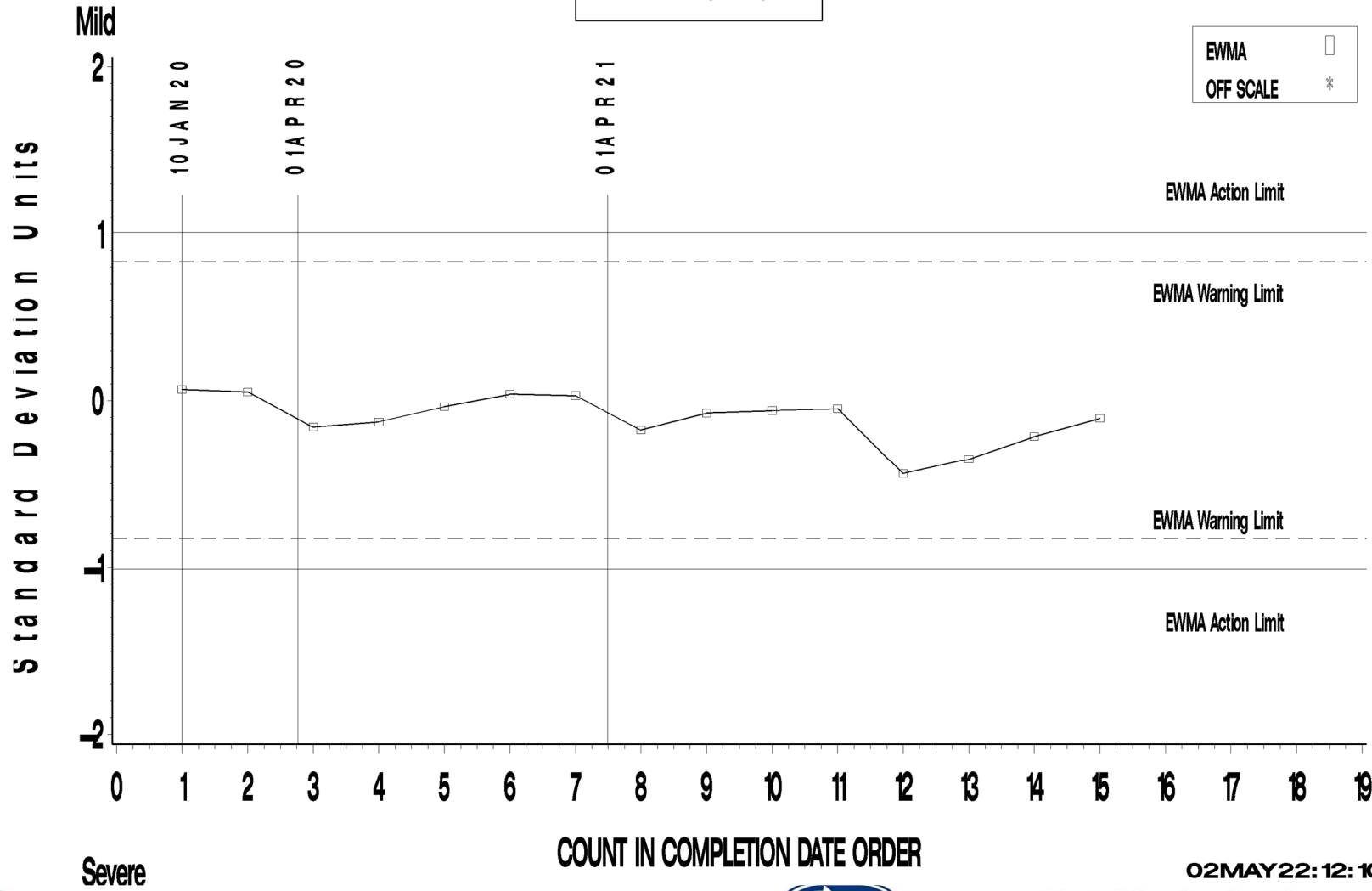
L-37-1 (D8165)

L-37-1 LUBRITED INDUSTRY OPERATIONALLY VALID

FINAL PINION GEAR PITTING/SPALLING

LTMS Severity Analysis

Results for 155-1 reference oil were not included in this SPIT charts based on the current targets for the oil



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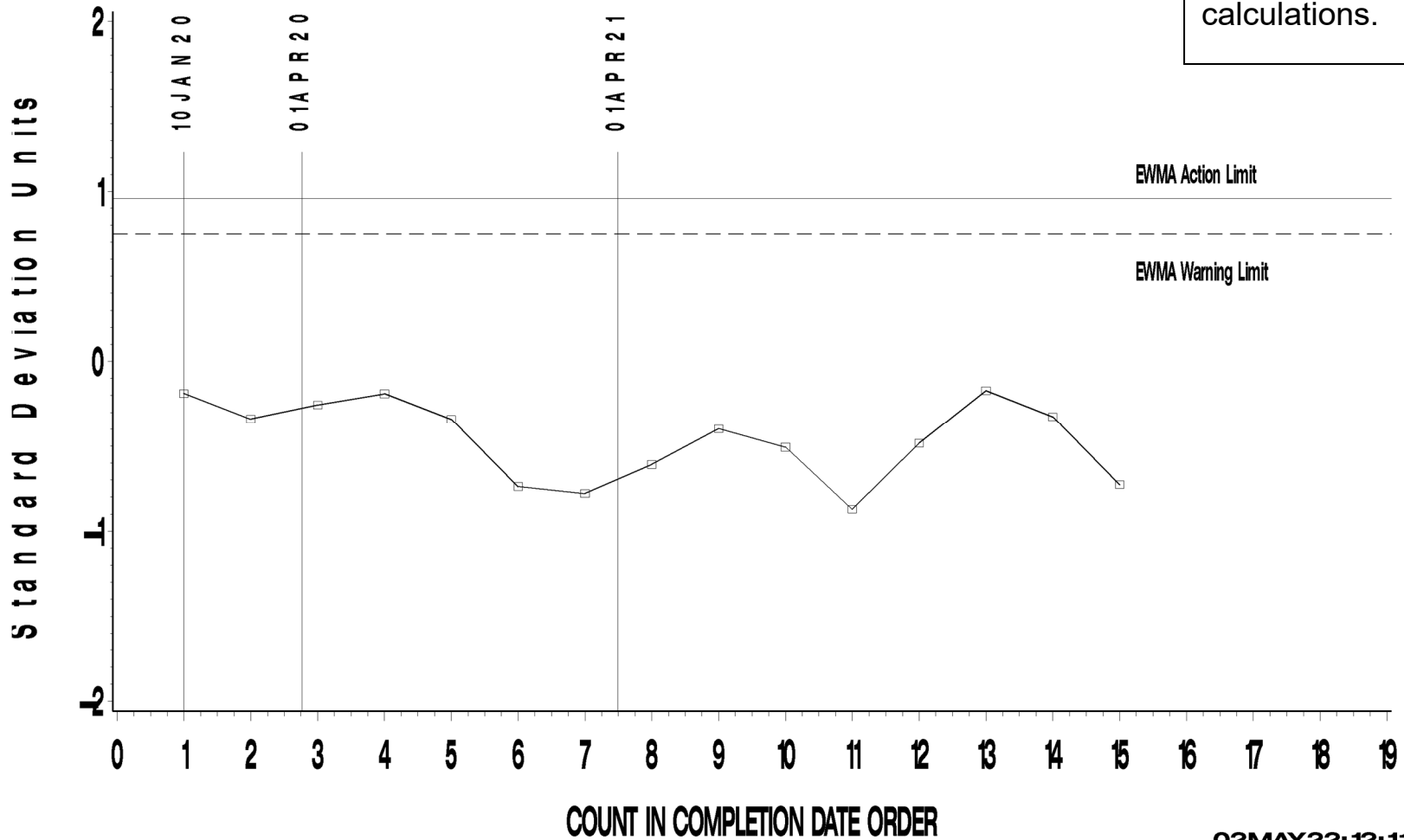
L-37-1 (D8165)

L-37-1 LUBRITED INDUSTRY OPERATIONALLY VALID

FINAL PINION GEAR PITTING/SPALLING

LTMS Precision Analysis

Results for 155-1 reference oil were not included in this SPIT charts based on the current targets for the oil leading to undefined calculations.



02MAY22: 12:11

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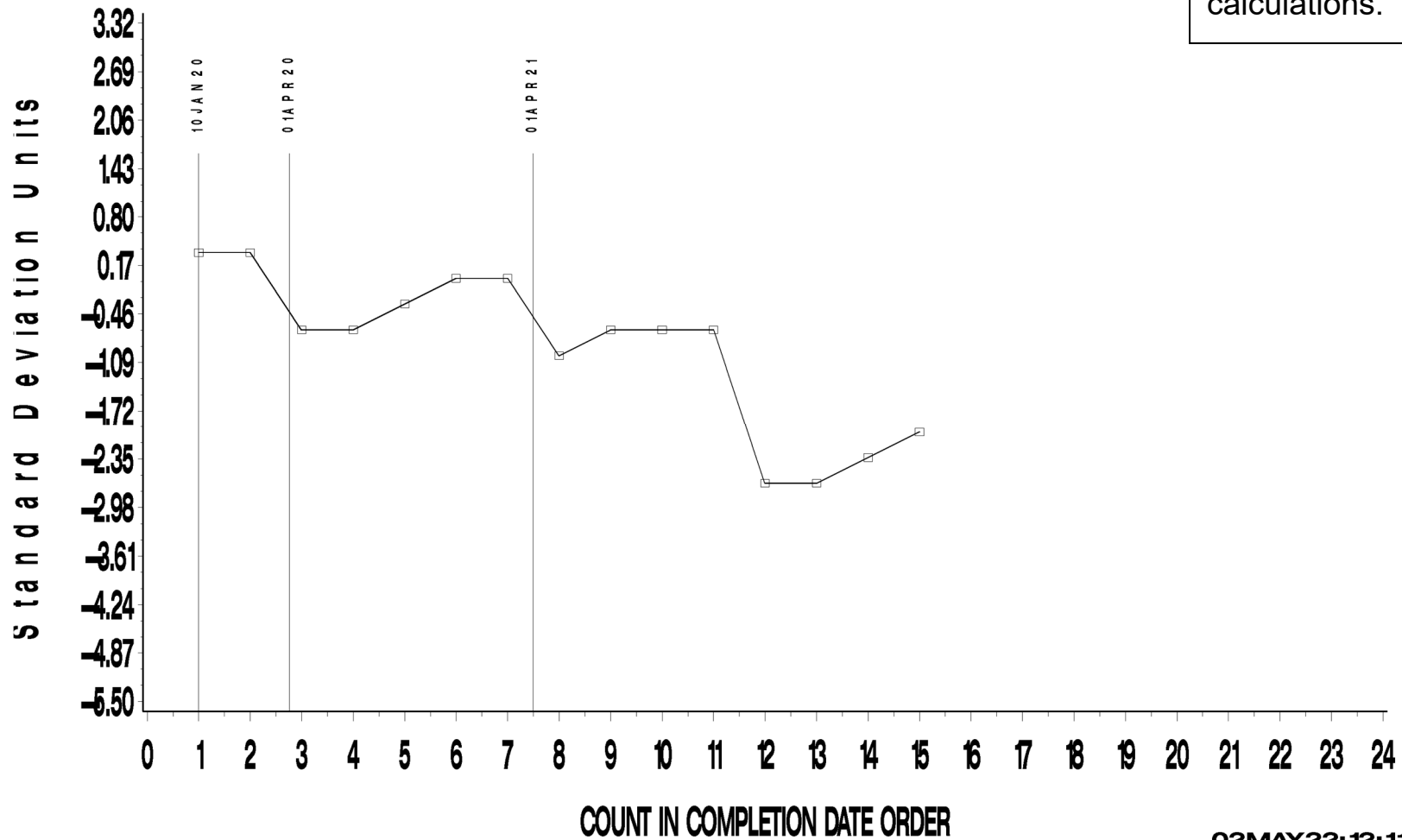
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L-37-1 (D8165)

L-37-1 LUBRITED INDUSTRY OPERATIONALLY VALID

FINAL PINION GEAR PITTING/SPALLING

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Results for 155-1 reference oil were not included in this SPIT charts based on the current targets for the oil leading to undefined calculations.



L-37-1 (D8165)

TIMELINE ADDITIONS

| Effective Date | Information Letter | Event |
|----------------|--------------------|---|
| March 9, 2022 | 22-1 | Lubrited removed from the test procedure due to trademark on that name. |

LAB VISITS

One lab visit was conducted during this reporting period. All observed areas of the test were found to be in compliance with the test procedure.

L-37-1 (D8165)

INFORMATION LETTERS

Information letter 22-1 was issued during this reporting period. This purpose of the information letter was to remove the term “lubrited” from the test method due to a trademark on that terminology.



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L-37-1 (D8165)

LTMS DEVIATIONS

No LTMS deviations were written this report period.

L-37-1 (D8165)

STATUS OF REFERENCE OIL SUPPLY

| Oil | Cans @ Labs | @ TMC | Gallons |
|-------|-------------|-------|---------|
| | | Cans | |
| 117 | 9 | 285 | 285.0 |
| 118 | 3 | 0 | 0.0 |
| 134 | 1 | 0 | 0.0 |
| 134-1 | 26 | 125 | 125.7 |
| 152-2 | 32 | 56 | 56.0 |
| 155 | 5 | 27 | 27.5 |
| 155-1 | 24 | 31 | 31.8 |
| Total | 100 | 524 | 526.0 |

The TMC quantity remaining presumes usage only for L-371 testing. Oil 155/155-1 is also used in other test areas (L-33-1, L-60-1, and HTCT). The 155-1 total also reflects that the L-60-1 surveillance panel has requested that TMC reserve a quantity of that oil (currently 22.9 gal) for use in that test.

A re-blend of 155-1 is available but has not yet been approved by the surveillance panel.