



A Program of ASTM International

Test Monitoring Center

203 Armstrong Drive, Freeport, PA 16229, USA

www.astmtmc.org
412-365-1000

MEMORANDUM: 21-035
DATE: October 19, 2021
TO: Robert Slocum, Chairman, L-37-1 Surveillance Panel
FROM: Dylan Beck *Dylan Beck*
SUBJECT: L-37-1 Testing from April 1, 2021 through September 30, 2021

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

DJB/djb/mem21-035.djb.doc

cc: Frank Farber
Jeff Clark

L-37 Surveillance Panel

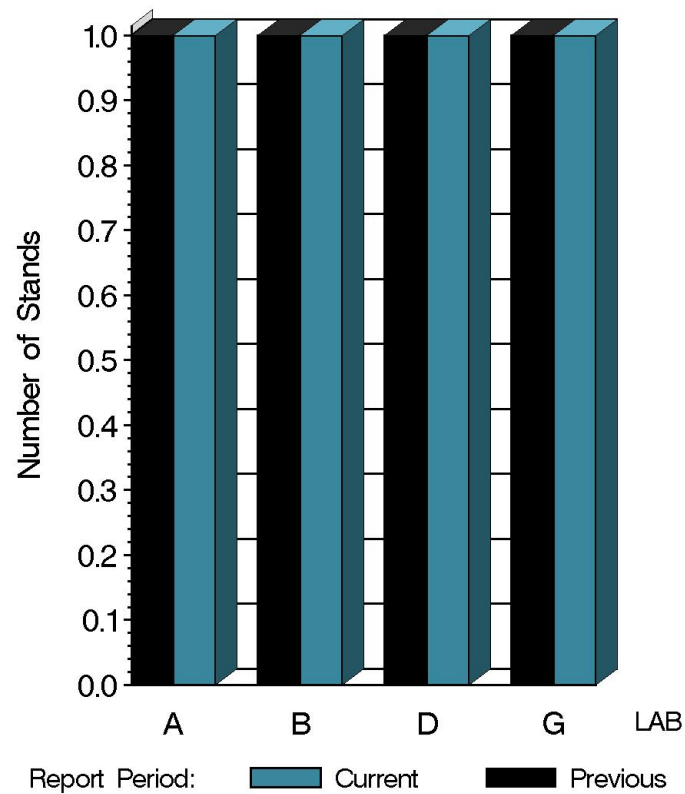
<https://www.astmtmc.org/ftp/docs/gear/l371/semiannualreports/l371-10-2021.pdf>

Distribution: email

L-37-1 (D8165)

	Reporting Data	Calibrated on 9-30-21
Number of Labs	4	4
Number of Stands	4	4

BY-LAB STAND
DISTRIBUTION



10.08.09 15OCT2021



Test Monitoring Center

203 Armstrong Drive, Freeport, PA 16229, USA

www.astmtmc.org
412-365-1000

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	4	3	1	9	8
Rejected (Mild)	OC	0	0	0	1	0
Rejected (Severe)	OC	2	0	0	4	2
Rejected (Precision)	OC	0	0	0	0	0
Aborted run	XC	0	0	1	0	1
Acceptable info run	NI	0	0	0	0	0
Total		6	3	2	14	11

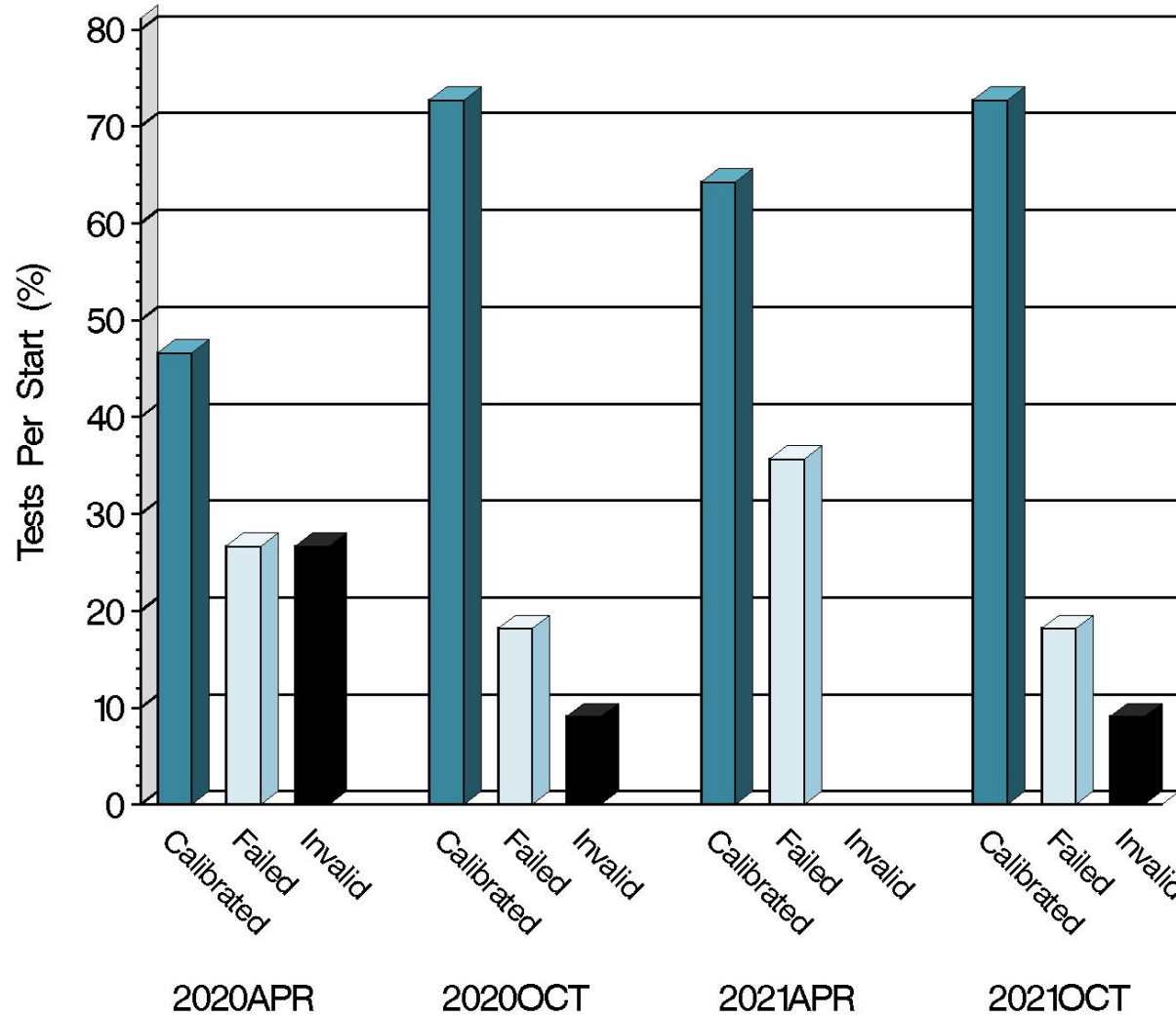
L-37-1 (D8165)

Calibration Attempt Detail

	Gear Batch	Acceptable	Aborted	Failed	Total
LUBRITED	04-2014	4	0	2	6
NONLUBRITED	06-2018	0	0	0	0
	12-2019	2	0	0	2
	01-2020	2	1	0	3
	Total	8	1	2	11

L-37-1 (D8165)

CALIBRATION ATTEMPT SUMMARY



Resolution

Report Period

11:49:22 15OCT2021



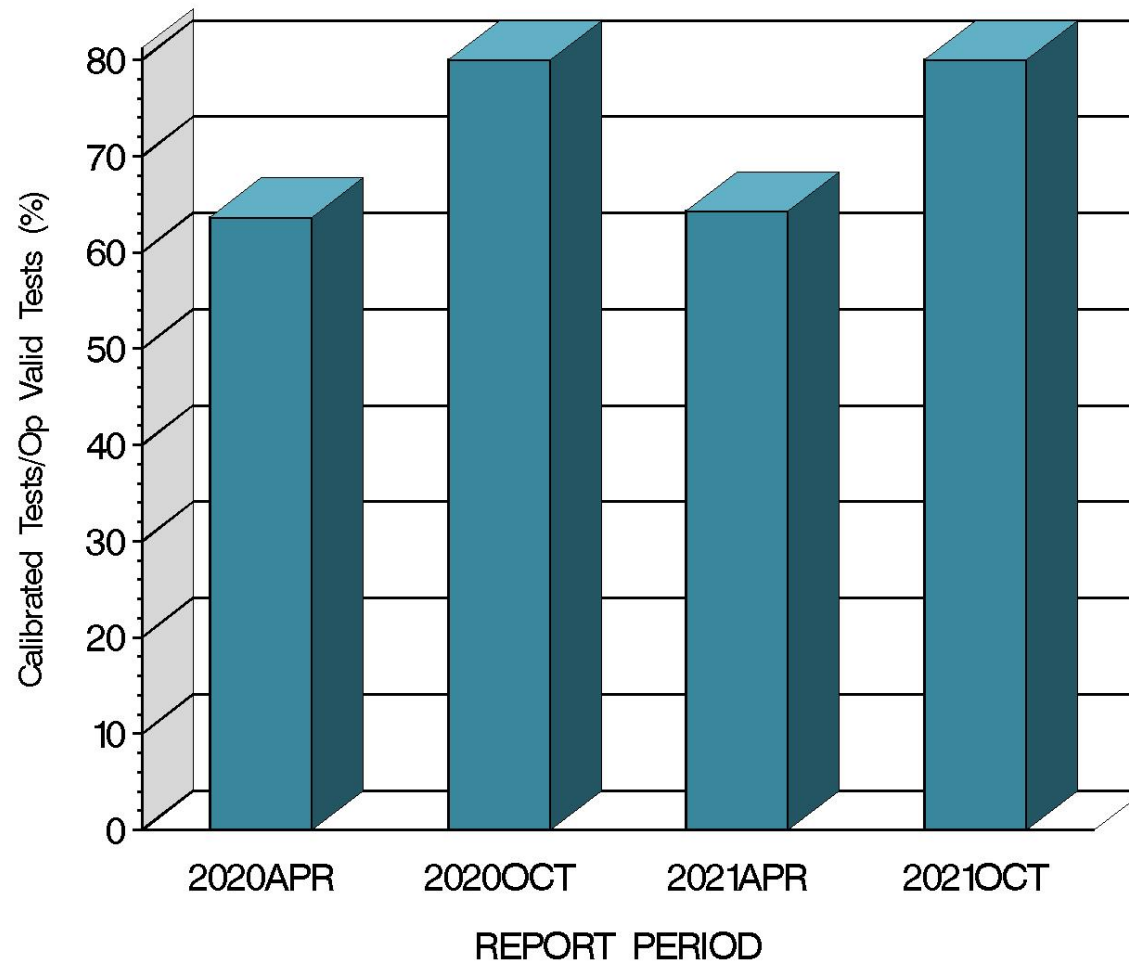
Test Monitoring Center

203 Armstrong Drive, Freeport, PA 16229, USA

www.astmtmc.org
412-365-1000

L-37-1 (D8165)

OPERATIONALLY VALID TESTS
MEETING ACCEPTANCE CRITERIA



11:49:22 15OCT2021



Test Monitoring Center

203 Armstrong Drive, Freeport, PA 16229, USA

www.astmtmc.org
412-365-1000

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	%
G	Oil temp and wheel speed out of spec during conditioning phase		•			•			1	2	50%
	Lost	0	1	0	0	1	0	0			
	Starts	6	4	1	0	11	11	11			
	%	0%	25%	0%	0%	9%	0%	0%			

L-37-1 (D8165)

GEAR BATCH SEVERITY

LUBRITED HARDWARE						
Parameter	Gear Batch	N	Δ/s	s^A	Overall Δ/s	Overall Shift (in Merits) ^B
RIDG	04-2014	6	-0.476	0.496	-0.476	-0.681
RIPP	04-2014	6	-0.308	0.420	-0.308	-0.147
SPIT	04-2014	6	-0.444	0.886	-0.444	-0.257
WEAR	04-2014	6	-0.974	0.558	-0.974	-0.505

NON-LUBRITED HARDWARE						
Parameter	Gear Batch	N	Δ/s	s^A	Overall Δ/s	Overall Shift (in Merits) ^B
RIDG	12-2019	2	0.000	0.000	0.222	0.148
RIPP	12-2019	2	0.167	0.589	-0.352	-0.196
SPIT	12-2019	2	0.000	0.000	0.317	0.268
WEAR	12-2019	2	-0.143	1.010	0.302	0.215
RIDG	01-2020	2	0.444	0.786	0.222	0.148
RIPP	01-2020	2	-0.870	0.826	-0.352	-0.196
SPIT	01-2020	2	0.950	.	0.317	-0.579
WEAR	01-2020	2	0.746	0.045	0.302	0.215

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

L-37-1 (D8165)

LAB SEVERITY

LUBRITED HARDWARE AVERAGE Δ/s						
Gear Batch	Lab	N	RIDG	RIPP	SPIT	WEAR
04-2014	A	1	-0.042	-0.875	-1	-0.88889
	B	2	-0.458	-0.250	0.000	-1.444
	D	3	-0.633	-0.158	-0.556	-0.688

NON-LUBRITED HARDWARE AVERAGE Δ/s						
Gear Batch	Lab	N	RIDG	RIPP	SPIT	WEAR
01-2020	A	1	-0.111	-0.286	0.950	0.778
	G	1	1.000	-1.455	.	0.714
12-2019	D	2	0.000	0.167	0.000	-0.143

L-37-1 (D8165)

SUMMARY OF SEVERITY & PRECISION

Severity

Nonlubrited – All parameters remained within the limits this period.

Lubrited – All parameters remained within the limits this period.

L-37-1 (D8165)

SUMMARY OF SEVERITY & PRECISION (cont.)

Precision

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

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

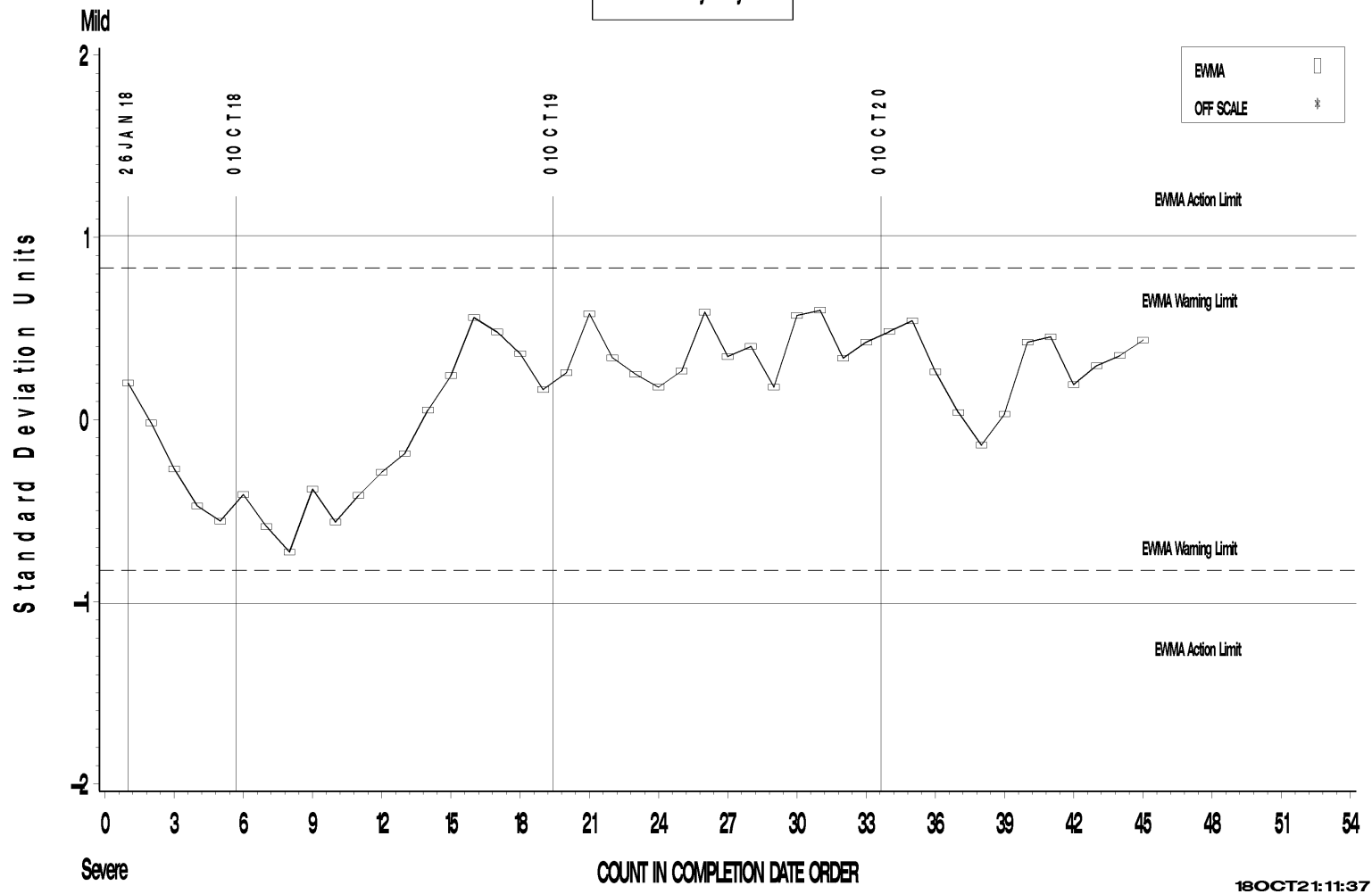
Industry control charts follow.

L-37-1 (D8165)

L-37-1 NONLUBRITED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR WEAR

LTMS Severity Analysis



Test Monitoring Center

203 Armstrong Drive, Freeport, PA 16229, USA

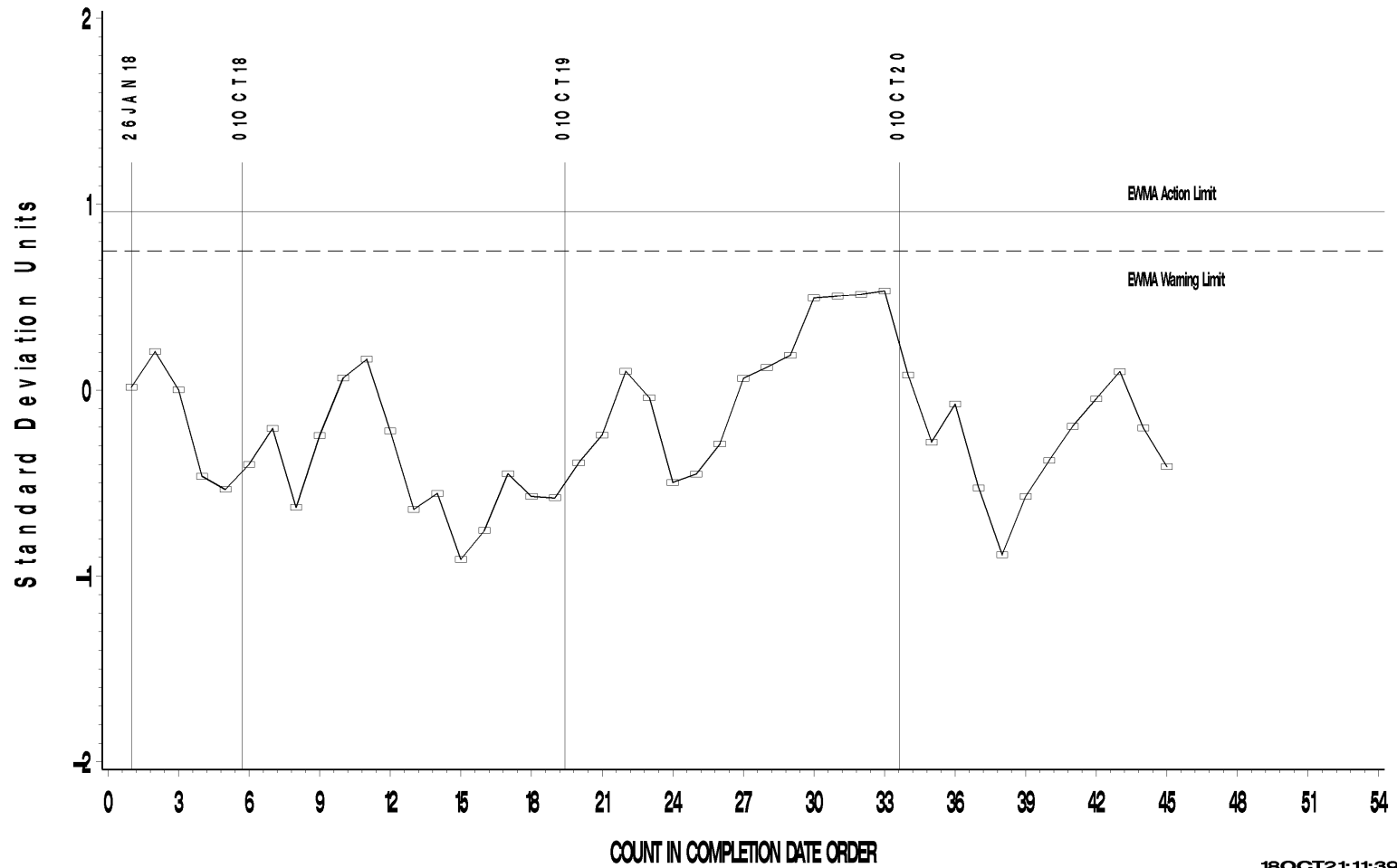
www.astmtmc.org
412-365-1000

L-37-1 (D8165)

L-37-1 NONLUBRITED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR WEAR

LTMS Precision Analysis



18OCT21:11:39



Test Monitoring Center

203 Armstrong Drive, Freeport, PA 16229, USA

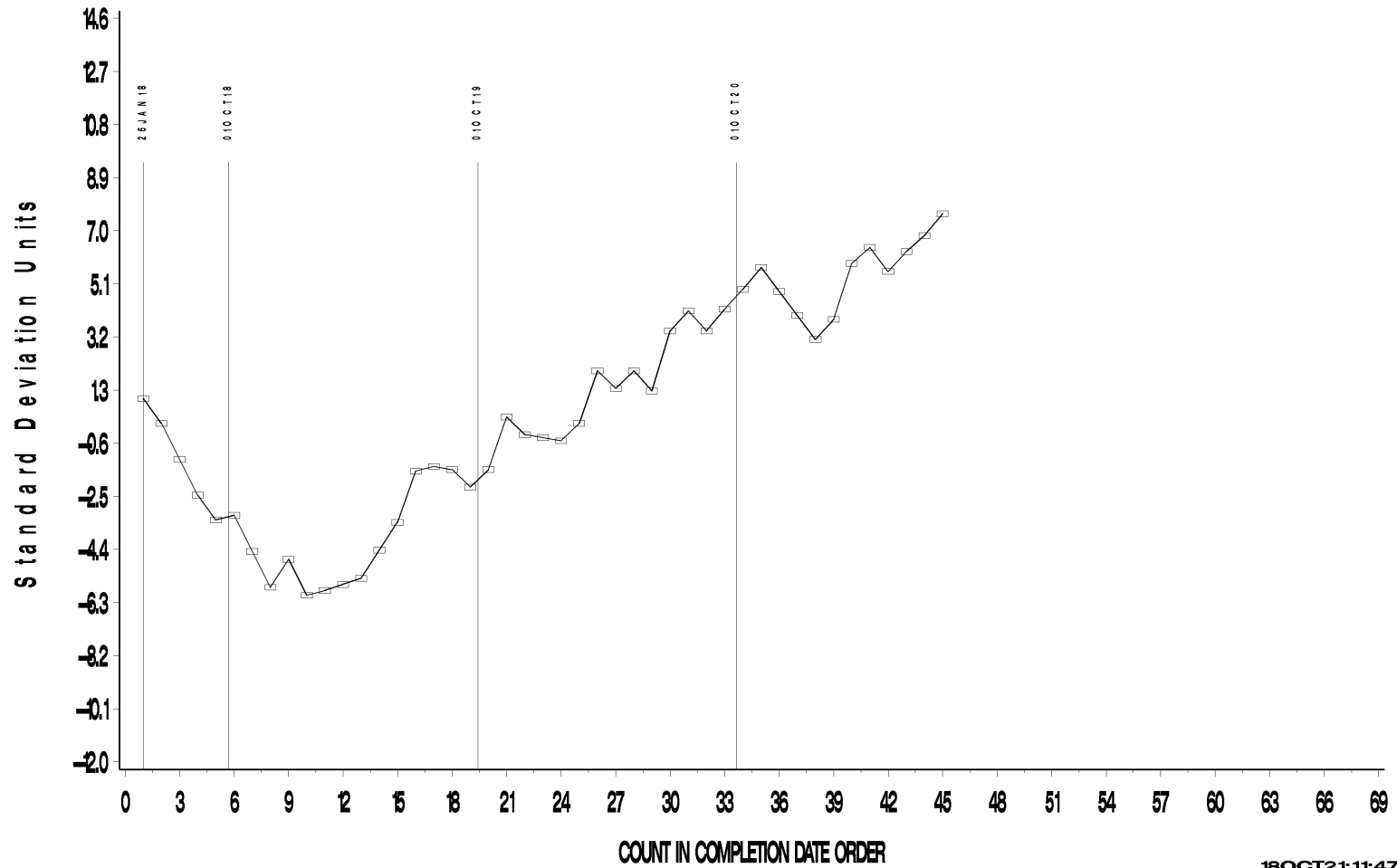
www.astmtmc.org
412-365-1000

L-37-1 (D8165)

L-37-1 NONLUBRITED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR WEAR

CUSUM Severity Analysis



18OCT21:11:47



Test Monitoring Center

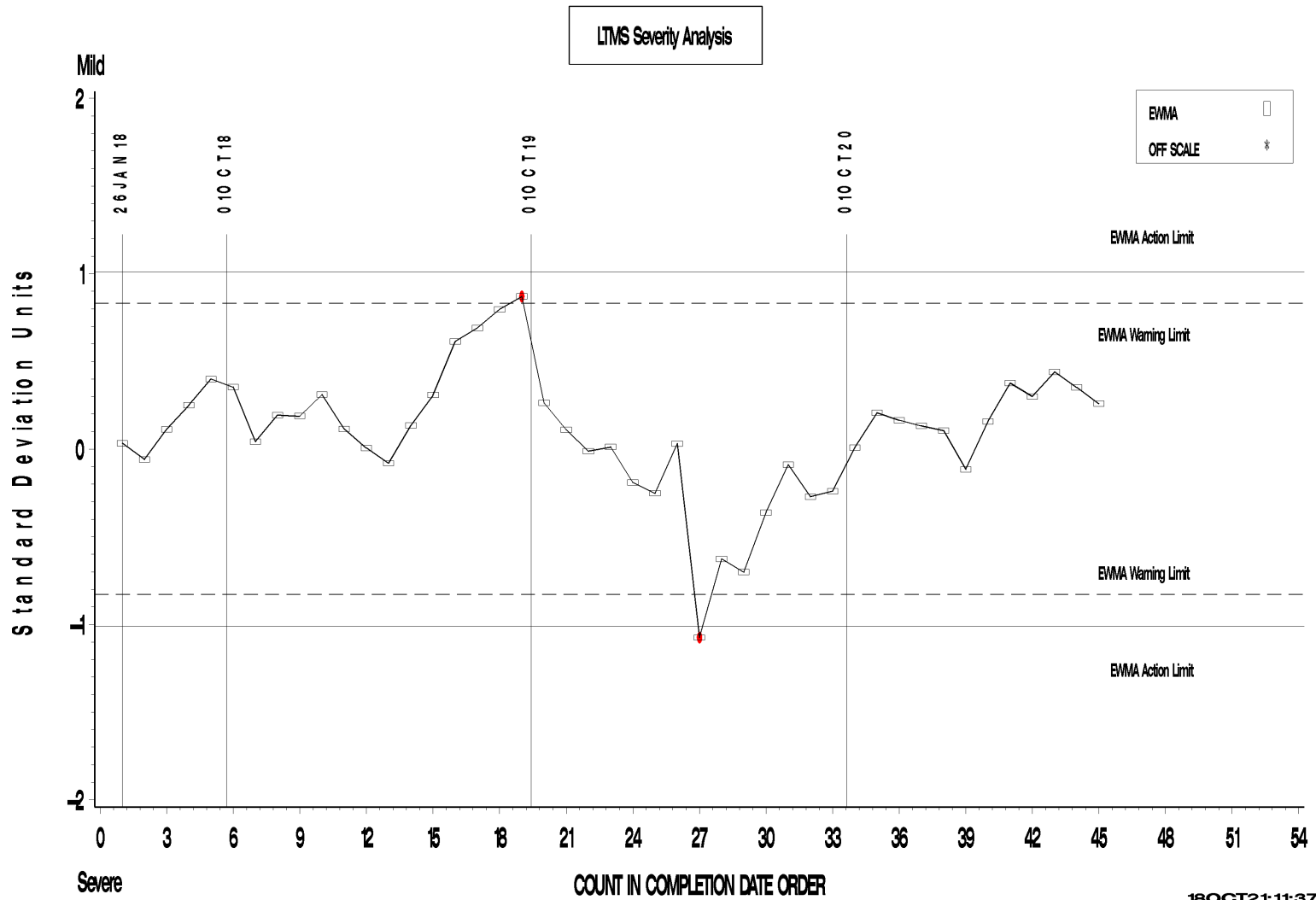
203 Armstrong Drive, Freeport, PA 16229, USA

www.astmtmc.org
412-365-1000

L-37-1 (D8165)

L-37-1 NONLUBRITED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR RIDGING



Test Monitoring Center

203 Armstrong Drive, Freeport, PA 16229, USA

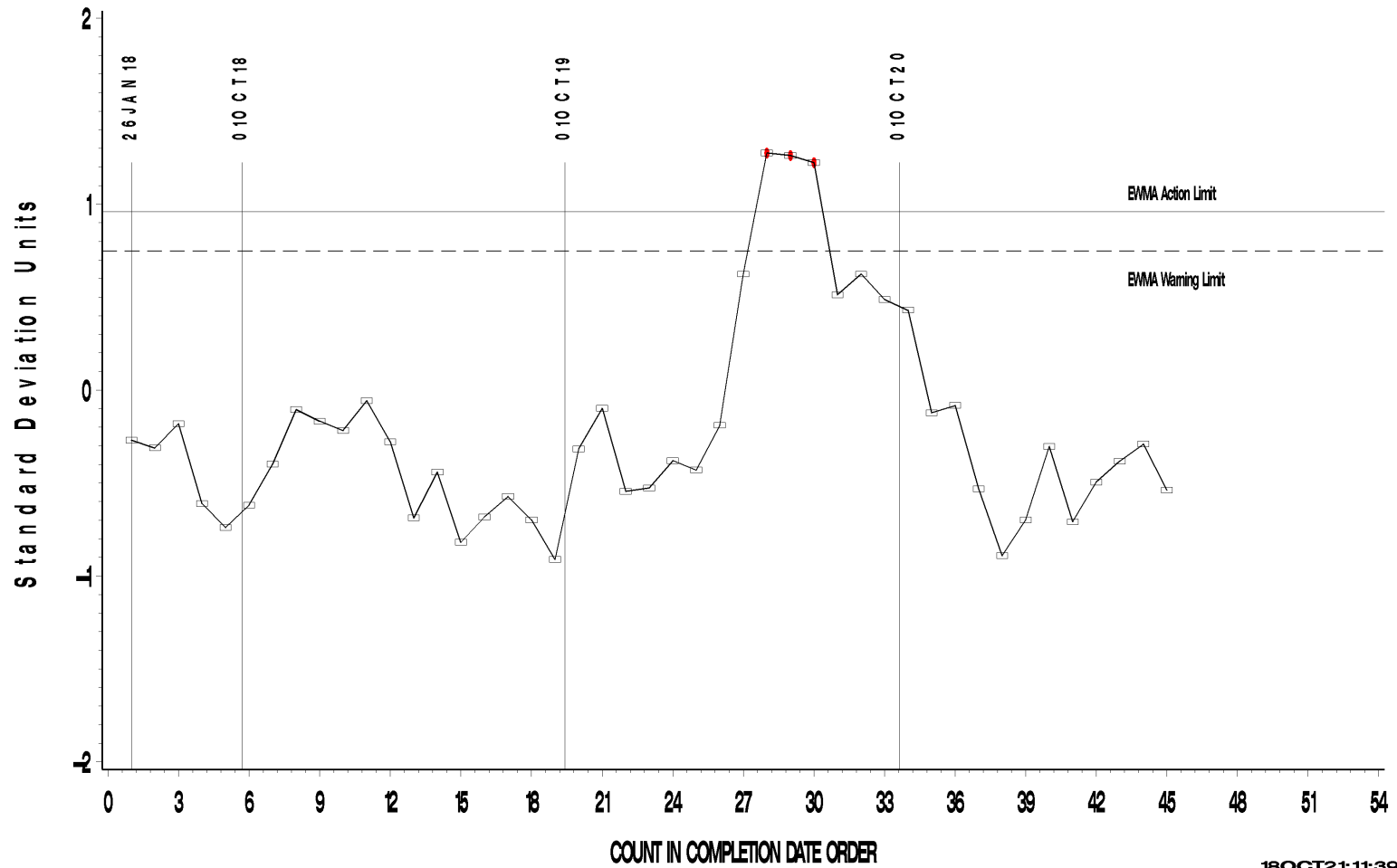
www.astmtmc.org
412-365-1000

L-37-1 (D8165)

L-37-1 NONLUBRITED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR RIDGING

LTMS Precision Analysis



18OCT21:11:39



Test Monitoring Center

203 Armstrong Drive, Freeport, PA 16229, USA

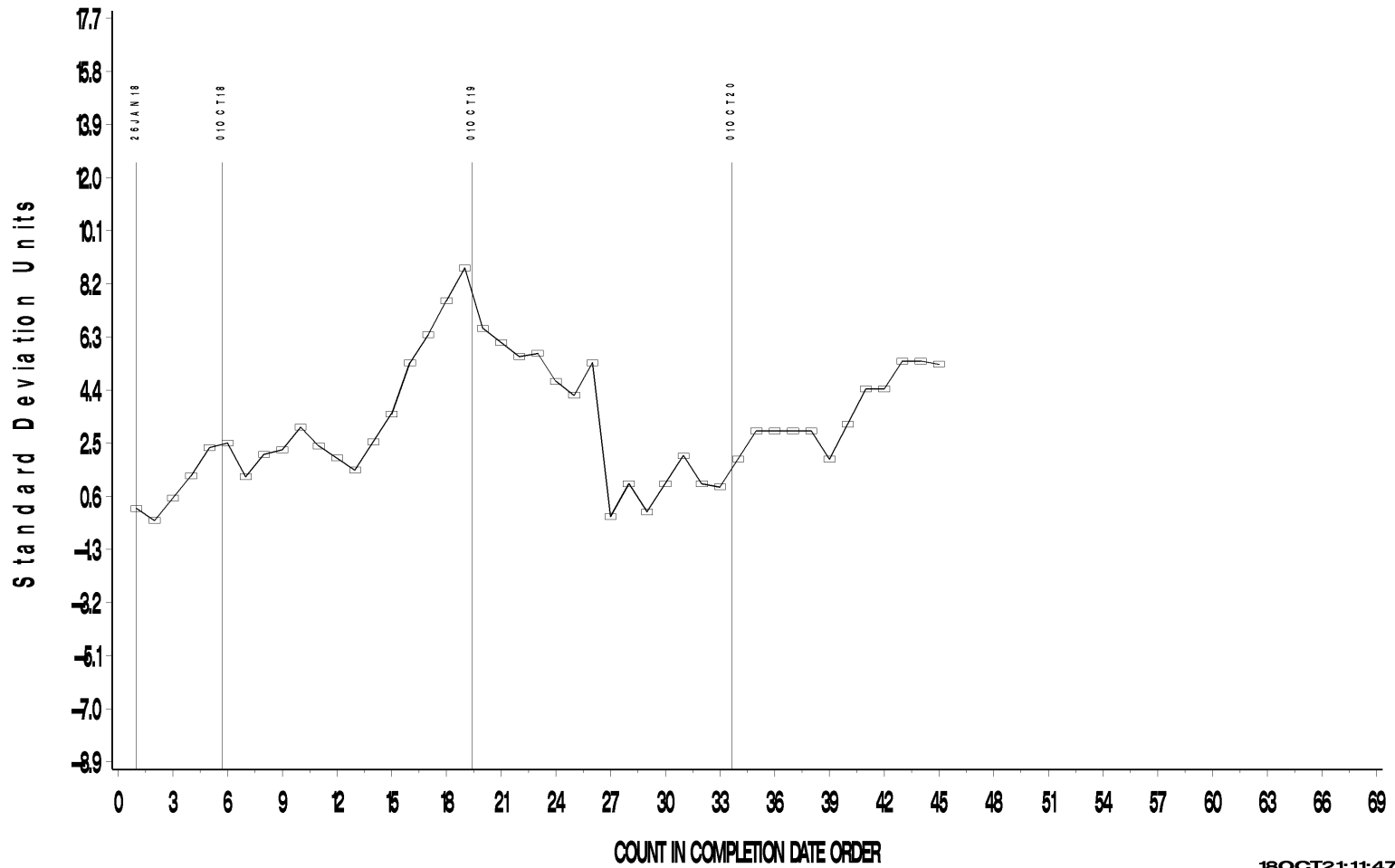
www.astmtmc.org
412-365-1000

L-37-1 (D8165)

L-37-1 NONLUBRITED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR RIDGING

CUSUM Severity Analysis



18OCT21:11:47



Test Monitoring Center

203 Armstrong Drive, Freeport, PA 16229, USA

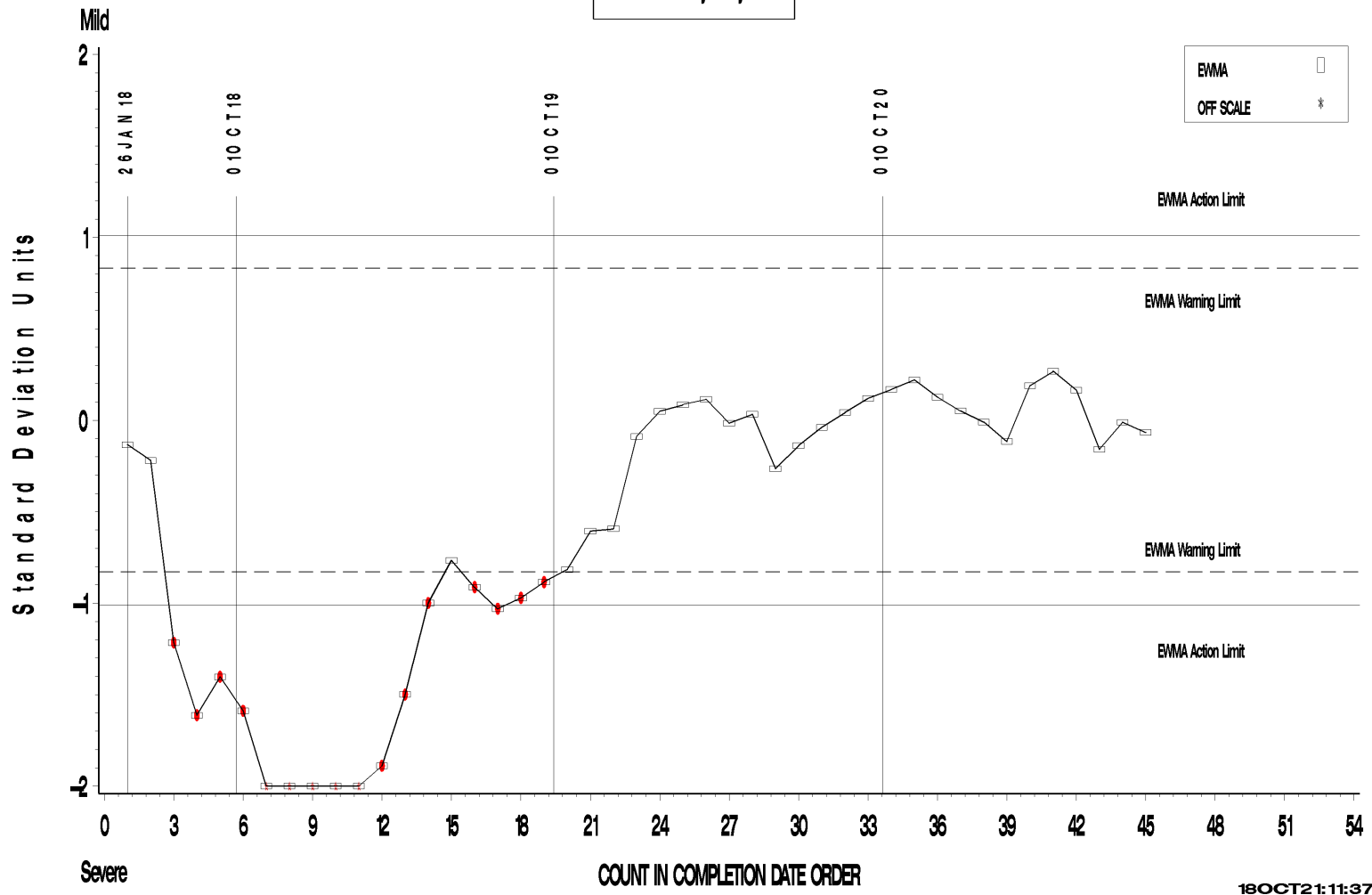
www.astmtmc.org
412-365-1000

L-37-1 (D8165)

L-37-1 NONLUBRITED INDUSTRY OPERATIONALLY VALID DA

FINAL PINION GEAR RIPPLING

LTMS Severity Analysis



18OCT21:11:37



Test Monitoring Center

203 Armstrong Drive, Freeport, PA 16229, USA

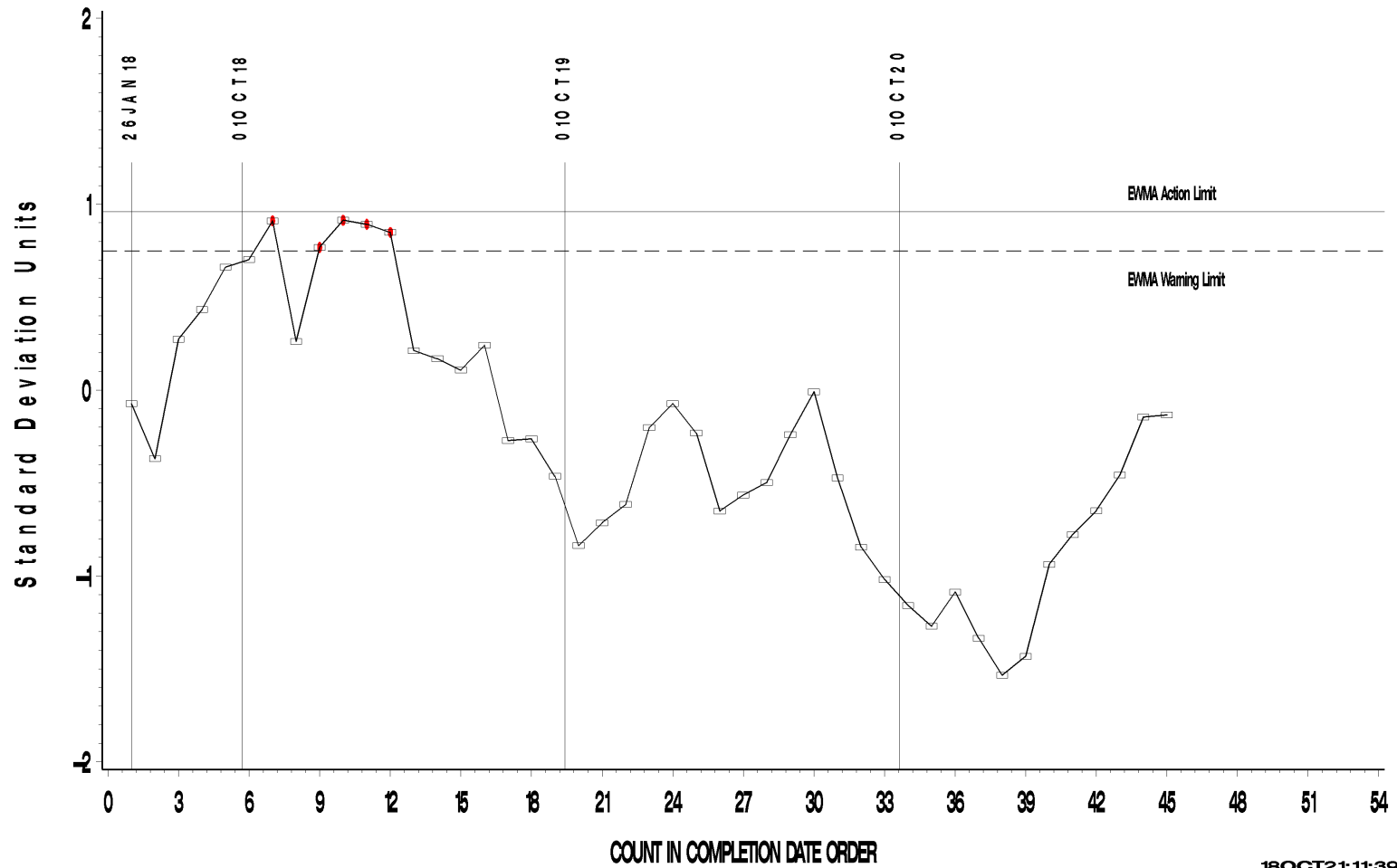
www.astmtmc.org
412-365-1000

L-37-1 (D8165)

L-37-1 NONLUBRITED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR RIPPLING

LTMS Precision Analysis



18OCT21:11:39



Test Monitoring Center

203 Armstrong Drive, Freeport, PA 16229, USA

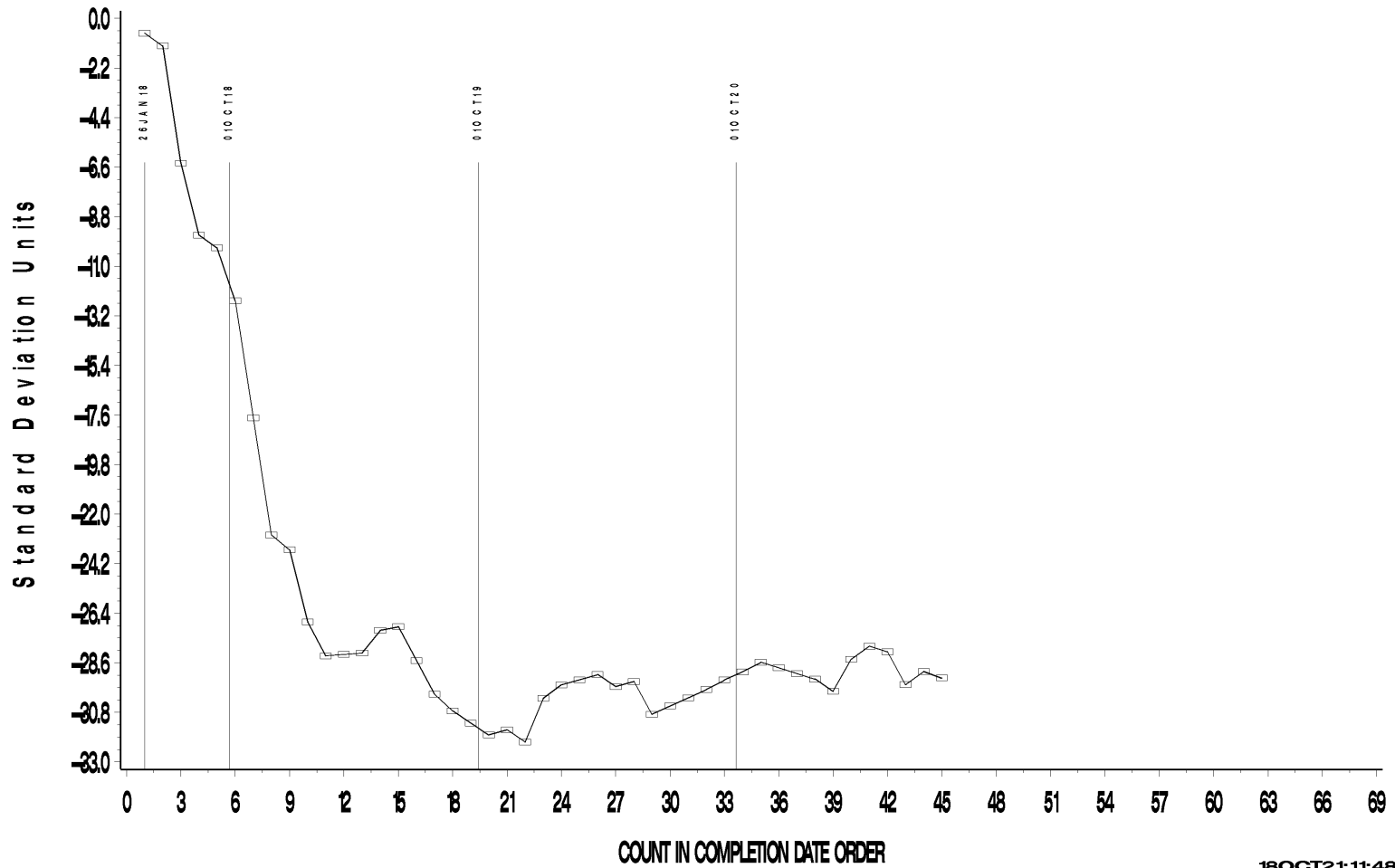
www.astmtmc.org
412-365-1000

L-37-1 (D8165)

L-37-1 NONLUBRITED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR RIPPLING

CUSUM Severity Analysis



18OCT21:11:48



Test Monitoring Center

203 Armstrong Drive, Freeport, PA 16229, USA

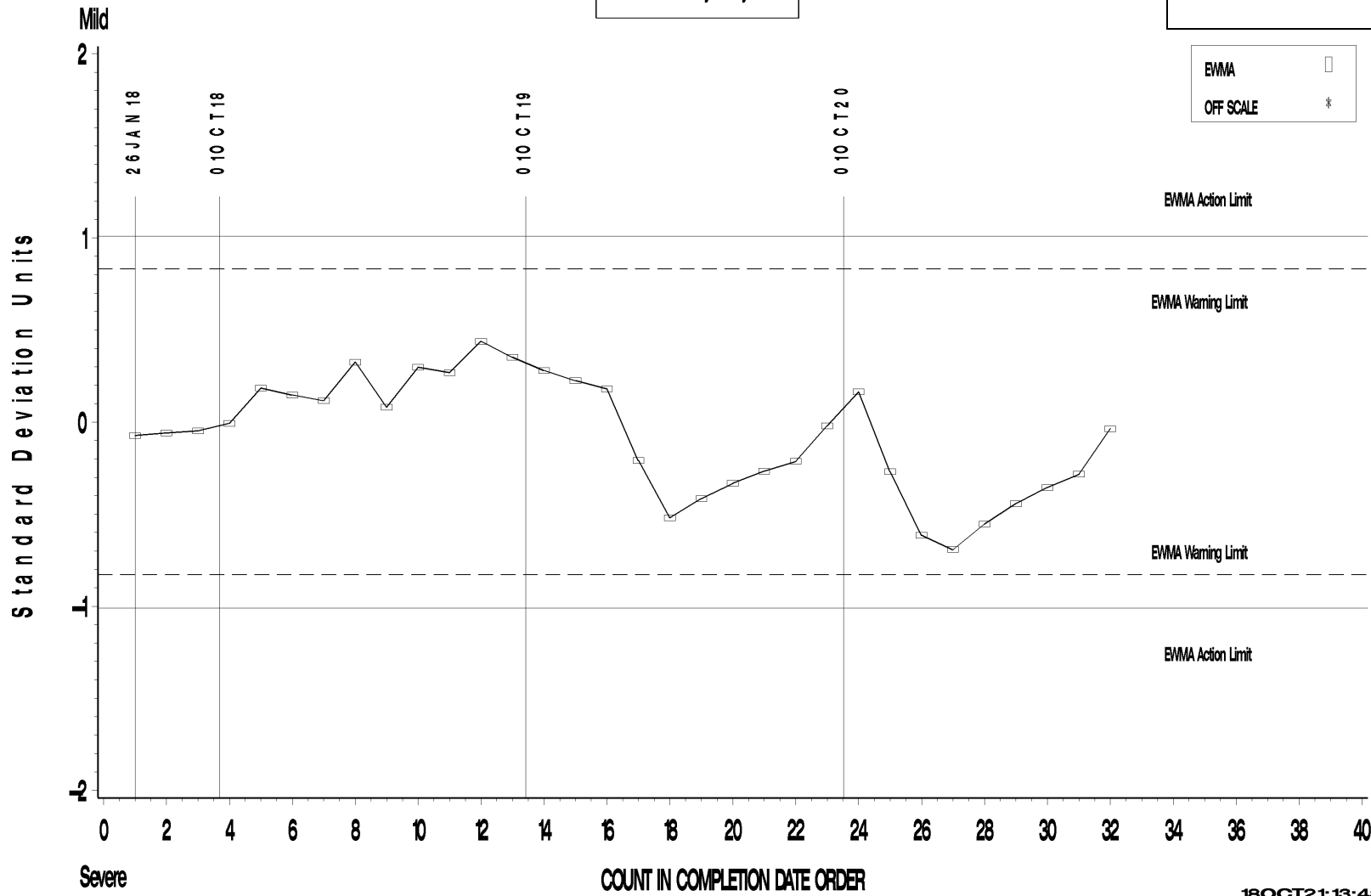
www.astmtmc.org
412-365-1000

L-37-1 (D8165)

L-37-1 NONLUBRITED INDUSTRY OPERATIONALLY VALID DATA
FINAL PINION GEAR PITTING/SPALLING

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.

LTMS Severity Analysis



EWMA □
OFF SCALE *

EWMA Action Limit
EWMA Warning Limit
EWMA Warning Limit
EWMA Action Limit



Test Monitoring Center

203 Armstrong Drive, Freeport, PA 16229, USA

www.astmtmc.org
412-365-1000

18OCT21: 13:43

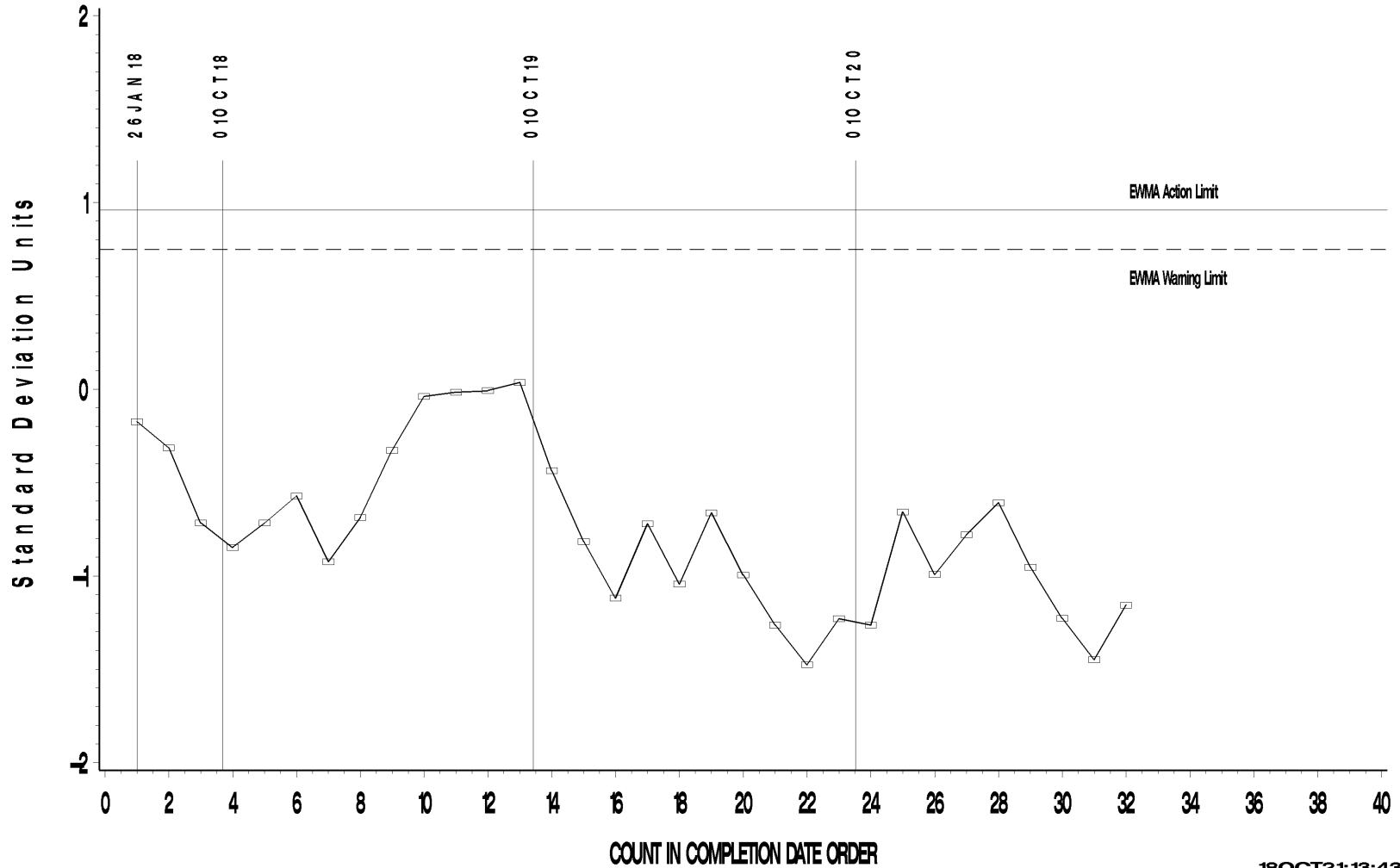
L-37-1 (D8165)

L-37-1 NONLUBRITED INDUSTRY OPERATIONALLY VALID DATA

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. Two 152-2 results (129856, and 138440) were also omitted.



18OCT21:13:43



Test Monitoring Center

203 Armstrong Drive, Freeport, PA 16229, USA

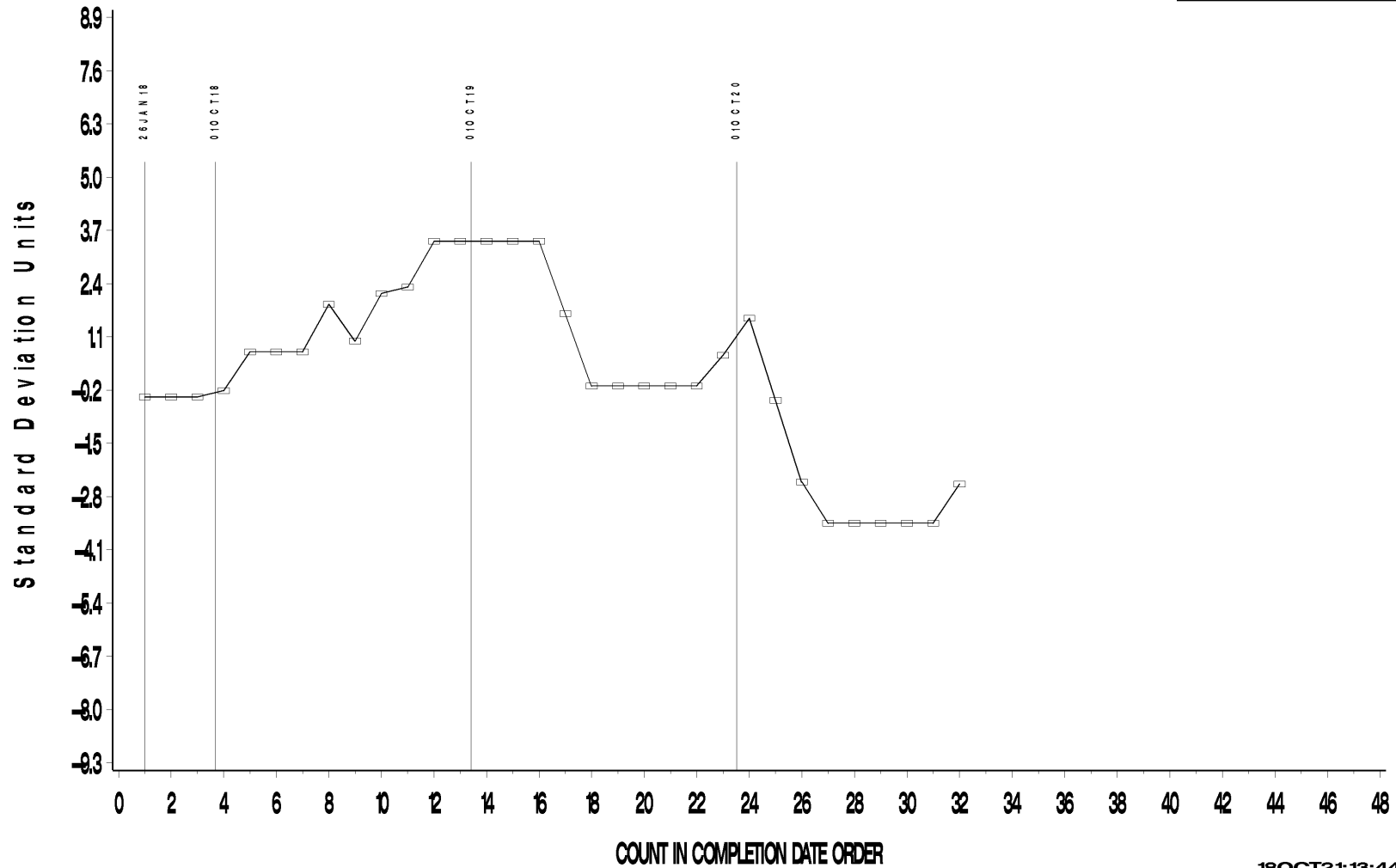
www.astmtmc.org
412-365-1000

L-37-1 (D8165)

L-37-1 NONLUBRICATED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR PITTING/SPALLING

CUSUM Severity Analysis



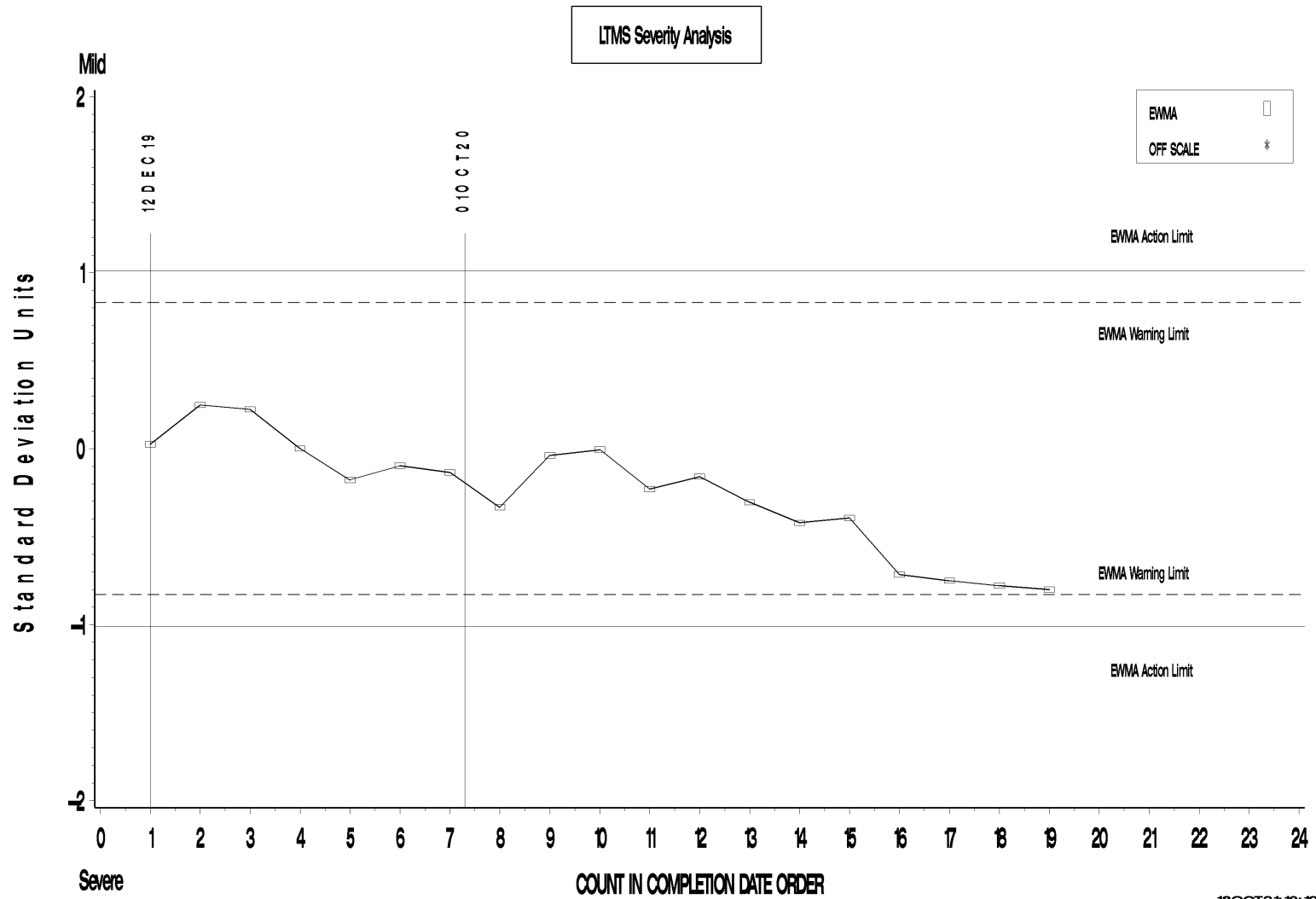
Results for 155-1 reference oil were not included in this SPIT charts based on the current targets for the oil leading to undefined calculations. Two 152-2 results (129856, and 138440) were also omitted.



L-37-1 (D8165)

L-37-1 LUBRITED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR WEAR



18OCT21 10:19



Test Monitoring Center

203 Armstrong Drive, Freeport, PA 16229, USA

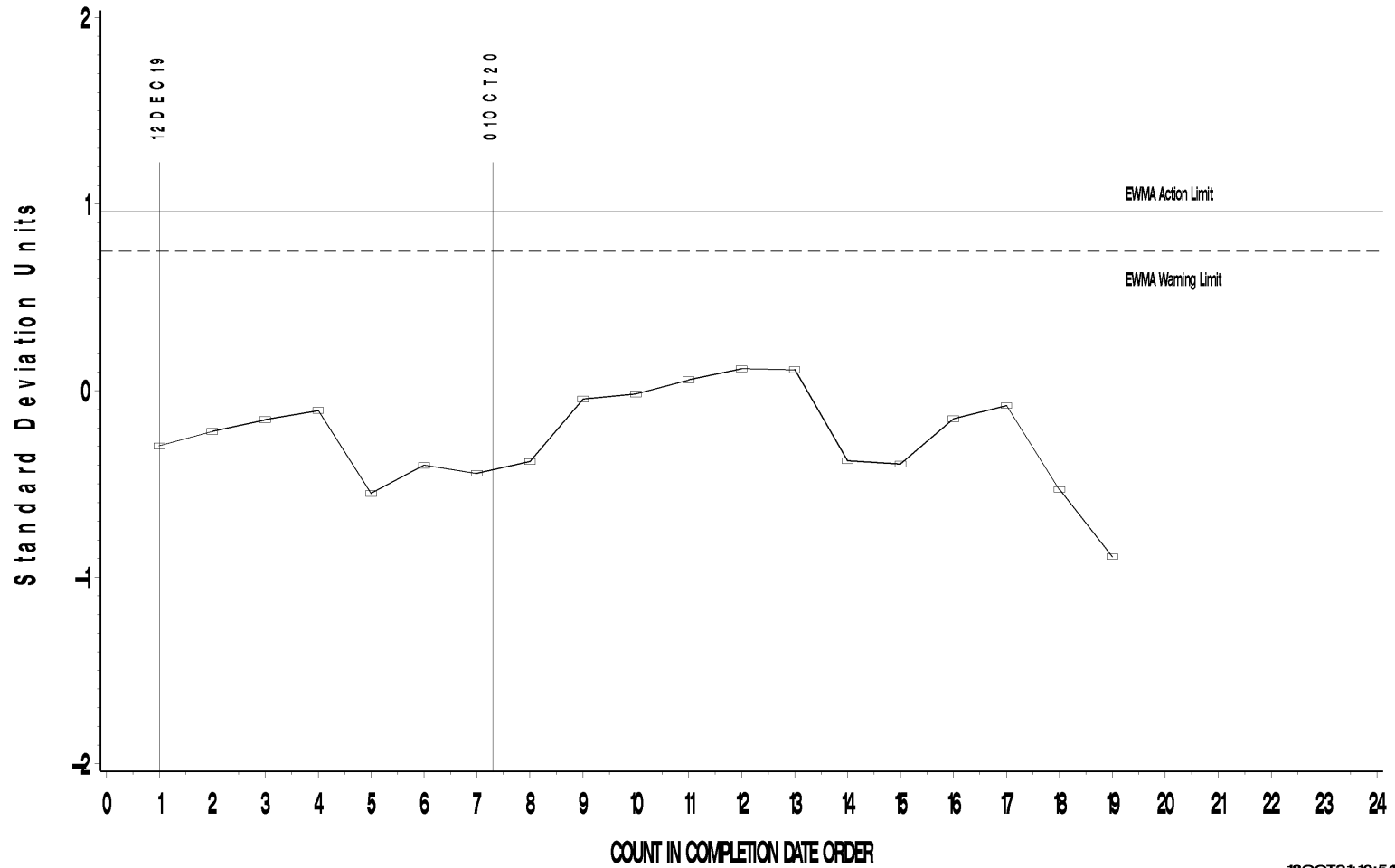
www.astmtmc.org
412-365-1000

L-37-1 (D8165)

L-37-1 LUBRITED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR WEAR

LTMS Precision Analysis



18OCT21 10:54



Test Monitoring Center

203 Armstrong Drive, Freeport, PA 16229, USA

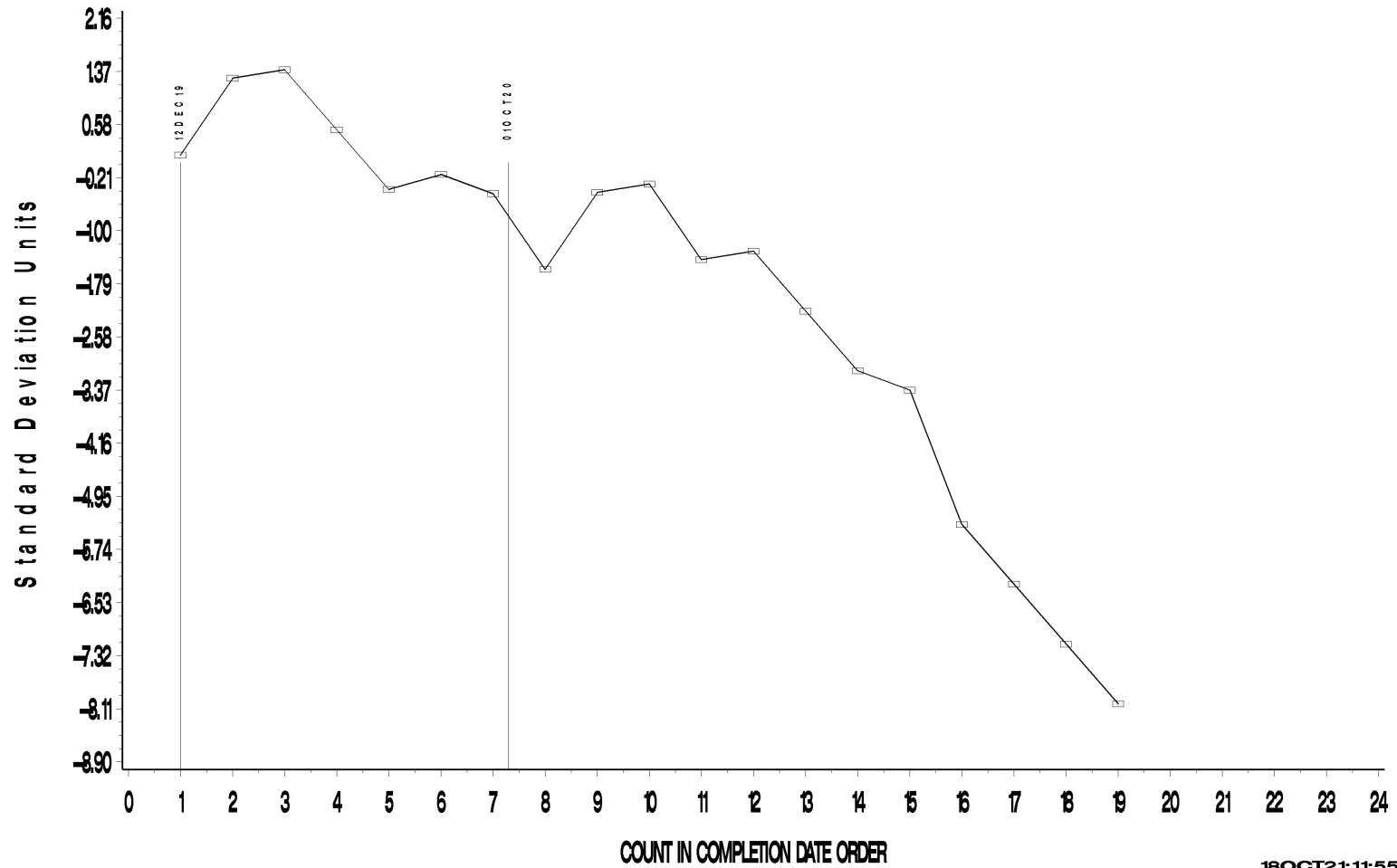
www.astmtmc.org
412-365-1000

L-37-1 (D8165)

L-37-1 LUBRITED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR WEAR

CUSUM Severity Analysis



18OCT21:11:55



Test Monitoring Center

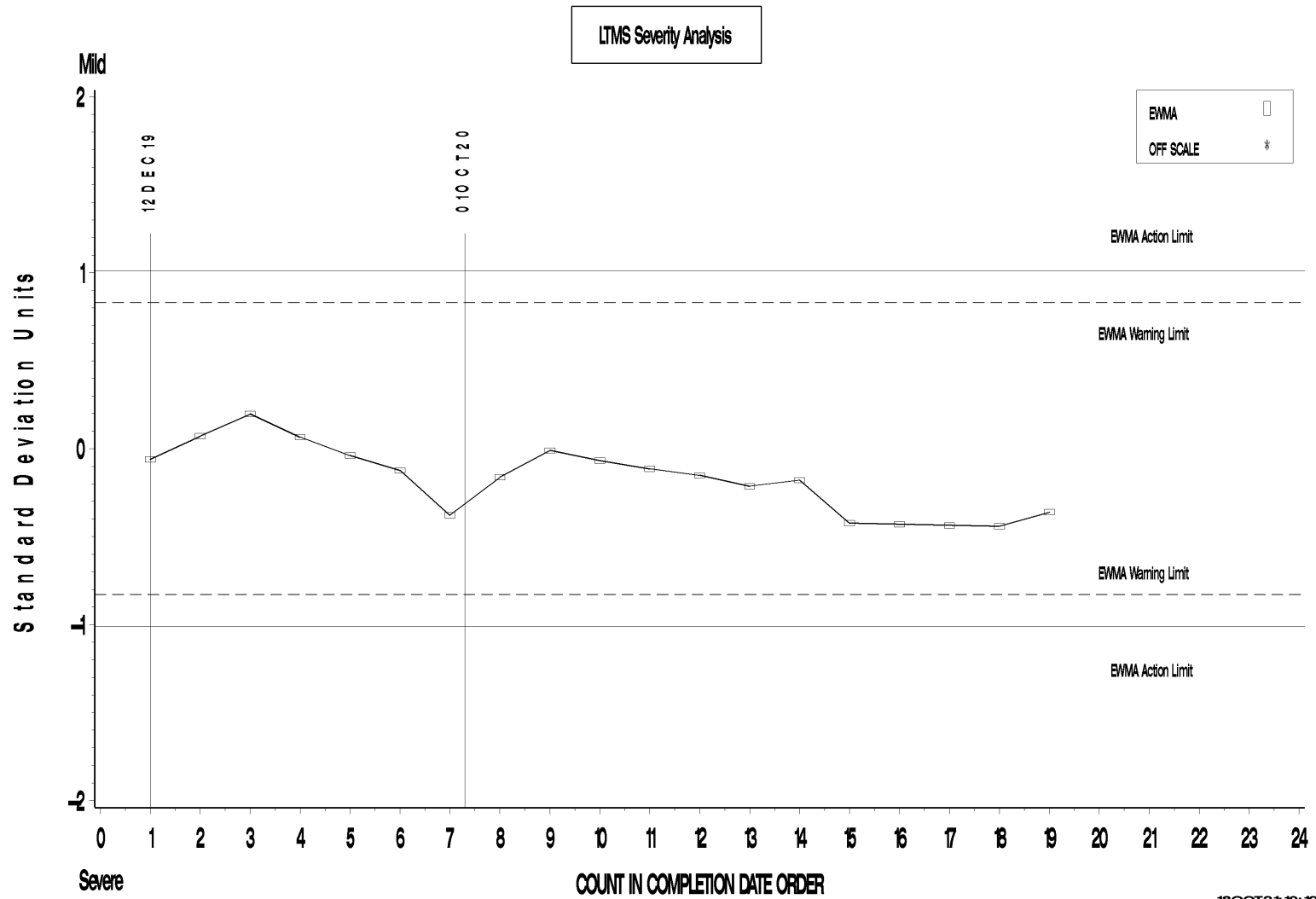
203 Armstrong Drive, Freeport, PA 16229, USA

www.astmtmc.org
412-365-1000

L-37-1 (D8165)

L-37-1 LUBRICATED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR RIDGING



Test Monitoring Center

203 Armstrong Drive, Freeport, PA 16229, USA

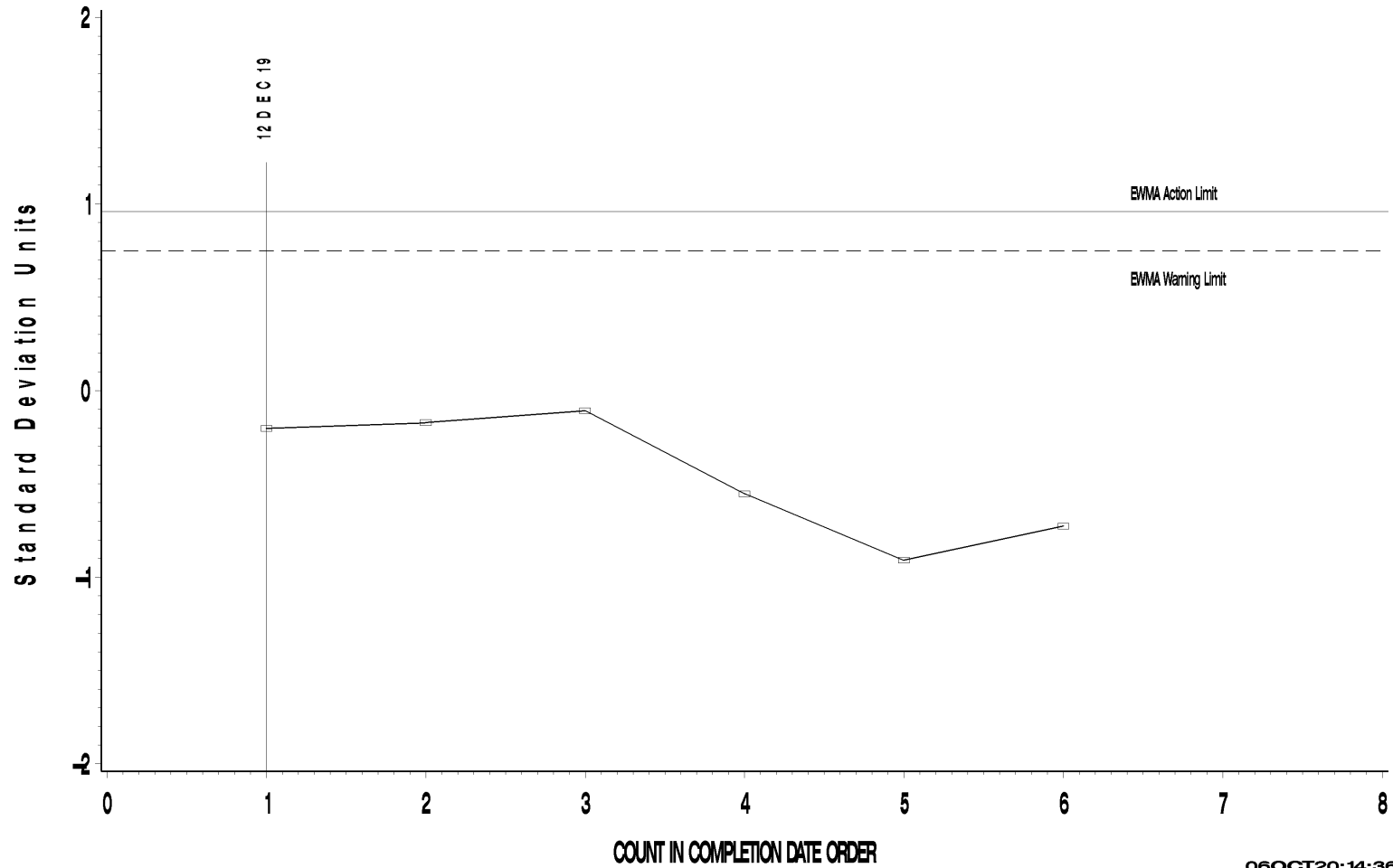
www.astmtmc.org
412-365-1000

L-37-1 (D8165)

L-37-1 LUBRITED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR RIDGING

LTMS Precision Analysis



Test Monitoring Center

203 Armstrong Drive, Freeport, PA 16229, USA

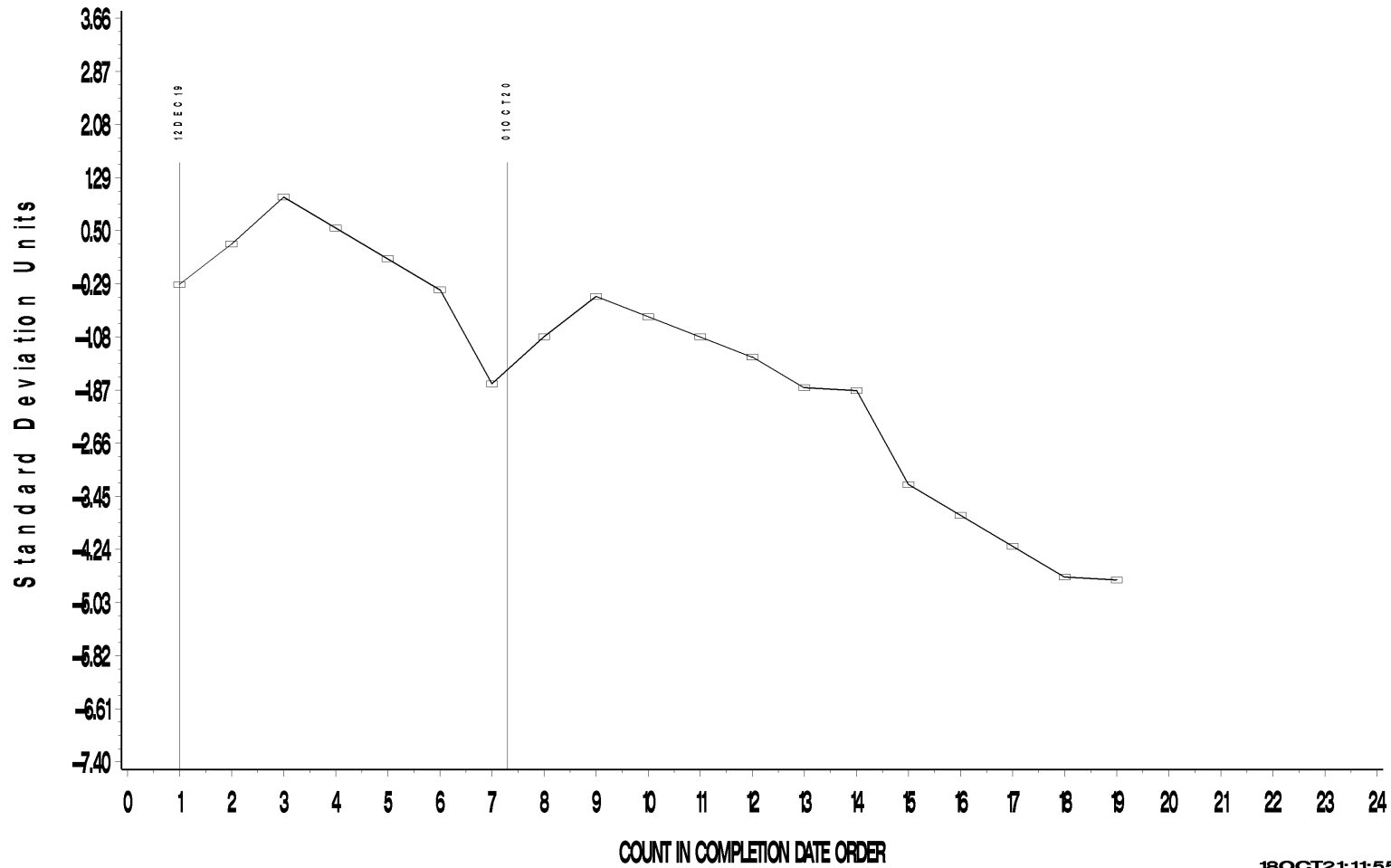
www.astmtmc.org
412-365-1000

L-37-1 (D8165)

L-37-1 LUBRITED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR RIDGING

CUSUM Severity Analysis



18OCT21:11:55 v



Test Monitoring Center

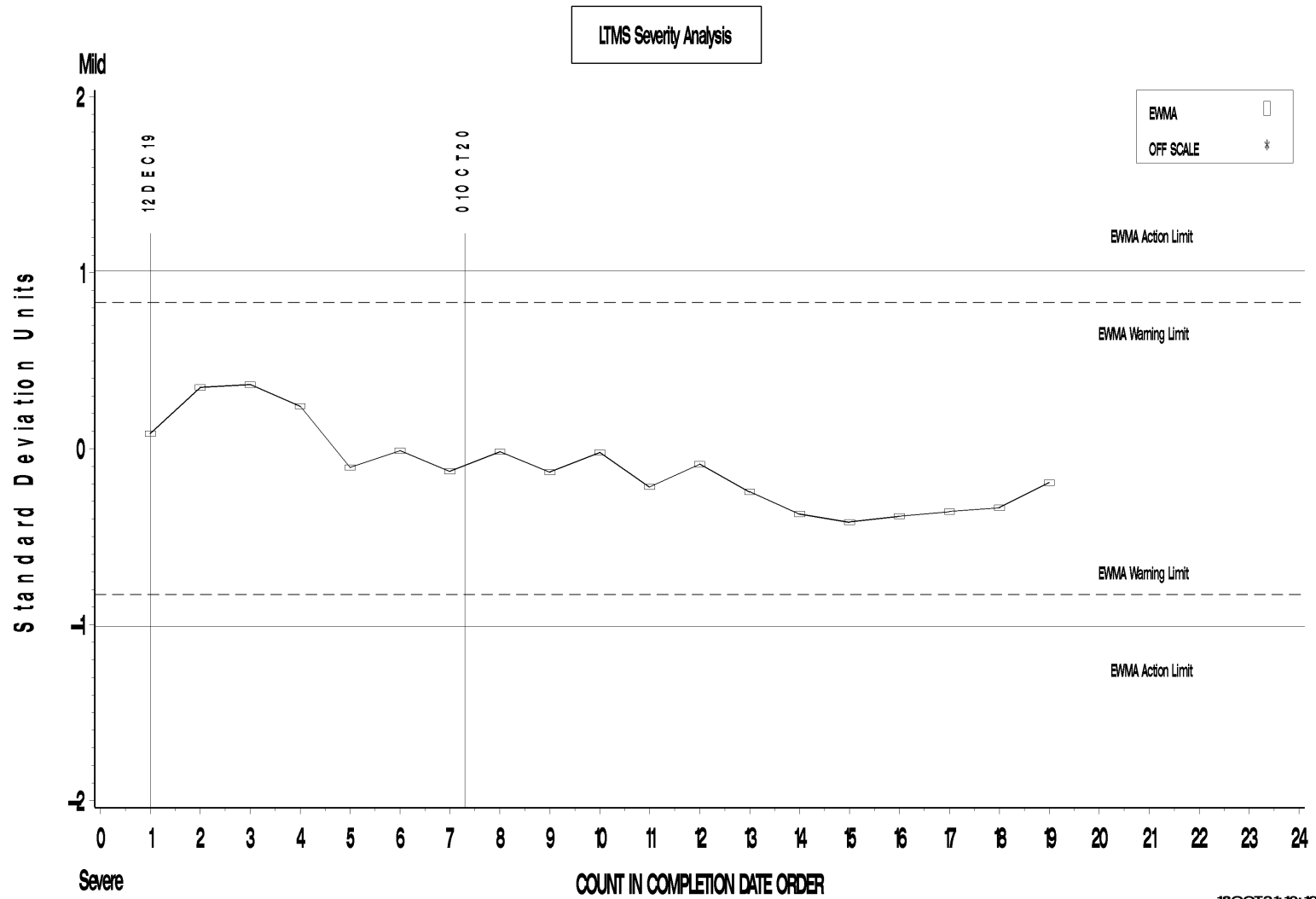
203 Armstrong Drive, Freeport, PA 16229, USA

www.astmtmc.org
412-365-1000

L-37-1 (D8165)

L-37-1 LUBRITED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR RIPPING



Test Monitoring Center

203 Armstrong Drive, Freeport, PA 16229, USA

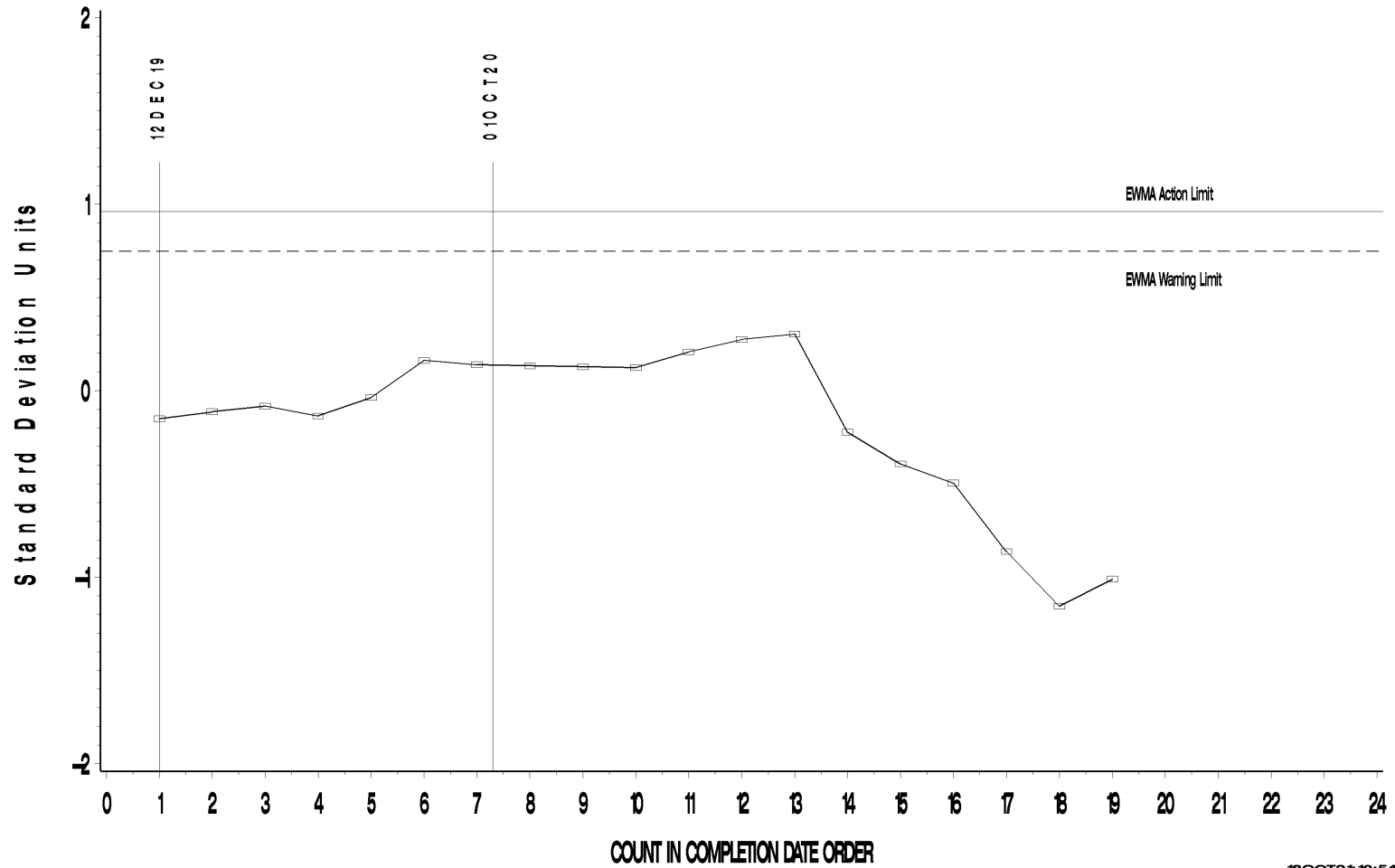
www.astmtmc.org
412-365-1000

L-37-1 (D8165)

L-37-1 LUBRITED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR RIPPLING

LTMS Precision Analysis



18OCT21:10:54



Test Monitoring Center

203 Armstrong Drive, Freeport, PA 16229, USA

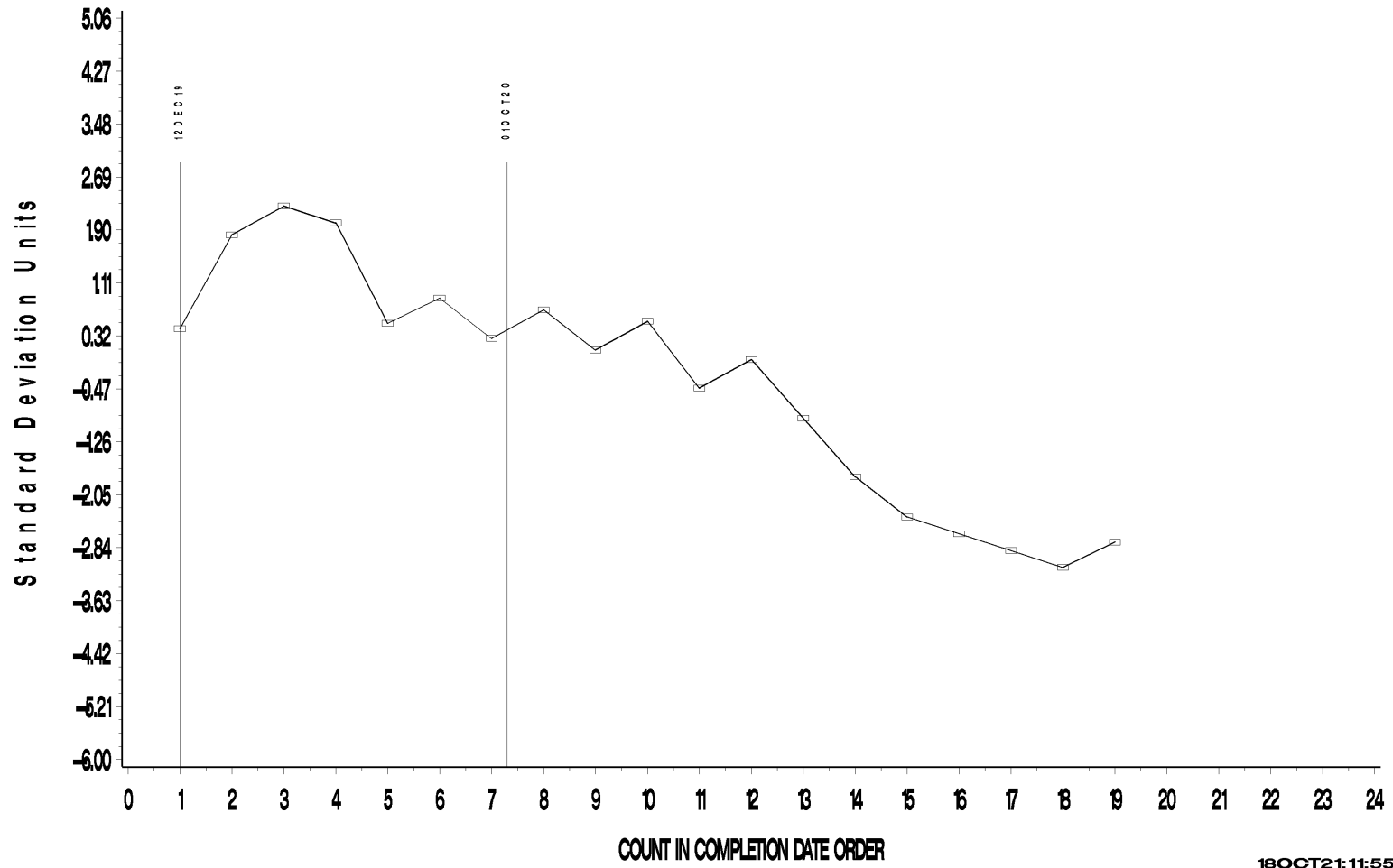
www.astmtmc.org
412-365-1000

L-37-1 (D8165)

L-37-1 LUBRITED INDUSTRY OPERATIONALLY VALID DATA

FINAL PINION GEAR RIPPLING

CUSUM Severity Analysis



18OCT21:11:55



Test Monitoring Center

203 Armstrong Drive, Freeport, PA 16229, USA

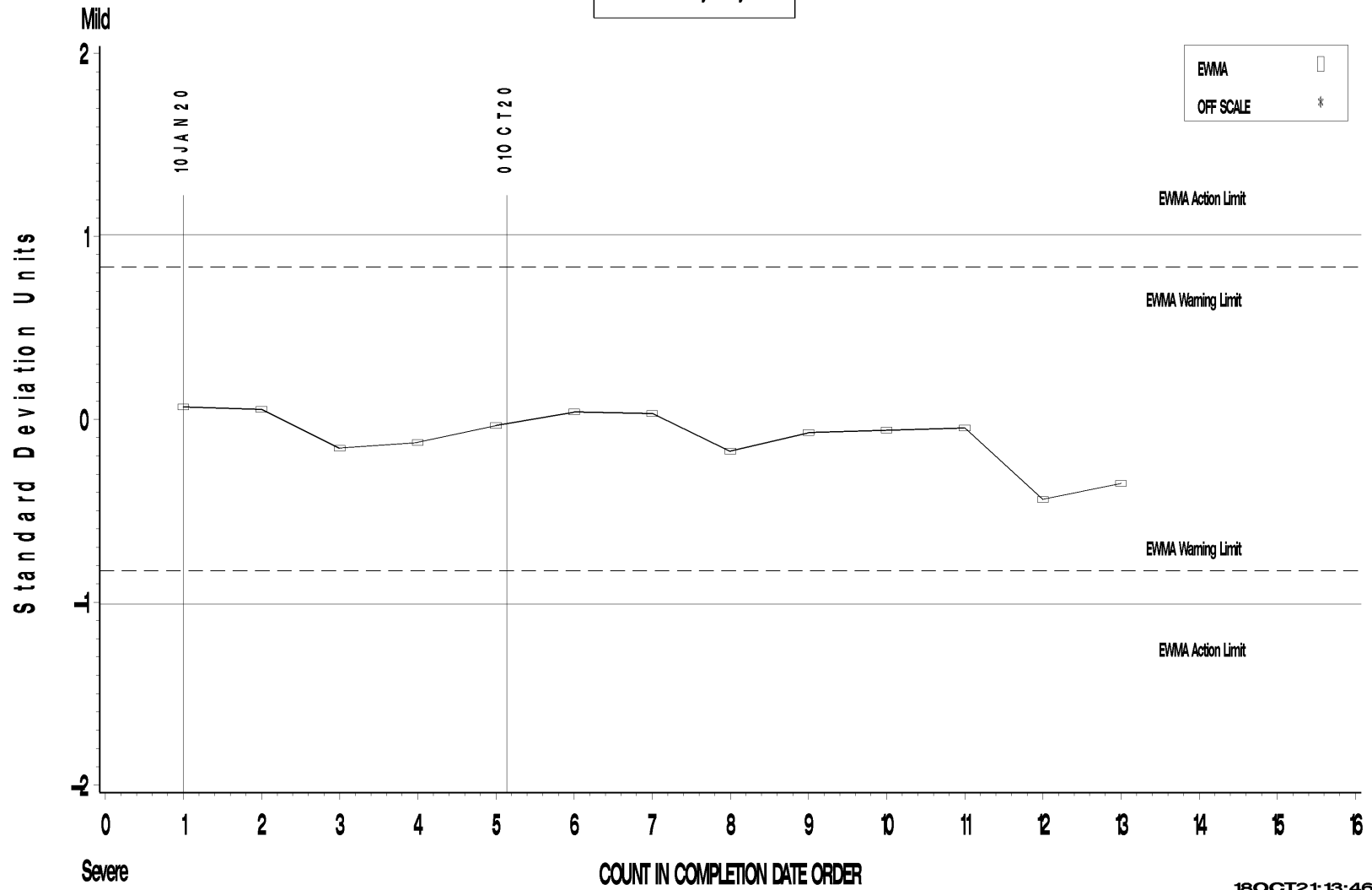
www.astmtmc.org
412-365-1000

L-37-1 (D8165)

L-37-1 LUBRICATED INDUSTRY OPERATIONALLY VALID DATA
FINAL PINION GEAR PITTING/SPALLING

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

LTMS Severity Analysis



EWMA □
OFF SCALE *

EWMA Action Limit
EWMA Warning Limit
EWMA Warning Limit
EWMA Action Limit

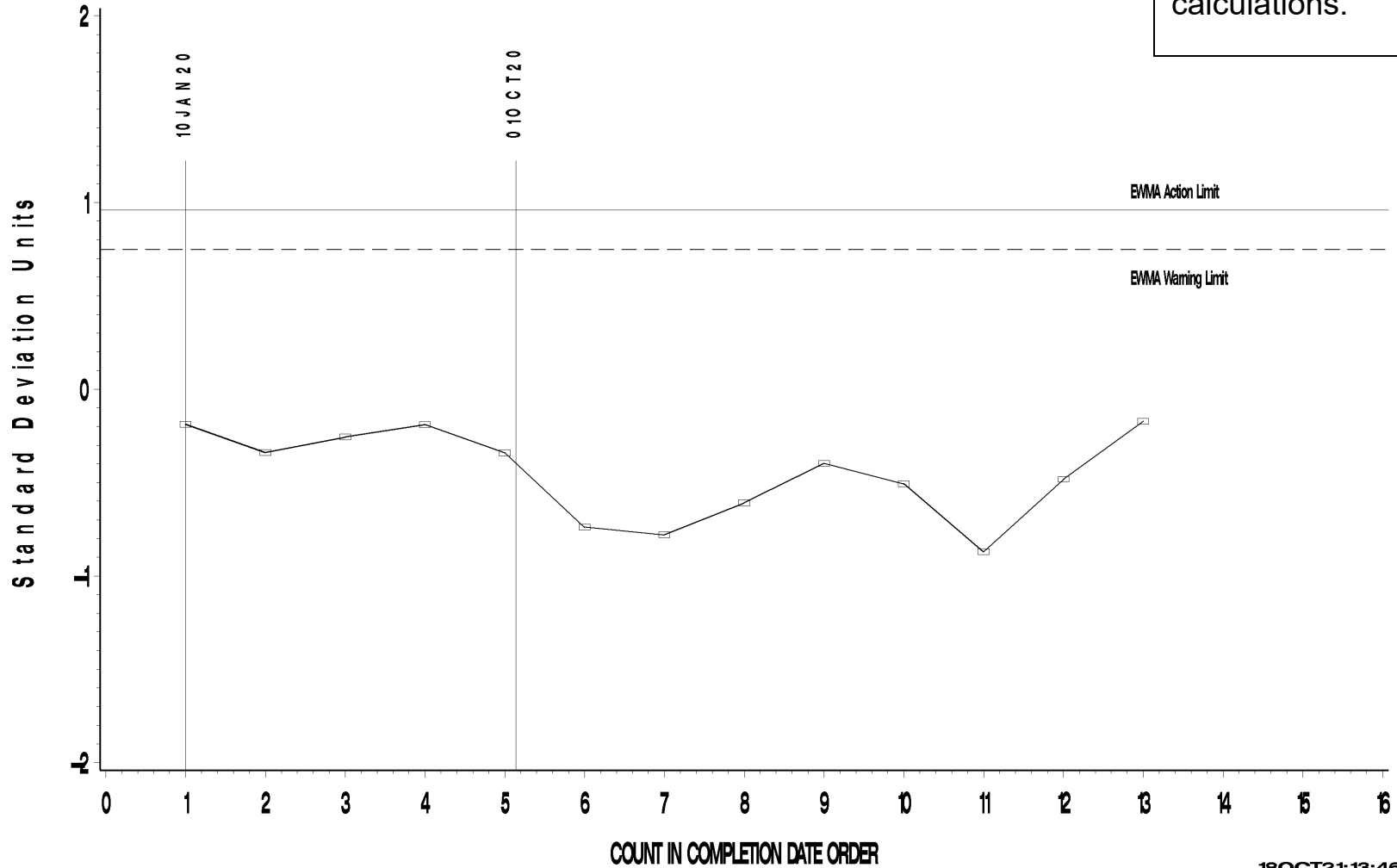


L-37-1 (D8165)

L-37-1 LUBRICATED INDUSTRY OPERATIONALLY VALID DATA
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.



18OCT21:13:46



Test Monitoring Center

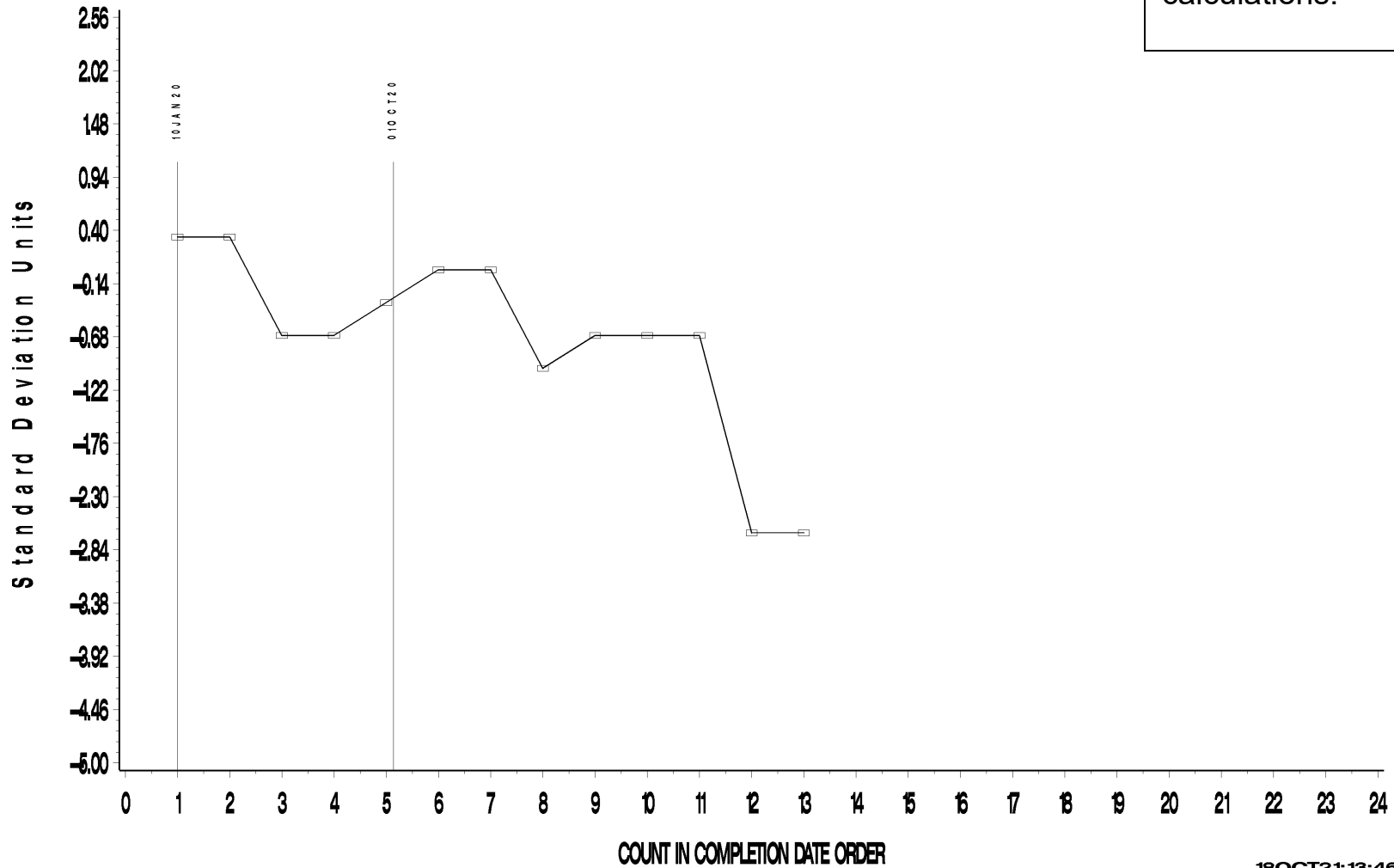
203 Armstrong Drive, Freeport, PA 16229, USA

www.astmtmc.org
412-365-1000

L-37-1 (D8165)

L-37-1 LUBRITED INDUSTRY OPERATIONALLY VALID DATA
FINAL PINION GEAR PITTING/SPALLING

CUSUM Severity 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.



L-37-1 (D8165)

TIMELINE ADDITIONS

Effective Date	Information Letter	Event
		No timeline events occurred during this reporting period.

LAB VISITS

No lab visits were conducted during this reporting period.

L-37-1 (D8165)

INFORMATION LETTERS

No information letters were issued during this period.

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	
		Cans	Gallons
117	9	293	293.0
118	3	0	0.0
134	1	0	0.0
134-1	27	129	129.0
152-2	34	56	56.0
155	5	27	27.5
155-1	28	32	32.8
Total	107	537	538.3

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 30.2 gal) for use in that test.

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