



Test Monitoring Center


Carnegie Mellon University
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<http://astmtmc.cmu.edu>
412-365-1000

MEMORANDUM: 12-045

DATE: December 7, 2012

TO: Wes Venhoff, Chairman, L-37 Surveillance Panel

FROM: Scott Parke 

SUBJECT: L-37 Testing from April 1, 2012 through September 30, 2012

Please find attached a summary of testing activity this period.

SDP/sdp/mem12-045.sdp.doc

cc: Frank Farber

Jeff Clark

L-37 Surveillance Panel

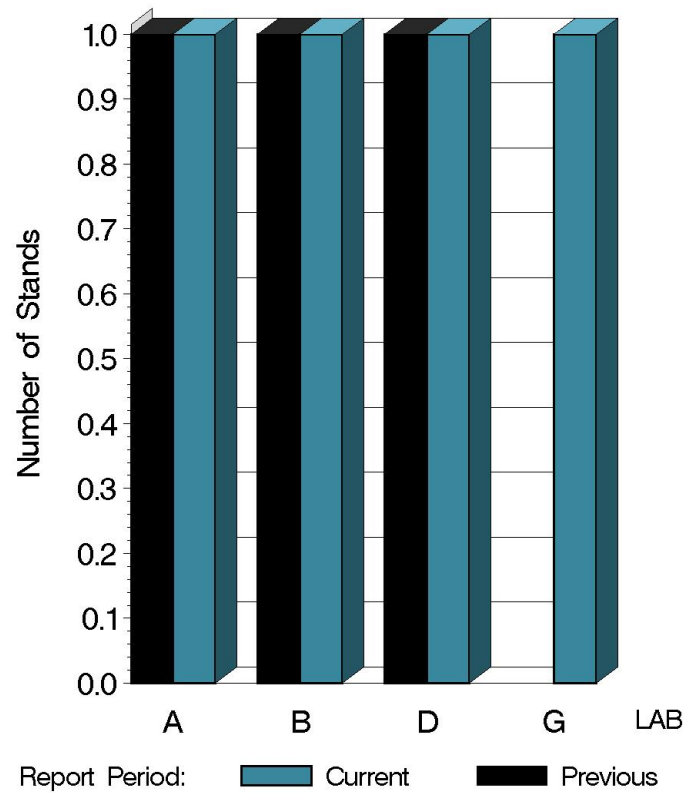
<ftp://ftp.astmtmc.cmu.edu/docs/gear/l37/semiannualreports/l37-10-2012.pdf>

Distribution: email

L-37 (D6121)

	Reporting Data	Calibrated on 9-30-12
Number of Labs	4	4
Number of Stands	4	4

BY-LAB STAND
DISTRIBUTION



11:25:33 05DEC2012

L-37 (D6121)

Test Distribution by Oil and Validity

						Totals	
		128-1	134	152-1	155	Last Period	This Period
Accepted for calibration	AC	1	0	6	0	6	7
Rejected (Mild)	OC	0	0	0	0	0	0
Rejected (Severe)	OC	0	0	0	0	0	0
Rejected (Precision)	OC	0	0	1	1	0	2
Invalidated calibration	LC	0	0	0	0	1	0
Hardware approval run	NI	0	9	16	7	0	32
Total		1	9	23	8	7	41

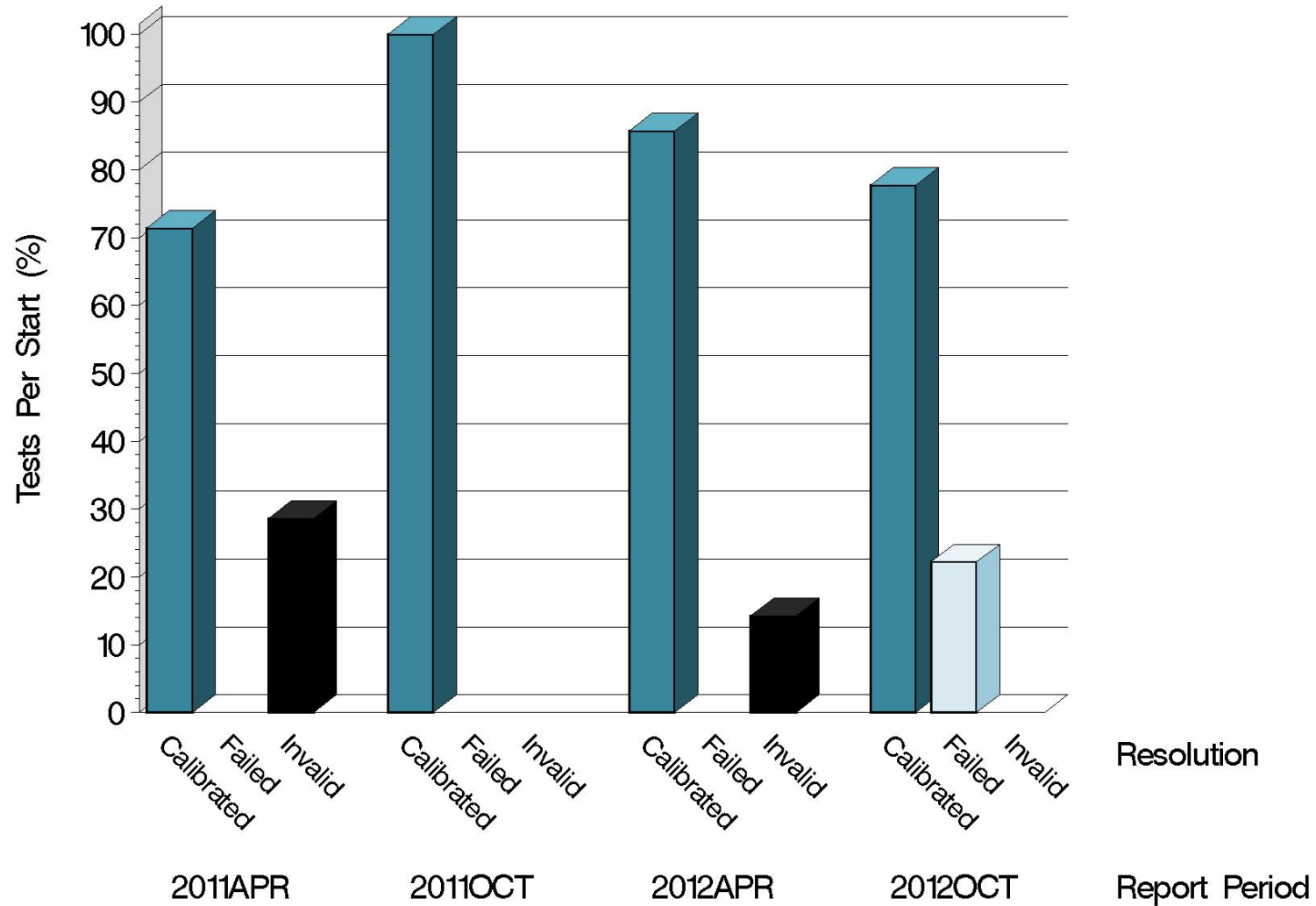
L-37 (D6121)

Calibration Attempt Detail

	Gear Batch	Acceptable	Failed	Total
LUBRITED	none	0	0	0
	Total	0	0	0
NONLUBRITED	V1L303/P4L514A	1	0	1
	V1L417/P4L792	1	0	1
	V1L500/P4T813	5	2	7
	Total	7	2	9

L-37 (D6121)

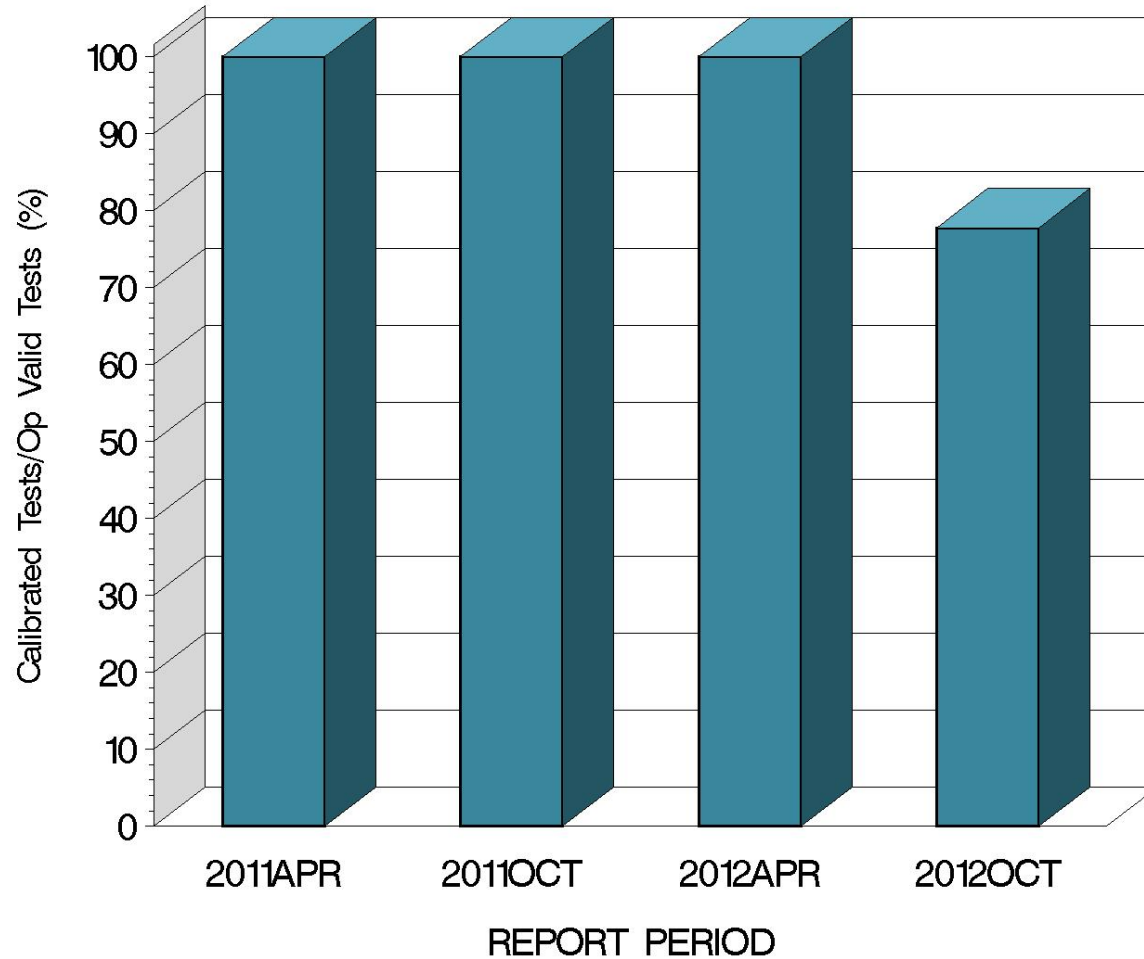
CALIBRATION ATTEMPT SUMMARY



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L-37 (D6121)

OPERATIONALLY VALID TESTS
MEETING ACCEPTANCE CRITERIA

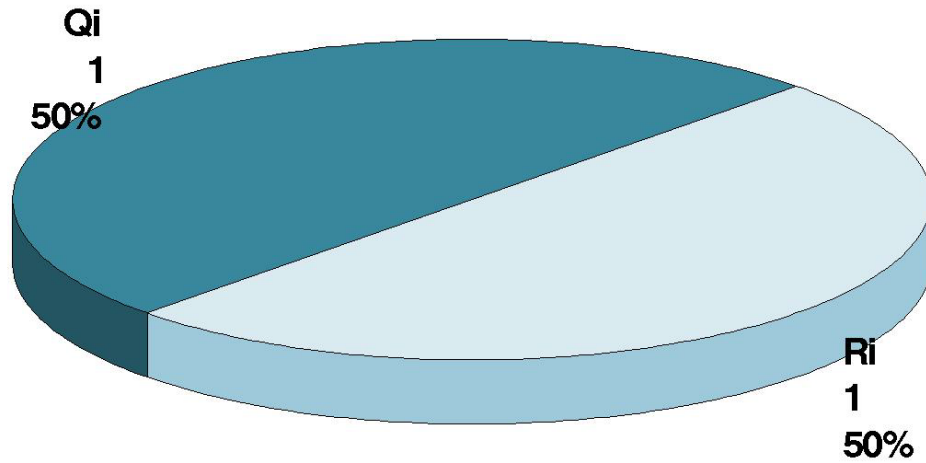


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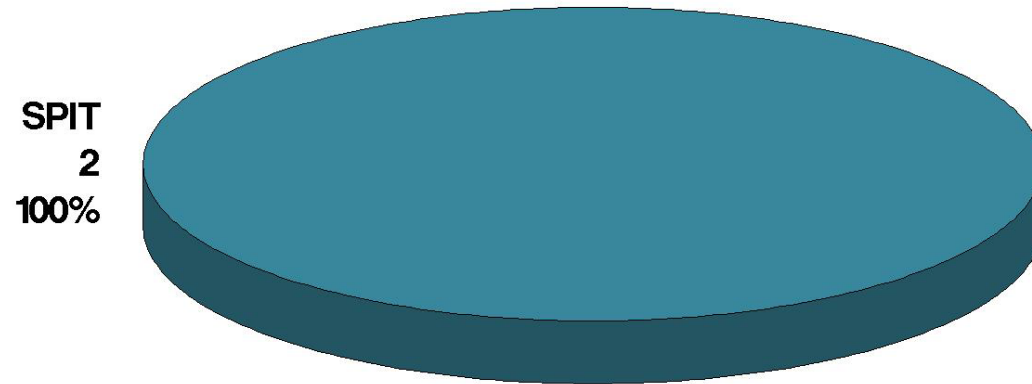
L-37 (D6121)

CAUSES FOR FAILED TESTS

By Alarm Type



By Parameter



L-37 (D6121)

CAUSES FOR LOST TESTS

Lab	Cause	Oil				Validity			Loss Rate		
		123-2	134	152-1	155	RC	LC	XC	Lost	Starts	%
	No tests were lost this period.								0	41	0%
	Lost	0	0	0	0	0	0	0			
	Starts	1	9	23	8	41	41	41			
	%	0%	0%	0%	0%	0%	0%	0%			

L-37 (D6121)

GEAR BATCH SEVERITY

NON-LUBRITED HARDWARE						
Parameter	Gear Batch	N	Δ/s	s^A	Overall Δ/s	Overall Shift (in Merits) ^B
RIDG	V1L303/P4L514A	1	1.862	0.000	0.431	0.287
	V1L417/P4L792	1	0.828	0.000		
	V1L500/P4T813	7	0.170	0.127		
RIPP	V1L303/P4L514A	1	-0.556	0.000	-0.072	-0.040
	V1L417/P4L792	1	-0.789	0.000		
	V1L500/P4T813	7	0.100	1.088		
SPIT	V1L303/P4L514A	1	0.787	0.000	-1.691	-1.433
	V1L417/P4L792	1	0.258	0.000		
	V1L500/P4T813	7	-2.324	5.677		
WEAR	V1L303/P4L514A	1	-2.261	0.000	-0.087	-0.062
	V1L417/P4L792	1	0.000	0.000		
	V1L500/P4T813	7	0.211	1.034		

^A Because the number of tests completed this period was too small to compute a representative pooled standard deviation, the straight standard deviation is shown.

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

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LAB SEVERITY

NON-LUBRITED HARDWARE						
Gear Batch	Lab	N	RIDG	RIPP	SPIT	WEAR
V1L303/P4L514A	A	1	1.862	-0.556	0.787	-2.261
V1L417/P4L792	G	1	0.828	-0.789	0.258	0.000
V1L500/P4T813	A	1	0.218	-0.771	-3.214	-0.886
	B	3	0.106	1.261	-4.708	-0.252
	D	3	0.218	-0.771	0.357	1.040

L-37 (D6121)

SUMMARY OF SEVERITY & PRECISION

Severity

SPIT exceeded the EWMA control chart action limit for 4 tests due to a spall (SPIT=8) on an oil 155 test at lab B in July. SPIT has returned to within-limits performance over the course of subsequent testing. WEAR, RIDG, and RIPP remained within control chart limits throughout this period.

Precision

The spalled test discussed above also pushed SPIT precision beyond the control chart action limit. As with severity, subsequent testing has restored SPIT to within-limits performance. WEAR, RIDG, and RIPP remained within control chart limits throughout this period.

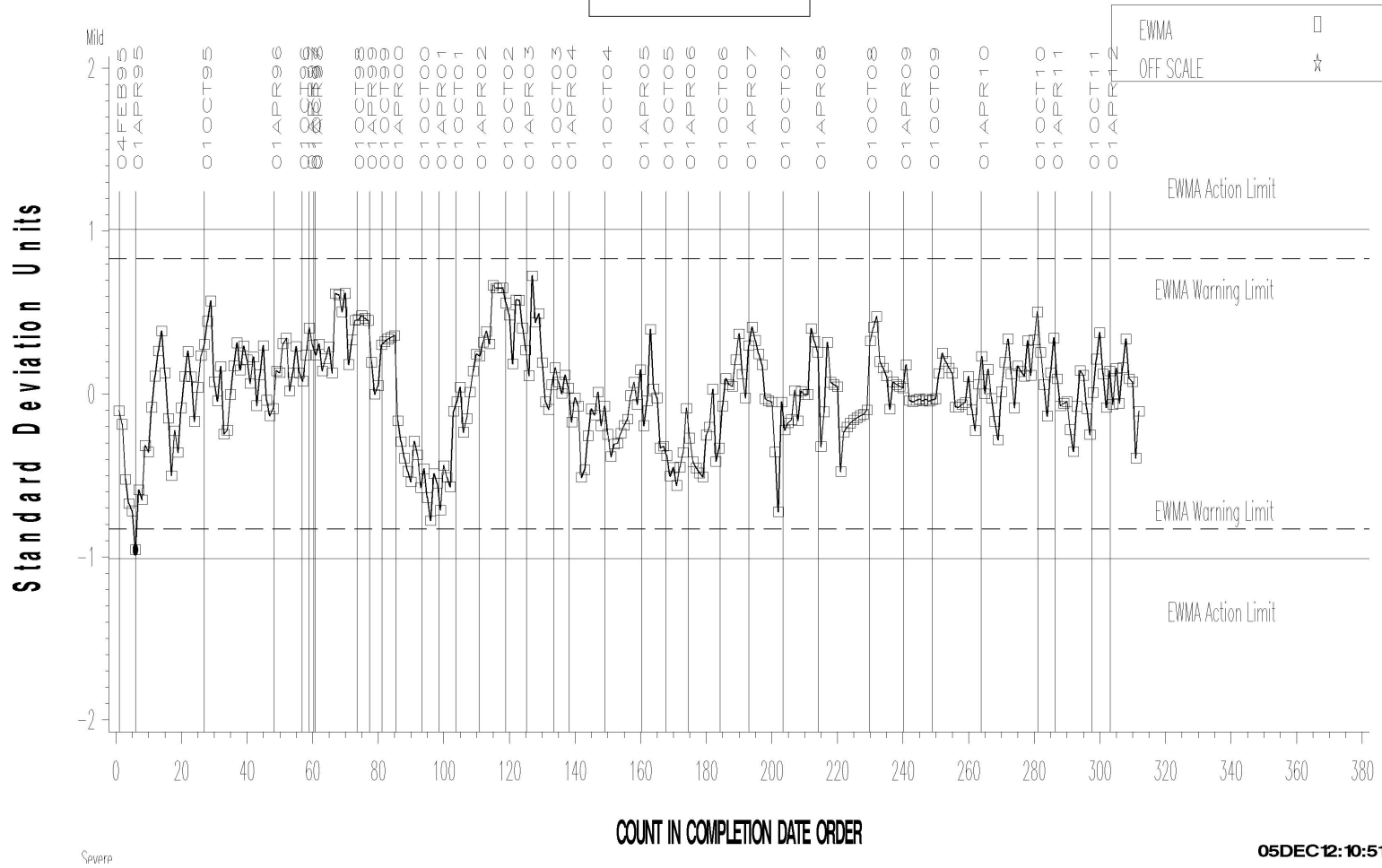
Industry control charts follow. No lubrited tests were reported this period. Refer to the TMC website for current lubrited hardware control charts.

L-37 (D6121)

L-37 NONLUBRITED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR WEAR

LTMS Severity Analysis

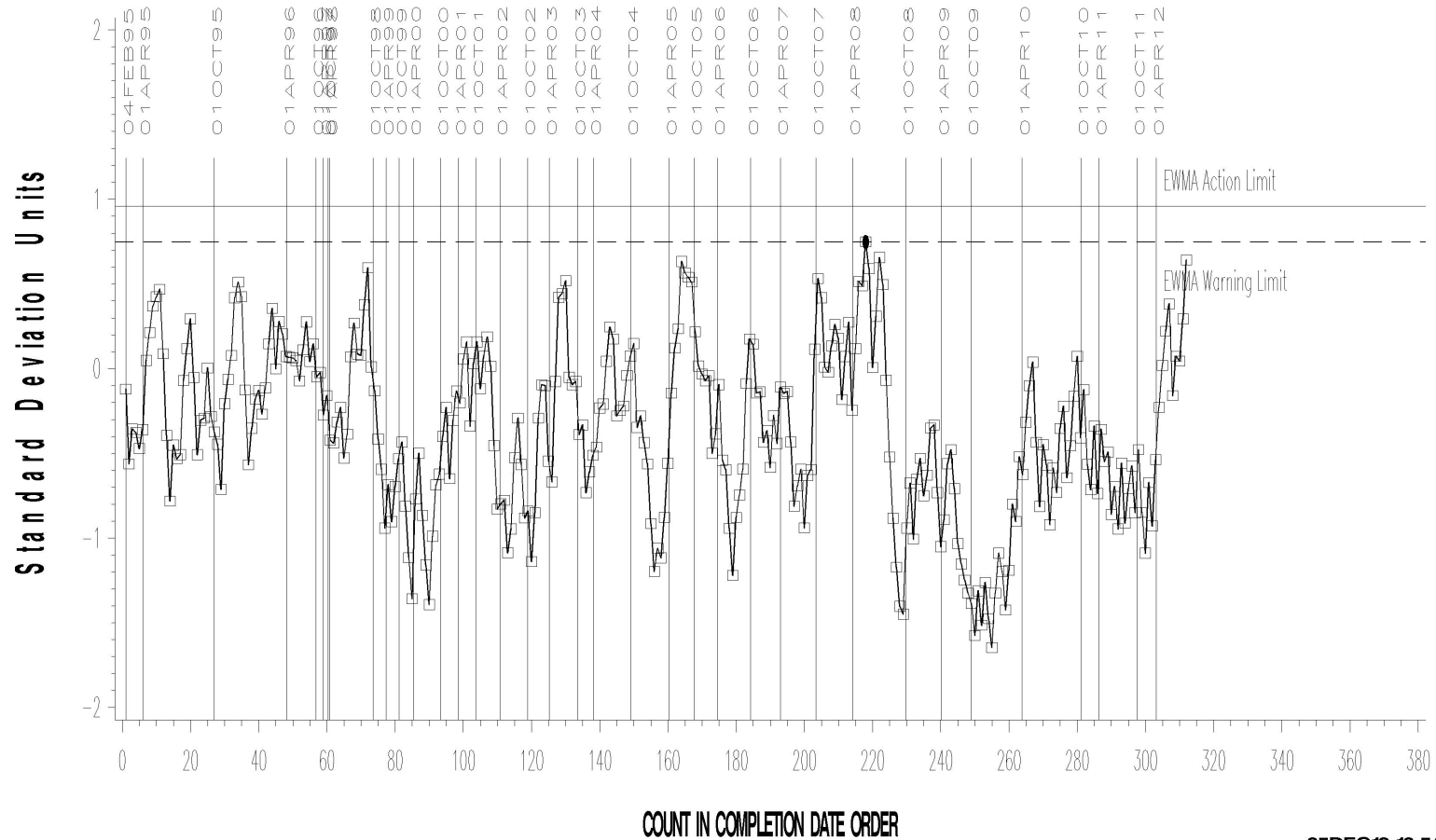


L-37 (D6121)

L-37 NONLUBRITED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR WEAR

LTMS Precision Analysis



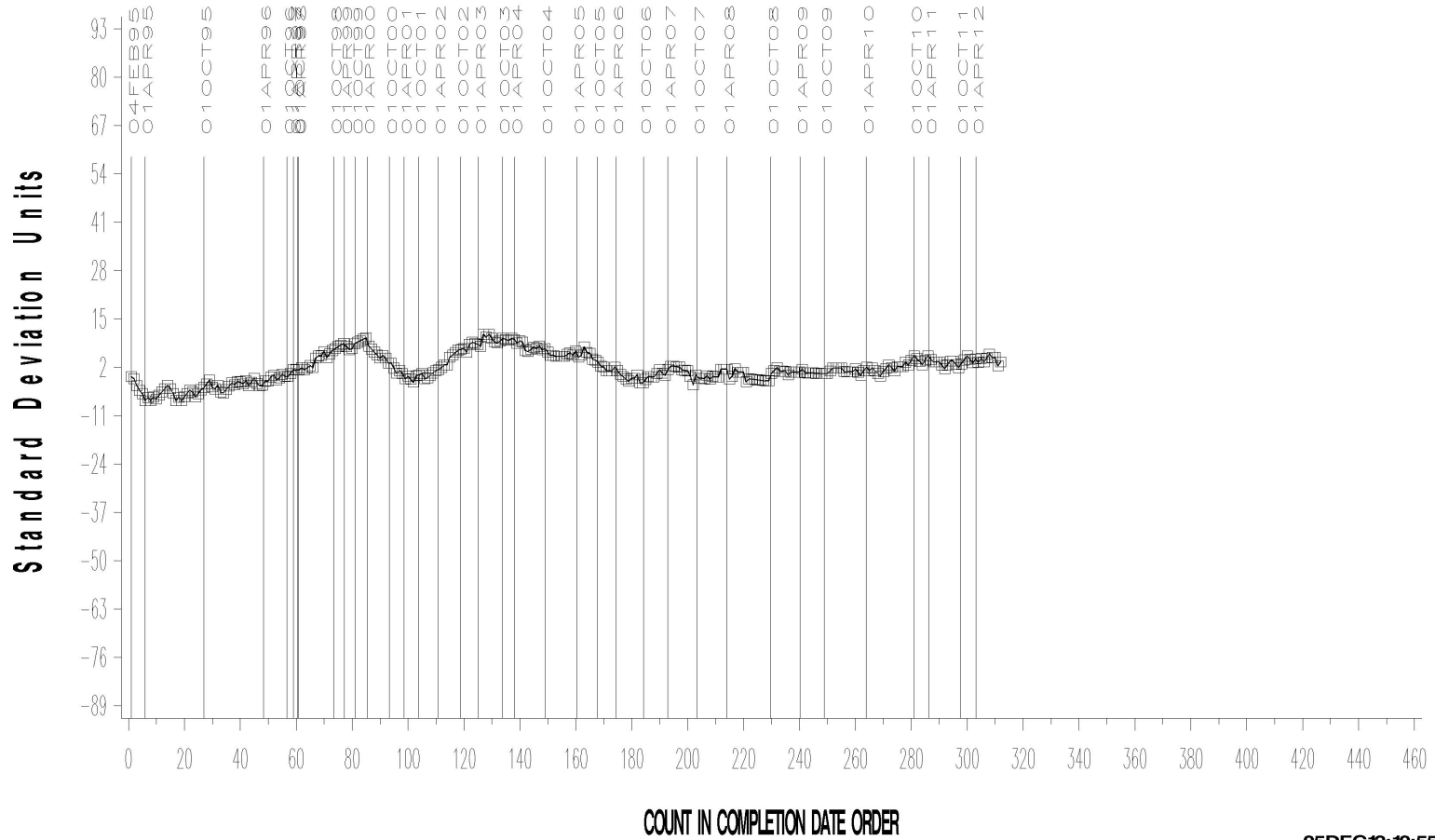
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L-37 (D6121)

L-37 NONLUBRITED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR WEAR

CUSUM Severity Analysis



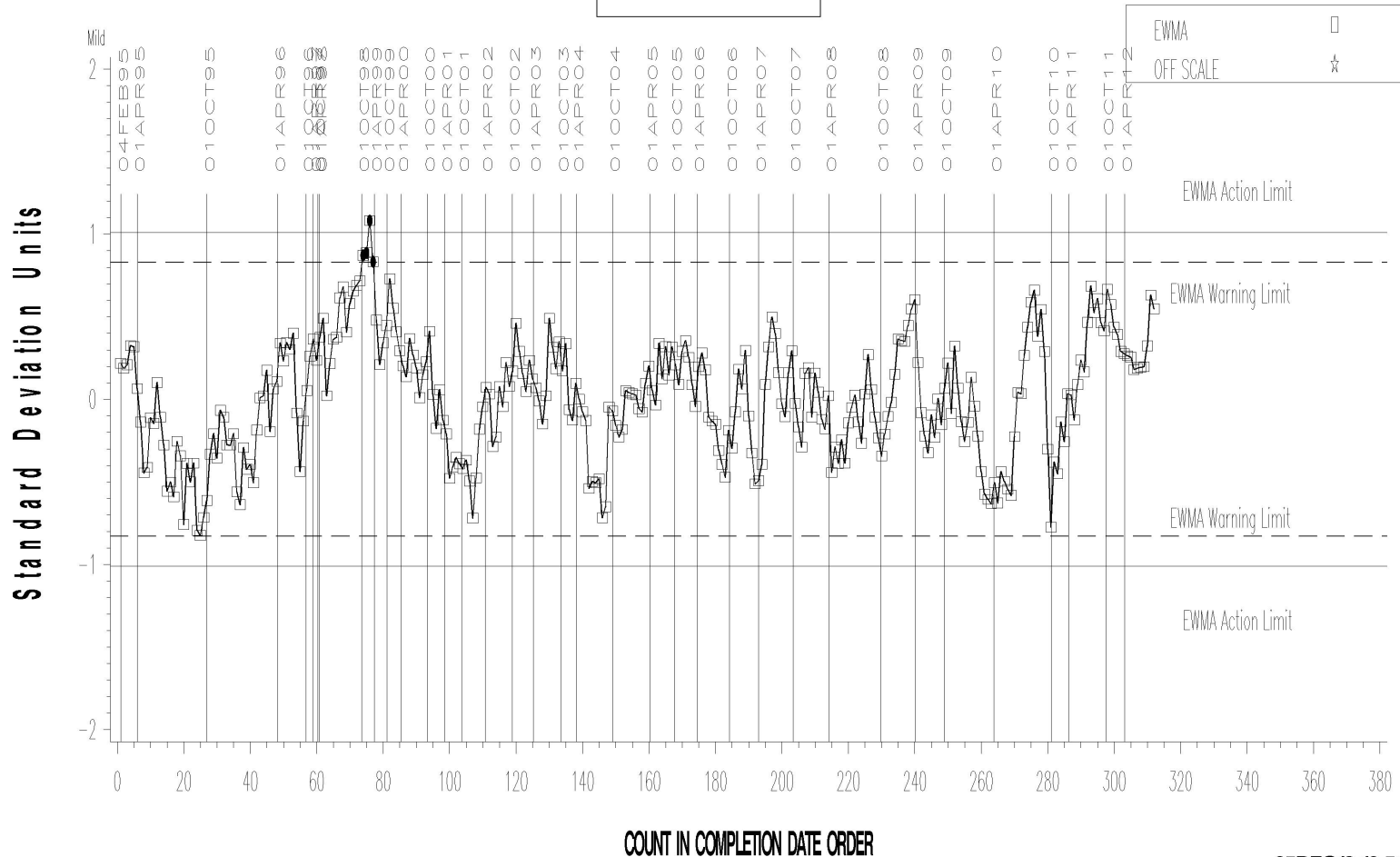
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L-37 (D6121)

L-37 NONLUBRITED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR RIDGING

LTMS Severity Analysis



Severe

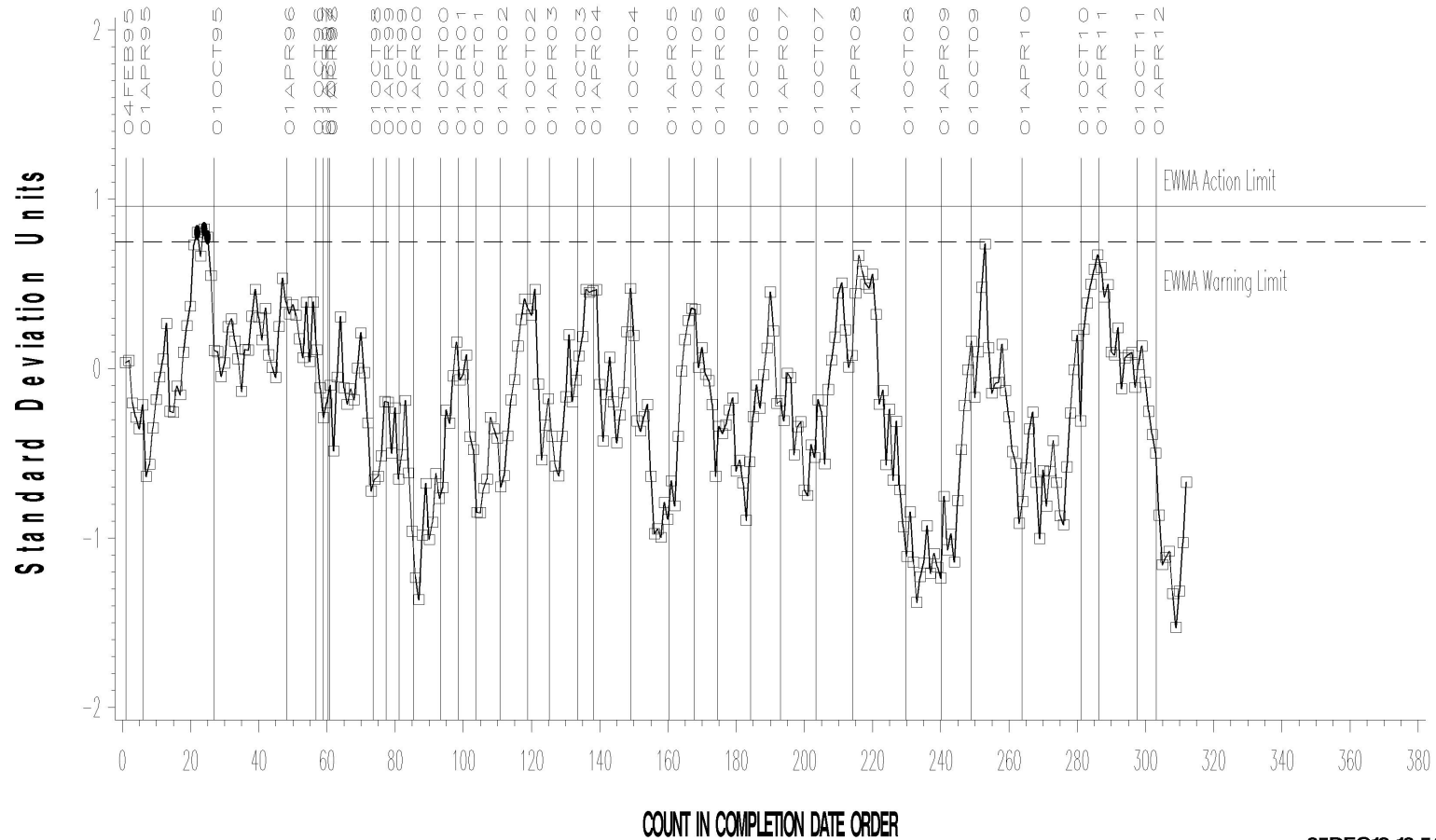
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L-37 (D6121)

L-37 NONLUBRITED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR RIDGING

LTMS Precision Analysis



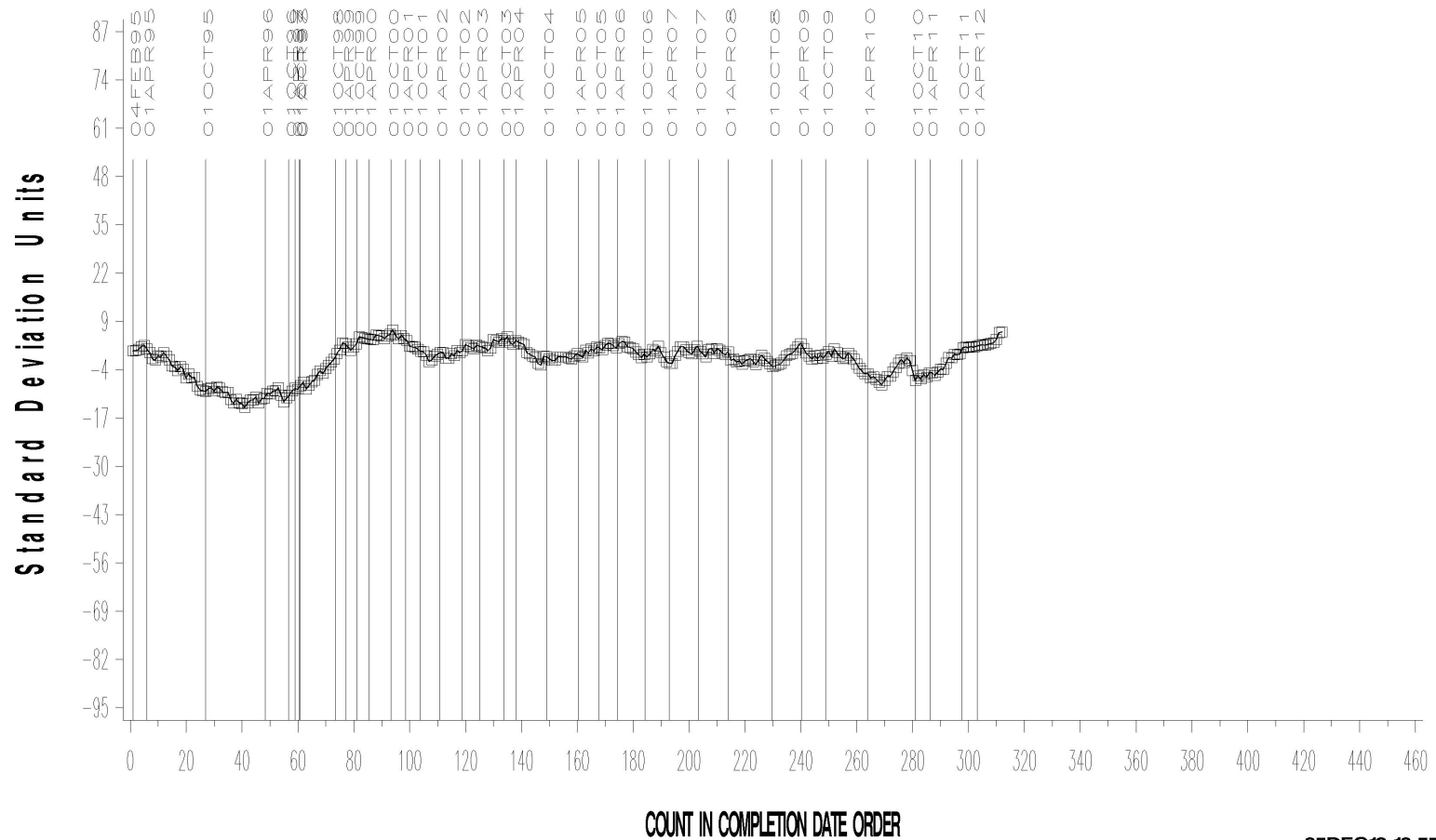
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L-37 (D6121)

L-37 NONLUBRITED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR RIDGING

CUSUM Severity Analysis



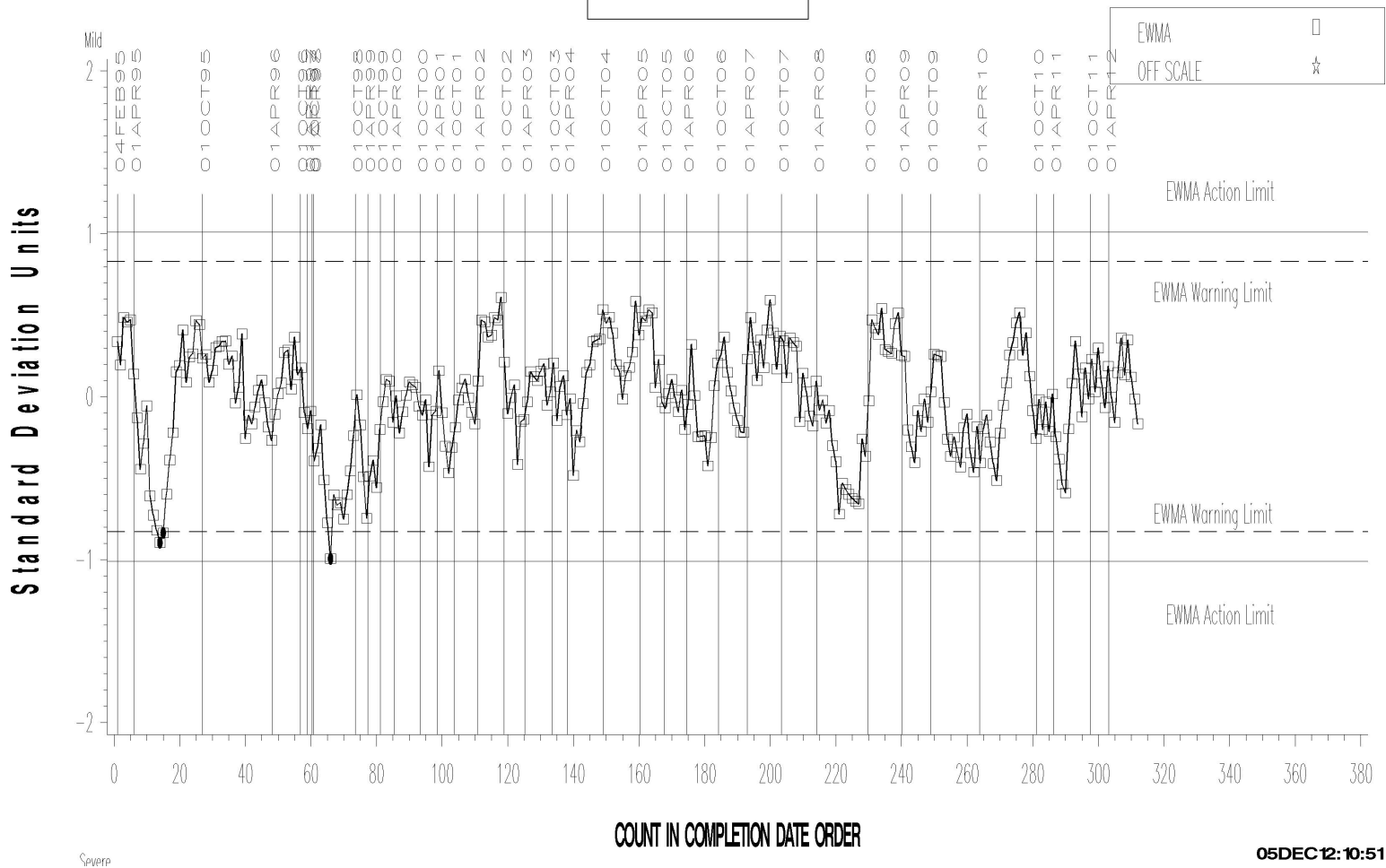
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L-37 (D6121)

L-37 NONLUBRITED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR RIPPILING

LTMS Severity Analysis

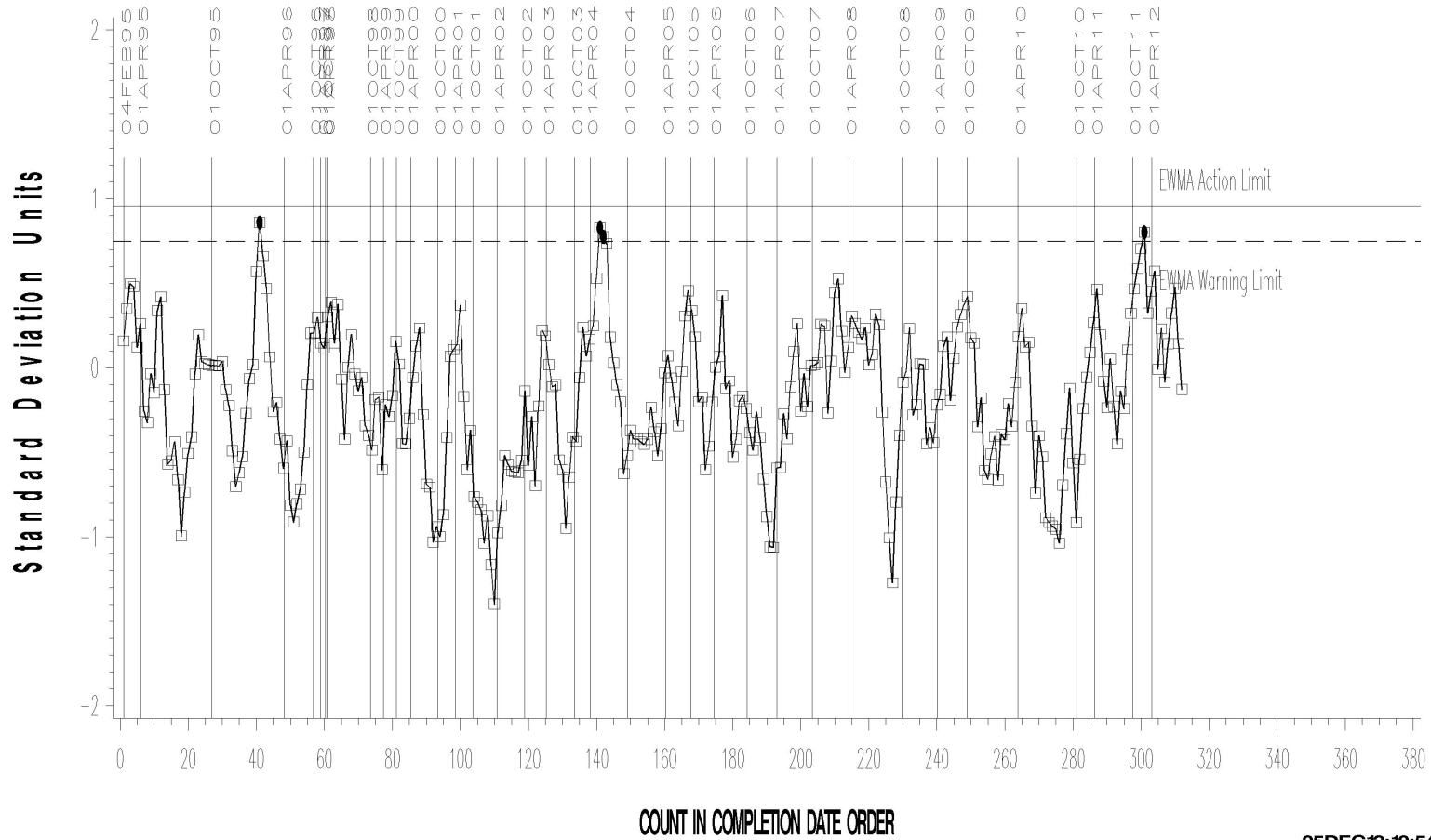


L-37 (D6121)

L-37 NONLUBRITED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR RIPPLING

LTMS Precision Analysis



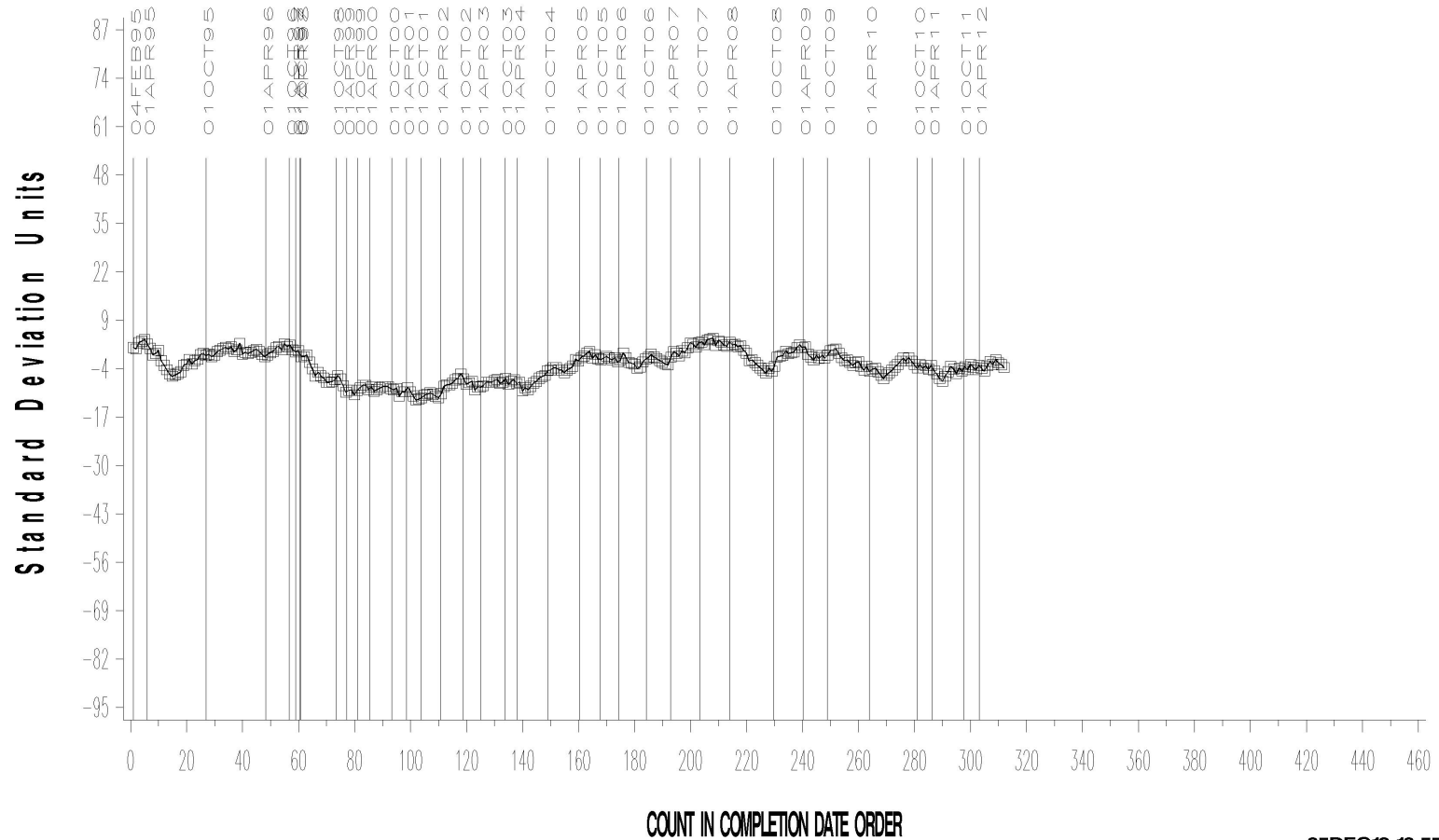
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L-37 (D6121)

L-37 NONLUBRITED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR RIPPLING

CUSUM Severity Analysis



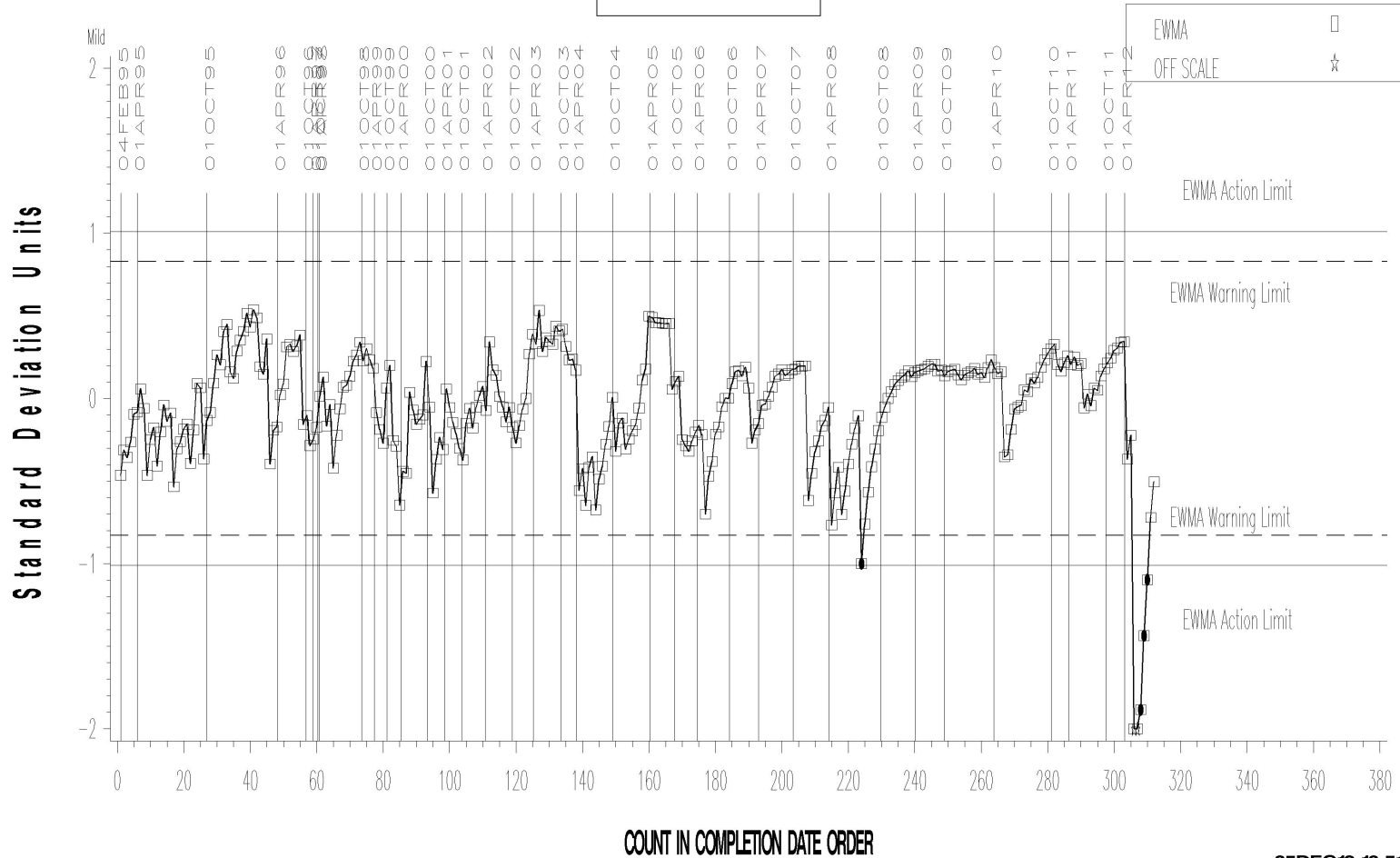
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L-37 (D6121)

L-37 NONLUBRITED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR PITTING/SPALLING

LTMS Severity Analysis



Severe

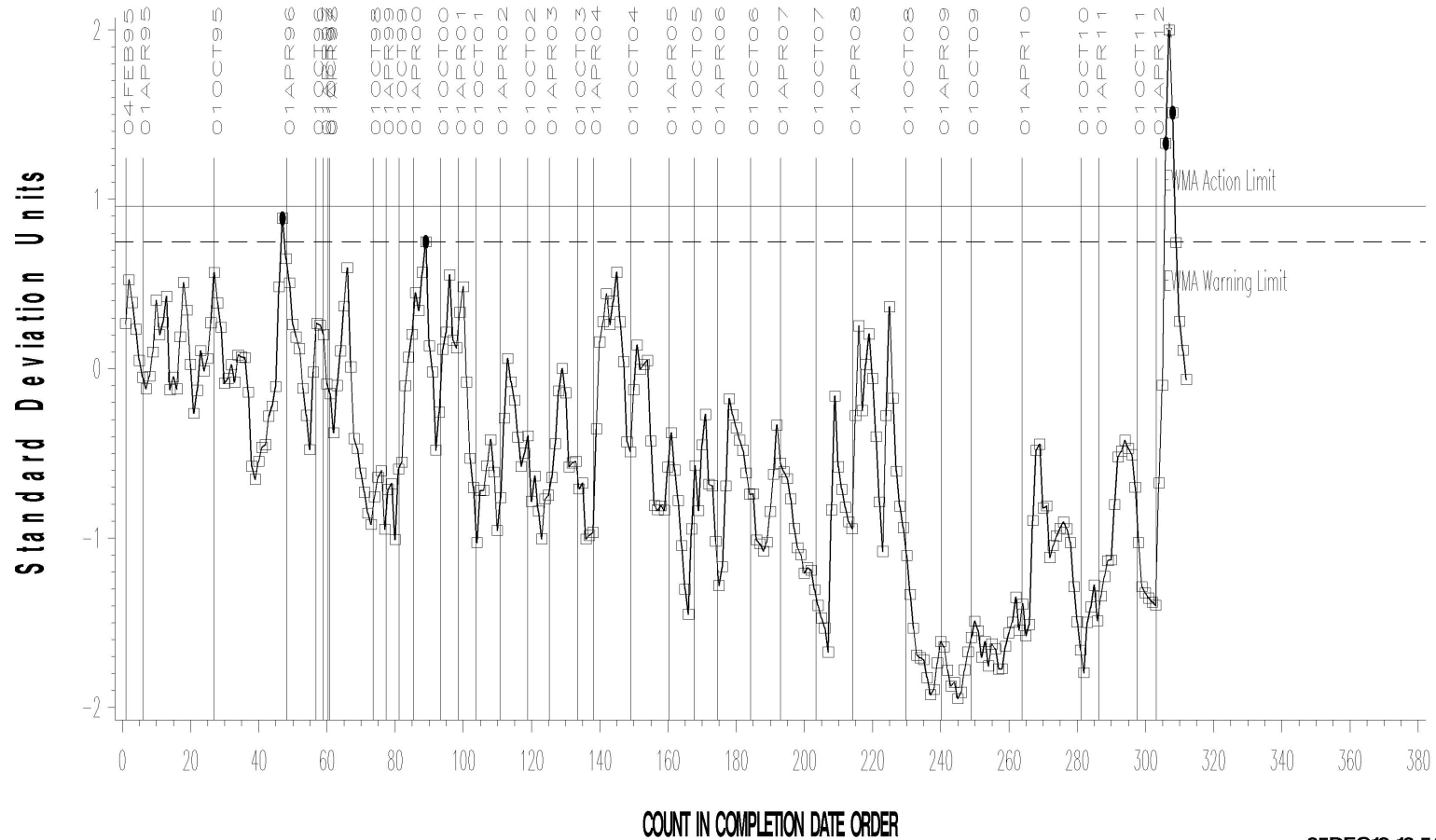
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L-37 (D6121)

L-37 NONLUBRITED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR PITTING/SPALLING

LTMS Precision Analysis



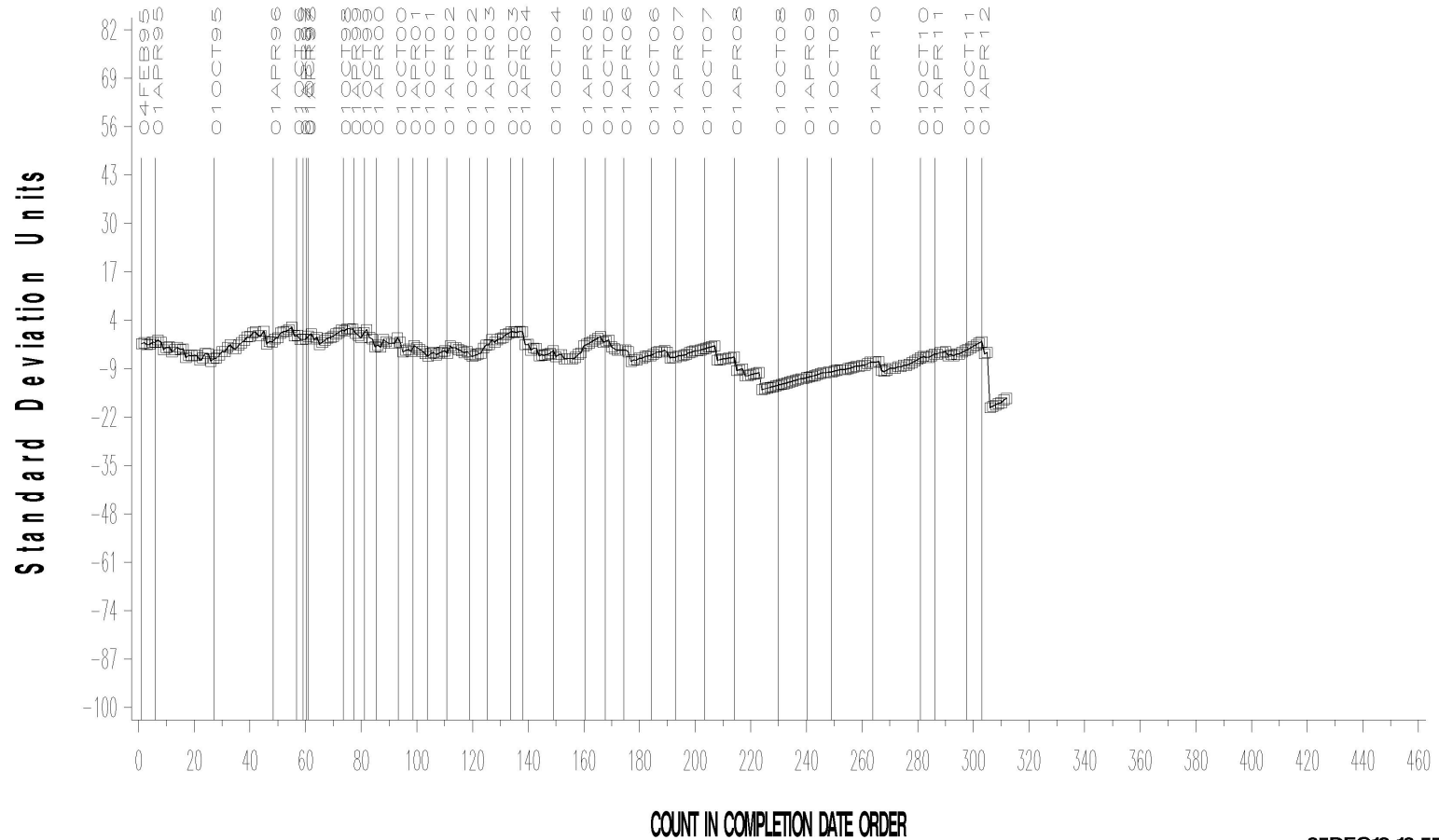
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L-37 (D6121)

L-37 NONLUBRITED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR PITTING/SPALLING

CUSUM Severity Analysis



05DEC12:10:55

L-37 (D6121)

TIMELINE ADDITIONS

Effective Date	Information Letter	Event
		No additions have been made this period.

L-37 (D6121)

LAB VISITS

No L-37 lab visits were conducted during this period.

INFORMATION LETTERS

No L-37 information letters were issued during this period.

LTMS DEVIATIONS

Three LTMS deviations were written for two labs to calibrate tests generating a SPIT precision alarm. These deviations were written in recognition that the LTMS targets for SPIT are such that tests meeting acceptance band severity criteria can generate widely varying Shewhart values and result in a false precision alarm.

L-37 (D6121)

STATUS OF REFERENCE OIL SUPPLY

Oil	Cans @ Labs	@ TMC	
		Cans	Gallons
127	2	1	1.0
134	9	85	85.4
151-2	4	3	3.8
151-3	3	0	0.0
152-1	5	3	3.4
152-2	16	242	242.0
152-3	0	54	54.8
153-1	39	57	58.0
155	7	36	36.4
155-1	8	433	433.8
Total	93	914	918.4

The TMC quantity remaining presumes usage only for L-37 testing. Oil 155/155-1 is also used in other test areas (L-33-1 and HTCT).